



October 04, 2016

Ms. Laurie Losey
MJW Technical Services
15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Re: Soil Radioisotopes
Work Order: 405235

Dear Ms. Losey:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on September 06, 2016. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4422.

Sincerely,

Jake Crook
Project Manager

Purchase Order: GELP15-0894
Chain of Custody: NYSERDA-29 and NYSERDA-31
Enclosures



MJW Technical Services
Soil Radioisotopes
SDG: 405235

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Continuing Calibration Data.....	5709
Background and Efficiency Data.....	5752
RAD Standards Traceability.....	5761
Runlogs.....	5785

Case Narrative

**Case Narrative
for
MJW Technical Services
SDG: 405235**

October 04, 2016

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample Receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on September 06, 2016 for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
405235001	4.1.B.R.1.2
405235002	4.1.B.R.1.3
405235003	4.1.B.R.1.4
405235004	4.1.B.R.7.2
405235005	4.1.C.R.1.3
405235006	4.1.C.R.1.4
405235007	4.1.C.R.2.3
405235008	4.1.C.R.2.4
405235009	4.1.D.R.1.3
405235010	4.1.D.R.1.4
405235011	4.1.D.R.3.2
405235012	4.1.D.R.2.4
405235013	4.2A.R.2.3
405235014	4.2A.R.1.3
405235015	4.2A.R.1.4
405235016	4.2A.R.2.4
405235017	4.2A.R.3.2
405235018	4.2A.R.4.2
405235019	4.2B.R.2.4
405235020	4.2B.R.1.4
405235021	4.2B.R.2.3
405235022	4.2B.R.1.3
405235023	4.2B.R.11.2
405235024	4.2B.R.2.2
405235025	4.2B.R.1.2
405235026	4.2C.R.1.3
405235027	4.2C.R.1.4
405235028	4.3.AR1.3
405235029	4.3.B.R.1.3

405235030	4.3A.R.2.3
405235031	4.3.BR19.2
405235032	4.3B.R.3.3
405235033	4.3B.R.3.4
405235034	4.3.B.R.1.4
405235035	4.3B.R.2.3
405235036	4.3B.R.2.4
405235037	4.4C.R.2.4
405235038	4.4C.R.1.3
405235039	4.4C.R.1.4
405235040	4.4D.R.1.3
405235041	4.4D.R.1.4
405235042	4.4D.R.2.3
405235043	4.4D.R.2.4
405235044	4.4D.R.4.2
405235045	4.4D.R.5.2
405235046	4.5A.R.1.3
405235047	4.5A.R.1.4
405235048	4.5B.R.1.2
405235049	4.5B.R.1.3
405235050	4.5B.R.1.4
405235051	4.5B.R.2.3
405235052	4.5B.R.2.4
405235053	4.5C.R.5.2
405235054	4.5C.R.1.3
405235055	4.5C.R.1.4
405235056	4.5C.R.2.2
405235057	4.5C.R.2.3
405235058	4.5C.R.2.4
405235059	5.1A.R.1.2
405235060	5.1A.R.1.3
405235061	5.1B.R.2.2
405235062	5.2.A.R.1.2
405235063	5.2.A.R.1.3
405235064	5.2.A.R.1.4
405235065	5.2.A.R.2.3
405235066	5.2.A.R.2.4
405235067	5.2.A.R.6.2
405235068	5.2.A.R.4.2
405235069	5.2.B.R.1.4
405235070	5.2.B.R.3.2
405235071	5.2.B.R.4.2
405235072	5.2.B.R.2.4
405235073	5.2.B.R.8.2
405235074	5.3.A.R.1.3
405235075	5.4A.R.1.3
405235076	5.4A.R.4.2
405235077	5.5A.R.1.3
405235078	5.6A.R.1.3

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Radiochemistry.



Jake Crook
Project Manager

List of current GEL Certifications as of 04 October 2016

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA160006
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-16-11
Utah NELAP	SC000122016-20
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Chain of Custody and Supporting Documentation

GEL Chain of Custody and Analytical Request

GEL Laboratories, LLC
 2040 Savage Road
 Charleston, SC 29407
 Phone: (843) 556-8171
 Fax: (843) 766-1178

Project #: N/A
 GEL Quote #: N/A
 COC Number (1): NYSERDA-29
 PO Number: N/A
 GEL Work Order Number: 4052357

Client Name: MJW TECHNICAL SERVICES Phone #: 716.372.5300
 Project/Site Name: NYSERDA Fax #: 716.372.5307

Address: 243 ROOT ST. SUITE 100, OLEANN, NY 14760
 Collected by: LOUIKER Send Results To: LAURIE LOSEY

Sample ID <small>* For composites - indicate start and stop date/time</small>	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (h)	Field Filtered (h)	Sample Matrix (h)	Should this sample be considered:		Total number of containers	Sample Analysis Requested (5) (Fill in the number of containers for each test)	Preservative Type (6)	Comments
						Radioactive	TSCA Regulated				
4.1.B.R.1.2	12/10/15	1420	N	NO	SO	N	N	1			
4.1.B.R.1.3	12/10/15	1430	N	NO	SO	N	N	1			
4.1.B.R.1.4	12/10/15	1435	N	NO	SO	N	N	1			
4.1.B.R.7.2	12/19/15	1400	N	NO	SO	N	N	1			
4.1.C.R.1.3	12/10/15	1315	N	NO	SO	N	N	1			
4.1.C.R.1.4	12/10/15	1325	N	NO	SO	N	N	1			
4.1.C.R.2.3	12/10/15	1355	N	NO	SO	N	N	1			
4.1.C.R.2.4	12/10/15	1405	N	NO	SO	N	N	1			
4.1.D.R.1.3	12/10/15	1030	N	NO	SO	N	N	1			
4.1.D.R.1.4	12/10/15	1035	N	NO	SO	N	N	1			

TAT Requested: Normal: Rush: Specify: (Subject to Surcharge) Fax Results: Yes / No Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4
 Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards
NO KNOWN HAZARDS, PLEASE HOLD FOR POTENTIAL FURTHER ANALYSIS.

Chain of Custody Signatures				Sample Shipping and Delivery Details			
Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time	GEL PM:	
<u>[Signature]</u>	<u>12/16</u>	<u>1400</u>	<u>[Signature]</u>	<u>9/16/16</u>	<u>9:30</u>		
						Method of Shipment:	Date Shipped:
						Airbill #:	
						Airbill #:	

1.) Chain of Custody Number = Client Determined
 2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
 3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
 4.) Matrix Codes: DW=Drinking Water, CW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, SO=Soil, SD=Sediment, ST=Sediment, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=Nasal
 5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
 6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank

For Lab Receiving Use Only
 Custody Seal Intact?
 YES NO
 Cooler Temp: C

Page: 2 of 3
 Project #: N/A
 GEL Quote #: N/A
 COC Number (1): NYSERDA-29
 PO Number: N/A

GEL Chain of Custody and Analytical Request
 GEL Work Order Number: _____
 Client Name: MJW TECHNICAL SERVICES Phone #: 716 372 5300
 Project/Site Name: NYSEANDA Fax #: 716 372 5307
 Address: 243 ROOT ST, SUITE 100, CLEAN, NY 14160
 Collected by: LOU HENRY Send Results To: LARAE LOSEY

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (b)	Field Filtered (c)	Sample Matrix (d)	Should this sample be considered:		Total number of containers	Sample Analysis Requested (5) (Fill in the number of containers for each test)	Preservative Type (6)	Comments
						Radioactive	TSCA Regulated				
4.1.D.R.3.2	12/9/15	1013	N	NO	SO			1			
4.1.D.R.2.4	12/10/15	1125									EXPANDED
4.2.A.R.2.3	12/8/15	1123									
4.2.A.R.1.3	12/8/15	1049									
4.2.A.R.1.4	12/8/15	1056									
4.2.A.R.2.4	12/8/15	1129									
4.2.A.R.3.2	12/2/15	1002									
4.2.A.R.4.2	12/2/15	1019									
4.2.B.R.2.4	12/8/15	1430									
4.2.B.R.1.4	12/8/15	1350									

TAT Requested: Normal: Rush: _____ Specify: _____ (Subject to Surcharges) Fax Results: Yes / No
 Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4
 Sample Collection Time Zone: Eastern Pacific Other
 Remarks: NO KNOWN HAZARDS. PLEASE HOLD FOR POTENTIAL FURTHER ANALYSIS.

Chain of Custody Signatures			Sample Shipping and Delivery Details		
Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
	9/2/16	1400	<u>3</u>	9/6/16	9:30

GEL PM: _____ Method of Shipment: _____ Date Shipped: _____
 Airbill #: _____
 Airbill #: _____

For Lab Receiving Use Only
 Custody Seal Intact? YES NO
 Cooler Temp: C

1.) Chain of Custody Number = Client Determined
 2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
 3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
 4.) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=Nasal
 5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
 6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank
 PINK = CLIENT

GEL Chain of Custody and Analytical Request

GEL Laboratories, LLC
 2040 Savage Road
 Charleston, SC 29407
 Phone: (843) 556-8171
 Fax: (843) 766-1178

Page: 3 of 3
 Project #: N/A
 GEL Quote #: N/A
 COC Number (1): NYSEK0DA-27
 PO Number: N/A

GEL Work Order Number:

Client Name: MJW TECHNICAL SERVICES Phone #: 716.372.5300

Project/Site Name: NYSEK0DA Fax #: 716.372.5307

Address: 243 ROOT ST, SUITE 100, OLEON, NY 14760

Collected by: ROBERT Send Results To: LAVINE LOSEY

Sample Analysis Requested (5) (Fill in the number of containers for each test)

Sample ID	Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (1)	Field Filtered (2)	Sample Matrix (6)	Should this sample be considered:		Total number of containers	Preservative Type (6)	Comments
						Radioactive	TSCA Regulated			
4-2B.R.2.1.3	12/8/15	1417	N	NO	SO	N		1		Note: extra sample is required for sample specific QC
4-2B.R.1.1.3	12/8/15	1343	J	↓	↓	↓		1		
4-2B.R.1.1.2	12/12/15	1040	J	↓	↓	↓		1		
4-2B.R.2.2.2	12/8/15	1413	J	↓	↓	↓		1		

Sample Analysis Requested (5) (Fill in the number of containers for each test)

Sample ID	Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (1)	Field Filtered (2)	Sample Matrix (6)	Should this sample be considered:		Total number of containers	Preservative Type (6)	Comments
						Radioactive	TSCA Regulated			
4-2B.R.2.1.3	12/8/15	1417	N	NO	SO	N		1		Note: extra sample is required for sample specific QC
4-2B.R.1.1.3	12/8/15	1343	J	↓	↓	↓		1		
4-2B.R.1.1.2	12/12/15	1040	J	↓	↓	↓		1		
4-2B.R.2.2.2	12/8/15	1413	J	↓	↓	↓		1		

TAT Requested: Normal: Rush: Specify: (Subject to Surcharge) Fax Results: Yes / No Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards
NO KNOWN HAZARDS PLEASE HAND FOR POTENTIAL FURTHER ANALYSIS.

Sample Collection Time Zone: Eastern Pacific Other

Chain of Custody Signatures		Sample Shipping and Delivery Details	
Relinquished By (Signed)	Date	Received by (signed)	Date
	9/12/16 1400		9/16/16 9:30

GEL PM: Method of Shipment: Date Shipped:

Airbill #:

Airbill #:

For Lab Receiving Use Only
 Custody Seal Intact? YES
 Cooler Temp: C

1.) Chain of Custody Number = Client Determined
 2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
 3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
 4.) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=Nasal
 5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
 6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank

WHITE = LABORATORY
 YELLOW = FILE
 PINK = CLIENT

Appendix C – Analytical Methodology

Analytical Parameter	Method	MDC	Units
Standard Analysis			
Gross Alpha	EPA 900.0 Mod/SW	4	pci/g
Gross Beta (Nonvolatile Beta)	EPA 900.0 Mod/SW	10	pci/g
Gamma Scan	DOE HASL 300 4.5.2.3/Ga-01-R	0.1 (Cs-137 Only)	pci/g
Expanded Analysis			
Am-241,Cm-242,Cm-243/244,Cm-245/246	DOE HASL 300 Am-05-RC Mod	1	pci/g
C-14	EPA EERF C-01 Mod	2	pci/g
I-129	DOE HASL 300 I-01	1	pci/g
Np-237	DOE HASL 300	1	pci/g
Pu-238, 239/240	DOE HASL 300 Pu-11-RC Mod	1	pci/g
Pu-241	DOE HASL 300 Pu-11-RC Mod	15	pci/g
Sr-90	EPA 905.0 Mod	2	pci/g
Tc-99	DOE HASL 300 Tc-02-RC Mod	5	pci/g
U-232	DOE HASL 300 U-02-RC Mod	1	pci/g
U-233/234, U-235/236, U-238	DOE HASL 300 U-02-RC Mod	1	pci/g
H-3	EPA 906.0 Mod	6	pci/g
Th-229	DOE HASL 300 Th-01-RC Mod	1	pci/g
Th-228, Th-230, Th-232	DOE HASL 300 Th-01-RC Mod	1	pci/g
Radium 226 (20-day ingrowth)	DOE HASL 300 4.5.2.3/Ga-01-R	1	pci/g
Radium 228	DOE HASL 300 4.5.2.3/Ga-01-R	3	pci/g

Page: 1 of 1
 Project #: NYSEKDA-31
 GEL Quote #: N/A
 COC Number (1): NYSEKDA-31
 PO Number: N/A

GEL Chain of Custody and Analytical Request
 GEL Work Order Number: _____
 Client Name: MJW TECHNICAL SERVICES Phone #: 716.377.5300
 Project/Site Name: NYSEKDA Fax #: 716.372.5307
 Address: 24300TST, SUITE 100, CLEAN, NY 14760
 Collected by: LOU HENRY Send Results To: LAURIE LOSEY

Sample ID <i>* For composites - indicate start and stop date/time</i>	*Date Collected (mm-dd-yy)	*Time Collected (Military (hhmm))	QC Code (2)	Field Filtered (3)	Sample Matrix (4)	Should this sample be considered:		Total number of containers	Sample Analysis Requested (5) (Fill in the number of containers for each test)	Preservative Type (6)	Comments
						Radiactive	TSCA Regulated				
S.2.B.R.2.4	12/15/15	1335	N	NO	SW	N	N	1			Note: extra sample is required for sample specific QC
S.2.B.R.8.2	12/11/15	1335									
S.3.A.R.1.3	12/15/15	1410									
S.4.A.R.1.3	12/16/15	0931									
S.4.A.R.4.2	12/11/15	1419									
S.5.A.R.1.3	12/17/15	1330									
S.6.A.R.1.3	12/17/15	1240									

TAT Requested: Normal: Rush: _____ Specify: _____ (Subject to Surcharge) Fax Results: Yes / No
 Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4
 Sample Collection Time Zone: Eastern Pacific Other _____
 Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards
NO KNOWN HAZARDS. PLEASE HOLD FOR POTENTIAL FURTHER ANALYSIS.

Chain of Custody Signatures			Sample Shipping and Delivery Details		
Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
<i>[Signature]</i>	9/2/16	1400	<i>[Signature]</i>	9/2/16	9:30

1) Chain of Custody Number = Client Determined
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 5) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
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WHITE = LABORATORY
 YELLOW = FILE
 PINK = CLIENT
 For Lab Receiving Use Only
 Custody Seal Intact? YES NO
 Cooler Temp: C

Appendix C – Analytical Methodology

Analytical Parameter	Method	MDC	Units
Standard Analysis			
Gross Alpha	EPA 900.0 Mod/SW	4	pCi/g
Gross Beta (Nonvolatile Beta)	EPA 900.0 Mod/SW	10	pCi/g
Gamma Scan	DOE HASL 300 4.5.2.3/Ga-01-R	0.1 (Cs-137 Only)	pCi/g
Expanded Analysis			
Am-241,Cm-242,Cm-243/244,Cm-245/246	DOE HASL 300 Am-05-RC Mod	1	pCi/g
C-14	EPA EERF C-01 Mod	2	pCi/g
I-129	DOE HASL 300 I-01	1	pCi/g
Np-237	DOE HASL 300	1	pCi/g
Pu-238, 239/240	DOE HASL 300 Pu-11-RC Mod	1	pCi/g
Pu-241	DOE HASL 300 Pu-11-RC Mod	15	pCi/g
Sr-90	EPA 905.0 Mod	2	pCi/g
Tc-99	DOE HASL 300 Tc-02-RC Mod	5	pCi/g
U-232	DOE HASL 300 U-02-RC Mod	1	pCi/g
U-233/234, U-235/236, U-238	DOE HASL 300 U-02-RC Mod	1	pCi/g
H-3	EPA 906.0 Mod	6	pCi/g
Th-229	DOE HASL 300 Th-01-RC Mod	1	pCi/g
Th-228, Th-230, Th-232	DOE HASL 300 Th-01-RC Mod	1	pCi/g
Radium 226 (20-day ingrowth)	DOEHASL 300 4.5.2.3/GA-01-R	1	pCi/g
Radium 228	DOEHASL 300 4.5.2.3/GA-01-R	3	pCi/g

GEL Chain of Custody and Analytical Request

GEL Work Order Number: _____

Client Name: MJW TECHNICAL SERVICES Phone #: 716.372.5302
 Project/Site Name: NYSEROA Fax #: 716.372.5307
 Address: 243 ROOT ST., SUITE 100, OLEAN, NY 14760
 Collected by: LOU HENNY Send Results To: LAURIE ROSEN

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (b)	Field Filtered (b)	Sample Matrix (c)	Should this sample be considered:		Total number of containers	Sample Analysis Requested (5) (Fill in the number of containers for each test)	Preservative Type (6)	Comments
						Radioactive	TSCA Regulated				
4.S.B.R.1.3	12/7/15	1333	N	NO	SO	N	N	1	✓		EXAMINED
4.S.B.R.1.4	12/7/15	1342									
4.S.B.R.2.3	12/7/15	1302									
4.S.B.R.2.4	12/7/15	1311									
4.S.C.R.1.2	12/1/15	1424									
4.S.C.R.1.3	12/2/15	1451									
4.S.C.R.1.4	12/2/15	1459									
4.S.C.R.2.2	12/2/15	1450									
4.S.C.R.2.3	12/2/15	1455									
4.S.C.R.2.4	12/2/15	1500									

TAT Requested: Normal: Rush: _____ Specify: _____ (Subject to Surcharge) Fax Results: Yes / No

Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Sample Collection Time Zone: Eastern Pacific Other _____
 Central Mountain

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards
NO KNOWN HAZARDS. PLEASE HOLD FOR POTENTIAL FURTHER ANALYSIS

Chain of Custody Signatures		Sample Shipping and Delivery Details	
Relinquished By (Signed)	Date	Time	Date Shipped:
<u>[Signature]</u>	<u>12/16</u>	<u>1400</u>	

1.) Chain of Custody Number = Client Determined
 2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
 3.) Field Filtered: For liquid matrices, indicate with a Y - for yes the sample was field filtered or - N - for sample was not field filtered.
 4.) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=Nasal
 5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
 6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, if no preservative is added = leave field blank

For Lab Receiving Use Only
 Custody Seal Intact? YES NO
 Cooler Temp: C

Page: 2 of 3
 Project #: N/A
 GEL Quote #: N/A
 COC Number (1): NYS ENDA-30
 PO Number: N/A

GEL Chain of Custody and Analytical Request
 GEL Laboratories, LLC
 2040 Savage Road
 Charleston, SC 29407
 Phone: (843) 556-8171
 Fax: (843) 766-1178

GEL Work Order Number: _____
 Client Name: MSJN TECHNICAL SERVICES Phone #: 716 372 5300
 Project/Site Name: NYS ENDA Fax #: 716 372 5307
 Address: 243 ROOT ST, SUITE 100, OLEON, NY 14760
 Collected by: DOU HENRY Send Results To: LAURENCE

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (b)	Field Filtered (a)	Sample Matrix (d)	Should this sample be considered:		Total number of containers	Sample Analysis Requested (6) (Fill in the number of containers for each test)	Preservative Type (6)	Comments
						Radioactive	TSCA Regulated				
S.1A.R.1.2	12/16/15	1226	N	NO	SO	N	N	1			
S.1A.R.1.3	12/16/15	1233						1			
S.1B.R.2.2	12/14/15	1347						2			
S.2.A.R.1.2	12/14/15	1310						2			
S.2.A.R.1.3	12/14/15	1315						2			
S.2.A.R.1.4	12/14/15	1325						2			
S.2A.R.2.3	12/14/15	1350						2			
S.2A.R.2.4	12/14/15	1400						2			
S.2A.R.6.2	12/11/15	1130						1			
S.2A.R.4.2	12/11/15	1027						1			

TAT Requested: Normal: Rush: _____ Specify: (Subject to Surcharge) Fax Results: Yes / No
 Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4
 Sample Collection Time Zone: Eastern Pacific Central Other _____
 Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards
NO KNOWN HAZARDS. PLEASE HOLD FOR POTENTIAL FURTHER ANALYSIS.

Chain of Custody Signatures

Refiniquished By (Signed)	Date	Time	Received by (signed)	Date	Time
<u>[Signature]</u>	<u>9/2/16</u>	<u>1400</u>	<u>[Signature]</u>	<u>9/2/16</u>	<u>9:30</u>

GEL PM: _____ Method of Shipment: _____ Date Shipped: _____
 Airbill #: _____
 Airbill #: _____

1.) Chain of Custody Number = Client Determined
 2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
 3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
 4.) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Feecal, N=Nasal
 5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
 6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank

For Lab Receiving Use Only
 Custody Seal Intact? YES / NO
 Cooler Temp: _____

WHITE = LABORATORY
 YELLOW = FILE
 PINK = CLIENT

GEL Chain of Custody and Analytical Request

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Page: 3 of 3
Project #: N/A
GEL Quote #: N/A
COC Number (1): NYSERDA-30
PO Number: N/A

GEL Work Order Number:

Client Name: MJW TECHNICAL SERVICES Phone #: 716.372.5300

Project/Site Name: NYSERDA Fax #: 716.372.5307

Address: 243 ROOT ST, SUITE 100, OLEAN, NY 14760

Collected by: LOU HENRY Send Results To: LAURIE LOSEY

Sample ID

* For composites - indicate start and stop date/time

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (1)	Field Filtered (2)	Sample Matrix (4)
5.2.B.R.1.4	12/11/15	1245	N	NO	SO
5.2.B.R.3.2	12/11/15	1610		↓	↓
5.2.B.R.4.2	12/11/15	1025		↓	↓

Sample Analysis Requested (5) (Fill in the number of containers for each test)

Should this sample be considered:	Total number of containers						Preservative Type (6)	Comments
	Radioactive	TSCA Regulated	1	2	3	4		
	N	N	1					Note: extra sample is required for sample specific QC
			1					
			1					

TAT Requested: Normal: ✓ Rush: ✓ Specify: (Subject to Surchage) Fax Results: ✓ Yes / No Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards
NO KNOWN HAZARDS. PLEASE HOLD FOR POTENTIAL FURTHER ANALYSIS

Sample Collection Time Zone
Eastern Pacific
Central Other
Mountain

Chain of Custody Signatures

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
	9/2/16	1400		9/6/16	9:30

Sample Shipping and Delivery Details

GEL PM:
Method of Shipment: Date Shipped:
Airbill #: Airbill #:

For Lab Receiving Use Only
Custody Seal Intact?
YES NO
Cooler Temp:
C

1.) Chain of Custody Number = Client Determined
2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
3.) Field Filtered: For liquid matrices, indicate with a -Y- for yes the sample was field filtered or -N- for sample was not field filtered.
4.) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=Nasal
5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

WHITE = LABORATORY
YELLOW = FILE
PINK = CLIENT

Appendix C – Analytical Methodology

Analytical Parameter	Method	MDC	Units
Standard Analysis			
Gross Alpha	EPA 900.0 Mod/SW	4	pCi/g
Gross Beta (Nonvolatile Beta)	EPA 900.0 Mod/SW	10	pCi/g
Gamma Scan	DOE HASL 300 4.5.2.3/Ga-01-R	0.1 (Cs-137 Only)	pCi/g
Expanded Analysis			
Am-241,Cm-242,Cm-243/244,Cm-245/246	DOE HASL 300 Am-05-RC Mod	1	pCi/g
C-14	EPA EERF C-01 Mod	2	pCi/g
I-129	DOE HASL 300 I-01	1	pCi/g
Np-237	DOE HASL 300	1	pCi/g
Pu-238, 239/240	DOE HASL 300 Pu-11-RC Mod	1	pCi/g
Pu-241	DOE HASL 300 Pu-11-RC Mod	15	pCi/g
Sr-90	EPA 905.0 Mod	2	pCi/g
Tc-99	DOE HASL 300 Tc-02-RC Mod	5	pCi/g
U-232	DOE HASL 300 U-02-RC Mod	1	pCi/g
U-233/234, U-235/236, U-238	DOE HASL 300 U-02-RC Mod	1	pCi/g
H-3	EPA 906.0 Mod	6	pCi/g
Th-229	DOE HASL 300 Th-01-RC Mod	1	pCi/g
Th-228, Th-230, Th-232	DOE HASL 300 Th-01-RC Mod	1	pCi/g
Radium 226 (20-day ingrowth)	DOEHASL 300 4.5.2.3/GA-01-R	1	pCi/g
Radium 228	DOEHASL 300 4.5.2.3/GA-01-R	3	pCi/g

GEL Chain of Custody and Analytical Request

GEL Laboratories, LLC
 2040 Savage Road
 Charleston, SC 29407
 Phone: (843) 556-8171
 Fax: (843) 766-1178

Page: 1 of 3
 Project #: N/A
 GEL Quote #: N/A
 COC Number (1): NYSERDA-30
 PO Number: N/A

GEL Work Order Number:

Client Name: MJW TECHNICAL SERVICES Phone #: 716.372.5300

Project/Site Name: NYSERDA Fax #:

Address: 243 ROOT ST., SUITE 100, OLEAN, NY 14760

Collected by: LOU HENRY Send Results To: LAURIE LOSEY

Sample Analysis Requested (6) (Fill in the number of containers for each test)

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (2)	Field Filtered (3)	Sample Matrix (4)	Should this sample be considered:		Total number of containers	Sample number of containers for each test	Preservative Type (6)	Comments
						Radioactive	TSCA Regulated				
4.2B.R.1.2	12/8/15	1338	N	NO	SO	N	N	1			Note: extra sample is required for sample specific QC
4.2C.R.1.3	12/8/15	1015									
4.2C.R.1.4	12/8/15	1019									
4.3.A.R.1.X.3	11/23/15	1450									
4.3.B.R.1.3	11/23/15	1110									
4.3A.R.2.3	11/23/15	1444									
4.3B.R.19.2	11/24/15	1425									
4.3B.R.3.3	11/23/15	1148									
4.3B.R.3.4	11/23/15	1153									
4.3B.R.1.4	11/23/15	1120									

TAT Requested: Normal: Rush: Specify: (Subject to Surcharges) Fax Results: Yes / No No
 Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4
 Sample Collection Time Zone: Eastern Pacific Other
 Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards
NO KNOWN HAZARDS. PLEASE HOLD FOR POTENTIAL FURTHER ANALYSIS,

Chain of Custody Signatures			Sample Shipping and Delivery Details		
Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
	9/21/16	1400	<u>Speed</u>	9/16/16	9:30

GEL PM: _____
 Method of Shipment: _____ Date Shipped: _____
 Airbill #: _____
 Airbill #: _____

For Lab Receiving Use Only
 Custody Seal Intact? YES / NO
 Cooler Temp: _____

1.) Chain of Custody Number = Client Determined
 2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
 3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
 4.) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=Nasal
 5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
 6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank
WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

Page: 2 of 3
 Project #: N/A
 GEL Quote #: N/A
 COC Number (1): NYSERDA30
 PO Number: N/A

GEL Chain of Custody and Analytical Request
 GEL Work Order Number: _____

GEL Laboratories, LLC
 2040 Savage Road
 Charleston, SC 29407
 Phone: (843) 556-8171
 Fax: (843) 766-1178

Client Name: MW TECHNICAL SERVICES Phone #: 716 372-5300
 Project/Site Name: NYSERDA Fax #: 716 372-5307
 Address: 243 ROOT ST, SUITE 10, OLEAN, NY 14760
 Collected by: LOU TENRY Send Results To: LAURIE LOSET

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (6)	Field Filtered (1)	Sample Matrix (6)	Should this sample be considered:		Total number of containers	Sample Analysis Requested (6) (Fill in the number of containers for each test)	Preservative Type (6)	Comments
						Radioactive	TSCA Regulated				
4.3B.R.2.3	11/23/15	1106N	N	No	SO	N	N	1			
4.3B.R.2.4	11/23/15	1112									
4.4C.R.2.4	11/30/15	1119									
4.4C.R.1.3	11/30/15	1040									
4.4C.R.1.4	11/30/15	1043									
4.4D.R.1.3	11/30/15	1323									
4.4D.R.1.4	11/30/15	1327									
4.4D.R.2.3	11/30/15	1353									
4.4D.R.2.4	11/30/15	1359									
4.4D.R.4.2	11/30/15	1350									

TAT Requested: Normal; Rush: Specify: (Subject to Surcharge) Fax Results: Yes / No
 Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4
 Sample Collection Time Zone: Eastern Pacific Mountain
 Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards
NO KNOWN HAZARDS. PLEASE HOLD FOR POTENTIAL FURTHER ANALYSIS

Chain of Custody Signatures			Sample Shipping and Delivery Details		
Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
<u>[Signature]</u>	11/2/16	1400	<u>[Signature]</u>	9/16/16	9:30

1.) Chain of Custody Number = Client Determined
 2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
 3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
 4.) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=Nasal
 5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
 6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank

WHITE = LABORATORY
 YELLOW = FILE
 PINK = CLIENT
 For Lab Receiving Use Only
 Custody Seal Intact?
 YES
 Cooler Temp: C

GEL Chain of Custody and Analytical Request

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Page: 3 of 3
Project #: N/A
GEL Quote #: N/A
COC Number (1): NYSERDA-30
PO Number: N/A

GEL Work Order Number:

Client Name: MJW TECHNICAL SERVICES Phone #: 716 372 5300
Project/Site Name: NYSERDA Fax #: 716 372 5307
Address: 243 ROOT ST, SUITE 100, GLEN, NY 14760

Collected by: BOUHENGT Send Results To: LAURIE LOSBY

Sample Analysis Requested (6) (Fill in the number of containers for each test)

Sample ID <small>* For composites - indicate start and stop date/time</small>	Date Collected (mm-dd-yy)	Time Collected (Military) (hhmm)	QC Code (7)	Field Filtered (8)	Sample Matrix (6)	Should this sample be considered:		Total number of containers	Preservative Type (6)	Comments Note: extra sample is required for sample specific QC
						Radioactive	TSCA Regulated			
4.4.D.R.S.2	11/30/15	1415	N	N	SO			1		EXCHANGED
4.SA.R.1.3	12/7/15	1002						1		
4.SA.R.1.4	12/7/15	1010						1		
4.SB.R.1.2	12/1/15	1328						1		

TAT Requested: Normal: Rush: Specify: (Subject to Surcharge) Fax Results: Yes / No Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards
NO KNOWN HAZARDS. PLEASE HOLD FOR POTENTIAL FURTHER ANALYSIS.

Sample Collection Time Zone: Eastern Pacific Central Mountain

Chain of Custody Signatures			
Relinquished By (Signed)	Date	Time	Received by (signed)
<u>[Signature]</u>	9/2/16	1400	<u>Jared</u>
			<u>9/2/16 9:30</u>

GEL PM:	
Method of Shipment:	Date Shipped:
Airbill #:	
Airbill #:	

For Lab Receiving Use Only
Custody Seal Intact?
YES NO
Cooler Temp:
C

1.) Chain of Custody Number = Client Determined
2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
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4.) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, SO=Soil, SD=Scum, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Faecal, N=Nasal
5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, if no preservative is added = leave field blank
WHITE = LABORATORY YELLOW = FILE PINK = CLIENT

Appendix C – Analytical Methodology

Analytical Parameter	Method	MDC	Units
Standard Analysis			
Gross Alpha	EPA 900.0 Mod/SW	4	pCi/g
Gross Beta (Nonvolatile Beta)	EPA 900.0 Mod/SW	10	pCi/g
Gamma Scan	DOE HASL 300 4.5.2.3/Ga-01-R	0.1 (Cs-137 Only)	pCi/g
Expanded Analysis			
Am-241,Cm-242,Cm-243/244,Cm-245/246	DOE HASL 300 Am-05-RC Mod	1	pCi/g
C-14	EPA EERF C-01 Mod	2	pCi/g
I-129	DOE HASL 300 I-01	1	pCi/g
Np-237	DOE HASL 300	1	pCi/g
Pu-238, 239/240	DOE HASL 300 Pu-11-RC Mod	1	pCi/g
Pu-241	DOE HASL 300 Pu-11-RC Mod	15	pCi/g
Sr-90	EPA 905.0 Mod	2	pCi/g
Tc-99	DOE HASL 300 Tc-02-RC Mod	5	pCi/g
U-232	DOE HASL 300 U-02-RC Mod	1	pCi/g
U-233/234, U-235/236, U-238	DOE HASL 300 U-02-RC Mod	1	pCi/g
H-3	EPA 906.0 Mod	6	pCi/g
Th-229	DOE HASL 300 Th-01-RC Mod	1	pCi/g
Th-228, Th-230, Th-232	DOE HASL 300 Th-01-RC Mod	1	pCi/g
Radium 226 (20-day ingrowth)	DOEHASL 300 4.5.2.3/GA-01-R	1	pCi/g
Radium 228	DOEHASL 300 4.5.2.3/GA-01-R	3	pCi/g

SAMPLE RECEIPT & REVIEW FORM

Client: <u>MJWL</u>		SDG/AR/COC/Work Order: <u>405235</u>	
Received By: <u>[Signature]</u>		Date Received: <u>9/16/16</u>	
Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0 CPM</u>
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		<input checked="" type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*		<input checked="" type="checkbox"/>		Preservation Method: Ice bags Blue ice Dry ice <u>None</u> Other (describe) <u>21°C</u> *all temperatures are recorded in Celsius
2a	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: _____ Secondary Temperature Device Serial # (If Applicable): <u>ES032015830</u>
3	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4	Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?		<input checked="" type="checkbox"/>		Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	Do Low Level Perchlorate samples have headspace as required?		<input checked="" type="checkbox"/>		Sample ID's and containers affected:
7	VOA vials contain acid preservation?		<input checked="" type="checkbox"/>		(If unknown, select No)
8	VOA vials free of headspace (defined as < 6mm bubble)?		<input checked="" type="checkbox"/>		Sample ID's and containers affected:
9	Are Encore containers present?		<input checked="" type="checkbox"/>		(If yes, immediately deliver to Volatiles laboratory)
10	Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
11	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
12	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
13	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
14	Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>			
15	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
16	Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground <u>UPS</u> Field Services Courier Other 1Z03 EY7301 9807 2671 1Z03EY7301 9939 1664 1Z03EY7301 9890 6244 1Z03EY7301 9591 3851

Comments (Use Continuation Form if needed):

Data Review Qualifier Definitions

Data Review Qualifier Definitions

Qualifier	Explanation
*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

- P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.
For HPLC, the difference is >70%.
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Radiological Analysis

Case Narrative

**Radiochemistry
Technical Case Narrative
MJW Technical Services (MJWC)
SDG #: 405235**

Product: Alphaspec Th229 + 228,230,232 Solid
Analytical Method: DOE EML HASL-300, Th-01-RC Modified
Analytical Procedure: GL-RAD-A-038 REV# 17
Analytical Batch: 1596388

Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1596227

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235001	4.1.B.R.1.2
405235002	4.1.B.R.1.3
405235003	4.1.B.R.1.4
405235004	4.1.B.R.7.2
405235005	4.1.C.R.1.3
405235006	4.1.C.R.1.4
405235007	4.1.C.R.2.3
405235008	4.1.C.R.2.4
405235009	4.1.D.R.1.3
405235010	4.1.D.R.1.4
405235011	4.1.D.R.3.2
405235012	4.1.D.R.2.4
405235013	4.2A.R.2.3
405235014	4.2A.R.1.3
405235015	4.2A.R.1.4
405235016	4.2A.R.2.4
405235017	4.2A.R.3.2
405235018	4.2A.R.4.2
405235019	4.2B.R.2.4
405235020	4.2B.R.1.4
1203621688	Method Blank (MB)
1203621689	405235001(4.1.B.R.1.2) Sample Duplicate (DUP)
1203621690	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

Sample 405235013 (4.2A.R.2.3) was recounted due to high MDC. The recount is reported. Samples 405235010 (4.1.D.R.1.4) and 405235014 (4.2A.R.1.3) were recounted due to a peak shift. The recounts are reported. Samples 405235001 (4.1.B.R.1.2) and 405235012 (4.1.D.R.2.4) were recounted due to a suspected false positive. The recounts are reported.

Miscellaneous Information

1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, and 1203621689 were received and analyzed out of holding. 1. Reporting results.

Product: ASP Uranium Isotopic, Solid

Analytical Method: DOE EML HASL-300, U-02-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 26

Analytical Batch: 1596389

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596227

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235001	4.1.B.R.1.2
405235002	4.1.B.R.1.3
405235003	4.1.B.R.1.4
405235004	4.1.B.R.7.2
405235005	4.1.C.R.1.3
405235006	4.1.C.R.1.4
405235007	4.1.C.R.2.3
405235008	4.1.C.R.2.4
405235009	4.1.D.R.1.3
405235010	4.1.D.R.1.4
405235011	4.1.D.R.3.2
405235012	4.1.D.R.2.4
405235013	4.2A.R.2.3
405235014	4.2A.R.1.3
405235015	4.2A.R.1.4
405235016	4.2A.R.2.4
405235017	4.2A.R.3.2
405235018	4.2A.R.4.2
405235019	4.2B.R.2.4
405235020	4.2B.R.1.4
1203621691	Method Blank (MB)
1203621692	405235001(4.1.B.R.1.2) Sample Duplicate (DUP)
1203621693	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The sample and the duplicate, 1203621692 (4.1.B.R.1.2DUP) and 405235001 (4.1.B.R.1.2), did not meet the U-233/234 relative percent difference requirement; however, they do meet the relative error ratio requirement with a value of 2.98.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, and 1203621692 were received and analyzed out of holding. 1. Reporting results.

Product: Am241, Cm Solid

Analytical Method: DOE EML HASL-300, Am-05-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 26

Analytical Batch: 1596390

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596227

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235001	4.1.B.R.1.2
405235002	4.1.B.R.1.3
405235003	4.1.B.R.1.4
405235004	4.1.B.R.7.2
405235005	4.1.C.R.1.3
405235006	4.1.C.R.1.4
405235007	4.1.C.R.2.3
405235008	4.1.C.R.2.4
405235009	4.1.D.R.1.3
405235010	4.1.D.R.1.4
405235011	4.1.D.R.3.2
405235012	4.1.D.R.2.4
405235013	4.2A.R.2.3
405235014	4.2A.R.1.3
405235015	4.2A.R.1.4

405235016	4.2A.R.2.4
405235017	4.2A.R.3.2
405235018	4.2A.R.4.2
405235019	4.2B.R.2.4
405235020	4.2B.R.1.4
1203621694	Method Blank (MB)
1203621695	405235001(4.1.B.R.1.2) Sample Duplicate (DUP)
1203621696	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

Samples 405235011 (4.1.D.R.3.2), 405235015 (4.2A.R.1.4) and 405235016 (4.2A.R.2.4) were recounted due to a peak shift. The recounts are reported.

Miscellaneous Information

1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, and 1203621695 were received and analyzed out of holding. 1. Reporting results.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
X	The Cm-245/246 Result may be biased high due to tailing from the Am-243 ROI into the Cm-245/246 ROI	Curium-245/246	405235005	4.1.C.R.1.3
			405235012	4.1.D.R.2.4
			405235018	4.2A.R.4.2
			405235019	4.2B.R.2.4

Product: Alphaspec Np237, Solid

Analytical Method: ASTM C 1475-00 Modified

Analytical Procedure: GL-RAD-A-032 REV# 21

Analytical Batch: 1596392

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596227

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235001	4.1.B.R.1.2
405235002	4.1.B.R.1.3
405235003	4.1.B.R.1.4
405235004	4.1.B.R.7.2
405235005	4.1.C.R.1.3
405235006	4.1.C.R.1.4
405235007	4.1.C.R.2.3
405235008	4.1.C.R.2.4
405235009	4.1.D.R.1.3
405235010	4.1.D.R.1.4
405235011	4.1.D.R.3.2
405235012	4.1.D.R.2.4
405235013	4.2A.R.2.3
405235014	4.2A.R.1.3
405235015	4.2A.R.1.4
405235016	4.2A.R.2.4
405235017	4.2A.R.3.2
405235018	4.2A.R.4.2
405235019	4.2B.R.2.4
405235020	4.2B.R.1.4
1203621697	Method Blank (MB)
1203621698	405235001(4.1.B.R.1.2) Sample Duplicate (DUP)
1203621699	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, and 1203621698 were received and analyzed out of holding. 1. Reporting results.

Product: ASP Plutonium Isotopic, Solid

Analytical Method: DOE EML HASL-300, Pu-11-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 26

Analytical Batch: 1596393

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596227

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235001	4.1.B.R.1.2
405235002	4.1.B.R.1.3
405235003	4.1.B.R.1.4
405235004	4.1.B.R.7.2
405235005	4.1.C.R.1.3
405235006	4.1.C.R.1.4
405235007	4.1.C.R.2.3
405235008	4.1.C.R.2.4
405235009	4.1.D.R.1.3
405235010	4.1.D.R.1.4
405235011	4.1.D.R.3.2
405235012	4.1.D.R.2.4
405235013	4.2A.R.2.3
405235014	4.2A.R.1.3
405235015	4.2A.R.1.4
405235016	4.2A.R.2.4
405235017	4.2A.R.3.2
405235018	4.2A.R.4.2
405235019	4.2B.R.2.4
405235020	4.2B.R.1.4
1203621700	Method Blank (MB)
1203621701	405235001(4.1.B.R.1.2) Sample Duplicate (DUP)
1203621702	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Miscellaneous Information section.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

Sample 1203621702 (LCS) was recounted due to a peak shift. The recount is reported.

Miscellaneous Information

1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, and 1203621701 were received and analyzed out of holding. 2. Sample 1203621701 does not meet the resolution requirement of having a full width half maximum of 100 keV or less for the Pu-242 tracer. 1. Reporting results. 2. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.

Product: Alphaspec Th229 + 228,230,232 Solid

Analytical Method: DOE EML HASL-300, Th-01-RC Modified

Analytical Procedure: GL-RAD-A-038 REV# 17

Analytical Batch: 1596395

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596228

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235021	4.2B.R.2.3
405235022	4.2B.R.1.3
405235023	4.2B.R.11.2
405235024	4.2B.R.2.2
405235025	4.2B.R.1.2
405235026	4.2C.R.1.3
405235027	4.2C.R.1.4
405235028	4.3.AR1.3
405235029	4.3.B.R.1.3
405235030	4.3A.R.2.3
405235031	4.3.BR19.2
405235032	4.3B.R.3.3
405235033	4.3B.R.3.4
405235034	4.3.B.R.1.4
405235035	4.3B.R.2.3
405235036	4.3B.R.2.4
405235037	4.4C.R.2.4
405235038	4.4C.R.1.3
405235039	4.4C.R.1.4
405235040	4.4D.R.1.3
1203621706	Method Blank (MB)
1203621707	405235021(4.2B.R.2.3) Sample Duplicate (DUP)
1203621708	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

Sample 1203621707 (4.2B.R.2.3DUP) was recounted due to high MDC. The recount is reported. Sample 405235039 (4.4C.R.1.4) was recounted due to a peak shift. The recount is reported. Sample 405235035 (4.3B.R.2.3) was recounted due to detector error. The recount is reported.

Miscellaneous Information

1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, and 1203621707 were received and analyzed outside of the holding time. 1. Reporting results.

Product: ASP Uranium Isotopic, Solid

Analytical Method: DOE EML HASL-300, U-02-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 26

Analytical Batch: 1596396

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596228

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235021	4.2B.R.2.3
405235022	4.2B.R.1.3
405235023	4.2B.R.11.2
405235024	4.2B.R.2.2
405235025	4.2B.R.1.2
405235026	4.2C.R.1.3
405235027	4.2C.R.1.4
405235028	4.3.AR1.3
405235029	4.3.B.R.1.3
405235030	4.3A.R.2.3
405235031	4.3.BR19.2
405235032	4.3B.R.3.3
405235033	4.3B.R.3.4
405235034	4.3.B.R.1.4
405235035	4.3B.R.2.3
405235036	4.3B.R.2.4
405235037	4.4C.R.2.4

405235038	4.4C.R.1.3
405235039	4.4C.R.1.4
405235040	4.4D.R.1.3
1203621709	Method Blank (MB)
1203621710	405235021(4.2B.R.2.3) Sample Duplicate (DUP)
1203621711	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The sample and the duplicate, 1203621710 (4.2B.R.2.3DUP) and 405235021 (4.2B.R.2.3), did not meet the U-233/234 and U-238 relative percent difference requirements; however, they do meet the relative error ratio requirements with the values of 0.901 and 1.99, respectively.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

The U-232 traced portion of samples 1203621710 (4.2B.R.2.3DUP), 405235022 (4.2B.R.1.3) and 405235023 (4.2B.R.11.2) and the U-236 traced portion of 1203621710 were recounted due to peak shifts. The recounts are reported.

Miscellaneous Information

1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, and 1203621710 were received and analyzed outside of the holding time. 1. Reporting results.

Product: Alphaspec Np237, Solid

Analytical Method: ASTM C 1475-00 Modified

Analytical Procedure: GL-RAD-A-032 REV# 21

Analytical Batch: 1596399

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596228

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
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405235021	4.2B.R.2.3
405235022	4.2B.R.1.3
405235023	4.2B.R.11.2
405235024	4.2B.R.2.2
405235025	4.2B.R.1.2
405235026	4.2C.R.1.3
405235027	4.2C.R.1.4
405235028	4.3.AR1.3
405235029	4.3.B.R.1.3
405235030	4.3A.R.2.3
405235031	4.3.BR19.2
405235032	4.3B.R.3.3
405235033	4.3B.R.3.4
405235034	4.3.B.R.1.4
405235035	4.3B.R.2.3
405235036	4.3B.R.2.4
405235037	4.4C.R.2.4
405235038	4.4C.R.1.3
405235039	4.4C.R.1.4
405235040	4.4D.R.1.3
1203621715	Method Blank (MB)
1203621716	405235021(4.2B.R.2.3) Sample Duplicate (DUP)
1203621717	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

The batch was recounted due to analyst error. The recounts are reported with the exception of samples 405235026(4.2C.R.1.3) and 1203621716(4.2B.R.2.3). Sample 405235026(4.2C.R.1.3) was recounted due to a high MDA and the third count is reported. Sample 1203621716(4.2B.R.2.3) was recounted due to a peak shift and the third count is reported.

Miscellaneous Information

1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, and 1203621716 were received and analyzed out of holding. 1. Reporting results.

Product: ASP Plutonium Isotopic, Solid

Analytical Method: DOE EML HASL-300, Pu-11-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 26

Analytical Batch: 1596400

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596228

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235021	4.2B.R.2.3
405235022	4.2B.R.1.3
405235023	4.2B.R.11.2
405235024	4.2B.R.2.2
405235025	4.2B.R.1.2
405235026	4.2C.R.1.3
405235027	4.2C.R.1.4
405235028	4.3.AR1.3
405235029	4.3.B.R.1.3
405235030	4.3A.R.2.3
405235031	4.3.BR19.2
405235032	4.3B.R.3.3
405235033	4.3B.R.3.4
405235034	4.3.B.R.1.4
405235035	4.3B.R.2.3
405235036	4.3B.R.2.4
405235037	4.4C.R.2.4
405235038	4.4C.R.1.3
405235039	4.4C.R.1.4
405235040	4.4D.R.1.3
1203621718	Method Blank (MB)
1203621719	405235021(4.2B.R.2.3) Sample Duplicate (DUP)
1203621720	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

Sample 405235039 (4.4C.R.1.4) was recounted due to a peak shift. The recount is reported. Sample 405235037 (4.4C.R.2.4) was recounted due to poor resolution. The recount is reported.

Miscellaneous Information

1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, and 1203621719 were received and analyzed out of holding. 1. Reporting

results.

Product: Alphaspec Th229 + 228,230,232 Solid

Analytical Method: DOE EML HASL-300, Th-01-RC Modified

Analytical Procedure: GL-RAD-A-038 REV# 17

Analytical Batch: 1596407

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596233

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235041	4.4D.R.1.4
405235042	4.4D.R.2.3
405235043	4.4D.R.2.4
405235044	4.4D.R.4.2
405235045	4.4D.R.5.2
405235046	4.5A.R.1.3
405235047	4.5A.R.1.4
405235048	4.5B.R.1.2
405235049	4.5B.R.1.3
405235050	4.5B.R.1.4
405235051	4.5B.R.2.3
405235052	4.5B.R.2.4
405235053	4.5C.R.5.2
405235054	4.5C.R.1.3
405235055	4.5C.R.1.4
405235056	4.5C.R.2.2
405235057	4.5C.R.2.3
405235058	4.5C.R.2.4
405235059	5.1A.R.1.2
405235060	5.1A.R.1.3
1203621736	Method Blank (MB)
1203621737	405235041(4.4D.R.1.4) Sample Duplicate (DUP)
1203621738	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

Samples 405235049 (4.5B.R.1.3) and 405235050 (4.5B.R.1.4) were recounted due to a peak shift. The recounts are reported. Samples 405235043 (4.4D.R.2.4), 405235051 (4.5B.R.2.3) and 405235058 (4.5C.R.2.4) were recounted due to a suspected false positive. The recounts are reported. Sample 405235041 (4.4D.R.1.4) was recounted to verify results and then recounted again due to a peak shift. The third count is reported.

Miscellaneous Information

1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060, and 1203621737 were received and analyzed out of holding. 1. Reporting results.

Product: ASP Uranium Isotopic, Solid

Analytical Method: DOE EML HASL-300, U-02-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 26

Analytical Batch: 1596408

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596233

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235041	4.4D.R.1.4
405235042	4.4D.R.2.3
405235043	4.4D.R.2.4
405235044	4.4D.R.4.2
405235045	4.4D.R.5.2
405235046	4.5A.R.1.3
405235047	4.5A.R.1.4
405235048	4.5B.R.1.2
405235049	4.5B.R.1.3
405235050	4.5B.R.1.4
405235052	4.5B.R.2.4
405235053	4.5C.R.5.2
405235054	4.5C.R.1.3
405235055	4.5C.R.1.4
405235056	4.5C.R.2.2
405235057	4.5C.R.2.3
405235058	4.5C.R.2.4
405235059	5.1A.R.1.2
405235060	5.1A.R.1.3
1203621739	Method Blank (MB)
1203621740	405235041(4.4D.R.1.4) Sample Duplicate (DUP)
1203621741	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and

procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The sample and the duplicate, 1203621740 (4.4D.R.1.4DUP) and 405235041 (4.4D.R.1.4), did not meet the U-233/234 relative percent difference requirement; however, they do meet the relative error ratio requirement with a value of 1.41.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

The U-232 traced portion of samples 1203621740 (4.4D.R.1.4DUP), 1203621741 (LCS) and 405235055 (4.5C.R.1.4) were recounted due to peak shifts. The recounts are reported. The U-236 traced portion of sample 405235041 (4.4D.R.1.4) was recounted due to poor resolution. The recount is reported.

Miscellaneous Information

1. 1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060, and 1203621740 were received and analyzed out of holding. 1. Reporting results.

Product: Am241, Cm Solid

Analytical Method: DOE EML HASL-300, Am-05-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 26

Analytical Batch: 1596410

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596233

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235041	4.4D.R.1.4
405235042	4.4D.R.2.3
405235043	4.4D.R.2.4
405235044	4.4D.R.4.2
405235045	4.4D.R.5.2
405235046	4.5A.R.1.3
405235047	4.5A.R.1.4
405235048	4.5B.R.1.2
405235049	4.5B.R.1.3
405235050	4.5B.R.1.4
405235051	4.5B.R.2.3
405235052	4.5B.R.2.4
405235053	4.5C.R.5.2

405235054	4.5C.R.1.3
405235055	4.5C.R.1.4
405235056	4.5C.R.2.2
405235057	4.5C.R.2.3
405235058	4.5C.R.2.4
405235059	5.1A.R.1.2
405235060	5.1A.R.1.3
1203621745	Method Blank (MB)
1203621746	405235041(4.4D.R.1.4) Sample Duplicate (DUP)
1203621747	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

Samples 1203621746 (4.4D.R.1.4DUP), 405235042 (4.4D.R.2.3), 405235048 (4.5B.R.1.2), 405235049 (4.5B.R.1.3) and 405235050 (4.5B.R.1.4) were recounted due to a peak shift. The recounts are reported.

Miscellaneous Information

1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060, and 1203621746 were received and analyzed out of holding. 1. Reporting results.

Product: Alphaspec Np237, Solid

Analytical Method: ASTM C 1475-00 Modified

Analytical Procedure: GL-RAD-A-032 REV# 21

Analytical Batch: 1596411

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596233

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235041	4.4D.R.1.4
405235042	4.4D.R.2.3
405235043	4.4D.R.2.4
405235044	4.4D.R.4.2
405235045	4.4D.R.5.2

405235046	4.5A.R.1.3
405235047	4.5A.R.1.4
405235048	4.5B.R.1.2
405235049	4.5B.R.1.3
405235050	4.5B.R.1.4
405235051	4.5B.R.2.3
405235052	4.5B.R.2.4
405235053	4.5C.R.5.2
405235054	4.5C.R.1.3
405235055	4.5C.R.1.4
405235056	4.5C.R.2.2
405235057	4.5C.R.2.3
405235058	4.5C.R.2.4
405235059	5.1A.R.1.2
405235060	5.1A.R.1.3
1203621748	Method Blank (MB)
1203621749	405235041(4.4D.R.1.4) Sample Duplicate (DUP)
1203621750	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

Samples 405235051 (4.5B.R.2.3) and 405235056 (4.5C.R.2.2) were recounted due to high MDCs. The recounts are reported.

Miscellaneous Information

1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060, and 1203621749 were received and analyzed out of holding. 1. Reporting results.

Product: ASP Plutonium Isotopic, Solid

Analytical Method: DOE EML HASL-300, Pu-11-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 26

Analytical Batch: 1596412

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596233

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235041	4.4D.R.1.4
405235042	4.4D.R.2.3
405235043	4.4D.R.2.4
405235044	4.4D.R.4.2
405235045	4.4D.R.5.2
405235046	4.5A.R.1.3
405235047	4.5A.R.1.4
405235048	4.5B.R.1.2
405235049	4.5B.R.1.3
405235050	4.5B.R.1.4
405235051	4.5B.R.2.3
405235052	4.5B.R.2.4
405235053	4.5C.R.5.2
405235054	4.5C.R.1.3
405235055	4.5C.R.1.4
405235056	4.5C.R.2.2
405235057	4.5C.R.2.3
405235058	4.5C.R.2.4
405235059	5.1A.R.1.2
405235060	5.1A.R.1.3
1203621751	Method Blank (MB)
1203621752	405235041(4.4D.R.1.4) Sample Duplicate (DUP)
1203621753	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060, and 1203621752 were received and analyzed out of holding. 2. The Pu-242 tracer peak centroid for sample 405235047 is greater than 50 keV from the expected energy value of 4890 keV. 1. Reporting results. 2. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.

Product: Alphaspec Th229 + 228,230,232 Solid

Analytical Method: DOE EML HASL-300, Th-01-RC Modified

Analytical Procedure: GL-RAD-A-038 REV# 17

Analytical Batch: 1596417

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596246

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235061	5.1B.R.2.2
405235062	5.2.A.R.1.2
405235063	5.2.A.R.1.3
405235064	5.2.A.R.1.4
405235065	5.2A.R.2.3
405235066	5.2.A.R.2.4
405235067	5.2A.R.6.2
405235068	5.2A.R.4.2
405235069	5.2.B.R.1.4
405235070	5.2.B.R.3.2
405235071	5.2.B.R.4.2
405235072	5.2.B.R.2.4
405235073	5.2.B.R.8.2
405235074	5.3.A.R.1.3
405235075	5.4A.R.1.3
405235076	5.4A.R.4.2
405235077	5.5A.R.1.3
405235078	5.6A.R.1.3
1203621757	Method Blank (MB)
1203621758	405235061(5.1B.R.2.2) Sample Duplicate (DUP)
1203621759	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

Samples 1203621757 (MB), 1203621759 (LCS) and 405235077 (5.5A.R.1.3) were recounted due to a peak shift. The recounts are reported.

Miscellaneous Information

1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, and 1203621758 were received and analyzed out of holding. 1. Reporting results.

Product: ASP Uranium Isotopic, Solid

Analytical Method: DOE EML HASL-300, U-02-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 26

Analytical Batch: 1596418

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596246

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235061	5.1B.R.2.2
405235062	5.2.A.R.1.2
405235063	5.2.A.R.1.3
405235064	5.2.A.R.1.4
405235065	5.2A.R.2.3
405235066	5.2.A.R.2.4
405235067	5.2A.R.6.2
405235068	5.2A.R.4.2
405235069	5.2.B.R.1.4
405235070	5.2.B.R.3.2
405235071	5.2.B.R.4.2
405235072	5.2.B.R.2.4
405235073	5.2.B.R.8.2
405235074	5.3.A.R.1.3
405235075	5.4A.R.1.3
405235076	5.4A.R.4.2
405235077	5.5A.R.1.3
405235078	5.6A.R.1.3
1203621760	Method Blank (MB)
1203621761	405235061(5.1B.R.2.2) Sample Duplicate (DUP)
1203621762	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

The U-232 traced portion of sample 405235064 (5.2.A.R.1.4) was recounted due to a peak shift. The recount is reported.

Miscellaneous Information

Manual Integration

Manual integrations of alpha spectroscopy spectra 405235067 (5.2A.R.6.2), 405235070 (5.2.B.R.3.2), 405235072 (5.2.B.R.2.4) and 405235077 (5.5A.R.1.3) were performed to fully separate counts in Regions of Interest which would have been biased.

1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, and 1203621761 were received and analyzed out of holding. 1. Reporting results.

Product: Alphaspec Np237, Solid

Analytical Method: ASTM C 1475-00 Modified

Analytical Procedure: GL-RAD-A-032 REV# 21

Analytical Batch: 1596420

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596246

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235061	5.1B.R.2.2
405235062	5.2.A.R.1.2
405235063	5.2.A.R.1.3
405235064	5.2.A.R.1.4
405235065	5.2A.R.2.3
405235066	5.2.A.R.2.4
405235067	5.2A.R.6.2
405235068	5.2A.R.4.2
405235069	5.2.B.R.1.4
405235070	5.2.B.R.3.2
405235071	5.2.B.R.4.2
405235072	5.2.B.R.2.4
405235073	5.2.B.R.8.2
405235074	5.3.A.R.1.3
405235075	5.4A.R.1.3
405235076	5.4A.R.4.2
405235077	5.5A.R.1.3
405235078	5.6A.R.1.3
1203621766	Method Blank (MB)
1203621767	405235061(5.1B.R.2.2) Sample Duplicate (DUP)
1203621768	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, and 1203621767 were received and analyzed out of holding. 1. Reporting results.

Product: ASP Plutonium Isotopic, Solid

Analytical Method: DOE EML HASL-300, Pu-11-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 26

Analytical Batch: 1596421

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596246

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235061	5.1B.R.2.2
405235062	5.2.A.R.1.2
405235063	5.2.A.R.1.3
405235064	5.2.A.R.1.4
405235065	5.2A.R.2.3
405235066	5.2.A.R.2.4
405235067	5.2A.R.6.2
405235068	5.2A.R.4.2
405235069	5.2.B.R.1.4
405235070	5.2.B.R.3.2
405235071	5.2.B.R.4.2
405235072	5.2.B.R.2.4
405235073	5.2.B.R.8.2
405235074	5.3.A.R.1.3
405235075	5.4A.R.1.3
405235076	5.4A.R.4.2
405235077	5.5A.R.1.3
405235078	5.6A.R.1.3
1203621769	Method Blank (MB)
1203621770	405235061(5.1B.R.2.2) Sample Duplicate (DUP)
1203621771	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, and 1203621770 were analyzed outside of holding. 1. Reporting results.

Product: Am241, Cm Solid

Analytical Method: DOE EML HASL-300, Am-05-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 26

Analytical Batch: 1599981

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596246

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235061	5.1B.R.2.2
405235062	5.2.A.R.1.2
405235063	5.2.A.R.1.3
405235064	5.2.A.R.1.4
405235065	5.2A.R.2.3
405235066	5.2.A.R.2.4
405235067	5.2A.R.6.2
405235068	5.2A.R.4.2
405235069	5.2.B.R.1.4
405235070	5.2.B.R.3.2
405235071	5.2.B.R.4.2
405235072	5.2.B.R.2.4
405235073	5.2.B.R.8.2
405235074	5.3.A.R.1.3
405235075	5.4A.R.1.3
405235076	5.4A.R.4.2
405235077	5.5A.R.1.3
405235078	5.6A.R.1.3
1203630763	Method Blank (MB)
1203630764	405235061(5.1B.R.2.2) Sample Duplicate (DUP)
1203630765	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The Cm-245/246 blank result is greater than the MDC but less than the detection limit.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Sample Re-prep/Re-analysis

Samples were reprepared due to low carrier/tracer yield. The re-analysis is being reported.

Miscellaneous Information

1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, and 1203630764 were received and analyzed out of holding. 1. Reporting results.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
X	The Cm-245/246 result may be biased high due to tailing from the Am-243 ROI.	Curium-245/246	405235062	5.2.A.R.1.2
			405235064	5.2.A.R.1.4
			405235068	5.2.A.R.4.2
			405235077	5.5.A.R.1.3
			1203630763	MB for batch 1599981

Product: ASP Uranium Isotopic, Solid

Analytical Method: DOE EML HASL-300, U-02-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 26

Analytical Batch: 1601257

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596233

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235051	4.5B.R.2.3
1203633742	Method Blank (MB)
1203633743	405235051(4.5B.R.2.3) Sample Duplicate (DUP)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The sample and the duplicate, 1203633743 (4.5B.R.2.3DUP) and 405235051 (4.5B.R.2.3), did not meet the U-233/234 relative percent difference requirement; however, they do meet the relative error ratio requirement with a value of 1.22. The U-233/234, U-235/235, and U-238 blank activities are greater than the MDC but is less than five percent of the lowest activity in the batch.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Sample Re-prep/Re-analysis

Sample 405235051 (4.5B.R.2.3) was re-prepped due to low carrier/tracer yield. The re-analysis is being reported.

Miscellaneous Information

1. Samples 405235051 and 1203633743 were received and analyzed out of holding. 1. Reporting results.

Product: Am241, Cm Solid

Analytical Method: DOE EML HASL-300, Am-05-RC Modified

Analytical Procedure: GL-RAD-A-011 REV# 26

Analytical Batch: 1602285

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596228

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235021	4.2B.R.2.3
405235022	4.2B.R.1.3
405235023	4.2B.R.11.2
405235024	4.2B.R.2.2
405235025	4.2B.R.1.2
405235026	4.2C.R.1.3
405235027	4.2C.R.1.4
405235028	4.3.AR1.3

405235029	4.3.B.R.1.3
405235030	4.3A.R.2.3
405235031	4.3.BR19.2
405235032	4.3B.R.3.3
405235033	4.3B.R.3.4
405235034	4.3.B.R.1.4
405235035	4.3B.R.2.3
405235036	4.3B.R.2.4
405235037	4.4C.R.2.4
405235038	4.4C.R.1.3
405235039	4.4C.R.1.4
405235040	4.4D.R.1.3
1203636290	Method Blank (MB)
1203636291	405235021(4.2B.R.2.3) Sample Duplicate (DUP)
1203636292	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The Cm-245/246 blank result is greater than the MDC but less than the detection limit.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Sample Re-prep/Re-analysis

Samples were re-prepped due to low carrier/tracer yield. The re-analysis is being reported.

Recounts

Sample 405235037 (4.4C.R.2.4) was recounted due to a peak shift. The recount is reported.

Miscellaneous Information

1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 40523531, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, and 1203636291 were received and analyzed out of holding. 1. Reporting results.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
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X	The Cm-245/246 Result may be biased high due to tailing from the Am-243 ROI into the Cm-245/246 ROI	Curium-245/246	405235021	4.2B.R.2.3
			405235025	4.2B.R.1.2
			405235028	4.3.AR1.3
			405235031	4.3.BR19.2
			405235036	4.3B.R.2.4
			1203636290	MB for batch 1602285

Product: Dry Weight

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596227

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235001	4.1.B.R.1.2
405235002	4.1.B.R.1.3
405235003	4.1.B.R.1.4
405235004	4.1.B.R.7.2
405235005	4.1.C.R.1.3
405235006	4.1.C.R.1.4
405235007	4.1.C.R.2.3
405235008	4.1.C.R.2.4
405235009	4.1.D.R.1.3
405235010	4.1.D.R.1.4
405235011	4.1.D.R.3.2
405235012	4.1.D.R.2.4
405235013	4.2A.R.2.3
405235014	4.2A.R.1.3
405235015	4.2A.R.1.4
405235016	4.2A.R.2.4
405235017	4.2A.R.3.2
405235018	4.2A.R.4.2
405235019	4.2B.R.2.4
405235020	4.2B.R.1.4
1203621316	405235001(4.1.B.R.1.2) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Product: Dry Weight

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596228

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235021	4.2B.R.2.3
405235022	4.2B.R.1.3
405235023	4.2B.R.11.2
405235024	4.2B.R.2.2
405235025	4.2B.R.1.2
405235026	4.2C.R.1.3
405235027	4.2C.R.1.4
405235028	4.3.AR1.3
405235029	4.3.B.R.1.3
405235030	4.3A.R.2.3
405235031	4.3.BR19.2
405235032	4.3B.R.3.3
405235033	4.3B.R.3.4
405235034	4.3.B.R.1.4
405235035	4.3B.R.2.3
405235036	4.3B.R.2.4
405235037	4.4C.R.2.4
405235038	4.4C.R.1.3
405235039	4.4C.R.1.4
405235040	4.4D.R.1.3
1203621317	405235021(4.2B.R.2.3) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Product: Dry Weight

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596233

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235041	4.4D.R.1.4
405235042	4.4D.R.2.3

405235043	4.4D.R.2.4
405235044	4.4D.R.4.2
405235045	4.4D.R.5.2
405235046	4.5A.R.1.3
405235047	4.5A.R.1.4
405235048	4.5B.R.1.2
405235049	4.5B.R.1.3
405235050	4.5B.R.1.4
405235051	4.5B.R.2.3
405235052	4.5B.R.2.4
405235053	4.5C.R.5.2
405235054	4.5C.R.1.3
405235055	4.5C.R.1.4
405235056	4.5C.R.2.2
405235057	4.5C.R.2.3
405235058	4.5C.R.2.4
405235059	5.1A.R.1.2
405235060	5.1A.R.1.3
1203621322	405235041(4.4D.R.1.4) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Product: Dry Weight

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596246

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235061	5.1B.R.2.2
405235062	5.2.A.R.1.2
405235063	5.2.A.R.1.3
405235064	5.2.A.R.1.4
405235065	5.2A.R.2.3
405235066	5.2.A.R.2.4
405235067	5.2A.R.6.2
405235068	5.2A.R.4.2
405235069	5.2.B.R.1.4
405235070	5.2.B.R.3.2
405235071	5.2.B.R.4.2
405235072	5.2.B.R.2.4
405235073	5.2.B.R.8.2
405235074	5.3.A.R.1.3
405235075	5.4A.R.1.3

405235076	5.4A.R.4.2
405235077	5.5A.R.1.3
405235078	5.6A.R.1.3
1203621353	405235061(5.1B.R.2.2) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Product: Gammaspec, Gamma, Solid

Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R

Analytical Procedure: GL-RAD-A-013 REV# 25

Analytical Batch: 1596247

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596227

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235001	4.1.B.R.1.2
405235002	4.1.B.R.1.3
405235003	4.1.B.R.1.4
405235004	4.1.B.R.7.2
405235005	4.1.C.R.1.3
405235006	4.1.C.R.1.4
405235007	4.1.C.R.2.3
405235008	4.1.C.R.2.4
405235009	4.1.D.R.1.3
405235010	4.1.D.R.1.4
405235011	4.1.D.R.3.2
405235012	4.1.D.R.2.4
405235013	4.2A.R.2.3
405235014	4.2A.R.1.3
405235015	4.2A.R.1.4
405235016	4.2A.R.2.4
405235017	4.2A.R.3.2
405235018	4.2A.R.4.2
405235019	4.2B.R.2.4
405235020	4.2B.R.1.4
1203621350	Method Blank (MB)
1203621351	405235001(4.1.B.R.1.2) Sample Duplicate (DUP)
1203621352	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The sample and the duplicate, 1203621351 (4.1.B.R.1.2DUP) and 405235001 (4.1.B.R.1.2), did not meet the Cs-137 and Tl-208 relative percent difference requirement; however, they do meet the relative error ratio requirement with a values of 1.46 and 2.08 respectively.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

Samples 405235 001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 013, 014, 015, 016, 017, 018, 019, 020, and 1203621351 (duplicate) were received outside of the holding period. Samples were analyzed in a timely manner upon receipt. Reporting results.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
UI	Data rejected due to high peak-width.	Bismuth-212	405235020	4.2B.R.1.4
		Cesium-137	405235002	4.1.B.R.1.3
UI	Data rejected due to interference.	Protactinium-231	405235002	4.1.B.R.1.3
			405235004	4.1.B.R.7.2
			405235005	4.1.C.R.1.3
			405235006	4.1.C.R.1.4
			405235007	4.1.C.R.2.3
			405235009	4.1.D.R.1.3
			405235011	4.1.D.R.3.2
			405235013	4.2A.R.2.3
			405235014	4.2A.R.1.3
			405235015	4.2A.R.1.4
405235017	4.2A.R.3.2			

			405235018	4.2A.R.4.2
			405235019	4.2B.R.2.4
		Tin-126	405235002	4.1.B.R.1.3
			405235003	4.1.B.R.1.4
			405235004	4.1.B.R.7.2
			405235005	4.1.C.R.1.3
			405235006	4.1.C.R.1.4
			405235009	4.1.D.R.1.3
			405235011	4.1.D.R.3.2
			405235012	4.1.D.R.2.4
			405235013	4.2A.R.2.3
			405235015	4.2A.R.1.4
			405235017	4.2A.R.3.2
			405235018	4.2A.R.4.2
			405235020	4.2B.R.1.4
			1203621351	4.1.B.R.1.2(405235001DUP)
UI	Data rejected due to low abundance.	Antimony-125	1203621351	4.1.B.R.1.2(405235001DUP)
		Bismuth-212	405235001	4.1.B.R.1.2
			405235002	4.1.B.R.1.3
			405235004	4.1.B.R.7.2
			405235005	4.1.C.R.1.3
			405235007	4.1.C.R.2.3
			405235009	4.1.D.R.1.3
			405235010	4.1.D.R.1.4
			405235011	4.1.D.R.3.2
			405235012	4.1.D.R.2.4
			405235013	4.2A.R.2.3
			405235014	4.2A.R.1.3
			405235015	4.2A.R.1.4
			405235016	4.2A.R.2.4
			405235018	4.2A.R.4.2
			405235019	4.2B.R.2.4

Cesium-137	405235020	4.2B.R.1.4
Cobalt-60	405235006	4.1.C.R.1.4
	405235007	4.1.C.R.2.3
	405235010	4.1.D.R.1.4
	405235015	4.2A.R.1.4
	405235003	4.1.B.R.1.4
Protactinium-231	405235003	4.1.B.R.1.4
Tin-126	405235001	4.1.B.R.1.2
	405235010	4.1.D.R.1.4
	405235014	4.2A.R.1.3
	405235016	4.2A.R.2.4

Product: Gammaspec, Gamma, Solid

Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R

Analytical Procedure: GL-RAD-A-013 REV# 25

Analytical Batch: 1596249

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596228

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235021	4.2B.R.2.3
405235022	4.2B.R.1.3
405235023	4.2B.R.11.2
405235024	4.2B.R.2.2
405235025	4.2B.R.1.2
405235026	4.2C.R.1.3
405235027	4.2C.R.1.4
405235028	4.3.AR1.3
405235029	4.3.B.R.1.3
405235030	4.3A.R.2.3
405235031	4.3.BR19.2
405235032	4.3B.R.3.3
405235033	4.3B.R.3.4
405235034	4.3.B.R.1.4
405235035	4.3B.R.2.3
405235036	4.3B.R.2.4
405235037	4.4C.R.2.4
405235038	4.4C.R.1.3
405235039	4.4C.R.1.4
405235040	4.4D.R.1.3
1203621354	Method Blank (MB)
1203621355	405235038(4.4C.R.1.3) Sample Duplicate (DUP)
1203621356	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The sample and the duplicate, 1203621355 (4.4C.R.1.3DUP) and 405235038 (4.4C.R.1.3), did not meet the Bi-214/Ra-226 and Pb-214 relative percent difference requirement; however, they do meet the relative error ratio requirement with a values of 1.78 and 2.36 respectively.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

Samples 405235 021, 022, 023, 024, 025, 026, 027, 028, 029, 030, 031, 032, 033, 034, 035, 036, 037, 038, 039, 040, and 1203621355 (duplicate) were received outside of the holding period. Samples were analyzed in a timely manner upon receipt. Reporting results.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
UI	Data rejected due to high counting uncertainty.	Cesium-137	1203621355	4.4C.R.1.3(405235038DUP)
UI	Data rejected due to high peak-width.	Bismuth-212	405235023	4.2B.R.11.2
UI	Data rejected due to interference.	Protactinium-231	405235021	4.2B.R.2.3
			405235022	4.2B.R.1.3
			405235023	4.2B.R.11.2
			405235024	4.2B.R.2.2
			405235025	4.2B.R.1.2
			405235026	4.2C.R.1.3
			405235027	4.2C.R.1.4
			405235028	4.3.AR1.3

			405235029	4.3.B.R.1.3
			405235030	4.3A.R.2.3
			405235032	4.3B.R.3.3
			405235033	4.3B.R.3.4
			405235034	4.3.B.R.1.4
			405235035	4.3B.R.2.3
			405235036	4.3B.R.2.4
			405235037	4.4C.R.2.4
			405235038	4.4C.R.1.3
			405235039	4.4C.R.1.4
			1203621355	4.4C.R.1.3(405235038DUP)
		Tin-126	405235021	4.2B.R.2.3
			405235022	4.2B.R.1.3
			405235023	4.2B.R.11.2
			405235024	4.2B.R.2.2
			405235026	4.2C.R.1.3
			405235027	4.2C.R.1.4
			405235029	4.3.B.R.1.3
			405235030	4.3A.R.2.3
			405235031	4.3.BR19.2
			405235032	4.3B.R.3.3
			405235033	4.3B.R.3.4
			405235035	4.3B.R.2.3
			405235036	4.3B.R.2.4
			405235037	4.4C.R.2.4
			405235038	4.4C.R.1.3
UI	Data rejected due to low abundance.	Actinium-227	405235023	4.2B.R.11.2
		Bismuth-212	405235022	4.2B.R.1.3
			405235024	4.2B.R.2.2
			405235025	4.2B.R.1.2
			405235026	4.2C.R.1.3
			405235027	4.2C.R.1.4

	405235030	4.3A.R.2.3
	405235033	4.3B.R.3.4
	405235034	4.3.B.R.1.4
	405235036	4.3B.R.2.4
	405235037	4.4C.R.2.4
	405235038	4.4C.R.1.3
	405235039	4.4C.R.1.4
	1203621355	4.4C.R.1.3(405235038DUP)
Cesium-137	405235027	4.2C.R.1.4
	405235039	4.4C.R.1.4
Europium-154	405235022	4.2B.R.1.3
	405235029	4.3.B.R.1.3
Protactinium-231	405235040	4.4D.R.1.3
Tin-126	405235025	4.2B.R.1.2

Product: Gammaspec, Gamma, Solid

Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R

Analytical Procedure: GL-RAD-A-013 REV# 25

Analytical Batch: 1596252

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596233

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235041	4.4D.R.1.4
405235042	4.4D.R.2.3
405235043	4.4D.R.2.4
405235044	4.4D.R.4.2
405235045	4.4D.R.5.2
405235046	4.5A.R.1.3
405235047	4.5A.R.1.4
405235048	4.5B.R.1.2
405235049	4.5B.R.1.3
405235050	4.5B.R.1.4
405235051	4.5B.R.2.3
405235052	4.5B.R.2.4
405235053	4.5C.R.5.2
405235054	4.5C.R.1.3
405235055	4.5C.R.1.4
405235056	4.5C.R.2.2

405235057	4.5C.R.2.3
405235058	4.5C.R.2.4
405235059	5.1A.R.1.2
405235060	5.1A.R.1.3
1203621361	Method Blank (MB)
1203621362	405235041(4.4D.R.1.4) Sample Duplicate (DUP)
1203621363	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

Sample received out of holding for sample 405235041, sample 405235042, sample 405235043, sample 405235044, sample 405235045, sample 405235046, sample 405235047, sample 405235048, sample 405235049, sample 405235050, sample 405235051, sample 405235052, sample 405235053, sample 405235054, sample 405235055, sample 405235056, sample 405235057, sample 405235058, sample 405235059, sample 405235060 and DUP 1203621362 Samples were analyzed as soon as possible. Reporting results.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
UI	Data rejected due to high counting uncertainty.	Cesium-137	405235041	4.4D.R.1.4
			1203621362	4.4D.R.1.4(405235041DUP)
			405235042	4.4D.R.2.3
			405235046	4.5A.R.1.3
			405235051	4.5B.R.2.3
		Tin-126	405235052	4.5B.R.2.4
			405235053	4.5C.R.5.2
			405235045	4.4D.R.5.2
			405235058	4.5C.R.2.4
			405235050	4.5B.R.1.4
UI	Data rejected due to high peak-width.	Antimony-125	405235050	4.5B.R.1.4

		Bismuth-212	405235053	4.5C.R.5.2
		Protactinium-231	405235056	4.5C.R.2.2
		Tin-126	405235047	4.5A.R.1.4
			405235048	4.5B.R.1.2
			405235049	4.5B.R.1.3
UI	Data rejected due to interference.	Protactinium-231	405235041	4.4D.R.1.4
			405235043	4.4D.R.2.4
			405235047	4.5A.R.1.4
			405235049	4.5B.R.1.3
		Tin-126	405235043	4.4D.R.2.4
			405235046	4.5A.R.1.3
			405235050	4.5B.R.1.4
			405235051	4.5B.R.2.3
			405235052	4.5B.R.2.4
			405235053	4.5C.R.5.2
			405235054	4.5C.R.1.3
			405235055	4.5C.R.1.4
			405235056	4.5C.R.2.2
			405235057	4.5C.R.2.3
			405235059	5.1A.R.1.2
			405235060	5.1A.R.1.3
			1203621362	4.4D.R.1.4(405235041DUP)
UI	Data rejected due to low abundance.	Antimony-125	405235048	4.5B.R.1.2
			405235054	4.5C.R.1.3
		Bismuth-212	405235041	4.4D.R.1.4
			405235042	4.4D.R.2.3
			405235044	4.4D.R.4.2
			405235047	4.5A.R.1.4
			405235048	4.5B.R.1.2
			405235049	4.5B.R.1.3
			405235050	4.5B.R.1.4

		405235051	4.5B.R.2.3	
		405235052	4.5B.R.2.4	
		405235054	4.5C.R.1.3	
		405235055	4.5C.R.1.4	
		405235056	4.5C.R.2.2	
		405235057	4.5C.R.2.3	
		405235059	5.1A.R.1.2	
		405235060	5.1A.R.1.3	
		1203621362	4.4D.R.1.4(405235041DUP)	
	Cesium-137	405235047	4.5A.R.1.4	
		405235058	4.5C.R.2.4	
	Europium-154	405235058	4.5C.R.2.4	
	Protactinium-231	405235044	4.4D.R.4.2	
		405235045	4.4D.R.5.2	
		405235055	4.5C.R.1.4	
	Radium-228	405235042	4.4D.R.2.3	
		405235051	4.5B.R.2.3	
	Tin-126	405235044	4.4D.R.4.2	
UI	Data rejected due to no valid peak.	Cesium-137	405235050	4.5B.R.1.4

Product: Gammaspec, Gamma, Solid

Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R

Analytical Procedure: GL-RAD-A-013 REV# 25

Analytical Batch: 1596254

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596246

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235061	5.1B.R.2.2
405235062	5.2.A.R.1.2
405235063	5.2.A.R.1.3
405235064	5.2.A.R.1.4
405235065	5.2.A.R.2.3
405235066	5.2.A.R.2.4

405235067	5.2A.R.6.2
405235068	5.2A.R.4.2
405235069	5.2.B.R.1.4
405235070	5.2.B.R.3.2
405235071	5.2.B.R.4.2
405235072	5.2.B.R.2.4
405235073	5.2.B.R.8.2
405235074	5.3.A.R.1.3
405235075	5.4A.R.1.3
405235076	5.4A.R.4.2
405235077	5.5A.R.1.3
405235078	5.6A.R.1.3
1203621364	Method Blank (MB)
1203621365	405235061(5.1B.R.2.2) Sample Duplicate (DUP)
1203621366	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The sample and the duplicate 1203621365 (5.1B.R.2.2DUP) and 405235061 (5.1B.R.2.2) did not meet the relative percent difference requirement for Bi-214/Ra-226; however, they do meet the relative error ratio requirement(0-3) with a value of 2.02.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

1. Sample received and analyzed out of holding: 405235061,062,063,064,065,066,067,068,069, 070,071,072,073,074,075,076,077,078, 1203621365DUP 1. Reporting Results

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
UI	Data rejected due to high counting uncertainty.	Bismuth-212	405235069	5.2.B.R.1.4
			405235071	5.2.B.R.4.2
		Cesium-137	405235068	5.2A.R.4.2

			405235070	5.2.B.R.3.2
		Protactinium-231	405235067	5.2.A.R.6.2
			405235071	5.2.B.R.4.2
			1203621365	5.1B.R.2.2(405235061DUP)
		Tin-126	405235063	5.2.A.R.1.3
			405235064	5.2.A.R.1.4
			405235065	5.2.A.R.2.3
			405235066	5.2.A.R.2.4
			405235067	5.2.A.R.6.2
			405235068	5.2.A.R.4.2
			405235071	5.2.B.R.4.2
			405235073	5.2.B.R.8.2
			405235077	5.5A.R.1.3
UI	Data rejected due to high peak-width.	Cesium-137	405235071	5.2.B.R.4.2
			405235076	5.4A.R.4.2
		Protactinium-231	405235074	5.3.A.R.1.3
		Tin-126	405235078	5.6A.R.1.3
UI	Data rejected due to interference.	Protactinium-231	405235061	5.1B.R.2.2
			405235063	5.2.A.R.1.3
			405235064	5.2.A.R.1.4
			405235065	5.2.A.R.2.3
			405235066	5.2.A.R.2.4
			405235069	5.2.B.R.1.4
			405235076	5.4A.R.4.2
UI	Data rejected due to low abundance.	Bismuth-212	405235061	5.1B.R.2.2
			405235063	5.2.A.R.1.3
			405235064	5.2.A.R.1.4
			405235065	5.2.A.R.2.3
			405235066	5.2.A.R.2.4
			405235067	5.2.A.R.6.2
			405235070	5.2.B.R.3.2

			405235072	5.2.B.R.2.4
			405235073	5.2.B.R.8.2
			405235074	5.3.A.R.1.3
			405235076	5.4.A.R.4.2
			405235077	5.5.A.R.1.3
			405235078	5.6.A.R.1.3
			1203621365	5.1B.R.2.2(405235061DUP)
		Cesium-137	405235066	5.2.A.R.2.4
		Europium-154	1203621365	5.1B.R.2.2(405235061DUP)
		Radium-228	405235061	5.1B.R.2.2
			405235073	5.2.B.R.8.2
			1203621364	MB for batch 1596254
		Tin-126	405235072	5.2.B.R.2.4
			1203621365	5.1B.R.2.2(405235061DUP)
UI	Data rejected due to no valid peak.	Cesium-137	405235062	5.2.A.R.1.2
			405235067	5.2.A.R.6.2
			1203621364	MB for batch 1596254

Product: Gamma I129, Solid

Analytical Method: DOE EML HASL-300,I-01 Modified

Analytical Procedure: GL-RAD-A-006 REV# 21

Analytical Batch: 1598618

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596227

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235001	4.1.B.R.1.2
405235002	4.1.B.R.1.3
405235003	4.1.B.R.1.4
405235004	4.1.B.R.7.2
405235005	4.1.C.R.1.3
405235006	4.1.C.R.1.4
405235007	4.1.C.R.2.3
405235008	4.1.C.R.2.4
405235009	4.1.D.R.1.3
405235010	4.1.D.R.1.4

405235011	4.1.D.R.3.2
405235012	4.1.D.R.2.4
405235013	4.2A.R.2.3
405235014	4.2A.R.1.3
405235015	4.2A.R.1.4
405235016	4.2A.R.2.4
405235017	4.2A.R.3.2
405235018	4.2A.R.4.2
405235019	4.2B.R.2.4
405235020	4.2B.R.1.4
1203627430	Method Blank (MB)
1203627431	405235001(4.1.B.R.1.2) Sample Duplicate (DUP)
1203627432	405235001(4.1.B.R.1.2) Matrix Spike (MS)
1203627433	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

Samples received out of holding: 405235 001,002,003,004,005,006,007,008,009, 010,011,012,013,014,015,016,017,018, 019,020 QC 1203627431DUP,1203627432MS Samples were counting in a timely manner upon receipt. Reporting results.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
UI	Data rejected due to high counting uncertainty.	Iodine-129	405235017	4.2A.R.3.2
UI	Data rejected due to low abundance.		405235015	4.2A.R.1.4

Product: Gamma I129, Solid

Analytical Method: DOE EML HASL-300,I-01 Modified

Analytical Procedure: GL-RAD-A-006 REV# 21

Analytical Batch: 1598620

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596228

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235021	4.2B.R.2.3
405235022	4.2B.R.1.3
405235023	4.2B.R.11.2
405235024	4.2B.R.2.2
405235025	4.2B.R.1.2
405235026	4.2C.R.1.3
405235027	4.2C.R.1.4
405235028	4.3.AR1.3
405235029	4.3.B.R.1.3
405235030	4.3A.R.2.3
405235031	4.3.BR19.2
405235032	4.3B.R.3.3
405235033	4.3B.R.3.4
405235034	4.3.B.R.1.4
405235035	4.3B.R.2.3
405235036	4.3B.R.2.4
405235037	4.4C.R.2.4
405235038	4.4C.R.1.3
405235039	4.4C.R.1.4
405235040	4.4D.R.1.3
1203627437	Method Blank (MB)
1203627438	405235021(4.2B.R.2.3) Sample Duplicate (DUP)
1203627439	405235021(4.2B.R.2.3) Matrix Spike (MS)
1203627440	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

Sample received out of holding: 405235 021,022,023,024,025,026,027,028,029, 030,031,032,033,034,035,036,037,038, 039,040 QC 1203627438DUP,1203627439MS Samples were analyzed in a timely manner upon receipt. Reporting results.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
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Product: Gamma I129, Solid

Analytical Method: DOE EML HASL-300,I-01 Modified

Analytical Procedure: GL-RAD-A-006 REV# 21

Analytical Batch: 1598647

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596233

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235041	4.4D.R.1.4
405235042	4.4D.R.2.3
405235043	4.4D.R.2.4
405235044	4.4D.R.4.2
405235045	4.4D.R.5.2
405235046	4.5A.R.1.3
405235047	4.5A.R.1.4
405235048	4.5B.R.1.2
405235049	4.5B.R.1.3
405235050	4.5B.R.1.4
405235051	4.5B.R.2.3
405235052	4.5B.R.2.4
405235053	4.5C.R.5.2
405235054	4.5C.R.1.3
405235055	4.5C.R.1.4
405235056	4.5C.R.2.2
405235057	4.5C.R.2.3
405235058	4.5C.R.2.4
405235059	5.1A.R.1.2
405235060	5.1A.R.1.3
1203627502	Method Blank (MB)
1203627503	405235041(4.4D.R.1.4) Sample Duplicate (DUP)
1203627504	405235041(4.4D.R.1.4) Matrix Spike (MS)
1203627505	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

Sample 1203627505 (LCS) was recounted due to high recovery. The recount is reported.

Miscellaneous Information

Sample received out of holding: 405235 041,042,043,044,045,046,047,048,049, 050,051,052,053,054,055,056,057,058, 059,060 QC 1203627503DUP,1203627504MS Samples analyzed in a timely manner upon receipt. Reporting results.

Product: Gamma I129, Solid

Analytical Method: DOE EML HASL-300,I-01 Modified

Analytical Procedure: GL-RAD-A-006 REV# 21

Analytical Batch: 1598663

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596246

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235061	5.1B.R.2.2
405235062	5.2.A.R.1.2
405235063	5.2.A.R.1.3
405235064	5.2.A.R.1.4
405235065	5.2A.R.2.3
405235066	5.2.A.R.2.4
405235067	5.2A.R.6.2
405235068	5.2A.R.4.2
405235069	5.2.B.R.1.4
405235070	5.2.B.R.3.2
405235071	5.2.B.R.4.2
405235072	5.2.B.R.2.4
405235073	5.2.B.R.8.2
405235074	5.3.A.R.1.3
405235075	5.4A.R.1.3
405235076	5.4A.R.4.2
405235077	5.5A.R.1.3
405235078	5.6A.R.1.3
1203627531	Method Blank (MB)
1203627532	405235061(5.1B.R.2.2) Sample Duplicate (DUP)
1203627533	405235061(5.1B.R.2.2) Matrix Spike (MS)
1203627534	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

Sample received out of holding: 405235 061,062,063,064,065,066,067,068,069, 070,071,072,073,074,075,076,077,078, QC 1203627532DUP,1203627533MS Samples were analyzed in a timely manner upon receipt. Reporting results.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
UI	Data rejected due to high counting uncertainty.	Iodine-129	405235061	5.1B.R.2.2

Product: GFPC, Sr90, solid

Analytical Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified

Analytical Procedure: GL-RAD-A-004 REV# 17

Analytical Batch: 1597795

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596227

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235001	4.1.B.R.1.2
405235002	4.1.B.R.1.3
405235003	4.1.B.R.1.4
405235004	4.1.B.R.7.2
405235005	4.1.C.R.1.3
405235006	4.1.C.R.1.4
405235007	4.1.C.R.2.3
405235008	4.1.C.R.2.4
405235009	4.1.D.R.1.3
405235010	4.1.D.R.1.4
405235011	4.1.D.R.3.2
405235012	4.1.D.R.2.4
405235013	4.2A.R.2.3
405235014	4.2A.R.1.3
405235015	4.2A.R.1.4
405235016	4.2A.R.2.4
405235017	4.2A.R.3.2
405235018	4.2A.R.4.2
405235019	4.2B.R.2.4

405235020	4.2B.R.1.4
1203625398	Method Blank (MB)
1203625399	405235005(4.1.C.R.1.3) Sample Duplicate (DUP)
1203625400	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

Sample 405235002 (4.1.B.R.1.3) was recounted due to a suspected false positive. The recount is reported.

Miscellaneous Information

1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, and 1203625399 were received and analyzed out of holding. 1. Reporting results

Product: GFPC, Sr90, solid

Analytical Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified

Analytical Procedure: GL-RAD-A-004 REV# 17

Analytical Batch: 1597796

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596228

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235021	4.2B.R.2.3
405235022	4.2B.R.1.3
405235023	4.2B.R.11.2
405235024	4.2B.R.2.2
405235025	4.2B.R.1.2
405235026	4.2C.R.1.3
405235027	4.2C.R.1.4
405235028	4.3.AR1.3
405235029	4.3.B.R.1.3
405235030	4.3A.R.2.3
405235031	4.3.BR19.2
405235032	4.3B.R.3.3

405235033	4.3B.R.3.4
405235034	4.3.B.R.1.4
405235035	4.3B.R.2.3
405235036	4.3B.R.2.4
405235037	4.4C.R.2.4
405235038	4.4C.R.1.3
405235039	4.4C.R.1.4
405235040	4.4D.R.1.3
1203625401	Method Blank (MB)
1203625402	405235025(4.2B.R.1.2) Sample Duplicate (DUP)
1203625403	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

Samples 405235025 (4.2B.R.1.2) and 405235033 (4.3B.R.3.4) were recounted due to results more negative than the three sigma TPU. The second counts are reported. Sample 405235024 (4.2B.R.2.2) was recounted due to a suspected false positive. The recount is reported.

Miscellaneous Information

1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, and 12036254402 were received and analyzed out of holding. 1. Reporting results

Product: GFPC, Sr90, solid

Analytical Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified

Analytical Procedure: GL-RAD-A-004 REV# 17

Analytical Batch: 1597803

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596233

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235041	4.4D.R.1.4
405235042	4.4D.R.2.3
405235043	4.4D.R.2.4

405235044	4.4D.R.4.2
405235045	4.4D.R.5.2
405235046	4.5A.R.1.3
405235047	4.5A.R.1.4
405235048	4.5B.R.1.2
405235049	4.5B.R.1.3
405235050	4.5B.R.1.4
405235051	4.5B.R.2.3
405235052	4.5B.R.2.4
405235053	4.5C.R.5.2
405235054	4.5C.R.1.3
405235055	4.5C.R.1.4
405235056	4.5C.R.2.2
405235057	4.5C.R.2.3
405235058	4.5C.R.2.4
405235059	5.1A.R.1.2
405235060	5.1A.R.1.3
1203625408	Method Blank (MB)
1203625409	405235045(4.4D.R.5.2) Sample Duplicate (DUP)
1203625410	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

Sample 405235053 (4.5C.R.5.2) was recounted due to high MDC. The recount is reported. Samples 405235057 (4.5C.R.2.3) and 405235058 (4.5C.R.2.4) were recounted due to results more negative than the three sigma TPU. The second counts are reported. Sample 405235044 (4.4D.R.4.2) was recounted due to a suspected false positive. The recount is reported.

Miscellaneous Information

1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060, and 1203625409 were received and analyzed out of holding. 1. Reporting results

Product: GFPC, Sr90, solid

Analytical Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified

Analytical Procedure: GL-RAD-A-004 REV# 17

Analytical Batch: 1597804

Preparation Method: ASTM D 2216 (Modified)
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1596246

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235061	5.1B.R.2.2
405235062	5.2.A.R.1.2
405235063	5.2.A.R.1.3
405235064	5.2.A.R.1.4
405235065	5.2A.R.2.3
405235066	5.2.A.R.2.4
405235067	5.2A.R.6.2
405235068	5.2A.R.4.2
405235069	5.2.B.R.1.4
405235070	5.2.B.R.3.2
405235071	5.2.B.R.4.2
405235072	5.2.B.R.2.4
405235073	5.2.B.R.8.2
405235074	5.3.A.R.1.3
405235075	5.4A.R.1.3
405235076	5.4A.R.4.2
405235077	5.5A.R.1.3
405235078	5.6A.R.1.3
1203625412	Method Blank (MB)
1203625413	405235065(5.2A.R.2.3) Sample Duplicate (DUP)
1203625414	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

Sample 1203625414 (LCS) was recounted due to low recovery. The recount is reported. Samples 405235063 (5.2.A.R.1.3), 405235064 (5.2.A.R.1.4), 405235066 (5.2.A.R.2.4), 405235067 (5.2A.R.6.2), 405235070 (5.2.B.R.3.2), 405235074 (5.3.A.R.1.3) and 405235076 (5.4A.R.4.2) were recounted due to results more negative than the three sigma TPU. The second counts are reported. Sample 1203625413 (5.2A.R.2.3DUP) was recounted due to a suspected false positive. The recount is reported.

Miscellaneous Information

1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, and 405235078 were received and analyzed out of holding. 1. Reporting results

Product: GFPC, Gross A/B, solid

Analytical Method: EPA 900.0/SW846 9310/SM 7110B Modified

Analytical Procedure: GL-RAD-A-001B REV# 17

Analytical Batch: 1597811

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596228

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235021	4.2B.R.2.3
405235022	4.2B.R.1.3
405235023	4.2B.R.11.2
405235024	4.2B.R.2.2
405235025	4.2B.R.1.2
405235026	4.2C.R.1.3
405235027	4.2C.R.1.4
405235028	4.3.AR1.3
405235029	4.3.B.R.1.3
405235030	4.3A.R.2.3
405235031	4.3.BR19.2
405235032	4.3B.R.3.3
405235033	4.3B.R.3.4
405235034	4.3.B.R.1.4
405235035	4.3B.R.2.3
405235036	4.3B.R.2.4
405235037	4.4C.R.2.4
405235038	4.4C.R.1.3
405235039	4.4C.R.1.4
405235040	4.4D.R.1.3
1203625435	Method Blank (MB)
1203625436	405235033(4.3B.R.3.4) Sample Duplicate (DUP)
1203625437	405235033(4.3B.R.3.4) Matrix Spike (MS)
1203625438	405235033(4.3B.R.3.4) Matrix Spike Duplicate (MSD)
1203625439	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture

absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Miscellaneous Information

1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, 1203625436, 1203625437, and 1203625438 were received and analyzed out of holding. 1. Reporting results

Product: GFPC, Gross A/B, solid

Analytical Method: EPA 900.0/SW846 9310/SM 7110B Modified

Analytical Procedure: GL-RAD-A-001B REV# 17

Analytical Batch: 1597816

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596227

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235001	4.1.B.R.1.2
405235002	4.1.B.R.1.3
405235003	4.1.B.R.1.4
405235004	4.1.B.R.7.2
405235005	4.1.C.R.1.3
405235006	4.1.C.R.1.4
405235007	4.1.C.R.2.3
405235008	4.1.C.R.2.4
405235009	4.1.D.R.1.3
405235010	4.1.D.R.1.4
405235011	4.1.D.R.3.2
405235012	4.1.D.R.2.4
405235013	4.2A.R.2.3
405235014	4.2A.R.1.3
405235015	4.2A.R.1.4
405235016	4.2A.R.2.4
405235017	4.2A.R.3.2
405235018	4.2A.R.4.2
405235019	4.2B.R.2.4
405235020	4.2B.R.1.4
1203625449	Method Blank (MB)
1203625450	405235013(4.2A.R.2.3) Sample Duplicate (DUP)
1203625451	405235013(4.2A.R.2.3) Matrix Spike (MS)
1203625452	405235013(4.2A.R.2.3) Matrix Spike Duplicate (MSD)
1203625453	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Recounts

Samples 1203625451 (4.2A.R.2.3MS) and 1203625452 (4.2A.R.2.3MSD) were recounted due to high recovery. The recounts are reported. Samples 1203625450 (4.2A.R.2.3DUP) and 405235013 (4.2A.R.2.3) were recounted due to high relative percent difference/relative error ratio. The recounts are reported.

Miscellaneous Information

1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, 1203625450, 1203625451, and 1203625452 were received and analyzed out of holding. 1. Reporting results

Product: GFPC, Gross A/B, solid

Analytical Method: EPA 900.0/SW846 9310/SM 7110B Modified

Analytical Procedure: GL-RAD-A-001B REV# 17

Analytical Batch: 1597817

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596246

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235061	5.1B.R.2.2
405235062	5.2.A.R.1.2
405235063	5.2.A.R.1.3
405235064	5.2.A.R.1.4
405235065	5.2A.R.2.3
405235066	5.2.A.R.2.4
405235067	5.2A.R.6.2
405235068	5.2A.R.4.2
405235069	5.2.B.R.1.4
405235070	5.2.B.R.3.2

405235071	5.2.B.R.4.2
405235072	5.2.B.R.2.4
405235073	5.2.B.R.8.2
405235074	5.3.A.R.1.3
405235075	5.4A.R.1.3
405235076	5.4A.R.4.2
405235077	5.5A.R.1.3
405235078	5.6A.R.1.3
1203625459	Method Blank (MB)
1203625460	405235073(5.2.B.R.8.2) Sample Duplicate (DUP)
1203625461	405235073(5.2.B.R.8.2) Matrix Spike (MS)
1203625462	405235073(5.2.B.R.8.2) Matrix Spike Duplicate (MSD)
1203625463	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The sample and the duplicate, 1203625460 (5.2.B.R.8.2DUP) and 405235073 (5.2.B.R.8.2) , did not meet the alpha relative percent difference requirement; however, they do meet the relative error ratio requirement with a value of 1.5705. The sample and the duplicate, 1203625460 (5.2.B.R.8.2DUP) and 405235073 (5.2.B.R.8.2) , did not meet the beta relative percent difference requirement; however, they do meet the relative error ratio requirement with a value of 2.7267.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Recounts

Sample 1203625461 (5.2.B.R.8.2MS) was recounted due to low recovery. The recount is reported.

Miscellaneous Information

1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, 1203625460, 1203625461, and 1203625462 were received and analyzed out of holding. 1. Reporting results

Product: GFPC, Gross A/B, solid

Analytical Method: EPA 900.0/SW846 9310/SM 7110B Modified

Analytical Procedure: GL-RAD-A-001B REV# 17

Analytical Batch: 1602427

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596233

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235041	4.4D.R.1.4
405235042	4.4D.R.2.3
405235043	4.4D.R.2.4
405235044	4.4D.R.4.2
405235045	4.4D.R.5.2
405235046	4.5A.R.1.3
405235047	4.5A.R.1.4
405235048	4.5B.R.1.2
405235049	4.5B.R.1.3
405235050	4.5B.R.1.4
405235051	4.5B.R.2.3
405235052	4.5B.R.2.4
405235053	4.5C.R.5.2
405235054	4.5C.R.1.3
405235055	4.5C.R.1.4
405235056	4.5C.R.2.2
405235057	4.5C.R.2.3
405235058	4.5C.R.2.4
405235059	5.1A.R.1.2
405235060	5.1A.R.1.3
1203636653	Method Blank (MB)
1203636654	405235045(4.4D.R.5.2) Sample Duplicate (DUP)
1203636655	405235045(4.4D.R.5.2) Matrix Spike (MS)
1203636656	405235045(4.4D.R.5.2) Matrix Spike Duplicate (MSD)
1203636657	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Sample Re-prep/Re-analysis

Samples were re-prepped due to low recovery. The re-analysis is being reported.

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Recounts

Samples 1203636655 (4.4D.R.5.2MS) and 1203636656 (4.4D.R.5.2MSD) were recounted due to high recovery. The recounts are reported.

Miscellaneous Information

1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, and 405235060 were received and analyzed out of holding. 1. Reporting results

Product: Liquid Scint Pu241, Solid

Analytical Method: DOE EML HASL-300, Pu-11-RC Modified

Analytical Procedure: GL-RAD-A-035 REV# 17

Analytical Batch: 1596394

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596227

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235001	4.1.B.R.1.2
405235002	4.1.B.R.1.3
405235003	4.1.B.R.1.4
405235004	4.1.B.R.7.2
405235005	4.1.C.R.1.3
405235006	4.1.C.R.1.4
405235007	4.1.C.R.2.3
405235008	4.1.C.R.2.4
405235009	4.1.D.R.1.3
405235010	4.1.D.R.1.4
405235011	4.1.D.R.3.2
405235012	4.1.D.R.2.4
405235013	4.2A.R.2.3
405235014	4.2A.R.1.3
405235015	4.2A.R.1.4
405235016	4.2A.R.2.4
405235017	4.2A.R.3.2
405235018	4.2A.R.4.2
405235019	4.2B.R.2.4
405235020	4.2B.R.1.4
1203621703	Method Blank (MB)
1203621704	405235001(4.1.B.R.1.2) Sample Duplicate (DUP)
1203621705	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

Samples 1203621704 (4.1.B.R.1.2DUP), 405235003 (4.1.B.R.1.4), 405235004 (4.1.B.R.7.2) and 405235011 (4.1.D.R.3.2) were recounted due to high MDCs. The recounts are reported. Samples 405235006 (4.1.C.R.1.4) and 405235018 (4.2A.R.4.2) were recounted due to results more negative than the three sigma TPU. The second counts are reported.

Miscellaneous Information

1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, and 1203621704 were received and analyzed out of holding. 2. Sample 1203621704 does not meet the resolution requirement of having a full width half maximum of 100 keV or less for the Pu-242 tracer. 1. Reporting results. 2. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.

Product: Liquid Scint Pu241, Solid

Analytical Method: DOE EML HASL-300, Pu-11-RC Modified

Analytical Procedure: GL-RAD-A-035 REV# 17

Analytical Batch: 1596402

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596228

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235021	4.2B.R.2.3
405235022	4.2B.R.1.3
405235023	4.2B.R.11.2
405235024	4.2B.R.2.2
405235025	4.2B.R.1.2
405235026	4.2C.R.1.3
405235027	4.2C.R.1.4
405235028	4.3.AR1.3
405235029	4.3.B.R.1.3
405235030	4.3A.R.2.3
405235031	4.3.BR19.2

405235032	4.3B.R.3.3
405235033	4.3B.R.3.4
405235034	4.3.B.R.1.4
405235035	4.3B.R.2.3
405235036	4.3B.R.2.4
405235037	4.4C.R.2.4
405235038	4.4C.R.1.3
405235039	4.4C.R.1.4
405235040	4.4D.R.1.3
1203621725	Method Blank (MB)
1203621726	405235021(4.2B.R.2.3) Sample Duplicate (DUP)
1203621727	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

Sample 1203621726 (4.2B.R.2.3DUP) was recounted due to results more negative than the three sigma TPU. The second count is reported. Samples 405235023 (4.2B.R.1.1.2), 405235024 (4.2B.R.2.2), 405235025 (4.2B.R.1.2) and 405235039 (4.4C.R.1.4) were recounted due to a suspected false positive. The recounts are reported.

Miscellaneous Information

1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, and 1203621726 were received and analyzed out of holding. 1. Reporting results.

Product: Liquid Scint Pu241, Solid

Analytical Method: DOE EML HASL-300, Pu-11-RC Modified

Analytical Procedure: GL-RAD-A-035 REV# 17

Analytical Batch: 1596414

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596233

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235041	4.4D.R.1.4

405235042	4.4D.R.2.3
405235043	4.4D.R.2.4
405235044	4.4D.R.4.2
405235045	4.4D.R.5.2
405235046	4.5A.R.1.3
405235047	4.5A.R.1.4
405235048	4.5B.R.1.2
405235049	4.5B.R.1.3
405235050	4.5B.R.1.4
405235051	4.5B.R.2.3
405235052	4.5B.R.2.4
405235053	4.5C.R.5.2
405235054	4.5C.R.1.3
405235055	4.5C.R.1.4
405235056	4.5C.R.2.2
405235057	4.5C.R.2.3
405235058	4.5C.R.2.4
405235059	5.1A.R.1.2
405235060	5.1A.R.1.3
1203621754	Method Blank (MB)
1203621755	405235041(4.4D.R.1.4) Sample Duplicate (DUP)
1203621756	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060, and 1203621752 were received and analyzed out of holding. 2. The Pu-242 tracer peak centroid for sample 405235047 is greater than 50 keV from the expected energy value of 4890 keV. 1. Reporting results. 2. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.

Product: Liquid Scint Pu241, Solid

Analytical Method: DOE EML HASL-300, Pu-11-RC Modified

Analytical Procedure: GL-RAD-A-035 REV# 17

Analytical Batch: 1596422

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596246

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235061	5.1B.R.2.2
405235062	5.2.A.R.1.2
405235063	5.2.A.R.1.3
405235064	5.2.A.R.1.4
405235065	5.2A.R.2.3
405235066	5.2.A.R.2.4
405235067	5.2A.R.6.2
405235068	5.2A.R.4.2
405235069	5.2.B.R.1.4
405235070	5.2.B.R.3.2
405235071	5.2.B.R.4.2
405235072	5.2.B.R.2.4
405235073	5.2.B.R.8.2
405235074	5.3.A.R.1.3
405235075	5.4A.R.1.3
405235076	5.4A.R.4.2
405235077	5.5A.R.1.3
405235078	5.6A.R.1.3
1203621772	Method Blank (MB)
1203621773	405235061(5.1B.R.2.2) Sample Duplicate (DUP)
1203621774	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Miscellaneous Information section.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, and 1203621773 were received and analyzed out of holding. 2. Sample 1203621774 does not meet the resolution requirement of having a full width half maximum of 100 keV or less for the Pu-242 tracer. 1. Reporting results. 2. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.

Product: Liquid Scint Tc99, Solid

Analytical Method: DOE EML HASL-300, Tc-02-RC Modified

Analytical Procedure: GL-RAD-A-059 REV# 4

Analytical Batch: 1597412

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596228

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235021	4.2B.R.2.3
405235022	4.2B.R.1.3
405235023	4.2B.R.11.2
405235024	4.2B.R.2.2
405235025	4.2B.R.1.2
405235026	4.2C.R.1.3
405235027	4.2C.R.1.4
405235028	4.3.AR1.3
405235029	4.3.B.R.1.3
405235030	4.3A.R.2.3
405235031	4.3.BR19.2
405235032	4.3B.R.3.3
405235033	4.3B.R.3.4
405235034	4.3.B.R.1.4
405235035	4.3B.R.2.3
405235036	4.3B.R.2.4
405235037	4.4C.R.2.4
405235038	4.4C.R.1.3
405235039	4.4C.R.1.4
405235040	4.4D.R.1.3
1203624301	Method Blank (MB)
1203624302	405235021(4.2B.R.2.3) Sample Duplicate (DUP)
1203624303	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037,

405235038, 405235039, 405235040 and 1203624302 were received and analyzed out of the method specified hold time. 1. Reporting results.

Product: Liquid Scint Tc99, Solid

Analytical Method: DOE EML HASL-300, Tc-02-RC Modified

Analytical Procedure: GL-RAD-A-059 REV# 4

Analytical Batch: 1597414

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596233

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235041	4.4D.R.1.4
405235042	4.4D.R.2.3
405235043	4.4D.R.2.4
405235044	4.4D.R.4.2
405235045	4.4D.R.5.2
405235046	4.5A.R.1.3
405235047	4.5A.R.1.4
405235048	4.5B.R.1.2
405235049	4.5B.R.1.3
405235050	4.5B.R.1.4
405235051	4.5B.R.2.3
405235052	4.5B.R.2.4
405235053	4.5C.R.5.2
405235054	4.5C.R.1.3
405235055	4.5C.R.1.4
405235056	4.5C.R.2.2
405235057	4.5C.R.2.3
405235058	4.5C.R.2.4
405235059	5.1A.R.1.2
405235060	5.1A.R.1.3
1203624304	Method Blank (MB)
1203624305	405235041(4.4D.R.1.4) Sample Duplicate (DUP)
1203624306	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060 and 1203624305 were received and analyzed out of the method specified hold time. 1. Reporting results.

Product: Liquid Scint Tc99, Solid

Analytical Method: DOE EML HASL-300, Tc-02-RC Modified

Analytical Procedure: GL-RAD-A-059 REV# 4

Analytical Batch: 1597416

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596227

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235001	4.1.B.R.1.2
405235002	4.1.B.R.1.3
405235003	4.1.B.R.1.4
405235004	4.1.B.R.7.2
405235005	4.1.C.R.1.3
405235006	4.1.C.R.1.4
405235007	4.1.C.R.2.3
405235008	4.1.C.R.2.4
405235009	4.1.D.R.1.3
405235010	4.1.D.R.1.4
405235011	4.1.D.R.3.2
405235012	4.1.D.R.2.4
405235013	4.2A.R.2.3
405235014	4.2A.R.1.3
405235015	4.2A.R.1.4
405235016	4.2A.R.2.4
405235017	4.2A.R.3.2
405235018	4.2A.R.4.2
405235019	4.2B.R.2.4
405235020	4.2B.R.1.4
1203624308	Method Blank (MB)
1203624309	405235001(4.1.B.R.1.2) Sample Duplicate (DUP)
1203624310	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

Sample 405235015 (4.2A.R.1.4) was recounted due to the quench number being outside the calibration range. The recount is reported.

Miscellaneous Information

1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, and 1203624309 were received and analyzed out of the method specified hold time. 1. Reporting results.

Product: Liquid Scint Tc99, Solid

Analytical Method: DOE EML HASL-300, Tc-02-RC Modified

Analytical Procedure: GL-RAD-A-059 REV# 4

Analytical Batch: 1597417

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596246

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235061	5.1B.R.2.2
405235062	5.2.A.R.1.2
405235063	5.2.A.R.1.3
405235064	5.2.A.R.1.4
405235065	5.2A.R.2.3
405235066	5.2.A.R.2.4
405235067	5.2A.R.6.2
405235068	5.2A.R.4.2
405235069	5.2.B.R.1.4
405235070	5.2.B.R.3.2
405235071	5.2.B.R.4.2
405235072	5.2.B.R.2.4
405235073	5.2.B.R.8.2
405235074	5.3.A.R.1.3
405235075	5.4A.R.1.3
405235076	5.4A.R.4.2
405235077	5.5A.R.1.3
405235078	5.6A.R.1.3
1203624311	Method Blank (MB)
1203624312	405235061(5.1B.R.2.2) Sample Duplicate (DUP)
1203624313	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, and 1203624312 were received and analyzed out of method specified hold time. 1. Reporting results.

Product: LSC, Tritium Dist, Solid

Analytical Method: EPA 906.0 Modified

Analytical Procedure: GL-RAD-A-002 REV# 21

Analytical Batch: 1598072

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596227

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235001	4.1.B.R.1.2
405235002	4.1.B.R.1.3
405235003	4.1.B.R.1.4
405235004	4.1.B.R.7.2
405235005	4.1.C.R.1.3
405235006	4.1.C.R.1.4
405235007	4.1.C.R.2.3
405235008	4.1.C.R.2.4
405235009	4.1.D.R.1.3
405235010	4.1.D.R.1.4
405235011	4.1.D.R.3.2
405235012	4.1.D.R.2.4
405235013	4.2A.R.2.3
405235014	4.2A.R.1.3
405235015	4.2A.R.1.4
405235016	4.2A.R.2.4
405235017	4.2A.R.3.2
405235018	4.2A.R.4.2
405235019	4.2B.R.2.4
405235020	4.2B.R.1.4
1203626094	Method Blank (MB)
1203626095	405235001(4.1.B.R.1.2) Sample Duplicate (DUP)

1203626096 405235001(4.1.B.R.1.2) Matrix Spike (MS)
1203626097 Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, 1203626095 and 1203626096 were received and analyzed out of the method specified hold time. 1. Reporting results.

Product: LSC, Tritium Dist, Solid

Analytical Method: EPA 906.0 Modified

Analytical Procedure: GL-RAD-A-002 REV# 21

Analytical Batch: 1598075

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596228

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235021	4.2B.R.2.3
405235022	4.2B.R.1.3
405235023	4.2B.R.11.2
405235024	4.2B.R.2.2
405235025	4.2B.R.1.2
405235026	4.2C.R.1.3
405235027	4.2C.R.1.4
405235028	4.3.AR1.3
405235029	4.3.B.R.1.3
405235030	4.3A.R.2.3
405235031	4.3.BR19.2
405235032	4.3B.R.3.3
405235033	4.3B.R.3.4
405235034	4.3.B.R.1.4
405235035	4.3B.R.2.3
405235036	4.3B.R.2.4
405235037	4.4C.R.2.4

405235038	4.4C.R.1.3
405235039	4.4C.R.1.4
405235040	4.4D.R.1.3
1203626098	Method Blank (MB)
1203626099	405235021(4.2B.R.2.3) Sample Duplicate (DUP)
1203626100	405235021(4.2B.R.2.3) Matrix Spike (MS)
1203626101	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, 1203626099, and 1203626100 were received and analyzed out of the method specified hold time. 1. Reporting results.

Product: Liquid Scint C14, Solid

Analytical Method: EPA EERF C-01 Modified

Analytical Procedure: GL-RAD-A-003 REV# 15

Analytical Batch: 1598078

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596227

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235001	4.1.B.R.1.2
405235002	4.1.B.R.1.3
405235003	4.1.B.R.1.4
405235004	4.1.B.R.7.2
405235005	4.1.C.R.1.3
405235006	4.1.C.R.1.4
405235007	4.1.C.R.2.3
405235008	4.1.C.R.2.4
405235009	4.1.D.R.1.3
405235010	4.1.D.R.1.4
405235011	4.1.D.R.3.2
405235012	4.1.D.R.2.4

405235013	4.2A.R.2.3
405235014	4.2A.R.1.3
405235015	4.2A.R.1.4
405235016	4.2A.R.2.4
405235017	4.2A.R.3.2
405235018	4.2A.R.4.2
405235019	4.2B.R.2.4
405235020	4.2B.R.1.4
1203626105	Method Blank (MB)
1203626106	405235001(4.1.B.R.1.2) Sample Duplicate (DUP)
1203626107	405235001(4.1.B.R.1.2) Matrix Spike (MS)
1203626108	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, 1203626106, and 1203626107 were received and analyzed out of the method specified hold time. 1. Reporting results.

Product: Liquid Scint C14, Solid

Analytical Method: EPA EERF C-01 Modified

Analytical Procedure: GL-RAD-A-003 REV# 15

Analytical Batch: 1598080

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596228

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235021	4.2B.R.2.3
405235022	4.2B.R.1.3
405235023	4.2B.R.11.2
405235024	4.2B.R.2.2
405235025	4.2B.R.1.2
405235026	4.2C.R.1.3
405235027	4.2C.R.1.4

405235028	4.3.AR1.3
405235029	4.3.B.R.1.3
405235030	4.3A.R.2.3
405235031	4.3.BR19.2
405235032	4.3B.R.3.3
405235033	4.3B.R.3.4
405235034	4.3.B.R.1.4
405235035	4.3B.R.2.3
405235036	4.3B.R.2.4
405235037	4.4C.R.2.4
405235038	4.4C.R.1.3
405235039	4.4C.R.1.4
405235040	4.4D.R.1.3
1203626126	Method Blank (MB)
1203626127	405235021(4.2B.R.2.3) Sample Duplicate (DUP)
1203626128	405235021(4.2B.R.2.3) Matrix Spike (MS)
1203626129	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, 1203626127, and 1203626128 were received and analyzed outside of the method specified hold time. 1. Reporting results.

Product: Liquid Scint C14, Solid

Analytical Method: EPA EERF C-01 Modified

Analytical Procedure: GL-RAD-A-003 REV# 15

Analytical Batch: 1598081

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596233

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235041	4.4D.R.1.4
405235042	4.4D.R.2.3

405235043	4.4D.R.2.4
405235044	4.4D.R.4.2
405235045	4.4D.R.5.2
405235046	4.5A.R.1.3
405235047	4.5A.R.1.4
405235048	4.5B.R.1.2
405235049	4.5B.R.1.3
405235050	4.5B.R.1.4
405235051	4.5B.R.2.3
405235052	4.5B.R.2.4
405235053	4.5C.R.5.2
405235054	4.5C.R.1.3
405235055	4.5C.R.1.4
405235056	4.5C.R.2.2
405235057	4.5C.R.2.3
405235058	4.5C.R.2.4
405235059	5.1A.R.1.2
405235060	5.1A.R.1.3
1203626109	Method Blank (MB)
1203626110	405235041(4.4D.R.1.4) Sample Duplicate (DUP)
1203626111	405235041(4.4D.R.1.4) Matrix Spike (MS)
1203626112	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060, 1203626110, and 1203626111 were received and analyzed out of the method specified hold time. 1. Reporting results.

Product: Liquid Scint C14, Solid

Analytical Method: EPA EERF C-01 Modified

Analytical Procedure: GL-RAD-A-003 REV# 15

Analytical Batch: 1598082

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596246

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235061	5.1B.R.2.2
405235062	5.2.A.R.1.2
405235063	5.2.A.R.1.3
405235064	5.2.A.R.1.4
405235065	5.2.A.R.2.3
405235066	5.2.A.R.2.4
405235067	5.2.A.R.6.2
405235068	5.2.A.R.4.2
405235069	5.2.B.R.1.4
405235070	5.2.B.R.3.2
405235071	5.2.B.R.4.2
405235072	5.2.B.R.2.4
405235073	5.2.B.R.8.2
405235074	5.3.A.R.1.3
405235075	5.4.A.R.1.3
405235076	5.4.A.R.4.2
405235077	5.5.A.R.1.3
405235078	5.6.A.R.1.3
1203626113	Method Blank (MB)
1203626114	405235061(5.1B.R.2.2) Sample Duplicate (DUP)
1203626115	405235061(5.1B.R.2.2) Matrix Spike (MS)
1203626116	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Miscellaneous Information

1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, 1203626114, and 1203626115 were received and analyzed out of method specified hold time. 1. Reporting results.

Product: LSC, Tritium Dist, Solid

Analytical Method: EPA 906.0 Modified

Analytical Procedure: GL-RAD-A-002 REV# 21

Analytical Batch: 1598092

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596233

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235041	4.4D.R.1.4
405235042	4.4D.R.2.3
405235043	4.4D.R.2.4
405235044	4.4D.R.4.2
405235045	4.4D.R.5.2
405235046	4.5A.R.1.3
405235047	4.5A.R.1.4
405235048	4.5B.R.1.2
405235049	4.5B.R.1.3
405235050	4.5B.R.1.4
405235051	4.5B.R.2.3
405235052	4.5B.R.2.4
405235053	4.5C.R.5.2
405235054	4.5C.R.1.3
405235055	4.5C.R.1.4
405235056	4.5C.R.2.2
405235057	4.5C.R.2.3
405235058	4.5C.R.2.4
405235059	5.1A.R.1.2
405235060	5.1A.R.1.3
1203626144	Method Blank (MB)
1203626145	405235041(4.4D.R.1.4) Sample Duplicate (DUP)
1203626146	405235041(4.4D.R.1.4) Matrix Spike (MS)
1203626147	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

Sample 405235059 (5.1A.R.1.2) was recounted due to high MDC. The recount is reported.

Miscellaneous Information

1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060, 1203626145, and 1203626146 were received and analyzed out of the method specified hold time. 1. Reporting results.

Product: LSC, Tritium Dist, Solid

Analytical Method: EPA 906.0 Modified

Analytical Procedure: GL-RAD-A-002 REV# 21

Analytical Batch: 1598096

Preparation Method: ASTM D 2216 (Modified)

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1596246

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
405235061	5.1B.R.2.2
405235062	5.2.A.R.1.2
405235063	5.2.A.R.1.3
405235064	5.2.A.R.1.4
405235065	5.2A.R.2.3
405235066	5.2.A.R.2.4
405235067	5.2A.R.6.2
405235068	5.2A.R.4.2
405235069	5.2.B.R.1.4
405235070	5.2.B.R.3.2
405235071	5.2.B.R.4.2
405235072	5.2.B.R.2.4
405235073	5.2.B.R.8.2
405235074	5.3.A.R.1.3
405235075	5.4A.R.1.3
405235076	5.4A.R.4.2
405235077	5.5A.R.1.3
405235078	5.6A.R.1.3
1203626152	Method Blank (MB)
1203626153	405235061(5.1B.R.2.2) Sample Duplicate (DUP)
1203626154	405235061(5.1B.R.2.2) Matrix Spike (MS)
1203626155	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time

Refer to Miscellaneous Information section.

Recounts

Sample 1203626155 (LCS) was recounted due to low recovery. The recount is reported.

Miscellaneous Information

1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068,

405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, 1203626153, and 1203626154 were received and analyzed out of the method specified hold time. 1. Reporting results.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

MJWC001 MJW Technical Services

Client SDG: 405235 GEL Work Order: 405235

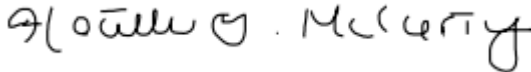
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- H Analytical holding time was exceeded
- U Analyte was analyzed for, but not detected above the Lc.
- UI Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- h Preparation or preservation holding time was exceeded

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Heather McCarty

Date: 04 OCT 2016

Title: Analyst II

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228
 Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Report Date: October 4, 2016

Client Sample ID: 4.1.B.R.1.2
 Sample ID: 405235001
 Matrix: Soil
 Collect Date: 10-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 19.4%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		19.4						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0364	+/-0.0647	0.105	0.0312	+/-0.0649	1.00	pCi/g			JXH2	09/29/16	0918	1596393	2
Plutonium-239/240	HUh	-0.00621	+/-0.0429	0.104	0.031	+/-0.0429	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0134	+/-0.0454	0.118	0.0371	+/-0.0455	1.00	pCi/g			JXH2	09/29/16	0913	1596389	3
Uranium-233/234	Hh	0.798	+/-0.232	0.128	0.0392	+/-0.268	1.00	pCi/g							
Uranium-235/236	Hh	0.0583	+/-0.0739	0.0918	0.021	+/-0.0745	1.00	pCi/g							
Uranium-238	Hh	1.00	+/-0.255	0.0792	0.0148	+/-0.306	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0857	+/-0.259	0.727	0.185	+/-0.259	1.00	pCi/g			JXH2	09/30/16	0859	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	2.13	+/-1.25	1.06	0.283	+/-1.33	1.00	pCi/g			JXH2	10/01/16	1254	1596388	5
Thorium-229	Hh	0.301	+/-0.488	0.691	0.161	+/-0.492	1.00	pCi/g							
Thorium-230	Hh	1.46	+/-0.868	0.529	0.0803	+/-0.916	1.00	pCi/g							
Thorium-232	Hh	0.962	+/-0.721	0.527	0.080	+/-0.746	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0138	+/-0.0417	0.117	0.0298	+/-0.0418	1.00	pCi/g			JXH2	09/29/16	2150	1596390	6
Curium-242	Hh	0.00	+/-0.133	0.199	0.00	+/-0.134	1.00	pCi/g							
Curium-243/244	HUh	0.0101	+/-0.0563	0.108	0.0247	+/-0.0563	1.00	pCi/g							
Curium-245/246	Hh	0.00	+/-0.0442	0.0658	0.00	+/-0.0443	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-4.14	+/-7.71	13.5	6.57	+/-7.71	15.0	pCi/g			JXH2	09/30/16	0539	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.016	+/-0.176	0.372	0.138	+/-0.177	1.00	pCi/g			MJH1	09/27/16	1226	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.0104	+/-0.258	0.498	0.231	+/-0.258		pCi/g			MXR1	10/03/16	0756	1596247	9
Antimony-125	HUh	-0.0487	+/-0.122	0.219	0.0991	+/-0.124		pCi/g							
Bismuth-212	HUIh	0.00	+/-0.761	1.46	0.672	+/-0.995		pCi/g							
Bismuth-214	Hh	1.03	+/-0.229	0.135	0.0601	+/-0.233		pCi/g							
Cesium-137	Hh	0.562	+/-0.104	0.0892	0.0403	+/-0.107	0.100	pCi/g							
Cobalt-60	HUh	-0.0365	+/-0.0504	0.0729	0.0295	+/-0.0531		pCi/g							
Europium-154	HUh	0.0457	+/-0.126	0.257	0.110	+/-0.128		pCi/g							
Lead-212	Hh	1.20	+/-0.144	0.107	0.050	+/-0.158		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.B.R.1.2
 Sample ID: 405235001

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Lead-214	Hh	1.22	+/-0.220	0.146	0.0669	+/-0.226		pCi/g							
Potassium-40	Hh	16.9	+/-1.81	0.592	0.232	+/-2.02		pCi/g							
Protactinium-231	HUh	0.0574	+/-0.533	1.02	0.474	+/-0.534		pCi/g							
Radium-226	Hh	1.03	+/-0.229	0.135	0.0601	+/-0.233		pCi/g							
Radium-228	Hh	1.04	+/-0.294	0.256	0.110	+/-0.299		pCi/g							
Thallium-208	Hh	0.422	+/-0.0952	0.0725	0.0324	+/-0.0969		pCi/g							
Tin-126	HUlh	0.00	+/-0.103	0.202	0.0966	+/-0.122		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	13.1	+/-3.68	3.94	1.69	+/-4.50	4.00	pCi/g		JXC9	09/16/16	1057	1597816	10
Beta	Hh	19.7	+/-2.86	3.33	1.58	+/-4.11	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.296	+/-0.340	0.779	0.334	+/-0.340	2.00	pCi/g		KSD1	09/17/16	1550	1597795	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.0866	+/-1.90	3.30	1.59	+/-1.90	6.00	pCi/g		AEA	09/19/16	1326	1598072	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.321	+/-0.636	1.11	0.542	+/-0.636	2.00	pCi/g		AEA	09/22/16	0038	1598078	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-1.43	+/-1.28	2.37	1.13	+/-1.28	5.00	pCi/g		GXR1	09/20/16	0440	1597416	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified

GEL LABORATORIES LLC

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.1.B.R.1.2
Sample ID: 405235001

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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14 DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer	Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"	1596393	78.4	(15%-125%)
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1596389	85.7	(15%-125%)
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"	1596389	104	(15%-125%)
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"	1596392	61.2	(15%-125%)
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"	1596388	92.3	(15%-125%)
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"	1596390	79.7	(15%-125%)
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"	1596394	78.4	(15%-125%)
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"	1597795	100	(25%-125%)
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"	1597416	91.8	(15%-125%)

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.B.R.1.3
 Sample ID: 405235002
 Matrix: Soil
 Collect Date: 10-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 22.4%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		22.4						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.0194	+/-0.0533	0.0924	0.0235	+/-0.0534	1.00	pCi/g			JXH2	09/29/16	0918	1596393	2
Plutonium-239/240	HUh	-0.00661	+/-0.0457	0.111	0.033	+/-0.0457	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	Hh	0.0524	+/-0.0754	0.091	0.017	+/-0.076	1.00	pCi/g			JXH2	09/29/16	0913	1596389	3
Uranium-233/234	Hh	1.13	+/-0.257	0.097	0.0264	+/-0.320	1.00	pCi/g							
Uranium-235/236	Hh	0.0337	+/-0.0595	0.0902	0.0229	+/-0.0598	1.00	pCi/g							
Uranium-238	Hh	1.17	+/-0.262	0.103	0.0295	+/-0.328	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0214	+/-0.184	0.427	0.0799	+/-0.185	1.00	pCi/g			JXH2	09/30/16	0859	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.89	+/-0.555	0.432	0.161	+/-0.598	1.00	pCi/g			JXH2	09/28/16	1405	1596388	5
Thorium-229	Hh	0.178	+/-0.170	0.218	0.068	+/-0.171	1.00	pCi/g							
Thorium-230	Hh	0.969	+/-0.334	0.218	0.0678	+/-0.353	1.00	pCi/g							
Thorium-232	Hh	1.23	+/-0.363	0.0817	0.00	+/-0.390	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.00606	+/-0.0634	0.132	0.0337	+/-0.0635	1.00	pCi/g			JXH2	09/29/16	2150	1596390	6
Curium-242	Hh	0.00	+/-0.151	0.224	0.00	+/-0.151	1.00	pCi/g							
Curium-243/244	HUh	0.0114	+/-0.0635	0.122	0.0279	+/-0.0636	1.00	pCi/g							
Curium-245/246	HUh	0.0188	+/-0.0706	0.119	0.0222	+/-0.0707	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-9.2	+/-7.64	13.7	6.65	+/-7.64	15.0	pCi/g			JXH2	09/30/16	0641	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.109	+/-0.278	0.598	0.252	+/-0.283	1.00	pCi/g			MJH1	09/27/16	1227	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.0188	+/-0.238	0.428	0.197	+/-0.238		pCi/g			MXR1	10/03/16	0757	1596247	9
Antimony-125	HUh	0.0438	+/-0.115	0.212	0.0961	+/-0.117		pCi/g							
Bismuth-212	HUIh	0.00	+/-0.812	1.33	0.613	+/-1.30		pCi/g							
Bismuth-214	Hh	0.915	+/-0.178	0.0819	0.0342	+/-0.192		pCi/g							
Cesium-137	HUIh	0.00	+/-0.0883	0.0595	0.0259	+/-0.0888	0.100	pCi/g							
Cobalt-60	HUh	-0.0144	+/-0.0498	0.0911	0.0391	+/-0.0502		pCi/g							
Europium-154	HUh	0.0466	+/-0.120	0.256	0.111	+/-0.122		pCi/g							
Lead-212	Hh	1.45	+/-0.143	0.0964	0.0446	+/-0.186		pCi/g							
Lead-214	Hh	1.12	+/-0.207	0.116	0.052	+/-0.227		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.B.R.1.3
 Sample ID: 405235002

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	17.8	+/-1.78	0.667	0.275	+/-2.39		pCi/g							
Protactinium-231	HUh	0.00	+/-0.777	0.803	0.367	+/-0.793		pCi/g							
Radium-226	Hh	0.915	+/-0.178	0.0819	0.0342	+/-0.192		pCi/g							
Radium-228	Hh	1.30	+/-0.343	0.207	0.0872	+/-0.388		pCi/g							
Thallium-208	Hh	0.249	+/-0.0673	0.0645	0.0288	+/-0.0703		pCi/g							
Tin-126	HUh	0.00	+/-0.126	0.118	0.0553	+/-0.128		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	32.3	+/-7.65	3.92	1.28	+/-9.68	4.00	pCi/g		JXC9	09/16/16	1057	1597816	10
Beta	Hh	20.1	+/-3.65	2.74	1.17	+/-4.63	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.462	+/-0.472	0.991	0.445	+/-0.472	2.00	pCi/g		KSD1	09/19/16	1155	1597795	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	1.12	+/-1.97	3.36	1.62	+/-1.97	6.00	pCi/g		AEA	09/19/16	1459	1598072	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.024	+/-0.636	1.10	0.534	+/-0.636	2.00	pCi/g		AEA	09/22/16	0125	1598078	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.822	+/-1.21	2.19	1.05	+/-1.21	5.00	pCi/g		GXR1	09/20/16	0456	1597416	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
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Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.1.B.R.1.3
Sample ID: 405235002

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596393	76.4	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	79.2	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	78.9	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596392	76	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596388	90.7	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596390	66.5	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596394	76.4	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597795	103	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597416	91.3	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.B.R.1.4
 Sample ID: 405235003
 Matrix: Soil
 Collect Date: 10-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 17.4%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		17.4						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.000753	+/-0.0558	0.124	0.0338	+/-0.0559	1.00	pCi/g			JXH2	09/29/16	0918	1596393	2
Plutonium-239/240	HUh	0.000748	+/-0.0555	0.123	0.0336	+/-0.0555	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.00505	+/-0.0759	0.177	0.0507	+/-0.076	1.00	pCi/g			JXH2	09/29/16	0913	1596389	3
Uranium-233/234	Hh	1.03	+/-0.255	0.0978	0.0249	+/-0.315	1.00	pCi/g							
Uranium-235/236	Hh	0.0488	+/-0.0724	0.106	0.0288	+/-0.0729	1.00	pCi/g							
Uranium-238	Hh	0.845	+/-0.231	0.0768	0.0144	+/-0.276	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	Hh	0.00	+/-0.354	0.526	0.00	+/-0.354	1.00	pCi/g			JXH2	09/30/16	0859	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.51	+/-0.530	0.441	0.159	+/-0.561	1.00	pCi/g			JXH2	09/28/16	1405	1596388	5
Thorium-229	Hh	0.0762	+/-0.148	0.244	0.0762	+/-0.148	1.00	pCi/g							
Thorium-230	Hh	0.733	+/-0.344	0.369	0.139	+/-0.354	1.00	pCi/g							
Thorium-232	Hh	1.25	+/-0.396	0.215	0.0619	+/-0.423	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0141	+/-0.0625	0.163	0.0373	+/-0.0627	1.00	pCi/g			JXH2	09/29/16	2150	1596390	6
Curium-242	Hh	0.00	+/-0.205	0.305	0.00	+/-0.205	1.00	pCi/g							
Curium-243/244	HUh	-0.0143	+/-0.0634	0.165	0.0379	+/-0.0636	1.00	pCi/g							
Curium-245/246	Hh	0.0673	+/-0.115	0.101	0.00	+/-0.116	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	0.249	+/-6.97	11.9	5.85	+/-6.97	15.0	pCi/g			JXH2	10/01/16	1708	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.238	+/-0.233	0.714	0.277	+/-0.258	1.00	pCi/g			MJH1	09/27/16	1227	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.0619	+/-0.261	0.517	0.239	+/-0.263		pCi/g			MXR1	10/03/16	0801	1596247	9
Antimony-125	HUh	-0.0547	+/-0.118	0.212	0.0943	+/-0.121		pCi/g							
Bismuth-212	Hh	1.18	+/-1.20	1.01	0.440	+/-1.20		pCi/g							
Bismuth-214	Hh	0.730	+/-0.212	0.173	0.0783	+/-0.214		pCi/g							
Cesium-137	HUh	0.00714	+/-0.0487	0.0919	0.0411	+/-0.0488	0.100	pCi/g							
Cobalt-60	HUh	0.00486	+/-0.0565	0.111	0.0479	+/-0.0565		pCi/g							
Europium-154	HUh	-0.0771	+/-0.149	0.261	0.110	+/-0.153		pCi/g							
Lead-212	Hh	1.22	+/-0.151	0.110	0.0508	+/-0.164		pCi/g							
Lead-214	Hh	1.01	+/-0.246	0.160	0.0733	+/-0.249		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.B.R.1.4
 Sample ID: 405235003

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	14.5	+/-1.70	0.817	0.338	+/-1.86		pCi/g							
Protactinium-231	HUh	0.00	+/-0.595	1.26	0.590	+/-0.740		pCi/g							
Radium-226	Hh	0.730	+/-0.212	0.173	0.0783	+/-0.214		pCi/g							
Radium-228	Hh	0.987	+/-0.335	0.311	0.135	+/-0.339		pCi/g							
Thallium-208	Hh	0.394	+/-0.103	0.0656	0.0285	+/-0.104		pCi/g							
Tin-126	HUh	0.00	+/-0.196	0.190	0.0902	+/-0.196		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	12.3	+/-3.18	3.97	1.81	+/-3.98	4.00	pCi/g		JXC9	09/16/16	1058	1597816	10
Beta	Hh	21.7	+/-2.16	2.24	1.07	+/-3.89	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.424	+/-0.636	1.30	0.581	+/-0.636	2.00	pCi/g		KSD1	09/17/16	1551	1597795	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	-0.534	+/-1.89	3.32	1.60	+/-1.89	6.00	pCi/g		AEA	09/19/16	1632	1598072	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.31	+/-0.650	1.14	0.554	+/-0.650	2.00	pCi/g		AEA	09/22/16	0211	1598078	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.375	+/-1.05	1.87	0.897	+/-1.05	5.00	pCi/g		GXR1	09/20/16	0512	1597416	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 4.1.B.R.1.4
Sample ID: 405235003

Report Date: October 4, 2016

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test						Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"						1596393	59.5	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596389	75.5	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596389	55.8	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"						1596392	36.7	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"						1596388	84.8	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"						1596390	50.7	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"						1596394	59.5	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"						1597795	102	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"						1597416	91.4	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.B.R.7.2
 Sample ID: 405235004
 Matrix: Soil
 Collect Date: 09-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 19.4%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		19.4						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.0229	+/-0.0783	0.194	0.0662	+/-0.0783	1.00	pCi/g			JXH2	09/29/16	0918	1596393	2
Plutonium-239/240	HUh	0.0106	+/-0.0588	0.113	0.0258	+/-0.0588	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.00835	+/-0.0577	0.140	0.0417	+/-0.0578	1.00	pCi/g			JXH2	09/29/16	0913	1596389	3
Uranium-233/234	Hh	0.855	+/-0.261	0.150	0.0458	+/-0.304	1.00	pCi/g							
Uranium-235/236	Hh	0.0728	+/-0.0858	0.0928	0.0174	+/-0.0868	1.00	pCi/g							
Uranium-238	Hh	1.11	+/-0.291	0.107	0.0245	+/-0.355	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.181	+/-0.537	0.951	0.301	+/-0.538	1.00	pCi/g			JXH2	10/01/16	1254	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.43	+/-0.656	0.667	0.243	+/-0.684	1.00	pCi/g			JXH2	09/28/16	1406	1596388	5
Thorium-229	Hh	0.203	+/-0.225	0.265	0.0646	+/-0.227	1.00	pCi/g							
Thorium-230	Hh	1.15	+/-0.462	0.264	0.0645	+/-0.486	1.00	pCi/g							
Thorium-232	Hh	0.784	+/-0.388	0.263	0.0643	+/-0.402	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.028	+/-0.0635	0.109	0.0312	+/-0.0636	1.00	pCi/g			JXH2	09/29/16	2150	1596390	6
Curium-242	Hh	0.00	+/-0.109	0.162	0.00	+/-0.109	1.00	pCi/g							
Curium-243/244	HUh	-0.00757	+/-0.0335	0.0874	0.020	+/-0.0336	1.00	pCi/g							
Curium-245/246	HUh	0.0135	+/-0.0506	0.0852	0.0159	+/-0.0507	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-5.99	+/-7.28	12.7	6.22	+/-7.28	15.0	pCi/g			JXH2	10/01/16	1909	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.0259	+/-0.221	0.512	0.181	+/-0.221	1.00	pCi/g			MJH1	09/27/16	1227	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0833	+/-0.234	0.418	0.193	+/-0.237		pCi/g			MXR1	10/03/16	0801	1596247	9
Antimony-125	HUh	-0.0294	+/-0.0997	0.193	0.0871	+/-0.101		pCi/g							
Bismuth-212	HUh	0.00	+/-1.06	1.39	0.641	+/-1.42		pCi/g							
Bismuth-214	Hh	0.880	+/-0.205	0.109	0.0477	+/-0.208		pCi/g							
Cesium-137	Hh	0.209	+/-0.0662	0.0653	0.0288	+/-0.0668	0.100	pCi/g							
Cobalt-60	HUh	-0.0229	+/-0.027	0.0451	0.0164	+/-0.0289		pCi/g							
Europium-154	HUh	0.0654	+/-0.0936	0.219	0.093	+/-0.0982		pCi/g							
Lead-212	Hh	1.17	+/-0.132	0.0916	0.0424	+/-0.145		pCi/g							
Lead-214	Hh	1.16	+/-0.217	0.351	0.170	+/-0.222		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.B.R.7.2
 Sample ID: 405235004

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	14.0	+/-1.60	0.576	0.232	+/-1.76		pCi/g							
Protactinium-231	HUh	0.00	+/-0.649	0.723	0.329	+/-0.663		pCi/g							
Radium-226	Hh	0.880	+/-0.205	0.109	0.0477	+/-0.208		pCi/g							
Radium-228	Hh	1.06	+/-0.255	0.239	0.103	+/-0.261		pCi/g							
Thallium-208	Hh	0.388	+/-0.084	0.0599	0.0265	+/-0.0856		pCi/g							
Tin-126	HUh	0.00	+/-0.168	0.127	0.0594	+/-0.169		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	20.6	+/-3.58	3.98	1.84	+/-5.41	4.00	pCi/g		JXC9	09/16/16	1058	1597816	10
Beta	Hh	25.9	+/-2.14	2.00	0.954	+/-4.34	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.282	+/-0.639	1.14	0.502	+/-0.641	2.00	pCi/g		KSD1	09/17/16	1551	1597795	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	Hh	1.73	+/-1.94	3.27	1.58	+/-1.94	6.00	pCi/g		AEA	09/19/16	1805	1598072	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.251	+/-0.701	1.20	0.582	+/-0.702	2.00	pCi/g		AEA	09/22/16	0410	1598078	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-1.25	+/-1.25	2.31	1.10	+/-1.25	5.00	pCi/g		GXR1	09/20/16	0528	1597416	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.1.B.R.7.2
Sample ID: 405235004

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer	ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596393	56.3	(15%-125%)				
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	63.4	(15%-125%)				
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	76.2	(15%-125%)				
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"							1596392	19.5	(15%-125%)				
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596388	73.8	(15%-125%)				
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"							1596390	95.4	(15%-125%)				
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596394	56.3	(15%-125%)				
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"							1597795	92.3	(25%-125%)				
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597416	92.3	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.C.R.1.3
 Sample ID: 405235005
 Matrix: Soil
 Collect Date: 10-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 20.4%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		20.4						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0468	+/-0.0651	0.0972	0.0289	+/-0.0654	1.00	pCi/g			JXH2	09/29/16	0918	1596393	2
Plutonium-239/240	HUh	0.00679	+/-0.0377	0.0723	0.0166	+/-0.0377	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0134	+/-0.0452	0.117	0.0369	+/-0.0452	1.00	pCi/g			JXH2	09/29/16	0913	1596389	3
Uranium-233/234	Hh	0.922	+/-0.227	0.0983	0.0281	+/-0.272	1.00	pCi/g							
Uranium-235/236	Hh	0.0495	+/-0.0627	0.0779	0.0178	+/-0.0632	1.00	pCi/g							
Uranium-238	Hh	0.754	+/-0.204	0.0672	0.0126	+/-0.238	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.143	+/-0.201	0.658	0.202	+/-0.201	1.00	pCi/g			JXH2	09/30/16	0859	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.44	+/-0.609	0.352	0.0835	+/-0.641	1.00	pCi/g			JXH2	09/28/16	1406	1596388	5
Thorium-229	Hh	0.162	+/-0.213	0.272	0.0665	+/-0.215	1.00	pCi/g							
Thorium-230	Hh	1.20	+/-0.511	0.464	0.163	+/-0.537	1.00	pCi/g							
Thorium-232	Hh	0.853	+/-0.424	0.368	0.115	+/-0.440	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.0225	+/-0.0594	0.107	0.0318	+/-0.0595	1.00	pCi/g			JXH2	09/29/16	2150	1596390	6
Curium-242	Hh	0.00	+/-0.100	0.150	0.00	+/-0.101	1.00	pCi/g							
Curium-243/244	Hh	0.00	+/-0.0296	0.044	0.00	+/-0.0296	1.00	pCi/g							
Curium-245/246	HXh	0.0495	+/-0.0652	0.0495	0.00	+/-0.0655	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-3.76	+/-6.42	11.3	5.48	+/-6.42	15.0	pCi/g			JXH2	09/30/16	0944	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.129	+/-0.275	0.734	0.275	+/-0.281	1.00	pCi/g			MJH1	09/27/16	1511	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.000521	+/-0.227	0.439	0.204	+/-0.227		pCi/g			MXR1	10/03/16	0802	1596247	9
Antimony-125	HUh	-0.0172	+/-0.104	0.194	0.0881	+/-0.104		pCi/g							
Bismuth-212	HUh	0.00	+/-1.04	1.31	0.604	+/-1.22		pCi/g							
Bismuth-214	Hh	0.907	+/-0.175	0.120	0.0537	+/-0.180		pCi/g							
Cesium-137	Hh	0.155	+/-0.0586	0.0573	0.025	+/-0.059	0.100	pCi/g							
Cobalt-60	HUh	0.00143	+/-0.0329	0.0673	0.0278	+/-0.0329		pCi/g							
Europium-154	HUh	0.0099	+/-0.109	0.217	0.0931	+/-0.109		pCi/g							
Lead-212	Hh	0.950	+/-0.129	0.0948	0.0443	+/-0.138		pCi/g							
Lead-214	Hh	1.03	+/-0.201	0.135	0.0624	+/-0.205		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228
 Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes
 Client Sample ID: 4.1.C.R.1.3
 Sample ID: 405235005

Report Date: October 4, 2016

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	14.6	+/-1.48	0.672	0.284	+/-1.67		pCi/g							
Protactinium-231	HUh	0.00	+/-0.784	0.824	0.381	+/-0.806		pCi/g							
Radium-226	Hh	0.907	+/-0.175	0.120	0.0537	+/-0.180		pCi/g							
Radium-228	Hh	1.08	+/-0.322	0.258	0.114	+/-0.327		pCi/g							
Thallium-208	Hh	0.321	+/-0.081	0.0577	0.0256	+/-0.0821		pCi/g							
Tin-126	HUh	0.00	+/-0.169	0.135	0.0643	+/-0.170		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	13.5	+/-3.31	3.93	1.78	+/-4.24	4.00	pCi/g		JXC9	09/16/16	1058	1597816	10
Beta	Hh	18.4	+/-2.38	2.93	1.40	+/-3.62	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.135	+/-0.565	1.10	0.489	+/-0.565	2.00	pCi/g		KSD1	09/17/16	1551	1597795	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	1.04	+/-1.85	3.14	1.52	+/-1.85	6.00	pCi/g		AEA	09/19/16	1938	1598072	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.188	+/-0.608	1.06	0.515	+/-0.608	2.00	pCi/g		AEA	09/22/16	0456	1598078	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.599	+/-1.32	2.36	1.13	+/-1.32	5.00	pCi/g		GXR1	09/20/16	0544	1597416	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.1.C.R.1.3
Sample ID: 405235005

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer	ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596393	93.2	(15%-125%)				
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	78.4	(15%-125%)				
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	100	(15%-125%)				
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"							1596392	83.9	(15%-125%)				
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596388	75.5	(15%-125%)				
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"							1596390	102	(15%-125%)				
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596394	93.2	(15%-125%)				
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"							1597795	89.6	(25%-125%)				
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597416	87.1	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.C.R.1.4
 Sample ID: 405235006
 Matrix: Soil
 Collect Date: 10-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 19.5%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		19.5						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0283	+/-0.0449	0.0621	0.0142	+/-0.0451	1.00	pCi/g			JXH2	09/29/16	0918	1596393	2
Plutonium-239/240	HUh	0.00847	+/-0.0318	0.0535	0.010	+/-0.0318	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.0147	+/-0.0501	0.0929	0.0253	+/-0.0502	1.00	pCi/g			JXH2	09/29/16	0913	1596389	3
Uranium-233/234	Hh	0.762	+/-0.223	0.128	0.0402	+/-0.257	1.00	pCi/g							
Uranium-235/236	Hh	0.0718	+/-0.0774	0.088	0.0202	+/-0.0783	1.00	pCi/g							
Uranium-238	Hh	0.923	+/-0.241	0.0968	0.0246	+/-0.286	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.00979	+/-0.450	0.989	0.311	+/-0.450	1.00	pCi/g			JXH2	09/30/16	0900	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.90	+/-0.599	0.333	0.0979	+/-0.644	1.00	pCi/g			JXH2	09/28/16	1406	1596388	5
Thorium-229	HUh	0.0681	+/-0.169	0.300	0.0986	+/-0.169	1.00	pCi/g							
Thorium-230	Hh	0.909	+/-0.368	0.273	0.0852	+/-0.384	1.00	pCi/g							
Thorium-232	Hh	0.941	+/-0.364	0.201	0.0491	+/-0.381	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.00585	+/-0.0612	0.128	0.0325	+/-0.0613	1.00	pCi/g			JXH2	09/29/16	2150	1596390	6
Curium-242	Hh	0.00	+/-0.145	0.216	0.00	+/-0.146	1.00	pCi/g							
Curium-243/244	Hh	0.00	+/-0.0428	0.0636	0.00	+/-0.0429	1.00	pCi/g							
Curium-245/246	Hh	0.00	+/-0.0482	0.0717	0.00	+/-0.0483	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-1.24	+/-4.20	7.24	3.55	+/-4.20	15.0	pCi/g			JXH2	10/01/16	2110	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.433	+/-0.424	1.30	0.503	+/-0.469	1.00	pCi/g			MJH1	09/27/16	1511	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.0195	+/-0.198	0.393	0.183	+/-0.199		pCi/g			MXR1	10/03/16	0802	1596247	9
Antimony-125	HUh	0.0559	+/-0.082	0.173	0.0784	+/-0.0858		pCi/g							
Bismuth-212	Hh	1.06	+/-0.592	0.698	0.305	+/-0.594		pCi/g							
Bismuth-214	Hh	0.770	+/-0.168	0.114	0.0516	+/-0.171		pCi/g							
Cesium-137	HUh	0.0344	+/-0.0386	0.0791	0.0363	+/-0.0417	0.100	pCi/g							
Cobalt-60	HUIh	0.00	+/-0.0282	0.0722	0.031	+/-0.0335		pCi/g							
Europium-154	HUh	-0.0518	+/-0.0803	0.144	0.0582	+/-0.0837		pCi/g							
Lead-212	Hh	1.11	+/-0.140	0.085	0.0397	+/-0.152		pCi/g							
Lead-214	Hh	1.08	+/-0.170	0.108	0.0495	+/-0.176		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.C.R.1.4
 Sample ID: 405235006

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	16.0	+/-1.44	0.371	0.138	+/-1.66		pCi/g							
Protactinium-231	HUh	0.00	+/-0.730	0.611	0.278	+/-0.771		pCi/g							
Radium-226	Hh	0.770	+/-0.168	0.114	0.0516	+/-0.171		pCi/g							
Radium-228	Hh	1.41	+/-0.299	0.158	0.0655	+/-0.307		pCi/g							
Thallium-208	Hh	0.366	+/-0.0864	0.0537	0.024	+/-0.0878		pCi/g							
Tin-126	HUh	0.00	+/-0.118	0.114	0.0541	+/-0.119		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	12.0	+/-4.38	3.90	1.42	+/-4.98	4.00	pCi/g		JXC9	09/16/16	1058	1597816	10
Beta	Hh	21.2	+/-3.32	2.68	1.18	+/-4.61	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.107	+/-0.733	1.33	0.606	+/-0.734	2.00	pCi/g		KSD1	09/17/16	1551	1597795	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.621	+/-1.94	3.34	1.61	+/-1.94	6.00	pCi/g		AEA	09/19/16	2111	1598072	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.0922	+/-0.709	1.22	0.593	+/-0.709	2.00	pCi/g		AEA	09/22/16	0542	1598078	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.909	+/-1.05	1.92	0.918	+/-1.05	5.00	pCi/g		GXR1	09/20/16	0601	1597416	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 4.1.C.R.1.4
Sample ID: 405235006

Report Date: October 4, 2016

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test						Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"						1596393	97.3	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596389	72.5	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596389	101	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"						1596392	57.3	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"						1596388	95.6	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"						1596390	67.9	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"						1596394	97.3	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"						1597795	89.6	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"						1597416	94.3	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228
 Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes
 Client Sample ID: 4.1.C.R.2.3
 Sample ID: 405235007
 Matrix: Soil
 Collect Date: 10-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 21.2%

Report Date: October 4, 2016

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		21.2						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.000504	+/-0.0373	0.083	0.0226	+/-0.0374	1.00	pCi/g			JXH2	09/29/16	0918	1596393	2
Plutonium-239/240	HUh	0.0005	+/-0.0371	0.0824	0.0225	+/-0.0371	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.0199	+/-0.0549	0.0952	0.0242	+/-0.055	1.00	pCi/g			JXH2	09/29/16	0913	1596389	3
Uranium-233/234	Hh	0.729	+/-0.191	0.0828	0.0225	+/-0.223	1.00	pCi/g							
Uranium-235/236	Hh	0.0852	+/-0.0703	0.0604	0.0113	+/-0.0716	1.00	pCi/g							
Uranium-238	Hh	0.929	+/-0.213	0.0377	0.00	+/-0.259	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	Hh	0.230	+/-0.371	0.575	0.164	+/-0.372	1.00	pCi/g			JXH2	09/30/16	0900	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.19	+/-0.546	0.621	0.243	+/-0.566	1.00	pCi/g			JXH2	09/28/16	1406	1596388	5
Thorium-229	HUh	0.0163	+/-0.132	0.268	0.0837	+/-0.132	1.00	pCi/g							
Thorium-230	Hh	0.790	+/-0.333	0.197	0.0482	+/-0.346	1.00	pCi/g							
Thorium-232	Hh	0.569	+/-0.292	0.236	0.068	+/-0.300	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	Hh	0.0419	+/-0.0679	0.105	0.0301	+/-0.0681	1.00	pCi/g			JXH2	09/29/16	2150	1596390	6
Curium-242	HUh	-0.0124	+/-0.107	0.248	0.0464	+/-0.107	1.00	pCi/g							
Curium-243/244	Hh	0.00	+/-0.0306	0.0456	0.00	+/-0.0307	1.00	pCi/g							
Curium-245/246	Hh	0.0342	+/-0.0587	0.0514	0.00	+/-0.0589	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-8.65	+/-7.14	12.8	6.21	+/-7.14	15.0	pCi/g			JXH2	09/30/16	1146	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.276	+/-0.459	0.604	0.155	+/-0.476	1.00	pCi/g			MJH1	09/27/16	1512	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0788	+/-0.249	0.471	0.219	+/-0.251		pCi/g			MXR1	10/03/16	0802	1596247	9
Antimony-125	HUh	-0.0108	+/-0.0993	0.190	0.0856	+/-0.0995		pCi/g							
Bismuth-212	HUIh	0.00	+/-0.945	1.37	0.635	+/-1.14		pCi/g							
Bismuth-214	Hh	0.846	+/-0.188	0.125	0.056	+/-0.191		pCi/g							
Cesium-137	Hh	0.267	+/-0.104	0.0762	0.0342	+/-0.105	0.100	pCi/g							
Cobalt-60	HUIh	0.00	+/-0.0439	0.084	0.0358	+/-0.0535		pCi/g							
Europium-154	HUh	-0.00743	+/-0.0993	0.201	0.0839	+/-0.0994		pCi/g							
Lead-212	Hh	1.05	+/-0.135	0.103	0.0479	+/-0.146		pCi/g							
Lead-214	Hh	1.12	+/-0.199	0.128	0.0585	+/-0.204		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.C.R.2.3
 Sample ID: 405235007

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	15.5	+/-1.59	0.542	0.215	+/-1.78		pCi/g							
Protactinium-231	HUh	0.00	+/-0.687	0.874	0.405	+/-0.700		pCi/g							
Radium-226	Hh	0.846	+/-0.188	0.125	0.056	+/-0.191		pCi/g							
Radium-228	Hh	1.23	+/-0.276	0.263	0.116	+/-0.283		pCi/g							
Thallium-208	Hh	0.368	+/-0.0928	0.0546	0.0238	+/-0.0941		pCi/g							
Tin-126	HUh	0.024	+/-0.144	0.167	0.0793	+/-0.145		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	13.6	+/-3.46	3.85	1.70	+/-4.38	4.00	pCi/g		JXC9	09/19/16	1241	1597816	10
Beta	Hh	15.9	+/-2.37	2.81	1.34	+/-3.42	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	Hh	0.276	+/-0.239	0.383	0.165	+/-0.244	2.00	pCi/g		KSD1	09/17/16	1551	1597795	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	-0.257	+/-2.05	3.58	1.73	+/-2.05	6.00	pCi/g		AEA	09/19/16	2244	1598072	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.207	+/-0.709	1.23	0.600	+/-0.709	2.00	pCi/g		AEA	09/22/16	0629	1598078	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.418	+/-1.28	2.27	1.09	+/-1.28	5.00	pCi/g		GXR1	09/20/16	0617	1597416	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.1.C.R.2.3
Sample ID: 405235007

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596393	82.9	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	91.4	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	94.4	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596392	85.6	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596388	103	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596390	96.4	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596394	82.9	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597795	96.4	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597416	87.1	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.C.R.2.4
 Sample ID: 405235008
 Matrix: Soil
 Collect Date: 10-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 20.7%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		20.7						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0454	+/-0.0575	0.0714	0.0164	+/-0.0577	1.00	pCi/g			JXH2	09/29/16	0918	1596393	2
Plutonium-239/240	HUh	0.00666	+/-0.037	0.0709	0.0163	+/-0.037	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0134	+/-0.0311	0.0921	0.0251	+/-0.0312	1.00	pCi/g			JXH2	09/29/16	0913	1596389	3
Uranium-233/234	Hh	1.03	+/-0.227	0.105	0.0337	+/-0.278	1.00	pCi/g							
Uranium-235/236	Hh	0.0256	+/-0.051	0.0828	0.0226	+/-0.0512	1.00	pCi/g							
Uranium-238	Hh	0.808	+/-0.200	0.0694	0.0159	+/-0.237	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.0552	+/-0.307	0.588	0.135	+/-0.307	1.00	pCi/g			JXH2	09/30/16	0900	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.73	+/-0.606	0.313	0.0785	+/-0.646	1.00	pCi/g			JXH2	09/28/16	1406	1596388	5
Thorium-229	HUh	0.0778	+/-0.167	0.276	0.0793	+/-0.168	1.00	pCi/g							
Thorium-230	Hh	1.07	+/-0.415	0.229	0.056	+/-0.437	1.00	pCi/g							
Thorium-232	Hh	0.895	+/-0.376	0.117	0.00	+/-0.392	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.000756	+/-0.0561	0.125	0.0339	+/-0.0561	1.00	pCi/g			JXH2	09/29/16	2150	1596390	6
Curium-242	Hh	0.00	+/-0.132	0.196	0.00	+/-0.132	1.00	pCi/g							
Curium-243/244	HUh	0.000767	+/-0.0569	0.126	0.0344	+/-0.057	1.00	pCi/g							
Curium-245/246	Hh	0.00	+/-0.0436	0.0648	0.00	+/-0.0437	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-8.21	+/-6.61	11.8	5.76	+/-6.61	15.0	pCi/g			JXH2	09/30/16	1247	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.121	+/-0.196	0.362	0.150	+/-0.204	1.00	pCi/g			MJH1	09/27/16	1619	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0183	+/-0.247	0.478	0.220	+/-0.247		pCi/g			MXR1	10/03/16	0803	1596247	9
Antimony-125	HUh	-0.053	+/-0.124	0.226	0.102	+/-0.127		pCi/g							
Bismuth-212	HUh	-0.0409	+/-0.638	1.19	0.530	+/-0.638		pCi/g							
Bismuth-214	Hh	0.810	+/-0.211	0.162	0.0729	+/-0.214		pCi/g							
Cesium-137	Hh	0.189	+/-0.0961	0.0837	0.0371	+/-0.0965	0.100	pCi/g							
Cobalt-60	HUh	-0.00334	+/-0.0418	0.0848	0.0345	+/-0.0418		pCi/g							
Europium-154	HUh	0.00693	+/-0.141	0.283	0.121	+/-0.141		pCi/g							
Lead-212	Hh	1.24	+/-0.156	0.111	0.0517	+/-0.169		pCi/g							
Lead-214	Hh	1.10	+/-0.226	0.371	0.179	+/-0.230		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.C.R.2.4
 Sample ID: 405235008

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	14.5	+/-1.78	0.811	0.334	+/-1.93		pCi/g							
Protactinium-231	HUh	0.269	+/-0.536	1.07	0.498	+/-0.552		pCi/g							
Radium-226	Hh	0.810	+/-0.211	0.162	0.0729	+/-0.214		pCi/g							
Radium-228	Hh	0.805	+/-0.386	0.319	0.140	+/-0.388		pCi/g							
Thallium-208	Hh	0.233	+/-0.108	0.0849	0.0382	+/-0.109		pCi/g							
Tin-126	HUh	0.0514	+/-0.117	0.131	0.0625	+/-0.118		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	14.6	+/-3.33	2.99	1.26	+/-4.36	4.00	pCi/g		JXC9	09/19/16	1232	1597816	10
Beta	Hh	23.5	+/-2.51	2.36	1.10	+/-4.14	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.321	+/-0.473	0.824	0.345	+/-0.477	2.00	pCi/g		KSD1	09/17/16	1551	1597795	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	1.42	+/-2.08	3.53	1.70	+/-2.08	6.00	pCi/g		AEA	09/20/16	0017	1598072	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.083	+/-0.738	1.27	0.617	+/-0.738	2.00	pCi/g		AEA	09/22/16	0715	1598078	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.332	+/-1.24	2.20	1.05	+/-1.24	5.00	pCi/g		GXR1	09/20/16	0633	1597416	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.1.C.R.2.4
Sample ID: 405235008

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer	ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596393	90.1	(15%-125%)				
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	89.1	(15%-125%)				
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	105	(15%-125%)				
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"							1596392	65.3	(15%-125%)				
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596388	86.4	(15%-125%)				
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"							1596390	78.4	(15%-125%)				
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596394	90.1	(15%-125%)				
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"							1597795	103	(25%-125%)				
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597416	90.8	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.D.R.1.3
 Sample ID: 405235009
 Matrix: Soil
 Collect Date: 10-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 23.6%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		23.6						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.00709	+/-0.0458	0.0936	0.0278	+/-0.0458	1.00	pCi/g			JXH2	09/29/16	0918	1596393	2
Plutonium-239/240	Hh	0.0191	+/-0.0439	0.0696	0.016	+/-0.044	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0068	+/-0.047	0.114	0.034	+/-0.047	1.00	pCi/g			JXH2	09/29/16	0913	1596389	3
Uranium-233/234	Hh	1.23	+/-0.301	0.152	0.0489	+/-0.370	1.00	pCi/g							
Uranium-235/236	HUh	0.0328	+/-0.0744	0.128	0.0366	+/-0.0747	1.00	pCi/g							
Uranium-238	Hh	0.818	+/-0.245	0.120	0.0326	+/-0.284	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.244	+/-0.540	0.948	0.298	+/-0.541	1.00	pCi/g			JXH2	09/30/16	0900	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	0.970	+/-0.460	0.356	0.104	+/-0.477	1.00	pCi/g			JXH2	09/28/16	1406	1596388	5
Thorium-229	HUh	0.0551	+/-0.163	0.296	0.0922	+/-0.163	1.00	pCi/g							
Thorium-230	Hh	0.758	+/-0.377	0.392	0.141	+/-0.389	1.00	pCi/g							
Thorium-232	Hh	1.29	+/-0.445	0.261	0.0749	+/-0.472	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	Hh	0.023	+/-0.0528	0.0838	0.0192	+/-0.0529	1.00	pCi/g			JXH2	09/29/16	2150	1596390	6
Curium-242	Hh	0.00	+/-0.105	0.157	0.00	+/-0.106	1.00	pCi/g							
Curium-243/244	HUh	-0.00737	+/-0.0326	0.0851	0.0195	+/-0.0327	1.00	pCi/g							
Curium-245/246	Hh	0.0346	+/-0.0593	0.0519	0.00	+/-0.0595	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-6.39	+/-6.93	12.3	5.98	+/-6.93	15.0	pCi/g			JXH2	09/30/16	1349	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.0486	+/-0.219	0.469	0.192	+/-0.220	1.00	pCi/g			MJH1	09/27/16	1618	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.157	+/-0.211	0.349	0.159	+/-0.223		pCi/g			MXR1	10/03/16	0806	1596247	9
Antimony-125	HUh	0.0387	+/-0.126	0.246	0.113	+/-0.127		pCi/g							
Bismuth-212	HUh	0.00	+/-1.13	1.48	0.683	+/-1.50		pCi/g							
Bismuth-214	Hh	1.11	+/-0.206	0.130	0.0582	+/-0.212		pCi/g							
Cesium-137	Hh	1.44	+/-0.141	0.0816	0.0367	+/-0.154	0.100	pCi/g							
Cobalt-60	HUh	0.0135	+/-0.045	0.093	0.0397	+/-0.0455		pCi/g							
Europium-154	HUh	0.077	+/-0.142	0.295	0.130	+/-0.147		pCi/g							
Lead-212	Hh	1.23	+/-0.128	0.0876	0.0405	+/-0.144		pCi/g							
Lead-214	Hh	1.16	+/-0.204	0.125	0.057	+/-0.210		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.D.R.1.3
 Sample ID: 405235009

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	15.7	+/-1.73	0.584	0.229	+/-1.91		pCi/g							
Protactinium-231	HUh	0.00	+/-0.637	0.638	0.286	+/-0.707		pCi/g							
Radium-226	Hh	1.11	+/-0.206	0.130	0.0582	+/-0.212		pCi/g							
Radium-228	Hh	1.23	+/-0.340	0.289	0.127	+/-0.345		pCi/g							
Thallium-208	Hh	0.370	+/-0.110	0.0768	0.0348	+/-0.111		pCi/g							
Tin-126	HUh	0.00	+/-0.0975	0.0827	0.039	+/-0.0994		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	22.6	+/-4.30	3.04	1.24	+/-6.15	4.00	pCi/g		JXC9	09/19/16	1232	1597816	10
Beta	Hh	22.4	+/-2.59	2.70	1.27	+/-4.08	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.735	+/-0.710	1.47	0.666	+/-0.710	2.00	pCi/g		KSD1	09/17/16	1551	1597795	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.397	+/-2.08	3.59	1.73	+/-2.08	6.00	pCi/g		AEA	09/20/16	0150	1598072	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	Hh	0.714	+/-0.802	1.35	0.655	+/-0.804	2.00	pCi/g		AEA	09/22/16	0801	1598078	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.944	+/-1.27	2.32	1.11	+/-1.27	5.00	pCi/g		GXR1	09/20/16	0649	1597416	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.1.D.R.1.3
Sample ID: 405235009

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596393	87	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	69.7	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	98.4	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596392	62.2	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596388	92.1	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596390	99.5	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596394	87	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597795	85.5	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597416	89.4	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.D.R.1.4
 Sample ID: 405235010
 Matrix: Soil
 Collect Date: 10-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 20.1%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		20.1						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.0211	+/-0.0707	0.170	0.0608	+/-0.0707	1.00	pCi/g			JXH2	09/29/16	0923	1596393	2
Plutonium-239/240	HUh	0.00444	+/-0.0465	0.097	0.0247	+/-0.0465	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.0171	+/-0.0584	0.108	0.0295	+/-0.0585	1.00	pCi/g			JXH2	09/29/16	0913	1596389	3
Uranium-233/234	Hh	0.741	+/-0.202	0.0903	0.0246	+/-0.235	1.00	pCi/g							
Uranium-235/236	Hh	0.0451	+/-0.0616	0.084	0.0214	+/-0.0621	1.00	pCi/g							
Uranium-238	Hh	0.988	+/-0.232	0.0903	0.0246	+/-0.282	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0377	+/-0.167	0.434	0.0996	+/-0.167	1.00	pCi/g			JXH2	09/30/16	0900	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.58	+/-1.06	1.06	0.305	+/-1.11	1.00	pCi/g			JXH2	10/01/16	1254	1596388	5
Thorium-229	HUh	-0.0307	+/-0.225	0.541	0.103	+/-0.226	1.00	pCi/g							
Thorium-230	Hh	0.655	+/-0.580	0.480	0.0726	+/-0.593	1.00	pCi/g							
Thorium-232	Hh	0.430	+/-0.490	0.479	0.0724	+/-0.496	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.00982	+/-0.0634	0.130	0.0386	+/-0.0635	1.00	pCi/g			JXH2	09/29/16	2151	1596390	6
Curium-242	Hh	0.00	+/-0.122	0.182	0.00	+/-0.122	1.00	pCi/g							
Curium-243/244	HUh	-0.00427	+/-0.0369	0.0854	0.016	+/-0.0369	1.00	pCi/g							
Curium-245/246	Hh	0.00	+/-0.0404	0.0602	0.00	+/-0.0405	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-1.6	+/-6.58	11.4	5.57	+/-6.58	15.0	pCi/g			JXH2	09/30/16	1450	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.030	+/-0.155	0.347	0.136	+/-0.156	1.00	pCi/g			MJH1	09/27/16	1619	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0885	+/-0.226	0.422	0.195	+/-0.229		pCi/g			MXR1	10/03/16	0806	1596247	9
Antimony-125	HUh	0.0788	+/-0.103	0.213	0.0971	+/-0.109		pCi/g							
Bismuth-212	HUIh	0.00	+/-1.33	1.52	0.707	+/-1.49		pCi/g							
Bismuth-214	Hh	0.774	+/-0.182	0.134	0.0606	+/-0.185		pCi/g							
Cesium-137	Hh	0.310	+/-0.0918	0.0698	0.0311	+/-0.0928	0.100	pCi/g							
Cobalt-60	HUIh	0.00	+/-0.0324	0.0816	0.0348	+/-0.0434		pCi/g							
Europium-154	HUh	0.0481	+/-0.114	0.238	0.103	+/-0.116		pCi/g							
Lead-212	Hh	1.11	+/-0.141	0.0996	0.0465	+/-0.153		pCi/g							
Lead-214	Hh	1.13	+/-0.213	0.120	0.0545	+/-0.218		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.D.R.1.4
 Sample ID: 405235010

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	15.5	+/-1.65	0.779	0.335	+/-1.84		pCi/g							
Protactinium-231	HUh	0.0151	+/-0.546	0.989	0.462	+/-0.546		pCi/g							
Radium-226	Hh	0.774	+/-0.182	0.134	0.0606	+/-0.185		pCi/g							
Radium-228	Hh	1.12	+/-0.275	0.194	0.0816	+/-0.280		pCi/g							
Thallium-208	Hh	0.428	+/-0.0832	0.0587	0.026	+/-0.0852		pCi/g							
Tin-126	HUh	0.00	+/-0.199	0.181	0.0868	+/-0.203		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	15.9	+/-3.91	3.92	1.68	+/-4.99	4.00	pCi/g		JXC9	09/19/16	1232	1597816	10
Beta	Hh	23.5	+/-2.58	2.74	1.30	+/-4.17	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.276	+/-0.501	0.880	0.390	+/-0.503	2.00	pCi/g		KSD1	09/17/16	1551	1597795	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.287	+/-2.03	3.51	1.69	+/-2.03	6.00	pCi/g		AEA	09/20/16	0323	1598072	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.232	+/-0.707	1.21	0.588	+/-0.708	2.00	pCi/g		AEA	09/22/16	0847	1598078	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-1.3	+/-1.15	2.13	1.02	+/-1.15	5.00	pCi/g		GXR1	09/20/16	0705	1597416	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.1.D.R.1.4
Sample ID: 405235010

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer	ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596393	93.4	(15%-125%)				
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	87.9	(15%-125%)				
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	87.1	(15%-125%)				
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"							1596392	90	(15%-125%)				
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596388	110	(15%-125%)				
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"							1596390	95.8	(15%-125%)				
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596394	93.4	(15%-125%)				
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"							1597795	93.7	(25%-125%)				
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597416	88.3	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.D.R.3.2
 Sample ID: 405235011
 Matrix: Soil
 Collect Date: 09-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 16.3%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		16.3						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0814	+/-0.106	0.150	0.043	+/-0.106	1.00	pCi/g			JXH2	09/29/16	0923	1596393	2
Plutonium-239/240	HUh	0.0272	+/-0.0749	0.130	0.0331	+/-0.0751	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.00718	+/-0.0399	0.0765	0.0175	+/-0.040	1.00	pCi/g			JXH2	09/29/16	0913	1596389	3
Uranium-233/234	Hh	0.819	+/-0.232	0.0916	0.021	+/-0.270	1.00	pCi/g							
Uranium-235/236	Hh	0.071	+/-0.0812	0.101	0.0258	+/-0.0821	1.00	pCi/g							
Uranium-238	Hh	0.823	+/-0.232	0.0793	0.0148	+/-0.270	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.0501	+/-0.278	0.534	0.122	+/-0.279	1.00	pCi/g			JXH2	09/30/16	0900	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.73	+/-0.653	0.491	0.161	+/-0.693	1.00	pCi/g			JXH2	09/28/16	1406	1596388	5
Thorium-229	HUh	0.0209	+/-0.131	0.248	0.0605	+/-0.131	1.00	pCi/g							
Thorium-230	Hh	1.66	+/-0.532	0.247	0.0604	+/-0.574	1.00	pCi/g							
Thorium-232	Hh	1.07	+/-0.432	0.246	0.0602	+/-0.454	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.00946	+/-0.200	0.458	0.145	+/-0.200	1.00	pCi/g			JXH2	10/01/16	1323	1596390	6
Curium-242	Hh	0.196	+/-0.545	0.587	0.00	+/-0.547	1.00	pCi/g							
Curium-243/244	HUh	-0.0386	+/-0.118	0.335	0.0821	+/-0.118	1.00	pCi/g							
Curium-245/246	HUh	-0.00869	+/-0.128	0.275	0.0414	+/-0.129	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-4.75	+/-5.90	10.3	5.04	+/-5.90	15.0	pCi/g			JXH2	10/03/16	0828	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.0943	+/-0.144	0.499	0.171	+/-0.151	1.00	pCi/g			MJH1	09/27/16	1619	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0188	+/-0.242	0.399	0.183	+/-0.242		pCi/g			MXR1	10/03/16	0807	1596247	9
Antimony-125	HUh	-0.00882	+/-0.112	0.217	0.0988	+/-0.113		pCi/g							
Bismuth-212	HUh	0.00	+/-0.762	1.17	0.529	+/-0.871		pCi/g							
Bismuth-214	Hh	1.13	+/-0.188	0.113	0.0494	+/-0.194		pCi/g							
Cesium-137	Hh	0.255	+/-0.0833	0.0782	0.0351	+/-0.084	0.100	pCi/g							
Cobalt-60	HUh	-0.00648	+/-0.0355	0.0709	0.0291	+/-0.0356		pCi/g							
Europium-154	HUh	-0.106	+/-0.0981	0.155	0.0607	+/-0.109		pCi/g							
Lead-212	Hh	0.962	+/-0.130	0.0886	0.0408	+/-0.139		pCi/g							
Lead-214	Hh	1.19	+/-0.193	0.0926	0.0406	+/-0.199		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.D.R.3.2
 Sample ID: 405235011

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	14.5	+/-1.61	0.668	0.276	+/-1.78		pCi/g							
Protactinium-231	HUh	0.00	+/-0.713	0.700	0.316	+/-0.718		pCi/g							
Radium-226	Hh	1.13	+/-0.188	0.113	0.0494	+/-0.194		pCi/g							
Radium-228	Hh	1.13	+/-0.312	0.192	0.0797	+/-0.317		pCi/g							
Thallium-208	Hh	0.309	+/-0.0942	0.0662	0.0295	+/-0.0951		pCi/g							
Tin-126	HUh	0.00	+/-0.168	0.149	0.0702	+/-0.169		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	14.2	+/-3.46	3.42	1.47	+/-4.45	4.00	pCi/g		JXC9	09/19/16	1232	1597816	10
Beta	Hh	23.0	+/-2.53	2.57	1.21	+/-4.10	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.237	+/-0.610	1.10	0.482	+/-0.611	2.00	pCi/g		KSD1	09/17/16	1632	1597795	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.641	+/-1.82	3.11	1.50	+/-1.82	6.00	pCi/g		AEA	09/20/16	0607	1598072	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.0917	+/-0.685	1.19	0.577	+/-0.685	2.00	pCi/g		AEA	09/22/16	0934	1598078	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.654	+/-1.01	1.83	0.874	+/-1.01	5.00	pCi/g		GXR1	09/20/16	0721	1597416	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
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Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.1.D.R.3.2
Sample ID: 405235011

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596393	67.8	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	73.8	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	102	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596392	70.3	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596388	76	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596390	38.4	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596394	67.8	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597795	82.8	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597416	92.7	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: 4.1.D.R.2.4

Sample ID: 405235012

Matrix: Soil

Collect Date: 10-DEC-15

Receive Date: 06-SEP-16

Collector: Client

Moisture: 17%

Project: MJWC00115

Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		17.0						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.00464	+/-0.0485	0.101	0.0258	+/-0.0486	1.00	pCi/g			JXH2	09/29/16	0923	1596393	2
Plutonium-239/240	HUh	-0.0198	+/-0.0375	0.116	0.0331	+/-0.0375	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	Hh	0.0538	+/-0.0681	0.0846	0.0194	+/-0.0686	1.00	pCi/g			JXH2	09/29/16	0913	1596389	3
Uranium-233/234	Hh	0.798	+/-0.206	0.0822	0.0209	+/-0.243	1.00	pCi/g							
Uranium-235/236	Hh	0.0918	+/-0.0809	0.0946	0.0271	+/-0.0822	1.00	pCi/g							
Uranium-238	Hh	0.871	+/-0.214	0.0645	0.0121	+/-0.256	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.0255	+/-0.267	0.557	0.142	+/-0.267	1.00	pCi/g			JXH2	09/30/16	0900	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.17	+/-0.926	0.977	0.265	+/-0.959	1.00	pCi/g			JXH2	10/01/16	1254	1596388	5
Thorium-229	HUh	-0.031	+/-0.225	0.541	0.103	+/-0.226	1.00	pCi/g							
Thorium-230	Hh	1.19	+/-0.757	0.540	0.103	+/-0.791	1.00	pCi/g							
Thorium-232	Hh	0.887	+/-0.653	0.333	0.00	+/-0.675	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.00646	+/-0.0446	0.109	0.0323	+/-0.0446	1.00	pCi/g			JXH2	09/29/16	2152	1596390	6
Curium-242	Hh	0.00	+/-0.102	0.152	0.00	+/-0.102	1.00	pCi/g							
Curium-243/244	HUh	0.00775	+/-0.043	0.0825	0.0189	+/-0.0431	1.00	pCi/g							
Curium-245/246	HXh	0.0503	+/-0.0662	0.0503	0.00	+/-0.0666	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-4.13	+/-6.82	12.0	5.83	+/-6.82	15.0	pCi/g			JXH2	09/30/16	1652	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.131	+/-0.161	0.521	0.191	+/-0.172	1.00	pCi/g			MJH1	09/27/16	1620	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.00685	+/-0.243	0.428	0.192	+/-0.243		pCi/g			MXR1	10/03/16	0807	1596247	9
Antimony-125	HUh	0.0103	+/-0.121	0.250	0.111	+/-0.121		pCi/g							
Bismuth-212	HUh	0.00	+/-1.08	1.56	0.696	+/-1.26		pCi/g							
Bismuth-214	Hh	0.847	+/-0.209	0.137	0.058	+/-0.213		pCi/g							
Cesium-137	Hh	0.364	+/-0.102	0.103	0.0452	+/-0.103	0.100	pCi/g							
Cobalt-60	HUh	-0.00745	+/-0.0467	0.0973	0.0383	+/-0.0468		pCi/g							
Europium-154	HUh	-0.11	+/-0.155	0.275	0.110	+/-0.163		pCi/g							
Lead-212	Hh	1.39	+/-0.158	0.0897	0.0403	+/-0.174		pCi/g							
Lead-214	Hh	1.01	+/-0.208	0.149	0.0665	+/-0.213		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.D.R.2.4
 Sample ID: 405235012

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	13.8	+/-1.96	0.908	0.359	+/-2.09		pCi/g							
Protactinium-231	HUh	0.324	+/-0.525	1.05	0.481	+/-0.550		pCi/g							
Radium-226	Hh	0.847	+/-0.209	0.137	0.058	+/-0.213		pCi/g							
Radium-228	Hh	1.01	+/-0.321	0.298	0.123	+/-0.325		pCi/g							
Thallium-208	Hh	0.331	+/-0.106	0.0886	0.039	+/-0.107		pCi/g							
Tin-126	HUh	0.00	+/-0.185	0.164	0.0774	+/-0.186		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	11.6	+/-3.25	3.42	1.45	+/-3.97	4.00	pCi/g		JXC9	09/19/16	1232	1597816	10
Beta	Hh	24.8	+/-2.62	2.63	1.24	+/-4.33	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	Hh	0.780	+/-0.883	1.48	0.669	+/-0.894	2.00	pCi/g		KSD1	09/17/16	1632	1597795	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.731	+/-1.86	3.19	1.54	+/-1.86	6.00	pCi/g		AEA	09/20/16	0740	1598072	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.321	+/-0.659	1.12	0.545	+/-0.660	2.00	pCi/g		AEA	09/22/16	1020	1598078	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.629	+/-1.08	1.96	0.936	+/-1.08	5.00	pCi/g		GXR1	09/20/16	0738	1597416	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.1.D.R.2.4
 Sample ID: 405235012

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596393	90.6	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	87.7	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	108	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596392	77.6	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596388	101	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596390	104	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596394	90.6	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597795	88.3	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597416	94.3	(15%-125%)				

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2A.R.2.3
 Sample ID: 405235013
 Matrix: Soil
 Collect Date: 08-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 21.6%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		21.6						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.000765	+/-0.0567	0.126	0.0343	+/-0.0568	1.00	pCi/g			JXH2	09/29/16	0923	1596393	2
Plutonium-239/240	Hh	0.0388	+/-0.0771	0.125	0.0341	+/-0.0773	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.0102	+/-0.0383	0.0644	0.0121	+/-0.0384	1.00	pCi/g			JXH2	09/29/16	0913	1596389	3
Uranium-233/234	Hh	0.778	+/-0.213	0.111	0.034	+/-0.247	1.00	pCi/g							
Uranium-235/236	Hh	0.065	+/-0.070	0.0796	0.0182	+/-0.0708	1.00	pCi/g							
Uranium-238	Hh	0.750	+/-0.209	0.111	0.034	+/-0.241	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.127	+/-0.437	0.837	0.278	+/-0.438	1.00	pCi/g			JXH2	09/30/16	0900	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	2.23	+/-1.33	1.06	0.255	+/-1.42	1.00	pCi/g			JXH2	10/01/16	1254	1596388	5
Thorium-229	HUh	-0.0188	+/-0.271	0.584	0.0887	+/-0.272	1.00	pCi/g							
Thorium-230	Hh	0.658	+/-0.652	0.583	0.0885	+/-0.666	1.00	pCi/g							
Thorium-232	Hh	1.20	+/-0.838	0.581	0.0882	+/-0.874	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0102	+/-0.0307	0.0864	0.022	+/-0.0308	1.00	pCi/g			JXH2	09/29/16	2152	1596390	6
Curium-242	Hh	0.00	+/-0.0992	0.148	0.00	+/-0.0994	1.00	pCi/g							
Curium-243/244	HUh	0.0115	+/-0.0515	0.101	0.0288	+/-0.0515	1.00	pCi/g							
Curium-245/246	Hh	0.0323	+/-0.0554	0.0485	0.00	+/-0.0556	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-6.24	+/-8.21	14.5	7.05	+/-8.21	15.0	pCi/g			JXH2	09/30/16	1753	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.0471	+/-0.319	0.718	0.278	+/-0.320	1.00	pCi/g			MJH1	09/28/16	0636	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0235	+/-0.246	0.466	0.215	+/-0.246		pCi/g			MXR1	10/03/16	0810	1596247	9
Antimony-125	HUh	0.0468	+/-0.134	0.260	0.119	+/-0.136		pCi/g							
Bismuth-212	HUh	0.00	+/-1.02	1.58	0.726	+/-1.24		pCi/g							
Bismuth-214	Hh	0.858	+/-0.186	0.123	0.0537	+/-0.200		pCi/g							
Cesium-137	Hh	1.22	+/-0.158	0.0943	0.0425	+/-0.187	0.100	pCi/g							
Cobalt-60	HUh	-0.0363	+/-0.0431	0.0683	0.026	+/-0.0462		pCi/g							
Europium-154	HUh	0.0172	+/-0.146	0.294	0.126	+/-0.147		pCi/g							
Lead-212	Hh	1.18	+/-0.136	0.102	0.0473	+/-0.176		pCi/g							
Lead-214	Hh	1.03	+/-0.203	0.148	0.0678	+/-0.221		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2A.R.2.3
 Sample ID: 405235013

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	13.4	+/-1.78	0.742	0.297	+/-2.12		pCi/g							
Protactinium-231	HUh	0.00	+/-1.09	0.832	0.379	+/-1.13		pCi/g							
Radium-226	Hh	0.858	+/-0.186	0.123	0.0537	+/-0.200		pCi/g							
Radium-228	Hh	0.907	+/-0.350	0.278	0.119	+/-0.367		pCi/g							
Thallium-208	Hh	0.329	+/-0.0958	0.0729	0.0323	+/-0.0999		pCi/g							
Tin-126	HUh	0.00	+/-0.108	0.106	0.0502	+/-0.110		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	17.1	+/-4.66	3.84	1.50	+/-5.72	4.00	pCi/g		JXC9	09/20/16	1156	1597816	10
Beta	Hh	24.3	+/-3.36	3.15	1.45	+/-4.90	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.385	+/-0.682	1.36	0.612	+/-0.682	2.00	pCi/g		KSD1	09/17/16	1632	1597795	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.645	+/-2.14	3.68	1.78	+/-2.14	6.00	pCi/g		AEA	09/20/16	0913	1598072	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.0611	+/-0.626	1.08	0.527	+/-0.626	2.00	pCi/g		AEA	09/22/16	1106	1598078	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.556	+/-1.12	2.01	0.962	+/-1.12	5.00	pCi/g		GXR1	09/20/16	0754	1597416	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2A.R.2.3
 Sample ID: 405235013

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test					Batch ID	Recovery%	Acceptable Limits						
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid	"Dry Weight Corrected"					1596393						75.4	(15%-125%)
Uranium-232 Tracer		ASP Uranium Isotopic, Solid	"Dry Weight Corrected"					1596389						90.2	(15%-125%)
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid	"Dry Weight Corrected"					1596389						107	(15%-125%)
Americium-243 Tracer		Alphaspec Np237, Solid	"Dry Weight Corrected"					1596392						76.1	(15%-125%)
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232	Solid "Dry Weight Corrected"					1596388						90.2	(15%-125%)
Americium-243 Tracer		Am241, Cm Solid	"Dry Weight Corrected"					1596390						109	(15%-125%)
Plutonium-242 Tracer		Liquid Scint Pu241, Solid	"Dry Weight Corrected"					1596394						75.4	(15%-125%)
Strontium Carrier		GFPC, Sr90, solid	"Dry Weight Corrected"					1597795						95	(25%-125%)
Technetium-99m Tracer		Liquid Scint Tc99, Solid	"Dry Weight Corrected"					1597416						89.6	(15%-125%)

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2A.R.1.3
 Sample ID: 405235014
 Matrix: Soil
 Collect Date: 08-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 15.2%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		15.2						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0265	+/-0.0609	0.0966	0.0221	+/-0.061	1.00	pCi/g			JXH2	09/29/16	0923	1596393	2
Plutonium-239/240	HUh	0.0402	+/-0.0793	0.134	0.0411	+/-0.0795	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.00397	+/-0.0415	0.0865	0.022	+/-0.0415	1.00	pCi/g			JXH2	09/29/16	0913	1596389	3
Uranium-233/234	Hh	0.886	+/-0.238	0.111	0.0319	+/-0.280	1.00	pCi/g							
Uranium-235/236	Hh	0.044	+/-0.0633	0.0764	0.0143	+/-0.0637	1.00	pCi/g							
Uranium-238	Hh	1.07	+/-0.259	0.0879	0.0202	+/-0.315	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.150	+/-0.630	1.24	0.417	+/-0.630	1.00	pCi/g			JXH2	09/30/16	0900	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.94	+/-1.43	1.46	0.402	+/-1.51	1.00	pCi/g			JXH2	10/01/16	1254	1596388	5
Thorium-229	HUh	-0.0914	+/-0.337	0.922	0.215	+/-0.339	1.00	pCi/g							
Thorium-230	Hh	1.45	+/-1.02	0.705	0.107	+/-1.07	1.00	pCi/g							
Thorium-232	Hh	0.326	+/-0.555	0.489	0.00	+/-0.560	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.00484	+/-0.0551	0.117	0.0359	+/-0.0552	1.00	pCi/g			JXH2	09/29/16	2152	1596390	6
Curium-242	Hh	0.0526	+/-0.148	0.158	0.00	+/-0.148	1.00	pCi/g							
Curium-243/244	HUh	-0.00368	+/-0.0318	0.0736	0.0138	+/-0.0318	1.00	pCi/g							
Curium-245/246	Hh	0.0173	+/-0.0486	0.0519	0.00	+/-0.0487	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-8.27	+/-7.14	12.8	6.21	+/-7.14	15.0	pCi/g			JXH2	09/30/16	1854	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.0846	+/-0.298	0.592	0.210	+/-0.301	1.00	pCi/g			MJH1	09/28/16	0645	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.0454	+/-0.230	0.451	0.209	+/-0.231		pCi/g			MXR1	10/03/16	0811	1596247	9
Antimony-125	HUh	0.0232	+/-0.125	0.215	0.0976	+/-0.125		pCi/g							
Bismuth-212	HUh	0.00	+/-0.928	1.31	0.598	+/-0.996		pCi/g							
Bismuth-214	Hh	0.734	+/-0.194	0.140	0.0629	+/-0.197		pCi/g							
Cesium-137	Hh	0.651	+/-0.115	0.0842	0.038	+/-0.118	0.100	pCi/g							
Cobalt-60	HUh	0.0222	+/-0.043	0.0952	0.0408	+/-0.0441		pCi/g							
Europium-154	HUh	-0.0276	+/-0.114	0.223	0.0936	+/-0.115		pCi/g							
Lead-212	Hh	1.15	+/-0.129	0.0938	0.0435	+/-0.143		pCi/g							
Lead-214	Hh	0.941	+/-0.177	0.130	0.0591	+/-0.181		pCi/g							

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 Suite 112
 Buffalo, New York 14228
 Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes
 Client Sample ID: 4.2A.R.1.3
 Sample ID: 405235014

Report Date: October 4, 2016

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis															
<i>Gammasec, Gamma, Solid "Dry Weight Corrected"</i>															
Potassium-40	Hh	14.8	+/-1.64	0.686	0.281	+/-1.82		pCi/g							
Protactinium-231	HUh	0.00	+/-0.997	0.832	0.383	+/-1.02		pCi/g							
Radium-226	Hh	0.734	+/-0.194	0.140	0.0629	+/-0.197		pCi/g							
Radium-228	Hh	1.22	+/-0.270	0.266	0.116	+/-0.277		pCi/g							
Thallium-208	Hh	0.296	+/-0.105	0.0728	0.0328	+/-0.106		pCi/g							
Tin-126	HUh	0.00	+/-0.0993	0.196	0.0937	+/-0.135		pCi/g							
Rad Gas Flow Proportional Counting															
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>															
Alpha	Hh	17.6	+/-4.06	3.43	1.41	+/-5.34	4.00	pCi/g		JXC9	09/19/16	1416	1597816	10	
Beta	Hh	21.5	+/-2.78	3.23	1.54	+/-4.09	10.0	pCi/g							
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>															
Strontium-90	HUh	0.0021	+/-0.944	1.72	0.792	+/-0.944	2.00	pCi/g		KSD1	09/17/16	1632	1597795	11	
Rad Liquid Scintillation Analysis															
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>															
Tritium	HUh	0.668	+/-1.89	3.25	1.57	+/-1.89	6.00	pCi/g		AEA	09/20/16	1046	1598072	12	
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>															
Carbon-14	HUh	-0.0653	+/-0.648	1.12	0.546	+/-0.648	2.00	pCi/g		AEA	09/22/16	1152	1598078	13	
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>															
Technetium-99	HUh	0.179	+/-1.17	2.03	0.972	+/-1.17	5.00	pCi/g		GXR1	09/20/16	0810	1597416	14	

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2A.R.1.3
 Sample ID: 405235014

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596393	86	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	69.5	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	101	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596392	51.5	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596388	72.6	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596390	97.5	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596394	86	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597795	93.7	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597416	83.5	(15%-125%)				

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2A.R.1.4
 Sample ID: 405235015
 Matrix: Soil
 Collect Date: 08-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 7.15%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		7.15						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0659	+/-0.0753	0.0941	0.0239	+/-0.0759	1.00	pCi/g			JXH2	09/29/16	0944	1596393	2
Plutonium-239/240	HUh	-0.0147	+/-0.034	0.101	0.0275	+/-0.0341	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.00798	+/-0.0745	0.173	0.0566	+/-0.0746	1.00	pCi/g			JXH2	09/29/16	0920	1596389	3
Uranium-233/234	Hh	0.674	+/-0.230	0.160	0.0523	+/-0.260	1.00	pCi/g							
Uranium-235/236	Hh	0.102	+/-0.097	0.102	0.0235	+/-0.0987	1.00	pCi/g							
Uranium-238	Hh	0.881	+/-0.256	0.129	0.037	+/-0.301	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.0721	+/-0.360	0.720	0.231	+/-0.360	1.00	pCi/g			JXH2	09/30/16	0900	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.32	+/-0.551	0.451	0.149	+/-0.577	1.00	pCi/g			JXH2	09/28/16	1407	1596388	5
Thorium-229	Hh	0.153	+/-0.217	0.336	0.110	+/-0.217	1.00	pCi/g							
Thorium-230	Hh	0.516	+/-0.336	0.406	0.145	+/-0.343	1.00	pCi/g							
Thorium-232	Hh	0.974	+/-0.393	0.224	0.0548	+/-0.412	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.0111	+/-0.0681	0.134	0.0309	+/-0.0682	1.00	pCi/g			JXH2	10/01/16	1323	1596390	6
Curium-242	Hh	0.00	+/-0.166	0.253	0.00	+/-0.167	1.00	pCi/g							
Curium-243/244	HUh	-0.00328	+/-0.0487	0.105	0.0157	+/-0.0488	1.00	pCi/g							
Curium-245/246	Hh	0.106	+/-0.121	0.118	0.0176	+/-0.122	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-7.61	+/-6.12	11.0	5.33	+/-6.12	15.0	pCi/g			JXH2	09/30/16	1955	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUIh	0.00	+/-0.176	0.244	0.00	+/-0.00	1.00	pCi/g			MJH1	09/28/16	0648	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.376	+/-0.266	0.400	0.182	+/-0.319		pCi/g			MXR1	10/03/16	0811	1596247	9
Antimony-125	HUh	0.0241	+/-0.102	0.206	0.0924	+/-0.102		pCi/g							
Bismuth-212	HUIh	0.00	+/-0.878	1.34	0.609	+/-0.940		pCi/g							
Bismuth-214	Hh	0.879	+/-0.200	0.130	0.0575	+/-0.203		pCi/g							
Cesium-137	Hh	0.257	+/-0.0964	0.0799	0.0356	+/-0.0971	0.100	pCi/g							
Cobalt-60	HUIh	0.00	+/-0.0531	0.0945	0.0402	+/-0.0565		pCi/g							
Europium-154	HUh	-0.0622	+/-0.139	0.252	0.108	+/-0.142		pCi/g							
Lead-212	Hh	1.07	+/-0.136	0.0919	0.0423	+/-0.147		pCi/g							
Lead-214	Hh	1.16	+/-0.195	0.349	0.168	+/-0.201		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2A.R.1.4
 Sample ID: 405235015

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	17.4	+/-1.80	0.678	0.275	+/-2.02		pCi/g							
Protactinium-231	HUh	0.00	+/-0.802	0.825	0.377	+/-0.812		pCi/g							
Radium-226	Hh	0.879	+/-0.200	0.130	0.0575	+/-0.203		pCi/g							
Radium-228	Hh	0.964	+/-0.340	0.292	0.128	+/-0.343		pCi/g							
Thallium-208	Hh	0.352	+/-0.0898	0.0652	0.0287	+/-0.0911		pCi/g							
Tin-126	HUh	0.00	+/-0.159	0.158	0.0744	+/-0.159		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	19.0	+/-4.27	3.92	1.67	+/-5.70	4.00	pCi/g		JXC9	09/19/16	1232	1597816	10
Beta	Hh	19.4	+/-2.44	2.83	1.35	+/-3.63	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.139	+/-0.756	1.41	0.646	+/-0.756	2.00	pCi/g		KSD1	09/17/16	1632	1597795	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	-1.12	+/-1.71	3.05	1.47	+/-1.71	6.00	pCi/g		AEA	09/20/16	1219	1598072	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.327	+/-0.617	1.05	0.510	+/-0.617	2.00	pCi/g		AEA	09/22/16	1239	1598078	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.265	+/-0.925	1.64	0.787	+/-0.925	5.00	pCi/g		GXR1	09/20/16	1231	1597416	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2A.R.1.4
 Sample ID: 405235015

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test					Batch ID	Recovery%	Acceptable Limits						
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid	"Dry Weight Corrected"					1596393						97.3	(15%-125%)
Uranium-232 Tracer		ASP Uranium Isotopic, Solid	"Dry Weight Corrected"					1596389						81.7	(15%-125%)
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid	"Dry Weight Corrected"					1596389						74	(15%-125%)
Americium-243 Tracer		Alphaspec Np237, Solid	"Dry Weight Corrected"					1596392						81	(15%-125%)
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232	Solid "Dry Weight Corrected"					1596388						88.5	(15%-125%)
Americium-243 Tracer		Am241, Cm Solid	"Dry Weight Corrected"					1596390						87.4	(15%-125%)
Plutonium-242 Tracer		Liquid Scint Pu241, Solid	"Dry Weight Corrected"					1596394						97.3	(15%-125%)
Strontium Carrier		GFPC, Sr90, solid	"Dry Weight Corrected"					1597795						96.4	(25%-125%)
Technetium-99m Tracer		Liquid Scint Tc99, Solid	"Dry Weight Corrected"					1597416						93.8	(15%-125%)

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2A.R.2.4
 Sample ID: 405235016
 Matrix: Soil
 Collect Date: 08-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 20.4%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		20.4						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.0115	+/-0.0348	0.0979	0.0249	+/-0.0349	1.00	pCi/g			JXH2	09/29/16	0923	1596393	2
Plutonium-239/240	HUh	0.0121	+/-0.0454	0.0763	0.0143	+/-0.0454	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0171	+/-0.0465	0.124	0.0398	+/-0.0465	1.00	pCi/g			JXH2	09/29/16	0920	1596389	3
Uranium-233/234	Hh	0.764	+/-0.242	0.131	0.0376	+/-0.276	1.00	pCi/g							
Uranium-235/236	Hh	0.0706	+/-0.0832	0.090	0.0168	+/-0.0841	1.00	pCi/g							
Uranium-238	Hh	0.689	+/-0.230	0.131	0.0376	+/-0.260	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.108	+/-0.204	0.631	0.180	+/-0.205	1.00	pCi/g			JXH2	09/30/16	0900	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	0.879	+/-0.681	1.04	0.445	+/-0.691	1.00	pCi/g			JXH2	09/28/16	1407	1596388	5
Thorium-229	Hh	0.113	+/-0.177	0.266	0.0764	+/-0.178	1.00	pCi/g							
Thorium-230	Hh	1.31	+/-0.487	0.454	0.170	+/-0.515	1.00	pCi/g							
Thorium-232	Hh	1.40	+/-0.470	0.298	0.0931	+/-0.503	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0511	+/-0.0689	0.236	0.0704	+/-0.0691	1.00	pCi/g			JXH2	10/01/16	1323	1596390	6
Curium-242	Hh	0.00	+/-0.219	0.332	0.00	+/-0.220	1.00	pCi/g							
Curium-243/244	HUh	-0.013	+/-0.0652	0.168	0.0357	+/-0.0654	1.00	pCi/g							
Curium-245/246	Hh	0.0361	+/-0.101	0.108	0.00	+/-0.101	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-8.9	+/-6.01	10.8	5.27	+/-6.01	15.0	pCi/g			JXH2	09/30/16	2057	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.0336	+/-0.117	0.563	0.139	+/-0.118	1.00	pCi/g			MJH1	09/28/16	0655	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.157	+/-0.227	0.431	0.200	+/-0.239		pCi/g			MXR1	10/03/16	0815	1596247	9
Antimony-125	HUh	0.0581	+/-0.116	0.213	0.0975	+/-0.119		pCi/g							
Bismuth-212	HUh	0.00	+/-1.14	1.39	0.647	+/-1.39		pCi/g							
Bismuth-214	Hh	0.734	+/-0.186	0.114	0.0503	+/-0.188		pCi/g							
Cesium-137	Hh	0.080	+/-0.089	0.086	0.0392	+/-0.0891	0.100	pCi/g							
Cobalt-60	HUh	0.0157	+/-0.0357	0.079	0.0335	+/-0.0364		pCi/g							
Europium-154	HUh	0.0746	+/-0.106	0.238	0.103	+/-0.111		pCi/g							
Lead-212	Hh	1.09	+/-0.138	0.0936	0.0436	+/-0.150		pCi/g							
Lead-214	Hh	1.02	+/-0.200	0.135	0.0623	+/-0.205		pCi/g							

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 Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes
 Client Sample ID: 4.2A.R.2.4
 Sample ID: 405235016

Report Date: October 4, 2016

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis															
<i>Gammasec, Gamma, Solid "Dry Weight Corrected"</i>															
Potassium-40	Hh	13.0	+/-1.39	0.376	0.133	+/-1.55		pCi/g							
Protactinium-231	HUh	-0.259	+/-0.411	0.747	0.342	+/-0.431		pCi/g							
Radium-226	Hh	0.734	+/-0.186	0.114	0.0503	+/-0.188		pCi/g							
Radium-228	Hh	0.899	+/-0.294	0.184	0.0766	+/-0.298		pCi/g							
Thallium-208	Hh	0.321	+/-0.0818	0.0556	0.0245	+/-0.083		pCi/g							
Tin-126	HUh	0.00	+/-0.175	0.192	0.0916	+/-0.183		pCi/g							
Rad Gas Flow Proportional Counting															
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>															
Alpha	Hh	16.1	+/-3.81	3.52	1.49	+/-5.01	4.00	pCi/g		JXC9	09/19/16	1232	1597816	10	
Beta	Hh	23.6	+/-2.65	2.83	1.34	+/-4.26	10.0	pCi/g							
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>															
Strontium-90	HUh	0.157	+/-0.413	0.766	0.320	+/-0.414	2.00	pCi/g		KSD1	09/17/16	1631	1597795	11	
Rad Liquid Scintillation Analysis															
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>															
Tritium	HUh	-0.501	+/-2.13	3.73	1.80	+/-2.13	6.00	pCi/g		AEA	09/20/16	1352	1598072	12	
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>															
Carbon-14	HUh	0.359	+/-0.742	1.26	0.614	+/-0.743	2.00	pCi/g		AEA	09/22/16	1325	1598078	13	
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>															
Technetium-99	HUh	-0.98	+/-1.23	2.24	1.07	+/-1.23	5.00	pCi/g		GXR1	09/20/16	0842	1597416	14	

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2A.R.2.4
 Sample ID: 405235016

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test			Batch ID			Recovery%		Acceptable Limits					
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"			1596393	98	(15%-125%)								
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"			1596389	80	(15%-125%)								
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"			1596389	101	(15%-125%)								
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"			1596392	76.1	(15%-125%)								
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"			1596388	87.6	(15%-125%)								
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"			1596390	67.6	(15%-125%)								
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"			1596394	98	(15%-125%)								
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"			1597795	95	(25%-125%)								
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"			1597416	88.8	(15%-125%)								

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2A.R.3.2
 Sample ID: 405235017
 Matrix: Soil
 Collect Date: 02-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 22.5%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		22.5						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.0101	+/-0.0564	0.108	0.0248	+/-0.0564	1.00	pCi/g			JXH2	09/29/16	0923	1596393	2
Plutonium-239/240	HUh	0.0248	+/-0.0683	0.118	0.0301	+/-0.0684	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.0271	+/-0.0616	0.106	0.0303	+/-0.0619	1.00	pCi/g			JXH2	09/29/16	0920	1596389	3
Uranium-233/234	Hh	1.04	+/-0.387	0.196	0.0449	+/-0.448	1.00	pCi/g							
Uranium-235/236	HUh	-0.00851	+/-0.0734	0.170	0.0318	+/-0.0738	1.00	pCi/g							
Uranium-238	Hh	1.35	+/-0.440	0.233	0.0635	+/-0.527	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.152	+/-0.517	0.974	0.377	+/-0.517	1.00	pCi/g			JXH2	09/30/16	0900	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.59	+/-0.554	0.370	0.117	+/-0.589	1.00	pCi/g			JXH2	09/28/16	1407	1596388	5
Thorium-229	HUh	-0.122	+/-0.270	0.586	0.242	+/-0.270	1.00	pCi/g							
Thorium-230	Hh	1.18	+/-0.466	0.511	0.205	+/-0.489	1.00	pCi/g							
Thorium-232	Hh	0.739	+/-0.328	0.237	0.0682	+/-0.340	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0671	+/-0.121	0.309	0.115	+/-0.121	1.00	pCi/g			JXH2	09/29/16	2152	1596390	6
Curium-242	Hh	0.00	+/-0.192	0.285	0.00	+/-0.192	1.00	pCi/g							
Curium-243/244	HUh	0.0141	+/-0.0781	0.150	0.0343	+/-0.0783	1.00	pCi/g							
Curium-245/246	HUh	-0.0146	+/-0.0646	0.169	0.0386	+/-0.0648	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-9.98	+/-8.06	14.4	7.02	+/-8.06	15.0	pCi/g			JXH2	09/30/16	2158	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUIh	0.00	+/-0.330	0.676	0.242	+/-0.333	1.00	pCi/g			MJH1	09/28/16	0722	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.100	+/-0.247	0.496	0.233	+/-0.252		pCi/g			MXR1	10/03/16	0816	1596247	9
Antimony-125	HUh	0.019	+/-0.131	0.251	0.116	+/-0.131		pCi/g							
Bismuth-212	Hh	1.65	+/-0.904	0.837	0.370	+/-0.908		pCi/g							
Bismuth-214	Hh	1.13	+/-0.189	0.132	0.0597	+/-0.195		pCi/g							
Cesium-137	Hh	3.94	+/-0.228	0.0716	0.0322	+/-0.284	0.100	pCi/g							
Cobalt-60	HUh	-0.011	+/-0.0417	0.078	0.0331	+/-0.042		pCi/g							
Europium-154	HUh	0.0439	+/-0.0997	0.215	0.092	+/-0.102		pCi/g							
Lead-212	Hh	1.19	+/-0.137	0.0944	0.0441	+/-0.151		pCi/g							
Lead-214	Hh	1.13	+/-0.234	0.145	0.0673	+/-0.238		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2A.R.3.2
 Sample ID: 405235017

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	16.0	+/-1.58	0.702	0.298	+/-1.79		pCi/g							
Protactinium-231	HUh	0.00	+/-1.04	0.948	0.444	+/-1.07		pCi/g							
Radium-226	Hh	1.13	+/-0.189	0.132	0.0597	+/-0.195		pCi/g							
Radium-228	Hh	0.829	+/-0.336	0.251	0.111	+/-0.339		pCi/g							
Thallium-208	Hh	0.342	+/-0.104	0.0704	0.032	+/-0.105		pCi/g							
Tin-126	HUh	0.00	+/-0.158	0.145	0.0689	+/-0.158		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	19.4	+/-4.17	3.05	1.22	+/-5.62	4.00	pCi/g		JXC9	09/19/16	1232	1597816	10
Beta	Hh	21.2	+/-2.50	2.73	1.29	+/-3.87	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	Hh	0.570	+/-0.475	0.747	0.317	+/-0.486	2.00	pCi/g		KSD1	09/17/16	1634	1597795	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.921	+/-2.14	3.66	1.77	+/-2.14	6.00	pCi/g		AEA	09/20/16	1525	1598072	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.168	+/-0.740	1.29	0.625	+/-0.740	2.00	pCi/g		AEA	09/22/16	1411	1598078	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-1.03	+/-1.32	2.40	1.15	+/-1.32	5.00	pCi/g		GXR1	09/20/16	0858	1597416	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 4.2A.R.3.2
Sample ID: 405235017

Report Date: October 4, 2016

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596393	75.8	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	41.6	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	102	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596392	91.9	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596388	100	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596390	57.4	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596394	75.8	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597795	95	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597416	87.9	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2A.R.4.2
 Sample ID: 405235018
 Matrix: Soil
 Collect Date: 02-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 21.7%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		21.7						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.0285	+/-0.0752	0.135	0.0402	+/-0.0753	1.00	pCi/g			JXH2	09/29/16	0923	1596393	2
Plutonium-239/240	HUh	-0.00436	+/-0.0376	0.0871	0.0163	+/-0.0377	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	Hh	0.0404	+/-0.0643	0.0889	0.0204	+/-0.0647	1.00	pCi/g			JXH2	09/29/16	0920	1596389	3
Uranium-233/234	Hh	0.671	+/-0.244	0.157	0.0467	+/-0.273	1.00	pCi/g							
Uranium-235/236	HUh	0.0162	+/-0.0608	0.102	0.0191	+/-0.0609	1.00	pCi/g							
Uranium-238	Hh	0.761	+/-0.258	0.149	0.0427	+/-0.293	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0813	+/-0.154	0.475	0.136	+/-0.154	1.00	pCi/g			JXH2	09/30/16	0900	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.22	+/-0.546	0.438	0.137	+/-0.570	1.00	pCi/g			JXH2	09/28/16	1407	1596388	5
Thorium-229	Hh	0.143	+/-0.188	0.240	0.0586	+/-0.189	1.00	pCi/g							
Thorium-230	Hh	0.732	+/-0.402	0.453	0.165	+/-0.413	1.00	pCi/g							
Thorium-232	Hh	0.671	+/-0.343	0.239	0.0583	+/-0.354	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.0041	+/-0.0428	0.0894	0.0227	+/-0.0429	1.00	pCi/g			JXH2	09/29/16	2152	1596390	6
Curium-242	Hh	0.00	+/-0.105	0.157	0.00	+/-0.106	1.00	pCi/g							
Curium-243/244	HUh	-0.0143	+/-0.0331	0.0979	0.0267	+/-0.0331	1.00	pCi/g							
Curium-245/246	HXh	0.0836	+/-0.0807	0.0502	0.00	+/-0.0814	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-0.157	+/-5.24	8.99	4.40	+/-5.24	15.0	pCi/g			JXH2	10/03/16	1029	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.237	+/-0.378	0.630	0.224	+/-0.394	1.00	pCi/g			MJH1	09/28/16	0722	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.116	+/-0.222	0.448	0.211	+/-0.228		pCi/g			MXR1	10/03/16	0816	1596247	9
Antimony-125	HUh	0.046	+/-0.108	0.212	0.0986	+/-0.110		pCi/g							
Bismuth-212	HUh	0.00	+/-0.699	1.19	0.553	+/-0.986		pCi/g							
Bismuth-214	Hh	0.578	+/-0.166	0.121	0.0553	+/-0.168		pCi/g							
Cesium-137	Hh	2.22	+/-0.163	0.0621	0.028	+/-0.189	0.100	pCi/g							
Cobalt-60	HUh	0.0103	+/-0.0236	0.0511	0.0207	+/-0.0241		pCi/g							
Europium-154	HUh	-0.0371	+/-0.0869	0.159	0.0667	+/-0.0885		pCi/g							
Lead-212	Hh	1.06	+/-0.121	0.085	0.0398	+/-0.134		pCi/g							
Lead-214	Hh	1.07	+/-0.177	0.118	0.0545	+/-0.182		pCi/g							

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Certificate of Analysis

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 Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes
 Client Sample ID: 4.2A.R.4.2
 Sample ID: 405235018

Report Date: October 4, 2016

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis															
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>															
Potassium-40	Hh	13.2	+/-1.35	0.500	0.206	+/-1.51		pCi/g							
Protactinium-231	HUh	0.00	+/-0.673	0.790	0.368	+/-0.698		pCi/g							
Radium-226	Hh	0.578	+/-0.166	0.121	0.0553	+/-0.168		pCi/g							
Radium-228	Hh	0.974	+/-0.282	0.204	0.0897	+/-0.287		pCi/g							
Thallium-208	Hh	0.262	+/-0.0775	0.0598	0.0272	+/-0.0783		pCi/g							
Tin-126	HUh	0.00	+/-0.110	0.107	0.051	+/-0.111		pCi/g							
Rad Gas Flow Proportional Counting															
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>															
Alpha	Hh	13.3	+/-3.55	4.00	1.76	+/-4.39	4.00	pCi/g		JXC9	09/19/16	1232	1597816	10	
Beta	Hh	21.0	+/-2.40	2.39	1.12	+/-3.81	10.0	pCi/g							
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>															
Strontium-90	HUh	0.336	+/-0.801	1.41	0.644	+/-0.803	2.00	pCi/g		KSD1	09/17/16	1640	1597795	11	
Rad Liquid Scintillation Analysis															
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>															
Tritium	HUh	0.0322	+/-2.18	3.79	1.83	+/-2.18	6.00	pCi/g		AEA	09/20/16	1658	1598072	12	
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>															
Carbon-14	HUh	0.0823	+/-0.648	1.11	0.542	+/-0.648	2.00	pCi/g		AEA	09/22/16	1458	1598078	13	
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>															
Technetium-99	HUh	-0.527	+/-1.22	2.19	1.05	+/-1.22	5.00	pCi/g		GXR1	09/20/16	0914	1597416	14	

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2A.R.4.2
 Sample ID: 405235018

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596393	80.7	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	69.6	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	92.9	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596392	97.9	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596388	78.2	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596390	110	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596394	80.7	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597795	106	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597416	92.3	(15%-125%)				

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Company : MJW Technical Services
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.2.4
 Sample ID: 405235019
 Matrix: Soil
 Collect Date: 08-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 17.5%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		17.5						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.00708	+/-0.0489	0.119	0.0354	+/-0.0489	1.00	pCi/g			JXH2	09/29/16	0923	1596393	2
Plutonium-239/240	Hh	0.0684	+/-0.0782	0.0977	0.0248	+/-0.0788	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.00385	+/-0.0577	0.135	0.0386	+/-0.0578	1.00	pCi/g			JXH2	09/29/16	0920	1596389	3
Uranium-233/234	Hh	0.738	+/-0.235	0.0567	0.00	+/-0.270	1.00	pCi/g							
Uranium-235/236	Hh	0.128	+/-0.106	0.091	0.017	+/-0.108	1.00	pCi/g							
Uranium-238	Hh	0.922	+/-0.262	0.0907	0.017	+/-0.311	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	Hh	0.00	+/-0.470	0.700	0.00	+/-0.471	1.00	pCi/g			JXH2	09/30/16	0900	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.22	+/-0.456	0.349	0.116	+/-0.479	1.00	pCi/g			JXH2	09/28/16	1407	1596388	5
Thorium-229	HUh	0.0288	+/-0.110	0.205	0.0589	+/-0.111	1.00	pCi/g							
Thorium-230	Hh	0.463	+/-0.256	0.253	0.0831	+/-0.261	1.00	pCi/g							
Thorium-232	Hh	0.679	+/-0.286	0.170	0.0414	+/-0.297	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0148	+/-0.0342	0.101	0.0276	+/-0.0343	1.00	pCi/g			JXH2	09/29/16	2152	1596390	6
Curium-242	Hh	0.00	+/-0.108	0.161	0.00	+/-0.108	1.00	pCi/g							
Curium-243/244	HUh	-0.00749	+/-0.0331	0.0864	0.0198	+/-0.0332	1.00	pCi/g							
Curium-245/246	HXh	0.0527	+/-0.0694	0.0527	0.00	+/-0.0698	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-9.54	+/-6.66	12.0	5.84	+/-6.66	15.0	pCi/g			JXH2	10/01/16	0000	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.152	+/-0.253	0.899	0.301	+/-0.263	1.00	pCi/g			MJH1	09/28/16	0723	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0607	+/-0.172	0.312	0.143	+/-0.175		pCi/g			MXR1	10/03/16	0821	1596247	9
Antimony-125	HUh	0.0623	+/-0.148	0.169	0.0769	+/-0.150		pCi/g							
Bismuth-212	HUh	0.00	+/-0.674	1.12	0.517	+/-0.892		pCi/g							
Bismuth-214	Hh	0.698	+/-0.153	0.102	0.0458	+/-0.156		pCi/g							
Cesium-137	Hh	0.0561	+/-0.0482	0.0498	0.0218	+/-0.0483	0.100	pCi/g							
Cobalt-60	HUh	-0.0119	+/-0.041	0.0685	0.0294	+/-0.0413		pCi/g							
Europium-154	HUh	-0.0127	+/-0.0837	0.166	0.0703	+/-0.0839		pCi/g							
Lead-212	Hh	0.927	+/-0.113	0.0823	0.0385	+/-0.123		pCi/g							
Lead-214	Hh	0.916	+/-0.156	0.0951	0.0431	+/-0.161		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.2.4
 Sample ID: 405235019

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	13.1	+/-1.32	0.393	0.152	+/-1.49		pCi/g							
Protactinium-231	HUh	0.00	+/-0.750	0.628	0.288	+/-0.771		pCi/g							
Radium-226	Hh	0.698	+/-0.153	0.102	0.0458	+/-0.156		pCi/g							
Radium-228	Hh	0.828	+/-0.255	0.199	0.0867	+/-0.258		pCi/g							
Thallium-208	Hh	0.348	+/-0.075	0.0507	0.0226	+/-0.0765		pCi/g							
Tin-126	HUh	0.046	+/-0.110	0.100	0.0472	+/-0.111		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	16.1	+/-4.31	3.87	1.58	+/-5.34	4.00	pCi/g		JXC9	09/19/16	1230	1597816	10
Beta	Hh	16.3	+/-2.92	3.15	1.45	+/-3.72	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.149	+/-0.454	0.927	0.402	+/-0.454	2.00	pCi/g		KSD1	09/17/16	1640	1597795	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.271	+/-1.95	3.37	1.63	+/-1.95	6.00	pCi/g		AEA	09/20/16	1831	1598072	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.259	+/-0.665	1.13	0.551	+/-0.665	2.00	pCi/g		AEA	09/22/16	1544	1598078	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.451	+/-1.22	2.17	1.04	+/-1.22	5.00	pCi/g		GXR1	09/20/16	0931	1597416	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.2.4
 Sample ID: 405235019

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test					Batch ID	Recovery%	Acceptable Limits						
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid	"Dry Weight Corrected"					1596393						90.2	(15%-125%)
Uranium-232 Tracer		ASP Uranium Isotopic, Solid	"Dry Weight Corrected"					1596389						77.2	(15%-125%)
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid	"Dry Weight Corrected"					1596389						78.3	(15%-125%)
Americium-243 Tracer		Alphaspec Np237, Solid	"Dry Weight Corrected"					1596392						35.7	(15%-125%)
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232	Solid "Dry Weight Corrected"					1596388						112	(15%-125%)
Americium-243 Tracer		Am241, Cm Solid	"Dry Weight Corrected"					1596390						96.6	(15%-125%)
Plutonium-242 Tracer		Liquid Scint Pu241, Solid	"Dry Weight Corrected"					1596394						90.2	(15%-125%)
Strontium Carrier		GFPC, Sr90, solid	"Dry Weight Corrected"					1597795						95	(25%-125%)
Technetium-99m Tracer		Liquid Scint Tc99, Solid	"Dry Weight Corrected"					1597416						90.6	(15%-125%)

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.1.4
 Sample ID: 405235020
 Matrix: Soil
 Collect Date: 08-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 14.3%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		14.3						percent			LYT1	09/08/16	0806	1596227	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.0243	+/-0.0668	0.116	0.0295	+/-0.0669	1.00	pCi/g			JXH2	09/29/16	0923	1596393	2
Plutonium-239/240	HUh	-0.0272	+/-0.0438	0.139	0.0414	+/-0.0439	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.0108	+/-0.0756	0.155	0.0508	+/-0.0757	1.00	pCi/g			JXH2	09/29/16	0920	1596389	3
Uranium-233/234	Hh	0.602	+/-0.223	0.113	0.0259	+/-0.249	1.00	pCi/g							
Uranium-235/236	Hh	0.0564	+/-0.0813	0.098	0.0184	+/-0.082	1.00	pCi/g							
Uranium-238	Hh	0.847	+/-0.266	0.151	0.0448	+/-0.308	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0197	+/-0.295	0.690	0.197	+/-0.295	1.00	pCi/g			JXH2	09/30/16	0900	1596392	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.11	+/-0.464	0.328	0.0964	+/-0.485	1.00	pCi/g			JXH2	09/28/16	1407	1596388	5
Thorium-229	Hh	0.135	+/-0.172	0.239	0.0686	+/-0.173	1.00	pCi/g							
Thorium-230	Hh	0.928	+/-0.368	0.269	0.0838	+/-0.385	1.00	pCi/g							
Thorium-232	Hh	0.673	+/-0.304	0.101	0.00	+/-0.315	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	Hh	0.0333	+/-0.0589	0.0892	0.0227	+/-0.0591	1.00	pCi/g			JXH2	09/29/16	2152	1596390	6
Curium-242	Hh	0.00	+/-0.103	0.153	0.00	+/-0.103	1.00	pCi/g							
Curium-243/244	HUh	-0.00712	+/-0.0315	0.0821	0.0188	+/-0.0315	1.00	pCi/g							
Curium-245/246	Hh	0.0167	+/-0.047	0.0501	0.00	+/-0.047	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-7.36	+/-8.04	14.3	6.93	+/-8.04	15.0	pCi/g			JXH2	10/01/16	0101	1596394	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.0571	+/-0.291	0.835	0.281	+/-0.292	1.00	pCi/g			MJH1	09/28/16	0727	1598618	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.0243	+/-0.209	0.421	0.195	+/-0.209		pCi/g			MXR1	10/03/16	0853	1596247	9
Antimony-125	HUh	0.0107	+/-0.0847	0.173	0.077	+/-0.0849		pCi/g							
Bismuth-212	HUIh	0.00	+/-0.981	0.702	0.298	+/-0.986		pCi/g							
Bismuth-214	Hh	0.626	+/-0.161	0.134	0.0603	+/-0.164		pCi/g							
Cesium-137	HUIh	0.00	+/-0.0381	0.0831	0.0376	+/-0.0421	0.100	pCi/g							
Cobalt-60	HUh	-0.0221	+/-0.0298	0.0531	0.0201	+/-0.0314		pCi/g							
Europium-154	HUh	0.0634	+/-0.108	0.245	0.105	+/-0.112		pCi/g							
Lead-212	Hh	0.961	+/-0.126	0.0847	0.0391	+/-0.136		pCi/g							
Lead-214	Hh	1.02	+/-0.181	0.305	0.147	+/-0.186		pCi/g							

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 Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes
 Client Sample ID: 4.2B.R.1.4
 Sample ID: 405235020

Report Date: October 4, 2016

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	10.7	+/-1.41	0.546	0.215	+/-1.52		pCi/g							
Protactinium-231	HUh	0.116	+/-0.445	0.896	0.416	+/-0.449		pCi/g							
Radium-226	Hh	0.626	+/-0.161	0.134	0.0603	+/-0.164		pCi/g							
Radium-228	Hh	0.703	+/-0.292	0.258	0.113	+/-0.294		pCi/g							
Thallium-208	Hh	0.302	+/-0.0928	0.0526	0.0228	+/-0.0936		pCi/g							
Tin-126	HUh	0.00	+/-0.192	0.157	0.0744	+/-0.192		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	12.9	+/-3.42	3.86	1.70	+/-4.24	4.00	pCi/g		JXC9	09/19/16	1416	1597816	10
Beta	Hh	21.8	+/-2.67	3.05	1.45	+/-4.10	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.30	+/-0.630	1.26	0.562	+/-0.630	2.00	pCi/g		KSD1	09/17/16	1640	1597795	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	-0.266	+/-1.89	3.30	1.59	+/-1.89	6.00	pCi/g		AEA	09/20/16	2004	1598072	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.364	+/-0.649	1.14	0.554	+/-0.649	2.00	pCi/g		AEA	09/22/16	1630	1598078	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.951	+/-1.17	2.14	1.02	+/-1.17	5.00	pCi/g		GXR1	09/20/16	0947	1597416	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0806	1596227

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

GEL LABORATORIES LLC

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.1.4
Sample ID: 405235020

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596393	74	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	79.3	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596389	87	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596392	69.1	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596388	94.8	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596390	103	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596394	74	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597795	91	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597416	89.9	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.2.3
 Sample ID: 405235021
 Matrix: Soil
 Collect Date: 08-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 16.5%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		16.5						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.0188	+/-0.0726	0.141	0.0442	+/-0.0727	1.00	pCi/g			MXS2	09/24/16	2054	1596400	2
Plutonium-239/240	HUh	-0.00208	+/-0.0744	0.164	0.056	+/-0.0745	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.00834	+/-0.0576	0.140	0.0417	+/-0.0577	1.00	pCi/g			MXS2	09/24/16	1319	1596396	3
Uranium-233/234	Hh	0.665	+/-0.200	0.104	0.0298	+/-0.230	1.00	pCi/g							
Uranium-235/236	Hh	0.0262	+/-0.0515	0.0714	0.0134	+/-0.0517	1.00	pCi/g							
Uranium-238	Hh	0.606	+/-0.192	0.104	0.0298	+/-0.218	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0443	+/-0.400	0.969	0.277	+/-0.400	1.00	pCi/g			MXS2	09/26/16	1711	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.13	+/-0.629	0.584	0.180	+/-0.653	1.00	pCi/g			MXS2	09/24/16	1316	1596395	5
Thorium-229	HUh	-0.0135	+/-0.117	0.270	0.0505	+/-0.117	1.00	pCi/g							
Thorium-230	Hh	0.787	+/-0.427	0.169	0.00	+/-0.443	1.00	pCi/g							
Thorium-232	Hh	0.645	+/-0.398	0.310	0.0711	+/-0.410	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.000535	+/-0.0397	0.0881	0.024	+/-0.0397	1.00	pCi/g			MXS2	09/29/16	2126	1602285	6
Curium-242	HUh	-0.0112	+/-0.0964	0.223	0.0418	+/-0.0965	1.00	pCi/g							
Curium-243/244	HUh	-0.00652	+/-0.0288	0.0752	0.0172	+/-0.0289	1.00	pCi/g							
Curium-245/246	HXh	0.122	+/-0.0902	0.0459	0.00	+/-0.0915	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	Hh	9.46	+/-7.66	12.7	6.17	+/-7.93	15.0	pCi/g			MXS2	09/28/16	0520	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.057	+/-0.204	0.456	0.189	+/-0.206	1.00	pCi/g			MJH1	09/28/16	0845	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0409	+/-0.194	0.383	0.176	+/-0.195		pCi/g			MXR1	10/03/16	0857	1596249	9
Antimony-125	HUh	-0.0541	+/-0.0882	0.161	0.0714	+/-0.0915		pCi/g							
Bismuth-212	HUh	0.477	+/-0.931	1.12	0.511	+/-0.956		pCi/g							
Bismuth-214	Hh	0.709	+/-0.165	0.105	0.0462	+/-0.167		pCi/g							
Cesium-137	Hh	0.130	+/-0.0708	0.0737	0.0332	+/-0.071	0.100	pCi/g							
Cobalt-60	HUh	0.0124	+/-0.0304	0.0686	0.0284	+/-0.0309		pCi/g							
Europium-154	HUh	-0.0116	+/-0.0856	0.171	0.0703	+/-0.0857		pCi/g							
Lead-212	Hh	0.748	+/-0.132	0.103	0.0484	+/-0.137		pCi/g							
Lead-214	Hh	0.805	+/-0.188	0.118	0.0537	+/-0.191		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.2.3
 Sample ID: 405235021

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	11.5	+/-1.38	0.602	0.248	+/-1.50		pCi/g							
Protactinium-231	HUh	0.00	+/-1.06	0.668	0.303	+/-1.08		pCi/g							
Radium-226	Hh	0.709	+/-0.165	0.105	0.0462	+/-0.167		pCi/g							
Radium-228	Hh	1.02	+/-0.391	0.201	0.0854	+/-0.395		pCi/g							
Thallium-208	Hh	0.259	+/-0.0824	0.0629	0.0282	+/-0.0832		pCi/g							
Tin-126	HUh	0.00	+/-0.106	0.119	0.0562	+/-0.106		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	8.46	+/-3.09	3.90	1.70	+/-3.49	4.00	pCi/g		BXF1	09/19/16	1436	1597811	10
Beta	Hh	13.9	+/-2.55	3.32	1.58	+/-3.26	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.281	+/-0.605	1.08	0.470	+/-0.607	2.00	pCi/g		KSD1	09/17/16	1534	1597796	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	Hh	2.57	+/-2.07	3.33	1.48	+/-2.07	6.00	pCi/g		TXP3	09/22/16	1503	1598075	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.211	+/-0.697	1.19	0.581	+/-0.698	2.00	pCi/g		TXJ1	09/23/16	0839	1598080	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	1.02	+/-1.78	3.01	1.46	+/-1.78	5.00	pCi/g		CXS7	09/20/16	1044	1597412	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
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Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.2.3
Sample ID: 405235021

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596400	72.2	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	95.3	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	76.4	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596399	93	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596395	95.9	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1602285	85.5	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596402	72.2	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597796	88.3	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597412	92.5	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.1.3
 Sample ID: 405235022
 Matrix: Soil
 Collect Date: 08-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 19.4%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		19.4						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.0154	+/-0.0356	0.106	0.0288	+/-0.0357	1.00	pCi/g			MXS2	09/24/16	2054	1596400	2
Plutonium-239/240	HUh	0.000637	+/-0.0472	0.105	0.0286	+/-0.0473	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.000625	+/-0.0463	0.103	0.028	+/-0.0464	1.00	pCi/g			MXS2	09/28/16	1755	1596396	3
Uranium-233/234	Hh	0.802	+/-0.240	0.0547	0.00	+/-0.278	1.00	pCi/g							
Uranium-235/236	Hh	0.060	+/-0.082	0.112	0.0284	+/-0.0826	1.00	pCi/g							
Uranium-238	Hh	0.948	+/-0.260	0.0547	0.00	+/-0.308	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.227	+/-0.582	1.04	0.303	+/-0.583	1.00	pCi/g			MXS2	09/26/16	1711	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.07	+/-0.608	0.558	0.167	+/-0.630	1.00	pCi/g			MXS2	09/24/16	1316	1596395	5
Thorium-229	HUh	0.0426	+/-0.160	0.269	0.0503	+/-0.160	1.00	pCi/g							
Thorium-230	Hh	0.770	+/-0.426	0.268	0.0502	+/-0.441	1.00	pCi/g							
Thorium-232	Hh	0.433	+/-0.330	0.268	0.0501	+/-0.336	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	Hh	0.0502	+/-0.0592	0.064	0.012	+/-0.0595	1.00	pCi/g			MXS2	09/29/16	2126	1602285	6
Curium-242	HUh	-0.0223	+/-0.0986	0.257	0.059	+/-0.0988	1.00	pCi/g							
Curium-243/244	Hh	0.0374	+/-0.0539	0.065	0.0122	+/-0.0541	1.00	pCi/g							
Curium-245/246	Hh	0.0153	+/-0.0429	0.0458	0.00	+/-0.043	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	Hh	12.5	+/-8.08	13.3	6.44	+/-8.50	15.0	pCi/g			MXS2	09/28/16	0607	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.163	+/-0.312	0.734	0.298	+/-0.321	1.00	pCi/g			MJH1	09/28/16	0845	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.119	+/-0.177	0.327	0.153	+/-0.186		pCi/g			MXR1	10/03/16	0858	1596249	9
Antimony-125	HUh	-0.0437	+/-0.0837	0.147	0.0675	+/-0.086		pCi/g							
Bismuth-212	HUh	0.00	+/-0.652	0.912	0.426	+/-0.930		pCi/g							
Bismuth-214	Hh	0.839	+/-0.166	0.0894	0.0407	+/-0.169		pCi/g							
Cesium-137	Hh	0.645	+/-0.0922	0.0604	0.0279	+/-0.0962	0.100	pCi/g							
Cobalt-60	HUh	0.0214	+/-0.0323	0.0612	0.0272	+/-0.0337		pCi/g							
Europium-154	HUh	0.00	+/-0.0944	0.186	0.0836	+/-0.104		pCi/g							
Lead-212	Hh	0.961	+/-0.107	0.0763	0.0359	+/-0.119		pCi/g							
Lead-214	Hh	0.997	+/-0.168	0.245	0.119	+/-0.173		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.1.3
 Sample ID: 405235022

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	13.1	+/-1.10	0.381	0.159	+/-1.30		pCi/g							
Protactinium-231	HUh	0.00	+/-0.651	0.623	0.290	+/-0.667		pCi/g							
Radium-226	Hh	0.839	+/-0.166	0.0894	0.0407	+/-0.169		pCi/g							
Radium-228	Hh	0.593	+/-0.211	0.200	0.0909	+/-0.213		pCi/g							
Thallium-208	Hh	0.357	+/-0.074	0.0449	0.0204	+/-0.0755		pCi/g							
Tin-126	HUh	0.00	+/-0.113	0.110	0.0519	+/-0.114		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	7.10	+/-2.95	3.98	1.77	+/-3.29	4.00	pCi/g		BXF1	09/19/16	1436	1597811	10
Beta	Hh	16.5	+/-2.16	2.09	0.965	+/-3.17	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.311	+/-0.441	0.908	0.405	+/-0.441	2.00	pCi/g		KSD1	09/17/16	1534	1597796	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	1.14	+/-1.76	3.05	1.36	+/-1.76	6.00	pCi/g		TXP3	09/22/16	1535	1598075	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	Hh	0.675	+/-0.682	1.14	0.558	+/-0.684	2.00	pCi/g		TXJ1	09/23/16	0950	1598080	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.616	+/-1.86	3.24	1.58	+/-1.86	5.00	pCi/g		CXS7	09/20/16	1116	1597412	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.1.3
Sample ID: 405235022

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596400	69.9	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	79.1	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	94.4	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596399	93.4	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596395	91	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1602285	90	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596402	69.9	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597796	92.3	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597412	86.4	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.11.2

Sample ID: 405235023

Matrix: Soil

Collect Date: 02-DEC-15

Receive Date: 06-SEP-16

Collector: Client

Moisture: 22.6%

Project: MJWC00115

Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		22.6						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.032	+/-0.0637	0.103	0.0282	+/-0.0638	1.00	pCi/g			MXS2	09/24/16	2054	1596400	2
Plutonium-239/240	HUh	-0.00748	+/-0.0331	0.0863	0.0198	+/-0.0332	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.00054	+/-0.040	0.0889	0.0242	+/-0.0401	1.00	pCi/g			MXS2	09/28/16	1755	1596396	3
Uranium-233/234	Hh	0.949	+/-0.254	0.112	0.0304	+/-0.300	1.00	pCi/g							
Uranium-235/236	Hh	0.068	+/-0.0749	0.051	0.00	+/-0.0758	1.00	pCi/g							
Uranium-238	Hh	0.822	+/-0.235	0.0938	0.0215	+/-0.273	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0115	+/-0.411	0.948	0.259	+/-0.411	1.00	pCi/g			MXS2	09/26/16	1711	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.26	+/-0.708	0.642	0.191	+/-0.737	1.00	pCi/g			MXS2	09/24/16	1316	1596395	5
Thorium-229	Hh	0.0988	+/-0.227	0.360	0.0825	+/-0.227	1.00	pCi/g							
Thorium-230	Hh	0.910	+/-0.513	0.427	0.116	+/-0.532	1.00	pCi/g							
Thorium-232	Hh	0.858	+/-0.494	0.395	0.100	+/-0.512	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0279	+/-0.0547	0.152	0.0506	+/-0.0547	1.00	pCi/g			MXS2	09/29/16	2126	1602285	6
Curium-242	Hh	0.00	+/-0.122	0.182	0.00	+/-0.123	1.00	pCi/g							
Curium-243/244	HUh	0.000691	+/-0.0512	0.114	0.031	+/-0.0513	1.00	pCi/g							
Curium-245/246	Hh	0.0536	+/-0.0773	0.0932	0.0174	+/-0.0776	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-1.13	+/-6.99	12.2	5.90	+/-6.99	15.0	pCi/g			MXS2	09/29/16	1042	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.0562	+/-0.220	0.523	0.199	+/-0.221	1.00	pCi/g			MJH1	09/28/16	0845	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUIh	0.00	+/-0.201	0.425	0.198	+/-0.222		pCi/g			MXR1	10/03/16	0858	1596249	9
Antimony-125	HUh	0.0252	+/-0.0922	0.184	0.0834	+/-0.0929		pCi/g							
Bismuth-212	HUIh	0.00	+/-0.958	0.739	0.323	+/-0.960		pCi/g							
Bismuth-214	Hh	0.922	+/-0.202	0.113	0.0503	+/-0.205		pCi/g							
Cesium-137	Hh	0.349	+/-0.105	0.0611	0.0271	+/-0.106	0.100	pCi/g							
Cobalt-60	HUh	0.00735	+/-0.0289	0.0633	0.0262	+/-0.029		pCi/g							
Europium-154	HUh	0.0261	+/-0.122	0.232	0.101	+/-0.123		pCi/g							
Lead-212	Hh	1.09	+/-0.119	0.0829	0.0384	+/-0.132		pCi/g							
Lead-214	Hh	1.19	+/-0.182	0.108	0.0488	+/-0.188		pCi/g							

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Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.11.2
 Sample ID: 405235023

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	12.4	+/-1.34	0.483	0.192	+/-1.49		pCi/g							
Protactinium-231	HUh	0.00	+/-0.570	0.721	0.331	+/-0.611		pCi/g							
Radium-226	Hh	0.922	+/-0.202	0.113	0.0503	+/-0.205		pCi/g							
Radium-228	Hh	0.733	+/-0.299	0.245	0.108	+/-0.301		pCi/g							
Thallium-208	Hh	0.325	+/-0.0773	0.0591	0.0264	+/-0.0785		pCi/g							
Tin-126	HUh	0.00	+/-0.104	0.0941	0.0443	+/-0.105		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	13.3	+/-3.50	3.97	1.75	+/-4.32	4.00	pCi/g		BXF1	09/19/16	1441	1597811	10
Beta	Hh	20.6	+/-2.30	2.01	0.932	+/-3.73	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.402	+/-0.432	0.930	0.412	+/-0.432	2.00	pCi/g		KSD1	09/17/16	1534	1597796	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	Hh	2.23	+/-2.08	3.41	1.52	+/-2.08	6.00	pCi/g		TXP3	09/22/16	1608	1598075	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.518	+/-0.749	1.26	0.618	+/-0.750	2.00	pCi/g		TXJ1	09/23/16	1102	1598080	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.627	+/-1.89	3.22	1.57	+/-1.89	5.00	pCi/g		CXS7	09/20/16	1148	1597412	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.11.2
 Sample ID: 405235023

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596400	68.9	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	87.7	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	92.5	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596399	85.3	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596395	88.5	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1602285	64	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596402	68.9	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597796	97.8	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597412	93.5	(15%-125%)				

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.2.2
 Sample ID: 405235024
 Matrix: Soil
 Collect Date: 08-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 19.4%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		19.4						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.000735	+/-0.0545	0.121	0.033	+/-0.0545	1.00	pCi/g			MXS2	09/24/16	2054	1596400	2
Plutonium-239/240	HUh	0.00146	+/-0.0671	0.147	0.0463	+/-0.0672	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0142	+/-0.0329	0.0975	0.0266	+/-0.033	1.00	pCi/g			MXS2	09/24/16	1319	1596396	3
Uranium-233/234	Hh	0.795	+/-0.258	0.101	0.0189	+/-0.296	1.00	pCi/g							
Uranium-235/236	Hh	0.0211	+/-0.0594	0.0634	0.00	+/-0.0595	1.00	pCi/g							
Uranium-238	Hh	0.996	+/-0.290	0.129	0.0327	+/-0.341	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.126	+/-0.360	1.04	0.259	+/-0.361	1.00	pCi/g			MXS2	09/26/16	1711	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.35	+/-1.07	1.29	0.415	+/-1.10	1.00	pCi/g			MXS2	09/24/16	1316	1596395	5
Thorium-229	HUh	0.0324	+/-0.338	0.706	0.180	+/-0.339	1.00	pCi/g							
Thorium-230	Hh	0.263	+/-0.465	0.705	0.179	+/-0.468	1.00	pCi/g							
Thorium-232	Hh	0.805	+/-0.640	0.345	0.00	+/-0.661	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.012	+/-0.0537	0.105	0.0301	+/-0.0537	1.00	pCi/g			MXS2	09/29/16	2126	1602285	6
Curium-242	HUh	-0.0626	+/-0.119	0.366	0.105	+/-0.119	1.00	pCi/g							
Curium-243/244	Hh	0.0304	+/-0.0521	0.0456	0.00	+/-0.0523	1.00	pCi/g							
Curium-245/246	Hh	0.0342	+/-0.0587	0.0514	0.00	+/-0.0589	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	3.92	+/-7.32	12.5	6.02	+/-7.37	15.0	pCi/g			MXS2	09/29/16	1128	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.241	+/-0.272	0.254	0.00	+/-0.294	1.00	pCi/g			MJH1	09/28/16	0846	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.183	+/-0.227	0.373	0.171	+/-0.243		pCi/g			MXR1	10/03/16	0859	1596249	9
Antimony-125	HUh	-0.00429	+/-0.106	0.205	0.0939	+/-0.106		pCi/g							
Bismuth-212	HUh	0.00	+/-0.551	1.13	0.519	+/-0.783		pCi/g							
Bismuth-214	Hh	0.954	+/-0.213	0.107	0.0471	+/-0.217		pCi/g							
Cesium-137	Hh	0.779	+/-0.117	0.058	0.0255	+/-0.122	0.100	pCi/g							
Cobalt-60	HUh	0.0112	+/-0.0408	0.0813	0.035	+/-0.0411		pCi/g							
Europium-154	HUh	0.0166	+/-0.0926	0.187	0.0788	+/-0.0929		pCi/g							
Lead-212	Hh	1.01	+/-0.125	0.0834	0.0385	+/-0.136		pCi/g							
Lead-214	Hh	1.03	+/-0.198	0.128	0.0588	+/-0.203		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.2.2
 Sample ID: 405235024

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	13.0	+/-1.44	0.678	0.288	+/-1.60		pCi/g							
Protactinium-231	HUh	0.00	+/-0.638	0.840	0.389	+/-0.663		pCi/g							
Radium-226	Hh	0.954	+/-0.213	0.107	0.0471	+/-0.217		pCi/g							
Radium-228	Hh	0.912	+/-0.297	0.220	0.0957	+/-0.301		pCi/g							
Thallium-208	Hh	0.273	+/-0.0921	0.0624	0.0281	+/-0.0929		pCi/g							
Tin-126	HUh	0.00	+/-0.131	0.136	0.0645	+/-0.131		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	9.08	+/-3.25	3.99	1.72	+/-3.69	4.00	pCi/g		BXF1	09/19/16	1437	1597811	10
Beta	Hh	18.8	+/-2.53	2.56	1.19	+/-3.67	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.234	+/-0.374	0.655	0.281	+/-0.376	2.00	pCi/g		KSD1	09/21/16	1046	1597796	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.732	+/-1.92	3.44	1.54	+/-1.92	6.00	pCi/g		TXP3	09/22/16	1640	1598075	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	Hh	0.613	+/-0.670	1.13	0.550	+/-0.672	2.00	pCi/g		TXJ1	09/23/16	1213	1598080	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.62	+/-1.85	3.23	1.57	+/-1.85	5.00	pCi/g		CXS7	09/20/16	1220	1597412	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.2.2
Sample ID: 405235024

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596400	67.1	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	69.5	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	92.2	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596399	81.8	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596395	45	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1602285	80.8	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596402	67.1	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597796	95	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597412	91.6	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.1.2
 Sample ID: 405235025
 Matrix: Soil
 Collect Date: 08-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 21.4%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		21.4						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.0198	+/-0.062	0.116	0.0356	+/-0.0621	1.00	pCi/g			MXS2	09/24/16	2054	1596400	2
Plutonium-239/240	HUh	-0.025	+/-0.0353	0.115	0.0354	+/-0.0353	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.00636	+/-0.0594	0.138	0.0451	+/-0.0594	1.00	pCi/g			MXS2	09/24/16	1319	1596396	3
Uranium-233/234	Hh	0.747	+/-0.250	0.142	0.0407	+/-0.284	1.00	pCi/g							
Uranium-235/236	HUh	0.0155	+/-0.0581	0.0977	0.0183	+/-0.0582	1.00	pCi/g							
Uranium-238	Hh	0.889	+/-0.271	0.142	0.0407	+/-0.315	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.103	+/-0.352	0.982	0.232	+/-0.353	1.00	pCi/g			MXS2	09/26/16	1711	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.25	+/-0.633	0.569	0.180	+/-0.661	1.00	pCi/g			MXS2	09/24/16	1316	1596395	5
Thorium-229	HUh	0.0147	+/-0.154	0.321	0.0817	+/-0.154	1.00	pCi/g							
Thorium-230	Hh	0.922	+/-0.478	0.455	0.149	+/-0.497	1.00	pCi/g							
Thorium-232	Hh	0.759	+/-0.412	0.289	0.0663	+/-0.427	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.0257	+/-0.0646	0.117	0.0376	+/-0.0647	1.00	pCi/g			MXS2	09/29/16	2126	1602285	6
Curium-242	Hh	0.00	+/-0.0979	0.146	0.00	+/-0.0981	1.00	pCi/g							
Curium-243/244	HUh	-0.0323	+/-0.0641	0.162	0.0596	+/-0.0641	1.00	pCi/g							
Curium-245/246	HXh	0.0478	+/-0.063	0.0478	0.00	+/-0.0633	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	0.281	+/-6.48	11.2	5.43	+/-6.48	15.0	pCi/g			MXS2	09/29/16	1215	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.205	+/-0.277	0.922	0.329	+/-0.293	1.00	pCi/g			MJH1	09/28/16	0846	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.0352	+/-0.297	0.569	0.267	+/-0.298		pCi/g			MXR1	10/03/16	0901	1596249	9
Antimony-125	HUh	0.148	+/-0.187	0.361	0.170	+/-0.199		pCi/g							
Bismuth-212	HUh	0.00	+/-0.945	1.53	0.705	+/-1.20		pCi/g							
Bismuth-214	Hh	0.921	+/-0.232	0.165	0.0747	+/-0.235		pCi/g							
Cesium-137	Hh	5.38	+/-0.275	0.0889	0.040	+/-0.359	0.100	pCi/g							
Cobalt-60	HUh	0.0029	+/-0.050	0.0979	0.0418	+/-0.0501		pCi/g							
Europium-154	HUh	0.0645	+/-0.130	0.275	0.119	+/-0.133		pCi/g							
Lead-212	Hh	0.953	+/-0.183	0.138	0.0652	+/-0.190		pCi/g							
Lead-214	Hh	0.962	+/-0.226	0.191	0.0895	+/-0.230		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.1.2
 Sample ID: 405235025

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	14.1	+/-1.74	0.733	0.301	+/-1.89		pCi/g							
Protactinium-231	HUh	0.00	+/-0.964	1.13	0.526	+/-0.977		pCi/g							
Radium-226	Hh	0.921	+/-0.232	0.165	0.0747	+/-0.235		pCi/g							
Radium-228	Hh	1.11	+/-0.317	0.323	0.143	+/-0.322		pCi/g							
Thallium-208	Hh	0.267	+/-0.114	0.0789	0.0355	+/-0.114		pCi/g							
Tin-126	HUh	0.00	+/-0.191	0.194	0.0929	+/-0.197		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	15.3	+/-4.30	3.92	1.59	+/-5.22	4.00	pCi/g		BXF1	09/19/16	1436	1597811	10
Beta	Hh	25.3	+/-3.08	2.50	1.13	+/-4.79	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.106	+/-0.613	1.11	0.506	+/-0.614	2.00	pCi/g		KSD1	09/19/16	1154	1597796	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.0983	+/-1.82	3.39	1.51	+/-1.82	6.00	pCi/g		TXP3	09/22/16	1713	1598075	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.573	+/-0.730	1.23	0.601	+/-0.732	2.00	pCi/g		TXJ1	09/23/16	1324	1598080	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-1.6	+/-1.95	3.46	1.68	+/-1.95	5.00	pCi/g		CXS7	09/20/16	1324	1597412	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2B.R.1.2
 Sample ID: 405235025

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596400	75.4	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	71.5	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	85.5	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596399	78.6	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596395	96.9	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1602285	92.9	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596402	75.4	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597796	103	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597412	86.4	(15%-125%)				

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2C.R.1.3
 Sample ID: 405235026
 Matrix: Soil
 Collect Date: 08-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 16.6%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		16.6						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.000592	+/-0.0439	0.0976	0.0266	+/-0.0439	1.00	pCi/g			MXS2	09/24/16	2054	1596400	2
Plutonium-239/240	Hh	0.0224	+/-0.0514	0.0815	0.0187	+/-0.0515	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0262	+/-0.0329	0.110	0.0346	+/-0.033	1.00	pCi/g			MXS2	09/24/16	1319	1596396	3
Uranium-233/234	Hh	0.633	+/-0.216	0.132	0.0391	+/-0.242	1.00	pCi/g							
Uranium-235/236	Hh	0.0314	+/-0.0618	0.0856	0.016	+/-0.062	1.00	pCi/g							
Uranium-238	Hh	0.530	+/-0.195	0.0854	0.016	+/-0.215	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.00244	+/-0.181	0.403	0.110	+/-0.181	1.00	pCi/g			MXS2	09/29/16	1405	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.69	+/-0.824	0.601	0.160	+/-0.871	1.00	pCi/g			MXS2	09/24/16	1317	1596395	5
Thorium-229	Hh	0.194	+/-0.280	0.338	0.0632	+/-0.282	1.00	pCi/g							
Thorium-230	Hh	0.793	+/-0.501	0.429	0.109	+/-0.517	1.00	pCi/g							
Thorium-232	Hh	0.824	+/-0.497	0.336	0.0629	+/-0.515	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.0129	+/-0.0441	0.0818	0.0223	+/-0.0441	1.00	pCi/g			MXS2	09/29/16	2126	1602285	6
Curium-242	Hh	0.00	+/-0.0871	0.130	0.00	+/-0.0872	1.00	pCi/g							
Curium-243/244	HUh	-0.00302	+/-0.0261	0.0604	0.0113	+/-0.0261	1.00	pCi/g							
Curium-245/246	Hh	0.0675	+/-0.0688	0.068	0.0127	+/-0.0693	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	Hh	8.50	+/-6.75	11.2	5.43	+/-6.98	15.0	pCi/g			MXS2	09/28/16	0915	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.0231	+/-0.175	0.400	0.159	+/-0.176	1.00	pCi/g			MJH1	09/28/16	0928	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.00958	+/-0.210	0.385	0.178	+/-0.210		pCi/g			MXR1	10/03/16	0901	1596249	9
Antimony-125	HUh	-0.00334	+/-0.0702	0.141	0.0627	+/-0.0702		pCi/g							
Bismuth-212	HUh	0.00	+/-0.670	1.23	0.574	+/-1.17		pCi/g							
Bismuth-214	Hh	0.660	+/-0.159	0.0941	0.0416	+/-0.168		pCi/g							
Cesium-137	Hh	0.153	+/-0.0572	0.0499	0.0218	+/-0.0585	0.100	pCi/g							
Cobalt-60	HUh	-0.0265	+/-0.0292	0.0494	0.0195	+/-0.0316		pCi/g							
Europium-154	HUh	0.0305	+/-0.0757	0.171	0.072	+/-0.077		pCi/g							
Lead-212	Hh	0.920	+/-0.119	0.0844	0.0393	+/-0.140		pCi/g							
Lead-214	Hh	0.847	+/-0.170	0.107	0.0489	+/-0.183		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes
 Client Sample ID: 4.2C.R.1.3
 Sample ID: 405235026

Report Date: October 4, 2016

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis															
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>															
Potassium-40	Hh	12.5	+/-1.28	0.316	0.111	+/-1.69		pCi/g							
Protactinium-231	HUh	0.00	+/-0.661	0.589	0.266	+/-0.681		pCi/g							
Radium-226	Hh	0.660	+/-0.159	0.0941	0.0416	+/-0.168		pCi/g							
Radium-228	Hh	0.966	+/-0.306	0.196	0.085	+/-0.335		pCi/g							
Thallium-208	Hh	0.283	+/-0.0683	0.0506	0.0225	+/-0.0721		pCi/g							
Tin-126	HUh	0.00	+/-0.108	0.101	0.0476	+/-0.110		pCi/g							
Rad Gas Flow Proportional Counting															
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>															
Alpha	Hh	15.3	+/-4.06	3.94	1.65	+/-5.04	4.00	pCi/g		BXF1	09/19/16	1441	1597811	10	
Beta	Hh	17.4	+/-2.92	3.43	1.61	+/-3.87	10.0	pCi/g							
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>															
Strontium-90	HUh	-0.601	+/-0.458	1.00	0.450	+/-0.458	2.00	pCi/g		KSD1	09/17/16	1533	1597796	11	
Rad Liquid Scintillation Analysis															
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>															
Tritium	HUh	0.600	+/-1.85	3.34	1.49	+/-1.85	6.00	pCi/g		TXP3	09/22/16	1745	1598075	12	
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>															
Carbon-14	HUh	0.510	+/-0.695	1.17	0.573	+/-0.696	2.00	pCi/g		TXJ1	09/23/16	1435	1598080	13	
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>															
Technetium-99	HUh	-0.392	+/-1.78	3.10	1.51	+/-1.78	5.00	pCi/g		CXS7	09/20/16	1252	1597412	14	

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2C.R.1.3
 Sample ID: 405235026

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596400	83.6	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	85.1	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	93.5	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596399	86.3	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596395	92	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1602285	91.4	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596402	83.6	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597796	97.8	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597412	88.5	(15%-125%)				

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: 4.2C.R.1.4
 Sample ID: 405235027
 Matrix: Soil
 Collect Date: 08-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 18.2%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		18.2						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.00984	+/-0.0445	0.112	0.0343	+/-0.0445	1.00	pCi/g			MXS2	09/24/16	2054	1596400	2
Plutonium-239/240	HUh	0.00403	+/-0.0421	0.0878	0.0223	+/-0.0421	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0321	+/-0.0366	0.125	0.0401	+/-0.0367	1.00	pCi/g			MXS2	09/24/16	1319	1596396	3
Uranium-233/234	Hh	0.982	+/-0.280	0.0966	0.0181	+/-0.330	1.00	pCi/g							
Uranium-235/236	Hh	0.0558	+/-0.0803	0.0969	0.0181	+/-0.081	1.00	pCi/g							
Uranium-238	Hh	0.968	+/-0.280	0.133	0.0362	+/-0.329	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.0716	+/-0.507	1.02	0.241	+/-0.507	1.00	pCi/g			MXS2	09/26/16	1711	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	0.721	+/-0.573	0.661	0.201	+/-0.586	1.00	pCi/g			MXS2	09/24/16	1317	1596395	5
Thorium-229	Hh	0.164	+/-0.261	0.361	0.0828	+/-0.263	1.00	pCi/g							
Thorium-230	Hh	0.911	+/-0.495	0.195	0.00	+/-0.517	1.00	pCi/g							
Thorium-232	Hh	1.10	+/-0.540	0.195	0.00	+/-0.569	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	Hh	0.024	+/-0.0424	0.0642	0.0163	+/-0.0424	1.00	pCi/g			MXS2	09/29/16	2126	1602285	6
Curium-242	Hh	0.00	+/-0.0737	0.110	0.00	+/-0.0738	1.00	pCi/g							
Curium-243/244	HUh	-0.00768	+/-0.0232	0.0651	0.0166	+/-0.0232	1.00	pCi/g							
Curium-245/246	Hh	0.0211	+/-0.0415	0.0576	0.0108	+/-0.0416	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	4.77	+/-6.96	11.8	5.71	+/-7.03	15.0	pCi/g			MXS2	09/28/16	1002	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.0423	+/-0.247	0.525	0.214	+/-0.248	1.00	pCi/g			MJH1	09/28/16	0928	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.0503	+/-0.233	0.469	0.217	+/-0.234		pCi/g			MXR1	10/03/16	0908	1596249	9
Antimony-125	HUh	-0.0387	+/-0.108	0.200	0.0895	+/-0.110		pCi/g							
Bismuth-212	HUIh	0.00	+/-1.03	1.49	0.684	+/-1.22		pCi/g							
Bismuth-214	Hh	0.854	+/-0.191	0.114	0.0497	+/-0.194		pCi/g							
Cesium-137	HUIh	0.00	+/-0.0442	0.0921	0.0417	+/-0.0515	0.100	pCi/g							
Cobalt-60	HUh	-0.0217	+/-0.0423	0.0754	0.0308	+/-0.0434		pCi/g							
Europium-154	HUh	0.103	+/-0.106	0.254	0.109	+/-0.116		pCi/g							
Lead-212	Hh	0.963	+/-0.133	0.103	0.0479	+/-0.143		pCi/g							
Lead-214	Hh	0.786	+/-0.187	0.126	0.0569	+/-0.189		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2C.R.1.4
 Sample ID: 405235027

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	14.0	+/-1.59	0.769	0.322	+/-1.75		pCi/g							
Protactinium-231	HUh	0.00	+/-0.974	0.862	0.395	+/-0.995		pCi/g							
Radium-226	Hh	0.854	+/-0.191	0.114	0.0497	+/-0.194		pCi/g							
Radium-228	Hh	0.865	+/-0.383	0.270	0.117	+/-0.385		pCi/g							
Thallium-208	Hh	0.357	+/-0.0944	0.0644	0.0283	+/-0.0956		pCi/g							
Tin-126	HUh	0.00	+/-0.126	0.158	0.0746	+/-0.127		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	12.2	+/-4.79	3.89	1.29	+/-5.36	4.00	pCi/g		BXF1	09/19/16	1441	1597811	10
Beta	Hh	24.0	+/-3.81	2.79	1.20	+/-5.20	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.0791	+/-0.605	1.16	0.517	+/-0.605	2.00	pCi/g		KSD1	09/17/16	1533	1597796	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	1.19	+/-1.90	3.29	1.47	+/-1.90	6.00	pCi/g		TXP3	09/22/16	1818	1598075	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.528	+/-0.674	1.13	0.555	+/-0.675	2.00	pCi/g		TXJ1	09/23/16	1547	1598080	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.141	+/-1.93	3.33	1.62	+/-1.94	5.00	pCi/g		CXS7	09/20/16	1428	1597412	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.2C.R.1.4
 Sample ID: 405235027

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test			Batch ID			Recovery%		Acceptable Limits					
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"						1596400		78.8					(15%-125%)
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596396		70.7					(15%-125%)
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596396		95.1					(15%-125%)
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"						1596399		68.4					(15%-125%)
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"						1596395		88.9					(15%-125%)
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"						1602285		105					(15%-125%)
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"						1596402		78.8					(15%-125%)
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"						1597796		100					(25%-125%)
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"						1597412		86.7					(15%-125%)

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: 4.3.AR1.3
 Sample ID: 405235028
 Matrix: Soil
 Collect Date: 23-NOV-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 22.7%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		22.7						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.00618	+/-0.0273	0.0713	0.0163	+/-0.0274	1.00	pCi/g			MXS2	09/24/16	2054	1596400	2
Plutonium-239/240	Hh	0.0292	+/-0.0516	0.0781	0.0199	+/-0.0517	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0116	+/-0.0349	0.0981	0.025	+/-0.035	1.00	pCi/g			MXS2	09/24/16	1319	1596396	3
Uranium-233/234	Hh	0.999	+/-0.242	0.0907	0.0231	+/-0.293	1.00	pCi/g							
Uranium-235/236	Hh	0.0453	+/-0.0671	0.0982	0.0267	+/-0.0676	1.00	pCi/g							
Uranium-238	Hh	0.880	+/-0.228	0.0907	0.0231	+/-0.270	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0874	+/-0.298	0.830	0.196	+/-0.298	1.00	pCi/g			MXS2	09/26/16	1711	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.22	+/-0.837	0.925	0.294	+/-0.865	1.00	pCi/g			MXS2	09/24/16	1317	1596395	5
Thorium-229	HUh	0.0633	+/-0.237	0.399	0.0747	+/-0.238	1.00	pCi/g							
Thorium-230	Hh	1.23	+/-0.653	0.398	0.0745	+/-0.686	1.00	pCi/g							
Thorium-232	Hh	1.72	+/-0.763	0.397	0.0743	+/-0.817	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	Hh	0.0504	+/-0.0708	0.110	0.0353	+/-0.0711	1.00	pCi/g			MXS2	09/29/16	2126	1602285	6
Curium-242	Hh	0.00	+/-0.0981	0.146	0.00	+/-0.0983	1.00	pCi/g							
Curium-243/244	HUh	0.0139	+/-0.0474	0.0879	0.0239	+/-0.0475	1.00	pCi/g							
Curium-245/246	HXh	0.090	+/-0.0781	0.045	0.00	+/-0.079	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	Hh	11.2	+/-6.89	11.3	5.48	+/-7.26	15.0	pCi/g			MXS2	09/28/16	1049	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.211	+/-0.243	0.342	0.108	+/-0.262	1.00	pCi/g			MJH1	09/28/16	0929	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.136	+/-0.253	0.394	0.178	+/-0.261		pCi/g			MXR1	10/03/16	0908	1596249	9
Antimony-125	HUh	0.0174	+/-0.113	0.226	0.102	+/-0.113		pCi/g							
Bismuth-212	Hh	1.84	+/-0.908	0.822	0.350	+/-0.913		pCi/g							
Bismuth-214	Hh	1.04	+/-0.178	0.117	0.0509	+/-0.184		pCi/g							
Cesium-137	Hh	0.132	+/-0.0782	0.0728	0.0319	+/-0.0784	0.100	pCi/g							
Cobalt-60	HUh	-0.00215	+/-0.0369	0.0767	0.0311	+/-0.0369		pCi/g							
Europium-154	HUh	0.0403	+/-0.114	0.250	0.106	+/-0.116		pCi/g							
Lead-212	Hh	1.19	+/-0.139	0.102	0.0471	+/-0.152		pCi/g							
Lead-214	Hh	1.12	+/-0.163	0.364	0.176	+/-0.169		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3.AR1.3
 Sample ID: 405235028

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	14.6	+/-1.63	0.578	0.223	+/-1.80		pCi/g							
Protactinium-231	HUh	0.00	+/-0.745	0.746	0.335	+/-0.753		pCi/g							
Radium-226	Hh	1.04	+/-0.178	0.117	0.0509	+/-0.184		pCi/g							
Radium-228	Hh	0.827	+/-0.270	0.270	0.116	+/-0.273		pCi/g							
Thallium-208	Hh	0.355	+/-0.0778	0.0518	0.0219	+/-0.0792		pCi/g							
Tin-126	HUh	0.0334	+/-0.163	0.157	0.0737	+/-0.163		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	13.1	+/-3.58	3.89	1.69	+/-4.41	4.00	pCi/g		BXF1	09/19/16	1437	1597811	10
Beta	Hh	47.8	+/-3.72	2.57	1.19	+/-7.56	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.331	+/-0.532	0.931	0.400	+/-0.535	2.00	pCi/g		KSD1	09/17/16	1533	1597796	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	-0.54	+/-1.80	3.51	1.57	+/-1.80	6.00	pCi/g		TXP3	09/22/16	1851	1598075	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.394	+/-0.710	1.20	0.588	+/-0.711	2.00	pCi/g		TXJ1	09/23/16	1658	1598080	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.604	+/-1.89	3.24	1.57	+/-1.90	5.00	pCi/g		CXS7	09/20/16	1356	1597412	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3.AR1.3
 Sample ID: 405235028

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test					Batch ID	Recovery%	Acceptable Limits						
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid	"Dry Weight Corrected"					1596400						82	(15%-125%)
Uranium-232 Tracer		ASP Uranium Isotopic, Solid	"Dry Weight Corrected"					1596396						94.7	(15%-125%)
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid	"Dry Weight Corrected"					1596396						87.3	(15%-125%)
Americium-243 Tracer		Alphaspec Np237, Solid	"Dry Weight Corrected"					1596399						87.3	(15%-125%)
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232	Solid "Dry Weight Corrected"					1596395						80.9	(15%-125%)
Americium-243 Tracer		Am241, Cm Solid	"Dry Weight Corrected"					1602285						86.1	(15%-125%)
Plutonium-242 Tracer		Liquid Scint Pu241, Solid	"Dry Weight Corrected"					1596402						82	(15%-125%)
Strontium Carrier		GFPC, Sr90, solid	"Dry Weight Corrected"					1597796						88.3	(25%-125%)
Technetium-99m Tracer		Liquid Scint Tc99, Solid	"Dry Weight Corrected"					1597412						88	(15%-125%)

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3.B.R.1.3
 Sample ID: 405235029
 Matrix: Soil
 Collect Date: 23-NOV-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 19.3%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		19.3						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0475	+/-0.0602	0.0748	0.0171	+/-0.0605	1.00	pCi/g			MXS2	09/24/16	2054	1596400	2
Plutonium-239/240	Hh	0.0204	+/-0.0468	0.0743	0.017	+/-0.0469	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.00507	+/-0.0708	0.150	0.0576	+/-0.0709	1.00	pCi/g			MXS2	09/24/16	1319	1596396	3
Uranium-233/234	Hh	0.716	+/-0.215	0.112	0.0321	+/-0.245	1.00	pCi/g							
Uranium-235/236	Hh	0.0442	+/-0.0637	0.0768	0.0144	+/-0.0641	1.00	pCi/g							
Uranium-238	Hh	0.635	+/-0.201	0.0766	0.0143	+/-0.226	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.079	+/-0.334	0.890	0.198	+/-0.334	1.00	pCi/g			MXS2	09/26/16	1711	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	0.924	+/-0.671	0.558	0.117	+/-0.691	1.00	pCi/g			MXS2	09/24/16	1317	1596395	5
Thorium-229	HUh	0.0608	+/-0.228	0.383	0.0717	+/-0.228	1.00	pCi/g							
Thorium-230	Hh	0.762	+/-0.551	0.590	0.175	+/-0.566	1.00	pCi/g							
Thorium-232	Hh	1.06	+/-0.608	0.486	0.124	+/-0.635	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.00423	+/-0.0482	0.102	0.0314	+/-0.0482	1.00	pCi/g			MXS2	09/29/16	2126	1602285	6
Curium-242	Hh	0.00	+/-0.0988	0.147	0.00	+/-0.099	1.00	pCi/g							
Curium-243/244	HUh	-0.0193	+/-0.0312	0.0993	0.0295	+/-0.0312	1.00	pCi/g							
Curium-245/246	Hh	0.0151	+/-0.0425	0.0453	0.00	+/-0.0425	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	4.01	+/-7.21	12.3	5.94	+/-7.26	15.0	pCi/g			MXS2	09/28/16	1135	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.0502	+/-0.218	0.521	0.165	+/-0.219	1.00	pCi/g			MJH1	09/28/16	0929	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.175	+/-0.417	0.478	0.223	+/-0.425		pCi/g			MXR1	10/03/16	0908	1596249	9
Antimony-125	HUh	-0.0671	+/-0.122	0.215	0.0983	+/-0.126		pCi/g							
Bismuth-212	Hh	1.03	+/-0.964	0.907	0.402	+/-0.965		pCi/g							
Bismuth-214	Hh	0.758	+/-0.185	0.144	0.0654	+/-0.188		pCi/g							
Cesium-137	Hh	0.311	+/-0.0801	0.0706	0.0315	+/-0.0812	0.100	pCi/g							
Cobalt-60	HUh	0.00176	+/-0.0368	0.0743	0.0311	+/-0.0368		pCi/g							
Europium-154	HUh	0.00	+/-0.146	0.254	0.111	+/-0.167		pCi/g							
Lead-212	Hh	1.07	+/-0.131	0.098	0.0458	+/-0.143		pCi/g							
Lead-214	Hh	1.16	+/-0.194	0.327	0.158	+/-0.200		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3.B.R.1.3
 Sample ID: 405235029

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	14.2	+/-1.49	0.502	0.196	+/-1.66		pCi/g							
Protactinium-231	HUh	0.00	+/-0.864	0.886	0.411	+/-0.880		pCi/g							
Radium-226	Hh	0.758	+/-0.185	0.144	0.0654	+/-0.188		pCi/g							
Radium-228	Hh	0.859	+/-0.295	0.274	0.121	+/-0.298		pCi/g							
Thallium-208	Hh	0.323	+/-0.0806	0.0667	0.030	+/-0.0818		pCi/g							
Tin-126	HUh	0.00	+/-0.194	0.137	0.065	+/-0.194		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	9.55	+/-3.39	3.99	1.71	+/-3.87	4.00	pCi/g			BXF1	09/19/16	1436	1597811	10
Beta	Hh	17.6	+/-2.35	2.24	1.03	+/-3.37	10.0	pCi/g							

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.278	+/-0.515	0.919	0.391	+/-0.518	2.00	pCi/g			KSD1	09/17/16	1533	1597796	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	1.23	+/-1.94	3.37	1.50	+/-1.94	6.00	pCi/g			TXP3	09/22/16	1923	1598075	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.285	+/-0.621	1.06	0.516	+/-0.622	2.00	pCi/g			TXJ1	09/23/16	1809	1598080	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.373	+/-1.92	3.29	1.60	+/-1.92	5.00	pCi/g			CXS7	09/20/16	1532	1597412	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3.B.R.1.3
 Sample ID: 405235029

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test					Batch ID	Recovery%	Acceptable Limits						
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"					1596400	78	(15%-125%)						
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"					1596396	103	(15%-125%)						
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"					1596396	99.4	(15%-125%)						
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"					1596399	82	(15%-125%)						
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"					1596395	88	(15%-125%)						
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"					1602285	86.9	(15%-125%)						
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"					1596402	78	(15%-125%)						
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"					1597796	93.7	(25%-125%)						
Techneium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"					1597412	88.4	(15%-125%)						

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.2.3
 Sample ID: 405235030
 Matrix: Soil
 Collect Date: 23-NOV-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 23.9%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		23.9						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.0227	+/-0.0625	0.108	0.0276	+/-0.0626	1.00	pCi/g			MXS2	09/24/16	2051	1596400	2
Plutonium-239/240	HUh	0.0183	+/-0.0626	0.116	0.0316	+/-0.0627	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.00403	+/-0.0422	0.088	0.0224	+/-0.0422	1.00	pCi/g			MXS2	09/24/16	1320	1596396	3
Uranium-233/234	Hh	0.972	+/-0.233	0.0429	0.00	+/-0.281	1.00	pCi/g							
Uranium-235/236	HUh	0.0109	+/-0.0409	0.0687	0.0129	+/-0.0409	1.00	pCi/g							
Uranium-238	Hh	0.830	+/-0.218	0.0942	0.0257	+/-0.256	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.164	+/-0.405	1.21	0.312	+/-0.406	1.00	pCi/g			MXS2	09/26/16	1711	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.13	+/-0.680	0.556	0.140	+/-0.705	1.00	pCi/g			MXS2	09/24/16	1318	1596395	5
Thorium-229	HUh	0.00274	+/-0.203	0.451	0.123	+/-0.203	1.00	pCi/g							
Thorium-230	Hh	0.976	+/-0.539	0.417	0.106	+/-0.560	1.00	pCi/g							
Thorium-232	Hh	1.21	+/-0.584	0.327	0.0611	+/-0.613	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	Hh	0.0222	+/-0.0436	0.0604	0.0113	+/-0.0437	1.00	pCi/g			MXS2	09/29/16	2126	1602285	6
Curium-242	Hh	0.00	+/-0.0943	0.140	0.00	+/-0.0944	1.00	pCi/g							
Curium-243/244	HUh	-0.0154	+/-0.0291	0.0899	0.0257	+/-0.0292	1.00	pCi/g							
Curium-245/246	Hh	0.0254	+/-0.0498	0.0691	0.0129	+/-0.0499	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	1.02	+/-6.76	11.6	5.65	+/-6.77	15.0	pCi/g			MXS2	09/28/16	1222	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.0659	+/-0.232	0.443	0.124	+/-0.234	1.00	pCi/g			MJH1	09/28/16	0930	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.158	+/-0.210	0.431	0.200	+/-0.223		pCi/g			MXR1	10/03/16	0909	1596249	9
Antimony-125	HUh	0.0273	+/-0.0935	0.186	0.0838	+/-0.0943		pCi/g							
Bismuth-212	HUh	0.00	+/-1.02	1.45	0.672	+/-1.20		pCi/g							
Bismuth-214	Hh	0.800	+/-0.189	0.129	0.0581	+/-0.192		pCi/g							
Cesium-137	Hh	0.0731	+/-0.0455	0.0548	0.0236	+/-0.0456	0.100	pCi/g							
Cobalt-60	HUh	0.0237	+/-0.036	0.0822	0.035	+/-0.0376		pCi/g							
Europium-154	HUh	-0.0571	+/-0.0973	0.175	0.0713	+/-0.101		pCi/g							
Lead-212	Hh	1.25	+/-0.128	0.089	0.0412	+/-0.144		pCi/g							
Lead-214	Hh	0.958	+/-0.163	0.119	0.0539	+/-0.168		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.2.3
 Sample ID: 405235030

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	15.1	+/-1.51	0.378	0.134	+/-1.71		pCi/g							
Protactinium-231	HUh	0.00	+/-0.768	0.724	0.330	+/-0.794		pCi/g							
Radium-226	Hh	0.800	+/-0.189	0.129	0.0581	+/-0.192		pCi/g							
Radium-228	Hh	0.975	+/-0.282	0.216	0.0922	+/-0.286		pCi/g							
Thallium-208	Hh	0.442	+/-0.0829	0.0427	0.018	+/-0.085		pCi/g							
Tin-126	HUh	0.00	+/-0.123	0.117	0.0555	+/-0.125		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	13.9	+/-3.89	3.93	1.65	+/-4.78	4.00	pCi/g		BXF1	09/19/16	1437	1597811	10
Beta	Hh	21.5	+/-3.01	3.28	1.54	+/-4.37	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.253	+/-0.522	1.07	0.470	+/-0.522	2.00	pCi/g		KSD1	09/17/16	1533	1597796	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.263	+/-1.93	3.56	1.59	+/-1.93	6.00	pCi/g		TXP3	09/22/16	1956	1598075	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.092	+/-0.760	1.30	0.636	+/-0.760	2.00	pCi/g		TXJ1	09/23/16	1920	1598080	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.298	+/-2.09	3.60	1.75	+/-2.09	5.00	pCi/g		CXS7	09/20/16	1500	1597412	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
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Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.3A.R.2.3
Sample ID: 405235030

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596400	80.8	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	98	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	82.4	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596399	69.6	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596395	101	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1602285	84.3	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596402	80.8	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597796	100	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597412	87.3	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3.BR19.2
 Sample ID: 405235031
 Matrix: Soil
 Collect Date: 26-NOV-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 22.6%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		22.6						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.0083	+/-0.0367	0.0958	0.0219	+/-0.0368	1.00	pCi/g			MXS2	09/24/16	2051	1596400	2
Plutonium-239/240	HUh	-0.00825	+/-0.0365	0.0951	0.0218	+/-0.0365	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0215	+/-0.0886	0.192	0.0761	+/-0.0886	1.00	pCi/g			MXS2	09/24/16	1320	1596396	3
Uranium-233/234	Hh	0.823	+/-0.220	0.0967	0.0264	+/-0.257	1.00	pCi/g							
Uranium-235/236	Hh	0.0295	+/-0.0505	0.0442	0.00	+/-0.0507	1.00	pCi/g							
Uranium-238	Hh	0.790	+/-0.216	0.103	0.0295	+/-0.251	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0742	+/-0.314	0.837	0.186	+/-0.314	1.00	pCi/g			MXS2	09/26/16	1711	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.18	+/-0.756	0.883	0.308	+/-0.779	1.00	pCi/g			MXS2	09/24/16	1318	1596395	5
Thorium-229	HUh	0.0846	+/-0.233	0.404	0.103	+/-0.233	1.00	pCi/g							
Thorium-230	Hh	0.841	+/-0.485	0.316	0.0592	+/-0.502	1.00	pCi/g							
Thorium-232	Hh	0.889	+/-0.502	0.364	0.0834	+/-0.520	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	Hh	0.0553	+/-0.0632	0.0789	0.0201	+/-0.0636	1.00	pCi/g			MXS2	09/29/16	2126	1602285	6
Curium-242	HUh	-0.0227	+/-0.100	0.262	0.0601	+/-0.101	1.00	pCi/g							
Curium-243/244	HUh	0.00683	+/-0.0379	0.0727	0.0167	+/-0.038	1.00	pCi/g							
Curium-245/246	HXh	0.0591	+/-0.0651	0.0443	0.00	+/-0.0655	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	3.98	+/-6.37	10.8	5.24	+/-6.43	15.0	pCi/g			MXS2	09/28/16	1309	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.00	+/-0.263	0.578	0.230	+/-0.00	1.00	pCi/g			MJH1	09/28/16	1017	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.0527	+/-0.229	0.452	0.209	+/-0.230		pCi/g			MXR1	10/03/16	0909	1596249	9
Antimony-125	HUh	-0.0864	+/-0.112	0.193	0.0863	+/-0.118		pCi/g							
Bismuth-212	Hh	0.824	+/-0.649	0.797	0.342	+/-0.650		pCi/g							
Bismuth-214	Hh	0.983	+/-0.202	0.121	0.0533	+/-0.206		pCi/g							
Cesium-137	Hh	0.205	+/-0.067	0.0539	0.0227	+/-0.0676	0.100	pCi/g							
Cobalt-60	HUh	-0.0189	+/-0.0354	0.0648	0.0256	+/-0.0364		pCi/g							
Europium-154	HUh	0.0583	+/-0.118	0.257	0.111	+/-0.121		pCi/g							
Lead-212	Hh	1.16	+/-0.140	0.0934	0.0431	+/-0.153		pCi/g							
Lead-214	Hh	1.07	+/-0.243	0.138	0.0631	+/-0.247		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3.BR19.2
 Sample ID: 405235031

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	14.0	+/-1.54	0.749	0.313	+/-1.70		pCi/g							
Protactinium-231	HUh	0.0906	+/-0.528	0.926	0.428	+/-0.530		pCi/g							
Radium-226	Hh	0.983	+/-0.202	0.121	0.0533	+/-0.206		pCi/g							
Radium-228	Hh	0.898	+/-0.342	0.273	0.119	+/-0.345		pCi/g							
Thallium-208	Hh	0.275	+/-0.0953	0.0655	0.029	+/-0.096		pCi/g							
Tin-126	HUh	0.00	+/-0.193	0.178	0.0846	+/-0.194		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	15.8	+/-5.45	3.91	1.28	+/-6.24	4.00	pCi/g		BXF1	09/19/16	1441	1597811	10
Beta	Hh	16.6	+/-3.36	2.69	1.14	+/-4.17	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.0157	+/-0.569	1.07	0.475	+/-0.569	2.00	pCi/g		KSD1	09/17/16	1533	1597796	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	Hh	2.12	+/-2.18	3.63	1.62	+/-2.19	6.00	pCi/g		TXP3	09/22/16	2028	1598075	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.478	+/-0.721	1.22	0.595	+/-0.722	2.00	pCi/g		TXJ1	09/23/16	2032	1598080	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.361	+/-2.05	3.51	1.71	+/-2.05	5.00	pCi/g		CXS7	09/20/16	1604	1597412	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.3.BR19.2
Sample ID: 405235031

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596400	84.1	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	94.6	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	94.2	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596399	88.4	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596395	109	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1602285	82.4	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596402	84.1	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597796	95	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597412	87.7	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3B.R.3.3
 Sample ID: 405235032
 Matrix: Soil
 Collect Date: 23-NOV-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 20.4%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		20.4						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0429	+/-0.0759	0.115	0.0293	+/-0.0762	1.00	pCi/g			MXS2	09/24/16	2051	1596400	2
Plutonium-239/240	HUh	-0.0314	+/-0.0443	0.145	0.0444	+/-0.0444	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.0376	+/-0.0865	0.157	0.0598	+/-0.0867	1.00	pCi/g			MXS2	09/24/16	1320	1596396	3
Uranium-233/234	Hh	0.898	+/-0.292	0.143	0.0365	+/-0.336	1.00	pCi/g							
Uranium-235/236	Hh	0.0885	+/-0.104	0.113	0.0211	+/-0.106	1.00	pCi/g							
Uranium-238	Hh	0.616	+/-0.244	0.143	0.0365	+/-0.270	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0581	+/-0.325	0.821	0.169	+/-0.326	1.00	pCi/g			MXS2	09/26/16	1709	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.53	+/-0.773	0.493	0.107	+/-0.814	1.00	pCi/g			MXS2	09/24/16	1318	1596395	5
Thorium-229	Hh	0.105	+/-0.240	0.381	0.0873	+/-0.241	1.00	pCi/g							
Thorium-230	Hh	0.601	+/-0.428	0.329	0.0616	+/-0.438	1.00	pCi/g							
Thorium-232	Hh	1.16	+/-0.570	0.205	0.00	+/-0.600	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0257	+/-0.0323	0.108	0.0339	+/-0.0323	1.00	pCi/g			MXS2	09/29/16	2126	1602285	6
Curium-242	Hh	0.00	+/-0.100	0.149	0.00	+/-0.100	1.00	pCi/g							
Curium-243/244	HUh	-0.00978	+/-0.0295	0.083	0.0211	+/-0.0296	1.00	pCi/g							
Curium-245/246	Hh	0.0306	+/-0.0524	0.0458	0.00	+/-0.0525	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	Hh	6.06	+/-7.07	11.9	5.76	+/-7.19	15.0	pCi/g			MXS2	09/28/16	1356	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.0975	+/-0.327	0.752	0.298	+/-0.331	1.00	pCi/g			MJH1	09/28/16	1018	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.0296	+/-0.282	0.548	0.255	+/-0.282		pCi/g			MXR1	10/03/16	0910	1596249	9
Antimony-125	HUh	-0.0866	+/-0.125	0.218	0.0974	+/-0.131		pCi/g							
Bismuth-212	Hh	1.88	+/-1.03	1.12	0.495	+/-1.04		pCi/g							
Bismuth-214	Hh	0.958	+/-0.189	0.144	0.0635	+/-0.193		pCi/g							
Cesium-137	Hh	0.206	+/-0.113	0.094	0.0422	+/-0.113	0.100	pCi/g							
Cobalt-60	HUh	0.00618	+/-0.0448	0.0942	0.0391	+/-0.0448		pCi/g							
Europium-154	HUh	-0.0346	+/-0.178	0.293	0.126	+/-0.179		pCi/g							
Lead-212	Hh	1.19	+/-0.153	0.0997	0.0459	+/-0.165		pCi/g							
Lead-214	Hh	0.866	+/-0.237	0.141	0.0636	+/-0.240		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3B.R.3.3
 Sample ID: 405235032

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis															
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>															
Potassium-40	Hh	13.9	+/-1.78	0.766	0.311	+/-1.93		pCi/g							
Protactinium-231	HUh	0.00	+/-0.887	0.912	0.417	+/-0.899		pCi/g							
Radium-226	Hh	0.958	+/-0.189	0.144	0.0635	+/-0.193		pCi/g							
Radium-228	Hh	1.06	+/-0.350	0.270	0.115	+/-0.354		pCi/g							
Thallium-208	Hh	0.279	+/-0.109	0.0719	0.0317	+/-0.109		pCi/g							
Tin-126	HUh	0.00	+/-0.114	0.122	0.0581	+/-0.114		pCi/g							
Rad Gas Flow Proportional Counting															
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>															
Alpha	Hh	10.2	+/-3.66	3.99	1.63	+/-4.17	4.00	pCi/g		BXF1	09/19/16	1442	1597811	10	
Beta	Hh	18.7	+/-2.95	3.23	1.51	+/-4.00	10.0	pCi/g							
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>															
Strontium-90	HUh	-0.266	+/-0.285	0.661	0.283	+/-0.285	2.00	pCi/g		KSD1	09/17/16	1534	1597796	11	
Rad Liquid Scintillation Analysis															
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>															
Tritium	HUh	1.33	+/-2.09	3.62	1.62	+/-2.09	6.00	pCi/g		TXP3	09/22/16	2101	1598075	12	
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>															
Carbon-14	HUh	0.471	+/-0.673	1.14	0.555	+/-0.674	2.00	pCi/g		TXJ1	09/23/16	2143	1598080	13	
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>															
Technetium-99	HUh	-0.182	+/-1.82	3.16	1.53	+/-1.82	5.00	pCi/g		CXS7	09/20/16	1636	1597412	14	

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3B.R.3.3
 Sample ID: 405235032

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596400	79.2	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	62.9	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	96.3	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596399	86.8	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596395	91.6	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1602285	92.2	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596402	79.2	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597796	110	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597412	91.5	(15%-125%)				

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: 4.3B.R.3.4
 Sample ID: 405235033
 Matrix: Soil
 Collect Date: 23-NOV-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 17.6%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		17.6						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.0149	+/-0.045	0.126	0.0322	+/-0.0451	1.00	pCi/g			MXS2	09/24/16	2051	1596400	2
Plutonium-239/240	HUh	0.0214	+/-0.073	0.135	0.0369	+/-0.0731	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.023	+/-0.102	0.196	0.0762	+/-0.102	1.00	pCi/g			MXS2	09/24/16	1320	1596396	3
Uranium-233/234	Hh	0.633	+/-0.231	0.115	0.0263	+/-0.257	1.00	pCi/g							
Uranium-235/236	Hh	0.0783	+/-0.0923	0.0998	0.0187	+/-0.0933	1.00	pCi/g							
Uranium-238	Hh	0.981	+/-0.285	0.127	0.0323	+/-0.336	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	Hh	0.128	+/-0.406	0.612	0.0877	+/-0.407	1.00	pCi/g			MXS2	09/26/16	1709	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	0.674	+/-0.656	0.720	0.172	+/-0.669	1.00	pCi/g			MXS2	09/24/16	1318	1596395	5
Thorium-229	HUh	0.026	+/-0.272	0.568	0.145	+/-0.273	1.00	pCi/g							
Thorium-230	Hh	0.587	+/-0.559	0.719	0.220	+/-0.569	1.00	pCi/g							
Thorium-232	Hh	0.788	+/-0.578	0.512	0.117	+/-0.595	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.00952	+/-0.0287	0.0808	0.0206	+/-0.0288	1.00	pCi/g			MXS2	09/29/16	2126	1602285	6
Curium-242	Hh	0.00	+/-0.0989	0.147	0.00	+/-0.0991	1.00	pCi/g							
Curium-243/244	Hh	0.0237	+/-0.0465	0.0645	0.0121	+/-0.0466	1.00	pCi/g							
Curium-245/246	Hh	0.0302	+/-0.0518	0.0453	0.00	+/-0.0519	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	1.91	+/-7.82	13.4	6.51	+/-7.84	15.0	pCi/g			MXS2	09/28/16	1443	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.0794	+/-0.131	0.465	0.156	+/-0.136	1.00	pCi/g			MJH1	09/28/16	1018	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.026	+/-0.173	0.318	0.146	+/-0.173		pCi/g			MXR1	10/03/16	0915	1596249	9
Antimony-125	HUh	-0.0033	+/-0.0849	0.168	0.0759	+/-0.085		pCi/g							
Bismuth-212	HUh	0.00	+/-0.525	1.09	0.501	+/-0.585		pCi/g							
Bismuth-214	Hh	0.742	+/-0.158	0.103	0.0457	+/-0.162		pCi/g							
Cesium-137	Hh	0.0502	+/-0.043	0.0647	0.029	+/-0.0431	0.100	pCi/g							
Cobalt-60	HUh	-0.029	+/-0.0378	0.0623	0.0255	+/-0.040		pCi/g							
Europium-154	HUh	0.021	+/-0.108	0.217	0.0938	+/-0.108		pCi/g							
Lead-212	Hh	0.937	+/-0.110	0.0737	0.0342	+/-0.120		pCi/g							
Lead-214	Hh	0.954	+/-0.157	0.274	0.132	+/-0.162		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3B.R.3.4
 Sample ID: 405235033

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	12.5	+/-1.33	0.511	0.204	+/-1.48		pCi/g							
Protactinium-231	HUh	0.00	+/-0.704	0.577	0.261	+/-0.711		pCi/g							
Radium-226	Hh	0.742	+/-0.158	0.103	0.0457	+/-0.162		pCi/g							
Radium-228	Hh	0.994	+/-0.240	0.190	0.0809	+/-0.245		pCi/g							
Thallium-208	Hh	0.210	+/-0.074	0.0516	0.0228	+/-0.0746		pCi/g							
Tin-126	HUh	0.00	+/-0.114	0.0574	0.0268	+/-0.116		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	11.6	+/-3.82	4.00	1.63	+/-4.42	4.00	pCi/g		BXF1	09/19/16	1437	1597811	10
Beta	Hh	15.8	+/-2.74	2.75	1.25	+/-3.54	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.398	+/-0.450	0.962	0.426	+/-0.450	2.00	pCi/g		KSD1	09/19/16	1523	1597796	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.606	+/-1.83	3.30	1.47	+/-1.83	6.00	pCi/g		TXP3	09/22/16	2133	1598075	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.116	+/-0.649	1.11	0.543	+/-0.650	2.00	pCi/g		TXJ1	09/23/16	2254	1598080	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-1.37	+/-1.92	3.39	1.65	+/-1.92	5.00	pCi/g		CXS7	09/20/16	1708	1597412	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3B.R.3.4
 Sample ID: 405235033

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test					Batch ID	Recovery%	Acceptable Limits						
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"					1596400	70.2	(15%-125%)						
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"					1596396	71.3	(15%-125%)						
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"					1596396	87.4	(15%-125%)						
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"					1596399	89.6	(15%-125%)						
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"					1596395	74.5	(15%-125%)						
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"					1602285	83.3	(15%-125%)						
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"					1596402	70.2	(15%-125%)						
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"					1597796	95	(25%-125%)						
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"					1597412	83.8	(15%-125%)						

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: 4.3.B.R.1.4
 Sample ID: 405235034
 Matrix: Soil
 Collect Date: 23-NOV-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 19.6%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		19.6						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.0116	+/-0.0433	0.0729	0.0136	+/-0.0434	1.00	pCi/g			MXS2	09/24/16	2054	1596400	2
Plutonium-239/240	HUh	-0.00725	+/-0.0321	0.0837	0.0192	+/-0.0321	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.0252	+/-0.074	0.138	0.0525	+/-0.0741	1.00	pCi/g			MXS2	09/24/16	1320	1596396	3
Uranium-233/234	Hh	0.998	+/-0.329	0.164	0.0416	+/-0.381	1.00	pCi/g							
Uranium-235/236	Hh	0.0806	+/-0.106	0.0806	0.00	+/-0.107	1.00	pCi/g							
Uranium-238	Hh	1.03	+/-0.333	0.164	0.0416	+/-0.387	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	Hh	0.00	+/-0.350	0.532	0.00	+/-0.351	1.00	pCi/g			MXS2	09/26/16	1735	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.25	+/-0.716	0.623	0.175	+/-0.747	1.00	pCi/g			MXS2	09/24/16	1318	1596395	5
Thorium-229	Hh	0.00	+/-0.136	0.202	0.00	+/-0.136	1.00	pCi/g							
Thorium-230	Hh	0.470	+/-0.373	0.201	0.00	+/-0.381	1.00	pCi/g							
Thorium-232	Hh	0.987	+/-0.526	0.321	0.060	+/-0.550	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.000508	+/-0.0376	0.0837	0.0228	+/-0.0377	1.00	pCi/g			MXS2	09/29/16	2126	1602285	6
Curium-242	Hh	0.0471	+/-0.132	0.141	0.00	+/-0.133	1.00	pCi/g							
Curium-243/244	Hh	0.0196	+/-0.0451	0.0715	0.0164	+/-0.0451	1.00	pCi/g							
Curium-245/246	Hh	0.029	+/-0.0497	0.0435	0.00	+/-0.0499	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	3.52	+/-5.71	9.67	4.69	+/-5.75	15.0	pCi/g			MXS2	09/28/16	1530	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUIh	0.00	+/-0.198	0.273	0.00	+/-0.00	1.00	pCi/g			MJH1	09/28/16	1019	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0244	+/-0.193	0.375	0.172	+/-0.193		pCi/g			MXR1	10/03/16	0915	1596249	9
Antimony-125	HUh	-0.00164	+/-0.0904	0.175	0.0784	+/-0.0904		pCi/g							
Bismuth-212	HUIh	0.00	+/-0.612	1.32	0.612	+/-0.792		pCi/g							
Bismuth-214	Hh	0.717	+/-0.174	0.109	0.0485	+/-0.177		pCi/g							
Cesium-137	Hh	0.111	+/-0.0865	0.0748	0.0339	+/-0.0866	0.100	pCi/g							
Cobalt-60	HUh	0.0135	+/-0.0362	0.0771	0.0329	+/-0.0367		pCi/g							
Europium-154	HUh	-0.114	+/-0.101	0.153	0.0617	+/-0.113		pCi/g							
Lead-212	Hh	1.16	+/-0.129	0.0892	0.0415	+/-0.143		pCi/g							
Lead-214	Hh	1.06	+/-0.185	0.313	0.151	+/-0.190		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3.B.R.1.4
 Sample ID: 405235034

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	13.3	+/-1.48	0.643	0.271	+/-1.64		pCi/g							
Protactinium-231	HUh	0.00	+/-0.882	0.684	0.312	+/-0.908		pCi/g							
Radium-226	Hh	0.717	+/-0.174	0.109	0.0485	+/-0.177		pCi/g							
Radium-228	Hh	0.967	+/-0.285	0.196	0.0835	+/-0.290		pCi/g							
Thallium-208	Hh	0.292	+/-0.0785	0.0461	0.0199	+/-0.0795		pCi/g							
Tin-126	HUh	0.0419	+/-0.122	0.127	0.0601	+/-0.123		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	13.5	+/-4.12	3.90	1.57	+/-4.89	4.00	pCi/g		BXF1	09/19/16	1437	1597811	10
Beta	Hh	16.3	+/-2.90	3.06	1.39	+/-3.68	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.0669	+/-0.493	0.914	0.406	+/-0.493	2.00	pCi/g		KSD1	09/17/16	1534	1597796	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.877	+/-1.93	3.41	1.52	+/-1.93	6.00	pCi/g		TXP3	09/22/16	2206	1598075	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.354	+/-0.674	1.14	0.558	+/-0.675	2.00	pCi/g		TXJ1	09/24/16	0005	1598080	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-1.28	+/-1.93	3.41	1.66	+/-1.93	5.00	pCi/g		CXS7	09/20/16	1740	1597412	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.3.B.R.1.4
Sample ID: 405235034

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596400	96.6	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	57.5	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	95	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596399	81.7	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596395	88.7	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1602285	82.6	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596402	96.6	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597796	92.3	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597412	84.4	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3B.R.2.3
 Sample ID: 405235035
 Matrix: Soil
 Collect Date: 23-NOV-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 16.3%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		16.3						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.00871	+/-0.0602	0.146	0.0435	+/-0.0602	1.00	pCi/g			MXS2	09/24/16	2054	1596400	2
Plutonium-239/240	HUh	-0.0181	+/-0.0612	0.159	0.0499	+/-0.0612	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.098	+/-0.225	0.408	0.156	+/-0.226	1.00	pCi/g			MXS2	09/24/16	1320	1596396	3
Uranium-233/234	Hh	0.933	+/-0.352	0.212	0.0577	+/-0.409	1.00	pCi/g							
Uranium-235/236	HUh	0.0335	+/-0.115	0.212	0.0578	+/-0.115	1.00	pCi/g							
Uranium-238	Hh	0.731	+/-0.309	0.154	0.0288	+/-0.350	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0184	+/-0.305	0.646	0.0926	+/-0.306	1.00	pCi/g			MXS2	09/26/16	1709	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.21	+/-0.753	0.731	0.217	+/-0.784	1.00	pCi/g			MXS2	09/28/16	1756	1596395	5
Thorium-229	Hh	0.00	+/-0.147	0.219	0.00	+/-0.148	1.00	pCi/g							
Thorium-230	Hh	1.09	+/-0.572	0.219	0.00	+/-0.598	1.00	pCi/g							
Thorium-232	Hh	0.927	+/-0.535	0.348	0.0652	+/-0.555	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	Hh	0.0348	+/-0.0553	0.0764	0.0175	+/-0.0554	1.00	pCi/g			MXS2	09/29/16	2126	1602285	6
Curium-242	HUh	0.0389	+/-0.146	0.246	0.0459	+/-0.146	1.00	pCi/g							
Curium-243/244	Hh	0.014	+/-0.0395	0.0421	0.00	+/-0.0395	1.00	pCi/g							
Curium-245/246	Hh	0.00	+/-0.0318	0.0473	0.00	+/-0.0319	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	2.11	+/-7.34	12.6	6.10	+/-7.35	15.0	pCi/g			MXS2	09/28/16	1616	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.0528	+/-0.393	0.914	0.324	+/-0.394	1.00	pCi/g			MJH1	09/28/16	1019	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.0482	+/-0.212	0.400	0.185	+/-0.214		pCi/g			MXR1	10/03/16	0916	1596249	9
Antimony-125	HUh	0.0602	+/-0.101	0.197	0.0894	+/-0.105		pCi/g							
Bismuth-212	Hh	0.839	+/-0.578	1.02	0.460	+/-0.579		pCi/g							
Bismuth-214	Hh	0.668	+/-0.175	0.114	0.0507	+/-0.178		pCi/g							
Cesium-137	HUh	0.0251	+/-0.0614	0.0681	0.0304	+/-0.0614	0.100	pCi/g							
Cobalt-60	HUh	-0.0136	+/-0.0372	0.0708	0.0296	+/-0.0377		pCi/g							
Europium-154	HUh	0.0382	+/-0.0958	0.210	0.0897	+/-0.0973		pCi/g							
Lead-212	Hh	0.937	+/-0.124	0.0806	0.0371	+/-0.134		pCi/g							
Lead-214	Hh	0.769	+/-0.209	0.113	0.0514	+/-0.211		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3B.R.2.3
 Sample ID: 405235035

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	12.3	+/-1.37	0.533	0.215	+/-1.51		pCi/g							
Protactinium-231	HUh	0.00	+/-0.650	0.717	0.328	+/-0.666		pCi/g							
Radium-226	Hh	0.668	+/-0.175	0.114	0.0507	+/-0.178		pCi/g							
Radium-228	Hh	0.974	+/-0.239	0.193	0.0814	+/-0.244		pCi/g							
Thallium-208	Hh	0.225	+/-0.0773	0.0633	0.0284	+/-0.0779		pCi/g							
Tin-126	HUh	0.00	+/-0.149	0.120	0.0562	+/-0.150		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	7.78	+/-3.10	3.91	1.71	+/-3.52	4.00	pCi/g		BXF1	09/19/16	1437	1597811	10
Beta	Hh	20.8	+/-2.86	3.36	1.59	+/-4.11	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.472	+/-0.450	0.969	0.432	+/-0.450	2.00	pCi/g		KSD1	09/17/16	1536	1597796	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.970	+/-1.89	3.32	1.48	+/-1.89	6.00	pCi/g		TXP3	09/22/16	2238	1598075	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.342	+/-0.665	1.13	0.551	+/-0.665	2.00	pCi/g		TXJ1	09/24/16	0229	1598080	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-1.35	+/-1.80	3.18	1.55	+/-1.80	5.00	pCi/g		CXS7	09/20/16	1812	1597412	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.3B.R.2.3
Sample ID: 405235035

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596400	74.6	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	46.2	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	35.2	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596399	89	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596395	95.5	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1602285	85.2	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596402	74.6	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597796	113	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597412	86.6	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: 4.3B.R.2.4
 Sample ID: 405235036
 Matrix: Soil
 Collect Date: 23-NOV-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 17.7%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		17.7						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.0223	+/-0.0613	0.106	0.027	+/-0.0614	1.00	pCi/g			MXS2	09/24/16	2054	1596400	2
Plutonium-239/240	HUh	0.018	+/-0.0614	0.114	0.031	+/-0.0615	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.0193	+/-0.0673	0.128	0.0473	+/-0.0674	1.00	pCi/g			MXS2	09/24/16	1320	1596396	3
Uranium-233/234	Hh	0.786	+/-0.374	0.235	0.0539	+/-0.415	1.00	pCi/g							
Uranium-235/236	Hh	0.075	+/-0.147	0.204	0.0382	+/-0.148	1.00	pCi/g							
Uranium-238	Hh	1.06	+/-0.425	0.127	0.00	+/-0.490	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.149	+/-0.366	1.09	0.282	+/-0.367	1.00	pCi/g			MXS2	09/26/16	1709	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.23	+/-0.706	0.615	0.174	+/-0.735	1.00	pCi/g			MXS2	09/24/16	1318	1596395	5
Thorium-229	HUh	0.0504	+/-0.189	0.318	0.0595	+/-0.189	1.00	pCi/g							
Thorium-230	Hh	0.711	+/-0.451	0.317	0.0593	+/-0.465	1.00	pCi/g							
Thorium-232	Hh	0.709	+/-0.450	0.316	0.0591	+/-0.464	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0192	+/-0.0309	0.0986	0.0293	+/-0.031	1.00	pCi/g			MXS2	09/29/16	2126	1602285	6
Curium-242	Hh	0.00	+/-0.0996	0.148	0.00	+/-0.0998	1.00	pCi/g							
Curium-243/244	HUh	0.00704	+/-0.0391	0.075	0.0172	+/-0.0392	1.00	pCi/g							
Curium-245/246	HXh	0.0609	+/-0.0671	0.0457	0.00	+/-0.0676	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	0.212	+/-6.32	10.9	5.30	+/-6.32	15.0	pCi/g			MXS2	09/28/16	1703	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	3.93E-05	+/-0.167	0.352	0.145	+/-0.167	1.00	pCi/g			MJH1	09/28/16	1117	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0376	+/-0.234	0.439	0.198	+/-0.235		pCi/g			MXR1	10/03/16	0916	1596249	9
Antimony-125	HUh	0.121	+/-0.124	0.281	0.127	+/-0.136		pCi/g							
Bismuth-212	HUh	0.00	+/-0.895	1.62	0.733	+/-1.08		pCi/g							
Bismuth-214	Hh	0.815	+/-0.184	0.136	0.0581	+/-0.187		pCi/g							
Cesium-137	HUh	0.0114	+/-0.0402	0.0854	0.0369	+/-0.0405	0.100	pCi/g							
Cobalt-60	HUh	-0.028	+/-0.0465	0.0852	0.0326	+/-0.0481		pCi/g							
Europium-154	HUh	0.0695	+/-0.143	0.308	0.128	+/-0.146		pCi/g							
Lead-212	Hh	0.934	+/-0.135	0.0982	0.0447	+/-0.144		pCi/g							
Lead-214	Hh	0.850	+/-0.194	0.117	0.0507	+/-0.197		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
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 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3B.R.2.4
 Sample ID: 405235036

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	10.6	+/-1.77	0.713	0.266	+/-1.86		pCi/g							
Protactinium-231	HUh	0.00	+/-0.928	0.658	0.285	+/-0.960		pCi/g							
Radium-226	Hh	0.815	+/-0.184	0.136	0.0581	+/-0.187		pCi/g							
Radium-228	Hh	0.922	+/-0.308	0.249	0.0996	+/-0.311		pCi/g							
Thallium-208	Hh	0.235	+/-0.111	0.0556	0.0227	+/-0.112		pCi/g							
Tin-126	HUh	0.00	+/-0.146	0.131	0.0614	+/-0.146		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	8.65	+/-3.14	3.86	1.67	+/-3.56	4.00	pCi/g		BXF1	09/19/16	1437	1597811	10
Beta	Hh	17.3	+/-2.42	2.48	1.15	+/-3.44	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.159	+/-0.339	0.727	0.310	+/-0.339	2.00	pCi/g		KSD1	09/17/16	1536	1597796	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	Hh	1.79	+/-2.04	3.43	1.53	+/-2.04	6.00	pCi/g		TXP3	09/22/16	2311	1598075	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.434	+/-0.690	1.17	0.570	+/-0.690	2.00	pCi/g		TXJ1	09/24/16	0341	1598080	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.0134	+/-1.77	3.05	1.48	+/-1.77	5.00	pCi/g		CXS7	09/20/16	1844	1597412	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.3B.R.2.4
 Sample ID: 405235036

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596400	84.6	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	34.8	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	99.4	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596399	80.6	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596395	92.3	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1602285	81.4	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596402	84.6	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597796	82.8	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597412	91.3	(15%-125%)				

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: 4.4C.R.2.4
 Sample ID: 405235037
 Matrix: Soil
 Collect Date: 30-NOV-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 6.23%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		6.23						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.016	+/-0.0483	0.136	0.0345	+/-0.0484	1.00	pCi/g			MXS2	09/26/16	1355	1596400	2
Plutonium-239/240	HUh	-0.0371	+/-0.0523	0.171	0.0524	+/-0.0524	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.060	+/-0.102	0.178	0.0692	+/-0.104	1.00	pCi/g			MXS2	09/24/16	1320	1596396	3
Uranium-233/234	Hh	0.295	+/-0.371	0.572	0.195	+/-0.379	1.00	pCi/g							
Uranium-235/236	HUh	-0.0582	+/-0.135	0.399	0.109	+/-0.136	1.00	pCi/g							
Uranium-238	Hh	0.454	+/-0.359	0.334	0.0766	+/-0.378	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.139	+/-0.302	0.930	0.247	+/-0.302	1.00	pCi/g			MXS2	09/26/16	1709	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.12	+/-0.782	0.683	0.162	+/-0.810	1.00	pCi/g			MXS2	09/24/16	1318	1596395	5
Thorium-229	HUh	0.0679	+/-0.255	0.428	0.0801	+/-0.255	1.00	pCi/g							
Thorium-230	Hh	0.224	+/-0.357	0.493	0.113	+/-0.359	1.00	pCi/g							
Thorium-232	Hh	0.558	+/-0.499	0.543	0.138	+/-0.509	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.00816	+/-0.0669	0.163	0.0469	+/-0.067	1.00	pCi/g			MXS2	10/01/16	1323	1602285	6
Curium-242	Hh	0.00	+/-0.165	0.250	0.00	+/-0.165	1.00	pCi/g							
Curium-243/244	HUh	-0.0253	+/-0.0494	0.155	0.0427	+/-0.0496	1.00	pCi/g							
Curium-245/246	Hh	0.102	+/-0.116	0.113	0.017	+/-0.117	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	3.80	+/-8.24	14.0	6.81	+/-8.28	15.0	pCi/g			MXS2	09/28/16	1750	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.0144	+/-0.221	0.437	0.179	+/-0.221	1.00	pCi/g			MJH1	09/28/16	1118	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0456	+/-0.176	0.342	0.156	+/-0.177		pCi/g			MXR1	10/03/16	0917	1596249	9
Antimony-125	HUh	0.0696	+/-0.0879	0.190	0.0856	+/-0.0935		pCi/g							
Bismuth-212	HUh	0.00	+/-0.766	1.20	0.548	+/-0.830		pCi/g							
Bismuth-214	Hh	0.632	+/-0.169	0.112	0.0493	+/-0.177		pCi/g							
Cesium-137	HUh	0.0137	+/-0.0379	0.0798	0.036	+/-0.0384	0.100	pCi/g							
Cobalt-60	HUh	-0.0144	+/-0.0333	0.0619	0.0242	+/-0.0339		pCi/g							
Europium-154	HUh	0.0683	+/-0.139	0.292	0.128	+/-0.143		pCi/g							
Lead-212	Hh	0.766	+/-0.124	0.0852	0.0394	+/-0.144		pCi/g							
Lead-214	Hh	0.827	+/-0.178	0.278	0.134	+/-0.191		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.4C.R.2.4
 Sample ID: 405235037

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	11.9	+/-1.42	0.497	0.188	+/-1.75		pCi/g							
Protactinium-231	HUh	0.00	+/-0.889	0.681	0.309	+/-0.896		pCi/g							
Radium-226	Hh	0.632	+/-0.169	0.112	0.0493	+/-0.177		pCi/g							
Radium-228	Hh	0.545	+/-0.228	0.202	0.0844	+/-0.237		pCi/g							
Thallium-208	Hh	0.210	+/-0.0801	0.0604	0.0268	+/-0.0821		pCi/g							
Tin-126	HUh	0.00	+/-0.0738	0.0866	0.041	+/-0.0754		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	8.01	+/-3.21	3.85	1.60	+/-3.55	4.00	pCi/g		BXF1	09/19/16	1437	1597811	10
Beta	Hh	15.9	+/-2.27	2.13	0.974	+/-3.16	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.427	+/-0.519	1.11	0.491	+/-0.520	2.00	pCi/g		KSD1	09/17/16	1536	1597796	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	1.19	+/-1.73	2.97	1.33	+/-1.73	6.00	pCi/g		TXP3	09/22/16	2344	1598075	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.0748	+/-0.588	1.01	0.492	+/-0.588	2.00	pCi/g		TXJ1	09/24/16	0452	1598080	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-1.14	+/-1.48	2.62	1.27	+/-1.48	5.00	pCi/g		CXS7	09/20/16	1915	1597412	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.4C.R.2.4
Sample ID: 405235037

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596400	67.4	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	25.9	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	84.8	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596399	86.6	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596395	70.6	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1602285	88.9	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596402	67.4	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597796	97.8	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597412	87.1	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228
 Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes
 Client Sample ID: 4.4C.R.1.3
 Sample ID: 405235038
 Matrix: Soil
 Collect Date: 30-NOV-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 16.3%

Report Date: October 4, 2016

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		16.3						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0287	+/-0.066	0.105	0.024	+/-0.0661	1.00	pCi/g			MXS2	09/24/16	2054	1596400	2
Plutonium-239/240	HUh	-0.00902	+/-0.0399	0.104	0.0238	+/-0.040	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.0122	+/-0.074	0.147	0.055	+/-0.074	1.00	pCi/g			MXS2	09/24/16	1320	1596396	3
Uranium-233/234	Hh	0.572	+/-0.201	0.114	0.0311	+/-0.223	1.00	pCi/g							
Uranium-235/236	Hh	0.0916	+/-0.0915	0.106	0.027	+/-0.0928	1.00	pCi/g							
Uranium-238	Hh	0.736	+/-0.225	0.0958	0.022	+/-0.257	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0866	+/-0.295	0.822	0.195	+/-0.295	1.00	pCi/g			MXS2	09/26/16	1709	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.30	+/-0.853	0.803	0.222	+/-0.888	1.00	pCi/g			MXS2	09/24/16	1318	1596395	5
Thorium-229	Hh	0.246	+/-0.355	0.428	0.0801	+/-0.358	1.00	pCi/g							
Thorium-230	Hh	0.891	+/-0.581	0.267	0.00	+/-0.603	1.00	pCi/g							
Thorium-232	Hh	1.33	+/-0.698	0.266	0.00	+/-0.738	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	Hh	0.016	+/-0.045	0.0481	0.00	+/-0.0451	1.00	pCi/g			MXS2	09/29/16	2152	1602285	6
Curium-242	Hh	0.00	+/-0.116	0.173	0.00	+/-0.117	1.00	pCi/g							
Curium-243/244	HUh	-0.00781	+/-0.0345	0.0901	0.0207	+/-0.0346	1.00	pCi/g							
Curium-245/246	Hh	0.0366	+/-0.0628	0.0549	0.00	+/-0.063	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-5.78	+/-7.72	13.7	6.64	+/-7.72	15.0	pCi/g			MXS2	09/28/16	1837	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.0563	+/-0.191	0.434	0.172	+/-0.193	1.00	pCi/g			MJH1	09/28/16	1118	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.024	+/-0.214	0.373	0.172	+/-0.215		pCi/g			MXR1	10/03/16	0917	1596249	9
Antimony-125	HUh	-0.0676	+/-0.0977	0.170	0.0758	+/-0.102		pCi/g							
Bismuth-212	HUh	0.00	+/-1.34	1.34	0.619	+/-1.72		pCi/g							
Bismuth-214	Hh	0.567	+/-0.155	0.132	0.0594	+/-0.157		pCi/g							
Cesium-137	Hh	0.115	+/-0.0596	0.0624	0.0274	+/-0.0598	0.100	pCi/g							
Cobalt-60	HUh	0.0113	+/-0.0424	0.0894	0.0385	+/-0.0427		pCi/g							
Europium-154	HUh	-0.0421	+/-0.122	0.231	0.0991	+/-0.123		pCi/g							
Lead-212	Hh	0.937	+/-0.121	0.0868	0.0403	+/-0.131		pCi/g							
Lead-214	Hh	0.776	+/-0.168	0.114	0.0518	+/-0.171		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.4C.R.1.3
 Sample ID: 405235038

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	12.4	+/-1.44	0.658	0.273	+/-1.58		pCi/g							
Protactinium-231	HUh	0.00	+/-0.599	0.740	0.340	+/-0.616		pCi/g							
Radium-226	Hh	0.567	+/-0.155	0.132	0.0594	+/-0.157		pCi/g							
Radium-228	Hh	0.819	+/-0.386	0.260	0.114	+/-0.388		pCi/g							
Thallium-208	Hh	0.285	+/-0.0667	0.0613	0.0273	+/-0.0678		pCi/g							
Tin-126	HUh	0.00	+/-0.194	0.135	0.0635	+/-0.195		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	11.4	+/-3.53	3.90	1.66	+/-4.14	4.00	pCi/g		BXF1	09/19/16	1437	1597811	10
Beta	Hh	15.6	+/-2.33	2.41	1.11	+/-3.18	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.784	+/-0.594	1.26	0.573	+/-0.594	2.00	pCi/g		KSD1	09/17/16	1537	1597796	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	1.35	+/-1.95	3.36	1.50	+/-1.95	6.00	pCi/g		TXP3	09/23/16	0017	1598075	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	Hh	0.700	+/-0.638	1.07	0.521	+/-0.640	2.00	pCi/g		TXJ1	09/24/16	0603	1598080	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.739	+/-1.84	3.14	1.53	+/-1.84	5.00	pCi/g		CXS7	09/20/16	1947	1597412	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.4C.R.1.3
Sample ID: 405235038

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596400	76.4	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	83.8	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	98.2	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596399	86.4	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596395	81.5	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1602285	88.7	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596402	76.4	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597796	92.3	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597412	89.2	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: 4.4C.R.1.4
 Sample ID: 405235039
 Matrix: Soil
 Collect Date: 30-NOV-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 8.7%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		8.70						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.0121	+/-0.0366	0.103	0.0261	+/-0.0366	1.00	pCi/g			MXS2	09/26/16	1355	1596400	2
Plutonium-239/240	HUh	0.000668	+/-0.0495	0.110	0.030	+/-0.0496	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.00515	+/-0.0614	0.127	0.0458	+/-0.0614	1.00	pCi/g			MXS2	09/24/16	1320	1596396	3
Uranium-233/234	Hh	0.627	+/-0.214	0.101	0.023	+/-0.239	1.00	pCi/g							
Uranium-235/236	Hh	0.0277	+/-0.0636	0.101	0.0231	+/-0.0638	1.00	pCi/g							
Uranium-238	Hh	0.994	+/-0.267	0.0871	0.0163	+/-0.316	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0332	+/-0.277	0.650	0.118	+/-0.277	1.00	pCi/g			MXS2	09/26/16	1711	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.13	+/-0.727	0.789	0.256	+/-0.756	1.00	pCi/g			MXS2	09/28/16	1756	1596395	5
Thorium-229	HUh	0.123	+/-0.279	0.479	0.137	+/-0.280	1.00	pCi/g							
Thorium-230	Hh	0.223	+/-0.305	0.416	0.106	+/-0.307	1.00	pCi/g							
Thorium-232	Hh	0.883	+/-0.499	0.204	0.00	+/-0.519	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.000729	+/-0.0541	0.120	0.0327	+/-0.0541	1.00	pCi/g			MXS2	09/29/16	2152	1602285	6
Curium-242	Hh	0.00	+/-0.132	0.197	0.00	+/-0.133	1.00	pCi/g							
Curium-243/244	HUh	0.00519	+/-0.0542	0.113	0.0288	+/-0.0543	1.00	pCi/g							
Curium-245/246	Hh	0.0208	+/-0.0586	0.0625	0.00	+/-0.0587	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	0.788	+/-5.30	9.16	4.42	+/-5.30	15.0	pCi/g			MXS2	09/29/16	1301	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.0138	+/-0.173	0.440	0.156	+/-0.173	1.00	pCi/g			MJH1	09/28/16	1119	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.123	+/-0.222	0.350	0.160	+/-0.230		pCi/g			MXR1	10/03/16	0918	1596249	9
Antimony-125	HUh	-0.0428	+/-0.0855	0.162	0.0719	+/-0.0877		pCi/g							
Bismuth-212	HUIh	0.00	+/-0.503	1.14	0.521	+/-0.622		pCi/g							
Bismuth-214	Hh	0.787	+/-0.143	0.0513	0.0193	+/-0.147		pCi/g							
Cesium-137	HUIh	0.00	+/-0.0333	0.0738	0.0332	+/-0.0369	0.100	pCi/g							
Cobalt-60	HUh	-0.00863	+/-0.0359	0.0695	0.0288	+/-0.0361		pCi/g							
Europium-154	HUh	0.0381	+/-0.097	0.212	0.0902	+/-0.0985		pCi/g							
Lead-212	Hh	0.726	+/-0.137	0.0813	0.0376	+/-0.142		pCi/g							
Lead-214	Hh	1.05	+/-0.168	0.271	0.130	+/-0.174		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.4C.R.1.4
 Sample ID: 405235039

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	13.3	+/-1.58	0.670	0.281	+/-1.72		pCi/g							
Protactinium-231	HUh	0.00	+/-0.739	0.721	0.330	+/-0.761		pCi/g							
Radium-226	Hh	0.787	+/-0.143	0.0513	0.0193	+/-0.147		pCi/g							
Radium-228	Hh	0.666	+/-0.327	0.222	0.0955	+/-0.329		pCi/g							
Thallium-208	Hh	0.240	+/-0.0812	0.059	0.0262	+/-0.0819		pCi/g							
Tin-126	HUh	0.0634	+/-0.134	0.145	0.0687	+/-0.134		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	10.3	+/-3.89	3.94	1.52	+/-4.38	4.00	pCi/g		BXF1	09/19/16	1442	1597811	10
Beta	Hh	17.9	+/-3.34	3.59	1.64	+/-4.27	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.286	+/-0.620	1.11	0.485	+/-0.622	2.00	pCi/g		KSD1	09/17/16	1537	1597796	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	1.13	+/-1.78	3.08	1.38	+/-1.78	6.00	pCi/g		TXP3	09/23/16	0049	1598075	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.201	+/-0.586	0.998	0.488	+/-0.586	2.00	pCi/g		TXJ1	09/24/16	0714	1598080	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.678	+/-1.82	3.18	1.54	+/-1.82	5.00	pCi/g		CXS7	09/20/16	2019	1597412	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.4C.R.1.4
Sample ID: 405235039

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596400	85.3	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	77.2	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	102	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596399	95.8	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596395	90.4	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1602285	79.1	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596402	85.3	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597796	92.3	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597412	81.1	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: 4.4D.R.1.3
 Sample ID: 405235040
 Matrix: Soil
 Collect Date: 30-NOV-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 14.8%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		14.8						percent			LYT1	09/08/16	0812	1596228	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.00424	+/-0.0636	0.149	0.0425	+/-0.0637	1.00	pCi/g			MXS2	09/24/16	2054	1596400	2
Plutonium-239/240	Hh	0.0581	+/-0.0837	0.101	0.0189	+/-0.0842	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0248	+/-0.040	0.127	0.0378	+/-0.0401	1.00	pCi/g			MXS2	09/24/16	1320	1596396	3
Uranium-233/234	Hh	0.495	+/-0.185	0.103	0.0263	+/-0.204	1.00	pCi/g							
Uranium-235/236	Hh	0.107	+/-0.0954	0.104	0.0264	+/-0.0971	1.00	pCi/g							
Uranium-238	Hh	0.698	+/-0.218	0.103	0.0263	+/-0.249	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.184	+/-0.615	1.14	0.302	+/-0.615	1.00	pCi/g			MXS2	09/26/16	1711	1596399	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.15	+/-0.721	0.675	0.191	+/-0.746	1.00	pCi/g			MXS2	09/24/16	1318	1596395	5
Thorium-229	HUh	0.00291	+/-0.216	0.479	0.131	+/-0.216	1.00	pCi/g							
Thorium-230	Hh	0.677	+/-0.502	0.562	0.172	+/-0.514	1.00	pCi/g							
Thorium-232	Hh	0.417	+/-0.378	0.347	0.0649	+/-0.384	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.00357	+/-0.0308	0.0712	0.0133	+/-0.0308	1.00	pCi/g			MXS2	09/29/16	2152	1602285	6
Curium-242	Hh	0.0535	+/-0.150	0.161	0.00	+/-0.151	1.00	pCi/g							
Curium-243/244	HUh	0.0115	+/-0.043	0.0724	0.0135	+/-0.0431	1.00	pCi/g							
Curium-245/246	Hh	0.017	+/-0.0478	0.051	0.00	+/-0.0478	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-6.22	+/-7.91	14.0	6.81	+/-7.91	15.0	pCi/g			MXS2	09/28/16	2010	1596402	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.0767	+/-0.179	0.293	0.0925	+/-0.183	1.00	pCi/g			MJH1	09/28/16	1119	1598620	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.0811	+/-0.206	0.418	0.194	+/-0.209		pCi/g			MXR1	10/03/16	0920	1596249	9
Antimony-125	HUh	-0.122	+/-0.113	0.160	0.0709	+/-0.126		pCi/g							
Bismuth-212	Hh	0.799	+/-0.910	0.879	0.391	+/-0.911		pCi/g							
Bismuth-214	Hh	0.756	+/-0.194	0.130	0.0588	+/-0.197		pCi/g							
Cesium-137	Hh	0.142	+/-0.0717	0.0633	0.0281	+/-0.072	0.100	pCi/g							
Cobalt-60	HUh	-0.00875	+/-0.0349	0.0589	0.0237	+/-0.0351		pCi/g							
Europium-154	HUh	-0.0592	+/-0.0908	0.161	0.0655	+/-0.0947		pCi/g							
Lead-212	Hh	0.961	+/-0.133	0.0882	0.041	+/-0.143		pCi/g							
Lead-214	Hh	0.784	+/-0.163	0.107	0.0483	+/-0.167		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.4D.R.1.3
 Sample ID: 405235040

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	13.0	+/-1.36	0.462	0.179	+/-1.52		pCi/g							
Protactinium-231	HUh	0.00	+/-0.418	0.829	0.384	+/-0.473		pCi/g							
Radium-226	Hh	0.756	+/-0.194	0.130	0.0588	+/-0.197		pCi/g							
Radium-228	Hh	0.863	+/-0.231	0.202	0.0862	+/-0.236		pCi/g							
Thallium-208	Hh	0.245	+/-0.0778	0.0501	0.0218	+/-0.0785		pCi/g							
Tin-126	HUh	0.0671	+/-0.159	0.182	0.0871	+/-0.160		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	10.2	+/-3.65	3.91	1.59	+/-4.16	4.00	pCi/g			BXF1	09/19/16	1438	1597811	10
Beta	Hh	13.0	+/-2.34	2.17	0.961	+/-3.02	10.0	pCi/g							

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.328	+/-0.390	0.926	0.389	+/-0.390	2.00	pCi/g			KSD1	09/17/16	1537	1597796	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	Hh	1.74	+/-1.98	3.32	1.48	+/-1.98	6.00	pCi/g			TXP3	09/23/16	0237	1598075	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.276	+/-0.680	1.16	0.565	+/-0.680	2.00	pCi/g			TXJ1	09/24/16	0826	1598080	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.152	+/-1.88	3.24	1.58	+/-1.88	5.00	pCi/g			CXS7	09/20/16	2051	1597412	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0812	1596228

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.4D.R.1.3
 Sample ID: 405235040

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596400	66.9	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	83.8	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596396	88.4	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596399	73.5	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596395	101	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1602285	95.7	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596402	66.9	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597796	91	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597412	86.1	(15%-125%)				

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: 4.4D.R.1.4
 Sample ID: 405235041
 Matrix: Soil
 Collect Date: 30-NOV-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 12%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		12.0						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0701	+/-0.119	0.105	0.00	+/-0.120	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	HUh	-0.00872	+/-0.0698	0.165	0.0304	+/-0.0702	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.0147	+/-0.0865	0.172	0.0631	+/-0.0866	1.00	pCi/g			HAKB	09/22/16	1000	1596408	3
Uranium-233/234	Hh	0.802	+/-0.207	0.0934	0.0266	+/-0.244	1.00	pCi/g							
Uranium-235/236	HUh	0.0181	+/-0.0555	0.103	0.0316	+/-0.0556	1.00	pCi/g							
Uranium-238	Hh	0.704	+/-0.193	0.0739	0.0168	+/-0.224	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0562	+/-0.315	0.795	0.163	+/-0.315	1.00	pCi/g			HAKB	09/22/16	1555	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.07	+/-0.620	0.626	0.202	+/-0.648	1.00	pCi/g			HAKB	09/27/16	1712	1596407	5
Thorium-229	Hh	0.373	+/-0.308	0.265	0.0496	+/-0.314	1.00	pCi/g							
Thorium-230	Hh	0.445	+/-0.366	0.445	0.140	+/-0.373	1.00	pCi/g							
Thorium-232	Hh	0.646	+/-0.390	0.263	0.0493	+/-0.402	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0106	+/-0.0523	0.132	0.0395	+/-0.0523	1.00	pCi/g			HAKB	09/22/16	0956	1596410	6
Curium-242	HUh	-0.00899	+/-0.124	0.269	0.0415	+/-0.124	1.00	pCi/g							
Curium-243/244	Hh	0.0154	+/-0.0505	0.0783	0.0121	+/-0.0506	1.00	pCi/g							
Curium-245/246	Hh	0.00	+/-0.0402	0.0609	0.00	+/-0.0403	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-0.671	+/-7.42	12.8	6.25	+/-7.42	15.0	pCi/g			HAKB	09/23/16	1325	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.176	+/-0.244	0.817	0.290	+/-0.257	1.00	pCi/g			MJH1	09/28/16	1250	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.0314	+/-0.177	0.361	0.167	+/-0.177		pCi/g			MXR1	10/03/16	0554	1596252	9
Antimony-125	HUh	-0.0586	+/-0.0781	0.140	0.0622	+/-0.0825		pCi/g							
Bismuth-212	HUIh	0.00	+/-0.700	0.973	0.446	+/-0.824		pCi/g							
Bismuth-214	Hh	0.794	+/-0.159	0.0844	0.0369	+/-0.163		pCi/g							
Cesium-137	HUIh	0.00	+/-0.049	0.0572	0.0256	+/-0.049	0.100	pCi/g							
Cobalt-60	HUh	0.0168	+/-0.033	0.0712	0.0309	+/-0.0339		pCi/g							
Europium-154	HUh	-0.00765	+/-0.101	0.196	0.0853	+/-0.101		pCi/g							
Lead-212	Hh	0.807	+/-0.113	0.0767	0.0356	+/-0.121		pCi/g							
Lead-214	Hh	0.803	+/-0.167	0.252	0.122	+/-0.170		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.4D.R.1.4
 Sample ID: 405235041

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	11.8	+/-1.23	0.428	0.171	+/-1.38		pCi/g							
Protactinium-231	HUh	0.00	+/-0.541	0.642	0.295	+/-0.565		pCi/g							
Radium-226	Hh	0.794	+/-0.159	0.0844	0.0369	+/-0.163		pCi/g							
Radium-228	Hh	0.629	+/-0.246	0.204	0.0896	+/-0.249		pCi/g							
Thallium-208	Hh	0.273	+/-0.0808	0.0494	0.022	+/-0.0816		pCi/g							
Tin-126	HUh	0.0427	+/-0.187	0.128	0.0606	+/-0.188		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	17.9	+/-4.49	3.91	1.60	+/-5.60	4.00	pCi/g		JXC9	09/28/16	1448	1602427	10
Beta	Hh	19.7	+/-2.89	2.95	1.36	+/-3.85	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	Hh	0.653	+/-0.699	1.16	0.509	+/-0.709	2.00	pCi/g		KSD1	09/22/16	1720	1597803	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	1.40	+/-2.36	4.00	1.94	+/-2.36	6.00	pCi/g		TXP3	09/23/16	2131	1598092	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.0252	+/-0.675	1.16	0.567	+/-0.675	2.00	pCi/g		TXJ1	09/26/16	1633	1598081	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.325	+/-1.62	2.84	1.34	+/-1.62	5.00	pCi/g		CXS7	09/20/16	1338	1597414	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.4D.R.1.4
Sample ID: 405235041

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596412	69.6	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	84.9	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	72.2	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596411	82.6	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596407	99.9	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596410	107	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596414	69.6	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597803	92.3	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597414	98.3	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Company : MJW Technical Services
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.4D.R.2.3
 Sample ID: 405235042
 Matrix: Soil
 Collect Date: 30-NOV-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 11%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		11.0						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.00	+/-0.0544	0.0826	0.00	+/-0.0546	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	HUh	-0.0103	+/-0.0553	0.141	0.0293	+/-0.0555	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.00324	+/-0.0731	0.160	0.0418	+/-0.0732	1.00	pCi/g			HAKB	09/22/16	1000	1596408	3
Uranium-233/234	Hh	0.599	+/-0.246	0.187	0.0589	+/-0.273	1.00	pCi/g							
Uranium-235/236	Hh	0.0574	+/-0.092	0.129	0.0296	+/-0.0927	1.00	pCi/g							
Uranium-238	Hh	0.636	+/-0.245	0.128	0.0295	+/-0.275	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.0409	+/-0.415	0.870	0.216	+/-0.415	1.00	pCi/g			HAKB	09/22/16	1555	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.65	+/-0.701	0.603	0.203	+/-0.744	1.00	pCi/g			HAKB	09/22/16	0957	1596407	5
Thorium-229	Hh	0.187	+/-0.243	0.344	0.0986	+/-0.244	1.00	pCi/g							
Thorium-230	Hh	0.809	+/-0.409	0.271	0.0622	+/-0.427	1.00	pCi/g							
Thorium-232	Hh	0.623	+/-0.360	0.234	0.0438	+/-0.372	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0056	+/-0.0928	0.196	0.0282	+/-0.0934	1.00	pCi/g			HAKB	09/22/16	1614	1596410	6
Curium-242	Hh	0.00	+/-0.322	0.489	0.00	+/-0.324	1.00	pCi/g							
Curium-243/244	Hh	0.00	+/-0.0936	0.142	0.00	+/-0.0941	1.00	pCi/g							
Curium-245/246	Hh	0.047	+/-0.149	0.225	0.0322	+/-0.149	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	1.61	+/-6.94	11.9	5.79	+/-6.95	15.0	pCi/g			HAKB	09/23/16	1426	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.0936	+/-0.181	0.355	0.129	+/-0.186	1.00	pCi/g			MJH1	09/28/16	1334	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0685	+/-0.199	0.389	0.178	+/-0.202		pCi/g			MXR1	10/03/16	0655	1596252	9
Antimony-125	HUh	0.0894	+/-0.101	0.218	0.0991	+/-0.109		pCi/g							
Bismuth-212	HUh	0.00	+/-0.930	1.30	0.598	+/-1.13		pCi/g							
Bismuth-214	Hh	0.651	+/-0.198	0.131	0.0587	+/-0.200		pCi/g							
Cesium-137	Hh	0.249	+/-0.0842	0.0702	0.0311	+/-0.0848	0.100	pCi/g							
Cobalt-60	HUh	0.00586	+/-0.0368	0.0772	0.0324	+/-0.0369		pCi/g							
Europium-154	HUh	-0.0302	+/-0.0912	0.172	0.0697	+/-0.0922		pCi/g							
Lead-212	Hh	0.687	+/-0.146	0.101	0.0471	+/-0.151		pCi/g							
Lead-214	Hh	0.799	+/-0.221	0.122	0.0553	+/-0.223		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.4D.R.2.3
 Sample ID: 405235042

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	12.3	+/-1.42	0.616	0.251	+/-1.56		pCi/g							
Protactinium-231	HUlh	0.00	+/-0.703	0.675	0.304	+/-0.714		pCi/g							
Radium-226	Hh	0.651	+/-0.198	0.131	0.0587	+/-0.200		pCi/g							
Radium-228	HUlh	0.00	+/-0.270	0.502	0.235	+/-0.454		pCi/g							
Thallium-208	Hh	0.308	+/-0.0737	0.0631	0.028	+/-0.0749		pCi/g							
Tin-126	HUh	0.0374	+/-0.0762	0.152	0.0718	+/-0.0781		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	17.7	+/-4.03	3.99	1.75	+/-5.42	4.00	pCi/g		JXC9	09/28/16	1448	1602427	10
Beta	Hh	21.8	+/-2.57	2.47	1.15	+/-4.01	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.253	+/-0.585	1.03	0.469	+/-0.587	2.00	pCi/g		KSD1	09/22/16	1720	1597803	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	-0.0656	+/-2.16	3.75	1.81	+/-2.16	6.00	pCi/g		TXP3	09/23/16	2314	1598092	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.159	+/-0.683	1.16	0.570	+/-0.683	2.00	pCi/g		TXJ1	09/26/16	1745	1598081	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	Hh	1.43	+/-1.62	2.73	1.29	+/-1.63	5.00	pCi/g		CXS7	09/20/16	1355	1597414	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

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Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 4.4D.R.2.3
Sample ID: 405235042

Report Date: October 4, 2016

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596412	79.8	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	88.9	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	94	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596411	91.9	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596407	94.6	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596410	64.6	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596414	79.8	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597803	81.5	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597414	97	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: 4.4D.R.2.4
 Sample ID: 405235043
 Matrix: Soil
 Collect Date: 30-NOV-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 14.5%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		14.5						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.016	+/-0.0724	0.132	0.0275	+/-0.0725	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	HUh	-0.016	+/-0.0524	0.147	0.0353	+/-0.0525	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0233	+/-0.0564	0.169	0.0441	+/-0.0567	1.00	pCi/g			HAKB	09/22/16	1000	1596408	3
Uranium-233/234	Hh	0.761	+/-0.284	0.152	0.0369	+/-0.324	1.00	pCi/g							
Uranium-235/236	Hh	0.0677	+/-0.103	0.135	0.0287	+/-0.104	1.00	pCi/g							
Uranium-238	Hh	0.739	+/-0.279	0.144	0.033	+/-0.318	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.0399	+/-0.405	0.848	0.210	+/-0.405	1.00	pCi/g			HAKB	09/22/16	1555	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.71	+/-0.858	0.785	0.253	+/-0.911	1.00	pCi/g			HAKB	09/27/16	1712	1596407	5
Thorium-229	Hh	0.243	+/-0.308	0.383	0.0877	+/-0.310	1.00	pCi/g							
Thorium-230	Hh	0.623	+/-0.454	0.454	0.124	+/-0.465	1.00	pCi/g							
Thorium-232	Hh	0.739	+/-0.469	0.329	0.0617	+/-0.484	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	Hh	0.0414	+/-0.0794	0.107	0.0189	+/-0.0797	1.00	pCi/g			HAKB	09/22/16	0956	1596410	6
Curium-242	Hh	0.00	+/-0.161	0.242	0.00	+/-0.162	1.00	pCi/g							
Curium-243/244	Hh	0.0234	+/-0.0656	0.0703	0.00	+/-0.0657	1.00	pCi/g							
Curium-245/246	Hh	0.0737	+/-0.105	0.122	0.0216	+/-0.105	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	0.786	+/-6.12	10.5	5.12	+/-6.12	15.0	pCi/g			HAKB	09/23/16	1527	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.0904	+/-0.393	0.769	0.298	+/-0.395	1.00	pCi/g			MJH1	09/28/16	1334	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0834	+/-0.187	0.339	0.155	+/-0.192		pCi/g			MXR1	10/03/16	0656	1596252	9
Antimony-125	HUh	0.037	+/-0.0842	0.180	0.0811	+/-0.0859		pCi/g							
Bismuth-212	Hh	1.63	+/-0.684	0.770	0.337	+/-0.689		pCi/g							
Bismuth-214	Hh	0.703	+/-0.135	0.0873	0.0376	+/-0.138		pCi/g							
Cesium-137	Hh	0.0694	+/-0.0535	0.0503	0.0216	+/-0.0536	0.100	pCi/g							
Cobalt-60	HUh	0.013	+/-0.0208	0.0545	0.0216	+/-0.0216		pCi/g							
Europium-154	HUh	-0.0759	+/-0.113	0.169	0.0699	+/-0.118		pCi/g							
Lead-212	Hh	0.954	+/-0.116	0.0771	0.0355	+/-0.126		pCi/g							
Lead-214	Hh	0.876	+/-0.167	0.094	0.0419	+/-0.171		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.4D.R.2.4
 Sample ID: 405235043

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	13.6	+/-1.43	0.443	0.171	+/-1.60		pCi/g							
Protactinium-231	HUh	0.00	+/-0.611	0.580	0.260	+/-0.635		pCi/g							
Radium-226	Hh	0.703	+/-0.135	0.0873	0.0376	+/-0.138		pCi/g							
Radium-228	Hh	0.685	+/-0.232	0.216	0.0936	+/-0.234		pCi/g							
Thallium-208	Hh	0.298	+/-0.072	0.047	0.0204	+/-0.0731		pCi/g							
Tin-126	HUh	0.00	+/-0.121	0.113	0.0528	+/-0.122		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	11.7	+/-3.97	4.35	1.81	+/-4.58	4.00	pCi/g		JXC9	09/28/16	1448	1602427	10
Beta	Hh	20.6	+/-2.63	2.17	0.981	+/-3.92	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-1.14	+/-0.912	1.86	0.857	+/-0.912	2.00	pCi/g		KSD1	09/22/16	1721	1597803	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.554	+/-2.33	4.00	1.94	+/-2.33	6.00	pCi/g		TXP3	09/24/16	0209	1598092	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.202	+/-0.670	1.15	0.566	+/-0.670	2.00	pCi/g		TXJ1	09/26/16	1857	1598081	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	Hh	1.57	+/-1.69	2.84	1.34	+/-1.70	5.00	pCi/g		CXS7	09/20/16	1411	1597414	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.4D.R.2.4
 Sample ID: 405235043

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test					Batch ID	Recovery%	Acceptable Limits						
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"					1596412	88.8	(15%-125%)						
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"					1596408	86.3	(15%-125%)						
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"					1596408	89.3	(15%-125%)						
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"					1596411	98.3	(15%-125%)						
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"					1596407	91.1	(15%-125%)						
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"					1596410	75.5	(15%-125%)						
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"					1596414	88.7	(15%-125%)						
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"					1597803	96.4	(25%-125%)						
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"					1597414	95.3	(15%-125%)						

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.4D.R.4.2
 Sample ID: 405235044
 Matrix: Soil
 Collect Date: 30-NOV-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 24.8%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		24.8						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.00373	+/-0.0544	0.117	0.0177	+/-0.0546	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	HUh	0.0197	+/-0.0761	0.131	0.0249	+/-0.0763	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0071	+/-0.0496	0.120	0.0232	+/-0.0499	1.00	pCi/g			HAKB	09/22/16	1000	1596408	3
Uranium-233/234	Hh	0.934	+/-0.328	0.180	0.0475	+/-0.382	1.00	pCi/g							
Uranium-235/236	Hh	0.130	+/-0.137	0.147	0.0312	+/-0.139	1.00	pCi/g							
Uranium-238	Hh	0.881	+/-0.318	0.173	0.044	+/-0.368	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.0595	+/-0.421	0.848	0.201	+/-0.422	1.00	pCi/g			HAKB	09/22/16	1555	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.80	+/-0.674	0.463	0.142	+/-0.723	1.00	pCi/g			HAKB	09/22/16	0957	1596407	5
Thorium-229	Hh	0.214	+/-0.237	0.312	0.0894	+/-0.239	1.00	pCi/g							
Thorium-230	Hh	0.924	+/-0.421	0.312	0.0892	+/-0.441	1.00	pCi/g							
Thorium-232	Hh	0.787	+/-0.380	0.212	0.0398	+/-0.396	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0132	+/-0.0625	0.158	0.0478	+/-0.0626	1.00	pCi/g			HAKB	09/22/16	0956	1596410	6
Curium-242	HUh	-0.0148	+/-0.147	0.334	0.0589	+/-0.148	1.00	pCi/g							
Curium-243/244	Hh	0.00	+/-0.042	0.063	0.00	+/-0.0421	1.00	pCi/g							
Curium-245/246	Hh	0.0661	+/-0.0936	0.110	0.0193	+/-0.0941	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-1.67	+/-7.16	12.4	6.05	+/-7.16	15.0	pCi/g			HAKB	09/23/16	1629	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.014	+/-0.327	0.751	0.273	+/-0.327	1.00	pCi/g			MJH1	09/28/16	1335	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0362	+/-0.246	0.465	0.214	+/-0.246		pCi/g			MXR1	10/03/16	0656	1596252	9
Antimony-125	HUh	0.0844	+/-0.127	0.256	0.117	+/-0.132		pCi/g							
Bismuth-212	HUh	0.00	+/-0.768	1.62	0.748	+/-0.933		pCi/g							
Bismuth-214	Hh	1.05	+/-0.201	0.152	0.0681	+/-0.206		pCi/g							
Cesium-137	Hh	0.311	+/-0.106	0.0782	0.0346	+/-0.107	0.100	pCi/g							
Cobalt-60	HUh	-0.0134	+/-0.0451	0.0859	0.0357	+/-0.0455		pCi/g							
Europium-154	HUh	0.00237	+/-0.120	0.244	0.103	+/-0.120		pCi/g							
Lead-212	Hh	1.16	+/-0.142	0.100	0.0462	+/-0.155		pCi/g							
Lead-214	Hh	1.13	+/-0.209	0.150	0.0686	+/-0.214		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.4D.R.4.2
 Sample ID: 405235044

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	15.3	+/-1.67	0.451	0.160	+/-1.85		pCi/g							
Protactinium-231	HUh	0.00	+/-0.493	0.974	0.450	+/-0.571		pCi/g							
Radium-226	Hh	1.05	+/-0.201	0.152	0.0681	+/-0.206		pCi/g							
Radium-228	Hh	1.09	+/-0.392	0.264	0.113	+/-0.396		pCi/g							
Thallium-208	Hh	0.319	+/-0.0938	0.0767	0.0343	+/-0.0948		pCi/g							
Tin-126	HUh	0.00	+/-0.117	0.211	0.101	+/-0.138		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	13.6	+/-3.67	3.96	1.72	+/-4.54	4.00	pCi/g		JXC9	09/28/16	1448	1602427	10
Beta	Hh	23.3	+/-3.04	3.43	1.63	+/-4.50	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.0758	+/-0.786	1.45	0.652	+/-0.786	2.00	pCi/g		KSD1	09/23/16	1327	1597803	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.256	+/-2.75	4.74	2.30	+/-2.75	6.00	pCi/g		TXP3	09/24/16	0352	1598092	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.122	+/-0.737	1.27	0.621	+/-0.737	2.00	pCi/g		TXJ1	09/26/16	2009	1598081	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.319	+/-1.96	3.44	1.63	+/-1.96	5.00	pCi/g		CXS7	09/20/16	1428	1597414	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.4D.R.4.2
Sample ID: 405235044

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596412	75	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	76.9	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	98.2	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596411	93	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596407	103	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596410	88.8	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596414	75	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597803	92.3	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597414	96.3	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.4D.R.5.2
 Sample ID: 405235045
 Matrix: Soil
 Collect Date: 30-NOV-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 22.4%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		22.4						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0245	+/-0.0796	0.122	0.0185	+/-0.0797	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	HUh	0.00119	+/-0.0812	0.182	0.0485	+/-0.0814	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0347	+/-0.0839	0.251	0.0656	+/-0.0844	1.00	pCi/g			HAKB	09/22/16	1000	1596408	3
Uranium-233/234	Hh	0.893	+/-0.321	0.167	0.0406	+/-0.378	1.00	pCi/g							
Uranium-235/236	Hh	0.082	+/-0.113	0.122	0.0182	+/-0.114	1.00	pCi/g							
Uranium-238	Hh	0.937	+/-0.326	0.122	0.0182	+/-0.387	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.00579	+/-0.414	0.929	0.247	+/-0.415	1.00	pCi/g			HAKB	09/22/16	1555	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.88	+/-0.876	0.569	0.139	+/-0.927	1.00	pCi/g			HAKB	09/22/16	0957	1596407	5
Thorium-229	HUh	0.0407	+/-0.263	0.538	0.160	+/-0.263	1.00	pCi/g							
Thorium-230	Hh	0.726	+/-0.473	0.218	0.00	+/-0.487	1.00	pCi/g							
Thorium-232	Hh	0.778	+/-0.493	0.347	0.0649	+/-0.509	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.0126	+/-0.061	0.113	0.0247	+/-0.0611	1.00	pCi/g			HAKB	09/22/16	0956	1596410	6
Curium-242	Hh	0.00	+/-0.149	0.223	0.00	+/-0.149	1.00	pCi/g							
Curium-243/244	HUh	0.0128	+/-0.0619	0.115	0.0251	+/-0.062	1.00	pCi/g							
Curium-245/246	Hh	0.0244	+/-0.0684	0.0732	0.00	+/-0.0685	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-1.17	+/-7.47	12.9	6.30	+/-7.47	15.0	pCi/g			HAKB	09/23/16	1730	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.0136	+/-0.241	0.687	0.217	+/-0.241	1.00	pCi/g			MJH1	09/28/16	1335	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.151	+/-0.326	0.528	0.243	+/-0.334		pCi/g			MXR1	10/03/16	0657	1596252	9
Antimony-125	HUh	0.0292	+/-0.128	0.251	0.113	+/-0.129		pCi/g							
Bismuth-212	HUh	0.616	+/-0.826	1.65	0.752	+/-0.872		pCi/g							
Bismuth-214	Hh	0.712	+/-0.279	0.191	0.0865	+/-0.281		pCi/g							
Cesium-137	Hh	0.880	+/-0.160	0.0938	0.0415	+/-0.164	0.100	pCi/g							
Cobalt-60	HUh	0.0326	+/-0.0533	0.120	0.0509	+/-0.0553		pCi/g							
Europium-154	HUh	0.112	+/-0.145	0.332	0.142	+/-0.154		pCi/g							
Lead-212	Hh	0.991	+/-0.169	0.137	0.0642	+/-0.177		pCi/g							
Lead-214	Hh	1.16	+/-0.281	0.146	0.0657	+/-0.285		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.4D.R.5.2
 Sample ID: 405235045

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	12.5	+/-1.76	0.966	0.402	+/-1.88		pCi/g							
Protactinium-231	HUh	0.00	+/-0.622	1.25	0.581	+/-0.720		pCi/g							
Radium-226	Hh	0.712	+/-0.279	0.191	0.0865	+/-0.281		pCi/g							
Radium-228	Hh	1.02	+/-0.490	0.375	0.165	+/-0.492		pCi/g							
Thallium-208	Hh	0.420	+/-0.139	0.086	0.0382	+/-0.140		pCi/g							
Tin-126	HUh	0.00	+/-0.123	0.127	0.0601	+/-0.124		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	15.6	+/-3.57	3.94	1.76	+/-4.60	4.00	pCi/g		JXC9	09/28/16	1448	1602427	10
Beta	Hh	20.5	+/-2.55	2.83	1.34	+/-3.71	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	Hh	0.742	+/-0.723	1.17	0.495	+/-0.737	2.00	pCi/g		KSD1	09/22/16	1720	1597803	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	-0.969	+/-2.54	4.46	2.16	+/-2.54	6.00	pCi/g		TXP3	09/24/16	0536	1598092	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.104	+/-0.745	1.28	0.627	+/-0.745	2.00	pCi/g		TXJ1	09/26/16	2120	1598081	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.206	+/-1.72	3.04	1.43	+/-1.72	5.00	pCi/g		CXS7	09/20/16	1444	1597414	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

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 Address : 15 Hazelwood Drive
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.4D.R.5.2
 Sample ID: 405235045

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596412	73	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	77.2	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	61.4	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596411	91.5	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596407	97.1	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596410	80.1	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596414	73	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597803	91	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597414	98.3	(15%-125%)				

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5A.R.1.3
 Sample ID: 405235046
 Matrix: Soil
 Collect Date: 07-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 18.6%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		18.6						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.0146	+/-0.0701	0.130	0.028	+/-0.0703	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	HUh	-0.017	+/-0.051	0.146	0.0359	+/-0.0512	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.0142	+/-0.0962	0.192	0.0453	+/-0.0965	1.00	pCi/g			HAKB	09/22/16	1000	1596408	3
Uranium-233/234	Hh	0.645	+/-0.264	0.146	0.0336	+/-0.298	1.00	pCi/g							
Uranium-235/236	Hh	0.0459	+/-0.0905	0.127	0.0238	+/-0.0911	1.00	pCi/g							
Uranium-238	Hh	0.787	+/-0.288	0.113	0.0168	+/-0.333	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.0797	+/-0.432	0.829	0.185	+/-0.433	1.00	pCi/g			HAKB	09/22/16	1555	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.10	+/-0.640	0.585	0.171	+/-0.665	1.00	pCi/g			HAKB	09/22/16	0957	1596407	5
Thorium-229	Hh	0.139	+/-0.246	0.372	0.0947	+/-0.247	1.00	pCi/g							
Thorium-230	Hh	0.914	+/-0.496	0.401	0.109	+/-0.516	1.00	pCi/g							
Thorium-232	Hh	0.485	+/-0.358	0.182	0.00	+/-0.366	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.0228	+/-0.0574	0.096	0.0233	+/-0.0575	1.00	pCi/g			HAKB	09/22/16	0956	1596410	6
Curium-242	Hh	0.00	+/-0.112	0.167	0.00	+/-0.112	1.00	pCi/g							
Curium-243/244	HUh	-0.00342	+/-0.0341	0.0774	0.0136	+/-0.0342	1.00	pCi/g							
Curium-245/246	Hh	0.0188	+/-0.0527	0.0565	0.00	+/-0.0528	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-2.2	+/-6.79	11.8	5.75	+/-6.79	15.0	pCi/g			HAKB	09/23/16	1831	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.129	+/-0.253	0.239	0.00	+/-0.260	1.00	pCi/g			MJH1	09/28/16	1336	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.145	+/-0.200	0.415	0.194	+/-0.212		pCi/g			MXR1	10/03/16	0657	1596252	9
Antimony-125	HUh	-0.00584	+/-0.0839	0.163	0.0733	+/-0.0839		pCi/g							
Bismuth-212	Hh	1.05	+/-0.648	0.631	0.272	+/-0.650		pCi/g							
Bismuth-214	Hh	0.887	+/-0.149	0.0852	0.037	+/-0.153		pCi/g							
Cesium-137	Hh	0.162	+/-0.065	0.0542	0.0239	+/-0.0654	0.100	pCi/g							
Cobalt-60	HUh	0.0143	+/-0.0303	0.0676	0.0287	+/-0.031		pCi/g							
Europium-154	HUh	-0.0604	+/-0.105	0.189	0.0807	+/-0.108		pCi/g							
Lead-212	Hh	1.02	+/-0.115	0.0793	0.0368	+/-0.127		pCi/g							
Lead-214	Hh	0.940	+/-0.153	0.107	0.0487	+/-0.158		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5A.R.1.3
 Sample ID: 405235046

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	12.7	+/-1.31	0.515	0.211	+/-1.47		pCi/g							
Protactinium-231	HUh	0.00	+/-0.859	0.652	0.299	+/-0.881		pCi/g							
Radium-226	Hh	0.887	+/-0.149	0.0852	0.037	+/-0.153		pCi/g							
Radium-228	Hh	1.11	+/-0.270	0.183	0.0781	+/-0.276		pCi/g							
Thallium-208	Hh	0.271	+/-0.0819	0.0502	0.0222	+/-0.0827		pCi/g							
Tin-126	HUh	0.00	+/-0.106	0.123	0.0589	+/-0.108		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	15.1	+/-3.64	3.95	1.75	+/-4.66	4.00	pCi/g		JXC9	09/28/16	1448	1602427	10
Beta	Hh	20.9	+/-2.48	2.50	1.17	+/-3.88	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.382	+/-0.657	1.16	0.500	+/-0.660	2.00	pCi/g		KSD1	09/22/16	1720	1597803	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	1.29	+/-2.45	4.16	2.02	+/-2.45	6.00	pCi/g		TXP3	09/24/16	0719	1598092	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.182	+/-0.690	1.17	0.576	+/-0.690	2.00	pCi/g		TXJ1	09/26/16	2232	1598081	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	Hh	2.30	+/-1.90	3.13	1.48	+/-1.92	5.00	pCi/g		CXS7	09/20/16	1501	1597414	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.5A.R.1.3
Sample ID: 405235046

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596412	77	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	79.8	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	69.5	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596411	82.9	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596407	96.1	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596410	106	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596414	77	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597803	93.7	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597414	95.1	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

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 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: 4.5A.R.1.4
 Sample ID: 405235047
 Matrix: Soil
 Collect Date: 07-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 20.7%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		20.7						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.00389	+/-0.0565	0.122	0.0184	+/-0.0567	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	HUh	-0.00773	+/-0.0566	0.136	0.0259	+/-0.0569	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.00909	+/-0.0632	0.153	0.0297	+/-0.0635	1.00	pCi/g			HAKB	09/22/16	1000	1596408	3
Uranium-233/234	Hh	0.785	+/-0.284	0.154	0.0393	+/-0.327	1.00	pCi/g							
Uranium-235/236	Hh	0.069	+/-0.0995	0.121	0.0227	+/-0.101	1.00	pCi/g							
Uranium-238	Hh	1.05	+/-0.323	0.121	0.0227	+/-0.390	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.118	+/-0.291	0.872	0.225	+/-0.292	1.00	pCi/g			HAKB	09/22/16	1555	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.16	+/-0.676	0.613	0.178	+/-0.704	1.00	pCi/g			HAKB	09/22/16	0957	1596407	5
Thorium-229	HUh	0.085	+/-0.267	0.499	0.153	+/-0.267	1.00	pCi/g							
Thorium-230	Hh	0.758	+/-0.477	0.450	0.129	+/-0.493	1.00	pCi/g							
Thorium-232	Hh	0.704	+/-0.436	0.192	0.00	+/-0.451	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0135	+/-0.0356	0.104	0.027	+/-0.0357	1.00	pCi/g			HAKB	09/22/16	0956	1596410	6
Curium-242	Hh	0.00	+/-0.112	0.168	0.00	+/-0.112	1.00	pCi/g							
Curium-243/244	HUh	-0.0103	+/-0.0355	0.0978	0.0237	+/-0.0356	1.00	pCi/g							
Curium-245/246	Hh	0.0189	+/-0.0529	0.0567	0.00	+/-0.053	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-0.679	+/-7.35	12.7	6.19	+/-7.35	15.0	pCi/g			HAKB	09/23/16	1932	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.208	+/-0.187	0.517	0.211	+/-0.210	1.00	pCi/g			MJH1	09/28/16	1439	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.169	+/-0.200	0.398	0.185	+/-0.215		pCi/g			MXR1	10/03/16	0700	1596252	9
Antimony-125	HUh	-0.00121	+/-0.0854	0.169	0.0756	+/-0.0854		pCi/g							
Bismuth-212	HUh	0.00	+/-0.576	1.16	0.529	+/-0.845		pCi/g							
Bismuth-214	Hh	0.882	+/-0.197	0.120	0.0535	+/-0.201		pCi/g							
Cesium-137	HUIh	0.00	+/-0.039	0.0849	0.0388	+/-0.046	0.100	pCi/g							
Cobalt-60	HUh	0.0341	+/-0.0453	0.0926	0.0402	+/-0.0479		pCi/g							
Europium-154	HUh	0.0428	+/-0.112	0.234	0.101	+/-0.113		pCi/g							
Lead-212	Hh	1.08	+/-0.121	0.0919	0.043	+/-0.134		pCi/g							
Lead-214	Hh	1.07	+/-0.185	0.120	0.0551	+/-0.190		pCi/g							

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Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5A.R.1.4
 Sample ID: 405235047

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	16.0	+/-1.57	0.429	0.159	+/-1.78		pCi/g							
Protactinium-231	HUh	0.00	+/-0.679	0.669	0.305	+/-0.712		pCi/g							
Radium-226	Hh	0.882	+/-0.197	0.120	0.0535	+/-0.201		pCi/g							
Radium-228	Hh	0.886	+/-0.322	0.247	0.108	+/-0.325		pCi/g							
Thallium-208	Hh	0.267	+/-0.0818	0.069	0.0313	+/-0.0826		pCi/g							
Tin-126	HUh	0.00	+/-0.133	0.0664	0.0311	+/-0.135		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	16.1	+/-3.83	3.93	1.71	+/-4.93	4.00	pCi/g		JXC9	09/28/16	1448	1602427	10
Beta	Hh	16.5	+/-2.64	3.34	1.60	+/-3.61	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.744	+/-0.917	1.78	0.825	+/-0.917	2.00	pCi/g		KSD1	09/22/16	1721	1597803	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	-0.418	+/-2.59	4.52	2.19	+/-2.59	6.00	pCi/g		TXP3	09/24/16	0903	1598092	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.334	+/-0.725	1.25	0.614	+/-0.725	2.00	pCi/g		TXJ1	09/26/16	2344	1598081	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.454	+/-1.77	3.10	1.47	+/-1.77	5.00	pCi/g		CXS7	09/20/16	1517	1597414	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.5A.R.1.4
Sample ID: 405235047

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596412	76.4	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	78.5	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	74.3	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596411	90	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596407	89.4	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596410	103	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596414	76.4	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597803	91	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597414	92.6	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5B.R.1.2
 Sample ID: 405235048
 Matrix: Soil
 Collect Date: 07-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 22.9%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		22.9						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.00333	+/-0.0483	0.104	0.0157	+/-0.0485	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	Hh	0.0448	+/-0.0822	0.103	0.0157	+/-0.0825	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0357	+/-0.0658	0.209	0.0583	+/-0.0661	1.00	pCi/g			HAKB	09/22/16	1002	1596408	3
Uranium-233/234	Hh	0.933	+/-0.322	0.146	0.0313	+/-0.379	1.00	pCi/g							
Uranium-235/236	Hh	0.0442	+/-0.0957	0.146	0.0314	+/-0.0962	1.00	pCi/g							
Uranium-238	Hh	0.866	+/-0.313	0.172	0.0442	+/-0.364	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.125	+/-0.308	0.921	0.237	+/-0.308	1.00	pCi/g			HAKB	09/22/16	1555	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.76	+/-0.896	0.704	0.196	+/-0.945	1.00	pCi/g			HAKB	09/22/16	0957	1596407	5
Thorium-229	Hh	0.399	+/-0.449	0.634	0.199	+/-0.454	1.00	pCi/g							
Thorium-230	Hh	0.846	+/-0.561	0.550	0.157	+/-0.578	1.00	pCi/g							
Thorium-232	Hh	1.29	+/-0.653	0.433	0.0991	+/-0.687	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.023	+/-0.0846	0.142	0.0258	+/-0.0848	1.00	pCi/g			HAKB	09/22/16	1614	1596410	6
Curium-242	HUh	-0.0123	+/-0.204	0.431	0.0617	+/-0.204	1.00	pCi/g							
Curium-243/244	Hh	0.0772	+/-0.121	0.166	0.037	+/-0.122	1.00	pCi/g							
Curium-245/246	HUh	-0.00414	+/-0.0687	0.145	0.0208	+/-0.0689	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-1.19	+/-6.48	11.2	5.47	+/-6.48	15.0	pCi/g			HAKB	09/23/16	2033	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.0758	+/-0.343	0.674	0.261	+/-0.345	1.00	pCi/g			MJH1	09/28/16	1440	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.027	+/-0.250	0.472	0.219	+/-0.250		pCi/g			MXR1	10/03/16	0700	1596252	9
Antimony-125	HUIh	0.00	+/-0.223	0.245	0.113	+/-0.237		pCi/g							
Bismuth-212	HUIh	0.00	+/-0.708	1.29	0.590	+/-0.875		pCi/g							
Bismuth-214	Hh	0.974	+/-0.193	0.139	0.0623	+/-0.198		pCi/g							
Cesium-137	Hh	1.52	+/-0.161	0.0695	0.0307	+/-0.174	0.100	pCi/g							
Cobalt-60	HUh	0.0124	+/-0.0388	0.0825	0.0348	+/-0.0392		pCi/g							
Europium-154	HUh	0.0899	+/-0.120	0.263	0.115	+/-0.126		pCi/g							
Lead-212	Hh	1.16	+/-0.142	0.114	0.0534	+/-0.155		pCi/g							
Lead-214	Hh	1.36	+/-0.222	0.360	0.174	+/-0.229		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5B.R.1.2
 Sample ID: 405235048

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	16.4	+/-1.65	0.666	0.275	+/-1.86		pCi/g							
Protactinium-231	HUh	0.195	+/-0.533	1.03	0.481	+/-0.542		pCi/g							
Radium-226	Hh	0.974	+/-0.193	0.139	0.0623	+/-0.198		pCi/g							
Radium-228	Hh	1.07	+/-0.364	0.274	0.121	+/-0.368		pCi/g							
Thallium-208	Hh	0.366	+/-0.0776	0.0727	0.0327	+/-0.0792		pCi/g							
Tin-126	HUh	0.00	+/-0.198	0.159	0.0757	+/-0.198		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	24.1	+/-5.05	3.94	1.63	+/-6.80	4.00	pCi/g		JXC9	09/28/16	1448	1602427	10
Beta	Hh	27.2	+/-3.07	2.35	1.07	+/-4.63	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.194	+/-0.617	1.13	0.492	+/-0.618	2.00	pCi/g		KSD1	09/22/16	1720	1597803	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	-0.411	+/-2.59	4.52	2.19	+/-2.59	6.00	pCi/g		TXP3	09/24/16	1046	1598092	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.209	+/-0.770	1.33	0.650	+/-0.770	2.00	pCi/g		TXJ1	09/27/16	0207	1598081	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-1.72	+/-1.81	3.41	1.61	+/-1.81	5.00	pCi/g		CXS7	09/20/16	1534	1597414	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Company : MJW Technical Services
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Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.5B.R.1.2
Sample ID: 405235048

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596412	83.1	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	95.1	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	88.8	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596411	91.8	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596407	83.9	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596410	100	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596414	83.1	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597803	92.3	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597414	92.3	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5B.R.1.3
 Sample ID: 405235049
 Matrix: Soil
 Collect Date: 07-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 18.8%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		18.8						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.00337	+/-0.0486	0.105	0.0159	+/-0.0487	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	Hh	0.0208	+/-0.0676	0.104	0.0158	+/-0.0678	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0105	+/-0.0491	0.128	0.028	+/-0.0493	1.00	pCi/g			HAKB	09/22/16	1002	1596408	3
Uranium-233/234	Hh	0.773	+/-0.290	0.186	0.0538	+/-0.330	1.00	pCi/g							
Uranium-235/236	HUh	0.0118	+/-0.0743	0.147	0.0341	+/-0.0745	1.00	pCi/g							
Uranium-238	Hh	0.746	+/-0.281	0.137	0.0294	+/-0.319	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0222	+/-0.369	0.780	0.112	+/-0.369	1.00	pCi/g			HAKB	09/22/16	1555	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.44	+/-0.870	0.907	0.294	+/-0.913	1.00	pCi/g			HAKB	09/26/16	1201	1596407	5
Thorium-229	HUh	0.0416	+/-0.231	0.443	0.101	+/-0.231	1.00	pCi/g							
Thorium-230	Hh	1.04	+/-0.586	0.239	0.00	+/-0.614	1.00	pCi/g							
Thorium-232	Hh	1.11	+/-0.605	0.239	0.00	+/-0.636	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	Hh	0.0565	+/-0.110	0.151	0.0274	+/-0.110	1.00	pCi/g			HAKB	09/22/16	1614	1596410	6
Curium-242	Hh	0.00	+/-0.215	0.326	0.00	+/-0.216	1.00	pCi/g							
Curium-243/244	HUh	-0.0117	+/-0.0656	0.166	0.034	+/-0.0659	1.00	pCi/g							
Curium-245/246	Hh	0.0367	+/-0.102	0.110	0.00	+/-0.102	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	Hh	6.62	+/-6.96	11.7	5.68	+/-7.13	15.0	pCi/g			HAKB	09/23/16	2134	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.00955	+/-0.223	0.511	0.186	+/-0.223	1.00	pCi/g			MJH1	09/28/16	1440	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.0667	+/-0.208	0.394	0.180	+/-0.210		pCi/g			MXR1	10/03/16	0701	1596252	9
Antimony-125	HUh	0.00107	+/-0.0965	0.183	0.0819	+/-0.0965		pCi/g							
Bismuth-212	HUh	0.00	+/-0.839	1.35	0.623	+/-1.05		pCi/g							
Bismuth-214	Hh	1.11	+/-0.183	0.109	0.0477	+/-0.189		pCi/g							
Cesium-137	Hh	0.481	+/-0.0908	0.0735	0.0327	+/-0.0931	0.100	pCi/g							
Cobalt-60	HUh	6.07E-05	+/-0.0306	0.059	0.0232	+/-0.0306		pCi/g							
Europium-154	HUh	0.0647	+/-0.111	0.246	0.106	+/-0.115		pCi/g							
Lead-212	Hh	1.06	+/-0.134	0.100	0.0466	+/-0.145		pCi/g							
Lead-214	Hh	0.911	+/-0.179	0.132	0.060	+/-0.183		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5B.R.1.3
 Sample ID: 405235049

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	13.1	+/-1.48	0.503	0.194	+/-1.63		pCi/g							
Protactinium-231	HUh	0.00	+/-0.921	0.654	0.293	+/-0.957		pCi/g							
Radium-226	Hh	1.11	+/-0.183	0.109	0.0477	+/-0.189		pCi/g							
Radium-228	Hh	1.05	+/-0.289	0.202	0.0848	+/-0.294		pCi/g							
Thallium-208	Hh	0.323	+/-0.0861	0.0606	0.0267	+/-0.0871		pCi/g							
Tin-126	HUh	0.00	+/-0.211	0.143	0.0673	+/-0.211		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	27.8	+/-5.44	3.93	1.60	+/-7.72	4.00	pCi/g		JXC9	09/28/16	1448	1602427	10
Beta	Hh	21.9	+/-2.68	2.19	1.00	+/-4.43	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.132	+/-0.636	1.26	0.552	+/-0.636	2.00	pCi/g		KSD1	09/22/16	1720	1597803	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	-0.551	+/-2.55	4.45	2.16	+/-2.55	6.00	pCi/g		TXP3	09/24/16	1230	1598092	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.593	+/-0.721	1.25	0.615	+/-0.721	2.00	pCi/g		TXJ1	09/27/16	0319	1598081	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.0409	+/-1.78	3.17	1.50	+/-1.78	5.00	pCi/g		CXS7	09/20/16	1550	1597414	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.5B.R.1.3
Sample ID: 405235049

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596412	79.6	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	101	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	98.2	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596411	73.9	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596407	71.9	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596410	94.8	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596414	79.6	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597803	93.7	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597414	95.2	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5B.R.1.4
 Sample ID: 405235050
 Matrix: Soil
 Collect Date: 07-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 11%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		11.0						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.00592	+/-0.0431	0.104	0.0197	+/-0.0432	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	HUh	-0.0118	+/-0.0436	0.119	0.0277	+/-0.0437	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.00617	+/-0.064	0.134	0.0336	+/-0.0642	1.00	pCi/g			HAKB	09/22/16	1002	1596408	3
Uranium-233/234	Hh	0.565	+/-0.240	0.151	0.0388	+/-0.264	1.00	pCi/g							
Uranium-235/236	HUh	0.0178	+/-0.0688	0.118	0.0225	+/-0.0689	1.00	pCi/g							
Uranium-238	Hh	0.652	+/-0.253	0.118	0.0224	+/-0.284	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0372	+/-0.310	0.729	0.132	+/-0.311	1.00	pCi/g			HAKB	09/22/16	1555	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.60	+/-0.922	0.967	0.323	+/-0.966	1.00	pCi/g			HAKB	09/26/16	1201	1596407	5
Thorium-229	Hh	0.442	+/-0.420	0.444	0.102	+/-0.427	1.00	pCi/g							
Thorium-230	Hh	0.764	+/-0.552	0.591	0.176	+/-0.565	1.00	pCi/g							
Thorium-232	Hh	0.618	+/-0.471	0.382	0.0715	+/-0.482	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	Hh	0.0554	+/-0.108	0.148	0.0268	+/-0.108	1.00	pCi/g			HAKB	09/22/16	1614	1596410	6
Curium-242	HUh	-0.0128	+/-0.212	0.449	0.0643	+/-0.213	1.00	pCi/g							
Curium-243/244	HUh	0.0204	+/-0.0897	0.162	0.0333	+/-0.0899	1.00	pCi/g							
Curium-245/246	Hh	0.00	+/-0.071	0.108	0.00	+/-0.0713	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	2.12	+/-6.17	10.5	5.13	+/-6.19	15.0	pCi/g			HAKB	09/23/16	2235	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.0874	+/-0.171	0.277	0.00	+/-0.176	1.00	pCi/g			MJH1	09/28/16	1440	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.132	+/-0.242	0.393	0.176	+/-0.249		pCi/g			MXR1	10/03/16	0701	1596252	9
Antimony-125	HUIh	0.00	+/-0.245	0.201	0.0876	+/-0.246		pCi/g							
Bismuth-212	HUIh	0.00	+/-0.769	1.42	0.634	+/-0.896		pCi/g							
Bismuth-214	Hh	0.725	+/-0.191	0.120	0.0504	+/-0.193		pCi/g							
Cesium-137	HUIh	0.0702	+/-0.0653	0.089	0.039	+/-0.0654	0.100	pCi/g							
Cobalt-60	HUh	-0.0183	+/-0.0338	0.0645	0.0228	+/-0.0348		pCi/g							
Europium-154	HUh	-0.00145	+/-0.132	0.279	0.115	+/-0.132		pCi/g							
Lead-212	Hh	0.801	+/-0.172	0.114	0.0529	+/-0.177		pCi/g							
Lead-214	Hh	0.950	+/-0.184	0.336	0.161	+/-0.188		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5B.R.1.4
 Sample ID: 405235050

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	12.6	+/-1.74	0.822	0.325	+/-1.86		pCi/g							
Protactinium-231	HUh	0.291	+/-0.505	0.960	0.438	+/-0.526		pCi/g							
Radium-226	Hh	0.725	+/-0.191	0.120	0.0504	+/-0.193		pCi/g							
Radium-228	Hh	1.05	+/-0.340	0.271	0.112	+/-0.344		pCi/g							
Thallium-208	Hh	0.232	+/-0.0865	0.0613	0.0258	+/-0.087		pCi/g							
Tin-126	HUh	0.00	+/-0.143	0.112	0.0521	+/-0.144		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	16.6	+/-4.28	4.00	1.66	+/-5.38	4.00	pCi/g		JXC9	09/28/16	1448	1602427	10
Beta	Hh	16.3	+/-2.75	3.25	1.53	+/-3.62	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.545	+/-0.687	1.46	0.645	+/-0.687	2.00	pCi/g		KSD1	09/22/16	1720	1597803	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	-1.75	+/-2.15	3.83	1.86	+/-2.15	6.00	pCi/g		TXP3	09/24/16	1414	1598092	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.264	+/-0.622	1.07	0.527	+/-0.622	2.00	pCi/g		TXJ1	09/27/16	0430	1598081	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.438	+/-1.51	2.73	1.29	+/-1.51	5.00	pCi/g		CXS7	09/20/16	1606	1597414	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.5B.R.1.4
Sample ID: 405235050

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596412	88.3	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	107	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	104	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596411	80.4	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596407	90.8	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596410	93.3	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596414	88.3	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597803	95	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597414	95.3	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5B.R.2.3
 Sample ID: 405235051
 Matrix: Soil
 Collect Date: 07-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 17.7%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		17.7						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.00	+/-0.0523	0.0793	0.00	+/-0.0525	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	HUh	-0.0146	+/-0.0539	0.147	0.0343	+/-0.0541	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0211	+/-0.228	0.434	0.191	+/-0.228	1.00	pCi/g			KXB2	09/29/16	1404	1601257	3
Uranium-233/234	Hh	0.741	+/-0.301	0.304	0.116	+/-0.314	1.00	pCi/g							
Uranium-235/236	Hh	0.134	+/-0.145	0.196	0.0622	+/-0.146	1.00	pCi/g							
Uranium-238	Hh	0.988	+/-0.311	0.159	0.0438	+/-0.333	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	Hh	0.406	+/-0.736	0.907	0.130	+/-0.737	1.00	pCi/g			HAKB	09/26/16	1151	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.67	+/-0.803	0.662	0.200	+/-0.854	1.00	pCi/g			HAKB	09/26/16	1201	1596407	5
Thorium-229	Hh	0.329	+/-0.346	0.431	0.117	+/-0.350	1.00	pCi/g							
Thorium-230	Hh	1.32	+/-0.603	0.398	0.101	+/-0.639	1.00	pCi/g							
Thorium-232	Hh	1.15	+/-0.557	0.312	0.0584	+/-0.587	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0206	+/-0.0543	0.158	0.0412	+/-0.0545	1.00	pCi/g			HAKB	09/22/16	0956	1596410	6
Curium-242	Hh	0.00	+/-0.171	0.256	0.00	+/-0.171	1.00	pCi/g							
Curium-243/244	HUh	-0.0262	+/-0.056	0.170	0.0467	+/-0.0562	1.00	pCi/g							
Curium-245/246	HUh	-0.0059	+/-0.0587	0.133	0.0235	+/-0.0589	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	1.43	+/-7.24	12.4	6.04	+/-7.25	15.0	pCi/g			HAKB	09/23/16	2336	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.0898	+/-0.258	0.462	0.119	+/-0.261	1.00	pCi/g			MJH1	09/28/16	1441	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.00182	+/-0.236	0.412	0.188	+/-0.236		pCi/g			MXR1	10/03/16	0704	1596252	9
Antimony-125	HUh	-0.0278	+/-0.116	0.214	0.0965	+/-0.117		pCi/g							
Bismuth-212	HUh	0.00	+/-0.984	1.50	0.690	+/-1.28		pCi/g							
Bismuth-214	Hh	0.829	+/-0.210	0.154	0.0693	+/-0.222		pCi/g							
Cesium-137	Hh	0.139	+/-0.0833	0.0784	0.0348	+/-0.0841	0.100	pCi/g							
Cobalt-60	HUh	0.0154	+/-0.0408	0.0906	0.0376	+/-0.0414		pCi/g							
Europium-154	HUh	-0.0629	+/-0.142	0.255	0.107	+/-0.145		pCi/g							
Lead-212	Hh	0.909	+/-0.149	0.118	0.0552	+/-0.173		pCi/g							
Lead-214	Hh	0.956	+/-0.174	0.327	0.157	+/-0.192		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5B.R.2.3
 Sample ID: 405235051

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	13.0	+/-1.70	0.576	0.218	+/-2.03		pCi/g							
Protactinium-231	HUh	0.00	+/-0.671	0.808	0.369	+/-0.683		pCi/g							
Radium-226	Hh	0.829	+/-0.210	0.154	0.0693	+/-0.222		pCi/g							
Radium-228	HUh	0.00	+/-0.367	0.597	0.280	+/-0.548		pCi/g							
Thallium-208	Hh	0.336	+/-0.0777	0.0658	0.029	+/-0.0829		pCi/g							
Tin-126	HUh	0.00	+/-0.102	0.0935	0.0442	+/-0.104		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	16.7	+/-4.25	3.99	1.67	+/-5.36	4.00	pCi/g		JXC9	09/28/16	1448	1602427	10
Beta	Hh	21.1	+/-2.79	2.62	1.21	+/-4.19	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.384	+/-0.664	1.36	0.604	+/-0.664	2.00	pCi/g		KSD1	09/22/16	1720	1597803	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	-0.479	+/-2.45	4.27	2.07	+/-2.45	6.00	pCi/g		TXP3	09/24/16	1557	1598092	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.322	+/-0.715	1.24	0.606	+/-0.715	2.00	pCi/g		TXJ1	09/27/16	0542	1598081	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.139	+/-1.73	3.08	1.46	+/-1.73	5.00	pCi/g		CXS7	09/20/16	1623	1597414	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.5B.R.2.3
Sample ID: 405235051

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596412	74.7	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1601257	89	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1601257	100	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596411	58.2	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596407	91.7	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596410	70.3	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596414	74.7	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597803	92.3	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597414	95	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5B.R.2.4
 Sample ID: 405235052
 Matrix: Soil
 Collect Date: 07-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 15.5%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		15.5						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.0204	+/-0.0608	0.174	0.0429	+/-0.061	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	HUh	-0.0688	+/-0.0663	0.245	0.0786	+/-0.0666	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0158	+/-0.056	0.155	0.0365	+/-0.0564	1.00	pCi/g			HAKB	09/22/16	1002	1596408	3
Uranium-233/234	Hh	0.900	+/-0.341	0.209	0.0576	+/-0.393	1.00	pCi/g							
Uranium-235/236	HUh	0.0183	+/-0.0883	0.164	0.0354	+/-0.0885	1.00	pCi/g							
Uranium-238	Hh	0.699	+/-0.300	0.175	0.0407	+/-0.336	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0771	+/-0.262	0.732	0.173	+/-0.263	1.00	pCi/g			HAKB	09/22/16	1555	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	0.596	+/-0.665	0.881	0.252	+/-0.675	1.00	pCi/g			HAKB	09/22/16	0957	1596407	5
Thorium-229	HUh	-0.0908	+/-0.210	0.623	0.170	+/-0.211	1.00	pCi/g							
Thorium-230	Hh	1.13	+/-0.668	0.283	0.00	+/-0.702	1.00	pCi/g							
Thorium-232	Hh	1.27	+/-0.718	0.521	0.119	+/-0.758	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0184	+/-0.0393	0.119	0.0328	+/-0.0394	1.00	pCi/g			HAKB	09/22/16	0956	1596410	6
Curium-242	HUh	-0.0124	+/-0.124	0.281	0.0496	+/-0.124	1.00	pCi/g							
Curium-243/244	HUh	-0.00418	+/-0.054	0.127	0.0364	+/-0.054	1.00	pCi/g							
Curium-245/246	Hh	0.0205	+/-0.0574	0.0614	0.00	+/-0.0574	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	3.66	+/-7.82	13.3	6.48	+/-7.87	15.0	pCi/g			HAKB	09/24/16	0038	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.0439	+/-0.250	0.532	0.207	+/-0.250	1.00	pCi/g			MJH1	09/28/16	1514	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.137	+/-0.374	0.398	0.183	+/-0.380		pCi/g			MXR1	10/03/16	0704	1596252	9
Antimony-125	HUh	-0.0333	+/-0.0969	0.185	0.083	+/-0.0981		pCi/g							
Bismuth-212	HUh	0.00	+/-1.02	1.23	0.560	+/-1.06		pCi/g							
Bismuth-214	Hh	0.693	+/-0.165	0.131	0.0587	+/-0.168		pCi/g							
Cesium-137	Hh	0.148	+/-0.0611	0.063	0.0276	+/-0.0614	0.100	pCi/g							
Cobalt-60	HUh	0.00693	+/-0.0303	0.0673	0.0274	+/-0.0305		pCi/g							
Europium-154	HUh	-0.00356	+/-0.116	0.205	0.086	+/-0.116		pCi/g							
Lead-212	Hh	0.907	+/-0.127	0.0844	0.0389	+/-0.135		pCi/g							
Lead-214	Hh	1.03	+/-0.235	0.319	0.154	+/-0.238		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5B.R.2.4
 Sample ID: 405235052

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	14.2	+/-1.56	0.599	0.243	+/-1.73		pCi/g							
Protactinium-231	HUh	0.00	+/-0.615	0.677	0.307	+/-0.623		pCi/g							
Radium-226	Hh	0.693	+/-0.165	0.131	0.0587	+/-0.168		pCi/g							
Radium-228	Hh	0.852	+/-0.276	0.247	0.107	+/-0.280		pCi/g							
Thallium-208	Hh	0.198	+/-0.0902	0.0635	0.0283	+/-0.0906		pCi/g							
Tin-126	HUh	0.00	+/-0.154	0.142	0.0668	+/-0.154		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	17.6	+/-4.06	3.95	1.71	+/-5.39	4.00	pCi/g		JXC9	09/28/16	1448	1602427	10
Beta	Hh	20.3	+/-2.72	3.19	1.52	+/-3.95	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	Hh	0.896	+/-0.802	1.30	0.576	+/-0.817	2.00	pCi/g		KSD1	09/22/16	1720	1597803	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	1.12	+/-2.40	4.10	1.99	+/-2.40	6.00	pCi/g		TXP3	09/24/16	1741	1598092	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.267	+/-0.635	1.10	0.537	+/-0.635	2.00	pCi/g		TXJ1	09/27/16	0654	1598081	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.295	+/-2.06	3.51	1.73	+/-2.06	5.00	pCi/g		CXS7	09/20/16	1207	1597414	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.5B.R.2.4
Sample ID: 405235052

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596412	68.6	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	80.2	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	88.8	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596411	93.5	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596407	64.3	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596410	96.3	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596414	68.6	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597803	82.8	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597414	42.3	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.5.2
 Sample ID: 405235053
 Matrix: Soil
 Collect Date: 01-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 30.4%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		30.4						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0754	+/-0.117	0.177	0.049	+/-0.118	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	HUh	0.00801	+/-0.0923	0.198	0.0597	+/-0.0924	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.000599	+/-0.0904	0.205	0.0557	+/-0.0907	1.00	pCi/g			HAKB	09/22/16	1002	1596408	3
Uranium-233/234	Hh	1.16	+/-0.389	0.199	0.0514	+/-0.466	1.00	pCi/g							
Uranium-235/236	Hh	0.221	+/-0.179	0.139	0.021	+/-0.186	1.00	pCi/g							
Uranium-238	Hh	1.27	+/-0.403	0.169	0.0363	+/-0.492	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.159	+/-0.529	0.978	0.260	+/-0.529	1.00	pCi/g			HAKB	09/22/16	1556	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	2.20	+/-0.918	0.583	0.154	+/-0.984	1.00	pCi/g			HAKB	09/22/16	0957	1596407	5
Thorium-229	HUh	0.0356	+/-0.198	0.379	0.087	+/-0.198	1.00	pCi/g							
Thorium-230	Hh	1.56	+/-0.658	0.328	0.0613	+/-0.702	1.00	pCi/g							
Thorium-232	Hh	1.41	+/-0.628	0.327	0.0612	+/-0.667	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0133	+/-0.0673	0.172	0.0374	+/-0.0676	1.00	pCi/g			HAKB	09/22/16	0956	1596410	6
Curium-242	Hh	0.00	+/-0.225	0.337	0.00	+/-0.226	1.00	pCi/g							
Curium-243/244	HUh	-0.0337	+/-0.0721	0.219	0.0601	+/-0.0723	1.00	pCi/g							
Curium-245/246	Hh	0.037	+/-0.104	0.111	0.00	+/-0.104	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	2.18	+/-6.84	11.7	5.68	+/-6.85	15.0	pCi/g			HAKB	09/24/16	0139	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.193	+/-0.507	1.14	0.465	+/-0.514	1.00	pCi/g			MJH1	09/28/16	1514	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.194	+/-0.396	0.700	0.319	+/-0.407		pCi/g			MXR1	10/03/16	0706	1596252	9
Antimony-125	HUh	0.0321	+/-0.199	0.387	0.174	+/-0.200		pCi/g							
Bismuth-212	HUh	0.00	+/-1.40	1.62	0.704	+/-1.41		pCi/g							
Bismuth-214	Hh	1.36	+/-0.320	0.249	0.111	+/-0.325		pCi/g							
Cesium-137	Hh	0.258	+/-0.150	0.126	0.0552	+/-0.150	0.100	pCi/g							
Cobalt-60	HUh	-0.00448	+/-0.0858	0.168	0.0707	+/-0.0858		pCi/g							
Europium-154	HUh	-0.103	+/-0.237	0.428	0.179	+/-0.241		pCi/g							
Lead-212	Hh	1.55	+/-0.207	0.151	0.069	+/-0.223		pCi/g							
Lead-214	Hh	1.65	+/-0.339	0.606	0.292	+/-0.346		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228
 Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes
 Client Sample ID: 4.5C.R.5.2
 Sample ID: 405235053

Report Date: October 4, 2016

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	18.7	+/-2.58	0.973	0.367	+/-2.76		pCi/g							
Protactinium-231	HUh	0.00	+/-1.27	1.25	0.559	+/-1.28		pCi/g							
Radium-226	Hh	1.36	+/-0.320	0.249	0.111	+/-0.325		pCi/g							
Radium-228	Hh	1.36	+/-0.443	0.427	0.180	+/-0.448		pCi/g							
Thallium-208	Hh	0.324	+/-0.148	0.113	0.0495	+/-0.149		pCi/g							
Tin-126	HUh	0.00	+/-0.124	0.147	0.0689	+/-0.125		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	17.1	+/-4.24	3.91	1.63	+/-5.38	4.00	pCi/g		JXC9	09/28/16	1448	1602427	10
Beta	Hh	26.3	+/-2.91	2.30	1.05	+/-4.70	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.426	+/-0.604	1.30	0.566	+/-0.604	2.00	pCi/g		KSD1	09/23/16	1136	1597803	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	-1.02	+/-3.28	5.75	2.78	+/-3.28	6.00	pCi/g		TXP3	09/24/16	1924	1598092	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.335	+/-0.860	1.46	0.716	+/-0.860	2.00	pCi/g		TXJ1	09/27/16	0806	1598081	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	1.06	+/-2.16	3.73	1.76	+/-2.17	5.00	pCi/g		CXS7	09/20/16	1639	1597414	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Company : MJW Technical Services
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Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 4.5C.R.5.2
Sample ID: 405235053

Report Date: October 4, 2016

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test						Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"						1596412	83.8	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596408	79.7	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596408	81.5	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"						1596411	88.5	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"						1596407	98	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"						1596410	57.4	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"						1596414	83.8	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"						1597803	82.8	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"						1597414	96.6	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.1.3
 Sample ID: 405235054
 Matrix: Soil
 Collect Date: 02-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 18.2%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		18.2						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.00714	+/-0.0509	0.123	0.0236	+/-0.0511	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	HUh	-0.0071	+/-0.0506	0.122	0.0234	+/-0.0507	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0174	+/-0.0613	0.169	0.040	+/-0.0616	1.00	pCi/g			HAKB	09/22/16	1003	1596408	3
Uranium-233/234	Hh	0.913	+/-0.341	0.184	0.0454	+/-0.395	1.00	pCi/g							
Uranium-235/236	Hh	0.0851	+/-0.123	0.151	0.0288	+/-0.125	1.00	pCi/g							
Uranium-238	Hh	0.948	+/-0.346	0.175	0.0406	+/-0.403	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0119	+/-0.427	0.985	0.269	+/-0.427	1.00	pCi/g			HAKB	09/22/16	1556	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.17	+/-0.728	0.668	0.186	+/-0.753	1.00	pCi/g			HAKB	09/22/16	0957	1596407	5
Thorium-229	Hh	0.280	+/-0.364	0.517	0.148	+/-0.367	1.00	pCi/g							
Thorium-230	Hh	1.16	+/-0.596	0.353	0.066	+/-0.625	1.00	pCi/g							
Thorium-232	Hh	0.862	+/-0.521	0.352	0.0658	+/-0.539	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.00405	+/-0.0403	0.0916	0.0162	+/-0.0404	1.00	pCi/g			HAKB	09/22/16	0956	1596410	6
Curium-242	Hh	0.00	+/-0.137	0.205	0.00	+/-0.137	1.00	pCi/g							
Curium-243/244	HUh	0.0159	+/-0.0567	0.093	0.0164	+/-0.0568	1.00	pCi/g							
Curium-245/246	Hh	0.0226	+/-0.0633	0.0678	0.00	+/-0.0634	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-2.03	+/-7.01	12.2	5.93	+/-7.01	15.0	pCi/g			HAKB	09/24/16	0352	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.138	+/-0.251	0.435	0.138	+/-0.259	1.00	pCi/g			MJH1	09/28/16	1514	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0501	+/-0.223	0.419	0.193	+/-0.224		pCi/g			MXR1	10/03/16	0707	1596252	9
Antimony-125	HUIh	0.00	+/-0.112	0.236	0.108	+/-0.124		pCi/g							
Bismuth-212	HUIh	0.00	+/-0.741	1.51	0.699	+/-1.15		pCi/g							
Bismuth-214	Hh	0.835	+/-0.220	0.121	0.0532	+/-0.223		pCi/g							
Cesium-137	HUh	-0.00469	+/-0.043	0.0826	0.037	+/-0.0431	0.100	pCi/g							
Cobalt-60	HUh	0.00992	+/-0.0397	0.0863	0.036	+/-0.0399		pCi/g							
Europium-154	HUh	0.035	+/-0.112	0.243	0.103	+/-0.113		pCi/g							
Lead-212	Hh	1.20	+/-0.130	0.0961	0.0446	+/-0.145		pCi/g							
Lead-214	Hh	1.11	+/-0.189	0.346	0.167	+/-0.195		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.1.3
 Sample ID: 405235054

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	15.5	+/-1.68	0.516	0.193	+/-1.86		pCi/g							
Protactinium-231	HUh	0.334	+/-0.456	0.924	0.428	+/-0.485		pCi/g							
Radium-226	Hh	0.835	+/-0.220	0.121	0.0532	+/-0.223		pCi/g							
Radium-228	Hh	1.30	+/-0.285	0.227	0.0955	+/-0.293		pCi/g							
Thallium-208	Hh	0.338	+/-0.0819	0.0772	0.0348	+/-0.0832		pCi/g							
Tin-126	HUh	0.00	+/-0.141	0.149	0.0697	+/-0.141		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	16.3	+/-3.97	3.97	1.73	+/-5.20	4.00	pCi/g		JXC9	09/28/16	1448	1602427	10
Beta	Hh	21.8	+/-2.94	3.45	1.64	+/-4.32	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.599	+/-0.569	1.22	0.547	+/-0.569	2.00	pCi/g		KSD1	09/22/16	1720	1597803	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.682	+/-2.51	4.31	2.09	+/-2.51	6.00	pCi/g		TXP3	09/24/16	2108	1598092	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.502	+/-0.719	1.25	0.612	+/-0.719	2.00	pCi/g		TXJ1	09/27/16	0917	1598081	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.447	+/-1.80	3.25	1.54	+/-1.80	5.00	pCi/g		CXS7	09/20/16	1656	1597414	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.1.3
 Sample ID: 405235054

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test			Batch ID			Recovery%		Acceptable Limits					
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"			1596412	76	(15%-125%)								
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"			1596408	90.3	(15%-125%)								
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"			1596408	82.8	(15%-125%)								
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"			1596411	79.7	(15%-125%)								
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"			1596407	93.3	(15%-125%)								
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"			1596410	88.5	(15%-125%)								
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"			1596414	76	(15%-125%)								
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"			1597803	92.3	(25%-125%)								
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"			1597414	92.6	(15%-125%)								

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.1.4
 Sample ID: 405235055
 Matrix: Soil
 Collect Date: 02-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 19.3%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		19.3						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.02	+/-0.0586	0.168	0.0418	+/-0.0588	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	HUh	-0.0157	+/-0.0823	0.207	0.0615	+/-0.0825	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0368	+/-0.0549	0.183	0.0537	+/-0.0551	1.00	pCi/g			HAKB	09/22/16	1424	1596408	3
Uranium-233/234	Hh	0.707	+/-0.190	0.0889	0.0254	+/-0.225	1.00	pCi/g							
Uranium-235/236	Hh	0.0381	+/-0.0502	0.0381	0.00	+/-0.0506	1.00	pCi/g							
Uranium-238	Hh	0.947	+/-0.217	0.0608	0.0114	+/-0.270	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.0277	+/-0.494	1.07	0.277	+/-0.495	1.00	pCi/g			HAKB	09/22/16	1556	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.44	+/-0.687	0.554	0.166	+/-0.721	1.00	pCi/g			HAKB	09/22/16	1344	1596407	5
Thorium-229	Hh	0.267	+/-0.295	0.390	0.112	+/-0.298	1.00	pCi/g							
Thorium-230	Hh	0.710	+/-0.426	0.389	0.111	+/-0.439	1.00	pCi/g							
Thorium-232	Hh	0.803	+/-0.436	0.306	0.0702	+/-0.452	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.017	+/-0.0605	0.0991	0.0175	+/-0.0606	1.00	pCi/g			HAKB	09/22/16	0956	1596410	6
Curium-242	Hh	0.00	+/-0.148	0.222	0.00	+/-0.148	1.00	pCi/g							
Curium-243/244	HUh	-0.0134	+/-0.046	0.127	0.0307	+/-0.0461	1.00	pCi/g							
Curium-245/246	Hh	0.00	+/-0.0489	0.0733	0.00	+/-0.049	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	0.440	+/-8.36	14.4	7.01	+/-8.36	15.0	pCi/g			HAKB	09/24/16	0453	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.0833	+/-0.361	0.865	0.273	+/-0.363	1.00	pCi/g			MJH1	09/28/16	1515	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0469	+/-0.204	0.363	0.166	+/-0.205		pCi/g			MXR1	10/03/16	0718	1596252	9
Antimony-125	HUh	0.00308	+/-0.105	0.205	0.0932	+/-0.105		pCi/g							
Bismuth-212	HUh	0.00	+/-0.734	1.20	0.552	+/-0.819		pCi/g							
Bismuth-214	Hh	0.785	+/-0.176	0.112	0.0494	+/-0.180		pCi/g							
Cesium-137	HUh	-0.00211	+/-0.0311	0.0647	0.0286	+/-0.0311	0.100	pCi/g							
Cobalt-60	HUh	0.00585	+/-0.0396	0.0822	0.0352	+/-0.0397		pCi/g							
Europium-154	HUh	-0.0184	+/-0.0824	0.164	0.0664	+/-0.0828		pCi/g							
Lead-212	Hh	1.14	+/-0.122	0.0856	0.0396	+/-0.137		pCi/g							
Lead-214	Hh	1.08	+/-0.203	0.328	0.159	+/-0.208		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.1.4
 Sample ID: 405235055

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	15.7	+/-1.64	0.753	0.322	+/-1.83		pCi/g							
Protactinium-231	HUh	0.00	+/-0.462	0.908	0.423	+/-0.516		pCi/g							
Radium-226	Hh	0.785	+/-0.176	0.112	0.0494	+/-0.180		pCi/g							
Radium-228	Hh	0.951	+/-0.298	0.199	0.0844	+/-0.302		pCi/g							
Thallium-208	Hh	0.345	+/-0.0764	0.0678	0.0306	+/-0.0778		pCi/g							
Tin-126	HUh	0.00	+/-0.138	0.100	0.047	+/-0.140		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	21.1	+/-4.85	3.98	1.64	+/-6.48	4.00	pCi/g		JXC9	09/28/16	1448	1602427	10
Beta	Hh	23.3	+/-2.96	2.74	1.26	+/-4.44	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.797	+/-0.573	1.24	0.560	+/-0.573	2.00	pCi/g		KSD1	09/22/16	1721	1597803	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.550	+/-2.56	4.41	2.14	+/-2.56	6.00	pCi/g		TXP3	09/24/16	2252	1598092	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.383	+/-0.679	1.18	0.577	+/-0.679	2.00	pCi/g		TXJ1	09/27/16	1029	1598081	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.234	+/-1.85	3.26	1.54	+/-1.85	5.00	pCi/g		CXS7	09/20/16	1745	1597414	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.1.4
Sample ID: 405235055

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596412	64.1	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	83.6	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	98.9	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596411	79.9	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596407	98.8	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596410	81.7	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596414	64.1	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597803	89.6	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597414	90	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.2.2
 Sample ID: 405235056
 Matrix: Soil
 Collect Date: 02-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 31.8%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		31.8						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.0209	+/-0.0446	0.137	0.0369	+/-0.0447	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	HUh	-0.0178	+/-0.0439	0.131	0.034	+/-0.044	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.00495	+/-0.0717	0.169	0.0476	+/-0.0719	1.00	pCi/g			HAKB	09/22/16	1003	1596408	3
Uranium-233/234	Hh	1.14	+/-0.419	0.202	0.0435	+/-0.495	1.00	pCi/g							
Uranium-235/236	Hh	0.116	+/-0.151	0.116	0.00	+/-0.154	1.00	pCi/g							
Uranium-238	Hh	1.44	+/-0.470	0.216	0.0502	+/-0.576	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	Hh	0.00	+/-0.273	0.415	0.00	+/-0.274	1.00	pCi/g			HAKB	09/26/16	1151	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.13	+/-0.657	0.675	0.220	+/-0.683	1.00	pCi/g			HAKB	09/22/16	1344	1596407	5
Thorium-229	HUh	0.124	+/-0.297	0.538	0.181	+/-0.298	1.00	pCi/g							
Thorium-230	Hh	1.09	+/-0.527	0.408	0.117	+/-0.555	1.00	pCi/g							
Thorium-232	Hh	0.887	+/-0.472	0.355	0.0903	+/-0.493	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0122	+/-0.0574	0.145	0.0439	+/-0.0575	1.00	pCi/g			HAKB	09/22/16	0956	1596410	6
Curium-242	Hh	0.00	+/-0.131	0.197	0.00	+/-0.132	1.00	pCi/g							
Curium-243/244	Hh	0.0193	+/-0.054	0.0578	0.00	+/-0.0541	1.00	pCi/g							
Curium-245/246	HUh	0.0173	+/-0.0614	0.101	0.0178	+/-0.0615	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	1.00	+/-5.49	9.41	4.58	+/-5.49	15.0	pCi/g			HAKB	09/24/16	0554	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.167	+/-0.262	0.913	0.311	+/-0.273	1.00	pCi/g			MJH1	09/28/16	1515	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0863	+/-0.361	0.655	0.303	+/-0.363		pCi/g			MXR1	10/03/16	0750	1596252	9
Antimony-125	HUh	0.0737	+/-0.151	0.302	0.136	+/-0.155		pCi/g							
Bismuth-212	HUh	0.00	+/-0.880	1.86	0.843	+/-1.01		pCi/g							
Bismuth-214	Hh	1.48	+/-0.253	0.159	0.0684	+/-0.261		pCi/g							
Cesium-137	Hh	0.228	+/-0.100	0.0865	0.0369	+/-0.101	0.100	pCi/g							
Cobalt-60	HUh	0.0496	+/-0.0626	0.145	0.062	+/-0.0665		pCi/g							
Europium-154	HUh	0.0879	+/-0.210	0.358	0.151	+/-0.214		pCi/g							
Lead-212	Hh	1.32	+/-0.162	0.146	0.0681	+/-0.177		pCi/g							
Lead-214	Hh	1.53	+/-0.274	0.510	0.246	+/-0.282		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228
 Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes
 Client Sample ID: 4.5C.R.2.2
 Sample ID: 405235056

Report Date: October 4, 2016

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis															
<i>Gammasec, Gamma, Solid "Dry Weight Corrected"</i>															
Potassium-40	Hh	19.2	+/-2.25	0.967	0.387	+/-2.46		pCi/g							
Protactinium-231	HUh	0.00	+/-1.28	1.15	0.524	+/-1.29		pCi/g							
Radium-226	Hh	1.48	+/-0.253	0.159	0.0684	+/-0.261		pCi/g							
Radium-228	Hh	1.18	+/-0.484	0.478	0.213	+/-0.488		pCi/g							
Thallium-208	Hh	0.354	+/-0.112	0.0842	0.0365	+/-0.113		pCi/g							
Tin-126	HUh	0.00	+/-0.211	0.180	0.0841	+/-0.212		pCi/g							
Rad Gas Flow Proportional Counting															
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>															
Alpha	Hh	18.6	+/-4.44	3.95	1.65	+/-5.79	4.00	pCi/g		JXC9	09/28/16	1448	1602427	10	
Beta	Hh	31.6	+/-3.63	3.23	1.50	+/-5.91	10.0	pCi/g							
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>															
Strontium-90	HUh	-0.971	+/-0.874	1.85	0.835	+/-0.874	2.00	pCi/g		KSD1	09/22/16	1719	1597803	11	
Rad Liquid Scintillation Analysis															
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>															
Tritium	HUh	-2.66	+/-2.87	5.14	2.49	+/-2.87	6.00	pCi/g		TXP3	09/25/16	0035	1598092	12	
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>															
Carbon-14	HUh	-0.647	+/-0.823	1.43	0.702	+/-0.823	2.00	pCi/g		TXJ1	09/27/16	1141	1598081	13	
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>															
Technetium-99	HUh	0.739	+/-2.33	4.06	1.92	+/-2.33	5.00	pCi/g		CXS7	09/20/16	1729	1597414	14	

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.2.2
 Sample ID: 405235056

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test					Batch ID	Recovery%	Acceptable Limits						
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"					1596412	98.2	(15%-125%)						
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"					1596408	63.9	(15%-125%)						
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"					1596408	99.5	(15%-125%)						
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"					1596411	86.5	(15%-125%)						
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"					1596407	97.7	(15%-125%)						
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"					1596410	90.1	(15%-125%)						
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"					1596414	98.2	(15%-125%)						
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"					1597803	78.8	(25%-125%)						
Techneium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"					1597414	91.8	(15%-125%)						

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.2.3
 Sample ID: 405235057
 Matrix: Soil
 Collect Date: 02-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 27.1%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		27.1						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.0209	+/-0.0515	0.154	0.0399	+/-0.0517	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	HUh	0.0106	+/-0.0694	0.138	0.0324	+/-0.0695	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0184	+/-0.0509	0.148	0.0373	+/-0.0512	1.00	pCi/g			HAKB	09/22/16	1003	1596408	3
Uranium-233/234	Hh	0.915	+/-0.356	0.166	0.0317	+/-0.409	1.00	pCi/g							
Uranium-235/236	Hh	0.0639	+/-0.117	0.148	0.0225	+/-0.118	1.00	pCi/g							
Uranium-238	Hh	0.666	+/-0.308	0.192	0.0448	+/-0.341	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0314	+/-0.262	0.616	0.112	+/-0.262	1.00	pCi/g			HAKB	09/22/16	1553	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.29	+/-0.620	0.461	0.127	+/-0.650	1.00	pCi/g			HAKB	09/22/16	1344	1596407	5
Thorium-229	HUh	-0.0206	+/-0.192	0.447	0.146	+/-0.192	1.00	pCi/g							
Thorium-230	Hh	1.17	+/-0.519	0.431	0.138	+/-0.547	1.00	pCi/g							
Thorium-232	Hh	1.24	+/-0.514	0.313	0.0796	+/-0.545	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.0246	+/-0.062	0.104	0.0252	+/-0.0621	1.00	pCi/g			HAKB	09/22/16	0956	1596410	6
Curium-242	Hh	0.00	+/-0.123	0.185	0.00	+/-0.123	1.00	pCi/g							
Curium-243/244	HUh	-0.0333	+/-0.0422	0.143	0.0443	+/-0.0422	1.00	pCi/g							
Curium-245/246	Hh	0.00	+/-0.0407	0.061	0.00	+/-0.0408	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-4.86	+/-6.76	11.9	5.79	+/-6.76	15.0	pCi/g			HAKB	09/24/16	0655	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.0658	+/-0.148	0.356	0.144	+/-0.151	1.00	pCi/g			MJH1	09/28/16	1548	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0122	+/-0.218	0.390	0.177	+/-0.218		pCi/g			MXR1	10/03/16	0751	1596252	9
Antimony-125	HUh	0.00259	+/-0.0957	0.189	0.0836	+/-0.0957		pCi/g							
Bismuth-212	HUh	0.00	+/-0.757	1.43	0.654	+/-0.962		pCi/g							
Bismuth-214	Hh	1.11	+/-0.196	0.128	0.0563	+/-0.202		pCi/g							
Cesium-137	Hh	0.225	+/-0.0798	0.0759	0.0336	+/-0.0804	0.100	pCi/g							
Cobalt-60	HUh	-0.00665	+/-0.0424	0.0734	0.0295	+/-0.0425		pCi/g							
Europium-154	HUh	0.0281	+/-0.129	0.242	0.102	+/-0.130		pCi/g							
Lead-212	Hh	1.16	+/-0.130	0.0951	0.0439	+/-0.144		pCi/g							
Lead-214	Hh	1.17	+/-0.203	0.130	0.0591	+/-0.209		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.2.3
 Sample ID: 405235057

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	14.8	+/-1.85	0.693	0.281	+/-2.00		pCi/g							
Protactinium-231	HUh	0.0304	+/-0.520	0.853	0.391	+/-0.520		pCi/g							
Radium-226	Hh	1.11	+/-0.196	0.128	0.0563	+/-0.202		pCi/g							
Radium-228	Hh	1.46	+/-0.347	0.296	0.130	+/-0.355		pCi/g							
Thallium-208	Hh	0.322	+/-0.097	0.0655	0.0289	+/-0.098		pCi/g							
Tin-126	HUh	0.00	+/-0.105	0.081	0.0378	+/-0.106		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	22.1	+/-4.74	3.98	1.66	+/-6.35	4.00	pCi/g		JXC9	09/28/16	1448	1602427	10
Beta	Hh	23.9	+/-2.90	2.68	1.24	+/-4.46	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.749	+/-0.592	1.34	0.592	+/-0.593	2.00	pCi/g		KSD1	09/23/16	1121	1597803	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	-0.183	+/-2.78	4.82	2.34	+/-2.78	6.00	pCi/g		TXP3	09/25/16	0219	1598092	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.286	+/-0.798	1.36	0.665	+/-0.798	2.00	pCi/g		TXJ1	09/27/16	1253	1598081	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.0999	+/-1.95	3.47	1.64	+/-1.95	5.00	pCi/g		CXS7	09/20/16	1712	1597414	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.2.3
Sample ID: 405235057

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596412	78.6	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	73.6	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	94	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596411	89.7	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596407	109	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596410	97.5	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596414	78.6	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597803	91	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597414	96.7	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.2.4
 Sample ID: 405235058
 Matrix: Soil
 Collect Date: 02-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 19.8%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		19.8						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.0115	+/-0.0761	0.152	0.0356	+/-0.0763	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	Hh	0.0381	+/-0.0919	0.151	0.0354	+/-0.0921	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0251	+/-0.0586	0.176	0.0466	+/-0.0589	1.00	pCi/g			HAKB	09/22/16	1003	1596408	3
Uranium-233/234	Hh	0.771	+/-0.313	0.215	0.0621	+/-0.355	1.00	pCi/g							
Uranium-235/236	Hh	0.156	+/-0.158	0.187	0.0483	+/-0.162	1.00	pCi/g							
Uranium-238	Hh	0.557	+/-0.279	0.257	0.0834	+/-0.304	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0274	+/-0.395	0.934	0.261	+/-0.395	1.00	pCi/g			HAKB	09/22/16	1553	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.08	+/-0.624	0.595	0.182	+/-0.652	1.00	pCi/g			HAKB	09/26/16	1201	1596407	5
Thorium-229	Hh	0.131	+/-0.232	0.351	0.0893	+/-0.233	1.00	pCi/g							
Thorium-230	Hh	0.878	+/-0.483	0.444	0.136	+/-0.502	1.00	pCi/g							
Thorium-232	Hh	0.716	+/-0.422	0.317	0.0725	+/-0.436	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0158	+/-0.0567	0.147	0.0457	+/-0.0568	1.00	pCi/g			HAKB	09/22/16	0956	1596410	6
Curium-242	Hh	0.00	+/-0.129	0.193	0.00	+/-0.129	1.00	pCi/g							
Curium-243/244	HUh	-0.0155	+/-0.0407	0.118	0.0309	+/-0.0408	1.00	pCi/g							
Curium-245/246	HUh	-0.0131	+/-0.0451	0.124	0.0301	+/-0.0452	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	1.19	+/-7.09	12.2	5.92	+/-7.09	15.0	pCi/g			HAKB	09/24/16	0757	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.188	+/-0.285	0.478	0.196	+/-0.298	1.00	pCi/g			MJH1	09/28/16	1549	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.0411	+/-0.246	0.455	0.209	+/-0.246		pCi/g			MXR1	10/03/16	0751	1596252	9
Antimony-125	HUh	-0.0263	+/-0.107	0.204	0.0914	+/-0.108		pCi/g							
Bismuth-212	HUh	0.178	+/-0.543	1.08	0.479	+/-0.549		pCi/g							
Bismuth-214	Hh	0.900	+/-0.201	0.146	0.0657	+/-0.215		pCi/g							
Cesium-137	HUIh	0.00	+/-0.0407	0.0895	0.0404	+/-0.0465	0.100	pCi/g							
Cobalt-60	HUh	-0.0217	+/-0.0423	0.0769	0.031	+/-0.0434		pCi/g							
Europium-154	HUIh	0.00	+/-0.192	0.272	0.116	+/-0.209		pCi/g							
Lead-212	Hh	1.11	+/-0.136	0.094	0.0431	+/-0.169		pCi/g							
Lead-214	Hh	1.18	+/-0.209	0.363	0.175	+/-0.234		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.2.4
 Sample ID: 405235058

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	12.8	+/-1.62	0.799	0.332	+/-1.95		pCi/g							
Protactinium-231	HUh	-0.0493	+/-0.455	0.894	0.410	+/-0.456		pCi/g							
Radium-226	Hh	0.900	+/-0.201	0.146	0.0657	+/-0.215		pCi/g							
Radium-228	Hh	0.576	+/-0.375	0.291	0.127	+/-0.383		pCi/g							
Thallium-208	Hh	0.214	+/-0.102	0.066	0.0291	+/-0.104		pCi/g							
Tin-126	HUh	0.00	+/-0.128	0.127	0.0597	+/-0.129		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	16.9	+/-4.00	3.92	1.69	+/-5.20	4.00	pCi/g		JXC9	09/28/16	1448	1602427	10
Beta	Hh	21.2	+/-2.72	2.65	1.23	+/-4.04	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.0972	+/-0.753	1.40	0.640	+/-0.753	2.00	pCi/g		KSD1	09/23/16	1121	1597803	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.869	+/-2.79	4.78	2.32	+/-2.79	6.00	pCi/g		TXP3	09/25/16	0647	1598092	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.0863	+/-0.716	1.23	0.602	+/-0.716	2.00	pCi/g		TXJ1	09/27/16	1404	1598081	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.0868	+/-1.74	3.09	1.46	+/-1.74	5.00	pCi/g		CXS7	09/20/16	1835	1597414	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Company : MJW Technical Services
Address : 15 Hazelwood Drive
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Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 4.5C.R.2.4
Sample ID: 405235058

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596412	76.2	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	86.8	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	82.1	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596411	91.1	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596407	99.8	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596410	90.3	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596414	76.2	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597803	88.3	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597414	92.6	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.1A.R.1.2
 Sample ID: 405235059
 Matrix: Soil
 Collect Date: 16-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 12%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		12.0						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.0153	+/-0.0758	0.142	0.0309	+/-0.076	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	HUh	-0.0114	+/-0.0543	0.141	0.0307	+/-0.0545	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0334	+/-0.0534	0.175	0.0505	+/-0.0536	1.00	pCi/g			HAKB	09/22/16	1003	1596408	3
Uranium-233/234	Hh	0.791	+/-0.303	0.151	0.0325	+/-0.345	1.00	pCi/g							
Uranium-235/236	Hh	0.111	+/-0.127	0.124	0.0188	+/-0.129	1.00	pCi/g							
Uranium-238	Hh	0.619	+/-0.270	0.151	0.0325	+/-0.299	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.158	+/-0.343	1.06	0.281	+/-0.343	1.00	pCi/g			HAKB	09/22/16	1553	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.45	+/-0.774	0.778	0.261	+/-0.810	1.00	pCi/g			HAKB	09/22/16	1344	1596407	5
Thorium-229	Hh	0.439	+/-0.387	0.452	0.129	+/-0.393	1.00	pCi/g							
Thorium-230	Hh	0.726	+/-0.459	0.393	0.100	+/-0.473	1.00	pCi/g							
Thorium-232	Hh	0.962	+/-0.504	0.192	0.00	+/-0.527	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.0239	+/-0.085	0.139	0.0246	+/-0.0851	1.00	pCi/g			HAKB	09/22/16	0956	1596410	6
Curium-242	Hh	0.00	+/-0.196	0.294	0.00	+/-0.197	1.00	pCi/g							
Curium-243/244	Hh	0.0663	+/-0.122	0.191	0.0498	+/-0.123	1.00	pCi/g							
Curium-245/246	Hh	0.0343	+/-0.0961	0.103	0.00	+/-0.0963	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-4.9	+/-7.29	12.8	6.24	+/-7.29	15.0	pCi/g			HAKB	09/24/16	0858	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.00576	+/-0.128	0.274	0.103	+/-0.129	1.00	pCi/g			MJH1	09/28/16	1549	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.00951	+/-0.180	0.364	0.166	+/-0.180		pCi/g			MXR1	10/03/16	0752	1596252	9
Antimony-125	HUh	-0.000891	+/-0.0924	0.181	0.0812	+/-0.0924		pCi/g							
Bismuth-212	HUh	0.00	+/-0.970	1.26	0.580	+/-1.14		pCi/g							
Bismuth-214	Hh	0.795	+/-0.217	0.100	0.0436	+/-0.220		pCi/g							
Cesium-137	Hh	0.072	+/-0.0437	0.055	0.0237	+/-0.0438	0.100	pCi/g							
Cobalt-60	HUh	-0.0335	+/-0.0339	0.0522	0.020	+/-0.0371		pCi/g							
Europium-154	HUh	-0.0301	+/-0.0965	0.183	0.0756	+/-0.0974		pCi/g							
Lead-212	Hh	0.931	+/-0.118	0.0819	0.0377	+/-0.128		pCi/g							
Lead-214	Hh	0.851	+/-0.179	0.112	0.0506	+/-0.183		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.1A.R.1.2
 Sample ID: 405235059

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	10.9	+/-1.40	0.548	0.219	+/-1.51		pCi/g							
Protactinium-231	HUh	0.0471	+/-0.348	0.682	0.309	+/-0.349		pCi/g							
Radium-226	Hh	0.795	+/-0.217	0.100	0.0436	+/-0.220		pCi/g							
Radium-228	Hh	0.513	+/-0.251	0.194	0.0812	+/-0.253		pCi/g							
Thallium-208	Hh	0.286	+/-0.0704	0.0532	0.0232	+/-0.0714		pCi/g							
Tin-126	HUh	0.00	+/-0.136	0.124	0.0584	+/-0.137		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	19.9	+/-3.99	3.98	1.77	+/-5.56	4.00	pCi/g		JXC9	09/28/16	1448	1602427	10
Beta	Hh	24.8	+/-3.02	3.45	1.65	+/-4.86	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.292	+/-0.653	1.16	0.516	+/-0.655	2.00	pCi/g		KSD1	09/22/16	1718	1597803	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	-1.78	+/-2.83	4.95	2.42	+/-2.83	6.00	pCi/g		TXP3	09/26/16	0950	1598092	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.242	+/-0.688	1.17	0.574	+/-0.689	2.00	pCi/g		TXJ1	09/27/16	1516	1598081	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.587	+/-1.60	2.77	1.31	+/-1.60	5.00	pCi/g		CXS7	09/20/16	1818	1597414	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 5.1A.R.1.2
Sample ID: 405235059

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596412	72.5	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	90.4	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	93.8	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596411	81.2	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596407	94.1	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1596410	55.1	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596414	72.5	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597803	92.3	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597414	95.9	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.1A.R.1.3
 Sample ID: 405235060
 Matrix: Soil
 Collect Date: 16-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 9.64%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		9.64						percent			LYT1	09/08/16	0827	1596233	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.0108	+/-0.0389	0.107	0.0252	+/-0.039	1.00	pCi/g			HAKB	09/22/16	0956	1596412	2
Plutonium-239/240	HUh	-0.00806	+/-0.0383	0.0997	0.0217	+/-0.0384	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0171	+/-0.0587	0.163	0.0389	+/-0.059	1.00	pCi/g			HAKB	09/22/16	1003	1596408	3
Uranium-233/234	Hh	0.262	+/-0.171	0.141	0.0329	+/-0.179	1.00	pCi/g							
Uranium-235/236	Hh	0.0217	+/-0.0704	0.109	0.0165	+/-0.0706	1.00	pCi/g							
Uranium-238	Hh	0.570	+/-0.241	0.122	0.0233	+/-0.268	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.096	+/-0.412	1.06	0.318	+/-0.412	1.00	pCi/g			HAKB	09/22/16	1553	1596411	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	0.404	+/-0.528	0.787	0.245	+/-0.533	1.00	pCi/g			HAKB	09/22/16	1344	1596407	5
Thorium-229	HUh	-0.0511	+/-0.231	0.583	0.179	+/-0.232	1.00	pCi/g							
Thorium-230	Hh	1.16	+/-0.609	0.415	0.0952	+/-0.641	1.00	pCi/g							
Thorium-232	Hh	0.748	+/-0.487	0.224	0.00	+/-0.504	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.00394	+/-0.0507	0.120	0.0342	+/-0.0507	1.00	pCi/g			HAKB	09/22/16	0956	1596410	6
Curium-242	Hh	0.00	+/-0.111	0.167	0.00	+/-0.112	1.00	pCi/g							
Curium-243/244	HUh	-0.0106	+/-0.0367	0.101	0.0245	+/-0.0367	1.00	pCi/g							
Curium-245/246	Hh	0.031	+/-0.0676	0.104	0.0226	+/-0.0678	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	2.74	+/-5.93	10.1	4.91	+/-5.96	15.0	pCi/g			HAKB	09/24/16	0959	1596414	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.0572	+/-0.119	0.254	0.0668	+/-0.122	1.00	pCi/g			MJH1	09/28/16	1550	1598647	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.00776	+/-0.189	0.362	0.170	+/-0.189		pCi/g			MXR1	10/03/16	0752	1596252	9
Antimony-125	HUh	0.0261	+/-0.0828	0.158	0.0728	+/-0.0836		pCi/g							
Bismuth-212	HUh	0.00	+/-0.686	0.983	0.459	+/-0.878		pCi/g							
Bismuth-214	Hh	0.855	+/-0.176	0.108	0.0499	+/-0.180		pCi/g							
Cesium-137	Hh	0.094	+/-0.0438	0.0505	0.0228	+/-0.044	0.100	pCi/g							
Cobalt-60	HUh	0.0163	+/-0.0265	0.0568	0.0248	+/-0.0275		pCi/g							
Europium-154	HUh	0.0611	+/-0.103	0.189	0.0846	+/-0.107		pCi/g							
Lead-212	Hh	0.811	+/-0.101	0.0736	0.0344	+/-0.110		pCi/g							
Lead-214	Hh	1.07	+/-0.167	0.269	0.131	+/-0.173		pCi/g							

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Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 5.1A.R.1.3
Sample ID: 405235060

Report Date: October 4, 2016

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis															
<i>Gammascpec, Gamma, Solid "Dry Weight Corrected"</i>															
Potassium-40	Hh	12.6	+/-1.07	0.422	0.178	+/-1.26		pCi/g							
Protactinium-231	HUh	0.201	+/-0.376	0.711	0.333	+/-0.389		pCi/g							
Radium-226	Hh	0.855	+/-0.176	0.108	0.0499	+/-0.180		pCi/g							
Radium-228	Hh	0.869	+/-0.259	0.162	0.0711	+/-0.263		pCi/g							
Thallium-208	Hh	0.220	+/-0.0883	0.0472	0.0214	+/-0.0888		pCi/g							
Tin-126	HUh	0.00	+/-0.104	0.0964	0.0451	+/-0.105		pCi/g							
Rad Gas Flow Proportional Counting															
<i>GFPC, Gross A/B, solid "Dry Weight Corrected"</i>															
Alpha	Hh	17.4	+/-3.70	3.92	1.75	+/-5.03	4.00	pCi/g			JXC9	09/28/16	1449	1602427	10
Beta	Hh	22.6	+/-2.51	2.42	1.13	+/-4.10	10.0	pCi/g							
<i>GFPC, Sr90, solid "Dry Weight Corrected"</i>															
Strontium-90	HUh	0.112	+/-0.508	0.954	0.410	+/-0.508	2.00	pCi/g			KSD1	09/22/16	1718	1597803	11
Rad Liquid Scintillation Analysis															
<i>LSC, Tritium Dist, Solid "Dry Weight Corrected"</i>															
Tritium	HUh	-2.08	+/-2.20	3.94	1.91	+/-2.20	6.00	pCi/g			TXP3	09/25/16	1017	1598092	12
<i>Liquid Scint C14, Solid "Dry Weight Corrected"</i>															
Carbon-14	HUh	-0.0157	+/-0.598	1.02	0.502	+/-0.598	2.00	pCi/g			TXJ1	09/27/16	1628	1598081	13
<i>Liquid Scint Tc99, Solid "Dry Weight Corrected"</i>															
Technetium-99	HUh	-1.35	+/-1.41	2.66	1.26	+/-1.41	5.00	pCi/g			CXS7	09/20/16	1802	1597414	14

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0827	1596233

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.1A.R.1.3
 Sample ID: 405235060

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer	ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596412	92.2	(15%-125%)				
Uranium-232 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	94.7	(15%-125%)				
Uranium-235/236 Tracer	ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596408	79.8	(15%-125%)				
Americium-243 Tracer	Alphaspec Np237, Solid "Dry Weight Corrected"							1596411	85.5	(15%-125%)				
Actinium-227 Tracer	Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596407	72.5	(15%-125%)				
Americium-243 Tracer	Am241, Cm Solid "Dry Weight Corrected"							1596410	96.3	(15%-125%)				
Plutonium-242 Tracer	Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596414	92.2	(15%-125%)				
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"							1597803	88.3	(25%-125%)				
Technetium-99m Tracer	Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597414	96.3	(15%-125%)				

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.1B.R.2.2
 Sample ID: 405235061
 Matrix: Soil
 Collect Date: 14-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 17.6%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		17.6						percent			LYT1	09/08/16	0846	1596246	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0258	+/-0.0508	0.0704	0.0132	+/-0.0509	1.00	pCi/g			KXB2	09/17/16	1142	1596421	2
Plutonium-239/240	Hh	0.0257	+/-0.0505	0.070	0.0131	+/-0.0506	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.0232	+/-0.0794	0.147	0.0401	+/-0.0795	1.00	pCi/g			KXB2	09/17/16	1142	1596418	3
Uranium-233/234	Hh	0.585	+/-0.188	0.0462	0.00	+/-0.214	1.00	pCi/g							
Uranium-235/236	Hh	0.0309	+/-0.0529	0.0463	0.00	+/-0.0532	1.00	pCi/g							
Uranium-238	Hh	0.800	+/-0.220	0.0462	0.00	+/-0.260	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.102	+/-0.237	0.704	0.192	+/-0.238	1.00	pCi/g			KXB2	09/22/16	0959	1596420	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	0.491	+/-0.506	0.689	0.217	+/-0.514	1.00	pCi/g			KXB2	09/19/16	1741	1596417	5
Thorium-229	Hh	0.00	+/-0.130	0.193	0.00	+/-0.130	1.00	pCi/g							
Thorium-230	Hh	0.707	+/-0.437	0.193	0.00	+/-0.450	1.00	pCi/g							
Thorium-232	Hh	0.850	+/-0.490	0.391	0.0995	+/-0.507	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	Hh	0.142	+/-0.243	0.213	0.00	+/-0.244	1.00	pCi/g			KXB2	09/22/16	1753	1599981	6
Curium-242	Hh	0.00	+/-0.470	0.700	0.00	+/-0.471	1.00	pCi/g							
Curium-243/244	Hh	0.00	+/-0.145	0.216	0.00	+/-0.145	1.00	pCi/g							
Curium-245/246	Hh	0.081	+/-0.228	0.243	0.00	+/-0.228	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-1.33	+/-4.61	7.97	3.89	+/-4.61	15.0	pCi/g			KXB2	09/21/16	1435	1596422	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUIh	0.00	+/-0.328	0.449	0.183	+/-0.328	1.00	pCi/g			MJH1	09/28/16	1909	1598663	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.12	+/-0.189	0.350	0.160	+/-0.197		pCi/g			MXR1	10/03/16	0552	1596254	9
Antimony-125	HUh	0.068	+/-0.0832	0.178	0.0804	+/-0.0887		pCi/g							
Bismuth-212	HUIh	0.00	+/-0.504	1.12	0.513	+/-0.633		pCi/g							
Bismuth-214	Hh	0.922	+/-0.164	0.114	0.0512	+/-0.168		pCi/g							
Cesium-137	HUh	0.0251	+/-0.039	0.0783	0.0357	+/-0.0407	0.100	pCi/g							
Cobalt-60	HUh	0.0224	+/-0.0301	0.0701	0.0295	+/-0.0318		pCi/g							
Europium-154	HUh	0.0331	+/-0.098	0.208	0.0895	+/-0.0992		pCi/g							
Lead-212	Hh	0.802	+/-0.112	0.0916	0.0428	+/-0.120		pCi/g							
Lead-214	Hh	1.19	+/-0.158	0.102	0.0459	+/-0.166		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.1B.R.2.2
 Sample ID: 405235061

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	10.5	+/-1.37	0.674	0.286	+/-1.47		pCi/g							
Protactinium-231	HUh	0.00	+/-0.553	0.521	0.231	+/-0.593		pCi/g							
Radium-226	Hh	0.922	+/-0.164	0.114	0.0512	+/-0.168		pCi/g							
Radium-228	HUh	0.00	+/-0.227	0.497	0.234	+/-0.465		pCi/g							
Thallium-208	Hh	0.264	+/-0.0737	0.0515	0.0227	+/-0.0745		pCi/g							
Tin-126	HUh	0.0261	+/-0.125	0.109	0.0517	+/-0.126		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	28.5	+/-6.85	3.64	1.21	+/-8.71	4.00	pCi/g		JXC9	09/22/16	1239	1597817	10
Beta	Hh	37.7	+/-4.83	2.94	1.26	+/-7.08	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.823	+/-0.639	1.42	0.634	+/-0.640	2.00	pCi/g		BXF1	09/27/16	1539	1597804	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.635	+/-2.11	3.63	1.75	+/-2.11	6.00	pCi/g		TXP3	09/26/16	1335	1598096	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.0115	+/-0.738	1.27	0.620	+/-0.738	2.00	pCi/g		TXJ1	09/29/16	0031	1598082	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.147	+/-0.973	1.72	0.808	+/-0.974	5.00	pCi/g		CXS7	09/20/16	0558	1597417	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0846	1596246

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 5.1B.R.2.2
Sample ID: 405235061

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test						Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"						1596421	88	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596418	80.7	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596418	64.1	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"						1596420	62.2	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"						1596417	104	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"						1599981	94.9	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"						1596422	88	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"						1597804	95	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"						1597417	94.4	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.A.R.1.2
 Sample ID: 405235062
 Matrix: Soil
 Collect Date: 14-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 19.4%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		19.4						percent			LYT1	09/08/16	0846	1596246	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.00479	+/-0.0501	0.105	0.0266	+/-0.0502	1.00	pCi/g			KXB2	09/17/16	1142	1596421	2
Plutonium-239/240	HUh	-0.0204	+/-0.0387	0.119	0.0341	+/-0.0388	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	Hh	0.0327	+/-0.0651	0.106	0.0288	+/-0.0654	1.00	pCi/g			KXB2	09/17/16	1142	1596418	3
Uranium-233/234	Hh	0.647	+/-0.236	0.137	0.0374	+/-0.264	1.00	pCi/g							
Uranium-235/236	Hh	0.0577	+/-0.0831	0.100	0.0188	+/-0.0838	1.00	pCi/g							
Uranium-238	Hh	0.954	+/-0.281	0.100	0.0187	+/-0.330	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.024	+/-0.251	0.524	0.133	+/-0.251	1.00	pCi/g			KXB2	09/22/16	0959	1596420	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	0.234	+/-0.407	0.646	0.185	+/-0.410	1.00	pCi/g			KXB2	09/19/16	1741	1596417	5
Thorium-229	Hh	0.176	+/-0.279	0.386	0.0885	+/-0.280	1.00	pCi/g							
Thorium-230	Hh	0.871	+/-0.513	0.385	0.0883	+/-0.531	1.00	pCi/g							
Thorium-232	Hh	0.399	+/-0.363	0.333	0.0622	+/-0.368	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.037	+/-0.164	0.427	0.0978	+/-0.164	1.00	pCi/g			KXB2	09/22/16	1753	1599981	6
Curium-242	HUh	-0.0609	+/-0.525	1.22	0.228	+/-0.526	1.00	pCi/g							
Curium-243/244	HUh	-0.0375	+/-0.166	0.433	0.0992	+/-0.166	1.00	pCi/g							
Curium-245/246	HXh	0.529	+/-0.459	0.264	0.00	+/-0.465	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-5.88	+/-4.74	8.38	4.10	+/-4.74	15.0	pCi/g			KXB2	09/21/16	1606	1596422	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.00633	+/-0.128	0.361	0.108	+/-0.128	1.00	pCi/g			MJH1	09/28/16	1909	1598663	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.249	+/-0.253	0.413	0.183	+/-0.279		pCi/g			MXR1	10/03/16	0553	1596254	9
Antimony-125	HUh	-0.00782	+/-0.0964	0.201	0.0855	+/-0.0965		pCi/g							
Bismuth-212	HUh	0.507	+/-1.06	1.48	0.652	+/-1.09		pCi/g							
Bismuth-214	Hh	0.881	+/-0.205	0.144	0.0609	+/-0.208		pCi/g							
Cesium-137	HUIh	0.00	+/-0.0638	0.0743	0.0308	+/-0.0639	0.100	pCi/g							
Cobalt-60	HUh	-0.0307	+/-0.0466	0.0834	0.0308	+/-0.0486		pCi/g							
Europium-154	HUh	-0.0193	+/-0.140	0.289	0.116	+/-0.140		pCi/g							
Lead-212	Hh	0.897	+/-0.140	0.0957	0.0431	+/-0.148		pCi/g							
Lead-214	Hh	1.02	+/-0.219	0.394	0.189	+/-0.223		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.A.R.1.2
 Sample ID: 405235062

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	10.3	+/-1.84	0.678	0.239	+/-1.92		pCi/g							
Protactinium-231	HUh	0.259	+/-0.545	1.07	0.488	+/-0.560		pCi/g							
Radium-226	Hh	0.881	+/-0.205	0.144	0.0609	+/-0.208		pCi/g							
Radium-228	Hh	1.03	+/-0.387	0.313	0.130	+/-0.390		pCi/g							
Thallium-208	Hh	0.238	+/-0.0747	0.0643	0.0266	+/-0.0754		pCi/g							
Tin-126	HUh	0.00635	+/-0.207	0.148	0.0696	+/-0.207		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	16.6	+/-3.93	4.00	1.74	+/-5.09	4.00	pCi/g		JXC9	09/22/16	1239	1597817	10
Beta	Hh	31.2	+/-3.15	2.56	1.19	+/-5.59	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.0085	+/-0.969	1.80	0.814	+/-0.969	2.00	pCi/g		BXF1	09/27/16	1539	1597804	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	1.14	+/-2.25	3.84	1.85	+/-2.25	6.00	pCi/g		TXP3	09/26/16	1510	1598096	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.065	+/-0.756	1.29	0.633	+/-0.756	2.00	pCi/g		TXJ1	09/29/16	0255	1598082	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.0577	+/-1.04	1.85	0.869	+/-1.04	5.00	pCi/g		CXS7	09/20/16	0626	1597417	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0846	1596246

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.A.R.1.2
 Sample ID: 405235062

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596421	83.5	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596418	64.8	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596418	90.8	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596420	83.5	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596417	98.5	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1599981	86.8	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596422	83.5	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597804	86.9	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597417	92.1	(15%-125%)				

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.A.R.1.3
 Sample ID: 405235063
 Matrix: Soil
 Collect Date: 14-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 10.5%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		10.5						percent			LYT1	09/08/16	0846	1596246	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0159	+/-0.0448	0.0478	0.00	+/-0.0448	1.00	pCi/g			KXB2	09/17/16	1142	1596421	2
Plutonium-239/240	HUh	0.00823	+/-0.0457	0.0877	0.0201	+/-0.0458	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.00436	+/-0.0455	0.095	0.0242	+/-0.0456	1.00	pCi/g			KXB2	09/17/16	1142	1596418	3
Uranium-233/234	Hh	0.622	+/-0.242	0.170	0.0522	+/-0.268	1.00	pCi/g							
Uranium-235/236	Hh	0.0335	+/-0.077	0.122	0.028	+/-0.0772	1.00	pCi/g							
Uranium-238	Hh	0.600	+/-0.233	0.134	0.0342	+/-0.258	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.0471	+/-0.262	0.501	0.115	+/-0.262	1.00	pCi/g			KXB2	09/22/16	0959	1596420	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.41	+/-0.660	0.490	0.138	+/-0.697	1.00	pCi/g			KXB2	09/19/16	1803	1596417	5
Thorium-229	Hh	0.0829	+/-0.190	0.302	0.0692	+/-0.191	1.00	pCi/g							
Thorium-230	Hh	0.274	+/-0.288	0.359	0.0977	+/-0.291	1.00	pCi/g							
Thorium-232	Hh	0.380	+/-0.302	0.163	0.00	+/-0.307	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	Hh	0.0585	+/-0.164	0.175	0.00	+/-0.165	1.00	pCi/g			KXB2	09/22/16	1753	1599981	6
Curium-242	HUh	-0.0462	+/-0.398	0.923	0.173	+/-0.399	1.00	pCi/g							
Curium-243/244	Hh	0.00	+/-0.119	0.178	0.00	+/-0.120	1.00	pCi/g							
Curium-245/246	Hh	0.134	+/-0.229	0.201	0.00	+/-0.230	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-4.21	+/-5.03	8.81	4.31	+/-5.03	15.0	pCi/g			KXB2	09/21/16	1737	1596422	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.0176	+/-0.200	0.416	0.158	+/-0.201	1.00	pCi/g			MJH1	09/28/16	1910	1598663	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.032	+/-0.230	0.425	0.195	+/-0.231		pCi/g			MXR1	10/03/16	0553	1596254	9
Antimony-125	HUh	0.0909	+/-0.119	0.248	0.113	+/-0.126		pCi/g							
Bismuth-212	HUh	0.00	+/-1.07	1.32	0.604	+/-1.13		pCi/g							
Bismuth-214	Hh	0.860	+/-0.230	0.125	0.055	+/-0.233		pCi/g							
Cesium-137	HUh	0.0309	+/-0.0428	0.0883	0.0399	+/-0.045	0.100	pCi/g							
Cobalt-60	HUh	-0.0124	+/-0.0393	0.0748	0.0305	+/-0.0397		pCi/g							
Europium-154	HUh	0.0544	+/-0.111	0.245	0.104	+/-0.114		pCi/g							
Lead-212	Hh	0.989	+/-0.132	0.0893	0.0411	+/-0.142		pCi/g							
Lead-214	Hh	0.957	+/-0.183	0.133	0.0604	+/-0.188		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.A.R.1.3
 Sample ID: 405235063

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	11.6	+/-1.59	0.823	0.349	+/-1.70		pCi/g							
Protactinium-231	HUh	0.00	+/-0.644	0.896	0.413	+/-0.680		pCi/g							
Radium-226	Hh	0.860	+/-0.230	0.125	0.055	+/-0.233		pCi/g							
Radium-228	Hh	1.14	+/-0.396	0.227	0.0957	+/-0.400		pCi/g							
Thallium-208	Hh	0.243	+/-0.0819	0.0715	0.0319	+/-0.0825		pCi/g							
Tin-126	HUh	0.00	+/-0.133	0.121	0.0562	+/-0.134		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	35.9	+/-5.02	3.93	1.74	+/-8.55	4.00	pCi/g		JXC9	09/22/16	1239	1597817	10
Beta	Hh	39.3	+/-3.20	2.23	1.03	+/-6.59	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.500	+/-0.924	1.61	0.729	+/-0.928	2.00	pCi/g		BXF1	09/28/16	0851	1597804	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	Hh	1.83	+/-2.01	3.37	1.62	+/-2.01	6.00	pCi/g		TXP3	09/26/16	1643	1598096	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.0622	+/-0.657	1.13	0.551	+/-0.657	2.00	pCi/g		TXJ1	09/29/16	0406	1598082	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.343	+/-0.880	1.53	0.718	+/-0.880	5.00	pCi/g		CXS7	09/20/16	0653	1597417	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0846	1596246

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.A.R.1.3
 Sample ID: 405235063

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test					Batch ID	Recovery%	Acceptable Limits						
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"					1596421	78.5	(15%-125%)						
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"					1596418	60.2	(15%-125%)						
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"					1596418	92.5	(15%-125%)						
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"					1596420	74.7	(15%-125%)						
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"					1596417	110	(15%-125%)						
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"					1599981	104	(15%-125%)						
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"					1596422	78.5	(15%-125%)						
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"					1597804	86.9	(25%-125%)						
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"					1597417	92.9	(15%-125%)						

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.A.R.1.4
 Sample ID: 405235064
 Matrix: Soil
 Collect Date: 14-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 8.16%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		8.16						percent			LYT1	09/08/16	0846	1596246	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0295	+/-0.0587	0.0953	0.026	+/-0.0589	1.00	pCi/g			KXB2	09/17/16	1142	1596421	2
Plutonium-239/240	HUh	-0.0173	+/-0.0327	0.101	0.0289	+/-0.0328	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.026	+/-0.0755	0.141	0.0461	+/-0.0757	1.00	pCi/g			KXB2	09/19/16	1547	1596418	3
Uranium-233/234	Hh	0.700	+/-0.267	0.151	0.0385	+/-0.299	1.00	pCi/g							
Uranium-235/236	Hh	0.00	+/-0.0501	0.0745	0.00	+/-0.0503	1.00	pCi/g							
Uranium-238	Hh	0.588	+/-0.243	0.119	0.0222	+/-0.268	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	Hh	0.242	+/-0.481	0.781	0.213	+/-0.482	1.00	pCi/g			KXB2	09/22/16	0959	1596420	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	2.18	+/-1.09	0.768	0.194	+/-1.16	1.00	pCi/g			KXB2	09/19/16	1741	1596417	5
Thorium-229	Hh	0.147	+/-0.337	0.534	0.122	+/-0.338	1.00	pCi/g							
Thorium-230	Hh	0.481	+/-0.464	0.289	0.00	+/-0.472	1.00	pCi/g							
Thorium-232	Hh	1.44	+/-0.754	0.288	0.00	+/-0.796	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.00272	+/-0.202	0.448	0.122	+/-0.202	1.00	pCi/g			KXB2	09/22/16	1753	1599981	6
Curium-242	Hh	0.00	+/-0.451	0.671	0.00	+/-0.452	1.00	pCi/g							
Curium-243/244	HUh	-0.0827	+/-0.157	0.483	0.138	+/-0.157	1.00	pCi/g							
Curium-245/246	HXh	0.233	+/-0.307	0.233	0.00	+/-0.308	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-3.29	+/-4.38	7.66	3.75	+/-4.38	15.0	pCi/g			KXB2	09/21/16	1908	1596422	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.0487	+/-0.244	0.378	0.172	+/-0.245	1.00	pCi/g			MJH1	09/29/16	0619	1598663	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0385	+/-0.200	0.392	0.181	+/-0.201		pCi/g			MXR1	10/03/16	0544	1596254	9
Antimony-125	HUh	-0.0366	+/-0.0928	0.172	0.0773	+/-0.0943		pCi/g							
Bismuth-212	HUh	0.00	+/-0.935	1.43	0.665	+/-1.33		pCi/g							
Bismuth-214	Hh	0.994	+/-0.171	0.129	0.0584	+/-0.177		pCi/g							
Cesium-137	HUh	-0.0037	+/-0.0402	0.0763	0.0346	+/-0.0403	0.100	pCi/g							
Cobalt-60	HUh	0.0221	+/-0.0363	0.0756	0.032	+/-0.0376		pCi/g							
Europium-154	HUh	-0.0397	+/-0.0989	0.180	0.075	+/-0.101		pCi/g							
Lead-212	Hh	1.04	+/-0.133	0.0845	0.0392	+/-0.144		pCi/g							
Lead-214	Hh	1.22	+/-0.204	0.314	0.152	+/-0.210		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.A.R.1.4
 Sample ID: 405235064

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	12.7	+/-1.48	0.719	0.307	+/-1.62		pCi/g							
Protactinium-231	HUh	0.00	+/-0.669	0.712	0.326	+/-0.744		pCi/g							
Radium-226	Hh	0.994	+/-0.171	0.129	0.0584	+/-0.177		pCi/g							
Radium-228	Hh	0.903	+/-0.293	0.244	0.107	+/-0.297		pCi/g							
Thallium-208	Hh	0.306	+/-0.0844	0.0577	0.0256	+/-0.0854		pCi/g							
Tin-126	HUh	0.00	+/-0.143	0.151	0.0718	+/-0.144		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	21.7	+/-4.92	3.99	1.63	+/-6.51	4.00	pCi/g		JXC9	09/22/16	1240	1597817	10
Beta	Hh	31.5	+/-3.80	3.63	1.69	+/-6.01	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.0966	+/-0.745	1.40	0.614	+/-0.746	2.00	pCi/g		BXF1	09/28/16	0851	1597804	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	-0.00112	+/-1.91	3.32	1.60	+/-1.91	6.00	pCi/g		TXP3	09/26/16	1817	1598096	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.222	+/-0.672	1.14	0.560	+/-0.673	2.00	pCi/g		TXJ1	09/29/16	0517	1598082	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.016	+/-0.849	1.52	0.712	+/-0.849	5.00	pCi/g		CXS7	09/20/16	0721	1597417	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0846	1596246

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.A.R.1.4
 Sample ID: 405235064

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test						Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"						1596421	91	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596418	57	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596418	98.3	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"						1596420	64.9	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"						1596417	69.8	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"						1599981	107	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"						1596422	91	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"						1597804	80.1	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"						1597417	91.4	(15%-125%)				

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: 5.2A.R.2.3
 Sample ID: 405235065
 Matrix: Soil
 Collect Date: 14-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 10.1%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		10.1						percent			LYT1	09/08/16	0846	1596246	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0124	+/-0.0349	0.0372	0.00	+/-0.0349	1.00	pCi/g			KXB2	09/17/16	1142	1596421	2
Plutonium-239/240	HUh	-0.00888	+/-0.0268	0.0753	0.0192	+/-0.0269	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0209	+/-0.0476	0.130	0.0424	+/-0.0476	1.00	pCi/g			KXB2	09/17/16	1142	1596418	3
Uranium-233/234	Hh	0.659	+/-0.204	0.0482	0.00	+/-0.232	1.00	pCi/g							
Uranium-235/236	Hh	0.0967	+/-0.0839	0.0484	0.00	+/-0.0855	1.00	pCi/g							
Uranium-238	Hh	0.663	+/-0.207	0.0982	0.025	+/-0.235	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	Hh	0.641	+/-0.610	0.643	0.147	+/-0.614	1.00	pCi/g			KXB2	09/22/16	0959	1596420	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.14	+/-0.649	0.599	0.179	+/-0.676	1.00	pCi/g			KXB2	09/19/16	1741	1596417	5
Thorium-229	HUh	-0.0292	+/-0.129	0.337	0.0771	+/-0.129	1.00	pCi/g							
Thorium-230	Hh	0.820	+/-0.463	0.336	0.0769	+/-0.479	1.00	pCi/g							
Thorium-232	Hh	0.604	+/-0.394	0.181	0.00	+/-0.405	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0985	+/-0.187	0.575	0.165	+/-0.187	1.00	pCi/g			KXB2	09/22/16	1753	1599981	6
Curium-242	Hh	0.00	+/-0.544	0.810	0.00	+/-0.546	1.00	pCi/g							
Curium-243/244	Hh	0.166	+/-0.285	0.250	0.00	+/-0.286	1.00	pCi/g							
Curium-245/246	Hh	0.188	+/-0.321	0.281	0.00	+/-0.323	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-2.13	+/-4.55	7.90	3.86	+/-4.55	15.0	pCi/g			KXB2	09/21/16	2039	1596422	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.0554	+/-0.207	0.417	0.170	+/-0.209	1.00	pCi/g			MJH1	09/29/16	0620	1598663	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.128	+/-0.198	0.338	0.154	+/-0.207		pCi/g			MXR1	10/03/16	0557	1596254	9
Antimony-125	HUh	-0.0197	+/-0.081	0.156	0.0691	+/-0.0815		pCi/g							
Bismuth-212	HUh	0.00	+/-0.858	1.27	0.584	+/-0.927		pCi/g							
Bismuth-214	Hh	0.984	+/-0.194	0.129	0.0581	+/-0.199		pCi/g							
Cesium-137	HUh	0.0325	+/-0.0369	0.0774	0.035	+/-0.0398	0.100	pCi/g							
Cobalt-60	HUh	0.0293	+/-0.0452	0.0909	0.0392	+/-0.0471		pCi/g							
Europium-154	HUh	0.0228	+/-0.115	0.233	0.100	+/-0.116		pCi/g							
Lead-212	Hh	1.08	+/-0.122	0.0782	0.0361	+/-0.135		pCi/g							
Lead-214	Hh	1.31	+/-0.192	0.334	0.162	+/-0.200		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2A.R.2.3
 Sample ID: 405235065

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	14.9	+/-1.62	0.707	0.296	+/-1.79		pCi/g							
Protactinium-231	HUh	0.00	+/-0.652	0.639	0.290	+/-0.706		pCi/g							
Radium-226	Hh	0.984	+/-0.194	0.129	0.0581	+/-0.199		pCi/g							
Radium-228	Hh	1.17	+/-0.293	0.233	0.101	+/-0.300		pCi/g							
Thallium-208	Hh	0.359	+/-0.0862	0.0502	0.0218	+/-0.0876		pCi/g							
Tin-126	HUh	0.00	+/-0.084	0.0691	0.0324	+/-0.0855		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	16.4	+/-5.58	3.56	1.08	+/-6.34	4.00	pCi/g		JXC9	09/22/16	1240	1597817	10
Beta	Hh	17.7	+/-3.85	3.41	1.46	+/-4.50	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	Hh	1.02	+/-0.909	1.46	0.629	+/-0.929	2.00	pCi/g		BXF1	09/27/16	1539	1597804	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	1.23	+/-2.00	3.40	1.64	+/-2.00	6.00	pCi/g		TXP3	09/26/16	1950	1598096	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.30	+/-0.640	1.11	0.543	+/-0.640	2.00	pCi/g		TXJ1	09/29/16	0629	1598082	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.364	+/-0.883	1.63	0.763	+/-0.883	5.00	pCi/g		CXS7	09/20/16	0748	1597417	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0846	1596246

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2A.R.2.3
 Sample ID: 405235065

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596421	91.1	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596418	88.2	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596418	99.2	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596420	58.7	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596417	114	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1599981	87.5	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596422	91.1	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597804	84.2	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597417	89.1	(15%-125%)				

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228
 Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes
 Client Sample ID: 5.2.A.R.2.4
 Sample ID: 405235066
 Matrix: Soil
 Collect Date: 14-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 9.29%

Report Date: October 4, 2016

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		9.29						percent			LYT1	09/08/16	0846	1596246	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.030	+/-0.053	0.0803	0.0204	+/-0.0531	1.00	pCi/g			KXB2	09/17/16	1142	1596421	2
Plutonium-239/240	HUh	-0.00261	+/-0.0392	0.0916	0.0262	+/-0.0392	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.00443	+/-0.0664	0.155	0.0444	+/-0.0666	1.00	pCi/g			KXB2	09/17/16	1142	1596418	3
Uranium-233/234	Hh	0.712	+/-0.227	0.130	0.0386	+/-0.261	1.00	pCi/g							
Uranium-235/236	HUh	0.0225	+/-0.062	0.108	0.0274	+/-0.0622	1.00	pCi/g							
Uranium-238	Hh	0.738	+/-0.229	0.116	0.0315	+/-0.265	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0606	+/-0.274	0.690	0.212	+/-0.274	1.00	pCi/g			KXB2	09/22/16	0959	1596420	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	0.469	+/-0.591	0.889	0.288	+/-0.599	1.00	pCi/g			KXB2	09/19/16	1741	1596417	5
Thorium-229	Hh	0.00	+/-0.159	0.237	0.00	+/-0.160	1.00	pCi/g							
Thorium-230	Hh	0.515	+/-0.442	0.437	0.100	+/-0.450	1.00	pCi/g							
Thorium-232	Hh	0.828	+/-0.538	0.436	0.0999	+/-0.555	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	Hh	0.00	+/-0.144	0.215	0.00	+/-0.145	1.00	pCi/g			KXB2	09/22/16	1755	1599981	6
Curium-242	Hh	0.00	+/-0.475	0.707	0.00	+/-0.476	1.00	pCi/g							
Curium-243/244	Hh	0.00	+/-0.146	0.218	0.00	+/-0.147	1.00	pCi/g							
Curium-245/246	Hh	0.0819	+/-0.230	0.246	0.00	+/-0.230	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-3.42	+/-4.43	7.75	3.79	+/-4.43	15.0	pCi/g			KXB2	09/21/16	2210	1596422	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.012	+/-0.292	0.623	0.245	+/-0.292	1.00	pCi/g			MJH1	09/29/16	0630	1598663	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.0968	+/-0.220	0.421	0.194	+/-0.225		pCi/g			MXR1	10/03/16	0557	1596254	9
Antimony-125	HUh	-0.0479	+/-0.0868	0.162	0.0717	+/-0.0895		pCi/g							
Bismuth-212	HUIh	0.00	+/-0.746	1.19	0.544	+/-0.914		pCi/g							
Bismuth-214	Hh	0.903	+/-0.191	0.0939	0.0405	+/-0.195		pCi/g							
Cesium-137	HUIh	0.00	+/-0.0333	0.0772	0.0349	+/-0.0403	0.100	pCi/g							
Cobalt-60	HUh	-0.00205	+/-0.0339	0.0695	0.0288	+/-0.034		pCi/g							
Europium-154	HUh	0.0238	+/-0.0922	0.184	0.0765	+/-0.0928		pCi/g							
Lead-212	Hh	0.792	+/-0.144	0.113	0.0534	+/-0.150		pCi/g							
Lead-214	Hh	1.11	+/-0.160	0.116	0.0525	+/-0.166		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.A.R.2.4
 Sample ID: 405235066

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	13.6	+/-1.47	0.590	0.241	+/-1.63		pCi/g							
Protactinium-231	HUh	0.00	+/-0.617	0.658	0.297	+/-0.634		pCi/g							
Radium-226	Hh	0.903	+/-0.191	0.0939	0.0405	+/-0.195		pCi/g							
Radium-228	Hh	0.861	+/-0.392	0.209	0.0892	+/-0.395		pCi/g							
Thallium-208	Hh	0.347	+/-0.0826	0.0529	0.0231	+/-0.0839		pCi/g							
Tin-126	HUh	0.00	+/-0.217	0.150	0.0709	+/-0.217		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	26.5	+/-6.87	3.83	1.26	+/-8.56	4.00	pCi/g		JXC9	09/22/16	1240	1597817	10
Beta	Hh	28.9	+/-4.26	2.69	1.14	+/-6.06	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.452	+/-0.594	1.24	0.552	+/-0.594	2.00	pCi/g		BXF1	09/28/16	0851	1597804	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	1.47	+/-1.92	3.25	1.57	+/-1.92	6.00	pCi/g		TXP3	09/26/16	2123	1598096	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.27	+/-0.641	1.11	0.544	+/-0.641	2.00	pCi/g		TXJ1	09/29/16	0740	1598082	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.000319	+/-0.867	1.55	0.727	+/-0.867	5.00	pCi/g		CXS7	09/20/16	0816	1597417	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0846	1596246

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
Suite 112
Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 5.2.A.R.2.4
Sample ID: 405235066

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596421	90.3	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596418	70.9	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596418	63.3	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596420	74.4	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596417	86.6	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1599981	86	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596422	90.3	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597804	84.2	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597417	94.1	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Company : MJW Technical Services
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 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2A.R.6.2
 Sample ID: 405235067
 Matrix: Soil
 Collect Date: 11-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 13.9%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		13.9						percent			LYT1	09/08/16	0846	1596246	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0221	+/-0.0435	0.0603	0.0113	+/-0.0436	1.00	pCi/g			KXB2	09/17/16	1142	1596421	2
Plutonium-239/240	HUh	-0.006	+/-0.0265	0.0693	0.0159	+/-0.0266	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.0006	+/-0.0445	0.0989	0.0269	+/-0.0446	1.00	pCi/g			KXB2	09/17/16	1142	1596418	3
Uranium-233/234	Hh	0.563	+/-0.188	0.142	0.0497	+/-0.209	1.00	pCi/g							
Uranium-235/236	HUh	0.00459	+/-0.0523	0.111	0.034	+/-0.0523	1.00	pCi/g							
Uranium-238	Hh	0.708	+/-0.203	0.106	0.0314	+/-0.234	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.068	+/-0.305	0.596	0.170	+/-0.305	1.00	pCi/g			KXB2	09/22/16	0959	1596420	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.23	+/-0.757	0.870	0.304	+/-0.785	1.00	pCi/g			KXB2	09/19/16	1741	1596417	5
Thorium-229	HUh	-0.0317	+/-0.140	0.366	0.0838	+/-0.140	1.00	pCi/g							
Thorium-230	Hh	0.990	+/-0.537	0.434	0.118	+/-0.558	1.00	pCi/g							
Thorium-232	Hh	0.853	+/-0.482	0.197	0.00	+/-0.500	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.0776	+/-0.214	0.370	0.0943	+/-0.214	1.00	pCi/g			KXB2	09/22/16	1755	1599981	6
Curium-242	Hh	0.00	+/-0.407	0.606	0.00	+/-0.408	1.00	pCi/g							
Curium-243/244	Hh	0.00	+/-0.124	0.184	0.00	+/-0.124	1.00	pCi/g							
Curium-245/246	Hh	0.00	+/-0.140	0.208	0.00	+/-0.140	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-0.892	+/-4.48	7.73	3.78	+/-4.48	15.0	pCi/g			KXB2	09/21/16	2341	1596422	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.0119	+/-0.227	0.508	0.180	+/-0.227	1.00	pCi/g			MJH1	09/29/16	0634	1598663	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.121	+/-0.219	0.403	0.184	+/-0.226		pCi/g			MXR1	10/03/16	0558	1596254	9
Antimony-125	HUh	-0.0314	+/-0.117	0.216	0.0976	+/-0.118		pCi/g							
Bismuth-212	HUh	0.00	+/-0.888	1.52	0.702	+/-1.20		pCi/g							
Bismuth-214	Hh	0.724	+/-0.186	0.121	0.0532	+/-0.195		pCi/g							
Cesium-137	HUh	0.00	+/-0.0428	0.0368	0.0141	+/-0.0432	0.100	pCi/g							
Cobalt-60	HUh	-0.0303	+/-0.0431	0.0725	0.0288	+/-0.0452		pCi/g							
Europium-154	HUh	-0.0476	+/-0.127	0.234	0.097	+/-0.129		pCi/g							
Lead-212	Hh	0.922	+/-0.118	0.0879	0.0404	+/-0.147		pCi/g							
Lead-214	Hh	1.01	+/-0.209	0.324	0.156	+/-0.226		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
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 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2A.R.6.2
 Sample ID: 405235067

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	11.2	+/-1.46	0.699	0.281	+/-1.74		pCi/g							
Protactinium-231	HUh	0.00	+/-1.15	0.755	0.343	+/-1.17		pCi/g							
Radium-226	Hh	0.724	+/-0.186	0.121	0.0532	+/-0.195		pCi/g							
Radium-228	Hh	0.691	+/-0.281	0.255	0.109	+/-0.292		pCi/g							
Thallium-208	Hh	0.223	+/-0.0744	0.0602	0.0263	+/-0.0768		pCi/g							
Tin-126	HUh	0.00	+/-0.0967	0.0947	0.0448	+/-0.0982		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	22.7	+/-4.31	3.31	1.38	+/-6.19	4.00	pCi/g		JXC9	09/22/16	1357	1597817	10
Beta	Hh	30.6	+/-2.98	2.70	1.27	+/-5.17	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.464	+/-0.743	1.52	0.678	+/-0.743	2.00	pCi/g		BXF1	09/28/16	0850	1597804	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	1.39	+/-2.57	4.37	2.11	+/-2.57	6.00	pCi/g		TXP3	09/26/16	2258	1598096	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.0984	+/-0.678	1.17	0.571	+/-0.678	2.00	pCi/g		TXJ1	09/29/16	0851	1598082	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.152	+/-0.867	1.57	0.737	+/-0.867	5.00	pCi/g		CXS7	09/20/16	0843	1597417	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0846	1596246

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2A.R.6.2
 Sample ID: 405235067

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test					Batch ID	Recovery%	Acceptable Limits						
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"					1596421	92	(15%-125%)						
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"					1596418	83.9	(15%-125%)						
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"					1596418	96.3	(15%-125%)						
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"					1596420	81.7	(15%-125%)						
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"					1596417	105	(15%-125%)						
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"					1599981	118	(15%-125%)						
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"					1596422	92	(15%-125%)						
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"					1597804	84.2	(25%-125%)						
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"					1597417	95	(15%-125%)						

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2A.R.4.2
 Sample ID: 405235068
 Matrix: Soil
 Collect Date: 11-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 13.9%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		13.9						percent			LYT1	09/08/16	0846	1596246	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.00587	+/-0.0506	0.117	0.0219	+/-0.0508	1.00	pCi/g			KXB2	09/17/16	1142	1596421	2
Plutonium-239/240	HUh	0.00778	+/-0.0886	0.188	0.0577	+/-0.0887	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0294	+/-0.0415	0.136	0.0416	+/-0.0416	1.00	pCi/g			KXB2	09/17/16	1142	1596418	3
Uranium-233/234	Hh	0.783	+/-0.224	0.147	0.0509	+/-0.260	1.00	pCi/g							
Uranium-235/236	Hh	0.073	+/-0.0807	0.107	0.0305	+/-0.0817	1.00	pCi/g							
Uranium-238	Hh	1.01	+/-0.245	0.0839	0.0192	+/-0.299	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.126	+/-0.332	0.598	0.178	+/-0.333	1.00	pCi/g			KXB2	09/22/16	0959	1596420	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	0.974	+/-0.691	0.702	0.199	+/-0.712	1.00	pCi/g			KXB2	09/19/16	1742	1596417	5
Thorium-229	HUh	0.0583	+/-0.219	0.368	0.0689	+/-0.219	1.00	pCi/g							
Thorium-230	Hh	0.958	+/-0.565	0.424	0.0972	+/-0.585	1.00	pCi/g							
Thorium-232	Hh	0.498	+/-0.428	0.423	0.0969	+/-0.435	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0838	+/-0.159	0.490	0.140	+/-0.159	1.00	pCi/g			KXB2	09/22/16	1755	1599981	6
Curium-242	Hh	0.00	+/-0.469	0.698	0.00	+/-0.470	1.00	pCi/g							
Curium-243/244	HUh	-0.034	+/-0.150	0.392	0.0898	+/-0.151	1.00	pCi/g							
Curium-245/246	HXh	0.239	+/-0.315	0.239	0.00	+/-0.317	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-7.65	+/-8.52	14.9	7.31	+/-8.52	15.0	pCi/g			KXB2	09/22/16	0225	1596422	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.0393	+/-0.125	0.577	0.148	+/-0.126	1.00	pCi/g			MJH1	09/29/16	0645	1598663	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.105	+/-0.287	0.502	0.225	+/-0.292		pCi/g			MXR1	10/03/16	0605	1596254	9
Antimony-125	HUh	-0.0441	+/-0.123	0.235	0.102	+/-0.125		pCi/g							
Bismuth-212	HUh	0.594	+/-0.766	1.58	0.701	+/-0.812		pCi/g							
Bismuth-214	Hh	0.862	+/-0.255	0.160	0.0688	+/-0.258		pCi/g							
Cesium-137	HUIh	0.00	+/-0.0803	0.0907	0.0388	+/-0.0805	0.100	pCi/g							
Cobalt-60	HUh	-0.0195	+/-0.0654	0.123	0.051	+/-0.066		pCi/g							
Europium-154	HUh	0.0529	+/-0.132	0.305	0.124	+/-0.134		pCi/g							
Lead-212	Hh	0.892	+/-0.184	0.130	0.0597	+/-0.190		pCi/g							
Lead-214	Hh	1.08	+/-0.262	0.158	0.0696	+/-0.266		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2A.R.4.2
 Sample ID: 405235068

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	10.7	+/-1.72	0.196	0.00	+/-1.81		pCi/g							
Protactinium-231	HUh	0.479	+/-0.591	1.26	0.579	+/-0.637		pCi/g							
Radium-226	Hh	0.862	+/-0.255	0.160	0.0688	+/-0.258		pCi/g							
Radium-228	Hh	0.598	+/-0.299	0.410	0.178	+/-0.301		pCi/g							
Thallium-208	Hh	0.333	+/-0.0999	0.0792	0.0338	+/-0.101		pCi/g							
Tin-126	HUh	0.00	+/-0.132	0.110	0.051	+/-0.133		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	23.1	+/-4.69	3.78	1.58	+/-6.59	4.00	pCi/g		JXC9	09/22/16	1357	1597817	10
Beta	Hh	26.6	+/-3.05	3.26	1.55	+/-4.82	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.093	+/-0.975	1.78	0.825	+/-0.975	2.00	pCi/g		BXF1	09/27/16	1539	1597804	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	Hh	1.96	+/-2.06	3.45	1.66	+/-2.06	6.00	pCi/g		TXP3	09/27/16	0032	1598096	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.00569	+/-0.689	1.18	0.578	+/-0.689	2.00	pCi/g		TXJ1	09/29/16	1002	1598082	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.347	+/-0.969	1.78	0.834	+/-0.969	5.00	pCi/g		CXS7	09/20/16	0911	1597417	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0846	1596246

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 5.2A.R.4.2
Sample ID: 405235068

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test						Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"						1596421	47.7	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596418	83.6	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596418	87.7	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"						1596420	83.7	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"						1596417	93.6	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"						1599981	100	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"						1596422	47.7	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"						1597804	89.6	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"						1597417	89.5	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.1.4

Sample ID: 405235069

Matrix: Soil

Collect Date: 16-DEC-15

Receive Date: 06-SEP-16

Collector: Client

Moisture: 10.6%

Project: MJWC00115

Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		10.6						percent			LYT1	09/08/16	0846	1596246	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.00999	+/-0.0302	0.0847	0.0216	+/-0.0302	1.00	pCi/g			KXB2	09/17/16	1142	1596421	2
Plutonium-239/240	HUh	-0.0165	+/-0.0313	0.0967	0.0277	+/-0.0314	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.0123	+/-0.055	0.107	0.0308	+/-0.055	1.00	pCi/g			KXB2	09/17/16	1142	1596418	3
Uranium-233/234	Hh	0.829	+/-0.206	0.0897	0.0257	+/-0.244	1.00	pCi/g							
Uranium-235/236	Hh	0.0385	+/-0.0506	0.0385	0.00	+/-0.051	1.00	pCi/g							
Uranium-238	Hh	0.816	+/-0.202	0.0613	0.0115	+/-0.240	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.0573	+/-0.215	0.361	0.0676	+/-0.215	1.00	pCi/g			KXB2	09/22/16	0959	1596420	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.52	+/-0.758	0.599	0.170	+/-0.800	1.00	pCi/g			KXB2	09/19/16	1742	1596417	5
Thorium-229	Hh	0.166	+/-0.263	0.364	0.0834	+/-0.264	1.00	pCi/g							
Thorium-230	Hh	0.889	+/-0.520	0.485	0.144	+/-0.539	1.00	pCi/g							
Thorium-232	Hh	0.784	+/-0.463	0.196	0.00	+/-0.479	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.0373	+/-0.207	0.398	0.0911	+/-0.208	1.00	pCi/g			KXB2	09/22/16	1755	1599981	6
Curium-242	Hh	0.00	+/-0.472	0.703	0.00	+/-0.473	1.00	pCi/g							
Curium-243/244	HUh	-0.0873	+/-0.165	0.510	0.146	+/-0.166	1.00	pCi/g							
Curium-245/246	Hh	0.0821	+/-0.231	0.246	0.00	+/-0.231	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-5.61	+/-4.94	8.72	4.26	+/-4.94	15.0	pCi/g			KXB2	09/22/16	0356	1596422	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.0542	+/-0.386	0.892	0.316	+/-0.386	1.00	pCi/g			MJH1	09/29/16	0646	1598663	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.03	+/-0.228	0.435	0.201	+/-0.228		pCi/g			MXR1	10/03/16	0605	1596254	9
Antimony-125	HUh	0.0365	+/-0.0967	0.194	0.0871	+/-0.0981		pCi/g							
Bismuth-212	HUh	0.00	+/-1.22	0.857	0.373	+/-1.22		pCi/g							
Bismuth-214	Hh	0.993	+/-0.166	0.123	0.0545	+/-0.171		pCi/g							
Cesium-137	HUh	-0.00406	+/-0.0411	0.0794	0.0357	+/-0.0412	0.100	pCi/g							
Cobalt-60	HUh	0.0163	+/-0.0365	0.0827	0.0347	+/-0.0373		pCi/g							
Europium-154	HUh	0.020	+/-0.131	0.269	0.117	+/-0.132		pCi/g							
Lead-212	Hh	0.870	+/-0.120	0.094	0.0437	+/-0.129		pCi/g							
Lead-214	Hh	1.22	+/-0.202	0.344	0.167	+/-0.208		pCi/g							

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Company : MJW Technical Services
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.1.4
 Sample ID: 405235069

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	13.8	+/-1.63	0.635	0.256	+/-1.78		pCi/g							
Protactinium-231	HUh	0.00	+/-0.851	0.783	0.359	+/-0.905		pCi/g							
Radium-226	Hh	0.993	+/-0.166	0.123	0.0545	+/-0.171		pCi/g							
Radium-228	Hh	1.30	+/-0.286	0.224	0.095	+/-0.294		pCi/g							
Thallium-208	Hh	0.305	+/-0.0768	0.061	0.0269	+/-0.0779		pCi/g							
Tin-126	HUh	0.024	+/-0.150	0.177	0.0842	+/-0.151		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	17.0	+/-4.04	3.77	1.59	+/-5.23	4.00	pCi/g		JXC9	09/22/16	1357	1597817	10
Beta	Hh	21.4	+/-2.76	3.02	1.42	+/-4.07	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.526	+/-0.831	1.45	0.626	+/-0.837	2.00	pCi/g		BXF1	09/27/16	1539	1597804	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	Hh	2.26	+/-2.00	3.33	1.61	+/-2.00	6.00	pCi/g		TXP3	09/27/16	0316	1598096	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.00499	+/-0.674	1.16	0.565	+/-0.674	2.00	pCi/g		TXJ1	09/29/16	1114	1598082	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.183	+/-0.879	1.55	0.727	+/-0.879	5.00	pCi/g		CXS7	09/20/16	0938	1597417	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0846	1596246

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Company : MJW Technical Services
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.1.4
 Sample ID: 405235069

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596421	80.3	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596418	83.8	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596418	97.5	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596420	89.2	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596417	96.3	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1599981	98.1	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596422	80.3	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597804	81.5	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597417	89.3	(15%-125%)				

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.3.2
 Sample ID: 405235070
 Matrix: Soil
 Collect Date: 11-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 18.9%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		18.9						percent			LYT1	09/08/16	0846	1596246	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.00372	+/-0.0321	0.0744	0.0139	+/-0.0322	1.00	pCi/g			KXB2	09/17/16	1142	1596421	2
Plutonium-239/240	HUh	-0.0074	+/-0.0327	0.0854	0.0196	+/-0.0328	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0215	+/-0.0346	0.110	0.0328	+/-0.0347	1.00	pCi/g			KXB2	09/17/16	1142	1596418	3
Uranium-233/234	Hh	0.602	+/-0.175	0.0778	0.0198	+/-0.200	1.00	pCi/g							
Uranium-235/236	HUh	0.0133	+/-0.0454	0.0841	0.0229	+/-0.0454	1.00	pCi/g							
Uranium-238	Hh	0.802	+/-0.202	0.0839	0.0228	+/-0.239	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	Hh	0.0843	+/-0.237	0.253	0.00	+/-0.237	1.00	pCi/g			KXB2	09/22/16	0959	1596420	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	0.794	+/-0.651	0.815	0.266	+/-0.667	1.00	pCi/g			KXB2	09/19/16	1742	1596417	5
Thorium-229	Hh	0.180	+/-0.286	0.396	0.0908	+/-0.288	1.00	pCi/g							
Thorium-230	Hh	0.428	+/-0.372	0.214	0.00	+/-0.378	1.00	pCi/g							
Thorium-232	Hh	1.28	+/-0.609	0.213	0.00	+/-0.642	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	Hh	0.00	+/-0.134	0.200	0.00	+/-0.135	1.00	pCi/g			KXB2	09/22/16	1755	1599981	6
Curium-242	Hh	0.00	+/-0.448	0.667	0.00	+/-0.449	1.00	pCi/g							
Curium-243/244	Hh	0.0677	+/-0.190	0.203	0.00	+/-0.190	1.00	pCi/g							
Curium-245/246	Hh	0.153	+/-0.261	0.229	0.00	+/-0.262	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-3.56	+/-5.28	9.21	4.50	+/-5.28	15.0	pCi/g			KXB2	09/22/16	0527	1596422	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.118	+/-0.181	0.338	0.119	+/-0.189	1.00	pCi/g			MJH1	09/29/16	0653	1598663	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.00526	+/-0.216	0.395	0.182	+/-0.216		pCi/g			MXR1	10/03/16	0608	1596254	9
Antimony-125	HUh	-0.0182	+/-0.0902	0.157	0.0694	+/-0.0905		pCi/g							
Bismuth-212	HUIh	0.00	+/-0.930	1.28	0.591	+/-1.11		pCi/g							
Bismuth-214	Hh	0.966	+/-0.176	0.105	0.0461	+/-0.181		pCi/g							
Cesium-137	HUIh	0.00	+/-0.071	0.0657	0.0292	+/-0.0711	0.100	pCi/g							
Cobalt-60	HUh	0.0239	+/-0.0296	0.0753	0.0318	+/-0.0316		pCi/g							
Europium-154	HUh	0.0236	+/-0.0961	0.204	0.0866	+/-0.0967		pCi/g							
Lead-212	Hh	0.836	+/-0.110	0.0758	0.0348	+/-0.119		pCi/g							
Lead-214	Hh	1.00	+/-0.169	0.100	0.045	+/-0.174		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.3.2
 Sample ID: 405235070

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	11.7	+/-1.35	0.515	0.204	+/-1.48		pCi/g							
Protactinium-231	HUh	-0.0614	+/-0.403	0.715	0.327	+/-0.404		pCi/g							
Radium-226	Hh	0.966	+/-0.176	0.105	0.0461	+/-0.181		pCi/g							
Radium-228	Hh	0.566	+/-0.322	0.222	0.0957	+/-0.323		pCi/g							
Thallium-208	Hh	0.258	+/-0.0727	0.0577	0.0256	+/-0.0735		pCi/g							
Tin-126	Hh	0.101	+/-0.116	0.105	0.0493	+/-0.117		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	15.2	+/-3.46	3.10	1.31	+/-4.58	4.00	pCi/g		JXC9	09/22/16	1357	1597817	10
Beta	Hh	23.8	+/-2.74	2.70	1.26	+/-4.30	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.589	+/-0.442	1.12	0.477	+/-0.442	2.00	pCi/g		BXF1	09/28/16	0850	1597804	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	1.56	+/-2.30	3.90	1.88	+/-2.30	6.00	pCi/g		TXP3	09/27/16	0450	1598096	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.148	+/-0.740	1.27	0.624	+/-0.740	2.00	pCi/g		TXJ1	09/29/16	1225	1598082	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.0532	+/-1.00	1.78	0.836	+/-1.00	5.00	pCi/g		CXS7	09/20/16	1006	1597417	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0846	1596246

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.3.2
 Sample ID: 405235070

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.	
Surrogate/Tracer Recovery		Test			Batch ID			Recovery%		Acceptable Limits						
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"						1596421								78.8 (15%-125%)
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596418								89.3 (15%-125%)
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596418								93.4 (15%-125%)
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"						1596420								81.2 (15%-125%)
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"						1596417								93.6 (15%-125%)
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"						1599981								96.8 (15%-125%)
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"						1596422								78.8 (15%-125%)
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"						1597804								86.9 (25%-125%)
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"						1597417								93.4 (15%-125%)

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.4.2
 Sample ID: 405235071
 Matrix: Soil
 Collect Date: 11-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 16.6%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		16.6						percent			LYT1	09/08/16	0846	1596246	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0511	+/-0.0602	0.0651	0.0122	+/-0.0606	1.00	pCi/g			KXB2	09/17/16	1142	1596421	2
Plutonium-239/240	Hh	0.0373	+/-0.0537	0.0647	0.0121	+/-0.0539	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.00297	+/-0.0446	0.104	0.0298	+/-0.0447	1.00	pCi/g			KXB2	09/17/16	1142	1596418	3
Uranium-233/234	Hh	0.531	+/-0.166	0.0891	0.0255	+/-0.186	1.00	pCi/g							
Uranium-235/236	HUh	0.0168	+/-0.0527	0.0987	0.0302	+/-0.0528	1.00	pCi/g							
Uranium-238	Hh	0.693	+/-0.187	0.0703	0.0161	+/-0.217	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	Hh	0.186	+/-0.366	0.507	0.0949	+/-0.366	1.00	pCi/g			KXB2	09/22/16	0959	1596420	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	0.306	+/-0.368	0.515	0.152	+/-0.373	1.00	pCi/g			KXB2	09/19/16	1750	1596417	5
Thorium-229	HUh	-0.0128	+/-0.111	0.256	0.0479	+/-0.111	1.00	pCi/g							
Thorium-230	Hh	0.307	+/-0.279	0.256	0.0478	+/-0.282	1.00	pCi/g							
Thorium-232	Hh	0.425	+/-0.313	0.159	0.00	+/-0.319	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0316	+/-0.140	0.365	0.0836	+/-0.140	1.00	pCi/g			KXB2	09/22/16	1755	1599981	6
Curium-242	Hh	0.00	+/-0.443	0.659	0.00	+/-0.444	1.00	pCi/g							
Curium-243/244	HUh	-0.0481	+/-0.145	0.408	0.104	+/-0.146	1.00	pCi/g							
Curium-245/246	Hh	0.151	+/-0.258	0.226	0.00	+/-0.259	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-0.832	+/-4.89	8.44	4.13	+/-4.89	15.0	pCi/g			KXB2	09/22/16	0658	1596422	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.283	+/-0.260	0.787	0.309	+/-0.291	1.00	pCi/g			MJH1	09/29/16	0704	1598663	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.0687	+/-0.212	0.432	0.198	+/-0.215		pCi/g			MXR1	10/03/16	0645	1596254	9
Antimony-125	HUh	-0.0358	+/-0.106	0.199	0.089	+/-0.108		pCi/g							
Bismuth-212	HUIh	0.00	+/-0.987	0.994	0.437	+/-0.989		pCi/g							
Bismuth-214	Hh	0.746	+/-0.173	0.107	0.0461	+/-0.176		pCi/g							
Cesium-137	HUIh	0.00	+/-0.0625	0.0605	0.0258	+/-0.0627	0.100	pCi/g							
Cobalt-60	HUh	0.0286	+/-0.0363	0.089	0.0373	+/-0.0386		pCi/g							
Europium-154	HUh	-0.0159	+/-0.0894	0.186	0.0741	+/-0.0897		pCi/g							
Lead-212	Hh	0.775	+/-0.121	0.0929	0.0428	+/-0.128		pCi/g							
Lead-214	Hh	1.02	+/-0.192	0.334	0.161	+/-0.196		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.4.2
 Sample ID: 405235071

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	12.3	+/-1.61	0.619	0.243	+/-1.73		pCi/g							
Protactinium-231	HUh	0.00	+/-1.18	0.846	0.387	+/-1.19		pCi/g							
Radium-226	Hh	0.746	+/-0.173	0.107	0.0461	+/-0.176		pCi/g							
Radium-228	Hh	0.861	+/-0.261	0.220	0.0917	+/-0.264		pCi/g							
Thallium-208	Hh	0.217	+/-0.0618	0.0533	0.0227	+/-0.0625		pCi/g							
Tin-126	HUh	0.00	+/-0.126	0.155	0.0732	+/-0.127		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	14.8	+/-3.76	3.43	1.42	+/-4.81	4.00	pCi/g		JXC9	09/22/16	1357	1597817	10
Beta	Hh	19.0	+/-2.60	2.90	1.36	+/-3.72	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.325	+/-0.832	1.66	0.737	+/-0.832	2.00	pCi/g		BXF1	09/27/16	1539	1597804	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	-0.231	+/-2.58	4.50	2.17	+/-2.58	6.00	pCi/g		TXP3	09/27/16	0625	1598096	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.112	+/-0.731	1.25	0.612	+/-0.731	2.00	pCi/g		TXJ1	09/29/16	1336	1598082	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.444	+/-1.12	1.95	0.917	+/-1.12	5.00	pCi/g		CXS7	09/20/16	1033	1597417	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0846	1596246

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Buffalo, New York 14228
Contact: Ms. Laurie Losey
Project: Soil Radioisotopes
Client Sample ID: 5.2.B.R.4.2
Sample ID: 405235071

Report Date: October 4, 2016

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596421	83.6	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596418	86.7	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596418	96.7	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596420	62	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596417	116	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1599981	91.4	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596422	83.6	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597804	86.9	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597417	90.9	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.2.4
 Sample ID: 405235072
 Matrix: Soil
 Collect Date: 15-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 8.17%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		8.17						percent			LYT1	09/08/16	0846	1596246	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.0114	+/-0.0426	0.0717	0.0134	+/-0.0427	1.00	pCi/g			KXB2	09/17/16	1142	1596421	2
Plutonium-239/240	HUh	0.0113	+/-0.0424	0.0712	0.0133	+/-0.0424	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.0085	+/-0.0472	0.0905	0.0207	+/-0.0473	1.00	pCi/g			KXB2	09/17/16	1142	1596418	3
Uranium-233/234	Hh	0.939	+/-0.244	0.154	0.0542	+/-0.291	1.00	pCi/g							
Uranium-235/236	Hh	0.107	+/-0.0905	0.0999	0.0272	+/-0.0923	1.00	pCi/g							
Uranium-238	Hh	0.711	+/-0.208	0.0996	0.0271	+/-0.240	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.0837	+/-0.286	0.530	0.144	+/-0.286	1.00	pCi/g			KXB2	09/22/16	0959	1596420	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.09	+/-0.658	0.646	0.198	+/-0.684	1.00	pCi/g			KXB2	09/19/16	1749	1596417	5
Thorium-229	Hh	0.127	+/-0.218	0.190	0.00	+/-0.218	1.00	pCi/g							
Thorium-230	Hh	0.950	+/-0.497	0.190	0.00	+/-0.519	1.00	pCi/g							
Thorium-232	Hh	0.679	+/-0.431	0.303	0.0566	+/-0.444	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0148	+/-0.222	0.518	0.148	+/-0.222	1.00	pCi/g			KXB2	09/22/16	1755	1599981	6
Curium-242	Hh	0.00	+/-0.488	0.726	0.00	+/-0.489	1.00	pCi/g							
Curium-243/244	HUh	-0.0718	+/-0.166	0.493	0.134	+/-0.167	1.00	pCi/g							
Curium-245/246	Hh	0.00	+/-0.170	0.253	0.00	+/-0.170	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-0.293	+/-5.63	9.68	4.73	+/-5.63	15.0	pCi/g			KXB2	09/22/16	0829	1596422	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.00515	+/-0.352	0.761	0.289	+/-0.352	1.00	pCi/g			MJH1	09/29/16	0711	1598663	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.0734	+/-0.182	0.333	0.153	+/-0.185		pCi/g			MXR1	10/03/16	0645	1596254	9
Antimony-125	HUh	-0.00985	+/-0.0726	0.145	0.0648	+/-0.0727		pCi/g							
Bismuth-212	HUh	0.00	+/-0.603	1.05	0.483	+/-0.832		pCi/g							
Bismuth-214	Hh	0.986	+/-0.149	0.0982	0.0437	+/-0.155		pCi/g							
Cesium-137	HUh	0.0159	+/-0.0264	0.0564	0.0251	+/-0.0274	0.100	pCi/g							
Cobalt-60	HUh	-0.00332	+/-0.0326	0.0644	0.0271	+/-0.0326		pCi/g							
Europium-154	HUh	0.00365	+/-0.0927	0.187	0.0802	+/-0.0927		pCi/g							
Lead-212	Hh	0.929	+/-0.102	0.0758	0.0352	+/-0.114		pCi/g							
Lead-214	Hh	1.10	+/-0.150	0.0958	0.0434	+/-0.157		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.2.4
 Sample ID: 405235072

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	15.0	+/-1.44	0.374	0.141	+/-1.64		pCi/g							
Protactinium-231	HUh	0.0695	+/-0.409	0.708	0.328	+/-0.411		pCi/g							
Radium-226	Hh	0.986	+/-0.149	0.0982	0.0437	+/-0.155		pCi/g							
Radium-228	Hh	1.01	+/-0.239	0.206	0.0898	+/-0.245		pCi/g							
Thallium-208	Hh	0.297	+/-0.0609	0.0562	0.0253	+/-0.0622		pCi/g							
Tin-126	HUh	0.00	+/-0.0488	0.0967	0.0463	+/-0.0715		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	18.3	+/-4.04	3.01	1.20	+/-5.37	4.00	pCi/g		JXC9	09/22/16	1357	1597817	10
Beta	Hh	22.9	+/-2.72	2.74	1.29	+/-4.18	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.264	+/-0.826	1.64	0.725	+/-0.826	2.00	pCi/g		BXF1	09/27/16	1540	1597804	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.772	+/-1.90	3.26	1.57	+/-1.90	6.00	pCi/g		TXP3	09/27/16	0758	1598096	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.384	+/-0.652	1.10	0.540	+/-0.652	2.00	pCi/g		TXJ1	09/29/16	1447	1598082	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.0651	+/-0.850	1.53	0.717	+/-0.850	5.00	pCi/g		CXS7	09/20/16	1101	1597417	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0846	1596246

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Project: Soil Radioisotopes

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Sample ID: 405235072

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test						Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"						1596421	73.7	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596418	73.2	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596418	87.4	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"						1596420	87.5	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"						1596417	97.2	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"						1599981	98.9	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"						1596422	73.7	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"						1597804	86.9	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"						1597417	91.1	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.8.2
 Sample ID: 405235073
 Matrix: Soil
 Collect Date: 11-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 18.9%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		18.9						percent			LYT1	09/08/16	0846	1596246	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.00657	+/-0.0365	0.070	0.016	+/-0.0366	1.00	pCi/g			KXB2	09/17/16	1142	1596421	2
Plutonium-239/240	Hh	0.0256	+/-0.051	0.0828	0.0225	+/-0.0511	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.0192	+/-0.053	0.0918	0.0234	+/-0.053	1.00	pCi/g			KXB2	09/17/16	1142	1596418	3
Uranium-233/234	Hh	0.678	+/-0.202	0.104	0.0297	+/-0.231	1.00	pCi/g							
Uranium-235/236	Hh	0.0487	+/-0.0666	0.0908	0.0231	+/-0.0671	1.00	pCi/g							
Uranium-238	Hh	0.771	+/-0.214	0.0976	0.0266	+/-0.249	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.111	+/-0.378	0.701	0.191	+/-0.378	1.00	pCi/g			KXB2	09/22/16	0959	1596420	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.21	+/-0.790	0.731	0.198	+/-0.823	1.00	pCi/g			KXB2	09/19/16	1749	1596417	5
Thorium-229	Hh	0.00	+/-0.170	0.253	0.00	+/-0.171	1.00	pCi/g							
Thorium-230	Hh	0.737	+/-0.525	0.404	0.0755	+/-0.541	1.00	pCi/g							
Thorium-232	Hh	0.671	+/-0.495	0.252	0.00	+/-0.509	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	Hh	0.147	+/-0.251	0.220	0.00	+/-0.252	1.00	pCi/g			KXB2	09/22/16	1755	1599981	6
Curium-242	HUh	-0.117	+/-0.519	1.35	0.310	+/-0.520	1.00	pCi/g							
Curium-243/244	HUh	-0.0536	+/-0.162	0.454	0.116	+/-0.162	1.00	pCi/g							
Curium-245/246	Hh	0.00	+/-0.169	0.252	0.00	+/-0.169	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-5.28	+/-4.68	8.26	4.04	+/-4.69	15.0	pCi/g			KXB2	09/22/16	1000	1596422	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.115	+/-0.373	0.827	0.278	+/-0.377	1.00	pCi/g			MJH1	09/29/16	0718	1598663	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0814	+/-0.233	0.409	0.186	+/-0.236		pCi/g			MXR1	10/03/16	0646	1596254	9
Antimony-125	HUh	-0.0602	+/-0.0947	0.173	0.0763	+/-0.0986		pCi/g							
Bismuth-212	HUh	0.00	+/-0.513	1.15	0.518	+/-0.601		pCi/g							
Bismuth-214	Hh	0.849	+/-0.157	0.114	0.050	+/-0.173		pCi/g							
Cesium-137	Hh	0.121	+/-0.0558	0.0623	0.027	+/-0.0567	0.100	pCi/g							
Cobalt-60	HUh	-0.033	+/-0.0397	0.066	0.0259	+/-0.0425		pCi/g							
Europium-154	HUh	-0.0381	+/-0.115	0.218	0.0903	+/-0.116		pCi/g							
Lead-212	Hh	0.779	+/-0.155	0.116	0.0543	+/-0.170		pCi/g							
Lead-214	Hh	1.06	+/-0.169	0.328	0.158	+/-0.194		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.8.2
 Sample ID: 405235073

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammasec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	11.7	+/-1.45	0.355	0.112	+/-1.76		pCi/g							
Protactinium-231	HUh	-0.0449	+/-0.388	0.774	0.351	+/-0.389		pCi/g							
Radium-226	Hh	0.849	+/-0.157	0.114	0.050	+/-0.173		pCi/g							
Radium-228	HUh	0.00	+/-0.334	0.520	0.242	+/-0.428		pCi/g							
Thallium-208	Hh	0.303	+/-0.0843	0.0603	0.0265	+/-0.0883		pCi/g							
Tin-126	HUh	0.00	+/-0.138	0.123	0.0576	+/-0.139		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	27.6	+/-5.03	3.97	1.68	+/-7.39	4.00	pCi/g		JXC9	09/22/16	1357	1597817	10
Beta	Hh	39.4	+/-3.28	2.74	1.29	+/-6.39	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.27	+/-0.886	1.66	0.765	+/-0.886	2.00	pCi/g		BXF1	09/27/16	1540	1597804	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	1.17	+/-2.14	3.64	1.75	+/-2.14	6.00	pCi/g		TXP3	09/27/16	0932	1598096	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.547	+/-0.749	1.26	0.618	+/-0.750	2.00	pCi/g		TXJ1	09/29/16	1559	1598082	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.381	+/-0.970	1.78	0.837	+/-0.970	5.00	pCi/g		CXS7	09/20/16	1128	1597417	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0846	1596246

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
Address : 15 Hazelwood Drive
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Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
Project: Soil Radioisotopes

Client Sample ID: 5.2.B.R.8.2
Sample ID: 405235073

Project: MJWC00115
Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596421	86	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596418	83.9	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596418	91.7	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596420	76	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596417	72.1	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1599981	91.5	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596422	86	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597804	89.6	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597417	89.6	(15%-125%)				

Notes:
The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey

Project: Soil Radioisotopes

Client Sample ID: 5.3.A.R.1.3
 Sample ID: 405235074
 Matrix: Soil
 Collect Date: 15-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 10.7%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		10.7						percent			LYT1	09/08/16	0846	1596246	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.00	+/-0.050	0.0744	0.00	+/-0.0501	1.00	pCi/g			KXB2	09/17/16	1142	1596421	2
Plutonium-239/240	HUh	0.000986	+/-0.0731	0.162	0.0442	+/-0.0732	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.00986	+/-0.0298	0.0836	0.0213	+/-0.0298	1.00	pCi/g			KXB2	09/17/16	1142	1596418	3
Uranium-233/234	Hh	0.639	+/-0.202	0.120	0.0367	+/-0.228	1.00	pCi/g							
Uranium-235/236	HUh	0.00434	+/-0.0454	0.0947	0.0241	+/-0.0454	1.00	pCi/g							
Uranium-238	Hh	0.967	+/-0.245	0.114	0.034	+/-0.292	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.0753	+/-0.404	0.810	0.277	+/-0.404	1.00	pCi/g			KXB2	09/22/16	0959	1596420	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.10	+/-0.681	0.732	0.241	+/-0.705	1.00	pCi/g			KXB2	09/19/16	1750	1596417	5
Thorium-229	HUh	-0.0456	+/-0.138	0.387	0.0985	+/-0.138	1.00	pCi/g							
Thorium-230	Hh	1.04	+/-0.528	0.350	0.0802	+/-0.551	1.00	pCi/g							
Thorium-232	Hh	0.411	+/-0.353	0.349	0.080	+/-0.359	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0336	+/-0.148	0.387	0.0887	+/-0.149	1.00	pCi/g			KXB2	09/22/16	1755	1599981	6
Curium-242	HUh	-0.055	+/-0.474	1.10	0.206	+/-0.475	1.00	pCi/g							
Curium-243/244	HUh	0.0539	+/-0.202	0.340	0.0636	+/-0.202	1.00	pCi/g							
Curium-245/246	Hh	0.0799	+/-0.225	0.240	0.00	+/-0.225	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-7.43	+/-8.81	15.4	7.55	+/-8.81	15.0	pCi/g			KXB2	09/22/16	1132	1596422	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.0791	+/-0.278	0.532	0.149	+/-0.280	1.00	pCi/g			MJH1	09/29/16	0718	1598663	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.121	+/-0.180	0.343	0.157	+/-0.189		pCi/g			MXR1	10/03/16	0646	1596254	9
Antimony-125	HUh	0.0202	+/-0.0825	0.169	0.0759	+/-0.083		pCi/g							
Bismuth-212	HUh	0.00	+/-0.651	1.10	0.503	+/-0.802		pCi/g							
Bismuth-214	Hh	0.863	+/-0.198	0.115	0.0515	+/-0.201		pCi/g							
Cesium-137	HUh	0.00388	+/-0.0311	0.061	0.027	+/-0.0311	0.100	pCi/g							
Cobalt-60	HUh	0.0162	+/-0.0434	0.0823	0.0356	+/-0.044		pCi/g							
Europium-154	HUh	0.044	+/-0.099	0.213	0.092	+/-0.101		pCi/g							
Lead-212	Hh	0.992	+/-0.123	0.0771	0.0356	+/-0.134		pCi/g							
Lead-214	Hh	1.15	+/-0.193	0.112	0.0509	+/-0.199		pCi/g							

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.3.A.R.1.3
 Sample ID: 405235074

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	12.9	+/-1.39	0.608	0.253	+/-1.54		pCi/g							
Protactinium-231	HUh	0.00	+/-0.859	0.758	0.350	+/-0.873		pCi/g							
Radium-226	Hh	0.863	+/-0.198	0.115	0.0515	+/-0.201		pCi/g							
Radium-228	Hh	0.568	+/-0.335	0.255	0.113	+/-0.337		pCi/g							
Thallium-208	Hh	0.272	+/-0.0705	0.0556	0.0247	+/-0.0714		pCi/g							
Tin-126	HUh	0.035	+/-0.127	0.125	0.0592	+/-0.128		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	15.1	+/-3.78	2.92	1.14	+/-4.78	4.00	pCi/g		JXC9	09/22/16	1357	1597817	10
Beta	Hh	18.7	+/-2.48	2.72	1.28	+/-3.57	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.219	+/-0.836	1.52	0.679	+/-0.837	2.00	pCi/g		BXF1	09/28/16	0854	1597804	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	Hh	1.82	+/-2.03	3.40	1.64	+/-2.03	6.00	pCi/g		TXP3	09/27/16	1106	1598096	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.332	+/-0.628	1.06	0.521	+/-0.628	2.00	pCi/g		TXJ1	09/29/16	1710	1598082	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.0722	+/-0.825	1.49	0.697	+/-0.825	5.00	pCi/g		CXS7	09/20/16	1156	1597417	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0846	1596246

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.3.A.R.1.3
 Sample ID: 405235074

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test			Batch ID			Recovery%		Acceptable Limits					
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"						1596421	46						(15%-125%)
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596418	78						(15%-125%)
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"						1596418	104						(15%-125%)
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"						1596420	82.3						(15%-125%)
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"						1596417	106						(15%-125%)
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"						1599981	92.4						(15%-125%)
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"						1596422	46						(15%-125%)
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"						1597804	88.3						(25%-125%)
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"						1597417	88.9						(15%-125%)

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
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 Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes
 Client Sample ID: 5.4A.R.1.3
 Sample ID: 405235075
 Matrix: Soil
 Collect Date: 16-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 10.7%

Report Date: October 4, 2016

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		10.7						percent			LYT1	09/08/16	0846	1596246	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	-0.00303	+/-0.0455	0.106	0.0304	+/-0.0456	1.00	pCi/g			KXB2	09/17/16	1142	1596421	2
Plutonium-239/240	HUh	-0.0464	+/-0.0515	0.157	0.0558	+/-0.0515	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0274	+/-0.0442	0.141	0.0418	+/-0.0443	1.00	pCi/g			KXB2	09/17/16	1142	1596418	3
Uranium-233/234	Hh	0.590	+/-0.206	0.122	0.035	+/-0.231	1.00	pCi/g							
Uranium-235/236	Hh	0.118	+/-0.0978	0.0839	0.0157	+/-0.100	1.00	pCi/g							
Uranium-238	Hh	0.607	+/-0.206	0.0837	0.0157	+/-0.232	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0657	+/-0.342	0.797	0.281	+/-0.342	1.00	pCi/g			KXB2	09/22/16	1000	1596420	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.23	+/-0.843	0.877	0.261	+/-0.874	1.00	pCi/g			KXB2	09/19/16	1750	1596417	5
Thorium-229	HUh	-0.0432	+/-0.191	0.499	0.114	+/-0.192	1.00	pCi/g							
Thorium-230	Hh	0.518	+/-0.470	0.431	0.0806	+/-0.478	1.00	pCi/g							
Thorium-232	Hh	0.426	+/-0.434	0.430	0.0804	+/-0.441	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	Hh	0.0986	+/-0.227	0.359	0.0823	+/-0.227	1.00	pCi/g			KXB2	09/22/16	1755	1599981	6
Curium-242	HUh	-0.0508	+/-0.438	1.02	0.190	+/-0.439	1.00	pCi/g							
Curium-243/244	HUh	0.0184	+/-0.192	0.402	0.102	+/-0.193	1.00	pCi/g							
Curium-245/246	Hh	0.205	+/-0.295	0.356	0.0666	+/-0.296	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-2.47	+/-5.69	9.88	4.83	+/-5.69	15.0	pCi/g			KXB2	09/22/16	1303	1596422	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.176	+/-0.240	0.576	0.237	+/-0.254	1.00	pCi/g			MJH1	09/29/16	0724	1598663	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.088	+/-0.189	0.312	0.144	+/-0.193		pCi/g			MXR1	10/03/16	0647	1596254	9
Antimony-125	HUh	0.00	+/-0.0907	0.150	0.0687	+/-0.0997		pCi/g							
Bismuth-212	HUh	0.00	+/-0.481	0.968	0.451	+/-0.730		pCi/g							
Bismuth-214	HUh	0.00	+/-0.154	0.270	0.131	+/-0.443		pCi/g							
Cesium-137	HUh	0.00254	+/-0.0268	0.0519	0.0235	+/-0.0269	0.100	pCi/g							
Cobalt-60	HUh	-0.00243	+/-0.0319	0.0547	0.0237	+/-0.0319		pCi/g							
Europium-154	HUh	0.0297	+/-0.0833	0.168	0.0742	+/-0.0844		pCi/g							
Lead-212	Hh	0.745	+/-0.0993	0.0717	0.0334	+/-0.107		pCi/g							
Lead-214	Hh	1.01	+/-0.160	0.101	0.0467	+/-0.166		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.4A.R.1.3
 Sample ID: 405235075

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	13.6	+/-1.12	0.404	0.169	+/-1.32		pCi/g							
Protactinium-231	HUh	0.00	+/-0.650	0.596	0.275	+/-0.667		pCi/g							
Radium-226	HUh	0.00	+/-0.154	0.270	0.131	+/-0.443		pCi/g							
Radium-228	HUh	0.00	+/-0.253	0.454	0.217	+/-0.530		pCi/g							
Thallium-208	Hh	0.274	+/-0.0698	0.0428	0.0192	+/-0.0707		pCi/g							
Tin-126	HUh	0.00	+/-0.126	0.115	0.0544	+/-0.127		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	9.45	+/-4.22	3.42	1.04	+/-4.56	4.00	pCi/g		JXC9	09/22/16	1400	1597817	10
Beta	Hh	18.1	+/-3.82	3.37	1.44	+/-4.47	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	0.362	+/-0.940	1.69	0.749	+/-0.943	2.00	pCi/g		BXF1	09/27/16	1538	1597804	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	-0.0471	+/-1.96	3.42	1.65	+/-1.96	6.00	pCi/g		TXP3	09/27/16	1239	1598096	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.179	+/-0.616	1.06	0.521	+/-0.616	2.00	pCi/g		TXJ1	09/29/16	1821	1598082	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	-0.0553	+/-0.840	1.51	0.708	+/-0.840	5.00	pCi/g		CXS7	09/20/16	1223	1597417	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0846	1596246

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.4A.R.1.3
 Sample ID: 405235075

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"							1596421	76.7	(15%-125%)				
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596418	68.7	(15%-125%)				
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"							1596418	75.8	(15%-125%)				
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"							1596420	88.4	(15%-125%)				
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"							1596417	87.7	(15%-125%)				
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"							1599981	104	(15%-125%)				
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"							1596422	76.7	(15%-125%)				
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"							1597804	88.3	(25%-125%)				
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"							1597417	95.4	(15%-125%)				

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.4A.R.4.2
 Sample ID: 405235076
 Matrix: Soil
 Collect Date: 11-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 20.5%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		20.5						percent			LYT1	09/08/16	0846	1596246	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0353	+/-0.0448	0.0556	0.0127	+/-0.0449	1.00	pCi/g			KXB2	09/17/16	1142	1596421	2
Plutonium-239/240	HUh	0.0104	+/-0.0355	0.0658	0.0179	+/-0.0355	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	0.00935	+/-0.0604	0.124	0.0367	+/-0.0604	1.00	pCi/g			KXB2	09/17/16	1142	1596418	3
Uranium-233/234	Hh	0.837	+/-0.207	0.0848	0.0231	+/-0.247	1.00	pCi/g							
Uranium-235/236	Hh	0.0196	+/-0.0451	0.0715	0.0164	+/-0.0452	1.00	pCi/g							
Uranium-238	Hh	0.769	+/-0.197	0.0617	0.0115	+/-0.233	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0735	+/-0.248	0.645	0.203	+/-0.249	1.00	pCi/g			KXB2	09/22/16	1000	1596420	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.33	+/-0.790	0.756	0.228	+/-0.824	1.00	pCi/g			KXB2	09/19/16	1750	1596417	5
Thorium-229	HUh	0.0424	+/-0.274	0.561	0.167	+/-0.274	1.00	pCi/g							
Thorium-230	Hh	0.856	+/-0.564	0.586	0.180	+/-0.581	1.00	pCi/g							
Thorium-232	Hh	0.905	+/-0.534	0.226	0.00	+/-0.555	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0335	+/-0.148	0.386	0.0886	+/-0.148	1.00	pCi/g			KXB2	09/22/16	1755	1599981	6
Curium-242	Hh	0.00	+/-0.469	0.698	0.00	+/-0.470	1.00	pCi/g							
Curium-243/244	HUh	-0.034	+/-0.150	0.392	0.0898	+/-0.150	1.00	pCi/g							
Curium-245/246	Hh	0.160	+/-0.273	0.239	0.00	+/-0.274	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-1.12	+/-4.00	6.92	3.38	+/-4.00	15.0	pCi/g			KXB2	09/22/16	1434	1596422	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.101	+/-0.349	0.554	0.250	+/-0.352	1.00	pCi/g			MJH1	09/29/16	0801	1598663	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.157	+/-0.200	0.369	0.170	+/-0.213		pCi/g			MXR1	10/03/16	0647	1596254	9
Antimony-125	HUh	-0.0336	+/-0.0908	0.169	0.0761	+/-0.092		pCi/g							
Bismuth-212	HUh	0.00	+/-0.702	1.08	0.497	+/-0.779		pCi/g							
Bismuth-214	Hh	0.867	+/-0.167	0.106	0.0471	+/-0.171		pCi/g							
Cesium-137	HUh	0.00	+/-0.0553	0.0518	0.0225	+/-0.0554	0.100	pCi/g							
Cobalt-60	HUh	0.0204	+/-0.0296	0.0693	0.0293	+/-0.031		pCi/g							
Europium-154	HUh	-0.0324	+/-0.109	0.206	0.0886	+/-0.110		pCi/g							
Lead-212	Hh	0.807	+/-0.107	0.0865	0.0403	+/-0.115		pCi/g							
Lead-214	Hh	1.07	+/-0.163	0.106	0.0479	+/-0.169		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
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 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.4A.R.4.2
 Sample ID: 405235076

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	11.5	+/-1.31	0.509	0.206	+/-1.44		pCi/g							
Protactinium-231	HUh	0.00	+/-0.535	0.609	0.276	+/-0.565		pCi/g							
Radium-226	Hh	0.867	+/-0.167	0.106	0.0471	+/-0.171		pCi/g							
Radium-228	Hh	0.734	+/-0.264	0.199	0.0855	+/-0.267		pCi/g							
Thallium-208	Hh	0.219	+/-0.0714	0.0497	0.0218	+/-0.072		pCi/g							
Tin-126	HUh	0.0254	+/-0.111	0.112	0.0534	+/-0.112		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	8.56	+/-3.96	3.55	1.14	+/-4.31	4.00	pCi/g		JXC9	09/22/16	1400	1597817	10
Beta	Hh	16.5	+/-3.53	3.04	1.29	+/-4.31	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	Hh	0.629	+/-0.706	1.18	0.525	+/-0.715	2.00	pCi/g		BXF1	09/28/16	0854	1597804	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	Hh	3.03	+/-2.39	3.96	1.91	+/-2.39	6.00	pCi/g		TXP3	09/27/16	1413	1598096	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	-0.000296	+/-0.705	1.21	0.592	+/-0.705	2.00	pCi/g		TXJ1	09/29/16	1932	1598082	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.0528	+/-1.01	1.79	0.842	+/-1.01	5.00	pCi/g		CXS7	09/20/16	1251	1597417	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0846	1596246

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.4A.R.4.2
 Sample ID: 405235076

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test					Batch ID	Recovery%	Acceptable Limits						
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"					1596421	104	(15%-125%)						
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"					1596418	90.5	(15%-125%)						
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"					1596418	87.5	(15%-125%)						
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"					1596420	89.9	(15%-125%)						
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"					1596417	87.6	(15%-125%)						
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"					1599981	103	(15%-125%)						
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"					1596422	104	(15%-125%)						
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"					1597804	84.2	(25%-125%)						
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"					1597417	94.6	(15%-125%)						

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.5A.R.1.3
 Sample ID: 405235077
 Matrix: Soil
 Collect Date: 17-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 9.92%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		9.92						percent			LYT1	09/08/16	0846	1596246	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	Hh	0.0324	+/-0.0555	0.0486	0.00	+/-0.0557	1.00	pCi/g			KXB2	09/17/16	1142	1596421	2
Plutonium-239/240	HUh	0.00516	+/-0.0587	0.125	0.0382	+/-0.0588	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.00832	+/-0.0368	0.096	0.022	+/-0.0369	1.00	pCi/g			KXB2	09/17/16	1142	1596418	3
Uranium-233/234	Hh	0.688	+/-0.173	0.0801	0.0238	+/-0.204	1.00	pCi/g							
Uranium-235/236	HUh	-0.00521	+/-0.0231	0.0602	0.0138	+/-0.0231	1.00	pCi/g							
Uranium-238	Hh	0.677	+/-0.170	0.060	0.0137	+/-0.200	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	-0.0683	+/-0.231	0.599	0.188	+/-0.231	1.00	pCi/g			KXB2	09/22/16	1030	1596420	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.69	+/-0.836	0.739	0.234	+/-0.886	1.00	pCi/g			KXB2	09/20/16	1128	1596417	5
Thorium-229	HUh	0.0358	+/-0.199	0.381	0.0874	+/-0.199	1.00	pCi/g							
Thorium-230	Hh	0.602	+/-0.428	0.329	0.0617	+/-0.439	1.00	pCi/g							
Thorium-232	Hh	0.721	+/-0.468	0.379	0.0869	+/-0.483	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	-0.0178	+/-0.153	0.355	0.0665	+/-0.154	1.00	pCi/g			KXB2	09/22/16	1756	1599981	6
Curium-242	Hh	0.00	+/-0.485	0.722	0.00	+/-0.486	1.00	pCi/g							
Curium-243/244	HUh	-0.036	+/-0.159	0.416	0.0953	+/-0.160	1.00	pCi/g							
Curium-245/246	HXh	0.593	+/-0.471	0.254	0.00	+/-0.478	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-1.51	+/-6.32	10.9	5.33	+/-6.32	15.0	pCi/g			KXB2	09/22/16	1605	1596422	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	0.0882	+/-0.302	0.663	0.275	+/-0.304	1.00	pCi/g			MJH1	09/29/16	0802	1598663	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	0.0556	+/-0.190	0.363	0.169	+/-0.192		pCi/g			MXR1	10/03/16	0647	1596254	9
Antimony-125	HUh	0.00686	+/-0.0746	0.152	0.0689	+/-0.0747		pCi/g							
Bismuth-212	HUh	0.00	+/-0.820	1.03	0.474	+/-0.979		pCi/g							
Bismuth-214	Hh	0.869	+/-0.160	0.101	0.0456	+/-0.164		pCi/g							
Cesium-137	HUh	-0.00906	+/-0.0273	0.0515	0.0229	+/-0.0276	0.100	pCi/g							
Cobalt-60	HUh	-0.016	+/-0.031	0.0533	0.0221	+/-0.0319		pCi/g							
Europium-154	HUh	-0.0737	+/-0.0876	0.139	0.0573	+/-0.0938		pCi/g							
Lead-212	Hh	0.859	+/-0.112	0.080	0.0374	+/-0.121		pCi/g							
Lead-214	Hh	1.22	+/-0.168	0.296	0.144	+/-0.176		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.5A.R.1.3
 Sample ID: 405235077

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	13.0	+/-1.25	0.441	0.179	+/-1.43		pCi/g							
Protactinium-231	HUh	-0.00486	+/-0.389	0.711	0.330	+/-0.389		pCi/g							
Radium-226	Hh	0.869	+/-0.160	0.101	0.0456	+/-0.164		pCi/g							
Radium-228	Hh	1.15	+/-0.240	0.175	0.0754	+/-0.248		pCi/g							
Thallium-208	Hh	0.273	+/-0.0575	0.048	0.0214	+/-0.0587		pCi/g							
Tin-126	HUh	0.00	+/-0.157	0.119	0.0567	+/-0.158		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	17.3	+/-5.81	3.91	1.24	+/-6.70	4.00	pCi/g		JXC9	09/22/16	1400	1597817	10
Beta	Hh	17.0	+/-3.65	2.90	1.21	+/-4.46	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.967	+/-0.744	1.66	0.741	+/-0.744	2.00	pCi/g		BXF1	09/27/16	1538	1597804	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	0.818	+/-1.94	3.33	1.60	+/-1.94	6.00	pCi/g		TXP3	09/27/16	1547	1598096	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.240	+/-0.653	1.11	0.544	+/-0.653	2.00	pCi/g		TXJ1	09/29/16	2044	1598082	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.153	+/-0.883	1.56	0.732	+/-0.883	5.00	pCi/g		CXS7	09/20/16	1318	1597417	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0846	1596246

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.5A.R.1.3
 Sample ID: 405235077

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test					Batch ID	Recovery%	Acceptable Limits						
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid "Dry Weight Corrected"					1596421	65.9	(15%-125%)						
Uranium-232 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"					1596418	99.3	(15%-125%)						
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid "Dry Weight Corrected"					1596418	83.1	(15%-125%)						
Americium-243 Tracer		Alphaspec Np237, Solid "Dry Weight Corrected"					1596420	86	(15%-125%)						
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"					1596417	88	(15%-125%)						
Americium-243 Tracer		Am241, Cm Solid "Dry Weight Corrected"					1599981	97.1	(15%-125%)						
Plutonium-242 Tracer		Liquid Scint Pu241, Solid "Dry Weight Corrected"					1596422	65.9	(15%-125%)						
Strontium Carrier		GFPC, Sr90, solid "Dry Weight Corrected"					1597804	82.8	(25%-125%)						
Technetium-99m Tracer		Liquid Scint Tc99, Solid "Dry Weight Corrected"					1597417	90.9	(15%-125%)						

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.6A.R.1.3
 Sample ID: 405235078
 Matrix: Soil
 Collect Date: 17-DEC-15
 Receive Date: 06-SEP-16
 Collector: Client
 Moisture: 16.1%

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Gravimetric Solids															
<i>ASTM D 2216 % Moisture "As Received"</i>															
Moisture		16.1						percent			LYT1	09/08/16	0846	1596246	1
Rad Alpha Spec Analysis															
<i>ASP Plutonium Isotopic, Solid "Dry Weight Corrected"</i>															
Plutonium-238	HUh	0.0181	+/-0.0567	0.106	0.0325	+/-0.0568	1.00	pCi/g			KXB2	09/17/16	1142	1596421	2
Plutonium-239/240	HUh	-0.00599	+/-0.0414	0.101	0.0299	+/-0.0414	1.00	pCi/g							
<i>ASP Uranium Isotopic, Solid "Dry Weight Corrected"</i>															
Uranium-232	HUh	-0.0365	+/-0.252	0.614	0.183	+/-0.253	1.00	pCi/g			KXB2	09/17/16	1144	1596418	3
Uranium-233/234	Hh	0.624	+/-0.197	0.0946	0.0241	+/-0.245	1.00	pCi/g							
Uranium-235/236	HUh	0.00435	+/-0.0455	0.0949	0.0241	+/-0.0456	1.00	pCi/g							
Uranium-238	Hh	0.566	+/-0.190	0.115	0.034	+/-0.232	1.00	pCi/g							
<i>Alphaspec Np237, Solid "Dry Weight Corrected"</i>															
Neptunium-237	HUh	0.0981	+/-0.270	0.468	0.119	+/-0.270	1.00	pCi/g			KXB2	09/22/16	1000	1596420	4
<i>Alphaspec Th229 + 228,230,232 Solid "Dry Weight Corrected"</i>															
Thorium-228	Hh	1.25	+/-0.685	0.615	0.185	+/-0.715	1.00	pCi/g			KXB2	09/19/16	1741	1596417	5
Thorium-229	HUh	0.0325	+/-0.181	0.346	0.0793	+/-0.181	1.00	pCi/g							
Thorium-230	Hh	0.359	+/-0.326	0.299	0.056	+/-0.330	1.00	pCi/g							
Thorium-232	Hh	0.855	+/-0.474	0.298	0.0558	+/-0.491	1.00	pCi/g							
<i>Am241, Cm Solid "Dry Weight Corrected"</i>															
Americium-241	HUh	0.0272	+/-0.151	0.290	0.0664	+/-0.151	1.00	pCi/g			KXB2	09/22/16	1752	1599981	6
Curium-242	Hh	0.00	+/-0.343	0.510	0.00	+/-0.343	1.00	pCi/g							
Curium-243/244	HUh	-0.0509	+/-0.118	0.349	0.0951	+/-0.118	1.00	pCi/g							
Curium-245/246	Hh	0.00	+/-0.121	0.179	0.00	+/-0.121	1.00	pCi/g							
<i>Liquid Scint Pu241, Solid "Dry Weight Corrected"</i>															
Plutonium-241	HUh	-1.21	+/-4.93	8.50	4.16	+/-4.93	15.0	pCi/g			KXB2	09/22/16	1736	1596422	7
Rad Gamma Spec Analysis															
<i>Gamma I129, Solid "Dry Weight Corrected"</i>															
Iodine-129	HUh	-0.0983	+/-0.302	0.576	0.219	+/-0.305	1.00	pCi/g			MJH1	09/29/16	0802	1598663	8
<i>Gammasespec, Gamma, Solid "Dry Weight Corrected"</i>															
Actinium-227	HUh	-0.0194	+/-0.162	0.298	0.135	+/-0.163		pCi/g			MXR1	10/03/16	0648	1596254	9
Antimony-125	HUh	-0.0269	+/-0.0729	0.141	0.0624	+/-0.0739		pCi/g							
Bismuth-212	HUh	0.00	+/-0.768	0.978	0.447	+/-0.874		pCi/g							
Bismuth-214	Hh	0.634	+/-0.148	0.0849	0.037	+/-0.157		pCi/g							
Cesium-137	HUh	0.012	+/-0.0204	0.0458	0.0198	+/-0.0211	0.100	pCi/g							
Cobalt-60	HUh	0.00665	+/-0.0194	0.0479	0.0188	+/-0.0197		pCi/g							
Europium-154	HUh	-0.00848	+/-0.0693	0.145	0.0587	+/-0.0694		pCi/g							
Lead-212	Hh	0.649	+/-0.103	0.074	0.0341	+/-0.116		pCi/g							
Lead-214	Hh	0.805	+/-0.157	0.097	0.0438	+/-0.170		pCi/g							

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
 Suite 112
 Buffalo, New York 14228

Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.6A.R.1.3
 Sample ID: 405235078

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Gamma Spec Analysis

Gammascpec, Gamma, Solid "Dry Weight Corrected"

Potassium-40	Hh	9.82	+/-1.23	0.562	0.234	+/-1.51		pCi/g							
Protactinium-231	HUh	0.0133	+/-0.325	0.602	0.273	+/-0.325		pCi/g							
Radium-226	Hh	0.634	+/-0.148	0.0849	0.037	+/-0.157		pCi/g							
Radium-228	Hh	0.618	+/-0.175	0.202	0.0877	+/-0.195		pCi/g							
Thallium-208	Hh	0.214	+/-0.067	0.0438	0.0191	+/-0.0693		pCi/g							
Tin-126	HUh	0.00	+/-0.151	0.0835	0.0389	+/-0.153		pCi/g							

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, solid "Dry Weight Corrected"

Alpha	Hh	30.8	+/-6.68	3.94	1.44	+/-8.94	4.00	pCi/g		JXC9	09/22/16	1400	1597817	10
Beta	Hh	35.2	+/-5.09	4.66	2.12	+/-7.15	10.0	pCi/g						

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	HUh	-0.473	+/-0.668	1.44	0.628	+/-0.668	2.00	pCi/g		BXF1	09/27/16	1538	1597804	11
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Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Solid "Dry Weight Corrected"

Tritium	HUh	1.10	+/-2.20	3.75	1.81	+/-2.20	6.00	pCi/g		TXP3	09/27/16	1721	1598096	12
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Liquid Scint C14, Solid "Dry Weight Corrected"

Carbon-14	HUh	0.277	+/-0.699	1.19	0.581	+/-0.699	2.00	pCi/g		TXJ1	09/29/16	2155	1598082	13
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Liquid Scint Tc99, Solid "Dry Weight Corrected"

Technetium-99	HUh	0.829	+/-1.10	1.86	0.873	+/-1.10	5.00	pCi/g		CXS7	09/20/16	1346	1597417	14
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	LYT1	09/08/16	0846	1596246

The following Analytical Methods were performed

Method	Description
1	ASTM D 2216 (Modified)
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	ASTM C 1475-00 Modified
5	DOE EML HASL-300, Th-01-RC Modified
6	DOE EML HASL-300, Am-05-RC Modified
7	DOE EML HASL-300, Pu-11-RC Modified
8	DOE EML HASL-300,I-01 Modified
9	DOE HASL 300, 4.5.2.3/Ga-01-R
10	EPA 900.0/SW846 9310/SM 7110B Modified
11	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
12	EPA 906.0 Modified
13	EPA EERF C-01 Modified
14	DOE EML HASL-300, Tc-02-RC Modified

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Certificate of Analysis

Company : MJW Technical Services
 Address : 15 Hazelwood Drive
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Report Date: October 4, 2016

Contact: Ms. Laurie Losey
 Project: Soil Radioisotopes

Client Sample ID: 5.6A.R.1.3
 Sample ID: 405235078

Project: MJWC00115
 Client ID: MJWC001

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery		Test					Batch ID	Recovery%	Acceptable Limits						
Plutonium-242 Tracer		ASP Plutonium Isotopic, Solid	"Dry Weight Corrected"					1596421	82.8						(15%-125%)
Uranium-232 Tracer		ASP Uranium Isotopic, Solid	"Dry Weight Corrected"					1596418	97.9						(15%-125%)
Uranium-235/236 Tracer		ASP Uranium Isotopic, Solid	"Dry Weight Corrected"					1596418	17.9						(15%-125%)
Americium-243 Tracer		Alphaspec Np237, Solid	"Dry Weight Corrected"					1596420	92.6						(15%-125%)
Actinium-227 Tracer		Alphaspec Th229 + 228,230,232	Solid "Dry Weight Corrected"					1596417	106						(15%-125%)
Americium-243 Tracer		Am241, Cm Solid	"Dry Weight Corrected"					1599981	102						(15%-125%)
Plutonium-242 Tracer		Liquid Scint Pu241, Solid	"Dry Weight Corrected"					1596422	82.8						(15%-125%)
Strontium Carrier		GFPC, Sr90, solid	"Dry Weight Corrected"					1597804	84.2						(25%-125%)
Technetium-99m Tracer		Liquid Scint Tc99, Solid	"Dry Weight Corrected"					1597417	86.2						(15%-125%)

Notes:
 The MDC is a sample specific MDC.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Mtd.: Method
DL: Detection Limit	PF: Prep Factor
Lc/LC: Critical Level	RL: Reporting Limit
MDA: Minimum Detectable Activity	TPU: Total Propagated Uncertainty
MDC: Minimum Detectable Concentration	

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: October 4, 2016
Page 1 of 39

Client : MJW Technical Services
15 Hazelwood Drive
Suite 112
Buffalo, New York

Contact: Ms. Laurie Losey

Workorder: 405235

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1596388										
QC1203621689	405235001	DUP									
Thorium-228	Hh	2.13	H	1.16	pCi/g	58.6		(0% - 100%)	JXH2	09/28/16	14:07
	Uncert:	+/-1.25		+/-0.588							
	TPU:	+/-1.33		+/-0.606							
Thorium-229	Hh	0.301	HU	0.142	pCi/g	0		N/A			
	Uncert:	+/-0.488		+/-0.309							
	TPU:	+/-0.492		+/-0.310							
Thorium-230	Hh	1.46	H	0.740	pCi/g	65.2		(0% - 100%)			
	Uncert:	+/-0.868		+/-0.427							
	TPU:	+/-0.916		+/-0.437							
Thorium-232	Hh	0.962	H	0.484	pCi/g	45.4		(0% - 100%)			
	Uncert:	+/-0.721		+/-0.402							
	TPU:	+/-0.746		+/-0.406							
QC1203621690	LCS										
Thorium-228			U	-0.0115	pCi/g				JXH2	09/28/16	14:07
	Uncert:			+/-0.118							
	TPU:			+/-0.119							
Thorium-229			U	0.0374	pCi/g						
	Uncert:			+/-0.172							
	TPU:			+/-0.172							
Thorium-230	19.2			20.6	pCi/g		107	(75%-125%)			
	Uncert:			+/-1.74							
	TPU:			+/-3.16							
Thorium-232				0.133	pCi/g			(75%-125%)			
	Uncert:			+/-0.175							
	TPU:			+/-0.176							
QC1203621688	MB										
Thorium-228			U	0.0793	pCi/g				JXH2	09/28/16	14:05
	Uncert:			+/-0.155							
	TPU:			+/-0.156							
Thorium-229				0.0689	pCi/g						
	Uncert:			+/-0.115							
	TPU:			+/-0.115							
Thorium-230			U	-0.0139	pCi/g						
	Uncert:			+/-0.0663							
	TPU:			+/-0.0664							
Thorium-232				0.0411	pCi/g						
	Uncert:			+/-0.101							
	TPU:			+/-0.101							
Batch	1596389										
QC1203621692	405235001	DUP									
Uranium-232	HUh	-0.0134	HU	-0.0295	pCi/g	0		N/A	JXH2	09/29/16	09:20

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1596389										
Uranium-233/234	Uncert:	+/-0.0454		+/-0.0476							
	TPU:	+/-0.0455		+/-0.0478							
	Hh	0.798	H	1.58	pCi/g	65.9*		(0%-20%)			
	Uncert:	+/-0.232		+/-0.338							
	TPU:	+/-0.268		+/-0.441							
Uranium-235/236	Hh	0.0583	H	0.092	pCi/g	.246		(0% - 100%)			
	Uncert:	+/-0.0739		+/-0.0888							
	TPU:	+/-0.0745		+/-0.0903							
Uranium-238	Hh	1.00	H	1.08	pCi/g	7.53		(0%-20%)			
	Uncert:	+/-0.255		+/-0.279							
	TPU:	+/-0.306		+/-0.340							
QC1203621693	LCS										
Uranium-232			U	-0.0213	pCi/g				JXH2	09/29/1609:20	
	Uncert:			+/-0.0577							
	TPU:			+/-0.0578							
Uranium-233/234				5.38	pCi/g						
	Uncert:			+/-0.648							
	TPU:			+/-1.18							
Uranium-235/236				0.379	pCi/g						
	Uncert:			+/-0.178							
	TPU:			+/-0.191							
Uranium-238	5.29			6.27	pCi/g		118	(75%-125%)			
	Uncert:			+/-0.698							
	TPU:			+/-1.34							
QC1203621691	MB										
Uranium-232			U	-0.0183	pCi/g				JXH2	09/29/1609:13	
	Uncert:			+/-0.0815							
	TPU:			+/-0.0815							
Uranium-233/234			U	-0.00641	pCi/g						
	Uncert:			+/-0.0598							
	TPU:			+/-0.0599							
Uranium-235/236			U	0.00514	pCi/g						
	Uncert:			+/-0.0586							
	TPU:			+/-0.0586							
Uranium-238			U	0.0211	pCi/g						
	Uncert:			+/-0.0663							
	TPU:			+/-0.0664							
Batch	1596390										
QC1203621695	405235001 DUP										
Americium-241	HUh	-0.0138	HU	-0.0228	pCi/g	0			N/A	JXH2	09/29/1621:52
	Uncert:	+/-0.0417		+/-0.0688							
	TPU:	+/-0.0418		+/-0.069							
Curium-242	Hh	0.00	H	0.00	pCi/g	0			N/A		
	Uncert:	+/-0.133		+/-0.220							
	TPU:	+/-0.134		+/-0.221							
Curium-243/244	HUh	0.0101	HU	-0.0077	pCi/g	0			N/A		

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time	
Rad Alpha Spec												
Batch	1596390											
Curium-245/246												
	Uncert:	+/-0.0563		+/-0.0664								
	TPU:	+/-0.0563		+/-0.0667								
	Hh	0.00	H	0.00	pCi/g	0			N/A			
	Uncert:	+/-0.0442		+/-0.0729								
	TPU:	+/-0.0443		+/-0.0732								
QC1203621696	LCS											
Americium-241	3.87			3.64	pCi/g		94.2	(75%-125%)	JXH2	09/29/16	21:52	
	Uncert:			+/-0.592								
	TPU:			+/-0.838								
Curium-242				0.00	pCi/g							
	Uncert:			+/-0.049								
	TPU:			+/-0.0492								
Curium-243/244	5.11			5.30	pCi/g		104	(75%-125%)				
	Uncert:			+/-0.700								
	TPU:			+/-1.11								
Curium-245/246				0.0766	pCi/g							
	Uncert:			+/-0.110								
	TPU:			+/-0.111								
QC1203621694	MB											
Americium-241			U	0.00305	pCi/g				JXH2	09/29/16	21:26	
	Uncert:			+/-0.0319								
	TPU:			+/-0.032								
Curium-242			U	-0.00262	pCi/g							
	Uncert:			+/-0.0226								
	TPU:			+/-0.0227								
Curium-243/244			U	-0.0103	pCi/g							
	Uncert:			+/-0.0239								
	TPU:			+/-0.024								
Curium-245/246			U	-0.003	pCi/g							
	Uncert:			+/-0.0258								
	TPU:			+/-0.0259								
Batch	1596392											
QC1203621698	405235001	DUP										
Neptunium-237	HUh	-0.0857	H	0.00	pCi/g	0			N/A	JXH2	09/30/16	09:00
	Uncert:	+/-0.259		+/-0.358								
	TPU:	+/-0.259		+/-0.359								
QC1203621699	LCS											
Neptunium-237	41.0			42.2	pCi/g		103	(75%-125%)	JXH2	09/30/16	09:00	
	Uncert:			+/-3.94								
	TPU:			+/-6.20								
QC1203621697	MB											
Neptunium-237			U	-0.0165	pCi/g				JXH2	09/30/16	09:00	
	Uncert:			+/-0.142								
	TPU:			+/-0.142								
Batch	1596393											
QC1203621701	405235001	DUP										

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Rad Alpha Spec											
Batch	1596393										
Plutonium-238	Hh	0.0364	HU	0.0338	pCi/g	0			N/A	JXH2	09/29/1609:23
	Uncert:	+/-0.0647		+/-0.093							
	TPU:	+/-0.0649		+/-0.0932							
Plutonium-239/240	HUh	-0.00621	HU	0.0483	pCi/g	0			N/A		
	Uncert:	+/-0.0429		+/-0.121							
	TPU:	+/-0.0429		+/-0.122							
QC1203621702	LCS										
Plutonium-238				0.0899	pCi/g			(75%-125%)	JXH2	09/29/1614:16	
	Uncert:			+/-0.114							
	TPU:			+/-0.115							
Plutonium-239/240	3.88			4.32	pCi/g		111	(75%-125%)			
	Uncert:			+/-0.653							
	TPU:			+/-0.978							
QC1203621700	MB										
Plutonium-238			U	-0.0183	pCi/g				JXH2	09/29/1609:24	
	Uncert:			+/-0.0347							
	TPU:			+/-0.0347							
Plutonium-239/240				0.0586	pCi/g						
	Uncert:			+/-0.0823							
	TPU:			+/-0.0827							
Batch	1596394										
QC1203621704	405235001	DUP									
Plutonium-241	HUh	-4.14	HU	-4.08	pCi/g	0			N/A	JXH2	10/03/1612:30
	Uncert:	+/-7.71		+/-7.44							
	TPU:	+/-7.71		+/-7.44							
QC1203621705	LCS										
Plutonium-241	150			154	pCi/g		103	(75%-125%)	JXH2	10/01/1604:05	
	Uncert:			+/-14.7							
	TPU:			+/-39.3							
QC1203621703	MB										
Plutonium-241			U	-1.94	pCi/g				JXH2	10/01/1602:02	
	Uncert:			+/-6.44							
	TPU:			+/-6.44							
Batch	1596395										
QC1203621707	405235021	DUP									
Thorium-228	Hh	1.13	H	1.10	pCi/g	3.48		(0% - 100%)	MXS2	09/28/1617:56	
	Uncert:	+/-0.629		+/-0.529							
	TPU:	+/-0.653		+/-0.551							
Thorium-229	HUh	-0.0135	H	0.107	pCi/g	0			N/A		
	Uncert:	+/-0.117		+/-0.190							
	TPU:	+/-0.117		+/-0.191							
Thorium-230	Hh	0.787	H	0.682	pCi/g	14.2		(0% - 100%)			
	Uncert:	+/-0.427		+/-0.329							
	TPU:	+/-0.443		+/-0.339							
Thorium-232	Hh	0.645	H	0.448	pCi/g	36.2		(0% - 100%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time	
Rad Alpha Spec												
Batch	1596395											
		Uncert:	+/-0.398	+/-0.267								
		TPU:	+/-0.410	+/-0.273								
QC1203621708	LCS											
Thorium-228			U	0.0211	pCi/g				MXS2	09/24/16	13:18	
		Uncert:		+/-0.294								
		TPU:		+/-0.295								
Thorium-229			U	0.00	pCi/g							
		Uncert:		+/-0.582								
		TPU:		+/-0.582								
Thorium-230		17.2		19.3	pCi/g		112	(75%-125%)				
		Uncert:		+/-2.79								
		TPU:		+/-4.88								
Thorium-232			U	-0.0486	pCi/g			(75%-125%)				
		Uncert:		+/-0.215								
		TPU:		+/-0.216								
QC1203621706	MB											
Thorium-228			U	-0.0414	pCi/g				MXS2	09/24/16	13:16	
		Uncert:		+/-0.145								
		TPU:		+/-0.145								
Thorium-229			U	0.0617	pCi/g							
		Uncert:		+/-0.170								
		TPU:		+/-0.170								
Thorium-230			U	-0.0212	pCi/g							
		Uncert:		+/-0.146								
		TPU:		+/-0.146								
Thorium-232			U	-0.0115	pCi/g							
		Uncert:		+/-0.0993								
		TPU:		+/-0.0995								
Batch	1596396											
QC1203621710	405235021 DUP											
Uranium-232		HUh	-0.00834	HU	-0.00399	pCi/g	0		N/A	MXS2	09/28/16	17:55
		Uncert:	+/-0.0576		+/-0.0344							
		TPU:	+/-0.0577		+/-0.0345							
Uranium-233/234		Hh	0.665	H	0.520	pCi/g	24.6*	(0%-20%)				
		Uncert:	+/-0.200		+/-0.198							
		TPU:	+/-0.230		+/-0.218							
Uranium-235/236		Hh	0.0262	H	0.0509	pCi/g	0		N/A			
		Uncert:	+/-0.0515		+/-0.0733							
		TPU:	+/-0.0517		+/-0.0738							
Uranium-238		Hh	0.606	H	1.00	pCi/g	49.2*	(0%-20%)				
		Uncert:	+/-0.192		+/-0.270							
		TPU:	+/-0.218		+/-0.323							
QC1203621711	LCS											
Uranium-232			U	0.00859	pCi/g				MXS2	09/24/16	13:20	
		Uncert:		+/-0.0554								
		TPU:		+/-0.0555								

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1596396										
Uranium-233/234				4.78	pCi/g						
	Uncert:			+/-0.521							
	TPU:			+/-0.950							
Uranium-235/236				0.295	pCi/g						
	Uncert:			+/-0.133							
	TPU:			+/-0.141							
Uranium-238	5.20			5.04	pCi/g		96.9	(75%-125%)			
	Uncert:			+/-0.535							
	TPU:			+/-0.993							
QC1203621709	MB										
Uranium-232				0.0297	pCi/g				MXS2	09/24/16	13:49
	Uncert:			+/-0.059							
	TPU:			+/-0.0592							
Uranium-233/234			U	-0.0113	pCi/g						
	Uncert:			+/-0.0342							
	TPU:			+/-0.0343							
Uranium-235/236			U	0.00821	pCi/g						
	Uncert:			+/-0.0456							
	TPU:			+/-0.0457							
Uranium-238				0.0239	pCi/g						
	Uncert:			+/-0.055							
	TPU:			+/-0.0551							
Batch	1596399										
QC1203621716	405235021	DUP									
Neptunium-237			HUh	-0.0443	HU	0.0446	pCi/g	0	N/A	MXS2	09/29/16
	Uncert:			+/-0.400		+/-0.467					
	TPU:			+/-0.400		+/-0.467					
QC1203621717	LCS										
Neptunium-237	38.2			41.4	pCi/g		108	(75%-125%)	MXS2	09/26/16	11:53
	Uncert:			+/-4.43							
	TPU:			+/-6.36							
QC1203621715	MB										
Neptunium-237			U	-0.0347	pCi/g				MXS2	09/26/16	17:11
	Uncert:			+/-0.289							
	TPU:			+/-0.290							
Batch	1596400										
QC1203621719	405235021	DUP									
Plutonium-238			HUh	0.0188	HU	0.0047	pCi/g	0	N/A	MXS2	09/24/16
	Uncert:			+/-0.0726		+/-0.0491					
	TPU:			+/-0.0727		+/-0.0492					
Plutonium-239/240			HUh	-0.00208	HU	0.026	pCi/g	0	N/A		
	Uncert:			+/-0.0744		+/-0.0686					
	TPU:			+/-0.0745		+/-0.0687					
QC1203621720	LCS										
Plutonium-238			U	-0.0109	pCi/g			(75%-125%)	MXS2	09/24/16	20:54
	Uncert:			+/-0.0329							

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time	
Rad Alpha Spec												
Batch	1596400											
Plutonium-239/240	3.81			3.65	pCi/g		95.5	(75%-125%)				
				+/-0.033								
				+/-0.463								
				+/-0.677								
QC1203621718	MB											
Plutonium-238			U	-0.0483	pCi/g				MXS2	09/24/16	20:54	
				+/-0.0801								
				+/-0.0801								
Plutonium-239/240				0.0441	pCi/g							
				+/-0.0701								
				+/-0.0704								
Batch	1596402											
QC1203621726	405235021 DUP											
Plutonium-241		9.46	HU	3.29	pCi/g	0			N/A	MXS2	09/29/16	13:48
				+/-5.23								
				+/-5.28								
QC1203621727	LCS											
Plutonium-241	147			146	pCi/g		99.4	(75%-125%)	MXS2	09/28/16	23:41	
				+/-9.96								
				+/-32.9								
QC1203621725	MB											
Plutonium-241			U	-5.12	pCi/g				MXS2	09/28/16	22:08	
				+/-5.93								
				+/-5.93								
Batch	1596407											
QC1203621737	405235041 DUP											
Thorium-228		1.07	H	1.21	pCi/g	12.4		(0% - 100%)	HAKB	09/22/16	14:25	
				+/-0.702								
				+/-0.731								
Thorium-229		0.373	H	0.0642	pCi/g	63.9		(0% - 100%)				
				+/-0.180								
				+/-0.181								
Thorium-230		0.445	H	0.225	pCi/g	22.7		N/A				
				+/-0.285								
				+/-0.288								
Thorium-232		0.646	H	0.863	pCi/g	28.8		(0% - 100%)				
				+/-0.487								
				+/-0.508								
QC1203621738	LCS											
Thorium-228			U	0.00462	pCi/g				HAKB	09/22/16	14:25	
				+/-0.413								
				+/-0.413								
Thorium-229				0.148	pCi/g							
				+/-0.340								
				+/-0.341								

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Rad Alpha Spec									
Batch	1596407								
Thorium-230	16.4		16.5	pCi/g		101	(75%-125%)		
	Uncert:		+/-2.50						
	TPU:		+/-4.14						
Thorium-232			0.0969	pCi/g			(75%-125%)		
	Uncert:		+/-0.272						
	TPU:		+/-0.273						
QC1203621736	MB								
Thorium-228			0.303	pCi/g				HAKB	09/22/1613:44
	Uncert:		+/-0.350						
	TPU:		+/-0.354						
Thorium-229		U	0.0371	pCi/g					
	Uncert:		+/-0.239						
	TPU:		+/-0.240						
Thorium-230			0.100	pCi/g					
	Uncert:		+/-0.231						
	TPU:		+/-0.231						
Thorium-232		U	-0.0158	pCi/g					
	Uncert:		+/-0.136						
	TPU:		+/-0.137						
Batch	1596408								
QC1203621740	405235041 DUP								
Uranium-232	HUh	0.0147	HU	-0.0419	pCi/g	0		N/AHAKB	09/22/1614:24
	Uncert:	+/-0.0865		+/-0.0482					
	TPU:	+/-0.0866		+/-0.0483					
Uranium-233/234	Hh	0.802	H	0.572	pCi/g	33.5*	(0%-20%)		
	Uncert:	+/-0.207		+/-0.181					
	TPU:	+/-0.244		+/-0.205					
Uranium-235/236	HUh	0.0181	H	0.0433	pCi/g	0		N/A	
	Uncert:	+/-0.0555		+/-0.0641					
	TPU:	+/-0.0556		+/-0.0646					
Uranium-238	Hh	0.704	H	0.781	pCi/g	10.4	(0%-20%)		
	Uncert:	+/-0.193		+/-0.210					
	TPU:	+/-0.224		+/-0.249					
QC1203621741	LCS								
Uranium-232			U	-0.00759	pCi/g			HAKB	09/22/1614:24
	Uncert:			+/-0.0511					
	TPU:			+/-0.0513					
Uranium-233/234				5.05	pCi/g				
	Uncert:			+/-0.482					
	TPU:			+/-0.980					
Uranium-235/236				0.303	pCi/g				
	Uncert:			+/-0.125					
	TPU:			+/-0.135					
Uranium-238	5.23			5.38	pCi/g		103 (75%-125%)		
	Uncert:			+/-0.497					
	TPU:			+/-1.04					

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Rad Alpha Spec									
Batch	1596408								
QC1203621739	MB								
Uranium-232		U	0.0439	pCi/g				HAKB	09/22/1610:03
		Uncert:	+/-0.139						
		TPU:	+/-0.140						
Uranium-233/234			0.072	pCi/g					
		Uncert:	+/-0.104						
		TPU:	+/-0.106						
Uranium-235/236			0.0722	pCi/g					
		Uncert:	+/-0.105						
		TPU:	+/-0.106						
Uranium-238			0.0757	pCi/g					
		Uncert:	+/-0.104						
		TPU:	+/-0.106						
Batch	1596410								
QC1203621746	405235041 DUP								
Americium-241		HUh	-0.0106	HU	-0.00367	pCi/g	0	N/A	HAKB 09/22/1616:14
		Uncert:	+/-0.0523		+/-0.0608				
		TPU:	+/-0.0523		+/-0.0611				
Curium-242		HUh	-0.00899	HU	-0.0128	pCi/g	0	N/A	
		Uncert:	+/-0.124		+/-0.212				
		TPU:	+/-0.124		+/-0.213				
Curium-243/244		Hh	0.0154	HU	-0.00745	pCi/g	0	N/A	
		Uncert:	+/-0.0505		+/-0.0622				
		TPU:	+/-0.0506		+/-0.0624				
Curium-245/246		Hh	0.00	HU	-0.0042	pCi/g	0	N/A	
		Uncert:	+/-0.0402		+/-0.0695				
		TPU:	+/-0.0403		+/-0.0698				
QC1203621747	LCS								
Americium-241		3.82			4.02	pCi/g	105 (75%-125%)	HAKB	09/22/1609:56
		Uncert:			+/-0.497				
		TPU:			+/-0.743				
Curium-242					0.0158	pCi/g			
		Uncert:			+/-0.0443				
		TPU:			+/-0.0443				
Curium-243/244		5.06			5.37	pCi/g	106 (75%-125%)		
		Uncert:			+/-0.569				
		TPU:			+/-0.931				
Curium-245/246					0.145	pCi/g			
		Uncert:			+/-0.107				
		TPU:			+/-0.109				
QC1203621745	MB								
Americium-241			U	0.00652	pCi/g			HAKB	09/22/1609:56
		Uncert:			+/-0.049				
		TPU:			+/-0.049				
Curium-242				0.00	pCi/g				
		Uncert:			+/-0.0338				
		TPU:			+/-0.0339				

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1596410										
Curium-243/244				0.00	pCi/g						
	Uncert:			+/-0.0335							
	TPU:			+/-0.0335							
Curium-245/246			U	-0.00398	pCi/g						
	Uncert:			+/-0.0396							
	TPU:			+/-0.0397							
Batch	1596411										
QC1203621749	405235041 DUP										
Neptunium-237	HUh	-0.0562	HU	0.147	pCi/g	0			N/A	09/22/16	15:54
	Uncert:	+/-0.315		+/-0.542							
	TPU:	+/-0.315		+/-0.543							
QC1203621750	LCS	36.6		42.3	pCi/g		116	(75%-125%)	HAKB	09/22/16	15:54
Neptunium-237											
	Uncert:			+/-4.57							
	TPU:			+/-6.51							
QC1203621748	MB			0.229	pCi/g				HAKB	09/22/16	15:54
Neptunium-237											
	Uncert:			+/-0.444							
	TPU:			+/-0.445							
Batch	1596412										
QC1203621752	405235041 DUP										
Plutonium-238	Hh	0.0701	HU	-0.00713	pCi/g	0			N/A	09/22/16	09:56
	Uncert:	+/-0.119		+/-0.0497							
	TPU:	+/-0.120		+/-0.0499							
Plutonium-239/240	HUh	-0.00872	HU	-0.00354	pCi/g	0			N/A		
	Uncert:	+/-0.0698		+/-0.0489							
	TPU:	+/-0.0702		+/-0.0491							
QC1203621753	LCS			0.0726	pCi/g			(75%-125%)	HAKB	09/22/16	09:56
Plutonium-238											
	Uncert:			+/-0.106							
	TPU:			+/-0.107							
Plutonium-239/240		3.84		4.34	pCi/g		113	(75%-125%)			
	Uncert:			+/-0.673							
	TPU:			+/-1.01							
QC1203621751	MB			0.0086	pCi/g				HAKB	09/22/16	09:56
Plutonium-238			U								
	Uncert:			+/-0.057							
	TPU:			+/-0.0571							
Plutonium-239/240			U	-0.00573	pCi/g						
	Uncert:			+/-0.0405							
	TPU:			+/-0.0406							
Batch	1596414										
QC1203621755	405235041 DUP										
Plutonium-241	HUh	-0.671	HU	-4.08	pCi/g	0			N/A	09/24/16	12:01
	Uncert:	+/-7.42		+/-7.14							

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Alpha Spec									
Batch	1596414								
		TPU:	+/-7.42	+/-7.14					
QC1203621756	LCS								
Plutonium-241	148		172	pCi/g		116	(75%-125%)	HAKB	09/24/1613:02
		Uncert:		+/-12.2					
		TPU:		+/-43.3					
QC1203621754	MB								
Plutonium-241		U	2.09	pCi/g				HAKB	09/24/1611:00
		Uncert:		+/-6.03					
		TPU:		+/-6.04					
Batch	1596417								
QC1203621758	405235061 DUP								
Thorium-228		Hh	0.491	H	1.40	pCi/g	67.9	(0% - 100%)	KXB2 09/19/1617:56
		Uncert:	+/-0.506		+/-0.764				
		TPU:	+/-0.514		+/-0.799				
Thorium-229		Hh	0.00	H	0.198	pCi/g	0	N/A	
		Uncert:	+/-0.130		+/-0.285				
		TPU:	+/-0.130		+/-0.287				
Thorium-230		Hh	0.707	H	0.323	pCi/g	56.3	(0% - 100%)	
		Uncert:	+/-0.437		+/-0.348				
		TPU:	+/-0.450		+/-0.352				
Thorium-232		Hh	0.850	H	0.625	pCi/g	30.6	(0% - 100%)	
		Uncert:	+/-0.490		+/-0.445				
		TPU:	+/-0.507		+/-0.455				
QC1203621759	LCS								
Thorium-228		U	0.0682	pCi/g				KXB2	09/20/1611:29
		Uncert:		+/-0.276					
		TPU:		+/-0.277					
Thorium-229		U	-0.0821	pCi/g					
		Uncert:		+/-0.156					
		TPU:		+/-0.156					
Thorium-230	17.7		18.3	pCi/g		103	(75%-125%)		
		Uncert:		+/-2.20					
		TPU:		+/-3.69					
Thorium-232			0.120	pCi/g			(75%-125%)		
		Uncert:		+/-0.236					
		TPU:		+/-0.236					
QC1203621757	MB								
Thorium-228		U	0.0778	pCi/g				KXB2	09/20/1611:28
		Uncert:		+/-0.263					
		TPU:		+/-0.265					
Thorium-229			0.0999	pCi/g					
		Uncert:		+/-0.230					
		TPU:		+/-0.230					
Thorium-230		U	-0.0157	pCi/g					
		Uncert:		+/-0.136					
		TPU:		+/-0.136					

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1596417										
Thorium-232			U	-0.0157	pCi/g						
				Uncert: +/-0.135							
				TPU: +/-0.136							
Batch	1596418										
QC1203621761	405235061	DUP									
Uranium-232	HUh	0.0232	H	0.0725	pCi/g	0			N/A	KXB2	09/17/16 11:44
				Uncert: +/-0.0881							
				TPU: +/-0.089							
Uranium-233/234	Hh	0.585	H	0.630	pCi/g	7.39		(0%-20%)			
				Uncert: +/-0.215							
				TPU: +/-0.241							
Uranium-235/236	Hh	0.0309	H	0.0352	pCi/g	0			N/A		
				Uncert: +/-0.070							
				TPU: +/-0.0703							
Uranium-238	Hh	0.800	H	0.676	pCi/g	16.9		(0%-20%)			
				Uncert: +/-0.216							
				TPU: +/-0.246							
QC1203621762	LCS										
Uranium-232				0.0338	pCi/g				KXB2		09/17/16 11:44
				Uncert: +/-0.0777							
				TPU: +/-0.0779							
Uranium-233/234				5.07	pCi/g						
				Uncert: +/-0.550							
				TPU: +/-1.05							
Uranium-235/236				0.332	pCi/g						
				Uncert: +/-0.146							
				TPU: +/-0.157							
Uranium-238	5.20			5.61	pCi/g		108	(75%-125%)			
				Uncert: +/-0.577							
				TPU: +/-1.14							
QC1203621760	MB										
Uranium-232			U	-0.0885	pCi/g				KXB2		09/17/16 11:44
				Uncert: +/-0.0663							
				TPU: +/-0.0663							
Uranium-233/234			U	-0.0104	pCi/g						
				Uncert: +/-0.0353							
				TPU: +/-0.0353							
Uranium-235/236			U	-0.00546	pCi/g						
				Uncert: +/-0.0242							
				TPU: +/-0.0242							
Uranium-238			U	-0.0136	pCi/g						
				Uncert: +/-0.0258							
				TPU: +/-0.0259							
Batch	1596420										
QC1203621767	405235061	DUP									
Neptunium-237	HUh	-0.102	HU	-0.0527	pCi/g	0			N/A	KXB2	09/22/16 10:00

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Alpha Spec									
Batch	1596420								
		Uncert:	+/-0.237						
		TPU:	+/-0.238						
QC1203621768	LCS								
Neptunium-237	40.6		45.4	pCi/g		112	(75%-125%)	KXB2	09/22/1610:00
		Uncert:							
		TPU:							
QC1203621766	MB								
Neptunium-237		U	0.183	pCi/g				KXB2	09/22/1610:00
		Uncert:	+/-0.625						
		TPU:	+/-0.625						
Batch	1596421								
QC1203621770	405235061	DUP							
Plutonium-238		Hh	0.0258	H	0.0228	pCi/g	0	N/A	KXB2 09/17/1611:42
		Uncert:	+/-0.0508		+/-0.0447				
		TPU:	+/-0.0509		+/-0.0448				
Plutonium-239/240		Hh	0.0257	HU	-0.0185	pCi/g	0	N/A	
		Uncert:	+/-0.0505		+/-0.0298				
		TPU:	+/-0.0506		+/-0.0299				
QC1203621771	LCS								
Plutonium-238		U	-0.0103	pCi/g			(75%-125%)	KXB2	09/17/1611:44
		Uncert:	+/-0.0713						
		TPU:	+/-0.0714						
Plutonium-239/240	3.81		3.99	pCi/g		105	(75%-125%)		
		Uncert:	+/-0.602						
		TPU:	+/-0.889						
QC1203621769	MB								
Plutonium-238			0.0566	pCi/g				KXB2	09/17/1611:42
		Uncert:	+/-0.0689						
		TPU:	+/-0.0693						
Plutonium-239/240		U	0.00056	pCi/g					
		Uncert:	+/-0.0415						
		TPU:	+/-0.0416						
Batch	1596422								
QC1203621773	405235061	DUP							
Plutonium-241		HUh	-1.33	HU	-1.42	pCi/g	0	N/A	KXB2 09/22/1620:39
		Uncert:	+/-4.61		+/-4.49				
		TPU:	+/-4.61		+/-4.49				
QC1203621774	LCS								
Plutonium-241	147		177	pCi/g		120	(75%-125%)	KXB2	09/22/1622:10
		Uncert:	+/-9.48						
		TPU:	+/-41.0						
QC1203621772	MB								
Plutonium-241		U	-2.3	pCi/g				KXB2	09/22/1619:07
		Uncert:	+/-4.71						
		TPU:	+/-4.71						

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time	
Rad Alpha Spec												
Batch	1599981											
QC1203630764	405235061 DUP											
Americium-241	Hh	0.142	H	0.0535	pCi/g	0			N/A	KXB2	09/22/16	17:52
	Uncert:	+/-0.243		+/-0.150								
	TPU:	+/-0.244		+/-0.150								
Curium-242	Hh	0.00	H	0.00	pCi/g	0			N/A			
	Uncert:	+/-0.470		+/-0.355								
	TPU:	+/-0.471		+/-0.355								
Curium-243/244	Hh	0.00	HU	-0.013	pCi/g	0			N/A			
	Uncert:	+/-0.145		+/-0.112								
	TPU:	+/-0.145		+/-0.112								
Curium-245/246	Hh	0.081	H	0.0611	pCi/g	0			N/A			
	Uncert:	+/-0.228		+/-0.172								
	TPU:	+/-0.228		+/-0.172								
QC1203630765	LCS											
Americium-241	16.1			16.5	pCi/g		102	(75%-125%)	KXB2		09/22/16	17:52
	Uncert:			+/-1.70								
	TPU:			+/-2.61								
Curium-242			U	0.0342	pCi/g							
	Uncert:			+/-0.128								
	TPU:			+/-0.128								
Curium-243/244	21.3			20.7	pCi/g		97	(75%-125%)				
	Uncert:			+/-1.89								
	TPU:			+/-3.12								
Curium-245/246				0.622	pCi/g							
	Uncert:			+/-0.367								
	TPU:			+/-0.374								
QC1203630763	MB											
Americium-241			U	-0.0329	pCi/g				KXB2		09/22/16	17:52
	Uncert:			+/-0.0993								
	TPU:			+/-0.0994								
Curium-242				0.00	pCi/g							
	Uncert:			+/-0.0914								
	TPU:			+/-0.0915								
Curium-243/244				0.045	pCi/g							
	Uncert:			+/-0.126								
	TPU:			+/-0.127								
Curium-245/246			X	0.341	pCi/g							
	Uncert:			+/-0.293								
	TPU:			+/-0.296								
Batch	1601257											
QC1203633743	405235051 DUP											
Uranium-232	HUh	-0.0211	HU	-0.172	pCi/g	0			N/A	KXB2	09/29/16	14:04
	Uncert:	+/-0.228		+/-0.189								
	TPU:	+/-0.228		+/-0.189								
Uranium-233/234	Hh	0.741	H	1.02	pCi/g	31.3*		(0%-20%)				
	Uncert:	+/-0.301		+/-0.289								
	TPU:	+/-0.314		+/-0.312								

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time	
Rad Alpha Spec												
Batch	1601257											
Uranium-235/236	Hh	0.134	H	0.266	pCi/g	30		(0% - 100%)				
	Uncert:	+/-0.145		+/-0.164								
	TPU:	+/-0.146		+/-0.167								
Uranium-238	Hh	0.988	H	1.04	pCi/g	5.17		(0%-20%)				
	Uncert:	+/-0.311		+/-0.296								
	TPU:	+/-0.333		+/-0.319								
QC1203633744	LCS											
Uranium-232			U	0.0707	pCi/g				KXB2	09/29/16	14:04	
	Uncert:			+/-0.176								
	TPU:			+/-0.176								
Uranium-233/234				24.9	pCi/g							
	Uncert:			+/-1.51								
	TPU:			+/-3.36								
Uranium-235/236				1.50	pCi/g							
	Uncert:			+/-0.376								
	TPU:			+/-0.417								
Uranium-238	24.3			25.0	pCi/g		103	(75%-125%)				
	Uncert:			+/-1.51								
	TPU:			+/-3.37								
QC1203633742	MB											
Uranium-232			U	-0.036	pCi/g				KXB2	09/29/16	14:04	
	Uncert:			+/-0.224								
	TPU:			+/-0.224								
Uranium-233/234				0.344	pCi/g							
	Uncert:			+/-0.175								
	TPU:			+/-0.180								
Uranium-235/236				0.460	pCi/g							
	Uncert:			+/-0.202								
	TPU:			+/-0.208								
Uranium-238				0.370	pCi/g							
	Uncert:			+/-0.172								
	TPU:			+/-0.177								
Batch	1602285											
QC1203636291	405235021	DUP										
Americium-241	HUh	0.000535	HU	-0.0107	pCi/g	0			N/A	MXS2	09/29/16	21:52
	Uncert:	+/-0.0397		+/-0.0322								
	TPU:	+/-0.0397		+/-0.0322								
Curium-242	HUh	-0.0112	H	0.00	pCi/g	0			N/A			
	Uncert:	+/-0.0964		+/-0.104								
	TPU:	+/-0.0965		+/-0.104								
Curium-243/244	HUh	-0.00652	HU	0.00781	pCi/g	0			N/A			
	Uncert:	+/-0.0288		+/-0.0434								
	TPU:	+/-0.0289		+/-0.0435								
Curium-245/246	HXh	0.122	H	0.00	pCi/g	82.7		(0% - 100%)				
	Uncert:	+/-0.0902		+/-0.0341								
	TPU:	+/-0.0915		+/-0.0342								

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1602285										
QC1203636292	LCS										
Americium-241	3.82			4.56	pCi/g		119	(75%-125%)	MXS2	09/29/16	21:52
	Uncert:			+/-0.588							
	TPU:			+/-0.899							
Curium-242				0.0195	pCi/g						
	Uncert:			+/-0.055							
	TPU:			+/-0.055							
Curium-243/244	5.04			6.01	pCi/g		119	(75%-125%)			
	Uncert:			+/-0.670							
	TPU:			+/-1.12							
Curium-245/246				0.157	pCi/g						
	Uncert:			+/-0.125							
	TPU:			+/-0.127							
QC1203636290	MB										
Americium-241				0.0346	pCi/g				MXS2	09/29/16	21:26
	Uncert:			+/-0.0549							
	TPU:			+/-0.0551							
Curium-242			U	-0.00657	pCi/g						
	Uncert:			+/-0.0291							
	TPU:			+/-0.0291							
Curium-243/244			U	0.00703	pCi/g						
	Uncert:			+/-0.0391							
	TPU:			+/-0.0391							
Curium-245/246			X	0.149	pCi/g						
	Uncert:			+/-0.103							
	TPU:			+/-0.105							
Rad Gamma Spec											
Batch	1596247										
QC1203621351	405235001 DUP										
Actinium-227		HUh	0.0104	HU	0.0262	pCi/g	0		N/AMXR1	10/03/16	08:53
	Uncert:		+/-0.258		+/-0.199						
	TPU:		+/-0.258		+/-0.199						
Antimony-125		HUh	-0.0487	HUI	0.00	pCi/g	0		N/A		
	Uncert:		+/-0.122		+/-0.164						
	TPU:		+/-0.124		+/-0.173						
Bismuth-212		HUIh	0.00	H	1.80	pCi/g	20.5	(0% - 100%)			
	Uncert:		+/-0.761		+/-1.02						
	TPU:		+/-0.995		+/-1.02						
Bismuth-214		Hh	1.03	H	0.864	pCi/g	17.1	(0%-20%)			
	Uncert:		+/-0.229		+/-0.147						
	TPU:		+/-0.233		+/-0.151						
Cesium-137		Hh	0.562	H	0.441	pCi/g	24.2*	(0%-20%)			
	Uncert:		+/-0.104		+/-0.122						
	TPU:		+/-0.107		+/-0.123						
Cobalt-60		HUh	-0.0365	HU	0.00612	pCi/g	0		N/A		
	Uncert:		+/-0.0504		+/-0.0347						
	TPU:		+/-0.0531		+/-0.0348						

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1596247										
Europium-154	HUh	0.0457	HU	-0.0186	pCi/g	0		N/A			
	Uncert:	+/-0.126		+/-0.0993							
	TPU:	+/-0.128		+/-0.0997							
Lead-212	Hh	1.20	H	1.19	pCi/g	.669		(0%-20%)			
	Uncert:	+/-0.144		+/-0.123							
	TPU:	+/-0.158		+/-0.139							
Lead-214	Hh	1.22	H	1.07	pCi/g	13.2		(0%-20%)			
	Uncert:	+/-0.220		+/-0.186							
	TPU:	+/-0.226		+/-0.191							
Potassium-40	Hh	16.9	H	18.1	pCi/g	6.99		(0%-20%)			
	Uncert:	+/-1.81		+/-1.67							
	TPU:	+/-2.02		+/-1.92							
Protactinium-231	HUh	0.0574	HU	-0.134	pCi/g	0		N/A			
	Uncert:	+/-0.533		+/-0.449							
	TPU:	+/-0.534		+/-0.454							
Radium-226	Hh	1.03	H	0.864	pCi/g	17.1		(0%-20%)			
	Uncert:	+/-0.229		+/-0.147							
	TPU:	+/-0.233		+/-0.151							
Radium-228	Hh	1.04	H	1.24	pCi/g	17.1		(0%-20%)			
	Uncert:	+/-0.294		+/-0.285							
	TPU:	+/-0.299		+/-0.292							
Thallium-208	Hh	0.422	H	0.287	pCi/g	38.1*		(0%-20%)			
	Uncert:	+/-0.0952		+/-0.0816							
	TPU:	+/-0.0969		+/-0.0825							
Tin-126	HUIh	0.00	HUI	0.00	pCi/g	0		N/A			
	Uncert:	+/-0.103		+/-0.0976							
	TPU:	+/-0.122		+/-0.0992							
QC1203621352 LCS											
Americium-241	489			541	pCi/g		111	(75%-125%)	MXR1	10/03/1608:54	
	Uncert:			+/-10.1							
	TPU:			+/-43.1							
Actinium-227			U	-0.853	pCi/g						
	Uncert:			+/-3.70							
	TPU:			+/-3.72							
Antimony-125			U	-0.647	pCi/g						
	Uncert:			+/-1.68							
	TPU:			+/-1.71							
Bismuth-212			U	0.995	pCi/g						
	Uncert:			+/-7.92							
	TPU:			+/-7.94							
Bismuth-214			U	-0.329	pCi/g						
	Uncert:			+/-1.08							
	TPU:			+/-1.09							
Cesium-137	179			176	pCi/g		98.3	(75%-125%)			
	Uncert:			+/-3.51							
	TPU:			+/-15.0							

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec										
Batch	1596247									
Cobalt-60	162		153	pCi/g		94.3	(75%-125%)			
	Uncert:		+/-3.86							
	TPU:		+/-12.5							
Europium-154		U	-0.798	pCi/g						
	Uncert:		+/-1.02							
	TPU:		+/-1.09							
Lead-212		U	0.273	pCi/g						
	Uncert:		+/-0.801							
	TPU:		+/-0.811							
Lead-214		U	-0.396	pCi/g						
	Uncert:		+/-1.12							
	TPU:		+/-1.13							
Potassium-40		U	-0.439	pCi/g						
	Uncert:		+/-2.34							
	TPU:		+/-2.35							
Protactinium-231		U	-7.97	pCi/g						
	Uncert:		+/-6.63							
	TPU:		+/-7.76							
Radium-226		U	-0.329	pCi/g						
	Uncert:		+/-1.08							
	TPU:		+/-1.09							
Radium-228		U	0.270	pCi/g						
	Uncert:		+/-3.17							
	TPU:		+/-3.17							
Thallium-208		U	-0.0447	pCi/g						
	Uncert:		+/-0.557							
	TPU:		+/-0.558							
Tin-126			38.3	pCi/g						
	Uncert:		+/-2.70							
	TPU:		+/-4.16							
QC1203621350	MB									
Actinium-227		U	-0.00211	pCi/g				MXR1	10/03/1608:50	
	Uncert:		+/-0.166							
	TPU:		+/-0.166							
Antimony-125		U	-0.0111	pCi/g						
	Uncert:		+/-0.0665							
	TPU:		+/-0.0667							
Bismuth-212		U	-0.012	pCi/g						
	Uncert:		+/-0.304							
	TPU:		+/-0.304							
Bismuth-214		U	0.0133	pCi/g						
	Uncert:		+/-0.0896							
	TPU:		+/-0.0896							
Cesium-137		U	0.028	pCi/g						
	Uncert:		+/-0.0253							
	TPU:		+/-0.0283							

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1596247										
Cobalt-60			U	-0.0144	pCi/g						
	Uncert:			+/-0.0349							
	TPU:			+/-0.0355							
Europium-154			U	-0.00702	pCi/g						
	Uncert:			+/-0.0946							
	TPU:			+/-0.0947							
Lead-212			U	-0.0294	pCi/g						
	Uncert:			+/-0.0457							
	TPU:			+/-0.0476							
Lead-214			U	0.00584	pCi/g						
	Uncert:			+/-0.0668							
	TPU:			+/-0.0668							
Potassium-40			U	-0.307	pCi/g						
	Uncert:			+/-0.401							
	TPU:			+/-0.425							
Protactinium-231			U	-0.0946	pCi/g						
	Uncert:			+/-0.290							
	TPU:			+/-0.294							
Radium-226			U	0.0133	pCi/g						
	Uncert:			+/-0.0896							
	TPU:			+/-0.0896							
Radium-228			U	0.0959	pCi/g						
	Uncert:			+/-0.141							
	TPU:			+/-0.148							
Thallium-208			U	0.0174	pCi/g						
	Uncert:			+/-0.0327							
	TPU:			+/-0.0337							
Tin-126			U	-0.00222	pCi/g						
	Uncert:			+/-0.0316							
	TPU:			+/-0.0316							
Batch	1596249										
QC1203621355	405235038 DUP										
Actinium-227	HUh	-0.024	HU	0.0379	pCi/g	0			N/AMXR1	10/03/1609:21	
	Uncert:	+/-0.214		+/-0.177							
	TPU:	+/-0.215		+/-0.178							
Antimony-125	HUh	-0.0676	HU	0.0181	pCi/g	0			N/A		
	Uncert:	+/-0.0977		+/-0.0746							
	TPU:	+/-0.102		+/-0.0751							
Bismuth-212	HUIh	0.00	HUI	0.00	pCi/g	0			N/A		
	Uncert:	+/-1.34		+/-0.873							
	TPU:	+/-1.72		+/-1.01							
Bismuth-214	Hh	0.567	H	0.774	pCi/g	30.8*		(0%-20%)			
	Uncert:	+/-0.155		+/-0.162							
	TPU:	+/-0.157		+/-0.166							
Cesium-137	Hh	0.115	HUI	0.00	pCi/g	74.7		(0% - 100%)			
	Uncert:	+/-0.0596		+/-0.0694							

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1596249										
Cobalt-60		TPU:	+/-0.0598								
		HUh	0.0113	HU	0.00345	pCi/g	0				N/A
		Uncert:	+/-0.0424		+/-0.0252						
Europium-154		TPU:	+/-0.0427		+/-0.0252						
		HUh	-0.0421	HU	0.0338	pCi/g	0				N/A
		Uncert:	+/-0.122		+/-0.0842						
Lead-212		TPU:	+/-0.123		+/-0.0856						
		Hh	0.937	H	0.876	pCi/g	6.71				(0%-20%)
		Uncert:	+/-0.121		+/-0.135						
Lead-214		TPU:	+/-0.131		+/-0.143						
		Hh	0.776	H	1.07	pCi/g	31.8*				(0%-20%)
		Uncert:	+/-0.168		+/-0.167						
Potassium-40		TPU:	+/-0.171		+/-0.173						
		Hh	12.4	H	12.0	pCi/g	2.95				(0%-20%)
		Uncert:	+/-1.44		+/-1.20						
Protactinium-231		TPU:	+/-1.58		+/-1.35						
		HUIh	0.00	HUI	0.00	pCi/g	0				N/A
		Uncert:	+/-0.599		+/-0.581						
Radium-226		TPU:	+/-0.616		+/-0.626						
		Hh	0.567	H	0.774	pCi/g	30.8*				(0%-20%)
		Uncert:	+/-0.155		+/-0.162						
Radium-228		TPU:	+/-0.157		+/-0.166						
		Hh	0.819	H	0.779	pCi/g	5.09				(0% - 100%)
		Uncert:	+/-0.386		+/-0.284						
Thallium-208		TPU:	+/-0.388		+/-0.287						
		Hh	0.285	H	0.308	pCi/g	8.03				(0%-20%)
		Uncert:	+/-0.0667		+/-0.0765						
Tin-126		TPU:	+/-0.0678		+/-0.0776						
		HUIh	0.00	HU	0.0281	pCi/g	0				N/A
		Uncert:	+/-0.194		+/-0.113						
		TPU:	+/-0.195		+/-0.114						
QC1203621356	LCS										
Americium-241		489			550	pCi/g		112			(75%-125%) MXR1 10/03/1609:11
		Uncert:			+/-12.2						
		TPU:			+/-44.3						
Actinium-227				U	0.0258	pCi/g					
		Uncert:			+/-3.69						
		TPU:			+/-3.69						
Antimony-125				U	-0.919	pCi/g					
		Uncert:			+/-1.65						
		TPU:			+/-1.70						
Bismuth-212				U	3.24	pCi/g					
		Uncert:			+/-8.15						
		TPU:			+/-8.29						
Bismuth-214				U	-0.366	pCi/g					
		Uncert:			+/-1.10						

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Parname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec										
Batch	1596249									
Cesium-137	179		TPU: +/-1.11 175	pCi/g		97.8	(75%-125%)			
			Uncert: +/-3.45							
Cobalt-60	162		TPU: +/-14.9 153	pCi/g		94.4	(75%-125%)			
			Uncert: +/-3.77							
Europium-154		U	TPU: +/-12.5 0.318	pCi/g						
			Uncert: +/-1.14							
Lead-212		U	TPU: +/-1.15 0.185	pCi/g						
			Uncert: +/-0.774							
Lead-214		U	TPU: +/-0.778 0.861	pCi/g						
			Uncert: +/-1.11							
Potassium-40		U	TPU: +/-1.18 0.257	pCi/g						
			Uncert: +/-2.57							
Protactinium-231		U	TPU: +/-2.57 -1.17	pCi/g						
			Uncert: +/-6.68							
Radium-226		U	TPU: +/-6.70 -0.366	pCi/g						
			Uncert: +/-1.10							
Radium-228		U	TPU: +/-1.11 1.60	pCi/g						
			Uncert: +/-3.24							
Thallium-208		U	TPU: +/-3.32 -0.126	pCi/g						
			Uncert: +/-0.551							
Tin-126			TPU: +/-0.554 35.4	pCi/g						
			Uncert: +/-2.38							
QC1203621354 MB			TPU: +/-3.77							
Actinium-227		U	0.0024	pCi/g				MXR1	10/03/1609:20	
			Uncert: +/-0.109							
Antimony-125		U	TPU: +/-0.109 0.0346	pCi/g						
			Uncert: +/-0.0376							
Bismuth-212		U	TPU: +/-0.0407 0.00283	pCi/g						
			Uncert: +/-0.222							
Bismuth-214		U	TPU: +/-0.222 0.0218	pCi/g						
			Uncert: +/-0.043							

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1596249										
Cesium-137	TPU:			+/-0.0442							
			U	-0.0156	pCi/g						
	Uncert:			+/-0.020							
Cobalt-60	TPU:			+/-0.0212							
			U	0.00355	pCi/g						
	Uncert:			+/-0.0145							
Europium-154	TPU:			+/-0.0146							
			U	-0.00923	pCi/g						
	Uncert:			+/-0.039							
Lead-212	TPU:			+/-0.0393							
			U	-0.0403	pCi/g						
	Uncert:			+/-0.0274							
Lead-214	TPU:			+/-0.0329							
			U	0.020	pCi/g						
	Uncert:			+/-0.0382							
Potassium-40	TPU:			+/-0.0393							
			U	0.120	pCi/g						
	Uncert:			+/-0.322							
Protactinium-231	TPU:			+/-0.323							
			U	0.0281	pCi/g						
	Uncert:			+/-0.180							
Radium-226	TPU:			+/-0.180							
			U	0.0218	pCi/g						
	Uncert:			+/-0.043							
Radium-228	TPU:			+/-0.0442							
			U	-0.043	pCi/g						
	Uncert:			+/-0.066							
Thallium-208	TPU:			+/-0.0689							
			U	0.00107	pCi/g						
	Uncert:			+/-0.0148							
Tin-126	TPU:			+/-0.0148							
			U	0.00835	pCi/g						
	Uncert:			+/-0.0266							
Batch	1596252										
QC1203621362	405235041 DUP										
Actinium-227	HUh	0.0314	HU	0.0461	pCi/g	0			N/AMXR1	10/03/1607:54	
	Uncert:	+/-0.177		+/-0.164							
	TPU:	+/-0.177		+/-0.166							
Antimony-125	HUh	-0.0586	HU	0.00169	pCi/g	0			N/A		
	Uncert:	+/-0.0781		+/-0.0712							
	TPU:	+/-0.0825		+/-0.0712							
Bismuth-212	HUIh	0.00	HUI	0.00	pCi/g	0			N/A		
	Uncert:	+/-0.700		+/-0.892							
	TPU:	+/-0.824		+/-0.959							
Bismuth-214	Hh	0.794	H	0.654	pCi/g	19.3		(0%-20%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1596252										
Cesium-137		Uncert:	+/-0.159	+/-0.138							
		TPU:	+/-0.163	+/-0.141							
		HUIh	0.00	HUI	0.0546	pCi/g	4.56	(0% - 100%)			
		Uncert:	+/-0.049	+/-0.0611							
		TPU:	+/-0.049	+/-0.0612							
Cobalt-60		HUh	0.0168	HU	-0.00701	pCi/g	0		N/A		
		Uncert:	+/-0.033	+/-0.0329							
		TPU:	+/-0.0339	+/-0.033							
Europium-154		HUh	-0.00765	HU	-0.0325	pCi/g	0		N/A		
		Uncert:	+/-0.101	+/-0.0702							
		TPU:	+/-0.101	+/-0.0717							
Lead-212		Hh	0.807	H	0.736	pCi/g	9.17	(0%-20%)			
		Uncert:	+/-0.113	+/-0.102							
		TPU:	+/-0.121	+/-0.109							
Lead-214		Hh	0.803	H	0.934	pCi/g	15.1	(0%-20%)			
		Uncert:	+/-0.167	+/-0.157							
		TPU:	+/-0.170	+/-0.162							
Potassium-40		Hh	11.8	H	13.4	pCi/g	12.4	(0%-20%)			
		Uncert:	+/-1.23	+/-1.28							
		TPU:	+/-1.38	+/-1.46							
Protactinium-231		HUIh	0.00	HU	-0.182	pCi/g	23.5		N/A		
		Uncert:	+/-0.541	+/-0.342							
		TPU:	+/-0.565	+/-0.354							
Radium-226		Hh	0.794	H	0.654	pCi/g	19.3	(0%-20%)			
		Uncert:	+/-0.159	+/-0.138							
		TPU:	+/-0.163	+/-0.141							
Radium-228		Hh	0.629	H	0.529	pCi/g	17.2	(0% - 100%)			
		Uncert:	+/-0.246	+/-0.228							
		TPU:	+/-0.249	+/-0.230							
Thallium-208		Hh	0.273	H	0.230	pCi/g	17.3	(0%-20%)			
		Uncert:	+/-0.0808	+/-0.0708							
		TPU:	+/-0.0816	+/-0.0715							
Tin-126		HUh	0.0427	HUI	0.00	pCi/g	14.1		N/A		
		Uncert:	+/-0.187	+/-0.102							
		TPU:	+/-0.188	+/-0.103							
QC1203621363	LCS										
Americium-241		489			544	pCi/g		111 (75%-125%)	MXR1	10/03/16	05:45
		Uncert:			+/-7.77						
		TPU:			+/-40.8						
Actinium-227				U	1.33	pCi/g					
		Uncert:			+/-3.42						
		TPU:			+/-3.48						
Antimony-125				U	0.557	pCi/g					
		Uncert:			+/-1.53						
		TPU:			+/-1.55						
Bismuth-212				U	-1.37	pCi/g					

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec										
Batch	1596252									
			Uncert:							
			TPU:							
Bismuth-214		U	0.115	pCi/g						
			Uncert:							
			TPU:							
Cesium-137	179		189	pCi/g		105	(75%-125%)			
			Uncert:							
			TPU:							
Cobalt-60	162		157	pCi/g		97.2	(75%-125%)			
			Uncert:							
			TPU:							
Europium-154		U	-0.324	pCi/g						
			Uncert:							
			TPU:							
Lead-212		U	-0.0245	pCi/g						
			Uncert:							
			TPU:							
Lead-214			1.37	pCi/g						
			Uncert:							
			TPU:							
Potassium-40		U	-1.01	pCi/g						
			Uncert:							
			TPU:							
Protactinium-231		U	-0.788	pCi/g						
			Uncert:							
			TPU:							
Radium-226		U	0.115	pCi/g						
			Uncert:							
			TPU:							
Radium-228		U	-2.57	pCi/g						
			Uncert:							
			TPU:							
Thallium-208		U	-0.432	pCi/g						
			Uncert:							
			TPU:							
Tin-126			40.7	pCi/g						
			Uncert:							
			TPU:							
QC1203621361 MB										
Actinium-227		U	-0.028	pCi/g				MXR1	10/03/1607:53	
			Uncert:							
			TPU:							
Antimony-125		U	-0.0423	pCi/g						
			Uncert:							
			TPU:							
Bismuth-212		U	0.0179	pCi/g						

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1596252										
Bismuth-214											
	Uncert:			+/-0.238							
	TPU:			+/-0.238							
			U	0.011	pCi/g						
Cesium-137											
	Uncert:			+/-0.0391							
	TPU:			+/-0.0394							
			U	0.00281	pCi/g						
Cobalt-60											
	Uncert:			+/-0.0144							
	TPU:			+/-0.0144							
			U	0.0143	pCi/g						
Europium-154											
	Uncert:			+/-0.0147							
	TPU:			+/-0.0161							
			U	0.00394	pCi/g						
Lead-212											
	Uncert:			+/-0.0315							
	TPU:			+/-0.0315							
			U	0.00468	pCi/g						
Lead-214											
	Uncert:			+/-0.0237							
	TPU:			+/-0.0238							
			U	-0.00503	pCi/g						
Potassium-40											
	Uncert:			+/-0.035							
	TPU:			+/-0.0351							
			U	-0.109	pCi/g						
Protactinium-231											
	Uncert:			+/-0.171							
	TPU:			+/-0.178							
			U	0.0246	pCi/g						
Radium-226											
	Uncert:			+/-0.174							
	TPU:			+/-0.174							
			U	0.011	pCi/g						
Radium-228											
	Uncert:			+/-0.0391							
	TPU:			+/-0.0394							
			U	0.00265	pCi/g						
Thallium-208											
	Uncert:			+/-0.0623							
	TPU:			+/-0.0623							
			U	0.011	pCi/g						
Tin-126											
	Uncert:			+/-0.0203							
	TPU:			+/-0.0209							
			U	0.0098	pCi/g						
Batch	1596254										
QC1203621365	405235061	DUP									
Actinium-227		HUh	-0.12	HU	-0.0297	pCi/g	0		N/AMXR1	10/03/1606:55	
		Uncert:	+/-0.189		+/-0.227						
		TPU:	+/-0.197		+/-0.227						
Antimony-125		HUh	0.068	HU	0.0819	pCi/g	0		N/A		
		Uncert:	+/-0.0832		+/-0.107						
		TPU:	+/-0.0887		+/-0.113						

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1596254										
Bismuth-212	HUIh	0.00	HUI	0.00	pCi/g	0					N/A
	Uncert:	+/-0.504		+/-0.911							
	TPU:	+/-0.633		+/-1.09							
Bismuth-214	Hh	0.922	H	1.18	pCi/g	24.8*		(0%-20%)			
	Uncert:	+/-0.164		+/-0.181							
	TPU:	+/-0.168		+/-0.188							
Cesium-137	HUIh	0.0251	H	0.161	pCi/g	68.8		(0% - 100%)			
	Uncert:	+/-0.039		+/-0.0673							
	TPU:	+/-0.0407		+/-0.0676							
Cobalt-60	HUIh	0.0224	HU	-0.0228	pCi/g	0					N/A
	Uncert:	+/-0.0301		+/-0.0348							
	TPU:	+/-0.0318		+/-0.0363							
Europium-154	HUIh	0.0331	HUI	0.00	pCi/g	0					N/A
	Uncert:	+/-0.098		+/-0.117							
	TPU:	+/-0.0992		+/-0.130							
Lead-212	Hh	0.802	H	0.931	pCi/g	14.9		(0%-20%)			
	Uncert:	+/-0.112		+/-0.126							
	TPU:	+/-0.120		+/-0.135							
Lead-214	Hh	1.19	H	1.34	pCi/g	11.9		(0%-20%)			
	Uncert:	+/-0.158		+/-0.206							
	TPU:	+/-0.166		+/-0.213							
Potassium-40	Hh	10.5	H	11.9	pCi/g	12.4		(0%-20%)			
	Uncert:	+/-1.37		+/-1.40							
	TPU:	+/-1.47		+/-1.53							
Protactinium-231	HUIh	0.00	HUI	0.00	pCi/g	14.9					N/A
	Uncert:	+/-0.553		+/-0.780							
	TPU:	+/-0.593		+/-0.785							
Radium-226	Hh	0.922	H	1.18	pCi/g	24.8*		(0%-20%)			
	Uncert:	+/-0.164		+/-0.181							
	TPU:	+/-0.168		+/-0.188							
Radium-228	HUIh	0.00	H	0.741	pCi/g	18.7		(0% - 100%)			
	Uncert:	+/-0.227		+/-0.368							
	TPU:	+/-0.465		+/-0.370							
Thallium-208	Hh	0.264	H	0.231	pCi/g	13.6		(0%-20%)			
	Uncert:	+/-0.0737		+/-0.0777							
	TPU:	+/-0.0745		+/-0.0784							
Tin-126	HUIh	0.0261	HUI	0.00	pCi/g	56.9					N/A
	Uncert:	+/-0.125		+/-0.0789							
	TPU:	+/-0.126		+/-0.119							
QC1203621366 LCS											
Americium-241		489		562	pCi/g		115	(75%-125%)	MXR1	10/03/1605:28	
	Uncert:			+/-9.26							
	TPU:			+/-42.4							
Actinium-227			U	-0.721	pCi/g						
	Uncert:			+/-3.25							
	TPU:			+/-3.26							

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec										
Batch	1596254									
Antimony-125		U	0.821	pCi/g						
	Uncert:		+/-1.55							
	TPU:		+/-1.59							
Bismuth-212		U	-1.2	pCi/g						
	Uncert:		+/-7.37							
	TPU:		+/-7.39							
Bismuth-214		U	0.183	pCi/g						
	Uncert:		+/-0.955							
	TPU:		+/-0.959							
Cesium-137	179		195	pCi/g		108	(75%-125%)			
	Uncert:		+/-3.39							
	TPU:		+/-9.01							
Cobalt-60	162		160	pCi/g		98.8	(75%-125%)			
	Uncert:		+/-3.46							
	TPU:		+/-6.82							
Europium-154		U	0.0867	pCi/g						
	Uncert:		+/-0.929							
	TPU:		+/-0.930							
Lead-212		U	-0.0738	pCi/g						
	Uncert:		+/-0.686							
	TPU:		+/-0.686							
Lead-214		U	0.372	pCi/g						
	Uncert:		+/-1.00							
	TPU:		+/-1.01							
Potassium-40		U	0.749	pCi/g						
	Uncert:		+/-2.54							
	TPU:		+/-2.56							
Protactinium-231		U	-2.71	pCi/g						
	Uncert:		+/-6.49							
	TPU:		+/-6.63							
Radium-226		U	0.183	pCi/g						
	Uncert:		+/-0.955							
	TPU:		+/-0.959							
Radium-228		U	-1.64	pCi/g						
	Uncert:		+/-2.91							
	TPU:		+/-3.00							
Thallium-208		U	0.0682	pCi/g						
	Uncert:		+/-0.498							
	TPU:		+/-0.499							
Tin-126			39.8	pCi/g						
	Uncert:		+/-2.19							
	TPU:		+/-3.30							
QC1203621364 MB										
Actinium-227		U	0.109	pCi/g				MXR1	10/03/16	06:55
	Uncert:		+/-0.136							
	TPU:		+/-0.145							

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gamma Spec									
Batch	1596254								
Antimony-125		U	-0.0541	pCi/g					
	Uncert:		+/-0.0598						
	TPU:		+/-0.0646						
Bismuth-212		U	-0.00482	pCi/g					
	Uncert:		+/-0.343						
	TPU:		+/-0.343						
Bismuth-214		U	-0.014	pCi/g					
	Uncert:		+/-0.060						
	TPU:		+/-0.0604						
Cesium-137		UI	0.00	pCi/g					
	Uncert:		+/-0.0248						
	TPU:		+/-0.0248						
Cobalt-60		U	-0.00794	pCi/g					
	Uncert:		+/-0.0197						
	TPU:		+/-0.020						
Europium-154		U	-0.0127	pCi/g					
	Uncert:		+/-0.0476						
	TPU:		+/-0.0479						
Lead-212		U	0.0243	pCi/g					
	Uncert:		+/-0.0666						
	TPU:		+/-0.0675						
Lead-214		U	-0.0308	pCi/g					
	Uncert:		+/-0.0485						
	TPU:		+/-0.0505						
Potassium-40		U	0.0557	pCi/g					
	Uncert:		+/-0.284						
	TPU:		+/-0.284						
Protactinium-231		U	-0.142	pCi/g					
	Uncert:		+/-0.262						
	TPU:		+/-0.271						
Radium-226		U	-0.014	pCi/g					
	Uncert:		+/-0.060						
	TPU:		+/-0.0604						
Radium-228		UI	0.00	pCi/g					
	Uncert:		+/-0.109						
	TPU:		+/-0.132						
Thallium-208		U	0.00626	pCi/g					
	Uncert:		+/-0.0281						
	TPU:		+/-0.0282						
Tin-126		U	0.000999	pCi/g					
	Uncert:		+/-0.0457						
	TPU:		+/-0.0457						
Batch	1598618								
QC1203627431	405235001 DUP								
Iodine-129	HUh	-0.016	HU	0.087	pCi/g	0		N/A MJH1	09/28/1608:03
	Uncert:	+/-0.176		+/-0.366					

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1598618										
QC1203627433	LCS	TPU:	+/-0.177	+/-0.368							
Iodine-129	12.5			10.5	pCi/g	84.3	(75%-125%)		MJH1	09/28/1608:11	
		Uncert:		+/-1.50							
		TPU:		+/-1.82							
QC1203627430	MB										
Iodine-129			U	-0.011	pCi/g				MJH1	09/28/1607:39	
		Uncert:		+/-0.173							
		TPU:		+/-0.173							
QC1203627432	405235001 MS										
Iodine-129	16.3	HUh	-0.016	H	13.0	pCi/g	79.8	(75%-125%)	MJH1	09/28/1608:04	
		Uncert:	+/-0.176		+/-2.16						
		TPU:	+/-0.177		+/-2.52						
Batch	1598620										
QC1203627438	405235021 DUP										
Iodine-129		HUh	0.057	HU	0.243	pCi/g	0		N/A MJH1	09/28/1612:51	
		Uncert:	+/-0.204		+/-0.267						
		TPU:	+/-0.206		+/-0.289						
QC1203627440	LCS										
Iodine-129	11.8			13.2	pCi/g	112	(75%-125%)		MJH1	09/28/1612:52	
		Uncert:		+/-1.91							
		TPU:		+/-2.31							
QC1203627437	MB										
Iodine-129			U	0.0472	pCi/g				MJH1	09/28/1612:50	
		Uncert:		+/-0.190							
		TPU:		+/-0.191							
QC1203627439	405235021 MS										
Iodine-129	14.2	HUh	0.057	H	12.0	pCi/g	84.6	(75%-125%)	MJH1	09/28/1612:52	
		Uncert:	+/-0.204		+/-1.68						
		TPU:	+/-0.206		+/-2.06						
Batch	1598647										
QC1203627503	405235041 DUP										
Iodine-129		HUh	0.176	HU	-0.153	pCi/g	0		N/A MJH1	09/28/1619:04	
		Uncert:	+/-0.244		+/-0.323						
		TPU:	+/-0.257		+/-0.330						
QC1203627505	LCS										
Iodine-129	11.2			10.4	pCi/g	92.4	(75%-125%)		MJH1	09/29/1609:10	
		Uncert:		+/-1.03							
		TPU:		+/-1.47							
QC1203627502	MB										
Iodine-129			U	-0.153	pCi/g				MJH1	09/28/1615:50	
		Uncert:		+/-0.195							
		TPU:		+/-0.207							
QC1203627504	405235041 MS										
Iodine-129	13.1	HUh	0.176	H	14.1	pCi/g	107	(75%-125%)	MJH1	09/28/1619:05	

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1598647										
		Uncert:	+/-0.244								
		TPU:	+/-0.257								
Batch	1598663										
QC1203627532	405235061	DUP									
Iodine-129		HUIh	0.00	HU	0.034	pCi/g	0		N/A MJH1	09/29/16	08:03
		Uncert:	+/-0.328		+/-0.118						
		TPU:	+/-0.328		+/-0.119						
QC1203627534	LCS										
Iodine-129		9.84			10.0	pCi/g		102	(75%-125%) MJH1	09/29/16	08:33
		Uncert:			+/-1.44						
		TPU:			+/-1.74						
QC1203627531	MB										
Iodine-129				U	0.00336	pCi/g			MJH1	09/29/16	08:03
		Uncert:			+/-0.230						
		TPU:			+/-0.230						
QC1203627533	405235061	MS									
Iodine-129		14.0 HUIh	0.00	H	12.1	pCi/g		86.9	(75%-125%) MJH1	09/29/16	08:04
		Uncert:	+/-0.328		+/-2.48						
		TPU:	+/-0.328		+/-2.76						
Rad Gas Flow											
Batch	1597795										
QC1203625399	405235005	DUP									
Strontium-90		HUh	-0.135	HU	-0.662	pCi/g	0		N/A KSD1	09/17/16	16:39
		Uncert:	+/-0.565		+/-0.742						
		TPU:	+/-0.565		+/-0.742						
QC1203625400	LCS										
Strontium-90		25.9			26.7	pCi/g		103	(75%-125%) KSD1	09/17/16	16:39
		Uncert:			+/-1.40						
		TPU:			+/-4.98						
QC1203625398	MB										
Strontium-90				U	-0.169	pCi/g			KSD1	09/17/16	16:40
		Uncert:			+/-0.211						
		TPU:			+/-0.211						
Batch	1597796										
QC1203625402	405235025	DUP									
Strontium-90		HUh	0.106	HU	0.0519	pCi/g	0		N/A KSD1	09/17/16	15:45
		Uncert:	+/-0.613		+/-0.715						
		TPU:	+/-0.614		+/-0.715						
QC1203625403	LCS										
Strontium-90		46.1			45.9	pCi/g		99.4	(75%-125%) KSD1	09/17/16	15:45
		Uncert:			+/-2.35						
		TPU:			+/-8.52						
QC1203625401	MB										
Strontium-90				U	-0.0178	pCi/g			KSD1	09/17/16	15:37
		Uncert:			+/-0.356						

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Rad Gas Flow										
Batch	1597796									
		TPU:		+/-0.356						
Batch	1597803									
QC1203625409	405235045 DUP									
Strontium-90		Hh	0.742	HU	-1.02	pCi/g	0	N/A	KSD1	09/22/16 17:18
		Uncert:	+/-0.723		+/-0.730					
		TPU:	+/-0.737		+/-0.730					
QC1203625410	LCS									
Strontium-90		37.9			43.6	pCi/g	115	(75%-125%)	KSD1	09/22/16 17:18
		Uncert:			+/-2.41					
		TPU:			+/-8.33					
QC1203625408	MB									
Strontium-90			U		0.054	pCi/g			KSD1	09/22/16 17:18
		Uncert:			+/-0.342					
		TPU:			+/-0.342					
Batch	1597804									
QC1203625413	405235065 DUP									
Strontium-90		Hh	1.02	HU	0.278	pCi/g	0	N/A	BXF1	09/28/16 08:54
		Uncert:	+/-0.909		+/-0.577					
		TPU:	+/-0.929		+/-0.579					
QC1203625414	LCS									
Strontium-90		58.2			61.6	pCi/g	106	(75%-125%)	BXF1	09/28/16 08:54
		Uncert:			+/-3.25					
		TPU:			+/-11.9					
QC1203625412	MB									
Strontium-90			U		-0.289	pCi/g			BXF1	09/27/16 15:37
		Uncert:			+/-0.526					
		TPU:			+/-0.526					
Batch	1597811									
QC1203625436	405235033 DUP									
Alpha		Hh	11.6	H	12.1	pCi/g	4.49	(0% - 100%)	BXF1	09/19/16 14:36
		Uncert:	+/-3.82		+/-3.36					
		TPU:	+/-4.42		+/-4.13					
Beta		Hh	15.8	H	15.9	pCi/g	.634	(0%-20%)		
		Uncert:	+/-2.74		+/-2.28					
		TPU:	+/-3.54		+/-3.21					
QC1203625439	LCS									
Alpha		95.1			88.9	pCi/g	93.4	(75%-125%)	BXF1	09/19/16 16:05
		Uncert:			+/-8.60					
		TPU:			+/-19.4					
Beta		346			380	pCi/g	110	(75%-125%)		
		Uncert:			+/-13.7					
		TPU:			+/-55.8					
QC1203625435	MB									
Alpha			U		0.190	pCi/g			BXF1	09/19/16 14:36
		Uncert:			+/-1.62					

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Rad Gas Flow											
Batch	1597811										
Beta		TPU:									
				+/-1.62							
			U	0.538	pCi/g						
		Uncert:		+/-1.45							
		TPU:		+/-1.46							
QC1203625437	405235033	MS									
Alpha	113	Hh	11.6	H	129	pCi/g		104	(75%-125%)	BXF1	09/19/1616:05
		Uncert:	+/-3.82		+/-15.1						
		TPU:	+/-4.42		+/-29.1						
Beta	411	Hh	15.8	H	440	pCi/g		103	(75%-125%)		
		Uncert:	+/-2.74		+/-16.0						
		TPU:	+/-3.54		+/-64.0						
QC1203625438	405235033	MSD									
Alpha	113	Hh	11.6	H	142	pCi/g	9.51	116	(0%-20%)	BXF1	09/19/1616:05
		Uncert:	+/-3.82		+/-16.1						
		TPU:	+/-4.42		+/-31.9						
Beta	411	Hh	15.8	H	438	pCi/g	.51	103	(0%-20%)		
		Uncert:	+/-2.74		+/-16.8						
		TPU:	+/-3.54		+/-64.7						
Batch	1597816										
QC1203625450	405235013	DUP									
Alpha		Hh	17.1	H	19.8	pCi/g	14.5		(0%-20%)	JXC9	09/20/1611:56
		Uncert:	+/-4.66		+/-4.36						
		TPU:	+/-5.72		+/-5.82						
Beta		Hh	24.3	H	20.1	pCi/g	18.9		(0%-20%)		
		Uncert:	+/-3.36		+/-2.88						
		TPU:	+/-4.90		+/-4.12						
QC1203625453	LCS										
Alpha	109				105	pCi/g		96.5	(75%-125%)	JXC9	09/19/1612:37
		Uncert:			+/-10.3						
		TPU:			+/-23.7						
Beta	396				410	pCi/g		104	(75%-125%)		
		Uncert:			+/-15.0						
		TPU:			+/-58.3						
QC1203625449	MB										
Alpha				U	0.0336	pCi/g				JXC9	09/19/1612:20
		Uncert:			+/-1.85						
		TPU:			+/-1.85						
Beta				U	-0.87	pCi/g					
		Uncert:			+/-1.81						
		TPU:			+/-1.81						
QC1203625451	405235013	MS									
Alpha	109	Hh	17.1	H	109	pCi/g		83.9	(75%-125%)	JXC9	09/20/1611:56
		Uncert:	+/-4.66		+/-14.2						
		TPU:	+/-5.72		+/-25.6						
Beta	396	Hh	24.3	H	428	pCi/g		102	(75%-125%)		
		Uncert:	+/-3.36		+/-15.8						

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Rad Gas Flow									
Batch	1597816								
TPU: +/-4.90 +/-63.2									
QC1203625452	405235013 MSD								
Alpha	110	Hh	17.1 H	116	pCi/g	6.65	90	(0%-20%)	JXC9 09/20/1611:56
Uncert: +/-4.66 +/-15.6									
TPU: +/-5.72 +/-27.4									
Beta	400	Hh	24.3 H	452	pCi/g	5.3	107	(0%-20%)	
Uncert: +/-3.36 +/-16.4									
TPU: +/-4.90 +/-65.4									
Batch	1597817								
QC1203625460	405235073 DUP								
Alpha		Hh	27.6 H	20.0	pCi/g	32*		(0%-20%)	JXC9 09/22/1614:00
Uncert: +/-5.03 +/-4.54									
TPU: +/-7.39 +/-5.94									
Beta		Hh	39.4 H	27.9	pCi/g	34.3*		(0%-20%)	
Uncert: +/-3.28 +/-3.51									
TPU: +/-6.39 +/-5.27									
QC1203625463	LCS								
Alpha	108			108	pCi/g		100	(75%-125%)	JXC9 09/22/1613:58
Uncert: +/-10.4									
TPU: +/-24.1									
Beta	392			436	pCi/g		111	(75%-125%)	
Uncert: +/-15.5									
TPU: +/-62.0									
QC1203625459	MB								
Alpha			U	-1.29	pCi/g				JXC9 09/22/1614:00
Uncert: +/-1.11									
TPU: +/-1.11									
Beta			U	-0.444	pCi/g				
Uncert: +/-1.41									
TPU: +/-1.41									
QC1203625461	405235073 MS								
Alpha	116	Hh	27.6 H	118	pCi/g		77.4	(75%-125%)	JXC9 09/23/1613:24
Uncert: +/-5.03 +/-13.3									
TPU: +/-7.39 +/-26.8									
Beta	423	Hh	39.4 H	359	pCi/g		75.7	(75%-125%)	
Uncert: +/-3.28 +/-14.5									
TPU: +/-6.39 +/-52.3									
QC1203625462	405235073 MSD								
Alpha	113	Hh	27.6 H	141	pCi/g	18.2	100	(0%-20%)	JXC9 09/22/1613:58
Uncert: +/-5.03 +/-15.6									
TPU: +/-7.39 +/-31.9									
Beta	411	Hh	39.4 H	389	pCi/g	7.96	85.1	(0%-20%)	
Uncert: +/-3.28 +/-15.9									
TPU: +/-6.39 +/-57.0									
Batch	1602427								
QC1203636654	405235045 DUP								

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time	
Rad Gas Flow												
Batch	1602427											
Alpha	Hh	15.6	H	19.2	pCi/g	20.8		(0% - 100%)	JXC9	09/28/16	14:47	
	Uncert:	+/-3.57		+/-3.82								
	TPU:	+/-4.60		+/-5.36								
Beta	Hh	20.5	H	24.4	pCi/g	17.2		(0%-20%)				
	Uncert:	+/-2.55		+/-2.37								
	TPU:	+/-3.71		+/-4.16								
QC1203636657	LCS											
Alpha		107		113	pCi/g		106	(75%-125%)	JXC9	09/28/16	14:47	
	Uncert:			+/-10.8								
	TPU:			+/-24.3								
Beta		389		441	pCi/g		113	(75%-125%)				
	Uncert:			+/-15.8								
	TPU:			+/-63.3								
QC1203636653	MB											
Alpha			U	0.070	pCi/g				JXC9	09/28/16	14:47	
	Uncert:			+/-1.26								
	TPU:			+/-1.26								
Beta			U	-2.93	pCi/g							
	Uncert:			+/-2.07								
	TPU:			+/-2.07								
QC1203636655	405235045 MS											
Alpha	Hh	15.6	H	155	pCi/g		121	(75%-125%)	JXC9	09/29/16	13:04	
	Uncert:	+/-3.57		+/-16.2								
	TPU:	+/-4.60		+/-34.9								
Beta	Hh	20.5	H	443	pCi/g		101	(75%-125%)				
	Uncert:	+/-2.55		+/-15.9								
	TPU:	+/-3.71		+/-63.6								
QC1203636656	405235045 MSD											
Alpha	Hh	15.6	H	161	pCi/g	3.41	121	(0%-20%)	JXC9	09/29/16	13:04	
	Uncert:	+/-3.57		+/-16.5								
	TPU:	+/-4.60		+/-34.5								
Beta	Hh	20.5	H	488	pCi/g	9.74	108	(0%-20%)				
	Uncert:	+/-2.55		+/-17.1								
	TPU:	+/-3.71		+/-63.8								
Rad Liquid Scintillation												
Batch	1597412											
QC1203624302	405235021 DUP											
Technetium-99	HUh	1.02	H	1.66	pCi/g	0			N/A	CXS7	09/20/16	21:55
	Uncert:	+/-1.78		+/-1.88								
	TPU:	+/-1.78		+/-1.89								
QC1203624303	LCS											
Technetium-99		67.5		77.5	pCi/g		115	(75%-125%)	CXS7	09/20/16	22:27	
	Uncert:			+/-2.99								
	TPU:			+/-9.39								
QC1203624301	MB											
Technetium-99			U	-1.36	pCi/g				CXS7	09/20/16	21:23	

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QC Summary

Workorder: 405235

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Liquid Scintillation											
Batch	1597412										
		Uncert:		+/-1.38							
		TPU:		+/-1.38							
Batch	1597414										
QC1203624305	405235041	DUP									
Technetium-99		HUh	0.325	HU	0.594	pCi/g	0		N/A	CXS7	09/20/1619:08
		Uncert:	+/-1.62		+/-1.66						
		TPU:	+/-1.62		+/-1.66						
QC1203624306	LCS										
Technetium-99		74.5			81.1	pCi/g	109	(75%-125%)	CXS7		09/20/1619:24
		Uncert:			+/-4.23						
		TPU:			+/-10.2						
QC1203624304	MB										
Technetium-99				U	0.445	pCi/g			CXS7		09/20/1618:51
		Uncert:			+/-1.51						
		TPU:			+/-1.51						
Batch	1597416										
QC1203624309	405235001	DUP									
Technetium-99		HUh	-1.43	HU	-0.522	pCi/g	0		N/A	GXR1	09/20/1610:19
		Uncert:	+/-1.28		+/-1.18						
		TPU:	+/-1.28		+/-1.18						
QC1203624310	LCS										
Technetium-99		40.3			39.9	pCi/g	99.1	(75%-125%)	GXR1		09/20/1610:35
		Uncert:			+/-2.06						
		TPU:			+/-5.03						
QC1203624308	MB										
Technetium-99				U	0.212	pCi/g			GXR1		09/20/1610:03
		Uncert:			+/-0.938						
		TPU:			+/-0.939						
Batch	1597417										
QC1203624312	405235061	DUP									
Technetium-99		HUh	0.147	HU	-0.0928	pCi/g	0		N/A	CXS7	09/20/1614:41
		Uncert:	+/-0.973		+/-0.978						
		TPU:	+/-0.974		+/-0.978						
QC1203624313	LCS										
Technetium-99		71.2			73.0	pCi/g	103	(75%-125%)	CXS7		09/20/1615:09
		Uncert:			+/-2.93						
		TPU:			+/-8.88						
QC1203624311	MB										
Technetium-99				U	-0.31	pCi/g			CXS7		09/20/1614:13
		Uncert:			+/-0.742						
		TPU:			+/-0.742						
Batch	1598072										
QC1203626095	405235001	DUP									
Tritium		HUh	0.0866	HU	0.210	pCi/g	0		N/A	AEA	09/20/1623:10
		Uncert:	+/-1.90		+/-2.48						

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QC Summary

Workorder: 405235

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Liquid Scintillation											
Batch	1598072										
QC1203626097	LCS	TPU:	+/-1.90	+/-2.48							
Tritium	33.0			33.8	pCi/g		102	(75%-125%)	AEA	09/21/1600:58	
		Uncert:		+/-5.98							
		TPU:		+/-6.00							
QC1203626094	MB										
Tritium			U	-0.953	pCi/g				AEA	09/20/1621:37	
		Uncert:		+/-1.64							
		TPU:		+/-1.64							
QC1203626096	405235001 MS										
Tritium	38.7	HUh	0.0866	H	37.0	pCi/g	95.6	(75%-125%)	AEA	09/21/1600:42	
		Uncert:	+/-1.90		+/-6.91						
		TPU:	+/-1.90		+/-6.94						
Batch	1598075										
QC1203626099	405235021 DUP										
Tritium		Hh	2.57	H	2.22	pCi/g	0		N/A TXP3	09/23/1603:42	
		Uncert:	+/-2.07		+/-2.14						
		TPU:	+/-2.07		+/-2.14						
QC1203626101	LCS										
Tritium	35.6			32.1	pCi/g		90.2	(75%-125%)	TXP3	09/23/1604:32	
		Uncert:		+/-5.28							
		TPU:		+/-5.31							
QC1203626098	MB										
Tritium				1.40	pCi/g				TXP3	09/23/1603:10	
		Uncert:		+/-1.61							
		TPU:		+/-1.61							
QC1203626100	405235021 MS										
Tritium	43.5	Hh	2.57	H	39.8	pCi/g	91.5	(75%-125%)	TXP3	09/23/1604:15	
		Uncert:	+/-2.07		+/-6.50						
		TPU:	+/-2.07		+/-6.53						
Batch	1598078										
QC1203626106	405235001 DUP										
Carbon-14		HUh	-0.321	HU	-0.248	pCi/g	0		N/A AEA	09/22/1618:03	
		Uncert:	+/-0.636		+/-0.603						
		TPU:	+/-0.636		+/-0.603						
QC1203626108	LCS										
Carbon-14	49.9			47.8	pCi/g		95.6	(75%-125%)	AEA	09/22/1619:06	
		Uncert:		+/-2.46							
		TPU:		+/-4.26							
QC1203626105	MB										
Carbon-14				U	-0.226	pCi/g			AEA	09/22/1617:16	
		Uncert:		+/-0.595							
		TPU:		+/-0.595							
QC1203626107	405235001 MS										
Carbon-14	55.9	HUh	-0.321	H	56.3	pCi/g	101	(75%-125%)	AEA	09/22/1618:50	

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QC Summary

Workorder: 405235

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Liquid Scintillation											
Batch	1598078										
		Uncert:	+/-0.636								+/-2.80
		TPU:	+/-0.636								+/-4.98
Batch	1598080										
QC1203626127	405235021	DUP									
Carbon-14		HUh	0.211	HU	-0.163	pCi/g	0		N/A	TXJ1	09/24/1610:48
		Uncert:	+/-0.697		+/-0.649						
		TPU:	+/-0.698		+/-0.649						
QC1203626129	LCS										
Carbon-14		61.0			62.1	pCi/g		102	(75%-125%)	TXJ1	09/24/1613:11
		Uncert:			+/-1.46						
		TPU:			+/-4.76						
QC1203626126	MB										
Carbon-14				U	0.300	pCi/g				TXJ1	09/24/1609:37
		Uncert:			+/-0.588						
		TPU:			+/-0.588						
QC1203626128	405235021	MS									
Carbon-14		70.5 HUh	0.211	H	71.3	pCi/g		101	(75%-125%)	TXJ1	09/24/1611:59
		Uncert:	+/-0.697		+/-1.68						
		TPU:	+/-0.698		+/-5.48						
Batch	1598081										
QC1203626110	405235041	DUP									
Carbon-14		HUh	-0.0252	HU	0.194	pCi/g	0		N/A	TXJ1	09/27/1618:52
		Uncert:	+/-0.675		+/-0.672						
		TPU:	+/-0.675		+/-0.672						
QC1203626112	LCS										
Carbon-14		59.9			59.2	pCi/g		98.9	(75%-125%)	TXJ1	09/27/1621:15
		Uncert:			+/-1.36						
		TPU:			+/-4.53						
QC1203626109	MB										
Carbon-14				U	-0.233	pCi/g				TXJ1	09/27/1617:40
		Uncert:			+/-0.594						
		TPU:			+/-0.594						
QC1203626111	405235041	MS									
Carbon-14		61.8 HUh	-0.0252	H	59.8	pCi/g		96.7	(75%-125%)	TXJ1	09/27/1620:03
		Uncert:	+/-0.675		+/-1.39						
		TPU:	+/-0.675		+/-4.58						
Batch	1598082										
QC1203626114	405235061	DUP									
Carbon-14		HUh	-0.0115	H	0.915	pCi/g	0		N/A	TXJ1	09/30/1600:17
		Uncert:	+/-0.738		+/-0.715						
		TPU:	+/-0.738		+/-0.718						
QC1203626116	LCS										
Carbon-14		61.4			62.3	pCi/g		101	(75%-125%)	TXJ1	09/30/1602:40
		Uncert:			+/-1.48						
		TPU:			+/-4.78						

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time	
Rad Liquid Scintillation												
Batch	1598082											
QC1203626113	MB											
Carbon-14			U	0.310	pCi/g				TXJ1	09/29/16	23:06	
				Uncert: +/-0.626								
				TPU: +/-0.627								
QC1203626115	405235061	MS										
Carbon-14	70.2	HUh	-0.0115	H	68.7	pCi/g	97.9	(75%-125%)	TXJ1	09/30/16	01:29	
				Uncert: +/-0.738								
				TPU: +/-0.738								
Batch	1598092											
QC1203626145	405235041	DUP										
Tritium		HUh	1.40	HU	0.374	pCi/g	0		N/A	TXP3	09/25/16	13:44
				Uncert: +/-2.36								
				TPU: +/-2.36								
QC1203626147	LCS											
Tritium	37.7				32.8	pCi/g	87	(75%-125%)	TXP3	09/25/16	17:12	
				Uncert: +/-3.03								
				TPU: +/-3.07								
QC1203626144	MB											
Tritium				U	0.339	pCi/g			TXP3	09/25/16	12:01	
				Uncert: +/-2.16								
				TPU: +/-2.16								
QC1203626146	405235041	MS										
Tritium	41.4	HUh	1.40	H	35.4	pCi/g	85.4	(75%-125%)	TXP3	09/25/16	15:28	
				Uncert: +/-2.36								
				TPU: +/-2.36								
Batch	1598096											
QC1203626153	405235061	DUP										
Tritium		HUh	0.635	HU	1.55	pCi/g	0		N/A	TXP3	09/27/16	20:28
				Uncert: +/-2.11								
				TPU: +/-2.11								
QC1203626155	LCS											
Tritium	36.9				36.2	pCi/g	98.2	(75%-125%)	TXP3	09/29/16	08:14	
				Uncert: +/-6.79								
				TPU: +/-6.82								
QC1203626152	MB											
Tritium				U	0.402	pCi/g			TXP3	09/27/16	18:54	
				Uncert: +/-1.82								
				TPU: +/-1.82								
QC1203626154	405235061	MS										
Tritium	42.4	HUh	0.635	H	35.0	pCi/g	82.5	(75%-125%)	TXP3	09/27/16	21:59	
				Uncert: +/-2.11								
				TPU: +/-2.11								

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

The Qualifiers in this report are defined as follows:

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QC Summary

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
**	Analyte is a Tracer compound									
<	Result is less than value reported									
>	Result is greater than value reported									
BD	Results are either below the MDC or tracer recovery is low									
FA	Failed analysis.									
H	Analytical holding time was exceeded									
J	Value is estimated									
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.									
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.									
M	M if above MDC and less than LLD									
M	REMP Result > MDC/CL and < RDL									
N/A	RPD or %Recovery limits do not apply.									
N1	See case narrative									
ND	Analyte concentration is not detected above the detection limit									
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier									
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.									
R	Sample results are rejected									
U	Analyte was analyzed for, but not detected above the Lc.									
UI	Gamma Spectroscopy--Uncertain identification									
UJ	Gamma Spectroscopy--Uncertain identification									
UL	Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.									
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier									
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.									
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.									
h	Preparation or preservation holding time was exceeded									

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

** Indicates analyte is a surrogate/tracer compound.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Alpha Spectroscopy Raw Data

Batch# 1596418 Product: U Date: 9/20/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			ND
Samples have been blank corrected (if required). Blank correction reported included (if required).			ND
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.			
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	DER# 1559386
Sample was correctly preserved if required.			ND
Smears Taken for Radioactive batches.			ND
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			ND
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			ND
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER# 1559386
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER# 1559386
Aliquot Correction completed if required.			ND
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: Michelle D. [Signature] 9/20/16

Secondary Review Performed By: Jessie Davis [Signature] 09/30/16

10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 20-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, U-02-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596418	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, and 1203621761 were received and analyzed out of holding.</p>		<p>1. Reporting results.</p>	

Originator's Name:

Melanie Aycock 20-SEP-16

Data Validator/Group Leader:

Jessica Davis 30-SEP-16

Uranium Que Sheet

S-RUN 07-SEP-16

Batch #: 1596418 Analyst: KXB2 First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16
 Tracer Isotope: U-232 U-236 Tracer Code: 1510*1504 Expiration Date: 11-23-11 Vol: 0.1 Analyzed Sequentially with Pu Analyzed Sequentially with:
 LCS Isotope: U-238 LCS Code: 1000-E Expiration Date: 7-12-17 Vol: 0.1 Pu-236 ID: ---
 Spike Isotope: U-238 Spike Code: --- Expiration Date: --- Vol: --- Am: 1596419
 Prep Date: 9-15-16 Initials: KB Pipet ID: 1840027 Balance ID: 607602 Witness: ~~SK~~ 9/15/16

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	U Det #
405235061-1	5.1B.R.2.2	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	1	1	0.514	1
405235062-1	5.2A.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	2	2	0.515	2
405235063-1	5.2A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	3	3	0.518	3
405235064-1	5.2A.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	4	4	0.517	3
405235065-1	5.2A.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	5	5	0.507	6
405235066-1	5.2A.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	6	6	0.509	10
405235067-1	5.2A.R.6.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	7	7	0.508	11
405235068-1	5.2A.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	8	8	0.509	12
405235069-1	5.2B.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	16-DEC-15	9	9	0.505	13
405235070-1	5.2B.R.3.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	10	10	0.509	14
405235071-1	5.2B.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	11	11	0.515	15
405235072-1	5.2B.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	15-DEC-15	12	12	0.513	16
405235073-1	5.2B.R.8.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	13	13	0.505	17
405235074-1	5.3A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	15-DEC-15	14	14	0.507	18
405235075-1	5.4A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	16-DEC-15	15	15	0.508	20
405235076-1	5.4A.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	16	16	0.512	21
405235077-1	5.5A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	17-DEC-15	17	17	0.510	24
405235078-1	5.6A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	17-DEC-15	18	18	0.505	113
1203621760-1	MB for batch 1596418	MB		1 pCi/g	SOIL	QC ACCOUNT		19	19	0.518	4
1203621761-1	5.1B.R.2.2(405235061DUP)	DUP		1 pCi/g	SOIL	QC ACCOUNT	14-DEC-15	20	20	0.507	114
1203621762-1	LCS for batch 1596418	LCS		1 pCi/g	SOIL	QC ACCOUNT		21	21	0.518	115

Choose SOP used: GL-RAD-A-011

Solid Sample Dissolution by: LEACH OF DIGESTION
 Circle One

Data Reviewed By: N. D. Day 9/19/16

Uranium Que Sheet

T-Run 07-SEP-16

Batch #: 1596418 Analyst: KXB2 First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16
 Tracer Isotope: U-232 (U-236) Tracer Code: 1510-E Expiration Date: 7-18-17 Vol: 0.1
 LCS Isotope: U-238 LCS Code: Expiration Date: Vol: Expiration Date: Vol: Pu-236 ID: Pu-236 ID: Analyzed Sequentially with Pu Analyzed Sequentially with:
 Spike Isotope: U-238 Spike Code: Expiration Date: Vol: Expiration Date: Vol: Pu-236 ID: Pu-236 ID: Analyzed Sequentially with:
 Prep Date: 9-15-16 Initials: KB Pipet ID: 1040022 Balance ID: 6107602 Witness: 9/15/16

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	U Det #
405235061-1	5.1B.R.2.2	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	1	1	0.511	116
405235062-1	5.2A.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	2	2	0.503	117
405235063-1	5.2A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	3	3	0.513	118
405235064-1	5.2A.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	4	4	0.507	119
405235065-1	5.2A.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	5	5	0.509	120
405235066-1	5.2A.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	6	6	0.515	121
405235067-1	5.2A.R.6.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	7	7	0.504	122
405235068-1	5.2A.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	8	8	0.502	124
405235069-1	5.2B.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	16-DEC-15	9	9	0.505	124
405235070-1	5.2B.R.3.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	10	10	0.510	127
405235071-1	5.2B.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	11	11	0.506	128
405235072-1	5.2B.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	15-DEC-15	12	12	0.503	129
405235073-1	5.2B.R.8.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	13	13	0.515	130
405235074-1	5.3A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	15-DEC-15	14	14	0.517	131
405235075-1	5.4A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	16-DEC-15	15	15	0.503	132
405235076-1	5.4A.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	16	16	0.507	133
405235077-1	5.5A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	17-DEC-15	17	17	0.510	134
405235078-1	5.6A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	17-DEC-15	18	18	0.512	139
1203621760-1	MB for batch 1596418	MB		1 pCi/g	SOIL	QC ACCOUNT		19	19	0.517	8
1203621761-1	5.1B.R.2.2(405235061DUP)	DUP		1 pCi/g	SOIL	QC ACCOUNT	14-DEC-15	20	20	0.502	140
1203621762-1	LCS for batch 1596418	LCS		1 pCi/g	SOIL	QC ACCOUNT		21	21	0.517	142

Choose SOP used: GL-RAD-A-011 Solid Sample Dissolution by: LEACH or DIGESTION Data Reviewed By: Melinda Shepard 9/14/16
 Circle One

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418
 SAMPLE ID : T0405235067_UU
 SAMPLE QTY : 0.508 G +/-0.197 %
 SAMPLE DATE : 11-Dec-2015 00:00:00
 ANALYST : KXB2
 CORRECTED % YIELD : 83.4 +/-8.115 %
 SECONDARY QTY : 0.504 G +/-0.198 %

CHAMBER : 122
 DETECTOR S/N : 75546
 AVERAGE %EFFICIENCY : 25.9617
 AVERAGE %EFF ERROR : 0.5030
 COUNT DATE : 17-Sep-2016 11:44:56
 ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : U236
 BKG FILE : B122.CNF;1170
 BKG DATE : 16-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W122.CNF;334
 CAL DATE : 08-Sep-2016

TRACER

ID : 1570-E
 NUCLIDE : U-235
 NOMINAL : 1.1123E+01 dpm
 RESULTS : 1.0744E+01 dpm

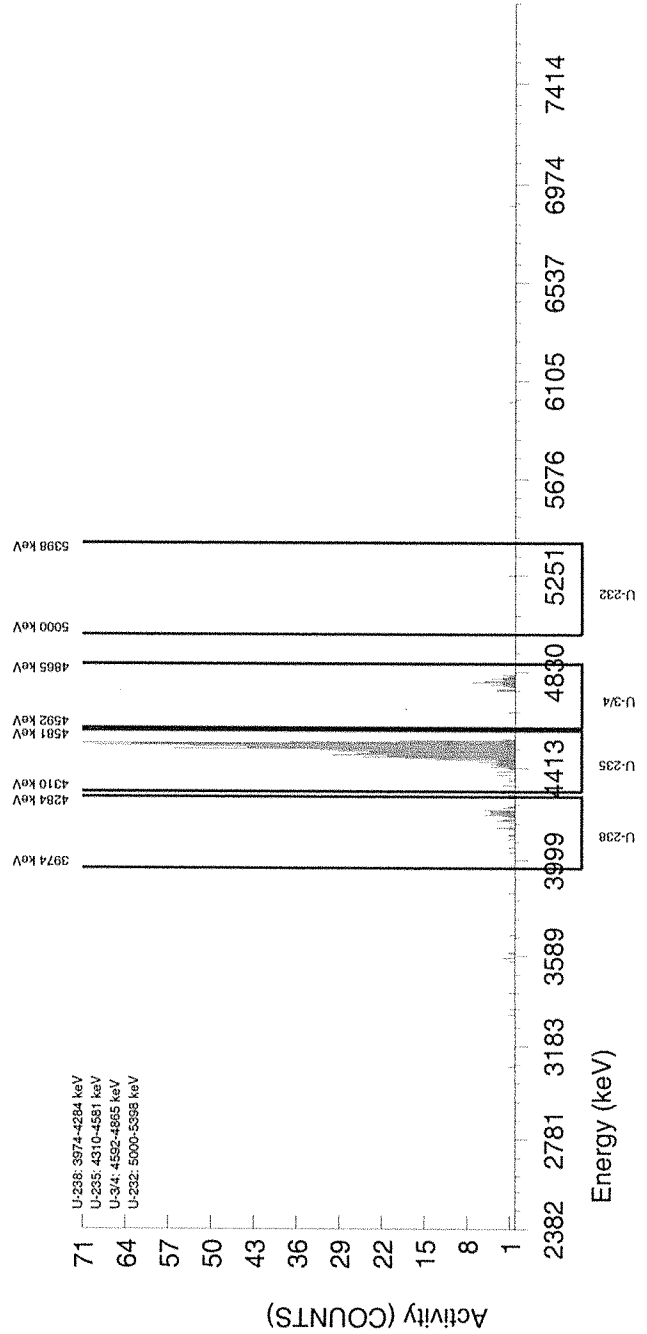
TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4494.61	4490.61	667.45	0.32	96.307	N/A
TRACER 2	1564-I	U-232	4.6535 dpm	5251.42	5340.45	0.04	289.48	84.111	1.0079

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma cnt Unc	
										TPU pCi/G	MDA pCi/G		
U-232	5302.10	5251.42	4.959	1.000	0.040	0.960	0.9798	100.000	6.00E-04	4.46E-02	9.89E-02	2.69E-02	4.45E-02
U-3/4	4763.02	4783.25	27.272	43.000	39.400	3.600	1.8974	100.000	5.62E-01	2.09E-01	1.42E-01	4.95E-02	1.87E-01
U-235	4391.00	4494.61	34.400	2.000	0.320	1.680	1.2961	99.700	4.58E-03	5.22E-02	1.11E-01	3.40E-02	5.21E-02
U-238	4184.73	4190.49	78.098	51.000	49.560	1.440	1.2000	100.000	7.07E-01	2.33E-01	1.05E-01	3.13E-02	2.02E-01

NOTES:

- * Results are a compilation of S0405235067_UU and T0405235067_UU.
- * The following nuclide results were quantified from the U-235 traced sample:
U-232
- * Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418
SAMPLE ID : S0405235067_UU
SAMPLE QTY : 0.508 G +/-0.197 %
SAMPLE DATE : 11-Dec-2015 00:00:00
ANALYST : KXB2
% YIELD : 84.1 +/-6.731 %

CHAMBER : 011
DETECTOR S/N : 72531
AVERAGE %EFFICIENCY : 31.0555
AVERAGE %EFF ERROR : 0.5992
COUNT DATE : 17-Sep-2016 11:42:40
ELAPSED LIVE TIME(SEC) : 14400.00

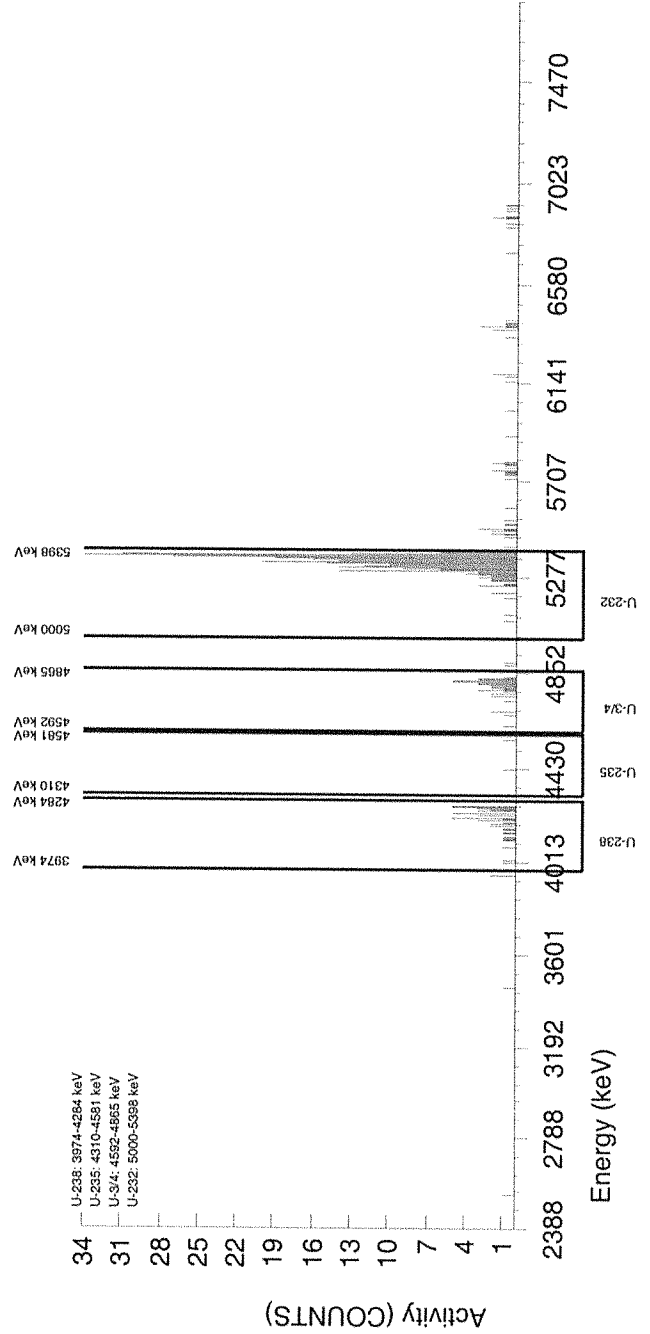
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BKG FILE : B011.CNF;1833
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 59999.99
EFF FILE : W011.CNF;511
CAL DATE : 27-Aug-2016

TRACER

ID : 1564-I
NUCLIDE : U-232
NOMINAL : 4.6535E+00 dpm
RESULTS : 3.9142E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG S/Dev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5340.45	36.661	295.000	289.480	5.520	2.3495	100.000	4.13E+00	7.44E-01	1.65E-01	6.13E-02	4.82E-01
U-3/4	4763.02	4787.66	52.176	43.000	39.400	3.600	1.8974	100.000	5.57E-01	2.01E-01	1.41E-01	4.92E-02	1.86E-01
U-235	4391.00	4490.61	129.198	2.000	0.320	1.680	1.2961	99.700	4.54E-03	5.18E-02	1.10E-01	3.37E-02	5.17E-02
U-238	4184.73	4203.59	62.943	51.000	49.560	1.440	1.2000	100.000	7.01E-01	2.23E-01	1.05E-01	3.11E-02	2.01E-01



Integrated
DO NOT REPORT

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418
 SAMPLE ID : T0405235070_UU
 SAMPLE QTY : 0.509 G +/-0.196 %
 SAMPLE DATE : 11-Dec-2015 00:00:00
 ANALYST : KXB2
 CORRECTED % YIELD : 88.0 +/-7.889 %
 SECONDARY QTY : 0.510 G +/-0.196 %

CHAMBER : 127
 DETECTOR S/N : 78770
 AVERAGE %EFFICIENCY : 26.6218
 AVERAGE %EFF ERROR : 0.5155
 COUNT DATE : 17-Sep-2016 11:45:04
 ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : U236
 BKG FILE : B127.CNF;1165
 BKG DATE : 16-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W127.CNF;322
 CAL DATE : 08-Sep-2016

TRACER

ID : 1570-E
 NUCLIDE : U-235
 NOMINAL : 1.1123E+01 dpm
 RESULTS : 1.0422E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4486.14	4545.16	663.86	1.04	93.413	N/A
TRACER 2	1564-I	U-232	4.6535 dpm	5198.55	5334.16	-1.44	321.20	88.668	1.0078

NUCLIDE ACTIVITY SUMMARY

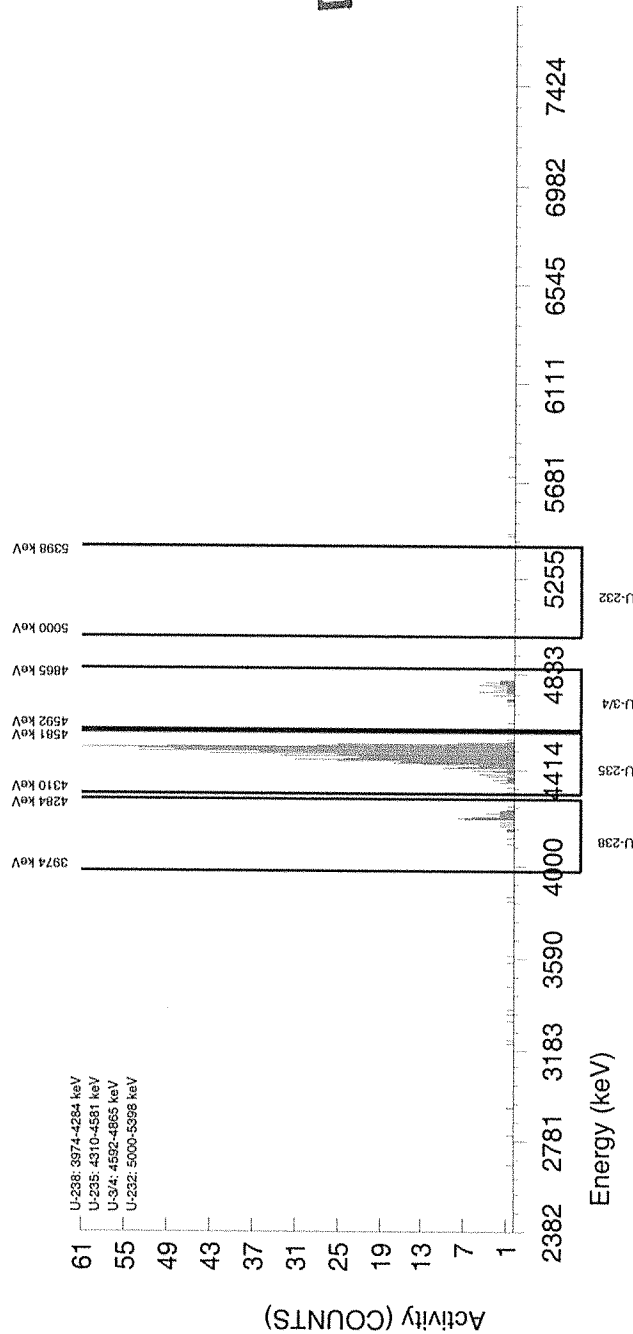
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma	
										TPU pCi/G	Lc pCi/G
U-232	5302.10	5198.55	0.000	0.000	-1.440	1.440	1.2000	100.000	-2.15E-02	3.47E-02	1.10E-01
U-3/4	4763.02	4764.95	59.086	48.000	47.280	0.720	0.8485	100.000	6.06E-01	2.01E-01	7.83E-02
U-235	4391.00	4486.14	59.322	2.000	1.040	0.960	0.9798	99.700	1.34E-02	4.58E-02	8.47E-02
U-238	4184.73	4202.83	14.521	64.000	63.040	0.960	0.9798	100.000	8.08E-01	2.40E-01	8.45E-02

NOTES:

* Results are a compilation of S0405235070_UU and T0405235070_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



Interpreted
DO NOT REPORT

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418
SAMPLE ID : S0405235070_UU
SAMPLE QTY : 0.509 G +/-0.196 %
SAMPLE DATE : 11-Dec-2015 00:00:00
ANALYST : KXB2
% YIELD : 88.7 +/-6.451 %

CHAMBER : 014
DETECTOR S/N : 83289
AVERAGE %EFFICIENCY : 32.6875
AVERAGE %EFF ERROR : 0.6302
COUNT DATE : 17-Sep-2016 11:42:41
ELAPSED LIVE TIME(SEC) : 14399.99

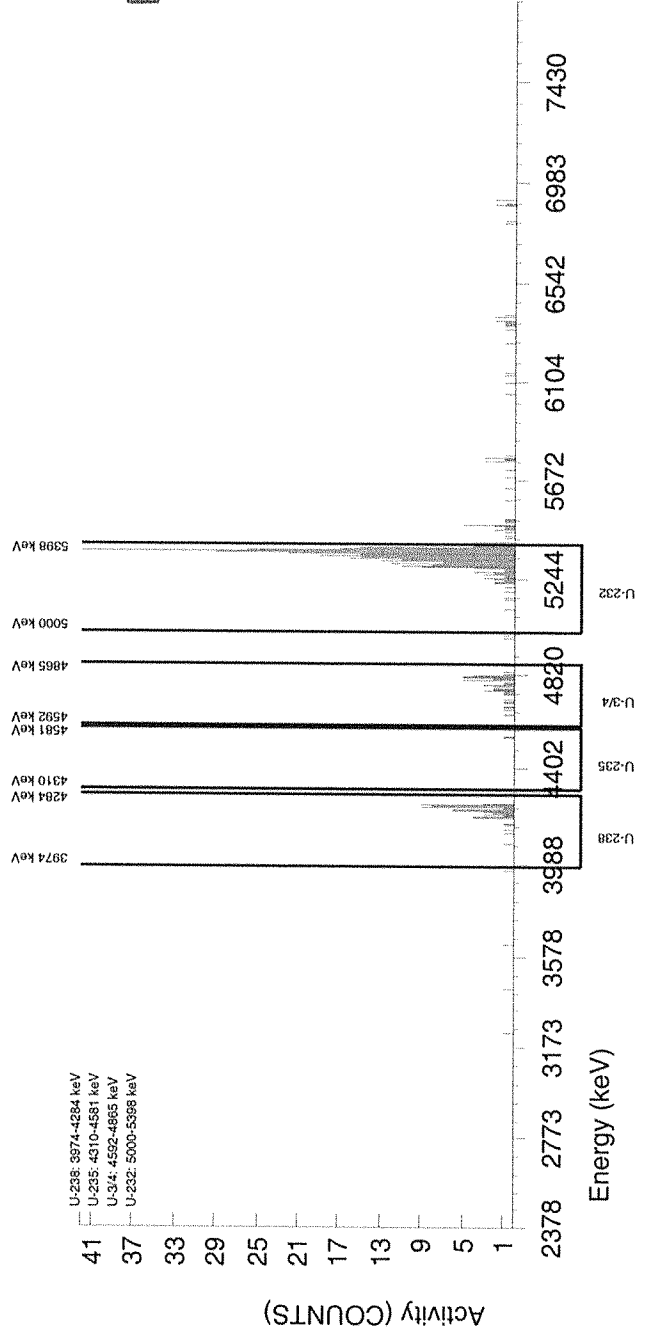
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BKG FILE : B014.CNF;1814
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 59999.99
EFF FILE : W014.CNF;523
CAL DATE : 27-Aug-2016

TRACER

ID : 1564-I
NUCLIDE : U-232
NOMINAL : 4.6535E+00 dpm
RESULTS : 4.1262E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5334.16	18.176	326.000	321.200	4.800	2.1909	100.000	4.12E+00	7.09E-01	1.41E-01	5.15E-02	4.55E-01
U-3/4	4763.02	4772.03	67.576	48.000	47.280	0.720	0.8485	100.000	6.02E-01	1.92E-01	7.77E-02	1.98E-02	1.75E-01
U-235	4391.00	4545.16	9.829	2.000	1.040	0.960	0.9798	99.700	1.33E-02	4.54E-02	8.41E-02	2.29E-02	4.54E-02
U-238	4184.73	4218.40	30.716	64.000	63.040	0.960	0.9798	100.000	8.02E-01	2.28E-01	8.38E-02	2.28E-02	2.01E-01



Integrated
DO NOT REPORT

DO NOT REPORT

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418
 SAMPLE ID : T0405235072_UU
 SAMPLE QTY : 0.513 G +/-0.195 %
 SAMPLE DATE : 15-Dec-2015 00:00:00
 ANALYST : KXB2
 CORRECTED % YIELD : 71.4 +/-8.366 %
 SECONDARY QTY : 0.503 G +/-0.199 %

CHAMBER : 129
 DETECTOR S/N : 76227
 AVERAGE %EFFICIENCY : 26.3145
 AVERAGE %EFF ERROR : 0.5097
 COUNT DATE : 17-Sep-2016 11:45:08
 ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : U236
 BKG FILE : B129.CNF;1168
 BKG DATE : 16-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W129.CNF;343
 CAL DATE : 08-Sep-2016

TRACER

ID : 1570-E
 NUCLIDE : U-235
 NOMINAL : 1.1123E+01 dpm
 RESULTS : 9.7493E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4489.30	4451.07	613.87	7.04	87.387	N/A
TRACER 2	1564-I	U-232	4.6530 dpm	5321.84	5332.80	0.52	266.96	72.083	1.0098

NUCLIDE ACTIVITY SUMMARY

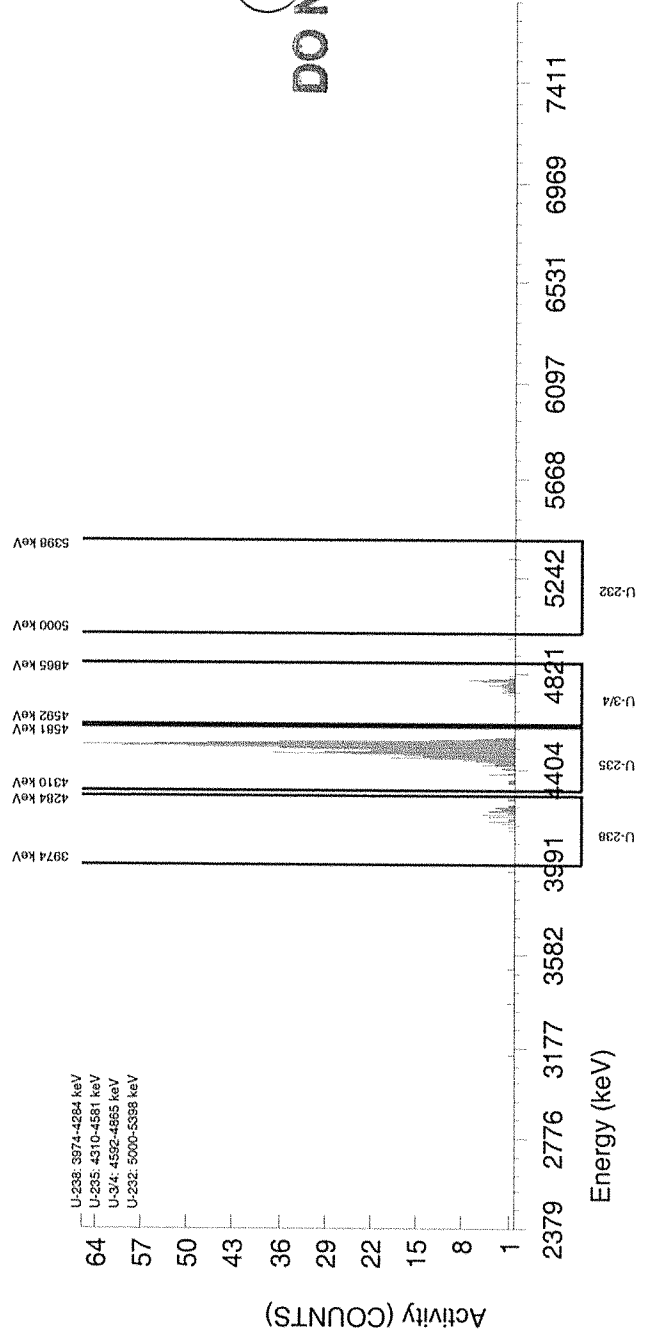
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma			
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc
U-232	5302.10	5321.84	4.932	1.000	0.520	0.480	0.6928	100.000	8.50E-03	4.73E-02	9.06E-02	2.08E-02	4.72E-02
U-3/4	4763.02	4774.35	26.715	66.000	62.160	3.840	1.9596	100.000	9.53E-01	2.95E-01	1.56E-01	5.51E-02	2.48E-01
U-235	4391.00	4489.30	51.608	8.000	7.040	0.960	0.9798	99.700	1.08E-01	9.37E-02	1.01E-01	2.76E-02	9.19E-02
U-238	4184.73	4204.51	62.267	48.000	47.040	0.960	0.9798	100.000	7.21E-01	2.43E-01	1.01E-01	2.75E-02	2.11E-01

NOTES:

* Results are a compilation of S0405235072_UU and T0405235072_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.009 +/-0.000)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418
SAMPLE ID : S0405235072_UU
SAMPLE QTY : 0.513 G +/-0.195 %
SAMPLE DATE : 15-Dec-2015 00:00:00
ANALYST : KXB2
% YIELD : 72.1 +/-6.949 %

CHAMBER : 016
DETECTOR S/N : 78774
AVERAGE %EFFICIENCY : 33.4185
AVERAGE %EFF ERROR : 0.6439
COUNT DATE : 17-Sep-2016 11:42:41
ELAPSED LIVE TIME(SEC) : 14399.99

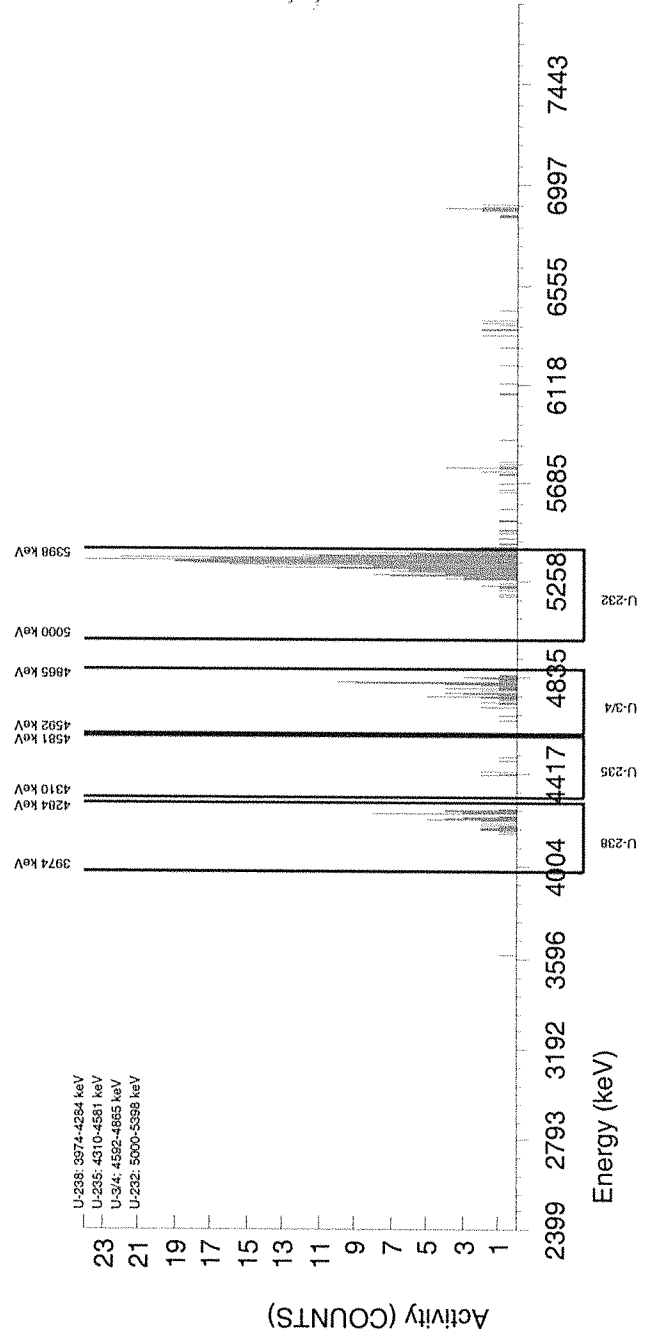
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BKG FILE : B016.CNF;1809
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 59999.99
EFF FILE : W016.CNF;494
CAL DATE : 27-Aug-2016

TRACER

ID : 1564-I
NUCLIDE : U-232
NOMINAL : 4.6530E+00 dpm
RESULTS : 3.3540E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5332.80	46.059	272.000	266.960	5.040	2.2450	100.000	4.09E+00	7.62E-01	6.29E-02	4.97E-01
U-3/4	4763.02	4783.92	11.531	66.000	62.160	3.840	1.9596	100.000	9.44E-01	2.79E-01	5.45E-02	2.45E-01
U-235	4391.00	4451.07	19.581	8.000	7.040	0.960	0.9798	99.700	1.07E-01	9.23E-02	2.73E-02	9.10E-02
U-238	4184.73	4215.06	30.024	48.000	47.040	0.960	0.9798	100.000	7.14E-01	2.32E-01	2.73E-02	2.09E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418
 SAMPLE ID : T0405235077_UU
 SAMPLE QTY : 0.510 G +/-0.196 %
 SAMPLE DATE : 17-Dec-2015 00:00:00
 ANALYST : KXB2
 CORRECTED % YIELD : 92.2 +/-7.848 %
 SECONDARY QTY : 0.510 G +/-0.196 %

CHAMBER : 134
 DETECTOR S/N : 76230
 AVERAGE %EFFICIENCY : 25.7389
 AVERAGE %EFF ERROR : 0.4988
 COUNT DATE : 17-Sep-2016 11:45:20
 ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : U236
 BKG FILE : B134.CNF;1149
 BKG DATE : 16-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W134.CNF;336
 CAL DATE : 08-Sep-2016

TRACER

ID : 1570-E
 NUCLIDE : U-235
 NOMINAL : 1.1123E+01 dpm
 RESULTS : 9.2687E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4490.69	4445.41	570.84	-0.48	83.080	N/A
TRACER 2	1564-I	U-232	4.6528 dpm	5198.58	5336.26	-0.48	354.92	92.894	1.0076

NUCLIDE ACTIVITY SUMMARY

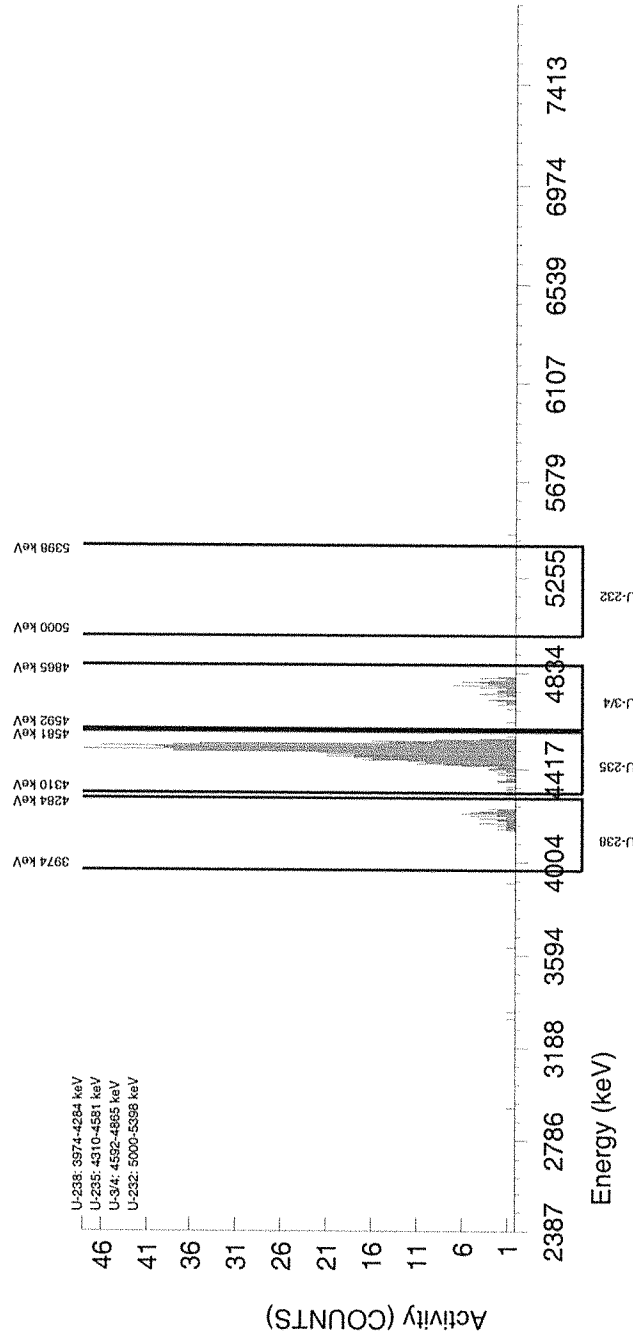
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma cnt Unc	
										TPU pCi/G	MDA pCi/G		Lc pCi/G
U-232	5302.10	5198.58	0.000	0.000	-0.480	0.480	0.6928	100.000	-8.32E-03	3.69E-02	9.60E-02	2.20E-02	3.68E-02
U-3/4	4763.02	4765.90	66.549	65.000	63.560	1.440	1.2000	100.000	7.36E-01	2.19E-01	8.56E-02	2.55E-02	1.85E-01
U-235	4391.00	4490.69	41.660	0.000	-0.480	0.480	0.6928	99.700	-5.57E-03	2.47E-02	6.43E-02	1.47E-02	2.47E-02
U-238	4184.73	4204.31	53.735	62.000	61.520	0.480	0.6928	100.000	7.12E-01	2.19E-01	6.41E-02	1.47E-02	1.80E-01

NOTES:

* Results are a compilation of S0405235077_UU and T0405235077_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.009 +/-0.000)



In-Hand
DO NOT REPORT

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418
 SAMPLE ID : S0405235077_UU
 SAMPLE QTY : 0.510 G +/-0.196 %
 SAMPLE DATE : 17-Dec-2015 00:00:00
 ANALYST : KXB2
 % YIELD : 92.9 +/-6.201 %

CHAMBER : 024
 DETECTOR S/N : 76542
 AVERAGE %EFFICIENCY : 34.4760
 AVERAGE %EFF ERROR : 0.6639
 COUNT DATE : 17-Sep-2016 11:42:42
 ELAPSED LIVE TIME(SEC) : 14399.99

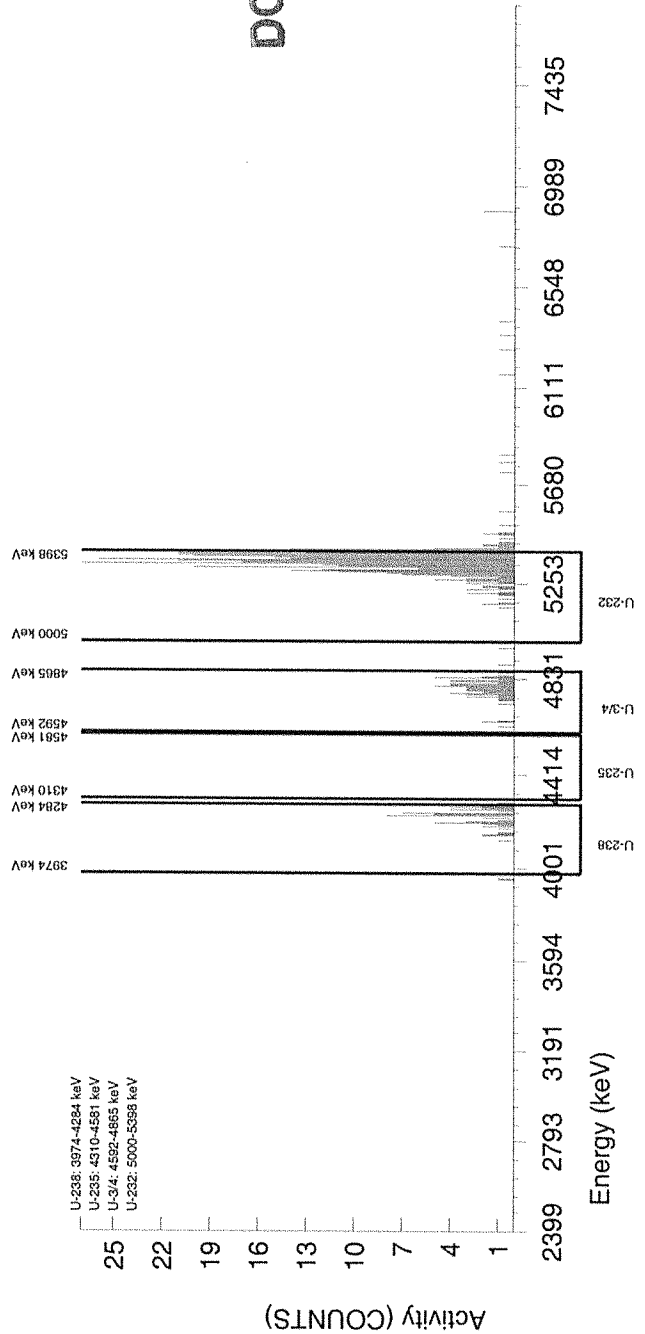
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 BKG DATE : 16-Sep-2016
 BKG LIVE TIME(SEC) : 59999.99
 EFF FILE : W024.CNF;517
 CAL DATE : 27-Aug-2016

TRACER

ID : 1564-I
 NUCLIDE : U-232
 NOMINAL : 4.6528E+00 dpm
 RESULTS : 4.3221E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc
U-232	5302.10	5336.26	80.219	359.000	354.920	4.080	2.0199	100.000	4.11E+00	6.78E-01	1.20E-01	4.28E-02	4.31E-01
U-3/4	4763.02	4786.44	83.477	65.000	63.560	1.440	1.2000	100.000	7.30E-01	2.06E-01	8.50E-02	2.53E-02	1.84E-01
U-235	4391.00	4445.41	0.000	0.000	-0.480	0.480	0.6928	99.700	-5.53E-03	2.45E-02	6.38E-02	1.46E-02	2.45E-02
U-238	4184.73	4226.59	42.814	62.000	61.520	0.480	0.6928	100.000	7.07E-01	2.00E-01	6.36E-02	1.46E-02	1.79E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T0405235061_UU SAMPLE QTY : 0.514 G +/-0.195 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 79.6 +/-8.702 % SECONDARY QTY : 0.511 G +/-0.196 %	CHAMBER : 116 DETECTOR S/N : 80004 AVERAGE %EFFICIENCY : 25.8624 AVERAGE %EFF ERROR : 0.5011 COUNT DATE : 17-Sep-2016 11:44:41 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B116.CNF;1159 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W116.CNF;295 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 7.1485E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4493.71	4428.18	442.37	2.00	64.075	N/A
TRACER 2	1564-I	U-232	4.6532 dpm	5351.04	5338.87	1.04	266.52	80.712	1.0134

NUCLIDE ACTIVITY SUMMARY

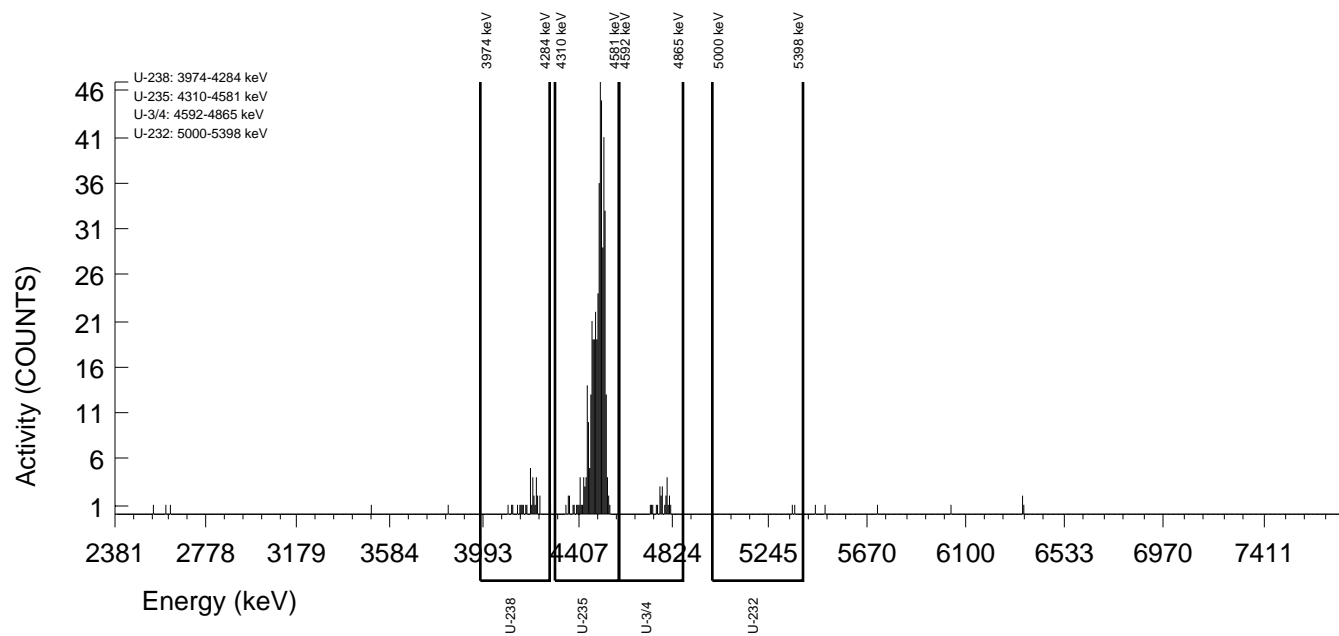
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5351.04	14.817	2.000	1.040	0.960	0.9798	100.000	2.32E-02	7.95E-02	1.47E-01	4.01E-02	7.94E-02
U-3/4	4763.02	4777.62	34.574	38.000	38.000	0.000	0.0000	100.000	5.85E-01	2.14E-01	4.62E-02	0.00E+00	1.88E-01
U-235	4391.00	4493.71	32.475	2.000	2.000	0.000	0.0000	99.700	3.09E-02	5.32E-02	4.63E-02	0.00E+00	5.29E-02
U-238	4184.73	4194.40	30.869	52.000	52.000	0.000	0.0000	100.000	8.00E-01	2.60E-01	4.62E-02	0.00E+00	2.20E-01

NOTES:

* Results are a compilation of S0405235061_UU and T0405235061_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.007 +/-0.000)



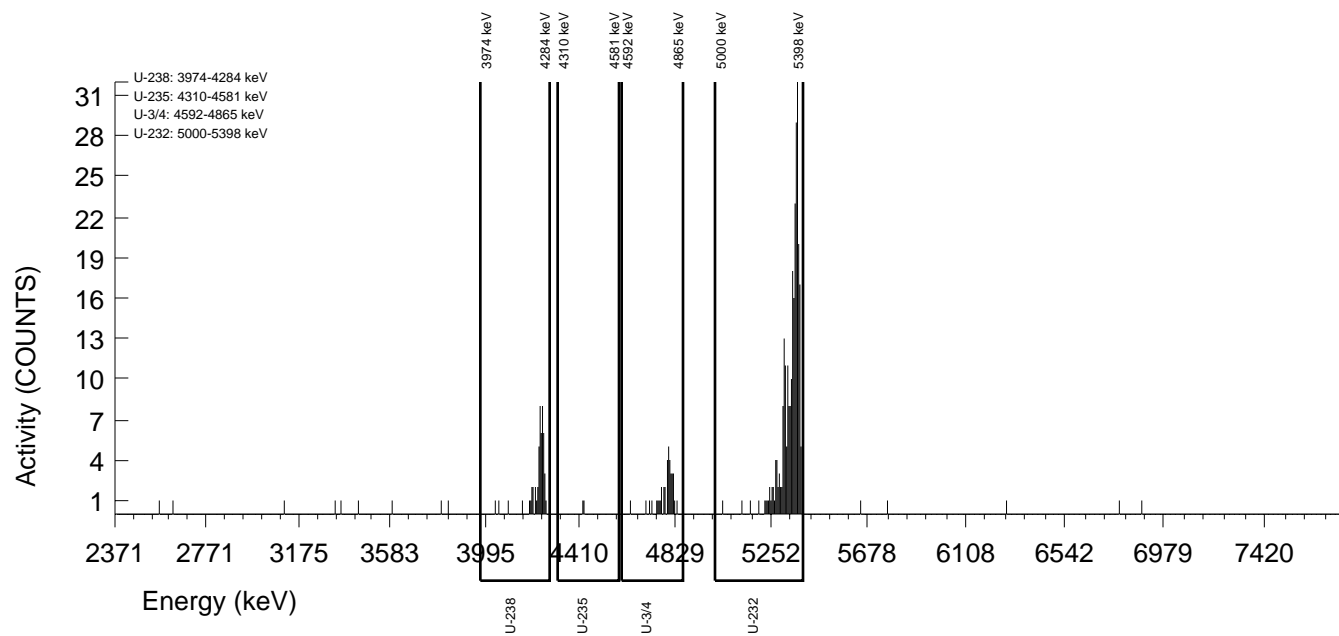
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : S0405235061_UU SAMPLE QTY : 0.514 G +/-0.195 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 80.7 +/-6.897 %	CHAMBER : 001 DETECTOR S/N : 79451 AVERAGE %EFFICIENCY : 29.7966 AVERAGE %EFF ERROR : 0.5755 COUNT DATE : 17-Sep-2016 11:42:39 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B001.CNF;1858 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W001.CNF;565 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6532E+00 dpm RESULTS : 3.7556E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5338.87	31.548	267.000	266.520	0.480	0.6928	100.000	4.08E+00	7.54E-01	8.47E-02	1.94E-02	4.91E-01
U-3/4	4763.02	4788.47	28.019	38.000	38.000	0.000	0.0000	100.000	5.77E-01	2.03E-01	4.56E-02	0.00E+00	1.86E-01
U-235	4391.00	4428.18	9.962	2.000	2.000	0.000	0.0000	99.700	3.05E-02	5.24E-02	4.57E-02	0.00E+00	5.22E-02
U-238	4184.73	4226.11	24.906	52.000	52.000	0.000	0.0000	100.000	7.90E-01	2.43E-01	4.56E-02	0.00E+00	2.17E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T0405235062_UU SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 63.8 +/-9.083 % SECONDARY QTY : 0.503 G +/-0.199 %	CHAMBER : 117 DETECTOR S/N : 80003 AVERAGE %EFFICIENCY : 25.8068 AVERAGE %EFF ERROR : 0.5001 COUNT DATE : 17-Sep-2016 11:44:44 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B117.CNF;1162 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W117.CNF;308 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0132E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4492.84	4446.11	625.67	2.76	90.819	N/A
TRACER 2	1564-I	U-232	4.6532 dpm	5252.28	5333.07	2.04	196.76	64.781	1.0157

NUCLIDE ACTIVITY SUMMARY

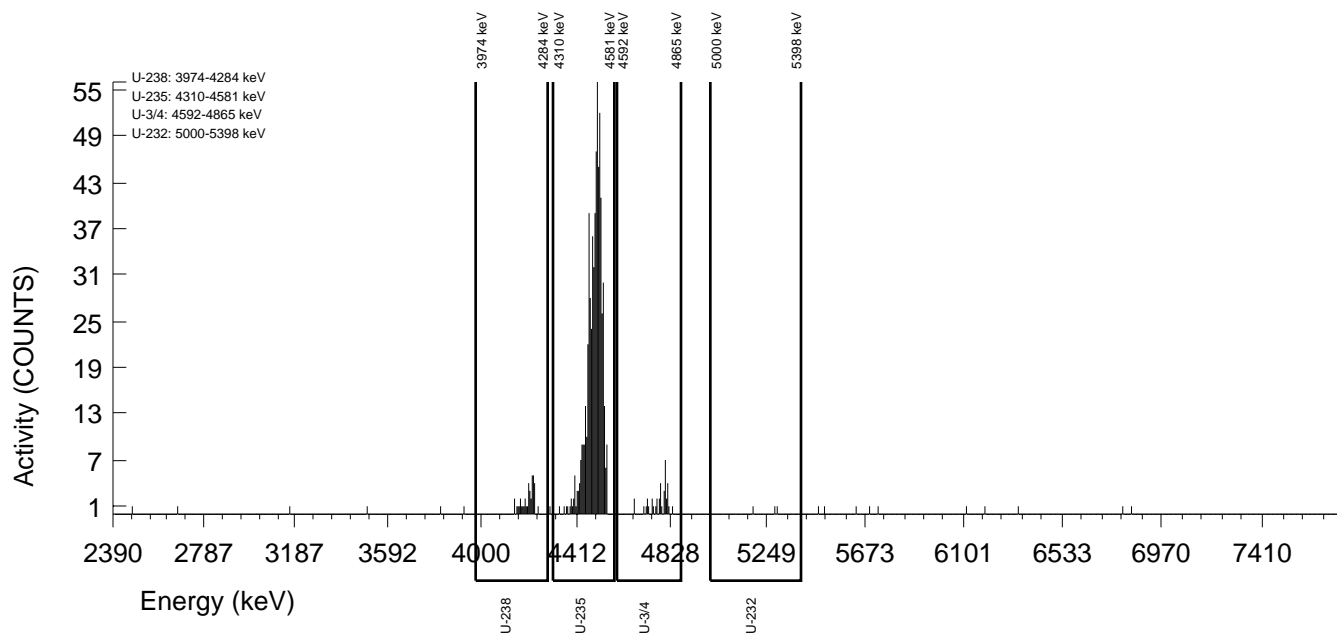
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		Lc pCi/G	1.96-sigma	
										TPU pCi/G	MDA pCi/G		cnt	Unc pCi/G
U-232	5302.10	5252.28	103.522	3.000	2.040	0.960	0.9798	100.000	3.27E-02	6.54E-02	1.06E-01	2.88E-02	6.51E-02	6.51E-02
U-3/4	4763.02	4775.28	31.632	32.000	31.040	0.960	0.9798	100.000	6.47E-01	2.64E-01	1.37E-01	3.74E-02	2.36E-01	2.36E-01
U-235	4391.00	4492.84	62.961	3.000	2.760	0.240	0.4899	99.700	5.77E-02	8.38E-02	1.00E-01	1.88E-02	8.31E-02	8.31E-02
U-238	4184.73	4202.98	28.961	46.000	45.760	0.240	0.4899	100.000	9.54E-01	3.30E-01	1.00E-01	1.87E-02	2.81E-01	2.81E-01

NOTES:

* Results are a compilation of S0405235062_UU and T0405235062_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.009 +/-0.000)



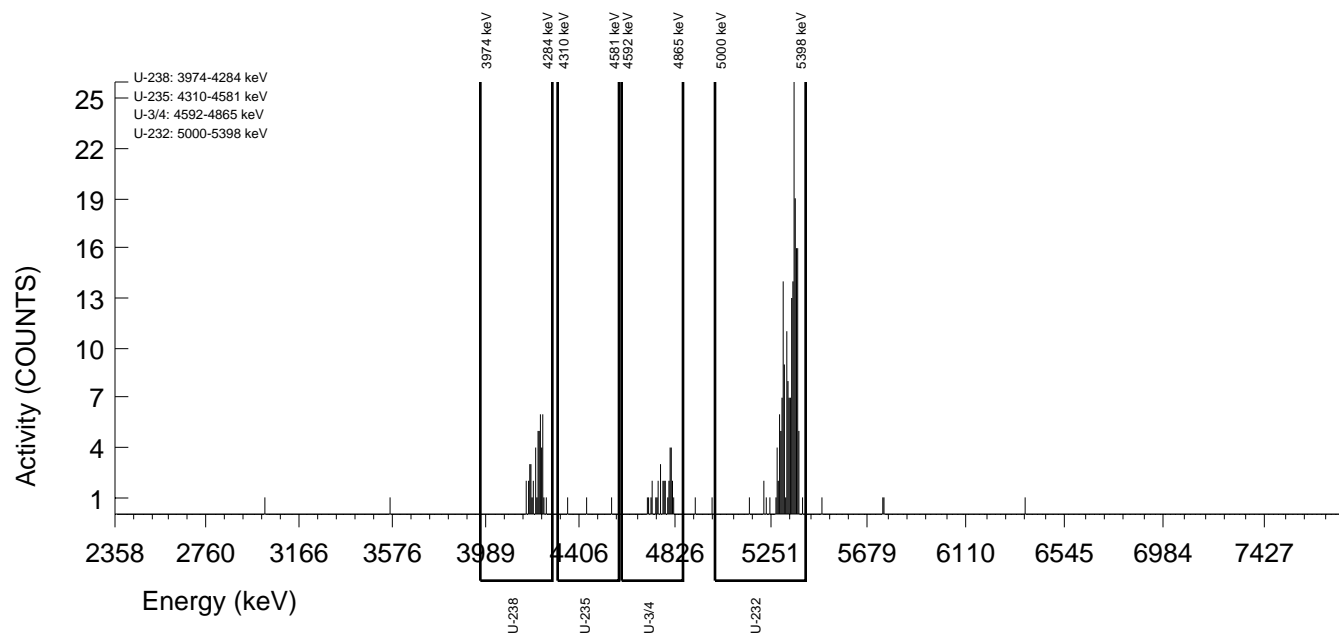
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : S0405235062_UU SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 64.8 +/-7.811 %	CHAMBER : 002 DETECTOR S/N : 79452 AVERAGE %EFFICIENCY : 27.4069 AVERAGE %EFF ERROR : 0.5303 COUNT DATE : 17-Sep-2016 11:42:39 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B002.CNF;1843 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W002.CNF;518 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6532E+00 dpm RESULTS : 3.0144E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5333.07	62.129	197.000	196.760	0.240	0.4899	100.000	4.07E+00	8.59E-01	9.92E-02	1.86E-02	5.71E-01
U-3/4	4763.02	4776.86	51.709	32.000	31.040	0.960	0.9798	100.000	6.37E-01	2.53E-01	1.35E-01	3.68E-02	2.32E-01
U-235	4391.00	4446.11	190.157	3.000	2.760	0.240	0.4899	99.700	5.68E-02	8.23E-02	9.87E-02	1.85E-02	8.19E-02
U-238	4184.73	4219.51	34.278	46.000	45.760	0.240	0.4899	100.000	9.39E-01	3.13E-01	9.84E-02	1.84E-02	2.76E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T0405235063_UU SAMPLE QTY : 0.518 G +/-0.193 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 59.7 +/-9.292 % SECONDARY QTY : 0.513 G +/-0.195 %	CHAMBER : 118 DETECTOR S/N : 80061 AVERAGE %EFFICIENCY : 25.6062 AVERAGE %EFF ERROR : 0.4962 COUNT DATE : 17-Sep-2016 11:44:46 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B118.CNF;1171 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W118.CNF;318 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0325E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4488.59	4497.89	632.60	1.52	92.544	N/A
TRACER 2	1564-I	U-232	4.6532 dpm	5236.31	5331.41	0.28	184.32	60.208	1.0088

NUCLIDE ACTIVITY SUMMARY

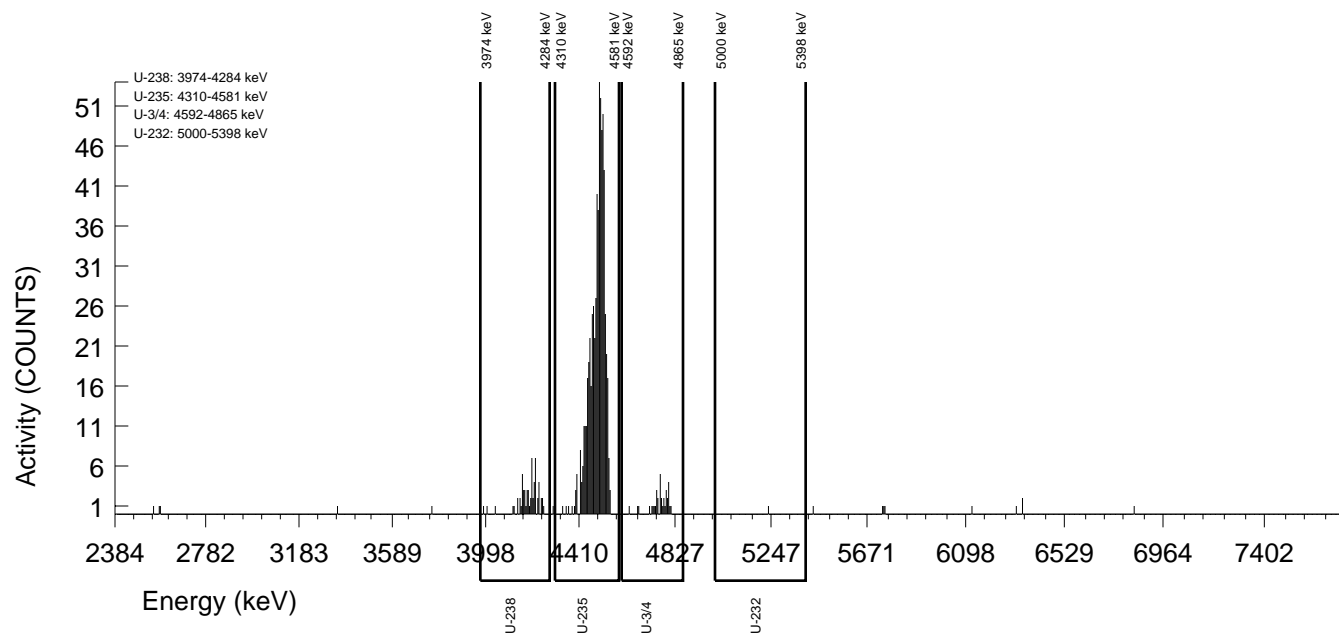
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		Lc pCi/G	1.96-sigma cnt Unc pCi/G
										TPU pCi/G	MDA pCi/G		
U-232	5302.10	5236.31	4.952	1.000	0.280	0.720	0.8485	100.000	4.36E-03	4.56E-02	9.50E-02	2.42E-02	4.55E-02
U-3/4	4763.02	4761.02	53.237	30.000	28.320	1.680	1.2961	100.000	6.22E-01	2.68E-01	1.70E-01	5.22E-02	2.42E-01
U-235	4391.00	4488.59	39.068	2.000	1.520	0.480	0.6928	99.700	3.35E-02	7.72E-02	1.22E-01	2.80E-02	7.70E-02
U-238	4184.73	4189.02	71.808	28.000	27.280	0.720	0.8485	100.000	6.00E-01	2.58E-01	1.34E-01	3.42E-02	2.33E-01

NOTES:

* Results are a compilation of S0405235063_UU and T0405235063_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



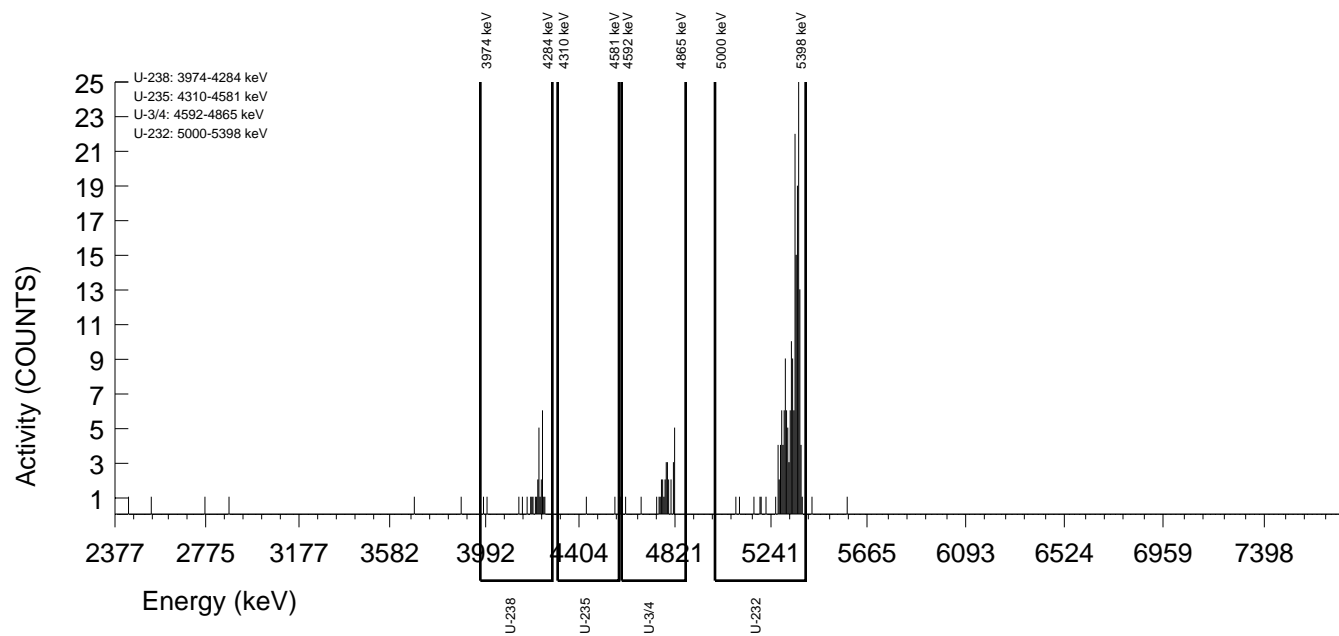
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : S0405235063_UU SAMPLE QTY : 0.518 G +/-0.193 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 60.2 +/-8.063 %	CHAMBER : 003 DETECTOR S/N : 79453 AVERAGE %EFFICIENCY : 27.6246 AVERAGE %EFF ERROR : 0.5344 COUNT DATE : 17-Sep-2016 11:42:39 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B003.CNF;1841 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W003.CNF;535 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6532E+00 dpm RESULTS : 2.8015E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5331.41	23.035	186.000	184.320	1.680	1.2961	100.000	4.05E+00	8.83E-01	1.70E-01	5.21E-02	5.89E-01
U-3/4	4763.02	4780.29	39.635	30.000	28.320	1.680	1.2961	100.000	6.17E-01	2.60E-01	1.69E-01	5.17E-02	2.39E-01
U-235	4391.00	4497.89	123.861	2.000	1.520	0.480	0.6928	99.700	3.32E-02	7.65E-02	1.21E-01	2.77E-02	7.63E-02
U-238	4184.73	4205.49	21.139	28.000	27.280	0.720	0.8485	100.000	5.94E-01	2.50E-01	1.33E-01	3.39E-02	2.31E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T0405235064_UU SAMPLE QTY : 0.517 G +/-0.193 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 56.2 +/-9.663 % SECONDARY QTY : 0.507 G +/-0.197 %	CHAMBER : 119 DETECTOR S/N : 79450 AVERAGE %EFFICIENCY : 23.3886 AVERAGE %EFF ERROR : 0.4544 COUNT DATE : 17-Sep-2016 11:44:49 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B119.CNF;1176 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W119.CNF;315 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0963E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4491.91	4445.46	613.52	0.00	98.264	N/A
TRACER 2	1564-I	U-232	4.6532 dpm	5291.61	5314.15	1.60	164.80	56.952	1.0142

NUCLIDE ACTIVITY SUMMARY

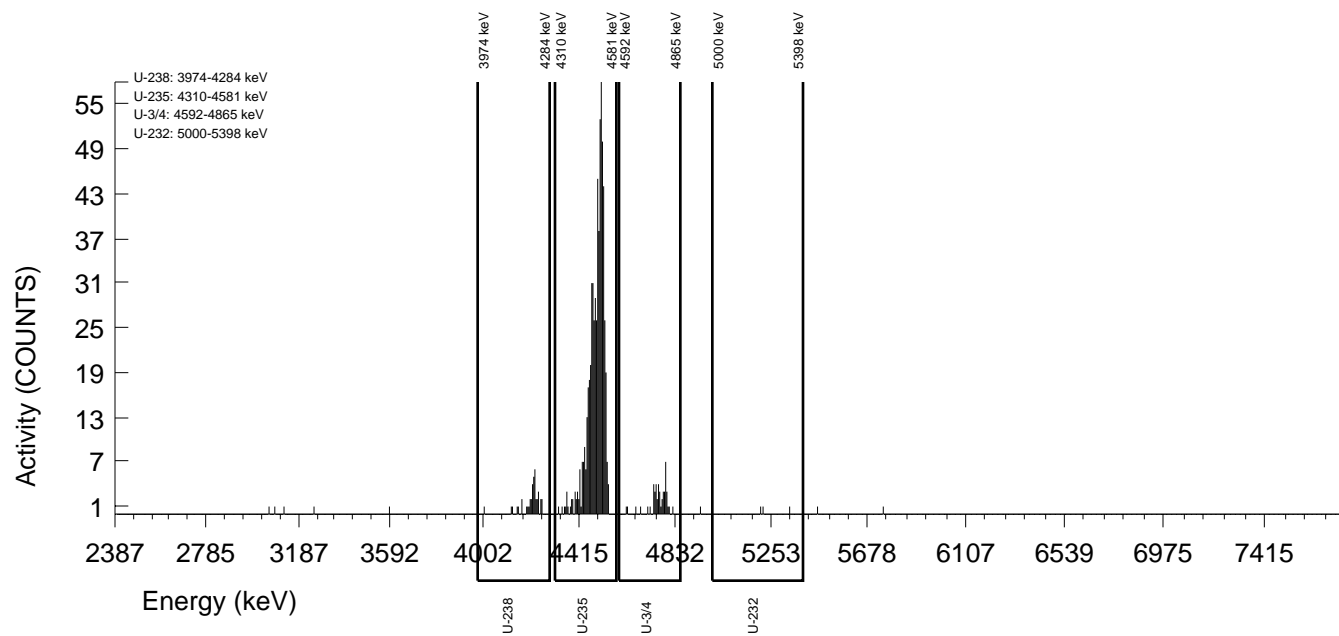
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5291.61	0.000	4.000	1.600	2.400	1.5492	100.000	2.60E-02	7.57E-02	1.41E-01	4.61E-02	7.55E-02
U-3/4	4763.02	4763.46	54.467	29.000	28.280	0.720	0.8485	100.000	7.00E-01	2.99E-01	1.51E-01	3.85E-02	2.67E-01
U-235	4391.00	4491.91	54.542	0.000	0.000	0.000	0.0000	99.700	0.00E+00	5.03E-02	7.45E-02	0.00E+00	5.01E-02
U-238	4184.73	4205.43	16.092	24.000	23.760	0.240	0.4899	100.000	5.88E-01	2.68E-01	1.19E-01	2.22E-02	2.43E-01

NOTES:

* Results are a compilation of S0405235064_UU and T0405235064_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.009 +/-0.000)



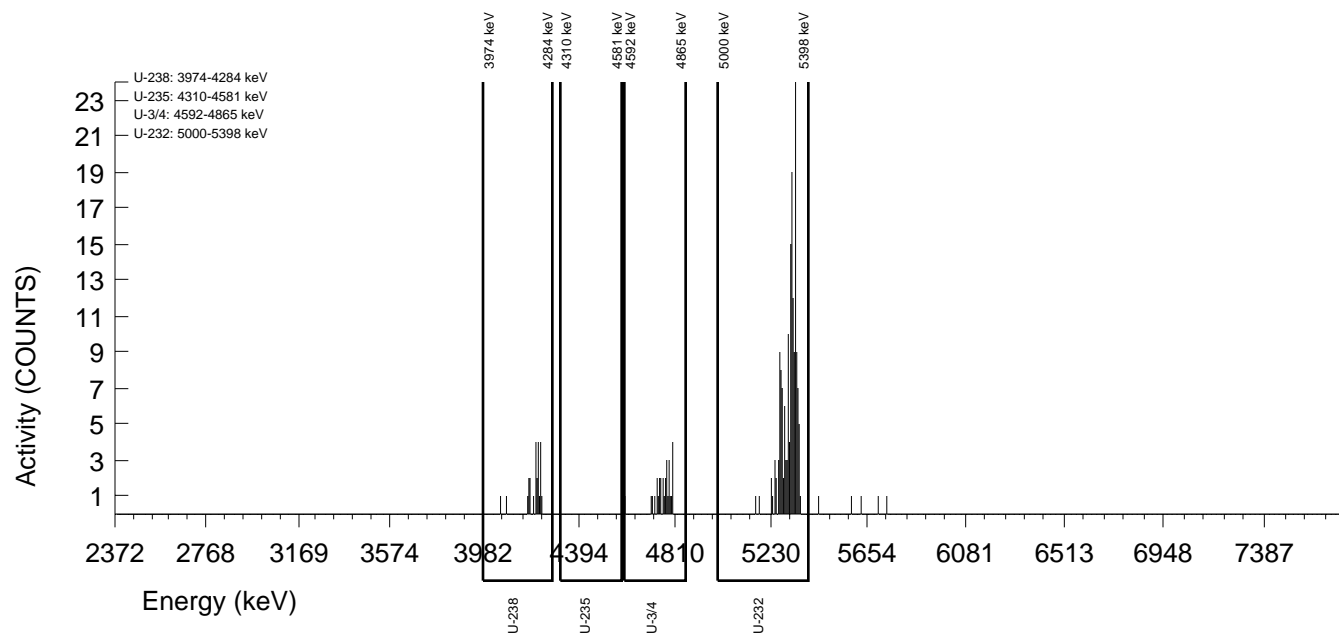
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : S0405235064_UU SAMPLE QTY : 0.517 G +/-0.193 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 57.0 +/-8.453 %	CHAMBER : 154 DETECTOR S/N : 76224 AVERAGE %EFFICIENCY : 26.1126 AVERAGE %EFF ERROR : 0.5058 COUNT DATE : 19-Sep-2016 15:47:38 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B154.CNF;1097 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W154.CNF;304 CAL DATE : 09-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6532E+00 dpm RESULTS : 2.6501E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5314.15	25.045	166.000	164.800	1.200	1.0954	100.000	4.05E+00	9.30E-01	1.73E-01	4.94E-02	6.24E-01
U-3/4	4763.02	4762.64	32.091	29.000	28.280	0.720	0.8485	100.000	6.90E-01	2.88E-01	1.49E-01	3.79E-02	2.63E-01
U-235	4391.00	4445.46	0.000	0.000	0.000	0.000	0.0000	99.700	0.00E+00	4.95E-02	7.35E-02	0.00E+00	4.94E-02
U-238	4184.73	4197.23	25.509	24.000	23.760	0.240	0.4899	100.000	5.80E-01	2.59E-01	1.17E-01	2.19E-02	2.40E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T0405235065_UU SAMPLE QTY : 0.507 G +/-0.197 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 87.5 +/-8.339 % SECONDARY QTY : 0.509 G +/-0.196 %	CHAMBER : 120 DETECTOR S/N : 74430 AVERAGE %EFFICIENCY : 25.0593 AVERAGE %EFF ERROR : 0.4860 COUNT DATE : 17-Sep-2016 11:44:52 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B120.CNF;1186 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W120.CNF;351 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.1062E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4490.86	4429.67	663.30	6.00	99.154	N/A
TRACER 2	1564-I	U-232	4.6532 dpm	5382.69	5335.27	-1.40	257.28	88.195	1.0077

NUCLIDE ACTIVITY SUMMARY

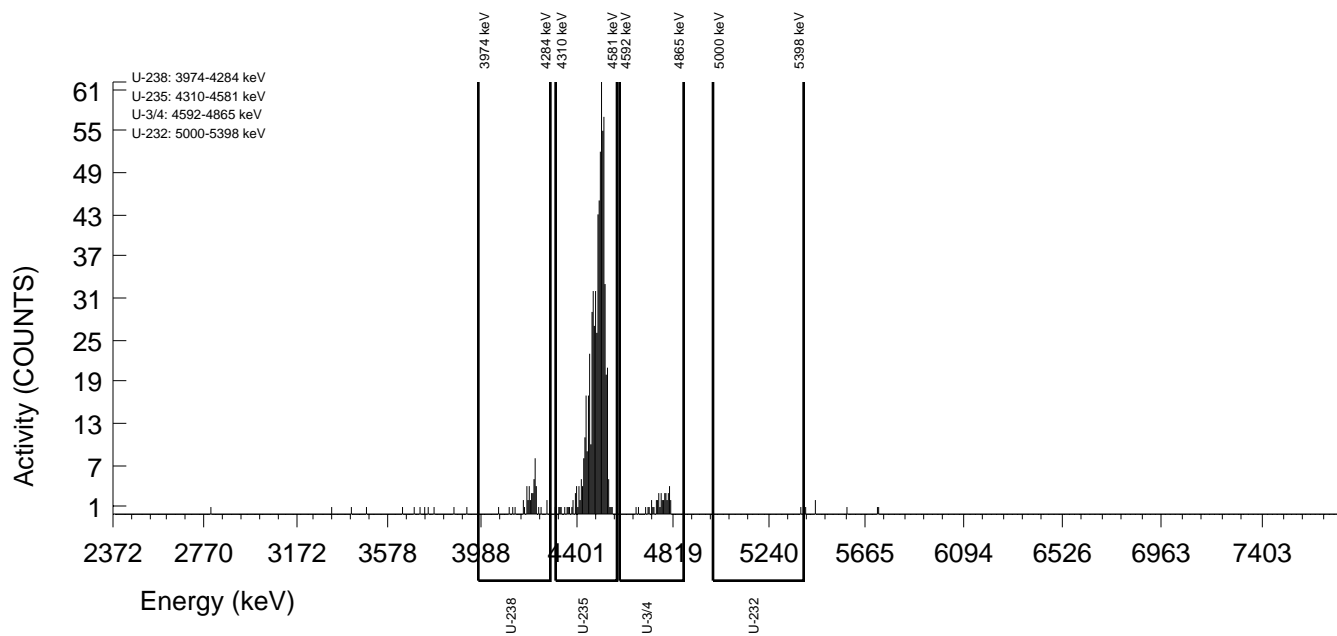
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		Lc pCi/G	1.96-sigma cnt Unc pCi/G
										TPU pCi/G	MDA pCi/G		
U-232	5302.10	5382.69	4.951	1.000	-1.400	2.400	1.5492	100.000	-2.09E-02	4.76E-02	1.30E-01	4.24E-02	4.76E-02
U-3/4	4763.02	4768.20	54.462	41.000	41.000	0.000	0.0000	100.000	6.59E-01	2.32E-01	4.82E-02	0.00E+00	2.04E-01
U-235	4391.00	4490.86	51.923	6.000	6.000	0.000	0.0000	99.700	9.67E-02	8.55E-02	4.84E-02	0.00E+00	8.39E-02
U-238	4184.73	4200.31	12.378	42.000	41.280	0.720	0.8485	100.000	6.63E-01	2.35E-01	9.82E-02	2.50E-02	2.07E-01

NOTES:

* Results are a compilation of S0405235065_UU and T0405235065_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



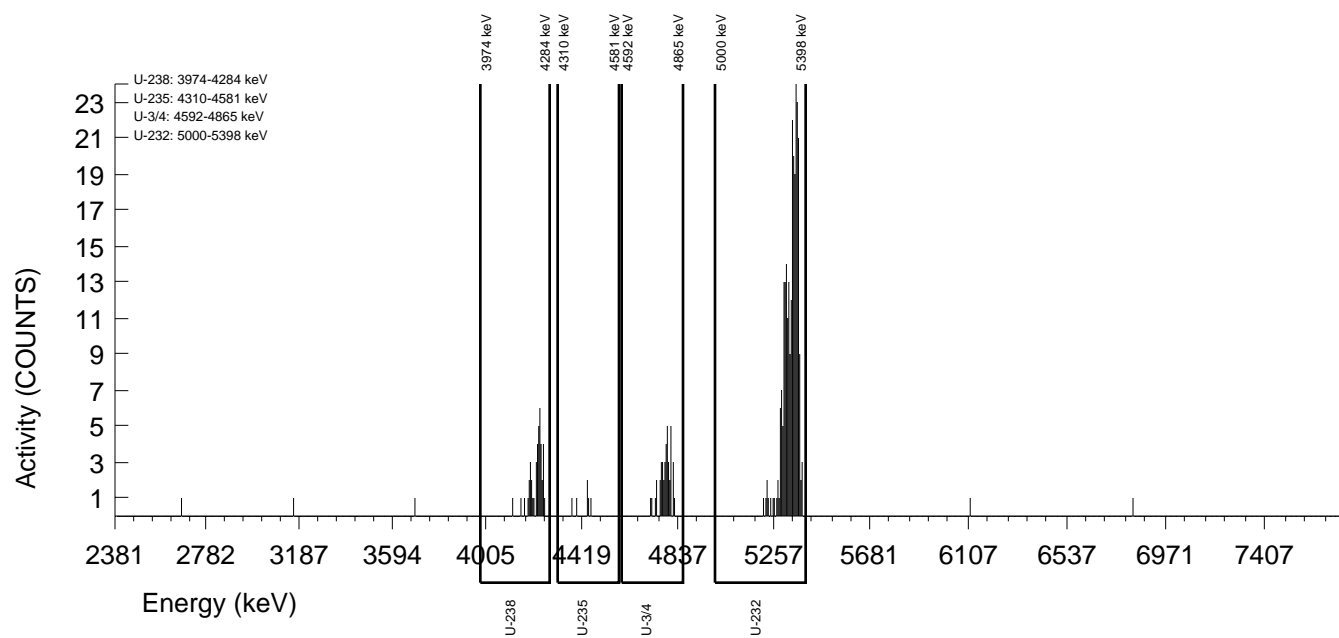
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : S0405235065_UU SAMPLE QTY : 0.507 G +/-0.197 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 88.2 +/-7.000 %	CHAMBER : 006 DETECTOR S/N : 79455 AVERAGE %EFFICIENCY : 26.3231 AVERAGE %EFF ERROR : 0.5098 COUNT DATE : 17-Sep-2016 11:42:39 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B006.CNF;1837 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W006.CNF;571 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6532E+00 dpm RESULTS : 4.1038E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5335.27	64.310	258.000	257.280	0.720	0.8485	100.000	4.13E+00	7.77E-01	9.82E-02	2.50E-02	5.07E-01
U-3/4	4763.02	4786.10	53.696	41.000	41.000	0.000	0.0000	100.000	6.54E-01	2.23E-01	4.78E-02	0.00E+00	2.03E-01
U-235	4391.00	4429.67	7.492	6.000	6.000	0.000	0.0000	99.700	9.60E-02	8.44E-02	4.80E-02	0.00E+00	8.33E-02
U-238	4184.73	4222.09	31.635	42.000	41.280	0.720	0.8485	100.000	6.58E-01	2.26E-01	9.74E-02	2.48E-02	2.05E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T0405235066_UU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 70.3 +/-9.068 % SECONDARY QTY : 0.515 G +/-0.194 %	CHAMBER : 121 DETECTOR S/N : 75545 AVERAGE %EFFICIENCY : 26.2144 AVERAGE %EFF ERROR : 0.5077 COUNT DATE : 17-Sep-2016 11:44:54 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B121.CNF;1158 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W121.CNF;322 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 7.0621E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4519.65	4412.67	442.98	1.28	63.301	N/A
TRACER 2	1564-I	U-232	4.6532 dpm	5302.73	5323.47	-0.20	234.52	70.870	1.0077

NUCLIDE ACTIVITY SUMMARY

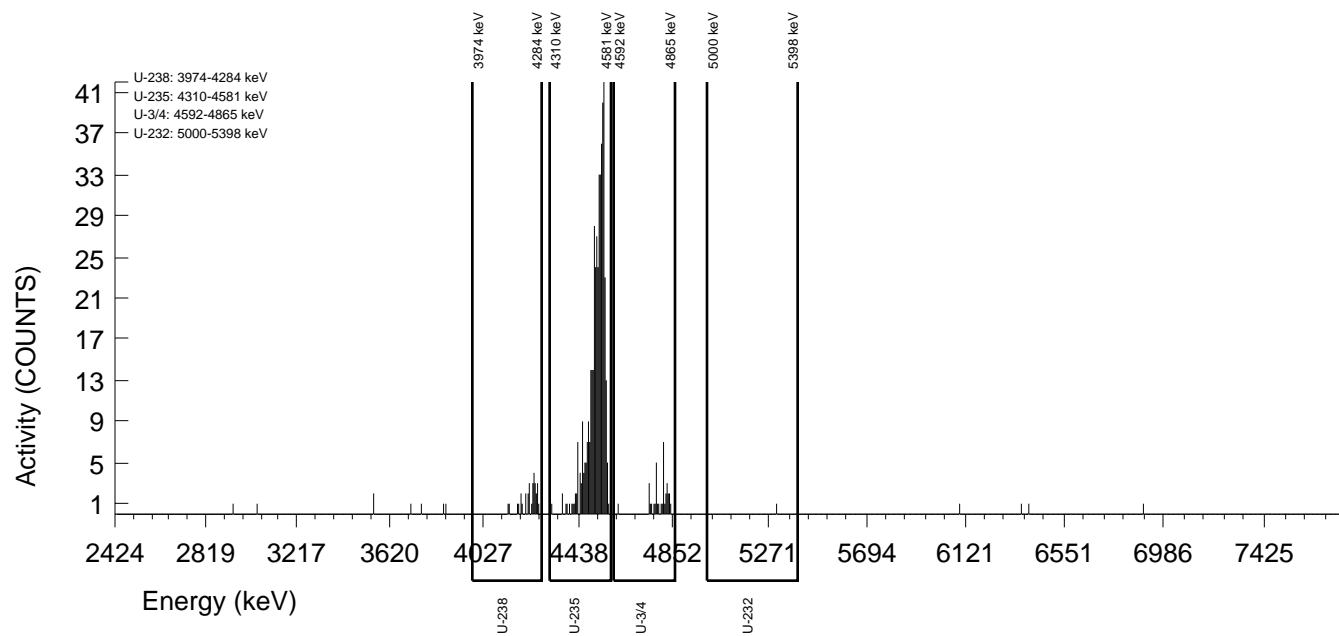
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5302.73	4.909	1.000	-0.200	1.200	1.0954	100.000	-4.43E-03	6.66E-02	1.55E-01	4.44E-02	6.64E-02
U-3/4	4763.02	4793.84	34.159	42.000	40.560	1.440	1.2000	100.000	7.12E-01	2.61E-01	1.30E-01	3.86E-02	2.27E-01
U-235	4391.00	4519.65	47.618	2.000	1.280	0.720	0.8485	99.700	2.25E-02	6.22E-02	1.08E-01	2.74E-02	6.20E-02
U-238	4184.73	4226.86	41.727	43.000	42.040	0.960	0.9798	100.000	7.38E-01	2.65E-01	1.16E-01	3.15E-02	2.29E-01

NOTES:

* Results are a compilation of S0405235066_UU and T0405235066_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.007 +/-0.000)



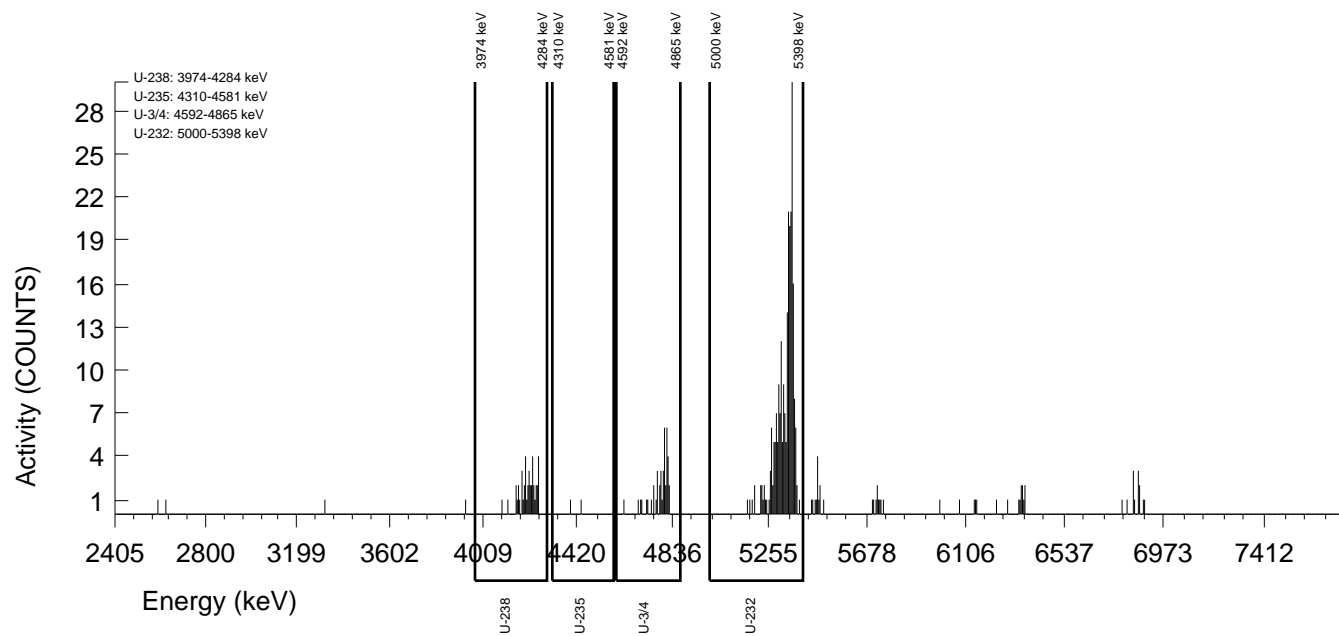
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : S0405235066_UU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 70.9 +/-7.356 %	CHAMBER : 010 DETECTOR S/N : 72529 AVERAGE %EFFICIENCY : 29.8601 AVERAGE %EFF ERROR : 0.5768 COUNT DATE : 17-Sep-2016 11:42:40 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B010.CNF;1841 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W010.CNF;511 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6532E+00 dpm RESULTS : 3.2977E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5323.47	24.469	241.000	234.520	6.480	2.5456	100.000	4.12E+00	8.16E-01	2.16E-01	8.19E-02	5.37E-01
U-3/4	4763.02	4778.58	22.101	42.000	40.560	1.440	1.2000	100.000	7.07E-01	2.48E-01	1.29E-01	3.83E-02	2.25E-01
U-235	4391.00	4412.67	49.114	2.000	1.280	0.720	0.8485	99.700	2.24E-02	6.17E-02	1.07E-01	2.72E-02	6.16E-02
U-238	4184.73	4202.35	72.852	43.000	42.040	0.960	0.9798	100.000	7.33E-01	2.52E-01	1.15E-01	3.13E-02	2.27E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T0405235067_UU SAMPLE QTY : 0.508 G +/-0.197 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 83.2 +/-8.127 % SECONDARY QTY : 0.504 G +/-0.198 %	CHAMBER : 122 DETECTOR S/N : 75546 AVERAGE %EFFICIENCY : 25.9617 AVERAGE %EFF ERROR : 0.5030 COUNT DATE : 17-Sep-2016 11:44:56 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B122.CNF;1170 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W122.CNF;334 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0744E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4494.61	4490.61	667.45	0.32	96.307	N/A
TRACER 2	1564-I	U-232	4.6535 dpm	5251.42	5340.45	0.04	288.76	83.902	1.0079

NUCLIDE ACTIVITY SUMMARY

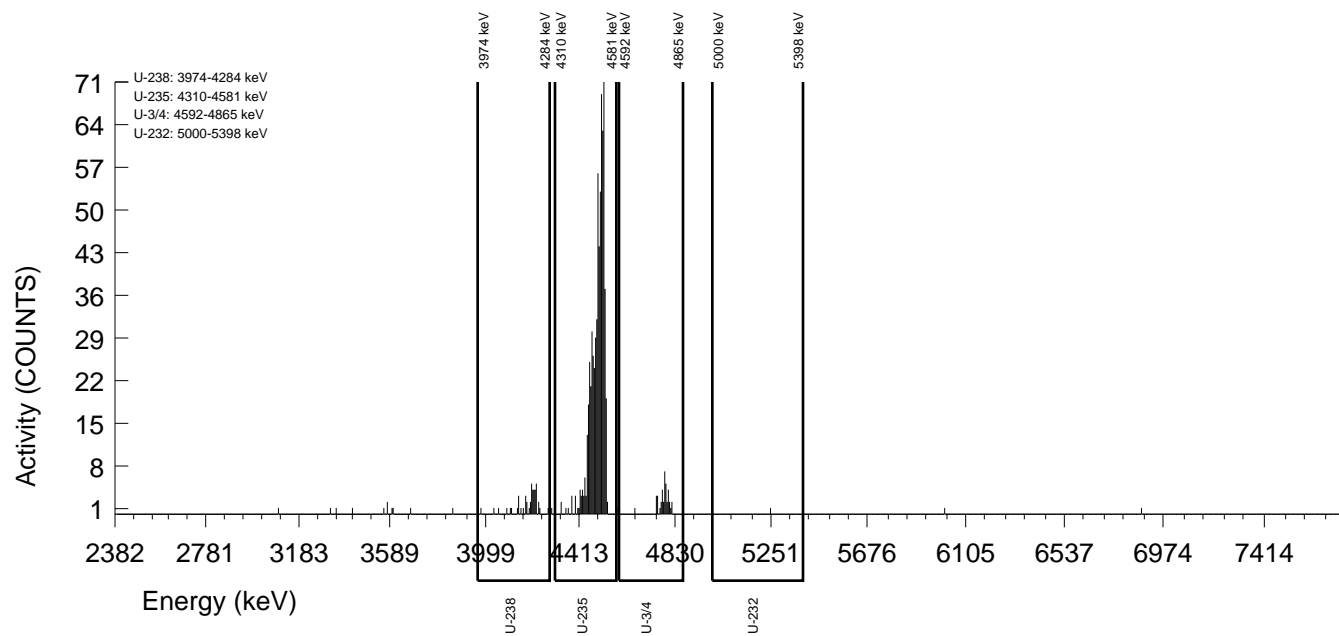
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5251.42	4.959	1.000	0.040	0.960	0.9798	100.000	6.00E-04	4.46E-02	9.89E-02	2.69E-02	4.45E-02
U-3/4	4763.02	4783.25	27.272	43.000	39.400	3.600	1.8974	100.000	5.63E-01	2.09E-01	1.42E-01	4.97E-02	1.88E-01
U-235	4391.00	4494.61	34.400	2.000	0.320	1.680	1.2961	99.700	4.59E-03	5.23E-02	1.11E-01	3.40E-02	5.23E-02
U-238	4184.73	4190.49	78.098	51.000	49.560	1.440	1.2000	100.000	7.08E-01	2.34E-01	1.06E-01	3.14E-02	2.03E-01

NOTES:

* Results are a compilation of S0405235067_UU and T0405235067_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

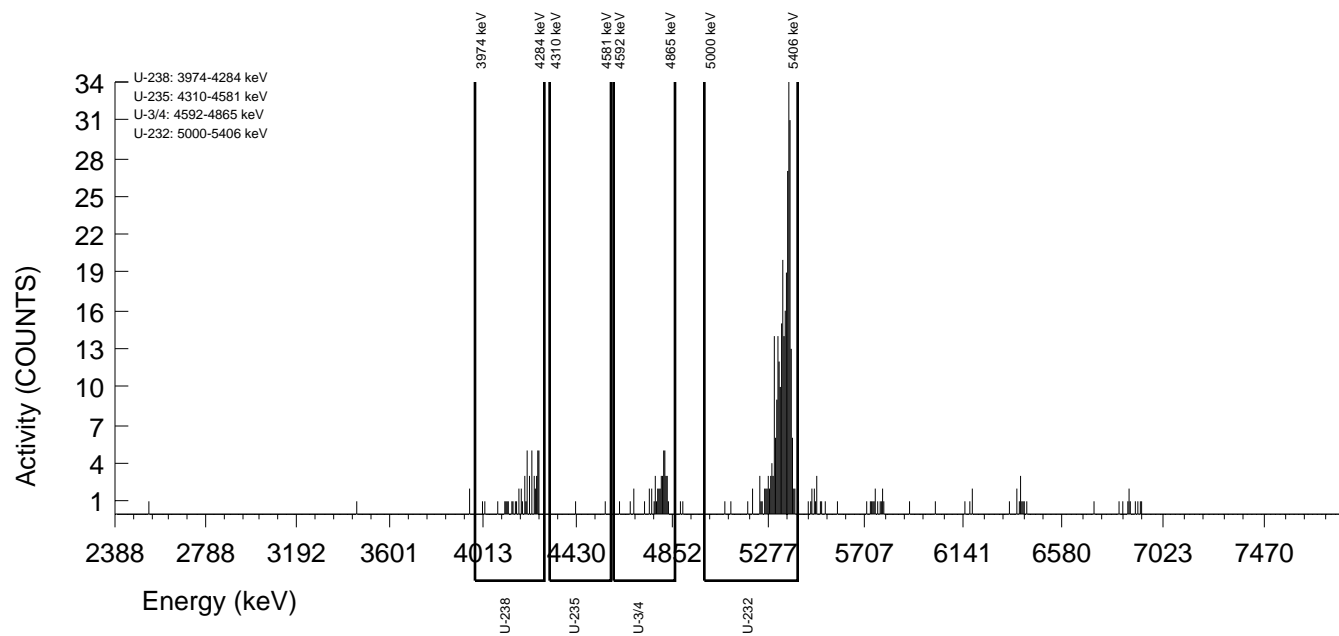
BATCH NUMBER : 1596418 SAMPLE ID : S0405235067_UU SAMPLE QTY : 0.508 G +/-0.197 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 83.9 +/-6.745 %	CHAMBER : 011 DETECTOR S/N : 72531 AVERAGE %EFFICIENCY : 31.0555 AVERAGE %EFF ERROR : 0.5992 COUNT DATE : 17-Sep-2016 11:42:40 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B011.CNF;1833 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W011.CNF;511 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6535E+00 dpm RESULTS : 3.9044E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5340.45	36.661	295.000	288.760	6.240	2.4980	100.000	4.13E+00	7.45E-01	1.74E-01	6.54E-02	4.83E-01
U-3/4	4763.02	4787.66	52.176	43.000	39.400	3.600	1.8974	100.000	5.59E-01	2.02E-01	1.41E-01	4.93E-02	1.86E-01
U-235	4391.00	4490.61	129.198	2.000	0.320	1.680	1.2961	99.700	4.55E-03	5.19E-02	1.10E-01	3.38E-02	5.19E-02
U-238	4184.73	4203.59	62.943	51.000	49.560	1.440	1.2000	100.000	7.03E-01	2.23E-01	1.05E-01	3.12E-02	2.01E-01

NOTES:

* Regions have been manually adjusted



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T0405235068_UU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 82.9 +/-8.410 % SECONDARY QTY : 0.502 G +/-0.199 %	CHAMBER : 124 DETECTOR S/N : 80053 AVERAGE %EFFICIENCY : 24.5380 AVERAGE %EFF ERROR : 0.4761 COUNT DATE : 17-Sep-2016 11:44:59 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B124.CNF;1158 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W124.CNF;300 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.7825E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4490.35	4414.65	574.37	4.80	87.685	N/A
TRACER 2	1564-I	U-232	4.6535 dpm	5198.58	5327.34	-1.68	271.76	83.585	1.0078

NUCLIDE ACTIVITY SUMMARY

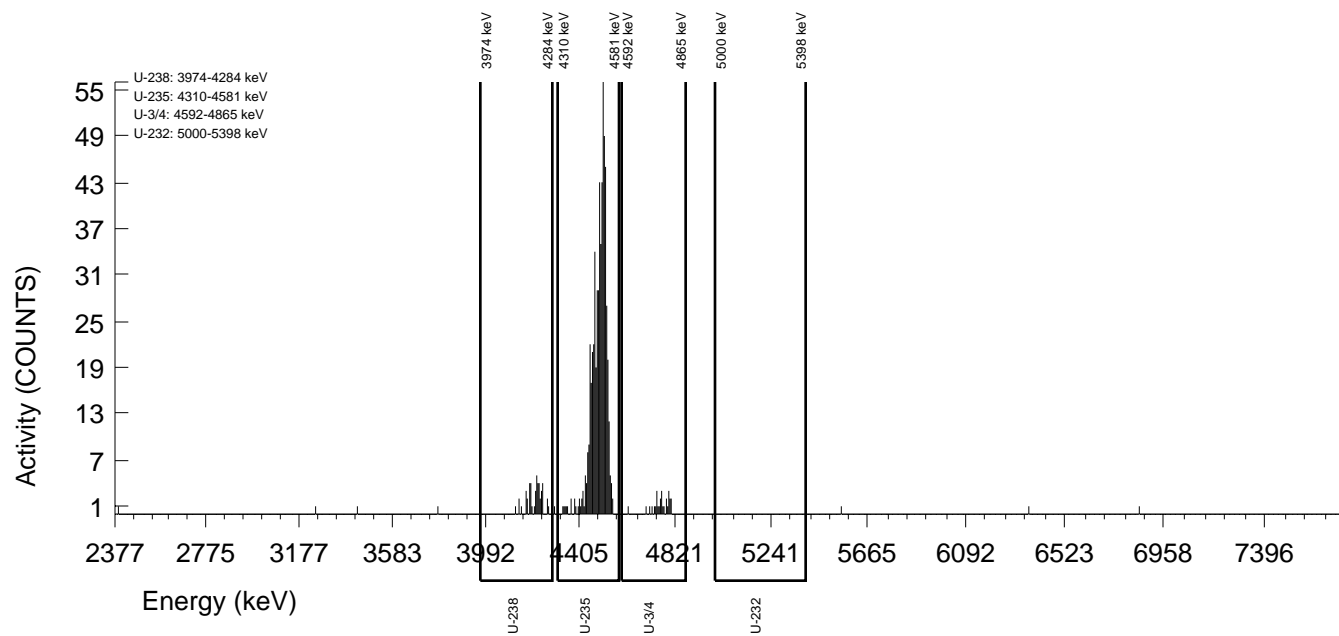
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5198.58	0.000	0.000	-1.680	1.680	1.2961	100.000	-2.94E-02	4.16E-02	1.36E-01	4.16E-02	4.15E-02
U-3/4	4763.02	4758.87	64.409	55.000	51.640	3.360	1.8330	100.000	7.83E-01	2.60E-01	1.47E-01	5.09E-02	2.24E-01
U-235	4391.00	4490.35	51.747	6.000	4.800	1.200	1.0954	99.700	7.30E-02	8.17E-02	1.07E-01	3.05E-02	8.07E-02
U-238	4184.73	4209.68	72.047	67.000	66.520	0.480	0.6928	100.000	1.01E+00	2.99E-01	8.39E-02	1.92E-02	2.45E-01

NOTES:

* Results are a compilation of S0405235068_UU and T0405235068_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.009 +/-0.000)



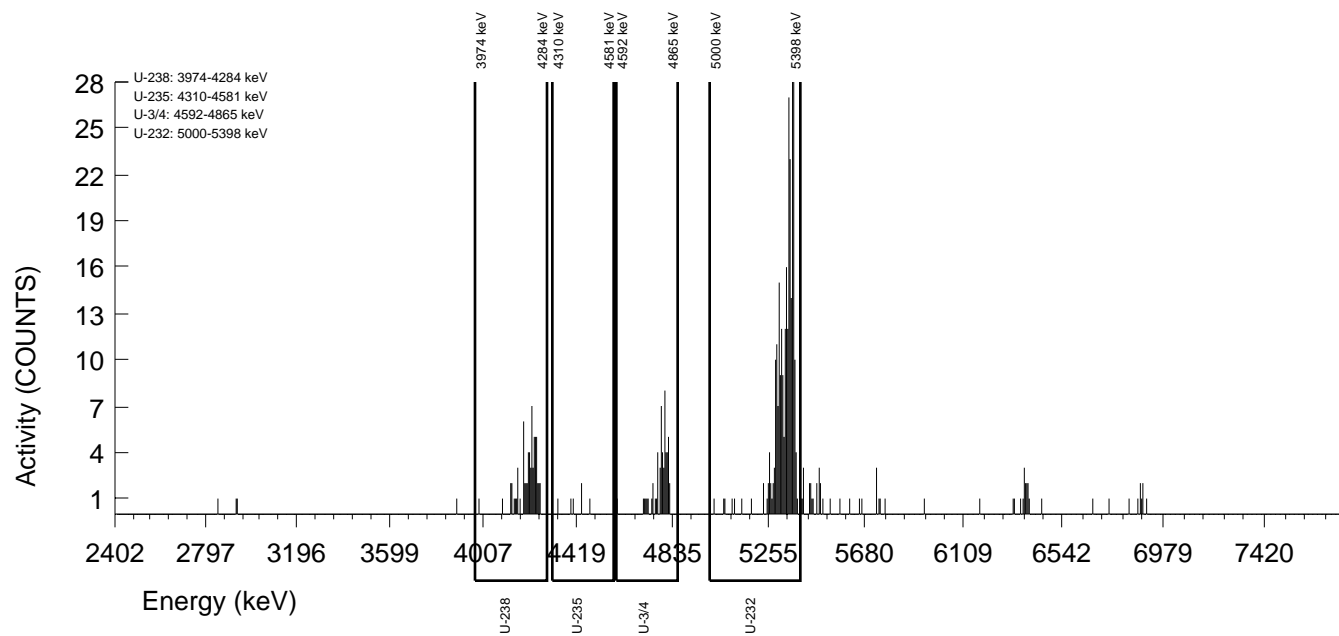
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : S0405235068_UU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 83.6 +/-6.915 %	CHAMBER : 012 DETECTOR S/N : 80054 AVERAGE %EFFICIENCY : 29.3381 AVERAGE %EFF ERROR : 0.5668 COUNT DATE : 17-Sep-2016 11:42:40 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B012.CNF;1837 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W012.CNF;494 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6535E+00 dpm RESULTS : 3.8896E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5327.34	63.348	278.000	271.760	6.240	2.4980	100.000	4.12E+00	7.64E-01	1.84E-01	6.93E-02	4.97E-01
U-3/4	4763.02	4784.80	34.777	55.000	51.640	3.360	1.8330	100.000	7.77E-01	2.48E-01	1.46E-01	5.05E-02	2.22E-01
U-235	4391.00	4414.65	4.910	6.000	4.800	1.200	1.0954	99.700	7.24E-02	8.08E-02	1.06E-01	3.03E-02	8.01E-02
U-238	4184.73	4204.44	58.507	67.000	66.520	0.480	0.6928	100.000	1.00E+00	2.81E-01	8.33E-02	1.91E-02	2.43E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T0405235069_UU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 83.0 +/-7.875 % SECONDARY QTY : 0.505 G +/-0.198 %	CHAMBER : 126 DETECTOR S/N : 75548 AVERAGE %EFFICIENCY : 25.0653 AVERAGE %EFF ERROR : 0.4861 COUNT DATE : 17-Sep-2016 11:45:01 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B126.CNF;1162 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W126.CNF;338 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0875E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4491.76	4429.79	652.24	3.00	97.477	N/A
TRACER 2	1564-I	U-232	4.6529 dpm	5250.62	5329.42	0.80	325.44	83.834	1.0106

NUCLIDE ACTIVITY SUMMARY

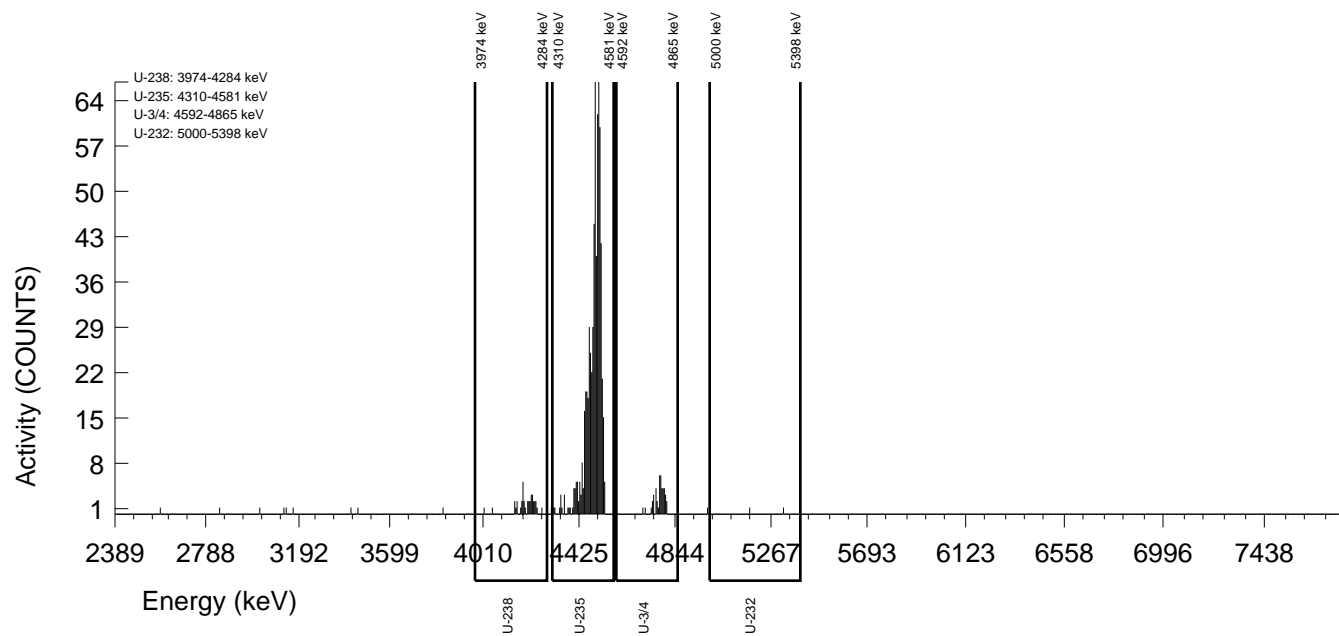
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5250.62	144.136	2.000	0.800	1.200	1.0954	100.000	1.23E-02	5.50E-02	1.07E-01	3.08E-02	5.50E-02
U-3/4	4763.02	4779.86	41.004	66.000	64.800	1.200	1.0954	100.000	8.29E-01	2.44E-01	8.97E-02	2.57E-02	2.06E-01
U-235	4391.00	4491.76	35.405	3.000	3.000	0.000	0.0000	99.700	3.85E-02	5.10E-02	3.85E-02	0.00E+00	5.06E-02
U-238	4184.73	4190.90	46.388	64.000	63.760	0.240	0.4899	100.000	8.16E-01	2.40E-01	6.13E-02	1.15E-02	2.02E-01

NOTES:

* Results are a compilation of S0405235069_UU and T0405235069_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

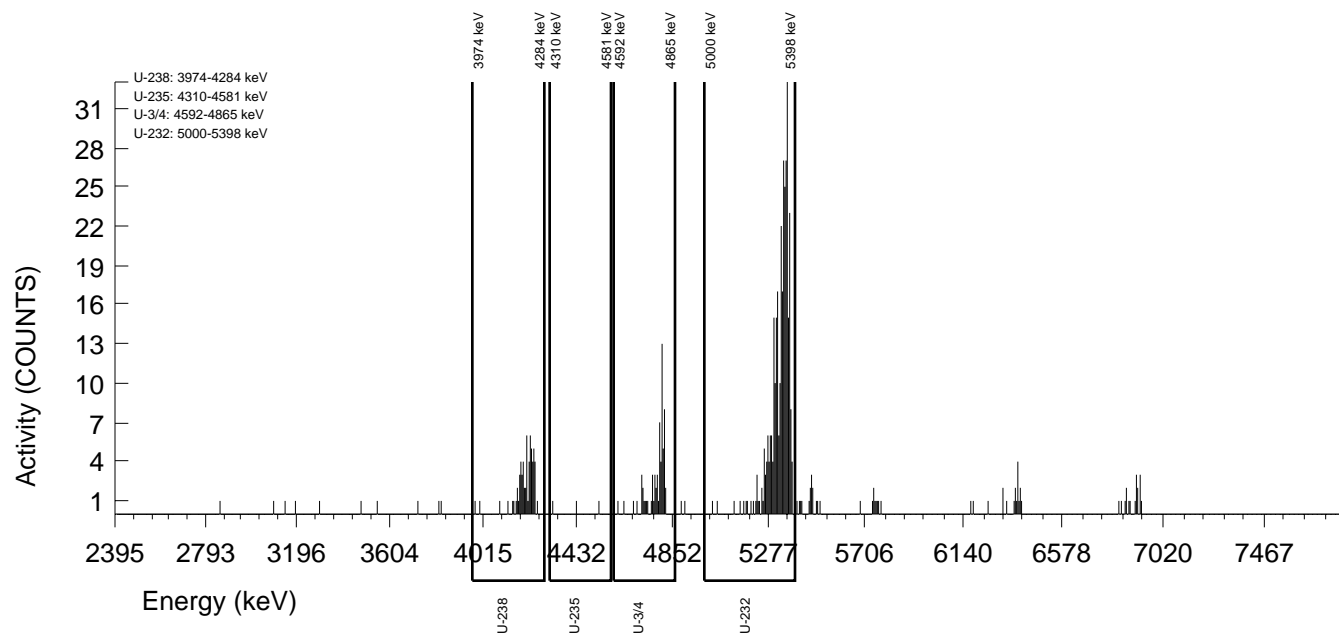
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : S0405235069_UU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 83.8 +/-6.415 %	CHAMBER : 013 DETECTOR S/N : 78790 AVERAGE %EFFICIENCY : 35.0288 AVERAGE %EFF ERROR : 0.6744 COUNT DATE : 17-Sep-2016 11:42:41 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B013.CNF;1813 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W013.CNF;513 CAL DATE : 27-Aug-2016
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TRACER
 ID : 1564-I
 NUCLIDE : U-232
 NOMINAL : 4.6529E+00 dpm
 RESULTS : 3.9007E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5329.42	52.927	330.000	325.440	4.560	2.1354	100.000	4.15E+00	7.10E-01	1.38E-01	4.99E-02	4.56E-01
U-3/4	4763.02	4783.77	21.468	66.000	64.800	1.200	1.0954	100.000	8.20E-01	2.30E-01	8.88E-02	2.54E-02	2.04E-01
U-235	4391.00	4429.79	198.168	3.000	3.000	0.000	0.0000	99.700	3.81E-02	5.04E-02	3.81E-02	0.00E+00	5.01E-02
U-238	4184.73	4203.45	65.643	64.000	63.760	0.240	0.4899	100.000	8.07E-01	2.26E-01	6.07E-02	1.14E-02	2.00E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T0405235070_UU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 88.6 +/-7.887 % SECONDARY QTY : 0.510 G +/-0.196 %	CHAMBER : 127 DETECTOR S/N : 78770 AVERAGE %EFFICIENCY : 26.6218 AVERAGE %EFF ERROR : 0.5155 COUNT DATE : 17-Sep-2016 11:45:04 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B127.CNF;1165 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W127.CNF;322 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0422E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4486.14	4545.16	663.87	1.04	93.414	N/A
TRACER 2	1564-I	U-232	4.6535 dpm	5198.55	5335.00	-1.44	323.52	89.309	1.0078

NUCLIDE ACTIVITY SUMMARY

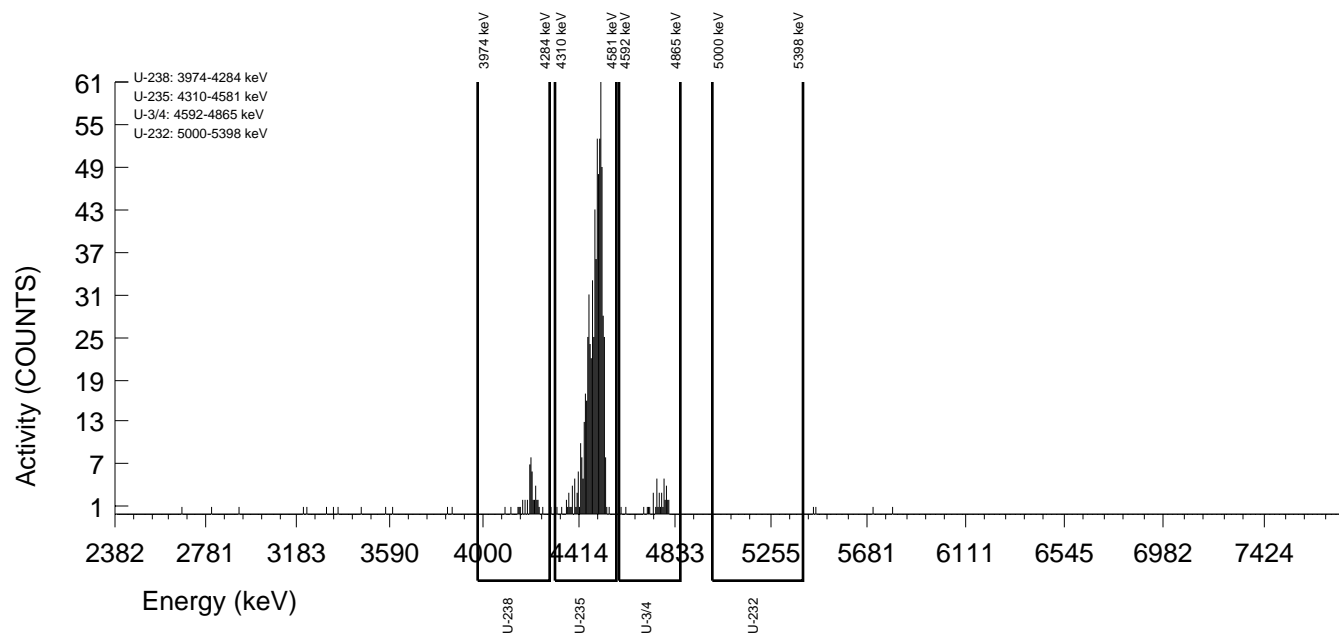
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		Lc pCi/G	1.96-sigma	
										TPU pCi/G	MDA pCi/G		cnt	Unc pCi/G
U-232	5302.10	5198.55	0.000	0.000	-1.440	1.440	1.2000	100.000	-2.15E-02	3.47E-02	1.10E-01	3.28E-02	3.46E-02	3.46E-02
U-3/4	4763.02	4764.95	59.086	48.000	47.280	0.720	0.8485	100.000	6.02E-01	2.00E-01	7.78E-02	1.98E-02	1.75E-01	1.75E-01
U-235	4391.00	4486.14	59.322	2.000	1.040	0.960	0.9798	99.700	1.33E-02	4.54E-02	8.41E-02	2.29E-02	4.54E-02	4.54E-02
U-238	4184.73	4202.83	14.521	64.000	63.040	0.960	0.9798	100.000	8.02E-01	2.39E-01	8.39E-02	2.28E-02	2.02E-01	2.02E-01

NOTES:

* Results are a compilation of S0405235070_UU and T0405235070_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

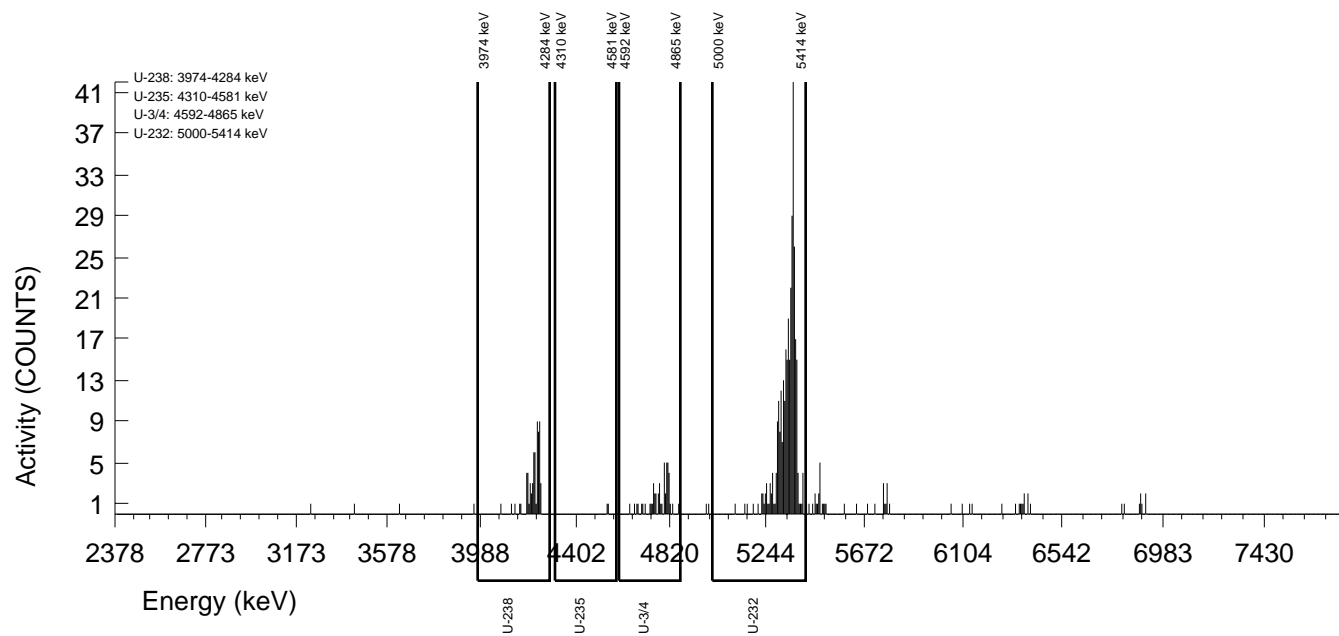
BATCH NUMBER : 1596418 SAMPLE ID : S0405235070_UU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 89.3 +/-6.449 %	CHAMBER : 014 DETECTOR S/N : 83289 AVERAGE %EFFICIENCY : 32.6875 AVERAGE %EFF ERROR : 0.6302 COUNT DATE : 17-Sep-2016 11:42:41 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B014.CNF;1814 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W014.CNF;523 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6535E+00 dpm RESULTS : 4.1560E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5335.00	18.176	330.000	323.520	6.480	2.5456	100.000	4.12E+00	7.09E-01	1.57E-01	5.94E-02	4.55E-01
U-3/4	4763.02	4772.03	67.576	48.000	47.280	0.720	0.8485	100.000	5.97E-01	1.91E-01	7.72E-02	1.96E-02	1.74E-01
U-235	4391.00	4545.16	9.829	2.000	1.040	0.960	0.9798	99.700	1.32E-02	4.51E-02	8.35E-02	2.27E-02	4.50E-02
U-238	4184.73	4218.40	30.716	64.000	63.040	0.960	0.9798	100.000	7.96E-01	2.26E-01	8.32E-02	2.27E-02	2.00E-01

NOTES:

* Regions have been manually adjusted



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T0405235071_UU SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 86.0 +/-7.881 % SECONDARY QTY : 0.506 G +/-0.198 %	CHAMBER : 128 DETECTOR S/N : 75549 AVERAGE %EFFICIENCY : 26.0039 AVERAGE %EFF ERROR : 0.5038 COUNT DATE : 17-Sep-2016 11:45:06 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B128.CNF;1169 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W128.CNF;324 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0790E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4495.17	4396.18	671.38	1.32	96.716	N/A
TRACER 2	1564-I	U-232	4.6535 dpm	5326.22	5331.81	-0.20	320.44	86.654	1.0078

NUCLIDE ACTIVITY SUMMARY

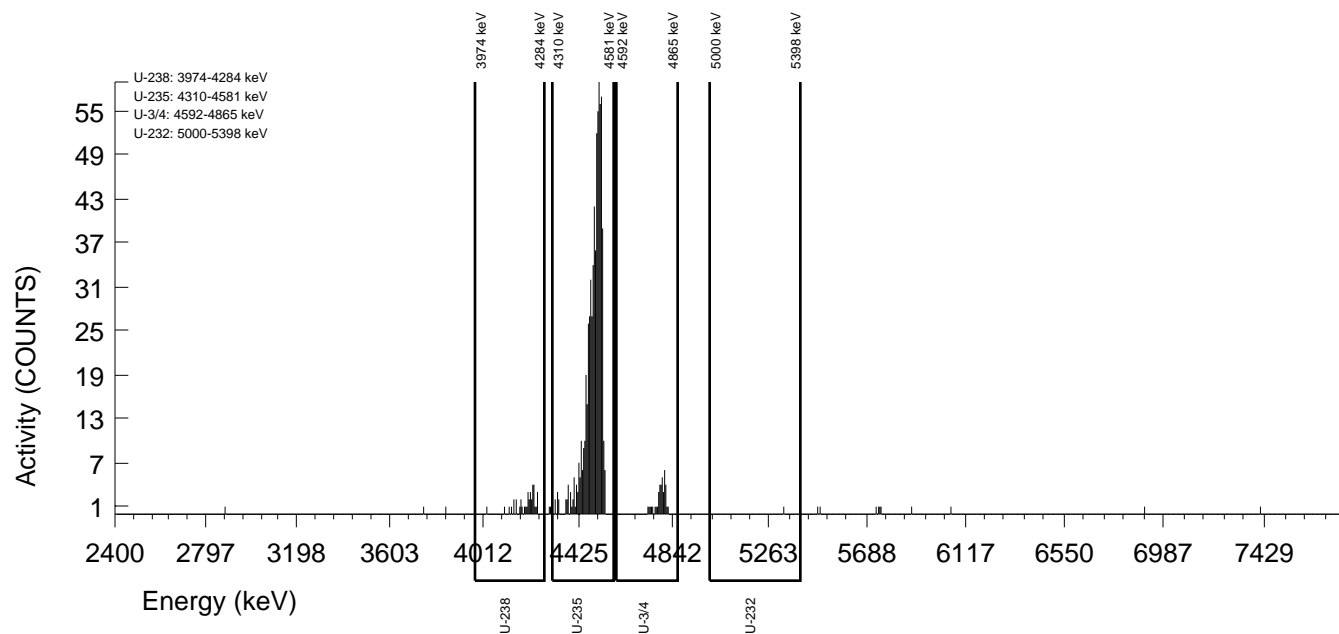
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5326.22	4.935	1.000	-0.200	1.200	1.0954	100.000	-2.97E-03	4.47E-02	1.04E-01	2.98E-02	4.46E-02
U-3/4	4763.02	4787.82	31.253	43.000	41.800	1.200	1.0954	100.000	5.31E-01	1.86E-01	8.91E-02	2.55E-02	1.66E-01
U-235	4391.00	4495.17	53.430	3.000	1.320	1.680	1.2961	99.700	1.68E-02	5.28E-02	9.87E-02	3.02E-02	5.27E-02
U-238	4184.73	4197.52	43.589	55.000	54.520	0.480	0.6928	100.000	6.93E-01	2.17E-01	7.03E-02	1.61E-02	1.87E-01

NOTES:

* Results are a compilation of S0405235071_UU and T0405235071_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



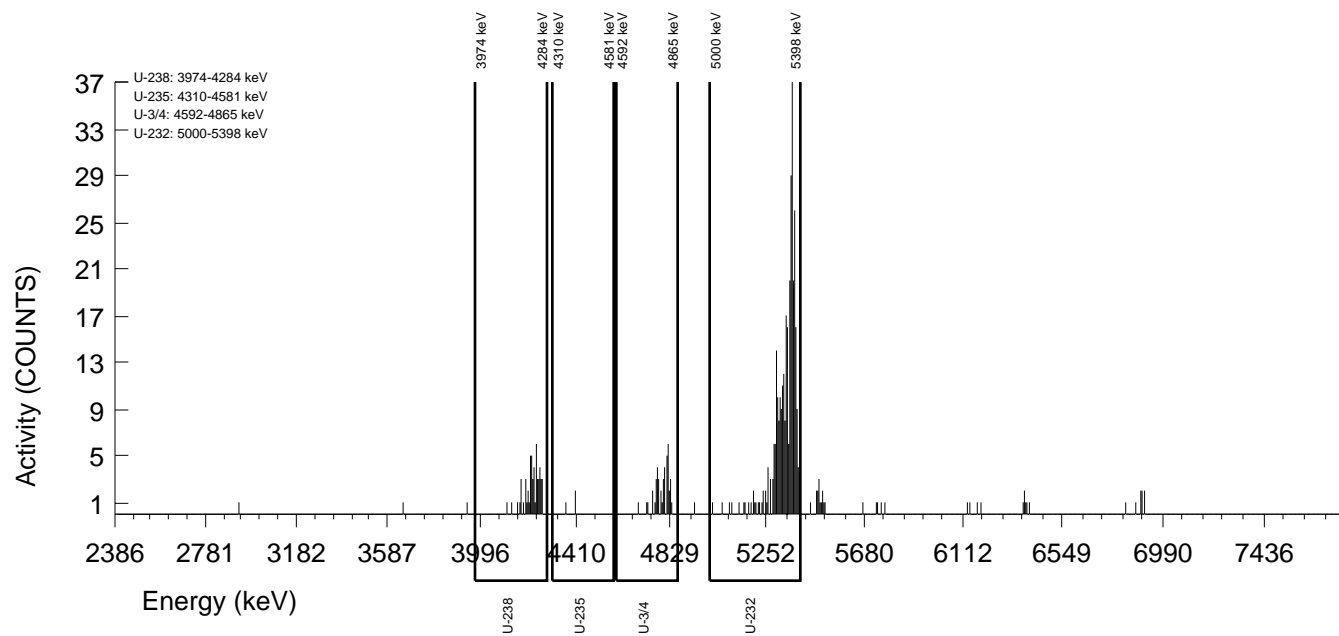
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : S0405235071_UU SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 86.7 +/-6.455 %	CHAMBER : 015 DETECTOR S/N : 80055 AVERAGE %EFFICIENCY : 33.3682 AVERAGE %EFF ERROR : 0.6430 COUNT DATE : 17-Sep-2016 11:42:41 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B015.CNF;1833 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W015.CNF;530 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6535E+00 dpm RESULTS : 4.0325E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5331.81	23.884	325.000	320.440	4.560	2.1354	100.000	4.07E+00	7.01E-01	1.37E-01	4.97E-02	4.50E-01
U-3/4	4763.02	4791.00	52.861	43.000	41.800	1.200	1.0954	100.000	5.27E-01	1.79E-01	8.84E-02	2.53E-02	1.65E-01
U-235	4391.00	4396.18	4.917	3.000	1.320	1.680	1.2961	99.700	1.67E-02	5.24E-02	9.80E-02	3.00E-02	5.23E-02
U-238	4184.73	4220.26	46.714	55.000	54.520	0.480	0.6928	100.000	6.87E-01	2.06E-01	6.98E-02	1.60E-02	1.85E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T0405235072_UU SAMPLE QTY : 0.513 G +/-0.195 % SAMPLE DATE : 15-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 72.5 +/-8.340 % SECONDARY QTY : 0.503 G +/-0.199 %	CHAMBER : 129 DETECTOR S/N : 76227 AVERAGE %EFFICIENCY : 26.3145 AVERAGE %EFF ERROR : 0.5097 COUNT DATE : 17-Sep-2016 11:45:08 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B129.CNF;1168 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W129.CNF;343 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.7508E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4489.30	4451.07	613.96	7.04	87.401	N/A
TRACER 2	1564-I	U-232	4.6530 dpm	5321.84	5334.22	0.52	271.00	73.174	1.0098

NUCLIDE ACTIVITY SUMMARY

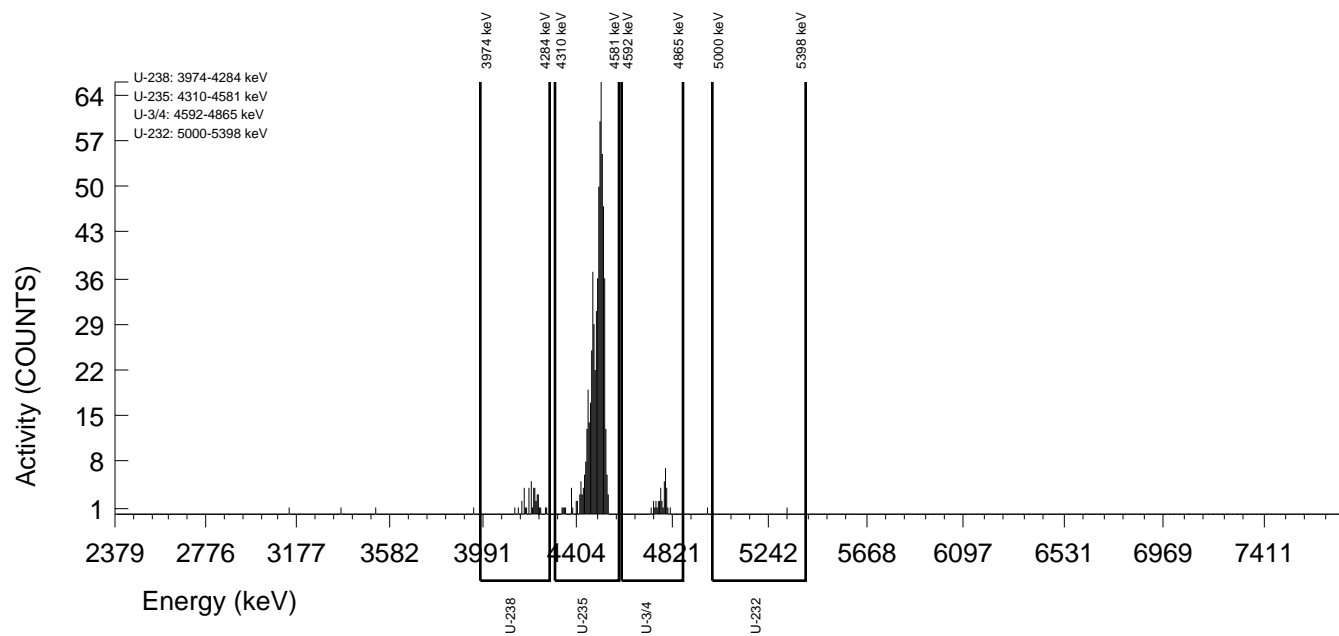
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5321.84	4.932	1.000	0.520	0.480	0.6928	100.000	8.50E-03	4.73E-02	9.05E-02	2.07E-02	4.72E-02
U-3/4	4763.02	4774.35	26.715	66.000	62.160	3.840	1.9596	100.000	9.39E-01	2.91E-01	1.54E-01	5.42E-02	2.44E-01
U-235	4391.00	4489.30	51.608	8.000	7.040	0.960	0.9798	99.700	1.07E-01	9.23E-02	9.99E-02	2.72E-02	9.05E-02
U-238	4184.73	4204.51	62.267	48.000	47.040	0.960	0.9798	100.000	7.11E-01	2.40E-01	9.96E-02	2.71E-02	2.08E-01

NOTES:

* Results are a compilation of S0405235072_UU and T0405235072_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.009 +/-0.000)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

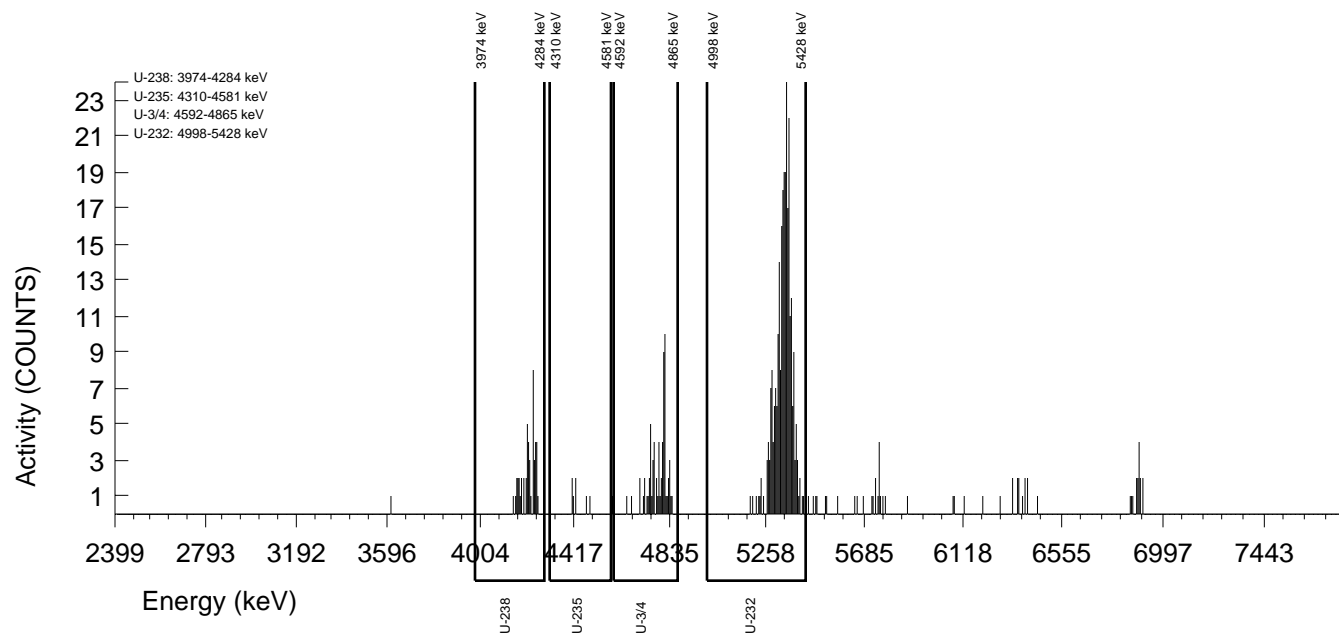
BATCH NUMBER : 1596418 SAMPLE ID : S0405235072_UU SAMPLE QTY : 0.513 G +/-0.195 % SAMPLE DATE : 15-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 73.2 +/-6.918 %	CHAMBER : 016 DETECTOR S/N : 78774 AVERAGE %EFFICIENCY : 33.4185 AVERAGE %EFF ERROR : 0.6439 COUNT DATE : 17-Sep-2016 11:42:41 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B016.CNF;1809 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W016.CNF;494 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6530E+00 dpm RESULTS : 3.4048E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5334.22	46.059	277.000	271.000	6.000	2.4495	100.000	4.09E+00	7.58E-01	1.81E-01	6.76E-02	4.94E-01
U-3/4	4763.02	4783.92	11.531	66.000	62.160	3.840	1.9596	100.000	9.30E-01	2.75E-01	1.52E-01	5.37E-02	2.42E-01
U-235	4391.00	4451.07	19.581	8.000	7.040	0.960	0.9798	99.700	1.06E-01	9.09E-02	9.89E-02	2.69E-02	8.96E-02
U-238	4184.73	4215.06	30.024	48.000	47.040	0.960	0.9798	100.000	7.04E-01	2.28E-01	9.86E-02	2.69E-02	2.06E-01

NOTES:

* Regions have been manually adjusted



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T0405235073_UU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 82.9 +/-8.205 % SECONDARY QTY : 0.515 G +/-0.194 %	CHAMBER : 130 DETECTOR S/N : 76228 AVERAGE %EFFICIENCY : 26.6411 AVERAGE %EFF ERROR : 0.5158 COUNT DATE : 17-Sep-2016 11:45:10 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B130.CNF;1165 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W130.CNF;349 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0232E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4483.54	4372.84	652.26	3.28	91.715	N/A
TRACER 2	1564-I	U-232	4.6535 dpm	5185.30	5321.59	1.28	281.52	83.933	1.0124

NUCLIDE ACTIVITY SUMMARY

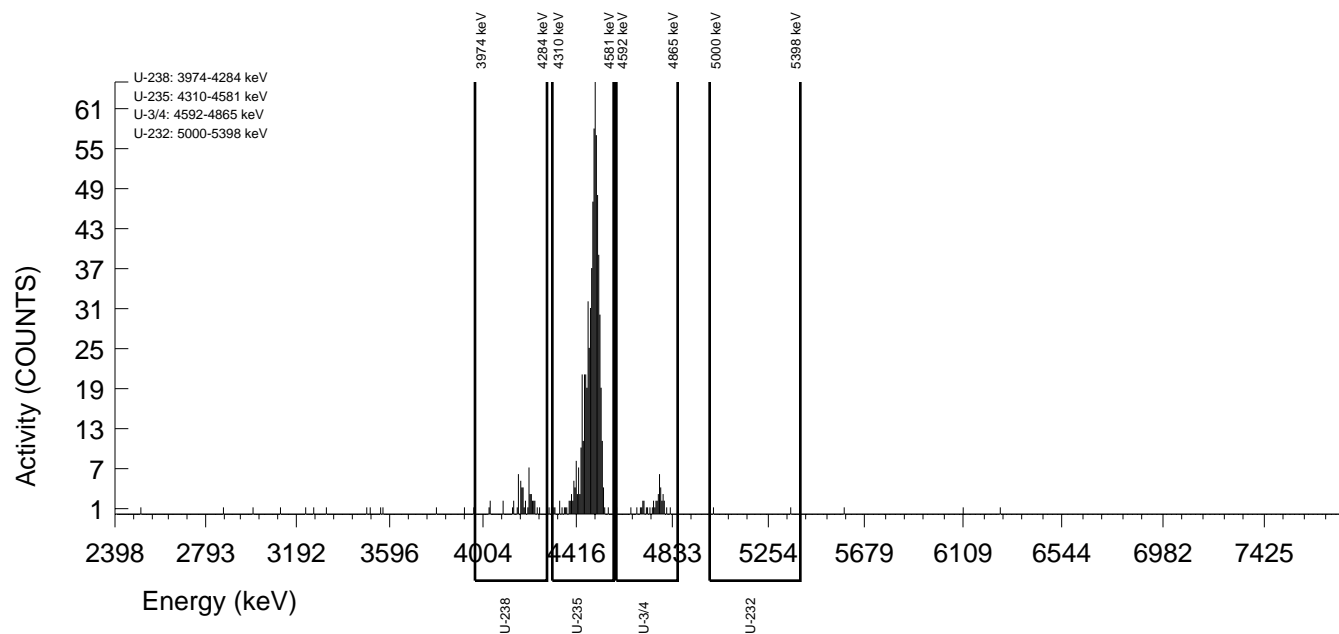
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5185.30	319.016	2.000	1.280	0.720	0.8485	100.000	1.92E-02	5.30E-02	9.18E-02	2.34E-02	5.30E-02
U-3/4	4763.02	4757.44	12.270	47.000	45.800	1.200	1.0954	100.000	6.78E-01	2.31E-01	1.04E-01	2.97E-02	2.02E-01
U-235	4391.00	4483.54	36.673	4.000	3.280	0.720	0.8485	99.700	4.87E-02	6.71E-02	9.08E-02	2.31E-02	6.66E-02
U-238	4184.73	4181.37	50.920	53.000	52.040	0.960	0.9798	100.000	7.71E-01	2.49E-01	9.76E-02	2.66E-02	2.14E-01

NOTES:

* Results are a compilation of S0405235073_UU and T0405235073_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



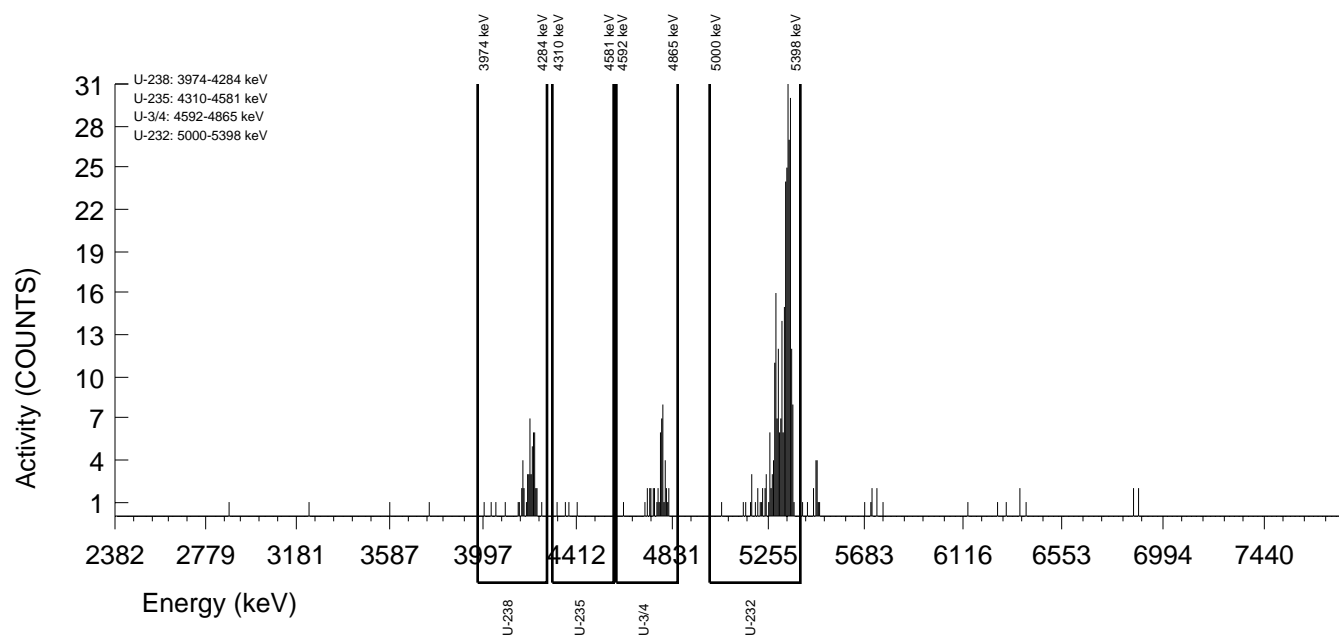
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : S0405235073_UU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 83.9 +/-6.818 %	CHAMBER : 017 DETECTOR S/N : 78791 AVERAGE %EFFICIENCY : 30.2659 AVERAGE %EFF ERROR : 0.5843 COUNT DATE : 17-Sep-2016 11:42:41 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B017.CNF;2655 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W017.CNF;1450 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6535E+00 dpm RESULTS : 3.9058E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5321.59	63.674	288.000	281.520	6.480	2.5456	100.000	4.15E+00	7.58E-01	1.82E-01	6.88E-02	4.93E-01
U-3/4	4763.02	4777.29	14.661	47.000	45.800	1.200	1.0954	100.000	6.70E-01	2.20E-01	1.03E-01	2.94E-02	1.99E-01
U-235	4391.00	4372.84	88.809	4.000	3.280	0.720	0.8485	99.700	4.81E-02	6.61E-02	8.96E-02	2.28E-02	6.58E-02
U-238	4184.73	4197.99	53.655	53.000	52.040	0.960	0.9798	100.000	7.61E-01	2.36E-01	9.64E-02	2.63E-02	2.11E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T0405235074_UU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 15-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 77.4 +/-8.208 % SECONDARY QTY : 0.517 G +/-0.193 %	CHAMBER : 131 DETECTOR S/N : 80008 AVERAGE %EFFICIENCY : 25.5970 AVERAGE %EFF ERROR : 0.4961 COUNT DATE : 17-Sep-2016 11:45:13 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B131.CNF;1160 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W131.CNF;319 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.1648E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4485.87	4446.79	713.44	0.28	104.409	N/A
TRACER 2	1564-I	U-232	4.6530 dpm	5198.56	5326.43	-0.72	270.72	77.972	1.0077

NUCLIDE ACTIVITY SUMMARY

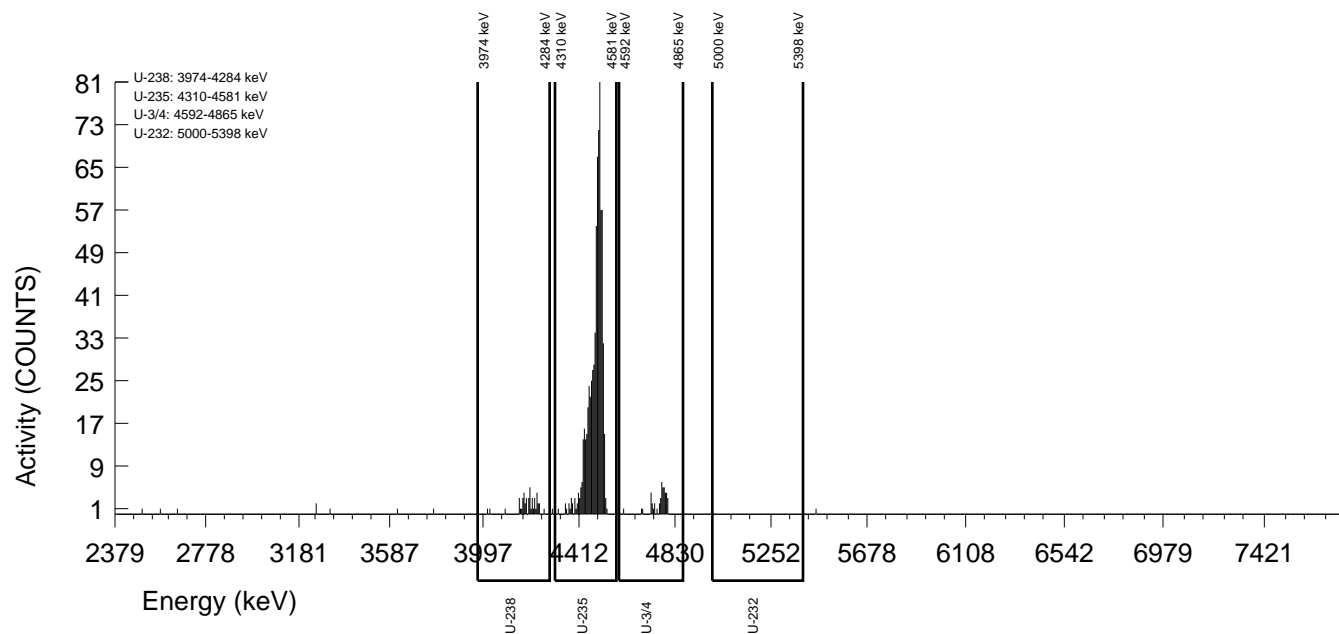
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5198.56	0.000	0.000	-0.720	0.720	0.8485	100.000	-9.86E-03	2.98E-02	8.36E-02	2.13E-02	2.98E-02
U-3/4	4763.02	4767.10	70.676	43.000	41.320	1.680	1.2961	100.000	6.39E-01	2.28E-01	1.20E-01	3.67E-02	2.02E-01
U-235	4391.00	4485.87	31.420	1.000	0.280	0.720	0.8485	99.700	4.34E-03	4.54E-02	9.47E-02	2.41E-02	4.54E-02
U-238	4184.73	4187.93	78.942	64.000	62.560	1.440	1.2000	100.000	9.67E-01	2.92E-01	1.14E-01	3.40E-02	2.45E-01

NOTES:

* Results are a compilation of S0405235074_UU and T0405235074_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.011 +/-0.000)



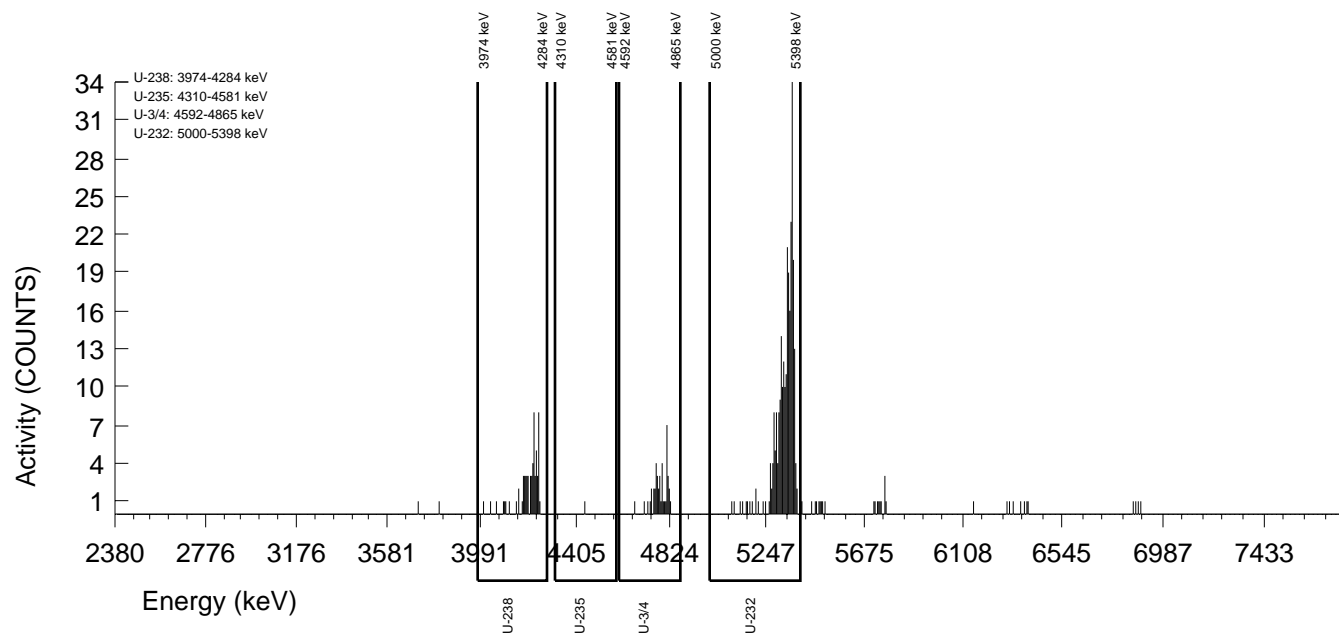
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : S0405235074_UU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 15-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 78.0 +/-6.913 %	CHAMBER : 018 DETECTOR S/N : 78782 AVERAGE %EFFICIENCY : 31.3297 AVERAGE %EFF ERROR : 0.6044 COUNT DATE : 17-Sep-2016 11:42:41 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B018.CNF;1810 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W018.CNF;484 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6530E+00 dpm RESULTS : 3.6281E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5326.43	28.662	276.000	270.720	5.280	2.2978	100.000	4.18E+00	7.76E-01	1.76E-01	6.50E-02	5.05E-01
U-3/4	4763.02	4777.18	49.790	43.000	41.320	1.680	1.2961	100.000	6.34E-01	2.19E-01	1.19E-01	3.64E-02	2.00E-01
U-235	4391.00	4446.79	4.918	1.000	0.280	0.720	0.8485	99.700	4.31E-03	4.51E-02	9.40E-02	2.39E-02	4.50E-02
U-238	4184.73	4197.13	27.398	64.000	62.560	1.440	1.2000	100.000	9.59E-01	2.78E-01	1.13E-01	3.37E-02	2.43E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T0405235075_UU SAMPLE QTY : 0.508 G +/-0.197 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 68.1 +/-8.792 % SECONDARY QTY : 0.503 G +/-0.199 %	CHAMBER : 132 DETECTOR S/N : 67579 AVERAGE %EFFICIENCY : 26.0712 AVERAGE %EFF ERROR : 0.5050 COUNT DATE : 17-Sep-2016 11:45:16 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B132.CNF;1156 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W132.CNF;324 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 8.4573E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4492.82	4445.87	527.59	6.76	75.806	N/A
TRACER 2	1564-I	U-232	4.6529 dpm	5198.57	5317.75	-1.44	236.36	68.663	1.0076

NUCLIDE ACTIVITY SUMMARY

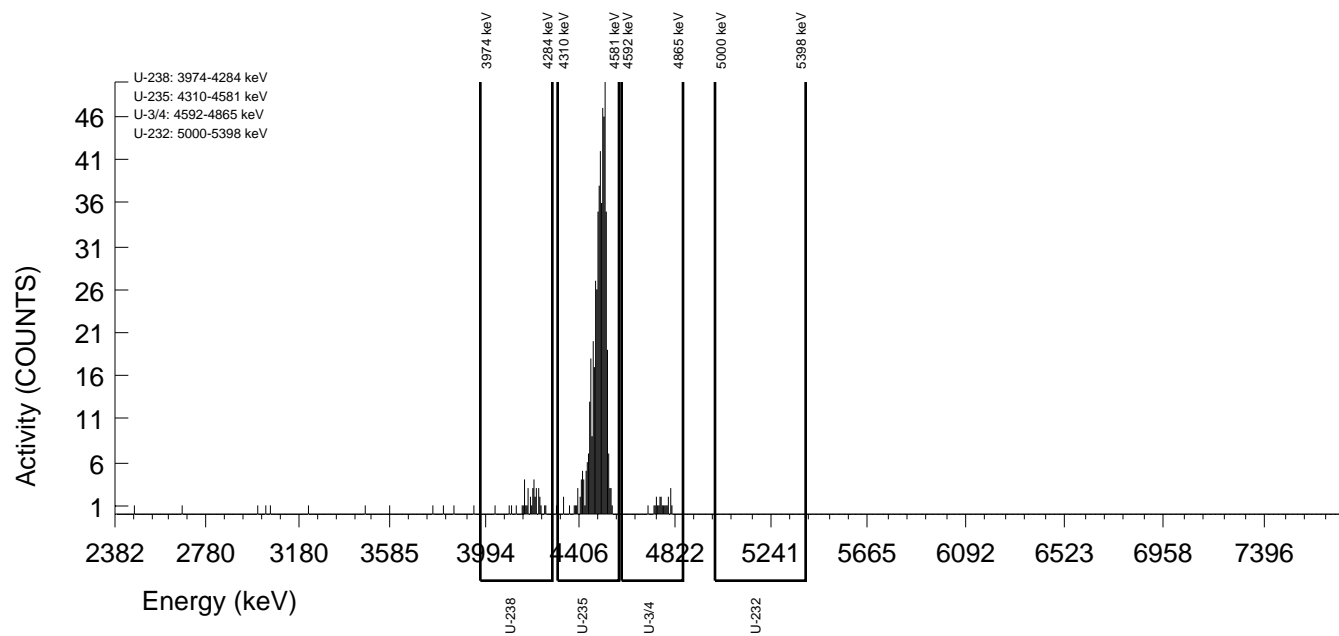
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5198.57	0.000	0.000	-1.440	1.440	1.2000	100.000	-2.74E-02	4.43E-02	1.41E-01	4.18E-02	4.42E-02
U-3/4	4763.02	4769.72	65.455	35.000	33.800	1.200	1.0954	100.000	5.90E-01	2.31E-01	1.22E-01	3.50E-02	2.06E-01
U-235	4391.00	4492.82	48.535	7.000	6.760	0.240	0.4899	99.700	1.18E-01	1.00E-01	8.39E-02	1.57E-02	9.78E-02
U-238	4184.73	4192.81	67.513	35.000	34.760	0.240	0.4899	100.000	6.07E-01	2.32E-01	8.37E-02	1.57E-02	2.06E-01

NOTES:

* Results are a compilation of S0405235075_UU and T0405235075_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.008 +/-0.000)



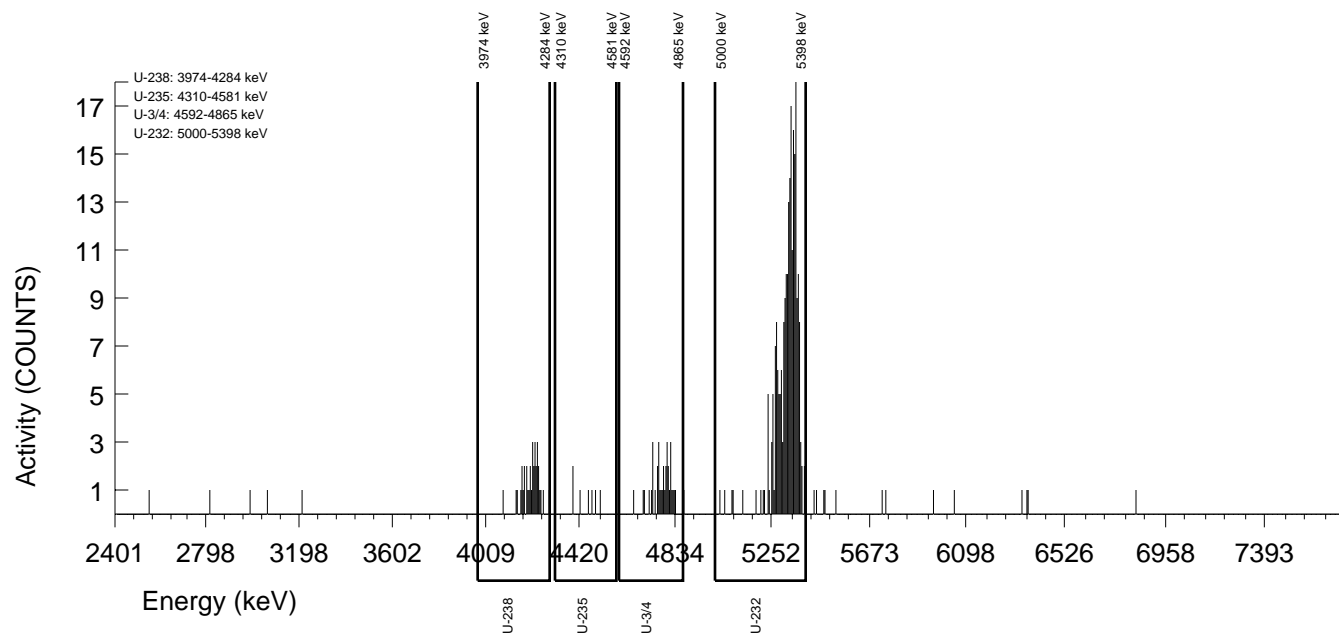
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : S0405235075_UU SAMPLE QTY : 0.508 G +/-0.197 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 68.7 +/-7.273 %	CHAMBER : 020 DETECTOR S/N : 78787 AVERAGE %EFFICIENCY : 31.0619 AVERAGE %EFF ERROR : 0.5993 COUNT DATE : 17-Sep-2016 11:42:42 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B020.CNF;1831 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W020.CNF;560 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6529E+00 dpm RESULTS : 3.1948E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5317.75	56.794	239.000	236.360	2.640	1.6248	100.000	4.13E+00	8.08E-01	1.56E-01	5.20E-02	5.31E-01
U-3/4	4763.02	4773.04	81.487	35.000	33.800	1.200	1.0954	100.000	5.86E-01	2.22E-01	1.21E-01	3.48E-02	2.05E-01
U-235	4391.00	4445.87	4.939	7.000	6.760	0.240	0.4899	99.700	1.17E-01	9.85E-02	8.33E-02	1.56E-02	9.70E-02
U-238	4184.73	4206.61	74.079	35.000	34.760	0.240	0.4899	100.000	6.02E-01	2.23E-01	8.31E-02	1.55E-02	2.04E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T0405235076_UU SAMPLE QTY : 0.512 G +/-0.195 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 89.6 +/-7.999 % SECONDARY QTY : 0.507 G +/-0.197 %	CHAMBER : 133 DETECTOR S/N : 76229 AVERAGE %EFFICIENCY : 25.5293 AVERAGE %EFF ERROR : 0.4948 COUNT DATE : 17-Sep-2016 11:45:18 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B133.CNF;1153 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W133.CNF;359 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.7622E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4493.84	4411.76	596.34	1.52	87.503	N/A
TRACER 2	1564-I	U-232	4.6535 dpm	5356.51	5325.19	0.56	318.88	90.461	1.0101

NUCLIDE ACTIVITY SUMMARY

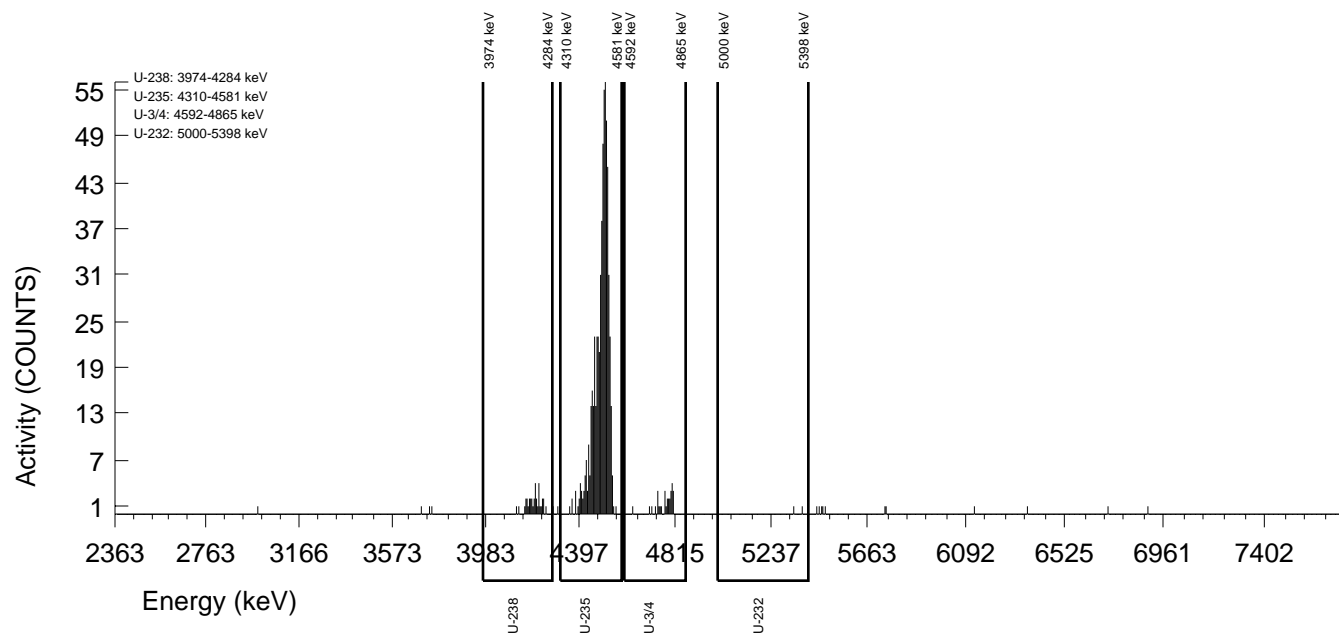
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5356.51	39.750	2.000	0.560	1.440	1.2000	100.000	9.35E-03	6.04E-02	1.24E-01	3.67E-02	6.04E-02
U-3/4	4763.02	4771.77	67.906	66.000	65.040	0.960	0.9798	100.000	8.37E-01	2.47E-01	8.48E-02	2.31E-02	2.07E-01
U-235	4391.00	4493.84	38.135	2.000	1.520	0.480	0.6928	99.700	1.96E-02	4.52E-02	7.15E-02	1.64E-02	4.51E-02
U-238	4184.73	4201.37	23.187	60.000	59.760	0.240	0.4899	100.000	7.69E-01	2.33E-01	6.17E-02	1.15E-02	1.97E-01

NOTES:

* Results are a compilation of S0405235076_UU and T0405235076_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.009 +/-0.000)



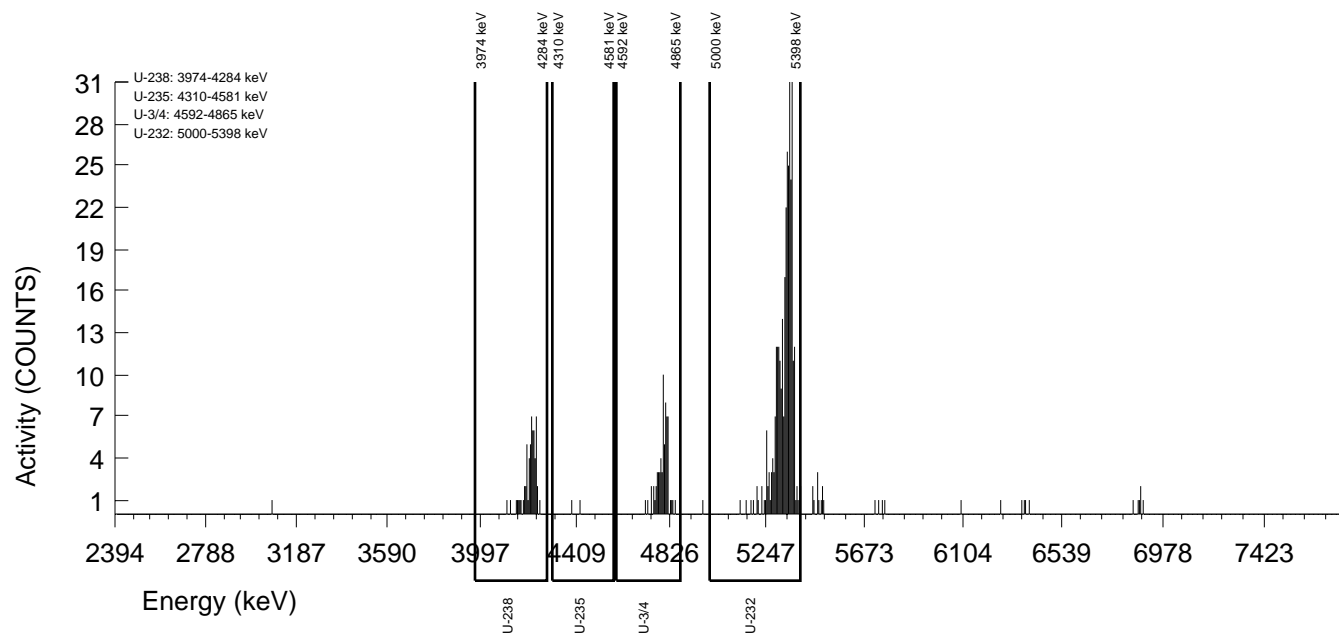
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : S0405235076_UU SAMPLE QTY : 0.512 G +/-0.195 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 90.5 +/-6.454 %	CHAMBER : 021 DETECTOR S/N : 795159 AVERAGE %EFFICIENCY : 31.8082 AVERAGE %EFF ERROR : 0.6134 COUNT DATE : 17-Sep-2016 11:42:42 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B021.CNF;1833 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W021.CNF;537 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6535E+00 dpm RESULTS : 4.2096E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5325.19	33.881	322.000	318.880	3.120	1.7664	100.000	4.09E+00	7.05E-01	1.22E-01	4.15E-02	4.53E-01
U-3/4	4763.02	4792.17	24.463	66.000	65.040	0.960	0.9798	100.000	8.29E-01	2.32E-01	8.40E-02	2.29E-02	2.05E-01
U-235	4391.00	4411.76	39.140	2.000	1.520	0.480	0.6928	99.700	1.94E-02	4.47E-02	7.08E-02	1.62E-02	4.46E-02
U-238	4184.73	4210.78	45.011	60.000	59.760	0.240	0.4899	100.000	7.61E-01	2.20E-01	6.11E-02	1.14E-02	1.95E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T0405235077_UU SAMPLE QTY : 0.510 G +/-0.196 % SAMPLE DATE : 17-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 98.6 +/-7.735 % SECONDARY QTY : 0.510 G +/-0.196 %	CHAMBER : 134 DETECTOR S/N : 76230 AVERAGE %EFFICIENCY : 25.7389 AVERAGE %EFF ERROR : 0.4988 COUNT DATE : 17-Sep-2016 11:45:20 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B134.CNF;1149 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W134.CNF;336 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.2684E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4490.69	4445.41	570.82	-0.48	83.077	N/A
TRACER 2	1564-I	U-232	4.6528 dpm	5198.58	5341.13	-0.48	379.48	99.322	1.0076

NUCLIDE ACTIVITY SUMMARY

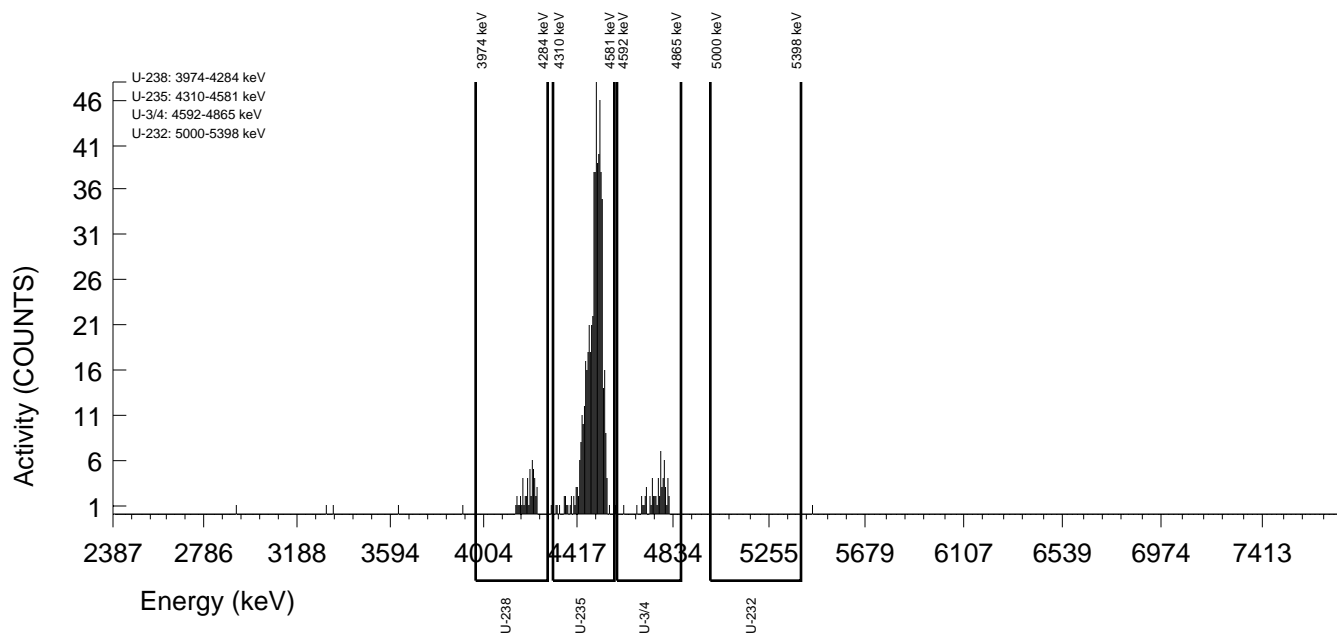
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5198.58	0.000	0.000	-0.480	0.480	0.6928	100.000	-8.32E-03	3.69E-02	9.60E-02	2.20E-02	3.68E-02
U-3/4	4763.02	4765.90	66.549	65.000	63.560	1.440	1.2000	100.000	6.88E-01	2.04E-01	8.01E-02	2.38E-02	1.73E-01
U-235	4391.00	4490.69	41.660	0.000	-0.480	0.480	0.6928	99.700	-5.21E-03	2.31E-02	6.02E-02	1.38E-02	2.31E-02
U-238	4184.73	4204.31	53.735	63.000	62.520	0.480	0.6928	100.000	6.77E-01	2.00E-01	6.00E-02	1.37E-02	1.70E-01

NOTES:

* Results are a compilation of S0405235077_UU and T0405235077_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.009 +/-0.000)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

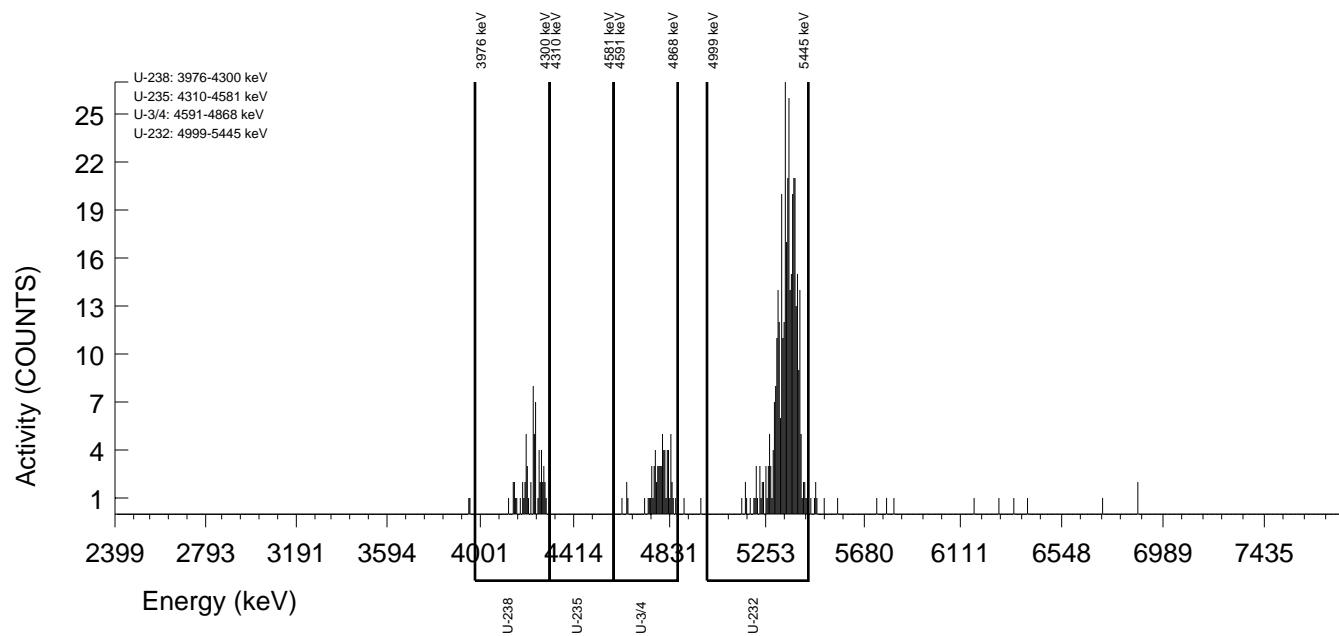
BATCH NUMBER : 1596418 SAMPLE ID : S0405235077_UU SAMPLE QTY : 0.510 G +/-0.196 % SAMPLE DATE : 17-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 99.3 +/-6.058 %	CHAMBER : 024 DETECTOR S/N : 76542 AVERAGE %EFFICIENCY : 34.4760 AVERAGE %EFF ERROR : 0.6639 COUNT DATE : 17-Sep-2016 11:42:42 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B024.CNF;1824 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W024.CNF;517 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6528E+00 dpm RESULTS : 4.6212E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5341.13	89.042	385.000	379.480	5.520	2.3495	100.000	4.11E+00	6.61E-01	1.26E-01	4.66E-02	4.18E-01
U-3/4	4763.02	4786.44	83.477	65.000	63.560	1.440	1.2000	100.000	6.83E-01	1.92E-01	7.95E-02	2.36E-02	1.72E-01
U-235	4391.00	4445.41	0.000	0.000	-0.480	0.480	0.6928	99.700	-5.17E-03	2.29E-02	5.97E-02	1.37E-02	2.29E-02
U-238	4184.73	4227.59	42.814	63.000	62.520	0.480	0.6928	100.000	6.72E-01	1.88E-01	5.95E-02	1.36E-02	1.69E-01

NOTES:

* Regions have been manually adjusted



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T0405235078_UU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 17-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 97.1 +/-11.797 % SECONDARY QTY : 0.512 G +/-0.195 %	CHAMBER : 139 DETECTOR S/N : 76231 AVERAGE %EFFICIENCY : 24.8887 AVERAGE %EFF ERROR : 0.4828 COUNT DATE : 17-Sep-2016 11:45:23 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B139.CNF;1107 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W139.CNF;334 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.9940E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4470.93	4429.03	118.75	0.28	17.873	N/A
TRACER 2	1564-I	U-232	4.6528 dpm	5015.77	5321.19	-0.44	268.08	97.883	1.0076

NUCLIDE ACTIVITY SUMMARY

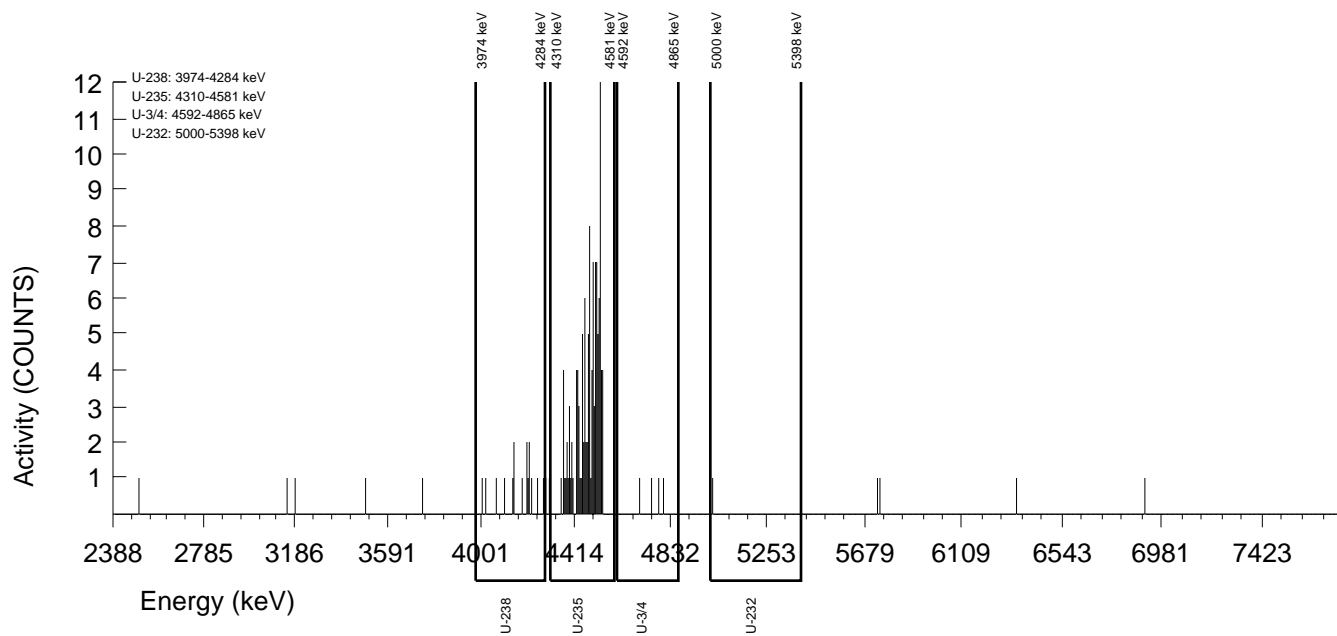
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5015.77	4.936	1.000	-0.440	1.440	1.2000	100.000	-3.65E-02	2.53E-01	6.14E-01	1.83E-01	2.52E-01
U-3/4	4763.02	4755.81	103.662	41.000	40.280	0.720	0.8485	100.000	6.24E-01	2.45E-01	9.46E-02	2.41E-02	1.97E-01
U-235	4391.00	4470.93	51.420	1.000	0.280	0.720	0.8485	99.700	4.35E-03	4.56E-02	9.49E-02	2.41E-02	4.55E-02
U-238	4184.73	4169.02	71.576	38.000	36.560	1.440	1.2000	100.000	5.66E-01	2.32E-01	1.15E-01	3.40E-02	1.90E-01

NOTES:

* Results are a compilation of S0405235078_UU and T0405235078_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.002 +/-0.000)



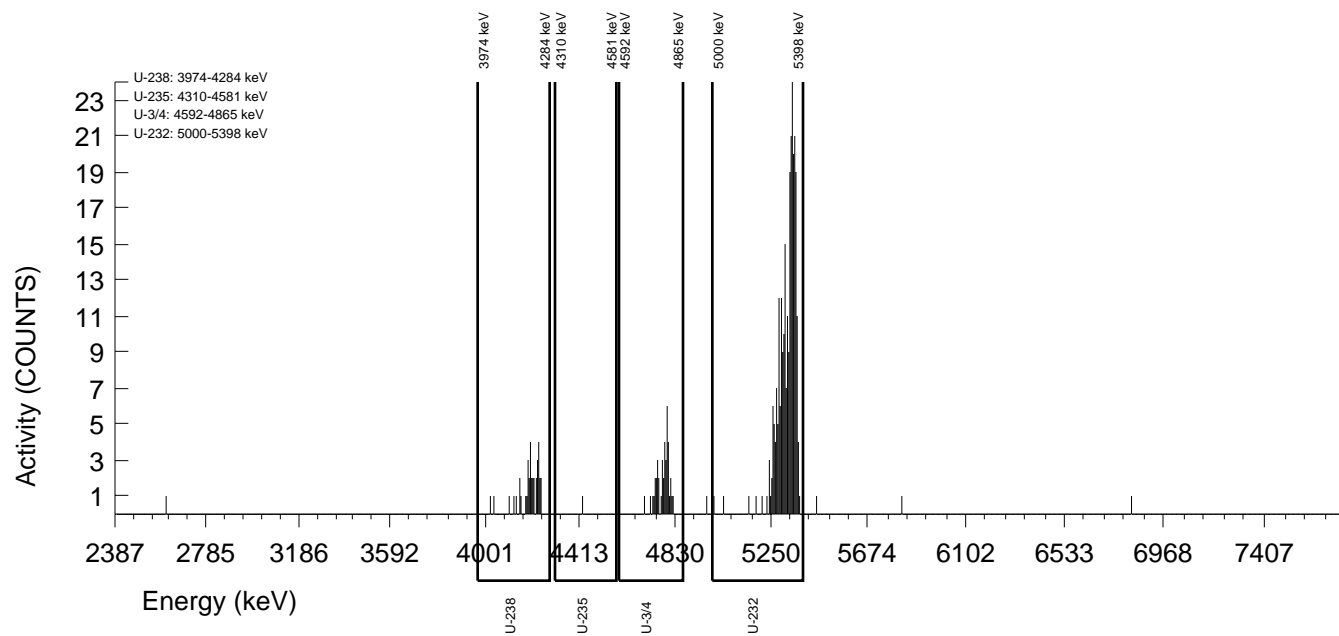
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : S0405235078_UU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 17-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 97.9 +/-6.902 %	CHAMBER : 113 DETECTOR S/N : 80009 AVERAGE %EFFICIENCY : 24.7132 AVERAGE %EFF ERROR : 0.4794 COUNT DATE : 17-Sep-2016 11:44:34 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B113.CNF;1165 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W113.CNF;318 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6528E+00 dpm RESULTS : 4.5543E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5321.19	51.836	270.000	268.080	1.920	1.3856	100.000	4.15E+00	7.68E-01	1.25E-01	3.93E-02	5.00E-01
U-3/4	4763.02	4780.12	18.969	41.000	40.280	0.720	0.8485	100.000	6.19E-01	2.14E-01	9.39E-02	2.39E-02	1.96E-01
U-235	4391.00	4429.03	4.949	1.000	0.280	0.720	0.8485	99.700	4.31E-03	4.52E-02	9.41E-02	2.40E-02	4.51E-02
U-238	4184.73	4194.96	51.960	38.000	36.560	1.440	1.2000	100.000	5.62E-01	2.05E-01	1.14E-01	3.38E-02	1.89E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T1203621760_UU SAMPLE QTY : 0.518 G +/-0.193 % SAMPLE DATE : 15-Sep-2016 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 107 +/-7.595 % SECONDARY QTY : 0.517 G +/-0.193 %	CHAMBER : 008 DETECTOR S/N : 78788 AVERAGE %EFFICIENCY : 32.5514 AVERAGE %EFF ERROR : 0.6275 COUNT DATE : 17-Sep-2016 11:42:40 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B008.CNF;1833 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W008.CNF;515 CAL DATE : 27-Aug-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.2820E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4509.62	4445.44	722.97	-0.48	83.199	N/A
TRACER 2	1564-I	U-232	4.6179 dpm	5271.27	5327.73	-6.60	353.80	106.788	1.0001

NUCLIDE ACTIVITY SUMMARY

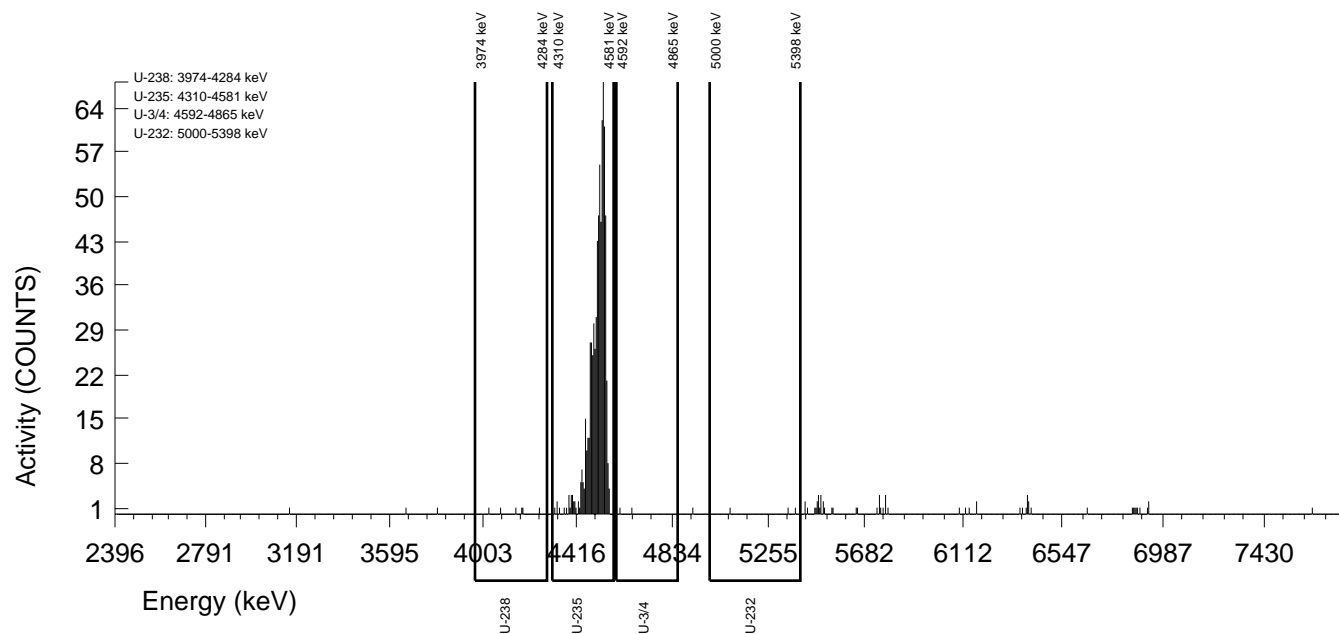
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		Lc pCi/G	1.96-sigma	
										TPU pCi/G	MDA pCi/G		cnt	Unc pCi/G
U-232	5302.10	5271.27	270.140	3.000	-6.600	9.600	3.0984	100.000	-8.85E-02	6.63E-02	1.92E-01	7.61E-02	6.63E-02	6.63E-02
U-3/4	4763.02	4634.86	54.028	1.000	-0.920	1.920	1.3856	100.000	-1.04E-02	3.53E-02	9.17E-02	2.88E-02	3.53E-02	3.53E-02
U-235	4391.00	4509.62	40.521	0.000	-0.480	0.480	0.6928	99.700	-5.46E-03	2.42E-02	6.30E-02	1.44E-02	2.42E-02	2.42E-02
U-238	4184.73	4148.30	216.112	0.000	-1.200	1.200	1.0954	100.000	-1.36E-02	2.59E-02	7.96E-02	2.28E-02	2.58E-02	2.58E-02

NOTES:

* Results are a compilation of S1203621760_UU and T1203621760_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.011 +/-0.000)



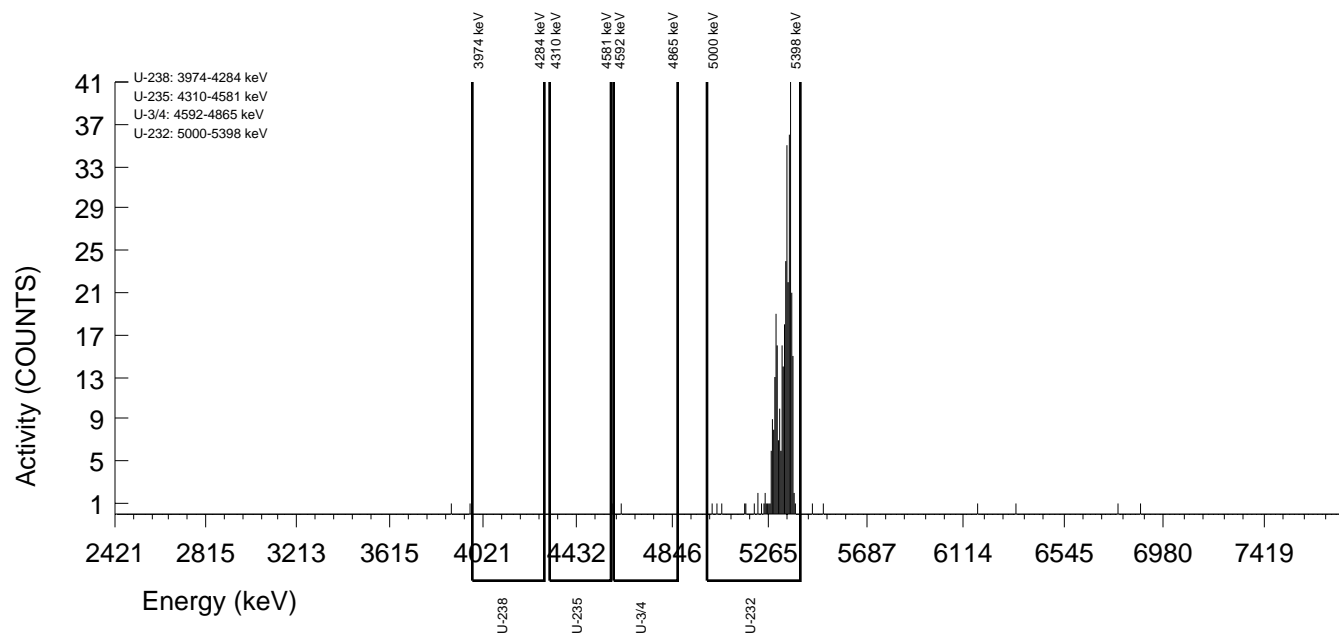
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : S1203621760_UU SAMPLE QTY : 0.518 G +/-0.193 % SAMPLE DATE : 15-Sep-2016 00:00:00 ANALYST : KXB2 % YIELD : 107 +/-6.188 %	CHAMBER : 004 DETECTOR S/N : 76389 AVERAGE %EFFICIENCY : 29.8956 AVERAGE %EFF ERROR : 0.5774 COUNT DATE : 17-Sep-2016 11:42:39 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B004.CNF;1844 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W004.CNF;539 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6179E+00 dpm RESULTS : 4.9314E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5327.73	27.749	355.000	353.800	1.200	1.0954	100.000	4.02E+00	6.61E-01	7.96E-02	2.28E-02	4.20E-01
U-3/4	4763.02	4622.89	4.897	1.000	-0.920	1.920	1.3856	100.000	-1.04E-02	3.53E-02	9.17E-02	2.88E-02	3.53E-02
U-235	4391.00	4445.44	0.000	0.000	-0.480	0.480	0.6928	99.700	-5.46E-03	2.42E-02	6.30E-02	1.44E-02	2.42E-02
U-238	4184.73	4129.07	0.000	0.000	-1.200	1.200	1.0954	100.000	-1.36E-02	2.58E-02	7.96E-02	2.28E-02	2.58E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T1203621761_UU SAMPLE QTY : 0.507 G +/-0.197 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 87.1 +/-8.625 % SECONDARY QTY : 0.502 G +/-0.199 %	CHAMBER : 140 DETECTOR S/N : 78771 AVERAGE %EFFICIENCY : 26.0317 AVERAGE %EFF ERROR : 0.5043 COUNT DATE : 17-Sep-2016 11:45:25 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B140.CNF;1100 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W140.CNF;283 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.0031E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4498.61	4439.44	560.79	2.04	80.698	N/A
TRACER 2	1564-I	U-232	4.6532 dpm	5369.55	5323.21	4.04	244.52	89.287	1.0252

NUCLIDE ACTIVITY SUMMARY

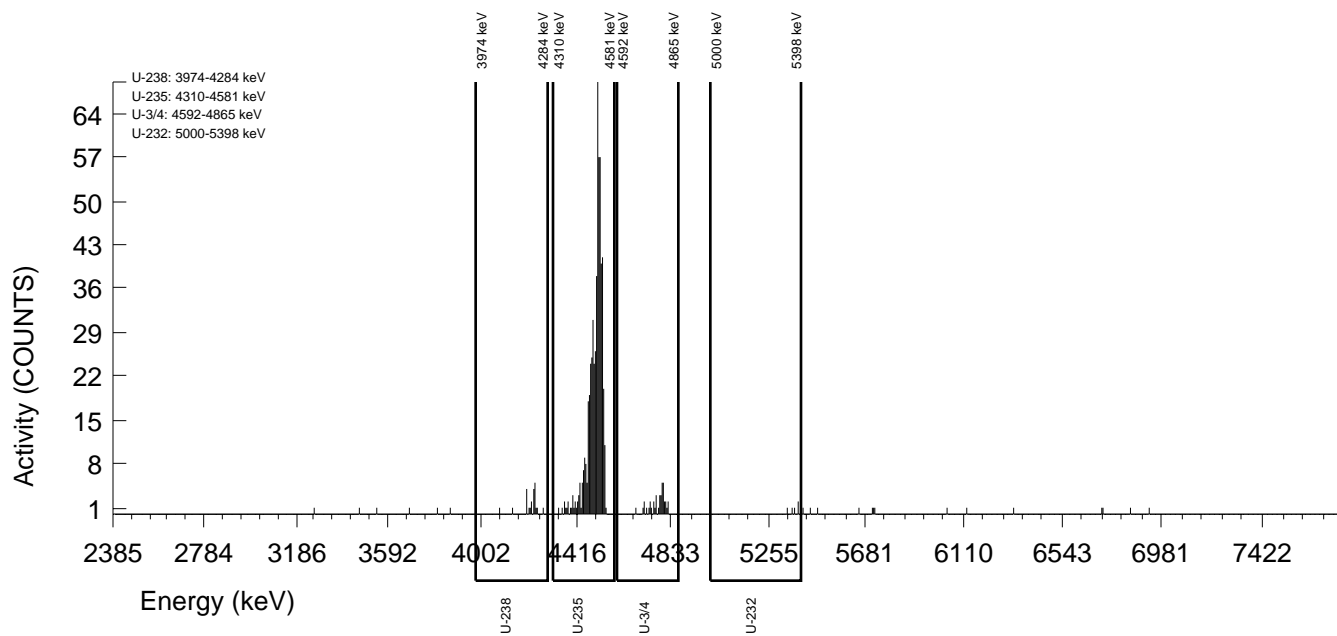
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		Lc pCi/G	1.96-sigma	
										TPU pCi/G	MDA pCi/G		cnt	Unc pCi/G
U-232	5302.10	5369.55	4.953	5.000	4.040	0.960	0.9798	100.000	7.25E-02	8.90E-02	1.18E-01	3.22E-02	8.81E-02	2.15E-01
U-3/4	4763.02	4772.75	35.082	39.000	36.600	2.400	1.5492	100.000	6.30E-01	2.41E-01	1.49E-01	4.88E-02	2.15E-01	2.15E-01
U-235	4391.00	4498.61	27.741	3.000	2.040	0.960	0.9798	99.700	3.52E-02	7.03E-02	1.14E-01	3.10E-02	7.00E-02	7.00E-02
U-238	4184.73	4213.87	39.622	40.000	39.280	0.720	0.8485	100.000	6.76E-01	2.46E-01	1.05E-01	2.67E-02	2.16E-01	2.16E-01

NOTES:

* Results are a compilation of S1203621761_UU and T1203621761_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.008 +/-0.000)



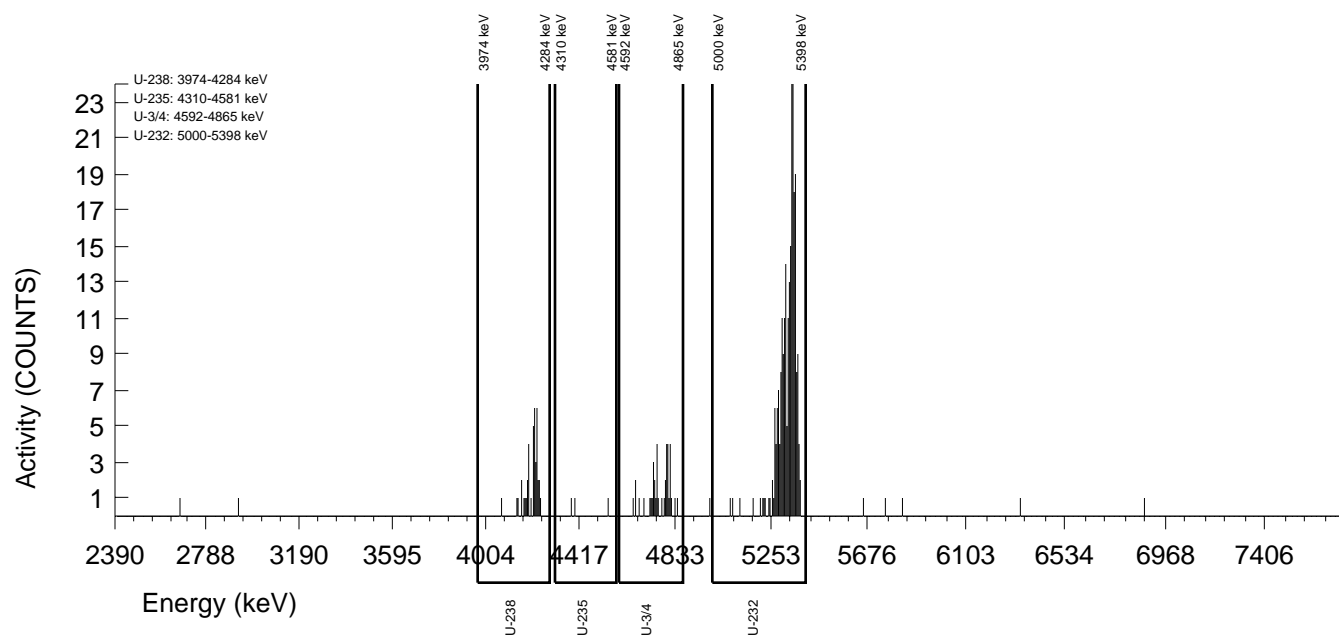
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : S1203621761_UU SAMPLE QTY : 0.507 G +/-0.197 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 89.3 +/-7.143 %	CHAMBER : 114 DETECTOR S/N : 78258 AVERAGE %EFFICIENCY : 24.7116 AVERAGE %EFF ERROR : 0.4794 COUNT DATE : 17-Sep-2016 11:44:37 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B114.CNF;1168 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W114.CNF;324 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6532E+00 dpm RESULTS : 4.1547E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5323.21	46.083	245.000	244.520	0.480	0.6928	100.000	4.13E+00	7.94E-01	9.36E-02	2.15E-02	5.20E-01
U-3/4	4763.02	4765.55	75.128	39.000	36.600	2.400	1.5492	100.000	6.14E-01	2.28E-01	1.46E-01	4.76E-02	2.10E-01
U-235	4391.00	4439.44	158.513	3.000	2.040	0.960	0.9798	99.700	3.43E-02	6.85E-02	1.11E-01	3.02E-02	6.83E-02
U-238	4184.73	4206.52	40.867	40.000	39.280	0.720	0.8485	100.000	6.59E-01	2.32E-01	1.02E-01	2.61E-02	2.11E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596418 SAMPLE ID : T1203621762_UU SAMPLE QTY : 0.518 G +/-0.193 % SAMPLE DATE : 15-Sep-2016 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 93.3 +/-8.747 % SECONDARY QTY : 0.517 G +/-0.193 %	CHAMBER : 142 DETECTOR S/N : 42285 AVERAGE %EFFICIENCY : 26.5347 AVERAGE %EFF ERROR : 0.5139 COUNT DATE : 17-Sep-2016 11:45:28 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B142.CNF;1100 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W142.CNF;306 CAL DATE : 09-Sep-2016
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TRACER ID : 1570-E NUCLIDE : U-235 NOMINAL : 1.1123E+01 dpm RESULTS : 6.8612E+00 dpm	LCS ID : 1600-E NUCLIDE : U-238 NOMINAL (pCi/G) : 5.1996E+00 % RECOVERY : 107.879
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TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4498.41	4424.04	435.63	21.52	61.500	N/A
TRACER 2	1564-I	U-232	4.6179 dpm	5299.02	5310.25	1.52	263.16	94.122	1.0085

NUCLIDE ACTIVITY SUMMARY

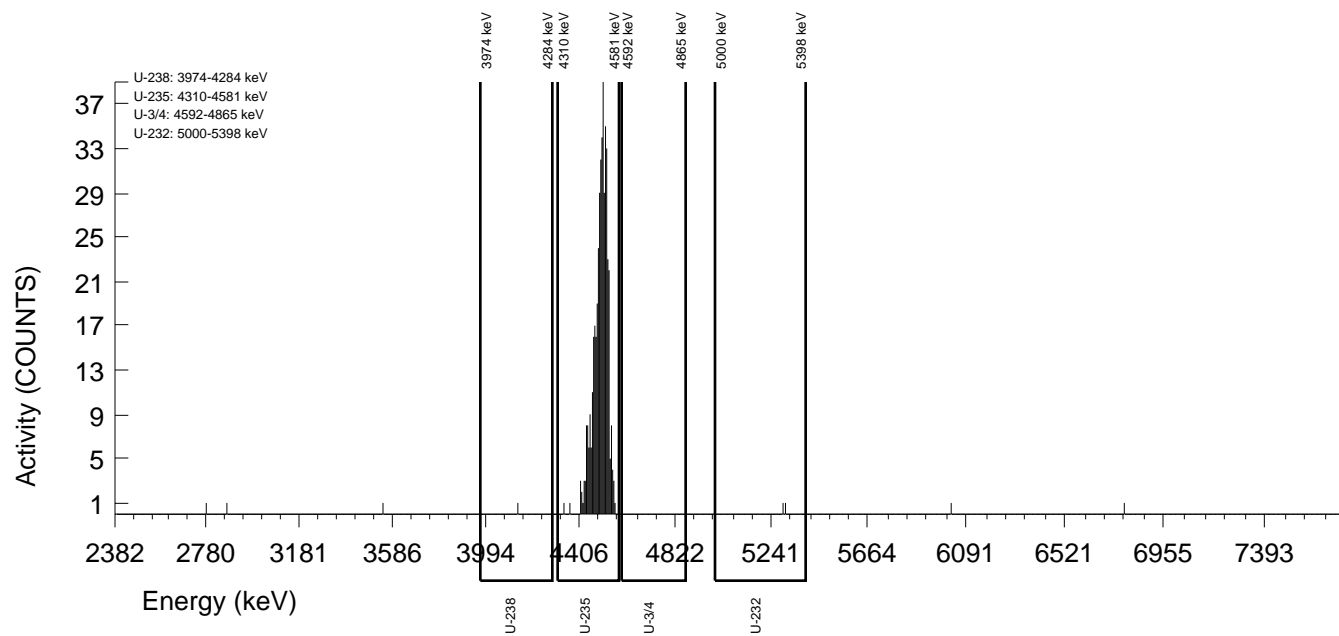
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5299.02	14.833	2.000	1.520	0.480	0.6928	100.000	3.38E-02	7.79E-02	1.23E-01	2.82E-02	7.77E-02
U-3/4	4763.02	4728.18	0.000	331.000	329.560	1.440	1.2000	100.000	5.07E+00	1.05E+00	1.14E-01	3.38E-02	5.50E-01
U-235	4391.00	4498.41	49.675	22.000	21.520	0.480	0.6928	99.700	3.32E-01	1.57E-01	8.55E-02	1.96E-02	1.46E-01
U-238	4184.73	4137.78	4.944	365.000	364.520	0.480	0.6928	100.000	5.61E+00	1.14E+00	8.52E-02	1.95E-02	5.77E-01

NOTES:

* Results are a compilation of S1203621762_UU and T1203621762_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.007 +/-0.000)



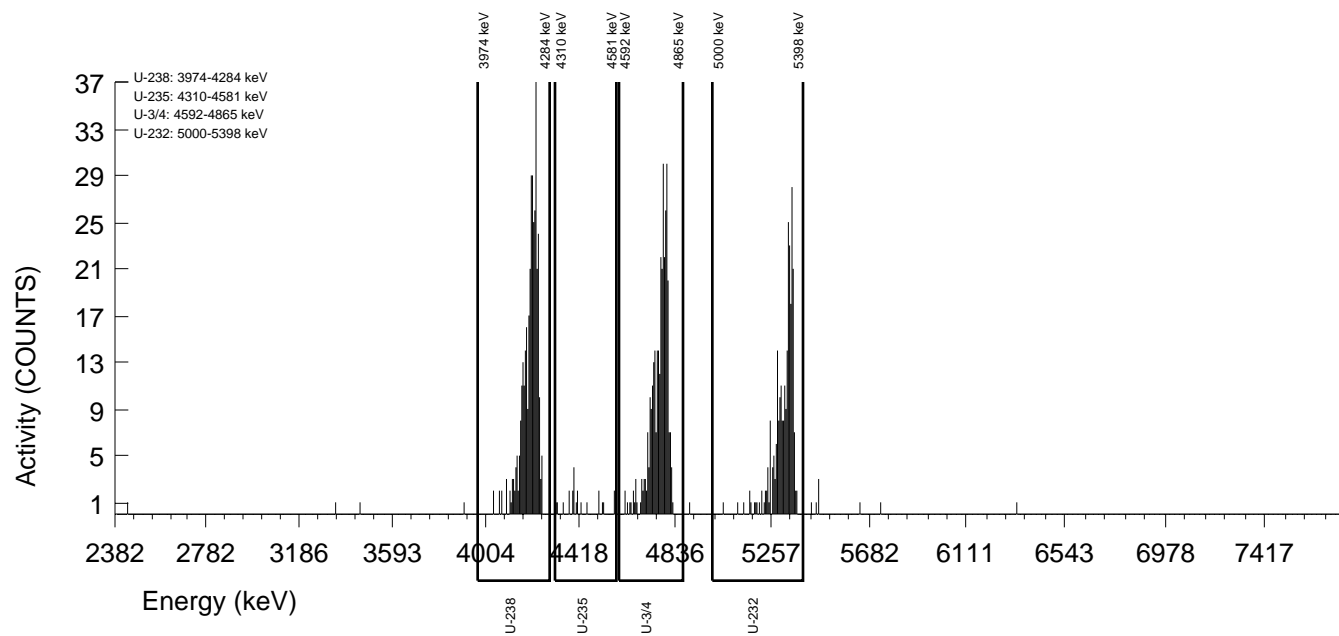
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER : 1596418 SAMPLE ID : S1203621762_UU SAMPLE QTY : 0.518 G +/-0.193 % SAMPLE DATE : 15-Sep-2016 00:00:00 ANALYST : KXB2 % YIELD : 94.1 +/-6.978 %	CHAMBER : 115 DETECTOR S/N : 79995 AVERAGE %EFFICIENCY : 25.2291 AVERAGE %EFF ERROR : 0.4892 COUNT DATE : 17-Sep-2016 11:44:39 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B115.CNF;1177 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W115.CNF;335 CAL DATE : 08-Sep-2016
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TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6179E+00 dpm RESULTS : 4.3465E+00 dpm	LCS ID : 1600-E NUCLIDE : U-238 NOMINAL (pCi/G) : 5.1996E+00 % RECOVERY : 106.971
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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5310.25	27.370	267.000	263.160	3.840	1.9596	100.000	4.02E+00	7.52E-01	1.55E-01	5.48E-02	4.91E-01
U-3/4	4763.02	4765.96	35.256	331.000	329.560	1.440	1.2000	100.000	5.03E+00	8.98E-01	1.13E-01	3.35E-02	5.45E-01
U-235	4391.00	4424.04	7.465	22.000	21.520	0.480	0.6928	99.700	3.29E-01	1.52E-01	8.48E-02	1.94E-02	1.44E-01
U-238	4184.73	4199.07	39.900	365.000	364.520	0.480	0.6928	100.000	5.56E+00	9.75E-01	8.45E-02	1.94E-02	5.72E-01



Batch# 1596389 Product: U Date: 9/30/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			No
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.		✓	Case narrative
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	•	✓	DER# 1563433
Sample was correctly preserved if required.			No
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER# 1563433
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER# 1563433
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: Melanie Dwyer 9/30/16

Secondary Review Performed By: Jeri Davis 10/02/16

DATA EXCEPTION REPORT

Mo.Day Yr. 30-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, U-02-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596389	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, and 1203621692 were received and analyzed out of holding.</p>		<p>1. Reporting results.</p>	

Originator's Name:
Melanie Aycock 30-SEP-16

Data Validator/Group Leader:
Jessica Davis 02-OCT-16

Uranium Que Sheet

S-run W
07-SEP-16

Batch #: 1596389 Analyst: JXH2 Internal Due Date: 30-SEP-16
 Tracer Isotope: U-232/U-236 Tracer Code: 1564-I Expiration Date: 11-23-16 Vol: 0.1ml
 LCS Isotope: U-238 Spike Code: 1600-E Expiration Date: 7-17-17 Vol: 0.1ml
 Spike Isotope: U-238 Initials: JEH Pipet ID: 1840022 Balance ID: 16107662 Vol: ---
 Prep Date: 9-26-16 Witness: KB 9-24-16

Analyzed Sequentially with Pu
 Pu-236 ID: --- Pu: 1596393
 Vol: --- Am: 1596390
 Witness: KB 9-24-16

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/ml)	U Det #
405235001-1	4.1.B.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	1	1	0.501	7
405235002-1	4.1.B.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	2	2	0.505	8
405235003-1	4.1.B.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	3	3	0.501	9
405235004-1	4.1.B.R.7.2	SAMPLE		1 pCi/g	SOIL	MJWC001	09-DEC-15	4	4	0.502	10
405235005-1	4.1.C.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	5	5	0.503	13
405235006-1	4.1.C.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	6	6	0.501	14
405235007-1	4.1.C.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	7	7	0.501	15
405235008-1	4.1.C.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	8	8	0.503	16
405235009-1	4.1.D.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	9	9	0.504	17
405235010-1	4.1.D.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	10	10	0.501	18
405235011-1	4.1.D.R.3.2	SAMPLE		1 pCi/g	SOIL	MJWC001	09-DEC-15	11	11	0.500	20
405235012-1	4.1.D.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	12	12	0.506	21
405235013-1	4.2.A.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	13	13	0.500	23
405235014-1	4.2.A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	14	14	0.502	24
405235015-1	4.2.A.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	15	15	0.509	113
405235016-1	4.2.A.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	16	16	0.501	115
405235017-1	4.2.A.R.3.2	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	17	17	0.501	116
405235018-1	4.2.A.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	18	18	0.500	117
405235019-1	4.2.B.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	19	19	0.506	118
405235020-1	4.2.B.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	20	20	0.502	119
1203621691-1	MB for batch 1596389	MB		1 pCi/g	SOIL	QC ACCOUNT		21	21	0.509	11
1203621692-1	4.1.B.R.1.2/(405235001)DUP	DUP		1 pCi/g	SOIL	QC ACCOUNT	10-DEC-15	22	22	0.500	121
1203621693-1	LCS for batch 1596389	LCS		1 pCi/g	SOIL	QC ACCOUNT		23	23	0.509	122

Choose SOP used: GL-RAD-A-011
 Solid Sample Dissolution by: LEACH or DIGESTION
 Data Reviewed By: M. Landry 12/13/16
 Circle One

T-run

Uranium Que Sheet

07-SEP-16

Batch #: 1596389 Analyst: JXH2 First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16
 Tracer Isotope: U-232(0-236) Tracer Code: 12156*1510-5 Expiration Date: 7-18-11* Vol: 0.1 mL Analyzed Sequentially with Pu Analyzed Sequentially with:
 LCS Isotope: U-238 LCS Code: _____ Expiration Date: _____ Vol: _____ Pu: _____
 Spike Isotope: U-238 Spike Code: _____ Expiration Date: _____ Vol: _____ Am: _____
 Prep Date: 9-26-16 Initials: JH Pipet ID: 1840022 Balance ID: 16107662 Witness: KB 9-26-16

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g)/D	U Det #
405235001-1	4.1.B.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	1	1	0.507	124
405235002-1	4.1.B.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	2	2	0.504	126
405235003-1	4.1.B.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	3	3	0.504	127
405235004-1	4.1.B.R.7.2	SAMPLE		1 pCi/g	SOIL	MJWC001	09-DEC-15	4	4	0.505	128
405235005-1	4.1.C.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	5	5	0.508	131
405235006-1	4.1.C.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	6	6	0.508	132
405235007-1	4.1.C.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	7	7	0.504	133
405235008-1	4.1.C.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	8	8	0.502	134
405235009-1	4.1.D.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	9	9	0.500	139
405235010-1	4.1.D.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	10	10	0.508	140
405235011-1	4.1.D.R.3.2	SAMPLE		1 pCi/g	SOIL	MJWC001	09-DEC-15	11	11	0.504	142
405235012-1	4.1.D.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	12	12	0.505	143
405235013-1	4.2.A.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	13	13	0.502	144
405235014-1	4.2.A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	14	14	0.502	145
405235015-1	4.2.A.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	15	15	0.503	146
405235016-1	4.2.A.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	16	16	0.500	147
405235017-1	4.2.A.R.3.2	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	17	17	0.508	148
405235018-1	4.2.A.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	18	18	0.502	149
405235019-1	4.2.B.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	19	19	0.506	150
405235020-1	4.2.B.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	20	20	0.500	152
1203621691-1	MB for batch 1596389	MB		1 pCi/g	SOIL	QC ACCOUNT		21	21	0.509	152
1203621692-1	4.1.B.R.1.2(405235001DUP)	DUP		1 pCi/g	SOIL	QC ACCOUNT	10-DEC-15	22	22	0.509	154
1203621693-1	LCS for batch 1596389	LCS		1 pCi/g	SOIL	QC ACCOUNT		23	23	0.509	155

*K6 9-26-16

Choose SOP used: GL-RAD-A-011

Solid Sample Dissolution by: LEACH or DIGESTION
Circle One

Data Reviewed By: M. Decker 9/30/16

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T0405235001_UU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 85.0 +/-8.354 % SECONDARY QTY : 0.507 G +/-0.197 %	CHAMBER : 124 DETECTOR S/N : 80053 AVERAGE %EFFICIENCY : 24.5380 AVERAGE %EFF ERROR : 0.4761 COUNT DATE : 29-Sep-2016 09:20:35 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B124.CNF;1160 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W124.CNF;300 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.1620E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4483.59	4408.48	682.27	3.52	104.156	N/A
TRACER 2	1564-I	U-232	4.6537 dpm	5325.56	5326.36	-0.92	253.28	85.741	1.0081

NUCLIDE ACTIVITY SUMMARY

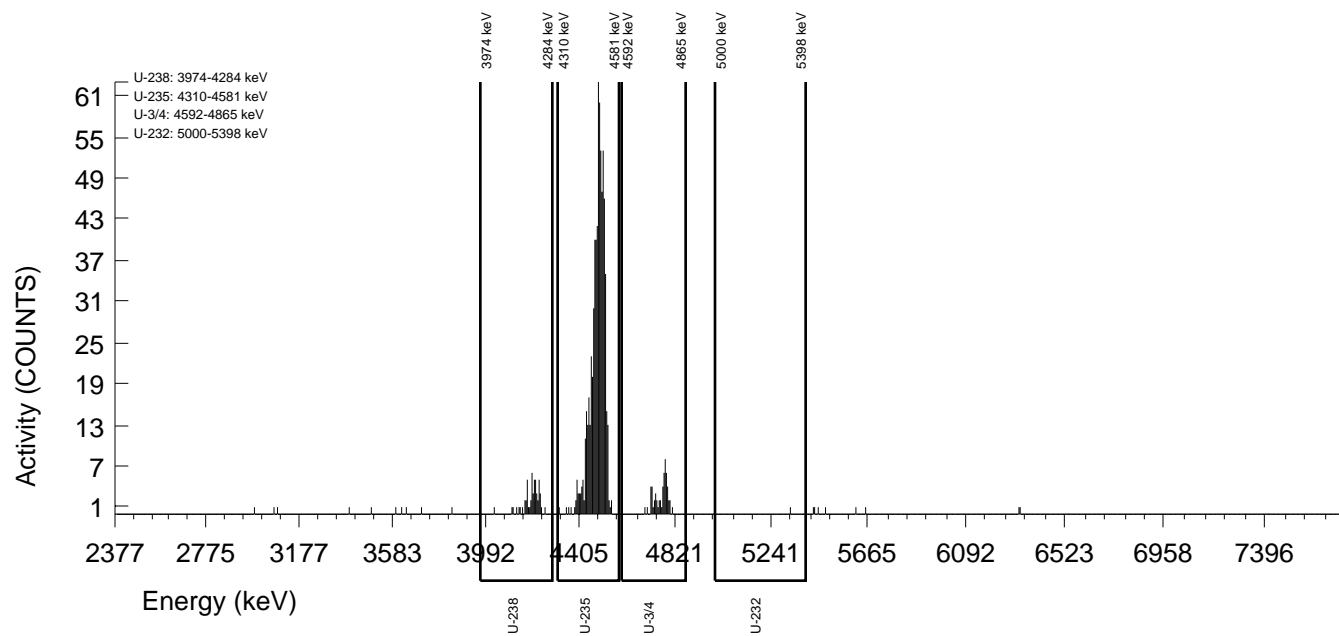
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5325.56	4.955	1.000	-0.920	1.920	1.3856	100.000	-1.34E-02	4.55E-02	1.18E-01	3.71E-02	4.54E-02
U-3/4	4763.02	4761.15	19.818	50.000	48.320	1.680	1.2961	100.000	7.98E-01	2.68E-01	1.28E-01	3.92E-02	2.32E-01
U-235	4391.00	4483.59	49.669	4.000	3.520	0.480	0.6928	99.700	5.83E-02	7.45E-02	9.18E-02	2.10E-02	7.39E-02
U-238	4184.73	4194.27	57.803	61.000	60.760	0.240	0.4899	100.000	1.00E+00	3.06E-01	7.92E-02	1.48E-02	2.55E-01

NOTES:

* Results are a compilation of S0405235001_UU and T0405235001_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



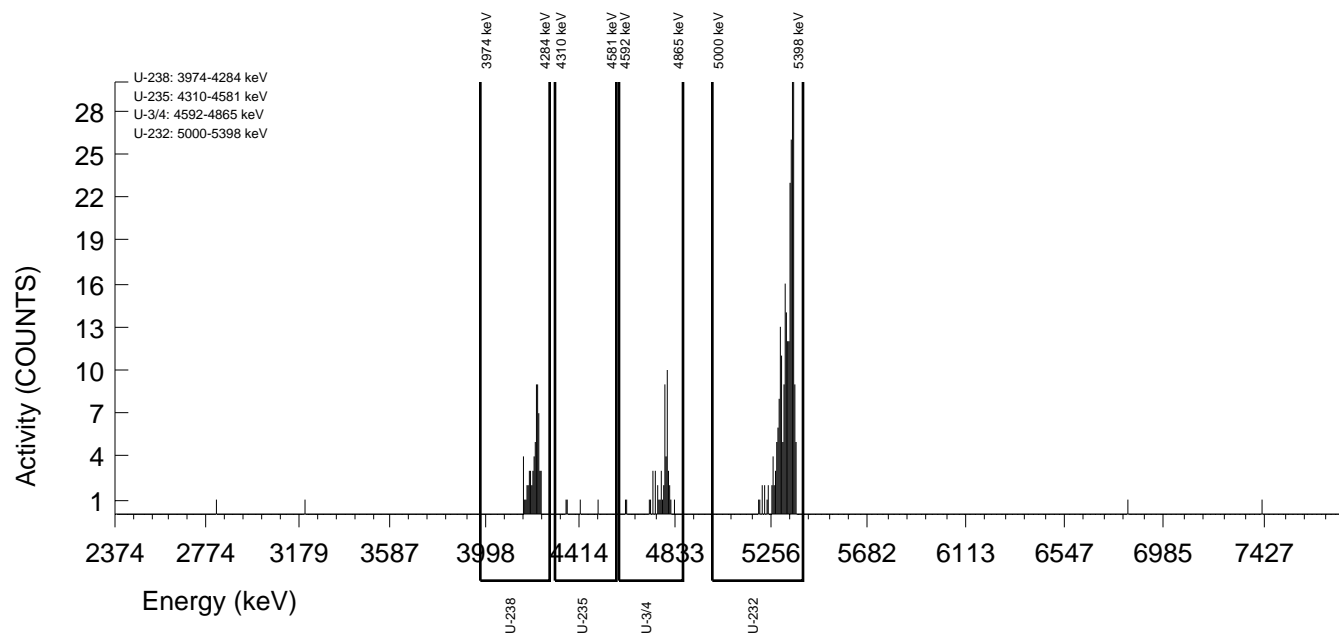
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S0405235001_UU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 85.7 +/-7.045 %	CHAMBER : 007 DETECTOR S/N : 50-066Z1 AVERAGE %EFFICIENCY : 26.6641 AVERAGE %EFF ERROR : 0.5164 COUNT DATE : 29-Sep-2016 09:13:18 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B007.CNF;1847 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W007.CNF;505 CAL DATE : 27-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6537E+00 dpm RESULTS : 3.9901E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5326.36	39.141	254.000	253.280	0.720	0.8485	100.000	4.18E+00	7.92E-01	1.01E-01	2.57E-02	5.17E-01
U-3/4	4763.02	4777.74	16.368	50.000	48.320	1.680	1.2961	100.000	7.92E-01	2.57E-01	1.27E-01	3.89E-02	2.30E-01
U-235	4391.00	4408.48	139.483	4.000	3.520	0.480	0.6928	99.700	5.79E-02	7.37E-02	9.10E-02	2.09E-02	7.33E-02
U-238	4184.73	4216.76	20.549	61.000	60.760	0.240	0.4899	100.000	9.96E-01	2.91E-01	7.86E-02	1.47E-02	2.53E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T0405235002_UU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 77.6 +/-8.399 % SECONDARY QTY : 0.504 G +/-0.198 %	CHAMBER : 126 DETECTOR S/N : 75548 AVERAGE %EFFICIENCY : 25.0653 AVERAGE %EFF ERROR : 0.4861 COUNT DATE : 29-Sep-2016 09:20:38 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B126.CNF;1164 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W126.CNF;338 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 8.8071E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4489.35	4515.40	528.22	2.28	78.942	N/A
TRACER 2	1564-I	U-232	4.6537 dpm	5255.93	5315.21	2.76	285.56	79.190	1.0208

NUCLIDE ACTIVITY SUMMARY

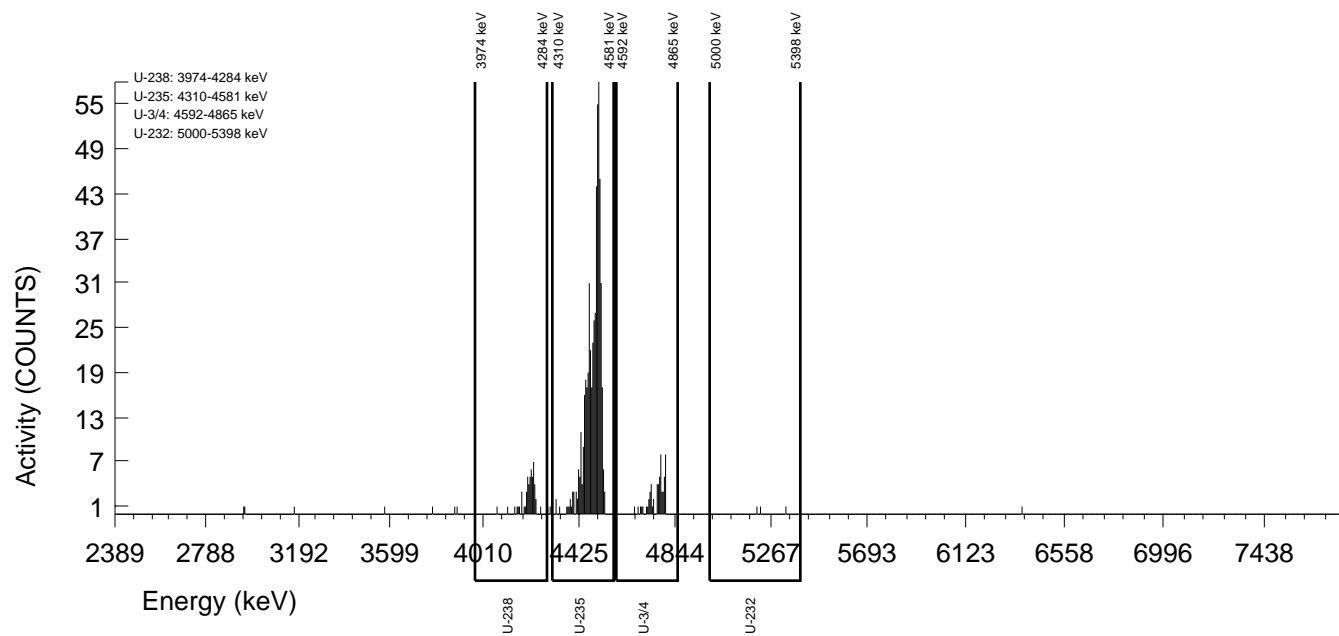
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5255.93	124.255	3.000	2.760	0.240	0.4899	100.000	5.24E-02	7.60E-02	9.10E-02	1.70E-02	7.54E-02
U-3/4	4763.02	4770.13	32.306	78.000	77.040	0.960	0.9798	100.000	1.13E+00	3.20E-01	9.70E-02	2.64E-02	2.57E-01
U-235	4391.00	4489.35	51.240	3.000	2.280	0.720	0.8485	99.700	3.37E-02	5.98E-02	9.02E-02	2.29E-02	5.95E-02
U-238	4184.73	4204.97	34.791	81.000	79.800	1.200	1.0954	100.000	1.17E+00	3.28E-01	1.03E-01	2.95E-02	2.62E-01

NOTES:

* Results are a compilation of S0405235002_UU and T0405235002_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.008 +/-0.000)



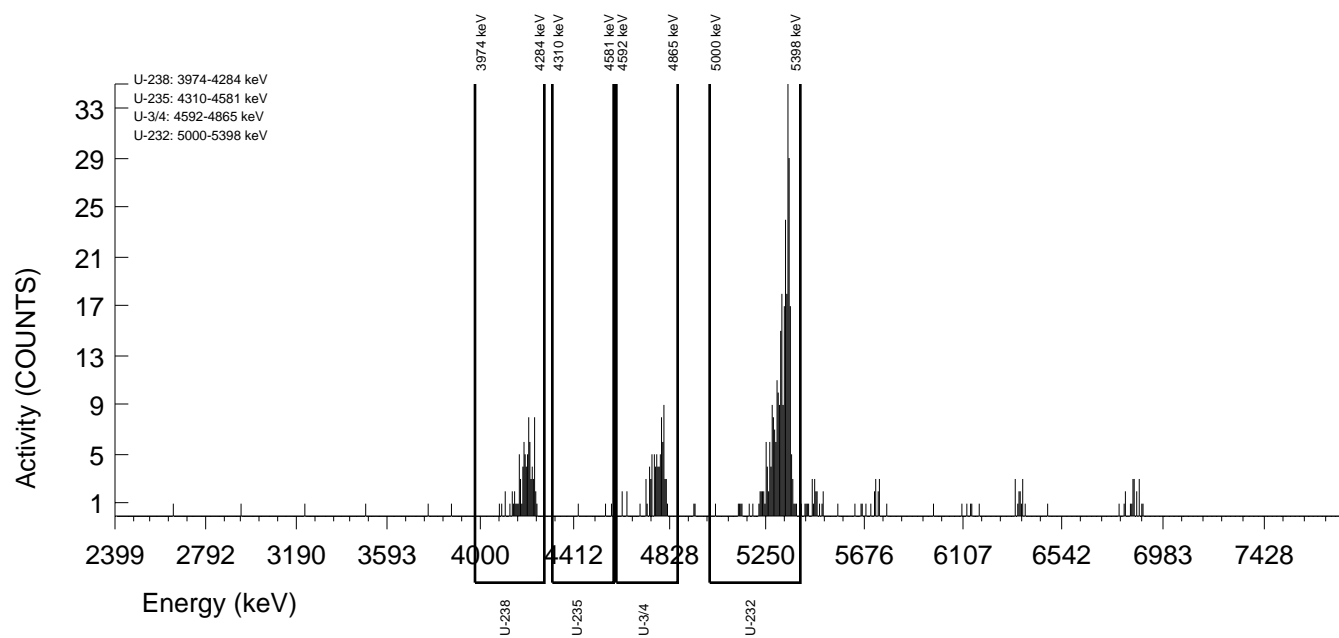
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S0405235002_UU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 79.2 +/-6.789 %	CHAMBER : 008 DETECTOR S/N : 78788 AVERAGE %EFFICIENCY : 32.5495 AVERAGE %EFF ERROR : 0.6275 COUNT DATE : 29-Sep-2016 09:13:18 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B008.CNF;1835 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W008.CNF;517 CAL DATE : 27-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6537E+00 dpm RESULTS : 3.6852E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5315.21	34.785	293.000	285.560	7.440	2.7276	100.000	4.15E+00	7.55E-01	1.89E-01	7.26E-02	4.90E-01
U-3/4	4763.02	4768.55	53.702	78.000	77.040	0.960	0.9798	100.000	1.11E+00	2.95E-01	9.50E-02	2.59E-02	2.52E-01
U-235	4391.00	4515.40	141.579	3.000	2.280	0.720	0.8485	99.700	3.30E-02	5.85E-02	8.83E-02	2.25E-02	5.83E-02
U-238	4184.73	4194.83	67.942	81.000	79.800	1.200	1.0954	100.000	1.15E+00	3.02E-01	1.01E-01	2.89E-02	2.56E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T0405235003_UU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 74.9 +/-8.894 % SECONDARY QTY : 0.504 G +/-0.198 %	CHAMBER : 127 DETECTOR S/N : 78770 AVERAGE %EFFICIENCY : 26.6218 AVERAGE %EFF ERROR : 0.5155 COUNT DATE : 29-Sep-2016 09:20:41 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B127.CNF;1167 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W127.CNF;322 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 6.2257E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4484.28	4420.30	396.58	3.04	55.803	N/A
TRACER 2	1564-I	U-232	4.6537 dpm	5392.81	5324.92	-0.20	261.28	75.465	1.0081

NUCLIDE ACTIVITY SUMMARY

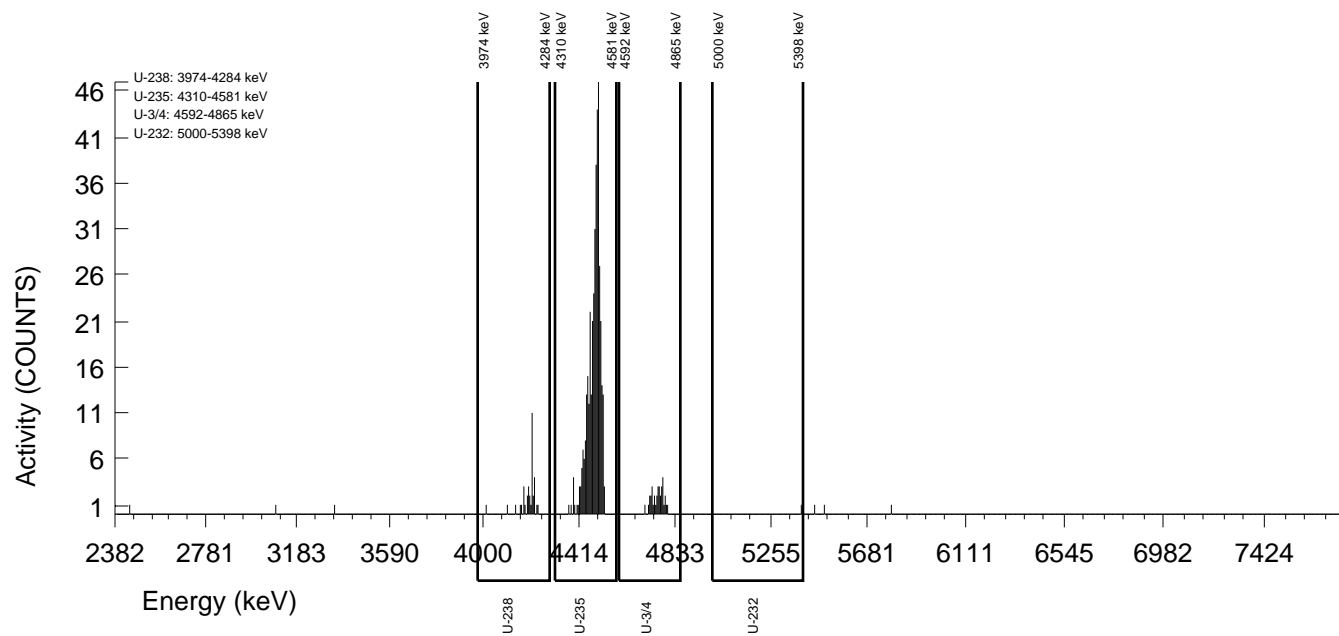
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		Lc pCi/G	1.96-sigma cnt Unc pCi/G
										TPU pCi/G	MDA pCi/G		
U-232	5302.10	5392.81	4.958	1.000	-0.200	1.200	1.0954	100.000	-5.05E-03	7.60E-02	1.77E-01	5.07E-02	7.59E-02
U-3/4	4763.02	4762.91	52.888	65.000	64.280	0.720	0.8485	100.000	1.03E+00	3.15E-01	9.78E-02	2.49E-02	2.55E-01
U-235	4391.00	4484.28	28.510	4.000	3.040	0.960	0.9798	99.700	4.88E-02	7.29E-02	1.06E-01	2.88E-02	7.24E-02
U-238	4184.73	4194.26	5.757	53.000	52.760	0.240	0.4899	100.000	8.45E-01	2.76E-01	7.68E-02	1.44E-02	2.31E-01

NOTES:

* Results are a compilation of S0405235003_UU and T0405235003_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.006 +/-0.000)



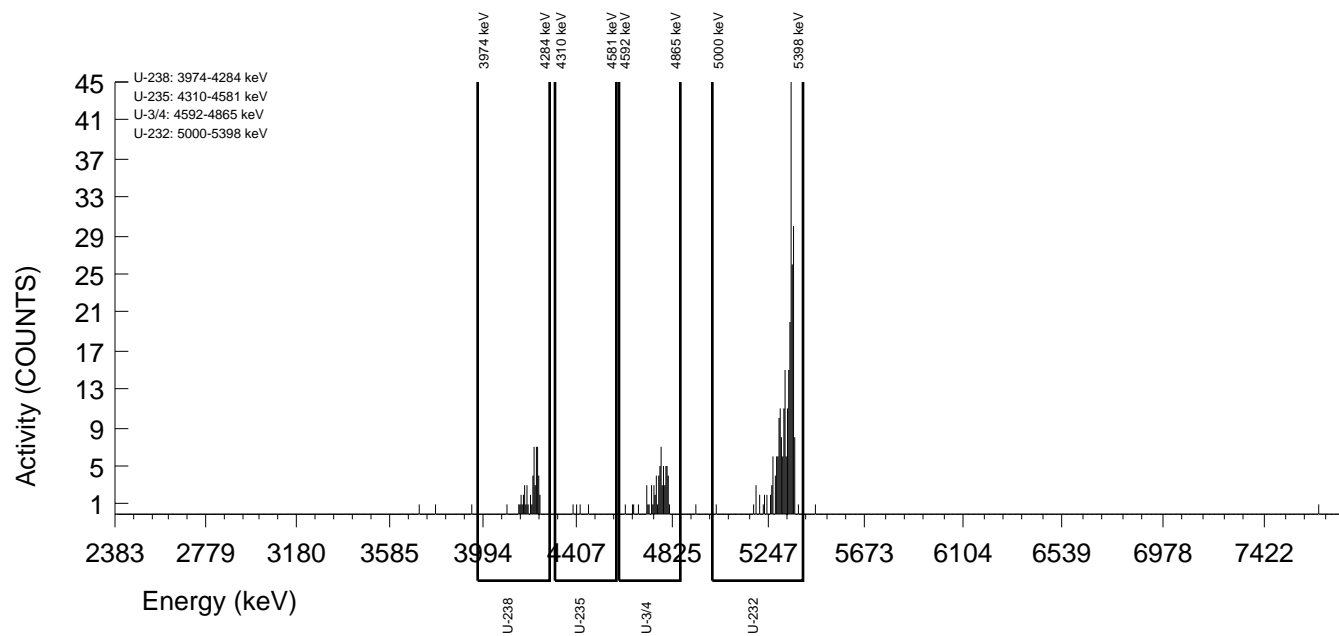
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S0405235003_UU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 75.5 +/-6.955 %	CHAMBER : 009 DETECTOR S/N : 72528 AVERAGE %EFFICIENCY : 31.2521 AVERAGE %EFF ERROR : 0.6030 COUNT DATE : 29-Sep-2016 09:13:18 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B009.CNF;1839 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W009.CNF;516 CAL DATE : 27-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6537E+00 dpm RESULTS : 3.5119E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5324.92	15.969	262.000	261.280	0.720	0.8485	100.000	4.18E+00	7.81E-01	9.78E-02	2.49E-02	5.09E-01
U-3/4	4763.02	4766.09	51.326	65.000	64.280	0.720	0.8485	100.000	1.02E+00	2.92E-01	9.70E-02	2.47E-02	2.53E-01
U-235	4391.00	4420.30	68.983	4.000	3.040	0.960	0.9798	99.700	4.84E-02	7.21E-02	1.05E-01	2.86E-02	7.18E-02
U-238	4184.73	4210.95	26.690	53.000	52.760	0.240	0.4899	100.000	8.38E-01	2.58E-01	7.62E-02	1.43E-02	2.29E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T0405235004_UU SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 09-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 62.9 +/-9.119 % SECONDARY QTY : 0.503 G +/-0.199 %	CHAMBER : 128 DETECTOR S/N : 75549 AVERAGE %EFFICIENCY : 26.0039 AVERAGE %EFF ERROR : 0.5038 COUNT DATE : 29-Sep-2016 09:20:43 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B128.CNF;1171 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W128.CNF;324 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 8.5003E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4492.37	4533.08	528.91	3.76	76.192	N/A
TRACER 2	1564-I	U-232	4.6538 dpm	5283.87	5320.97	-0.44	216.40	63.379	1.0082

NUCLIDE ACTIVITY SUMMARY

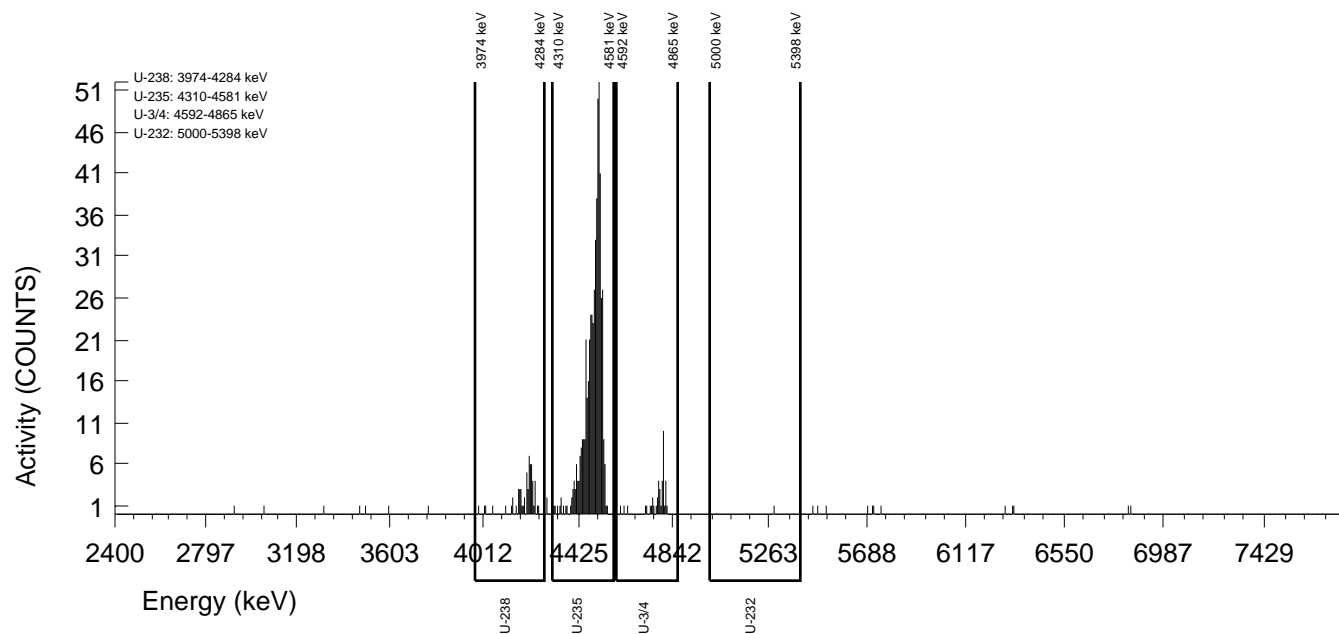
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5283.87	4.935	1.000	-0.440	1.440	1.2000	100.000	-8.35E-03	5.78E-02	1.40E-01	4.17E-02	5.77E-02
U-3/4	4763.02	4772.96	6.854	46.000	44.320	1.680	1.2961	100.000	8.55E-01	3.04E-01	1.50E-01	4.58E-02	2.61E-01
U-235	4391.00	4492.37	36.050	4.000	3.760	0.240	0.4899	99.700	7.28E-02	8.68E-02	9.28E-02	1.74E-02	8.58E-02
U-238	4184.73	4190.26	36.640	58.000	57.520	0.480	0.6928	100.000	1.11E+00	3.55E-01	1.07E-01	2.45E-02	2.91E-01

NOTES:

* Results are a compilation of S0405235004_UU and T0405235004_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.008 +/-0.000)



GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

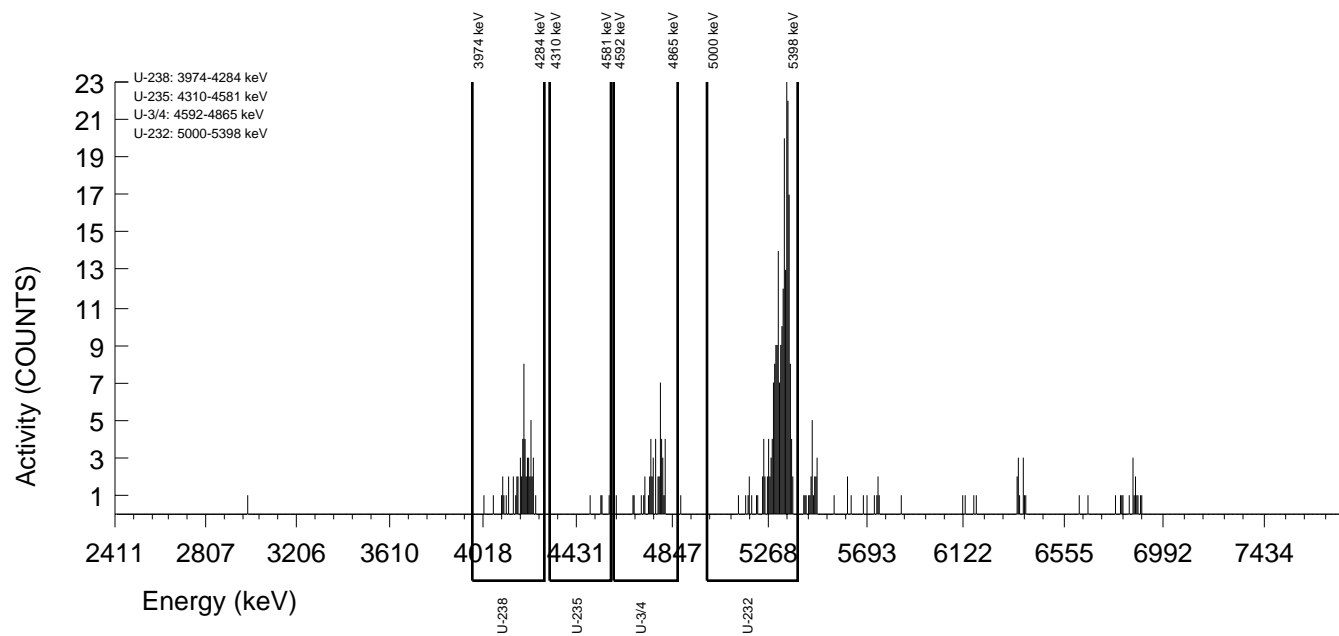
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S0405235004_UU SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 09-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 63.4 +/-7.668 %	CHAMBER : 010 DETECTOR S/N : 72529 AVERAGE %EFFICIENCY : 30.8196 AVERAGE %EFF ERROR : 0.5949 COUNT DATE : 29-Sep-2016 09:13:18 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B010.CNF;1843 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W010.CNF;513 CAL DATE : 27-Sep-2016
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TRACER
 ID : 1564-I
 NUCLIDE : U-232
 NOMINAL : 4.6538E+00 dpm
 RESULTS : 2.9495E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5320.97	49.721	226.000	216.400	9.600	3.0984	100.000	4.18E+00	8.64E-01	2.77E-01	1.10E-01	5.73E-01
U-3/4	4763.02	4769.50	60.854	46.000	44.320	1.680	1.2961	100.000	8.48E-01	2.90E-01	1.48E-01	4.54E-02	2.58E-01
U-235	4391.00	4533.08	83.598	4.000	3.760	0.240	0.4899	99.700	7.22E-02	8.58E-02	9.21E-02	1.72E-02	8.51E-02
U-238	4184.73	4187.60	36.062	58.000	57.520	0.480	0.6928	100.000	1.10E+00	3.35E-01	1.06E-01	2.43E-02	2.89E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T0405235005_UU SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 77.8 +/-8.038 % SECONDARY QTY : 0.508 G +/-0.197 %	CHAMBER : 131 DETECTOR S/N : 80008 AVERAGE %EFFICIENCY : 25.5970 AVERAGE %EFF ERROR : 0.4961 COUNT DATE : 29-Sep-2016 09:41:50 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B131.CNF;1162 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W131.CNF;319 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.1177E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4482.43	4471.19	684.57	3.52	100.184	N/A
TRACER 2	1564-I	U-232	4.6537 dpm	5374.11	5314.87	-0.92	297.28	78.406	1.0081

NUCLIDE ACTIVITY SUMMARY

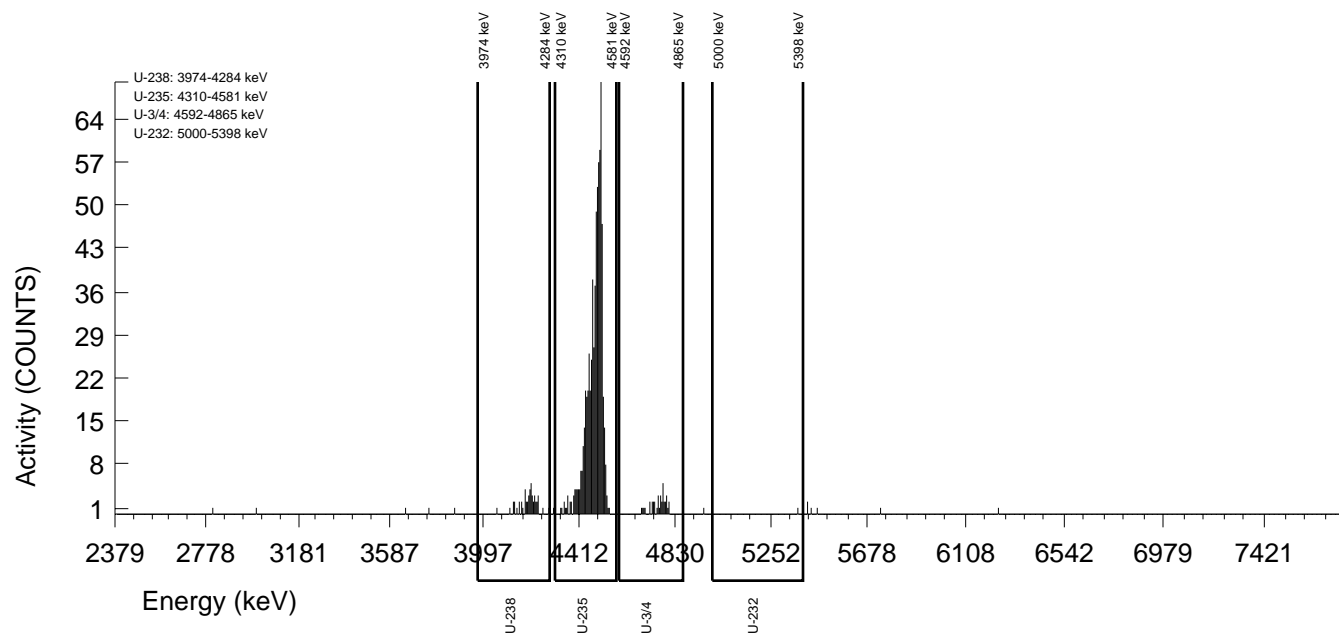
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		Lc pCi/G	1.96-sigma	
										TPU pCi/G	MDA pCi/G		cnt	Unc pCi/G
U-232	5302.10	5374.11	4.960	1.000	-0.920	1.920	1.3856	100.000	-1.34E-02	4.52E-02	1.17E-01	3.69E-02	4.52E-02	4.52E-02
U-3/4	4763.02	4763.59	37.198	67.000	65.800	1.200	1.0954	100.000	9.22E-01	2.72E-01	9.83E-02	2.81E-02	2.27E-01	2.27E-01
U-235	4391.00	4482.43	42.948	4.000	3.520	0.480	0.6928	99.700	4.95E-02	6.32E-02	7.79E-02	1.78E-02	6.27E-02	6.27E-02
U-238	4184.73	4190.71	57.243	54.000	53.760	0.240	0.4899	100.000	7.54E-01	2.38E-01	6.72E-02	1.26E-02	2.04E-01	2.04E-01

NOTES:

* Results are a compilation of S0405235005_UU and T0405235005_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



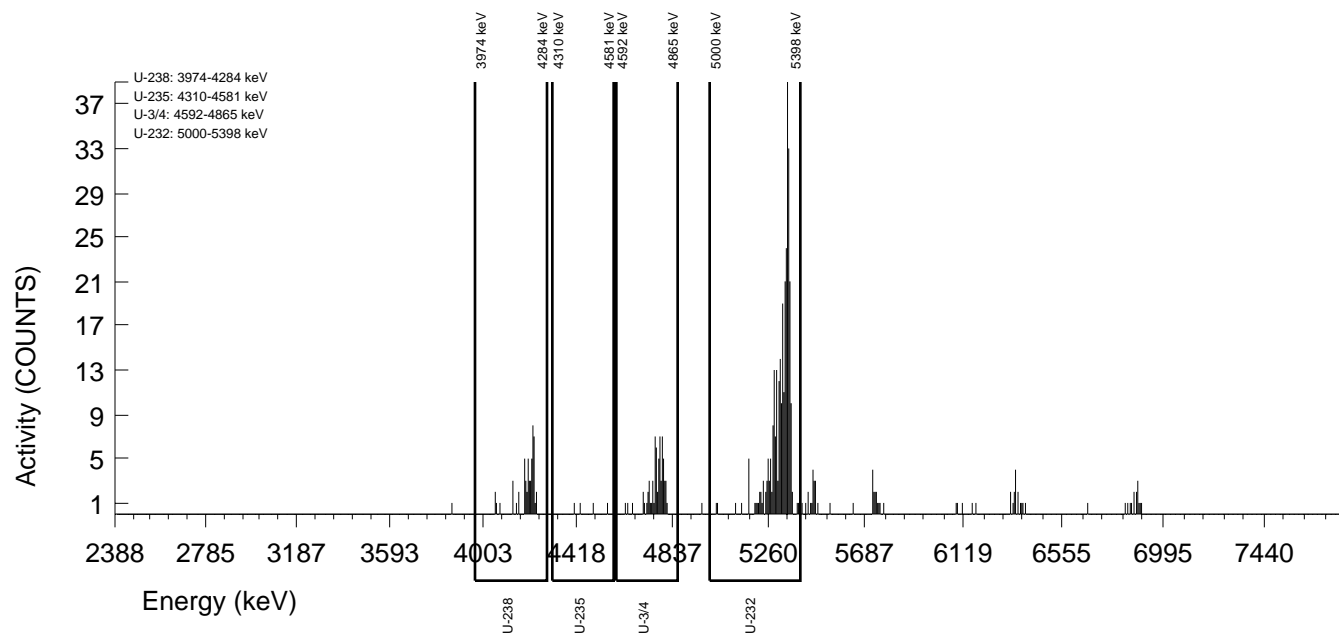
GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S0405235005_UU SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 78.4 +/-6.671 %	CHAMBER : 013 DETECTOR S/N : 78790 AVERAGE %EFFICIENCY : 34.2243 AVERAGE %EFF ERROR : 0.6594 COUNT DATE : 29-Sep-2016 09:13:19 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B013.CNF;1815 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W013.CNF;515 CAL DATE : 27-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6537E+00 dpm RESULTS : 3.6487E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5314.87	21.172	304.000	297.280	6.720	2.5923	100.000	4.17E+00	7.44E-01	1.75E-01	6.66E-02	4.81E-01
U-3/4	4763.02	4767.88	41.162	67.000	65.800	1.200	1.0954	100.000	9.15E-01	2.57E-01	9.75E-02	2.79E-02	2.25E-01
U-235	4391.00	4471.19	143.242	4.000	3.520	0.480	0.6928	99.700	4.91E-02	6.25E-02	7.72E-02	1.77E-02	6.22E-02
U-238	4184.73	4196.71	42.973	54.000	53.760	0.240	0.4899	100.000	7.48E-01	2.26E-01	6.67E-02	1.25E-02	2.02E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T0405235006_UU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 71.7 +/-8.282 % SECONDARY QTY : 0.508 G +/-0.197 %	CHAMBER : 132 DETECTOR S/N : 67579 AVERAGE %EFFICIENCY : 26.0712 AVERAGE %EFF ERROR : 0.5050 COUNT DATE : 29-Sep-2016 09:20:46 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B132.CNF;1158 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W132.CNF;324 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.1304E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4493.00	4418.23	705.20	4.52	101.326	N/A
TRACER 2	1564-I	U-232	4.6537 dpm	5309.95	5317.00	1.04	265.04	72.537	1.0116

NUCLIDE ACTIVITY SUMMARY

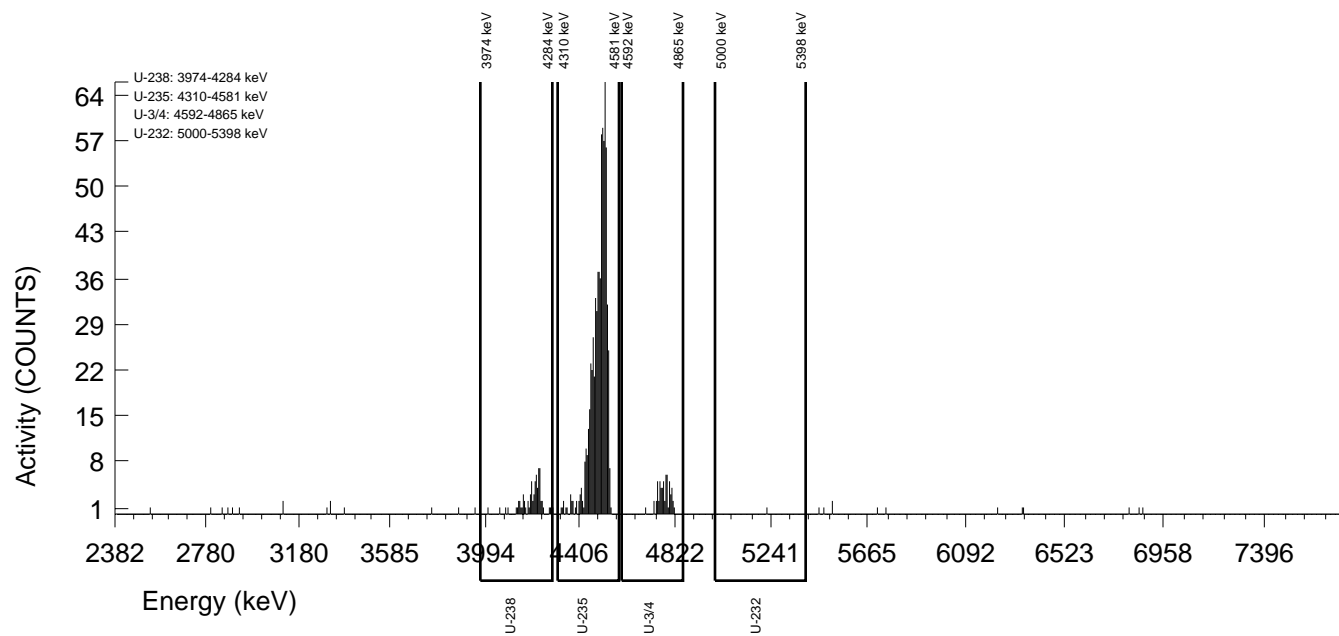
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5309.95	163.020	2.000	1.040	0.960	0.9798	100.000	1.47E-02	5.02E-02	9.29E-02	2.53E-02	5.01E-02
U-3/4	4763.02	4774.19	65.043	50.000	48.080	1.920	1.3856	100.000	7.62E-01	2.57E-01	1.28E-01	4.02E-02	2.23E-01
U-235	4391.00	4493.00	42.607	5.000	4.520	0.480	0.6928	99.700	7.18E-02	7.83E-02	8.80E-02	2.02E-02	7.74E-02
U-238	4184.73	4199.98	41.743	59.000	58.280	0.720	0.8485	100.000	9.23E-01	2.86E-01	9.68E-02	2.46E-02	2.41E-01

NOTES:

* Results are a compilation of S0405235006_UU and T0405235006_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.011 +/-0.000)

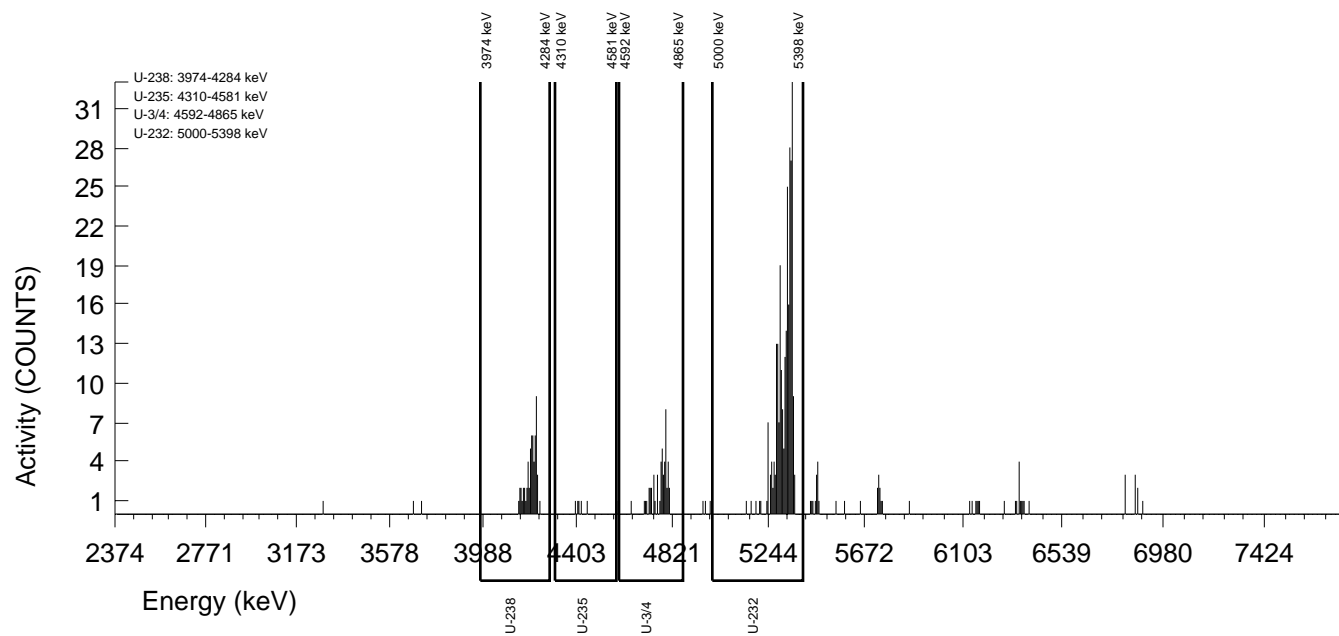


GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER : 1596389 SAMPLE ID : S0405235006_UU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 72.5 +/-6.994 %	CHAMBER : 014 DETECTOR S/N : 83289 AVERAGE %EFFICIENCY : 32.9813 AVERAGE %EFF ERROR : 0.6357 COUNT DATE : 29-Sep-2016 09:13:19 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B014.CNF;1816 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W014.CNF;525 CAL DATE : 27-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6537E+00 dpm RESULTS : 3.3756E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5317.00	53.769	272.000	265.040	6.960	2.6382	100.000	4.18E+00	7.86E-01	2.00E-01	7.63E-02	5.13E-01
U-3/4	4763.02	4768.91	23.029	50.000	48.080	1.920	1.3856	100.000	7.53E-01	2.45E-01	1.26E-01	3.97E-02	2.20E-01
U-235	4391.00	4418.23	54.283	5.000	4.520	0.480	0.6928	99.700	7.10E-02	7.71E-02	8.70E-02	1.99E-02	7.65E-02
U-238	4184.73	4202.89	29.198	59.000	58.280	0.720	0.8485	100.000	9.13E-01	2.71E-01	9.57E-02	2.43E-02	2.38E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T0405235007_UU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 90.3 +/-7.833 % SECONDARY QTY : 0.504 G +/-0.198 %	CHAMBER : 133 DETECTOR S/N : 76229 AVERAGE %EFFICIENCY : 25.5293 AVERAGE %EFF ERROR : 0.4948 COUNT DATE : 29-Sep-2016 09:20:48 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B133.CNF;1155 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W133.CNF;359 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0530E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4477.41	4492.86	643.27	6.76	94.389	N/A
TRACER 2	1564-I	U-232	4.6537 dpm	5213.40	5309.66	1.28	334.72	91.448	1.0129

NUCLIDE ACTIVITY SUMMARY

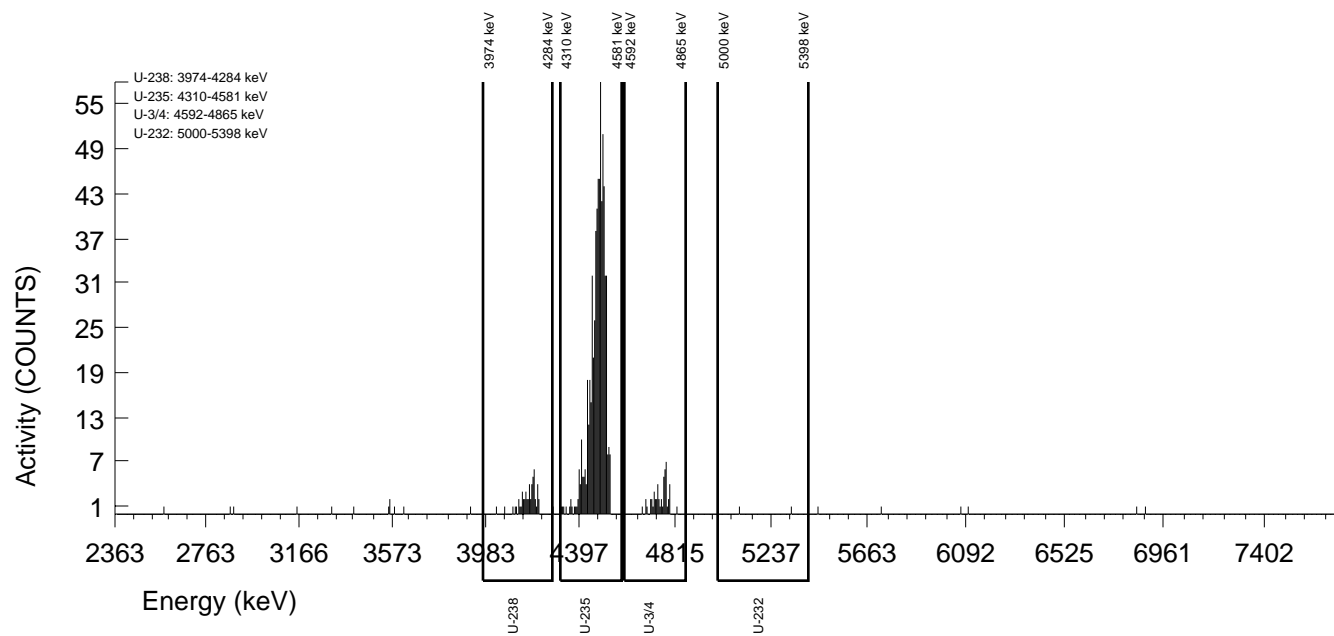
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5213.40	218.623	2.000	1.280	0.720	0.8485	100.000	1.99E-02	5.50E-02	9.52E-02	2.42E-02	5.49E-02
U-3/4	4763.02	4754.46	51.550	59.000	58.040	0.960	0.9798	100.000	7.29E-01	2.23E-01	8.28E-02	2.25E-02	1.91E-01
U-235	4391.00	4477.41	61.122	7.000	6.760	0.240	0.4899	99.700	8.52E-02	7.16E-02	6.04E-02	1.13E-02	7.03E-02
U-238	4184.73	4175.58	39.750	74.000	74.000	0.000	0.0000	100.000	9.29E-01	2.59E-01	3.77E-02	0.00E+00	2.13E-01

NOTES:

* Results are a compilation of S0405235007_UU and T0405235007_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



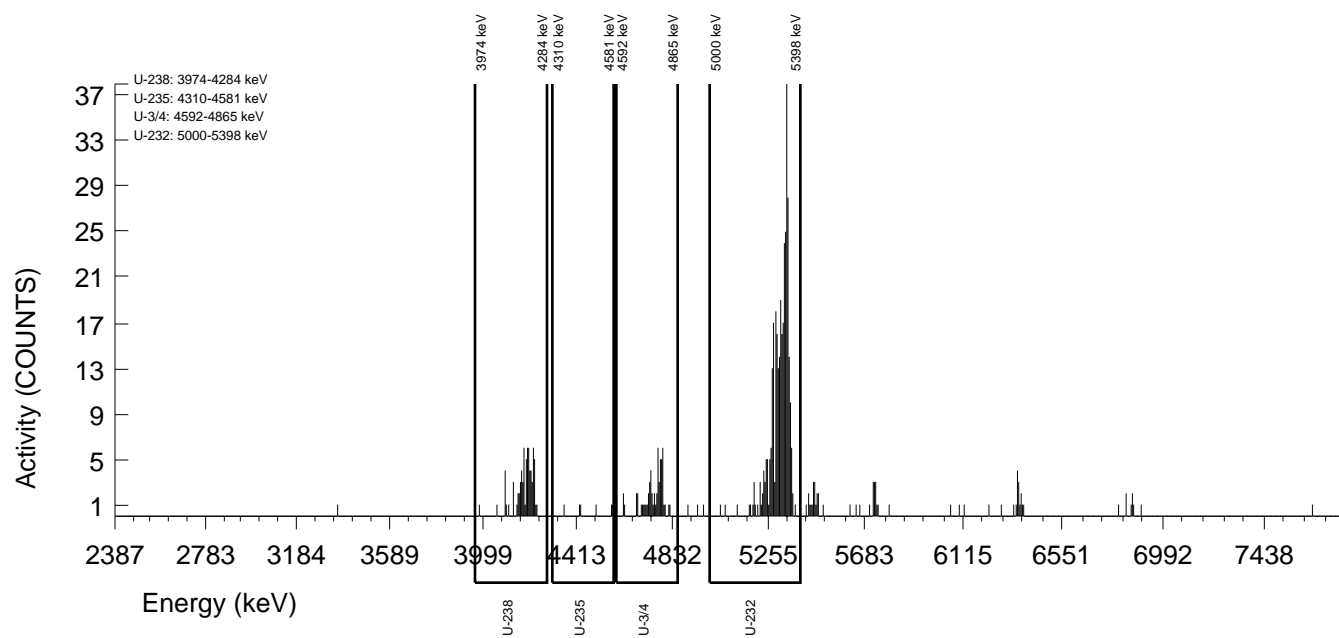
GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S0405235007_UU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 91.4 +/-6.353 %	CHAMBER : 015 DETECTOR S/N : 80055 AVERAGE %EFFICIENCY : 33.0386 AVERAGE %EFF ERROR : 0.6369 COUNT DATE : 29-Sep-2016 09:13:19 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B015.CNF;1835 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W015.CNF;532 CAL DATE : 27-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6537E+00 dpm RESULTS : 4.2557E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5309.66	21.461	340.000	334.720	5.280	2.2978	100.000	4.18E+00	7.09E-01	1.43E-01	5.26E-02	4.53E-01
U-3/4	4763.02	4753.74	57.136	59.000	58.040	0.960	0.9798	100.000	7.20E-01	2.11E-01	8.17E-02	2.23E-02	1.89E-01
U-235	4391.00	4492.86	0.000	7.000	6.760	0.240	0.4899	99.700	8.41E-02	7.03E-02	5.96E-02	1.12E-02	6.94E-02
U-238	4184.73	4185.41	126.833	74.000	74.000	0.000	0.0000	100.000	9.18E-01	2.42E-01	3.72E-02	0.00E+00	2.11E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T0405235008_UU SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 88.4 +/-7.767 % SECONDARY QTY : 0.502 G +/-0.199 %	CHAMBER : 134 DETECTOR S/N : 76230 AVERAGE %EFFICIENCY : 25.7389 AVERAGE %EFF ERROR : 0.4988 COUNT DATE : 29-Sep-2016 09:20:50 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B134.CNF;1151 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W134.CNF;336 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.1689E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4488.82	4424.15	719.92	2.04	104.776	N/A
TRACER 2	1564-I	U-232	4.6537 dpm	5198.58	5311.51	-0.96	332.60	89.095	1.0081

NUCLIDE ACTIVITY SUMMARY

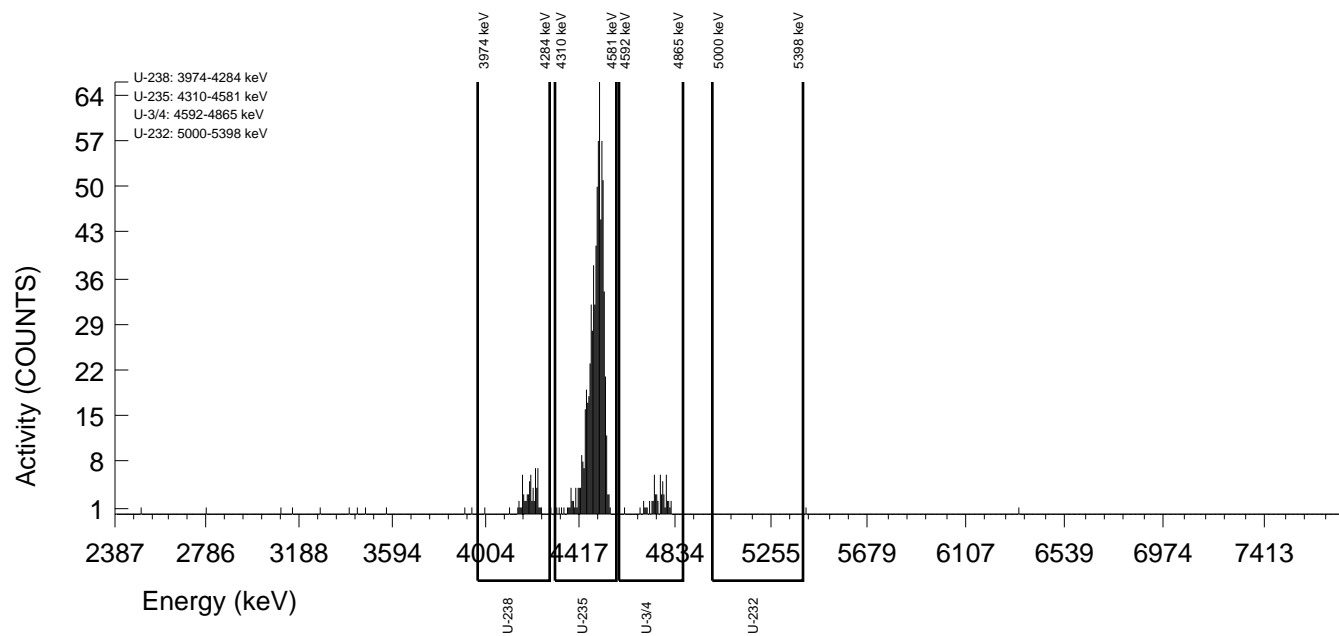
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5198.58	0.000	0.000	-0.960	0.960	0.9798	100.000	-1.34E-02	3.12E-02	9.21E-02	2.51E-02	3.11E-02
U-3/4	4763.02	4762.28	57.042	84.000	81.840	2.160	1.4697	100.000	1.03E+00	2.78E-01	1.05E-01	3.37E-02	2.27E-01
U-235	4391.00	4488.82	47.503	3.000	2.040	0.960	0.9798	99.700	2.56E-02	5.12E-02	8.28E-02	2.26E-02	5.10E-02
U-238	4184.73	4199.23	69.856	65.000	64.520	0.480	0.6928	100.000	8.08E-01	2.37E-01	6.94E-02	1.59E-02	2.00E-01

NOTES:

* Results are a compilation of S0405235008_UU and T0405235008_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.011 +/-0.000)



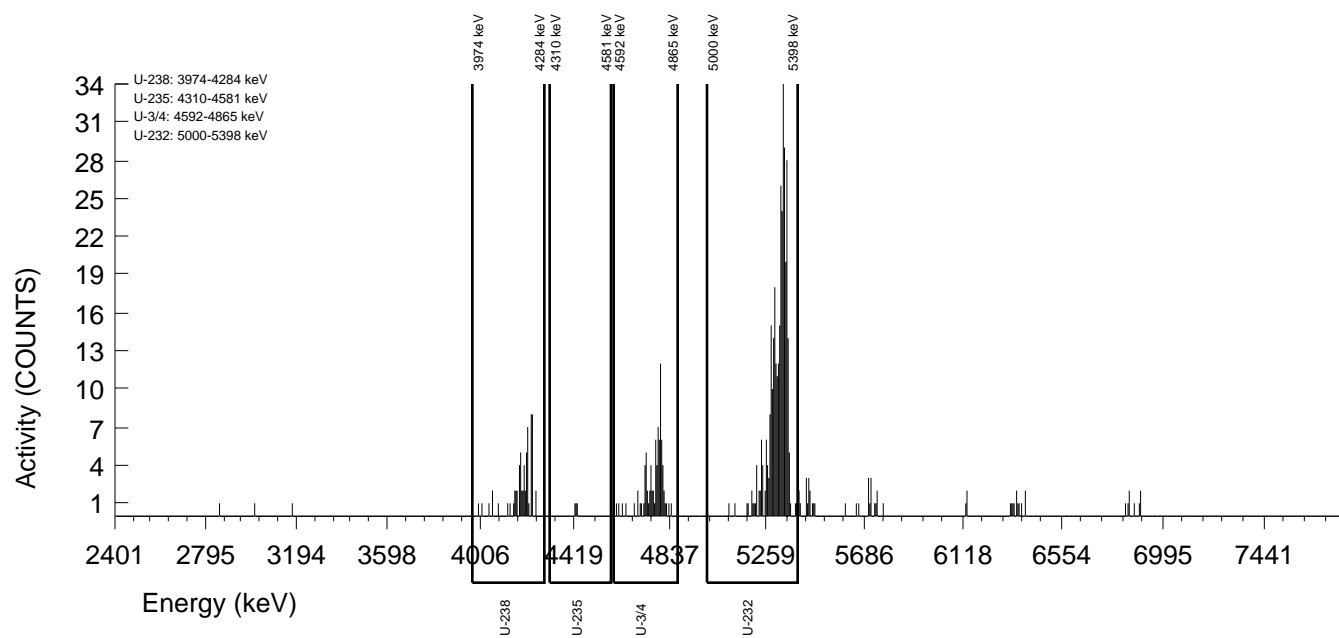
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S0405235008_UU SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 89.1 +/-6.396 %	CHAMBER : 016 DETECTOR S/N : 78774 AVERAGE %EFFICIENCY : 33.6964 AVERAGE %EFF ERROR : 0.6491 COUNT DATE : 29-Sep-2016 09:13:19 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B016.CNF;1811 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W016.CNF;496 CAL DATE : 27-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6537E+00 dpm RESULTS : 4.1462E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5311.51	54.054	341.000	332.600	8.400	2.8983	100.000	4.17E+00	7.11E-01	1.71E-01	6.65E-02	4.56E-01
U-3/4	4763.02	4764.93	16.327	84.000	81.840	2.160	1.4697	100.000	1.02E+00	2.62E-01	1.04E-01	3.35E-02	2.25E-01
U-235	4391.00	4424.15	14.694	3.000	2.040	0.960	0.9798	99.700	2.54E-02	5.07E-02	8.21E-02	2.24E-02	5.06E-02
U-238	4184.73	4185.76	56.328	65.000	64.520	0.480	0.6928	100.000	8.02E-01	2.24E-01	6.88E-02	1.58E-02	1.98E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T0405235009_UU SAMPLE QTY : 0.504 G +/-0.198 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 69.1 +/-8.715 % SECONDARY QTY : 0.500 G +/-0.200 %	CHAMBER : 139 DETECTOR S/N : 76231 AVERAGE %EFFICIENCY : 24.8887 AVERAGE %EFF ERROR : 0.4828 COUNT DATE : 29-Sep-2016 09:20:52 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B139.CNF;1109 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W139.CNF;334 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0975E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4490.43	4379.56	653.63	1.80	98.378	N/A
TRACER 2	1564-I	U-232	4.6537 dpm	5253.47	5307.67	-0.44	229.00	69.702	1.0081

NUCLIDE ACTIVITY SUMMARY

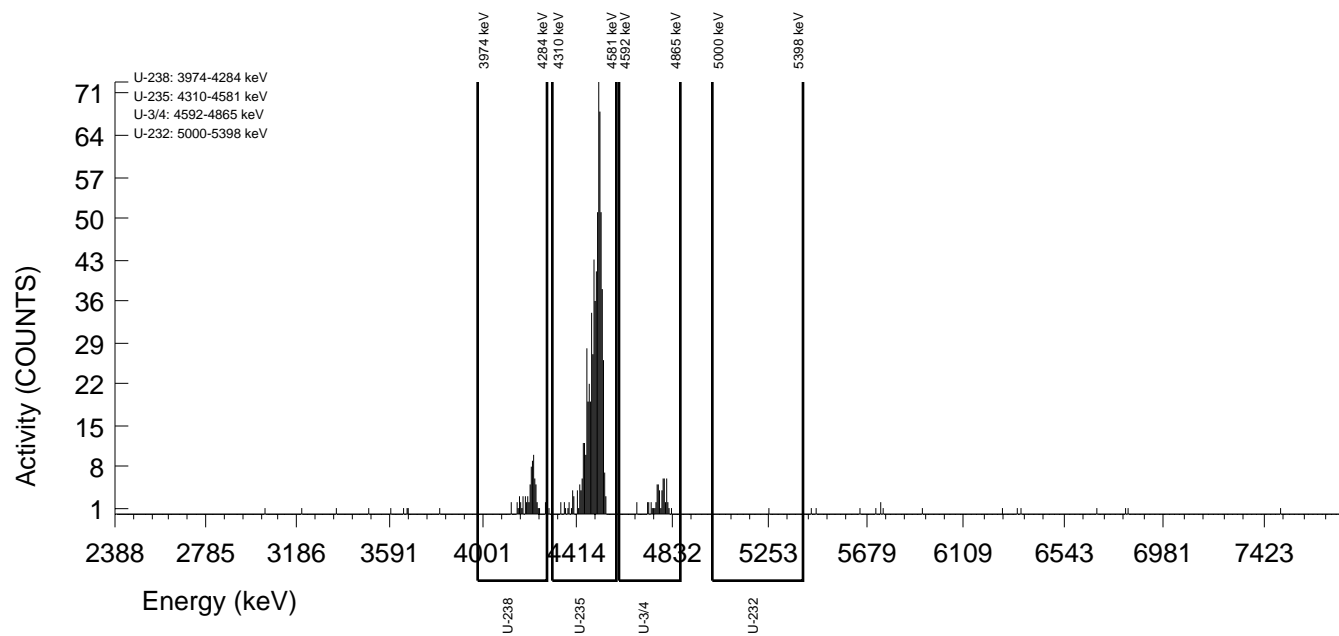
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5253.47	4.936	1.000	-0.440	1.440	1.2000	100.000	-6.80E-03	4.70E-02	1.14E-01	3.40E-02	4.70E-02
U-3/4	4763.02	4774.42	46.484	70.000	67.840	2.160	1.4697	100.000	1.23E+00	3.70E-01	1.52E-01	4.89E-02	3.01E-01
U-235	4391.00	4490.43	37.177	3.000	1.800	1.200	1.0954	99.700	3.28E-02	7.47E-02	1.28E-01	3.66E-02	7.44E-02
U-238	4184.73	4207.00	24.682	46.000	45.040	0.960	0.9798	100.000	8.18E-01	2.84E-01	1.20E-01	3.26E-02	2.45E-01

NOTES:

* Results are a compilation of S0405235009_UU and T0405235009_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



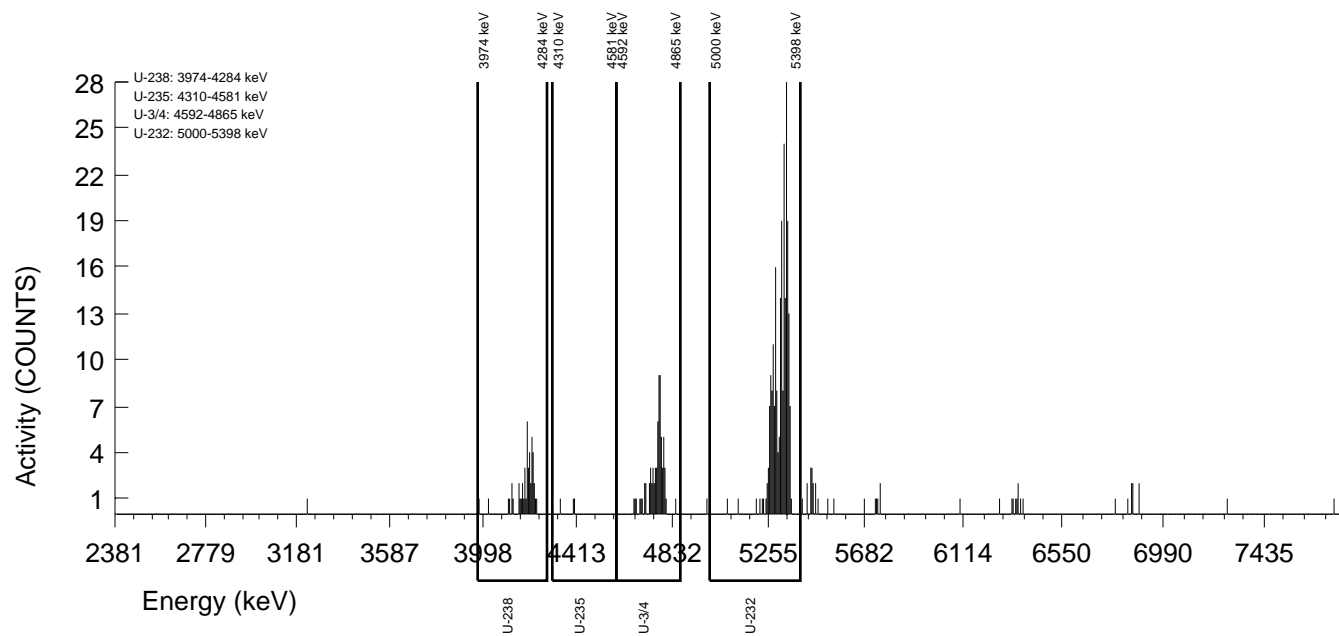
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S0405235009_UU SAMPLE QTY : 0.504 G +/-0.198 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 69.7 +/-7.424 %	CHAMBER : 017 DETECTOR S/N : 78791 AVERAGE %EFFICIENCY : 29.6554 AVERAGE %EFF ERROR : 0.5728 COUNT DATE : 29-Sep-2016 09:13:19 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B017.CNF;2657 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W017.CNF;1452 CAL DATE : 27-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6537E+00 dpm RESULTS : 3.2437E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5307.67	54.660	235.000	229.000	6.000	2.4495	100.000	4.16E+00	8.32E-01	2.17E-01	8.15E-02	5.49E-01
U-3/4	4763.02	4761.58	28.429	70.000	67.840	2.160	1.4697	100.000	1.22E+00	3.51E-01	1.51E-01	4.85E-02	2.99E-01
U-235	4391.00	4379.56	64.273	3.000	1.800	1.200	1.0954	99.700	3.25E-02	7.40E-02	1.27E-01	3.63E-02	7.38E-02
U-238	4184.73	4182.80	30.159	46.000	45.040	0.960	0.9798	100.000	8.11E-01	2.72E-01	1.19E-01	3.23E-02	2.43E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T0405235010_UU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 86.8 +/-8.074 % SECONDARY QTY : 0.508 G +/-0.197 %	CHAMBER : 140 DETECTOR S/N : 78771 AVERAGE %EFFICIENCY : 26.0317 AVERAGE %EFF ERROR : 0.5043 COUNT DATE : 29-Sep-2016 09:20:55 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B140.CNF;1102 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W140.CNF;283 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.7129E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4495.55	4384.79	605.00	3.28	87.061	N/A
TRACER 2	1564-I	U-232	4.6537 dpm	5361.06	5306.47	1.04	306.44	87.881	1.0122

NUCLIDE ACTIVITY SUMMARY

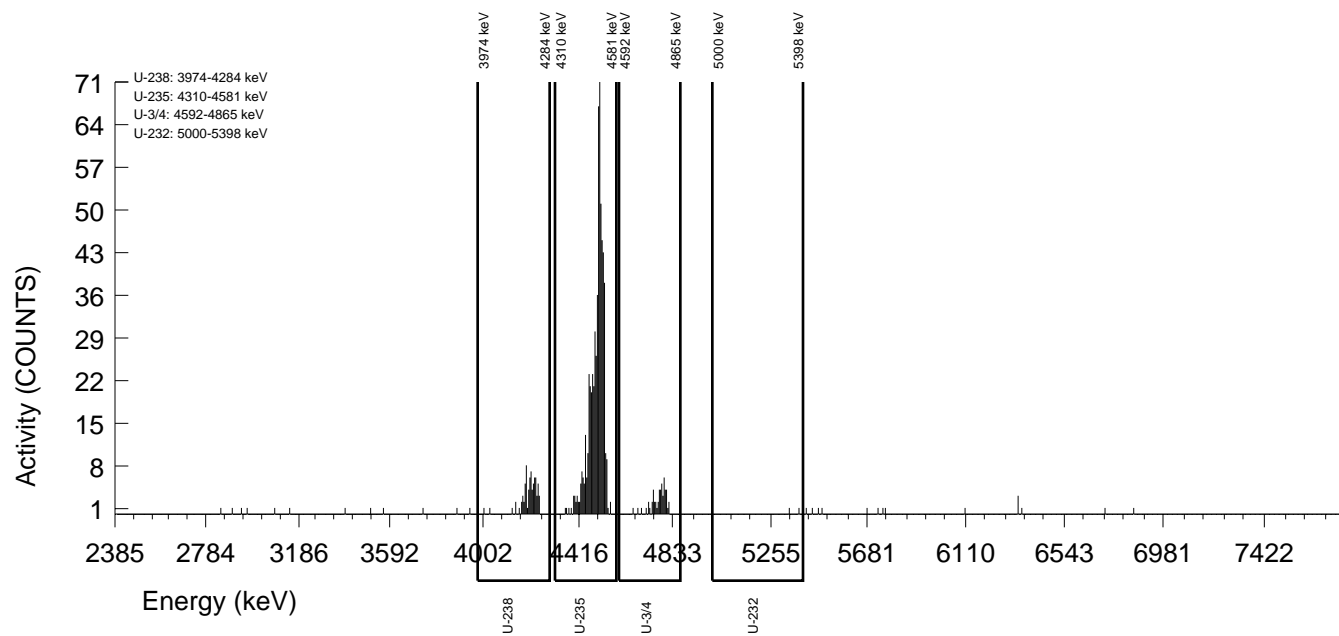
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		Lc pCi/G	1.96-sigma cnt Unc pCi/G
										TPU pCi/G	MDA pCi/G		
U-232	5302.10	5361.06	44.575	2.000	1.040	0.960	0.9798	100.000	1.71E-02	5.85E-02	1.08E-01	2.95E-02	5.84E-02
U-3/4	4763.02	4767.70	58.608	55.000	54.040	0.960	0.9798	100.000	7.41E-01	2.35E-01	9.03E-02	2.46E-02	2.02E-01
U-235	4391.00	4495.55	30.407	4.000	3.280	0.720	0.8485	99.700	4.51E-02	6.21E-02	8.40E-02	2.14E-02	6.16E-02
U-238	4184.73	4199.51	58.608	73.000	72.040	0.960	0.9798	100.000	9.88E-01	2.82E-01	9.03E-02	2.46E-02	2.32E-01

NOTES:

* Results are a compilation of S0405235010_UU and T0405235010_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.009 +/-0.000)



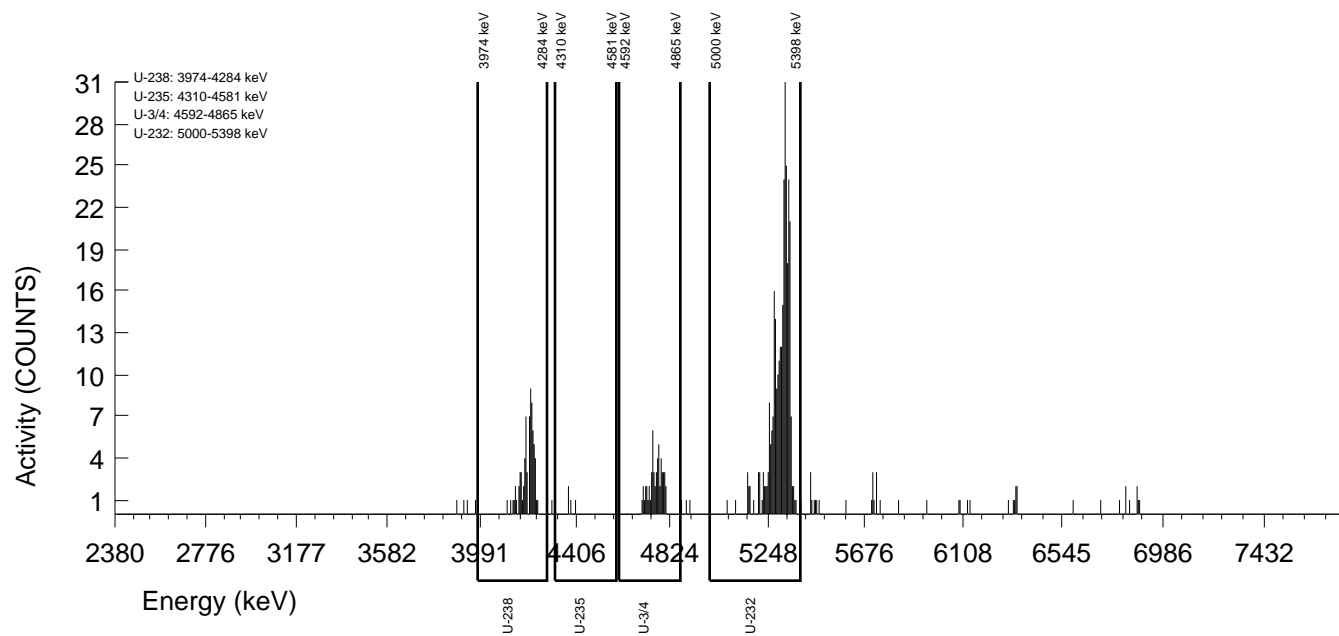
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S0405235010_UU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 87.9 +/-6.569 %	CHAMBER : 018 DETECTOR S/N : 78782 AVERAGE %EFFICIENCY : 31.4751 AVERAGE %EFF ERROR : 0.6072 COUNT DATE : 29-Sep-2016 09:13:19 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B018.CNF;1812 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W018.CNF;486 CAL DATE : 27-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6537E+00 dpm RESULTS : 4.0897E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5306.47	66.176	311.000	306.440	4.560	2.1354	100.000	4.18E+00	7.35E-01	1.48E-01	5.34E-02	4.74E-01
U-3/4	4763.02	4758.01	44.286	55.000	54.040	0.960	0.9798	100.000	7.32E-01	2.22E-01	8.92E-02	2.43E-02	1.99E-01
U-235	4391.00	4384.79	4.921	4.000	3.280	0.720	0.8485	99.700	4.46E-02	6.12E-02	8.30E-02	2.11E-02	6.09E-02
U-238	4184.73	4194.40	41.006	73.000	72.040	0.960	0.9798	100.000	9.76E-01	2.64E-01	8.92E-02	2.43E-02	2.29E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T0405235011_UU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 09-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 73.1 +/-8.368 % SECONDARY QTY : 0.504 G +/-0.198 %	CHAMBER : 142 DETECTOR S/N : 42285 AVERAGE %EFFICIENCY : 26.5347 AVERAGE %EFF ERROR : 0.5139 COUNT DATE : 29-Sep-2016 09:20:58 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B142.CNF;1102 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W142.CNF;306 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.1432E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4493.76	4497.15	725.87	4.28	102.474	N/A
TRACER 2	1564-I	U-232	4.6538 dpm	5283.21	5316.88	0.52	253.80	73.813	1.0099

NUCLIDE ACTIVITY SUMMARY

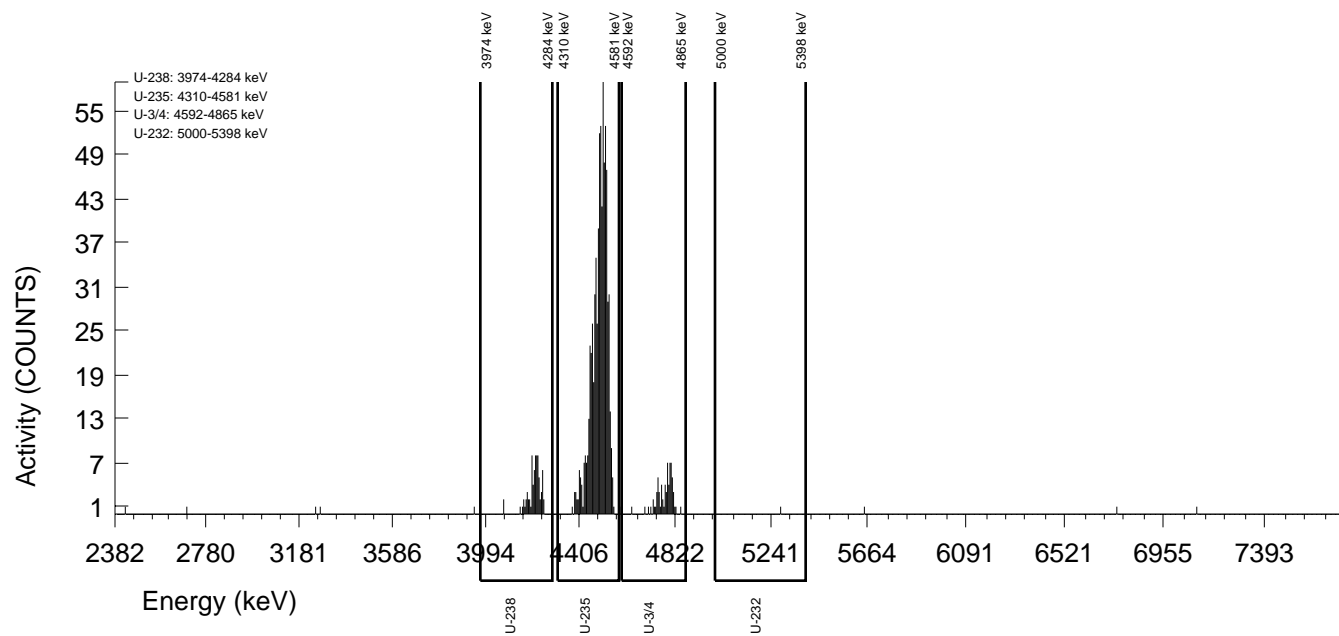
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5283.21	4.944	1.000	0.520	0.480	0.6928	100.000	7.18E-03	4.00E-02	7.65E-02	1.75E-02	3.99E-02
U-3/4	4763.02	4778.35	66.747	50.000	49.520	0.480	0.6928	100.000	8.19E-01	2.70E-01	9.16E-02	2.10E-02	2.32E-01
U-235	4391.00	4493.76	59.692	5.000	4.280	0.720	0.8485	99.700	7.10E-02	8.21E-02	1.01E-01	2.58E-02	8.12E-02
U-238	4184.73	4208.58	49.796	50.000	49.760	0.240	0.4899	100.000	8.23E-01	2.70E-01	7.93E-02	1.48E-02	2.32E-01

NOTES:

* Results are a compilation of S0405235011_UU and T0405235011_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.011 +/-0.000)



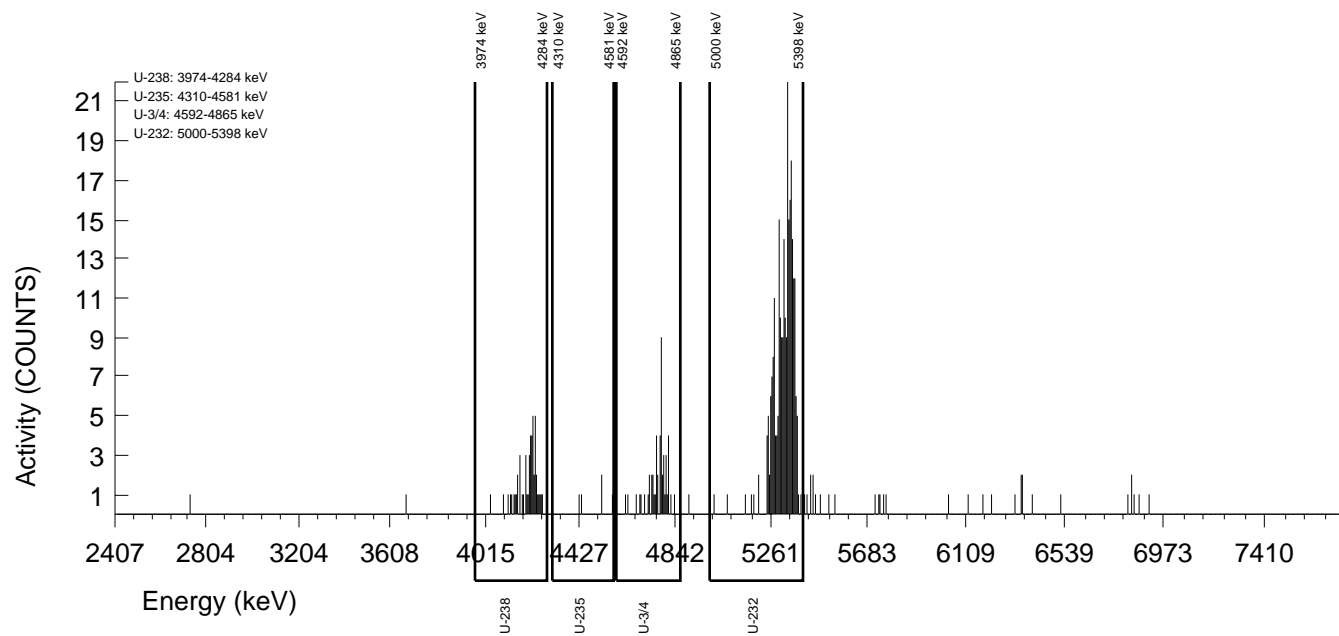
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S0405235011_UU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 09-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 73.8 +/-7.125 %	CHAMBER : 020 DETECTOR S/N : 78787 AVERAGE %EFFICIENCY : 31.0365 AVERAGE %EFF ERROR : 0.5989 COUNT DATE : 29-Sep-2016 09:13:20 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B020.CNF;1833 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W020.CNF;562 CAL DATE : 27-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6538E+00 dpm RESULTS : 3.4351E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5316.88	66.928	261.000	253.800	7.200	2.6833	100.000	4.19E+00	8.03E-01	2.12E-01	8.12E-02	5.26E-01
U-3/4	4763.02	4768.48	7.611	50.000	49.520	0.480	0.6928	100.000	8.11E-01	2.58E-01	9.07E-02	2.08E-02	2.30E-01
U-235	4391.00	4497.15	4.933	5.000	4.280	0.720	0.8485	99.700	7.03E-02	8.10E-02	1.00E-01	2.55E-02	8.04E-02
U-238	4184.73	4201.17	69.066	50.000	49.760	0.240	0.4899	100.000	8.15E-01	2.58E-01	7.86E-02	1.47E-02	2.30E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T0405235012_UU SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 85.9 +/-7.945 % SECONDARY QTY : 0.505 G +/-0.198 %	CHAMBER : 143 DETECTOR S/N : 65882 AVERAGE %EFFICIENCY : 22.7820 AVERAGE %EFF ERROR : 0.4430 COUNT DATE : 29-Sep-2016 09:21:00 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B143.CNF;1098 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W143.CNF;291 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.2010E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4496.13	4452.21	654.72	6.80	107.655	N/A
TRACER 2	1564-I	U-232	4.6537 dpm	5232.76	5299.44	3.52	311.88	87.718	1.0211

NUCLIDE ACTIVITY SUMMARY

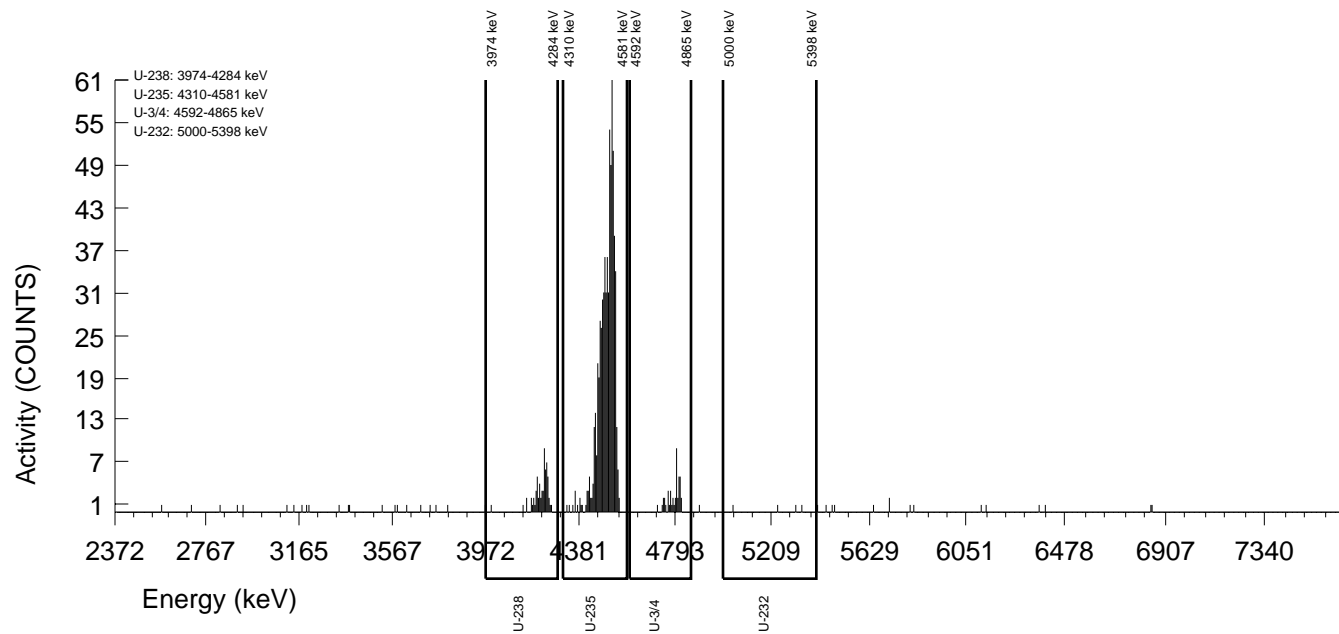
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5232.76	285.047	4.000	3.520	0.480	0.6928	100.000	5.38E-02	6.86E-02	8.46E-02	1.94E-02	6.81E-02
U-3/4	4763.02	4786.60	18.722	60.000	59.280	0.720	0.8485	100.000	7.98E-01	2.43E-01	8.22E-02	2.09E-02	2.06E-01
U-235	4391.00	4496.13	52.385	8.000	6.800	1.200	1.0954	99.700	9.18E-02	8.22E-02	9.46E-02	2.71E-02	8.09E-02
U-238	4184.73	4208.30	46.279	65.000	64.760	0.240	0.4899	100.000	8.71E-01	2.56E-01	6.45E-02	1.21E-02	2.14E-01

NOTES:

* Results are a compilation of S0405235012_UU and T0405235012_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



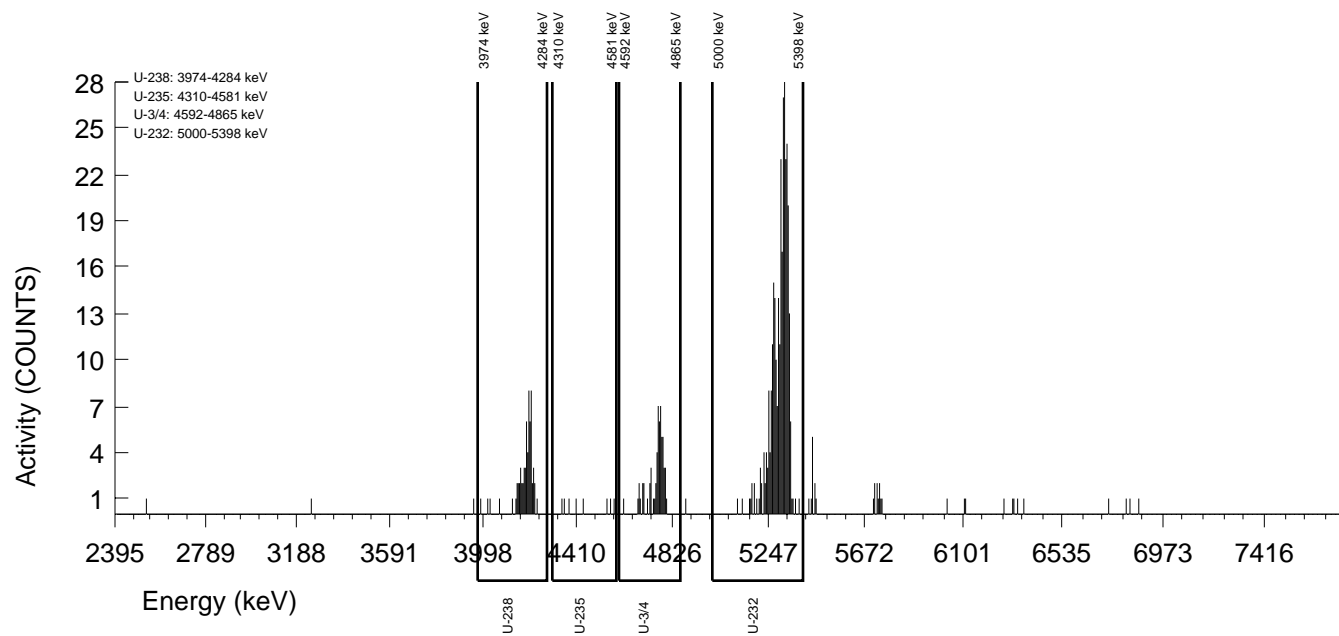
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S0405235012_UU SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 87.7 +/-6.510 %	CHAMBER : 021 DETECTOR S/N : 795159 AVERAGE %EFFICIENCY : 32.0933 AVERAGE %EFF ERROR : 0.6189 COUNT DATE : 29-Sep-2016 09:13:20 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B021.CNF;1835 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W021.CNF;539 CAL DATE : 27-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6537E+00 dpm RESULTS : 4.0821E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5299.44	64.241	315.000	311.880	3.120	1.7664	100.000	4.14E+00	7.20E-01	1.26E-01	4.30E-02	4.63E-01
U-3/4	4763.02	4759.82	29.407	60.000	59.280	0.720	0.8485	100.000	7.81E-01	2.27E-01	8.05E-02	2.05E-02	2.02E-01
U-235	4391.00	4452.21	220.556	8.000	6.800	1.200	1.0954	99.700	8.99E-02	8.01E-02	9.27E-02	2.65E-02	7.92E-02
U-238	4184.73	4184.97	26.140	65.000	64.760	0.240	0.4899	100.000	8.53E-01	2.39E-01	6.32E-02	1.18E-02	2.10E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T0405235013_UU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 89.2 +/-7.944 % SECONDARY QTY : 0.502 G +/-0.199 %	CHAMBER : 144 DETECTOR S/N : 75551 AVERAGE %EFFICIENCY : 26.3153 AVERAGE %EFF ERROR : 0.5097 COUNT DATE : 29-Sep-2016 09:21:03 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B144.CNF;1103 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W144.CNF;297 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.1893E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4485.04	4432.63	748.90	4.52	106.607	N/A
TRACER 2	1564-I	U-232	4.6539 dpm	5310.72	5313.74	0.76	293.32	90.160	1.0106

NUCLIDE ACTIVITY SUMMARY

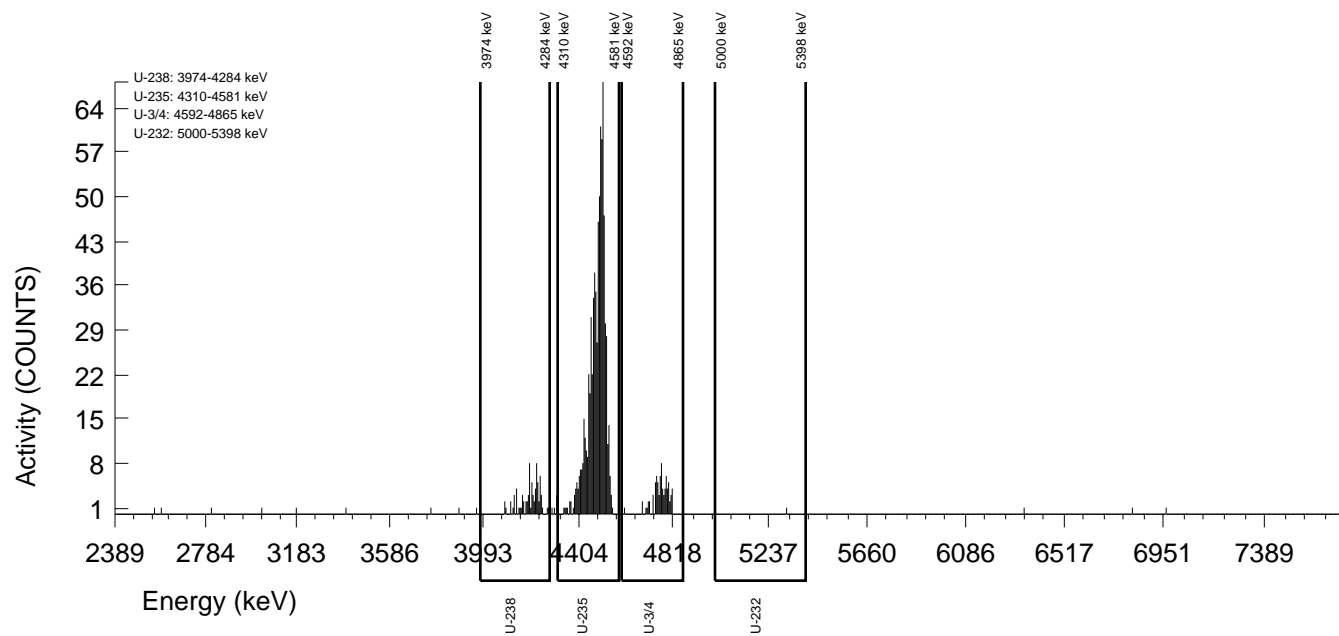
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5310.72	4.914	1.000	0.760	0.240	0.4899	100.000	1.02E-02	3.84E-02	6.44E-02	1.21E-02	3.83E-02
U-3/4	4763.02	4762.56	56.678	56.000	54.320	1.680	1.2961	100.000	7.78E-01	2.47E-01	1.11E-01	3.40E-02	2.13E-01
U-235	4391.00	4485.04	47.987	5.000	4.520	0.480	0.6928	99.700	6.50E-02	7.08E-02	7.96E-02	1.82E-02	7.00E-02
U-238	4184.73	4193.61	51.437	54.000	52.320	1.680	1.2961	100.000	7.50E-01	2.41E-01	1.11E-01	3.40E-02	2.09E-01

NOTES:

* Results are a compilation of S0405235013_UU and T0405235013_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.011 +/-0.000)



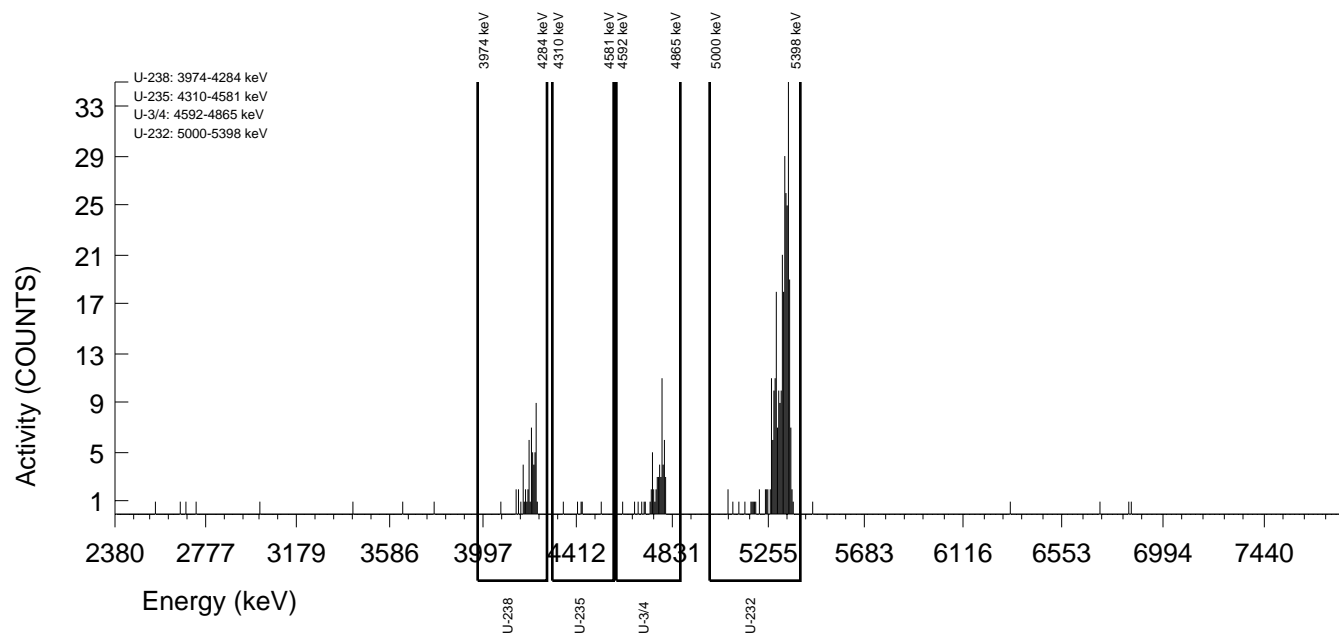
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S0405235013_UU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 90.2 +/-6.654 %	CHAMBER : 023 DETECTOR S/N : 78264 AVERAGE %EFFICIENCY : 29.3659 AVERAGE %EFF ERROR : 0.5674 COUNT DATE : 29-Sep-2016 09:13:20 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B023.CNF;1854 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W023.CNF;546 CAL DATE : 27-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6539E+00 dpm RESULTS : 4.1960E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5313.74	55.353	295.000	293.320	1.680	1.2961	100.000	4.19E+00	7.46E-01	1.11E-01	3.39E-02	4.82E-01
U-3/4	4763.02	4767.78	14.110	56.000	54.320	1.680	1.2961	100.000	7.70E-01	2.35E-01	1.10E-01	3.37E-02	2.11E-01
U-235	4391.00	4432.63	163.146	5.000	4.520	0.480	0.6928	99.700	6.43E-02	6.98E-02	7.88E-02	1.80E-02	6.92E-02
U-238	4184.73	4206.23	34.298	54.000	52.320	1.680	1.2961	100.000	7.42E-01	2.30E-01	1.10E-01	3.37E-02	2.07E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T0405235014_UU SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 68.8 +/-8.281 % SECONDARY QTY : 0.503 G +/-0.199 %	CHAMBER : 145 DETECTOR S/N : 72526 AVERAGE %EFFICIENCY : 26.3634 AVERAGE %EFF ERROR : 0.5106 COUNT DATE : 29-Sep-2016 09:21:05 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B145.CNF;1121 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W145.CNF;365 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.1237E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4515.14	4427.25	708.88	2.76	100.726	N/A
TRACER 2	1564-I	U-232	4.6539 dpm	5248.57	5316.91	0.28	263.24	69.468	1.0091

NUCLIDE ACTIVITY SUMMARY

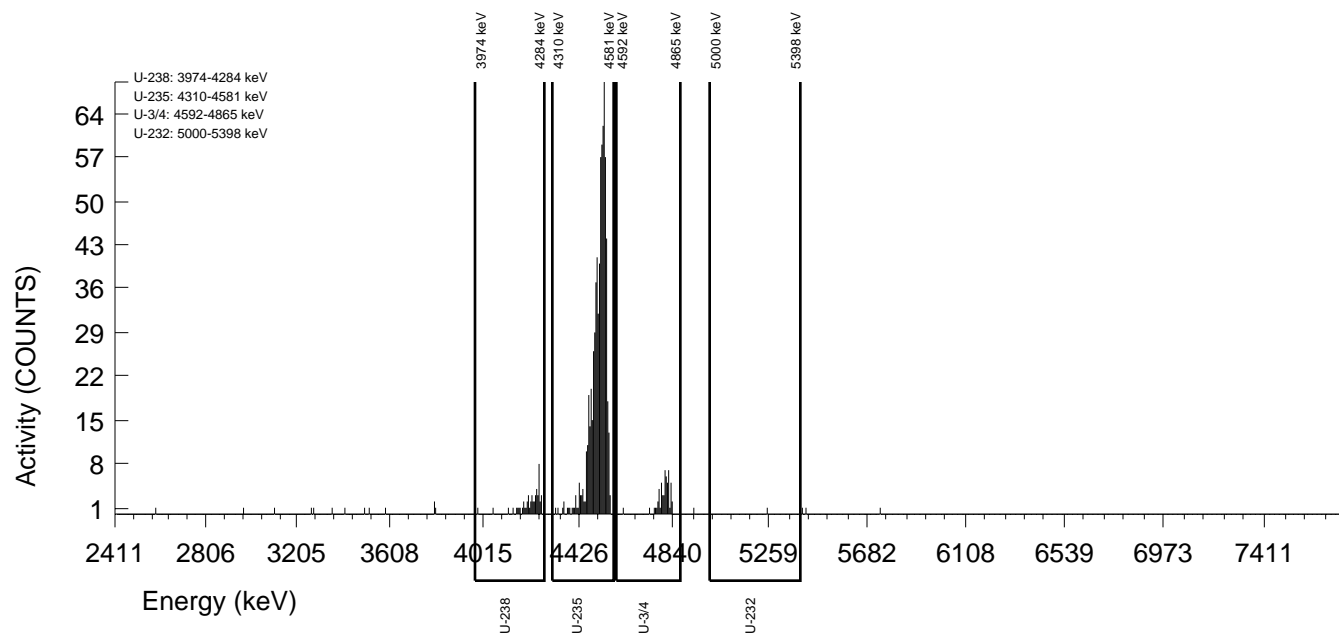
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5248.57	4.914	1.000	0.280	0.720	0.8485	100.000	3.97E-03	4.15E-02	8.65E-02	2.20E-02	4.15E-02
U-3/4	4763.02	4798.98	52.821	57.000	55.800	1.200	1.0954	100.000	8.86E-01	2.80E-01	1.11E-01	3.19E-02	2.38E-01
U-235	4391.00	4515.14	47.553	3.000	2.760	0.240	0.4899	99.700	4.40E-02	6.37E-02	7.64E-02	1.43E-02	6.33E-02
U-238	4184.73	4212.03	7.207	68.000	67.520	0.480	0.6928	100.000	1.07E+00	3.15E-01	8.79E-02	2.02E-02	2.59E-01

NOTES:

* Results are a compilation of S0405235014_UU and T0405235014_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.011 +/-0.000)



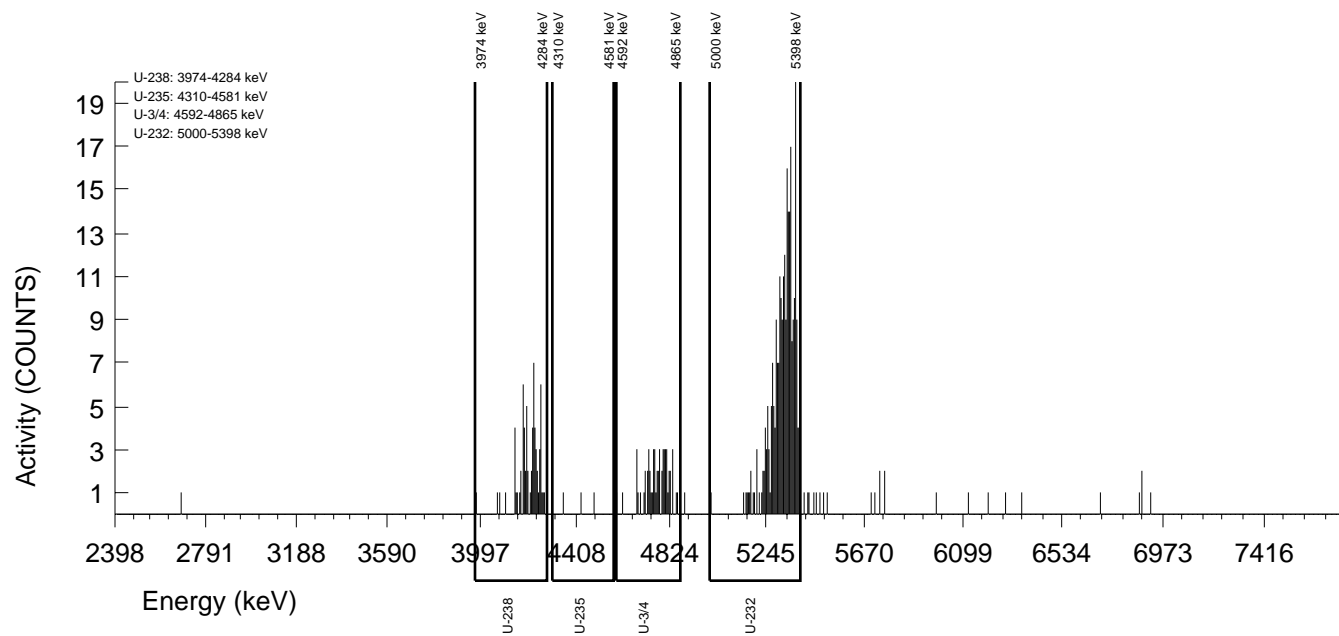
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S0405235014_UU SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 69.5 +/-6.998 %	CHAMBER : 024 DETECTOR S/N : 76542 AVERAGE %EFFICIENCY : 34.2046 AVERAGE %EFF ERROR : 0.6588 COUNT DATE : 29-Sep-2016 09:13:20 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B024.CNF;1826 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W024.CNF;519 CAL DATE : 27-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6539E+00 dpm RESULTS : 3.2330E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5316.91	69.121	269.000	263.240	5.760	2.4000	100.000	4.18E+00	7.85E-01	1.87E-01	6.97E-02	5.12E-01
U-3/4	4763.02	4763.80	151.334	57.000	55.800	1.200	1.0954	100.000	8.78E-01	2.67E-01	1.10E-01	3.16E-02	2.36E-01
U-235	4391.00	4427.25	131.807	3.000	2.760	0.240	0.4899	99.700	4.36E-02	6.31E-02	7.57E-02	1.42E-02	6.28E-02
U-238	4184.73	4203.88	110.450	68.000	67.520	0.480	0.6928	100.000	1.06E+00	2.98E-01	8.71E-02	2.00E-02	2.57E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T0405235015_UU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 81.0 +/-8.967 % SECONDARY QTY : 0.503 G +/-0.199 %	CHAMBER : 146 DETECTOR S/N : 72527 AVERAGE %EFFICIENCY : 25.4962 AVERAGE %EFF ERROR : 0.4943 COUNT DATE : 29-Sep-2016 09:21:07 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B146.CNF;1123 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W146.CNF;315 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 8.2551E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4505.61	4473.12	503.62	5.52	73.994	N/A
TRACER 2	1564-I	U-232	4.6539 dpm	5182.40	5324.79	-0.40	223.56	81.655	1.0082

NUCLIDE ACTIVITY SUMMARY

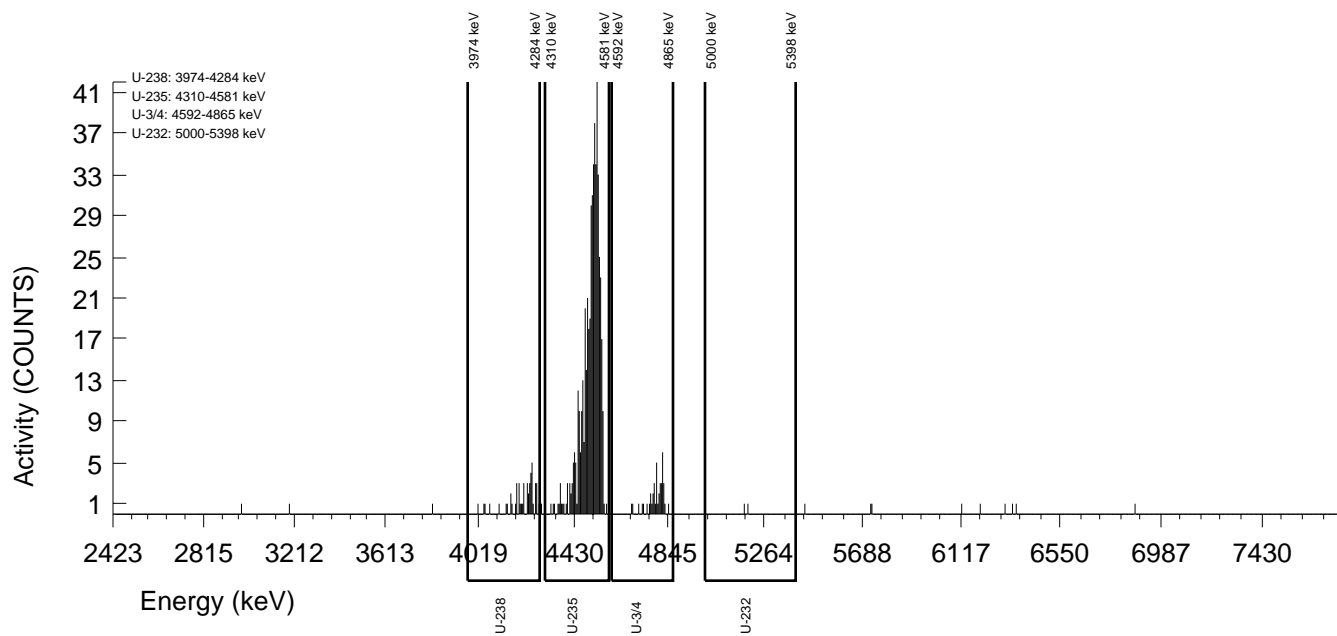
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5182.40	19.500	2.000	-0.400	2.400	1.5492	100.000	-7.98E-03	7.46E-02	1.73E-01	5.66E-02	7.45E-02
U-3/4	4763.02	4788.70	31.688	39.000	36.600	2.400	1.5492	100.000	6.74E-01	2.60E-01	1.60E-01	5.23E-02	2.30E-01
U-235	4391.00	4505.61	44.614	6.000	5.520	0.480	0.6928	99.700	1.02E-01	9.87E-02	1.02E-01	2.35E-02	9.70E-02
U-238	4184.73	4204.38	84.908	49.000	47.800	1.200	1.0954	100.000	8.81E-01	3.01E-01	1.29E-01	3.70E-02	2.56E-01

NOTES:

* Results are a compilation of S0405235015_UU and T0405235015_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.008 +/-0.000)



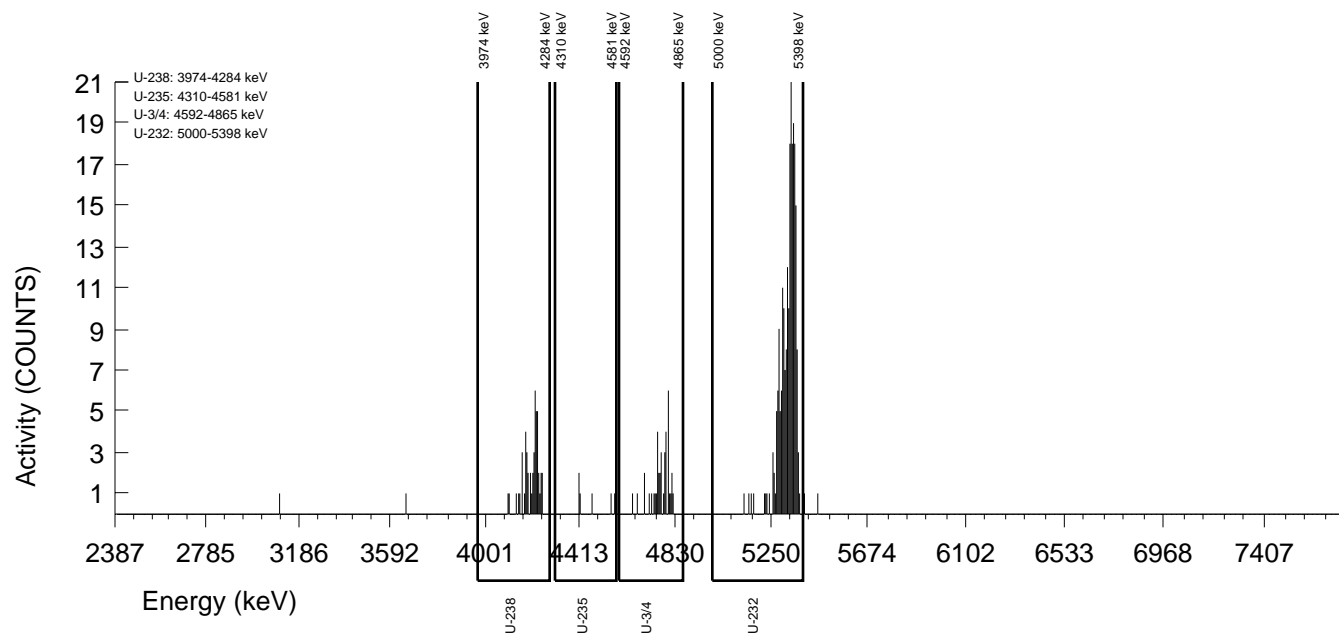
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S0405235015_UU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 81.7 +/-7.426 %	CHAMBER : 113 DETECTOR S/N : 80009 AVERAGE %EFFICIENCY : 24.7132 AVERAGE %EFF ERROR : 0.4794 COUNT DATE : 29-Sep-2016 09:20:16 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B113.CNF;1167 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W113.CNF;318 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6539E+00 dpm RESULTS : 3.8001E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5324.79	58.110	225.000	223.560	1.440	1.2000	100.000	4.12E+00	8.24E-01	1.36E-01	4.05E-02	5.43E-01
U-3/4	4763.02	4770.20	49.156	39.000	36.600	2.400	1.5492	100.000	6.69E-01	2.50E-01	1.59E-01	5.19E-02	2.28E-01
U-235	4391.00	4473.12	7.423	6.000	5.520	0.480	0.6928	99.700	1.01E-01	9.74E-02	1.02E-01	2.33E-02	9.62E-02
U-238	4184.73	4204.64	54.434	49.000	47.800	1.200	1.0954	100.000	8.73E-01	2.86E-01	1.28E-01	3.67E-02	2.54E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T0405235016_UU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 79.3 +/-8.674 % SECONDARY QTY : 0.500 G +/-0.200 %	CHAMBER : 147 DETECTOR S/N : 75550 AVERAGE %EFFICIENCY : 25.4403 AVERAGE %EFF ERROR : 0.4932 COUNT DATE : 29-Sep-2016 09:21:11 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B147.CNF;1093 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W147.CNF;294 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.1236E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4497.15	4385.41	683.96	3.76	100.710	N/A
TRACER 2	1564-I	U-232	4.6539 dpm	5373.12	5302.74	-1.16	223.56	79.985	1.0082

NUCLIDE ACTIVITY SUMMARY

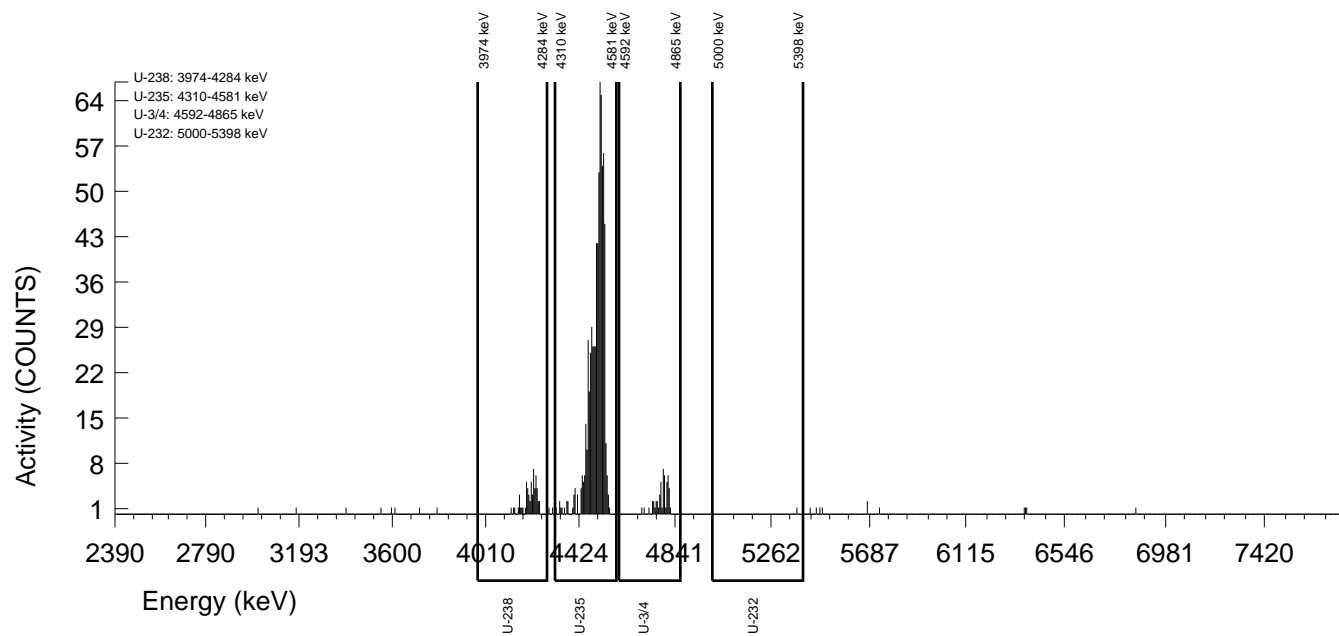
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5373.12	4.973	1.000	-1.160	2.160	1.4697	100.000	-1.71E-02	4.65E-02	1.24E-01	3.98E-02	4.65E-02
U-3/4	4763.02	4782.67	39.369	42.000	40.800	1.200	1.0954	100.000	7.64E-01	2.76E-01	1.31E-01	3.76E-02	2.42E-01
U-235	4391.00	4497.15	39.134	4.000	3.760	0.240	0.4899	99.700	7.06E-02	8.41E-02	9.00E-02	1.68E-02	8.32E-02
U-238	4184.73	4207.27	47.864	38.000	36.800	1.200	1.0954	100.000	6.89E-01	2.60E-01	1.31E-01	3.76E-02	2.30E-01

NOTES:

* Results are a compilation of S0405235016_UU and T0405235016_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



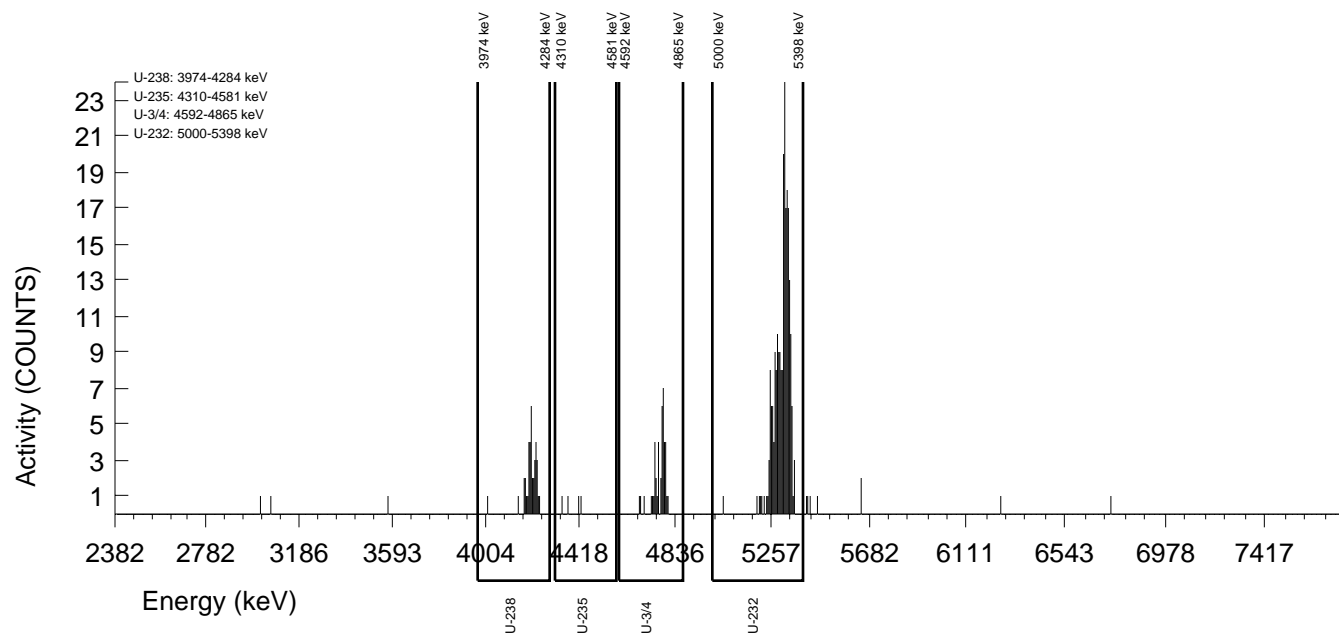
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S0405235016_UU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 80.0 +/-7.426 %	CHAMBER : 115 DETECTOR S/N : 79995 AVERAGE %EFFICIENCY : 25.2291 AVERAGE %EFF ERROR : 0.4892 COUNT DATE : 29-Sep-2016 09:20:17 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B115.CNF;1179 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W115.CNF;335 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6539E+00 dpm RESULTS : 3.7224E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5302.74	29.859	225.000	223.560	1.440	1.2000	100.000	4.18E+00	8.37E-01	1.38E-01	4.11E-02	5.52E-01
U-3/4	4763.02	4766.56	46.447	42.000	40.800	1.200	1.0954	100.000	7.57E-01	2.65E-01	1.30E-01	3.73E-02	2.40E-01
U-235	4391.00	4385.41	84.599	4.000	3.760	0.240	0.4899	99.700	7.00E-02	8.32E-02	8.93E-02	1.67E-02	8.25E-02
U-238	4184.73	4201.07	36.494	38.000	36.800	1.200	1.0954	100.000	6.83E-01	2.50E-01	1.30E-01	3.73E-02	2.28E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389
SAMPLE ID : T0405235017_UU
SAMPLE QTY : 0.501 G +/-0.200 %
SAMPLE DATE : 02-Dec-2015 00:00:00
ANALYST : JXH2
CORRECTED % YIELD : 41.0 +/-10.817 %
SECONDARY QTY : 0.508 G +/-0.197 %

CHAMBER : 148
DETECTOR S/N : 74429
AVERAGE %EFFICIENCY : 24.2876
AVERAGE %EFF ERROR : 0.4715
COUNT DATE : 29-Sep-2016 09:21:13
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : U236
BKG FILE : B148.CNF;1094
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W148.CNF;312
CAL DATE : 09-Sep-2016

TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.1349E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4493.59	4445.45	659.57	-0.24	101.728	N/A
TRACER 2	1564-I	U-232	4.6547 dpm	5309.91	5314.28	1.80	119.08	41.561	1.0149

NUCLIDE ACTIVITY SUMMARY

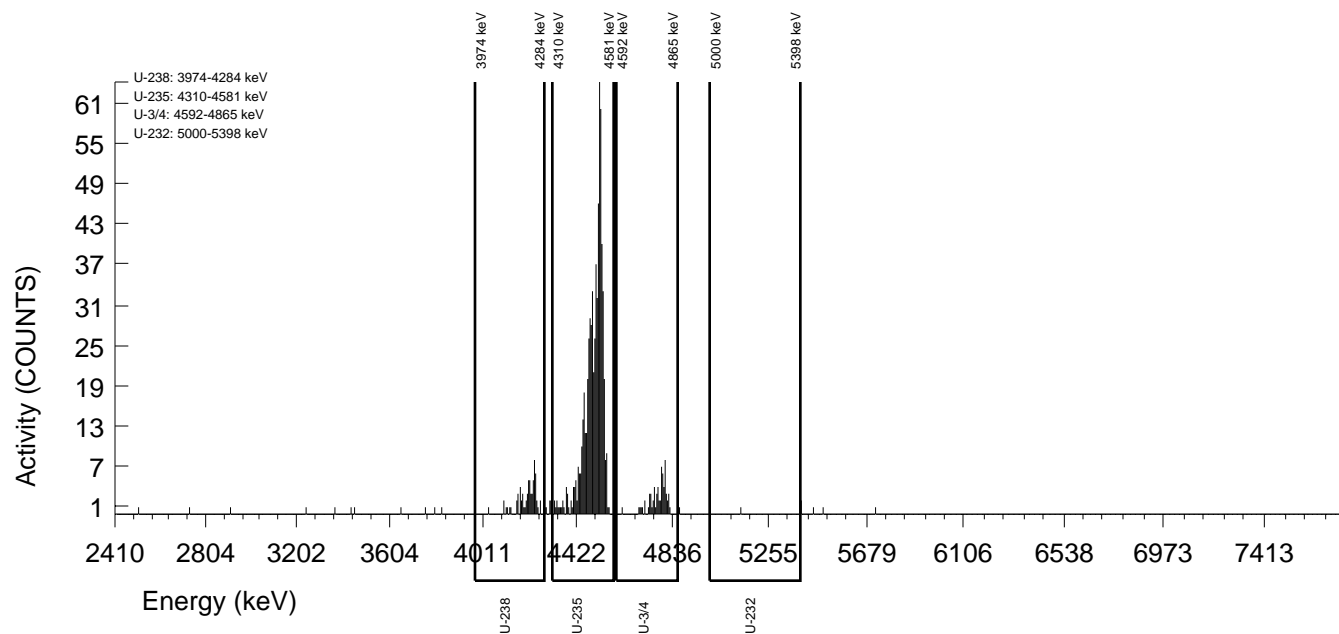
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5309.91	0.000	3.000	1.800	1.200	1.0954	100.000	2.71E-02	6.19E-02	1.06E-01	3.03E-02	6.16E-02
U-3/4	4763.02	4774.44	21.556	30.000	29.520	0.480	0.6928	100.000	1.04E+00	4.48E-01	1.96E-01	4.49E-02	3.87E-01
U-235	4391.00	4493.59	45.448	0.000	-0.240	0.240	0.4899	99.700	-8.51E-03	7.38E-02	1.70E-01	3.18E-02	7.34E-02
U-238	4184.73	4200.78	34.293	39.000	38.040	0.960	0.9798	100.000	1.35E+00	5.27E-01	2.33E-01	6.35E-02	4.40E-01

NOTES:

* Results are a compilation of S0405235017_UU and T0405235017_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



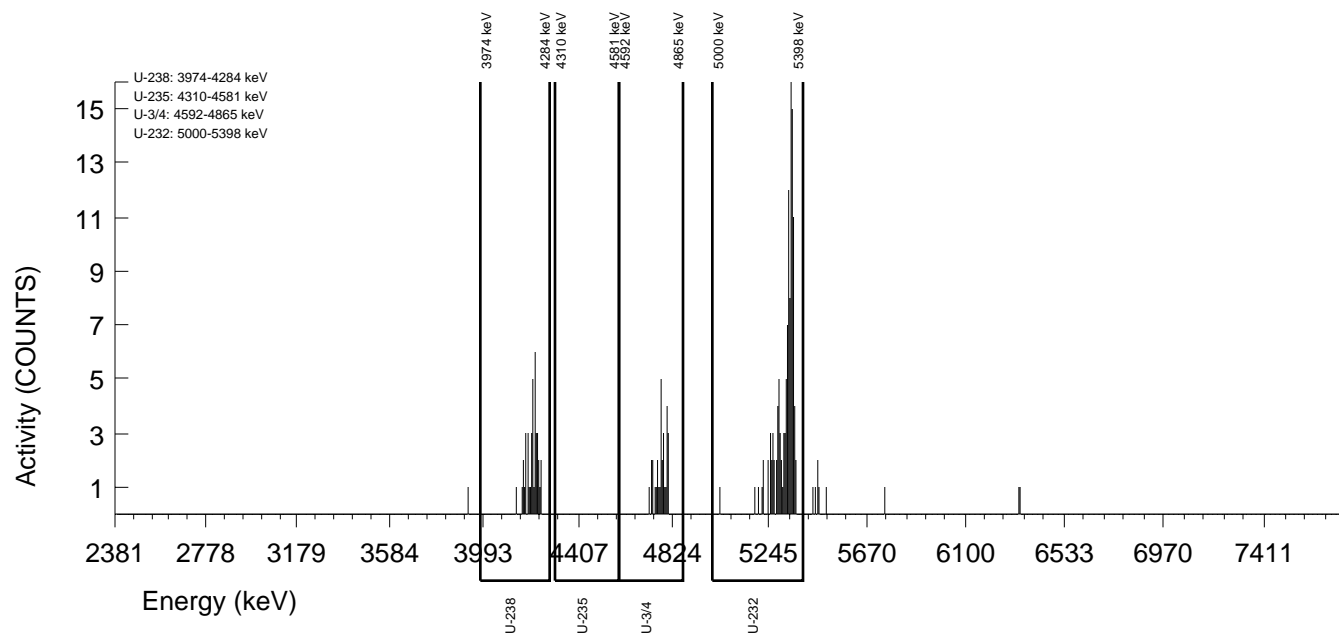
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S0405235017_UU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 41.6 +/-9.811 %	CHAMBER : 116 DETECTOR S/N : 80004 AVERAGE %EFFICIENCY : 25.8624 AVERAGE %EFF ERROR : 0.5011 COUNT DATE : 29-Sep-2016 09:20:21 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B116.CNF;1161 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W116.CNF;295 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6547E+00 dpm RESULTS : 1.9345E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5314.28	25.824	121.000	119.080	1.920	1.3856	100.000	4.19E+00	1.12E+00	2.84E-01	8.92E-02	7.62E-01
U-3/4	4763.02	4770.64	33.545	30.000	29.520	0.480	0.6928	100.000	1.03E+00	4.31E-01	1.93E-01	4.42E-02	3.81E-01
U-235	4391.00	4445.45	0.000	0.000	-0.240	0.240	0.4899	99.700	-8.39E-03	7.27E-02	1.68E-01	3.14E-02	7.24E-02
U-238	4184.73	4207.25	19.756	39.000	38.040	0.960	0.9798	100.000	1.33E+00	5.06E-01	2.30E-01	6.26E-02	4.34E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T0405235018_UU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 68.4 +/-9.097 % SECONDARY QTY : 0.502 G +/-0.199 %	CHAMBER : 149 DETECTOR S/N : 33449 AVERAGE %EFFICIENCY : 25.2769 AVERAGE %EFF ERROR : 0.4901 COUNT DATE : 29-Sep-2016 09:21:16 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B149.CNF;1104 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W149.CNF;305 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0367E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4485.13	4355.28	627.02	0.76	92.924	N/A
TRACER 2	1564-I	U-232	4.6547 dpm	5336.73	5321.48	2.52	199.12	69.646	1.0180

NUCLIDE ACTIVITY SUMMARY

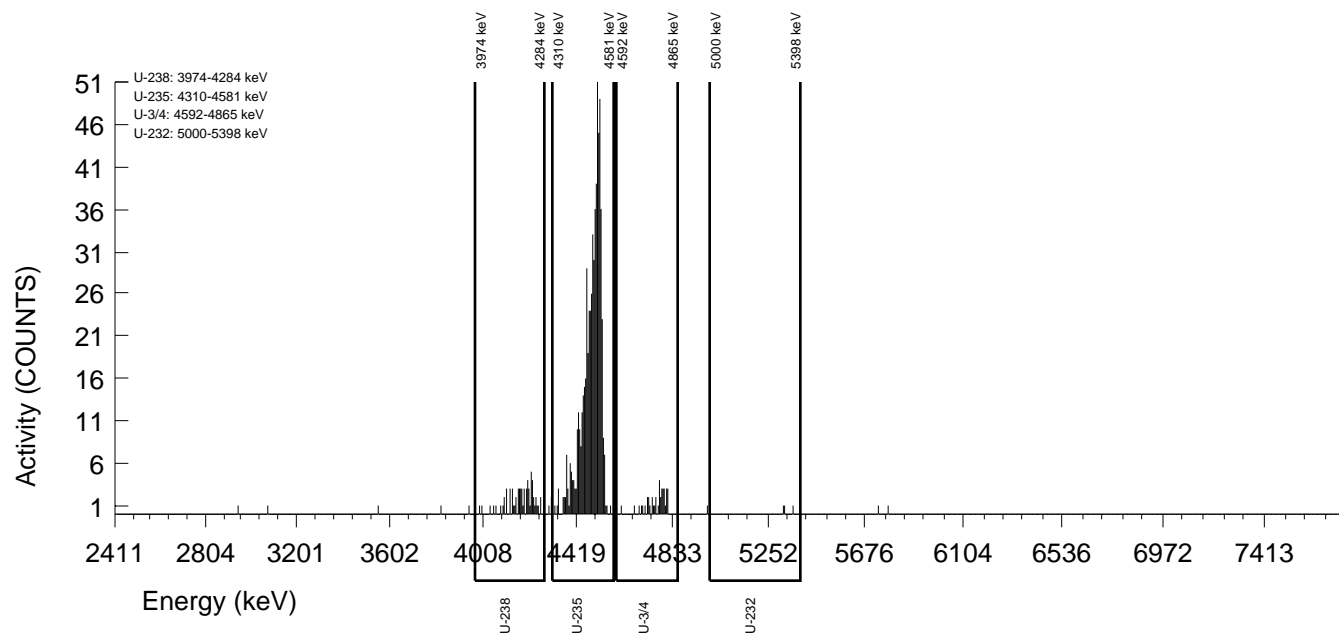
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		Lc pCi/G	1.96-sigma	
										TPU pCi/G	MDA pCi/G		cnt	Unc pCi/G
U-232	5302.10	5336.73	43.948	3.000	2.520	0.480	0.6928	100.000	4.04E-02	6.47E-02	8.89E-02	2.04E-02	6.43E-02	6.43E-02
U-3/4	4763.02	4766.73	39.065	33.000	31.560	1.440	1.2000	100.000	6.71E-01	2.73E-01	1.57E-01	4.67E-02	2.44E-01	2.44E-01
U-235	4391.00	4485.13	63.856	1.000	0.760	0.240	0.4899	99.700	1.62E-02	6.09E-02	1.02E-01	1.91E-02	6.08E-02	6.08E-02
U-238	4184.73	4177.10	111.905	37.000	35.800	1.200	1.0954	100.000	7.61E-01	2.93E-01	1.49E-01	4.27E-02	2.58E-01	2.58E-01

NOTES:

* Results are a compilation of S0405235018_UU and T0405235018_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.009 +/-0.000)



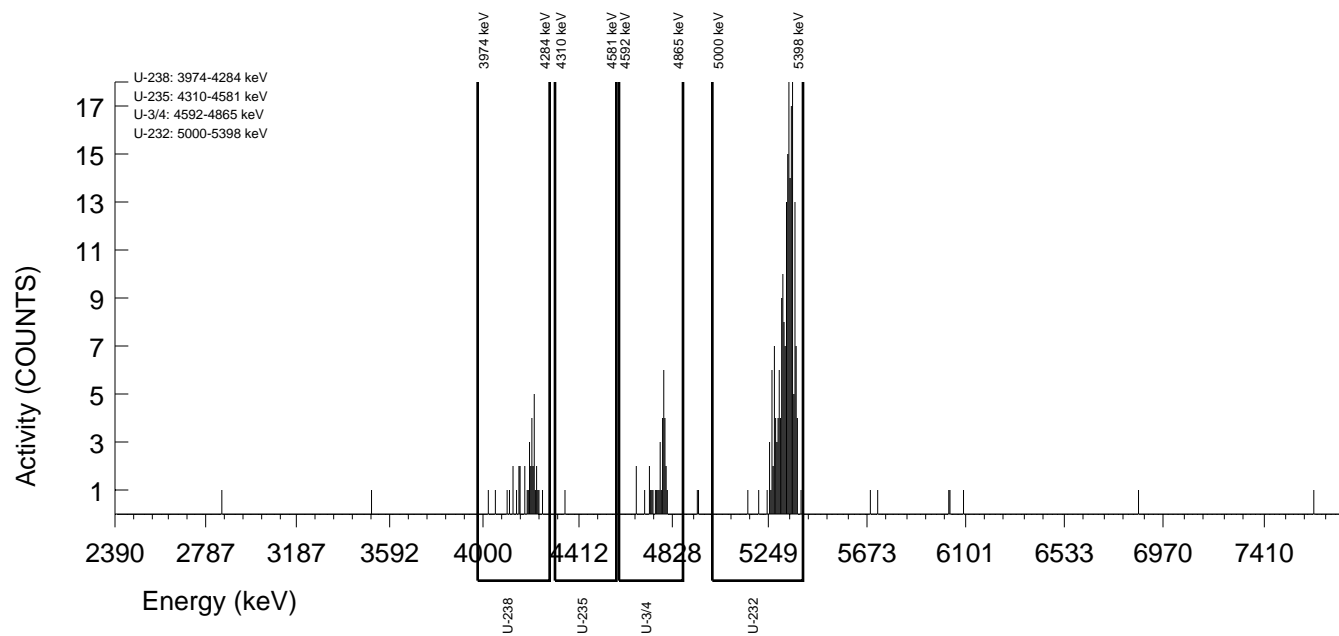
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S0405235018_UU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 69.6 +/-7.825 %	CHAMBER : 117 DETECTOR S/N : 80003 AVERAGE %EFFICIENCY : 25.8068 AVERAGE %EFF ERROR : 0.5001 COUNT DATE : 29-Sep-2016 09:20:23 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B117.CNF;1164 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W117.CNF;308 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6547E+00 dpm RESULTS : 3.2418E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5321.48	57.512	202.000	199.120	2.880	1.6971	100.000	4.19E+00	8.87E-01	1.94E-01	6.55E-02	5.89E-01
U-3/4	4763.02	4764.22	13.967	33.000	31.560	1.440	1.2000	100.000	6.59E-01	2.62E-01	1.54E-01	4.59E-02	2.40E-01
U-235	4391.00	4355.28	4.930	1.000	0.760	0.240	0.4899	99.700	1.59E-02	5.98E-02	1.00E-01	1.88E-02	5.97E-02
U-238	4184.73	4185.79	24.032	37.000	35.800	1.200	1.0954	100.000	7.48E-01	2.80E-01	1.46E-01	4.19E-02	2.53E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T0405235019_UU SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 76.6 +/-8.977 % SECONDARY QTY : 0.506 G +/-0.198 %	CHAMBER : 150 DETECTOR S/N : 75552 AVERAGE %EFFICIENCY : 24.8352 AVERAGE %EFF ERROR : 0.4817 COUNT DATE : 29-Sep-2016 09:21:17 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B150.CNF;1102 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W150.CNF;296 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 8.7346E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4496.47	4406.78	519.06	6.76	78.292	N/A
TRACER 2	1564-I	U-232	4.6539 dpm	5337.91	5307.70	-0.20	219.04	77.214	1.0082

NUCLIDE ACTIVITY SUMMARY

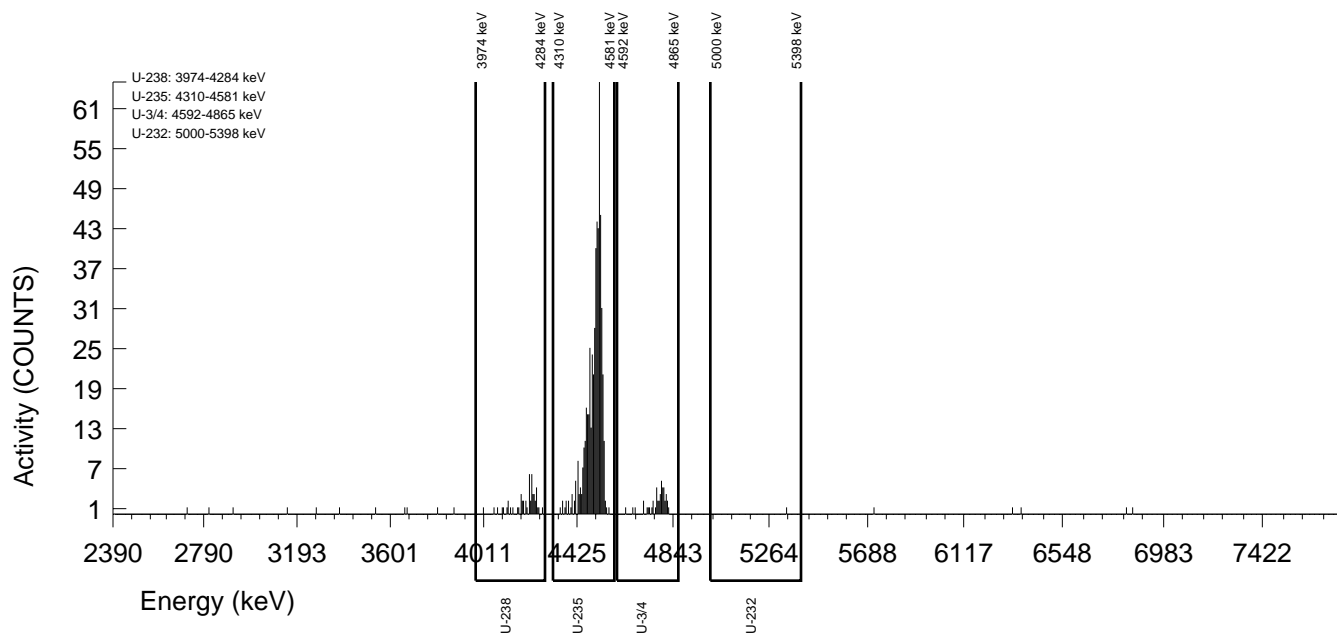
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5337.91	4.978	1.000	-0.200	1.200	1.0954	100.000	-3.85E-03	5.78E-02	1.35E-01	3.86E-02	5.77E-02
U-3/4	4763.02	4768.72	44.803	39.000	39.000	0.000	0.0000	100.000	7.38E-01	2.70E-01	5.67E-02	0.00E+00	2.35E-01
U-235	4391.00	4496.47	27.468	7.000	6.760	0.240	0.4899	99.700	1.28E-01	1.08E-01	9.10E-02	1.70E-02	1.06E-01
U-238	4184.73	4192.11	34.017	49.000	48.760	0.240	0.4899	100.000	9.22E-01	3.11E-01	9.07E-02	1.70E-02	2.62E-01

NOTES:

* Results are a compilation of S0405235019_UU and T0405235019_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.008 +/-0.000)



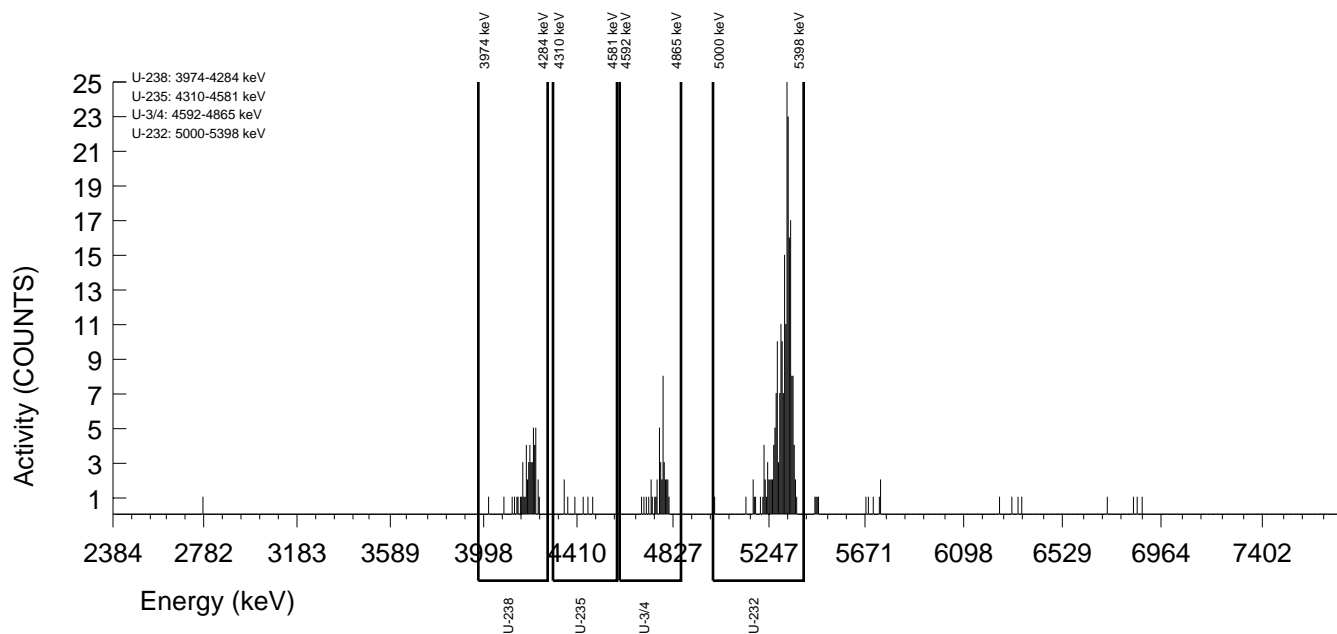
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S0405235019_UU SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 77.2 +/-7.481 %	CHAMBER : 118 DETECTOR S/N : 80061 AVERAGE %EFFICIENCY : 25.6062 AVERAGE %EFF ERROR : 0.4962 COUNT DATE : 29-Sep-2016 09:20:26 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B118.CNF;1173 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W118.CNF;318 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6539E+00 dpm RESULTS : 3.5935E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5307.70	28.785	220.000	219.040	0.960	0.9798	100.000	4.14E+00	8.36E-01	1.25E-01	3.39E-02	5.51E-01
U-3/4	4763.02	4770.44	19.809	39.000	39.000	0.000	0.0000	100.000	7.32E-01	2.58E-01	5.63E-02	0.00E+00	2.33E-01
U-235	4391.00	4406.78	4.952	7.000	6.760	0.240	0.4899	99.700	1.27E-01	1.07E-01	9.02E-02	1.69E-02	1.05E-01
U-238	4184.73	4195.25	58.189	49.000	48.760	0.240	0.4899	100.000	9.15E-01	2.95E-01	9.00E-02	1.68E-02	2.60E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T0405235020_UU SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 78.4 +/-9.102 % SECONDARY QTY : 0.500 G +/-0.200 %	CHAMBER : 152 DETECTOR S/N : 76222 AVERAGE %EFFICIENCY : 24.2896 AVERAGE %EFF ERROR : 0.4714 COUNT DATE : 29-Sep-2016 09:21:21 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B152.CNF;1088 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W152.CNF;285 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.7019E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4488.89	4403.16	563.87	2.76	86.962	N/A
TRACER 2	1564-I	U-232	4.6539 dpm	5061.99	5317.48	0.60	205.36	79.255	1.0108

NUCLIDE ACTIVITY SUMMARY

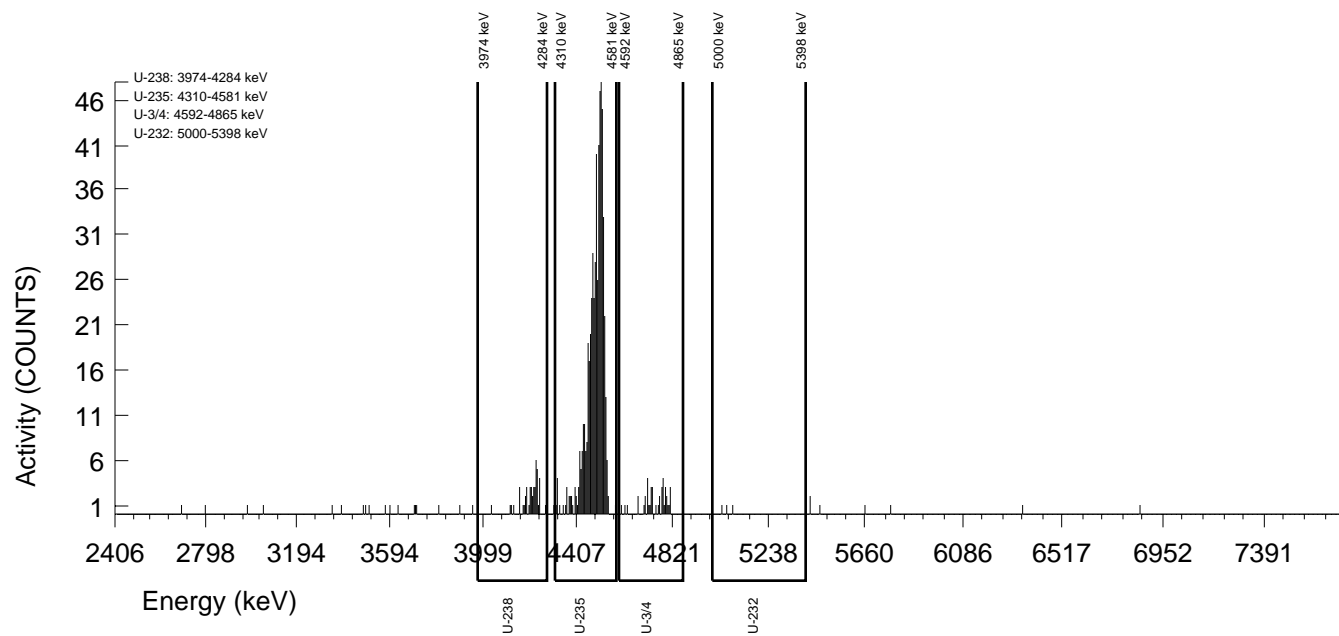
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		Lc pCi/G	1.96-sigma cnt Unc pCi/G
										TPU pCi/G	MDA pCi/G		
U-232	5302.10	5061.99	48.668	3.000	0.600	2.400	1.5492	100.000	1.08E-02	7.57E-02	1.55E-01	5.08E-02	7.56E-02
U-3/4	4763.02	4747.81	96.525	30.000	29.520	0.480	0.6928	100.000	6.02E-01	2.49E-01	1.13E-01	2.59E-02	2.23E-01
U-235	4391.00	4488.89	52.650	3.000	2.760	0.240	0.4899	99.700	5.64E-02	8.20E-02	9.80E-02	1.84E-02	8.13E-02
U-238	4184.73	4208.03	20.684	43.000	41.560	1.440	1.2000	100.000	8.47E-01	3.08E-01	1.51E-01	4.48E-02	2.66E-01

NOTES:

* Results are a compilation of S0405235020_UU and T0405235020_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.009 +/-0.000)



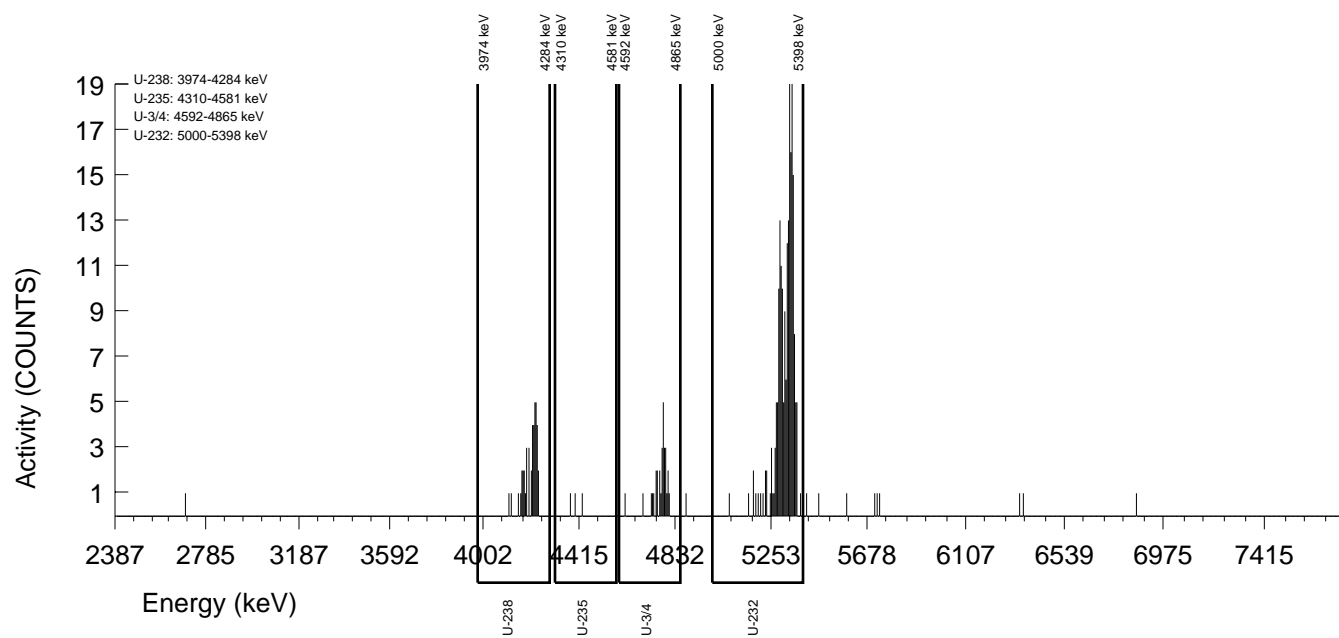
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S0405235020_UU SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 79.3 +/-7.719 %	CHAMBER : 119 DETECTOR S/N : 79450 AVERAGE %EFFICIENCY : 23.3886 AVERAGE %EFF ERROR : 0.4544 COUNT DATE : 29-Sep-2016 09:20:28 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B119.CNF;1182 BKG DATE : 24-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W119.CNF;315 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6539E+00 dpm RESULTS : 3.6885E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5317.48	63.804	208.000	205.360	2.640	1.6248	100.000	4.18E+00	8.71E-01	1.82E-01	6.05E-02	5.77E-01
U-3/4	4763.02	4770.61	17.330	30.000	29.520	0.480	0.6928	100.000	5.95E-01	2.39E-01	1.12E-01	2.56E-02	2.21E-01
U-235	4391.00	4403.16	54.467	3.000	2.760	0.240	0.4899	99.700	5.58E-02	8.09E-02	9.70E-02	1.82E-02	8.04E-02
U-238	4184.73	4203.10	49.515	43.000	41.560	1.440	1.2000	100.000	8.38E-01	2.94E-01	1.49E-01	4.43E-02	2.63E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T1203621691_UU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 26-Sep-2016 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 74.3 +/-8.329 % SECONDARY QTY : 0.509 G +/-0.196 %	CHAMBER : 012 DETECTOR S/N : 80054 AVERAGE %EFFICIENCY : 29.2738 AVERAGE %EFF ERROR : 0.5658 COUNT DATE : 29-Sep-2016 09:13:18 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B012.CNF;1839 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W012.CNF;496 CAL DATE : 27-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0731E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4492.76	4386.49	751.65	0.32	96.184	N/A
TRACER 2	1564-I	U-232	4.6165 dpm	5295.22	5318.39	-1.40	255.04	74.267	1.0001

NUCLIDE ACTIVITY SUMMARY

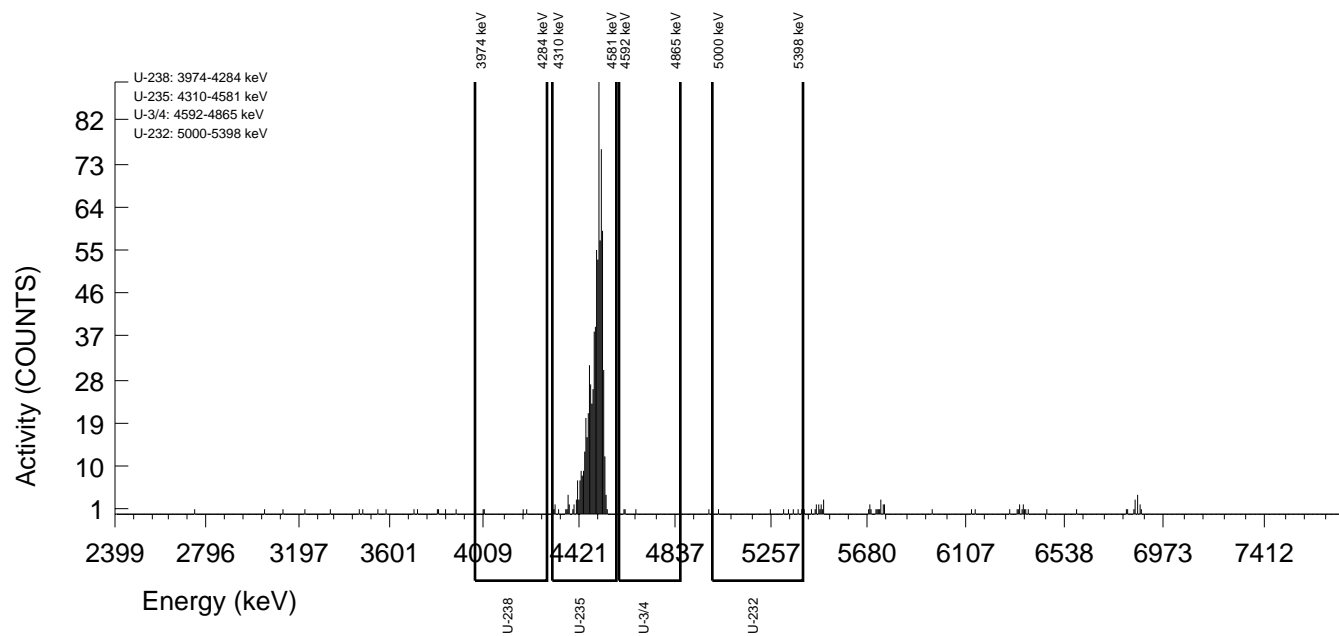
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5295.22	345.512	7.000	-1.400	8.400	2.8983	100.000	-1.83E-02	8.15E-02	1.78E-01	6.95E-02	8.15E-02
U-3/4	4763.02	4637.55	54.295	2.000	-0.400	2.400	1.5492	100.000	-6.41E-03	5.99E-02	1.39E-01	4.55E-02	5.98E-02
U-235	4391.00	4492.76	30.147	2.000	0.320	1.680	1.2961	99.700	5.14E-03	5.86E-02	1.24E-01	3.81E-02	5.86E-02
U-238	4184.73	4096.71	187.564	3.000	1.320	1.680	1.2961	100.000	2.11E-02	6.64E-02	1.24E-01	3.80E-02	6.63E-02

NOTES:

* Results are a compilation of S1203621691_UU and T1203621691_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.011 +/-0.000)



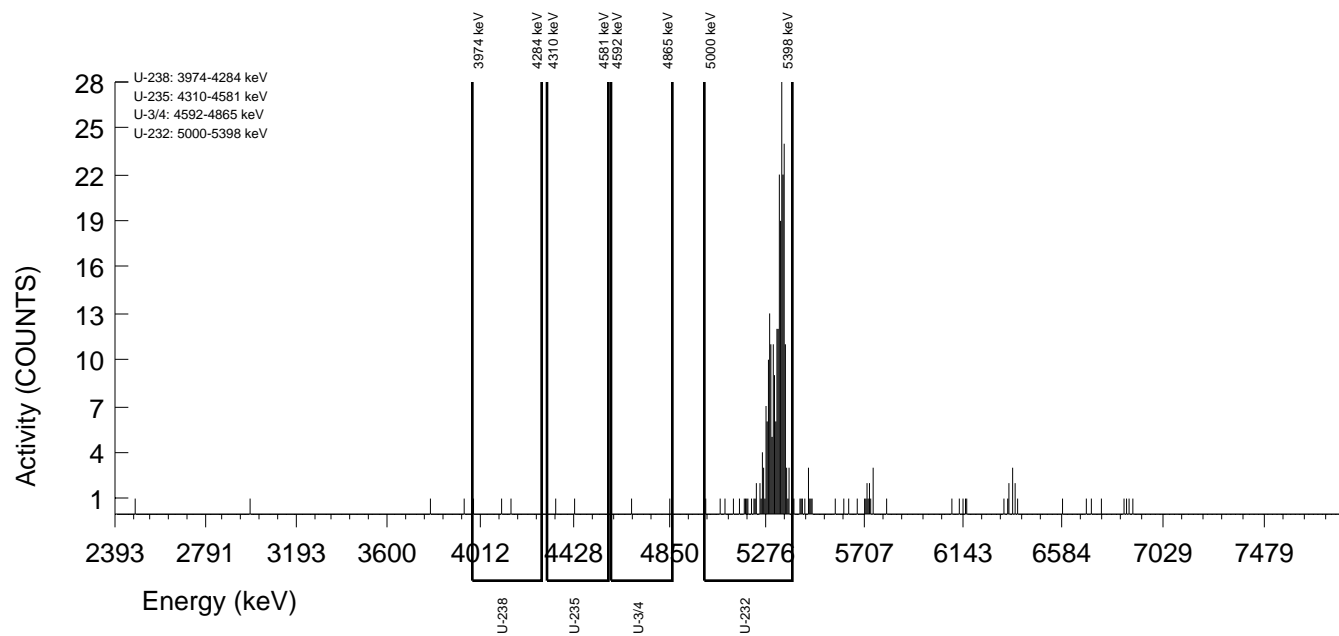
GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S1203621691_UU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 26-Sep-2016 00:00:00 ANALYST : JXH2 % YIELD : 74.3 +/-7.107 %	CHAMBER : 011 DETECTOR S/N : 72531 AVERAGE %EFFICIENCY : 30.9977 AVERAGE %EFF ERROR : 0.5982 COUNT DATE : 29-Sep-2016 09:13:18 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B011.CNF;1835 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W011.CNF;515 CAL DATE : 27-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6165E+00 dpm RESULTS : 3.4285E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5318.39	27.491	262.000	255.040	6.960	2.6382	100.000	4.09E+00	7.80E-01	2.03E-01	7.74E-02	5.11E-01
U-3/4	4763.02	4765.12	162.895	2.000	-0.400	2.400	1.5492	100.000	-6.41E-03	5.99E-02	1.39E-01	4.55E-02	5.98E-02
U-235	4391.00	4386.49	83.916	2.000	0.320	1.680	1.2961	99.700	5.14E-03	5.86E-02	1.24E-01	3.81E-02	5.86E-02
U-238	4184.73	4077.40	162.895	3.000	1.320	1.680	1.2961	100.000	2.11E-02	6.64E-02	1.24E-01	3.80E-02	6.63E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : T1203621692_UU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 78.1 +/-8.958 % SECONDARY QTY : 0.509 G +/-0.196 %	CHAMBER : 154 DETECTOR S/N : 76224 AVERAGE %EFFICIENCY : 26.1126 AVERAGE %EFF ERROR : 0.5058 COUNT DATE : 29-Sep-2016 09:21:23 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B154.CNF;1099 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W154.CNF;304 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 7.7426E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4484.14	4468.67	483.77	5.00	69.400	N/A
TRACER 2	1564-I	U-232	4.6537 dpm	5198.56	5340.29	-1.44	228.56	78.700	1.0081

NUCLIDE ACTIVITY SUMMARY

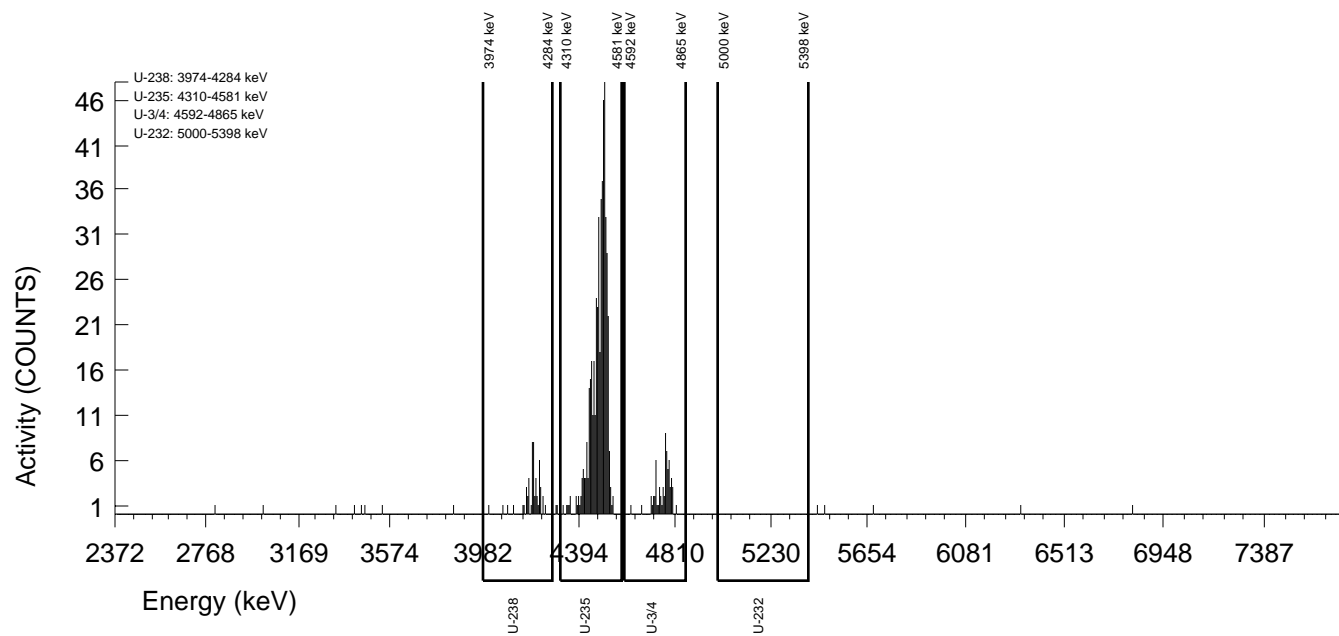
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5198.56	0.000	0.000	-1.440	1.440	1.2000	100.000	-2.95E-02	4.78E-02	1.52E-01	4.51E-02	4.76E-02
U-3/4	4763.02	4764.08	58.629	87.000	86.280	0.720	0.8485	100.000	1.58E+00	4.41E-01	1.12E-01	2.85E-02	3.38E-01
U-235	4391.00	4484.14	42.530	5.000	5.000	0.000	0.0000	99.700	9.20E-02	9.03E-02	5.52E-02	0.00E+00	8.88E-02
U-238	4184.73	4191.98	35.736	59.000	59.000	0.000	0.0000	100.000	1.08E+00	3.40E-01	5.50E-02	0.00E+00	2.79E-01

NOTES:

* Results are a compilation of S1203621692_UU and T1203621692_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.007 +/-0.000)



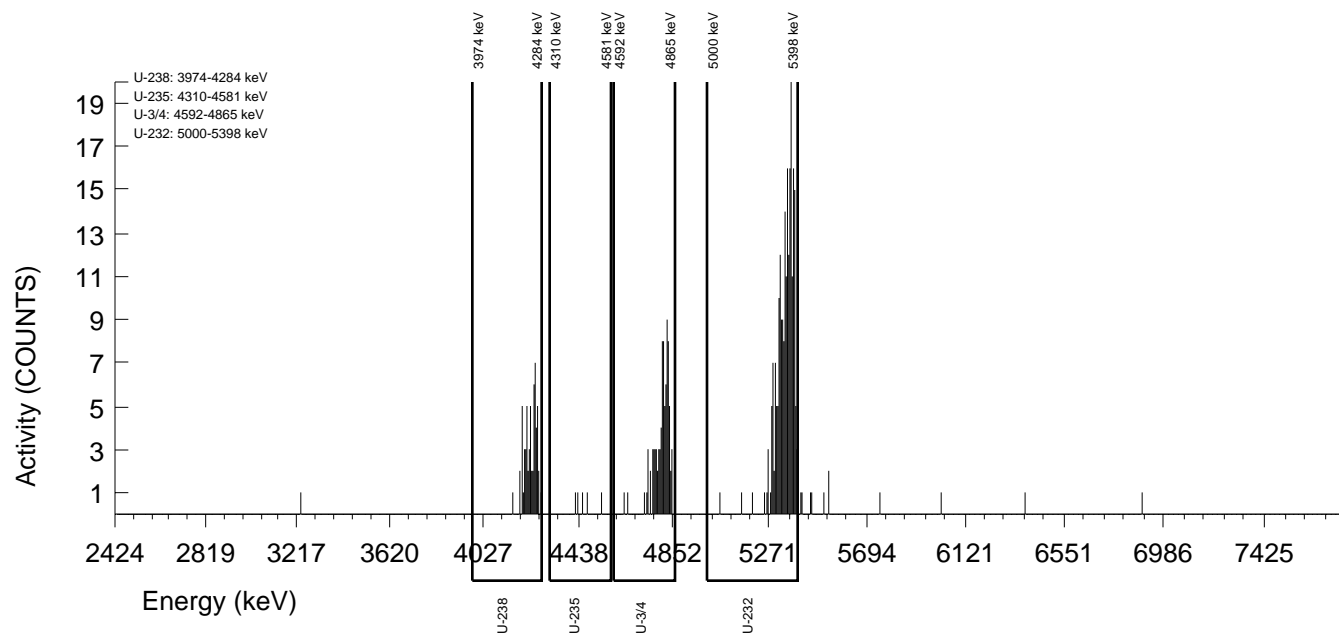
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S1203621692_UU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 78.7 +/-7.358 %	CHAMBER : 121 DETECTOR S/N : 75545 AVERAGE %EFFICIENCY : 26.2144 AVERAGE %EFF ERROR : 0.5077 COUNT DATE : 29-Sep-2016 09:20:31 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B121.CNF;1160 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W121.CNF;322 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6537E+00 dpm RESULTS : 3.6624E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5340.29	66.272	230.000	228.560	1.440	1.2000	100.000	4.19E+00	8.31E-01	1.36E-01	4.03E-02	5.47E-01
U-3/4	4763.02	4801.39	34.568	87.000	86.280	0.720	0.8485	100.000	1.57E+00	4.09E-01	1.11E-01	2.83E-02	3.35E-01
U-235	4391.00	4468.67	112.909	5.000	5.000	0.000	0.0000	99.700	9.12E-02	8.91E-02	5.47E-02	0.00E+00	8.80E-02
U-238	4184.73	4232.01	67.745	59.000	59.000	0.000	0.0000	100.000	1.07E+00	3.19E-01	5.46E-02	0.00E+00	2.76E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

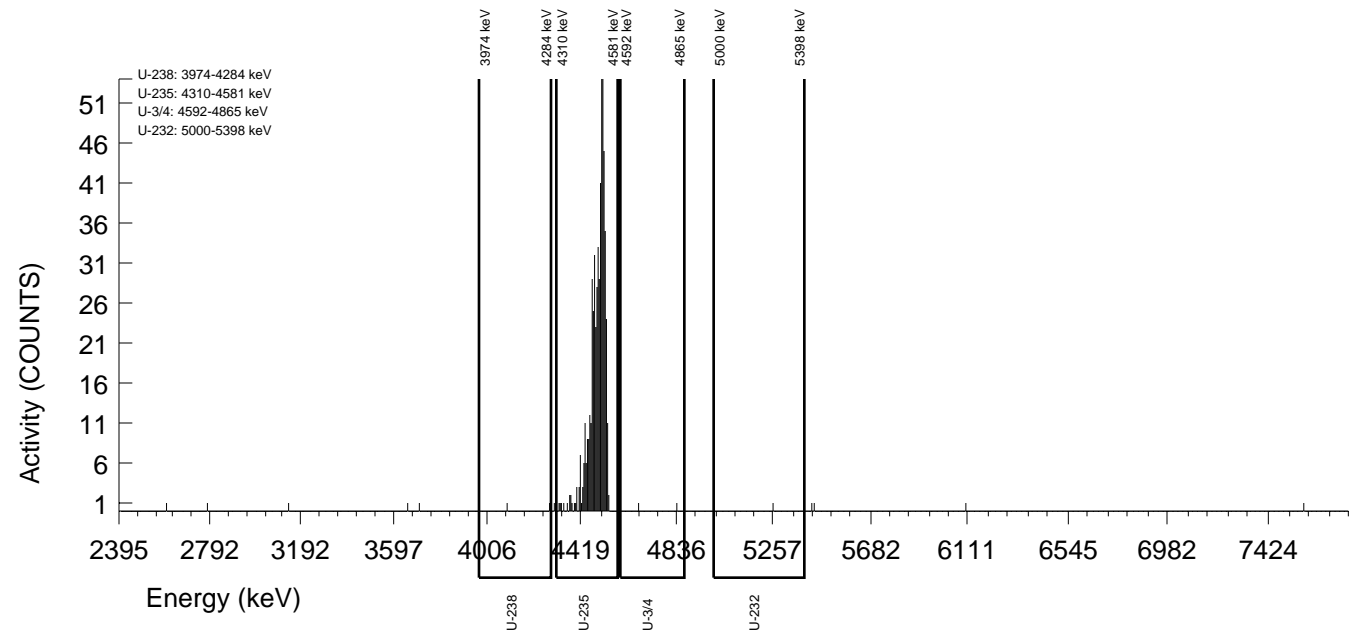
BATCH NUMBER : 1596389 SAMPLE ID : T1203621693_UU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 26-Sep-2016 00:00:00 ANALYST : JXH2 CORRECTED % YIELD : 70.5 +/-9.127 % SECONDARY QTY : 0.509 G +/-0.196 %	CHAMBER : 155 DETECTOR S/N : 75553 AVERAGE %EFFICIENCY : 26.3876 AVERAGE %EFF ERROR : 0.5110 COUNT DATE : 29-Sep-2016 09:21:25 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B155.CNF;1101 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W155.CNF;289 CAL DATE : 09-Sep-2016
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TRACER ID : 1570-E NUCLIDE : U-235 NOMINAL : 1.1123E+01 dpm RESULTS : 8.5034E+00 dpm	LCS ID : 1600-E NUCLIDE : U-238 NOMINAL (pCi/G) : 5.2915E+00 % RECOVERY : 118.401
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TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4488.36	4431.18	536.91	18.76	76.219	N/A
TRACER 2	1564-I	U-232	4.6165 dpm	5256.88	5318.73	-1.16	202.80	70.510	1.0001

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5256.88	4.930	1.000	-1.160	2.160	1.4697	100.000	-2.13E-02	5.78E-02	1.54E-01	4.94E-02	5.77E-02
U-3/4	4763.02	4752.09	162.697	268.000	267.280	0.720	0.8485	100.000	5.38E+00	1.18E+00	1.23E-01	3.13E-02	6.48E-01
U-235	4391.00	4488.36	58.366	19.000	18.760	0.240	0.4899	99.700	3.79E-01	1.91E-01	9.69E-02	1.81E-02	1.78E-01
U-238	4184.73	4186.09	182.418	311.000	311.000	0.000	0.0000	100.000	6.27E+00	1.34E+00	6.04E-02	0.00E+00	6.98E-01

NOTES:
 * Results are a compilation of S1203621693_UU and T1203621693_UU.
 * The following nuclide results were quantified from the U-235 traced sample:
 U-232
 * Correction made to the following net area due to tracer impurity:
 U-238 (0.008 +/-0.000)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

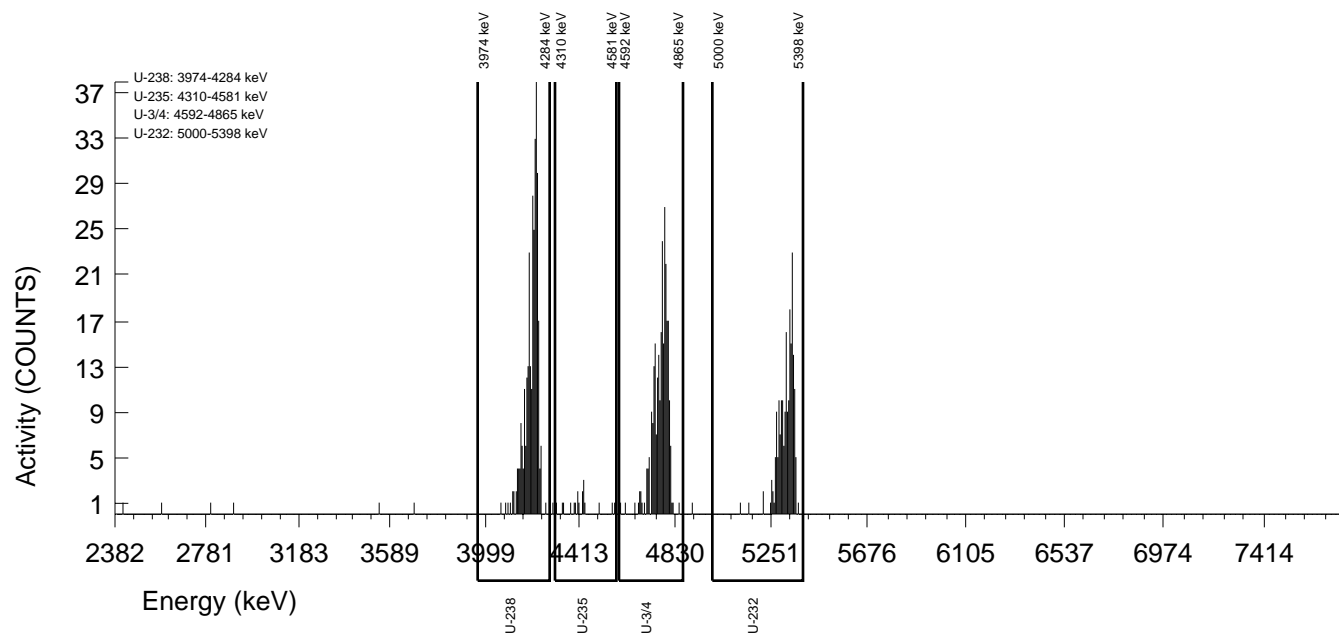
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596389 SAMPLE ID : S1203621693_UU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 26-Sep-2016 00:00:00 ANALYST : JXH2 % YIELD : 70.5 +/-7.731 %	CHAMBER : 122 DETECTOR S/N : 75546 AVERAGE %EFFICIENCY : 25.9617 AVERAGE %EFF ERROR : 0.5030 COUNT DATE : 29-Sep-2016 09:20:33 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B122.CNF;1172 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W122.CNF;334 CAL DATE : 08-Sep-2016
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TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6165E+00 dpm RESULTS : 3.2551E+00 dpm	LCS ID : 1600-E NUCLIDE : U-238 NOMINAL (pCi/G) : 5.2915E+00 % RECOVERY : 118.390
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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5318.73	37.071	204.000	202.800	1.200	1.0954	100.000	4.09E+00	8.53E-01	1.41E-01	4.04E-02	5.66E-01
U-3/4	4763.02	4769.36	60.743	268.000	267.280	0.720	0.8485	100.000	5.38E+00	1.06E+00	1.23E-01	3.13E-02	6.48E-01
U-235	4391.00	4431.18	29.751	19.000	18.760	0.240	0.4899	99.700	3.79E-01	1.87E-01	9.69E-02	1.81E-02	1.78E-01
U-238	4184.73	4205.12	40.889	311.000	311.000	0.000	0.0000	100.000	6.26E+00	1.20E+00	6.04E-02	0.00E+00	6.97E-01



Batch# 11601257 Product: U Date: 9/30/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			Nb
Samples have been blank corrected (if required). Blank correction reported included (if required).			Nb
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.			
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.		✓	Case narrative
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		Case Narrative
Sample was run within hold time.		✓	DER# 1563353
Sample was correctly preserved if required.			Nb
Smears Taken for Radioactive batches.			Nb
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			Nb
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			Nb
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER# 1563353
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER# 1563353
Aliquot Correction completed if required.			Nb
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: Maria Olyash 9/30/16

Secondary Review Performed By: Jessie Davis 10/02/16

1014

DATA EXCEPTION REPORT

Mo.Day Yr. 30-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, U-02-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1601257	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Samples 405235051 and 1203633743 were received and analyzed out of holding.		1. Reporting results.	

Originator's Name:
Melanie Aycock 30-SEP-16

Data Validator/Group Leader:
Jessica Davis 02-OCT-16

pu
S-Run

22-SEP-16

Uranium Que Sheet

Internal Due Date: 01-OCT-16

First Client Due Date: 04-OCT-16

Analyst: KXB2

Batch #: 1601257

Tracer Isotope: U-232/U-236 Tracer Code: 1504-I Expiration Date: 11-23-14 Vol: 0.1 Analyzed Sequentially with Pu Analyzed Sequentially with:

LCS Isotope: U-238 LCS Code: 1000-E Expiration Date: 7-12-17 Vol: 0.1 Pu-236 ID: --- Pu: ---

Spike Isotope: U-238 Spike Code: --- Expiration Date: --- Vol: --- Am: --- Witness: JEH 9-27-16

Prep Date: 9-27-16 Initials: KB Pipet ID: 1640027 Balance ID: 16107162

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	U Det #
405235051-2	4.5B.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	1	1	0.111	7
1203633742-1	MB for batch 1601257	MB		UCF pCi/g to pCi	SOIL	QC ACCOUNT		2	2	0.111	9
1203633743-2	4.5B.R.2.3(405235051DUP)	DUP		1 pCi/g	SOIL	QC ACCOUNT	07-DEC-15	3	3	0.106	8
1203633744-1	LCS for batch 1601257	LCS		UCF pCi/g to pCi	SOIL	QC ACCOUNT		4	4	0.111	10

Choose SOP used: GL-RAD-A-011

Solid Sample Dissolution by: LEACH or DIGESTION
Circle One

Data Reviewed By: Mla. Slat 9/30/16

T-Run
22-SEP-16

Uranium Que Sheet

Batch #: 1601257 Analyst: KXB2 First Client Due Date: 04-OCT-16 Internal Due Date: 01-OCT-16
 Tracer Isotope: U-232/U-236 Tracer Code: 1510-E Expiration Date: 7-18-17 Vol: 0.1 Analyzed Sequentially with Pu Analyzed Sequentially with:
 LCS Isotope: U-238 LCS Code: Expiration Date: Vol: Pu-236 ID: Pu: Pu-236 ID: Pu: Pu: Pu:
 Spike Isotope: U-238 Spike Code: Expiration Date: Vol: Vol: Vol: Am: Am:
 Prep Date: 9-27-16 Initials: KB Pipet ID: 184002L Balance ID: 111010102 Witness: JEH 9/22/16

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	U Det #
405235051-2	4.5B.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	1	1	0.122	12
1203633742-1	MB for batch 1601257	MB		UCF pCi/g to pCi	SOIL	QC ACCOUNT		2	2	0.122	11
1203633743-2	4.5B.R.2.3(405235051DUP)	DUP		1 pCi/g	SOIL	QC ACCOUNT	07-DEC-15	3	3	0.116	20
1203633744-1	LCS for batch 1601257	LCS		UCF pCi/g to pCi	SOIL	QC ACCOUNT		4	4	0.122	21

Choose SOP used: GL-RAD-A-011

Solid Sample Dissolution by: LEACH or DIGESTION
Circle One

Data Reviewed By: M. C. 2016 9/20/16

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1601257 SAMPLE ID : T0405235051_UU SAMPLE QTY : 0.111 G +/-0.901 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 88.3 +/-5.690 % SECONDARY QTY : 0.122 G +/-0.820 %	CHAMBER : 012 DETECTOR S/N : 80054 AVERAGE %EFFICIENCY : 29.2738 AVERAGE %EFF ERROR : 0.5658 COUNT DATE : 29-Sep-2016 14:04:46 ELAPSED LIVE TIME(SEC) : 43200.00	LIB FILE : U236 BKG FILE : B012.CNF;1839 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W012.CNF;496 CAL DATE : 27-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.1185E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4487.35	4415.19	2350.50	5.56	100.260	N/A
TRACER 2	1564-I	U-232	4.6540 dpm	5281.19	5320.37	-1.20	788.84	89.015	1.0082

NUCLIDE ACTIVITY SUMMARY

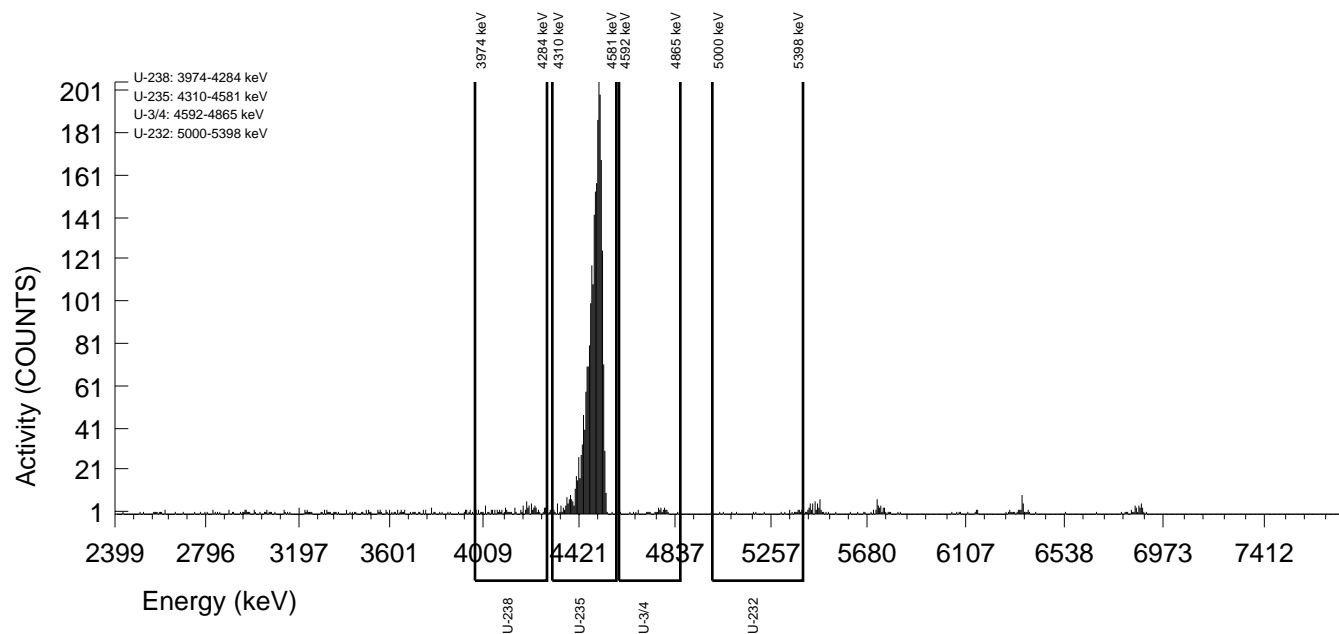
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5281.19	56.763	24.000	-1.200	25.200	5.0200	100.000	-2.11E-02	2.28E-01	4.34E-01	1.91E-01	2.28E-01
U-3/4	4763.02	4751.18	122.163	36.000	30.960	5.040	2.2450	100.000	7.41E-01	3.14E-01	3.04E-01	1.16E-01	3.01E-01
U-235	4391.00	4487.35	50.730	7.000	5.560	1.440	1.2000	99.700	1.34E-01	1.46E-01	1.96E-01	6.22E-02	1.45E-01
U-238	4184.73	4149.67	213.477	42.000	41.280	0.720	0.8485	100.000	9.88E-01	3.33E-01	1.59E-01	4.38E-02	3.11E-01

NOTES:

* Results are a compilation of S0405235051_UU and T0405235051_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.035 +/-0.001)



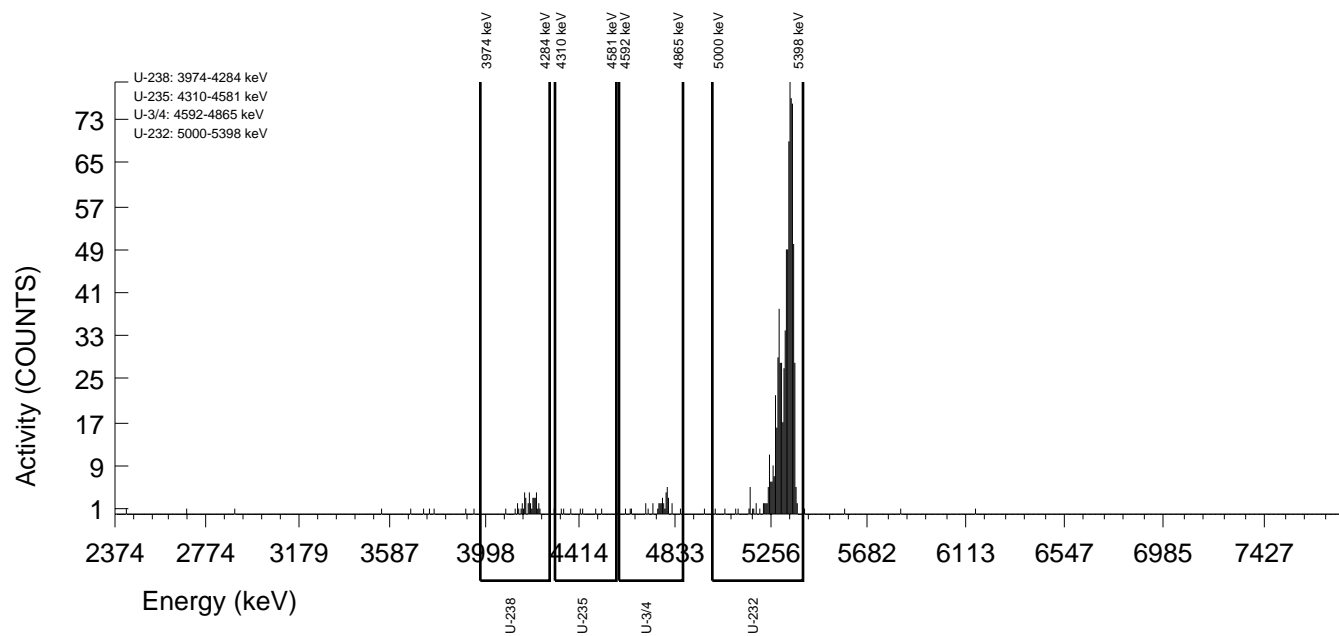
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1601257 SAMPLE ID : S0405235051_UU SAMPLE QTY : 0.111 G +/-0.901 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 89.0 +/-4.754 %	CHAMBER : 007 DETECTOR S/N : 50-066Z1 AVERAGE %EFFICIENCY : 26.6641 AVERAGE %EFF ERROR : 0.5164 COUNT DATE : 29-Sep-2016 14:04:46 ELAPSED LIVE TIME(SEC) : 43200.00	LIB FILE : U236 BKG FILE : B007.CNF;1847 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W007.CNF;505 CAL DATE : 27-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6540E+00 dpm RESULTS : 4.1428E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5320.37	35.142	791.000	788.840	2.160	1.4697	100.000	1.89E+01	2.34E+00	2.24E-01	7.59E-02	1.32E+00
U-3/4	4763.02	4769.46	28.229	36.000	30.960	5.040	2.2450	100.000	7.35E-01	3.08E-01	3.01E-01	1.15E-01	2.99E-01
U-235	4391.00	4415.19	174.353	7.000	5.560	1.440	1.2000	99.700	1.32E-01	1.45E-01	1.95E-01	6.17E-02	1.44E-01
U-238	4184.73	4193.16	56.457	42.000	41.280	0.720	0.8485	100.000	9.80E-01	3.25E-01	1.58E-01	4.35E-02	3.09E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1601257 SAMPLE ID : T1203633742_UU SAMPLE QTY : 0.111 G +/-0.901 % SAMPLE DATE : 27-Sep-2016 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 98.9 +/-5.454 % SECONDARY QTY : 0.122 G +/-0.820 %	CHAMBER : 011 DETECTOR S/N : 72531 AVERAGE %EFFICIENCY : 30.9977 AVERAGE %EFF ERROR : 0.5982 COUNT DATE : 29-Sep-2016 14:04:46 ELAPSED LIVE TIME(SEC) : 43200.00	LIB FILE : U236 BKG FILE : B011.CNF;1835 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W011.CNF;515 CAL DATE : 27-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.6489E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4486.25	4449.26	2147.00	25.12	86.487	N/A
TRACER 2	1564-I	U-232	4.6164 dpm	5245.29	5310.19	-1.88	1026.84	98.860	1.0001

NUCLIDE ACTIVITY SUMMARY

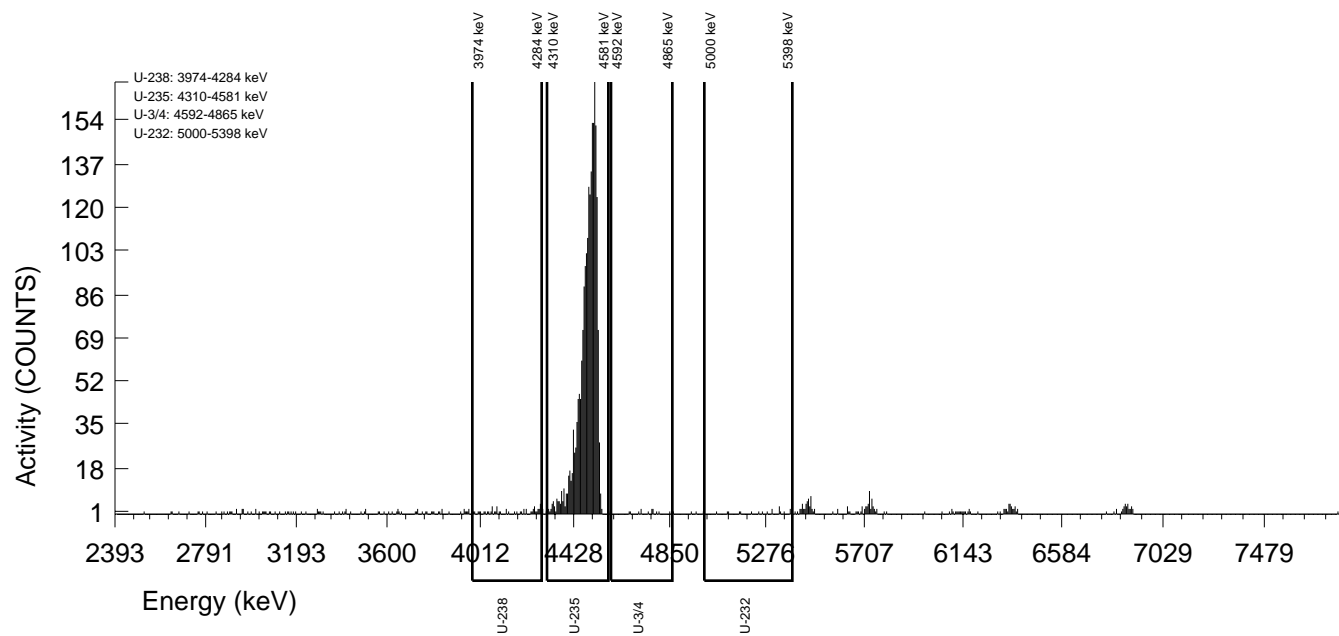
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5245.29	76.511	19.000	-1.880	20.880	4.5695	100.000	-3.60E-02	2.24E-01	4.35E-01	1.89E-01	2.24E-01
U-3/4	4763.02	4761.34	54.298	21.000	18.840	2.160	1.4697	100.000	3.44E-01	1.80E-01	1.70E-01	5.78E-02	1.75E-01
U-235	4391.00	4486.25	59.355	28.000	25.120	2.880	1.6971	99.700	4.60E-01	2.08E-01	1.89E-01	6.70E-02	2.02E-01
U-238	4184.73	4152.91	207.321	21.000	20.280	0.720	0.8485	100.000	3.70E-01	1.77E-01	1.22E-01	3.34E-02	1.72E-01

NOTES:

* Results are a compilation of S1203633742_UU and T1203633742_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.033 +/-0.001)



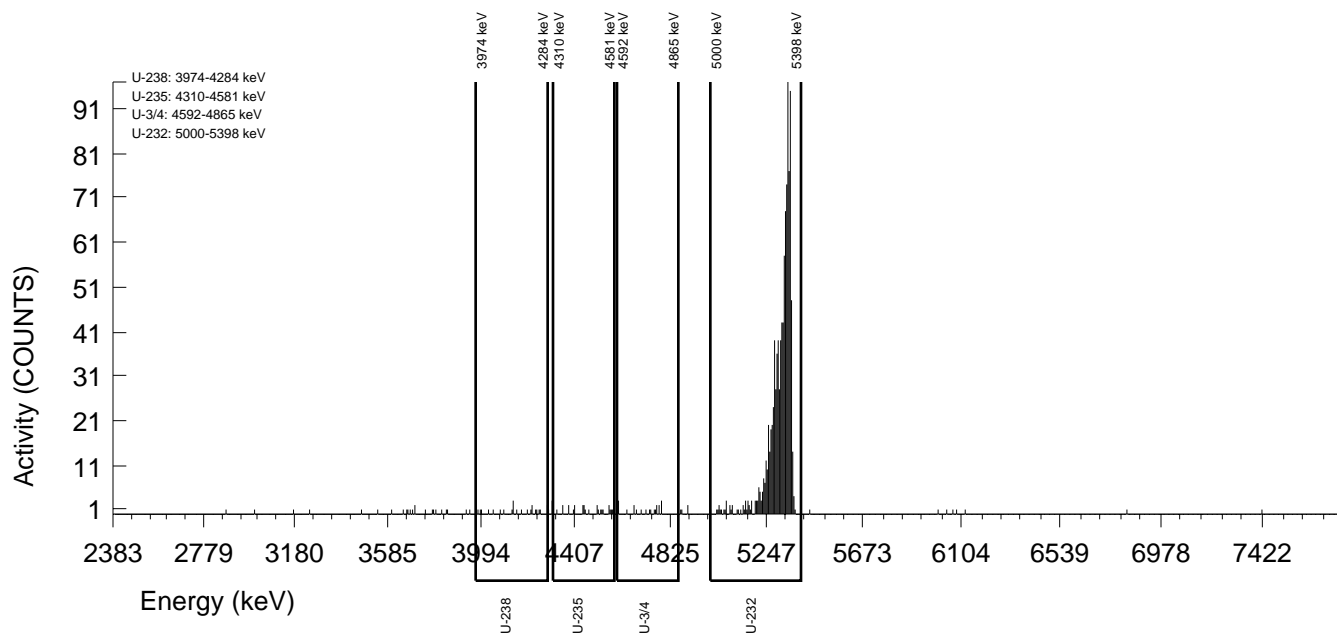
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1601257 SAMPLE ID : S1203633742_UU SAMPLE QTY : 0.111 G +/-0.901 % SAMPLE DATE : 27-Sep-2016 00:00:00 ANALYST : KXB2 % YIELD : 98.9 +/-4.427 %	CHAMBER : 009 DETECTOR S/N : 72528 AVERAGE %EFFICIENCY : 31.2521 AVERAGE %EFF ERROR : 0.6030 COUNT DATE : 29-Sep-2016 14:04:46 ELAPSED LIVE TIME(SEC) : 43200.00	LIB FILE : U236 BKG FILE : B009.CNF;1839 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W009.CNF;516 CAL DATE : 27-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6164E+00 dpm RESULTS : 4.5638E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5310.19	32.632	1029.000	1026.840	2.160	1.4697	100.000	1.87E+01	2.14E+00	1.70E-01	5.78E-02	1.15E+00
U-3/4	4763.02	4710.26	183.543	21.000	18.840	2.160	1.4697	100.000	3.44E-01	1.79E-01	1.70E-01	5.78E-02	1.75E-01
U-235	4391.00	4449.26	0.000	28.000	25.120	2.880	1.6971	99.700	4.60E-01	2.06E-01	1.89E-01	6.70E-02	2.02E-01
U-238	4184.73	4140.51	83.765	21.000	20.280	0.720	0.8485	100.000	3.70E-01	1.75E-01	1.22E-01	3.34E-02	1.72E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1601257 SAMPLE ID : T1203633743_UU SAMPLE QTY : 0.106 G +/-0.943 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 94.8 +/-5.428 % SECONDARY QTY : 0.116 G +/-0.862 %	CHAMBER : 020 DETECTOR S/N : 78787 AVERAGE %EFFICIENCY : 31.0365 AVERAGE %EFF ERROR : 0.5989 COUNT DATE : 29-Sep-2016 14:04:55 ELAPSED LIVE TIME(SEC) : 43199.99	LIB FILE : U236 BKG FILE : B020.CNF;1833 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W020.CNF;562 CAL DATE : 27-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0911E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4474.39	4444.39	2430.94	13.84	97.802	N/A
TRACER 2	1564-I	U-232	4.6540 dpm	5275.55	5306.73	-9.60	1033.68	95.552	1.0082

NUCLIDE ACTIVITY SUMMARY

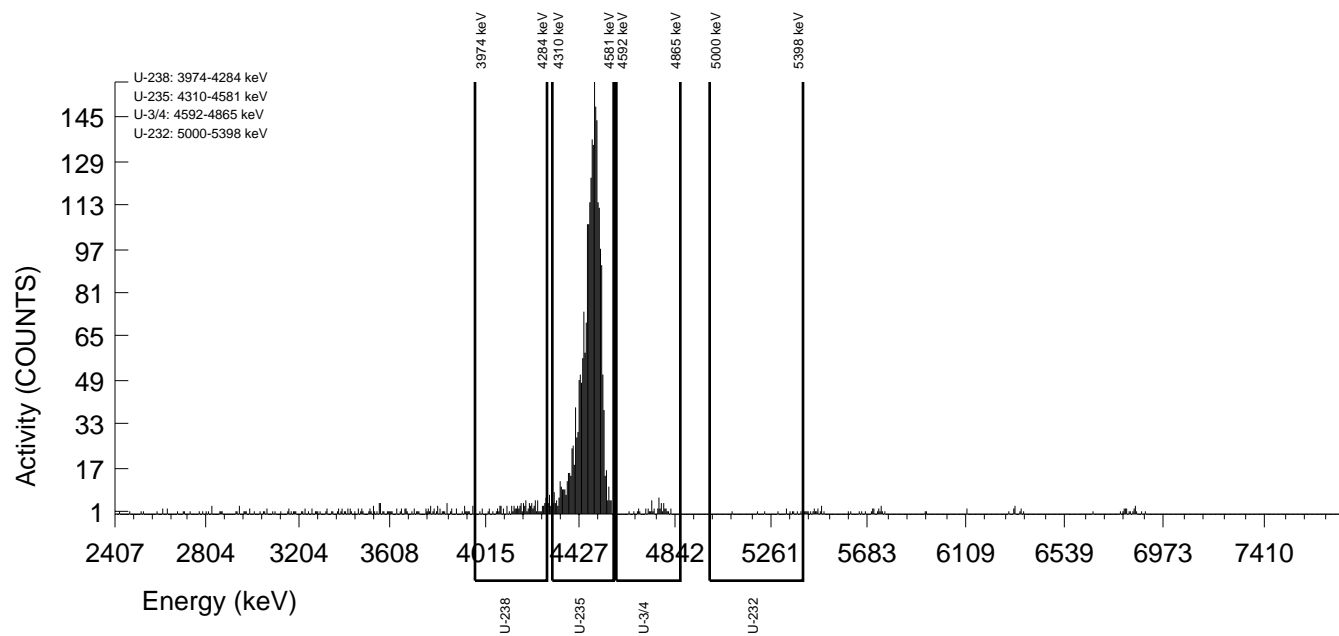
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5275.55	4.933	12.000	-9.600	21.600	4.6476	100.000	-1.72E-01	1.89E-01	4.13E-01	1.80E-01	1.89E-01
U-3/4	4763.02	4760.03	54.266	56.000	53.120	2.880	1.6971	100.000	1.02E+00	3.12E-01	1.98E-01	7.01E-02	2.89E-01
U-235	4391.00	4474.39	64.379	16.000	13.840	2.160	1.4697	99.700	2.66E-01	1.67E-01	1.79E-01	6.08E-02	1.64E-01
U-238	4184.73	4181.73	0.000	58.000	54.400	3.600	1.8974	100.000	1.04E+00	3.19E-01	2.14E-01	7.83E-02	2.96E-01

NOTES:

* Results are a compilation of S1203633743_UU and T1203633743_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.037 +/-0.001)

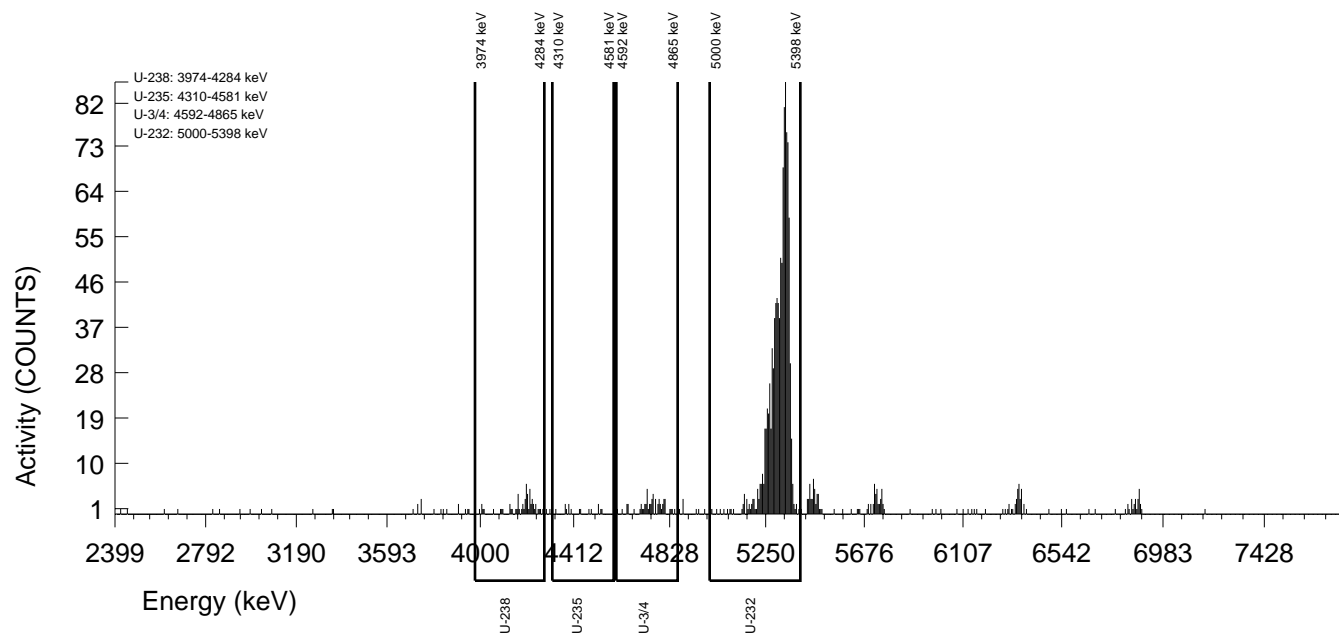


GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER : 1601257 SAMPLE ID : S1203633743_UU SAMPLE QTY : 0.106 G +/-0.943 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 95.6 +/-4.456 %	CHAMBER : 008 DETECTOR S/N : 78788 AVERAGE %EFFICIENCY : 32.5495 AVERAGE %EFF ERROR : 0.6275 COUNT DATE : 29-Sep-2016 14:04:46 ELAPSED LIVE TIME(SEC) : 43200.00	LIB FILE : U236 BKG FILE : B008.CNF;1835 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W008.CNF;517 CAL DATE : 27-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6540E+00 dpm RESULTS : 4.4470E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5306.73	40.123	1056.000	1033.680	22.320	4.7244	100.000	1.98E+01	2.28E+00	4.47E-01	1.95E-01	1.23E+00
U-3/4	4763.02	4746.68	78.113	56.000	53.120	2.880	1.6971	100.000	1.01E+00	3.03E-01	1.96E-01	6.95E-02	2.87E-01
U-235	4391.00	4444.39	141.579	16.000	13.840	2.160	1.4697	99.700	2.63E-01	1.65E-01	1.78E-01	6.04E-02	1.63E-01
U-238	4184.73	4177.09	53.702	58.000	54.400	3.600	1.8974	100.000	1.03E+00	3.10E-01	2.12E-01	7.77E-02	2.93E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1601257 SAMPLE ID : T1203633744_UU SAMPLE QTY : 0.111 G +/-0.901 % SAMPLE DATE : 27-Sep-2016 00:00:00 ANALYST : KXB2 CORRECTED % YIELD : 77.6 +/-5.765 % SECONDARY QTY : 0.122 G +/-0.820 %	CHAMBER : 021 DETECTOR S/N : 795159 AVERAGE %EFFICIENCY : 32.0933 AVERAGE %EFF ERROR : 0.6189 COUNT DATE : 29-Sep-2016 14:04:55 ELAPSED LIVE TIME(SEC) : 43199.99	LIB FILE : U236 BKG FILE : B021.CNF;1835 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W021.CNF;539 CAL DATE : 27-Sep-2016
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TRACER ID : 1570-E NUCLIDE : U-235 NOMINAL : 1.1123E+01 dpm RESULTS : 9.1790E+00 dpm	LCS ID : 1600-E NUCLIDE : U-238 NOMINAL (pCi/G) : 2.4265E+01 % RECOVERY : 103.164
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TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4473.72	4437.62	2114.64	63.28	82.275	N/A
TRACER 2	1564-I	U-232	4.6164 dpm	5282.36	5305.41	3.64	798.20	77.926	1.0039

NUCLIDE ACTIVITY SUMMARY

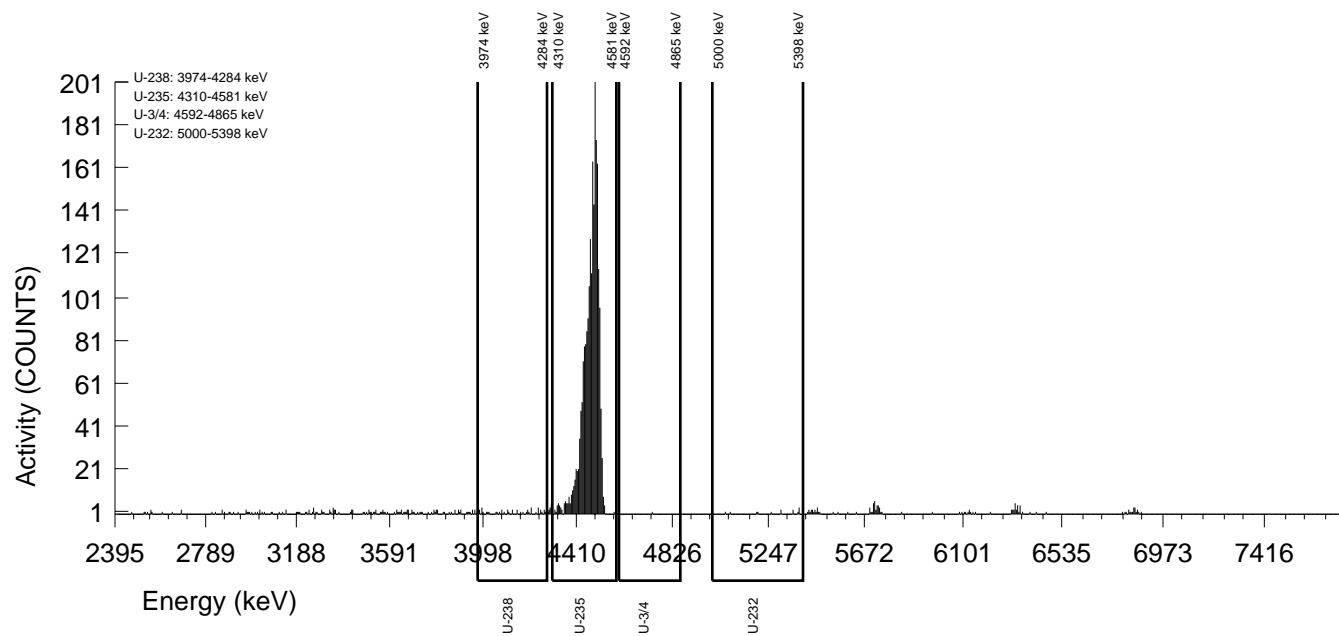
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5282.36	77.195	13.000	3.640	9.360	3.0594	100.000	7.07E-02	1.76E-01	3.15E-01	1.28E-01	1.76E-01
U-3/4	4763.02	4669.77	142.136	1064.000	1058.960	5.040	2.2450	100.000	2.49E+01	3.36E+00	2.99E-01	1.14E-01	1.51E+00
U-235	4391.00	4473.72	44.683	64.000	63.280	0.720	0.8485	99.700	1.50E+00	4.17E-01	1.57E-01	4.33E-02	3.76E-01
U-238	4184.73	4139.53	274.470	1064.000	1062.560	1.440	1.2000	100.000	2.50E+01	3.37E+00	1.93E-01	6.10E-02	1.51E+00

NOTES:

* Results are a compilation of S1203633744_UU and T1203633744_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.033 +/-0.001)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

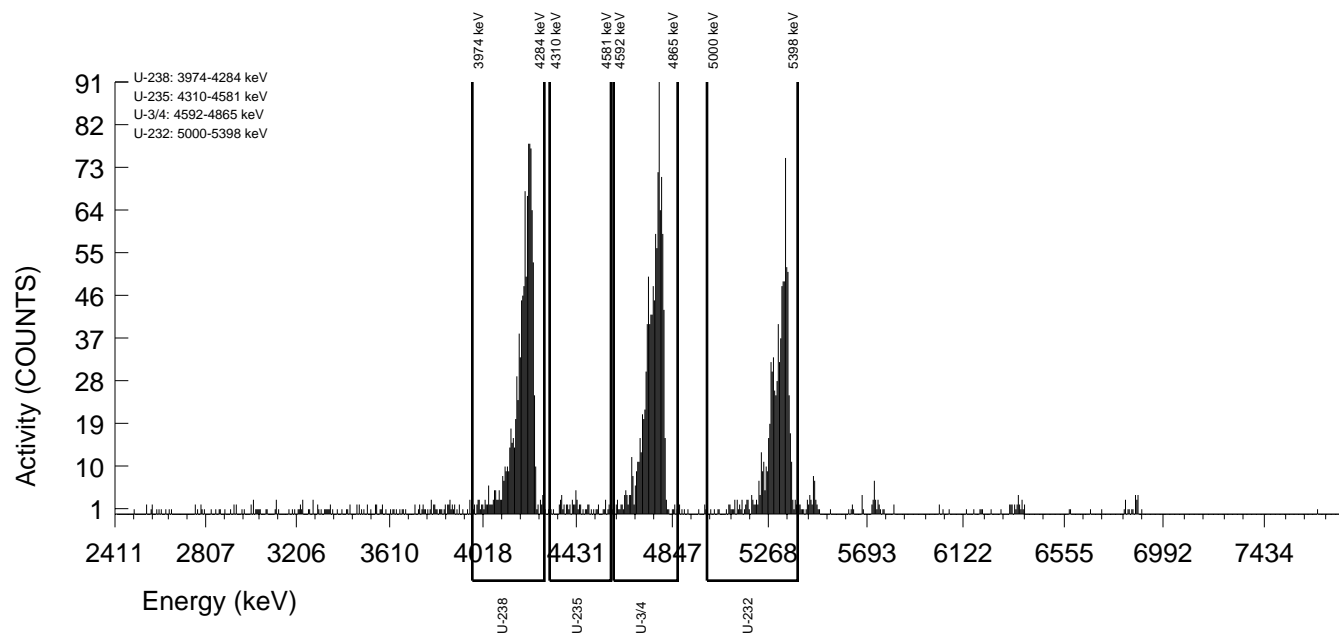
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1601257 SAMPLE ID : S1203633744_UU SAMPLE QTY : 0.111 G +/-0.901 % SAMPLE DATE : 27-Sep-2016 00:00:00 ANALYST : KXB2 % YIELD : 77.9 +/-4.811 %	CHAMBER : 010 DETECTOR S/N : 72529 AVERAGE %EFFICIENCY : 30.8196 AVERAGE %EFF ERROR : 0.5949 COUNT DATE : 29-Sep-2016 14:04:46 ELAPSED LIVE TIME(SEC) : 43200.00	LIB FILE : U236 BKG FILE : B010.CNF;1843 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W010.CNF;513 CAL DATE : 27-Sep-2016
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TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6164E+00 dpm RESULTS : 3.5974E+00 dpm	LCS ID : 1600-E NUCLIDE : U-238 NOMINAL (pCi/G) : 2.4265E+01 % RECOVERY : 102.768
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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5305.41	42.918	827.000	798.200	28.800	5.3666	100.000	1.87E+01	2.35E+00	6.14E-01	2.72E-01	1.34E+00
U-3/4	4763.02	4762.11	65.372	1064.000	1058.960	5.040	2.2450	100.000	2.49E+01	2.97E+00	2.98E-01	1.14E-01	1.50E+00
U-235	4391.00	4437.62	190.144	64.000	63.280	0.720	0.8485	99.700	1.49E+00	4.05E-01	1.57E-01	4.31E-02	3.75E-01
U-238	4184.73	4191.08	54.093	1064.000	1062.560	1.440	1.2000	100.000	2.49E+01	2.98E+00	1.92E-01	6.08E-02	1.50E+00



Batch# 1596408 Product: U Date: 9/29/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater than 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		Case narrative
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	DATA 1562825
Sample was correctly preserved if required.	•		NA
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DATA 1562825
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DATA 1562825
Aliquot Correction completed if required.			NA
Review sample historical results if available (IF REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: M. Carroll 9/29/16

Secondary Review Performed By: Jessie Davis 09/30/16

6/14

DATA EXCEPTION REPORT

Mo.Day Yr. 29-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, U-02-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596408	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. 1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060, and 1203621740 were received and analyzed out of holding.</p>		<p>1. Reporting results.</p>	

Originator's Name:

Melanie Aycock 29-SEP-16

Data Validator/Group Leader:

Jessica Davis 30-SEP-16

Uranium Que Sheet

S-RUN 07-SEP-16

Batch #: 1596408 Analyst: HAKB First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16
 Tracer Isotope: U-232/U-236 Tracer Code: 1564-J Expiration Date: 11/23/16 Vol: 0.1
 LCS Isotope: U-238 LCS Code: 1600-E Expiration Date: 7/12/17 Vol: 0.1
 Spike Isotope: U-238 Spike Code: --- Expiration Date: --- Vol: ---
 Prep Date: 9/20/16 Initials: AKB Pipet ID: 1840022 Balance ID: 16107662

Analyzed Sequentially with Pu Analyzed Sequentially with:
 Pu-236 ID: MA Vol: ---
 Am: 1596410
 Witness: Jeff 9/20/16

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	U Det #
405235041-1	4.4D.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	1		0.509	15
405235042-1	4.4D.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	2		0.500	16
405235043-1	4.4D.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	3		0.507	17
405235044-1	4.4D.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	4		0.505	18
405235045-1	4.4D.R.5.2	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	5		0.502	20
405235046-1	4.5A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	6		0.514	21
405235047-1	4.5A.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	7		0.503	24
405235048-1	4.5B.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	8		0.507	113
405235049-1	4.5B.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	9		0.506	114
405235050-1	4.5B.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	10		0.504	115
405235051-1	4.5B.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	11		0.502	116
405235052-1	4.5B.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	12		0.508	117
405235053-1	4.5C.R.5.2	SAMPLE		1 pCi/g	SOIL	MJWC001	01-DEC-15	13		0.500	118
405235054-1	4.5C.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	14		0.500	119
405235055-1	4.5C.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	15		0.510	120, 13
405235056-1	4.5C.R.2.2	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	16		0.509	121
405235057-1	4.5C.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	17		0.506	122
405235058-1	4.5C.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	18		0.512	124
405235059-1	5.1A.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	16-DEC-15	19		0.503	126
405235060-1	5.1A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	16-DEC-15	20		0.515	127
1203621739-1	MB for batch 1596408	MB		1 pCi/g	SOIL	QC ACCOUNT		21		0.515	128
1203621740-1	4.4D.R.1.4(405235041DUP)	DUP		1 pCi/g	SOIL	QC ACCOUNT	30-NOV-15	22		0.511	129, 14
1203621741-1	LCS for batch 1596408	LCS		1 pCi/g	SOIL	QC ACCOUNT		23		0.515	130, 15

Choose SOP used: GL-RAD-A-011 Solid Sample Dissolution by: LEACH ON DIGESTION Data Reviewed By: M. Sandberg 9/23/16
 Circle One

Uranium Que Sheet

T-RUN 07-SEP-16

Batch #: 1596408 Analyst: HAKB First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16
 Tracer Isotope: U-234(U-236) Tracer Code: 1570-6 Expiration Date: 7/18/17 Vol: 0.1
 LCS Isotope: U-238 LCS Code: Expiration Date: Vol: Pu-236 ID: ~~MA~~
 Spike Isotope: U-238 Spike Code: Expiration Date: Vol: Pu: ~~MA~~
 Prep Date: 9/20/16 Initials: ~~HAKB~~ Pipet ID: 1840022 Balance ID: 16107662 Am: Witness: ~~AKB~~ 9/20/16

Analyzed Sequentially with Pu Analyzed Sequentially with:
 Pu-236 ID: ~~MA~~ Vol: Pu: ~~MA~~
 Vol: Am: Witness: ~~AKB~~ 9/20/16

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	U Det #
405235041-1	4.4D.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	1	1	0.511	12176
405235042-1	4.4D.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	2	2	0.501	132
405235043-1	4.4D.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	3	3	0.513	133
405235044-1	4.4D.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	4	4	0.506	134
405235045-1	4.4D.R.5.2	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	5	5	0.513	139
405235046-1	4.5A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	6	6	0.512	140
405235047-1	4.5A.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	7	7	0.507	142
405235048-1	4.5B.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	8	8	0.503	143
405235049-1	4.5B.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	9	9	0.503	144
405235050-1	4.5B.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	10	10	0.510	145
405235051-1	4.5B.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	11	11	0.507	146
405235052-1	4.5B.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	12	12	0.508	147
405235053-1	4.5C.R.5.2	SAMPLE		1 pCi/g	SOIL	MJWC001	01-DEC-15	13	13	0.503	148
405235054-1	4.5C.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	14	14	0.500	149
405235055-1	4.5C.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	15	15	0.502	150
405235056-1	4.5C.R.2.2	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	16	16	0.508	152
405235057-1	4.5C.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	17	17	0.504	151
405235058-1	4.5C.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	18	18	0.501	155
405235059-1	5.1A.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	16-DEC-15	19	19	0.503	156
405235060-1	5.1A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	16-DEC-15	20	20	0.512	157
1203621739-1	MB for batch 1596408	MB		1 pCi/g	SOIL	QC ACCOUNT		21	21	0.515	158
1203621740-1	4.4D.R.1.4(405235041DUP)	DUP		1 pCi/g	SOIL	QC ACCOUNT	30-NOV-15	22	22	0.508	159
1203621741-1	LCS for batch 1596408	LCS		1 pCi/g	SOIL	QC ACCOUNT		23	23	0.513	160

Choose SOP used: GL-RAD-A-011 Solid Sample Dissolution by: LEACH or DIGESTION Data Reviewed By: M. S. ... 9/23/16
 Circle One

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T0405235041_UU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 83.9 +/-7.998 % SECONDARY QTY : 0.511 G +/-0.196 %	CHAMBER : 016 DETECTOR S/N : 78774 AVERAGE %EFFICIENCY : 33.4185 AVERAGE %EFF ERROR : 0.6439 COUNT DATE : 22-Sep-2016 14:24:56 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B016.CNF;1809 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W016.CNF;494 CAL DATE : 27-Aug-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 8.0518E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4451.57	4496.89	643.85	1.35	72.172	N/A
TRACER 2	1564-I	U-232	4.6549 dpm	5251.75	5306.36	0.96	308.52	84.905	1.0118

NUCLIDE ACTIVITY SUMMARY

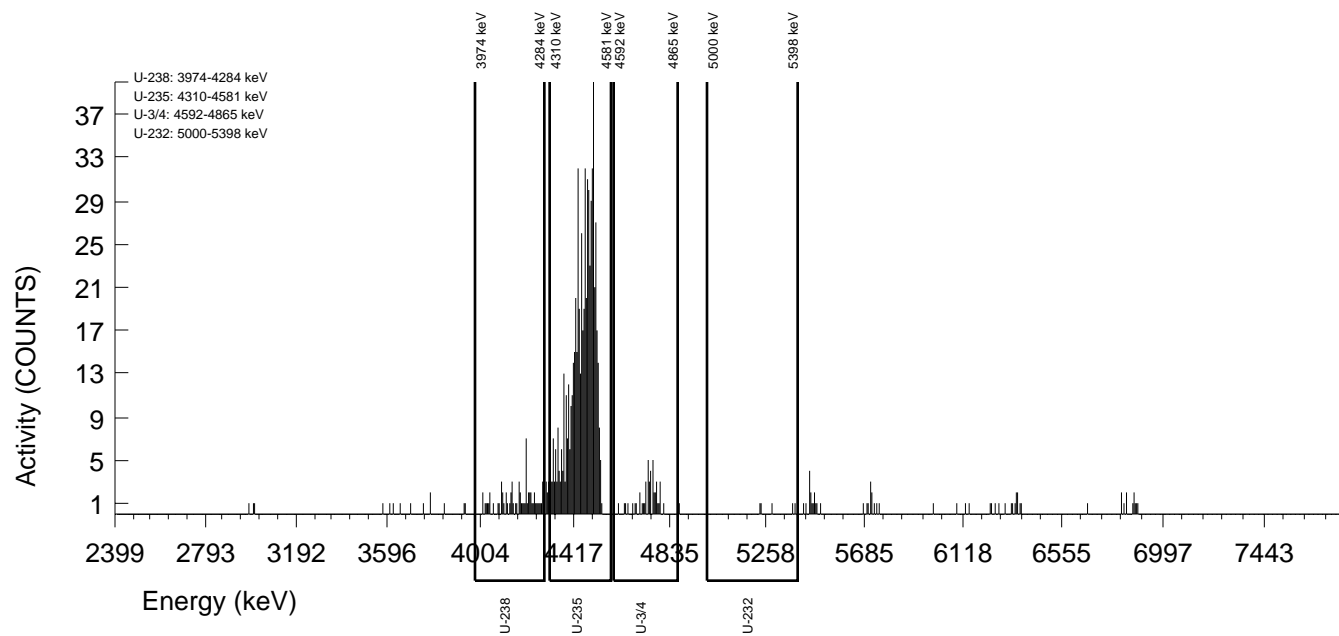
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5251.75	0.000	6.000	0.960	5.040	2.2450	100.000	1.47E-02	8.66E-02	1.72E-01	6.31E-02	8.65E-02
U-3/4	4763.02	4739.26	60.781	61.000	59.821	1.179	1.0860	100.000	8.02E-01	2.44E-01	9.34E-02	2.66E-02	2.07E-01
U-235	4391.00	4451.57	80.309	3.000	1.349	1.651	1.2849	99.700	1.81E-02	5.56E-02	1.03E-01	3.16E-02	5.55E-02
U-238	4184.73	4166.24	5.711	53.000	52.528	0.472	0.6868	100.000	7.04E-01	2.24E-01	7.39E-02	1.68E-02	1.93E-01

NOTES:

* Results are a compilation of S0405235041_UU and T0405235041_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



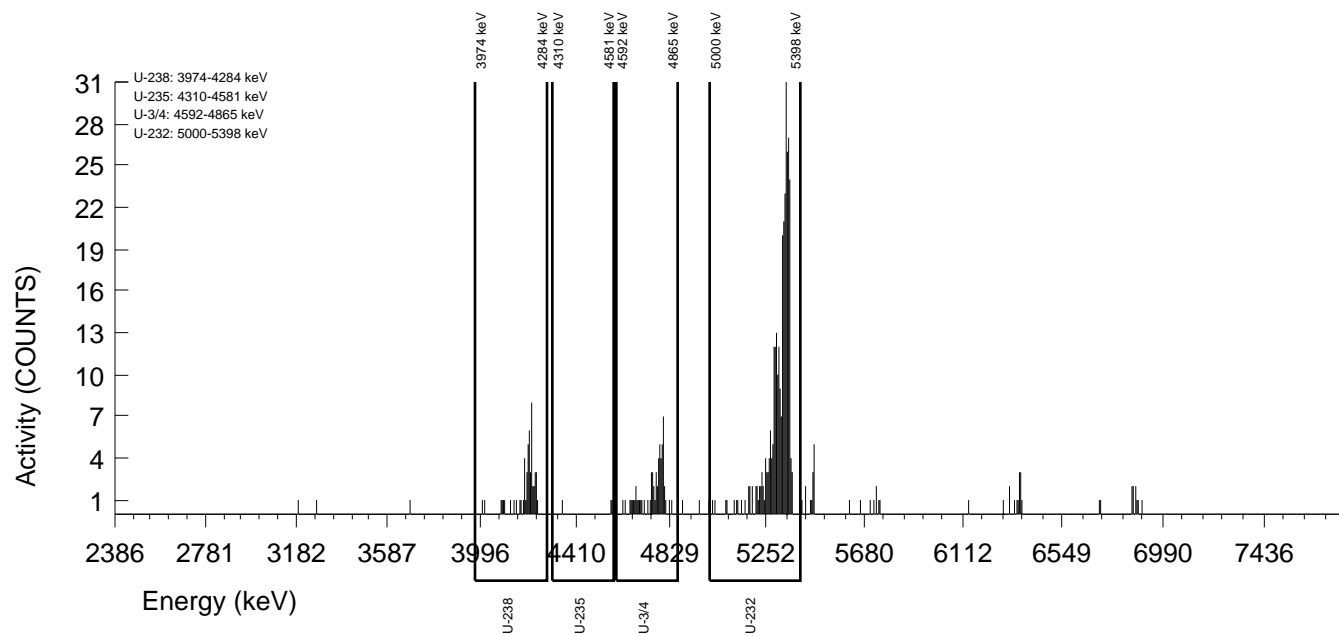
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S0405235041_UU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 84.9 +/-6.550 %	CHAMBER : 015 DETECTOR S/N : 80055 AVERAGE %EFFICIENCY : 33.3682 AVERAGE %EFF ERROR : 0.6430 COUNT DATE : 22-Sep-2016 10:00:17 ELAPSED LIVE TIME(SEC) : 14151.84	LIB FILE : U236 BKG FILE : B015.CNF;1833 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W015.CNF;530 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6549E+00 dpm RESULTS : 3.9523E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5306.36	33.296	313.000	308.519	4.481	2.1169	100.000	4.12E+00	7.21E-01	1.43E-01	5.17E-02	4.65E-01
U-3/4	4763.02	4752.50	24.340	61.000	59.821	1.179	1.0860	100.000	7.92E-01	2.31E-01	9.23E-02	2.63E-02	2.05E-01
U-235	4391.00	4496.89	211.442	3.000	1.349	1.651	1.2849	99.700	1.79E-02	5.49E-02	1.02E-01	3.12E-02	5.49E-02
U-238	4184.73	4189.58	20.489	53.000	52.528	0.472	0.6868	100.000	6.96E-01	2.13E-01	7.30E-02	1.66E-02	1.91E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T0405235042_UU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 88.1 +/-9.851 % SECONDARY QTY : 0.501 G +/-0.200 %	CHAMBER : 132 DETECTOR S/N : 67579 AVERAGE %EFFICIENCY : 26.0712 AVERAGE %EFF ERROR : 0.5050 COUNT DATE : 22-Sep-2016 10:03:28 ELAPSED LIVE TIME(SEC) : 8725.74	LIB FILE : U236 BKG FILE : B132.CNF;1156 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W132.CNF;324 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0487E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4481.52	4484.88	396.42	2.47	93.999	N/A
TRACER 2	1564-I	U-232	4.6549 dpm	5172.94	5307.10	0.13	181.23	88.926	1.0090

NUCLIDE ACTIVITY SUMMARY

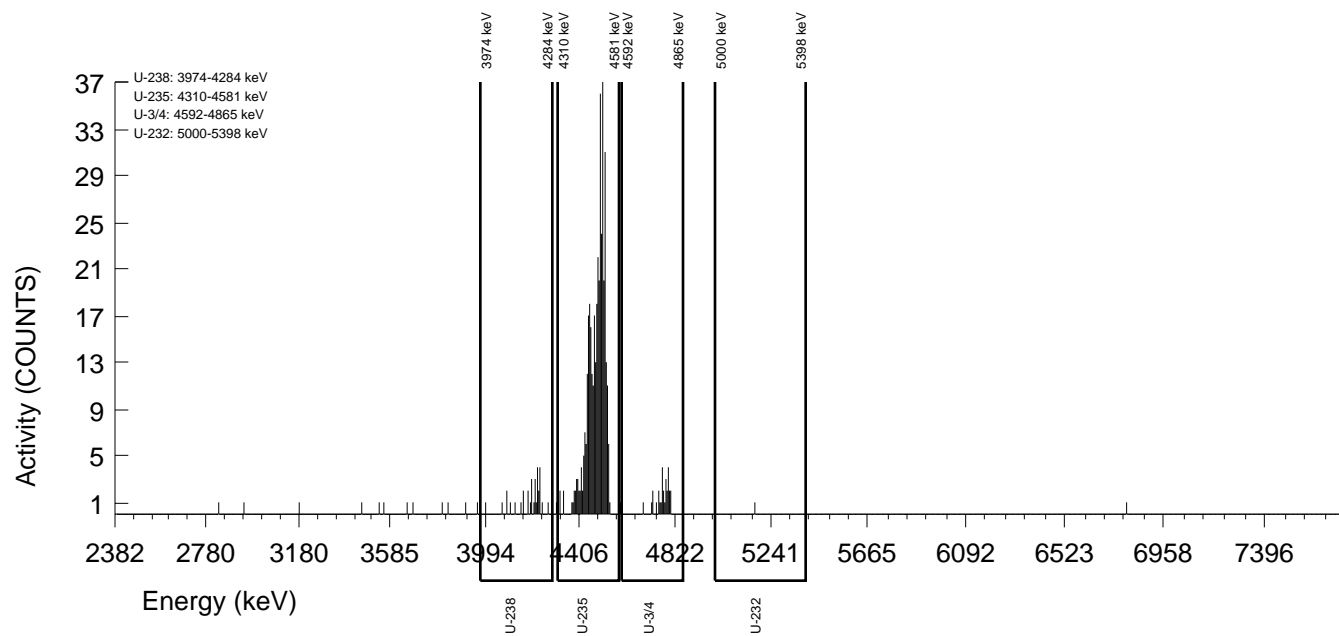
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5172.94	4.940	1.000	0.127	0.873	0.9341	100.000	3.24E-03	7.32E-02	1.60E-01	4.18E-02	7.31E-02
U-3/4	4763.02	4771.65	32.933	28.000	25.887	2.113	1.4537	100.000	5.99E-01	2.73E-01	1.87E-01	5.89E-02	2.46E-01
U-235	4391.00	4481.52	37.393	3.000	2.472	0.528	0.7269	99.700	5.74E-02	9.27E-02	1.29E-01	2.96E-02	9.20E-02
U-238	4184.73	4187.91	39.520	28.000	27.472	0.528	0.7269	100.000	6.36E-01	2.75E-01	1.28E-01	2.95E-02	2.45E-01

NOTES:

* Results are a compilation of S0405235042_UU and T0405235042_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.006 +/-0.000)



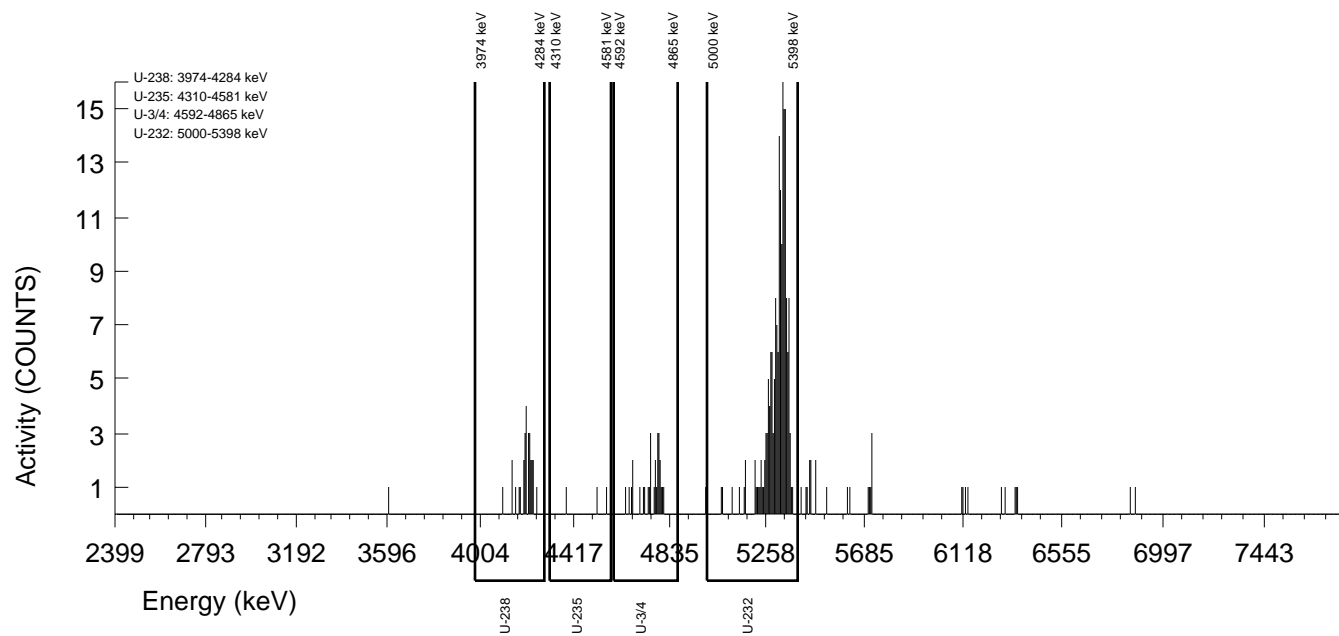
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S0405235042_UU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 88.9 +/-8.139 %	CHAMBER : 016 DETECTOR S/N : 78774 AVERAGE %EFFICIENCY : 33.4185 AVERAGE %EFF ERROR : 0.6439 COUNT DATE : 22-Sep-2016 10:00:17 ELAPSED LIVE TIME(SEC) : 7925.02	LIB FILE : U236 BKG FILE : B016.CNF;1809 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W016.CNF;494 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6549E+00 dpm RESULTS : 4.1395E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5307.10	33.042	184.000	181.226	2.774	1.6655	100.000	4.19E+00	9.24E-01	2.04E-01	6.75E-02	6.18E-01
U-3/4	4763.02	4749.95	117.484	28.000	25.887	2.113	1.4537	100.000	5.94E-01	2.62E-01	1.86E-01	5.84E-02	2.43E-01
U-235	4391.00	4484.88	171.330	3.000	2.472	0.528	0.7269	99.700	5.69E-02	9.17E-02	1.28E-01	2.93E-02	9.12E-02
U-238	4184.73	4201.81	29.371	28.000	27.472	0.528	0.7269	100.000	6.31E-01	2.64E-01	1.27E-01	2.92E-02	2.43E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T0405235043_UU SAMPLE QTY : 0.507 G +/-0.197 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 85.6 +/-10.358 % SECONDARY QTY : 0.513 G +/-0.195 %	CHAMBER : 133 DETECTOR S/N : 76229 AVERAGE %EFFICIENCY : 25.5293 AVERAGE %EFF ERROR : 0.4948 COUNT DATE : 22-Sep-2016 10:03:29 ELAPSED LIVE TIME(SEC) : 8665.95	LIB FILE : U236 BKG FILE : B133.CNF;1153 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W133.CNF;359 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.9608E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4485.26	4394.55	366.18	2.60	89.283	N/A
TRACER 2	1564-I	U-232	4.6549 dpm	5198.57	5305.58	-0.87	159.43	86.341	1.0082

NUCLIDE ACTIVITY SUMMARY

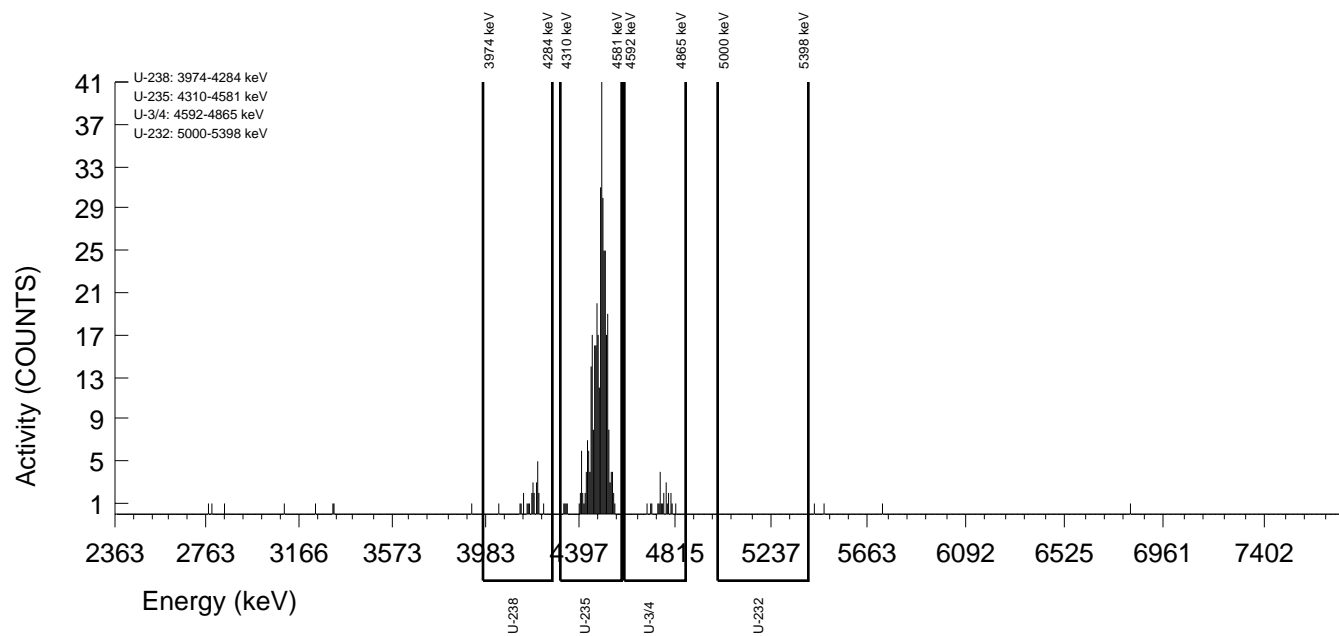
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5198.57	0.000	0.000	-0.867	0.867	0.9309	100.000	-2.33E-02	5.67E-02	1.69E-01	4.41E-02	5.64E-02
U-3/4	4763.02	4765.31	30.640	30.000	29.339	0.661	0.8128	100.000	7.61E-01	3.24E-01	1.52E-01	3.69E-02	2.84E-01
U-235	4391.00	4485.26	25.416	3.000	2.604	0.396	0.6296	99.700	6.77E-02	1.04E-01	1.35E-01	2.87E-02	1.03E-01
U-238	4184.73	4189.07	26.500	29.000	28.471	0.529	0.7270	100.000	7.39E-01	3.18E-01	1.44E-01	3.30E-02	2.79E-01

NOTES:

* Results are a compilation of S0405235043_UU and T0405235043_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.006 +/-0.000)



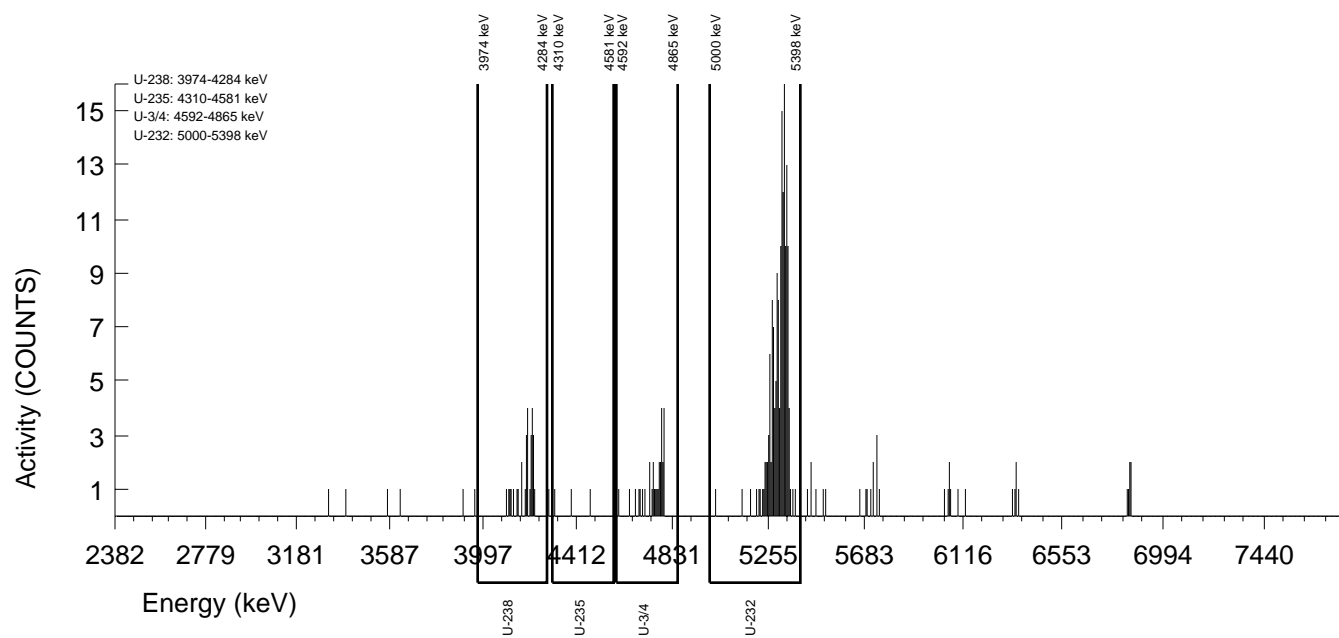
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S0405235043_UU SAMPLE QTY : 0.507 G +/-0.197 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 86.3 +/-8.633 %	CHAMBER : 017 DETECTOR S/N : 78791 AVERAGE %EFFICIENCY : 30.2659 AVERAGE %EFF ERROR : 0.5843 COUNT DATE : 22-Sep-2016 10:00:17 ELAPSED LIVE TIME(SEC) : 7928.65	LIB FILE : U236 BKG FILE : B017.CNF;2655 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W017.CNF;1450 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6549E+00 dpm RESULTS : 4.0191E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5305.58	47.283	163.000	159.432	3.568	1.8889	100.000	4.14E+00	9.69E-01	2.49E-01	8.58E-02	6.52E-01
U-3/4	4763.02	4752.58	17.268	30.000	29.339	0.661	0.8128	100.000	7.55E-01	3.10E-01	1.50E-01	3.66E-02	2.81E-01
U-235	4391.00	4394.55	152.949	3.000	2.604	0.396	0.6296	99.700	6.72E-02	1.03E-01	1.34E-01	2.84E-02	1.02E-01
U-238	4184.73	4188.23	34.537	29.000	28.471	0.529	0.7270	100.000	7.33E-01	3.04E-01	1.43E-01	3.27E-02	2.77E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T0405235044_UU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 76.3 +/-10.474 % SECONDARY QTY : 0.506 G +/-0.198 %	CHAMBER : 134 DETECTOR S/N : 76230 AVERAGE %EFFICIENCY : 25.7389 AVERAGE %EFF ERROR : 0.4988 COUNT DATE : 22-Sep-2016 10:03:32 ELAPSED LIVE TIME(SEC) : 8669.78	LIB FILE : U236 BKG FILE : B134.CNF;1149 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W134.CNF;336 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0959E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4489.44	4431.16	406.38	4.60	98.234	N/A
TRACER 2	1564-I	U-232	4.6549 dpm	5198.58	5301.90	-0.29	147.09	76.913	1.0082

NUCLIDE ACTIVITY SUMMARY

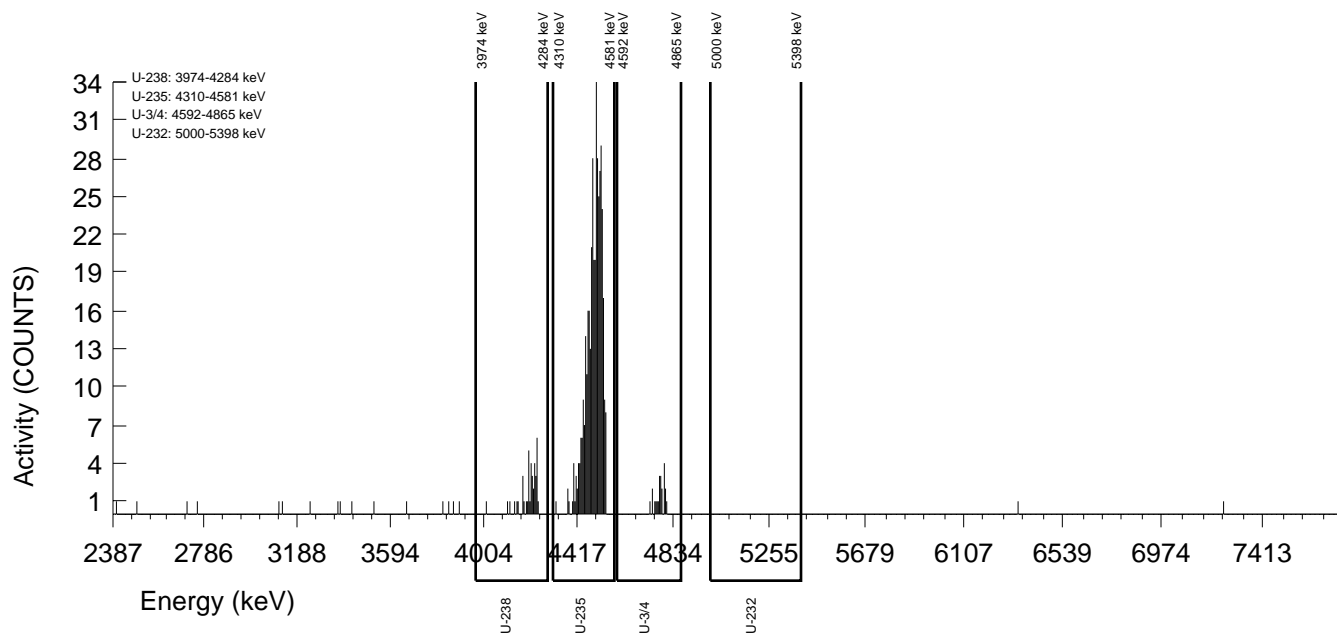
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		Lc pCi/G	1.96-sigma cnt Unc pCi/G
										TPU pCi/G	MDA pCi/G		
U-232	5302.10	5198.58	0.000	0.000	-0.289	0.289	0.5376	100.000	-7.10E-03	4.99E-02	1.20E-01	2.32E-02	4.96E-02
U-3/4	4763.02	4778.84	27.281	34.000	33.075	0.925	0.9620	100.000	9.34E-01	3.82E-01	1.80E-01	4.75E-02	3.28E-01
U-235	4391.00	4489.44	52.082	5.000	4.603	0.397	0.6298	99.700	1.30E-01	1.39E-01	1.47E-01	3.12E-02	1.37E-01
U-238	4184.73	4198.30	40.177	32.000	31.207	0.793	0.8907	100.000	8.81E-01	3.68E-01	1.73E-01	4.40E-02	3.18E-01

NOTES:

* Results are a compilation of S0405235044_UU and T0405235044_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.006 +/-0.000)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

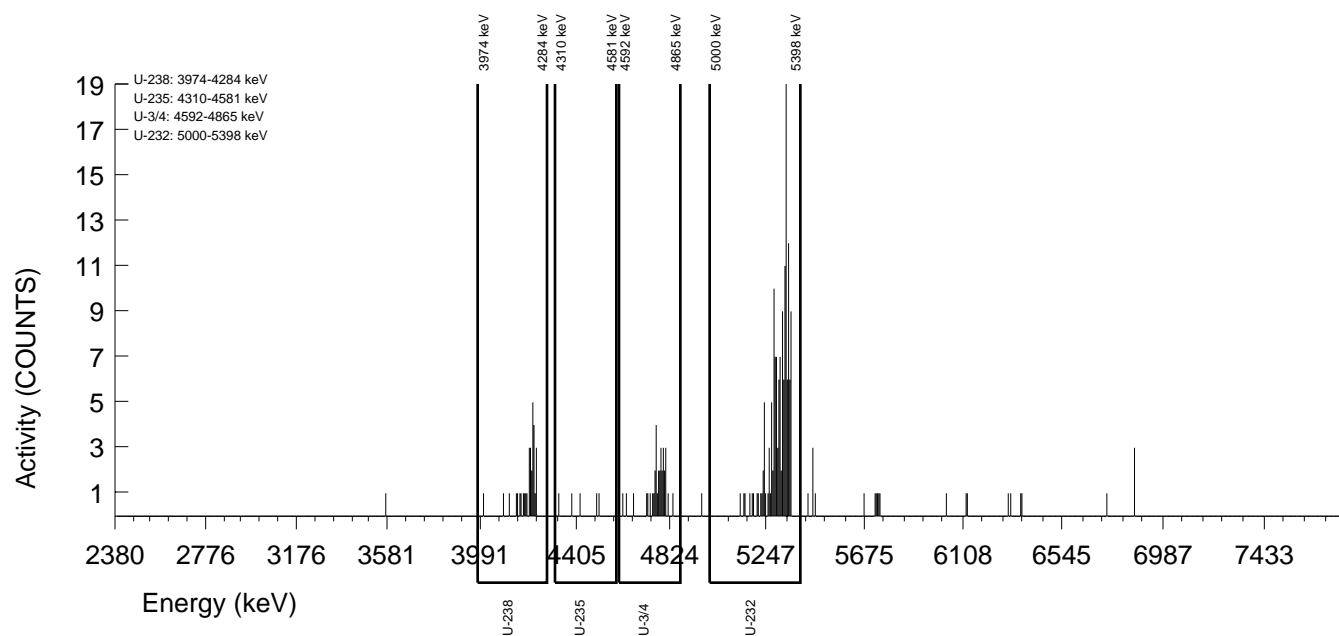
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S0405235044_UU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 76.9 +/-8.932 %	CHAMBER : 018 DETECTOR S/N : 78782 AVERAGE %EFFICIENCY : 31.3297 AVERAGE %EFF ERROR : 0.6044 COUNT DATE : 22-Sep-2016 10:00:17 ELAPSED LIVE TIME(SEC) : 7932.85	LIB FILE : U236 BKG FILE : B018.CNF;1810 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W018.CNF;484 CAL DATE : 27-Aug-2016
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TRACER
 ID : 1564-I
 NUCLIDE : U-232
 NOMINAL : 4.6549E+00 dpm
 RESULTS : 3.5802E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5301.90	61.367	150.000	147.091	2.909	1.7055	100.000	4.15E+00	1.01E+00	2.53E-01	8.43E-02	6.81E-01
U-3/4	4763.02	4762.96	45.897	34.000	33.075	0.925	0.9620	100.000	9.26E-01	3.65E-01	1.78E-01	4.71E-02	3.25E-01
U-235	4391.00	4431.16	172.113	5.000	4.603	0.397	0.6298	99.700	1.29E-01	1.38E-01	1.46E-01	3.10E-02	1.36E-01
U-238	4184.73	4191.79	31.144	32.000	31.207	0.793	0.8907	100.000	8.74E-01	3.52E-01	1.71E-01	4.36E-02	3.16E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T0405235045_UU SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 76.5 +/-11.199 % SECONDARY QTY : 0.513 G +/-0.195 %	CHAMBER : 139 DETECTOR S/N : 76231 AVERAGE %EFFICIENCY : 24.8887 AVERAGE %EFF ERROR : 0.4828 COUNT DATE : 22-Sep-2016 10:03:34 ELAPSED LIVE TIME(SEC) : 8688.31	LIB FILE : U236 BKG FILE : B139.CNF;1107 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W139.CNF;334 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 6.8523E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4477.49	4476.83	246.22	2.87	61.420	N/A
TRACER 2	1564-I	U-232	4.6549 dpm	5198.53	5301.23	-0.87	146.54	77.154	1.0082

NUCLIDE ACTIVITY SUMMARY

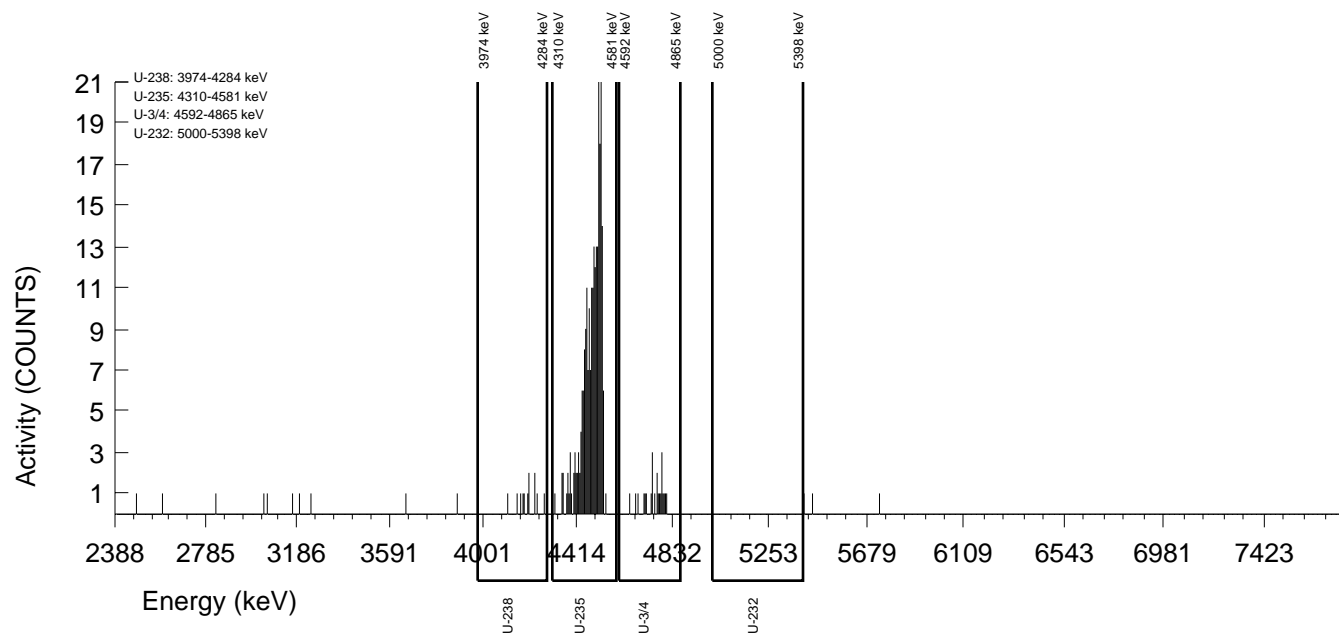
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5198.53	0.000	0.000	-0.869	0.869	0.9321	100.000	-3.47E-02	8.44E-02	2.51E-01	6.56E-02	8.39E-02
U-3/4	4763.02	4749.55	46.895	32.000	31.338	0.662	0.8138	100.000	8.93E-01	3.78E-01	1.67E-01	4.06E-02	3.21E-01
U-235	4391.00	4477.49	67.566	3.000	2.868	0.132	0.3639	99.700	8.20E-02	1.14E-01	1.22E-01	1.82E-02	1.13E-01
U-238	4184.73	4195.38	32.086	33.000	32.868	0.132	0.3639	100.000	9.37E-01	3.87E-01	1.22E-01	1.82E-02	3.26E-01

NOTES:

* Results are a compilation of S0405235045_UU and T0405235045_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.004 +/-0.000)



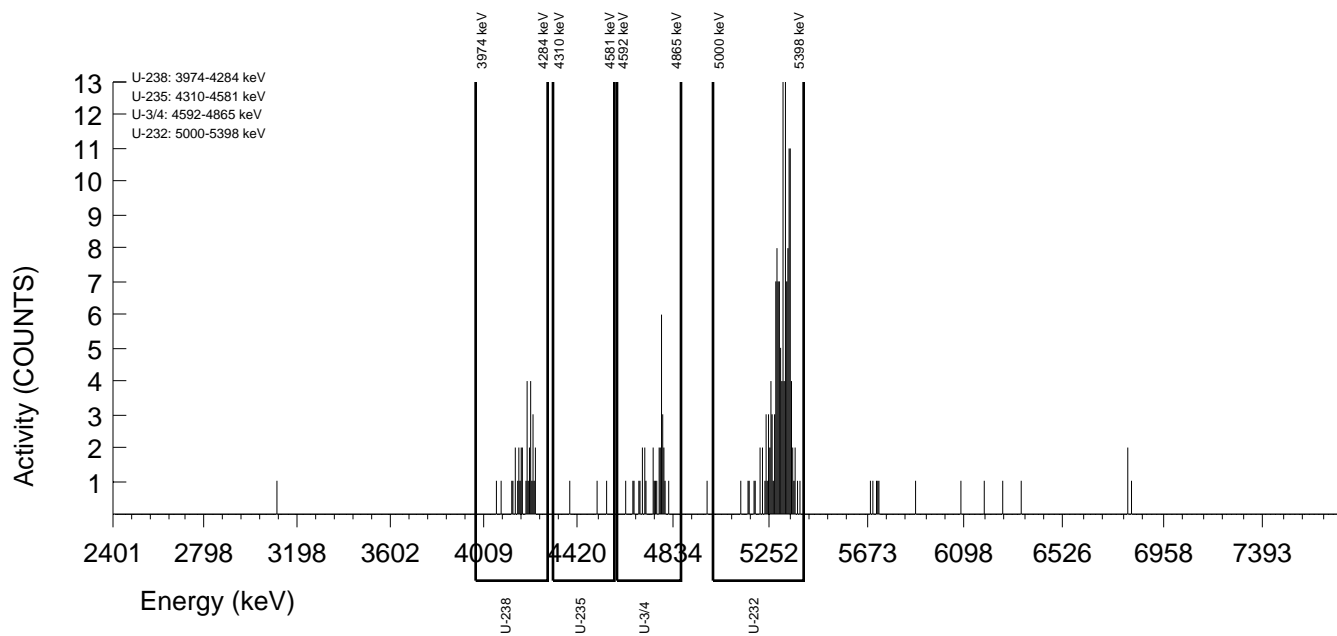
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S0405235045_UU SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 77.2 +/-8.905 %	CHAMBER : 020 DETECTOR S/N : 78787 AVERAGE %EFFICIENCY : 31.0619 AVERAGE %EFF ERROR : 0.5993 COUNT DATE : 22-Sep-2016 10:00:19 ELAPSED LIVE TIME(SEC) : 7946.44	LIB FILE : U236 BKG FILE : B020.CNF;1831 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W020.CNF;560 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6549E+00 dpm RESULTS : 3.5915E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5301.23	63.056	148.000	146.543	1.457	1.2070	100.000	4.18E+00	1.01E+00	2.06E-01	6.02E-02	6.82E-01
U-3/4	4763.02	4748.95	8.643	32.000	31.338	0.662	0.8138	100.000	8.86E-01	3.56E-01	1.65E-01	4.03E-02	3.19E-01
U-235	4391.00	4476.83	158.036	3.000	2.868	0.132	0.3639	99.700	8.13E-02	1.13E-01	1.21E-01	1.81E-02	1.12E-01
U-238	4184.73	4185.77	30.455	33.000	32.868	0.132	0.3639	100.000	9.29E-01	3.63E-01	1.21E-01	1.80E-02	3.23E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T0405235046_UU SAMPLE QTY : 0.514 G +/-0.195 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 78.9 +/-10.736 % SECONDARY QTY : 0.512 G +/-0.195 %	CHAMBER : 140 DETECTOR S/N : 78771 AVERAGE %EFFICIENCY : 26.0317 AVERAGE %EFF ERROR : 0.5043 COUNT DATE : 22-Sep-2016 10:03:37 ELAPSED LIVE TIME(SEC) : 8691.66	LIB FILE : U236 BKG FILE : B140.CNF;1100 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W140.CNF;283 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 7.7532E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4493.36	4409.17	291.49	1.73	69.495	N/A
TRACER 2	1564-I	U-232	4.6540 dpm	5255.03	5280.18	0.42	155.28	79.798	1.0115

NUCLIDE ACTIVITY SUMMARY

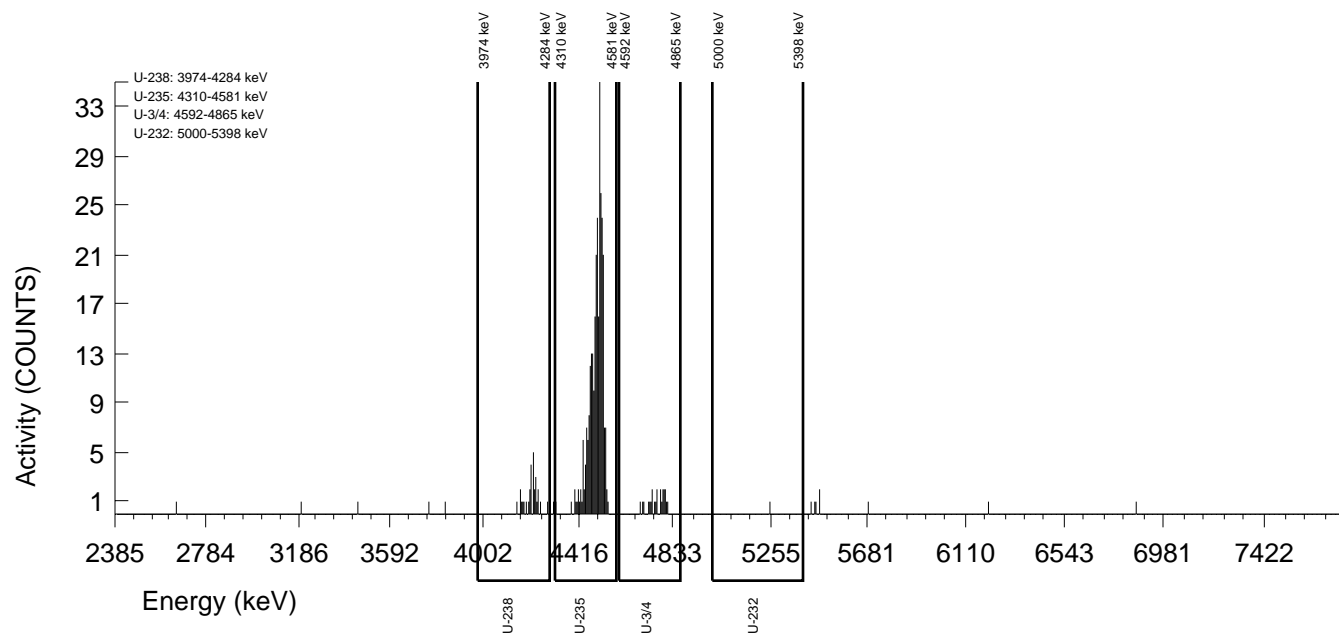
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5255.03	4.953	1.000	0.421	0.579	0.7612	100.000	1.42E-02	9.65E-02	1.92E-01	4.53E-02	9.62E-02
U-3/4	4763.02	4759.31	64.386	25.000	24.470	0.530	0.7280	100.000	6.45E-01	2.98E-01	1.46E-01	3.36E-02	2.64E-01
U-235	4391.00	4493.36	34.422	2.000	1.735	0.265	0.5148	99.700	4.59E-02	9.11E-02	1.27E-01	2.38E-02	9.05E-02
U-238	4184.73	4209.65	24.764	30.000	29.867	0.133	0.3640	100.000	7.87E-01	3.33E-01	1.13E-01	1.68E-02	2.88E-01

NOTES:

* Results are a compilation of S0405235046_UU and T0405235046_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.004 +/-0.000)



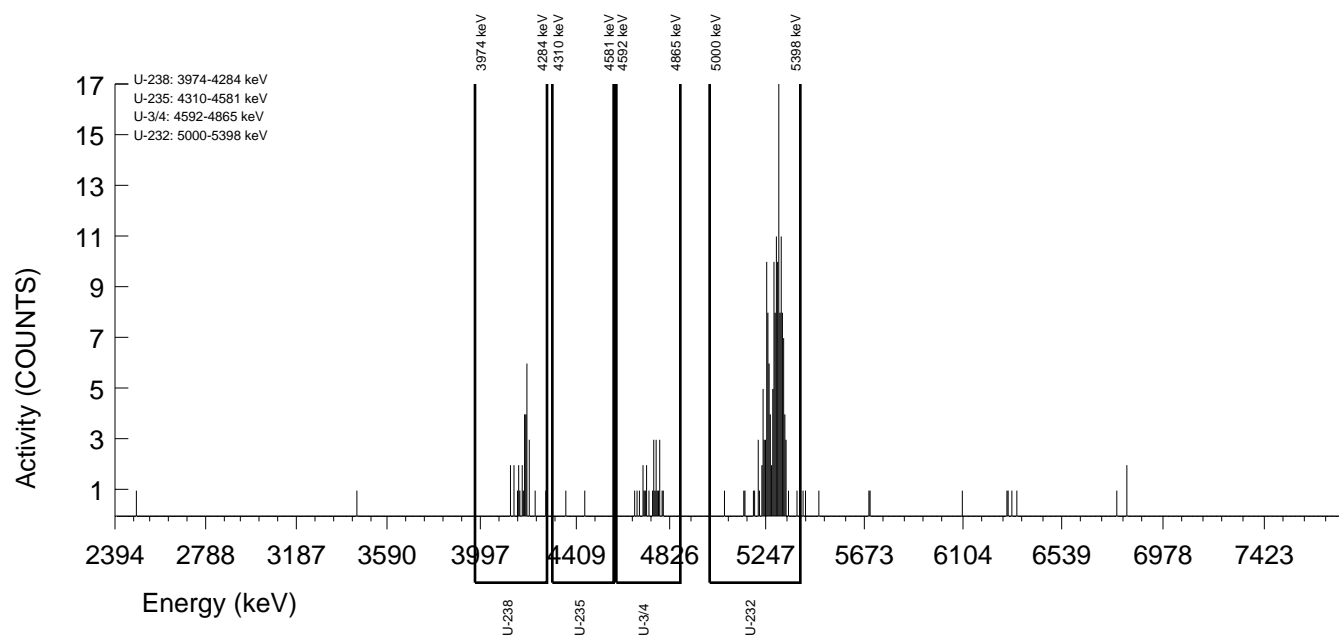
GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S0405235046_UU SAMPLE QTY : 0.514 G +/-0.195 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 79.8 +/-8.686 %	CHAMBER : 021 DETECTOR S/N : 795159 AVERAGE %EFFICIENCY : 31.8082 AVERAGE %EFF ERROR : 0.6134 COUNT DATE : 22-Sep-2016 10:00:19 ELAPSED LIVE TIME(SEC) : 7950.06	LIB FILE : U236 BKG FILE : B021.CNF;1833 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W021.CNF;537 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6540E+00 dpm RESULTS : 3.7138E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5280.18	63.836	157.000	155.277	1.723	1.3124	100.000	4.08E+00	9.62E-01	1.99E-01	6.03E-02	6.48E-01
U-3/4	4763.02	4742.59	72.165	25.000	24.470	0.530	0.7280	100.000	6.38E-01	2.84E-01	1.45E-01	3.32E-02	2.61E-01
U-235	4391.00	4409.17	83.173	2.000	1.735	0.265	0.5148	99.700	4.53E-02	8.99E-02	1.26E-01	2.36E-02	8.95E-02
U-238	4184.73	4185.02	13.862	30.000	29.867	0.133	0.3640	100.000	7.78E-01	3.15E-01	1.11E-01	1.66E-02	2.85E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T0405235047_UU SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 77.9 +/-10.406 % SECONDARY QTY : 0.507 G +/-0.197 %	CHAMBER : 142 DETECTOR S/N : 42285 AVERAGE %EFFICIENCY : 26.5347 AVERAGE %EFF ERROR : 0.5139 COUNT DATE : 22-Sep-2016 10:03:39 ELAPSED LIVE TIME(SEC) : 8717.12	LIB FILE : U236 BKG FILE : B142.CNF;1100 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W142.CNF;306 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 8.2865E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4492.37	4443.19	318.49	2.73	74.275	N/A
TRACER 2	1564-I	U-232	4.6540 dpm	5198.58	5301.65	-0.29	165.75	78.525	1.0080

NUCLIDE ACTIVITY SUMMARY

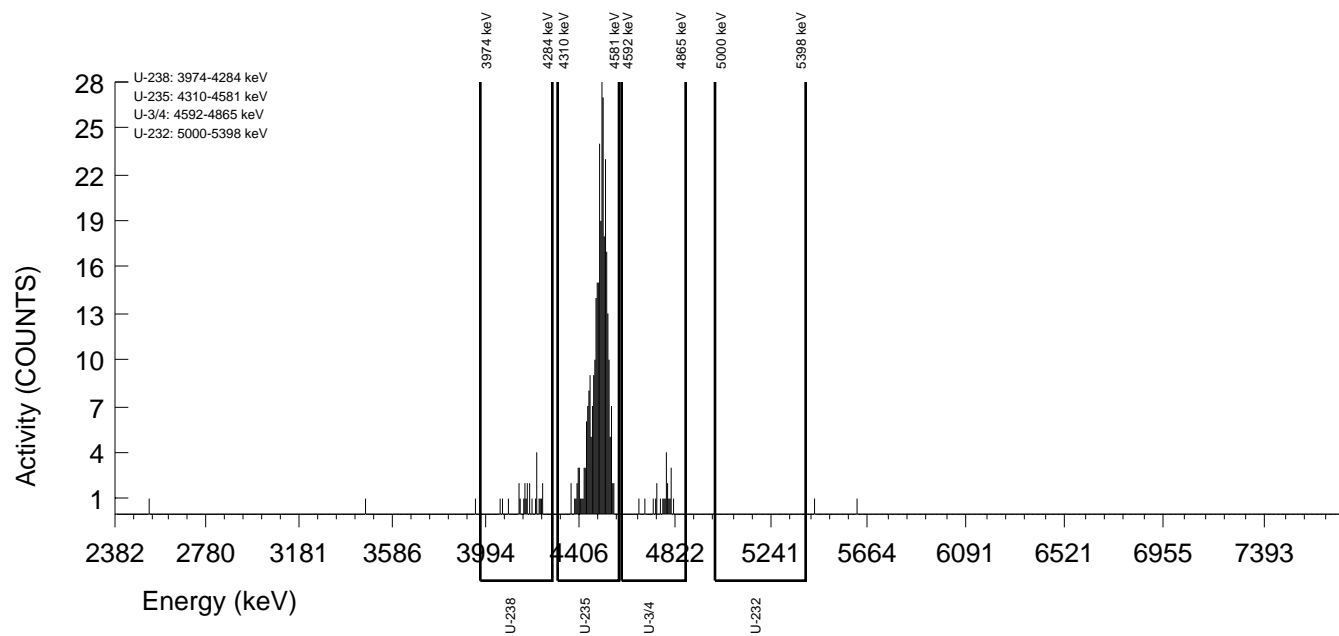
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5198.58	0.000	0.000	-0.291	0.291	0.5390	100.000	-9.09E-03	6.35E-02	1.53E-01	2.97E-02	6.32E-02
U-3/4	4763.02	4770.27	24.721	32.000	31.204	0.796	0.8920	100.000	7.85E-01	3.27E-01	1.54E-01	3.93E-02	2.84E-01
U-235	4391.00	4492.37	48.206	3.000	2.735	0.265	0.5150	99.700	6.90E-02	1.01E-01	1.21E-01	2.27E-02	9.95E-02
U-238	4184.73	4182.66	5.768	42.000	41.735	0.265	0.5150	100.000	1.05E+00	3.90E-01	1.21E-01	2.27E-02	3.23E-01

NOTES:

* Results are a compilation of S0405235047_UU and T0405235047_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.005 +/-0.000)



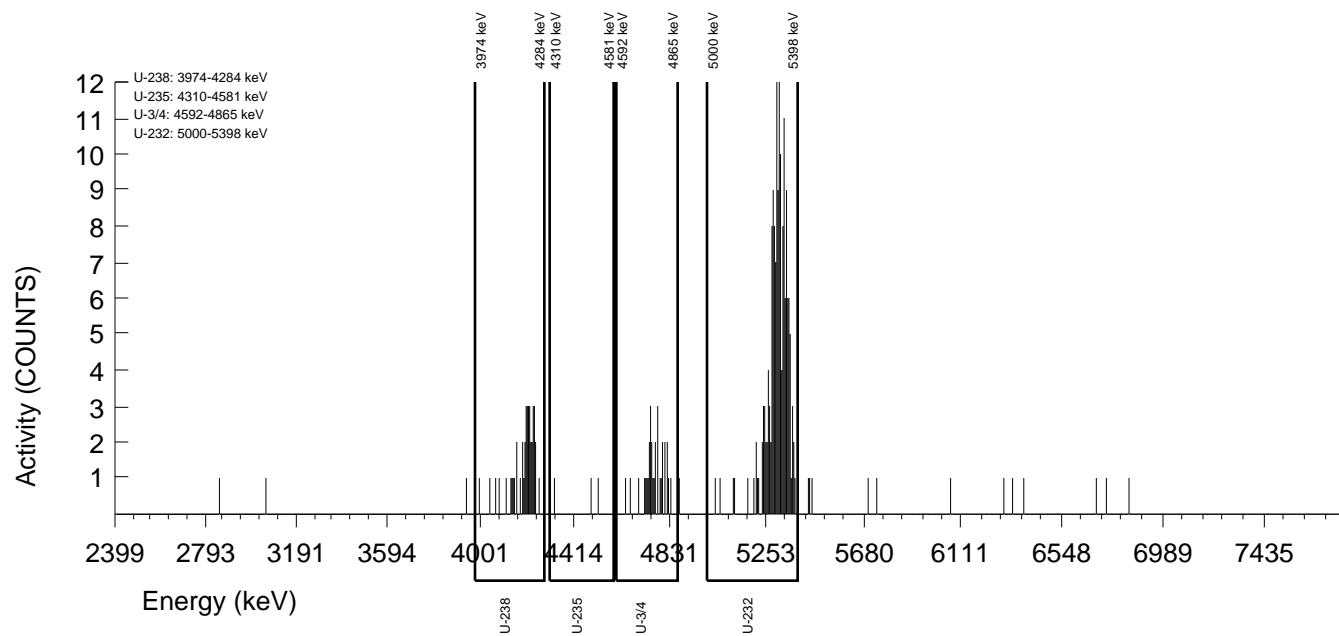
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S0405235047_UU SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 78.5 +/-8.452 %	CHAMBER : 024 DETECTOR S/N : 76542 AVERAGE %EFFICIENCY : 34.4760 AVERAGE %EFF ERROR : 0.6639 COUNT DATE : 22-Sep-2016 10:00:19 ELAPSED LIVE TIME(SEC) : 7956.34	LIB FILE : U236 BKG FILE : B024.CNF;1824 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W024.CNF;517 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6540E+00 dpm RESULTS : 3.6546E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5301.65	65.152	168.000	165.746	2.254	1.5014	100.000	4.17E+00	9.55E-01	2.08E-01	6.61E-02	6.41E-01
U-3/4	4763.02	4757.02	78.183	32.000	31.204	0.796	0.8920	100.000	7.78E-01	3.11E-01	1.53E-01	3.90E-02	2.81E-01
U-235	4391.00	4443.19	185.685	3.000	2.735	0.265	0.5150	99.700	6.84E-02	9.94E-02	1.20E-01	2.26E-02	9.87E-02
U-238	4184.73	4188.06	80.626	42.000	41.735	0.265	0.5150	100.000	1.04E+00	3.66E-01	1.20E-01	2.25E-02	3.21E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T0405235048_UU SAMPLE QTY : 0.507 G +/-0.197 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 94.3 +/-10.687 % SECONDARY QTY : 0.503 G +/-0.199 %	CHAMBER : 143 DETECTOR S/N : 65882 AVERAGE %EFFICIENCY : 22.7820 AVERAGE %EFF ERROR : 0.4430 COUNT DATE : 22-Sep-2016 10:03:42 ELAPSED LIVE TIME(SEC) : 8707.51	LIB FILE : U236 BKG FILE : B143.CNF;1096 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W143.CNF;291 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.9022E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4496.76	4483.50	326.41	1.59	88.758	N/A
TRACER 2	1564-I	U-232	4.6540 dpm	5198.59	5317.91	-1.16	148.90	95.056	1.0080

NUCLIDE ACTIVITY SUMMARY

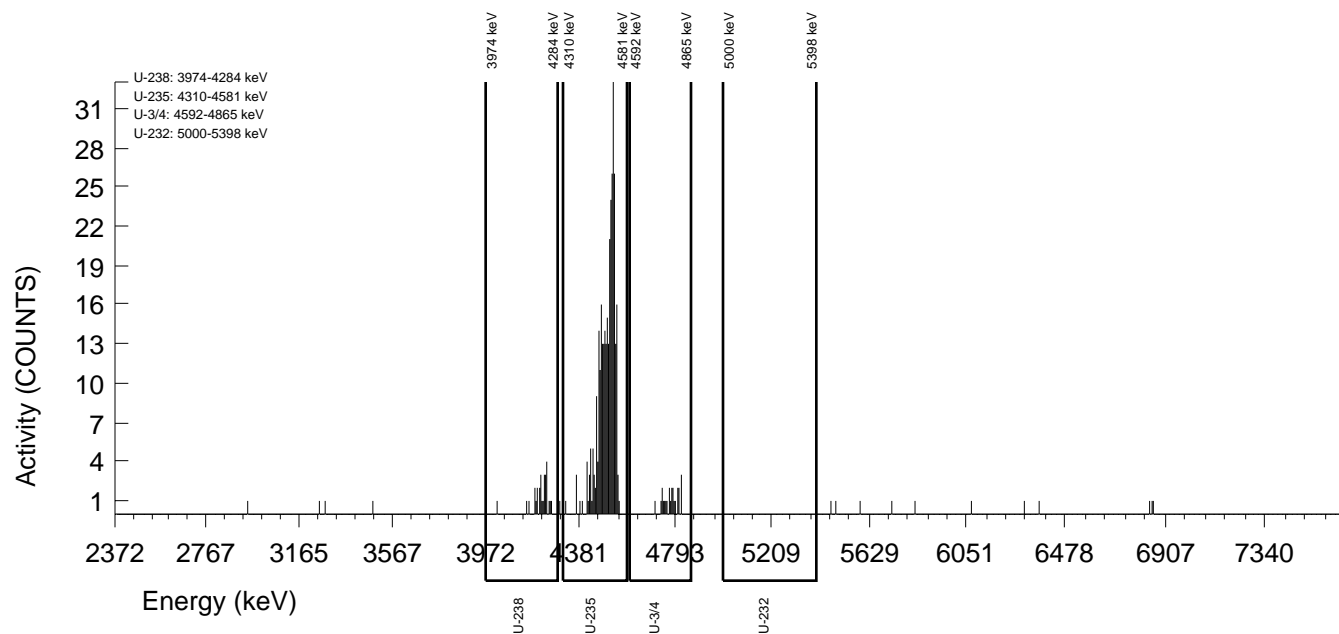
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5198.59	0.000	0.000	-1.161	1.161	1.0775	100.000	-3.57E-02	6.61E-02	2.09E-01	5.83E-02	6.58E-02
U-3/4	4763.02	4775.14	83.548	34.000	33.588	0.412	0.6418	100.000	9.33E-01	3.79E-01	1.46E-01	3.13E-02	3.22E-01
U-235	4391.00	4496.76	26.014	2.000	1.588	0.412	0.6418	99.700	4.42E-02	9.62E-02	1.46E-01	3.14E-02	9.57E-02
U-238	4184.73	4209.68	31.945	32.000	31.176	0.824	0.9076	100.000	8.66E-01	3.64E-01	1.72E-01	4.42E-02	3.13E-01

NOTES:

* Results are a compilation of S0405235048_UU and T0405235048_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.005 +/-0.000)



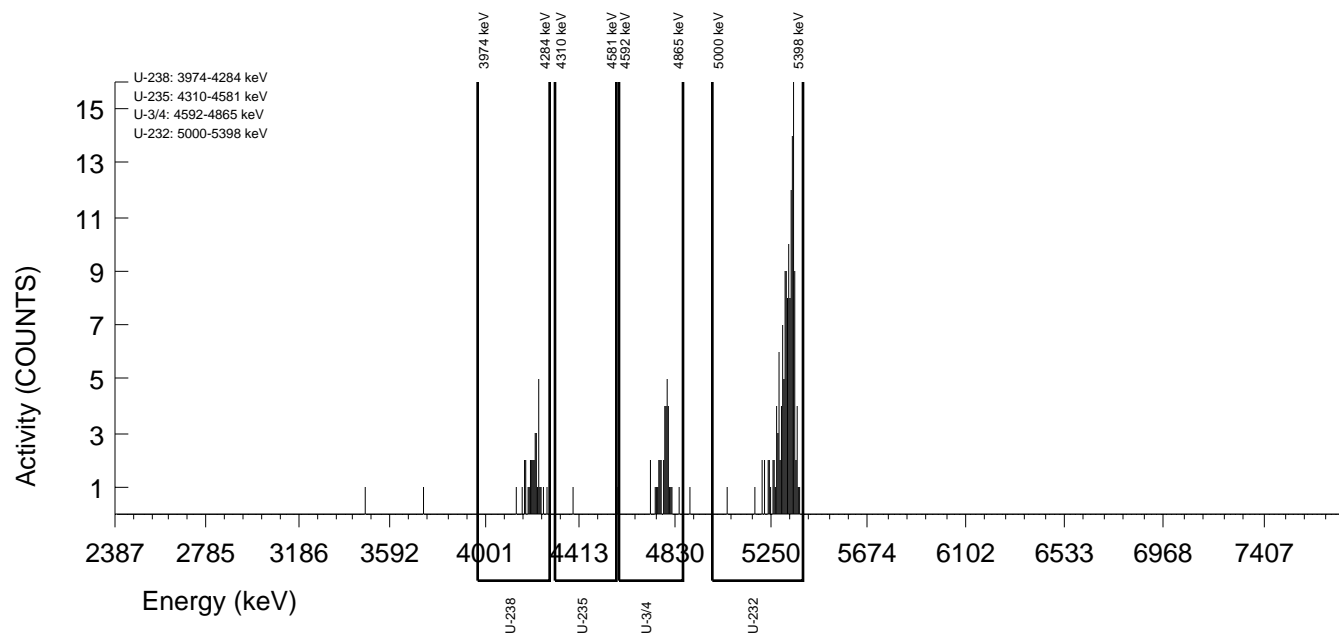
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S0405235048_UU SAMPLE QTY : 0.507 G +/-0.197 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 95.1 +/-8.834 %	CHAMBER : 113 DETECTOR S/N : 80009 AVERAGE %EFFICIENCY : 24.7132 AVERAGE %EFF ERROR : 0.4794 COUNT DATE : 22-Sep-2016 10:02:46 ELAPSED LIVE TIME(SEC) : 8237.28	LIB FILE : U236 BKG FILE : B113.CNF;1165 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W113.CNF;318 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6540E+00 dpm RESULTS : 4.4240E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5317.91	41.533	150.000	148.902	1.098	1.0480	100.000	4.13E+00	9.93E-01	1.85E-01	5.11E-02	6.69E-01
U-3/4	4763.02	4785.38	21.031	34.000	33.588	0.412	0.6418	100.000	9.25E-01	3.59E-01	1.45E-01	3.10E-02	3.20E-01
U-235	4391.00	4483.50	0.000	2.000	1.588	0.412	0.6418	99.700	4.39E-02	9.53E-02	1.45E-01	3.11E-02	9.50E-02
U-238	4184.73	4214.70	20.413	32.000	31.176	0.824	0.9076	100.000	8.59E-01	3.46E-01	1.70E-01	4.39E-02	3.11E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T0405235049_UU SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 100 +/-10.145 % SECONDARY QTY : 0.503 G +/-0.199 %	CHAMBER : 144 DETECTOR S/N : 75551 AVERAGE %EFFICIENCY : 26.3153 AVERAGE %EFF ERROR : 0.5097 COUNT DATE : 22-Sep-2016 10:03:44 ELAPSED LIVE TIME(SEC) : 8714.54	LIB FILE : U236 BKG FILE : B144.CNF;1101 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W144.CNF;297 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0953E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4488.87	4551.85	417.36	0.45	98.173	N/A
TRACER 2	1564-I	U-232	4.6540 dpm	5198.55	5291.92	-0.44	158.72	100.989	1.0080

NUCLIDE ACTIVITY SUMMARY

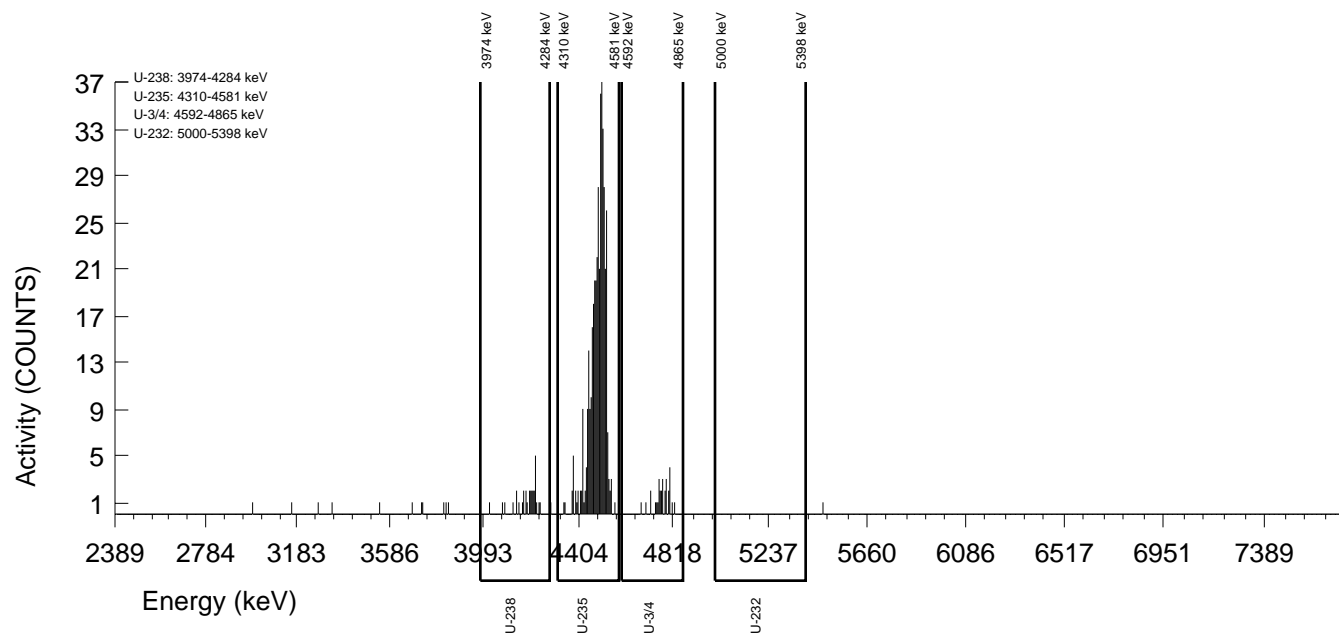
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		Lc pCi/G	1.96-sigma cnt Unc pCi/G
										TPU pCi/G	MDA pCi/G		
U-232	5302.10	5198.55	0.000	0.000	-0.436	0.436	0.6601	100.000	-1.05E-02	4.93E-02	1.28E-01	2.80E-02	4.91E-02
U-3/4	4763.02	4768.52	49.143	31.000	29.622	1.378	1.1737	100.000	7.73E-01	3.30E-01	1.86E-01	5.38E-02	2.90E-01
U-235	4391.00	4488.87	54.769	1.000	0.449	0.551	0.7423	99.700	1.18E-02	7.45E-02	1.47E-01	3.41E-02	7.43E-02
U-238	4184.73	4182.70	7.167	29.000	28.587	0.413	0.6429	100.000	7.46E-01	3.19E-01	1.37E-01	2.94E-02	2.81E-01

NOTES:

* Results are a compilation of S0405235049_UU and T0405235049_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.006 +/-0.000)



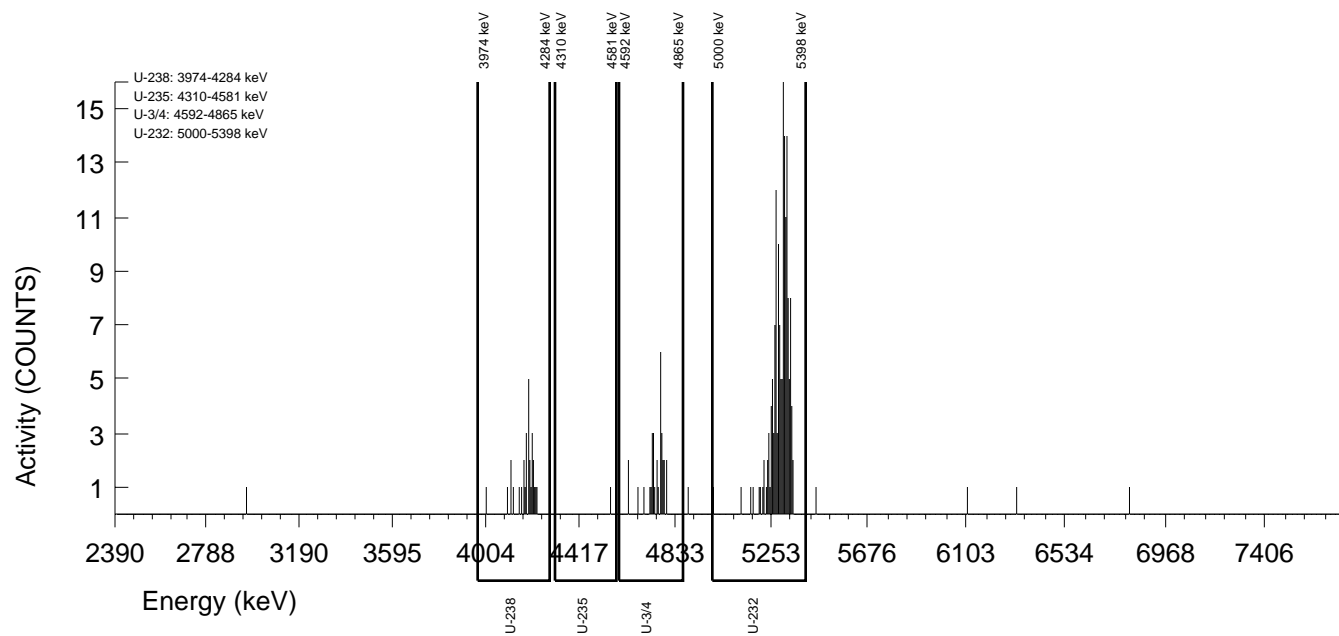
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S0405235049_UU SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 101 +/-8.566 %	CHAMBER : 114 DETECTOR S/N : 78258 AVERAGE %EFFICIENCY : 24.7116 AVERAGE %EFF ERROR : 0.4794 COUNT DATE : 22-Sep-2016 10:02:49 ELAPSED LIVE TIME(SEC) : 8265.39	LIB FILE : U236 BKG FILE : B114.CNF;1168 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W114.CNF;324 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6540E+00 dpm RESULTS : 4.7001E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5291.92	53.498	159.000	158.724	0.276	0.5249	100.000	4.14E+00	9.63E-01	1.26E-01	2.40E-02	6.47E-01
U-3/4	4763.02	4748.12	7.430	31.000	29.622	1.378	1.1737	100.000	7.67E-01	3.17E-01	1.84E-01	5.33E-02	2.88E-01
U-235	4391.00	4551.85	4.954	1.000	0.449	0.551	0.7423	99.700	1.17E-02	7.38E-02	1.46E-01	3.38E-02	7.37E-02
U-238	4184.73	4178.97	28.483	29.000	28.587	0.413	0.6429	100.000	7.40E-01	3.06E-01	1.36E-01	2.92E-02	2.78E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T0405235050_UU SAMPLE QTY : 0.504 G +/-0.198 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 106 +/-9.889 % SECONDARY QTY : 0.510 G +/-0.196 %	CHAMBER : 145 DETECTOR S/N : 72526 AVERAGE %EFFICIENCY : 26.3634 AVERAGE %EFF ERROR : 0.5106 COUNT DATE : 22-Sep-2016 10:03:47 ELAPSED LIVE TIME(SEC) : 8694.70	LIB FILE : U236 BKG FILE : B145.CNF;1119 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W145.CNF;365 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.1602E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4514.21	4402.30	441.91	0.73	103.995	N/A
TRACER 2	1564-I	U-232	4.6540 dpm	5369.63	5313.33	0.28	170.81	106.979	1.0095

NUCLIDE ACTIVITY SUMMARY

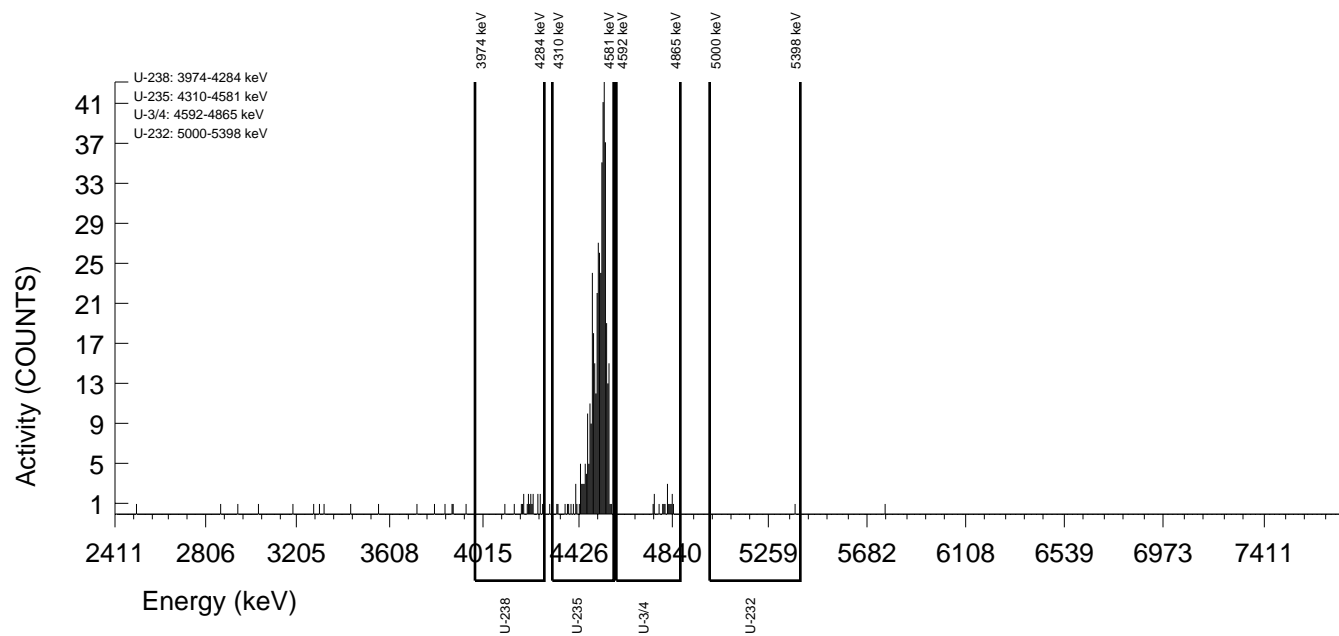
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5369.63	4.914	1.000	0.275	0.725	0.8512	100.000	6.17E-03	6.42E-02	1.34E-01	3.36E-02	6.40E-02
U-3/4	4763.02	4804.32	78.618	24.000	23.178	0.822	0.9069	100.000	5.65E-01	2.64E-01	1.51E-01	3.88E-02	2.40E-01
U-235	4391.00	4514.21	59.100	1.000	0.726	0.274	0.5236	99.700	1.78E-02	6.89E-02	1.18E-01	2.25E-02	6.88E-02
U-238	4184.73	4215.68	76.161	27.000	26.726	0.274	0.5236	100.000	6.52E-01	2.84E-01	1.18E-01	2.24E-02	2.53E-01

NOTES:

* Results are a compilation of S0405235050_UU and T0405235050_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.007 +/-0.000)



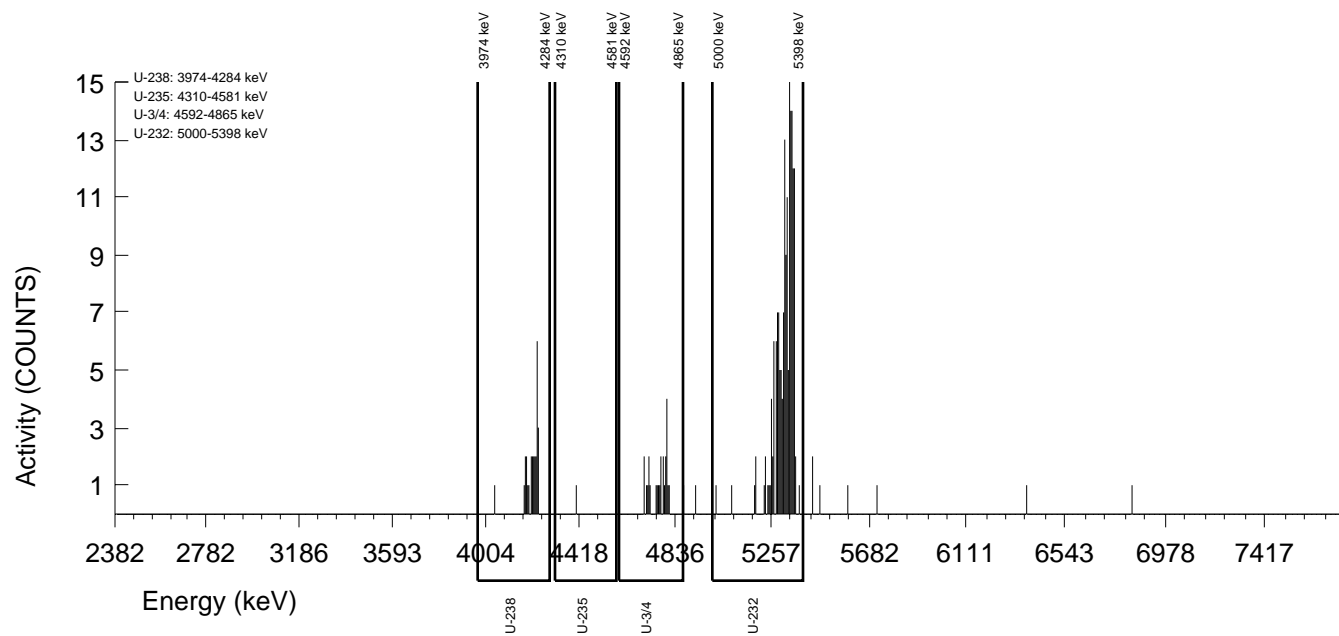
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S0405235050_UU SAMPLE QTY : 0.504 G +/-0.198 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 107 +/-8.343 %	CHAMBER : 115 DETECTOR S/N : 79995 AVERAGE %EFFICIENCY : 25.2291 AVERAGE %EFF ERROR : 0.4892 COUNT DATE : 22-Sep-2016 10:02:51 ELAPSED LIVE TIME(SEC) : 8224.29	LIB FILE : U236 BKG FILE : B115.CNF;1177 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W115.CNF;335 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6540E+00 dpm RESULTS : 4.9789E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5313.33	46.613	173.000	170.807	2.193	1.4809	100.000	4.16E+00	9.41E-01	2.00E-01	6.33E-02	6.30E-01
U-3/4	4763.02	4763.63	8.294	24.000	23.178	0.822	0.9069	100.000	5.60E-01	2.55E-01	1.49E-01	3.84E-02	2.37E-01
U-235	4391.00	4402.30	4.976	1.000	0.726	0.274	0.5236	99.700	1.76E-02	6.82E-02	1.17E-01	2.23E-02	6.81E-02
U-238	4184.73	4206.69	8.709	27.000	26.726	0.274	0.5236	100.000	6.46E-01	2.73E-01	1.17E-01	2.22E-02	2.51E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T0405235052_UU SAMPLE QTY : 0.508 G +/-0.197 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 79.6 +/-10.921 % SECONDARY QTY : 0.508 G +/-0.197 %	CHAMBER : 147 DETECTOR S/N : 75550 AVERAGE %EFFICIENCY : 25.4403 AVERAGE %EFF ERROR : 0.4932 COUNT DATE : 22-Sep-2016 10:03:52 ELAPSED LIVE TIME(SEC) : 8729.03	LIB FILE : U236 BKG FILE : B147.CNF;1091 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W147.CNF;294 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.9077E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4499.39	4375.98	365.60	0.58	88.807	N/A
TRACER 2	1564-I	U-232	4.6540 dpm	5198.59	5313.61	-0.58	132.45	80.231	1.0080

NUCLIDE ACTIVITY SUMMARY

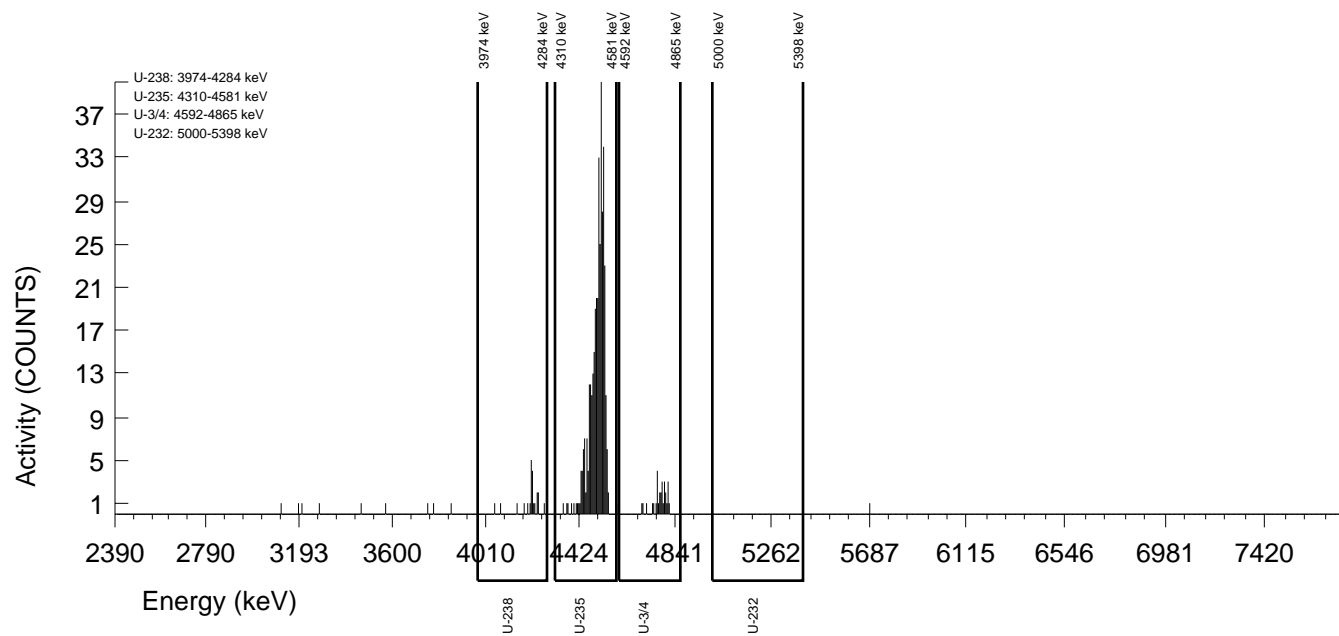
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5198.59	0.000	0.000	-0.582	0.582	0.7628	100.000	-1.58E-02	5.64E-02	1.55E-01	3.65E-02	5.60E-02
U-3/4	4763.02	4773.91	50.558	30.000	28.892	1.108	1.0528	100.000	9.00E-01	3.93E-01	2.09E-01	5.76E-02	3.41E-01
U-235	4391.00	4499.39	31.081	1.000	0.584	0.416	0.6447	99.700	1.83E-02	8.85E-02	1.64E-01	3.54E-02	8.83E-02
U-238	4184.73	4202.43	10.567	23.000	22.446	0.554	0.7444	100.000	6.99E-01	3.36E-01	1.75E-01	4.07E-02	3.00E-01

NOTES:

* Results are a compilation of S0405235052_UU and T0405235052_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.006 +/-0.000)



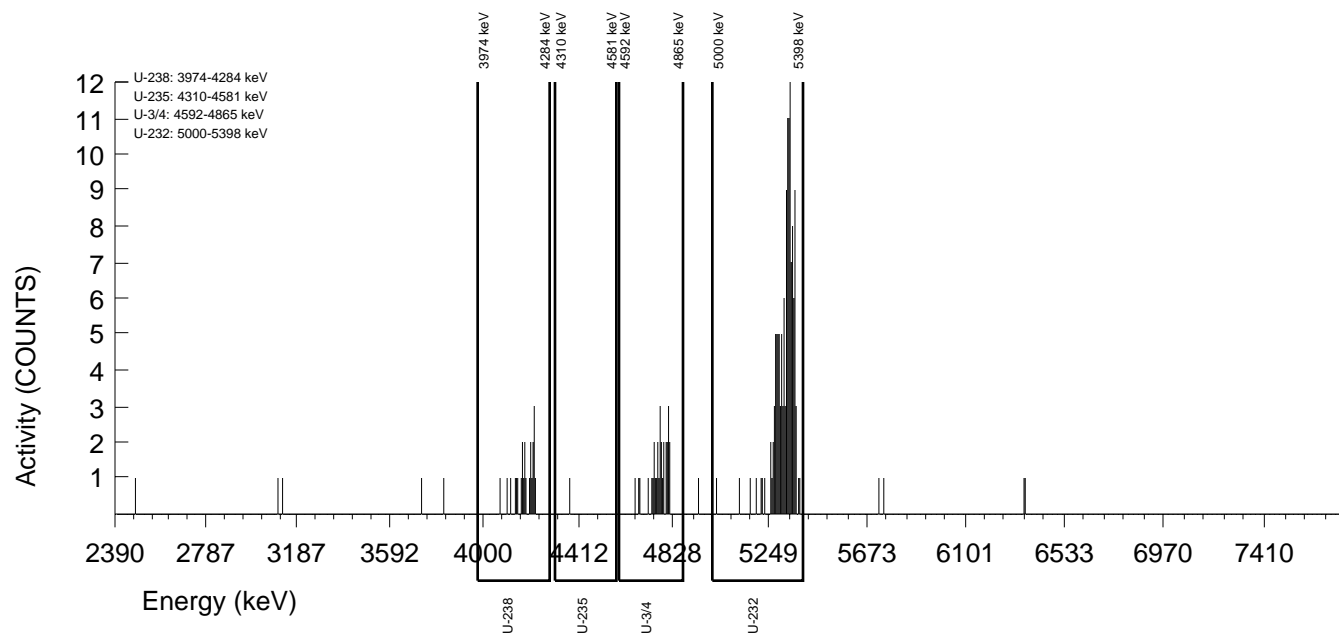
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S0405235052_UU SAMPLE QTY : 0.508 G +/-0.197 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 80.2 +/-9.289 %	CHAMBER : 117 DETECTOR S/N : 80003 AVERAGE %EFFICIENCY : 25.8068 AVERAGE %EFF ERROR : 0.5001 COUNT DATE : 22-Sep-2016 10:02:56 ELAPSED LIVE TIME(SEC) : 8312.94	LIB FILE : U236 BKG FILE : B117.CNF;1162 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W117.CNF;308 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6540E+00 dpm RESULTS : 3.7340E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5313.61	39.437	133.000	132.446	0.554	0.7444	100.000	4.13E+00	1.04E+00	1.75E-01	4.07E-02	7.07E-01
U-3/4	4763.02	4765.45	67.782	30.000	28.892	1.108	1.0528	100.000	8.93E-01	3.77E-01	2.07E-01	5.71E-02	3.38E-01
U-235	4391.00	4375.98	4.930	1.000	0.584	0.416	0.6447	99.700	1.81E-02	8.78E-02	1.63E-01	3.51E-02	8.76E-02
U-238	4184.73	4177.78	55.458	23.000	22.446	0.554	0.7444	100.000	6.94E-01	3.24E-01	1.74E-01	4.04E-02	2.97E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T0405235053_UU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 01-Dec-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 79.0 +/-11.113 % SECONDARY QTY : 0.503 G +/-0.199 %	CHAMBER : 148 DETECTOR S/N : 74429 AVERAGE %EFFICIENCY : 24.2876 AVERAGE %EFF ERROR : 0.4715 COUNT DATE : 22-Sep-2016 10:03:54 ELAPSED LIVE TIME(SEC) : 8735.45	LIB FILE : U236 BKG FILE : B148.CNF;1092 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W148.CNF;312 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.0943E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4493.89	4448.99	320.62	6.86	81.517	N/A
TRACER 2	1564-I	U-232	4.6548 dpm	5250.22	5301.43	-0.02	130.58	79.697	1.0082

NUCLIDE ACTIVITY SUMMARY

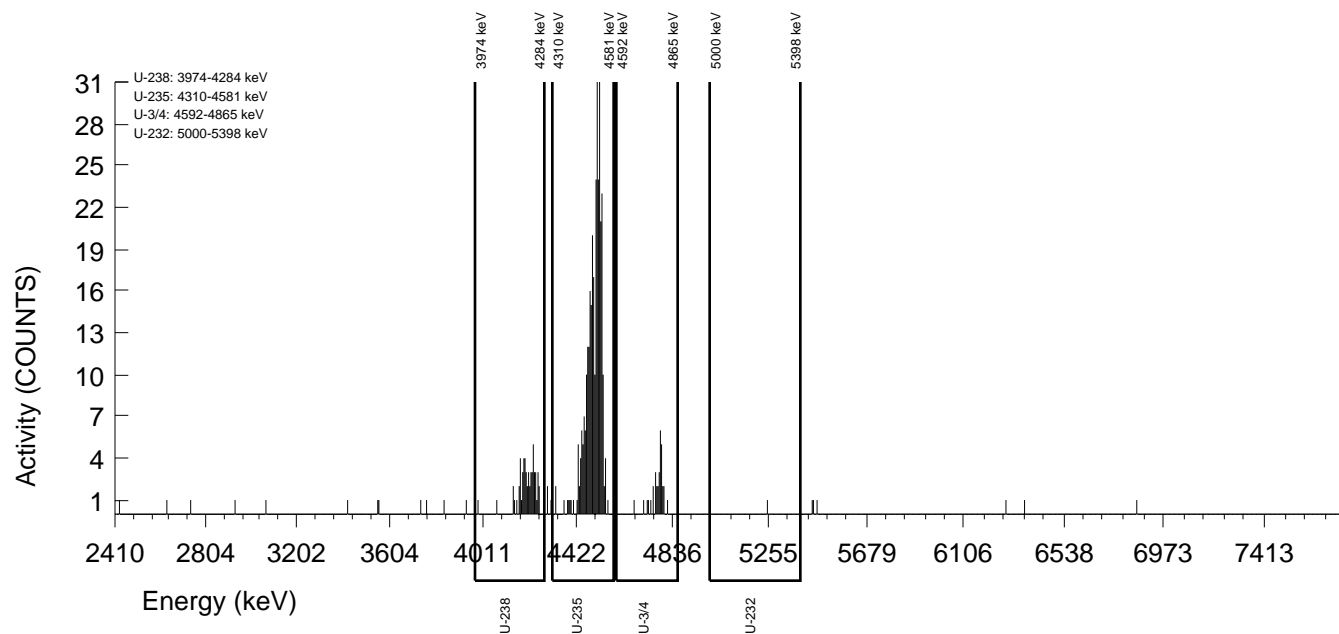
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5250.22	4.899	1.000	-0.019	1.019	1.0095	100.000	-5.99E-04	9.07E-02	2.05E-01	5.57E-02	9.04E-02
U-3/4	4763.02	4771.61	13.064	37.000	36.168	0.832	0.9119	100.000	1.16E+00	4.66E-01	1.99E-01	5.14E-02	3.89E-01
U-235	4391.00	4493.89	52.429	7.000	6.861	0.139	0.3723	99.700	2.21E-01	1.86E-01	1.39E-01	2.10E-02	1.79E-01
U-238	4184.73	4201.60	79.609	40.000	39.584	0.416	0.6448	100.000	1.27E+00	4.92E-01	1.69E-01	3.63E-02	4.03E-01

NOTES:

* Results are a compilation of S0405235053_UU and T0405235053_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.005 +/-0.000)



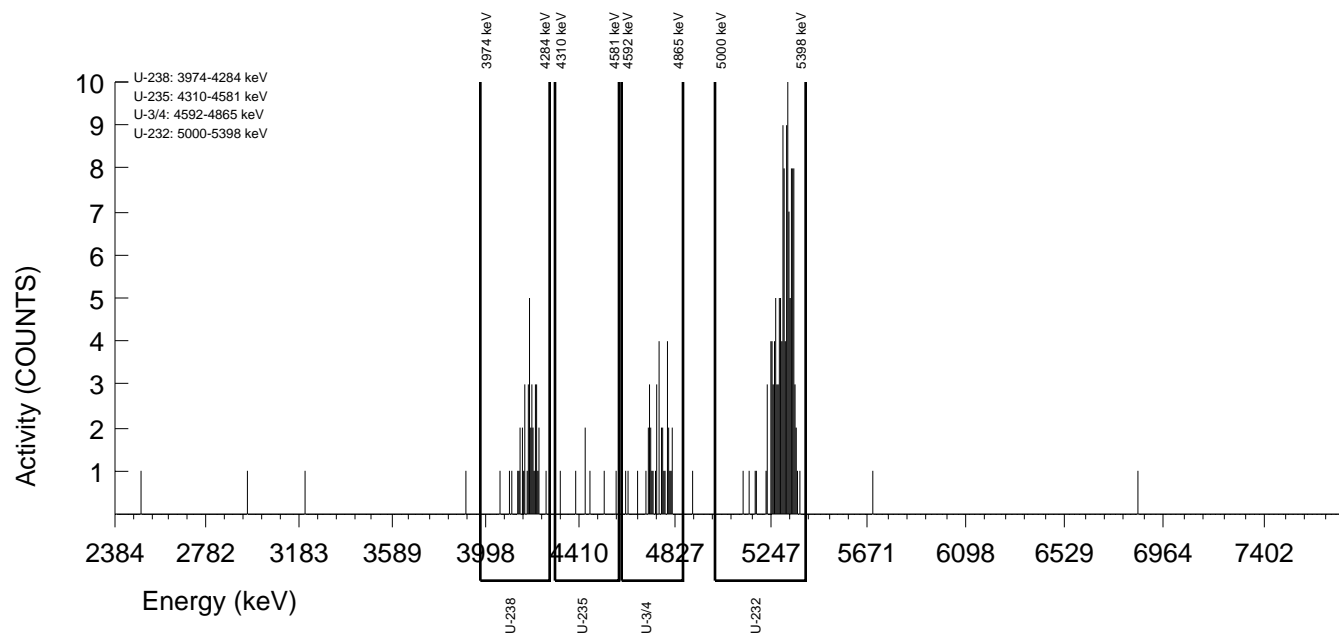
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S0405235053_UU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 01-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 79.7 +/-9.343 %	CHAMBER : 118 DETECTOR S/N : 80061 AVERAGE %EFFICIENCY : 25.6062 AVERAGE %EFF ERROR : 0.4962 COUNT DATE : 22-Sep-2016 10:02:58 ELAPSED LIVE TIME(SEC) : 8315.75	LIB FILE : U236 BKG FILE : B118.CNF;1171 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W118.CNF;318 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6548E+00 dpm RESULTS : 3.7097E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5301.43	51.504	131.000	130.584	0.416	0.6448	100.000	4.19E+00	1.07E+00	1.69E-01	3.63E-02	7.23E-01
U-3/4	4763.02	4751.17	84.188	37.000	36.168	0.832	0.9119	100.000	1.15E+00	4.42E-01	1.98E-01	5.10E-02	3.86E-01
U-235	4391.00	4448.99	4.952	7.000	6.861	0.139	0.3723	99.700	2.19E-01	1.82E-01	1.38E-01	2.09E-02	1.78E-01
U-238	4184.73	4188.46	51.999	40.000	39.584	0.416	0.6448	100.000	1.26E+00	4.64E-01	1.68E-01	3.61E-02	4.00E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T0405235054_UU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 89.6 +/-10.974 % SECONDARY QTY : 0.500 G +/-0.200 %	CHAMBER : 149 DETECTOR S/N : 33449 AVERAGE %EFFICIENCY : 25.2769 AVERAGE %EFF ERROR : 0.4901 COUNT DATE : 22-Sep-2016 10:03:57 ELAPSED LIVE TIME(SEC) : 8757.15	LIB FILE : U236 BKG FILE : B149.CNF;1102 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W149.CNF;305 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.2392E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4481.90	4411.81	339.83	2.72	82.815	N/A
TRACER 2	1564-I	U-232	4.6547 dpm	5198.50	5314.76	-0.58	134.62	90.321	1.0082

NUCLIDE ACTIVITY SUMMARY

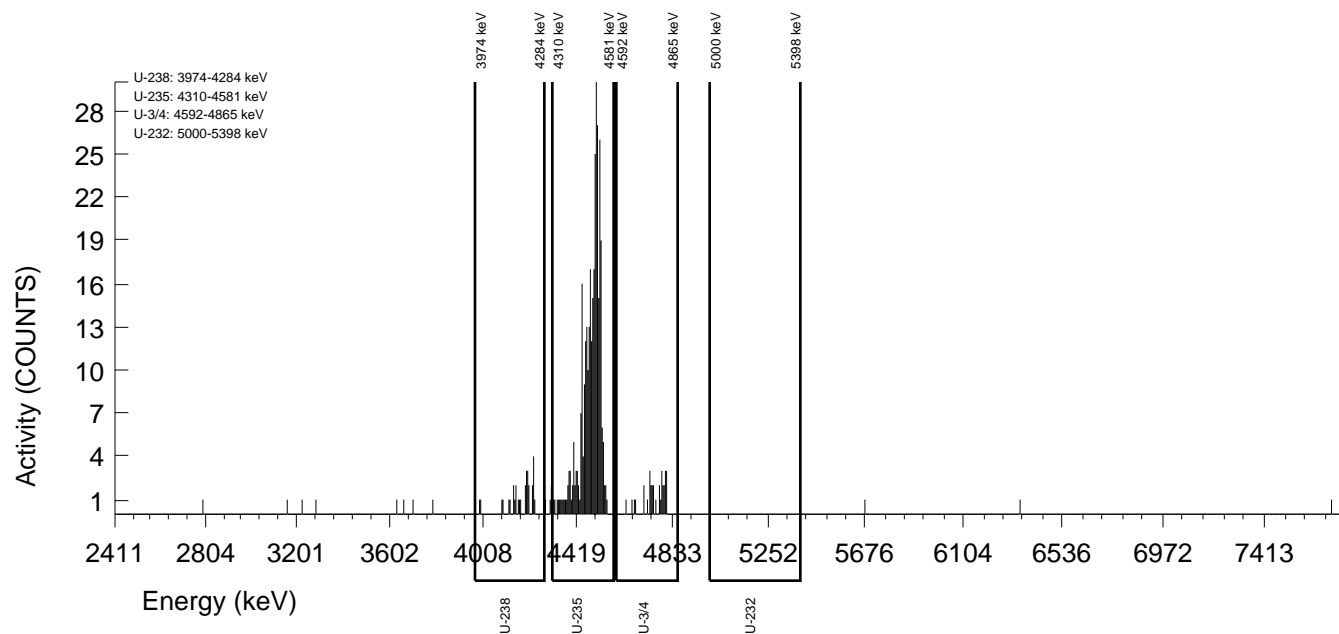
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5198.50	0.000	0.000	-0.584	0.584	0.7641	100.000	-1.74E-02	6.16E-02	1.69E-01	4.00E-02	6.13E-02
U-3/4	4763.02	4759.70	96.442	30.000	29.310	0.690	0.8307	100.000	9.13E-01	3.95E-01	1.84E-01	4.54E-02	3.41E-01
U-235	4391.00	4481.90	80.175	3.000	2.724	0.276	0.5254	99.700	8.51E-02	1.25E-01	1.51E-01	2.88E-02	1.23E-01
U-238	4184.73	4177.90	37.437	31.000	30.448	0.552	0.7430	100.000	9.48E-01	4.03E-01	1.75E-01	4.06E-02	3.46E-01

NOTES:

* Results are a compilation of S0405235054_UU and T0405235054_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.005 +/-0.000)



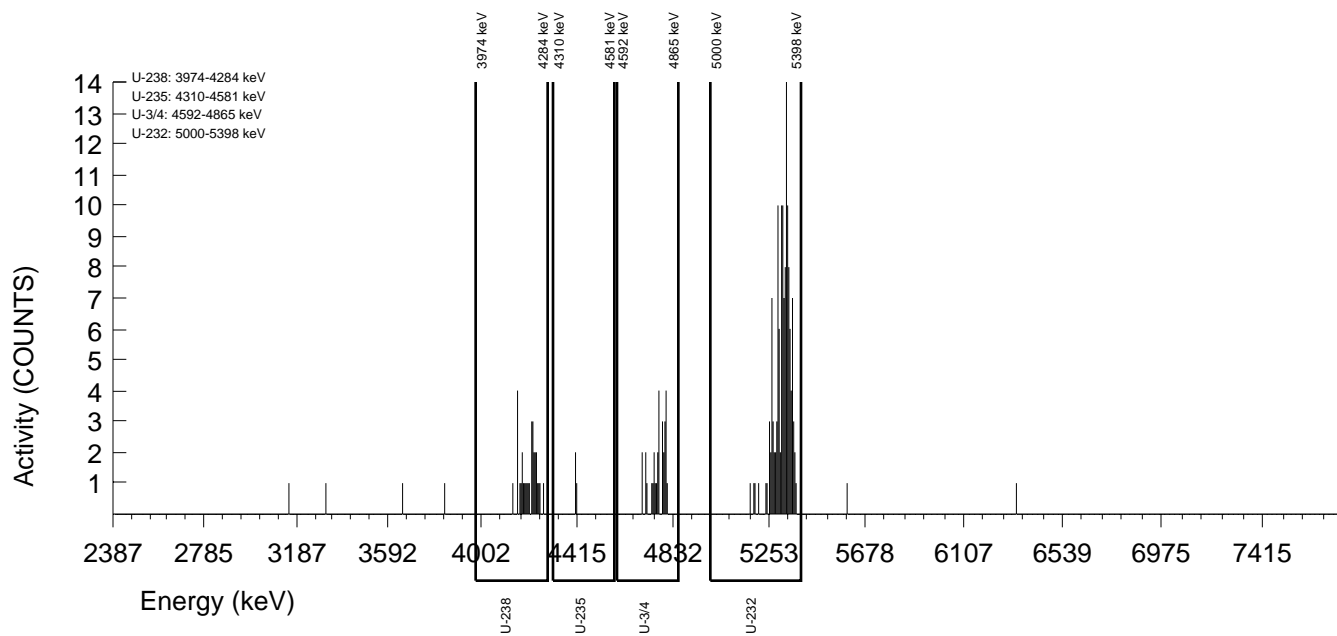
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S0405235054_UU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 90.3 +/-9.251 %	CHAMBER : 119 DETECTOR S/N : 79450 AVERAGE %EFFICIENCY : 23.3886 AVERAGE %EFF ERROR : 0.4544 COUNT DATE : 22-Sep-2016 10:03:00 ELAPSED LIVE TIME(SEC) : 8281.53	LIB FILE : U236 BKG FILE : B119.CNF;1176 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W119.CNF;315 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6547E+00 dpm RESULTS : 4.2042E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5314.76	49.162	136.000	134.620	1.380	1.1748	100.000	4.19E+00	1.06E+00	2.22E-01	6.42E-02	7.15E-01
U-3/4	4763.02	4770.78	37.962	30.000	29.310	0.690	0.8307	100.000	9.06E-01	3.77E-01	1.83E-01	4.50E-02	3.38E-01
U-235	4391.00	4411.81	7.427	3.000	2.724	0.276	0.5254	99.700	8.44E-02	1.23E-01	1.50E-01	2.86E-02	1.22E-01
U-238	4184.73	4205.64	71.797	31.000	30.448	0.552	0.7430	100.000	9.41E-01	3.85E-01	1.73E-01	4.03E-02	3.43E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T0405235055_UU SAMPLE QTY : 0.510 G +/-0.196 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 82.9 +/-8.476 % SECONDARY QTY : 0.502 G +/-0.199 %	CHAMBER : 150 DETECTOR S/N : 75552 AVERAGE %EFFICIENCY : 24.8352 AVERAGE %EFF ERROR : 0.4817 COUNT DATE : 22-Sep-2016 10:03:59 ELAPSED LIVE TIME(SEC) : 8764.54	LIB FILE : U236 BKG FILE : B150.CNF;1100 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W150.CNF;296 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.1037E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4494.59	4475.13	399.19	3.00	98.926	N/A
TRACER 2	1564-I	U-232	4.6547 dpm	5198.60	5309.33	-1.46	324.44	83.588	1.0082

NUCLIDE ACTIVITY SUMMARY

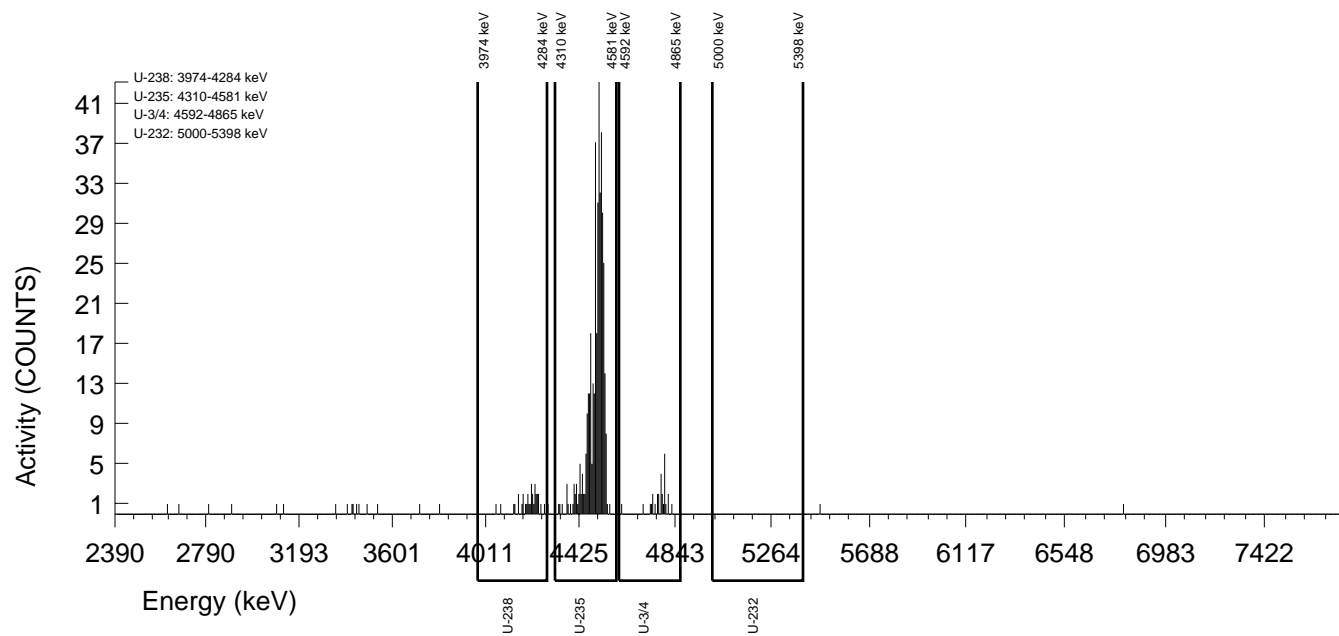
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5198.60	0.000	0.000	-1.461	1.461	1.2086	100.000	-3.68E-02	5.51E-02	1.83E-01	5.37E-02	5.49E-02
U-3/4	4763.02	4771.11	19.166	57.000	55.800	1.200	1.0954	100.000	7.07E-01	2.25E-01	8.89E-02	2.54E-02	1.90E-01
U-235	4391.00	4494.59	39.517	3.000	3.000	0.000	0.0000	99.700	3.81E-02	5.06E-02	3.81E-02	0.00E+00	5.02E-02
U-238	4184.73	4201.37	87.117	75.000	74.760	0.240	0.4899	100.000	9.47E-01	2.70E-01	6.08E-02	1.14E-02	2.17E-01

NOTES:

* Results are a compilation of S0405235055_UU and T0405235055_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.006 +/-0.000)

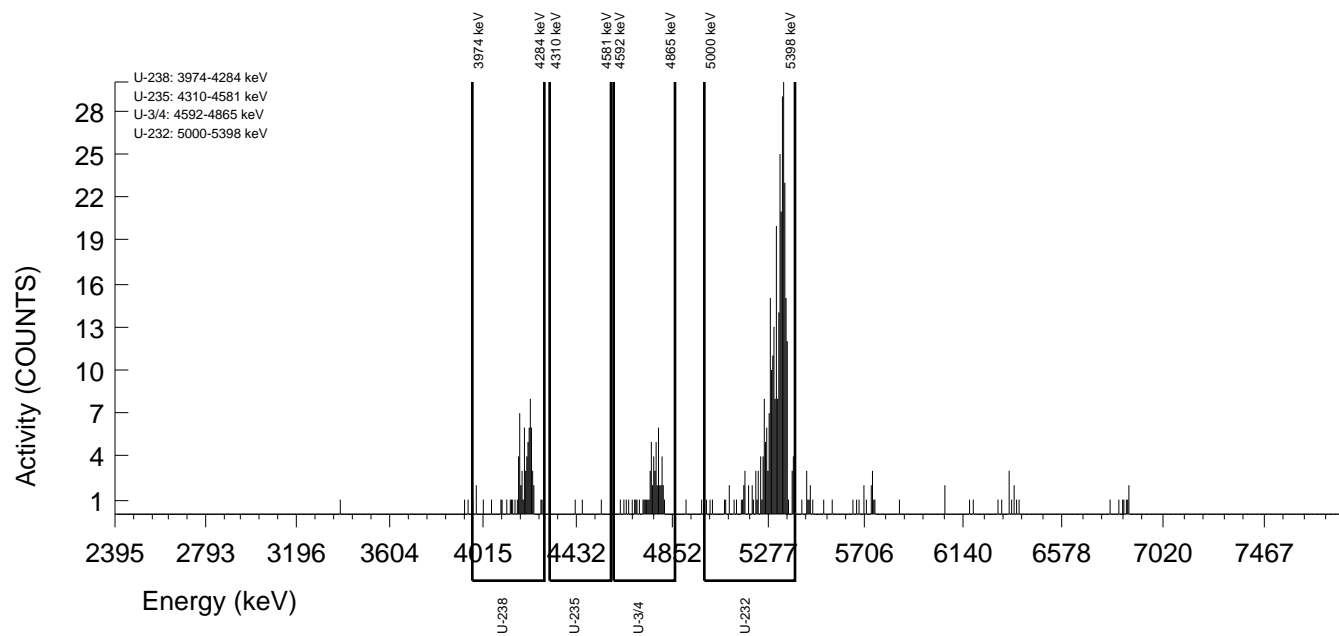


GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER : 1596408 SAMPLE ID : S0405235055_UU SAMPLE QTY : 0.510 G +/-0.196 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 83.6 +/-6.423 %	CHAMBER : 013 DETECTOR S/N : 78790 AVERAGE %EFFICIENCY : 35.0288 AVERAGE %EFF ERROR : 0.6744 COUNT DATE : 22-Sep-2016 14:24:56 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B013.CNF;1813 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W013.CNF;513 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6547E+00 dpm RESULTS : 3.8908E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5309.33	41.698	329.000	324.440	4.560	2.1354	100.000	4.11E+00	7.05E-01	1.37E-01	4.96E-02	4.52E-01
U-3/4	4763.02	4759.22	52.019	57.000	55.800	1.200	1.0954	100.000	7.01E-01	2.10E-01	8.81E-02	2.52E-02	1.88E-01
U-235	4391.00	4475.13	113.947	3.000	3.000	0.000	0.0000	99.700	3.78E-02	5.00E-02	3.78E-02	0.00E+00	4.98E-02
U-238	4184.73	4191.13	57.799	75.000	74.760	0.240	0.4899	100.000	9.40E-01	2.48E-01	6.03E-02	1.13E-02	2.15E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T0405235056_UU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 63.4 +/-11.609 % SECONDARY QTY : 0.508 G +/-0.197 %	CHAMBER : 152 DETECTOR S/N : 76222 AVERAGE %EFFICIENCY : 24.2896 AVERAGE %EFF ERROR : 0.4714 COUNT DATE : 22-Sep-2016 10:04:02 ELAPSED LIVE TIME(SEC) : 9007.66	LIB FILE : U236 BKG FILE : B152.CNF;1086 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W152.CNF;285 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.1100E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4485.29	4547.91	403.54	3.00	99.491	N/A
TRACER 2	1564-I	U-232	4.6547 dpm	5332.78	5335.19	-0.20	107.31	63.878	1.0082

NUCLIDE ACTIVITY SUMMARY

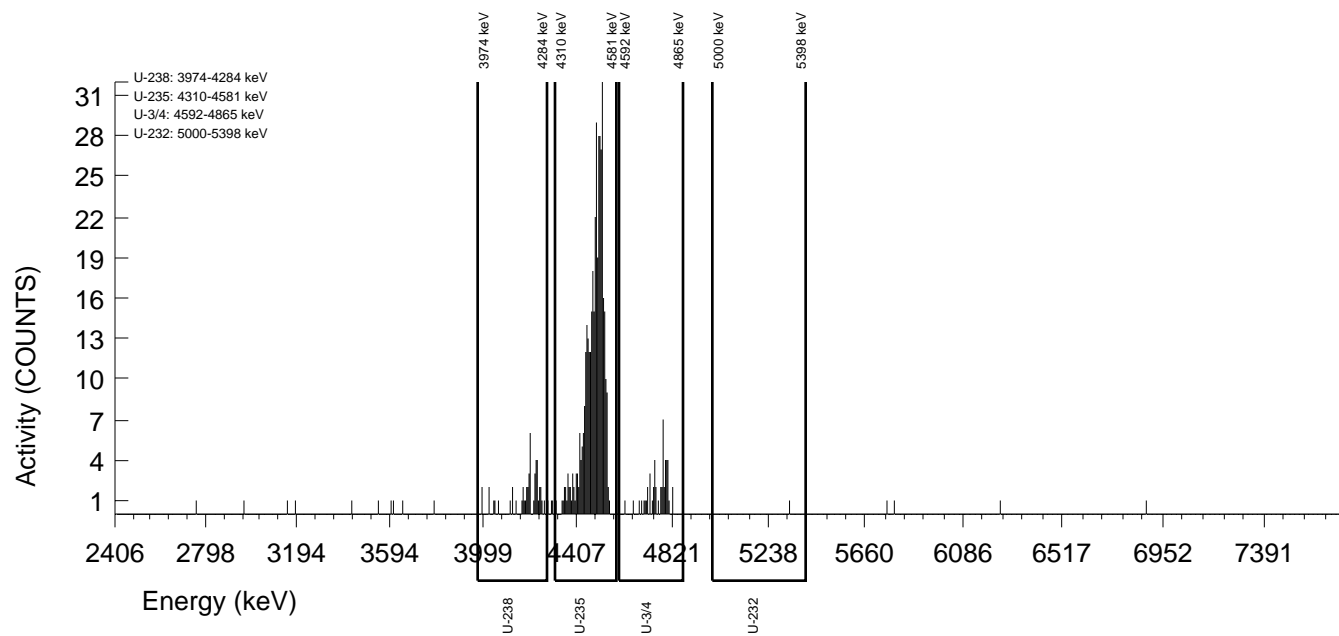
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		Lc pCi/G	1.96-sigma cnt Unc pCi/G
										TPU pCi/G	MDA pCi/G		
U-232	5302.10	5332.78	4.867	1.000	-0.201	1.201	1.0959	100.000	-4.95E-03	7.19E-02	1.69E-01	4.76E-02	7.17E-02
U-3/4	4763.02	4755.53	55.563	30.000	29.584	0.416	0.6453	100.000	1.14E+00	4.95E-01	2.02E-01	4.35E-02	4.19E-01
U-235	4391.00	4485.29	47.046	3.000	3.000	0.000	0.0000	99.700	1.16E-01	1.54E-01	1.16E-01	0.00E+00	1.51E-01
U-238	4184.73	4186.41	35.690	38.000	37.445	0.555	0.7451	100.000	1.44E+00	5.76E-01	2.16E-01	5.02E-02	4.70E-01

NOTES:

* Results are a compilation of S0405235056_UU and T0405235056_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.006 +/-0.000)



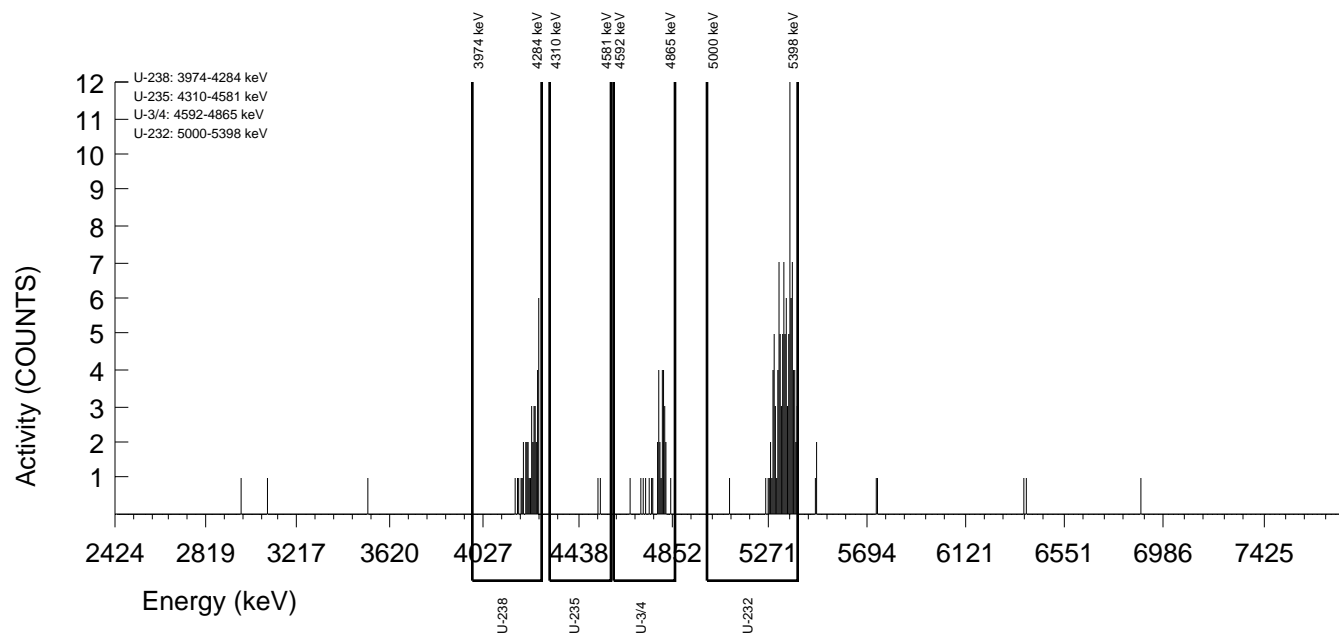
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S0405235056_UU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 63.9 +/-10.228 %	CHAMBER : 121 DETECTOR S/N : 75545 AVERAGE %EFFICIENCY : 26.2144 AVERAGE %EFF ERROR : 0.5077 COUNT DATE : 22-Sep-2016 10:03:06 ELAPSED LIVE TIME(SEC) : 8327.71	LIB FILE : U236 BKG FILE : B121.CNF;1158 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W121.CNF;322 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6547E+00 dpm RESULTS : 2.9733E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5335.19	57.272	108.000	107.306	0.694	0.8331	100.000	4.12E+00	1.15E+00	2.27E-01	5.61E-02	7.86E-01
U-3/4	4763.02	4787.37	34.363	30.000	29.584	0.416	0.6453	100.000	1.13E+00	4.75E-01	2.00E-01	4.31E-02	4.16E-01
U-235	4391.00	4547.91	0.000	3.000	3.000	0.000	0.0000	99.700	1.15E-01	1.52E-01	1.15E-01	0.00E+00	1.50E-01
U-238	4184.73	4235.07	9.818	38.000	37.445	0.555	0.7451	100.000	1.43E+00	5.50E-01	2.14E-01	4.98E-02	4.67E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T0405235057_UU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 73.0 +/-11.062 % SECONDARY QTY : 0.504 G +/-0.198 %	CHAMBER : 154 DETECTOR S/N : 76224 AVERAGE %EFFICIENCY : 26.1126 AVERAGE %EFF ERROR : 0.5058 COUNT DATE : 22-Sep-2016 10:04:04 ELAPSED LIVE TIME(SEC) : 9038.90	LIB FILE : U236 BKG FILE : B154.CNF;1097 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W154.CNF;304 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0489E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4479.40	4410.26	411.36	1.86	94.013	N/A
TRACER 2	1564-I	U-232	4.6547 dpm	5198.56	5317.59	-0.75	122.44	73.570	1.0082

NUCLIDE ACTIVITY SUMMARY

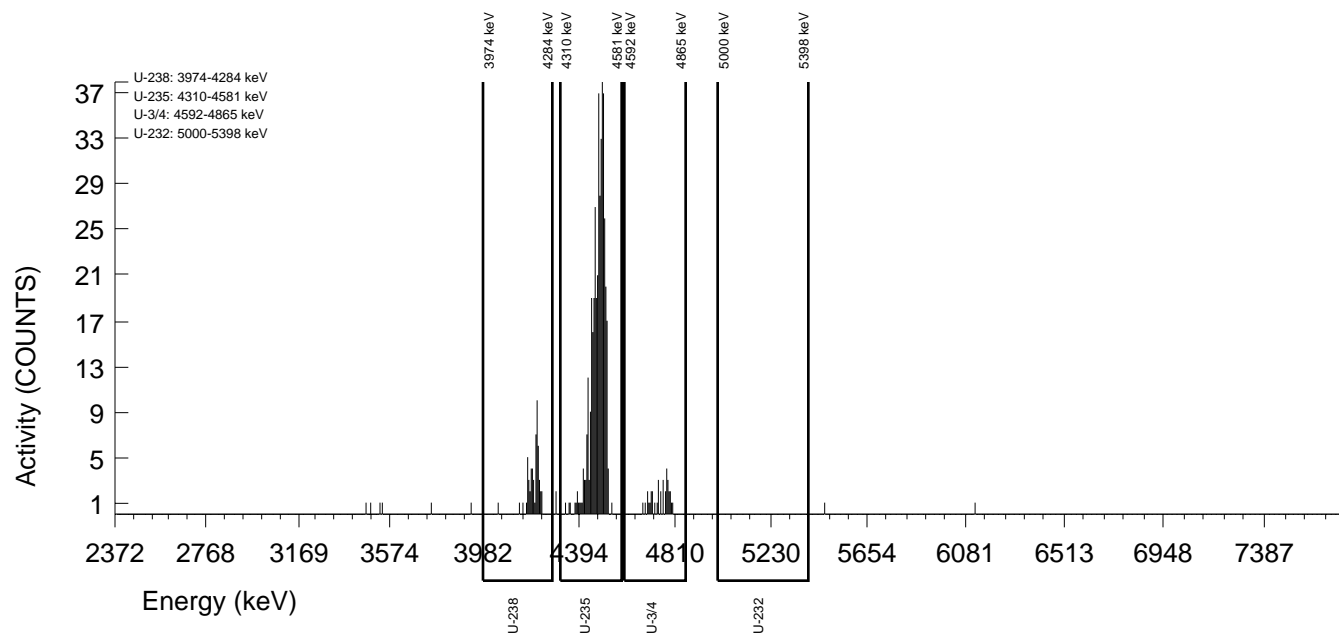
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5198.56	0.000	0.000	-0.753	0.753	0.8679	100.000	-1.84E-02	5.12E-02	1.48E-01	3.73E-02	5.09E-02
U-3/4	4763.02	4751.14	46.903	27.000	26.722	0.278	0.5270	100.000	9.15E-01	4.09E-01	1.66E-01	3.17E-02	3.56E-01
U-235	4391.00	4479.40	51.017	2.000	1.861	0.139	0.3726	99.700	6.39E-02	1.18E-01	1.48E-01	2.25E-02	1.17E-01
U-238	4184.73	4197.90	13.166	20.000	19.445	0.555	0.7453	100.000	6.66E-01	3.41E-01	1.92E-01	4.48E-02	3.08E-01

NOTES:

* Results are a compilation of S0405235057_UU and T0405235057_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.006 +/-0.000)



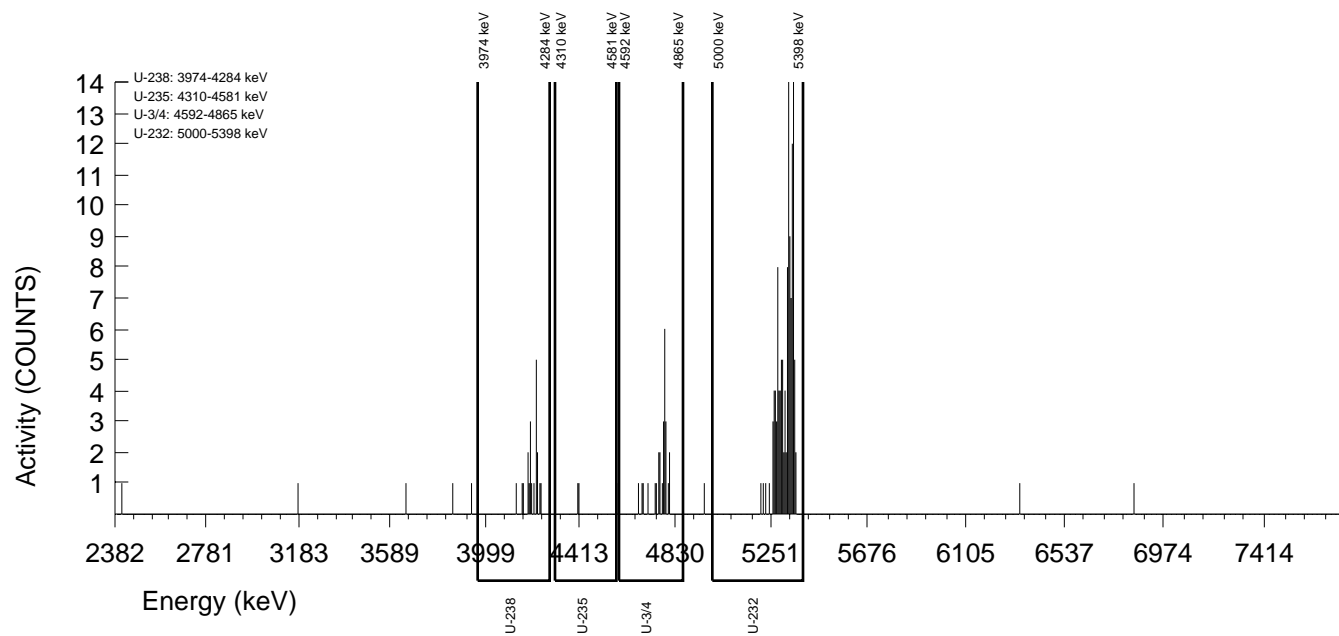
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S0405235057_UU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 73.6 +/-9.624 %	CHAMBER : 122 DETECTOR S/N : 75546 AVERAGE %EFFICIENCY : 25.9617 AVERAGE %EFF ERROR : 0.5030 COUNT DATE : 22-Sep-2016 10:03:08 ELAPSED LIVE TIME(SEC) : 8331.10	LIB FILE : U236 BKG FILE : B122.CNF;1170 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W122.CNF;334 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6547E+00 dpm RESULTS : 3.4244E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5317.59	69.310	123.000	122.445	0.555	0.7453	100.000	4.19E+00	1.10E+00	1.92E-01	4.48E-02	7.48E-01
U-3/4	4763.02	4762.18	9.917	27.000	26.722	0.278	0.5270	100.000	9.08E-01	3.94E-01	1.65E-01	3.14E-02	3.53E-01
U-235	4391.00	4410.26	9.917	2.000	1.861	0.139	0.3726	99.700	6.34E-02	1.17E-01	1.47E-01	2.23E-02	1.16E-01
U-238	4184.73	4207.64	30.165	20.000	19.445	0.555	0.7453	100.000	6.61E-01	3.31E-01	1.91E-01	4.44E-02	3.06E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T0405235058_UU SAMPLE QTY : 0.512 G +/-0.195 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 86.1 +/-10.828 % SECONDARY QTY : 0.501 G +/-0.200 %	CHAMBER : 155 DETECTOR S/N : 75553 AVERAGE %EFFICIENCY : 26.3876 AVERAGE %EFF ERROR : 0.5110 COUNT DATE : 22-Sep-2016 10:04:06 ELAPSED LIVE TIME(SEC) : 9041.49	LIB FILE : U236 BKG FILE : B155.CNF;1099 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W155.CNF;289 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.1613E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4483.92	4410.61	363.20	5.17	82.117	N/A
TRACER 2	1564-I	U-232	4.6547 dpm	5198.53	5309.09	-0.90	136.03	86.802	1.0082

NUCLIDE ACTIVITY SUMMARY

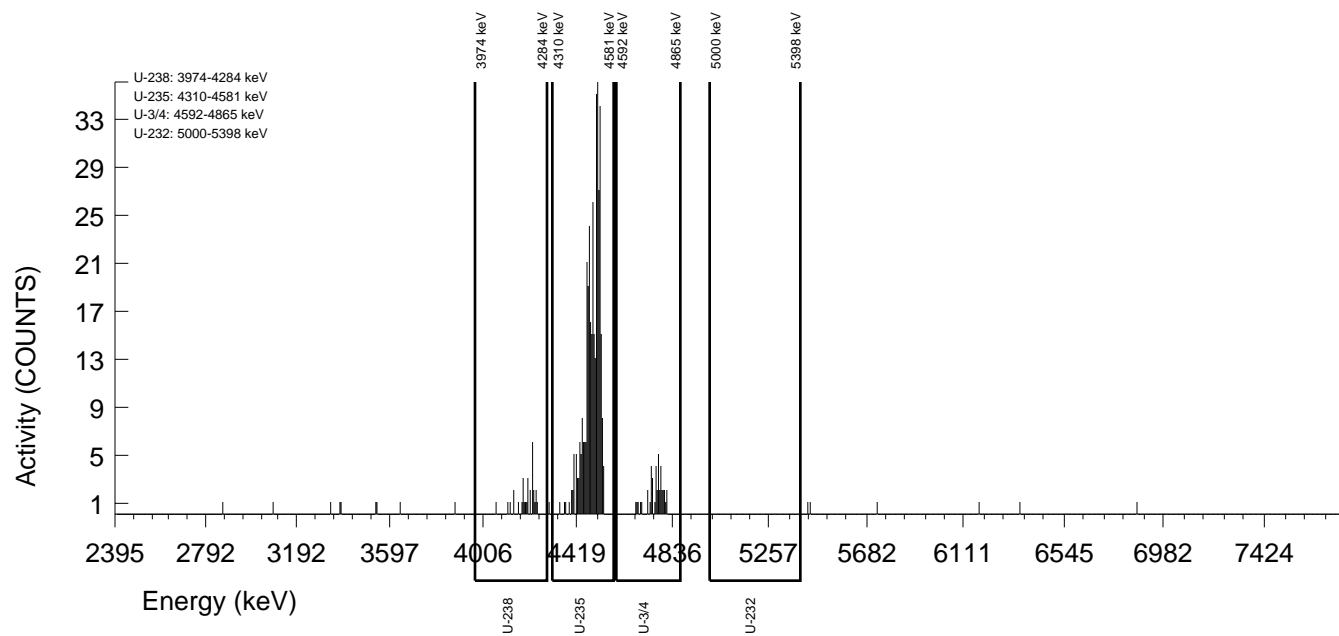
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5198.53	0.000	0.000	-0.904	0.904	0.9509	100.000	-2.51E-02	5.89E-02	1.76E-01	4.66E-02	5.86E-02
U-3/4	4763.02	4759.81	45.605	27.000	25.617	1.383	1.1761	100.000	7.71E-01	3.55E-01	2.15E-01	6.21E-02	3.13E-01
U-235	4391.00	4483.92	59.370	6.000	5.170	0.830	0.9110	99.700	1.56E-01	1.62E-01	1.87E-01	4.83E-02	1.58E-01
U-238	4184.73	4193.31	6.163	21.000	18.510	2.490	1.5779	100.000	5.57E-01	3.04E-01	2.57E-01	8.34E-02	2.79E-01

NOTES:

* Results are a compilation of S0405235058_UU and T0405235058_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.006 +/-0.000)



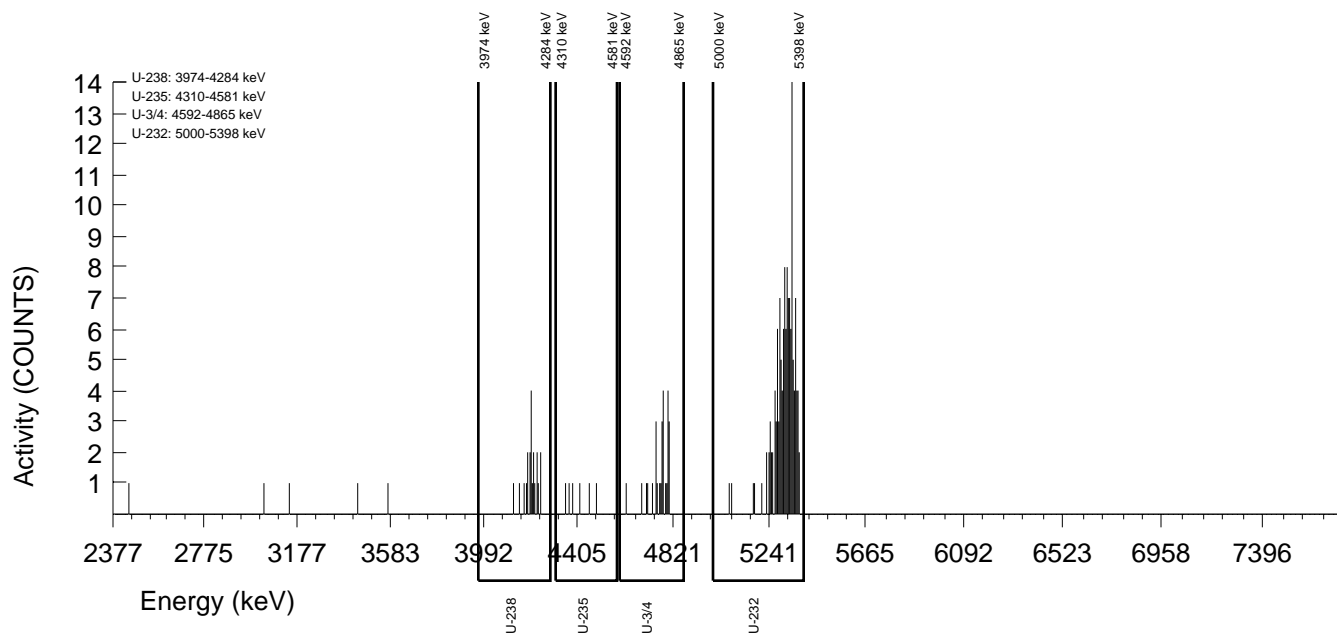
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S0405235058_UU SAMPLE QTY : 0.512 G +/-0.195 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 86.8 +/-9.193 %	CHAMBER : 124 DETECTOR S/N : 80053 AVERAGE %EFFICIENCY : 24.5380 AVERAGE %EFF ERROR : 0.4761 COUNT DATE : 22-Sep-2016 10:03:10 ELAPSED LIVE TIME(SEC) : 8299.73	LIB FILE : U236 BKG FILE : B124.CNF;1158 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W124.CNF;300 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6547E+00 dpm RESULTS : 4.0404E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5309.09	36.058	137.000	136.032	0.968	0.9840	100.000	4.10E+00	1.02E+00	1.94E-01	5.20E-02	6.94E-01
U-3/4	4763.02	4763.73	57.803	27.000	25.617	1.383	1.1761	100.000	7.65E-01	3.41E-01	2.13E-01	6.16E-02	3.11E-01
U-235	4391.00	4410.61	133.772	6.000	5.170	0.830	0.9110	99.700	1.55E-01	1.59E-01	1.86E-01	4.79E-02	1.57E-01
U-238	4184.73	4202.13	8.258	21.000	18.510	2.490	1.5779	100.000	5.53E-01	2.95E-01	2.55E-01	8.27E-02	2.77E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T0405235059_UU SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 89.7 +/-10.459 % SECONDARY QTY : 0.503 G +/-0.199 %	CHAMBER : 156 DETECTOR S/N : 75554 AVERAGE %EFFICIENCY : 25.9446 AVERAGE %EFF ERROR : 0.5027 COUNT DATE : 22-Sep-2016 10:04:10 ELAPSED LIVE TIME(SEC) : 9043.93	LIB FILE : U236 BKG FILE : B156.CNF;1098 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W156.CNF;299 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0469E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4486.35	4456.35	408.16	3.86	93.834	N/A
TRACER 2	1564-I	U-232	4.6529 dpm	5198.55	5305.56	-1.36	145.31	90.390	1.0078

NUCLIDE ACTIVITY SUMMARY

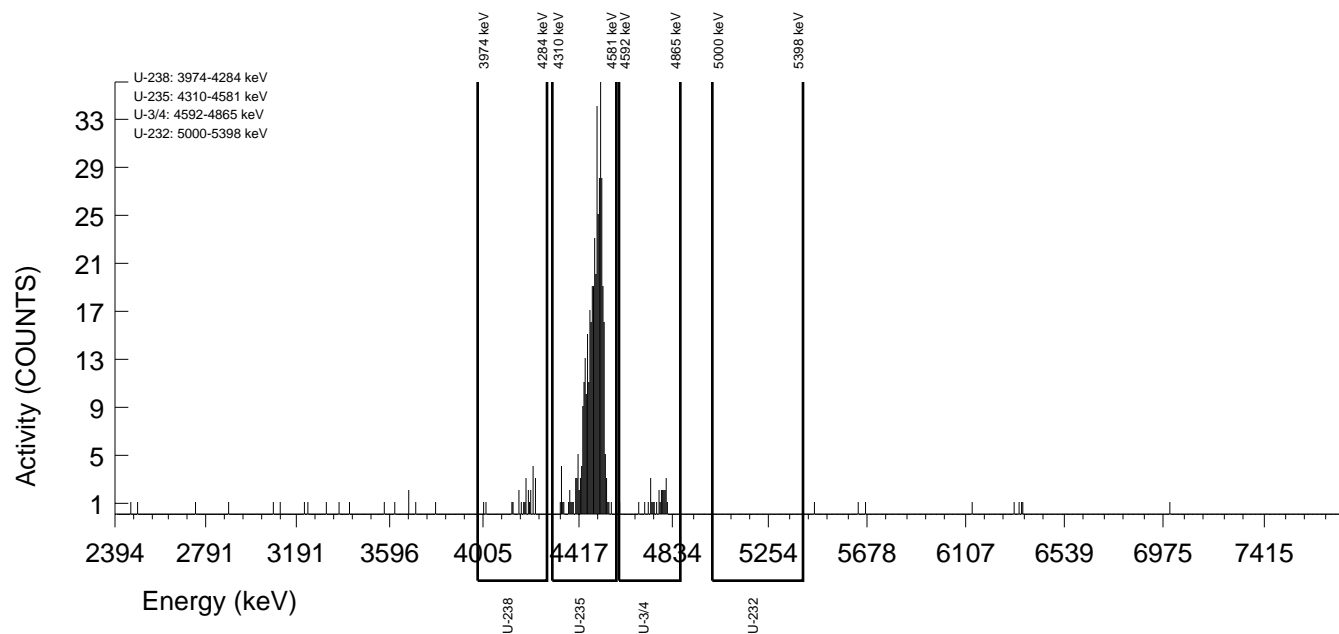
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5198.55	0.000	0.000	-1.357	1.357	1.1647	100.000	-3.34E-02	5.36E-02	1.75E-01	5.05E-02	5.34E-02
U-3/4	4763.02	4759.84	70.310	28.000	27.583	0.417	0.6455	100.000	7.91E-01	3.45E-01	1.51E-01	3.25E-02	3.03E-01
U-235	4391.00	4486.35	47.695	4.000	3.861	0.139	0.3727	99.700	1.11E-01	1.29E-01	1.24E-01	1.88E-02	1.27E-01
U-238	4184.73	4183.35	43.584	22.000	21.583	0.417	0.6455	100.000	6.19E-01	2.99E-01	1.51E-01	3.25E-02	2.70E-01

NOTES:

* Results are a compilation of S0405235059_UU and T0405235059_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.006 +/-0.000)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

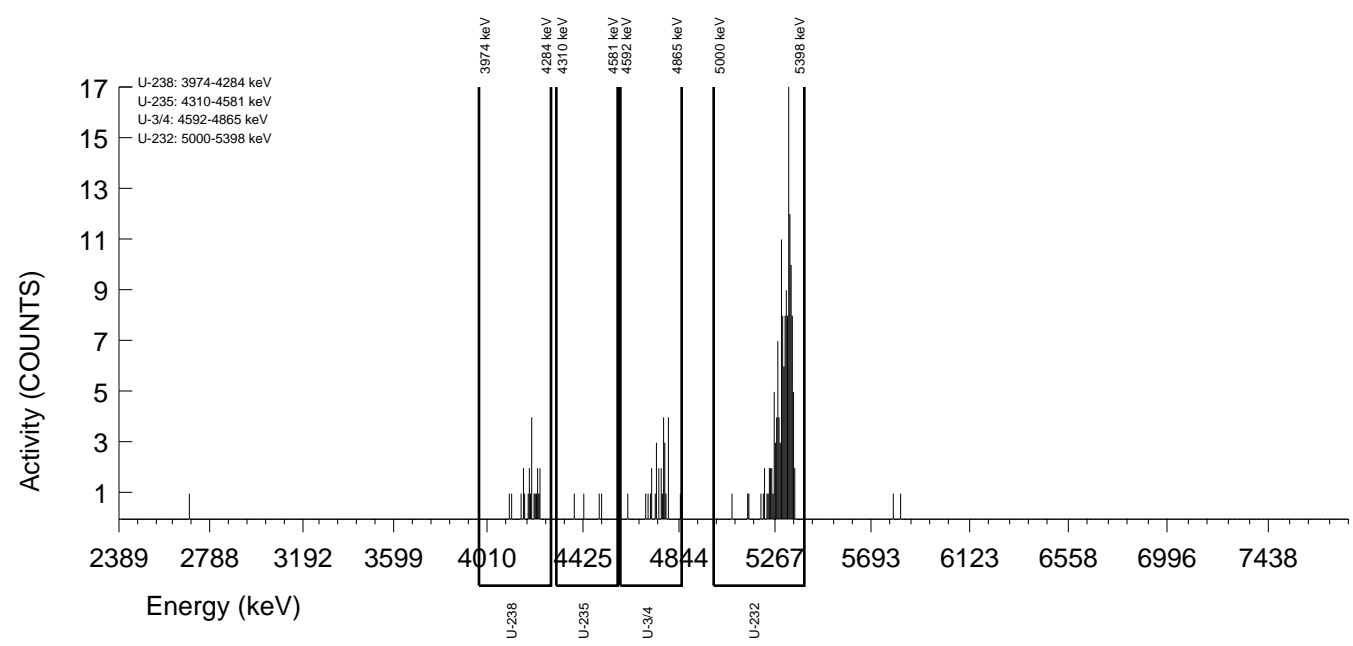
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S0405235059_UU SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 90.4 +/-8.918 %	CHAMBER : 126 DETECTOR S/N : 75548 AVERAGE %EFFICIENCY : 25.0653 AVERAGE %EFF ERROR : 0.4861 COUNT DATE : 22-Sep-2016 10:03:12 ELAPSED LIVE TIME(SEC) : 8334.57	LIB FILE : U236 BKG FILE : B126.CNF;1162 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W126.CNF;338 CAL DATE : 08-Sep-2016
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TRACER
 ID : 1564-I
 NUCLIDE : U-232
 NOMINAL : 4.6529E+00 dpm
 RESULTS : 4.2058E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5305.56	45.042	146.000	145.305	0.695	0.8334	100.000	4.17E+00	1.01E+00	1.70E-01	4.20E-02	6.82E-01
U-3/4	4763.02	4763.56	54.672	28.000	27.583	0.417	0.6455	100.000	7.85E-01	3.32E-01	1.50E-01	3.22E-02	3.01E-01
U-235	4391.00	4456.35	119.285	4.000	3.861	0.139	0.3727	99.700	1.10E-01	1.27E-01	1.23E-01	1.87E-02	1.26E-01
U-238	4184.73	4193.53	5.799	22.000	21.583	0.417	0.6455	100.000	6.14E-01	2.90E-01	1.50E-01	3.22E-02	2.68E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T0405235060_UU SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 94.0 +/-10.326 % SECONDARY QTY : 0.512 G +/-0.195 %	CHAMBER : 157 DETECTOR S/N : 7555 AVERAGE %EFFICIENCY : 26.0007 AVERAGE %EFF ERROR : 0.5038 COUNT DATE : 22-Sep-2016 10:04:12 ELAPSED LIVE TIME(SEC) : 9024.81	LIB FILE : U236 BKG FILE : B157.CNF;1098 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W157.CNF;284 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 8.9054E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4481.60	4555.13	347.23	0.86	79.823	N/A
TRACER 2	1564-I	U-232	4.6529 dpm	5198.56	5297.33	-0.60	162.16	94.733	1.0078

NUCLIDE ACTIVITY SUMMARY

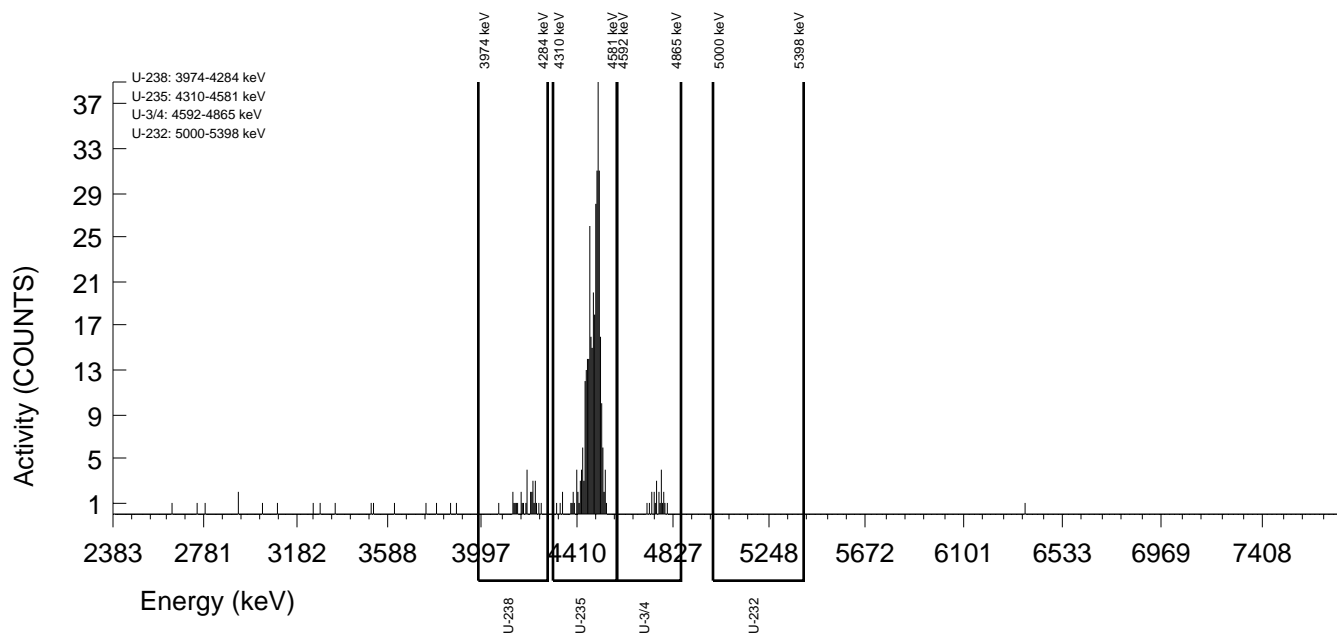
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5198.56	0.000	0.000	-0.602	0.602	0.7757	100.000	-1.71E-02	5.90E-02	1.63E-01	3.89E-02	5.87E-02
U-3/4	4763.02	4766.10	25.572	11.000	10.443	0.557	0.7464	100.000	2.62E-01	1.79E-01	1.41E-01	3.29E-02	1.71E-01
U-235	4391.00	4481.60	46.071	1.000	0.861	0.139	0.3732	99.700	2.17E-02	7.06E-02	1.09E-01	1.65E-02	7.04E-02
U-238	4184.73	4193.00	40.420	23.000	22.721	0.279	0.5278	100.000	5.70E-01	2.68E-01	1.22E-01	2.33E-02	2.41E-01

NOTES:

* Results are a compilation of S0405235060_UU and T0405235060_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.005 +/-0.000)



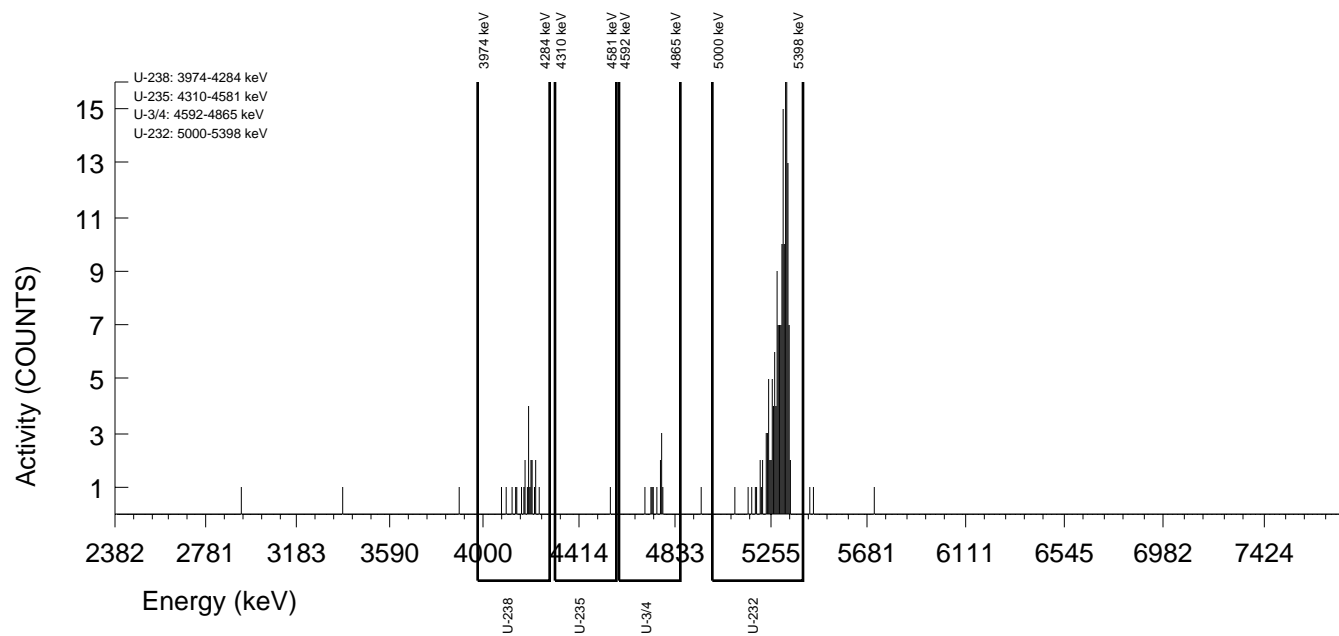
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S0405235060_UU SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 94.7 +/-8.500 %	CHAMBER : 127 DETECTOR S/N : 78770 AVERAGE %EFFICIENCY : 26.6218 AVERAGE %EFF ERROR : 0.5155 COUNT DATE : 22-Sep-2016 10:03:15 ELAPSED LIVE TIME(SEC) : 8356.29	LIB FILE : U236 BKG FILE : B127.CNF;1165 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W127.CNF;322 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6529E+00 dpm RESULTS : 4.4078E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5297.33	49.748	163.000	162.164	0.836	0.9141	100.000	4.07E+00	9.39E-01	1.56E-01	4.03E-02	6.30E-01
U-3/4	4763.02	4759.64	9.916	11.000	10.443	0.557	0.7464	100.000	2.60E-01	1.75E-01	1.40E-01	3.26E-02	1.70E-01
U-235	4391.00	4555.13	4.958	1.000	0.861	0.139	0.3732	99.700	2.15E-02	7.00E-02	1.08E-01	1.64E-02	6.99E-02
U-238	4184.73	4183.58	6.611	23.000	22.721	0.279	0.5278	100.000	5.66E-01	2.58E-01	1.21E-01	2.31E-02	2.39E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T1203621739_UU SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 20-Sep-2016 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 91.2 +/-11.038 % SECONDARY QTY : 0.513 G +/-0.195 %	CHAMBER : 158 DETECTOR S/N : 80007 AVERAGE %EFFICIENCY : 25.2718 AVERAGE %EFF ERROR : 0.4900 COUNT DATE : 22-Sep-2016 10:04:13 ELAPSED LIVE TIME(SEC) : 9027.47	LIB FILE : U236 BKG FILE : B158.CNF;1103 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W158.CNF;286 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 6.4377E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4494.41	4450.56	244.05	2.72	57.704	N/A
TRACER 2	1564-I	U-232	4.6173 dpm	5149.19	5308.18	1.10	154.30	92.218	1.0109

NUCLIDE ACTIVITY SUMMARY

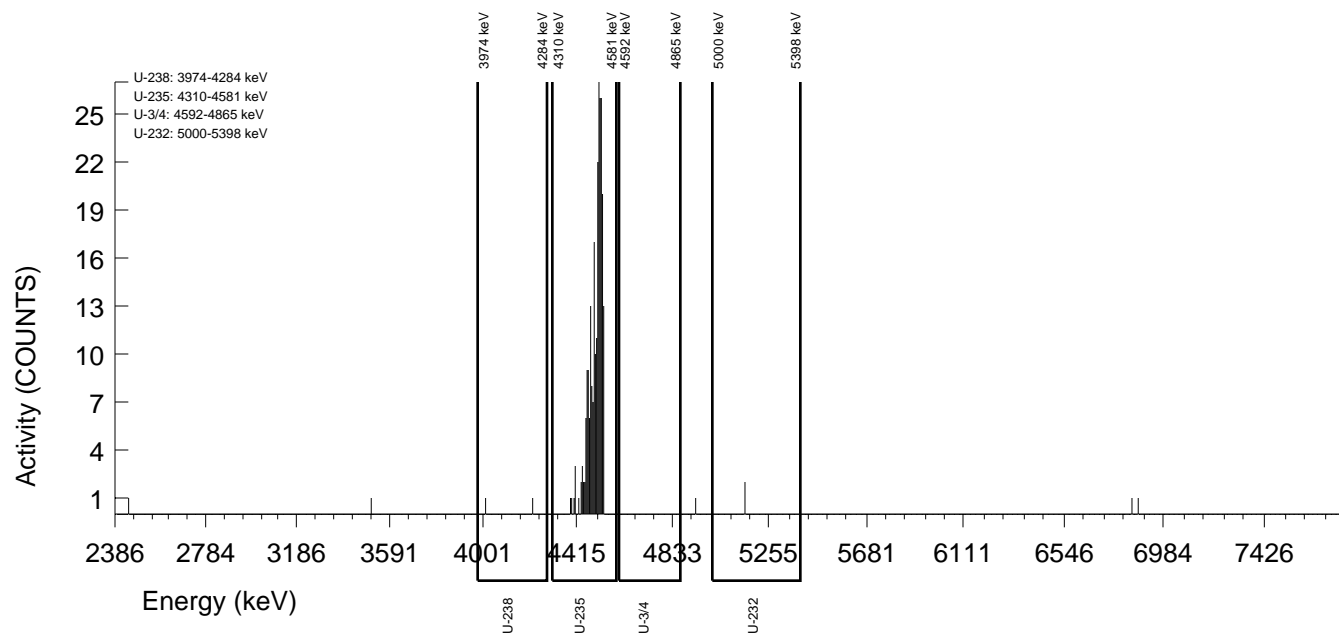
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		Lc pCi/G	1.96-sigma	
										TPU pCi/G	MDA pCi/G		cnt	Unc pCi/G
U-232	5302.10	5149.19	4.944	2.000	1.097	0.903	0.9501	100.000	4.39E-02	1.40E-01	2.54E-01	6.71E-02	1.39E-01	1.39E-01
U-3/4	4763.02	4728.16	0.000	3.000	2.721	0.279	0.5280	100.000	7.20E-02	1.06E-01	1.28E-01	2.45E-02	1.04E-01	1.04E-01
U-235	4391.00	4494.41	40.926	3.000	2.721	0.279	0.5280	99.700	7.22E-02	1.06E-01	1.29E-01	2.46E-02	1.05E-01	1.05E-01
U-238	4184.73	4114.61	202.689	3.000	2.861	0.139	0.3733	100.000	7.57E-02	1.06E-01	1.14E-01	1.73E-02	1.04E-01	1.04E-01

NOTES:

* Results are a compilation of S1203621739_UU and T1203621739_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.004 +/-0.000)



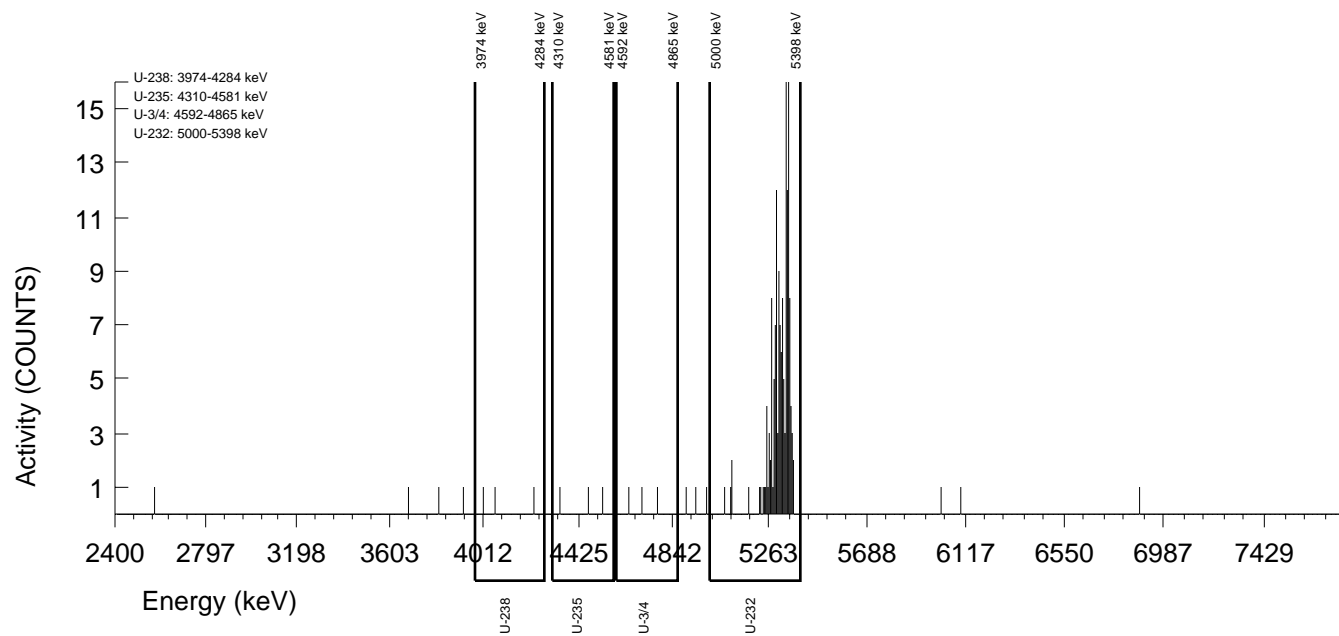
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S1203621739_UU SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 20-Sep-2016 00:00:00 ANALYST : HAKB % YIELD : 92.2 +/-8.684 %	CHAMBER : 128 DETECTOR S/N : 75549 AVERAGE %EFFICIENCY : 26.0039 AVERAGE %EFF ERROR : 0.5038 COUNT DATE : 22-Sep-2016 10:03:17 ELAPSED LIVE TIME(SEC) : 8362.11	LIB FILE : U236 BKG FILE : B128.CNF;1169 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W128.CNF;324 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6173E+00 dpm RESULTS : 4.2579E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5308.18	58.229	155.000	154.303	0.697	0.8348	100.000	4.04E+00	9.52E-01	1.55E-01	3.84E-02	6.41E-01
U-3/4	4763.02	4709.15	123.366	3.000	2.721	0.279	0.5280	100.000	7.12E-02	1.04E-01	1.27E-01	2.43E-02	1.03E-01
U-235	4391.00	4450.56	182.582	3.000	2.721	0.279	0.5280	99.700	7.14E-02	1.04E-01	1.27E-01	2.43E-02	1.04E-01
U-238	4184.73	4102.48	217.125	3.000	2.861	0.139	0.3733	100.000	7.49E-02	1.04E-01	1.13E-01	1.72E-02	1.03E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T1203621740_UU SAMPLE QTY : 0.511 G +/-0.196 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 79.2 +/-8.502 % SECONDARY QTY : 0.508 G +/-0.197 %	CHAMBER : 159 DETECTOR S/N : 76225 AVERAGE %EFFICIENCY : 25.5501 AVERAGE %EFF ERROR : 0.4952 COUNT DATE : 22-Sep-2016 10:04:16 ELAPSED LIVE TIME(SEC) : 9014.70	LIB FILE : U236 BKG FILE : B159.CNF;1072 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W159.CNF;278 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.2119E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4484.70	4473.39	463.82	3.04	108.627	N/A
TRACER 2	1564-I	U-232	4.6549 dpm	5198.48	5311.68	-1.95	289.20	79.846	1.0082

NUCLIDE ACTIVITY SUMMARY

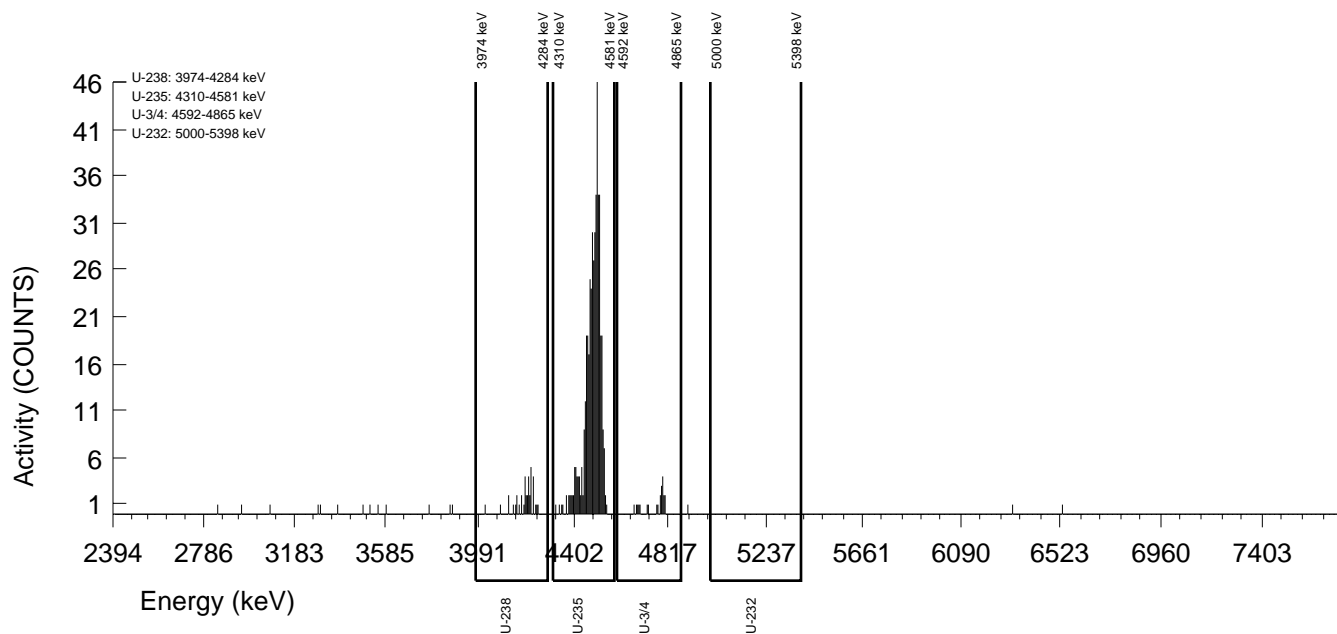
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5198.48	0.000	0.000	-1.953	1.953	1.3976	100.000	-4.19E-02	4.83E-02	1.70E-01	5.29E-02	4.82E-02
U-3/4	4763.02	4757.52	14.636	41.000	40.280	0.720	0.8485	100.000	5.72E-01	2.05E-01	8.67E-02	2.21E-02	1.81E-01
U-235	4391.00	4484.70	43.827	4.000	3.040	0.960	0.9798	99.700	4.33E-02	6.46E-02	9.38E-02	2.55E-02	6.41E-02
U-238	4184.73	4182.94	38.419	56.000	55.040	0.960	0.9798	100.000	7.81E-01	2.49E-01	9.35E-02	2.55E-02	2.10E-01

NOTES:

* Results are a compilation of S1203621740_UU and T1203621740_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.007 +/-0.000)



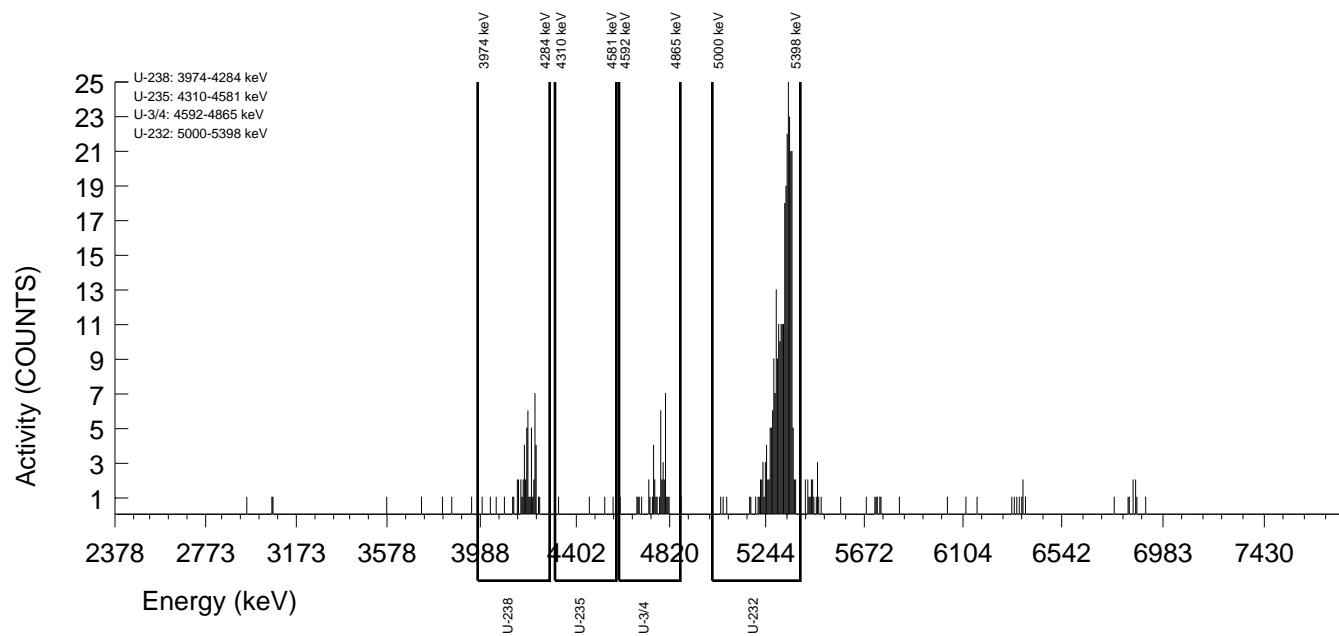
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S1203621740_UU SAMPLE QTY : 0.511 G +/-0.196 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 79.8 +/-6.725 %	CHAMBER : 014 DETECTOR S/N : 83289 AVERAGE %EFFICIENCY : 32.6875 AVERAGE %EFF ERROR : 0.6302 COUNT DATE : 22-Sep-2016 14:24:56 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B014.CNF;1814 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W014.CNF;523 CAL DATE : 27-Aug-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6549E+00 dpm RESULTS : 3.7168E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5311.68	66.910	294.000	289.200	4.800	2.1909	100.000	4.10E+00	7.39E-01	1.56E-01	5.69E-02	4.79E-01
U-3/4	4763.02	4762.35	52.832	41.000	40.280	0.720	0.8485	100.000	5.67E-01	1.95E-01	8.60E-02	2.19E-02	1.79E-01
U-235	4391.00	4473.39	230.986	4.000	3.040	0.960	0.9798	99.700	4.29E-02	6.39E-02	9.30E-02	2.53E-02	6.36E-02
U-238	4184.73	4180.73	50.989	56.000	55.040	0.960	0.9798	100.000	7.75E-01	2.34E-01	9.27E-02	2.53E-02	2.09E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : T1203621741_UU SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 20-Sep-2016 00:00:00 ANALYST : HAKB CORRECTED % YIELD : 91.5 +/-8.404 % SECONDARY QTY : 0.513 G +/-0.195 %	CHAMBER : 160 DETECTOR S/N : 79994 AVERAGE %EFFICIENCY : 25.3966 AVERAGE %EFF ERROR : 0.4923 COUNT DATE : 22-Sep-2016 10:04:19 ELAPSED LIVE TIME(SEC) : 9017.69	LIB FILE : U236 BKG FILE : B160.CNF;1074 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W160.CNF;308 CAL DATE : 09-Sep-2016
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TRACER ID : 1570-E NUCLIDE : U-235 NOMINAL : 1.1123E+01 dpm RESULTS : 1.0166E+01 dpm	LCS ID : 1600-E NUCLIDE : U-238 NOMINAL (pCi/G) : 5.2299E+00 % RECOVERY : 102.794
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TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4487.00	4465.41	386.88	25.32	91.125	N/A
TRACER 2	1564-I	U-232	4.6173 dpm	5198.56	5301.22	-0.30	338.44	91.534	1.0001

NUCLIDE ACTIVITY SUMMARY

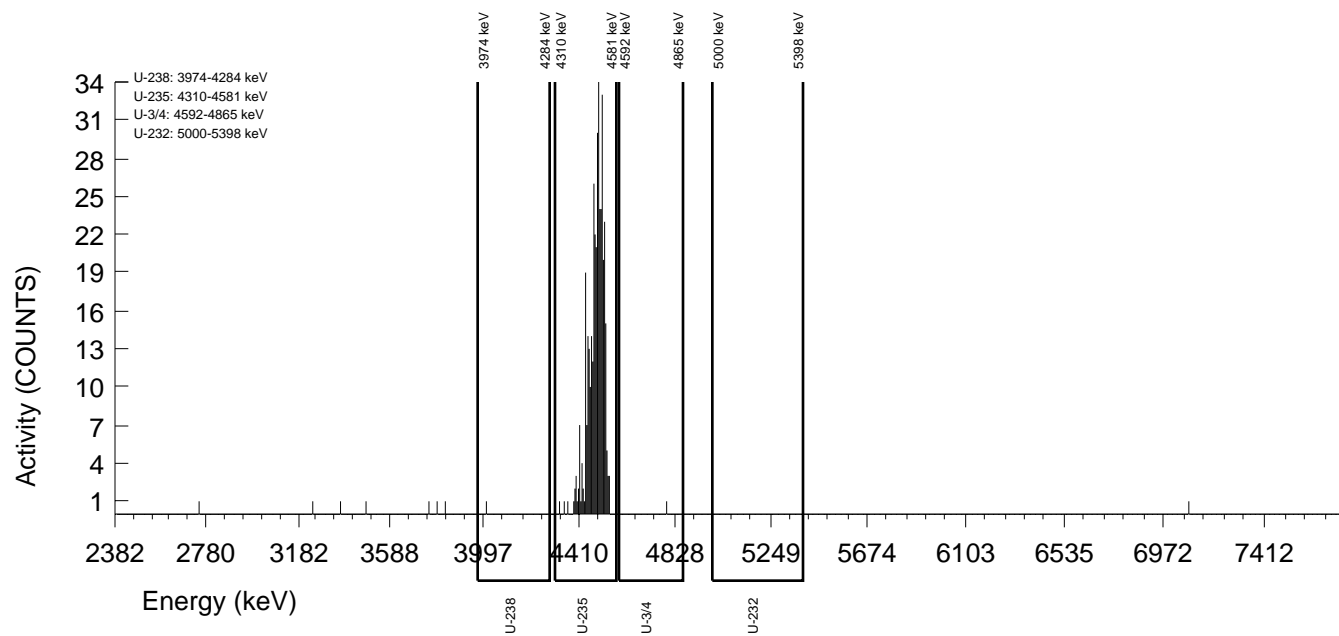
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5198.56	0.000	0.000	-0.301	0.301	0.5483	100.000	-7.59E-03	5.13E-02	1.25E-01	2.44E-02	5.11E-02
U-3/4	4763.02	4796.23	4.950	424.000	422.800	1.200	1.0954	100.000	5.05E+00	9.80E-01	8.37E-02	2.39E-02	4.82E-01
U-235	4391.00	4487.00	83.454	27.000	25.320	1.680	1.2961	99.700	3.03E-01	1.35E-01	9.27E-02	2.84E-02	1.25E-01
U-238	4184.73	4007.33	4.950	451.000	450.520	0.480	0.6928	100.000	5.38E+00	1.04E+00	6.61E-02	1.51E-02	4.97E-01

NOTES:

* Results are a compilation of S1203621741_UU and T1203621741_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.006 +/-0.000)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

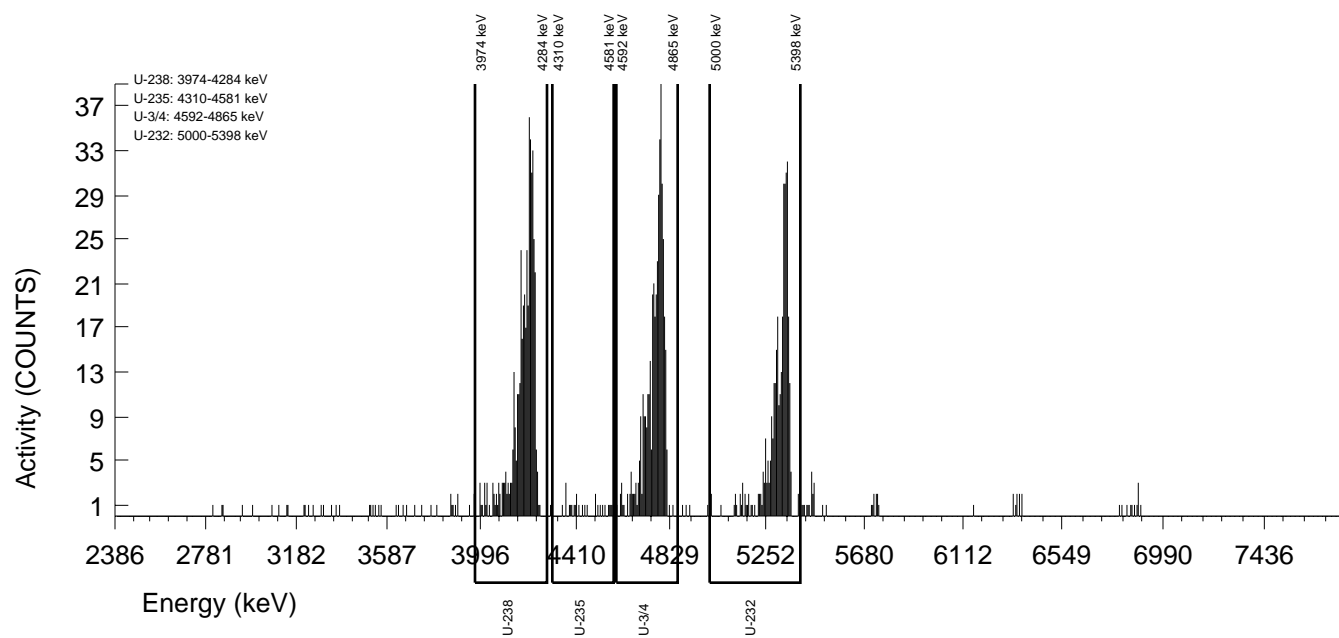
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596408 SAMPLE ID : S1203621741_UU SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 20-Sep-2016 00:00:00 ANALYST : HAKB % YIELD : 91.5 +/-6.319 %	CHAMBER : 015 DETECTOR S/N : 80055 AVERAGE %EFFICIENCY : 33.3682 AVERAGE %EFF ERROR : 0.6430 COUNT DATE : 22-Sep-2016 14:24:56 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B015.CNF;1833 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W015.CNF;530 CAL DATE : 27-Aug-2016
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TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6173E+00 dpm RESULTS : 4.2264E+00 dpm	LCS ID : 1600-E NUCLIDE : U-238 NOMINAL (pCi/G) : 5.2299E+00 % RECOVERY : 102.786
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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5301.22	49.173	343.000	338.440	4.560	2.1354	100.000	4.04E+00	6.80E-01	1.29E-01	4.67E-02	4.35E-01
U-3/4	4763.02	4758.19	48.295	424.000	422.800	1.200	1.0954	100.000	5.04E+00	8.12E-01	8.37E-02	2.39E-02	4.82E-01
U-235	4391.00	4465.41	0.000	27.000	25.320	1.680	1.2961	99.700	3.03E-01	1.31E-01	9.27E-02	2.84E-02	1.25E-01
U-238	4184.73	4182.75	62.695	451.000	450.520	0.480	0.6928	100.000	5.38E+00	8.56E-01	6.61E-02	1.51E-02	4.97E-01



Batch# 15912407 Product: Th Date: 9/29/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.			
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	Der# 1562839
Sample was correctly preserved if required.			NA
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		Der# 1562839
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		Der# 1562839
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: M. Anderson 9/29/16

Secondary Review Performed By: Jessie Davis 09/30/16

10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 29-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Th-01-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596407	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060, and 1203621737 were received and analyzed out of holding.</p>		<p>1. Reporting results.</p>	

Originator's Name:

Melanie Aycock 29-SEP-16

Data Validator/Group Leader:

Jessica Davis 30-SEP-16

Thorium (Ac-227 Tracer) Queue Sheet

07-SEP-16

Batch #: 1596407 Analyst: HAKB First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16

Tracer Isotope: Ac-227 Tracer Code: 0387-B-402 Expiration Date: 5/31/13 Vol: 0.1 Ac-227 Separation Date/Time: 9/21/16 @ 0930 hrs

LCS Isotope: Th-230 Th-232 LCS Code: 1242-H Expiration Date: 2/1/13 Vol: 0.1

Spike Isotope: Th-230, Th-232 Spike Code: Expiration Date: Vol: 0.1

Prep Date: 9/20/16 Initials: AKB Pipet ID: 1840022 Balance ID: 16107662 Witness: Jon 9/20/16

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet (Dry) Aliquot (g/l/f)	Th Det #
405235041-1	4.4D.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	1		0.128	28 188
405235042-1	4.4D.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	2		0.125	40
405235043-1	4.4D.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	3		0.118	44 18A
405235044-1	4.4D.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	4		0.123	42
405235045-1	4.4D.R.5.2	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	5		0.102	199
405235046-1	4.5A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	6		0.119	200
405235047-1	4.5A.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	7		0.125	201
405235048-1	4.5B.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	8		0.105	202
405235049-1	4.5B.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	9		0.123	203 162
405235050-1	4.5B.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	10		0.101	204 163
405235051-1	4.5B.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	11		0.120	205 164
405235052-1	4.5B.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	12		0.120	206
405235053-1	4.5C.R.5.2	SAMPLE		1 pCi/g	SOIL	MJWC001	01-DEC-15	13		0.108	207
405235054-1	4.5C.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	14		0.105	208
405235055-1	4.5C.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	15		0.105	26
405235056-1	4.5C.R.2.2	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	16		0.113	28
405235057-1	4.5C.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	17		0.110	29
405235058-1	4.5C.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	18		0.128	30 176
405235059-1	5.1A.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	16-DEC-15	19		0.112	32
405235060-1	5.1A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	16-DEC-15	20		0.106	33
1203621736-1	MB for batch 1596407	MB		1 pCi/g	SOIL	QC ACCOUNT		21		0.128	34
1203621737-1	4.4D.R.1.4(405235041DUP)	DUP		1 pCi/g	SOIL	QC ACCOUNT	30-NOV-15	22		0.128	169
1203621738-1	LCS for batch 1596407	LCS		1 pCi/g	SOIL	QC ACCOUNT		23		0.128	170

Choose SOP Used: GL-RAD-A-038
GL-RAD-A-032

Solid Sample Dissolution by: LEACH or DIGESTION
Circle One

Data Reviewed By: M. Mandel
*TAT 10/4/16

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

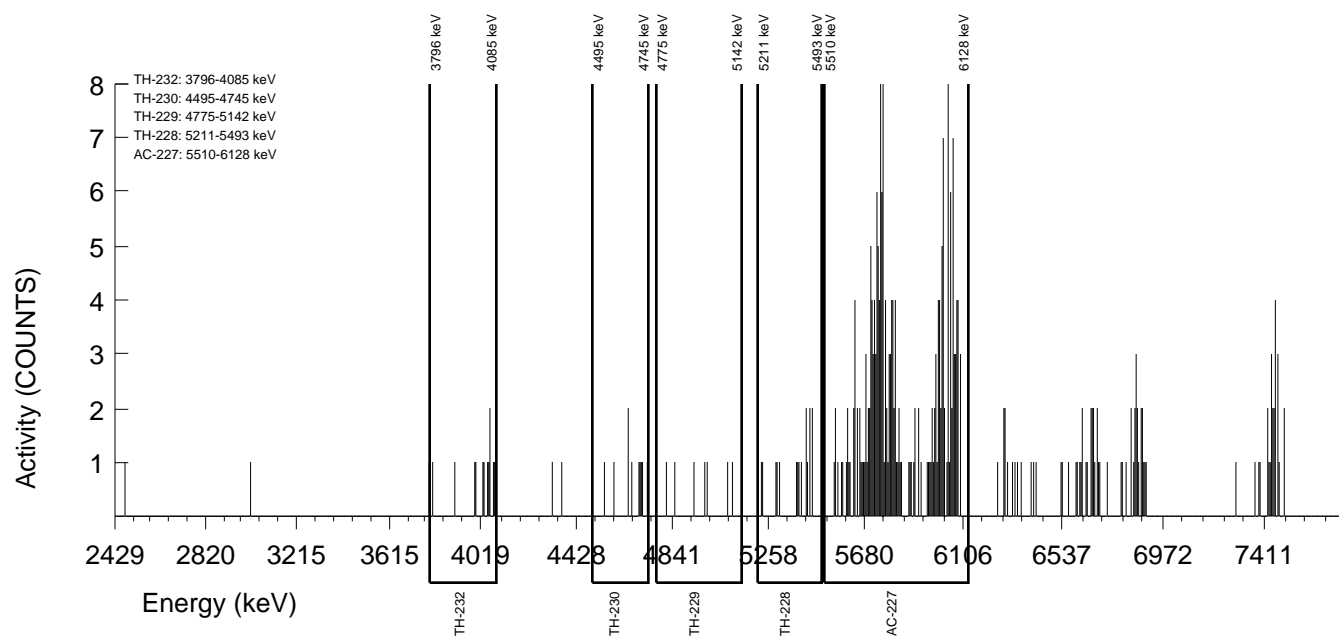
BATCH NUMBER : 1596407 SAMPLE ID : S0405235041_TH SAMPLE QTY : 0.128 G +/-0.781 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 99.9 +/-7.512 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 188 DETECTOR S/N : 68621 AVERAGE %EFFICIENCY : 26.7276 AVERAGE %EFF ERROR : 0.5175 COUNT DATE : 27-Sep-2016 17:12:36 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B188.CNF;854 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W188.CNF;233 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2593E+00 dpm RESULTS : 3.2557E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5838.40	5849.25	330.929	211.000	208.840	2.160	1.4697	100.000	1.45E+01	2.98E+00	5.84E-01	1.88E-01	1.99E+00
TH-228	5363.00	5383.55	29.164	17.000	14.384	0.480	0.6928	99.940	1.07E+00	6.48E-01	6.26E-01	2.02E-01	6.20E-01
TH-229	4900.00	4970.22	272.197	7.000	6.760	0.240	0.4899	99.469	3.73E-01	3.14E-01	2.65E-01	4.96E-02	3.08E-01
TH-230	4671.39	4669.57	4.861	10.000	8.080	1.920	1.3856	99.700	4.45E-01	3.73E-01	4.45E-01	1.40E-01	3.66E-01
TH-232	3972.00	4007.90	7.291	12.000	11.760	0.240	0.4899	100.000	6.46E-01	4.02E-01	2.63E-01	4.93E-02	3.90E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 8.3874E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (2.136 +/-0.014)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

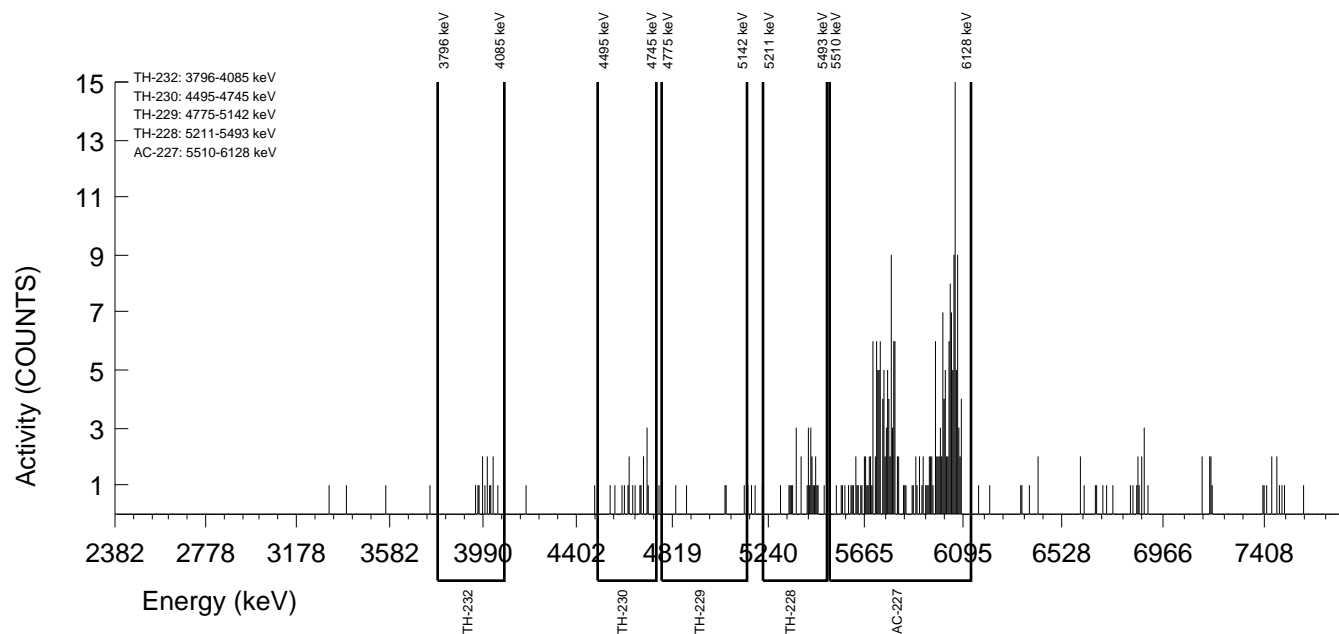
BATCH NUMBER : 1596407 SAMPLE ID : S0405235042_TH SAMPLE QTY : 0.125 G +/-0.800 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 94.6 +/-7.308 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 040 DETECTOR S/N : 78773 AVERAGE %EFFICIENCY : 32.4791 AVERAGE %EFF ERROR : 0.6262 COUNT DATE : 22-Sep-2016 09:57:38 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : AC BKG FILE : B040.CNF;1827 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W040.CNF;485 CAL DATE : 29-Aug-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1337E+00 dpm RESULTS : 2.9655E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5870.91	5883.53	267.791	241.000	231.160	9.840	3.1369	100.000	1.18E+01	2.35E+00	7.38E-01	2.92E-01	1.56E+00
TH-228	5363.00	5395.86	83.586	28.000	25.052	2.400	1.5492	99.940	1.65E+00	7.44E-01	6.03E-01	2.03E-01	7.01E-01
TH-229	4900.00	4991.07	285.176	5.000	3.800	1.200	1.0954	99.469	1.87E-01	2.44E-01	3.44E-01	9.86E-02	2.43E-01
TH-230	4671.39	4653.33	79.898	17.000	16.520	0.480	0.6928	99.700	8.09E-01	4.27E-01	2.71E-01	6.22E-02	4.09E-01
TH-232	3972.00	4005.98	49.168	13.000	12.760	0.240	0.4899	100.000	6.23E-01	3.72E-01	2.34E-01	4.38E-02	3.60E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8692E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.548 +/-0.004)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

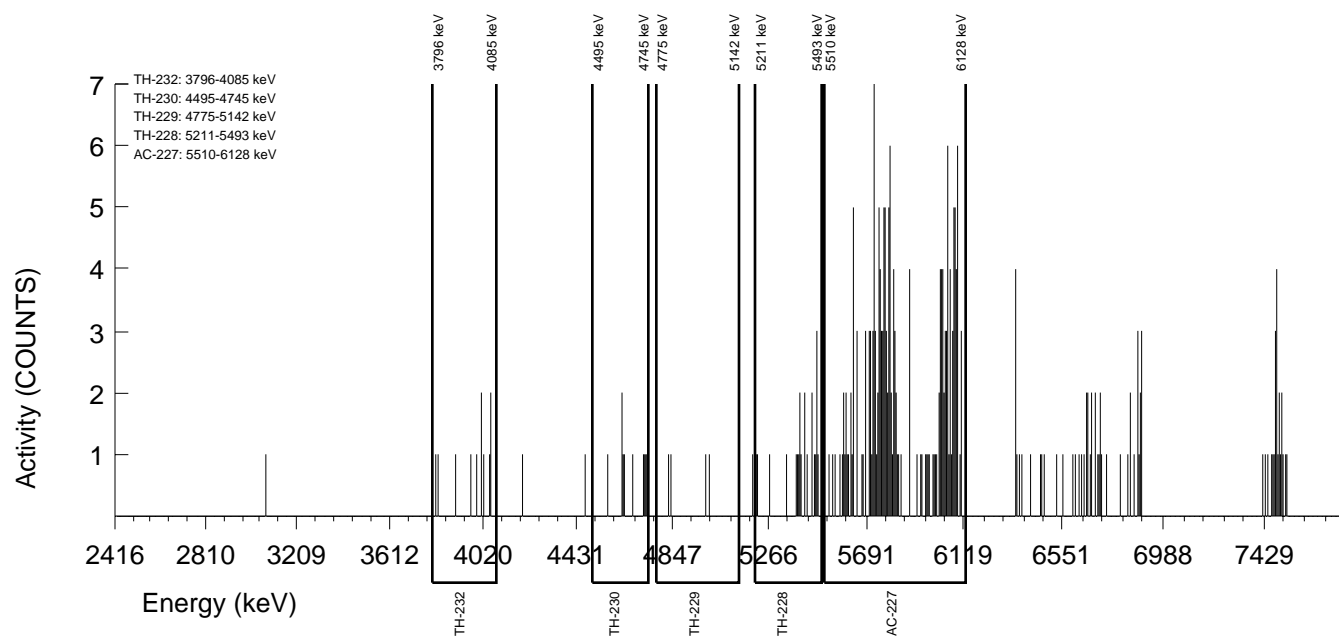
BATCH NUMBER : 1596407 SAMPLE ID : S0405235043_TH SAMPLE QTY : 0.118 G +/-0.847 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 91.1 +/-7.998 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 189 DETECTOR S/N : 68622 AVERAGE %EFFICIENCY : 25.4050 AVERAGE %EFF ERROR : 0.4925 COUNT DATE : 27-Sep-2016 17:12:39 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B189.CNF;855 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W189.CNF;231 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2593E+00 dpm RESULTS : 2.9699E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5838.40	5856.79	420.922	183.000	181.080	1.920	1.3856	100.000	1.58E+01	3.45E+00	7.04E-01	2.21E-01	2.32E+00
TH-228	5363.00	5404.84	74.822	21.000	18.428	0.720	0.8485	99.940	1.71E+00	9.11E-01	7.85E-01	2.53E-01	8.58E-01
TH-229	4900.00	4918.49	171.722	4.000	3.520	0.480	0.6928	99.469	2.43E-01	3.10E-01	3.83E-01	8.77E-02	3.08E-01
TH-230	4671.39	4668.42	7.359	10.000	9.040	0.960	0.9798	99.700	6.23E-01	4.65E-01	4.54E-01	1.24E-01	4.54E-01
TH-232	3972.00	3974.42	44.157	11.000	10.760	0.240	0.4899	100.000	7.39E-01	4.84E-01	3.29E-01	6.17E-02	4.69E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 8.3874E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.852 +/-0.012)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

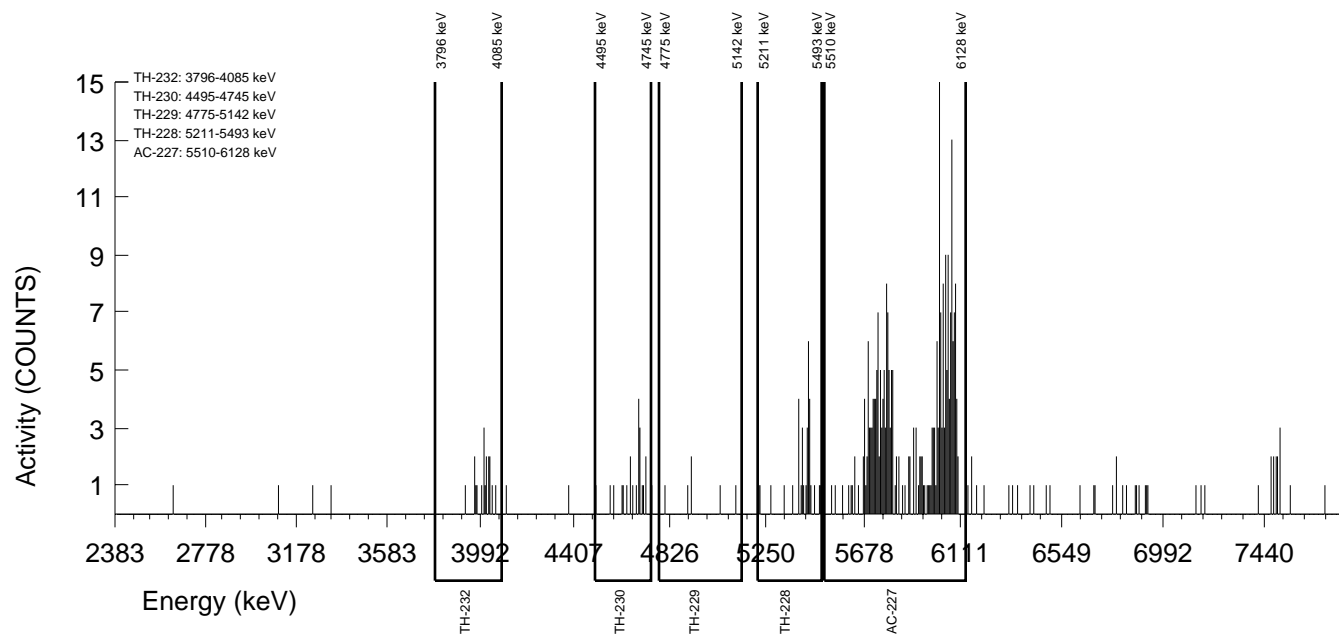
BATCH NUMBER : 1596407 SAMPLE ID : S0405235044_TH SAMPLE QTY : 0.123 G +/-0.813 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 103 +/-6.974 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 042 DETECTOR S/N : 78793 AVERAGE %EFFICIENCY : 33.3976 AVERAGE %EFF ERROR : 0.6435 COUNT DATE : 22-Sep-2016 09:57:38 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : AC BKG FILE : B042.CNF;1821 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W042.CNF;490 CAL DATE : 29-Aug-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1337E+00 dpm RESULTS : 3.2313E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5870.91	5901.30	276.100	271.000	259.000	12.000	3.4641	100.000	1.20E+01	2.27E+00	7.24E-01	2.93E-01	1.50E+00
TH-228	5363.00	5406.88	47.060	32.000	30.186	1.200	1.0954	99.940	1.80E+00	7.23E-01	4.63E-01	1.42E-01	6.74E-01
TH-229	4900.00	4952.43	4.911	6.000	4.800	1.200	1.0954	99.469	2.14E-01	2.39E-01	3.12E-01	8.94E-02	2.37E-01
TH-230	4671.39	4663.80	9.003	22.000	20.800	1.200	1.0954	99.700	9.24E-01	4.41E-01	3.12E-01	8.92E-02	4.21E-01
TH-232	3972.00	4005.91	66.294	18.000	17.760	0.240	0.4899	100.000	7.87E-01	3.96E-01	2.12E-01	3.98E-02	3.80E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8692E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.614 +/-0.004)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

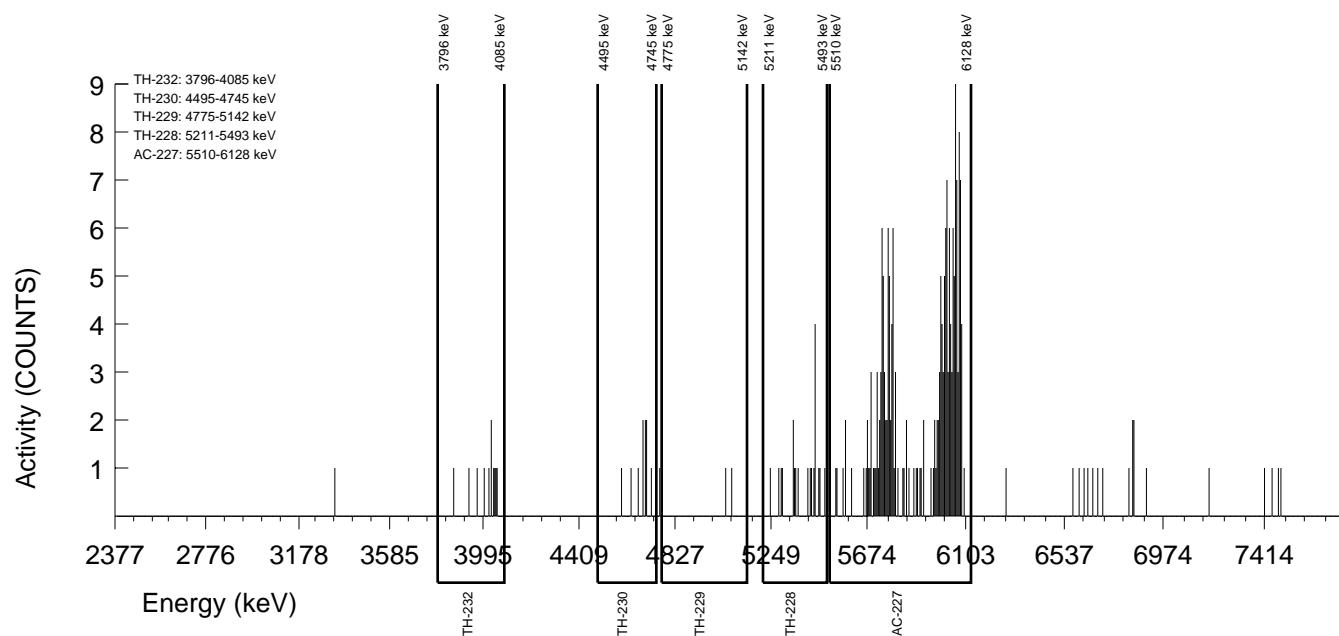
BATCH NUMBER : 1596407 SAMPLE ID : S0405235045_TH SAMPLE QTY : 0.102 G +/-0.980 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 97.1 +/-7.799 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 199 DETECTOR S/N : 78896 AVERAGE %EFFICIENCY : 26.2038 AVERAGE %EFF ERROR : 0.5077 COUNT DATE : 22-Sep-2016 09:57:35 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B199.CNF;799 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W199.CNF;222 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1337E+00 dpm RESULTS : 3.0422E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5870.91	5911.65	324.158	193.000	191.320	1.680	1.2961	100.000	1.44E+01	3.08E+00	5.84E-01	1.79E-01	2.06E+00
TH-228	5363.00	5390.81	5.789	20.000	19.307	0.240	0.4899	99.940	1.88E+00	9.27E-01	5.69E-01	1.39E-01	8.76E-01
TH-229	4900.00	5066.37	29.770	2.000	0.560	1.440	1.2000	99.469	4.07E-02	2.63E-01	5.38E-01	1.60E-01	2.63E-01
TH-230	4671.39	4682.92	19.846	10.000	10.000	0.000	0.0000	99.700	7.26E-01	4.87E-01	2.18E-01	0.00E+00	4.73E-01
TH-232	3972.00	3999.24	4.962	11.000	10.760	0.240	0.4899	100.000	7.78E-01	5.09E-01	3.47E-01	6.49E-02	4.93E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8692E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.453 +/-0.003)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

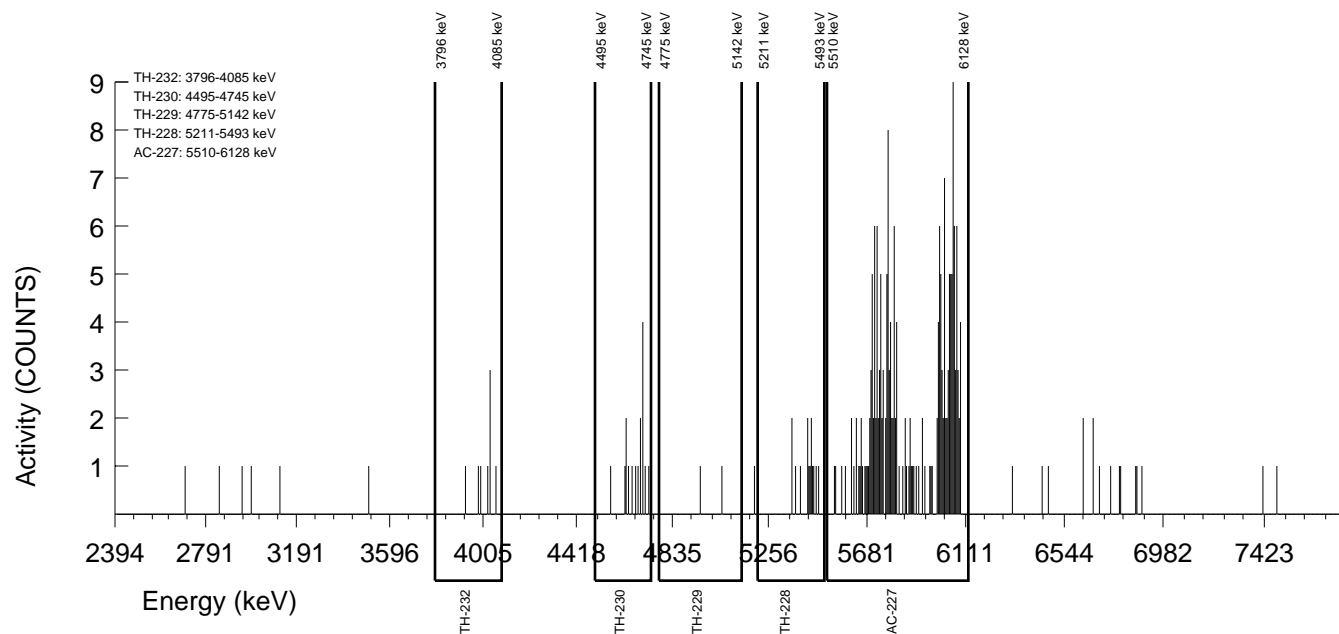
BATCH NUMBER : 1596407 SAMPLE ID : S0405235046_TH SAMPLE QTY : 0.119 G +/-0.840 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 96.1 +/-7.776 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 200 DETECTOR S/N : 78900 AVERAGE %EFFICIENCY : 27.0654 AVERAGE %EFF ERROR : 0.5238 COUNT DATE : 22-Sep-2016 09:57:38 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B200.CNF;799 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W200.CNF;230 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1337E+00 dpm RESULTS : 3.0125E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5870.91	5879.57	343.877	200.000	195.680	4.320	2.0785	100.000	1.24E+01	2.63E+00	6.70E-01	2.40E-01	1.76E+00
TH-228	5363.00	5408.18	86.277	15.000	13.576	0.960	0.9798	99.940	1.10E+00	6.65E-01	5.85E-01	1.71E-01	6.40E-01
TH-229	4900.00	5048.33	0.000	3.000	2.280	0.720	0.8485	99.469	1.39E-01	2.47E-01	3.72E-01	9.47E-02	2.46E-01
TH-230	4671.39	4672.01	4.930	16.000	15.040	0.960	0.9798	99.700	9.14E-01	5.16E-01	4.01E-01	1.09E-01	4.96E-01
TH-232	3972.00	4012.46	4.930	8.000	8.000	0.000	0.0000	100.000	4.85E-01	3.66E-01	1.82E-01	0.00E+00	3.58E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8692E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.464 +/-0.003)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

BATCH NUMBER : 1596407 SAMPLE ID : S0405235047_TH SAMPLE QTY : 0.125 G +/-0.800 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 89.4 +/-8.111 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 201 DETECTOR S/N : 78902 AVERAGE %EFFICIENCY : 26.2326 AVERAGE %EFF ERROR : 0.5081 COUNT DATE : 22-Sep-2016 09:57:40 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B201.CNF;799 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W201.CNF;224 CAL DATE : 15-Sep-2016
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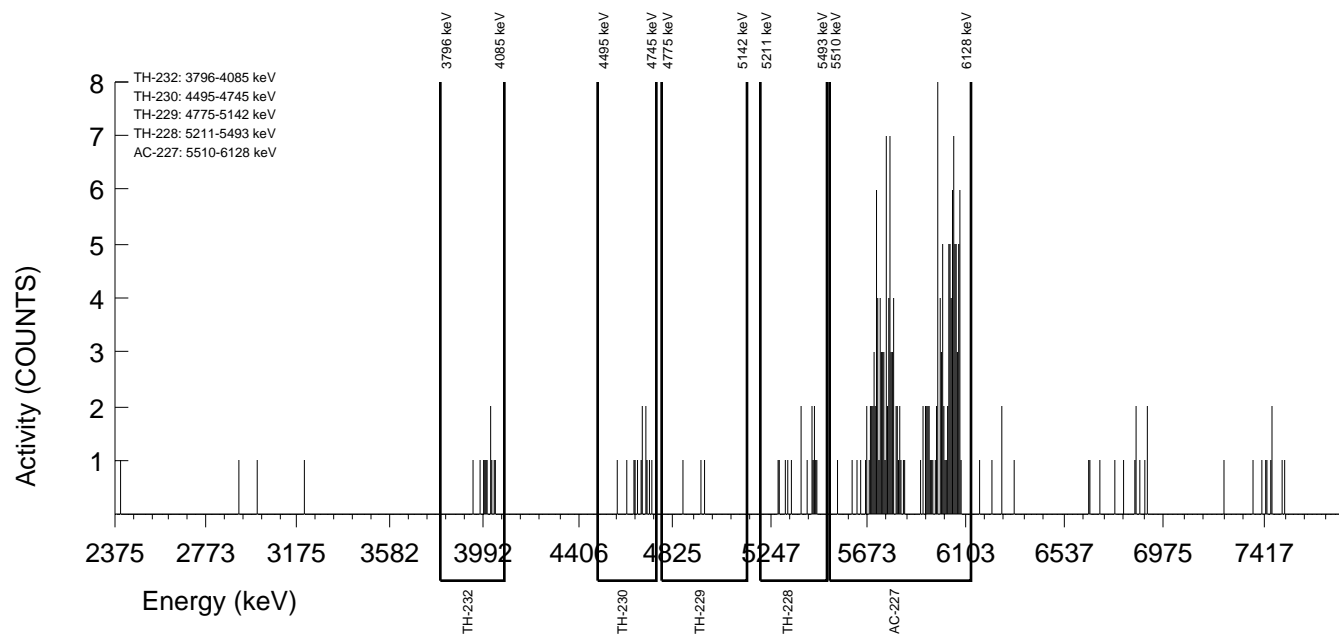
TRACER
ID : 0387-B-402
NUCLIDE : AC-227
NOMINAL : 3.1337E+00 dpm
RESULTS : 2.8012E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5870.91	5890.97	341.355	179.000	176.360	2.640	1.6248	100.000	1.18E+01	2.61E+00	5.97E-01	1.99E-01	1.76E+00
TH-228	5363.00	5388.73	61.929	15.000	13.622	0.960	0.9798	99.940	1.16E+00	7.04E-01	6.13E-01	1.78E-01	6.76E-01
TH-229	4900.00	4924.47	94.133	3.000	1.320	1.680	1.2961	99.469	8.50E-02	2.67E-01	4.99E-01	1.53E-01	2.67E-01
TH-230	4671.39	4676.91	24.772	13.000	11.800	1.200	1.0954	99.700	7.58E-01	4.93E-01	4.50E-01	1.29E-01	4.77E-01
TH-232	3972.00	4007.04	7.432	11.000	11.000	0.000	0.0000	100.000	7.04E-01	4.51E-01	1.92E-01	0.00E+00	4.36E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8693E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.418 +/-0.003)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

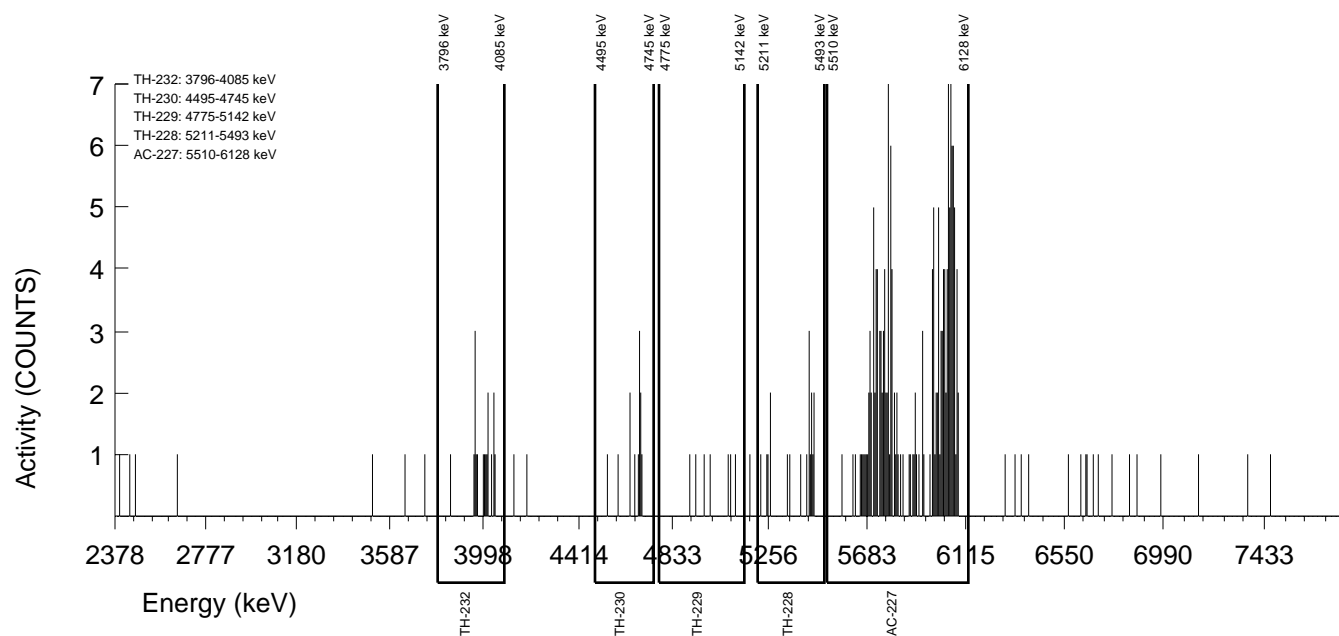
BATCH NUMBER : 1596407 SAMPLE ID : S0405235048_TH SAMPLE QTY : 0.105 G +/-0.952 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 83.9 +/-8.183 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 202 DETECTOR S/N : 78903 AVERAGE %EFFICIENCY : 27.2753 AVERAGE %EFF ERROR : 0.5278 COUNT DATE : 22-Sep-2016 09:57:43 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B202.CNF;797 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W202.CNF;226 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1337E+00 dpm RESULTS : 2.6287E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5870.91	5894.59	340.010	174.000	172.080	1.920	1.3856	100.000	1.40E+01	3.14E+00	6.57E-01	2.07E-01	2.11E+00
TH-228	5363.00	5372.55	181.041	18.000	16.872	0.720	0.8485	99.940	1.76E+00	9.45E-01	7.04E-01	1.96E-01	8.96E-01
TH-229	4900.00	5010.64	193.441	7.000	5.080	1.920	1.3856	99.469	3.99E-01	4.54E-01	6.34E-01	1.99E-01	4.49E-01
TH-230	4671.39	4658.47	48.360	12.000	10.800	1.200	1.0954	99.700	8.46E-01	5.78E-01	5.50E-01	1.57E-01	5.61E-01
TH-232	3972.00	3992.64	85.561	17.000	16.520	0.480	0.6928	100.000	1.29E+00	6.87E-01	4.33E-01	9.91E-02	6.53E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8693E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.408 +/-0.003)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

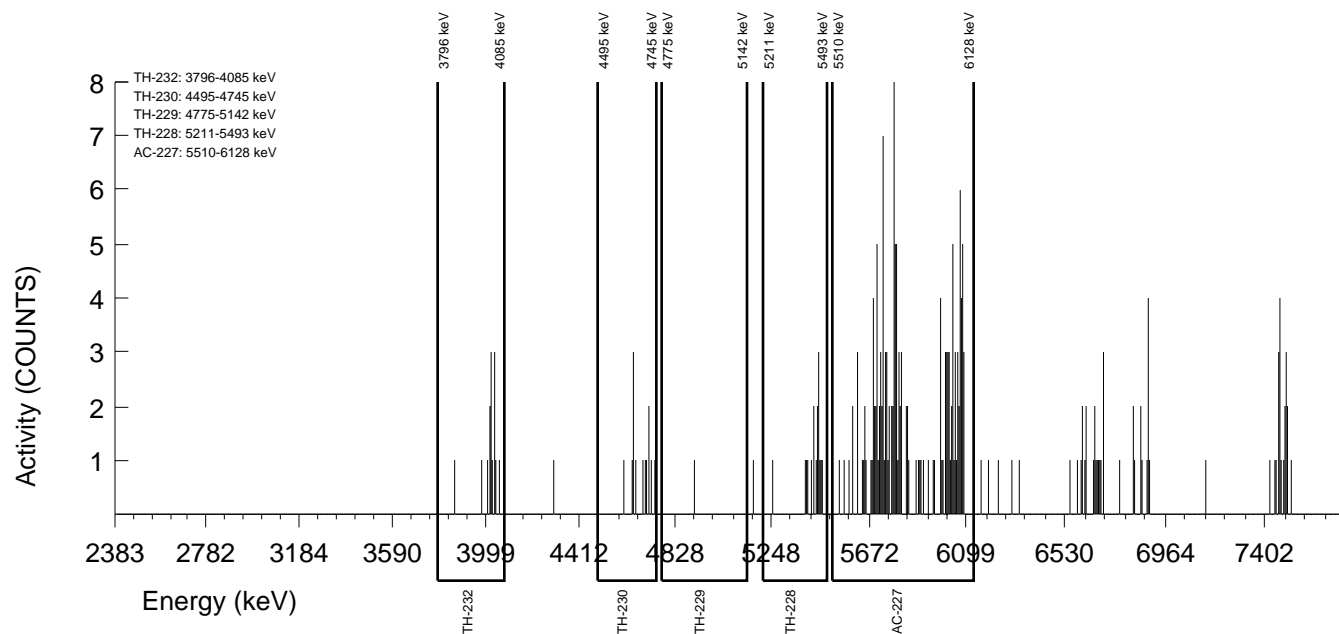
BATCH NUMBER : 1596407 SAMPLE ID : S0405235049_TH SAMPLE QTY : 0.123 G +/-0.813 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 71.9 +/-8.694 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 162 DETECTOR S/N : 70323 AVERAGE %EFFICIENCY : 26.6669 AVERAGE %EFF ERROR : 0.5165 COUNT DATE : 26-Sep-2016 12:01:33 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B162.CNF;862 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W162.CNF;260 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2531E+00 dpm RESULTS : 2.3406E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5843.45	5857.66	351.396	151.000	149.800	1.200	1.0954	100.000	1.44E+01	3.44E+00	6.76E-01	1.93E-01	2.33E+00
TH-228	5363.00	5428.05	24.804	16.000	13.481	1.200	1.0954	99.940	1.44E+00	9.13E-01	9.07E-01	2.94E-01	8.70E-01
TH-229	4900.00	4912.17	4.961	1.000	0.520	0.480	0.6928	99.469	4.16E-02	2.31E-01	4.43E-01	1.01E-01	2.31E-01
TH-230	4671.39	4678.27	69.452	13.000	13.000	0.000	0.0000	99.700	1.04E+00	6.14E-01	2.39E-01	0.00E+00	5.86E-01
TH-232	3972.00	4016.32	24.804	14.000	14.000	0.000	0.0000	100.000	1.11E+00	6.36E-01	2.39E-01	0.00E+00	6.05E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 7.2086E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.319 +/-0.009)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

BATCH NUMBER : 1596407 SAMPLE ID : S0405235050_TH SAMPLE QTY : 0.101 G +/-0.990 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 90.8 +/-8.000 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 163 DETECTOR S/N : 80056 AVERAGE %EFFICIENCY : 25.6920 AVERAGE %EFF ERROR : 0.4979 COUNT DATE : 26-Sep-2016 12:01:36 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B163.CNF;908 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W163.CNF;238 CAL DATE : 13-Sep-2016
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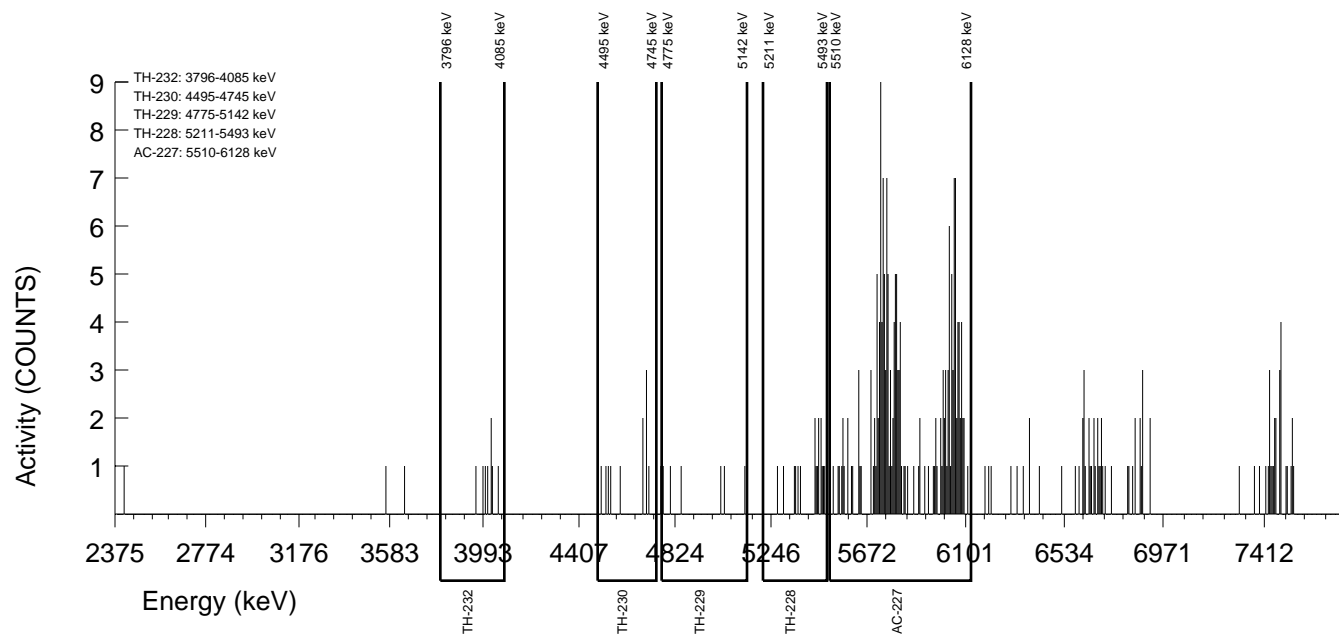
TRACER
ID : 0387-B-402
NUCLIDE : AC-227
NOMINAL : 3.2531E+00 dpm
RESULTS : 2.9536E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5843.45	5856.68	320.356	185.000	182.120	2.880	1.6971	100.000	1.76E+01	3.86E+00	8.90E-01	3.00E-01	2.59E+00
TH-228	5363.00	5422.98	32.221	18.000	14.956	1.440	1.2000	99.940	1.60E+00	9.66E-01	9.67E-01	3.23E-01	9.22E-01
TH-229	4900.00	4941.81	0.000	6.000	5.520	0.480	0.6928	99.469	4.42E-01	4.27E-01	4.44E-01	1.02E-01	4.20E-01
TH-230	4671.39	4627.91	18.589	11.000	9.560	1.440	1.2000	99.700	7.64E-01	5.65E-01	5.91E-01	1.76E-01	5.52E-01
TH-232	3972.00	4010.09	7.436	8.000	7.760	0.240	0.4899	100.000	6.18E-01	4.82E-01	3.82E-01	7.15E-02	4.71E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 7.2087E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.604 +/-0.010)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

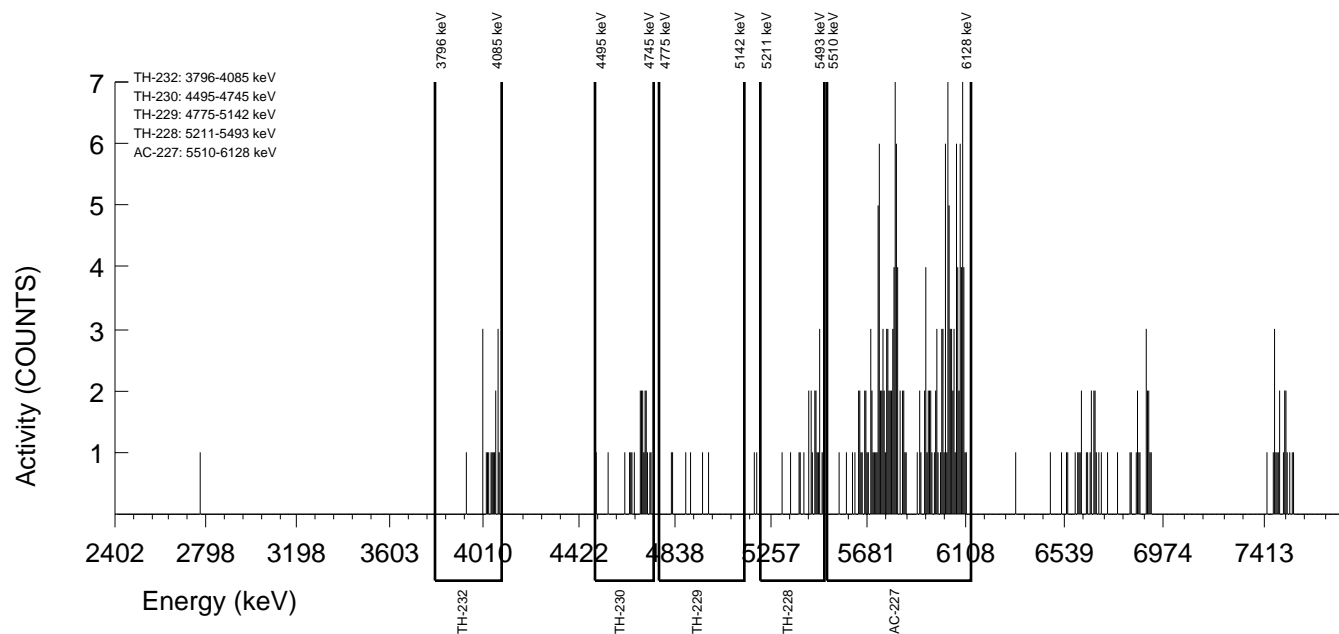
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TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2531E+00 dpm RESULTS : 2.9834E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5843.45	5897.33	347.714	189.000	187.800	1.200	1.0954	100.000	1.48E+01	3.18E+00	5.53E-01	1.58E-01	2.13E+00
TH-228	5363.00	5435.79	48.060	21.000	19.106	0.240	0.4899	99.940	1.67E+00	8.54E-01	6.62E-01	2.00E-01	8.03E-01
TH-229	4900.00	4902.26	157.734	6.000	5.040	0.960	0.9798	99.469	3.29E-01	3.50E-01	4.31E-01	1.17E-01	3.46E-01
TH-230	4671.39	4678.06	32.040	21.000	20.280	0.720	0.8485	99.700	1.32E+00	6.39E-01	3.98E-01	1.01E-01	6.03E-01
TH-232	3972.00	4040.34	70.241	18.000	17.760	0.240	0.4899	100.000	1.15E+00	5.87E-01	3.12E-01	5.84E-02	5.57E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 7.2087E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.654 +/-0.011)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

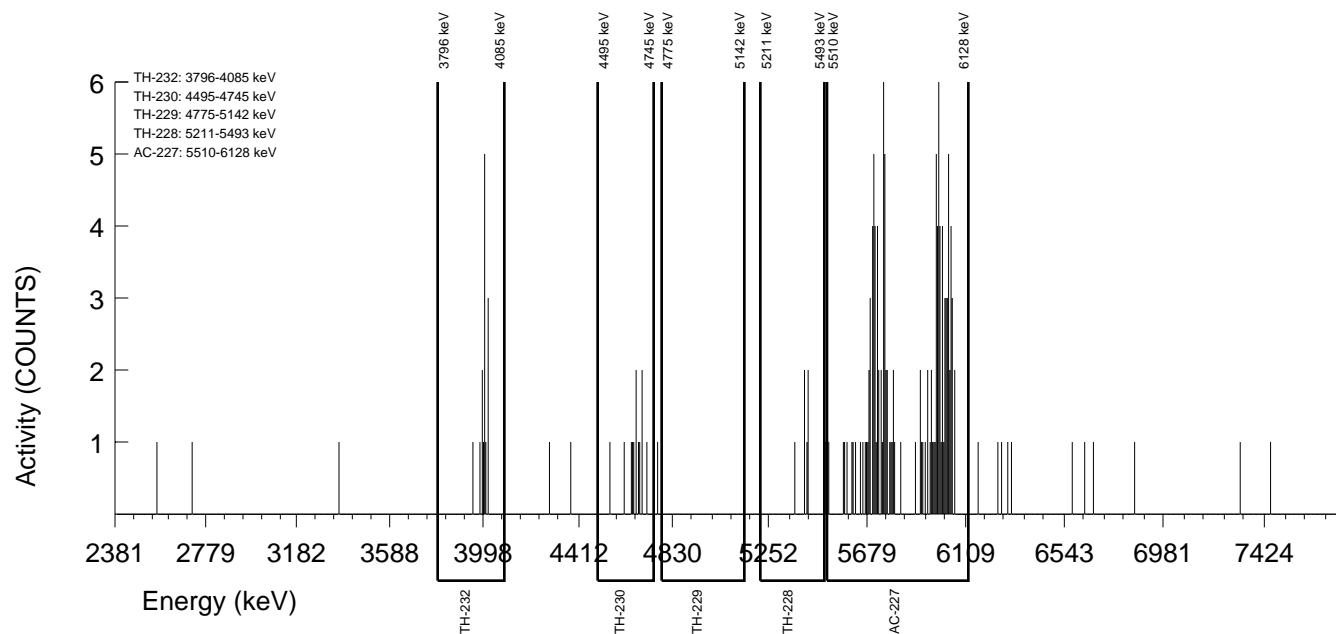
BATCH NUMBER : 1596407 SAMPLE ID : S0405235052_TH SAMPLE QTY : 0.120 G +/-0.833 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 64.3 +/-9.440 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 206 DETECTOR S/N : 78909 AVERAGE %EFFICIENCY : 25.8407 AVERAGE %EFF ERROR : 0.5007 COUNT DATE : 22-Sep-2016 09:57:53 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B206.CNF;798 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W206.CNF;226 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1337E+00 dpm RESULTS : 2.0162E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5870.91	5861.87	322.991	126.000	125.040	0.960	0.9798	100.000	1.23E+01	3.18E+00	6.46E-01	1.76E-01	2.17E+00
TH-228	5363.00	5406.36	19.800	6.000	4.744	0.960	0.9798	99.940	5.96E-01	6.75E-01	8.81E-01	2.52E-01	6.65E-01
TH-229	4900.00	4958.10	0.000	0.000	-0.960	0.960	0.9798	99.469	-9.08E-02	2.11E-01	6.23E-01	1.70E-01	2.10E-01
TH-230	4671.39	4660.20	29.700	12.000	12.000	0.000	0.0000	99.700	1.13E+00	7.02E-01	2.83E-01	0.00E+00	6.68E-01
TH-232	3972.00	3999.66	18.769	14.000	13.520	0.480	0.6928	100.000	1.27E+00	7.58E-01	5.21E-01	1.19E-01	7.18E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8695E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.296 +/-0.002)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

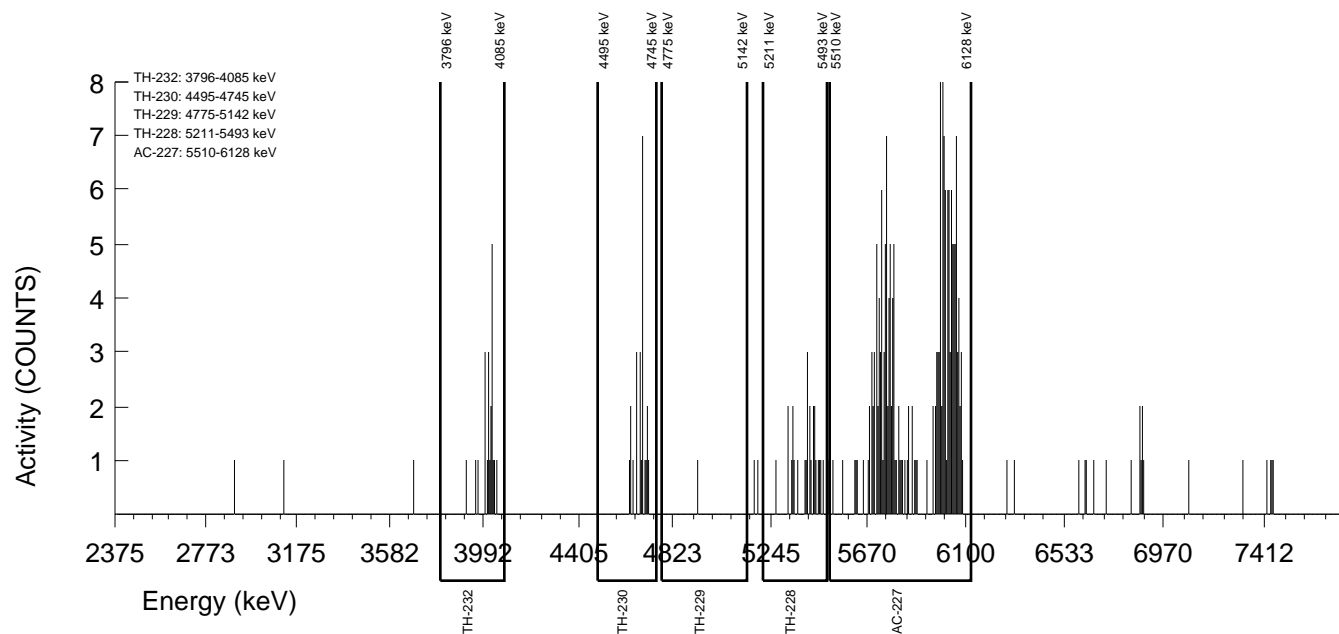
BATCH NUMBER : 1596407 SAMPLE ID : S0405235053_TH SAMPLE QTY : 0.108 G +/-0.926 % SAMPLE DATE : 01-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 98.0 +/-7.780 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 207 DETECTOR S/N : 78910 AVERAGE %EFFICIENCY : 26.0138 AVERAGE %EFF ERROR : 0.5040 COUNT DATE : 22-Sep-2016 09:57:55 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B207.CNF;809 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W207.CNF;228 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1337E+00 dpm RESULTS : 3.0721E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5870.91	5895.52	326.706	193.000	191.800	1.200	1.0954	100.000	1.36E+01	2.90E+00	4.98E-01	1.42E-01	1.94E+00
TH-228	5363.00	5401.24	112.700	25.000	24.065	0.480	0.6928	99.940	2.20E+00	9.84E-01	5.83E-01	1.54E-01	9.18E-01
TH-229	4900.00	4928.26	4.954	1.000	0.520	0.480	0.6928	99.469	3.56E-02	1.98E-01	3.79E-01	8.70E-02	1.98E-01
TH-230	4671.39	4677.22	5.367	23.000	22.760	0.240	0.4899	99.700	1.56E+00	7.02E-01	3.28E-01	6.13E-02	6.58E-01
TH-232	3972.00	4008.97	33.645	21.000	20.760	0.240	0.4899	100.000	1.41E+00	6.67E-01	3.27E-01	6.12E-02	6.28E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8696E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.455 +/-0.003)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

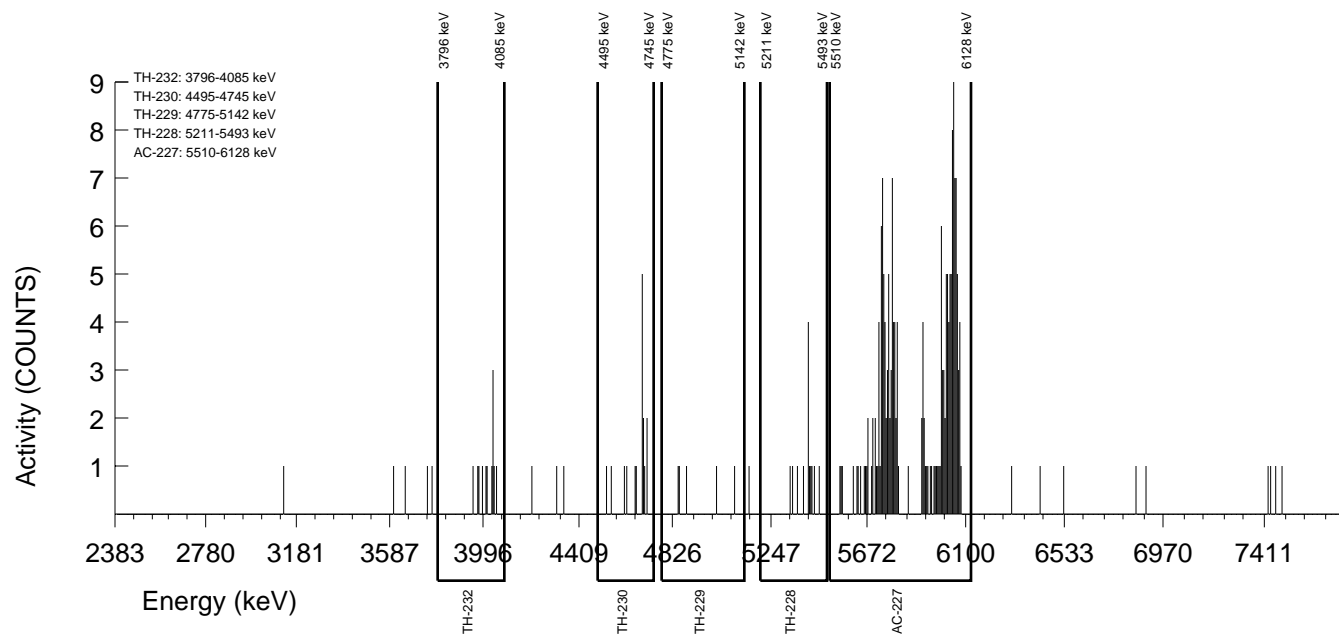
BATCH NUMBER : 1596407 SAMPLE ID : S0405235054_TH SAMPLE QTY : 0.105 G +/-0.952 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 93.3 +/-7.949 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 208 DETECTOR S/N : 78911 AVERAGE %EFFICIENCY : 26.1198 AVERAGE %EFF ERROR : 0.5060 COUNT DATE : 22-Sep-2016 09:57:57 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B208.CNF;805 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W208.CNF;253 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1337E+00 dpm RESULTS : 2.9243E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5870.91	5895.15	308.970	185.000	183.320	1.680	1.2961	100.000	1.40E+01	3.05E+00	5.92E-01	1.81E-01	2.04E+00
TH-228	5363.00	5407.57	5.763	13.000	11.845	0.720	0.8485	99.940	1.17E+00	7.53E-01	6.68E-01	1.86E-01	7.28E-01
TH-229	4900.00	4937.89	237.099	5.000	3.800	1.200	1.0954	99.469	2.80E-01	3.67E-01	5.17E-01	1.48E-01	3.64E-01
TH-230	4671.39	4662.63	6.586	16.000	15.760	0.240	0.4899	99.700	1.16E+00	6.25E-01	3.53E-01	6.60E-02	5.96E-01
TH-232	3972.00	4011.46	7.409	12.000	11.760	0.240	0.4899	100.000	8.62E-01	5.39E-01	3.52E-01	6.58E-02	5.21E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8696E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.435 +/-0.003)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

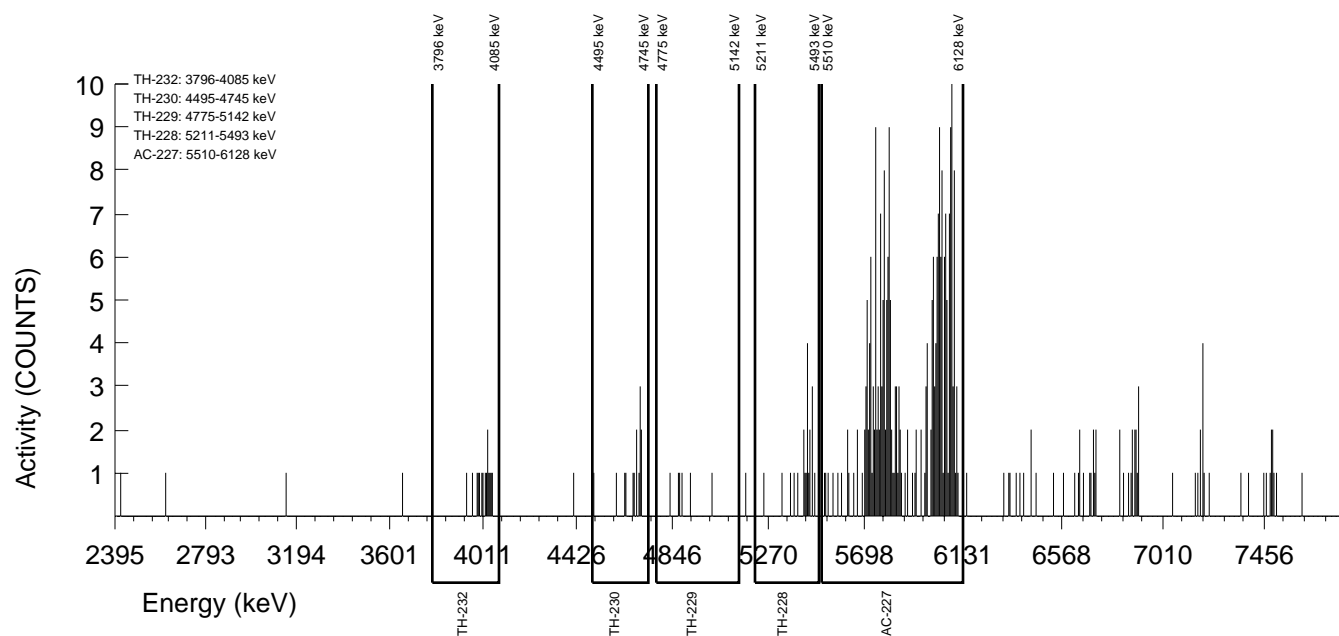
BATCH NUMBER : 1596407 SAMPLE ID : S0405235055_TH SAMPLE QTY : 0.105 G +/-0.952 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 98.8 +/-7.217 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 026 DETECTOR S/N : 80017 AVERAGE %EFFICIENCY : 32.6942 AVERAGE %EFF ERROR : 0.6303 COUNT DATE : 22-Sep-2016 13:44:15 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B026.CNF;1838 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W026.CNF;495 CAL DATE : 29-Aug-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1416E+00 dpm RESULTS : 3.1050E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.42	5900.99	340.302	259.000	243.640	15.360	3.9192	100.000	1.41E+01	2.78E+00	1.01E+00	4.16E-01	1.85E+00
TH-228	5363.00	5415.49	24.685	21.000	19.387	0.960	0.9798	99.940	1.44E+00	7.21E-01	5.54E-01	1.66E-01	6.87E-01
TH-229	4900.00	4908.09	177.733	6.000	4.800	1.200	1.0954	99.469	2.67E-01	2.98E-01	3.90E-01	1.12E-01	2.95E-01
TH-230	4671.39	4671.32	22.217	14.000	12.800	1.200	1.0954	99.700	7.10E-01	4.39E-01	3.89E-01	1.11E-01	4.26E-01
TH-232	3972.00	4017.29	9.874	15.000	14.520	0.480	0.6928	100.000	8.03E-01	4.52E-01	3.06E-01	7.02E-02	4.36E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1197E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.653 +/-0.004)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

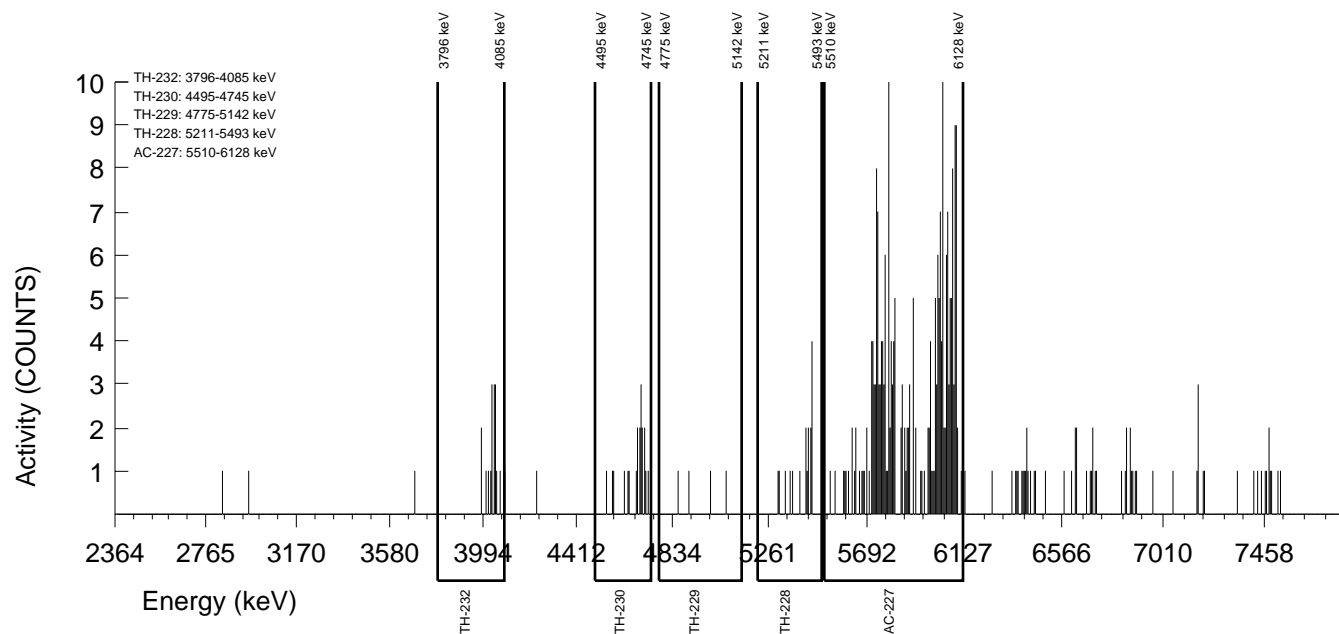
BATCH NUMBER : 1596407 SAMPLE ID : S0405235056_TH SAMPLE QTY : 0.113 G +/-0.885 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 97.7 +/-7.760 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 028 DETECTOR S/N : 78792 AVERAGE %EFFICIENCY : 29.2888 AVERAGE %EFF ERROR : 0.5659 COUNT DATE : 22-Sep-2016 13:44:15 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B028.CNF;1842 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W028.CNF;507 CAL DATE : 29-Aug-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1416E+00 dpm RESULTS : 3.0683E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.42	5902.85	329.931	238.000	215.680	22.320	4.7244	100.000	1.31E+01	2.79E+00	1.24E+00	5.27E-01	1.86E+00
TH-228	5363.00	5408.75	7.479	17.000	14.502	1.920	1.3856	99.940	1.13E+00	6.83E-01	6.75E-01	2.20E-01	6.57E-01
TH-229	4900.00	4997.75	0.000	5.000	2.120	2.880	1.6971	99.469	1.24E-01	2.98E-01	5.38E-01	1.81E-01	2.97E-01
TH-230	4671.39	4668.50	34.902	20.000	18.800	1.200	1.0954	99.700	1.09E+00	5.55E-01	4.08E-01	1.17E-01	5.27E-01
TH-232	3972.00	4034.79	64.818	16.000	15.280	0.720	0.8485	100.000	8.87E-01	4.93E-01	3.55E-01	9.03E-02	4.72E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1197E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.578 +/-0.004)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

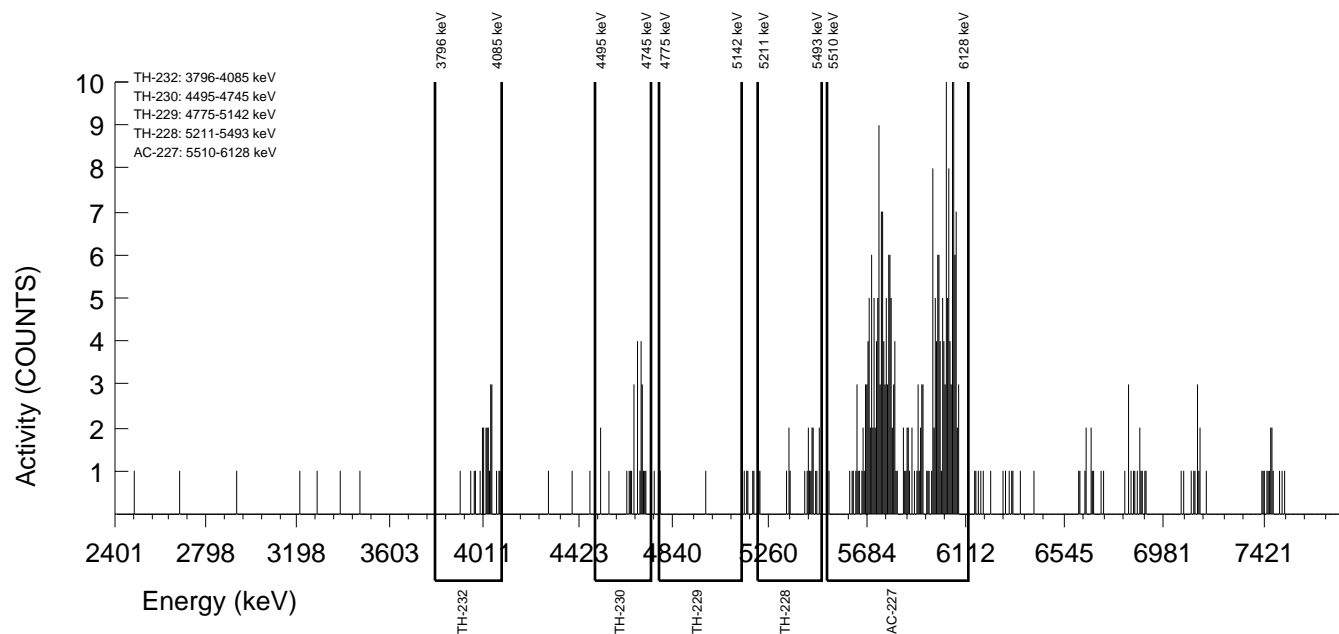
BATCH NUMBER : 1596407 SAMPLE ID : S0405235057_TH SAMPLE QTY : 0.110 G +/-0.909 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 109 +/-7.163 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 029 DETECTOR S/N : 33454 AVERAGE %EFFICIENCY : 30.7100 AVERAGE %EFF ERROR : 0.5928 COUNT DATE : 22-Sep-2016 13:44:15 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B029.CNF;1830 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W029.CNF;544 CAL DATE : 29-Aug-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1416E+00 dpm RESULTS : 3.4093E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.42	5878.40	343.443	270.000	251.280	18.720	4.3267	100.000	1.35E+01	2.64E+00	1.01E+00	4.25E-01	1.75E+00
TH-228	5363.00	5402.17	128.206	20.000	18.846	0.480	0.6928	99.940	1.29E+00	6.50E-01	4.61E-01	1.27E-01	6.20E-01
TH-229	4900.00	4881.53	192.309	2.000	-0.400	2.400	1.5492	99.469	-2.06E-02	1.92E-01	4.47E-01	1.46E-01	1.92E-01
TH-230	4671.39	4666.84	38.626	25.000	22.840	2.160	1.4697	99.700	1.17E+00	5.47E-01	4.31E-01	1.38E-01	5.19E-01
TH-232	3972.00	4021.06	43.146	25.000	24.280	0.720	0.8485	100.000	1.24E+00	5.45E-01	3.13E-01	7.96E-02	5.14E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1197E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.674 +/-0.004)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

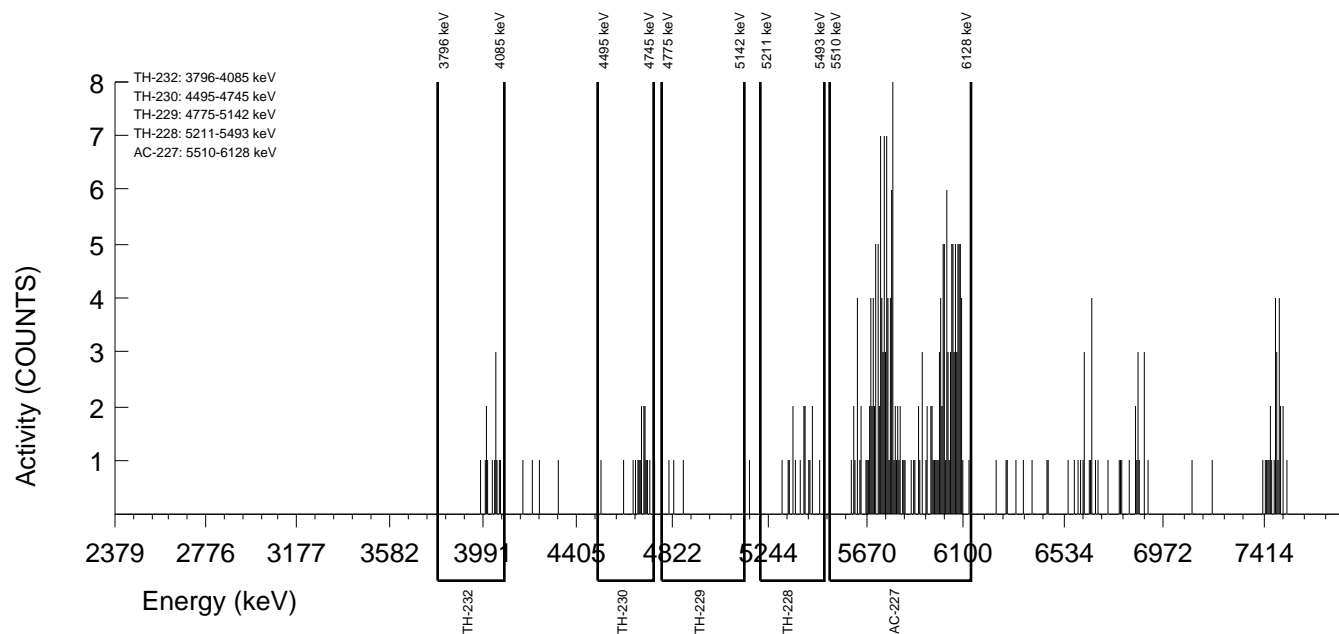
BATCH NUMBER : 1596407 SAMPLE ID : S0405235058_TH SAMPLE QTY : 0.128 G +/-0.781 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 99.8 +/-7.642 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 176 DETECTOR S/N : 74434 AVERAGE %EFFICIENCY : 25.6995 AVERAGE %EFF ERROR : 0.4981 COUNT DATE : 26-Sep-2016 12:01:41 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B176.CNF;865 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W176.CNF;237 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2531E+00 dpm RESULTS : 3.2478E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5843.45	5872.04	347.078	202.000	200.320	1.680	1.2961	100.000	1.39E+01	2.90E+00	5.37E-01	1.64E-01	1.94E+00
TH-228	5363.00	5386.79	83.891	16.000	13.996	0.240	0.4899	99.940	1.08E+00	6.52E-01	5.95E-01	1.82E-01	6.24E-01
TH-229	4900.00	4834.42	64.152	3.000	2.280	0.720	0.8485	99.469	1.31E-01	2.33E-01	3.51E-01	8.93E-02	2.32E-01
TH-230	4671.39	4676.80	24.674	17.000	15.320	1.680	1.2961	99.700	8.78E-01	5.02E-01	4.44E-01	1.36E-01	4.83E-01
TH-232	3972.00	4031.57	45.646	13.000	12.520	0.480	0.6928	100.000	7.16E-01	4.36E-01	3.17E-01	7.25E-02	4.22E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 7.2087E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.764 +/-0.011)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

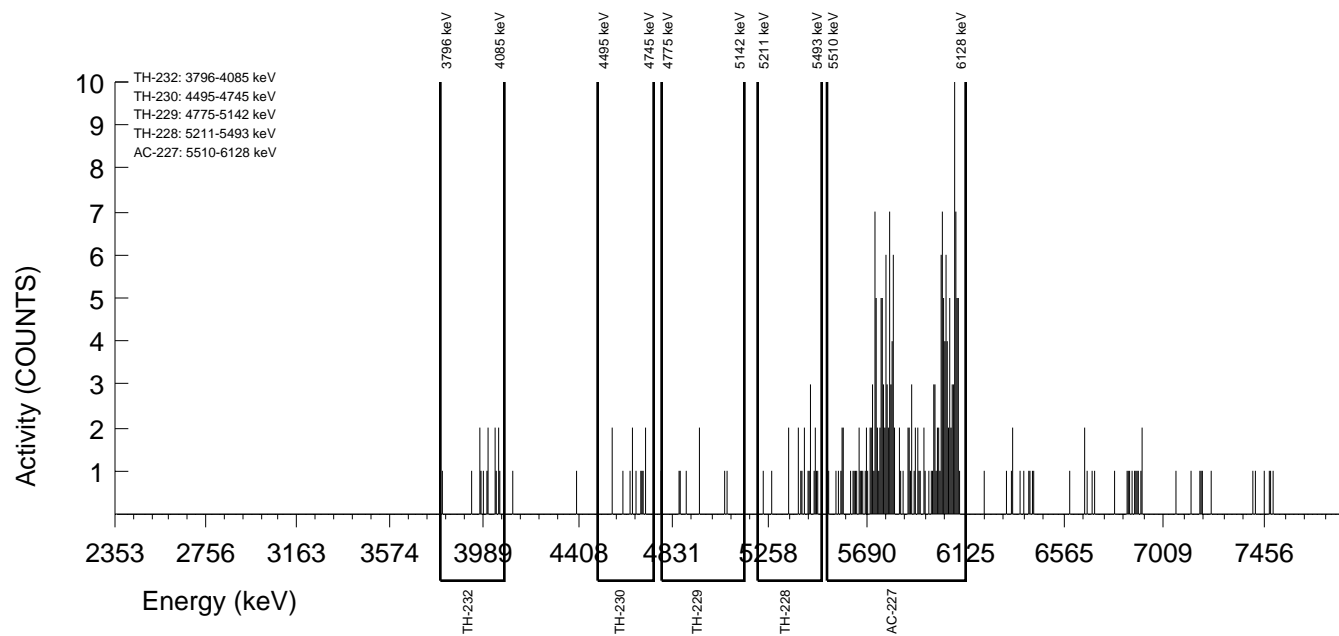
BATCH NUMBER : 1596407 SAMPLE ID : S0405235059_TH SAMPLE QTY : 0.112 G +/-0.893 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 94.1 +/-7.872 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 032 DETECTOR S/N : 67041 AVERAGE %EFFICIENCY : 27.7435 AVERAGE %EFF ERROR : 0.5367 COUNT DATE : 22-Sep-2016 13:44:16 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : AC BKG FILE : B032.CNF;1838 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W032.CNF;509 CAL DATE : 29-Aug-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1416E+00 dpm RESULTS : 2.9574E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.42	5887.58	337.206	207.000	196.920	10.080	3.1749	100.000	1.32E+01	2.85E+00	9.84E-01	3.91E-01	1.91E+00
TH-228	5363.00	5405.45	113.932	20.000	17.072	2.400	1.5492	99.940	1.45E+00	8.10E-01	7.78E-01	2.61E-01	7.74E-01
TH-229	4900.00	4926.91	5.008	8.000	6.800	1.200	1.0954	99.469	4.39E-01	3.93E-01	4.52E-01	1.29E-01	3.87E-01
TH-230	4671.39	4652.96	145.232	12.000	11.280	0.720	0.8485	99.700	7.26E-01	4.73E-01	3.93E-01	1.00E-01	4.59E-01
TH-232	3972.00	3998.87	87.640	15.000	15.000	0.000	0.0000	100.000	9.62E-01	5.27E-01	1.92E-01	0.00E+00	5.04E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1197E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.528 +/-0.003)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

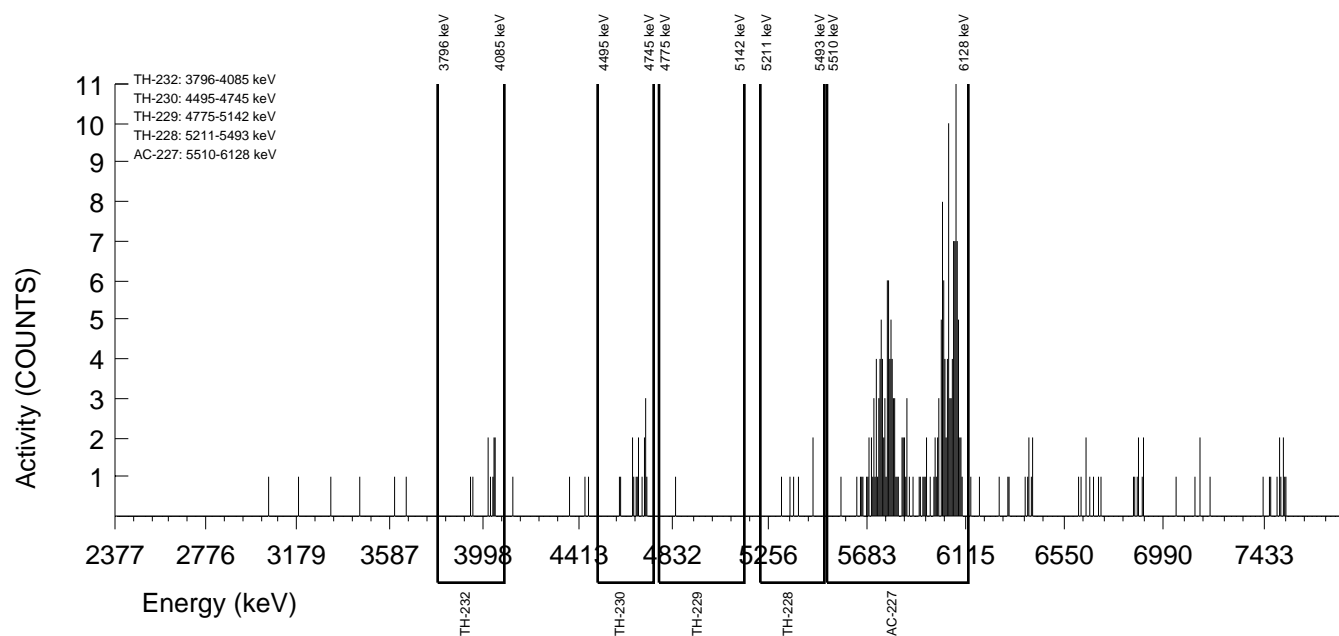
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TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1416E+00 dpm RESULTS : 2.2777E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.42	5916.77	287.162	197.000	178.520	18.480	4.2988	100.000	1.40E+01	3.24E+00	1.47E+00	6.17E-01	2.19E+00
TH-228	5363.00	5382.75	4.964	6.000	4.081	1.440	1.2000	99.940	4.04E-01	5.33E-01	7.87E-01	2.45E-01	5.28E-01
TH-229	4900.00	4842.99	4.964	1.000	-0.680	1.680	1.2961	99.469	-5.11E-02	2.32E-01	5.83E-01	1.79E-01	2.31E-01
TH-230	4671.39	4676.69	59.567	16.000	15.520	0.480	0.6928	99.700	1.16E+00	6.41E-01	4.15E-01	9.52E-02	6.09E-01
TH-232	3972.00	4018.46	34.747	10.000	10.000	0.000	0.0000	100.000	7.48E-01	5.04E-01	2.24E-01	0.00E+00	4.87E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1197E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.479 +/-0.003)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

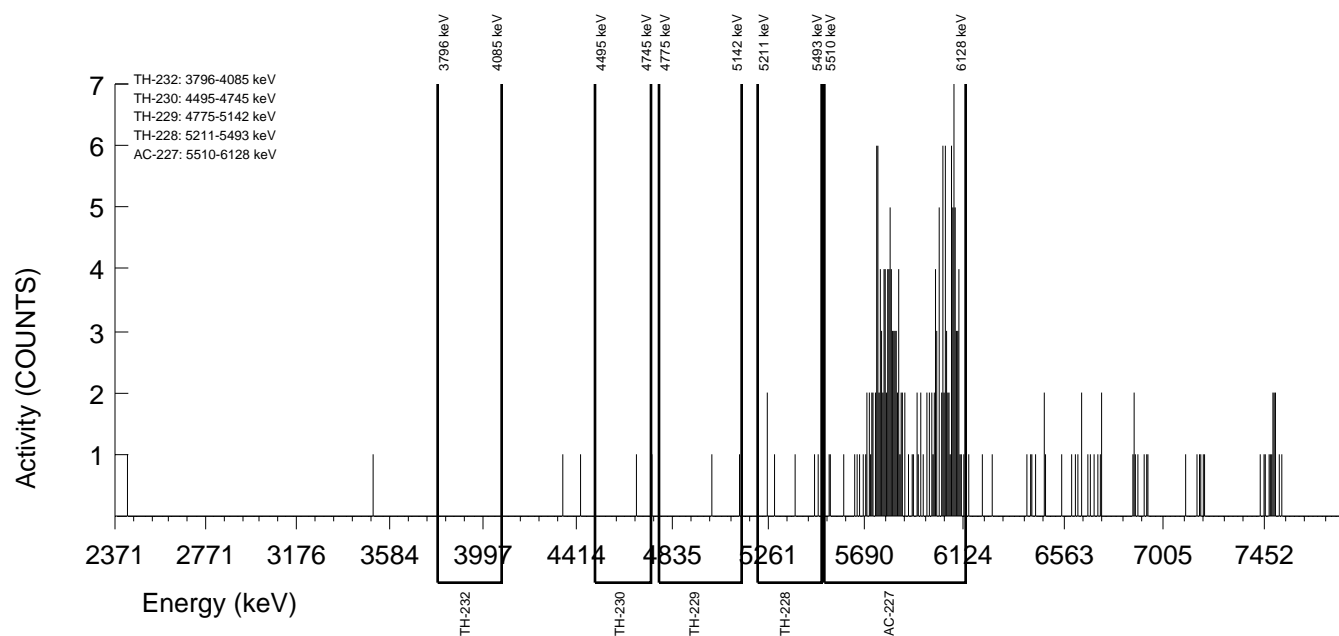
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TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1416E+00 dpm RESULTS : 2.1464E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.42	5898.89	337.132	184.000	167.920	16.080	4.0100	100.000	1.16E+01	2.74E+00	1.22E+00	5.07E-01	1.86E+00
TH-228	5363.00	5353.47	4.973	6.000	4.590	0.960	0.9798	99.940	3.03E-01	3.54E-01	4.77E-01	1.39E-01	3.50E-01
TH-229	4900.00	5071.38	119.353	2.000	0.560	1.440	1.2000	99.469	3.71E-02	2.40E-01	4.90E-01	1.45E-01	2.39E-01
TH-230	4671.39	4711.04	0.000	2.000	1.520	0.480	0.6928	99.700	1.00E-01	2.31E-01	3.66E-01	8.38E-02	2.31E-01
TH-232	3972.00	3940.43	0.000	0.000	-0.240	0.240	0.4899	100.000	-1.58E-02	1.37E-01	3.16E-01	5.91E-02	1.36E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1197E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.450 +/-0.003)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

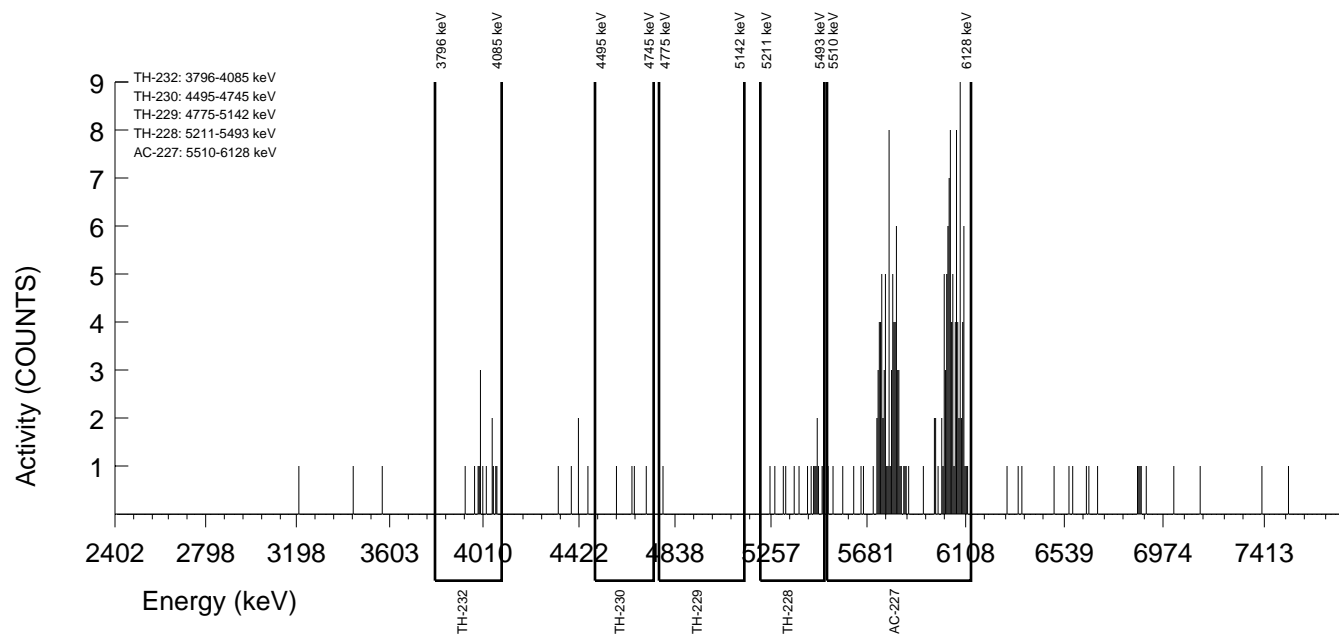
BATCH NUMBER : 1596407 SAMPLE ID : S1203621737_TH SAMPLE QTY : 0.128 G +/-0.781 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 87.6 +/-8.151 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 169 DETECTOR S/N : 72548 AVERAGE %EFFICIENCY : 26.2282 AVERAGE %EFF ERROR : 0.5082 COUNT DATE : 22-Sep-2016 14:25:33 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B169.CNF;874 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W169.CNF;259 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1430E+00 dpm RESULTS : 2.7534E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.15	5920.96	334.199	175.000	173.320	1.680	1.2961	100.000	1.16E+01	2.59E+00	5.19E-01	1.59E-01	1.74E+00
TH-228	5363.00	5406.73	9.858	16.000	14.086	1.440	1.2000	99.940	1.21E+00	7.31E-01	6.82E-01	2.12E-01	7.02E-01
TH-229	4900.00	4790.89	4.929	1.000	1.000	0.000	0.0000	99.469	6.42E-02	1.81E-01	1.92E-01	0.00E+00	1.80E-01
TH-230	4671.39	4656.83	128.159	4.000	3.520	0.480	0.6928	99.700	2.25E-01	2.88E-01	3.54E-01	8.12E-02	2.85E-01
TH-232	3972.00	4011.17	55.453	14.000	13.520	0.480	0.6928	100.000	8.63E-01	5.08E-01	3.53E-01	8.10E-02	4.87E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1649E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.474 +/-0.003)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER : 1596407 SAMPLE ID : S1203621738_TH SAMPLE QTY : 0.128 G +/-0.781 % SAMPLE DATE : 20-Sep-2016 00:00:00 ANALYST : HAKB % YIELD : 58.8 +/-9.988 % AC-227 SEP. : 21-Sep-2016 09:30:00	CHAMBER : 170 DETECTOR S/N : 72549 AVERAGE %EFFICIENCY : 25.7306 AVERAGE %EFF ERROR : 0.4988 COUNT DATE : 22-Sep-2016 14:25:35 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B170.CNF;874 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W170.CNF;241 CAL DATE : 13-Sep-2016
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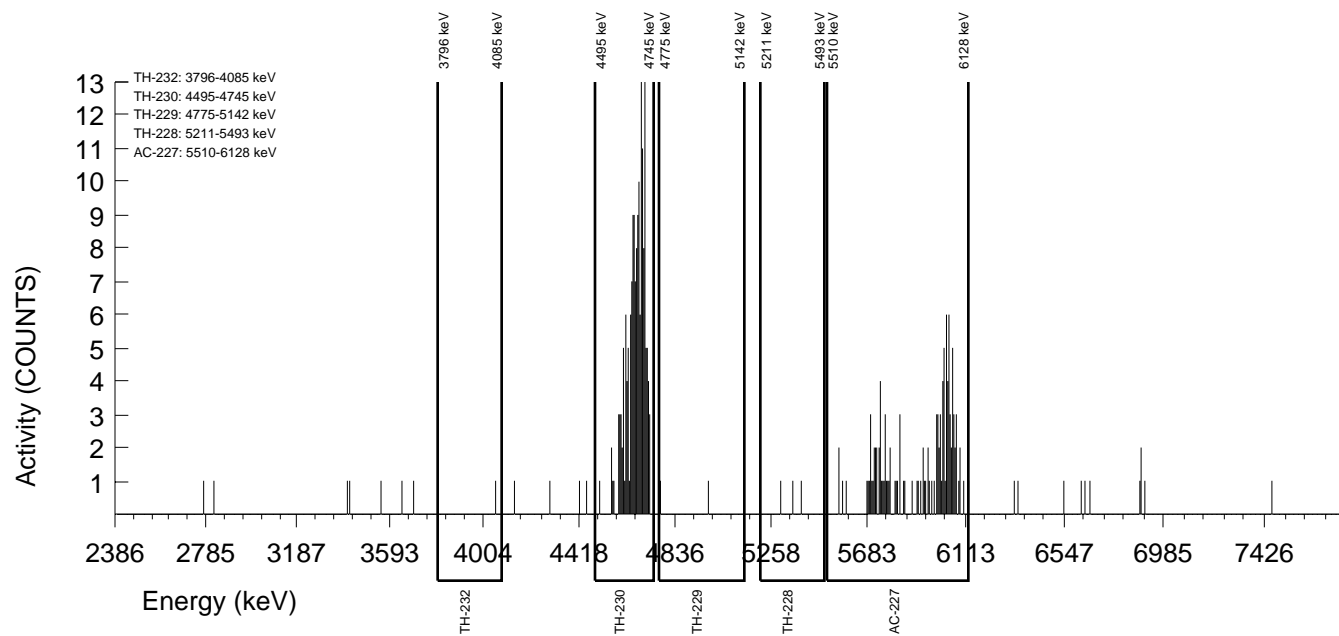
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1430E+00 dpm RESULTS : 1.8486E+00 dpm	LCS ID : 1242-H NUCLIDE : TH-230 NOMINAL (pCi/G) : 1.6352E+01 % RECOVERY : 101.057
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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.15	5913.02	299.789	118.000	114.160	3.840	1.9596	100.000	1.16E+01	3.19E+00	1.03E+00	3.65E-01	2.18E+00
TH-228	5363.00	5353.12	89.193	3.000	0.048	2.640	1.6248	99.940	4.62E-03	4.13E-01	8.97E-01	3.03E-01	4.13E-01
TH-229	4900.00	4882.97	203.163	2.000	1.520	0.480	0.6928	99.469	1.48E-01	3.41E-01	5.39E-01	1.24E-01	3.40E-01
TH-230	4671.39	4669.80	61.011	171.000	170.040	0.960	0.9798	99.700	1.65E+01	4.14E+00	6.40E-01	1.74E-01	2.50E+00
TH-232	3972.00	4055.13	4.955	1.000	1.000	0.000	0.0000	100.000	9.69E-02	2.73E-01	2.91E-01	0.00E+00	2.72E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1650E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.312 +/-0.002)



Batch# 1596395 Product: Th Date: 10/4/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			N/A
Samples have been blank corrected (if required). Blank correction reported included (if required).			N/A
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	/		
Instrument source check is within limits.	/		
Instrument bkq check is within limits.	/		
Method RDL/ LLD has been met.			
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	/		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	/		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	/		
Sample was run within hold time.		/	DER# 1564126
Sample was correctly preserved if required.			N/A
Smears Taken for Radioactive batches.			N/A
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	/		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	/		
Aux data is correct.			N/A
Client Special requirements page has been checked.	/		
Raw Data and/ or spectrum are included and properly stasured.	/		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	/		
Hit notification complete (if necessary)			N/A
Batch entered into Case Narrative.	/		
Batch Data Exception Reports (DER) completed, if applicable.	/		DER# 1564126
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	/		DER# 1564126
Aliquot Correction completed if required.			N/A
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	/		

Primary Review Performed By: [Signature] 10/4/16

Secondary Review Performed By: [Signature] 10/04/16
 (10/4)
 MJW

DATA EXCEPTION REPORT

Mo.Day Yr. 04-OCT-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Th-01-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596395	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, and 1203621707 were received and analyzed outside of the holding time.</p>		<p>1. Reporting results.</p>	

Originator's Name:

Jessica Downey 04-OCT-16

Data Validator/Group Leader:

Jessica Davis 04-OCT-16

Thorium (Ac-227 Tracer) Queue Sheet

07-SEP-16

Batch #: 1596395

Analyst: MXS2 First Client Due Date: 04-OCT-16

Internal Due Date: 30-SEP-16

Tracer Isotope: Ac-227

Tracer Code: 0387-B-402

Expiration Date: 5-31-17

Vol: 0.1

Ac-227 Separation Date/Time: 9/23/16 @ 0830hrs

LCS Isotope: Th-230, Th-232

LCS Code: 1242-H

Expiration Date: 2-11-17

Vol: 0.1

Spike Isotope: Th-230, Th-232

Spike Code: _____

Expiration Date: _____

Vol: _____

Prep Date: 9-21-16

Initials: MSD

Pipet ID: 180022

Balance ID: 1607662

Witness: NA

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	Th Det #
405235021-1	4.2B.R.2.3	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	1	1	0.107	33	
405235022-1	4.2B.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	2	2	0.103	38	
405235023-1	4.2B.R.11.2	SAMPLE	1 pCi/g	SOIL	MJWC001	02-DEC-15	3	3	0.101	40	
405235024-1	4.2B.R.2.2	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	4	4	0.106	41	
405235025-1	4.2B.R.1.2	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	5	5	0.111	42	
405235026-1	4.2C.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	6	6	0.113	161	
405235027-1	4.2C.R.1.4	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	7	7	0.122	162	
405235028-1	4.3.A.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	8	8	0.105	164	
405235029-1	4.3.B.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	9	9	0.111	167	
405235030-1	4.3.A.R.2.3	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	10	10	0.104	169	
405235031-1	4.3.B.R.1.2	SAMPLE	1 pCi/g	SOIL	MJWC001	26-NOV-15	11	11	0.102	170	
405235032-1	4.3B.R.3.3	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	12	12	0.104	175	
405235033-1	4.3B.R.3.4	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	13	13	0.106	176	
405235034-1	4.3.B.R.1.4	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	14	14	0.119	177	
405235035-1	4.3B.R.2.3	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	15	15	0.104	178	
405235036-1	4.3B.R.2.4	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	16	16	0.117	179	
405235037-1	4.4C.R.2.4	SAMPLE	1 pCi/g	SOIL	MJWC001	30-NOV-15	17	17	0.114	180	
405235038-1	4.4C.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	30-NOV-15	18	18	0.115	182	
405235039-1	4.4C.R.1.4	SAMPLE	1 pCi/g	SOIL	MJWC001	30-NOV-15	19	19	0.117	184	
405235040-1	4.4D.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	30-NOV-15	20	20	0.101	185	
1203621706-1	MB for batch 1596395	MB	1 pCi/g	SOIL	QC ACCOUNT		21	21	0.122	34	
1203621707-1	4.2B.R.2.3(405235021DUP)	DUP	1 pCi/g	SOIL	QC ACCOUNT	08-DEC-15	22	22	0.103	186	
1203621708-1	LCS for batch 1596395	LCS	1 pCi/g	SOIL	QC ACCOUNT		23	23	0.122	187	

Choose SOP Used: GL-RAD-A-038

GL-RAD-A-032

Solid Sample Dissolution by: **LEACH or DIGESTION** Data Reviewed By: Paul De-10/1/16

Circle One

4 340 9/4/16

10/1/16

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

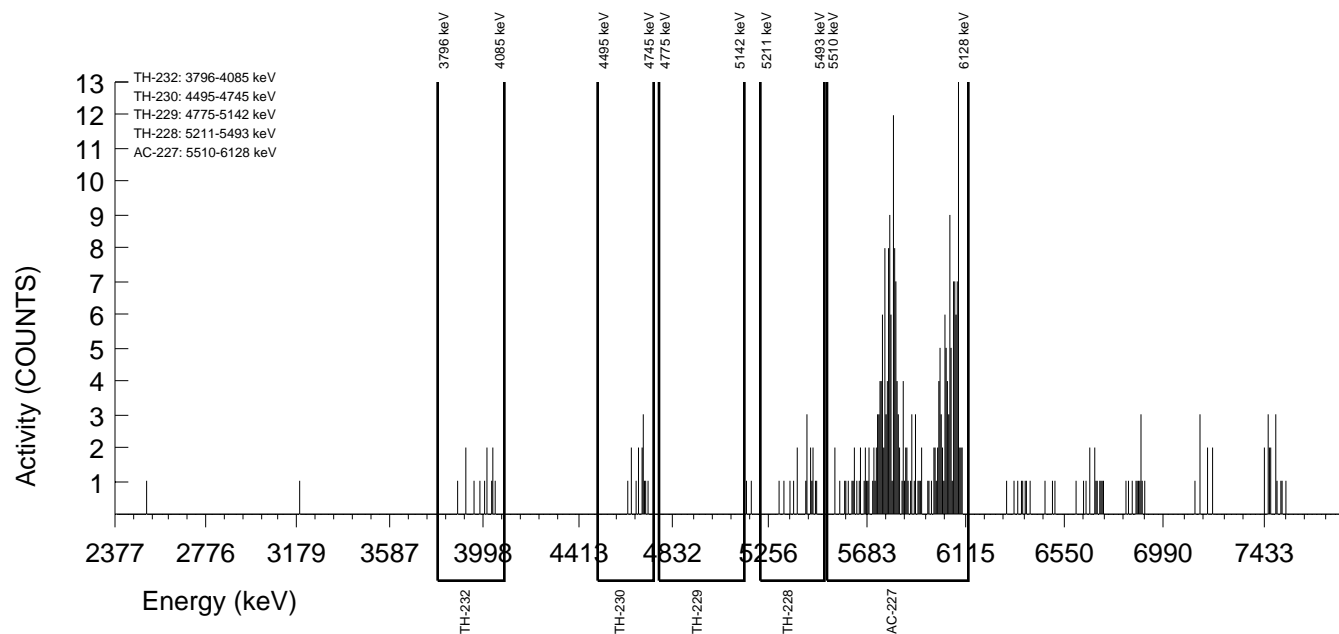
BATCH NUMBER : 1596395 SAMPLE ID : S0405235021_TH SAMPLE QTY : 0.107 G +/-0.935 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 95.9 +/-7.329 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 033 DETECTOR S/N : 83293 AVERAGE %EFFICIENCY : 32.6568 AVERAGE %EFF ERROR : 0.6295 COUNT DATE : 24-Sep-2016 13:16:16 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B033.CNF;1825 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W033.CNF;546 CAL DATE : 29-Aug-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1422E+00 dpm RESULTS : 3.0132E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.21	5887.44	302.008	252.000	236.160	15.840	3.9799	100.000	1.39E+01	2.78E+00	1.03E+00	4.28E-01	1.85E+00
TH-228	5363.00	5405.61	67.013	17.000	15.157	1.200	1.0954	99.940	1.13E+00	6.53E-01	5.84E-01	1.80E-01	6.29E-01
TH-229	4900.00	4958.10	0.000	0.000	-0.240	0.240	0.4899	99.469	-1.35E-02	1.17E-01	2.70E-01	5.05E-02	1.17E-01
TH-230	4671.39	4685.22	54.603	14.000	14.000	0.000	0.0000	99.700	7.87E-01	4.43E-01	1.69E-01	0.00E+00	4.27E-01
TH-232	3972.00	3987.89	119.134	12.000	11.520	0.480	0.6928	100.000	6.45E-01	4.10E-01	3.10E-01	7.11E-02	3.98E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1544E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.643 +/-0.004)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

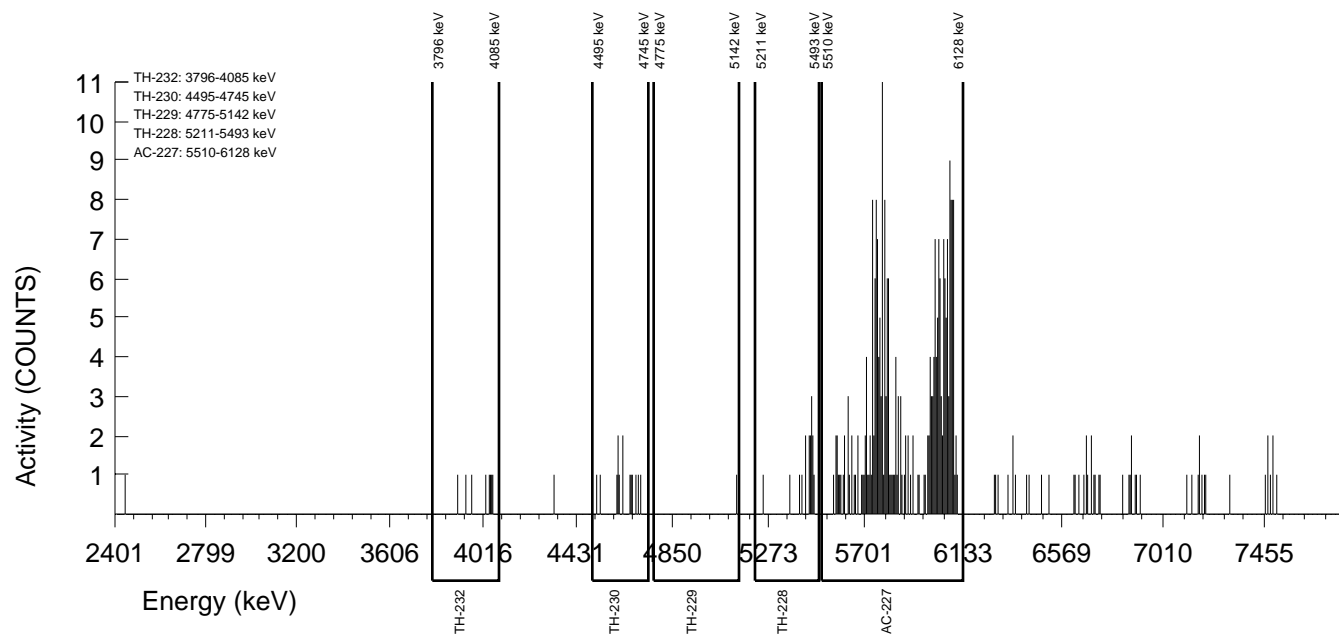
BATCH NUMBER : 1596395 SAMPLE ID : S0405235022_TH SAMPLE QTY : 0.103 G +/-0.971 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 91.0 +/-7.143 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 038 DETECTOR S/N : 72532 AVERAGE %EFFICIENCY : 35.8983 AVERAGE %EFF ERROR : 0.6908 COUNT DATE : 24-Sep-2016 13:16:17 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : AC BKG FILE : B038.CNF;1826 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W038.CNF;499 CAL DATE : 29-Aug-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1422E+00 dpm RESULTS : 2.8585E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.21	5887.91	329.431	259.000	246.280	12.720	3.5665	100.000	1.44E+01	2.81E+00	9.40E-01	3.82E-01	1.86E+00
TH-228	5363.00	5435.76	33.331	16.000	14.369	0.960	0.9798	99.940	1.07E+00	6.30E-01	5.58E-01	1.67E-01	6.08E-01
TH-229	4900.00	5135.18	4.938	1.000	0.760	0.240	0.4899	99.469	4.26E-02	1.60E-01	2.69E-01	5.03E-02	1.60E-01
TH-230	4671.39	4635.78	27.159	14.000	13.760	0.240	0.4899	99.700	7.70E-01	4.41E-01	2.68E-01	5.02E-02	4.26E-01
TH-232	3972.00	4009.24	153.076	8.000	7.760	0.240	0.4899	100.000	4.33E-01	3.36E-01	2.68E-01	5.01E-02	3.30E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1544E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.671 +/-0.004)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

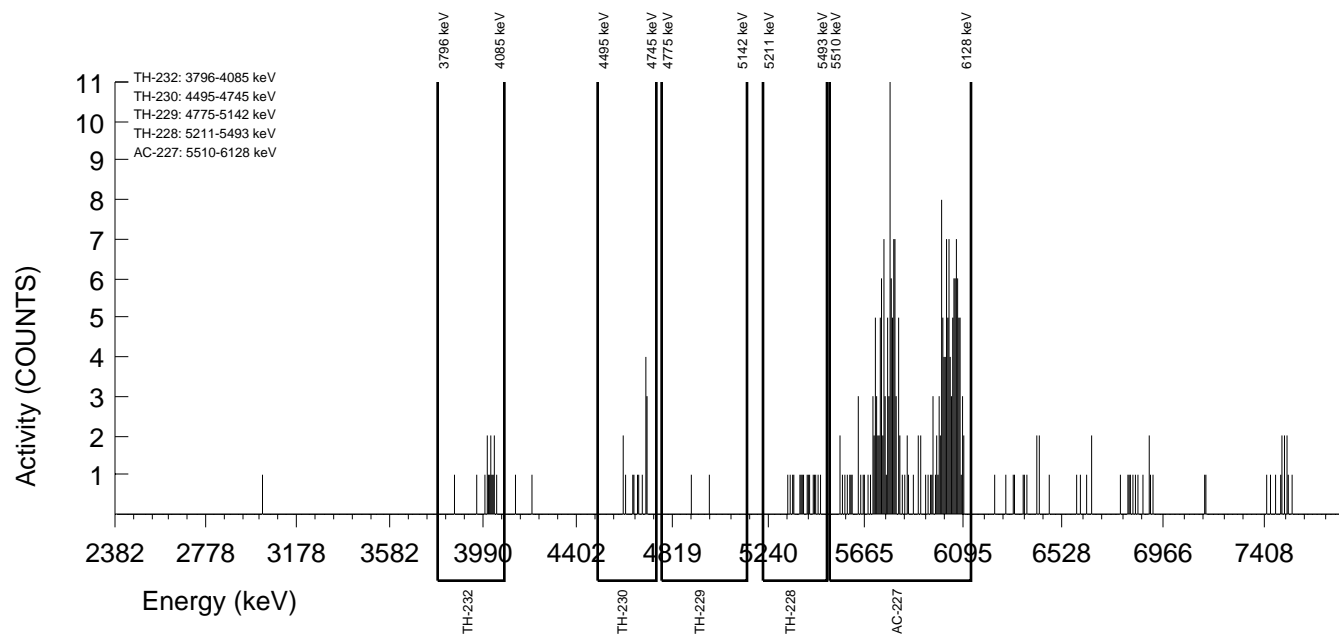
BATCH NUMBER : 1596395 SAMPLE ID : S0405235023_TH SAMPLE QTY : 0.101 G +/-0.990 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 88.5 +/-7.582 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 040 DETECTOR S/N : 78773 AVERAGE %EFFICIENCY : 32.4791 AVERAGE %EFF ERROR : 0.6262 COUNT DATE : 24-Sep-2016 13:16:17 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : AC BKG FILE : B040.CNF;1829 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W040.CNF;485 CAL DATE : 29-Aug-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1422E+00 dpm RESULTS : 2.7813E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.21	5882.40	309.760	230.000	216.800	13.200	3.6332	100.000	1.47E+01	3.05E+00	1.11E+00	4.51E-01	2.03E+00
TH-228	5363.00	5399.56	137.671	16.000	14.449	0.960	0.9798	99.940	1.26E+00	7.37E-01	6.42E-01	1.91E-01	7.08E-01
TH-229	4900.00	4942.20	78.669	2.000	1.520	0.480	0.6928	99.469	9.88E-02	2.27E-01	3.60E-01	8.25E-02	2.27E-01
TH-230	4671.39	4673.00	9.014	15.000	14.040	0.960	0.9798	99.700	9.10E-01	5.32E-01	4.27E-01	1.16E-01	5.13E-01
TH-232	3972.00	4009.96	34.418	14.000	13.280	0.720	0.8485	100.000	8.58E-01	5.12E-01	3.95E-01	1.00E-01	4.94E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1544E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.591 +/-0.004)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

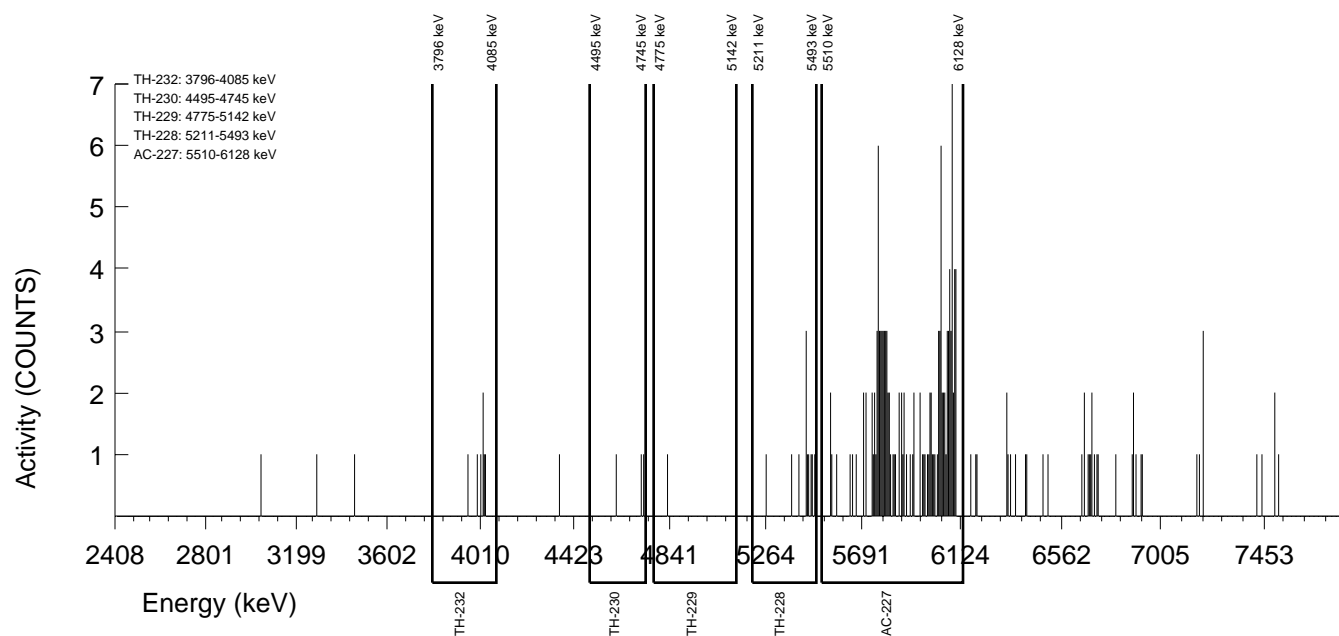
BATCH NUMBER : 1596395 SAMPLE ID : S0405235024_TH SAMPLE QTY : 0.106 G +/-0.943 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 45.0 +/-10.404 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 041 DETECTOR S/N : 78205 AVERAGE %EFFICIENCY : 34.2140 AVERAGE %EFF ERROR : 0.6590 COUNT DATE : 24-Sep-2016 13:16:17 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : AC BKG FILE : B041.CNF;1825 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W041.CNF;529 CAL DATE : 29-Aug-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1422E+00 dpm RESULTS : 1.4141E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.21	5907.13	312.061	131.000	116.120	14.880	3.8575	100.000	1.40E+01	4.01E+00	2.07E+00	8.52E-01	2.75E+00
TH-228	5363.00	5429.29	6.099	11.000	8.764	1.920	1.3856	99.940	1.35E+00	1.10E+00	1.29E+00	4.15E-01	1.07E+00
TH-229	4900.00	4835.49	4.879	1.000	0.280	0.720	0.8485	99.469	3.24E-02	3.39E-01	7.06E-01	1.80E-01	3.38E-01
TH-230	4671.39	4686.95	117.099	3.000	2.280	0.720	0.8485	99.700	2.63E-01	4.68E-01	7.05E-01	1.79E-01	4.65E-01
TH-232	3972.00	4012.95	7.319	7.000	7.000	0.000	0.0000	100.000	8.05E-01	6.61E-01	3.45E-01	0.00E+00	6.40E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1544E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.316 +/-0.002)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

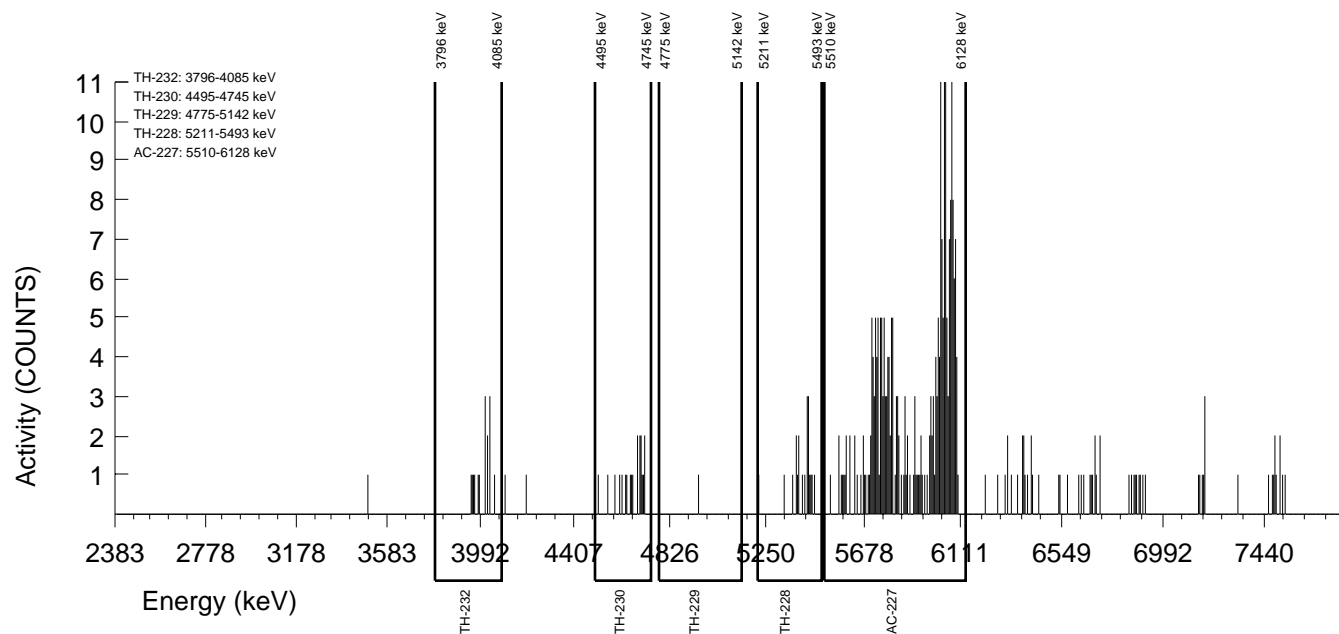
BATCH NUMBER : 1596395 SAMPLE ID : S0405235025_TH SAMPLE QTY : 0.111 G +/-0.901 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 96.9 +/-7.177 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 042 DETECTOR S/N : 78793 AVERAGE %EFFICIENCY : 33.3976 AVERAGE %EFF ERROR : 0.6435 COUNT DATE : 24-Sep-2016 13:16:17 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : AC BKG FILE : B042.CNF;1823 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W042.CNF;490 CAL DATE : 29-Aug-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1422E+00 dpm RESULTS : 3.0446E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.21	5907.34	65.241	257.000	244.040	12.960	3.6000	100.000	1.34E+01	2.62E+00	8.87E-01	3.61E-01	1.74E+00
TH-228	5363.00	5404.64	54.017	20.000	17.895	1.440	1.2000	99.940	1.25E+00	6.61E-01	5.69E-01	1.80E-01	6.33E-01
TH-229	4900.00	4952.43	4.911	1.000	0.280	0.720	0.8485	99.469	1.47E-02	1.54E-01	3.21E-01	8.17E-02	1.54E-01
TH-230	4671.39	4655.51	34.374	20.000	17.600	2.400	1.5492	99.700	9.22E-01	4.97E-01	4.55E-01	1.49E-01	4.78E-01
TH-232	3972.00	4003.11	24.553	15.000	14.520	0.480	0.6928	100.000	7.59E-01	4.27E-01	2.89E-01	6.63E-02	4.12E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1544E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.665 +/-0.004)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

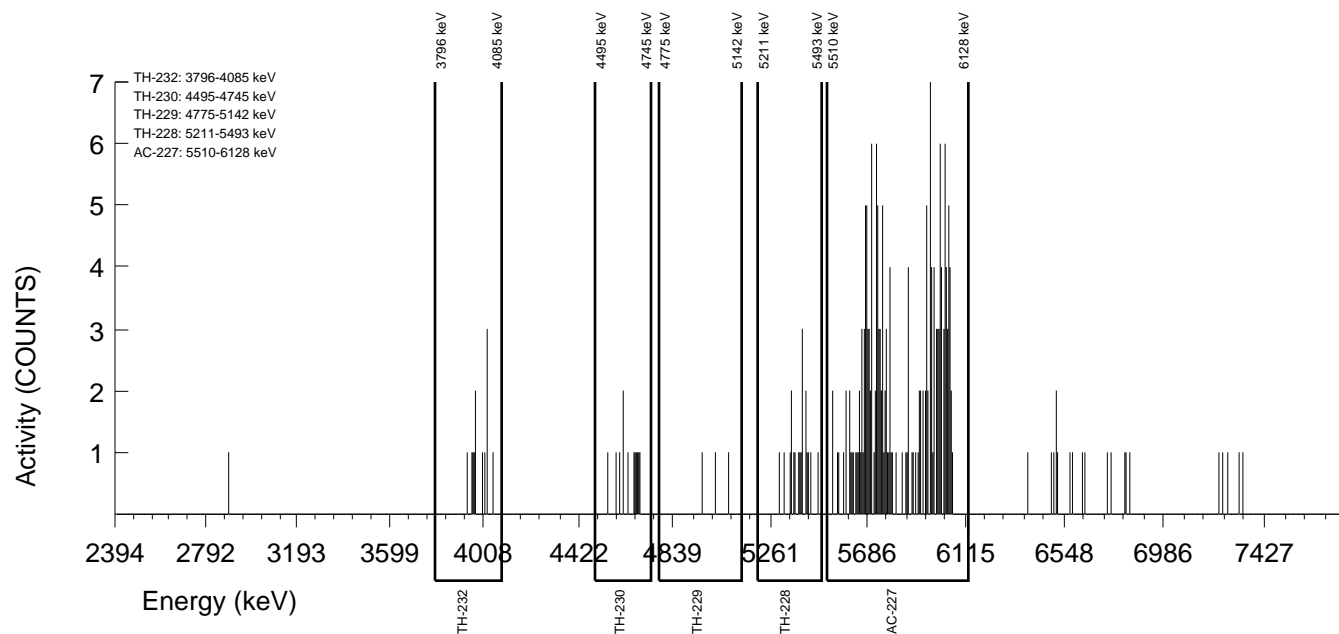
BATCH NUMBER : 1596395 SAMPLE ID : S0405235026_TH SAMPLE QTY : 0.113 G +/-0.885 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 92.0 +/-8.026 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 161 DETECTOR S/N : 70321 AVERAGE %EFFICIENCY : 25.7727 AVERAGE %EFF ERROR : 0.4995 COUNT DATE : 24-Sep-2016 13:17:52 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B161.CNF;860 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W161.CNF;261 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1422E+00 dpm RESULTS : 2.8907E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.20	5840.46	346.083	180.000	178.800	1.200	1.0954	100.000	1.31E+01	2.89E+00	5.15E-01	1.47E-01	1.94E+00
TH-228	5363.00	5390.77	64.272	19.000	18.032	0.480	0.6928	99.940	1.69E+00	8.71E-01	6.01E-01	1.60E-01	8.24E-01
TH-229	4900.00	5022.99	113.713	3.000	2.760	0.240	0.4899	99.469	1.94E-01	2.82E-01	3.38E-01	6.32E-02	2.80E-01
TH-230	4671.39	4641.67	4.944	12.000	11.280	0.720	0.8485	99.700	7.93E-01	5.17E-01	4.29E-01	1.09E-01	5.01E-01
TH-232	3972.00	3992.00	54.384	12.000	11.760	0.240	0.4899	100.000	8.24E-01	5.15E-01	3.36E-01	6.29E-02	4.97E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1562E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.488 +/-0.003)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

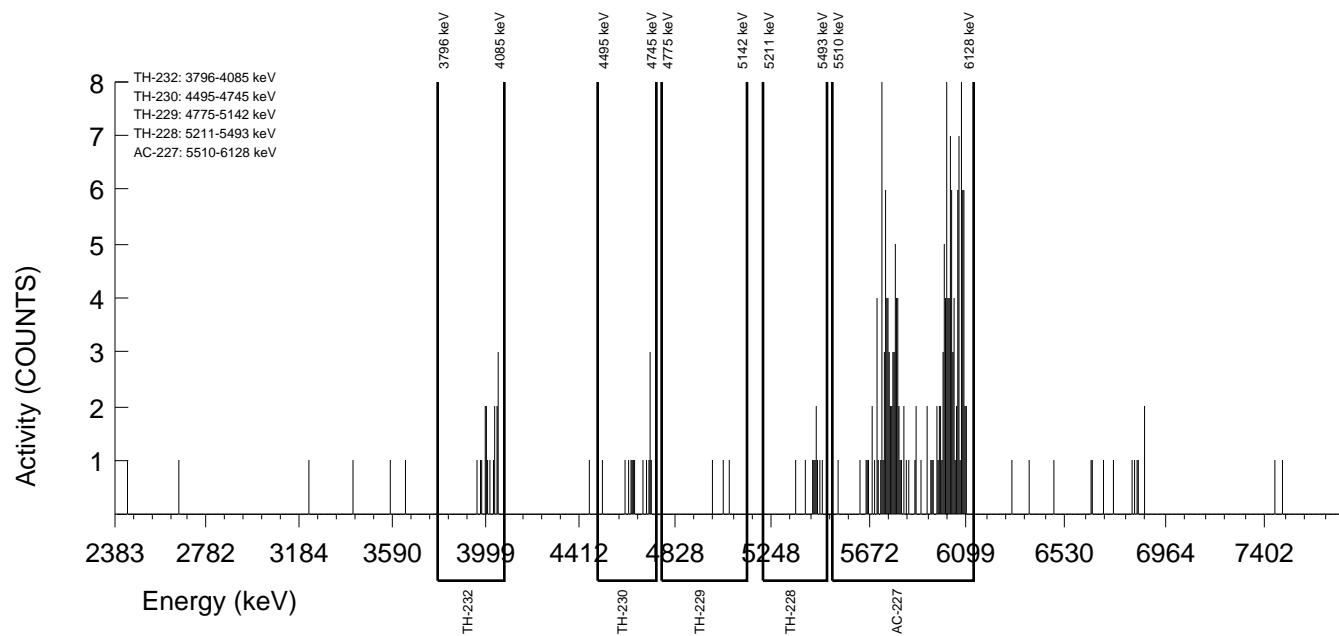
BATCH NUMBER : 1596395 SAMPLE ID : S0405235027_TH SAMPLE QTY : 0.122 G +/-0.820 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 88.9 +/-8.026 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 162 DETECTOR S/N : 70323 AVERAGE %EFFICIENCY : 26.6669 AVERAGE %EFF ERROR : 0.5165 COUNT DATE : 24-Sep-2016 13:17:55 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B162.CNF;862 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W162.CNF;260 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1422E+00 dpm RESULTS : 2.7937E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.20	5916.65	337.694	180.000	178.800	1.200	1.0954	100.000	1.22E+01	2.67E+00	4.77E-01	1.37E-01	1.80E+00
TH-228	5363.00	5431.76	9.922	10.000	8.312	1.200	1.0954	99.940	7.21E-01	5.86E-01	6.61E-01	2.01E-01	5.73E-01
TH-229	4900.00	5031.01	74.413	3.000	2.520	0.480	0.6928	99.469	1.64E-01	2.63E-01	3.61E-01	8.28E-02	2.61E-01
TH-230	4671.39	4664.41	7.441	14.000	14.000	0.000	0.0000	99.700	9.11E-01	5.17E-01	1.95E-01	0.00E+00	4.95E-01
TH-232	3972.00	4020.23	58.290	17.000	17.000	0.000	0.0000	100.000	1.10E+00	5.69E-01	1.95E-01	0.00E+00	5.40E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1562E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.488 +/-0.003)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

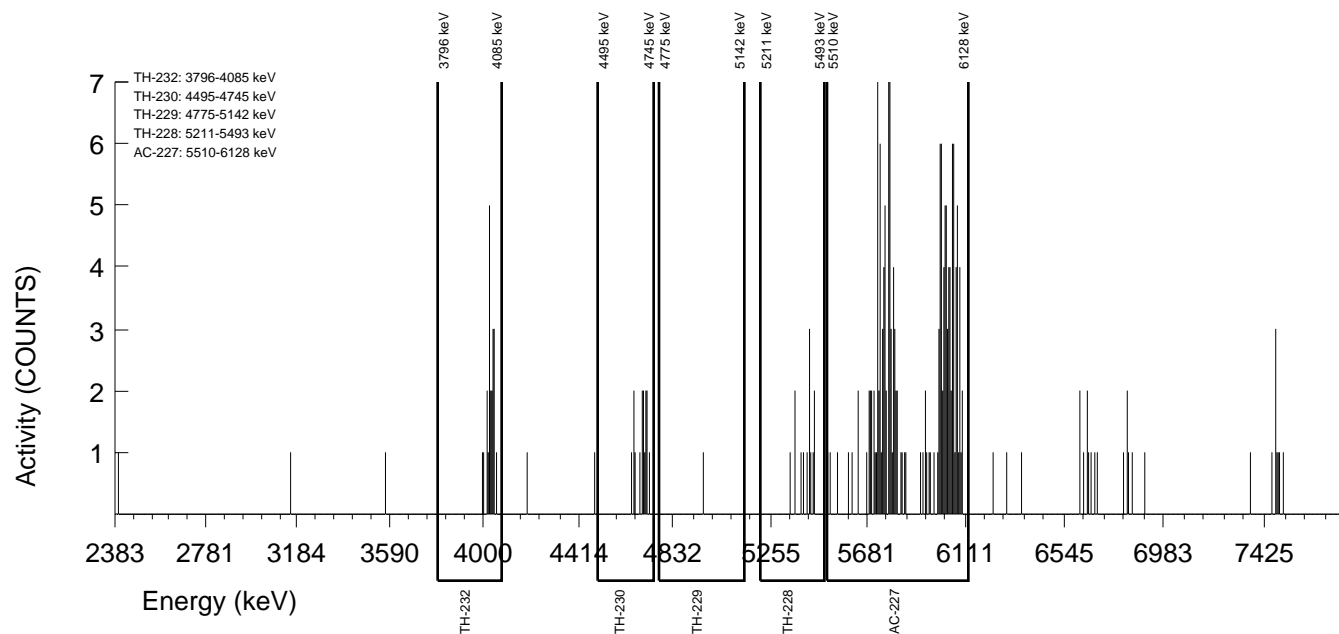
BATCH NUMBER : 1596395 SAMPLE ID : S0405235028_TH SAMPLE QTY : 0.105 G +/-0.952 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 80.9 +/-8.371 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 166 DETECTOR S/N : 74545 AVERAGE %EFFICIENCY : 26.6822 AVERAGE %EFF ERROR : 0.5167 COUNT DATE : 24-Sep-2016 13:17:57 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B166.CNF;891 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W166.CNF;299 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1422E+00 dpm RESULTS : 2.5423E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.20	5891.35	335.562	164.000	162.800	1.200	1.0954	100.000	1.41E+01	3.24E+00	6.09E-01	1.74E-01	2.19E+00
TH-228	5363.00	5412.74	81.724	13.000	10.876	1.680	1.2961	99.940	1.22E+00	8.65E-01	9.25E-01	2.94E-01	8.37E-01
TH-229	4900.00	4963.98	4.953	1.000	0.760	0.240	0.4899	99.469	6.33E-02	2.38E-01	3.99E-01	7.47E-02	2.37E-01
TH-230	4671.39	4693.71	59.435	15.000	14.760	0.240	0.4899	99.700	1.23E+00	6.86E-01	3.98E-01	7.45E-02	6.53E-01
TH-232	3972.00	4030.07	23.733	21.000	20.760	0.240	0.4899	100.000	1.72E+00	8.17E-01	3.97E-01	7.43E-02	7.63E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1562E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.444 +/-0.003)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

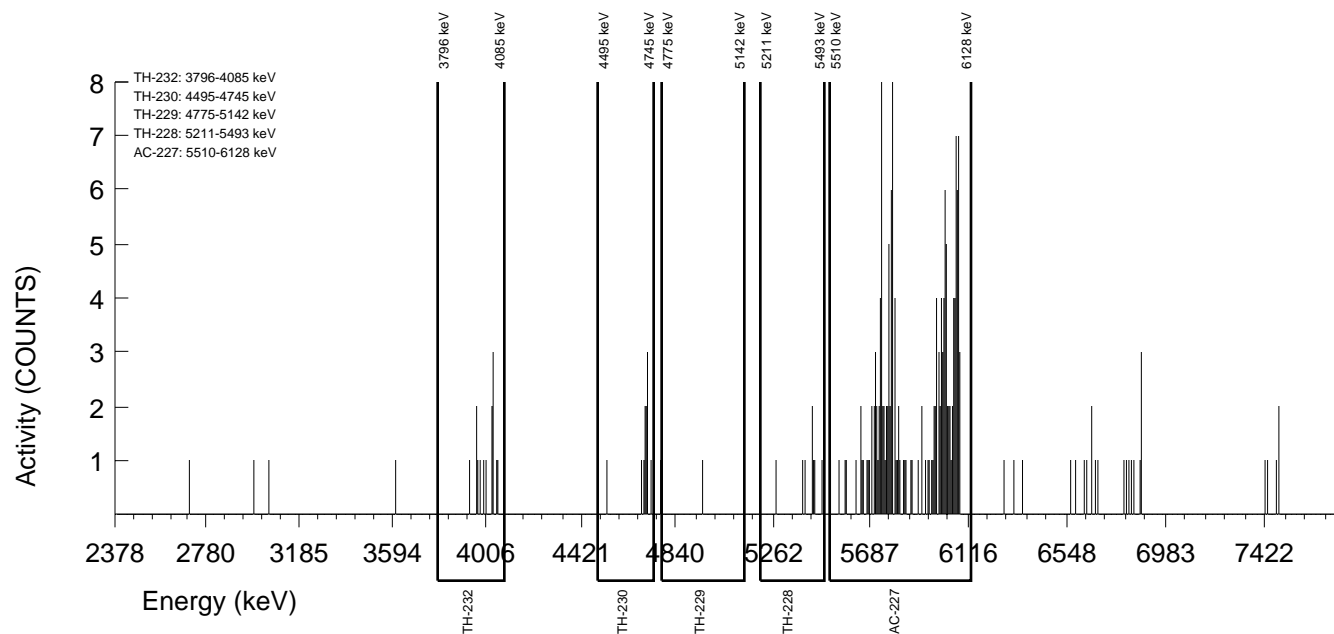
BATCH NUMBER : 1596395 SAMPLE ID : S0405235029_TH SAMPLE QTY : 0.111 G +/-0.901 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 88.0 +/-8.471 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 167 DETECTOR S/N : 72546 AVERAGE %EFFICIENCY : 24.1606 AVERAGE %EFF ERROR : 0.4690 COUNT DATE : 24-Sep-2016 13:17:59 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B167.CNF;886 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W167.CNF;246 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1422E+00 dpm RESULTS : 2.7655E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.20	5888.57	323.837	163.000	160.360	2.640	1.6248	100.000	1.34E+01	3.11E+00	7.47E-01	2.48E-01	2.10E+00
TH-228	5363.00	5391.80	7.502	9.000	8.563	0.000	0.0000	99.940	9.24E-01	6.91E-01	5.58E-01	1.17E-01	6.71E-01
TH-229	4900.00	4955.26	5.001	1.000	0.760	0.240	0.4899	99.469	6.08E-02	2.28E-01	3.83E-01	7.17E-02	2.28E-01
TH-230	4671.39	4692.14	15.004	11.000	9.560	1.440	1.2000	99.700	7.62E-01	5.66E-01	5.90E-01	1.75E-01	5.51E-01
TH-232	3972.00	4006.65	73.770	14.000	13.280	0.720	0.8485	100.000	1.06E+00	6.35E-01	4.86E-01	1.24E-01	6.08E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1563E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.437 +/-0.003)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

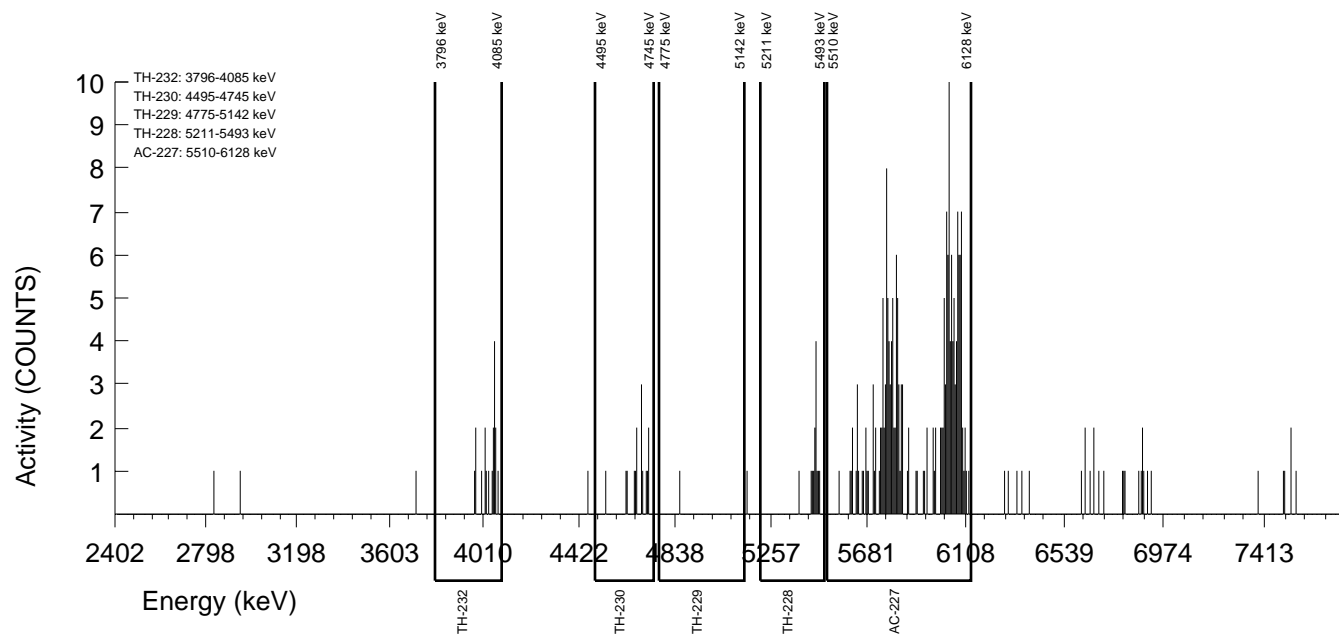
BATCH NUMBER : 1596395 SAMPLE ID : S0405235030_TH SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 101 +/-7.641 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 169 DETECTOR S/N : 72548 AVERAGE %EFFICIENCY : 26.2282 AVERAGE %EFF ERROR : 0.5082 COUNT DATE : 24-Sep-2016 13:18:02 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B169.CNF;876 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W169.CNF;259 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1422E+00 dpm RESULTS : 3.1741E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.20	5910.36	305.610	201.000	199.800	1.200	1.0954	100.000	1.43E+01	2.98E+00	5.01E-01	1.43E-01	1.99E+00
TH-228	5363.00	5450.22	8.215	13.000	12.215	0.240	0.4899	99.940	1.13E+00	7.05E-01	5.56E-01	1.40E-01	6.80E-01
TH-229	4900.00	4863.95	4.929	1.000	0.040	0.960	0.9798	99.469	2.74E-03	2.03E-01	4.51E-01	1.23E-01	2.03E-01
TH-230	4671.39	4679.10	52.989	15.000	14.280	0.720	0.8485	99.700	9.76E-01	5.60E-01	4.17E-01	1.06E-01	5.39E-01
TH-232	3972.00	4031.79	9.858	18.000	17.760	0.240	0.4899	100.000	1.21E+00	6.13E-01	3.27E-01	6.11E-02	5.84E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1563E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.545 +/-0.004)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

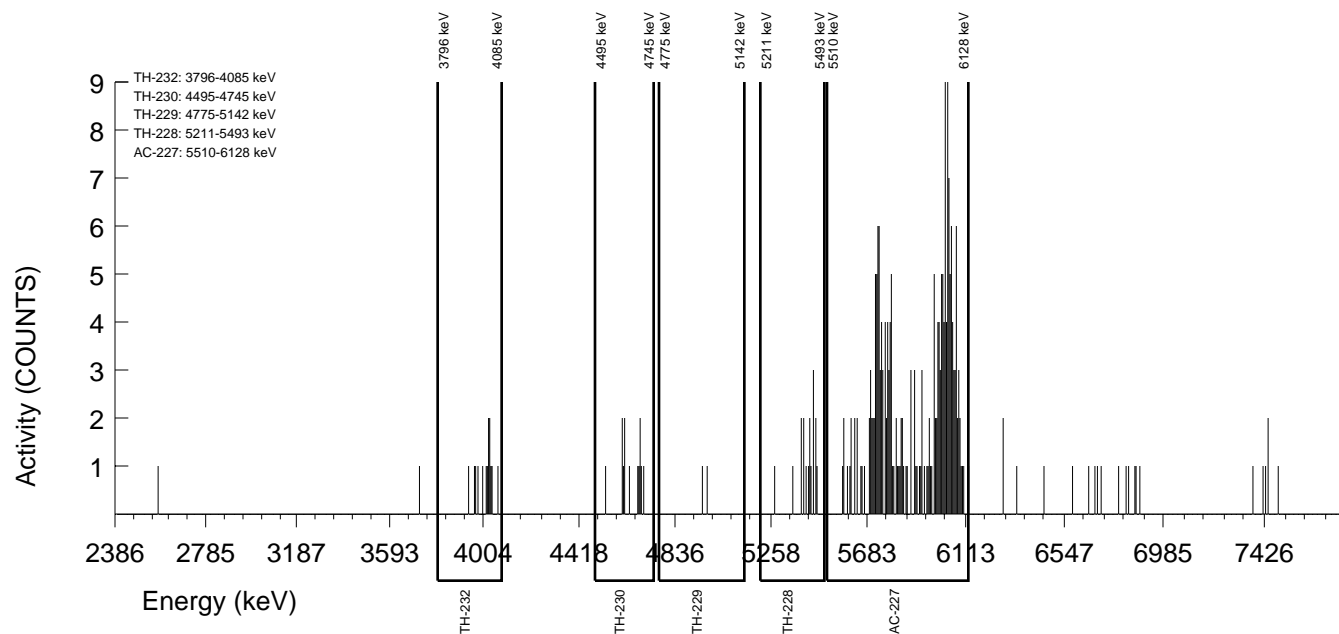
BATCH NUMBER : 1596395 SAMPLE ID : S0405235031_TH SAMPLE QTY : 0.102 G +/-0.980 % SAMPLE DATE : 26-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 109 +/-7.490 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 170 DETECTOR S/N : 72549 AVERAGE %EFFICIENCY : 25.7306 AVERAGE %EFF ERROR : 0.4988 COUNT DATE : 24-Sep-2016 13:18:04 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B170.CNF;876 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W170.CNF;241 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1422E+00 dpm RESULTS : 3.4188E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.20	5896.34	329.726	214.000	211.120	2.880	1.6971	100.000	1.46E+01	2.98E+00	6.35E-01	2.14E-01	1.98E+00
TH-228	5363.00	5418.75	63.179	17.000	13.304	3.120	1.7664	99.940	1.18E+00	7.79E-01	8.83E-01	3.08E-01	7.56E-01
TH-229	4900.00	4972.40	24.776	2.000	1.280	0.720	0.8485	99.469	8.46E-02	2.33E-01	4.04E-01	1.03E-01	2.33E-01
TH-230	4671.39	4645.90	81.761	13.000	12.760	0.240	0.4899	99.700	8.41E-01	5.02E-01	3.16E-01	5.92E-02	4.85E-01
TH-232	3972.00	4008.73	14.866	14.000	13.520	0.480	0.6928	100.000	8.89E-01	5.20E-01	3.64E-01	8.34E-02	5.02E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1564E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.576 +/-0.004)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

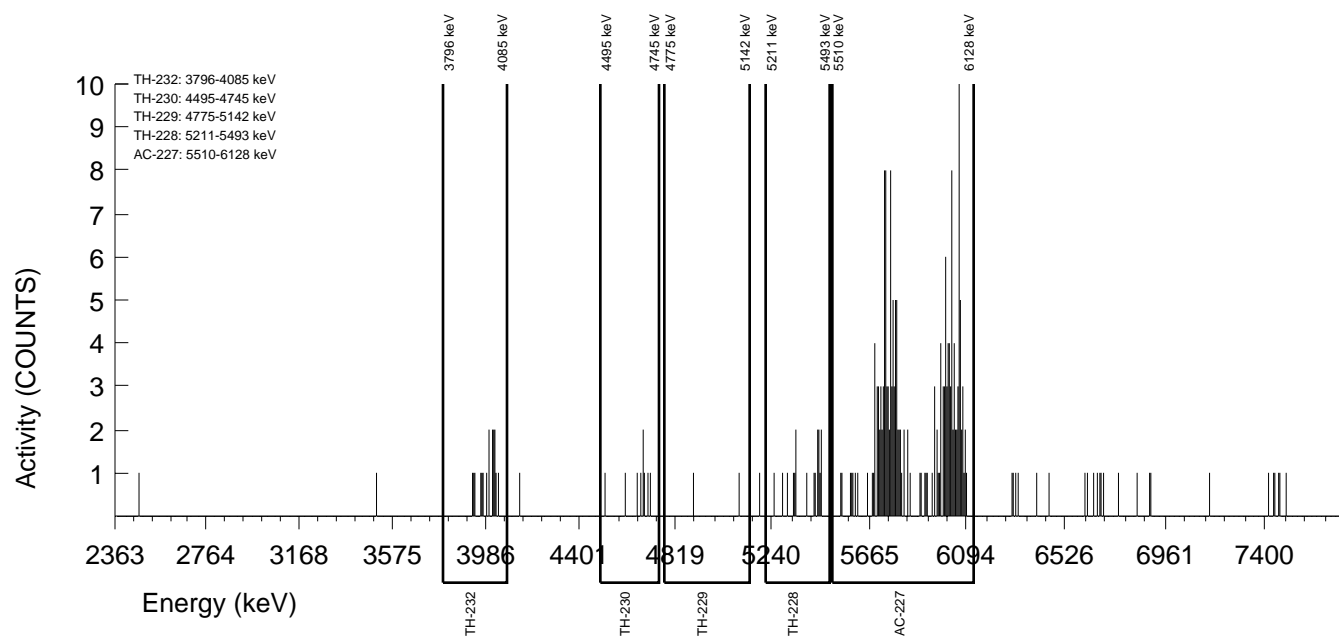
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TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1422E+00 dpm RESULTS : 2.8796E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.20	5875.01	311.902	183.000	181.560	1.440	1.2000	100.000	1.30E+01	2.84E+00	5.30E-01	1.58E-01	1.91E+00
TH-228	5363.00	5388.83	112.106	17.000	16.505	0.000	0.0000	99.940	1.53E+00	8.14E-01	4.93E-01	1.07E-01	7.73E-01
TH-229	4900.00	4997.36	194.316	2.000	1.520	0.480	0.6928	99.469	1.05E-01	2.41E-01	3.81E-01	8.73E-02	2.40E-01
TH-230	4671.39	4652.19	7.474	9.000	8.760	0.240	0.4899	99.700	6.01E-01	4.38E-01	3.29E-01	6.16E-02	4.28E-01
TH-232	3972.00	3995.29	32.386	17.000	17.000	0.000	0.0000	100.000	1.16E+00	6.00E-01	2.05E-01	0.00E+00	5.70E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1564E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.495 +/-0.003)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

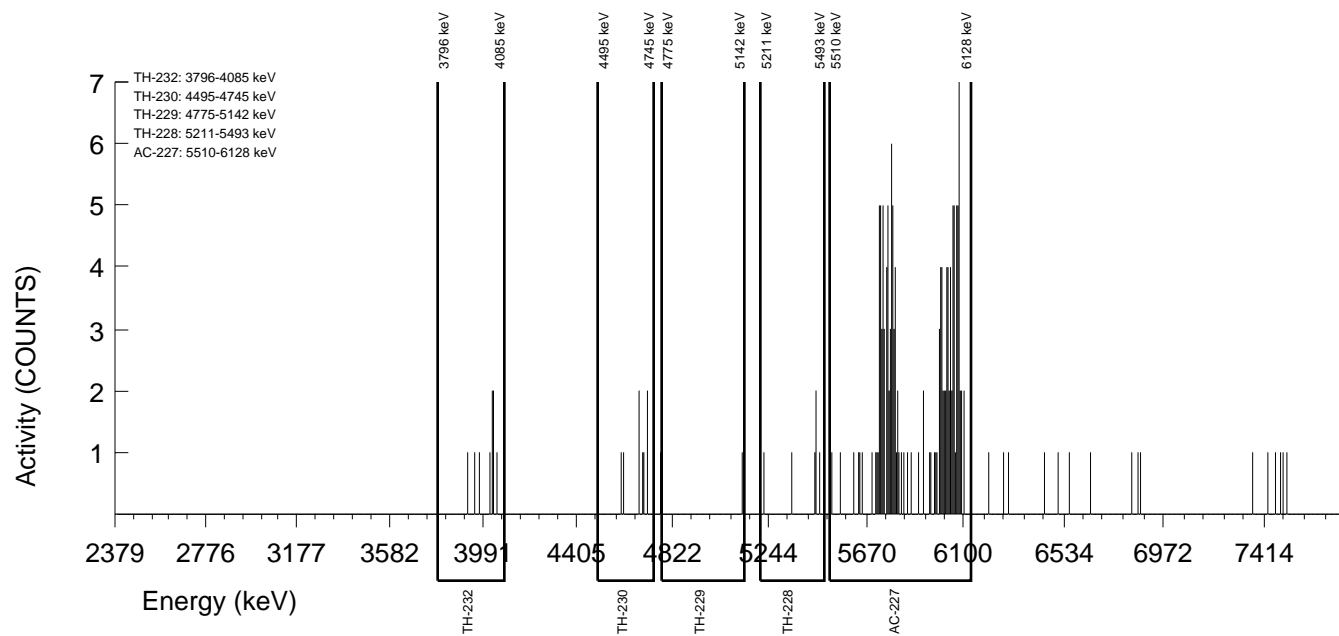
BATCH NUMBER : 1596395 SAMPLE ID : S0405235033_TH SAMPLE QTY : 0.106 G +/-0.943 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 74.5 +/-8.860 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 176 DETECTOR S/N : 74434 AVERAGE %EFFICIENCY : 25.6995 AVERAGE %EFF ERROR : 0.4981 COUNT DATE : 24-Sep-2016 13:18:08 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B176.CNF;865 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W176.CNF;237 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1422E+00 dpm RESULTS : 2.3399E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.20	5897.69	326.064	146.000	144.320	1.680	1.2961	100.000	1.40E+01	3.41E+00	7.52E-01	2.30E-01	2.31E+00
TH-228	5363.00	5396.86	7.402	6.000	5.366	0.240	0.4899	99.940	6.74E-01	6.69E-01	7.20E-01	1.72E-01	6.56E-01
TH-229	4900.00	5127.49	4.935	1.000	0.280	0.720	0.8485	99.469	2.60E-02	2.73E-01	5.68E-01	1.45E-01	2.72E-01
TH-230	4671.39	4671.00	39.478	8.000	6.320	1.680	1.2961	99.700	5.87E-01	5.69E-01	7.19E-01	2.20E-01	5.59E-01
TH-232	3972.00	4007.78	9.870	9.000	8.520	0.480	0.6928	100.000	7.88E-01	5.95E-01	5.12E-01	1.17E-01	5.78E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1564E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.394 +/-0.003)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

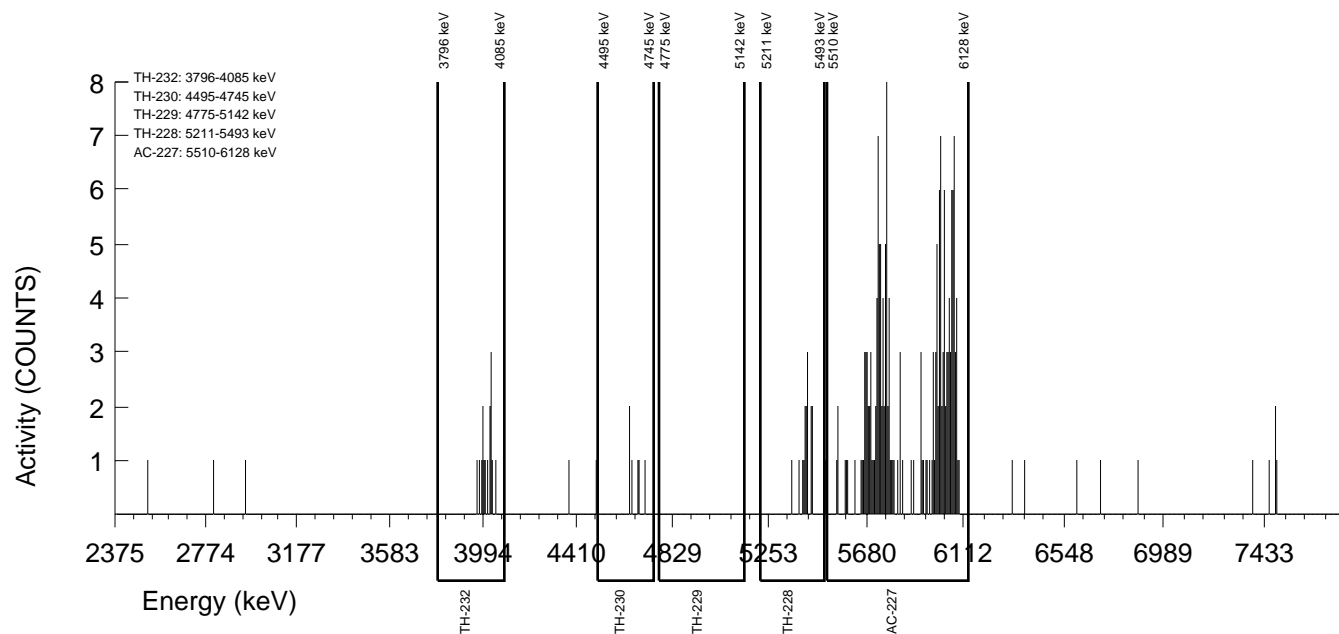
BATCH NUMBER : 1596395 SAMPLE ID : S0405235034_TH SAMPLE QTY : 0.119 G +/-0.840 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 88.7 +/-8.069 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 177 DETECTOR S/N : 74435 AVERAGE %EFFICIENCY : 26.5935 AVERAGE %EFF ERROR : 0.5150 COUNT DATE : 24-Sep-2016 13:18:10 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B177.CNF;877 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W177.CNF;243 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1422E+00 dpm RESULTS : 2.7864E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.20	5878.51	315.896	180.000	177.840	2.160	1.4697	100.000	1.25E+01	2.76E+00	5.88E-01	1.89E-01	1.85E+00
TH-228	5363.00	5416.46	33.448	15.000	13.795	0.720	0.8485	99.940	1.25E+00	7.47E-01	6.23E-01	1.75E-01	7.16E-01
TH-229	4900.00	4958.09	0.000	0.000	0.000	0.000	0.0000	99.469	0.00E+00	1.36E-01	2.02E-01	0.00E+00	1.36E-01
TH-230	4671.39	4641.34	4.955	7.000	7.000	0.000	0.0000	99.700	4.70E-01	3.81E-01	2.01E-01	0.00E+00	3.73E-01
TH-232	3972.00	4011.69	40.881	15.000	14.760	0.240	0.4899	100.000	9.87E-01	5.50E-01	3.21E-01	6.00E-02	5.26E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1565E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.485 +/-0.003)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

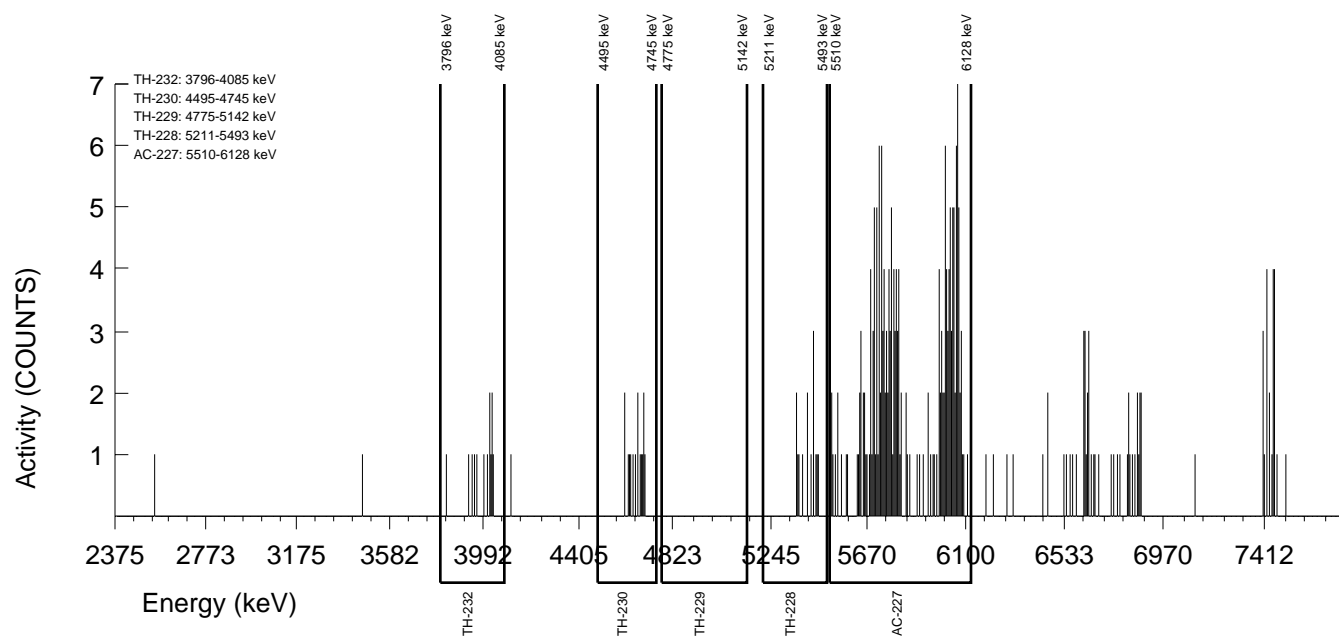
BATCH NUMBER : 1596395 SAMPLE ID : S0405235035_TH SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 95.5 +/-7.735 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 207 DETECTOR S/N : 78910 AVERAGE %EFFICIENCY : 26.0138 AVERAGE %EFF ERROR : 0.5040 COUNT DATE : 28-Sep-2016 17:56:50 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B207.CNF;811 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W207.CNF;228 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2551E+00 dpm RESULTS : 3.1080E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5842.16	5856.49	359.979	195.000	194.040	0.960	0.9798	100.000	1.73E+01	3.66E+00	5.87E-01	1.60E-01	2.44E+00
TH-228	5363.00	5411.21	73.069	14.000	12.223	0.000	0.0000	99.940	1.21E+00	7.84E-01	7.31E-01	2.17E-01	7.53E-01
TH-229	4900.00	4958.12	0.000	0.000	0.000	0.000	0.0000	99.469	0.00E+00	1.48E-01	2.19E-01	0.00E+00	1.47E-01
TH-230	4671.39	4657.72	86.692	15.000	15.000	0.000	0.0000	99.700	1.09E+00	5.98E-01	2.19E-01	0.00E+00	5.72E-01
TH-232	3972.00	3980.47	17.338	13.000	12.760	0.240	0.4899	100.000	9.27E-01	5.55E-01	3.48E-01	6.52E-02	5.35E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 7.5020E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.777 +/-0.012)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

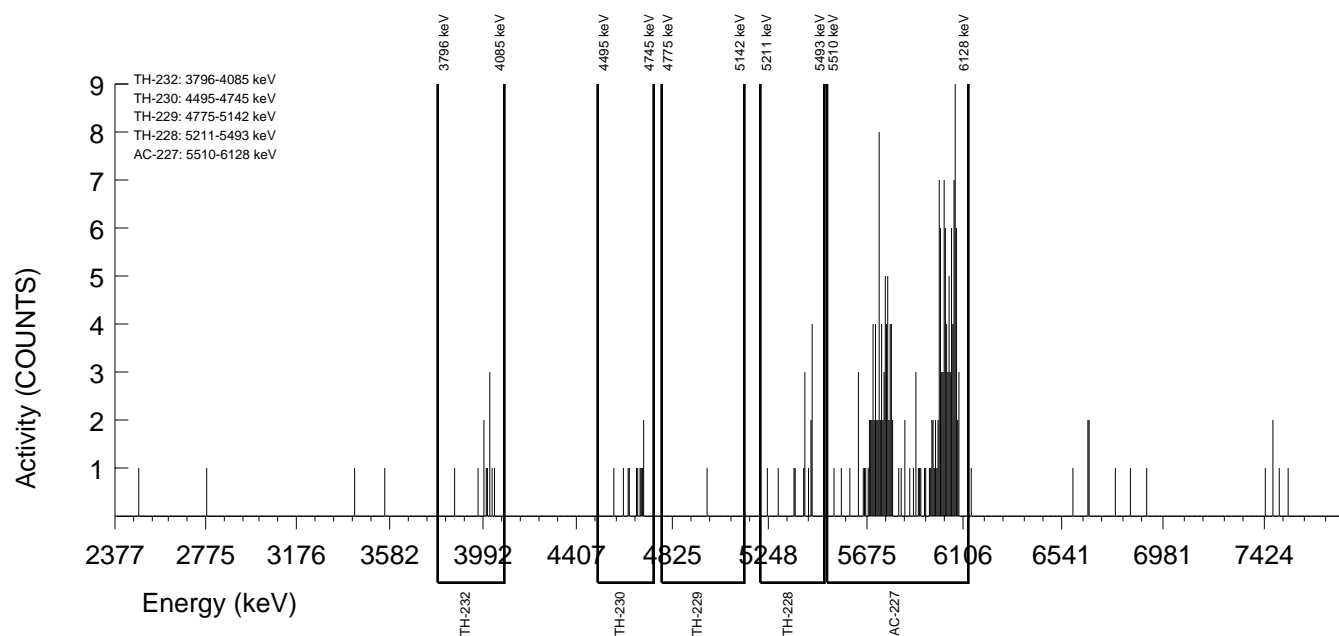
BATCH NUMBER : 1596395 SAMPLE ID : S0405235036_TH SAMPLE QTY : 0.117 G +/-0.855 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 92.3 +/-7.938 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 179 DETECTOR S/N : 74437 AVERAGE %EFFICIENCY : 26.3751 AVERAGE %EFF ERROR : 0.5108 COUNT DATE : 24-Sep-2016 13:18:15 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B179.CNF;877 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W179.CNF;254 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1422E+00 dpm RESULTS : 2.8998E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.20	5898.09	316.014	185.000	183.560	1.440	1.2000	100.000	1.27E+01	2.76E+00	5.11E-01	1.52E-01	1.85E+00
TH-228	5363.00	5395.28	34.587	15.000	13.779	0.720	0.8485	99.940	1.23E+00	7.35E-01	6.15E-01	1.74E-01	7.06E-01
TH-229	4900.00	4977.84	4.941	1.000	0.760	0.240	0.4899	99.469	5.04E-02	1.89E-01	3.18E-01	5.95E-02	1.89E-01
TH-230	4671.39	4659.12	7.411	11.000	10.760	0.240	0.4899	99.700	7.11E-01	4.65E-01	3.17E-01	5.93E-02	4.51E-01
TH-232	3972.00	4000.35	28.410	11.000	10.760	0.240	0.4899	100.000	7.09E-01	4.64E-01	3.16E-01	5.91E-02	4.50E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1566E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.501 +/-0.003)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

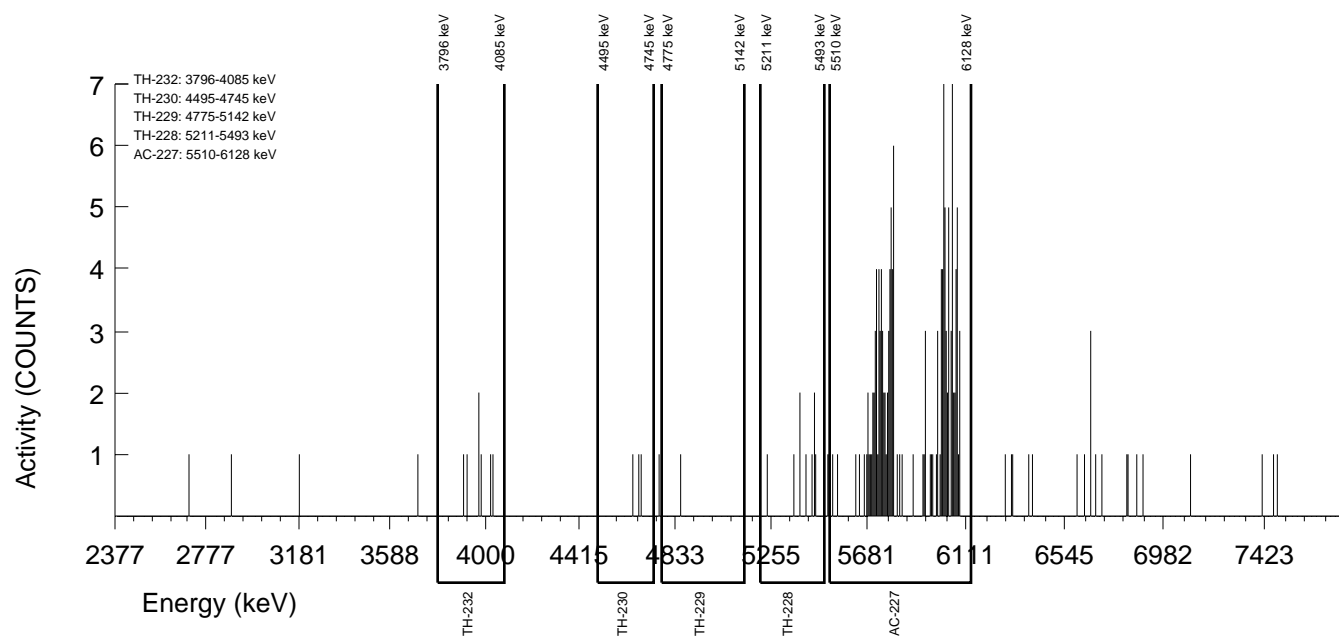
BATCH NUMBER : 1596395 SAMPLE ID : S0405235037_TH SAMPLE QTY : 0.114 G +/-0.877 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 70.6 +/-8.974 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 180 DETECTOR S/N : 83295 AVERAGE %EFFICIENCY : 26.2740 AVERAGE %EFF ERROR : 0.5089 COUNT DATE : 24-Sep-2016 13:18:18 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B180.CNF;879 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W180.CNF;230 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1422E+00 dpm RESULTS : 2.2170E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.20	5880.51	332.873	141.000	139.800	1.200	1.0954	100.000	1.30E+01	3.21E+00	6.53E-01	1.87E-01	2.18E+00
TH-228	5363.00	5404.13	67.197	10.000	9.379	0.240	0.4899	99.940	1.12E+00	8.10E-01	6.83E-01	1.62E-01	7.82E-01
TH-229	4900.00	4859.41	4.978	1.000	0.760	0.240	0.4899	99.469	6.79E-02	2.55E-01	4.28E-01	8.01E-02	2.55E-01
TH-230	4671.39	4670.48	39.820	3.000	2.520	0.480	0.6928	99.700	2.24E-01	3.59E-01	4.93E-01	1.13E-01	3.57E-01
TH-232	3972.00	3974.53	4.978	7.000	6.280	0.720	0.8485	100.000	5.58E-01	5.09E-01	5.43E-01	1.38E-01	4.99E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1566E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.381 +/-0.002)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

BATCH NUMBER : 1596395 SAMPLE ID : S0405235038_TH SAMPLE QTY : 0.115 G +/-0.870 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 81.5 +/-9.021 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 182 DETECTOR S/N : 74440 AVERAGE %EFFICIENCY : 22.5384 AVERAGE %EFF ERROR : 0.4383 COUNT DATE : 24-Sep-2016 13:18:20 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B182.CNF;320 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W182.CNF;95 CAL DATE : 13-Sep-2016
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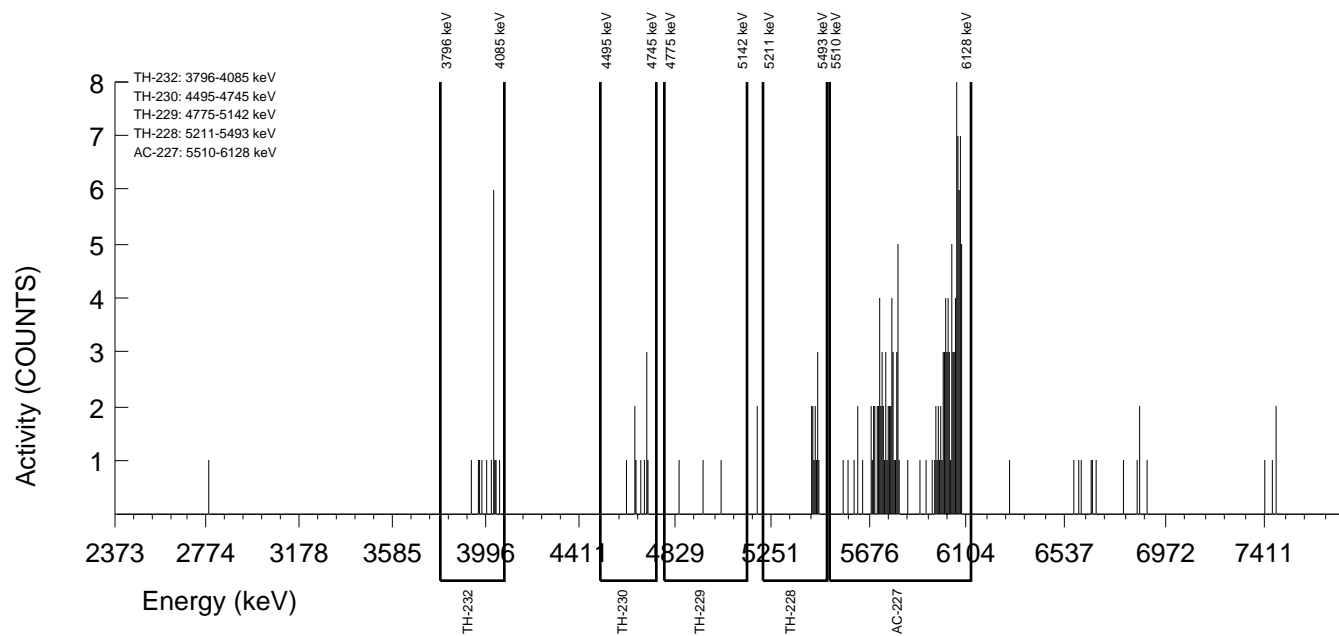
TRACER
 ID : 0387-B-402
 NUCLIDE : AC-227
 NOMINAL : 3.1422E+00 dpm
 RESULTS : 2.5615E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.20	5913.35	262.671	140.000	138.560	1.440	1.2000	100.000	1.29E+01	3.20E+00	6.89E-01	2.05E-01	2.17E+00
TH-228	5363.00	5441.12	29.906	12.000	10.902	0.720	0.8485	99.940	1.30E+00	8.88E-01	8.03E-01	2.22E-01	8.53E-01
TH-229	4900.00	4941.17	179.434	3.000	2.760	0.240	0.4899	99.469	2.46E-01	3.58E-01	4.28E-01	8.01E-02	3.55E-01
TH-230	4671.39	4676.07	54.827	10.000	10.000	0.000	0.0000	99.700	8.91E-01	6.03E-01	2.67E-01	0.00E+00	5.81E-01
TH-232	3972.00	4013.94	5.483	15.000	15.000	0.000	0.0000	100.000	1.33E+00	7.38E-01	2.66E-01	0.00E+00	6.98E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1567E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.378 +/-0.002)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

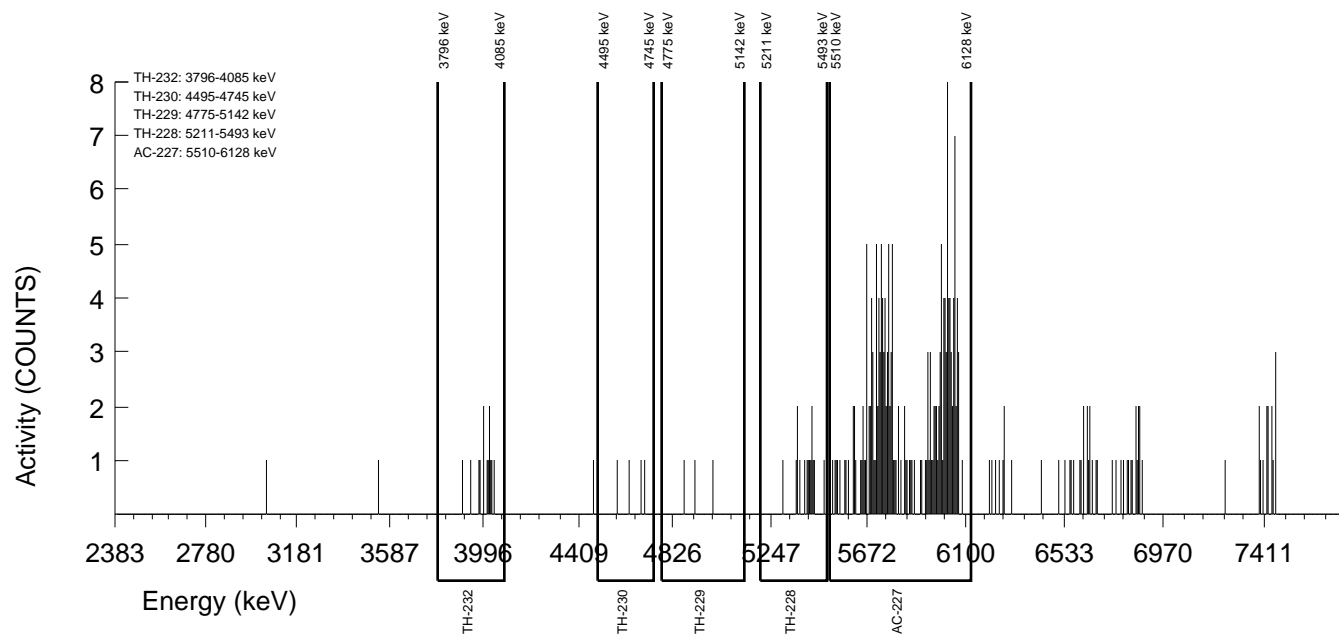
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TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2551E+00 dpm RESULTS : 2.9441E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5842.16	5852.22	359.847	186.000	184.560	1.440	1.2000	100.000	1.54E+01	3.33E+00	6.15E-01	1.83E-01	2.23E+00
TH-228	5363.00	5405.88	69.154	15.000	12.350	0.960	0.9798	99.940	1.13E+00	7.56E-01	7.89E-01	2.56E-01	7.27E-01
TH-229	4900.00	4930.54	123.489	3.000	1.800	1.200	1.0954	99.469	1.23E-01	2.80E-01	4.79E-01	1.37E-01	2.79E-01
TH-230	4671.39	4649.26	118.549	4.000	3.280	0.720	0.8485	99.700	2.23E-01	3.07E-01	4.16E-01	1.06E-01	3.05E-01
TH-232	3972.00	3996.80	32.107	13.000	13.000	0.000	0.0000	100.000	8.83E-01	5.19E-01	2.04E-01	0.00E+00	4.99E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 7.5021E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.690 +/-0.011)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

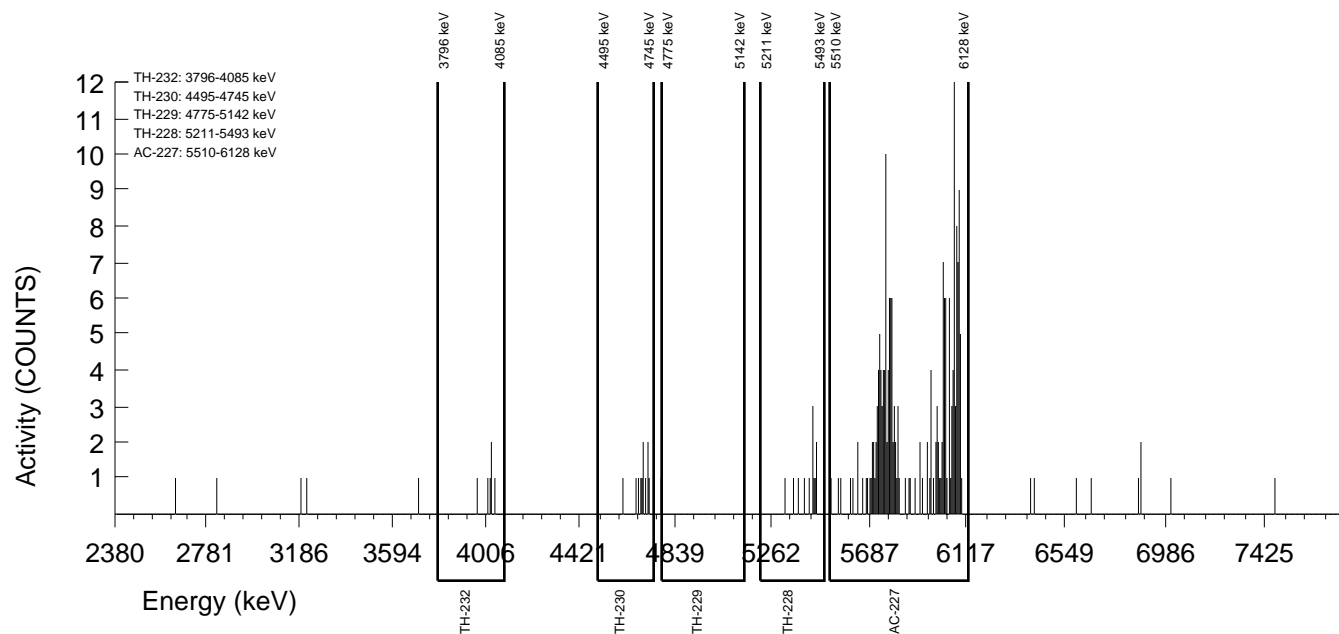
BATCH NUMBER : 1596395 SAMPLE ID : S0405235040_TH SAMPLE QTY : 0.101 G +/-0.990 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 101 +/-7.793 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 185 DETECTOR S/N : 68615 AVERAGE %EFFICIENCY : 25.3535 AVERAGE %EFF ERROR : 0.4915 COUNT DATE : 24-Sep-2016 13:18:25 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B185.CNF;859 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W185.CNF;237 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1422E+00 dpm RESULTS : 3.1823E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.20	5897.47	306.513	197.000	193.640	3.360	1.8330	100.000	1.47E+01	3.14E+00	7.37E-01	2.55E-01	2.10E+00
TH-228	5363.00	5424.50	18.715	13.000	11.752	0.720	0.8485	99.940	1.15E+00	7.46E-01	6.75E-01	1.91E-01	7.21E-01
TH-229	4900.00	4776.37	0.000	1.000	0.040	0.960	0.9798	99.469	2.91E-03	2.16E-01	4.79E-01	1.31E-01	2.16E-01
TH-230	4671.39	4690.56	29.944	11.000	9.320	1.680	1.2961	99.700	6.77E-01	5.14E-01	5.62E-01	1.72E-01	5.02E-01
TH-232	3972.00	4020.23	7.486	6.000	5.760	0.240	0.4899	100.000	4.17E-01	3.84E-01	3.47E-01	6.49E-02	3.78E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1568E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.528 +/-0.003)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

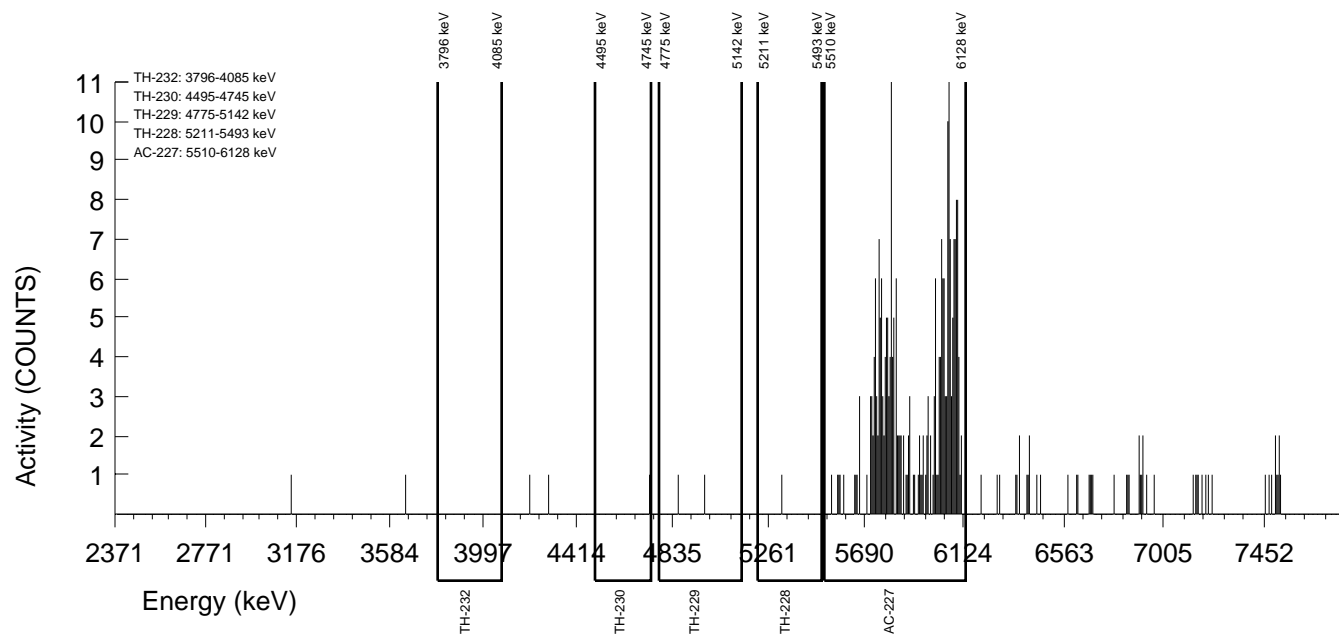
BATCH NUMBER : 1596395 SAMPLE ID : S1203621706_TH SAMPLE QTY : 0.122 G +/-0.820 % SAMPLE DATE : 21-Sep-2016 00:00:00 ANALYST : MXS2 % YIELD : 98.4 +/-7.238 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 034 DETECTOR S/N : 61586 AVERAGE %EFFICIENCY : 32.5970 AVERAGE %EFF ERROR : 0.6285 COUNT DATE : 24-Sep-2016 13:16:16 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B034.CNF;1838 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W034.CNF;481 CAL DATE : 29-Aug-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1422E+00 dpm RESULTS : 3.0918E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.21	5912.72	337.546	257.000	241.880	15.120	3.8884	100.000	1.22E+01	2.40E+00	8.67E-01	3.58E-01	1.59E+00
TH-228	5363.00	5319.56	4.973	1.000	-0.859	1.200	1.0954	99.940	-4.14E-02	1.45E-01	3.77E-01	1.16E-01	1.45E-01
TH-229	4900.00	4919.98	114.380	2.000	1.280	0.720	0.8485	99.469	6.17E-02	1.70E-01	2.95E-01	7.50E-02	1.70E-01
TH-230	4671.39	4734.79	4.973	1.000	-0.440	1.440	1.2000	99.700	-2.12E-02	1.46E-01	3.56E-01	1.06E-01	1.46E-01
TH-232	3972.00	3940.43	0.000	0.000	-0.240	0.240	0.4899	100.000	-1.15E-02	9.95E-02	2.30E-01	4.30E-02	9.93E-02

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1544E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.659 +/-0.004)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

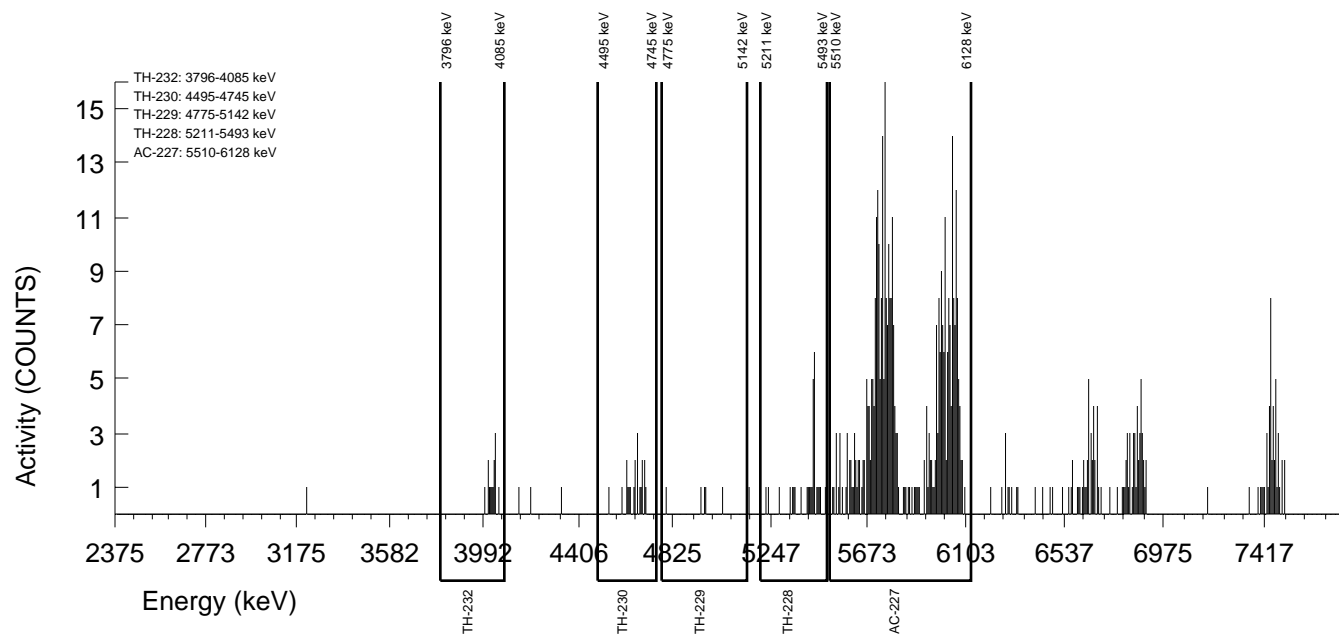
BATCH NUMBER : 1596395 SAMPLE ID : S1203621707_TH SAMPLE QTY : 0.103 G +/-0.971 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 92.2 +/-5.760 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 201 DETECTOR S/N : 78902 AVERAGE %EFFICIENCY : 26.2326 AVERAGE %EFF ERROR : 0.5081 COUNT DATE : 28-Sep-2016 17:56:47 ELAPSED LIVE TIME(SEC) : 30300.00	LIB FILE : AC BKG FILE : B201.CNF;801 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W201.CNF;224 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2557E+00 dpm RESULTS : 3.0004E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5841.76	5849.42	331.941	400.000	397.475	2.525	1.5890	100.000	1.75E+01	2.73E+00	4.15E-01	1.41E-01	1.73E+00
TH-228	5363.00	5408.31	9.909	29.000	22.791	2.525	1.5890	99.940	1.10E+00	5.51E-01	5.77E-01	2.16E-01	5.29E-01
TH-229	4900.00	4941.32	237.809	5.000	2.980	2.020	1.4213	99.469	1.07E-01	1.91E-01	3.15E-01	1.03E-01	1.90E-01
TH-230	4671.39	4653.90	78.031	20.000	18.990	1.010	1.0050	99.700	6.82E-01	3.39E-01	2.54E-01	7.29E-02	3.29E-01
TH-232	3972.00	4030.12	33.442	13.000	12.495	0.505	0.7106	100.000	4.48E-01	2.73E-01	2.10E-01	5.14E-02	2.67E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 7.5940E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (3.684 +/-0.024)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

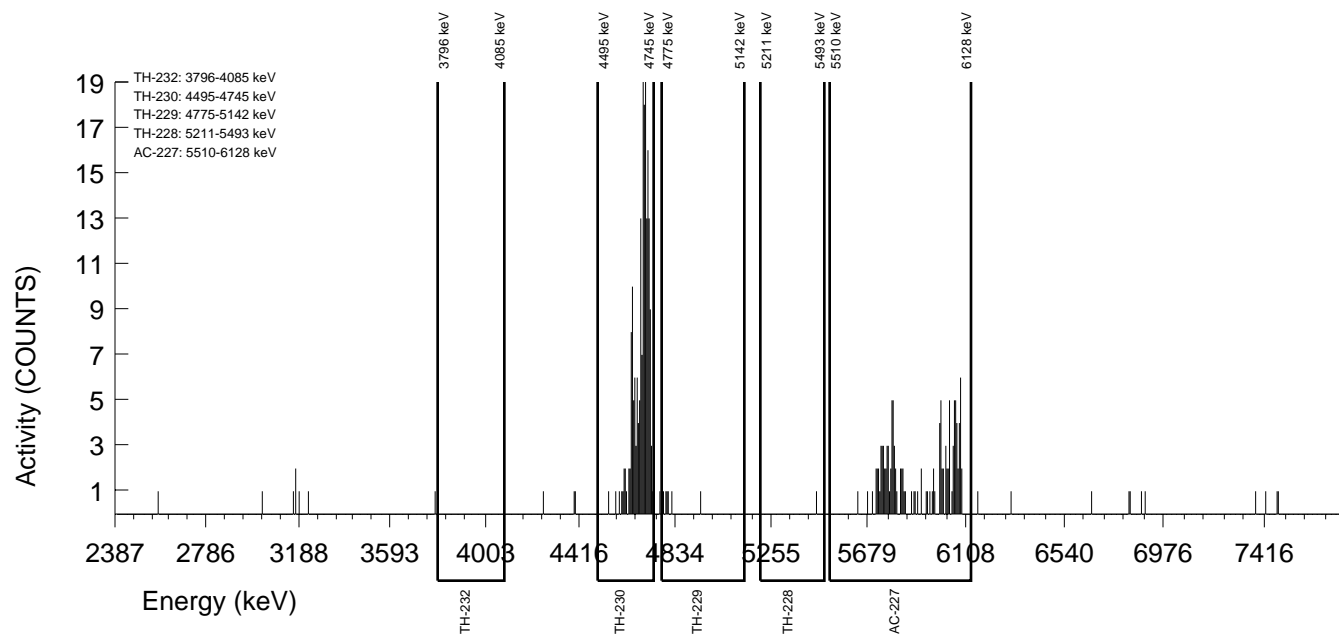
BATCH NUMBER : 1596395 SAMPLE ID : S1203621708_TH SAMPLE QTY : 0.122 G +/-0.820 % SAMPLE DATE : 21-Sep-2016 00:00:00 ANALYST : MXS2 % YIELD : 60.1 +/-10.374 % AC-227 SEP. : 23-Sep-2016 08:30:00	CHAMBER : 187 DETECTOR S/N : 68620 AVERAGE %EFFICIENCY : 25.2519 AVERAGE %EFF ERROR : 0.4896 COUNT DATE : 24-Sep-2016 13:18:31 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B187.CNF;854 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W187.CNF;238 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1423E+00 dpm RESULTS : 1.8896E+00 dpm	LCS ID : 1242-H NUCLIDE : TH-230 NOMINAL (pCi/G) : 1.7156E+01 % RECOVERY : 112.347	

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5869.20	5907.97	284.503	127.000	114.520	12.480	3.5327	100.000	1.22E+01	3.47E+00	1.69E+00	6.88E-01	2.38E+00
TH-228	5363.00	5455.82	4.955	1.000	0.208	0.480	0.6928	99.940	2.11E-02	2.95E-01	6.24E-01	1.59E-01	2.94E-01
TH-229	4900.00	4827.54	158.562	6.000	0.000	6.000	2.4495	99.469	0.00E+00	5.82E-01	1.22E+00	4.57E-01	5.82E-01
TH-230	4671.39	4690.45	74.945	194.000	189.680	4.320	2.0785	99.700	1.93E+01	4.88E+00	1.08E+00	3.87E-01	2.79E+00
TH-232	3972.00	3940.45	0.000	0.000	-0.480	0.480	0.6928	100.000	-4.86E-02	2.16E-01	5.61E-01	1.29E-01	2.15E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 2.1569E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.312 +/-0.002)



Batch# 1596388 Product: Th Date: 10/1/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		Case NA NA 10/1/16
Sample was run within hold time.		✓	DER# 1563610
Sample was correctly preserved if required.			NA
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER# 1563610
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER# 1563610
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: McLanahan 10/1/16

Secondary Review Performed By: Jessie Davis 10/02/16

10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 01-OCT-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Th-01-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596388	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, and 1203621689 were received and analyzed out of holding.</p>		<p>1. Reporting results.</p>	

Originator's Name:
Melanie Aycock 01-OCT-16

Data Validator/Group Leader:
Jessica Davis 02-OCT-16

Thorium (Ac-227 Tracer) Queue Sheet

07-SEP-16

Batch #: 1596388 Analyst: JXH2 First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16
 Tracer Isotope: Ac-227 Tracer Code: 0387-β-402 Expiration Date: 5-31-17 Vol: 0.106 Ac-227 Separation Date/Time: 9-27-16 1615
 LCS Isotope: Th-230 Th-232 LCS Code: 1242-H Expiration Date: 2-11-17 Vol: 0.106
 Spike Isotope: Th-230 Th-232 Spike Code: 1242-H Expiration Date: 2-11-17 Vol: 0.106
 Prep Date: 9-26-16 Initials: JXH Pipet ID: 184002 Z Balance ID: 1610766 Z Witness: KB 9-20-16

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/d)	Th Det #
405235001-1	4.1.B.R.1.2	SAMPLE	1 pCi/g	SOIL	MJWC001	10-DEC-15	1	1	0.103	177	
405235002-1	4.1.B.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	10-DEC-15	2	2	0.106	41	
405235003-1	4.1.B.R.1.4	SAMPLE	1 pCi/g	SOIL	MJWC001	10-DEC-15	3	3	0.103	42	
405235004-1	4.1.B.R.7.2	SAMPLE	1 pCi/g	SOIL	MJWC001	09-DEC-15	4	4	0.101	166	
405235005-1	4.1.C.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	10-DEC-15	5	5	0.106	167	
405235006-1	4.1.C.R.1.4	SAMPLE	1 pCi/g	SOIL	MJWC001	10-DEC-15	6	6	0.104	169	
405235007-1	4.1.C.R.2.3	SAMPLE	1 pCi/g	SOIL	MJWC001	10-DEC-15	7	7	0.100	170	
405235008-1	4.1.C.R.2.4	SAMPLE	1 pCi/g	SOIL	MJWC001	10-DEC-15	8	8	0.101	175	
405235009-1	4.1.D.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	10-DEC-15	9	9	0.102	176	
405235010-1	4.1.D.R.1.4	SAMPLE	1 pCi/g	SOIL	MJWC001	10-DEC-15	10	10	0.102	178*	
405235011-1	4.1.D.R.3.2	SAMPLE	1 pCi/g	SOIL	MJWC001	09-DEC-15	11	11	0.106	179	
405235012-1	4.1.D.R.2.4	SAMPLE	1 pCi/g	SOIL	MJWC001	10-DEC-15	12	12	0.104	180*	
405235013-1	4.2.A.R.2.3	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	13	13	0.105	181	
405235014-1	4.2.A.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	14	14	0.105	184	
405235015-1	4.2.A.R.1.4	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	15	15	0.104	185	
405235016-1	4.2.A.R.2.4	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	16	16	0.107	186	
405235017-1	4.2.A.R.3.2	SAMPLE	1 pCi/g	SOIL	MJWC001	02-DEC-15	17	17	0.105	187	
405235018-1	4.2.A.R.4.2	SAMPLE	1 pCi/g	SOIL	MJWC001	02-DEC-15	18	18	0.105	188	
405235019-1	4.2.B.R.2.4	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	19	19	0.104	189	
405235020-1	4.2.B.R.1.4	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	20	20	0.106	195	
1203621688-1	MB for batch 1596388	MB	1 pCi/g	SOIL	QC ACCOUNT		21	21	0.109	38	
1203621689-1	4.1.B.R.1.2(405235001DUP)	DUP	1 pCi/g	SOIL	QC ACCOUNT	10-DEC-15	22	22	0.101	197	
1203621690-1	LCS for batch 1596388	LCS	1 pCi/g	SOIL	QC ACCOUNT		23	23	0.109	199	

Choose SOP Used: GL-RAD-A-038 Solid Sample Dissolution by: LEACH or DIGESTION Data Reviewed By: M. Anderson 10/4/16

GL-RAD-A-032 10/4/16

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

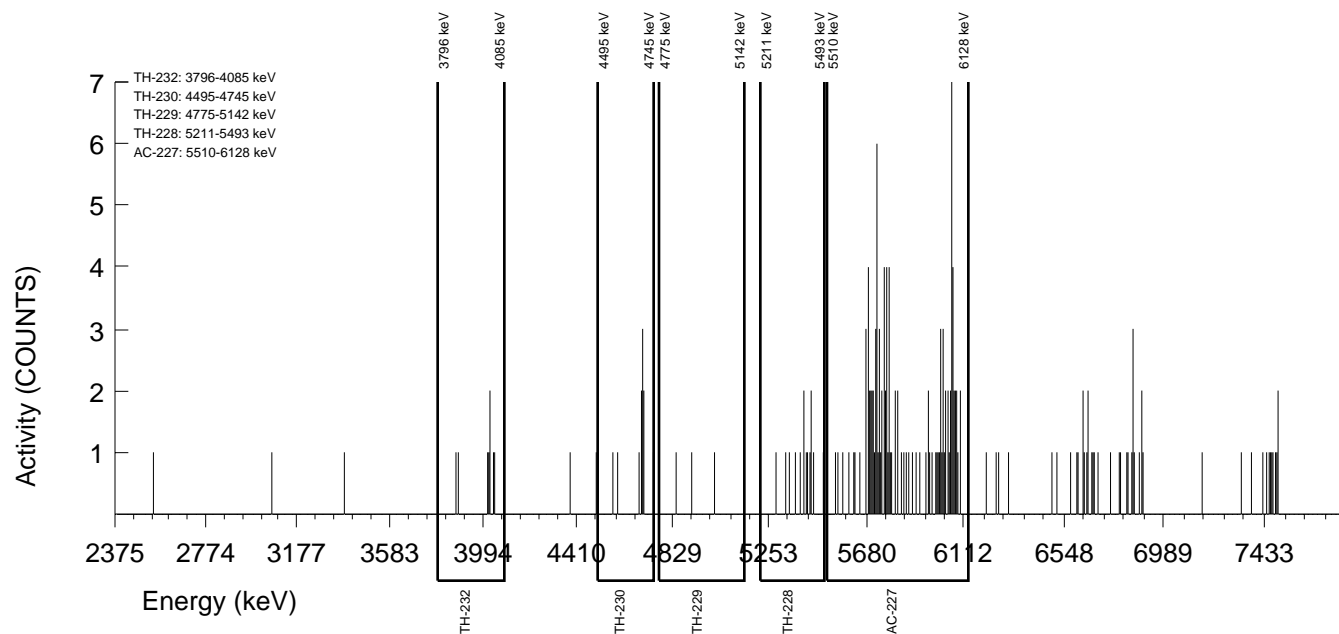
BATCH NUMBER : 1596388 SAMPLE ID : S0405235001_TH SAMPLE QTY : 0.108 G +/-0.926 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 92.3 +/-10.004 % AC-227 SEP. : 27-Sep-2016 16:15:00	CHAMBER : 177 DETECTOR S/N : 74435 AVERAGE %EFFICIENCY : 26.5935 AVERAGE %EFF ERROR : 0.5150 COUNT DATE : 01-Oct-2016 12:54:07 ELAPSED LIVE TIME(SEC) : 8333.38	LIB FILE : AC BKG FILE : B177.CNF;879 BKG DATE : 30-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W177.CNF;243 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2316E+00 dpm RESULTS : 2.9827E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5850.01	5857.42	343.769	111.000	110.167	0.833	0.9129	100.000	1.56E+01	4.29E+00	8.78E-01	2.27E-01	2.94E+00
TH-228	5363.00	5401.87	34.687	14.000	12.940	0.278	0.5270	99.940	2.13E+00	1.33E+00	1.06E+00	2.83E-01	1.25E+00
TH-229	4900.00	4924.02	163.522	3.000	2.444	0.556	0.7454	99.469	3.01E-01	4.92E-01	6.91E-01	1.61E-01	4.88E-01
TH-230	4671.39	4663.01	12.388	12.000	11.861	0.139	0.3727	99.700	1.46E+00	9.16E-01	5.29E-01	8.03E-02	8.68E-01
TH-232	3972.00	3991.89	7.433	8.000	7.861	0.139	0.3727	100.000	9.62E-01	7.46E-01	5.27E-01	8.00E-02	7.21E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 5.7763E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.783 +/-0.005)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

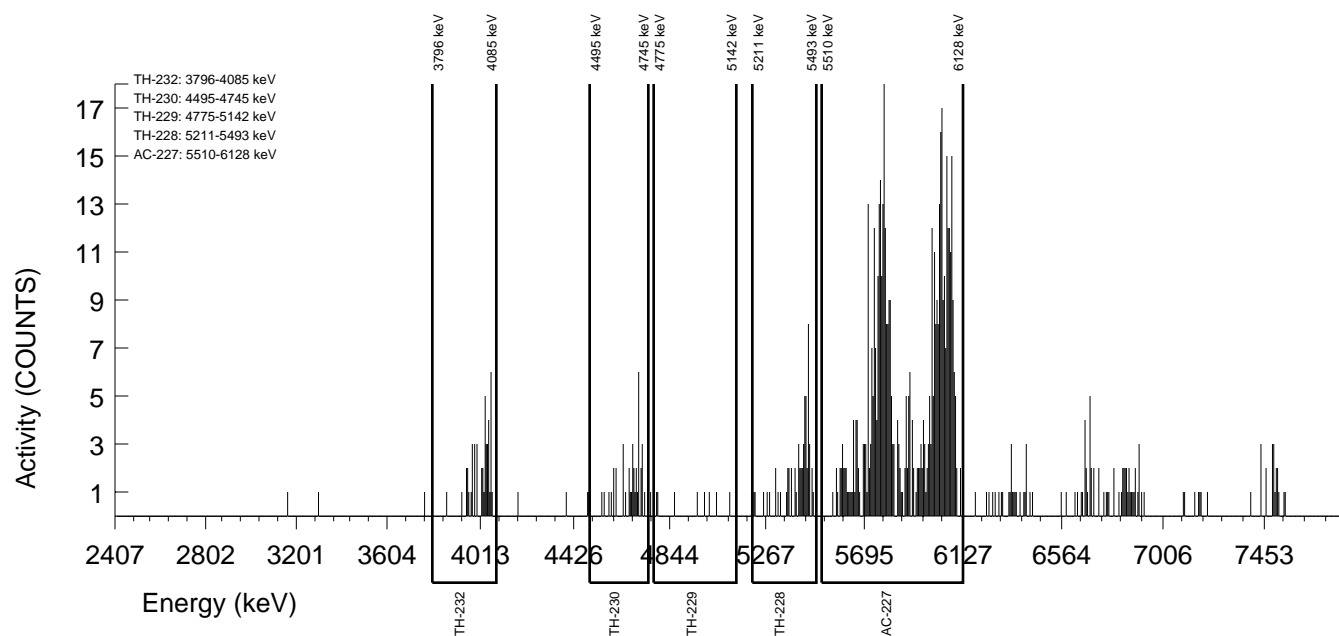
BATCH NUMBER : 1596388 SAMPLE ID : S0405235002_TH SAMPLE QTY : 0.106 G +/-0.943 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 90.7 +/-5.490 % AC-227 SEP. : 27-Sep-2016 16:15:00	CHAMBER : 041 DETECTOR S/N : 78205 AVERAGE %EFFICIENCY : 34.0563 AVERAGE %EFF ERROR : 0.6560 COUNT DATE : 28-Sep-2016 14:05:07 ELAPSED LIVE TIME(SEC) : 30300.00	LIB FILE : AC BKG FILE : B041.CNF;1825 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W041.CNF;531 CAL DATE : 28-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1311E+00 dpm RESULTS : 2.8415E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5871.08	5894.24	339.495	520.000	488.690	31.310	5.5955	100.000	1.39E+01	2.05E+00	7.25E-01	3.20E-01	1.29E+00
TH-228	5363.00	5404.46	21.055	57.000	51.819	4.040	2.0100	99.940	1.89E+00	5.98E-01	4.32E-01	1.61E-01	5.55E-01
TH-229	4900.00	4947.48	303.587	8.000	6.485	1.515	1.2309	99.469	1.78E-01	1.71E-01	2.18E-01	6.80E-02	1.70E-01
TH-230	4671.39	4668.19	5.386	37.000	35.485	1.515	1.2309	99.700	9.69E-01	3.53E-01	2.18E-01	6.78E-02	3.34E-01
TH-232	3972.00	4013.75	29.869	45.000	45.000	0.000	0.0000	100.000	1.23E+00	3.90E-01	8.17E-02	0.00E+00	3.63E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8403E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.141 +/-0.007)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

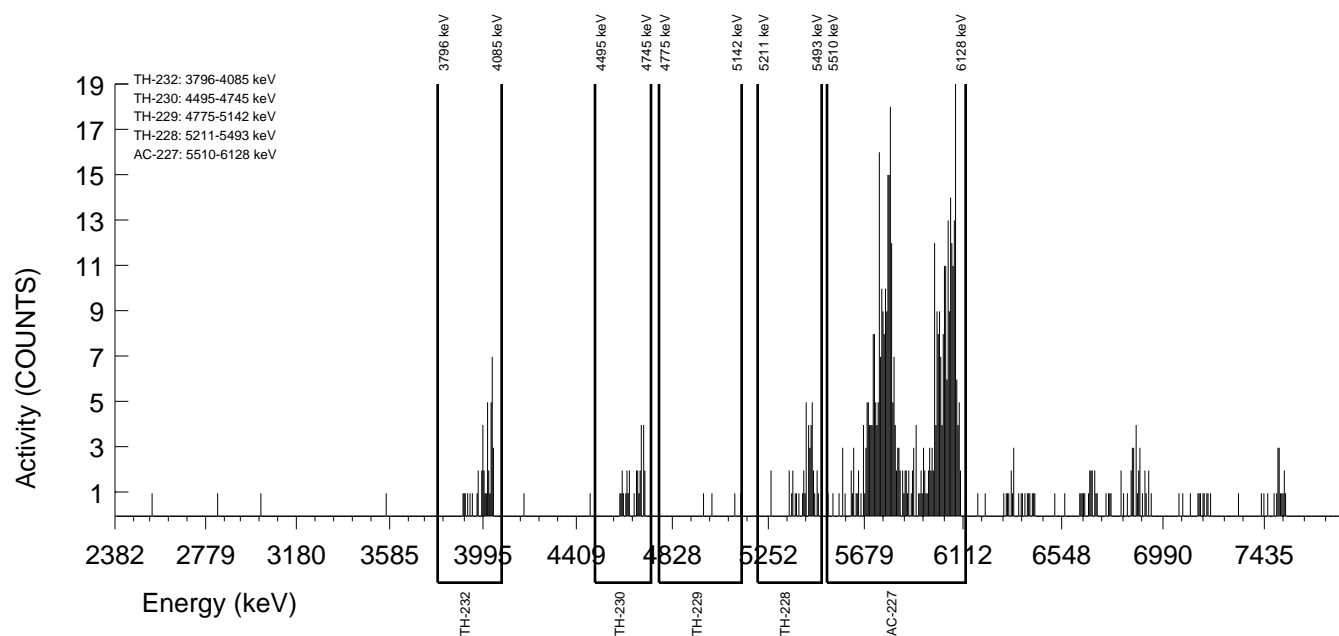
BATCH NUMBER : 1596388 SAMPLE ID : S0405235003_TH SAMPLE QTY : 0.103 G +/-0.971 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 84.8 +/-5.661 % AC-227 SEP. : 27-Sep-2016 16:15:00	CHAMBER : 042 DETECTOR S/N : 78793 AVERAGE %EFFICIENCY : 33.4532 AVERAGE %EFF ERROR : 0.6446 COUNT DATE : 28-Sep-2016 14:05:07 ELAPSED LIVE TIME(SEC) : 30300.00	LIB FILE : AC BKG FILE : B042.CNF;1823 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W042.CNF;492 CAL DATE : 28-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1311E+00 dpm RESULTS : 2.6562E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5871.08	5886.73	312.011	476.000	448.730	27.270	5.2221	100.000	1.43E+01	2.18E+00	7.65E-01	3.35E-01	1.38E+00
TH-228	5363.00	5416.11	31.823	41.000	36.922	3.030	1.7407	99.940	1.51E+00	5.61E-01	4.41E-01	1.59E-01	5.30E-01
TH-229	4900.00	5055.16	157.676	4.000	2.485	1.515	1.2309	99.469	7.62E-02	1.48E-01	2.44E-01	7.62E-02	1.48E-01
TH-230	4671.39	4667.87	19.710	29.000	23.950	5.050	2.2472	99.700	7.33E-01	3.54E-01	3.69E-01	1.39E-01	3.44E-01
TH-232	3972.00	4008.06	44.962	42.000	40.990	1.010	1.0050	100.000	1.25E+00	4.23E-01	2.15E-01	6.19E-02	3.96E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8403E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.048 +/-0.007)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

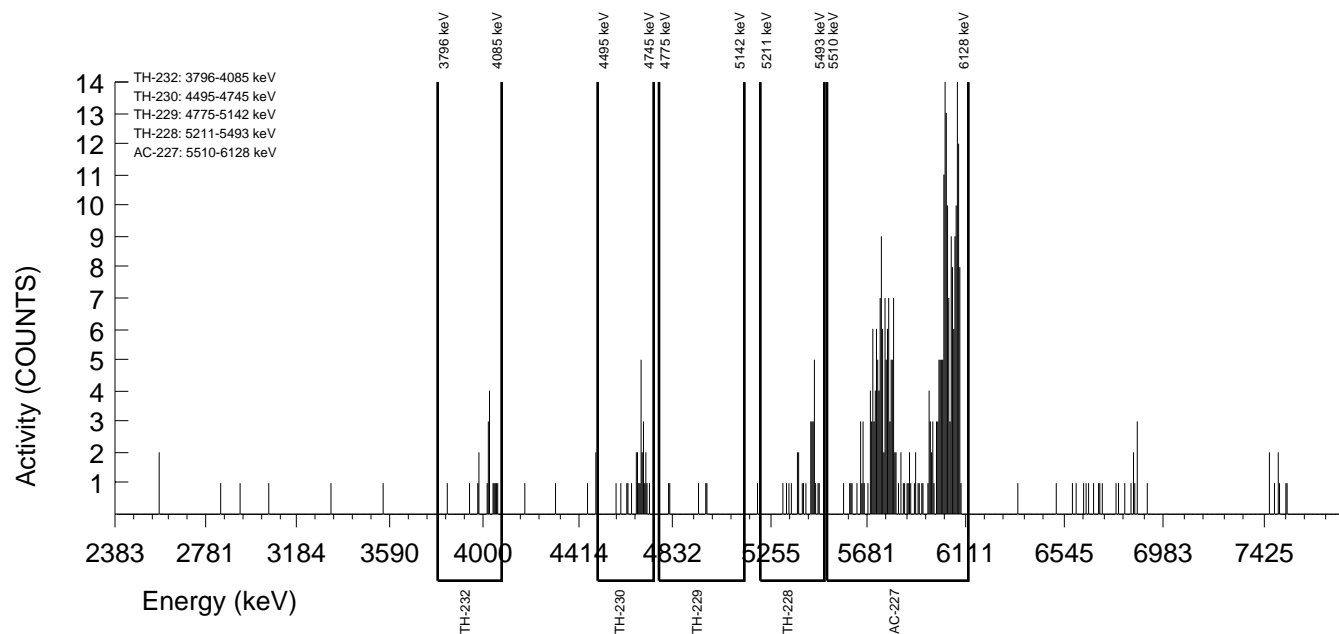
BATCH NUMBER : 1596388 SAMPLE ID : S0405235004_TH SAMPLE QTY : 0.101 G +/-0.990 % SAMPLE DATE : 09-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 73.8 +/-6.350 % AC-227 SEP. : 27-Sep-2016 16:15:00	CHAMBER : 166 DETECTOR S/N : 74545 AVERAGE %EFFICIENCY : 26.6822 AVERAGE %EFF ERROR : 0.5167 COUNT DATE : 28-Sep-2016 14:06:35 ELAPSED LIVE TIME(SEC) : 30300.00	LIB FILE : AC BKG FILE : B166.CNF;891 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W166.CNF;299 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1312E+00 dpm RESULTS : 2.3116E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5871.07	5913.54	322.649	314.000	311.475	2.525	1.5890	100.000	1.45E+01	2.51E+00	4.39E-01	1.50E-01	1.63E+00
TH-228	5363.00	5417.20	18.780	28.000	23.737	3.535	1.8802	99.940	1.43E+00	6.84E-01	6.67E-01	2.43E-01	6.56E-01
TH-229	4900.00	4905.03	163.447	5.000	4.495	0.505	0.7106	99.469	2.03E-01	2.27E-01	2.65E-01	6.46E-02	2.25E-01
TH-230	4671.39	4679.84	14.240	26.000	25.495	0.505	0.7106	99.700	1.15E+00	4.86E-01	2.64E-01	6.45E-02	4.62E-01
TH-232	3972.00	4008.43	9.906	18.000	17.495	0.505	0.7106	100.000	7.84E-01	4.02E-01	2.63E-01	6.43E-02	3.88E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8420E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.728 +/-0.005)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

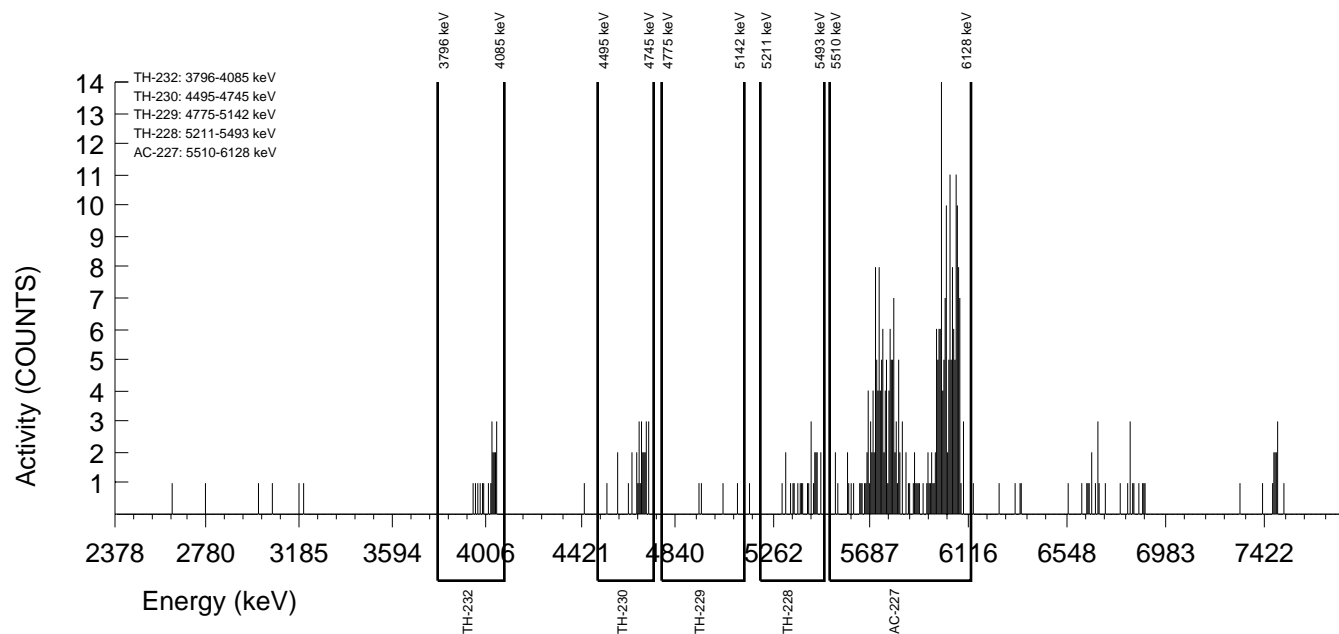
BATCH NUMBER : 1596388 SAMPLE ID : S0405235005_TH SAMPLE QTY : 0.106 G +/-0.943 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 75.5 +/-6.598 % AC-227 SEP. : 27-Sep-2016 16:15:00	CHAMBER : 167 DETECTOR S/N : 72546 AVERAGE %EFFICIENCY : 24.1606 AVERAGE %EFF ERROR : 0.4690 COUNT DATE : 28-Sep-2016 14:06:38 ELAPSED LIVE TIME(SEC) : 30300.00	LIB FILE : AC BKG FILE : B167.CNF;886 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W167.CNF;246 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1312E+00 dpm RESULTS : 2.3641E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5871.07	5898.71	345.926	294.000	288.445	5.555	2.3569	100.000	1.39E+01	2.49E+00	6.01E-01	2.28E-01	1.63E+00
TH-228	5363.00	5406.99	147.540	24.000	23.326	0.000	0.0000	99.940	1.44E+00	6.41E-01	3.52E-01	8.35E-02	6.09E-01
TH-229	4900.00	5010.58	165.044	4.000	3.495	0.505	0.7106	99.469	1.62E-01	2.15E-01	2.72E-01	6.65E-02	2.13E-01
TH-230	4671.39	4676.17	133.786	29.000	25.970	3.030	1.7407	99.700	1.20E+00	5.37E-01	4.64E-01	1.63E-01	5.11E-01
TH-232	3972.00	4019.25	26.257	20.000	18.485	1.515	1.2309	100.000	8.53E-01	4.40E-01	3.68E-01	1.15E-01	4.24E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8420E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.674 +/-0.004)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

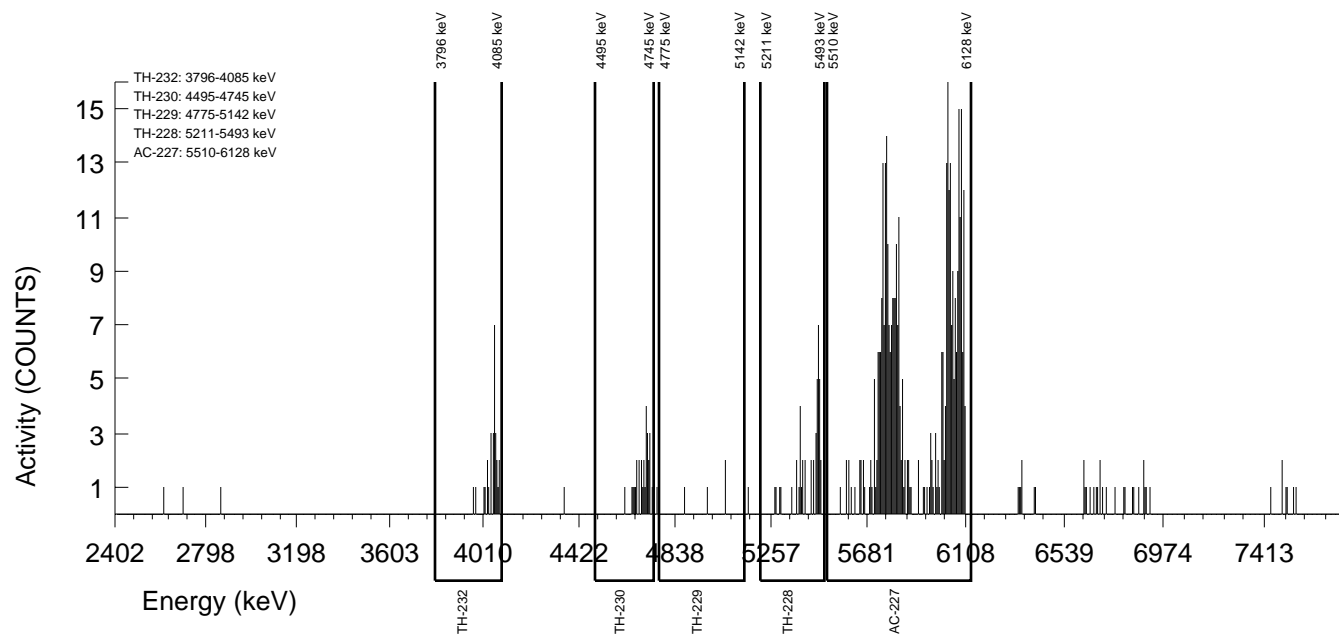
BATCH NUMBER : 1596388 SAMPLE ID : S0405235006_TH SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 95.6 +/-5.766 % AC-227 SEP. : 27-Sep-2016 16:15:00	CHAMBER : 169 DETECTOR S/N : 72548 AVERAGE %EFFICIENCY : 26.2282 AVERAGE %EFF ERROR : 0.5082 COUNT DATE : 28-Sep-2016 14:06:41 ELAPSED LIVE TIME(SEC) : 30300.00	LIB FILE : AC BKG FILE : B169.CNF;876 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W169.CNF;259 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1312E+00 dpm RESULTS : 2.9933E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5871.07	5907.41	332.721	399.000	396.475	2.525	1.5890	100.000	1.41E+01	2.20E+00	3.35E-01	1.14E-01	1.40E+00
TH-228	5363.00	5425.24	82.153	43.000	41.568	0.505	0.7106	99.940	1.90E+00	6.44E-01	3.33E-01	9.79E-02	5.99E-01
TH-229	4900.00	4998.63	4.929	4.000	1.980	2.020	1.4213	99.469	6.81E-02	1.69E-01	3.00E-01	9.86E-02	1.69E-01
TH-230	4671.39	4702.53	19.717	28.000	26.485	1.515	1.2309	99.700	9.09E-01	3.84E-01	2.73E-01	8.52E-02	3.68E-01
TH-232	3972.00	4045.22	8.626	28.000	27.495	0.505	0.7106	100.000	9.41E-01	3.81E-01	2.01E-01	4.91E-02	3.64E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8421E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.927 +/-0.006)



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ALPHA SPECTROSCOPY REPORT

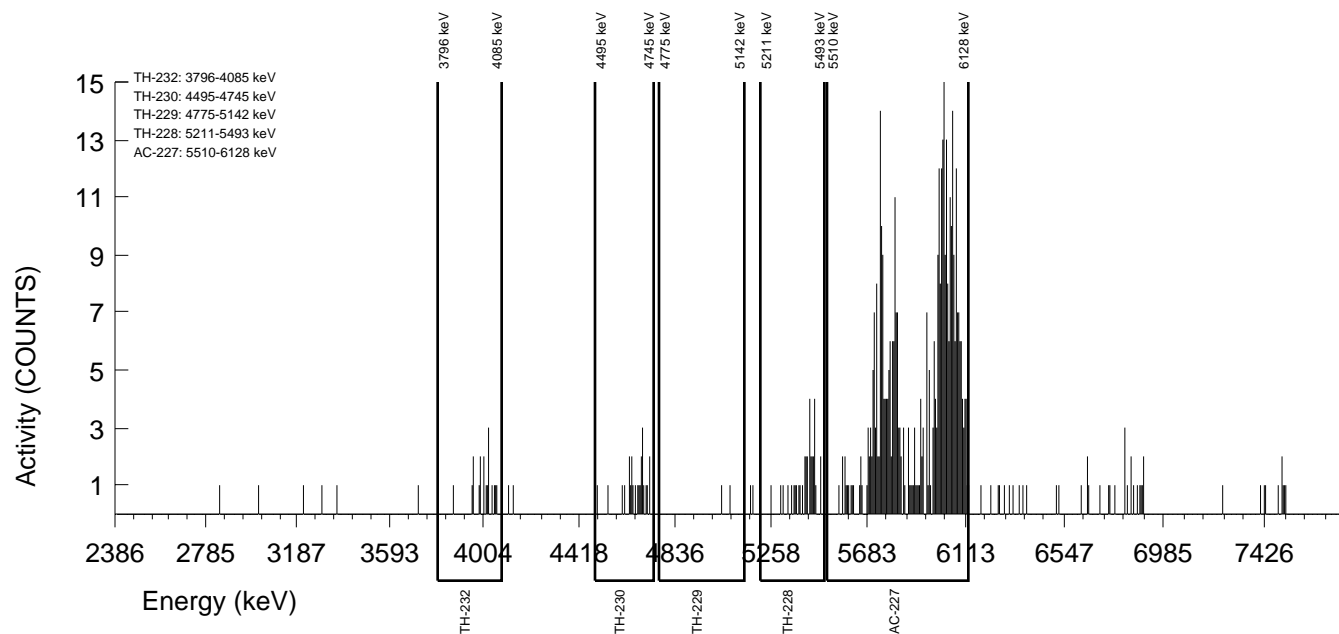
BATCH NUMBER : 1596388 SAMPLE ID : S0405235007_TH SAMPLE QTY : 0.100 G +/-1.000 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 103 +/-5.661 % AC-227 SEP. : 27-Sep-2016 16:15:00	CHAMBER : 170 DETECTOR S/N : 72549 AVERAGE %EFFICIENCY : 25.7306 AVERAGE %EFF ERROR : 0.4988 COUNT DATE : 28-Sep-2016 14:06:43 ELAPSED LIVE TIME(SEC) : 30300.00	LIB FILE : AC BKG FILE : B170.CNF;876 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W170.CNF;241 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1312E+00 dpm RESULTS : 3.2395E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5871.07	5919.97	327.042	427.000	420.940	6.060	2.4617	100.000	1.47E+01	2.25E+00	4.51E-01	1.73E-01	1.42E+00
TH-228	5363.00	5411.40	25.602	34.000	26.451	6.565	2.5622	99.940	1.19E+00	5.66E-01	6.21E-01	2.43E-01	5.46E-01
TH-229	4900.00	5064.64	39.641	2.000	0.485	1.515	1.2309	99.469	1.63E-02	1.32E-01	2.68E-01	8.37E-02	1.32E-01
TH-230	4671.39	4665.84	86.716	24.000	23.495	0.505	0.7106	99.700	7.90E-01	3.46E-01	1.97E-01	4.82E-02	3.33E-01
TH-232	3972.00	4000.72	69.373	18.000	16.990	1.010	1.0050	100.000	5.69E-01	3.00E-01	2.36E-01	6.80E-02	2.92E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8421E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.984 +/-0.006)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

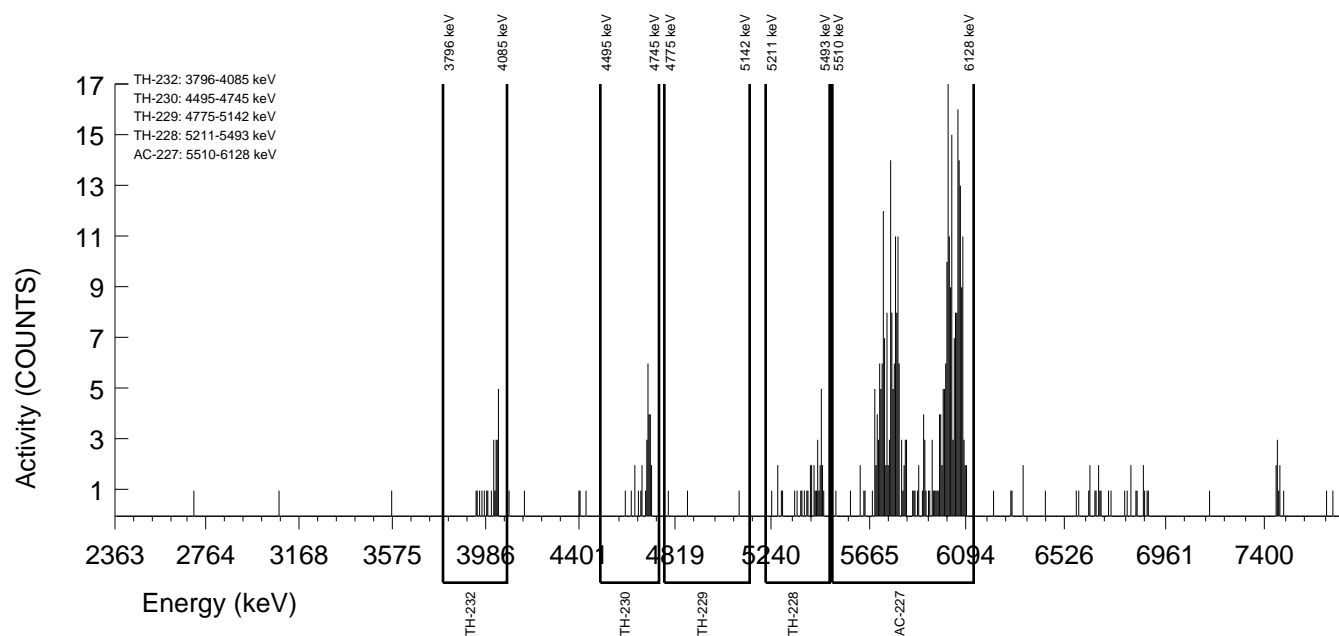
BATCH NUMBER : 1596388 SAMPLE ID : S0405235008_TH SAMPLE QTY : 0.101 G +/-0.990 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 86.4 +/-6.000 % AC-227 SEP. : 27-Sep-2016 16:15:00	CHAMBER : 175 DETECTOR S/N : 74433 AVERAGE %EFFICIENCY : 26.2713 AVERAGE %EFF ERROR : 0.5089 COUNT DATE : 28-Sep-2016 14:06:45 ELAPSED LIVE TIME(SEC) : 30300.00	LIB FILE : AC BKG FILE : B175.CNF;870 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W175.CNF;241 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1312E+00 dpm RESULTS : 2.7057E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5871.07	5907.95	328.324	362.000	358.970	3.030	1.7407	100.000	1.45E+01	2.37E+00	4.06E-01	1.42E-01	1.52E+00
TH-228	5363.00	5402.25	20.345	34.000	33.161	0.000	0.0000	99.940	1.73E+00	6.46E-01	3.13E-01	7.85E-02	6.06E-01
TH-229	4900.00	4918.44	298.948	3.000	1.990	1.010	1.0050	99.469	7.78E-02	1.68E-01	2.76E-01	7.93E-02	1.67E-01
TH-230	4671.39	4685.78	17.439	28.000	27.495	0.505	0.7106	99.700	1.07E+00	4.37E-01	2.29E-01	5.60E-02	4.15E-01
TH-232	3972.00	4014.23	23.252	23.000	23.000	0.000	0.0000	100.000	8.95E-01	3.92E-01	1.17E-01	0.00E+00	3.76E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8422E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.839 +/-0.005)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

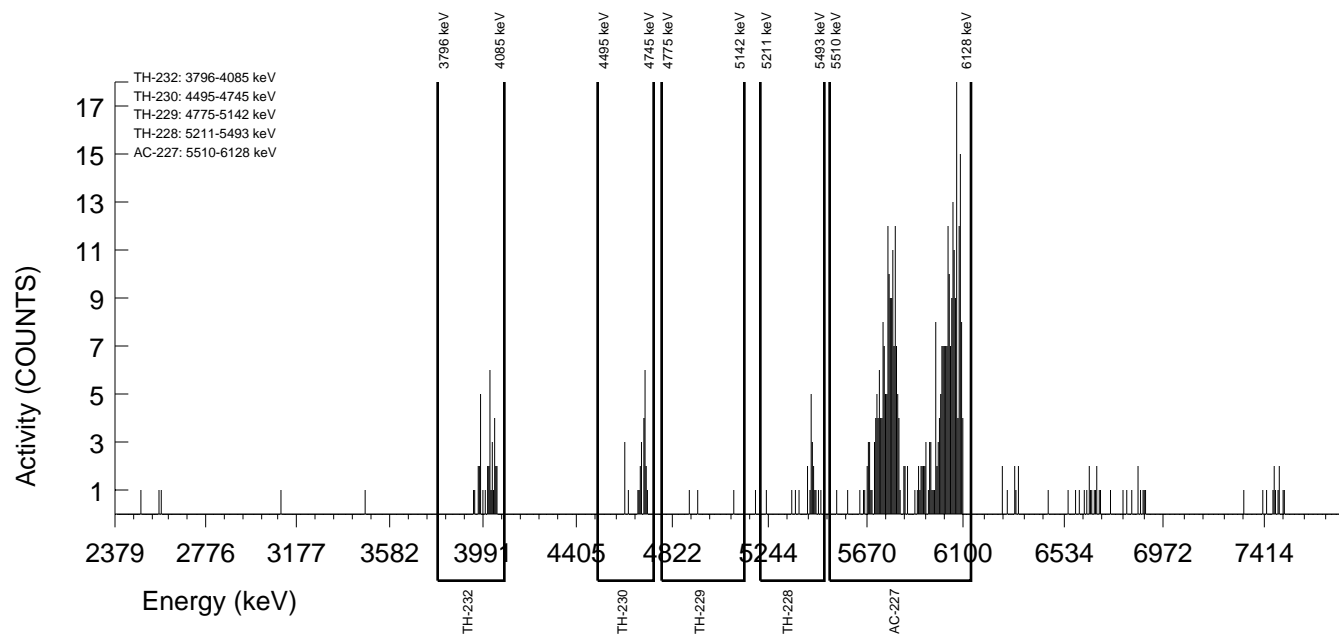
BATCH NUMBER : 1596388 SAMPLE ID : S0405235009_TH SAMPLE QTY : 0.102 G +/-0.980 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 92.1 +/-5.905 % AC-227 SEP. : 27-Sep-2016 16:15:00	CHAMBER : 176 DETECTOR S/N : 74434 AVERAGE %EFFICIENCY : 25.6995 AVERAGE %EFF ERROR : 0.4981 COUNT DATE : 28-Sep-2016 14:06:48 ELAPSED LIVE TIME(SEC) : 30300.00	LIB FILE : AC BKG FILE : B176.CNF;865 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W176.CNF;237 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1312E+00 dpm RESULTS : 2.8853E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5871.06	5913.30	297.495	378.000	374.465	3.535	1.8802	100.000	1.44E+01	2.31E+00	4.07E-01	1.46E-01	1.47E+00
TH-228	5363.00	5415.73	10.486	21.000	19.619	0.505	0.7106	99.940	9.70E-01	4.77E-01	3.56E-01	1.04E-01	4.60E-01
TH-229	4900.00	4972.81	187.521	3.000	1.485	1.515	1.2309	99.469	5.51E-02	1.63E-01	2.96E-01	9.22E-02	1.63E-01
TH-230	4671.39	4681.45	9.870	24.000	20.465	3.535	1.8802	99.700	7.58E-01	3.89E-01	3.92E-01	1.41E-01	3.77E-01
TH-232	3972.00	4011.64	64.974	36.000	34.990	1.010	1.0050	100.000	1.29E+00	4.72E-01	2.61E-01	7.49E-02	4.45E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8422E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.876 +/-0.006)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

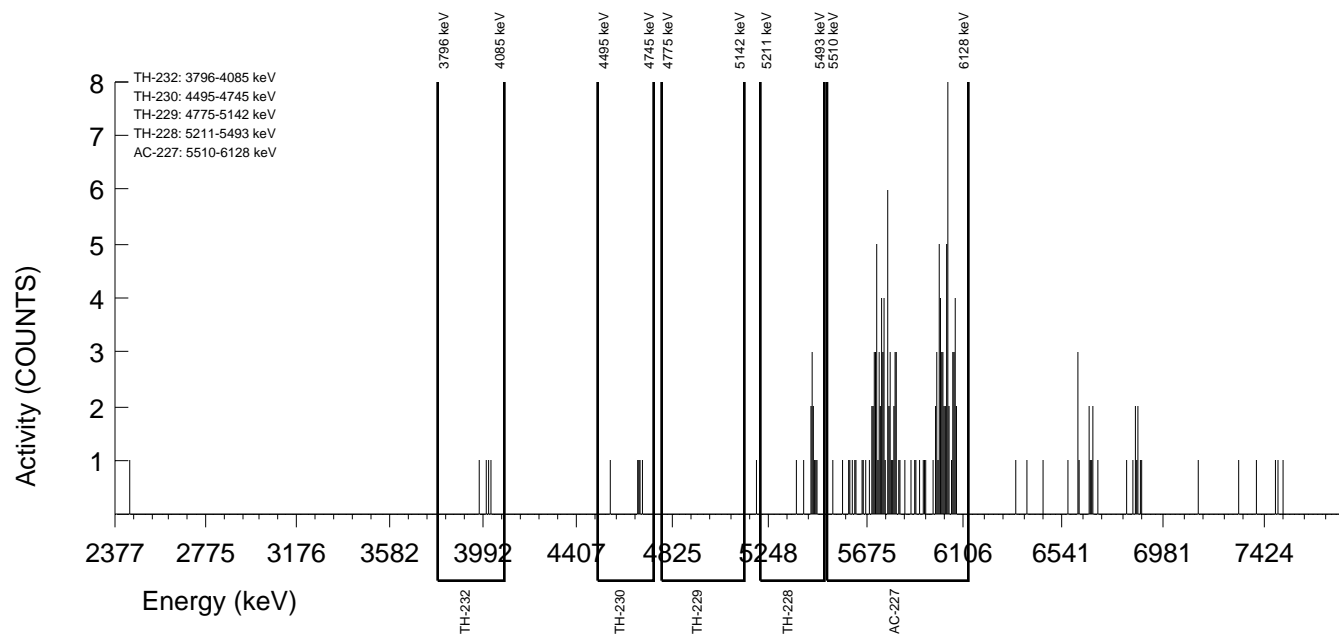
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TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2316E+00 dpm RESULTS : 3.5405E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5850.01	5868.28	292.338	130.000	128.215	1.785	1.3360	100.000	1.65E+01	4.24E+00	9.89E-01	3.02E-01	2.89E+00
TH-228	5363.00	5434.46	13.588	12.000	10.540	0.549	0.7411	99.940	1.58E+00	1.11E+00	1.06E+00	3.05E-01	1.06E+00
TH-229	4900.00	4958.09	0.000	0.000	-0.275	0.275	0.5240	99.469	-3.07E-02	2.26E-01	5.41E-01	1.03E-01	2.25E-01
TH-230	4671.39	4630.17	187.755	6.000	5.863	0.137	0.3705	99.700	6.55E-01	5.93E-01	4.80E-01	7.26E-02	5.80E-01
TH-232	3972.00	4007.84	54.350	4.000	3.863	0.137	0.3705	100.000	4.30E-01	4.96E-01	4.79E-01	7.24E-02	4.90E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 5.7757E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.911 +/-0.006)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

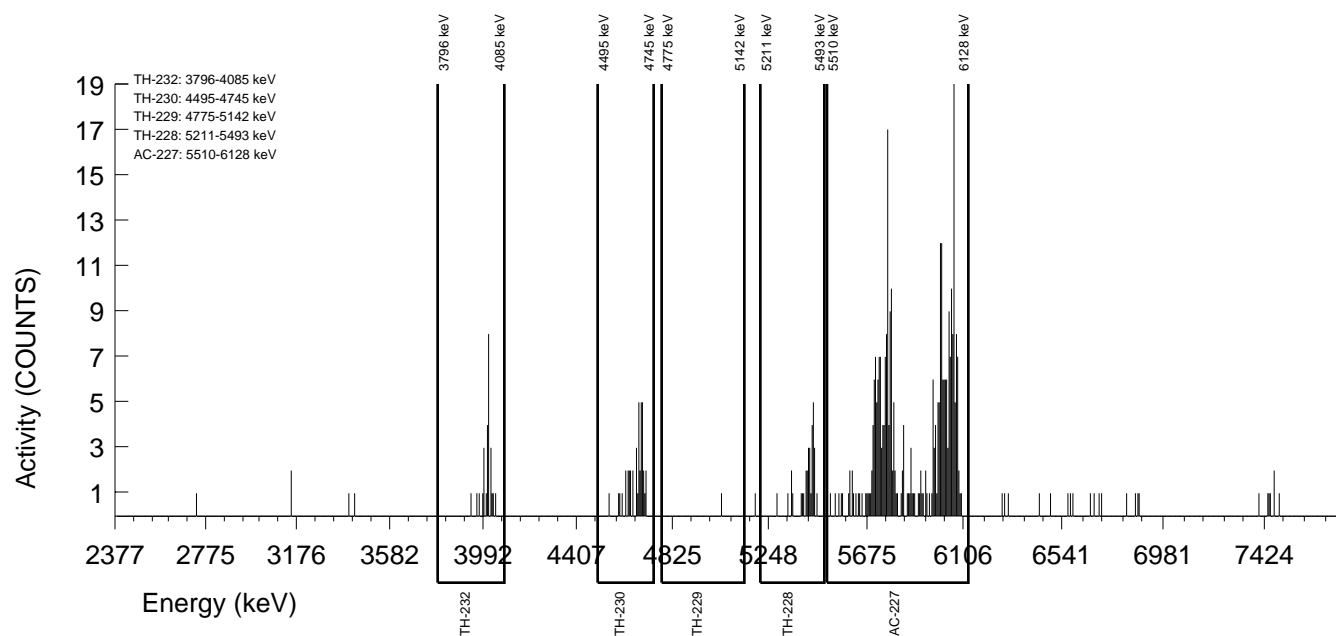
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TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1312E+00 dpm RESULTS : 2.3798E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5871.06	5890.11	274.280	320.000	316.970	3.030	1.7407	100.000	1.39E+01	2.38E+00	4.38E-01	1.54E-01	1.54E+00
TH-228	5363.00	5418.02	27.999	33.000	30.744	1.515	1.2309	99.940	1.73E+00	6.93E-01	4.91E-01	1.61E-01	6.53E-01
TH-229	4900.00	5041.20	4.941	1.000	0.495	0.505	0.7106	99.469	2.09E-02	1.31E-01	2.48E-01	6.05E-02	1.31E-01
TH-230	4671.39	4664.15	29.646	40.000	39.495	0.505	0.7106	99.700	1.66E+00	5.74E-01	2.47E-01	6.04E-02	5.32E-01
TH-232	3972.00	4010.82	7.411	26.000	25.495	0.505	0.7106	100.000	1.07E+00	4.54E-01	2.46E-01	6.02E-02	4.32E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8423E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.741 +/-0.005)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

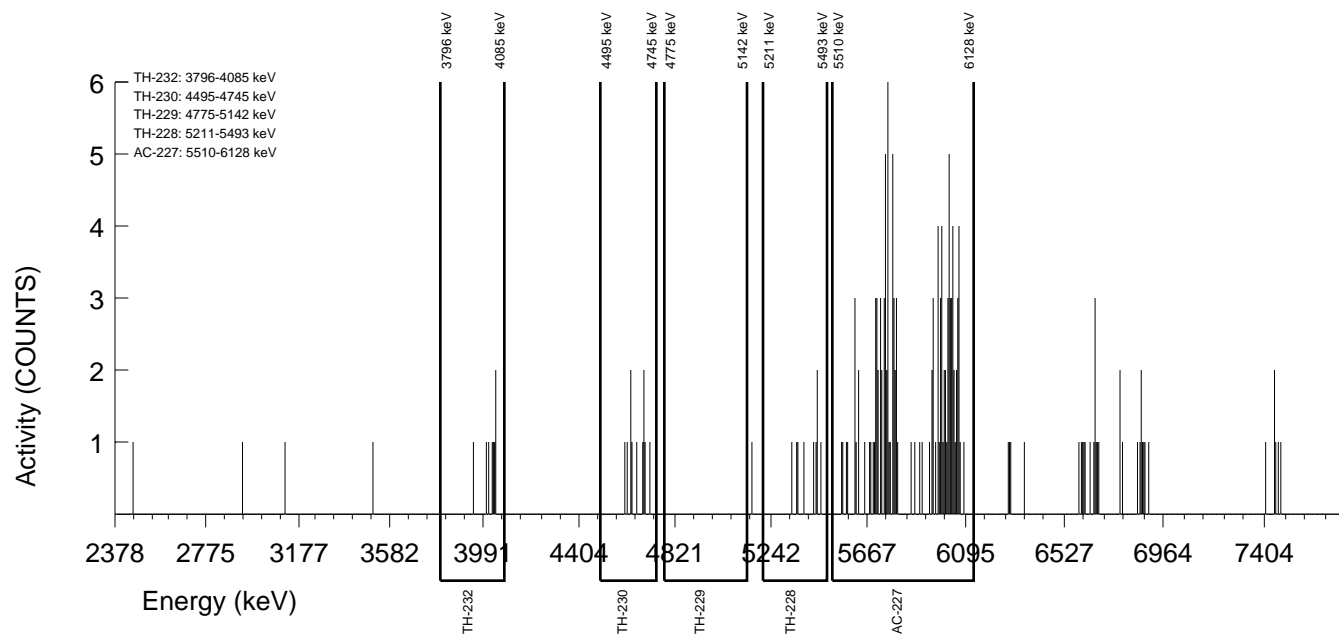
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TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2316E+00 dpm RESULTS : 3.2504E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5850.01	5865.48	303.314	121.000	120.443	0.557	0.7462	100.000	1.54E+01	4.07E+00	7.20E-01	1.68E-01	2.78E+00
TH-228	5363.00	5409.62	7.418	9.000	7.866	0.278	0.5277	99.940	1.17E+00	9.59E-01	9.77E-01	2.65E-01	9.26E-01
TH-229	4900.00	4958.12	0.000	0.000	-0.278	0.278	0.5277	99.469	-3.10E-02	2.26E-01	5.41E-01	1.03E-01	2.25E-01
TH-230	4671.39	4660.70	61.817	11.000	10.722	0.278	0.5277	99.700	1.19E+00	7.91E-01	5.40E-01	1.03E-01	7.57E-01
TH-232	3972.00	4017.72	7.418	8.000	8.000	0.000	0.0000	100.000	8.87E-01	6.75E-01	3.33E-01	0.00E+00	6.53E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 5.7765E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.856 +/-0.006)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

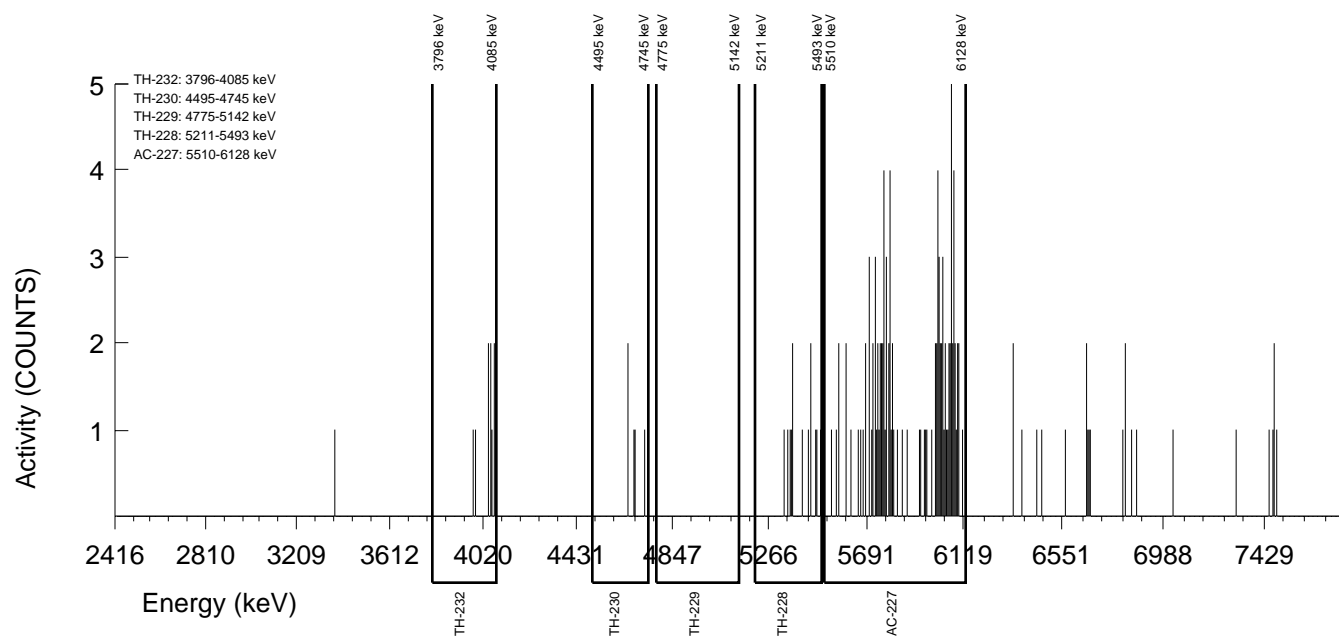
BATCH NUMBER : 1596388 SAMPLE ID : S0405235013_TH SAMPLE QTY : 0.105 G +/-0.952 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 90.2 +/-10.360 % AC-227 SEP. : 27-Sep-2016 16:15:00	CHAMBER : 189 DETECTOR S/N : 68622 AVERAGE %EFFICIENCY : 25.4050 AVERAGE %EFF ERROR : 0.4925 COUNT DATE : 01-Oct-2016 12:54:14 ELAPSED LIVE TIME(SEC) : 8328.62	LIB FILE : AC BKG FILE : B189.CNF;857 BKG DATE : 30-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W189.CNF;231 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2316E+00 dpm RESULTS : 2.9137E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5850.01	5885.18	343.034	104.000	102.751	1.249	1.1177	100.000	1.60E+01	4.57E+00	1.08E+00	3.06E-01	3.14E+00
TH-228	5363.00	5412.38	80.954	13.000	12.270	0.000	0.0000	99.940	2.23E+00	1.42E+00	1.06E+00	2.55E-01	1.33E+00
TH-229	4900.00	4958.08	0.000	0.000	-0.139	0.139	0.3726	99.469	-1.88E-02	2.72E-01	5.84E-01	8.87E-02	2.71E-01
TH-230	4671.39	4679.86	4.906	5.000	4.861	0.139	0.3726	99.700	6.58E-01	6.66E-01	5.83E-01	8.85E-02	6.52E-01
TH-232	3972.00	4041.13	29.438	9.000	8.861	0.139	0.3726	100.000	1.20E+00	8.74E-01	5.81E-01	8.82E-02	8.38E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 5.7764E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.730 +/-0.005)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

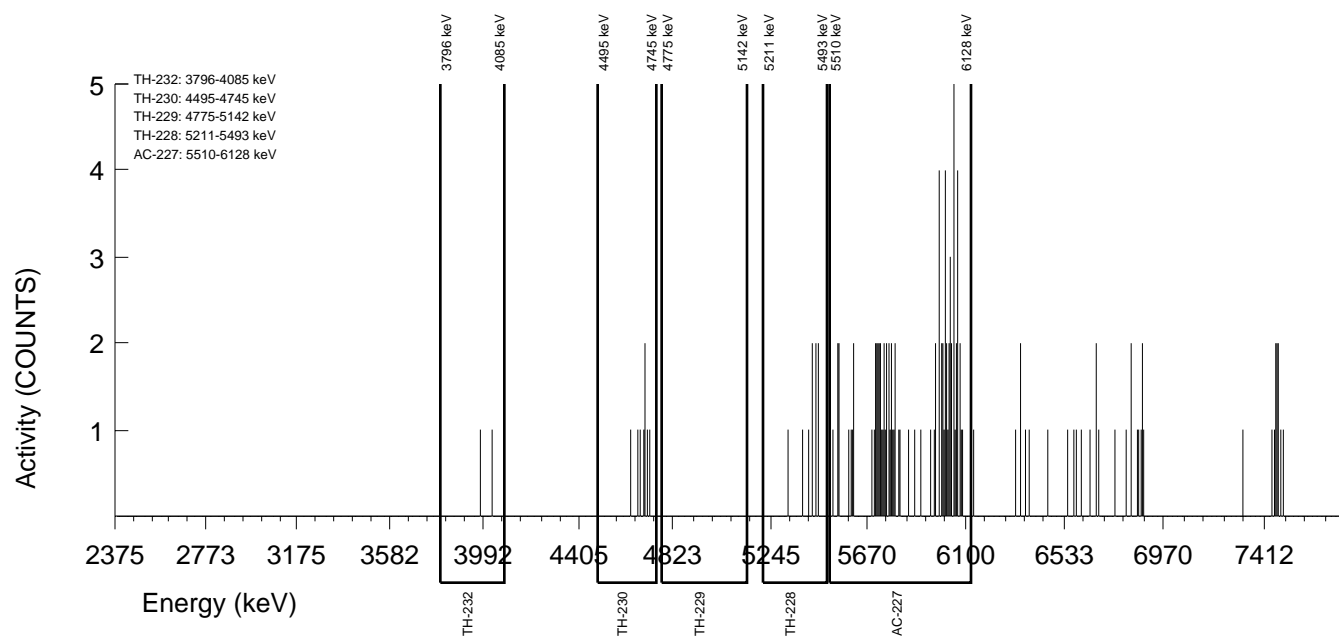
BATCH NUMBER : 1596388 SAMPLE ID : S0405235014_TH SAMPLE QTY : 0.105 G +/-0.952 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 72.6 +/-11.325 % AC-227 SEP. : 27-Sep-2016 16:15:00	CHAMBER : 207 DETECTOR S/N : 78910 AVERAGE %EFFICIENCY : 26.0138 AVERAGE %EFF ERROR : 0.5040 COUNT DATE : 01-Oct-2016 12:54:17 ELAPSED LIVE TIME(SEC) : 8363.20	LIB FILE : AC BKG FILE : B207.CNF;813 BKG DATE : 30-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W207.CNF;228 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2316E+00 dpm RESULTS : 2.3449E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5850.01	5872.06	78.023	86.000	85.024	0.976	0.9878	100.000	1.60E+01	5.00E+00	1.22E+00	3.27E-01	3.45E+00
TH-228	5363.00	5428.98	29.723	10.000	8.838	0.558	0.7467	99.940	1.94E+00	1.51E+00	1.46E+00	4.02E-01	1.43E+00
TH-229	4900.00	4958.12	0.000	0.000	-0.558	0.558	0.7467	99.469	-9.14E-02	3.39E-01	9.22E-01	2.15E-01	3.37E-01
TH-230	4671.39	4692.81	7.431	9.000	8.861	0.139	0.3733	99.700	1.45E+00	1.07E+00	7.05E-01	1.07E-01	1.02E+00
TH-232	3972.00	4001.85	54.492	2.000	2.000	0.000	0.0000	100.000	3.26E-01	5.60E-01	4.89E-01	0.00E+00	5.55E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 5.7767E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.604 +/-0.004)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

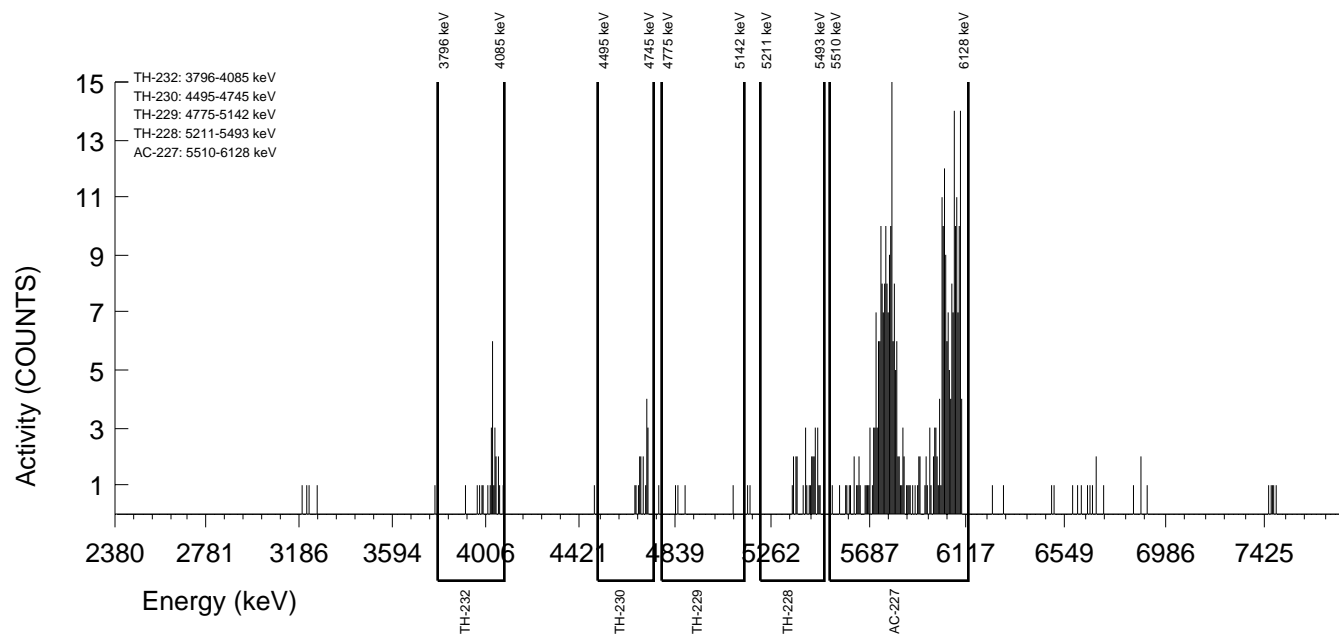
BATCH NUMBER : 1596388 SAMPLE ID : S0405235015_TH SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 88.5 +/-6.068 % AC-227 SEP. : 27-Sep-2016 16:15:00	CHAMBER : 185 DETECTOR S/N : 68615 AVERAGE %EFFICIENCY : 25.3535 AVERAGE %EFF ERROR : 0.4915 COUNT DATE : 28-Sep-2016 14:07:01 ELAPSED LIVE TIME(SEC) : 30300.00	LIB FILE : AC BKG FILE : B185.CNF;859 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W185.CNF;237 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1312E+00 dpm RESULTS : 2.7721E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5871.06	5895.90	330.760	362.000	354.930	7.070	2.6589	100.000	1.41E+01	2.33E+00	5.46E-01	2.13E-01	1.49E+00
TH-228	5363.00	5421.20	106.053	28.000	25.655	1.515	1.2309	99.940	1.32E+00	5.77E-01	4.51E-01	1.49E-01	5.51E-01
TH-229	4900.00	4870.94	4.991	6.000	3.980	2.020	1.4213	99.469	1.53E-01	2.17E-01	3.36E-01	1.10E-01	2.17E-01
TH-230	4671.39	4697.40	9.981	17.000	13.465	3.535	1.8802	99.700	5.16E-01	3.43E-01	4.06E-01	1.45E-01	3.36E-01
TH-232	3972.00	4029.64	7.985	26.000	25.495	0.505	0.7106	100.000	9.74E-01	4.12E-01	2.24E-01	5.48E-02	3.93E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8425E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.830 +/-0.005)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

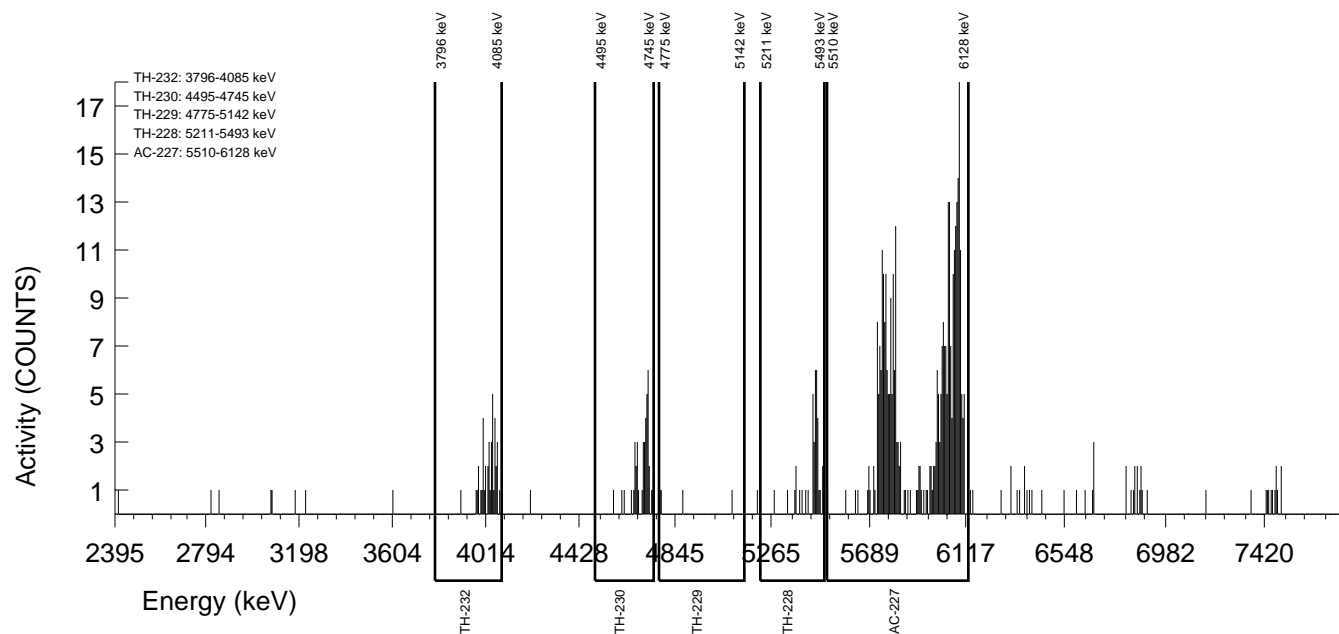
BATCH NUMBER : 1596388 SAMPLE ID : S0405235016_TH SAMPLE QTY : 0.107 G +/-0.935 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 87.6 +/-6.140 % AC-227 SEP. : 27-Sep-2016 16:15:00	CHAMBER : 186 DETECTOR S/N : 68616 AVERAGE %EFFICIENCY : 25.3981 AVERAGE %EFF ERROR : 0.4924 COUNT DATE : 28-Sep-2016 14:07:03 ELAPSED LIVE TIME(SEC) : 30300.00	LIB FILE : AC BKG FILE : B186.CNF;819 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W186.CNF;28 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1312E+00 dpm RESULTS : 2.7435E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5871.06	5928.76	321.944	364.000	351.880	12.120	3.4814	100.000	1.37E+01	2.29E+00	6.65E-01	2.74E-01	1.47E+00
TH-228	5363.00	5437.94	23.541	37.000	17.492	18.685	4.3226	99.940	8.79E-01	6.91E-01	1.04E+00	4.45E-01	6.81E-01
TH-229	4900.00	4881.50	0.000	4.000	2.990	1.010	1.0050	99.469	1.13E-01	1.78E-01	2.66E-01	7.64E-02	1.77E-01
TH-230	4671.39	4696.53	18.650	40.000	34.950	5.050	2.2472	99.700	1.31E+00	5.15E-01	4.54E-01	1.70E-01	4.87E-01
TH-232	3972.00	4027.08	62.996	39.000	37.485	1.515	1.2309	100.000	1.40E+00	5.03E-01	2.98E-01	9.31E-02	4.70E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8425E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.823 +/-0.005)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

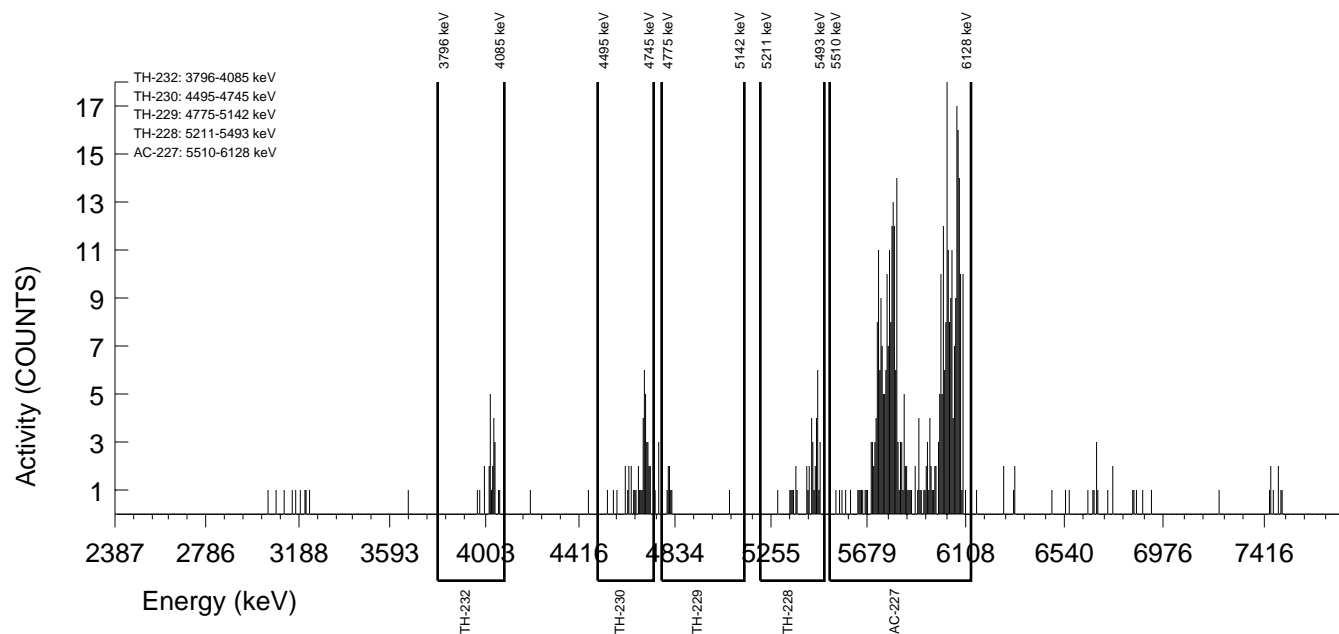
BATCH NUMBER : 1596388 SAMPLE ID : S0405235017_TH SAMPLE QTY : 0.105 G +/-0.952 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 100 +/-5.939 % AC-227 SEP. : 27-Sep-2016 16:15:00	CHAMBER : 187 DETECTOR S/N : 68620 AVERAGE %EFFICIENCY : 25.2519 AVERAGE %EFF ERROR : 0.4896 COUNT DATE : 28-Sep-2016 14:07:06 ELAPSED LIVE TIME(SEC) : 30300.00	LIB FILE : AC BKG FILE : B187.CNF;854 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W187.CNF;238 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1312E+00 dpm RESULTS : 3.1347E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5871.06	5904.66	345.698	426.000	399.740	26.260	5.1245	100.000	1.40E+01	2.25E+00	8.29E-01	3.62E-01	1.44E+00
TH-228	5363.00	5425.57	28.987	37.000	35.055	1.010	1.0050	99.940	1.59E+00	5.89E-01	3.70E-01	1.17E-01	5.54E-01
TH-229	4900.00	4837.73	14.865	9.000	-3.625	12.625	3.5532	99.469	-1.22E-01	2.70E-01	5.86E-01	2.42E-01	2.70E-01
TH-230	4671.39	4682.12	16.517	44.000	34.910	9.090	3.0150	99.700	1.18E+00	4.89E-01	5.11E-01	2.05E-01	4.66E-01
TH-232	3972.00	4031.52	24.775	23.000	21.990	1.010	1.0050	100.000	7.39E-01	3.40E-01	2.37E-01	6.82E-02	3.28E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8425E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.935 +/-0.006)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

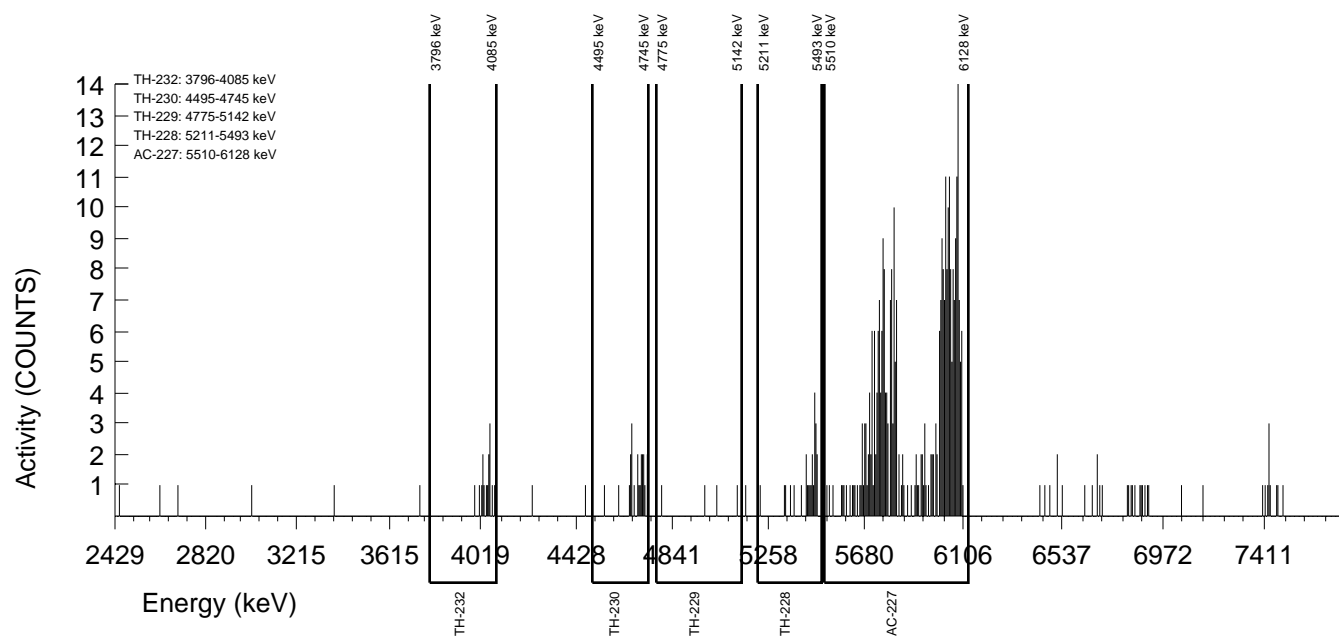
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TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1312E+00 dpm RESULTS : 2.4483E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5871.06	5907.08	304.601	335.000	330.455	4.545	2.1319	100.000	1.40E+01	2.36E+00	4.91E-01	1.82E-01	1.53E+00
TH-228	5363.00	5425.71	12.962	24.000	22.217	1.010	1.0050	99.940	1.22E+00	5.70E-01	4.38E-01	1.37E-01	5.46E-01
TH-229	4900.00	4987.89	311.082	4.000	3.495	0.505	0.7106	99.469	1.43E-01	1.89E-01	2.40E-01	5.86E-02	1.88E-01
TH-230	4671.39	4688.41	71.695	22.000	17.960	4.040	2.0100	99.700	7.32E-01	4.13E-01	4.53E-01	1.65E-01	4.02E-01
TH-232	3972.00	4043.84	57.113	17.000	16.495	0.505	0.7106	100.000	6.71E-01	3.54E-01	2.39E-01	5.83E-02	3.43E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8426E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.773 +/-0.005)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

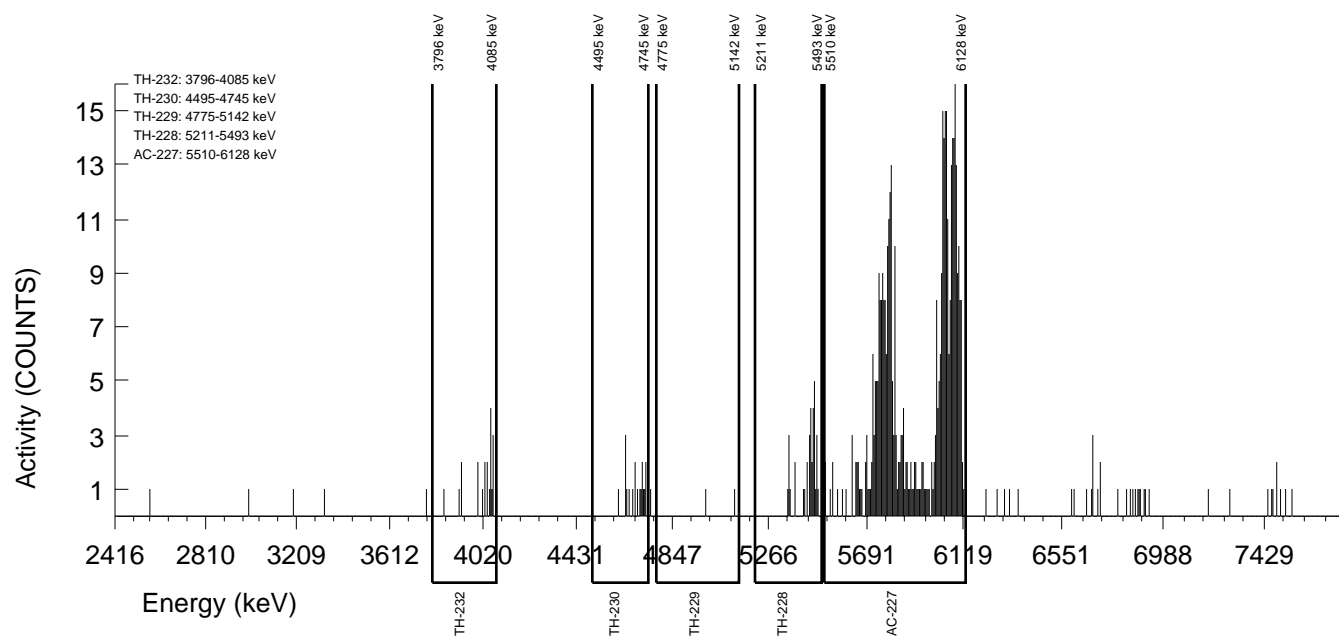
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TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1312E+00 dpm RESULTS : 3.4916E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5871.06	5921.13	325.044	452.000	447.960	4.040	2.0100	100.000	1.35E+01	2.01E+00	3.34E-01	1.22E-01	1.26E+00
TH-228	5363.00	5438.08	115.299	34.000	31.437	1.515	1.2309	99.940	1.22E+00	4.79E-01	3.49E-01	1.16E-01	4.56E-01
TH-229	4900.00	5056.02	122.658	2.000	0.990	1.010	1.0050	99.469	2.88E-02	1.11E-01	2.05E-01	5.89E-02	1.10E-01
TH-230	4671.39	4686.22	87.087	18.000	15.980	2.020	1.4213	99.700	4.63E-01	2.61E-01	2.53E-01	8.31E-02	2.56E-01
TH-232	3972.00	4025.70	25.349	24.000	23.495	0.505	0.7106	100.000	6.79E-01	2.97E-01	1.70E-01	4.14E-02	2.86E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8426E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.048 +/-0.007)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

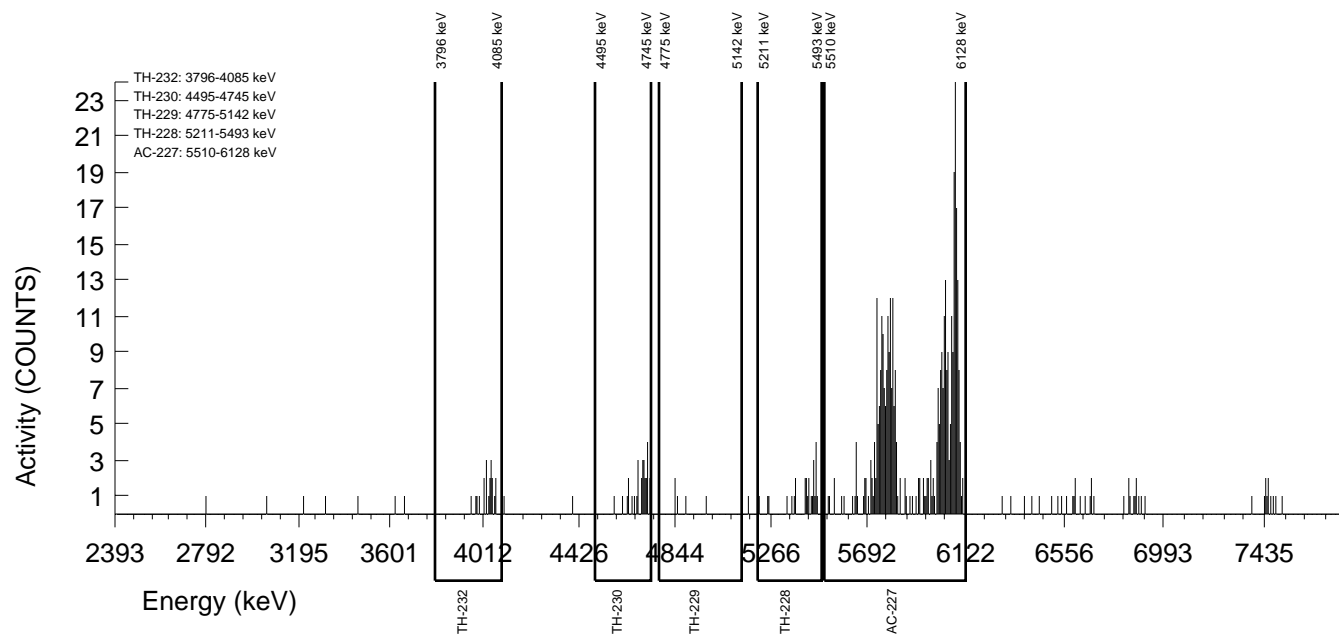
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TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1312E+00 dpm RESULTS : 2.9681E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5871.06	5916.79	53.080	398.000	395.475	2.525	1.5890	100.000	1.39E+01	2.16E+00	3.30E-01	1.12E-01	1.37E+00
TH-228	5363.00	5409.27	15.709	26.000	24.570	0.505	0.7106	99.940	1.11E+00	4.85E-01	3.28E-01	9.64E-02	4.64E-01
TH-229	4900.00	4888.43	4.961	5.000	3.990	1.010	1.0050	99.469	1.35E-01	1.73E-01	2.39E-01	6.86E-02	1.72E-01
TH-230	4671.39	4694.96	44.646	29.000	27.485	1.515	1.2309	99.700	9.28E-01	3.85E-01	2.69E-01	8.38E-02	3.68E-01
TH-232	3972.00	4025.45	52.088	20.000	20.000	0.000	0.0000	100.000	6.73E-01	3.15E-01	1.01E-01	0.00E+00	3.04E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8427E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.925 +/-0.006)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

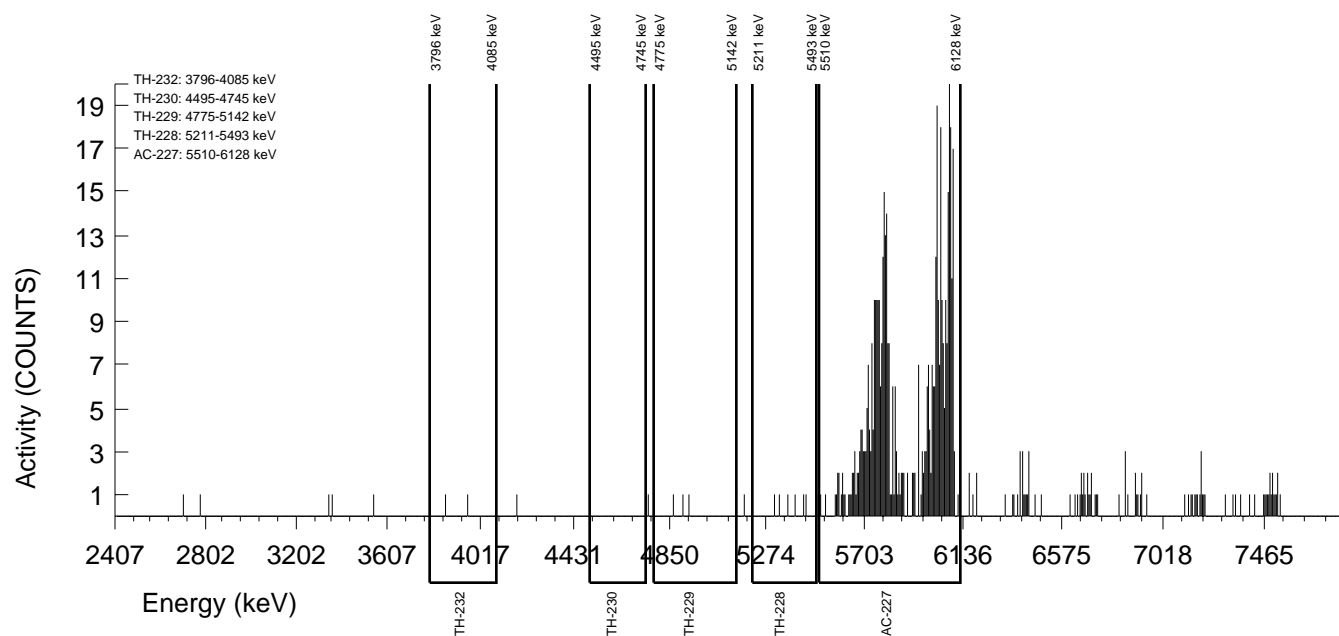
BATCH NUMBER : 1596388 SAMPLE ID : S1203621688_TH SAMPLE QTY : 0.109 G +/-0.917 % SAMPLE DATE : 26-Sep-2016 00:00:00 ANALYST : JXH2 % YIELD : 82.6 +/-5.544 % AC-227 SEP. : 27-Sep-2016 16:15:00	CHAMBER : 038 DETECTOR S/N : 72532 AVERAGE %EFFICIENCY : 36.0700 AVERAGE %EFF ERROR : 0.6941 COUNT DATE : 28-Sep-2016 14:05:07 ELAPSED LIVE TIME(SEC) : 30300.00	LIB FILE : AC BKG FILE : B038.CNF;1826 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W038.CNF;501 CAL DATE : 28-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1311E+00 dpm RESULTS : 2.5870E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5871.08	5905.18	284.762	498.000	471.235	26.765	5.1735	100.000	1.35E+01	2.02E+00	6.83E-01	2.98E-01	1.27E+00
TH-228	5363.00	5384.47	132.562	6.000	2.879	2.020	1.4213	99.940	7.93E-02	1.56E-01	2.67E-01	9.22E-02	1.55E-01
TH-229	4900.00	4903.00	68.736	3.000	2.495	0.505	0.7106	99.469	6.89E-02	1.15E-01	1.62E-01	3.96E-02	1.15E-01
TH-230	4671.39	4619.86	0.000	0.000	-0.505	0.505	0.7106	99.700	-1.39E-02	6.64E-02	1.62E-01	3.95E-02	6.63E-02
TH-232	3972.00	3911.38	98.194	2.000	1.495	0.505	0.7106	100.000	4.11E-02	1.01E-01	1.61E-01	3.94E-02	1.01E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8403E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.101 +/-0.007)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

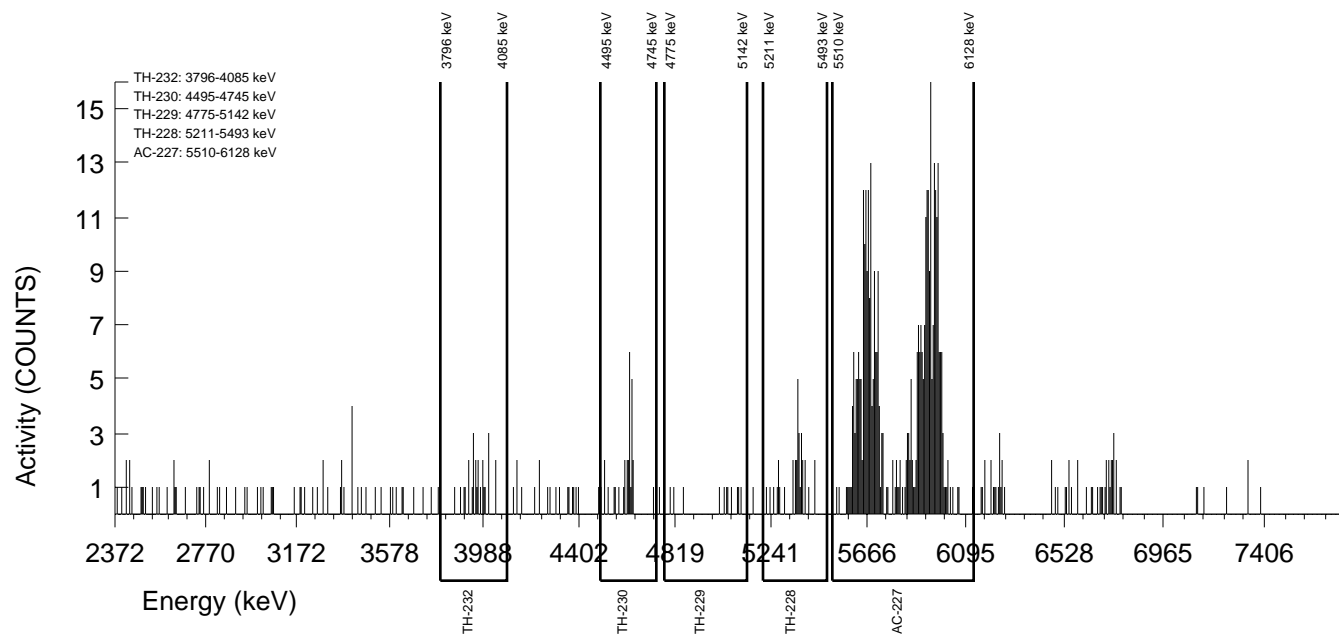
BATCH NUMBER : 1596388 SAMPLE ID : S1203621689_TH SAMPLE QTY : 0.101 G +/-0.990 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 93.7 +/-5.954 % AC-227 SEP. : 27-Sep-2016 16:15:00	CHAMBER : 197 DETECTOR S/N : 78894 AVERAGE %EFFICIENCY : 26.0674 AVERAGE %EFF ERROR : 0.5050 COUNT DATE : 28-Sep-2016 14:07:15 ELAPSED LIVE TIME(SEC) : 30300.00	LIB FILE : AC BKG FILE : B197.CNF;801 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W197.CNF;230 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1312E+00 dpm RESULTS : 2.9347E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5871.06	5815.81	307.675	404.000	386.325	17.675	4.2042	100.000	1.45E+01	2.35E+00	7.52E-01	3.19E-01	1.50E+00
TH-228	5363.00	5348.69	21.465	33.000	24.017	8.080	2.8425	99.940	1.16E+00	6.06E-01	7.21E-01	2.88E-01	5.88E-01
TH-229	4900.00	4996.37	0.000	13.000	3.910	9.090	3.0150	99.469	1.42E-01	3.10E-01	5.51E-01	2.21E-01	3.09E-01
TH-230	4671.39	4603.98	16.924	30.000	20.405	9.595	3.0976	99.700	7.40E-01	4.37E-01	5.62E-01	2.27E-01	4.27E-01
TH-232	3972.00	3958.62	116.404	25.000	13.385	11.615	3.4081	100.000	4.84E-01	4.06E-01	6.06E-01	2.49E-01	4.02E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8427E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.903 +/-0.006)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

BATCH NUMBER : 1596388 SAMPLE ID : S1203621690_TH SAMPLE QTY : 0.109 G +/-0.917 % SAMPLE DATE : 26-Sep-2016 00:00:00 ANALYST : JXH2 % YIELD : 82.2 +/-6.156 % AC-227 SEP. : 27-Sep-2016 16:15:00	CHAMBER : 199 DETECTOR S/N : 78896 AVERAGE %EFFICIENCY : 26.2038 AVERAGE %EFF ERROR : 0.5077 COUNT DATE : 28-Sep-2016 14:07:18 ELAPSED LIVE TIME(SEC) : 30300.00	LIB FILE : AC BKG FILE : B199.CNF;801 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W199.CNF;222 CAL DATE : 15-Sep-2016
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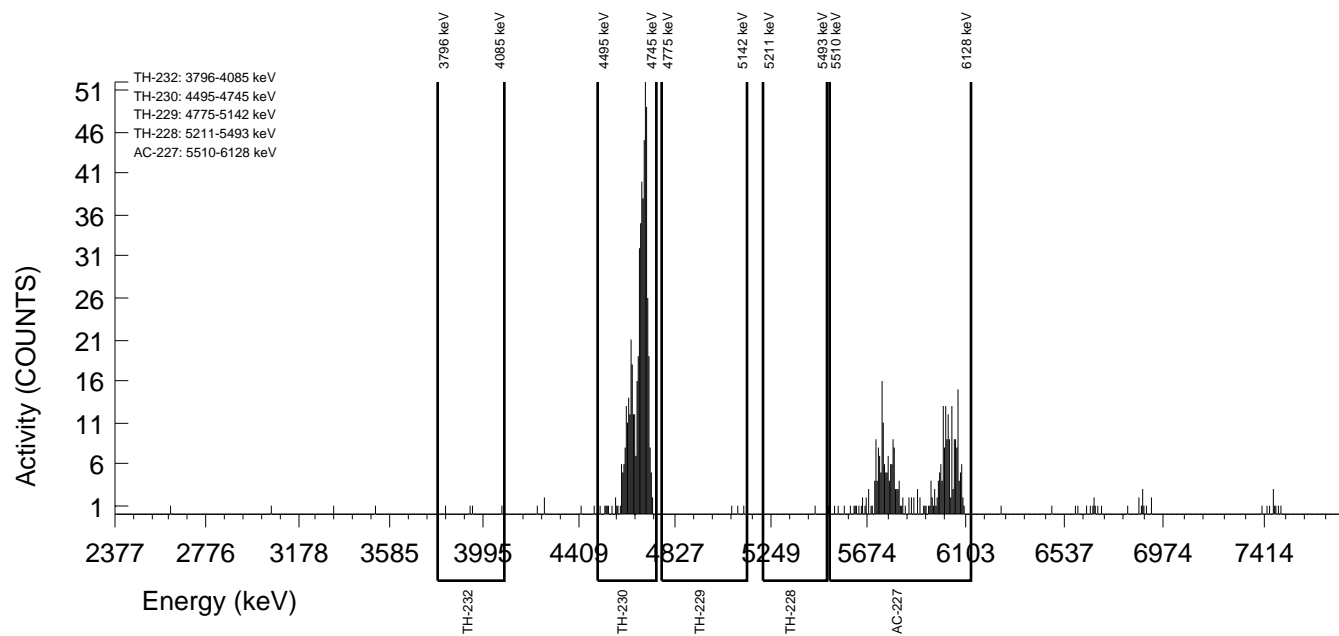
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.1312E+00 dpm RESULTS : 2.5727E+00 dpm	LCS ID : 1242-H NUCLIDE : TH-230 NOMINAL (pCi/G) : 1.9202E+01 % RECOVERY : 107.307
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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5871.06	5894.57	336.577	346.000	340.445	5.555	2.3569	100.000	1.35E+01	2.25E+00	4.95E-01	1.88E-01	1.45E+00
TH-228	5363.00	5445.02	4.962	1.000	-0.301	0.505	0.7106	99.940	-1.15E-02	1.19E-01	2.71E-01	7.83E-02	1.18E-01
TH-229	4900.00	5105.95	54.578	3.000	0.980	2.020	1.4213	99.469	3.74E-02	1.72E-01	3.34E-01	1.10E-01	1.72E-01
TH-230	4671.39	4674.48	37.021	542.000	540.485	1.515	1.2309	99.700	2.06E+01	3.16E+00	3.04E-01	9.47E-02	1.74E+00
TH-232	3972.00	3943.53	243.119	4.000	3.495	0.505	0.7106	100.000	1.33E-01	1.76E-01	2.23E-01	5.45E-02	1.75E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 1.8428E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.796 +/-0.005)



02-Sep-2016

Batch# 1596421 Product: PU Date: 9/19/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	/		
Instrument source check is within limits.	/		
Instrument bkg check is within limits.	/		
Method RDL/ LLD has been met.	/		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	/		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	/		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	/		
Sample was run within hold time.	<u>OK 9/19/16</u>	/	Don't # 1558949
Sample was correctly preserved if required.			NA
Smears Taken for Radioactive batches.	/		NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	/		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	/		
Aux data is correct.			NA
Client Special requirements page has been checked.	/		
Raw Data and/ or spectrum are included and properly stated.	/		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	/		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	/		NA # 9/19/16
Batch Data Exception Reports (DER) completed, if applicable.	/		NA Don't # 1558949
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	/		NA Don't # 1558949
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	/		

Primary Review Performed By: [Signature] 9/19/16

Secondary Review Performed By: [Signature] 9/20/16

(10/4)

MJWC

DATA EXCEPTION REPORT

Mo.Day Yr. 19-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Pu-11-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596421	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, and 1203621770 were analyzed outside of holding.		1. Reporting results.	

Originator's Name:
Jessica Downey 19-SEP-16

Data Validator/Group Leader:
Melanie Aycock 21-SEP-16

Plutonium Queue Sheet

07-SEP-16

Batch #: 1596421 Analyst: KXB2 First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16
 Tracer Isotope(s): Pu-242/Pu-236 Tracer Code: 1770-A Expiration Date: 9-3-17 Analyzed Sequentially with:
 LCS Isotope(s): Pu-239/Pu-238 LCS Code: 0380 MIM Expiration Date: 7-10-17 U: 1596418
 Spike Isotope(s): Pu-239/Pu-238 Spike Code: Expiration Date: Am: 15910419
 Prep Date: 9-15-16 Initials: KB Pipet ID: 18410027 Balance ID: 16107602 Witness: ~~AKB~~ 9/15/16

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet(Dry) Aliquot (g) (l/f)	Pu Det #
405235061-1	5.1B.R.2.2	SAMPLE	1 pCi/g	1 pCi/g	SOIL	MJWC001	14-DEC-15	1	1	0.514	65
405235062-1	5.2A.R.1.2	SAMPLE	1 pCi/g	1 pCi/g	SOIL	MJWC001	14-DEC-15	2	2	0.518	64
405235063-1	5.2A.R.1.3	SAMPLE	1 pCi/g	1 pCi/g	SOIL	MJWC001	14-DEC-15	3	3	0.518	67
405235064-1	5.2A.R.1.4	SAMPLE	1 pCi/g	1 pCi/g	SOIL	MJWC001	14-DEC-15	4	4	0.517	68
405235065-1	5.2A.R.2.3	SAMPLE	1 pCi/g	1 pCi/g	SOIL	MJWC001	14-DEC-15	5	5	0.507	69
405235066-1	5.2A.R.2.4	SAMPLE	1 pCi/g	1 pCi/g	SOIL	MJWC001	14-DEC-15	6	6	0.509	70
405235067-1	5.2A.R.6.2	SAMPLE	1 pCi/g	1 pCi/g	SOIL	MJWC001	11-DEC-15	7	7	0.508	71
405235068-1	5.2A.R.4.2	SAMPLE	1 pCi/g	1 pCi/g	SOIL	MJWC001	11-DEC-15	8	8	0.509	72
405235069-1	5.2B.R.1.4	SAMPLE	1 pCi/g	1 pCi/g	SOIL	MJWC001	16-DEC-15	9	9	0.505	73
405235070-1	5.2B.R.3.2	SAMPLE	1 pCi/g	1 pCi/g	SOIL	MJWC001	11-DEC-15	10	10	0.509	74
405235071-1	5.2B.R.4.2	SAMPLE	1 pCi/g	1 pCi/g	SOIL	MJWC001	11-DEC-15	11	11	0.515	75
405235072-1	5.2B.R.2.4	SAMPLE	1 pCi/g	1 pCi/g	SOIL	MJWC001	15-DEC-15	12	12	0.513	78
405235073-1	5.2B.R.8.2	SAMPLE	1 pCi/g	1 pCi/g	SOIL	MJWC001	11-DEC-15	13	13	0.505	80
405235074-1	5.3A.R.1.3	SAMPLE	1 pCi/g	1 pCi/g	SOIL	MJWC001	15-DEC-15	14	14	0.501	81
405235075-1	5.4A.R.1.3	SAMPLE	1 pCi/g	1 pCi/g	SOIL	MJWC001	16-DEC-15	15	15	0.508	82
405235076-1	5.4A.R.4.2	SAMPLE	1 pCi/g	1 pCi/g	SOIL	MJWC001	11-DEC-15	16	16	0.512	83
405235077-1	5.5A.R.1.3	SAMPLE	1 pCi/g	1 pCi/g	SOIL	MJWC001	17-DEC-15	17	17	0.510	84
405235078-1	5.6A.R.1.3	SAMPLE	1 pCi/g	1 pCi/g	SOIL	MJWC001	17-DEC-15	18	18	0.505	85
1203621769-1	MB for batch 1596421	MB	1 pCi/g	1 pCi/g	SOIL	QC.A.COUNT		19	19	0.518	86
1203621770-1	5.1B.R.2.2(405235061DUP)	DUP	1 pCi/g	1 pCi/g	SOIL	QC.A.COUNT	14-DEC-15	20	20	0.507	88
1203621771-1	LCS for batch 1596421	LCS	1 pCi/g	1 pCi/g	SOIL	QC.A.COUNT		21	21	0.518	169

Data Reviewed By: JWB 9/19/16
 Page: 1 of 1

LEACH or DIGESTION
 Circle One

Choose SOP Used: GL-RAD-A-011 GL-RAD-A-036, Solid Sample Dissolution by: LEACH or DIGESTION
 GL-RAD-A-053

GEL Laboratories LLC, Radiochemistry Division

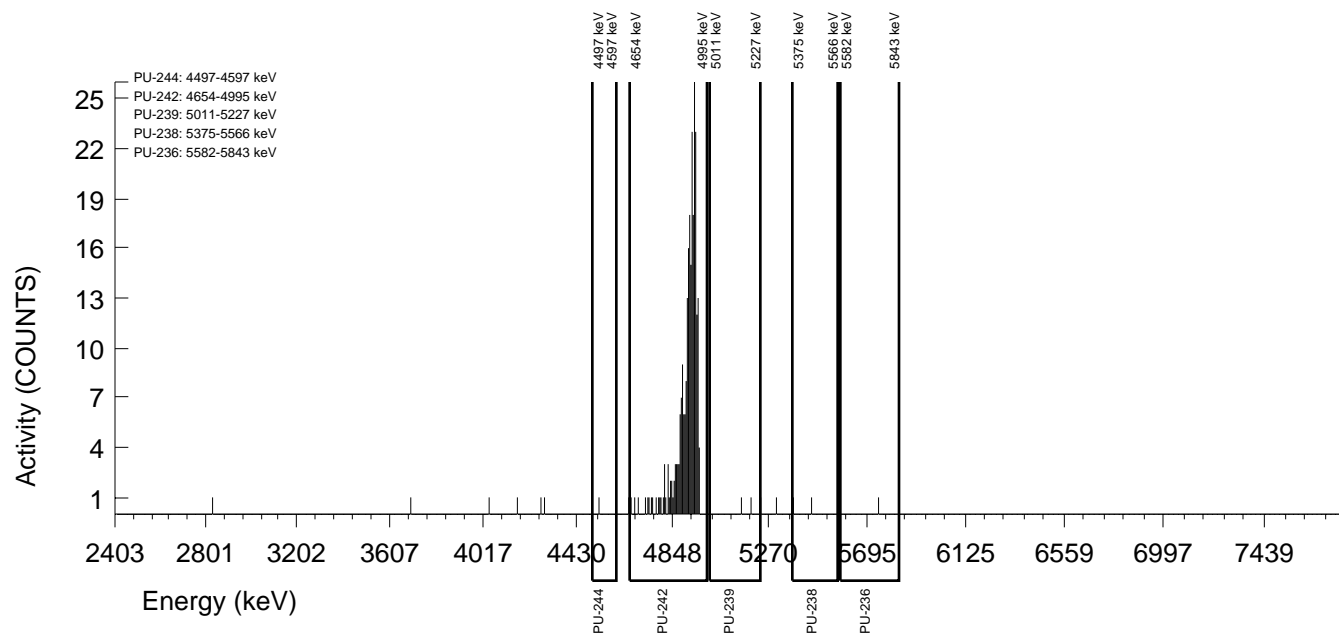
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S0405235061_PU SAMPLE QTY : 0.514 G +/-0.195 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 88.0 +/-6.490 %	CHAMBER : 065 DETECTOR S/N : 72194 AVERAGE %EFFICIENCY : 28.4758 AVERAGE %EFF ERROR : 0.5506 COUNT DATE : 17-Sep-2016 11:42:34 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B065.CNF;2658 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W065.CNF;489 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.8559E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5748.94	4.939	1.000	0.520	0.480	0.6928	100.000	9.12E-03	5.07E-02	9.71E-02	2.23E-02	5.07E-02
PU-238	5486.00	5415.55	0.000	2.000	1.760	0.240	0.4899	99.900	2.58E-02	5.09E-02	7.04E-02	1.32E-02	5.08E-02
PU-239	5155.00	5169.13	44.452	2.000	1.760	0.240	0.4899	99.900	2.57E-02	5.06E-02	7.00E-02	1.31E-02	5.05E-02
PU-242	4890.00	4909.38	39.064	264.000	263.520	0.480	0.6928	100.000	3.84E+00	6.90E-01	8.07E-02	1.85E-02	4.65E-01
PU-244	4589.00	4523.95	4.939	1.000	1.000	0.000	0.0000	99.900	1.46E-02	4.11E-02	4.38E-02	0.00E+00	4.10E-02



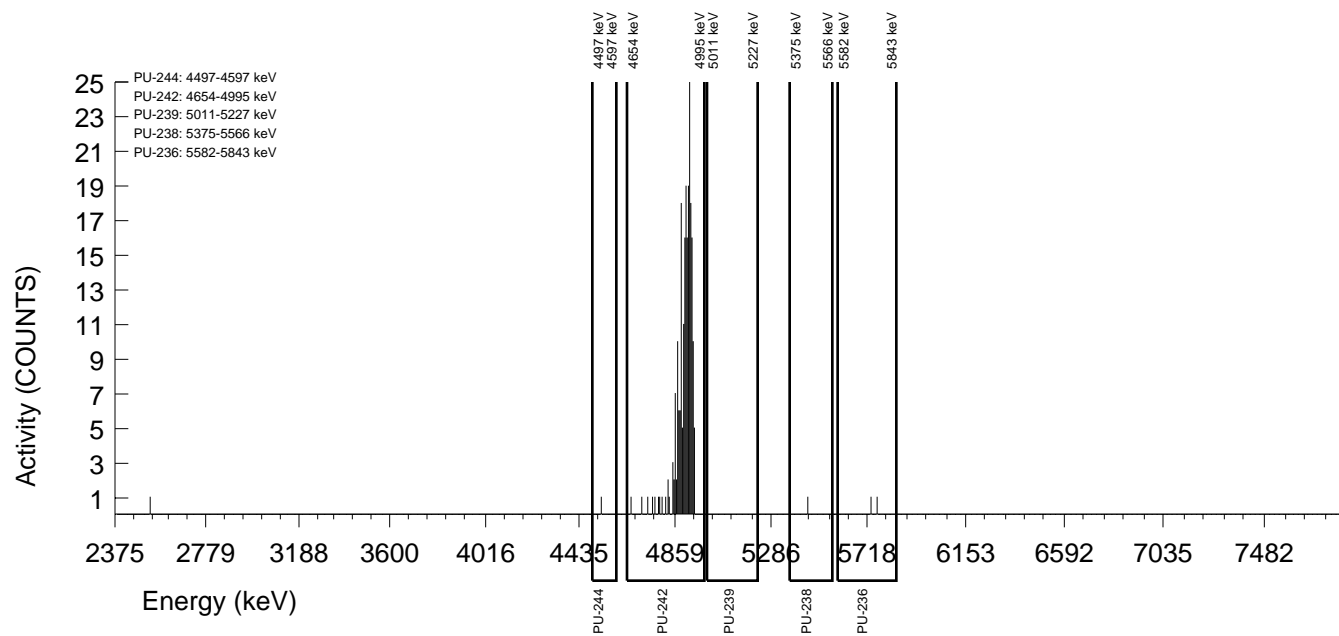
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S0405235062_PU SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 83.5 +/-6.972 %	CHAMBER : 066 DETECTOR S/N : 46-089C1 AVERAGE %EFFICIENCY : 25.6702 AVERAGE %EFF ERROR : 0.4975 COUNT DATE : 17-Sep-2016 11:42:34 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B066.CNF;1813 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W066.CNF;487 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.6605E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5747.65	30.175	2.000	1.760	0.240	0.4899	100.000	3.60E-02	7.09E-02	9.81E-02	1.84E-02	7.08E-02
PU-238	5486.00	5453.18	5.029	1.000	0.280	0.720	0.8485	99.900	4.79E-03	5.02E-02	1.05E-01	2.66E-02	5.01E-02
PU-239	5155.00	5118.70	0.000	0.000	-1.200	1.200	1.0954	99.900	-2.04E-02	3.88E-02	1.19E-01	3.41E-02	3.87E-02
PU-242	4890.00	4904.86	50.501	226.000	225.520	0.480	0.6928	100.000	3.83E+00	7.40E-01	9.41E-02	2.16E-02	5.02E-01
PU-244	4589.00	4535.62	5.029	1.000	0.760	0.240	0.4899	99.900	1.29E-02	4.86E-02	8.16E-02	1.53E-02	4.85E-02



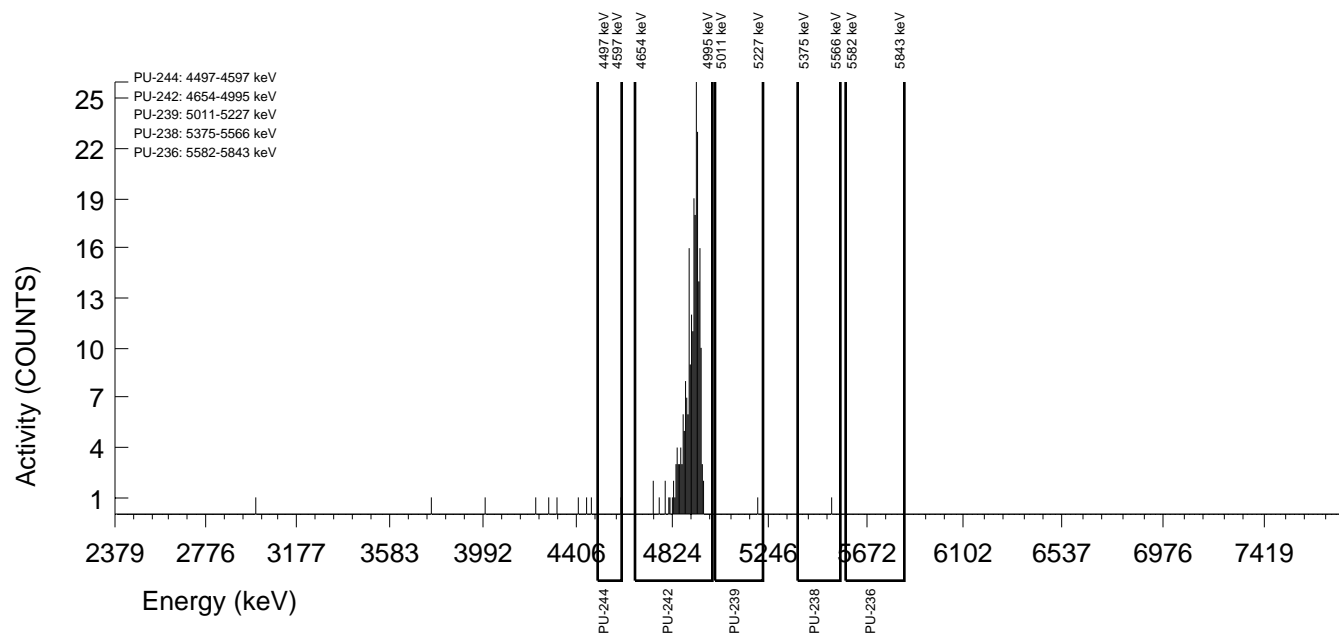
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S0405235063_PU SAMPLE QTY : 0.518 G +/-0.193 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 78.5 +/-6.767 %	CHAMBER : 067 DETECTOR S/N : 78780 AVERAGE %EFFICIENCY : 29.1959 AVERAGE %EFF ERROR : 0.5641 COUNT DATE : 17-Sep-2016 11:42:34 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B067.CNF;1813 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W067.CNF;476 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.4400E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	-1.200	1.200	1.0954	100.000	-2.28E-02	4.33E-02	1.33E-01	3.82E-02	4.33E-02
PU-238	5486.00	5522.37	4.935	1.000	1.000	0.000	0.0000	99.900	1.59E-02	4.48E-02	4.78E-02	0.00E+00	4.48E-02
PU-239	5155.00	5198.11	4.935	1.000	0.520	0.480	0.6928	99.900	8.23E-03	4.58E-02	8.77E-02	2.01E-02	4.57E-02
PU-242	4890.00	4907.93	48.359	242.000	241.040	0.960	0.9798	100.000	3.81E+00	7.14E-01	1.04E-01	2.84E-02	4.83E-01
PU-244	4589.00	4598.66	0.000	1.000	1.000	0.000	0.0000	99.900	1.58E-02	4.46E-02	4.75E-02	0.00E+00	4.45E-02



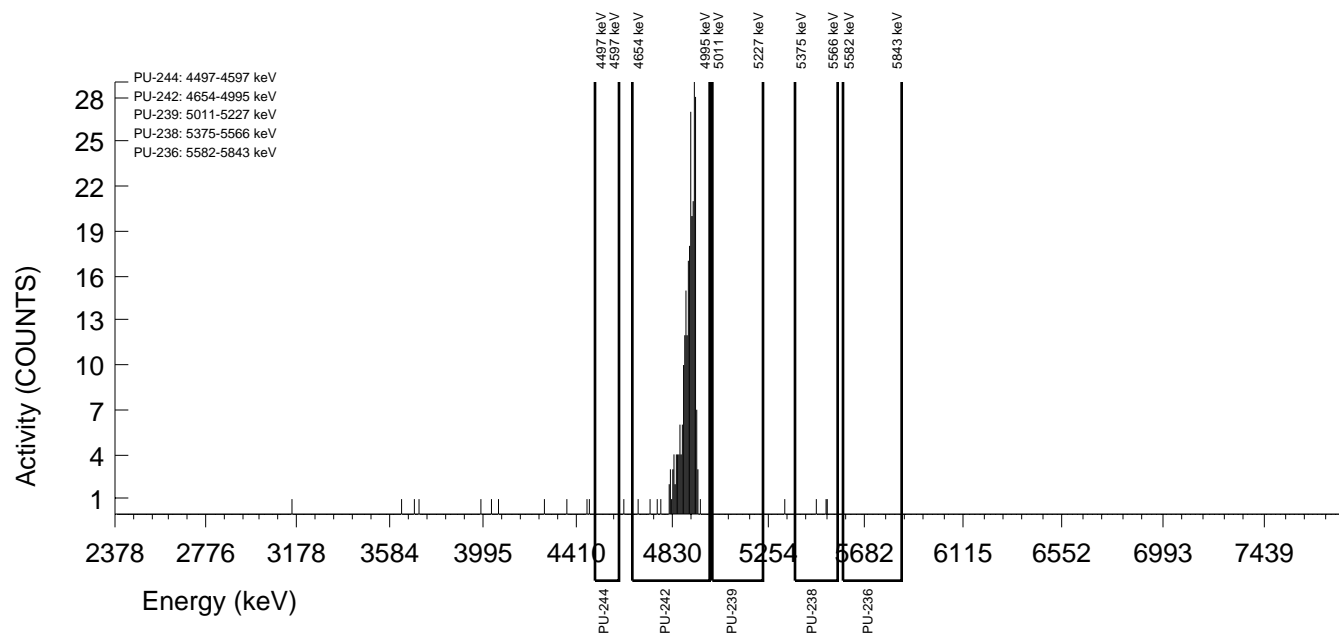
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S0405235064_PU SAMPLE QTY : 0.517 G +/-0.193 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 91.0 +/-6.474 %	CHAMBER : 068 DETECTOR S/N : 78794 AVERAGE %EFFICIENCY : 27.7658 AVERAGE %EFF ERROR : 0.5371 COUNT DATE : 17-Sep-2016 11:42:34 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B068.CNF;1804 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W068.CNF;453 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.9887E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.25	0.000	0.000	-0.960	0.960	0.9798	100.000	-1.66E-02	3.85E-02	1.14E-01	3.10E-02	3.85E-02
PU-238	5486.00	5497.56	49.420	3.000	2.040	0.960	0.9798	99.900	2.95E-02	5.89E-02	9.53E-02	2.60E-02	5.87E-02
PU-239	5155.00	5118.68	0.000	0.000	-1.200	1.200	1.0954	99.900	-1.73E-02	3.28E-02	1.01E-01	2.89E-02	3.27E-02
PU-242	4890.00	4902.87	43.536	267.000	265.800	1.200	1.0954	100.000	3.82E+00	6.85E-01	1.01E-01	2.88E-02	4.61E-01
PU-244	4589.00	4546.97	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	2.91E-02	4.31E-02	0.00E+00	2.90E-02



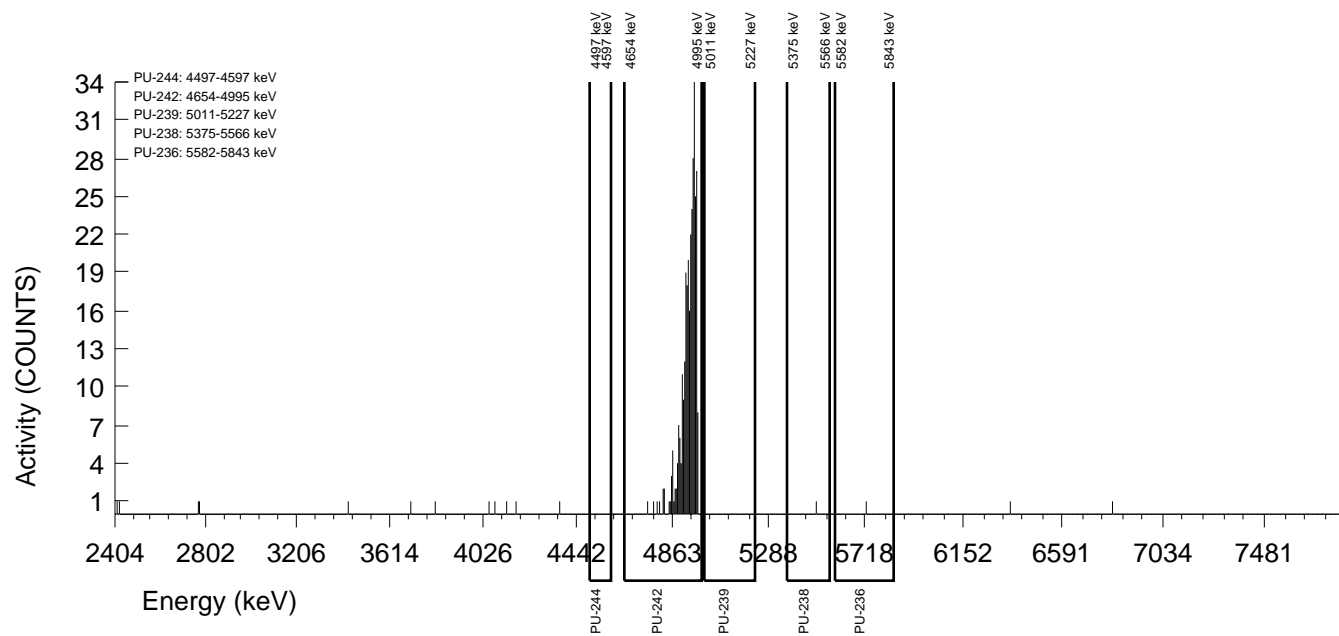
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S0405235065_PU SAMPLE QTY : 0.507 G +/-0.197 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 91.1 +/-5.981 %	CHAMBER : 069 DETECTOR S/N : 78795 AVERAGE %EFFICIENCY : 32.9662 AVERAGE %EFF ERROR : 0.6355 COUNT DATE : 17-Sep-2016 11:42:34 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B069.CNF;1819 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W069.CNF;495 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.9945E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5723.58	4.959	1.000	0.520	0.480	0.6928	100.000	7.71E-03	4.29E-02	8.21E-02	1.88E-02	4.28E-02
PU-238	5486.00	5502.78	4.959	1.000	1.000	0.000	0.0000	99.900	1.24E-02	3.49E-02	3.72E-02	0.00E+00	3.49E-02
PU-239	5155.00	5118.68	0.000	0.000	-0.720	0.720	0.8485	99.900	-8.88E-03	2.69E-02	7.53E-02	1.92E-02	2.68E-02
PU-242	4890.00	4938.75	48.654	317.000	316.040	0.960	0.9798	100.000	3.89E+00	6.45E-01	8.12E-02	2.21E-02	4.31E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.240	0.240	0.4899	99.900	-2.96E-03	2.56E-02	5.91E-02	1.11E-02	2.55E-02



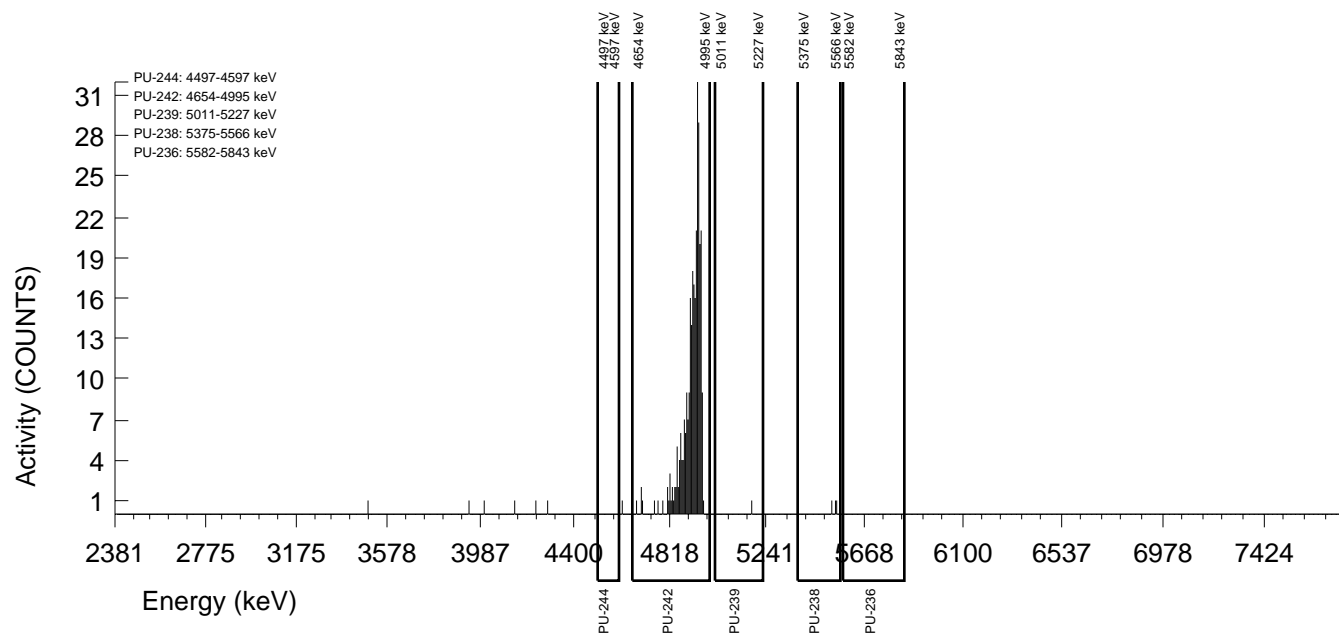
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S0405235066_PU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 90.3 +/-6.146 %	CHAMBER : 070 DETECTOR S/N : 78262 AVERAGE %EFFICIENCY : 31.2964 AVERAGE %EFF ERROR : 0.6038 COUNT DATE : 17-Sep-2016 11:42:34 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B070.CNF;1821 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W070.CNF;500 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.9579E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.24	0.000	0.000	-1.440	1.440	1.2000	100.000	-2.26E-02	3.65E-02	1.16E-01	3.45E-02	3.64E-02
PU-238	5486.00	5541.00	24.500	3.000	2.280	0.720	0.8485	99.900	3.00E-02	5.31E-02	8.03E-02	2.04E-02	5.30E-02
PU-239	5155.00	5176.90	4.900	1.000	-0.200	1.200	1.0954	99.900	-2.61E-03	3.92E-02	9.16E-02	2.62E-02	3.92E-02
PU-242	4890.00	4913.24	38.792	298.000	297.280	0.720	0.8485	100.000	3.88E+00	6.60E-01	7.97E-02	2.03E-02	4.42E-01
PU-244	4589.00	4546.97	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	2.64E-02	3.92E-02	0.00E+00	2.63E-02



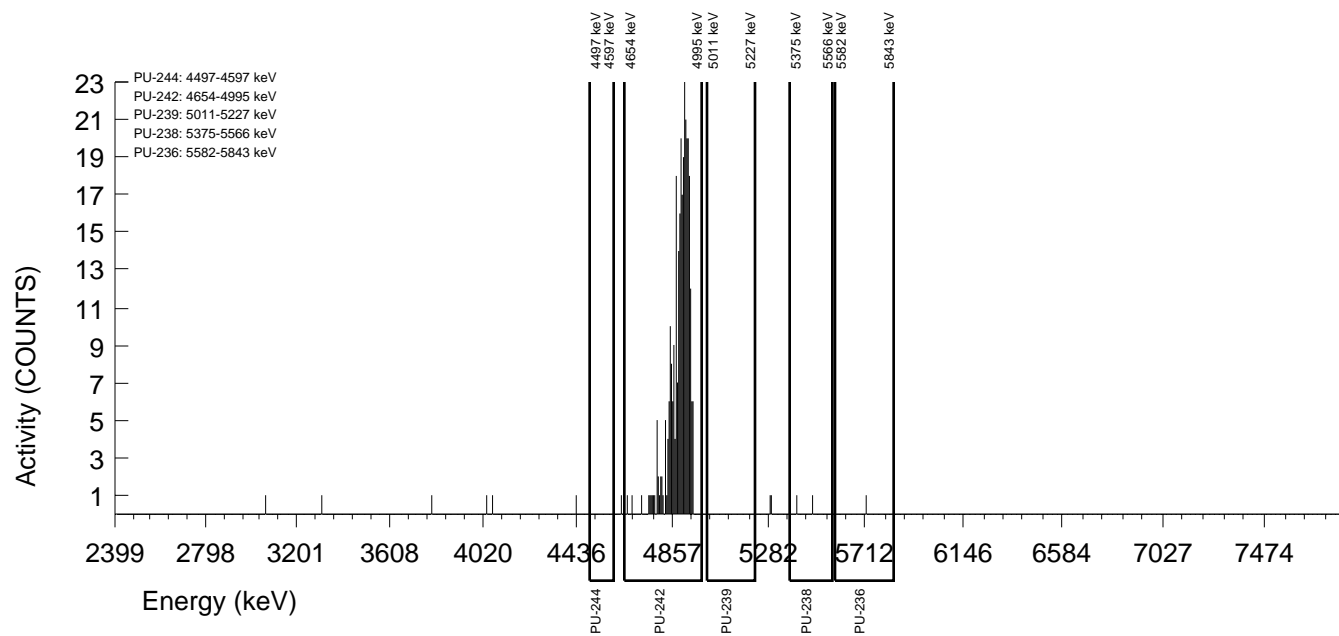
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S0405235067_PU SAMPLE QTY : 0.508 G +/-0.197 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 92.0 +/-6.024 %	CHAMBER : 071 DETECTOR S/N : 80020 AVERAGE %EFFICIENCY : 32.1394 AVERAGE %EFF ERROR : 0.6198 COUNT DATE : 17-Sep-2016 11:42:35 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B071.CNF;1814 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W071.CNF;464 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 4.0324E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5717.08	4.953	1.000	0.520	0.480	0.6928	100.000	7.83E-03	4.36E-02	8.34E-02	1.91E-02	4.35E-02
PU-238	5486.00	5445.38	69.348	2.000	1.760	0.240	0.4899	99.900	2.21E-02	4.36E-02	6.03E-02	1.13E-02	4.35E-02
PU-239	5155.00	5118.68	0.000	0.000	-0.480	0.480	0.6928	99.900	-6.00E-03	2.66E-02	6.93E-02	1.59E-02	2.65E-02
PU-242	4890.00	4893.79	62.153	312.000	311.040	0.960	0.9798	100.000	3.89E+00	6.48E-01	8.23E-02	2.24E-02	4.33E-01
PU-244	4589.00	4546.97	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	2.53E-02	3.75E-02	0.00E+00	2.52E-02



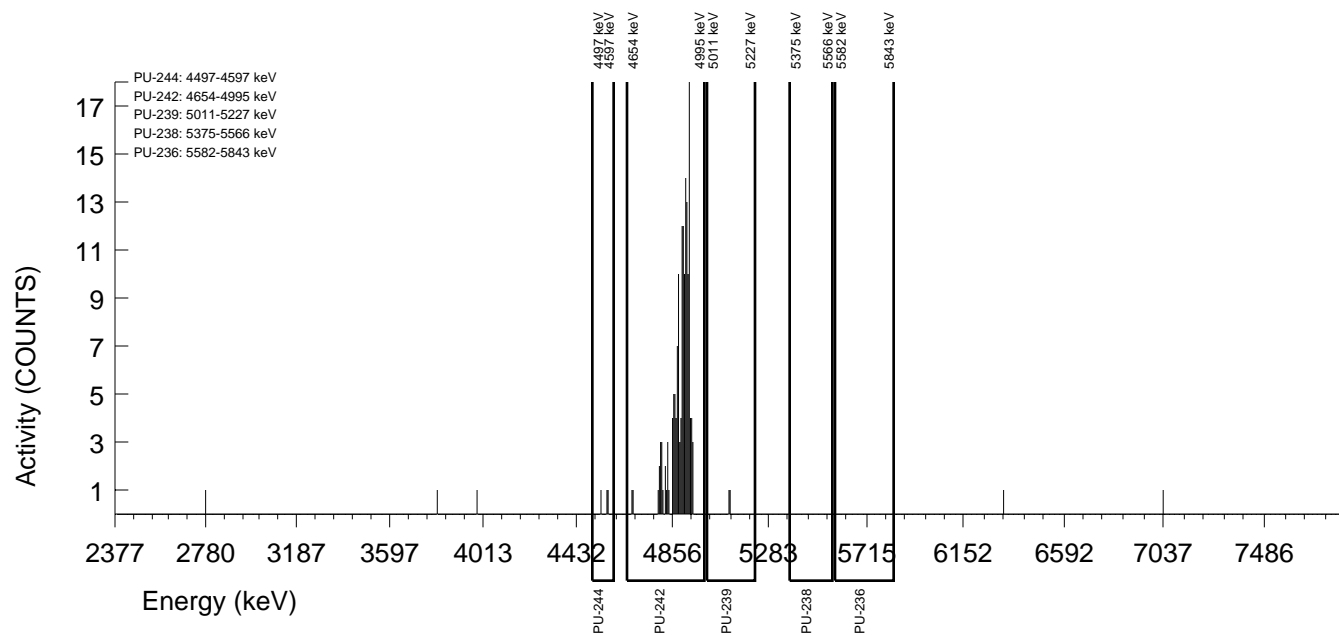
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S0405235068_PU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 47.7 +/-8.215 %	CHAMBER : 072 DETECTOR S/N : 67584 AVERAGE %EFFICIENCY : 31.8335 AVERAGE %EFF ERROR : 0.6139 COUNT DATE : 17-Sep-2016 11:42:35 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B072.CNF;1821 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W072.CNF;475 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 2.0916E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	5.92E-02	8.78E-02	0.00E+00	5.90E-02
PU-238	5486.00	5470.35	0.000	0.000	-0.240	0.240	0.4899	99.900	-5.87E-03	5.08E-02	1.17E-01	2.19E-02	5.06E-02
PU-239	5155.00	5109.06	10.008	2.000	0.320	1.680	1.2961	99.900	7.78E-03	8.87E-02	1.88E-01	5.77E-02	8.86E-02
PU-242	4890.00	4892.73	49.920	161.000	159.800	1.200	1.0954	100.000	3.88E+00	8.83E-01	1.70E-01	4.87E-02	6.06E-01
PU-244	4589.00	4556.86	35.028	3.000	3.000	0.000	0.0000	99.900	7.29E-02	9.67E-02	7.29E-02	0.00E+00	9.59E-02



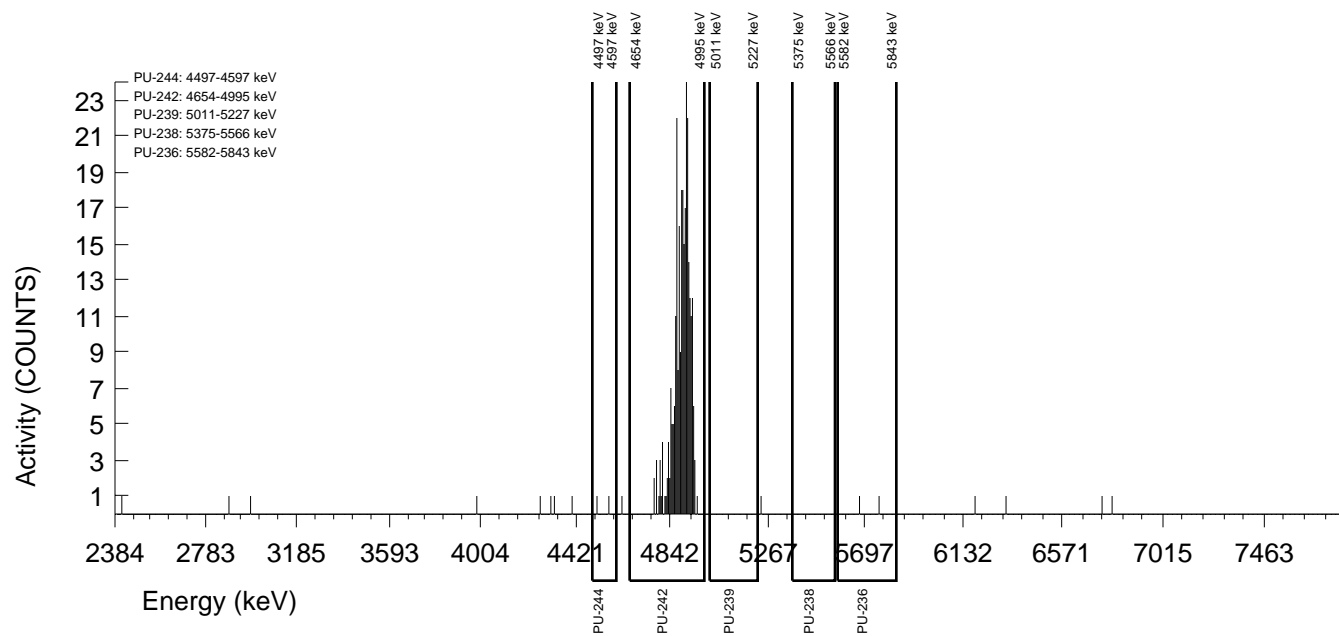
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S0405235069_PU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 80.3 +/-6.293 %	CHAMBER : 073 DETECTOR S/N : 78775 AVERAGE %EFFICIENCY : 33.5965 AVERAGE %EFF ERROR : 0.6474 COUNT DATE : 17-Sep-2016 11:42:35 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B073.CNF;1820 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W073.CNF;495 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.5202E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5718.81	84.102	2.000	0.320	1.680	1.2961	100.000	5.30E-03	6.04E-02	1.28E-01	3.93E-02	6.03E-02
PU-238	5486.00	5470.34	0.000	0.000	-0.720	0.720	0.8485	99.900	-9.99E-03	3.02E-02	8.47E-02	2.16E-02	3.02E-02
PU-239	5155.00	5118.68	0.000	0.000	-1.200	1.200	1.0954	99.900	-1.65E-02	3.14E-02	9.67E-02	2.77E-02	3.13E-02
PU-242	4890.00	4889.55	58.916	286.000	283.840	2.160	1.4697	100.000	3.91E+00	6.81E-01	1.15E-01	3.71E-02	4.58E-01
PU-244	4589.00	4541.25	54.419	2.000	1.520	0.480	0.6928	99.900	2.10E-02	4.82E-02	7.64E-02	1.75E-02	4.81E-02



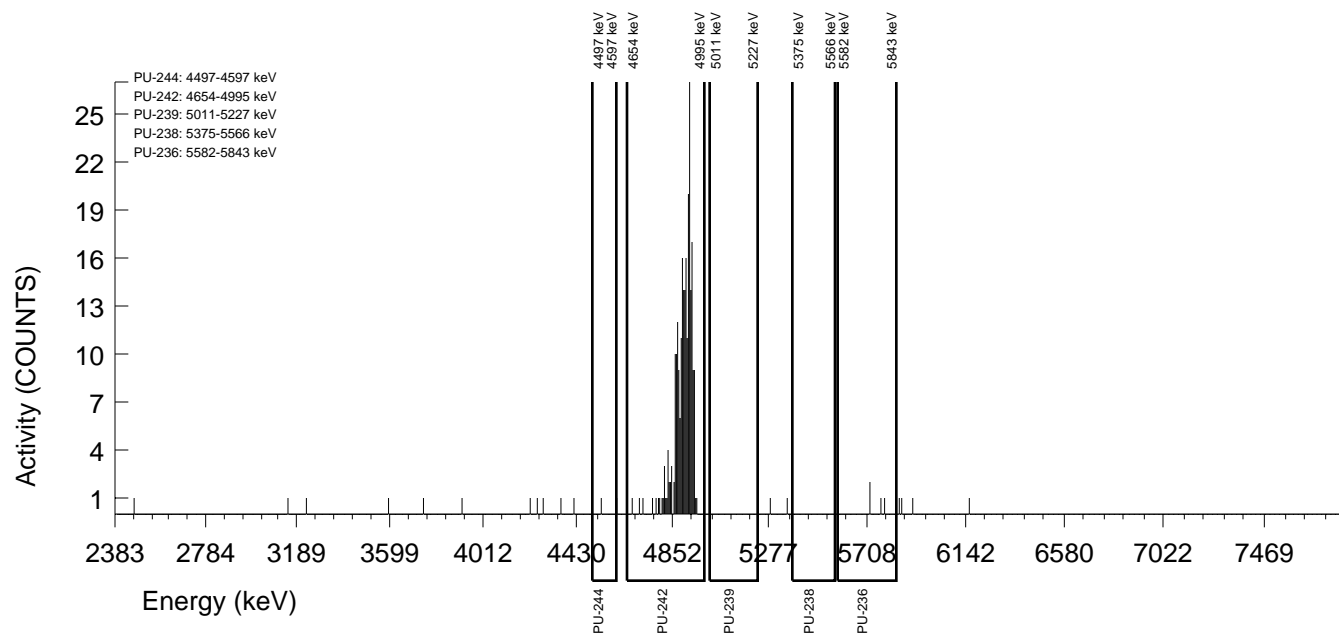
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S0405235070_PU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 78.8 +/-6.649 %	CHAMBER : 074 DETECTOR S/N : 83296 AVERAGE %EFFICIENCY : 30.3767 AVERAGE %EFF ERROR : 0.5864 COUNT DATE : 17-Sep-2016 11:42:35 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B074.CNF;1838 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W074.CNF;511 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.4544E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5752.09	4.988	4.000	1.840	2.160	1.4697	100.000	3.42E-02	8.61E-02	1.56E-01	5.00E-02	8.59E-02
PU-238	5486.00	5470.35	0.000	0.000	-0.240	0.240	0.4899	99.900	-3.72E-03	3.22E-02	7.44E-02	1.39E-02	3.21E-02
PU-239	5155.00	5118.69	0.000	0.000	-0.480	0.480	0.6928	99.900	-7.40E-03	3.28E-02	8.54E-02	1.96E-02	3.27E-02
PU-242	4890.00	4897.81	44.581	254.000	251.840	2.160	1.4697	100.000	3.88E+00	7.14E-01	1.29E-01	4.15E-02	4.83E-01
PU-244	4589.00	4566.43	0.000	2.000	2.000	0.000	0.0000	99.900	3.08E-02	5.30E-02	4.63E-02	0.00E+00	5.28E-02



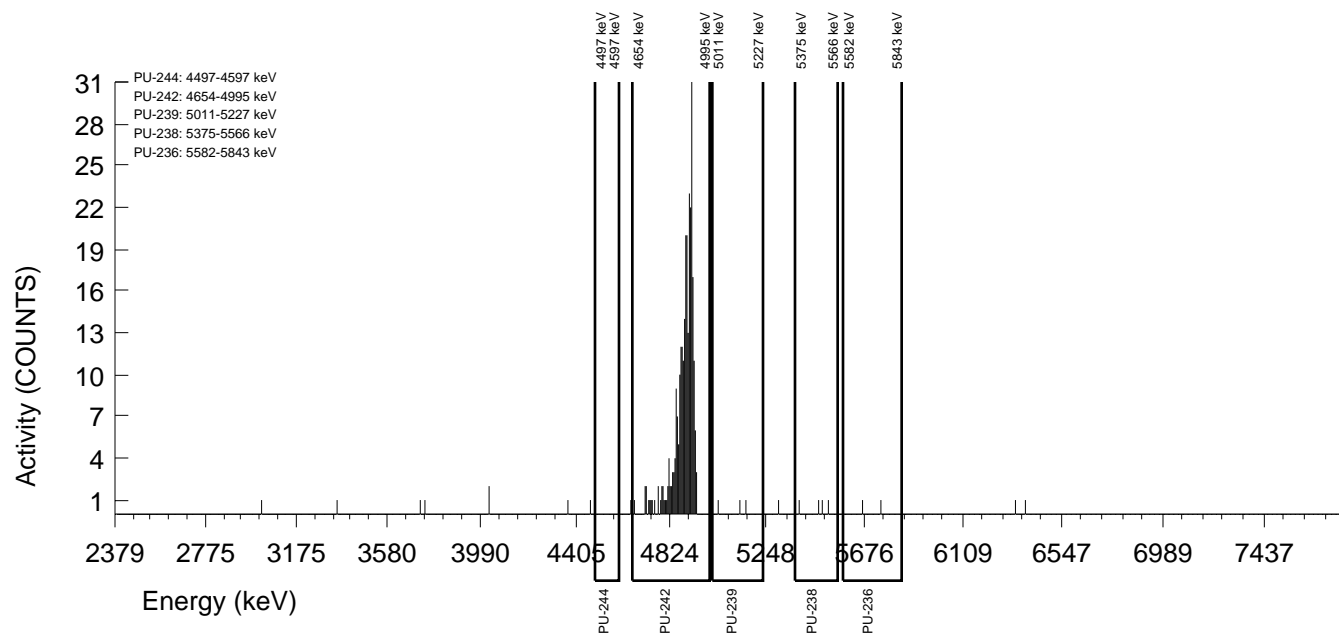
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S0405235071_PU SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 83.6 +/-6.282 %	CHAMBER : 075 DETECTOR S/N : 80010 AVERAGE %EFFICIENCY : 32.3452 AVERAGE %EFF ERROR : 0.6238 COUNT DATE : 17-Sep-2016 11:42:35 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B075.CNF;1821 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W075.CNF;478 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.6626E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5711.01	78.677	2.000	0.320	1.680	1.2961	100.000	5.20E-03	5.93E-02	1.26E-01	3.86E-02	5.93E-02
PU-238	5486.00	5470.55	122.933	4.000	3.760	0.240	0.4899	99.900	5.11E-02	6.06E-02	6.51E-02	1.22E-02	6.02E-02
PU-239	5155.00	5107.51	118.016	3.000	2.760	0.240	0.4899	99.900	3.73E-02	5.39E-02	6.47E-02	1.21E-02	5.37E-02
PU-242	4890.00	4883.78	34.421	286.000	284.320	1.680	1.2961	100.000	3.83E+00	6.67E-01	1.04E-01	3.20E-02	4.48E-01
PU-244	4589.00	4546.97	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	2.73E-02	4.05E-02	0.00E+00	2.72E-02



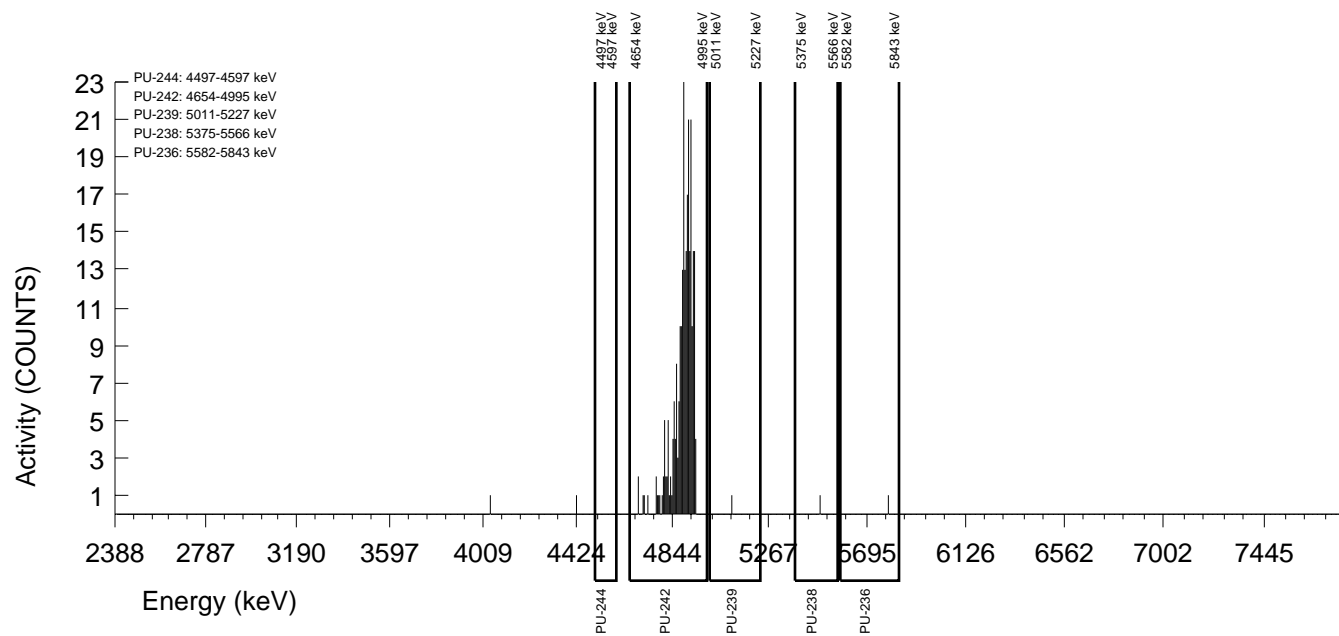
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S0405235072_PU SAMPLE QTY : 0.513 G +/-0.195 % SAMPLE DATE : 15-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 73.7 +/-6.539 %	CHAMBER : 078 DETECTOR S/N : 38633 AVERAGE %EFFICIENCY : 33.4433 AVERAGE %EFF ERROR : 0.6444 COUNT DATE : 17-Sep-2016 11:42:36 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B078.CNF;1726 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W078.CNF;447 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.2303E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5791.39	4.964	1.000	-0.200	1.200	1.0954	100.000	-3.57E-03	5.36E-02	1.25E-01	3.58E-02	5.36E-02
PU-238	5486.00	5491.03	4.964	1.000	0.760	0.240	0.4899	99.900	1.14E-02	4.27E-02	7.17E-02	1.34E-02	4.26E-02
PU-239	5155.00	5102.49	4.964	1.000	0.760	0.240	0.4899	99.900	1.13E-02	4.24E-02	7.12E-02	1.33E-02	4.24E-02
PU-242	4890.00	4888.52	53.358	260.000	259.280	0.720	0.8485	100.000	3.85E+00	6.97E-01	9.07E-02	2.31E-02	4.70E-01
PU-244	4589.00	4591.43	4.964	1.000	0.760	0.240	0.4899	99.900	1.13E-02	4.24E-02	7.12E-02	1.33E-02	4.24E-02



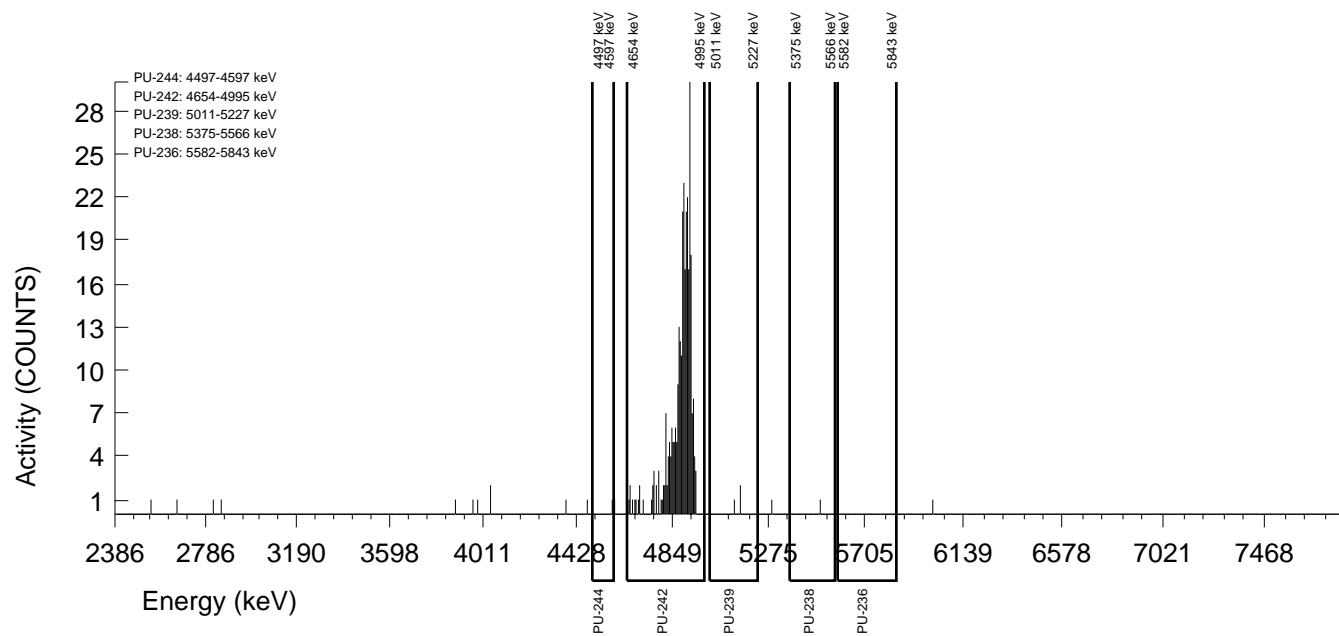
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S0405235073_PU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 86.0 +/-6.014 %	CHAMBER : 080 DETECTOR S/N : 78197 AVERAGE %EFFICIENCY : 34.4422 AVERAGE %EFF ERROR : 0.6633 COUNT DATE : 17-Sep-2016 11:42:36 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B080.CNF;1728 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W080.CNF;446 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.7686E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	-0.240	0.240	0.4899	100.000	-3.63E-03	3.14E-02	7.25E-02	1.36E-02	3.13E-02
PU-238	5486.00	5505.30	4.969	1.000	0.520	0.480	0.6928	99.900	6.57E-03	3.66E-02	7.00E-02	1.60E-02	3.65E-02
PU-239	5155.00	5143.01	4.969	3.000	2.040	0.960	0.9798	99.900	2.56E-02	5.11E-02	8.28E-02	2.25E-02	5.10E-02
PU-242	4890.00	4888.02	39.117	312.000	311.520	0.480	0.6928	100.000	3.91E+00	6.51E-01	6.95E-02	1.59E-02	4.35E-01
PU-244	4589.00	4590.46	0.000	2.000	1.520	0.480	0.6928	99.900	1.91E-02	4.39E-02	6.96E-02	1.59E-02	4.39E-02



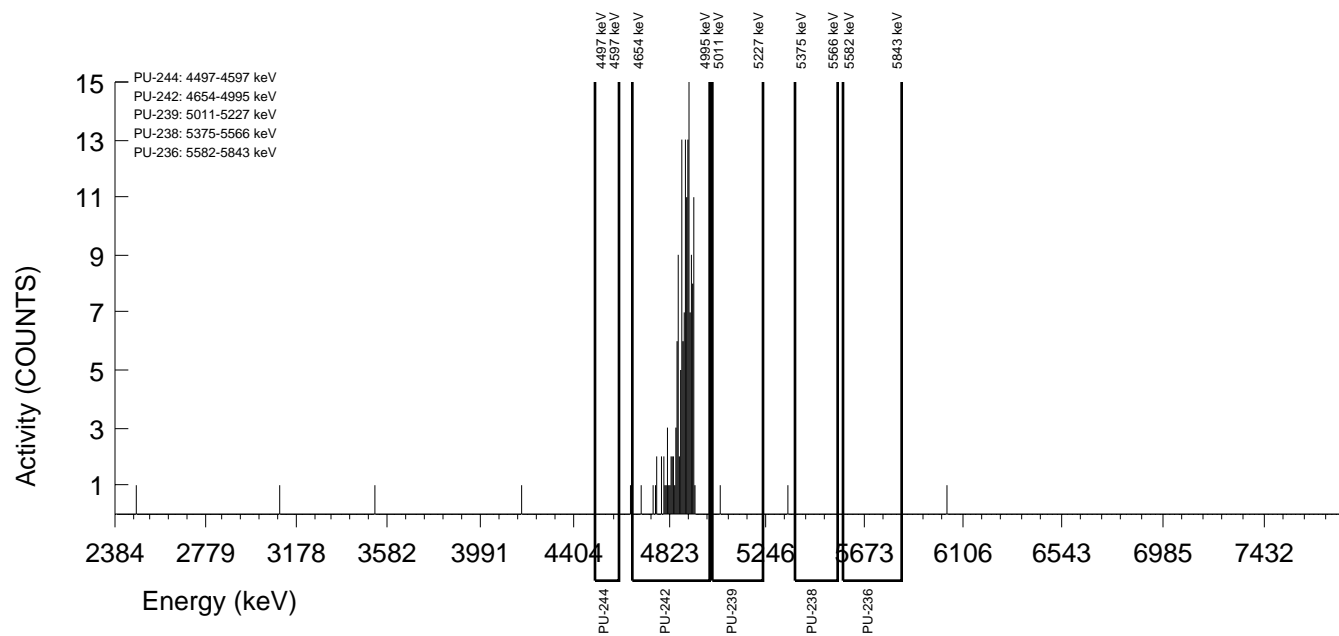
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S0405235074_PU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 15-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 46.0 +/-8.229 %	CHAMBER : 081 DETECTOR S/N : 79996 AVERAGE %EFFICIENCY : 33.0506 AVERAGE %EFF ERROR : 0.6369 COUNT DATE : 17-Sep-2016 11:42:36 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B081.CNF;1734 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W081.CNF;446 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 2.0181E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.23	0.000	0.000	-0.240	0.240	0.4899	100.000	-7.10E-03	6.15E-02	1.42E-01	2.66E-02	6.13E-02
PU-238	5486.00	5470.33	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	5.01E-02	7.44E-02	0.00E+00	5.00E-02
PU-239	5155.00	5044.07	4.901	1.000	0.040	0.960	0.9798	99.900	9.86E-04	7.32E-02	1.62E-01	4.42E-02	7.31E-02
PU-242	4890.00	4880.83	67.881	162.000	160.080	1.920	1.3856	100.000	3.94E+00	8.98E-01	1.99E-01	6.25E-02	6.17E-01
PU-244	4589.00	4597.20	0.000	1.000	0.520	0.480	0.6928	99.900	1.28E-02	7.13E-02	1.36E-01	3.13E-02	7.12E-02



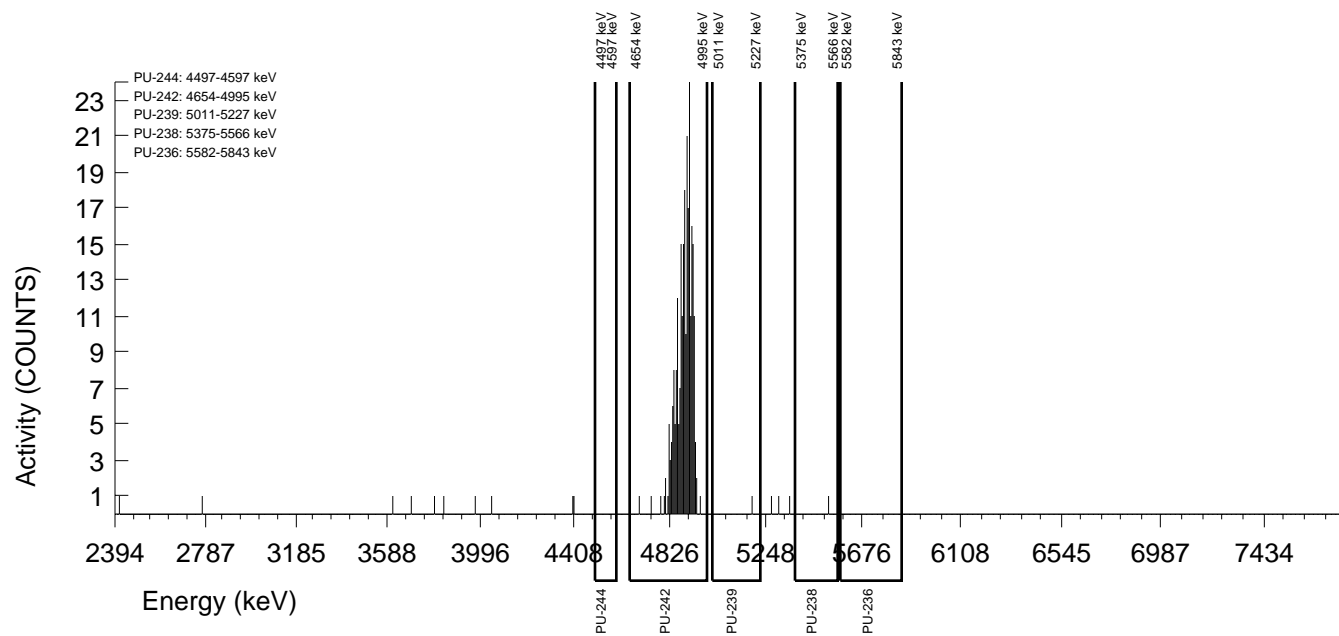
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S0405235075_PU SAMPLE QTY : 0.508 G +/-0.197 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 76.7 +/-6.584 %	CHAMBER : 082 DETECTOR S/N : 79997 AVERAGE %EFFICIENCY : 31.9848 AVERAGE %EFF ERROR : 0.6168 COUNT DATE : 17-Sep-2016 11:42:36 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B082.CNF;1724 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W082.CNF;423 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.3625E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.23	0.000	0.000	-0.720	0.720	0.8485	100.000	-1.30E-02	3.94E-02	1.11E-01	2.81E-02	3.93E-02
PU-238	5486.00	5525.58	4.883	1.000	-0.200	1.200	1.0954	99.900	-3.03E-03	4.56E-02	1.06E-01	3.04E-02	4.55E-02
PU-239	5155.00	5189.96	4.883	1.000	-3.080	4.080	2.0199	99.900	-4.64E-02	5.15E-02	1.57E-01	5.58E-02	5.15E-02
PU-242	4890.00	4891.83	54.322	261.000	258.120	2.880	1.6971	100.000	3.89E+00	7.09E-01	1.39E-01	4.68E-02	4.78E-01
PU-244	4589.00	4546.96	0.000	0.000	-0.240	0.240	0.4899	99.900	-3.62E-03	3.13E-02	7.23E-02	1.35E-02	3.12E-02



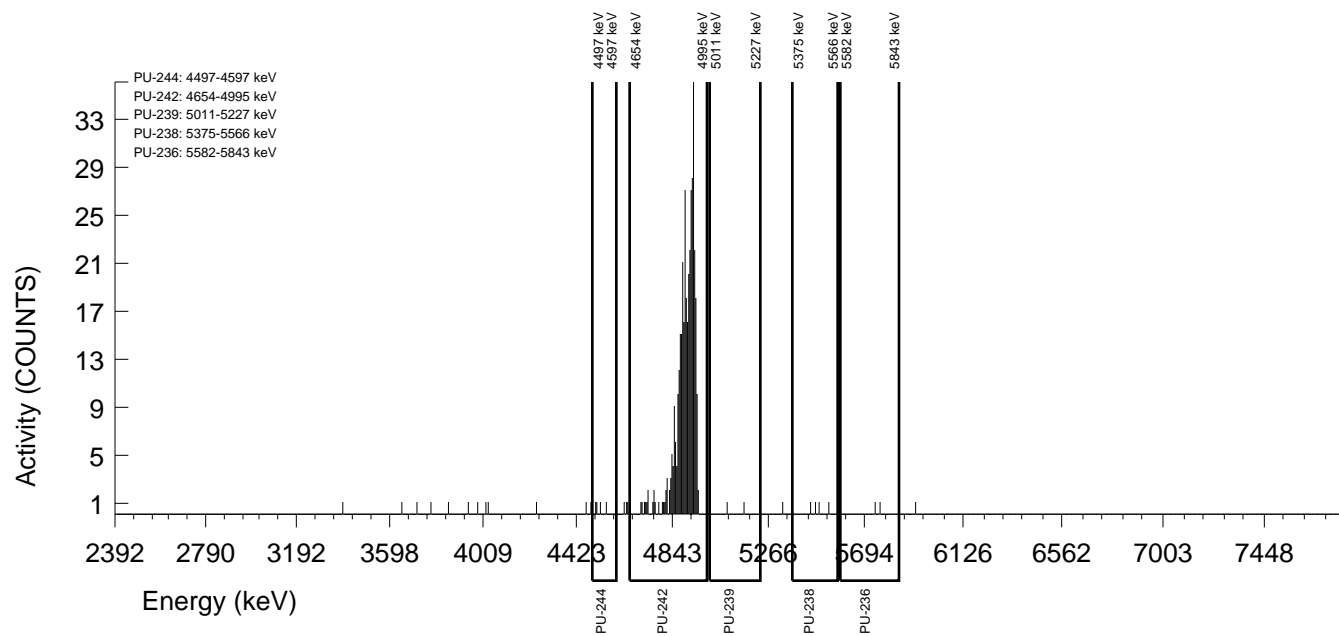
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S0405235076_PU SAMPLE QTY : 0.512 G +/-0.195 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 104 +/-5.477 %	CHAMBER : 083 DETECTOR S/N : 78785 AVERAGE %EFFICIENCY : 35.3477 AVERAGE %EFF ERROR : 0.6805 COUNT DATE : 17-Sep-2016 11:42:37 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B083.CNF;1740 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W083.CNF;485 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 4.5599E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5747.57	24.717	2.000	1.520	0.480	0.6928	100.000	1.83E-02	4.20E-02	6.66E-02	1.53E-02	4.20E-02
PU-238	5486.00	5487.40	79.093	4.000	3.520	0.480	0.6928	99.900	3.53E-02	4.49E-02	5.56E-02	1.27E-02	4.48E-02
PU-239	5155.00	5122.63	74.150	2.000	1.040	0.960	0.9798	99.900	1.04E-02	3.55E-02	6.58E-02	1.79E-02	3.55E-02
PU-242	4890.00	4901.61	56.848	389.000	386.840	2.160	1.4697	100.000	3.86E+00	5.85E-01	8.36E-02	2.68E-02	3.86E-01
PU-244	4589.00	4525.17	49.433	4.000	3.520	0.480	0.6928	99.900	3.51E-02	4.47E-02	5.53E-02	1.27E-02	4.45E-02



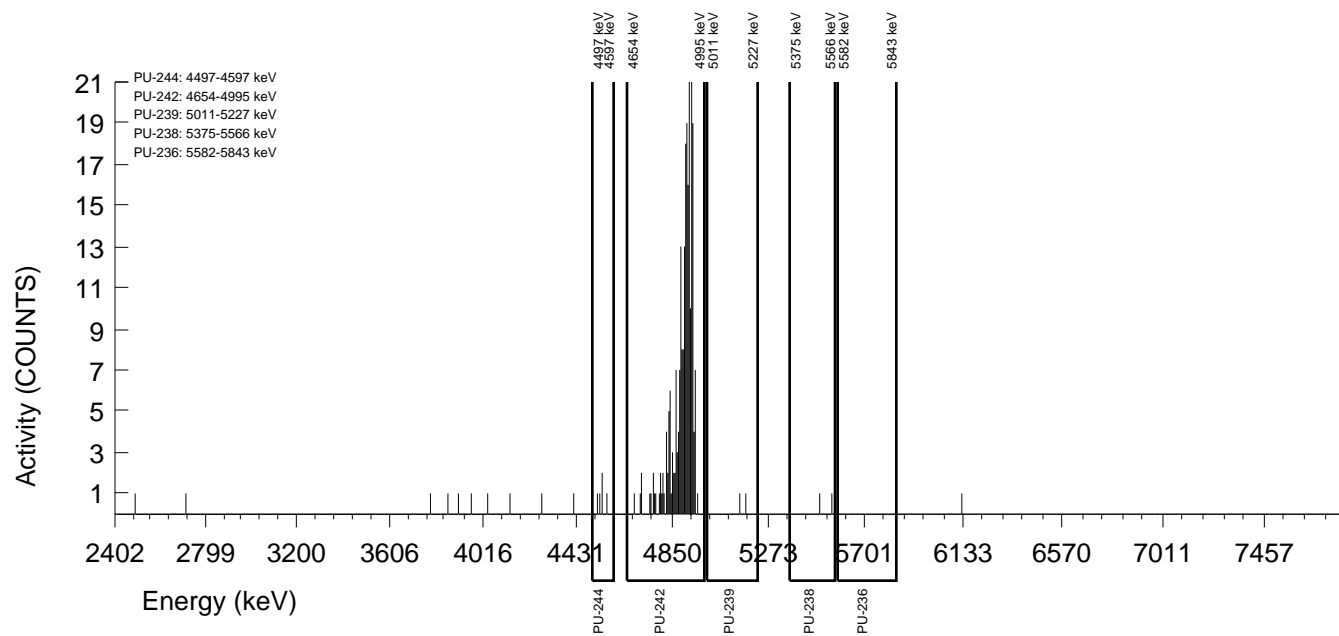
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S0405235077_PU SAMPLE QTY : 0.510 G +/-0.196 % SAMPLE DATE : 17-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 65.9 +/-6.779 %	CHAMBER : 084 DETECTOR S/N : 78265 AVERAGE %EFFICIENCY : 34.7248 AVERAGE %EFF ERROR : 0.6686 COUNT DATE : 17-Sep-2016 11:42:37 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B084.CNF;1729 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W084.CNF;476 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 2.8865E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.25	0.000	0.000	-0.720	0.720	0.8485	100.000	-1.39E-02	4.21E-02	1.18E-01	3.00E-02	4.20E-02
PU-238	5486.00	5529.44	54.265	2.000	2.000	0.000	0.0000	99.900	3.24E-02	5.57E-02	4.86E-02	0.00E+00	5.55E-02
PU-239	5155.00	5164.30	29.599	2.000	0.320	1.680	1.2961	99.900	5.16E-03	5.88E-02	1.25E-01	3.82E-02	5.87E-02
PU-242	4890.00	4899.77	54.182	242.000	240.560	1.440	1.2000	100.000	3.87E+00	7.27E-01	1.19E-01	3.54E-02	4.92E-01
PU-244	4589.00	4543.42	4.933	5.000	4.760	0.240	0.4899	99.900	7.67E-02	7.88E-02	7.72E-02	1.45E-02	7.81E-02



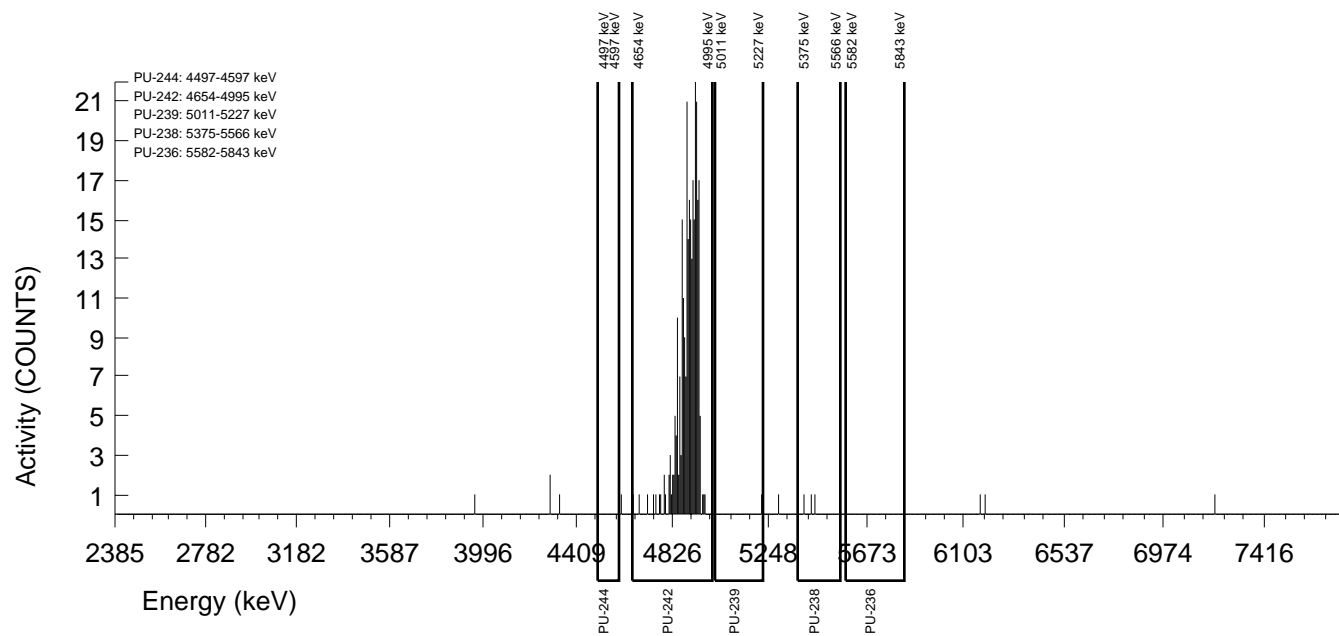
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S0405235078_PU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 17-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 82.8 +/-6.241 %	CHAMBER : 085 DETECTOR S/N : 78776 AVERAGE %EFFICIENCY : 32.9780 AVERAGE %EFF ERROR : 0.6356 COUNT DATE : 17-Sep-2016 11:42:37 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B085.CNF;1732 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W085.CNF;479 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.6297E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	-1.200	1.200	1.0954	100.000	-1.96E-02	3.72E-02	1.15E-01	3.28E-02	3.72E-02
PU-238	5486.00	5428.03	49.309	3.000	1.320	1.680	1.2961	99.900	1.81E-02	5.68E-02	1.06E-01	3.25E-02	5.67E-02
PU-239	5155.00	5215.97	4.931	1.000	-0.440	1.440	1.2000	99.900	-5.99E-03	4.14E-02	1.01E-01	2.99E-02	4.14E-02
PU-242	4890.00	4894.63	73.141	288.000	287.280	0.720	0.8485	100.000	3.91E+00	6.76E-01	8.31E-02	2.12E-02	4.54E-01
PU-244	4589.00	4546.97	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	2.75E-02	4.09E-02	0.00E+00	2.75E-02



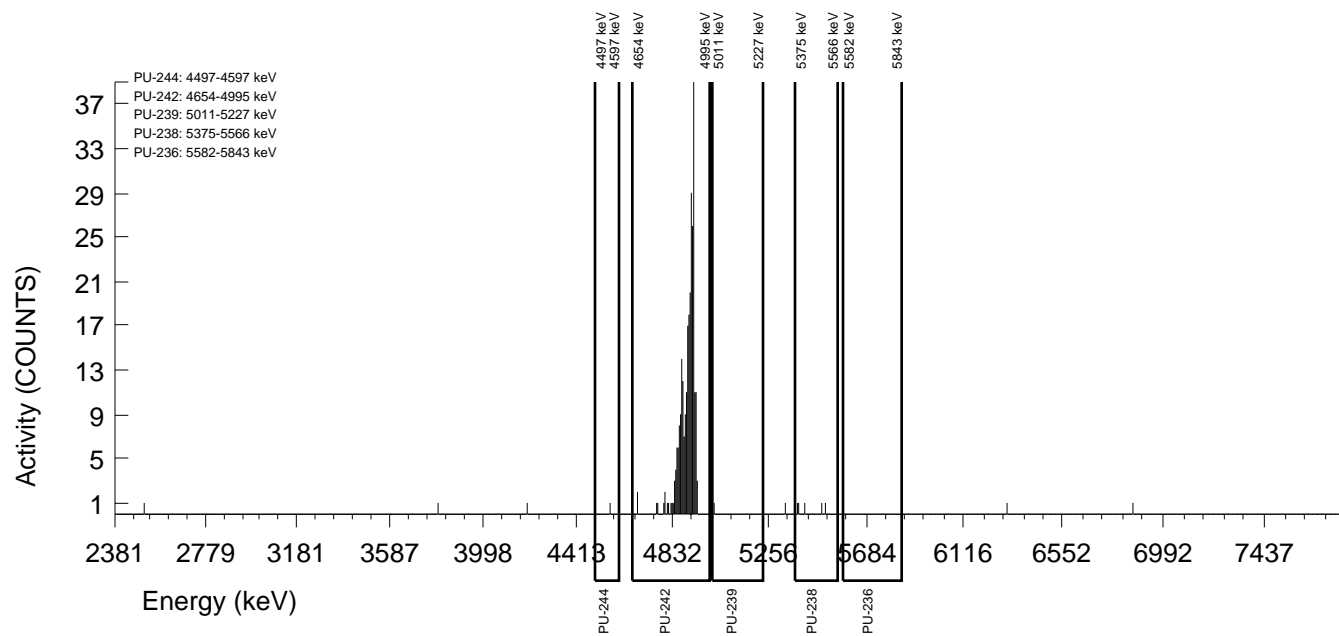
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S1203621769_PU SAMPLE QTY : 0.518 G +/-0.193 % SAMPLE DATE : 15-Sep-2016 00:00:00 ANALYST : KXB2 % YIELD : 83.0 +/-6.420 %	CHAMBER : 086 DETECTOR S/N : 78198 AVERAGE %EFFICIENCY : 31.1951 AVERAGE %EFF ERROR : 0.6019 COUNT DATE : 17-Sep-2016 11:42:37 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B086.CNF;1733 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W086.CNF;455 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.6379E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	-0.720	0.720	0.8485	100.000	-1.01E-02	3.05E-02	8.56E-02	2.18E-02	3.05E-02
PU-238	5486.00	5437.23	118.750	5.000	4.040	0.960	0.9798	99.900	5.66E-02	6.93E-02	9.23E-02	2.51E-02	6.89E-02
PU-239	5155.00	5017.21	4.948	1.000	0.040	0.960	0.9798	99.900	5.60E-04	4.16E-02	9.23E-02	2.51E-02	4.15E-02
PU-242	4890.00	4898.93	19.527	275.000	272.360	2.640	1.6248	100.000	3.81E+00	6.78E-01	1.25E-01	4.17E-02	4.56E-01
PU-244	4589.00	4559.45	4.948	1.000	0.520	0.480	0.6928	99.900	7.28E-03	4.05E-02	7.76E-02	1.78E-02	4.05E-02



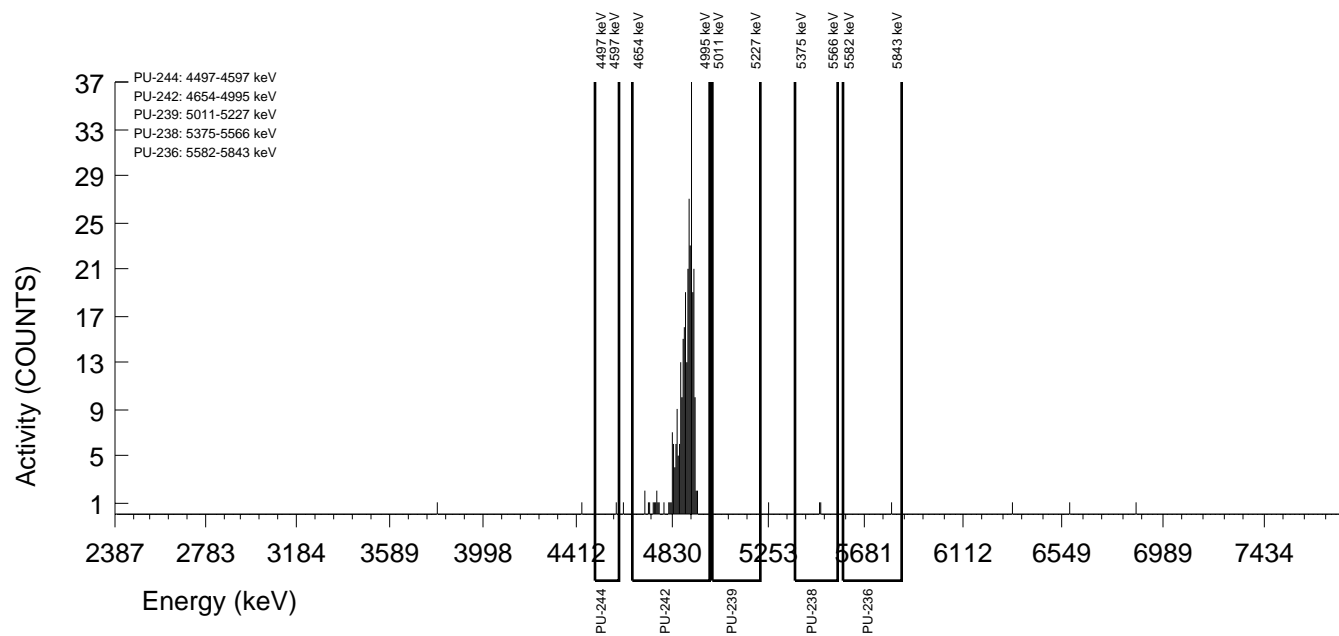
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S1203621770_PU SAMPLE QTY : 0.507 G +/-0.197 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 92.4 +/-6.111 %	CHAMBER : 088 DETECTOR S/N : 83291 AVERAGE %EFFICIENCY : 31.2191 AVERAGE %EFF ERROR : 0.6024 COUNT DATE : 17-Sep-2016 11:42:37 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B088.CNF;1728 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W088.CNF;463 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 4.0488E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5798.83	4.923	1.000	0.520	0.480	0.6928	100.000	8.03E-03	4.47E-02	8.55E-02	1.96E-02	4.46E-02
PU-238	5486.00	5485.03	9.845	2.000	1.760	0.240	0.4899	99.900	2.28E-02	4.48E-02	6.20E-02	1.16E-02	4.47E-02
PU-239	5155.00	5118.68	0.000	0.000	-1.440	1.440	1.2000	99.900	-1.85E-02	2.99E-02	9.50E-02	2.82E-02	2.98E-02
PU-242	4890.00	4892.91	36.398	306.000	303.360	2.640	1.6248	100.000	3.89E+00	6.59E-01	1.15E-01	3.82E-02	4.41E-01
PU-244	4589.00	4589.29	4.923	1.000	1.000	0.000	0.0000	99.900	1.28E-02	3.62E-02	3.85E-02	0.00E+00	3.61E-02



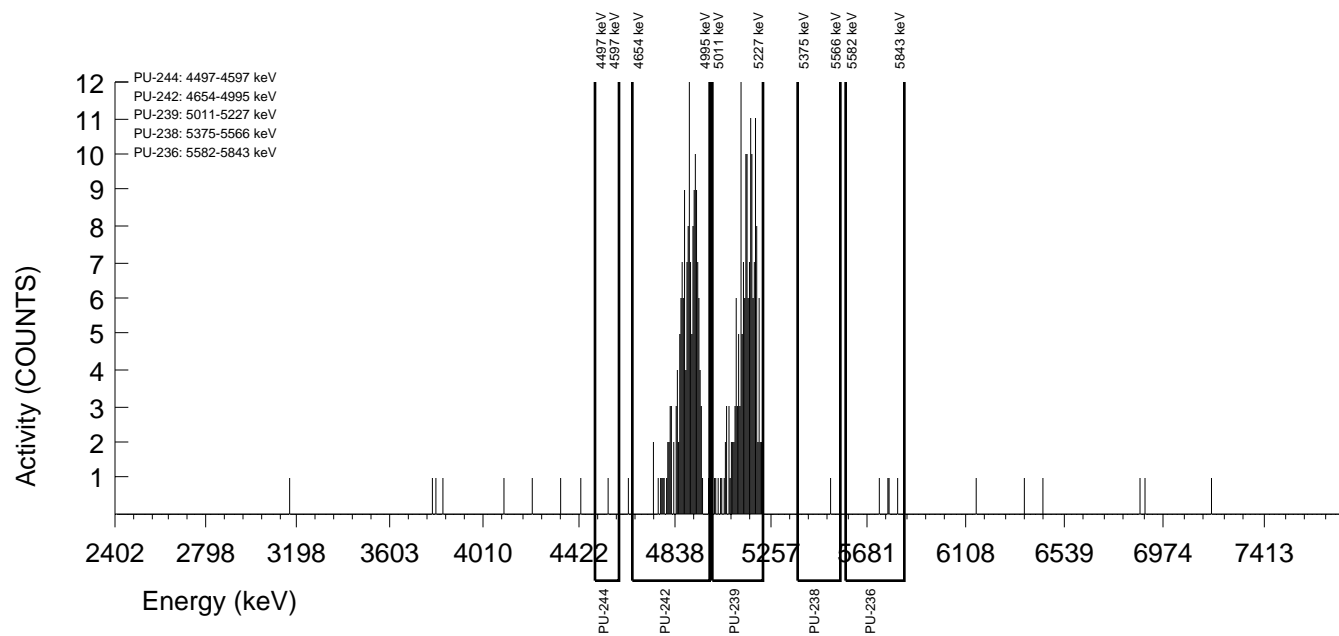
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596421 SAMPLE ID : S1203621771_PU SAMPLE QTY : 0.518 G +/-0.193 % SAMPLE DATE : 15-Sep-2016 00:00:00 ANALYST : KXB2 % YIELD : 58.9 +/-8.130 %	CHAMBER : 169 DETECTOR S/N : 72548 AVERAGE %EFFICIENCY : 26.2282 AVERAGE %EFF ERROR : 0.5082 COUNT DATE : 17-Sep-2016 11:44:20 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B169.CNF;874 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W169.CNF;259 CAL DATE : 13-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 2.5818E+00 dpm	LCS ID : 0338-MM NUCLIDE : PU-239 NOMINAL (pCi/G) : 3.8148E+00 % RECOVERY : 104.617	

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5773.82	78.867	4.000	3.040	0.960	0.9798	100.000	7.14E-02	1.07E-01	1.55E-01	4.22E-02	1.06E-01
PU-238	5486.00	5521.49	4.929	1.000	-0.440	1.440	1.2000	99.900	-1.03E-02	7.14E-02	1.74E-01	5.16E-02	7.13E-02
PU-239	5155.00	5151.24	69.009	170.000	170.000	0.000	0.0000	99.900	3.99E+00	8.89E-01	7.04E-02	0.00E+00	6.02E-01
PU-242	4890.00	4895.23	73.938	163.000	162.520	0.480	0.6928	100.000	3.81E+00	8.58E-01	1.30E-01	2.98E-02	5.89E-01
PU-244	4589.00	4551.68	4.929	1.000	1.000	0.000	0.0000	99.900	2.35E-02	6.61E-02	7.04E-02	0.00E+00	6.60E-02



Batch# 1596412 Product: Pu Date: 9/22/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NB
Samples have been blank corrected (if required). Blank correction reported included (if required).			NB
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	DER# 1560531
Sample was correctly preserved if required.			NB
Smears Taken for Radioactive batches.			NB
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.	✓		
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NB
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER# 1560531
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER# 1560531
Aliquot Correction completed if required.			NB
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: Y. M. [Signature] 9/22/16

Secondary Review Performed By: J. [Signature] 09/30/16

10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 22-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Pu-11-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596412	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Peak Centroid Values Off Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060, and 1203621752 were received and analyzed out of holding.</p> <p>2. The Pu-242 tracer peak centroid for sample 405235047 is greater than 50 keV from the expected energy value of 4890 keV.</p>		<p>1. Reporting results.</p> <p>2. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.</p>	

Originator's Name:

Melanie Aycock 22-SEP-16

Data Validator/Group Leader:

Jessica Davis 30-SEP-16

Plutonium Queue Sheet

07-SEP-16

Batch #: 1596412 Analyst: HAKB First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16
 Tracer Isotope(s): Pu-242/Pu-236 Tracer Code: 1710-A Expiration Date: 8/3/17 Analyzed Sequentially with:
 LCS Isotope(s): Pu-239/Pu-238 LCS Code: 0338-NAWA Expiration Date: 7/20/17 U: 1596408
 Spike Isotope(s): Pu-239/Pu-238 Spike Code: Expiration Date: Am: 1596410

Prep Date: 9/30/16 Initials: HAKB Pipet ID: 184002Z Balance ID: 16107662 Witness: JLB 9/20/16

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	Pu Det #
405235041-1	4.4D.R.1.4	SAMPLE	1 pCi/g	SOIL	MJWC001	30-NOV-15	1	1	0.509	67	
405235042-1	4.4D.R.2.3	SAMPLE	1 pCi/g	SOIL	MJWC001	30-NOV-15	2	2	0.500	69	
405235043-1	4.4D.R.2.4	SAMPLE	1 pCi/g	SOIL	MJWC001	30-NOV-15	3	3	0.507	70	
405235044-1	4.4D.R.4.2	SAMPLE	1 pCi/g	SOIL	MJWC001	30-NOV-15	4	4	0.505	71	
405235045-1	4.4D.R.5.2	SAMPLE	1 pCi/g	SOIL	MJWC001	30-NOV-15	5	5	0.502	72	
405235046-1	4.5A.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	07-DEC-15	6	6	0.514	73	
405235047-1	4.5A.R.1.4	SAMPLE	1 pCi/g	SOIL	MJWC001	07-DEC-15	7	7	0.503	74	
405235048-1	4.5B.R.1.2	SAMPLE	1 pCi/g	SOIL	MJWC001	07-DEC-15	8	8	0.507	75	
405235049-1	4.5B.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	07-DEC-15	9	9	0.506	78	
405235050-1	4.5B.R.1.4	SAMPLE	1 pCi/g	SOIL	MJWC001	07-DEC-15	10	10	0.504	80	
405235051-1	4.5B.R.2.3	SAMPLE	1 pCi/g	SOIL	MJWC001	07-DEC-15	11	11	0.502	81	
405235052-1	4.5B.R.2.4	SAMPLE	1 pCi/g	SOIL	MJWC001	07-DEC-15	12	12	0.508	82	
405235053-1	4.5C.R.5.2	SAMPLE	1 pCi/g	SOIL	MJWC001	01-DEC-15	13	13	0.500	89	
405235054-1	4.5C.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	02-DEC-15	14	14	0.500	90	
405235055-1	4.5C.R.1.4	SAMPLE	1 pCi/g	SOIL	MJWC001	02-DEC-15	15	15	0.510	91	
405235056-1	4.5C.R.2.2	SAMPLE	1 pCi/g	SOIL	MJWC001	02-DEC-15	16	16	0.509	92	
405235057-1	4.5C.R.2.3	SAMPLE	1 pCi/g	SOIL	MJWC001	02-DEC-15	17	17	0.500	93	
405235058-1	4.5C.R.2.4	SAMPLE	1 pCi/g	SOIL	MJWC001	02-DEC-15	18	18	0.512	95	
405235059-1	5.1A.R.1.2	SAMPLE	1 pCi/g	SOIL	MJWC001	16-DEC-15	19	19	0.503	96	
405235060-1	5.1A.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	16-DEC-15	20	20	0.515	97	
1203621751-1	MB for batch 1596412	MB	1 pCi/g	SOIL	QC ACCOUNT	30-NOV-15	21	21	0.515	99	
1203621752-1	4.4D.R.1.4(405235041DUP)	DUP	1 pCi/g	SOIL	QC ACCOUNT	30-NOV-15	22	22	0.511	103	
1203621753-1	LCS for batch 1596412	LCS	1 pCi/g	SOIL	QC ACCOUNT	30-NOV-15	23	23	0.515	104	

Choose SOP Used: GL-RAD-A-011 GL-RAD-A-036, Solid Sample Dissolution by: LEACH or DIGESTION Circle One
 GL-RAD-A-053
 GEL Laboratories LLC, Radiochemistry Division
 Data Reviewed By: M. Anderson 9/22/16
 Page: 1 of 1

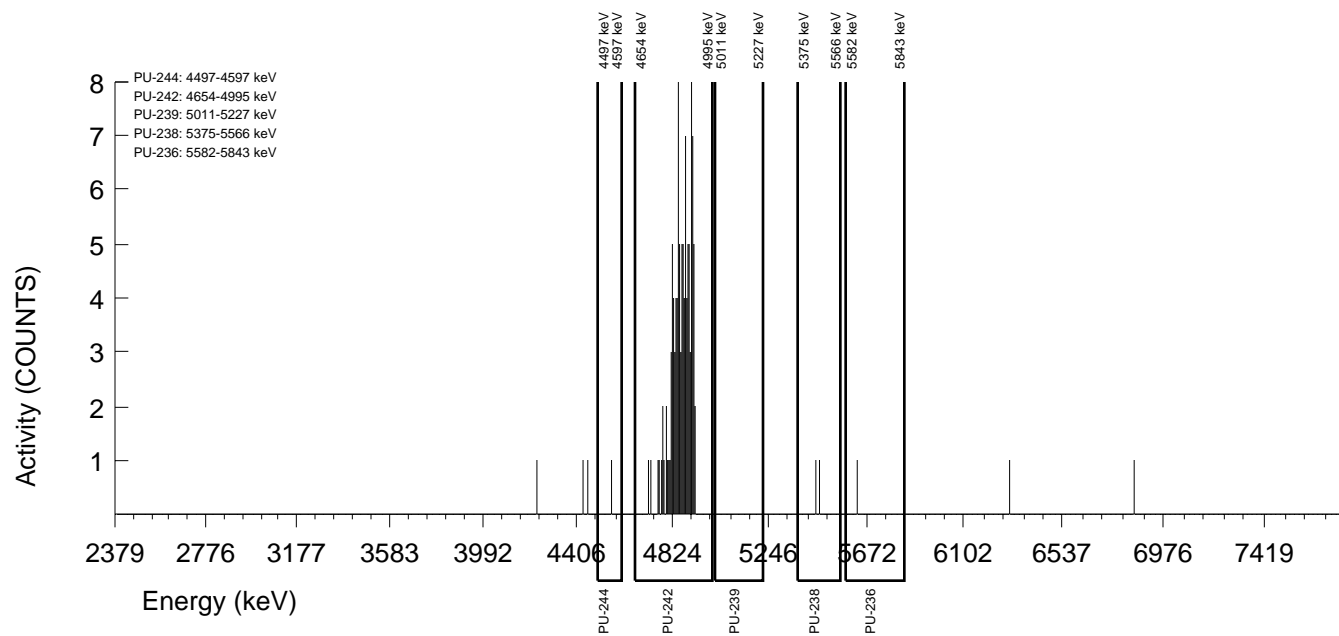
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235041_PU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 69.6 +/-9.741 %	CHAMBER : 067 DETECTOR S/N : 78780 AVERAGE %EFFICIENCY : 29.1959 AVERAGE %EFF ERROR : 0.5641 COUNT DATE : 22-Sep-2016 09:56:19 ELAPSED LIVE TIME(SEC) : 7510.30	LIB FILE : PU BKG FILE : B067.CNF;1813 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W067.CNF;476 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.0510E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5634.56	4.935	1.000	0.374	0.626	0.7911	100.000	1.59E-02	1.20E-01	2.44E-01	5.85E-02	1.20E-01
PU-238	5486.00	5461.05	19.738	2.000	2.000	0.000	0.0000	99.900	7.01E-02	1.20E-01	1.05E-01	0.00E+00	1.19E-01
PU-239	5155.00	5118.69	0.000	0.000	-0.250	0.250	0.5003	99.900	-8.72E-03	7.02E-02	1.65E-01	3.04E-02	6.98E-02
PU-242	4890.00	4862.17	92.935	112.000	111.499	0.501	0.7076	100.000	3.88E+00	1.05E+00	1.90E-01	4.30E-02	7.25E-01
PU-244	4589.00	4556.91	4.935	1.000	1.000	0.000	0.0000	99.900	3.48E-02	9.71E-02	1.04E-01	0.00E+00	9.69E-02



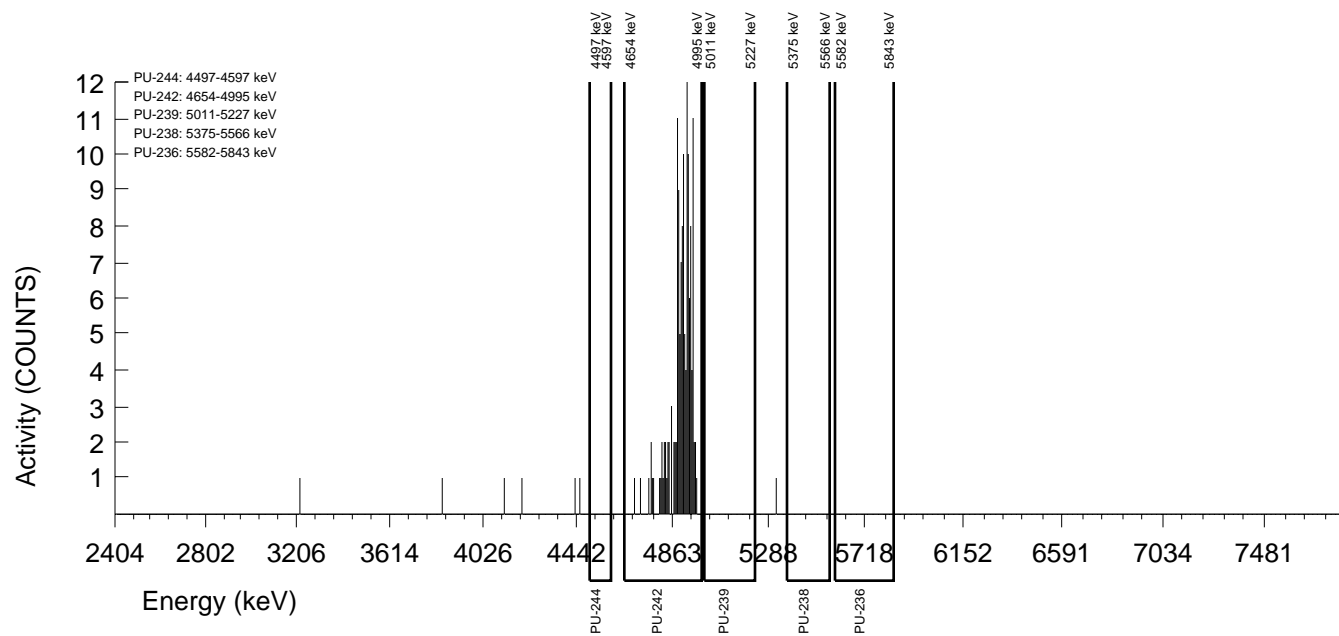
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235042_PU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 79.8 +/-8.595 %	CHAMBER : 069 DETECTOR S/N : 78795 AVERAGE %EFFICIENCY : 32.9662 AVERAGE %EFF ERROR : 0.6355 COUNT DATE : 22-Sep-2016 09:56:19 ELAPSED LIVE TIME(SEC) : 7518.12	LIB FILE : PU BKG FILE : B069.CNF;1819 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W069.CNF;495 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.4981E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.25	0.000	0.000	-0.251	0.251	0.5006	100.000	-8.34E-03	6.70E-02	1.58E-01	2.91E-02	6.68E-02
PU-238	5486.00	5470.34	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	5.46E-02	8.26E-02	0.00E+00	5.44E-02
PU-239	5155.00	5118.68	0.000	0.000	-0.376	0.376	0.6131	99.900	-1.03E-02	5.55E-02	1.41E-01	2.93E-02	5.53E-02
PU-242	4890.00	4905.23	69.971	145.000	144.499	0.501	0.7080	100.000	3.95E+00	9.40E-01	1.50E-01	3.38E-02	6.47E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.125	0.125	0.3540	99.900	-3.43E-03	5.47E-02	1.16E-01	1.69E-02	5.45E-02



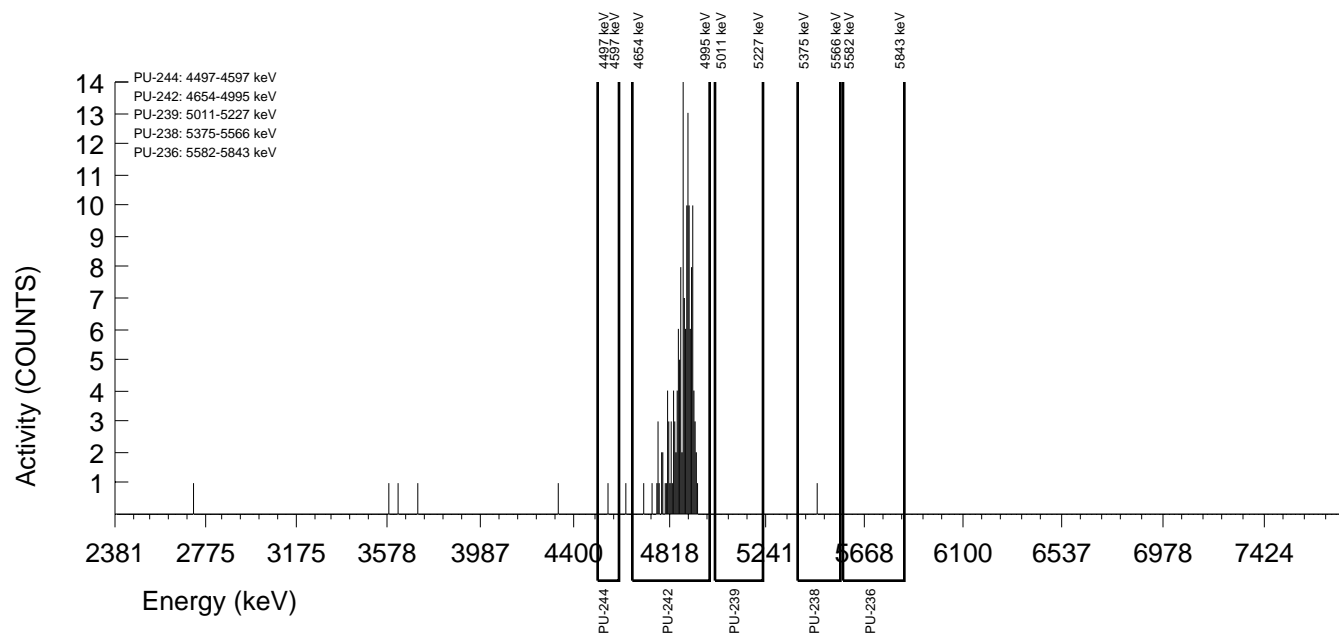
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235043_PU SAMPLE QTY : 0.507 G +/-0.197 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 88.8 +/-8.370 %	CHAMBER : 070 DETECTOR S/N : 78262 AVERAGE %EFFICIENCY : 31.2964 AVERAGE %EFF ERROR : 0.6038 COUNT DATE : 22-Sep-2016 09:56:19 ELAPSED LIVE TIME(SEC) : 7521.69	LIB FILE : PU BKG FILE : B070.CNF;1821 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W070.CNF;500 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.8901E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.24	0.000	0.000	-0.752	0.752	0.8673	100.000	-2.34E-02	6.44E-02	1.87E-01	4.70E-02	6.42E-02
PU-238	5486.00	5464.34	4.900	1.000	0.624	0.376	0.6133	99.900	1.60E-02	7.25E-02	1.32E-01	2.75E-02	7.24E-02
PU-239	5155.00	5118.67	0.000	0.000	-0.627	0.627	0.7917	99.900	-1.60E-02	5.25E-02	1.47E-01	3.53E-02	5.24E-02
PU-242	4890.00	4871.68	53.083	153.000	152.624	0.376	0.6133	100.000	3.89E+00	9.03E-01	1.31E-01	2.73E-02	6.21E-01
PU-244	4589.00	4545.79	4.900	1.000	1.000	0.000	0.0000	99.900	2.55E-02	7.12E-02	7.66E-02	0.00E+00	7.11E-02



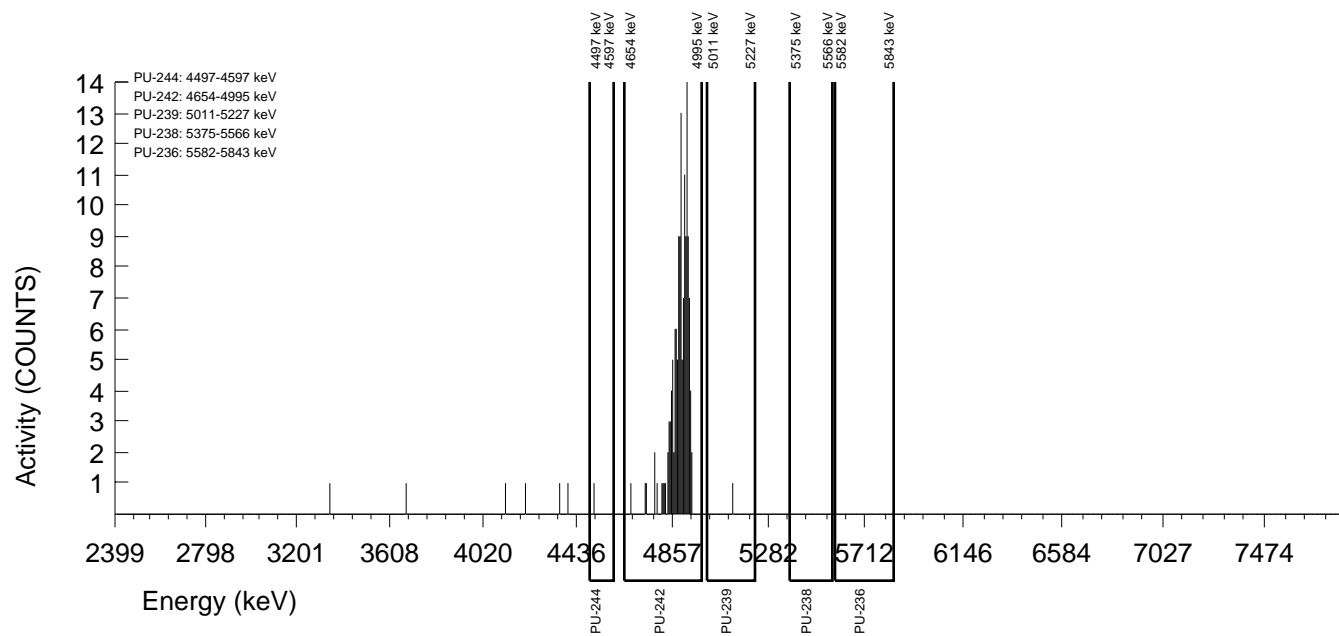
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235044_PU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 75.0 +/-8.598 %	CHAMBER : 071 DETECTOR S/N : 80020 AVERAGE %EFFICIENCY : 32.1394 AVERAGE %EFF ERROR : 0.6198 COUNT DATE : 22-Sep-2016 09:56:24 ELAPSED LIVE TIME(SEC) : 8207.94	LIB FILE : PU BKG FILE : B071.CNF;1814 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W071.CNF;464 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.2855E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.25	0.000	0.000	-0.274	0.274	0.5231	100.000	-9.02E-03	6.67E-02	1.59E-01	3.03E-02	6.64E-02
PU-238	5486.00	5470.34	0.000	0.000	-0.137	0.137	0.3699	99.900	-3.73E-03	5.46E-02	1.17E-01	1.77E-02	5.44E-02
PU-239	5155.00	5127.52	4.953	1.000	0.726	0.274	0.5231	99.900	1.97E-02	7.63E-02	1.31E-01	2.49E-02	7.61E-02
PU-242	4890.00	4893.28	47.057	145.000	144.453	0.547	0.7397	100.000	3.91E+00	9.31E-01	1.51E-01	3.51E-02	6.41E-01
PU-244	4589.00	4514.88	4.953	1.000	1.000	0.000	0.0000	99.900	2.71E-02	7.56E-02	8.13E-02	0.00E+00	7.54E-02



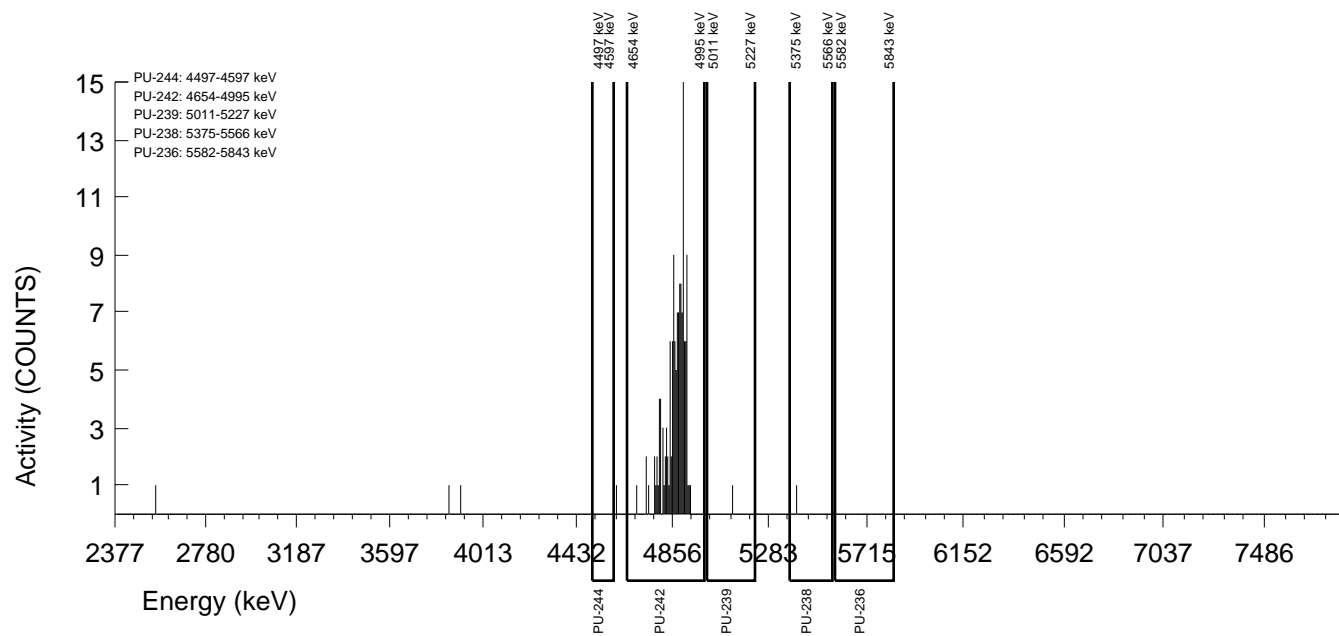
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235045_PU SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 73.0 +/-8.753 %	CHAMBER : 072 DETECTOR S/N : 67584 AVERAGE %EFFICIENCY : 31.8335 AVERAGE %EFF ERROR : 0.6139 COUNT DATE : 22-Sep-2016 09:56:24 ELAPSED LIVE TIME(SEC) : 8211.60	LIB FILE : PU BKG FILE : B072.CNF;1821 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W072.CNF;475 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.1977E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	6.83E-02	1.03E-01	0.00E+00	6.80E-02
PU-238	5486.00	5407.13	5.004	1.000	0.863	0.137	0.3699	99.900	2.45E-02	7.97E-02	1.22E-01	1.85E-02	7.96E-02
PU-239	5155.00	5122.44	5.004	1.000	0.042	0.958	0.9788	99.900	1.19E-03	8.14E-02	1.82E-01	4.85E-02	8.12E-02
PU-242	4890.00	4867.99	58.484	140.000	139.316	0.684	0.8272	100.000	3.93E+00	9.54E-01	1.67E-01	4.10E-02	6.57E-01
PU-244	4589.00	4546.97	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	5.61E-02	8.48E-02	0.00E+00	5.59E-02



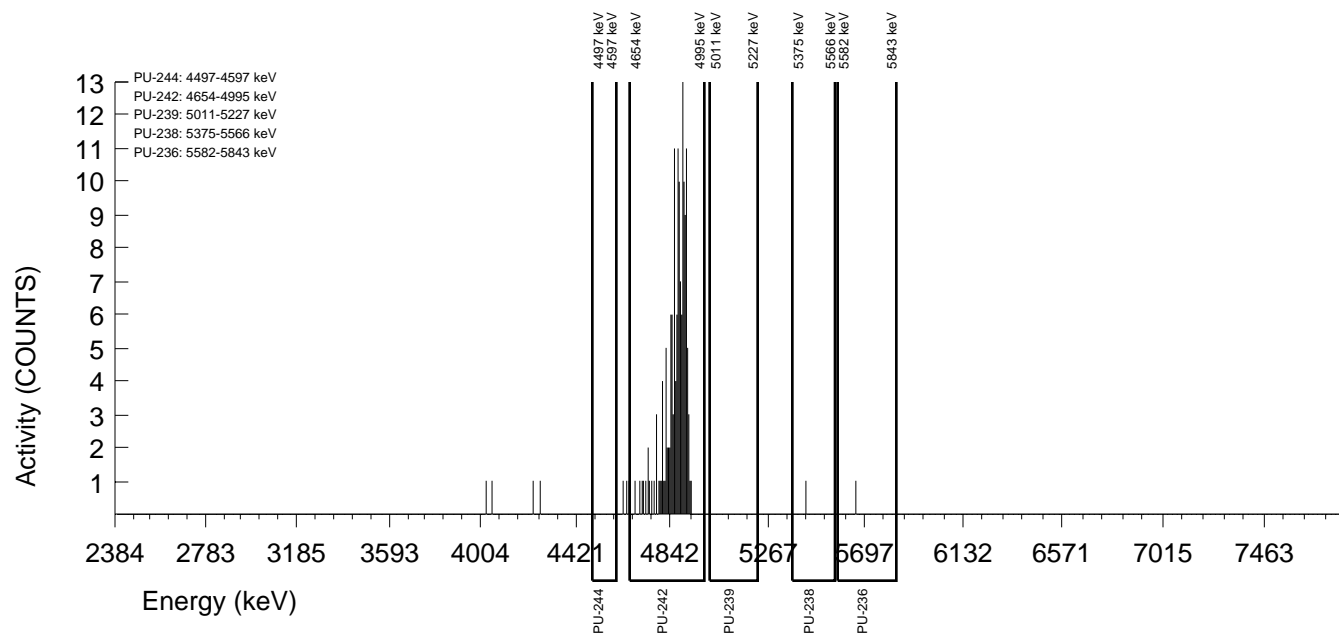
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235046_PU SAMPLE QTY : 0.514 G +/-0.195 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 77.0 +/-8.313 %	CHAMBER : 073 DETECTOR S/N : 78775 AVERAGE %EFFICIENCY : 33.5965 AVERAGE %EFF ERROR : 0.6474 COUNT DATE : 22-Sep-2016 09:56:24 ELAPSED LIVE TIME(SEC) : 8241.52	LIB FILE : PU BKG FILE : B073.CNF;1820 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W073.CNF;495 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.3753E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5659.37	4.947	1.000	0.038	0.962	0.9806	100.000	1.15E-03	8.61E-02	1.93E-01	5.14E-02	8.60E-02
PU-238	5486.00	5438.60	4.947	1.000	0.588	0.412	0.6419	99.900	1.46E-02	7.03E-02	1.30E-01	2.80E-02	7.01E-02
PU-239	5155.00	5118.68	0.000	0.000	-0.687	0.687	0.8287	99.900	-1.70E-02	5.12E-02	1.46E-01	3.59E-02	5.10E-02
PU-242	4890.00	4861.75	55.965	157.000	155.764	1.236	1.1119	100.000	3.84E+00	8.85E-01	1.70E-01	4.81E-02	6.08E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.275	0.275	0.5241	99.900	-6.78E-03	4.99E-02	1.19E-01	2.27E-02	4.97E-02



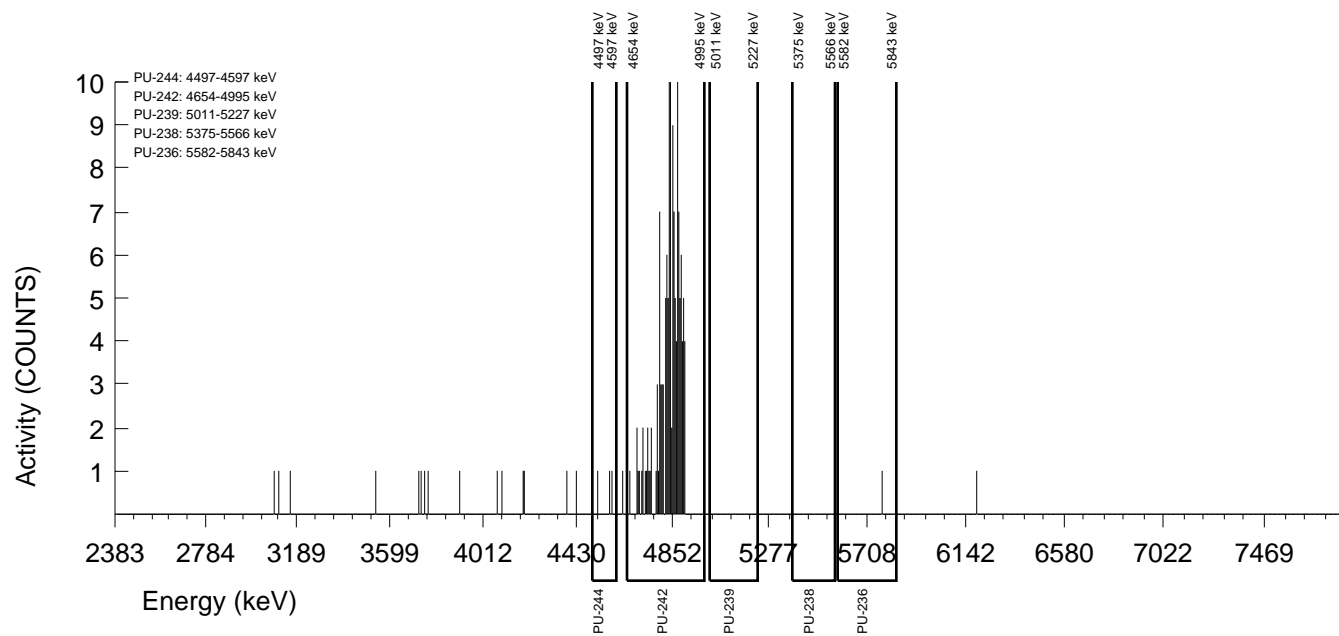
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235047_PU SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 76.4 +/-8.758 %	CHAMBER : 074 DETECTOR S/N : 83296 AVERAGE %EFFICIENCY : 30.3767 AVERAGE %EFF ERROR : 0.5864 COUNT DATE : 22-Sep-2016 09:56:24 ELAPSED LIVE TIME(SEC) : 8245.21	LIB FILE : PU BKG FILE : B074.CNF;1838 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W074.CNF;511 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.3481E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5777.78	4.988	1.000	-0.237	1.237	1.1121	100.000	-8.06E-03	9.89E-02	2.35E-01	6.65E-02	9.88E-02
PU-238	5486.00	5470.35	0.000	0.000	-0.137	0.137	0.3707	99.900	-3.89E-03	5.67E-02	1.22E-01	1.84E-02	5.65E-02
PU-239	5155.00	5118.69	0.000	0.000	-0.275	0.275	0.5243	99.900	-7.73E-03	5.69E-02	1.36E-01	2.59E-02	5.66E-02
PU-242	4890.00	4834.56	93.942	141.000	139.763	1.237	1.1121	100.000	3.93E+00	9.52E-01	1.94E-01	5.48E-02	6.56E-01
PU-244	4589.00	4557.66	64.845	3.000	3.000	0.000	0.0000	99.900	8.43E-02	1.11E-01	8.43E-02	0.00E+00	1.10E-01



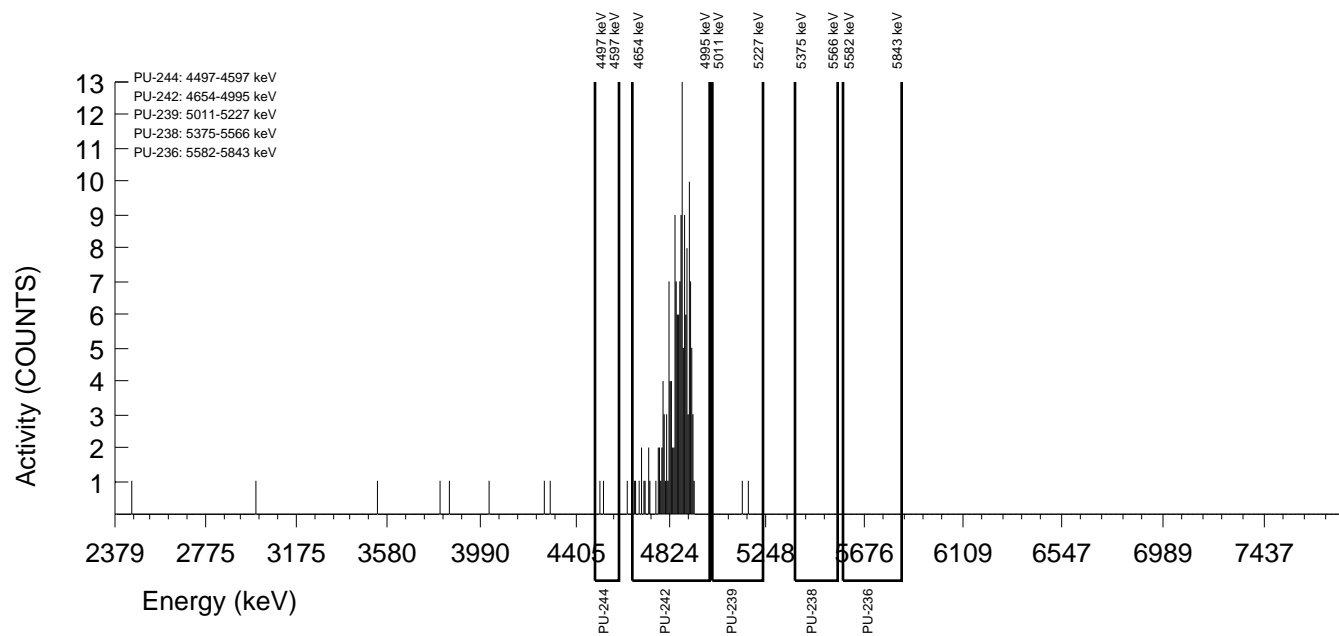
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235048_PU SAMPLE QTY : 0.507 G +/-0.197 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 83.1 +/-8.150 %	CHAMBER : 075 DETECTOR S/N : 80010 AVERAGE %EFFICIENCY : 32.3452 AVERAGE %EFF ERROR : 0.6238 COUNT DATE : 22-Sep-2016 09:56:24 ELAPSED LIVE TIME(SEC) : 8249.61	LIB FILE : PU BKG FILE : B075.CNF;1821 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W075.CNF;478 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.6436E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.24	0.000	0.000	-0.962	0.962	0.9810	100.000	-2.81E-02	6.15E-02	1.88E-01	5.02E-02	6.13E-02
PU-238	5486.00	5470.34	0.000	0.000	-0.137	0.137	0.3708	99.900	-3.33E-03	4.85E-02	1.04E-01	1.57E-02	4.83E-02
PU-239	5155.00	5154.42	29.504	2.000	1.863	0.137	0.3708	99.900	4.48E-02	8.25E-02	1.03E-01	1.57E-02	8.22E-02
PU-242	4890.00	4853.22	90.151	163.000	162.038	0.962	0.9810	100.000	3.89E+00	8.79E-01	1.55E-01	4.14E-02	6.04E-01
PU-244	4589.00	4522.01	19.669	2.000	2.000	0.000	0.0000	99.900	4.81E-02	8.23E-02	7.22E-02	0.00E+00	8.19E-02



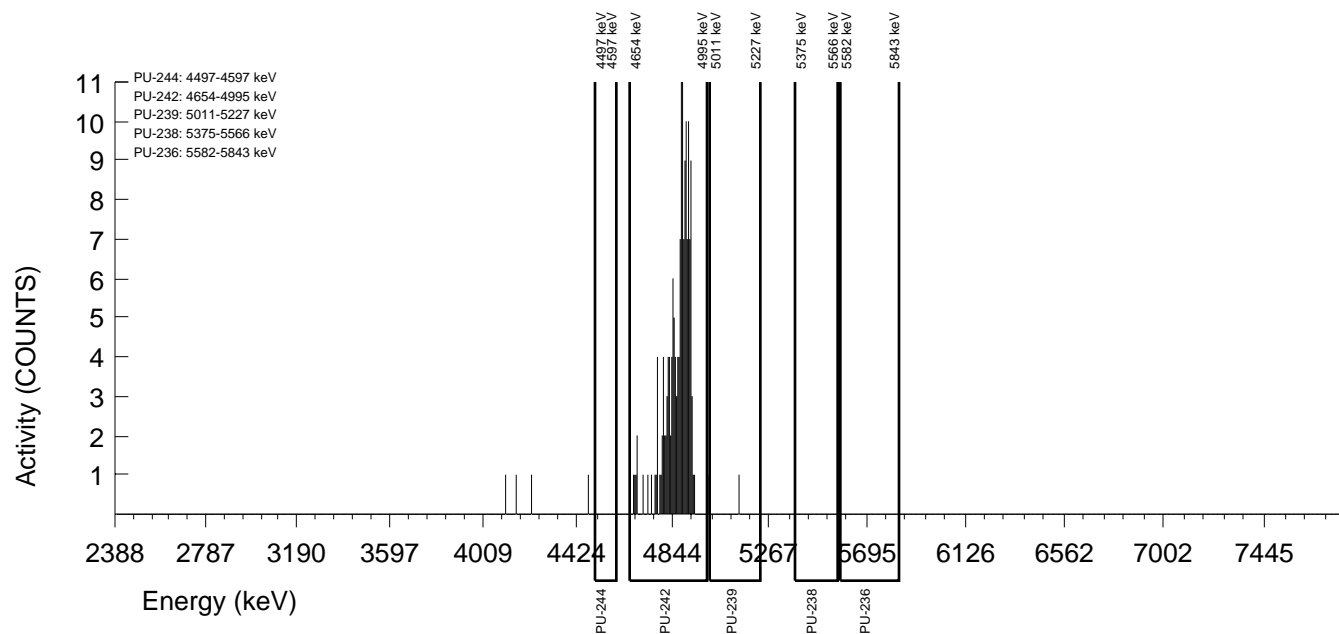
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235049_PU SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 79.6 +/-8.146 %	CHAMBER : 078 DETECTOR S/N : 38633 AVERAGE %EFFICIENCY : 33.4433 AVERAGE %EFF ERROR : 0.6444 COUNT DATE : 22-Sep-2016 09:56:26 ELAPSED LIVE TIME(SEC) : 8305.06	LIB FILE : PU BKG FILE : B078.CNF;1726 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W078.CNF;447 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.4906E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.27	0.000	0.000	-0.692	0.692	0.8319	100.000	-2.03E-02	6.08E-02	1.73E-01	4.28E-02	6.06E-02
PU-238	5486.00	5470.35	0.000	0.000	-0.138	0.138	0.3720	99.900	-3.37E-03	4.87E-02	1.05E-01	1.59E-02	4.86E-02
PU-239	5155.00	5134.30	4.964	1.000	0.862	0.138	0.3720	99.900	2.08E-02	6.78E-02	1.04E-01	1.58E-02	6.76E-02
PU-242	4890.00	4863.39	78.589	162.000	161.585	0.415	0.6444	100.000	3.90E+00	8.81E-01	1.27E-01	2.73E-02	6.04E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.138	0.138	0.3720	99.900	-3.35E-03	4.84E-02	1.04E-01	1.58E-02	4.83E-02



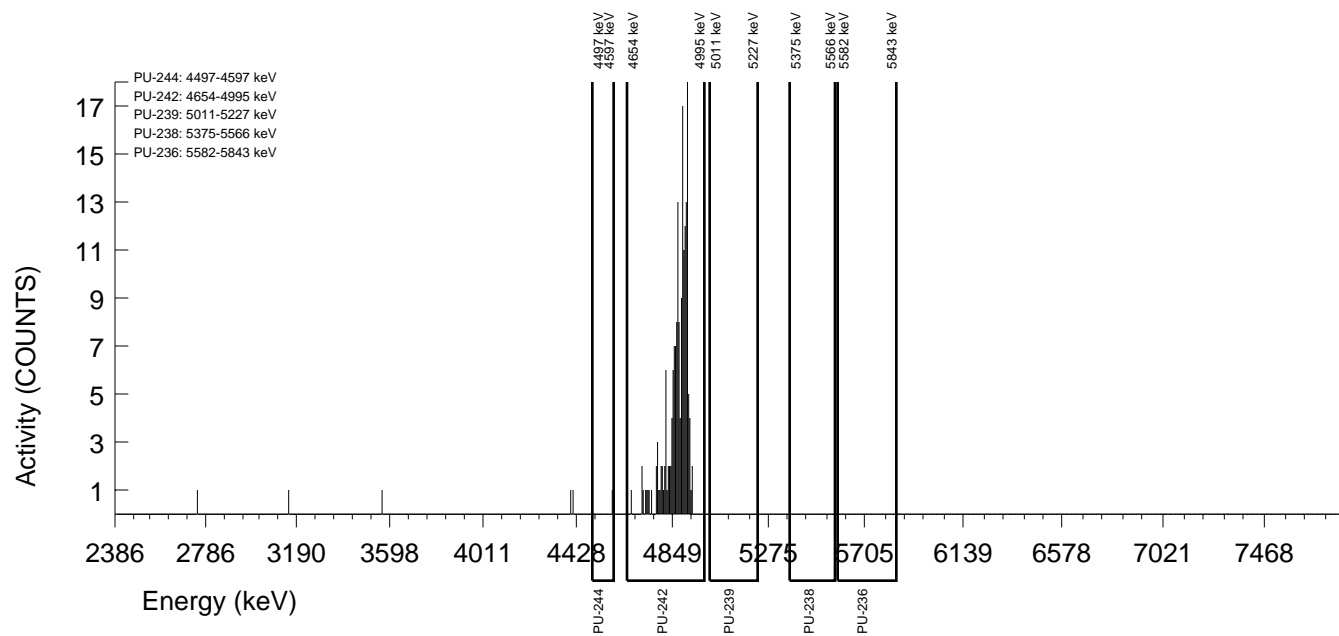
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235050_PU SAMPLE QTY : 0.504 G +/-0.198 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 88.3 +/-7.644 %	CHAMBER : 080 DETECTOR S/N : 78197 AVERAGE %EFFICIENCY : 34.4422 AVERAGE %EFF ERROR : 0.6633 COUNT DATE : 22-Sep-2016 09:56:26 ELAPSED LIVE TIME(SEC) : 8310.24	LIB FILE : PU BKG FILE : B080.CNF;1728 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W080.CNF;446 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.8723E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	-0.139	0.139	0.3722	100.000	-3.56E-03	5.15E-02	1.11E-01	1.68E-02	5.14E-02
PU-238	5486.00	5470.35	0.000	0.000	-0.277	0.277	0.5263	99.900	-5.92E-03	4.32E-02	1.04E-01	1.97E-02	4.31E-02
PU-239	5155.00	5118.69	0.000	0.000	-0.554	0.554	0.7443	99.900	-1.18E-02	4.37E-02	1.19E-01	2.77E-02	4.36E-02
PU-242	4890.00	4873.72	47.164	185.000	184.723	0.277	0.5263	100.000	3.92E+00	8.29E-01	1.03E-01	1.96E-02	5.67E-01
PU-244	4589.00	4585.20	4.969	1.000	0.723	0.277	0.5263	99.900	1.53E-02	5.98E-02	1.03E-01	1.96E-02	5.97E-02



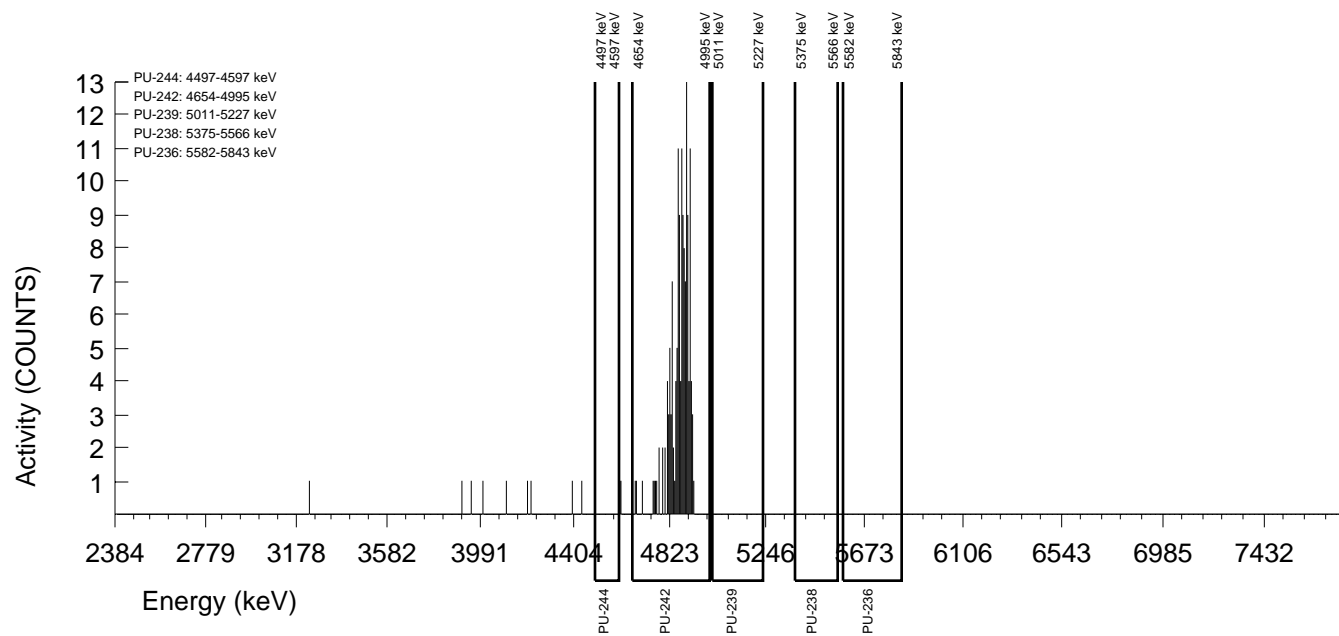
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235051_PU SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 74.7 +/-8.464 %	CHAMBER : 081 DETECTOR S/N : 79996 AVERAGE %EFFICIENCY : 33.0506 AVERAGE %EFF ERROR : 0.6369 COUNT DATE : 22-Sep-2016 09:56:26 ELAPSED LIVE TIME(SEC) : 8313.82	LIB FILE : PU BKG FILE : B081.CNF;1734 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W081.CNF;446 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.2730E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.23	0.000	0.000	-0.139	0.139	0.3722	100.000	-4.41E-03	6.38E-02	1.37E-01	2.08E-02	6.36E-02
PU-238	5486.00	5470.33	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	5.25E-02	7.93E-02	0.00E+00	5.23E-02
PU-239	5155.00	5118.67	0.000	0.000	-0.554	0.554	0.7445	99.900	-1.46E-02	5.41E-02	1.47E-01	3.43E-02	5.39E-02
PU-242	4890.00	4864.26	77.280	151.000	149.891	1.109	1.0529	100.000	3.93E+00	9.22E-01	1.76E-01	4.85E-02	6.34E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.277	0.277	0.5264	99.900	-7.28E-03	5.31E-02	1.27E-01	2.43E-02	5.29E-02



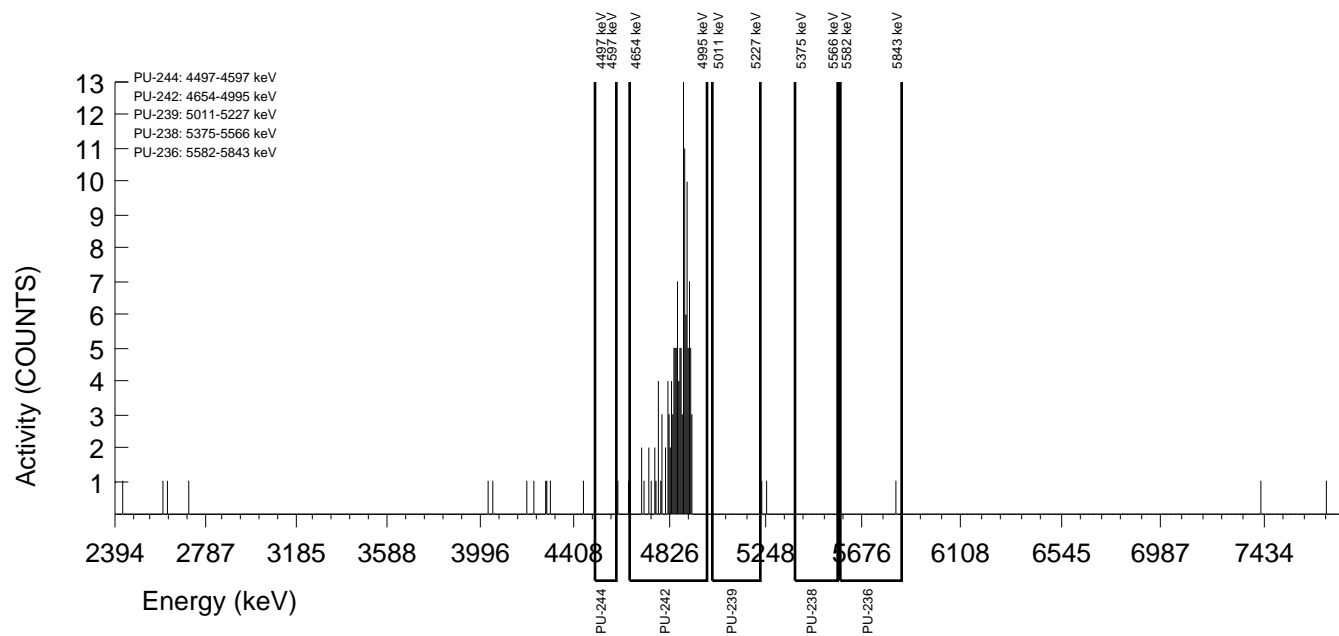
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235052_PU SAMPLE QTY : 0.508 G +/-0.197 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 68.6 +/-8.975 %	CHAMBER : 082 DETECTOR S/N : 79997 AVERAGE %EFFICIENCY : 31.9848 AVERAGE %EFF ERROR : 0.6168 COUNT DATE : 22-Sep-2016 09:56:26 ELAPSED LIVE TIME(SEC) : 8317.64	LIB FILE : PU BKG FILE : B082.CNF;1724 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W082.CNF;423 CAL DATE : 03-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.0072E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5821.05	4.883	1.000	0.584	0.416	0.6449	100.000	2.06E-02	1.00E-01	1.86E-01	4.00E-02	9.98E-02
PU-238	5486.00	5470.33	0.000	0.000	-0.693	0.693	0.8325	99.900	-2.04E-02	6.10E-02	1.74E-01	4.29E-02	6.08E-02
PU-239	5155.00	5118.67	0.000	0.000	-2.357	2.357	1.5351	99.900	-6.88E-02	6.66E-02	2.45E-01	7.86E-02	6.63E-02
PU-242	4890.00	4861.94	51.270	135.000	133.336	1.664	1.2898	100.000	3.89E+00	9.66E-01	2.19E-01	6.60E-02	6.67E-01
PU-244	4589.00	4501.82	4.883	1.000	0.861	0.139	0.3723	99.900	2.51E-02	8.18E-02	1.26E-01	1.91E-02	8.16E-02



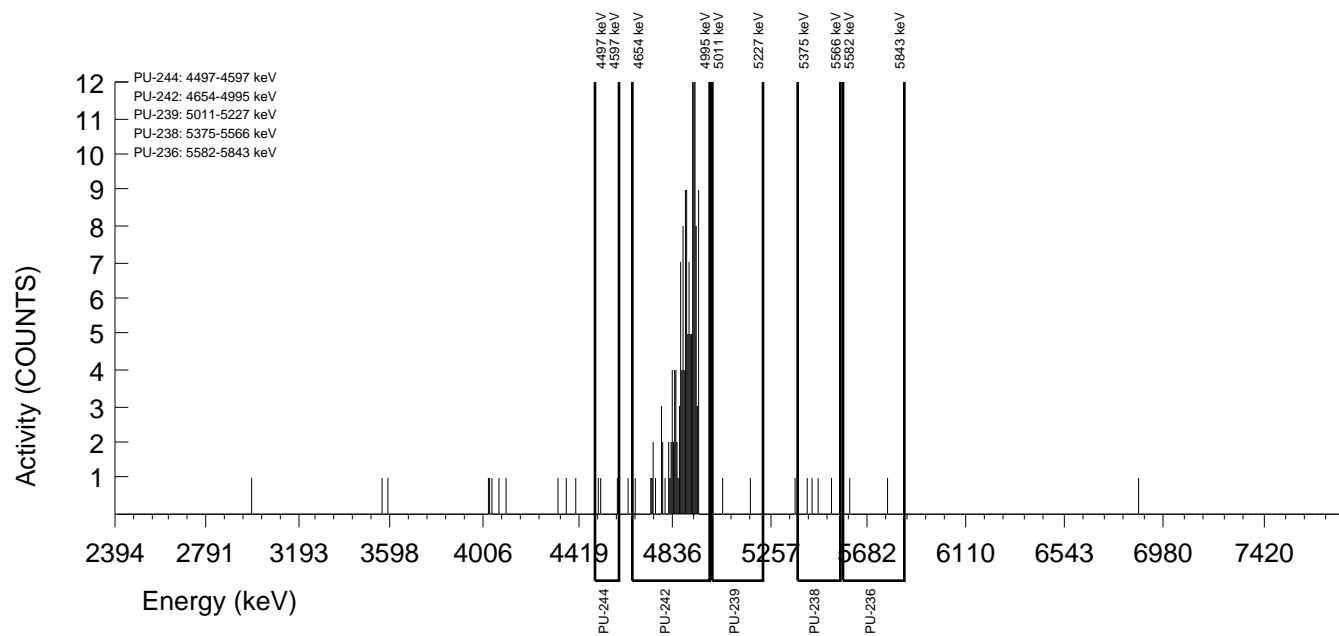
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235053_PU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 01-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 83.8 +/-8.522 %	CHAMBER : 089 DETECTOR S/N : 79988 AVERAGE %EFFICIENCY : 29.2461 AVERAGE %EFF ERROR : 0.5651 COUNT DATE : 22-Sep-2016 09:56:29 ELAPSED LIVE TIME(SEC) : 8465.80	LIB FILE : PU BKG FILE : B089.CNF;1433 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W089.CNF;384 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.6710E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5689.75	158.029	2.000	-2.092	4.092	2.0228	100.000	-6.64E-02	1.18E-01	3.21E-01	1.13E-01	1.18E-01
PU-238	5486.00	5464.90	103.707	4.000	2.871	1.129	1.0624	99.900	7.54E-02	1.18E-01	1.77E-01	4.90E-02	1.17E-01
PU-239	5155.00	5111.91	118.522	2.000	0.307	1.693	1.3012	99.900	8.01E-03	9.24E-02	1.98E-01	5.97E-02	9.23E-02
PU-242	4890.00	4887.02	76.957	156.000	151.485	4.515	2.1249	100.000	3.95E+00	9.32E-01	2.73E-01	9.73E-02	6.42E-01
PU-244	4589.00	4538.81	83.953	3.000	2.012	0.988	0.9938	99.900	5.25E-02	1.05E-01	1.69E-01	4.56E-02	1.04E-01



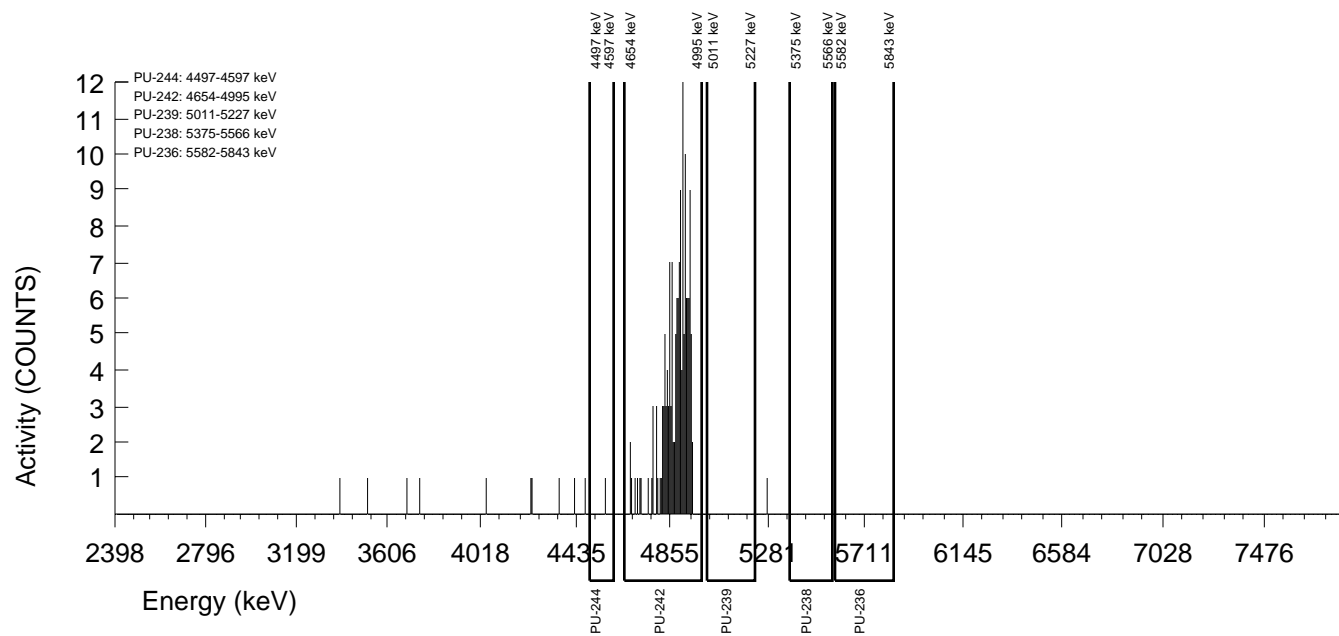
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235054_PU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 76.0 +/-8.237 %	CHAMBER : 090 DETECTOR S/N : 78263 AVERAGE %EFFICIENCY : 33.4344 AVERAGE %EFF ERROR : 0.6443 COUNT DATE : 22-Sep-2016 09:56:29 ELAPSED LIVE TIME(SEC) : 8495.79	LIB FILE : PU BKG FILE : B090.CNF;1438 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W090.CNF;374 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.3314E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.25	0.000	0.000	-0.425	0.425	0.6518	100.000	-1.29E-02	6.23E-02	1.61E-01	3.49E-02	6.21E-02
PU-238	5486.00	5470.34	0.000	0.000	-0.283	0.283	0.5322	99.900	-7.14E-03	5.11E-02	1.23E-01	2.36E-02	5.09E-02
PU-239	5155.00	5118.68	0.000	0.000	-0.283	0.283	0.5322	99.900	-7.10E-03	5.07E-02	1.22E-01	2.34E-02	5.06E-02
PU-242	4890.00	4876.09	89.071	158.000	157.717	0.283	0.5322	100.000	3.95E+00	9.01E-01	1.22E-01	2.34E-02	6.19E-01
PU-244	4589.00	4565.61	4.948	1.000	0.858	0.142	0.3763	99.900	2.15E-02	7.03E-02	1.08E-01	1.66E-02	7.02E-02



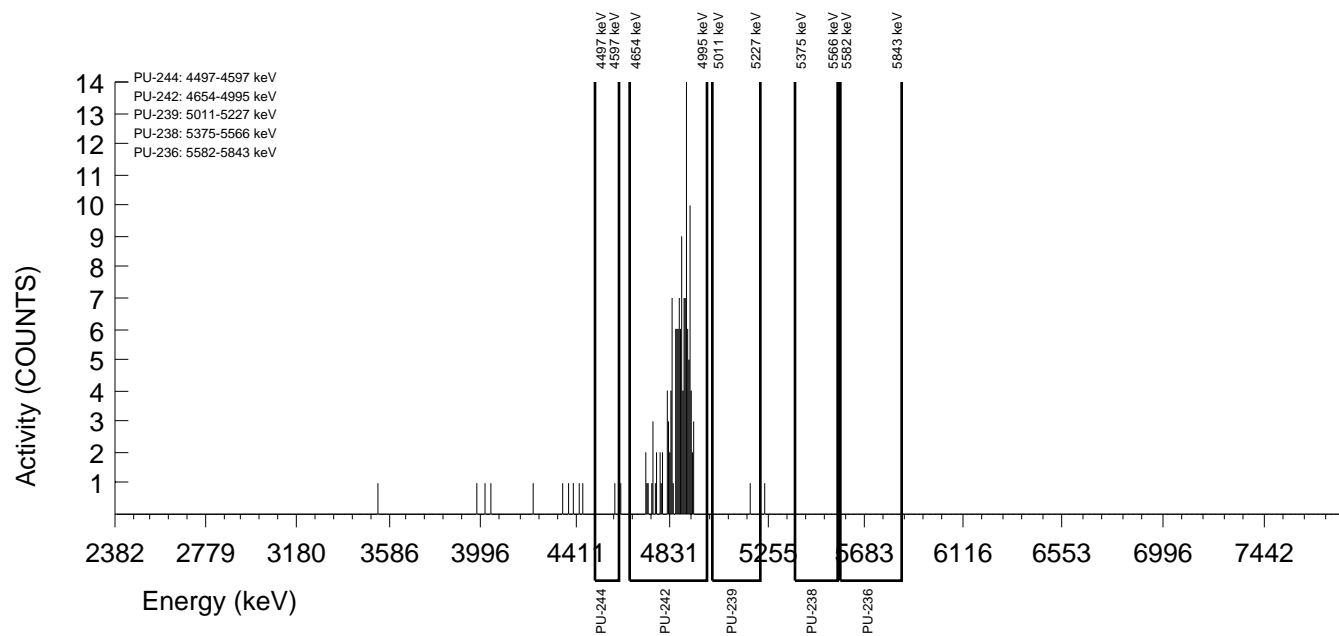
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235055_PU SAMPLE QTY : 0.510 G +/-0.196 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 64.1 +/-8.794 %	CHAMBER : 091 DETECTOR S/N : 78259 AVERAGE %EFFICIENCY : 34.7245 AVERAGE %EFF ERROR : 0.6687 COUNT DATE : 22-Sep-2016 09:56:29 ELAPSED LIVE TIME(SEC) : 8499.46	LIB FILE : PU BKG FILE : B091.CNF;1436 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W091.CNF;363 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 2.8085E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.25	0.000	0.000	-0.708	0.708	0.8416	100.000	-2.42E-02	7.10E-02	2.03E-01	5.04E-02	7.07E-02
PU-238	5486.00	5470.34	0.000	0.000	-0.708	0.708	0.8416	99.900	-2.00E-02	5.88E-02	1.68E-01	4.18E-02	5.86E-02
PU-239	5155.00	5180.03	4.930	1.000	-0.558	1.558	1.2483	99.900	-1.57E-02	8.25E-02	2.07E-01	6.15E-02	8.23E-02
PU-242	4890.00	4864.81	40.262	139.000	138.150	0.850	0.9219	100.000	3.87E+00	9.43E-01	1.75E-01	4.54E-02	6.50E-01
PU-244	4589.00	4583.70	4.930	1.000	0.858	0.142	0.3764	99.900	2.41E-02	7.87E-02	1.21E-01	1.86E-02	7.85E-02



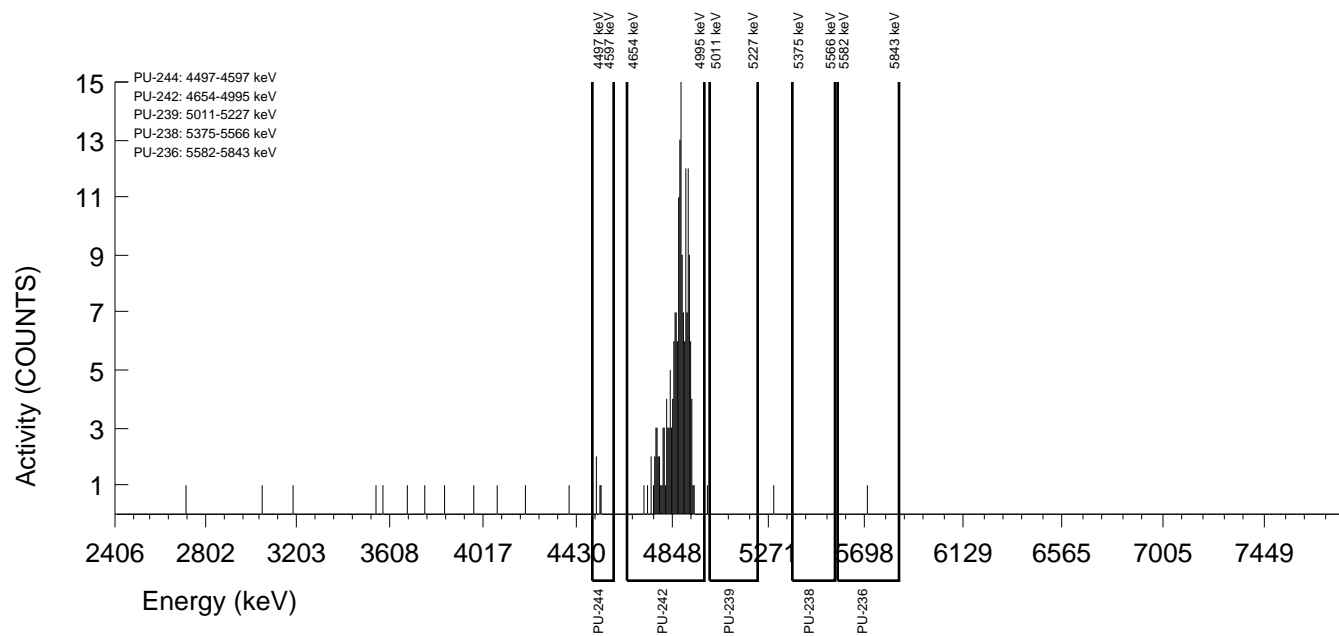
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235056_PU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 98.2 +/-7.671 %	CHAMBER : 092 DETECTOR S/N : 80063 AVERAGE %EFFICIENCY : 30.3421 AVERAGE %EFF ERROR : 0.5858 COUNT DATE : 22-Sep-2016 09:56:29 ELAPSED LIVE TIME(SEC) : 8503.81	LIB FILE : PU BKG FILE : B092.CNF;1440 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W092.CNF;414 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 4.3056E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5708.47	4.922	1.000	1.000	0.000	0.0000	100.000	2.55E-02	7.11E-02	7.65E-02	0.00E+00	7.10E-02
PU-238	5486.00	5470.34	0.000	0.000	-0.992	0.992	0.9960	99.900	-2.09E-02	4.47E-02	1.37E-01	3.69E-02	4.46E-02
PU-239	5155.00	5118.68	0.000	0.000	-0.850	0.850	0.9222	99.900	-1.78E-02	4.40E-02	1.31E-01	3.40E-02	4.39E-02
PU-242	4890.00	4876.40	50.204	187.000	185.158	1.842	1.3574	100.000	3.88E+00	8.24E-01	1.63E-01	5.00E-02	5.63E-01
PU-244	4589.00	4528.02	4.922	4.000	3.717	0.283	0.5324	99.900	7.79E-02	9.32E-02	1.02E-01	1.96E-02	9.25E-02



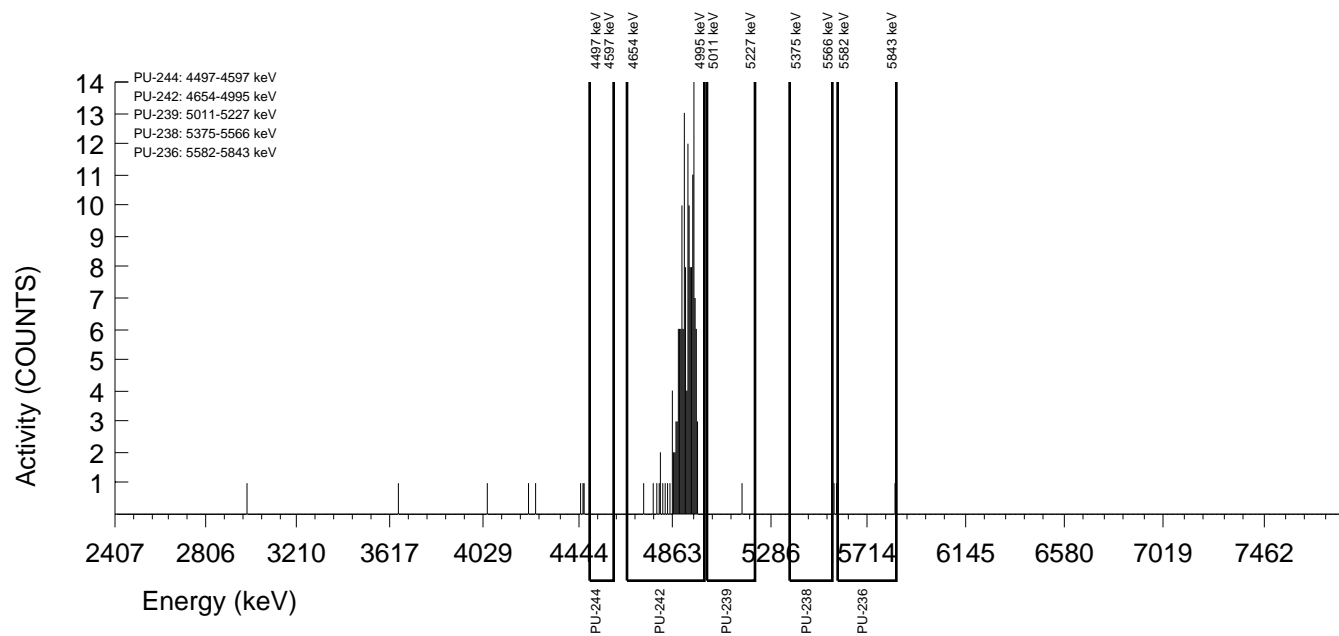
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235057_PU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 78.6 +/-8.140 %	CHAMBER : 093 DETECTOR S/N : 33206 AVERAGE %EFFICIENCY : 33.0892 AVERAGE %EFF ERROR : 0.6377 COUNT DATE : 22-Sep-2016 09:56:29 ELAPSED LIVE TIME(SEC) : 8507.47	LIB FILE : PU BKG FILE : B093.CNF;1429 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W093.CNF;379 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.4468E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5708.26	0.000	2.000	1.291	0.709	0.8420	100.000	3.84E-02	1.03E-01	1.77E-01	4.40E-02	1.03E-01
PU-238	5486.00	5470.35	0.000	0.000	-0.851	0.851	0.9224	99.900	-2.09E-02	5.17E-02	1.54E-01	3.99E-02	5.15E-02
PU-239	5155.00	5164.40	4.969	1.000	0.433	0.567	0.7531	99.900	1.06E-02	6.95E-02	1.38E-01	3.24E-02	6.94E-02
PU-242	4890.00	4914.26	58.384	162.000	161.716	0.284	0.5325	100.000	3.95E+00	8.90E-01	1.19E-01	2.29E-02	6.11E-01
PU-244	4589.00	4496.21	0.000	2.000	1.858	0.142	0.3766	99.900	4.54E-02	8.39E-02	1.06E-01	1.62E-02	8.35E-02



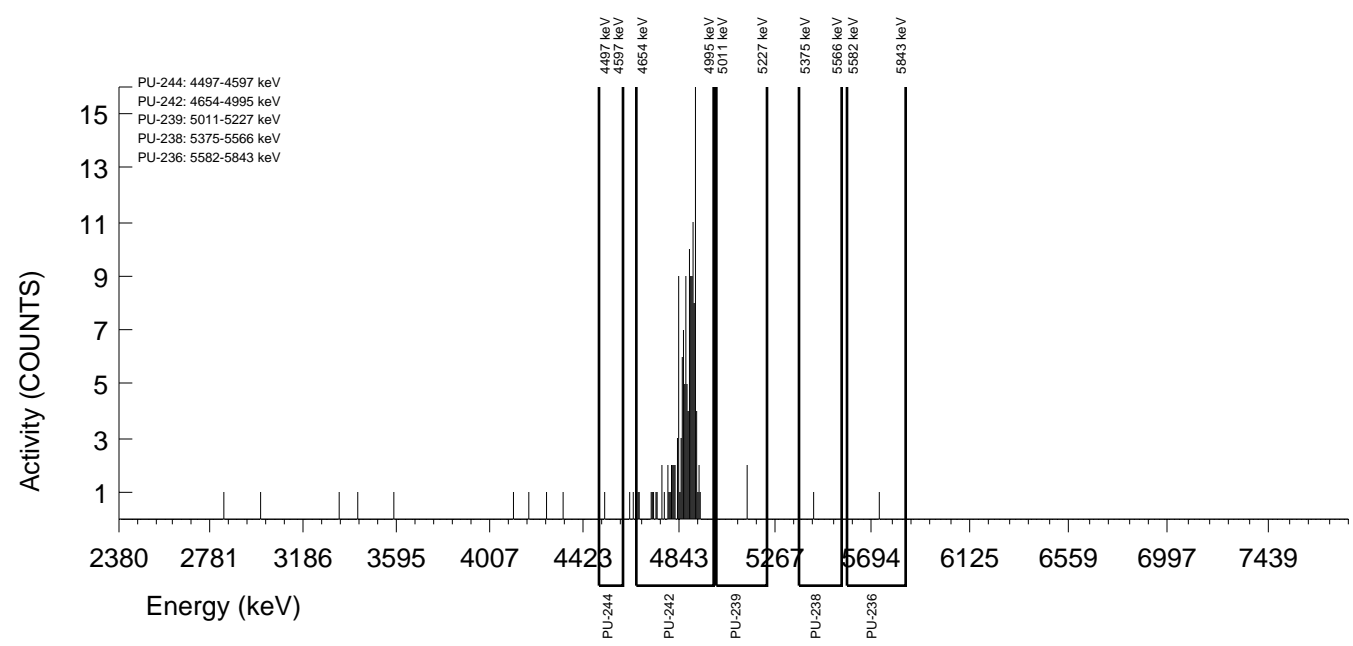
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235058_PU SAMPLE QTY : 0.512 G +/-0.195 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 76.2 +/-8.565 %	CHAMBER : 095 DETECTOR S/N : 38626 AVERAGE %EFFICIENCY : 30.4247 AVERAGE %EFF ERROR : 0.5873 COUNT DATE : 22-Sep-2016 09:56:32 ELAPSED LIVE TIME(SEC) : 8560.38	LIB FILE : PU BKG FILE : B095.CNF;1405 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W095.CNF;408 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.3404E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5725.89	4.993	1.000	0.144	0.856	0.9252	100.000	4.66E-03	9.30E-02	2.02E-01	5.26E-02	9.28E-02
PU-238	5486.00	5436.95	4.993	1.000	0.429	0.571	0.7554	99.900	1.15E-02	7.63E-02	1.52E-01	3.56E-02	7.61E-02
PU-239	5155.00	5144.38	4.993	2.000	1.429	0.571	0.7554	99.900	3.81E-02	9.21E-02	1.51E-01	3.54E-02	9.19E-02
PU-242	4890.00	4871.52	74.066	145.000	145.000	0.000	0.0000	100.000	3.86E+00	9.15E-01	7.98E-02	0.00E+00	6.30E-01
PU-244	4589.00	4517.34	4.993	1.000	1.000	0.000	0.0000	99.900	2.66E-02	7.43E-02	7.99E-02	0.00E+00	7.42E-02



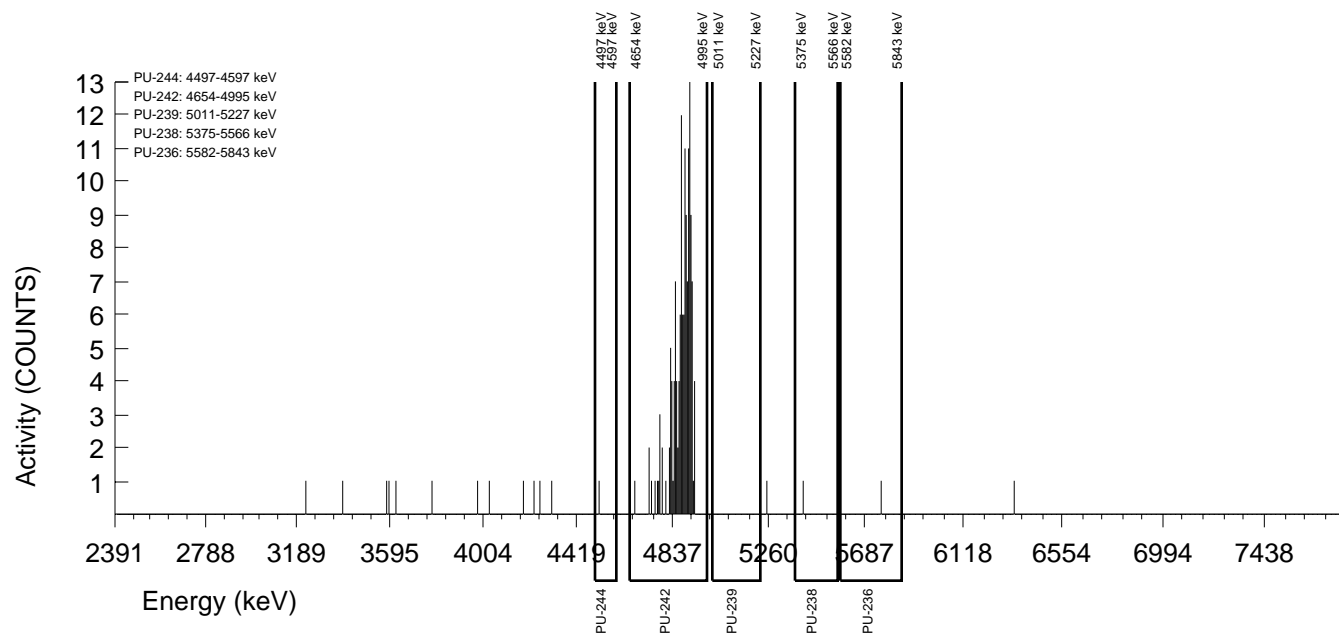
GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235059_PU SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 72.5 +/-8.515 %	CHAMBER : 096 DETECTOR S/N : 80016 AVERAGE %EFFICIENCY : 32.5188 AVERAGE %EFF ERROR : 0.6269 COUNT DATE : 22-Sep-2016 09:56:32 ELAPSED LIVE TIME(SEC) : 8564.06	LIB FILE : PU BKG FILE : B096.CNF;1397 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W096.CNF;357 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.1763E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5756.61	4.934	1.000	0.286	0.714	0.8448	100.000	9.19E-03	9.18E-02	1.92E-01	4.77E-02	9.16E-02
PU-238	5486.00	5414.05	4.934	1.000	0.572	0.428	0.6544	99.900	1.53E-02	7.60E-02	1.42E-01	3.09E-02	7.58E-02
PU-239	5155.00	5118.69	0.000	0.000	-0.428	0.428	0.6544	99.900	-1.14E-02	5.45E-02	1.41E-01	3.07E-02	5.43E-02
PU-242	4890.00	4878.73	70.307	148.000	147.429	0.571	0.7556	100.000	3.93E+00	9.26E-01	1.51E-01	3.54E-02	6.37E-01
PU-244	4589.00	4517.50	4.934	1.000	0.429	0.571	0.7556	99.900	1.14E-02	7.59E-02	1.51E-01	3.54E-02	7.57E-02



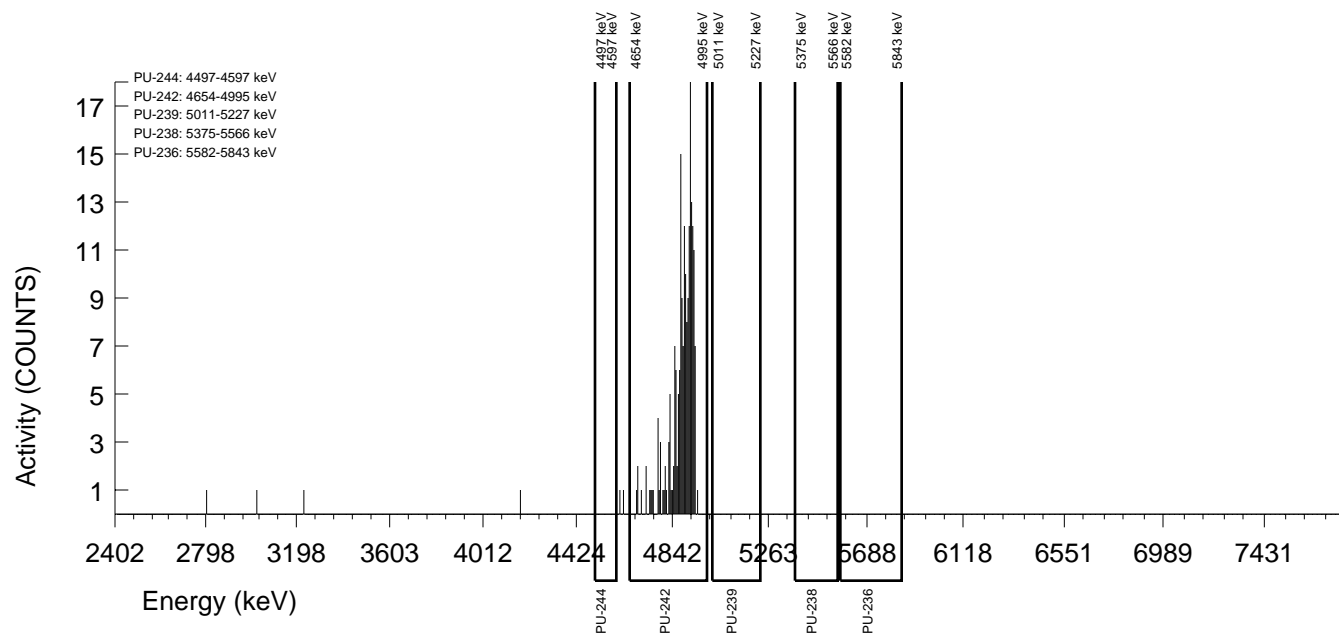
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S0405235060_PU SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 92.2 +/-7.310 %	CHAMBER : 097 DETECTOR S/N : 83288 AVERAGE %EFFICIENCY : 35.3557 AVERAGE %EFF ERROR : 0.6805 COUNT DATE : 22-Sep-2016 09:56:32 ELAPSED LIVE TIME(SEC) : 8567.84	LIB FILE : PU BKG FILE : B097.CNF;1394 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W097.CNF;381 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 4.0407E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	-0.286	0.286	0.5344	100.000	-6.47E-03	4.59E-02	1.11E-01	2.13E-02	4.57E-02
PU-238	5486.00	5470.35	0.000	0.000	-0.571	0.571	0.7558	99.900	-1.08E-02	3.90E-02	1.07E-01	2.52E-02	3.89E-02
PU-239	5155.00	5118.69	0.000	0.000	-0.428	0.428	0.6545	99.900	-8.06E-03	3.84E-02	9.97E-02	2.17E-02	3.83E-02
PU-242	4890.00	4882.92	59.932	205.000	204.000	1.000	0.9998	100.000	3.83E+00	7.76E-01	1.22E-01	3.30E-02	5.29E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.143	0.143	0.3779	99.900	-2.69E-03	3.77E-02	8.14E-02	1.25E-02	3.76E-02



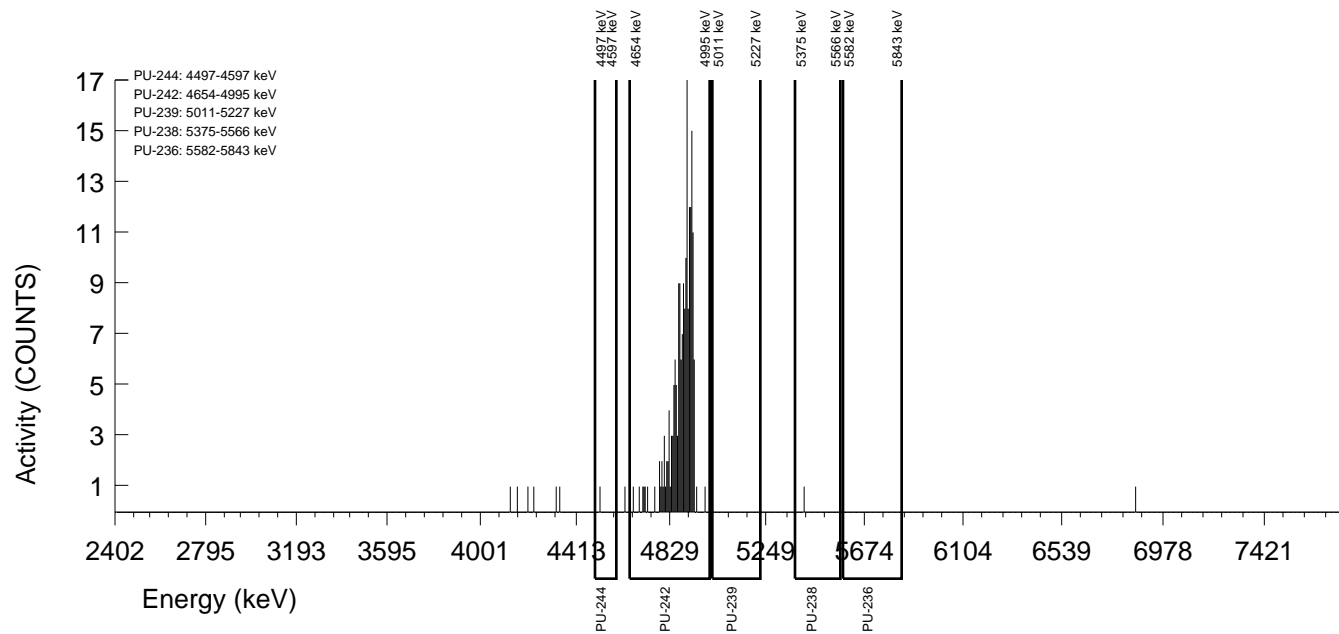
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S1203621751_PU SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 20-Sep-2016 00:00:00 ANALYST : HAKB % YIELD : 85.7 +/-7.528 %	CHAMBER : 099 DETECTOR S/N : 80059 AVERAGE %EFFICIENCY : 35.6284 AVERAGE %EFF ERROR : 0.6858 COUNT DATE : 22-Sep-2016 09:56:32 ELAPSED LIVE TIME(SEC) : 8572.83	LIB FILE : PU BKG FILE : B099.CNF;1397 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W099.CNF;383 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.7576E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.24	0.000	0.000	-0.857	0.857	0.9259	100.000	-1.72E-02	4.22E-02	1.26E-01	3.27E-02	4.21E-02
PU-238	5486.00	5413.43	4.881	1.000	0.428	0.572	0.7560	99.900	8.60E-03	5.71E-02	1.14E-01	2.67E-02	5.70E-02
PU-239	5155.00	5118.67	0.000	0.000	-0.286	0.286	0.5346	99.900	-5.73E-03	4.06E-02	9.79E-02	1.89E-02	4.05E-02
PU-242	4890.00	4878.90	61.418	192.000	191.286	0.714	0.8452	100.000	3.83E+00	7.99E-01	1.20E-01	2.98E-02	5.46E-01
PU-244	4589.00	4511.04	24.405	2.000	2.000	0.000	0.0000	99.900	4.01E-02	6.86E-02	6.02E-02	0.00E+00	6.83E-02



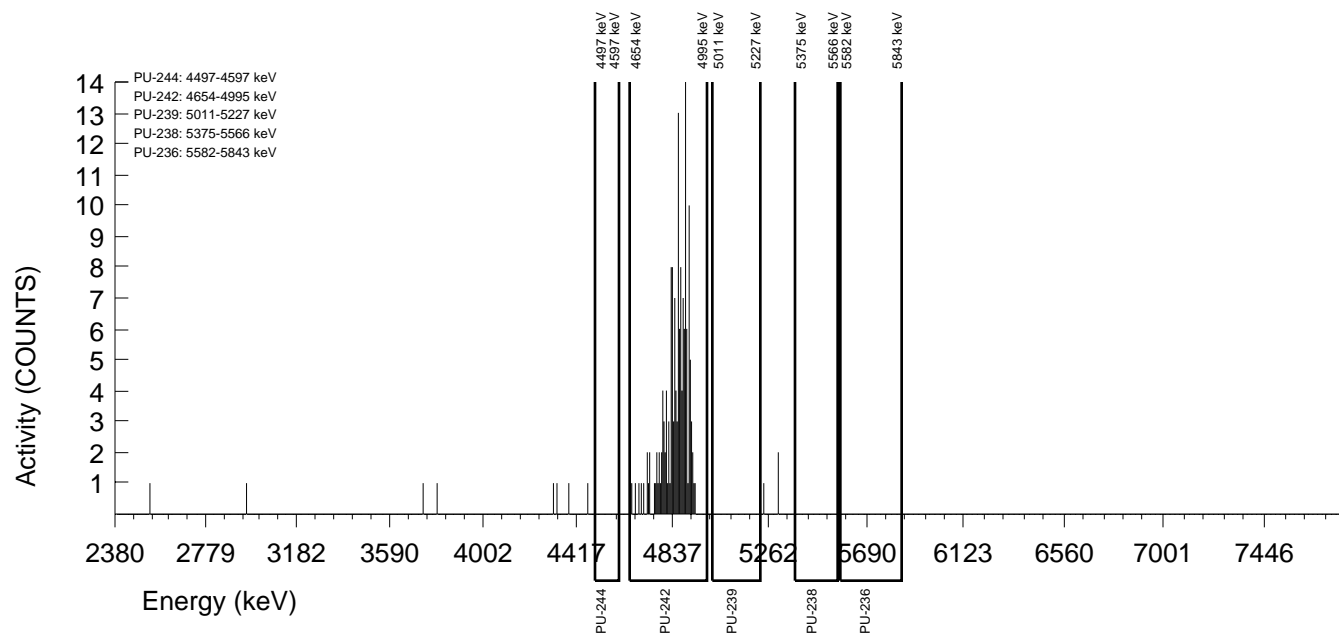
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S1203621752_PU SAMPLE QTY : 0.511 G +/-0.196 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 73.5 +/-8.243 %	CHAMBER : 103 DETECTOR S/N : 79461 AVERAGE %EFFICIENCY : 33.8848 AVERAGE %EFF ERROR : 0.6527 COUNT DATE : 22-Sep-2016 09:56:16 ELAPSED LIVE TIME(SEC) : 8694.85	LIB FILE : PU BKG FILE : B103.CNF;1412 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W103.CNF;395 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.2203E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	-0.290	0.290	0.5384	100.000	-8.63E-03	6.04E-02	1.46E-01	2.82E-02	6.02E-02
PU-238	5486.00	5470.35	0.000	0.000	-0.290	0.290	0.5384	99.900	-7.13E-03	4.99E-02	1.21E-01	2.33E-02	4.97E-02
PU-239	5155.00	5118.69	0.000	0.000	-0.145	0.145	0.3807	99.900	-3.54E-03	4.91E-02	1.06E-01	1.64E-02	4.89E-02
PU-242	4890.00	4851.52	78.116	159.000	158.131	0.869	0.9325	100.000	3.86E+00	8.82E-01	1.54E-01	4.01E-02	6.06E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.145	0.145	0.3807	99.900	-3.54E-03	4.91E-02	1.06E-01	1.64E-02	4.89E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

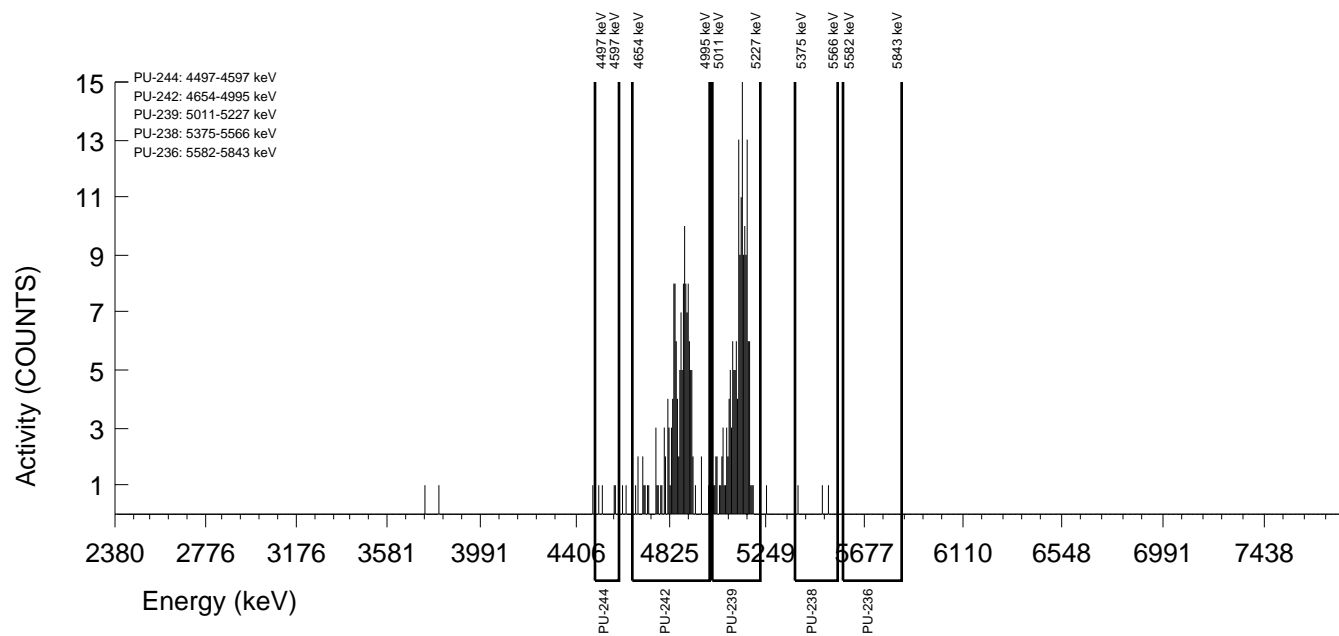
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596412 SAMPLE ID : S1203621753_PU SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 20-Sep-2016 00:00:00 ANALYST : HAKB % YIELD : 69.6 +/-8.637 %	CHAMBER : 104 DETECTOR S/N : 80011 AVERAGE %EFFICIENCY : 32.4069 AVERAGE %EFF ERROR : 0.6248 COUNT DATE : 22-Sep-2016 09:56:16 ELAPSED LIVE TIME(SEC) : 8698.89	LIB FILE : PU BKG FILE : B104.CNF;1397 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W104.CNF;386 CAL DATE : 06-Sep-2016
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TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.0494E+00 dpm	LCS ID : 0338-MM NUCLIDE : PU-239 NOMINAL (pCi/G) : 3.8370E+00 % RECOVERY : 113.176
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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.24	0.000	0.000	-0.580	0.580	0.7615	100.000	-1.55E-02	5.54E-02	1.52E-01	3.59E-02	5.52E-02
PU-238	5486.00	5467.79	127.893	3.000	2.710	0.290	0.5385	99.900	7.26E-02	1.07E-01	1.31E-01	2.54E-02	1.06E-01
PU-239	5155.00	5125.46	41.304	163.000	162.130	0.870	0.9327	99.900	4.34E+00	1.01E+00	1.68E-01	4.40E-02	6.73E-01
PU-242	4890.00	4858.49	72.555	144.000	143.275	0.725	0.8514	100.000	3.83E+00	9.17E-01	1.60E-01	4.01E-02	6.32E-01
PU-244	4589.00	4549.30	73.784	4.000	3.710	0.290	0.5385	99.900	9.94E-02	1.19E-01	1.31E-01	2.54E-02	1.18E-01



Batch# 1596399 Product: Np Date: 9/30/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	Der# 1563212
Sample was correctly preserved if required.			NA
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		Der# 1563212
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		Der# 1563212
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: Melanie Dwyer 9/30/16

Secondary Review Performed By: Jeri Davis 09/30/16

10/4
MWC
Page 670 of 5809

DATA EXCEPTION REPORT

Mo.Day Yr. 30-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: ASTM C 1475-00 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596399	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: RDL less than MDA Sample received out of holding			
Specification and Requirements		DER Disposition:	
Exception Description: 1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, and 1203621716 were received and analyzed out of holding.		1. Reporting results.	

Originator's Name:
Melanie Aycock 30-SEP-16

Data Validator/Group Leader:
Jessica Davis 30-SEP-16

Neptunium Queue Sheet

07-SEP-16

Batch #: 1596399
 Analyst: MXS2
 First Client Due Date: 04-OCT-16
 Internal Due Date: 30-SEP-16
 Routine #: 3
 REF #: 92-95
 BKG #: 91

Tracer Isotope: Am-243 (Np-239)
 Tracer Code: 445 96 2 III
 Expiration Date: 9-30-16
 Vol: 0.1
 LCS Isotope: Np-237
 LCS Code: 0518-5
 Expiration Date: 7-18-17
 Vol: 0.1
 Spike Isotope: Np-237
 Spike Code: _____
 Expiration Date: _____
 Vol: _____

Prep Date: 9-21-16
 Initials: MSD
 Pipet ID: 1840022
 Balance ID: 16107662
 Np Separation Date/Time: 9-22-16 / 20:05
 Witness: M/T

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	GFPC	Np Det #
405235021-1	4.2.B.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	1	1	0.115	25	205
405235022-1	4.2.B.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	2	2	0.109	26	206
405235023-1	4.2.B.R.11.2	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	3	3	0.115	27	207
405235024-1	4.2.B.R.2.2	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	4	4	0.103	28	208
405235025-1	4.2.B.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	5	5	0.105	29	209
405235026-1	4.2.C.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	6	6	0.108	30	210
405235027-1	4.2.C.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	7	7	0.117	31	211
405235028-1	4.3.A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	8	8	0.109	32	212
405235029-1	4.3.B.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	9	9	0.106	33	213
405235030-1	4.3.A.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	10	10	0.101	34	214
405235031-1	4.3.B.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	26-NOV-15	11	11	0.106	35	215
405235032-1	4.3.B.R.3.3	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	12	12	0.104	36	216
405235033-1	4.3.B.R.3.4	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	13	13	0.108	37	217
405235034-1	4.3.B.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	14	14	0.115	38	218
405235035-1	4.3.B.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	15	15	0.103	39	219
405235036-1	4.3.B.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	16	16	0.109	40	220
405235037-1	4.4.C.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	17	17	0.114	41	221
405235038-1	4.4.C.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	18	18	0.117	42	222
405235039-1	4.4.C.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	19	19	0.108	43	223
405235040-1	4.4.D.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	20	20	0.112	44	224
1203621715-1	MB for batch 1596399	MB		1 pCi/g	SOIL	QC ACCOUNT		21	21	0.117	45	225
1203621716-1	4.2.B.R.2.3(405235021DUP)	DUP		1 pCi/g	SOIL	QC ACCOUNT	08-DEC-15	22	22	0.102	46	226
1203621717-1	LCS for batch 1596399	LCS		1 pCi/g	SOIL	QC ACCOUNT		23	23	0.117	47	227

WMP 9/29/16

Solid Sample Dissolution by: LEACH or DIGESTION
 Circle One

Data Reviewed By: M. Lane 9/30/16

BKG	1			Bkg Upper Limit (CPM)=	2.000000			Reference	Tracer
Ref Std Np-239 Beta Cts=	3147	Efficiency=	0.4890	Efficiency Error=	0.0178			S/N=	445-96-2-GG
Ref Std Np-239 Beta Cts=	3109	Efficiency=	0.4832	Efficiency Error=	0.0179			DPM=	429.005
Ref Std Np-239 Beta Cts=	3049	Efficiency=	0.4737	Efficiency Error=	0.0181			Exp. Date=	9/30/2009
Ref Std Np-239 Beta Cts=	3159	Efficiency=	0.4909	Efficiency Error=	0.0178			Reference Limits (CPM)	9/30/2016
Average Counts=	3116	Avg Efficiency=	0.4842	Avg Efficiency Error=	0.0179			Lower	201
Am-243 Correction Factor=	1.15							Upper	220
Half-life of Np-239 (days)=	2.356								Filename : NP237Yields.xls
Sample ID	Net Beta Cts	Count time	Count Date/Time	Separation Date/Time	Decay Corr Counts	% NP Yield	Delta T (min)	Gross Counts	File type :
405235021.1	2471	15	9/23/2016 12:11	9/22/2016 20:05	3015.16	93.05%	966.7	2472	Excel
405235022.1	2472	15	9/23/2016 12:27	9/22/2016 20:05	3025.85	93.38%	982.0	2473	Version # :
405235023.1	2251	15	9/23/2016 12:42	9/22/2016 20:05	2764.00	85.30%	997.4	2252	1.2.2
405235024.1	2153	15	9/23/2016 12:57	9/22/2016 20:05	2651.96	81.84%	1012.7	2154	
405235025.1	2062	15	9/23/2016 13:13	9/22/2016 20:05	2547.85	78.62%	1028.0	2063	
405235026.1	2255	15	9/23/2016 13:28	9/22/2016 20:05	2795.07	86.25%	1043.4	2256	
405235027.1	1782	15	9/23/2016 13:43	9/22/2016 20:05	2215.73	68.38%	1058.7	1783	
405235028.1	2269	15	9/23/2016 13:59	9/22/2016 20:05	2830.12	87.34%	1074.1	2270	
405235029.1	2125	15	9/23/2016 14:14	9/22/2016 20:05	2658.84	82.05%	1089.4	2126	
405235030.1	1797	15	9/23/2016 14:29	9/22/2016 20:05	2255.50	69.60%	1104.8	1798	
405235031.1	2276	15	9/23/2016 14:45	9/22/2016 20:05	2865.69	88.43%	1120.1	2277	
405235032.1	2226	15	9/23/2016 15:00	9/22/2016 20:05	2811.54	86.76%	1135.5	2227	
405235033.1	2291	15	9/23/2016 15:15	9/22/2016 20:05	2902.72	89.58%	1150.8	2292	
405235034.1	2082	15	9/23/2016 15:31	9/22/2016 20:05	2646.21	81.66%	1166.2	2083	
405235035.1	2261	15	9/23/2016 15:46	9/22/2016 20:05	2882.74	88.96%	1181.5	2262	
405235036.1	2042	15	9/23/2016 16:01	9/22/2016 20:05	2611.70	80.60%	1196.9	2043	
405235037.1	2187	15	9/23/2016 16:17	9/22/2016 20:05	2805.93	86.59%	1212.2	2188	
405235038.1	2176	15	9/23/2016 16:32	9/22/2016 20:05	2800.59	86.42%	1227.6	2177	
405235039.1	2404	15	9/23/2016 16:47	9/22/2016 20:05	3103.75	95.78%	1243.0	2405	
405235040.1	1840	15	9/23/2016 17:03	9/22/2016 20:05	2383.05	73.54%	1258.3	1841	
1203621715.1	2081	15	9/23/2016 17:18	9/22/2016 20:05	2703.64	83.43%	1273.7	2082	
1203621716.1	917	15	9/23/2016 17:34	9/22/2016 20:05	1195.11	36.88%	1289.0	918	
1203621717.1	2462	15	9/23/2016 17:49	9/22/2016 20:05	3218.77	99.33%	1304.4	2463	
BKG	0	15	9/23/2016 0:17	9/22/2016 20:05	0.00	0.00%	252.2		
Sample ID	Carrier	Alpha	Beta	Count time	Voltage	Date/Time			
REF	92	1937	3620	15	1545	9/23/16 0:32			
REF	93	2046	3577	15	1545	9/23/16 0:47			
REF	94	2034	3507	15	1545	9/23/16 1:03			
REF	95	1974	3634	15	1545	9/23/16 10:15			
405235021.1	25	90	2472	15	1545	9/23/16 12:11			
405235022.1	26	111	2473	15	1545	9/23/16 12:27			
405235023.1	27	95	2252	15	1545	9/23/16 12:42			
405235024.1	28	97	2154	15	1545	9/23/16 12:57			
405235025.1	29	85	2063	15	1545	9/23/16 13:13			
405235026.1	30	100	2256	15	1545	9/23/16 13:28			
405235027.1	31	68	1783	15	1545	9/23/16 13:43			
405235028.1	32	96	2270	15	1545	9/23/16 13:59			
405235029.1	33	76	2126	15	1545	9/23/16 14:14			
405235030.1	34	83	1798	15	1545	9/23/16 14:29			
405235031.1	35	100	2277	15	1545	9/23/16 14:45			
405235032.1	36	99	2227	15	1545	9/23/16 15:00			
405235033.1	37	91	2292	15	1545	9/23/16 15:15			
405235034.1	38	79	2083	15	1545	9/23/16 15:31			
405235035.1	39	108	2262	15	1545	9/23/16 15:46			
405235036.1	40	89	2043	15	1545	9/23/16 16:01			
405235037.1	41	90	2188	15	1545	9/23/16 16:17			
405235038.1	42	110	2177	15	1545	9/23/16 16:32			
405235039.1	43	97	2405	15	1545	9/23/16 16:47			
405235040.1	44	73	1841	15	1545	9/23/16 17:03			
1203621715.1	45	84	2082	15	1545	9/23/16 17:18			
1203621716.1	46	56	918	15	1545	9/23/16 17:34			
1203621717.1	47	146	2463	15	1545	9/23/16 17:49			
BKG	91	2	1	15	1545	9/23/16 0:17			

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ALPHA SPECTROSCOPY REPORT

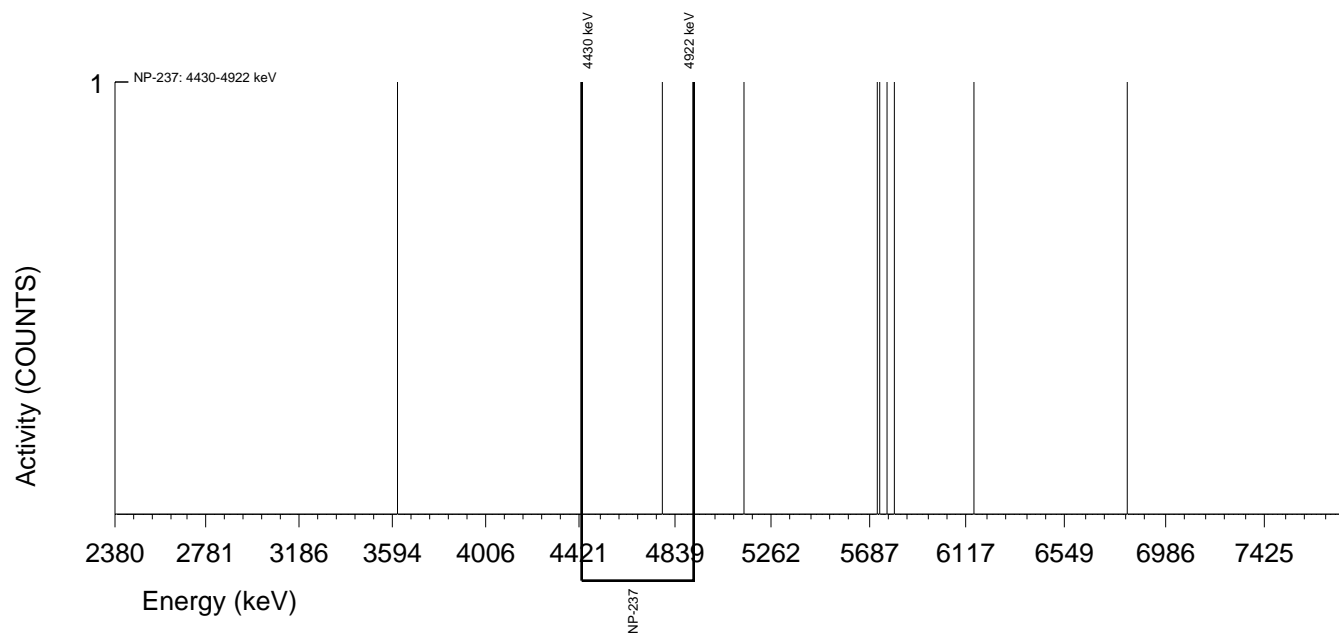
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235021_NP SAMPLE QTY : 0.115 G +/-0.870 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 93.0 +/-5.215 %	CHAMBER : 185 DETECTOR S/N : 68615 AVERAGE %EFFICIENCY : 25.3535 AVERAGE %EFF ERROR : 0.4915 COUNT DATE : 26-Sep-2016 17:11:18 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B185.CNF;859 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W185.CNF;237 CAL DATE : 15-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.42148
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 4.1513E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4781.62	4.991	1.000	-0.320	1.320	1.1489	100.000	-4.43E-02	4.00E-01	9.69E-01	2.77E-01	4.00E-01



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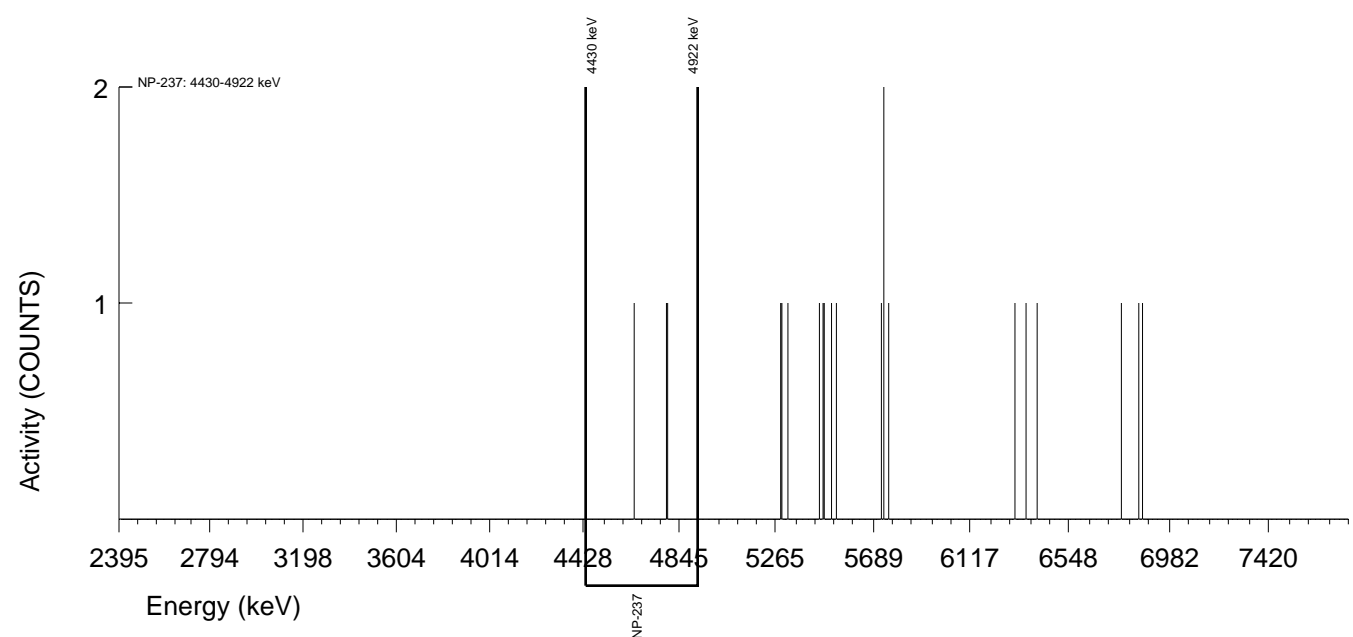
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235022_NP SAMPLE QTY : 0.109 G +/-0.917 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 93.4 +/-5.215 %	CHAMBER : 186 DETECTOR S/N : 68616 AVERAGE %EFFICIENCY : 25.3981 AVERAGE %EFF ERROR : 0.4924 COUNT DATE : 26-Sep-2016 17:11:20 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B186.CNF;819 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W186.CNF;28 CAL DATE : 15-Sep-2016
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TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.42148 NOMINAL : 4.4615E+02 dpm RESULTS : 4.1660E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4742.00	144.228	3.000	1.560	1.440	1.2000	100.000	2.27E-01	5.83E-01	1.04E+00	3.03E-01	5.82E-01



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ALPHA SPECTROSCOPY REPORT

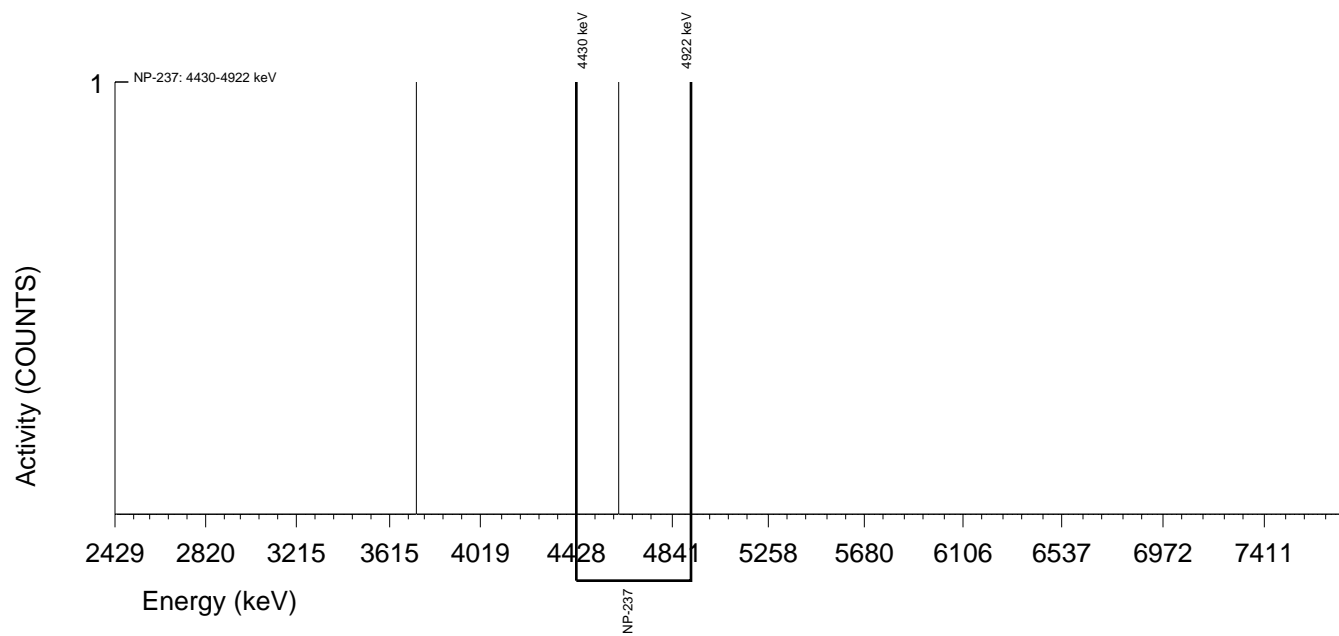
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235023_NP SAMPLE QTY : 0.115 G +/-0.870 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 85.3 +/-5.253 %	CHAMBER : 188 DETECTOR S/N : 68621 AVERAGE %EFFICIENCY : 26.7276 AVERAGE %EFF ERROR : 0.5175 COUNT DATE : 26-Sep-2016 17:11:23 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B188.CNF;854 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W188.CNF;233 CAL DATE : 15-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.42148
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.8055E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4613.29	4.861	1.000	-0.080	1.080	1.0392	100.000	-1.15E-02	4.11E-01	9.48E-01	2.59E-01	4.11E-01



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 ALPHA SPECTROSCOPY REPORT

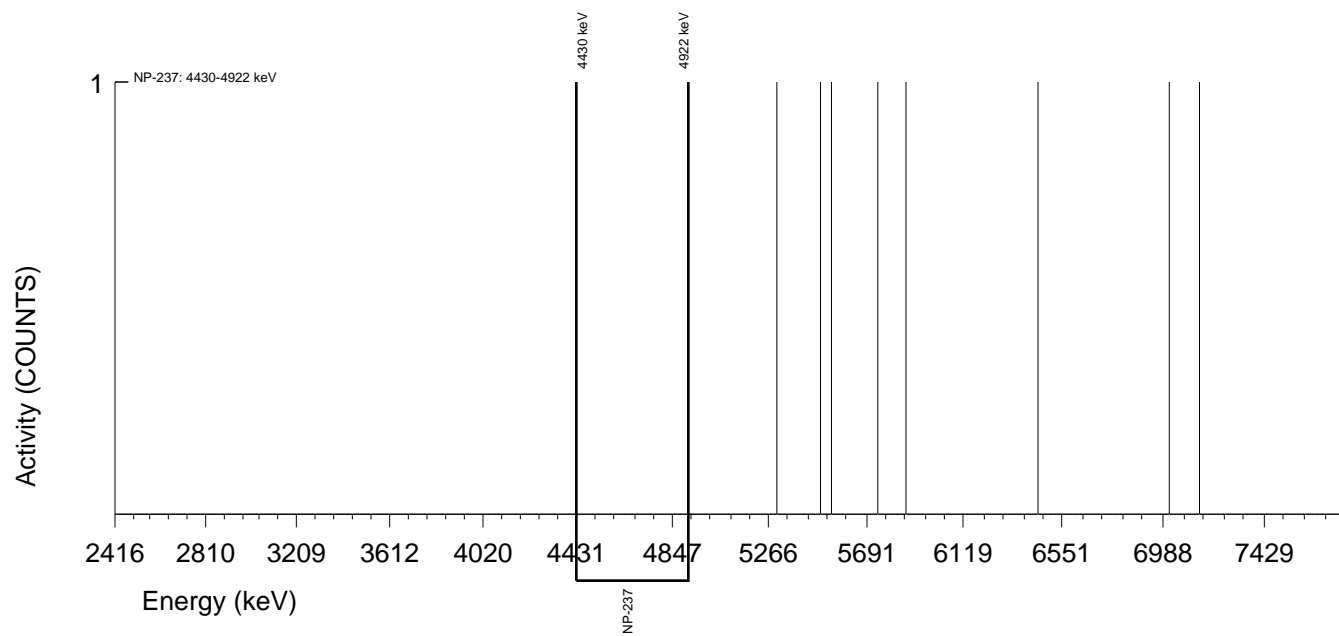
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235024_NP SAMPLE QTY : 0.103 G +/-0.971 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 81.8 +/-5.272 %	CHAMBER : 189 DETECTOR S/N : 68622 AVERAGE %EFFICIENCY : 25.4050 AVERAGE %EFF ERROR : 0.4925 COUNT DATE : 26-Sep-2016 17:11:25 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B189.CNF;855 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W189.CNF;231 CAL DATE : 15-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.42148
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.6512E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.26	0.000	0.000	-0.720	0.720	0.8485	100.000	-1.26E-01	3.61E-01	1.04E+00	2.59E-01	3.60E-01



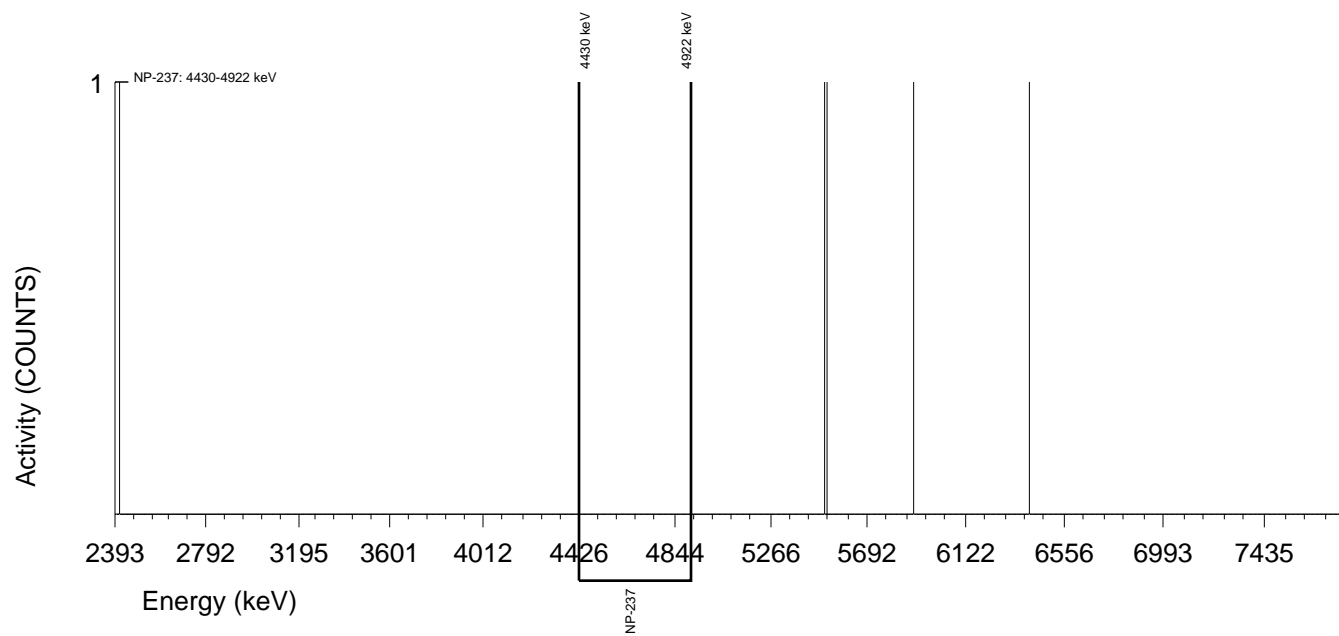
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235025_NP SAMPLE QTY : 0.105 G +/-0.952 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 78.6 +/-5.292 %	CHAMBER : 195 DETECTOR S/N : 78786 AVERAGE %EFFICIENCY : 26.3844 AVERAGE %EFF ERROR : 0.5110 COUNT DATE : 26-Sep-2016 17:11:27 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B195.CNF;880 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W195.CNF;259 CAL DATE : 15-Sep-2016
TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.42148 NOMINAL : 4.4615E+02 dpm RESULTS : 3.5079E+02 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.33	0.000	0.000	-0.600	0.600	0.7746	100.000	-1.03E-01	3.53E-01	9.82E-01	2.32E-01	3.52E-01



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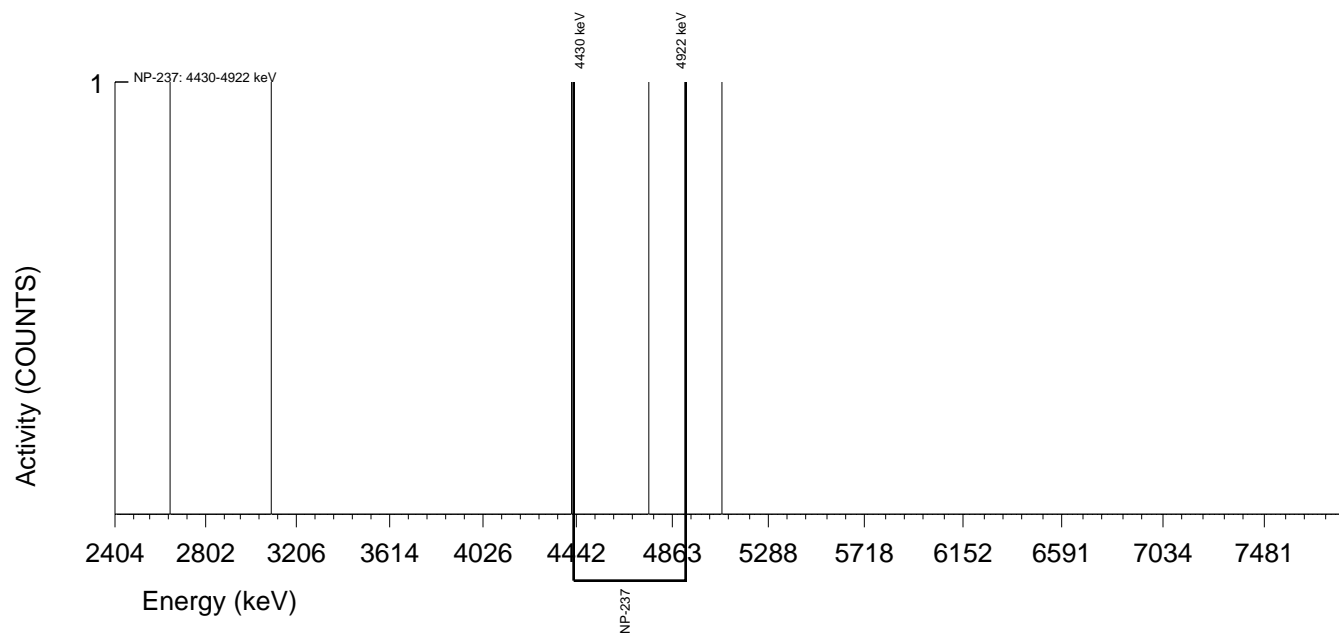
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235026_NP SAMPLE QTY : 0.108 G +/-0.926 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 86.3 +/-5.252 %	CHAMBER : 069 DETECTOR S/N : 78795 AVERAGE %EFFICIENCY : 32.9662 AVERAGE %EFF ERROR : 0.6355 COUNT DATE : 29-Sep-2016 14:05:23 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B069.CNF;1823 BKG DATE : 25-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W069.CNF;495 CAL DATE : 03-Sep-2016
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TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.42148 NOMINAL : 4.4615E+02 dpm RESULTS : 3.8483E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4762.78	4.959	1.000	0.040	0.960	0.9798	100.000	2.44E-03	1.81E-01	4.03E-01	1.10E-01	1.81E-01



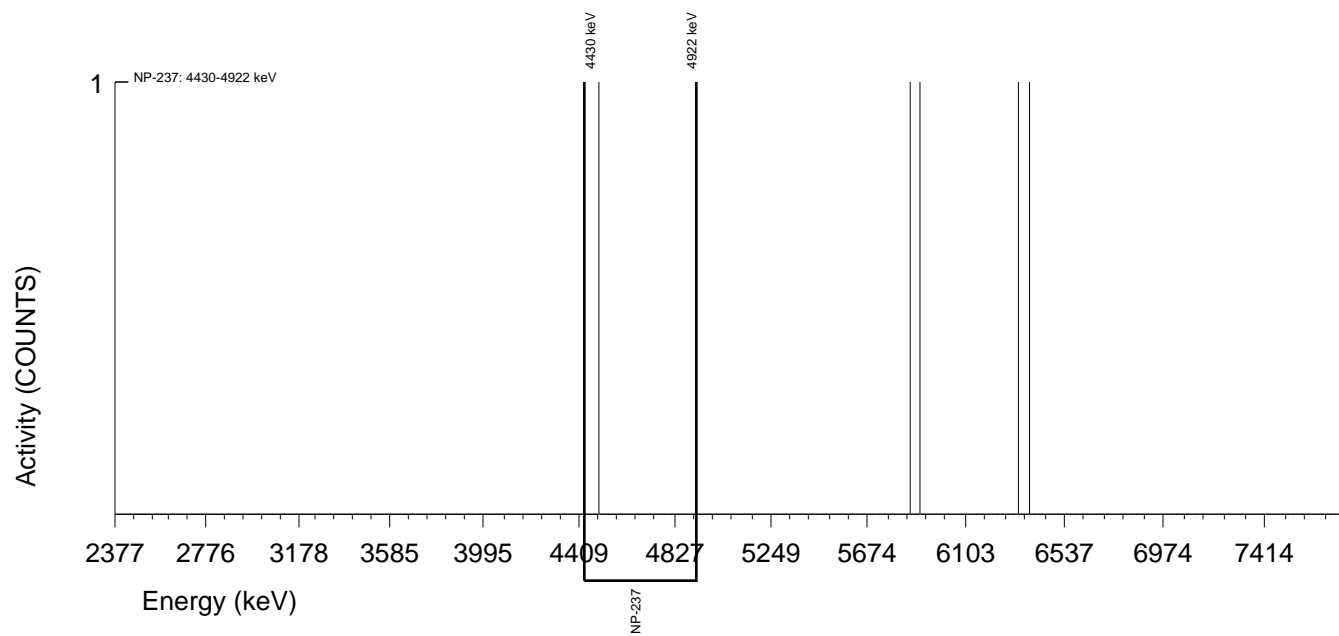
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235027_NP SAMPLE QTY : 0.117 G +/-0.855 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 68.4 +/-5.364 %	CHAMBER : 199 DETECTOR S/N : 78896 AVERAGE %EFFICIENCY : 26.2038 AVERAGE %EFF ERROR : 0.5077 COUNT DATE : 26-Sep-2016 17:11:32 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B199.CNF;801 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W199.CNF;222 CAL DATE : 15-Sep-2016
TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.42148 NOMINAL : 4.4615E+02 dpm RESULTS : 3.0506E+02 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4497.59	4.962	1.000	0.400	0.600	0.7746	100.000	7.16E-02	5.07E-01	1.02E+00	2.41E-01	5.07E-01



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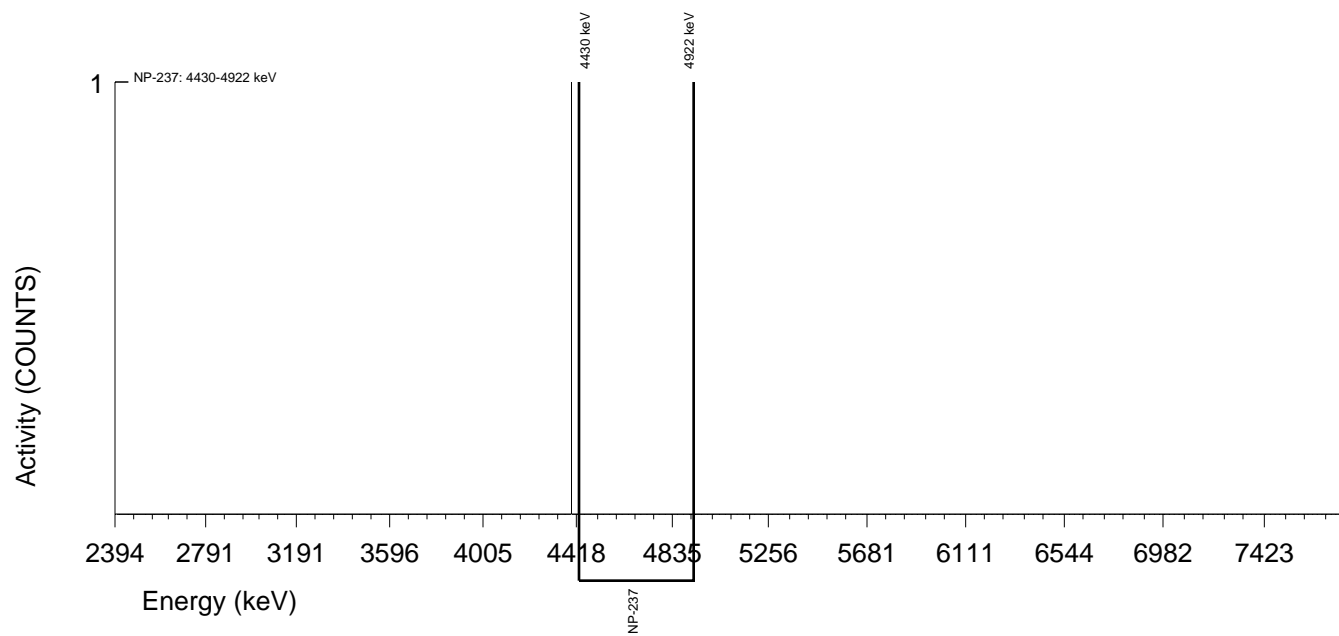
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235028_NP SAMPLE QTY : 0.109 G +/-0.917 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 87.3 +/-5.250 %	CHAMBER : 200 DETECTOR S/N : 78900 AVERAGE %EFFICIENCY : 27.0654 AVERAGE %EFF ERROR : 0.5238 COUNT DATE : 26-Sep-2016 17:11:35 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B200.CNF;801 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W200.CNF;230 CAL DATE : 15-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.42148
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.8965E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.29	0.000	0.000	-0.600	0.600	0.7746	100.000	-8.74E-02	2.98E-01	8.30E-01	1.96E-01	2.98E-01



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 ALPHA SPECTROSCOPY REPORT

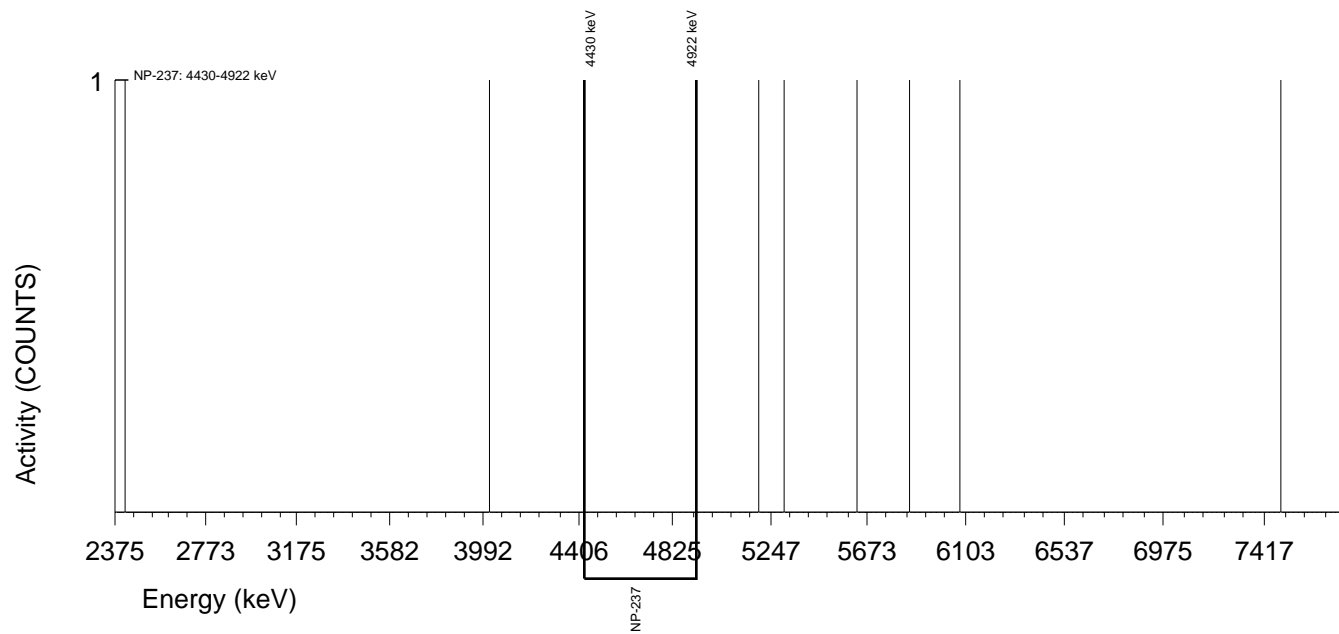
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235029_NP SAMPLE QTY : 0.106 G +/-0.943 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 82.0 +/-5.278 %	CHAMBER : 201 DETECTOR S/N : 78902 AVERAGE %EFFICIENCY : 26.2326 AVERAGE %EFF ERROR : 0.5081 COUNT DATE : 26-Sep-2016 17:11:37 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B201.CNF;801 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W201.CNF;224 CAL DATE : 15-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.42148
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.6607E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.31	0.000	0.000	-0.480	0.480	0.6928	100.000	-7.90E-02	3.34E-01	8.90E-01	1.98E-01	3.34E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

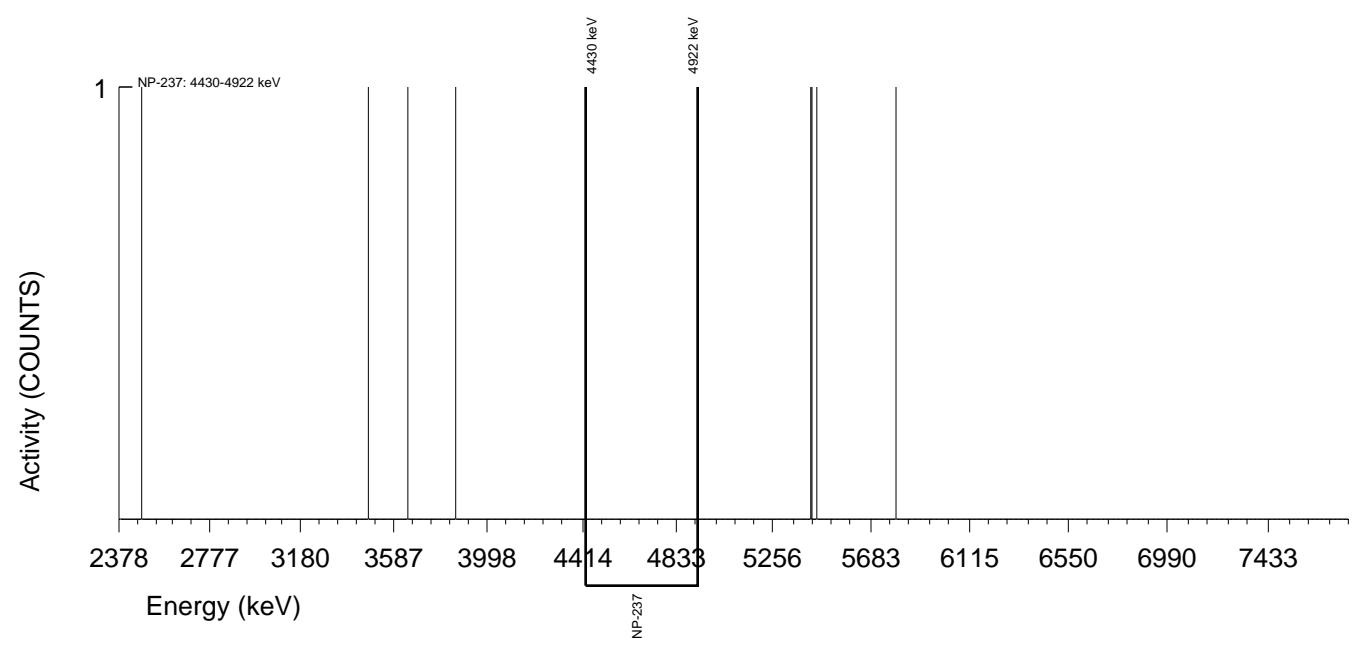
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235030_NP SAMPLE QTY : 0.101 G +/-0.990 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 69.6 +/-5.359 %	CHAMBER : 202 DETECTOR S/N : 78903 AVERAGE %EFFICIENCY : 27.2753 AVERAGE %EFF ERROR : 0.5278 COUNT DATE : 26-Sep-2016 17:11:40 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B202.CNF;799 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W202.CNF;226 CAL DATE : 15-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.42148
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.1054E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.30	0.000	0.000	-0.840	0.840	0.9165	100.000	-1.64E-01	4.06E-01	1.21E+00	3.12E-01	4.05E-01



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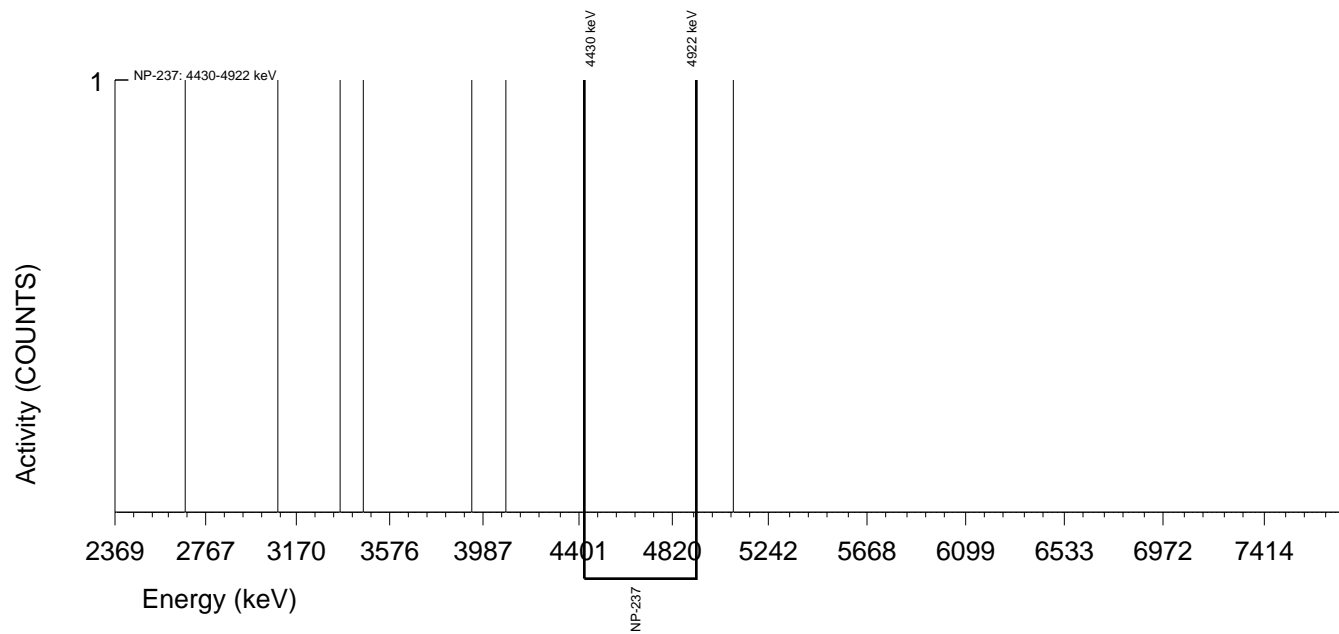
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235031_NP SAMPLE QTY : 0.106 G +/-0.943 % SAMPLE DATE : 26-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 88.4 +/-5.248 %	CHAMBER : 203 DETECTOR S/N : 78905 AVERAGE %EFFICIENCY : 25.9071 AVERAGE %EFF ERROR : 0.5020 COUNT DATE : 26-Sep-2016 17:11:43 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B203.CNF;801 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W203.CNF;229 CAL DATE : 15-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.42148
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.9455E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.31	0.000	0.000	-0.480	0.480	0.6928	100.000	-7.42E-02	3.14E-01	8.37E-01	1.86E-01	3.14E-01



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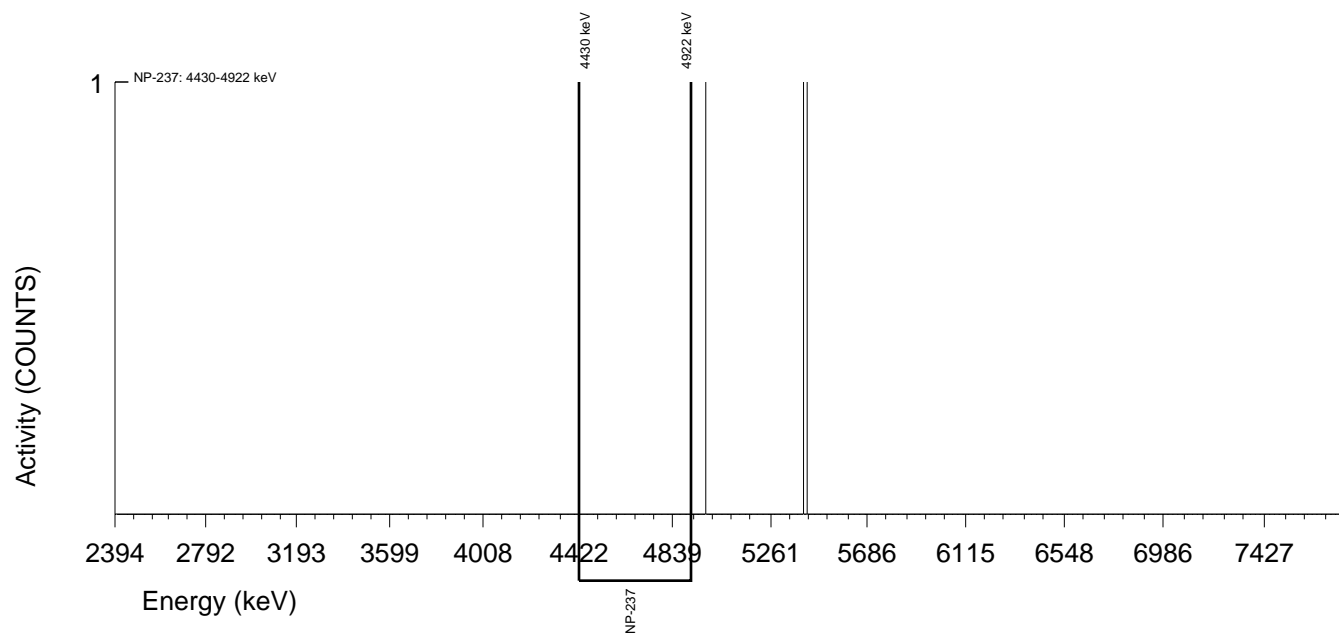
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235032_NP SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 86.8 +/-5.258 %	CHAMBER : 161 DETECTOR S/N : 70321 AVERAGE %EFFICIENCY : 25.7727 AVERAGE %EFF ERROR : 0.4995 COUNT DATE : 26-Sep-2016 17:09:37 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B161.CNF;860 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W161.CNF;261 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.42148
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.8709E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.31	0.000	0.000	-0.360	0.360	0.6000	100.000	-5.81E-02	3.26E-01	8.21E-01	1.69E-01	3.25E-01



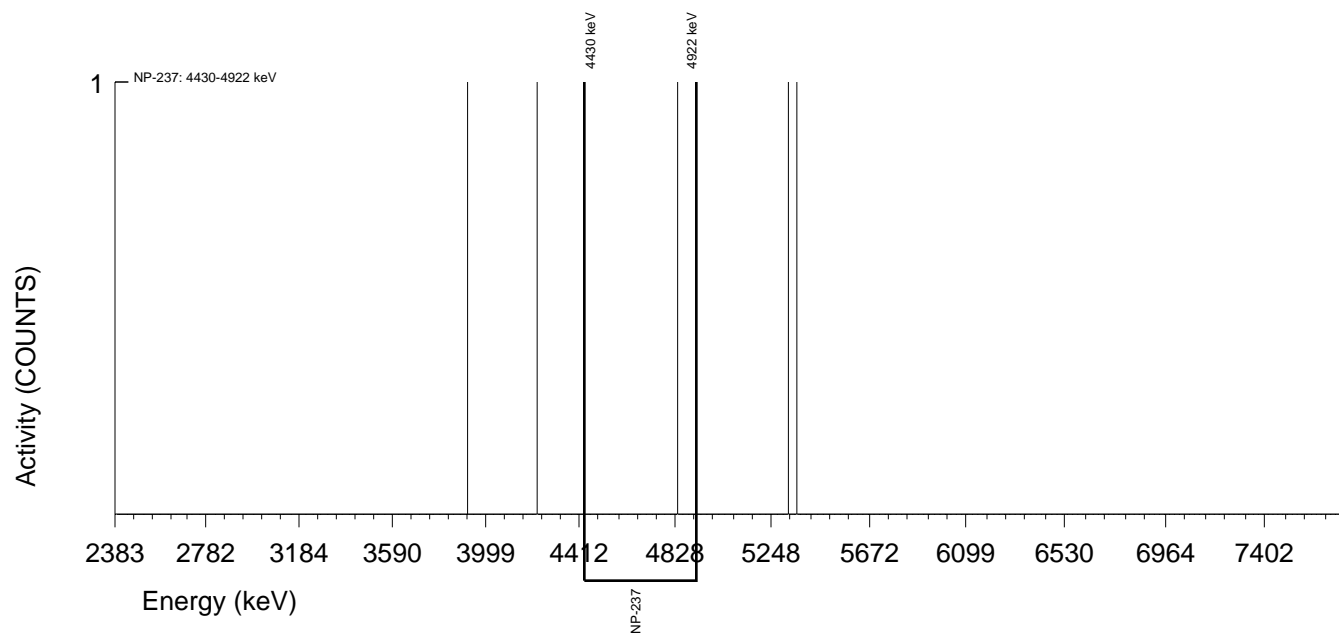
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Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235033_NP SAMPLE QTY : 0.108 G +/-0.926 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 89.6 +/-5.246 %	CHAMBER : 162 DETECTOR S/N : 70323 AVERAGE %EFFICIENCY : 26.6669 AVERAGE %EFF ERROR : 0.5165 COUNT DATE : 26-Sep-2016 17:09:39 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B162.CNF;862 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W162.CNF;260 CAL DATE : 13-Sep-2016
TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.42148 NOMINAL : 4.4615E+02 dpm RESULTS : 3.9965E+02 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4838.90	4.961	1.000	0.880	0.120	0.3464	100.000	1.28E-01	4.07E-01	6.12E-01	8.77E-02	4.06E-01



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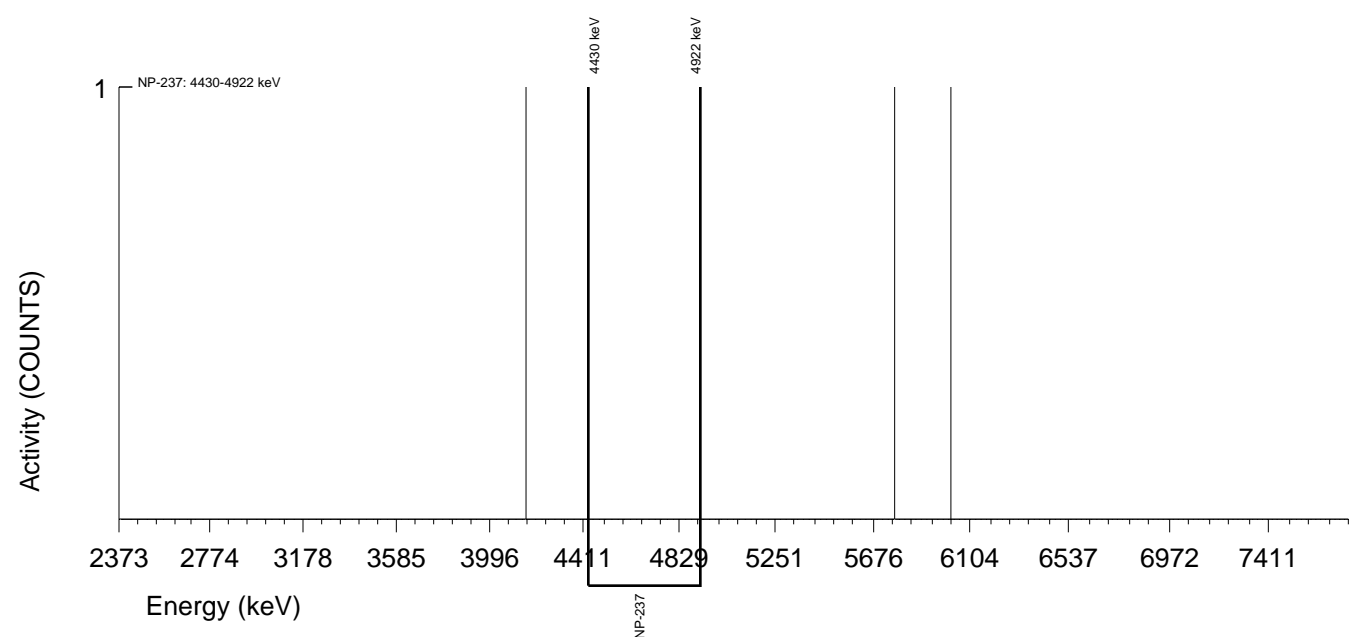
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235034_NP SAMPLE QTY : 0.115 G +/-0.870 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 81.7 +/-5.287 %	CHAMBER : 182 DETECTOR S/N : 74440 AVERAGE %EFFICIENCY : 22.5384 AVERAGE %EFF ERROR : 0.4383 COUNT DATE : 26-Sep-2016 17:35:29 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B182.CNF;320 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W182.CNF;95 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.42148
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.6433E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.39	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	3.51E-01	5.32E-01	0.00E+00	3.50E-01



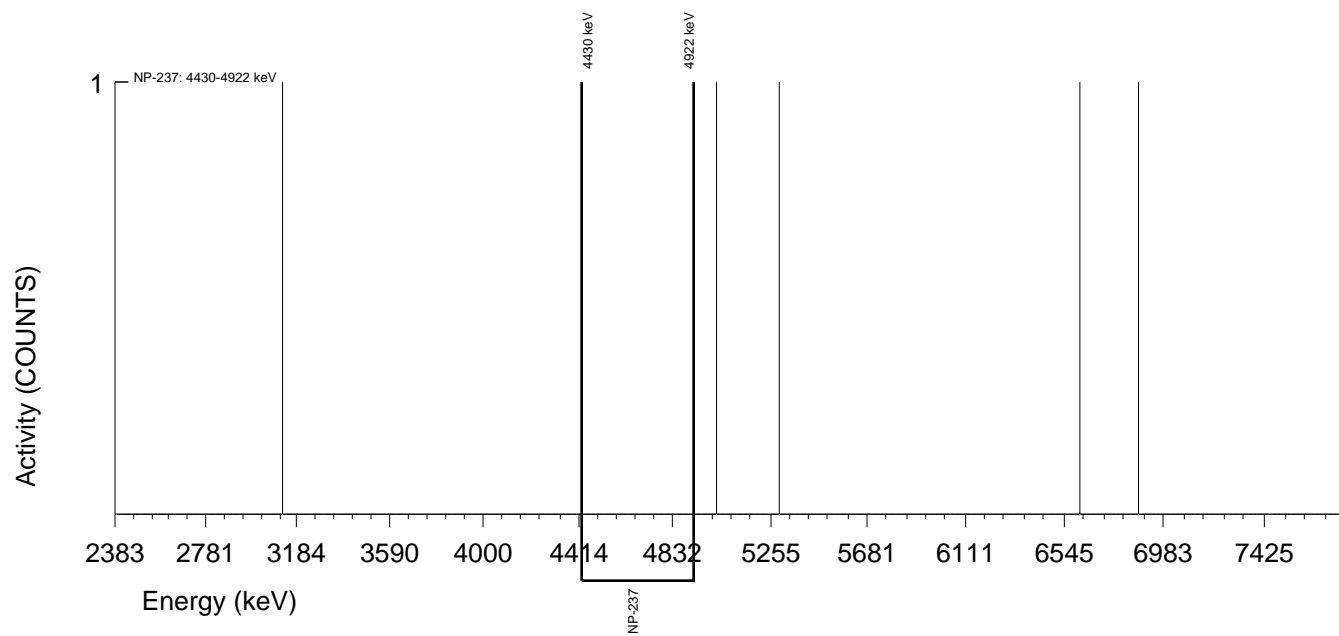
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Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235035_NP SAMPLE QTY : 0.103 G +/-0.971 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 89.0 +/-5.251 %	CHAMBER : 166 DETECTOR S/N : 74545 AVERAGE %EFFICIENCY : 26.6822 AVERAGE %EFF ERROR : 0.5167 COUNT DATE : 26-Sep-2016 17:09:43 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B166.CNF;891 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W166.CNF;299 CAL DATE : 13-Sep-2016
TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.42148 NOMINAL : 4.4615E+02 dpm RESULTS : 3.9690E+02 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.31	0.000	0.000	-0.120	0.120	0.3464	100.000	-1.84E-02	3.06E-01	6.46E-01	9.26E-02	3.05E-01



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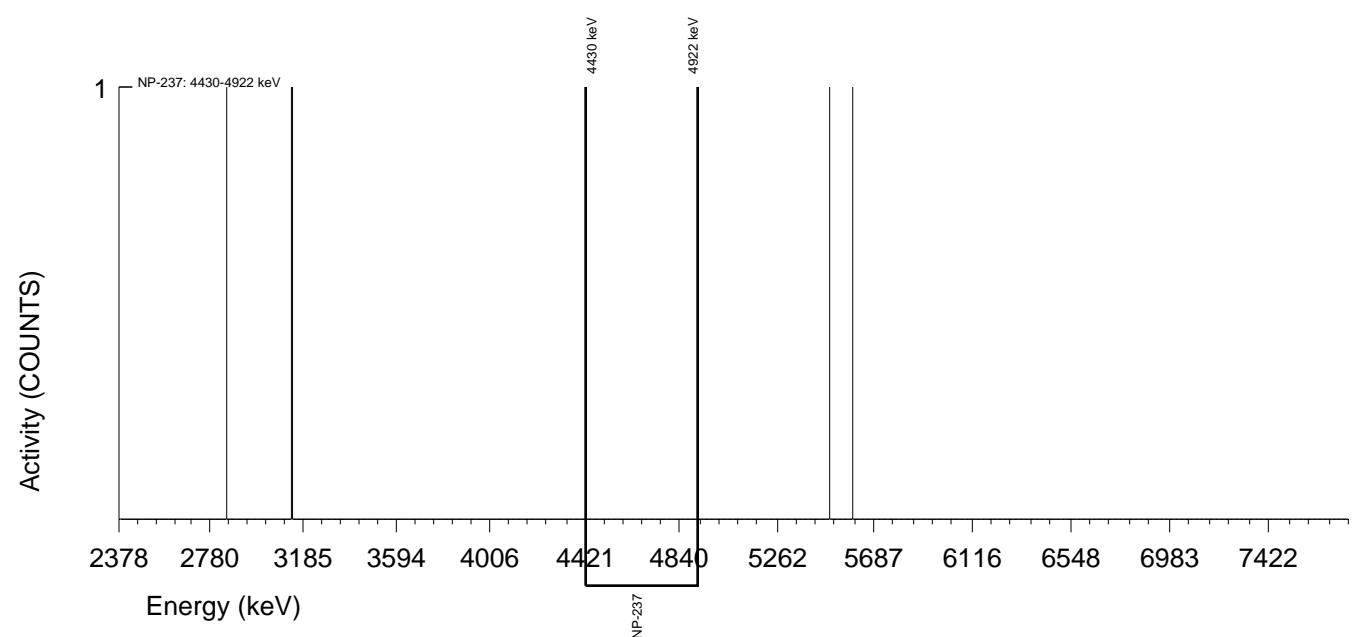
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235036_NP SAMPLE QTY : 0.109 G +/-0.917 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 80.6 +/-5.296 %	CHAMBER : 167 DETECTOR S/N : 72546 AVERAGE %EFFICIENCY : 24.1606 AVERAGE %EFF ERROR : 0.4690 COUNT DATE : 26-Sep-2016 17:09:46 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B167.CNF;886 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W167.CNF;246 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.42148
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.5958E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.42	0.000	0.000	-0.840	0.840	0.9165	100.000	-1.49E-01	3.67E-01	1.09E+00	2.82E-01	3.66E-01



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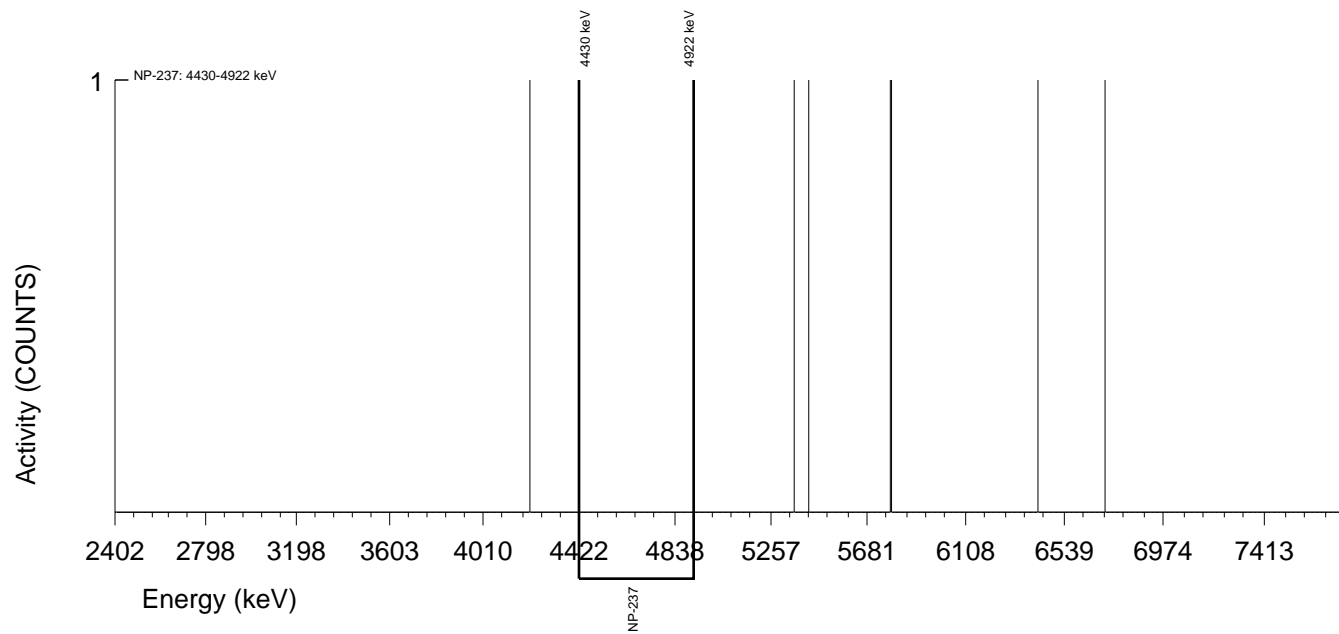
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235037_NP SAMPLE QTY : 0.114 G +/-0.877 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 86.6 +/-5.265 %	CHAMBER : 169 DETECTOR S/N : 72548 AVERAGE %EFFICIENCY : 26.2282 AVERAGE %EFF ERROR : 0.5082 COUNT DATE : 26-Sep-2016 17:09:48 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B169.CNF;876 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W169.CNF;259 CAL DATE : 13-Sep-2016
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TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.42148 NOMINAL : 4.4615E+02 dpm RESULTS : 3.8632E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.32	0.000	0.000	-0.960	0.960	0.9798	100.000	-1.39E-01	3.02E-01	9.30E-01	2.47E-01	3.02E-01



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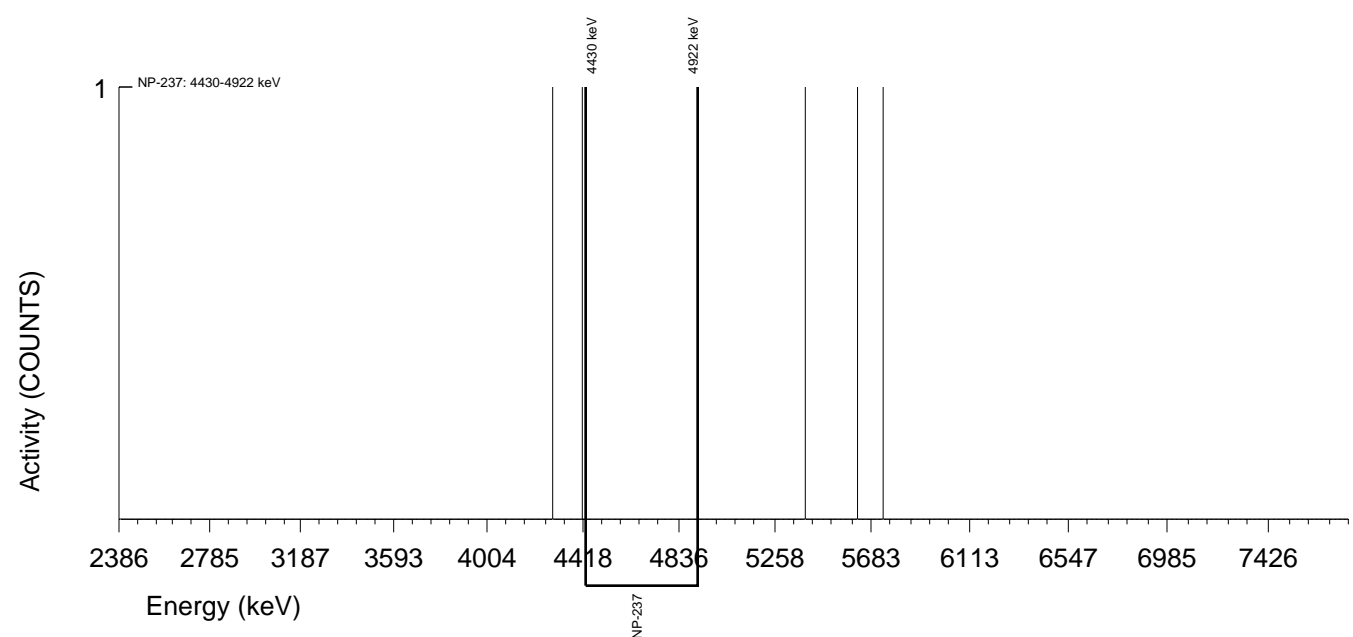
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235038_NP SAMPLE QTY : 0.117 G +/-0.855 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 86.4 +/-5.268 %	CHAMBER : 170 DETECTOR S/N : 72549 AVERAGE %EFFICIENCY : 25.7306 AVERAGE %EFF ERROR : 0.4988 COUNT DATE : 26-Sep-2016 17:09:51 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B170.CNF;876 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W170.CNF;241 CAL DATE : 13-Sep-2016
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TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.42148 NOMINAL : 4.4615E+02 dpm RESULTS : 3.8559E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.32	0.000	0.000	-0.600	0.600	0.7746	100.000	-8.66E-02	2.95E-01	8.22E-01	1.95E-01	2.95E-01



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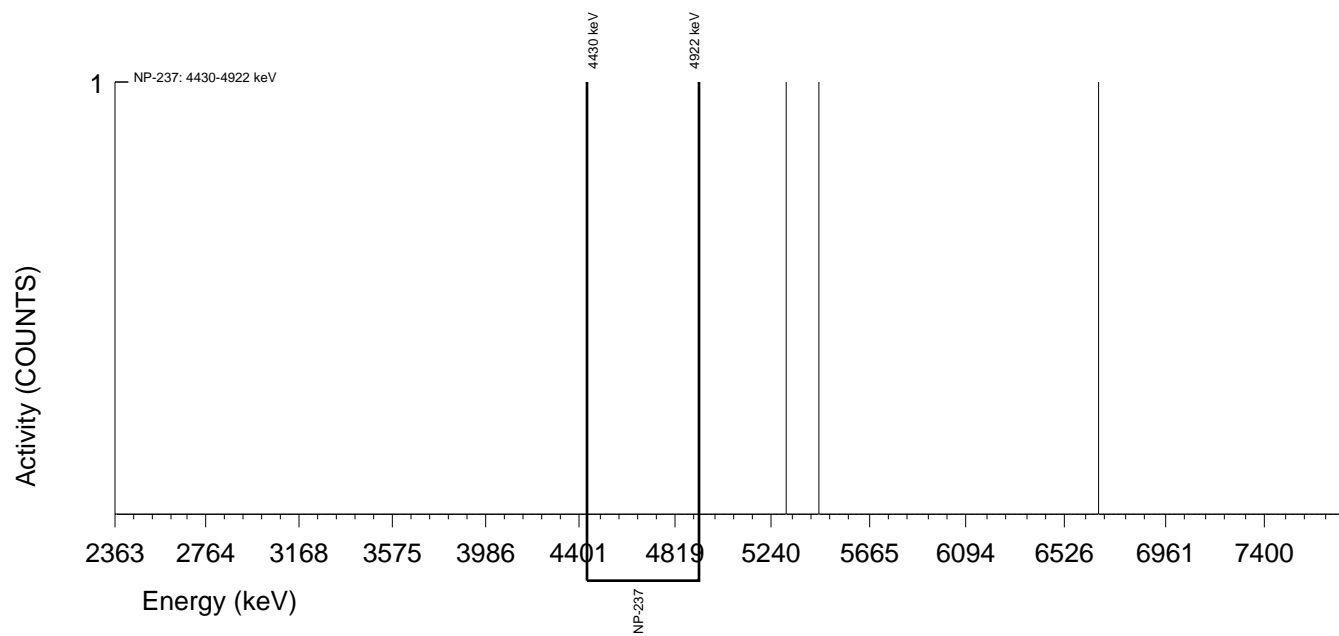
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235039_NP SAMPLE QTY : 0.108 G +/-0.926 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 95.8 +/-5.226 %	CHAMBER : 175 DETECTOR S/N : 74433 AVERAGE %EFFICIENCY : 26.2713 AVERAGE %EFF ERROR : 0.5089 COUNT DATE : 26-Sep-2016 17:11:08 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B175.CNF;870 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W175.CNF;241 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.42148
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 4.2732E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.39	0.000	0.000	-0.240	0.240	0.4899	100.000	-3.32E-02	2.77E-01	6.50E-01	1.18E-01	2.77E-01



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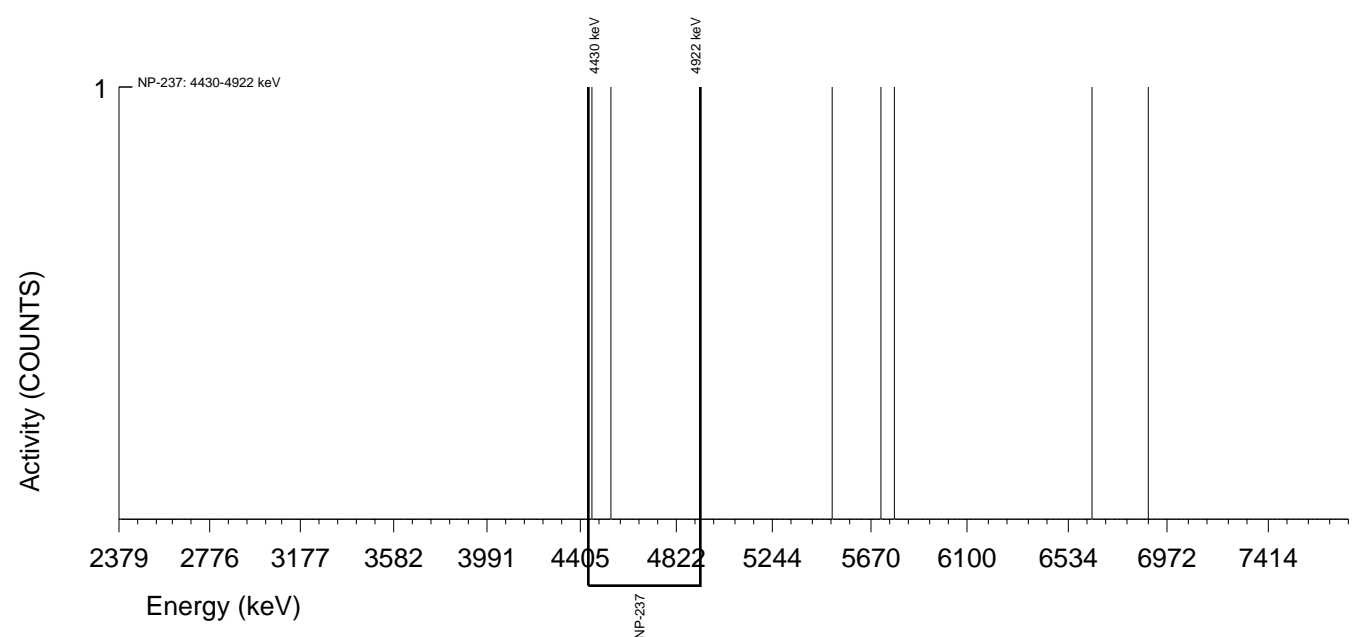
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S0405235040_NP SAMPLE QTY : 0.112 G +/-0.893 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 73.5 +/-5.347 %	CHAMBER : 176 DETECTOR S/N : 74434 AVERAGE %EFFICIENCY : 25.6995 AVERAGE %EFF ERROR : 0.4981 COUNT DATE : 26-Sep-2016 17:11:10 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B176.CNF;865 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W176.CNF;237 CAL DATE : 13-Sep-2016
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TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.42148 NOMINAL : 4.4615E+02 dpm RESULTS : 3.2810E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4493.02	83.891	2.000	1.040	0.960	0.9798	100.000	1.84E-01	6.15E-01	1.14E+00	3.02E-01	6.15E-01



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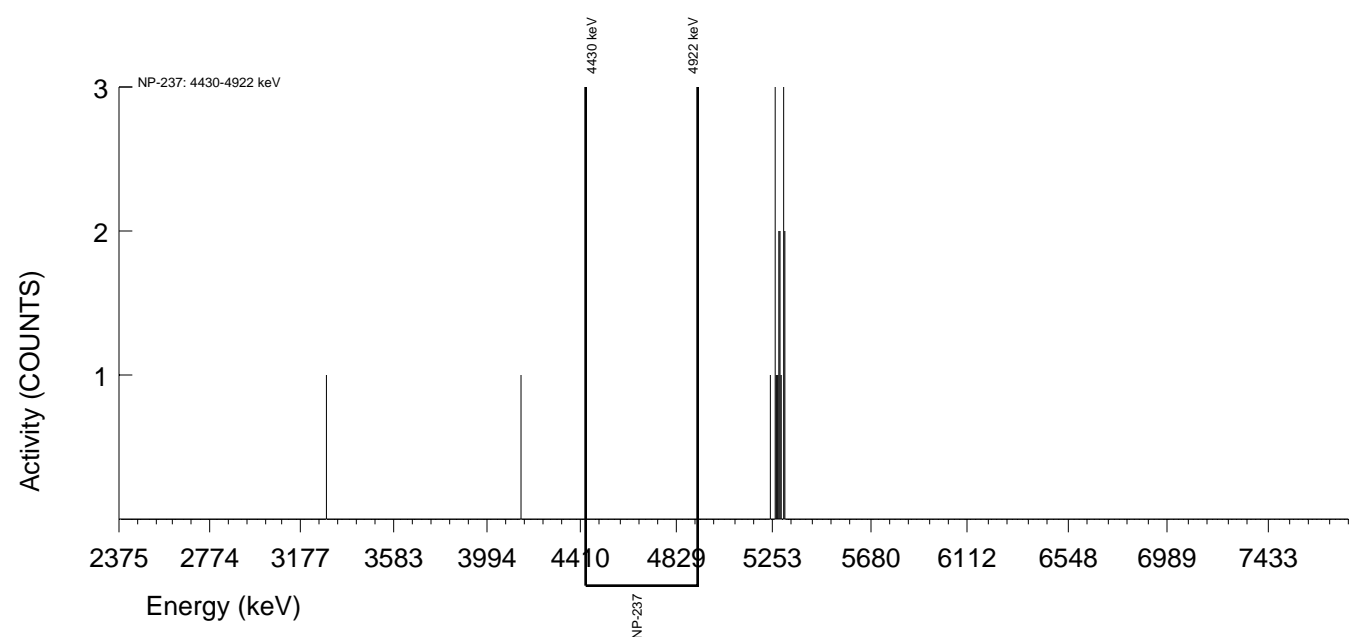
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S1203621715_NP SAMPLE QTY : 0.117 G +/-0.855 % SAMPLE DATE : 21-Sep-2016 00:00:00 ANALYST : MXS2 % YIELD : 83.4 +/-5.288 %	CHAMBER : 177 DETECTOR S/N : 74435 AVERAGE %EFFICIENCY : 26.5935 AVERAGE %EFF ERROR : 0.5150 COUNT DATE : 26-Sep-2016 17:11:13 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B177.CNF;877 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W177.CNF;243 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.42148
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.7224E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.28	0.000	0.000	-0.240	0.240	0.4899	100.000	-3.47E-02	2.90E-01	6.80E-01	1.23E-01	2.89E-01



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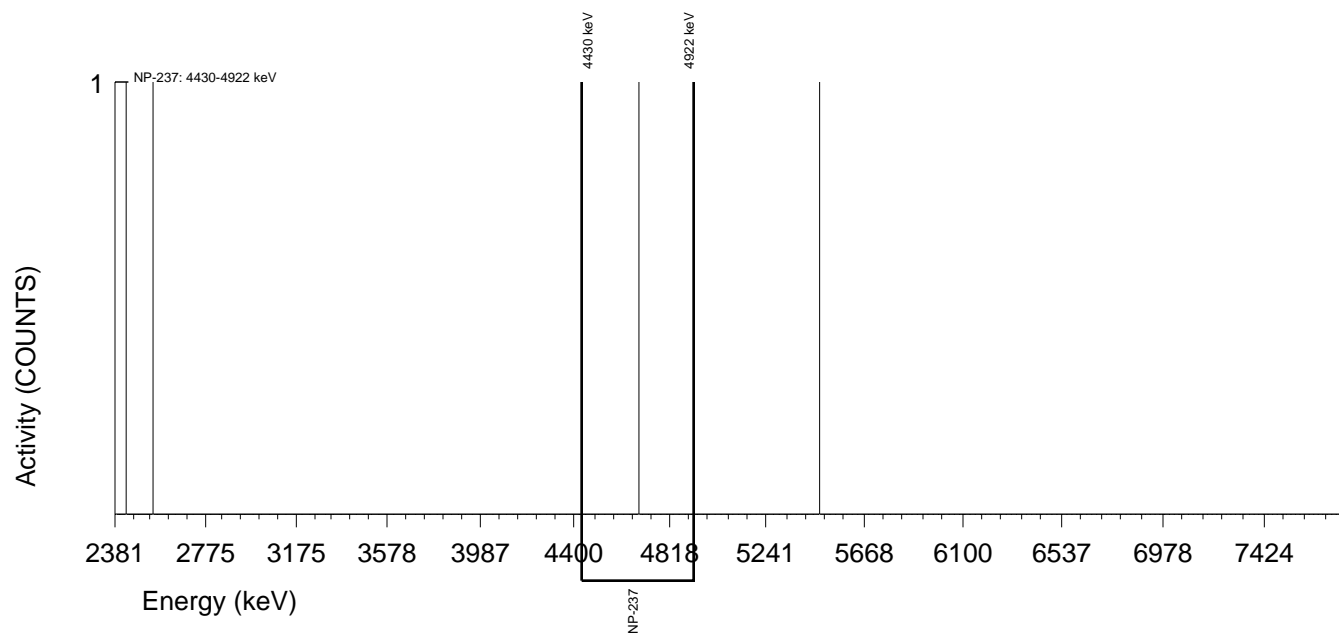
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S1203621716_NP SAMPLE QTY : 0.102 G +/-0.980 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 36.9 +/-5.839 %	CHAMBER : 070 DETECTOR S/N : 78262 AVERAGE %EFFICIENCY : 31.2964 AVERAGE %EFF ERROR : 0.6038 COUNT DATE : 29-Sep-2016 14:05:23 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B070.CNF;1825 BKG DATE : 25-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W070.CNF;500 CAL DATE : 03-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.42148
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 1.6454E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4681.64	4.900	1.000	0.280	0.720	0.8485	100.000	4.46E-02	4.67E-01	9.74E-01	2.48E-01	4.67E-01



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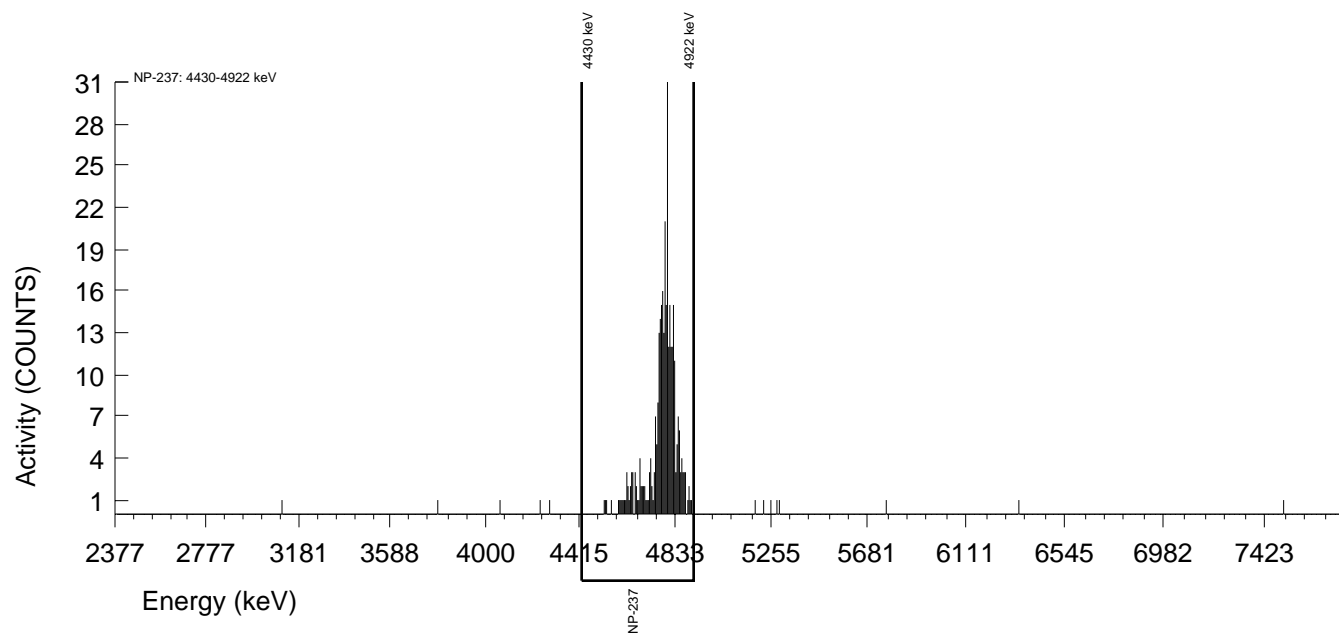
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596399 SAMPLE ID : S1203621717_NP SAMPLE QTY : 0.117 G +/-0.855 % SAMPLE DATE : 21-Sep-2016 00:00:00 ANALYST : MXS2 % YIELD : 99.3 +/-5.216 %	CHAMBER : 180 DETECTOR S/N : 83295 AVERAGE %EFFICIENCY : 26.2740 AVERAGE %EFF ERROR : 0.5089 COUNT DATE : 26-Sep-2016 11:53:52 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B180.CNF;879 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W180.CNF;230 CAL DATE : 13-Sep-2016
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TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.42148 NOMINAL : 4.4615E+02 dpm RESULTS : 4.4316E+02 dpm	LCS ID 0518-S NUCLIDE NP-237 NOMINAL (pCi/G) 3.8166E+01 % RECOVERY 108.434
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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4779.66	26.460	337.000	336.640	0.360	0.6000	100.000	4.14E+01	6.36E+00	6.26E-01	1.28E-01	4.43E+00



Batch# 11602285 Product: Am/Cm Date: 10/1/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NB
Samples have been blank corrected (if required). Blank correction reported included (if required).			NB
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		Case narrative
Sample was run within hold time.		✓	DER# 1563613
Sample was correctly preserved if required.			NB
Smears Taken for Radioactive batches.			NB
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NB
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NB
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER# 1563613 ^{10/1/16}
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER# 1563613
Aliquot Correction completed if required.			NB
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: M. Lane 10/1/16

Secondary Review Performed By: Joni Davis 10/03/16

10/4
MJC

DATA EXCEPTION REPORT

Mo.Day Yr. 01-OCT-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Am-05-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1602285	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 40523531, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, and 1203636291 were received and analyzed out of holding.</p>		<p>1. Reporting results.</p>	

Originator's Name:

Melanie Aycock 01-OCT-16

Data Validator/Group Leader:

Jessica Davis 03-OCT-16

Am/Cm Queue Sheet

27-SEP-16

Batch #: 1602285 Analyst: MXS2 First Client Due Date: 04-OCT-16 Internal Due Date: 01-OCT-16 Comments: Analyzed
 Tracer(s): Am243/Cm244 Tracer Code: 1752-C Expiration Date: 5-26-17 Vol: 0.1 Sequentially with
 LCS Isotope(s): Am241/Cm244 LCS Code(s): 0533-CC / 1216-G Expiration Date: 4-21-17 / 9-30-16 Vol(s): 0.1 / 0.1 U: _____
 Spike Isotope(s): Am241/Cm244 Spike Code(s): _____ Expiration Date: _____ Vol(s): _____ Pu: _____
 Prep Date: 9-27-16 Initials: MSD Pipet ID: 1840022 Balance ID: 1107602 Witness: NA

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	Am/Cm Det #
405235021-2	4.2B.R.2.3	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	1	0.504	69		
405235022-2	4.2B.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	2	0.507	70		
405235023-2	4.2B.R.11.2	SAMPLE	1 pCi/g	SOIL	MJWC001	02-DEC-15	3	0.505	84		
405235024-2	4.2B.R.2.2	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	4	0.505	88		
405235025-2	4.2B.R.1.2	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	5	0.503	89		
405235026-2	4.2C.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	6	0.503	90		
405235027-2	4.2C.R.1.4	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	7	0.500	91		
405235028-2	4.3.A.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	8	0.510	93		
405235029-2	4.3.B.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	9	0.511	96		
405235030-2	4.3.A.R.2.3	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	10	0.508	97		
405235031-2	4.3.B.R.1.2	SAMPLE	1 pCi/g	SOIL	MJWC001	26-NOV-15	11	0.503	99		
405235032-2	4.3.B.R.3.3	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	12	0.504	107		
405235033-2	4.3.B.R.3.4	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	13	0.501	108		
405235034-2	4.3.B.R.1.4	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	14	0.503	109		
405235035-2	4.3B.R.2.3	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	15	0.501	110		
405235036-2	4.3B.R.2.4	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	16	0.516	112		
405235037-2	4.4C.R.2.4	SAMPLE	1 pCi/g	SOIL	MJWC001	30-NOV-15	17	0.509	249		
405235038-2	4.4C.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	30-NOV-15	18	0.509	250		
405235039-2	4.4C.R.1.4	SAMPLE	1 pCi/g	SOIL	MJWC001	30-NOV-15	19	0.511	251		
405235040-2	4.4D.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	30-NOV-15	20	0.510	252		
1203636290-1	MB for batch 1602285	MB	UCF pCi/g to pCi/soil	QC ACCOUNT	QC ACCOUNT		21	0.516	92		
1203636291-2	4.2B.R.2.3(405235021DUP)	DUP	1 pCi/g	SOIL	QC ACCOUNT	08-DEC-15	22	0.501	253		
1203636292-1	LCS for batch 1602285	LCS	UCF pCi/g to pCi/soil	QC ACCOUNT	QC ACCOUNT		23	0.516	254		

Choose SOP Used: GL-RAD-A-011
 GL-RAD-A-036
 GEL Laboratories LLC, Radiochemistry Division
 Solid Sample Dissolution by: LEACH or DIGESTION
 Circle One
 Data Reviewed By: M. L. ...
 Page 1 of 1

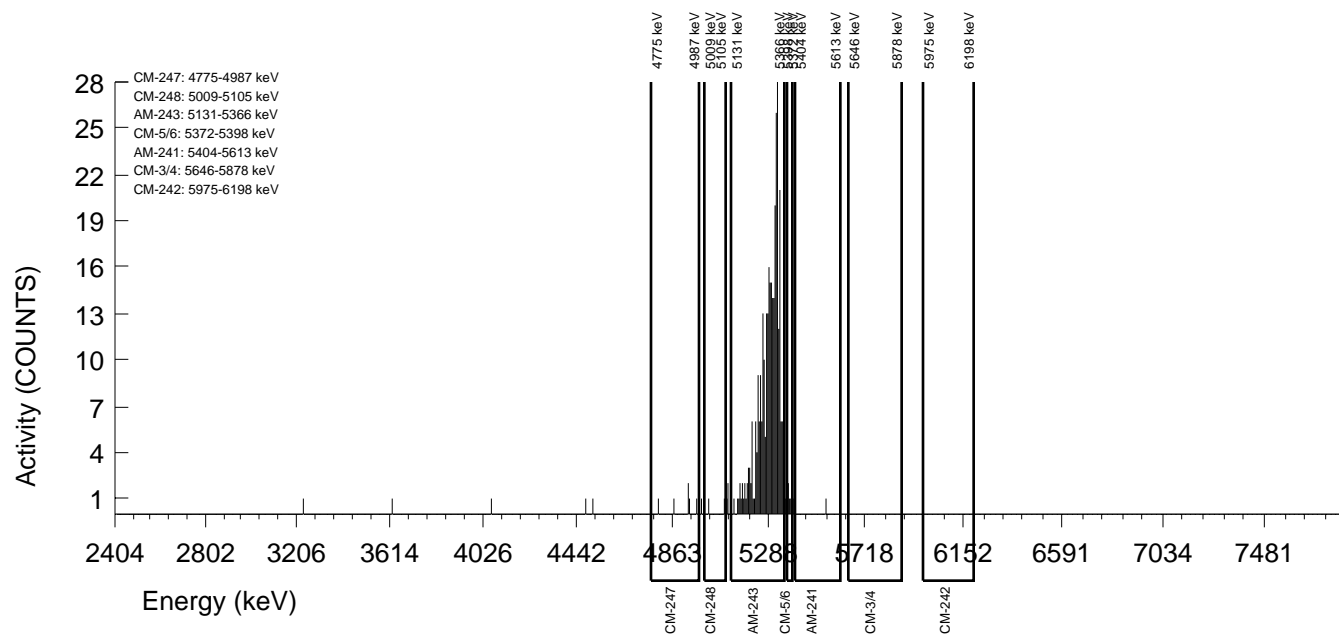
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235021_AM SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 85.5 +/-6.219 %	CHAMBER : 069 DETECTOR S/N : 78795 AVERAGE %EFFICIENCY : 32.9662 AVERAGE %EFF ERROR : 0.6355 COUNT DATE : 29-Sep-2016 21:26:39 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : AM BKG FILE : B069.CNF;1823 BKG DATE : 25-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W069.CNF;495 CAL DATE : 03-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.0558E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5545.77	4.959	1.000	0.040	0.960	0.9798	98.525	5.35E-04	3.97E-02	8.81E-02	2.40E-02	3.97E-02
AM-243	5269.50	5294.26	50.247	322.000	320.800	1.200	1.0954	99.980	4.22E+00	7.11E-01	9.23E-02	2.64E-02	4.64E-01
CM-242	6102.00	6086.57	0.000	0.000	-0.240	0.240	0.4899	100.000	-1.12E-02	9.65E-02	2.23E-01	4.18E-02	9.64E-02
CM-3/4	5795.02	5761.60	0.000	0.000	-0.480	0.480	0.6928	100.000	-6.52E-03	2.89E-02	7.52E-02	1.72E-02	2.88E-02
CM-5/6	5386.00	5387.45	24.793	8.000	8.000	0.000	0.0000	86.090	1.22E-01	9.15E-02	4.59E-02	0.00E+00	9.02E-02
CM-247	4946.00	4911.66	7.438	6.000	5.280	0.720	0.8485	79.300	8.76E-02	8.82E-02	1.01E-01	2.58E-02	8.75E-02
CM-248	5078.60	5077.03	0.000	3.000	2.280	0.720	0.8485	91.000	3.30E-02	5.85E-02	8.84E-02	2.25E-02	5.83E-02



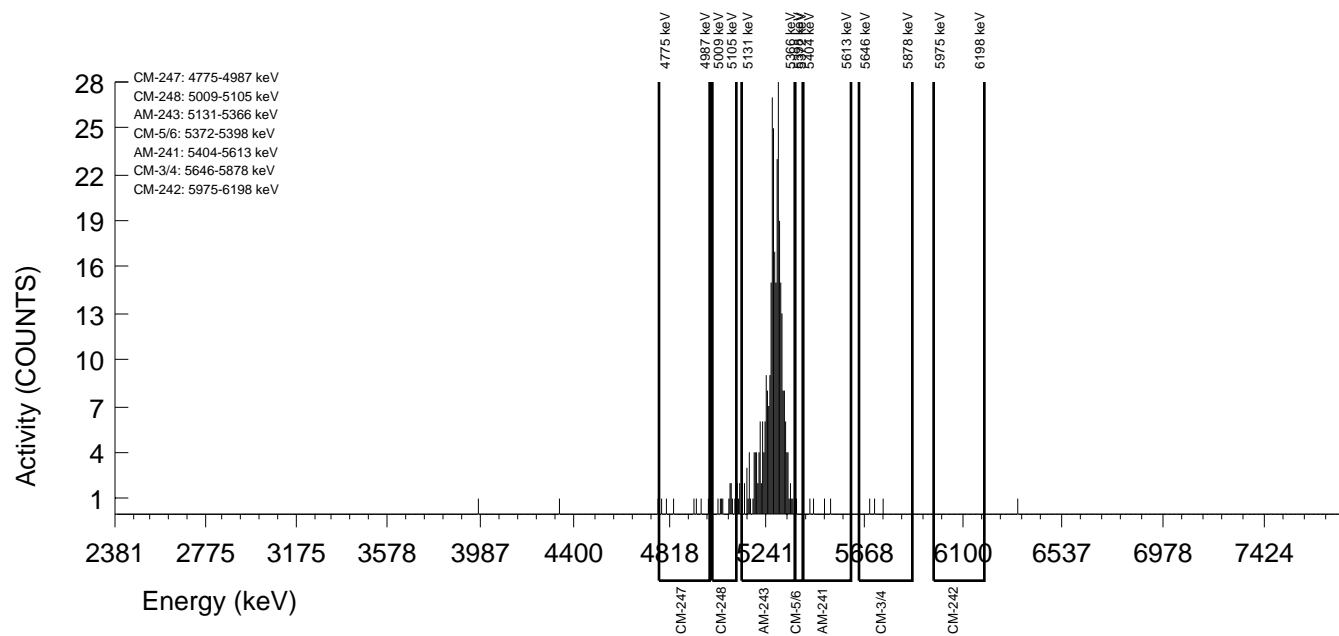
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235022_AM SAMPLE QTY : 0.507 G +/-0.197 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 90.0 +/-6.211 %	CHAMBER : 070 DETECTOR S/N : 78262 AVERAGE %EFFICIENCY : 31.2964 AVERAGE %EFF ERROR : 0.6038 COUNT DATE : 29-Sep-2016 21:26:39 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : AM BKG FILE : B070.CNF;1825 BKG DATE : 25-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W070.CNF;500 CAL DATE : 03-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.2716E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5475.03	88.200	4.000	3.760	0.240	0.4899	98.525	5.02E-02	5.95E-02	6.40E-02	1.20E-02	5.92E-02
AM-243	5269.50	5270.60	42.467	321.000	320.760	0.240	0.4899	99.980	4.22E+00	7.09E-01	6.30E-02	1.18E-02	4.62E-01
CM-242	6102.00	6086.56	0.000	0.000	-0.480	0.480	0.6928	100.000	-2.23E-02	9.88E-02	2.57E-01	5.90E-02	9.86E-02
CM-3/4	5795.02	5721.65	58.800	3.000	2.760	0.240	0.4899	100.000	3.74E-02	5.41E-02	6.50E-02	1.22E-02	5.39E-02
CM-5/6	5386.00	5373.62	0.000	1.000	1.000	0.000	0.0000	86.090	1.53E-02	4.30E-02	4.58E-02	0.00E+00	4.29E-02
CM-247	4946.00	4887.83	0.000	7.000	7.000	0.000	0.0000	79.300	1.16E-01	9.33E-02	4.97E-02	0.00E+00	9.22E-02
CM-248	5078.60	5070.02	14.700	11.000	11.000	0.000	0.0000	91.000	1.59E-01	1.00E-01	4.33E-02	0.00E+00	9.83E-02



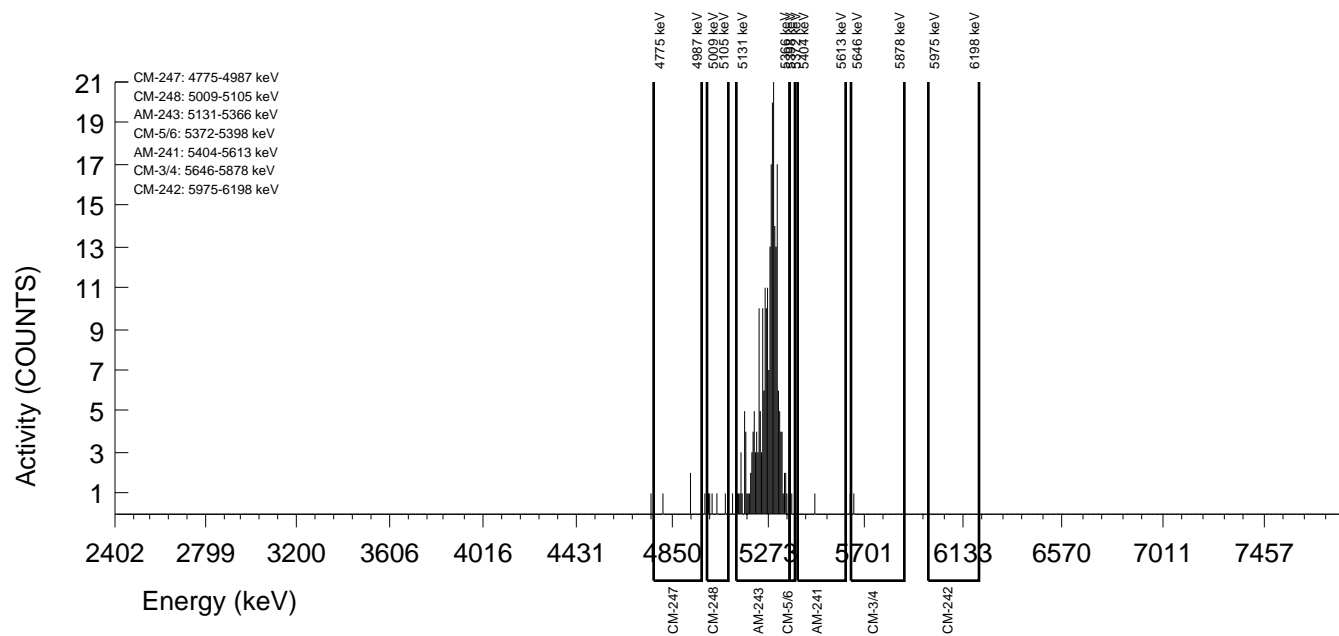
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235023_AM SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 64.0 +/-6.897 %	CHAMBER : 084 DETECTOR S/N : 78265 AVERAGE %EFFICIENCY : 34.7248 AVERAGE %EFF ERROR : 0.6686 COUNT DATE : 29-Sep-2016 21:26:41 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B084.CNF;1733 BKG DATE : 25-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W084.CNF;476 CAL DATE : 03-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 3.0352E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5481.28	4.933	1.000	-1.640	2.640	1.6248	98.525	-2.79E-02	5.47E-02	1.52E-01	5.06E-02	5.47E-02
AM-243	5269.50	5273.73	52.740	256.000	252.880	3.120	1.7664	99.980	4.23E+00	7.94E-01	1.58E-01	5.41E-02	5.27E-01
CM-242	6102.00	6086.57	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.23E-01	1.82E-01	0.00E+00	1.22E-01
CM-3/4	5795.02	5652.77	4.933	1.000	0.040	0.960	0.9798	100.000	6.91E-04	5.13E-02	1.14E-01	3.10E-02	5.12E-02
CM-5/6	5386.00	5372.68	0.000	3.000	2.760	0.240	0.4899	86.090	5.36E-02	7.76E-02	9.32E-02	1.74E-02	7.73E-02
CM-247	4946.00	4893.67	4.933	3.000	2.520	0.480	0.6928	79.300	5.32E-02	8.48E-02	1.17E-01	2.68E-02	8.45E-02
CM-248	5078.60	5039.12	0.000	8.000	7.760	0.240	0.4899	91.000	1.43E-01	1.11E-01	8.81E-02	1.65E-02	1.09E-01



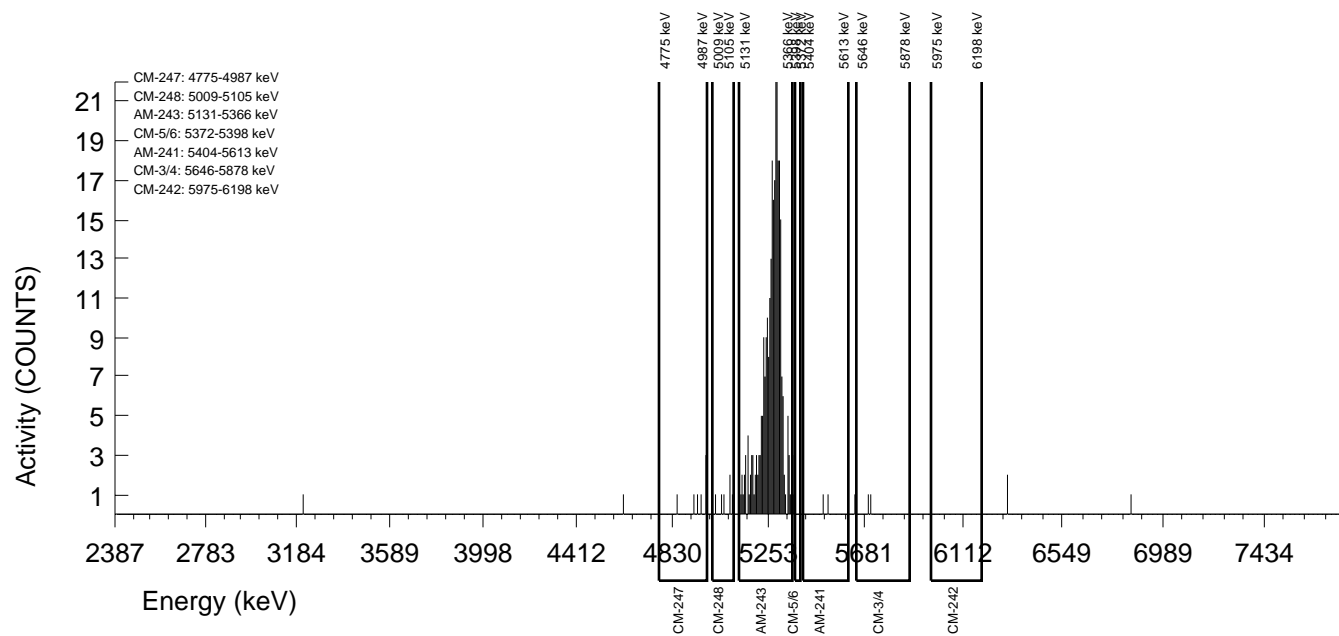
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235024_AM SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 80.8 +/-6.521 %	CHAMBER : 088 DETECTOR S/N : 83291 AVERAGE %EFFICIENCY : 31.2191 AVERAGE %EFF ERROR : 0.6024 COUNT DATE : 29-Sep-2016 21:26:41 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B088.CNF;1732 BKG DATE : 25-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W088.CNF;463 CAL DATE : 03-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 3.8326E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5509.09	24.614	2.000	0.800	1.200	1.0954	98.525	1.20E-02	5.37E-02	1.05E-01	3.01E-02	5.37E-02
AM-243	5269.50	5272.74	46.766	289.000	287.080	1.920	1.3856	99.980	4.23E+00	7.49E-01	1.19E-01	3.74E-02	4.92E-01
CM-242	6102.00	6086.57	0.000	0.000	-1.200	1.200	1.0954	100.000	-6.26E-02	1.19E-01	3.66E-01	1.05E-01	1.19E-01
CM-3/4	5795.02	5702.02	14.768	2.000	2.000	0.000	0.0000	100.000	3.04E-02	5.23E-02	4.56E-02	0.00E+00	5.21E-02
CM-5/6	5386.00	5372.97	0.000	2.000	2.000	0.000	0.0000	86.090	3.42E-02	5.89E-02	5.14E-02	0.00E+00	5.87E-02
CM-247	4946.00	4949.25	4.923	7.000	5.800	1.200	1.0954	79.300	1.08E-01	1.06E-01	1.30E-01	3.73E-02	1.05E-01
CM-248	5078.60	5066.38	4.923	8.000	7.520	0.480	0.6928	91.000	1.22E-01	9.75E-02	8.97E-02	2.06E-02	9.61E-02



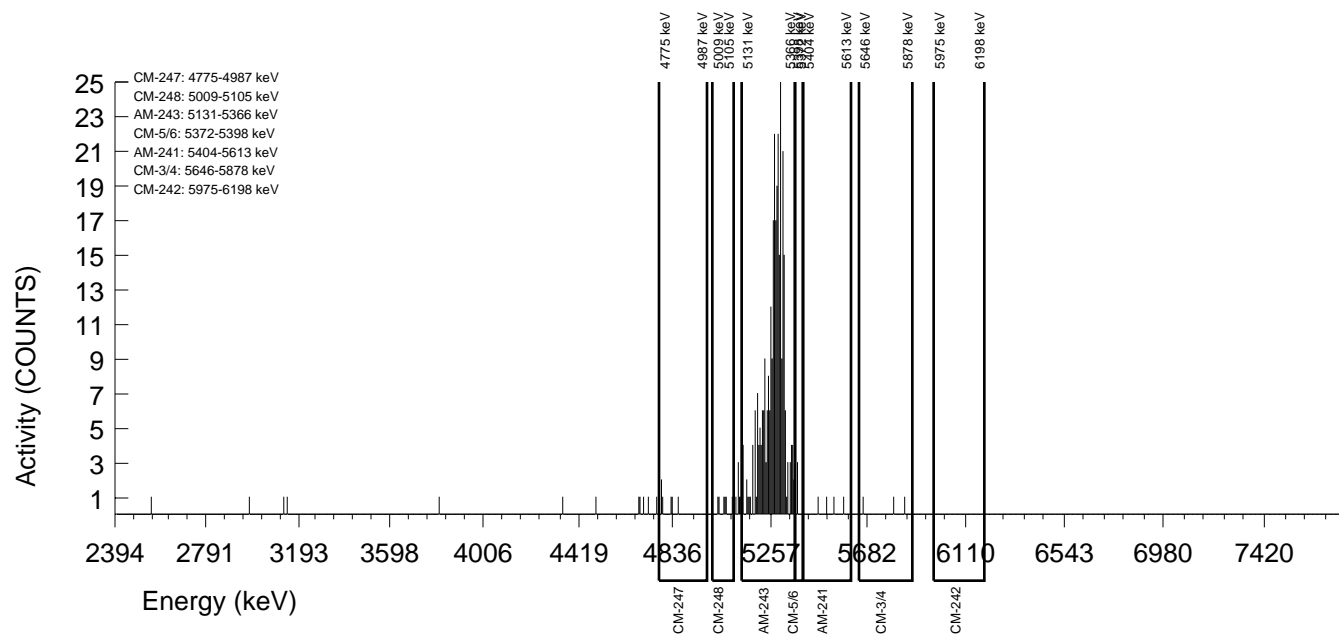
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235025_AM SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 92.9 +/-6.329 %	CHAMBER : 089 DETECTOR S/N : 79988 AVERAGE %EFFICIENCY : 29.2461 AVERAGE %EFF ERROR : 0.5651 COUNT DATE : 29-Sep-2016 21:26:42 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B089.CNF;1435 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W089.CNF;384 CAL DATE : 06-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.4086E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5523.34	108.645	4.000	1.840	2.160	1.4697	98.525	2.57E-02	6.47E-02	1.17E-01	3.76E-02	6.46E-02
AM-243	5269.50	5275.98	48.595	312.000	309.360	2.640	1.6248	99.980	4.25E+00	7.29E-01	1.23E-01	4.09E-02	4.77E-01
CM-242	6102.00	6086.58	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	9.81E-02	1.46E-01	0.00E+00	9.79E-02
CM-3/4	5795.02	5770.74	172.844	3.000	-2.280	5.280	2.2978	100.000	-3.23E-02	6.41E-02	1.62E-01	5.96E-02	6.41E-02
CM-5/6	5386.00	5378.72	4.938	3.000	3.000	0.000	0.0000	86.090	4.78E-02	6.33E-02	4.78E-02	0.00E+00	6.30E-02
CM-247	4946.00	4811.79	7.408	6.000	3.120	2.880	1.6971	79.300	5.40E-02	9.47E-02	1.60E-01	5.38E-02	9.45E-02
CM-248	5078.60	5067.82	7.408	8.000	6.560	1.440	1.2000	91.000	9.90E-02	9.16E-02	1.12E-01	3.32E-02	9.07E-02



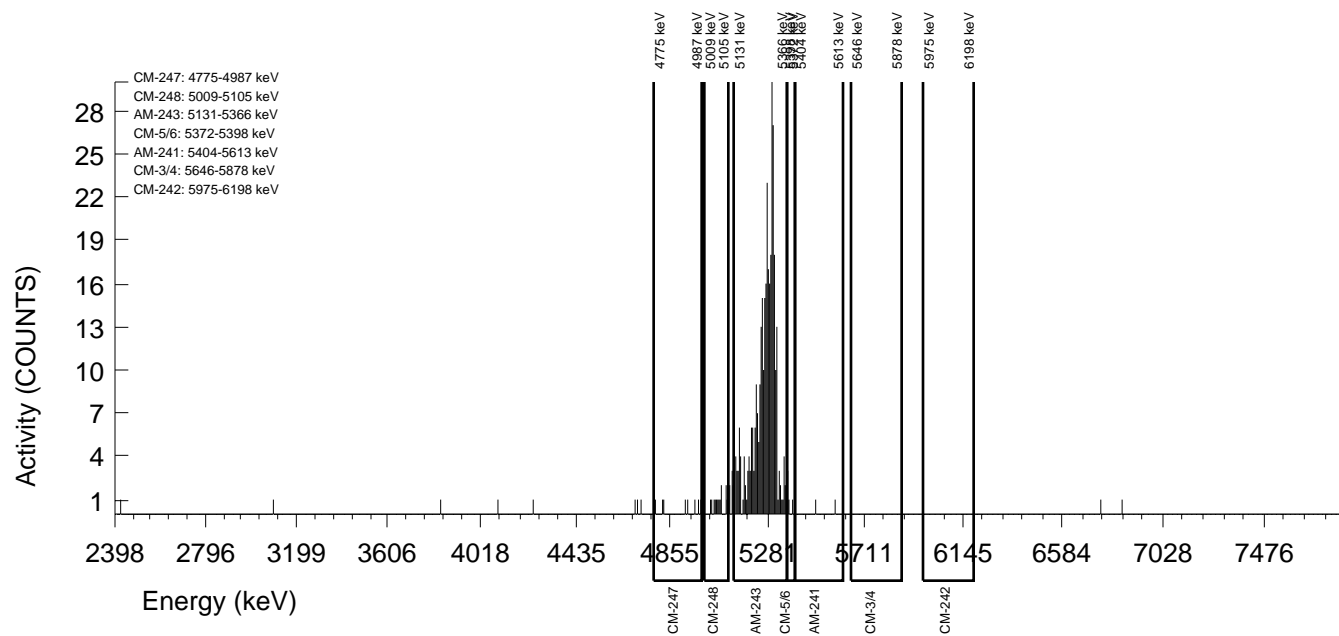
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235026_AM SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 91.4 +/-6.011 %	CHAMBER : 090 DETECTOR S/N : 78263 AVERAGE %EFFICIENCY : 33.4344 AVERAGE %EFF ERROR : 0.6443 COUNT DATE : 29-Sep-2016 21:26:42 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B090.CNF;1440 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W090.CNF;374 CAL DATE : 06-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.3351E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5538.23	84.122	2.000	1.040	0.960	0.9798	98.525	1.29E-02	4.41E-02	8.18E-02	2.23E-02	4.41E-02
AM-243	5269.50	5270.72	41.443	348.000	347.760	0.240	0.4899	99.980	4.25E+00	6.90E-01	5.86E-02	1.10E-02	4.47E-01
CM-242	6102.00	6086.56	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	8.72E-02	1.30E-01	0.00E+00	8.71E-02
CM-3/4	5795.02	5761.59	0.000	0.000	-0.240	0.240	0.4899	100.000	-3.02E-03	2.61E-02	6.04E-02	1.13E-02	2.61E-02
CM-5/6	5386.00	5377.16	0.000	5.000	4.760	0.240	0.4899	86.090	6.75E-02	6.93E-02	6.80E-02	1.27E-02	6.88E-02
CM-247	4946.00	4900.41	0.000	8.000	8.000	0.000	0.0000	79.300	1.23E-01	9.21E-02	4.62E-02	0.00E+00	9.09E-02
CM-248	5078.60	5067.97	29.690	13.000	12.520	0.480	0.6928	91.000	1.68E-01	1.01E-01	7.43E-02	1.70E-02	9.90E-02



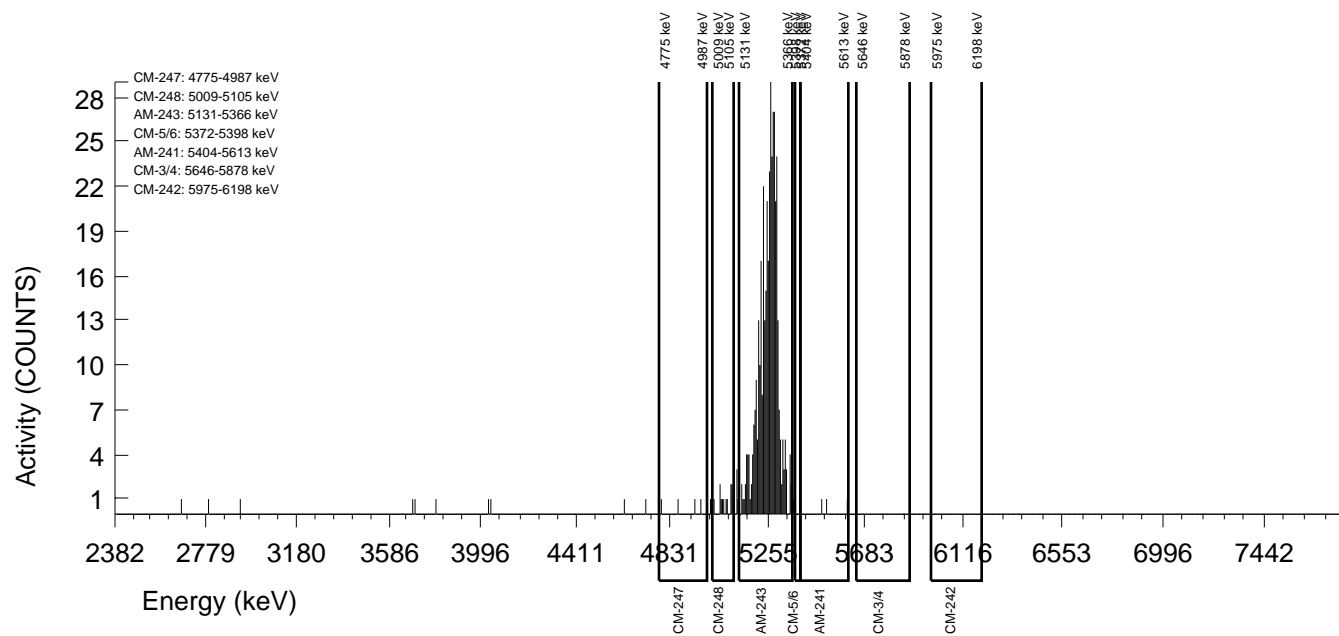
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235027_AM SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 105 +/-5.624 %	CHAMBER : 091 DETECTOR S/N : 78259 AVERAGE %EFFICIENCY : 34.7245 AVERAGE %EFF ERROR : 0.6687 COUNT DATE : 29-Sep-2016 21:26:42 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B091.CNF;1438 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W091.CNF;363 CAL DATE : 06-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.9609E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5539.67	108.461	3.000	2.280	0.720	0.8485	98.525	2.40E-02	4.24E-02	6.42E-02	1.63E-02	4.24E-02
AM-243	5269.50	5260.76	70.109	415.000	413.320	1.680	1.2961	99.980	4.27E+00	6.48E-01	8.01E-02	2.46E-02	4.14E-01
CM-242	6102.00	6086.56	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	7.38E-02	1.10E-01	0.00E+00	7.37E-02
CM-3/4	5795.02	5761.59	0.000	0.000	-0.720	0.720	0.8485	100.000	-7.68E-03	2.32E-02	6.51E-02	1.66E-02	2.32E-02
CM-5/6	5386.00	5374.59	0.000	2.000	1.760	0.240	0.4899	86.090	2.11E-02	4.16E-02	5.76E-02	1.08E-02	4.15E-02
CM-247	4946.00	4887.33	167.622	4.000	2.800	1.200	1.0954	79.300	3.65E-02	5.92E-02	9.14E-02	2.62E-02	5.91E-02
CM-248	5078.60	5072.20	56.696	13.000	13.000	0.000	0.0000	91.000	1.48E-01	8.52E-02	3.41E-02	0.00E+00	8.35E-02



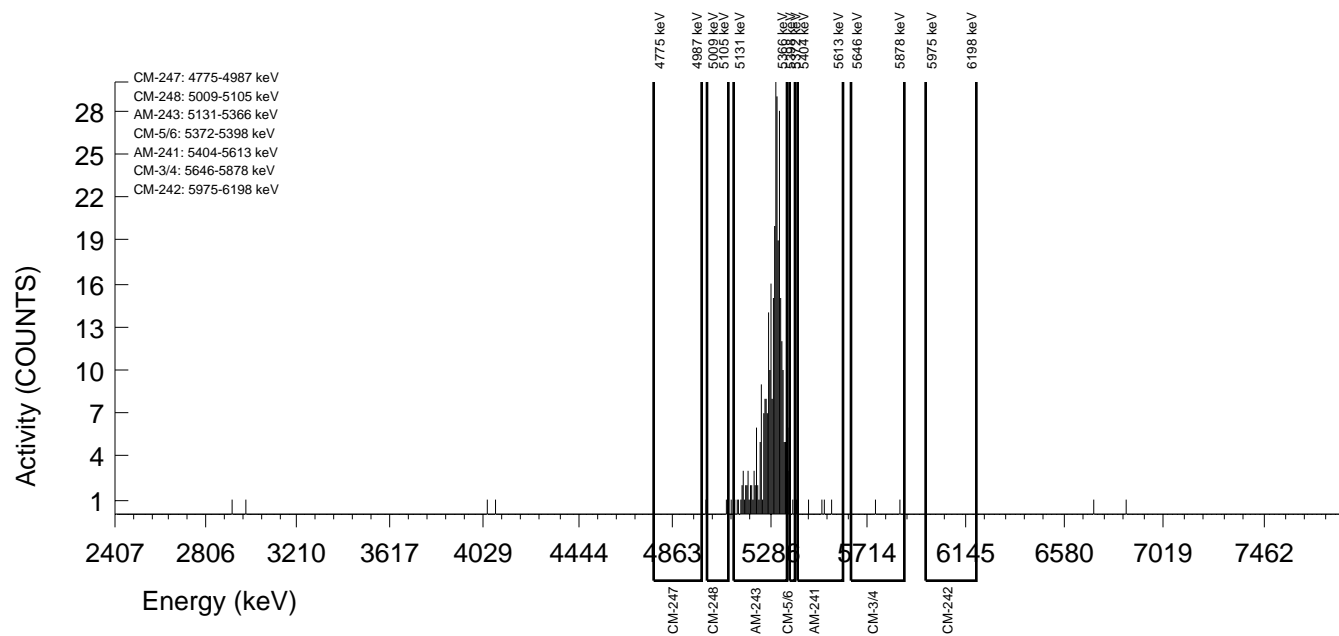
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235028_AM SAMPLE QTY : 0.510 G +/-0.196 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 86.1 +/-6.205 %	CHAMBER : 093 DETECTOR S/N : 33206 AVERAGE %EFFICIENCY : 33.0892 AVERAGE %EFF ERROR : 0.6377 COUNT DATE : 29-Sep-2016 21:26:42 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B093.CNF;1431 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W093.CNF;379 CAL DATE : 06-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.0856E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5478.20	0.000	6.000	3.840	2.160	1.4697	98.525	5.04E-02	7.11E-02	1.10E-01	3.53E-02	7.08E-02
AM-243	5269.50	5296.39	40.579	327.000	324.360	2.640	1.6248	99.980	4.19E+00	7.04E-01	1.16E-01	3.84E-02	4.59E-01
CM-242	6102.00	6086.58	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	9.83E-02	1.46E-01	0.00E+00	9.81E-02
CM-3/4	5795.02	5804.90	104.345	2.000	1.040	0.960	0.9798	100.000	1.39E-02	4.75E-02	8.79E-02	2.39E-02	4.74E-02
CM-5/6	5386.00	5379.57	0.000	6.000	6.000	0.000	0.0000	86.090	9.00E-02	7.90E-02	4.50E-02	0.00E+00	7.81E-02
CM-247	4946.00	4881.20	0.000	0.000	-0.960	0.960	0.9798	79.300	-1.56E-02	3.63E-02	1.07E-01	2.92E-02	3.62E-02
CM-248	5078.60	5095.54	4.969	1.000	1.000	0.000	0.0000	91.000	1.42E-02	3.99E-02	4.26E-02	0.00E+00	3.99E-02



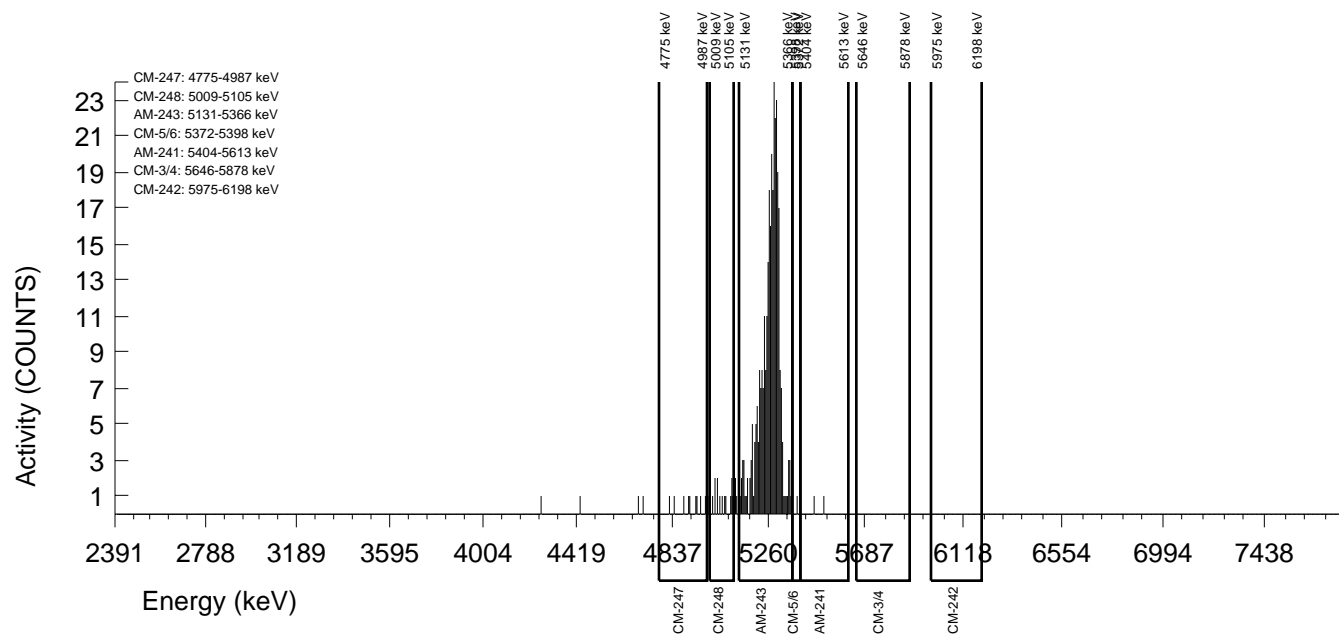
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235029_AM SAMPLE QTY : 0.511 G +/-0.196 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 86.9 +/-6.225 %	CHAMBER : 096 DETECTOR S/N : 80016 AVERAGE %EFFICIENCY : 32.5188 AVERAGE %EFF ERROR : 0.6269 COUNT DATE : 29-Sep-2016 21:26:43 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B096.CNF;1399 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W096.CNF;357 CAL DATE : 06-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.1218E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5483.41	44.404	2.000	0.320	1.680	1.2961	98.525	4.23E-03	4.82E-02	1.02E-01	3.14E-02	4.82E-02
AM-243	5269.50	5267.45	50.435	324.000	321.600	2.400	1.5492	99.980	4.18E+00	7.05E-01	1.13E-01	3.69E-02	4.60E-01
CM-242	6102.00	6086.57	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	9.90E-02	1.47E-01	0.00E+00	9.88E-02
CM-3/4	5795.02	5761.60	0.000	0.000	-1.440	1.440	1.2000	100.000	-1.93E-02	3.12E-02	9.93E-02	2.95E-02	3.12E-02
CM-5/6	5386.00	5387.40	4.934	1.000	1.000	0.000	0.0000	86.090	1.51E-02	4.25E-02	4.53E-02	0.00E+00	4.25E-02
CM-247	4946.00	4900.63	197.353	10.000	9.280	0.720	0.8485	79.300	1.52E-01	1.09E-01	1.00E-01	2.55E-02	1.08E-01
CM-248	5078.60	5061.23	76.474	13.000	13.000	0.000	0.0000	91.000	1.86E-01	1.08E-01	4.29E-02	0.00E+00	1.05E-01



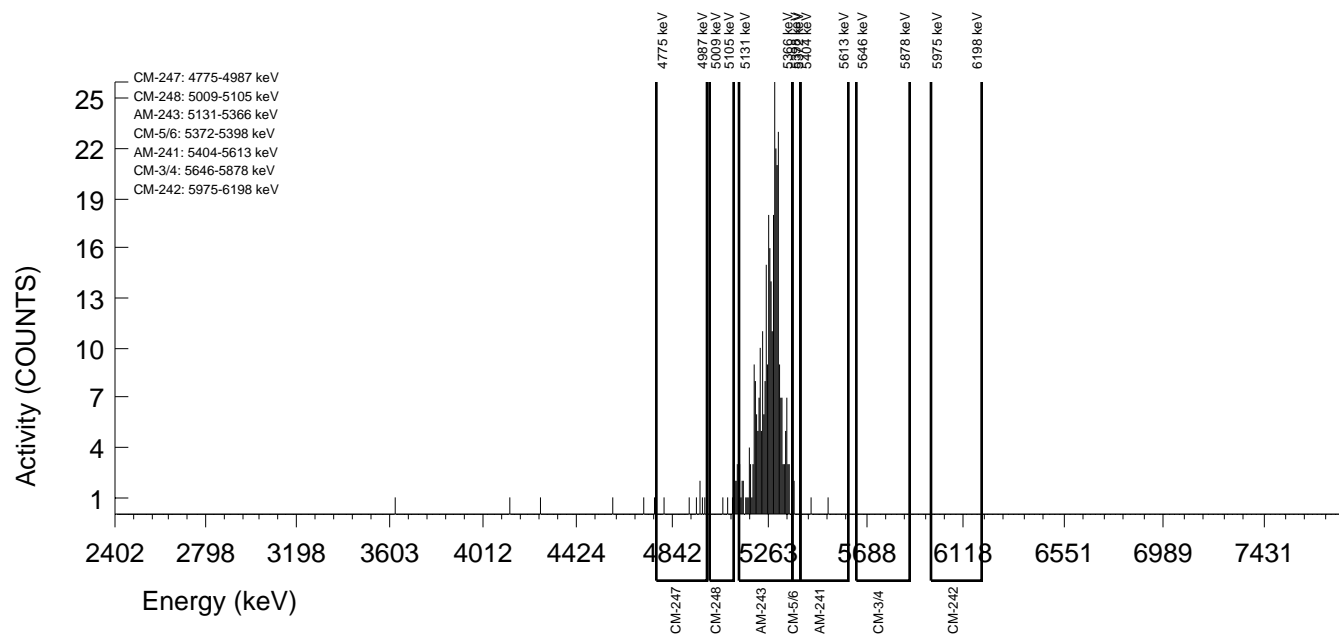
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235030_AM SAMPLE QTY : 0.508 G +/-0.197 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 84.3 +/-6.086 %	CHAMBER : 097 DETECTOR S/N : 83288 AVERAGE %EFFICIENCY : 35.3557 AVERAGE %EFF ERROR : 0.6805 COUNT DATE : 29-Sep-2016 21:26:43 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B097.CNF;1396 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W097.CNF;381 CAL DATE : 06-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 3.9972E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5485.52	73.888	2.000	1.760	0.240	0.4899	98.525	2.22E-02	4.37E-02	6.04E-02	1.13E-02	4.36E-02
AM-243	5269.50	5267.55	54.185	341.000	339.080	1.920	1.3856	99.980	4.21E+00	6.93E-01	1.00E-01	3.15E-02	4.50E-01
CM-242	6102.00	6086.57	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	9.44E-02	1.40E-01	0.00E+00	9.43E-02
CM-3/4	5795.02	5761.60	0.000	0.000	-1.200	1.200	1.0954	100.000	-1.54E-02	2.92E-02	8.99E-02	2.57E-02	2.91E-02
CM-5/6	5386.00	5373.98	0.000	2.000	1.760	0.240	0.4899	86.090	2.54E-02	4.99E-02	6.91E-02	1.29E-02	4.98E-02
CM-247	4946.00	4935.18	4.926	7.000	6.520	0.480	0.6928	79.300	1.02E-01	8.86E-02	8.66E-02	1.98E-02	8.76E-02
CM-248	5078.60	5083.20	0.000	3.000	3.000	0.000	0.0000	91.000	4.09E-02	5.41E-02	4.09E-02	0.00E+00	5.38E-02



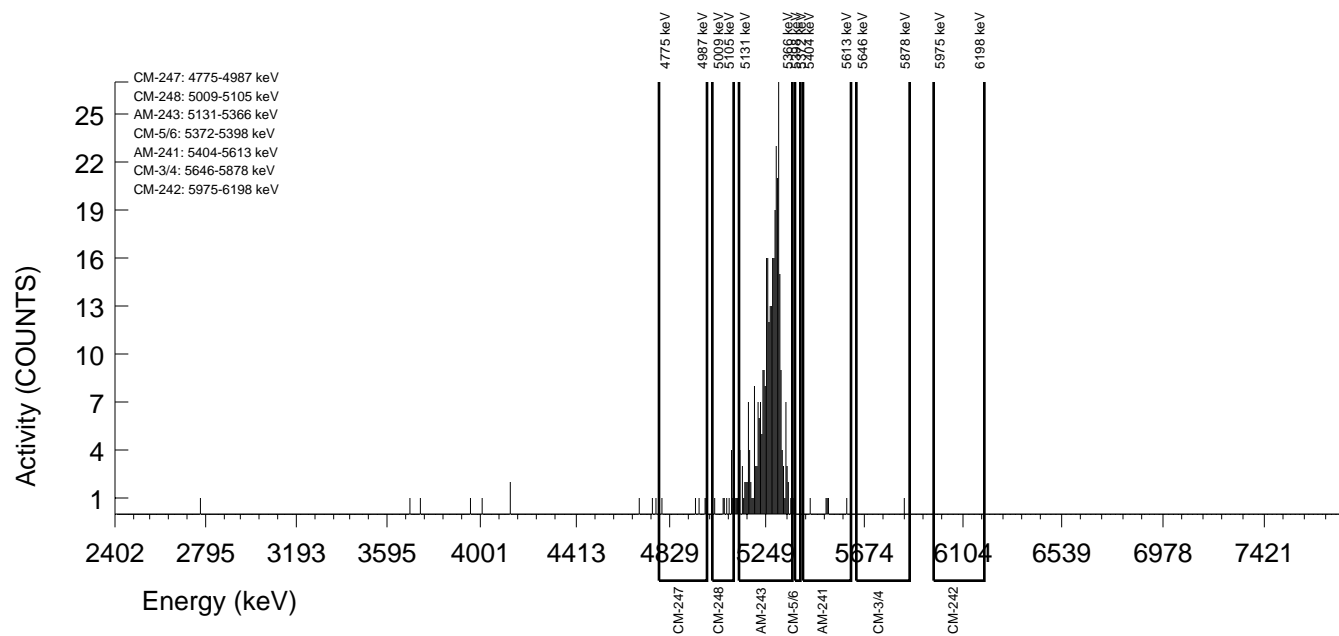
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235031_AM SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 26-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 82.4 +/-6.115 %	CHAMBER : 099 DETECTOR S/N : 80059 AVERAGE %EFFICIENCY : 35.6284 AVERAGE %EFF ERROR : 0.6858 COUNT DATE : 29-Sep-2016 21:26:43 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B099.CNF;1399 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W099.CNF;383 CAL DATE : 06-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 3.9076E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5516.55	151.309	5.000	4.280	0.720	0.8485	98.525	5.53E-02	6.36E-02	7.89E-02	2.01E-02	6.32E-02
AM-243	5269.50	5264.45	56.436	335.000	334.040	0.960	0.9798	99.980	4.25E+00	7.03E-01	8.38E-02	2.28E-02	4.57E-01
CM-242	6102.00	6086.56	0.000	0.000	-0.480	0.480	0.6928	100.000	-2.27E-02	1.01E-01	2.62E-01	6.01E-02	1.00E-01
CM-3/4	5795.02	5851.15	4.881	1.000	0.520	0.480	0.6928	100.000	6.83E-03	3.80E-02	7.27E-02	1.67E-02	3.79E-02
CM-5/6	5386.00	5376.28	4.881	4.000	4.000	0.000	0.0000	86.090	5.91E-02	6.55E-02	4.43E-02	0.00E+00	6.51E-02
CM-247	4946.00	4930.19	0.000	5.000	4.280	0.720	0.8485	79.300	6.86E-02	7.89E-02	9.79E-02	2.49E-02	7.84E-02
CM-248	5078.60	5081.86	5.694	11.000	10.760	0.240	0.4899	91.000	1.50E-01	9.72E-02	6.70E-02	1.25E-02	9.53E-02



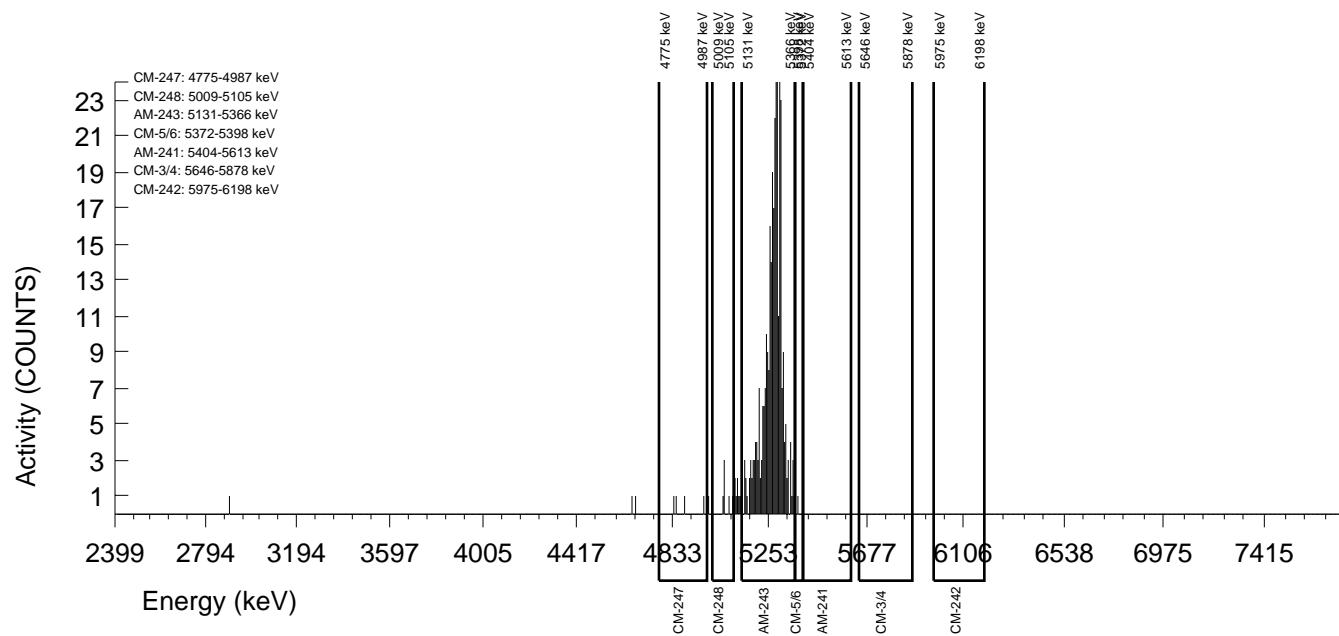
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235032_AM SAMPLE QTY : 0.504 G +/-0.198 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 92.2 +/-6.204 %	CHAMBER : 107 DETECTOR S/N : 67578 AVERAGE %EFFICIENCY : 30.7195 AVERAGE %EFF ERROR : 0.5929 COUNT DATE : 29-Sep-2016 21:26:44 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : AM BKG FILE : B107.CNF;1439 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W107.CNF;426 CAL DATE : 06-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.3725E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.48	0.000	0.000	-1.920	1.920	1.3856	98.525	-2.57E-02	3.23E-02	1.08E-01	3.39E-02	3.23E-02
AM-243	5269.50	5270.07	50.093	323.000	322.280	0.720	0.8485	99.980	4.24E+00	7.12E-01	8.04E-02	2.04E-02	4.64E-01
CM-242	6102.00	6086.57	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.00E-01	1.49E-01	0.00E+00	1.00E-01
CM-3/4	5795.02	5761.60	0.000	0.000	-0.720	0.720	0.8485	100.000	-9.78E-03	2.96E-02	8.30E-02	2.11E-02	2.95E-02
CM-5/6	5386.00	5374.65	0.000	2.000	2.000	0.000	0.0000	86.090	3.06E-02	5.25E-02	4.58E-02	0.00E+00	5.24E-02
CM-247	4946.00	4885.31	127.845	4.000	3.520	0.480	0.6928	79.300	5.84E-02	7.43E-02	9.19E-02	2.10E-02	7.39E-02
CM-248	5078.60	5076.70	0.000	8.000	8.000	0.000	0.0000	91.000	1.16E-01	8.65E-02	4.34E-02	0.00E+00	8.53E-02



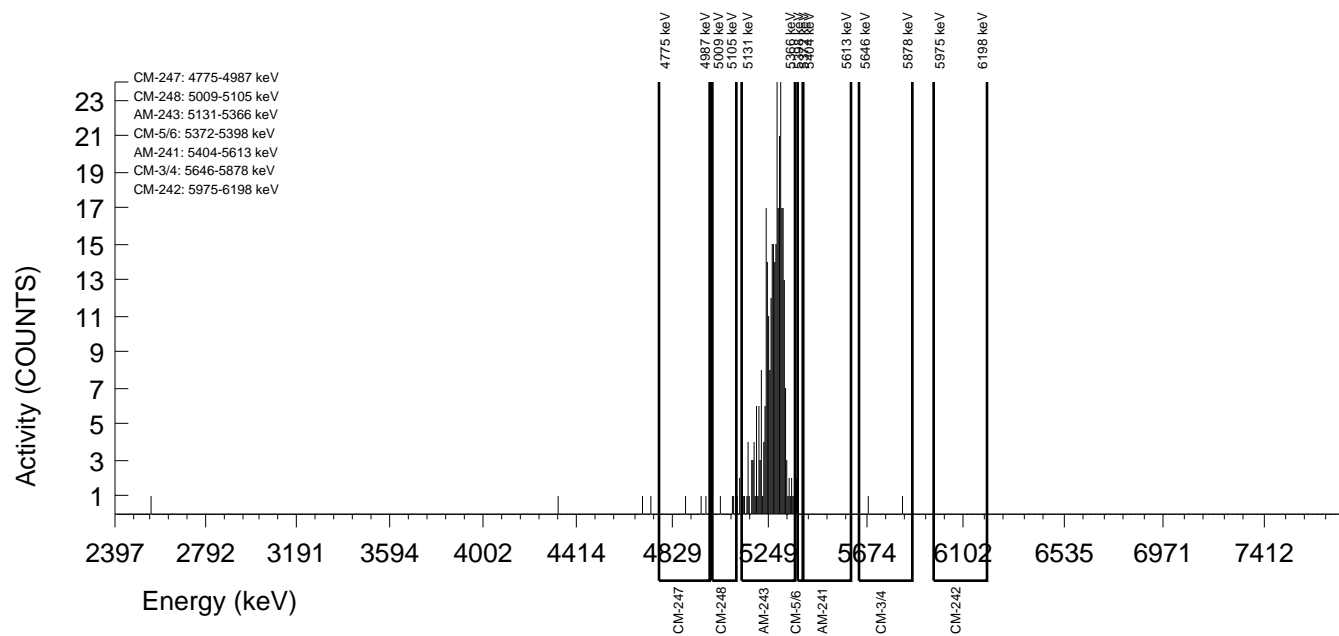
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235033_AM SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 83.3 +/-6.156 %	CHAMBER : 108 DETECTOR S/N : 78778 AVERAGE %EFFICIENCY : 34.5578 AVERAGE %EFF ERROR : 0.6655 COUNT DATE : 29-Sep-2016 21:26:44 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : AM BKG FILE : B108.CNF;1433 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W108.CNF;430 CAL DATE : 06-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 3.9529E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.48	0.000	0.000	-0.720	0.720	0.8485	98.525	-9.52E-03	2.88E-02	8.08E-02	2.06E-02	2.87E-02
AM-243	5269.50	5270.77	76.717	328.000	327.760	0.240	0.4899	99.980	4.27E+00	7.11E-01	6.24E-02	1.17E-02	4.63E-01
CM-242	6102.00	6086.57	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	9.91E-02	1.47E-01	0.00E+00	9.89E-02
CM-3/4	5795.02	5759.00	142.421	2.000	1.760	0.240	0.4899	100.000	2.37E-02	4.66E-02	6.45E-02	1.21E-02	4.65E-02
CM-5/6	5386.00	5370.99	0.000	2.000	2.000	0.000	0.0000	86.090	3.02E-02	5.19E-02	4.53E-02	0.00E+00	5.18E-02
CM-247	4946.00	4939.29	88.399	3.000	2.040	0.960	0.9798	79.300	3.35E-02	6.67E-02	1.08E-01	2.94E-02	6.66E-02
CM-248	5078.60	5075.70	58.933	3.000	3.000	0.000	0.0000	91.000	4.29E-02	5.67E-02	4.29E-02	0.00E+00	5.64E-02



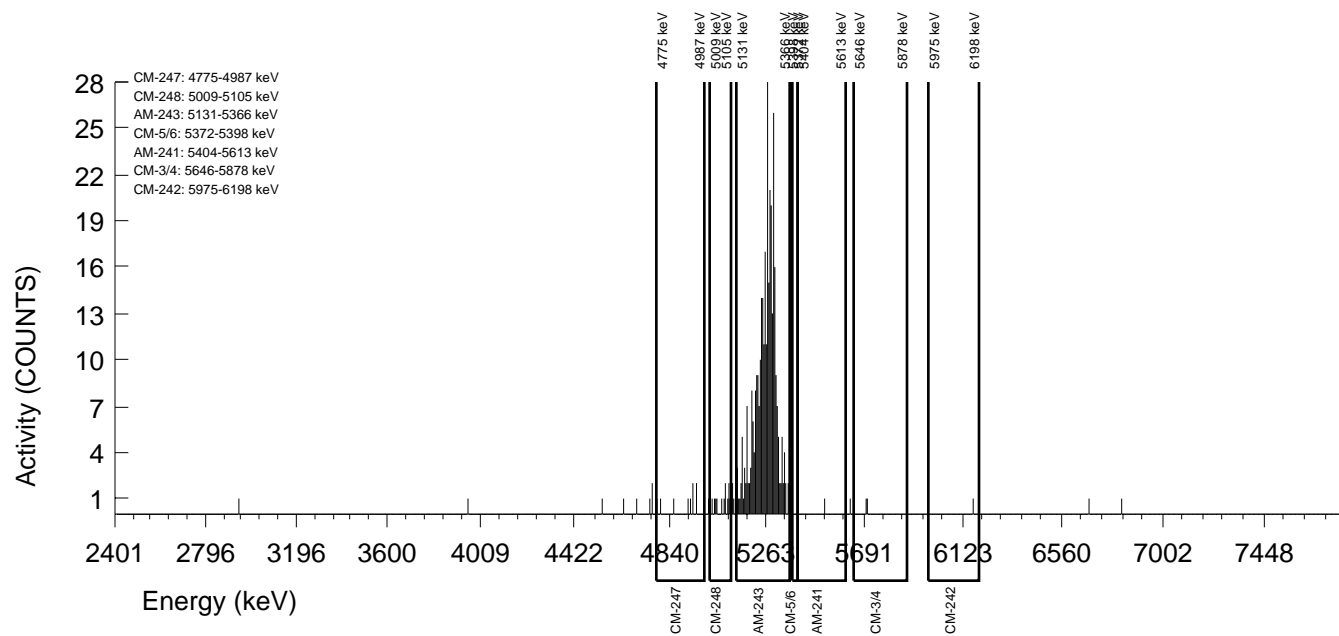
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235034_AM SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 82.6 +/-6.070 %	CHAMBER : 109 DETECTOR S/N : 79463 AVERAGE %EFFICIENCY : 36.1703 AVERAGE %EFF ERROR : 0.6959 COUNT DATE : 29-Sep-2016 21:26:44 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : AM BKG FILE : B109.CNF;1431 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W109.CNF;420 CAL DATE : 06-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 3.9182E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5519.34	4.905	1.000	0.040	0.960	0.9798	98.525	5.08E-04	3.77E-02	8.37E-02	2.28E-02	3.76E-02
AM-243	5269.50	5260.40	43.094	341.000	340.040	0.960	0.9798	99.980	4.25E+00	6.98E-01	8.23E-02	2.24E-02	4.53E-01
CM-242	6102.00	6172.15	4.905	1.000	1.000	0.000	0.0000	100.000	4.71E-02	1.33E-01	1.41E-01	0.00E+00	1.32E-01
CM-3/4	5795.02	5704.38	9.810	2.000	1.520	0.480	0.6928	100.000	1.96E-02	4.51E-02	7.15E-02	1.64E-02	4.51E-02
CM-5/6	5386.00	5372.47	0.000	2.000	2.000	0.000	0.0000	86.090	2.90E-02	4.99E-02	4.35E-02	0.00E+00	4.97E-02
CM-247	4946.00	4897.72	19.620	9.000	8.280	0.720	0.8485	79.300	1.30E-01	1.00E-01	9.62E-02	2.45E-02	9.87E-02
CM-248	5078.60	5066.35	24.525	13.000	12.520	0.480	0.6928	91.000	1.72E-01	1.04E-01	7.60E-02	1.74E-02	1.01E-01



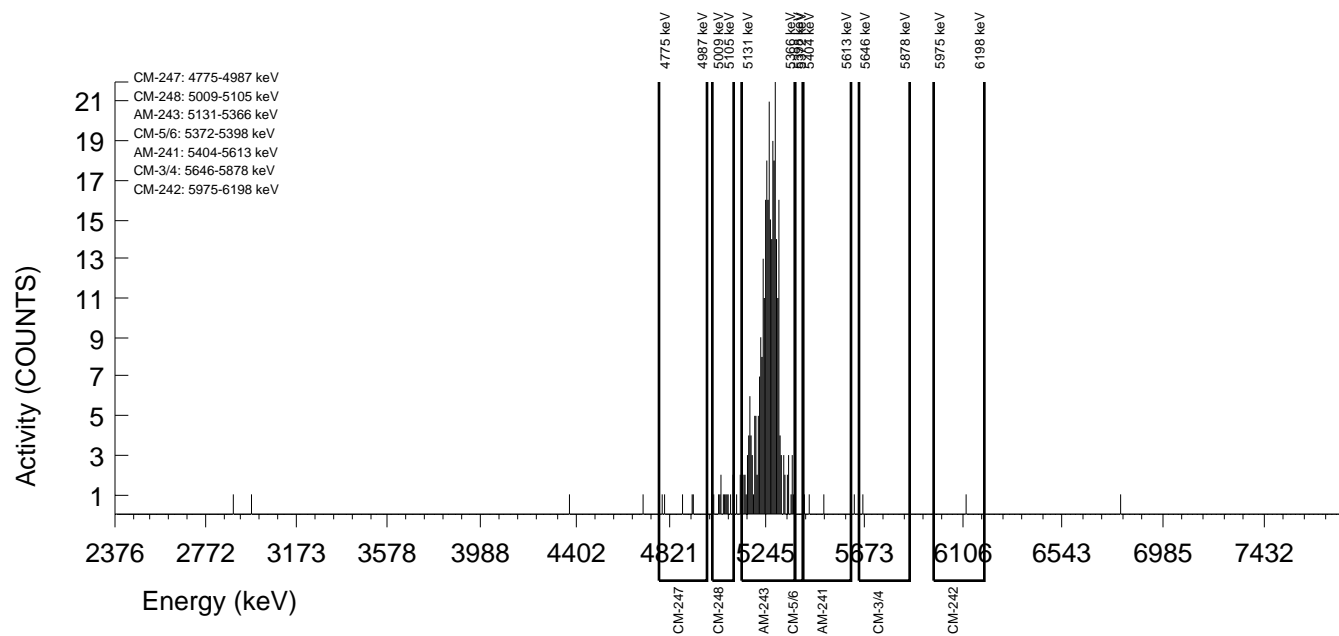
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235035_AM SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 85.2 +/-6.262 %	CHAMBER : 110 DETECTOR S/N : 83292 AVERAGE %EFFICIENCY : 32.3669 AVERAGE %EFF ERROR : 0.6241 COUNT DATE : 29-Sep-2016 21:26:44 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : AM BKG FILE : B110.CNF;1440 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W110.CNF;441 CAL DATE : 06-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.0433E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5446.02	83.679	3.000	2.520	0.480	0.6928	98.525	3.48E-02	5.54E-02	7.64E-02	1.75E-02	5.53E-02
AM-243	5269.50	5253.99	68.009	314.000	314.000	0.000	0.0000	99.980	4.27E+00	7.24E-01	4.08E-02	0.00E+00	4.73E-01
CM-242	6102.00	6122.26	4.922	1.000	0.760	0.240	0.4899	100.000	3.89E-02	1.46E-01	2.46E-01	4.59E-02	1.46E-01
CM-3/4	5795.02	5667.79	4.922	1.000	1.000	0.000	0.0000	100.000	1.40E-02	3.95E-02	4.21E-02	0.00E+00	3.95E-02
CM-5/6	5386.00	5385.09	0.000	0.000	0.000	0.000	0.0000	86.090	0.00E+00	3.19E-02	4.73E-02	0.00E+00	3.18E-02
CM-247	4946.00	4858.26	132.901	5.000	4.520	0.480	0.6928	79.300	7.74E-02	8.40E-02	9.48E-02	2.17E-02	8.34E-02
CM-248	5078.60	5064.74	61.528	15.000	14.760	0.240	0.4899	91.000	2.20E-01	1.21E-01	7.16E-02	1.34E-02	1.17E-01



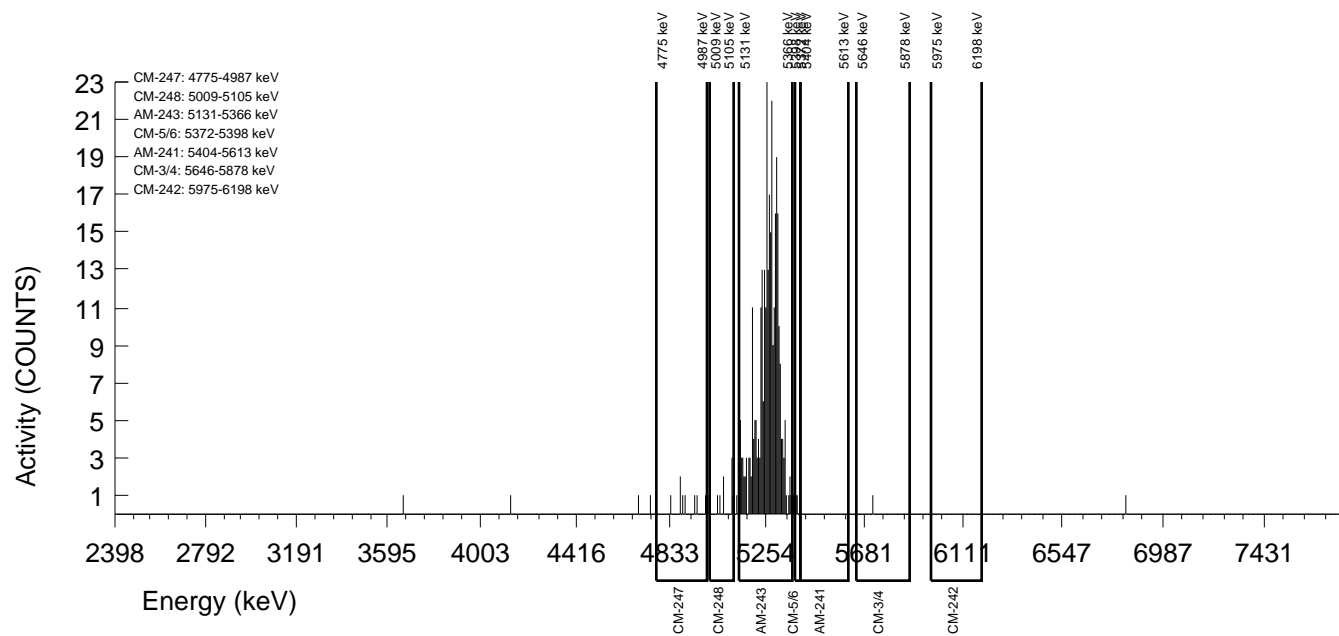
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235036_AM SAMPLE QTY : 0.516 G +/-0.194 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 81.4 +/-6.259 %	CHAMBER : 112 DETECTOR S/N : 78261 AVERAGE %EFFICIENCY : 34.0722 AVERAGE %EFF ERROR : 0.6563 COUNT DATE : 29-Sep-2016 21:26:44 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : AM BKG FILE : B112.CNF;1443 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W112.CNF;451 CAL DATE : 06-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 3.8630E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.47	0.000	0.000	-1.440	1.440	1.2000	98.525	-1.92E-02	3.10E-02	9.86E-02	2.93E-02	3.09E-02
AM-243	5269.50	5258.15	71.073	317.000	315.800	1.200	1.0954	99.980	4.14E+00	7.02E-01	9.20E-02	2.63E-02	4.59E-01
CM-242	6102.00	6086.56	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	9.98E-02	1.48E-01	0.00E+00	9.96E-02
CM-3/4	5795.02	5718.22	4.902	1.000	0.520	0.480	0.6928	100.000	7.04E-03	3.92E-02	7.50E-02	1.72E-02	3.91E-02
CM-5/6	5386.00	5379.20	0.000	4.000	4.000	0.000	0.0000	86.090	6.09E-02	6.76E-02	4.57E-02	0.00E+00	6.71E-02
CM-247	4946.00	4904.27	4.902	8.000	6.320	1.680	1.2961	79.300	1.04E-01	1.01E-01	1.28E-01	3.93E-02	9.97E-02
CM-248	5078.60	5063.61	0.000	10.000	9.760	0.240	0.4899	91.000	1.41E-01	9.59E-02	6.91E-02	1.29E-02	9.41E-02



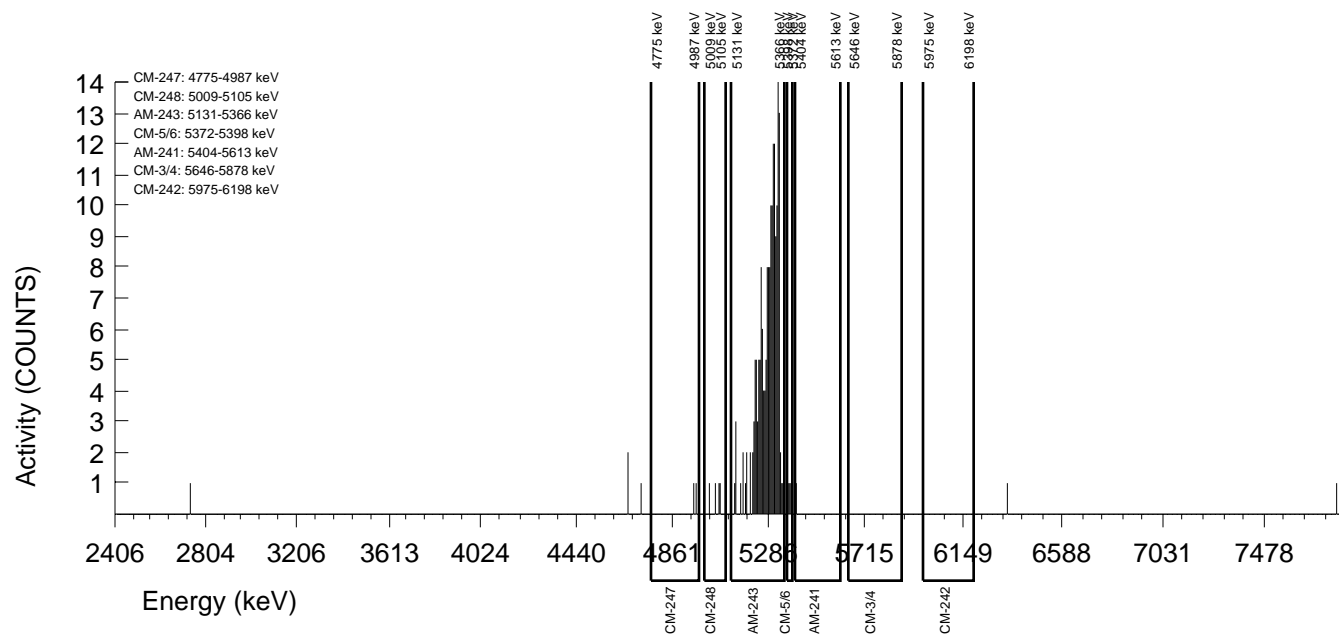
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235037_AM SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 88.9 +/-7.852 %	CHAMBER : 069 DETECTOR S/N : 78795 AVERAGE %EFFICIENCY : 32.4474 AVERAGE %EFF ERROR : 0.6257 COUNT DATE : 01-Oct-2016 13:23:25 ELAPSED LIVE TIME(SEC) : 8129.05	LIB FILE : AM BKG FILE : B069.CNF;1825 BKG DATE : 30-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W069.CNF;497 CAL DATE : 30-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.2199E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5414.29	4.946	1.000	-0.355	1.355	1.1640	98.525	-8.16E-03	6.70E-02	1.63E-01	4.69E-02	6.69E-02
AM-243	5269.50	5289.04	78.529	186.000	185.458	0.542	0.7362	99.980	4.20E+00	9.01E-01	1.26E-01	2.92E-02	6.07E-01
CM-242	6102.00	6086.56	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.65E-01	2.50E-01	0.00E+00	1.65E-01
CM-3/4	5795.02	5761.59	0.000	0.000	-1.084	1.084	1.0411	100.000	-2.53E-02	4.96E-02	1.55E-01	4.27E-02	4.94E-02
CM-5/6	5386.00	5379.48	0.000	4.000	3.865	0.135	0.3681	86.090	1.02E-01	1.17E-01	1.13E-01	1.70E-02	1.16E-01
CM-247	4946.00	4966.75	14.837	2.000	1.323	0.677	0.8231	79.300	3.77E-02	9.88E-02	1.68E-01	4.12E-02	9.87E-02
CM-248	5078.60	5059.58	49.455	4.000	3.458	0.542	0.7362	91.000	8.60E-02	1.11E-01	1.39E-01	3.21E-02	1.10E-01



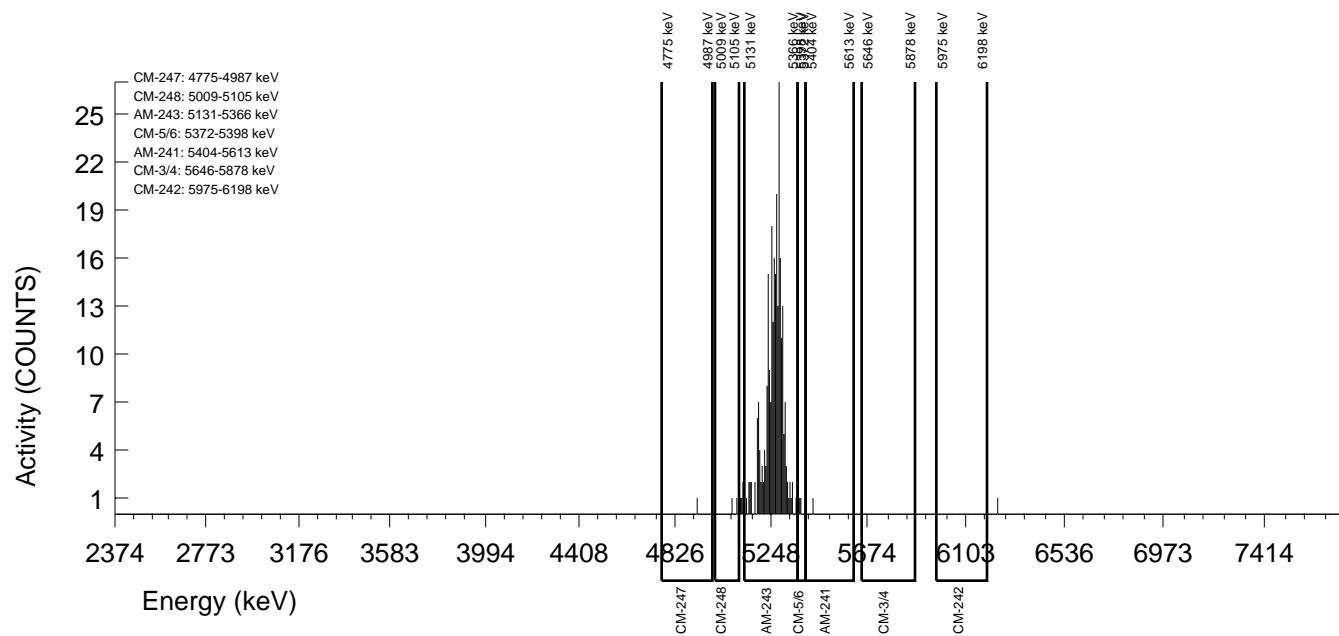
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235038_AM SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 88.7 +/-6.718 %	CHAMBER : 250 DETECTOR S/N : 87938 AVERAGE %EFFICIENCY : 26.3779 AVERAGE %EFF ERROR : 0.5108 COUNT DATE : 29-Sep-2016 21:52:33 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B250.CNF;458 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W250.CNF;115 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.2073E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5433.92	4.968	1.000	1.000	0.000	0.0000	98.525	1.60E-02	4.51E-02	4.81E-02	0.00E+00	4.50E-02
AM-243	5269.50	5262.36	53.230	267.000	266.280	0.720	0.8485	99.980	4.20E+00	7.66E-01	9.63E-02	2.45E-02	5.06E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.17E-01	1.73E-01	0.00E+00	1.16E-01
CM-3/4	5795.02	5761.62	0.000	0.000	-0.480	0.480	0.6928	100.000	-7.81E-03	3.46E-02	9.01E-02	2.07E-02	3.45E-02
CM-5/6	5386.00	5378.12	9.936	2.000	2.000	0.000	0.0000	86.090	3.66E-02	6.30E-02	5.49E-02	0.00E+00	6.28E-02
CM-247	4946.00	4926.16	4.968	1.000	0.520	0.480	0.6928	79.300	1.03E-02	5.75E-02	1.10E-01	2.52E-02	5.74E-02
CM-248	5078.60	5089.53	24.841	2.000	2.000	0.000	0.0000	91.000	3.46E-02	5.96E-02	5.20E-02	0.00E+00	5.94E-02



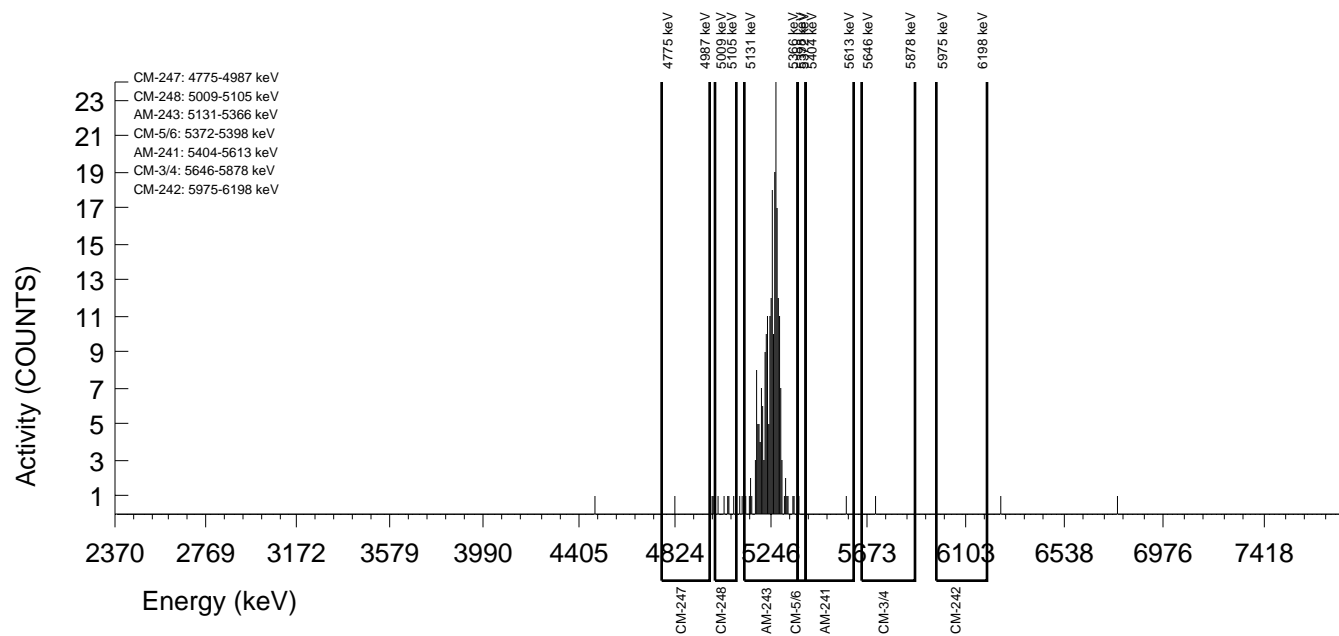
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235039_AM SAMPLE QTY : 0.511 G +/-0.196 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 79.1 +/-7.115 %	CHAMBER : 251 DETECTOR S/N : 87939 AVERAGE %EFFICIENCY : 25.8839 AVERAGE %EFF ERROR : 0.5015 COUNT DATE : 29-Sep-2016 21:52:36 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B251.CNF;458 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W251.CNF;114 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 3.7524E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5581.74	4.963	1.000	0.040	0.960	0.9798	98.525	7.29E-04	5.41E-02	1.20E-01	3.27E-02	5.41E-02
AM-243	5269.50	5250.19	29.778	234.000	233.040	0.960	0.9798	99.980	4.18E+00	8.10E-01	1.18E-01	3.22E-02	5.40E-01
CM-242	6102.00	6086.58	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.33E-01	1.97E-01	0.00E+00	1.32E-01
CM-3/4	5795.02	5710.21	4.963	1.000	0.280	0.720	0.8485	100.000	5.19E-03	5.43E-02	1.13E-01	2.88E-02	5.42E-02
CM-5/6	5386.00	5373.72	0.000	1.000	1.000	0.000	0.0000	86.090	2.08E-02	5.87E-02	6.25E-02	0.00E+00	5.86E-02
CM-247	4946.00	4828.83	4.963	1.000	0.520	0.480	0.6928	79.300	1.18E-02	6.54E-02	1.25E-01	2.87E-02	6.54E-02
CM-248	5078.60	5055.51	69.481	5.000	4.760	0.240	0.4899	91.000	9.38E-02	9.65E-02	9.45E-02	1.77E-02	9.56E-02



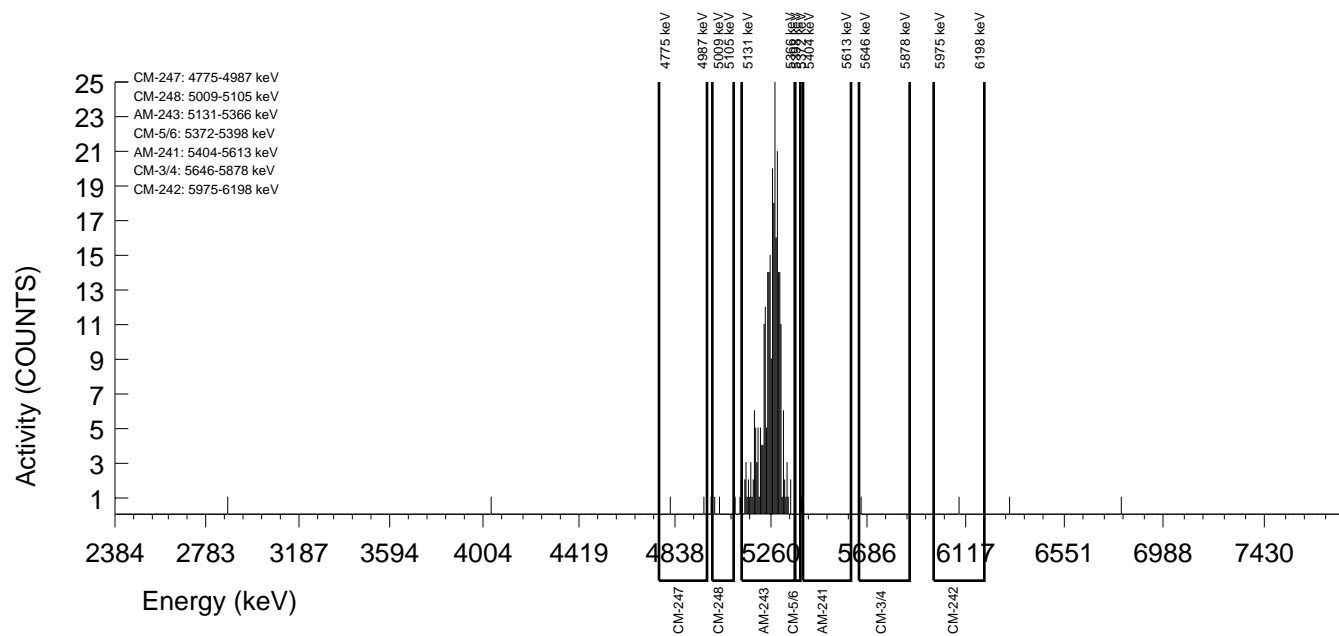
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S0405235040_AM SAMPLE QTY : 0.510 G +/-0.196 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 95.7 +/-6.512 %	CHAMBER : 252 DETECTOR S/N : 87940 AVERAGE %EFFICIENCY : 26.3006 AVERAGE %EFF ERROR : 0.5094 COUNT DATE : 29-Sep-2016 21:52:38 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B252.CNF;455 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W252.CNF;127 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.5405E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.49	0.000	0.000	-0.240	0.240	0.4899	98.525	-3.57E-03	3.08E-02	7.12E-02	1.33E-02	3.08E-02
AM-243	5269.50	5261.64	52.973	287.000	286.520	0.480	0.6928	99.980	4.19E+00	7.41E-01	8.10E-02	1.86E-02	4.87E-01
CM-242	6102.00	6089.58	4.966	1.000	1.000	0.000	0.0000	100.000	5.35E-02	1.51E-01	1.61E-01	0.00E+00	1.50E-01
CM-3/4	5795.02	5659.67	4.966	1.000	0.760	0.240	0.4899	100.000	1.15E-02	4.31E-02	7.24E-02	1.35E-02	4.30E-02
CM-5/6	5386.00	5398.26	0.000	1.000	1.000	0.000	0.0000	86.090	1.70E-02	4.78E-02	5.10E-02	0.00E+00	4.78E-02
CM-247	4946.00	4895.57	144.020	2.000	1.520	0.480	0.6928	79.300	2.80E-02	6.45E-02	1.02E-01	2.34E-02	6.44E-02
CM-248	5078.60	5053.72	0.000	3.000	3.000	0.000	0.0000	91.000	4.82E-02	6.38E-02	4.82E-02	0.00E+00	6.34E-02



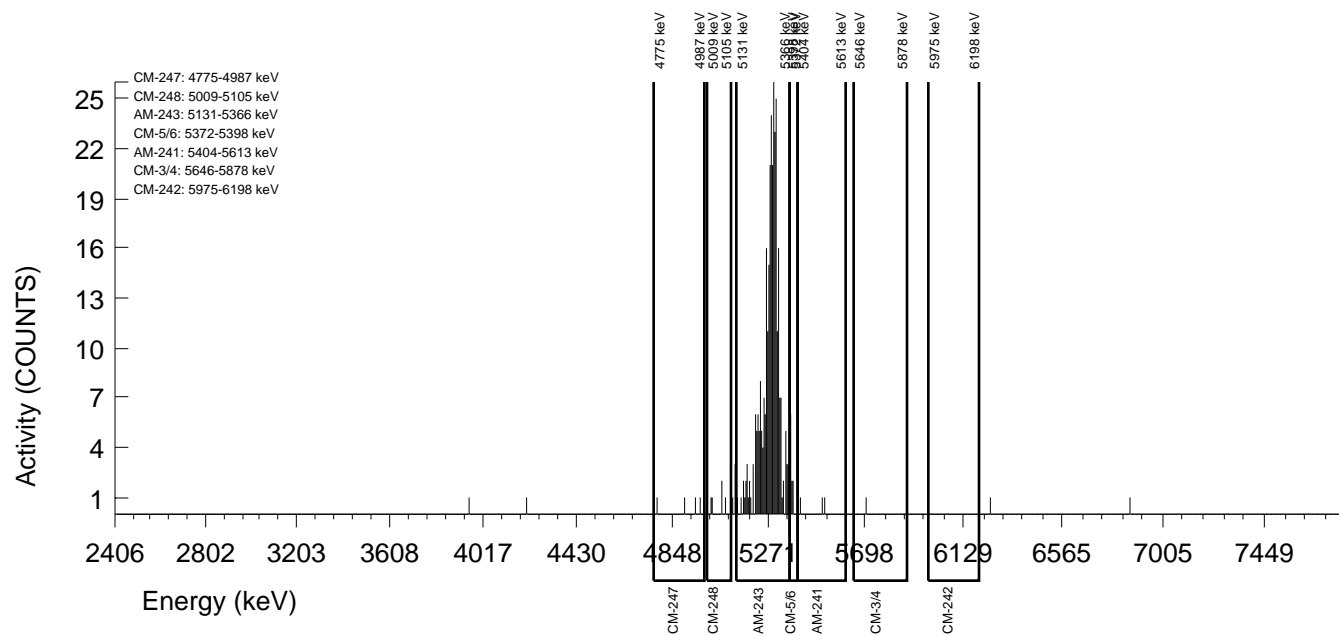
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S1203636290_AM SAMPLE QTY : 0.516 G +/-0.194 % SAMPLE DATE : 27-Sep-2016 00:00:00 ANALYST : MXS2 % YIELD : 88.7 +/-6.345 %	CHAMBER : 092 DETECTOR S/N : 80063 AVERAGE %EFFICIENCY : 30.3421 AVERAGE %EFF ERROR : 0.5858 COUNT DATE : 29-Sep-2016 21:26:42 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B092.CNF;1442 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W092.CNF;414 CAL DATE : 06-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7439E+00 dpm RESULTS : 4.2073E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5482.00	103.362	3.000	2.520	0.480	0.6928	98.525	3.46E-02	5.51E-02	7.60E-02	1.74E-02	5.49E-02
AM-243	5269.50	5282.42	52.337	308.000	306.320	1.680	1.2961	99.980	4.14E+00	7.12E-01	1.05E-01	3.21E-02	4.66E-01
CM-242	6102.00	6086.57	0.000	0.000	-0.480	0.480	0.6928	100.000	-6.57E-03	2.91E-02	7.58E-02	1.74E-02	2.91E-02
CM-3/4	5795.02	5703.11	4.922	1.000	0.520	0.480	0.6928	100.000	7.03E-03	3.91E-02	7.49E-02	1.72E-02	3.91E-02
CM-5/6	5386.00	5375.07	0.000	10.000	9.520	0.480	0.6928	86.090	1.49E-01	1.05E-01	8.70E-02	1.99E-02	1.03E-01
CM-247	4946.00	4904.98	182.114	4.000	2.560	1.440	1.2000	79.300	4.36E-02	7.79E-02	1.26E-01	3.75E-02	7.77E-02
CM-248	5078.60	5046.82	4.922	6.000	5.040	0.960	0.9798	91.000	7.49E-02	7.92E-02	9.79E-02	2.67E-02	7.86E-02



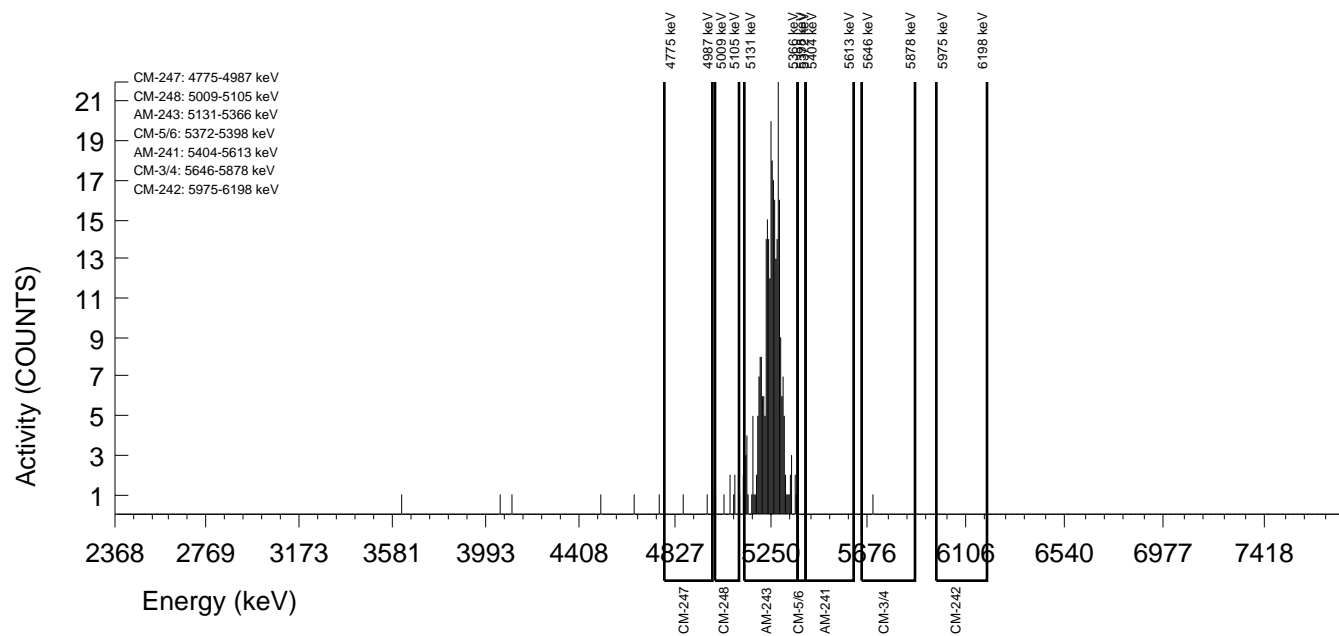
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S1203636291_AM SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 100 +/-6.462 %	CHAMBER : 253 DETECTOR S/N : 87941 AVERAGE %EFFICIENCY : 25.6727 AVERAGE %EFF ERROR : 0.4975 COUNT DATE : 29-Sep-2016 21:52:41 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B253.CNF;459 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W253.CNF;112 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.7534E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.50	0.000	0.000	-0.720	0.720	0.8485	98.525	-1.07E-02	3.22E-02	9.04E-02	2.30E-02	3.22E-02
AM-243	5269.50	5251.79	60.055	294.000	292.800	1.200	1.0954	99.980	4.27E+00	7.48E-01	1.02E-01	2.92E-02	4.91E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.04E-01	1.55E-01	0.00E+00	1.04E-01
CM-3/4	5795.02	5697.36	4.985	1.000	0.520	0.480	0.6928	100.000	7.81E-03	4.35E-02	8.32E-02	1.91E-02	4.34E-02
CM-5/6	5386.00	5385.09	0.000	0.000	0.000	0.000	0.0000	86.090	0.00E+00	3.42E-02	5.08E-02	0.00E+00	3.41E-02
CM-247	4946.00	4916.53	104.681	2.000	1.760	0.240	0.4899	79.300	3.23E-02	6.37E-02	8.81E-02	1.65E-02	6.35E-02
CM-248	5078.60	5074.29	0.000	9.000	8.520	0.480	0.6928	91.000	1.36E-01	1.02E-01	8.86E-02	2.03E-02	1.00E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

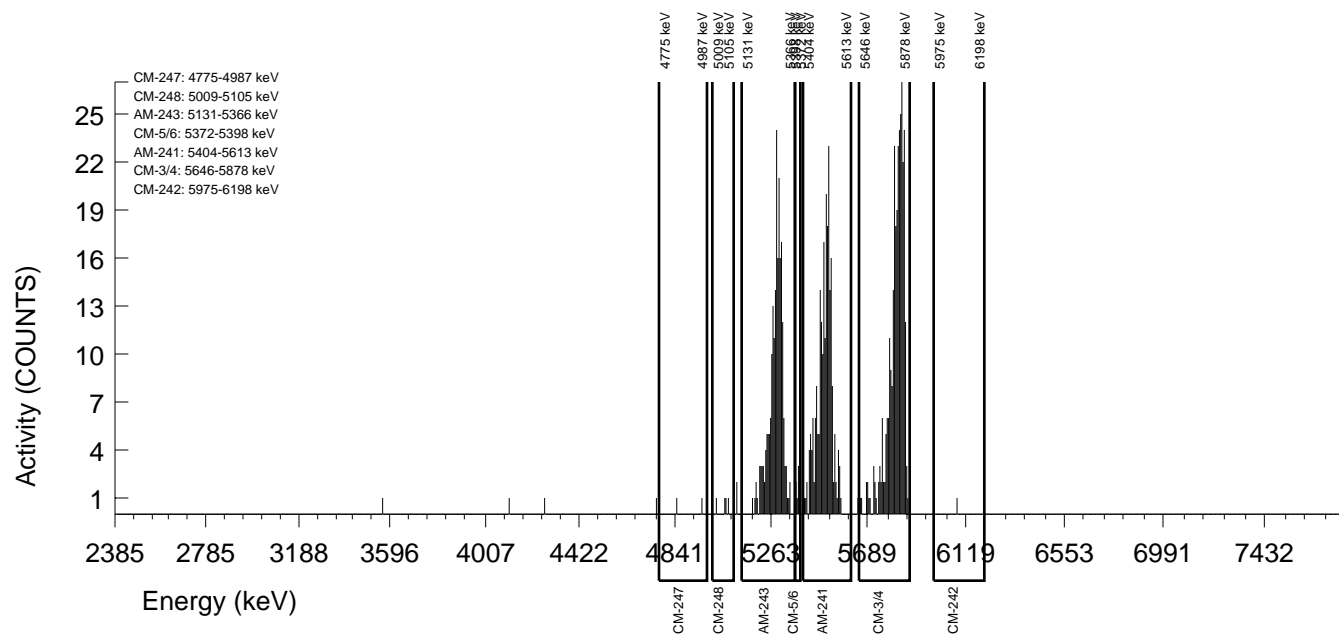
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1602285 SAMPLE ID : S1203636292_AM SAMPLE QTY : 0.516 G +/-0.194 % SAMPLE DATE : 27-Sep-2016 00:00:00 ANALYST : MXS2 % YIELD : 74.9 +/-7.368 %	CHAMBER : 254 DETECTOR S/N : 87942 AVERAGE %EFFICIENCY : 25.1642 AVERAGE %EFF ERROR : 0.4879 COUNT DATE : 29-Sep-2016 21:52:42 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B254.CNF;458 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W254.CNF;116 CAL DATE : 19-Sep-2016
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TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7439E+00 dpm RESULTS : 3.5527E+00 dpm	LCS ID : 0533-CC NUCLIDE : AM-241 NOMINAL (pCi/G) : 3.8166E+00 % RECOVERY : 119.347	ID : 1216-G NUCLIDE : CM-3/4 NOMINAL (pCi/G) : 5.0427E+00 % RECOVERY : 119.178
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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5498.98	48.957	233.000	232.520	0.480	0.6928	98.525	4.56E+00	8.99E-01	1.08E-01	2.49E-02	5.88E-01
AM-243	5269.50	5284.39	41.459	215.000	214.520	0.480	0.6928	99.980	4.14E+00	8.32E-01	1.07E-01	2.45E-02	5.56E-01
CM-242	6102.00	6081.71	4.975	1.000	1.000	0.000	0.0000	100.000	1.95E-02	5.50E-02	5.86E-02	0.00E+00	5.50E-02
CM-3/4	5795.02	5812.67	49.544	312.000	311.280	0.720	0.8485	100.000	6.01E+00	1.12E+00	1.18E-01	3.00E-02	6.70E-01
CM-5/6	5386.00	5379.30	14.925	7.000	7.000	0.000	0.0000	86.090	1.57E-01	1.27E-01	6.73E-02	0.00E+00	1.25E-01
CM-247	4946.00	4906.49	109.453	2.000	1.520	0.480	0.6928	79.300	3.70E-02	8.52E-02	1.35E-01	3.09E-02	8.50E-02
CM-248	5078.60	5058.10	54.726	4.000	3.760	0.240	0.4899	91.000	7.97E-02	9.48E-02	1.02E-01	1.90E-02	9.40E-02



Batch# 1596390 Product: Am/Cm Date: 10/1/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	DER# 1523616
Sample was correctly preserved if required.			NA
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER# 1523616
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER# 1523616
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: Ymlawley 10/1/16

Secondary Review Performed By: Joni Davis 10/02/16

DATA EXCEPTION REPORT

Mo.Day Yr. 01-OCT-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Am-05-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596390	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, and 1203621695 were received and analyzed out of holding.</p>		<p>1. Reporting results.</p>	

Originator's Name:
Melanie Aycock 01-OCT-16

Data Validator/Group Leader:
Jessica Davis 03-OCT-16

Am/Cm Queue Sheet

07-SEP-16

Batch #: 1596390 Analyst: JXH2 First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16 Comments: Analyzed Sequentially with
 Tracer(s): Am243/Cm244 Tracer Code: 1752-C Expiration Date: 5-26-17 Vol: 0.1mL U: 1596389
 LCS Isotope(s): Am241/Cm244 LCS Code(s): 0533-CC / 1716-G Expiration Date: 4-21-17 / 9-30-16 Vol(s): 0.1mL / 0.1mL
 Spike Isotope(s): Am241/Cm244 Spike Code(s): Expiration Date: / / Vol(s): / / Pu: 1596393
 Prep Date: 9-26-16 Initials: JXH Pipet ID: 184002Z Balance ID: 1610766Z Witness: KB 9-26-16

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	Am/Cm Det #
405235001-1	4.1.B.R.1.2	SAMPLE	1 pCi/g	1	SOIL	MJWC001	10-DEC-15	1	1	0.501	213
405235002-1	4.1.B.R.1.3	SAMPLE	1 pCi/g	1	SOIL	MJWC001	10-DEC-15	2	2	0.505	214
405235003-1	4.1.B.R.1.4	SAMPLE	1 pCi/g	1	SOIL	MJWC001	10-DEC-15	3	3	0.501	221
405235004-1	4.1.B.R.7.2	SAMPLE	1 pCi/g	1	SOIL	MJWC001	09-DEC-15	4	4	0.502	223
405235005-1	4.1.C.R.1.3	SAMPLE	1 pCi/g	1	SOIL	MJWC001	10-DEC-15	5	5	0.503	224
405235006-1	4.1.C.R.1.4	SAMPLE	1 pCi/g	1	SOIL	MJWC001	10-DEC-15	6	6	0.501	226
405235007-1	4.1.C.R.2.3	SAMPLE	1 pCi/g	1	SOIL	MJWC001	10-DEC-15	7	7	0.501	227
405235008-1	4.1.C.R.2.4	SAMPLE	1 pCi/g	1	SOIL	MJWC001	10-DEC-15	8	8	0.503	228
405235009-1	4.1.D.R.1.3	SAMPLE	1 pCi/g	1	SOIL	MJWC001	10-DEC-15	9	9	0.504	229
405235010-1	4.1.D.R.1.4	SAMPLE	1 pCi/g	1	SOIL	MJWC001	10-DEC-15	10	10	0.501	231
405235011-1	4.1.D.R.3.2	SAMPLE	1 pCi/g	1	SOIL	MJWC001	09-DEC-15	11	11	0.500	235
405235012-1	4.1.D.R.2.4	SAMPLE	1 pCi/g	1	SOIL	MJWC001	10-DEC-15	12	12	0.506	237
405235013-1	4.2.A.R.2.3	SAMPLE	1 pCi/g	1	SOIL	MJWC001	08-DEC-15	13	13	0.500	235
405235014-1	4.2.A.R.1.3	SAMPLE	1 pCi/g	1	SOIL	MJWC001	08-DEC-15	14	14	0.502	236
405235015-1	4.2.A.R.1.4	SAMPLE	1 pCi/g	1	SOIL	MJWC001	08-DEC-15	15	15	0.509	241
405235016-1	4.2.A.R.2.4	SAMPLE	1 pCi/g	1	SOIL	MJWC001	08-DEC-15	16	16	0.501	242
405235017-1	4.2.A.R.3.2	SAMPLE	1 pCi/g	1	SOIL	MJWC001	02-DEC-15	17	17	0.501	243
405235018-1	4.2.A.R.4.2	SAMPLE	1 pCi/g	1	SOIL	MJWC001	02-DEC-15	18	18	0.500	244
405235019-1	4.2.B.R.2.4	SAMPLE	1 pCi/g	1	SOIL	MJWC001	08-DEC-15	19	19	0.506	245
405235020-1	4.2.B.R.1.4	SAMPLE	1 pCi/g	1	SOIL	MJWC001	08-DEC-15	20	20	0.502	246
1203621694-1	MB for batch 1596390	MB	1 pCi/g	1	SOIL	QC ACCOUNT		21	21	0.509	95
1203621695-1	4.1.B.R.1.2(405235001DUP)	DUP	1 pCi/g	1	SOIL	QC ACCOUNT	10-DEC-15	22	22	0.500	247
1203621696-1	LCS for batch 1596390	LCS	1 pCi/g	1	SOIL	QC ACCOUNT		23	23	0.509	248

Choose SOP Used: GL-RAD-A-011
 GL-RAD-A-036
 GEL Laboratories LLC, Radiochemistry Division
 Solid Sample Dissolution by: LEACH or DIGESTION
 Circle One
 Data Reviewed By: M. Brandy, 10/1/16
 Page 1 of 1

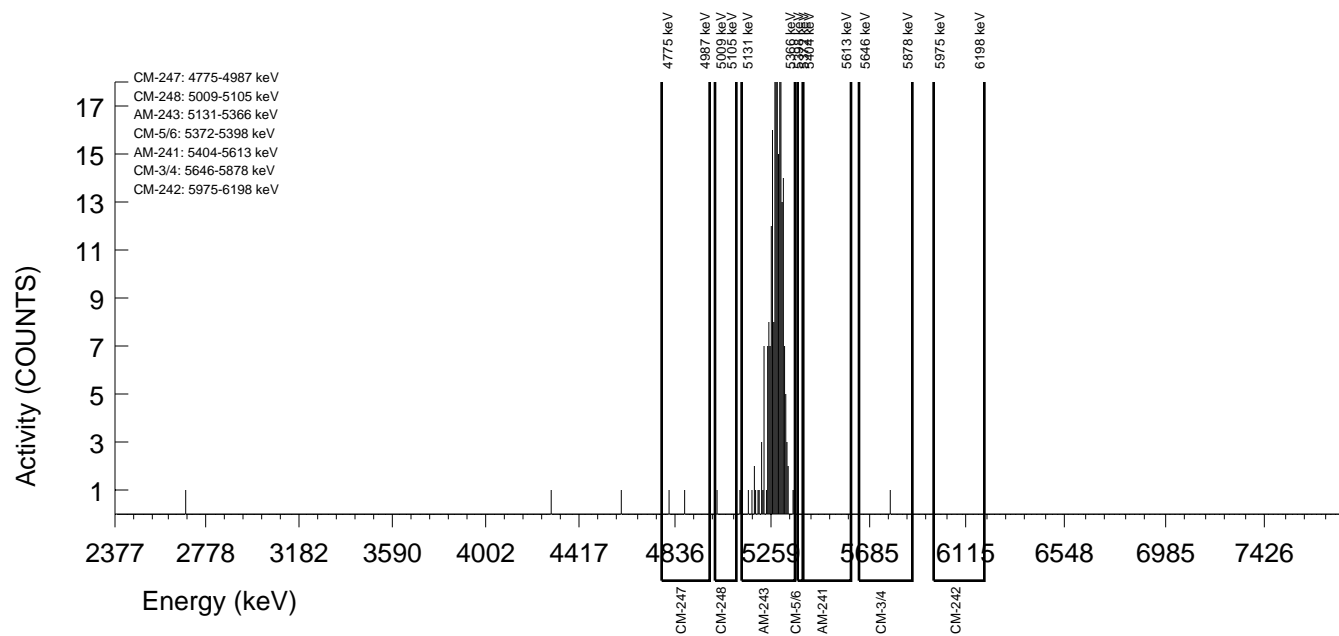
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235001_AM SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 79.7 +/-7.233 %	CHAMBER : 213 DETECTOR S/N : 87901 AVERAGE %EFFICIENCY : 24.8786 AVERAGE %EFF ERROR : 0.4826 COUNT DATE : 29-Sep-2016 21:50:31 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B213.CNF;469 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W213.CNF;152 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 3.7834E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.50	0.000	0.000	-0.720	0.720	0.8485	98.525	-1.38E-02	4.18E-02	1.17E-01	2.98E-02	4.17E-02
AM-243	5269.50	5279.38	56.423	228.000	225.840	2.160	1.4697	99.980	4.27E+00	8.41E-01	1.58E-01	5.08E-02	5.61E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.34E-01	1.99E-01	0.00E+00	1.33E-01
CM-3/4	5795.02	5781.22	4.987	1.000	0.520	0.480	0.6928	100.000	1.01E-02	5.63E-02	1.08E-01	2.47E-02	5.63E-02
CM-5/6	5386.00	5385.09	0.000	0.000	0.000	0.000	0.0000	86.090	0.00E+00	4.43E-02	6.58E-02	0.00E+00	4.42E-02
CM-247	4946.00	4844.10	69.816	2.000	1.040	0.960	0.9798	79.300	2.48E-02	8.47E-02	1.57E-01	4.27E-02	8.46E-02
CM-248	5078.60	5062.86	0.000	2.000	2.000	0.000	0.0000	91.000	4.15E-02	7.14E-02	6.22E-02	0.00E+00	7.11E-02



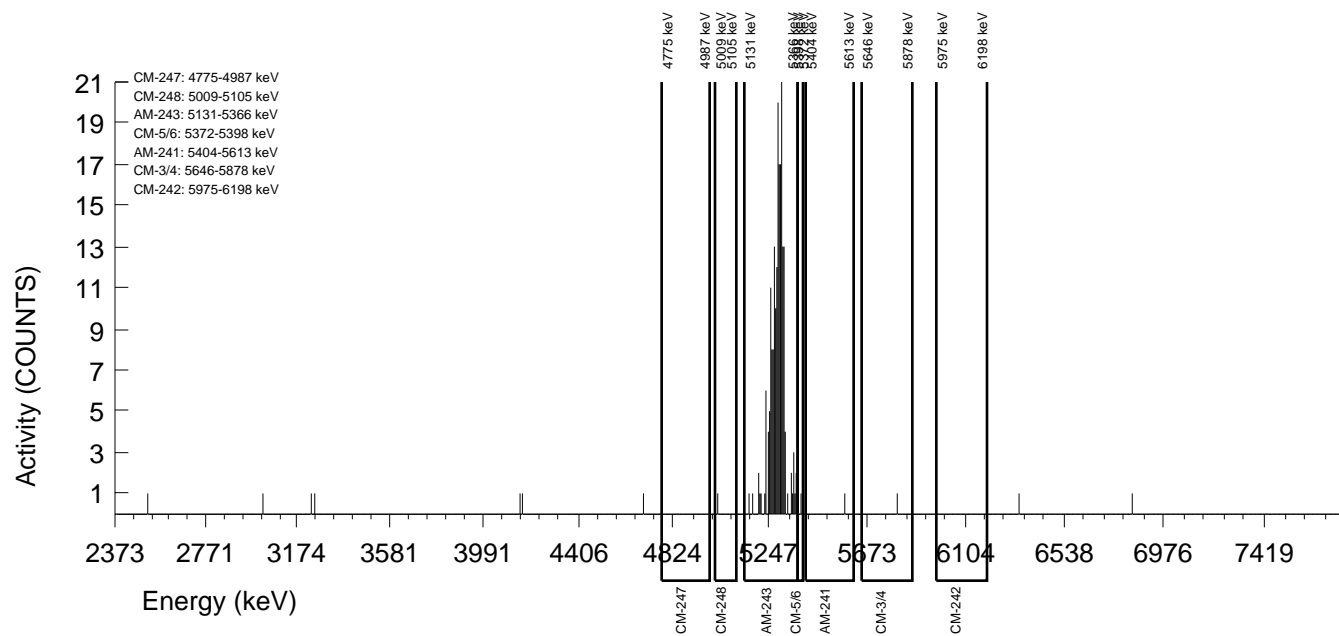
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235002_AM SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 66.5 +/-7.622 %	CHAMBER : 214 DETECTOR S/N : 87902 AVERAGE %EFFICIENCY : 26.2230 AVERAGE %EFF ERROR : 0.5080 COUNT DATE : 29-Sep-2016 21:50:34 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B214.CNF;456 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W214.CNF;119 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 3.1552E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5576.87	4.958	1.000	0.280	0.720	0.8485	98.525	6.06E-03	6.35E-02	1.32E-01	3.37E-02	6.34E-02
AM-243	5269.50	5281.92	56.323	199.000	198.520	0.480	0.6928	99.980	4.23E+00	8.80E-01	1.18E-01	2.71E-02	5.91E-01
CM-242	6102.00	6086.58	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.51E-01	2.24E-01	0.00E+00	1.51E-01
CM-3/4	5795.02	5807.25	4.958	1.000	0.520	0.480	0.6928	100.000	1.14E-02	6.36E-02	1.22E-01	2.79E-02	6.35E-02
CM-5/6	5386.00	5384.87	4.958	1.000	0.760	0.240	0.4899	86.090	1.88E-02	7.07E-02	1.19E-01	2.22E-02	7.06E-02
CM-247	4946.00	4881.19	0.000	0.000	-0.960	0.960	0.9798	79.300	-2.58E-02	5.99E-02	1.77E-01	4.82E-02	5.98E-02
CM-248	5078.60	5019.13	4.958	1.000	0.520	0.480	0.6928	91.000	1.22E-02	6.78E-02	1.30E-01	2.97E-02	6.77E-02



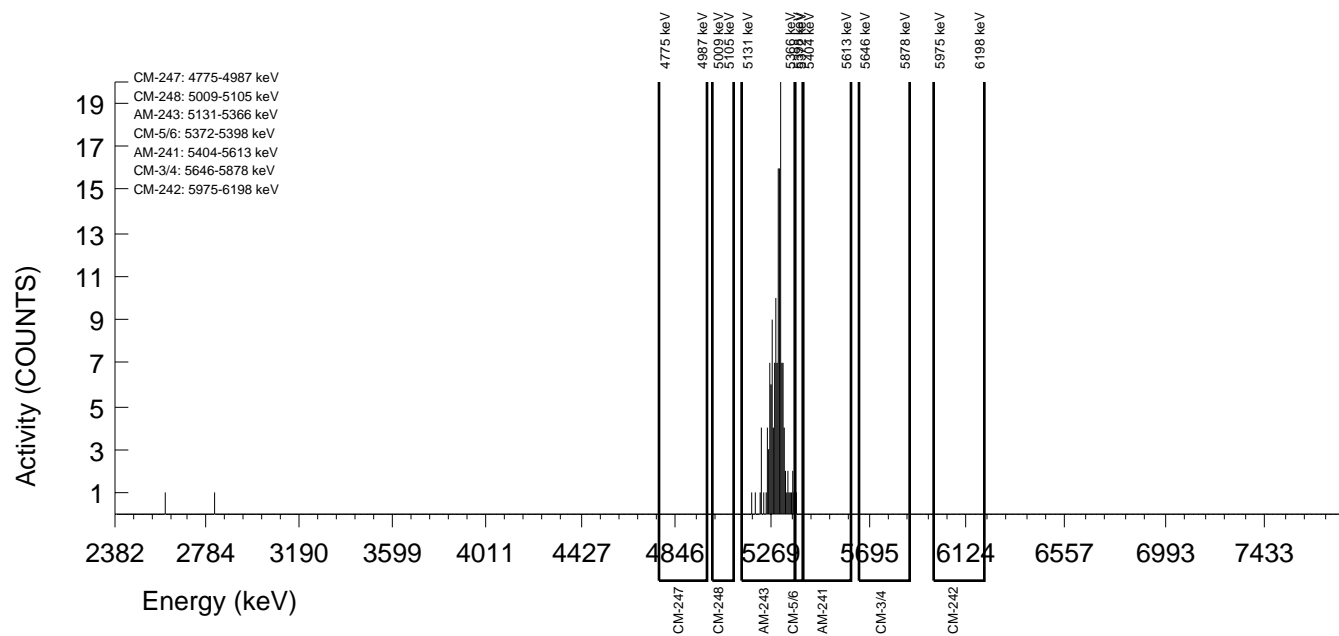
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235003_AM SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 50.7 +/-8.724 %	CHAMBER : 221 DETECTOR S/N : 87909 AVERAGE %EFFICIENCY : 25.5264 AVERAGE %EFF ERROR : 0.4948 COUNT DATE : 29-Sep-2016 21:50:41 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B221.CNF;467 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W221.CNF;128 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 2.4047E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.51	0.000	0.000	-0.480	0.480	0.6928	98.525	-1.41E-02	6.27E-02	1.63E-01	3.73E-02	6.25E-02
AM-243	5269.50	5288.54	17.199	148.000	147.280	0.720	0.8485	99.980	4.27E+00	1.02E+00	1.77E-01	4.50E-02	6.93E-01
CM-242	6102.00	6086.60	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	2.05E-01	3.05E-01	0.00E+00	2.05E-01
CM-3/4	5795.02	5761.63	0.000	0.000	-0.480	0.480	0.6928	100.000	-1.43E-02	6.36E-02	1.65E-01	3.79E-02	6.34E-02
CM-5/6	5386.00	5372.39	0.000	2.000	2.000	0.000	0.0000	86.090	6.73E-02	1.16E-01	1.01E-01	0.00E+00	1.15E-01
CM-247	4946.00	4881.21	0.000	0.000	-0.480	0.480	0.6928	79.300	-1.75E-02	7.78E-02	2.02E-01	4.63E-02	7.75E-02
CM-248	5078.60	5056.59	0.000	0.000	-0.480	0.480	0.6928	91.000	-1.53E-02	6.78E-02	1.76E-01	4.04E-02	6.75E-02



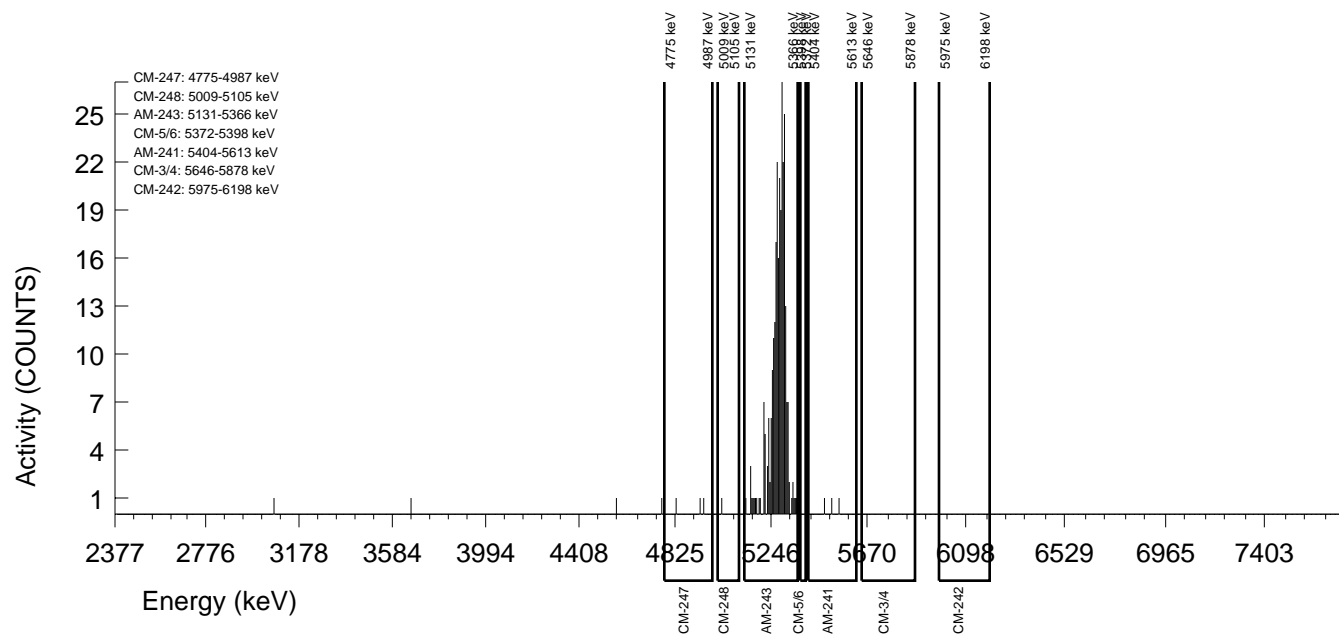
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235004_AM SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 09-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 95.4 +/-6.595 %	CHAMBER : 223 DETECTOR S/N : 87911 AVERAGE %EFFICIENCY : 25.6333 AVERAGE %EFF ERROR : 0.4968 COUNT DATE : 29-Sep-2016 21:50:45 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B223.CNF;460 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W223.CNF;114 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.5247E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5510.30	64.534	3.000	1.800	1.200	1.0954	98.525	2.80E-02	6.36E-02	1.09E-01	3.12E-02	6.35E-02
AM-243	5269.50	5277.36	42.981	279.000	278.280	0.720	0.8485	99.980	4.26E+00	7.62E-01	9.34E-02	2.38E-02	5.02E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.09E-01	1.62E-01	0.00E+00	1.09E-01
CM-3/4	5795.02	5761.62	0.000	0.000	-0.480	0.480	0.6928	100.000	-7.57E-03	3.36E-02	8.74E-02	2.00E-02	3.35E-02
CM-5/6	5386.00	5398.92	0.000	1.000	0.760	0.240	0.4899	86.090	1.35E-02	5.07E-02	8.52E-02	1.59E-02	5.06E-02
CM-247	4946.00	4905.16	119.140	3.000	2.760	0.240	0.4899	79.300	5.32E-02	7.70E-02	9.25E-02	1.73E-02	7.67E-02
CM-248	5078.60	5029.45	4.964	1.000	1.000	0.000	0.0000	91.000	1.68E-02	4.73E-02	5.04E-02	0.00E+00	4.73E-02



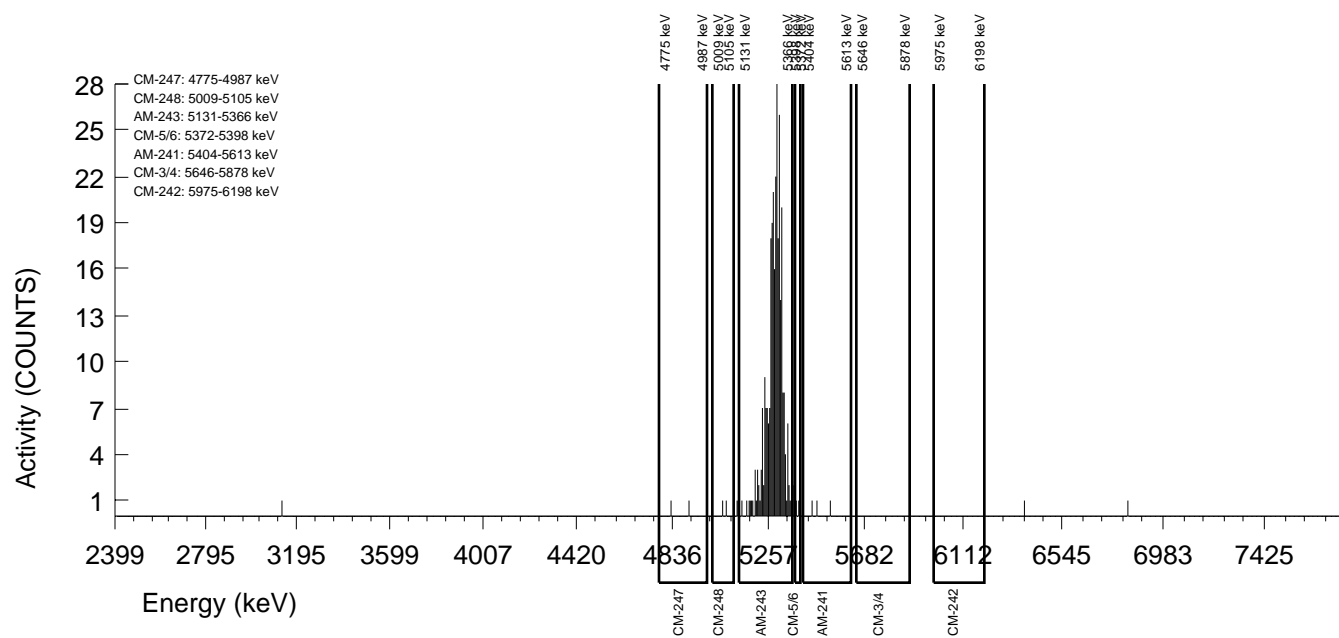
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235005_AM SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 102 +/-6.407 %	CHAMBER : 224 DETECTOR S/N : 87912 AVERAGE %EFFICIENCY : 25.7363 AVERAGE %EFF ERROR : 0.4987 COUNT DATE : 29-Sep-2016 21:50:48 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B224.CNF;471 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W224.CNF;150 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.8389E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5481.72	78.719	3.000	1.560	1.440	1.2000	98.525	2.25E-02	5.95E-02	1.07E-01	3.18E-02	5.94E-02
AM-243	5269.50	5284.24	48.529	300.000	298.800	1.200	1.0954	99.980	4.25E+00	7.38E-01	9.97E-02	2.85E-02	4.84E-01
CM-242	6102.00	6086.57	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.01E-01	1.50E-01	0.00E+00	1.00E-01
CM-3/4	5795.02	5761.60	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	2.96E-02	4.40E-02	0.00E+00	2.96E-02
CM-5/6	5386.00	5387.92	19.680	3.000	3.000	0.000	0.0000	86.090	4.95E-02	6.55E-02	4.95E-02	0.00E+00	6.52E-02
CM-247	4946.00	4870.40	78.719	2.000	1.280	0.720	0.8485	79.300	2.29E-02	6.32E-02	1.10E-01	2.79E-02	6.31E-02
CM-248	5078.60	5064.71	19.680	2.000	1.520	0.480	0.6928	91.000	2.37E-02	5.46E-02	8.65E-02	1.98E-02	5.45E-02



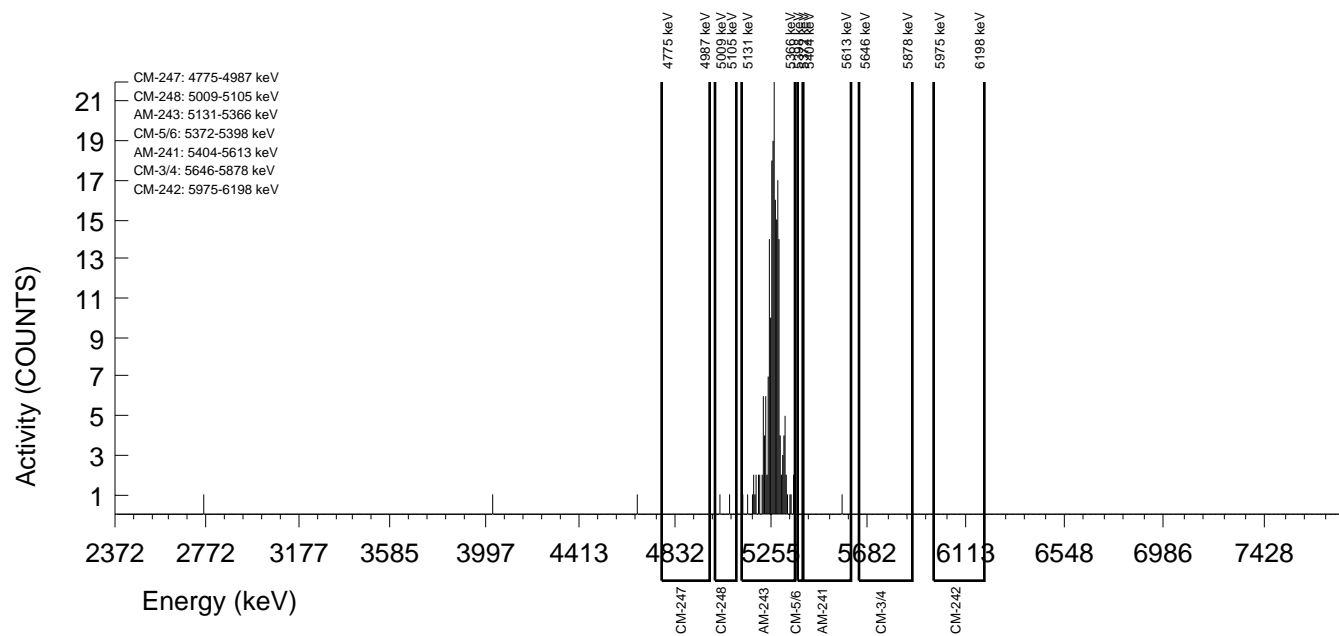
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235006_AM SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 67.9 +/-7.501 %	CHAMBER : 226 DETECTOR S/N : 87914 AVERAGE %EFFICIENCY : 26.8347 AVERAGE %EFF ERROR : 0.5195 COUNT DATE : 29-Sep-2016 21:50:50 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B226.CNF;460 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W226.CNF;122 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 3.2200E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5569.98	4.984	1.000	0.280	0.720	0.8485	98.525	5.85E-03	6.13E-02	1.28E-01	3.25E-02	6.12E-02
AM-243	5269.50	5267.31	43.500	209.000	207.320	1.680	1.2961	99.980	4.27E+00	8.73E-01	1.59E-01	4.88E-02	5.85E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.46E-01	2.16E-01	0.00E+00	1.45E-01
CM-3/4	5795.02	5761.62	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	4.29E-02	6.36E-02	0.00E+00	4.28E-02
CM-5/6	5386.00	5385.09	0.000	0.000	0.000	0.000	0.0000	86.090	0.00E+00	4.83E-02	7.17E-02	0.00E+00	4.82E-02
CM-247	4946.00	4881.20	0.000	0.000	-0.240	0.240	0.4899	79.300	-6.23E-03	5.38E-02	1.24E-01	2.33E-02	5.37E-02
CM-248	5078.60	5053.89	44.853	2.000	1.760	0.240	0.4899	91.000	3.98E-02	7.84E-02	1.08E-01	2.03E-02	7.82E-02



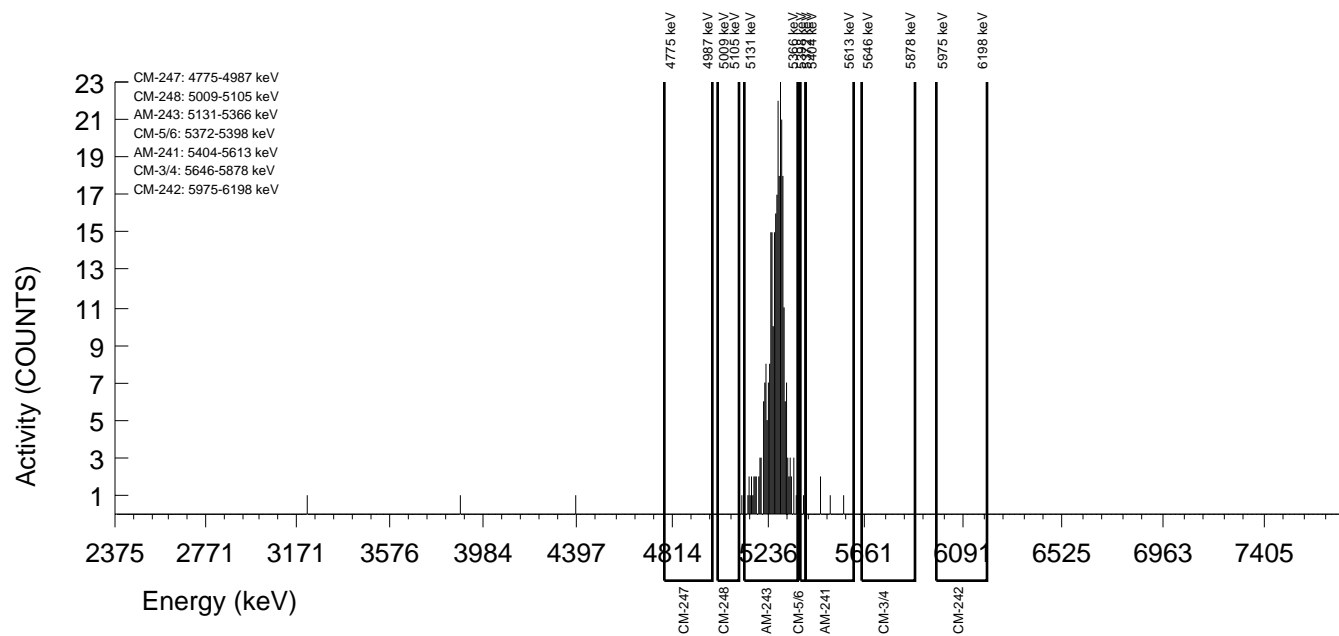
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235007_AM SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 96.4 +/-6.499 %	CHAMBER : 227 DETECTOR S/N : 87915 AVERAGE %EFFICIENCY : 26.3665 AVERAGE %EFF ERROR : 0.5107 COUNT DATE : 29-Sep-2016 21:50:52 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B227.CNF;459 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W227.CNF;120 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.5734E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5499.71	4.922	4.000	2.800	1.200	1.0954	98.525	4.19E-02	6.81E-02	1.05E-01	3.01E-02	6.79E-02
AM-243	5269.50	5267.49	56.257	291.000	289.320	1.680	1.2961	99.980	4.27E+00	7.52E-01	1.14E-01	3.50E-02	4.94E-01
CM-242	6102.00	6086.57	0.000	0.000	-0.240	0.240	0.4899	100.000	-1.24E-02	1.07E-01	2.48E-01	4.64E-02	1.07E-01
CM-3/4	5795.02	5761.60	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	3.07E-02	4.56E-02	0.00E+00	3.06E-02
CM-5/6	5386.00	5381.39	0.000	2.000	2.000	0.000	0.0000	86.090	3.42E-02	5.89E-02	5.14E-02	0.00E+00	5.87E-02
CM-247	4946.00	4881.19	0.000	0.000	-1.200	1.200	1.0954	79.300	-2.23E-02	4.23E-02	1.30E-01	3.73E-02	4.23E-02
CM-248	5078.60	5013.89	4.922	1.000	0.040	0.960	0.9798	91.000	6.48E-04	4.81E-02	1.07E-01	2.91E-02	4.80E-02



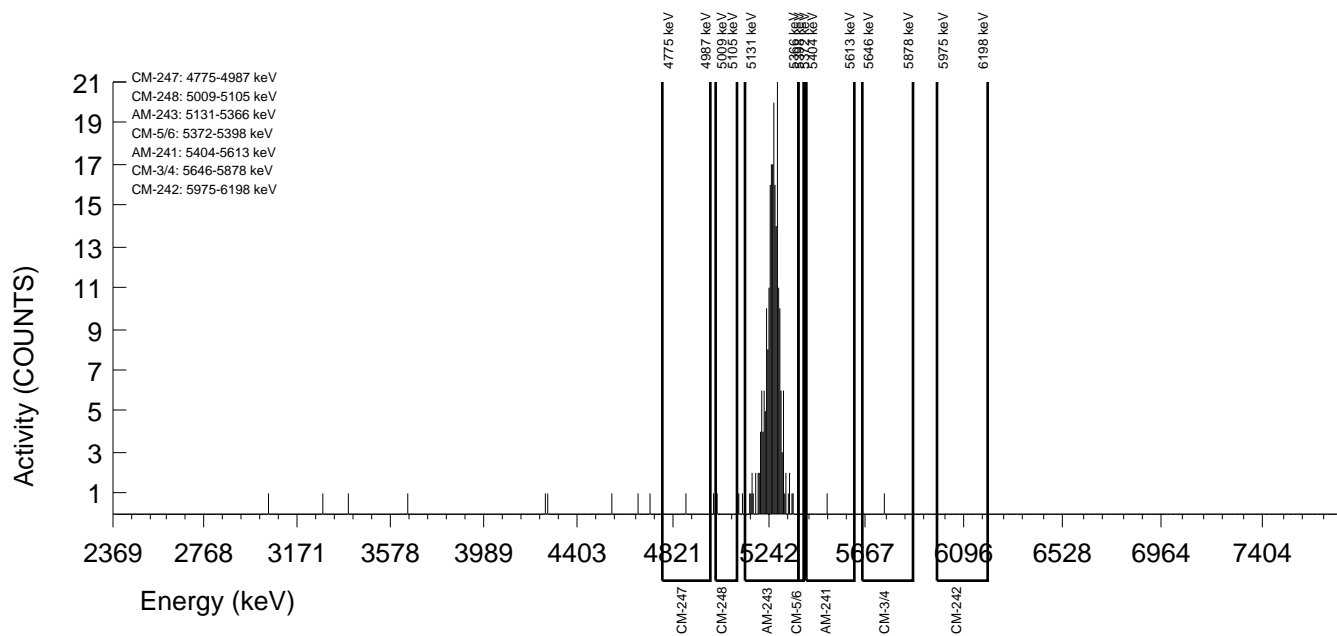
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235008_AM SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 78.4 +/-7.191 %	CHAMBER : 228 DETECTOR S/N : 87916 AVERAGE %EFFICIENCY : 25.5769 AVERAGE %EFF ERROR : 0.4958 COUNT DATE : 29-Sep-2016 21:50:56 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B228.CNF;457 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W228.CNF;117 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 3.7205E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5496.58	4.970	1.000	0.040	0.960	0.9798	98.525	7.56E-04	5.61E-02	1.25E-01	3.39E-02	5.61E-02
AM-243	5269.50	5257.74	43.071	230.000	228.320	1.680	1.2961	99.980	4.25E+00	8.32E-01	1.44E-01	4.42E-02	5.55E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.32E-01	1.96E-01	0.00E+00	1.32E-01
CM-3/4	5795.02	5747.18	4.970	1.000	0.040	0.960	0.9798	100.000	7.67E-04	5.70E-02	1.26E-01	3.44E-02	5.69E-02
CM-5/6	5386.00	5385.09	0.000	0.000	0.000	0.000	0.0000	86.090	0.00E+00	4.37E-02	6.48E-02	0.00E+00	4.36E-02
CM-247	4946.00	4878.24	4.970	1.000	-1.160	2.160	1.4697	79.300	-2.72E-02	7.39E-02	1.97E-01	6.32E-02	7.38E-02
CM-248	5078.60	5059.76	0.000	2.000	1.520	0.480	0.6928	91.000	3.11E-02	7.15E-02	1.13E-01	2.59E-02	7.14E-02



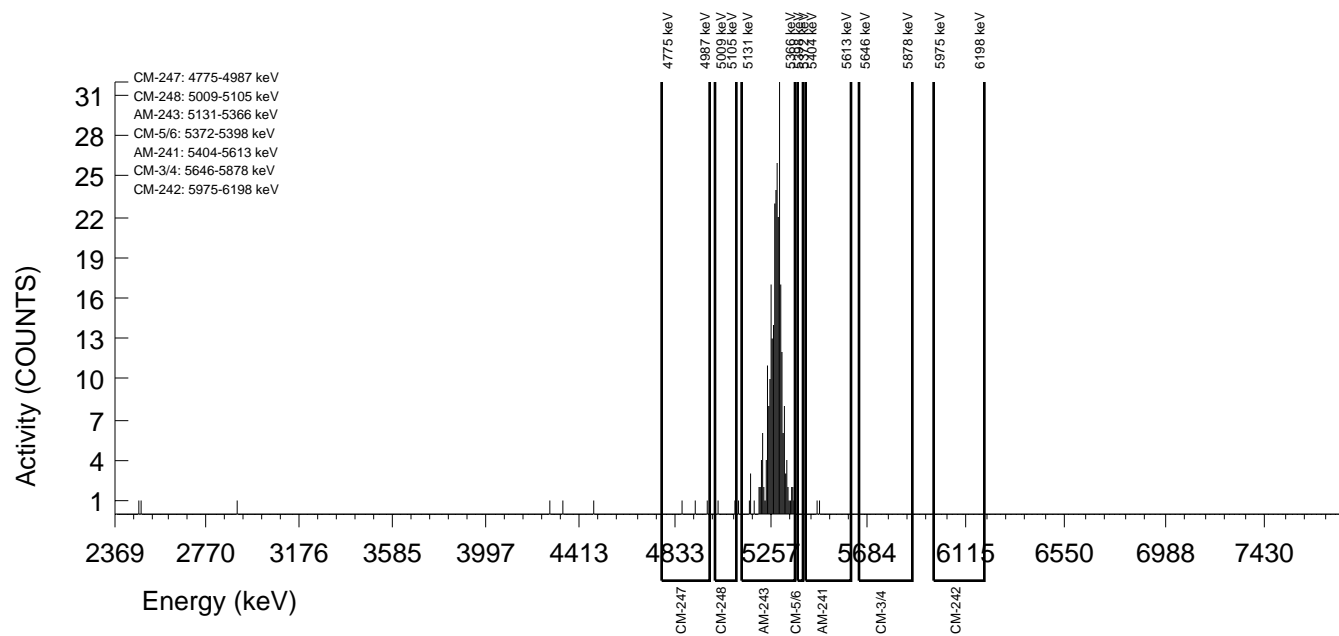
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235009_AM SAMPLE QTY : 0.504 G +/-0.198 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 99.5 +/-6.553 %	CHAMBER : 218 DETECTOR S/N : 87906 AVERAGE %EFFICIENCY : 25.1171 AVERAGE %EFF ERROR : 0.4871 COUNT DATE : 29-Sep-2016 21:50:36 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B218.CNF;459 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W218.CNF;126 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.7225E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5464.70	14.989	2.000	1.520	0.480	0.6928	98.525	2.30E-02	5.29E-02	8.38E-02	1.92E-02	5.28E-02
AM-243	5269.50	5275.95	41.684	287.000	284.600	2.400	1.5492	99.980	4.24E+00	7.54E-01	1.29E-01	4.23E-02	4.96E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.06E-01	1.57E-01	0.00E+00	1.05E-01
CM-3/4	5795.02	5761.62	0.000	0.000	-0.480	0.480	0.6928	100.000	-7.37E-03	3.27E-02	8.51E-02	1.95E-02	3.26E-02
CM-5/6	5386.00	5374.01	0.000	2.000	2.000	0.000	0.0000	86.090	3.46E-02	5.95E-02	5.19E-02	0.00E+00	5.93E-02
CM-247	4946.00	4921.26	109.919	3.000	2.520	0.480	0.6928	79.300	4.73E-02	7.55E-02	1.04E-01	2.38E-02	7.52E-02
CM-248	5078.60	5060.53	74.945	2.000	1.280	0.720	0.8485	91.000	2.10E-02	5.77E-02	1.00E-01	2.54E-02	5.77E-02



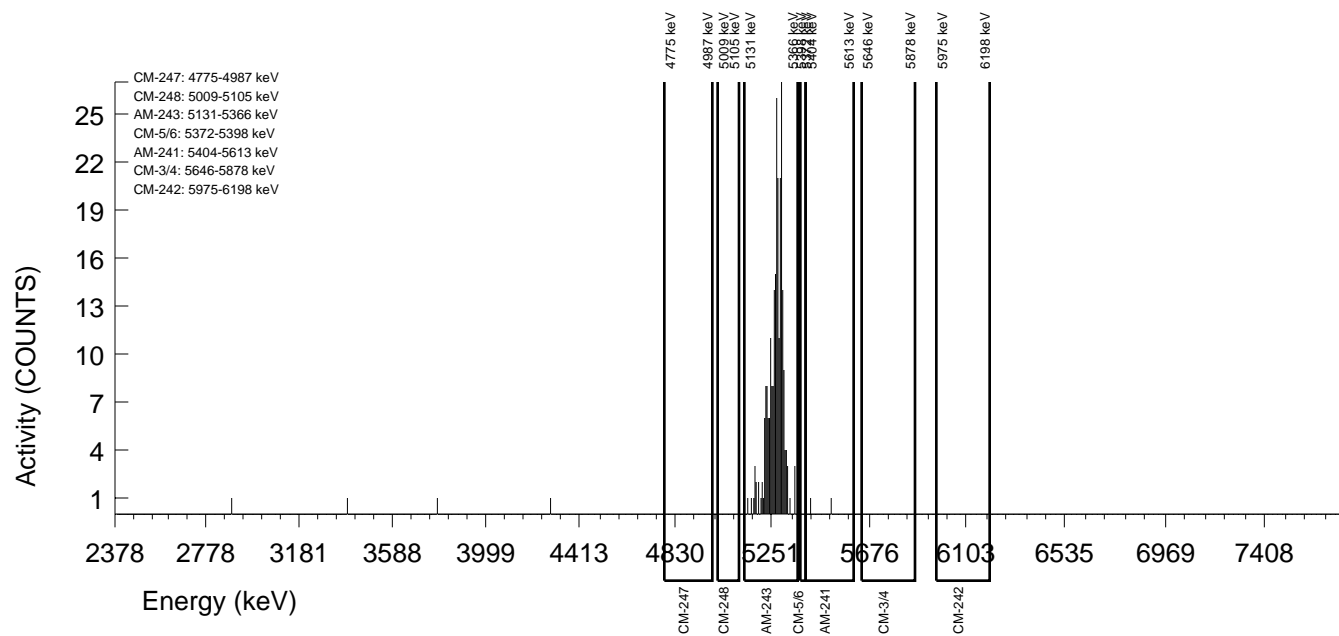
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235010_AM SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 95.8 +/-6.941 %	CHAMBER : 231 DETECTOR S/N : 87919 AVERAGE %EFFICIENCY : 22.6542 AVERAGE %EFF ERROR : 0.4405 COUNT DATE : 29-Sep-2016 21:51:01 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B231.CNF;423 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W231.CNF;109 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.5449E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5465.56	89.629	2.000	0.560	1.440	1.2000	98.525	9.82E-03	6.35E-02	1.30E-01	3.86E-02	6.34E-02
AM-243	5269.50	5268.52	35.769	248.000	247.040	0.960	0.9798	99.980	4.27E+00	8.06E-01	1.14E-01	3.10E-02	5.34E-01
CM-242	6102.00	6086.60	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.22E-01	1.82E-01	0.00E+00	1.22E-01
CM-3/4	5795.02	5761.63	0.000	0.000	-0.240	0.240	0.4899	100.000	-4.27E-03	3.69E-02	8.54E-02	1.60E-02	3.69E-02
CM-5/6	5386.00	5385.09	0.000	0.000	0.000	0.000	0.0000	86.090	0.00E+00	4.05E-02	6.02E-02	0.00E+00	4.04E-02
CM-247	4946.00	4881.21	0.000	0.000	0.000	0.000	0.0000	79.300	0.00E+00	4.40E-02	6.53E-02	0.00E+00	4.39E-02
CM-248	5078.60	5056.59	0.000	0.000	-0.720	0.720	0.8485	91.000	-1.37E-02	4.13E-02	1.16E-01	2.95E-02	4.12E-02



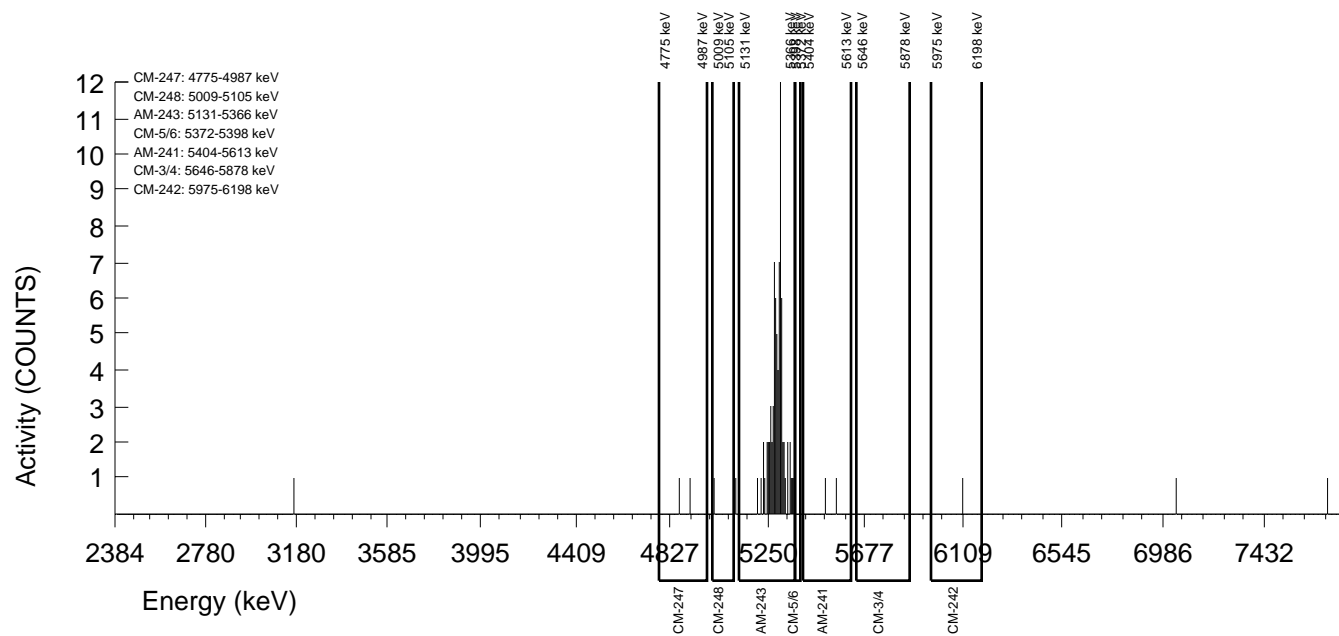
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235011_AM SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 09-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 38.4 +/-11.794 %	CHAMBER : 070 DETECTOR S/N : 78262 AVERAGE %EFFICIENCY : 31.3847 AVERAGE %EFF ERROR : 0.6055 COUNT DATE : 01-Oct-2016 13:23:25 ELAPSED LIVE TIME(SEC) : 8132.68	LIB FILE : AM BKG FILE : B070.CNF;1827 BKG DATE : 30-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W070.CNF;502 CAL DATE : 30-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 1.8213E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5529.73	49.198	2.000	-0.169	2.169	1.4727	98.525	-9.46E-03	2.00E-01	4.58E-01	1.45E-01	2.00E-01
AM-243	5269.50	5294.42	30.749	78.000	77.458	0.542	0.7363	99.980	4.27E+00	1.39E+00	3.08E-01	7.12E-02	9.62E-01
CM-242	6102.00	6109.03	4.920	1.000	1.000	0.000	0.0000	100.000	1.96E-01	5.47E-01	5.87E-01	0.00E+00	5.45E-01
CM-3/4	5795.02	5761.59	0.000	0.000	-0.678	0.678	0.8232	100.000	-3.86E-02	1.18E-01	3.35E-01	8.21E-02	1.18E-01
CM-5/6	5386.00	5385.09	0.000	0.000	-0.136	0.136	0.3682	86.090	-8.69E-03	1.29E-01	2.75E-01	4.14E-02	1.28E-01
CM-247	4946.00	4887.40	49.198	2.000	1.593	0.407	0.6377	79.300	1.11E-01	2.40E-01	3.64E-01	7.78E-02	2.39E-01
CM-248	5078.60	5016.63	4.920	1.000	0.864	0.136	0.3682	91.000	5.24E-02	1.70E-01	2.60E-01	3.91E-02	1.70E-01



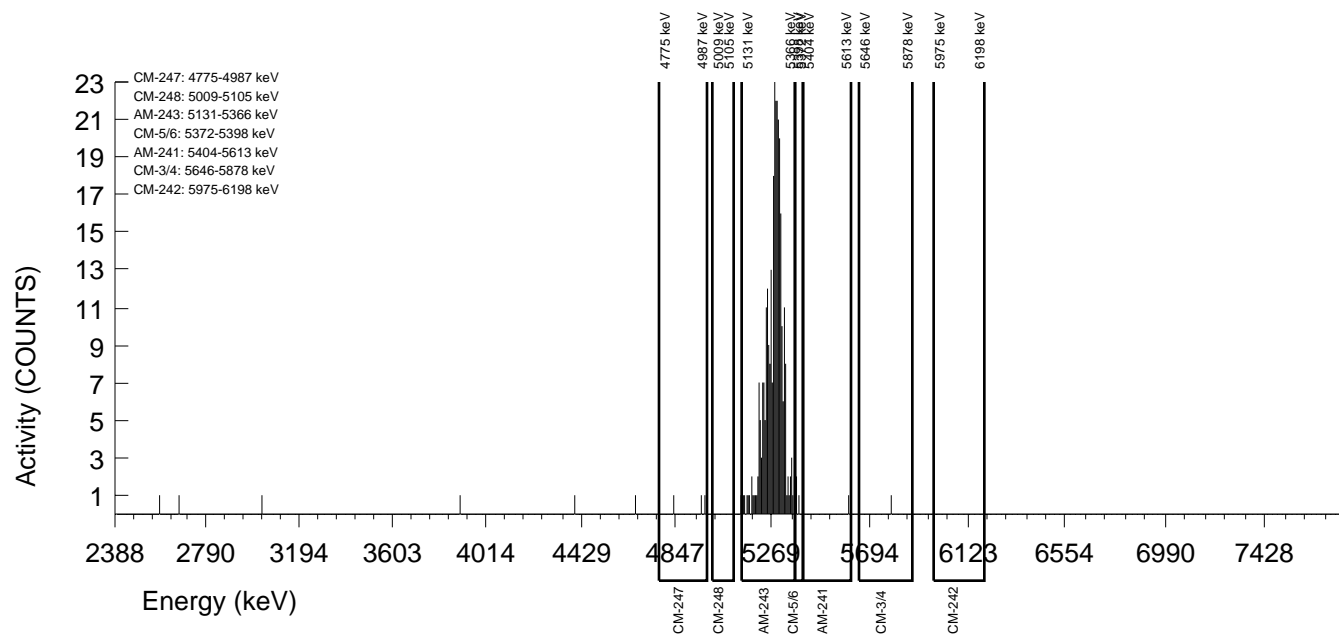
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235012_AM SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 104 +/-6.482 %	CHAMBER : 234 DETECTOR S/N : 87922 AVERAGE %EFFICIENCY : 24.8037 AVERAGE %EFF ERROR : 0.4811 COUNT DATE : 29-Sep-2016 21:52:02 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B234.CNF;454 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W234.CNF;117 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.9126E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5603.54	4.996	1.000	-0.440	1.440	1.2000	98.525	-6.46E-03	4.46E-02	1.09E-01	3.23E-02	4.46E-02
AM-243	5269.50	5275.14	61.205	295.000	292.360	2.640	1.6248	99.980	4.22E+00	7.43E-01	1.29E-01	4.30E-02	4.88E-01
CM-242	6102.00	6086.60	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.02E-01	1.52E-01	0.00E+00	1.02E-01
CM-3/4	5795.02	5790.25	4.996	1.000	0.520	0.480	0.6928	100.000	7.75E-03	4.31E-02	8.25E-02	1.89E-02	4.30E-02
CM-5/6	5386.00	5378.57	4.996	3.000	3.000	0.000	0.0000	86.090	5.03E-02	6.66E-02	5.03E-02	0.00E+00	6.62E-02
CM-247	4946.00	4922.71	134.901	3.000	3.000	0.000	0.0000	79.300	5.46E-02	7.23E-02	5.46E-02	0.00E+00	7.19E-02
CM-248	5078.60	5100.01	4.996	1.000	0.520	0.480	0.6928	91.000	8.25E-03	4.59E-02	8.79E-02	2.01E-02	4.59E-02



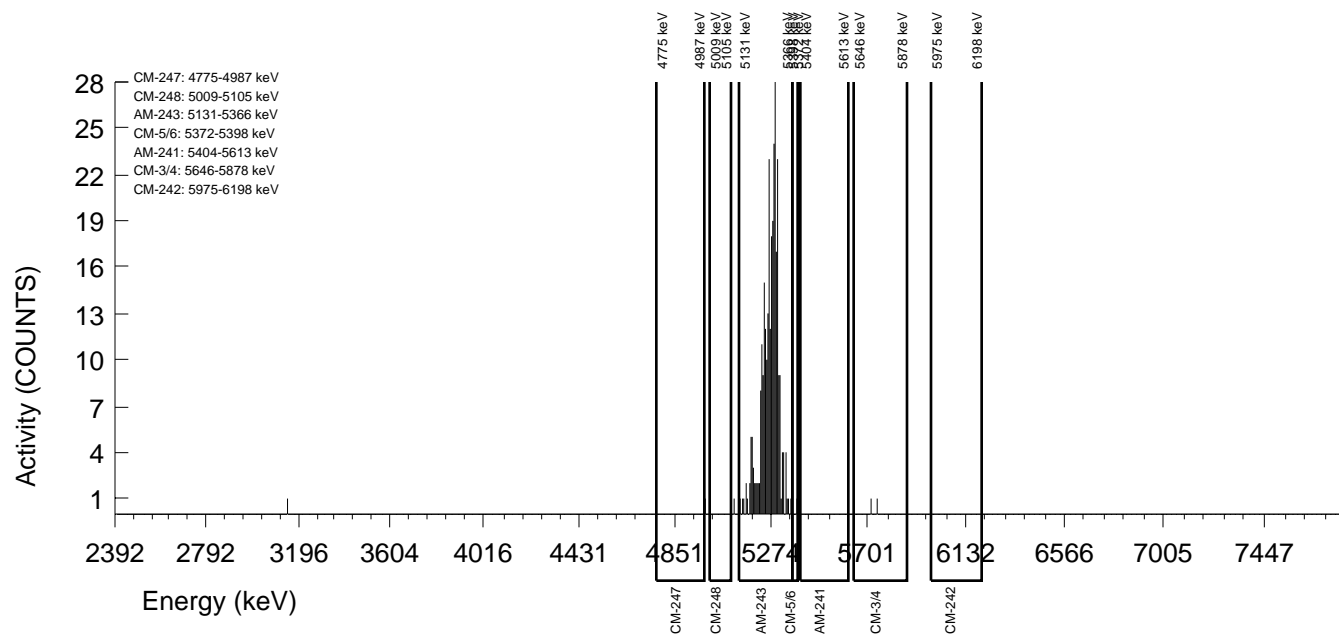
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235013_AM SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 109 +/-6.334 %	CHAMBER : 235 DETECTOR S/N : 87923 AVERAGE %EFFICIENCY : 24.7991 AVERAGE %EFF ERROR : 0.4811 COUNT DATE : 29-Sep-2016 21:52:04 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B235.CNF;455 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W235.CNF;118 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 5.1602E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.49	0.000	0.000	-0.720	0.720	0.8485	98.525	-1.02E-02	3.08E-02	8.64E-02	2.20E-02	3.07E-02
AM-243	5269.50	5272.08	58.786	308.000	307.040	0.960	0.9798	99.980	4.27E+00	7.34E-01	9.17E-02	2.50E-02	4.80E-01
CM-242	6102.00	6086.58	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	9.94E-02	1.48E-01	0.00E+00	9.92E-02
CM-3/4	5795.02	5730.37	29.867	2.000	0.800	1.200	1.0954	100.000	1.15E-02	5.15E-02	1.01E-01	2.88E-02	5.15E-02
CM-5/6	5386.00	5380.27	0.000	2.000	2.000	0.000	0.0000	86.090	3.23E-02	5.56E-02	4.85E-02	0.00E+00	5.54E-02
CM-247	4946.00	4987.82	0.000	1.000	0.280	0.720	0.8485	79.300	4.91E-03	5.14E-02	1.07E-01	2.73E-02	5.14E-02
CM-248	5078.60	5056.58	0.000	0.000	0.000	0.000	0.0000	91.000	0.00E+00	3.09E-02	4.59E-02	0.00E+00	3.08E-02



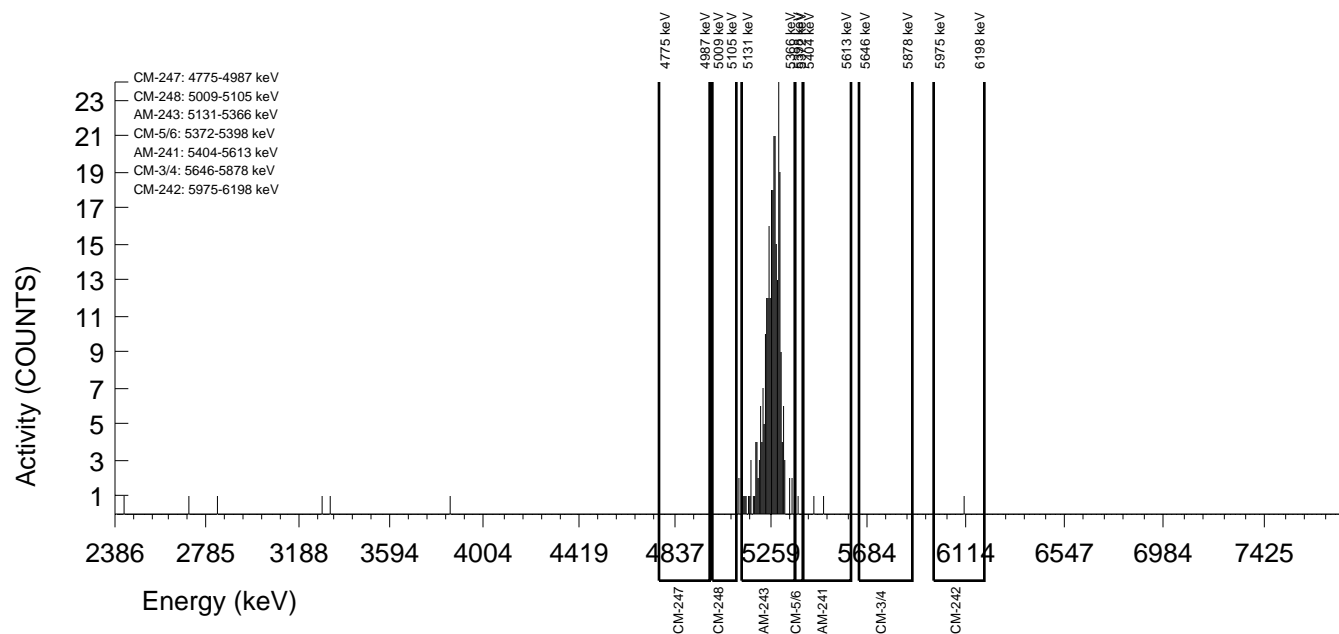
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235014_AM SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 97.5 +/-6.511 %	CHAMBER : 236 DETECTOR S/N : 87924 AVERAGE %EFFICIENCY : 25.7707 AVERAGE %EFF ERROR : 0.4994 COUNT DATE : 29-Sep-2016 21:52:07 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B236.CNF;455 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W236.CNF;117 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.6254E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5470.89	44.650	2.000	0.320	1.680	1.2961	98.525	4.84E-03	5.52E-02	1.17E-01	3.59E-02	5.51E-02
AM-243	5269.50	5264.88	53.084	286.000	286.000	0.000	0.0000	99.980	4.26E+00	7.52E-01	4.47E-02	0.00E+00	4.94E-01
CM-242	6102.00	6108.33	4.961	1.000	1.000	0.000	0.0000	100.000	5.26E-02	1.48E-01	1.58E-01	0.00E+00	1.48E-01
CM-3/4	5795.02	5761.61	0.000	0.000	-0.240	0.240	0.4899	100.000	-3.68E-03	3.18E-02	7.36E-02	1.38E-02	3.18E-02
CM-5/6	5386.00	5380.52	4.961	1.000	1.000	0.000	0.0000	86.090	1.73E-02	4.87E-02	5.19E-02	0.00E+00	4.86E-02
CM-247	4946.00	4881.20	0.000	0.000	-0.960	0.960	0.9798	79.300	-1.80E-02	4.18E-02	1.24E-01	3.37E-02	4.17E-02
CM-248	5078.60	5056.58	0.000	0.000	-0.480	0.480	0.6928	91.000	-7.85E-03	3.48E-02	9.06E-02	2.08E-02	3.47E-02



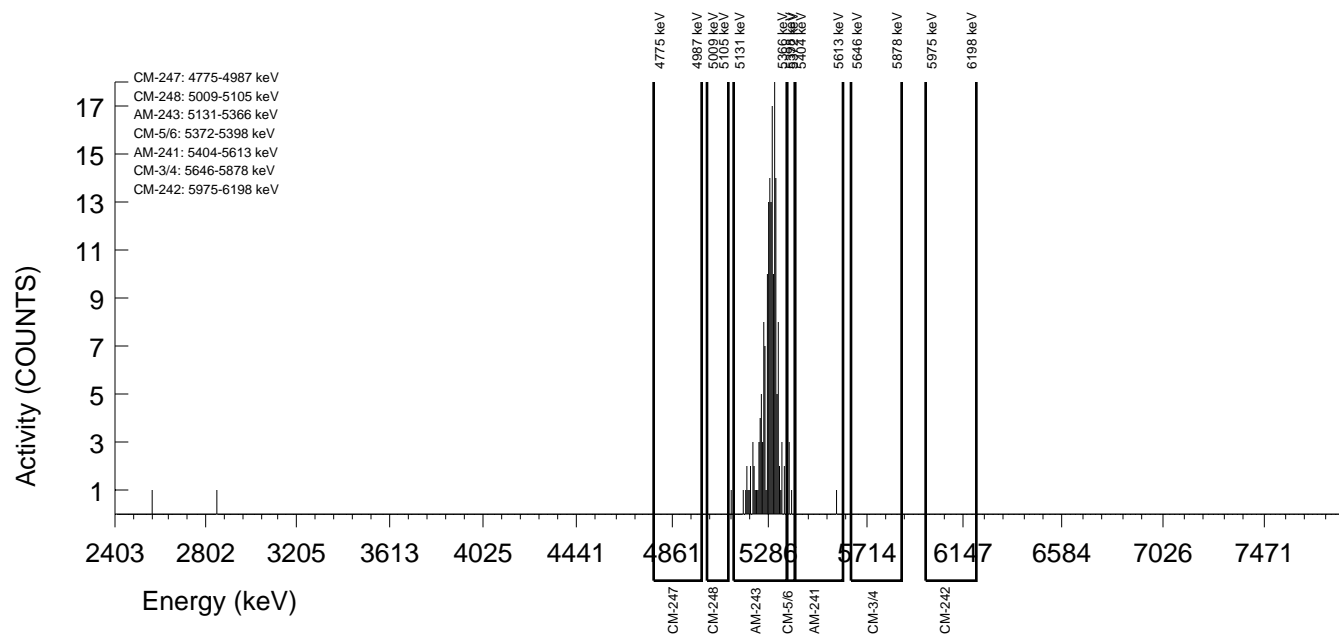
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235015_AM SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 87.4 +/-8.003 %	CHAMBER : 071 DETECTOR S/N : 80020 AVERAGE %EFFICIENCY : 31.8394 AVERAGE %EFF ERROR : 0.6142 COUNT DATE : 01-Oct-2016 13:23:22 ELAPSED LIVE TIME(SEC) : 8073.70	LIB FILE : AM BKG FILE : B071.CNF;1818 BKG DATE : 30-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W071.CNF;466 CAL DATE : 30-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.1464E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5585.42	4.963	1.000	0.462	0.538	0.7337	98.525	1.11E-02	6.82E-02	1.34E-01	3.09E-02	6.81E-02
AM-243	5269.50	5289.14	38.053	178.000	177.596	0.404	0.6354	99.980	4.20E+00	9.18E-01	1.24E-01	2.63E-02	6.20E-01
CM-242	6102.00	6086.57	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.67E-01	2.53E-01	0.00E+00	1.66E-01
CM-3/4	5795.02	5761.60	0.000	0.000	-0.135	0.135	0.3668	100.000	-3.28E-03	4.88E-02	1.05E-01	1.57E-02	4.87E-02
CM-5/6	5386.00	5379.20	4.963	4.000	3.865	0.135	0.3668	86.090	1.06E-01	1.22E-01	1.18E-01	1.76E-02	1.21E-01
CM-247	4946.00	4881.19	0.000	0.000	-0.538	0.538	0.7337	79.300	-1.60E-02	6.12E-02	1.66E-01	3.83E-02	6.10E-02
CM-248	5078.60	5056.58	0.000	0.000	-0.673	0.673	0.8202	91.000	-1.75E-02	5.38E-02	1.53E-01	3.73E-02	5.36E-02



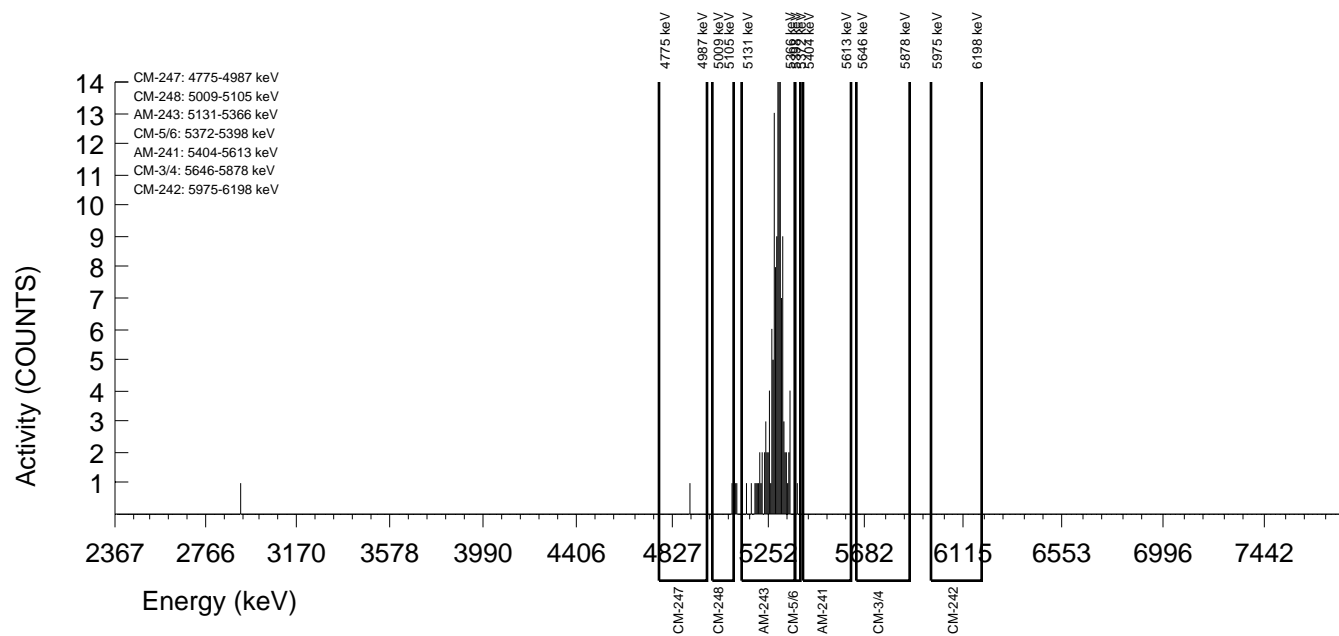
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235016_AM SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 67.6 +/-9.019 %	CHAMBER : 072 DETECTOR S/N : 67584 AVERAGE %EFFICIENCY : 31.7314 AVERAGE %EFF ERROR : 0.6121 COUNT DATE : 01-Oct-2016 13:23:22 ELAPSED LIVE TIME(SEC) : 8077.28	LIB FILE : AM BKG FILE : B072.CNF;1825 BKG DATE : 30-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W072.CNF;477 CAL DATE : 30-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 3.2094E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.48	0.000	0.000	-1.615	1.615	1.2710	98.525	-5.11E-02	6.91E-02	2.36E-01	7.04E-02	6.89E-02
AM-243	5269.50	5286.69	40.120	138.000	137.058	0.942	0.9707	99.980	4.27E+00	1.05E+00	1.99E-01	5.29E-02	7.20E-01
CM-242	6102.00	6086.57	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	2.20E-01	3.32E-01	0.00E+00	2.19E-01
CM-3/4	5795.02	5761.60	0.000	0.000	-0.404	0.404	0.6355	100.000	-1.30E-02	6.54E-02	1.68E-01	3.57E-02	6.52E-02
CM-5/6	5386.00	5380.68	4.963	1.000	1.000	0.000	0.0000	86.090	3.61E-02	1.01E-01	1.08E-01	0.00E+00	1.01E-01
CM-247	4946.00	4906.57	4.963	1.000	0.731	0.269	0.5189	79.300	2.87E-02	1.10E-01	1.89E-01	3.57E-02	1.10E-01
CM-248	5078.60	5092.38	4.963	1.000	0.865	0.135	0.3669	91.000	2.96E-02	9.58E-02	1.47E-01	2.20E-02	9.56E-02



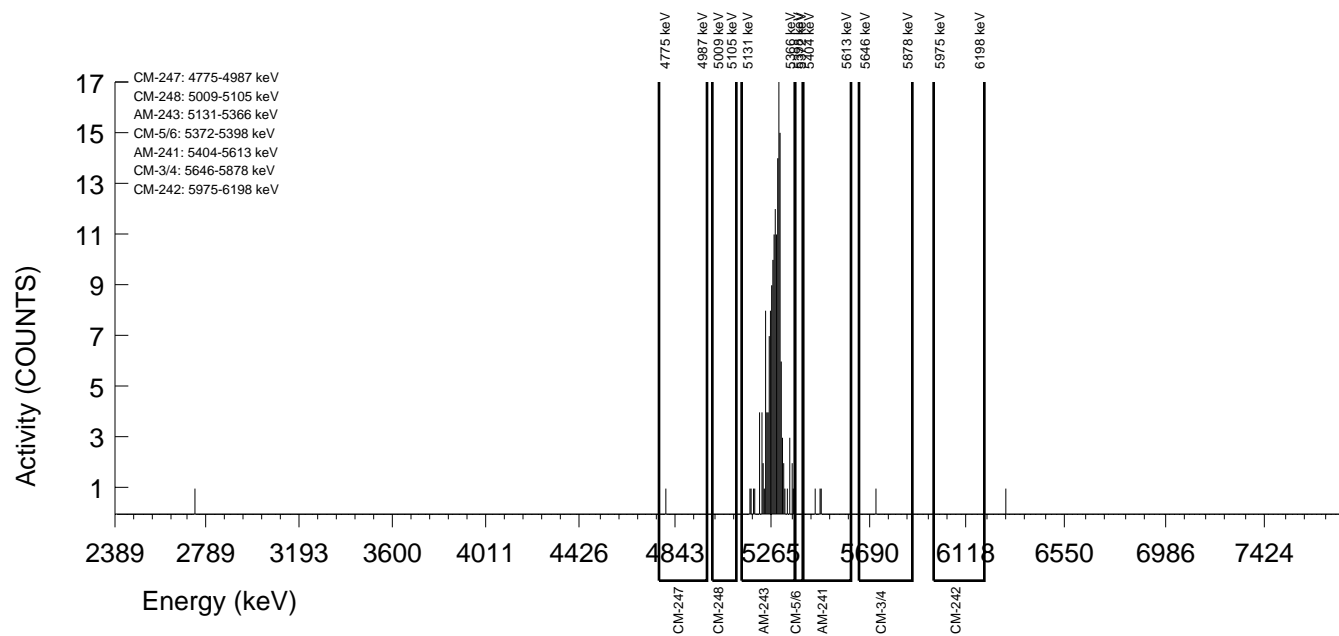
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235017_AM SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 57.4 +/-8.348 %	CHAMBER : 243 DETECTOR S/N : 87931 AVERAGE %EFFICIENCY : 24.8977 AVERAGE %EFF ERROR : 0.4829 COUNT DATE : 29-Sep-2016 21:52:14 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B243.CNF;455 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W243.CNF;118 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 2.7252E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5471.52	29.884	3.000	-2.520	5.520	2.3495	98.525	-6.71E-02	1.21E-01	3.09E-01	1.15E-01	1.21E-01
AM-243	5269.50	5276.40	40.952	164.000	162.800	1.200	1.0954	99.980	4.27E+00	9.75E-01	1.84E-01	5.26E-02	6.60E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.92E-01	2.85E-01	0.00E+00	1.92E-01
CM-3/4	5795.02	5721.73	4.981	1.000	0.520	0.480	0.6928	100.000	1.41E-02	7.83E-02	1.50E-01	3.43E-02	7.81E-02
CM-5/6	5386.00	5385.09	0.000	0.000	-0.480	0.480	0.6928	86.090	-1.46E-02	6.48E-02	1.69E-01	3.86E-02	6.46E-02
CM-247	4946.00	4801.50	4.981	1.000	-0.440	1.440	1.2000	79.300	-1.45E-02	1.01E-01	2.44E-01	7.26E-02	1.00E-01
CM-248	5078.60	5056.59	0.000	0.000	0.000	0.000	0.0000	91.000	0.00E+00	5.82E-02	8.64E-02	0.00E+00	5.80E-02



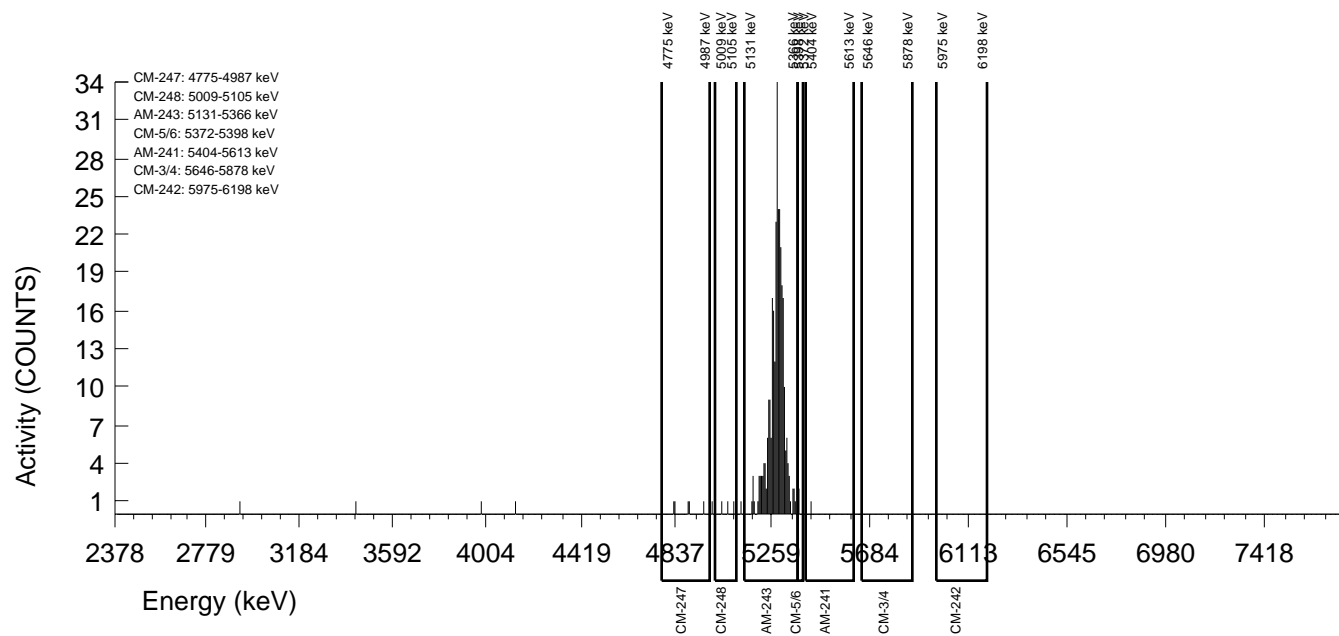
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235018_AM SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 110 +/-6.427 %	CHAMBER : 244 DETECTOR S/N : 87932 AVERAGE %EFFICIENCY : 23.7184 AVERAGE %EFF ERROR : 0.4607 COUNT DATE : 29-Sep-2016 21:52:17 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B244.CNF;455 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W244.CNF;112 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 5.2154E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5428.84	4.999	1.000	0.280	0.720	0.8485	98.525	4.10E-03	4.29E-02	8.94E-02	2.27E-02	4.28E-02
AM-243	5269.50	5277.59	32.718	298.000	296.800	1.200	1.0954	99.980	4.27E+00	7.45E-01	1.01E-01	2.89E-02	4.88E-01
CM-242	6102.00	6086.60	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.06E-01	1.57E-01	0.00E+00	1.05E-01
CM-3/4	5795.02	5761.63	0.000	0.000	-0.960	0.960	0.9798	100.000	-1.43E-02	3.31E-02	9.79E-02	2.67E-02	3.31E-02
CM-5/6	5386.00	5381.08	22.493	5.000	5.000	0.000	0.0000	86.090	8.36E-02	8.14E-02	5.02E-02	0.00E+00	8.07E-02
CM-247	4946.00	4880.55	129.962	5.000	3.800	1.200	1.0954	79.300	6.90E-02	9.01E-02	1.27E-01	3.64E-02	8.96E-02
CM-248	5078.60	5063.74	54.984	3.000	2.040	0.960	0.9798	91.000	3.23E-02	6.44E-02	1.04E-01	2.84E-02	6.42E-02



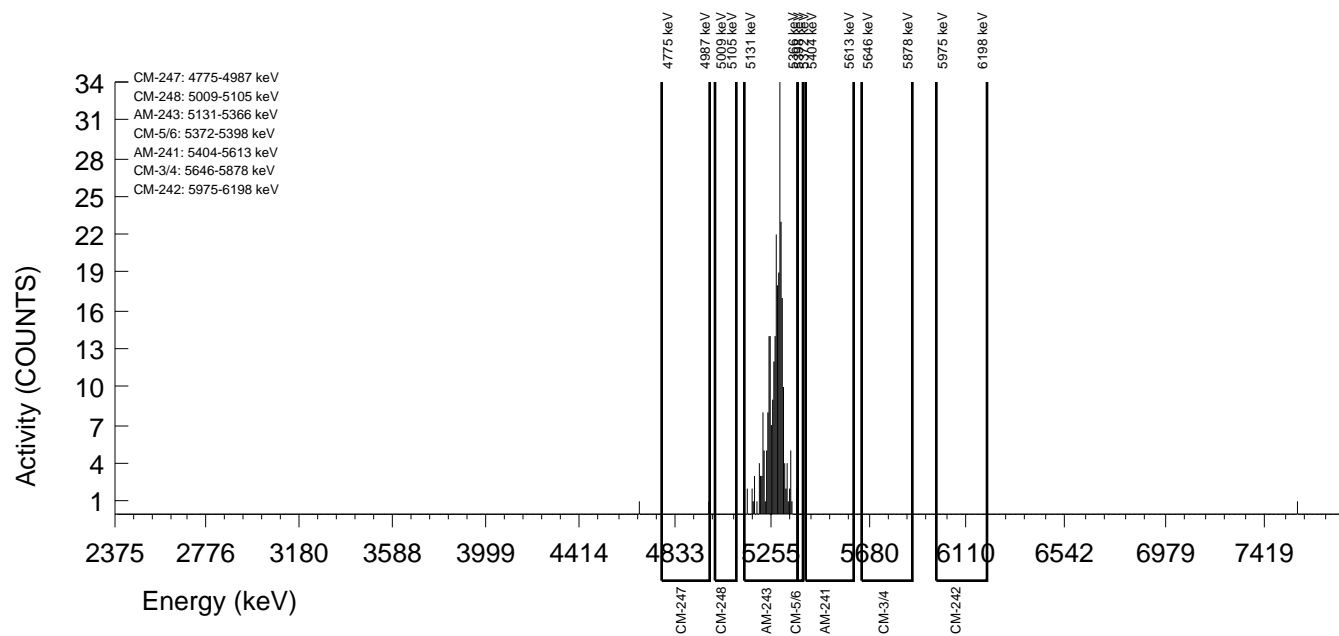
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235019_AM SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 96.6 +/-6.590 %	CHAMBER : 245 DETECTOR S/N : 87933 AVERAGE %EFFICIENCY : 25.3775 AVERAGE %EFF ERROR : 0.4920 COUNT DATE : 29-Sep-2016 21:52:20 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B245.CNF;457 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W245.CNF;118 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.5827E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.50	0.000	0.000	-0.960	0.960	0.9798	98.525	-1.48E-02	3.43E-02	1.01E-01	2.76E-02	3.42E-02
AM-243	5269.50	5272.42	28.048	280.000	279.040	0.960	0.9798	99.980	4.22E+00	7.56E-01	9.97E-02	2.72E-02	4.98E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.08E-01	1.61E-01	0.00E+00	1.08E-01
CM-3/4	5795.02	5761.62	0.000	0.000	-0.480	0.480	0.6928	100.000	-7.49E-03	3.32E-02	8.64E-02	1.98E-02	3.31E-02
CM-5/6	5386.00	5371.40	0.000	3.000	3.000	0.000	0.0000	86.090	5.27E-02	6.98E-02	5.27E-02	0.00E+00	6.94E-02
CM-247	4946.00	4979.93	4.986	1.000	0.760	0.240	0.4899	79.300	1.45E-02	5.45E-02	9.15E-02	1.71E-02	5.44E-02
CM-248	5078.60	5056.59	0.000	0.000	0.000	0.000	0.0000	91.000	0.00E+00	3.36E-02	4.99E-02	0.00E+00	3.35E-02



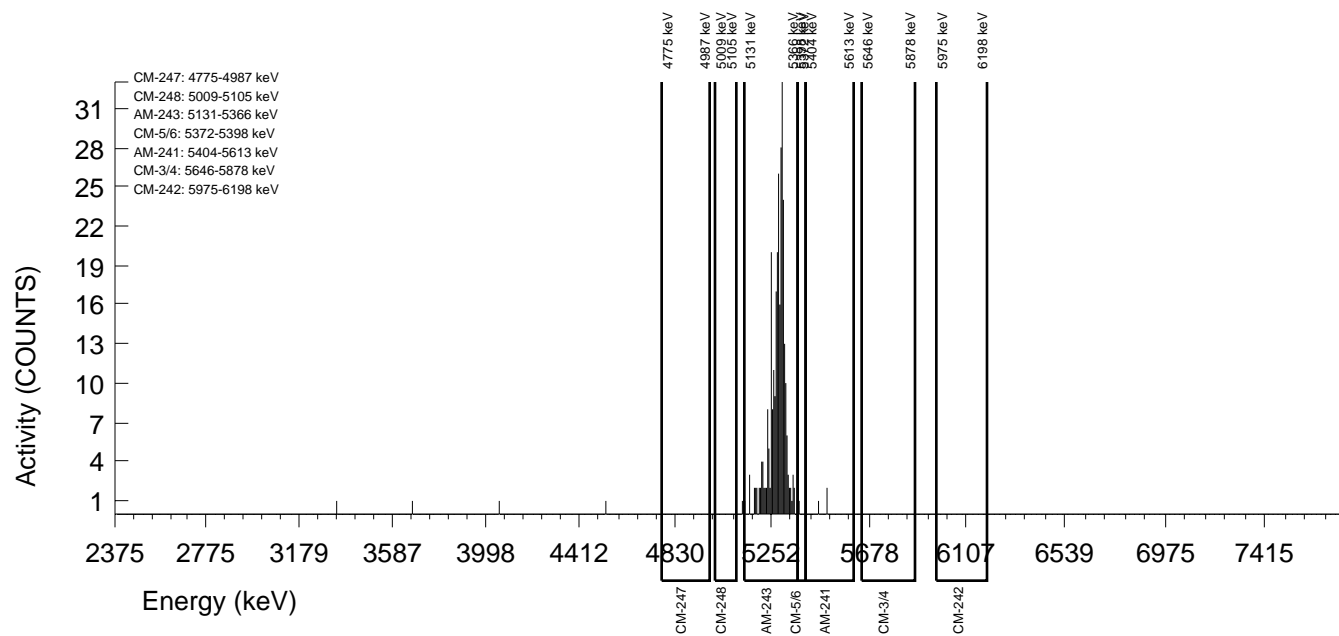
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S0405235020_AM SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 103 +/-6.430 %	CHAMBER : 246 DETECTOR S/N : 87949 AVERAGE %EFFICIENCY : 25.1972 AVERAGE %EFF ERROR : 0.4886 COUNT DATE : 29-Sep-2016 21:52:22 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B246.CNF;458 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W246.CNF;114 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.8967E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5483.90	4.979	3.000	2.280	0.720	0.8485	98.525	3.33E-02	5.91E-02	8.92E-02	2.27E-02	5.89E-02
AM-243	5269.50	5278.72	54.154	297.000	296.040	0.960	0.9798	99.980	4.26E+00	7.42E-01	9.48E-02	2.58E-02	4.87E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.03E-01	1.53E-01	0.00E+00	1.03E-01
CM-3/4	5795.02	5761.62	0.000	0.000	-0.480	0.480	0.6928	100.000	-7.12E-03	3.15E-02	8.21E-02	1.88E-02	3.15E-02
CM-5/6	5386.00	5374.08	0.000	1.000	1.000	0.000	0.0000	86.090	1.67E-02	4.70E-02	5.01E-02	0.00E+00	4.70E-02
CM-247	4946.00	4881.21	0.000	0.000	-0.480	0.480	0.6928	79.300	-8.70E-03	3.86E-02	1.00E-01	2.30E-02	3.85E-02
CM-248	5078.60	5056.59	0.000	0.000	0.000	0.000	0.0000	91.000	0.00E+00	3.19E-02	4.74E-02	0.00E+00	3.18E-02



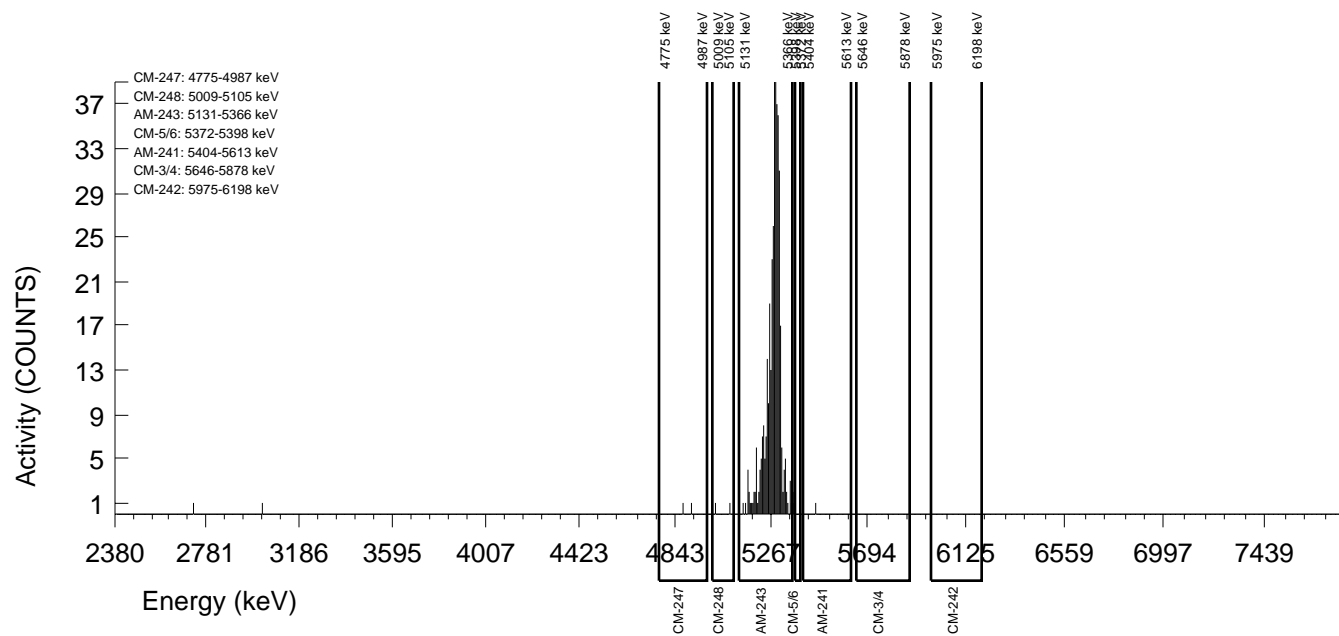
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S1203621694_AM SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 26-Sep-2016 00:00:00 ANALYST : JXH2 % YIELD : 113 +/-5.744 %	CHAMBER : 095 DETECTOR S/N : 38626 AVERAGE %EFFICIENCY : 30.4247 AVERAGE %EFF ERROR : 0.5873 COUNT DATE : 29-Sep-2016 21:26:43 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B095.CNF;1407 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W095.CNF;408 CAL DATE : 06-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7439E+00 dpm RESULTS : 5.3493E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5463.63	4.993	1.000	0.280	0.720	0.8485	98.525	3.05E-03	3.20E-02	6.66E-02	1.70E-02	3.19E-02
AM-243	5269.50	5277.02	35.808	391.000	390.520	0.480	0.6928	99.980	4.20E+00	6.50E-01	5.95E-02	1.36E-02	4.17E-01
CM-242	6102.00	6086.59	0.000	0.000	-0.240	0.240	0.4899	100.000	-2.62E-03	2.27E-02	5.24E-02	9.81E-03	2.26E-02
CM-3/4	5795.02	5761.62	0.000	0.000	-0.960	0.960	0.9798	100.000	-1.03E-02	2.40E-02	7.09E-02	1.93E-02	2.39E-02
CM-5/6	5386.00	5385.09	0.000	0.000	-0.240	0.240	0.4899	86.090	-3.00E-03	2.59E-02	5.99E-02	1.12E-02	2.58E-02
CM-247	4946.00	4898.38	39.946	2.000	1.280	0.720	0.8485	79.300	1.73E-02	4.78E-02	8.28E-02	2.11E-02	4.77E-02
CM-248	5078.60	5054.30	64.912	2.000	2.000	0.000	0.0000	91.000	2.36E-02	4.06E-02	3.54E-02	0.00E+00	4.05E-02



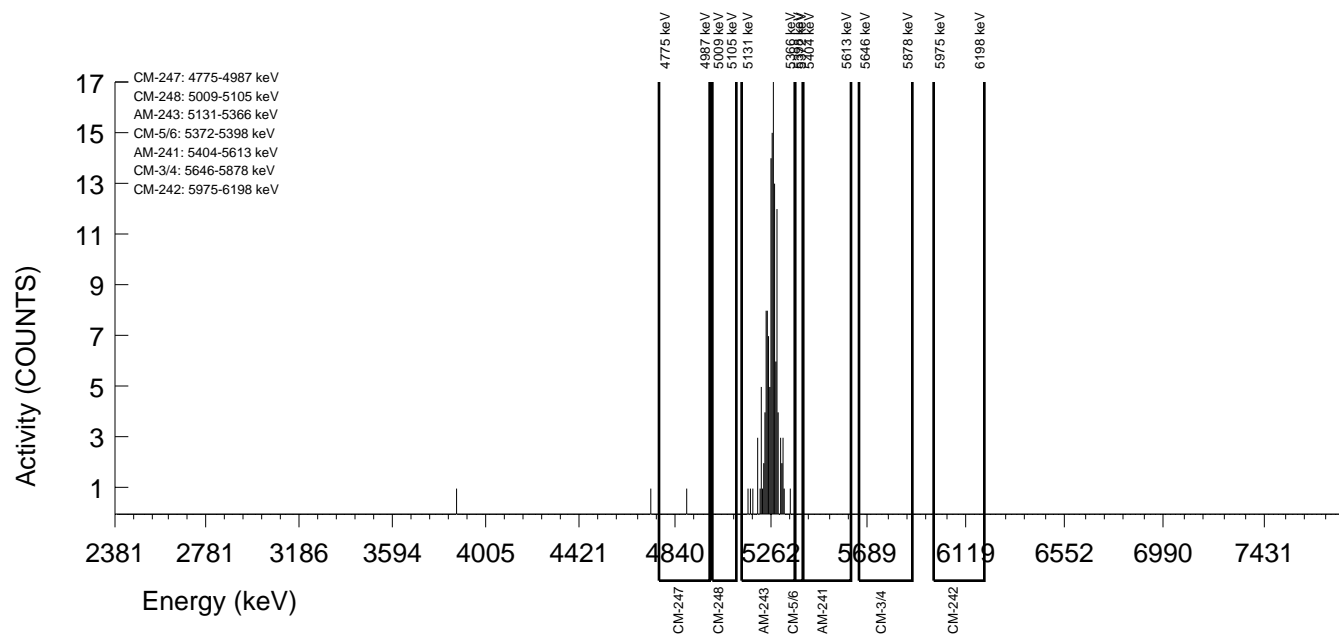
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S1203621695_AM SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 46.0 +/-9.010 %	CHAMBER : 247 DETECTOR S/N : 87935 AVERAGE %EFFICIENCY : 26.2005 AVERAGE %EFF ERROR : 0.5076 COUNT DATE : 29-Sep-2016 21:52:25 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B247.CNF;458 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W247.CNF;117 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 2.1838E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.50	0.000	0.000	-0.720	0.720	0.8485	98.525	-2.28E-02	6.90E-02	1.93E-01	4.92E-02	6.88E-02
AM-243	5269.50	5264.19	30.147	138.000	137.280	0.720	0.8485	99.980	4.27E+00	1.06E+00	1.90E-01	4.84E-02	7.20E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	2.21E-01	3.28E-01	0.00E+00	2.20E-01
CM-3/4	5795.02	5761.62	0.000	0.000	-0.240	0.240	0.4899	100.000	-7.70E-03	6.67E-02	1.54E-01	2.88E-02	6.64E-02
CM-5/6	5386.00	5385.09	0.000	0.000	0.000	0.000	0.0000	86.090	0.00E+00	7.32E-02	1.08E-01	0.00E+00	7.29E-02
CM-247	4946.00	4892.29	4.984	1.000	0.280	0.720	0.8485	79.300	1.10E-02	1.15E-01	2.40E-01	6.10E-02	1.15E-01
CM-248	5078.60	5056.59	0.000	0.000	-0.480	0.480	0.6928	91.000	-1.64E-02	7.29E-02	1.89E-01	4.34E-02	7.26E-02



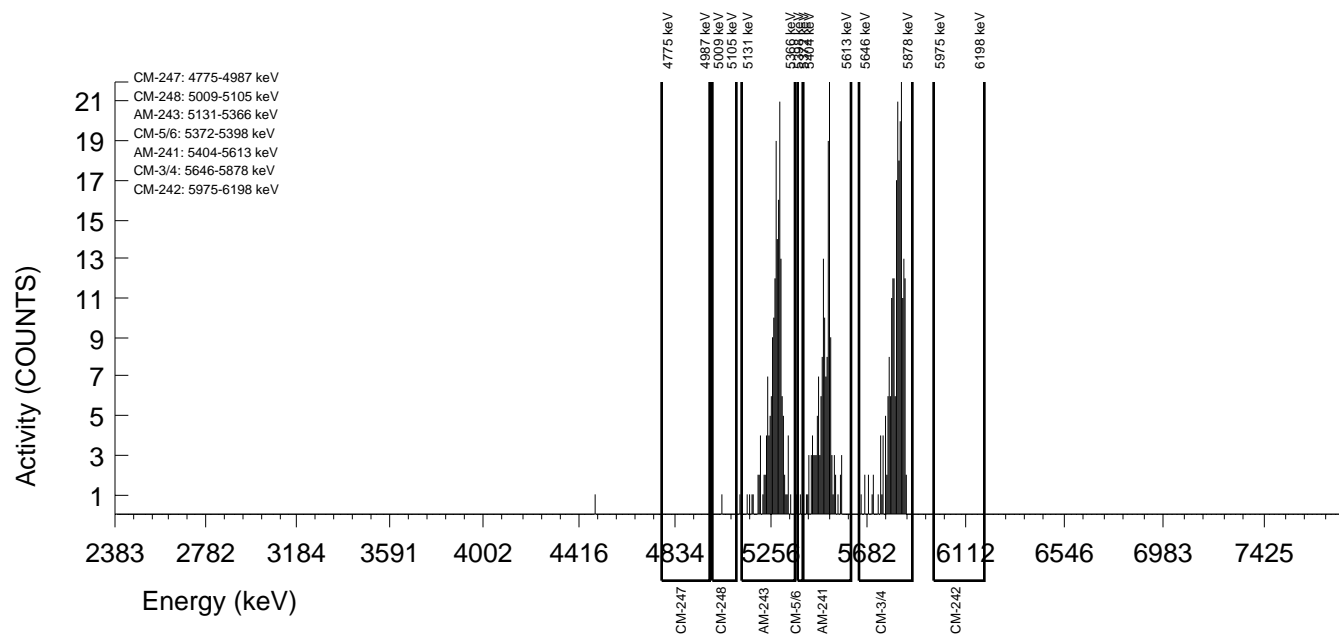
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596390 SAMPLE ID : S1203621696_AM SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 26-Sep-2016 00:00:00 ANALYST : JXH2 % YIELD : 59.2 +/-8.074 %	CHAMBER : 248 DETECTOR S/N : 87936 AVERAGE %EFFICIENCY : 26.0532 AVERAGE %EFF ERROR : 0.5047 COUNT DATE : 29-Sep-2016 21:52:28 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B248.CNF;455 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W248.CNF;117 CAL DATE : 19-Sep-2016												
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7439E+00 dpm RESULTS : 2.8083E+00 dpm	LCS <table border="1"> <tr> <td>ID</td> <td>0533-CC</td> <td>1216-G</td> </tr> <tr> <td>NUCLIDE</td> <td>AM-241</td> <td>CM-3/4</td> </tr> <tr> <td>NOMINAL (pCi/G)</td> <td>3.8691E+00</td> <td>5.1126E+00</td> </tr> <tr> <td>% RECOVERY</td> <td>94.153</td> <td>103.746</td> </tr> </table>		ID	0533-CC	1216-G	NUCLIDE	AM-241	CM-3/4	NOMINAL (pCi/G)	3.8691E+00	5.1126E+00	% RECOVERY	94.153	103.746
ID	0533-CC	1216-G												
NUCLIDE	AM-241	CM-3/4												
NOMINAL (pCi/G)	3.8691E+00	5.1126E+00												
% RECOVERY	94.153	103.746												

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5496.32	30.998	153.000	150.120	2.880	1.6971	98.525	3.64E+00	8.38E-01	2.24E-01	7.54E-02	5.92E-01
AM-243	5269.50	5278.36	30.308	177.000	175.560	1.440	1.2000	99.980	4.20E+00	9.27E-01	1.77E-01	5.26E-02	6.26E-01
CM-242	6102.00	6086.58	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	4.92E-02	7.30E-02	0.00E+00	4.90E-02
CM-3/4	5795.02	5807.03	55.086	222.000	221.760	0.240	0.4899	100.000	5.30E+00	1.11E+00	1.15E-01	2.15E-02	7.00E-01
CM-5/6	5386.00	5387.36	0.000	3.000	2.760	0.240	0.4899	86.090	7.66E-02	1.11E-01	1.33E-01	2.49E-02	1.10E-01
CM-247	4946.00	4881.20	0.000	0.000	-0.960	0.960	0.9798	79.300	-2.89E-02	6.72E-02	1.99E-01	5.41E-02	6.71E-02
CM-248	5078.60	5044.90	4.963	1.000	0.280	0.720	0.8485	91.000	7.36E-03	7.70E-02	1.60E-01	4.08E-02	7.69E-02



23-Sep-2016

Batch# 1599981 Product: Am/Cm Date: 9/25/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			No
Samples have been blank corrected (if required). Blank correction reported included (if required).			No
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.			
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		Case narrative
Sample was run within hold time.		✓	DER# 1561180
Sample was correctly preserved if required.			No
Smears Taken for Radioactive batches.			No
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			No
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			No
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER# 1561180
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER# 1561180
Aliquot Correction completed if required.			No
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: M. Lane Dey 9/25/16

Secondary Review Performed By: Joni Davis 10/02/16

10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 25-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Am-05-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1599981	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, and 1203630764 were received and analyzed out of holding.</p>		<p>1. Reporting results.</p>	

Originator's Name:

Melanie Aycock 25-SEP-16

Data Validator/Group Leader:

Jessica Davis 02-OCT-16

Am/Cm Queue Sheet

19-SEP-16

Batch #: 1599981 Analyst: KXB2 First Client Due Date: 04-OCT-16 Internal Due Date: 01-OCT-16 Comments: Analyzed Sequentially with U: Pu:
 Tracer(s): (Am243/Cm244) Tracer Code: 1752-C Expiration Date: 5-24-17 Vol: 0.1
 LCS Isotope(s): (Am241/Cm244) LCS Code(s): 0533-CC / 12U-G Expiration Date: 4-21-17 / 9-30-16 Vol(s): 0.1 / 0.1
 Spike Isotope(s): Am241/Cm244 Spike Code(s): Expiration Date: Vol(s):
 Prep Date: 9-21-16 Initials: KB Pipet ID: 1840022 Balance ID: 16107602 Witness: DKA 9/21/16

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/1/f)	Am/Cm Det #
405235061-2	5.1.B.R.2.2	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	1	1	0.111	240
405235062-2	5.2.A.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	2	2	0.110	241
405235063-2	5.2.A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	3	3	0.119	242
405235064-2	5.2.A.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	4	4	0.105	243
405235065-2	5.2.A.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	5	5	0.112	244
405235066-2	5.2.A.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	6	6	0.122	245
405235067-2	5.2.A.R.6.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	7	7	0.106	246
405235068-2	5.2.A.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	8	8	0.104	247
405235069-2	5.2.B.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	16-DEC-15	9	9	0.104	248
405235070-2	5.2.B.R.3.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	10	10	0.113	249
405235071-2	5.2.B.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	11	11	0.120	250
405235072-2	5.2.B.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	15-DEC-15	12	12	0.101	251
405235073-2	5.2.B.R.8.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	13	13	0.108	252
405235074-2	5.3.A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	15-DEC-15	14	14	0.115	253
405235075-2	5.4.A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	16-DEC-15	15	15	0.112	254
405235076-2	5.4.A.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	16	16	0.106	255
405235077-2	5.5.A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	17-DEC-15	17	17	0.103	256
405235078-2	5.6.A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	17-DEC-15	18	18	0.107	257
1203630763-1	MB for batch 1599981	MB		UCF pCi/g to pCi/SOIL	QC ACCOUNT	QC ACCOUNT	14-DEC-15	19	19	0.122	80
1203630764-2	5.1.B.R.2.2(405235061DUP)	DUP		1 pCi/g	SOIL	QC ACCOUNT	14-DEC-15	20	20	0.105	81
1203630765-1	LCS for batch 1599981	LCS		UCF pCi/g to pCi/SOIL	QC ACCOUNT	QC ACCOUNT	14-DEC-15	21	21	0.122	82

Choose SOP Used: GL-RAD-A-011
 GL-RAD-A-036
 GEL Laboratories LLC, Radiochemistry Division
 Solid Sample Dissolution by LEACH or DIGESTION
 Circle One
 Data Reviewed By: W. W. D. 9/25/16
 Page 1 of 1

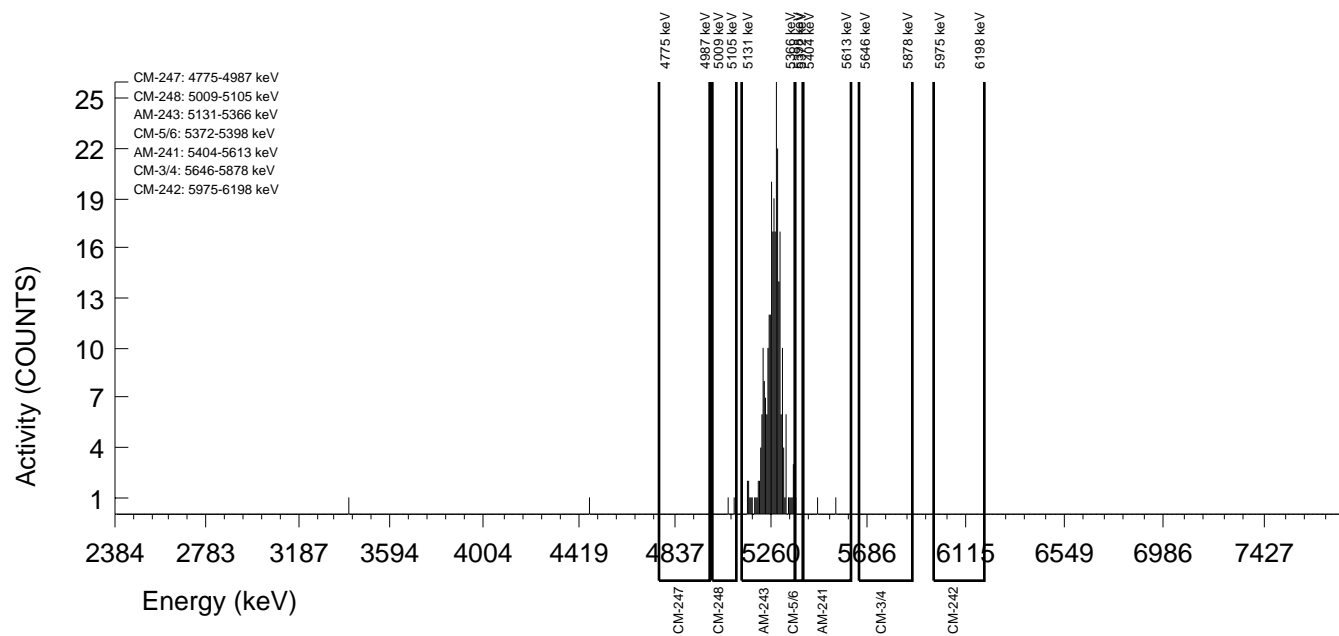
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S0405235061_AM SAMPLE QTY : 0.111 G +/-0.901 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 94.9 +/-6.609 %	CHAMBER : 240 DETECTOR S/N : 87928 AVERAGE %EFFICIENCY : 25.5516 AVERAGE %EFF ERROR : 0.4953 COUNT DATE : 22-Sep-2016 17:53:41 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B240.CNF;453 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W240.CNF;117 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.5019E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5506.72	79.495	2.000	2.000	0.000	0.0000	98.525	1.42E-01	2.44E-01	2.13E-01	0.00E+00	2.43E-01
AM-243	5269.50	5272.21	40.933	276.000	276.000	0.000	0.0000	99.980	1.93E+01	3.47E+00	2.09E-01	0.00E+00	2.28E+00
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	4.71E-01	7.00E-01	0.00E+00	4.70E-01
CM-3/4	5795.02	5761.62	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.45E-01	2.16E-01	0.00E+00	1.45E-01
CM-5/6	5386.00	5371.03	0.000	1.000	1.000	0.000	0.0000	86.090	8.10E-02	2.28E-01	2.43E-01	0.00E+00	2.28E-01
CM-247	4946.00	4881.20	0.000	0.000	-0.480	0.480	0.6928	79.300	-4.22E-02	1.87E-01	4.87E-01	1.12E-01	1.87E-01
CM-248	5078.60	5087.60	29.811	2.000	2.000	0.000	0.0000	91.000	1.53E-01	2.63E-01	2.30E-01	0.00E+00	2.63E-01



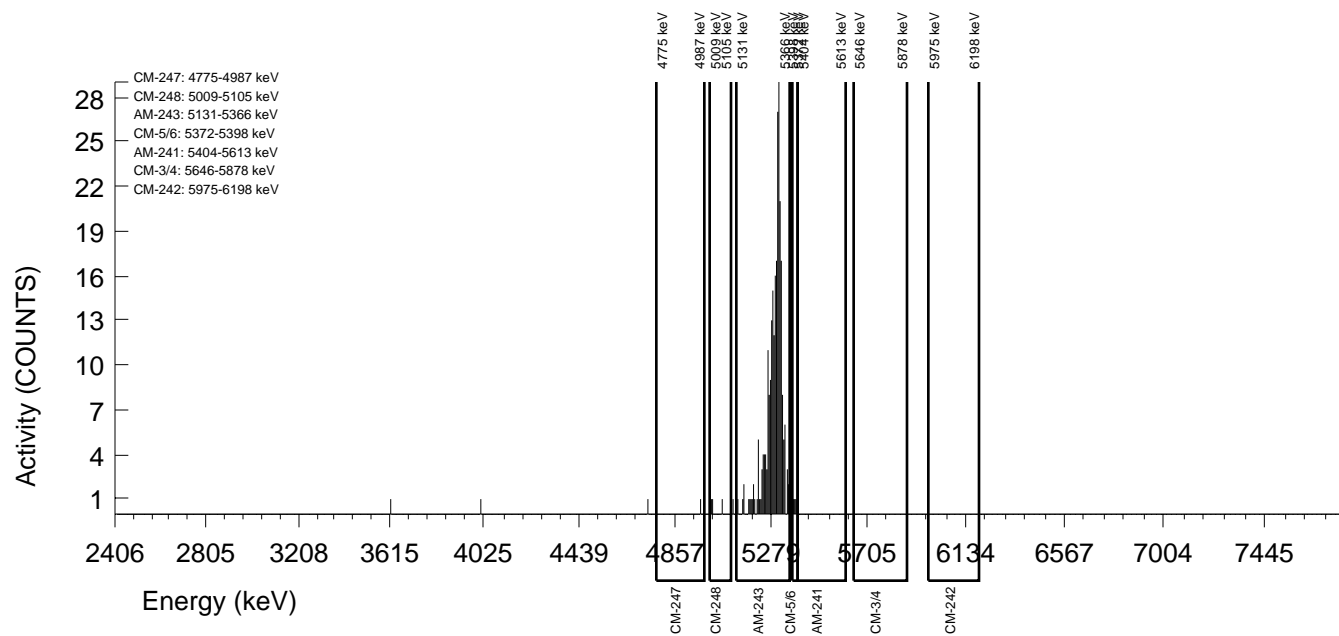
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S0405235062_AM SAMPLE QTY : 0.110 G +/-0.909 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 86.8 +/-6.834 %	CHAMBER : 241 DETECTOR S/N : 87963 AVERAGE %EFFICIENCY : 25.9137 AVERAGE %EFF ERROR : 0.5022 COUNT DATE : 22-Sep-2016 17:53:42 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B241.CNF;453 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W241.CNF;131 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.1180E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.49	0.000	0.000	-0.480	0.480	0.6928	98.525	-3.70E-02	1.64E-01	4.27E-01	9.78E-02	1.64E-01
AM-243	5269.50	5295.98	37.371	257.000	256.040	0.960	0.9798	99.980	1.94E+01	3.63E+00	5.00E-01	1.36E-01	2.39E+00
CM-242	6102.00	6086.59	0.000	0.000	-0.240	0.240	0.4899	100.000	-6.09E-02	5.26E-01	1.22E+00	2.28E-01	5.25E-01
CM-3/4	5795.02	5761.62	0.000	0.000	-0.480	0.480	0.6928	100.000	-3.75E-02	1.66E-01	4.33E-01	9.92E-02	1.66E-01
CM-5/6	5386.00	5383.56	7.447	6.000	6.000	0.000	0.0000	86.090	5.29E-01	4.65E-01	2.64E-01	0.00E+00	4.59E-01
CM-247	4946.00	4973.08	4.964	1.000	0.760	0.240	0.4899	79.300	7.27E-02	2.73E-01	4.59E-01	8.58E-02	2.73E-01
CM-248	5078.60	5038.02	49.645	3.000	2.760	0.240	0.4899	91.000	2.30E-01	3.33E-01	4.00E-01	7.48E-02	3.31E-01



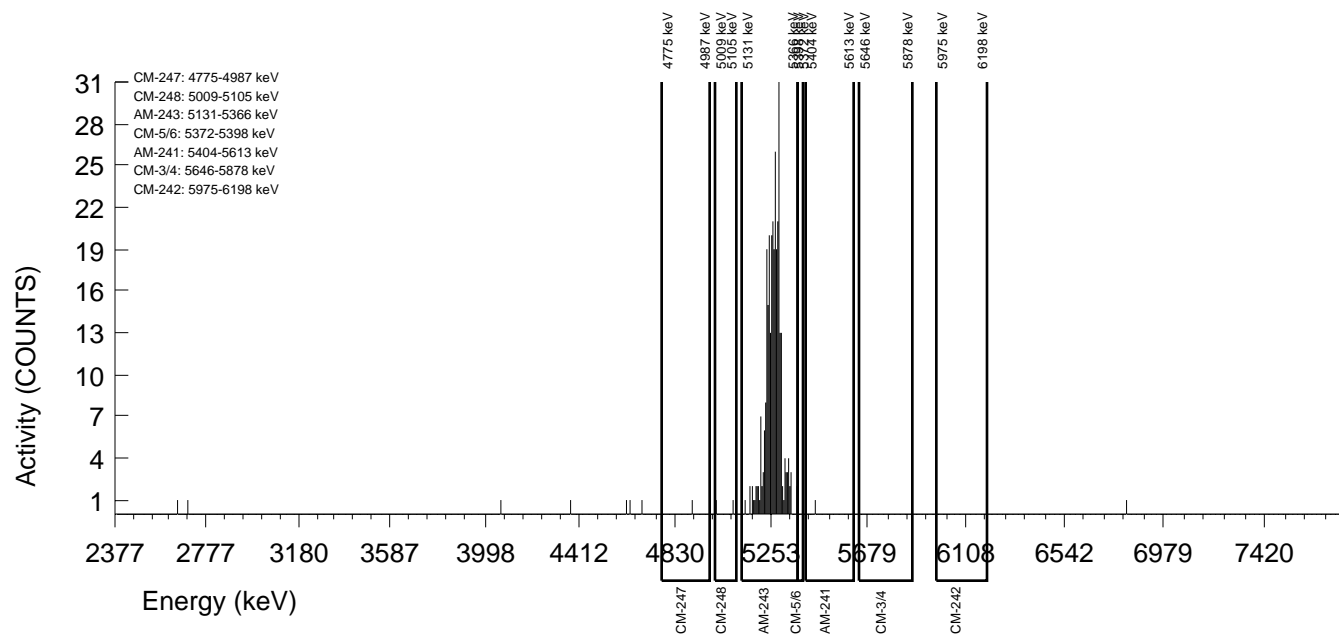
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S0405235063_AM SAMPLE QTY : 0.119 G +/-0.840 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 104 +/-6.282 %	CHAMBER : 242 DETECTOR S/N : 87930 AVERAGE %EFFICIENCY : 26.4545 AVERAGE %EFF ERROR : 0.5124 COUNT DATE : 22-Sep-2016 17:53:46 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B242.CNF;453 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W242.CNF;128 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.9154E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5449.14	4.968	1.000	1.000	0.000	0.0000	98.525	5.85E-02	1.65E-01	1.75E-01	0.00E+00	1.64E-01
AM-243	5269.50	5265.21	55.538	312.000	312.000	0.000	0.0000	99.980	1.80E+01	3.07E+00	1.73E-01	0.00E+00	2.00E+00
CM-242	6102.00	6086.59	0.000	0.000	-0.240	0.240	0.4899	100.000	-4.62E-02	3.99E-01	9.23E-01	1.73E-01	3.98E-01
CM-3/4	5795.02	5761.62	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.20E-01	1.78E-01	0.00E+00	1.19E-01
CM-5/6	5386.00	5369.37	0.000	2.000	2.000	0.000	0.0000	86.090	1.34E-01	2.30E-01	2.01E-01	0.00E+00	2.29E-01
CM-247	4946.00	4909.34	4.968	1.000	1.000	0.000	0.0000	79.300	7.26E-02	2.04E-01	2.18E-01	0.00E+00	2.04E-01
CM-248	5078.60	5051.63	74.519	2.000	2.000	0.000	0.0000	91.000	1.26E-01	2.17E-01	1.90E-01	0.00E+00	2.17E-01



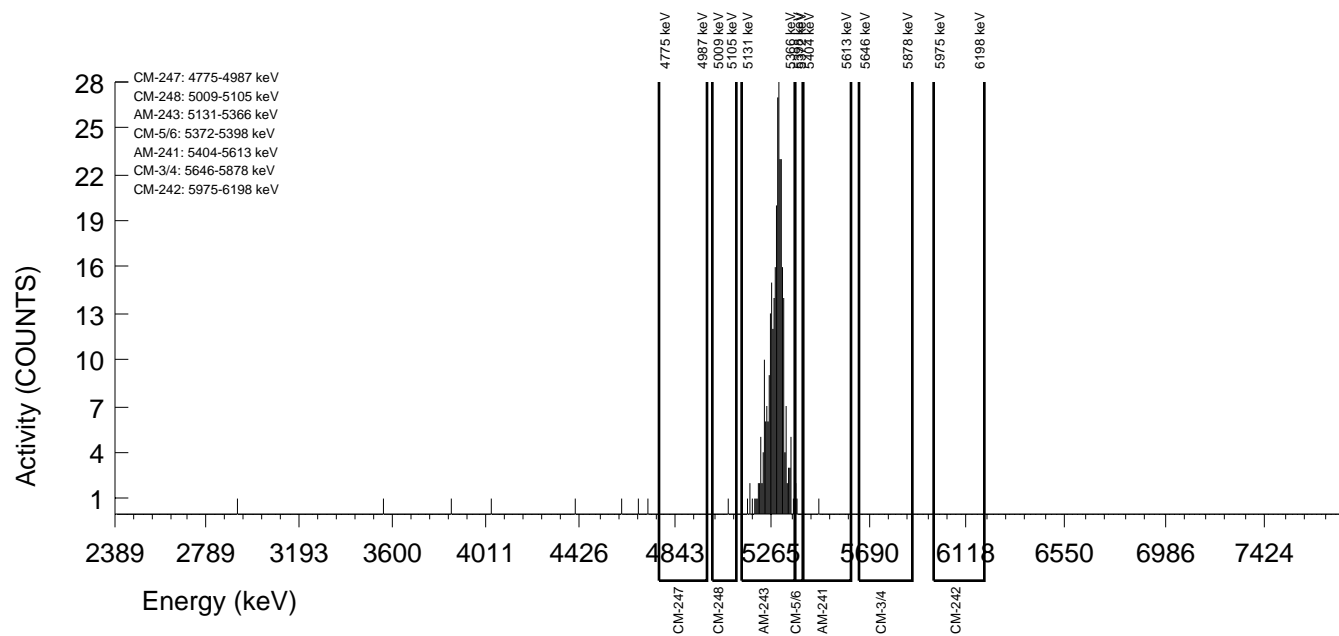
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S0405235064_AM SAMPLE QTY : 0.105 G +/-0.952 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 107 +/-6.369 %	CHAMBER : 243 DETECTOR S/N : 87931 AVERAGE %EFFICIENCY : 24.8977 AVERAGE %EFF ERROR : 0.4829 COUNT DATE : 22-Sep-2016 17:53:48 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B243.CNF;453 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W243.CNF;118 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 5.0902E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5471.52	4.981	1.000	0.040	0.960	0.9798	98.525	2.72E-03	2.02E-01	4.48E-01	1.22E-01	2.02E-01
AM-243	5269.50	5282.63	52.297	306.000	304.080	1.920	1.3856	99.980	2.04E+01	3.53E+00	5.41E-01	1.70E-01	2.30E+00
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	4.52E-01	6.71E-01	0.00E+00	4.51E-01
CM-3/4	5795.02	5761.63	0.000	0.000	-1.200	1.200	1.0954	100.000	-8.27E-02	1.57E-01	4.83E-01	1.38E-01	1.57E-01
CM-5/6	5386.00	5372.48	0.000	3.000	3.000	0.000	0.0000	86.090	2.33E-01	3.08E-01	2.33E-01	0.00E+00	3.07E-01
CM-247	4946.00	4980.01	4.981	1.000	0.520	0.480	0.6928	79.300	4.39E-02	2.44E-01	4.67E-01	1.07E-01	2.44E-01
CM-248	5078.60	5074.77	4.981	1.000	0.760	0.240	0.4899	91.000	5.59E-02	2.10E-01	3.53E-01	6.60E-02	2.10E-01



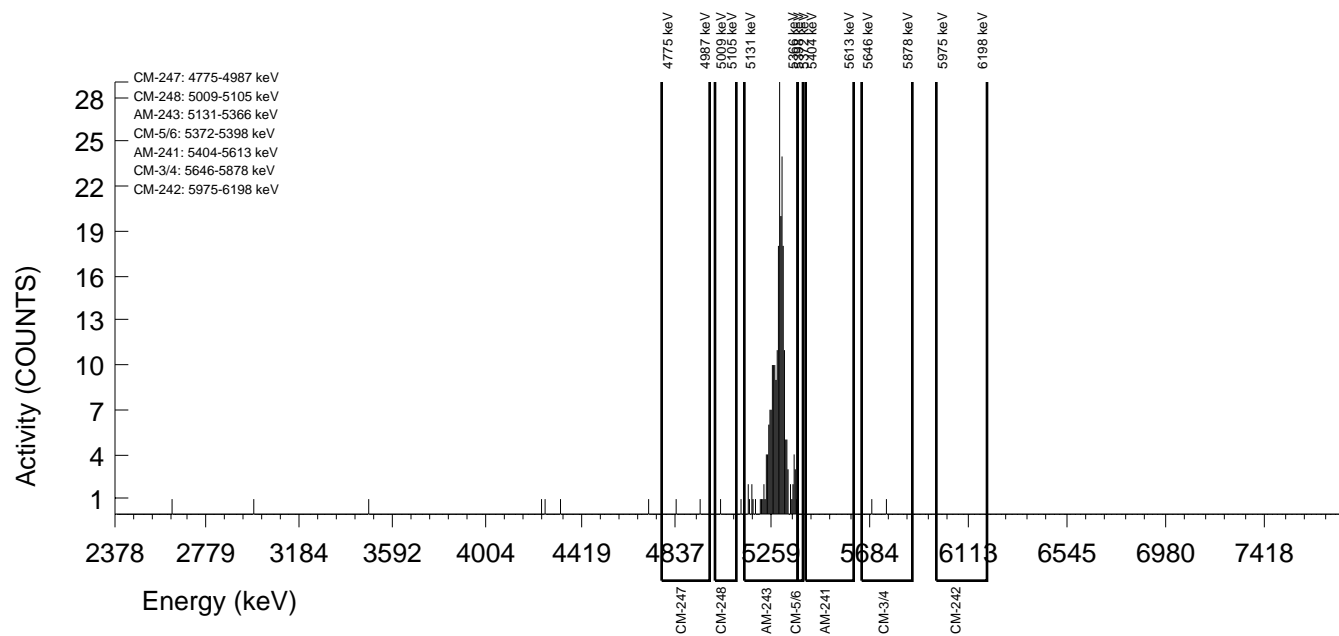
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S0405235065_AM SAMPLE QTY : 0.112 G +/-0.893 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 87.5 +/-7.070 %	CHAMBER : 244 DETECTOR S/N : 87932 AVERAGE %EFFICIENCY : 23.7184 AVERAGE %EFF ERROR : 0.4607 COUNT DATE : 22-Sep-2016 17:53:51 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B244.CNF;453 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W244.CNF;112 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.1519E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.51	0.000	0.000	-1.200	1.200	1.0954	98.525	-9.85E-02	1.87E-01	5.75E-01	1.65E-01	1.87E-01
AM-243	5269.50	5283.93	24.993	237.000	236.280	0.720	0.8485	99.980	1.91E+01	3.69E+00	4.93E-01	1.26E-01	2.44E+00
CM-242	6102.00	6086.60	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	5.46E-01	8.10E-01	0.00E+00	5.44E-01
CM-3/4	5795.02	5726.99	64.981	2.000	2.000	0.000	0.0000	100.000	1.66E-01	2.86E-01	2.50E-01	0.00E+00	2.85E-01
CM-5/6	5386.00	5370.47	0.000	2.000	2.000	0.000	0.0000	86.090	1.88E-01	3.23E-01	2.81E-01	0.00E+00	3.21E-01
CM-247	4946.00	4890.01	104.969	2.000	-0.160	2.160	1.4697	79.300	-1.63E-02	3.78E-01	8.54E-01	2.74E-01	3.77E-01
CM-248	5078.60	5032.11	4.999	1.000	-0.200	1.200	1.0954	91.000	-1.77E-02	2.67E-01	6.22E-01	1.78E-01	2.66E-01



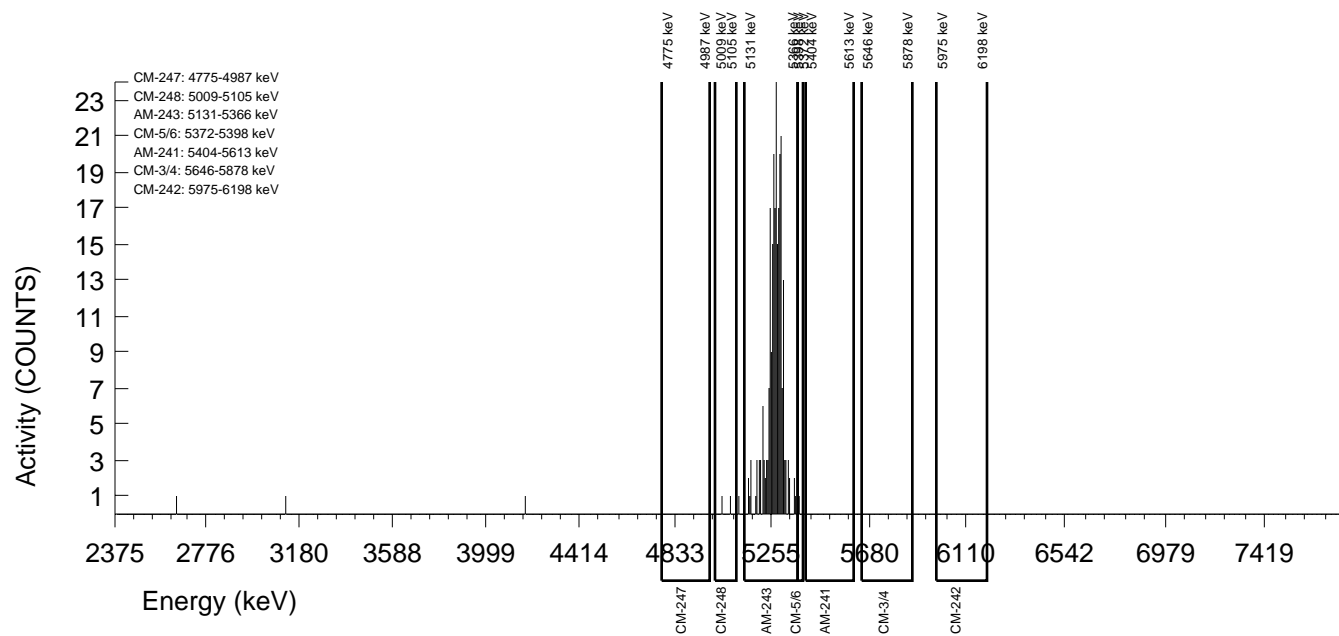
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S0405235066_AM SAMPLE QTY : 0.122 G +/-0.820 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 86.0 +/-6.915 %	CHAMBER : 245 DETECTOR S/N : 87933 AVERAGE %EFFICIENCY : 25.3775 AVERAGE %EFF ERROR : 0.4920 COUNT DATE : 22-Sep-2016 17:55:36 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B245.CNF;455 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W245.CNF;118 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.0815E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.50	0.000	0.000	0.000	0.000	0.0000	98.525	0.00E+00	1.45E-01	2.15E-01	0.00E+00	1.44E-01
AM-243	5269.50	5270.53	57.840	249.000	248.520	0.480	0.6928	99.980	1.75E+01	3.31E+00	3.90E-01	8.95E-02	2.19E+00
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	4.76E-01	7.07E-01	0.00E+00	4.75E-01
CM-3/4	5795.02	5761.62	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.47E-01	2.18E-01	0.00E+00	1.46E-01
CM-5/6	5386.00	5376.71	4.986	1.000	1.000	0.000	0.0000	86.090	8.19E-02	2.30E-01	2.46E-01	0.00E+00	2.30E-01
CM-247	4946.00	4881.21	0.000	0.000	-0.240	0.240	0.4899	79.300	-2.13E-02	1.84E-01	4.26E-01	7.97E-02	1.84E-01
CM-248	5078.60	5056.40	39.890	2.000	1.760	0.240	0.4899	91.000	1.36E-01	2.69E-01	3.71E-01	6.95E-02	2.68E-01



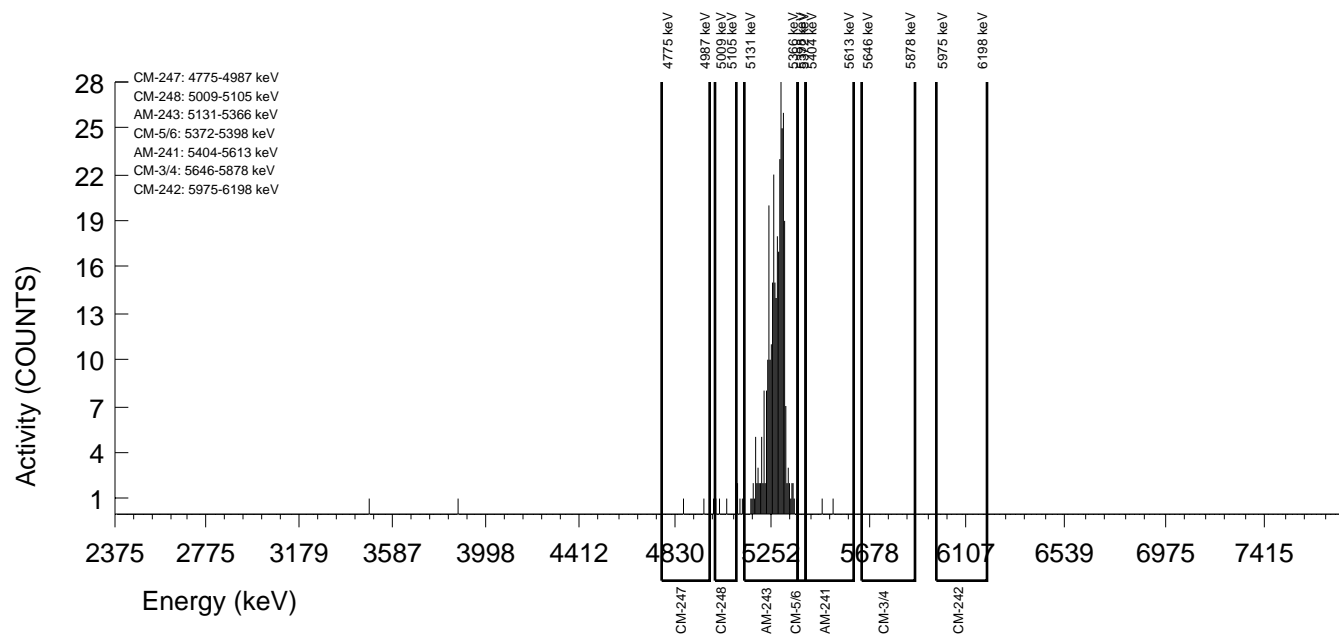
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S0405235067_AM SAMPLE QTY : 0.106 G +/-0.943 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 118 +/-6.085 %	CHAMBER : 246 DETECTOR S/N : 87949 AVERAGE %EFFICIENCY : 25.1972 AVERAGE %EFF ERROR : 0.4886 COUNT DATE : 22-Sep-2016 17:55:38 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B246.CNF;456 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W246.CNF;114 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 5.5868E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5498.98	49.791	2.000	1.280	0.720	0.8485	98.525	7.76E-02	2.14E-01	3.70E-01	9.43E-02	2.14E-01
AM-243	5269.50	5272.17	69.791	338.000	337.760	0.240	0.4899	99.980	2.02E+01	3.34E+00	2.86E-01	5.36E-02	2.15E+00
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	4.08E-01	6.06E-01	0.00E+00	4.07E-01
CM-3/4	5795.02	5761.62	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.24E-01	1.84E-01	0.00E+00	1.24E-01
CM-5/6	5386.00	5385.09	0.000	0.000	0.000	0.000	0.0000	86.090	0.00E+00	1.40E-01	2.08E-01	0.00E+00	1.40E-01
CM-247	4946.00	4911.78	89.624	2.000	2.000	0.000	0.0000	79.300	1.50E-01	2.59E-01	2.26E-01	0.00E+00	2.58E-01
CM-248	5078.60	5066.28	0.000	6.000	6.000	0.000	0.0000	91.000	3.93E-01	3.45E-01	1.97E-01	0.00E+00	3.41E-01



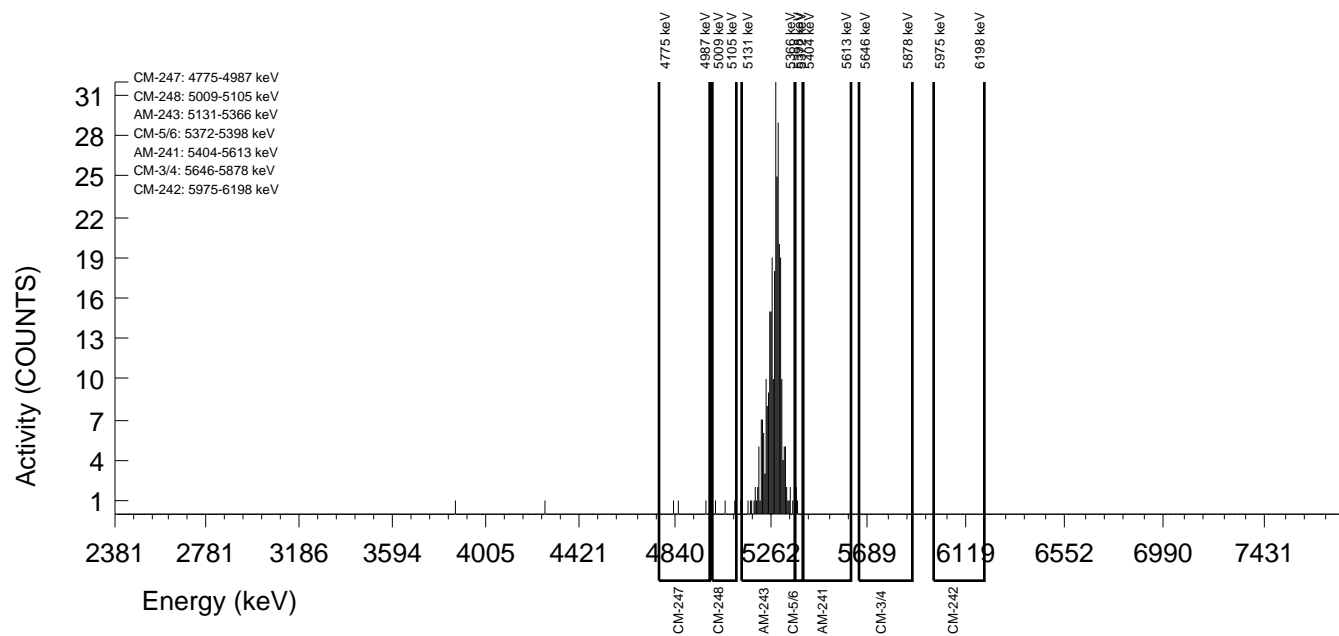
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S0405235068_AM SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 100 +/-6.402 %	CHAMBER : 247 DETECTOR S/N : 87935 AVERAGE %EFFICIENCY : 26.2005 AVERAGE %EFF ERROR : 0.5076 COUNT DATE : 22-Sep-2016 17:55:39 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B247.CNF;456 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W247.CNF;117 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.7569E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.50	0.000	0.000	-1.200	1.200	1.0954	98.525	-8.38E-02	1.59E-01	4.90E-01	1.40E-01	1.59E-01
AM-243	5269.50	5275.06	40.288	300.000	299.040	0.960	0.9798	99.980	2.05E+01	3.59E+00	4.53E-01	1.23E-01	2.34E+00
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	4.70E-01	6.98E-01	0.00E+00	4.69E-01
CM-3/4	5795.02	5761.62	0.000	0.000	-0.480	0.480	0.6928	100.000	-3.40E-02	1.51E-01	3.92E-01	8.98E-02	1.50E-01
CM-5/6	5386.00	5375.68	0.000	3.000	3.000	0.000	0.0000	86.090	2.39E-01	3.17E-01	2.39E-01	0.00E+00	3.15E-01
CM-247	4946.00	4888.78	139.555	3.000	2.280	0.720	0.8485	79.300	1.98E-01	3.50E-01	5.29E-01	1.35E-01	3.49E-01
CM-248	5078.60	5061.11	0.000	3.000	2.520	0.480	0.6928	91.000	1.90E-01	3.03E-01	4.18E-01	9.58E-02	3.02E-01



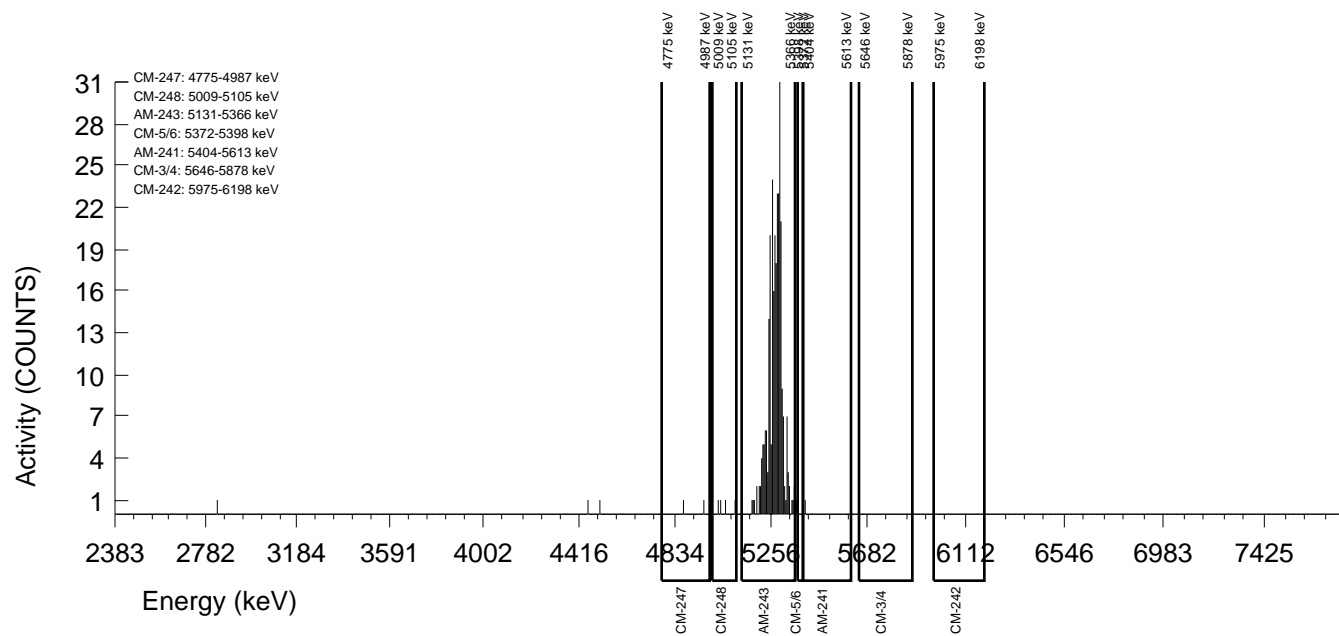
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S0405235069_AM SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 98.1 +/-6.480 %	CHAMBER : 248 DETECTOR S/N : 87936 AVERAGE %EFFICIENCY : 26.0532 AVERAGE %EFF ERROR : 0.5047 COUNT DATE : 22-Sep-2016 17:55:43 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B248.CNF;453 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W248.CNF;117 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.6520E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5410.40	4.963	1.000	0.520	0.480	0.6928	98.525	3.73E-02	2.08E-01	3.98E-01	9.11E-02	2.07E-01
AM-243	5269.50	5279.31	50.661	292.000	290.800	1.200	1.0954	99.980	2.05E+01	3.63E+00	4.96E-01	1.42E-01	2.37E+00
CM-242	6102.00	6086.58	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	4.73E-01	7.03E-01	0.00E+00	4.72E-01
CM-3/4	5795.02	5761.61	0.000	0.000	-1.200	1.200	1.0954	100.000	-8.73E-02	1.66E-01	5.10E-01	1.46E-01	1.65E-01
CM-5/6	5386.00	5373.19	0.000	1.000	1.000	0.000	0.0000	86.090	8.21E-02	2.31E-01	2.46E-01	0.00E+00	2.31E-01
CM-247	4946.00	4921.07	89.329	2.000	1.520	0.480	0.6928	79.300	1.35E-01	3.12E-01	4.93E-01	1.13E-01	3.11E-01
CM-248	5078.60	5058.09	0.000	4.000	3.520	0.480	0.6928	91.000	2.73E-01	3.48E-01	4.30E-01	9.85E-02	3.46E-01



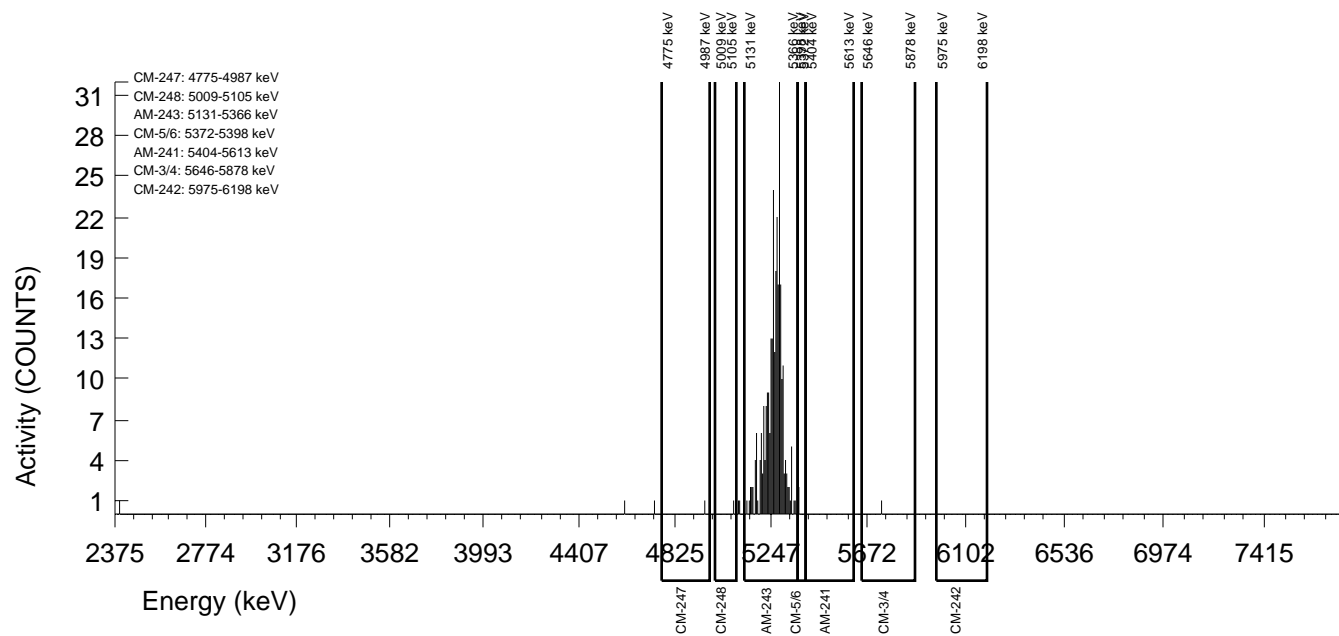
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S0405235070_AM SAMPLE QTY : 0.113 G +/-0.885 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 96.8 +/-6.492 %	CHAMBER : 249 DETECTOR S/N : 87937 AVERAGE %EFFICIENCY : 26.1419 AVERAGE %EFF ERROR : 0.5065 COUNT DATE : 22-Sep-2016 17:55:45 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B249.CNF;453 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W249.CNF;128 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.5916E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.49	0.000	0.000	0.000	0.000	0.0000	98.525	0.00E+00	1.35E-01	2.00E-01	0.00E+00	1.34E-01
AM-243	5269.50	5265.02	34.045	288.000	288.000	0.000	0.0000	99.980	1.89E+01	3.35E+00	1.97E-01	0.00E+00	2.19E+00
CM-242	6102.00	6086.58	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	4.49E-01	6.67E-01	0.00E+00	4.48E-01
CM-3/4	5795.02	5736.69	4.955	1.000	1.000	0.000	0.0000	100.000	6.77E-02	1.90E-01	2.03E-01	0.00E+00	1.90E-01
CM-5/6	5386.00	5373.96	0.000	2.000	2.000	0.000	0.0000	86.090	1.53E-01	2.62E-01	2.29E-01	0.00E+00	2.61E-01
CM-247	4946.00	4961.38	4.955	1.000	0.280	0.720	0.8485	79.300	2.32E-02	2.43E-01	5.06E-01	1.29E-01	2.42E-01
CM-248	5078.60	5087.93	4.955	1.000	1.000	0.000	0.0000	91.000	7.21E-02	2.03E-01	2.16E-01	0.00E+00	2.03E-01



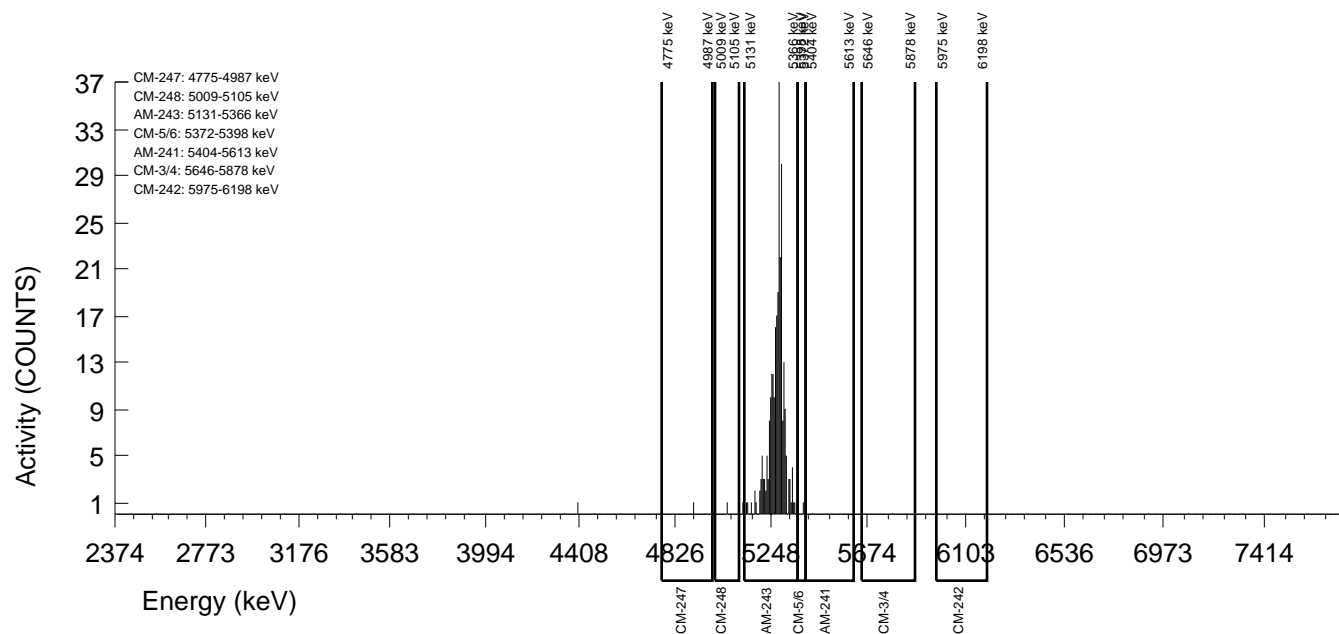
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S0405235071_AM SAMPLE QTY : 0.120 G +/-0.833 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 91.4 +/-6.629 %	CHAMBER : 250 DETECTOR S/N : 87938 AVERAGE %EFFICIENCY : 26.3779 AVERAGE %EFF ERROR : 0.5108 COUNT DATE : 22-Sep-2016 17:55:47 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B250.CNF;456 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W250.CNF;115 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.3375E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.49	0.000	0.000	-0.480	0.480	0.6928	98.525	-3.16E-02	1.40E-01	3.65E-01	8.36E-02	1.40E-01
AM-243	5269.50	5275.36	18.744	275.000	274.520	0.480	0.6928	99.980	1.78E+01	3.22E+00	3.59E-01	8.23E-02	2.11E+00
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	4.44E-01	6.59E-01	0.00E+00	4.43E-01
CM-3/4	5795.02	5761.62	0.000	0.000	-0.720	0.720	0.8485	100.000	-4.81E-02	1.46E-01	4.08E-01	1.04E-01	1.45E-01
CM-5/6	5386.00	5380.77	0.000	2.000	2.000	0.000	0.0000	86.090	1.51E-01	2.59E-01	2.26E-01	0.00E+00	2.58E-01
CM-247	4946.00	4910.38	4.968	1.000	0.280	0.720	0.8485	79.300	2.29E-02	2.40E-01	5.00E-01	1.27E-01	2.39E-01
CM-248	5078.60	5057.87	4.968	1.000	0.280	0.720	0.8485	91.000	2.00E-02	2.09E-01	4.35E-01	1.11E-01	2.09E-01



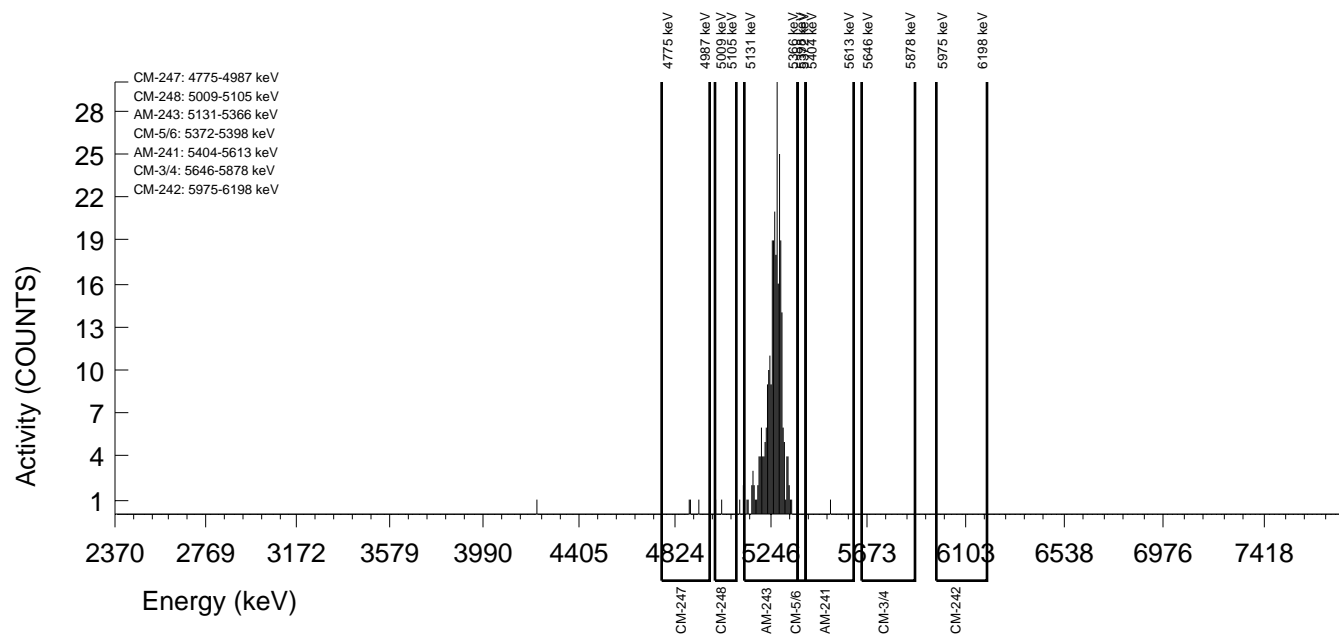
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S0405235072_AM SAMPLE QTY : 0.101 G +/-0.990 % SAMPLE DATE : 15-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 98.9 +/-6.470 %	CHAMBER : 251 DETECTOR S/N : 87939 AVERAGE %EFFICIENCY : 25.8839 AVERAGE %EFF ERROR : 0.5015 COUNT DATE : 22-Sep-2016 17:55:50 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B251.CNF;456 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W251.CNF;114 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.6902E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5512.29	4.963	1.000	-0.200	1.200	1.0954	98.525	-1.48E-02	2.22E-01	5.18E-01	1.48E-01	2.22E-01
AM-243	5269.50	5263.64	40.696	292.000	291.280	0.720	0.8485	99.980	2.12E+01	3.74E+00	4.44E-01	1.13E-01	2.44E+00
CM-242	6102.00	6086.58	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	4.89E-01	7.26E-01	0.00E+00	4.88E-01
CM-3/4	5795.02	5761.61	0.000	0.000	-0.960	0.960	0.9798	100.000	-7.18E-02	1.67E-01	4.93E-01	1.34E-01	1.66E-01
CM-5/6	5386.00	5385.09	0.000	0.000	0.000	0.000	0.0000	86.090	0.00E+00	1.70E-01	2.53E-01	0.00E+00	1.70E-01
CM-247	4946.00	4907.77	44.666	3.000	3.000	0.000	0.0000	79.300	2.75E-01	3.63E-01	2.75E-01	0.00E+00	3.62E-01
CM-248	5078.60	5021.17	0.000	2.000	1.520	0.480	0.6928	91.000	1.21E-01	2.79E-01	4.42E-01	1.01E-01	2.79E-01



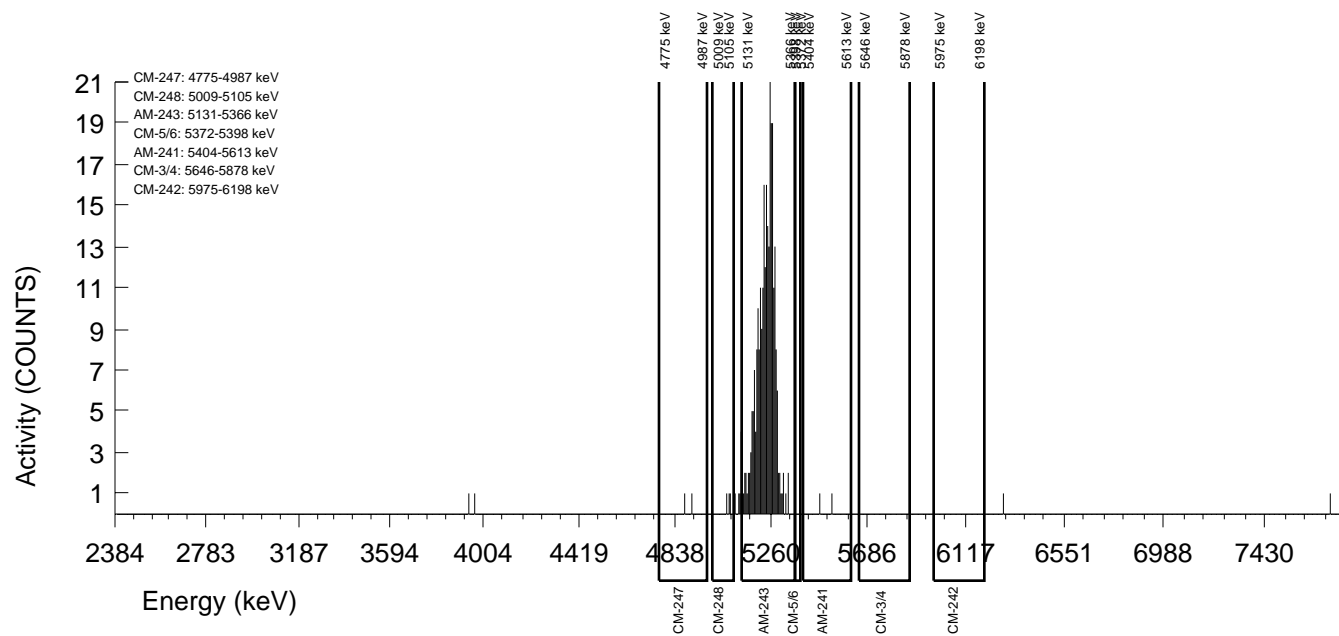
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S0405235073_AM SAMPLE QTY : 0.108 G +/-0.926 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 91.5 +/-6.640 %	CHAMBER : 252 DETECTOR S/N : 87940 AVERAGE %EFFICIENCY : 26.3006 AVERAGE %EFF ERROR : 0.5094 COUNT DATE : 22-Sep-2016 17:55:53 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B252.CNF;453 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W252.CNF;127 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.3427E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5504.79	54.628	2.000	2.000	0.000	0.0000	98.525	1.47E-01	2.52E-01	2.20E-01	0.00E+00	2.51E-01
AM-243	5269.50	5240.74	62.905	275.000	274.040	0.960	0.9798	99.980	1.98E+01	3.59E+00	4.76E-01	1.30E-01	2.35E+00
CM-242	6102.00	6086.58	0.000	0.000	-0.480	0.480	0.6928	100.000	-1.17E-01	5.20E-01	1.35E+00	3.10E-01	5.19E-01
CM-3/4	5795.02	5761.61	0.000	0.000	-0.720	0.720	0.8485	100.000	-5.36E-02	1.62E-01	4.54E-01	1.16E-01	1.62E-01
CM-5/6	5386.00	5385.09	0.000	0.000	0.000	0.000	0.0000	86.090	0.00E+00	1.69E-01	2.52E-01	0.00E+00	1.69E-01
CM-247	4946.00	4900.83	34.763	2.000	1.520	0.480	0.6928	79.300	1.38E-01	3.18E-01	5.04E-01	1.16E-01	3.18E-01
CM-248	5078.60	5085.42	0.000	4.000	3.760	0.240	0.4899	91.000	2.98E-01	3.54E-01	3.80E-01	7.12E-02	3.52E-01



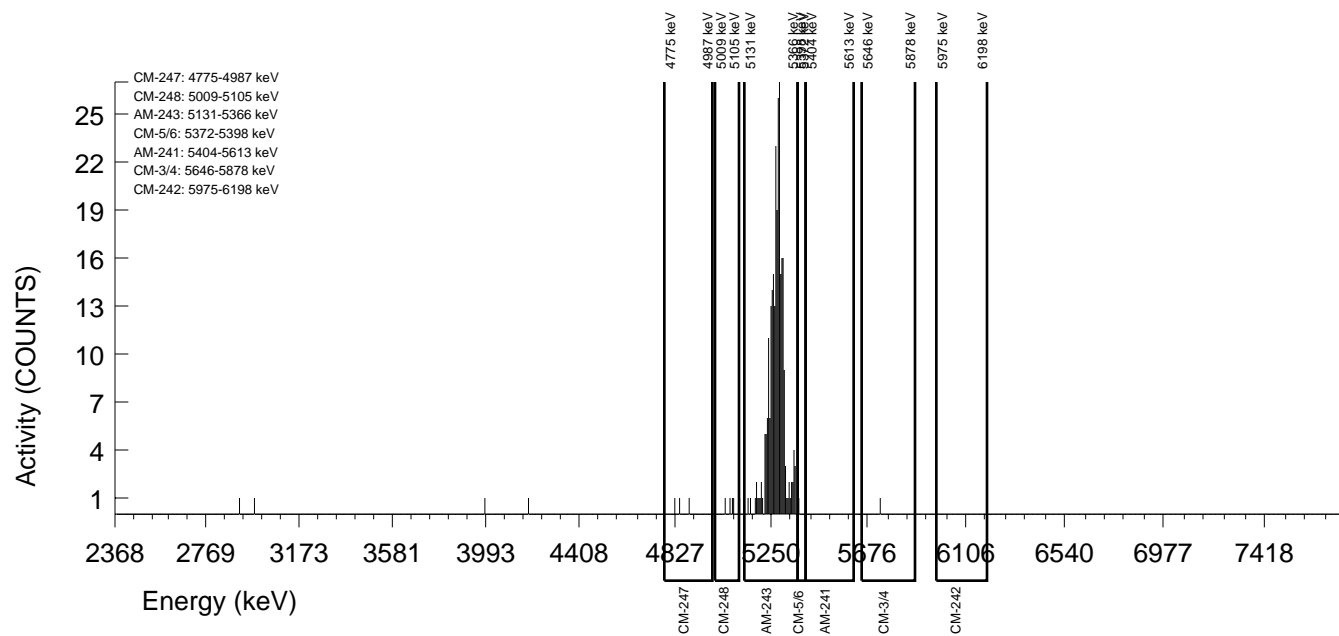
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S0405235074_AM SAMPLE QTY : 0.115 G +/-0.870 % SAMPLE DATE : 15-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 92.4 +/-6.681 %	CHAMBER : 253 DETECTOR S/N : 87941 AVERAGE %EFFICIENCY : 25.6727 AVERAGE %EFF ERROR : 0.4975 COUNT DATE : 22-Sep-2016 17:55:55 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B253.CNF;457 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W253.CNF;112 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.3839E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.50	0.000	0.000	-0.480	0.480	0.6928	98.525	-3.36E-02	1.49E-01	3.87E-01	8.87E-02	1.48E-01
AM-243	5269.50	5273.86	49.136	271.000	270.040	0.960	0.9798	99.980	1.86E+01	3.39E+00	4.53E-01	1.24E-01	2.23E+00
CM-242	6102.00	6086.59	0.000	0.000	-0.240	0.240	0.4899	100.000	-5.50E-02	4.75E-01	1.10E+00	2.06E-01	4.74E-01
CM-3/4	5795.02	5729.49	4.985	1.000	0.760	0.240	0.4899	100.000	5.39E-02	2.02E-01	3.40E-01	6.36E-02	2.02E-01
CM-5/6	5386.00	5371.84	0.000	1.000	1.000	0.000	0.0000	86.090	7.99E-02	2.25E-01	2.40E-01	0.00E+00	2.25E-01
CM-247	4946.00	4855.09	64.803	3.000	2.280	0.720	0.8485	79.300	1.98E-01	3.51E-01	5.30E-01	1.35E-01	3.50E-01
CM-248	5078.60	5070.91	39.878	4.000	3.760	0.240	0.4899	91.000	2.84E-01	3.37E-01	3.62E-01	6.78E-02	3.35E-01



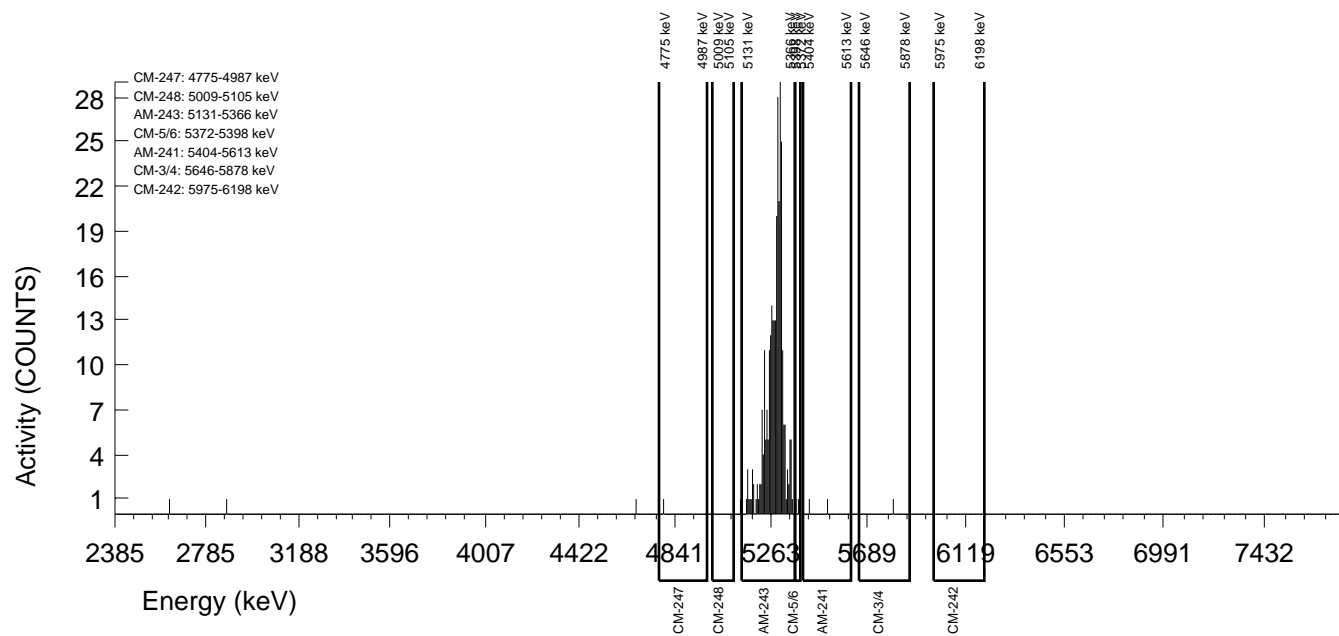
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S0405235075_AM SAMPLE QTY : 0.112 G +/-0.893 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 104 +/-6.398 %	CHAMBER : 254 DETECTOR S/N : 87942 AVERAGE %EFFICIENCY : 25.1642 AVERAGE %EFF ERROR : 0.4879 COUNT DATE : 22-Sep-2016 17:55:56 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B254.CNF;456 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W254.CNF;116 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.9482E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5473.21	79.602	2.000	1.520	0.480	0.6928	98.525	9.86E-02	2.27E-01	3.59E-01	8.23E-02	2.27E-01
AM-243	5269.50	5281.41	27.541	299.000	298.760	0.240	0.4899	99.980	1.91E+01	3.33E+00	3.06E-01	5.73E-02	2.17E+00
CM-242	6102.00	6086.59	0.000	0.000	-0.240	0.240	0.4899	100.000	-5.08E-02	4.39E-01	1.02E+00	1.90E-01	4.38E-01
CM-3/4	5795.02	5801.99	4.975	1.000	0.280	0.720	0.8485	100.000	1.84E-02	1.93E-01	4.02E-01	1.02E-01	1.92E-01
CM-5/6	5386.00	5376.52	0.000	3.000	2.760	0.240	0.4899	86.090	2.05E-01	2.96E-01	3.56E-01	6.66E-02	2.95E-01
CM-247	4946.00	4793.43	4.975	1.000	0.520	0.480	0.6928	79.300	4.19E-02	2.33E-01	4.46E-01	1.02E-01	2.33E-01
CM-248	5078.60	5104.34	0.000	1.000	0.760	0.240	0.4899	91.000	5.33E-02	2.00E-01	3.36E-01	6.30E-02	2.00E-01



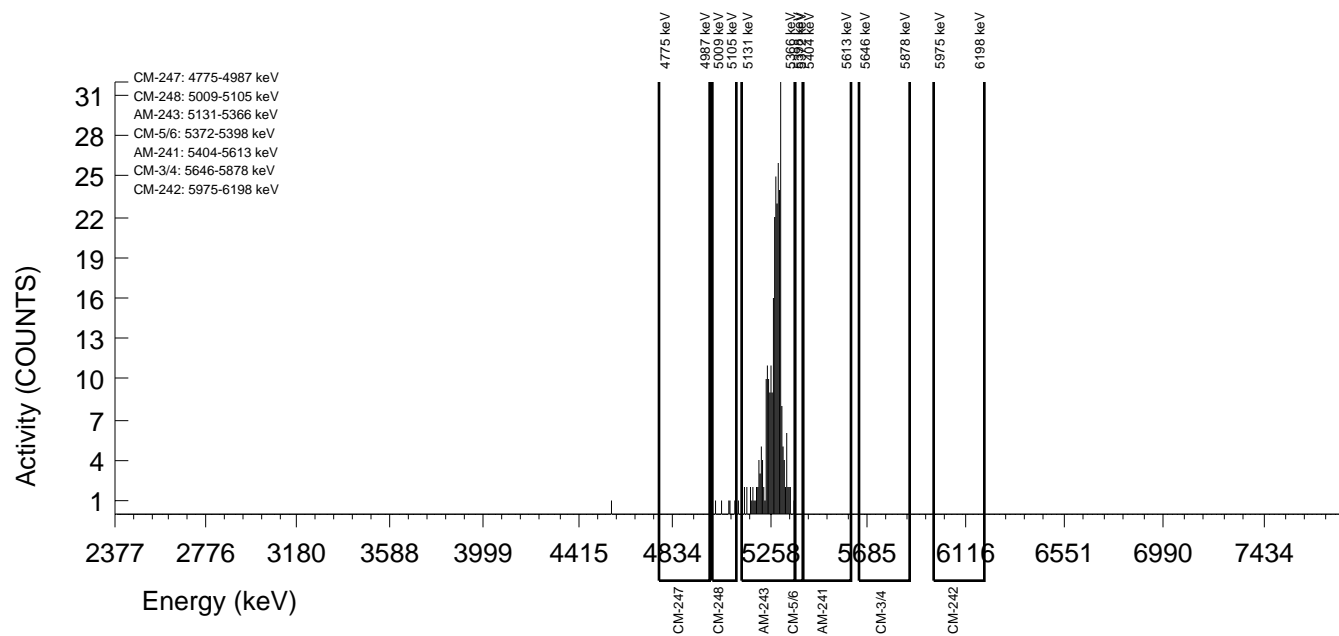
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S0405235076_AM SAMPLE QTY : 0.106 G +/-0.943 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 103 +/-6.447 %	CHAMBER : 255 DETECTOR S/N : 87943 AVERAGE %EFFICIENCY : 24.9747 AVERAGE %EFF ERROR : 0.4844 COUNT DATE : 22-Sep-2016 17:55:59 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B255.CNF;458 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W255.CNF;120 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.8983E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.49	0.000	0.000	-0.480	0.480	0.6928	98.525	-3.35E-02	1.48E-01	3.86E-01	8.86E-02	1.48E-01
AM-243	5269.50	5277.11	33.145	294.000	293.520	0.480	0.6928	99.980	2.02E+01	3.54E+00	3.80E-01	8.72E-02	2.31E+00
CM-242	6102.00	6086.58	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	4.70E-01	6.98E-01	0.00E+00	4.69E-01
CM-3/4	5795.02	5761.61	0.000	0.000	-0.480	0.480	0.6928	100.000	-3.40E-02	1.50E-01	3.92E-01	8.98E-02	1.50E-01
CM-5/6	5386.00	5369.33	0.000	2.000	2.000	0.000	0.0000	86.090	1.60E-01	2.74E-01	2.39E-01	0.00E+00	2.73E-01
CM-247	4946.00	4881.20	0.000	0.000	-0.240	0.240	0.4899	79.300	-2.08E-02	1.80E-01	4.15E-01	7.77E-02	1.79E-01
CM-248	5078.60	5065.47	0.000	5.000	4.280	0.720	0.8485	91.000	3.23E-01	3.72E-01	4.61E-01	1.17E-01	3.69E-01



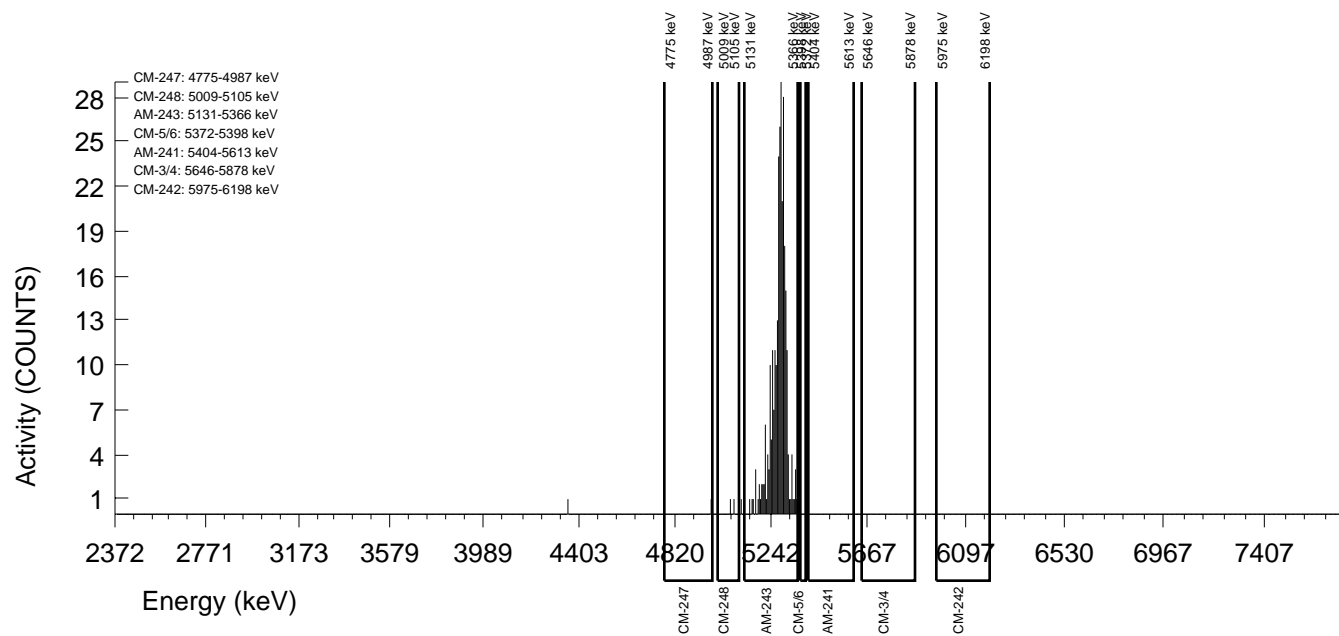
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S0405235077_AM SAMPLE QTY : 0.103 G +/-0.971 % SAMPLE DATE : 17-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 97.1 +/-6.542 %	CHAMBER : 256 DETECTOR S/N : 87944 AVERAGE %EFFICIENCY : 25.7507 AVERAGE %EFF ERROR : 0.4991 COUNT DATE : 22-Sep-2016 17:56:01 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B256.CNF;458 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W256.CNF;114 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.6057E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.49	0.000	0.000	-0.240	0.240	0.4899	98.525	-1.78E-02	1.54E-01	3.55E-01	6.65E-02	1.53E-01
AM-243	5269.50	5280.15	34.631	286.000	284.560	1.440	1.2000	99.980	2.07E+01	3.70E+00	5.39E-01	1.60E-01	2.42E+00
CM-242	6102.00	6086.58	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	4.86E-01	7.22E-01	0.00E+00	4.85E-01
CM-3/4	5795.02	5761.61	0.000	0.000	-0.480	0.480	0.6928	100.000	-3.60E-02	1.60E-01	4.16E-01	9.53E-02	1.59E-01
CM-5/6	5386.00	5370.73	0.000	7.000	7.000	0.000	0.0000	86.090	5.93E-01	4.78E-01	2.54E-01	0.00E+00	4.71E-01
CM-247	4946.00	4986.00	0.000	2.000	0.800	1.200	1.0954	79.300	7.35E-02	3.30E-01	6.45E-01	1.84E-01	3.30E-01
CM-248	5078.60	5075.57	19.821	2.000	1.520	0.480	0.6928	91.000	1.22E-01	2.80E-01	4.44E-01	1.02E-01	2.80E-01



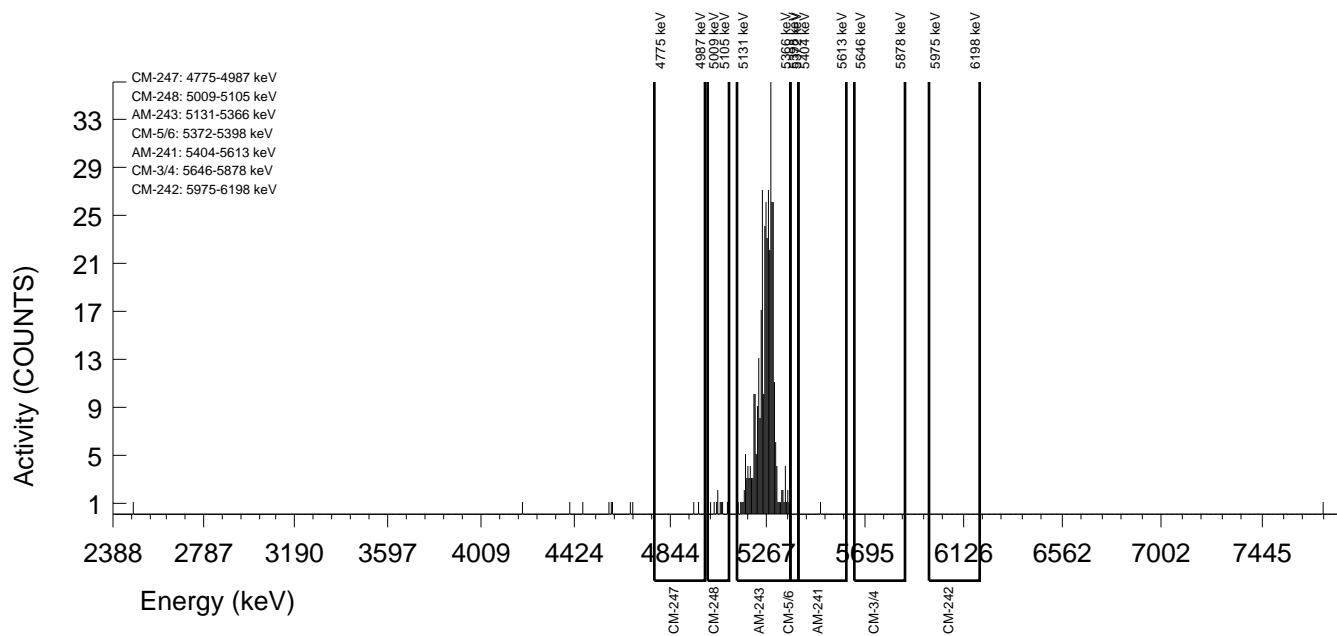
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S0405235078_AM SAMPLE QTY : 0.107 G +/-0.935 % SAMPLE DATE : 17-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 102 +/-5.754 %	CHAMBER : 078 DETECTOR S/N : 38633 AVERAGE %EFFICIENCY : 33.4433 AVERAGE %EFF ERROR : 0.6444 COUNT DATE : 22-Sep-2016 17:52:55 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B078.CNF;1726 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W078.CNF;447 CAL DATE : 03-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.8354E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5501.73	4.964	1.000	0.520	0.480	0.6928	98.525	2.72E-02	1.51E-01	2.90E-01	6.64E-02	1.51E-01
AM-243	5269.50	5259.96	51.786	388.000	388.000	0.000	0.0000	99.980	2.00E+01	3.12E+00	1.54E-01	0.00E+00	1.99E+00
CM-242	6102.00	6086.58	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	3.43E-01	5.10E-01	0.00E+00	3.43E-01
CM-3/4	5795.02	5761.61	0.000	0.000	-0.960	0.960	0.9798	100.000	-5.09E-02	1.18E-01	3.49E-01	9.51E-02	1.18E-01
CM-5/6	5386.00	5385.09	0.000	0.000	0.000	0.000	0.0000	86.090	0.00E+00	1.21E-01	1.79E-01	0.00E+00	1.21E-01
CM-247	4946.00	4954.35	24.818	2.000	1.520	0.480	0.6928	79.300	9.86E-02	2.27E-01	3.59E-01	8.24E-02	2.27E-01
CM-248	5078.60	5053.64	7.445	9.000	8.760	0.240	0.4899	91.000	4.95E-01	3.58E-01	2.71E-01	5.07E-02	3.53E-01



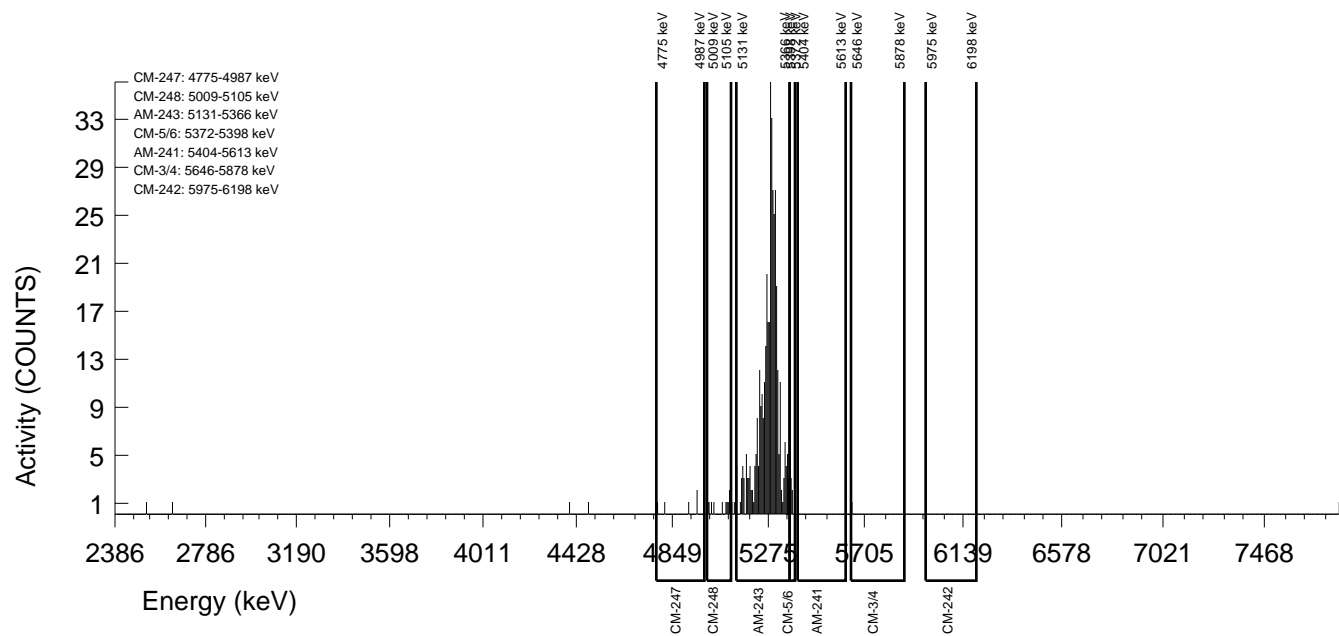
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S1203630763_AM SAMPLE QTY : 0.122 G +/-0.820 % SAMPLE DATE : 21-Sep-2016 00:00:00 ANALYST : KXB2 % YIELD : 99.3 +/-5.757 %	CHAMBER : 080 DETECTOR S/N : 78197 AVERAGE %EFFICIENCY : 34.4422 AVERAGE %EFF ERROR : 0.6633 COUNT DATE : 22-Sep-2016 17:52:55 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B080.CNF;1728 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W080.CNF;446 CAL DATE : 03-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7439E+00 dpm RESULTS : 4.7108E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.48	0.000	0.000	-0.720	0.720	0.8485	98.525	-3.29E-02	9.94E-02	2.79E-01	7.10E-02	9.93E-02
AM-243	5269.50	5276.94	42.115	391.000	389.320	1.680	1.2961	99.980	1.75E+01	2.73E+00	3.49E-01	1.07E-01	1.75E+00
CM-242	6102.00	6086.57	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	9.15E-02	1.36E-01	0.00E+00	9.14E-02
CM-3/4	5795.02	5645.33	0.000	1.000	1.000	0.000	0.0000	100.000	4.50E-02	1.27E-01	1.35E-01	0.00E+00	1.26E-01
CM-5/6	5386.00	5376.45	0.000	7.000	6.520	0.480	0.6928	86.090	3.41E-01	2.96E-01	2.89E-01	6.63E-02	2.93E-01
CM-247	4946.00	4889.30	4.969	5.000	4.760	0.240	0.4899	79.300	2.70E-01	2.77E-01	2.72E-01	5.09E-02	2.75E-01
CM-248	5078.60	5064.00	0.000	10.000	9.760	0.240	0.4899	91.000	4.82E-01	3.28E-01	2.37E-01	4.44E-02	3.23E-01



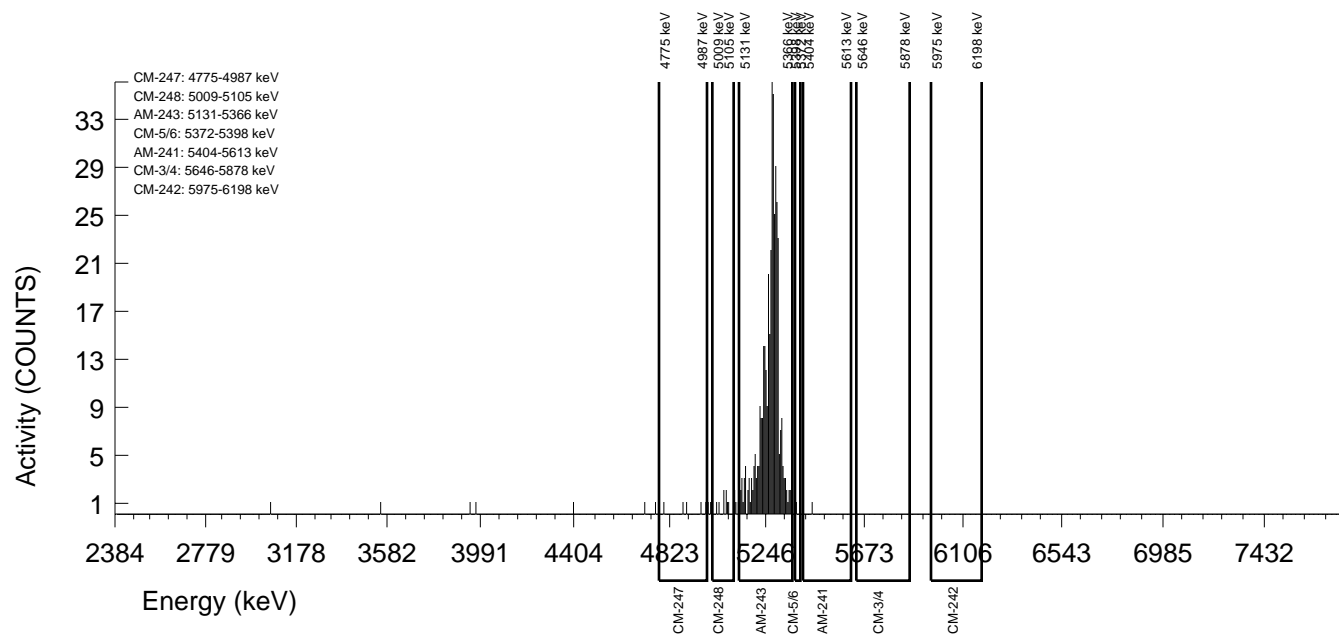
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S1203630764_AM SAMPLE QTY : 0.105 G +/-0.952 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 103 +/-5.769 %	CHAMBER : 081 DETECTOR S/N : 79996 AVERAGE %EFFICIENCY : 33.0506 AVERAGE %EFF ERROR : 0.6369 COUNT DATE : 22-Sep-2016 17:52:55 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B081.CNF;1734 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W081.CNF;446 CAL DATE : 03-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.8777E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5448.15	4.901	1.000	1.000	0.000	0.0000	98.525	5.35E-02	1.50E-01	1.60E-01	0.00E+00	1.50E-01
AM-243	5269.50	5263.62	41.462	388.000	386.800	1.200	1.0954	99.980	2.04E+01	3.19E+00	3.69E-01	1.06E-01	2.03E+00
CM-242	6102.00	6086.56	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	3.55E-01	5.28E-01	0.00E+00	3.55E-01
CM-3/4	5795.02	5761.58	0.000	0.000	-0.240	0.240	0.4899	100.000	-1.30E-02	1.12E-01	2.60E-01	4.86E-02	1.12E-01
CM-5/6	5386.00	5378.72	4.901	1.000	1.000	0.000	0.0000	86.090	6.11E-02	1.72E-01	1.83E-01	0.00E+00	1.72E-01
CM-247	4946.00	4916.47	0.000	6.000	4.560	1.440	1.2000	79.300	3.02E-01	3.56E-01	4.91E-01	1.46E-01	3.54E-01
CM-248	5078.60	5065.23	17.154	9.000	8.280	0.720	0.8485	91.000	4.79E-01	3.67E-01	3.53E-01	8.99E-02	3.62E-01



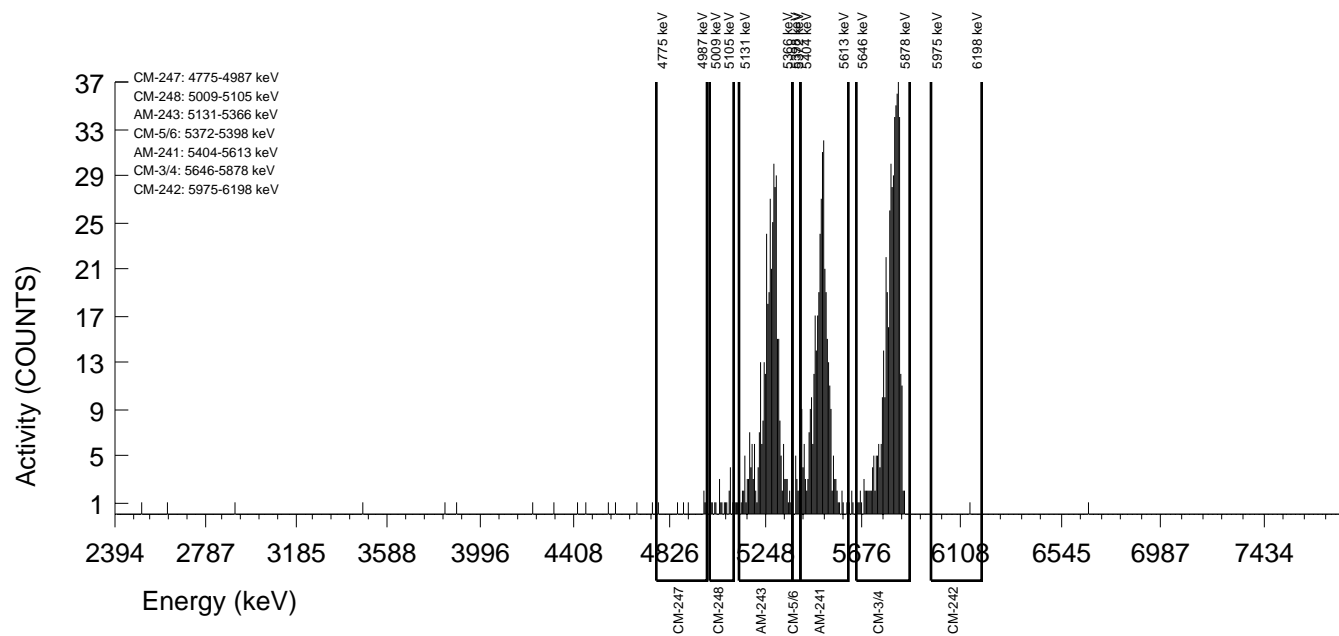
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1599981 SAMPLE ID : S1203630765_AM SAMPLE QTY : 0.122 G +/-0.820 % SAMPLE DATE : 21-Sep-2016 00:00:00 ANALYST : KXB2 % YIELD : 108 +/-5.757 %	CHAMBER : 082 DETECTOR S/N : 79997 AVERAGE %EFFICIENCY : 31.9848 AVERAGE %EFF ERROR : 0.6168 COUNT DATE : 22-Sep-2016 17:52:55 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AM BKG FILE : B082.CNF;1724 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W082.CNF;423 CAL DATE : 03-Sep-2016												
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7439E+00 dpm RESULTS : 5.1165E+00 dpm	LCS <table border="1"> <tr> <td>ID</td> <td>0533-CC</td> <td>1216-G</td> </tr> <tr> <td>NUCLIDE</td> <td>AM-241</td> <td>CM-3/4</td> </tr> <tr> <td>NOMINAL (pCi/G)</td> <td>1.6143E+01</td> <td>2.1342E+01</td> </tr> <tr> <td>% RECOVERY</td> <td>102.288</td> <td>96.985</td> </tr> </table>		ID	0533-CC	1216-G	NUCLIDE	AM-241	CM-3/4	NOMINAL (pCi/G)	1.6143E+01	2.1342E+01	% RECOVERY	102.288	96.985
ID	0533-CC	1216-G												
NUCLIDE	AM-241	CM-3/4												
NOMINAL (pCi/G)	1.6143E+01	2.1342E+01												
% RECOVERY	102.288	96.985												

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5490.15	48.584	366.000	364.800	1.200	1.0954	98.525	1.65E+01	2.61E+00	3.17E-01	9.08E-02	1.70E+00
AM-243	5269.50	5265.96	47.608	397.000	392.680	4.320	2.0785	99.980	1.75E+01	2.73E+00	4.73E-01	1.70E-01	1.75E+00
CM-242	6102.00	6146.02	4.883	1.000	0.760	0.240	0.4899	100.000	3.42E-02	1.28E-01	2.15E-01	4.03E-02	1.28E-01
CM-3/4	5795.02	5798.79	58.576	465.000	464.040	0.960	0.9798	100.000	2.07E+01	3.12E+00	2.94E-01	8.01E-02	1.89E+00
CM-5/6	5386.00	5387.15	9.766	12.000	12.000	0.000	0.0000	86.090	6.22E-01	3.74E-01	1.55E-01	0.00E+00	3.67E-01
CM-247	4946.00	4921.16	7.324	8.000	5.840	2.160	1.4697	79.300	3.28E-01	3.43E-01	4.72E-01	1.51E-01	3.41E-01
CM-248	5078.60	5064.02	48.015	19.000	18.520	0.480	0.6928	91.000	9.08E-01	4.45E-01	2.71E-01	6.22E-02	4.31E-01



Batch# 1596400 Product: PU Date: 9/29/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	/		
Instrument source check is within limits.	/		
Instrument bkg check is within limits.	/		
Method RDL/ LLD has been met.	/		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	/		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	/		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	/		
Sample was run within hold time.		/	DER# 1561615
Sample was correctly preserved if required.	/		AAA AAA
Smears Taken for Radioactive batches.			AAA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	/		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	/		
Aux data is correct.	/		NA
Client Special requirements page has been checked.	/		
Raw Data and/ or spectrum are included and properly stated.	/		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	/		
Hit notification complete (if necessary)	/		NA
Batch entered into Case Narrative.	/		
Batch Data Exception Reports (DER) completed, if applicable.	/		DER# 1561615
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	/		DER# 1561615
Allquot Correction completed if required.	/		NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	/		

Primary Review Performed By: [Signature] 9/29/16

Secondary Review Performed By: [Signature] 09/29/16

10/4
MJWC

DATA EXCEPTION REPORT

Mo.Day Yr. 27-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Pu-11-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596400	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, and 1203621719 were received and analyzed out of holding.</p>		<p>1. Reporting results.</p>	

Originator's Name:

Jessica Downey 27-SEP-16

Data Validator/Group Leader:

Jessica Davis 29-SEP-16

Plutonium Queue Sheet

07-SEP-16

Batch #: 1596400 Analyst: MXS2 First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16
 Tracer Isotope(s): Pu-239/Pu-236 Tracer Code: 1770-A Expiration Date: 8-3-17 Analyzed Sequentially with:
 LCS Isotope(s): Pu-239/Pu-238 LCS Code: 0338-MM Expiration Date: 7-20-17 U: 1596396
 Spike Isotope(s): Pu-239/Pu-238 Spike Code: Expiration Date: Am: 1596398
 Prep Date: 9-21-16 Initials: MSD Pipet ID: 1840022 Balance ID: 16107602 Witness: MA

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	Pu Det #
405235021-1	4.2B.R.2.3	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	1	1	0.514	87	
405235022-1	4.2B.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	2	2	0.505	90	
405235023-1	4.2B.R.1.1.2	SAMPLE	1 pCi/g	SOIL	MJWC001	02-DEC-15	3	3	0.504	91	
405235024-1	4.2B.R.2.2	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	4	4	0.505	92	
405235025-1	4.2B.R.1.2	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	5	5	0.506	93	
405235026-1	4.2C.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	6	6	0.502	95	
405235027-1	4.2C.R.1.4	SAMPLE	1 pCi/g	SOIL	MJWC001	08-DEC-15	7	7	0.510	96	
405235028-1	4.3.A.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	8	8	0.507	97	
405235029-1	4.3.B.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	9	9	0.504	99	
405235030-1	4.3.A.R.2.3	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	10	10	0.514	257	
405235031-1	4.3.B.R.1.2	SAMPLE	1 pCi/g	SOIL	MJWC001	26-NOV-15	11	11	0.517	259	
405235032-1	4.3.R.3.3	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	12	12	0.508	255	
405235033-1	4.3B.R.3.4	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	13	13	0.506	256	
405235034-1	4.3.B.R.1.4	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	14	14	0.509	277	
405235035-1	4.3B.R.2.3	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	15	15	0.516	239	
405235036-1	4.3B.R.2.4	SAMPLE	1 pCi/g	SOIL	MJWC001	23-NOV-15	16	16	0.518	235	
405235037-1	4.4C.R.2.4	SAMPLE	1 pCi/g	SOIL	MJWC001	30-NOV-15	17	17	0.506	376	
405235038-1	4.4C.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	30-NOV-15	18	18	0.501	238	
405235039-1	4.4C.R.1.4	SAMPLE	1 pCi/g	SOIL	MJWC001	30-NOV-15	19	19	0.512	202	
405235040-1	4.4D.R.1.3	SAMPLE	1 pCi/g	SOIL	MJWC001	30-NOV-15	20	20	0.515	241	
1203621718-1	MB for batch 1596400	MB	1 pCi/g	SOIL	QC ACCOUNT		21	21	0.518	243	
1203621719-1	4.2B.R.2.3(405235021DUP)	DUP	1 pCi/g	SOIL	QC ACCOUNT	08-DEC-15	22	22	0.508	244	
1203621720-1	LCS for batch 1596400	LCS	1 pCi/g	SOIL	QC ACCOUNT		23	23	0.518	226	

4 DO 9/29/16
 Data Reviewed By: *[Signature]* 9/29/16
 Page: 1 of 1

Choose SOP Used: GL-RAD-A-01L, GL-RAD-A-036, Solid Sample Dissolution by: LEACH or DIGESTION
 Circle One

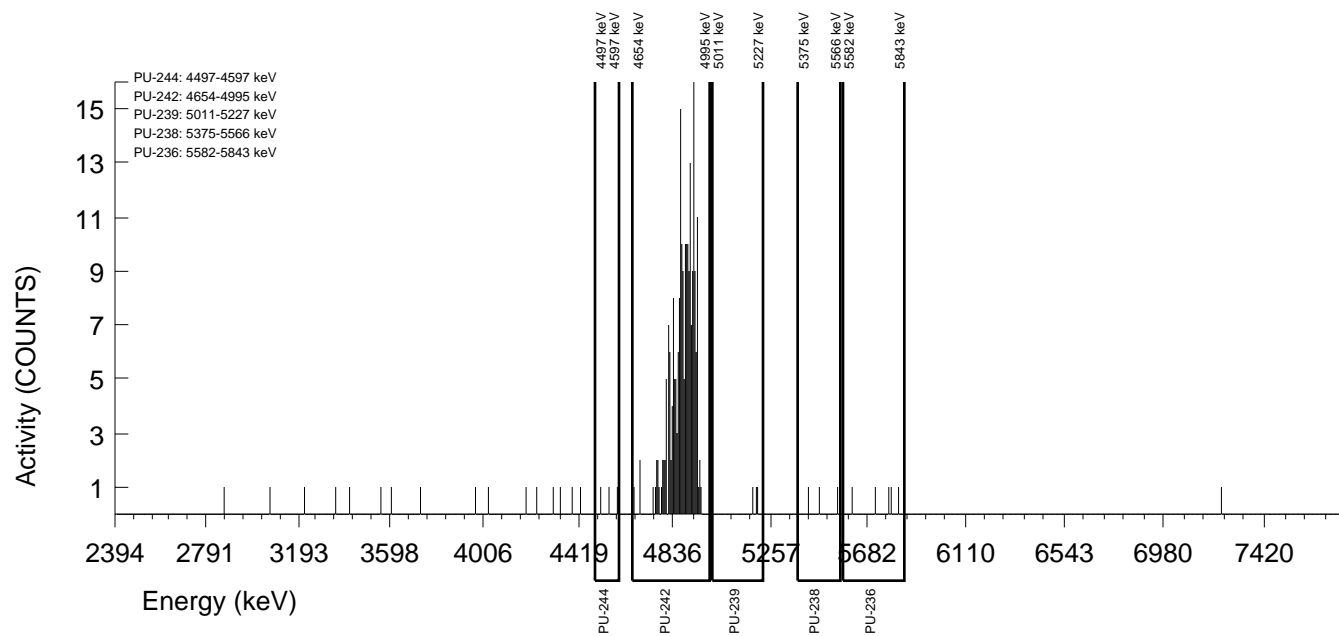
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235021_PU SAMPLE QTY : 0.514 G +/-0.195 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 72.2 +/-7.136 %	CHAMBER : 089 DETECTOR S/N : 79988 AVERAGE %EFFICIENCY : 29.2461 AVERAGE %EFF ERROR : 0.5651 COUNT DATE : 24-Sep-2016 20:54:51 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B089.CNF;1435 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W089.CNF;384 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.1634E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5744.73	192.598	5.000	-1.240	6.240	2.4980	100.000	-2.60E-02	1.13E-01	2.55E-01	9.61E-02	1.13E-01
PU-238	5486.00	5484.82	123.460	3.000	1.080	1.920	1.3856	99.900	1.88E-02	7.27E-02	1.41E-01	4.42E-02	7.26E-02
PU-239	5155.00	5195.39	24.692	3.000	-0.120	3.120	1.7664	99.900	-2.08E-03	7.45E-02	1.64E-01	5.60E-02	7.44E-02
PU-242	4890.00	4876.70	75.558	229.000	222.040	6.960	2.6382	100.000	3.84E+00	7.59E-01	2.19E-01	8.36E-02	5.16E-01
PU-244	4589.00	4554.41	74.076	3.000	1.320	1.680	1.2961	99.900	2.29E-02	7.18E-02	1.34E-01	4.11E-02	7.17E-02



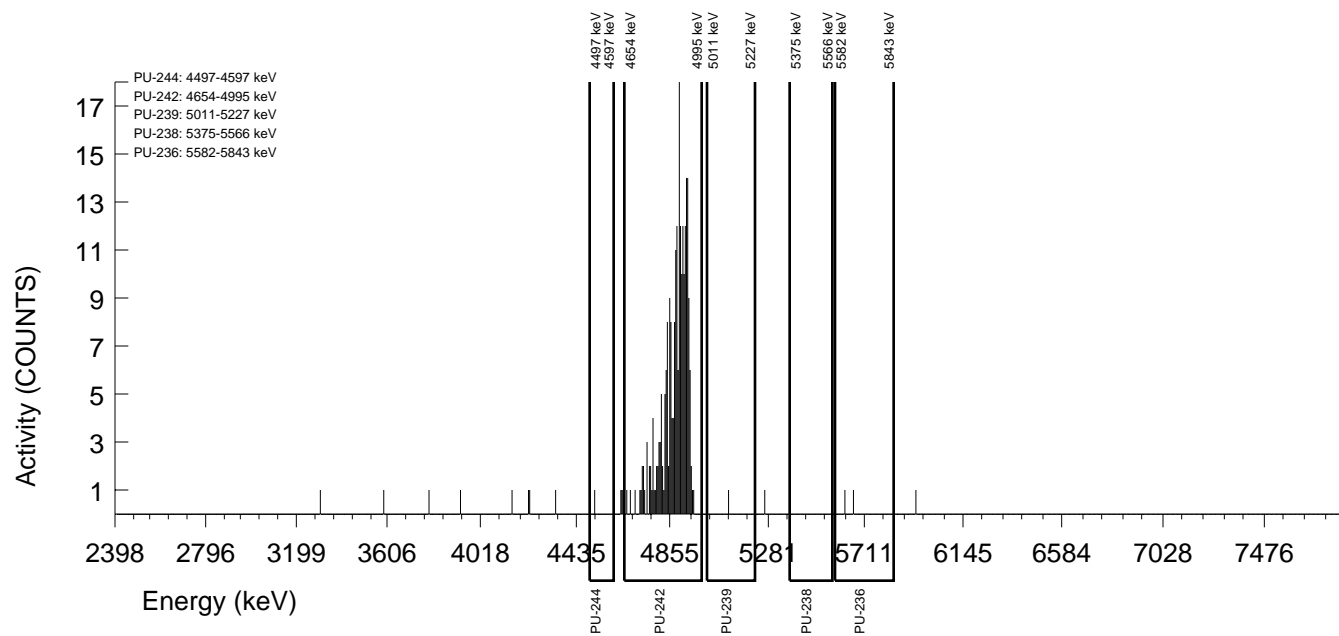
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235022_PU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 69.9 +/-6.695 %	CHAMBER : 090 DETECTOR S/N : 78263 AVERAGE %EFFICIENCY : 33.4344 AVERAGE %EFF ERROR : 0.6443 COUNT DATE : 24-Sep-2016 20:54:51 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B090.CNF;1440 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W090.CNF;374 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.0627E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5643.27	39.587	2.000	1.520	0.480	0.6928	100.000	2.94E-02	6.75E-02	1.07E-01	2.45E-02	6.74E-02
PU-238	5486.00	5470.34	0.000	0.000	-0.960	0.960	0.9798	99.900	-1.54E-02	3.57E-02	1.06E-01	2.88E-02	3.56E-02
PU-239	5155.00	5110.12	4.948	1.000	0.040	0.960	0.9798	99.900	6.37E-04	4.73E-02	1.05E-01	2.86E-02	4.72E-02
PU-242	4890.00	4872.46	57.731	246.000	245.760	0.240	0.4899	100.000	3.91E+00	7.25E-01	7.63E-02	1.43E-02	4.90E-01
PU-244	4589.00	4518.38	4.948	1.000	0.520	0.480	0.6928	99.900	8.28E-03	4.61E-02	8.82E-02	2.02E-02	4.60E-02



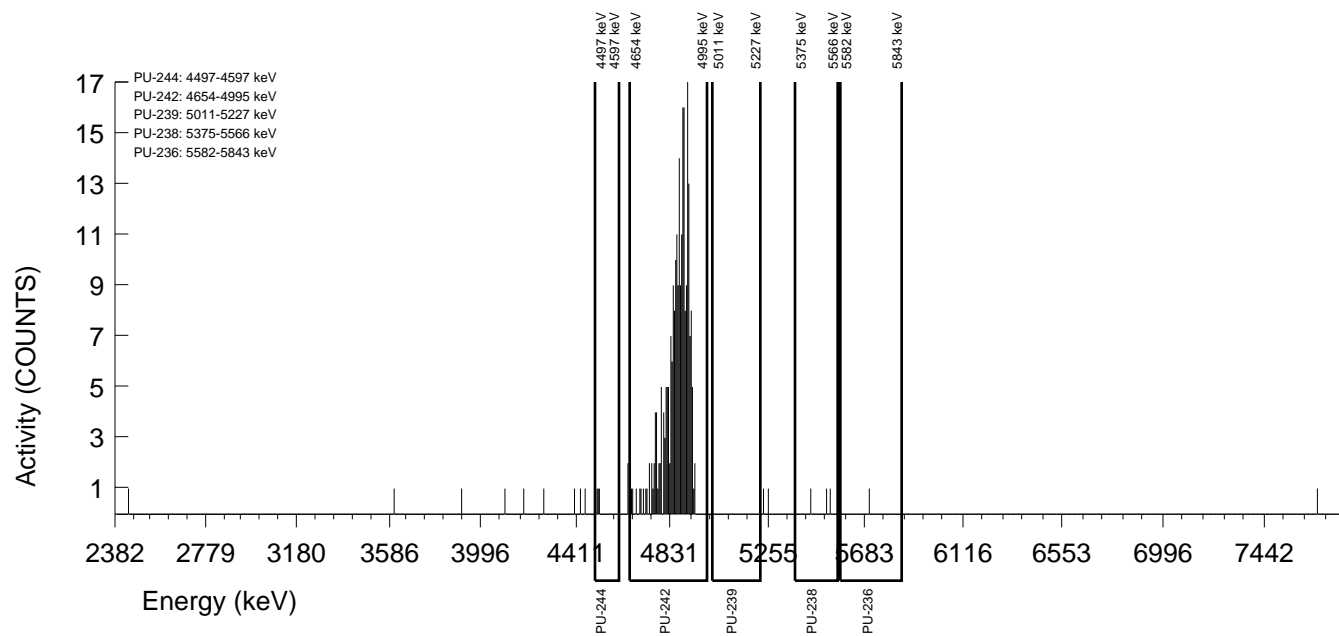
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235023_PU SAMPLE QTY : 0.504 G +/-0.198 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 68.9 +/-6.641 %	CHAMBER : 091 DETECTOR S/N : 78259 AVERAGE %EFFICIENCY : 34.7245 AVERAGE %EFF ERROR : 0.6687 COUNT DATE : 24-Sep-2016 20:54:51 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B091.CNF;1438 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W091.CNF;363 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.0185E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5704.53	4.930	1.000	0.280	0.720	0.8485	100.000	5.31E-03	5.56E-02	1.16E-01	2.95E-02	5.56E-02
PU-238	5486.00	5498.56	83.811	3.000	2.040	0.960	0.9798	99.900	3.20E-02	6.38E-02	1.03E-01	2.82E-02	6.37E-02
PU-239	5155.00	5118.68	0.000	0.000	-0.480	0.480	0.6928	99.900	-7.48E-03	3.32E-02	8.63E-02	1.98E-02	3.31E-02
PU-242	4890.00	4856.68	68.610	253.000	251.560	1.440	1.2000	100.000	3.92E+00	7.20E-01	1.15E-01	3.42E-02	4.87E-01
PU-244	4589.00	4510.45	14.790	3.000	2.760	0.240	0.4899	99.900	4.30E-02	6.23E-02	7.47E-02	1.40E-02	6.20E-02



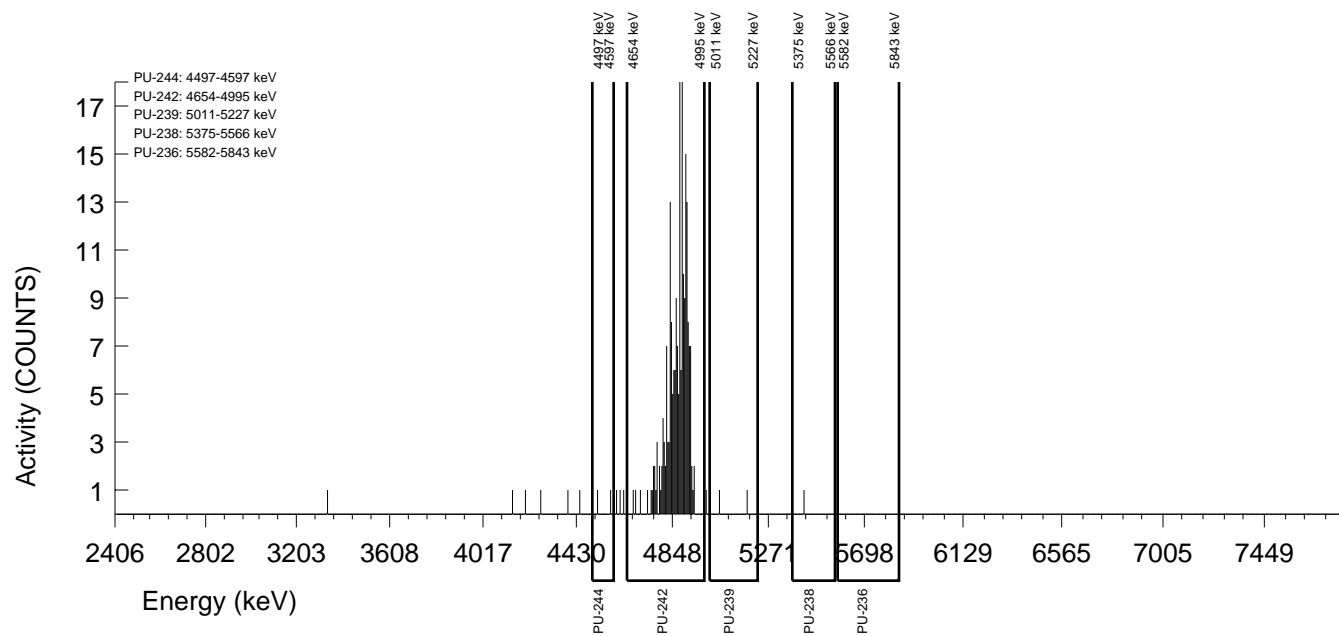
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235024_PU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 67.1 +/-7.160 %	CHAMBER : 092 DETECTOR S/N : 80063 AVERAGE %EFFICIENCY : 30.3421 AVERAGE %EFF ERROR : 0.5858 COUNT DATE : 24-Sep-2016 20:54:51 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B092.CNF;1442 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W092.CNF;414 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 2.9431E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.25	0.000	0.000	-0.480	0.480	0.6928	100.000	-1.06E-02	4.71E-02	1.23E-01	2.81E-02	4.70E-02
PU-238	5486.00	5430.46	4.922	1.000	0.040	0.960	0.9798	99.900	7.35E-04	5.45E-02	1.21E-01	3.30E-02	5.45E-02
PU-239	5155.00	5119.91	118.128	2.000	0.080	1.920	1.3856	99.900	1.46E-03	6.72E-02	1.47E-01	4.63E-02	6.71E-02
PU-242	4890.00	4873.62	74.814	216.000	214.320	1.680	1.2961	100.000	3.91E+00	7.75E-01	1.41E-01	4.33E-02	5.27E-01
PU-244	4589.00	4552.77	59.064	2.000	1.520	0.480	0.6928	99.900	2.78E-02	6.39E-02	1.01E-01	2.32E-02	6.38E-02



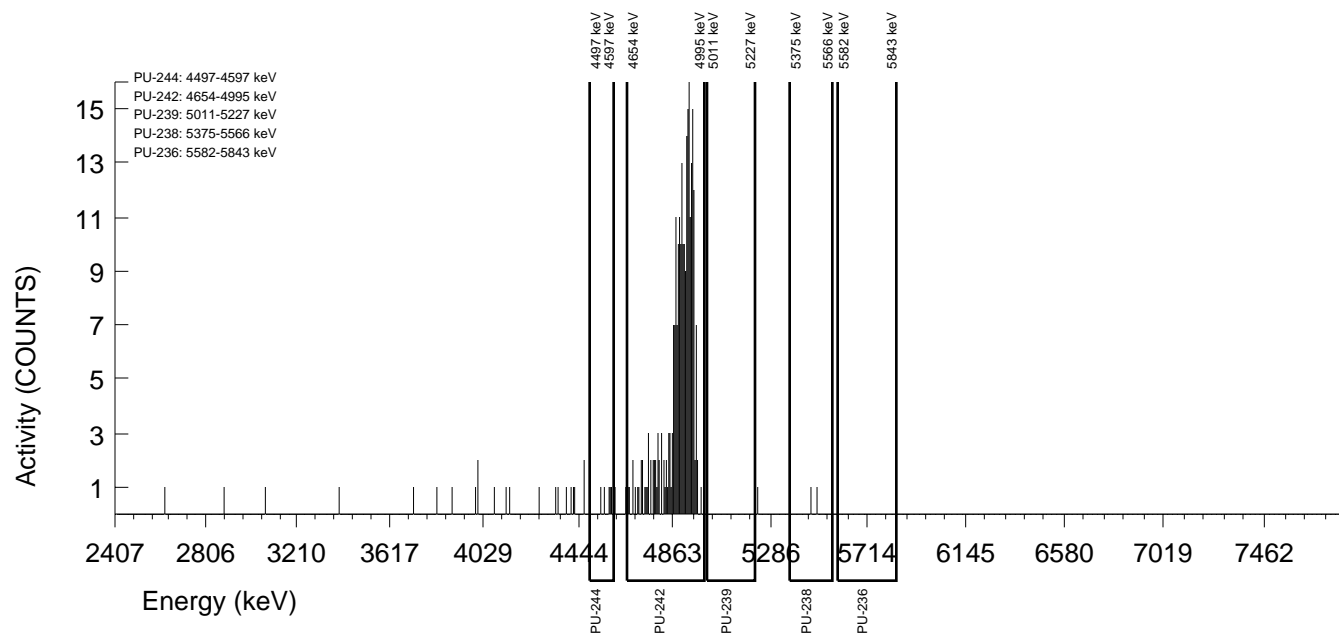
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235025_PU SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 75.4 +/-6.518 %	CHAMBER : 093 DETECTOR S/N : 33206 AVERAGE %EFFICIENCY : 33.0892 AVERAGE %EFF ERROR : 0.6377 COUNT DATE : 24-Sep-2016 20:54:51 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B093.CNF;1431 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W093.CNF;379 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.3032E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.27	0.000	0.000	-1.200	1.200	1.0954	100.000	-2.17E-02	4.11E-02	1.27E-01	3.62E-02	4.11E-02
PU-238	5486.00	5446.19	0.000	3.000	1.320	1.680	1.2961	99.900	1.98E-02	6.21E-02	1.16E-01	3.56E-02	6.20E-02
PU-239	5155.00	5118.70	0.000	0.000	-1.680	1.680	1.2961	99.900	-2.50E-02	3.53E-02	1.15E-01	3.54E-02	3.53E-02
PU-242	4890.00	4889.29	80.246	264.000	262.320	1.680	1.2961	100.000	3.90E+00	7.04E-01	1.15E-01	3.53E-02	4.75E-01
PU-244	4589.00	4558.92	0.000	6.000	6.000	0.000	0.0000	99.900	8.93E-02	7.84E-02	4.47E-02	0.00E+00	7.75E-02



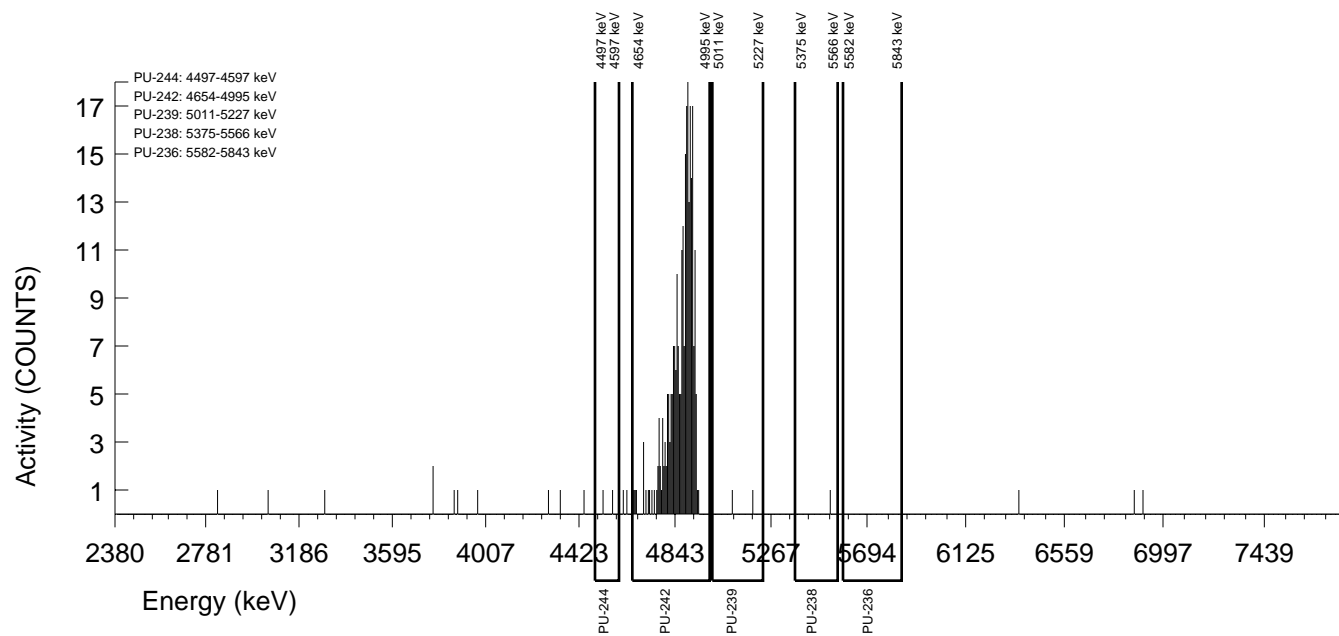
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235026_PU SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 83.6 +/-6.457 %	CHAMBER : 095 DETECTOR S/N : 38626 AVERAGE %EFFICIENCY : 30.4247 AVERAGE %EFF ERROR : 0.5873 COUNT DATE : 24-Sep-2016 20:54:52 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : PU BKG FILE : B095.CNF;1407 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W095.CNF;408 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.6642E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.28	0.000	0.000	-0.960	0.960	0.9798	100.000	-1.71E-02	3.98E-02	1.18E-01	3.20E-02	3.97E-02
PU-238	5486.00	5527.73	4.993	1.000	0.040	0.960	0.9798	99.900	5.92E-04	4.39E-02	9.76E-02	2.66E-02	4.39E-02
PU-239	5155.00	5141.73	89.878	2.000	1.520	0.480	0.6928	99.900	2.24E-02	5.15E-02	8.15E-02	1.87E-02	5.14E-02
PU-242	4890.00	4870.78	77.811	269.000	267.560	1.440	1.2000	100.000	3.93E+00	7.03E-01	1.09E-01	3.23E-02	4.74E-01
PU-244	4589.00	4548.76	44.939	2.000	2.000	0.000	0.0000	99.900	2.94E-02	5.06E-02	4.41E-02	0.00E+00	5.04E-02



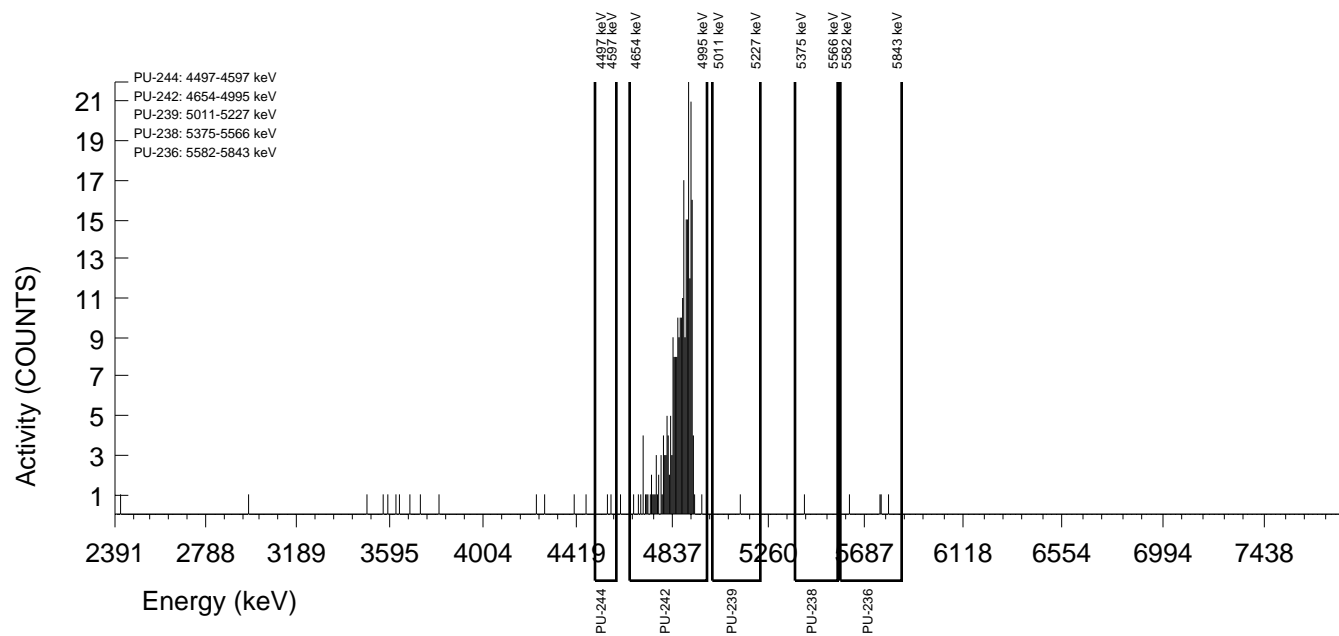
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235027_PU SAMPLE QTY : 0.510 G +/-0.196 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 78.8 +/-6.434 %	CHAMBER : 096 DETECTOR S/N : 80016 AVERAGE %EFFICIENCY : 32.5188 AVERAGE %EFF ERROR : 0.6269 COUNT DATE : 24-Sep-2016 20:54:52 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : PU BKG FILE : B096.CNF;1399 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W096.CNF;357 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.4539E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5728.41	162.816	4.000	2.560	1.440	1.2000	100.000	4.46E-02	7.96E-02	1.29E-01	3.83E-02	7.94E-02
PU-238	5486.00	5419.38	4.934	1.000	-0.680	1.680	1.2961	99.900	-9.84E-03	4.45E-02	1.12E-01	3.43E-02	4.45E-02
PU-239	5155.00	5137.74	4.934	1.000	0.280	0.720	0.8485	99.900	4.03E-03	4.21E-02	8.78E-02	2.23E-02	4.21E-02
PU-242	4890.00	4870.70	41.526	271.000	269.560	1.440	1.2000	100.000	3.87E+00	6.90E-01	1.06E-01	3.16E-02	4.65E-01
PU-244	4589.00	4561.87	19.735	2.000	1.040	0.960	0.9798	99.900	1.50E-02	5.11E-02	9.47E-02	2.58E-02	5.11E-02



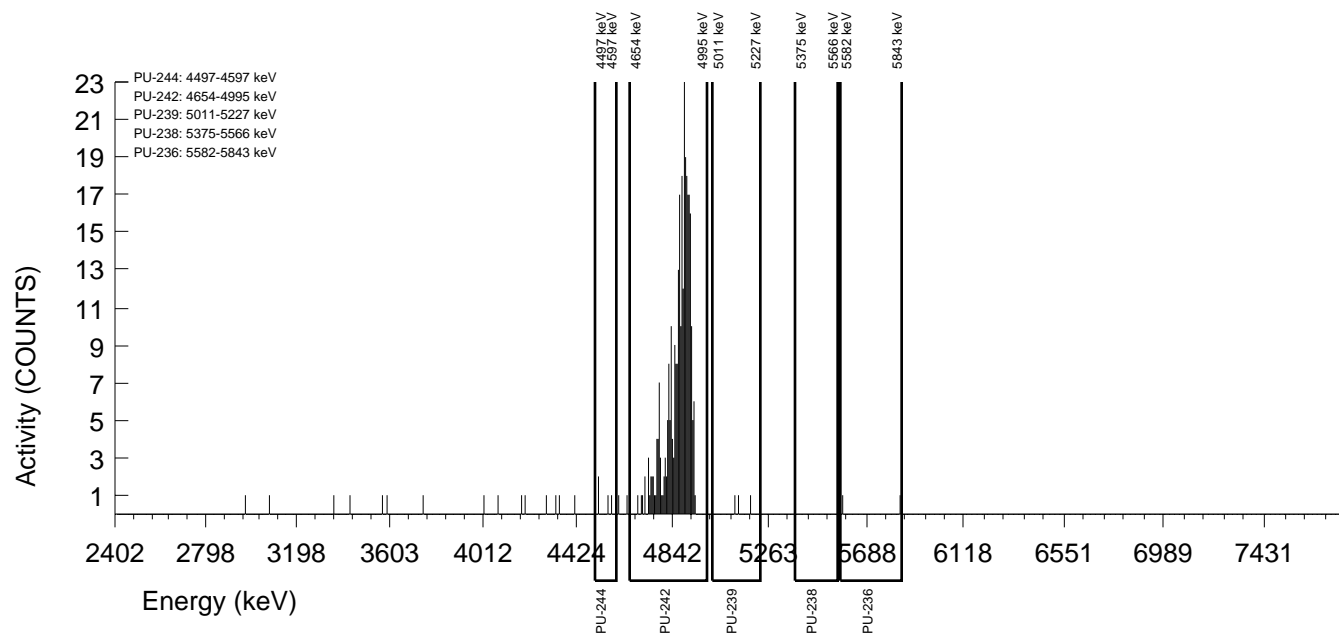
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235028_PU SAMPLE QTY : 0.507 G +/-0.197 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 82.0 +/-6.081 %	CHAMBER : 097 DETECTOR S/N : 83288 AVERAGE %EFFICIENCY : 35.3557 AVERAGE %EFF ERROR : 0.6805 COUNT DATE : 24-Sep-2016 20:54:52 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : PU BKG FILE : B097.CNF;1396 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W097.CNF;381 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.5921E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.14	236.442	2.000	0.560	1.440	1.2000	100.000	8.77E-03	5.67E-02	1.16E-01	3.44E-02	5.66E-02
PU-238	5486.00	5470.35	0.000	0.000	-0.480	0.480	0.6928	99.900	-6.18E-03	2.74E-02	7.13E-02	1.63E-02	2.73E-02
PU-239	5155.00	5142.96	68.962	3.000	2.280	0.720	0.8485	99.900	2.92E-02	5.17E-02	7.81E-02	1.99E-02	5.16E-02
PU-242	4890.00	4869.37	54.431	306.000	304.800	1.200	1.0954	100.000	3.89E+00	6.56E-01	8.96E-02	2.56E-02	4.39E-01
PU-244	4589.00	4542.65	4.926	4.000	4.000	0.000	0.0000	99.900	5.12E-02	5.67E-02	3.84E-02	0.00E+00	5.64E-02



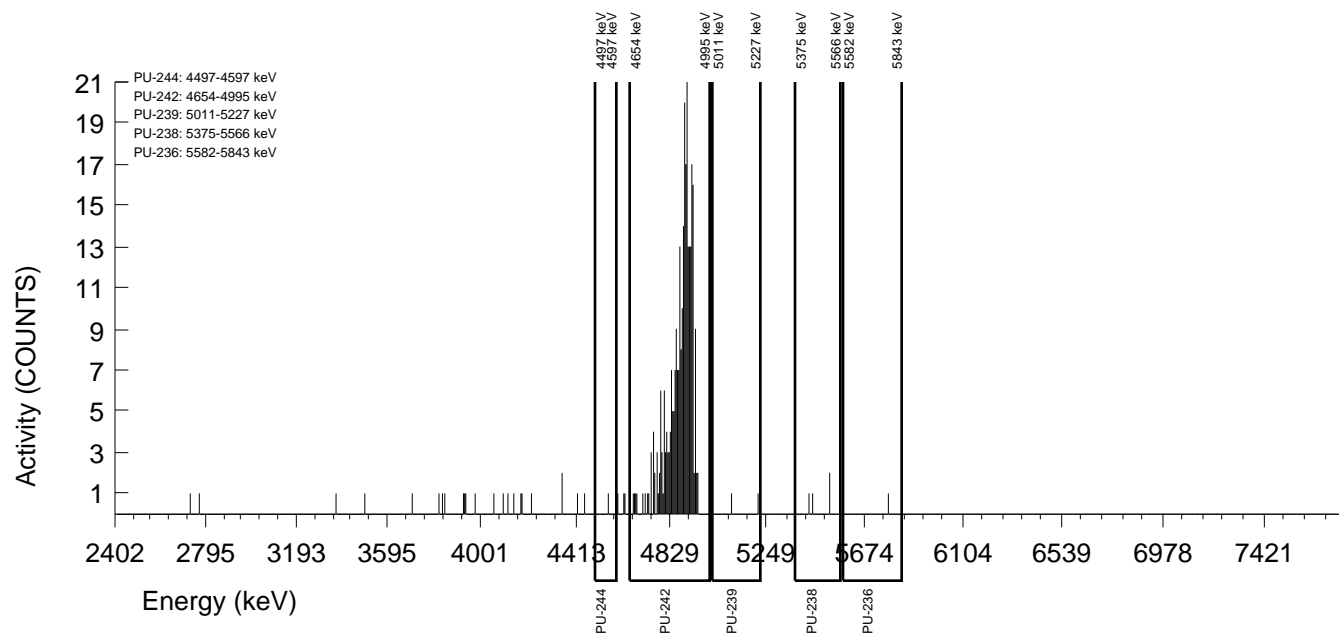
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235029_PU SAMPLE QTY : 0.504 G +/-0.198 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 78.0 +/-6.192 %	CHAMBER : 099 DETECTOR S/N : 80059 AVERAGE %EFFICIENCY : 35.6284 AVERAGE %EFF ERROR : 0.6858 COUNT DATE : 24-Sep-2016 20:54:52 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : PU BKG FILE : B099.CNF;1399 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W099.CNF;383 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.4182E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5781.43	4.881	1.000	0.040	0.960	0.9798	100.000	6.57E-04	4.88E-02	1.08E-01	2.95E-02	4.87E-02
PU-238	5486.00	5483.83	4.881	4.000	3.520	0.480	0.6928	99.900	4.75E-02	6.05E-02	7.48E-02	1.71E-02	6.02E-02
PU-239	5155.00	5154.17	112.262	2.000	1.520	0.480	0.6928	99.900	2.04E-02	4.69E-02	7.43E-02	1.70E-02	4.68E-02
PU-242	4890.00	4871.59	57.642	293.000	292.280	0.720	0.8485	100.000	3.92E+00	6.72E-01	8.19E-02	2.08E-02	4.51E-01
PU-244	4589.00	4578.50	0.000	2.000	1.280	0.720	0.8485	99.900	1.72E-02	4.73E-02	8.20E-02	2.09E-02	4.73E-02



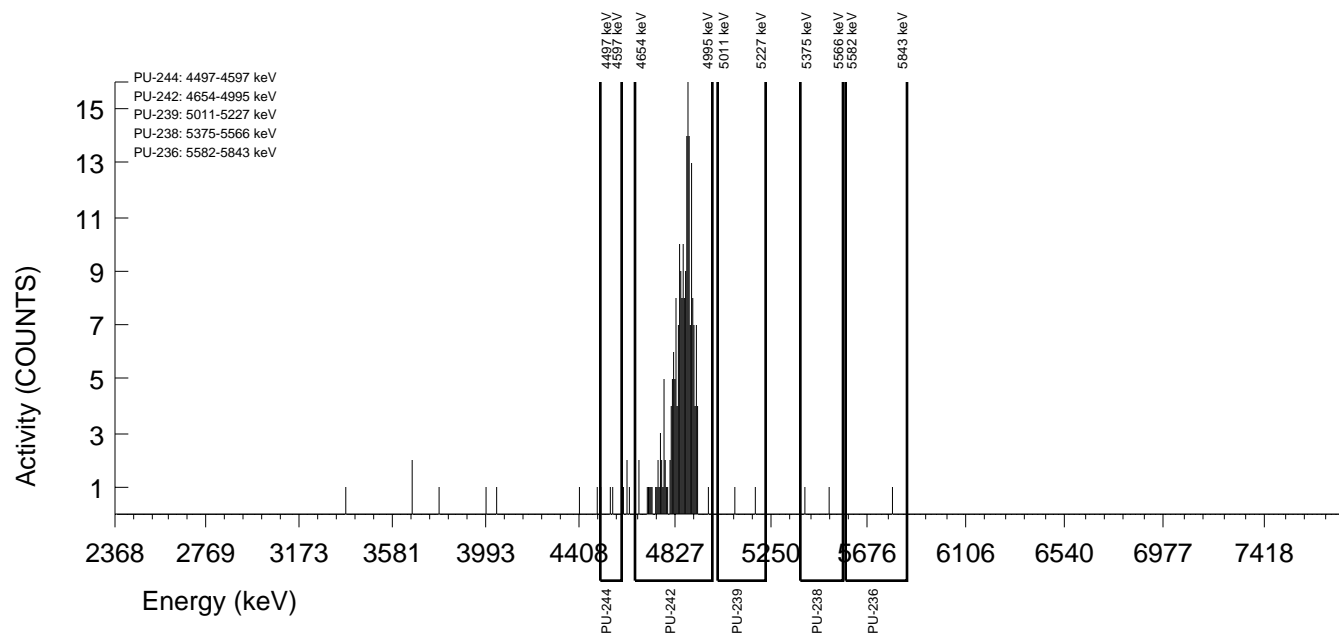
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235030_PU SAMPLE QTY : 0.514 G +/-0.195 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 80.8 +/-7.083 %	CHAMBER : 253 DETECTOR S/N : 87941 AVERAGE %EFFICIENCY : 25.6727 AVERAGE %EFF ERROR : 0.4975 COUNT DATE : 24-Sep-2016 20:51:04 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B253.CNF;459 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W253.CNF;112 CAL DATE : 19-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.5427E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5783.09	4.985	1.000	0.520	0.480	0.6928	100.000	1.12E-02	6.24E-02	1.19E-01	2.74E-02	6.23E-02
PU-238	5486.00	5451.69	104.681	2.000	1.280	0.720	0.8485	99.900	2.27E-02	6.26E-02	1.08E-01	2.76E-02	6.25E-02
PU-239	5155.00	5135.71	89.727	2.000	1.040	0.960	0.9798	99.900	1.83E-02	6.27E-02	1.16E-01	3.16E-02	6.26E-02
PU-242	4890.00	4855.64	58.156	219.000	218.280	0.720	0.8485	100.000	3.84E+00	7.54E-01	1.07E-01	2.74E-02	5.12E-01
PU-244	4589.00	4533.36	54.833	3.000	2.520	0.480	0.6928	99.900	4.44E-02	7.08E-02	9.76E-02	2.24E-02	7.05E-02



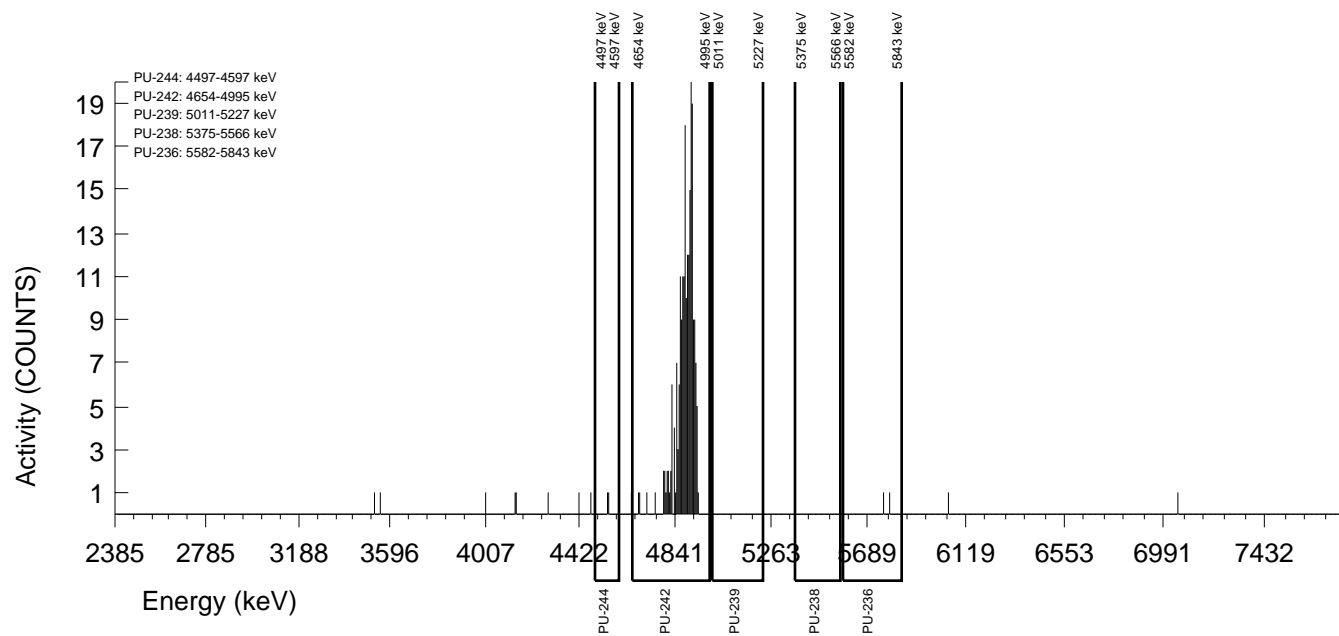
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235031_PU SAMPLE QTY : 0.517 G +/-0.193 % SAMPLE DATE : 26-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 84.1 +/-7.016 %	CHAMBER : 254 DETECTOR S/N : 87942 AVERAGE %EFFICIENCY : 25.1642 AVERAGE %EFF ERROR : 0.4879 COUNT DATE : 24-Sep-2016 20:51:06 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B254.CNF;458 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W254.CNF;116 CAL DATE : 19-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.6845E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5772.49	29.851	2.000	1.280	0.720	0.8485	100.000	2.69E-02	7.41E-02	1.28E-01	3.26E-02	7.40E-02
PU-238	5486.00	5470.36	0.000	0.000	-0.480	0.480	0.6928	99.900	-8.30E-03	3.68E-02	9.58E-02	2.19E-02	3.67E-02
PU-239	5155.00	5118.70	0.000	0.000	-0.480	0.480	0.6928	99.900	-8.25E-03	3.65E-02	9.51E-02	2.18E-02	3.65E-02
PU-242	4890.00	4886.46	55.224	223.000	222.520	0.480	0.6928	100.000	3.82E+00	7.42E-01	9.50E-02	2.18E-02	5.04E-01
PU-244	4589.00	4549.83	9.950	2.000	1.760	0.240	0.4899	99.900	3.02E-02	5.96E-02	8.24E-02	1.54E-02	5.94E-02



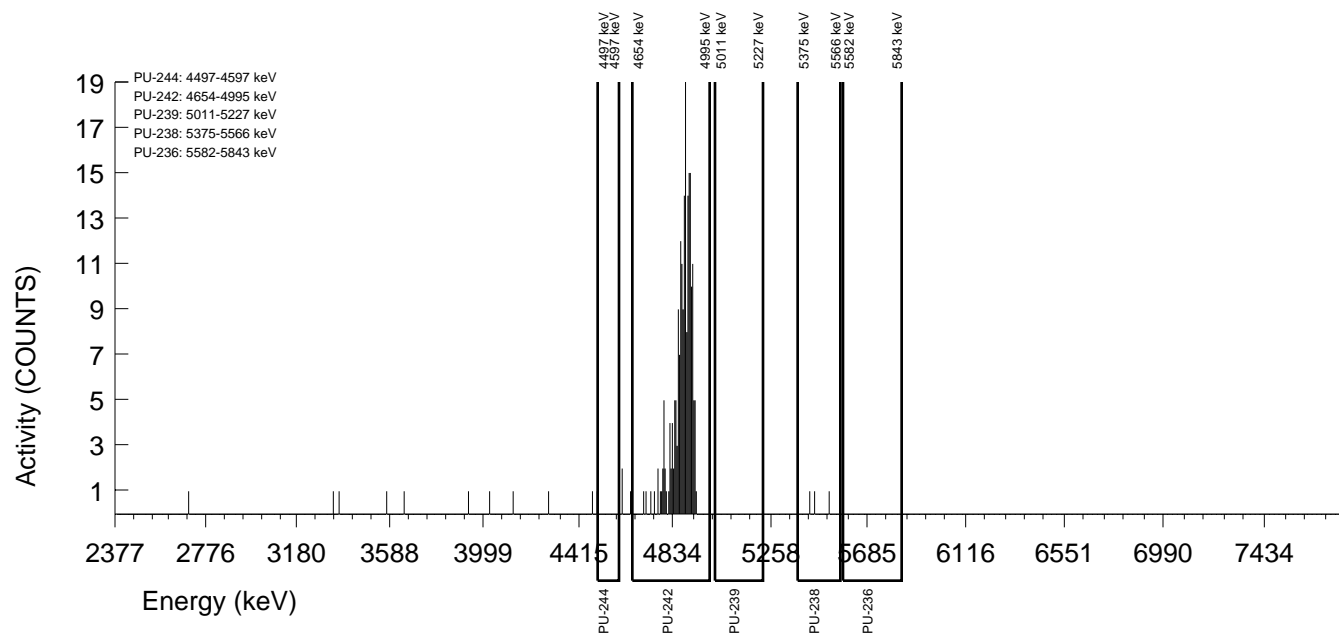
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235032_PU SAMPLE QTY : 0.508 G +/-0.197 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 79.2 +/-7.248 %	CHAMBER : 255 DETECTOR S/N : 87943 AVERAGE %EFFICIENCY : 24.9747 AVERAGE %EFF ERROR : 0.4844 COUNT DATE : 24-Sep-2016 20:51:08 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B255.CNF;460 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W255.CNF;120 CAL DATE : 19-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.4709E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.27	0.000	0.000	-0.480	0.480	0.6928	100.000	-1.10E-02	4.87E-02	1.27E-01	2.91E-02	4.86E-02
PU-238	5486.00	5468.93	84.520	3.000	2.280	0.720	0.8485	99.900	4.29E-02	7.62E-02	1.15E-01	2.93E-02	7.59E-02
PU-239	5155.00	5118.70	0.000	0.000	-1.680	1.680	1.2961	99.900	-3.14E-02	4.44E-02	1.45E-01	4.44E-02	4.43E-02
PU-242	4890.00	4874.01	53.447	209.000	208.040	0.960	0.9798	100.000	3.89E+00	7.80E-01	1.23E-01	3.35E-02	5.31E-01
PU-244	4589.00	4498.27	0.000	1.000	0.040	0.960	0.9798	99.900	7.48E-04	5.55E-02	1.23E-01	3.36E-02	5.54E-02



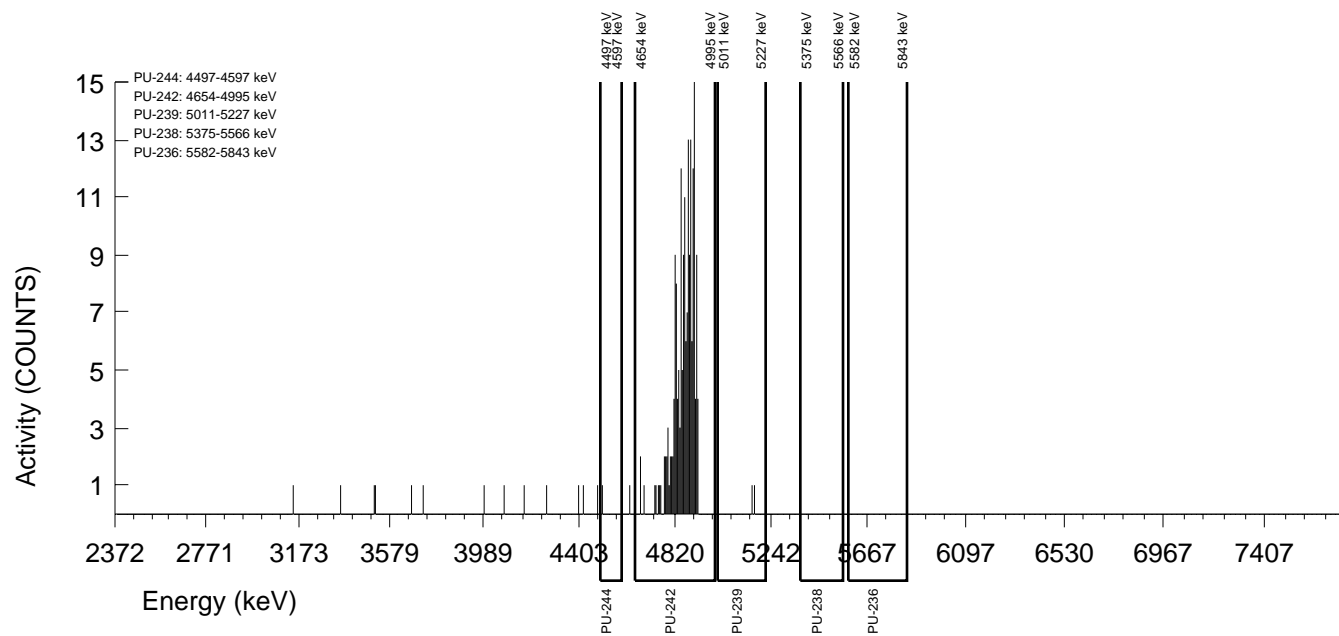
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235033_PU SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 70.2 +/-7.583 %	CHAMBER : 256 DETECTOR S/N : 87944 AVERAGE %EFFICIENCY : 25.7507 AVERAGE %EFF ERROR : 0.4991 COUNT DATE : 24-Sep-2016 20:51:11 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B256.CNF;460 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W256.CNF;114 CAL DATE : 19-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.0757E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.27	0.000	0.000	-0.480	0.480	0.6928	100.000	-1.21E-02	5.36E-02	1.39E-01	3.19E-02	5.34E-02
PU-238	5486.00	5470.36	0.000	0.000	-0.720	0.720	0.8485	99.900	-1.49E-02	4.51E-02	1.26E-01	3.22E-02	4.50E-02
PU-239	5155.00	5167.96	14.866	2.000	1.040	0.960	0.9798	99.900	2.14E-02	7.31E-02	1.35E-01	3.69E-02	7.30E-02
PU-242	4890.00	4863.70	92.169	192.000	190.080	1.920	1.3856	100.000	3.90E+00	8.20E-01	1.66E-01	5.21E-02	5.60E-01
PU-244	4589.00	4506.88	4.955	1.000	0.520	0.480	0.6928	99.900	1.07E-02	5.95E-02	1.14E-01	2.61E-02	5.94E-02



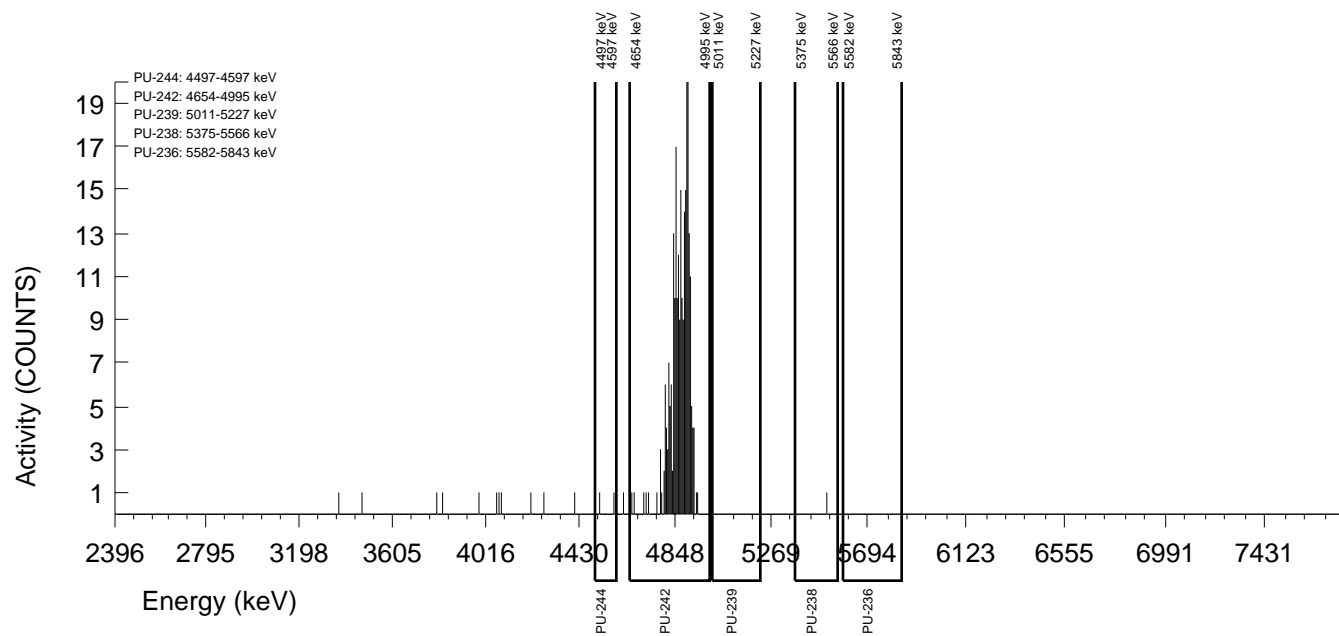
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235034_PU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 96.6 +/-6.572 %	CHAMBER : 233 DETECTOR S/N : 87921 AVERAGE %EFFICIENCY : 25.2931 AVERAGE %EFF ERROR : 0.4905 COUNT DATE : 24-Sep-2016 20:54:08 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B233.CNF;454 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W233.CNF;117 CAL DATE : 19-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 4.2344E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.28	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	3.74E-02	5.55E-02	0.00E+00	3.73E-02
PU-238	5486.00	5512.84	4.971	1.000	0.760	0.240	0.4899	99.900	1.16E-02	4.34E-02	7.29E-02	1.36E-02	4.33E-02
PU-239	5155.00	5118.71	0.000	0.000	-0.480	0.480	0.6928	99.900	-7.25E-03	3.21E-02	8.37E-02	1.92E-02	3.21E-02
PU-242	4890.00	4869.83	71.772	258.000	257.040	0.960	0.9798	100.000	3.88E+00	7.06E-01	9.94E-02	2.71E-02	4.76E-01
PU-244	4589.00	4532.12	0.000	3.000	3.000	0.000	0.0000	99.900	4.53E-02	5.99E-02	4.53E-02	0.00E+00	5.96E-02



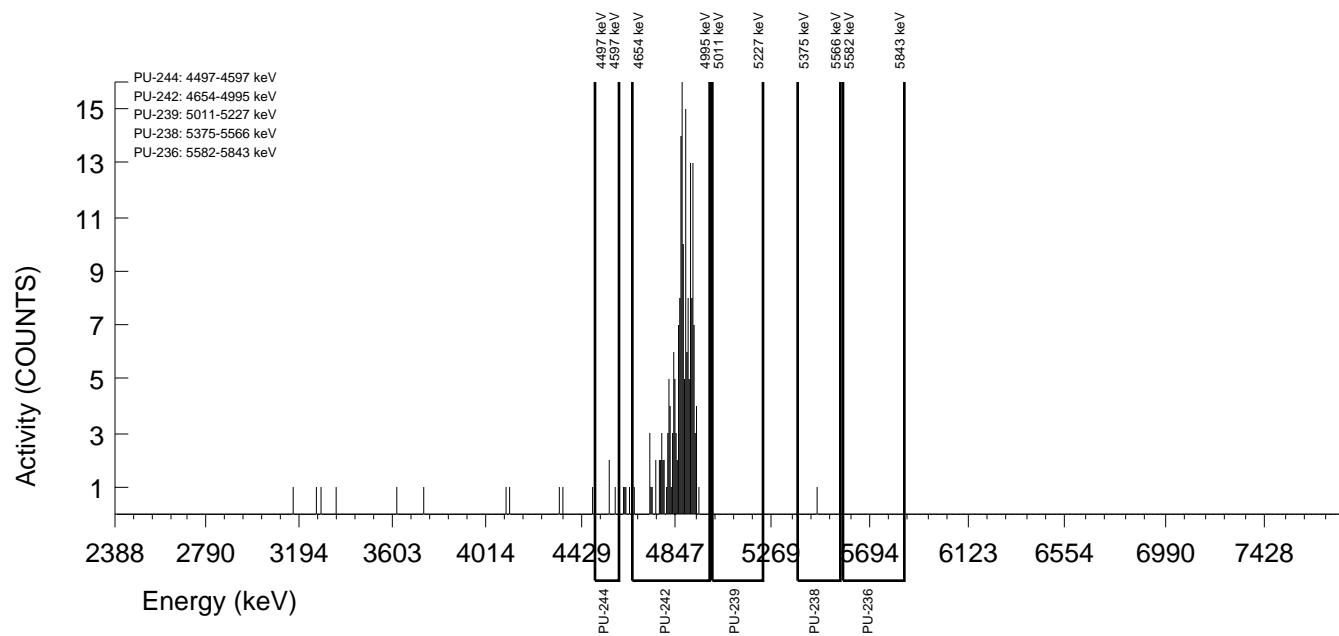
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235035_PU SAMPLE QTY : 0.516 G +/-0.194 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 74.6 +/-7.460 %	CHAMBER : 234 DETECTOR S/N : 87922 AVERAGE %EFFICIENCY : 24.8037 AVERAGE %EFF ERROR : 0.4811 COUNT DATE : 24-Sep-2016 20:54:11 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B234.CNF;454 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W234.CNF;117 CAL DATE : 19-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.2717E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.30	0.000	0.000	-0.480	0.480	0.6928	100.000	-1.16E-02	5.13E-02	1.33E-01	3.06E-02	5.11E-02
PU-238	5486.00	5465.26	4.996	1.000	-0.440	1.440	1.2000	99.900	-8.71E-03	6.02E-02	1.46E-01	4.35E-02	6.02E-02
PU-239	5155.00	5226.77	0.000	1.000	-0.920	1.920	1.3856	99.900	-1.81E-02	6.12E-02	1.59E-01	4.99E-02	6.12E-02
PU-242	4890.00	4870.16	59.123	195.000	194.760	0.240	0.4899	100.000	3.83E+00	7.91E-01	9.42E-02	1.76E-02	5.39E-01
PU-244	4589.00	4562.94	4.996	3.000	3.000	0.000	0.0000	99.900	5.90E-02	7.82E-02	5.90E-02	0.00E+00	7.76E-02



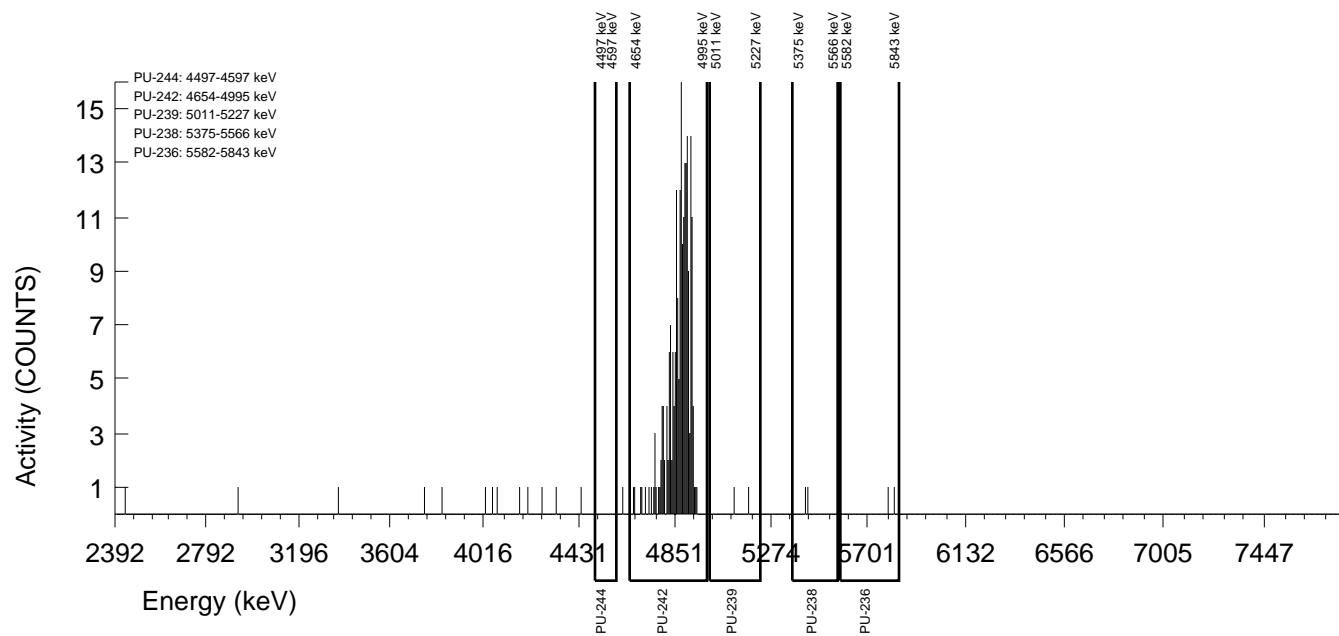
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235036_PU SAMPLE QTY : 0.518 G +/-0.193 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 84.6 +/-7.054 %	CHAMBER : 235 DETECTOR S/N : 87923 AVERAGE %EFFICIENCY : 24.7991 AVERAGE %EFF ERROR : 0.4811 COUNT DATE : 24-Sep-2016 20:54:13 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B235.CNF;455 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W235.CNF;118 CAL DATE : 19-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.7098E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5805.53	29.867	2.000	0.800	1.200	1.0954	100.000	1.69E-02	7.59E-02	1.48E-01	4.25E-02	7.59E-02
PU-238	5486.00	5433.55	14.933	2.000	1.280	0.720	0.8485	99.900	2.23E-02	6.14E-02	1.06E-01	2.70E-02	6.13E-02
PU-239	5155.00	5146.52	64.712	2.000	1.040	0.960	0.9798	99.900	1.80E-02	6.15E-02	1.14E-01	3.10E-02	6.14E-02
PU-242	4890.00	4871.68	70.163	222.000	220.800	1.200	1.0954	100.000	3.81E+00	7.45E-01	1.21E-01	3.46E-02	5.06E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.240	0.240	0.4899	99.900	-4.15E-03	3.59E-02	8.29E-02	1.55E-02	3.58E-02



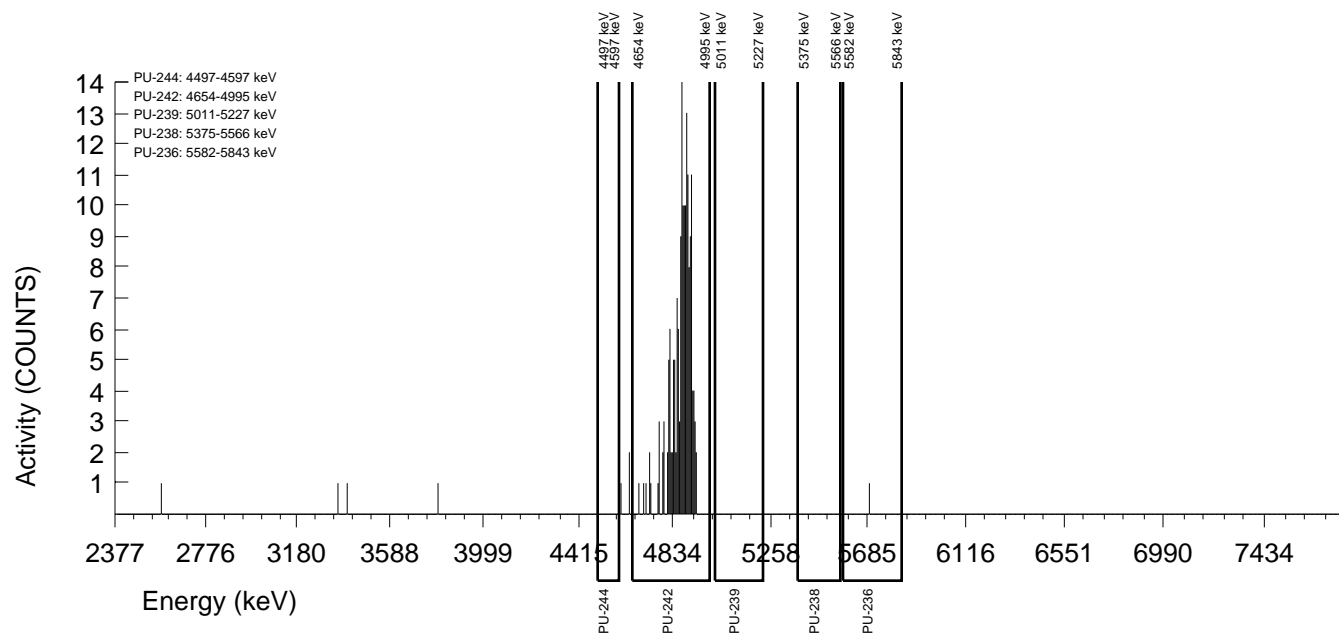
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235037_PU SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 67.4 +/-7.820 %	CHAMBER : 255 DETECTOR S/N : 87943 AVERAGE %EFFICIENCY : 24.9747 AVERAGE %EFF ERROR : 0.4844 COUNT DATE : 26-Sep-2016 13:55:05 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B255.CNF;460 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W255.CNF;120 CAL DATE : 19-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 2.9537E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5695.60	4.972	1.000	0.520	0.480	0.6928	100.000	1.40E-02	7.79E-02	1.49E-01	3.42E-02	7.78E-02
PU-238	5486.00	5470.35	0.000	0.000	-0.720	0.720	0.8485	99.900	-1.60E-02	4.84E-02	1.36E-01	3.45E-02	4.83E-02
PU-239	5155.00	5118.70	0.000	0.000	-1.680	1.680	1.2961	99.900	-3.71E-02	5.24E-02	1.71E-01	5.24E-02	5.23E-02
PU-242	4890.00	4866.83	49.244	178.000	177.040	0.960	0.9798	100.000	3.90E+00	8.45E-01	1.45E-01	3.96E-02	5.78E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.960	0.960	0.9798	99.900	-2.12E-02	4.92E-02	1.45E-01	3.96E-02	4.91E-02



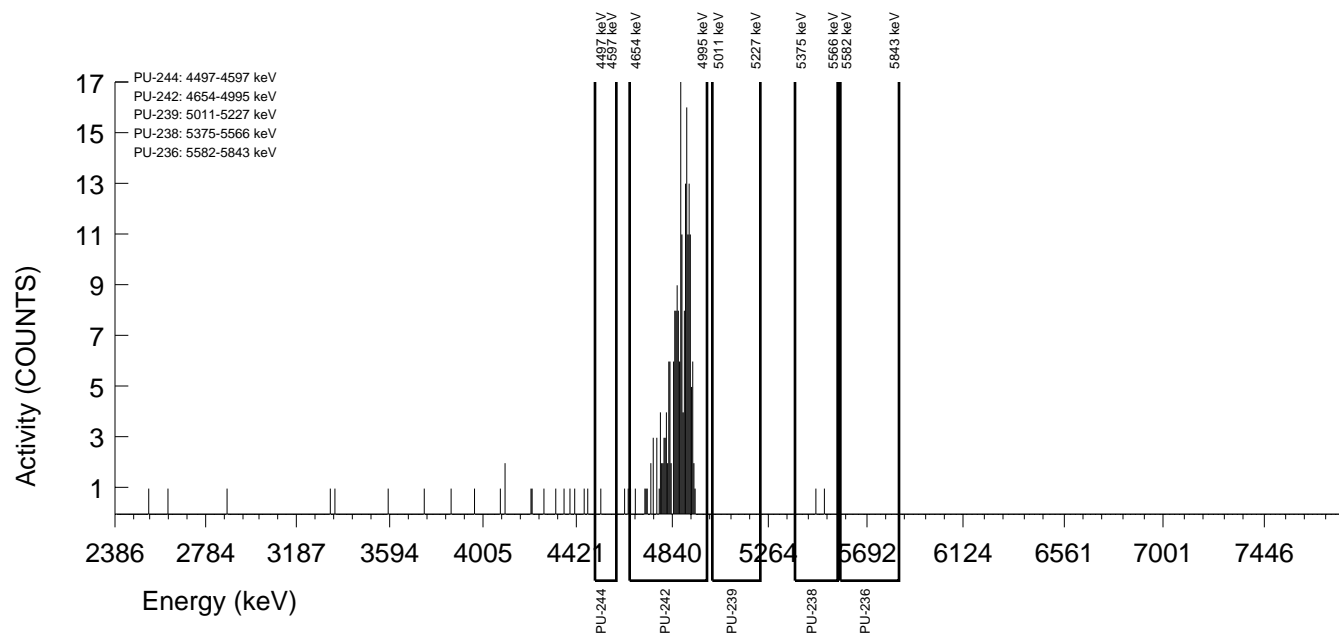
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235038_PU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 76.4 +/-7.215 %	CHAMBER : 238 DETECTOR S/N : 87926 AVERAGE %EFFICIENCY : 26.1325 AVERAGE %EFF ERROR : 0.5062 COUNT DATE : 24-Sep-2016 20:54:18 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B238.CNF;455 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W238.CNF;125 CAL DATE : 19-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.3490E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	-0.240	0.240	0.4899	100.000	-5.50E-03	4.75E-02	1.10E-01	2.05E-02	4.74E-02
PU-238	5486.00	5490.86	39.647	2.000	1.520	0.480	0.6928	99.900	2.87E-02	6.61E-02	1.05E-01	2.40E-02	6.60E-02
PU-239	5155.00	5118.69	0.000	0.000	-0.480	0.480	0.6928	99.900	-9.02E-03	4.00E-02	1.04E-01	2.38E-02	3.99E-02
PU-242	4890.00	4867.80	59.058	211.000	210.040	0.960	0.9798	100.000	3.94E+00	7.88E-01	1.24E-01	3.37E-02	5.36E-01
PU-244	4589.00	4525.12	4.956	1.000	1.000	0.000	0.0000	99.900	1.88E-02	5.29E-02	5.63E-02	0.00E+00	5.28E-02



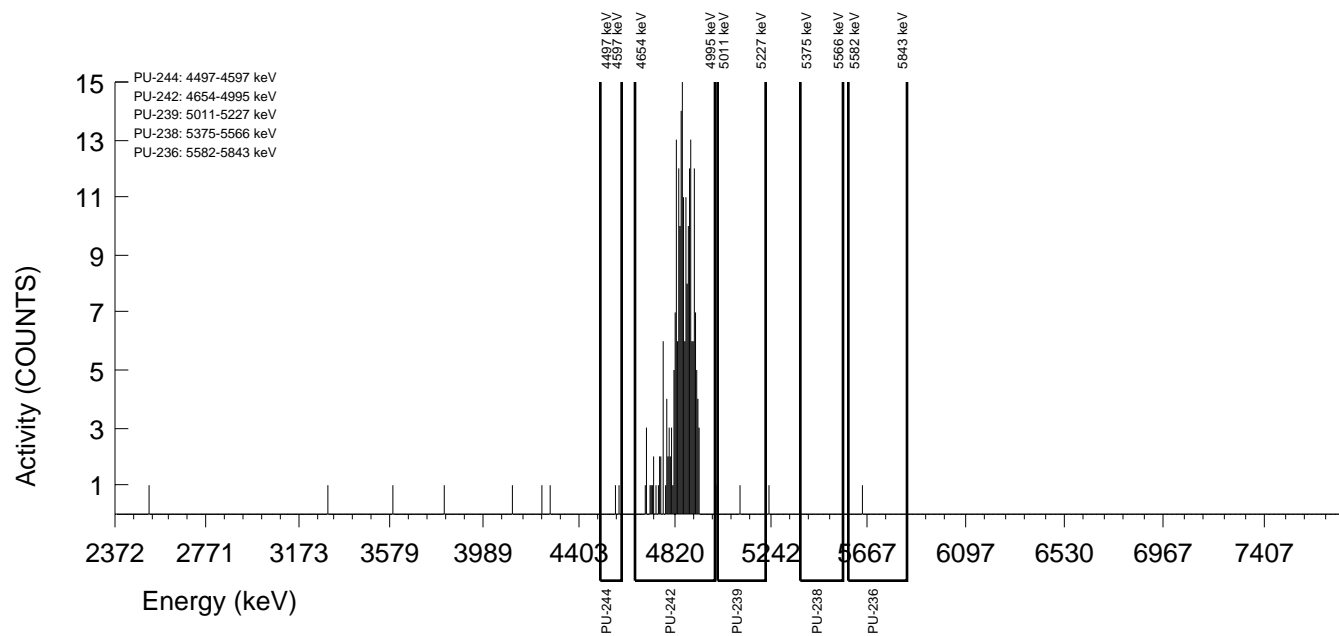
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235039_PU SAMPLE QTY : 0.512 G +/-0.195 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 85.3 +/-6.918 %	CHAMBER : 256 DETECTOR S/N : 87944 AVERAGE %EFFICIENCY : 25.7507 AVERAGE %EFF ERROR : 0.4991 COUNT DATE : 26-Sep-2016 13:55:07 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B256.CNF;460 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W256.CNF;114 CAL DATE : 19-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.7391E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5646.01	4.955	1.000	0.520	0.480	0.6928	100.000	1.06E-02	5.90E-02	1.13E-01	2.59E-02	5.89E-02
PU-238	5486.00	5470.36	0.000	0.000	-0.720	0.720	0.8485	99.900	-1.21E-02	3.66E-02	1.03E-01	2.61E-02	3.66E-02
PU-239	5155.00	5109.87	4.955	1.000	0.040	0.960	0.9798	99.900	6.68E-04	4.96E-02	1.10E-01	3.00E-02	4.95E-02
PU-242	4890.00	4854.54	83.332	233.000	231.080	1.920	1.3856	100.000	3.86E+00	7.39E-01	1.35E-01	4.24E-02	5.01E-01
PU-244	4589.00	4572.03	19.821	2.000	1.520	0.480	0.6928	99.900	2.54E-02	5.84E-02	9.25E-02	2.12E-02	5.83E-02



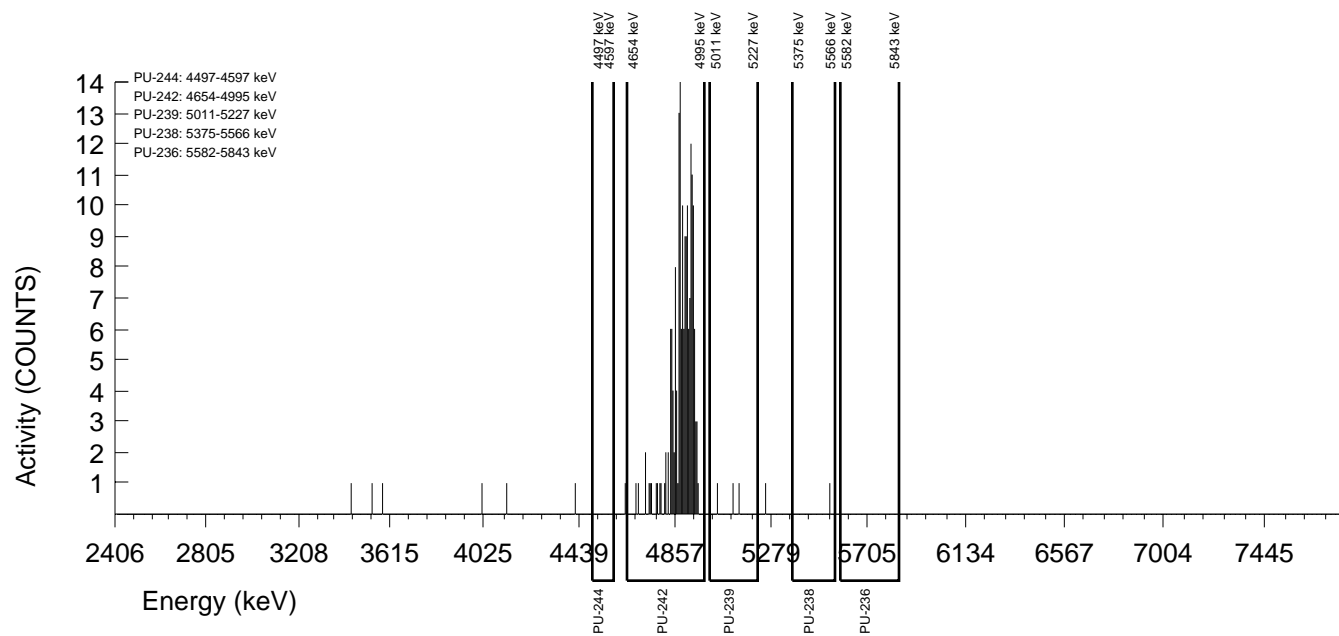
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S0405235040_PU SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 66.9 +/-7.707 %	CHAMBER : 241 DETECTOR S/N : 87963 AVERAGE %EFFICIENCY : 25.9137 AVERAGE %EFF ERROR : 0.5022 COUNT DATE : 24-Sep-2016 20:54:22 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B241.CNF;455 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W241.CNF;131 CAL DATE : 19-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 2.9309E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.28	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	5.19E-02	7.70E-02	0.00E+00	5.17E-02
PU-238	5486.00	5539.52	4.964	1.000	-0.200	1.200	1.0954	99.900	-4.24E-03	6.37E-02	1.49E-01	4.25E-02	6.36E-02
PU-239	5155.00	5101.30	94.325	3.000	2.760	0.240	0.4899	99.900	5.81E-02	8.42E-02	1.01E-01	1.89E-02	8.37E-02
PU-242	4890.00	4891.22	79.018	183.000	182.280	0.720	0.8485	100.000	3.83E+00	8.18E-01	1.28E-01	3.27E-02	5.60E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.240	0.240	0.4899	99.900	-5.05E-03	4.37E-02	1.01E-01	1.89E-02	4.36E-02



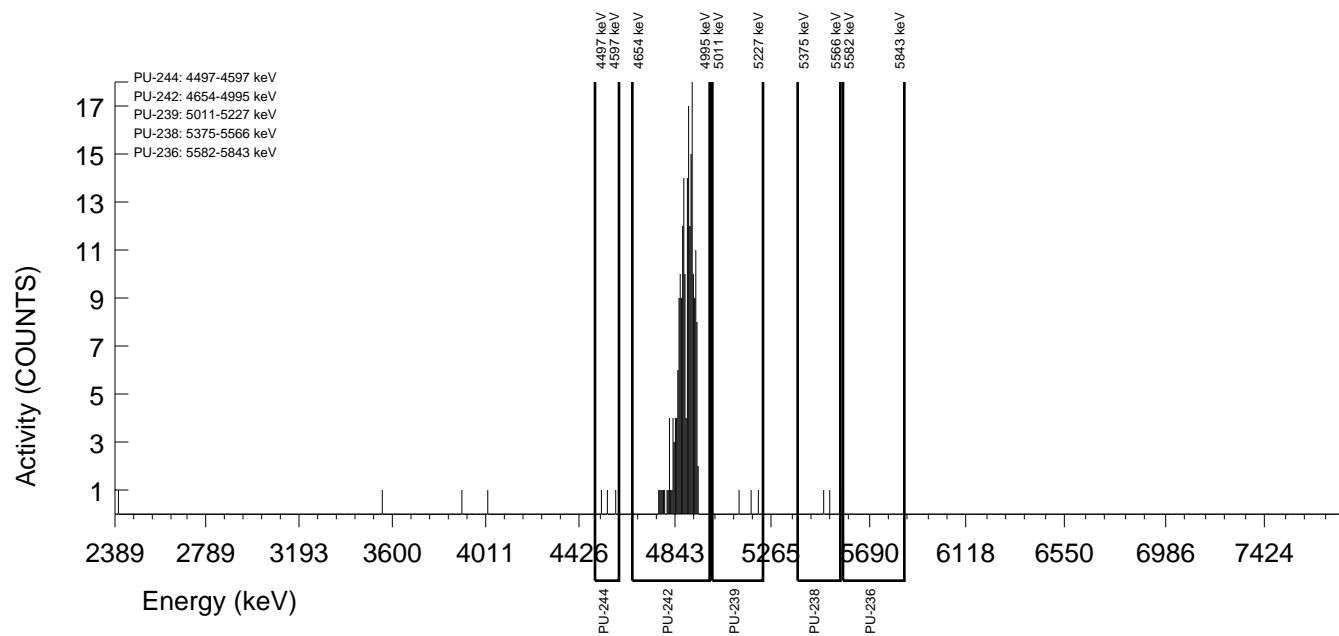
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S1203621718_PU SAMPLE QTY : 0.518 G +/-0.193 % SAMPLE DATE : 21-Sep-2016 00:00:00 ANALYST : MXS2 % YIELD : 83.2 +/-7.117 %	CHAMBER : 243 DETECTOR S/N : 87931 AVERAGE %EFFICIENCY : 24.8977 AVERAGE %EFF ERROR : 0.4829 COUNT DATE : 24-Sep-2016 20:54:24 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B243.CNF;455 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W243.CNF;118 CAL DATE : 19-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.6456E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.29	0.000	0.000	-0.960	0.960	0.9798	100.000	-1.68E-02	3.91E-02	1.16E-01	3.15E-02	3.90E-02
PU-238	5486.00	5526.42	0.000	3.000	-2.760	5.760	2.4000	99.900	-4.83E-02	8.01E-02	2.07E-01	7.70E-02	8.01E-02
PU-239	5155.00	5167.95	84.671	3.000	2.520	0.480	0.6928	99.900	4.41E-02	7.04E-02	9.70E-02	2.22E-02	7.01E-02
PU-242	4890.00	4887.31	73.049	220.000	217.840	2.160	1.4697	100.000	3.81E+00	7.51E-01	1.47E-01	4.71E-02	5.10E-01
PU-244	4589.00	4548.84	64.748	3.000	2.760	0.240	0.4899	99.900	4.83E-02	7.00E-02	8.40E-02	1.57E-02	6.96E-02



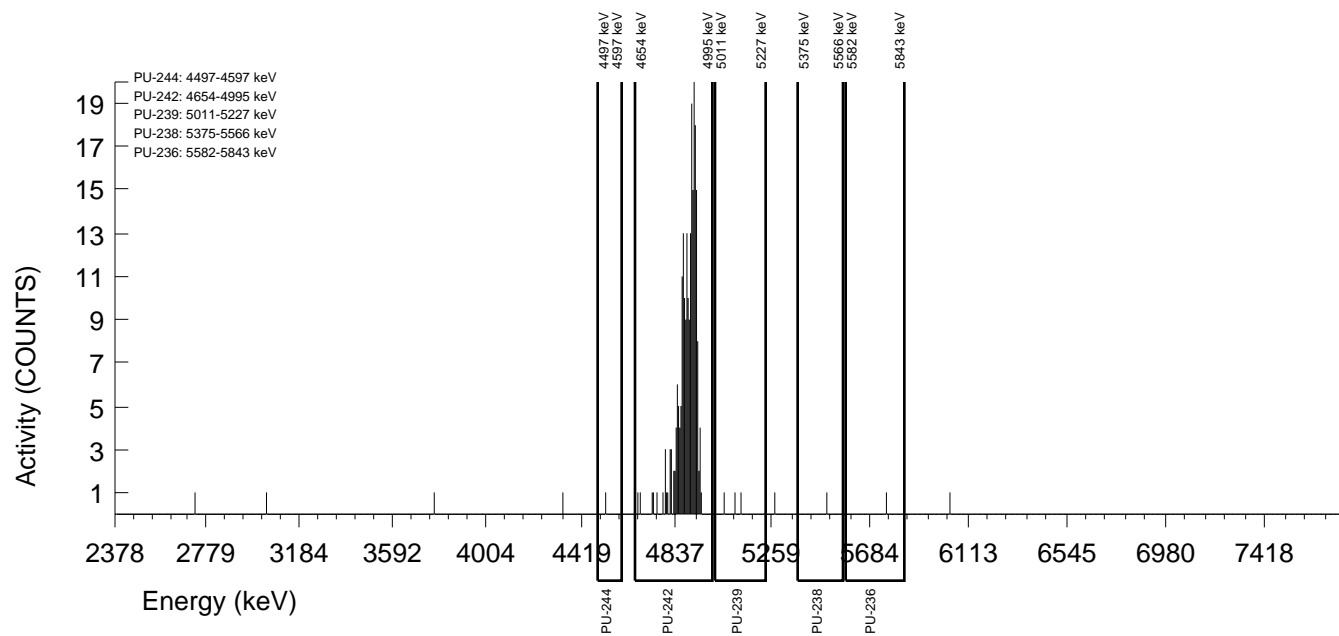
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S1203621719_PU SAMPLE QTY : 0.508 G +/-0.197 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 93.5 +/-6.885 %	CHAMBER : 244 DETECTOR S/N : 87932 AVERAGE %EFFICIENCY : 23.7184 AVERAGE %EFF ERROR : 0.4607 COUNT DATE : 24-Sep-2016 20:54:26 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B244.CNF;455 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W244.CNF;112 CAL DATE : 19-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 4.0988E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5759.03	4.999	1.000	-0.200	1.200	1.0954	100.000	-4.04E-03	6.08E-02	1.42E-01	4.06E-02	6.07E-02
PU-238	5486.00	5497.91	4.999	1.000	0.280	0.720	0.8485	99.900	4.70E-03	4.92E-02	1.03E-01	2.61E-02	4.91E-02
PU-239	5155.00	5088.35	74.978	3.000	1.560	1.440	1.2000	99.900	2.60E-02	6.87E-02	1.23E-01	3.67E-02	6.86E-02
PU-242	4890.00	4886.10	64.386	235.000	233.320	1.680	1.2961	100.000	3.89E+00	7.41E-01	1.29E-01	3.95E-02	5.02E-01
PU-244	4589.00	4528.60	4.999	1.000	1.000	0.000	0.0000	99.900	1.67E-02	4.69E-02	5.00E-02	0.00E+00	4.69E-02



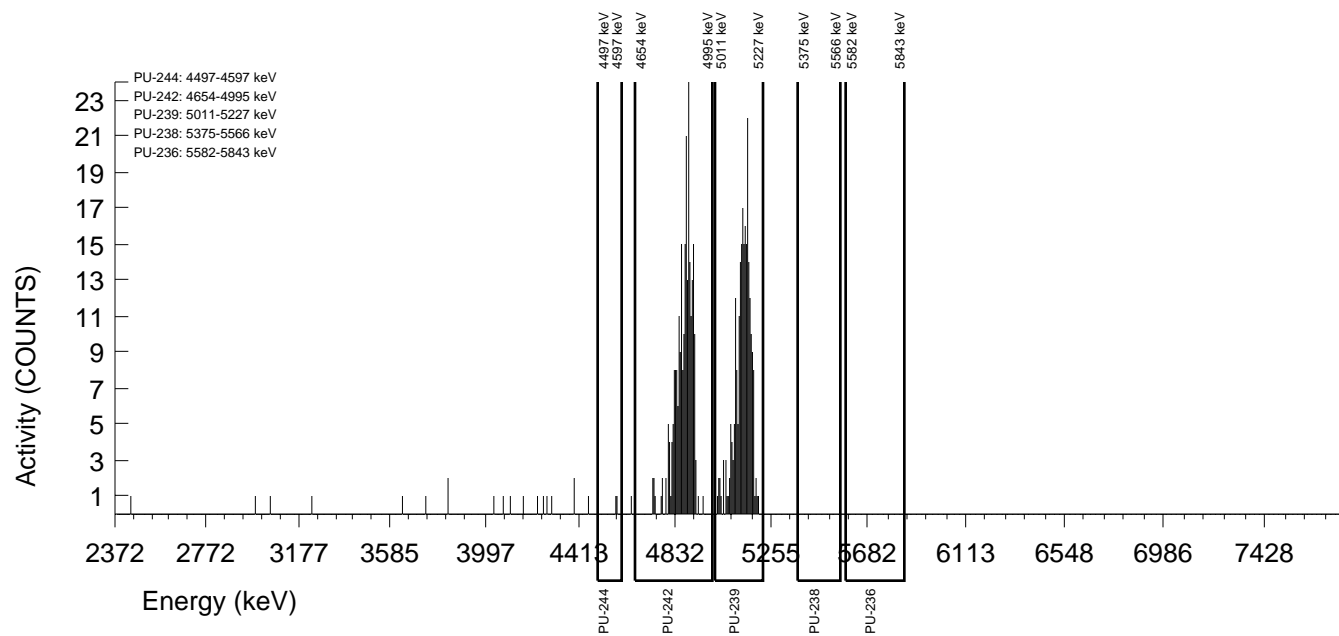
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596400 SAMPLE ID : S1203621720_PU SAMPLE QTY : 0.518 G +/-0.193 % SAMPLE DATE : 21-Sep-2016 00:00:00 ANALYST : MXS2 % YIELD : 89.2 +/-6.637 %	CHAMBER : 226 DETECTOR S/N : 87914 AVERAGE %EFFICIENCY : 26.8347 AVERAGE %EFF ERROR : 0.5195 COUNT DATE : 24-Sep-2016 20:54:04 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B226.CNF;460 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W226.CNF;122 CAL DATE : 16-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.9097E+00 dpm	LCS ID : 0338-MM NUCLIDE : PU-239 NOMINAL (pCi/G) : 3.8148E+00 % RECOVERY : 95.550	

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.28	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	3.07E-02	4.55E-02	0.00E+00	3.06E-02
PU-238	5486.00	5470.36	0.000	0.000	-0.720	0.720	0.8485	99.900	-1.09E-02	3.30E-02	9.26E-02	2.36E-02	3.29E-02
PU-239	5155.00	5132.53	63.008	242.000	240.560	1.440	1.2000	99.900	3.65E+00	6.77E-01	1.12E-01	3.33E-02	4.63E-01
PU-242	4890.00	4873.48	55.319	253.000	251.800	1.200	1.0954	100.000	3.81E+00	7.01E-01	1.06E-01	3.04E-02	4.73E-01
PU-244	4589.00	4577.39	9.967	2.000	1.760	0.240	0.4899	99.900	2.67E-02	5.25E-02	7.27E-02	1.36E-02	5.24E-02



Batch# 1596393 Product: Pu Date: 9/30/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			ND
Samples have been blank corrected (if required). Blank correction reported included (if required).			ND
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	Delta 1563222
Sample was correctly preserved if required.			ND
Smears Taken for Radioactive batches.			ND
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			ND
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			ND
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		Delta 1563222
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		Delta 1563222
Aliquot Correction completed if required.			ND
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: M. Davis 9/30/16

Secondary Review Performed By: Jessie Davis 10/02/16

10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 30-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Pu-11-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596393	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Other Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, and 1203621701 were received and analyzed out of holding.</p> <p>2.. Sample 1203621701 does not meet the resolution requirement of having a full width half maximum of 100 keV or less for the Pu-242 tracer.</p>		<p>1. Reporting results.</p> <p>2. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.</p>	

Originator's Name:

Melanie Aycock 30-SEP-16

Data Validator/Group Leader:

Jessica Davis 02-OCT-16

Plutonium Queue Sheet

PV

07-SEP-16

Batch #: 1596393 Analyst: JXH2 First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16
 Tracer Isotope(s): Pu-242/Pu-236 Tracer Code: 1770-A Expiration Date: 8-3-17 Analyzed Sequentially with:
 LCS Isotope(s): Pu-239/Pu-238 LCS Code: 0338-MJA Expiration Date: 7-20-17 U: 1596389
 Spike Isotope(s): Pu-239/Pu-238 Spike Code: Expiration Date: V: 1596390
 Prep Date: 9-26-16 Initials: JEH Pipet ID: 1840022 Balance ID: 16107662 Witness: KB 9-26-16

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g) (l/f)	Pu Det #
405235001-1	4.1.B.R.1.2	SAMPLE	1 pCi/g		SOIL	MJWC001	10-DEC-15	1	1	0.501	103
405235002-1	4.1.B.R.1.3	SAMPLE	1 pCi/g		SOIL	MJWC001	10-DEC-15	2	2	0.505	104
405235003-1	4.1.B.R.1.4	SAMPLE	1 pCi/g		SOIL	MJWC001	10-DEC-15	3	3	0.501	105
405235004-1	4.1.B.R.7.2	SAMPLE	1 pCi/g		SOIL	MJWC001	09-DEC-15	4	4	0.502	106
405235005-1	4.1.C.R.1.3	SAMPLE	1 pCi/g		SOIL	MJWC001	10-DEC-15	5	5	0.503	107
405235006-1	4.1.C.R.1.4	SAMPLE	1 pCi/g		SOIL	MJWC001	10-DEC-15	6	6	0.501	108
405235007-1	4.1.C.R.2.3	SAMPLE	1 pCi/g		SOIL	MJWC001	10-DEC-15	7	7	0.501	109
405235008-1	4.1.C.R.2.4	SAMPLE	1 pCi/g		SOIL	MJWC001	10-DEC-15	8	8	0.503	110
405235009-1	4.1.D.R.1.3	SAMPLE	1 pCi/g		SOIL	MJWC001	10-DEC-15	9	9	0.504	112
405235010-1	4.1.D.R.1.4	SAMPLE	1 pCi/g		SOIL	MJWC001	10-DEC-15	10	10	0.501	210
405235011-1	4.1.D.R.3.2	SAMPLE	1 pCi/g		SOIL	MJWC001	09-DEC-15	11	11	0.500	212
405235012-1	4.1.D.R.2.4	SAMPLE	1 pCi/g		SOIL	MJWC001	10-DEC-15	12	12	0.506	213
405235013-1	4.2.A.R.2.3	SAMPLE	1 pCi/g		SOIL	MJWC001	08-DEC-15	13	13	0.500	214
405235014-1	4.2.A.R.1.3	SAMPLE	1 pCi/g		SOIL	MJWC001	08-DEC-15	14	14	0.502	218
405235015-1	4.2.A.R.1.4	SAMPLE	1 pCi/g		SOIL	MJWC001	08-DEC-15	15	15	0.509	219
405235016-1	4.2.A.R.2.4	SAMPLE	1 pCi/g		SOIL	MJWC001	08-DEC-15	16	16	0.501	220
405235017-1	4.2.A.R.3.2	SAMPLE	1 pCi/g		SOIL	MJWC001	02-DEC-15	17	17	0.501	221
405235018-1	4.2.A.R.4.2	SAMPLE	1 pCi/g		SOIL	MJWC001	02-DEC-15	18	18	0.500	223
405235019-1	4.2.B.R.2.4	SAMPLE	1 pCi/g		SOIL	MJWC001	08-DEC-15	19	19	0.506	224
405235020-1	4.2.B.R.1.4	SAMPLE	1 pCi/g		SOIL	MJWC001	08-DEC-15	20	20	0.502	226
1203621700-1	MB for batch 1596393	MB	1 pCi/g		QC ACCOUNT	QC ACCOUNT		21	21	0.509	227
1203621701-1	4.1.B.R.1.2(405235001DUP)	DUP	1 pCi/g		SOIL	QC ACCOUNT	10-DEC-15	22	22	0.500	228
1203621702-1	LCS for batch 1596393	LCS	1 pCi/g		SOIL	QC ACCOUNT		23	23	0.509	233

Choose SOP Used: GL-RAD-A-011 GL-RAD-A-036, Solid Sample Dissolution by: LEACH or DIGESTION
 GL-RAD-A-053
 Circle One

Data Reviewed By: M. Landry
 Page: 1 of 1

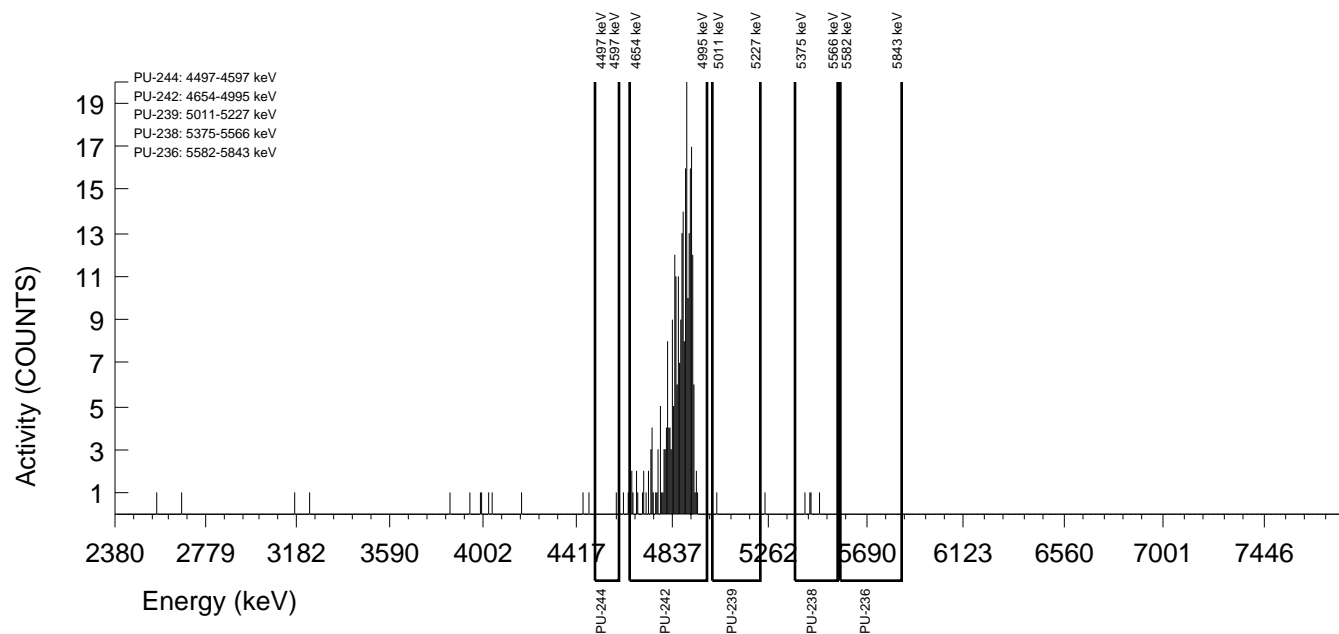
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235001_PU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 78.4 +/-6.316 %	CHAMBER : 103 DETECTOR S/N : 79461 AVERAGE %EFFICIENCY : 33.8848 AVERAGE %EFF ERROR : 0.6527 COUNT DATE : 29-Sep-2016 09:18:29 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : PU BKG FILE : B103.CNF;1414 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W103.CNF;395 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.4371E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	-0.960	0.960	0.9798	100.000	-1.65E-02	3.82E-02	1.13E-01	3.08E-02	3.81E-02
PU-238	5486.00	5450.04	64.506	4.000	2.560	1.440	1.2000	99.900	3.64E-02	6.49E-02	1.05E-01	3.12E-02	6.47E-02
PU-239	5155.00	5033.19	4.962	1.000	-0.440	1.440	1.2000	99.900	-6.21E-03	4.29E-02	1.04E-01	3.10E-02	4.29E-02
PU-242	4890.00	4865.40	77.502	280.000	279.520	0.480	0.6928	100.000	3.94E+00	6.89E-01	7.81E-02	1.79E-02	4.63E-01
PU-244	4589.00	4590.17	4.962	1.000	1.000	0.000	0.0000	99.900	1.41E-02	3.97E-02	4.23E-02	0.00E+00	3.97E-02



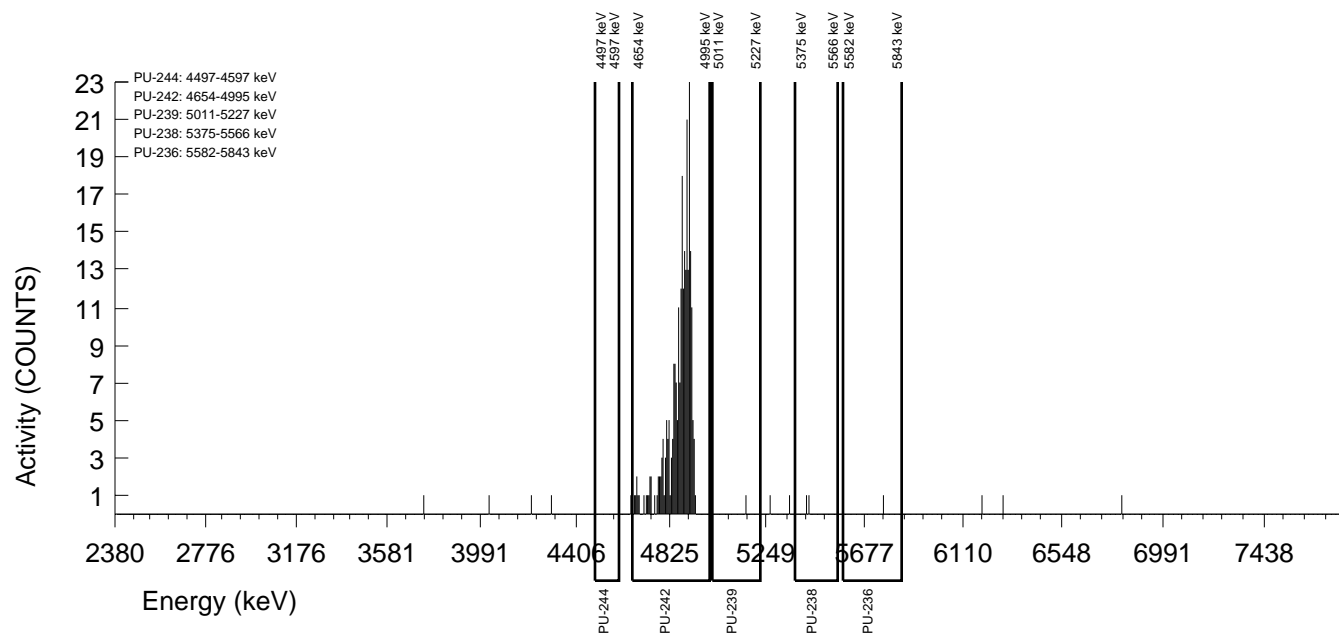
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235002_PU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 76.4 +/-6.541 %	CHAMBER : 104 DETECTOR S/N : 80011 AVERAGE %EFFICIENCY : 32.4069 AVERAGE %EFF ERROR : 0.6248 COUNT DATE : 29-Sep-2016 09:18:29 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : PU BKG FILE : B104.CNF;1399 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W104.CNF;386 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.3470E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5763.53	4.919	1.000	0.280	0.720	0.8485	100.000	5.11E-03	5.35E-02	1.12E-01	2.84E-02	5.35E-02
PU-238	5486.00	5430.31	14.757	2.000	1.280	0.720	0.8485	99.900	1.94E-02	5.34E-02	9.24E-02	2.35E-02	5.33E-02
PU-239	5155.00	5158.31	4.919	1.000	-0.440	1.440	1.2000	99.900	-6.61E-03	4.57E-02	1.11E-01	3.30E-02	4.57E-02
PU-242	4890.00	4865.77	43.943	262.000	260.320	1.680	1.2961	100.000	3.91E+00	7.08E-01	1.16E-01	3.57E-02	4.78E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.720	0.720	0.8485	99.900	-1.08E-02	3.27E-02	9.18E-02	2.34E-02	3.27E-02



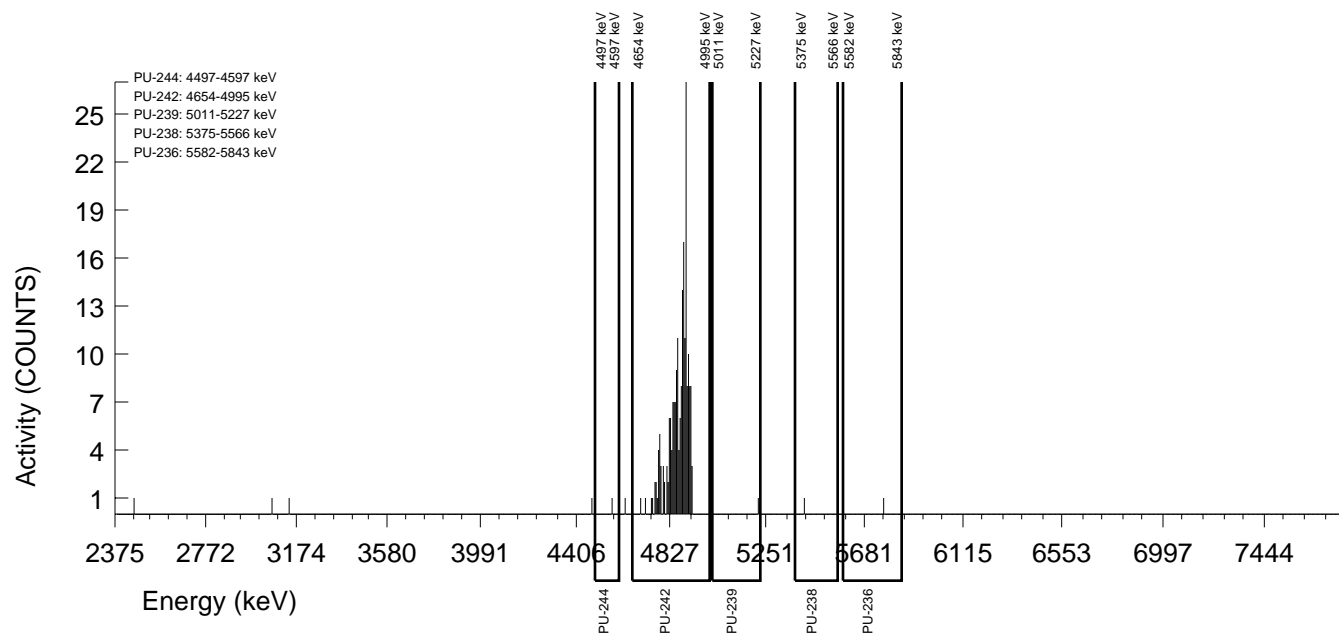
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235003_PU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 59.5 +/-7.223 %	CHAMBER : 105 DETECTOR S/N : 78777 AVERAGE %EFFICIENCY : 33.6886 AVERAGE %EFF ERROR : 0.6490 COUNT DATE : 29-Sep-2016 09:18:29 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : PU BKG FILE : B105.CNF;1398 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W105.CNF;364 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 2.6077E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5767.11	4.933	1.000	-0.680	1.680	1.2961	100.000	-1.55E-02	7.00E-02	1.76E-01	5.40E-02	6.99E-02
PU-238	5486.00	5417.13	4.933	1.000	0.040	0.960	0.9798	99.900	7.53E-04	5.59E-02	1.24E-01	3.38E-02	5.58E-02
PU-239	5155.00	5213.95	4.933	1.000	0.040	0.960	0.9798	99.900	7.48E-04	5.55E-02	1.23E-01	3.36E-02	5.55E-02
PU-242	4890.00	4861.02	18.714	213.000	210.840	2.160	1.4697	100.000	3.94E+00	7.88E-01	1.57E-01	5.03E-02	5.37E-01
PU-244	4589.00	4568.67	4.933	1.000	0.040	0.960	0.9798	99.900	7.48E-04	5.55E-02	1.23E-01	3.36E-02	5.55E-02



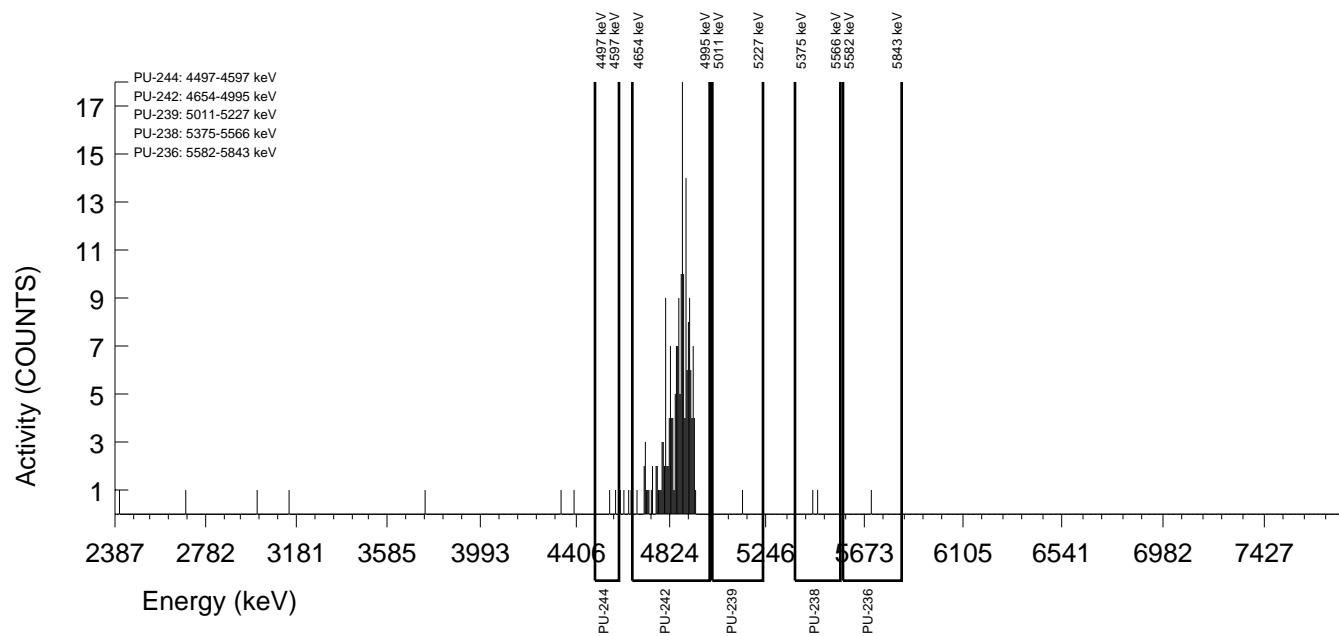
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235004_PU SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 09-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 56.3 +/-7.505 %	CHAMBER : 106 DETECTOR S/N : 80012 AVERAGE %EFFICIENCY : 32.6615 AVERAGE %EFF ERROR : 0.6296 COUNT DATE : 29-Sep-2016 09:18:29 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : PU BKG FILE : B106.CNF;1398 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W106.CNF;363 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 2.4693E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5705.53	4.904	1.000	0.760	0.240	0.4899	100.000	1.88E-02	7.06E-02	1.19E-01	2.22E-02	7.05E-02
PU-238	5486.00	5459.31	24.521	2.000	-1.120	3.120	1.7664	99.900	-2.29E-02	7.83E-02	1.94E-01	6.62E-02	7.83E-02
PU-239	5155.00	5140.44	4.904	1.000	0.520	0.480	0.6928	99.900	1.06E-02	5.88E-02	1.13E-01	2.58E-02	5.88E-02
PU-242	4890.00	4854.84	23.663	195.000	193.560	1.440	1.2000	100.000	3.93E+00	8.18E-01	1.50E-01	4.47E-02	5.58E-01
PU-244	4589.00	4570.39	29.425	2.000	1.760	0.240	0.4899	99.900	3.58E-02	7.06E-02	9.75E-02	1.83E-02	7.04E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

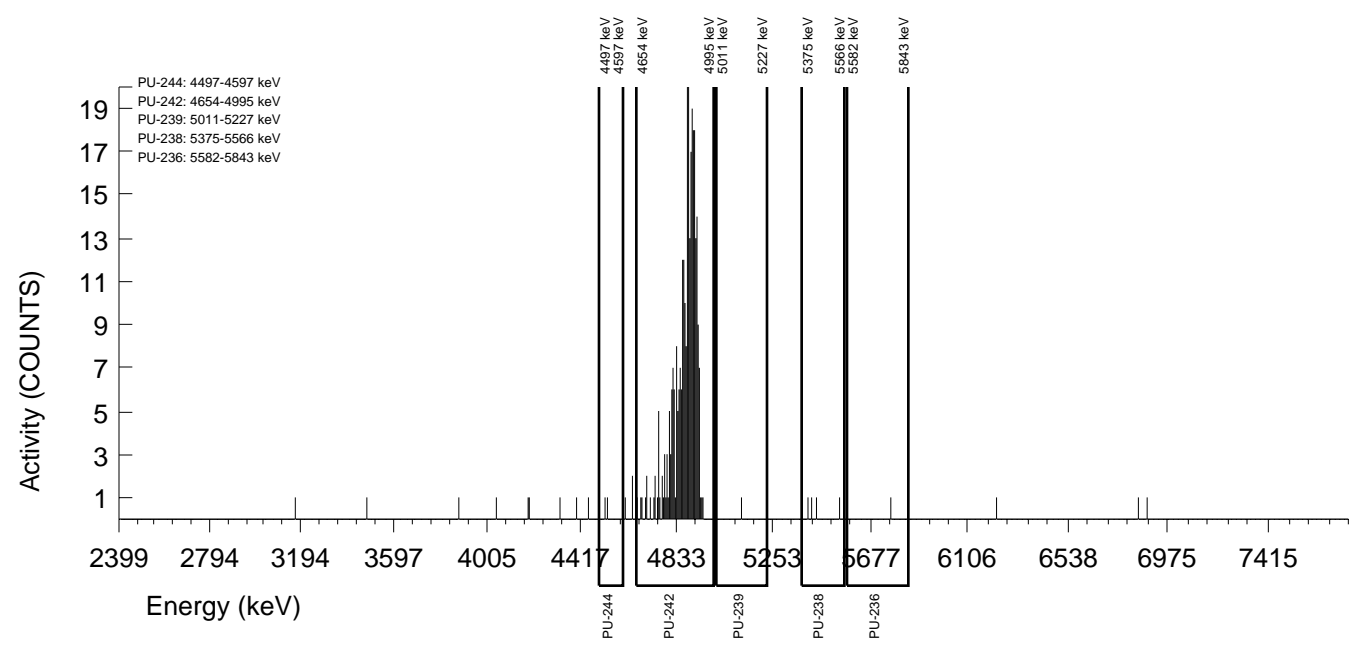
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235005_PU SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 93.2 +/-6.114 %	CHAMBER : 107 DETECTOR S/N : 67578 AVERAGE %EFFICIENCY : 30.7195 AVERAGE %EFF ERROR : 0.5929 COUNT DATE : 29-Sep-2016 09:18:30 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : PU BKG FILE : B107.CNF;1439 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W107.CNF;426 CAL DATE : 06-Sep-2016
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TRACER
ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 4.0832E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5767.98	4.917	1.000	-0.200	1.200	1.0954	100.000	-3.17E-03	4.76E-02	1.11E-01	3.18E-02	4.76E-02
PU-238	5486.00	5439.25	157.348	5.000	3.560	1.440	1.2000	99.900	4.68E-02	6.54E-02	9.72E-02	2.89E-02	6.51E-02
PU-239	5155.00	5116.13	4.917	1.000	0.520	0.480	0.6928	99.900	6.79E-03	3.77E-02	7.23E-02	1.66E-02	3.77E-02
PU-242	4890.00	4868.26	64.578	302.000	301.040	0.960	0.9798	100.000	3.93E+00	6.65E-01	8.59E-02	2.34E-02	4.45E-01
PU-244	4589.00	4515.46	0.000	3.000	2.760	0.240	0.4899	99.900	3.60E-02	5.21E-02	6.26E-02	1.17E-02	5.19E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

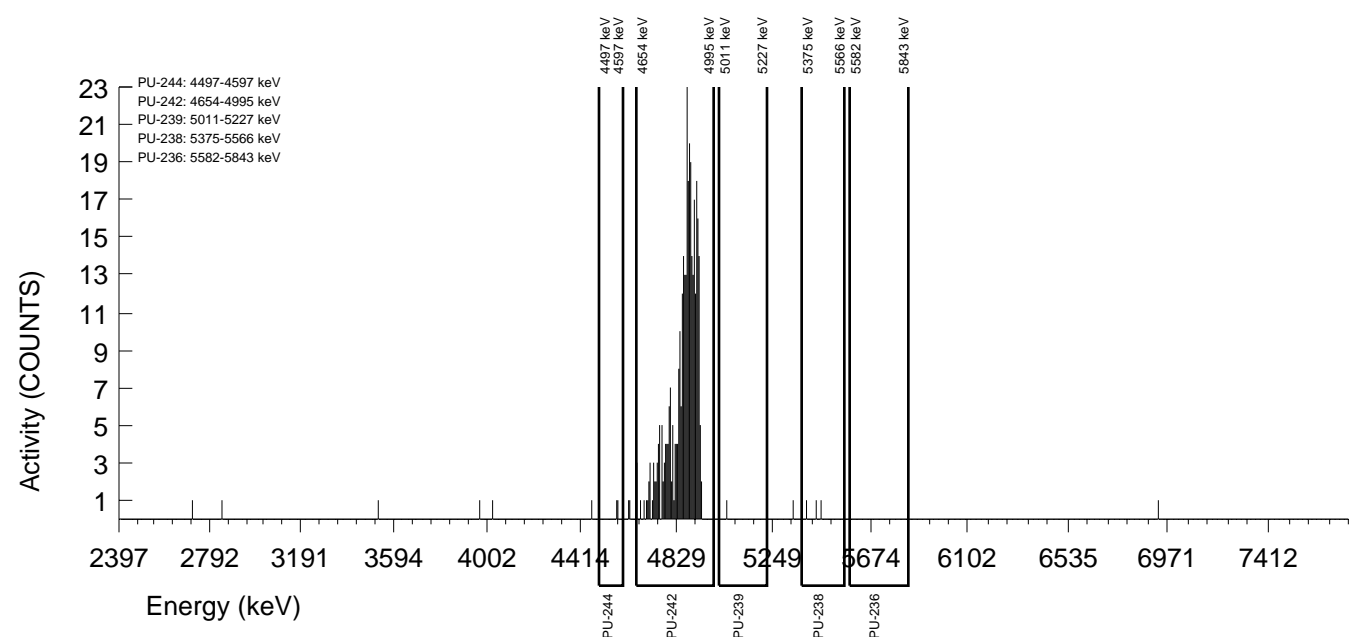
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235006_PU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 97.3 +/-5.689 %	CHAMBER : 108 DETECTOR S/N : 78778 AVERAGE %EFFICIENCY : 34.5578 AVERAGE %EFF ERROR : 0.6655 COUNT DATE : 29-Sep-2016 09:18:30 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : PU BKG FILE : B108.CNF;1433 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W108.CNF;430 CAL DATE : 06-Sep-2016
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TRACER
 ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 4.2658E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	-0.480	0.480	0.6928	100.000	-6.50E-03	2.88E-02	7.50E-02	1.72E-02	2.87E-02
PU-238	5486.00	5432.77	63.844	3.000	2.520	0.480	0.6928	99.900	2.83E-02	4.51E-02	6.21E-02	1.42E-02	4.49E-02
PU-239	5155.00	5049.43	4.911	1.000	0.760	0.240	0.4899	99.900	8.47E-03	3.18E-02	5.35E-02	1.00E-02	3.18E-02
PU-242	4890.00	4860.01	70.528	355.000	353.800	1.200	1.0954	100.000	3.94E+00	6.21E-01	7.81E-02	2.24E-02	4.12E-01
PU-244	4589.00	4571.63	9.822	2.000	2.000	0.000	0.0000	99.900	2.23E-02	3.83E-02	3.34E-02	0.00E+00	3.82E-02



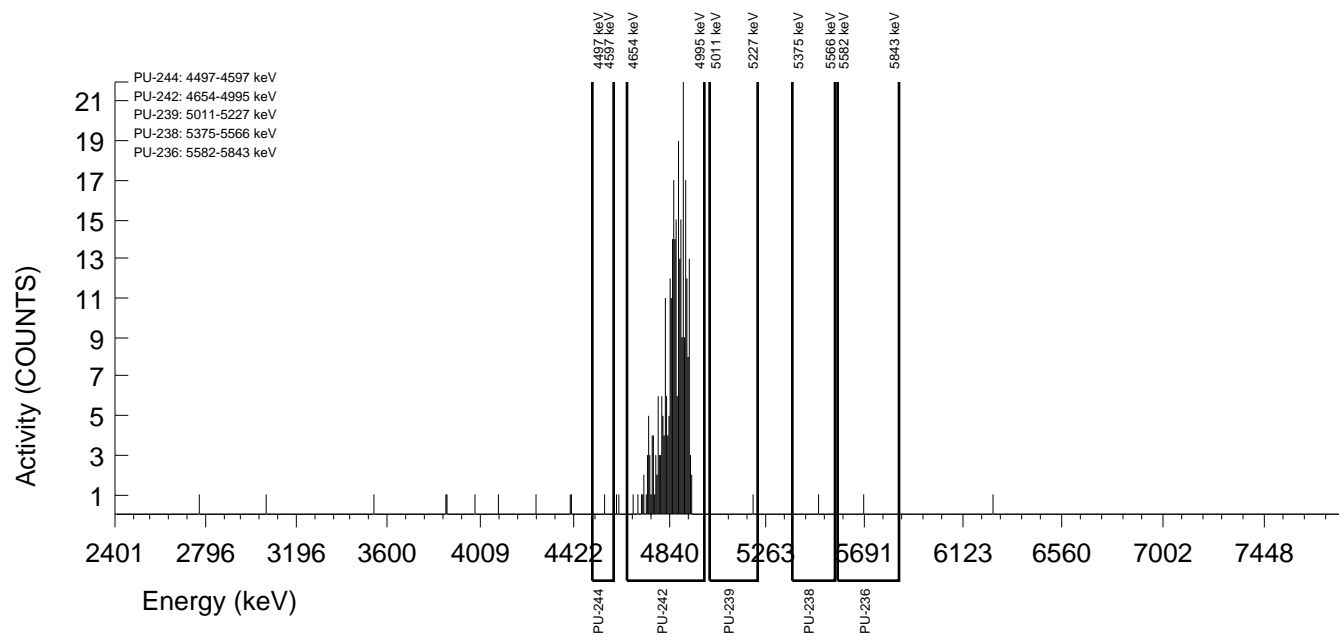
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235007_PU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 82.9 +/-5.993 %	CHAMBER : 109 DETECTOR S/N : 79463 AVERAGE %EFFICIENCY : 36.1703 AVERAGE %EFF ERROR : 0.6959 COUNT DATE : 29-Sep-2016 09:18:30 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : PU BKG FILE : B109.CNF;1431 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W109.CNF;420 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.6324E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5690.95	4.905	1.000	0.520	0.480	0.6928	100.000	7.90E-03	4.39E-02	8.42E-02	1.93E-02	4.39E-02
PU-238	5486.00	5492.60	4.905	1.000	0.040	0.960	0.9798	99.900	5.04E-04	3.74E-02	8.30E-02	2.26E-02	3.73E-02
PU-239	5155.00	5204.92	4.905	1.000	0.040	0.960	0.9798	99.900	5.00E-04	3.71E-02	8.24E-02	2.25E-02	3.71E-02
PU-242	4890.00	4857.44	80.162	317.000	315.320	1.680	1.2961	100.000	3.94E+00	6.54E-01	9.68E-02	2.97E-02	4.37E-01
PU-244	4589.00	4552.40	4.905	1.000	0.520	0.480	0.6928	99.900	6.51E-03	3.62E-02	6.93E-02	1.59E-02	3.61E-02



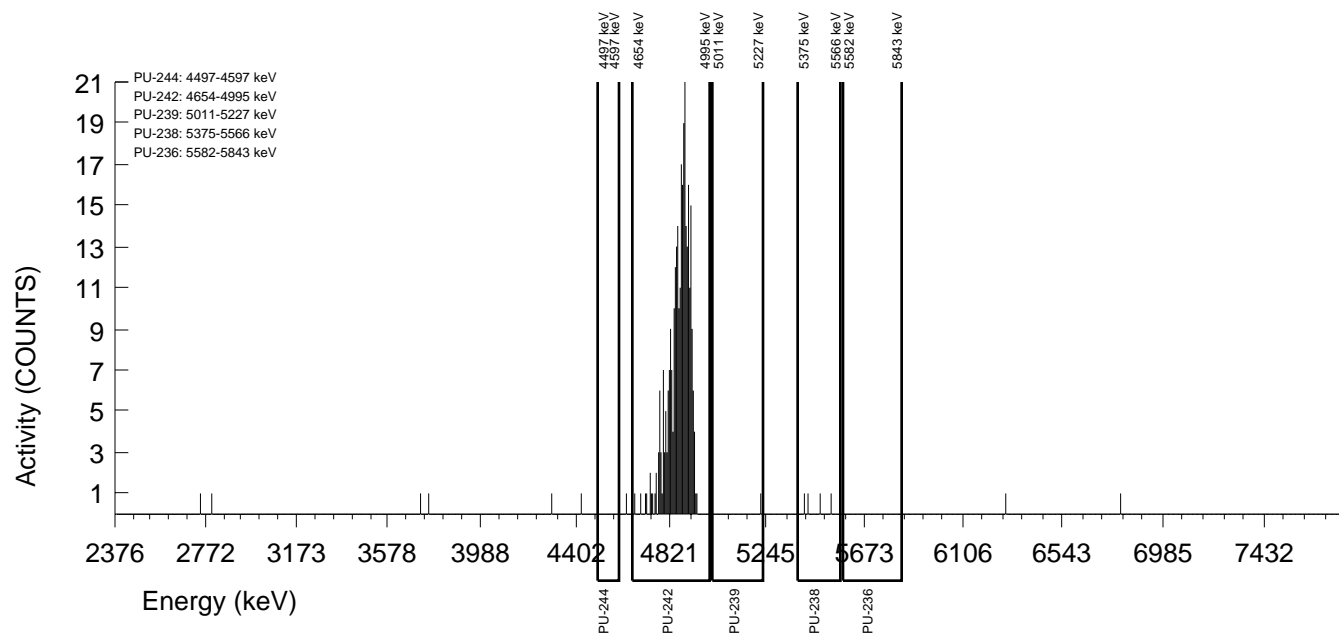
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235008_PU SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 90.1 +/-6.064 %	CHAMBER : 110 DETECTOR S/N : 83292 AVERAGE %EFFICIENCY : 32.3669 AVERAGE %EFF ERROR : 0.6241 COUNT DATE : 29-Sep-2016 09:18:30 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : PU BKG FILE : B110.CNF;1440 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W110.CNF;441 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.9495E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.24	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	3.14E-02	4.67E-02	0.00E+00	3.14E-02
PU-238	5486.00	5461.18	113.212	4.000	3.520	0.480	0.6928	99.900	4.54E-02	5.77E-02	7.14E-02	1.64E-02	5.75E-02
PU-239	5155.00	5218.37	4.922	1.000	0.520	0.480	0.6928	99.900	6.66E-03	3.70E-02	7.09E-02	1.63E-02	3.70E-02
PU-242	4890.00	4858.84	71.373	308.000	306.800	1.200	1.0954	100.000	3.93E+00	6.59E-01	8.97E-02	2.57E-02	4.41E-01
PU-244	4589.00	4546.97	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	2.59E-02	3.84E-02	0.00E+00	2.58E-02



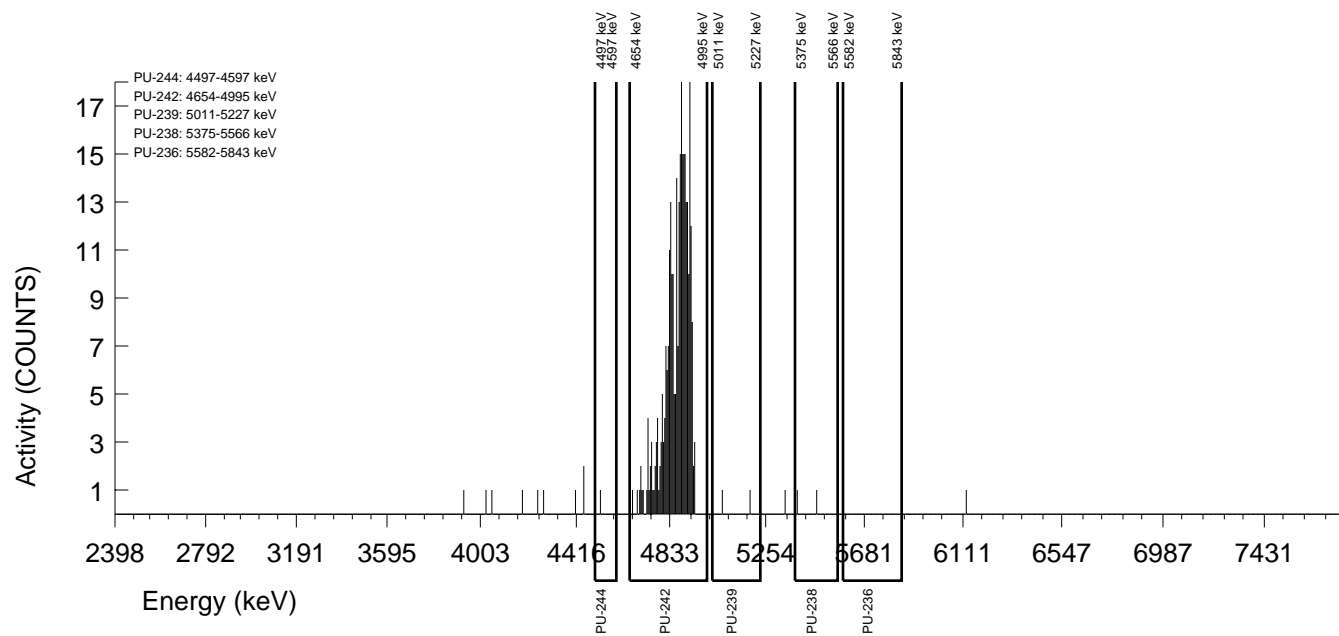
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235009_PU SAMPLE QTY : 0.504 G +/-0.198 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 87.0 +/-6.029 %	CHAMBER : 112 DETECTOR S/N : 78261 AVERAGE %EFFICIENCY : 34.0722 AVERAGE %EFF ERROR : 0.6563 COUNT DATE : 29-Sep-2016 09:18:30 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : PU BKG FILE : B112.CNF;1443 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W112.CNF;451 CAL DATE : 06-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.8135E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.24	0.000	0.000	-0.480	0.480	0.6928	100.000	-7.33E-03	3.25E-02	8.46E-02	1.94E-02	3.24E-02
PU-238	5486.00	5429.74	83.327	2.000	0.560	1.440	1.2000	99.900	7.09E-03	4.58E-02	9.36E-02	2.78E-02	4.58E-02
PU-239	5155.00	5119.56	117.638	2.000	1.520	0.480	0.6928	99.900	1.91E-02	4.40E-02	6.96E-02	1.60E-02	4.39E-02
PU-242	4890.00	4857.86	94.356	314.000	311.840	2.160	1.4697	100.000	3.92E+00	6.54E-01	1.05E-01	3.38E-02	4.37E-01
PU-244	4589.00	4524.68	4.902	1.000	0.760	0.240	0.4899	99.900	9.56E-03	3.59E-02	6.03E-02	1.13E-02	3.58E-02



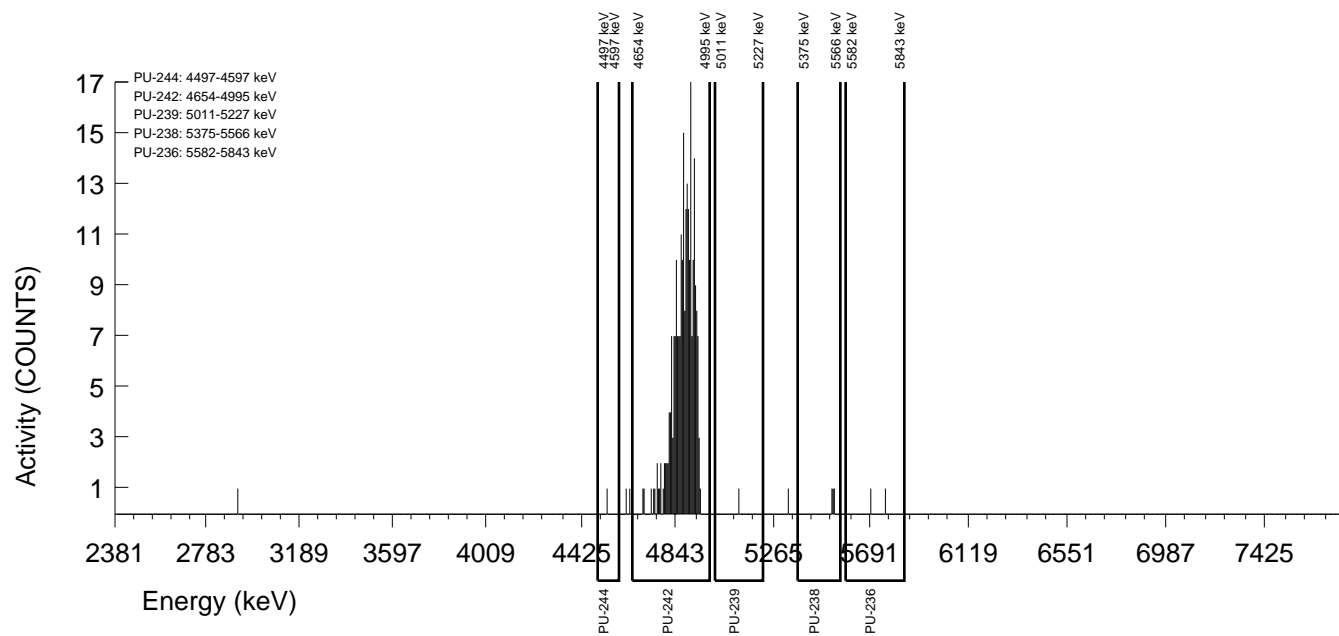
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235010_PU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 93.4 +/-6.681 %	CHAMBER : 210 DETECTOR S/N : 87898 AVERAGE %EFFICIENCY : 25.3042 AVERAGE %EFF ERROR : 0.4906 COUNT DATE : 29-Sep-2016 09:23:32 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B210.CNF;455 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W210.CNF;126 CAL DATE : 16-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 4.0929E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5728.05	65.062	2.000	1.760	0.240	0.4899	100.000	3.39E-02	6.69E-02	9.24E-02	1.73E-02	6.67E-02
PU-238	5486.00	5530.79	15.014	3.000	-1.320	4.320	2.0785	99.900	-2.11E-02	7.07E-02	1.70E-01	6.08E-02	7.07E-02
PU-239	5155.00	5117.29	5.005	1.000	0.280	0.720	0.8485	99.900	4.44E-03	4.65E-02	9.70E-02	2.47E-02	4.65E-02
PU-242	4890.00	4874.31	85.080	250.000	248.560	1.440	1.2000	100.000	3.94E+00	7.29E-01	1.17E-01	3.49E-02	4.93E-01
PU-244	4589.00	4518.61	0.000	2.000	2.000	0.000	0.0000	99.900	3.17E-02	5.46E-02	4.76E-02	0.00E+00	5.44E-02



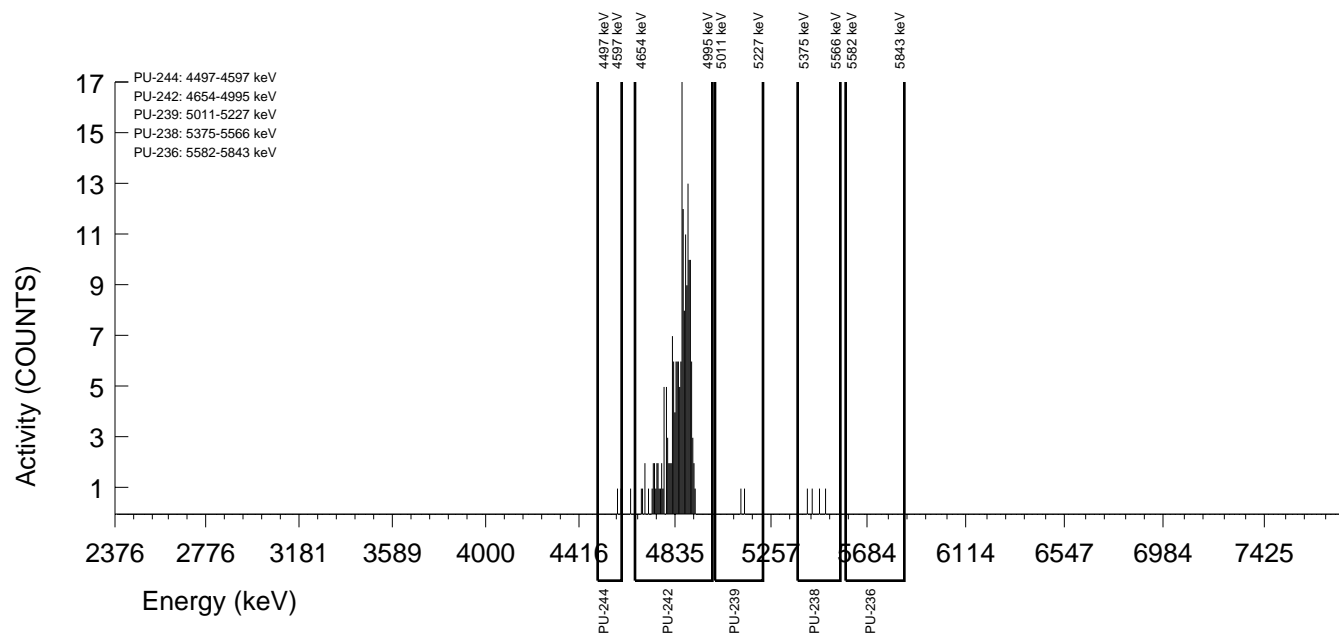
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235011_PU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 09-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 67.8 +/-7.649 %	CHAMBER : 212 DETECTOR S/N : 87900 AVERAGE %EFFICIENCY : 26.0378 AVERAGE %EFF ERROR : 0.5045 COUNT DATE : 29-Sep-2016 09:23:34 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B212.CNF;455 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W212.CNF;119 CAL DATE : 16-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 2.9732E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.28	0.000	0.000	-0.720	0.720	0.8485	100.000	-1.86E-02	5.64E-02	1.58E-01	4.02E-02	5.62E-02
PU-238	5486.00	5439.10	0.000	5.000	3.800	1.200	1.0954	99.900	8.14E-02	1.06E-01	1.50E-01	4.30E-02	1.06E-01
PU-239	5155.00	5132.78	19.941	2.000	1.280	0.720	0.8485	99.900	2.72E-02	7.51E-02	1.30E-01	3.31E-02	7.49E-02
PU-242	4890.00	4851.76	40.619	187.000	185.800	1.200	1.0954	100.000	3.95E+00	8.37E-01	1.49E-01	4.26E-02	5.72E-01
PU-244	4589.00	4590.71	0.000	2.000	1.520	0.480	0.6928	99.900	3.23E-02	7.44E-02	1.18E-01	2.70E-02	7.43E-02



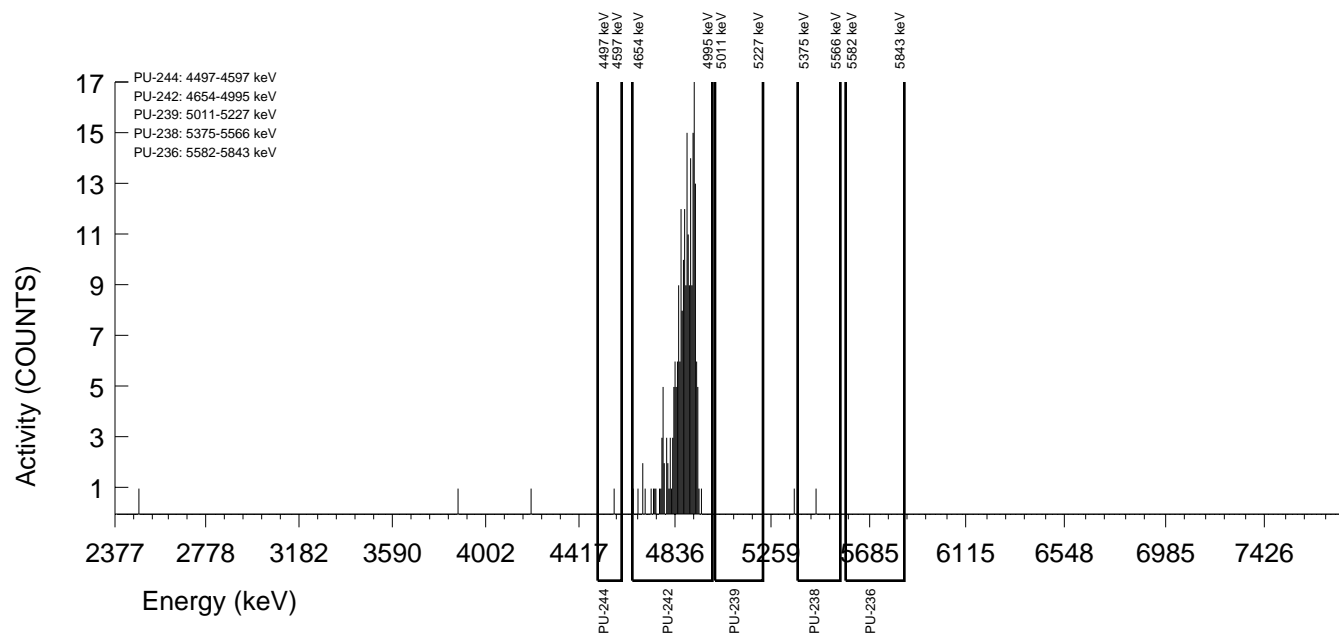
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235012_PU SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 90.6 +/-6.822 %	CHAMBER : 213 DETECTOR S/N : 87901 AVERAGE %EFFICIENCY : 24.8786 AVERAGE %EFF ERROR : 0.4826 COUNT DATE : 29-Sep-2016 09:23:37 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B213.CNF;469 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W213.CNF;152 CAL DATE : 16-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.9699E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.28	0.000	0.000	-0.480	0.480	0.6928	100.000	-9.61E-03	4.26E-02	1.11E-01	2.54E-02	4.25E-02
PU-238	5486.00	5455.35	4.987	1.000	0.280	0.720	0.8485	99.900	4.64E-03	4.86E-02	1.01E-01	2.58E-02	4.85E-02
PU-239	5155.00	5118.71	0.000	0.000	-1.200	1.200	1.0954	99.900	-1.98E-02	3.75E-02	1.16E-01	3.31E-02	3.75E-02
PU-242	4890.00	4873.06	73.853	238.000	237.040	0.960	0.9798	100.000	3.90E+00	7.37E-01	1.08E-01	2.95E-02	4.99E-01
PU-244	4589.00	4568.76	4.987	1.000	0.520	0.480	0.6928	99.900	8.57E-03	4.77E-02	9.13E-02	2.09E-02	4.76E-02



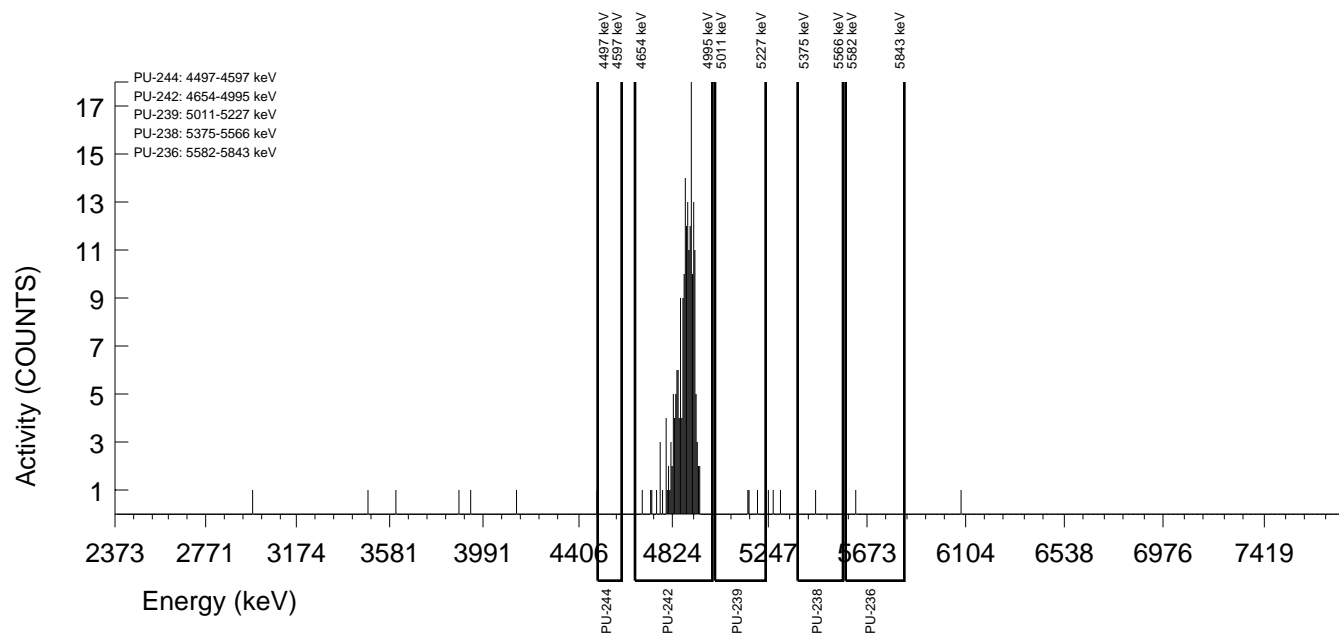
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235013_PU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 75.4 +/-7.266 %	CHAMBER : 214 DETECTOR S/N : 87902 AVERAGE %EFFICIENCY : 26.2230 AVERAGE %EFF ERROR : 0.5080 COUNT DATE : 29-Sep-2016 09:23:39 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B214.CNF;456 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W214.CNF;119 CAL DATE : 16-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.3063E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5624.99	4.958	1.000	0.520	0.480	0.6928	100.000	1.20E-02	6.68E-02	1.28E-01	2.93E-02	6.68E-02
PU-238	5486.00	5448.78	4.958	1.000	0.040	0.960	0.9798	99.900	7.65E-04	5.68E-02	1.26E-01	3.43E-02	5.67E-02
PU-239	5155.00	5167.19	44.618	3.000	2.040	0.960	0.9798	99.900	3.88E-02	7.73E-02	1.25E-01	3.41E-02	7.71E-02
PU-242	4890.00	4873.06	51.228	210.000	208.080	1.920	1.3856	100.000	3.95E+00	7.95E-01	1.53E-01	4.82E-02	5.41E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.480	0.480	0.6928	99.900	-9.12E-03	4.04E-02	1.05E-01	2.41E-02	4.03E-02



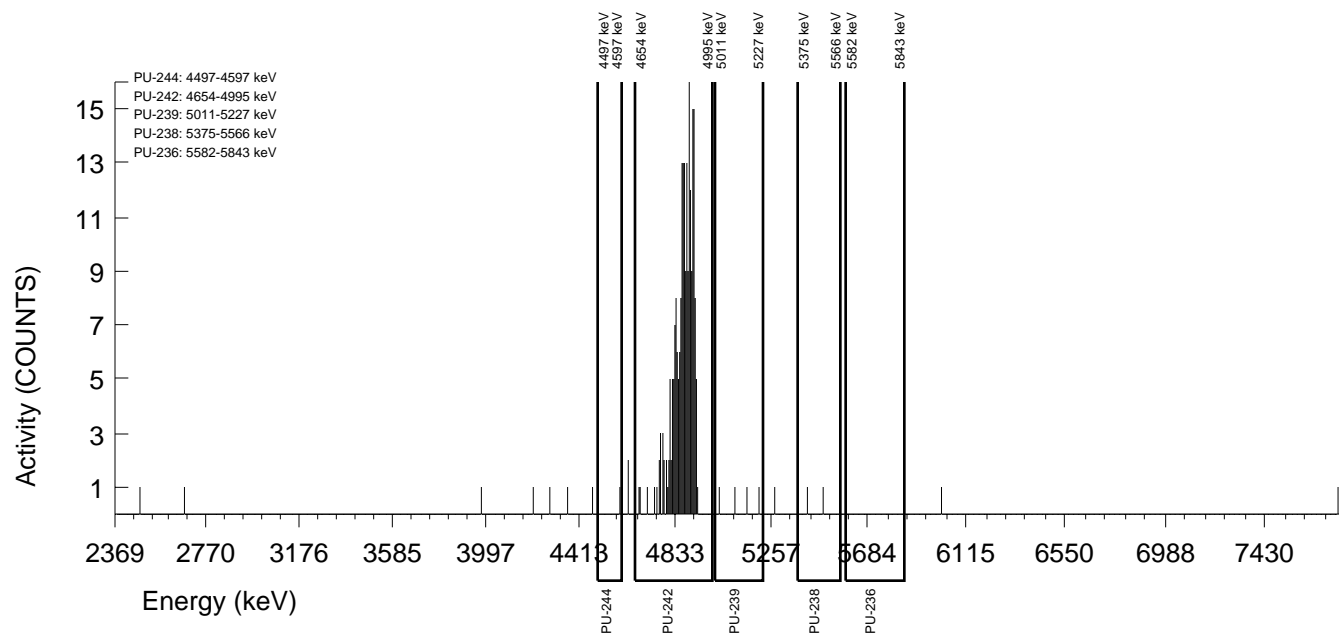
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235014_PU SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 86.0 +/-6.952 %	CHAMBER : 218 DETECTOR S/N : 87906 AVERAGE %EFFICIENCY : 25.1171 AVERAGE %EFF ERROR : 0.4871 COUNT DATE : 29-Sep-2016 09:23:41 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B218.CNF;459 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W218.CNF;126 CAL DATE : 16-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.7703E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.28	0.000	0.000	-0.480	0.480	0.6928	100.000	-1.01E-02	4.48E-02	1.17E-01	2.67E-02	4.47E-02
PU-238	5486.00	5451.35	69.949	2.000	1.520	0.480	0.6928	99.900	2.65E-02	6.10E-02	9.66E-02	2.21E-02	6.09E-02
PU-239	5155.00	5120.15	169.875	4.000	2.320	1.680	1.2961	99.900	4.02E-02	7.95E-02	1.34E-01	4.11E-02	7.93E-02
PU-242	4890.00	4869.65	59.956	228.000	227.280	0.720	0.8485	100.000	3.93E+00	7.57E-01	1.06E-01	2.69E-02	5.14E-01
PU-244	4589.00	4591.42	4.996	1.000	0.520	0.480	0.6928	99.900	9.01E-03	5.01E-02	9.59E-02	2.20E-02	5.00E-02



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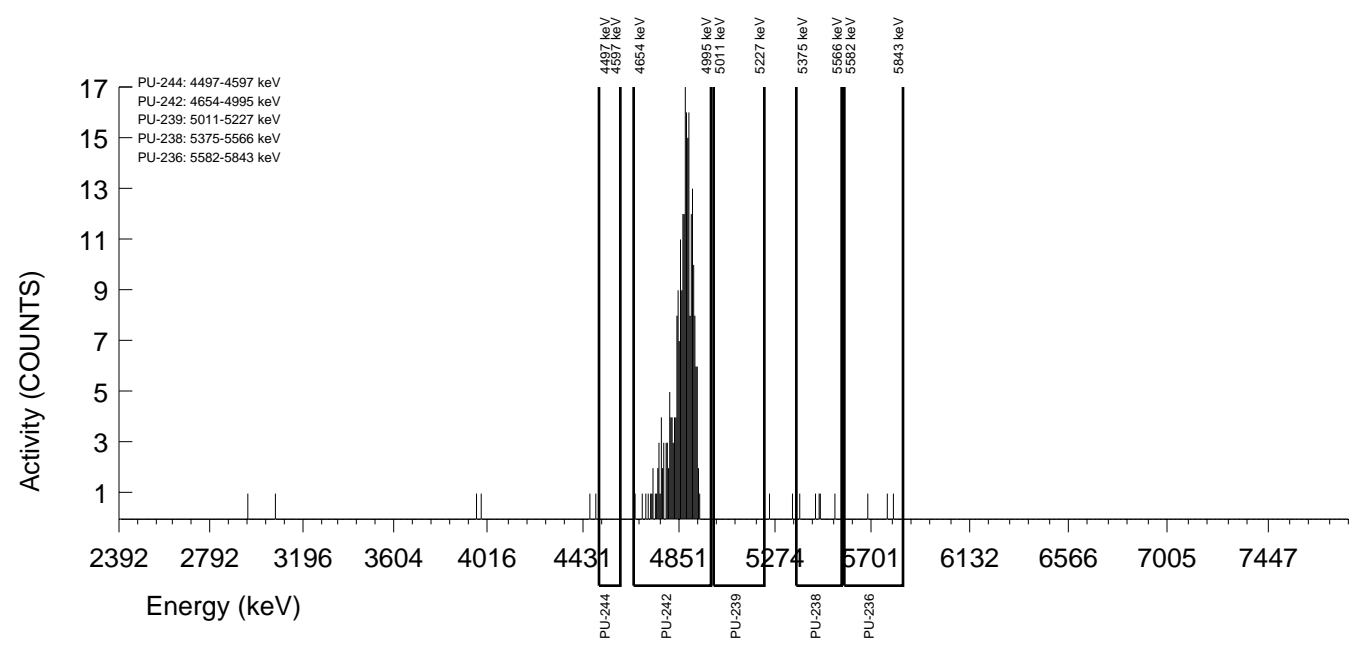
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235015_PU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 97.3 +/-6.614 %	CHAMBER : 235 DETECTOR S/N : 87923 AVERAGE %EFFICIENCY : 24.7991 AVERAGE %EFF ERROR : 0.4811 COUNT DATE : 29-Sep-2016 09:44:15 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B235.CNF;455 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W235.CNF;118 CAL DATE : 19-Sep-2016
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TRACER
 ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 4.2643E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5750.94	109.512	3.000	1.800	1.200	1.0954	100.000	3.35E-02	7.62E-02	1.31E-01	3.73E-02	7.60E-02
PU-238	5486.00	5465.55	149.334	5.000	4.280	0.720	0.8485	99.900	6.59E-02	7.59E-02	9.41E-02	2.39E-02	7.53E-02
PU-239	5155.00	5118.70	0.000	0.000	-0.960	0.960	0.9798	99.900	-1.47E-02	3.41E-02	1.01E-01	2.75E-02	3.40E-02
PU-242	4890.00	4868.08	70.934	255.000	253.800	1.200	1.0954	100.000	3.88E+00	7.11E-01	1.07E-01	3.07E-02	4.80E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.240	0.240	0.4899	99.900	-3.67E-03	3.17E-02	7.34E-02	1.37E-02	3.17E-02



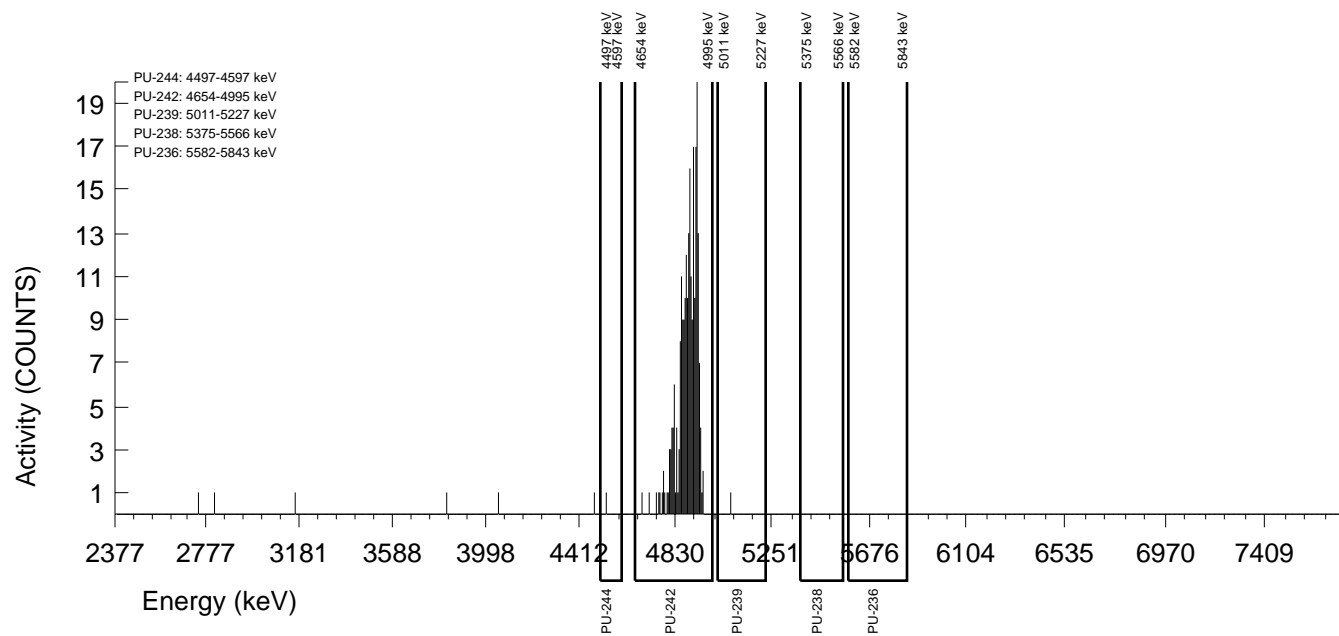
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235016_PU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 98.0 +/-6.688 %	CHAMBER : 220 DETECTOR S/N : 87908 AVERAGE %EFFICIENCY : 24.0361 AVERAGE %EFF ERROR : 0.4668 COUNT DATE : 29-Sep-2016 09:23:45 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B220.CNF;458 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W220.CNF;142 CAL DATE : 16-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 4.2956E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.29	0.000	0.000	-0.720	0.720	0.8485	100.000	-1.39E-02	4.22E-02	1.18E-01	3.01E-02	4.21E-02
PU-238	5486.00	5470.36	0.000	0.000	-0.720	0.720	0.8485	99.900	-1.15E-02	3.49E-02	9.79E-02	2.49E-02	3.48E-02
PU-239	5155.00	5071.69	4.978	1.000	0.760	0.240	0.4899	99.900	1.21E-02	4.54E-02	7.63E-02	1.43E-02	4.54E-02
PU-242	4890.00	4882.99	73.840	249.000	247.800	1.200	1.0954	100.000	3.94E+00	7.30E-01	1.12E-01	3.19E-02	4.93E-01
PU-244	4589.00	4526.96	4.978	1.000	0.760	0.240	0.4899	99.900	1.21E-02	4.54E-02	7.63E-02	1.43E-02	4.54E-02



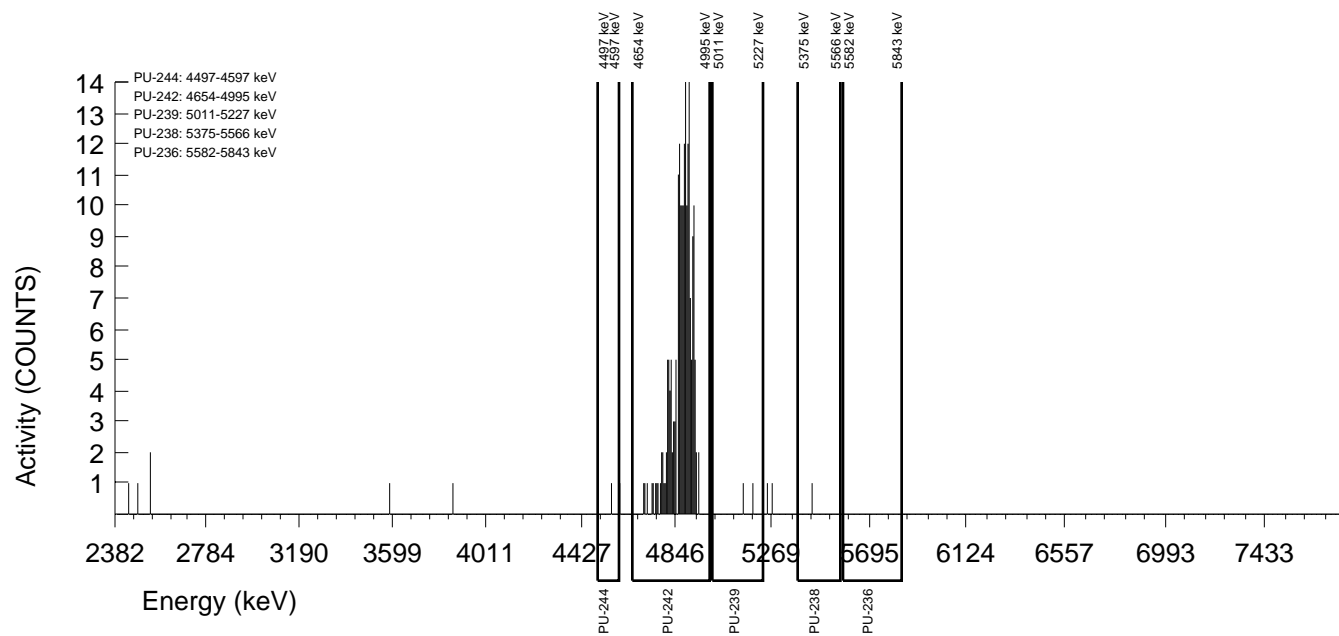
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235017_PU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 75.8 +/-7.313 %	CHAMBER : 221 DETECTOR S/N : 87909 AVERAGE %EFFICIENCY : 25.5264 AVERAGE %EFF ERROR : 0.4948 COUNT DATE : 29-Sep-2016 09:23:48 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B221.CNF;467 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W221.CNF;128 CAL DATE : 16-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.3221E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.29	0.000	0.000	-0.720	0.720	0.8485	100.000	-1.70E-02	5.16E-02	1.45E-01	3.68E-02	5.15E-02
PU-238	5486.00	5444.18	5.006	1.000	0.520	0.480	0.6928	99.900	1.01E-02	5.64E-02	1.08E-01	2.48E-02	5.64E-02
PU-239	5155.00	5162.88	45.052	2.000	1.280	0.720	0.8485	99.900	2.48E-02	6.84E-02	1.18E-01	3.01E-02	6.83E-02
PU-242	4890.00	4871.18	69.899	204.000	203.520	0.480	0.6928	100.000	3.94E+00	7.98E-01	1.07E-01	2.46E-02	5.44E-01
PU-244	4589.00	4581.20	0.000	2.000	1.760	0.240	0.4899	99.900	3.41E-02	6.72E-02	9.29E-02	1.74E-02	6.71E-02



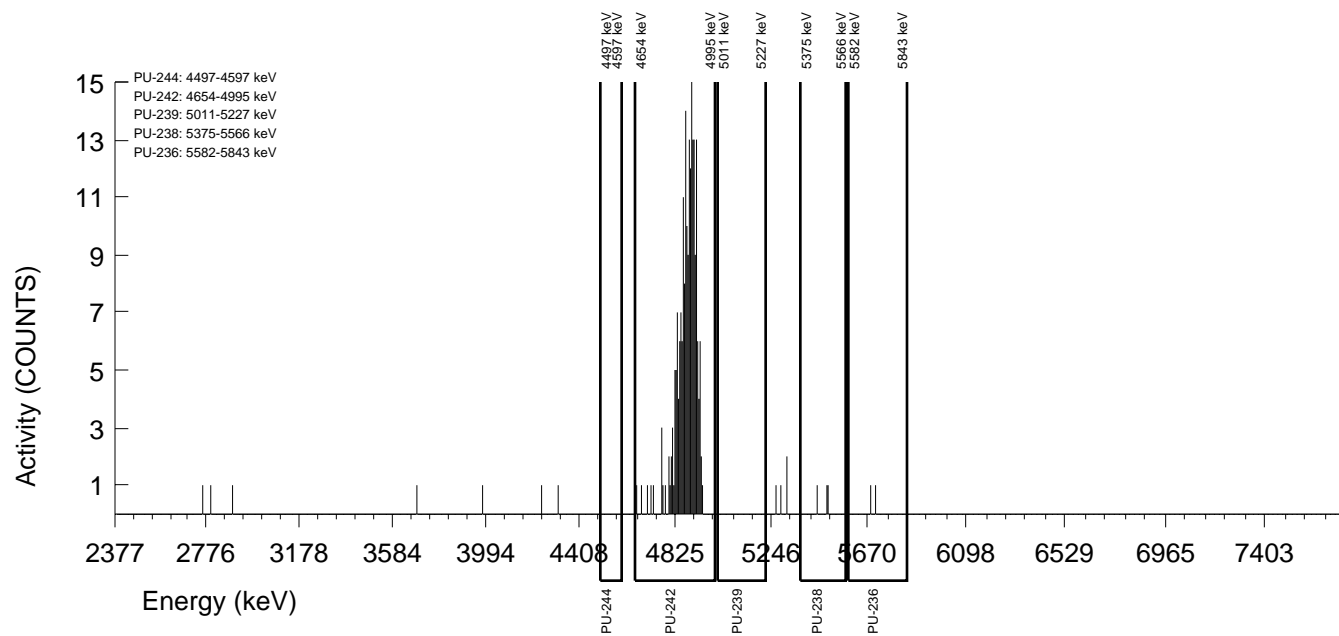
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235018_PU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 80.7 +/-7.090 %	CHAMBER : 223 DETECTOR S/N : 87911 AVERAGE %EFFICIENCY : 25.6333 AVERAGE %EFF ERROR : 0.4968 COUNT DATE : 29-Sep-2016 09:23:51 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B223.CNF;460 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W223.CNF;114 CAL DATE : 16-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.5358E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5691.16	24.821	2.000	1.520	0.480	0.6928	100.000	3.37E-02	7.76E-02	1.23E-01	2.82E-02	7.75E-02
PU-238	5486.00	5476.68	49.642	3.000	1.560	1.440	1.2000	99.900	2.85E-02	7.53E-02	1.35E-01	4.02E-02	7.52E-02
PU-239	5155.00	5118.71	0.000	0.000	-0.240	0.240	0.4899	99.900	-4.36E-03	3.77E-02	8.71E-02	1.63E-02	3.76E-02
PU-242	4890.00	4875.08	61.981	218.000	217.520	0.480	0.6928	100.000	3.95E+00	7.75E-01	1.01E-01	2.30E-02	5.27E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.240	0.240	0.4899	99.900	-4.36E-03	3.77E-02	8.71E-02	1.63E-02	3.76E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

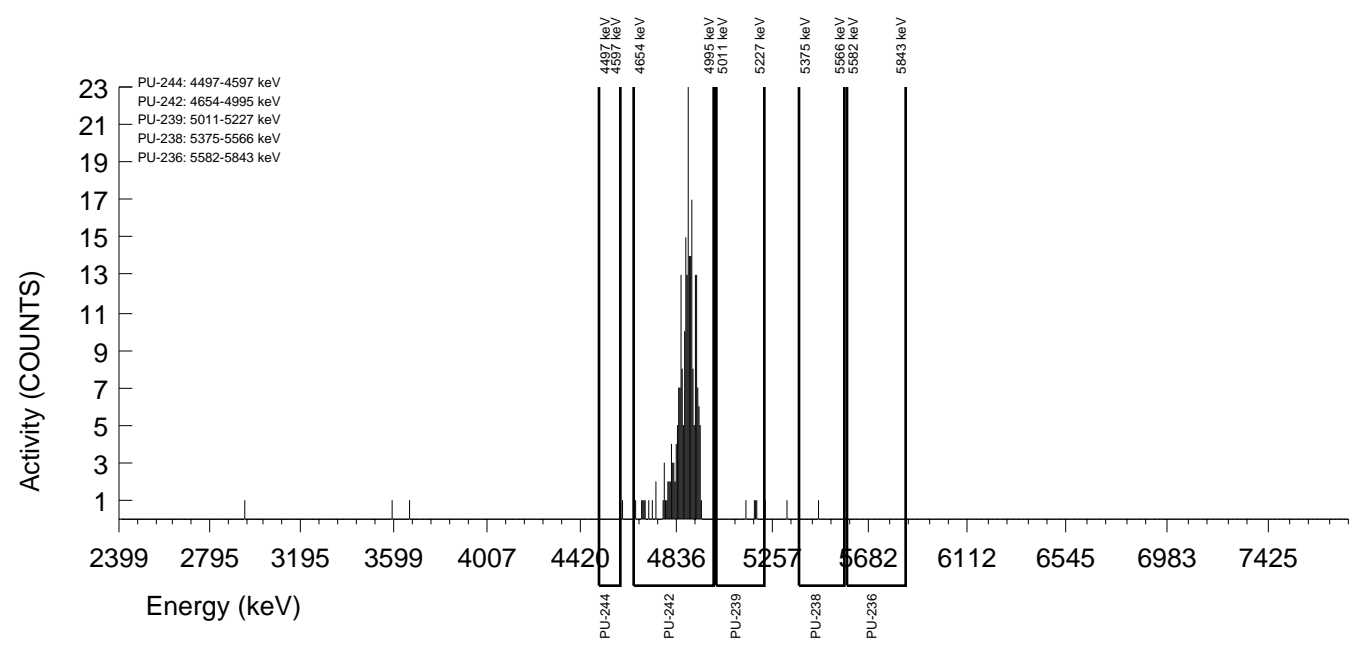
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235019_PU SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 90.2 +/-6.738 %	CHAMBER : 224 DETECTOR S/N : 87912 AVERAGE %EFFICIENCY : 25.7363 AVERAGE %EFF ERROR : 0.4987 COUNT DATE : 29-Sep-2016 09:23:52 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B224.CNF;471 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W224.CNF;150 CAL DATE : 16-Sep-2016
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TRACER
ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.9555E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	3.93E-02	5.83E-02	0.00E+00	3.92E-02
PU-238	5486.00	5458.69	4.920	1.000	-0.440	1.440	1.2000	99.900	-7.08E-03	4.89E-02	1.19E-01	3.54E-02	4.89E-02
PU-239	5155.00	5183.32	0.000	5.000	4.280	0.720	0.8485	99.900	6.84E-02	7.88E-02	9.77E-02	2.48E-02	7.82E-02
PU-242	4890.00	4876.19	66.419	246.000	244.320	1.680	1.2961	100.000	3.90E+00	7.28E-01	1.24E-01	3.79E-02	4.92E-01
PU-244	4589.00	4546.97	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	3.23E-02	4.80E-02	0.00E+00	3.22E-02



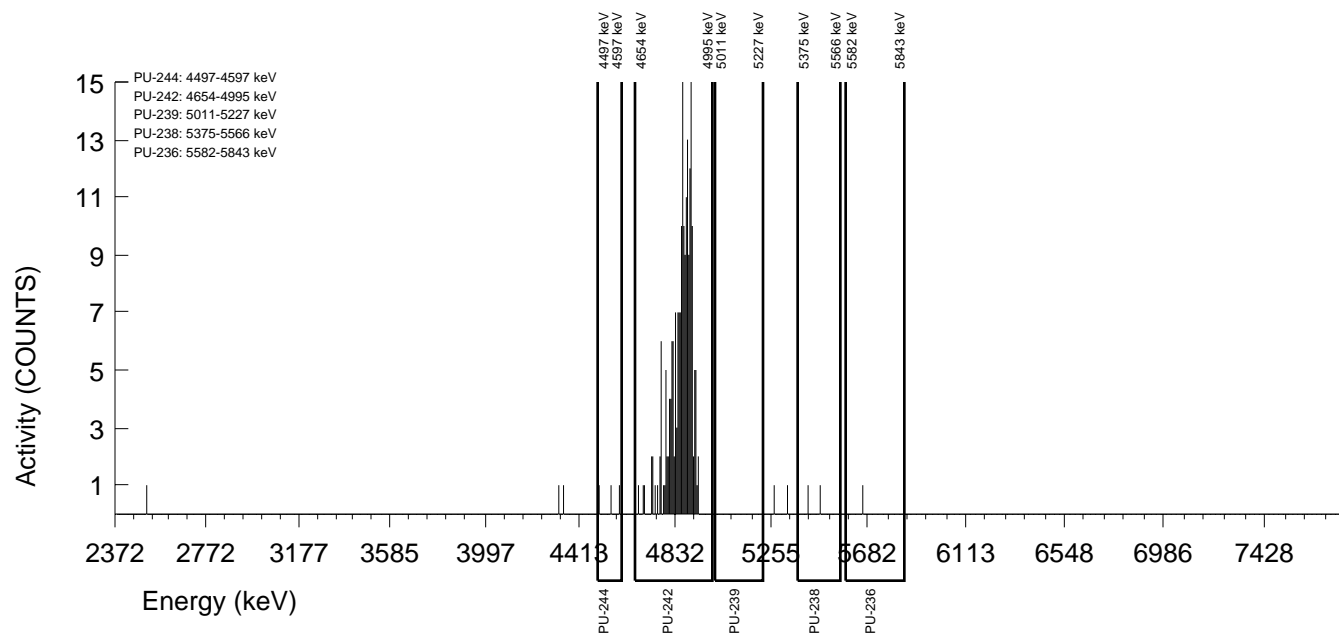
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S0405235020_PU SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 74.0 +/-7.240 %	CHAMBER : 226 DETECTOR S/N : 87914 AVERAGE %EFFICIENCY : 26.8347 AVERAGE %EFF ERROR : 0.5195 COUNT DATE : 29-Sep-2016 09:23:54 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B226.CNF;460 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W226.CNF;122 CAL DATE : 16-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 3.2421E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5661.00	4.984	1.000	1.000	0.000	0.0000	100.000	2.29E-02	6.46E-02	6.88E-02	0.00E+00	6.45E-02
PU-238	5486.00	5447.11	54.821	2.000	1.280	0.720	0.8485	99.900	2.43E-02	6.69E-02	1.16E-01	2.95E-02	6.68E-02
PU-239	5155.00	5118.70	0.000	0.000	-1.440	1.440	1.2000	99.900	-2.72E-02	4.39E-02	1.39E-01	4.14E-02	4.38E-02
PU-242	4890.00	4861.53	50.564	210.000	208.800	1.200	1.0954	100.000	3.93E+00	7.89E-01	1.32E-01	3.78E-02	5.37E-01
PU-244	4589.00	4535.50	0.000	4.000	3.760	0.240	0.4899	99.900	7.09E-02	8.42E-02	9.04E-02	1.69E-02	8.36E-02



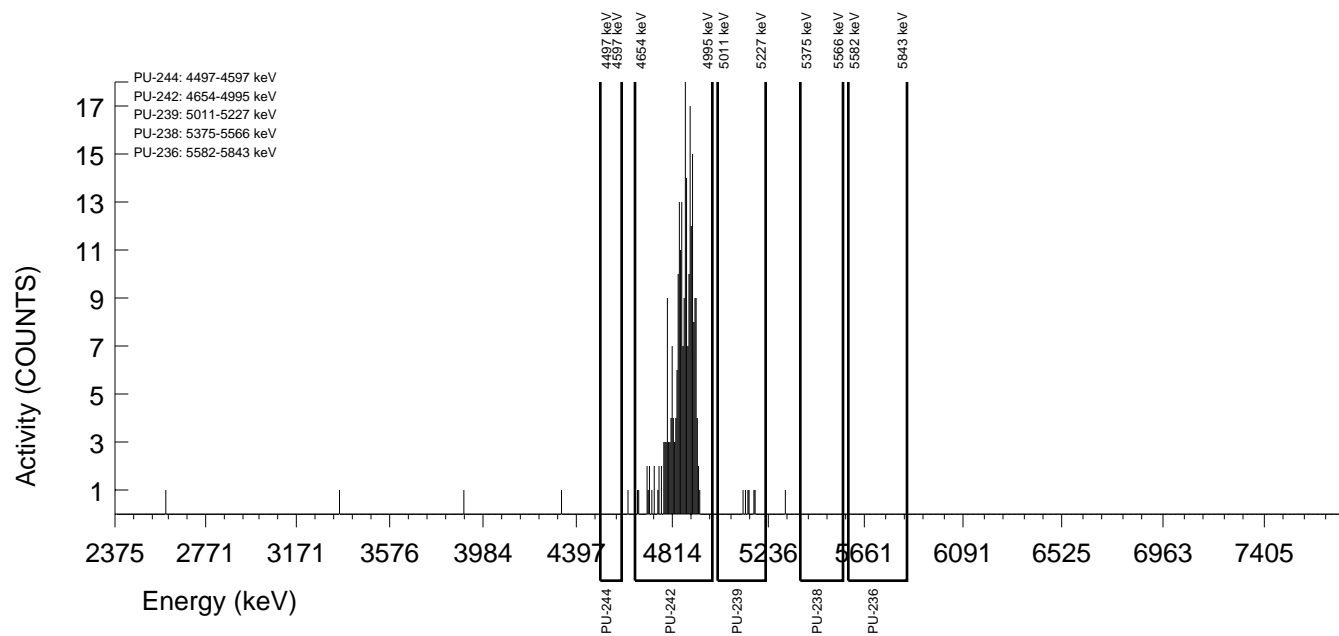
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S1203621700_PU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 26-Sep-2016 00:00:00 ANALYST : JXH2 % YIELD : 91.8 +/-6.608 %	CHAMBER : 227 DETECTOR S/N : 87915 AVERAGE %EFFICIENCY : 26.3665 AVERAGE %EFF ERROR : 0.5107 COUNT DATE : 29-Sep-2016 09:24:00 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B227.CNF;459 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W227.CNF;120 CAL DATE : 16-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 4.0228E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	3.09E-02	4.58E-02	0.00E+00	3.08E-02
PU-238	5486.00	5470.35	0.000	0.000	-1.200	1.200	1.0954	99.900	-1.83E-02	3.47E-02	1.07E-01	3.06E-02	3.47E-02
PU-239	5155.00	5151.00	54.147	6.000	3.840	2.160	1.4697	99.900	5.86E-02	8.27E-02	1.28E-01	4.11E-02	8.23E-02
PU-242	4890.00	4857.07	64.520	256.000	254.560	1.440	1.2000	100.000	3.88E+00	7.10E-01	1.13E-01	3.35E-02	4.79E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.240	0.240	0.4899	99.900	-3.66E-03	3.16E-02	7.31E-02	1.37E-02	3.16E-02



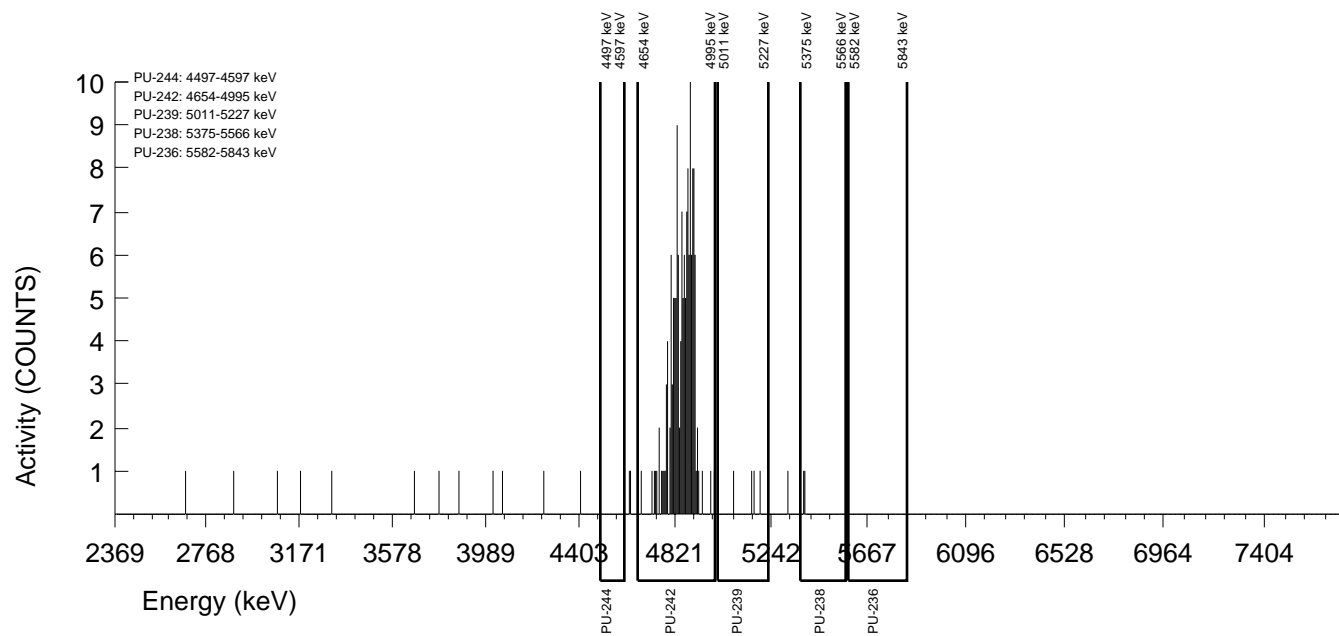
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S1203621701_PU SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 56.0 +/-8.523 %	CHAMBER : 228 DETECTOR S/N : 87916 AVERAGE %EFFICIENCY : 25.5769 AVERAGE %EFF ERROR : 0.4958 COUNT DATE : 29-Sep-2016 09:23:57 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B228.CNF;457 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W228.CNF;117 CAL DATE : 16-Sep-2016
TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 2.4540E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.28	0.000	0.000	-1.200	1.200	1.0954	100.000	-3.82E-02	7.27E-02	2.24E-01	6.40E-02	7.25E-02
PU-238	5486.00	5387.67	9.940	2.000	1.280	0.720	0.8485	99.900	3.38E-02	9.32E-02	1.61E-01	4.10E-02	9.30E-02
PU-239	5155.00	5149.45	114.305	4.000	1.840	2.160	1.4697	99.900	4.83E-02	1.22E-01	2.20E-01	7.06E-02	1.21E-01
PU-242	4890.00	4853.01	101.632	154.000	150.640	3.360	1.8330	100.000	3.95E+00	9.32E-01	2.55E-01	8.80E-02	6.41E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.720	0.720	0.8485	99.900	-1.89E-02	5.72E-02	1.60E-01	4.08E-02	5.70E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

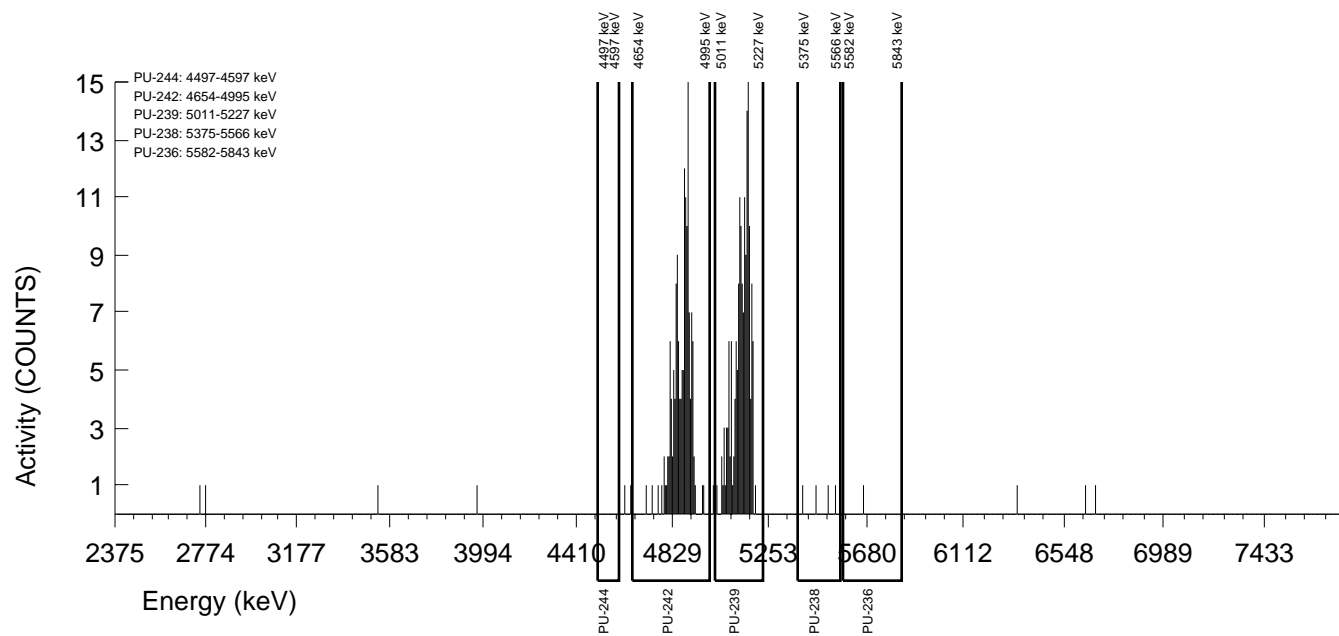
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596393 SAMPLE ID : S1203621702_PU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 26-Sep-2016 00:00:00 ANALYST : JXH2 % YIELD : 54.3 +/-8.378 %	CHAMBER : 177 DETECTOR S/N : 74435 AVERAGE %EFFICIENCY : 26.5935 AVERAGE %EFF ERROR : 0.5150 COUNT DATE : 29-Sep-2016 14:16:08 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B177.CNF;877 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W177.CNF;243 CAL DATE : 13-Sep-2016
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TRACER ID : 1770-A NUCLIDE : PU-242 NOMINAL : 4.3831E+00 dpm RESULTS : 2.3815E+00 dpm	LCS ID : 0338-MM NUCLIDE : PU-239 NOMINAL (pCi/G) : 3.8823E+00 % RECOVERY : 111.200
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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5669.61	4.955	1.000	-0.200	1.200	1.0954	100.000	-5.12E-03	7.69E-02	1.79E-01	5.13E-02	7.68E-02
PU-238	5486.00	5480.68	138.746	4.000	3.520	0.480	0.6928	99.900	8.99E-02	1.15E-01	1.41E-01	3.24E-02	1.14E-01
PU-239	5155.00	5132.07	56.572	169.000	169.000	0.000	0.0000	99.900	4.32E+00	9.78E-01	7.66E-02	0.00E+00	6.53E-01
PU-242	4890.00	4870.35	54.817	152.000	152.000	0.000	0.0000	100.000	3.88E+00	9.00E-01	7.66E-02	0.00E+00	6.19E-01
PU-244	4589.00	4546.97	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	5.17E-02	7.66E-02	0.00E+00	5.15E-02



Batch# 1596410 Product: Am/Cm Date: 9/25/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	Der# 1561191
Sample was correctly preserved if required.			NA
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		Der# 1561191
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		Der# 1561191
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: Umlare/Slyke 9/25/16

Secondary Review Performed By: Jessie Davis 09/30/16

10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 25-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Am-05-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596410	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060, and 1203621746 were received and analyzed out of holding.</p>		<p>1. Reporting results.</p>	

Originator's Name:

Melanie Aycock 25-SEP-16

Data Validator/Group Leader:

Jessica Davis 30-SEP-16

Am/Cm Queue Sheet

07-SEP-16

Batch #: 1596410 Analyst: HAKB First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16 Comments: Analyzed Sequentially with U: 1596408

Tracer(s): Am241/Cm244 Tracer Code: 1752-C Expiration Date: 5/26/17 Vol: 0.1

LCS Isotope(s): Am241/Cm244 LCS Code(s): 0533-CC/1216-C Expiration Date: 4/21/17 / 9/30/16 Vol(s): 1/18.1

Spike Isotope(s): Am241/Cm244 Spike Code(s): _____ Expiration Date: _____ Vol(s): _____

Prep Date: 9/20/16 Initials: HAKB Pipet ID: 1510022 Balance ID: 16107662 Witness: Jeb 9/20/16

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	Am/Cm Det #
405235041-1	4.4D.R.1.4	SAMPLE	1	pCi/g	SOIL	MJWC001	30-NOV-15	1	1	0.509	106
405235042-1	4.4D.R.2.3	SAMPLE	1	pCi/g	SOIL	MJWC001	30-NOV-15	2	2	0.500	209*
405235043-1	4.4D.R.2.4	SAMPLE	1	pCi/g	SOIL	MJWC001	30-NOV-15	3	3	0.507	210
405235044-1	4.4D.R.4.2	SAMPLE	1	pCi/g	SOIL	MJWC001	30-NOV-15	4	4	0.505	211
405235045-1	4.4D.R.5.2	SAMPLE	1	pCi/g	SOIL	MJWC001	30-NOV-15	5	5	0.502	212
405235046-1	4.5A.R.1.3	SAMPLE	1	pCi/g	SOIL	MJWC001	07-DEC-15	6	6	0.514	213
405235047-1	4.5A.R.1.4	SAMPLE	1	pCi/g	SOIL	MJWC001	07-DEC-15	7	7	0.503	214
405235048-1	4.5B.R.1.2	SAMPLE	1	pCi/g	SOIL	MJWC001	07-DEC-15	8	8	0.507	215*
405235049-1	4.5B.R.1.3	SAMPLE	1	pCi/g	SOIL	MJWC001	07-DEC-15	9	9	0.506	216
405235050-1	4.5B.R.1.4	SAMPLE	1	pCi/g	SOIL	MJWC001	07-DEC-15	10	10	0.504	217
405235051-1	4.5B.R.2.3	SAMPLE	1	pCi/g	SOIL	MJWC001	07-DEC-15	11	11	0.502	218
405235052-1	4.5B.R.2.4	SAMPLE	1	pCi/g	SOIL	MJWC001	07-DEC-15	12	12	0.508	229
405235053-1	4.5C.R.5.2	SAMPLE	1	pCi/g	SOIL	MJWC001	01-DEC-15	13	13	0.500	220
405235054-1	4.5C.R.1.3	SAMPLE	1	pCi/g	SOIL	MJWC001	02-DEC-15	14	14	0.500	221
405235055-1	4.5C.R.1.4	SAMPLE	1	pCi/g	SOIL	MJWC001	02-DEC-15	15	15	0.510	222
405235056-1	4.5C.R.2.2	SAMPLE	1	pCi/g	SOIL	MJWC001	02-DEC-15	16	16	0.509	223
405235057-1	4.5C.R.2.3	SAMPLE	1	pCi/g	SOIL	MJWC001	02-DEC-15	17	17	0.500	224
405235058-1	4.5C.R.2.4	SAMPLE	1	pCi/g	SOIL	MJWC001	02-DEC-15	18	18	0.512	225
405235059-1	5.1A.R.1.2	SAMPLE	1	pCi/g	SOIL	MJWC001	16-DEC-15	19	19	0.503	226
405235060-1	5.1A.R.1.3	SAMPLE	1	pCi/g	SOIL	MJWC001	16-DEC-15	20	20	0.515	227
1203621745-1	MB for batch 1596410	MB			QC ACCOUNT	QC ACCOUNT		21	21	0.515	228
1203621746-1	4.4D.R.1.4(405235041DUP)	DUP			QC ACCOUNT	QC ACCOUNT	30-NOV-15	22	22	0.511	229*
1203621747-1	LCS for batch 1596410	LCS			QC ACCOUNT	QC ACCOUNT		23	23	0.515	230

Choose SOP Used: GL-RAD-A-011 Solid Sample Dissolution by: LEACH or DIGESTION Data Reviewed By: [Signature]

GL-RAD-A-036 Circle One

GEL Laboratories LLC, Radiochemistry Division

9/14/16
1/20/16

Page 1 of 1

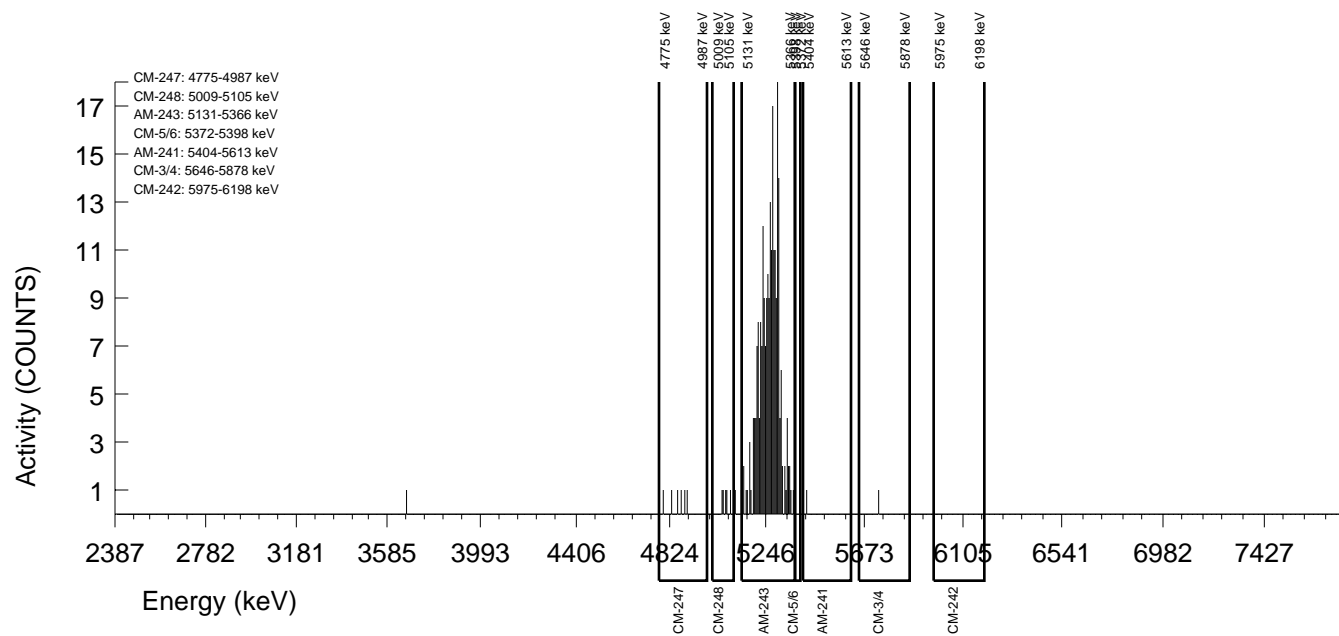
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235041_AM SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 107 +/-7.018 %	CHAMBER : 106 DETECTOR S/N : 80012 AVERAGE %EFFICIENCY : 32.6615 AVERAGE %EFF ERROR : 0.6296 COUNT DATE : 22-Sep-2016 09:56:16 ELAPSED LIVE TIME(SEC) : 8706.02	LIB FILE : AM BKG FILE : B106.CNF;1396 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W106.CNF;363 CAL DATE : 06-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 5.0683E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5421.98	4.904	1.000	-0.596	1.596	1.2634	98.525	-1.06E-02	5.23E-02	1.32E-01	3.95E-02	5.23E-02
AM-243	5269.50	5258.18	69.150	241.000	240.129	0.871	0.9331	99.980	4.20E+00	8.02E-01	1.10E-01	2.87E-02	5.33E-01
CM-242	6102.00	6086.56	0.000	0.000	-0.145	0.145	0.3809	100.000	-8.99E-03	1.24E-01	2.69E-01	4.15E-02	1.24E-01
CM-3/4	5795.02	5737.76	4.904	1.000	0.855	0.145	0.3809	100.000	1.54E-02	5.06E-02	7.83E-02	1.21E-02	5.05E-02
CM-5/6	5386.00	5385.09	0.000	0.000	0.000	0.000	0.0000	86.090	0.00E+00	4.03E-02	6.09E-02	0.00E+00	4.02E-02
CM-247	4946.00	4855.67	102.989	6.000	4.839	1.161	1.0774	79.300	1.07E-01	1.17E-01	1.50E-01	4.18E-02	1.16E-01
CM-248	5078.60	5066.41	39.234	5.000	4.855	0.145	0.3809	91.000	9.33E-02	9.35E-02	8.34E-02	1.29E-02	9.25E-02



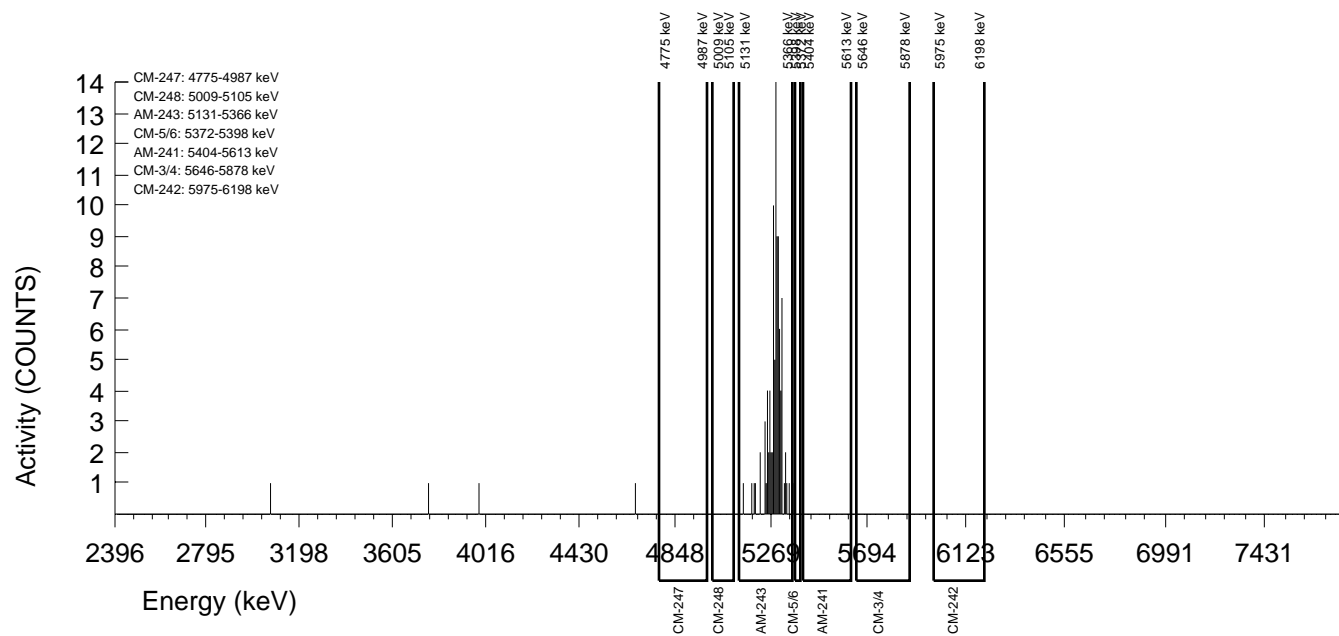
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235042_AM SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 64.6 +/-10.771 %	CHAMBER : 233 DETECTOR S/N : 87921 AVERAGE %EFFICIENCY : 25.2931 AVERAGE %EFF ERROR : 0.4905 COUNT DATE : 22-Sep-2016 16:14:38 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : AM BKG FILE : B233.CNF;452 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W233.CNF;117 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 3.0649E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.50	0.000	0.000	-0.120	0.120	0.3464	98.525	-5.60E-03	9.34E-02	1.96E-01	2.82E-02	9.28E-02
AM-243	5269.50	5284.20	25.060	93.000	93.000	0.000	0.0000	99.980	4.27E+00	1.27E+00	1.38E-01	0.00E+00	8.73E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	3.24E-01	4.89E-01	0.00E+00	3.22E-01
CM-3/4	5795.02	5761.62	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	9.41E-02	1.42E-01	0.00E+00	9.36E-02
CM-5/6	5386.00	5369.51	0.000	1.000	0.880	0.120	0.3464	86.090	4.70E-02	1.49E-01	2.25E-01	3.22E-02	1.49E-01
CM-247	4946.00	4881.20	0.000	0.000	-0.480	0.480	0.6928	79.300	-2.78E-02	1.18E-01	3.14E-01	6.99E-02	1.18E-01
CM-248	5078.60	5056.59	0.000	0.000	-0.120	0.120	0.3464	91.000	-6.06E-03	1.01E-01	2.12E-01	3.04E-02	1.00E-01



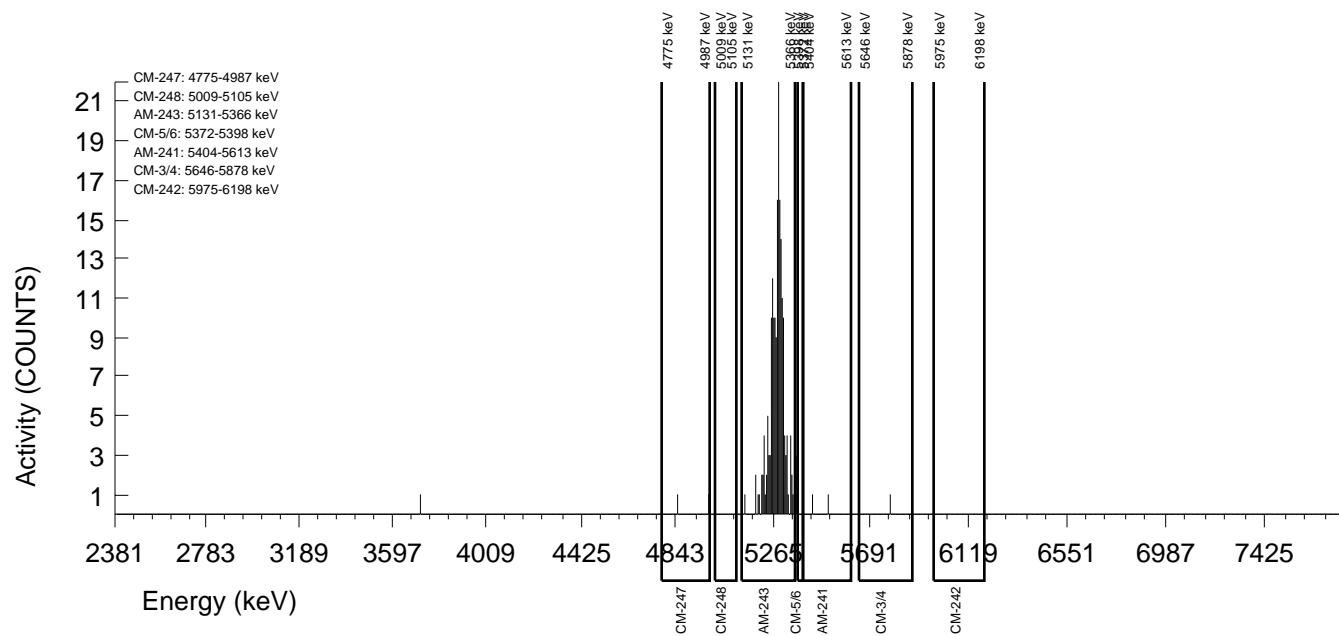
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235043_AM SAMPLE QTY : 0.507 G +/-0.197 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 75.5 +/-7.897 %	CHAMBER : 210 DETECTOR S/N : 87898 AVERAGE %EFFICIENCY : 25.3042 AVERAGE %EFF ERROR : 0.4906 COUNT DATE : 22-Sep-2016 09:56:00 ELAPSED LIVE TIME(SEC) : 12284.26	LIB FILE : AM BKG FILE : B210.CNF;453 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W210.CNF;126 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 3.5824E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5474.95	70.066	2.000	1.795	0.205	0.4525	98.525	4.14E-02	7.97E-02	1.07E-01	1.89E-02	7.94E-02
AM-243	5269.50	5284.72	42.540	188.000	185.543	2.457	1.5674	99.980	4.22E+00	9.10E-01	1.97E-01	6.43E-02	6.13E-01
CM-242	6102.00	6086.60	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.62E-01	2.42E-01	0.00E+00	1.61E-01
CM-3/4	5795.02	5781.48	5.005	1.000	1.000	0.000	0.0000	100.000	2.34E-02	6.57E-02	7.03E-02	0.00E+00	6.56E-02
CM-5/6	5386.00	5371.38	0.000	3.000	2.795	0.205	0.4525	86.090	7.37E-02	1.05E-01	1.22E-01	2.16E-02	1.05E-01
CM-247	4946.00	4916.98	0.000	2.000	1.795	0.205	0.4525	79.300	5.14E-02	9.89E-02	1.33E-01	2.34E-02	9.86E-02
CM-248	5078.60	5056.59	0.000	0.000	-0.409	0.409	0.6399	91.000	-1.02E-02	5.21E-02	1.33E-01	2.88E-02	5.19E-02



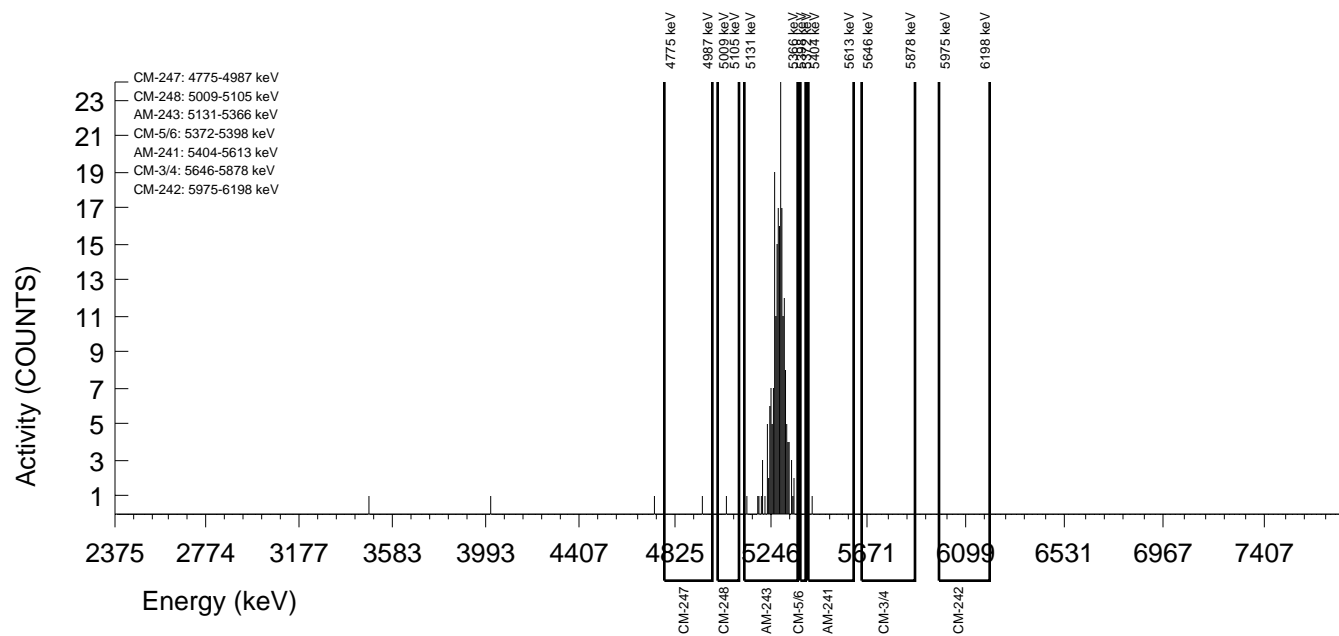
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235044_AM SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 88.8 +/-7.498 %	CHAMBER : 211 DETECTOR S/N : 87899 AVERAGE %EFFICIENCY : 24.1091 AVERAGE %EFF ERROR : 0.4680 COUNT DATE : 22-Sep-2016 09:56:03 ELAPSED LIVE TIME(SEC) : 12291.35	LIB FILE : AM BKG FILE : B211.CNF;454 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W211.CNF;131 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.2117E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5426.05	4.967	1.000	-0.639	1.639	1.2802	98.525	-1.32E-02	6.26E-02	1.58E-01	4.78E-02	6.25E-02
AM-243	5269.50	5278.75	36.836	210.000	207.951	2.049	1.4313	99.980	4.23E+00	8.66E-01	1.66E-01	5.26E-02	5.80E-01
CM-242	6102.00	6086.59	0.000	0.000	-0.205	0.205	0.4526	100.000	-1.48E-02	1.48E-01	3.34E-01	5.89E-02	1.47E-01
CM-3/4	5795.02	5761.62	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	4.21E-02	6.30E-02	0.00E+00	4.20E-02
CM-5/6	5386.00	5373.02	0.000	3.000	2.795	0.205	0.4526	86.090	6.61E-02	9.41E-02	1.10E-01	1.93E-02	9.36E-02
CM-247	4946.00	4945.50	4.967	1.000	0.385	0.615	0.7839	79.300	9.89E-03	7.41E-02	1.50E-01	3.63E-02	7.40E-02
CM-248	5078.60	5050.71	4.967	1.000	-0.229	1.229	1.1087	91.000	-5.12E-03	6.65E-02	1.57E-01	4.48E-02	6.64E-02



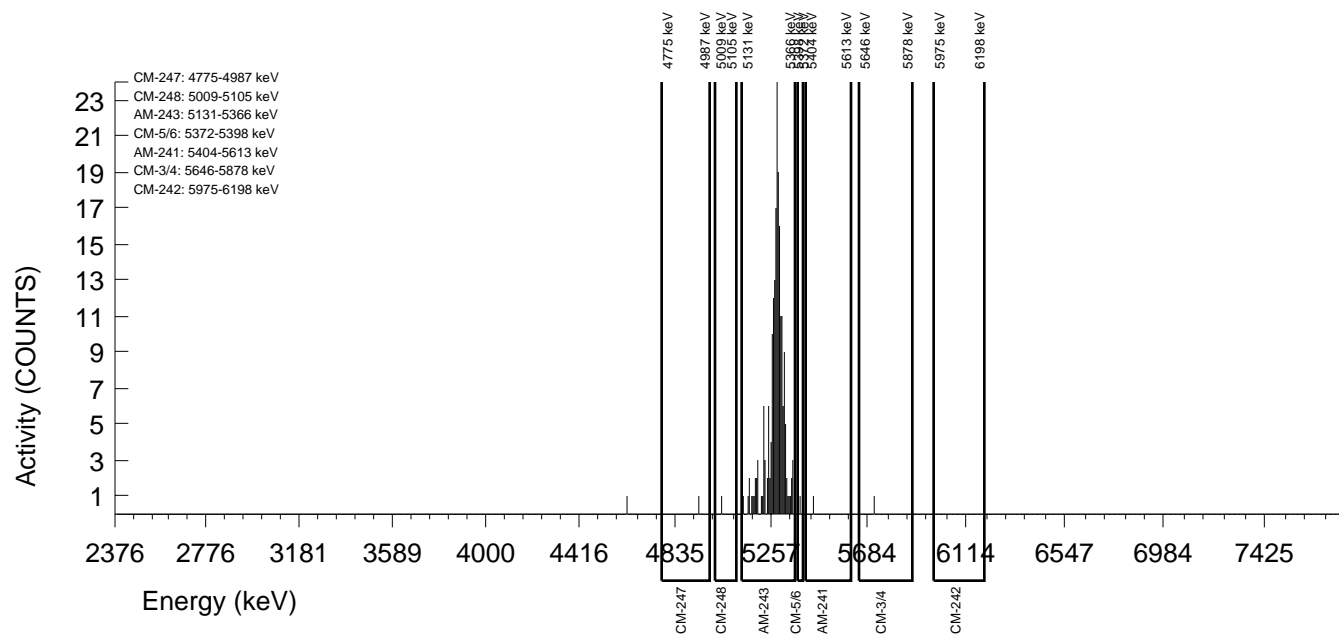
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235045_AM SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 80.1 +/-7.552 %	CHAMBER : 212 DETECTOR S/N : 87900 AVERAGE %EFFICIENCY : 26.0378 AVERAGE %EFF ERROR : 0.5045 COUNT DATE : 22-Sep-2016 09:56:06 ELAPSED LIVE TIME(SEC) : 12293.51	LIB FILE : AM BKG FILE : B212.CNF;453 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W212.CNF;119 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 3.7985E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5443.36	4.985	1.000	0.590	0.410	0.6401	98.525	1.26E-02	6.11E-02	1.13E-01	2.47E-02	6.10E-02
AM-243	5269.50	5277.70	28.915	203.000	202.590	0.410	0.6401	99.980	4.26E+00	8.77E-01	1.12E-01	2.43E-02	5.88E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.49E-01	2.23E-01	0.00E+00	1.49E-01
CM-3/4	5795.02	5710.36	4.985	1.000	0.590	0.410	0.6401	100.000	1.28E-02	6.20E-02	1.15E-01	2.51E-02	6.19E-02
CM-5/6	5386.00	5384.81	4.985	1.000	1.000	0.000	0.0000	86.090	2.44E-02	6.85E-02	7.32E-02	0.00E+00	6.84E-02
CM-247	4946.00	4939.99	4.985	1.000	-0.024	1.024	1.0122	79.300	-6.48E-04	7.80E-02	1.76E-01	4.84E-02	7.79E-02
CM-248	5078.60	5040.26	4.985	1.000	1.000	0.000	0.0000	91.000	2.31E-02	6.48E-02	6.93E-02	0.00E+00	6.47E-02



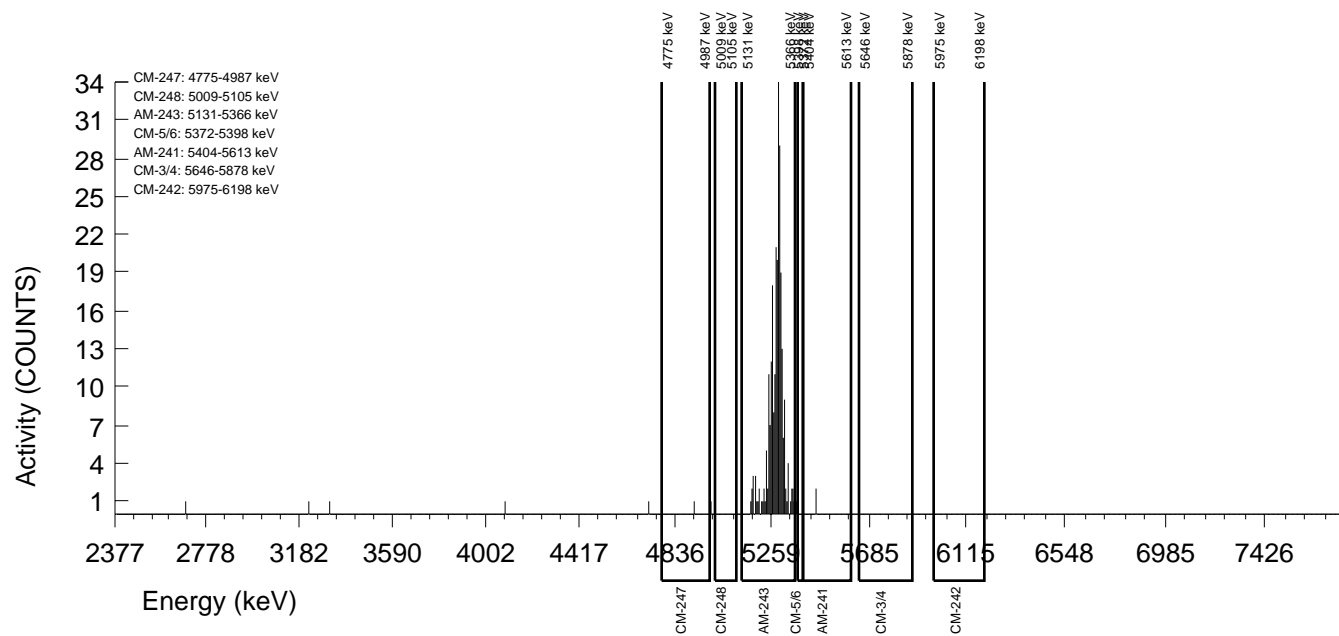
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235046_AM SAMPLE QTY : 0.514 G +/-0.195 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 106 +/-6.834 %	CHAMBER : 213 DETECTOR S/N : 87901 AVERAGE %EFFICIENCY : 24.8786 AVERAGE %EFF ERROR : 0.4826 COUNT DATE : 22-Sep-2016 09:56:08 ELAPSED LIVE TIME(SEC) : 12291.75	LIB FILE : AM BKG FILE : B213.CNF;467 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W213.CNF;152 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 5.0354E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5455.35	4.987	2.000	1.385	0.615	0.7840	98.525	2.28E-02	5.75E-02	9.60E-02	2.33E-02	5.74E-02
AM-243	5269.50	5279.63	37.402	258.000	256.566	1.434	1.1975	99.980	4.16E+00	7.73E-01	1.19E-01	3.50E-02	5.11E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.12E-01	1.67E-01	0.00E+00	1.12E-01
CM-3/4	5795.02	5761.62	0.000	0.000	-0.205	0.205	0.4526	100.000	-3.42E-03	3.42E-02	7.74E-02	1.36E-02	3.41E-02
CM-5/6	5386.00	5370.23	0.000	1.000	1.000	0.000	0.0000	86.090	1.88E-02	5.28E-02	5.65E-02	0.00E+00	5.27E-02
CM-247	4946.00	4920.43	4.987	1.000	0.385	0.615	0.7840	79.300	7.87E-03	5.90E-02	1.19E-01	2.89E-02	5.90E-02
CM-248	5078.60	5056.59	0.000	0.000	-0.205	0.205	0.4526	91.000	-3.65E-03	3.64E-02	8.25E-02	1.45E-02	3.63E-02



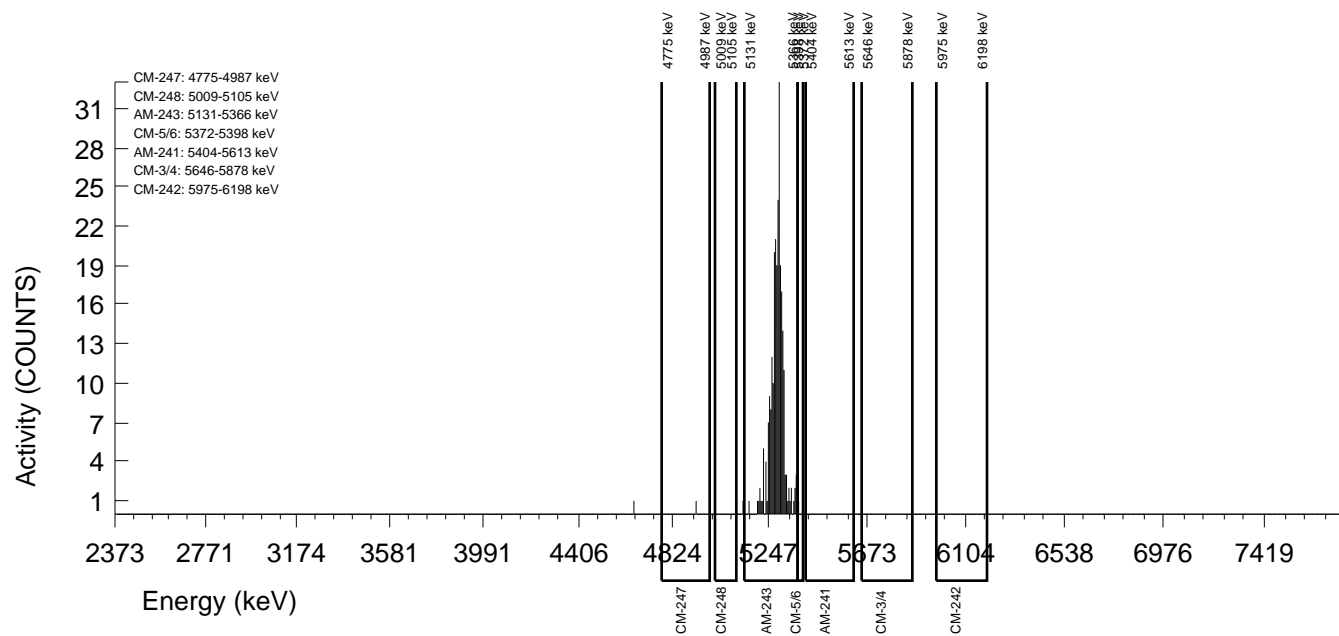
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235047_AM SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 103 +/-6.774 %	CHAMBER : 214 DETECTOR S/N : 87902 AVERAGE %EFFICIENCY : 26.2230 AVERAGE %EFF ERROR : 0.5080 COUNT DATE : 22-Sep-2016 09:56:10 ELAPSED LIVE TIME(SEC) : 12292.20	LIB FILE : AM BKG FILE : B214.CNF;454 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W214.CNF;119 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.8629E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.49	0.000	0.000	-0.819	0.819	0.9053	98.525	-1.35E-02	3.57E-02	1.04E-01	2.70E-02	3.56E-02
AM-243	5269.50	5279.08	32.307	262.000	261.181	0.819	0.9053	99.980	4.25E+00	7.82E-01	1.02E-01	2.66E-02	5.17E-01
CM-242	6102.00	6086.58	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.12E-01	1.68E-01	0.00E+00	1.12E-01
CM-3/4	5795.02	5761.61	0.000	0.000	-0.615	0.615	0.7840	100.000	-1.03E-02	3.56E-02	9.78E-02	2.37E-02	3.55E-02
CM-5/6	5386.00	5374.23	0.000	1.000	1.000	0.000	0.0000	86.090	1.89E-02	5.30E-02	5.67E-02	0.00E+00	5.29E-02
CM-247	4946.00	4924.20	4.958	1.000	-0.639	1.639	1.2802	79.300	-1.31E-02	6.20E-02	1.56E-01	4.74E-02	6.20E-02
CM-248	5078.60	5056.58	0.000	0.000	-0.410	0.410	0.6401	91.000	-7.32E-03	3.72E-02	9.49E-02	2.07E-02	3.72E-02



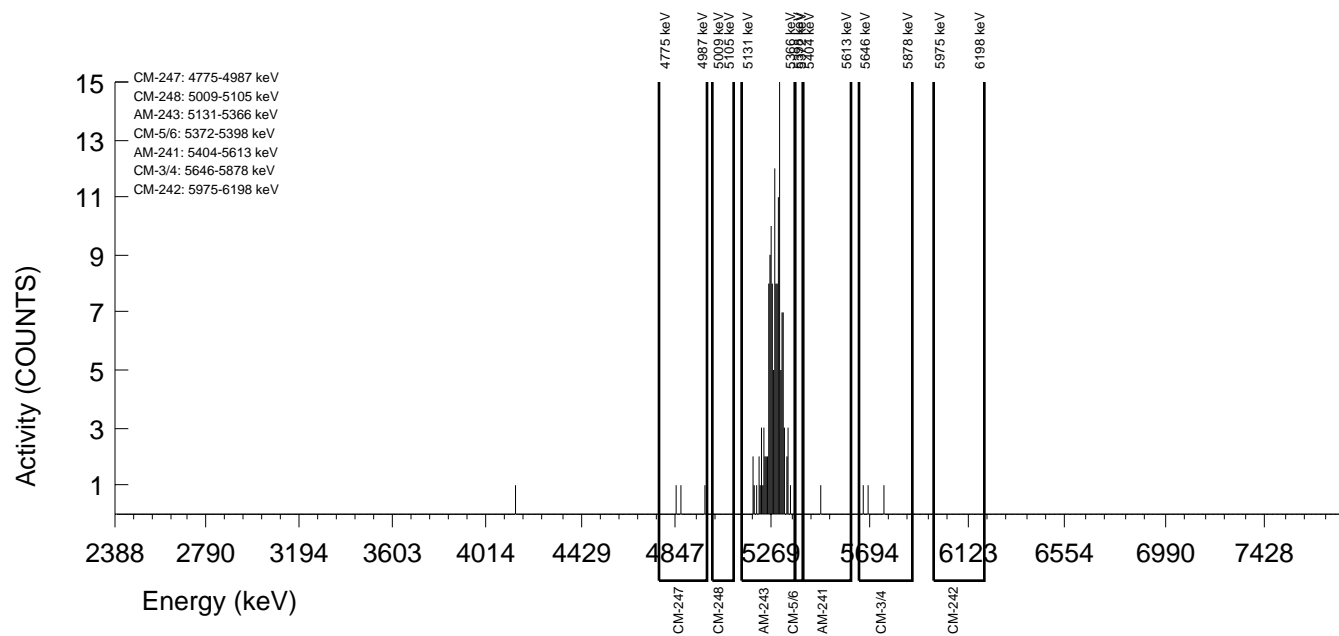
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235048_AM SAMPLE QTY : 0.507 G +/-0.197 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 100 +/-8.859 %	CHAMBER : 234 DETECTOR S/N : 87922 AVERAGE %EFFICIENCY : 24.8037 AVERAGE %EFF ERROR : 0.4811 COUNT DATE : 22-Sep-2016 16:14:39 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : AM BKG FILE : B234.CNF;452 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W234.CNF;117 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.7640E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5481.20	4.996	1.000	0.760	0.240	0.4899	98.525	2.30E-02	8.48E-02	1.42E-01	2.58E-02	8.46E-02
AM-243	5269.50	5278.86	49.131	142.000	141.760	0.240	0.4899	99.980	4.22E+00	1.02E+00	1.40E-01	2.54E-02	6.97E-01
CM-242	6102.00	6086.60	0.000	0.000	-0.120	0.120	0.3464	100.000	-1.23E-02	2.04E-01	4.31E-01	6.17E-02	2.04E-01
CM-3/4	5795.02	5704.82	89.934	3.000	2.520	0.480	0.6928	100.000	7.72E-02	1.22E-01	1.66E-01	3.70E-02	1.21E-01
CM-5/6	5386.00	5385.09	0.000	0.000	-0.120	0.120	0.3464	86.090	-4.14E-03	6.89E-02	1.45E-01	2.08E-02	6.87E-02
CM-247	4946.00	4896.43	124.908	3.000	2.760	0.240	0.4899	79.300	1.03E-01	1.49E-01	1.76E-01	3.20E-02	1.48E-01
CM-248	5078.60	5056.59	0.000	0.000	-0.120	0.120	0.3464	91.000	-3.92E-03	6.52E-02	1.37E-01	1.97E-02	6.49E-02



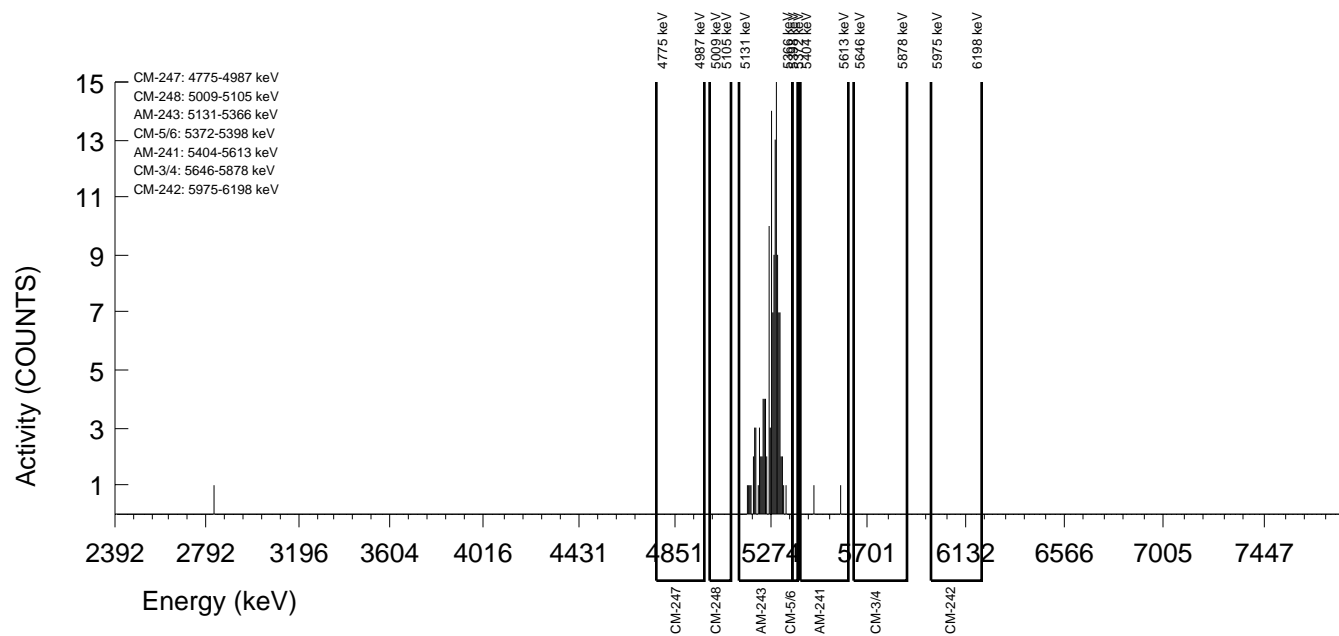
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235049_AM SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 94.8 +/-9.099 %	CHAMBER : 235 DETECTOR S/N : 87923 AVERAGE %EFFICIENCY : 24.7991 AVERAGE %EFF ERROR : 0.4811 COUNT DATE : 22-Sep-2016 16:14:41 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : AM BKG FILE : B235.CNF;453 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W235.CNF;118 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.4960E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5524.27	114.490	2.000	1.760	0.240	0.4899	98.525	5.65E-02	1.10E-01	1.51E-01	2.74E-02	1.10E-01
AM-243	5269.50	5277.33	39.822	134.000	133.760	0.240	0.4899	99.980	4.22E+00	1.05E+00	1.49E-01	2.69E-02	7.19E-01
CM-242	6102.00	6086.58	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	2.16E-01	3.26E-01	0.00E+00	2.15E-01
CM-3/4	5795.02	5761.62	0.000	0.000	-0.360	0.360	0.6000	100.000	-1.17E-02	6.59E-02	1.66E-01	3.40E-02	6.56E-02
CM-5/6	5386.00	5369.62	0.000	1.000	1.000	0.000	0.0000	86.090	3.67E-02	1.02E-01	1.10E-01	0.00E+00	1.02E-01
CM-247	4946.00	4881.20	0.000	0.000	-0.840	0.840	0.9165	79.300	-3.34E-02	8.27E-02	2.46E-01	6.35E-02	8.24E-02
CM-248	5078.60	5056.58	0.000	0.000	-0.240	0.240	0.4899	91.000	-8.33E-03	6.97E-02	1.63E-01	2.96E-02	6.94E-02



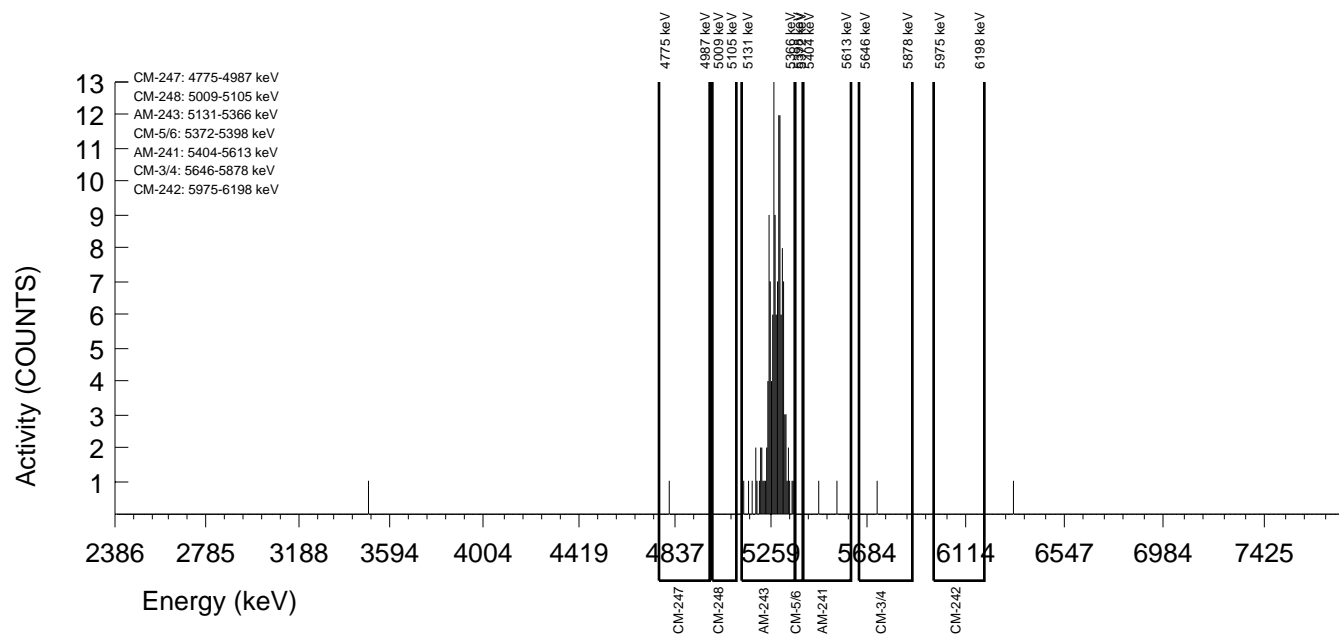
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235050_AM SAMPLE QTY : 0.504 G +/-0.198 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 93.3 +/-9.029 %	CHAMBER : 236 DETECTOR S/N : 87924 AVERAGE %EFFICIENCY : 25.7707 AVERAGE %EFF ERROR : 0.4994 COUNT DATE : 22-Sep-2016 16:14:43 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : AM BKG FILE : B236.CNF;453 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W236.CNF;117 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.4287E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5510.82	79.378	2.000	1.760	0.240	0.4899	98.525	5.54E-02	1.08E-01	1.48E-01	2.68E-02	1.08E-01
AM-243	5269.50	5279.99	62.634	138.000	136.920	1.080	1.0392	99.980	4.24E+00	1.05E+00	2.05E-01	5.60E-02	7.16E-01
CM-242	6102.00	6086.58	0.000	0.000	-0.120	0.120	0.3464	100.000	-1.28E-02	2.13E-01	4.49E-01	6.43E-02	2.12E-01
CM-3/4	5795.02	5726.99	4.961	1.000	0.640	0.360	0.6000	100.000	2.04E-02	8.99E-02	1.62E-01	3.33E-02	8.97E-02
CM-5/6	5386.00	5385.09	0.000	0.000	0.000	0.000	0.0000	86.090	0.00E+00	7.13E-02	1.08E-01	0.00E+00	7.10E-02
CM-247	4946.00	4815.69	4.961	1.000	0.400	0.600	0.7746	79.300	1.56E-02	1.11E-01	2.22E-01	5.26E-02	1.11E-01
CM-248	5078.60	5056.58	0.000	0.000	0.000	0.000	0.0000	91.000	0.00E+00	6.74E-02	1.02E-01	0.00E+00	6.72E-02



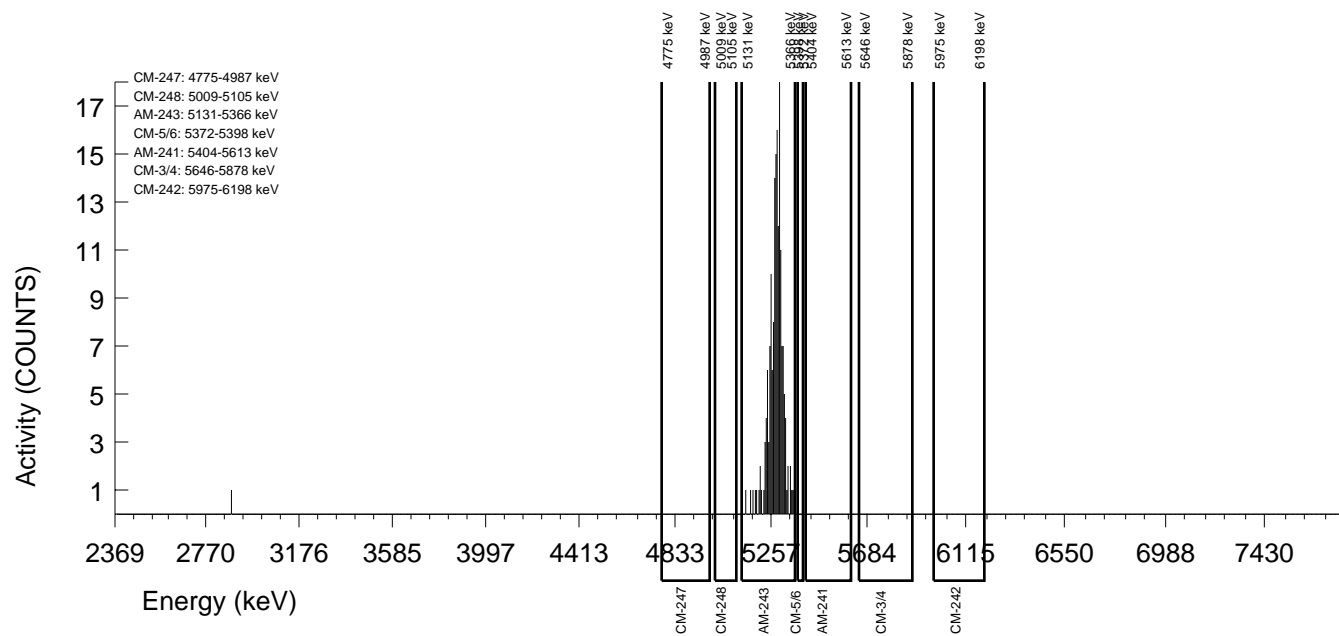
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235051_AM SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 70.3 +/-8.174 %	CHAMBER : 218 DETECTOR S/N : 87906 AVERAGE %EFFICIENCY : 25.1171 AVERAGE %EFF ERROR : 0.4871 COUNT DATE : 22-Sep-2016 09:56:21 ELAPSED LIVE TIME(SEC) : 12299.48	LIB FILE : AM BKG FILE : B218.CNF;457 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W218.CNF;126 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 3.3366E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.50	0.000	0.000	-0.820	0.820	0.9055	98.525	-2.06E-02	5.45E-02	1.58E-01	4.12E-02	5.43E-02
AM-243	5269.50	5277.39	44.134	174.000	171.745	2.255	1.5016	99.980	4.26E+00	9.52E-01	2.09E-01	6.72E-02	6.44E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.71E-01	2.56E-01	0.00E+00	1.71E-01
CM-3/4	5795.02	5761.62	0.000	0.000	-1.025	1.025	1.0124	100.000	-2.62E-02	5.62E-02	1.70E-01	4.67E-02	5.60E-02
CM-5/6	5386.00	5385.09	0.000	0.000	-0.205	0.205	0.4528	86.090	-5.90E-03	5.89E-02	1.33E-01	2.35E-02	5.87E-02
CM-247	4946.00	4881.20	0.000	0.000	-1.025	1.025	1.0124	79.300	-3.20E-02	6.87E-02	2.08E-01	5.71E-02	6.85E-02
CM-248	5078.60	5056.59	0.000	0.000	-1.230	1.230	1.1090	91.000	-3.35E-02	6.09E-02	1.91E-01	5.45E-02	6.07E-02



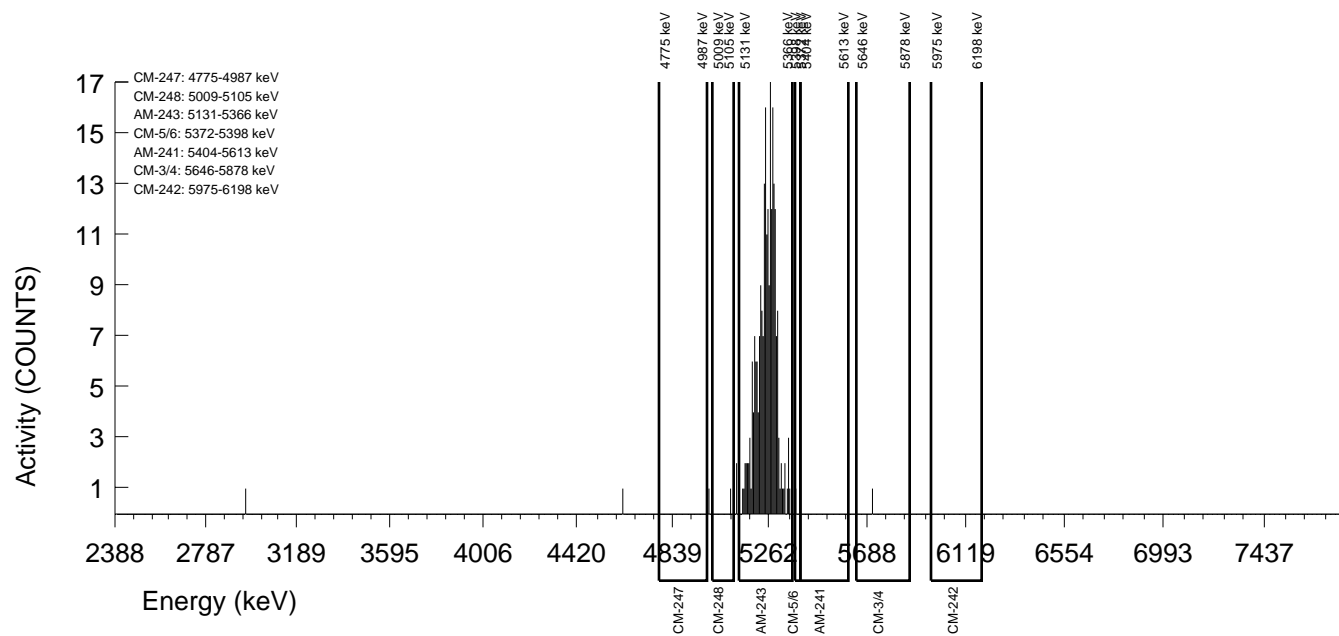
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235052_AM SAMPLE QTY : 0.508 G +/-0.197 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 96.3 +/-7.050 %	CHAMBER : 219 DETECTOR S/N : 87907 AVERAGE %EFFICIENCY : 25.4729 AVERAGE %EFF ERROR : 0.4938 COUNT DATE : 22-Sep-2016 09:56:24 ELAPSED LIVE TIME(SEC) : 12298.88	LIB FILE : AM BKG FILE : B219.CNF;457 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W219.CNF;132 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.5702E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.49	0.000	0.000	-1.025	1.025	1.0124	98.525	-1.84E-02	3.94E-02	1.19E-01	3.28E-02	3.93E-02
AM-243	5269.50	5251.22	64.123	240.000	238.565	1.435	1.1979	99.980	4.21E+00	8.07E-01	1.29E-01	3.81E-02	5.37E-01
CM-242	6102.00	6086.58	0.000	0.000	-0.205	0.205	0.4527	100.000	-1.24E-02	1.24E-01	2.81E-01	4.96E-02	1.24E-01
CM-3/4	5795.02	5715.29	4.952	1.000	-0.230	1.230	1.1090	100.000	-4.18E-03	5.40E-02	1.27E-01	3.64E-02	5.40E-02
CM-5/6	5386.00	5378.63	4.952	1.000	1.000	0.000	0.0000	86.090	2.05E-02	5.74E-02	6.14E-02	0.00E+00	5.74E-02
CM-247	4946.00	4881.19	0.000	0.000	-1.025	1.025	1.0124	79.300	-2.28E-02	4.89E-02	1.48E-01	4.06E-02	4.88E-02
CM-248	5078.60	5092.08	4.952	1.000	-0.230	1.230	1.1090	91.000	-4.45E-03	5.76E-02	1.36E-01	3.88E-02	5.75E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

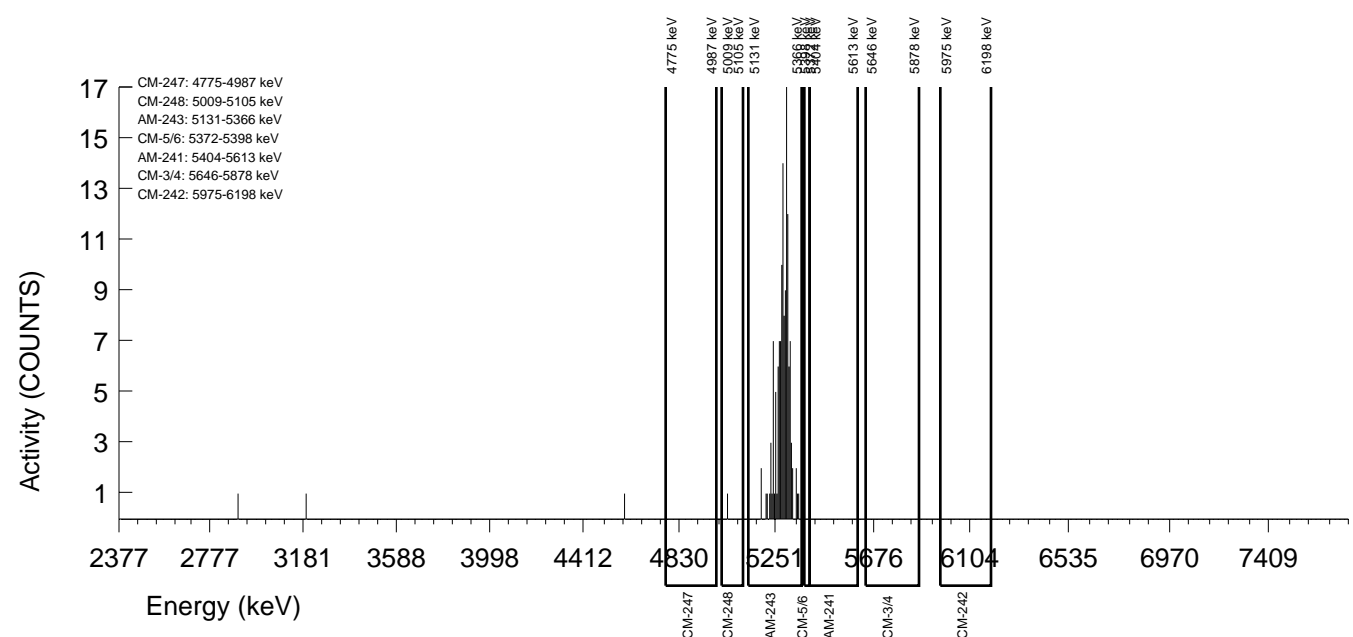
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235053_AM SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 01-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 57.4 +/-9.147 %	CHAMBER : 220 DETECTOR S/N : 87908 AVERAGE %EFFICIENCY : 24.0361 AVERAGE %EFF ERROR : 0.4668 COUNT DATE : 22-Sep-2016 09:56:27 ELAPSED LIVE TIME(SEC) : 12300.10	LIB FILE : AM BKG FILE : B220.CNF;456 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W220.CNF;142 CAL DATE : 16-Sep-2016
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TRACER
 ID : 1752-C
 NUCLIDE : AM-243
 NOMINAL : 4.7442E+00 dpm
 RESULTS : 2.7234E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.50	0.000	0.000	-0.410	0.410	0.6403	98.525	-1.33E-02	6.76E-02	1.72E-01	3.74E-02	6.73E-02
AM-243	5269.50	5283.44	30.283	136.000	134.155	1.845	1.3583	99.980	4.27E+00	1.07E+00	2.52E-01	7.81E-02	7.32E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	2.26E-01	3.37E-01	0.00E+00	2.25E-01
CM-3/4	5795.02	5761.63	0.000	0.000	-1.025	1.025	1.0124	100.000	-3.37E-02	7.23E-02	2.19E-01	6.01E-02	7.21E-02
CM-5/6	5386.00	5372.75	0.000	1.000	1.000	0.000	0.0000	86.090	3.70E-02	1.04E-01	1.11E-01	0.00E+00	1.04E-01
CM-247	4946.00	4881.21	0.000	0.000	-0.410	0.410	0.6403	79.300	-1.65E-02	8.39E-02	2.13E-01	4.64E-02	8.35E-02
CM-248	5078.60	5040.10	4.978	1.000	1.000	0.000	0.0000	91.000	3.50E-02	9.82E-02	1.05E-01	0.00E+00	9.80E-02



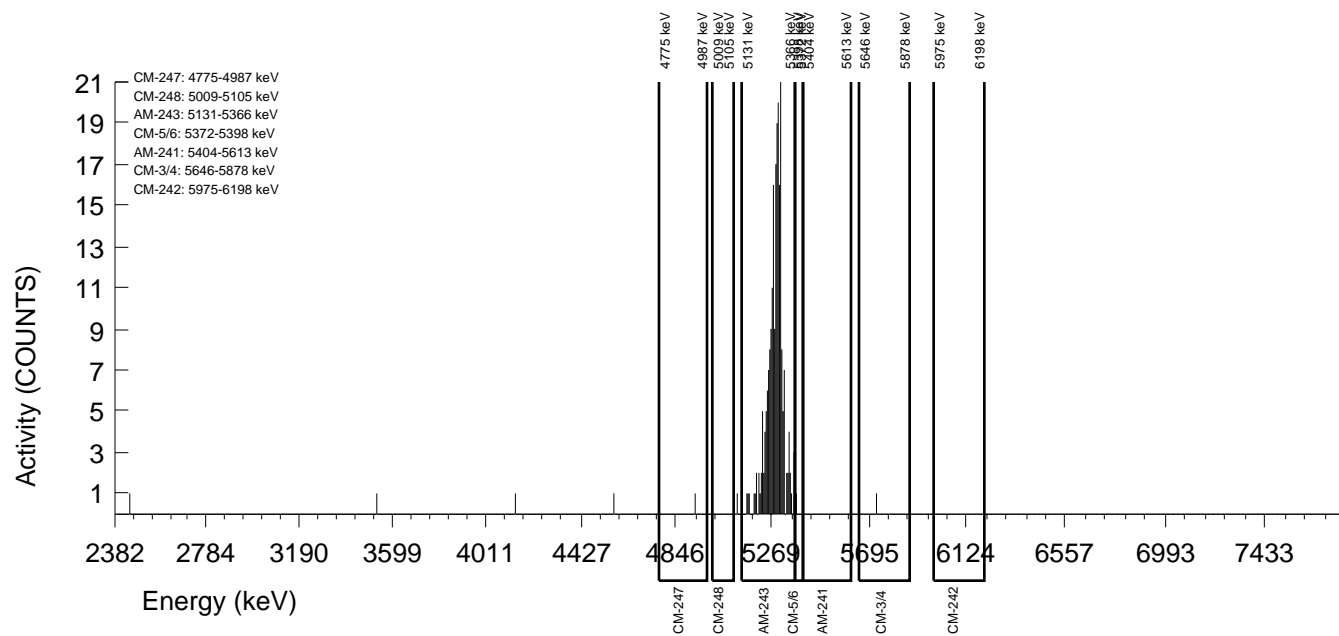
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235054_AM SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 88.5 +/-7.303 %	CHAMBER : 221 DETECTOR S/N : 87909 AVERAGE %EFFICIENCY : 25.5264 AVERAGE %EFF ERROR : 0.4948 COUNT DATE : 22-Sep-2016 09:56:29 ELAPSED LIVE TIME(SEC) : 12307.16	LIB FILE : AM BKG FILE : B221.CNF;465 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W221.CNF;128 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.1985E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.51	0.000	0.000	-0.205	0.205	0.4529	98.525	-4.05E-03	4.04E-02	9.16E-02	1.62E-02	4.03E-02
AM-243	5269.50	5282.09	40.335	221.000	219.769	1.231	1.1094	99.980	4.27E+00	8.51E-01	1.36E-01	3.90E-02	5.68E-01
CM-242	6102.00	6086.60	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.37E-01	2.05E-01	0.00E+00	1.37E-01
CM-3/4	5795.02	5726.98	5.006	1.000	0.795	0.205	0.4529	100.000	1.59E-02	5.68E-02	9.30E-02	1.64E-02	5.67E-02
CM-5/6	5386.00	5375.05	5.006	1.000	1.000	0.000	0.0000	86.090	2.26E-02	6.34E-02	6.78E-02	0.00E+00	6.33E-02
CM-247	4946.00	4930.49	5.006	1.000	0.795	0.205	0.4529	79.300	1.95E-02	6.95E-02	1.14E-01	2.01E-02	6.94E-02
CM-248	5078.60	5056.59	0.000	0.000	-0.410	0.410	0.6405	91.000	-8.76E-03	4.46E-02	1.14E-01	2.47E-02	4.44E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

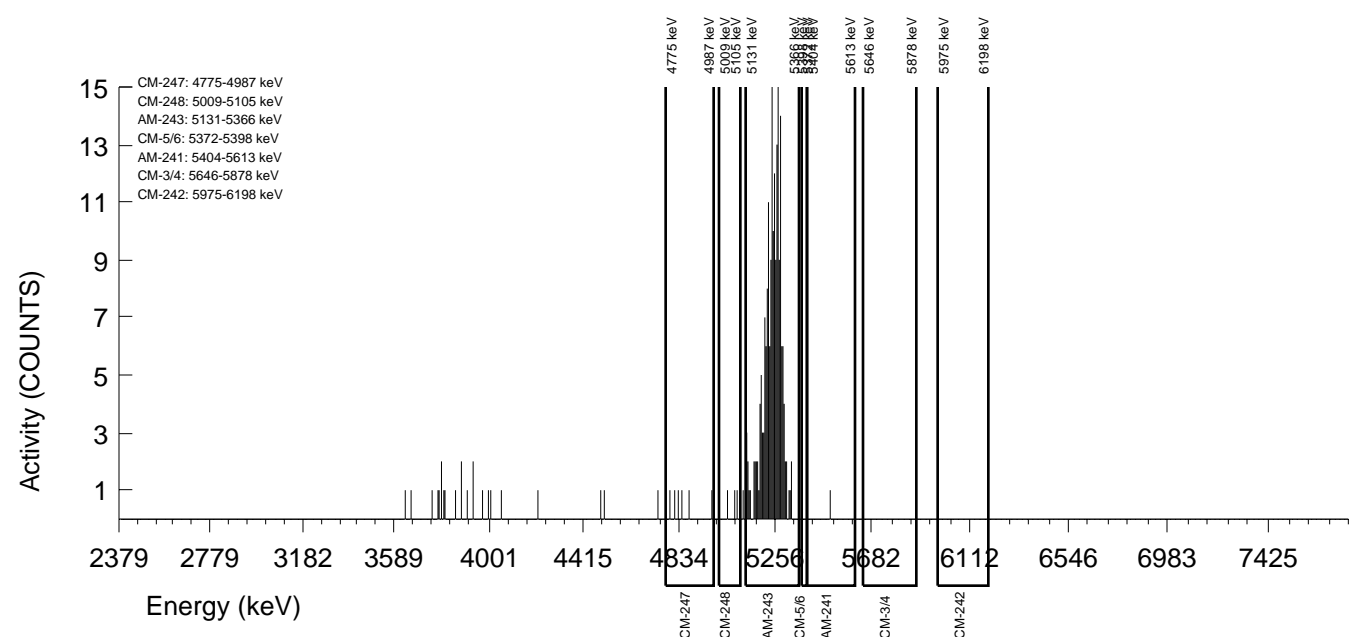
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235055_AM SAMPLE QTY : 0.510 G +/-0.196 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 81.7 +/-7.617 %	CHAMBER : 222 DETECTOR S/N : 87910 AVERAGE %EFFICIENCY : 25.0479 AVERAGE %EFF ERROR : 0.4857 COUNT DATE : 22-Sep-2016 09:56:32 ELAPSED LIVE TIME(SEC) : 12308.89	LIB FILE : AM BKG FILE : B222.CNF;457 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W222.CNF;125 CAL DATE : 16-Sep-2016
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TRACER
 ID : 1752-C
 NUCLIDE : AM-243
 NOMINAL : 4.7442E+00 dpm
 RESULTS : 3.8773E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5500.89	4.973	1.000	0.795	0.205	0.4529	98.525	1.70E-02	6.06E-02	9.91E-02	1.75E-02	6.05E-02
AM-243	5269.50	5246.25	59.992	200.000	199.179	0.821	0.9059	99.980	4.19E+00	8.71E-01	1.32E-01	3.44E-02	5.85E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.48E-01	2.22E-01	0.00E+00	1.48E-01
CM-3/4	5795.02	5761.62	0.000	0.000	-0.615	0.615	0.7845	100.000	-1.34E-02	4.61E-02	1.27E-01	3.07E-02	4.60E-02
CM-5/6	5386.00	5385.09	0.000	0.000	0.000	0.000	0.0000	86.090	0.00E+00	4.90E-02	7.33E-02	0.00E+00	4.89E-02
CM-247	4946.00	4860.25	179.044	6.000	4.974	1.026	1.0128	79.300	1.32E-01	1.41E-01	1.77E-01	4.85E-02	1.40E-01
CM-248	5078.60	5085.87	0.000	5.000	4.179	0.821	0.9059	91.000	9.66E-02	1.14E-01	1.45E-01	3.78E-02	1.13E-01



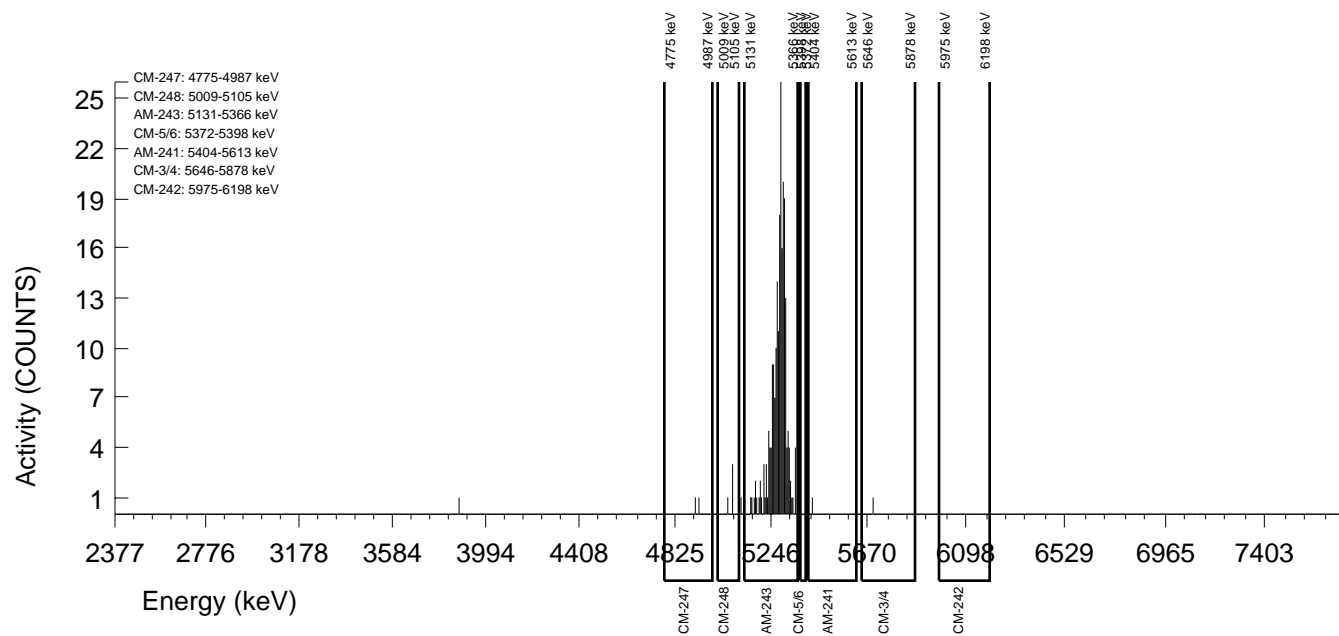
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235056_AM SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 90.1 +/-7.220 %	CHAMBER : 223 DETECTOR S/N : 87911 AVERAGE %EFFICIENCY : 25.6333 AVERAGE %EFF ERROR : 0.4968 COUNT DATE : 22-Sep-2016 09:56:35 ELAPSED LIVE TIME(SEC) : 12304.18	LIB FILE : AM BKG FILE : B223.CNF;458 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W223.CNF;114 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.2737E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5425.41	4.964	1.000	-0.641	1.641	1.2808	98.525	-1.22E-02	5.75E-02	1.45E-01	4.39E-02	5.74E-02
AM-243	5269.50	5279.44	35.990	225.000	224.590	0.410	0.6404	99.980	4.20E+00	8.26E-01	9.93E-02	2.16E-02	5.51E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.32E-01	1.97E-01	0.00E+00	1.31E-01
CM-3/4	5795.02	5691.16	4.964	1.000	1.000	0.000	0.0000	100.000	1.93E-02	5.41E-02	5.78E-02	0.00E+00	5.40E-02
CM-5/6	5386.00	5372.43	0.000	1.000	0.795	0.205	0.4528	86.090	1.73E-02	6.15E-02	1.01E-01	1.78E-02	6.14E-02
CM-247	4946.00	4921.77	19.857	2.000	1.795	0.205	0.4528	79.300	4.23E-02	8.14E-02	1.09E-01	1.93E-02	8.11E-02
CM-248	5078.60	5071.53	4.964	4.000	3.385	0.615	0.7844	91.000	6.95E-02	9.21E-02	1.20E-01	2.91E-02	9.15E-02



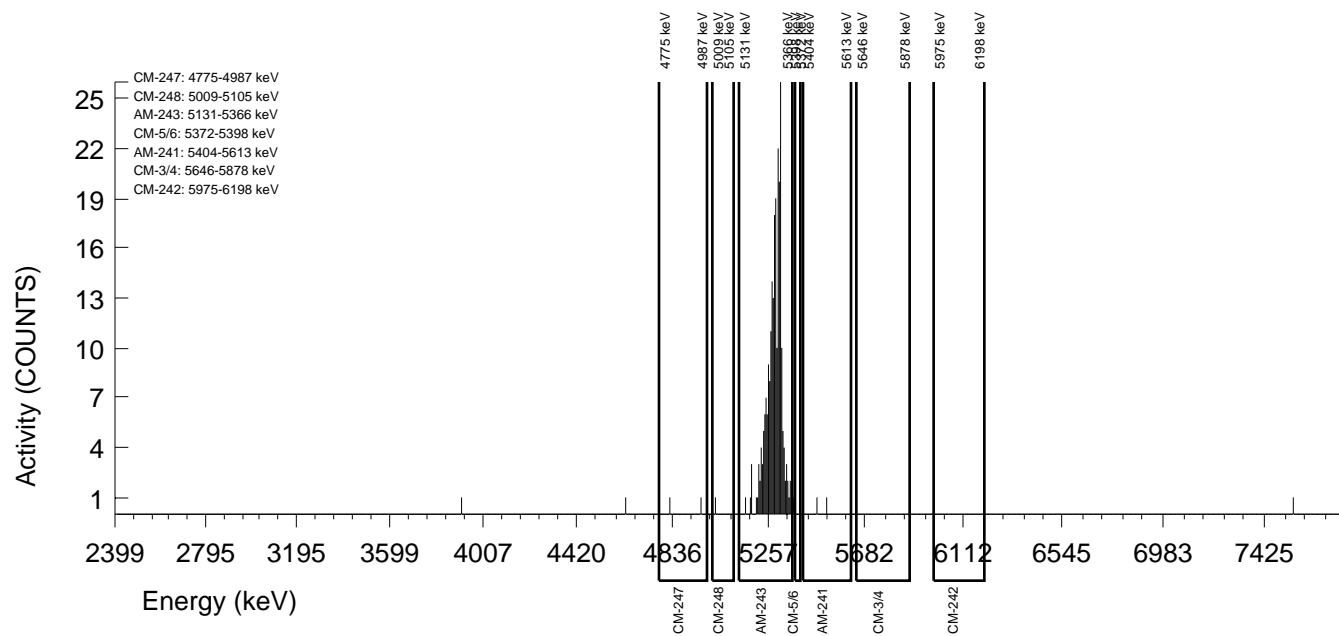
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235057_AM SAMPLE QTY : 0.500 G +/-0.200 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 97.5 +/-6.971 %	CHAMBER : 224 DETECTOR S/N : 87912 AVERAGE %EFFICIENCY : 25.7363 AVERAGE %EFF ERROR : 0.4987 COUNT DATE : 22-Sep-2016 09:56:37 ELAPSED LIVE TIME(SEC) : 12305.60	LIB FILE : AM BKG FILE : B224.CNF;469 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W224.CNF;150 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.6273E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5490.58	44.280	2.000	1.385	0.615	0.7844	98.525	2.46E-02	6.21E-02	1.04E-01	2.52E-02	6.20E-02
AM-243	5269.50	5283.71	40.077	245.000	244.180	0.820	0.9057	99.980	4.27E+00	8.11E-01	1.10E-01	2.86E-02	5.38E-01
CM-242	6102.00	6086.57	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.23E-01	1.85E-01	0.00E+00	1.23E-01
CM-3/4	5795.02	5761.60	0.000	0.000	-1.846	1.846	1.3586	100.000	-3.33E-02	4.22E-02	1.43E-01	4.43E-02	4.22E-02
CM-5/6	5386.00	5385.09	0.000	0.000	0.000	0.000	0.0000	86.090	0.00E+00	4.08E-02	6.10E-02	0.00E+00	4.07E-02
CM-247	4946.00	4893.98	132.839	2.000	0.564	1.436	1.1982	79.300	1.25E-02	7.91E-02	1.62E-01	4.77E-02	7.90E-02
CM-248	5078.60	5025.25	4.920	1.000	0.590	0.410	0.6405	91.000	1.13E-02	5.50E-02	1.02E-01	2.22E-02	5.50E-02



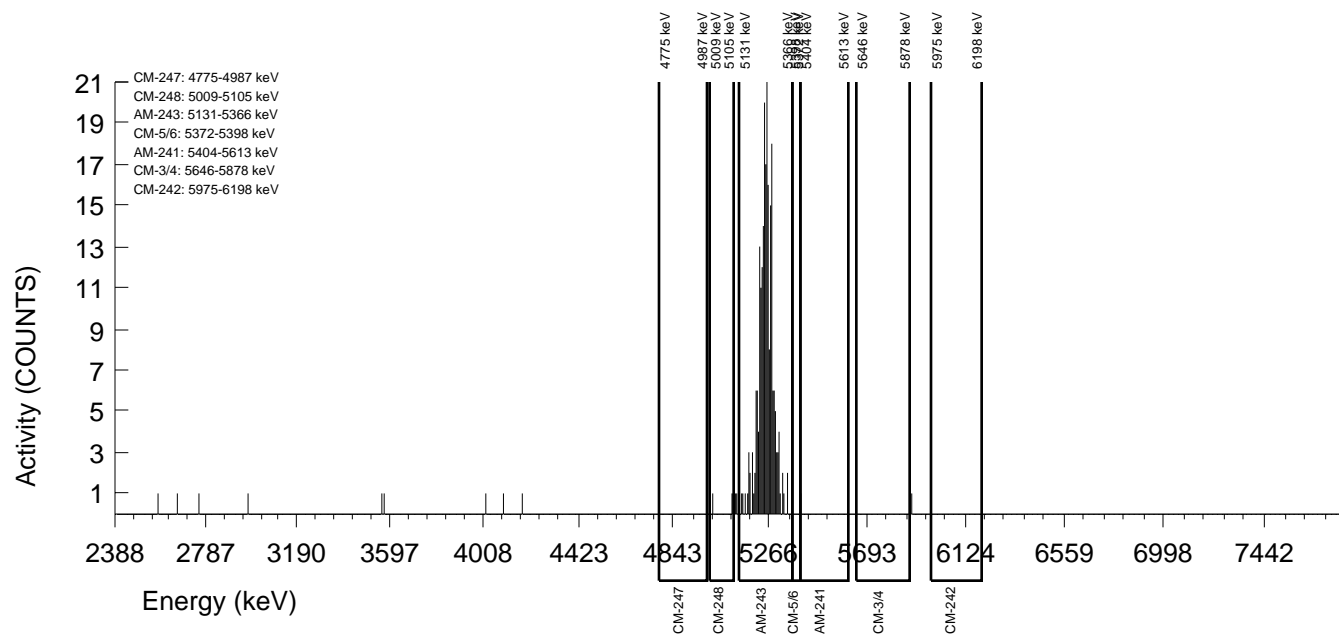
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235058_AM SAMPLE QTY : 0.512 G +/-0.195 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 90.3 +/-7.184 %	CHAMBER : 225 DETECTOR S/N : 87913 AVERAGE %EFFICIENCY : 25.9298 AVERAGE %EFF ERROR : 0.5025 COUNT DATE : 22-Sep-2016 09:56:40 ELAPSED LIVE TIME(SEC) : 12312.47	LIB FILE : AM BKG FILE : B225.CNF;458 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W225.CNF;124 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.2856E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5404.04	0.000	1.000	-0.847	1.847	1.3590	98.525	-1.58E-02	5.68E-02	1.47E-01	4.57E-02	5.67E-02
AM-243	5269.50	5250.41	54.094	229.000	227.974	1.026	1.0129	99.980	4.17E+00	8.17E-01	1.22E-01	3.35E-02	5.45E-01
CM-242	6102.00	6086.58	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.29E-01	1.93E-01	0.00E+00	1.29E-01
CM-3/4	5795.02	5761.61	0.000	0.000	-0.821	0.821	0.9060	100.000	-1.55E-02	4.08E-02	1.18E-01	3.09E-02	4.07E-02
CM-5/6	5386.00	5385.09	0.000	0.000	-0.616	0.616	0.7846	86.090	-1.31E-02	4.52E-02	1.24E-01	3.01E-02	4.51E-02
CM-247	4946.00	4881.19	0.000	0.000	-0.821	0.821	0.9060	79.300	-1.89E-02	4.99E-02	1.45E-01	3.78E-02	4.98E-02
CM-248	5078.60	5074.76	0.000	3.000	2.179	0.821	0.9060	91.000	4.38E-02	8.11E-02	1.26E-01	3.29E-02	8.09E-02



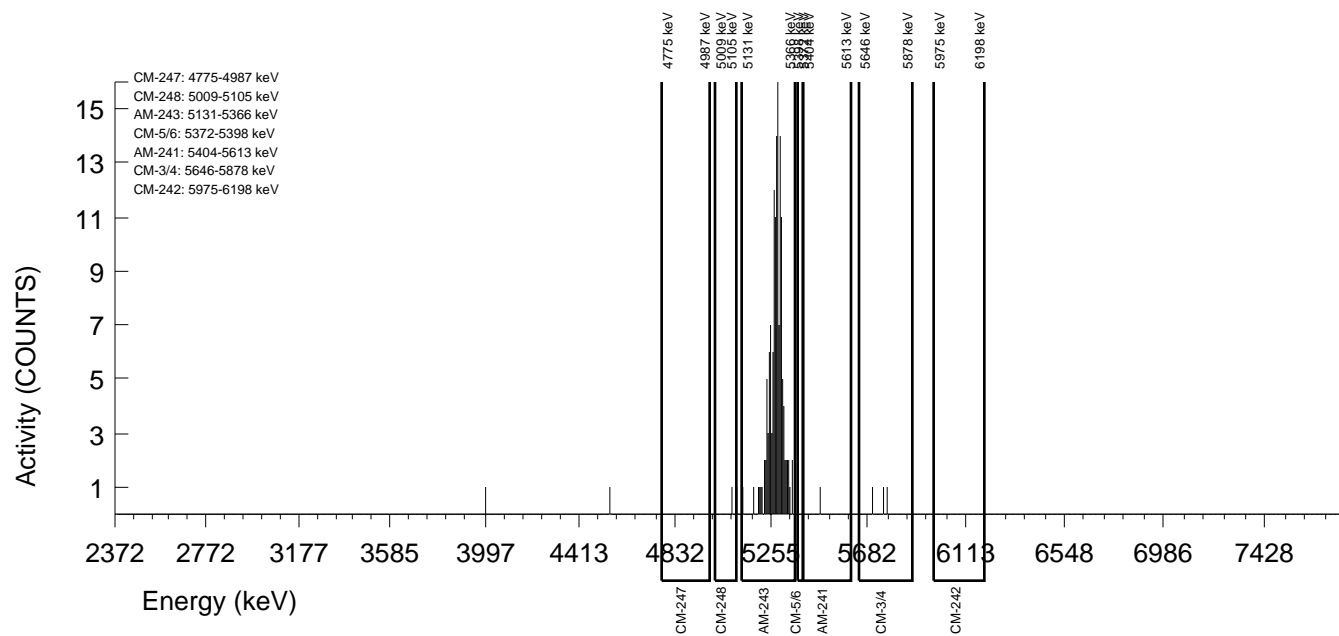
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235059_AM SAMPLE QTY : 0.503 G +/-0.199 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 55.1 +/-8.836 %	CHAMBER : 226 DETECTOR S/N : 87914 AVERAGE %EFFICIENCY : 26.8347 AVERAGE %EFF ERROR : 0.5195 COUNT DATE : 22-Sep-2016 09:56:43 ELAPSED LIVE TIME(SEC) : 12311.39	LIB FILE : AM BKG FILE : B226.CNF;458 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W226.CNF;122 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 2.6117E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5473.79	4.984	1.000	0.795	0.205	0.4530	98.525	2.39E-02	8.51E-02	1.39E-01	2.46E-02	8.50E-02
AM-243	5269.50	5279.57	35.716	145.000	143.769	1.231	1.1096	99.980	4.25E+00	1.03E+00	2.07E-01	5.92E-02	7.01E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.97E-01	2.94E-01	0.00E+00	1.96E-01
CM-3/4	5795.02	5741.45	64.788	3.000	2.179	0.821	0.9060	100.000	6.63E-02	1.23E-01	1.91E-01	4.98E-02	1.22E-01
CM-5/6	5386.00	5399.11	0.000	1.000	1.000	0.000	0.0000	86.090	3.43E-02	9.63E-02	1.03E-01	0.00E+00	9.61E-02
CM-247	4946.00	4881.20	0.000	0.000	-0.821	0.821	0.9060	79.300	-3.06E-02	8.06E-02	2.34E-01	6.10E-02	8.03E-02
CM-248	5078.60	5096.25	0.000	2.000	2.000	0.000	0.0000	91.000	6.49E-02	1.12E-01	9.74E-02	0.00E+00	1.11E-01



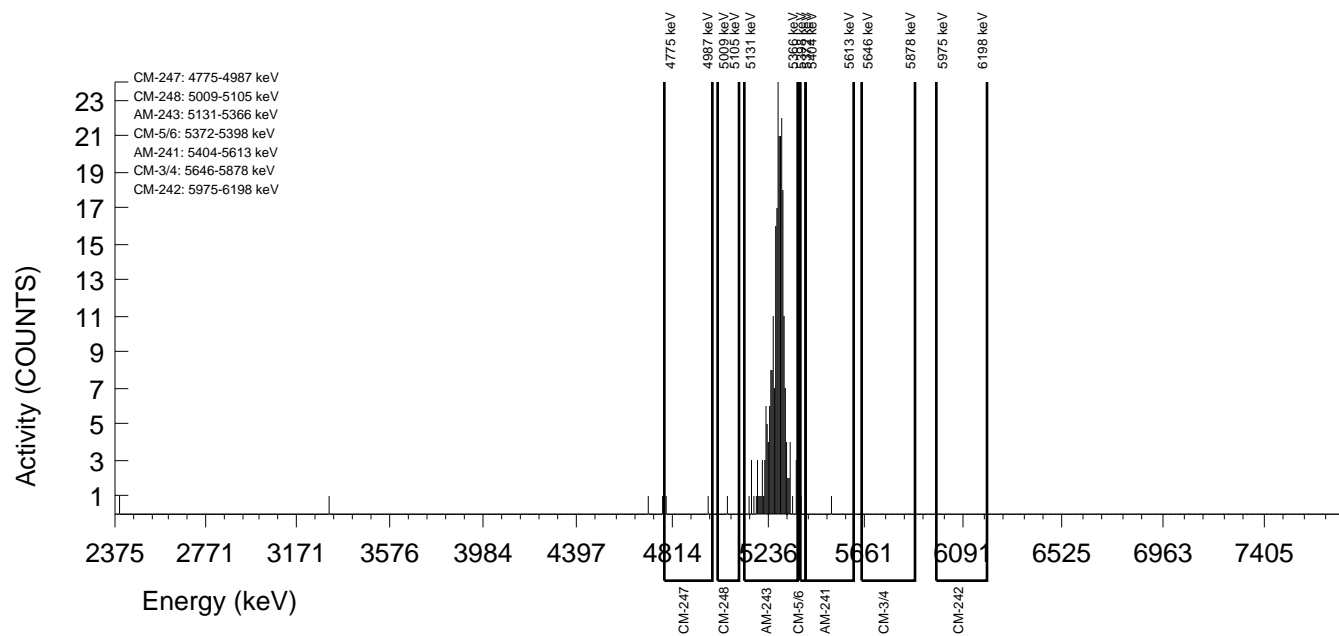
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S0405235060_AM SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 96.3 +/-6.940 %	CHAMBER : 227 DETECTOR S/N : 87915 AVERAGE %EFFICIENCY : 26.3665 AVERAGE %EFF ERROR : 0.5107 COUNT DATE : 22-Sep-2016 09:56:45 ELAPSED LIVE TIME(SEC) : 12310.57	LIB FILE : AM BKG FILE : B227.CNF;457 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W227.CNF;120 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.5666E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5511.69	4.922	1.000	-0.231	1.231	1.1095	98.525	-3.94E-03	5.07E-02	1.20E-01	3.42E-02	5.07E-02
AM-243	5269.50	5273.36	35.942	248.000	246.974	1.026	1.0129	99.980	4.15E+00	7.84E-01	1.12E-01	3.07E-02	5.20E-01
CM-242	6102.00	6086.57	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	1.12E-01	1.67E-01	0.00E+00	1.11E-01
CM-3/4	5795.02	5761.60	0.000	0.000	-0.616	0.616	0.7846	100.000	-1.06E-02	3.67E-02	1.01E-01	2.45E-02	3.67E-02
CM-5/6	5386.00	5376.08	0.000	2.000	1.590	0.410	0.6406	86.090	3.10E-02	6.78E-02	1.04E-01	2.26E-02	6.76E-02
CM-247	4946.00	4879.86	177.209	2.000	0.564	1.436	1.1984	79.300	1.19E-02	7.59E-02	1.55E-01	4.58E-02	7.58E-02
CM-248	5078.60	5056.03	4.922	1.000	0.179	0.821	0.9059	91.000	3.31E-03	5.39E-02	1.16E-01	3.02E-02	5.38E-02



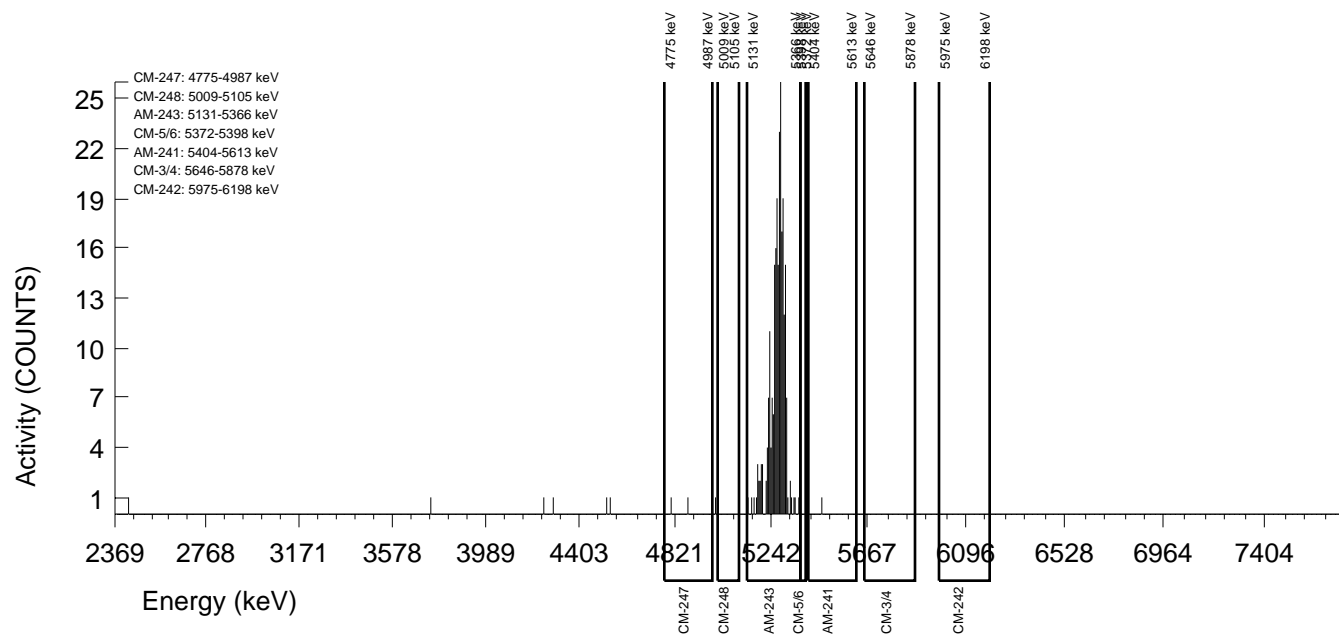
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S1203621745_AM SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 20-Sep-2016 00:00:00 ANALYST : HAKB % YIELD : 99.7 +/-6.923 %	CHAMBER : 228 DETECTOR S/N : 87916 AVERAGE %EFFICIENCY : 25.5769 AVERAGE %EFF ERROR : 0.4958 COUNT DATE : 22-Sep-2016 09:56:47 ELAPSED LIVE TIME(SEC) : 12310.50	LIB FILE : AM BKG FILE : B228.CNF;455 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W228.CNF;117 CAL DATE : 16-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7439E+00 dpm RESULTS : 4.7302E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5464.68	4.970	1.000	0.384	0.616	0.7846	98.525	6.52E-03	4.90E-02	9.90E-02	2.40E-02	4.90E-02
AM-243	5269.50	5270.24	47.075	249.000	248.179	0.821	0.9059	99.980	4.15E+00	7.82E-01	1.05E-01	2.74E-02	5.18E-01
CM-242	6102.00	6086.59	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	3.39E-02	5.07E-02	0.00E+00	3.38E-02
CM-3/4	5795.02	5761.62	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	3.35E-02	5.02E-02	0.00E+00	3.35E-02
CM-5/6	5386.00	5385.09	0.000	0.000	-0.205	0.205	0.4530	86.090	-3.98E-03	3.97E-02	9.00E-02	1.59E-02	3.96E-02
CM-247	4946.00	4841.49	74.547	2.000	0.153	1.847	1.3589	79.300	3.23E-03	7.65E-02	1.67E-01	5.17E-02	7.64E-02
CM-248	5078.60	5056.59	0.000	0.000	-0.410	0.410	0.6406	91.000	-7.54E-03	3.83E-02	9.76E-02	2.12E-02	3.82E-02



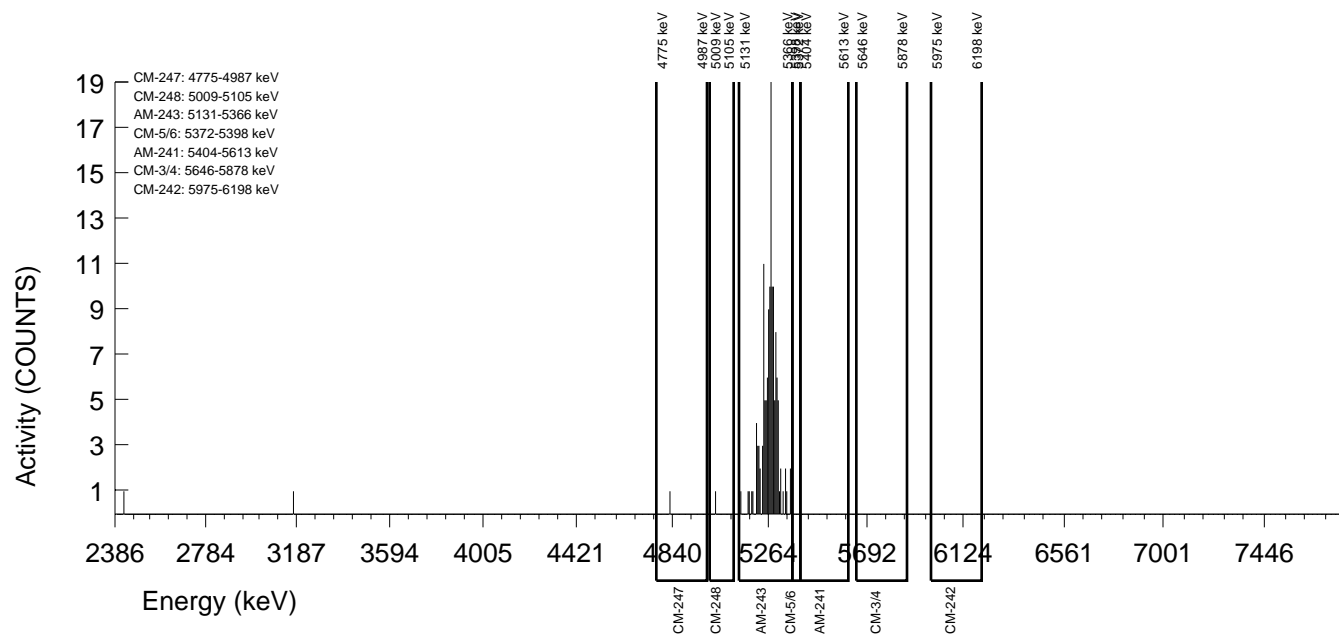
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S1203621746_AM SAMPLE QTY : 0.511 G +/-0.196 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 93.4 +/-8.939 %	CHAMBER : 238 DETECTOR S/N : 87926 AVERAGE %EFFICIENCY : 26.1325 AVERAGE %EFF ERROR : 0.5062 COUNT DATE : 22-Sep-2016 16:14:46 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : AM BKG FILE : B238.CNF;453 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W238.CNF;125 CAL DATE : 19-Sep-2016
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7442E+00 dpm RESULTS : 4.4299E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5508.48	0.000	0.000	-0.120	0.120	0.3464	98.525	-3.67E-03	6.11E-02	1.29E-01	1.85E-02	6.08E-02
AM-243	5269.50	5269.14	41.072	139.000	138.880	0.120	0.3464	99.980	4.18E+00	1.02E+00	1.27E-01	1.82E-02	6.98E-01
CM-242	6102.00	6086.57	0.000	0.000	-0.120	0.120	0.3464	100.000	-1.28E-02	2.13E-01	4.49E-01	6.44E-02	2.12E-01
CM-3/4	5795.02	5761.60	0.000	0.000	-0.240	0.240	0.4899	100.000	-7.45E-03	6.24E-02	1.46E-01	2.65E-02	6.22E-02
CM-5/6	5386.00	5385.09	0.000	0.000	-0.120	0.120	0.3464	86.090	-4.20E-03	6.98E-02	1.47E-01	2.11E-02	6.95E-02
CM-247	4946.00	4829.67	4.956	1.000	0.880	0.120	0.3464	79.300	3.34E-02	1.06E-01	1.60E-01	2.29E-02	1.06E-01
CM-248	5078.60	5030.40	4.956	1.000	0.880	0.120	0.3464	91.000	2.91E-02	9.25E-02	1.39E-01	2.00E-02	9.24E-02



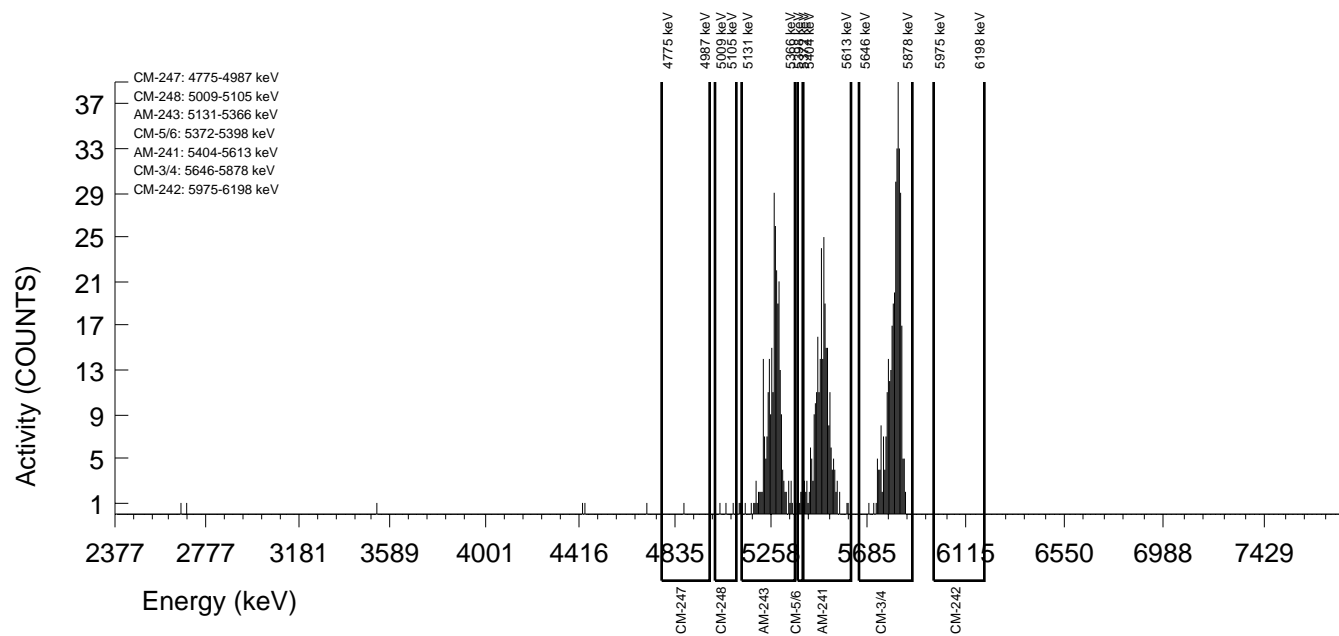
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596410 SAMPLE ID : S1203621747_AM SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 20-Sep-2016 00:00:00 ANALYST : HAKB % YIELD : 101 +/-6.732 %	CHAMBER : 230 DETECTOR S/N : 87918 AVERAGE %EFFICIENCY : 25.1072 AVERAGE %EFF ERROR : 0.4868 COUNT DATE : 22-Sep-2016 09:56:52 ELAPSED LIVE TIME(SEC) : 13214.12	LIB FILE : AM BKG FILE : B230.CNF;458 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W230.CNF;114 CAL DATE : 16-Sep-2016												
TRACER ID : 1752-C NUCLIDE : AM-243 NOMINAL : 4.7439E+00 dpm RESULTS : 4.8057E+00 dpm	LCS <table border="1"> <tr> <td>ID</td> <td>0533-CC</td> <td>1216-G</td> </tr> <tr> <td>NUCLIDE</td> <td>AM-241</td> <td>CM-3/4</td> </tr> <tr> <td>NOMINAL (pCi/G)</td> <td>3.8242E+00</td> <td>5.0562E+00</td> </tr> <tr> <td>% RECOVERY</td> <td>105.132</td> <td>106.193</td> </tr> </table>	ID	0533-CC	1216-G	NUCLIDE	AM-241	CM-3/4	NOMINAL (pCi/G)	3.8242E+00	5.0562E+00	% RECOVERY	105.132	106.193	
ID	0533-CC	1216-G												
NUCLIDE	AM-241	CM-3/4												
NOMINAL (pCi/G)	3.8242E+00	5.0562E+00												
% RECOVERY	105.132	106.193												

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AM-241	5480.15	5486.31	45.098	255.000	253.679	1.321	1.1495	98.525	4.02E+00	7.43E-01	1.14E-01	3.31E-02	4.97E-01
AM-243	5269.50	5271.48	34.336	267.000	265.679	1.321	1.1495	99.980	4.15E+00	7.59E-01	1.12E-01	3.26E-02	5.01E-01
CM-242	6102.00	5975.15	0.000	1.000	1.000	0.000	0.0000	100.000	1.58E-02	4.43E-02	4.73E-02	0.00E+00	4.43E-02
CM-3/4	5795.02	5801.52	31.328	344.000	343.780	0.220	0.4693	100.000	5.37E+00	9.31E-01	7.35E-02	1.33E-02	5.69E-01
CM-5/6	5386.00	5386.59	0.000	8.000	8.000	0.000	0.0000	86.090	1.45E-01	1.09E-01	5.44E-02	0.00E+00	1.07E-01
CM-247	4946.00	4877.52	4.979	1.000	-0.321	1.321	1.1495	79.300	-6.33E-03	5.91E-02	1.41E-01	4.11E-02	5.90E-02
CM-248	5078.60	5064.01	59.751	3.000	1.899	1.101	1.0494	91.000	3.26E-02	6.98E-02	1.17E-01	3.27E-02	6.97E-02



Batch# 1596396 Product: U Date: 10/4/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	/		
Instrument source check is within limits.	/		
Instrument bkg check is within limits.	/		
Method RDL/ LLD has been met.	/		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.		/	Case narrative
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	/		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	/		
Sample was run within hold time.		/	DER# 1564145
Sample was correctly preserved if required.			NA
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	/		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	/		
Aux data is correct.			NA
Client Special requirements page has been checked.	/		
Raw Data and/ or spectrum are included and properly stasured.	/		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	/		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	/		10/10/16 DER# 1564145
Batch Data Exception Reports (DER) completed, if applicable.	/		DER# 1564145
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	/		DER# 1564145
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	/		

Primary Review Performed By: [Signature] 10/4/16

Secondary Review Performed By: [Signature] 10/04/16

10/4
MJW c

DATA EXCEPTION REPORT

Mo.Day Yr. 04-OCT-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, U-02-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596396	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, and 1203621710 were received and analyzed outside of the holding time.</p>		<p>1. 1. Reporting results.</p>	

Originator's Name:
Jessica Downey 04-OCT-16

Data Validator/Group Leader:
Jessica Davis 04-OCT-16

Uranium Que Sheet

S-PuN 07-SEP-16

Batch #: 1596396 Analyst: MXS2 First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16
 Tracer Isotope: U-232 U-236 Tracer Code: 1564-I Expiration Date: 11-23-16 Vol: 0.1 Analyzed Sequentially with Pu Analyzed Sequentially with:
 LCS Isotope: U-238 LCS Code: 1000-E Expiration Date: 7-12-17 Vol: 0.1 Pu-236 ID: _____ Pu: 1596400
 Spike Isotope: U-238 Spike Code: _____ Expiration Date: _____ Vol: _____ Am: 1596398
 Prep Date: 9-21-14 Initials: MSB Pipet ID: 1842022 Balance ID: 16107662 Witness: NA

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	U Det #
405235021-1	4.2B.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	1	1	0.514	128*
405235022-1	4.2B.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	2	2	0.505	129 157
405235023-1	4.2B.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	3	3	0.504	130 158
405235024-1	4.2B.R.2.2	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	4	4	0.505	131
405235025-1	4.2B.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	5	5	0.506	134
405235026-1	4.2C.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	6	6	0.502	139
405235027-1	4.2C.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	7	7	0.510	140
405235028-1	4.3.A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	8	8	0.507	142
405235029-1	4.3.B.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	9	9	0.504	143
405235030-1	4.3A.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	10	10	0.514	144
405235031-1	4.3.B.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	26-NOV-15	11	11	0.517	145
405235032-1	4.3B.R.3.3	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	12	12	0.508	146
405235033-1	4.3B.R.3.4	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	13	13	0.506	147
405235034-1	4.3.B.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	14	14	0.509	148
405235035-1	4.3B.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	15	15	0.516	149
405235036-1	4.3B.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	16	16	0.518	150
405235037-1	4.4C.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	17	17	0.506	152
405235038-1	4.4C.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	18	18	0.501	154
405235039-1	4.4C.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	19	19	0.512	155
405235040-1	4.4D.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	20	20	0.515	156
1203621709-1	MB for batch 1596396	MB		1 pCi/g	SOIL	QC ACCOUNT		21	21	0.518	127*
1203621710-1	4.2B.R.2.3(405235021DUP)	DUP		1 pCi/g	SOIL	QC ACCOUNT	08-DEC-15	22	22	0.508	157 159
1203621711-1	LCS for batch 1596396	LCS		1 pCi/g	SOIL	QC ACCOUNT		23	23	0.518	158

4.300 9/24/16
 Data Reviewed By: Jim On 10/14/16

Solid Sample Dissolution by: **LEACH or DIGESTION**
 Circle One

Choose SOP used: GL-RAD-A-011

Uranium Que Sheet

T-RUN 07-SEP-16

Batch #: 1596396 Analyst: MXS2 First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16
 Tracer Isotope: U-232 ~~U-236~~ Fracer Code: 1570-E Expiration Date: 7-18-17 Vol: 0.1
 LCS Isotope: U-238 LCS Code: Expiration Date: Vol: Pu Analyzed Sequentially with Pu Analyzed Sequentially with:
 Spike Isotope: U-238 Spike Code: Expiration Date: Vol: Pu-236 ID: Pu-236 ID: Pu-236 ID: Pu-236 ID:
 Prep Date: 9-21-16 Initials: MSD Pipet ID: 1840022 Balance ID: 6107662 Witness: AJA

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g) (l / f)	U Det #
405235021-1	4.2B.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	1	1	0.511	159
405235022-1	4.2B.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	2	2	0.508	160
405235023-1	4.2B.R.11.2	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	3	3	0.509	1
405235024-1	4.2B.R.2.2	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	4	4	0.506	2
405235025-1	4.2B.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	5	5	0.504	3
405235026-1	4.2C.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	6	6	0.512	45
405235027-1	4.2C.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	7	7	0.508	4
405235028-1	4.3.A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	8	8	0.507	7
405235029-1	4.3.B.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	9	9	0.508	8
405235030-1	4.3A.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	10	10	0.503	9
405235031-1	4.3.B.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	26-NOV-15	11	11	0.502	10
405235032-1	4.3B.R.3.3	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	12	12	0.512	11
405235033-1	4.3B.R.3.4	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	13	13	0.514	12
405235034-1	4.3B.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	14	14	0.515	13
405235035-1	4.3B.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	15	15	0.510	14
405235036-1	4.3B.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	23-NOV-15	16	16	0.508	15
405235037-1	4.4C.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	17	17	0.512	16
405235038-1	4.4C.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	18	18	0.520	17
405235039-1	4.4C.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	19	19	0.507	18
405235040-1	4.4D.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	20	20	0.503	113
1203621709-1	MB for batch 1596396	MB		1 pCi/g	SOIL	QC ACCOUNT		21	21	0.520	132 00101416
1203621710-1	4.2B.R.2.3(405235021DUP)	DUP		1 pCi/g	SOIL	QC ACCOUNT	08-DEC-15	22	22	0.505	44 157
1203621711-1	LCS for batch 1596396	LCS		1 pCi/g	SOIL	QC ACCOUNT		23	23	0.520	115

Data Reviewed By: *[Signature]* 10/4/16

Solid Sample Dissolution by: **LEACH or DIGESTION**
 Circle One

Choose SOP used: GL-RAD-A-011

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235021_UU SAMPLE QTY : 0.514 G +/-0.195 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 94.5 +/-8.448 % SECONDARY QTY : 0.511 G +/-0.196 %	CHAMBER : 159 DETECTOR S/N : 76225 AVERAGE %EFFICIENCY : 25.5501 AVERAGE %EFF ERROR : 0.4952 COUNT DATE : 24-Sep-2016 13:20:33 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B159.CNF;1074 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W159.CNF;278 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 8.5280E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4487.77	4494.71	521.37	1.76	76.440	N/A
TRACER 2	1564-I	U-232	4.6539 dpm	5141.84	5313.71	-0.44	274.56	95.292	1.0081

NUCLIDE ACTIVITY SUMMARY

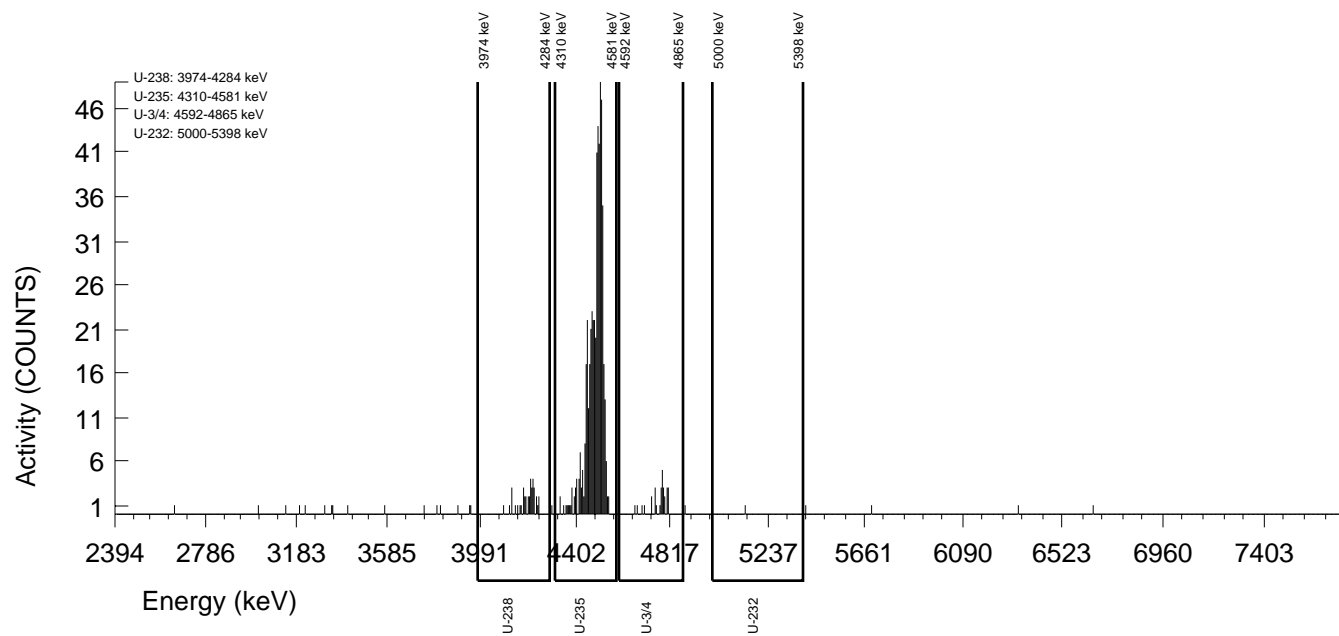
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5141.84	4.879	1.000	-0.440	1.440	1.2000	100.000	-8.34E-03	5.77E-02	1.40E-01	4.17E-02	5.76E-02
U-3/4	4763.02	4765.21	55.291	46.000	44.800	1.200	1.0954	100.000	6.65E-01	2.30E-01	1.04E-01	2.98E-02	2.00E-01
U-235	4391.00	4487.77	31.072	2.000	1.760	0.240	0.4899	99.700	2.62E-02	5.17E-02	7.14E-02	1.34E-02	5.15E-02
U-238	4184.73	4190.18	95.947	42.000	40.800	1.200	1.0954	100.000	6.06E-01	2.18E-01	1.04E-01	2.98E-02	1.92E-01

NOTES:

* Results are a compilation of S0405235021_UU and T0405235021_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.008 +/-0.000)



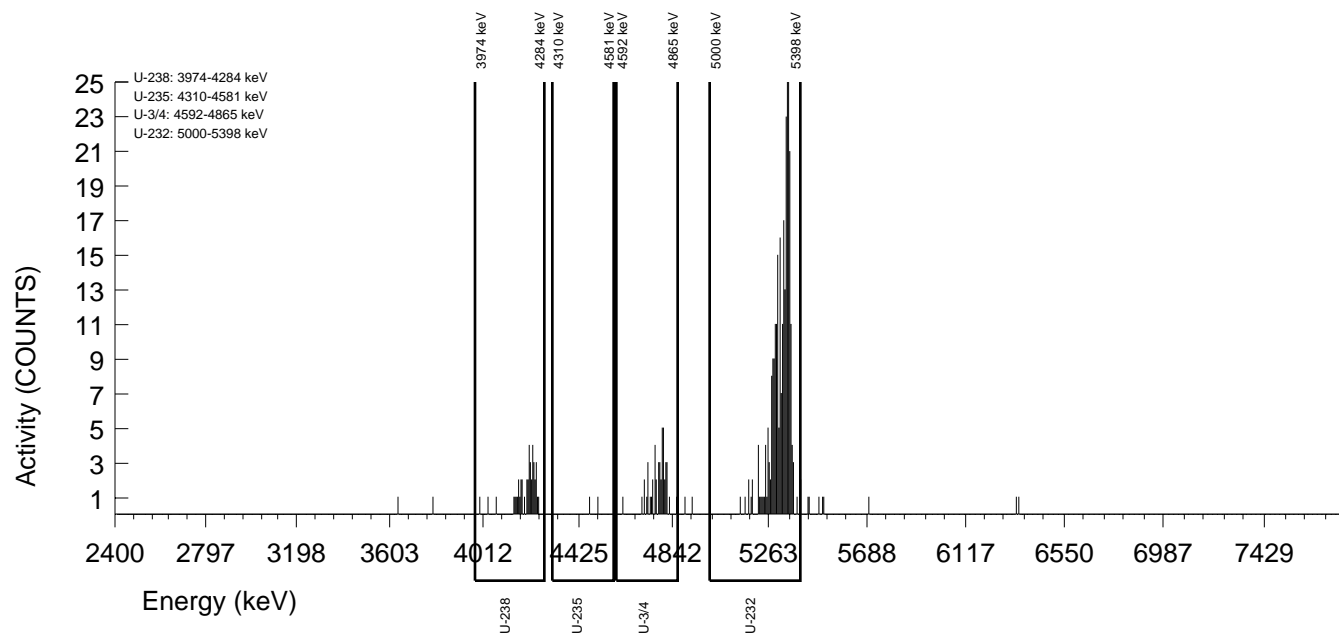
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235021_UU SAMPLE QTY : 0.514 G +/-0.195 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 95.3 +/-6.829 %	CHAMBER : 128 DETECTOR S/N : 75549 AVERAGE %EFFICIENCY : 26.0039 AVERAGE %EFF ERROR : 0.5038 COUNT DATE : 24-Sep-2016 13:19:38 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B128.CNF;1171 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W128.CNF;324 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6539E+00 dpm RESULTS : 4.4348E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5313.71	56.625	276.000	274.560	1.440	1.2000	100.000	4.08E+00	7.47E-01	1.10E-01	3.27E-02	4.85E-01
U-3/4	4763.02	4775.53	81.011	46.000	44.800	1.200	1.0954	100.000	6.60E-01	2.19E-01	1.03E-01	2.96E-02	1.99E-01
U-235	4391.00	4494.71	39.477	2.000	1.760	0.240	0.4899	99.700	2.60E-02	5.13E-02	7.09E-02	1.33E-02	5.11E-02
U-238	4184.73	4195.37	37.010	42.000	40.800	1.200	1.0954	100.000	6.01E-01	2.08E-01	1.03E-01	2.96E-02	1.90E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235022_UU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 78.4 +/-8.667 % SECONDARY QTY : 0.505 G +/-0.198 %	CHAMBER : 160 DETECTOR S/N : 79994 AVERAGE %EFFICIENCY : 25.3966 AVERAGE %EFF ERROR : 0.4923 COUNT DATE : 24-Sep-2016 13:20:35 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B160.CNF;1076 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W160.CNF;308 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0534E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4488.09	4431.09	640.14	3.28	94.421	N/A
TRACER 2	1564-I	U-232	4.6539 dpm	5322.84	5308.78	0.04	227.76	79.068	1.0083

NUCLIDE ACTIVITY SUMMARY

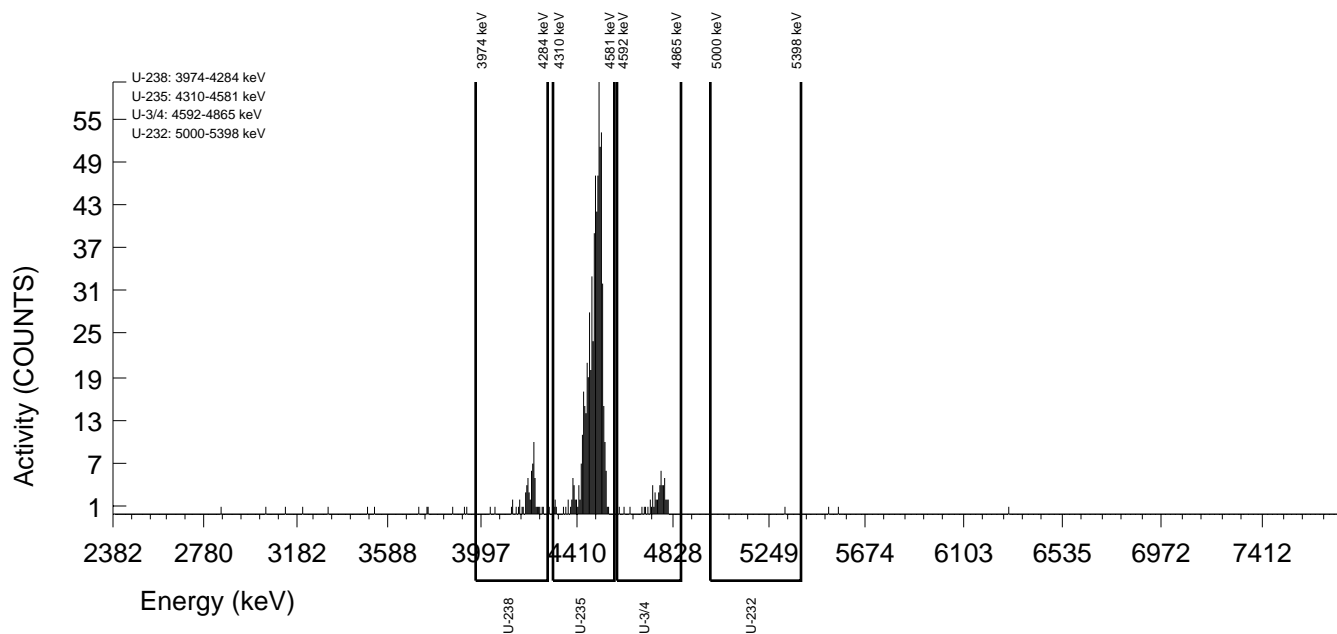
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5322.84	4.950	1.000	0.040	0.960	0.9798	100.000	6.25E-04	4.64E-02	1.03E-01	2.80E-02	4.63E-02
U-3/4	4763.02	4762.31	54.445	44.000	44.000	0.000	0.0000	100.000	8.02E-01	2.78E-01	5.47E-02	0.00E+00	2.40E-01
U-235	4391.00	4488.09	46.270	4.000	3.280	0.720	0.8485	99.700	6.00E-02	8.26E-02	1.12E-01	2.84E-02	8.20E-02
U-238	4184.73	4201.50	16.086	52.000	52.000	0.000	0.0000	100.000	9.48E-01	3.08E-01	5.47E-02	0.00E+00	2.60E-01

NOTES:

* Results are a compilation of S0405235022_UU and T0405235022_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



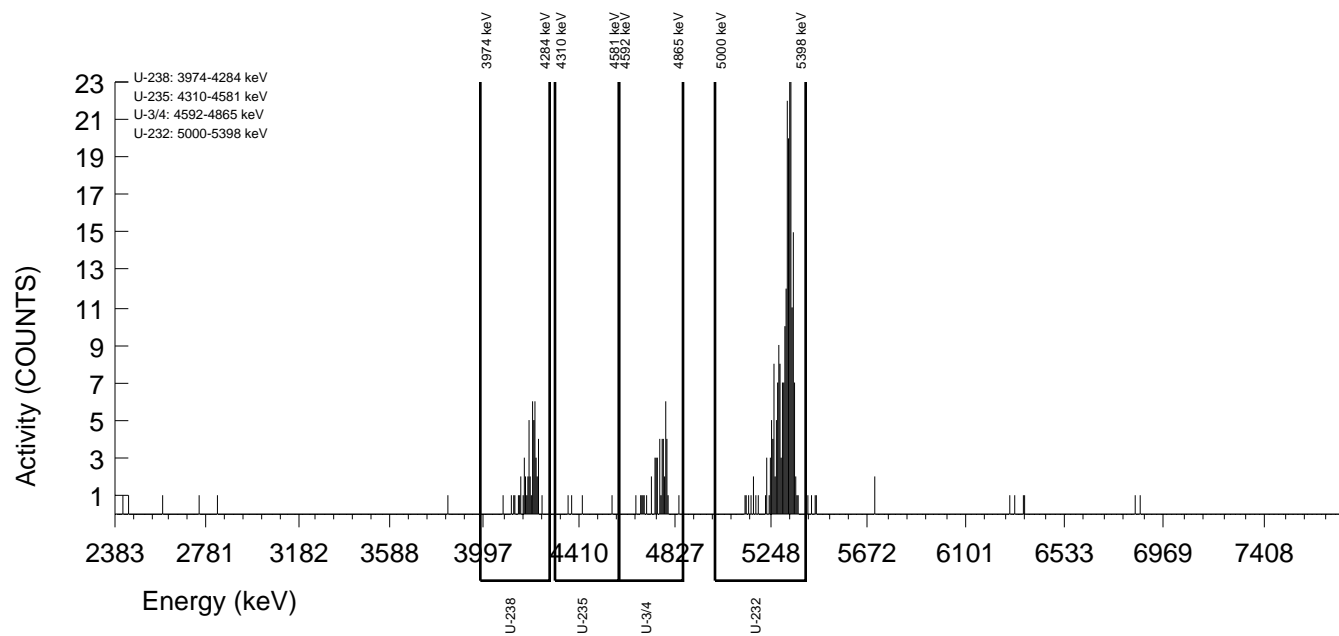
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235022_UU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 79.1 +/-7.349 %	CHAMBER : 157 DETECTOR S/N : 7555 AVERAGE %EFFICIENCY : 26.0007 AVERAGE %EFF ERROR : 0.5038 COUNT DATE : 28-Sep-2016 17:55:25 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B157.CNF;1100 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W157.CNF;284 CAL DATE : 09-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6539E+00 dpm RESULTS : 3.6798E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5308.78	33.099	228.000	227.760	0.240	0.4899	100.000	4.15E+00	8.22E-01	8.74E-02	1.64E-02	5.41E-01
U-3/4	4763.02	4761.59	32.584	44.000	44.000	0.000	0.0000	100.000	7.95E-01	2.66E-01	5.42E-02	0.00E+00	2.38E-01
U-235	4391.00	4431.09	188.077	4.000	3.280	0.720	0.8485	99.700	5.95E-02	8.18E-02	1.11E-01	2.82E-02	8.13E-02
U-238	4184.73	4195.68	44.132	52.000	52.000	0.000	0.0000	100.000	9.40E-01	2.94E-01	5.42E-02	0.00E+00	2.58E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235023_UU SAMPLE QTY : 0.504 G +/-0.198 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 87.0 +/-8.384 % SECONDARY QTY : 0.509 G +/-0.196 %	CHAMBER : 001 DETECTOR S/N : 79451 AVERAGE %EFFICIENCY : 29.7966 AVERAGE %EFF ERROR : 0.5755 COUNT DATE : 25-Sep-2016 15:53:59 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B001.CNF;1860 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W001.CNF;565 CAL DATE : 27-Aug-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0315E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4501.70	4444.99	735.46	4.00	92.461	N/A
TRACER 2	1564-I	U-232	4.6547 dpm	5177.29	5309.60	0.04	245.60	87.720	1.0085

NUCLIDE ACTIVITY SUMMARY

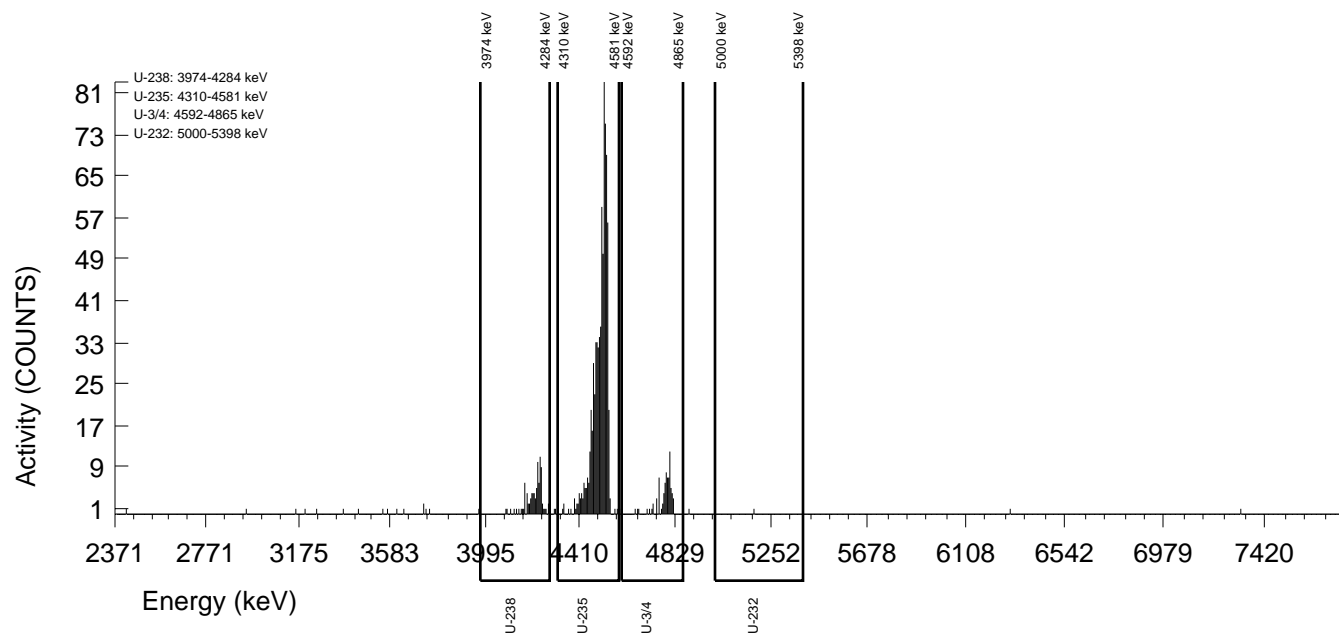
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5177.29	4.981	1.000	0.040	0.960	0.9798	100.000	5.40E-04	4.01E-02	8.89E-02	2.42E-02	4.00E-02
U-3/4	4763.02	4784.42	49.812	57.000	56.040	0.960	0.9798	100.000	9.49E-01	3.00E-01	1.12E-01	3.04E-02	2.54E-01
U-235	4391.00	4501.70	30.702	4.000	4.000	0.000	0.0000	99.700	6.80E-02	7.58E-02	5.10E-02	0.00E+00	7.49E-02
U-238	4184.73	4209.66	72.725	49.000	48.520	0.480	0.6928	100.000	8.22E-01	2.73E-01	9.38E-02	2.15E-02	2.35E-01

NOTES:

* Results are a compilation of S0405235023_UU and T0405235023_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.011 +/-0.000)



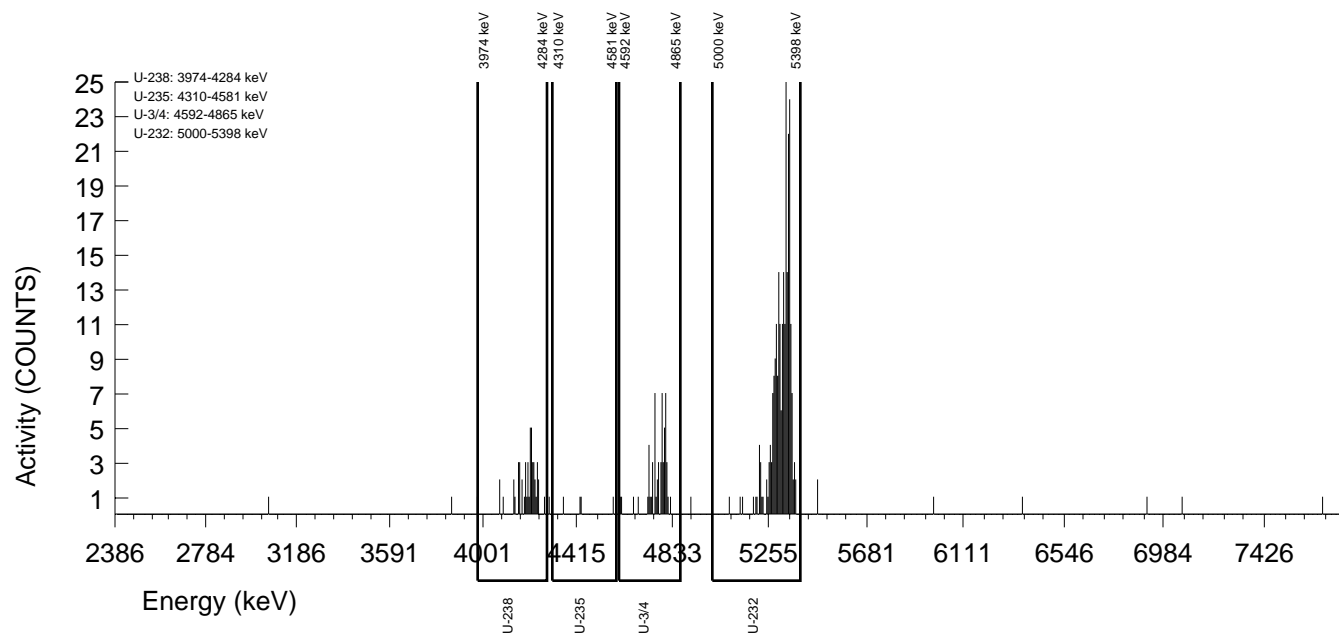
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235023_UU SAMPLE QTY : 0.504 G +/-0.198 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 87.7 +/-7.158 %	CHAMBER : 158 DETECTOR S/N : 80007 AVERAGE %EFFICIENCY : 25.2718 AVERAGE %EFF ERROR : 0.4900 COUNT DATE : 28-Sep-2016 17:55:27 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B158.CNF;1105 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W158.CNF;286 CAL DATE : 09-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6547E+00 dpm RESULTS : 4.0831E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5309.60	50.102	248.000	245.600	2.400	1.5492	100.000	4.16E+00	8.01E-01	1.47E-01	4.81E-02	5.25E-01
U-3/4	4763.02	4765.49	74.360	57.000	56.040	0.960	0.9798	100.000	9.41E-01	2.86E-01	1.11E-01	3.01E-02	2.51E-01
U-235	4391.00	4444.99	212.576	4.000	4.000	0.000	0.0000	99.700	6.74E-02	7.49E-02	5.05E-02	0.00E+00	7.43E-02
U-238	4184.73	4188.42	82.394	49.000	48.520	0.480	0.6928	100.000	8.15E-01	2.62E-01	9.30E-02	2.13E-02	2.33E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235024_UU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 68.9 +/-9.046 % SECONDARY QTY : 0.506 G +/-0.198 %	CHAMBER : 002 DETECTOR S/N : 79452 AVERAGE %EFFICIENCY : 27.4069 AVERAGE %EFF ERROR : 0.5303 COUNT DATE : 25-Sep-2016 15:53:59 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B002.CNF;1845 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W002.CNF;518 CAL DATE : 27-Aug-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0286E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4493.91	4443.00	674.57	1.00	92.200	N/A
TRACER 2	1564-I	U-232	4.6539 dpm	5198.58	5302.91	-0.96	197.08	69.488	1.0081

NUCLIDE ACTIVITY SUMMARY

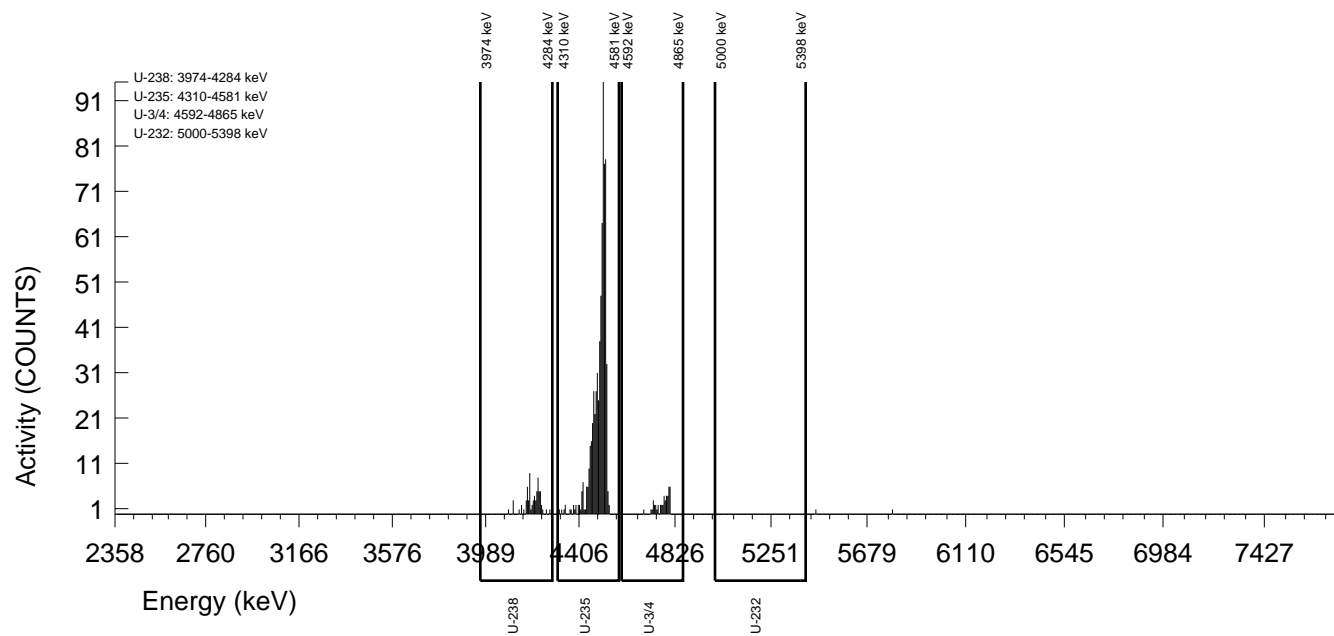
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5198.58	0.000	0.000	-0.960	0.960	0.9798	100.000	-1.42E-02	3.30E-02	9.75E-02	2.66E-02	3.29E-02
U-3/4	4763.02	4773.73	30.025	38.000	37.760	0.240	0.4899	100.000	7.95E-01	2.96E-01	1.01E-01	1.89E-02	2.58E-01
U-235	4391.00	4493.91	23.658	1.000	1.000	0.000	0.0000	99.700	2.11E-02	5.95E-02	6.34E-02	0.00E+00	5.94E-02
U-238	4184.73	4199.01	58.382	48.000	47.280	0.720	0.8485	100.000	9.96E-01	3.41E-01	1.29E-01	3.27E-02	2.90E-01

NOTES:

* Results are a compilation of S0405235024_UU and T0405235024_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



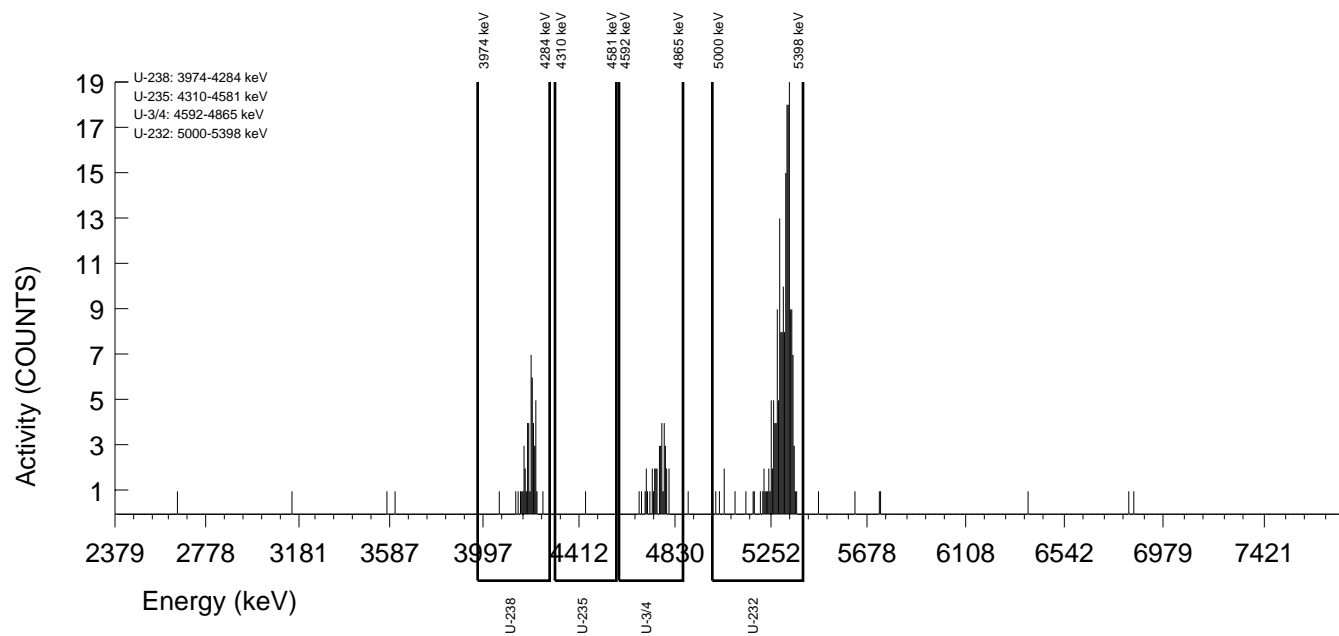
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235024_UU SAMPLE QTY : 0.505 G +/-0.198 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 69.5 +/-7.840 %	CHAMBER : 131 DETECTOR S/N : 80008 AVERAGE %EFFICIENCY : 25.5970 AVERAGE %EFF ERROR : 0.4961 COUNT DATE : 24-Sep-2016 13:19:46 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B131.CNF;1162 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W131.CNF;319 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6539E+00 dpm RESULTS : 3.2339E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5302.91	46.559	199.000	197.080	1.920	1.3856	100.000	4.15E+00	8.80E-01	1.70E-01	5.35E-02	5.85E-01
U-3/4	4763.02	4760.64	31.411	38.000	37.760	0.240	0.4899	100.000	7.89E-01	2.85E-01	1.00E-01	1.88E-02	2.56E-01
U-235	4391.00	4443.00	4.960	1.000	1.000	0.000	0.0000	99.700	2.10E-02	5.90E-02	6.29E-02	0.00E+00	5.89E-02
U-238	4184.73	4196.58	37.404	48.000	47.280	0.720	0.8485	100.000	9.88E-01	3.27E-01	1.28E-01	3.25E-02	2.87E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235025_UU SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 71.0 +/-8.988 % SECONDARY QTY : 0.504 G +/-0.198 %	CHAMBER : 003 DETECTOR S/N : 79453 AVERAGE %EFFICIENCY : 27.6246 AVERAGE %EFF ERROR : 0.5344 COUNT DATE : 25-Sep-2016 15:53:59 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B003.CNF;1843 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W003.CNF;535 CAL DATE : 27-Aug-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.5428E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4492.31	4412.05	630.78	0.76	85.536	N/A
TRACER 2	1564-I	U-232	4.6539 dpm	5072.78	5318.80	-0.40	204.04	71.546	1.0081

NUCLIDE ACTIVITY SUMMARY

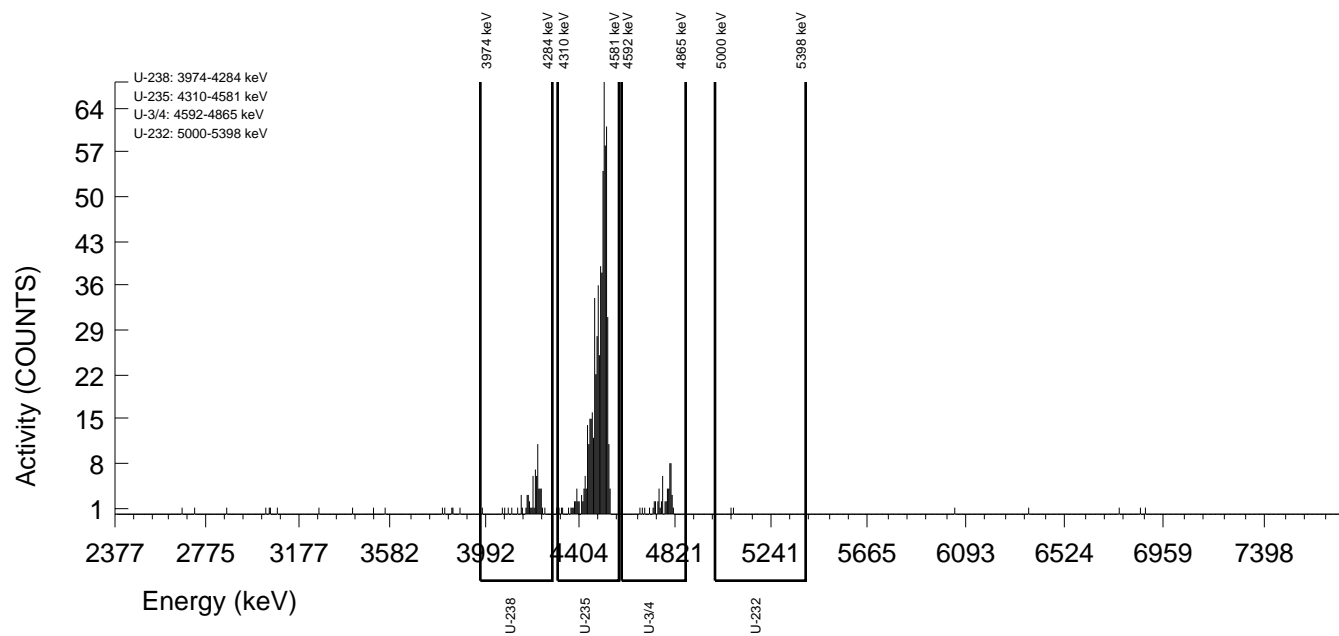
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5072.78	14.863	2.000	-0.400	2.400	1.5492	100.000	-6.36E-03	5.94E-02	1.38E-01	4.51E-02	5.94E-02
U-3/4	4763.02	4774.67	41.122	38.000	36.800	1.200	1.0954	100.000	7.47E-01	2.84E-01	1.42E-01	4.07E-02	2.50E-01
U-235	4391.00	4492.31	40.379	1.000	0.760	0.240	0.4899	99.700	1.55E-02	5.82E-02	9.77E-02	1.83E-02	5.81E-02
U-238	4184.73	4200.67	24.206	45.000	43.800	1.200	1.0954	100.000	8.89E-01	3.15E-01	1.42E-01	4.07E-02	2.71E-01

NOTES:

* Results are a compilation of S0405235025_UU and T0405235025_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



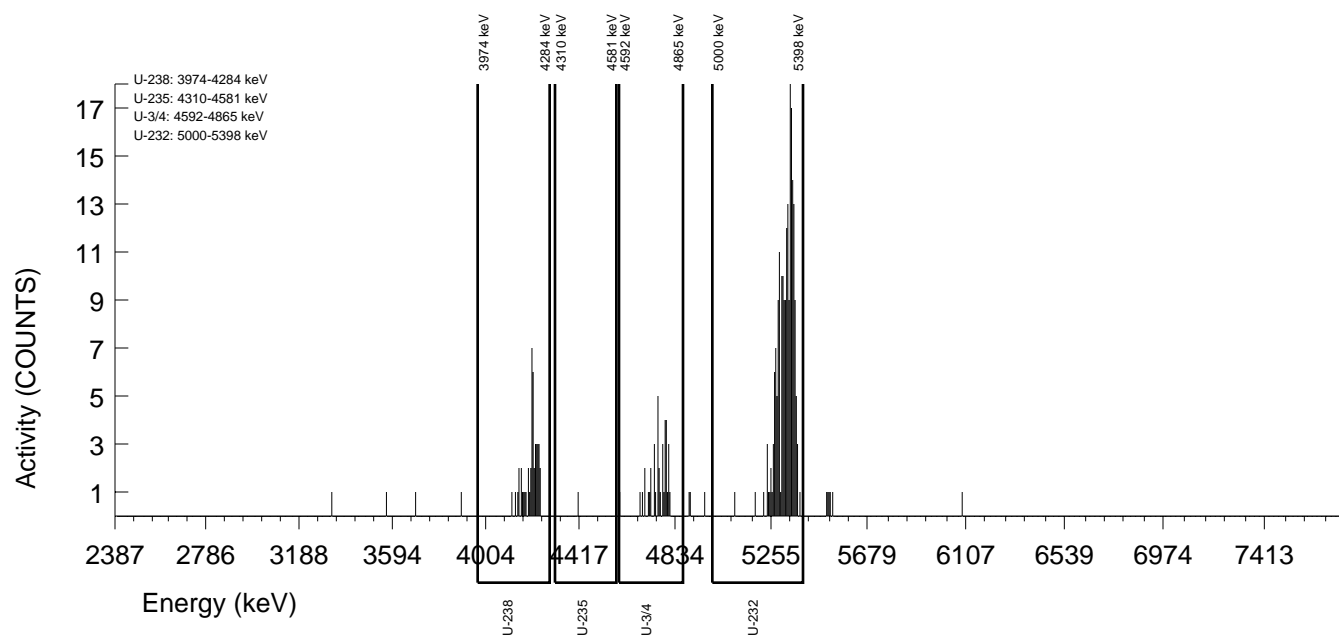
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235025_UU SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 71.5 +/-7.707 %	CHAMBER : 134 DETECTOR S/N : 76230 AVERAGE %EFFICIENCY : 25.7389 AVERAGE %EFF ERROR : 0.4988 COUNT DATE : 24-Sep-2016 13:19:49 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B134.CNF;1151 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W134.CNF;336 CAL DATE : 08-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6539E+00 dpm RESULTS : 3.3297E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5318.80	69.443	205.000	204.040	0.960	0.9798	100.000	4.14E+00	8.62E-01	1.34E-01	3.64E-02	5.72E-01
U-3/4	4763.02	4760.74	61.589	38.000	36.800	1.200	1.0954	100.000	7.41E-01	2.73E-01	1.41E-01	4.04E-02	2.48E-01
U-235	4391.00	4412.05	4.960	1.000	0.760	0.240	0.4899	99.700	1.54E-02	5.77E-02	9.69E-02	1.81E-02	5.76E-02
U-238	4184.73	4205.40	11.532	45.000	43.800	1.200	1.0954	100.000	8.82E-01	3.02E-01	1.41E-01	4.04E-02	2.69E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235026_UU SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 84.4 +/-8.505 % SECONDARY QTY : 0.512 G +/-0.195 %	CHAMBER : 005 DETECTOR S/N : 79454 AVERAGE %EFFICIENCY : 28.9835 AVERAGE %EFF ERROR : 0.5602 COUNT DATE : 25-Sep-2016 15:53:59 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B005.CNF;1828 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W005.CNF;575 CAL DATE : 27-Aug-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0432E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4517.94	4448.01	723.44	1.76	93.502	N/A
TRACER 2	1564-I	U-232	4.6539 dpm	5198.64	5320.94	-1.92	234.56	85.057	1.0081

NUCLIDE ACTIVITY SUMMARY

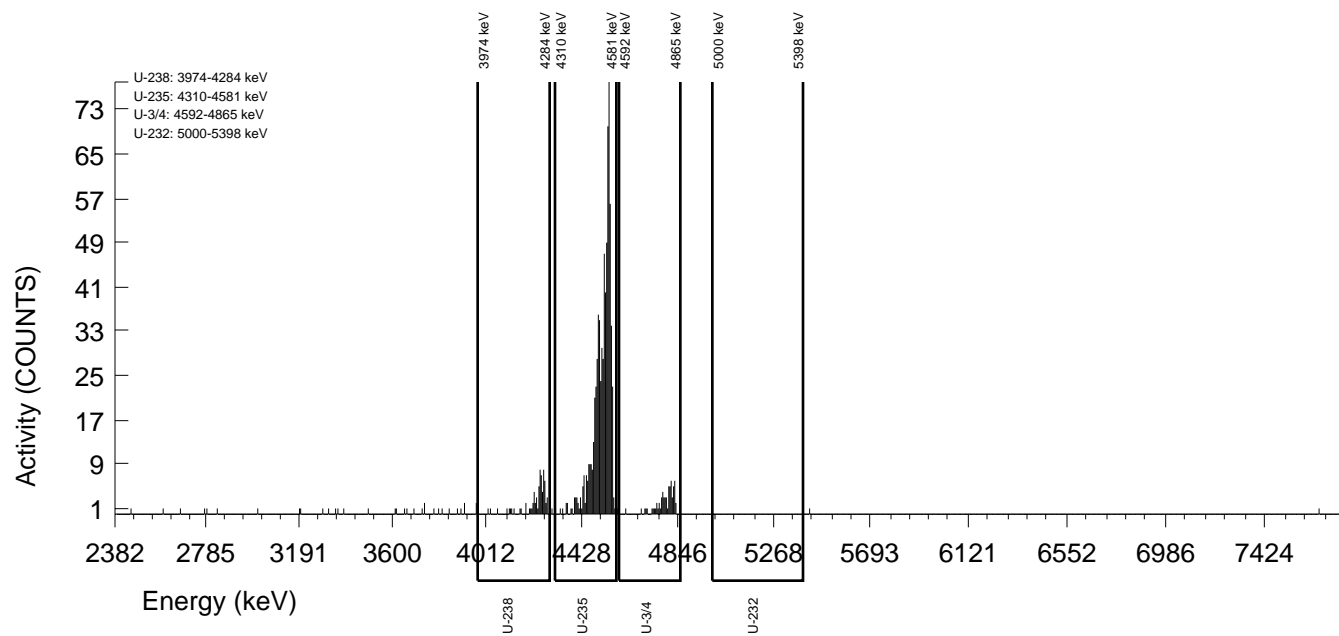
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5198.64	0.000	0.000	-1.920	1.920	1.3856	100.000	-2.62E-02	3.30E-02	1.10E-01	3.46E-02	3.29E-02
U-3/4	4763.02	4793.51	58.931	37.000	35.560	1.440	1.2000	100.000	6.33E-01	2.42E-01	1.32E-01	3.91E-02	2.16E-01
U-235	4391.00	4517.94	31.064	2.000	1.760	0.240	0.4899	99.700	3.14E-02	6.20E-02	8.56E-02	1.60E-02	6.18E-02
U-238	4184.73	4223.88	28.839	30.000	29.760	0.240	0.4899	100.000	5.30E-01	2.15E-01	8.54E-02	1.60E-02	1.95E-01

NOTES:

* Results are a compilation of S0405235026_UU and T0405235026_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.011 +/-0.000)



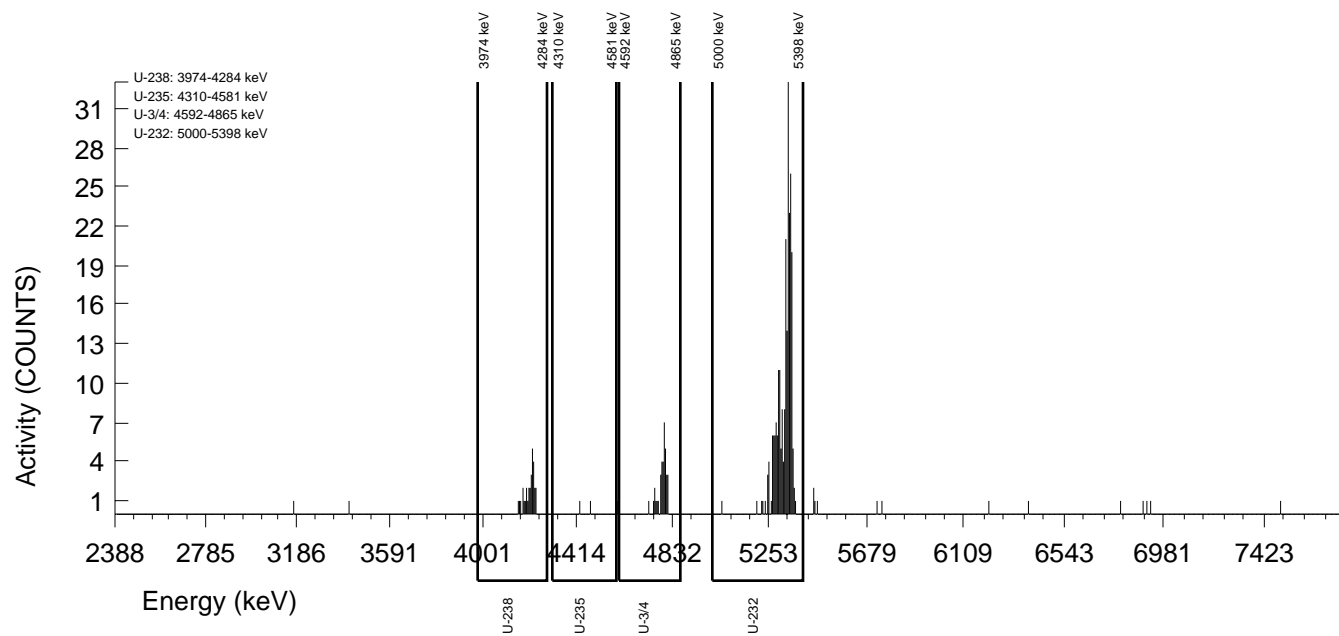
GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235026_UU SAMPLE QTY : 0.502 G +/-0.199 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 85.1 +/-7.280 %	CHAMBER : 139 DETECTOR S/N : 76231 AVERAGE %EFFICIENCY : 24.8887 AVERAGE %EFF ERROR : 0.4828 COUNT DATE : 24-Sep-2016 13:19:52 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B139.CNF;1109 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W139.CNF;334 CAL DATE : 09-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6539E+00 dpm RESULTS : 3.9585E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5320.94	27.542	236.000	234.560	1.440	1.2000	100.000	4.18E+00	8.18E-01	1.32E-01	3.91E-02	5.38E-01
U-3/4	4763.02	4781.50	20.979	37.000	35.560	1.440	1.2000	100.000	6.28E-01	2.34E-01	1.31E-01	3.88E-02	2.15E-01
U-235	4391.00	4448.01	49.363	2.000	1.760	0.240	0.4899	99.700	3.12E-02	6.15E-02	8.49E-02	1.59E-02	6.13E-02
U-238	4184.73	4204.42	16.043	30.000	29.760	0.240	0.4899	100.000	5.26E-01	2.08E-01	8.47E-02	1.58E-02	1.93E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235027_UU SAMPLE QTY : 0.510 G +/-0.196 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 70.2 +/-8.935 % SECONDARY QTY : 0.508 G +/-0.197 %	CHAMBER : 006 DETECTOR S/N : 79455 AVERAGE %EFFICIENCY : 26.3231 AVERAGE %EFF ERROR : 0.5098 COUNT DATE : 25-Sep-2016 15:53:59 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B006.CNF;1839 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W006.CNF;571 CAL DATE : 27-Aug-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0609E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4505.72	4453.76	668.23	2.76	95.095	N/A
TRACER 2	1564-I	U-232	4.6539 dpm	5198.63	5318.10	-2.16	204.04	70.741	1.0081

NUCLIDE ACTIVITY SUMMARY

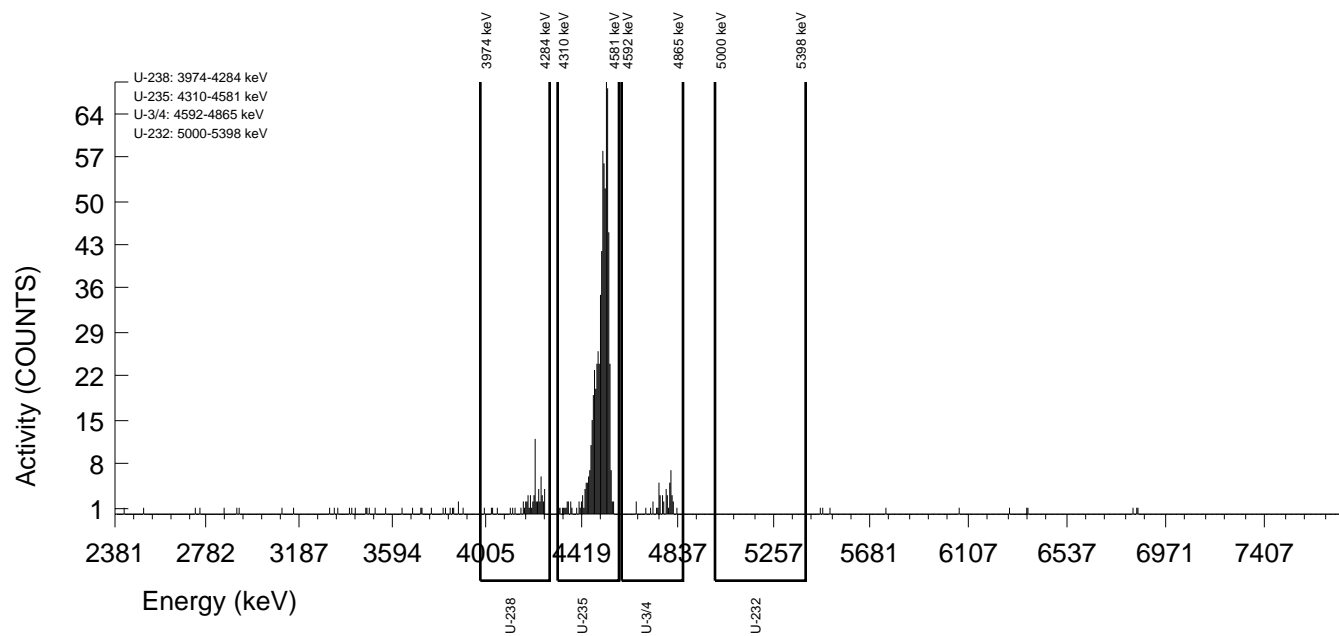
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5198.63	0.000	0.000	-2.160	2.160	1.4697	100.000	-3.21E-02	3.67E-02	1.25E-01	4.01E-02	3.66E-02
U-3/4	4763.02	4779.29	56.194	49.000	48.760	0.240	0.4899	100.000	9.82E-01	3.30E-01	9.66E-02	1.81E-02	2.80E-01
U-235	4391.00	4505.72	37.689	3.000	2.760	0.240	0.4899	99.700	5.58E-02	8.10E-02	9.69E-02	1.81E-02	8.03E-02
U-238	4184.73	4201.03	6.327	49.000	48.040	0.960	0.9798	100.000	9.68E-01	3.29E-01	1.33E-01	3.62E-02	2.80E-01

NOTES:

* Results are a compilation of S0405235027_UU and T0405235027_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



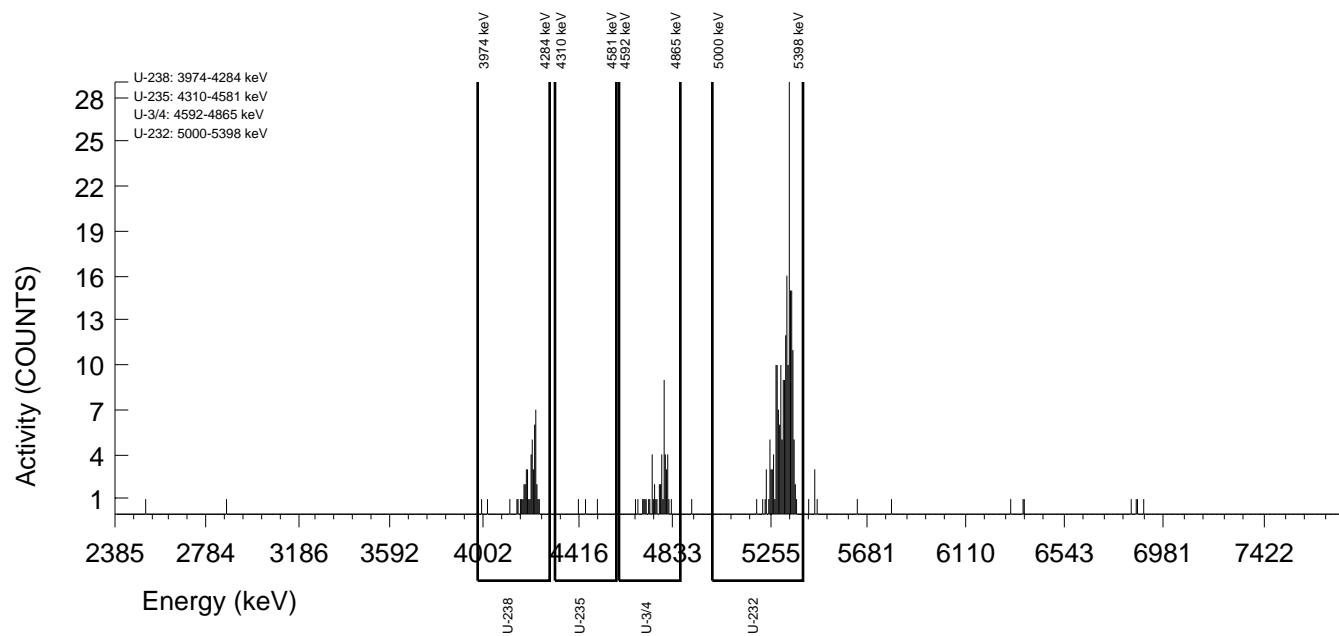
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235027_UU SAMPLE QTY : 0.510 G +/-0.196 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 70.7 +/-7.707 %	CHAMBER : 140 DETECTOR S/N : 78771 AVERAGE %EFFICIENCY : 26.0317 AVERAGE %EFF ERROR : 0.5043 COUNT DATE : 24-Sep-2016 13:19:54 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B140.CNF;1102 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W140.CNF;283 CAL DATE : 09-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6539E+00 dpm RESULTS : 3.2922E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5318.10	22.288	205.000	204.040	0.960	0.9798	100.000	4.11E+00	8.55E-01	1.33E-01	3.62E-02	5.67E-01
U-3/4	4763.02	4770.79	7.243	49.000	48.760	0.240	0.4899	100.000	9.74E-01	3.16E-01	9.58E-02	1.79E-02	2.77E-01
U-235	4391.00	4453.76	84.197	3.000	2.760	0.240	0.4899	99.700	5.53E-02	8.02E-02	9.61E-02	1.80E-02	7.97E-02
U-238	4184.73	4196.61	24.104	49.000	48.040	0.960	0.9798	100.000	9.60E-01	3.15E-01	1.32E-01	3.59E-02	2.78E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235028_UU SAMPLE QTY : 0.507 G +/-0.197 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 93.9 +/-8.221 % SECONDARY QTY : 0.507 G +/-0.197 %	CHAMBER : 007 DETECTOR S/N : 50-066Z1 AVERAGE %EFFICIENCY : 26.6444 AVERAGE %EFF ERROR : 0.5159 COUNT DATE : 25-Sep-2016 15:54:03 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B007.CNF;1847 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W007.CNF;503 CAL DATE : 23-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.7355E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4494.36	4408.61	620.68	3.04	87.264	N/A
TRACER 2	1564-I	U-232	4.6558 dpm	5198.60	5317.20	-0.72	278.52	94.733	1.0085

NUCLIDE ACTIVITY SUMMARY

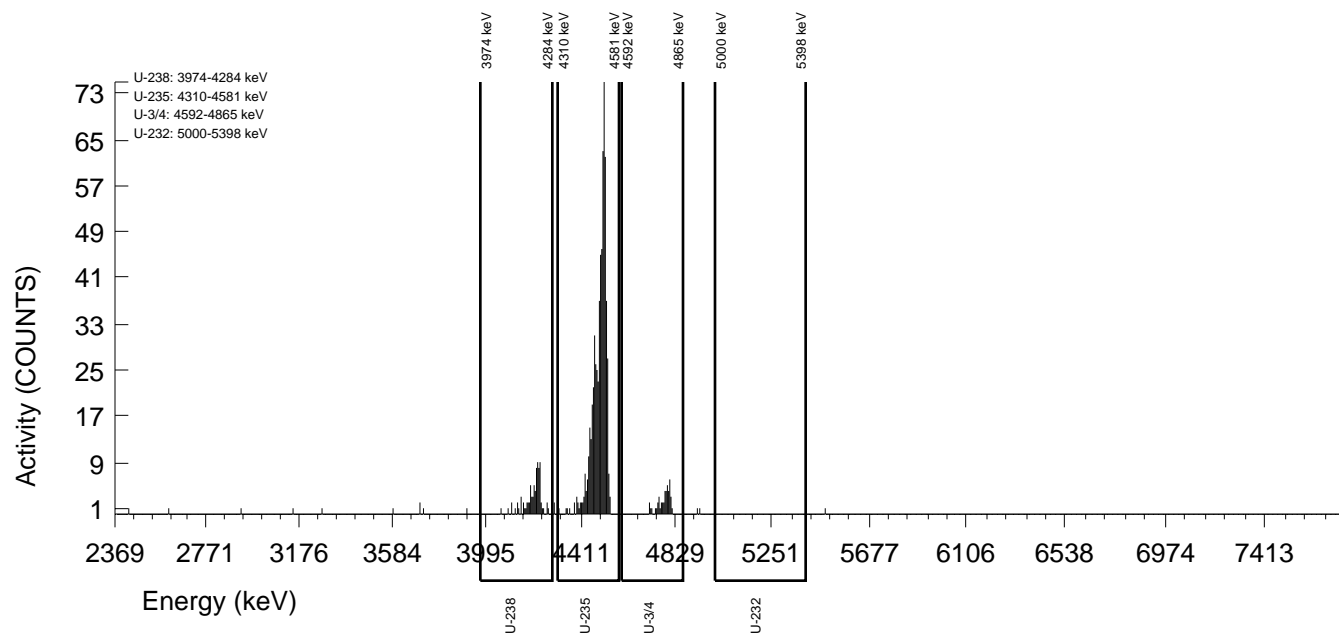
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		Lc pCi/G	1.96-sigma	
										TPU pCi/G	MDA pCi/G		cnt	Unc pCi/G
U-232	5302.10	5198.60	0.000	0.000	-0.720	0.720	0.8485	100.000	-1.16E-02	3.50E-02	9.81E-02	2.50E-02	3.49E-02	3.49E-02
U-3/4	4763.02	4777.66	27.466	68.000	67.280	0.720	0.8485	100.000	9.99E-01	2.93E-01	9.07E-02	2.31E-02	2.42E-01	2.42E-01
U-235	4391.00	4494.36	29.551	4.000	3.040	0.960	0.9798	99.700	4.53E-02	6.76E-02	9.82E-02	2.67E-02	6.71E-02	6.71E-02
U-238	4184.73	4202.66	43.994	60.000	59.280	0.720	0.8485	100.000	8.80E-01	2.70E-01	9.07E-02	2.31E-02	2.28E-01	2.28E-01

NOTES:

* Results are a compilation of S0405235028_UU and T0405235028_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.009 +/-0.000)



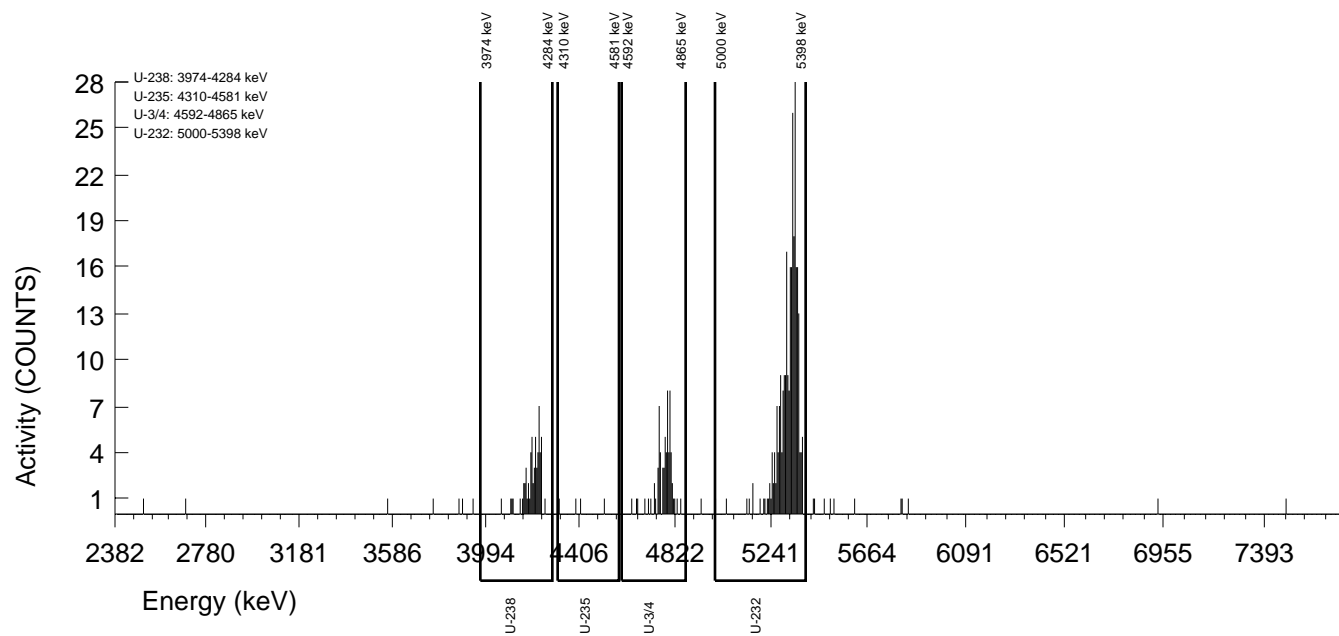
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235028_UU SAMPLE QTY : 0.507 G +/-0.197 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 94.7 +/-6.779 %	CHAMBER : 142 DETECTOR S/N : 42285 AVERAGE %EFFICIENCY : 26.5347 AVERAGE %EFF ERROR : 0.5139 COUNT DATE : 24-Sep-2016 13:19:57 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B142.CNF;1102 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W142.CNF;306 CAL DATE : 09-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6558E+00 dpm RESULTS : 4.4106E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5317.20	49.649	279.000	278.520	0.480	0.6928	100.000	4.14E+00	7.51E-01	8.23E-02	1.88E-02	4.87E-01
U-3/4	4763.02	4773.24	53.151	68.000	67.280	0.720	0.8485	100.000	9.91E-01	2.76E-01	9.00E-02	2.29E-02	2.40E-01
U-235	4391.00	4408.61	192.826	4.000	3.040	0.960	0.9798	99.700	4.49E-02	6.69E-02	9.73E-02	2.65E-02	6.66E-02
U-238	4184.73	4201.61	46.806	60.000	59.280	0.720	0.8485	100.000	8.73E-01	2.56E-01	9.00E-02	2.29E-02	2.26E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235029_UU SAMPLE QTY : 0.504 G +/-0.198 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 102 +/-8.097 % SECONDARY QTY : 0.508 G +/-0.197 %	CHAMBER : 008 DETECTOR S/N : 78788 AVERAGE %EFFICIENCY : 32.5514 AVERAGE %EFF ERROR : 0.6275 COUNT DATE : 25-Sep-2016 15:54:03 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B008.CNF;1835 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W008.CNF;515 CAL DATE : 27-Aug-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.1085E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4489.20	4453.04	863.42	2.76	99.362	N/A
TRACER 2	1564-I	U-232	4.6558 dpm	5363.01	5324.01	-0.44	260.52	103.207	1.0085

NUCLIDE ACTIVITY SUMMARY

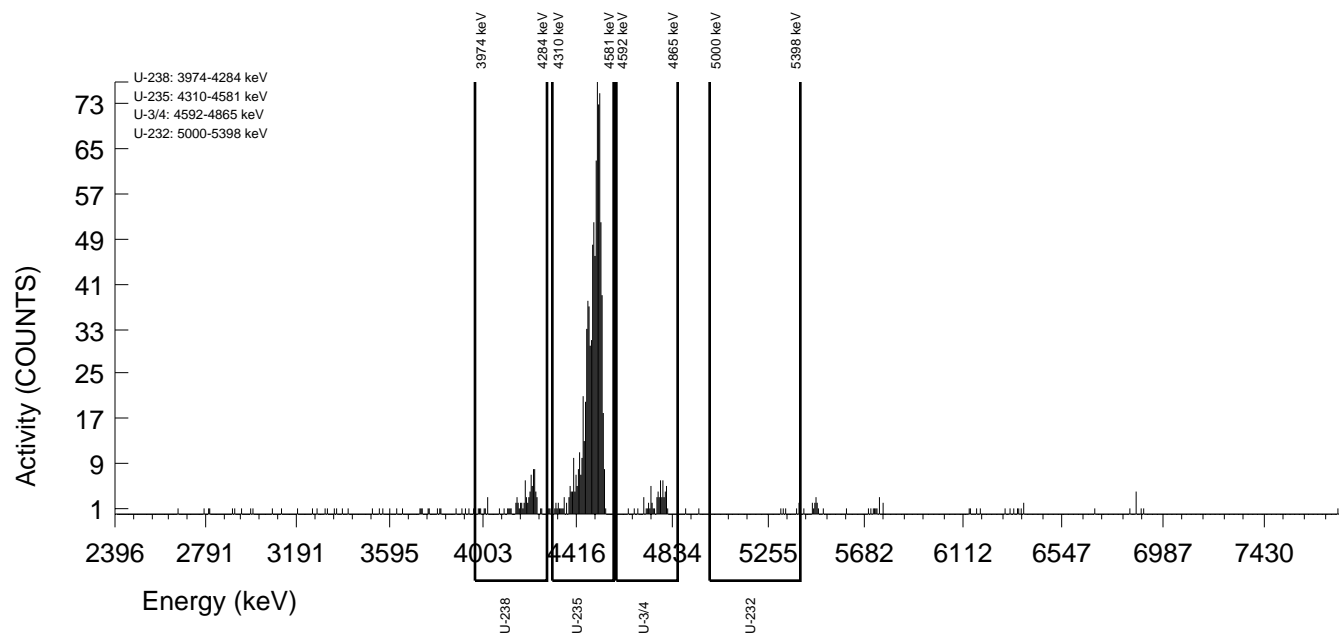
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		Lc pCi/G	1.96-sigma	
										TPU pCi/G	MDA pCi/G		cnt	Unc pCi/G
U-232	5302.10	5363.01	7.367	7.000	-0.440	7.440	2.7276	100.000	-5.07E-03	7.09E-02	1.50E-01	5.76E-02	7.08E-02	7.08E-02
U-3/4	4763.02	4770.57	68.763	46.000	44.800	1.200	1.0954	100.000	7.16E-01	2.45E-01	1.12E-01	3.21E-02	2.15E-01	2.15E-01
U-235	4391.00	4489.20	42.155	3.000	2.760	0.240	0.4899	99.700	4.42E-02	6.41E-02	7.68E-02	1.44E-02	6.37E-02	6.37E-02
U-238	4184.73	4186.56	46.661	40.000	39.760	0.240	0.4899	100.000	6.35E-01	2.26E-01	7.66E-02	1.43E-02	2.01E-01	2.01E-01

NOTES:

* Results are a compilation of S0405235029_UU and T0405235029_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.013 +/-0.000)



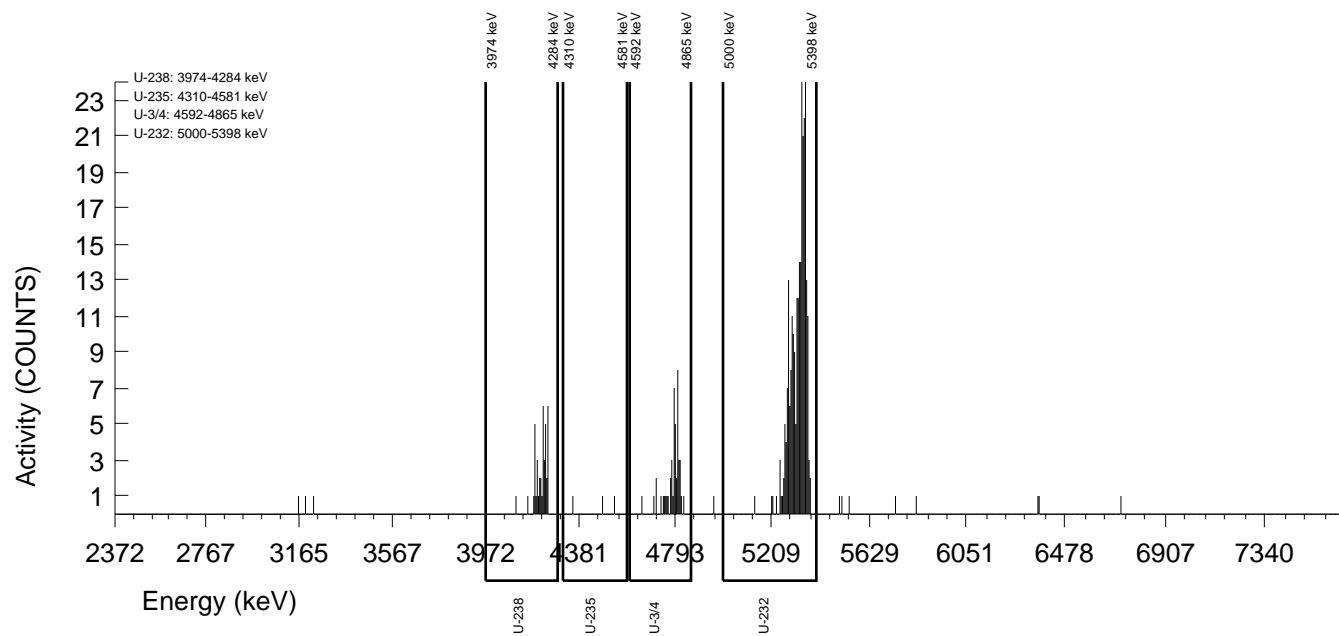
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235029_UU SAMPLE QTY : 0.504 G +/-0.198 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 103 +/-6.964 %	CHAMBER : 143 DETECTOR S/N : 65882 AVERAGE %EFFICIENCY : 22.7820 AVERAGE %EFF ERROR : 0.4430 COUNT DATE : 24-Sep-2016 13:19:59 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B143.CNF;1098 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W143.CNF;291 CAL DATE : 09-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6558E+00 dpm RESULTS : 4.8051E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5324.01	76.995	261.000	260.520	0.480	0.6928	100.000	4.16E+00	7.78E-01	8.85E-02	2.03E-02	5.07E-01
U-3/4	4763.02	4781.65	21.133	46.000	44.800	1.200	1.0954	100.000	7.10E-01	2.36E-01	1.11E-01	3.18E-02	2.14E-01
U-235	4391.00	4453.04	176.926	3.000	2.760	0.240	0.4899	99.700	4.38E-02	6.35E-02	7.62E-02	1.43E-02	6.32E-02
U-238	4184.73	4213.08	58.975	40.000	39.760	0.240	0.4899	100.000	6.30E-01	2.18E-01	7.59E-02	1.42E-02	1.99E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235030_UU SAMPLE QTY : 0.514 G +/-0.195 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 97.1 +/-8.055 % SECONDARY QTY : 0.503 G +/-0.199 %	CHAMBER : 009 DETECTOR S/N : 72528 AVERAGE %EFFICIENCY : 31.6819 AVERAGE %EFF ERROR : 0.6111 COUNT DATE : 25-Sep-2016 15:54:03 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B009.CNF;1839 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W009.CNF;514 CAL DATE : 23-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.1979E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4498.23	4393.23	697.28	0.76	82.445	N/A
TRACER 2	1564-I	U-232	4.6558 dpm	5242.83	5310.35	0.28	285.76	98.006	1.0095

NUCLIDE ACTIVITY SUMMARY

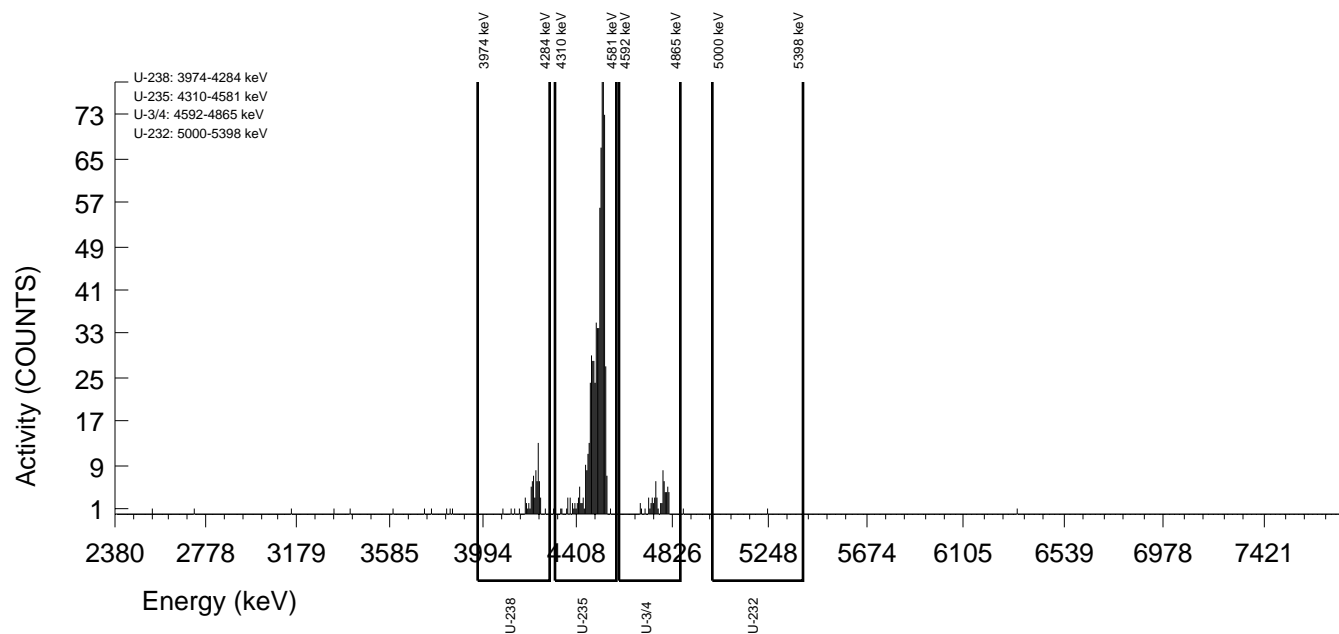
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5242.83	4.938	1.000	0.280	0.720	0.8485	100.000	4.03E-03	4.22E-02	8.80E-02	2.24E-02	4.22E-02
U-3/4	4763.02	4764.83	57.614	68.000	68.000	0.000	0.0000	100.000	9.72E-01	2.81E-01	4.29E-02	0.00E+00	2.33E-01
U-235	4391.00	4498.23	27.054	1.000	0.760	0.240	0.4899	99.700	1.09E-02	4.09E-02	6.87E-02	1.29E-02	4.09E-02
U-238	4184.73	4213.36	26.808	59.000	58.040	0.960	0.9798	100.000	8.30E-01	2.56E-01	9.42E-02	2.57E-02	2.18E-01

NOTES:

* Results are a compilation of S0405235030_UU and T0405235030_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.011 +/-0.000)



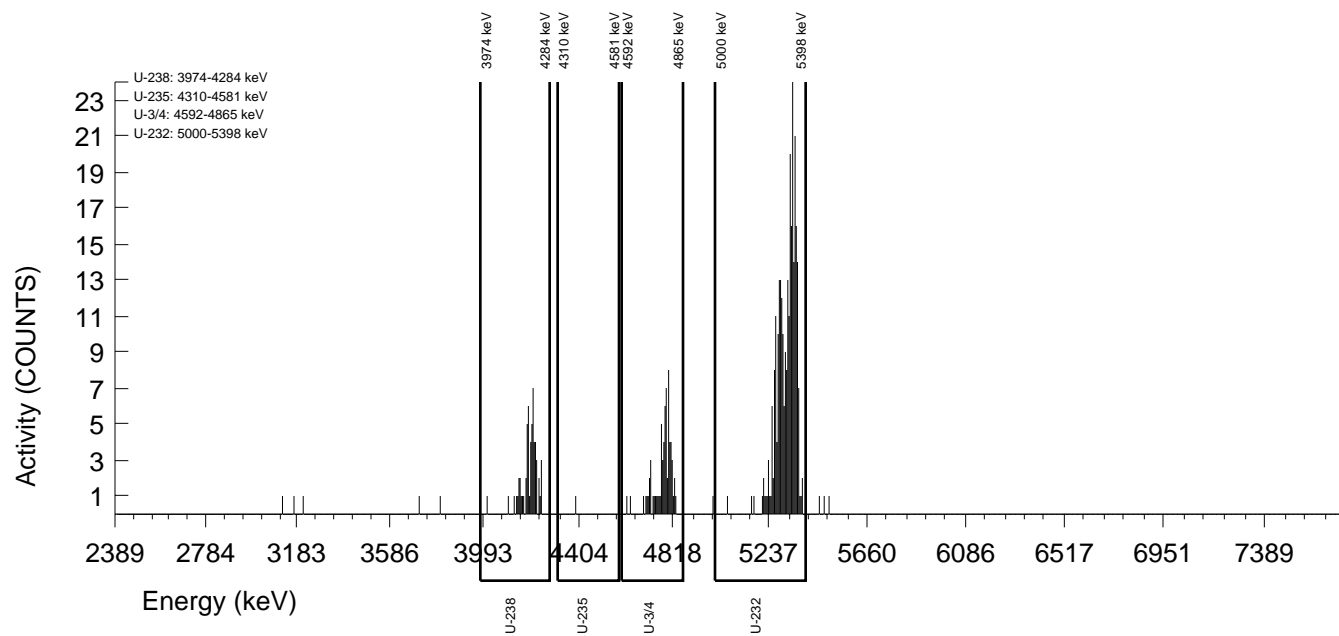
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235030_UU SAMPLE QTY : 0.514 G +/-0.195 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 98.0 +/-6.708 %	CHAMBER : 144 DETECTOR S/N : 75551 AVERAGE %EFFICIENCY : 26.3153 AVERAGE %EFF ERROR : 0.5097 COUNT DATE : 24-Sep-2016 13:20:01 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B144.CNF;1103 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W144.CNF;297 CAL DATE : 09-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6558E+00 dpm RESULTS : 4.5630E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5310.35	76.757	286.000	285.760	0.240	0.4899	100.000	4.08E+00	7.33E-01	6.85E-02	1.28E-02	4.74E-01
U-3/4	4763.02	4771.24	35.629	68.000	68.000	0.000	0.0000	100.000	9.63E-01	2.66E-01	4.25E-02	0.00E+00	2.31E-01
U-235	4391.00	4393.23	4.914	1.000	0.760	0.240	0.4899	99.700	1.08E-02	4.05E-02	6.81E-02	1.27E-02	4.05E-02
U-238	4184.73	4190.92	39.315	59.000	58.040	0.960	0.9798	100.000	8.22E-01	2.43E-01	9.33E-02	2.54E-02	2.15E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235031_UU SAMPLE QTY : 0.517 G +/-0.193 % SAMPLE DATE : 26-Nov-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 93.8 +/-8.070 % SECONDARY QTY : 0.502 G +/-0.199 %	CHAMBER : 010 DETECTOR S/N : 72529 AVERAGE %EFFICIENCY : 29.8601 AVERAGE %EFF ERROR : 0.5768 COUNT DATE : 25-Sep-2016 15:54:03 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B010.CNF;1843 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W010.CNF;511 CAL DATE : 27-Aug-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0505E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4478.00	4518.69	750.55	2.00	94.158	N/A
TRACER 2	1564-I	U-232	4.6555 dpm	5190.52	5340.26	-1.60	276.28	94.582	1.0084

NUCLIDE ACTIVITY SUMMARY

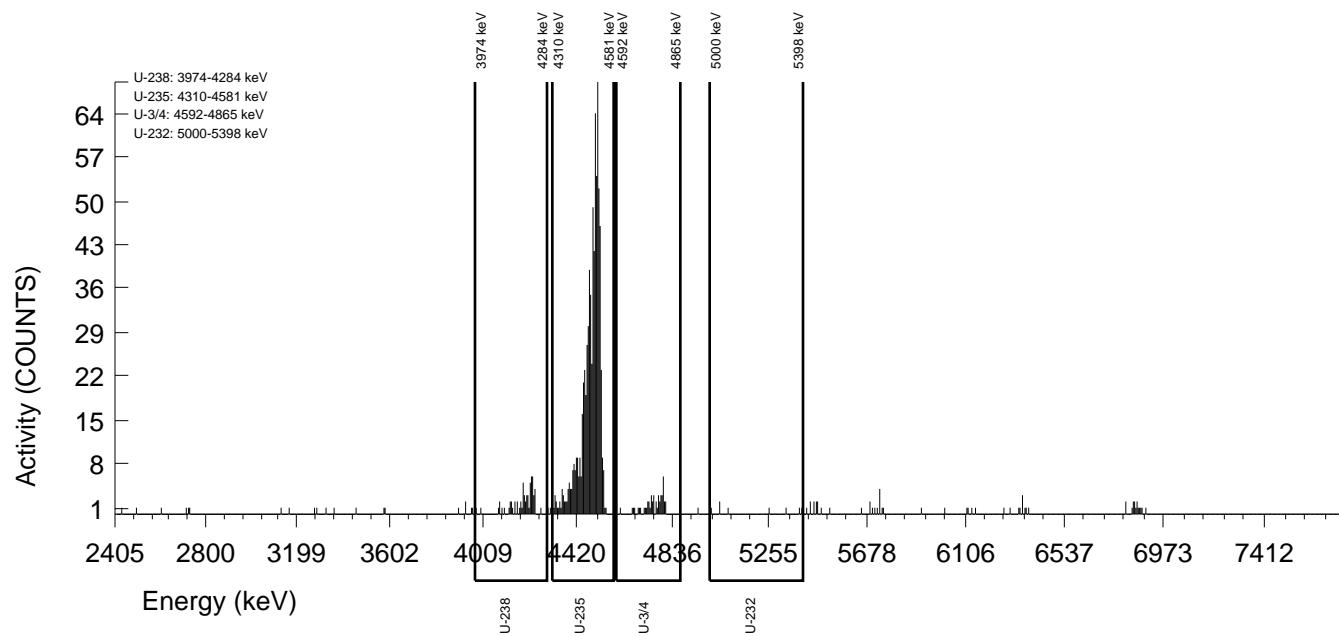
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5190.52	4.911	8.000	-1.600	9.600	3.0984	100.000	-2.15E-02	8.86E-02	1.92E-01	7.61E-02	8.86E-02
U-3/4	4763.02	4751.08	8.595	57.000	56.040	0.960	0.9798	100.000	8.23E-01	2.57E-01	9.67E-02	2.64E-02	2.20E-01
U-235	4391.00	4478.00	49.114	2.000	2.000	0.000	0.0000	99.700	2.95E-02	5.07E-02	4.42E-02	0.00E+00	5.05E-02
U-238	4184.73	4184.19	52.797	55.000	53.800	1.200	1.0954	100.000	7.90E-01	2.51E-01	1.03E-01	2.95E-02	2.16E-01

NOTES:

* Results are a compilation of S0405235031_UU and T0405235031_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.011 +/-0.000)



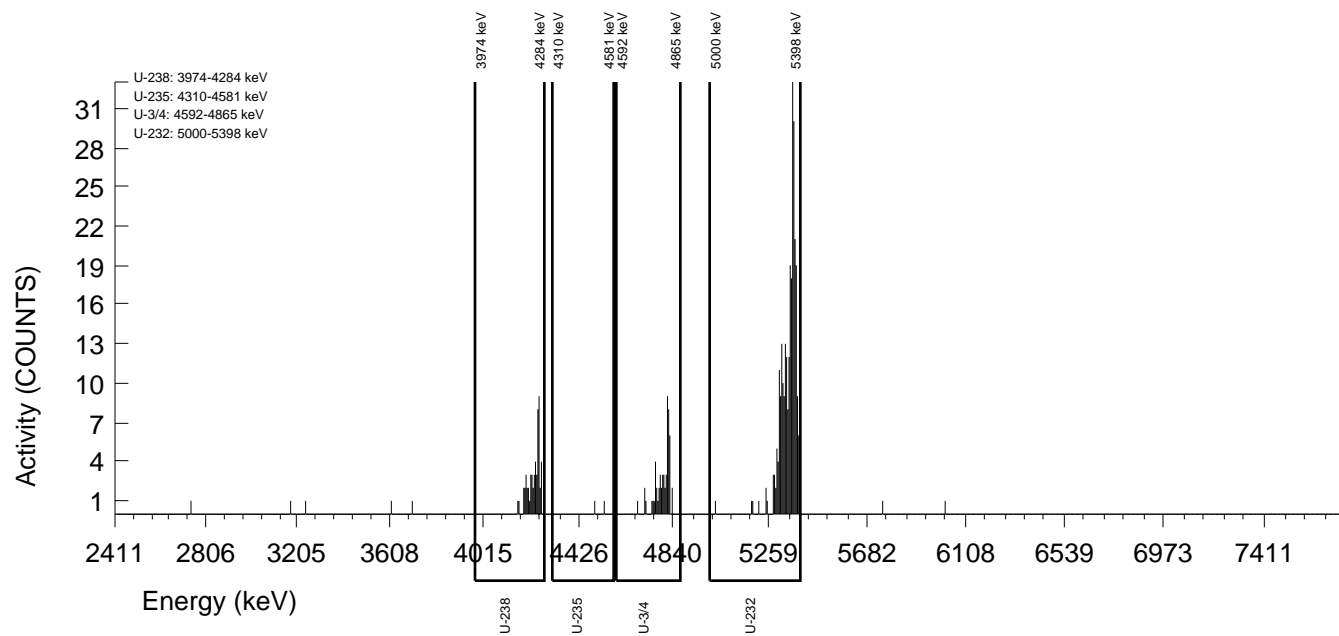
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235031_UU SAMPLE QTY : 0.517 G +/-0.193 % SAMPLE DATE : 26-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 94.6 +/-6.804 %	CHAMBER : 145 DETECTOR S/N : 72526 AVERAGE %EFFICIENCY : 26.3634 AVERAGE %EFF ERROR : 0.5106 COUNT DATE : 24-Sep-2016 13:20:04 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B145.CNF;1121 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W145.CNF;365 CAL DATE : 09-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6555E+00 dpm RESULTS : 4.4032E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5340.26	27.551	277.000	276.280	0.720	0.8485	100.000	4.06E+00	7.40E-01	8.97E-02	2.28E-02	4.80E-01
U-3/4	4763.02	4793.86	14.741	57.000	56.040	0.960	0.9798	100.000	8.16E-01	2.46E-01	9.59E-02	2.61E-02	2.18E-01
U-235	4391.00	4518.69	44.222	2.000	2.000	0.000	0.0000	99.700	2.92E-02	5.02E-02	4.38E-02	0.00E+00	5.00E-02
U-238	4184.73	4233.28	11.512	55.000	53.800	1.200	1.0954	100.000	7.83E-01	2.40E-01	1.02E-01	2.92E-02	2.14E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235032_UU SAMPLE QTY : 0.508 G +/-0.197 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 61.8 +/-9.242 % SECONDARY QTY : 0.512 G +/-0.195 %	CHAMBER : 011 DETECTOR S/N : 72531 AVERAGE %EFFICIENCY : 31.0555 AVERAGE %EFF ERROR : 0.5992 COUNT DATE : 25-Sep-2016 15:54:03 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B011.CNF;1835 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W011.CNF;511 CAL DATE : 27-Aug-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0741E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4491.87	4503.11	798.13	3.76	96.273	N/A
TRACER 2	1564-I	U-232	4.6558 dpm	5280.99	5313.39	3.04	177.60	62.867	1.0176

NUCLIDE ACTIVITY SUMMARY

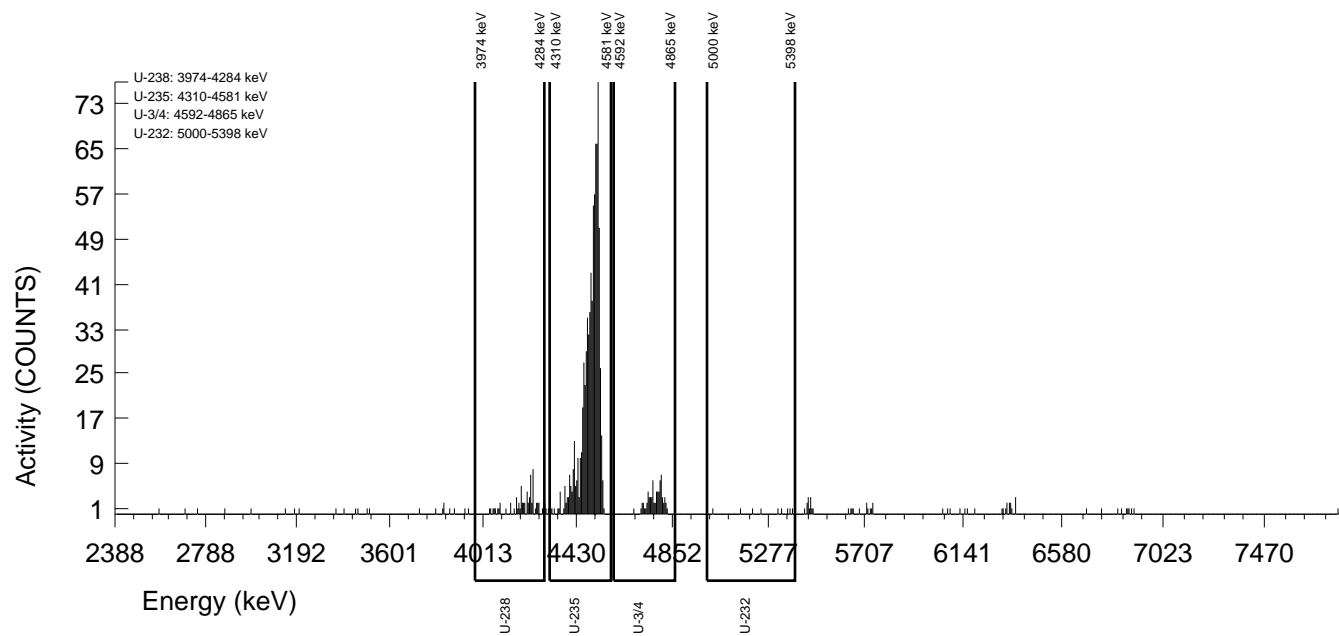
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5280.99	0.000	10.000	3.040	6.960	2.6382	100.000	3.76E-02	8.67E-02	1.57E-01	5.98E-02	8.65E-02
U-3/4	4763.02	4776.82	60.251	39.000	38.280	0.720	0.8485	100.000	8.98E-01	3.36E-01	1.43E-01	3.65E-02	2.92E-01
U-235	4391.00	4491.87	40.463	4.000	3.760	0.240	0.4899	99.700	8.85E-02	1.06E-01	1.13E-01	2.11E-02	1.04E-01
U-238	4184.73	4181.89	53.418	27.000	26.280	0.720	0.8485	100.000	6.16E-01	2.70E-01	1.43E-01	3.65E-02	2.44E-01

NOTES:

* Results are a compilation of S0405235032_UU and T0405235032_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.012 +/-0.000)



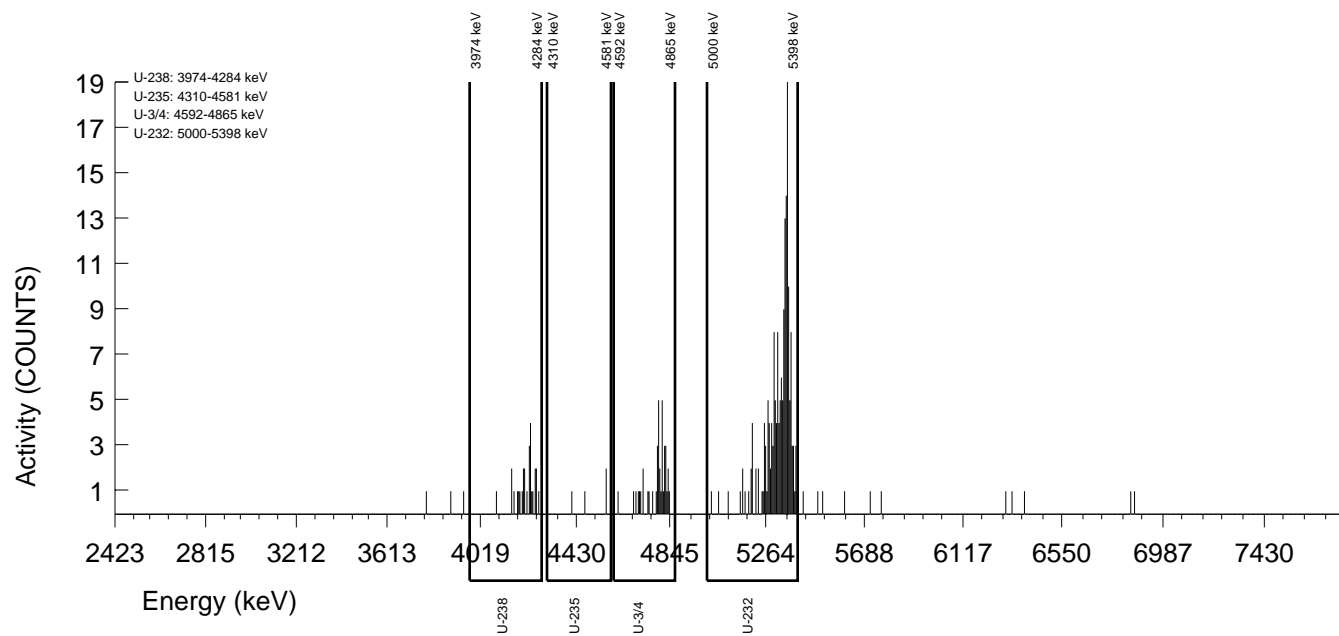
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235032_UU SAMPLE QTY : 0.508 G +/-0.197 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 62.9 +/-8.212 %	CHAMBER : 146 DETECTOR S/N : 72527 AVERAGE %EFFICIENCY : 25.4962 AVERAGE %EFF ERROR : 0.4943 COUNT DATE : 24-Sep-2016 13:20:06 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B146.CNF;1123 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W146.CNF;315 CAL DATE : 09-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6558E+00 dpm RESULTS : 2.9270E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5313.39	19.378	180.000	177.600	2.400	1.5492	100.000	4.13E+00	9.18E-01	2.02E-01	6.60E-02	6.14E-01
U-3/4	4763.02	4780.77	36.563	39.000	38.280	0.720	0.8485	100.000	8.82E-01	3.22E-01	1.41E-01	3.58E-02	2.87E-01
U-235	4391.00	4503.11	4.875	4.000	3.760	0.240	0.4899	99.700	8.69E-02	1.03E-01	1.11E-01	2.07E-02	1.02E-01
U-238	4184.73	4212.70	9.750	27.000	26.280	0.720	0.8485	100.000	6.06E-01	2.60E-01	1.41E-01	3.58E-02	2.40E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235033_UU SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 70.3 +/-8.979 % SECONDARY QTY : 0.514 G +/-0.195 %	CHAMBER : 012 DETECTOR S/N : 80054 AVERAGE %EFFICIENCY : 29.3381 AVERAGE %EFF ERROR : 0.5668 COUNT DATE : 25-Sep-2016 15:54:03 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B012.CNF;1839 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W012.CNF;494 CAL DATE : 27-Aug-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.7516E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4492.84	4396.40	684.56	3.76	87.407	N/A
TRACER 2	1564-I	U-232	4.6558 dpm	5305.56	5319.98	1.60	200.84	71.250	1.0140

NUCLIDE ACTIVITY SUMMARY

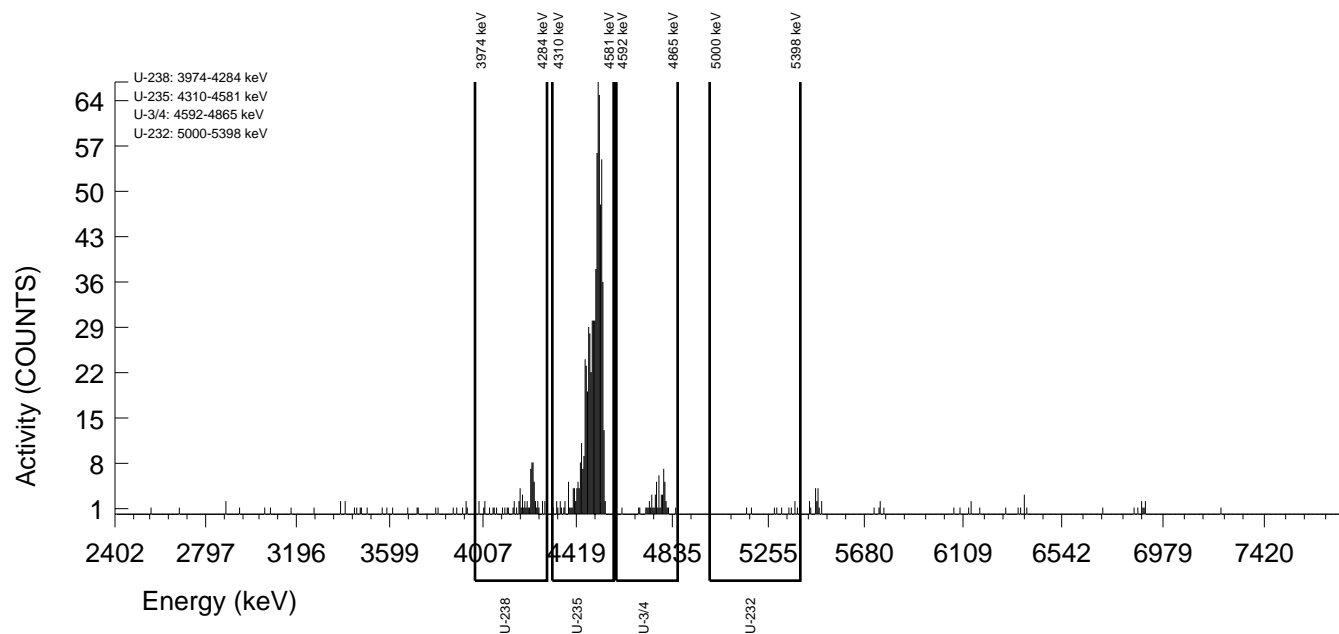
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5305.56	4.910	10.000	1.600	8.400	2.8983	100.000	2.30E-02	1.02E-01	1.96E-01	7.62E-02	1.02E-01
U-3/4	4763.02	4772.27	40.505	31.000	30.520	0.480	0.6928	100.000	6.33E-01	2.57E-01	1.15E-01	2.63E-02	2.31E-01
U-235	4391.00	4492.84	32.753	4.000	3.760	0.240	0.4899	99.700	7.83E-02	9.33E-02	9.98E-02	1.87E-02	9.23E-02
U-238	4184.73	4178.81	18.820	48.000	47.280	0.720	0.8485	100.000	9.81E-01	3.36E-01	1.27E-01	3.23E-02	2.85E-01

NOTES:

* Results are a compilation of S0405235033_UU and T0405235033_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



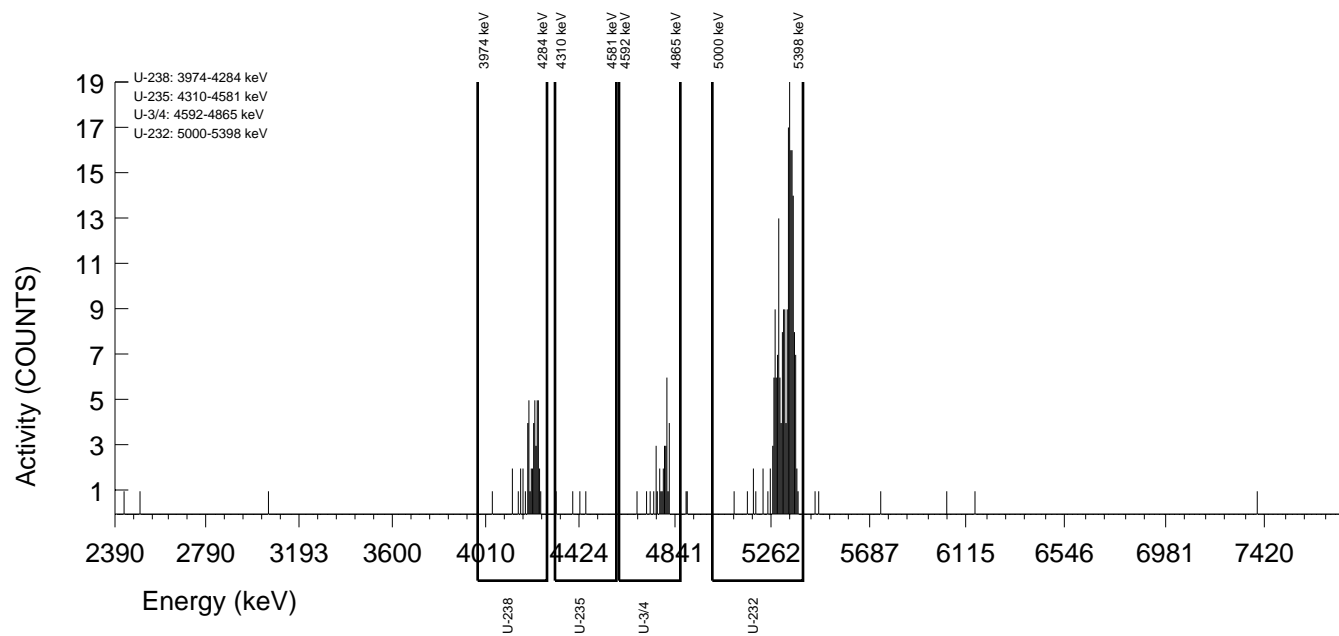
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235033_UU SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 71.3 +/-7.782 %	CHAMBER : 147 DETECTOR S/N : 75550 AVERAGE %EFFICIENCY : 25.4403 AVERAGE %EFF ERROR : 0.4932 COUNT DATE : 24-Sep-2016 13:20:09 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B147.CNF;1093 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W147.CNF;294 CAL DATE : 09-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6558E+00 dpm RESULTS : 3.3173E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5319.98	66.305	203.000	200.840	2.160	1.4697	100.000	4.14E+00	8.71E-01	1.73E-01	5.56E-02	5.79E-01
U-3/4	4763.02	4782.63	16.162	31.000	30.520	0.480	0.6928	100.000	6.25E-01	2.48E-01	1.13E-01	2.60E-02	2.27E-01
U-235	4391.00	4396.40	129.295	4.000	3.760	0.240	0.4899	99.700	7.72E-02	9.18E-02	9.84E-02	1.84E-02	9.10E-02
U-238	4184.73	4208.75	50.765	48.000	47.280	0.720	0.8485	100.000	9.68E-01	3.20E-01	1.25E-01	3.18E-02	2.81E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235034_UU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 56.7 +/-9.602 % SECONDARY QTY : 0.515 G +/-0.194 %	CHAMBER : 013 DETECTOR S/N : 78790 AVERAGE %EFFICIENCY : 35.0288 AVERAGE %EFF ERROR : 0.6744 COUNT DATE : 25-Sep-2016 15:54:08 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B013.CNF;1815 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W013.CNF;513 CAL DATE : 27-Aug-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0597E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4486.89	4421.61	888.19	3.00	94.983	N/A
TRACER 2	1564-I	U-232	4.6558 dpm	5327.26	5314.34	2.28	154.80	57.523	1.0146

NUCLIDE ACTIVITY SUMMARY

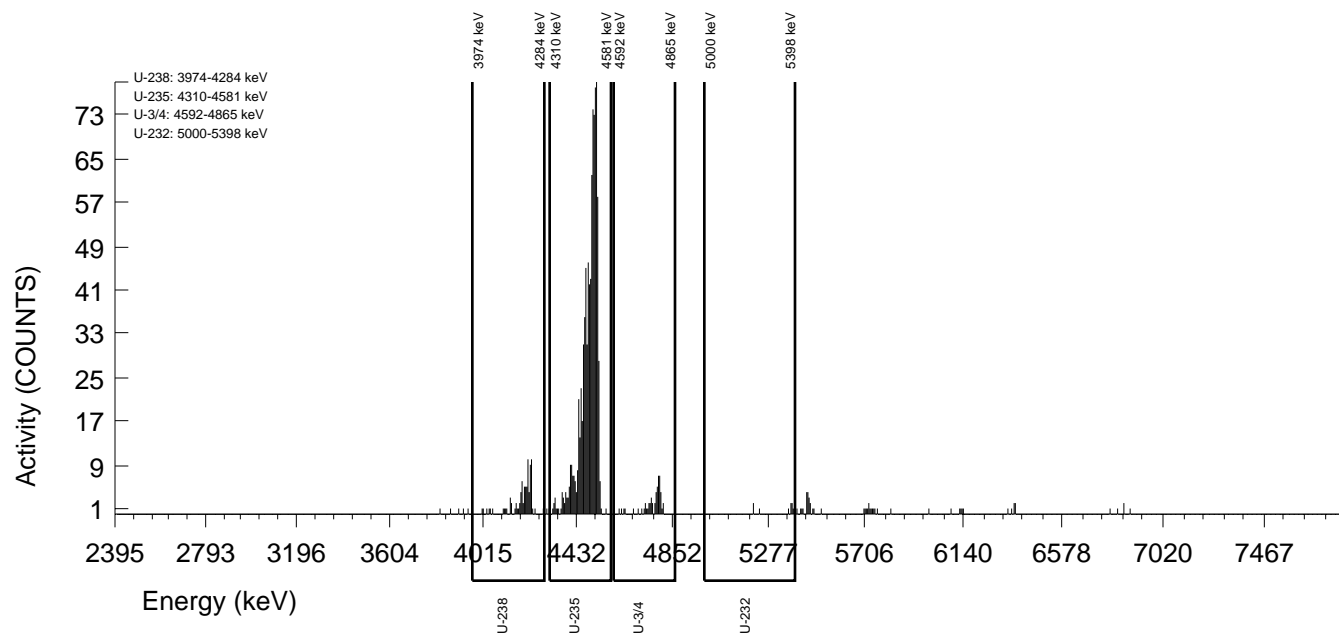
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5327.26	165.966	9.000	2.280	6.720	2.5923	100.000	2.52E-02	7.41E-02	1.38E-01	5.25E-02	7.40E-02
U-3/4	4763.02	4766.35	21.881	38.000	37.280	0.720	0.8485	100.000	9.98E-01	3.81E-01	1.64E-01	4.16E-02	3.29E-01
U-235	4391.00	4486.89	55.625	3.000	3.000	0.000	0.0000	99.700	8.06E-02	1.07E-01	8.06E-02	0.00E+00	1.06E-01
U-238	4184.73	4191.02	44.863	39.000	38.280	0.720	0.8485	100.000	1.03E+00	3.87E-01	1.64E-01	4.16E-02	3.33E-01

NOTES:

* Results are a compilation of S0405235034_UU and T0405235034_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.013 +/-0.000)



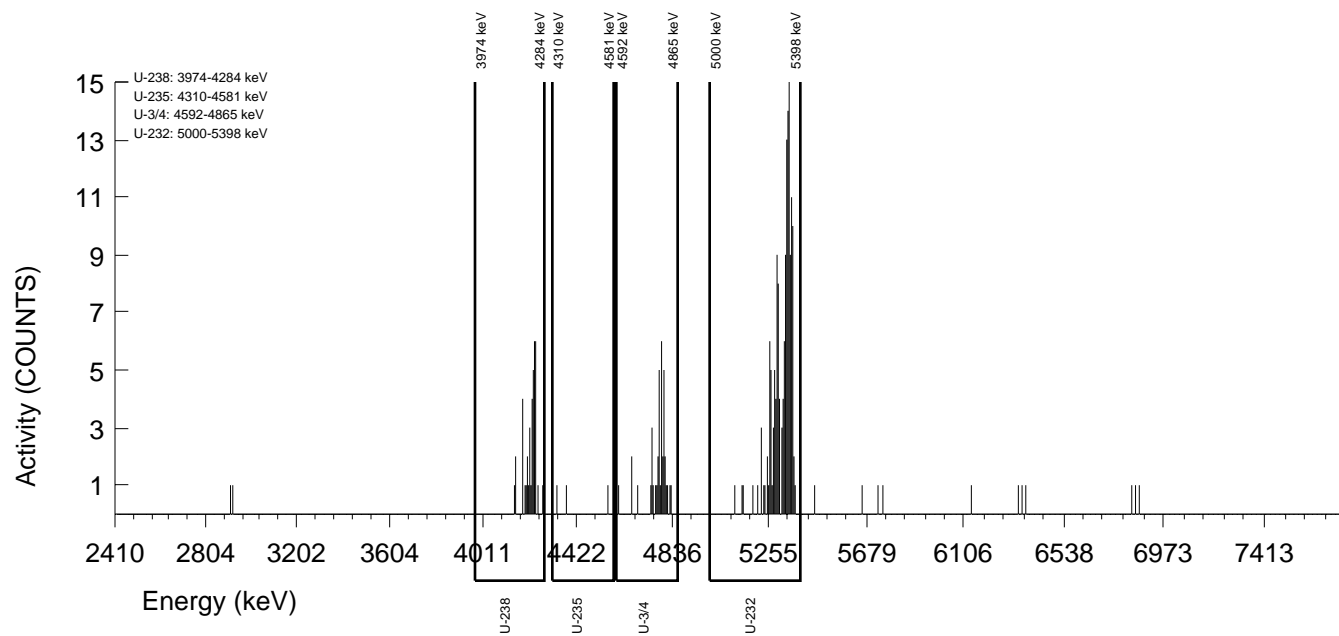
GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235034_UU SAMPLE QTY : 0.509 G +/-0.196 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 57.5 +/-8.690 %	CHAMBER : 148 DETECTOR S/N : 74429 AVERAGE %EFFICIENCY : 24.2876 AVERAGE %EFF ERROR : 0.4715 COUNT DATE : 24-Sep-2016 13:20:11 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B148.CNF;1094 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W148.CNF;312 CAL DATE : 09-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6558E+00 dpm RESULTS : 2.6782E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5314.34	66.688	156.000	154.800	1.200	1.0954	100.000	4.12E+00	9.72E-01	1.87E-01	5.34E-02	6.54E-01
U-3/4	4763.02	4771.78	26.128	38.000	37.280	0.720	0.8485	100.000	9.84E-01	3.67E-01	1.61E-01	4.10E-02	3.24E-01
U-235	4391.00	4421.61	215.558	3.000	3.000	0.000	0.0000	99.700	7.94E-02	1.05E-01	7.94E-02	0.00E+00	1.05E-01
U-238	4184.73	4218.77	57.564	39.000	38.280	0.720	0.8485	100.000	1.01E+00	3.73E-01	1.61E-01	4.10E-02	3.28E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235035_UU SAMPLE QTY : 0.516 G +/-0.194 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 44.8 +/-11.231 % SECONDARY QTY : 0.510 G +/-0.196 %	CHAMBER : 014 DETECTOR S/N : 83289 AVERAGE %EFFICIENCY : 32.6875 AVERAGE %EFF ERROR : 0.6302 COUNT DATE : 25-Sep-2016 15:54:08 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B014.CNF;1816 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W014.CNF;523 CAL DATE : 27-Aug-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 3.9312E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4492.23	4472.87	307.47	1.04	35.237	N/A
TRACER 2	1564-I	U-232	4.6558 dpm	5303.43	5320.42	3.04	129.52	46.246	1.0326

NUCLIDE ACTIVITY SUMMARY

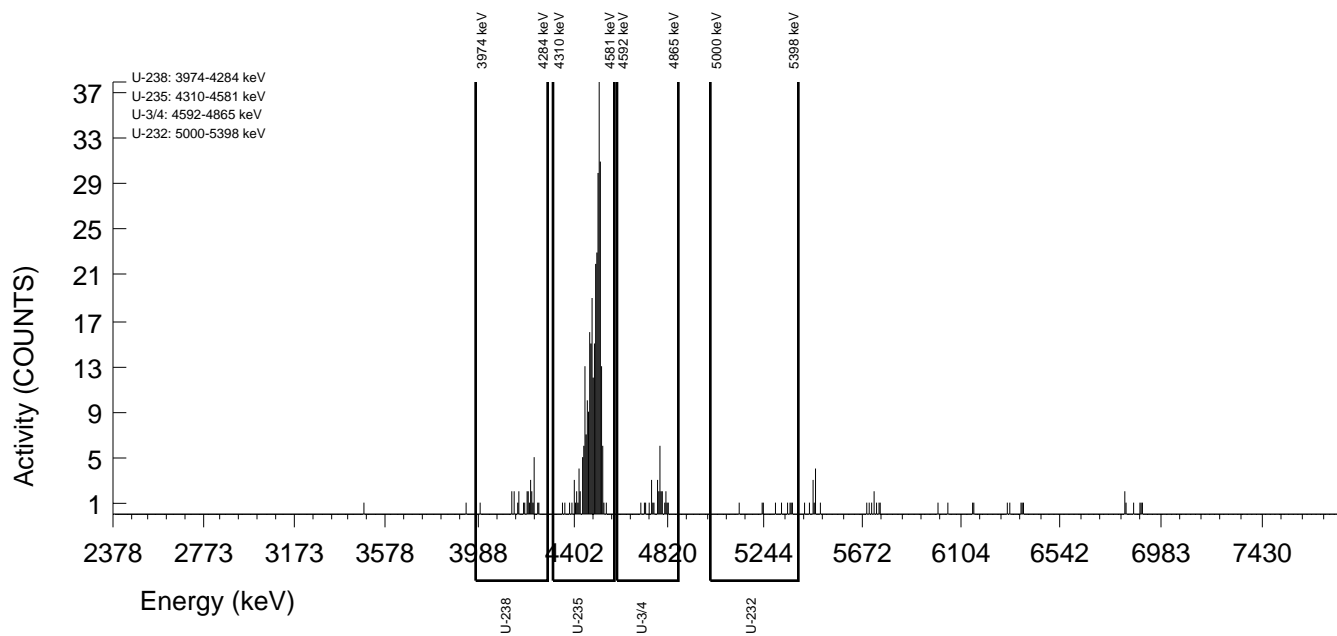
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5303.43	245.730	10.000	3.040	6.960	2.6382	100.000	9.80E-02	2.26E-01	4.08E-01	1.56E-01	2.25E-01
U-3/4	4763.02	4773.30	7.372	30.000	29.040	0.960	0.9798	100.000	9.33E-01	4.09E-01	2.12E-01	5.77E-02	3.52E-01
U-235	4391.00	4492.23	25.041	2.000	1.040	0.960	0.9798	99.700	3.35E-02	1.15E-01	2.12E-01	5.78E-02	1.15E-01
U-238	4184.73	4191.92	18.430	23.000	22.760	0.240	0.4899	100.000	7.31E-01	3.50E-01	1.54E-01	2.88E-02	3.09E-01

NOTES:

* Results are a compilation of S0405235035_UU and T0405235035_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.005 +/-0.000)



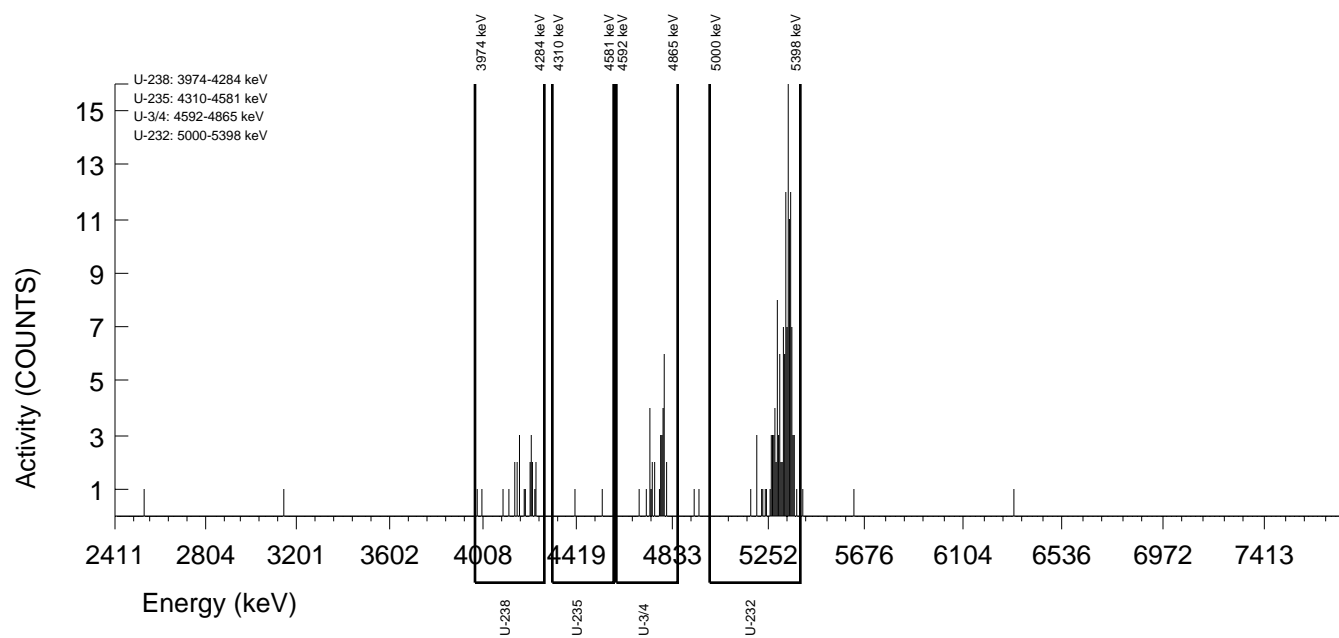
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235035_UU SAMPLE QTY : 0.516 G +/-0.194 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 46.2 +/-9.383 %	CHAMBER : 149 DETECTOR S/N : 33449 AVERAGE %EFFICIENCY : 25.2769 AVERAGE %EFF ERROR : 0.4901 COUNT DATE : 24-Sep-2016 13:20:13 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B149.CNF;1104 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W149.CNF;305 CAL DATE : 09-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6558E+00 dpm RESULTS : 2.1531E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5320.42	26.695	130.000	129.520	0.480	0.6928	100.000	4.06E+00	1.04E+00	1.74E-01	3.98E-02	7.04E-01
U-3/4	4763.02	4776.09	62.260	30.000	29.040	0.960	0.9798	100.000	9.04E-01	3.81E-01	2.05E-01	5.58E-02	3.41E-01
U-235	4391.00	4472.87	117.195	2.000	1.040	0.960	0.9798	99.700	3.25E-02	1.11E-01	2.06E-01	5.60E-02	1.11E-01
U-238	4184.73	4175.77	90.338	23.000	22.760	0.240	0.4899	100.000	7.08E-01	3.28E-01	1.49E-01	2.79E-02	2.99E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235036_UU SAMPLE QTY : 0.518 G +/-0.193 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 34.4 +/-11.565 % SECONDARY QTY : 0.508 G +/-0.197 %	CHAMBER : 015 DETECTOR S/N : 80055 AVERAGE %EFFICIENCY : 33.3682 AVERAGE %EFF ERROR : 0.6430 COUNT DATE : 25-Sep-2016 15:54:08 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B015.CNF;1835 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W015.CNF;530 CAL DATE : 27-Aug-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.1085E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4481.54	4456.36	885.05	1.76	99.359	N/A
TRACER 2	1564-I	U-232	4.6558 dpm	5302.79	5322.85	1.72	95.80	34.814	1.0133

NUCLIDE ACTIVITY SUMMARY

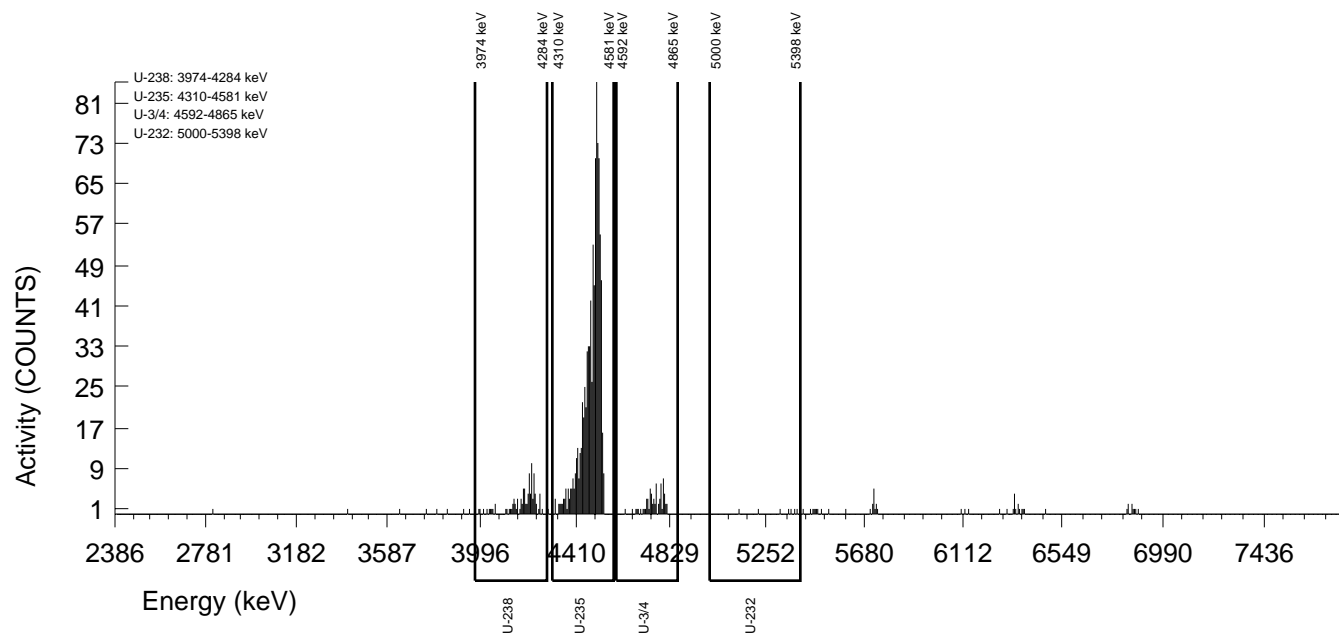
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		Lc pCi/G	1.96-sigma cnt Unc pCi/G
										TPU pCi/G	MDA pCi/G		
U-232	5302.10	5302.79	240.946	7.000	1.720	5.280	2.2978	100.000	1.93E-02	6.74E-02	1.28E-01	4.73E-02	6.73E-02
U-3/4	4763.02	4757.74	62.080	19.000	18.520	0.480	0.6928	100.000	7.86E-01	4.15E-01	2.35E-01	5.39E-02	3.74E-01
U-235	4391.00	4481.54	36.907	2.000	1.760	0.240	0.4899	99.700	7.50E-02	1.48E-01	2.04E-01	3.82E-02	1.47E-01
U-238	4184.73	4180.69	27.045	25.000	25.000	0.000	0.0000	100.000	1.06E+00	4.90E-01	1.27E-01	0.00E+00	4.25E-01

NOTES:

* Results are a compilation of S0405235036_UU and T0405235036_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.013 +/-0.000)



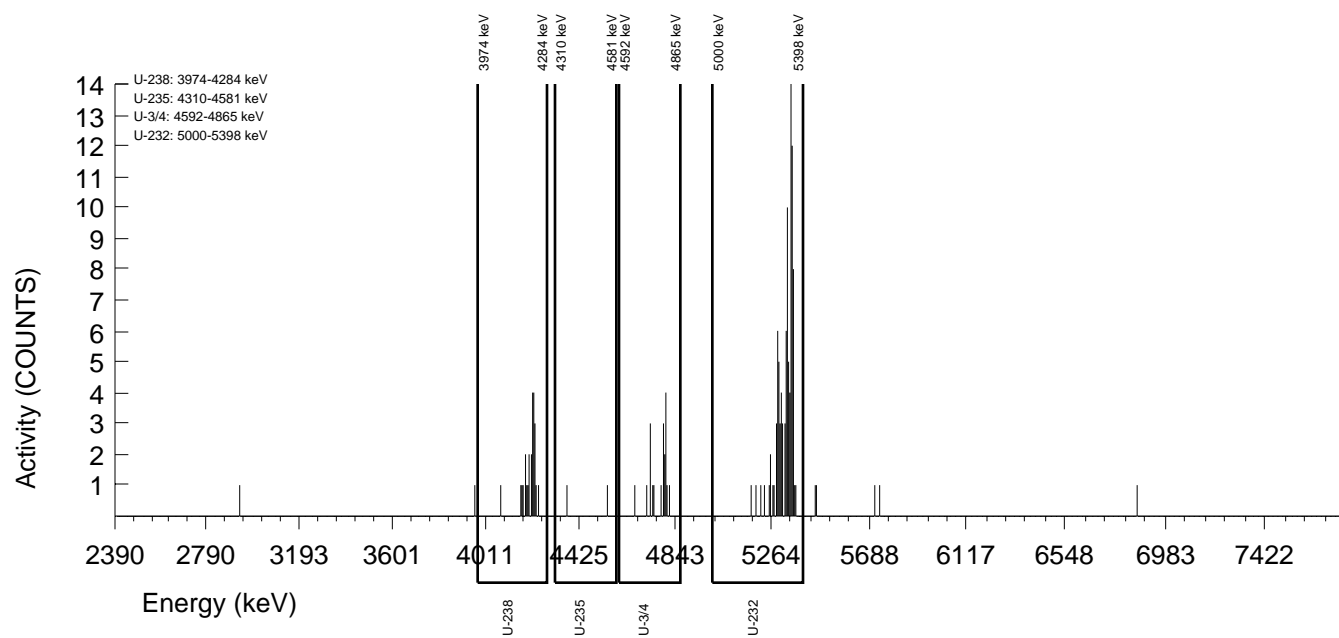
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235036_UU SAMPLE QTY : 0.518 G +/-0.193 % SAMPLE DATE : 23-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 34.8 +/-10.817 %	CHAMBER : 150 DETECTOR S/N : 75552 AVERAGE %EFFICIENCY : 24.8352 AVERAGE %EFF ERROR : 0.4817 COUNT DATE : 24-Sep-2016 13:20:16 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B150.CNF;1102 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W150.CNF;296 CAL DATE : 09-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6558E+00 dpm RESULTS : 1.6209E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5322.85	29.335	97.000	95.800	1.200	1.0954	100.000	4.05E+00	1.20E+00	2.96E-01	8.48E-02	8.21E-01
U-3/4	4763.02	4770.52	69.693	19.000	18.520	0.480	0.6928	100.000	7.76E-01	4.05E-01	2.32E-01	5.32E-02	3.69E-01
U-235	4391.00	4456.36	174.233	2.000	1.760	0.240	0.4899	99.700	7.40E-02	1.46E-01	2.02E-01	3.77E-02	1.45E-01
U-238	4184.73	4204.23	17.423	25.000	25.000	0.000	0.0000	100.000	1.05E+00	4.76E-01	1.26E-01	0.00E+00	4.19E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235037_UU SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 25.3 +/-13.443 % SECONDARY QTY : 0.512 G +/-0.195 %	CHAMBER : 016 DETECTOR S/N : 78774 AVERAGE %EFFICIENCY : 33.4185 AVERAGE %EFF ERROR : 0.6439 COUNT DATE : 25-Sep-2016 15:54:08 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B016.CNF;1811 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W016.CNF;494 CAL DATE : 27-Aug-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.4608E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4481.94	4445.43	756.52	-0.96	84.802	N/A
TRACER 2	1564-I	U-232	4.6549 dpm	5309.48	5319.42	4.60	69.60	25.861	1.0228

NUCLIDE ACTIVITY SUMMARY

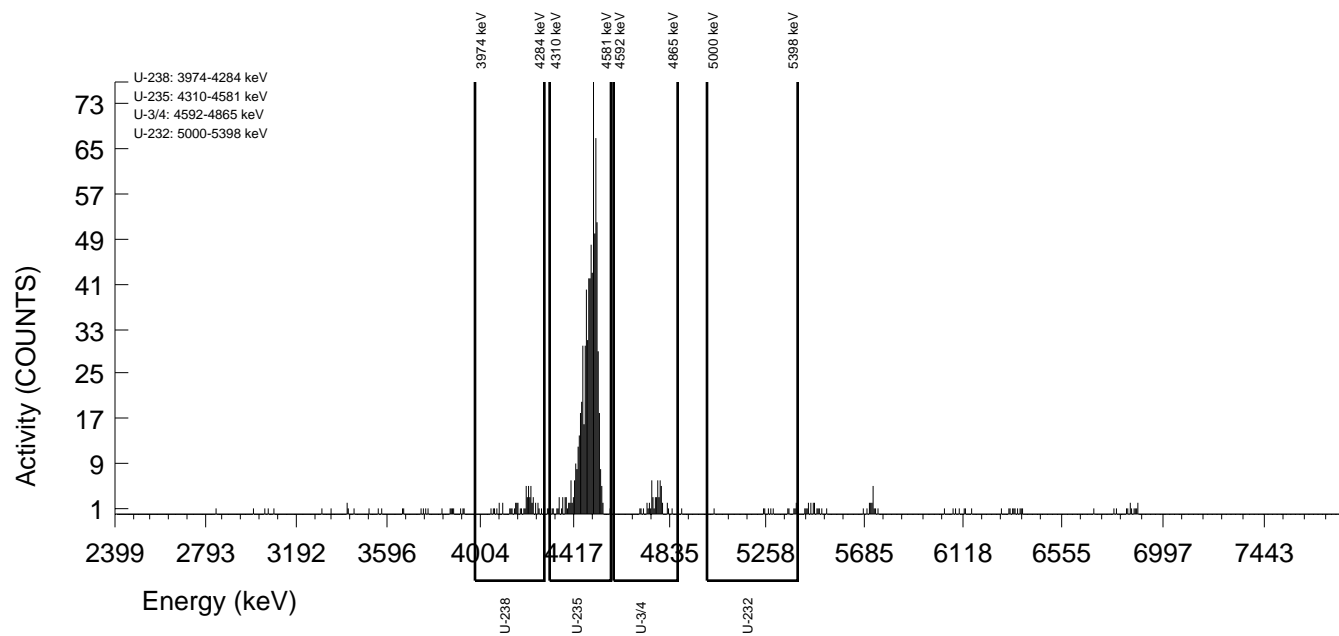
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5309.48	9.790	13.000	4.600	8.400	2.8983	100.000	6.00E-02	1.04E-01	1.78E-01	6.92E-02	1.02E-01
U-3/4	4763.02	4775.94	45.362	8.000	4.880	3.120	1.7664	100.000	2.95E-01	3.79E-01	5.72E-01	1.95E-01	3.71E-01
U-235	4391.00	4481.94	47.664	0.000	-0.960	0.960	0.9798	99.700	-5.82E-02	1.36E-01	3.99E-01	1.09E-01	1.35E-01
U-238	4184.73	4189.93	33.246	8.000	7.520	0.480	0.6928	100.000	4.54E-01	3.78E-01	3.34E-01	7.66E-02	3.59E-01

NOTES:

* Results are a compilation of S0405235037_UU and T0405235037_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.011 +/-0.000)



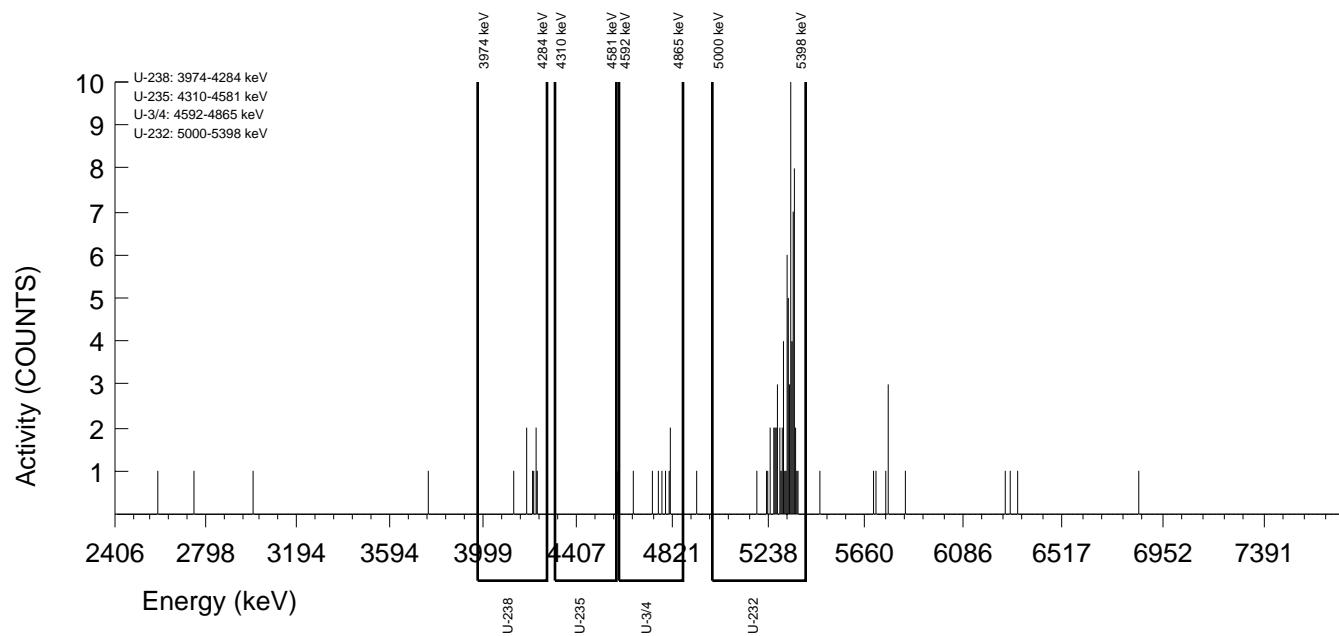
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235037_UU SAMPLE QTY : 0.506 G +/-0.198 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 25.9 +/-12.722 %	CHAMBER : 152 DETECTOR S/N : 76222 AVERAGE %EFFICIENCY : 24.2896 AVERAGE %EFF ERROR : 0.4714 COUNT DATE : 24-Sep-2016 13:20:18 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B152.CNF;1088 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W152.CNF;285 CAL DATE : 09-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6549E+00 dpm RESULTS : 1.2038E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5319.42	32.608	72.000	69.600	2.400	1.5492	100.000	4.14E+00	1.45E+00	5.17E-01	1.69E-01	1.00E+00
U-3/4	4763.02	4771.39	7.300	8.000	4.880	3.120	1.7664	100.000	2.88E-01	3.70E-01	5.59E-01	1.91E-01	3.62E-01
U-235	4391.00	4445.43	0.000	0.000	-0.960	0.960	0.9798	99.700	-5.69E-02	1.33E-01	3.90E-01	1.06E-01	1.32E-01
U-238	4184.73	4208.22	46.235	8.000	7.520	0.480	0.6928	100.000	4.44E-01	3.68E-01	3.27E-01	7.49E-02	3.51E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235038_UU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 82.9 +/-8.343 % SECONDARY QTY : 0.520 G +/-0.192 %	CHAMBER : 017 DETECTOR S/N : 78791 AVERAGE %EFFICIENCY : 30.2659 AVERAGE %EFF ERROR : 0.5843 COUNT DATE : 25-Sep-2016 15:54:08 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B017.CNF;2657 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W017.CNF;1450 CAL DATE : 27-Aug-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0954E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4478.19	4412.47	793.28	5.28	98.184	N/A
TRACER 2	1564-I	U-232	4.6549 dpm	5217.63	5310.83	1.00	242.56	83.836	1.0112

NUCLIDE ACTIVITY SUMMARY

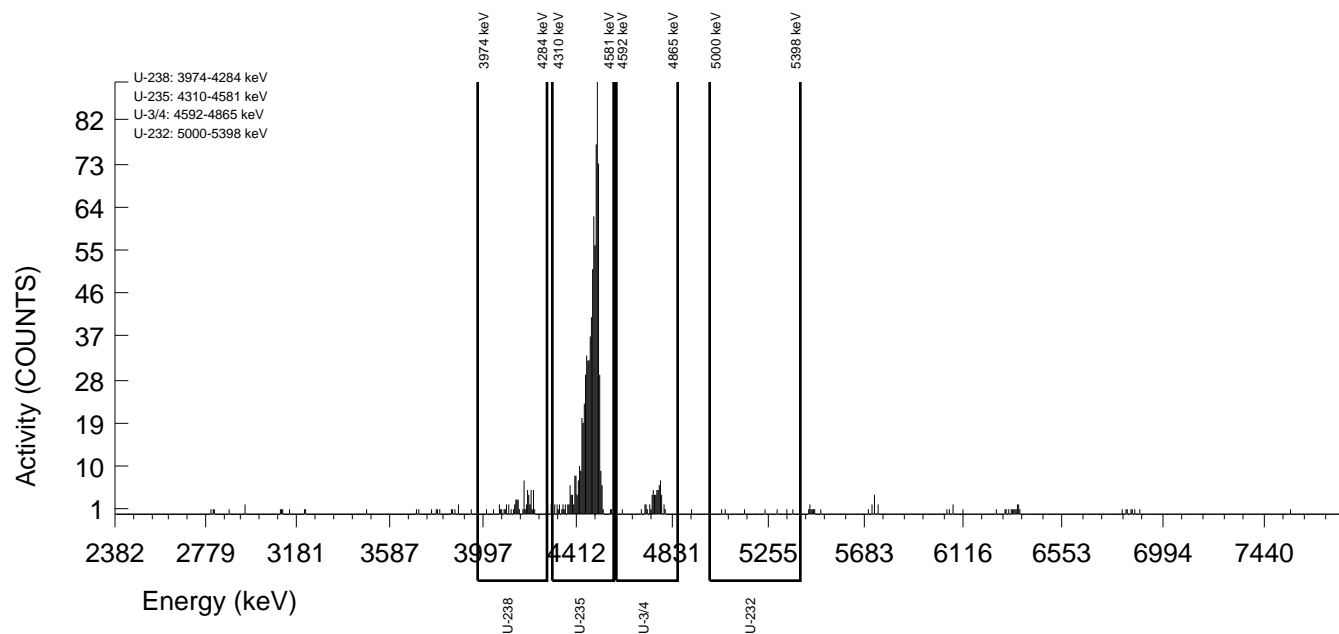
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5217.63	296.030	7.000	1.000	6.000	2.4495	100.000	1.22E-02	7.40E-02	1.47E-01	5.50E-02	7.40E-02
U-3/4	4763.02	4761.08	40.910	34.000	33.040	0.960	0.9798	100.000	5.72E-01	2.23E-01	1.14E-01	3.11E-02	2.01E-01
U-235	4391.00	4478.19	30.769	6.000	5.280	0.720	0.8485	99.700	9.16E-02	9.28E-02	1.06E-01	2.70E-02	9.15E-02
U-238	4184.73	4166.73	44.199	43.000	42.520	0.480	0.6928	100.000	7.36E-01	2.57E-01	9.58E-02	2.20E-02	2.25E-01

NOTES:

* Results are a compilation of S0405235038_UU and T0405235038_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.012 +/-0.000)



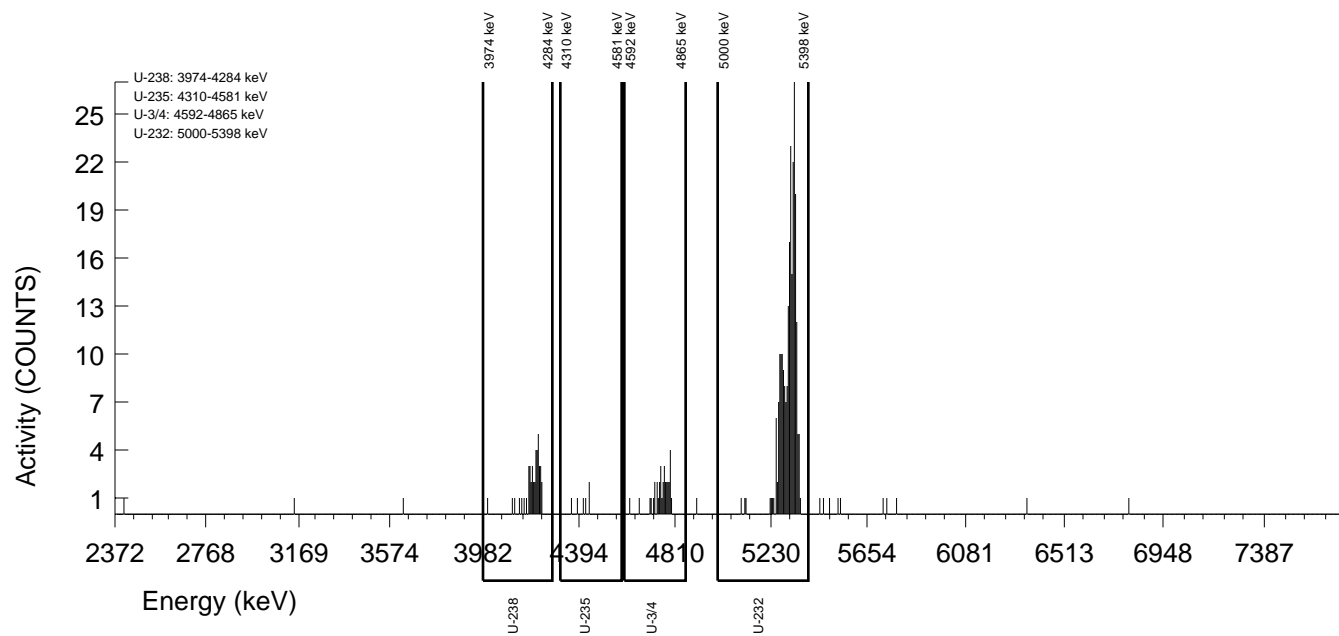
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235038_UU SAMPLE QTY : 0.501 G +/-0.200 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 83.8 +/-7.180 %	CHAMBER : 154 DETECTOR S/N : 76224 AVERAGE %EFFICIENCY : 26.1126 AVERAGE %EFF ERROR : 0.5058 COUNT DATE : 24-Sep-2016 13:20:21 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B154.CNF;1099 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W154.CNF;304 CAL DATE : 09-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6549E+00 dpm RESULTS : 3.9025E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5310.83	33.017	244.000	242.560	1.440	1.2000	100.000	4.19E+00	8.08E-01	1.28E-01	3.79E-02	5.30E-01
U-3/4	4763.02	4754.77	47.726	34.000	33.040	0.960	0.9798	100.000	5.65E-01	2.16E-01	1.13E-01	3.07E-02	1.99E-01
U-235	4391.00	4412.47	4.937	6.000	5.280	0.720	0.8485	99.700	9.06E-02	9.14E-02	1.05E-01	2.67E-02	9.05E-02
U-238	4184.73	4192.33	52.663	43.000	42.520	0.480	0.6928	100.000	7.28E-01	2.47E-01	9.48E-02	2.17E-02	2.23E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235039_UU SAMPLE QTY : 0.512 G +/-0.195 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 76.5 +/-8.492 % SECONDARY QTY : 0.507 G +/-0.197 %	CHAMBER : 018 DETECTOR S/N : 78782 AVERAGE %EFFICIENCY : 31.3297 AVERAGE %EFF ERROR : 0.6044 COUNT DATE : 25-Sep-2016 15:54:08 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : U236 BKG FILE : B018.CNF;1812 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W018.CNF;484 CAL DATE : 27-Aug-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.1351E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4482.13	4398.10	850.90	1.52	101.740	N/A
TRACER 2	1564-I	U-232	4.6549 dpm	5236.66	5308.15	0.44	225.84	77.243	1.0095

NUCLIDE ACTIVITY SUMMARY

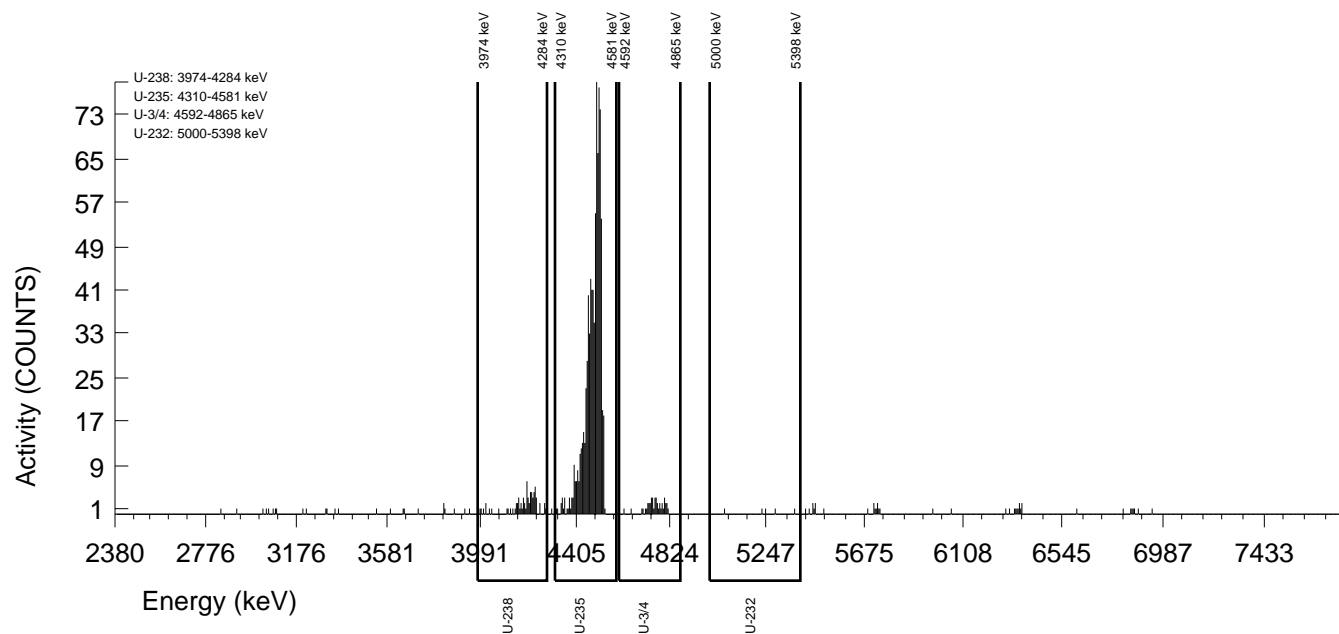
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5236.66	290.134	5.000	0.440	4.560	2.1354	100.000	5.15E-03	6.14E-02	1.27E-01	4.58E-02	6.14E-02
U-3/4	4763.02	4753.92	83.598	35.000	34.520	0.480	0.6928	100.000	6.27E-01	2.39E-01	1.01E-01	2.30E-02	2.14E-01
U-235	4391.00	4482.13	56.335	2.000	1.520	0.480	0.6928	99.700	2.77E-02	6.38E-02	1.01E-01	2.31E-02	6.36E-02
U-238	4184.73	4175.10	42.291	55.000	54.760	0.240	0.4899	100.000	9.94E-01	3.16E-01	8.71E-02	1.63E-02	2.67E-01

NOTES:

* Results are a compilation of S0405235039_UU and T0405235039_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.013 +/-0.000)



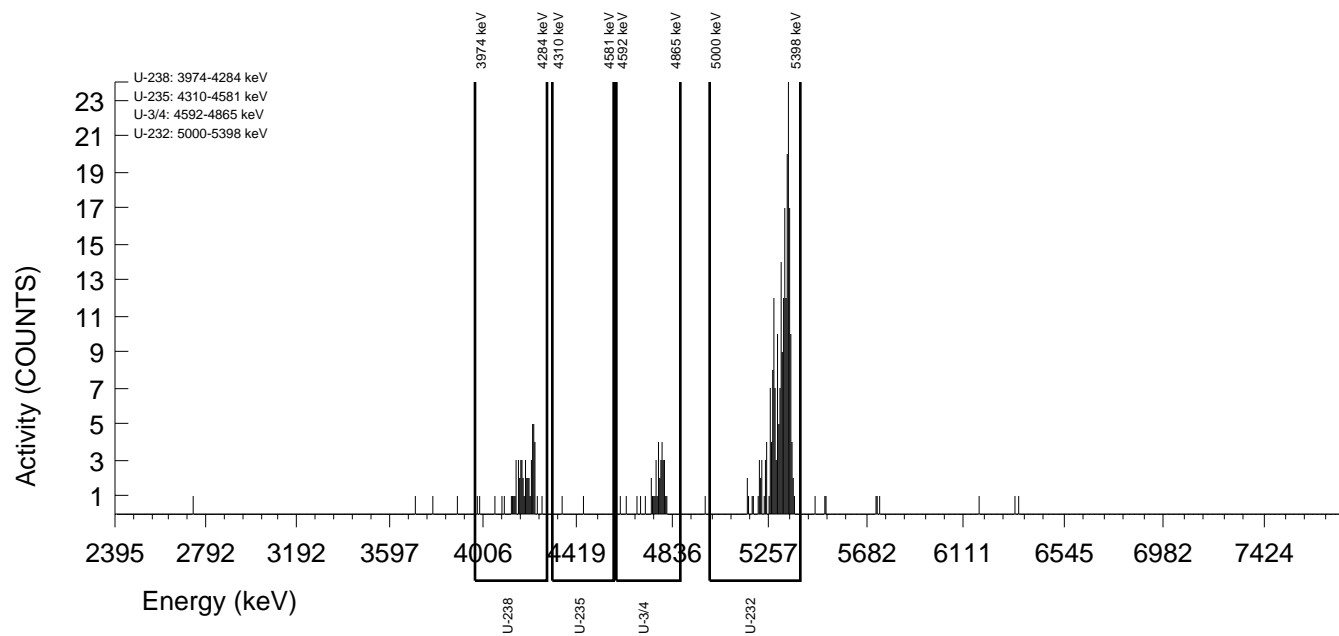
GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235039_UU SAMPLE QTY : 0.512 G +/-0.195 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 77.2 +/-7.406 %	CHAMBER : 155 DETECTOR S/N : 75553 AVERAGE %EFFICIENCY : 26.3876 AVERAGE %EFF ERROR : 0.5110 COUNT DATE : 24-Sep-2016 13:20:22 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B155.CNF;1101 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W155.CNF;289 CAL DATE : 09-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6549E+00 dpm RESULTS : 3.5956E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5308.15	39.442	228.000	225.840	2.160	1.4697	100.000	4.10E+00	8.17E-01	1.52E-01	4.88E-02	5.39E-01
U-3/4	4763.02	4761.95	39.442	35.000	34.520	0.480	0.6928	100.000	6.21E-01	2.32E-01	9.96E-02	2.28E-02	2.12E-01
U-235	4391.00	4398.10	93.674	2.000	1.520	0.480	0.6928	99.700	2.74E-02	6.31E-02	9.99E-02	2.29E-02	6.30E-02
U-238	4184.73	4180.74	81.965	55.000	54.760	0.240	0.4899	100.000	9.85E-01	3.03E-01	8.62E-02	1.61E-02	2.64E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T0405235040_UU SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 83.1 +/-8.624 % SECONDARY QTY : 0.503 G +/-0.199 %	CHAMBER : 113 DETECTOR S/N : 80009 AVERAGE %EFFICIENCY : 24.7132 AVERAGE %EFF ERROR : 0.4794 COUNT DATE : 25-Sep-2016 15:54:41 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B113.CNF;1167 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W113.CNF;318 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.8641E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4496.66	4488.99	583.30	6.28	88.416	N/A
TRACER 2	1564-I	U-232	4.6549 dpm	5198.57	5308.13	-1.44	240.80	83.766	1.0083

NUCLIDE ACTIVITY SUMMARY

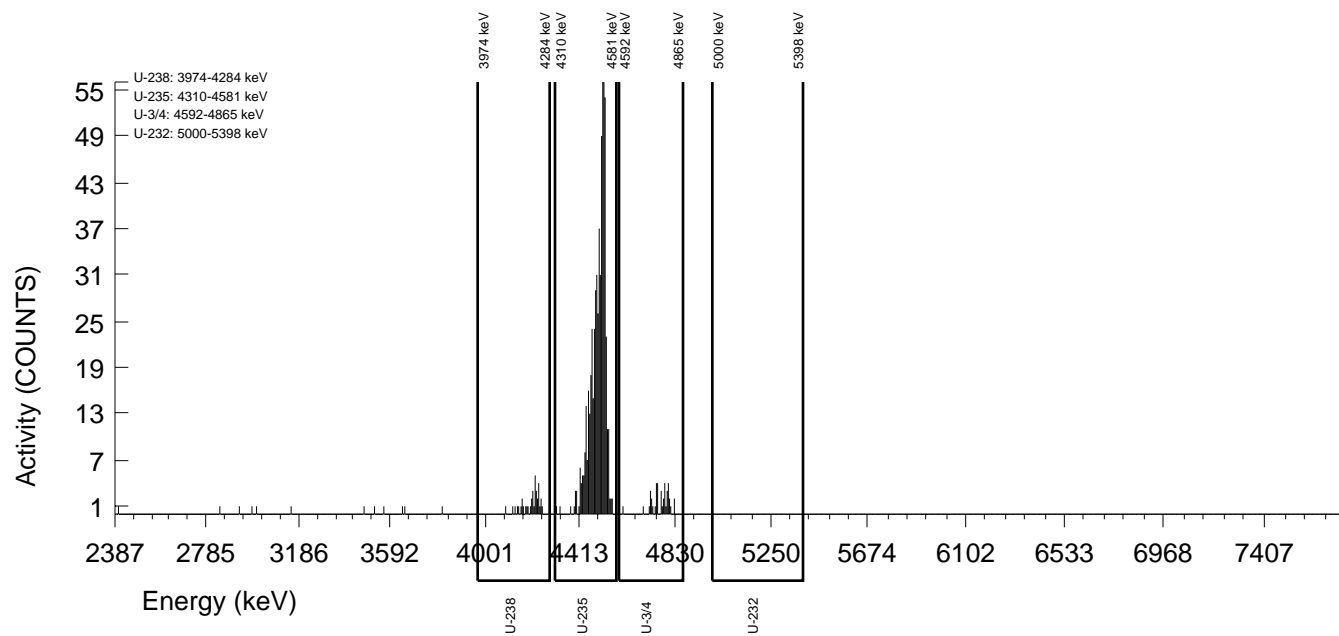
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		Lc pCi/G	1.96-sigma	
										TPU pCi/G	MDA pCi/G		cnt	Unc pCi/G
U-232	5302.10	5198.57	0.000	0.000	-1.440	1.440	1.2000	100.000	-2.48E-02	4.01E-02	1.27E-01	3.78E-02	4.00E-02	4.00E-02
U-3/4	4763.02	4767.89	81.651	30.000	29.280	0.720	0.8485	100.000	4.95E-01	2.04E-01	1.03E-01	2.63E-02	1.85E-01	1.85E-01
U-235	4391.00	4496.66	44.729	7.000	6.280	0.720	0.8485	99.700	1.07E-01	9.71E-02	1.04E-01	2.64E-02	9.54E-02	9.54E-02
U-238	4184.73	4205.69	29.691	42.000	41.280	0.720	0.8485	100.000	6.98E-01	2.49E-01	1.03E-01	2.63E-02	2.18E-01	2.18E-01

NOTES:

* Results are a compilation of S0405235040_UU and T0405235040_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.009 +/-0.000)



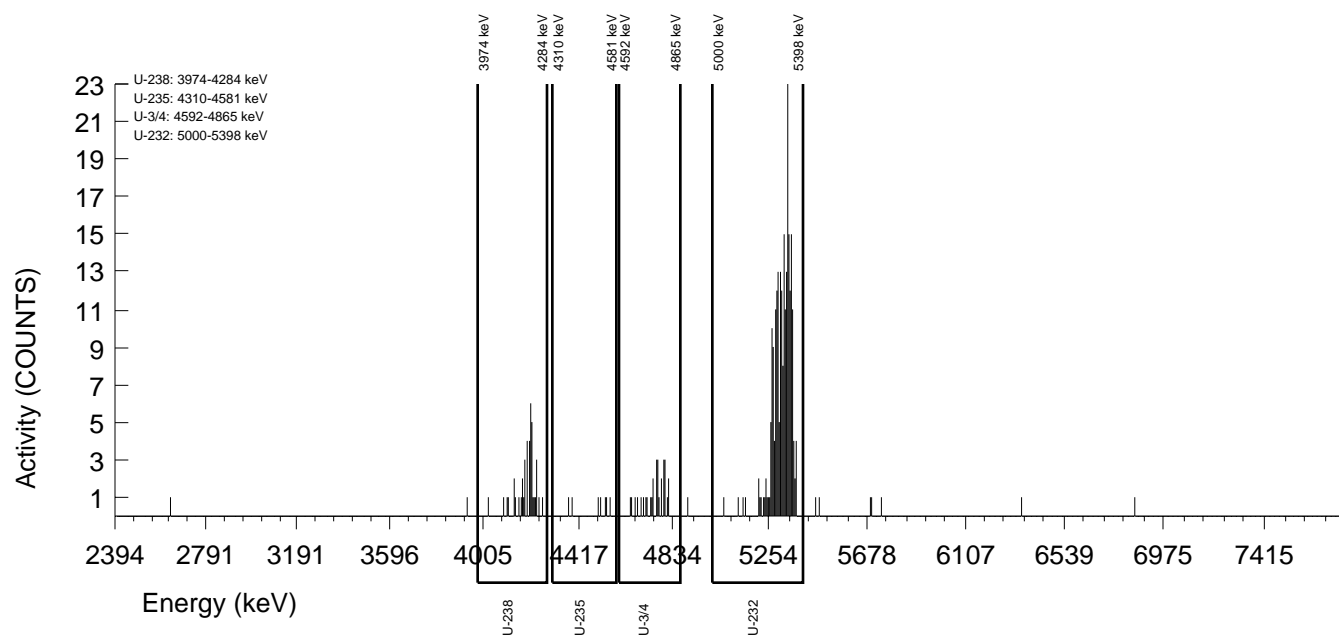
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S0405235040_UU SAMPLE QTY : 0.515 G +/-0.194 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : MXS2 % YIELD : 83.8 +/-7.198 %	CHAMBER : 156 DETECTOR S/N : 75554 AVERAGE %EFFICIENCY : 25.9446 AVERAGE %EFF ERROR : 0.5027 COUNT DATE : 24-Sep-2016 13:20:25 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B156.CNF;1100 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W156.CNF;299 CAL DATE : 09-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6549E+00 dpm RESULTS : 3.8993E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5308.13	65.992	242.000	240.800	1.200	1.0954	100.000	4.07E+00	7.88E-01	1.19E-01	3.39E-02	5.17E-01
U-3/4	4763.02	4751.40	67.843	30.000	29.280	0.720	0.8485	100.000	4.91E-01	1.97E-01	1.02E-01	2.61E-02	1.84E-01
U-235	4391.00	4488.99	177.624	7.000	6.280	0.720	0.8485	99.700	1.06E-01	9.58E-02	1.03E-01	2.61E-02	9.46E-02
U-238	4184.73	4190.48	23.437	42.000	41.280	0.720	0.8485	100.000	6.92E-01	2.39E-01	1.02E-01	2.61E-02	2.16E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T1203621709_UU SAMPLE QTY : 0.518 G +/-0.193 % SAMPLE DATE : 21-Sep-2016 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 86.4 +/-8.358 % SECONDARY QTY : 0.520 G +/-0.192 %	CHAMBER : 132 DETECTOR S/N : 67579 AVERAGE %EFFICIENCY : 26.0712 AVERAGE %EFF ERROR : 0.5050 COUNT DATE : 24-Sep-2016 13:49:58 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B132.CNF;1158 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W132.CNF;324 CAL DATE : 08-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 1.0624E+01 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4492.36	4357.21	662.76	0.52	95.227	N/A
TRACER 2	1564-I	U-232	4.6171 dpm	5313.47	5307.13	2.04	256.80	87.060	1.0075

NUCLIDE ACTIVITY SUMMARY

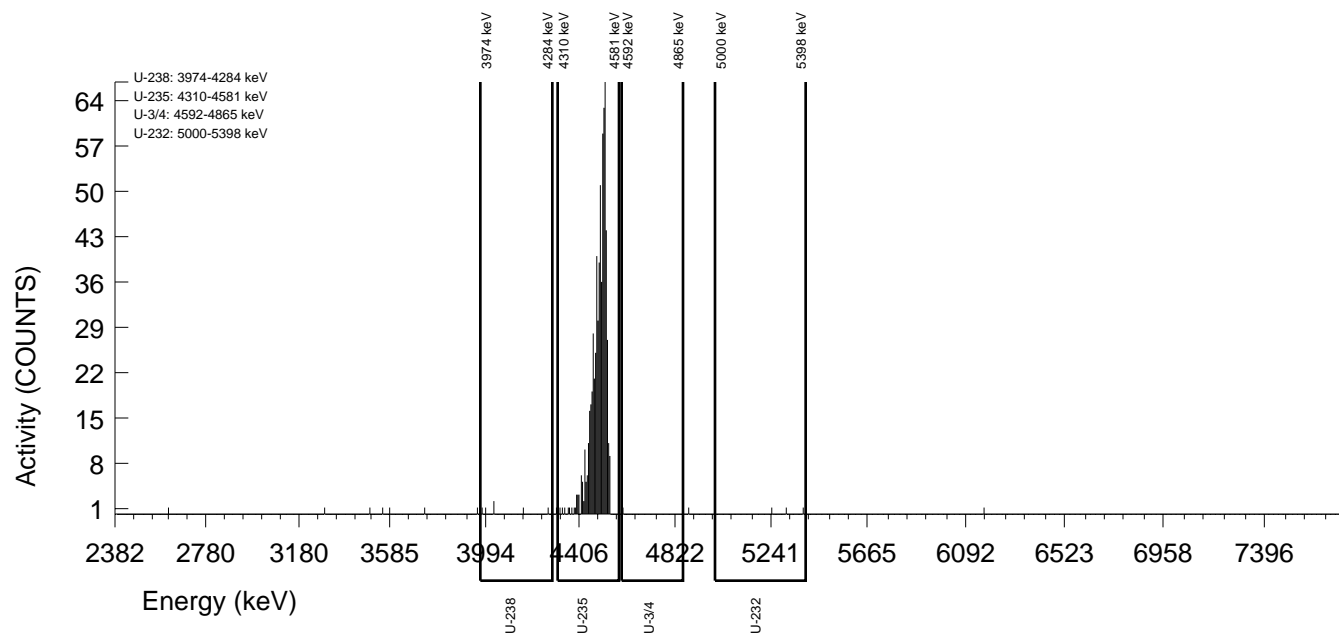
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5313.47	133.380	3.000	2.040	0.960	0.9798	100.000	2.97E-02	5.92E-02	9.58E-02	2.61E-02	5.90E-02
U-3/4	4763.02	4597.65	4.940	0.000	-0.720	0.720	0.8485	100.000	-1.13E-02	3.43E-02	9.62E-02	2.45E-02	3.42E-02
U-235	4391.00	4492.36	44.712	1.000	0.520	0.480	0.6928	99.700	8.21E-03	4.57E-02	8.75E-02	2.00E-02	4.56E-02
U-238	4184.73	4080.83	4.940	2.000	1.520	0.480	0.6928	100.000	2.39E-02	5.51E-02	8.72E-02	2.00E-02	5.50E-02

NOTES:

* Results are a compilation of S1203621709_UU and T1203621709_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

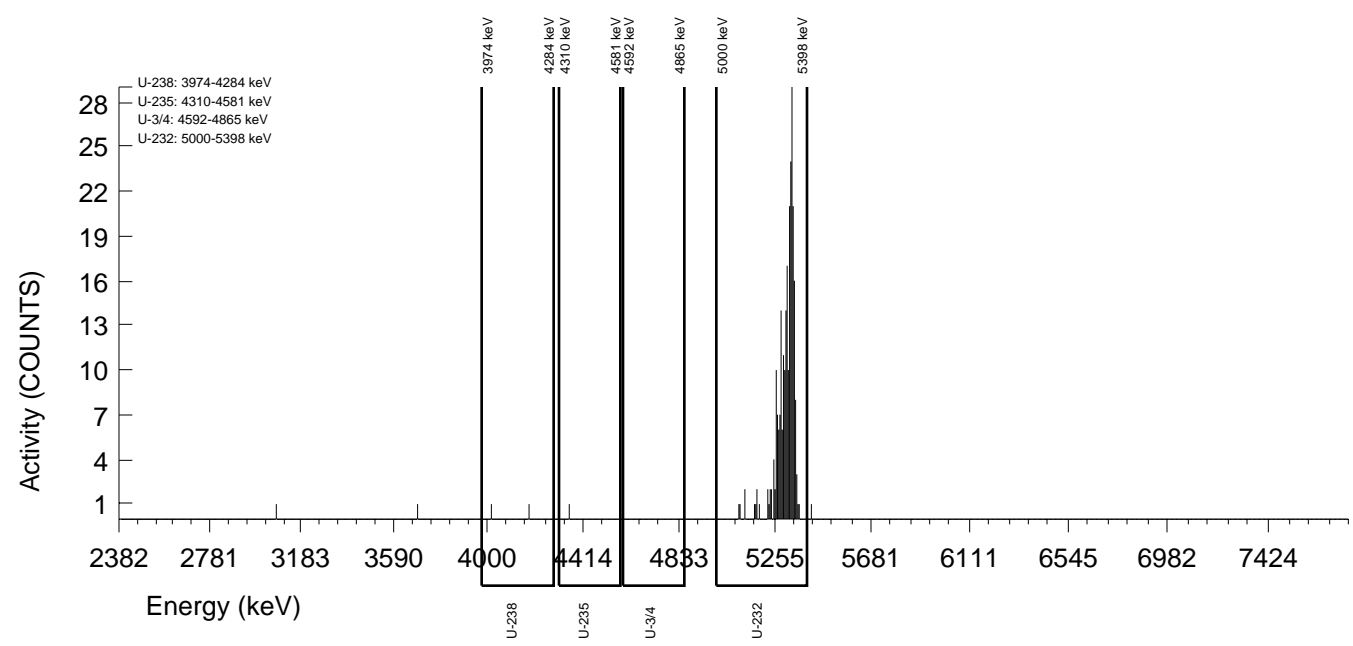
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S1203621709_UU SAMPLE QTY : 0.518 G +/-0.193 % SAMPLE DATE : 21-Sep-2016 00:00:00 ANALYST : MXS2 % YIELD : 87.1 +/-7.012 %	CHAMBER : 127 DETECTOR S/N : 78770 AVERAGE %EFFICIENCY : 26.6218 AVERAGE %EFF ERROR : 0.5155 COUNT DATE : 24-Sep-2016 13:49:22 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B127.CNF;1167 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W127.CNF;322 CAL DATE : 08-Sep-2016
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TRACER
 ID : 1564-I
 NUCLIDE : U-232
 NOMINAL : 4.6171E+00 dpm
 RESULTS : 4.0197E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5307.13	34.811	258.000	256.800	1.200	1.0954	100.000	4.02E+00	7.56E-01	1.10E-01	3.14E-02	4.94E-01
U-3/4	4763.02	4728.17	0.000	0.000	-0.720	0.720	0.8485	100.000	-1.13E-02	3.41E-02	9.55E-02	2.43E-02	3.40E-02
U-235	4391.00	4357.21	4.958	1.000	0.520	0.480	0.6928	99.700	8.15E-03	4.54E-02	8.68E-02	1.99E-02	4.53E-02
U-238	4184.73	4098.15	163.622	2.000	1.520	0.480	0.6928	100.000	2.38E-02	5.47E-02	8.66E-02	1.98E-02	5.46E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T1203621710_UU SAMPLE QTY : 0.508 G +/-0.197 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 78.7 +/-8.778 % SECONDARY QTY : 0.505 G +/-0.198 %	CHAMBER : 157 DETECTOR S/N : 75555 AVERAGE %EFFICIENCY : 26.0007 AVERAGE %EFF ERROR : 0.5038 COUNT DATE : 29-Sep-2016 14:04:04 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B157.CNF;1100 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W157.CNF;284 CAL DATE : 09-Sep-2016
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TRACER
ID : 1570-E
NUCLIDE : U-235
NOMINAL : 1.1123E+01 dpm
RESULTS : 9.6794E+00 dpm

TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4482.78	4469.01	602.20	2.76	86.761	N/A
TRACER 2	1564-I	U-232	4.6539 dpm	5198.56	5292.21	-0.24	224.56	79.332	1.0082

NUCLIDE ACTIVITY SUMMARY

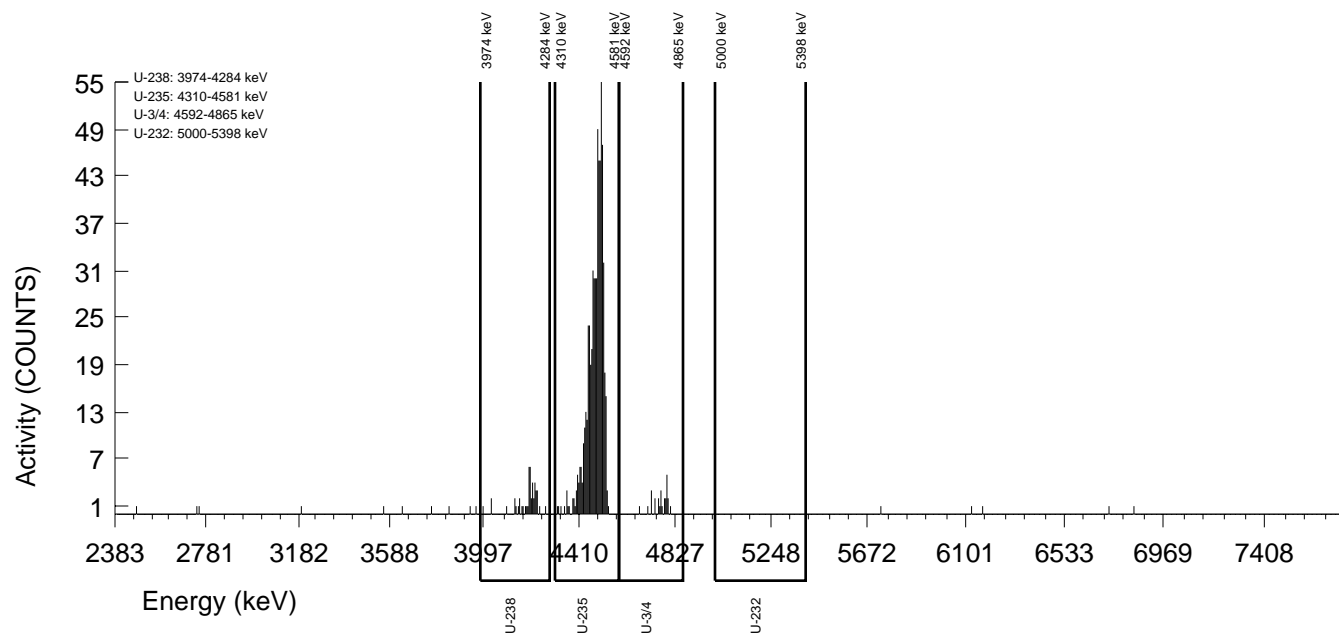
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
U-232	5302.10	5198.56	0.000	0.000	-0.240	0.240	0.4899	100.000	-3.99E-03	3.45E-02	7.96E-02	1.49E-02	3.44E-02
U-3/4	4763.02	4768.06	69.292	29.000	28.280	0.720	0.8485	100.000	5.20E-01	2.18E-01	1.12E-01	2.86E-02	1.98E-01
U-235	4391.00	4482.78	47.868	3.000	2.760	0.240	0.4899	99.700	5.09E-02	7.38E-02	8.84E-02	1.65E-02	7.33E-02
U-238	4184.73	4187.62	32.666	55.000	54.520	0.480	0.6928	100.000	1.00E+00	3.23E-01	1.02E-01	2.33E-02	2.70E-01

NOTES:

* Results are a compilation of S1203621710_UU and T1203621710_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.009 +/-0.000)



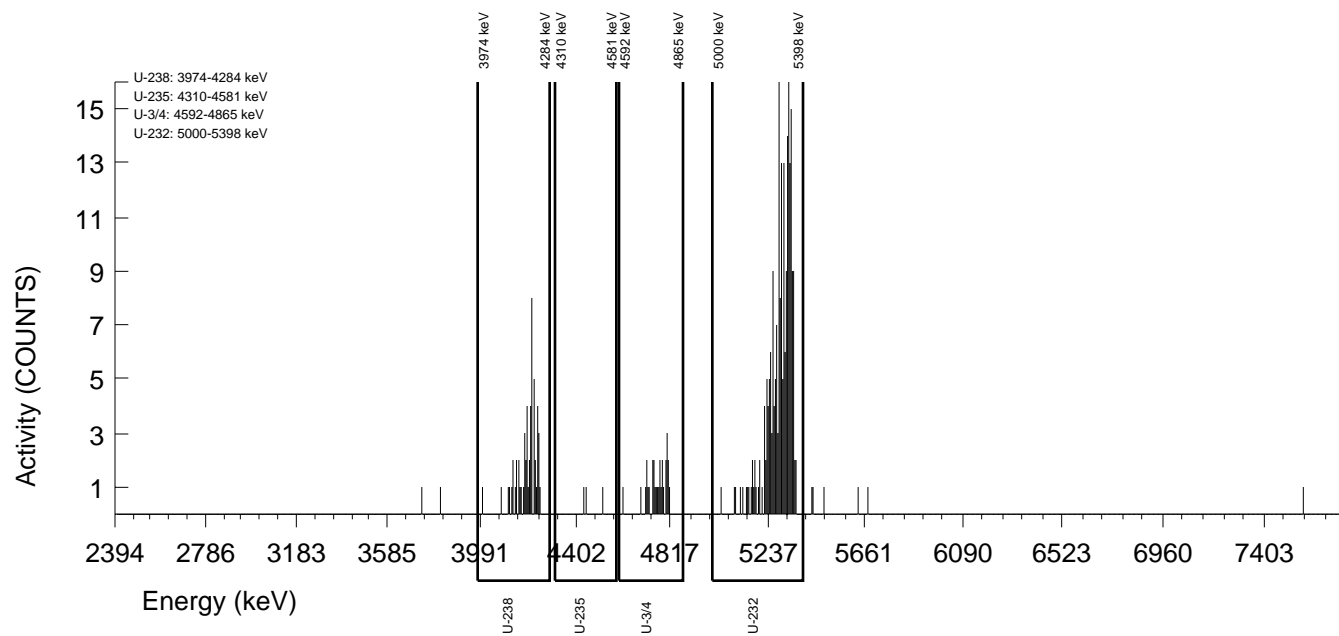
GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : S1203621710_UU SAMPLE QTY : 0.508 G +/-0.197 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : MXS2 % YIELD : 79.3 +/-7.412 %	CHAMBER : 159 DETECTOR S/N : 76225 AVERAGE %EFFICIENCY : 25.5501 AVERAGE %EFF ERROR : 0.4952 COUNT DATE : 28-Sep-2016 17:55:29 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B159.CNF;1074 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W159.CNF;278 CAL DATE : 09-Sep-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6539E+00 dpm RESULTS : 3.6920E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5292.21	84.447	226.000	224.560	1.440	1.2000	100.000	4.13E+00	8.24E-01	1.36E-01	4.04E-02	5.43E-01
U-3/4	4763.02	4756.78	92.694	29.000	28.280	0.720	0.8485	100.000	5.15E-01	2.11E-01	1.11E-01	2.83E-02	1.96E-01
U-235	4391.00	4469.01	82.937	3.000	2.760	0.240	0.4899	99.700	5.05E-02	7.31E-02	8.77E-02	1.64E-02	7.27E-02
U-238	4184.73	4189.53	16.262	55.000	54.520	0.480	0.6928	100.000	9.94E-01	3.07E-01	1.01E-01	2.31E-02	2.68E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1596396 SAMPLE ID : T1203621711_UU SAMPLE QTY : 0.518 G +/-0.193 % SAMPLE DATE : 21-Sep-2016 00:00:00 ANALYST : MXS2 CORRECTED % YIELD : 97.5 +/-8.244 % SECONDARY QTY : 0.520 G +/-0.192 %	CHAMBER : 115 DETECTOR S/N : 79995 AVERAGE %EFFICIENCY : 25.2291 AVERAGE %EFF ERROR : 0.4892 COUNT DATE : 25-Sep-2016 15:54:46 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B115.CNF;1179 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W115.CNF;335 CAL DATE : 08-Sep-2016
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TRACER ID : 1570-E NUCLIDE : U-235 NOMINAL : 1.1123E+01 dpm RESULTS : 1.0412E+01 dpm	LCS ID : 1600-E NUCLIDE : U-238 NOMINAL (pCi/G) : 5.1996E+00 % RECOVERY : 96.877
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TRACER CORRECTION	ID	NUCLIDE	NOMINAL	PEAK ENERGY 1	PEAK ENERGY 2	PEAK NET 1	PEAK NET 2	RECOVERY	YIELD CORR.
TRACER 1	1570-E	U-235	11.1230 dpm	4491.00	4452.79	628.57	20.00	93.330	N/A
TRACER 2	1564-I	U-232	4.6171 dpm	5355.02	5313.00	0.56	273.60	97.710	1.0022

NUCLIDE ACTIVITY SUMMARY

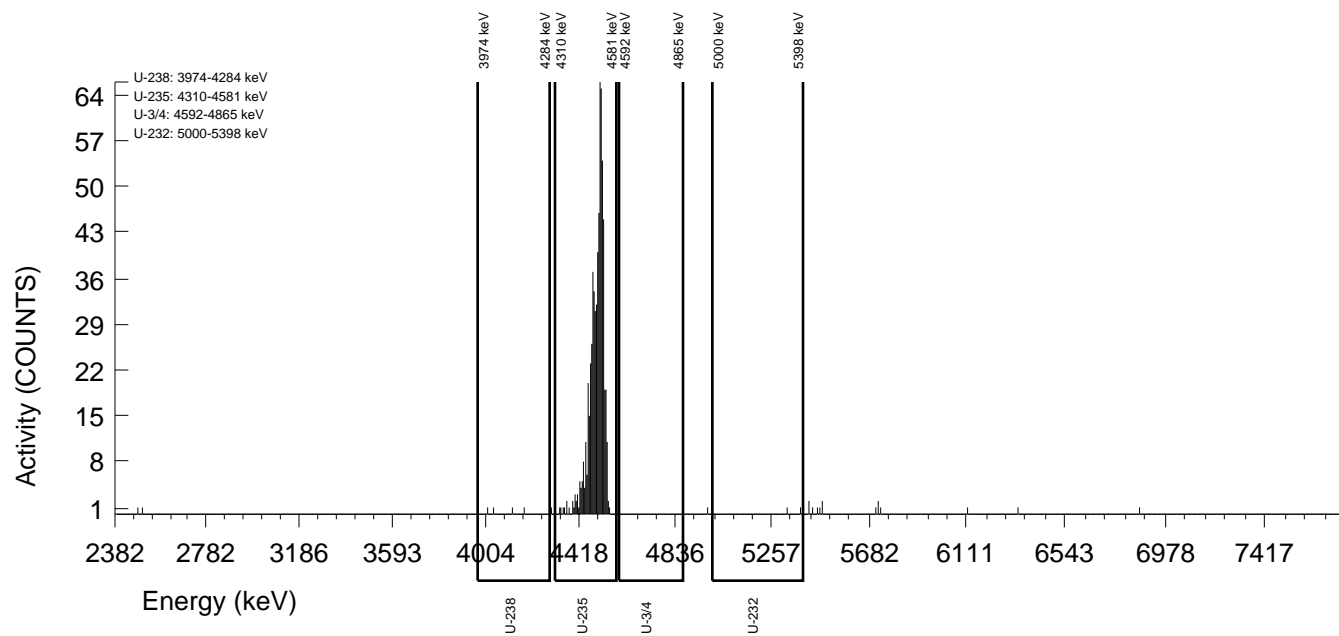
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5355.02	59.717	2.000	0.560	1.440	1.2000	100.000	8.59E-03	5.55E-02	1.13E-01	3.37E-02	5.54E-02
U-3/4	4763.02	4728.19	0.000	326.000	325.040	0.960	0.9798	100.000	4.78E+00	9.50E-01	9.69E-02	2.64E-02	5.21E-01
U-235	4391.00	4491.00	48.894	20.000	20.000	0.000	0.0000	99.700	2.95E-01	1.41E-01	4.43E-02	0.00E+00	1.33E-01
U-238	4184.73	4087.52	159.246	343.000	342.520	0.480	0.6928	100.000	5.04E+00	9.93E-01	8.14E-02	1.87E-02	5.35E-01

NOTES:

* Results are a compilation of S1203621711_UU and T1203621711_UU.

* The following nuclide results were quantified from the U-235 traced sample:
U-232

* Correction made to the following net area due to tracer impurity:
U-238 (0.010 +/-0.000)



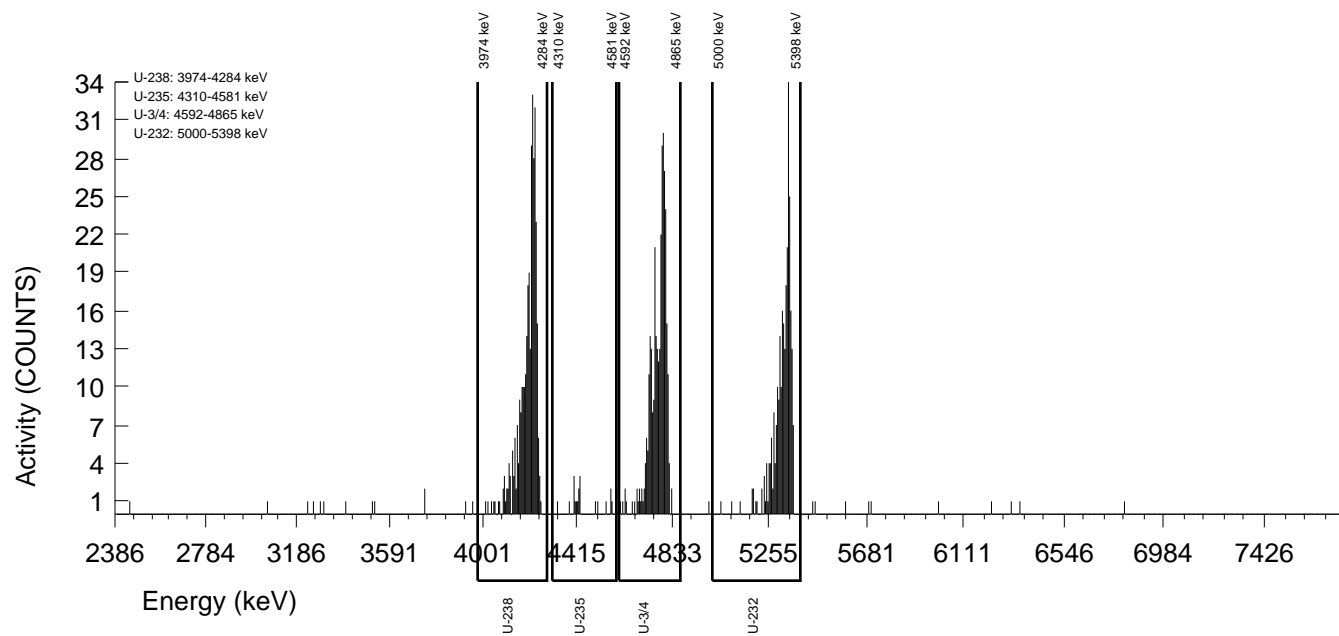
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER : 1596396 SAMPLE ID : S1203621711_UU SAMPLE QTY : 0.518 G +/-0.193 % SAMPLE DATE : 21-Sep-2016 00:00:00 ANALYST : MXS2 % YIELD : 97.7 +/-6.851 %	CHAMBER : 158 DETECTOR S/N : 80007 AVERAGE %EFFICIENCY : 25.2718 AVERAGE %EFF ERROR : 0.4900 COUNT DATE : 24-Sep-2016 13:20:30 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : U236 BKG FILE : B158.CNF;1105 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W158.CNF;286 CAL DATE : 09-Sep-2016
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TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6171E+00 dpm RESULTS : 4.5114E+00 dpm	LCS ID : 1600-E NUCLIDE : U-238 NOMINAL (pCi/G) : 5.1996E+00 % RECOVERY : 96.661
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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5313.00	20.214	276.000	273.600	2.400	1.5492	100.000	4.02E+00	7.37E-01	1.27E-01	4.16E-02	4.79E-01
U-3/4	4763.02	4767.13	51.908	326.000	325.040	0.960	0.9798	100.000	4.77E+00	8.45E-01	9.67E-02	2.63E-02	5.20E-01
U-235	4391.00	4452.79	158.196	20.000	20.000	0.000	0.0000	99.700	2.94E-01	1.39E-01	4.42E-02	0.00E+00	1.32E-01
U-238	4184.73	4196.02	40.476	343.000	342.520	0.480	0.6928	100.000	5.03E+00	8.81E-01	8.13E-02	1.86E-02	5.34E-01



Batch# 1596417 Product: Th Date: 9/21/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples. < 5% of lowest activity)	✓		
Sample was run within hold time.	X mm 9/21/16	✓	DER# 1559853
Sample was correctly preserved if required.			NA
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER# 1559853
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER# 1559853
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: Melanie Slonek 9/21/16

Secondary Review Performed By: Jessie Davis 09/30/16

10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 21-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Th-01-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596417	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, and 1203621758 were received and analyzed out of holding.		1. Reporting results.	

Originator's Name:

Melanie Aycock 21-SEP-16

Data Validator/Group Leader:

Jessica Davis 30-SEP-16

Thorium (Ac-227 Tracer) Queue Sheet

07-SEP-16

Batch #: 1596417 Analyst: KXB2 First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16
 Tracer Isotope: Ac-227 Tracer Code: 0301-B-402 Expiration Date: 5-31-17
 LCS Isotope: Th-230 Th-232 LCS Code: 1242-H Expiration Date: 2-11-17
 Spike Isotope: Th-230, Th-232 Spike Code: Expiration Date: ---
 Prep Date: 9-15-16 Initials: KXB/PAS Pipet ID: 1840072 Balance ID: 16107602
 Witness: NA

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/d)	Th Det #
405235061-1	5.1B.R.2.2	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	1	1	0-109	161
405235062-1	5.2A.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	2	2	0-107	162
405235063-1	5.2A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	3	3	0-118	163
405235064-1	5.2A.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	4	4	0-105	166
405235065-1	5.2A.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	5	5	0-113	167
405235066-1	5.2A.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	6	6	0-105	169
405235067-1	5.2A.R.6.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	7	7	0-106	170
405235068-1	5.2A.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	8	8	0-100	175
405235069-1	5.2B.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	16-DEC-15	9	9	0-116	176
405235070-1	5.2B.R.3.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	10	10	0-106	177
405235071-1	5.2B.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	11	11	0-115	185
405235072-1	5.2B.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	15-DEC-15	12	12	0-116	179
405235073-1	5.2B.R.8.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	13	13	0-118	180
405235074-1	5.3A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	15-DEC-15	14	14	0-105	181
405235075-1	5.4A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	16-DEC-15	15	15	0-106	183
405235076-1	5.4A.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	16	16	0-112	184
405235077-1	5.5A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	17-DEC-15	17	17	0-117	205
405235078-1	5.6A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	17-DEC-15	18	18	0-109	207
1203621757-1	MB for batch 1596417	MB		1 pCi/g	SOIL	QC ACCOUNT		19	19	0-118	208
1203621758-1	5.1B.R.2.2(405235061DUP)	DUP		1 pCi/g	SOIL	QC ACCOUNT	14-DEC-15	20	20	0-102	189
1203621759-1	LCS for batch 1596417	LCS		1 pCi/g	SOIL	QC ACCOUNT		21	21	0-118	191

Choose SOP Used: GL-RAD-A-038
GL-RAD-A-052

Solid Sample Dissolution by: LEACH or DIGESTION
 Circle One

Data Reviewed By: M. Lawrence

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

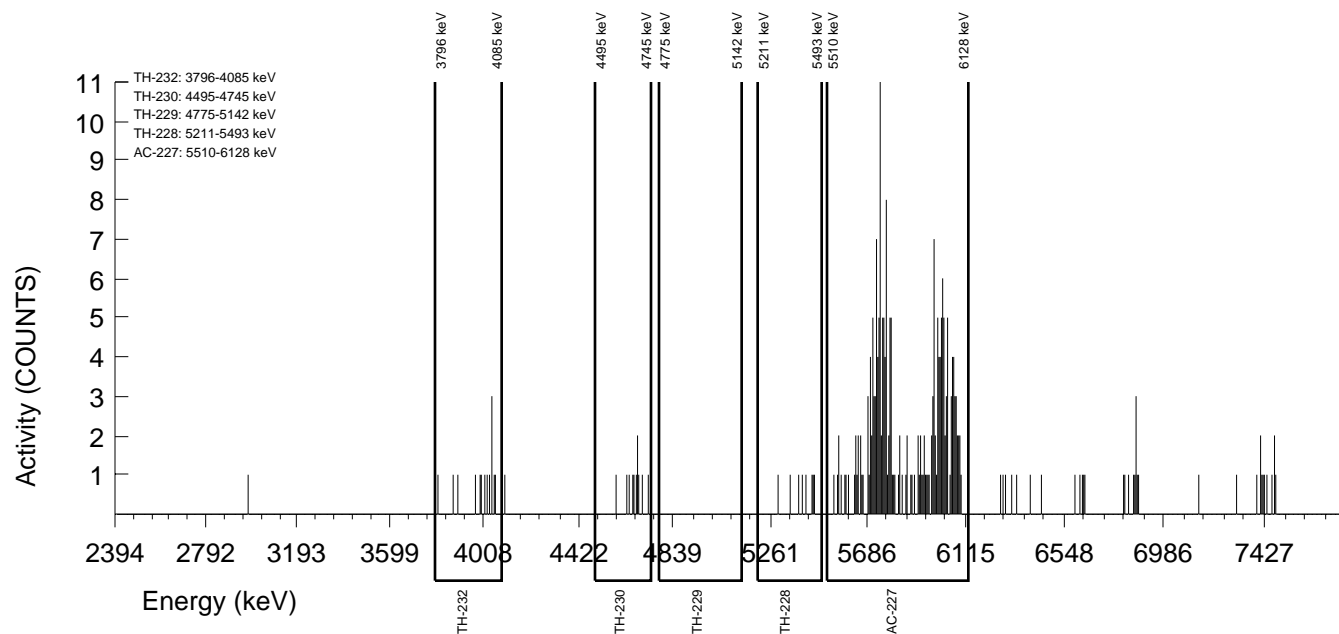
BATCH NUMBER : 1596417 SAMPLE ID : S0405235061_TH SAMPLE QTY : 0.109 G +/-0.917 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 104 +/-7.501 % AC-227 SEP. : 16-Sep-2016 16:00:00	CHAMBER : 161 DETECTOR S/N : 70321 AVERAGE %EFFICIENCY : 25.7727 AVERAGE %EFF ERROR : 0.4995 COUNT DATE : 19-Sep-2016 17:41:44 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B161.CNF;858 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W161.CNF;261 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2160E+00 dpm RESULTS : 3.3550E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5854.62	5858.99	271.304	208.000	207.520	0.480	0.6928	100.000	1.49E+01	3.06E+00	3.99E-01	9.14E-02	2.04E+00
TH-228	5363.00	5401.63	153.265	8.000	5.799	0.960	0.9798	99.940	4.91E-01	5.14E-01	6.89E-01	2.17E-01	5.06E-01
TH-229	4900.00	4958.11	0.000	0.000	0.000	0.000	0.0000	99.469	0.00E+00	1.30E-01	1.93E-01	0.00E+00	1.30E-01
TH-230	4671.39	4668.84	9.888	11.000	11.000	0.000	0.0000	99.700	7.07E-01	4.50E-01	1.93E-01	0.00E+00	4.37E-01
TH-232	3972.00	3989.92	4.944	14.000	13.280	0.720	0.8485	100.000	8.50E-01	5.07E-01	3.91E-01	9.95E-02	4.90E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 4.8401E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.241 +/-0.008)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

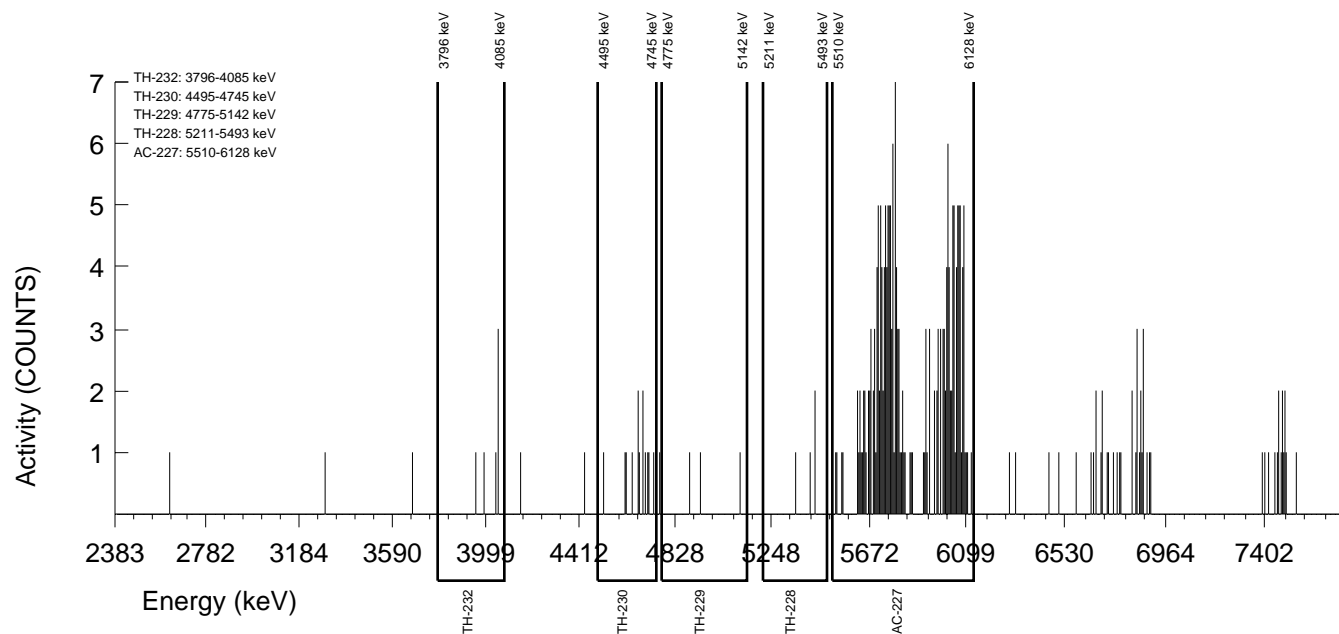
BATCH NUMBER : 1596417 SAMPLE ID : S0405235062_TH SAMPLE QTY : 0.103 G +/-0.971 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 98.5 +/-7.591 % AC-227 SEP. : 16-Sep-2016 16:00:00	CHAMBER : 162 DETECTOR S/N : 70323 AVERAGE %EFFICIENCY : 26.6669 AVERAGE %EFF ERROR : 0.5165 COUNT DATE : 19-Sep-2016 17:41:46 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B162.CNF;860 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W162.CNF;260 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2160E+00 dpm RESULTS : 3.1687E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5854.62	5863.03	354.910	204.000	202.800	1.200	1.0954	100.000	1.58E+01	3.28E+00	5.47E-01	1.56E-01	2.19E+00
TH-228	5363.00	5412.18	4.961	4.000	2.547	0.240	0.4899	99.940	2.34E-01	4.10E-01	6.46E-01	1.85E-01	4.07E-01
TH-229	4900.00	4980.29	213.318	3.000	2.520	0.480	0.6928	99.469	1.76E-01	2.80E-01	3.86E-01	8.85E-02	2.79E-01
TH-230	4671.39	4662.63	24.804	13.000	12.520	0.480	0.6928	99.700	8.71E-01	5.31E-01	3.85E-01	8.83E-02	5.13E-01
TH-232	3972.00	4027.34	4.961	6.000	5.760	0.240	0.4899	100.000	3.99E-01	3.68E-01	3.33E-01	6.22E-02	3.63E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 4.8402E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.213 +/-0.008)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

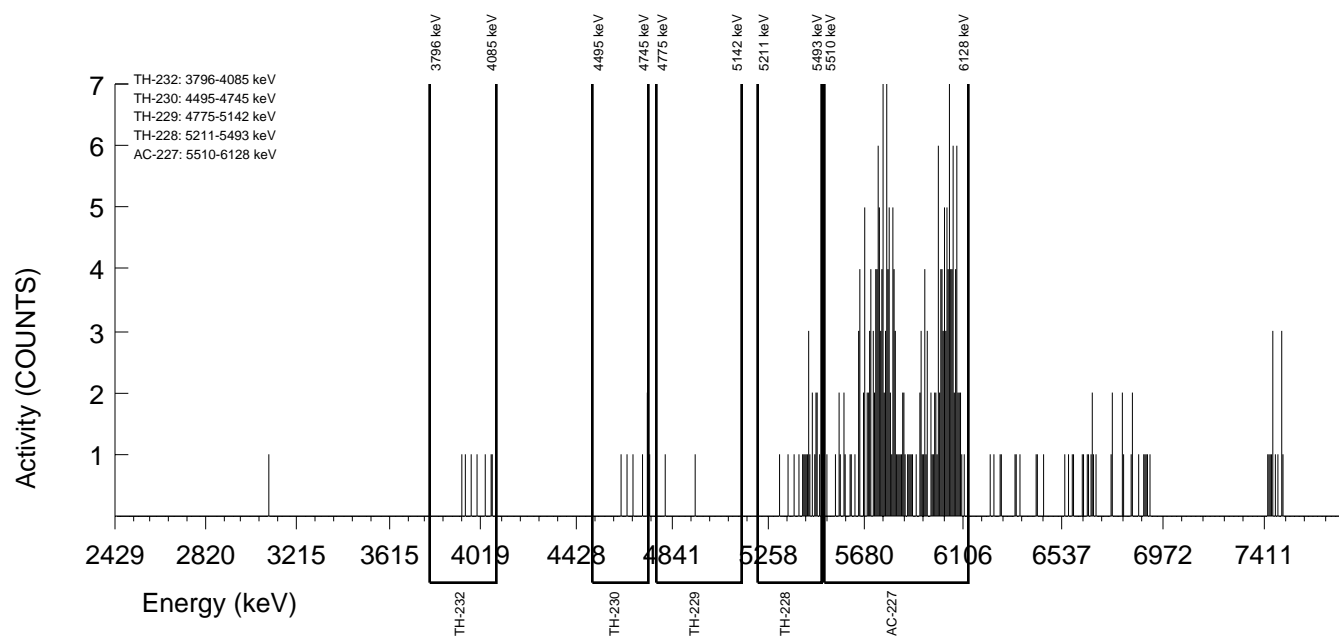
BATCH NUMBER : 1596417 SAMPLE ID : S0405235063_TH SAMPLE QTY : 0.118 G +/-0.847 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 110 +/-7.230 % AC-227 SEP. : 16-Sep-2016 16:00:00	CHAMBER : 188 DETECTOR S/N : 68621 AVERAGE %EFFICIENCY : 26.7276 AVERAGE %EFF ERROR : 0.5175 COUNT DATE : 19-Sep-2016 18:03:46 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B188.CNF;852 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W188.CNF;233 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2164E+00 dpm RESULTS : 3.5276E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5854.52	5868.29	389.460	227.000	226.280	0.720	0.8485	100.000	1.38E+01	2.72E+00	3.73E-01	9.49E-02	1.81E+00
TH-228	5363.00	5429.85	38.885	21.000	19.641	0.000	0.0000	99.940	1.41E+00	6.97E-01	4.90E-01	1.38E-01	6.60E-01
TH-229	4900.00	4879.94	126.377	2.000	1.520	0.480	0.6928	99.469	8.29E-02	1.91E-01	3.02E-01	6.92E-02	1.90E-01
TH-230	4671.39	4689.90	4.861	6.000	5.040	0.960	0.9798	99.700	2.74E-01	2.91E-01	3.59E-01	9.77E-02	2.88E-01
TH-232	3972.00	4001.92	131.238	7.000	7.000	0.000	0.0000	100.000	3.80E-01	3.07E-01	1.63E-01	0.00E+00	3.02E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 4.8600E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.359 +/-0.009)



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ALPHA SPECTROSCOPY REPORT

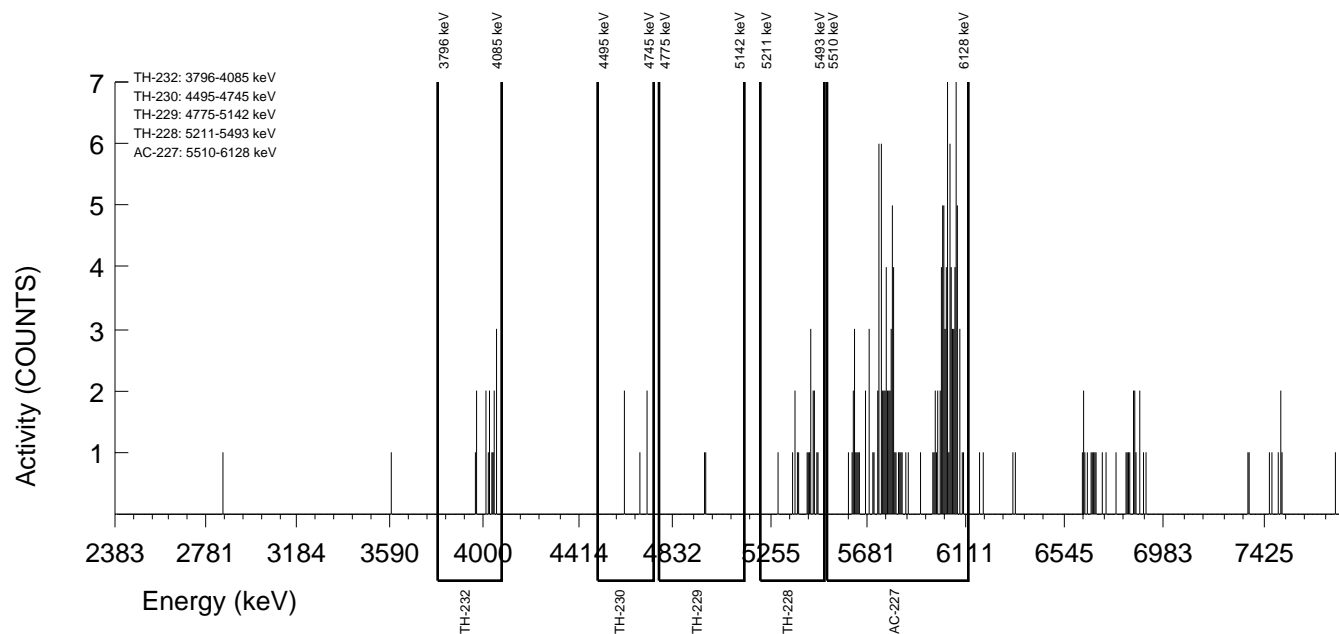
BATCH NUMBER : 1596417 SAMPLE ID : S0405235064_TH SAMPLE QTY : 0.105 G +/-0.952 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 69.8 +/-8.827 % AC-227 SEP. : 16-Sep-2016 16:00:00	CHAMBER : 166 DETECTOR S/N : 74545 AVERAGE %EFFICIENCY : 26.6822 AVERAGE %EFF ERROR : 0.5167 COUNT DATE : 19-Sep-2016 17:41:51 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B166.CNF;889 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W166.CNF;299 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2160E+00 dpm RESULTS : 2.2449E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5854.62	5898.94	321.570	144.000	143.760	0.240	0.4899	100.000	1.55E+01	3.76E+00	5.17E-01	9.68E-02	2.55E+00
TH-228	5363.00	5413.38	81.724	18.000	17.140	0.000	0.0000	99.940	2.18E+00	1.16E+00	7.68E-01	1.94E-01	1.09E+00
TH-229	4900.00	4971.89	9.906	2.000	1.520	0.480	0.6928	99.469	1.47E-01	3.38E-01	5.34E-01	1.22E-01	3.37E-01
TH-230	4671.39	4671.02	99.059	5.000	5.000	0.000	0.0000	99.700	4.81E-01	4.72E-01	2.89E-01	0.00E+00	4.64E-01
TH-232	3972.00	4022.46	89.153	15.000	15.000	0.000	0.0000	100.000	1.44E+00	7.96E-01	2.88E-01	0.00E+00	7.54E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 4.8403E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.860 +/-0.006)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

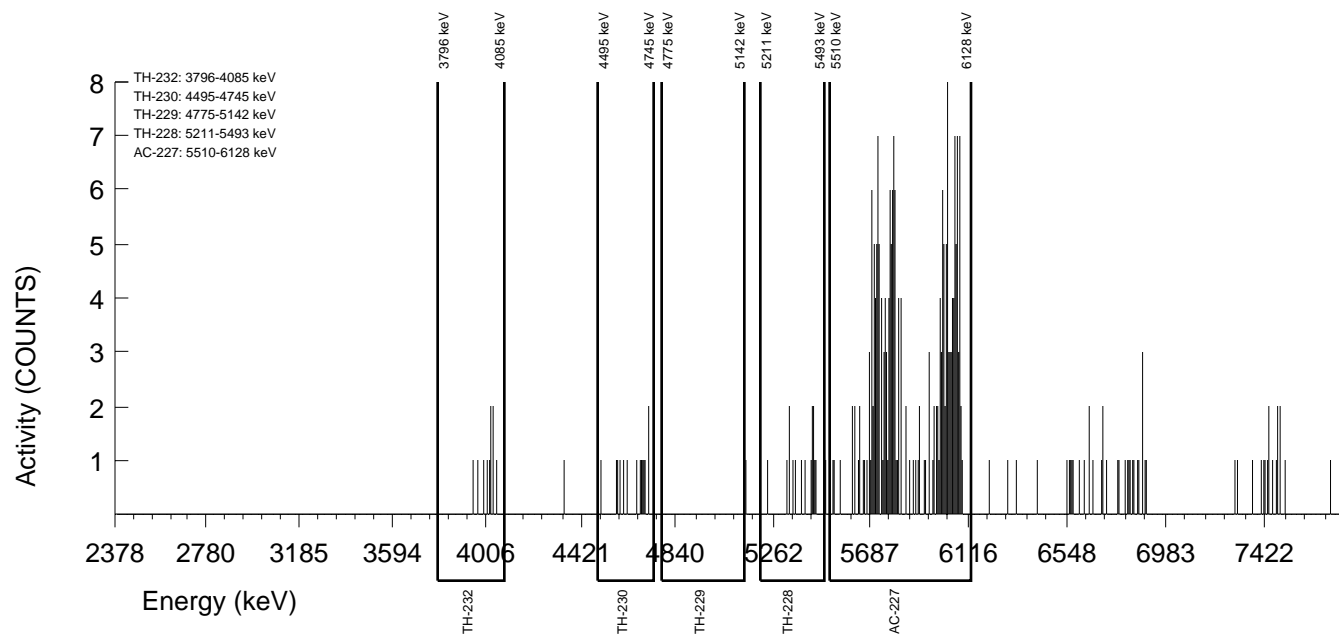
BATCH NUMBER : 1596417 SAMPLE ID : S0405235065_TH SAMPLE QTY : 0.113 G +/-0.885 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 114 +/-7.458 % AC-227 SEP. : 16-Sep-2016 16:00:00	CHAMBER : 167 DETECTOR S/N : 72546 AVERAGE %EFFICIENCY : 24.1606 AVERAGE %EFF ERROR : 0.4690 COUNT DATE : 19-Sep-2016 17:41:54 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B167.CNF;884 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W167.CNF;246 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2160E+00 dpm RESULTS : 3.6575E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5854.62	5875.10	365.098	214.000	212.080	1.920	1.3856	100.000	1.44E+01	2.94E+00	5.49E-01	1.72E-01	1.96E+00
TH-228	5363.00	5395.49	107.529	16.000	14.252	0.480	0.6928	99.940	1.14E+00	6.76E-01	5.99E-01	1.79E-01	6.49E-01
TH-229	4900.00	4958.17	0.000	0.000	-0.480	0.480	0.6928	99.469	-2.92E-02	1.29E-01	3.37E-01	7.71E-02	1.29E-01
TH-230	4671.39	4647.35	5.001	14.000	13.520	0.480	0.6928	99.700	8.20E-01	4.79E-01	3.36E-01	7.69E-02	4.63E-01
TH-232	3972.00	4012.27	17.505	10.000	10.000	0.000	0.0000	100.000	6.04E-01	4.05E-01	1.81E-01	0.00E+00	3.94E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 4.8403E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.268 +/-0.008)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

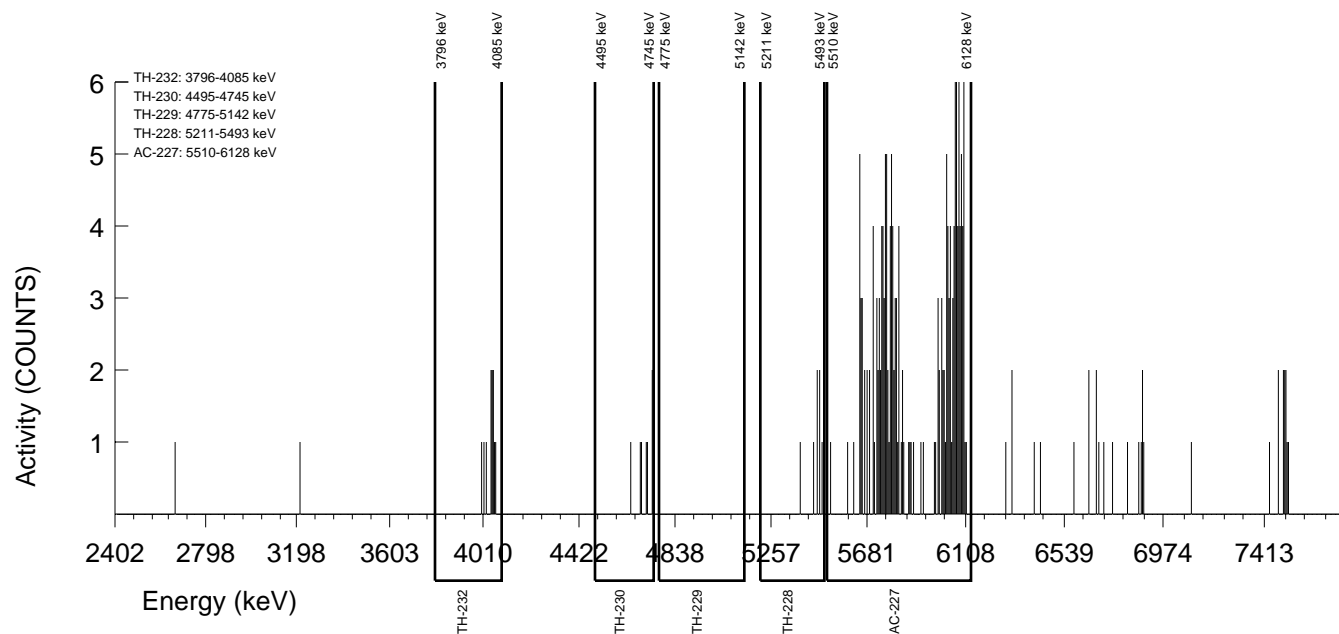
BATCH NUMBER : 1596417 SAMPLE ID : S0405235066_TH SAMPLE QTY : 0.105 G +/-0.952 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 86.6 +/-8.109 % AC-227 SEP. : 16-Sep-2016 16:00:00	CHAMBER : 169 DETECTOR S/N : 72548 AVERAGE %EFFICIENCY : 26.2282 AVERAGE %EFF ERROR : 0.5082 COUNT DATE : 19-Sep-2016 17:41:55 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B169.CNF;874 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W169.CNF;259 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2160E+00 dpm RESULTS : 2.7852E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5854.62	5893.07	423.911	177.000	175.320	1.680	1.2961	100.000	1.55E+01	3.45E+00	6.85E-01	2.10E-01	2.32E+00
TH-228	5363.00	5456.44	14.788	7.000	4.511	1.440	1.2000	99.940	4.69E-01	5.99E-01	8.89E-01	2.88E-01	5.91E-01
TH-229	4900.00	4958.11	0.000	0.000	0.000	0.000	0.0000	99.469	0.00E+00	1.60E-01	2.37E-01	0.00E+00	1.59E-01
TH-230	4671.39	4709.77	0.000	7.000	6.520	0.480	0.6928	99.700	5.15E-01	4.50E-01	4.37E-01	1.00E-01	4.42E-01
TH-232	3972.00	4038.86	17.252	11.000	10.520	0.480	0.6928	100.000	8.28E-01	5.55E-01	4.36E-01	9.99E-02	5.38E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 4.8403E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.049 +/-0.007)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

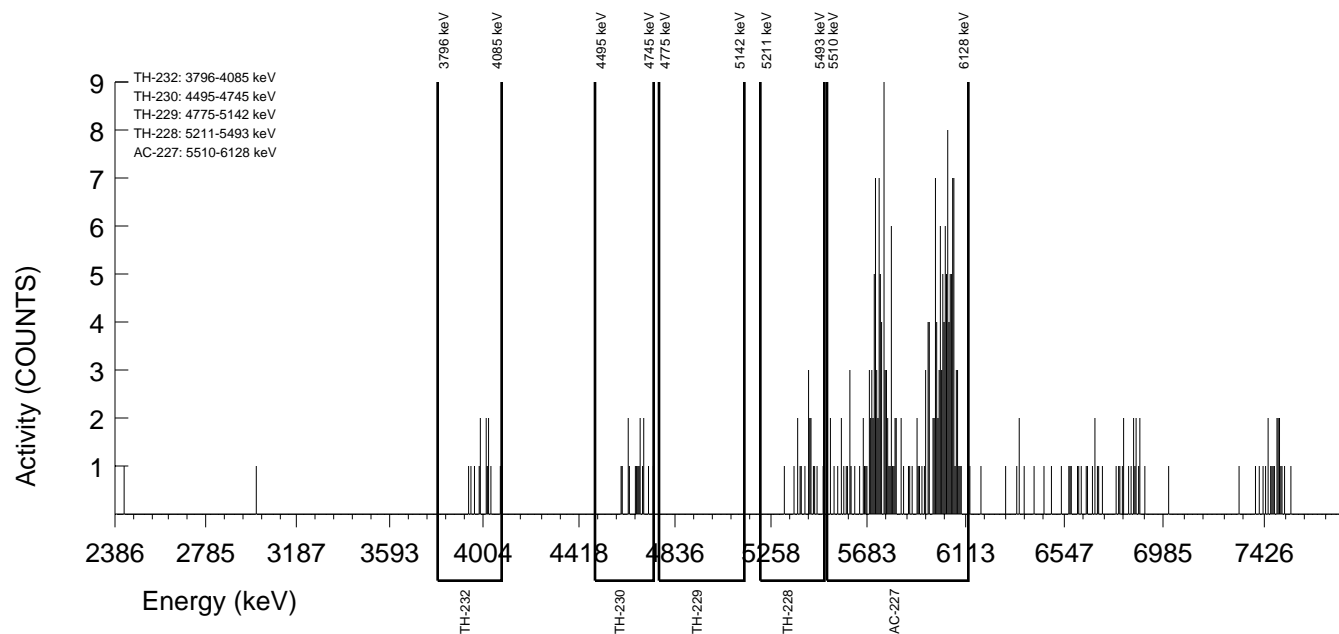
BATCH NUMBER : 1596417 SAMPLE ID : S0405235067_TH SAMPLE QTY : 0.106 G +/-0.943 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 105 +/-7.555 % AC-227 SEP. : 16-Sep-2016 16:00:00	CHAMBER : 170 DETECTOR S/N : 72549 AVERAGE %EFFICIENCY : 25.7306 AVERAGE %EFF ERROR : 0.4988 COUNT DATE : 19-Sep-2016 17:41:58 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B170.CNF;874 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W170.CNF;241 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2160E+00 dpm RESULTS : 3.3708E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5854.62	5879.23	324.977	212.000	208.160	3.840	1.9596	100.000	1.54E+01	3.17E+00	7.51E-01	2.65E-01	2.12E+00
TH-228	5363.00	5418.06	56.985	18.000	14.115	2.640	1.6248	99.940	1.23E+00	7.85E-01	8.70E-01	3.04E-01	7.57E-01
TH-229	4900.00	4958.11	0.000	0.000	-0.480	0.480	0.6928	99.469	-3.17E-02	1.40E-01	3.66E-01	8.38E-02	1.40E-01
TH-230	4671.39	4674.56	69.373	16.000	15.040	0.960	0.9798	99.700	9.90E-01	5.58E-01	4.34E-01	1.18E-01	5.37E-01
TH-232	3972.00	4000.80	42.119	13.000	13.000	0.000	0.0000	100.000	8.53E-01	5.00E-01	1.97E-01	0.00E+00	4.82E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 4.8404E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.245 +/-0.008)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

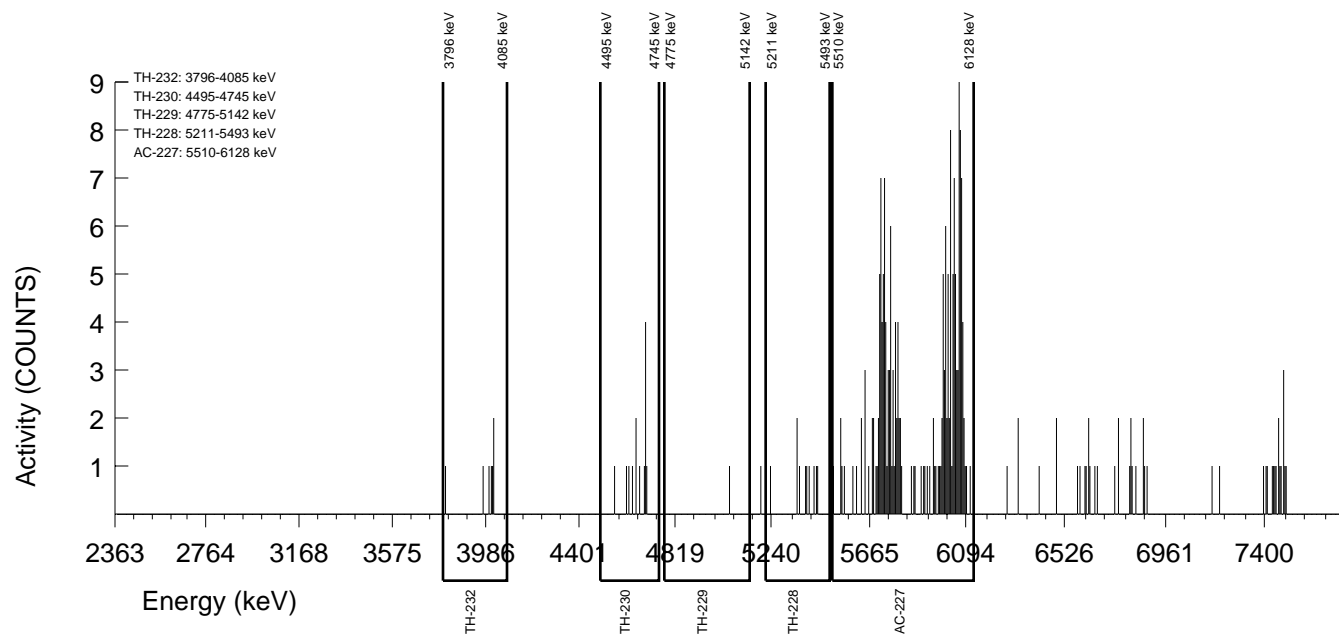
BATCH NUMBER : 1596417 SAMPLE ID : S0405235068_TH SAMPLE QTY : 0.100 G +/-1.000 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 93.6 +/-7.816 % AC-227 SEP. : 16-Sep-2016 16:00:00	CHAMBER : 175 DETECTOR S/N : 74433 AVERAGE %EFFICIENCY : 26.2713 AVERAGE %EFF ERROR : 0.5089 COUNT DATE : 19-Sep-2016 17:42:00 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B175.CNF;868 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W175.CNF;241 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2160E+00 dpm RESULTS : 3.0103E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5854.62	5888.19	338.808	191.000	189.800	1.200	1.0954	100.000	1.63E+01	3.49E+00	6.02E-01	1.72E-01	2.33E+00
TH-228	5363.00	5389.48	4.982	11.000	9.625	0.240	0.4899	99.940	9.74E-01	7.12E-01	7.02E-01	1.99E-01	6.91E-01
TH-229	4900.00	5055.31	4.982	1.000	0.760	0.240	0.4899	99.469	5.83E-02	2.19E-01	3.68E-01	6.89E-02	2.19E-01
TH-230	4671.39	4652.23	6.643	13.000	12.520	0.480	0.6928	99.700	9.58E-01	5.85E-01	4.24E-01	9.72E-02	5.65E-01
TH-232	3972.00	3980.29	7.474	7.000	6.520	0.480	0.6928	100.000	4.98E-01	4.35E-01	4.23E-01	9.69E-02	4.28E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 4.8404E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.135 +/-0.007)



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ALPHA SPECTROSCOPY REPORT

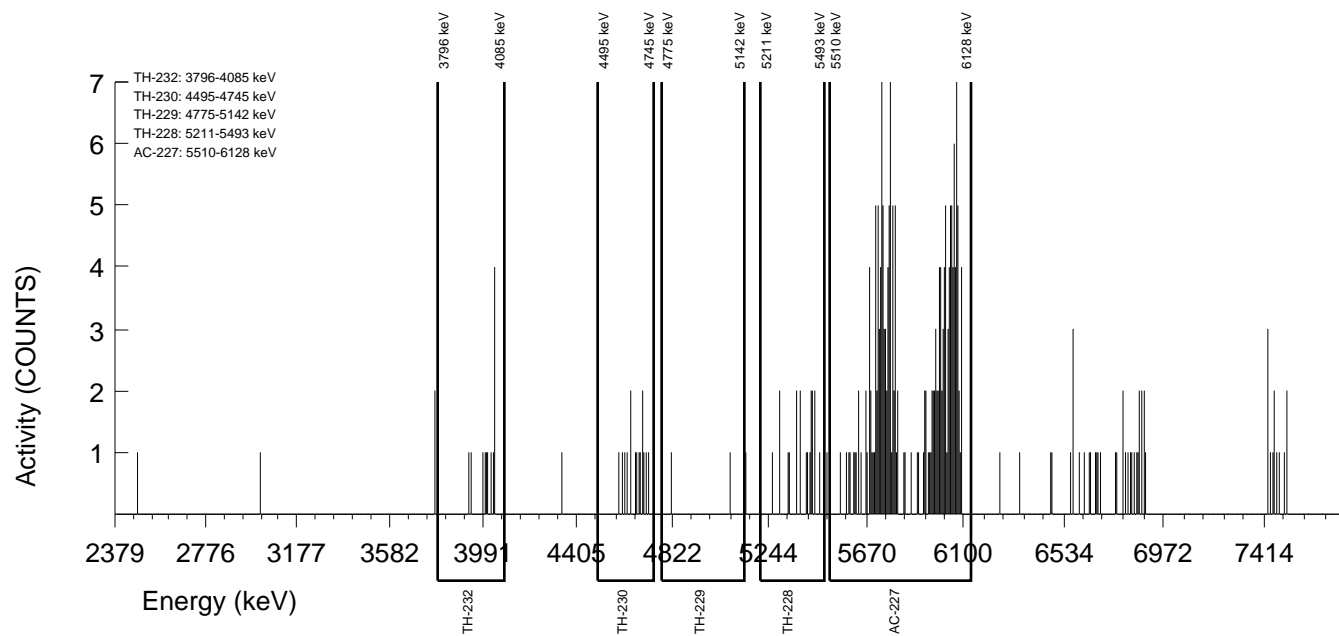
BATCH NUMBER : 1596417 SAMPLE ID : S0405235069_TH SAMPLE QTY : 0.116 G +/-0.862 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 96.3 +/-7.788 % AC-227 SEP. : 16-Sep-2016 16:00:00	CHAMBER : 176 DETECTOR S/N : 74434 AVERAGE %EFFICIENCY : 25.6995 AVERAGE %EFF ERROR : 0.4981 COUNT DATE : 19-Sep-2016 17:42:03 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B176.CNF;863 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W176.CNF;237 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2160E+00 dpm RESULTS : 3.0973E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5854.62	5878.01	371.340	192.000	191.040	0.960	0.9798	100.000	1.40E+01	2.99E+00	4.84E-01	1.32E-01	2.00E+00
TH-228	5363.00	5386.00	148.043	19.000	17.617	0.240	0.4899	99.940	1.52E+00	8.00E-01	5.99E-01	1.70E-01	7.58E-01
TH-229	4900.00	5011.43	0.000	3.000	2.520	0.480	0.6928	99.469	1.66E-01	2.64E-01	3.64E-01	8.34E-02	2.63E-01
TH-230	4671.39	4659.20	56.750	15.000	13.560	1.440	1.2000	99.700	8.89E-01	5.39E-01	4.85E-01	1.44E-01	5.20E-01
TH-232	3972.00	4009.64	5.757	12.000	12.000	0.000	0.0000	100.000	7.84E-01	4.79E-01	1.96E-01	0.00E+00	4.63E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 4.8404E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.143 +/-0.007)



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ALPHA SPECTROSCOPY REPORT

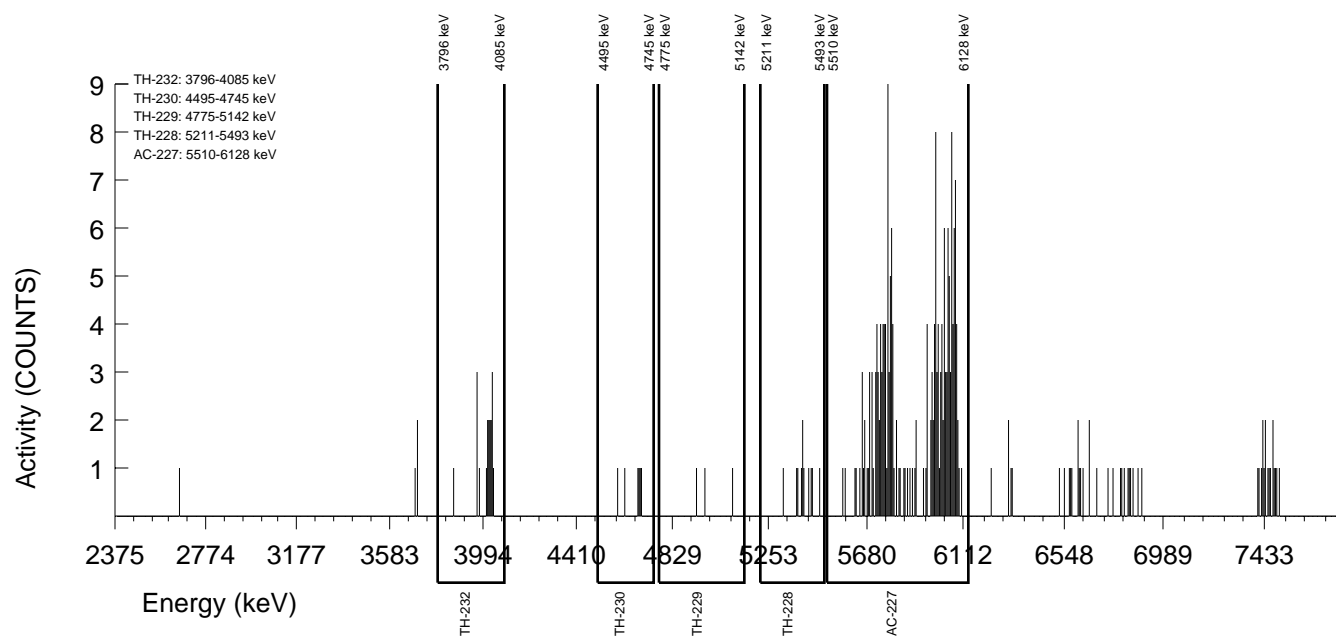
BATCH NUMBER : 1596417 SAMPLE ID : S0405235070_TH SAMPLE QTY : 0.106 G +/-0.943 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 93.6 +/-7.790 % AC-227 SEP. : 16-Sep-2016 16:00:00	CHAMBER : 177 DETECTOR S/N : 74435 AVERAGE %EFFICIENCY : 26.5935 AVERAGE %EFF ERROR : 0.5150 COUNT DATE : 19-Sep-2016 17:42:05 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B177.CNF;875 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W177.CNF;243 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2160E+00 dpm RESULTS : 3.0095E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5854.62	5896.17	279.454	194.000	192.080	1.920	1.3856	100.000	1.54E+01	3.28E+00	6.46E-01	2.03E-01	2.19E+00
TH-228	5363.00	5406.23	9.910	11.000	8.411	1.440	1.2000	99.940	7.94E-01	6.67E-01	8.15E-01	2.66E-01	6.51E-01
TH-229	4900.00	4999.77	153.612	3.000	2.520	0.480	0.6928	99.469	1.80E-01	2.88E-01	3.96E-01	9.08E-02	2.86E-01
TH-230	4671.39	4657.33	104.060	6.000	6.000	0.000	0.0000	99.700	4.28E-01	3.78E-01	2.14E-01	0.00E+00	3.72E-01
TH-232	3972.00	4005.09	70.612	18.000	18.000	0.000	0.0000	100.000	1.28E+00	6.42E-01	2.13E-01	0.00E+00	6.09E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 4.8405E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.149 +/-0.007)



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ALPHA SPECTROSCOPY REPORT

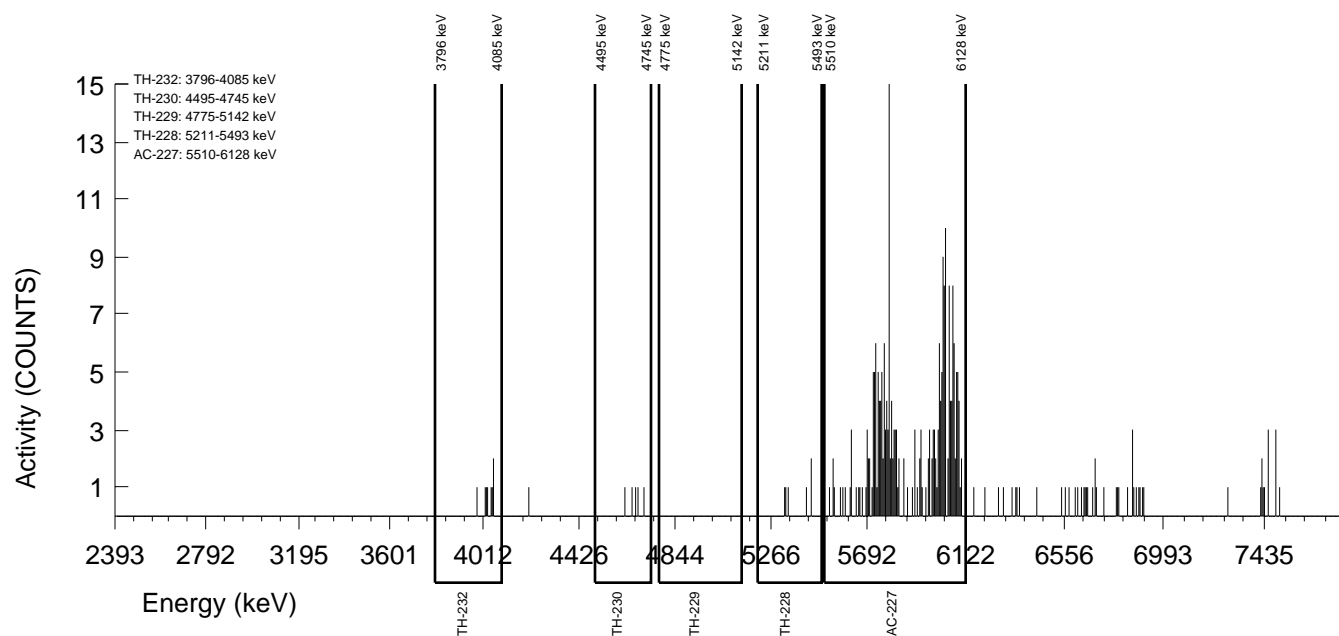
BATCH NUMBER : 1596417 SAMPLE ID : S0405235071_TH SAMPLE QTY : 0.115 G +/-0.870 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 116 +/-7.105 % AC-227 SEP. : 16-Sep-2016 16:00:00	CHAMBER : 195 DETECTOR S/N : 78786 AVERAGE %EFFICIENCY : 26.3844 AVERAGE %EFF ERROR : 0.5110 COUNT DATE : 19-Sep-2016 17:50:08 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B195.CNF;878 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W195.CNF;259 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2161E+00 dpm RESULTS : 3.7440E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5854.58	5891.29	262.298	239.000	237.080	1.920	1.3856	100.000	1.42E+01	2.75E+00	4.83E-01	1.52E-01	1.82E+00
TH-228	5363.00	5388.42	4.961	6.000	4.340	0.240	0.4899	99.940	3.06E-01	3.73E-01	5.15E-01	1.52E-01	3.68E-01
TH-229	4900.00	4958.12	0.000	0.000	-0.240	0.240	0.4899	99.469	-1.28E-02	1.11E-01	2.56E-01	4.79E-02	1.11E-01
TH-230	4671.39	4685.28	0.000	6.000	5.760	0.240	0.4899	99.700	3.07E-01	2.82E-01	2.56E-01	4.78E-02	2.79E-01
TH-232	3972.00	4030.48	7.441	8.000	8.000	0.000	0.0000	100.000	4.25E-01	3.19E-01	1.59E-01	0.00E+00	3.13E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 4.8477E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.420 +/-0.009)



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ALPHA SPECTROSCOPY REPORT

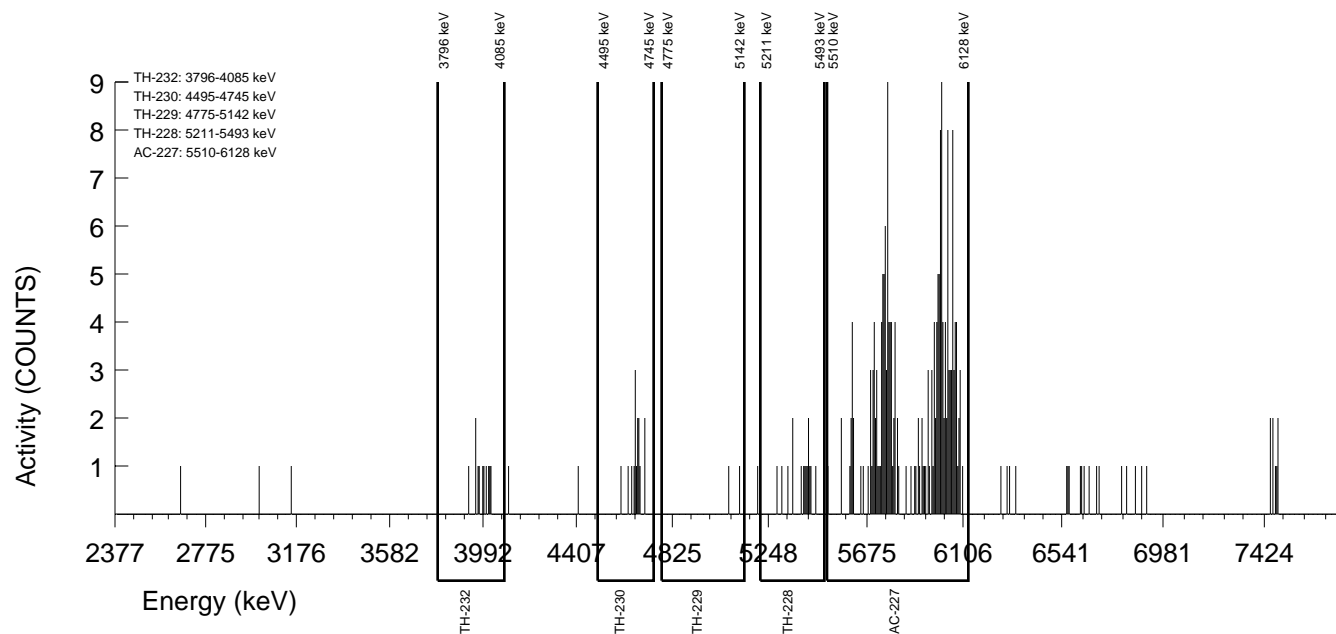
BATCH NUMBER : 1596417 SAMPLE ID : S0405235072_TH SAMPLE QTY : 0.116 G +/-0.862 % SAMPLE DATE : 15-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 97.2 +/-7.694 % AC-227 SEP. : 16-Sep-2016 16:00:00	CHAMBER : 179 DETECTOR S/N : 74437 AVERAGE %EFFICIENCY : 26.3751 AVERAGE %EFF ERROR : 0.5108 COUNT DATE : 19-Sep-2016 17:49:57 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B179.CNF;875 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W179.CNF;254 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2161E+00 dpm RESULTS : 3.1254E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5854.58	5888.05	287.562	200.000	197.840	2.160	1.4697	100.000	1.40E+01	2.95E+00	5.95E-01	1.91E-01	1.98E+00
TH-228	5363.00	5388.53	71.643	15.000	13.095	0.720	0.8485	99.940	1.09E+00	6.84E-01	6.46E-01	1.98E-01	6.58E-01
TH-229	4900.00	5096.72	49.409	2.000	2.000	0.000	0.0000	99.469	1.27E-01	2.18E-01	1.90E-01	0.00E+00	2.18E-01
TH-230	4671.39	4665.59	44.468	15.000	15.000	0.000	0.0000	99.700	9.50E-01	5.19E-01	1.90E-01	0.00E+00	4.97E-01
TH-232	3972.00	3988.17	4.941	11.000	10.760	0.240	0.4899	100.000	6.79E-01	4.44E-01	3.03E-01	5.66E-02	4.31E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 4.8476E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.185 +/-0.008)



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ALPHA SPECTROSCOPY REPORT

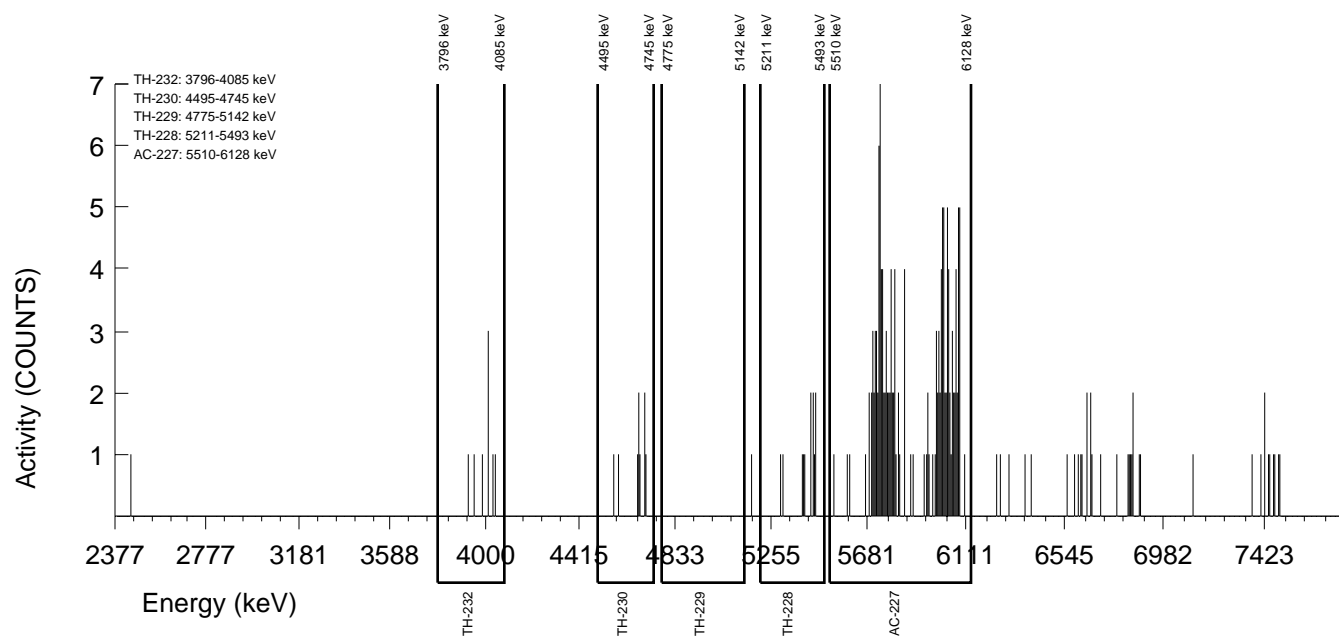
BATCH NUMBER : 1596417 SAMPLE ID : S0405235073_TH SAMPLE QTY : 0.118 G +/-0.847 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 72.1 +/-8.804 % AC-227 SEP. : 16-Sep-2016 16:00:00	CHAMBER : 180 DETECTOR S/N : 83295 AVERAGE %EFFICIENCY : 26.2740 AVERAGE %EFF ERROR : 0.5089 COUNT DATE : 19-Sep-2016 17:49:59 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B180.CNF;877 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W180.CNF;230 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2161E+00 dpm RESULTS : 2.3204E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5854.58	5882.36	333.121	148.000	146.320	1.680	1.2961	100.000	1.38E+01	3.33E+00	7.31E-01	2.24E-01	2.26E+00
TH-228	5363.00	5408.12	24.888	12.000	10.884	0.240	0.4899	99.940	1.21E+00	8.23E-01	7.31E-01	1.98E-01	7.90E-01
TH-229	4900.00	4958.13	0.000	0.000	0.000	0.000	0.0000	99.469	0.00E+00	1.71E-01	2.53E-01	0.00E+00	1.70E-01
TH-230	4671.39	4662.91	34.843	9.000	8.760	0.240	0.4899	99.700	7.37E-01	5.41E-01	4.04E-01	7.55E-02	5.25E-01
TH-232	3972.00	3999.60	4.978	8.000	8.000	0.000	0.0000	100.000	6.71E-01	5.09E-01	2.52E-01	0.00E+00	4.95E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 4.8476E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.876 +/-0.006)



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ALPHA SPECTROSCOPY REPORT

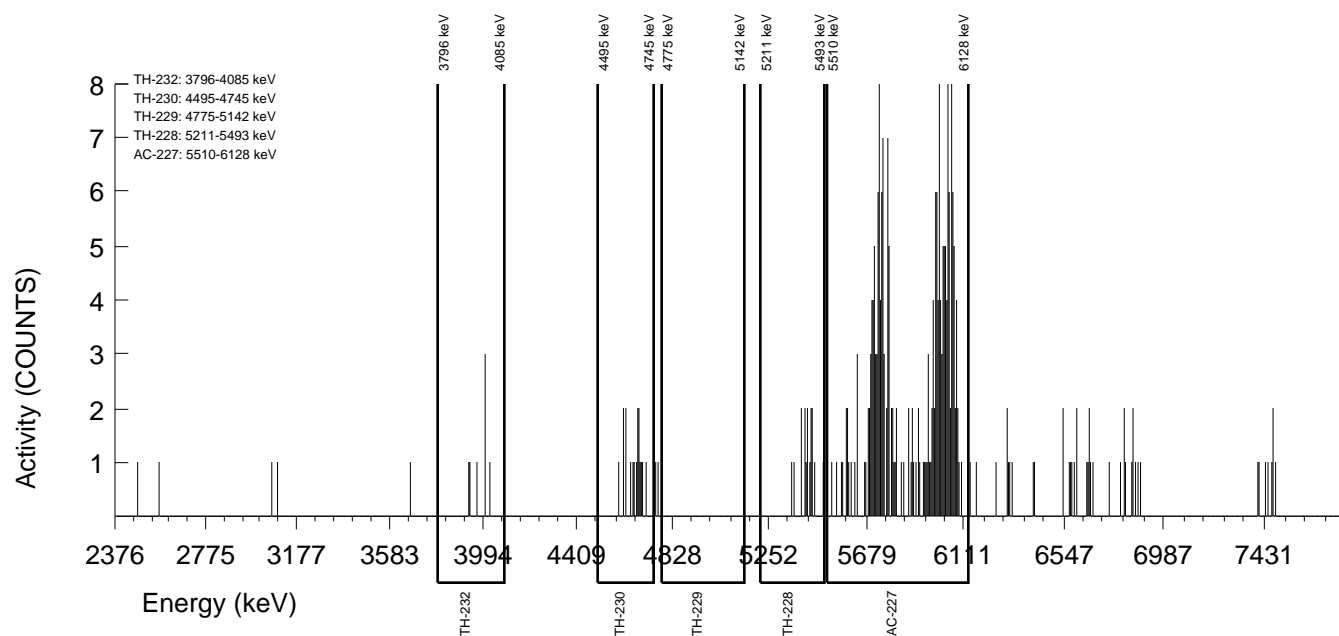
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TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2161E+00 dpm RESULTS : 3.4232E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5854.58	5882.18	328.306	222.000	218.880	3.120	1.7664	100.000	1.55E+01	3.13E+00	6.71E-01	2.29E-01	2.08E+00
TH-228	5363.00	5420.70	49.493	16.000	13.249	1.440	1.2000	99.940	1.10E+00	7.05E-01	7.32E-01	2.41E-01	6.81E-01
TH-229	4900.00	4958.09	0.000	0.000	-0.720	0.720	0.8485	99.469	-4.56E-02	1.38E-01	3.87E-01	9.85E-02	1.38E-01
TH-230	4671.39	4658.47	71.765	17.000	16.520	0.480	0.6928	99.700	1.04E+00	5.51E-01	3.50E-01	8.02E-02	5.28E-01
TH-232	3972.00	3982.31	4.949	7.000	6.520	0.480	0.6928	100.000	4.11E-01	3.59E-01	3.49E-01	8.00E-02	3.53E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 4.8476E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.311 +/-0.009)



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ALPHA SPECTROSCOPY REPORT

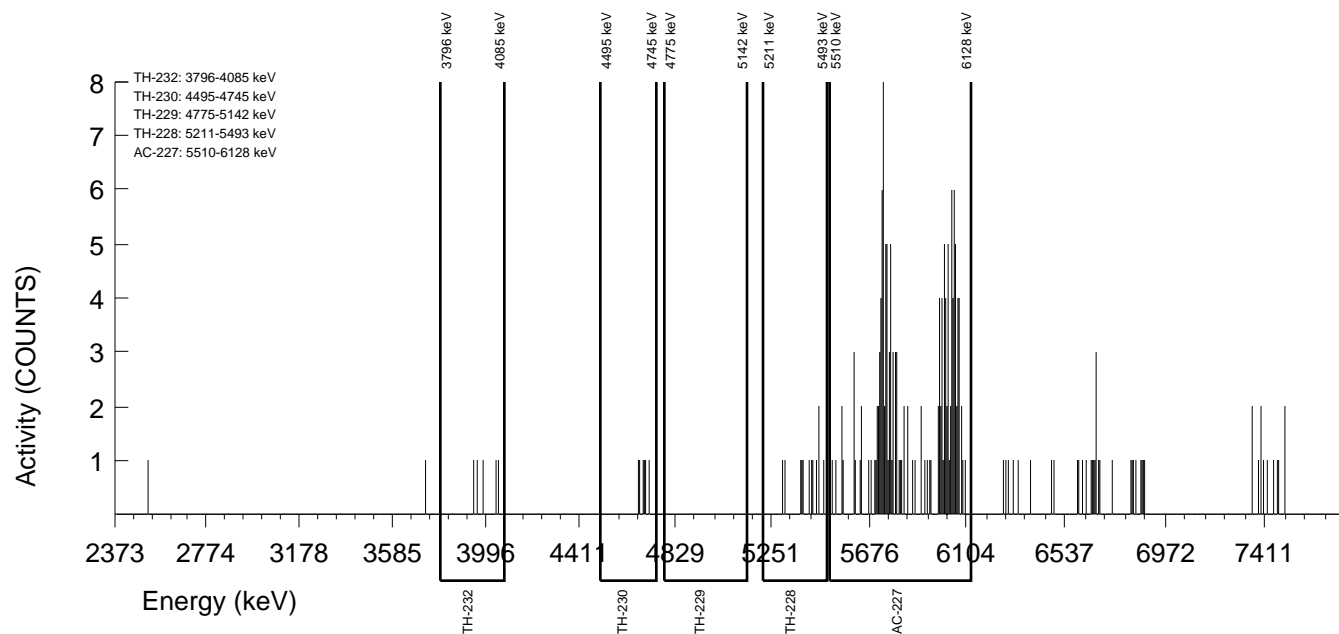
BATCH NUMBER : 1596417 SAMPLE ID : S0405235075_TH SAMPLE QTY : 0.106 G +/-0.943 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 87.7 +/-8.631 % AC-227 SEP. : 16-Sep-2016 16:00:00	CHAMBER : 182 DETECTOR S/N : 74440 AVERAGE %EFFICIENCY : 22.5384 AVERAGE %EFF ERROR : 0.4383 COUNT DATE : 19-Sep-2016 17:50:04 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B182.CNF;318 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W182.CNF;95 CAL DATE : 13-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2161E+00 dpm RESULTS : 2.8204E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5854.58	5872.30	305.702	154.000	152.560	1.440	1.2000	100.000	1.54E+01	3.64E+00	7.45E-01	2.21E-01	2.46E+00
TH-228	5363.00	5405.72	4.984	12.000	10.366	0.720	0.8485	99.940	1.23E+00	8.74E-01	8.77E-01	2.61E-01	8.43E-01
TH-229	4900.00	4958.15	0.000	0.000	-0.480	0.480	0.6928	99.469	-4.32E-02	1.92E-01	4.99E-01	1.14E-01	1.91E-01
TH-230	4671.39	4688.45	49.843	6.000	5.760	0.240	0.4899	99.700	5.18E-01	4.78E-01	4.31E-01	8.06E-02	4.70E-01
TH-232	3972.00	3997.42	109.654	5.000	4.760	0.240	0.4899	100.000	4.26E-01	4.41E-01	4.30E-01	8.04E-02	4.34E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 4.8477E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (0.914 +/-0.006)



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Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

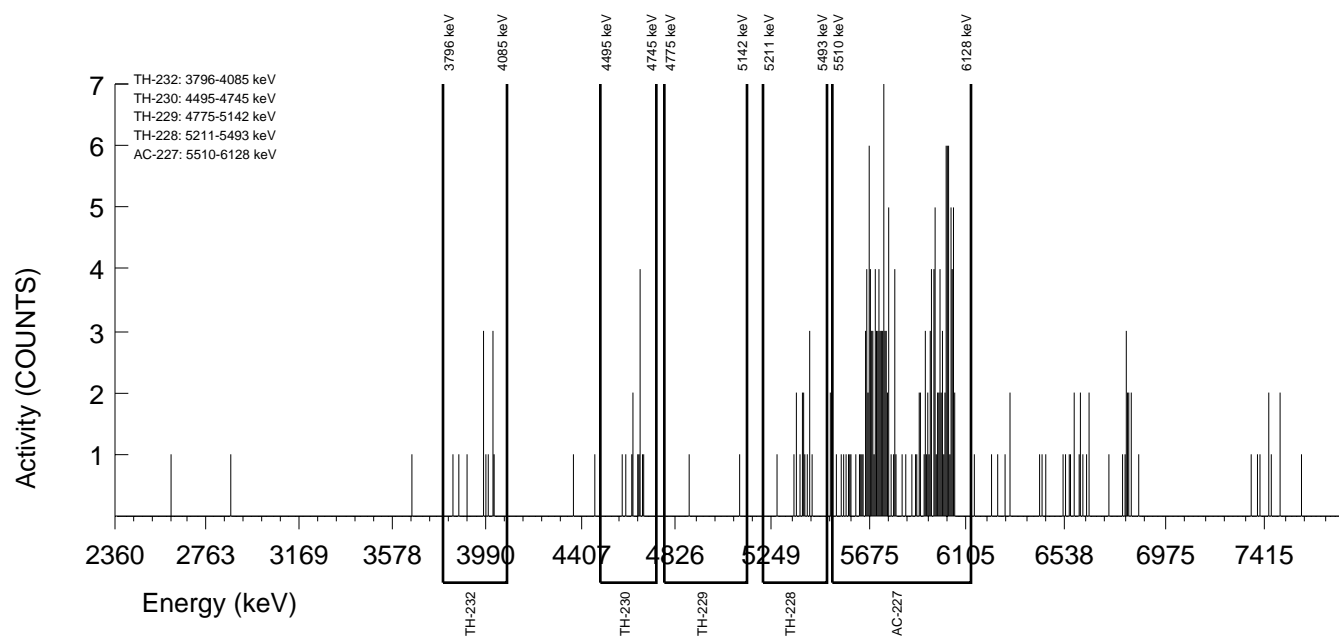
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TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2161E+00 dpm RESULTS : 2.8166E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5854.58	5838.99	360.530	173.000	171.560	1.440	1.2000	100.000	1.45E+01	3.26E+00	6.27E-01	1.86E-01	2.19E+00
TH-228	5363.00	5379.75	58.836	15.000	13.252	0.720	0.8485	99.940	1.33E+00	8.24E-01	7.56E-01	2.28E-01	7.90E-01
TH-229	4900.00	4994.81	215.316	2.000	0.560	1.440	1.2000	99.469	4.24E-02	2.74E-01	5.61E-01	1.67E-01	2.74E-01
TH-230	4671.39	4650.56	5.842	13.000	11.320	1.680	1.2961	99.700	8.56E-01	5.81E-01	5.86E-01	1.80E-01	5.64E-01
TH-232	3972.00	3970.59	46.318	12.000	12.000	0.000	0.0000	100.000	9.05E-01	5.55E-01	2.26E-01	0.00E+00	5.34E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 4.8477E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.028 +/-0.007)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

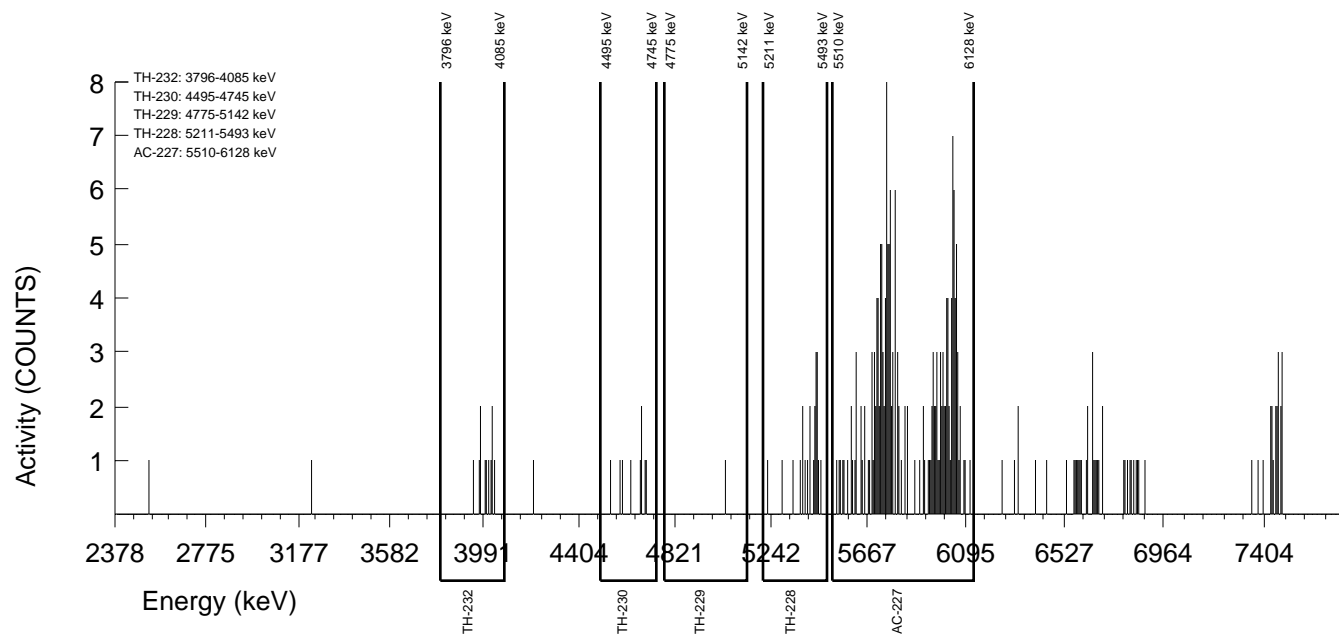
BATCH NUMBER : 1596417 SAMPLE ID : S0405235077_TH SAMPLE QTY : 0.117 G +/-0.855 % SAMPLE DATE : 17-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 88.0 +/-7.967 % AC-227 SEP. : 16-Sep-2016 16:00:00	CHAMBER : 205 DETECTOR S/N : 78908 AVERAGE %EFFICIENCY : 26.6171 AVERAGE %EFF ERROR : 0.5154 COUNT DATE : 20-Sep-2016 11:28:57 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B205.CNF;801 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W205.CNF;223 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2344E+00 dpm RESULTS : 2.8459E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5850.09	5849.40	310.732	183.000	181.800	1.200	1.0954	100.000	1.44E+01	3.14E+00	5.55E-01	1.59E-01	2.11E+00
TH-228	5363.00	5407.10	64.289	21.000	18.752	0.960	0.9798	99.940	1.69E+00	8.86E-01	7.39E-01	2.34E-01	8.36E-01
TH-229	4900.00	5046.95	4.945	1.000	0.520	0.480	0.6928	99.469	3.58E-02	1.99E-01	3.81E-01	8.74E-02	1.99E-01
TH-230	4671.39	4643.63	7.418	9.000	8.760	0.240	0.4899	99.700	6.02E-01	4.39E-01	3.29E-01	6.17E-02	4.28E-01
TH-232	3972.00	3999.32	56.871	11.000	10.520	0.480	0.6928	100.000	7.21E-01	4.83E-01	3.79E-01	8.69E-02	4.68E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 5.7655E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.288 +/-0.008)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

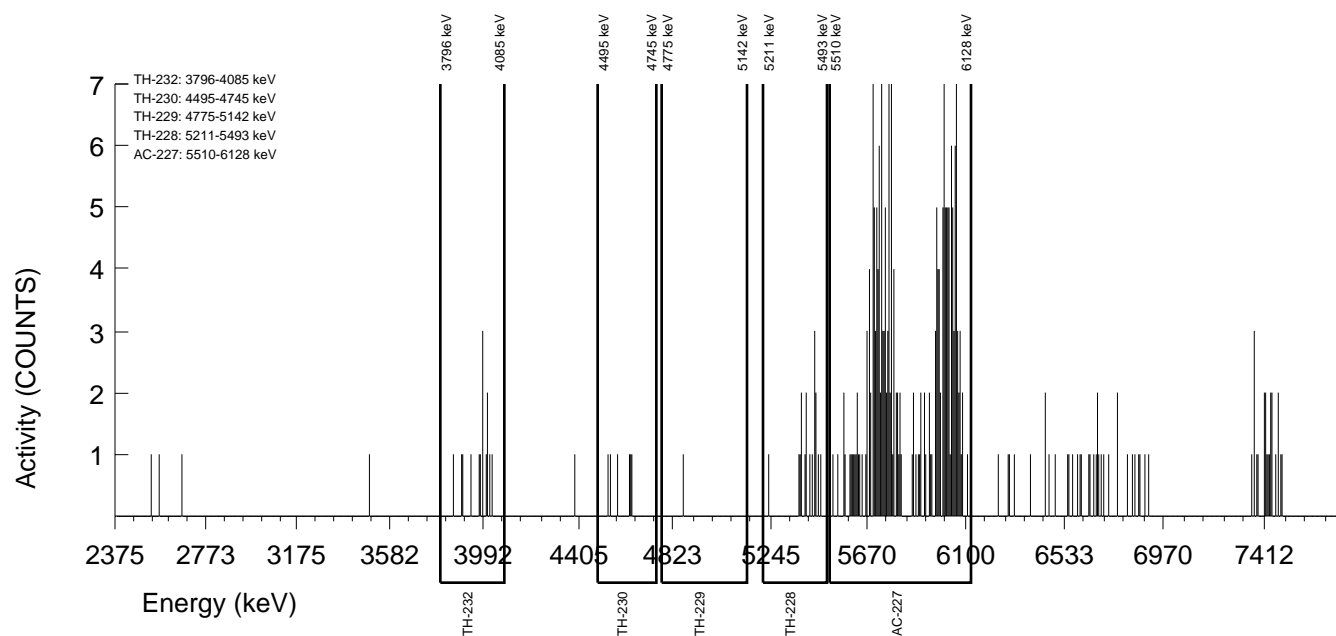
BATCH NUMBER : 1596417 SAMPLE ID : S0405235078_TH SAMPLE QTY : 0.109 G +/-0.917 % SAMPLE DATE : 17-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 106 +/-7.418 % AC-227 SEP. : 16-Sep-2016 16:00:00	CHAMBER : 207 DETECTOR S/N : 78910 AVERAGE %EFFICIENCY : 26.0138 AVERAGE %EFF ERROR : 0.5040 COUNT DATE : 19-Sep-2016 17:41:01 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B207.CNF;809 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W207.CNF;228 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2159E+00 dpm RESULTS : 3.4245E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5854.62	5861.43	356.677	215.000	213.800	1.200	1.0954	100.000	1.49E+01	3.03E+00	4.90E-01	1.40E-01	2.01E+00
TH-228	5363.00	5409.00	63.162	17.000	15.241	0.480	0.6928	99.940	1.25E+00	7.15E-01	6.15E-01	1.85E-01	6.85E-01
TH-229	4900.00	4865.20	4.954	1.000	0.520	0.480	0.6928	99.469	3.25E-02	1.81E-01	3.46E-01	7.93E-02	1.81E-01
TH-230	4671.39	4593.82	104.031	6.000	5.760	0.240	0.4899	99.700	3.59E-01	3.30E-01	2.99E-01	5.60E-02	3.26E-01
TH-232	3972.00	3968.02	23.531	14.000	13.760	0.240	0.4899	100.000	8.55E-01	4.91E-01	2.98E-01	5.58E-02	4.74E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 4.8395E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.279 +/-0.008)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

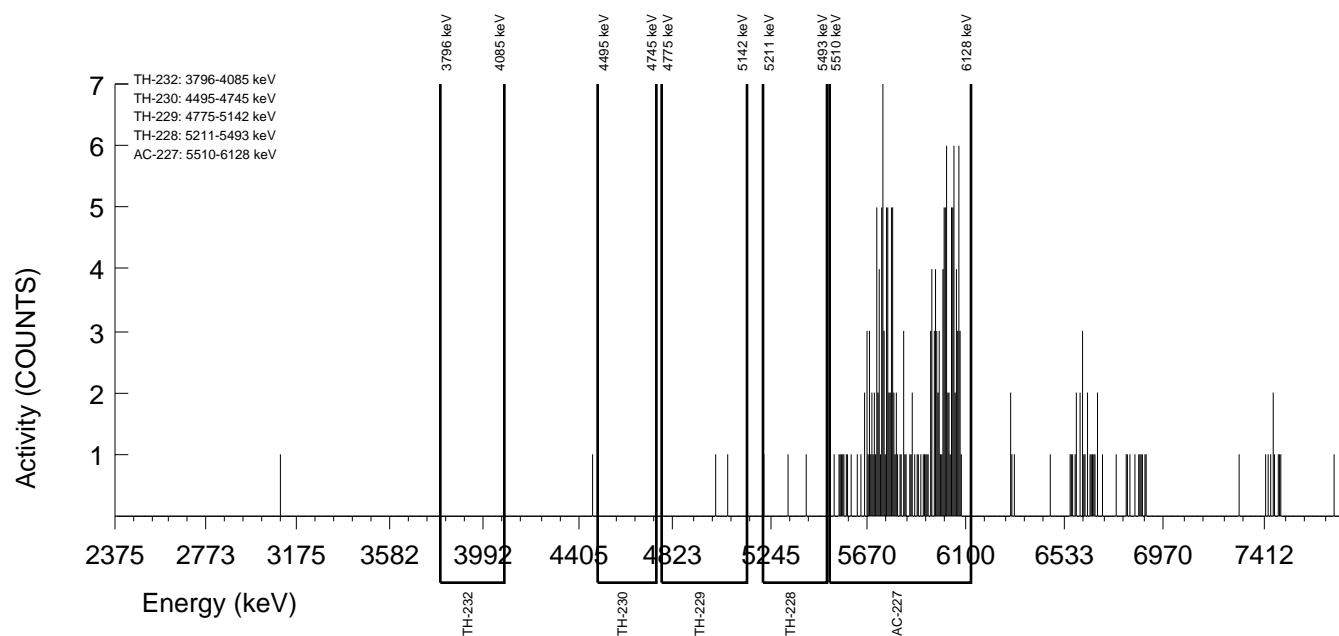
BATCH NUMBER : 1596417 SAMPLE ID : S1203621757_TH SAMPLE QTY : 0.118 G +/-0.847 % SAMPLE DATE : 15-Sep-2016 00:00:00 ANALYST : KXB2 % YIELD : 93.5 +/-7.834 % AC-227 SEP. : 16-Sep-2016 16:00:00	CHAMBER : 207 DETECTOR S/N : 78910 AVERAGE %EFFICIENCY : 26.0138 AVERAGE %EFF ERROR : 0.5040 COUNT DATE : 20-Sep-2016 11:28:59 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B207.CNF;809 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W207.CNF;228 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2344E+00 dpm RESULTS : 3.0240E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5850.09	5866.59	337.894	190.000	188.800	1.200	1.0954	100.000	1.43E+01	3.06E+00	5.30E-01	1.52E-01	2.05E+00
TH-228	5363.00	5315.53	178.338	3.000	1.183	0.480	0.6928	99.940	7.78E-02	2.65E-01	4.98E-01	1.50E-01	2.63E-01
TH-229	4900.00	5033.55	54.492	2.000	1.520	0.480	0.6928	99.469	9.99E-02	2.30E-01	3.64E-01	8.34E-02	2.30E-01
TH-230	4671.39	4619.90	0.000	0.000	-0.240	0.240	0.4899	99.700	-1.57E-02	1.36E-01	3.15E-01	5.89E-02	1.36E-01
TH-232	3972.00	3940.45	0.000	0.000	-0.240	0.240	0.4899	100.000	-1.57E-02	1.36E-01	3.14E-01	5.87E-02	1.35E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 5.7656E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.337 +/-0.009)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

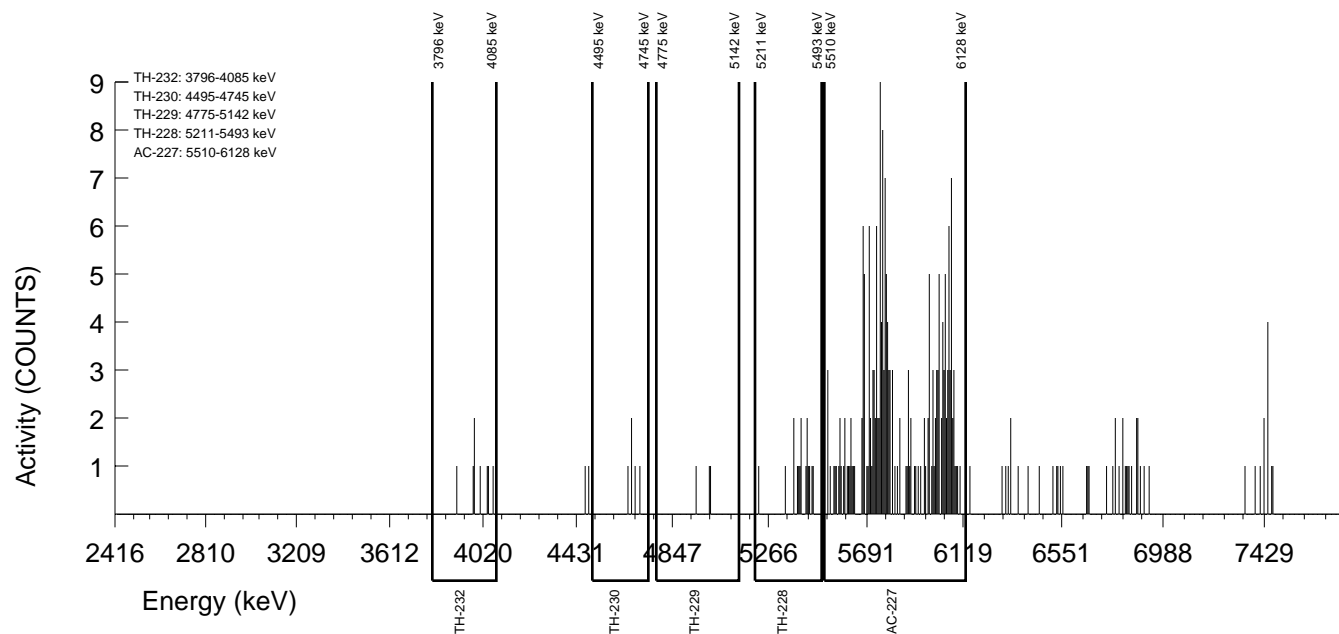
BATCH NUMBER : 1596417 SAMPLE ID : S1203621758_TH SAMPLE QTY : 0.102 G +/-0.980 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 102 +/-7.668 % AC-227 SEP. : 16-Sep-2016 16:00:00	CHAMBER : 189 DETECTOR S/N : 68622 AVERAGE %EFFICIENCY : 25.4050 AVERAGE %EFF ERROR : 0.4925 COUNT DATE : 19-Sep-2016 17:56:38 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B189.CNF;853 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W189.CNF;231 CAL DATE : 15-Sep-2016
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2163E+00 dpm RESULTS : 3.2651E+00 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5854.55	5839.03	357.549	201.000	199.080	1.920	1.3856	100.000	1.60E+01	3.35E+00	6.48E-01	2.04E-01	2.24E+00
TH-228	5363.00	5402.50	61.329	16.000	14.806	0.000	0.0000	99.940	1.40E+00	7.99E-01	6.22E-01	1.70E-01	7.64E-01
TH-229	4900.00	4991.35	63.782	3.000	2.760	0.240	0.4899	99.469	1.98E-01	2.87E-01	3.44E-01	6.44E-02	2.85E-01
TH-230	4671.39	4676.74	4.906	5.000	4.520	0.480	0.6928	99.700	3.23E-01	3.52E-01	3.96E-01	9.08E-02	3.48E-01
TH-232	3972.00	4009.86	7.359	9.000	8.760	0.240	0.4899	100.000	6.25E-01	4.55E-01	3.42E-01	6.40E-02	4.45E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 4.8536E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.194 +/-0.008)



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-038

BATCH NUMBER : 1596417 SAMPLE ID : S1203621759_TH SAMPLE QTY : 0.118 G +/-0.847 % SAMPLE DATE : 15-Sep-2016 00:00:00 ANALYST : KXB2 % YIELD : 89.4 +/-7.988 % AC-227 SEP. : 16-Sep-2016 16:00:00	CHAMBER : 208 DETECTOR S/N : 78911 AVERAGE %EFFICIENCY : 26.1198 AVERAGE %EFF ERROR : 0.5060 COUNT DATE : 20-Sep-2016 11:29:02 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : AC BKG FILE : B208.CNF;805 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W208.CNF;253 CAL DATE : 15-Sep-2016
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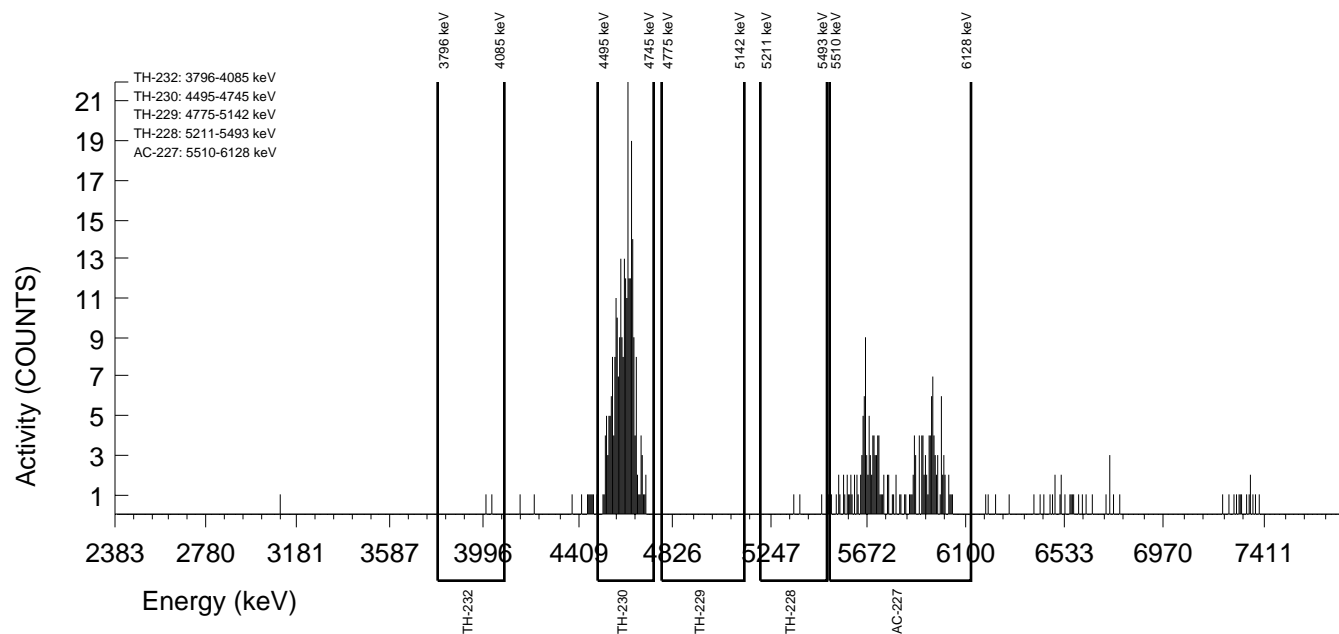
TRACER ID : 0387-B-402 NUCLIDE : AC-227 NOMINAL : 3.2344E+00 dpm RESULTS : 2.8924E+00 dpm	LCS ID : 1242-H NUCLIDE : TH-230 NOMINAL (pCi/G) : 1.7737E+01 % RECOVERY : 103.103
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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
AC-227	5850.09	5803.95	319.219	183.000	181.320	1.680	1.2961	100.000	1.43E+01	3.12E+00	6.10E-01	1.87E-01	2.09E+00
TH-228	5363.00	5401.99	118.549	3.000	0.996	0.720	0.8485	99.940	6.82E-02	2.77E-01	5.38E-01	1.66E-01	2.76E-01
TH-229	4900.00	4958.11	0.000	0.000	-1.200	1.200	1.0954	99.469	-8.21E-02	1.56E-01	4.80E-01	1.37E-01	1.56E-01
TH-230	4671.39	4610.78	54.829	268.000	267.760	0.240	0.4899	99.700	1.83E+01	3.69E+00	3.27E-01	6.13E-02	2.20E+00
TH-232	3972.00	4018.74	29.637	2.000	1.760	0.240	0.4899	100.000	1.20E-01	2.36E-01	3.26E-01	6.11E-02	2.36E-01

NOTES:

- * Ac-227 results are decay corrected to separation date/time.
- * Ac-227 Tracer nominal includes 5.7656E-01 dpm ingrowth from Ra-223.
- * Ac-227 Library Energy adjusted to compensate for ingrowth from Ra-223.
- * Corrections were made to Th-228 net area due to Ra-223 ingrowth from tracer. (1.284 +/-0.008)



Batch# 1596392 Product: Np Date: 10/3/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	DEBT# 1563744
Sample was correctly preserved if required.	✓ mms		NA
Smears Taken for Radioactive batches.		10/3/16	NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DEBT# 1563744
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DEBT# 1563744
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: Melan Deyk 10/3/16

Secondary Review Performed By: Joni Davis 10/03/16

10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 03-OCT-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: ASTM C 1475-00 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596392	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, and 1203621698 were received and analyzed out of holding.</p>		<p>1. Reporting results.</p>	

Originator's Name:
Melanie Aycock 03-OCT-16

Data Validator/Group Leader:
Jessica Davis 03-OCT-16

Neptunium Queue Sheet

07-SEP-16

Batch #: 1596392 Analyst: JXH2 First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16 Routine #: 3
 Tracer Isotope: Am-243 (Np-239) Tracer Code: 445-96-2-III Expiration Date: 9-30-16 Vol: 0.1 mL REF #: 9295
 LCS Isotope: Np-237 LCS Code: 05185 Expiration Date: 7-18-17 Vol: 0.1 mL BKG #: 91
 Spike Isotope: Np-237 Spike Code: _____ Expiration Date: _____ Np Separation Date/Time: 9-28-16 1600
 Prep Date: 9-26-16 Initials: JEH Pipet ID: 184002Z Balance ID: 16107662 Witness: K6d-2U-1U

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/1/1)	GFPC	Np Det #
405235001-1	4.1.B.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	1	1	0.100	27	161
405235002-1	4.1.B.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	2	2	0.104	28	162
405235003-1	4.1.B.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	3	3	0.105	29	178
405235004-1	4.1.B.R.7.2	SAMPLE		1 pCi/g	SOIL	MJWC001	09-DEC-15	4	4	0.105	30	160
405235005-1	4.1.C.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	5	5	0.109	31	167
405235006-1	4.1.C.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	6	6	0.102	32	169
405235007-1	4.1.C.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	7	7	0.104	33	170
405235008-1	4.1.C.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	8	8	0.103	34	175
405235009-1	4.1.D.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	9	9	0.100	35	174
405235010-1	4.1.D.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	10	10	0.100	36	177
405235011-1	4.1.D.R.3.2	SAMPLE		1 pCi/g	SOIL	MJWC001	09-DEC-15	11	11	0.105	37	179
405235012-1	4.1.D.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	10-DEC-15	12	12	0.101	38	180
405235013-1	4.2.A.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	13	13	0.104	39	185
405235014-1	4.2.A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	14	14	0.107	40	186
405235015-1	4.2.A.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	15	15	0.101	41	188
405235016-1	4.2.A.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	16	16	0.104	42	195
405235017-1	4.2.A.R.3.2	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	17	17	0.107	43	197
405235018-1	4.2.A.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	18	18	0.108	44	199
405235019-1	4.2.B.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	19	19	0.100	45	182
405235020-1	4.2.B.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	08-DEC-15	20	20	0.102	46	200
1203621697-1	MB for batch 1596392	MB		1 pCi/g	SOIL	QC ACCOUNT		21	21	0.109	47	166
1203621698-1	4.1.B.R.1.2(405235001DUP)	DUP		1 pCi/g	SOIL	QC ACCOUNT	10-DEC-15	22	22	0.109	48	234
1203621699-1	LCS for batch 1596392	LCS		1 pCi/g	SOIL	QC ACCOUNT		23	23	0.109	49	189

Solid Sample Dissolution by: LEACH or DIGESTION
 Circle One

Data Reviewed By: M. Landry

BKG		4	Bkg Upper Limit (CPM)=		2.000000	Reference		Tracer	
Ref Std Np-239 Beta Cts=	3139	Efficiency=	0.4879	Efficiency Error=	0.0178	S/N=	445-96-2-GG	445-96-2-III	
Ref Std Np-239 Beta Cts=	3194	Efficiency=	0.4964	Efficiency Error=	0.0177	DPM=	429.004	446.153	
Ref Std Np-239 Beta Cts=	3212	Efficiency=	0.4991	Efficiency Error=	0.0176	Exp. Date=	9/30/2009	9/30/2016	
Ref Std Np-239 Beta Cts=	3078	Efficiency=	0.4783	Efficiency Error=	0.0180	Reference Limits (CPM)			
Average Counts=	3156	Avg Efficiency=	0.4904	Avg Efficiency Error=	0.0178	Lower	201	Filename :	
Am-243 Correction Factor=	1.15					Upper	220	NP237Yields.xls	
Half-life of Np-239 (days)=	2.356								
Sample ID	Net Beta Cts	Count time	Count Date/Time	Separation Date/Time	Decay Corr Counts	% NP Yield	Delta T (min)	Gross Counts	File type :
405235001.1	1507	15	9/29/2016 15:15	9/28/2016 16:00	2007.31	61.16%	1395.6	1511	Excel
405235002.1	1866	15	9/29/2016 15:31	9/28/2016 16:00	2493.31	75.97%	1411.0	1870	Version # :
405235003.1	899	15	9/29/2016 15:46	9/28/2016 16:00	1204.99	36.72%	1426.3	903	1.2.2
405235004.1	476	15	9/29/2016 16:01	9/28/2016 16:00	640.02	19.50%	1441.7	480	
405235005.1	2042	15	9/29/2016 16:17	9/28/2016 16:00	2754.26	83.92%	1457.1	2046	
405235006.1	1390	15	9/29/2016 16:32	9/28/2016 16:00	1880.73	57.31%	1472.4	1394	
405235007.1	2069	15	9/29/2016 16:47	9/28/2016 16:00	2808.24	85.57%	1487.8	2073	
405235008.1	1575	15	9/29/2016 17:03	9/28/2016 16:00	2144.45	65.34%	1503.1	1579	
405235009.1	1495	15	9/29/2016 17:18	9/28/2016 16:00	2041.92	62.22%	1518.5	1499	
405235010.1	2155	15	9/29/2016 17:33	9/28/2016 16:00	2952.61	89.97%	1533.8	2159	
405235011.1	1679	15	9/29/2016 17:49	9/28/2016 16:00	2307.66	70.31%	1549.2	1683	
405235012.1	1848	15	9/29/2016 18:04	9/28/2016 16:00	2547.91	77.63%	1564.5	1852	
405235013.1	1806	15	9/29/2016 18:19	9/28/2016 16:00	2497.84	76.11%	1579.9	1810	
405235014.1	1219	15	9/29/2016 18:35	9/28/2016 16:00	1691.26	51.53%	1595.2	1223	
405235015.1	1909	15	9/29/2016 18:50	9/28/2016 16:00	2656.90	80.96%	1610.5	1913	
405235016.1	1788	15	9/29/2016 19:05	9/28/2016 16:00	2496.31	76.06%	1625.9	1792	
405235017.1	2154	15	9/29/2016 19:21	9/28/2016 16:00	3016.74	91.92%	1641.2	2158	
405235018.1	2287	15	9/29/2016 19:36	9/28/2016 16:00	3213.07	97.90%	1656.6	2291	
405235019.1	831	15	9/29/2016 19:51	9/28/2016 16:00	1171.17	35.69%	1672.0	835	
405235020.1	1605	15	9/29/2016 20:07	9/28/2016 16:00	2269.10	69.14%	1687.3	1609	
1203621697.1	2174	15	9/29/2016 20:22	9/28/2016 16:00	3083.19	93.94%	1702.6	2178	
1203621698.1	901	15	9/29/2016 20:37	9/28/2016 16:00	1281.82	39.06%	1718.0	905	
1203621699.1	1637	15	9/29/2016 20:53	9/28/2016 16:00	2336.22	71.18%	1733.3	1641	
BKG	0	15	9/29/2016 8:03	9/28/2016 16:00	0	0.00%	963.3		
Sample ID	Carrier	Alpha	Beta	Count time	Voltage	Date/Time			
REF	92	1980	3615	15	1545	9/29/16 8:18			
REF	93	1997	3678	15	1545	9/29/16 8:34			
REF	94	2094	3698	15	1545	9/29/16 8:49			
REF	95	2015	3544	15	1545	9/29/16 9:04			
405235001.1	27	59	1511	15	1545	9/29/16 15:15			
405235002.1	28	78	1870	15	1545	9/29/16 15:31			
405235003.1	29	40	903	15	1545	9/29/16 15:46			
405235004.1	30	22	480	15	1545	9/29/16 16:01			
405235005.1	31	84	2046	15	1545	9/29/16 16:17			
405235006.1	32	62	1394	15	1545	9/29/16 16:32			
405235007.1	33	105	2073	15	1545	9/29/16 16:47			
405235008.1	34	66	1579	15	1545	9/29/16 17:03			
405235009.1	35	60	1499	15	1545	9/29/16 17:18			
405235010.1	36	91	2159	15	1545	9/29/16 17:33			
405235011.1	37	64	1683	15	1545	9/29/16 17:49			
405235012.1	38	74	1852	15	1545	9/29/16 18:04			
405235013.1	39	76	1810	15	1545	9/29/16 18:19			
405235014.1	40	57	1223	15	1545	9/29/16 18:35			
405235015.1	41	83	1913	15	1545	9/29/16 18:50			
405235016.1	42	72	1792	15	1545	9/29/16 19:05			
405235017.1	43	105	2158	15	1545	9/29/16 19:21			
405235018.1	44	98	2291	15	1545	9/29/16 19:36			
405235019.1	45	37	835	15	1545	9/29/16 19:51			
405235020.1	46	71	1609	15	1545	9/29/16 20:07			
1203621697.1	47	95	2178	15	1545	9/29/16 20:22			
1203621698.1	48	46	905	15	1545	9/29/16 20:37			
1203621699.1	49	96	1641	15	1545	9/29/16 20:53			
BKG	91	1	4	15	1545	9/29/16 8:03			

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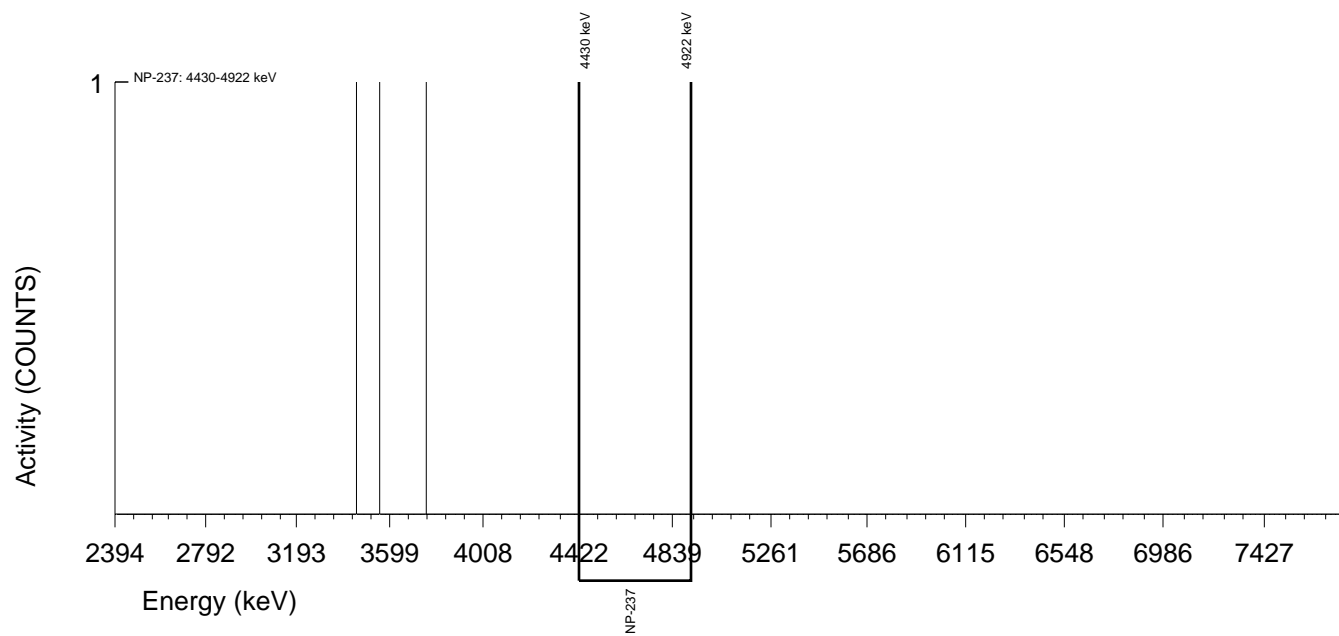
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S0405235001_NP SAMPLE QTY : 0.100 G +/-1.000 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 61.2 +/-5.414 %	CHAMBER : 161 DETECTOR S/N : 70321 AVERAGE %EFFICIENCY : 25.7727 AVERAGE %EFF ERROR : 0.4995 COUNT DATE : 30-Sep-2016 08:59:52 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B161.CNF;860 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W161.CNF;261 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 2.7288E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.31	0.000	0.000	-0.720	0.720	0.8485	100.000	-8.57E-02	2.59E-01	7.27E-01	1.85E-01	2.59E-01



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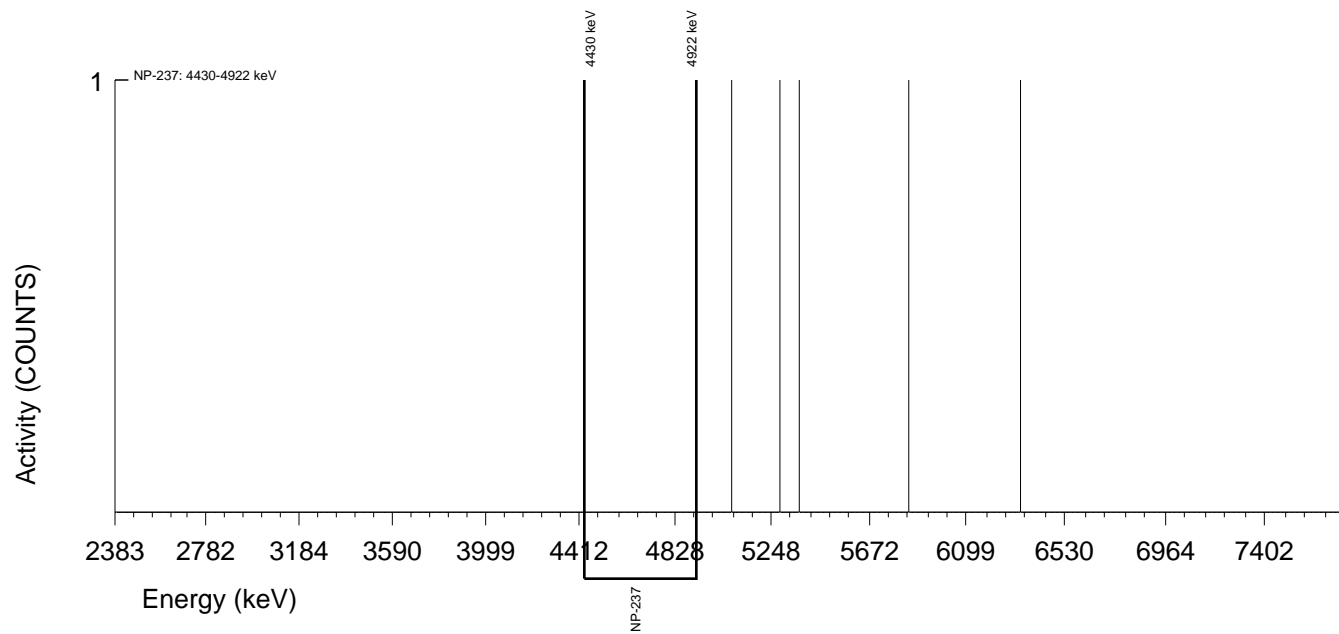
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S0405235002_NP SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 76.0 +/-5.293 %	CHAMBER : 162 DETECTOR S/N : 70323 AVERAGE %EFFICIENCY : 26.6669 AVERAGE %EFF ERROR : 0.5165 COUNT DATE : 30-Sep-2016 08:59:54 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B162.CNF;862 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W162.CNF;260 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.3895E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.38	0.000	0.000	-0.240	0.240	0.4899	100.000	-2.14E-02	1.85E-01	4.27E-01	7.99E-02	1.84E-01



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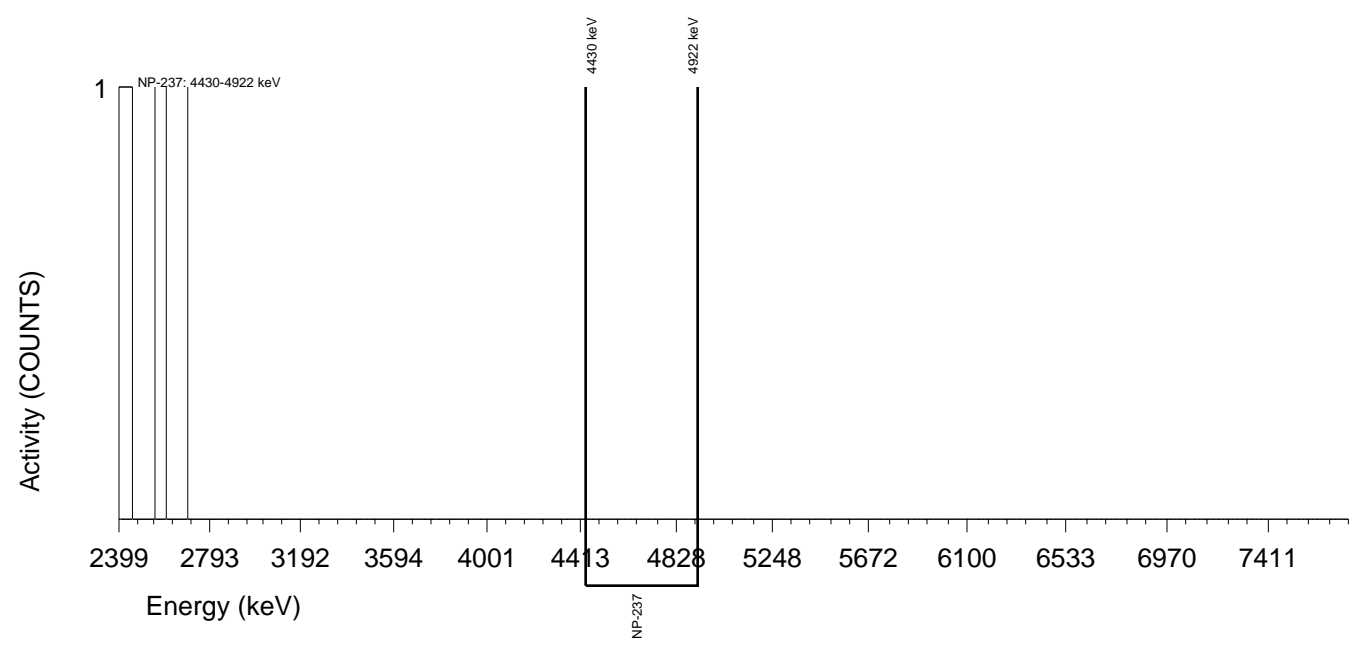
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S0405235003_NP SAMPLE QTY : 0.105 G +/-0.952 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 36.7 +/-5.821 %	CHAMBER : 178 DETECTOR S/N : 74436 AVERAGE %EFFICIENCY : 27.7549 AVERAGE %EFF ERROR : 0.5369 COUNT DATE : 30-Sep-2016 08:59:57 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B178.CNF;874 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W178.CNF;243 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 1.6381E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.25	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	3.54E-01	5.26E-01	0.00E+00	3.54E-01



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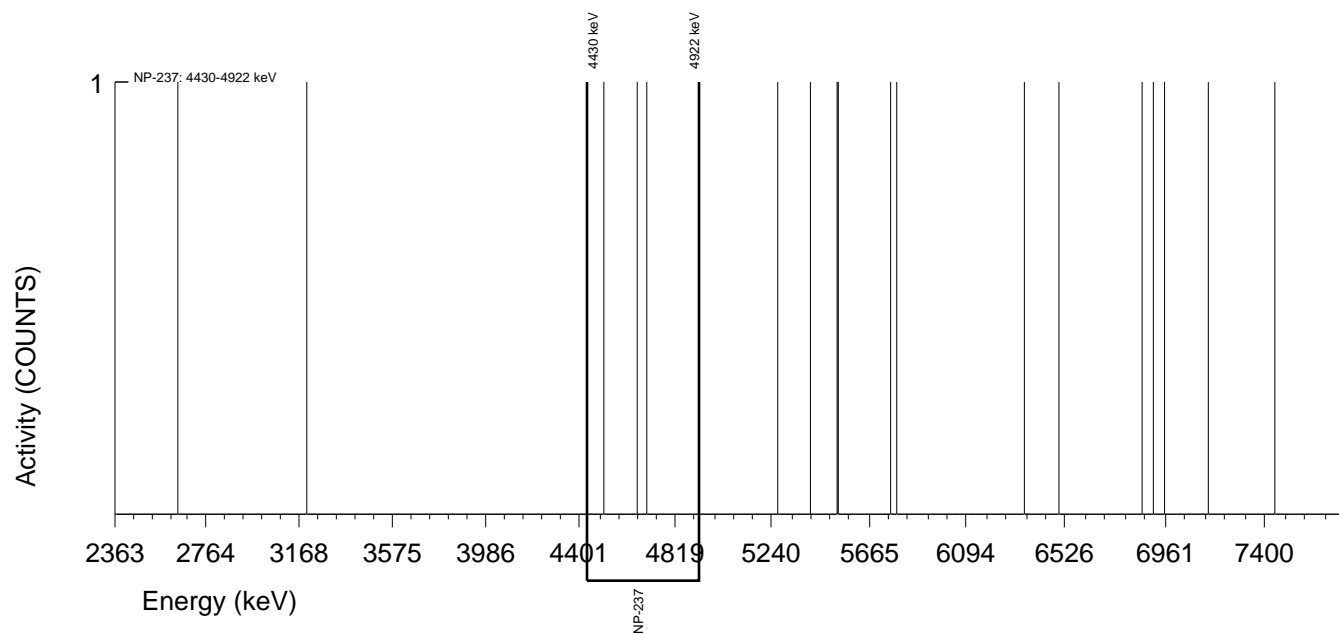
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S0405235004_NP SAMPLE QTY : 0.105 G +/-0.952 % SAMPLE DATE : 09-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 19.5 +/-6.639 %	CHAMBER : 175 DETECTOR S/N : 74433 AVERAGE %EFFICIENCY : 26.2713 AVERAGE %EFF ERROR : 0.5089 COUNT DATE : 01-Oct-2016 12:54:30 ELAPSED LIVE TIME(SEC) : 43200.00	LIB FILE : NP BKG FILE : B175.CNF;872 BKG DATE : 30-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W175.CNF;241 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 8.7006E+01 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4616.18	184.351	3.000	1.560	1.440	1.2000	100.000	1.81E-01	5.38E-01	9.51E-01	3.01E-01	5.37E-01



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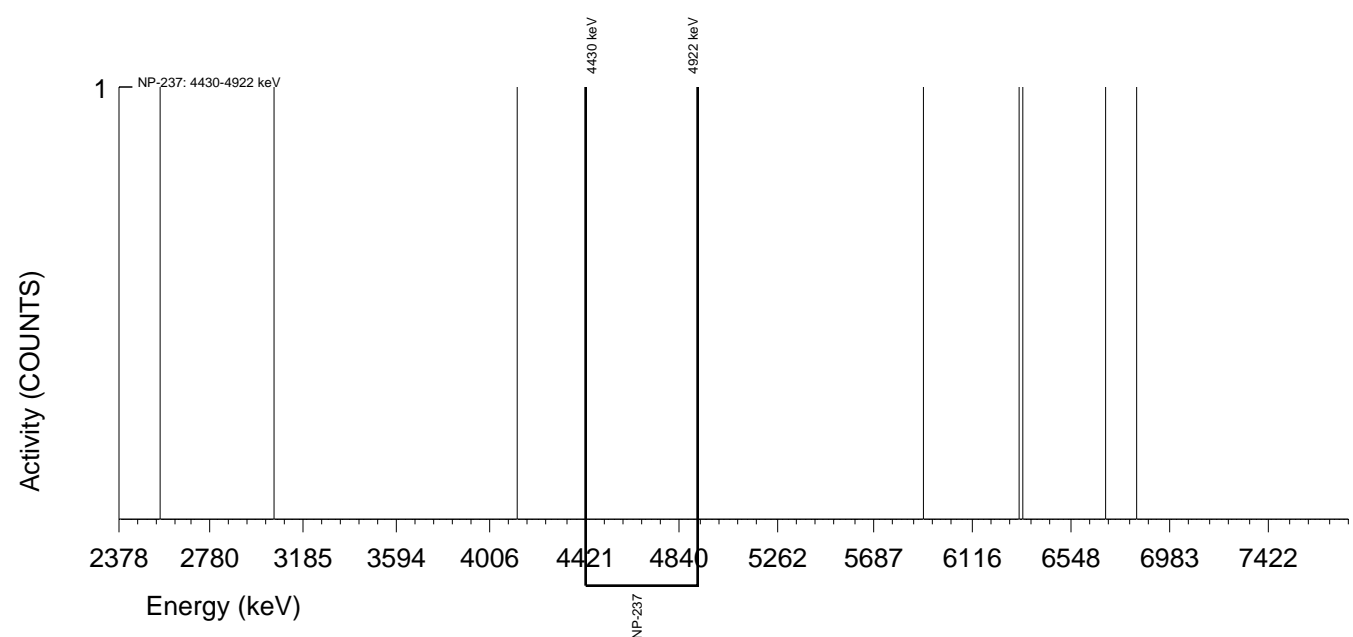
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S0405235005_NP SAMPLE QTY : 0.109 G +/-0.917 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 83.9 +/-5.249 %	CHAMBER : 167 DETECTOR S/N : 72546 AVERAGE %EFFICIENCY : 24.1606 AVERAGE %EFF ERROR : 0.4690 COUNT DATE : 30-Sep-2016 08:59:59 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B167.CNF;886 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W167.CNF;246 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.7442E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.42	0.000	0.000	-1.680	1.680	1.2961	100.000	-1.43E-01	2.01E-01	6.58E-01	2.02E-01	2.01E-01



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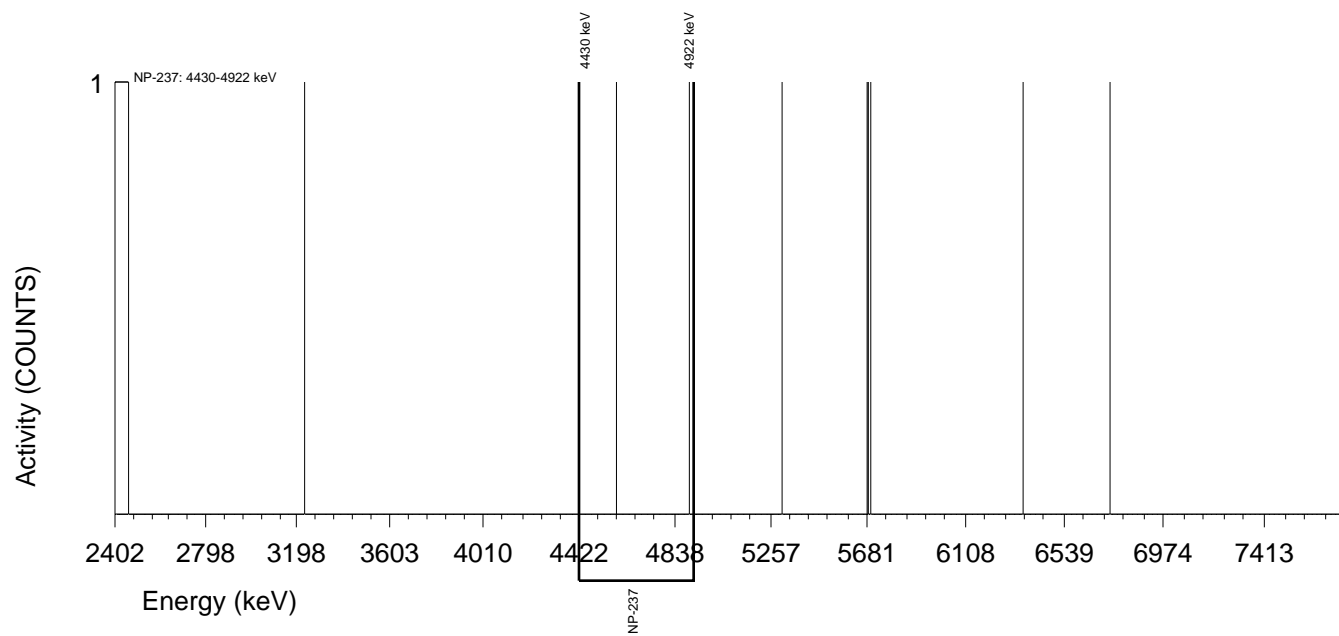
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S0405235006_NP SAMPLE QTY : 0.102 G +/-0.980 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 57.3 +/-5.466 %	CHAMBER : 169 DETECTOR S/N : 72548 AVERAGE %EFFICIENCY : 26.2282 AVERAGE %EFF ERROR : 0.5082 COUNT DATE : 30-Sep-2016 09:00:01 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B169.CNF;876 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W169.CNF;259 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 2.5567E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4746.59	305.610	2.000	0.080	1.920	1.3856	100.000	9.79E-03	4.50E-01	9.89E-01	3.11E-01	4.50E-01



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ALPHA SPECTROSCOPY REPORT

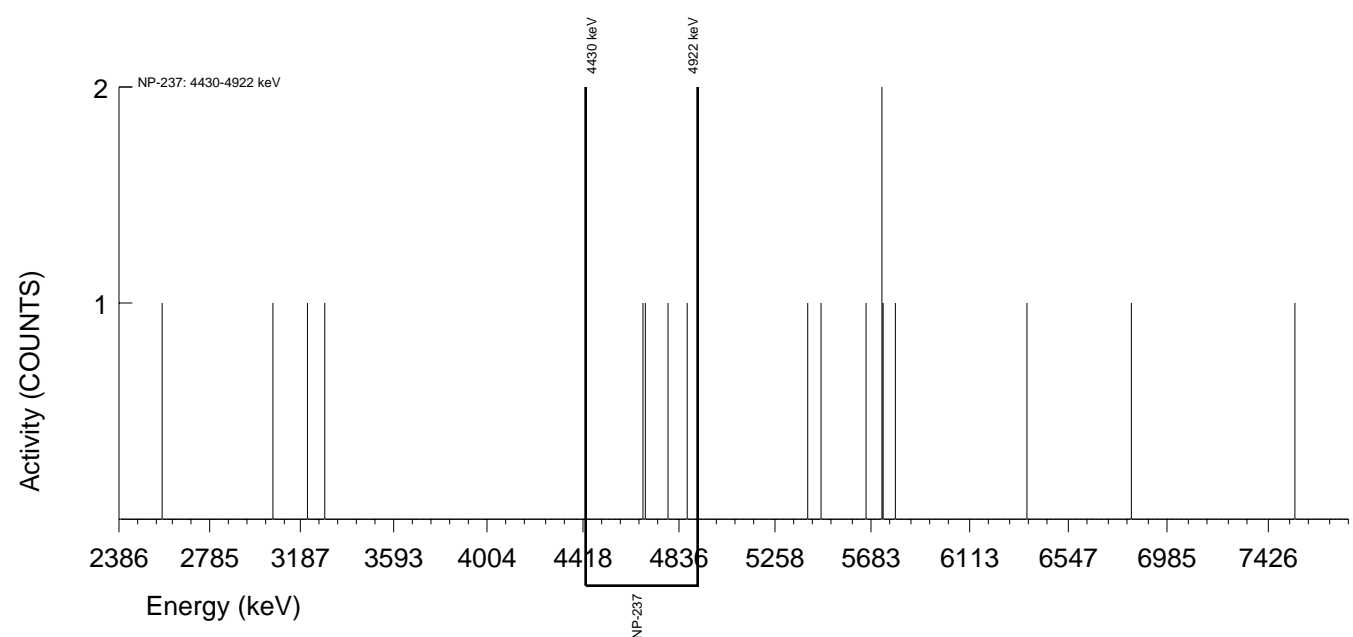
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S0405235007_NP SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 85.6 +/-5.243 %	CHAMBER : 170 DETECTOR S/N : 72549 AVERAGE %EFFICIENCY : 25.7306 AVERAGE %EFF ERROR : 0.4988 COUNT DATE : 30-Sep-2016 09:00:03 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B170.CNF;876 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W170.CNF;241 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.8176E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4762.26	188.297	4.000	2.800	1.200	1.0954	100.000	2.30E-01	3.72E-01	5.75E-01	1.64E-01	3.71E-01



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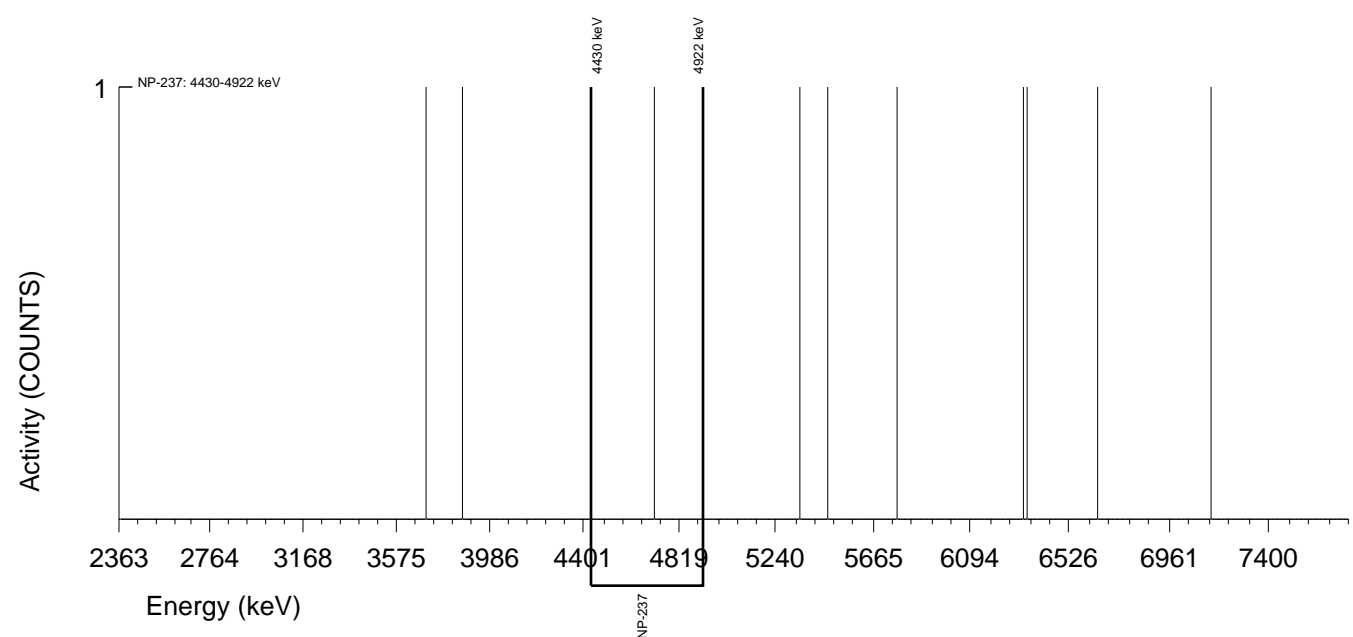
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S0405235008_NP SAMPLE QTY : 0.103 G +/-0.971 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 65.3 +/-5.387 %	CHAMBER : 175 DETECTOR S/N : 74433 AVERAGE %EFFICIENCY : 26.2713 AVERAGE %EFF ERROR : 0.5089 COUNT DATE : 30-Sep-2016 09:00:05 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B175.CNF;870 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W175.CNF;241 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 2.9152E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4708.58	4.982	1.000	0.520	0.480	0.6928	100.000	5.52E-02	3.07E-01	5.88E-01	1.35E-01	3.07E-01

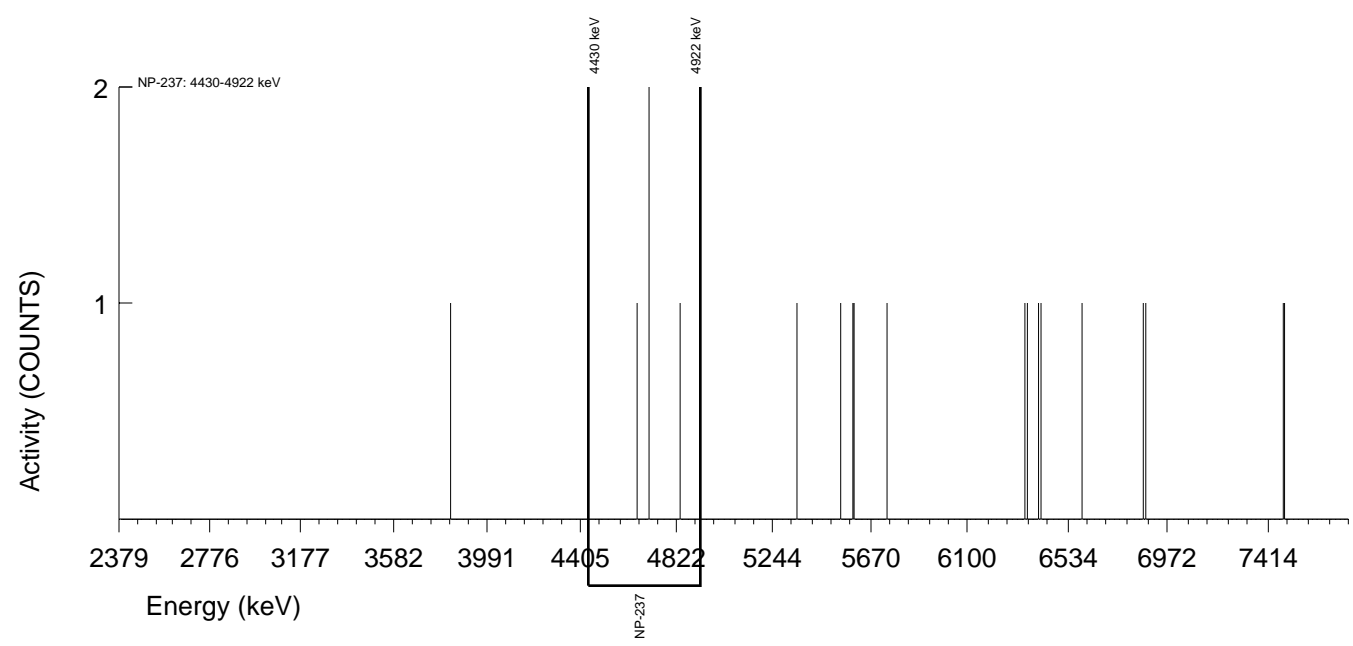


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 ALPHA SPECTROSCOPY REPORT

BATCH NUMBER : 1596392 SAMPLE ID : S0405235009_NP SAMPLE QTY : 0.100 G +/-1.000 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 62.2 +/-5.419 %	CHAMBER : 176 DETECTOR S/N : 74434 AVERAGE %EFFICIENCY : 25.6995 AVERAGE %EFF ERROR : 0.4981 COUNT DATE : 30-Sep-2016 09:00:08 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B176.CNF;865 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W176.CNF;237 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 2.7758E+02 dpm

NUCLIDE ACTIVITY SUMMARY													
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4722.64	4.935	4.000	2.080	1.920	1.3856	100.000	2.44E-01	5.41E-01	9.48E-01	2.98E-01	5.40E-01



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 ALPHA SPECTROSCOPY REPORT

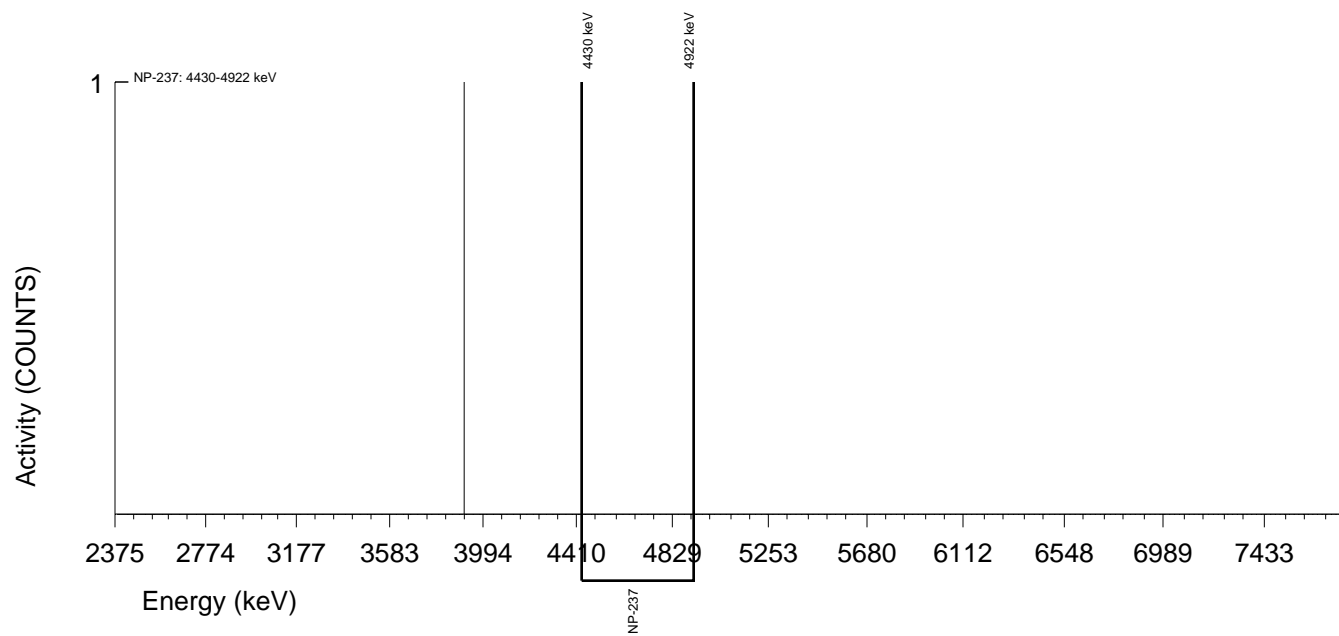
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S0405235010_NP SAMPLE QTY : 0.100 G +/-1.000 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 90.0 +/-5.224 %	CHAMBER : 177 DETECTOR S/N : 74435 AVERAGE %EFFICIENCY : 26.5935 AVERAGE %EFF ERROR : 0.5150 COUNT DATE : 30-Sep-2016 09:00:10 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B177.CNF;877 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W177.CNF;243 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 4.0138E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.28	0.000	0.000	-0.480	0.480	0.6928	100.000	-3.77E-02	1.67E-01	4.34E-01	9.96E-02	1.67E-01



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 ALPHA SPECTROSCOPY REPORT

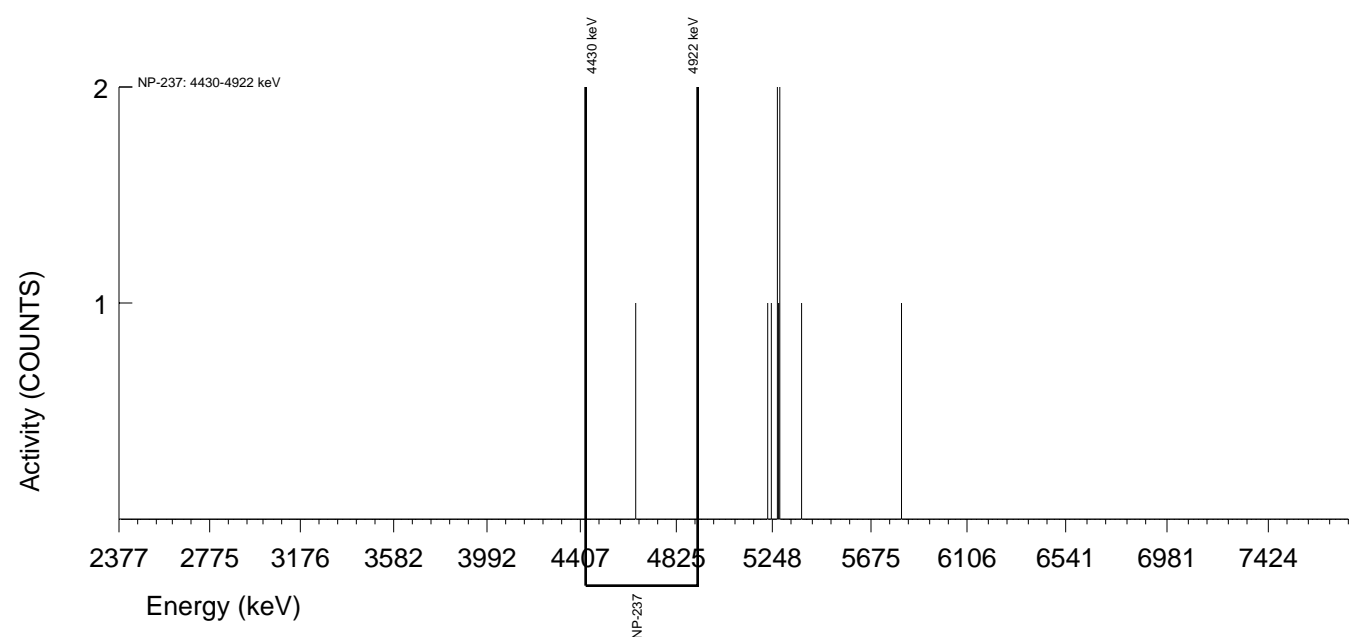
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S0405235011_NP SAMPLE QTY : 0.105 G +/-0.952 % SAMPLE DATE : 09-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 70.3 +/-5.350 %	CHAMBER : 179 DETECTOR S/N : 74437 AVERAGE %EFFICIENCY : 26.3751 AVERAGE %EFF ERROR : 0.5108 COUNT DATE : 30-Sep-2016 09:00:13 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B179.CNF;877 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W179.CNF;254 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.1371E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4646.74	4.941	1.000	0.520	0.480	0.6928	100.000	5.01E-02	2.79E-01	5.34E-01	1.22E-01	2.78E-01



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ALPHA SPECTROSCOPY REPORT

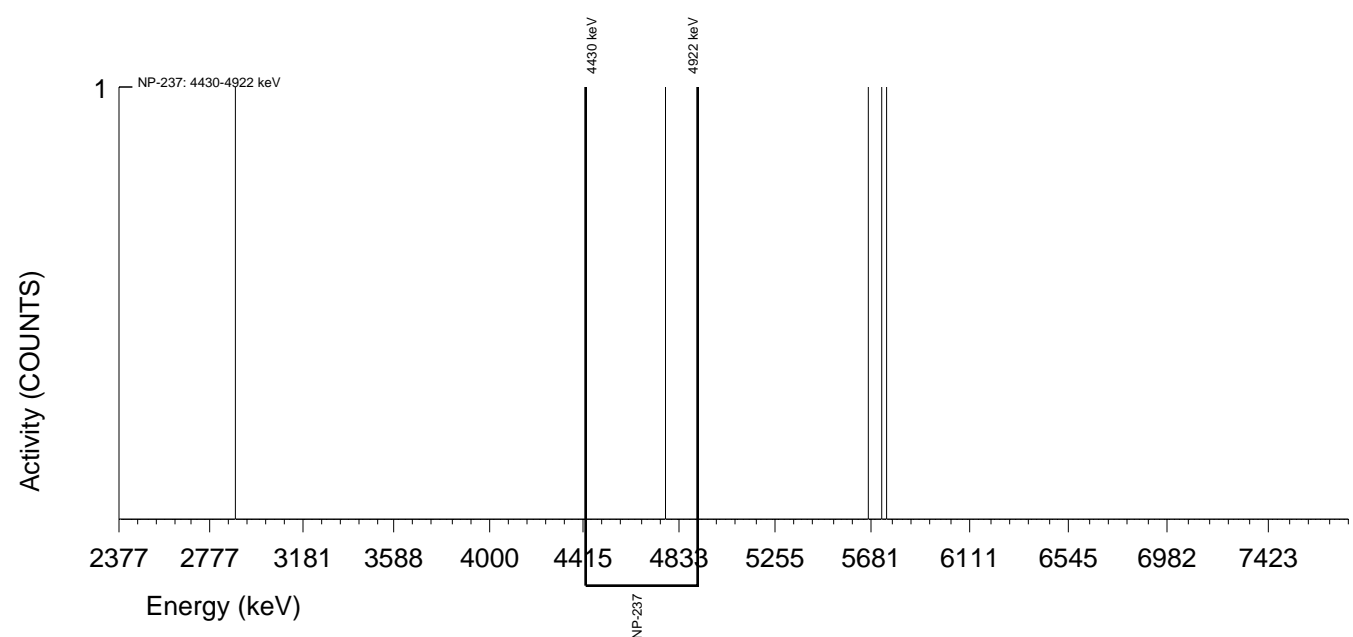
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S0405235012_NP SAMPLE QTY : 0.101 G +/-0.990 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 77.6 +/-5.298 %	CHAMBER : 180 DETECTOR S/N : 83295 AVERAGE %EFFICIENCY : 26.2740 AVERAGE %EFF ERROR : 0.5089 COUNT DATE : 30-Sep-2016 09:00:16 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B180.CNF;879 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W180.CNF;230 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.4637E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4775.35	4.978	1.000	0.280	0.720	0.8485	100.000	2.55E-02	2.67E-01	5.57E-01	1.42E-01	2.67E-01



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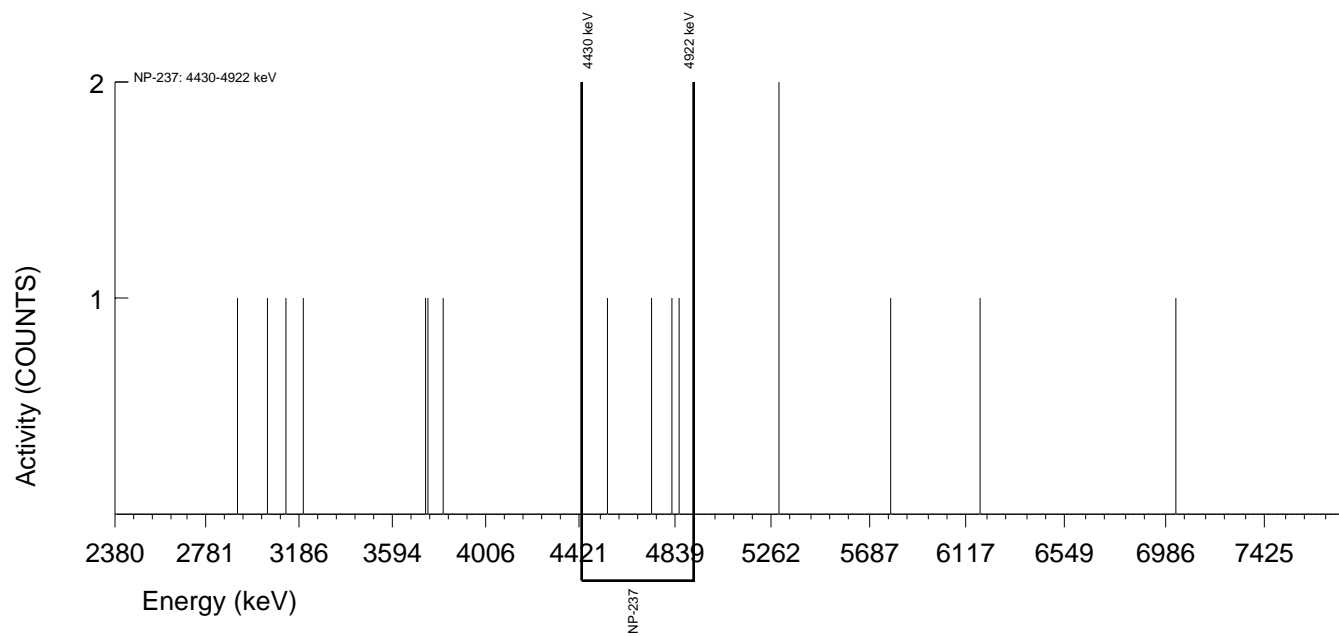
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S0405235013_NP SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 76.1 +/-5.310 %	CHAMBER : 185 DETECTOR S/N : 68615 AVERAGE %EFFICIENCY : 25.3535 AVERAGE %EFF ERROR : 0.4915 COUNT DATE : 30-Sep-2016 09:00:18 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B185.CNF;859 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W185.CNF;237 CAL DATE : 15-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.3956E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4738.33	304.433	4.000	1.360	2.640	1.6248	100.000	1.27E-01	4.38E-01	8.37E-01	2.78E-01	4.37E-01



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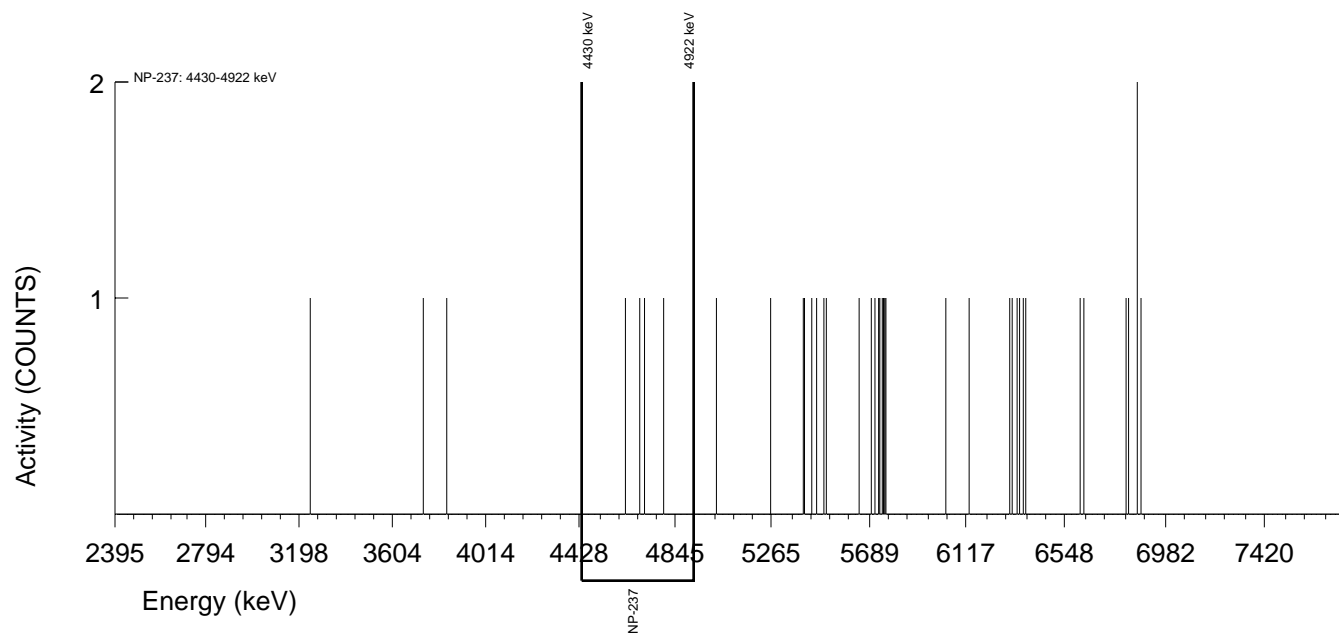
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S0405235014_NP SAMPLE QTY : 0.107 G +/-0.935 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 51.5 +/-5.559 %	CHAMBER : 186 DETECTOR S/N : 68616 AVERAGE %EFFICIENCY : 25.3981 AVERAGE %EFF ERROR : 0.4924 COUNT DATE : 30-Sep-2016 09:00:20 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B186.CNF;819 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W186.CNF;28 CAL DATE : 15-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 2.2991E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4703.71	164.122	4.000	1.120	2.880	1.6971	100.000	1.50E-01	6.30E-01	1.24E+00	4.17E-01	6.30E-01



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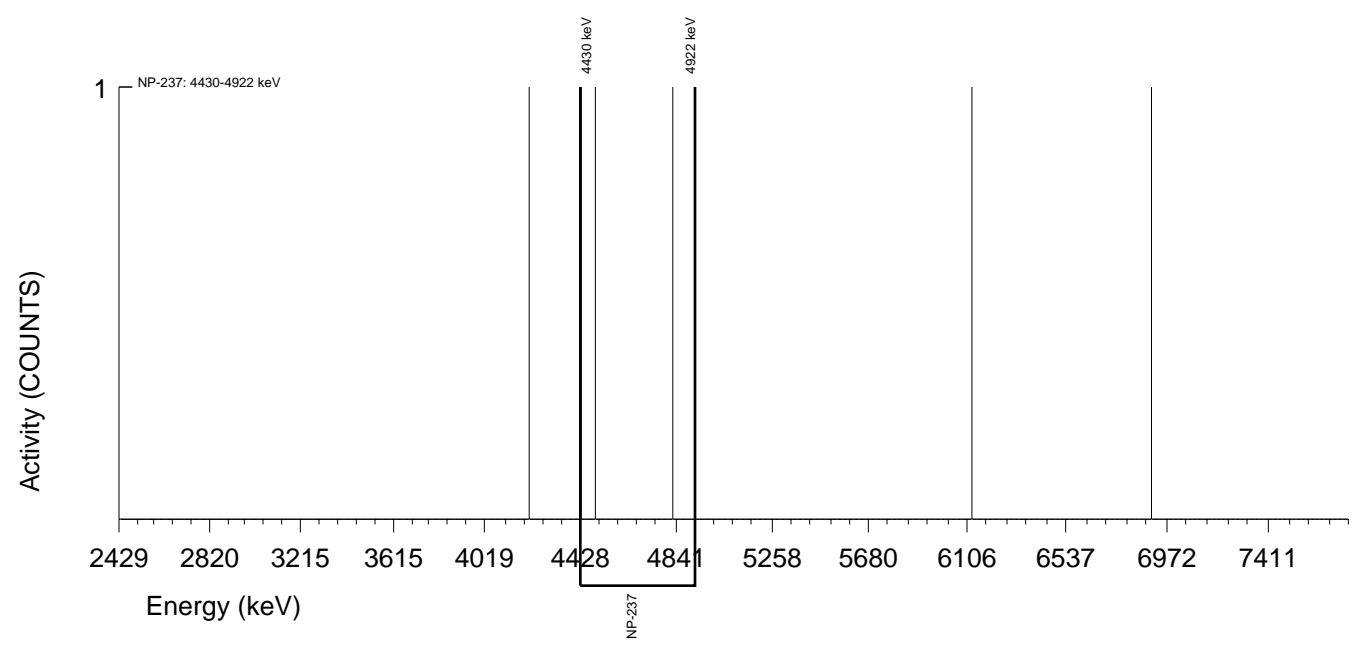
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S0405235015_NP SAMPLE QTY : 0.101 G +/-0.990 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 81.0 +/-5.282 %	CHAMBER : 188 DETECTOR S/N : 68621 AVERAGE %EFFICIENCY : 26.7276 AVERAGE %EFF ERROR : 0.5175 COUNT DATE : 30-Sep-2016 09:00:22 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B188.CNF;854 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W188.CNF;233 CAL DATE : 15-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.6118E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4585.78	379.131	3.000	0.840	2.160	1.4697	100.000	7.21E-02	3.60E-01	7.20E-01	2.31E-01	3.60E-01



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 ALPHA SPECTROSCOPY REPORT

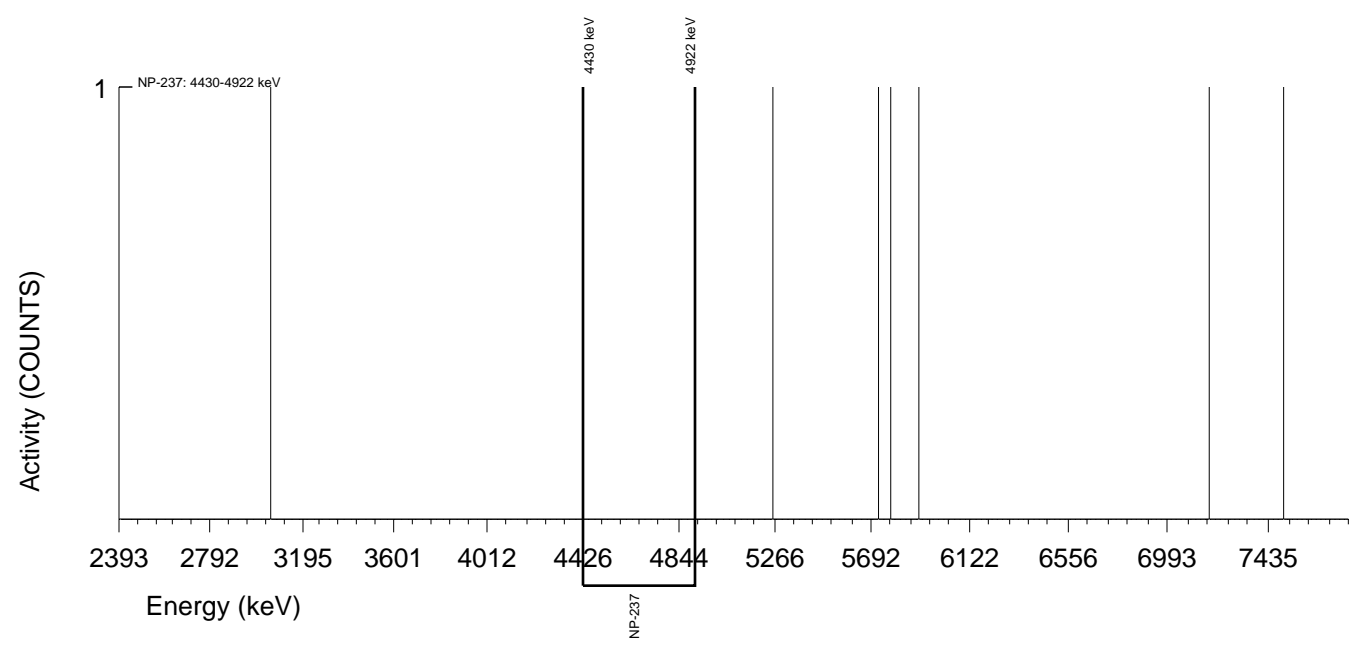
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S0405235016_NP SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 76.1 +/-5.316 %	CHAMBER : 195 DETECTOR S/N : 78786 AVERAGE %EFFICIENCY : 26.3844 AVERAGE %EFF ERROR : 0.5110 COUNT DATE : 30-Sep-2016 09:00:25 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B195.CNF;880 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W195.CNF;259 CAL DATE : 15-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.3935E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.33	0.000	0.000	-1.200	1.200	1.0954	100.000	-1.08E-01	2.05E-01	6.31E-01	1.80E-01	2.04E-01



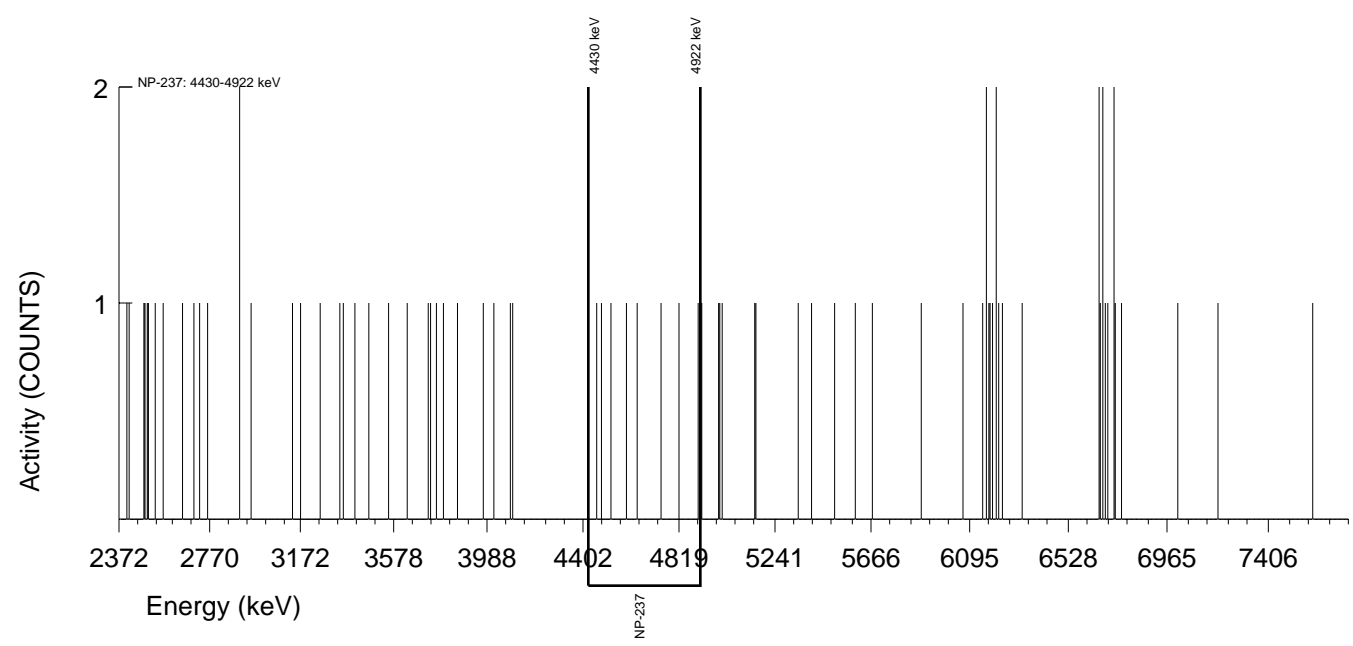
GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

BATCH NUMBER : 1596392 SAMPLE ID : S0405235017_NP SAMPLE QTY : 0.107 G +/-0.935 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 91.9 +/-5.225 %	CHAMBER : 197 DETECTOR S/N : 78894 AVERAGE %EFFICIENCY : 26.0674 AVERAGE %EFF ERROR : 0.5050 COUNT DATE : 30-Sep-2016 09:00:27 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B197.CNF;801 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W197.CNF;230 CAL DATE : 15-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 4.1010E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4703.08	0.000	10.000	2.080	7.920	2.8142	100.000	1.52E-01	5.17E-01	9.74E-01	3.77E-01	5.17E-01



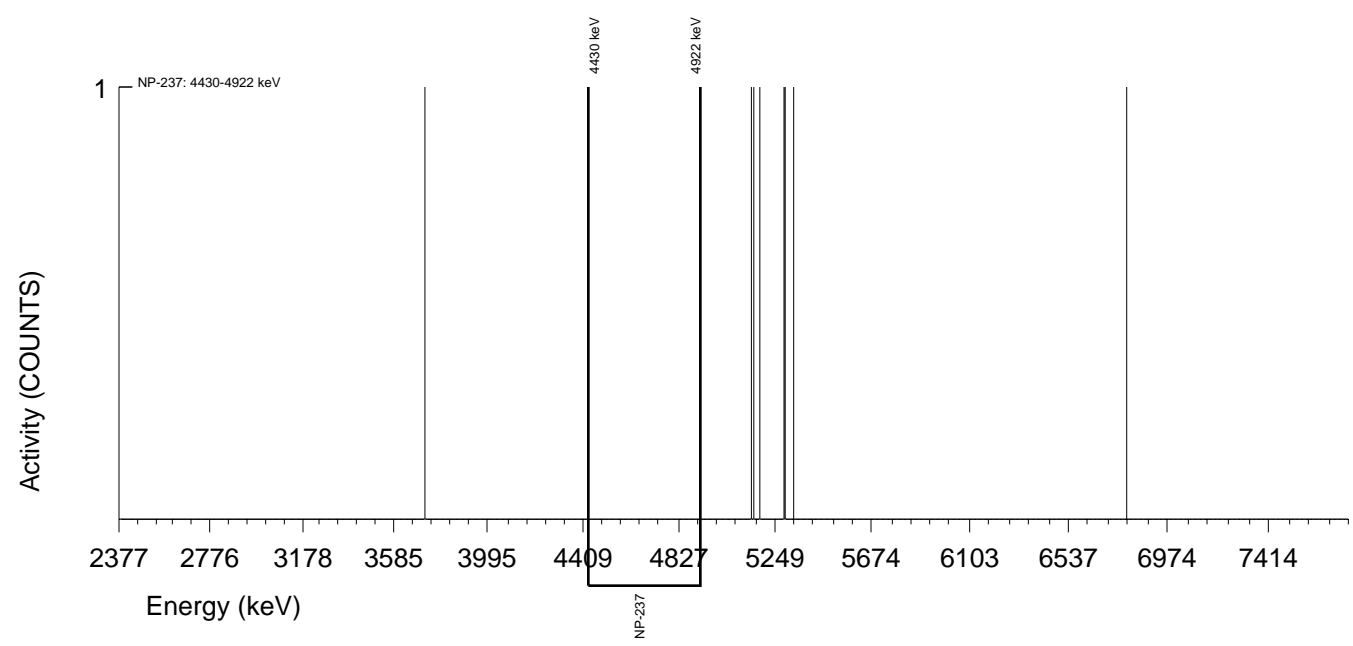
GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

BATCH NUMBER : 1596392 SAMPLE ID : S0405235018_NP SAMPLE QTY : 0.108 G +/-0.926 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 97.9 +/-5.198 %	CHAMBER : 199 DETECTOR S/N : 78896 AVERAGE %EFFICIENCY : 26.2038 AVERAGE %EFF ERROR : 0.5077 COUNT DATE : 30-Sep-2016 09:00:30 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B199.CNF;801 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W199.CNF;222 CAL DATE : 15-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 4.3679E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.34	0.000	0.000	-1.200	1.200	1.0954	100.000	-8.13E-02	1.54E-01	4.75E-01	1.36E-01	1.54E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

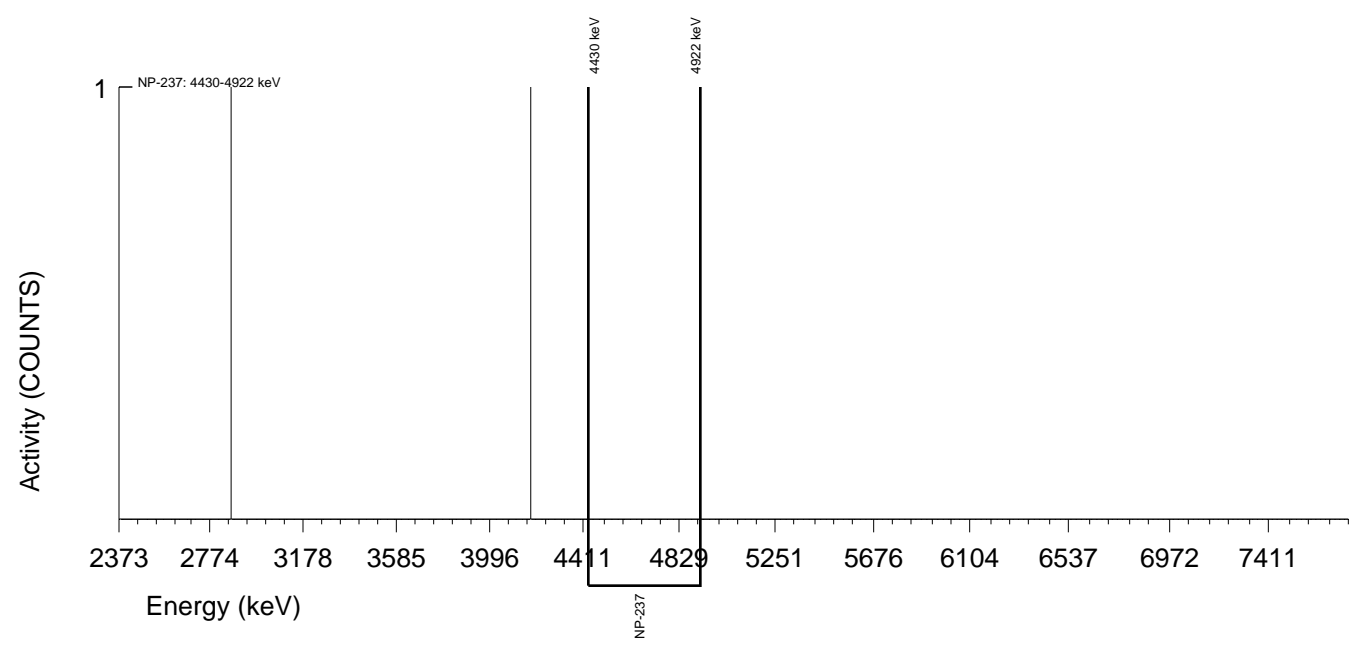
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S0405235019_NP SAMPLE QTY : 0.100 G +/-1.000 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 35.7 +/-5.900 %	CHAMBER : 182 DETECTOR S/N : 74440 AVERAGE %EFFICIENCY : 22.5384 AVERAGE %EFF ERROR : 0.4383 COUNT DATE : 30-Sep-2016 09:00:32 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B182.CNF;320 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W182.CNF;95 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 1.5921E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.39	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	4.71E-01	7.00E-01	0.00E+00	4.70E-01



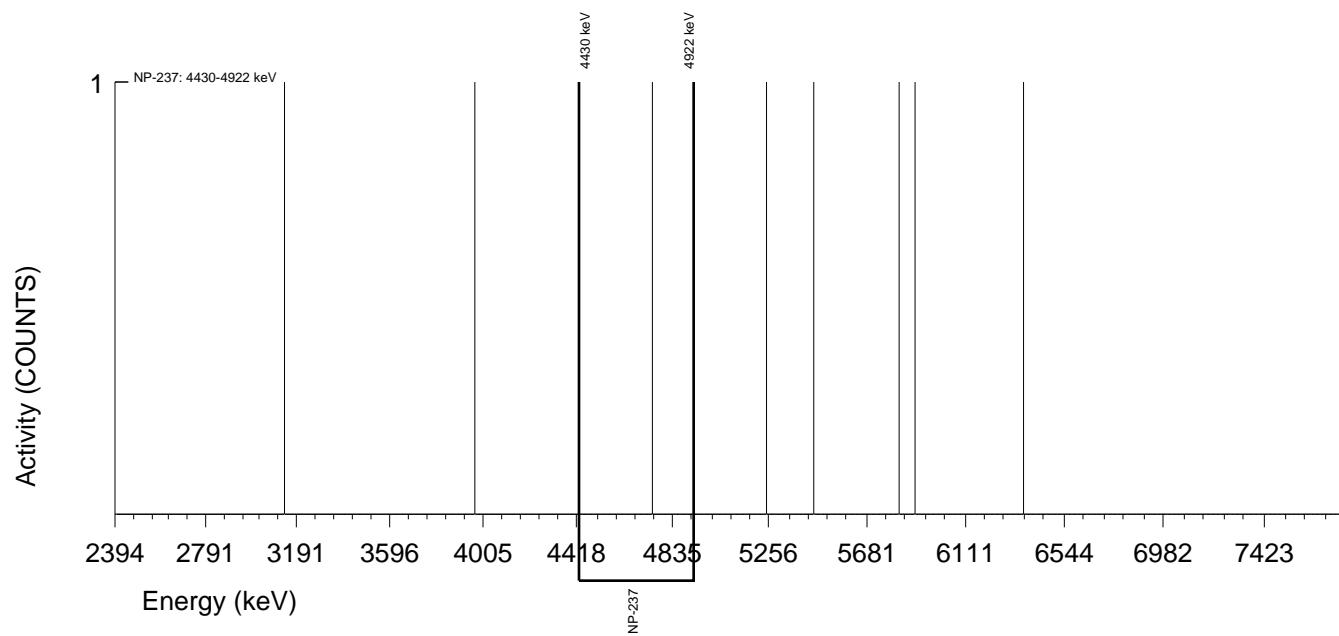
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S0405235020_NP SAMPLE QTY : 0.102 G +/-0.980 % SAMPLE DATE : 08-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 69.1 +/-5.376 %	CHAMBER : 200 DETECTOR S/N : 78900 AVERAGE %EFFICIENCY : 27.0654 AVERAGE %EFF ERROR : 0.5238 COUNT DATE : 30-Sep-2016 09:00:34 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B200.CNF;801 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W200.CNF;230 CAL DATE : 15-Sep-2016
TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 49.04044 NOMINAL : 4.4615E+02 dpm RESULTS : 3.0847E+02 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4745.79	4.930	1.000	-0.200	1.200	1.0954	100.000	-1.97E-02	2.95E-01	6.90E-01	1.97E-01	2.95E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

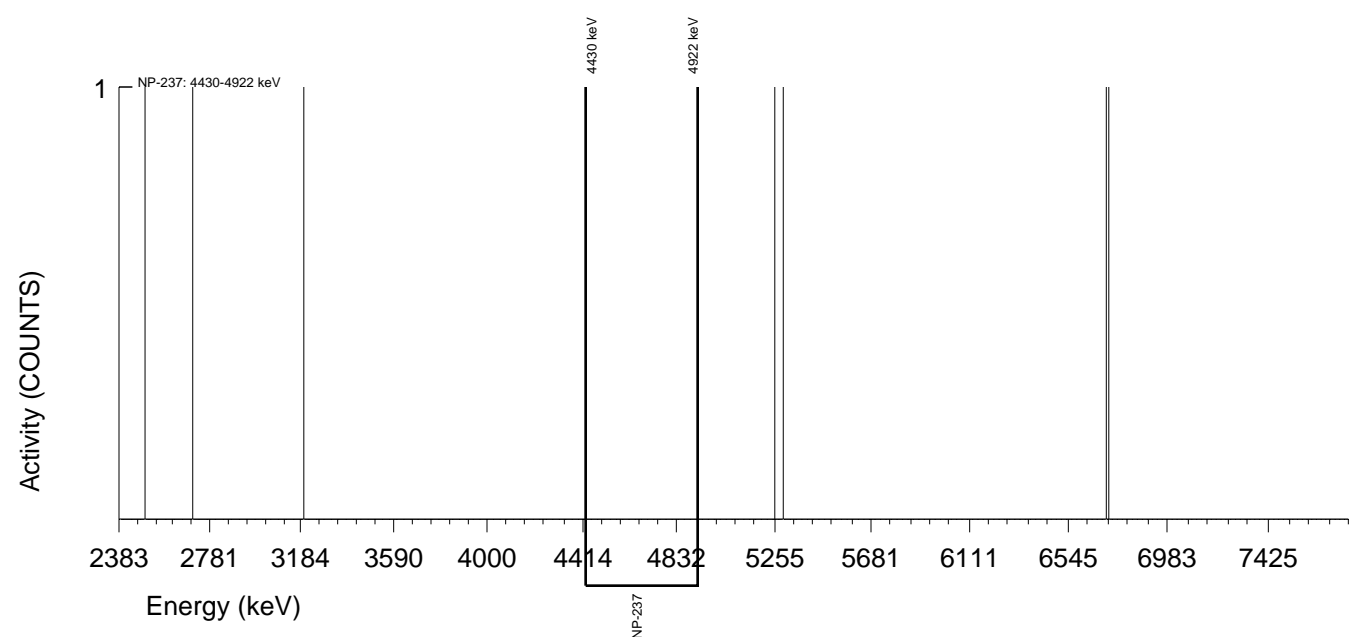
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S1203621697_NP SAMPLE QTY : 0.109 G +/-0.917 % SAMPLE DATE : 26-Sep-2016 00:00:00 ANALYST : JXH2 % YIELD : 93.9 +/-5.220 %	CHAMBER : 166 DETECTOR S/N : 74545 AVERAGE %EFFICIENCY : 26.6822 AVERAGE %EFF ERROR : 0.5167 COUNT DATE : 30-Sep-2016 09:00:37 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B166.CNF;891 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W166.CNF;299 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 4.1914E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.31	0.000	0.000	-0.240	0.240	0.4899	100.000	-1.65E-02	1.42E-01	3.29E-01	6.16E-02	1.42E-01



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 ALPHA SPECTROSCOPY REPORT

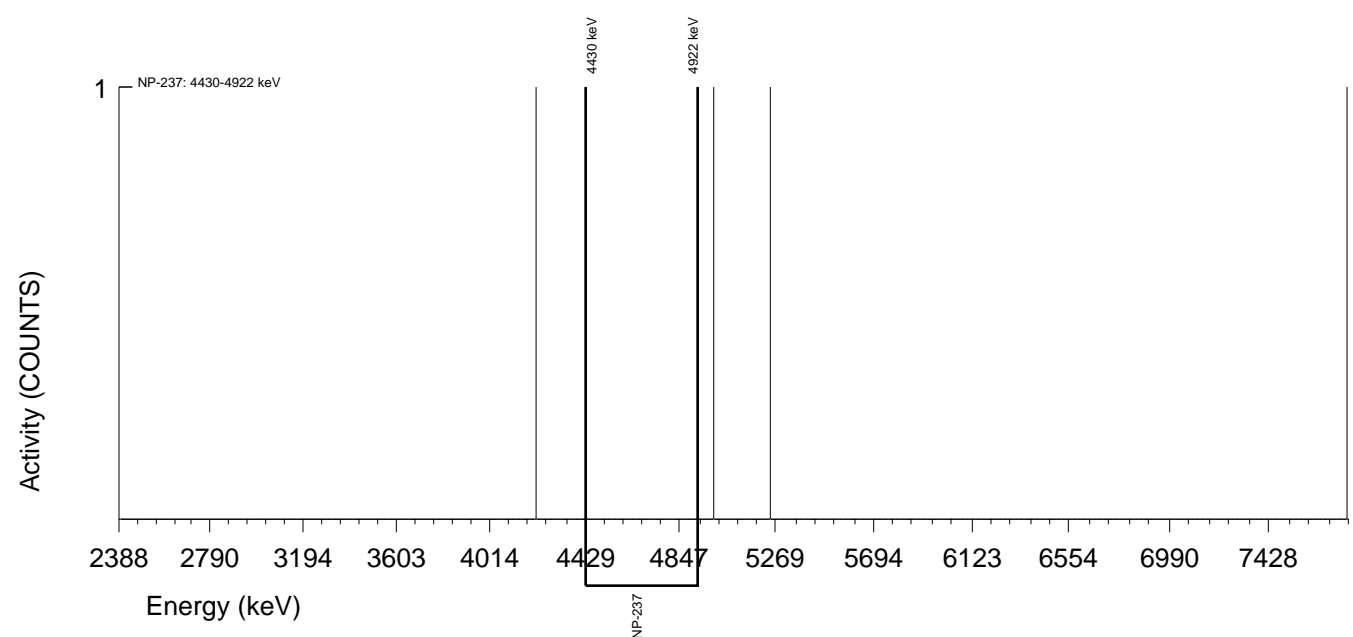
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S1203621698_NP SAMPLE QTY : 0.109 G +/-0.917 % SAMPLE DATE : 10-Dec-2015 00:00:00 ANALYST : JXH2 % YIELD : 39.1 +/-5.818 %	CHAMBER : 234 DETECTOR S/N : 87922 AVERAGE %EFFICIENCY : 24.8037 AVERAGE %EFF ERROR : 0.4811 COUNT DATE : 30-Sep-2016 09:00:39 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B234.CNF;454 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W234.CNF;117 CAL DATE : 19-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.04044
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 1.7425E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.42	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	3.59E-01	5.33E-01	0.00E+00	3.58E-01



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 ALPHA SPECTROSCOPY REPORT

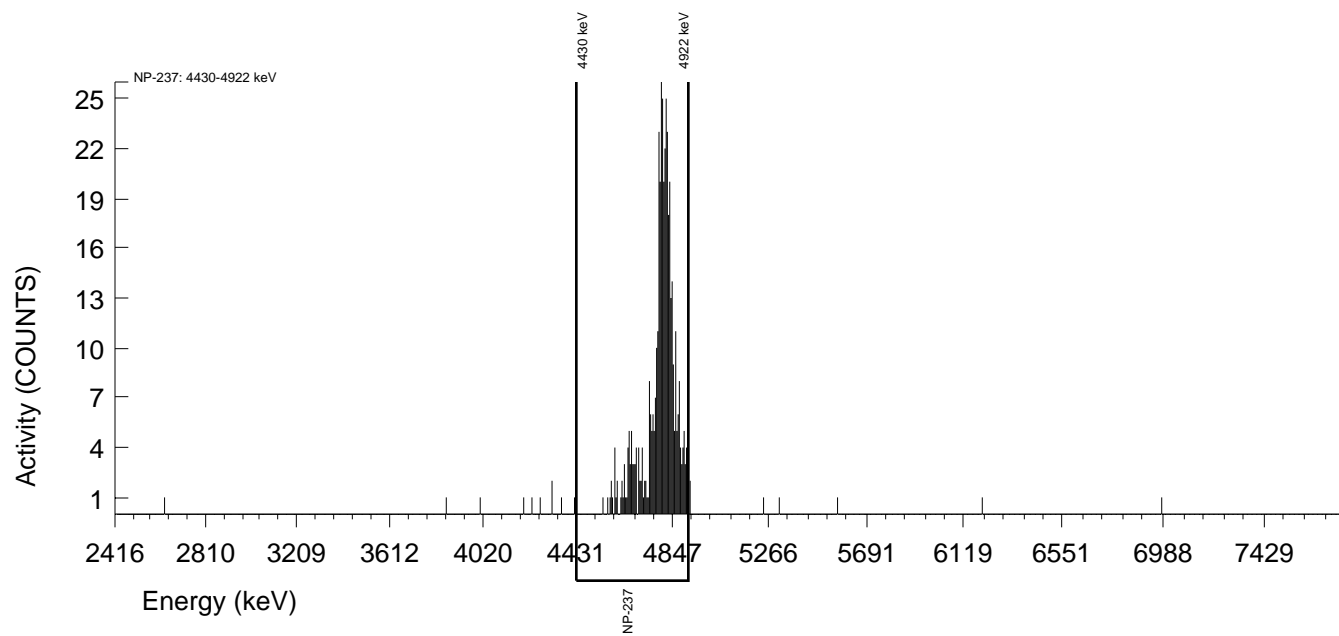
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596392 SAMPLE ID : S1203621699_NP SAMPLE QTY : 0.109 G +/-0.917 % SAMPLE DATE : 26-Sep-2016 00:00:00 ANALYST : JXH2 % YIELD : 71.2 +/-5.365 %	CHAMBER : 189 DETECTOR S/N : 68622 AVERAGE %EFFICIENCY : 25.4050 AVERAGE %EFF ERROR : 0.4925 COUNT DATE : 30-Sep-2016 09:00:42 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B189.CNF;855 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W189.CNF;231 CAL DATE : 15-Sep-2016
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TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 49.04044 NOMINAL : 4.4615E+02 dpm RESULTS : 3.1759E+02 dpm	LCS ID 0518-S NUCLIDE NP-237 NOMINAL (pCi/G) 4.0967E+01 % RECOVERY 103.092
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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4794.02	59.040	445.000	443.560	1.440	1.2000	100.000	4.22E+01	6.20E+00	7.04E-01	2.09E-01	3.94E+00



Batch# 1596420 Product: Np Date: 9/25/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	Der# 1561187
Sample was correctly preserved if required.			NA
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		Der# 1561187
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		Der# 1561187
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: MM David Deyard 9/25/16

Secondary Review Performed By: Joni Davis 09/30/16

1014

DATA EXCEPTION REPORT

Mo.Day Yr. 25-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: ASTM C 1475-00 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596420	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, and 1203621767 were received and analyzed out of holding.		1. Reporting results.	

Originator's Name:

Melanie Aycock 25-SEP-16

Data Validator/Group Leader:

Jessica Davis 30-SEP-16

Neptunium Queue Sheet

15-SEP-16

Batch #: 1596420 Analyst: KXB2 First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16 Routine #: 3
 Tracer Isotope: Am-243 (Np-239) Tracer Code: 445-992-III Expiration Date: 9-30-16 Vol: 0.1 REF #: 9245
 LCS Isotope: Np-237 LCS Code: 051805 Expiration Date: 7-18-17 Vol: 0.1 BKG #: 91
 Spike Isotope: Np-237 Spike Code: - Expiration Date: - Balance ID: 16107662 Witness: Tex 9-20-16
 Prep Date: 9-20-16 Initials: KB Pipet ID: 1840022 Np Separation Date/Time: 9/20/16 1500

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/L/F)	GFPC	Np Det #
405235061-1	5.1B.R.2.2	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	1	0-106	21		162
405235062-1	5.2A.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	2	0-102	22		163
405235063-1	5.2A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	3	0-104	23		164
405235064-1	5.2A.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	4	0-101	24		167
405235065-1	5.2A.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	5	0-105	25		149
405235066-1	5.2A.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	14-DEC-15	6	0-110	26		170
405235067-1	5.2A.R.6.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	7	0-103	27		175
405235068-1	5.2A.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	8	0-108	28		176
405235069-1	5.2B.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	16-DEC-15	9	0-105	29		177
405235070-1	5.2B.R.3.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	10	0-104	30		179
405235071-1	5.2B.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	11	0-109	31		180
405235072-1	5.2B.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	15-DEC-15	12	0-100	32		181
405235073-1	5.2B.R.8.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	13	0-103	33		182
405235074-1	5.3A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	15-DEC-15	14	0-105	34		184
405235075-1	5.4A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	16-DEC-15	15	0-107	35		185
405235076-1	5.4A.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	11-DEC-15	16	0-103	36		186
405235077-1	5.5A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	17-DEC-15	17	0-110	37		188
405235078-1	5.6A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	17-DEC-15	18	0-104	38		189
1203621766-1	MB for batch 1596420	MB		1 pCi/g	SOIL	QC ACCOUNT		19	0-110	39		191
1203621767-1	5.1B.R.2.2(405235061DUP)	DUP		1 pCi/g	SOIL	QC ACCOUNT	14-DEC-15	20	0-101	40		195
1203621768-1	LCS for batch 1596420	LCS		1 pCi/g	SOIL	QC ACCOUNT		21	0-110	41		197

Solid Sample Dissolution by LEACH or DIGESTION
 Circle One

Data Reviewed By: M. J. G. 9/25/16

Sample ID	Net Beta Cts	Count time	Count Date/Time	Separation Date/Time	Decay Corr Counts	% NP Yield	Delta T (min)	Gross Counts	File type :
405235061.1	1601	15	9/21/2016 10:00	9/20/2016 15:00	2024.00	62.19%	1140.0	1605	Excel
405235062.1	2143	15	9/21/2016 10:15	9/20/2016 15:00	2717.71	83.50%	1155.4	2147	Version # : 1.2.2
405235063.1	1911	15	9/21/2016 10:30	9/20/2016 15:00	2431.11	74.70%	1170.7	1915	
405235064.1	1656	15	9/21/2016 10:46	9/20/2016 15:00	2113.32	64.93%	1186.1	1660	
405235065.1	1492	15	9/21/2016 11:01	9/20/2016 15:00	1910.01	58.69%	1201.4	1496	
405235066.1	1886	15	9/21/2016 11:16	9/20/2016 15:00	2421.98	74.42%	1216.8	1890	
405235067.1	2063	15	9/21/2016 11:32	9/20/2016 15:00	2657.61	81.66%	1232.1	2067	
405235068.1	2108	15	9/21/2016 11:47	9/20/2016 15:00	2724.11	83.70%	1247.5	2112	
405235069.1	2240	15	9/21/2016 12:02	9/20/2016 15:00	2903.78	89.22%	1262.8	2244	
405235070.1	2032	15	9/21/2016 12:18	9/20/2016 15:00	2642.42	81.19%	1278.2	2036	
405235071.1	1546	15	9/21/2016 12:33	9/20/2016 15:00	2016.74	61.97%	1293.5	1550	
405235072.1	2177	15	9/21/2016 12:48	9/20/2016 15:00	2848.79	87.53%	1308.9	2181	
405235073.1	1884	15	9/21/2016 13:04	9/20/2016 15:00	2473.12	75.99%	1324.2	1888	
405235074.1	2035	15	9/21/2016 13:19	9/20/2016 15:00	2679.72	82.34%	1339.6	2039	
405235075.1	2178	15	9/21/2016 13:34	9/20/2016 15:00	2877.04	88.40%	1354.9	2182	
405235076.1	2207	15	9/21/2016 13:50	9/20/2016 15:00	2924.50	89.86%	1370.3	2211	
405235077.1	2067	15	9/21/2016 15:37	9/20/2016 15:00	2799.78	86.03%	1477.7	2071	
405235078.1	2219	15	9/21/2016 15:53	9/20/2016 15:00	3015.11	92.64%	1493.1	2223	
1203621766.1	953	15	9/21/2016 16:08	9/20/2016 15:00	1298.97	39.91%	1508.4	957	
1203621767.1	1526	15	9/21/2016 16:23	9/20/2016 15:00	2086.53	64.11%	1523.8	1530	
1203621768.1	1960	15	9/21/2016 16:39	9/20/2016 15:00	2688.35	82.60%	1539.1	1964	
BKG	0	15	9/21/2016 8:43	9/20/2016 15:00	0.00	0.00%	1063.3		

Sample ID	Carrier	Alpha	Beta	Count time	Voltage	Date/Time
REF	92	2007	3644	15	1545	9/21/16 8:58
REF	93	1986	3535	15	1545	9/21/16 9:13
REF	94	1948	3621	15	1545	9/21/16 9:29
REF	95	2043	3614	15	1545	9/21/16 15:19
405235061.1	21	72	1605	15	1545	9/21/16 10:00
405235062.1	22	94	2147	15	1545	9/21/16 10:15
405235063.1	23	82	1915	15	1545	9/21/16 10:30
405235064.1	24	61	1660	15	1545	9/21/16 10:46
405235065.1	25	45	1496	15	1545	9/21/16 11:01
405235066.1	26	100	1890	15	1545	9/21/16 11:16
405235067.1	27	104	2057	15	1545	9/21/16 11:32
405235068.1	28	101	2112	15	1545	9/21/16 11:47
405235069.1	29	110	2244	15	1545	9/21/16 12:02
405235070.1	30	102	2036	15	1545	9/21/16 12:18
405235071.1	31	85	1550	15	1545	9/21/16 12:33
405235072.1	32	97	2181	15	1545	9/21/16 12:48
405235073.1	33	101	1888	15	1545	9/21/16 13:04
405235074.1	34	105	2039	15	1545	9/21/16 13:19
405235075.1	35	105	2182	15	1545	9/21/16 13:34
405235076.1	36	106	2211	15	1545	9/21/16 13:50
405235077.1	37	101	2071	15	1545	9/21/16 15:37
405235078.1	38	94	2223	15	1545	9/21/16 15:53
1203621766.1	39	56	957	15	1545	9/21/16 16:08
1203621767.1	40	79	1530	15	1545	9/21/16 16:23
1203621768.1	41	138	1964	15	1545	9/21/16 16:39
BKG	91	6	4	15	1545	9/21/16 8:43

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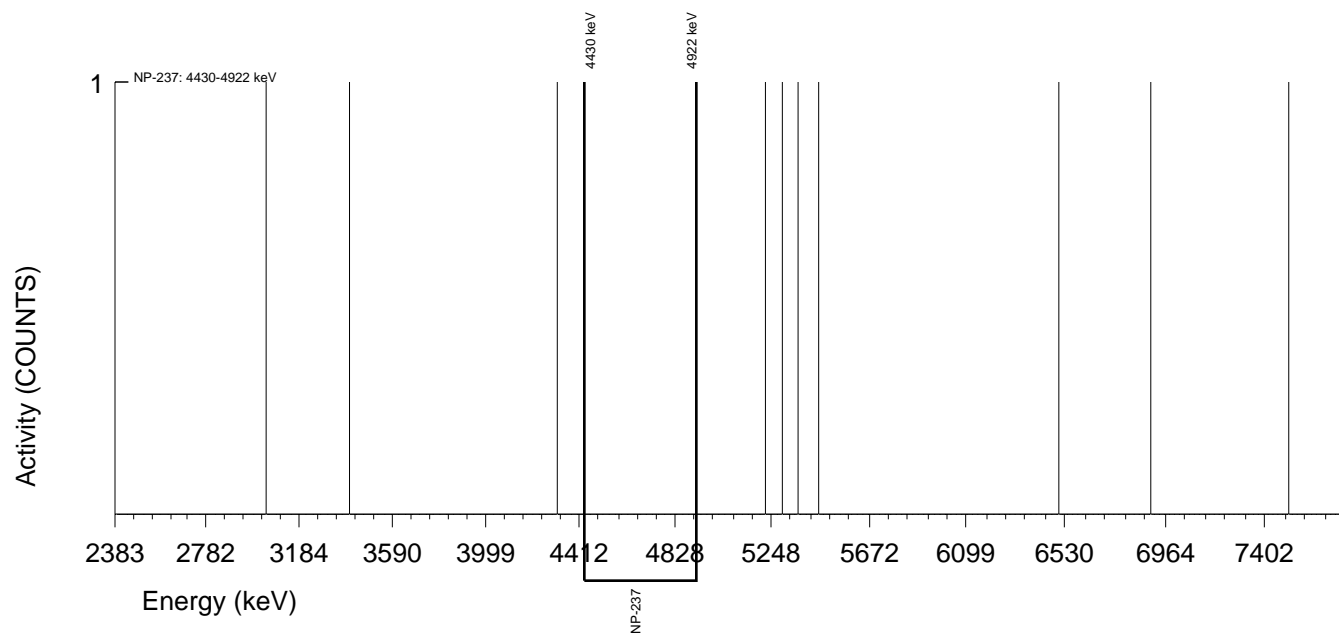
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S0405235061_NP SAMPLE QTY : 0.106 G +/-0.943 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 62.2 +/-5.408 %	CHAMBER : 162 DETECTOR S/N : 70323 AVERAGE %EFFICIENCY : 26.6669 AVERAGE %EFF ERROR : 0.5165 COUNT DATE : 22-Sep-2016 09:59:26 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B162.CNF;860 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W162.CNF;260 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.63157
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 2.7746E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.38	0.000	0.000	-0.960	0.960	0.9798	100.000	-1.02E-01	2.38E-01	7.04E-01	1.92E-01	2.37E-01



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ALPHA SPECTROSCOPY REPORT

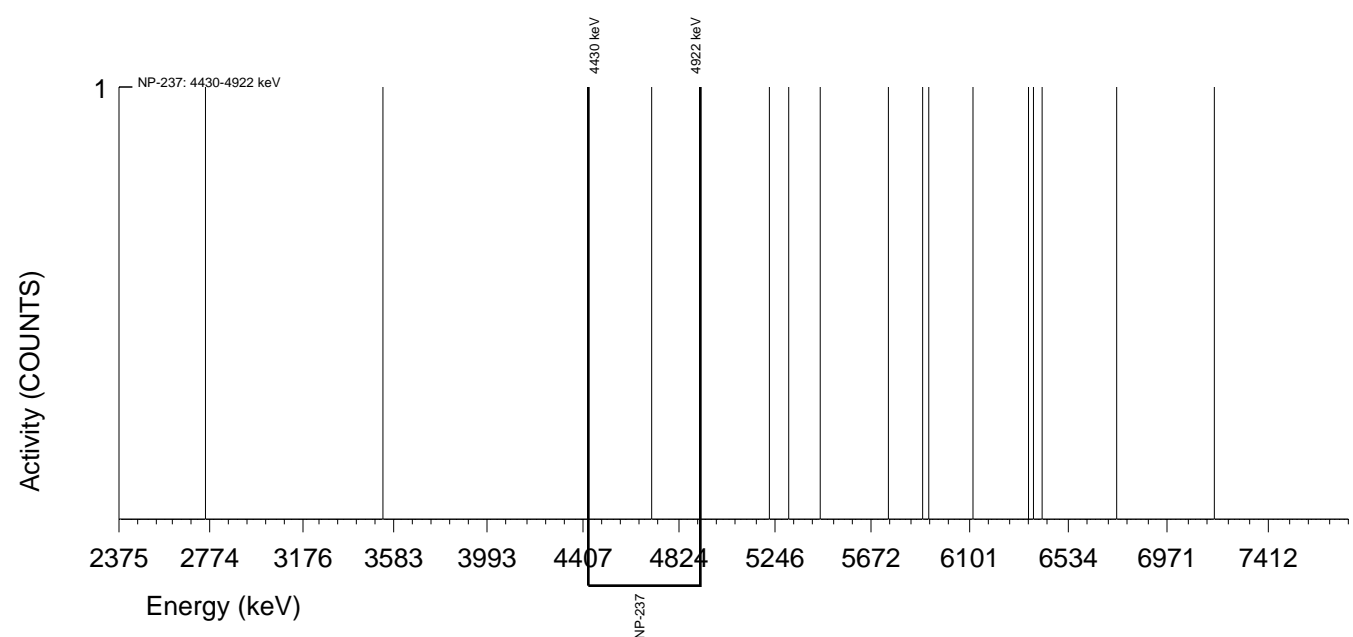
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S0405235062_NP SAMPLE QTY : 0.102 G +/-0.980 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 83.5 +/-5.259 %	CHAMBER : 163 DETECTOR S/N : 80056 AVERAGE %EFFICIENCY : 25.6920 AVERAGE %EFF ERROR : 0.4979 COUNT DATE : 22-Sep-2016 09:59:28 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B163.CNF;905 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W163.CNF;238 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.63157
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.7256E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4709.20	4.957	1.000	0.280	0.720	0.8485	100.000	2.40E-02	2.51E-01	5.24E-01	1.33E-01	2.51E-01



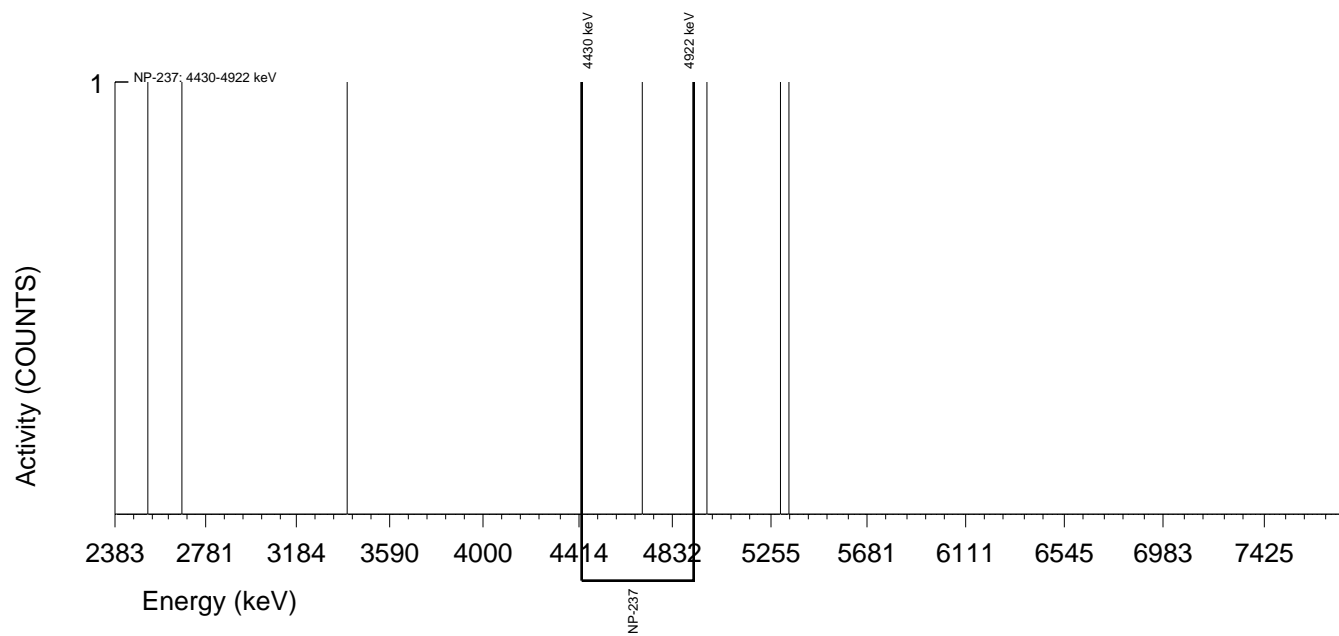
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Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S0405235063_NP SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 74.7 +/-5.313 %	CHAMBER : 166 DETECTOR S/N : 74545 AVERAGE %EFFICIENCY : 26.6822 AVERAGE %EFF ERROR : 0.5167 COUNT DATE : 22-Sep-2016 09:59:30 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B166.CNF;889 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W166.CNF;299 CAL DATE : 13-Sep-2016
TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.63157 NOMINAL : 4.4615E+02 dpm RESULTS : 3.3327E+02 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4696.15	4.953	1.000	0.520	0.480	0.6928	100.000	4.71E-02	2.62E-01	5.01E-01	1.15E-01	2.62E-01



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ALPHA SPECTROSCOPY REPORT

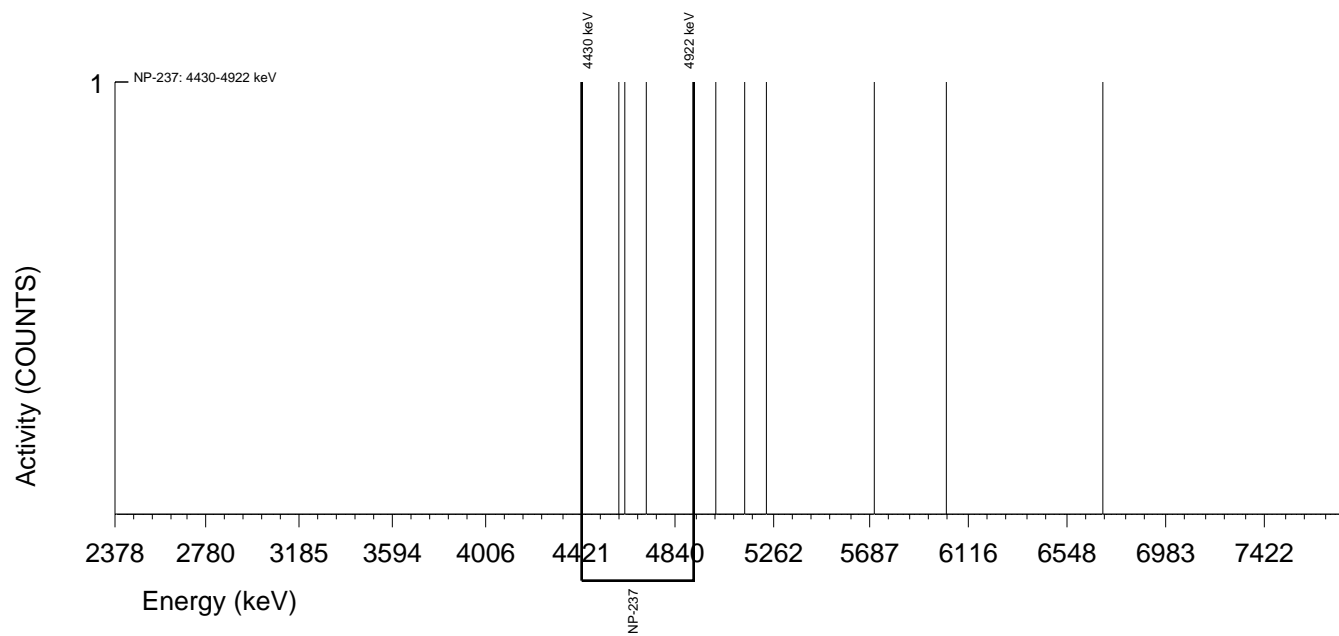
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S0405235064_NP SAMPLE QTY : 0.101 G +/-0.990 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 64.9 +/-5.389 %	CHAMBER : 167 DETECTOR S/N : 72546 AVERAGE %EFFICIENCY : 24.1606 AVERAGE %EFF ERROR : 0.4690 COUNT DATE : 22-Sep-2016 09:59:33 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B167.CNF;884 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W167.CNF;246 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.63157
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 2.8971E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4636.75	120.032	3.000	2.040	0.960	0.9798	100.000	2.42E-01	4.82E-01	7.81E-01	2.13E-01	4.81E-01



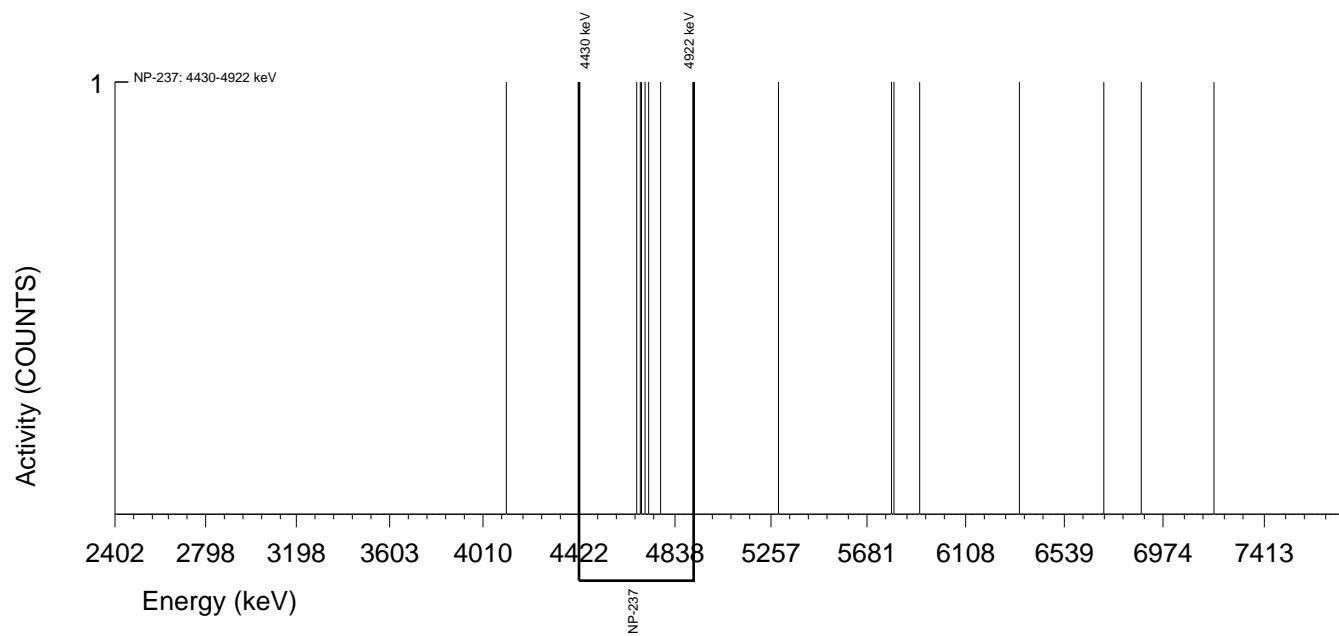
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Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S0405235065_NP SAMPLE QTY : 0.105 G +/-0.952 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 58.7 +/-5.451 %	CHAMBER : 169 DETECTOR S/N : 72548 AVERAGE %EFFICIENCY : 26.2282 AVERAGE %EFF ERROR : 0.5082 COUNT DATE : 22-Sep-2016 09:59:35 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B169.CNF;874 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W169.CNF;259 CAL DATE : 13-Sep-2016
TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.63157 NOMINAL : 4.4615E+02 dpm RESULTS : 2.6183E+02 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4714.48	103.513	6.000	5.520	0.480	0.6928	100.000	6.41E-01	6.14E-01	6.43E-01	1.47E-01	6.10E-01



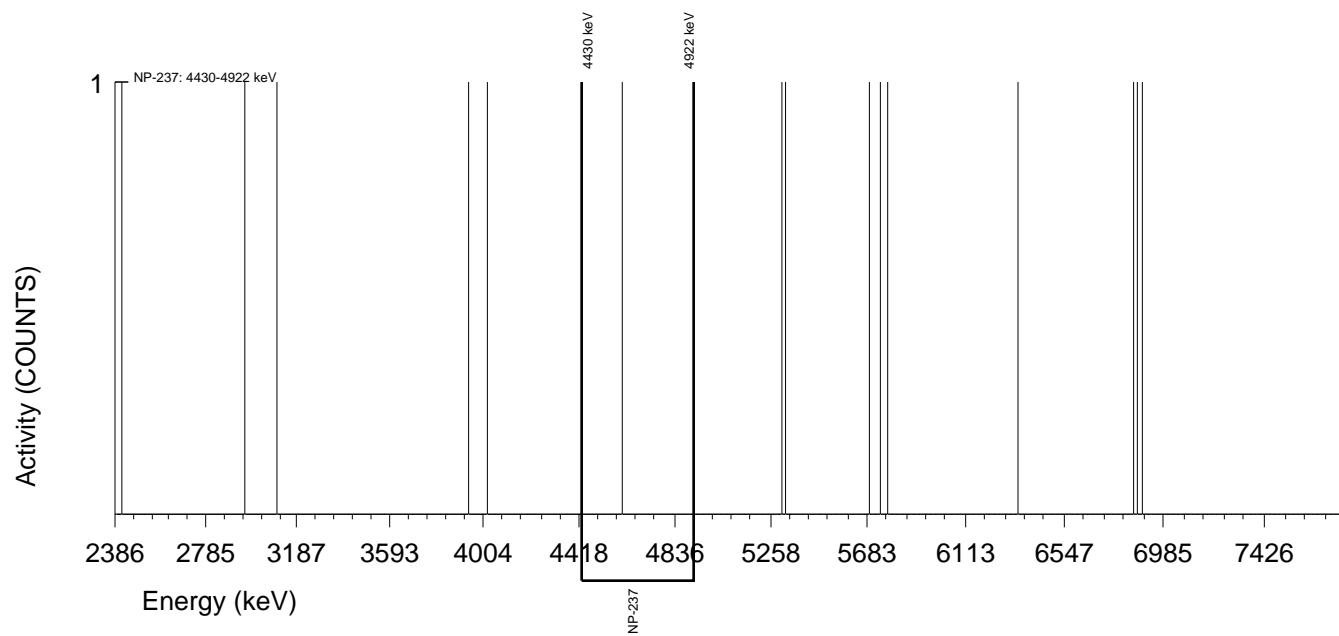
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Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S0405235066_NP SAMPLE QTY : 0.110 G +/-0.909 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 74.4 +/-5.319 %	CHAMBER : 170 DETECTOR S/N : 72549 AVERAGE %EFFICIENCY : 25.7306 AVERAGE %EFF ERROR : 0.4988 COUNT DATE : 22-Sep-2016 09:59:38 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B170.CNF;874 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W170.CNF;241 CAL DATE : 13-Sep-2016
TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.63157 NOMINAL : 4.4615E+02 dpm RESULTS : 3.3202E+02 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4610.53	4.955	1.000	-0.680	1.680	1.2961	100.000	-6.06E-02	2.74E-01	6.90E-01	2.12E-01	2.74E-01



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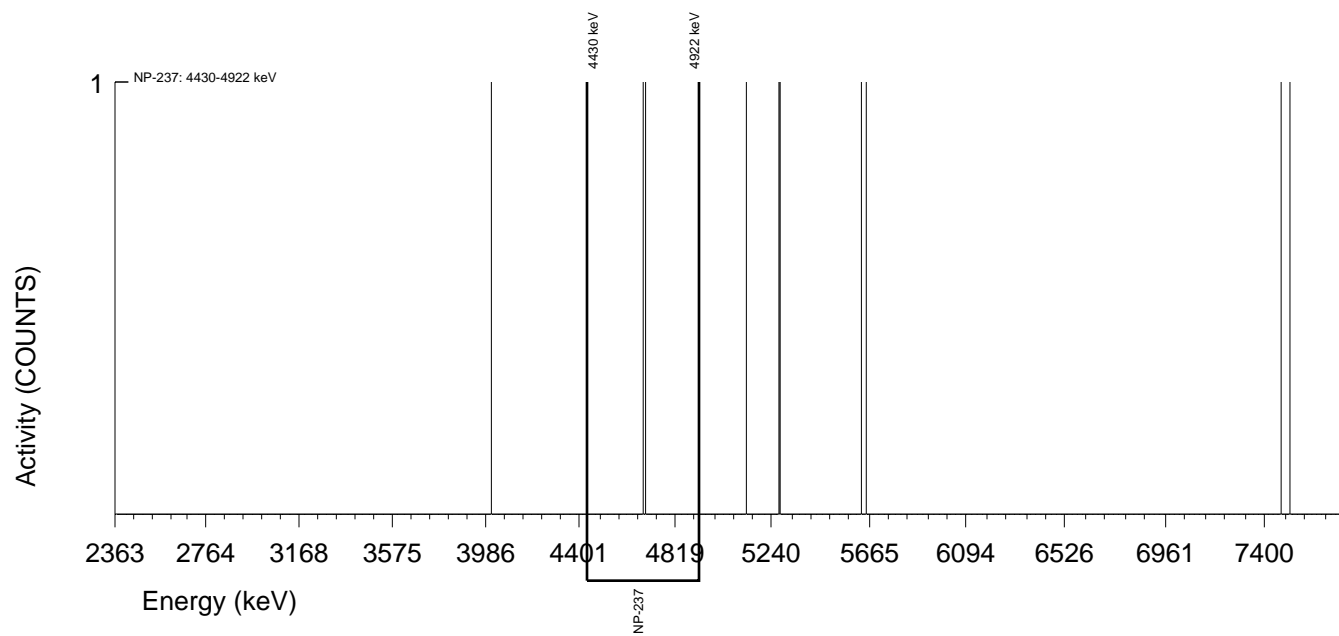
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S0405235067_NP SAMPLE QTY : 0.103 G +/-0.971 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 81.7 +/-5.276 %	CHAMBER : 175 DETECTOR S/N : 74433 AVERAGE %EFFICIENCY : 26.2713 AVERAGE %EFF ERROR : 0.5089 COUNT DATE : 22-Sep-2016 09:59:40 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B175.CNF;868 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W175.CNF;241 CAL DATE : 13-Sep-2016
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TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.63157 NOMINAL : 4.4615E+02 dpm RESULTS : 3.6432E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4682.41	14.947	2.000	0.800	1.200	1.0954	100.000	6.80E-02	3.05E-01	5.96E-01	1.70E-01	3.05E-01



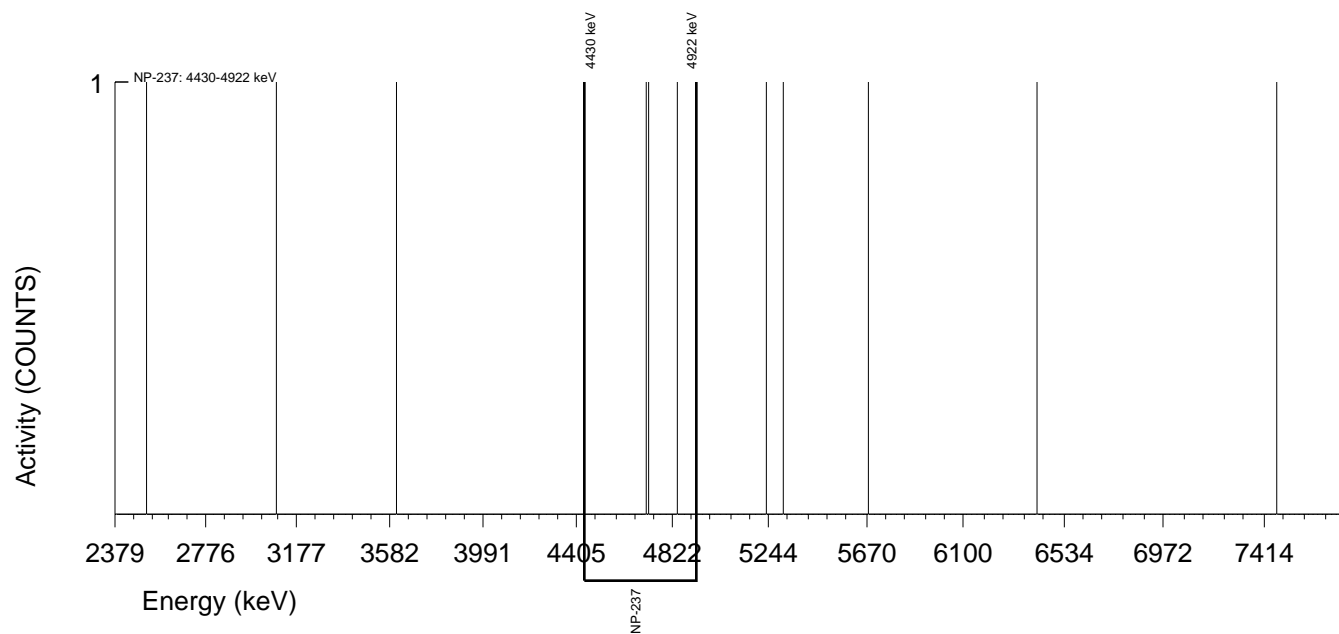
GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S0405235068_NP SAMPLE QTY : 0.108 G +/-0.926 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 83.7 +/-5.266 %	CHAMBER : 176 DETECTOR S/N : 74434 AVERAGE %EFFICIENCY : 25.6995 AVERAGE %EFF ERROR : 0.4981 COUNT DATE : 22-Sep-2016 09:59:42 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B176.CNF;863 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W176.CNF;237 CAL DATE : 13-Sep-2016
TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.63157 NOMINAL : 4.4615E+02 dpm RESULTS : 3.7343E+02 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4755.80	133.238	3.000	1.560	1.440	1.2000	100.000	1.26E-01	3.33E-01	5.98E-01	1.78E-01	3.32E-01



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ALPHA SPECTROSCOPY REPORT

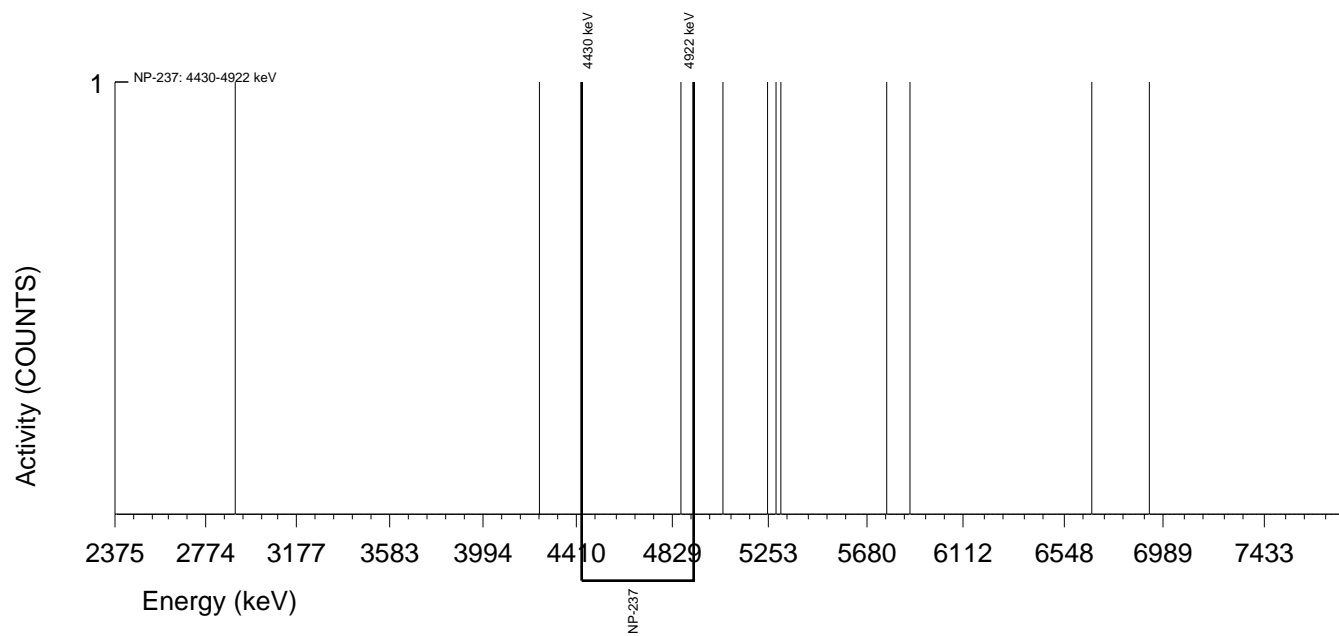
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S0405235069_NP SAMPLE QTY : 0.105 G +/-0.952 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 89.2 +/-5.239 %	CHAMBER : 177 DETECTOR S/N : 74435 AVERAGE %EFFICIENCY : 26.5935 AVERAGE %EFF ERROR : 0.5150 COUNT DATE : 22-Sep-2016 09:59:45 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B177.CNF;875 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W177.CNF;243 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.63157
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.9807E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4865.98	4.955	1.000	0.760	0.240	0.4899	100.000	5.73E-02	2.15E-01	3.61E-01	6.76E-02	2.15E-01



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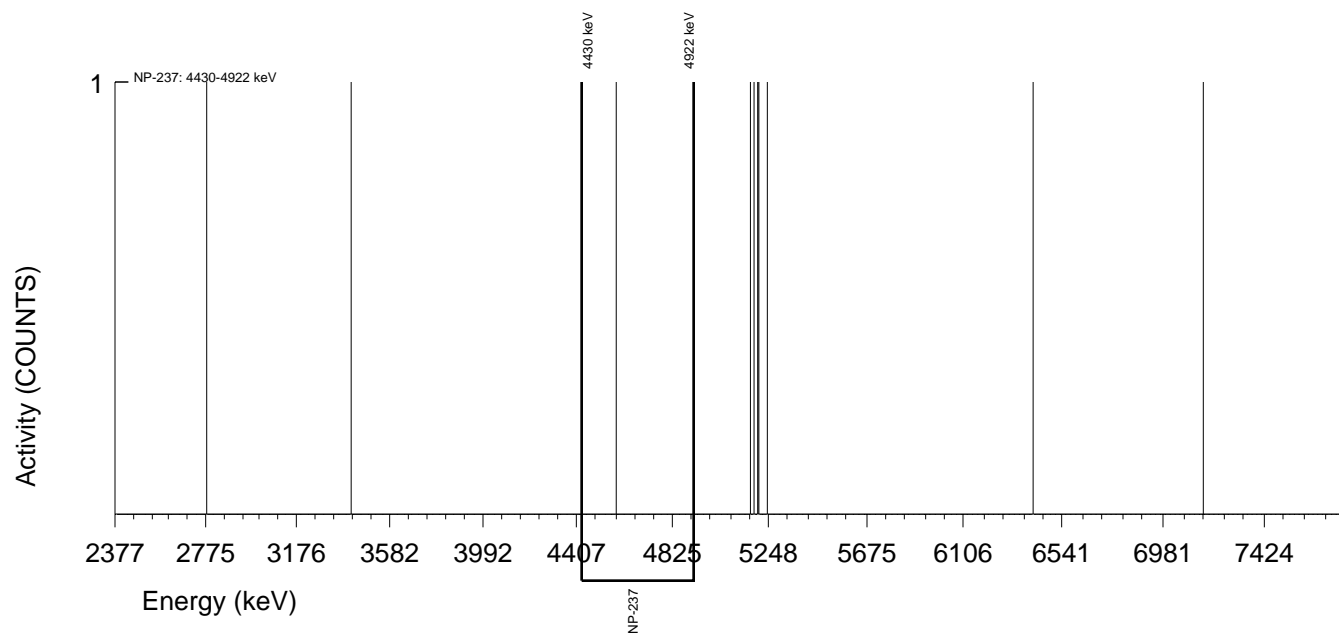
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S0405235070_NP SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 81.2 +/-5.283 %	CHAMBER : 179 DETECTOR S/N : 74437 AVERAGE %EFFICIENCY : 26.3751 AVERAGE %EFF ERROR : 0.5108 COUNT DATE : 22-Sep-2016 09:59:48 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B179.CNF;875 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W179.CNF;254 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.63157
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.6224E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4578.75	4.941	1.000	1.000	0.000	0.0000	100.000	8.43E-02	2.37E-01	2.53E-01	0.00E+00	2.37E-01



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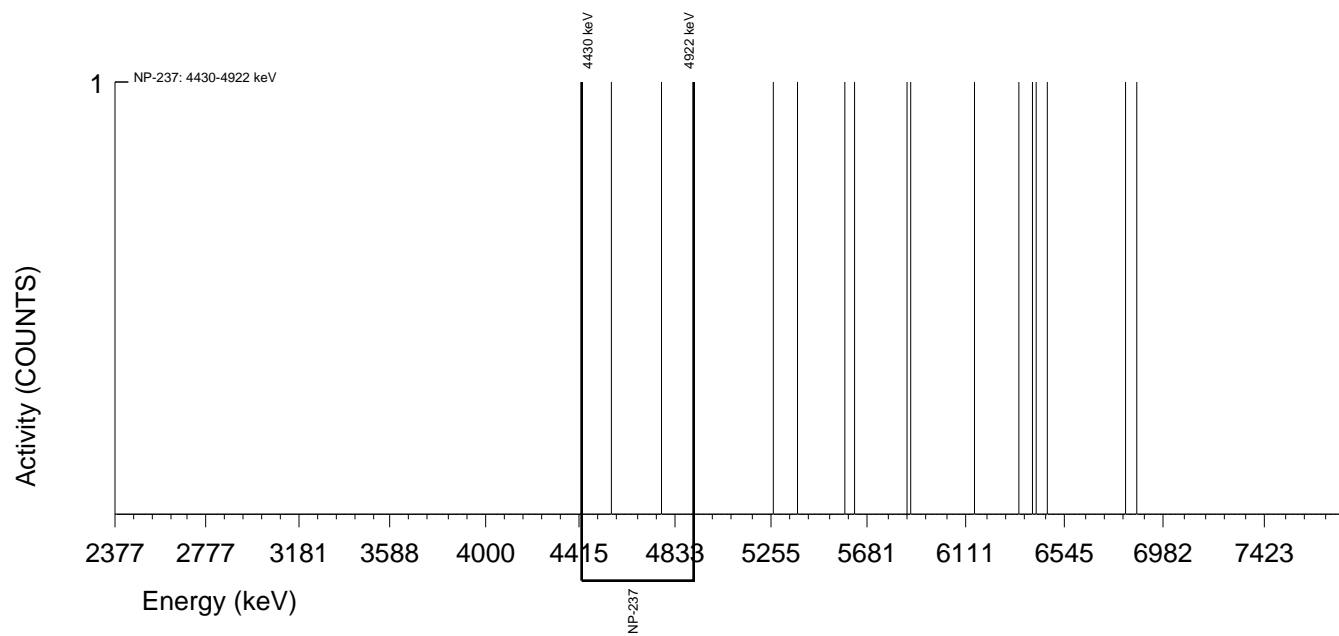
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S0405235071_NP SAMPLE QTY : 0.109 G +/-0.917 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 62.0 +/-5.429 %	CHAMBER : 180 DETECTOR S/N : 83295 AVERAGE %EFFICIENCY : 26.2740 AVERAGE %EFF ERROR : 0.5089 COUNT DATE : 22-Sep-2016 09:59:50 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B180.CNF;877 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W180.CNF;230 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.63157
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 2.7646E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4665.24	214.034	2.000	1.760	0.240	0.4899	100.000	1.86E-01	3.66E-01	5.07E-01	9.49E-02	3.66E-01



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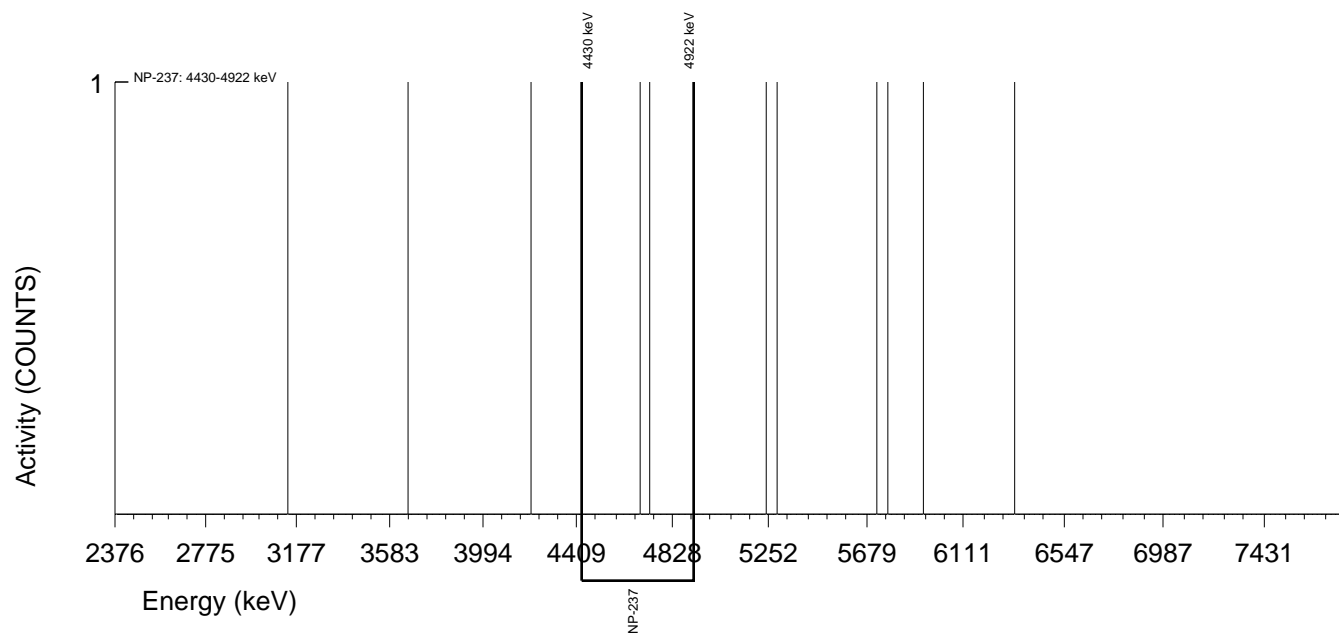
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S0405235072_NP SAMPLE QTY : 0.100 G +/-1.000 % SAMPLE DATE : 15-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 87.5 +/-5.252 %	CHAMBER : 181 DETECTOR S/N : 74439 AVERAGE %EFFICIENCY : 26.6415 AVERAGE %EFF ERROR : 0.5158 COUNT DATE : 22-Sep-2016 09:59:52 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B181.CNF;317 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W181.CNF;89 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.63157
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.9053E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4707.24	44.544	2.000	1.040	0.960	0.9798	100.000	8.37E-02	2.86E-01	5.30E-01	1.44E-01	2.86E-01



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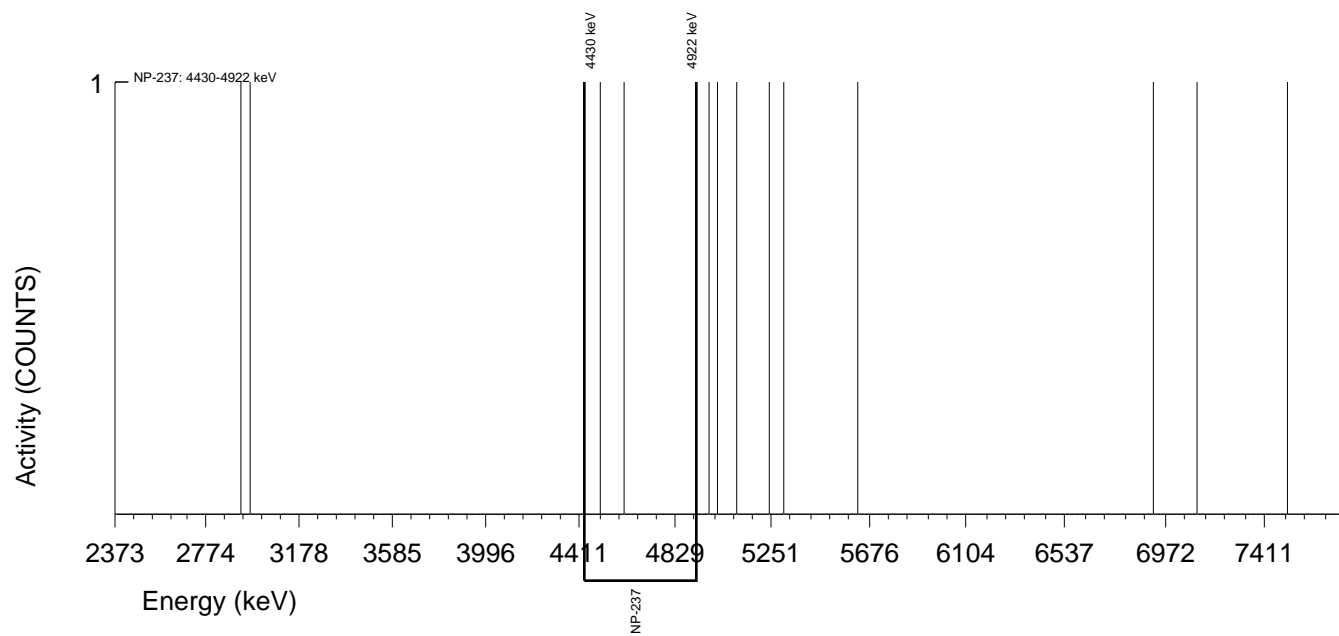
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S0405235073_NP SAMPLE QTY : 0.103 G +/-0.971 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 76.0 +/-5.320 %	CHAMBER : 182 DETECTOR S/N : 74440 AVERAGE %EFFICIENCY : 22.5384 AVERAGE %EFF ERROR : 0.4383 COUNT DATE : 22-Sep-2016 09:59:55 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B182.CNF;318 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W182.CNF;95 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.63157
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.3903E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4551.69	104.670	2.000	1.040	0.960	0.9798	100.000	1.11E-01	3.78E-01	7.01E-01	1.91E-01	3.78E-01



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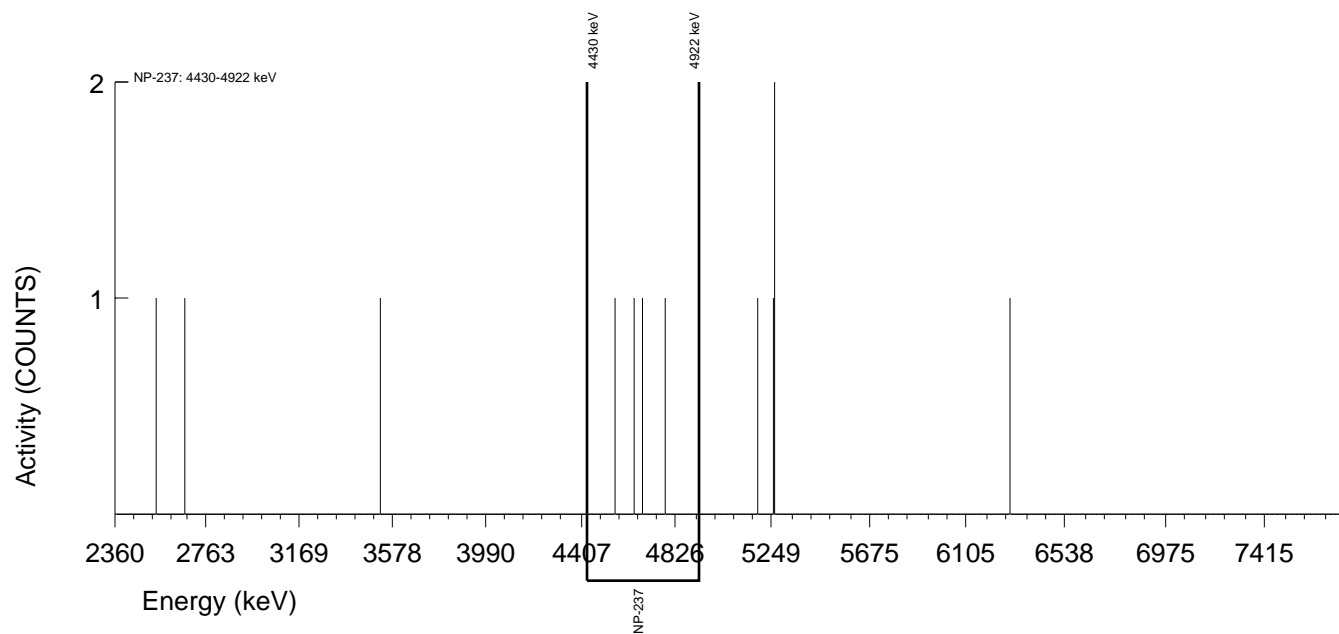
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S0405235074_NP SAMPLE QTY : 0.105 G +/-0.952 % SAMPLE DATE : 15-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 82.3 +/-5.282 %	CHAMBER : 184 DETECTOR S/N : 74442 AVERAGE %EFFICIENCY : 25.3797 AVERAGE %EFF ERROR : 0.4920 COUNT DATE : 22-Sep-2016 09:59:57 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B184.CNF;295 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W184.CNF;85 CAL DATE : 13-Sep-2016
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TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.63157 NOMINAL : 4.4615E+02 dpm RESULTS : 3.6735E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4664.38	215.316	4.000	0.880	3.120	1.7664	100.000	7.53E-02	4.04E-01	8.10E-01	2.77E-01	4.04E-01



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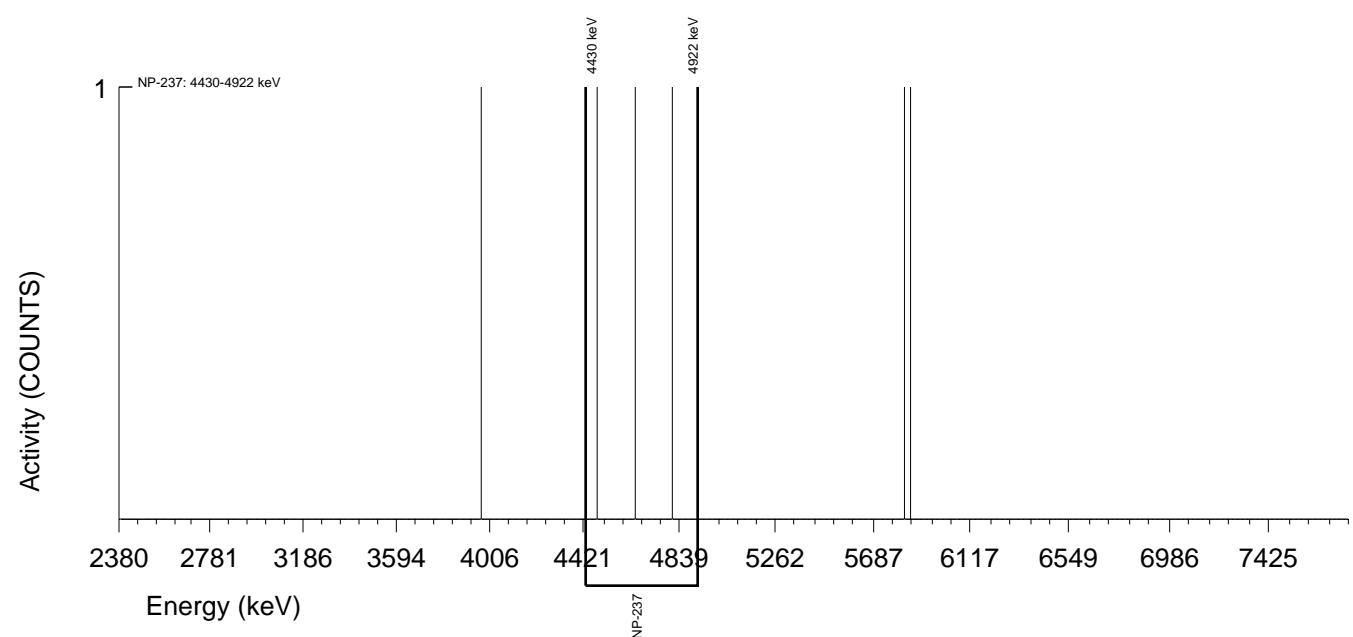
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S0405235075_NP SAMPLE QTY : 0.107 G +/-0.935 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 88.4 +/-5.252 %	CHAMBER : 185 DETECTOR S/N : 68615 AVERAGE %EFFICIENCY : 25.3535 AVERAGE %EFF ERROR : 0.4915 COUNT DATE : 22-Sep-2016 10:00:00 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B185.CNF;857 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W185.CNF;237 CAL DATE : 15-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.63157
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.9440E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4643.58	319.406	3.000	-0.840	3.840	1.9596	100.000	-6.57E-02	3.42E-01	7.97E-01	2.81E-01	3.42E-01



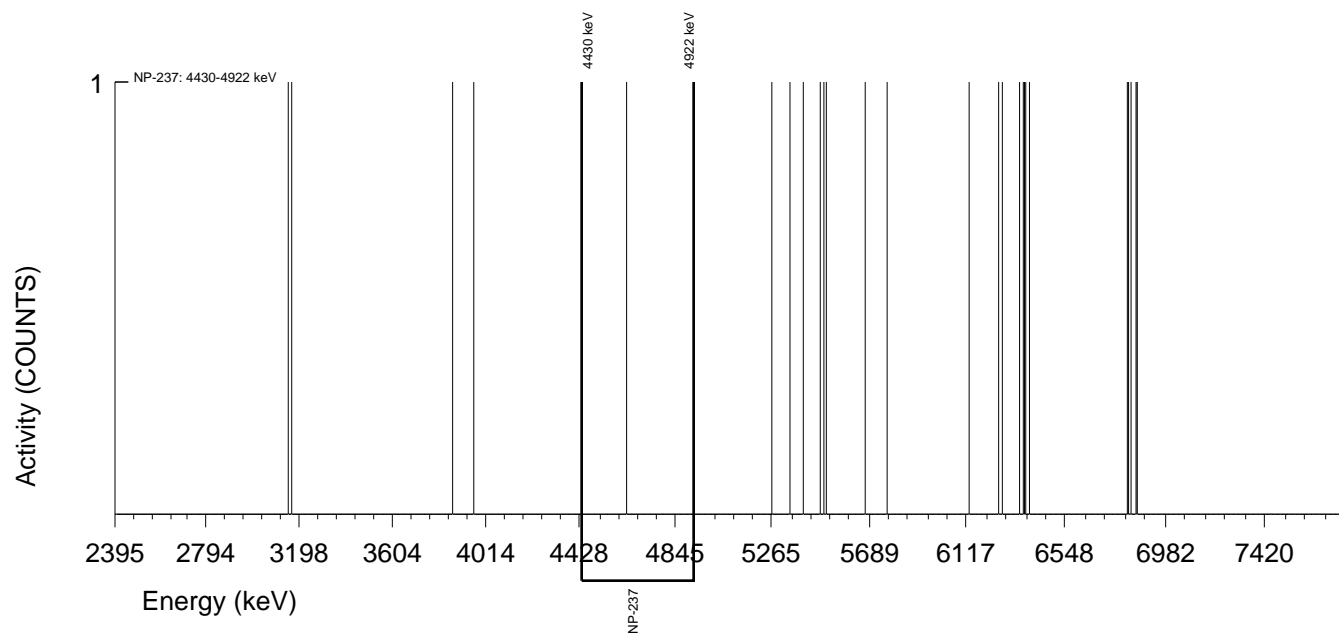
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Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S0405235076_NP SAMPLE QTY : 0.103 G +/-0.971 % SAMPLE DATE : 11-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 89.9 +/-5.246 %	CHAMBER : 186 DETECTOR S/N : 68616 AVERAGE %EFFICIENCY : 25.3981 AVERAGE %EFF ERROR : 0.4924 COUNT DATE : 22-Sep-2016 10:00:02 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B186.CNF;817 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W186.CNF;28 CAL DATE : 15-Sep-2016
TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.63157 NOMINAL : 4.4615E+02 dpm RESULTS : 4.0091E+02 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4630.69	4.973	1.000	-0.920	1.920	1.3856	100.000	-7.35E-02	2.49E-01	6.45E-01	2.03E-01	2.48E-01



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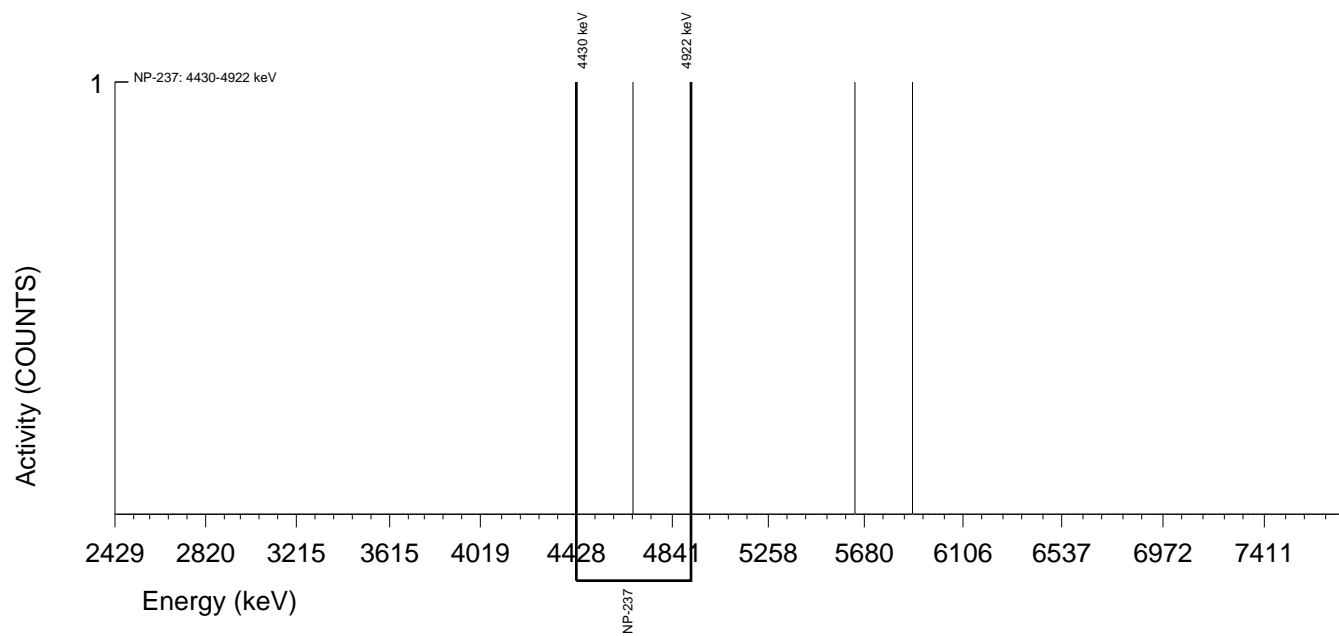
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S0405235077_NP SAMPLE QTY : 0.110 G +/-0.909 % SAMPLE DATE : 17-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 86.0 +/-5.275 %	CHAMBER : 188 DETECTOR S/N : 68621 AVERAGE %EFFICIENCY : 26.7276 AVERAGE %EFF ERROR : 0.5175 COUNT DATE : 22-Sep-2016 10:30:55 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B188.CNF;852 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W188.CNF;233 CAL DATE : 15-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.63157
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.8381E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.26	4.861	1.000	-0.920	1.920	1.3856	100.000	-6.83E-02	2.31E-01	5.99E-01	1.88E-01	2.31E-01



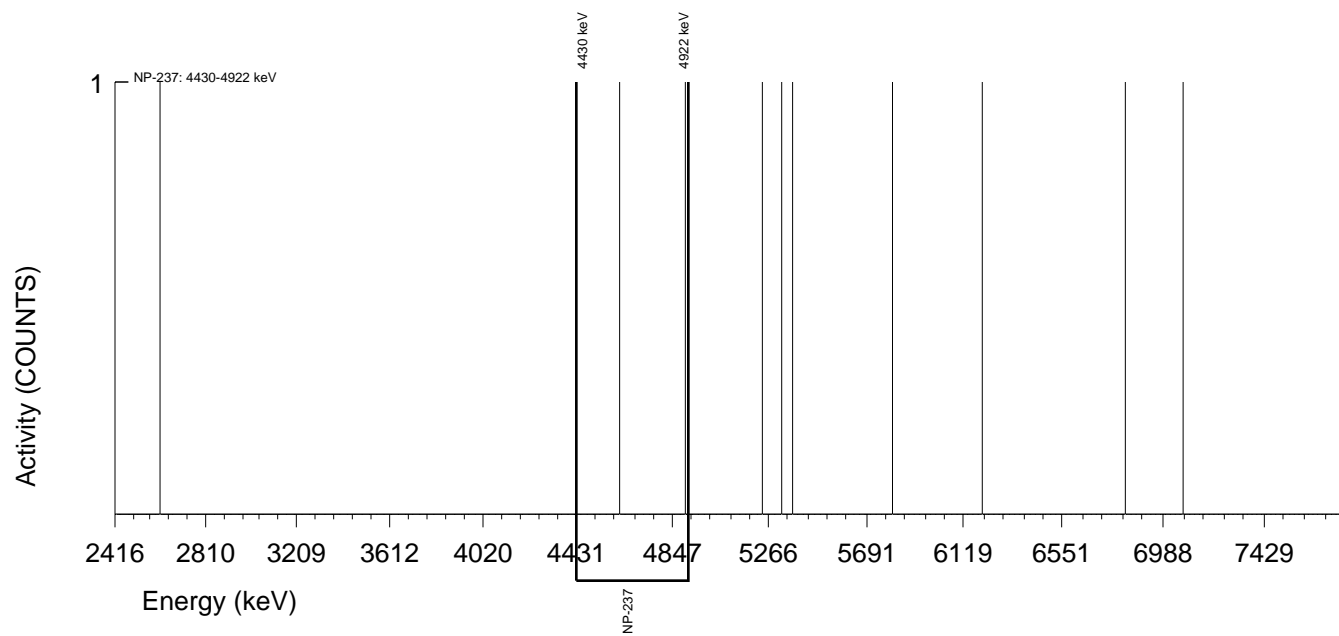
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S0405235078_NP SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 17-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 92.6 +/-5.243 %	CHAMBER : 189 DETECTOR S/N : 68622 AVERAGE %EFFICIENCY : 25.4050 AVERAGE %EFF ERROR : 0.4925 COUNT DATE : 22-Sep-2016 10:00:04 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B189.CNF;853 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W189.CNF;231 CAL DATE : 15-Sep-2016
TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.63157 NOMINAL : 4.4615E+02 dpm RESULTS : 4.1333E+02 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4760.55	274.755	2.000	1.280	0.720	0.8485	100.000	9.81E-02	2.70E-01	4.68E-01	1.19E-01	2.70E-01



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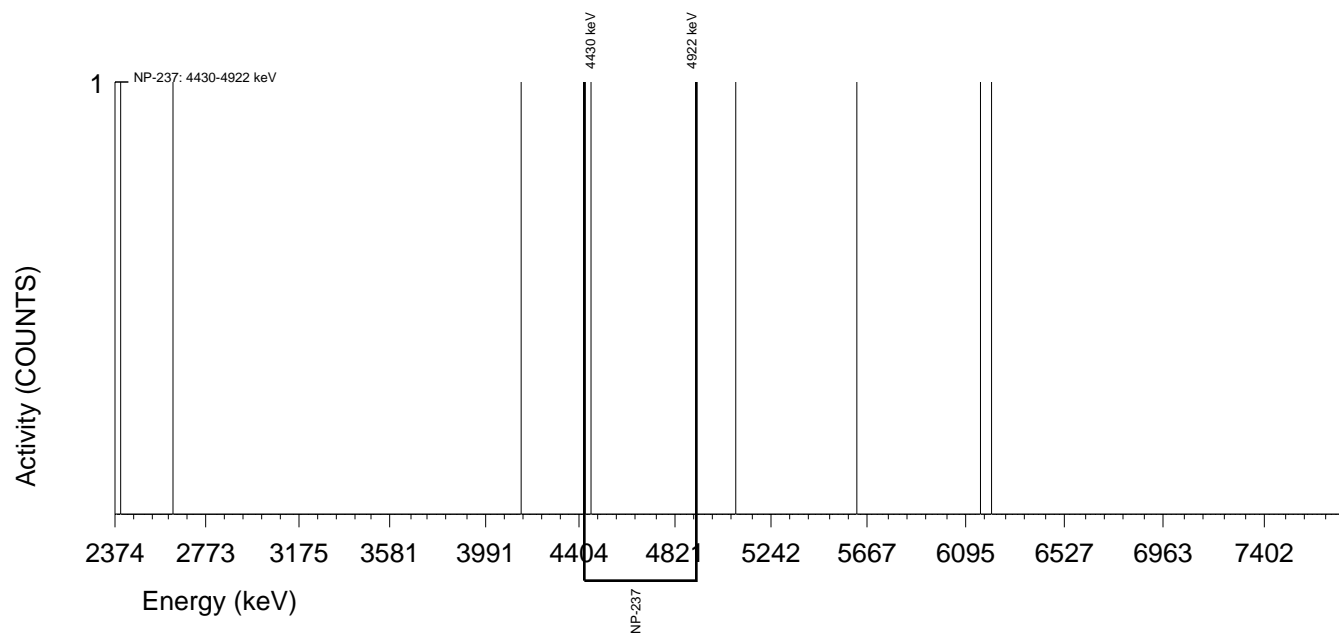
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S1203621766_NP SAMPLE QTY : 0.110 G +/-0.909 % SAMPLE DATE : 20-Sep-2016 00:00:00 ANALYST : KXB2 % YIELD : 39.9 +/-5.794 %	CHAMBER : 191 DETECTOR S/N : 68624 AVERAGE %EFFICIENCY : 24.3087 AVERAGE %EFF ERROR : 0.4718 COUNT DATE : 22-Sep-2016 10:00:10 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B191.CNF;864 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W191.CNF;260 CAL DATE : 15-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 48.63157
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 1.7807E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4443.11	0.000	2.000	1.040	0.960	0.9798	100.000	1.83E-01	6.25E-01	1.16E+00	3.16E-01	6.25E-01



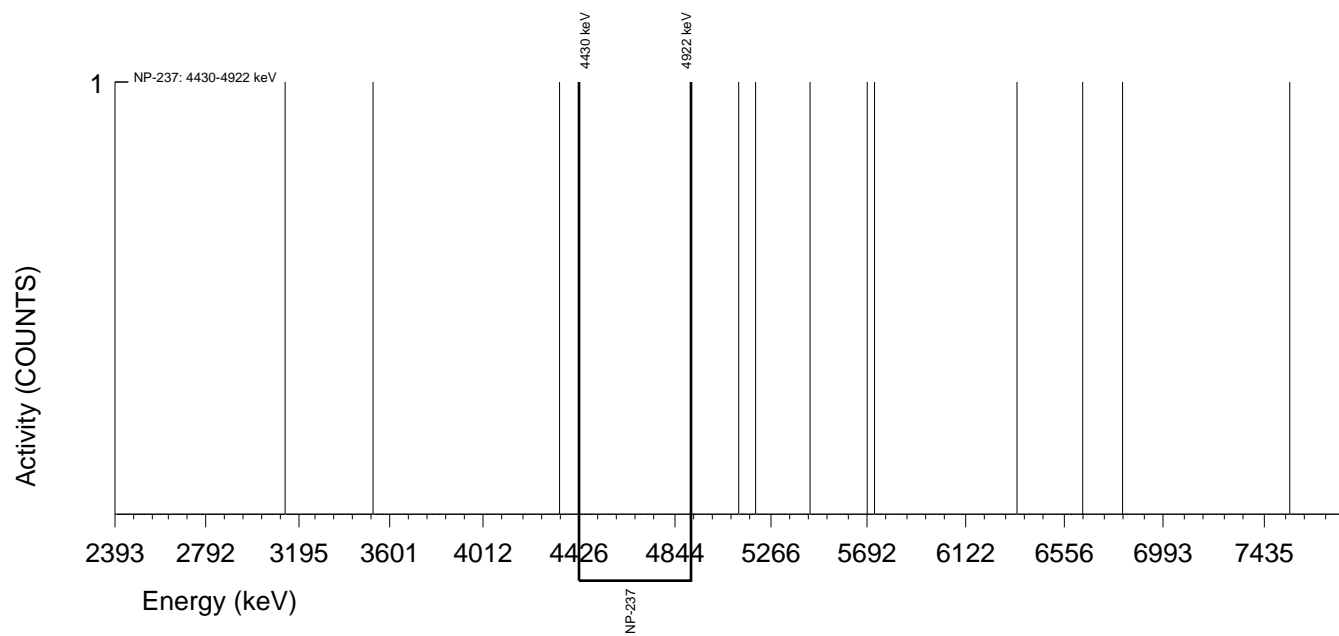
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ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S1203621767_NP SAMPLE QTY : 0.101 G +/-0.990 % SAMPLE DATE : 14-Dec-2015 00:00:00 ANALYST : KXB2 % YIELD : 64.1 +/-5.437 %	CHAMBER : 195 DETECTOR S/N : 78786 AVERAGE %EFFICIENCY : 26.3844 AVERAGE %EFF ERROR : 0.5110 COUNT DATE : 22-Sep-2016 10:00:12 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B195.CNF;878 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W195.CNF;259 CAL DATE : 15-Sep-2016
TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.63157 NOMINAL : 4.4615E+02 dpm RESULTS : 2.8603E+02 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.33	0.000	0.000	-0.480	0.480	0.6928	100.000	-5.27E-02	2.34E-01	6.08E-01	1.39E-01	2.33E-01



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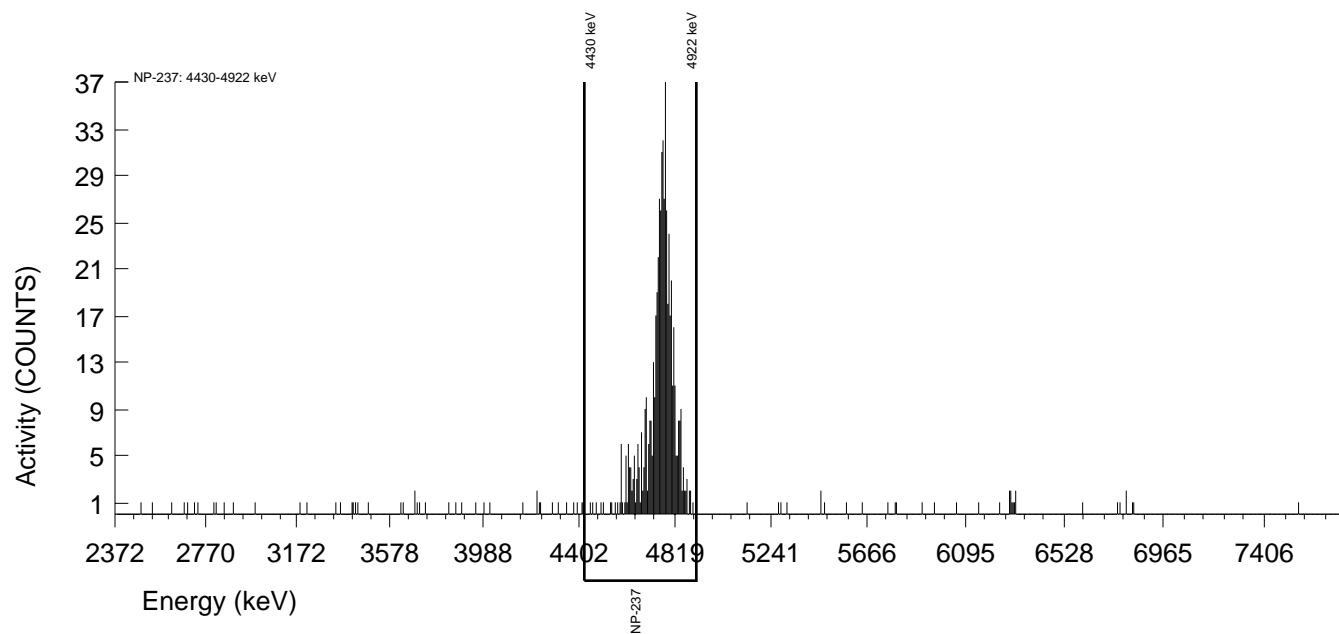
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596420 SAMPLE ID : S1203621768_NP SAMPLE QTY : 0.110 G +/-0.909 % SAMPLE DATE : 20-Sep-2016 00:00:00 ANALYST : KXB2 % YIELD : 82.6 +/-5.300 %	CHAMBER : 197 DETECTOR S/N : 78894 AVERAGE %EFFICIENCY : 26.0674 AVERAGE %EFF ERROR : 0.5050 COUNT DATE : 22-Sep-2016 10:00:14 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : NP BKG FILE : B197.CNF;799 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W197.CNF;230 CAL DATE : 15-Sep-2016
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TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 48.63157 NOMINAL : 4.4615E+02 dpm RESULTS : 3.6853E+02 dpm	LCS ID 0518-S NUCLIDE NP-237 NOMINAL (pCi/G) 4.0595E+01 % RECOVERY 111.921
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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4758.41	61.504	582.000	573.360	8.640	2.9394	100.000	4.54E+01	6.33E+00	1.09E+00	4.27E-01	3.76E+00



Batch# 15910411 Product: Np Date: 9/29/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	DER# 1562818
Sample was correctly preserved if required.			NA
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER# 1562818
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER# 1562818
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: Michael Dwyer 9/29/16

Secondary Review Performed By: Jessie Davis 09/30/16

10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 29-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: ASTM C 1475-00 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596411	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060, and 1203621749 were received and analyzed out of holding.</p>		<p>1. Reporting results.</p>	

Originator's Name:

Melanie Aycock 29-SEP-16

Data Validator/Group Leader:

Jessica Davis 30-SEP-16

Neptunium Queue Sheet

07-SEP-16

Batch #: 1596411

Analyst: HAKB

Internal Due Date: 30-SEP-16

Routine #: 3

Tracer Isotope: Am-243 (Np-239)

Tracer Code: 445-96-2

REF #: 92-95

LCS Isotope: Np-237

LCS Code: 0518-S

BKG #: 91

Spike Isotope: Np-237

Spike Code: ---

Prep Date: 9/20/16

Initials: HAKB

Pipet ID: 1840022

Witness: JKB 7/20/16

Np Separation Date/Time: 9/21/16 @ 1430 hrs

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	GFPC	Np Det #
405235041-1	4.4D.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	1	1	0.115	21	210
405235042-1	4.4D.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	2	2	0.116	22	211
405235043-1	4.4D.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	3	3	0.103	23	212
405235044-1	4.4D.R.4.2	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	4	4	0.109	24	213
405235045-1	4.4D.R.5.2	SAMPLE		1 pCi/g	SOIL	MJWC001	30-NOV-15	5	5	0.108	25	214
405235046-1	4.5A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	6	6	0.120	26	216
405235047-1	4.5A.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	7	7	0.118	27	218
405235048-1	4.5B.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	8	8	0.108	28	219
405235049-1	4.5B.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	9	9	0.114	29	220
405235050-1	4.5B.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	10	10	0.118	30	221
405235051-1	4.5B.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	11	11	0.112	31	222*166
405235052-1	4.5B.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	07-DEC-15	12	12	0.122	32	223
405235053-1	4.5C.R.5.2	SAMPLE		1 pCi/g	SOIL	MJWC001	01-DEC-15	13	13	0.108	33	224
405235054-1	4.5C.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	14	14	0.122	34	225
405235055-1	4.5C.R.1.4	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	15	15	0.101	35	226
405235056-1	4.5C.R.2.2	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	16	16	0.113	36	178*178
405235057-1	4.5C.R.2.3	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	17	17	0.122	37	149
405235058-1	4.5C.R.2.4	SAMPLE		1 pCi/g	SOIL	MJWC001	02-DEC-15	18	18	0.111	38	200
405235059-1	5.1A.R.1.2	SAMPLE		1 pCi/g	SOIL	MJWC001	16-DEC-15	19	19	0.107	39	201
405235060-1	5.1A.R.1.3	SAMPLE		1 pCi/g	SOIL	MJWC001	16-DEC-15	20	20	0.114	40	202
1203621748-1	MB for batch 1596411	MB		1 pCi/g	SOIL	QC ACCOUNT		21	21	0.122	41	203
1203621749-1	4.4D.R.1.4(405235041DUP)	DUP		1 pCi/g	SOIL	QC ACCOUNT	30-NOV-15	22	22	0.115	42	205
1203621750-1	LCS for batch 1596411	LCS		1 pCi/g	SOIL	QC ACCOUNT		23	23	0.122	43	206

* MB 9/28/16

Solid Sample Dissolution by: LEACH or DIGESTION

Circle One

Data Reviewed By: Melan Dwyer 9/28/16

BKG	6	Efficiency=	0.4934	Bkg Upper Limit (CPM)=	2.000000	S/N=	445-96-2-GG	Tracer	445-96-2-III
Ref Std Np-239 Beta Cts=	3175	Efficiency=	0.4816	Efficiency Error=	0.0177	DPM=	429.005	446.153	
Ref Std Np-239 Beta Cts=	3099	Efficiency=	0.4917	Efficiency Error=	0.0180	Exp. Date=	9/30/2009	9/30/2016	
Ref Std Np-239 Beta Cts=	3164	Efficiency=	0.4999	Efficiency Error=	0.0178	Reference Limits (CPM)			
Ref Std Np-239 Beta Cts=	3217	Efficiency=	0.4916	Efficiency Error=	0.0176	Lower	201	Filename :	
Average Counts=	3164	Avg Efficiency=	0.4916	Avg Efficiency Error=	0.0178	Upper	220	NP237Yields.xls	
Am-243 Correction Factor=	1.15								
Half-life of Np-239 (days)=	2.356								
Sample ID	Net Beta Cts	Count time	Count Date/Time	Separation Date/Time	Decay Corr Counts	% NP Yield	Delta T (min)	Gross Counts	File type :
405235041.1	2171	15	9/22/2016 8:42	9/21/2016 14:30	2718.09	82.61%	1092.5	2177	Excel
405235042.1	2407	15	9/22/2016 8:57	9/21/2016 14:30	3023.02	91.88%	1107.9	2413	Version # :
405235043.1	2566	15	9/22/2016 9:13	9/21/2016 14:30	3232.84	98.26%	1123.2	2572	1.2.2
405235044.1	2422	15	9/22/2016 9:28	9/21/2016 14:30	3061.01	93.03%	1138.6	2428	
405235045.1	2375	15	9/22/2016 9:43	9/21/2016 14:30	3011.04	91.51%	1153.9	2381	
405235046.1	2145	15	9/22/2016 9:59	9/21/2016 14:30	2727.99	82.91%	1169.3	2151	
405235047.1	2320	15	9/22/2016 10:14	9/21/2016 14:30	2959.82	89.96%	1184.6	2326	
405235048.1	2359	15	9/22/2016 10:29	9/21/2016 14:30	3019.03	91.76%	1200.0	2365	
405235049.1	1894	15	9/22/2016 10:45	9/21/2016 14:30	2431.54	73.90%	1215.3	1900	
405235050.1	2055	15	9/22/2016 11:00	9/21/2016 14:30	2646.52	80.44%	1230.7	2061	
405235051.1	1483	15	9/22/2016 11:16	9/21/2016 14:30	1915.87	58.23%	1246.0	1489	
405235052.1	2373	15	9/22/2016 11:31	9/21/2016 14:30	3075.28	93.47%	1261.4	2379	
405235053.1	2240	15	9/22/2016 11:46	9/21/2016 14:30	2912.04	88.51%	1276.7	2246	
405235054.1	2012	15	9/22/2016 12:02	9/21/2016 14:30	2623.85	79.75%	1292.1	2018	
405235055.1	2009	15	9/22/2016 12:17	9/21/2016 14:30	2628.17	79.88%	1307.4	2015	
405235056.1	2168	15	9/22/2016 12:32	9/21/2016 14:30	2845.08	86.47%	1322.8	2174	
405235057.1	2242	15	9/22/2016 12:48	9/21/2016 14:30	2951.43	89.70%	1338.1	2248	
405235058.1	2271	15	9/22/2016 13:03	9/21/2016 14:30	2999.00	91.15%	1353.5	2277	
405235059.1	2018	15	9/22/2016 13:18	9/21/2016 14:30	2673.28	81.25%	1368.8	2024	
405235060.1	2118	15	9/22/2016 13:34	9/21/2016 14:30	2814.55	85.54%	1384.2	2124	
1203621748.1	2257	15	9/22/2016 13:49	9/21/2016 14:30	3008.68	91.44%	1399.5	2263	
1203621749.1	1559	15	9/22/2016 14:04	9/21/2016 14:30	2084.75	63.36%	1414.9	1555	
1203621750.1	2288	15	9/22/2016 14:20	9/21/2016 14:30	3069.20	93.28%	1430.2	2294	
BKG	0	15	9/22/2016 0:44	9/21/2016 14:30	0.00	0.00%	614.5		
Sample ID	Carrier	Alpha	Beta	Count time	Voltage	Date/Time			
REF	92	2002	3658	15	1545	9/22/16 0:59			
REF	93	1989	3571	15	1545	9/22/16 1:15			
REF	94	1994	3646	15	1545	9/22/16 1:30			
REF	95	1988	3706	15	1545	9/22/16 1:45			
405235041.1	21	96	2177	15	1545	9/22/16 8:42			
405235042.1	22	120	2413	15	1545	9/22/16 8:57			
405235043.1	23	102	2572	15	1545	9/22/16 9:13			
405235044.1	24	108	2428	15	1545	9/22/16 9:28			
405235045.1	25	100	2381	15	1545	9/22/16 9:43			
405235046.1	26	105	2151	15	1545	9/22/16 9:59			
405235047.1	27	104	2326	15	1545	9/22/16 10:14			
405235048.1	28	114	2365	15	1545	9/22/16 10:29			
405235049.1	29	106	1900	15	1545	9/22/16 10:45			
405235050.1	30	86	2061	15	1545	9/22/16 11:00			
405235051.1	31	65	1489	15	1545	9/22/16 11:16			
405235052.1	32	98	2379	15	1545	9/22/16 11:31			
405235053.1	33	86	2246	15	1545	9/22/16 11:46			
405235054.1	34	101	2018	15	1545	9/22/16 12:02			
405235055.1	35	87	2015	15	1545	9/22/16 12:17			
405235056.1	36	126	2174	15	1545	9/22/16 12:32			
405235057.1	37	92	2248	15	1545	9/22/16 12:48			
405235058.1	38	116	2277	15	1545	9/22/16 13:03			
405235059.1	39	99	2024	15	1545	9/22/16 13:18			
405235060.1	40	93	2124	15	1545	9/22/16 13:34			
1203621748.1	41	104	2263	15	1545	9/22/16 13:49			
1203621749.1	42	72	1565	15	1545	9/22/16 14:04			
1203621750.1	43	135	2294	15	1545	9/22/16 14:20			
BKG	91	7	6	15	1545	9/22/16 0:44			

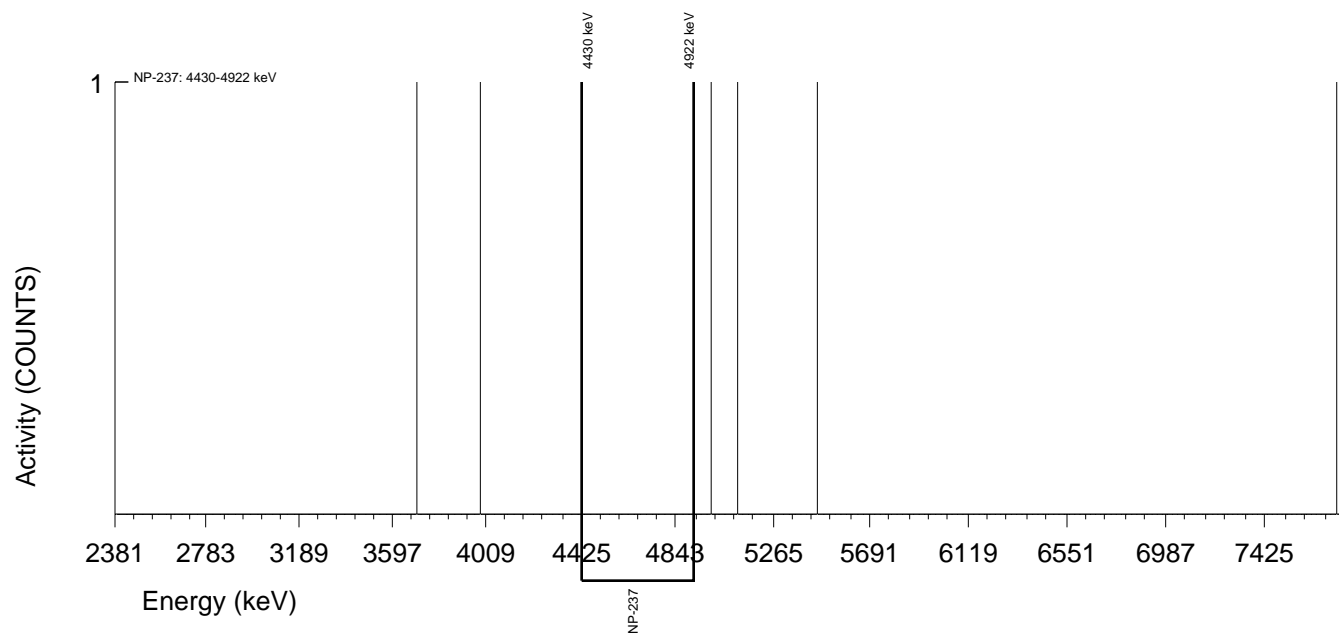
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 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235041_NP SAMPLE QTY : 0.115 G +/-0.870 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 82.6 +/-5.212 %	CHAMBER : 210 DETECTOR S/N : 87898 AVERAGE %EFFICIENCY : 25.3042 AVERAGE %EFF ERROR : 0.4906 COUNT DATE : 22-Sep-2016 15:55:09 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B210.CNF;453 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W210.CNF;126 CAL DATE : 16-Sep-2016
TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 49.16467 NOMINAL : 4.4615E+02 dpm RESULTS : 3.6857E+02 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.43	0.000	0.000	-0.360	0.360	0.6000	100.000	-5.62E-02	3.15E-01	7.95E-01	1.63E-01	3.15E-01



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ALPHA SPECTROSCOPY REPORT

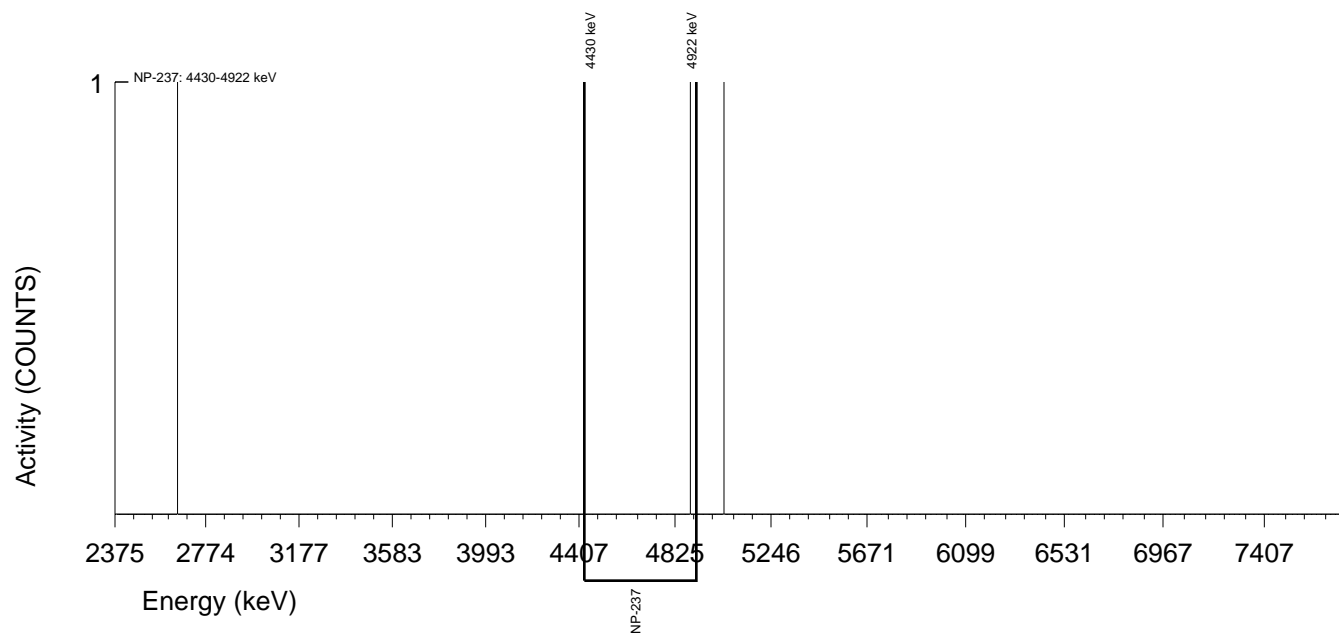
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235042_NP SAMPLE QTY : 0.116 G +/-0.862 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 91.9 +/-5.168 %	CHAMBER : 211 DETECTOR S/N : 87899 AVERAGE %EFFICIENCY : 24.1091 AVERAGE %EFF ERROR : 0.4680 COUNT DATE : 22-Sep-2016 15:55:11 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B211.CNF;454 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W211.CNF;131 CAL DATE : 16-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.16467
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 4.0992E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4892.98	4.967	1.000	0.280	0.720	0.8485	100.000	4.09E-02	4.15E-01	8.70E-01	2.16E-01	4.15E-01



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 ALPHA SPECTROSCOPY REPORT

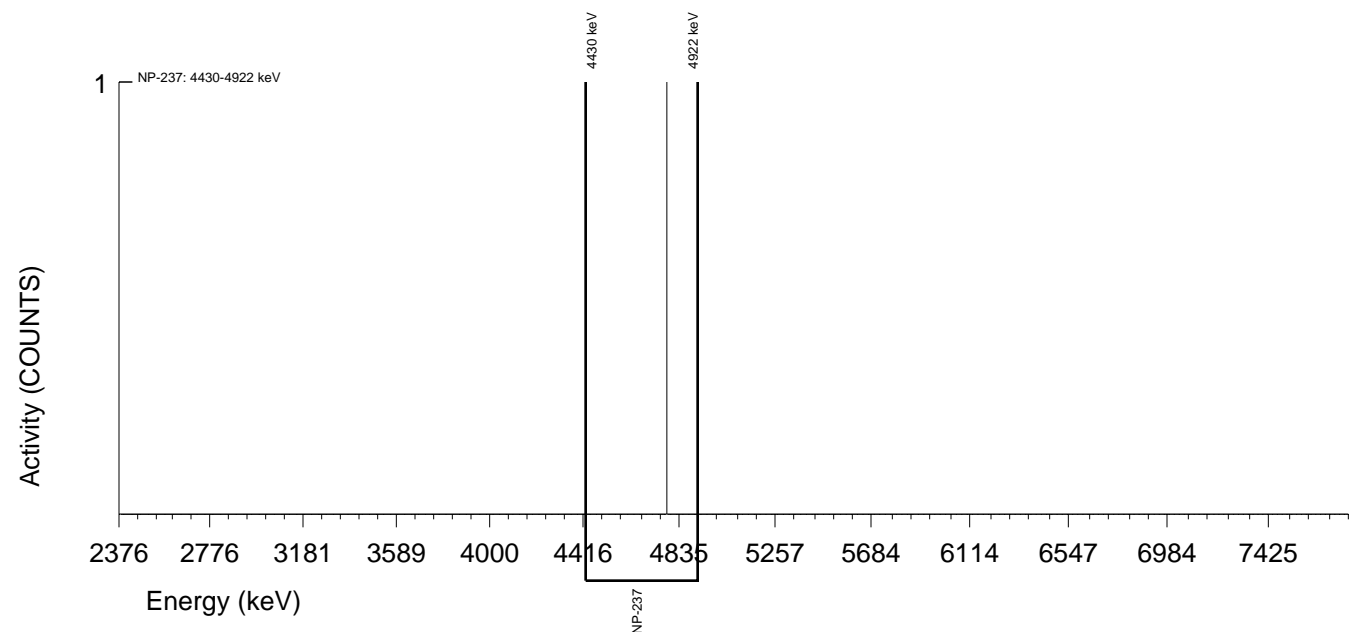
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235043_NP SAMPLE QTY : 0.103 G +/-0.971 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 98.3 +/-5.143 %	CHAMBER : 212 DETECTOR S/N : 87900 AVERAGE %EFFICIENCY : 26.0378 AVERAGE %EFF ERROR : 0.5045 COUNT DATE : 22-Sep-2016 15:55:13 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B212.CNF;453 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W212.CNF;119 CAL DATE : 16-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.16467
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 4.3837E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4782.11	4.985	1.000	0.280	0.720	0.8485	100.000	3.99E-02	4.05E-01	8.48E-01	2.10E-01	4.05E-01



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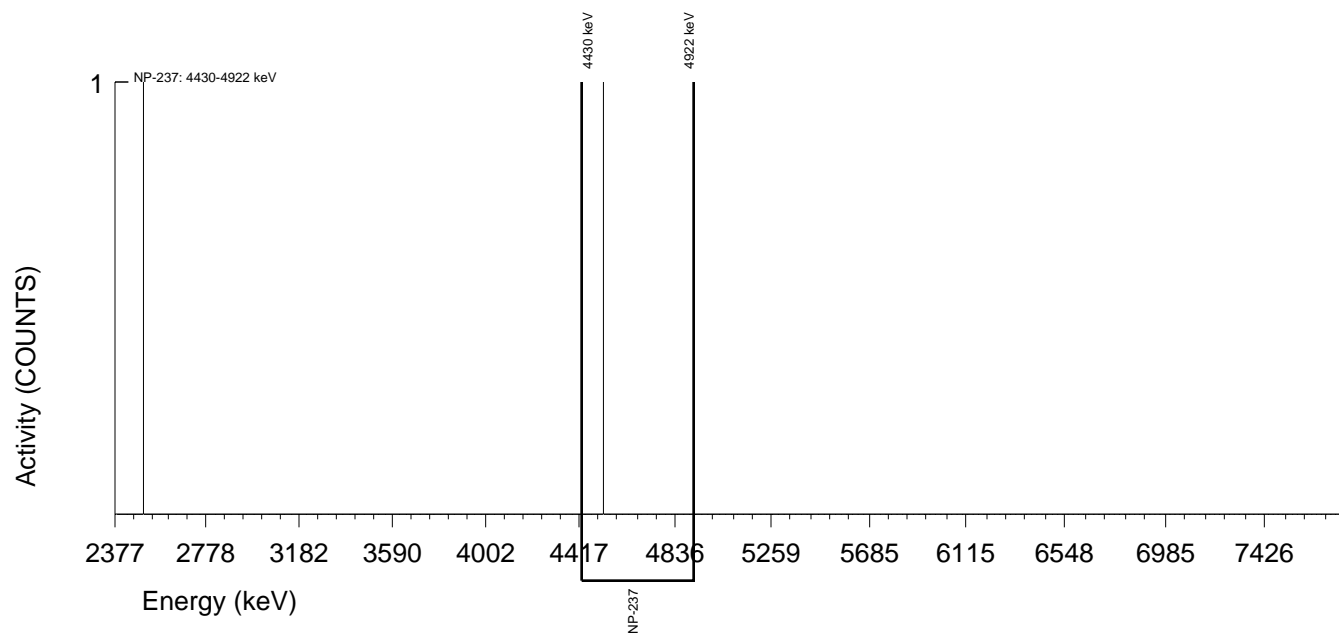
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235044_NP SAMPLE QTY : 0.109 G +/-0.917 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 93.0 +/-5.166 %	CHAMBER : 213 DETECTOR S/N : 87901 AVERAGE %EFFICIENCY : 24.8786 AVERAGE %EFF ERROR : 0.4826 COUNT DATE : 22-Sep-2016 15:55:16 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B213.CNF;467 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W213.CNF;152 CAL DATE : 16-Sep-2016
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TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 49.16467 NOMINAL : 4.4615E+02 dpm RESULTS : 4.1507E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4521.71	4.987	1.000	0.400	0.600	0.7746	100.000	5.95E-02	4.22E-01	8.48E-01	2.01E-01	4.21E-01



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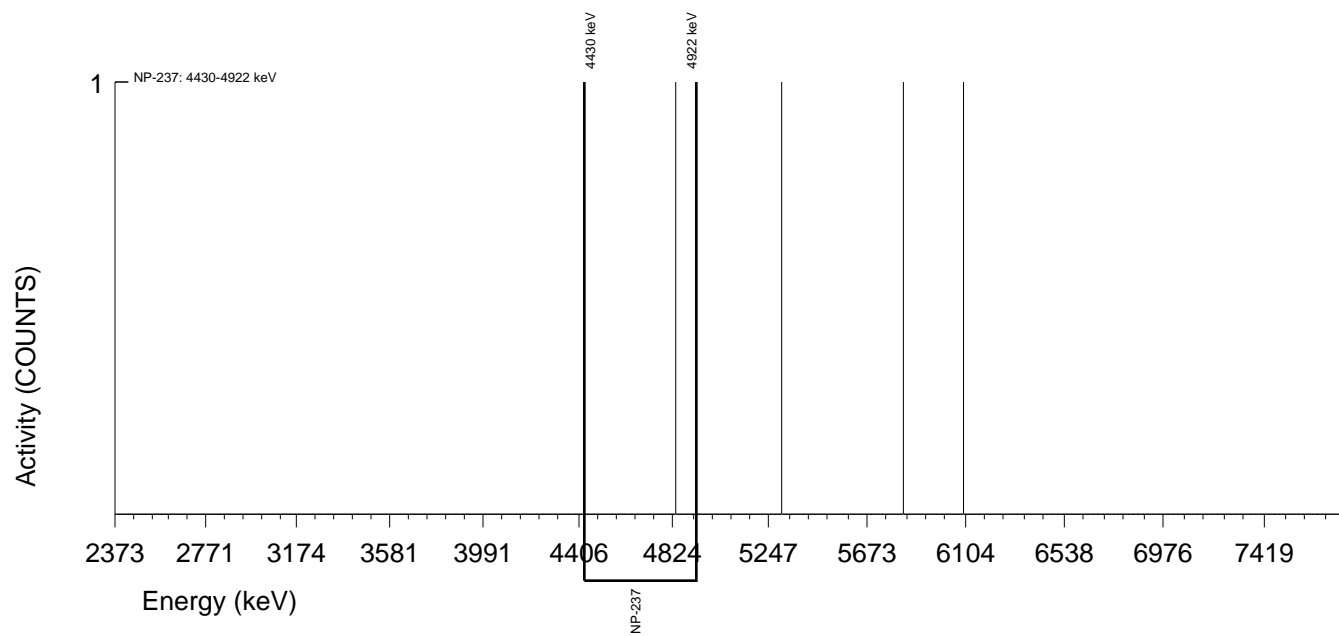
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235045_NP SAMPLE QTY : 0.108 G +/-0.926 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 91.5 +/-5.174 %	CHAMBER : 214 DETECTOR S/N : 87902 AVERAGE %EFFICIENCY : 26.2230 AVERAGE %EFF ERROR : 0.5080 COUNT DATE : 22-Sep-2016 15:55:18 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B214.CNF;454 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W214.CNF;119 CAL DATE : 16-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.16467
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 4.0829E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4834.74	4.958	1.000	0.040	0.960	0.9798	100.000	5.79E-03	4.15E-01	9.29E-01	2.47E-01	4.14E-01



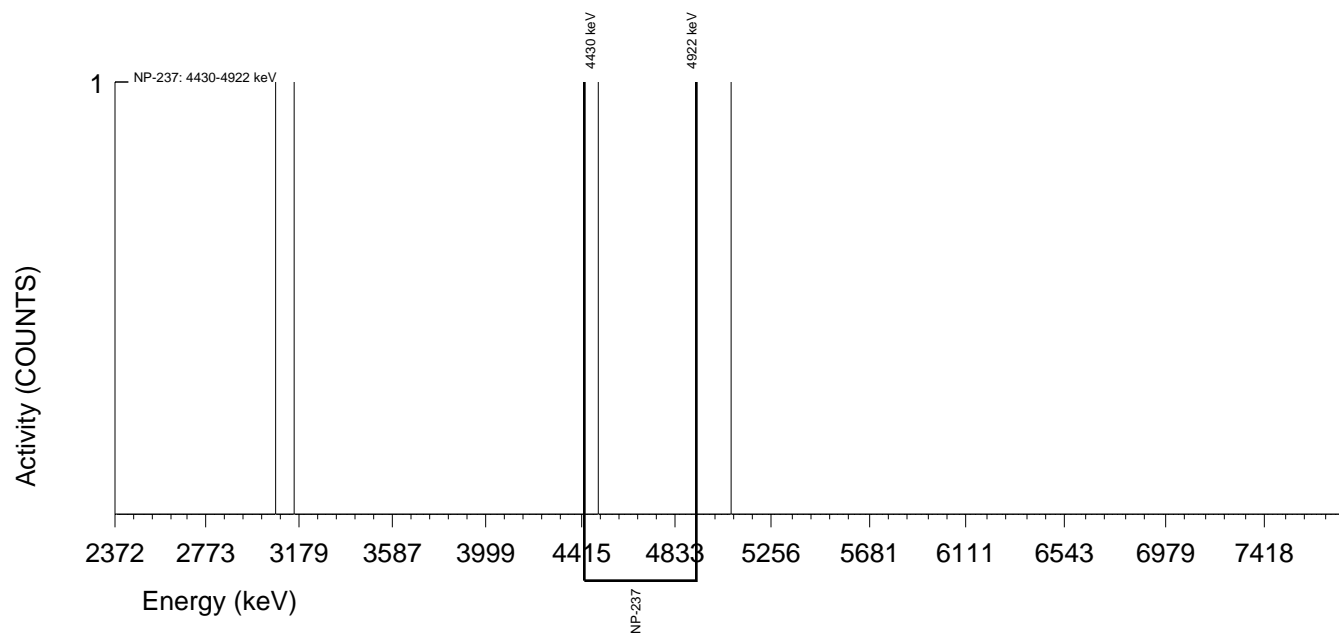
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235046_NP SAMPLE QTY : 0.120 G +/-0.833 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 82.9 +/-5.218 %	CHAMBER : 216 DETECTOR S/N : 87904 AVERAGE %EFFICIENCY : 24.6289 AVERAGE %EFF ERROR : 0.4779 COUNT DATE : 22-Sep-2016 15:55:21 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B216.CNF;454 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W216.CNF;128 CAL DATE : 16-Sep-2016
TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 49.16467 NOMINAL : 4.4615E+02 dpm RESULTS : 3.6991E+02 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4492.92	5.000	1.000	0.520	0.480	0.6928	100.000	7.97E-02	4.33E-01	8.29E-01	1.85E-01	4.32E-01



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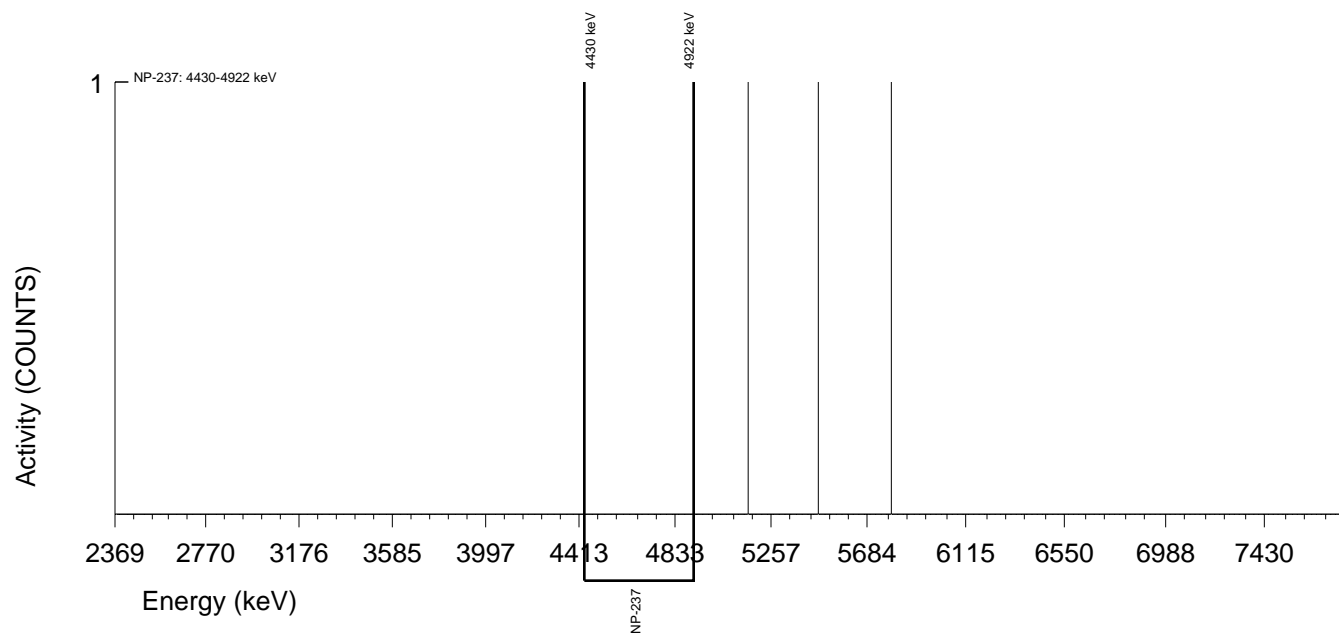
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235047_NP SAMPLE QTY : 0.118 G +/-0.847 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 90.0 +/-5.183 %	CHAMBER : 218 DETECTOR S/N : 87906 AVERAGE %EFFICIENCY : 25.1171 AVERAGE %EFF ERROR : 0.4871 COUNT DATE : 22-Sep-2016 15:55:23 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B218.CNF;457 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W218.CNF;126 CAL DATE : 16-Sep-2016
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TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 49.16467 NOMINAL : 4.4615E+02 dpm RESULTS : 4.0135E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.37	0.000	0.000	-0.840	0.840	0.9165	100.000	-1.18E-01	2.92E-01	8.72E-01	2.25E-01	2.91E-01



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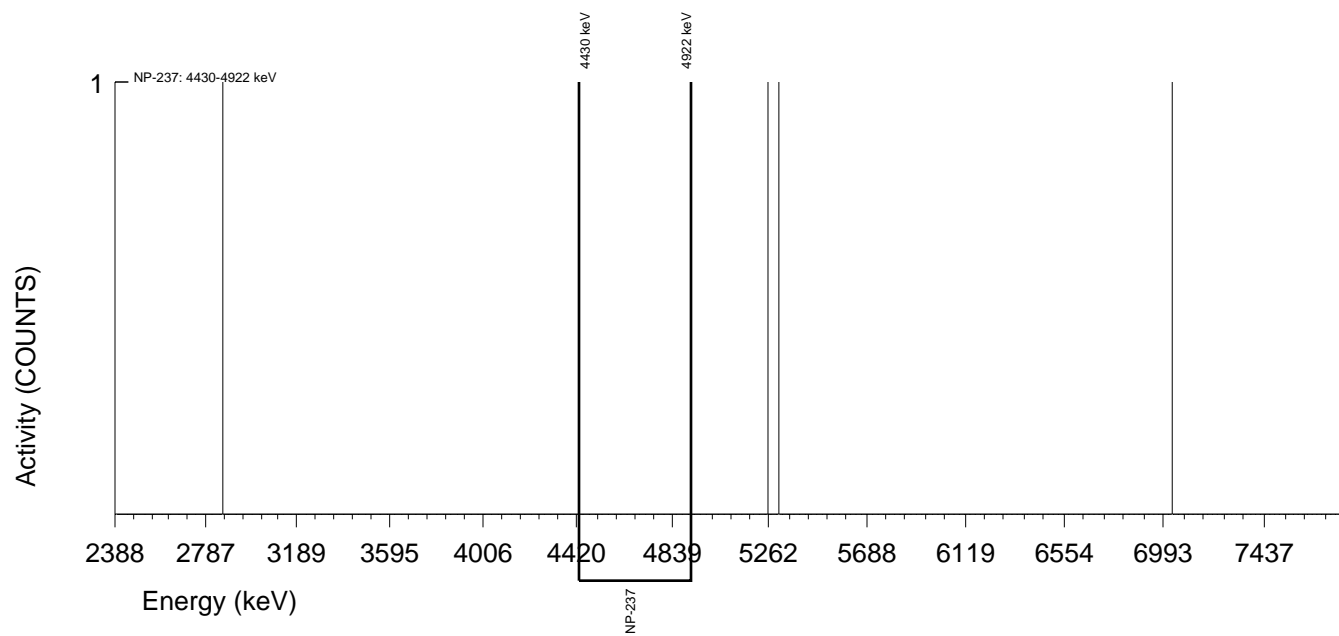
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235048_NP SAMPLE QTY : 0.108 G +/-0.926 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 91.8 +/-5.176 %	CHAMBER : 219 DETECTOR S/N : 87907 AVERAGE %EFFICIENCY : 25.4729 AVERAGE %EFF ERROR : 0.4938 COUNT DATE : 22-Sep-2016 15:55:26 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B219.CNF;457 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W219.CNF;132 CAL DATE : 16-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.16467
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 4.0938E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.29	0.000	0.000	-0.840	0.840	0.9165	100.000	-1.25E-01	3.08E-01	9.21E-01	2.37E-01	3.08E-01



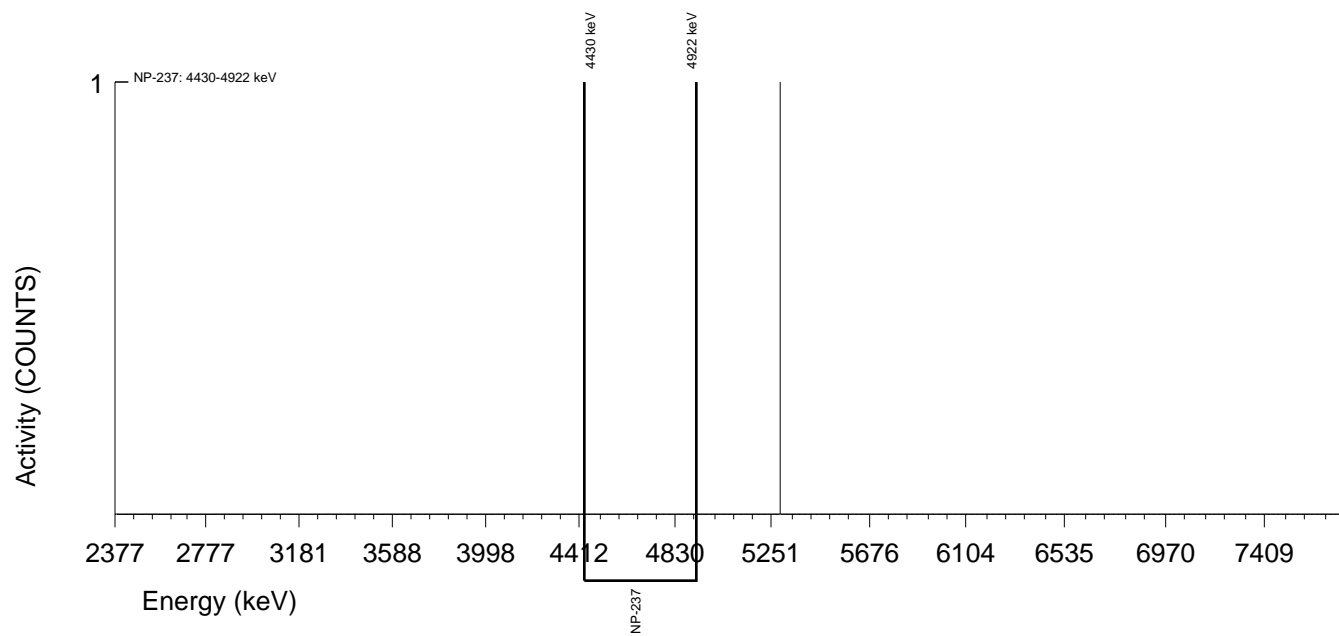
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Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235049_NP SAMPLE QTY : 0.114 G +/-0.877 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 73.9 +/-5.277 %	CHAMBER : 220 DETECTOR S/N : 87908 AVERAGE %EFFICIENCY : 24.0361 AVERAGE %EFF ERROR : 0.4668 COUNT DATE : 22-Sep-2016 15:55:28 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B220.CNF;456 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W220.CNF;142 CAL DATE : 16-Sep-2016
TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 49.16467 NOMINAL : 4.4615E+02 dpm RESULTS : 3.2971E+02 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.39	0.000	0.000	-0.120	0.120	0.3464	100.000	-2.22E-02	3.69E-01	7.80E-01	1.12E-01	3.69E-01



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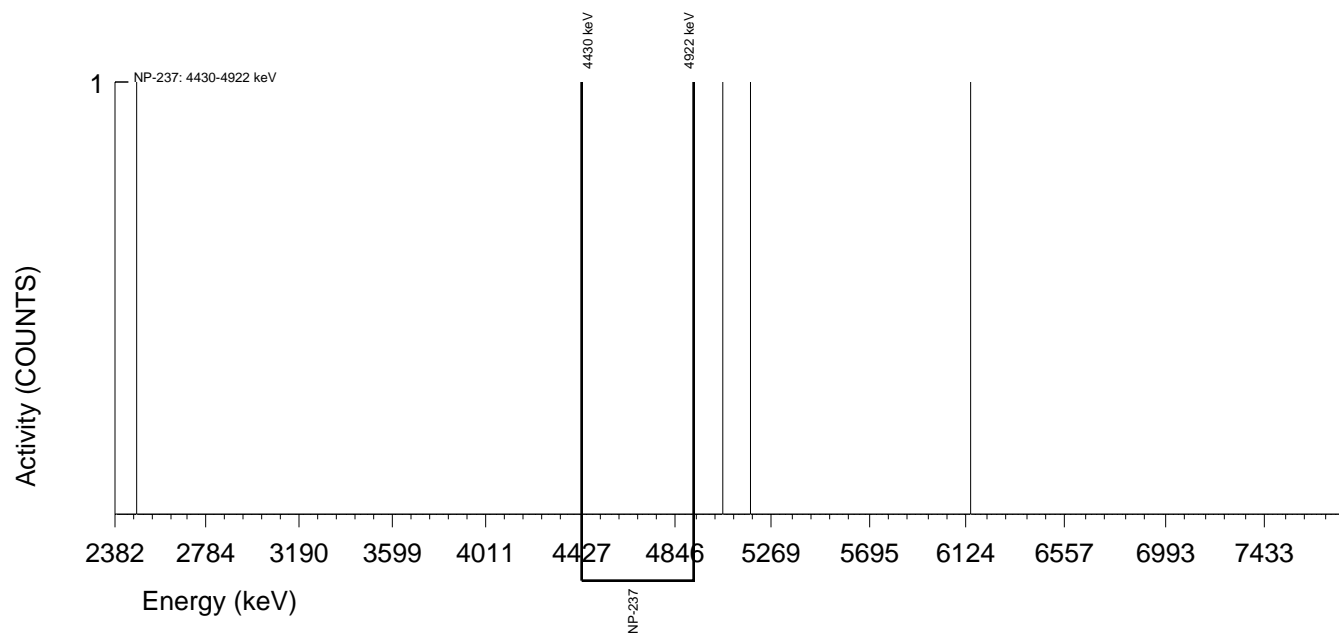
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235050_NP SAMPLE QTY : 0.118 G +/-0.847 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 80.4 +/-5.237 %	CHAMBER : 221 DETECTOR S/N : 87909 AVERAGE %EFFICIENCY : 25.5264 AVERAGE %EFF ERROR : 0.4948 COUNT DATE : 22-Sep-2016 15:55:56 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B221.CNF;465 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W221.CNF;128 CAL DATE : 16-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.16467
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.5886E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.41	0.000	0.000	-0.240	0.240	0.4899	100.000	-3.72E-02	3.11E-01	7.29E-01	1.32E-01	3.10E-01



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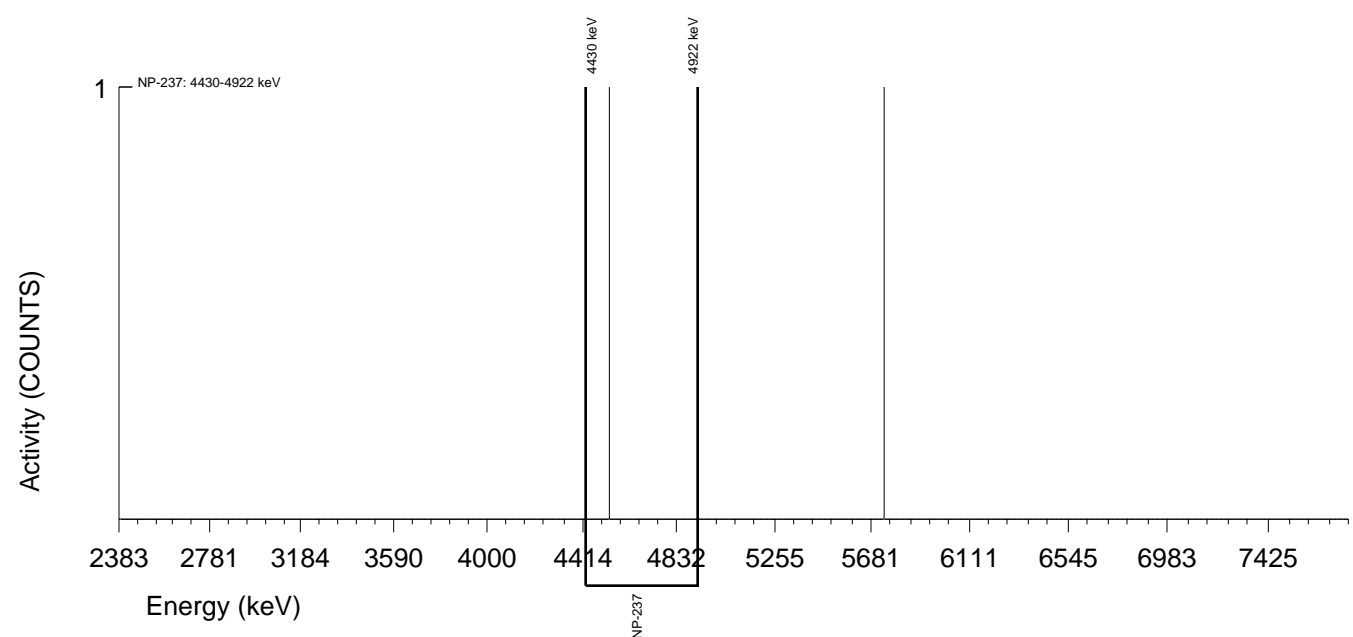
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235051_NP SAMPLE QTY : 0.112 G +/-0.893 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 58.2 +/-5.416 %	CHAMBER : 166 DETECTOR S/N : 74545 AVERAGE %EFFICIENCY : 26.6822 AVERAGE %EFF ERROR : 0.5167 COUNT DATE : 26-Sep-2016 11:51:54 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B166.CNF;891 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W166.CNF;299 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.16467
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 2.5979E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4727.57	0.000	2.000	1.880	0.120	0.3464	100.000	4.06E-01	7.37E-01	9.07E-01	1.30E-01	7.36E-01



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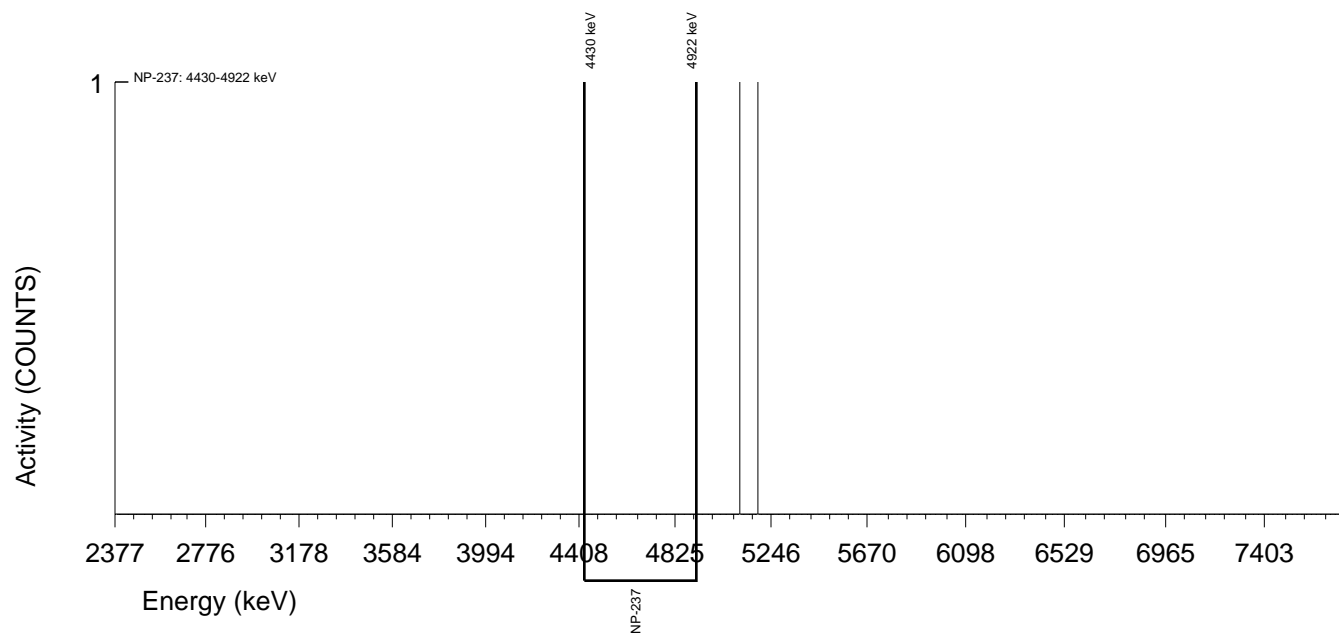
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235052_NP SAMPLE QTY : 0.122 G +/-0.820 % SAMPLE DATE : 07-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 93.5 +/-5.174 %	CHAMBER : 223 DETECTOR S/N : 87911 AVERAGE %EFFICIENCY : 25.6333 AVERAGE %EFF ERROR : 0.4968 COUNT DATE : 22-Sep-2016 15:55:59 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B223.CNF;458 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W223.CNF;114 CAL DATE : 16-Sep-2016
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TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 49.16467 NOMINAL : 4.4615E+02 dpm RESULTS : 4.1700E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.37	0.000	0.000	-0.600	0.600	0.7746	100.000	-7.71E-02	2.63E-01	7.32E-01	1.73E-01	2.62E-01



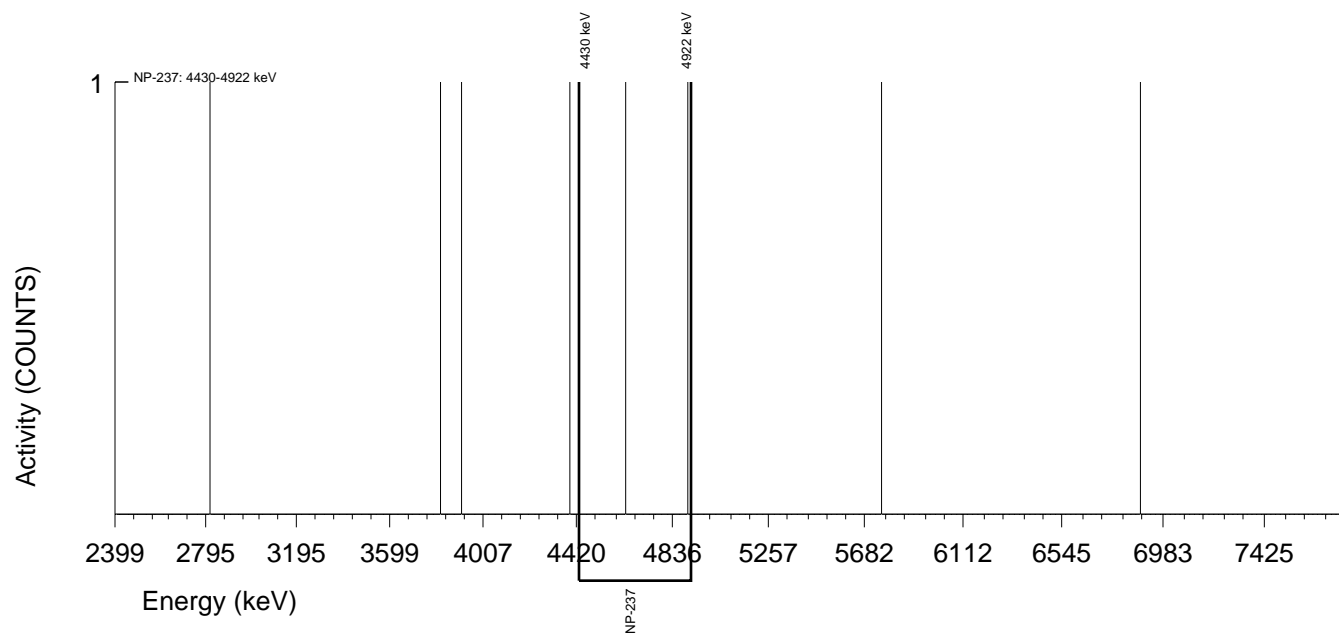
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Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235053_NP SAMPLE QTY : 0.108 G +/-0.926 % SAMPLE DATE : 01-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 88.5 +/-5.198 %	CHAMBER : 224 DETECTOR S/N : 87912 AVERAGE %EFFICIENCY : 25.7363 AVERAGE %EFF ERROR : 0.4987 COUNT DATE : 22-Sep-2016 15:56:03 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B224.CNF;469 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W224.CNF;150 CAL DATE : 16-Sep-2016
TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 49.16467 NOMINAL : 4.4615E+02 dpm RESULTS : 3.9487E+02 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4768.35	260.757	2.000	1.040	0.960	0.9798	100.000	1.59E-01	5.29E-01	9.78E-01	2.60E-01	5.29E-01



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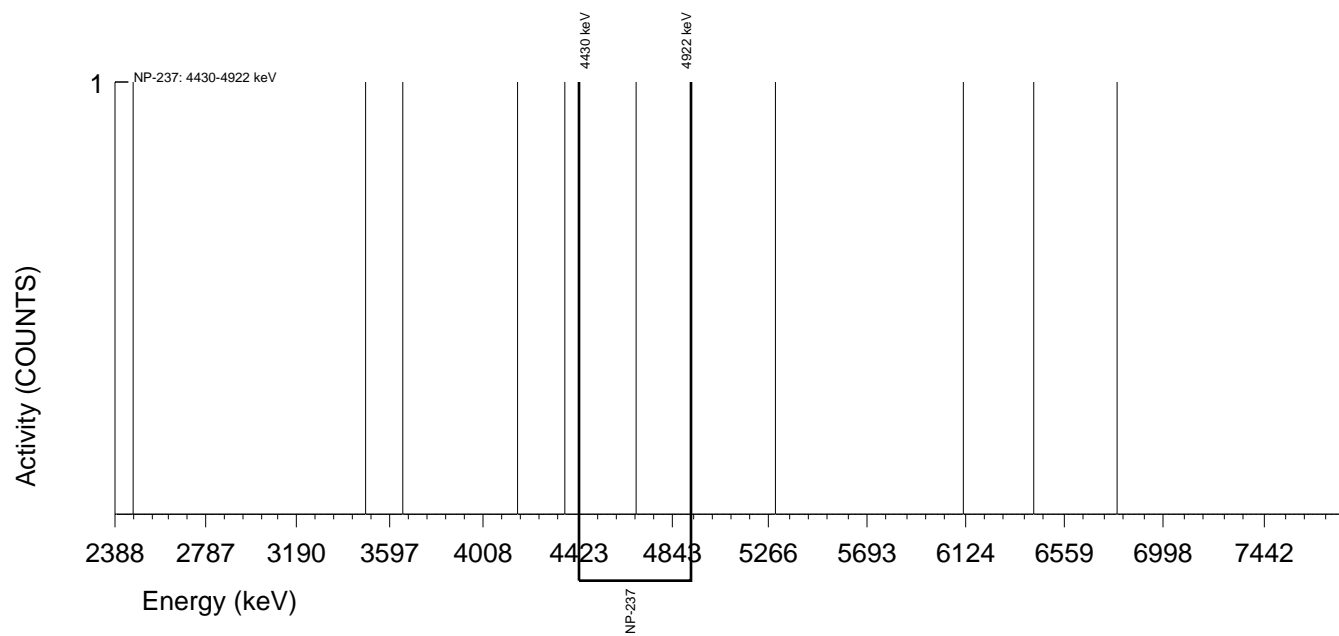
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235054_NP SAMPLE QTY : 0.122 G +/-0.820 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 79.7 +/-5.248 %	CHAMBER : 225 DETECTOR S/N : 87913 AVERAGE %EFFICIENCY : 25.9298 AVERAGE %EFF ERROR : 0.5025 COUNT DATE : 22-Sep-2016 15:56:05 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B225.CNF;458 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W225.CNF;124 CAL DATE : 16-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.16467
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.5579E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4679.66	4.962	1.000	-0.080	1.080	1.0392	100.000	-1.19E-02	4.27E-01	9.85E-01	2.69E-01	4.27E-01



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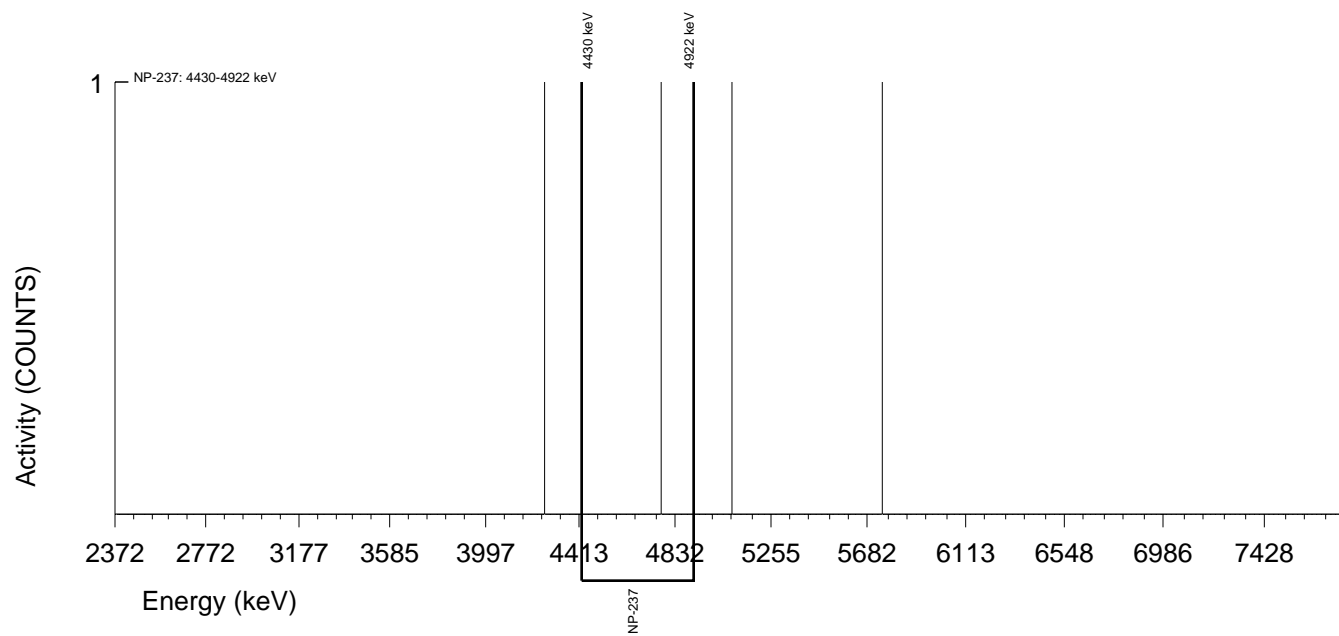
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235055_NP SAMPLE QTY : 0.101 G +/-0.990 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 79.9 +/-5.248 %	CHAMBER : 226 DETECTOR S/N : 87914 AVERAGE %EFFICIENCY : 26.8347 AVERAGE %EFF ERROR : 0.5195 COUNT DATE : 22-Sep-2016 15:56:08 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B226.CNF;458 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W226.CNF;122 CAL DATE : 16-Sep-2016
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TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 49.16467 NOMINAL : 4.4615E+02 dpm RESULTS : 3.5638E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4774.25	4.984	1.000	0.160	0.840	0.9165	100.000	2.77E-02	4.95E-01	1.07E+00	2.77E-01	4.94E-01



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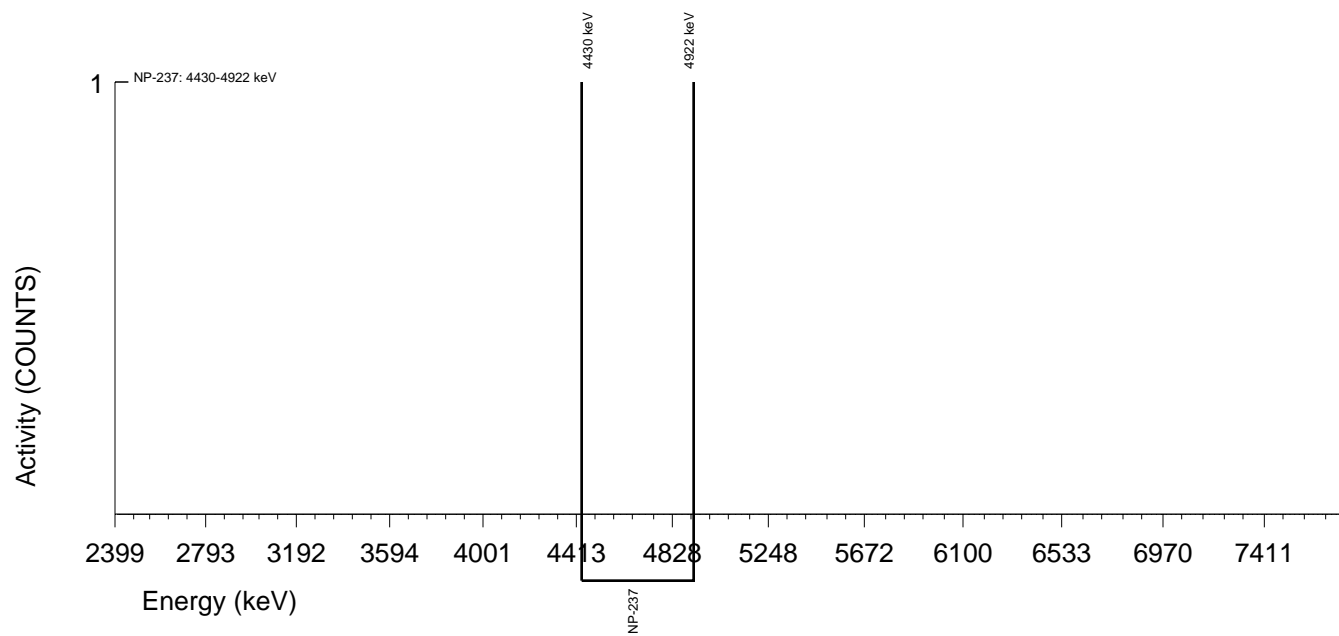
Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235056_NP SAMPLE QTY : 0.113 G +/-0.885 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 86.5 +/-5.213 %	CHAMBER : 178 DETECTOR S/N : 74436 AVERAGE %EFFICIENCY : 27.7549 AVERAGE %EFF ERROR : 0.5369 COUNT DATE : 26-Sep-2016 11:51:56 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B178.CNF;874 BKG DATE : 23-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W178.CNF;243 CAL DATE : 13-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.16467
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 3.8579E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.25	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	2.74E-01	4.15E-01	0.00E+00	2.73E-01



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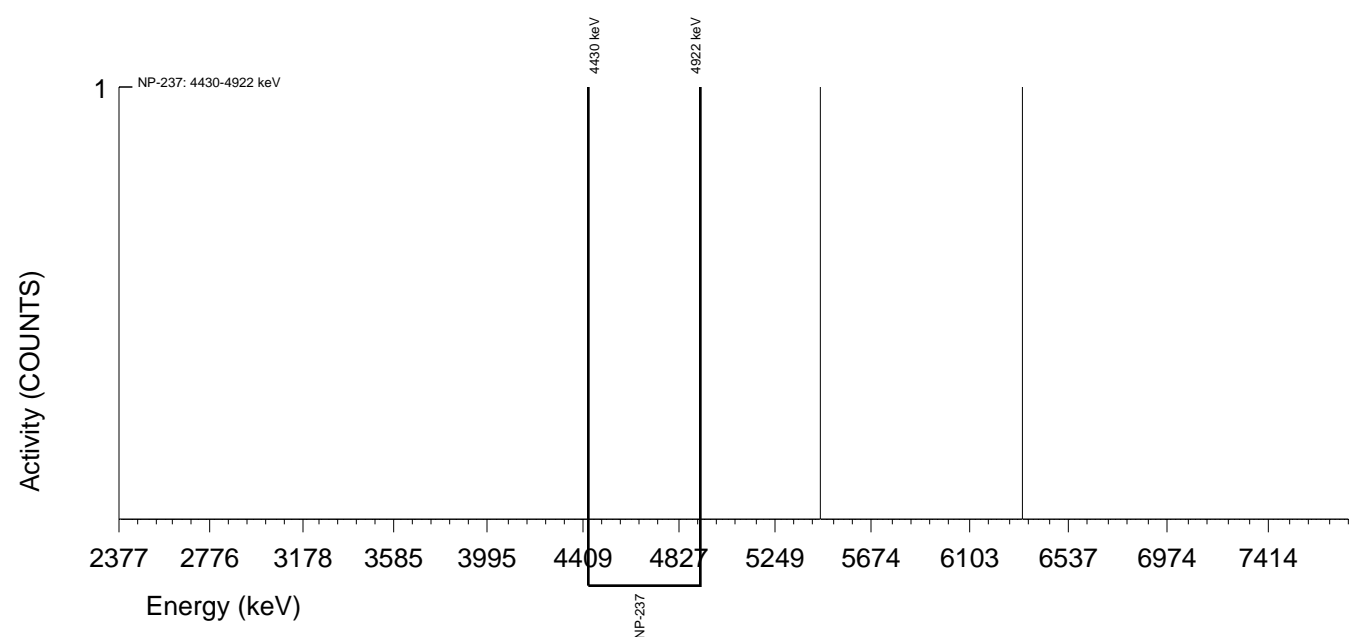
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235057_NP SAMPLE QTY : 0.122 G +/-0.820 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 89.7 +/-5.198 %	CHAMBER : 199 DETECTOR S/N : 78896 AVERAGE %EFFICIENCY : 26.2038 AVERAGE %EFF ERROR : 0.5077 COUNT DATE : 22-Sep-2016 15:53:49 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B199.CNF;799 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W199.CNF;222 CAL DATE : 15-Sep-2016
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TRACER
ID : 445-96-2-III
NUCLIDE : AM-243 BETA %EFF. : 49.16467
NOMINAL : 4.4615E+02 dpm
RESULTS : 4.0021E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.34	0.000	0.000	-0.240	0.240	0.4899	100.000	-3.14E-02	2.62E-01	6.16E-01	1.12E-01	2.62E-01



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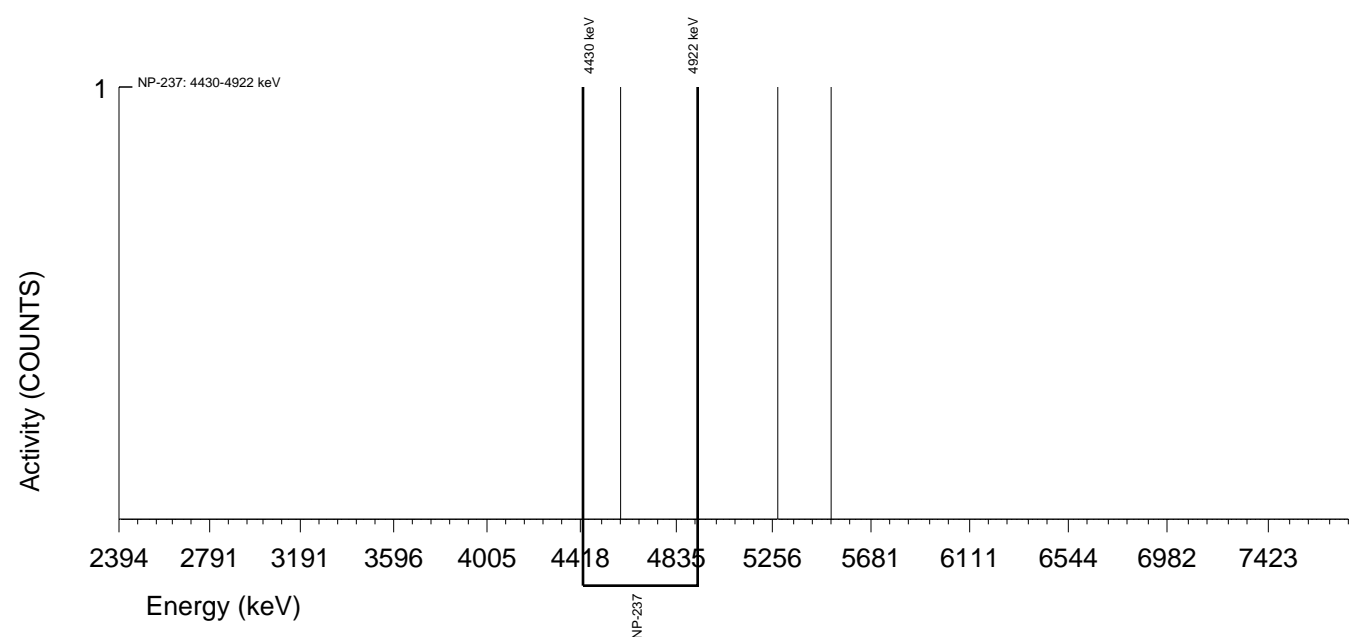
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235058_NP SAMPLE QTY : 0.111 G +/-0.901 % SAMPLE DATE : 02-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 91.1 +/-5.193 %	CHAMBER : 200 DETECTOR S/N : 78900 AVERAGE %EFFICIENCY : 27.0654 AVERAGE %EFF ERROR : 0.5238 COUNT DATE : 22-Sep-2016 15:53:52 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B200.CNF;799 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W200.CNF;230 CAL DATE : 15-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.16467
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 4.0666E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4589.24	4.930	1.000	-0.200	1.200	1.0954	100.000	-2.74E-02	3.95E-01	9.34E-01	2.61E-01	3.95E-01



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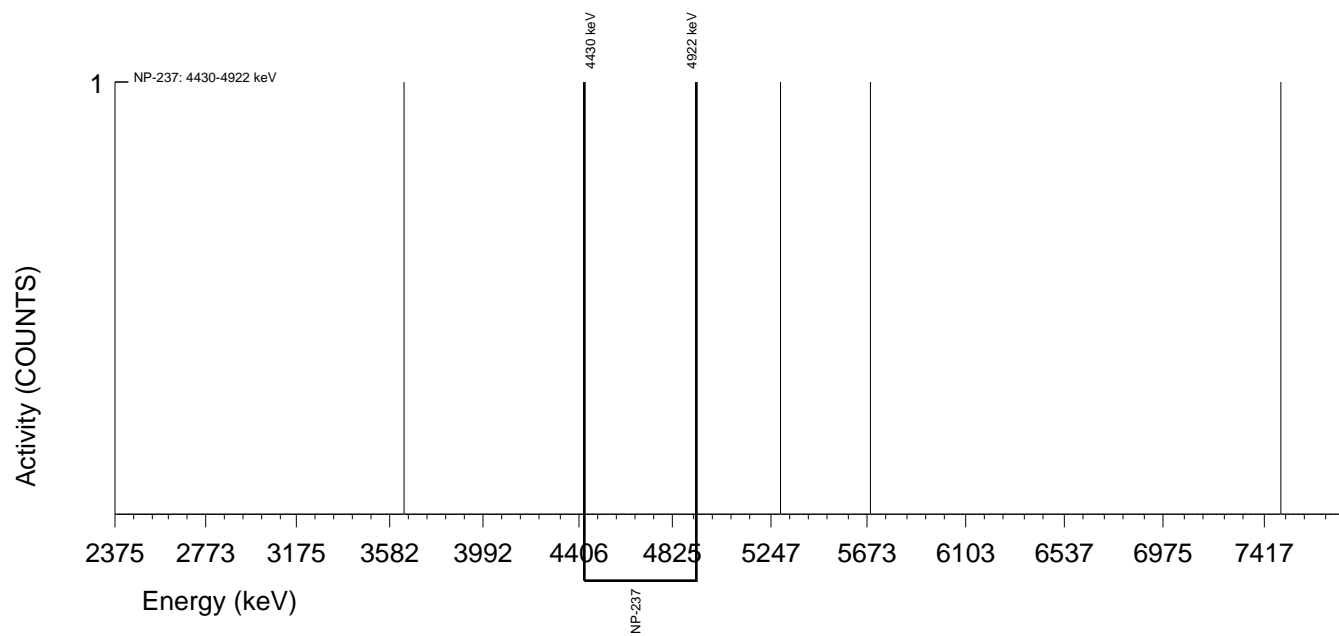
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235059_NP SAMPLE QTY : 0.107 G +/-0.935 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 81.2 +/-5.246 %	CHAMBER : 201 DETECTOR S/N : 78902 AVERAGE %EFFICIENCY : 26.2326 AVERAGE %EFF ERROR : 0.5081 COUNT DATE : 22-Sep-2016 15:53:55 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B201.CNF;799 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W201.CNF;224 CAL DATE : 15-Sep-2016
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TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 49.16467 NOMINAL : 4.4615E+02 dpm RESULTS : 3.6249E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.31	0.000	0.000	-0.960	0.960	0.9798	100.000	-1.58E-01	3.43E-01	1.06E+00	2.81E-01	3.43E-01



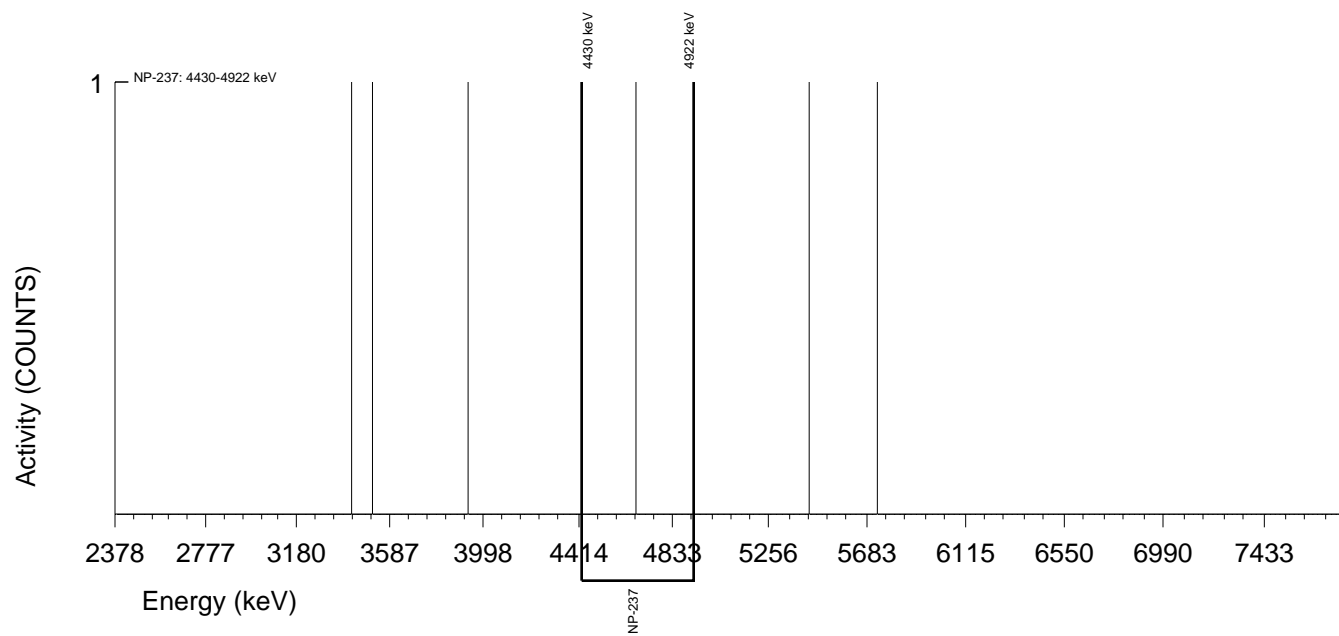
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Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S0405235060_NP SAMPLE QTY : 0.114 G +/-0.877 % SAMPLE DATE : 16-Dec-2015 00:00:00 ANALYST : HAKB % YIELD : 85.5 +/-5.223 %	CHAMBER : 202 DETECTOR S/N : 78903 AVERAGE %EFFICIENCY : 27.2753 AVERAGE %EFF ERROR : 0.5278 COUNT DATE : 22-Sep-2016 15:53:57 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B202.CNF;797 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W202.CNF;226 CAL DATE : 15-Sep-2016
TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 49.16467 NOMINAL : 4.4615E+02 dpm RESULTS : 3.8165E+02 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4669.83	4.960	1.000	-0.680	1.680	1.2961	100.000	-9.60E-02	4.12E-01	1.06E+00	3.18E-01	4.12E-01



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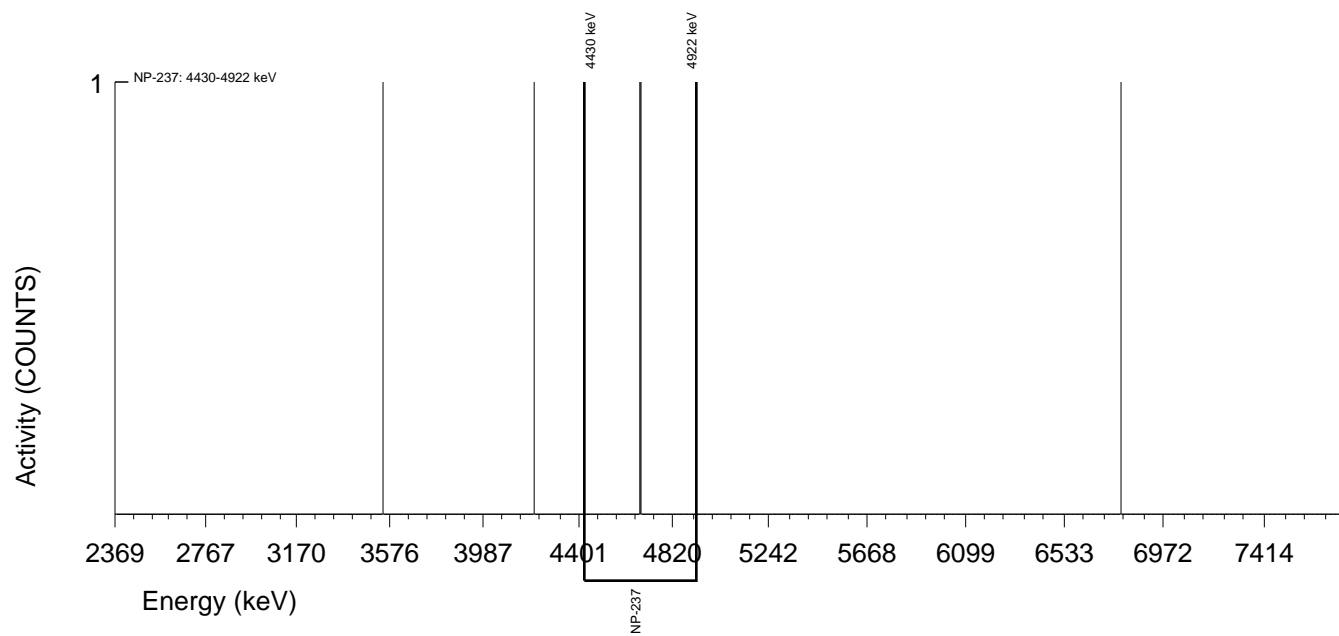
Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S1203621748_NP SAMPLE QTY : 0.122 G +/-0.820 % SAMPLE DATE : 20-Sep-2016 00:00:00 ANALYST : HAKB % YIELD : 91.4 +/-5.195 %	CHAMBER : 203 DETECTOR S/N : 78905 AVERAGE %EFFICIENCY : 25.9071 AVERAGE %EFF ERROR : 0.5020 COUNT DATE : 22-Sep-2016 15:54:00 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B203.CNF;799 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W203.CNF;229 CAL DATE : 15-Sep-2016
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TRACER
 ID : 445-96-2-III
 NUCLIDE : AM-243 BETA %EFF. : 49.16467
 NOMINAL : 4.4615E+02 dpm
 RESULTS : 4.0797E+02 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4675.22	9.911	2.000	1.760	0.240	0.4899	100.000	2.29E-01	4.45E-01	6.11E-01	1.11E-01	4.44E-01



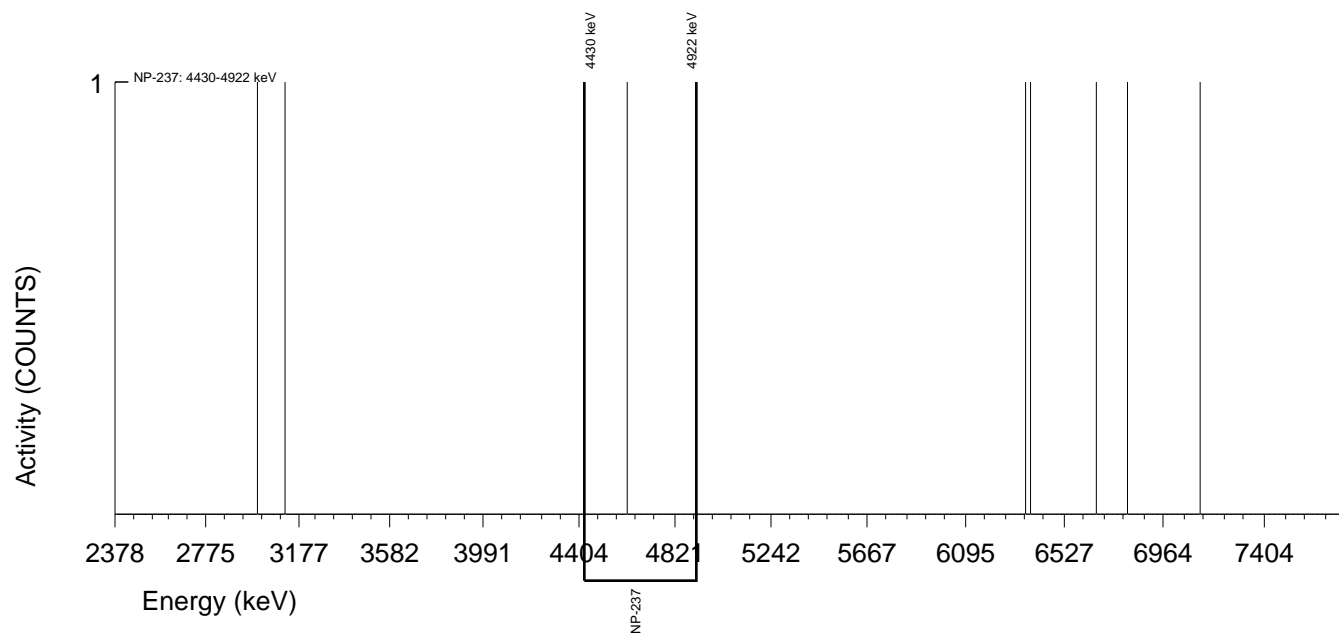
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S1203621749_NP SAMPLE QTY : 0.115 G +/-0.870 % SAMPLE DATE : 30-Nov-2015 00:00:00 ANALYST : HAKB % YIELD : 63.4 +/-5.385 %	CHAMBER : 205 DETECTOR S/N : 78908 AVERAGE %EFFICIENCY : 26.6171 AVERAGE %EFF ERROR : 0.5154 COUNT DATE : 22-Sep-2016 15:54:02 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B205.CNF;801 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W205.CNF;223 CAL DATE : 15-Sep-2016
TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 49.16467 NOMINAL : 4.4615E+02 dpm RESULTS : 2.8269E+02 dpm		

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4617.57	4.945	1.000	0.760	0.240	0.4899	100.000	1.47E-01	5.43E-01	9.11E-01	1.65E-01	5.42E-01



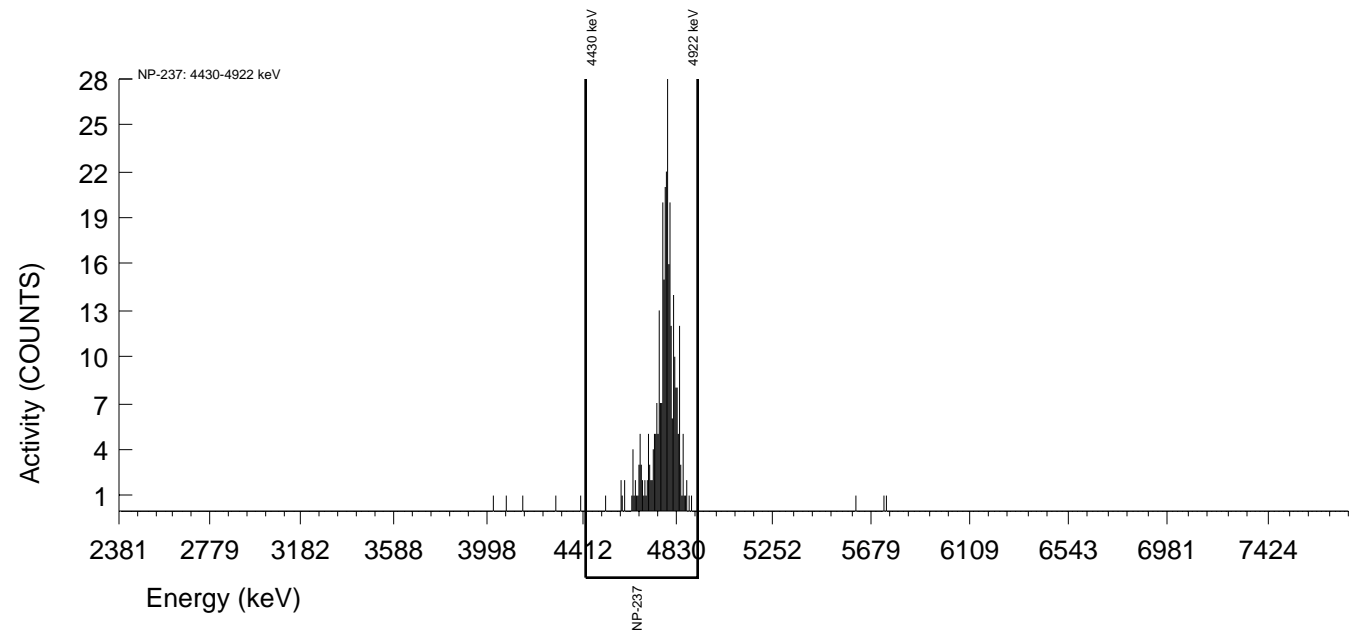
GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-032

BATCH NUMBER : 1596411 SAMPLE ID : S1203621750_NP SAMPLE QTY : 0.122 G +/-0.820 % SAMPLE DATE : 20-Sep-2016 00:00:00 ANALYST : HAKB % YIELD : 93.3 +/-5.189 %	CHAMBER : 206 DETECTOR S/N : 78909 AVERAGE %EFFICIENCY : 25.8407 AVERAGE %EFF ERROR : 0.5007 COUNT DATE : 22-Sep-2016 15:54:05 ELAPSED LIVE TIME(SEC) : 7200.00	LIB FILE : NP BKG FILE : B206.CNF;798 BKG DATE : 16-Sep-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W206.CNF;226 CAL DATE : 15-Sep-2016
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TRACER ID : 445-96-2-III NUCLIDE : AM-243 BETA %EFF. : 49.16467 NOMINAL : 4.4615E+02 dpm RESULTS : 4.1618E+02 dpm	LCS ID 0518-S NUCLIDE NP-237 NOMINAL (pCi/G) 3.6602E+01 % RECOVERY 115.531
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NUCLIDE ACTIVITY SUMMARY													
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
NP-237	4788.00	4772.71	35.697	332.000	331.280	0.720	0.8485	100.000	4.23E+01	6.51E+00	7.60E-01	1.89E-01	4.57E+00



Continuing Calibration Data

Bank 1 through bank 29 (detectors 1 through 256)

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

	Detector	Parameter	Flag

17-SEP-2016	19	PSFWHM-5000	Below
17-SEP-2016	19	PSENERGY-5000	Above
17-SEP-2016	19	PSCENTRD-5000	Above
17-SEP-2016	19	PSCTSS-5000	Below
17-SEP-2016	22	PSENERGY-5000	Above
17-SEP-2016	32	PSENERGY-5000	Below
17-SEP-2016	36	PSFWHM-5000	Below
17-SEP-2016	36	PSCTSS-5000	Below
17-SEP-2016	37	PSFWHM-5000	Below
17-SEP-2016	37	PSENERGY-5000	Below
17-SEP-2016	37	PSCENTRD-5000	Below
17-SEP-2016	37	PSCTSS-5000	Below
17-SEP-2016	39	PSENERGY-5000	Above
17-SEP-2016	39	PSCENTRD-5000	Above
17-SEP-2016	77	PSFWHM-5000	Below
17-SEP-2016	77	PSENERGY-5000	Below
17-SEP-2016	77	PSCENTRD-5000	Below
17-SEP-2016	77	PSCTSS-5000	Below
17-SEP-2016	79	PSFWHM-5000	Below
17-SEP-2016	79	PSCTSS-5000	Below
17-SEP-2016	94	PSFWHM-5000	Below
17-SEP-2016	94	PSCTSS-5000	Below
17-SEP-2016	98	PSENERGY-5000	Above
17-SEP-2016	98	PSCENTRD-5000	Above
17-SEP-2016	100	PSFWHM-5000	Above
17-SEP-2016	101	PSENERGY-5000	Above
17-SEP-2016	101	PSCENTRD-5000	Above
17-SEP-2016	102	PSFWHM-5000	Above
17-SEP-2016	111	PSENERGY-5000	Above
17-SEP-2016	111	PSCENTRD-5000	Above
17-SEP-2016	125	PSFWHM-5000	Above
17-SEP-2016	137	PSFWHM-5000	Above

17-SEP-2016	183	PSFWHM-5000	Below
17-SEP-2016	183	PSCENTRD-5000	Below
17-SEP-2016	183	PSCTSS-5000	Below
17-SEP-2016	192	PSENERGY-5000	Above
17-SEP-2016	198	PSFWHM-5000	Below
17-SEP-2016	198	PSCTSS-5000	Below
17-SEP-2016	237	PSENERGY-5000	Above
17-SEP-2016	237	PSCENTRD-5000	Above
17-SEP-2016	240	PSFWHM-5000	Above
17-SEP-2016	242	PSFWHM-5000	Above

The following detectors that may not have properly transferred to the QA file

163	may not have run since 17-SEP-2016
164	may not have run since 17-SEP-2016
171	may not have run since 17-SEP-2016
172	may not have run since 17-SEP-2016

APPROVAL DATE:

9/12/16

APPROVAL TIME:

1045

APPROVED BY:

[Signature]

PROCEDURE # GL-RAD-I-009

Report completed at 17-SEP-2016 10:30:04.90

Review of Alpha Spectrometer QA results (Daily checks) 19-SEP-2016 17:27:58.24

Bank 1 through bank 29 (detectors 1 through 256)

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

	Detector	Parameter	Flag

19-SEP-2016	19	PSFWHM-5000	Below
19-SEP-2016	19	PSENERGY-5000	Above
19-SEP-2016	19	PSCENTRD-5000	Above
19-SEP-2016	19	PSCTSS-5000	Below
19-SEP-2016	22	PSENERGY-5000	Above
19-SEP-2016	25	PSFWHM-5000	Above
19-SEP-2016	37	PSFWHM-5000	Below
19-SEP-2016	37	PSENERGY-5000	Below
19-SEP-2016	37	PSCENTRD-5000	Below
19-SEP-2016	37	PSCTSS-5000	Below
19-SEP-2016	39	PSENERGY-5000	Above
19-SEP-2016	48	PSFWHM-5000	Below
19-SEP-2016	48	PSENERGY-5000	Below
19-SEP-2016	48	PSCENTRD-5000	Below
19-SEP-2016	48	PSCTSS-5000	Below
19-SEP-2016	77	PSFWHM-5000	Below
19-SEP-2016	77	PSENERGY-5000	Below
19-SEP-2016	77	PSCENTRD-5000	Below
19-SEP-2016	77	PSCTSS-5000	Below
19-SEP-2016	79	PSFWHM-5000	Below
19-SEP-2016	79	PSCTSS-5000	Below
19-SEP-2016	94	PSFWHM-5000	Below
19-SEP-2016	94	PSCTSS-5000	Below
19-SEP-2016	98	PSENERGY-5000	Above
19-SEP-2016	98	PSCENTRD-5000	Above
19-SEP-2016	100	PSFWHM-5000	Above
19-SEP-2016	101	PSENERGY-5000	Above
19-SEP-2016	101	PSCENTRD-5000	Above
19-SEP-2016	102	PSFWHM-5000	Above
19-SEP-2016	111	PSENERGY-5000	Above
19-SEP-2016	111	PSCENTRD-5000	Above
19-SEP-2016	111	PSCTSS-5000	Below
19-SEP-2016	123	PSFWHM-5000	Above

19-SEP-2016	178	PSFWHM-5000	Above
19-SEP-2016	183	PSFWHM-5000	Below
19-SEP-2016	183	PSCENTRD-5000	Below
19-SEP-2016	183	PSCTSS-5000	Below
19-SEP-2016	192	PSENERGY-5000	Above
19-SEP-2016	193	PSFWHM-5000	Above
19-SEP-2016	198	PSFWHM-5000	Below
19-SEP-2016	198	PSCTSS-5000	Below
19-SEP-2016	237	PSENERGY-5000	Above
19-SEP-2016	237	PSCENTRD-5000	Above

The following detectors that may not have properly transferred to the QA file

171 may not have run since 19-SEP-2016
 172 may not have run since 19-SEP-2016

APPROVAL DATE: 9/19/16

APPROVAL TIME: 1815

APPROVED BY:

[Handwritten signature]

PROCEDURE # GL-RAD-I-009

Report completed at 19-SEP-2016 17:30:48.77

Bank 1 through bank 29 (detectors 1 through 256)

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

	Detector	Parameter	Flag

20-SEP-2016	19	PSFWHM-5000	Below
20-SEP-2016	19	PSENERGY-5000	Above
20-SEP-2016	19	PSCENTRD-5000	Above
20-SEP-2016	19	PSCTSS-5000	Below
20-SEP-2016	22	PSENERGY-5000	Above
20-SEP-2016	37	PSFWHM-5000	Below
20-SEP-2016	37	PSENERGY-5000	Below
20-SEP-2016	37	PSCENTRD-5000	Below
20-SEP-2016	37	PSCTSS-5000	Below
20-SEP-2016	39	PSENERGY-5000	Above
20-SEP-2016	46	PSENERGY-5000	Below
20-SEP-2016	67	PSENERGY-5000	Below
20-SEP-2016	77	PSFWHM-5000	Below
20-SEP-2016	77	PSENERGY-5000	Below
20-SEP-2016	77	PSCENTRD-5000	Below
20-SEP-2016	77	PSCTSS-5000	Below
20-SEP-2016	79	PSFWHM-5000	Below
20-SEP-2016	79	PSCTSS-5000	Below
20-SEP-2016	87	PSFWHM-5000	Above
20-SEP-2016	94	PSFWHM-5000	Below
20-SEP-2016	94	PSCTSS-5000	Below
20-SEP-2016	98	PSFWHM-5000	Below
20-SEP-2016	98	PSENERGY-5000	Below
20-SEP-2016	98	PSCTSS-5000	Below
20-SEP-2016	100	PSFWHM-5000	Above
20-SEP-2016	101	PSENERGY-5000	Above
20-SEP-2016	101	PSCENTRD-5000	Above
20-SEP-2016	102	PSFWHM-5000	Above
20-SEP-2016	111	PSENERGY-5000	Above
20-SEP-2016	111	PSCENTRD-5000	Above
20-SEP-2016	138	PSFWHM-5000	Above

20-SEP-2016	178	PSFWMH-5000	Above
20-SEP-2016	183	PSFWMH-5000	Below
20-SEP-2016	183	PSCENTRD-5000	Below
20-SEP-2016	183	PSCTSS-5000	Below
20-SEP-2016	192	PSENERGY-5000	Above
20-SEP-2016	198	PSFWMH-5000	Below
20-SEP-2016	198	PSCTSS-5000	Below
20-SEP-2016	237	PSFWMH-5000	Above
20-SEP-2016	237	PSENERGY-5000	Above
20-SEP-2016	237	PSCENTRD-5000	Above

The following detectors that may not have properly transferred to the QA file

7	may not have run since 20-SEP-2016	} work count
8	may not have run since 20-SEP-2016	
9	may not have run since 20-SEP-2016	
10	may not have run since 20-SEP-2016	
11	may not have run since 20-SEP-2016	
12	may not have run since 20-SEP-2016	

APPROVAL DATE:
9/20/16

APPROVAL TIME:
1500

APPROVED BY:


PROCEDURE # GL-RAD-I-009

Report completed at 20-SEP-2016 14:21:38.35

Bank 1 through bank 29 (detectors 1 through 256)

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

	Detector	Parameter	Flag

22-SEP-2016	19	PSFWHM-5000	Below
22-SEP-2016	19	PSENERGY-5000	Above
22-SEP-2016	19	PSCENTRD-5000	Above
22-SEP-2016	19	PSCTSS-5000	Below
22-SEP-2016	22	PSENERGY-5000	Above
22-SEP-2016	37	PSFWHM-5000	Below
22-SEP-2016	37	PSENERGY-5000	Below
22-SEP-2016	37	PSCENTRD-5000	Below
22-SEP-2016	37	PSCTSS-5000	Below
22-SEP-2016	39	PSENERGY-5000	Above
22-SEP-2016	46	PSENERGY-5000	Below
22-SEP-2016	77	PSFWHM-5000	Below
22-SEP-2016	77	PSENERGY-5000	Below
22-SEP-2016	77	PSCENTRD-5000	Below
22-SEP-2016	77	PSCTSS-5000	Below
22-SEP-2016	79	PSFWHM-5000	Below
22-SEP-2016	79	PSCTSS-5000	Below
22-SEP-2016	94	PSFWHM-5000	Below
22-SEP-2016	94	PSCTSS-5000	Below
22-SEP-2016	98	PSENERGY-5000	Above
22-SEP-2016	98	PSCENTRD-5000	Above
22-SEP-2016	100	PSFWHM-5000	Above
22-SEP-2016	101	PSENERGY-5000	Above
22-SEP-2016	101	PSCENTRD-5000	Above
22-SEP-2016	102	PSFWHM-5000	Above
22-SEP-2016	111	PSENERGY-5000	Above
22-SEP-2016	111	PSCENTRD-5000	Above
22-SEP-2016	138	PSFWHM-5000	Above
22-SEP-2016	183	PSFWHM-5000	Below
22-SEP-2016	183	PSCENTRD-5000	Below
22-SEP-2016	183	PSCTSS-5000	Below
22-SEP-2016	192	PSENERGY-5000	Above

22-SEP-2016	198	PSFWM-5000	Below
22-SEP-2016	198	PSCTSS-5000	Below
22-SEP-2016	237	PSENERGY-5000	Above
22-SEP-2016	237	PSCENTRD-5000	Above

All QA parameters have been transferred since 22-SEP-2016

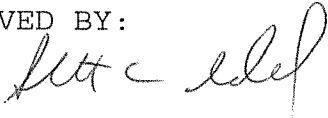
APPROVAL DATE:

9/22/16

APPROVAL TIME:

1710

APPROVED BY:



PROCEDURE # GL-RAD-I-009

Report completed at 22-SEP-2016 17:01:37.19

Review of Alpha Spectrometer QA results (Daily checks) 24-SEP-2016 11:50:37.75

Bank 1 through bank 29 (detectors 1 through 256)

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

	Detector	Parameter	Flag
24-SEP-2016	19	PSFWHM-5000	Below
24-SEP-2016	19	PSENERGY-5000	Above
24-SEP-2016	19	PSCENTRD-5000	Above
24-SEP-2016	19	PSCTSS-5000	Below
24-SEP-2016	22	PSENERGY-5000	Above
24-SEP-2016	37	PSENERGY-5000	Below
24-SEP-2016	37	PSCTSS-5000	Below
24-SEP-2016	39	PSENERGY-5000	Above
24-SEP-2016	46	PSENERGY-5000	Below
24-SEP-2016	67	PSENERGY-5000	Below
24-SEP-2016	77	PSFWHM-5000	Below
24-SEP-2016	77	PSENERGY-5000	Below
24-SEP-2016	77	PSCENTRD-5000	Below
24-SEP-2016	77	PSCTSS-5000	Below
24-SEP-2016	79	PSFWHM-5000	Below
24-SEP-2016	79	PSCTSS-5000	Below
24-SEP-2016	94	PSFWHM-5000	Below
24-SEP-2016	94	PSCTSS-5000	Below
24-SEP-2016	98	PSENERGY-5000	Above
24-SEP-2016	98	PSCENTRD-5000	Above
24-SEP-2016	100	PSFWHM-5000	Above
24-SEP-2016	101	PSENERGY-5000	Above
24-SEP-2016	101	PSCENTRD-5000	Above
24-SEP-2016	102	PSFWHM-5000	Above
24-SEP-2016	111	PSENERGY-5000	Above
24-SEP-2016	133	PSFWHM-5000	Above
24-SEP-2016	138	PSFWHM-5000	Above
24-SEP-2016	183	PSFWHM-5000	Below
24-SEP-2016	183	PSCENTRD-5000	Below
24-SEP-2016	183	PSCTSS-5000	Below

24-SEP-2016	192	PSENERGY-5000	Above
24-SEP-2016	198	PSFWHM-5000	Below
24-SEP-2016	198	PSCTSS-5000	Below
24-SEP-2016	215	PSFWHM-5000	Above
24-SEP-2016	225	PSFWHM-5000	Above
24-SEP-2016	237	PSENERGY-5000	Above
24-SEP-2016	237	PSCENTRD-5000	Above
24-SEP-2016	242	PSENERGY-5000	Below

The following detectors that may not have properly transferred to the QA file

163 may not have run since 24-SEP-2016
 164 may not have run since 24-SEP-2016
 171 may not have run since 24-SEP-2016
 172 may not have run since 24-SEP-2016

APPROVAL DATE:

9/24/16

APPROVAL TIME:

1230

APPROVED BY:



PROCEDURE # GL-RAD-I-009

Report completed at 24-SEP-2016 11:57:47.46

Review of Alpha Spectrometer QA results (Daily checks) 25-SEP-2016 15:22:51.14

Bank 1 through bank 29 (detectors 1 through 256)

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

	Detector	Parameter	Flag

24-SEP-2016	19	PSFWHM-5000	Below
24-SEP-2016	19	PSENERGY-5000	Above
24-SEP-2016	19	PSCENTRD-5000	Above
24-SEP-2016	19	PSCTSS-5000	Below
24-SEP-2016	22	PSENERGY-5000	Above
25-SEP-2016	36	PSFWHM-5000	Below
25-SEP-2016	36	PSCTSS-5000	Below
25-SEP-2016	37	PSFWHM-5000	Below
25-SEP-2016	37	PSENERGY-5000	Below
25-SEP-2016	37	PSCENTRD-5000	Below
25-SEP-2016	37	PSCTSS-5000	Below
25-SEP-2016	39	PSENERGY-5000	Above
25-SEP-2016	46	PSENERGY-5000	Below
25-SEP-2016	67	Second Check Required for D	
25-SEP-2016	77	PSFWHM-5000	Below
25-SEP-2016	77	PSENERGY-5000	Below
25-SEP-2016	77	PSCENTRD-5000	Below
25-SEP-2016	77	PSCTSS-5000	Below
25-SEP-2016	79	PSFWHM-5000	Below
25-SEP-2016	79	PSCTSS-5000	Below
25-SEP-2016	91	PSFWHM-5000	Below
25-SEP-2016	91	PSENERGY-5000	Below
25-SEP-2016	91	PSCENTRD-5000	Below
25-SEP-2016	91	PSCTSS-5000	Below
25-SEP-2016	94	PSFWHM-5000	Below
25-SEP-2016	94	PSCTSS-5000	Below
25-SEP-2016	98	PSENERGY-5000	Above
25-SEP-2016	98	PSCENTRD-5000	Above
25-SEP-2016	100	PSFWHM-5000	Above
25-SEP-2016	101	PSENERGY-5000	Above
25-SEP-2016	101	PSCENTRD-5000	Above
25-SEP-2016	102	PSFWHM-5000	Above

25-SEP-2016	111	PSENERGY-5000	Above
25-SEP-2016	123	PSFWHM-5000	Above
25-SEP-2016	133	PSFWHM-5000	Above
25-SEP-2016	138	PSFWHM-5000	Above
25-SEP-2016	168	PSFWHM-5000	Above
25-SEP-2016	183	PSFWHM-5000	Below
25-SEP-2016	183	PSCENTRD-5000	Below
25-SEP-2016	183	PSCTSS-5000	Below
25-SEP-2016	192	PSENERGY-5000	Above
25-SEP-2016	198	PSFWHM-5000	Below
25-SEP-2016	198	PSCTSS-5000	Below
25-SEP-2016	204	PSFWHM-5000	Above
25-SEP-2016	215	PSFWHM-5000	Above
25-SEP-2016	216	PSFWHM-5000	Above
25-SEP-2016	237	PSENERGY-5000	Above
25-SEP-2016	237	PSCENTRD-5000	Above

The following detectors that may not have properly transferred to the QA file

19	may not have run since 25-SEP-2016	} long counts
20	may not have run since 25-SEP-2016	
21	may not have run since 25-SEP-2016	
22	may not have run since 25-SEP-2016	
23	may not have run since 25-SEP-2016	
24	may not have run since 25-SEP-2016	} out of service
163	may not have run since 25-SEP-2016	
164	may not have run since 25-SEP-2016	
171	may not have run since 25-SEP-2016	
172	may not have run since 25-SEP-2016	

APPROVAL DATE: 9/25/16 APPROVAL TIME: 15:30

APPROVED BY:  PROCEDURE # GL-RAD-I-009

Report completed at 25-SEP-2016 15:26:08.15

Bank 1 through bank 29 (detectors 1 through 256)

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

	Detector	Parameter	Flag

26-SEP-2016	19	PSFWHM-5000	Below
26-SEP-2016	19	PSENERGY-5000	Above
26-SEP-2016	19	PSCTSS-5000	Below
26-SEP-2016	36	PSFWHM-5000	Below
26-SEP-2016	36	PSCTSS-5000	Below
26-SEP-2016	37	PSFWHM-5000	Below
26-SEP-2016	37	PSENERGY-5000	Below
26-SEP-2016	37	PSCENTRD-5000	Below
26-SEP-2016	37	PSCTSS-5000	Below
26-SEP-2016	39	PSENERGY-5000	Above
26-SEP-2016	46	PSENERGY-5000	Below
26-SEP-2016	77	PSFWHM-5000	Below
26-SEP-2016	77	PSENERGY-5000	Below
26-SEP-2016	77	PSCENTRD-5000	Below
26-SEP-2016	77	PSCTSS-5000	Below
26-SEP-2016	79	PSFWHM-5000	Below
26-SEP-2016	79	PSCTSS-5000	Below
26-SEP-2016	83	PSFWHM-5000	Below
26-SEP-2016	83	PSCTSS-5000	Below
26-SEP-2016	94	PSFWHM-5000	Below
26-SEP-2016	94	PSCTSS-5000	Below
26-SEP-2016	98	PSENERGY-5000	Above
26-SEP-2016	98	PSCENTRD-5000	Above
26-SEP-2016	100	PSFWHM-5000	Above
26-SEP-2016	101	PSFWHM-5000	Above
26-SEP-2016	101	PSENERGY-5000	Above
26-SEP-2016	101	PSCENTRD-5000	Above
26-SEP-2016	102	PSFWHM-5000	Above
26-SEP-2016	111	PSENERGY-5000	Above
26-SEP-2016	114	PSFWHM-5000	Above
26-SEP-2016	123	PSFWHM-5000	Above

26-SEP-2016	130	PSFWHM-5000	Above
26-SEP-2016	138	PSFWHM-5000	Above
26-SEP-2016	168	PSFWHM-5000	Above
26-SEP-2016	183	PSFWHM-5000	Below
26-SEP-2016	183	PSCENTRD-5000	Below
26-SEP-2016	183	PSCTSS-5000	Below
26-SEP-2016	192	PSENERGY-5000	Above
26-SEP-2016	198	PSFWHM-5000	Below
26-SEP-2016	198	PSCTSS-5000	Below
26-SEP-2016	215	PSFWHM-5000	Above
26-SEP-2016	216	PSENERGY-5000	Above
26-SEP-2016	237	PSENERGY-5000	Above
26-SEP-2016	237	PSCENTRD-5000	Above

The following detectors that may not have properly transferred to the QA file

171 may not have run since 26-SEP-2016 } out of service
 172 may not have run since 26-SEP-2016 }

APPROVAL DATE: 9/26/16

APPROVAL TIME: 11:30

APPROVED BY: 

PROCEDURE # GL-RAD-I-009

Report completed at 26-SEP-2016 11:02:39.49

Review of Alpha Spectrometer QA results (Daily checks) 27-SEP-2016 11:50:04.75

Bank 1 through bank 29 (detectors 1 through 256)

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

	Detector	Parameter	Flag

27-SEP-2016	19	PSFWHM-5000	Below
27-SEP-2016	19	PSENERGY-5000	Below
27-SEP-2016	19	PSCTSS-5000	Below
27-SEP-2016	22	PSENERGY-5000	Above
27-SEP-2016	36	PSFWHM-5000	Below
27-SEP-2016	36	PSCTSS-5000	Below
27-SEP-2016	37	PSFWHM-5000	Below
27-SEP-2016	37	PSENERGY-5000	Below
27-SEP-2016	37	PSCENTRD-5000	Below
27-SEP-2016	37	PSCTSS-5000	Below
27-SEP-2016	39	PSENERGY-5000	Above
27-SEP-2016	46	PSENERGY-5000	Below
27-SEP-2016	77	PSFWHM-5000	Below
27-SEP-2016	77	PSENERGY-5000	Below
27-SEP-2016	77	PSCENTRD-5000	Below
27-SEP-2016	77	PSCTSS-5000	Below
27-SEP-2016	79	PSFWHM-5000	Below
27-SEP-2016	79	PSCTSS-5000	Below
27-SEP-2016	94	PSFWHM-5000	Below
27-SEP-2016	94	PSCTSS-5000	Below
27-SEP-2016	98	PSENERGY-5000	Above
27-SEP-2016	98	PSCENTRD-5000	Above
27-SEP-2016	100	PSFWHM-5000	Above
27-SEP-2016	101	PSFWHM-5000	Above
27-SEP-2016	101	PSENERGY-5000	Above
27-SEP-2016	101	PSCENTRD-5000	Above
27-SEP-2016	102	PSFWHM-5000	Above
27-SEP-2016	111	PSENERGY-5000	Above
27-SEP-2016	114	PSFWHM-5000	Above
27-SEP-2016	130	PSFWHM-5000	Above
27-SEP-2016	138	PSFWHM-5000	Above

27-SEP-2016	183	PSFWHM-5000	Below
27-SEP-2016	183	PSCENTRD-5000	Below
27-SEP-2016	183	PSCTSS-5000	Below
27-SEP-2016	192	PSENERGY-5000	Above
27-SEP-2016	198	PSFWHM-5000	Below
27-SEP-2016	198	PSCTSS-5000	Below
27-SEP-2016	215	PSFWHM-5000	Above
27-SEP-2016	216	PSENERGY-5000	Above
27-SEP-2016	237	PSENERGY-5000	Above
27-SEP-2016	237	PSCENTRD-5000	Above
27-SEP-2016	240	PSFWHM-5000	Above

All QA parameters have been transferred since 27-SEP-2016

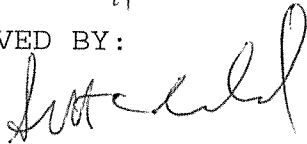
APPROVAL DATE:

9/27/16

APPROVAL TIME:

1158

APPROVED BY:



PROCEDURE # GL-RAD-I-009

Report completed at 27-SEP-2016 11:53:21.22

Review of Alpha Spectrometer QA results (Daily checks) 28-SEP-2016 15:27:27.78

Bank 1 through bank 29 (detectors 1 through 256)

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

	Detector	Parameter	Flag

28-SEP-2016	19	PSFWHM-5000	Below
28-SEP-2016	19	PSENERGY-5000	Above
28-SEP-2016	19	PSCTSS-5000	Below
28-SEP-2016	36	PSFWHM-5000	Below
28-SEP-2016	36	PSCTSS-5000	Below
28-SEP-2016	37	PSFWHM-5000	Below
28-SEP-2016	37	PSENERGY-5000	Below
28-SEP-2016	37	PSCENTRD-5000	Below
28-SEP-2016	37	PSCTSS-5000	Below
28-SEP-2016	39	PSENERGY-5000	Above
28-SEP-2016	46	PSENERGY-5000	Below
28-SEP-2016	77	PSFWHM-5000	Below
28-SEP-2016	77	PSENERGY-5000	Below
28-SEP-2016	77	PSCENTRD-5000	Below
28-SEP-2016	77	PSCTSS-5000	Below
28-SEP-2016	79	PSFWHM-5000	Below
28-SEP-2016	79	PSCTSS-5000	Below
28-SEP-2016	94	PSFWHM-5000	Below
28-SEP-2016	94	PSCTSS-5000	Below
28-SEP-2016	98	PSENERGY-5000	Above
28-SEP-2016	98	PSCENTRD-5000	Above
28-SEP-2016	100	PSFWHM-5000	Above
28-SEP-2016	101	PSFWHM-5000	Above
28-SEP-2016	101	PSENERGY-5000	Above
28-SEP-2016	101	PSCENTRD-5000	Above
28-SEP-2016	102	PSFWHM-5000	Above
28-SEP-2016	111	PSENERGY-5000	Above
28-SEP-2016	114	PSFWHM-5000	Above
28-SEP-2016	123	PSFWHM-5000	Above
28-SEP-2016	130	PSFWHM-5000	Above
28-SEP-2016	138	PSFWHM-5000	Above

28-SEP-2016	168	PSFWHM-5000	Above
28-SEP-2016	183	PSFWHM-5000	Below
28-SEP-2016	183	PSCENTRD-5000	Below
28-SEP-2016	183	PSCTSS-5000	Below
28-SEP-2016	192	PSENERGY-5000	Above
28-SEP-2016	198	PSFWHM-5000	Below
28-SEP-2016	198	PSCTSS-5000	Below
28-SEP-2016	211	PSFWHM-5000	Above
28-SEP-2016	215	PSFWHM-5000	Above
28-SEP-2016	216	PSENERGY-5000	Above
28-SEP-2016	237	PSENERGY-5000	Above
28-SEP-2016	237	PSCENTRD-5000	Above
28-SEP-2016	240	PSFWHM-5000	Above

The following detectors that may not have properly transferred to the QA file

171 may not have run since 28-SEP-2016
 172 may not have run since 28-SEP-2016

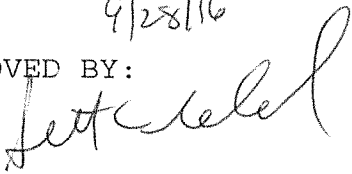
APPROVAL DATE:

9/28/16

APPROVAL TIME:

1600

APPROVED BY:



PROCEDURE # GL-RAD-I-009

Report completed at 28-SEP-2016 15:30:48.31

Review of Alpha Spectrometer QA results (Daily checks) 29-SEP-2016 11:28:28.67

Bank 1 through bank 29 (detectors 1 through 256)

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

	Detector	Parameter	Flag

29-SEP-2016	19	PSFWHM-5000	Below
29-SEP-2016	19	PSENERGY-5000	Above
29-SEP-2016	19	PSCTSS-5000	Below
29-SEP-2016	27	PSENERGY-5000	Below
29-SEP-2016	27	PSCENTRD-5000	Below
29-SEP-2016	29	PSENERGY-5000	Above
29-SEP-2016	36	PSFWHM-5000	Below
29-SEP-2016	36	PSCTSS-5000	Below
29-SEP-2016	37	PSENERGY-5000	Below
29-SEP-2016	37	PSCTSS-5000	Below
29-SEP-2016	43	PSENERGY-5000	Above
29-SEP-2016	44	PSENERGY-5000	Above
29-SEP-2016	45	PSENERGY-5000	Above
29-SEP-2016	45	PSCENTRD-5000	Above
29-SEP-2016	46	PSENERGY-5000	Above
29-SEP-2016	46	PSCENTRD-5000	Above
29-SEP-2016	47	PSENERGY-5000	Above
29-SEP-2016	47	PSCENTRD-5000	Above
29-SEP-2016	77	PSFWHM-5000	Below
29-SEP-2016	77	PSENERGY-5000	Below
29-SEP-2016	77	PSCENTRD-5000	Below
29-SEP-2016	77	PSCTSS-5000	Below
29-SEP-2016	79	PSFWHM-5000	Below
29-SEP-2016	79	PSCTSS-5000	Below
29-SEP-2016	94	PSFWHM-5000	Below
29-SEP-2016	94	PSCTSS-5000	Below
29-SEP-2016	98	PSENERGY-5000	Above
29-SEP-2016	98	PSCENTRD-5000	Above
29-SEP-2016	100	PSFWHM-5000	Above
29-SEP-2016	101	PSFWHM-5000	Above
29-SEP-2016	101	PSENERGY-5000	Above
29-SEP-2016	101	PSCENTRD-5000	Above


29-SEP-2016	102	PSFWMH-5000	Above
29-SEP-2016	111	PSENERGY-5000	Above
29-SEP-2016	114	PSFWMH-5000	Above
29-SEP-2016	130	PSFWMH-5000	Above
29-SEP-2016	137	PSFWMH-5000	Above
29-SEP-2016	138	PSFWMH-5000	Above
29-SEP-2016	183	PSFWMH-5000	Below
29-SEP-2016	183	PSCENTRD-5000	Below
29-SEP-2016	183	PSCTSS-5000	Below
29-SEP-2016	184	PSFWMH-5000	Above
29-SEP-2016	192	PSENERGY-5000	Above
29-SEP-2016	198	PSFWMH-5000	Below
29-SEP-2016	198	PSCTSS-5000	Below
29-SEP-2016	211	PSFWMH-5000	Above
29-SEP-2016	215	PSFWMH-5000	Above
29-SEP-2016	216	PSENERGY-5000	Above
29-SEP-2016	219	PSFWMH-5000	Above
29-SEP-2016	237	PSENERGY-5000	Above
29-SEP-2016	237	PSCENTRD-5000	Above
29-SEP-2016	240	PSFWMH-5000	Above

The following detectors that may not have properly transferred to the QA file

- 171 may not have run since 29-SEP-2016
- 172 may not have run since 29-SEP-2016

APPROVAL DATE:
9/29/16

APPROVAL TIME:
1200

APPROVED BY:


PROCEDURE # GL-RAD-I-009

Report completed at 29-SEP-2016 11:31:49.21

Bank 1 through bank 29 (detectors 1 through 256)

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

	Detector	Parameter	Flag
30-SEP-2016	19	PSFWHM-5000	Below
30-SEP-2016	19	PSENERGY-5000	Above
30-SEP-2016	19	PSCTSS-5000	Below
30-SEP-2016	27	PSENERGY-5000	Below
30-SEP-2016	27	PSCENTRD-5000	Below
30-SEP-2016	29	PSENERGY-5000	Above
30-SEP-2016	36	PSFWHM-5000	Below
30-SEP-2016	36	PSCTSS-5000	Below
30-SEP-2016	37	PSFWHM-5000	Below
30-SEP-2016	37	PSENERGY-5000	Below
30-SEP-2016	37	PSCENTRD-5000	Below
30-SEP-2016	37	PSCTSS-5000	Below
30-SEP-2016	43	PSENERGY-5000	Above
30-SEP-2016	44	PSENERGY-5000	Above
30-SEP-2016	45	PSENERGY-5000	Above
30-SEP-2016	45	PSCENTRD-5000	Above
30-SEP-2016	46	PSENERGY-5000	Above
30-SEP-2016	46	PSCENTRD-5000	Above
30-SEP-2016	47	PSENERGY-5000	Above
30-SEP-2016	47	PSCENTRD-5000	Above
30-SEP-2016	77	PSFWHM-5000	Below
30-SEP-2016	77	PSENERGY-5000	Below
30-SEP-2016	77	PSCENTRD-5000	Below
30-SEP-2016	77	PSCTSS-5000	Below
30-SEP-2016	79	PSFWHM-5000	Below
30-SEP-2016	79	PSCTSS-5000	Below
30-SEP-2016	94	PSFWHM-5000	Below
30-SEP-2016	94	PSCTSS-5000	Below
30-SEP-2016	98	PSFWHM-5000	Below
30-SEP-2016	98	PSENERGY-5000	Below
30-SEP-2016	98	PSCTSS-5000	Below
30-SEP-2016	100	PSFWHM-5000	Above

30-SEP-2016	101	PSENERGY-5000	Above
30-SEP-2016	101	PSCENTRD-5000	Above
30-SEP-2016	102	PSFWHM-5000	Above
30-SEP-2016	111	PSENERGY-5000	Above
30-SEP-2016	114	PSFWHM-5000	Above
30-SEP-2016	129	PSFWHM-5000	Above
30-SEP-2016	130	PSFWHM-5000	Above
30-SEP-2016	138	PSFWHM-5000	Above
30-SEP-2016	183	PSFWHM-5000	Below
30-SEP-2016	183	PSCENTRD-5000	Below
30-SEP-2016	183	PSCTSS-5000	Below
30-SEP-2016	184	PSFWHM-5000	Above
30-SEP-2016	192	PSENERGY-5000	Above
30-SEP-2016	198	PSFWHM-5000	Below
30-SEP-2016	198	PSCTSS-5000	Below
30-SEP-2016	215	PSFWHM-5000	Above
30-SEP-2016	216	PSENERGY-5000	Above
30-SEP-2016	237	PSENERGY-5000	Above
30-SEP-2016	237	PSCENTRD-5000	Above
30-SEP-2016	240	PSFWHM-5000	Above

The following detectors that may not have properly transferred to the QA file

171 may not have run since 30-SEP-2016
 172 may not have run since 30-SEP-2016

APPROVAL DATE:

9/30/16

APPROVAL TIME:

1925

APPROVED BY:

[Signature]

PROCEDURE # GL-RAD-I-009

Report completed at 30-SEP-2016 14:17:13.17

Review of Alpha Spectrometer QA results (Daily checks) 1-OCT-2016 12:15:45.37

Bank 1 through bank 29 (detectors 1 through 256)

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

	Detector	Parameter	Flag

1-OCT-2016	19	PSFWHM-5000	Below
1-OCT-2016	19	PSENERGY-5000	Above
1-OCT-2016	19	PSCENTRD-5000	Above
1-OCT-2016	19	PSCTSS-5000	Below
1-OCT-2016	27	PSFWHM-5000	Above
1-OCT-2016	27	PSENERGY-5000	Below
1-OCT-2016	27	PSCENTRD-5000	Below
1-OCT-2016	29	PSFWHM-5000	Above
1-OCT-2016	36	PSFWHM-5000	Below
1-OCT-2016	36	PSCTSS-5000	Below
1-OCT-2016	37	PSFWHM-5000	Below
1-OCT-2016	37	PSENERGY-5000	Below
1-OCT-2016	37	PSCENTRD-5000	Below
1-OCT-2016	37	PSCTSS-5000	Below
1-OCT-2016	43	PSENERGY-5000	Above
1-OCT-2016	44	PSFWHM-5000	Below
1-OCT-2016	44	PSCTSS-5000	Below
1-OCT-2016	45	PSFWHM-5000	Below
1-OCT-2016	45	PSENERGY-5000	Above
1-OCT-2016	45	PSCTSS-5000	Below
1-OCT-2016	46	PSFWHM-5000	Below
1-OCT-2016	46	PSENERGY-5000	Above
1-OCT-2016	46	PSCENTRD-5000	Above
1-OCT-2016	46	PSCTSS-5000	Below
1-OCT-2016	47	PSFWHM-5000	Below
1-OCT-2016	47	PSENERGY-5000	Above
1-OCT-2016	47	PSCTSS-5000	Below
1-OCT-2016	48	PSFWHM-5000	Below
1-OCT-2016	48	PSENERGY-5000	Below
1-OCT-2016	48	PSCENTRD-5000	Below
1-OCT-2016	48	PSCTSS-5000	Below
1-OCT-2016	66	PSFWHM-5000	Below
1-OCT-2016	66	PSENERGY-5000	Below
1-OCT-2016	66	PSCTSS-5000	Below
1-OCT-2016	78	PSENERGY-5000	Above


1-OCT-2016	79	PSFWHM-5000	Above
1-OCT-2016	87	PSENERGY-5000	Below
1-OCT-2016	87	PSCENTRD-5000	Below
1-OCT-2016	94	PSFWHM-5000	Below
1-OCT-2016	94	PSCTSS-5000	Below
1-OCT-2016	98	PSENERGY-5000	Above
1-OCT-2016	98	PSCENTRD-5000	Above
1-OCT-2016	100	PSFWHM-5000	Above
1-OCT-2016	101	PSENERGY-5000	Above
1-OCT-2016	101	PSCENTRD-5000	Above
1-OCT-2016	102	PSFWHM-5000	Above
1-OCT-2016	111	PSENERGY-5000	Above
1-OCT-2016	114	PSFWHM-5000	Above
1-OCT-2016	129	PSFWHM-5000	Above
1-OCT-2016	138	PSFWHM-5000	Above
1-OCT-2016	161	PSFWHM-5000	Above
1-OCT-2016	183	PSFWHM-5000	Below
1-OCT-2016	183	PSCENTRD-5000	Below
1-OCT-2016	183	PSCTSS-5000	Below
1-OCT-2016	184	PSFWHM-5000	Above
1-OCT-2016	192	PSENERGY-5000	Above
1-OCT-2016	198	PSFWHM-5000	Below
1-OCT-2016	198	PSCTSS-5000	Below
1-OCT-2016	211	PSFWHM-5000	Above
1-OCT-2016	215	PSFWHM-5000	Above
1-OCT-2016	216	PSENERGY-5000	Above
1-OCT-2016	232	PSFWHM-5000	Above
1-OCT-2016	233	PSFWHM-5000	Above
1-OCT-2016	237	PSENERGY-5000	Above
1-OCT-2016	237	PSCENTRD-5000	Above
1-OCT-2016	240	PSFWHM-5000	Above

The following detectors that may not have properly transferred to the QA file

171 may not have run since 1-OCT-2016 } out of service
172 may not have run since 1-OCT-2016 }

APPROVAL DATE: 10/1/16

APPROVAL TIME: 12:30

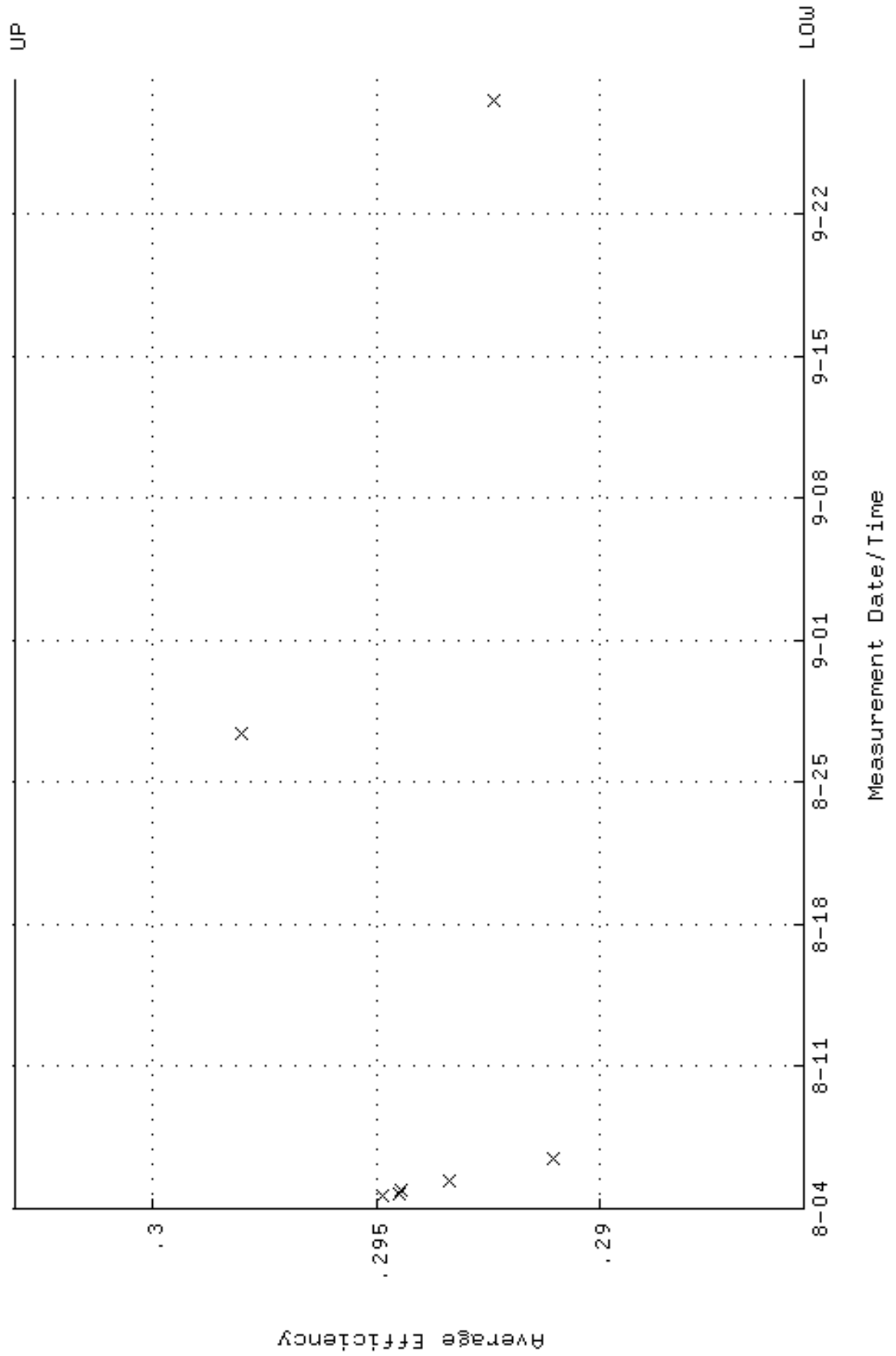
APPROVED BY: 

PROCEDURE # GL-RAD-I-009

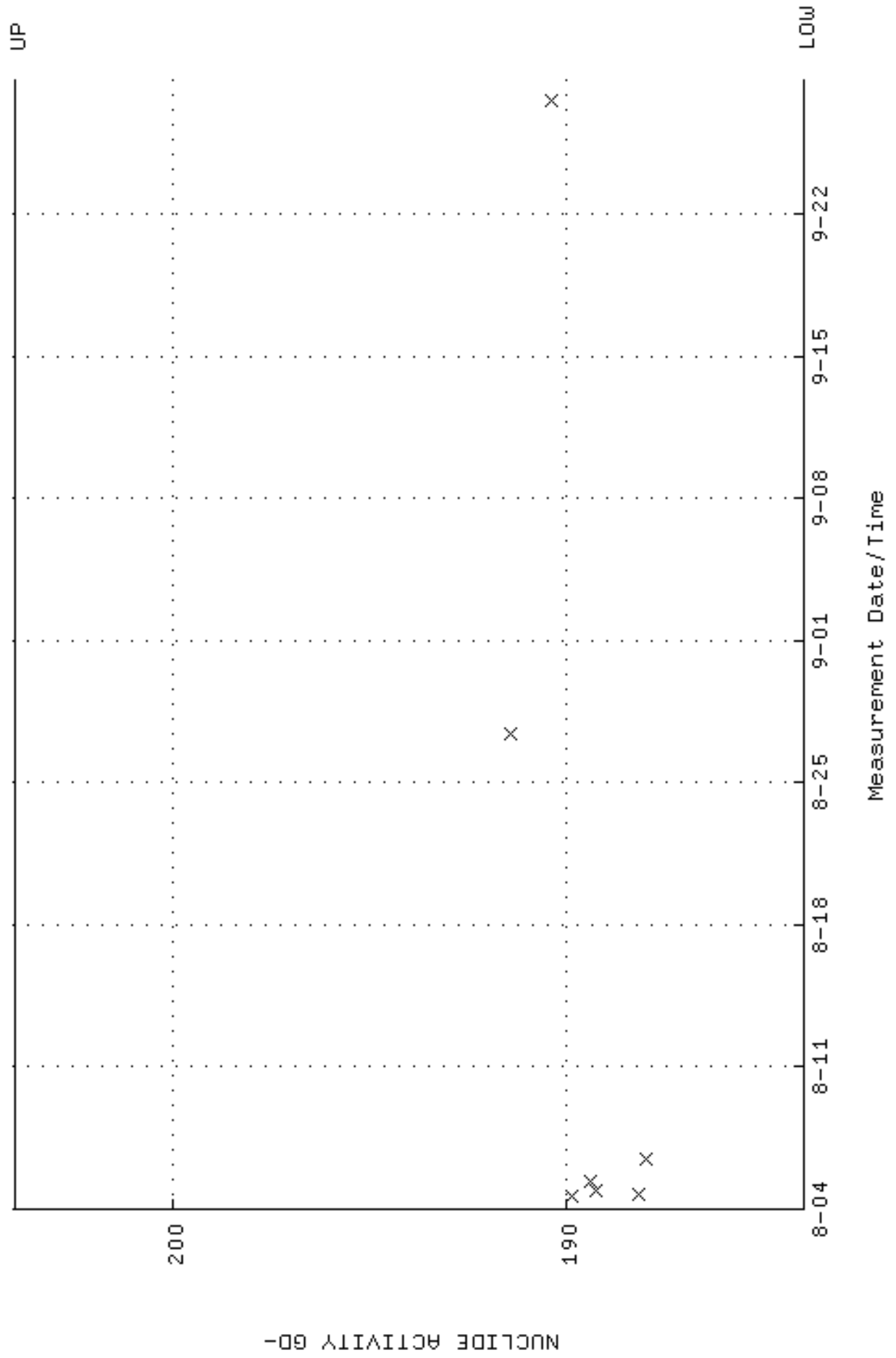
Report completed at 1-OCT-2016 12:19:29.45

Background and Efficiency Data

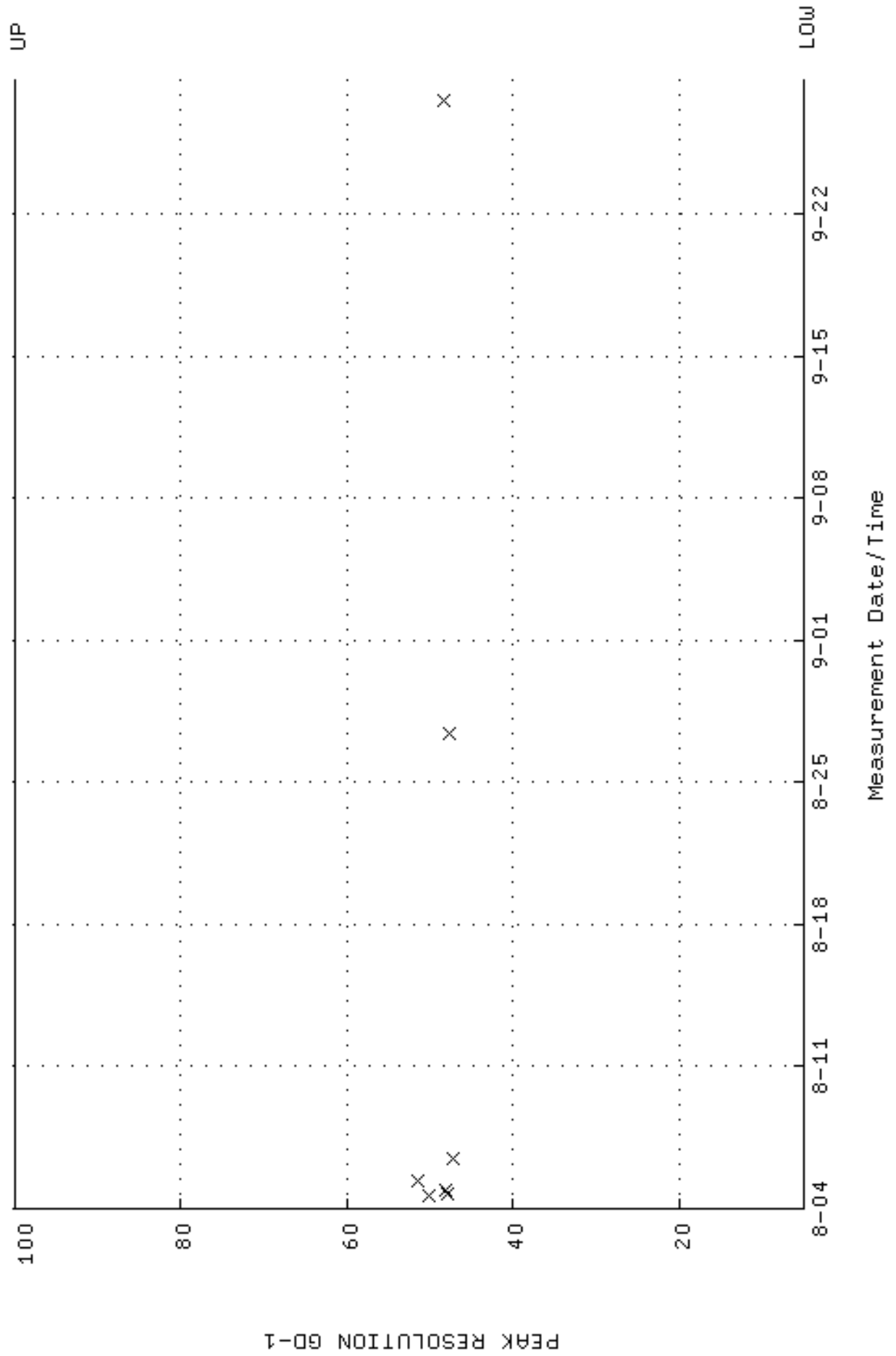
QA filename : DKA100:[ENV_ALPHA.QA.W]W001.QAF;12
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.285426 through 0.303082



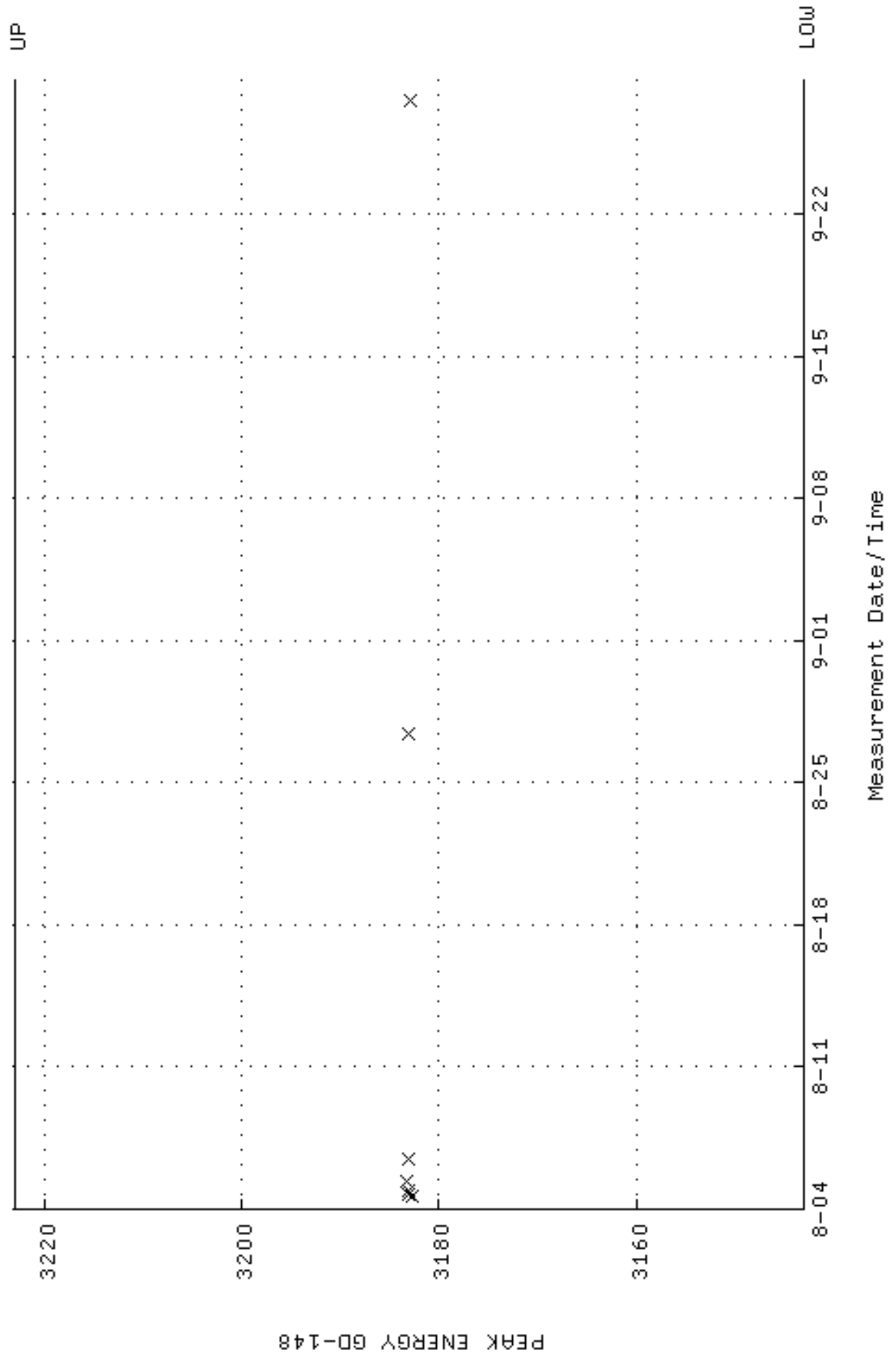
QA filename : DKA100:[ENV_ALPHA.QA.W]W001.QAF;12
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



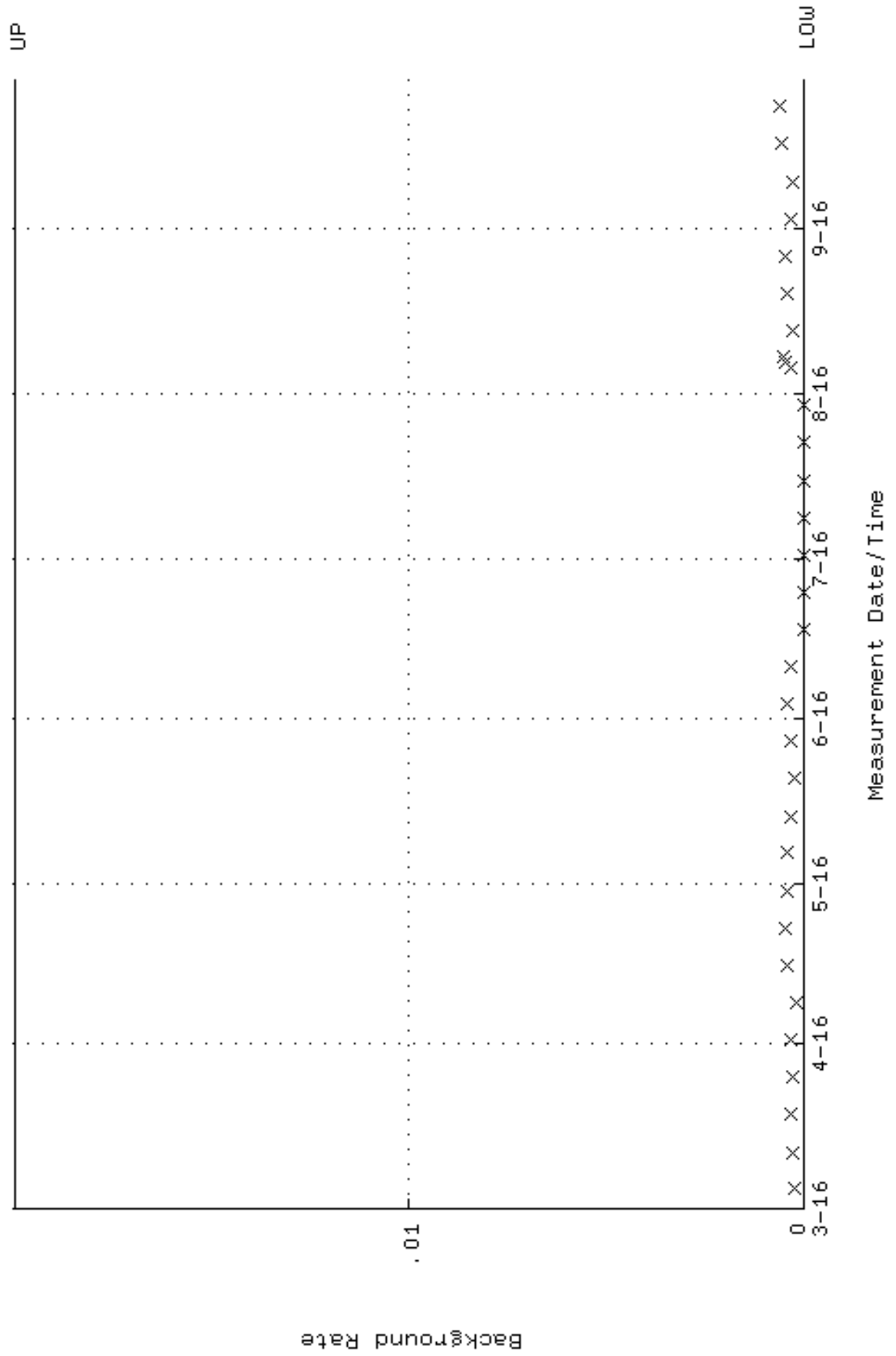
QA filename : DKA100:[ENV_ALPHA.QA.W]W001.QAF;12
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



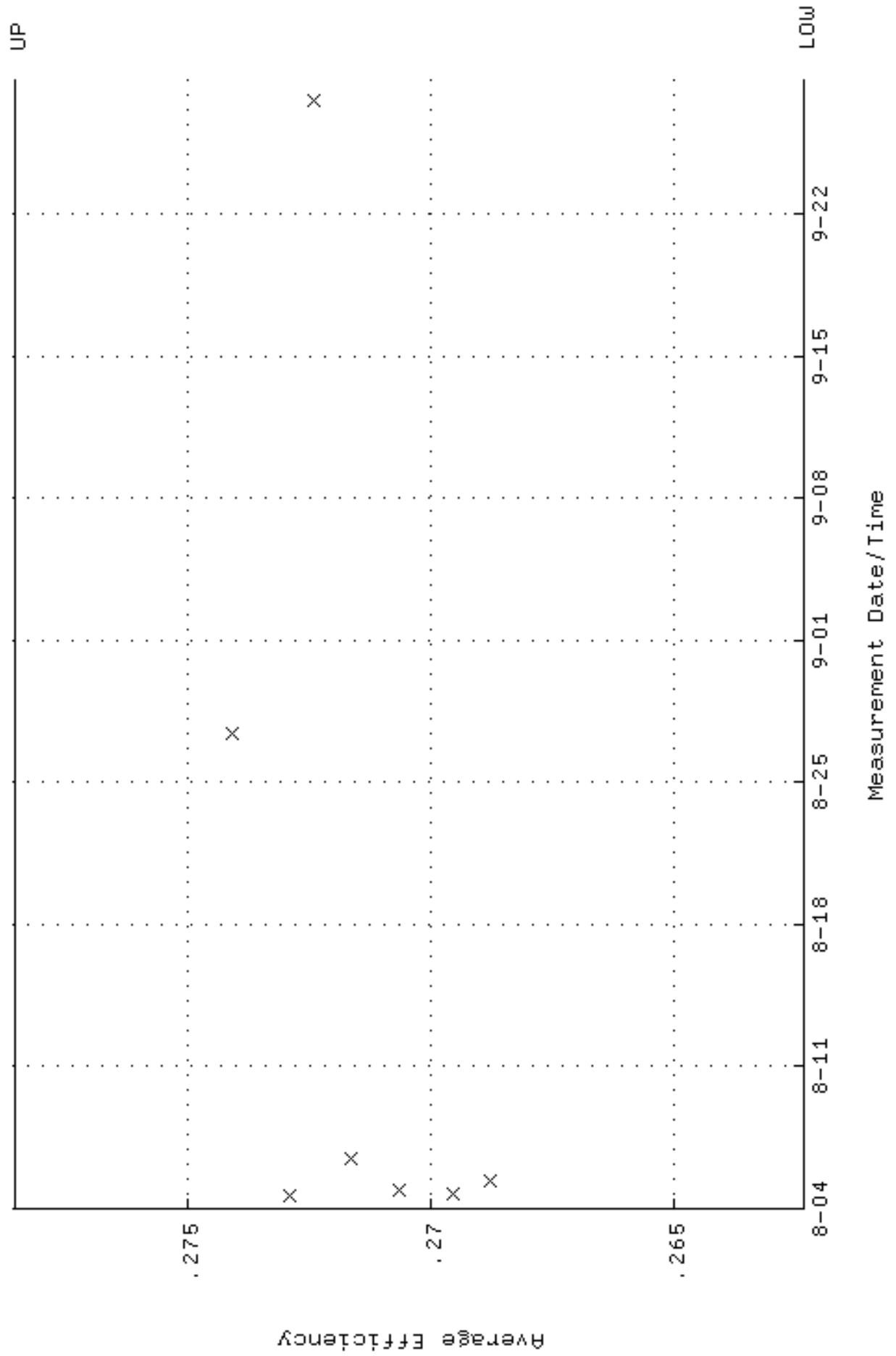
QA filename : DKA100:[ENV_ALPHA.QA.W]W001.QAF;12
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



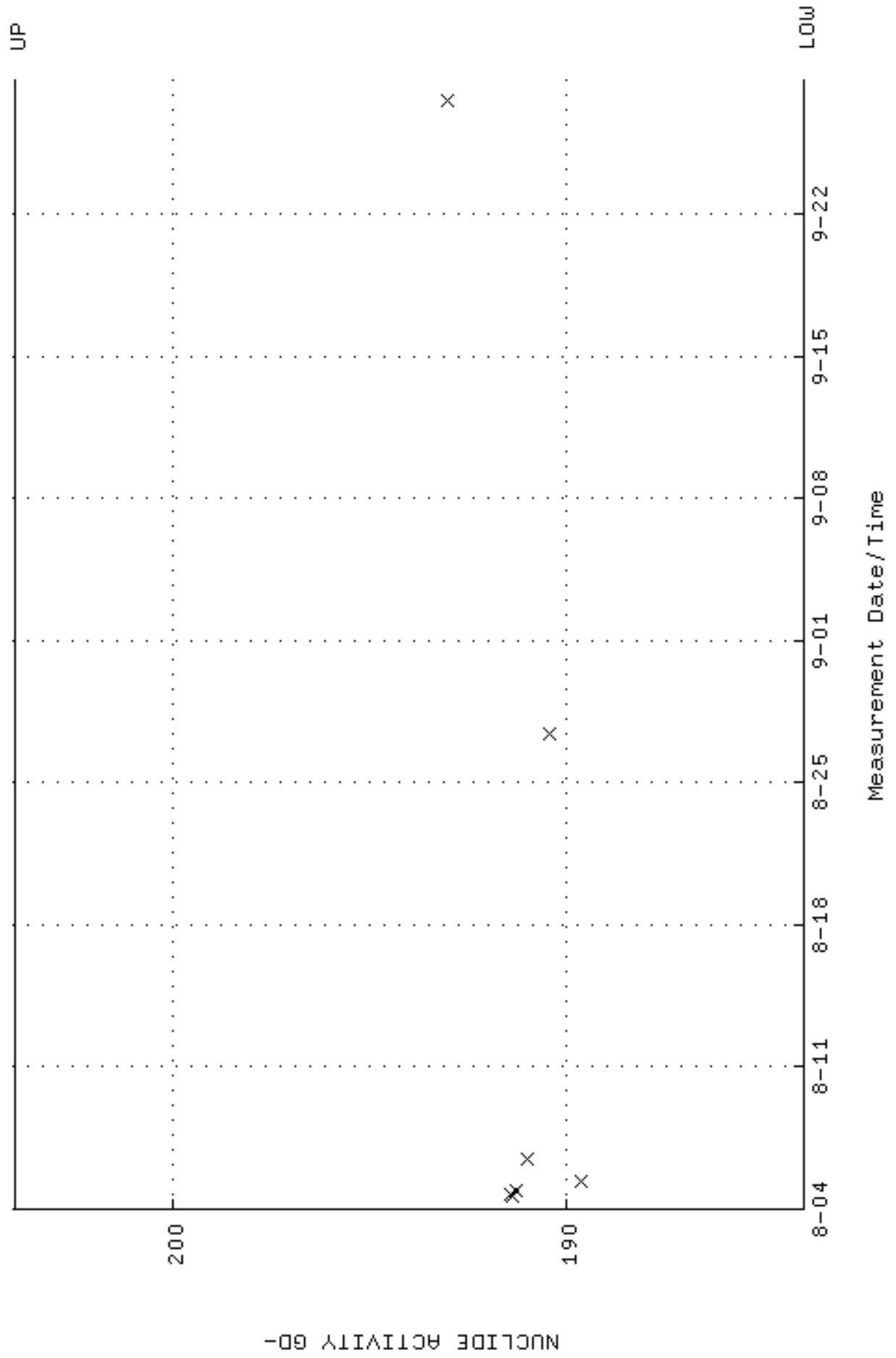
QA filename : DKA100:[ENV_ALPHA.QA.B]B001.QAF;5
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:29:27 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



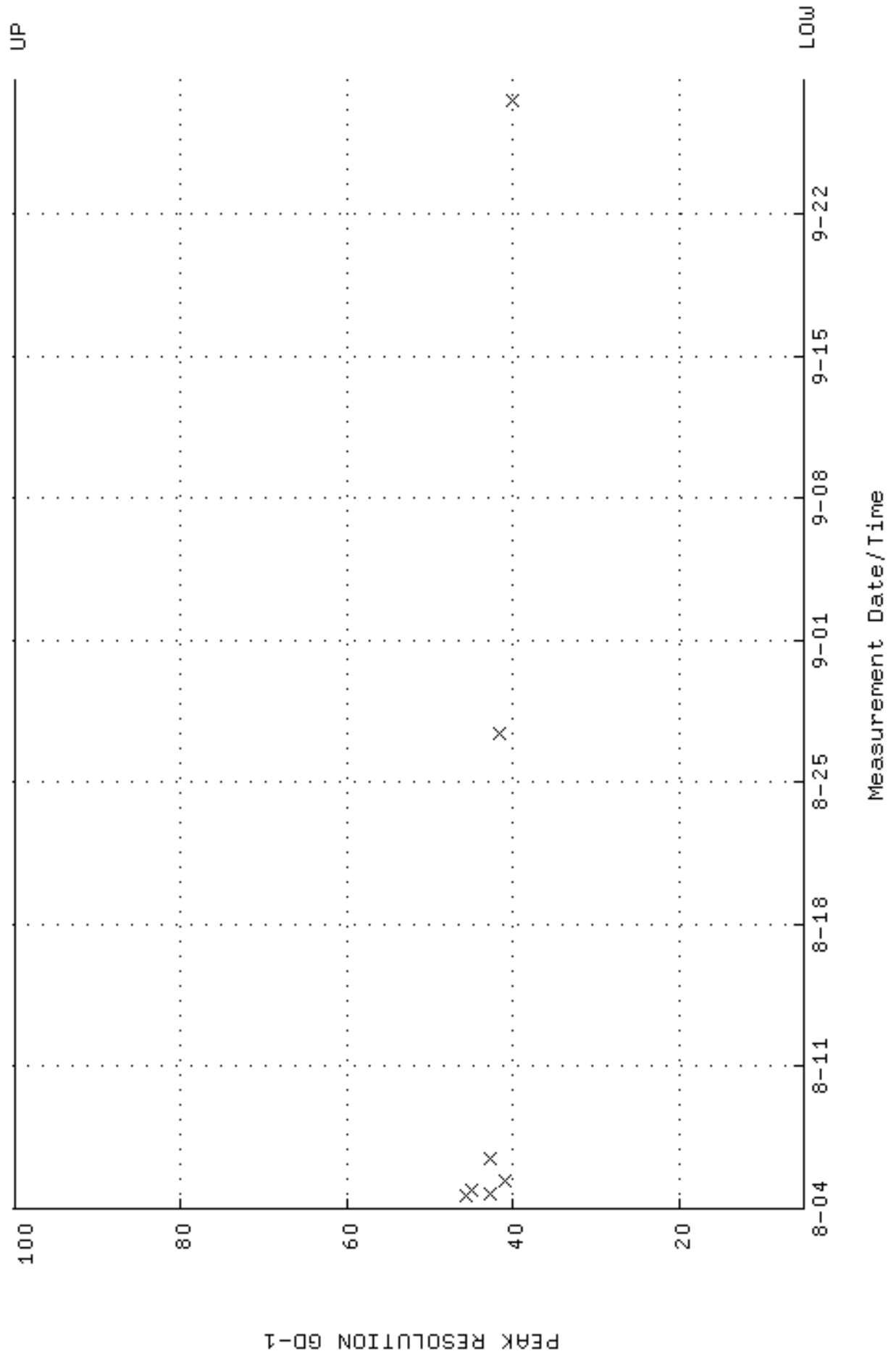
QA filename : DKA100:[ENV_ALPHA.QA.W]W002.QAF;8
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.262337 through 0.278564



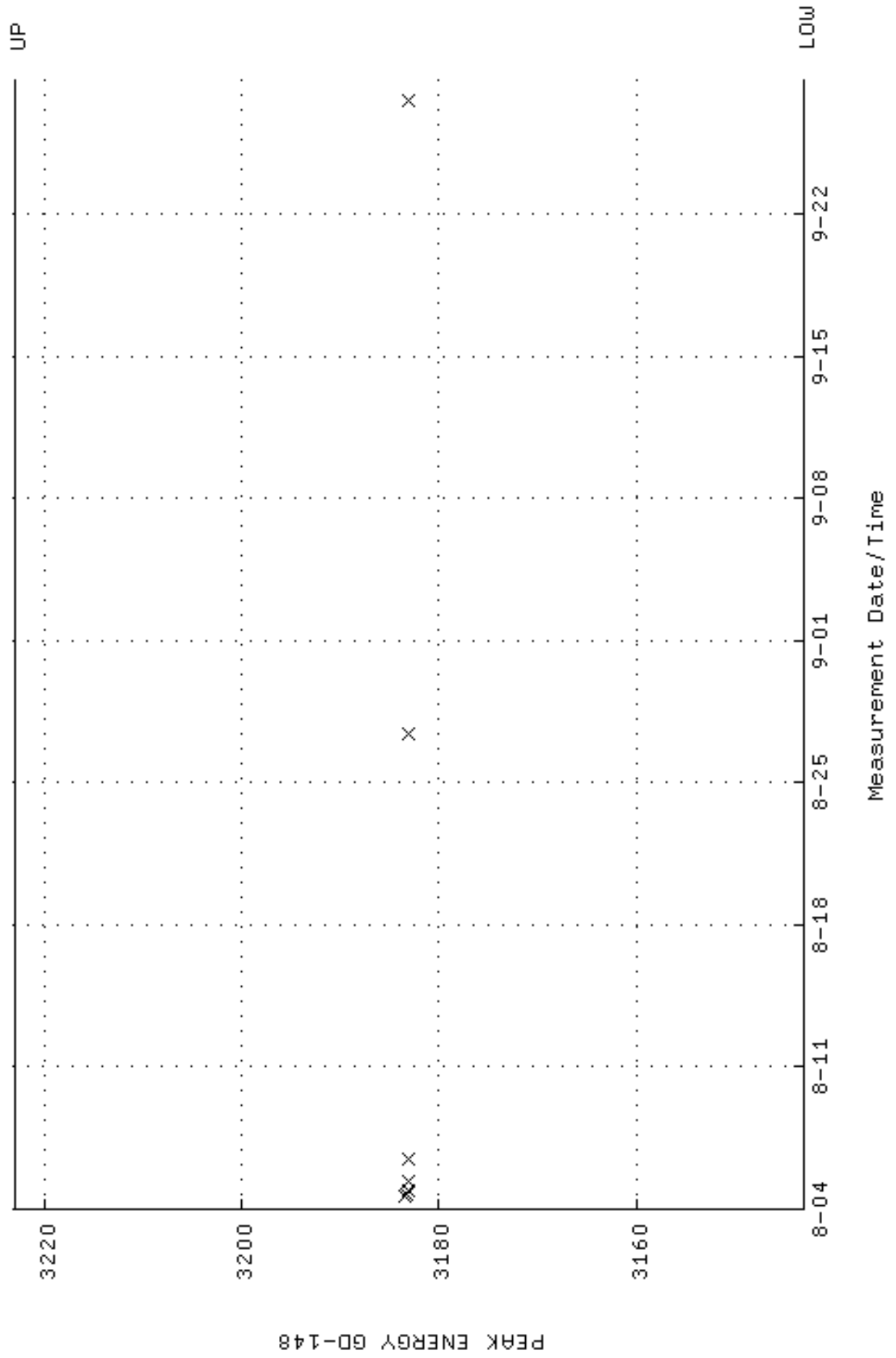
QA filename : DKA100:[ENV_ALPHA.QA.W]W002.QAF;8
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



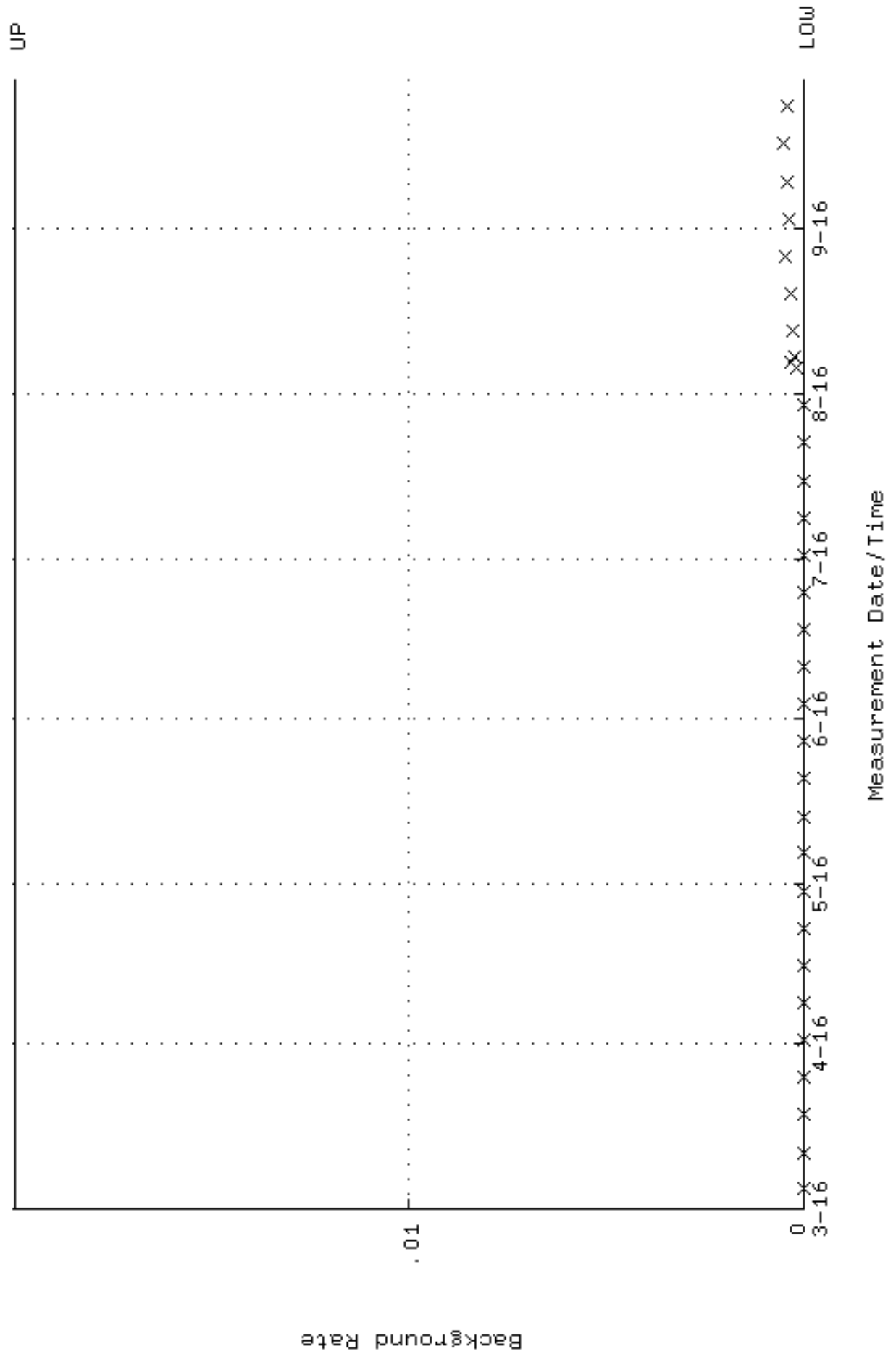
QA filename : DKA100:[ENV_ALPHA.QA.W]W002.QAF;8
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



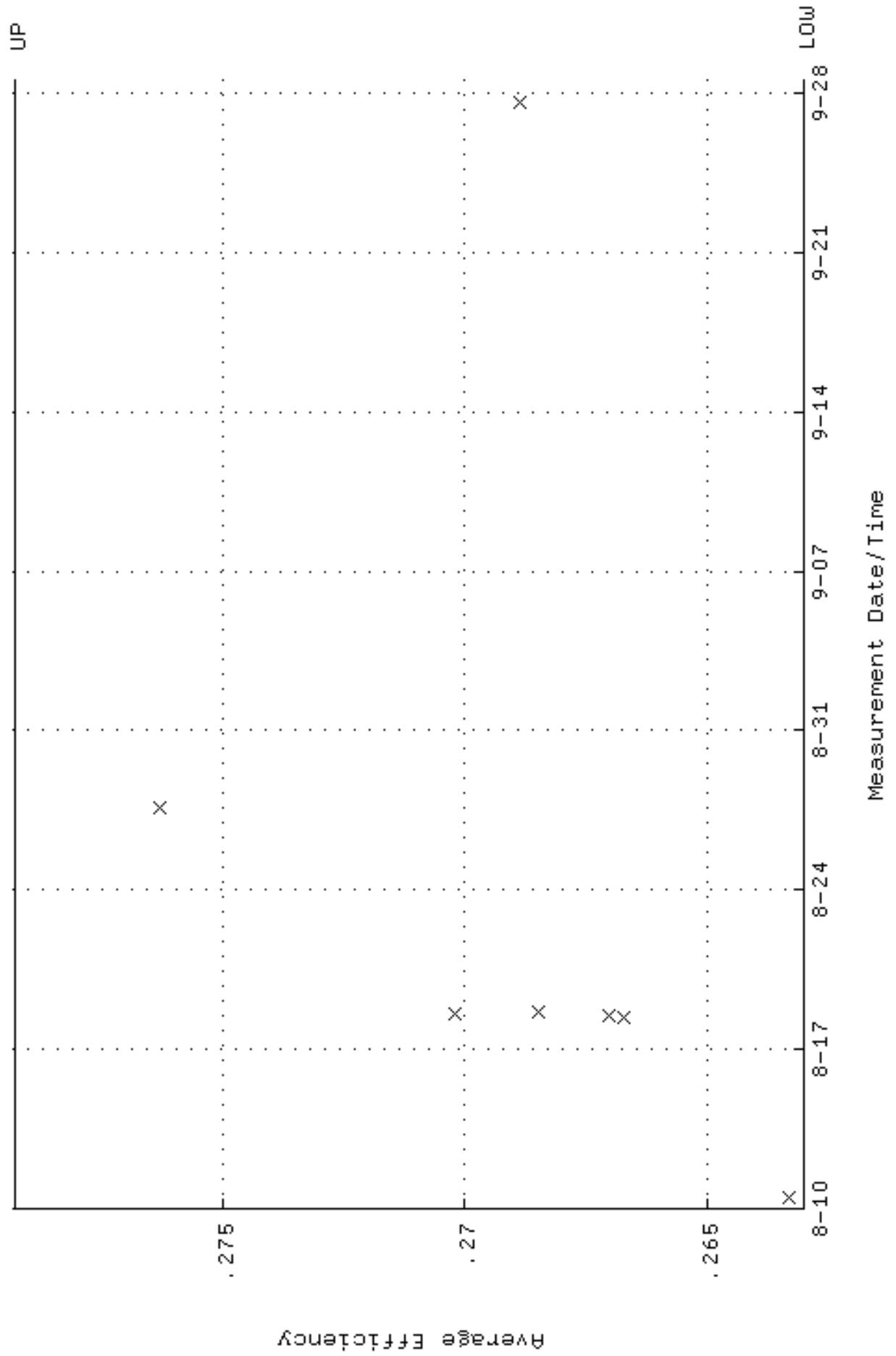
QA filename : DKA100:[ENV_ALPHA.QA.W]W002.QAF;8
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



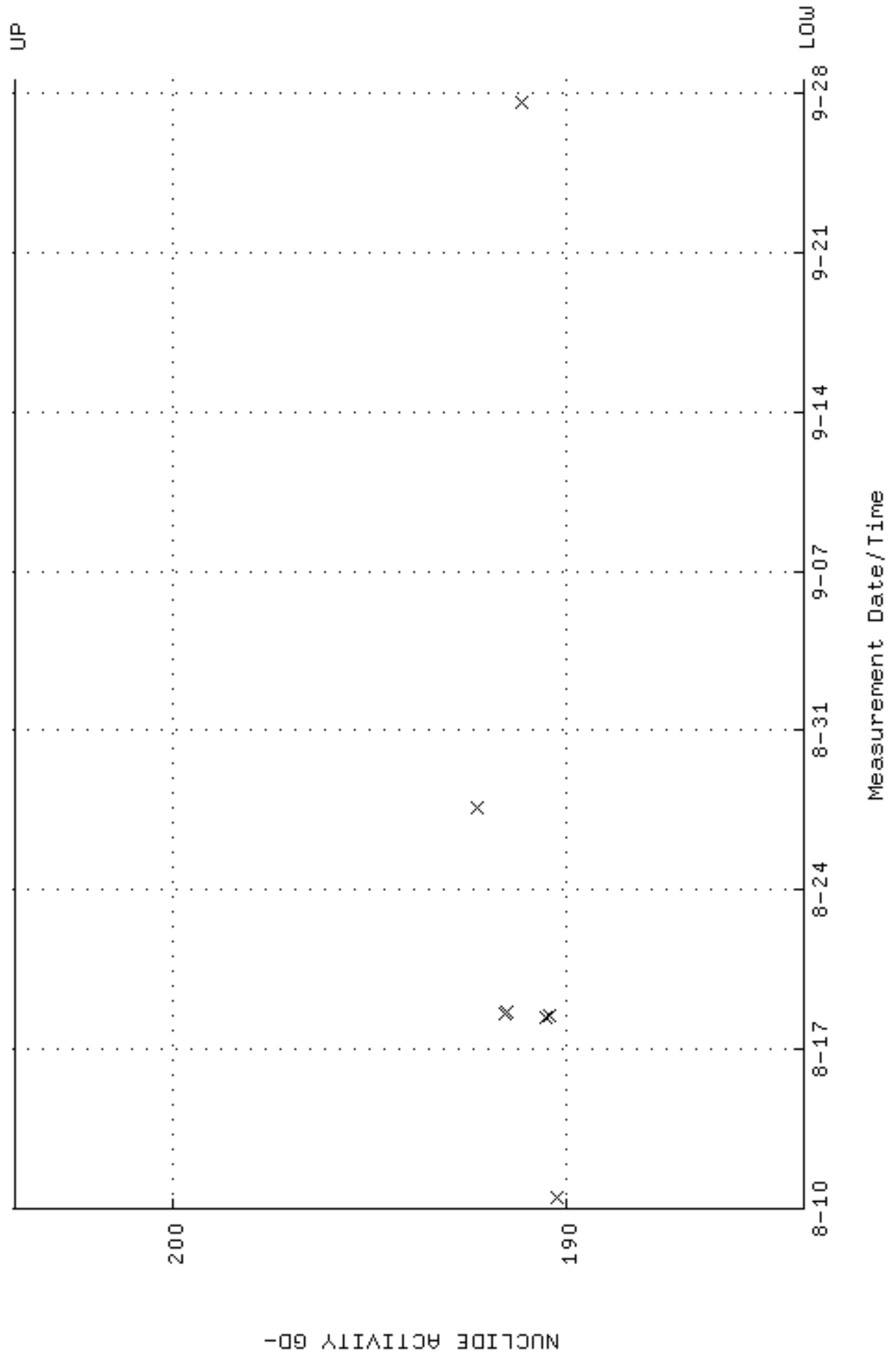
QA filename : DKA100:[ENV_ALPHA.QA.B]B002.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:29:27 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



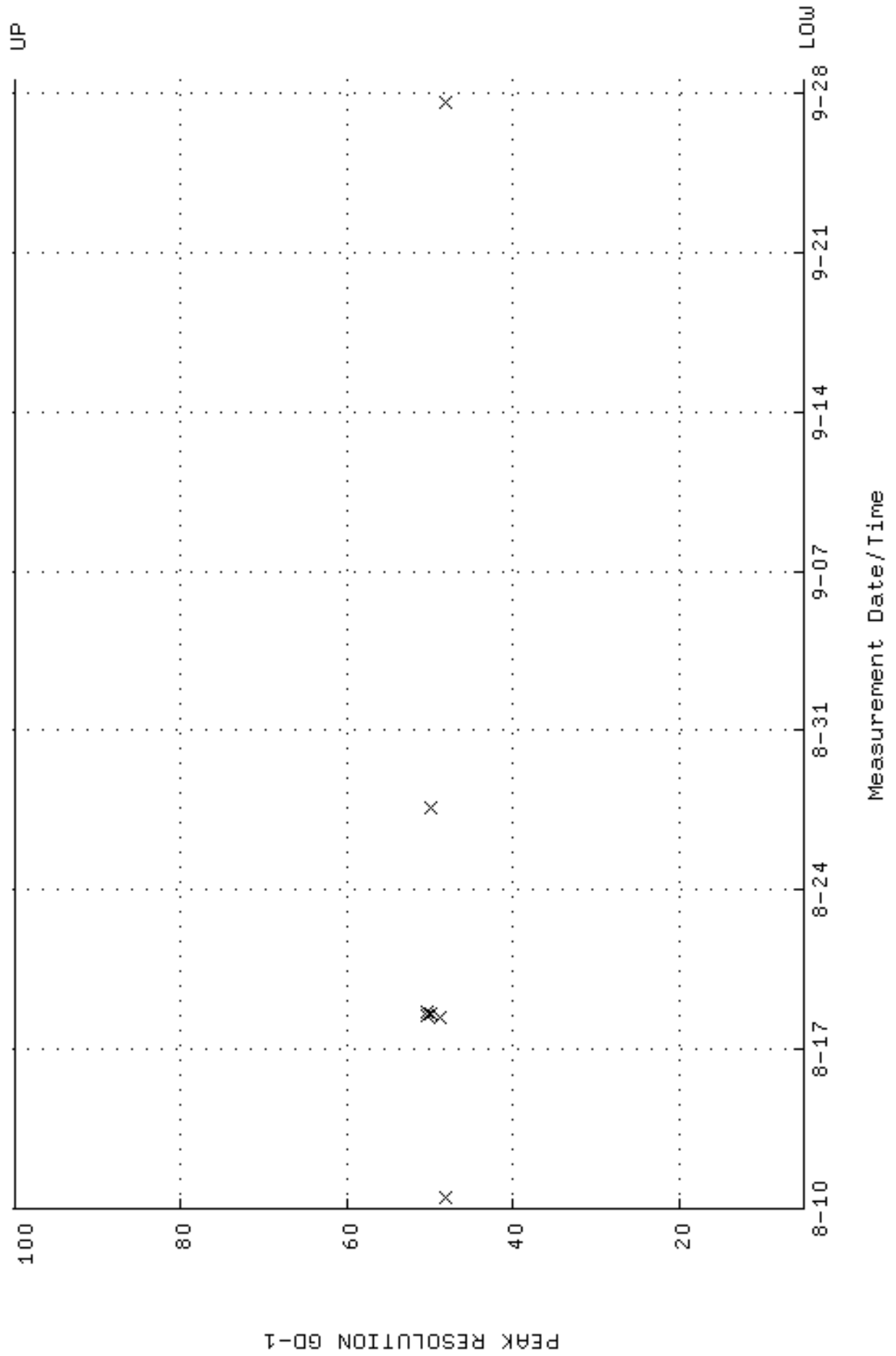
QA filename : DKA100:[ENV_ALPHA.QA.W]W003.QAF;9
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 10-AUG-2016 10:56:03 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.263000 through 0.279270



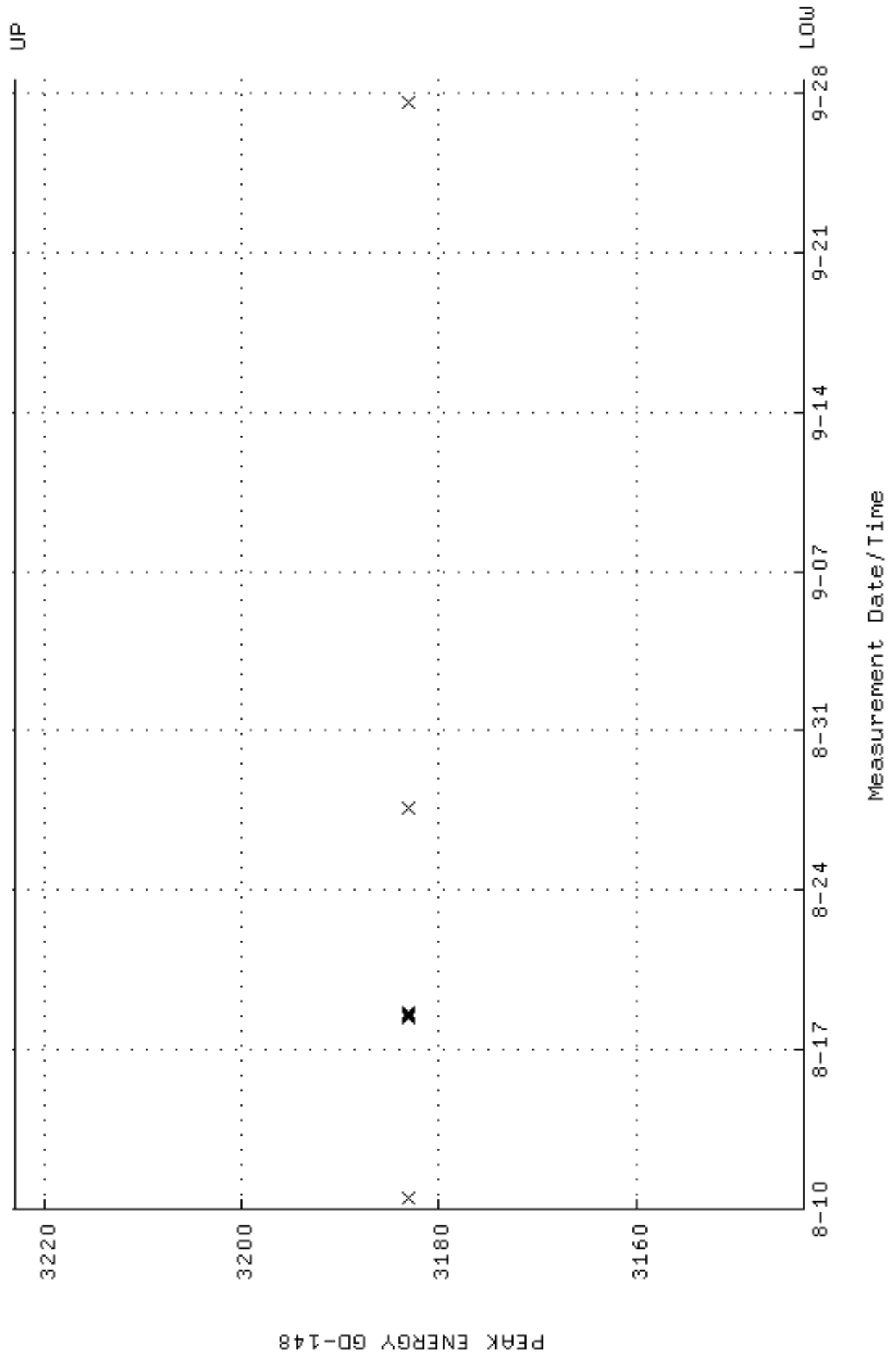
QA filename : DKA100:[ENV_ALPHA.QA.W]W003.QAF;9
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 10-AUG-2016 10:56:03 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



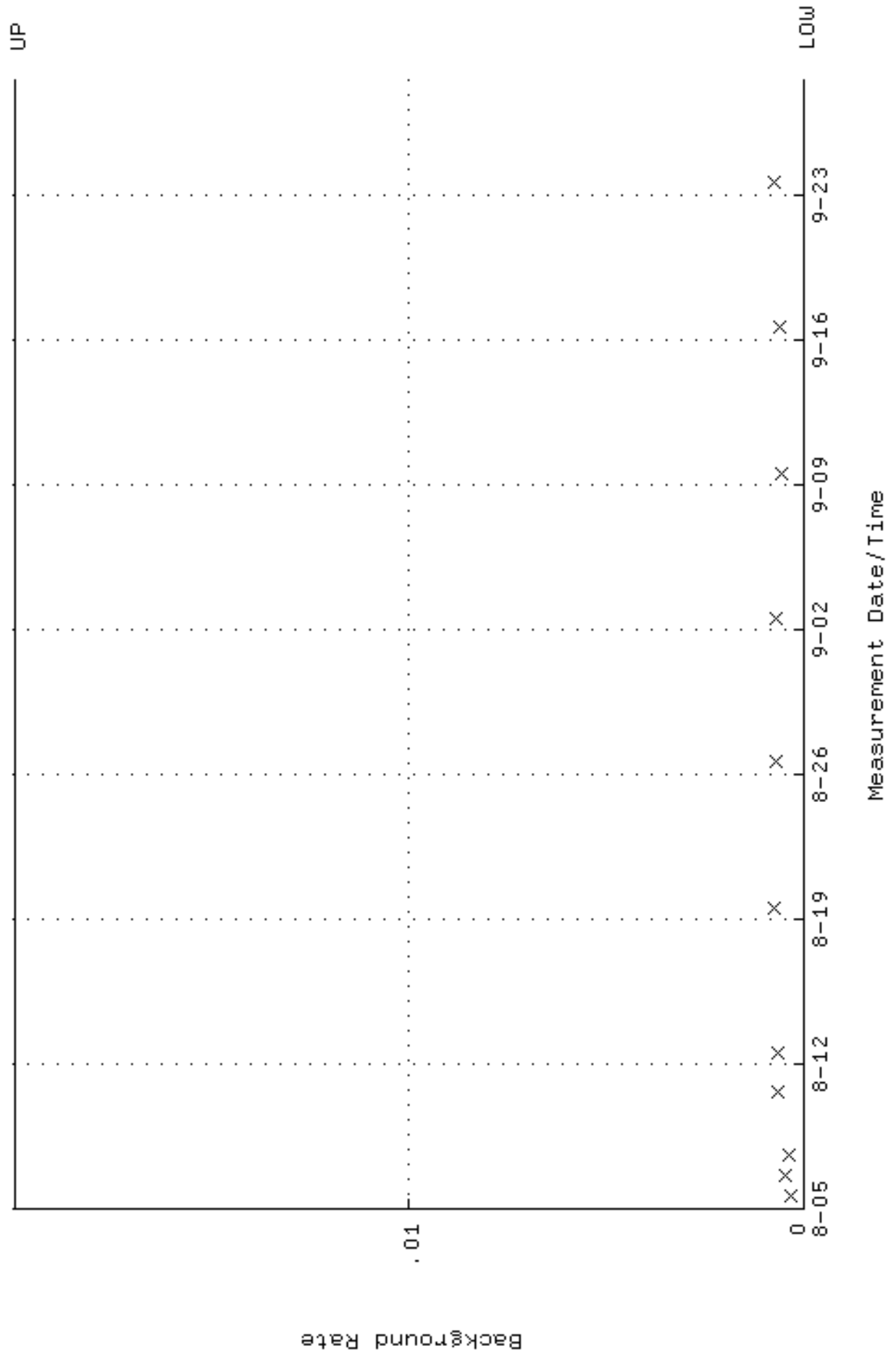
QA filename : DKA100:[ENV_ALPHA.QA.W]W003.QAF;9
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 10-AUG-2016 10:56:03 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



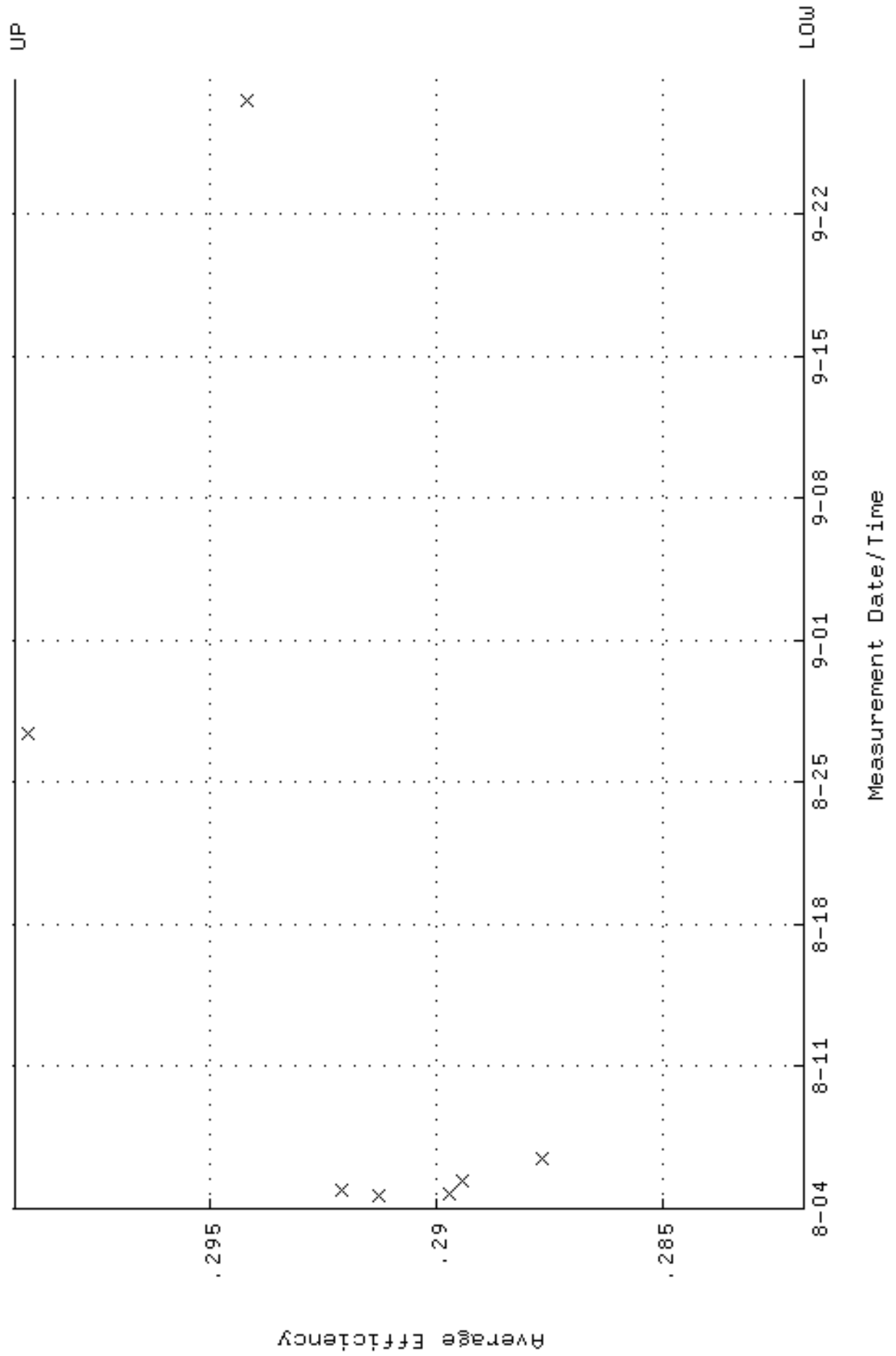
QA filename : DKA100:[ENV_ALPHA.QA.W]W003.QAF;9
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 10-AUG-2016 10:56:03 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



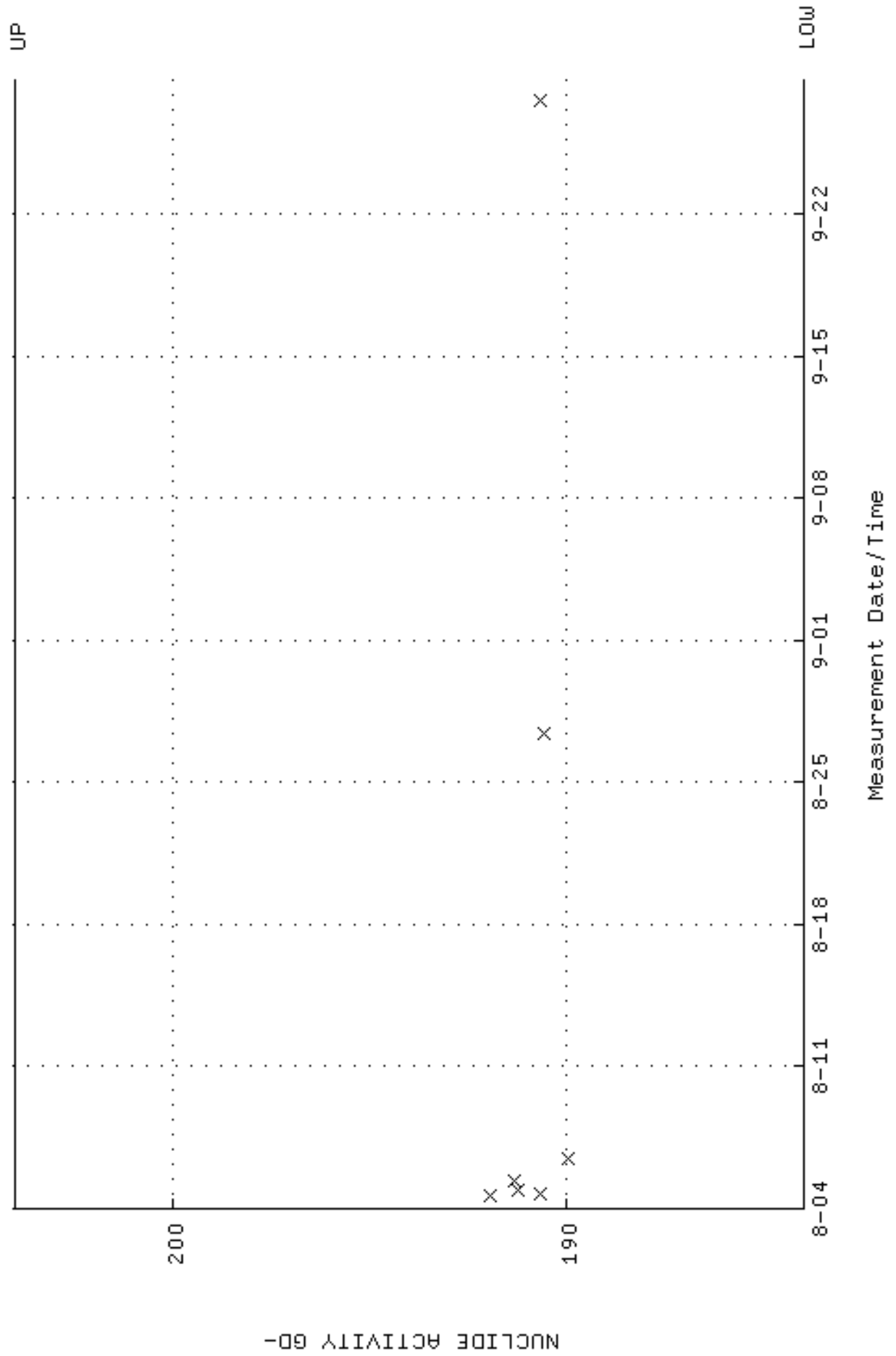
QA filename : DKA100:[ENV_ALPHA.QA.B]B003.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 5-AUG-2016 14:06:41 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



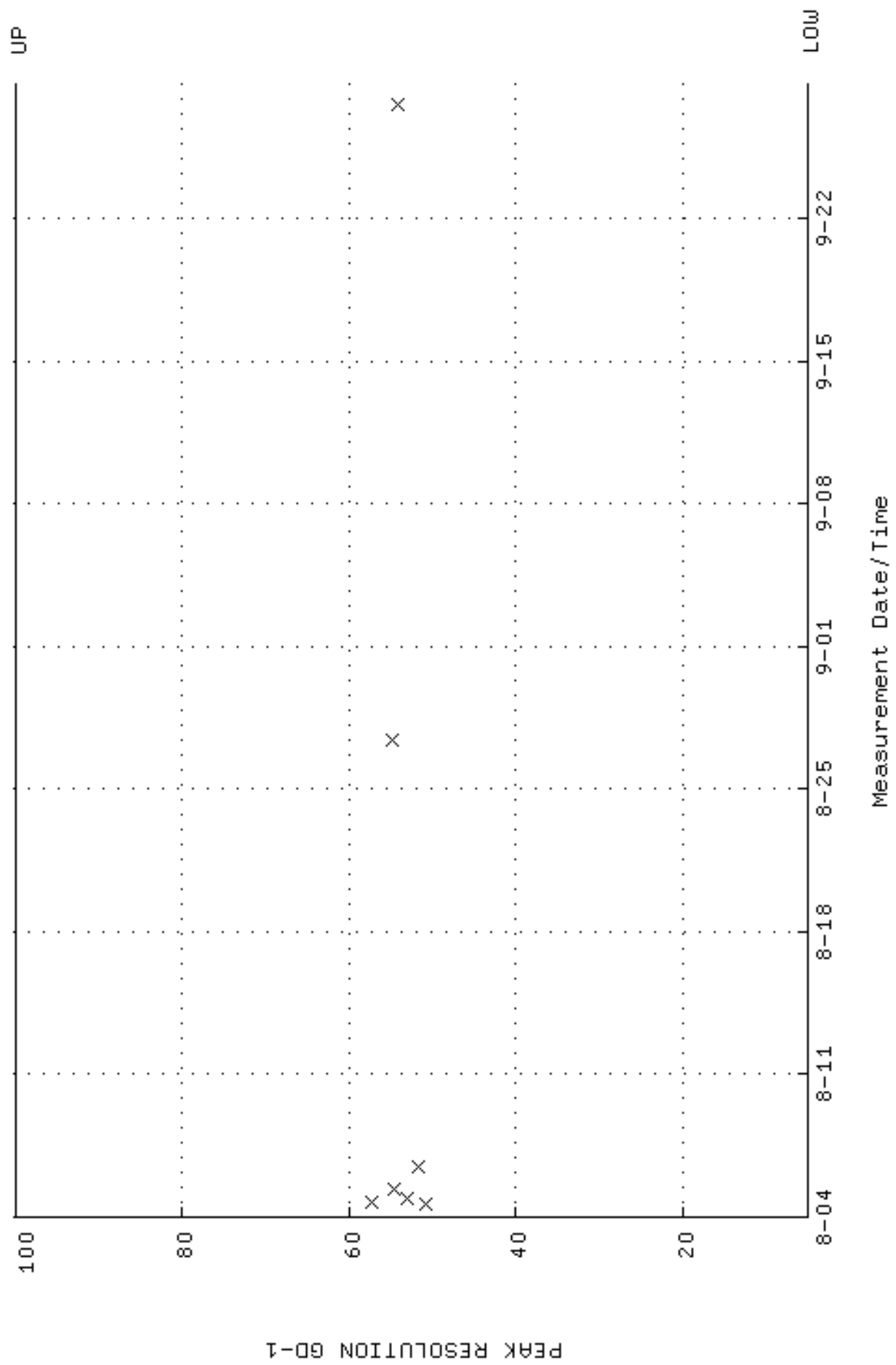
QA filename : DKA100:[ENV_ALPHA.QA.W]W004.QAF;11
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.281866 through 0.299302



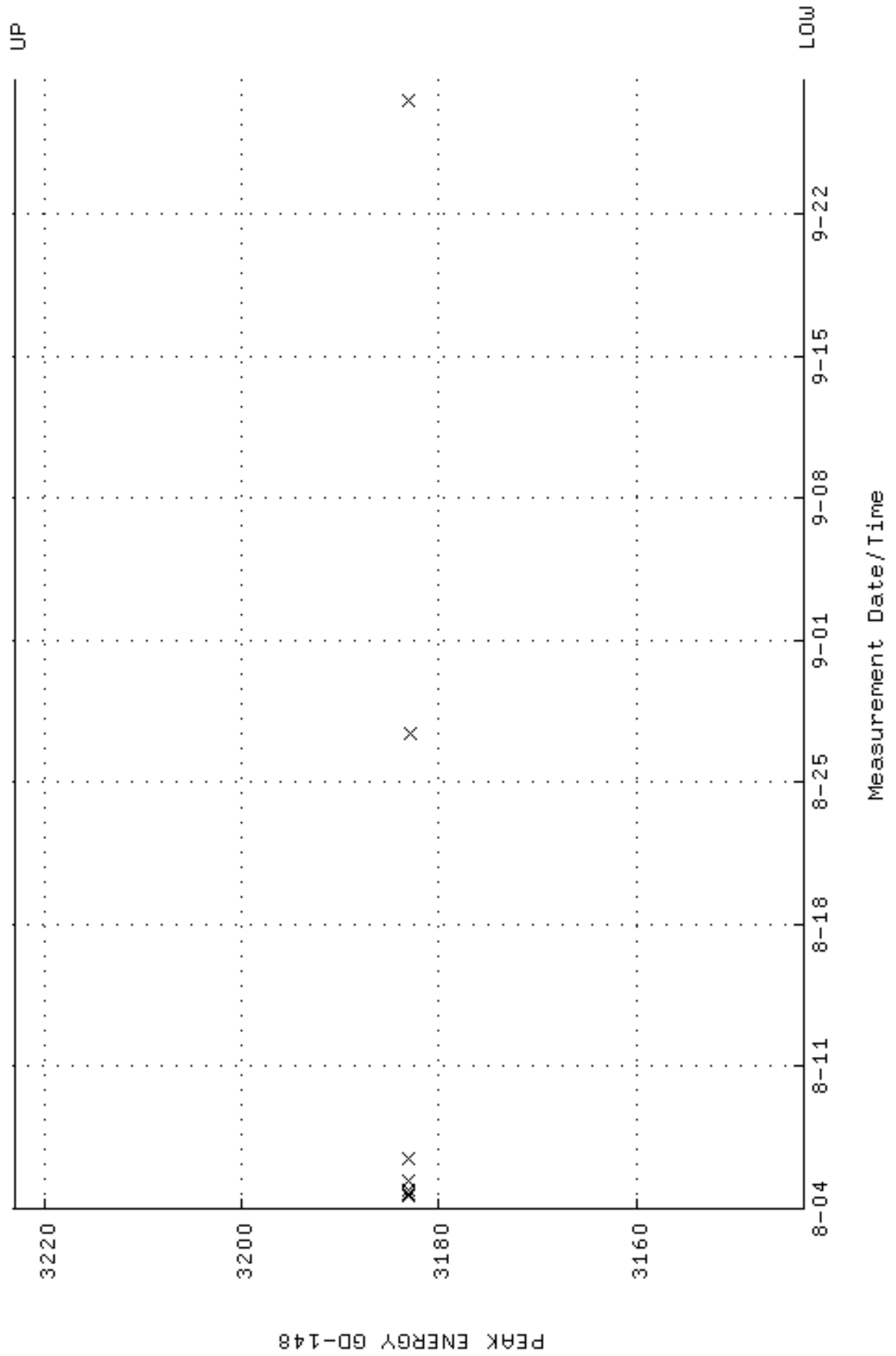
QA filename : DKA100:[ENV_ALPHA.QA.W]W004.QAF;11
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



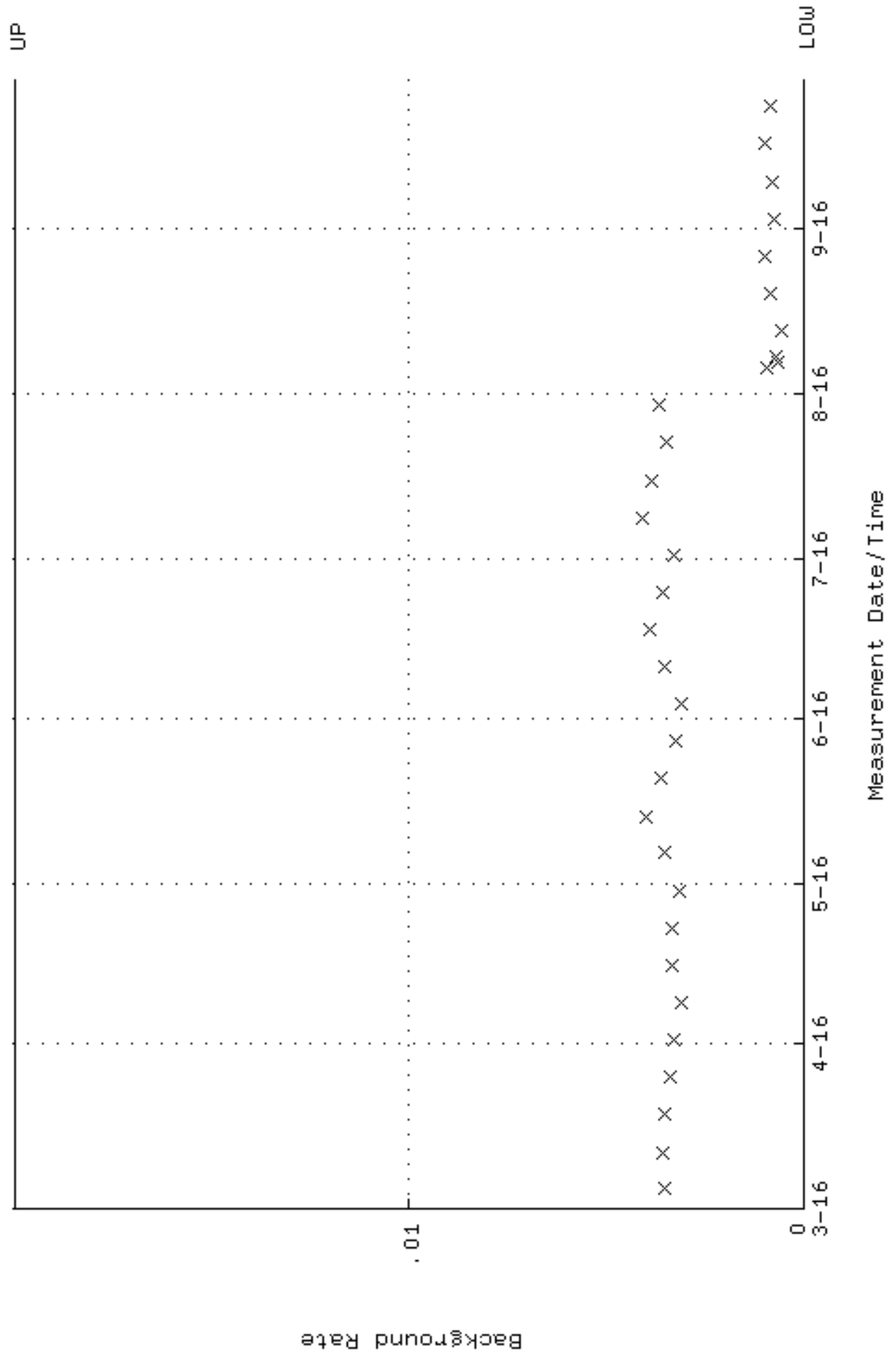
QA filename : DKA100:[ENV_ALPHA.QA.W]W004.QAF;11
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



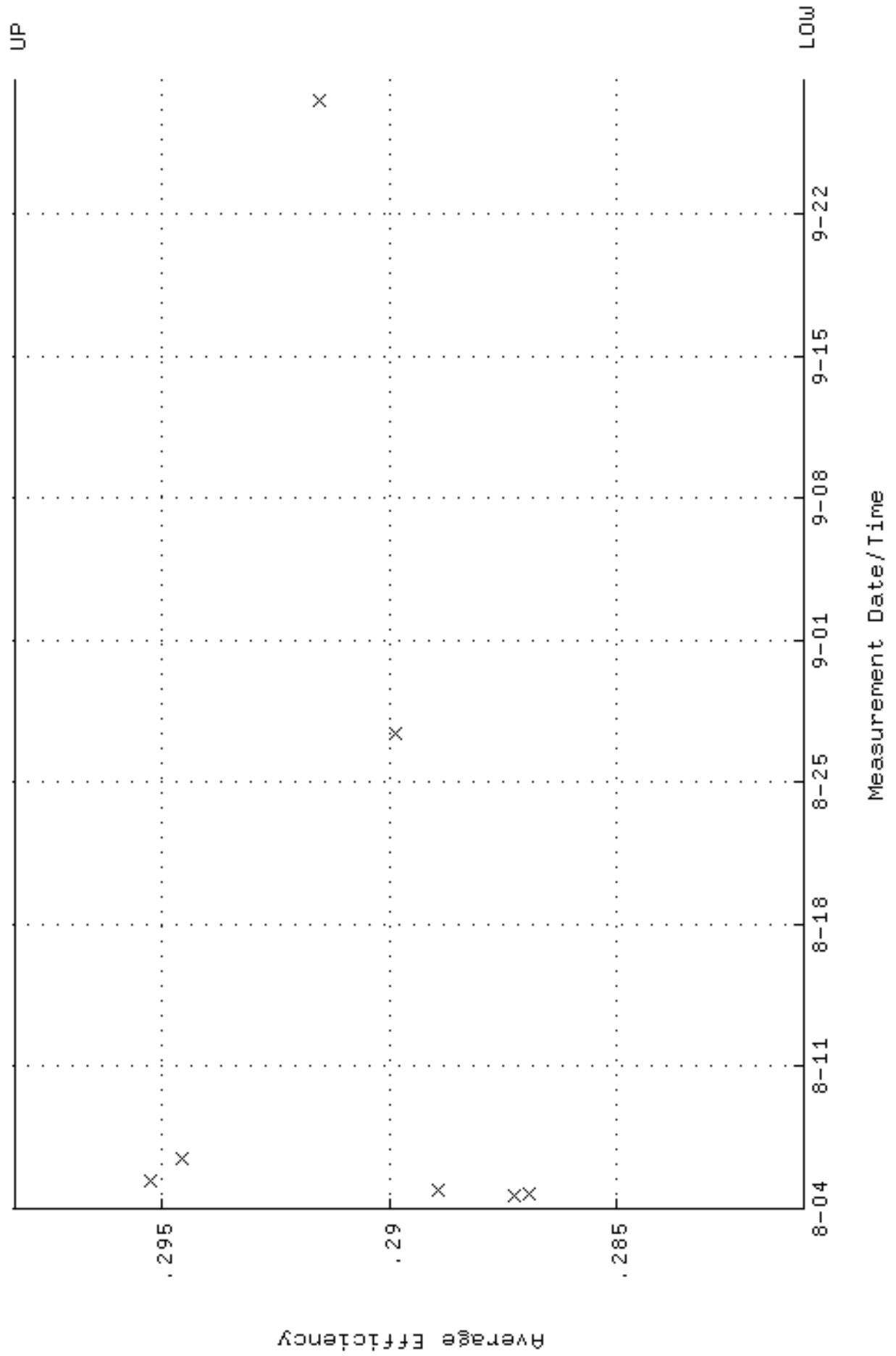
QA filename : DKA100:[ENV_ALPHA.QA.W]W004.QAF;11
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



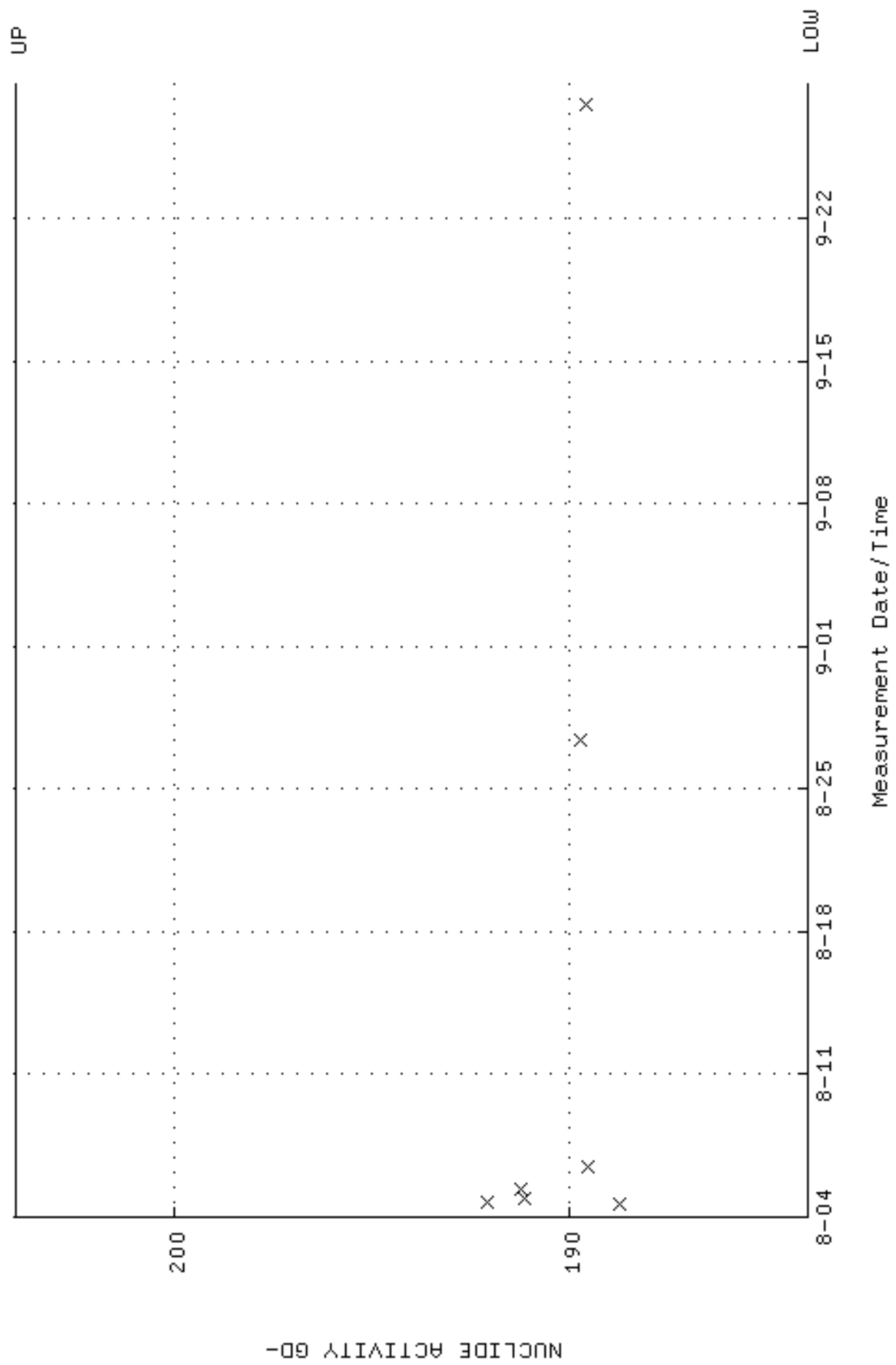
QA filename : DKA100:[ENV_ALPHA.QA.B]B004.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:29:27 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



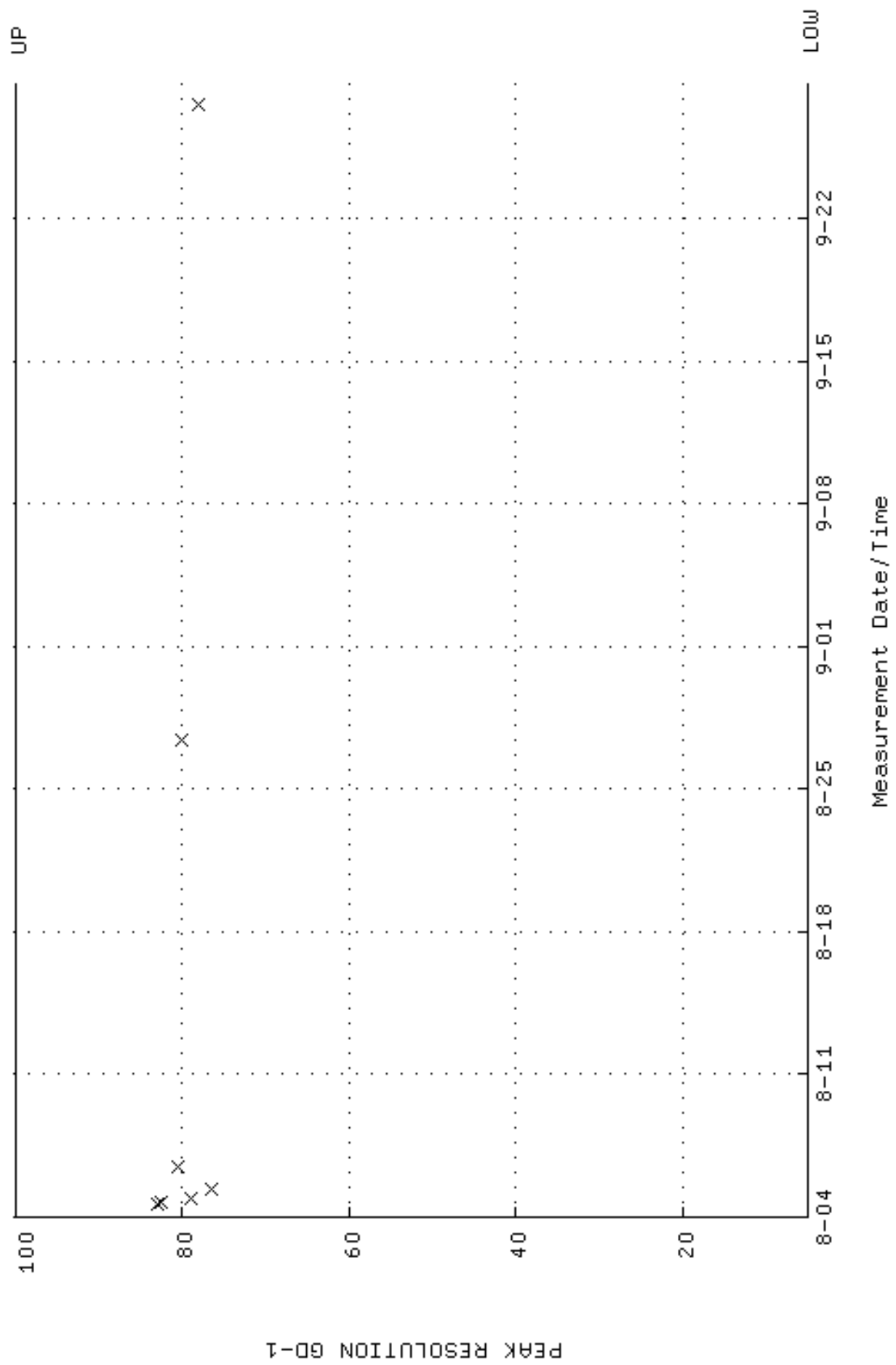
QA filename : DKA100:[ENV_ALPHA.QA.W]W005.QAF;11
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.280865 through 0.298239



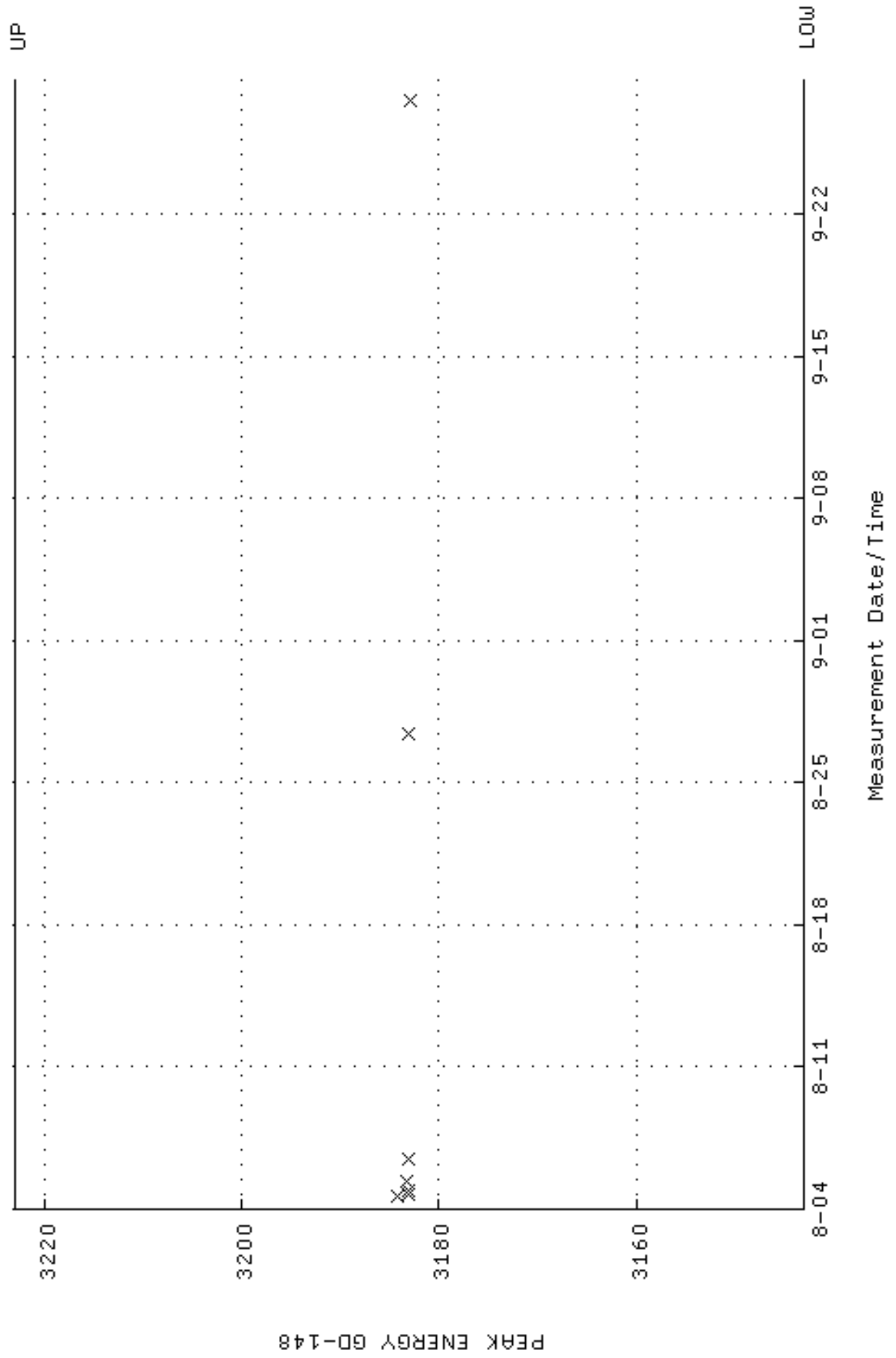
QA filename : DKA100:[ENV_ALPHA.QA.W]W005.QAF;11
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



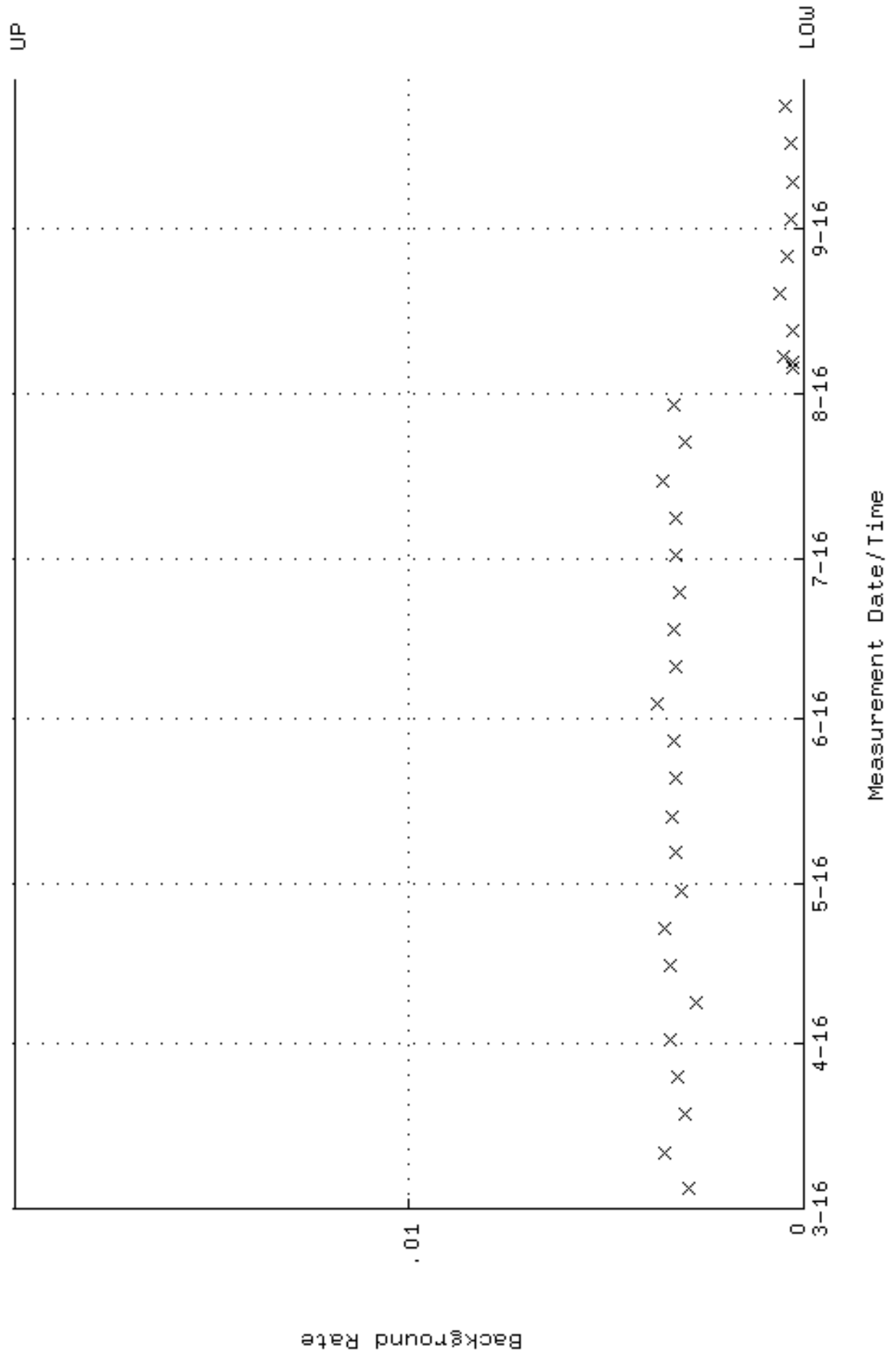
QA filename : DKA100:[ENV_ALPHA.QA.W]W005.QAF;11
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



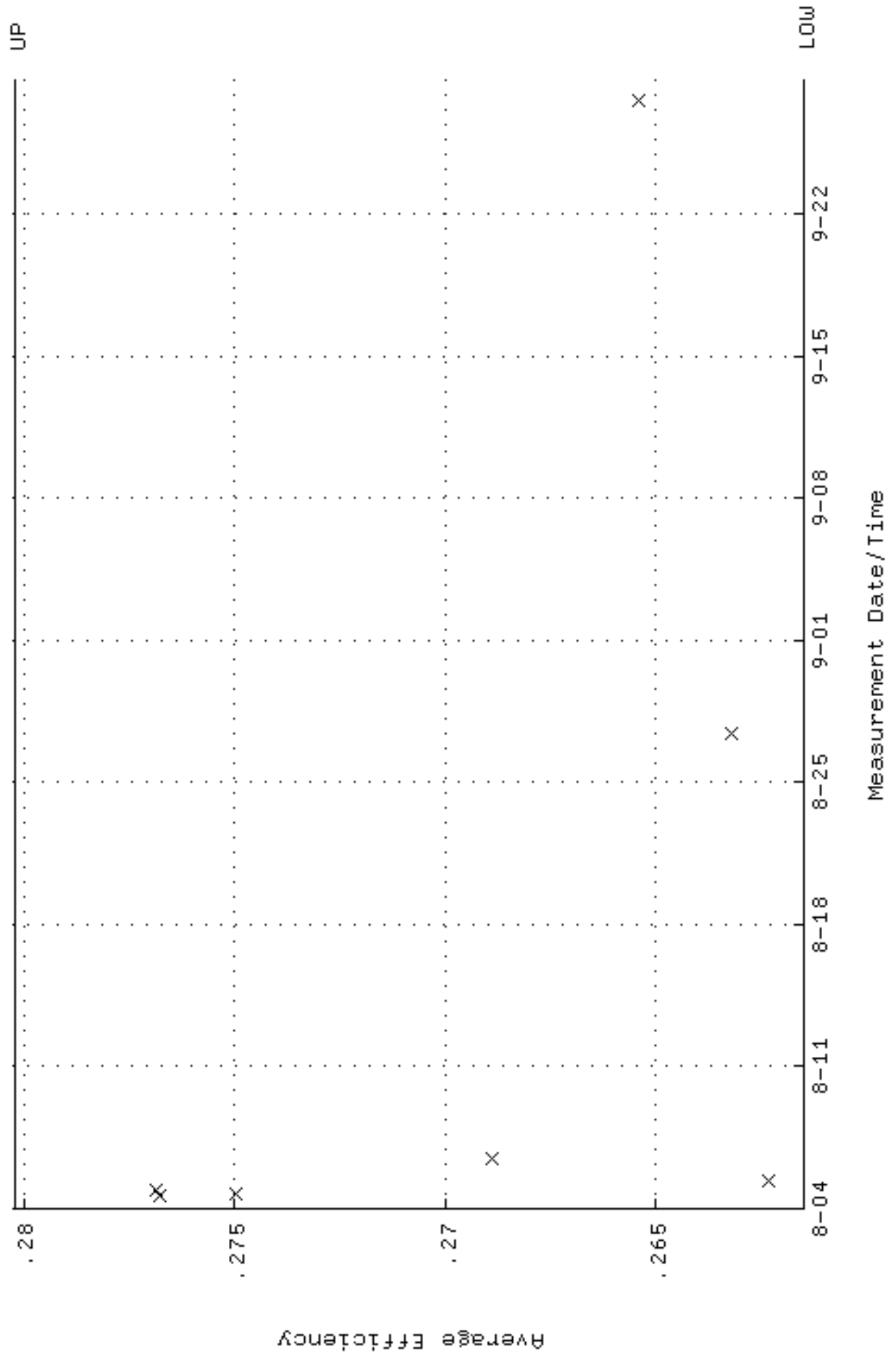
QA filename : DKA100:[ENV_ALPHA.QA.W]W005.QAF;11
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



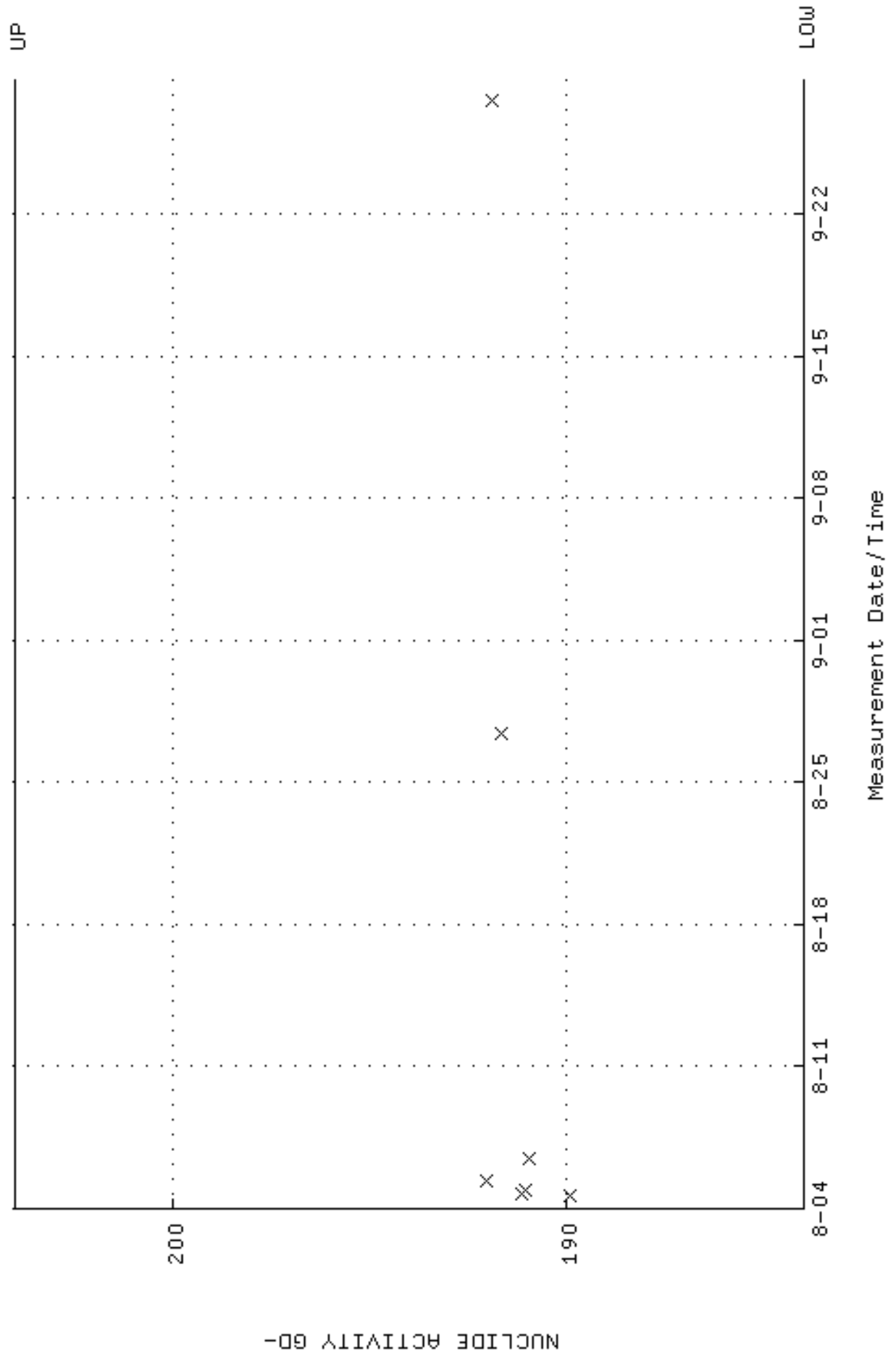
QA filename : DKA100:[ENV_ALPHA.QA.B]B005.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:29:27 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



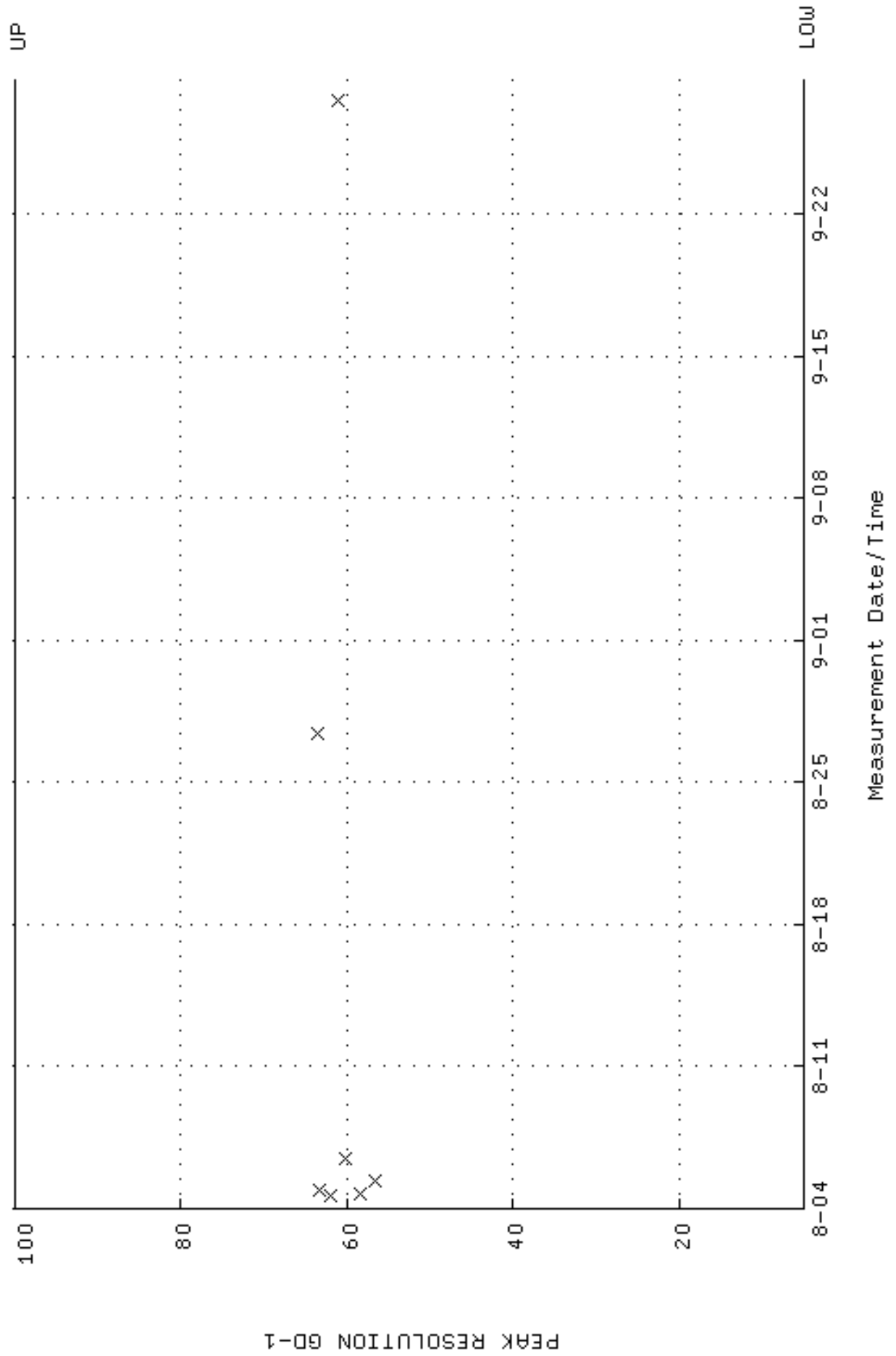
QA filename : DKA100:[ENV_ALPHA.QA.W]W006.QAF;8
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.261500 through 0.280200



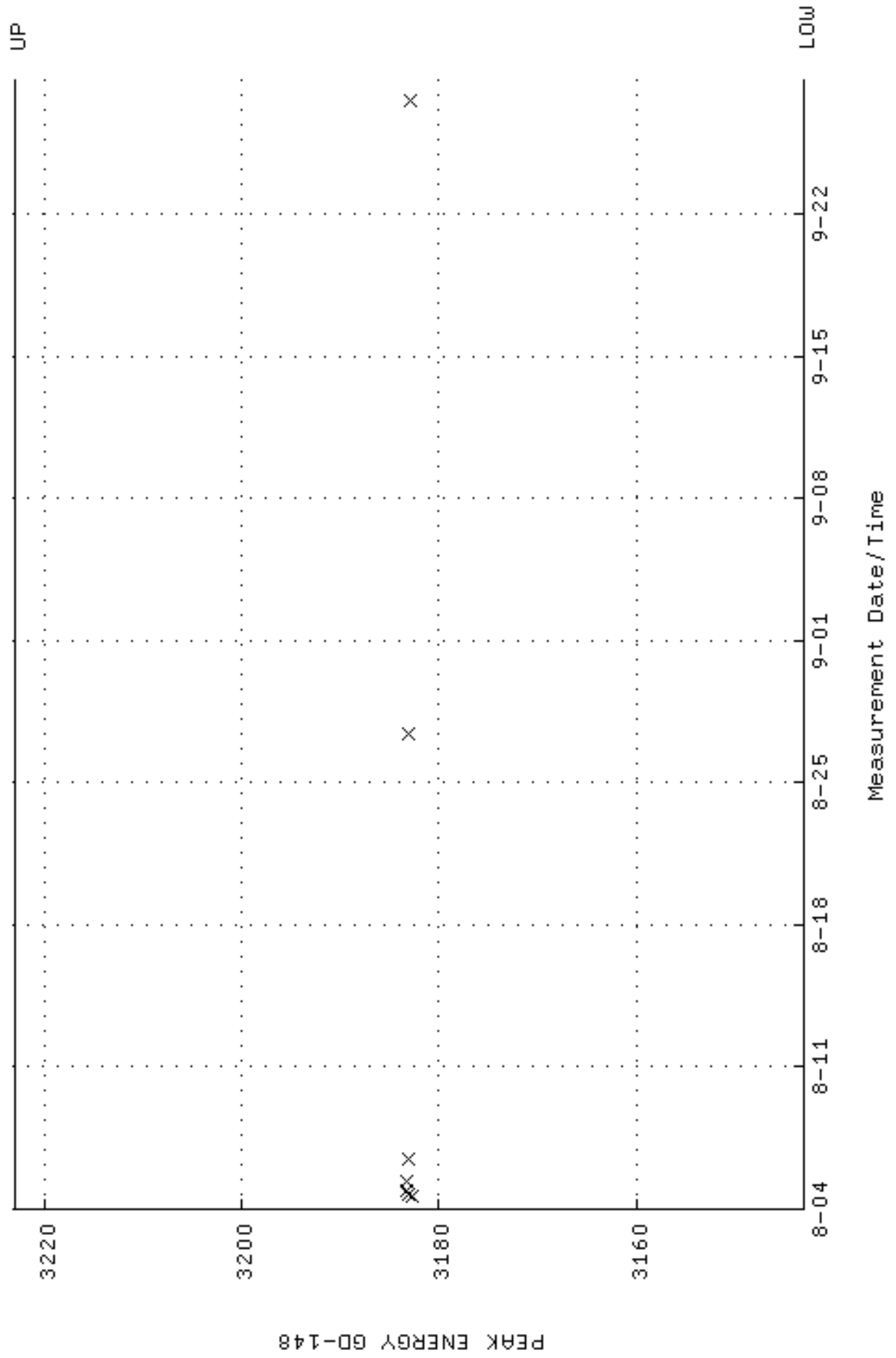
QA filename : DKA100:[ENV_ALPHA.QA.W]W006.QAF;8
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



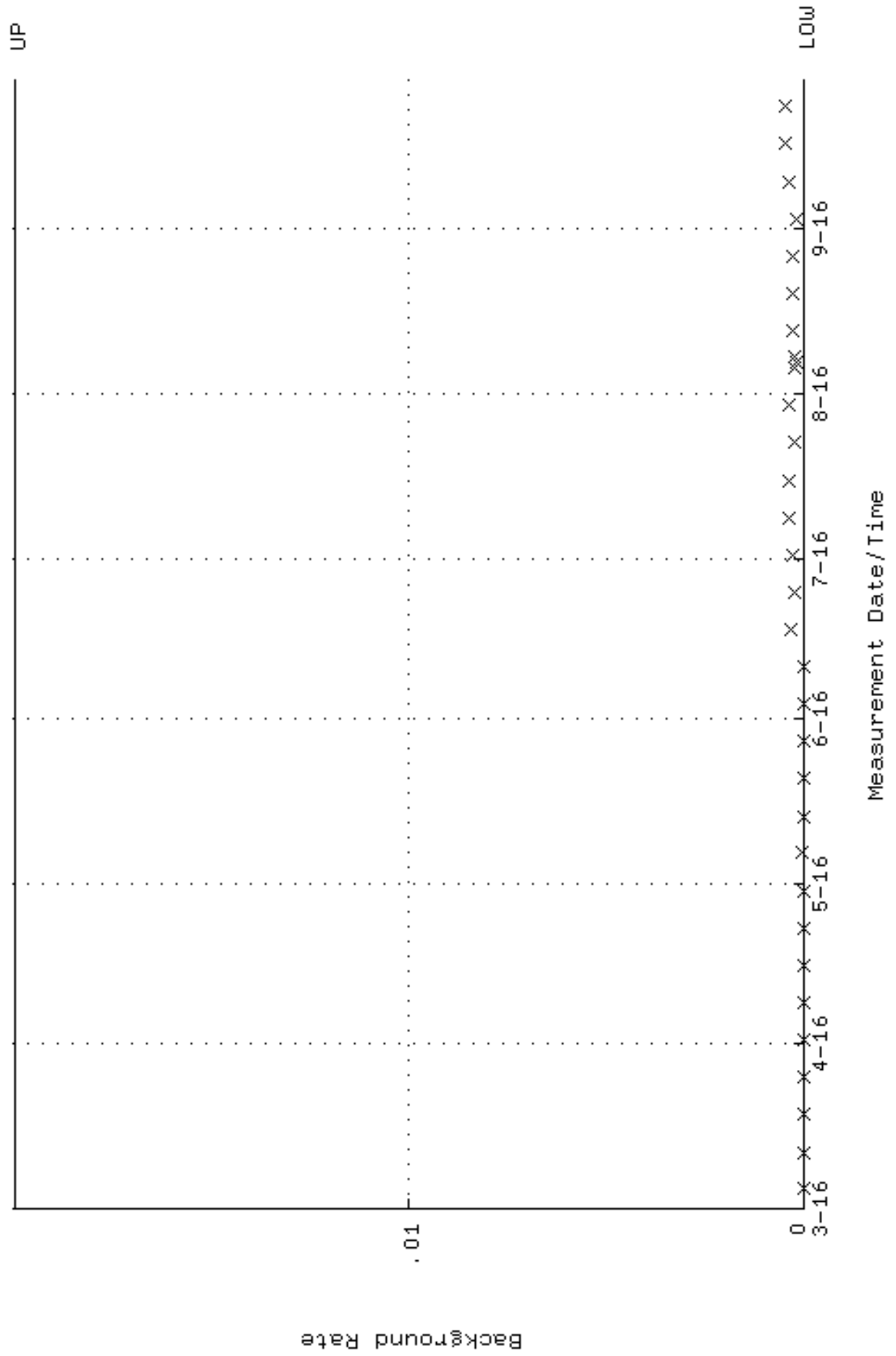
QA filename : DKA100:[ENV_ALPHA_QA.W]W006.QAF;8
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



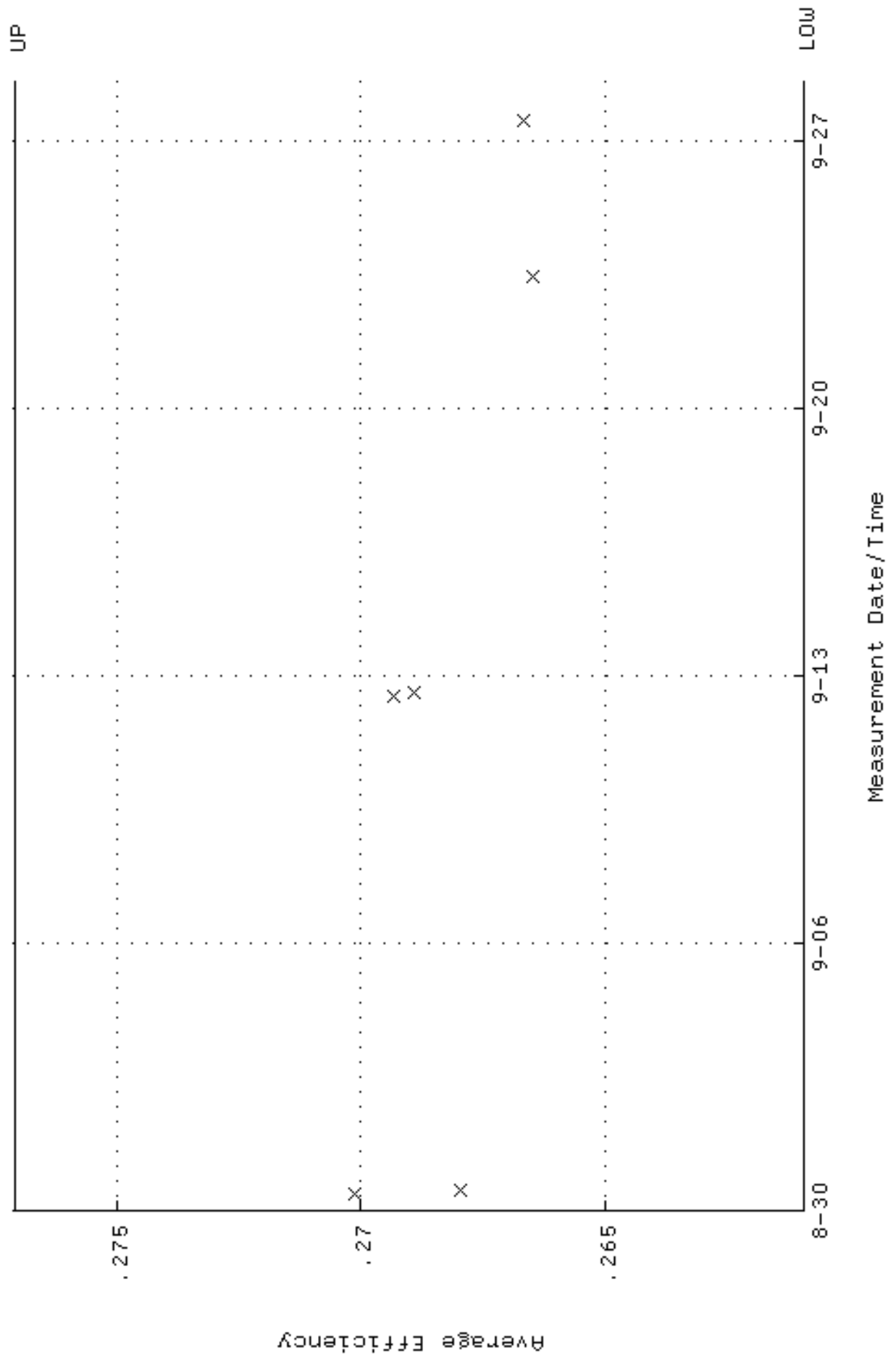
QA filename : DKA100:[ENV_ALPHA.QA.W]W006.QAF;8
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-AUG-2016 14:49:25 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



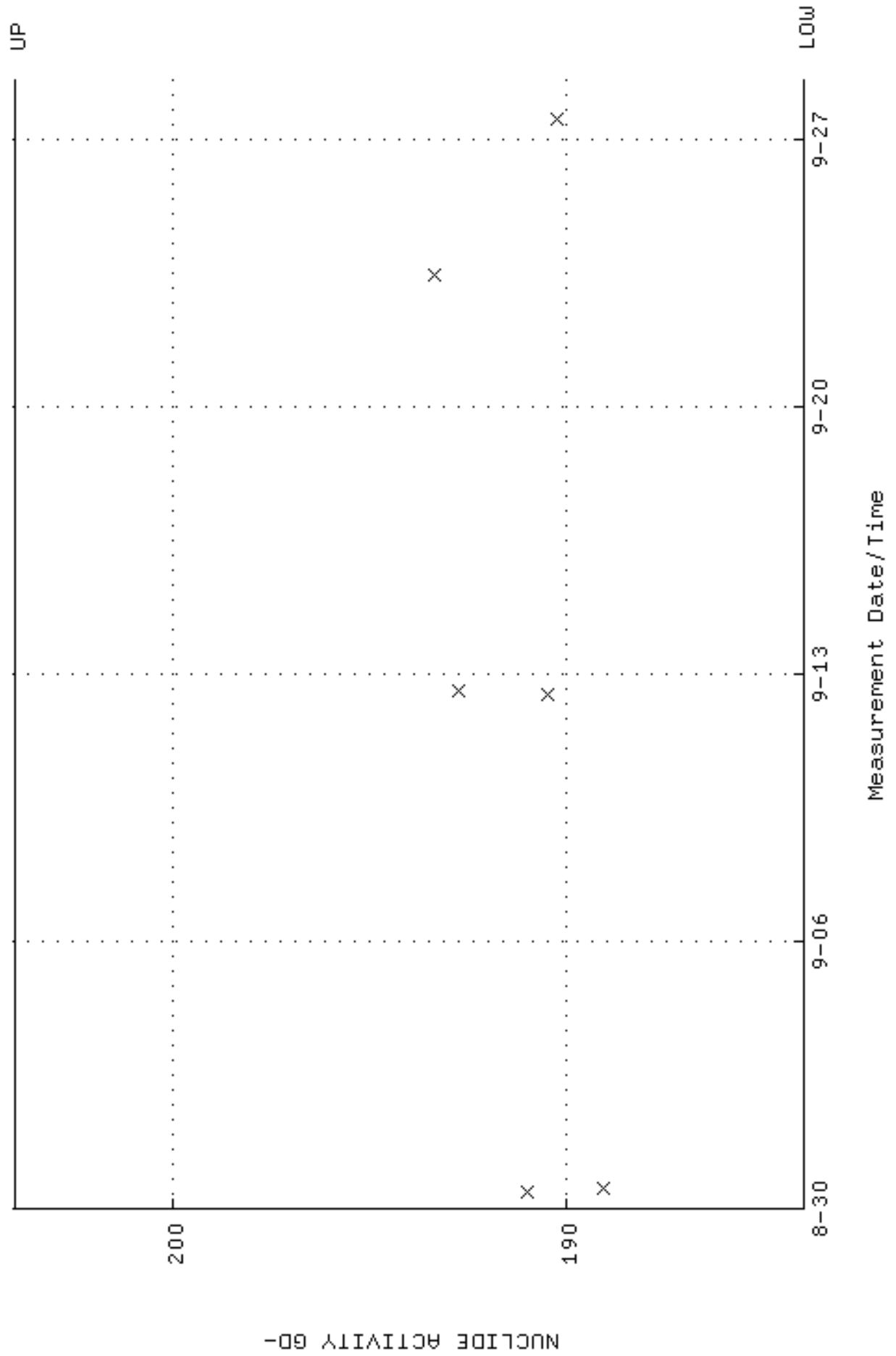
QA filename : DKA100:[ENV_ALPHA.QA.B]B0006.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:29:27 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



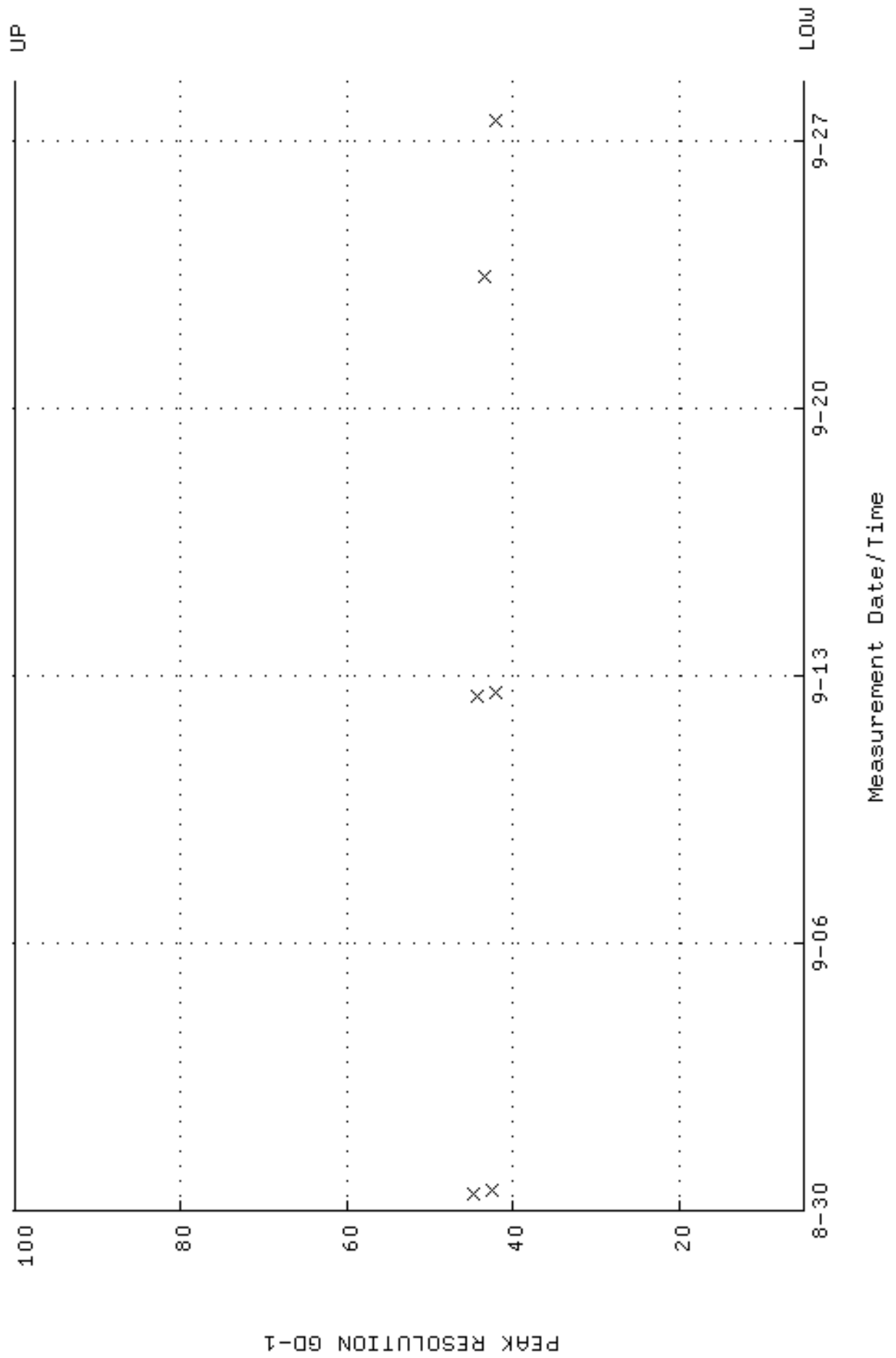
QA filename : DKA100:[ENV_ALPHA.QA.W]W007.QAF;7
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 30-AUG-2016 10:09:38 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.260930 through 0.277070



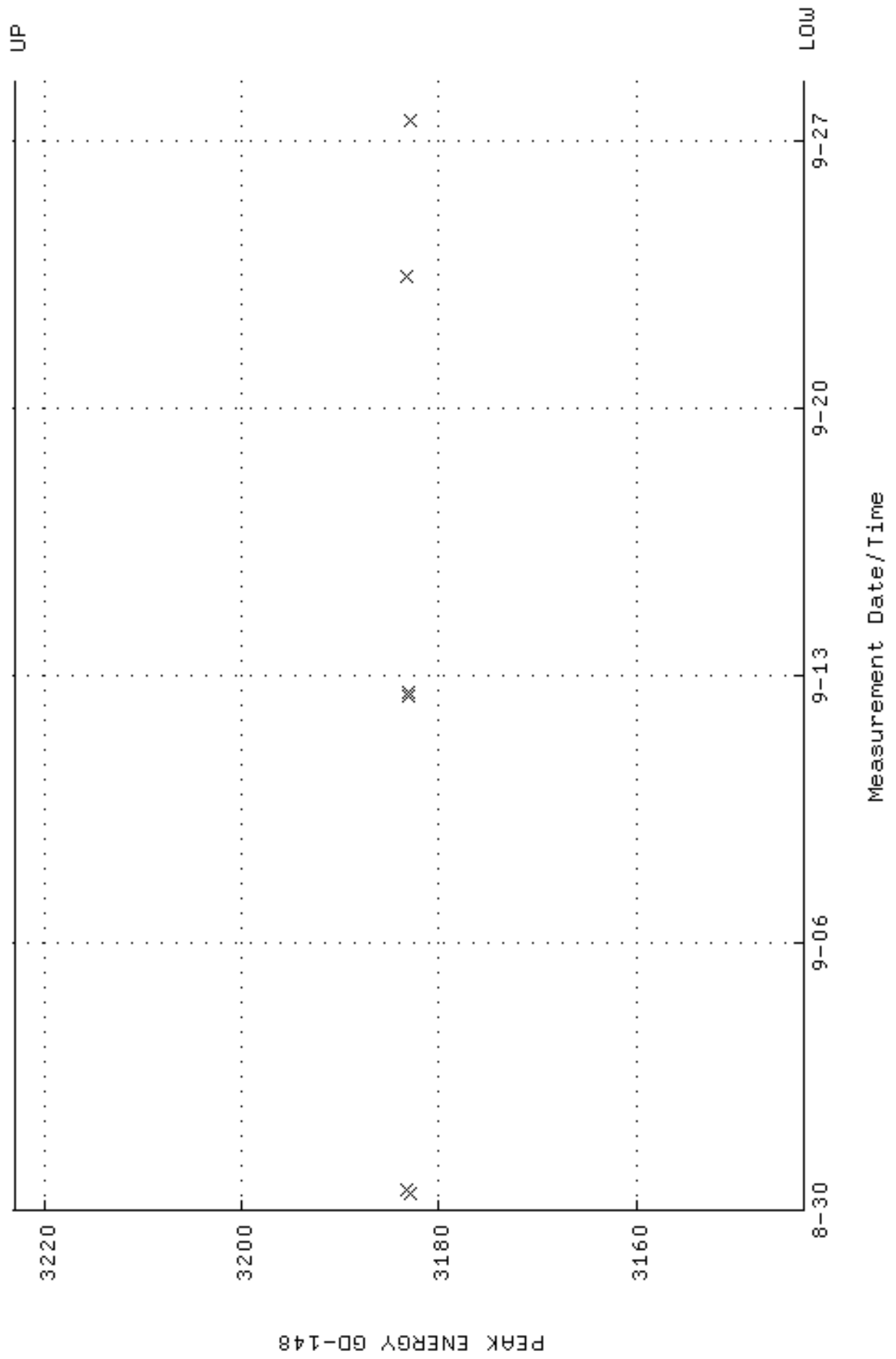
QA filename : DKA100:[ENV_ALPHA.QA.W]W007.QAF;7
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 30-AUG-2016 10:09:38 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



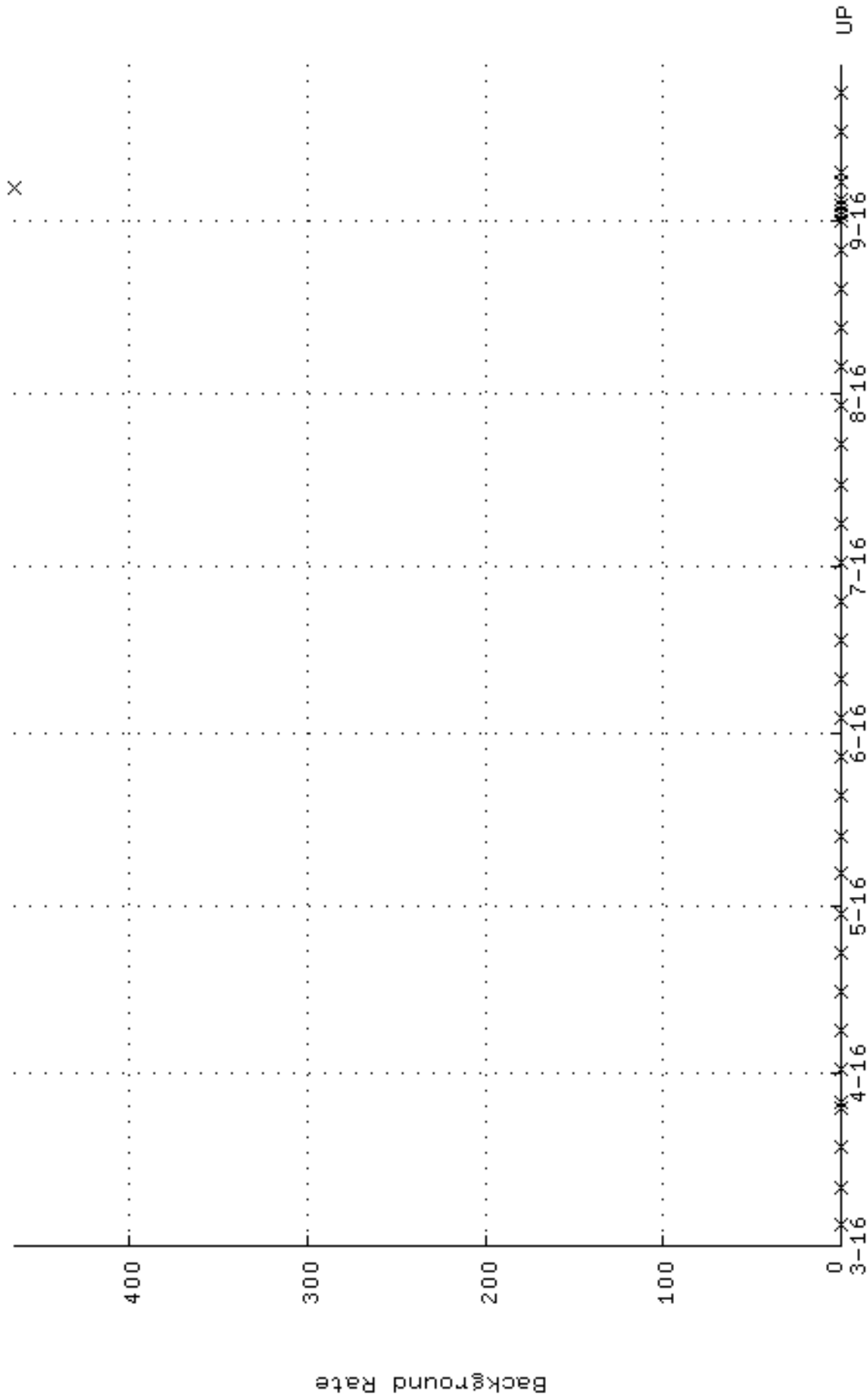
QA filename : DKA100:[ENV_ALPHA.QA.W]W007.QAF;7
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 30-AUG-2016 10:09:38 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



QA filename : DKA100:[ENV_ALPHA.QA.W]W007.QAF;7
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 30-AUG-2016 10:09:38 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00

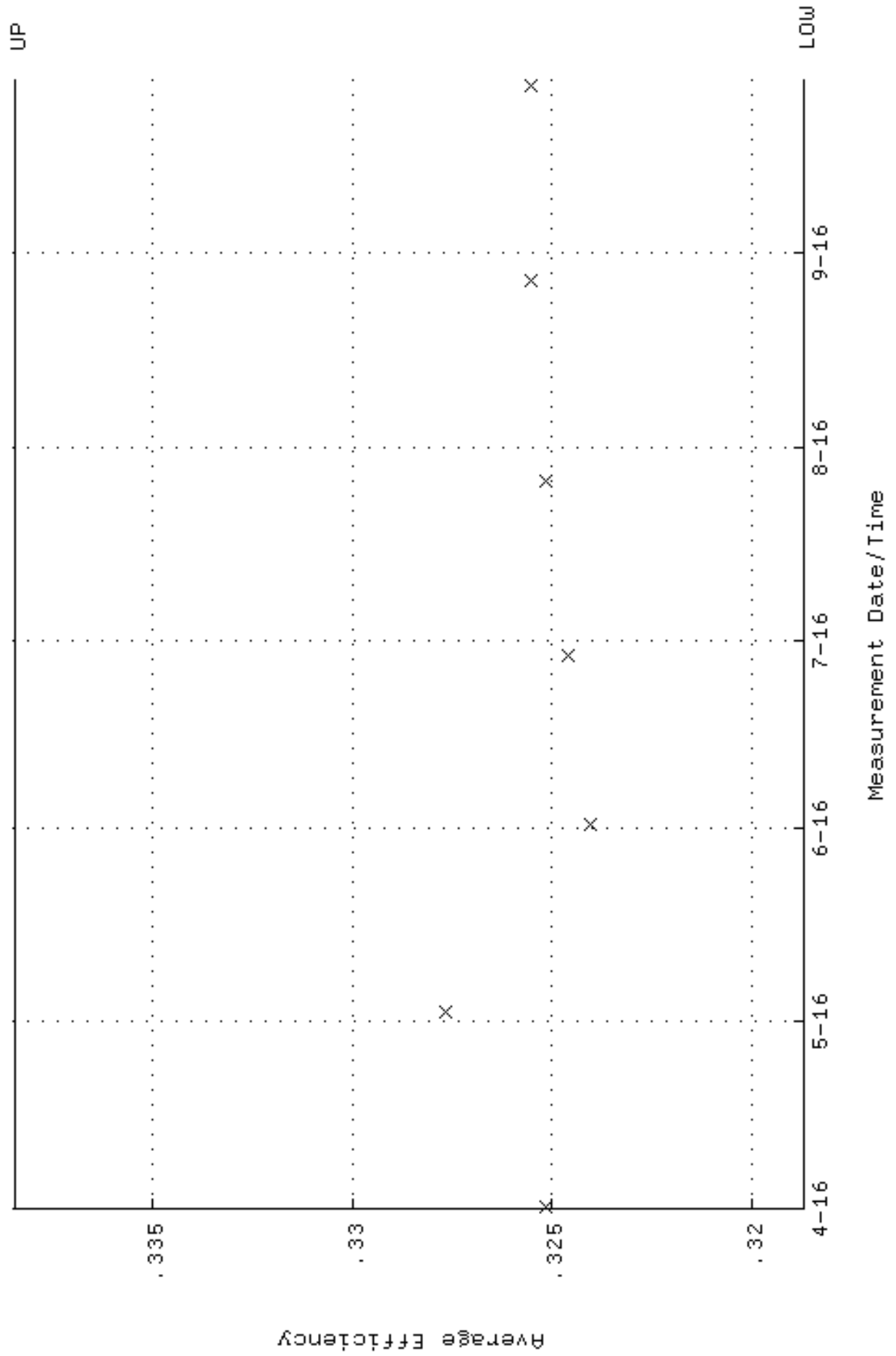


QA filename : DKA100:[ENV_ALPHA.QA.B]B007.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:29:28 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02

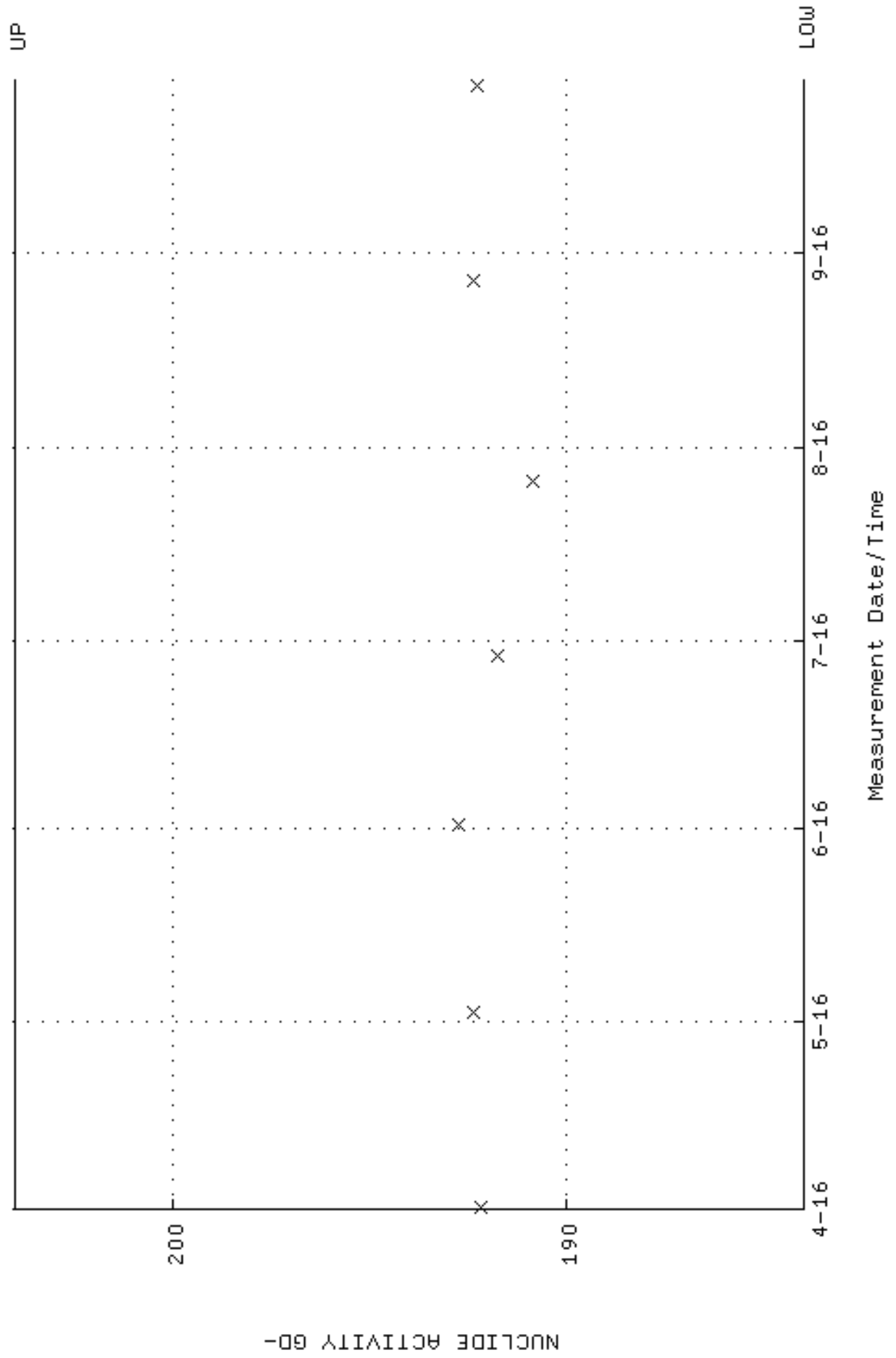


Measurement Date/Time

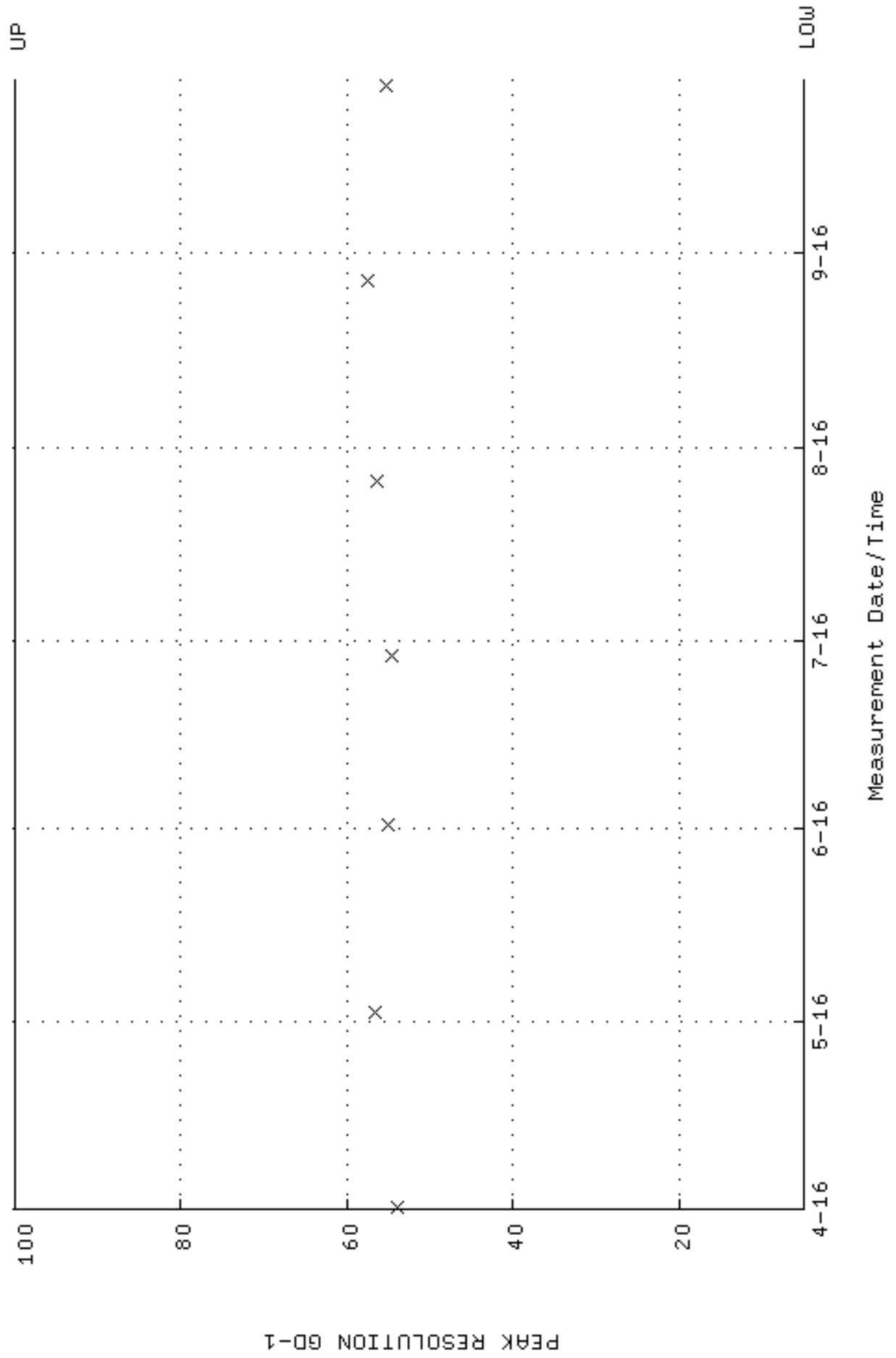
QA filename : DKA100:[ENV_ALPHA.QA.W]W008.QAF;6
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.318710 through 0.338420



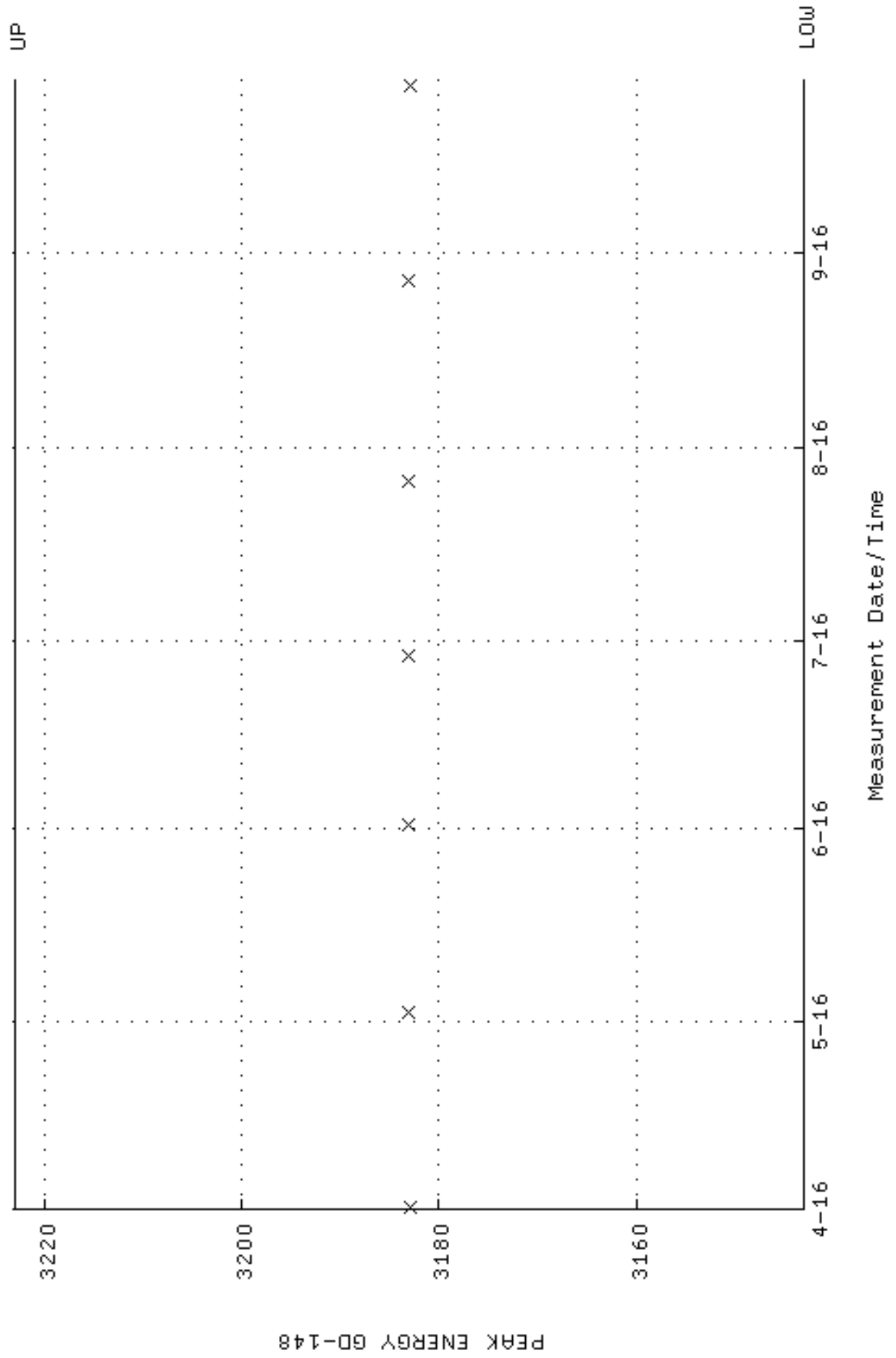
QA filename : DKA100:[ENV_ALPHA.QA.W]W008.QAF;6
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



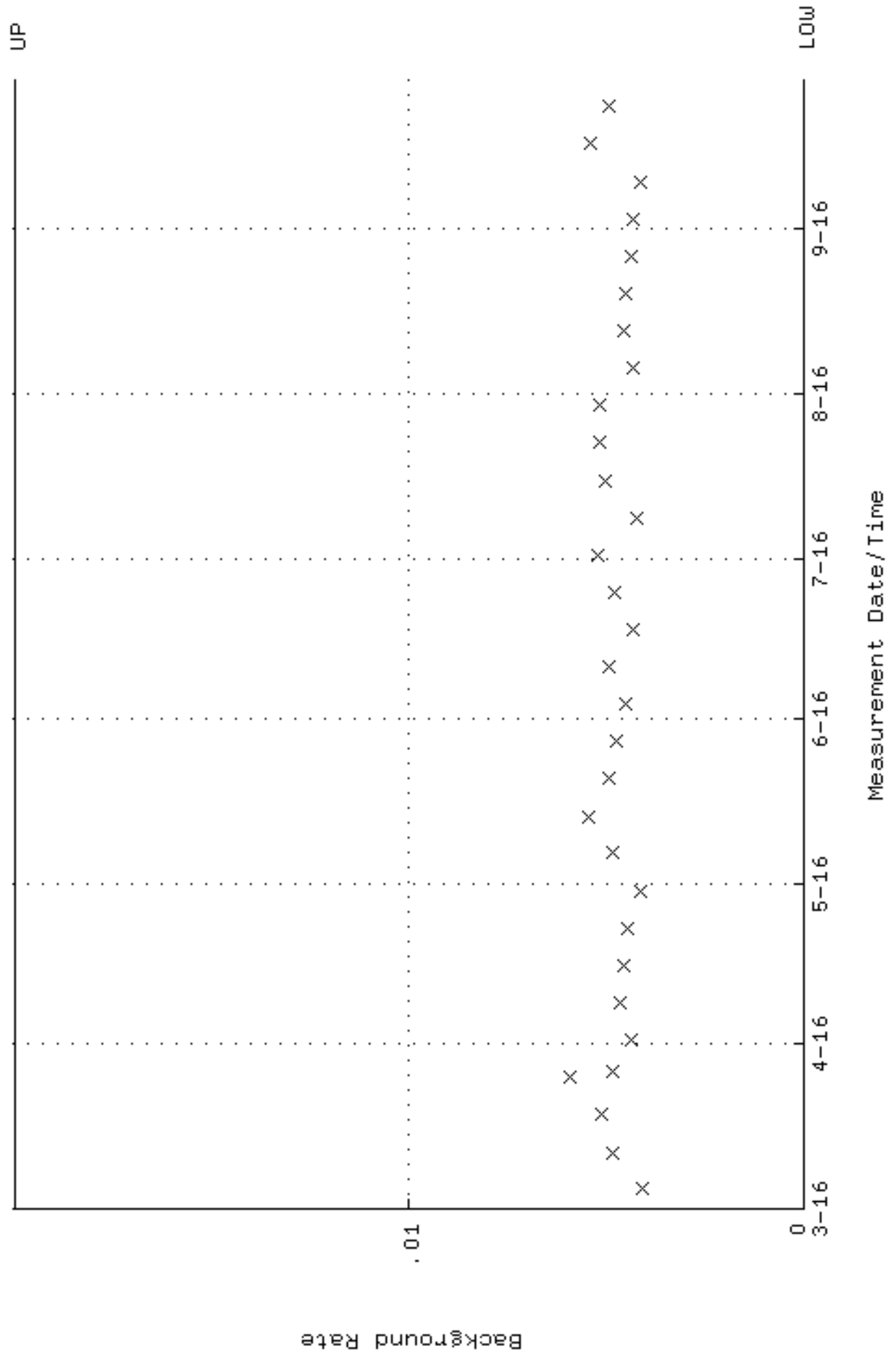
QA filename : DKA100:[ENV_ALPHA.QA.W]W008.QAF;6
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



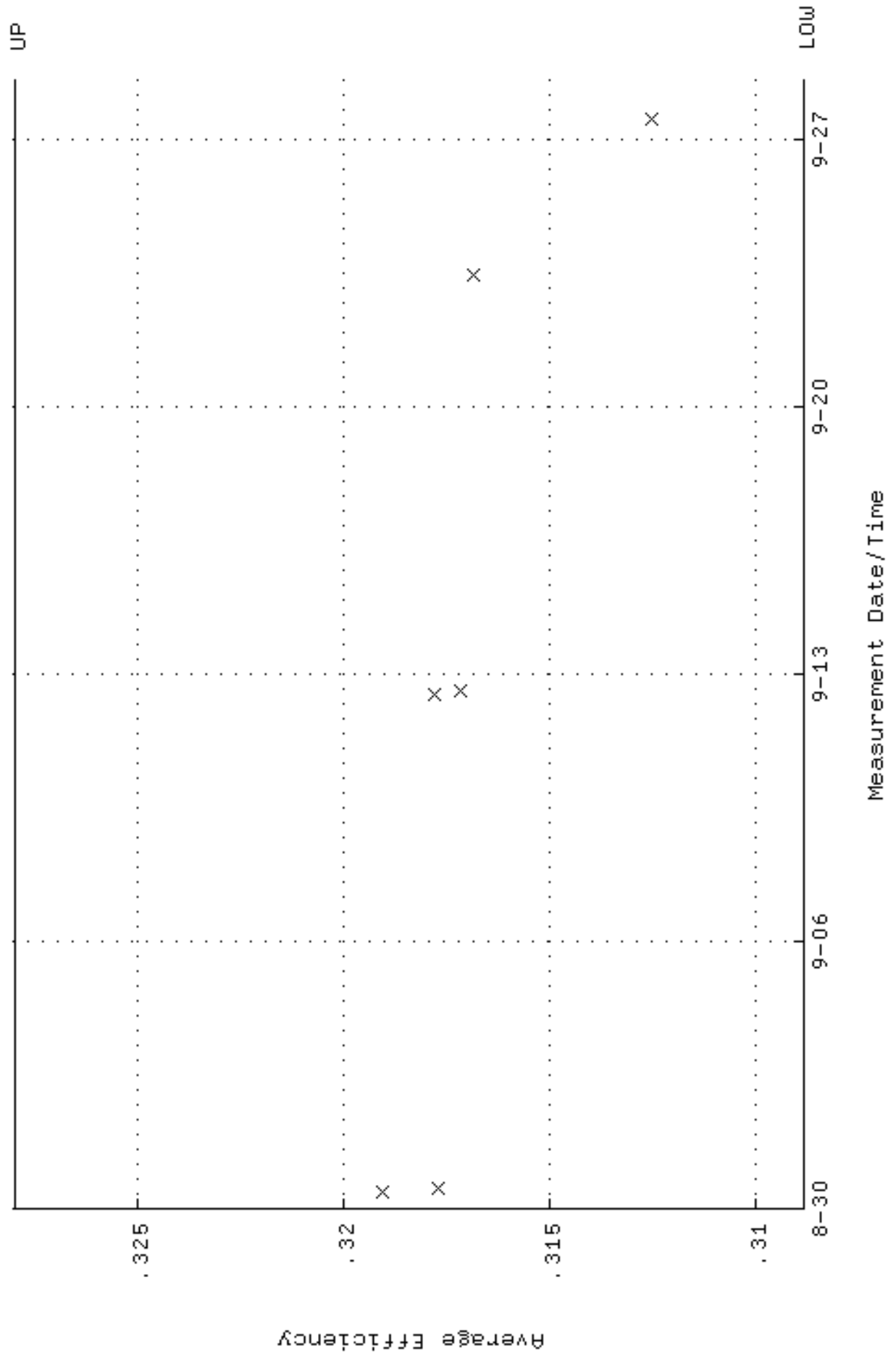
QA filename : DKA100:[ENV_ALPHA.QA.W]W008.QAF;6
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



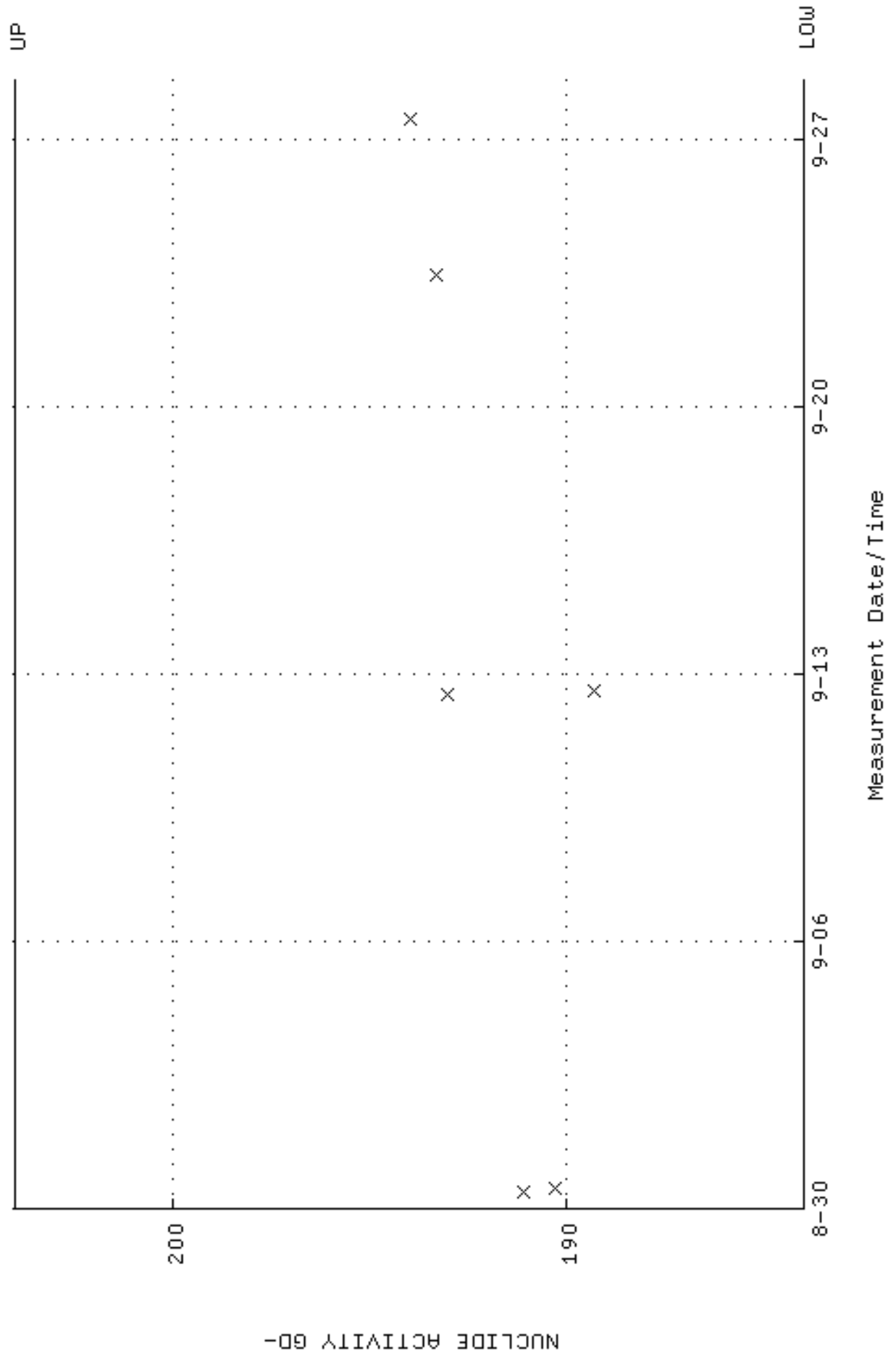
QA filename : DKA100:[ENV_ALPHA.QA.B]B008.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:29:28 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



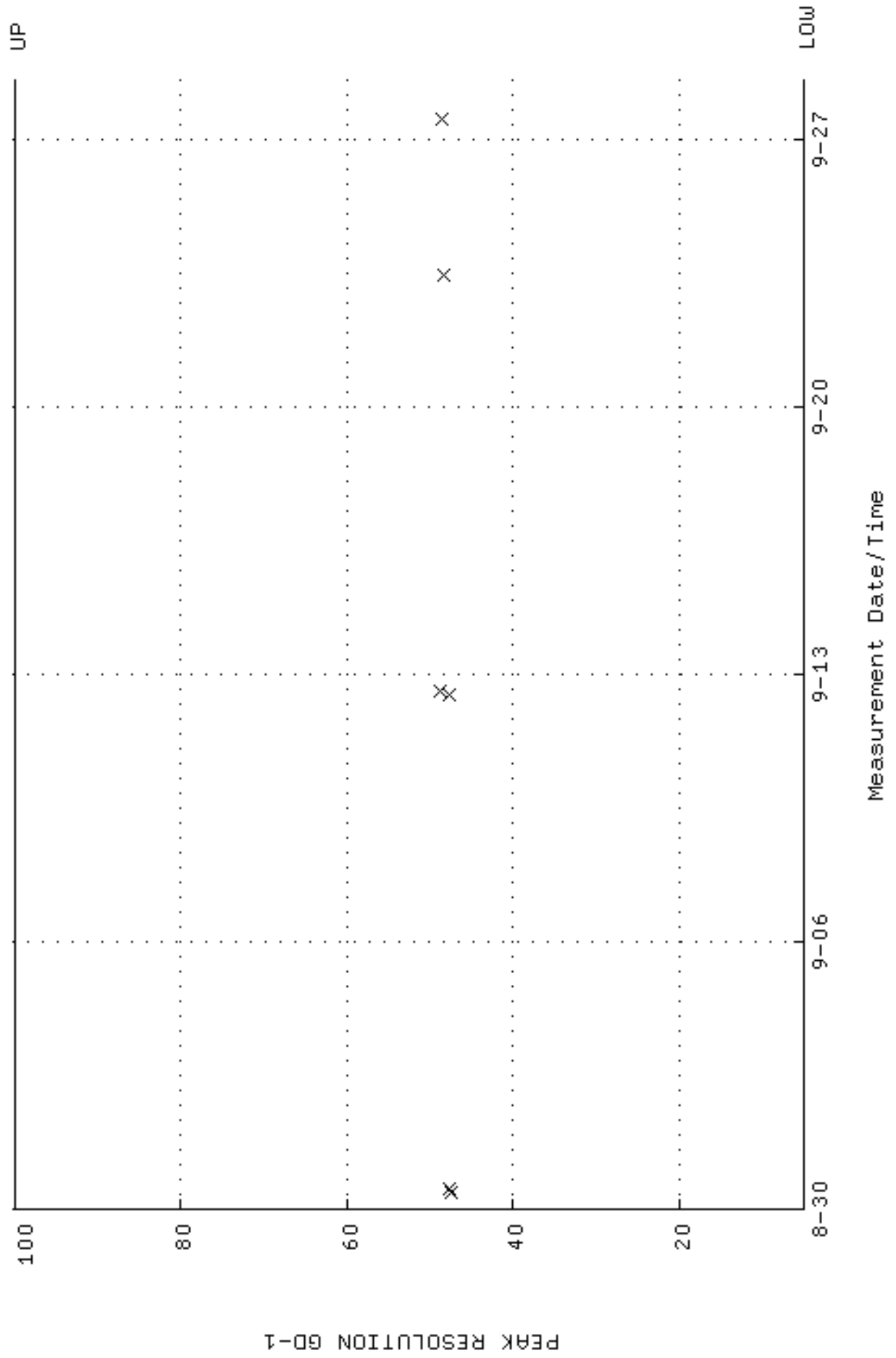
QA filename : DKA100:[ENV_ALPHA.QA.W]W009.QAF;7
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 30-AUG-2016 10:09:38 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.308850 through 0.327950



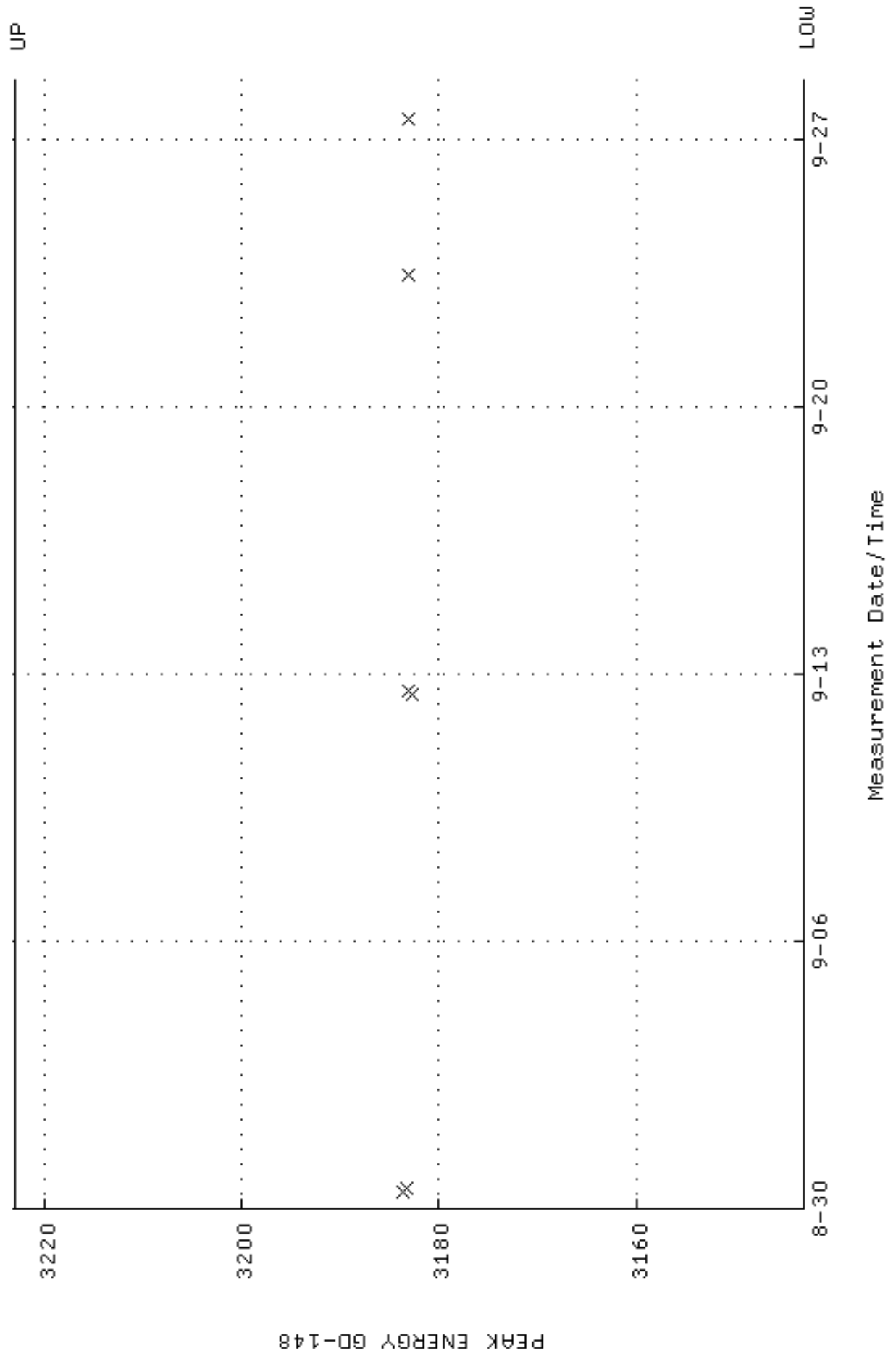
QA filename : DKA100:[ENV_ALPHA.QA.W]W009.QAF;7
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 30-AUG-2016 10:09:38 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



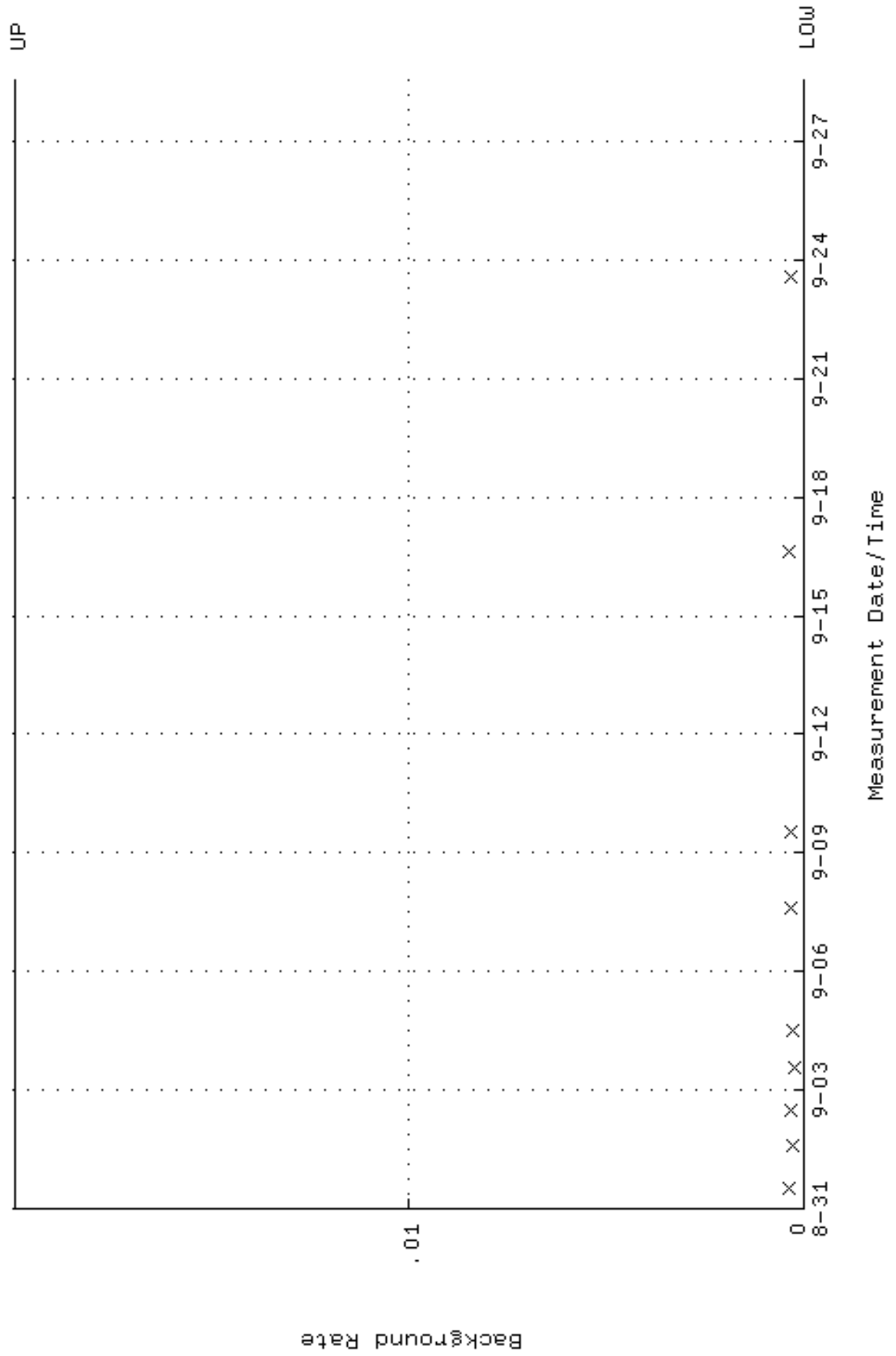
QA filename : DKA100:[ENV_ALPHA.QA.W]W009.QAF;7
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 30-AUG-2016 10:09:38 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



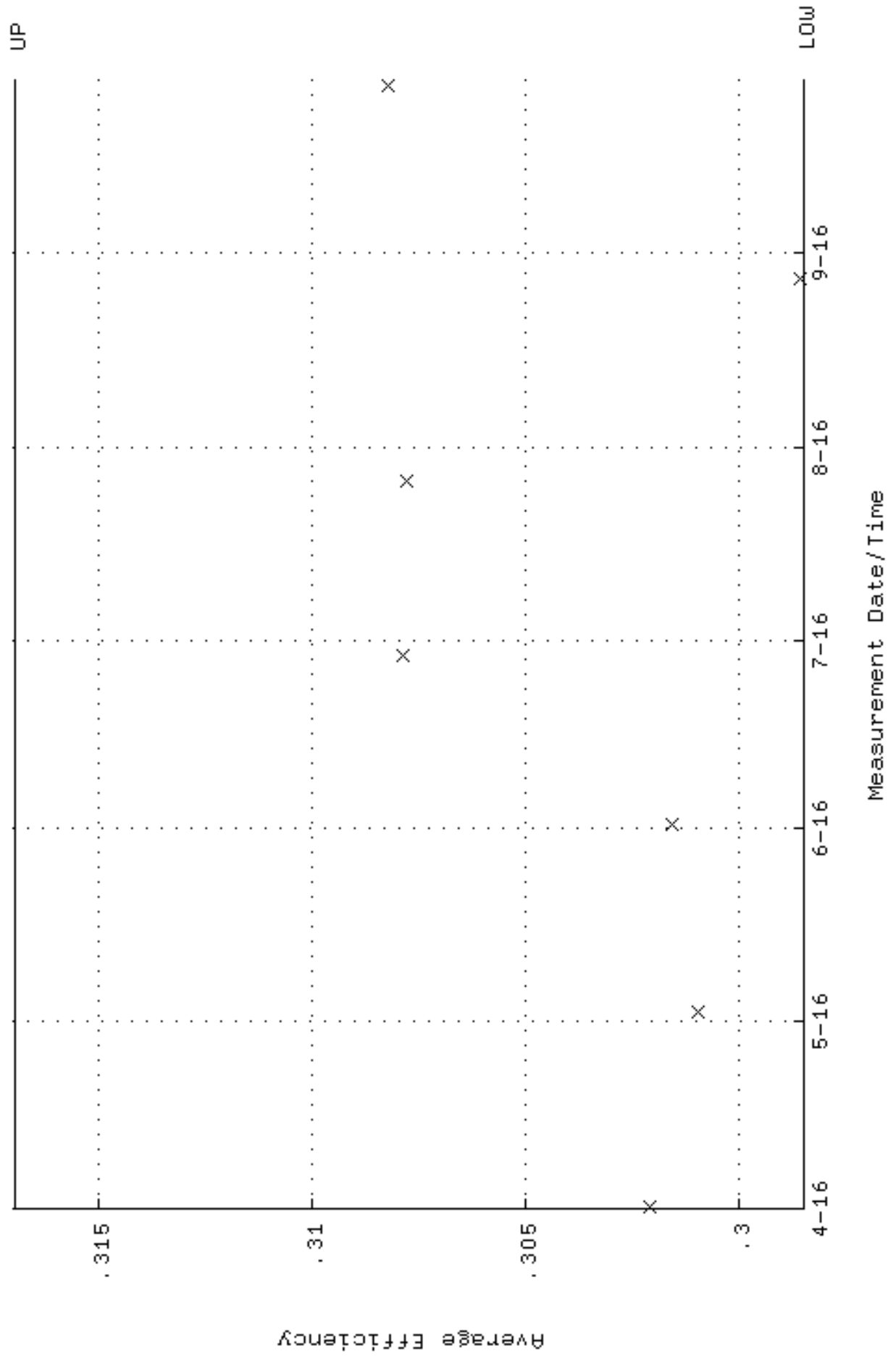
QA filename : DKA100:[ENV_ALPHA.QA.W]W009.QAF;7
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 30-AUG-2016 10:09:38 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



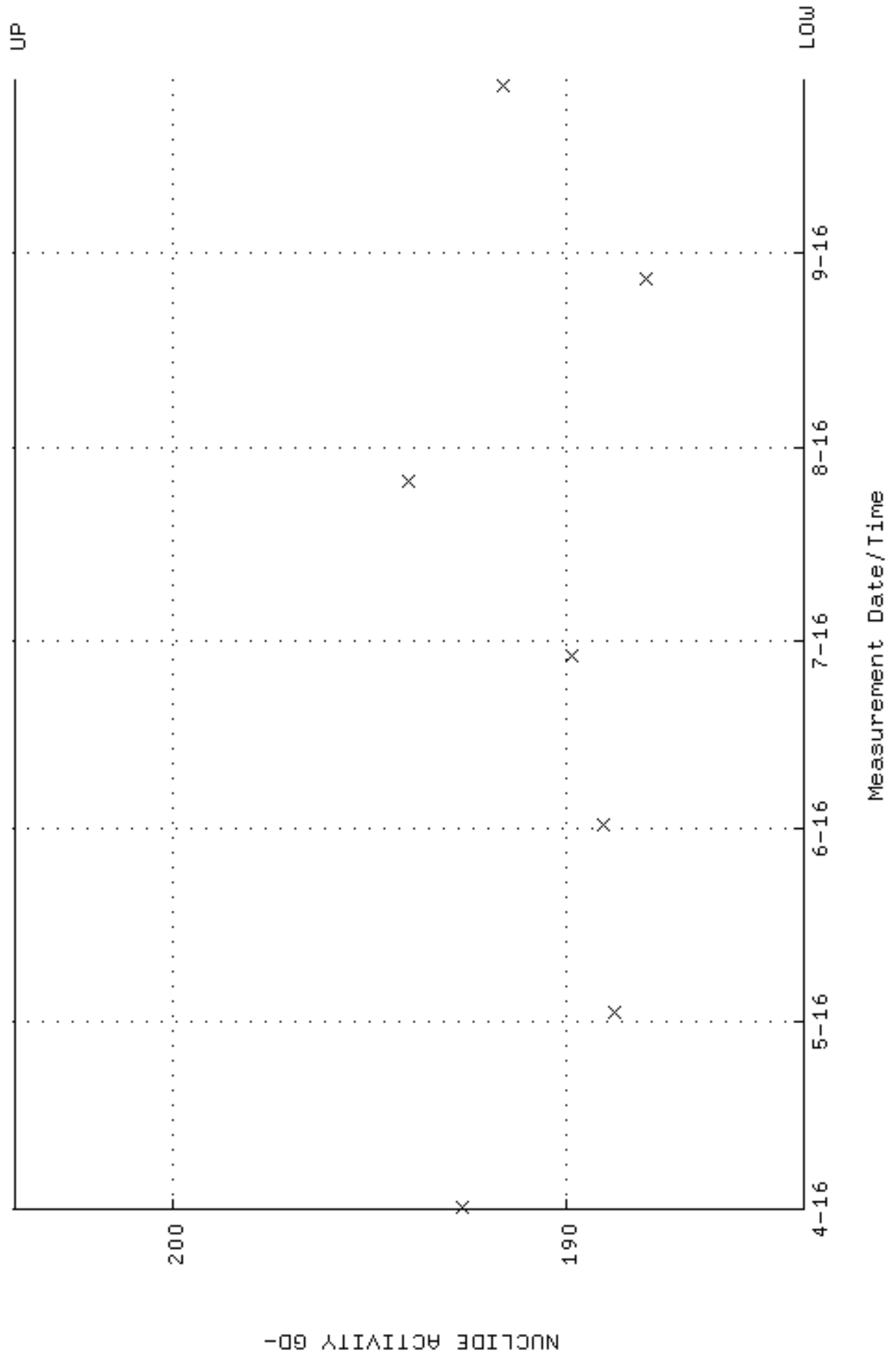
QA filename : DKA100:[ENV_ALPHA.QA.B]B009.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 31-AUG-2016 12:42:17 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



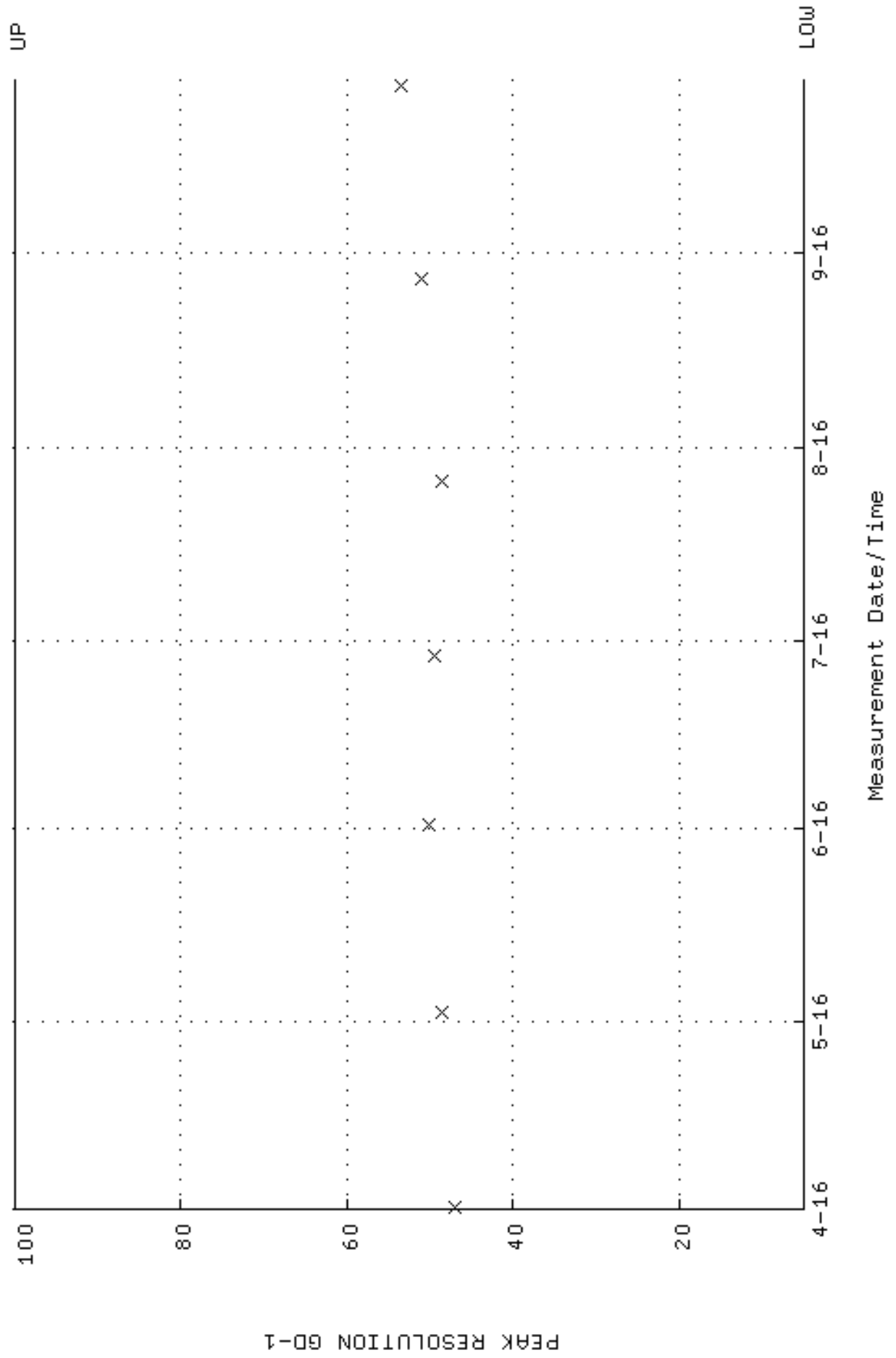
QA filename : DKA100:[ENV_ALPHA.QA.W]W010.QAF;8
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.298500 through 0.316960



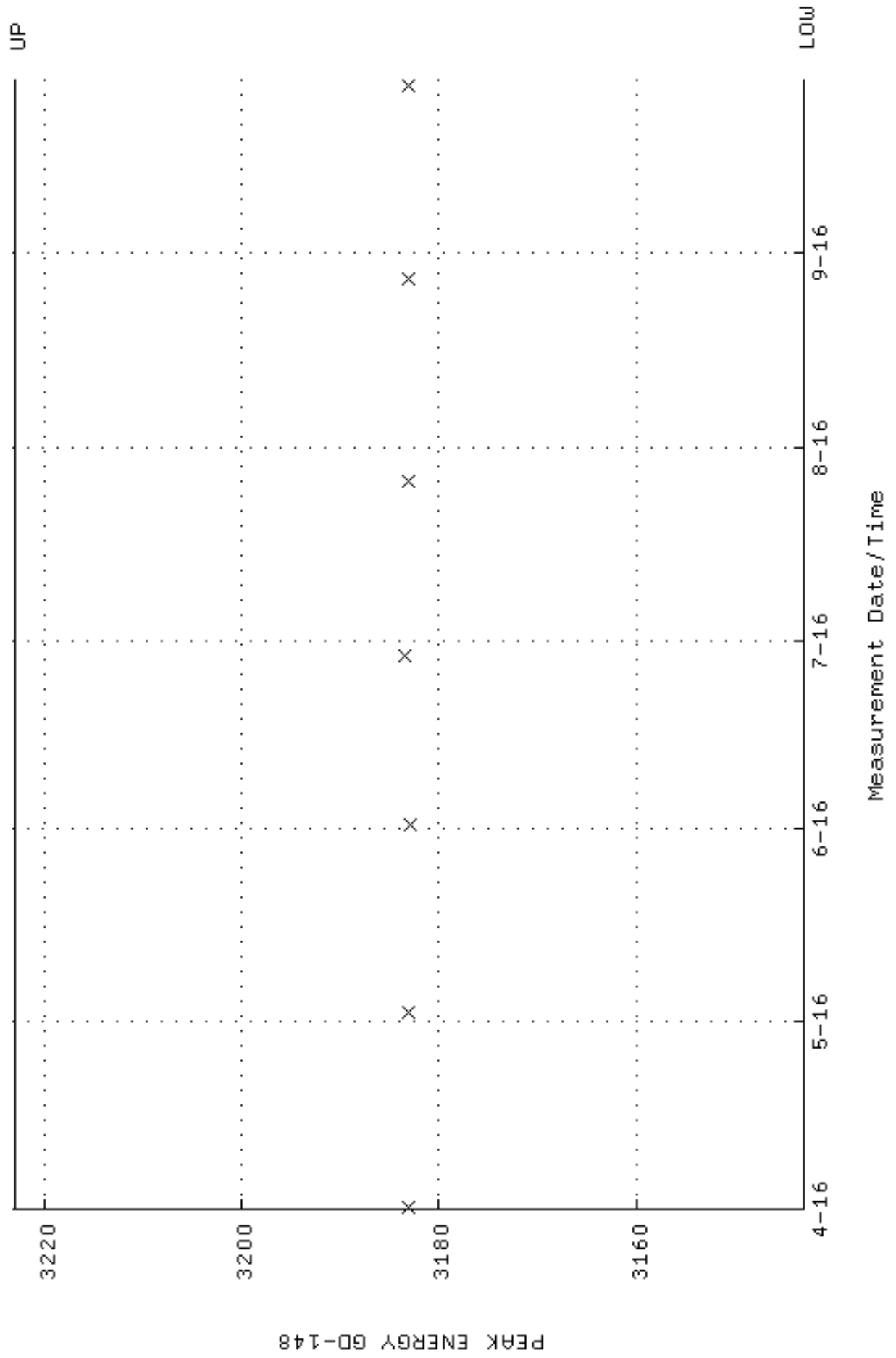
QA filename : DKA100:[ENV_ALPHA.QA.W]W010.QAF;8
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



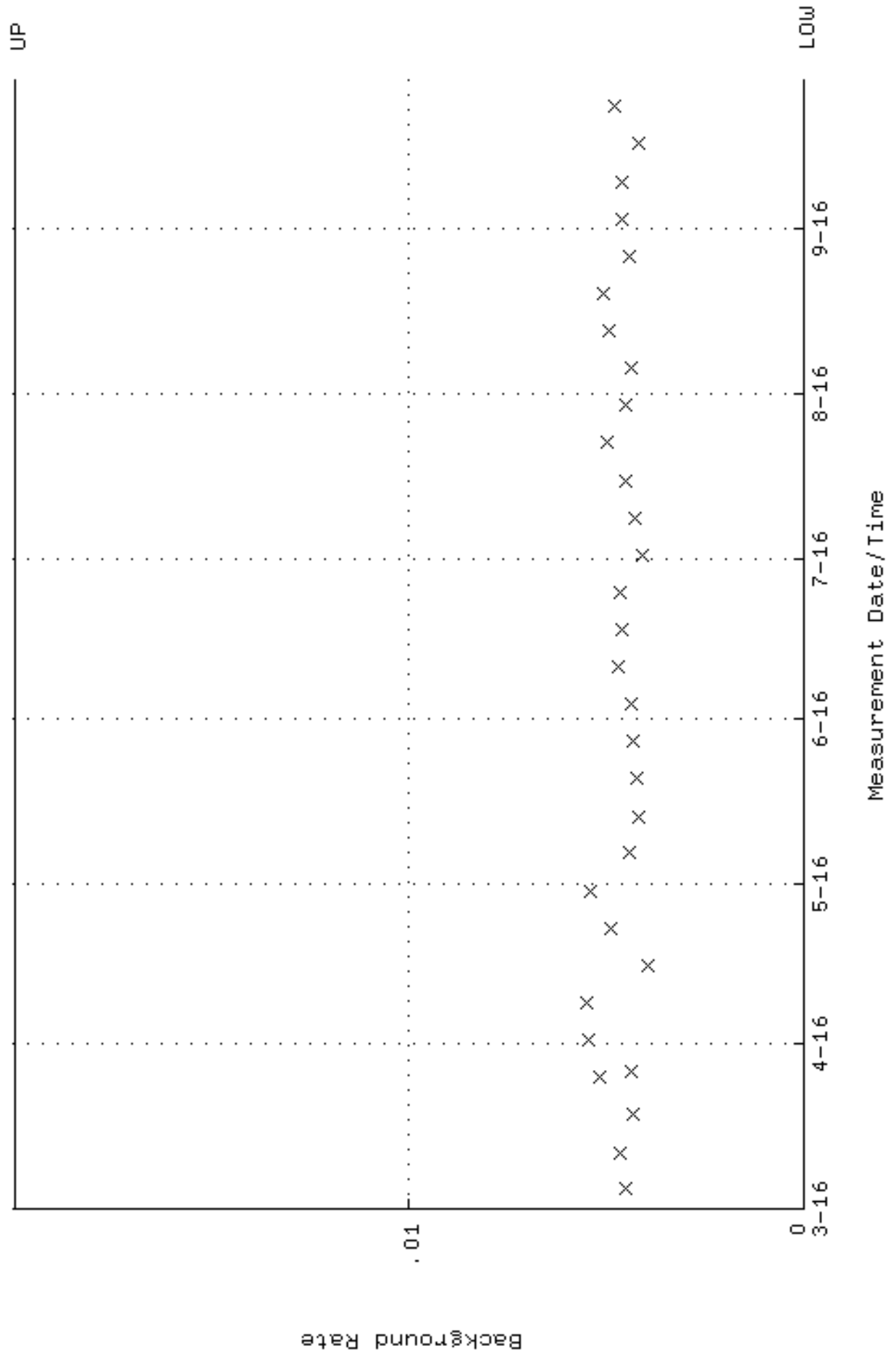
QA filename : DKA100:[ENV_ALPHA.QA.W]W010.QAF;8
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



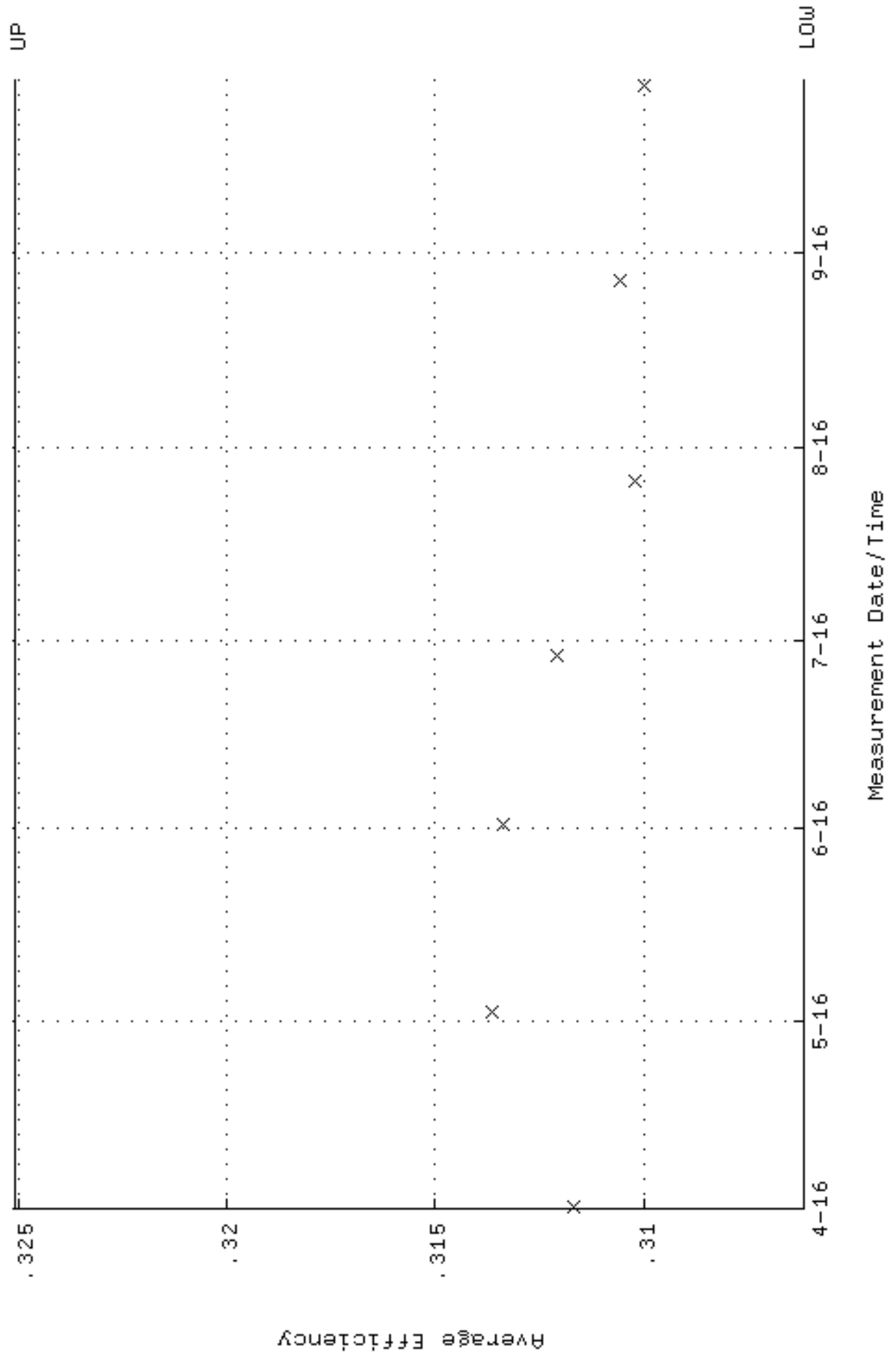
QA filename : DKA100:[ENV_ALPHA.QA.W]W010.QAF;8
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



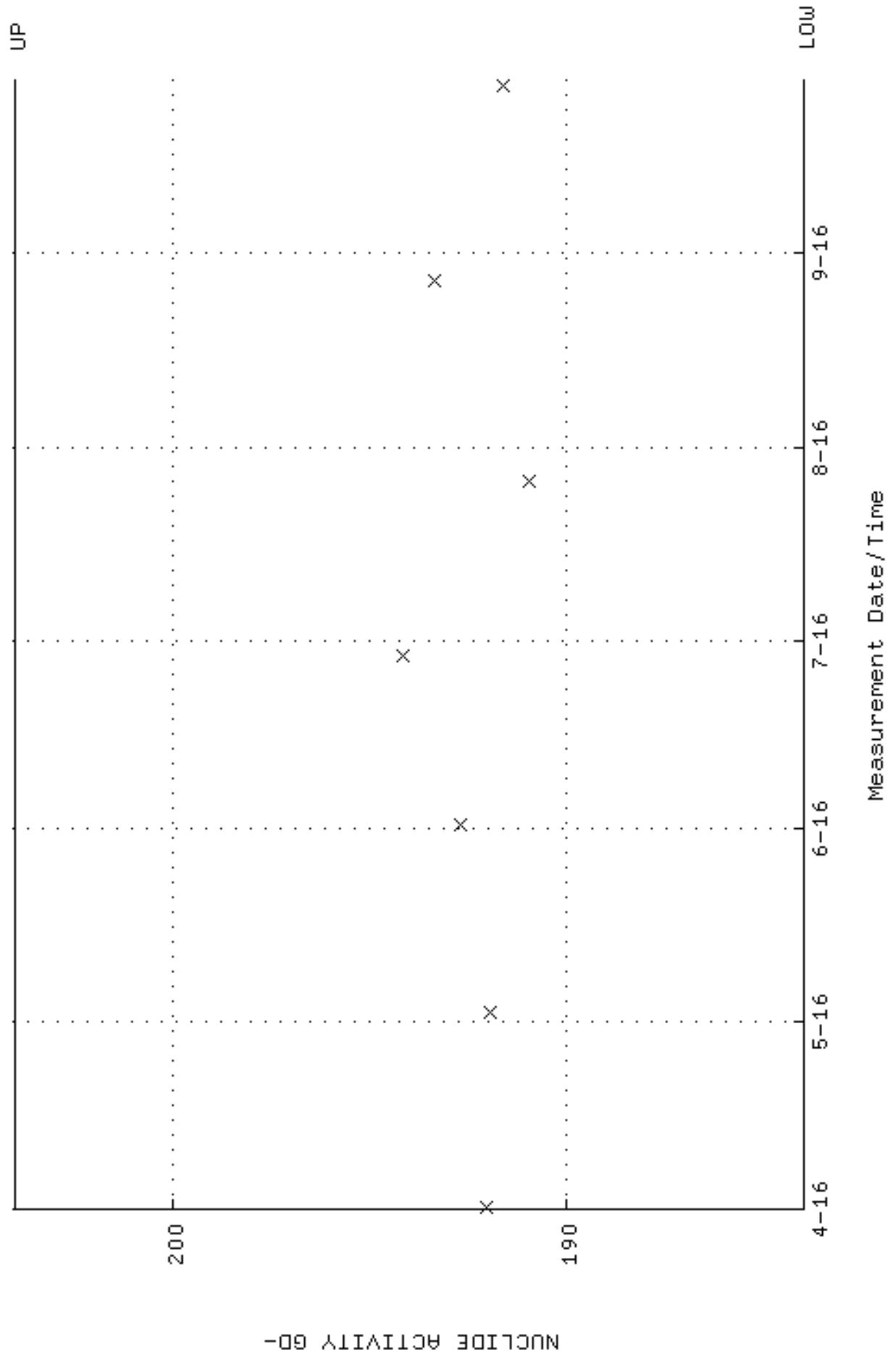
QA filename : DKA100:[ENV_ALPHA.QA.B]B010.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:29:28 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



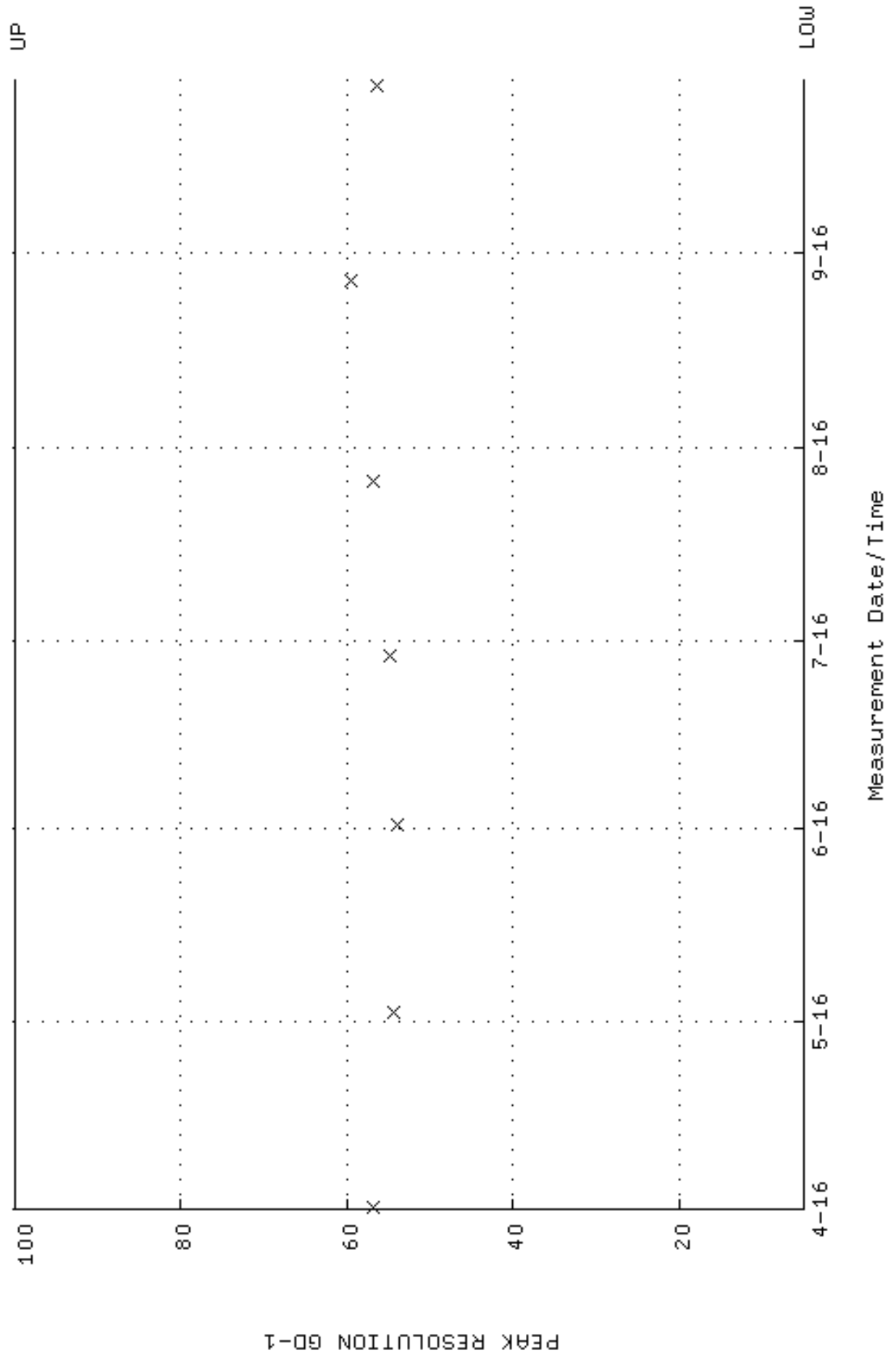
QA filename : DKA100:[ENV_ALPHA.QA.W]W011.QAF;8
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.306149 through 0.325087



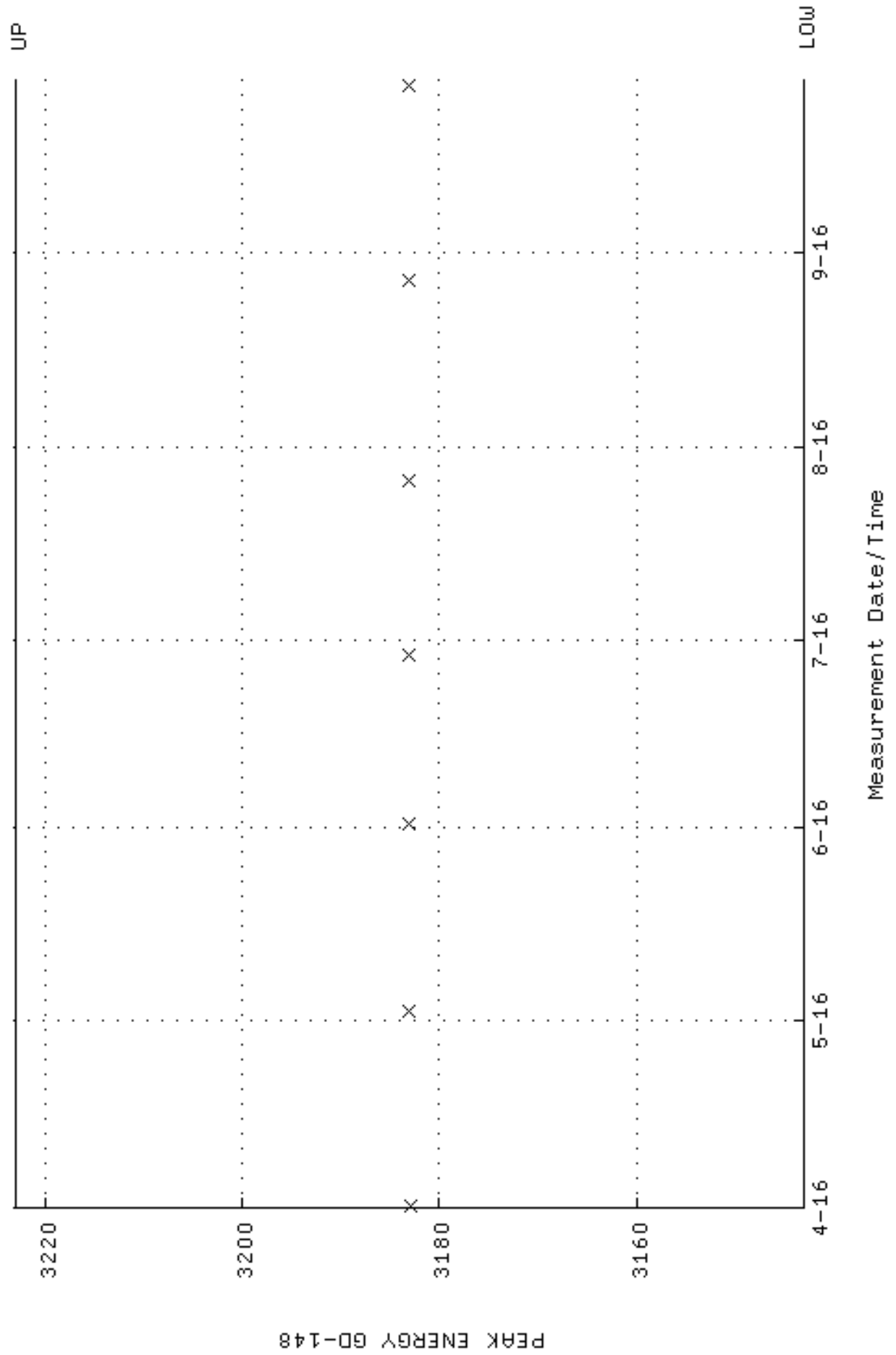
QA filename : DKA100:[ENV_ALPHA.QA.W]W011.QAF;8
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



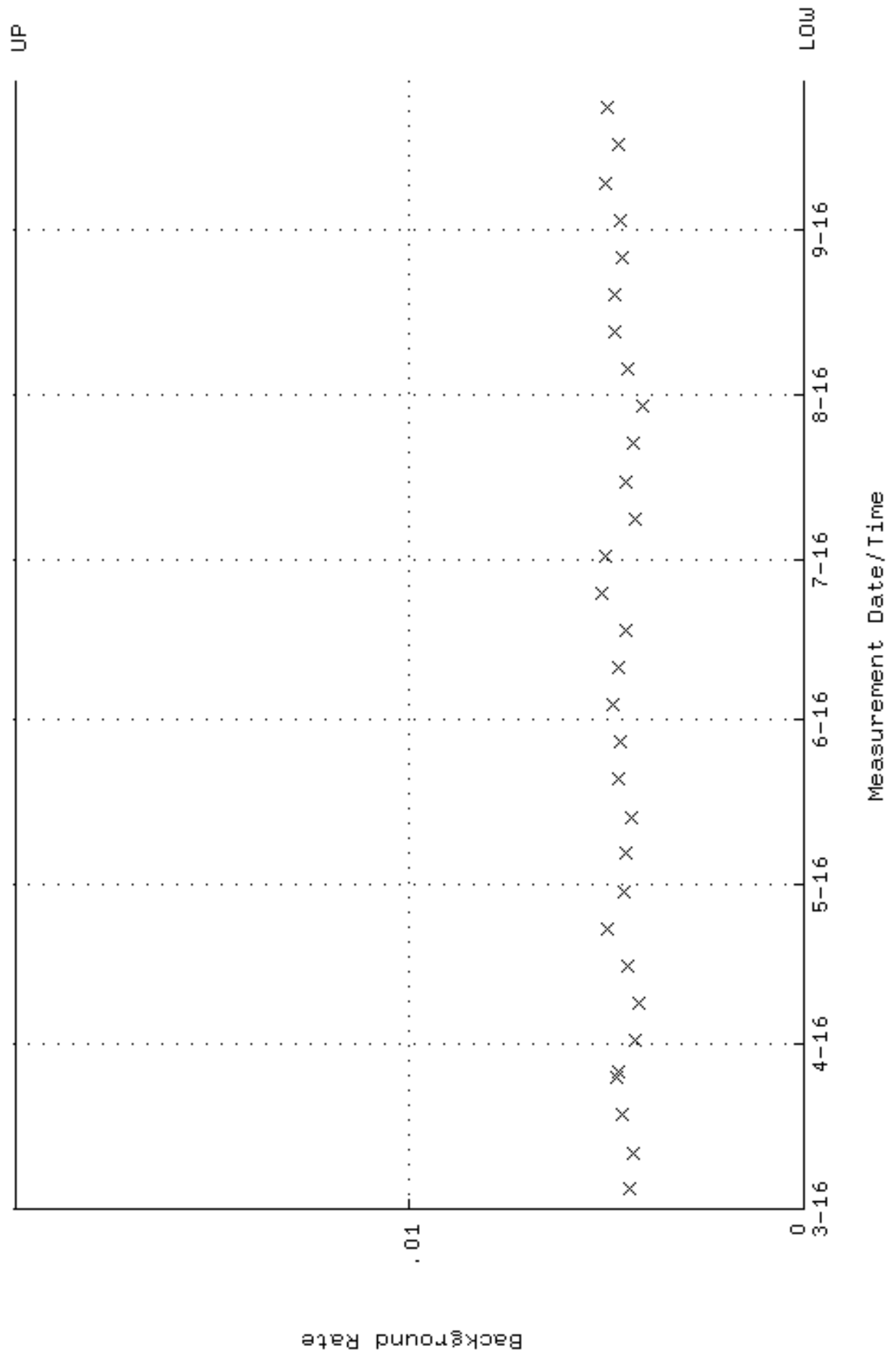
QA filename : DKA100:[ENV_ALPHA.QA.W]W011.QAF;8
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



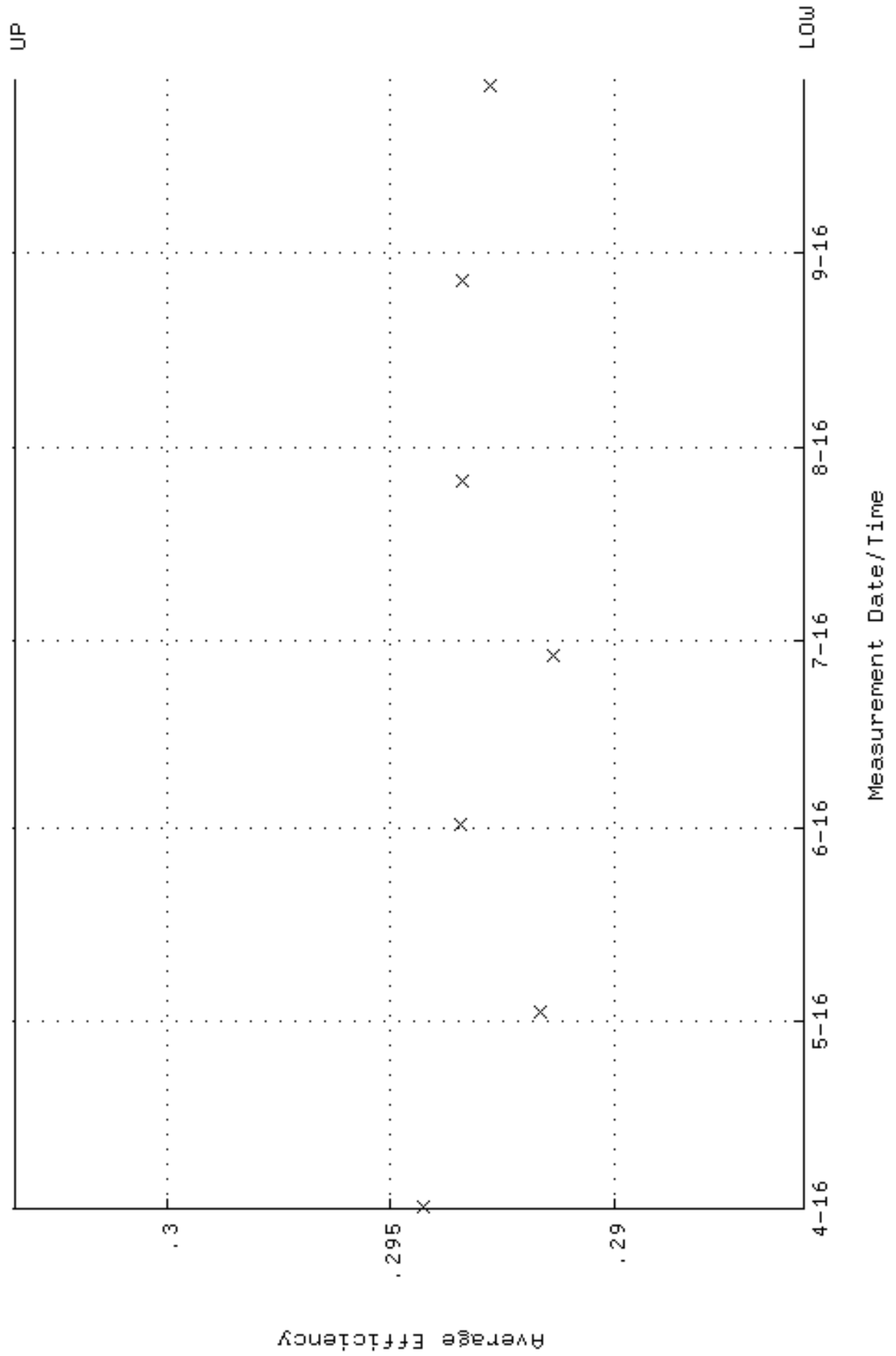
QA filename : DKA100:[ENV_ALPHA.QA.W]W011.QAF;8
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



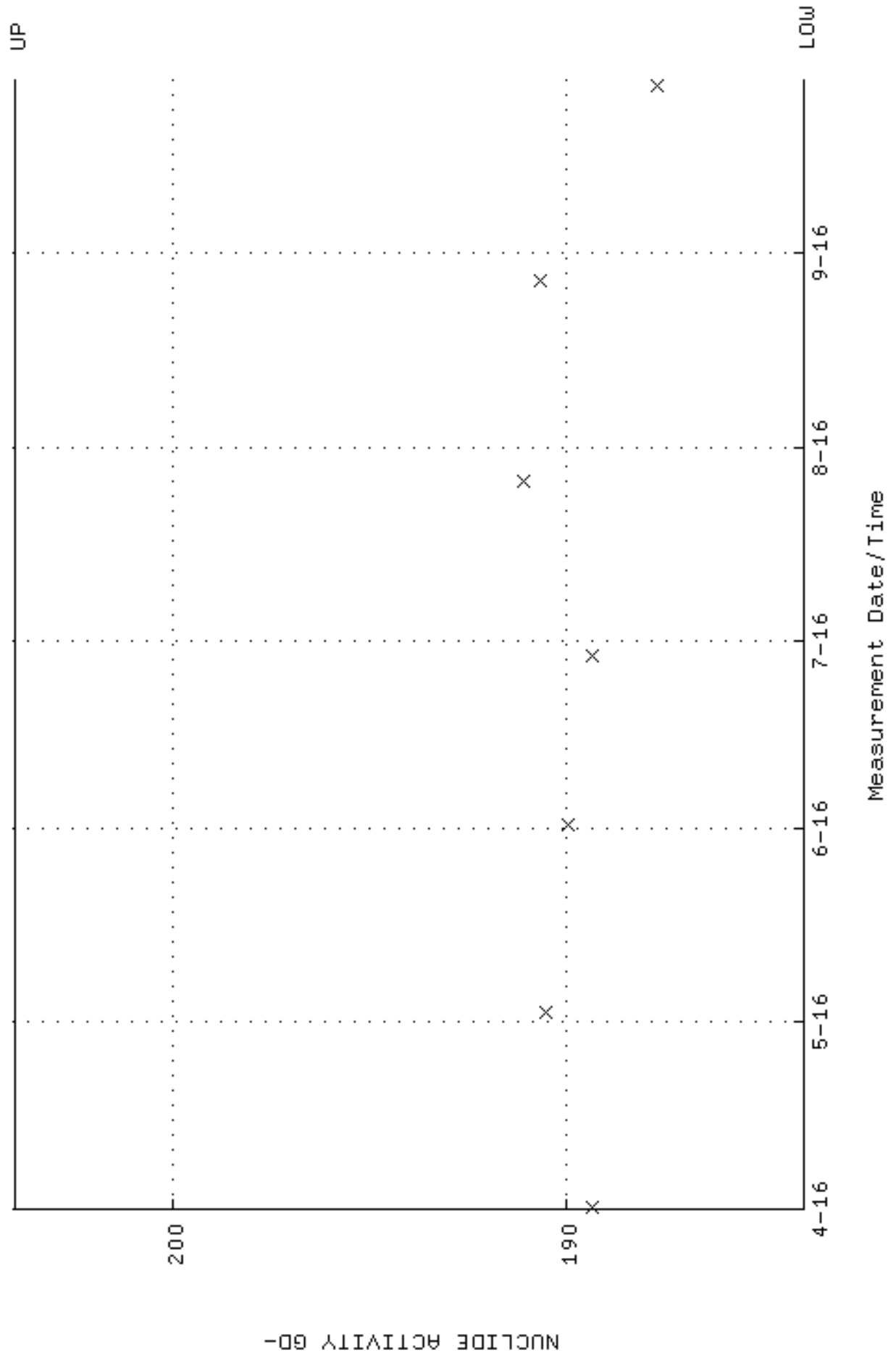
QA filename : DKA100:[ENV_ALPHA.QA.B]B011.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:29:28 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



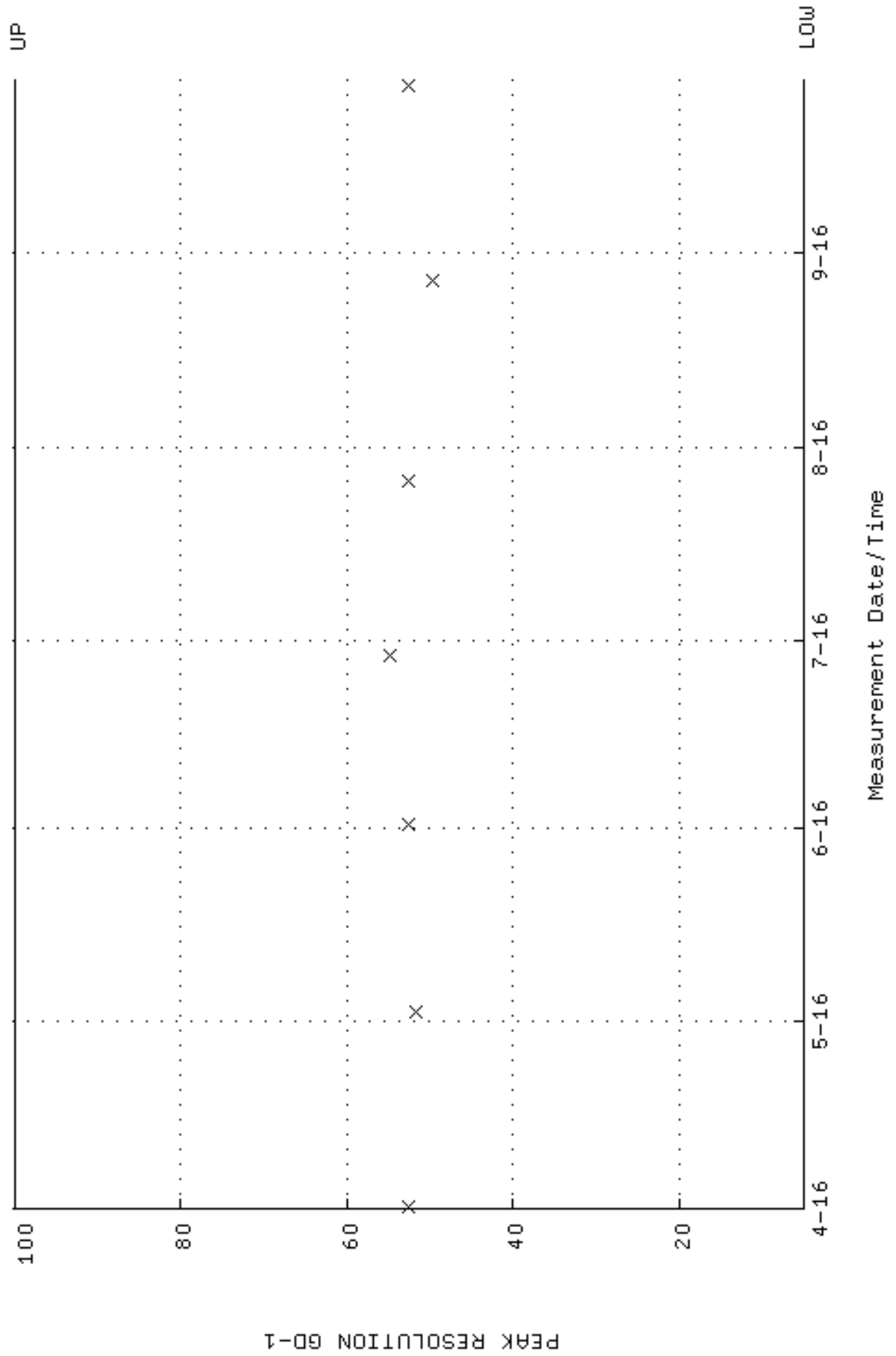
QA filename : DKA100:[ENV_ALPHA.QA.W]W012.QAF;7
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.285746 through 0.303420



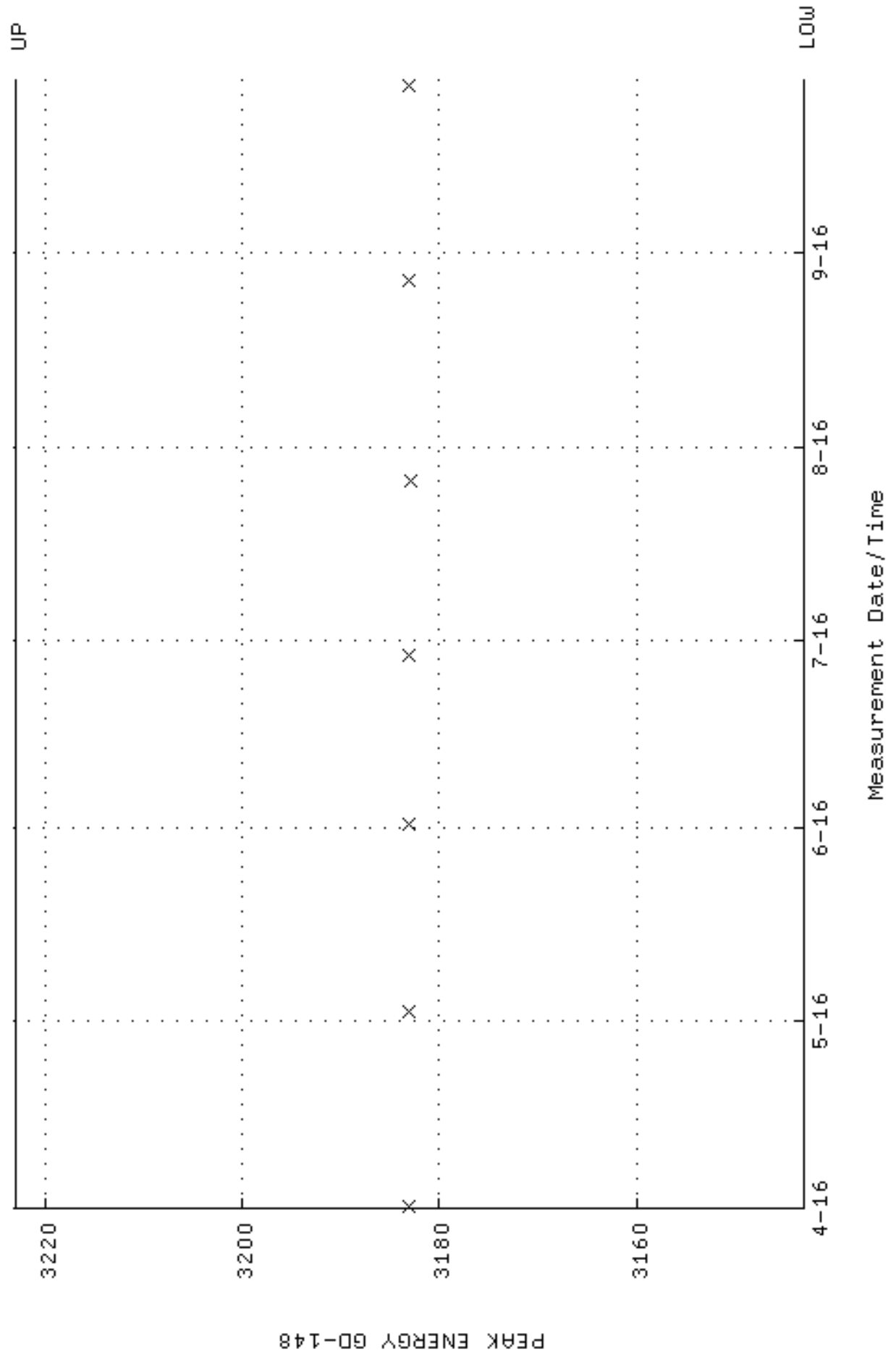
QA filename : DKA100:[ENV_ALPHA.QA.W]W012.QAF;7
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



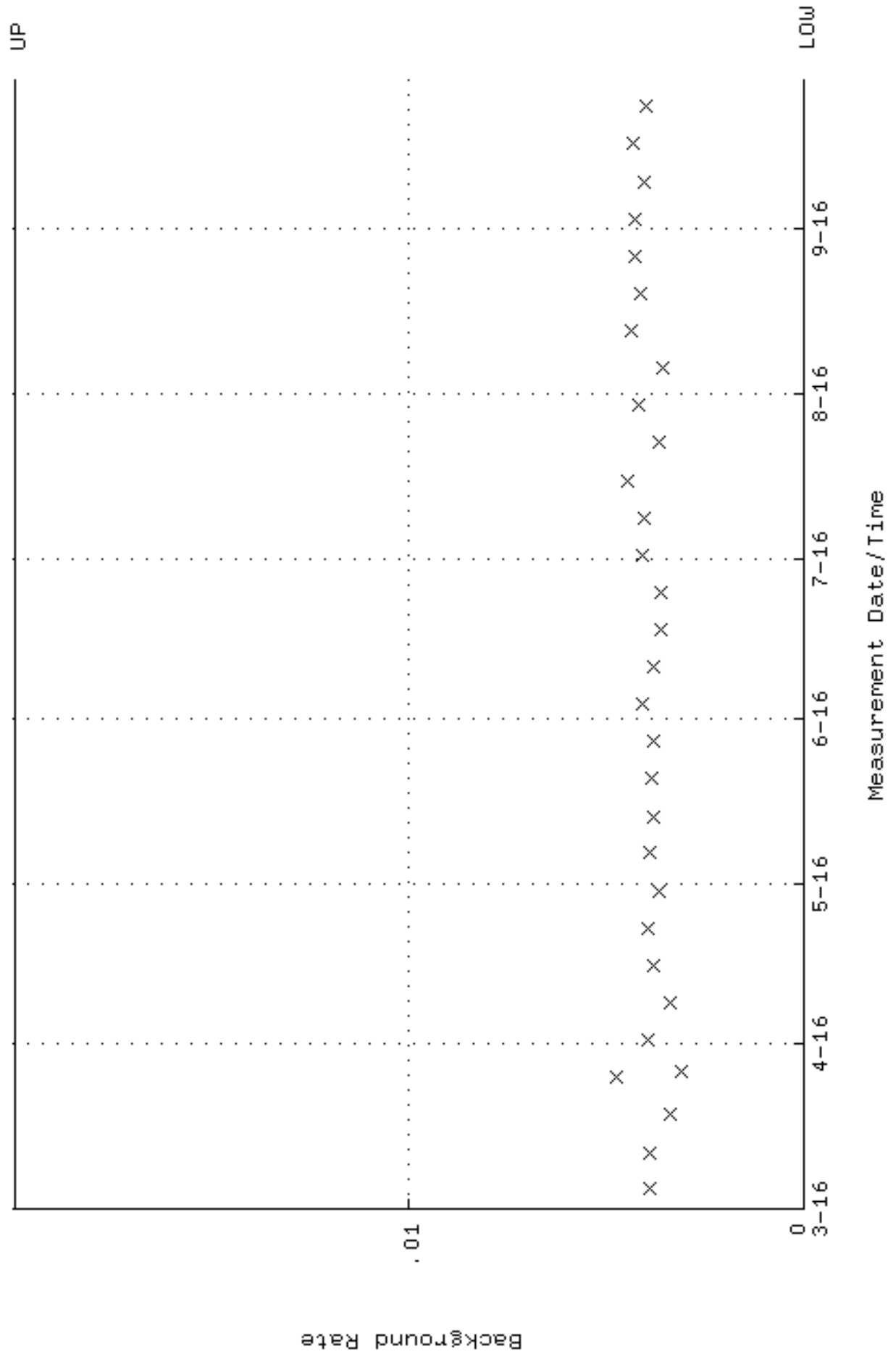
QA filename : DKA100:[ENV_ALPHA.QA.W]W012.QAF;7
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



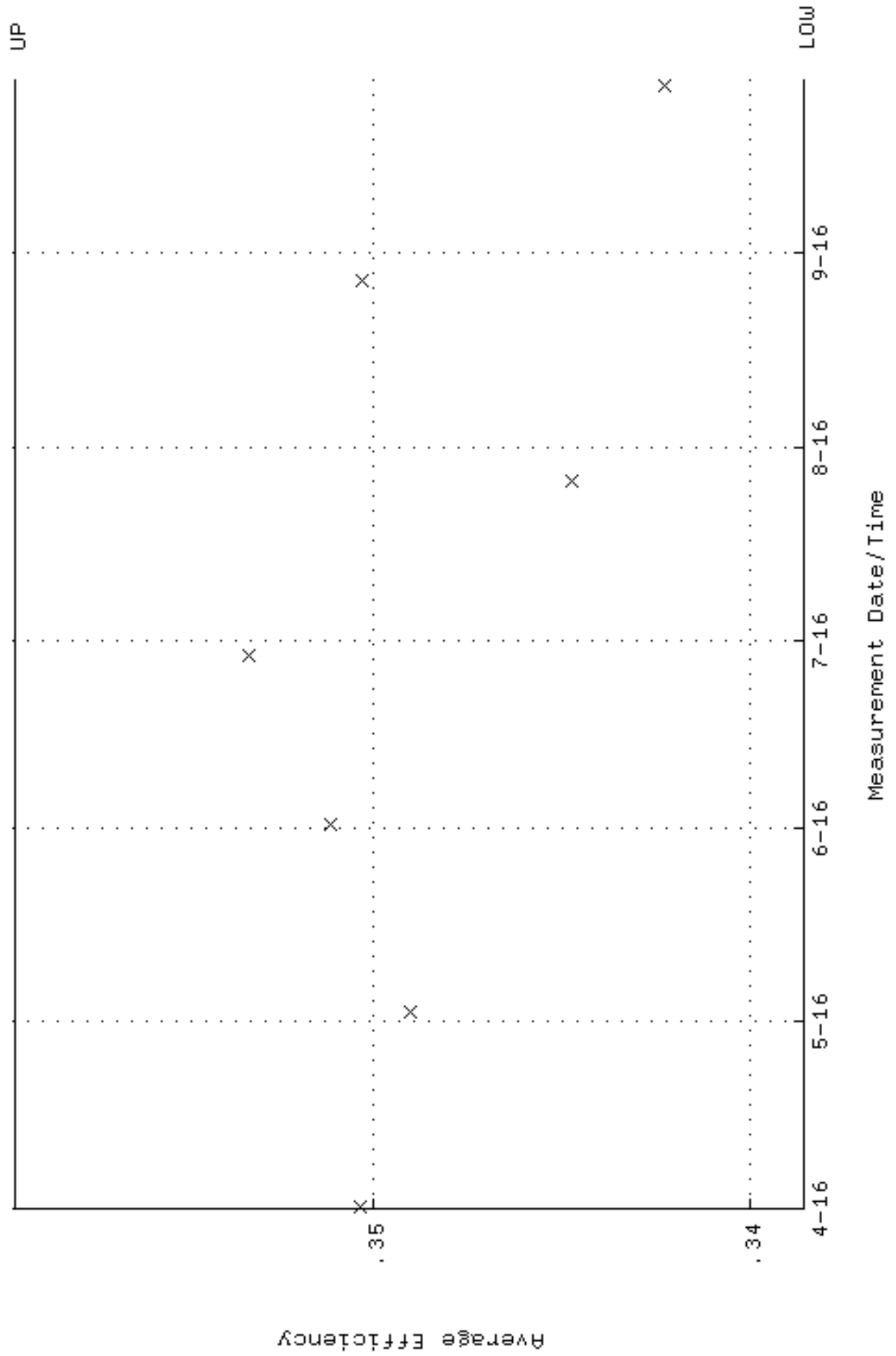
QA filename : DKA100:[ENV_ALPHA.QA.W]W012.QAF;7
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



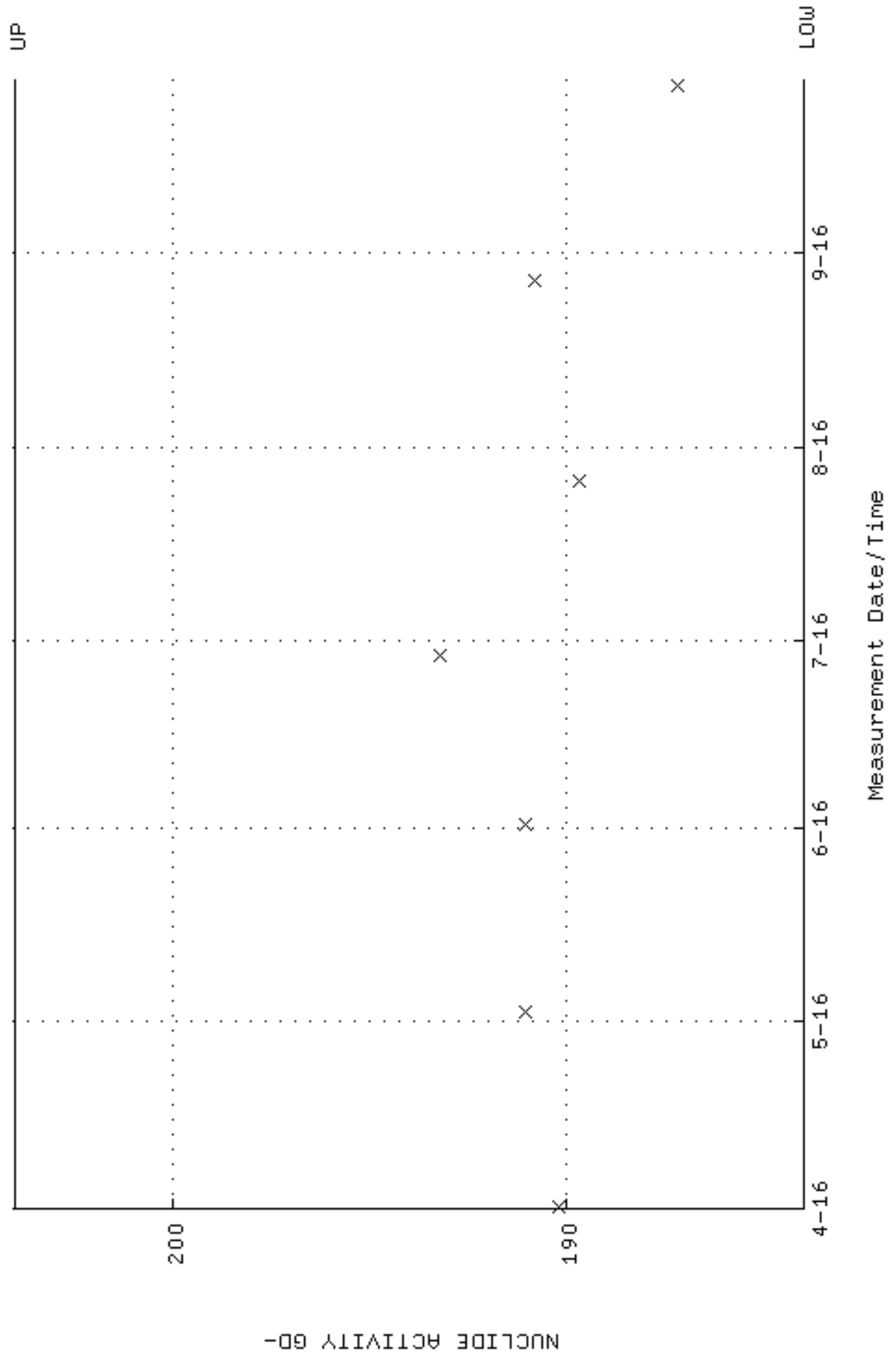
QA filename : DKA100:[ENV_ALPHA.QA.B]B012.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:29:28 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



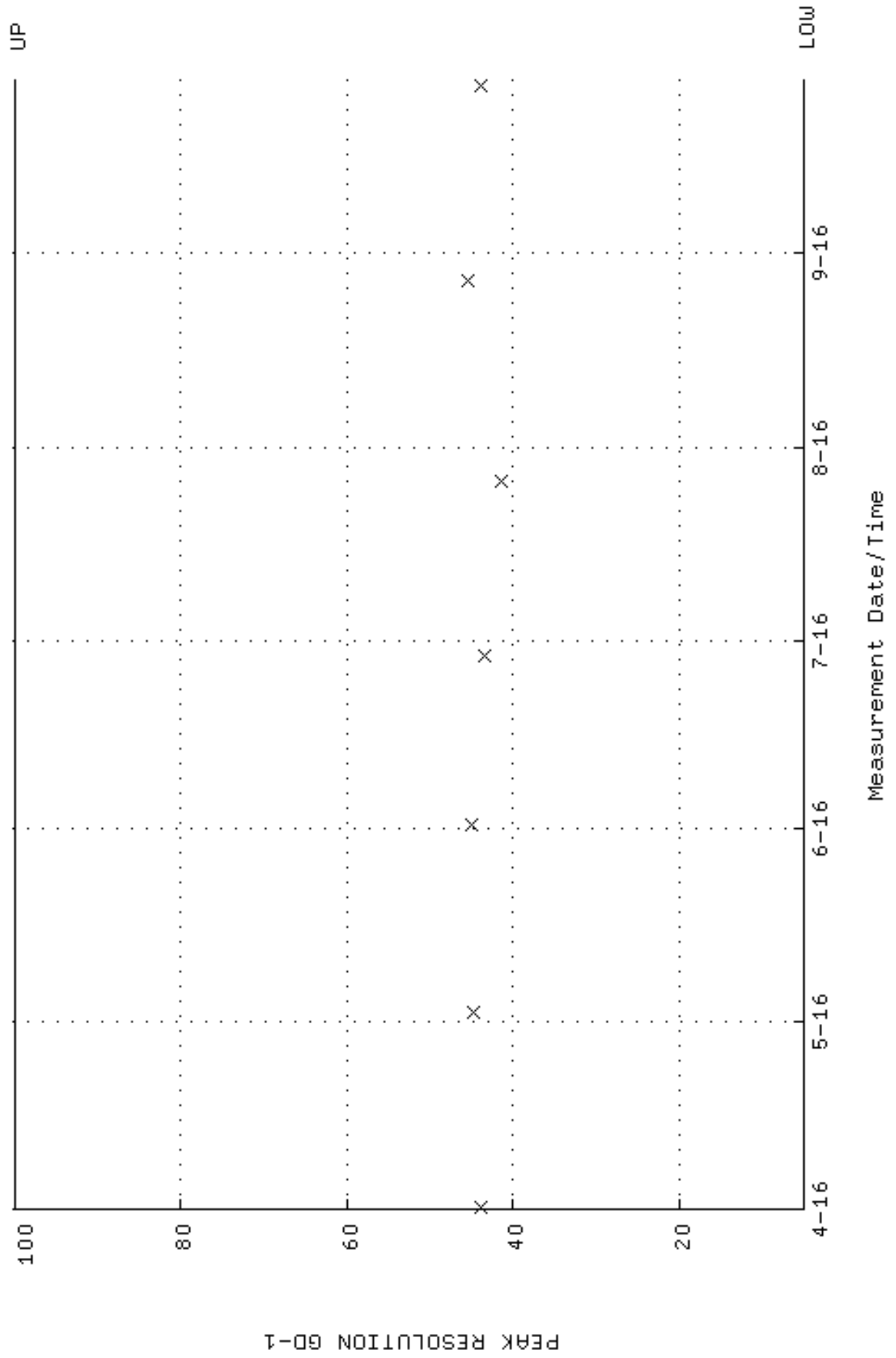
QA filename : DKA100:[ENV_ALPHA.QA.W]W013.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.338564 through 0.359506



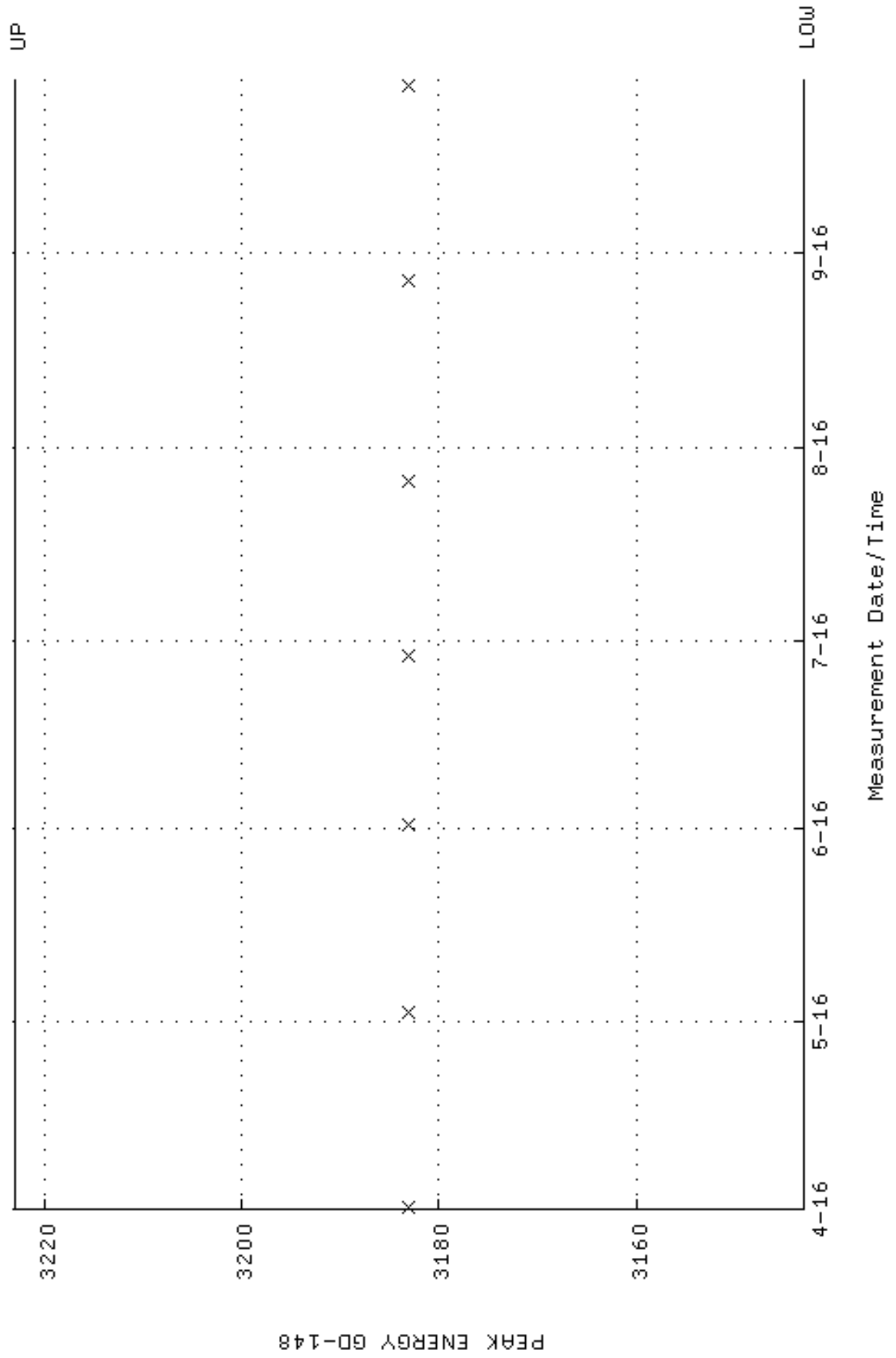
QA filename : DKA100:[ENV_ALPHA.QA.W]W013.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



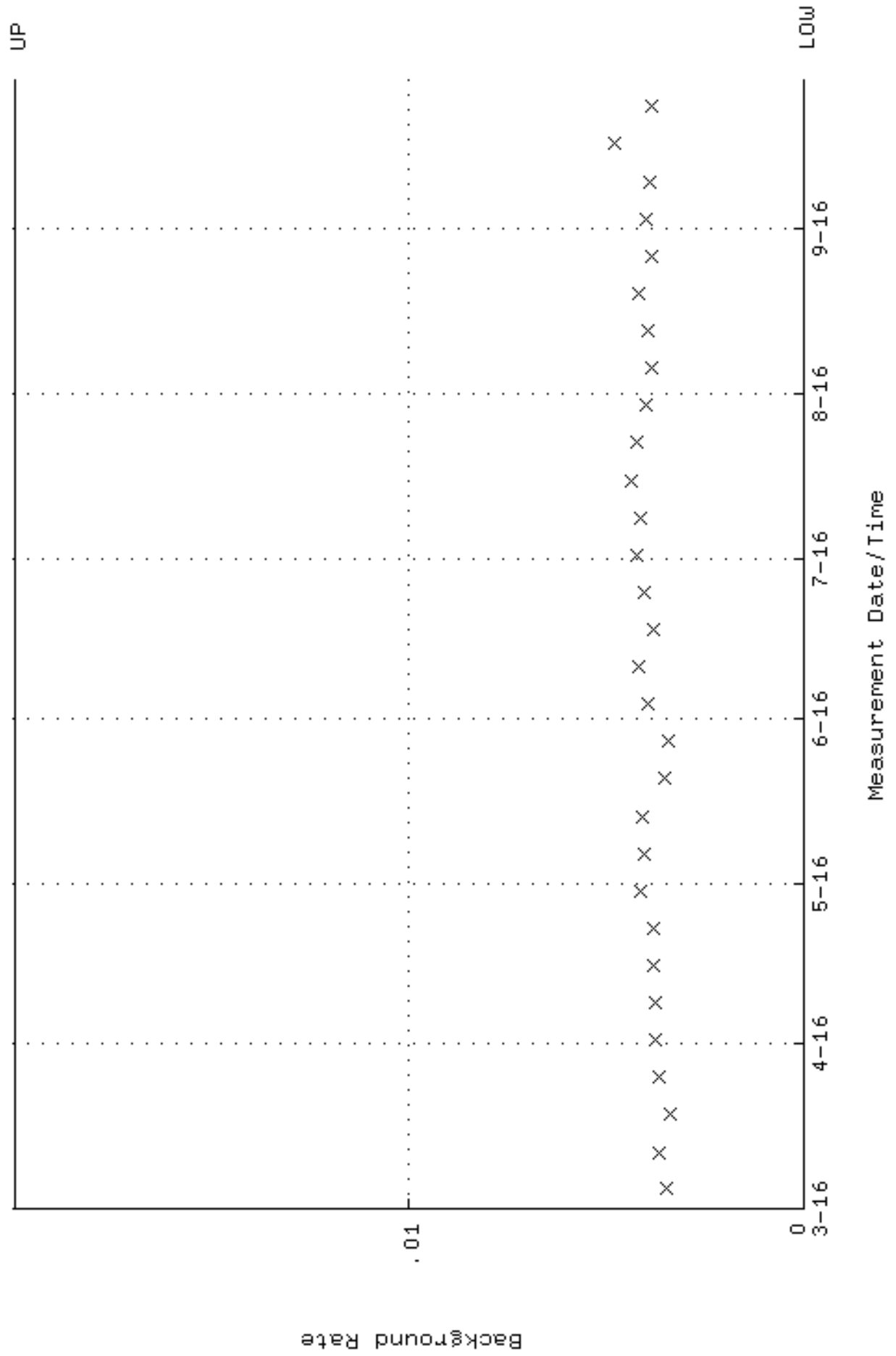
QA filename : DKA100:[ENV_ALPHA.QA.W]W013.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



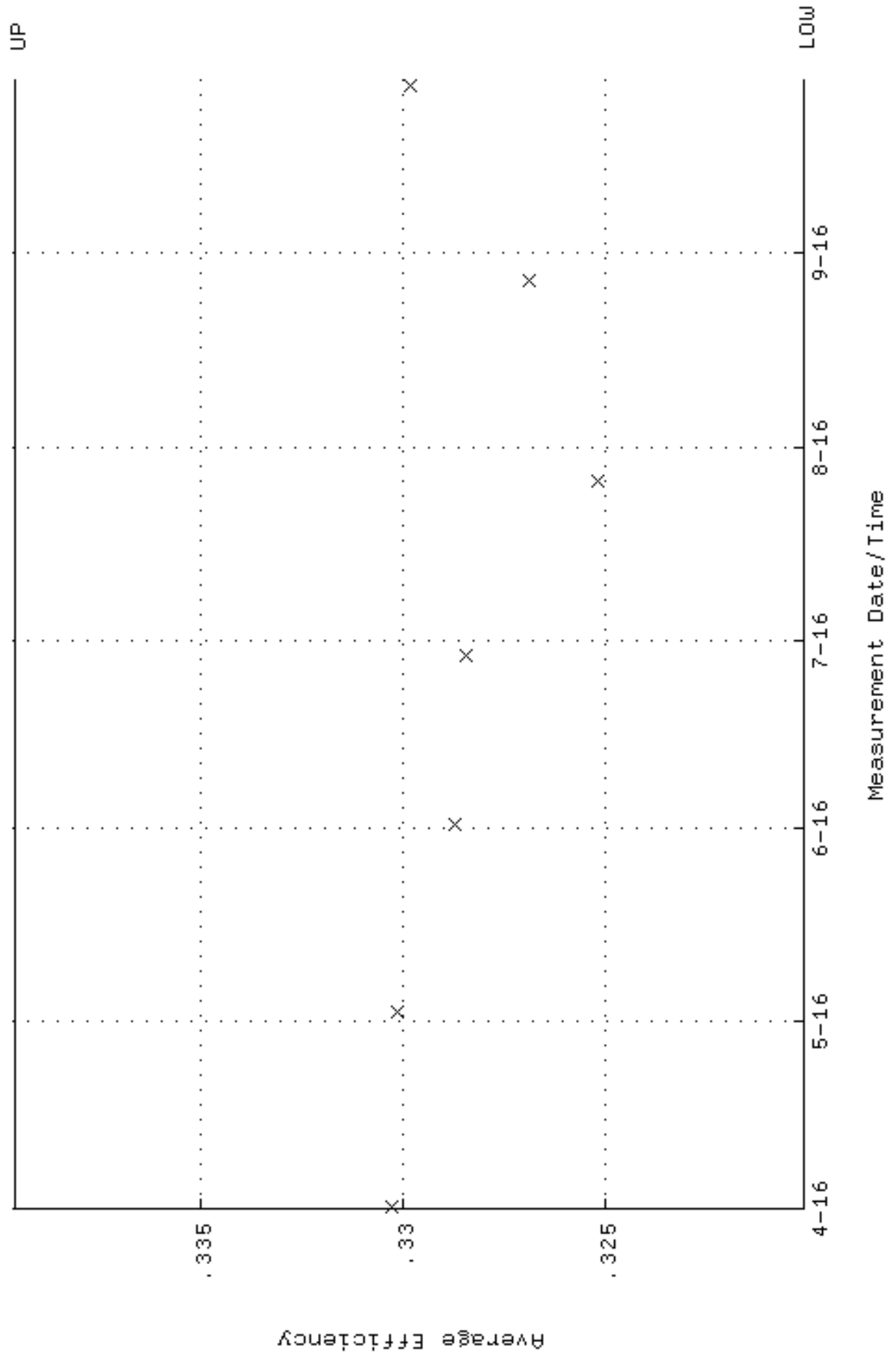
QA filename : DKA100:[ENV_ALPHA.QA.W]W013.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



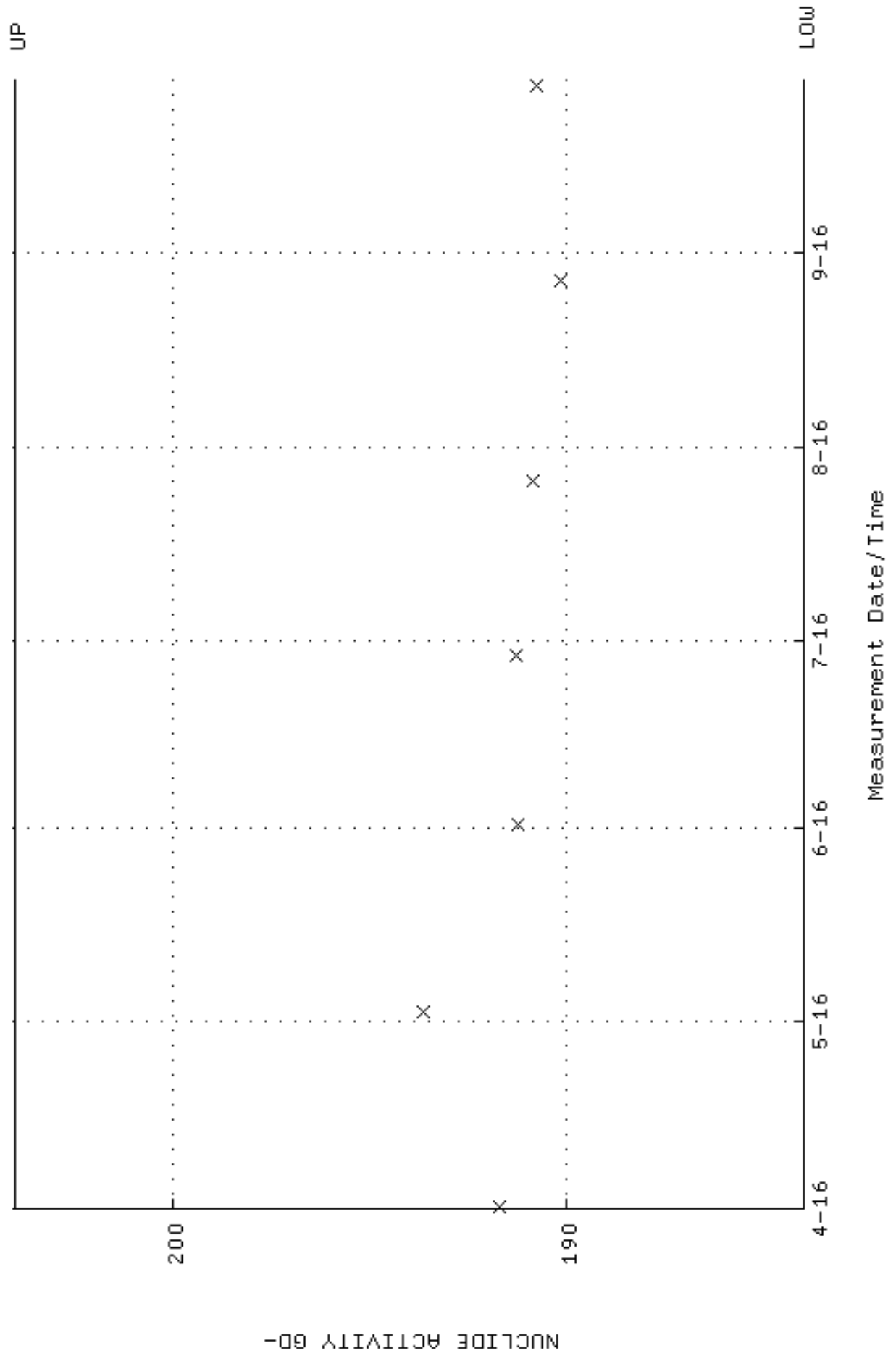
QA filename : DKA100:[ENV_ALPHA.QA.B]B013.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:29:29 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



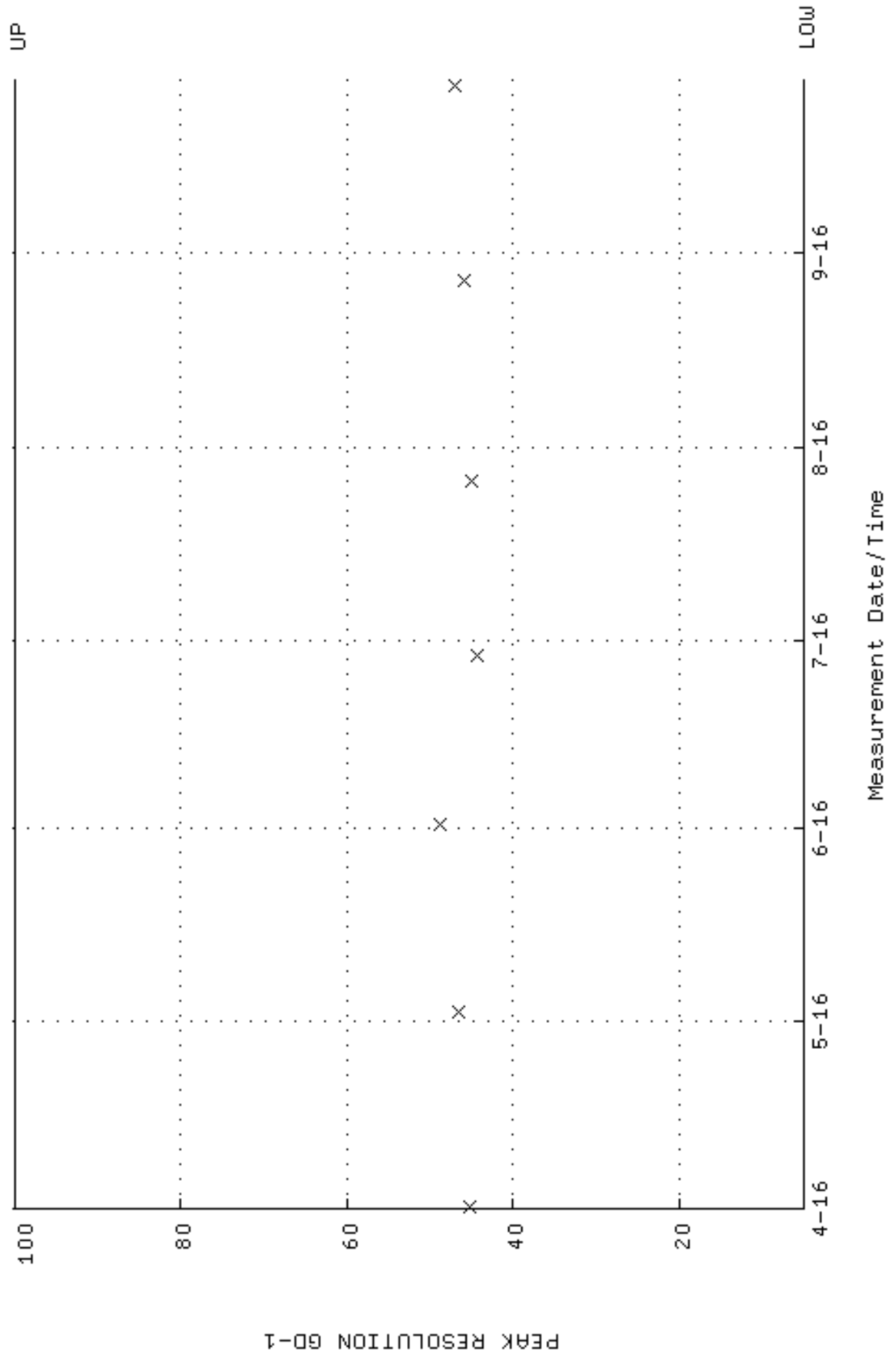
QA filename : DKA100:[ENV_ALPHA.QA.W]W014.QAF;8
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.320100 through 0.339600



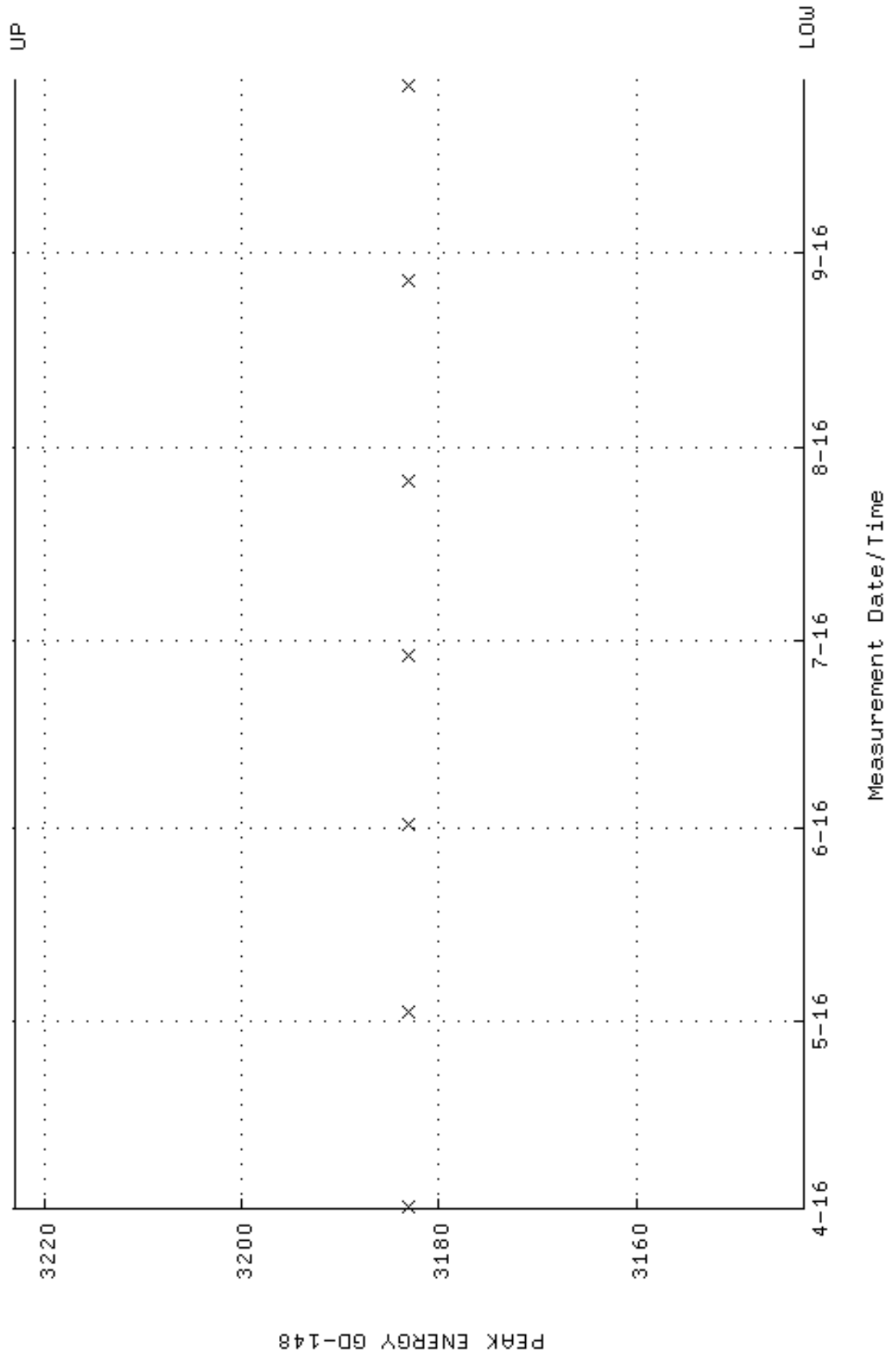
QA filename : DKA100:[ENV_ALPHA.QA.W]W014.QAF;8
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



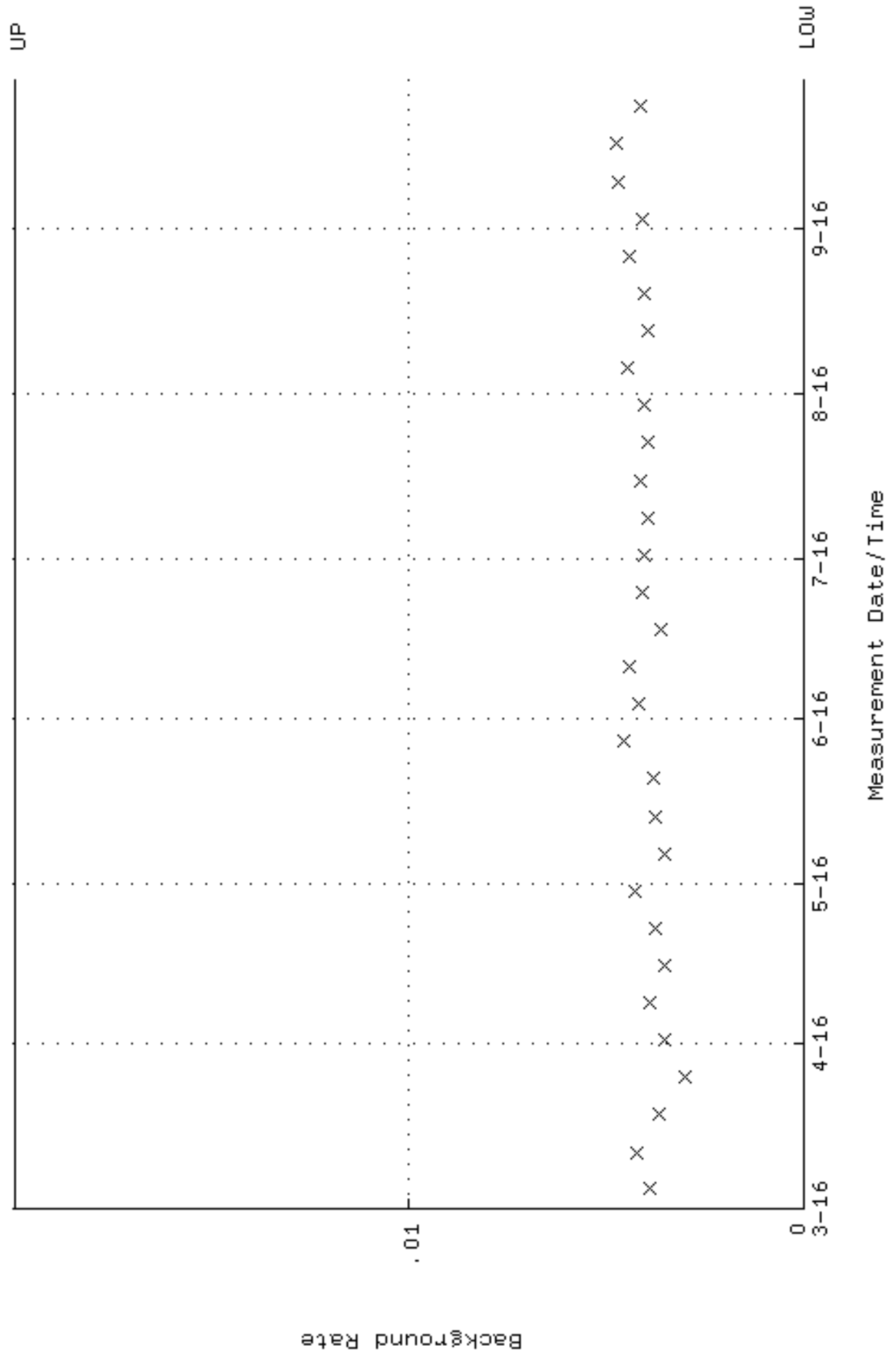
QA filename : DKA100:[ENV_ALPHA.QA.W]W014.QAF;8
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



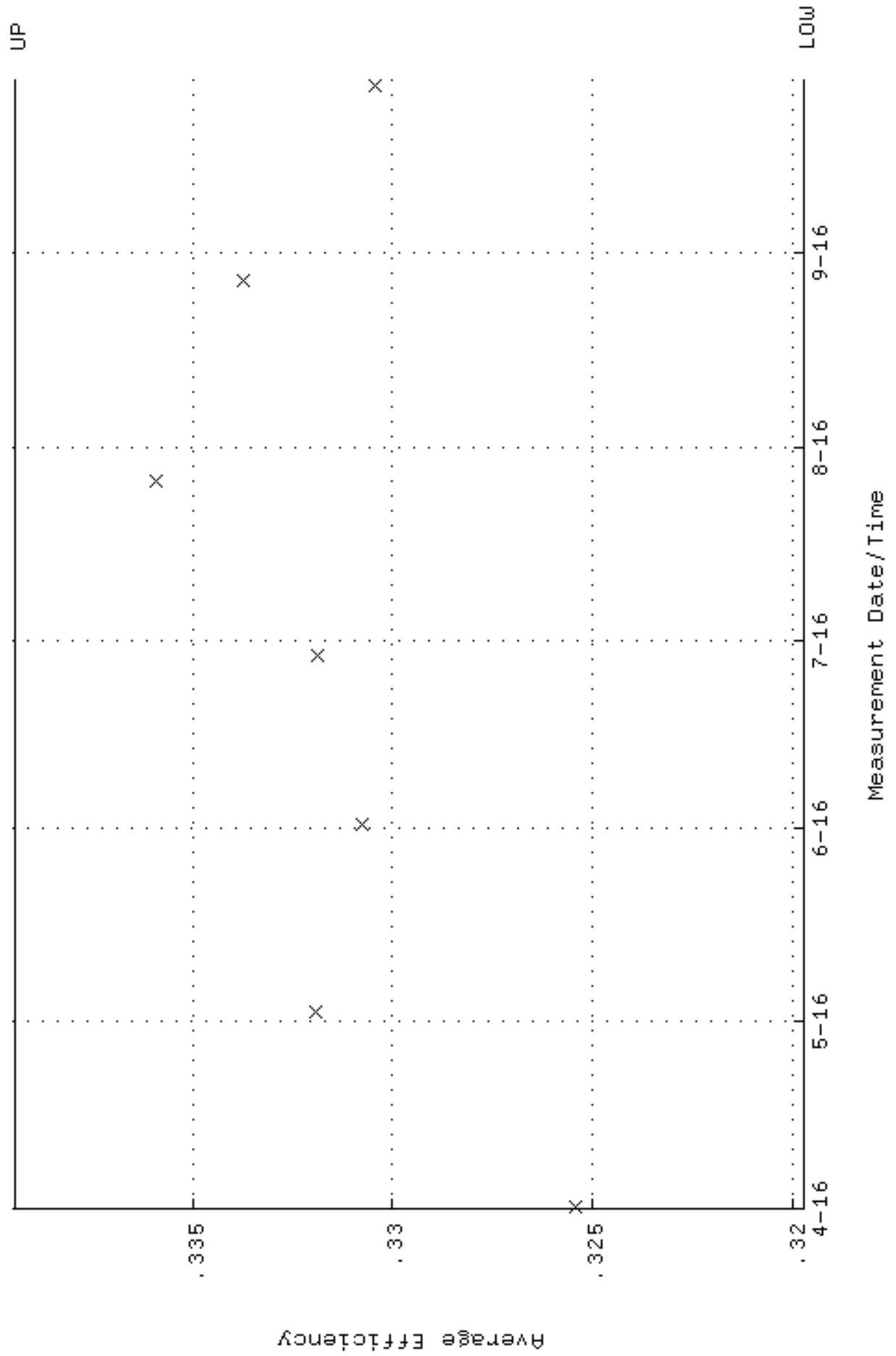
QA filename : DKA100:[ENV_ALPHA.QA.W]W014.QAF;8
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



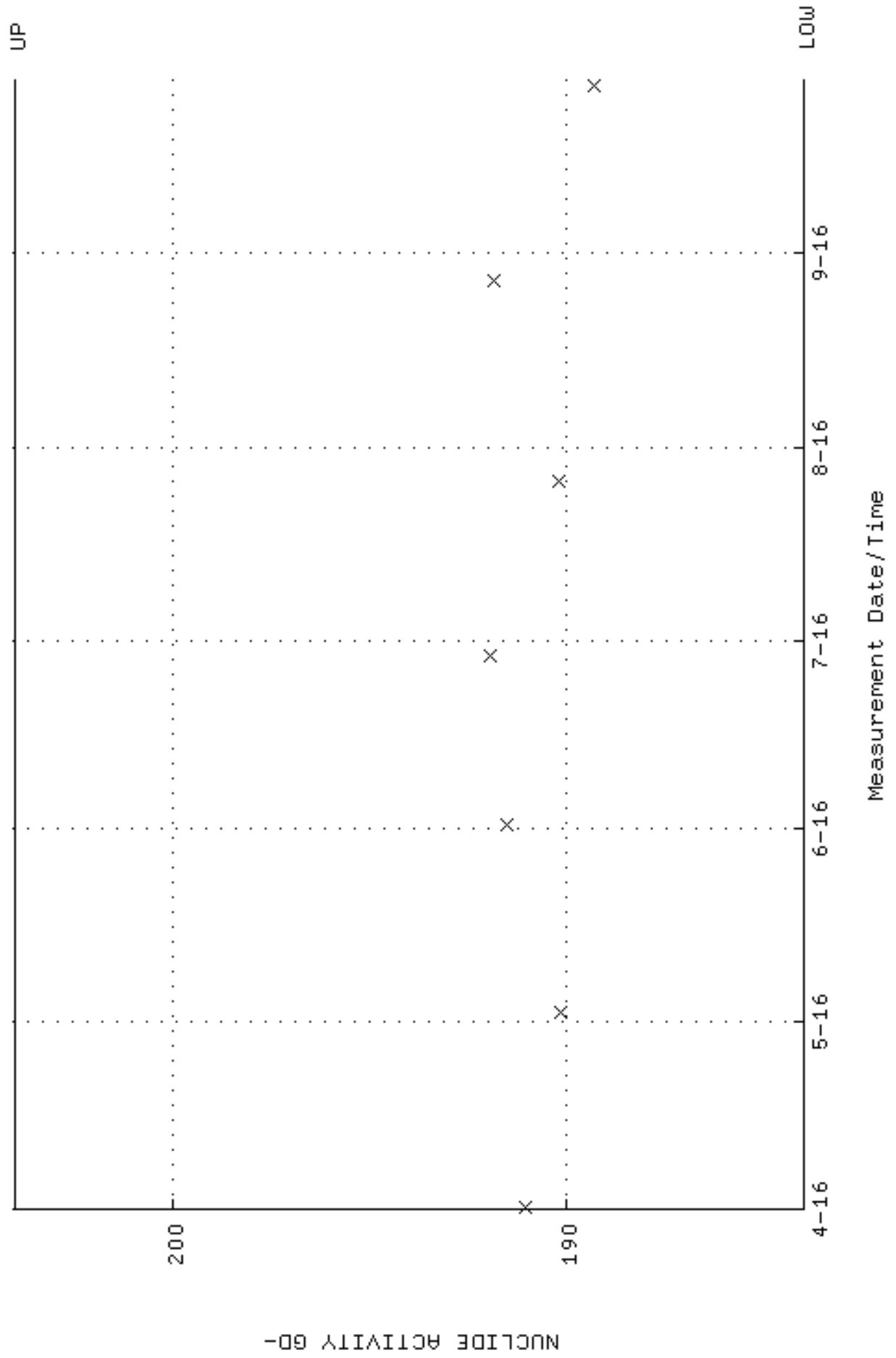
QA filename : DKA100:[ENV_ALPHA.QA.B]B014.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:29:29 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



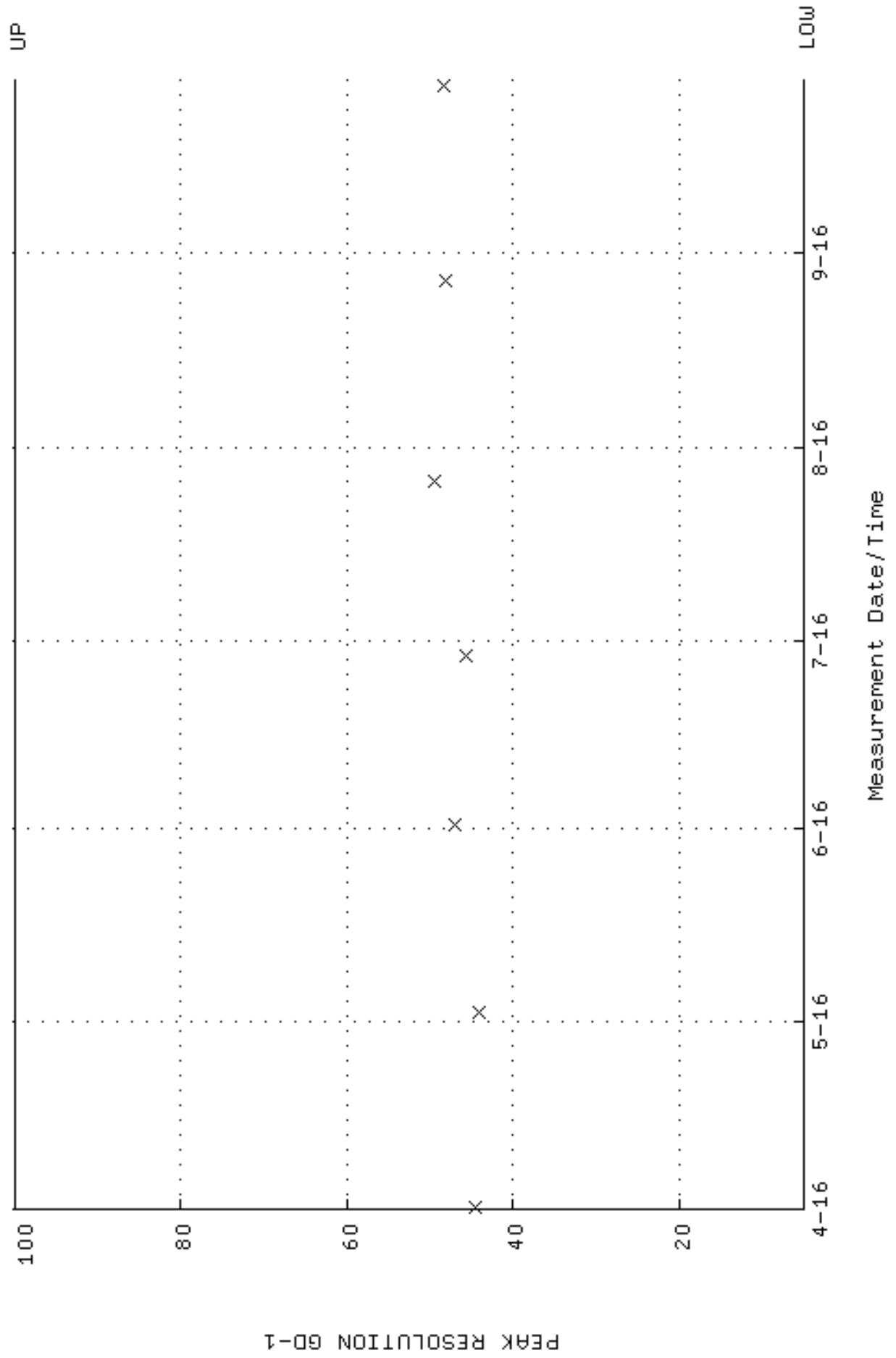
QA filename : DKA100:[ENV_ALPHA.QA.W]W015.QAF;6
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.319700 through 0.339450



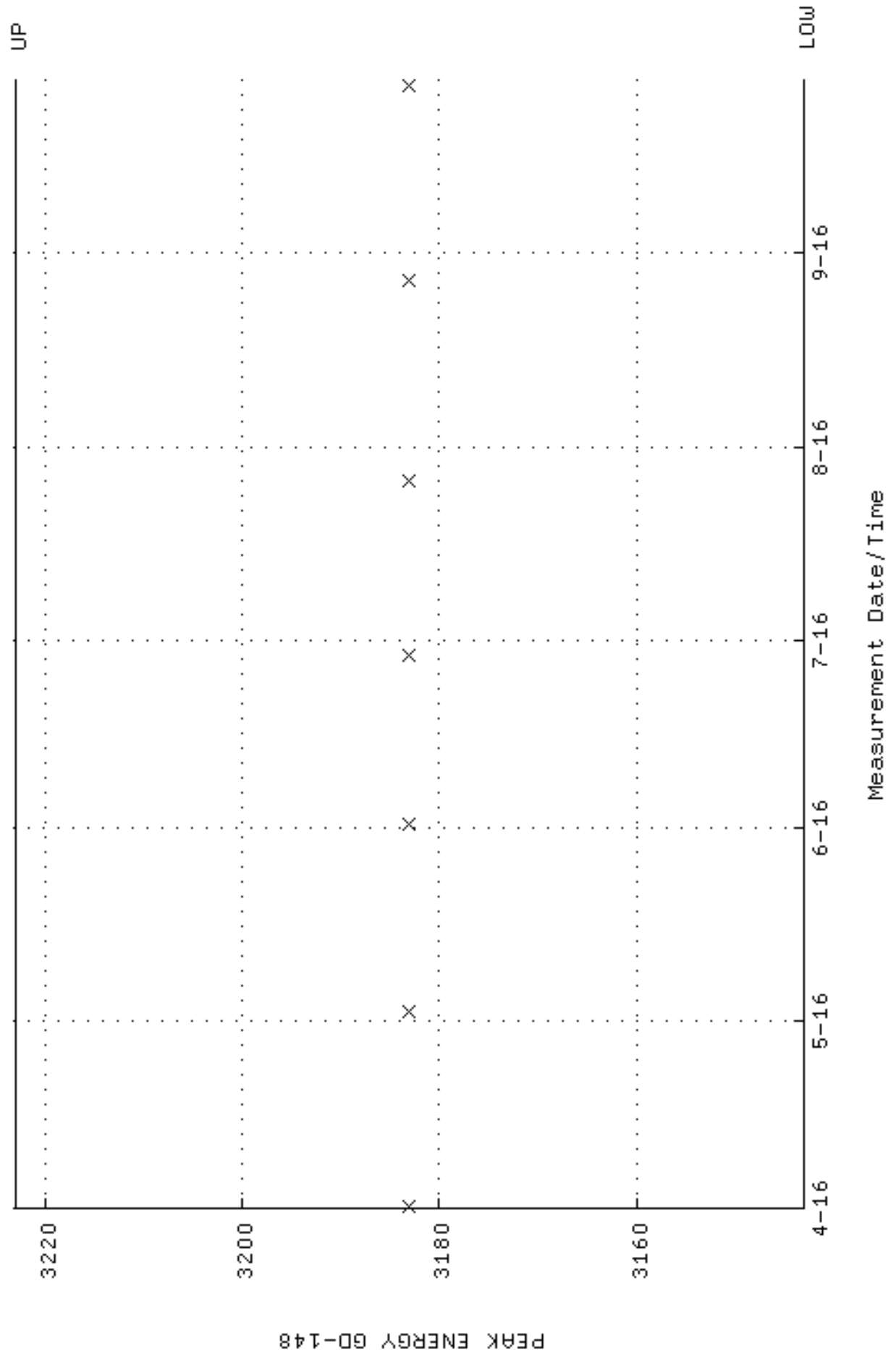
QA filename : DKA100:[ENV_ALPHA.QA.W]W015.QAF;6
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



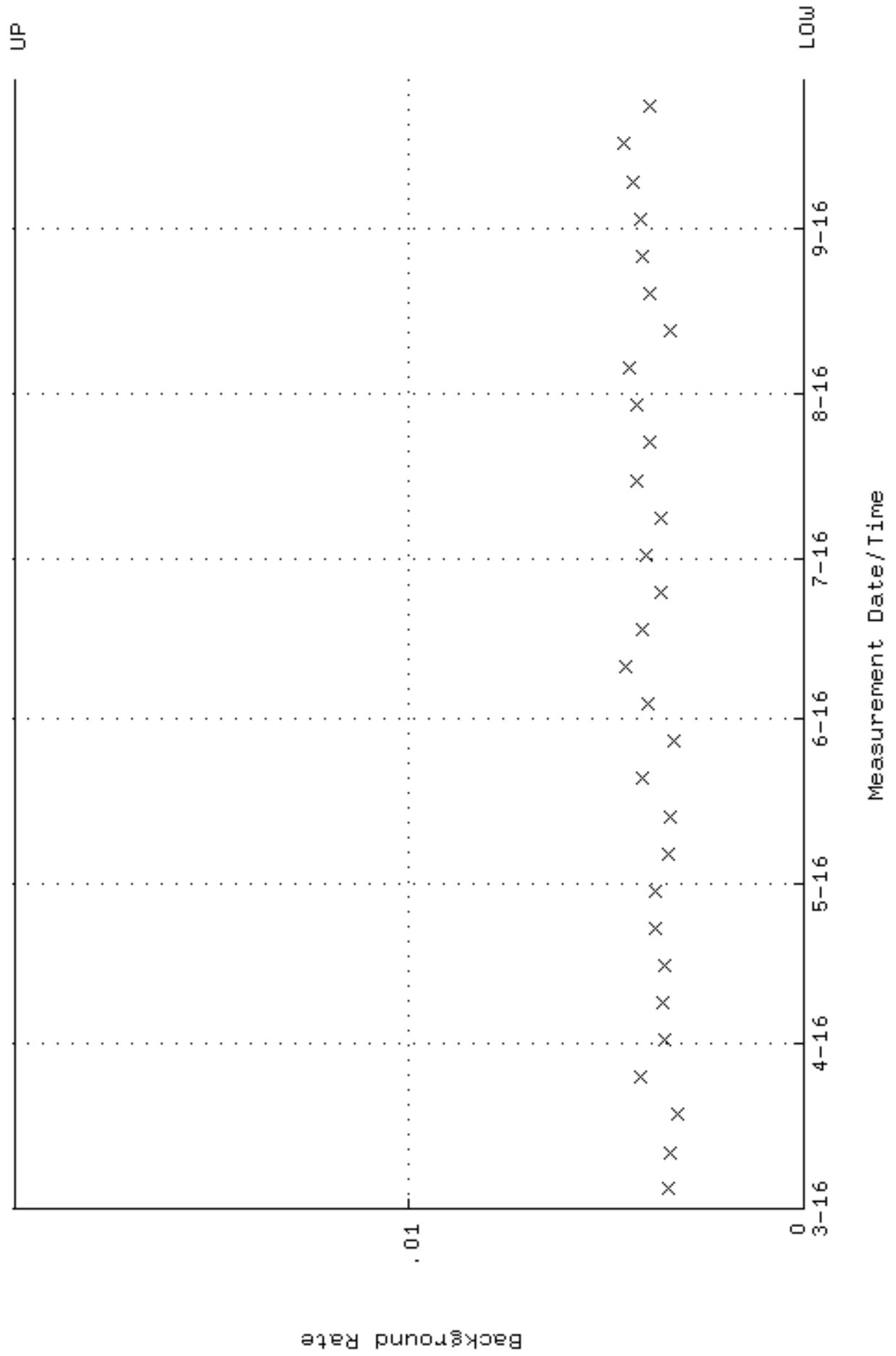
QA filename : DKA100:[ENV_ALPHA.QA.W]W015.QAF;6
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



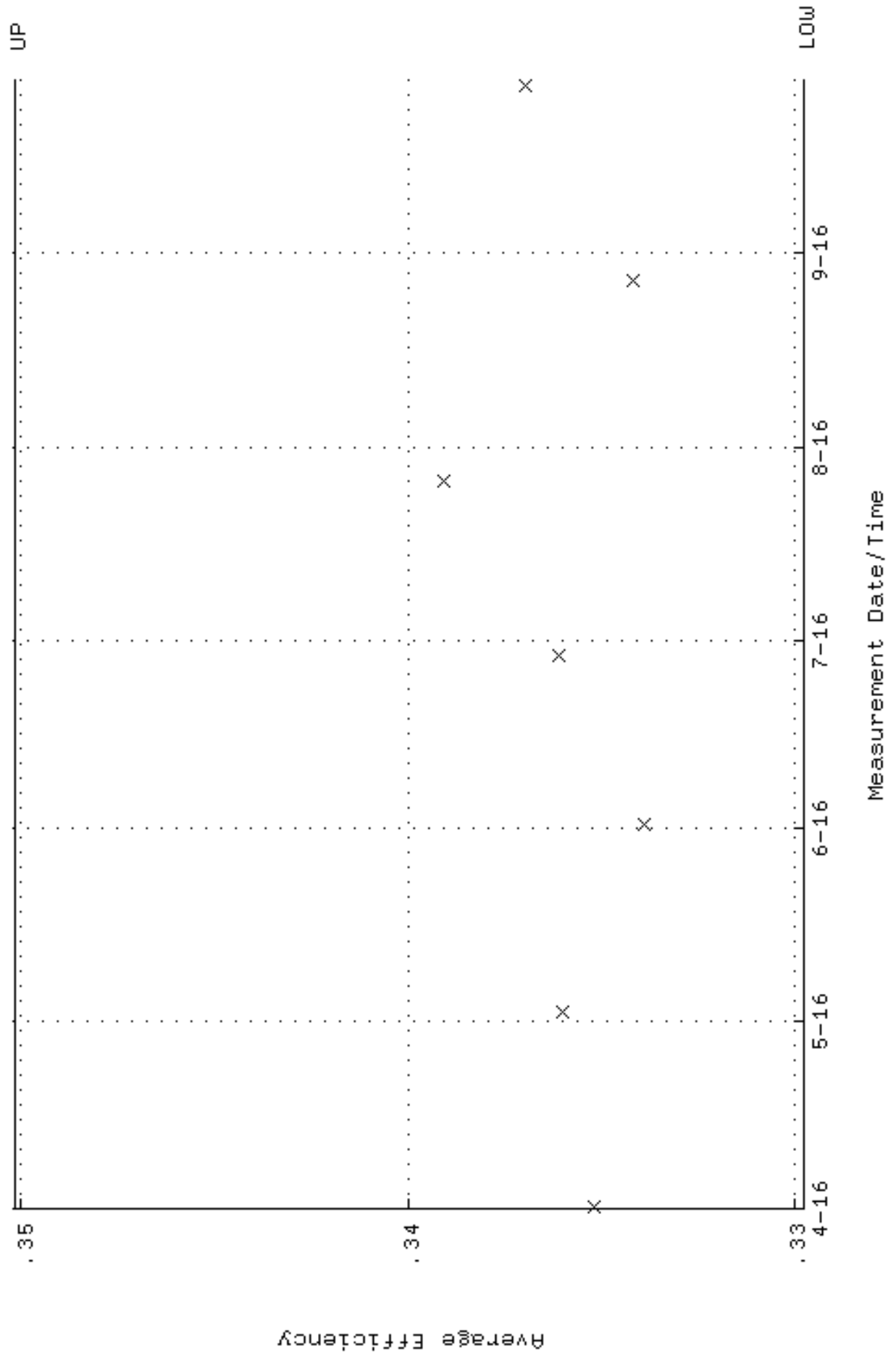
QA filename : DKA100:[ENV_ALPHA.QA.W]W015.QAF;6
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



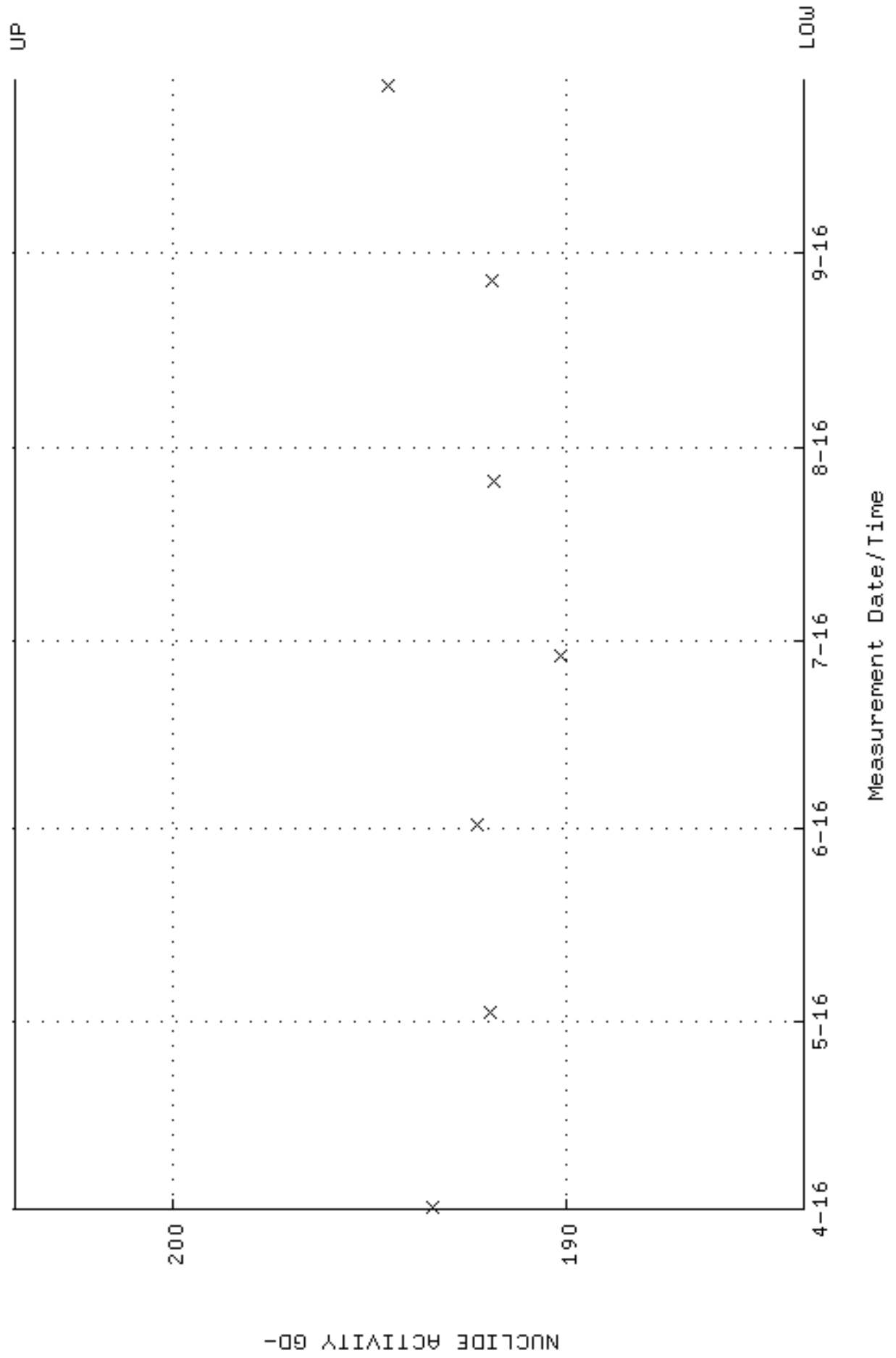
QA filename : DKA100:[ENV_ALPHA.QA.B]B015.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:29:29 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



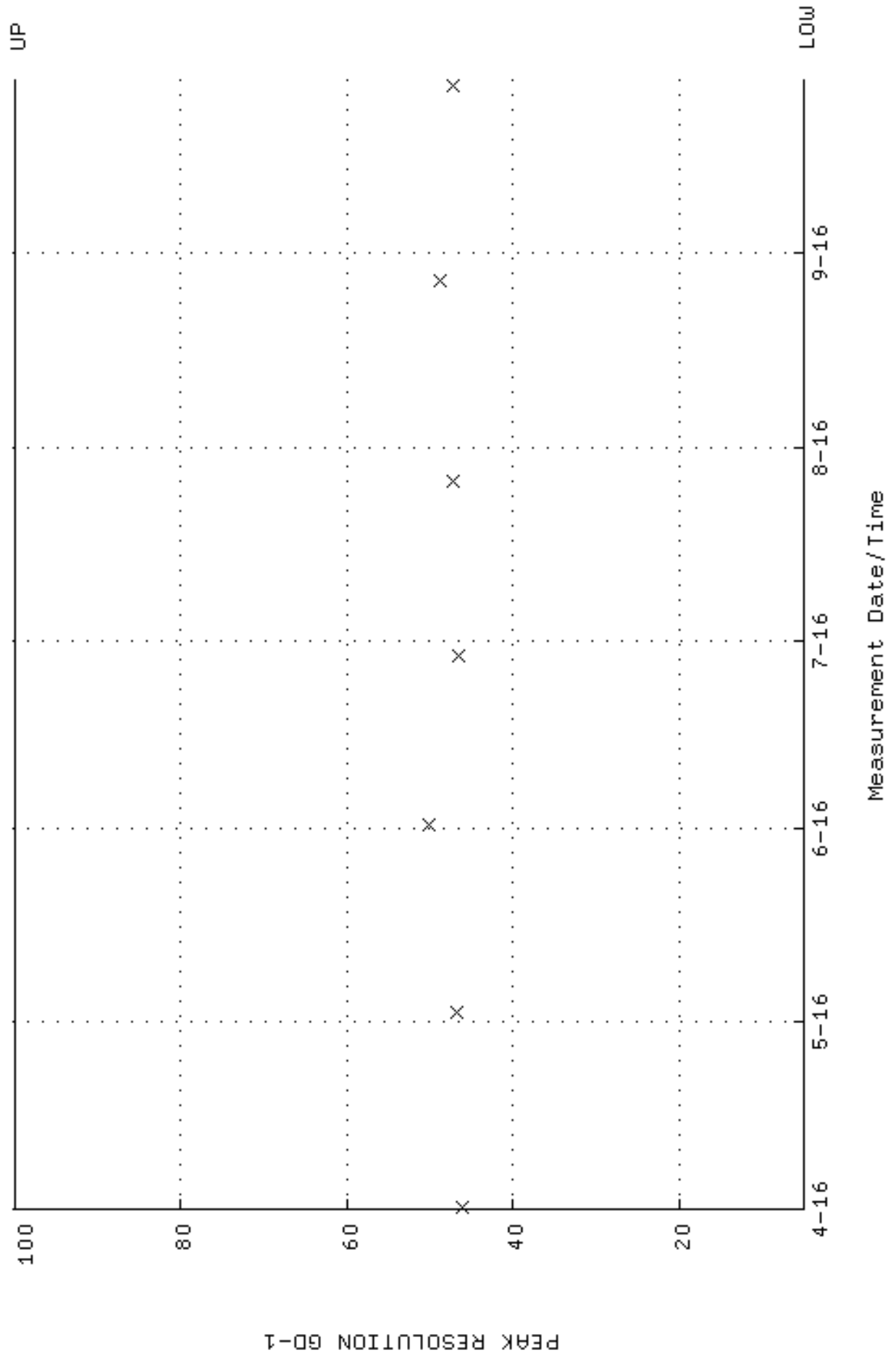
QA filename : DKA100:[ENV_ALPHA.QA.W]W016.QAF;6
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.329763 through 0.350160



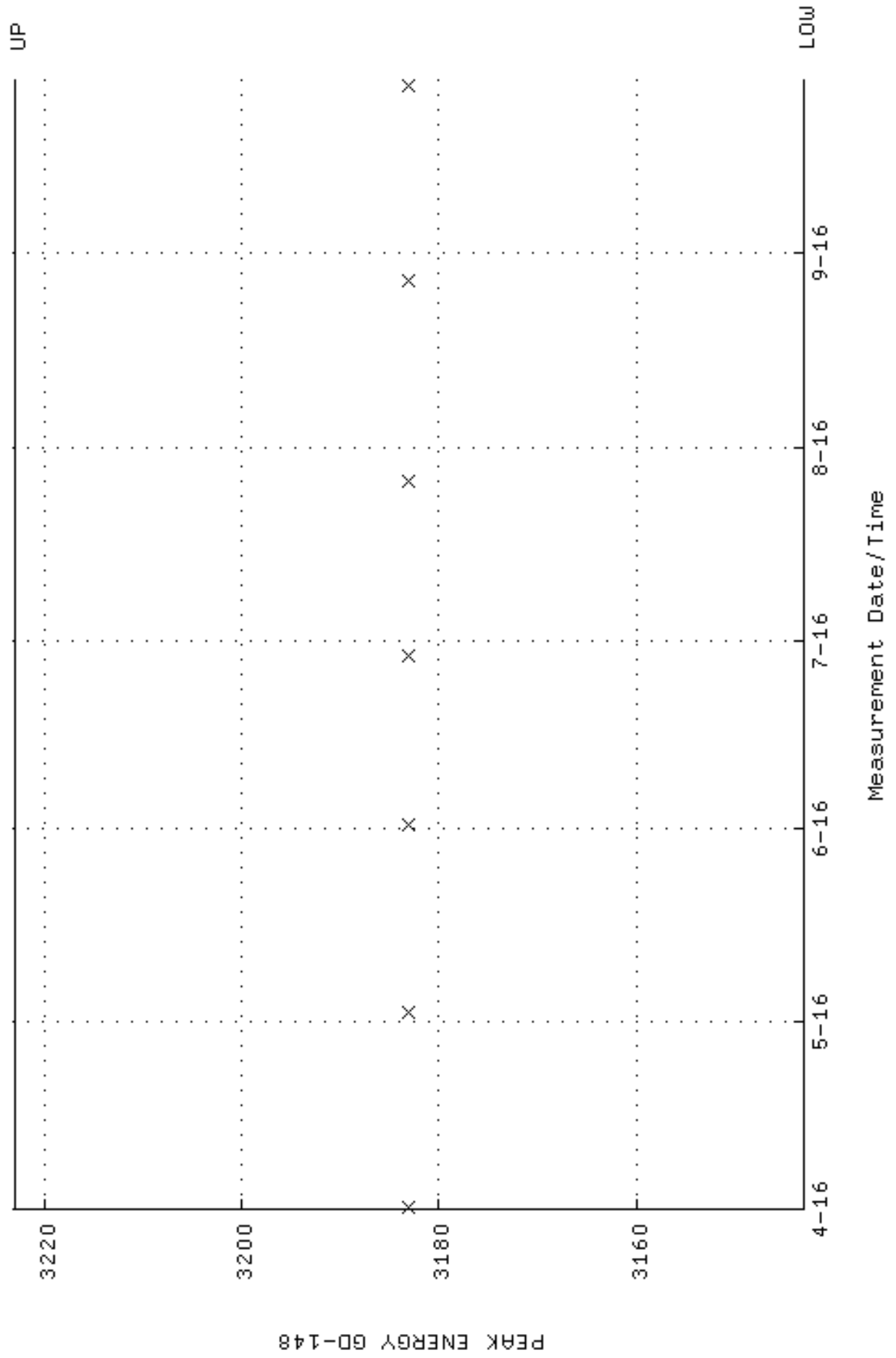
QA filename : DKA100:[ENV_ALPHA.QA.W]w016.QAF;6
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



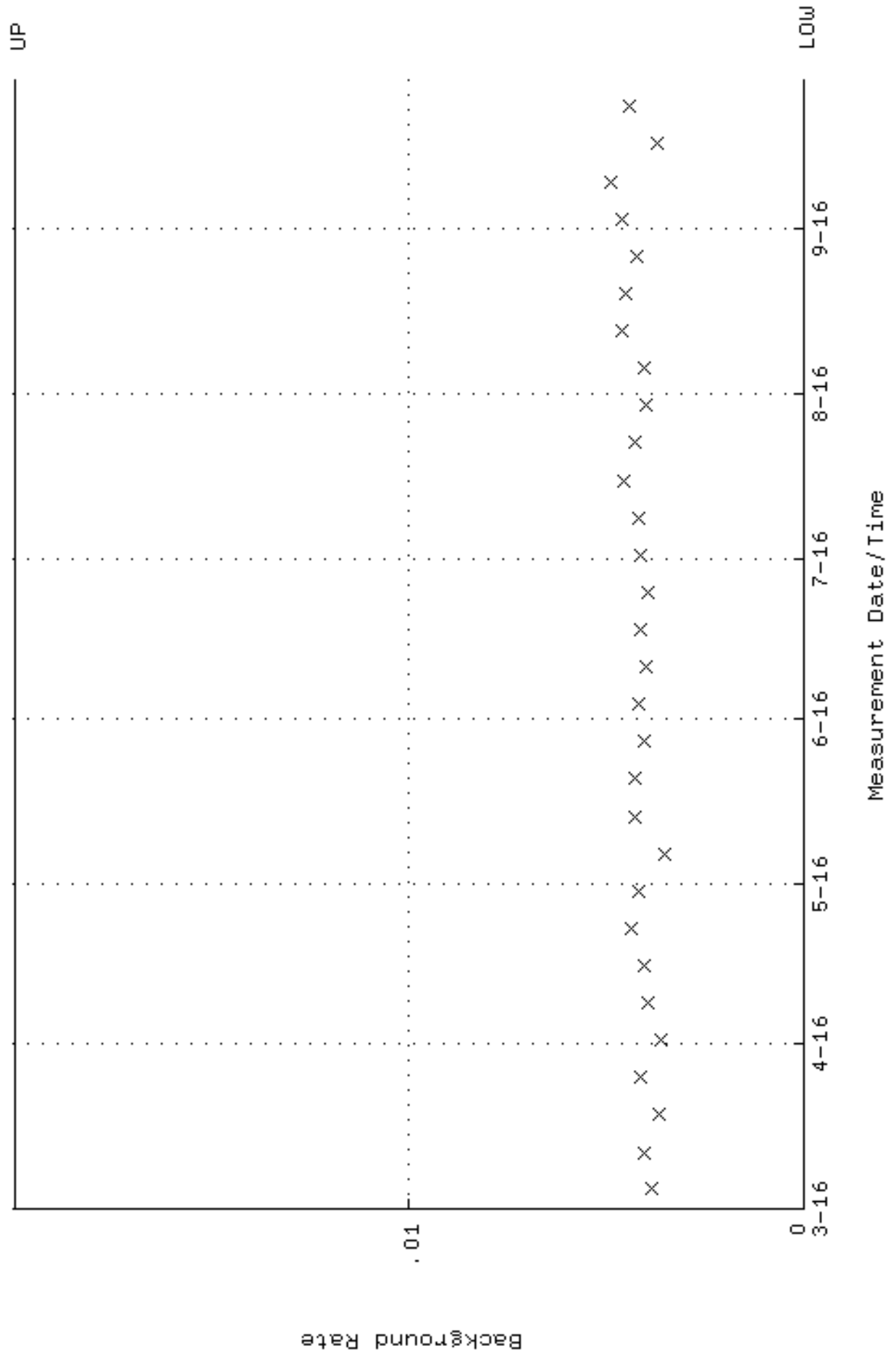
QA filename : DKA100:[ENV_ALPHA.QA.W]W016.QAF;6
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



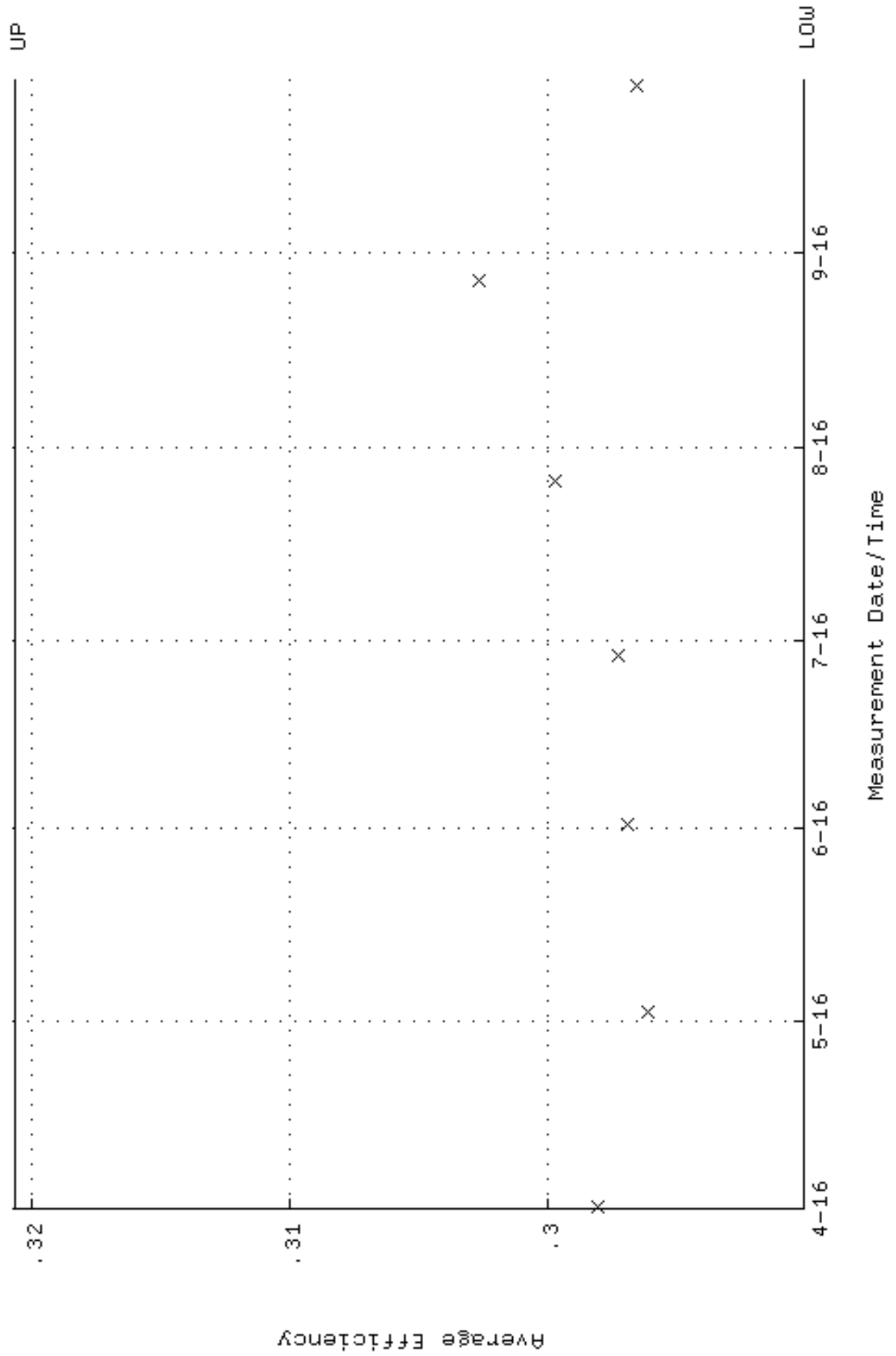
QA filename : DKA100:[ENV_ALPHA.QA.W]W016.QAF;6
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



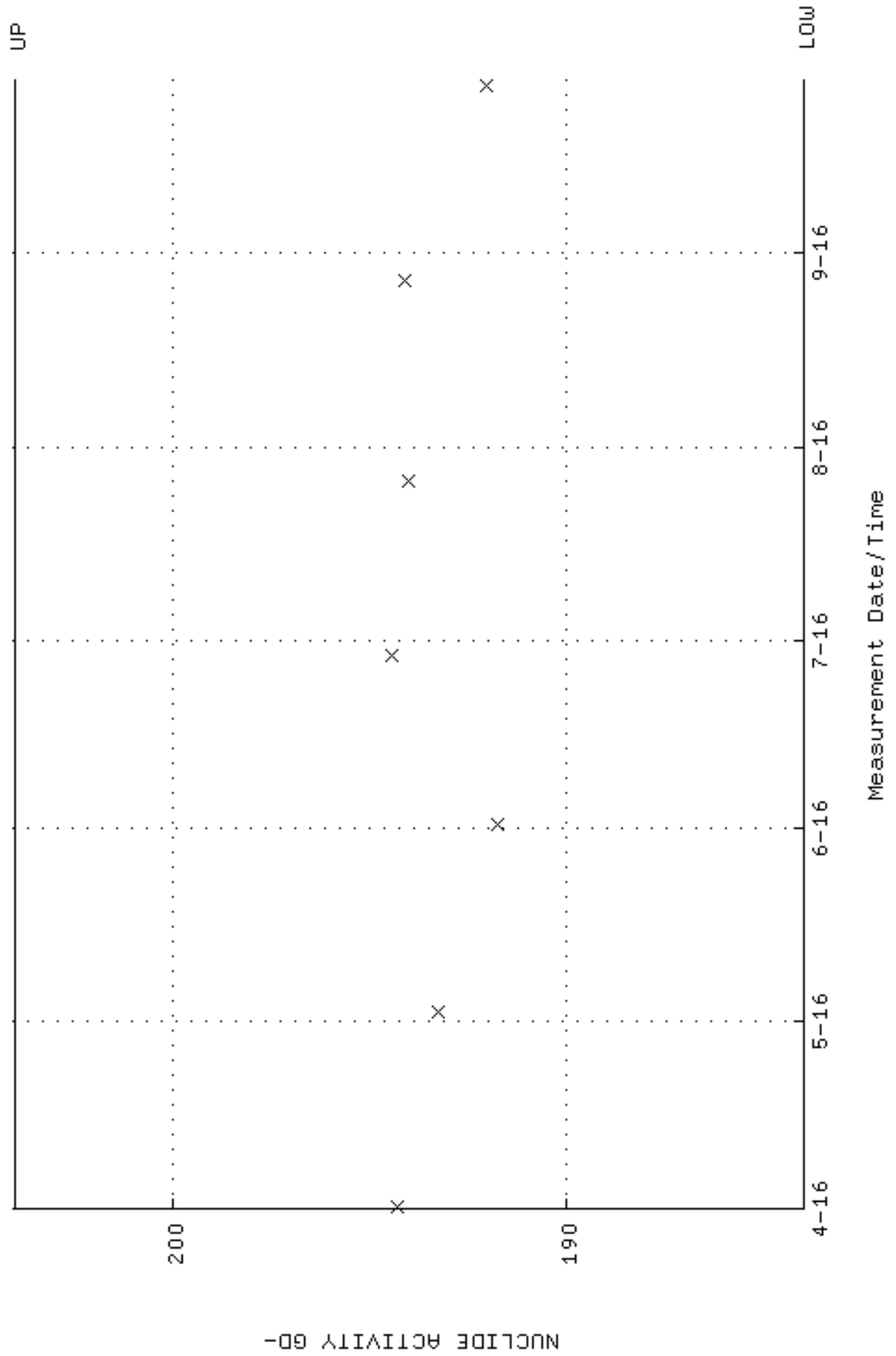
QA filename : DKA100:[ENV_ALPHA.QA.B]B016.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:29:29 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



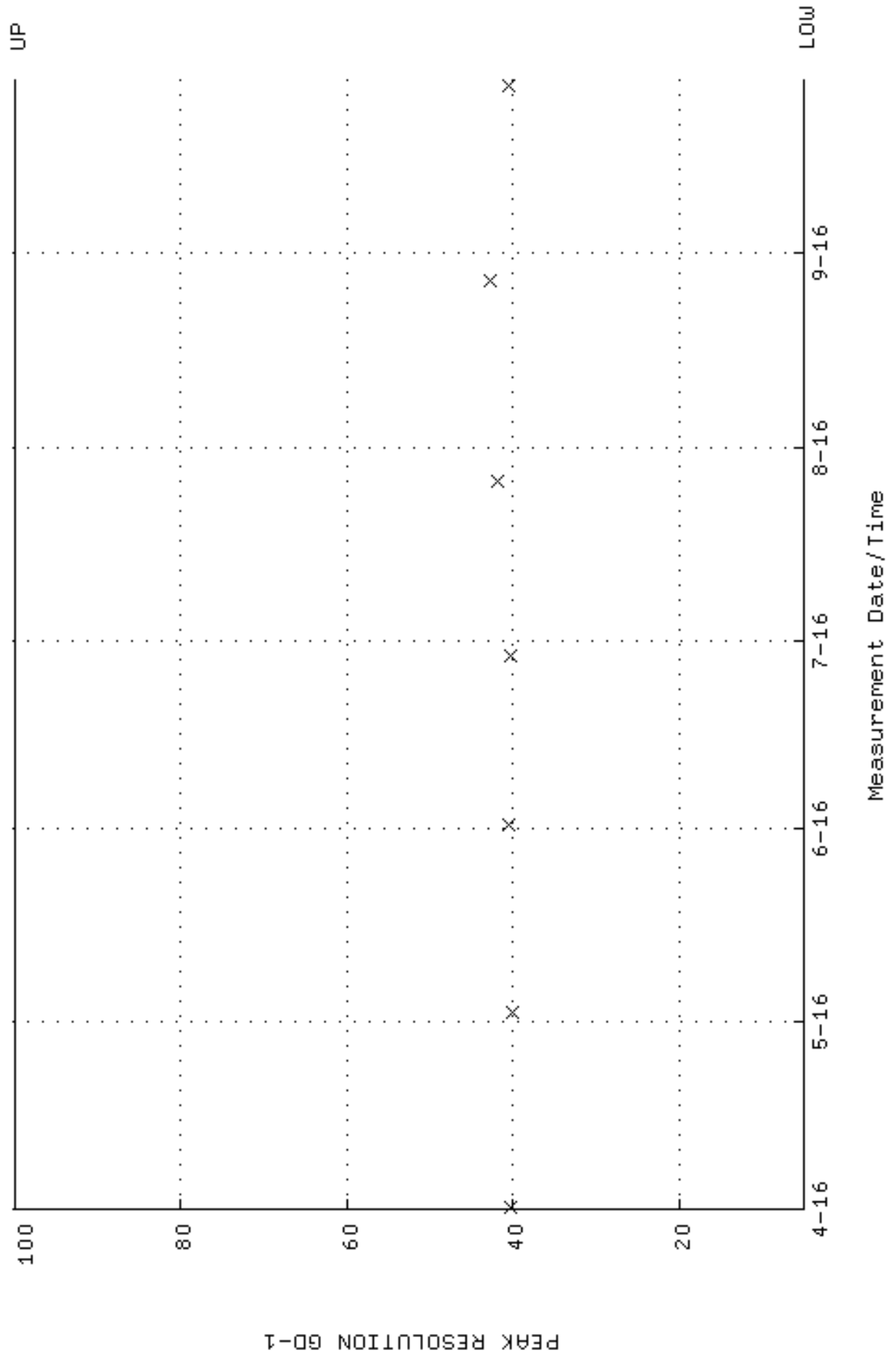
QA filename : DKA100:[ENV_ALPHA.QA.W]W017.QAF;6
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.290113 through 0.320651



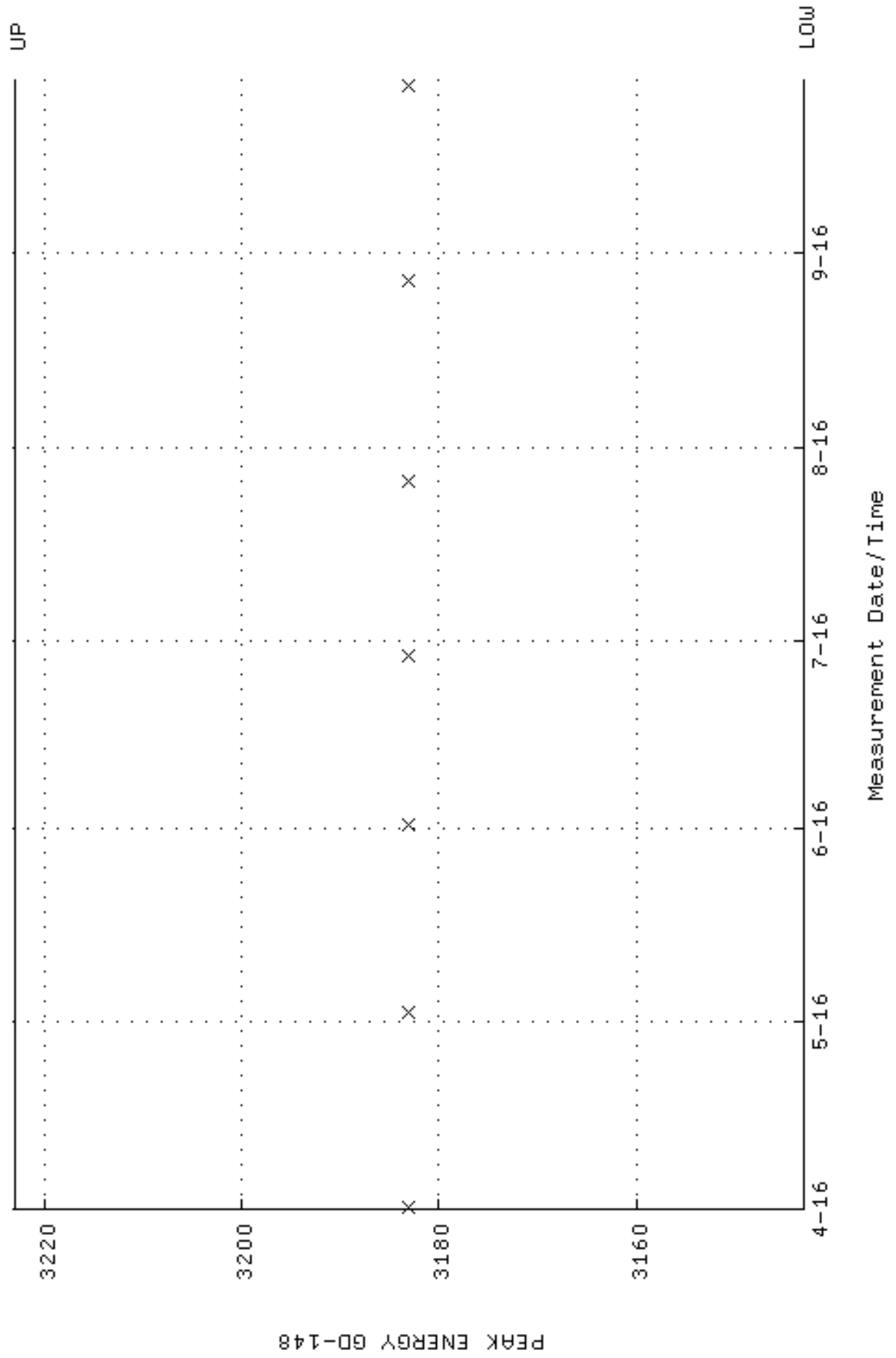
QA filename : DKA100:[ENV_ALPHA.QA.W]W017.QAF;6
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



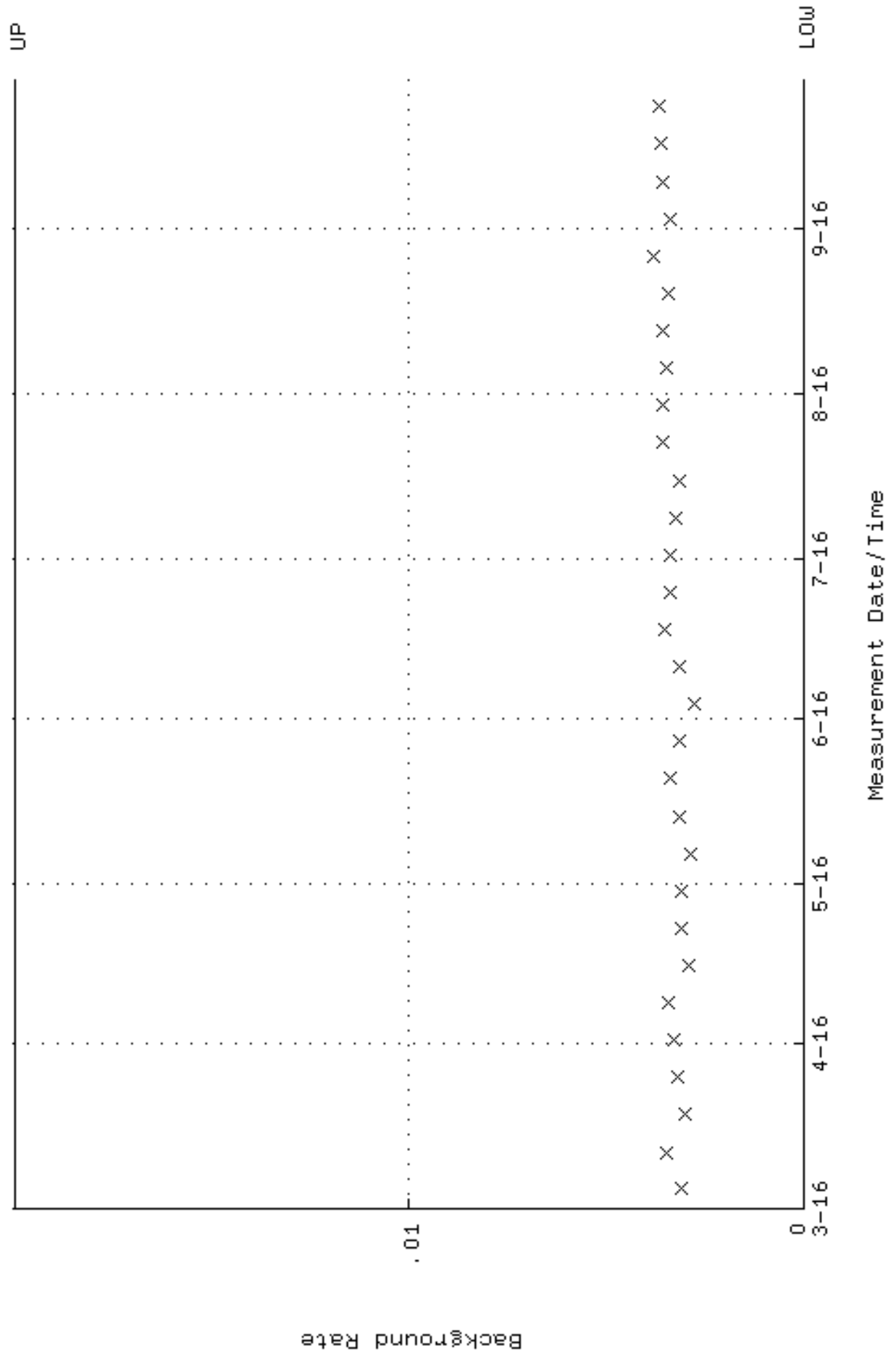
QA filename : DKA100:[ENV_ALPHA.QA.W]W017.QAF;6
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



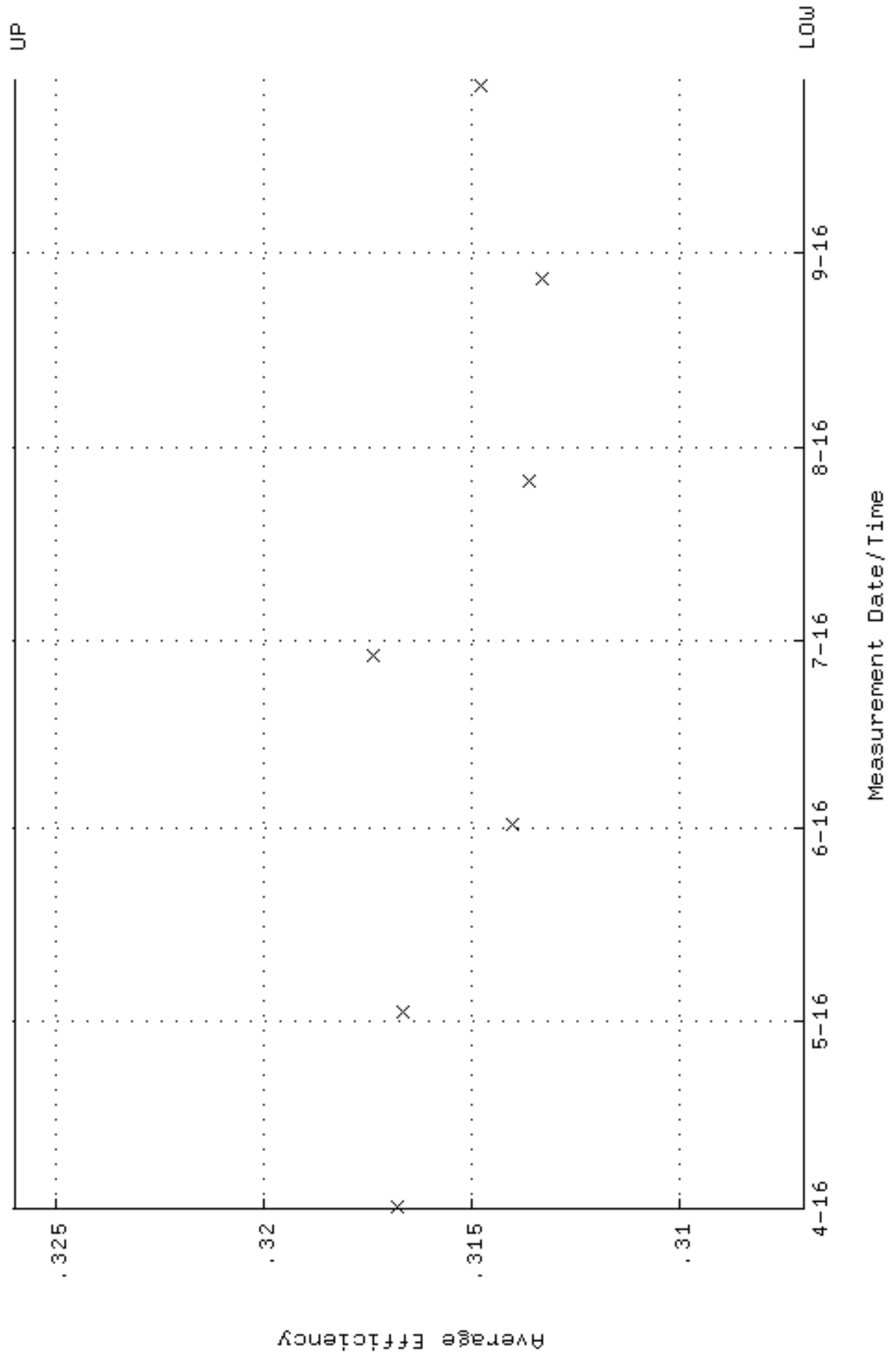
QA filename : DKA100:[ENV_ALPHA.QA.W]W017.QAF;6
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



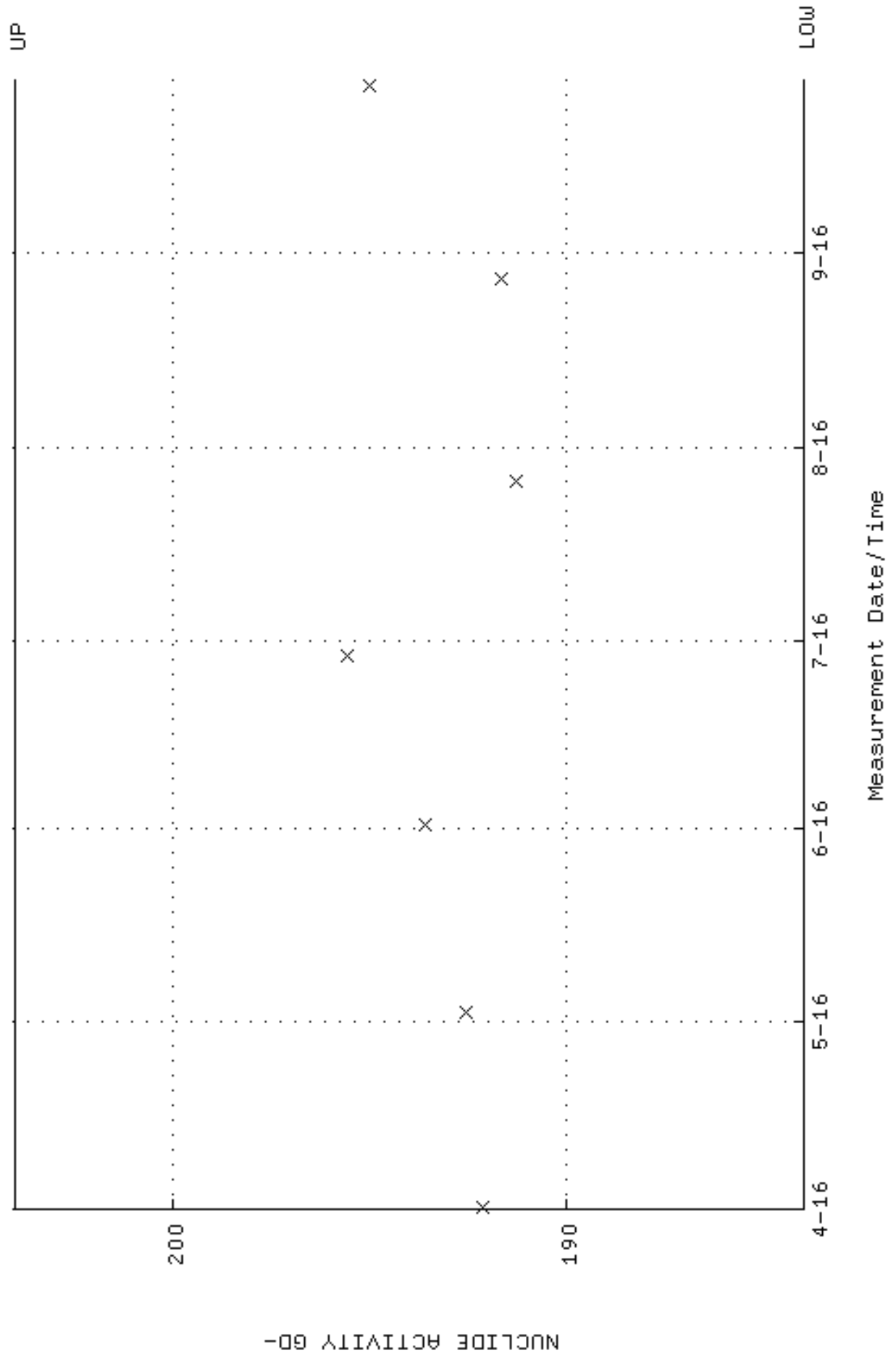
QA filename : DKA100:[ENV_ALPHA.QA.B]B017.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:29:29 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



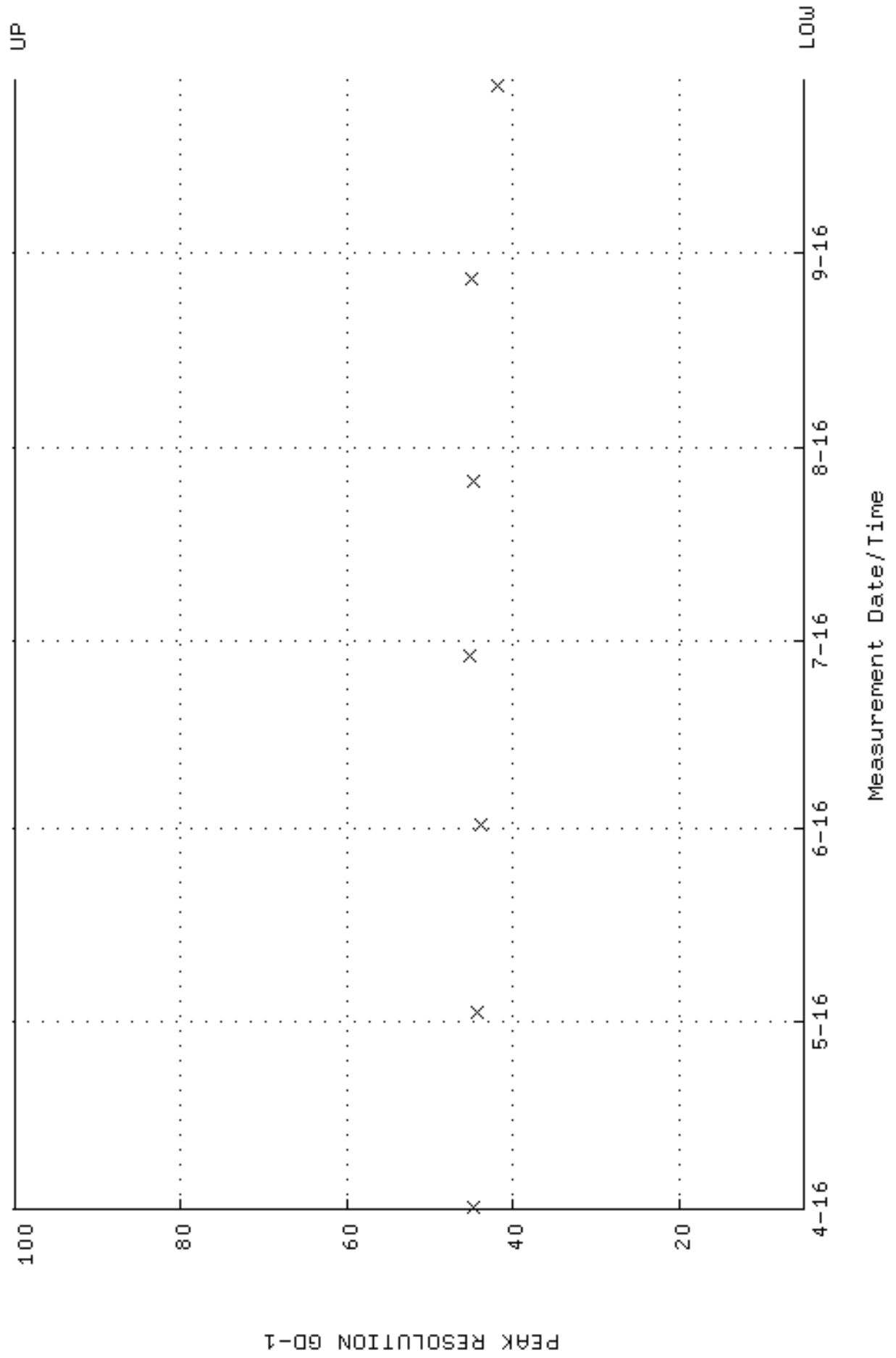
QA filename : DKA100:[ENV_ALPHA.QA.W]W018.QAF;5
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.307005 through 0.325995



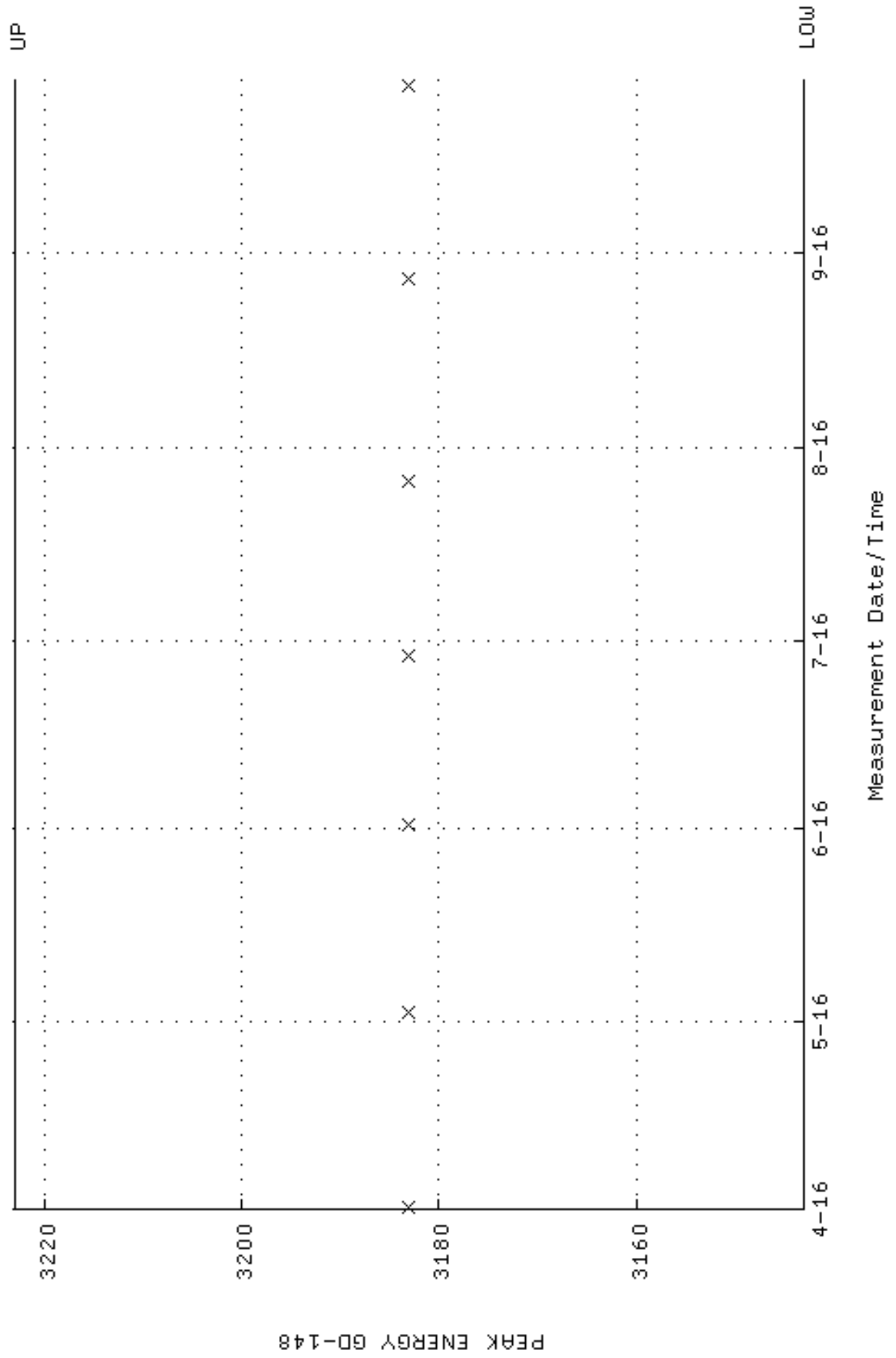
QA filename : DKA100:[ENV_ALPHA.QA.W]W018.QAF;5
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



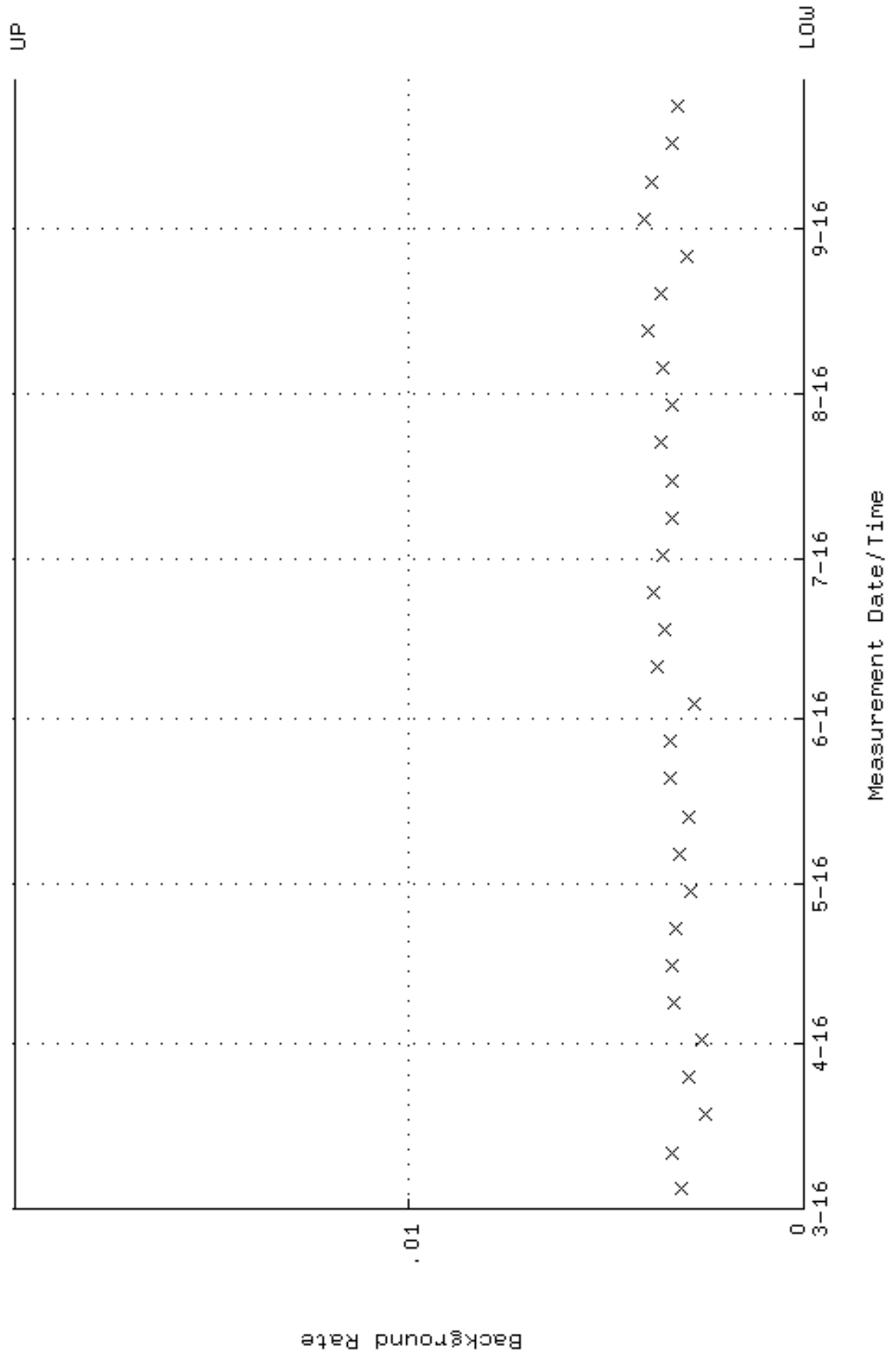
QA filename : DKA100:[ENV_ALPHA.QA.W]W018.QAF;5
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



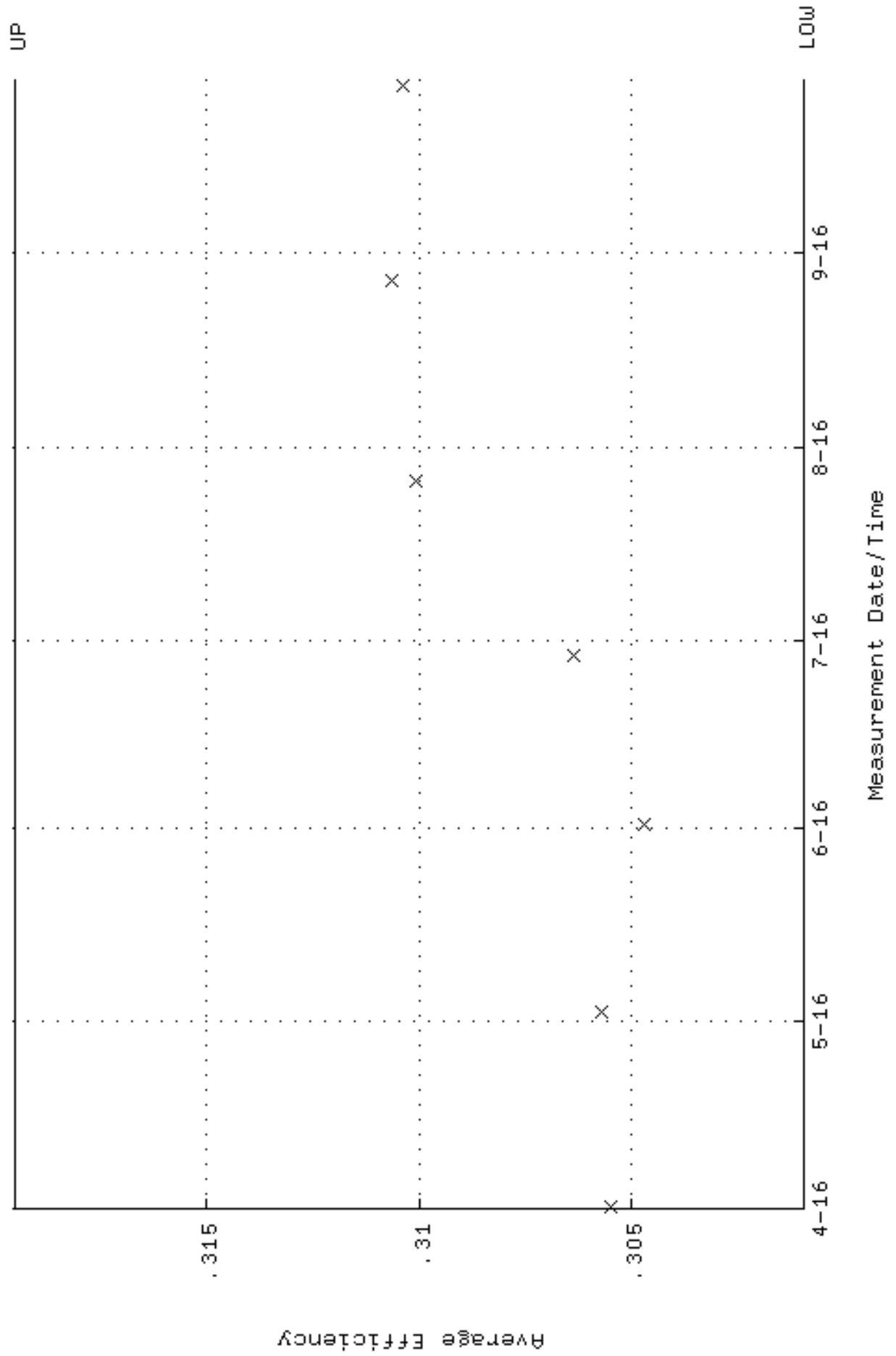
QA filename : DKA100:[ENV_ALPHA.QA.W]W018.QAF;5
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 1-APR-2016 08:48:19 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



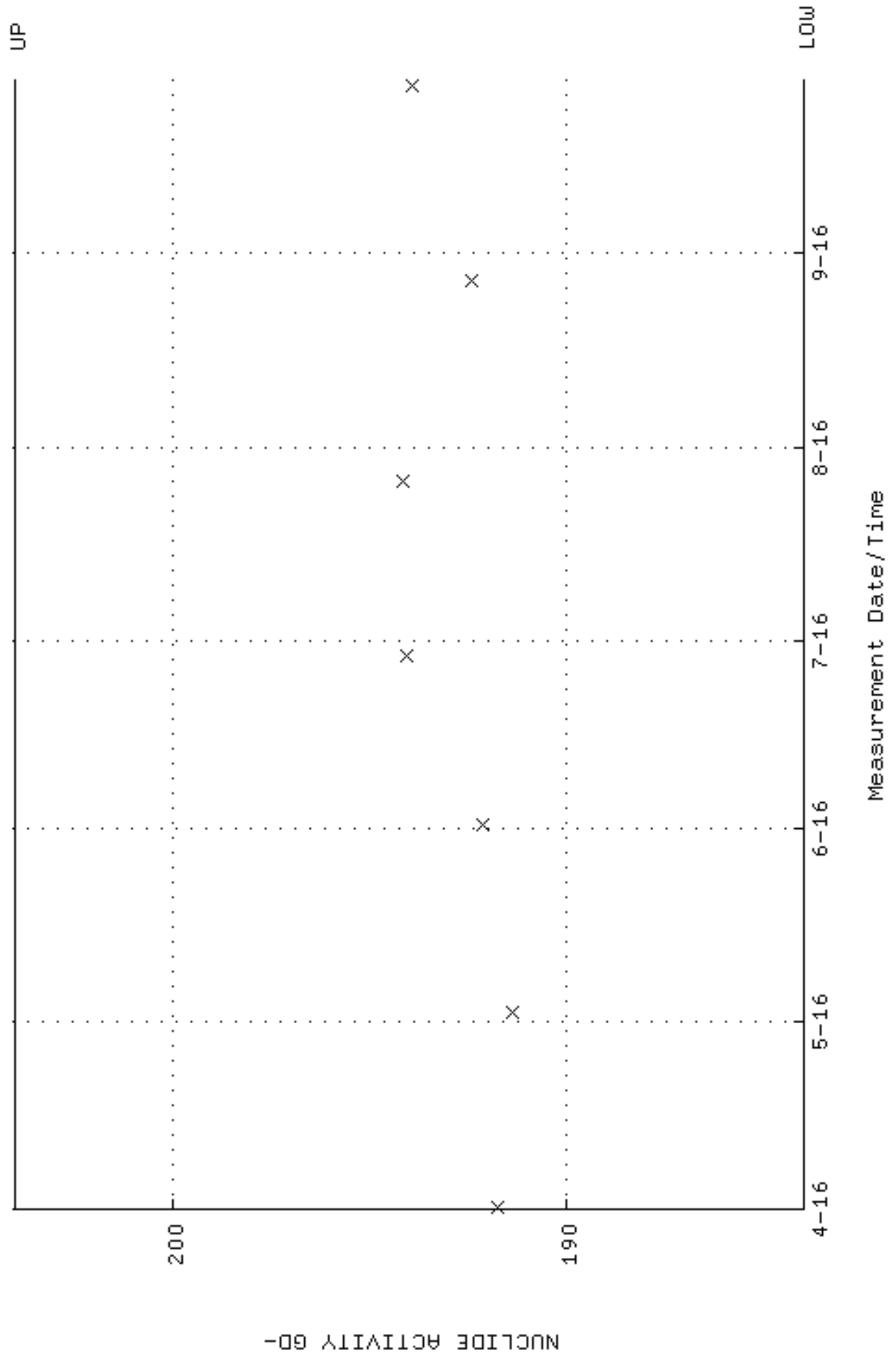
QA filename : DKA100:[ENV_ALPHA.QA.B]B018.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:29:29 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



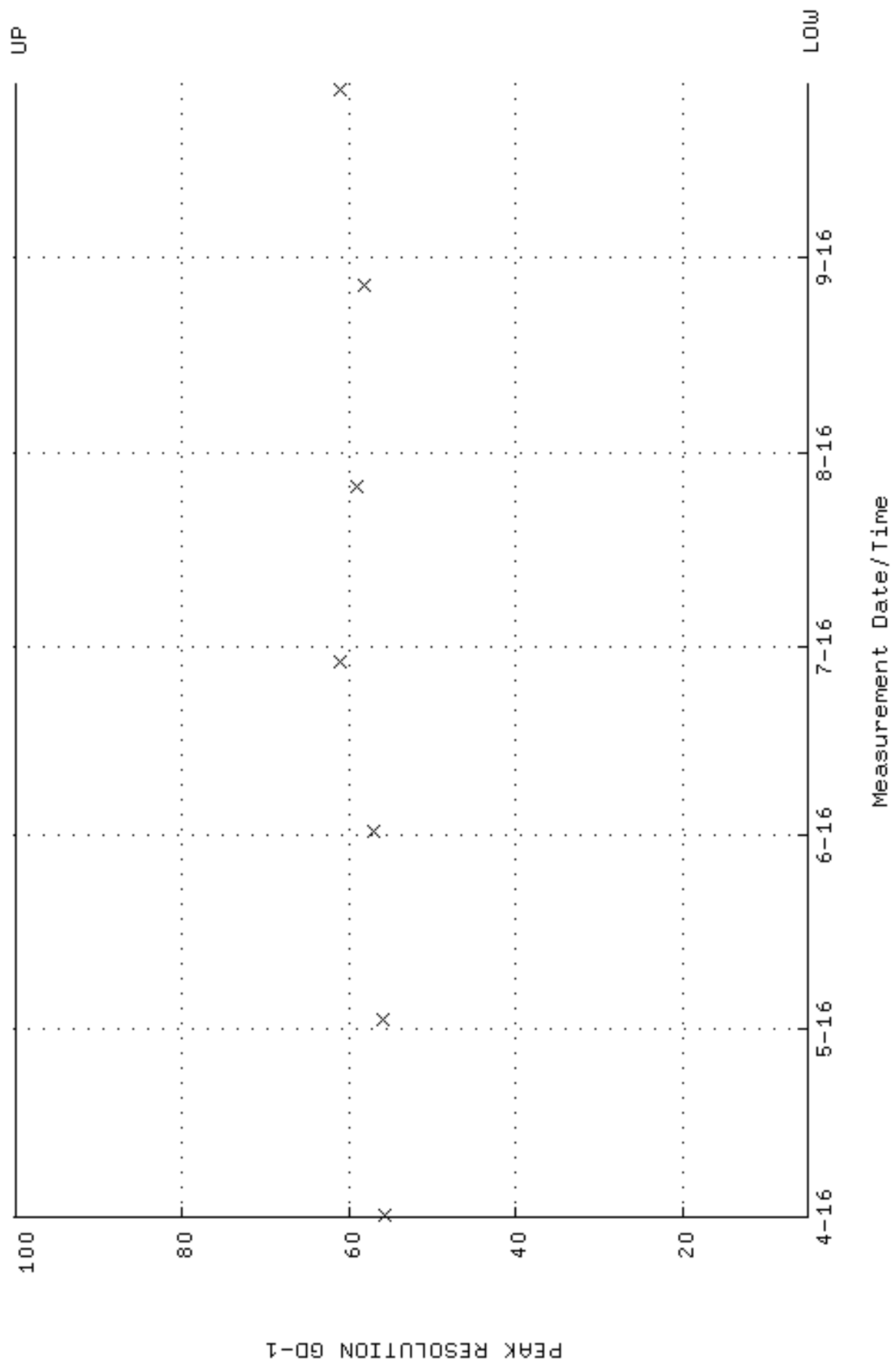
QA filename : DKA100:[ENV_ALPHA.QA.W]W020.QAF;6
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 1-APR-2016 08:54:43 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.300920 through 0.319530



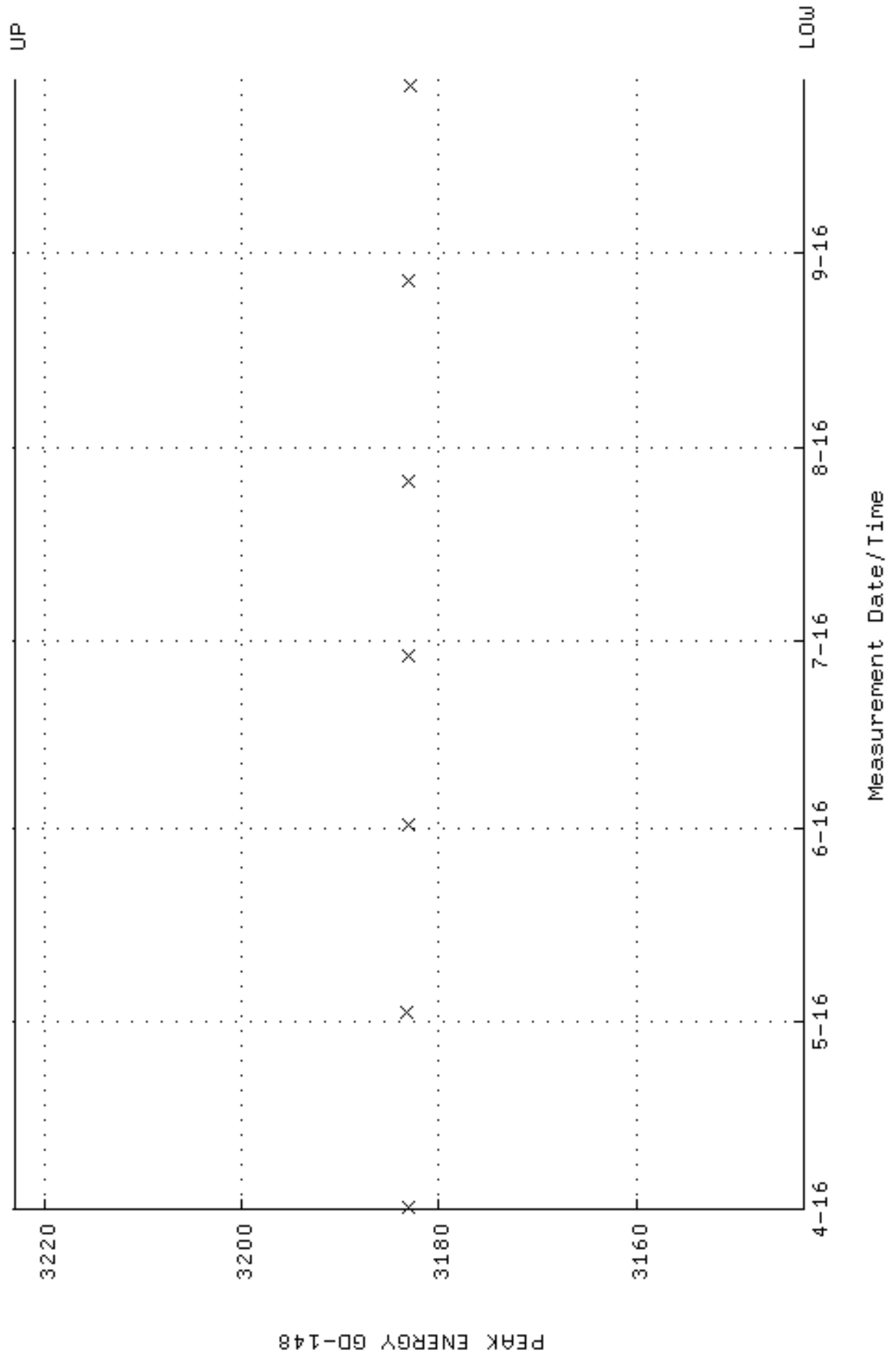
QA filename : DKA100:[ENV_ALPHA.QA.W]W020.QAF;6
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 1-APR-2016 08:54:43 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



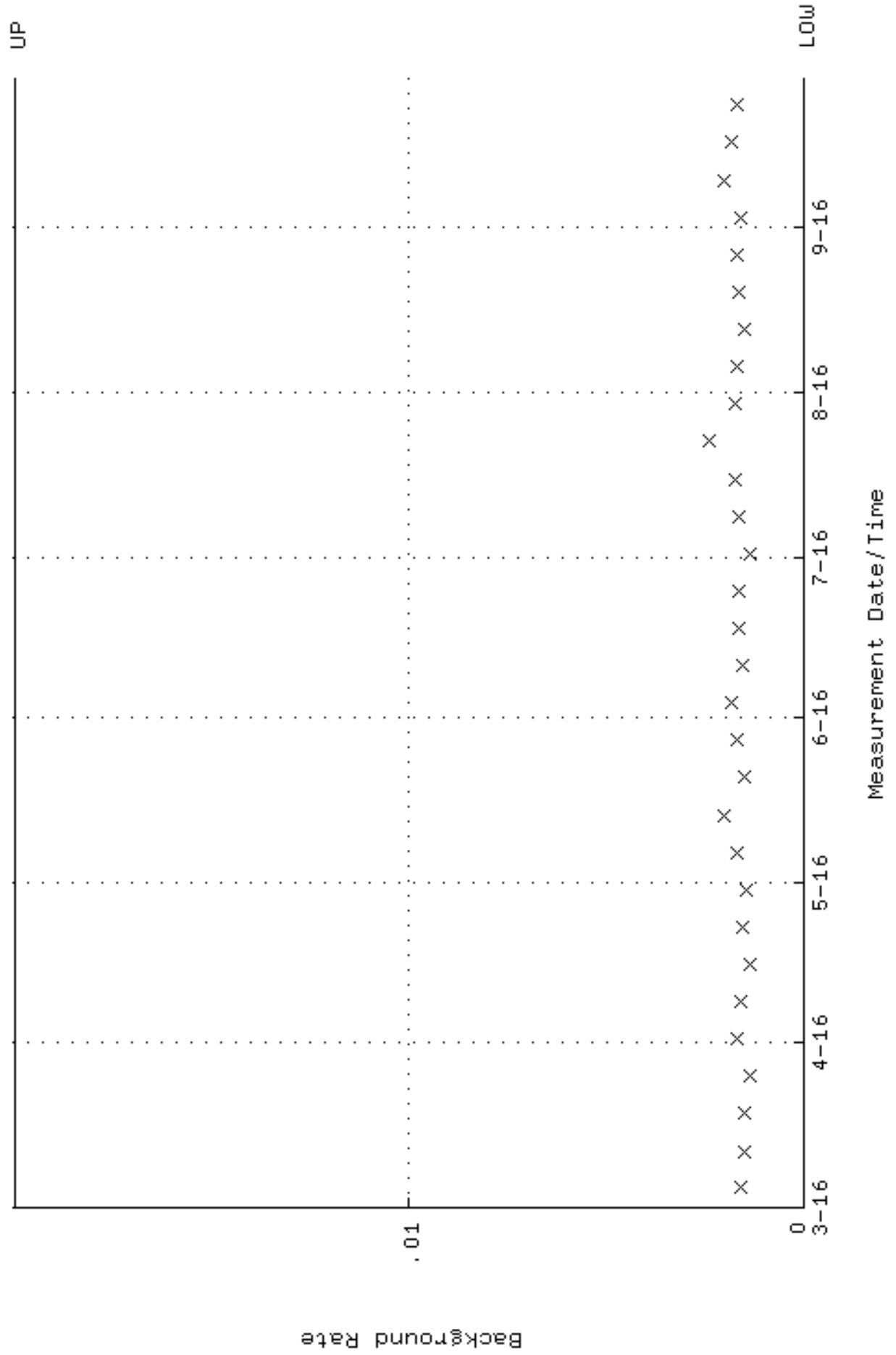
QA filename : DKA100:[ENV_ALPHA.QA.W]W020.QAF;6
 Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 1-APR-2016 08:54:43 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



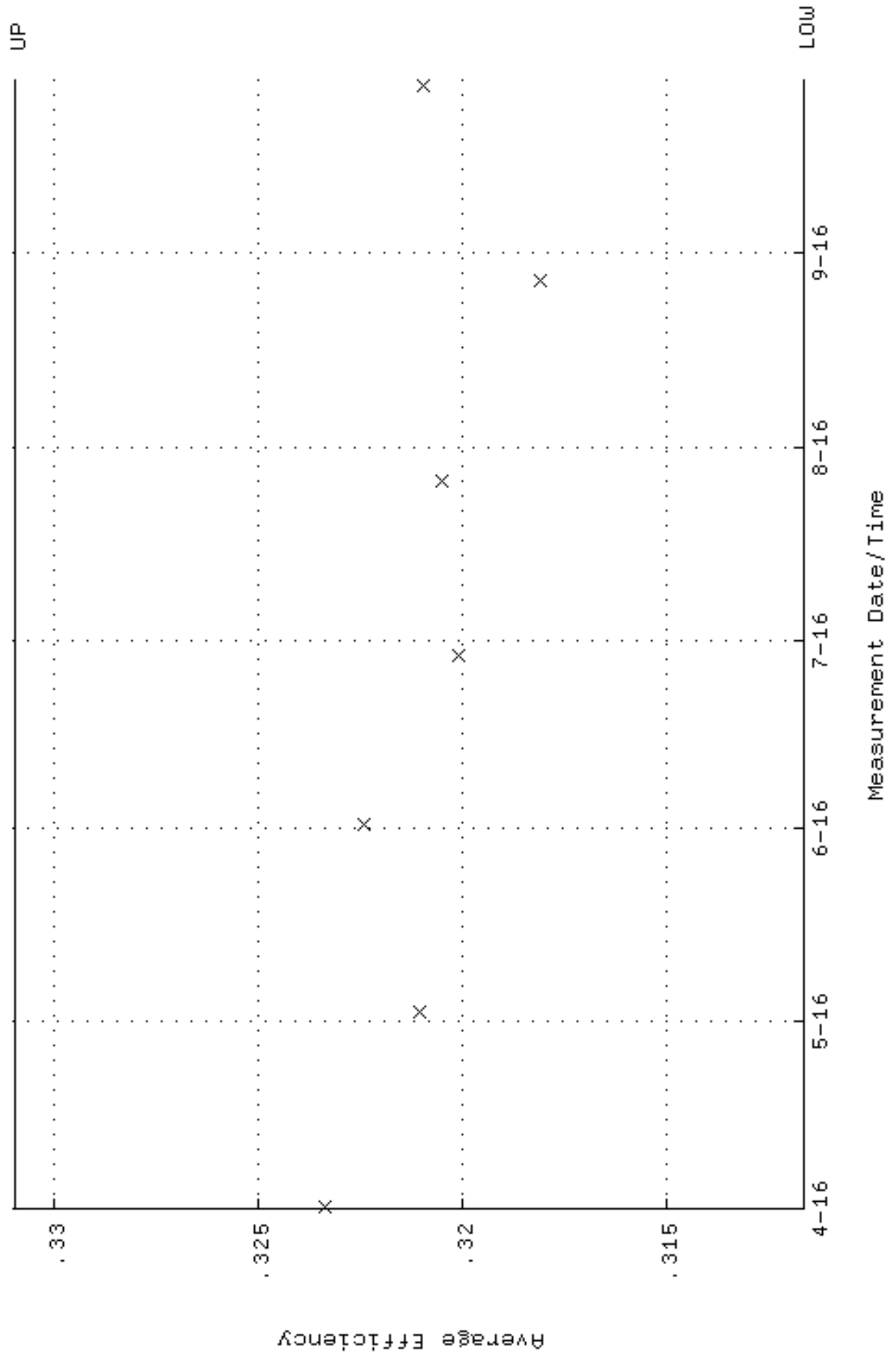
QA filename : DKA100:[ENV_ALPHA.QA.W]W020.QAF;6
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 1-APR-2016 08:54:43 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



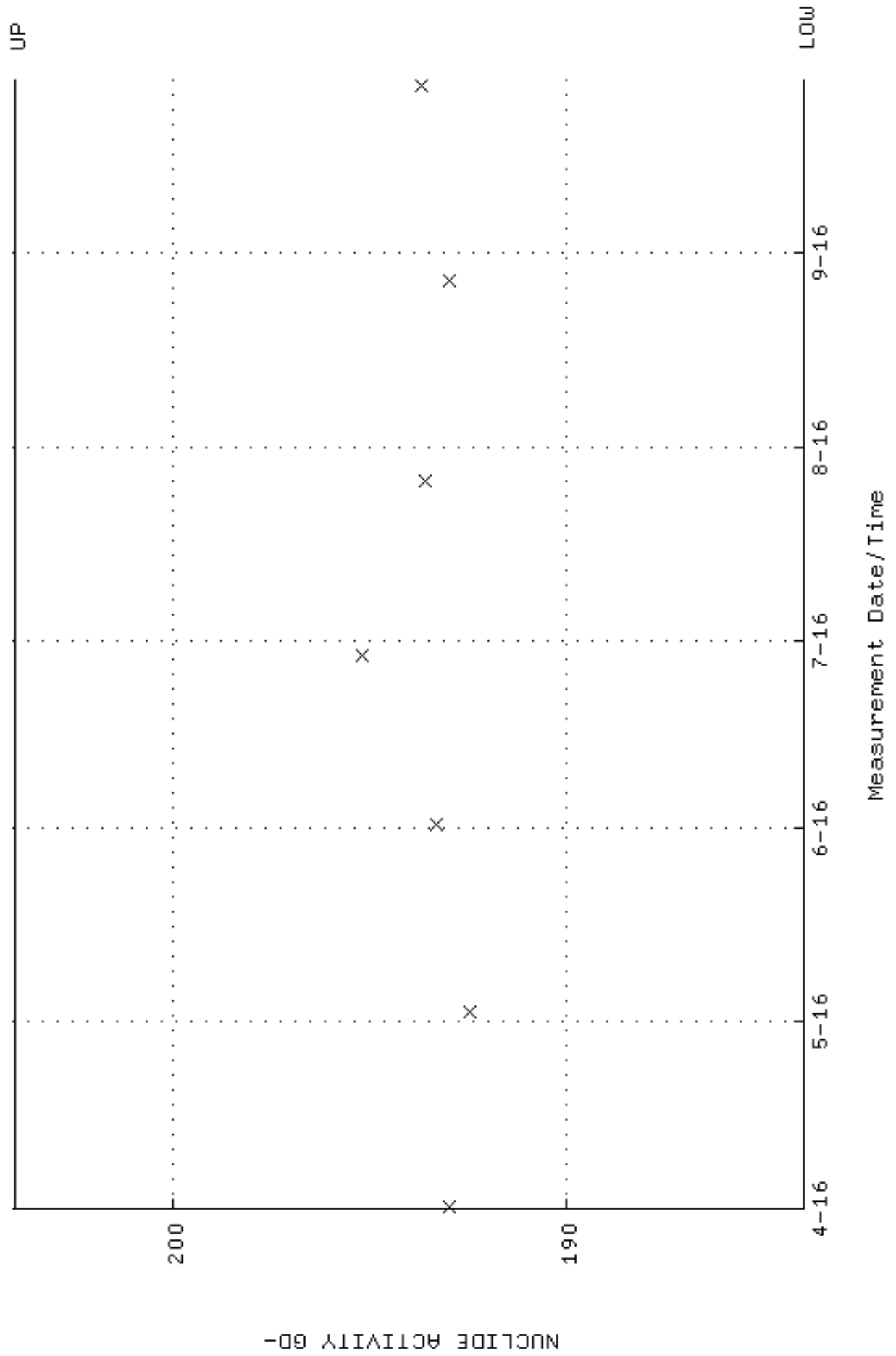
QA filename : DKA100:[ENV_ALPHA.QA.B]B020.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:29:30 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



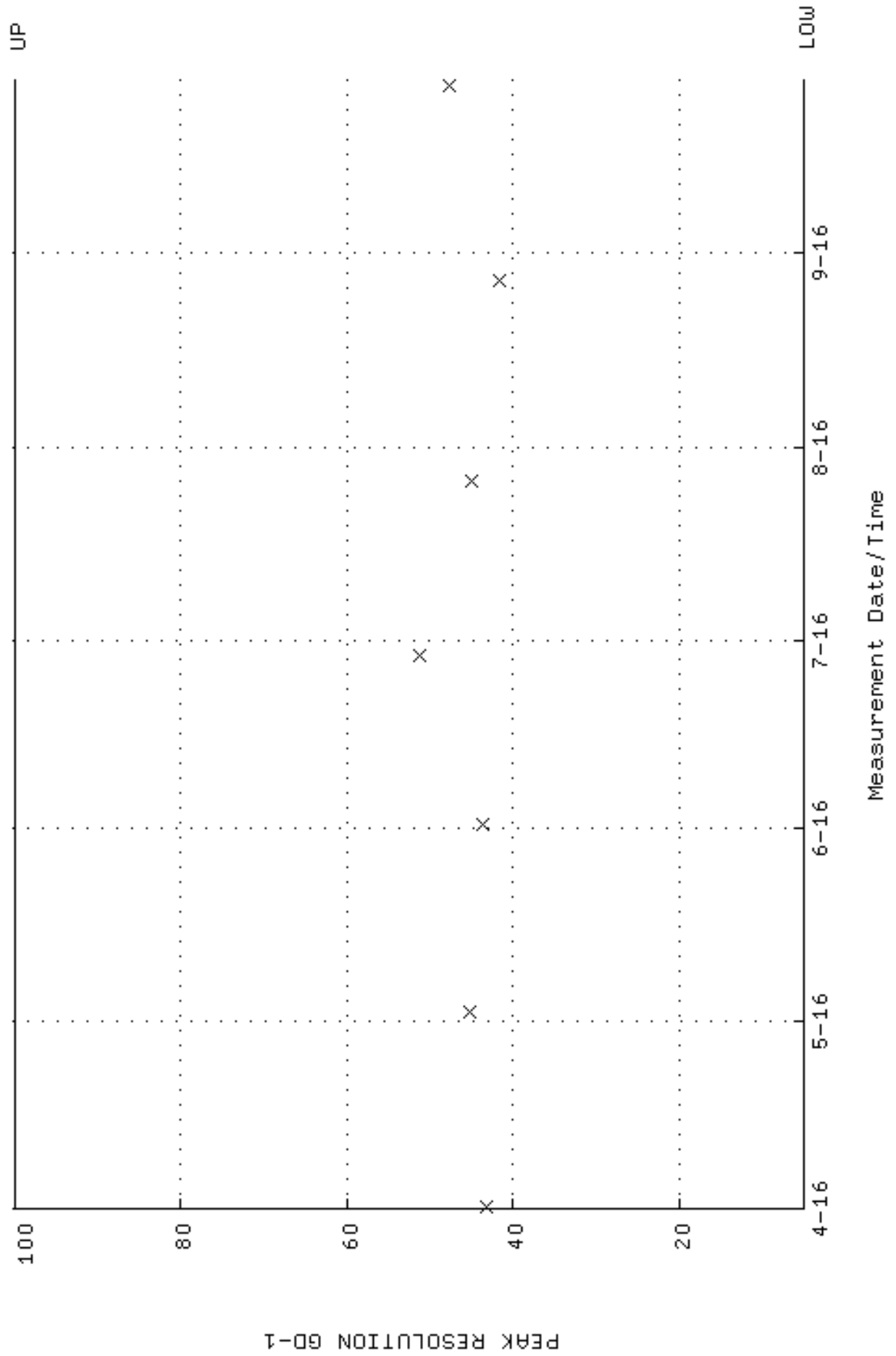
QA filename : DKA100:[ENV_ALPHA.QA.W]W021.QAF;10
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 1-APR-2016 08:54:43 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.311665 through 0.330943



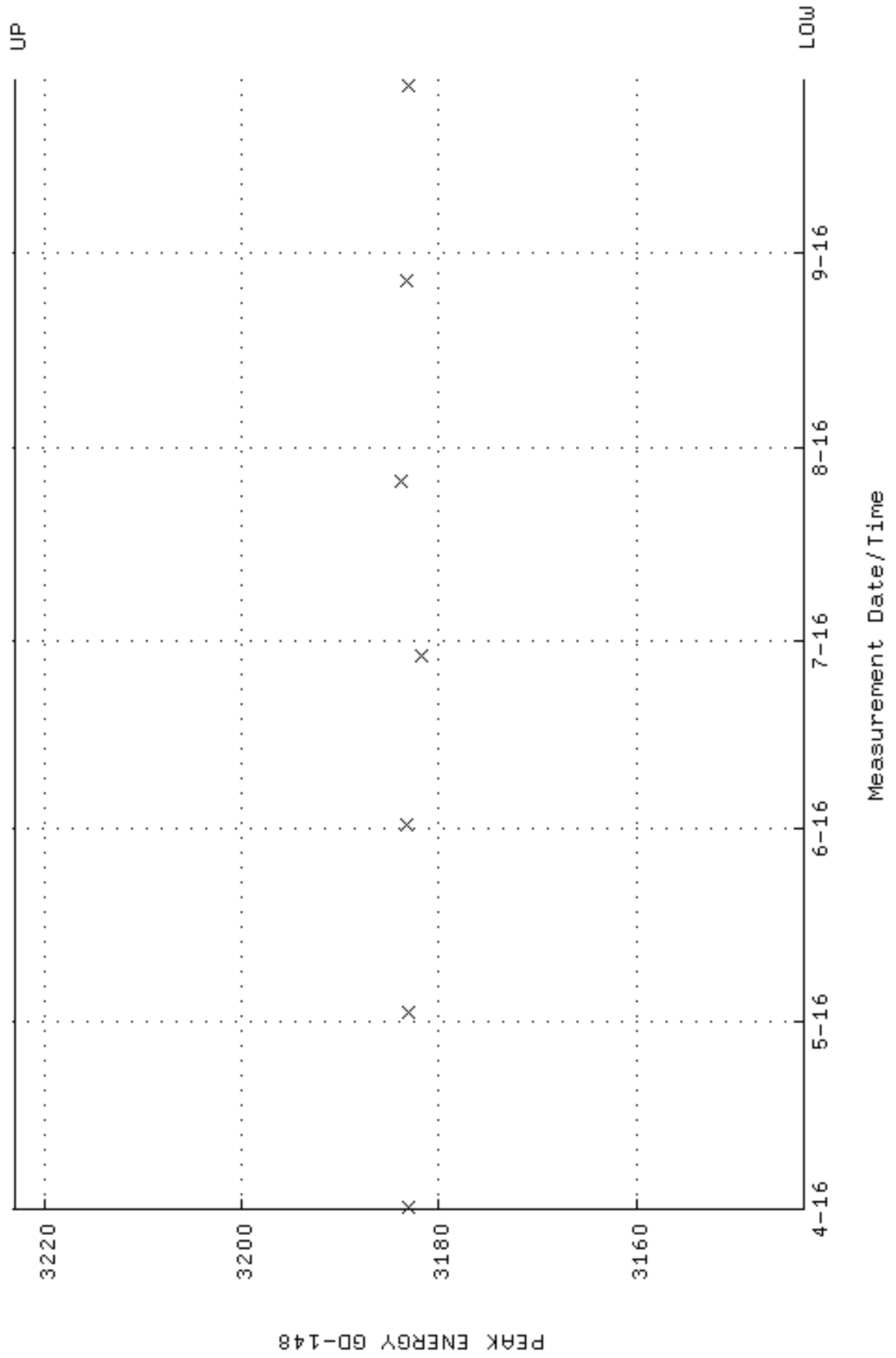
QA filename : DKA100:[ENV_ALPHA.QA.W]w021.QAF;10
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 1-APR-2016 08:54:43 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



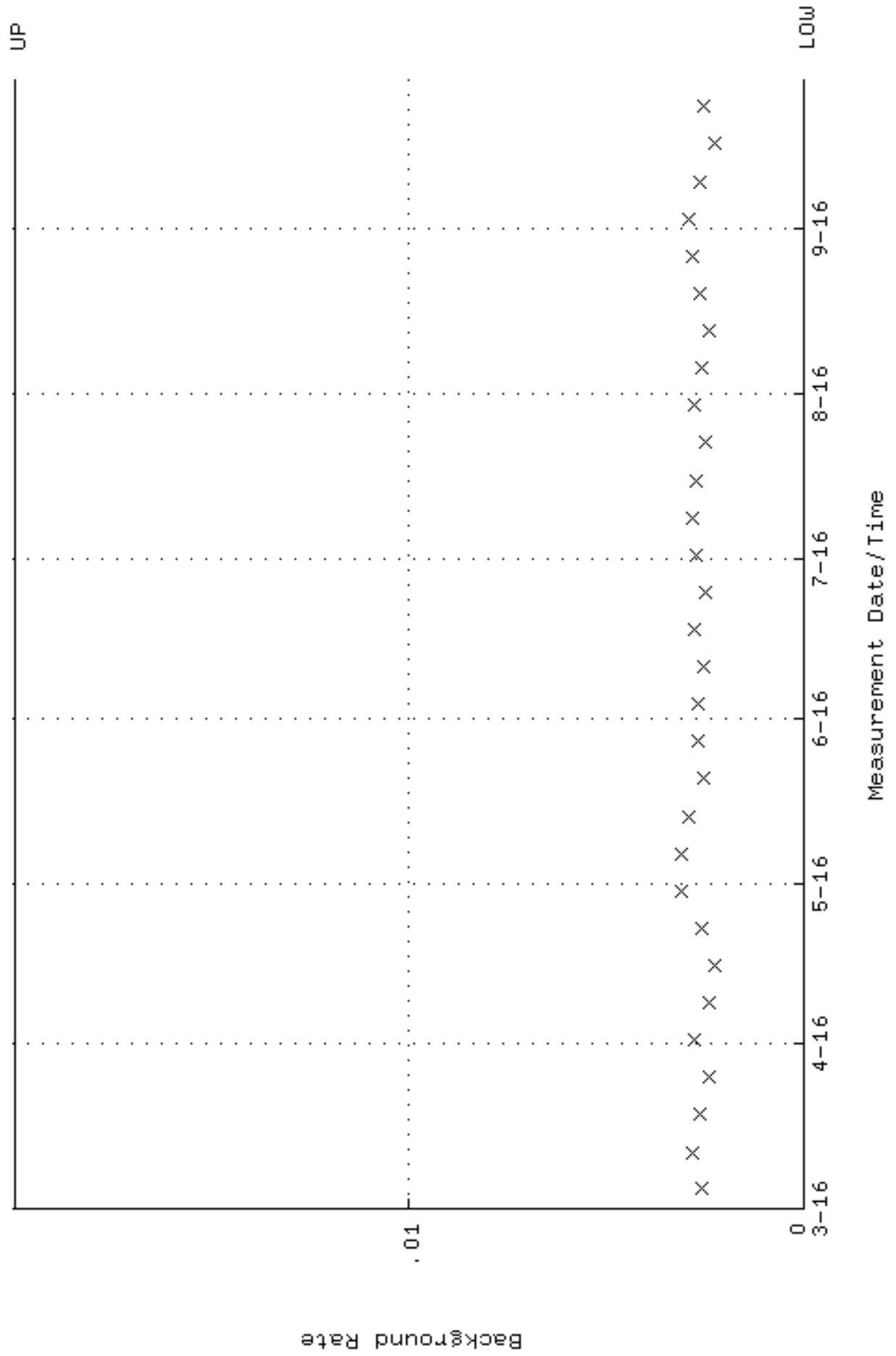
QA filename : DKA100:[ENV_ALPHA.QA.W]W021.QAF;10
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 1-APR-2016 08:54:43 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



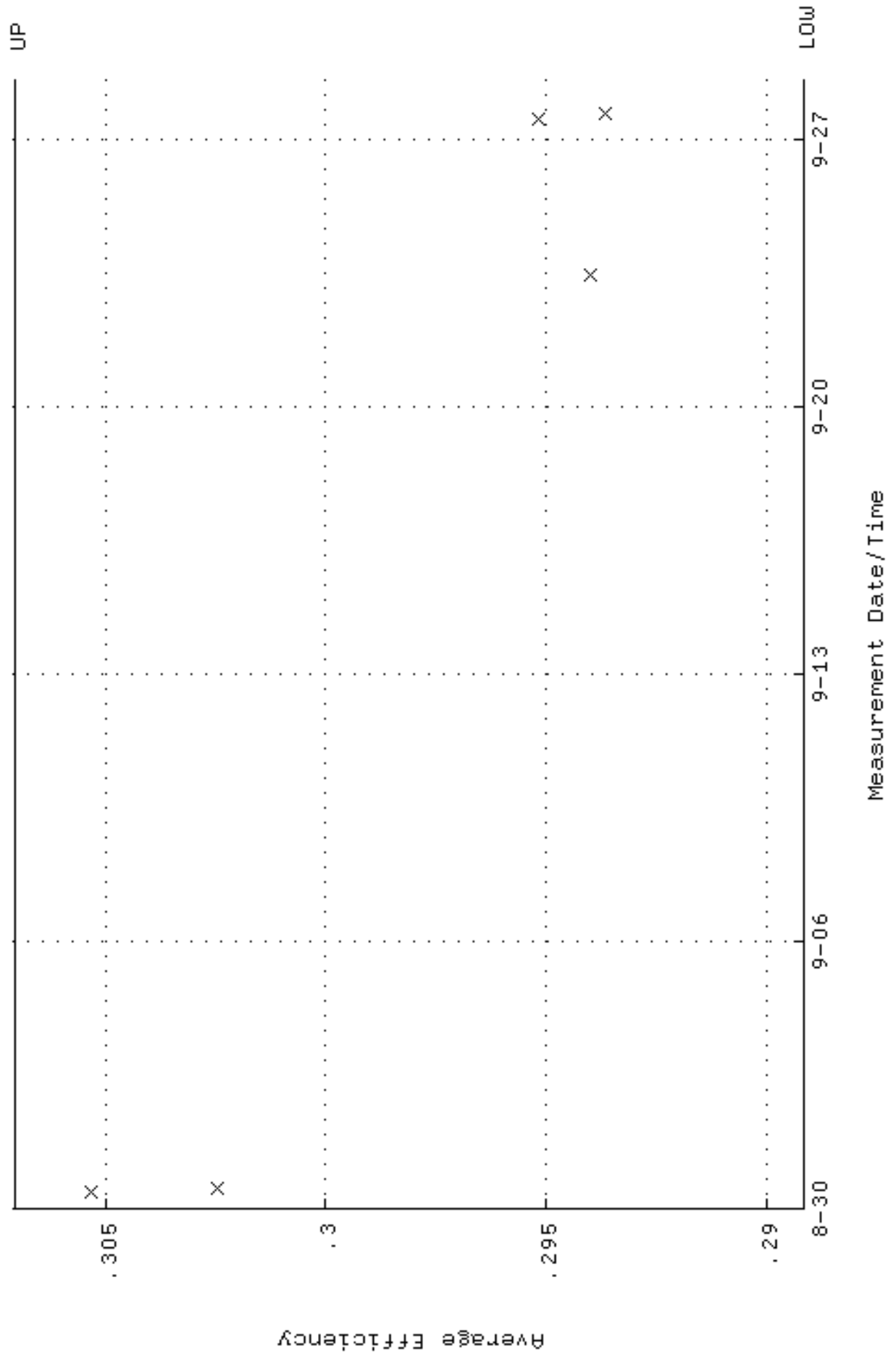
QA filename : DKA100:[ENV_ALPHA.QA.W]W021.QAF;10
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 1-APR-2016 08:54:43 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



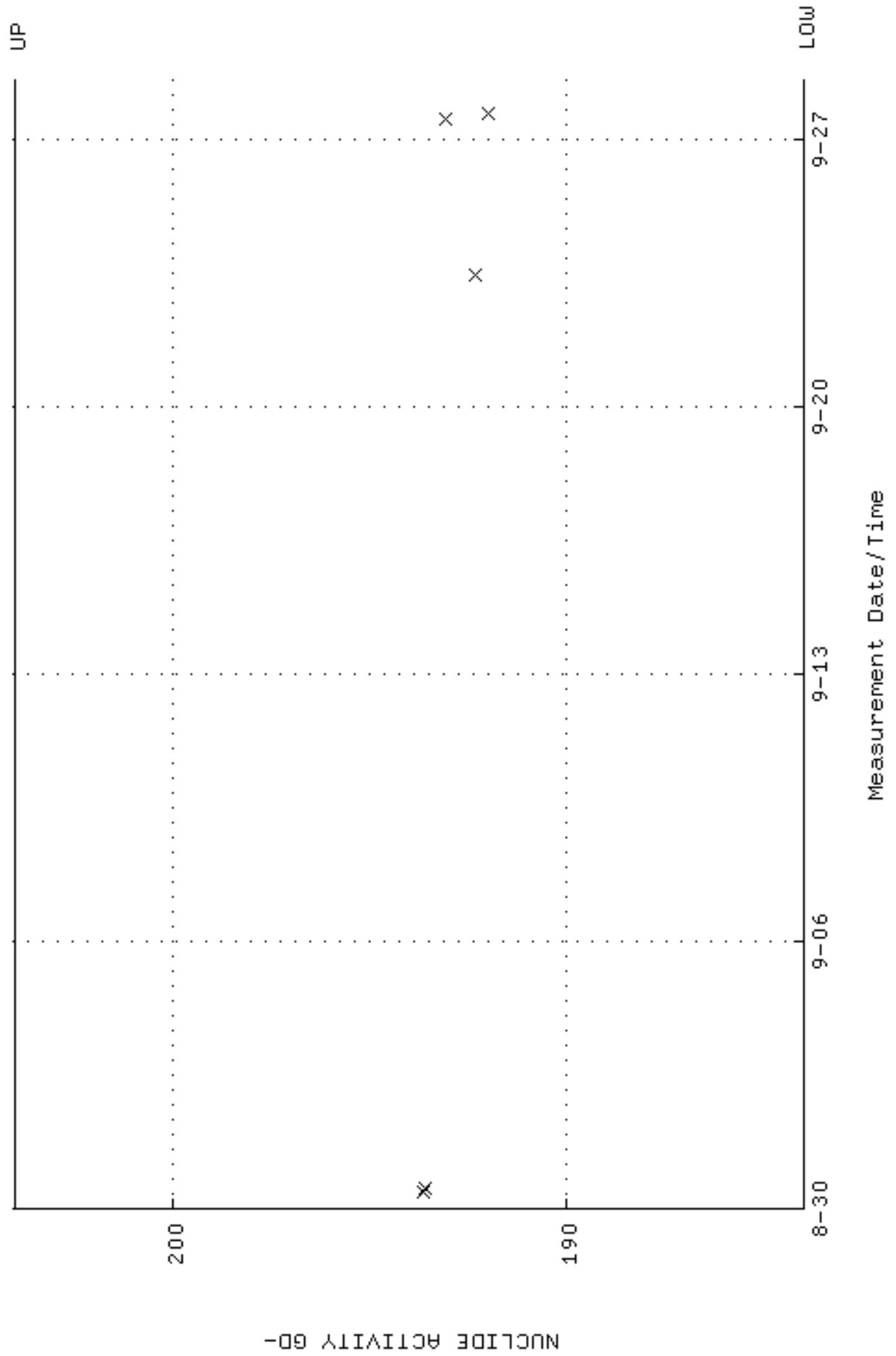
QA filename : DKA100:[ENV_ALPHA.QA.B]B021.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:29:30 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



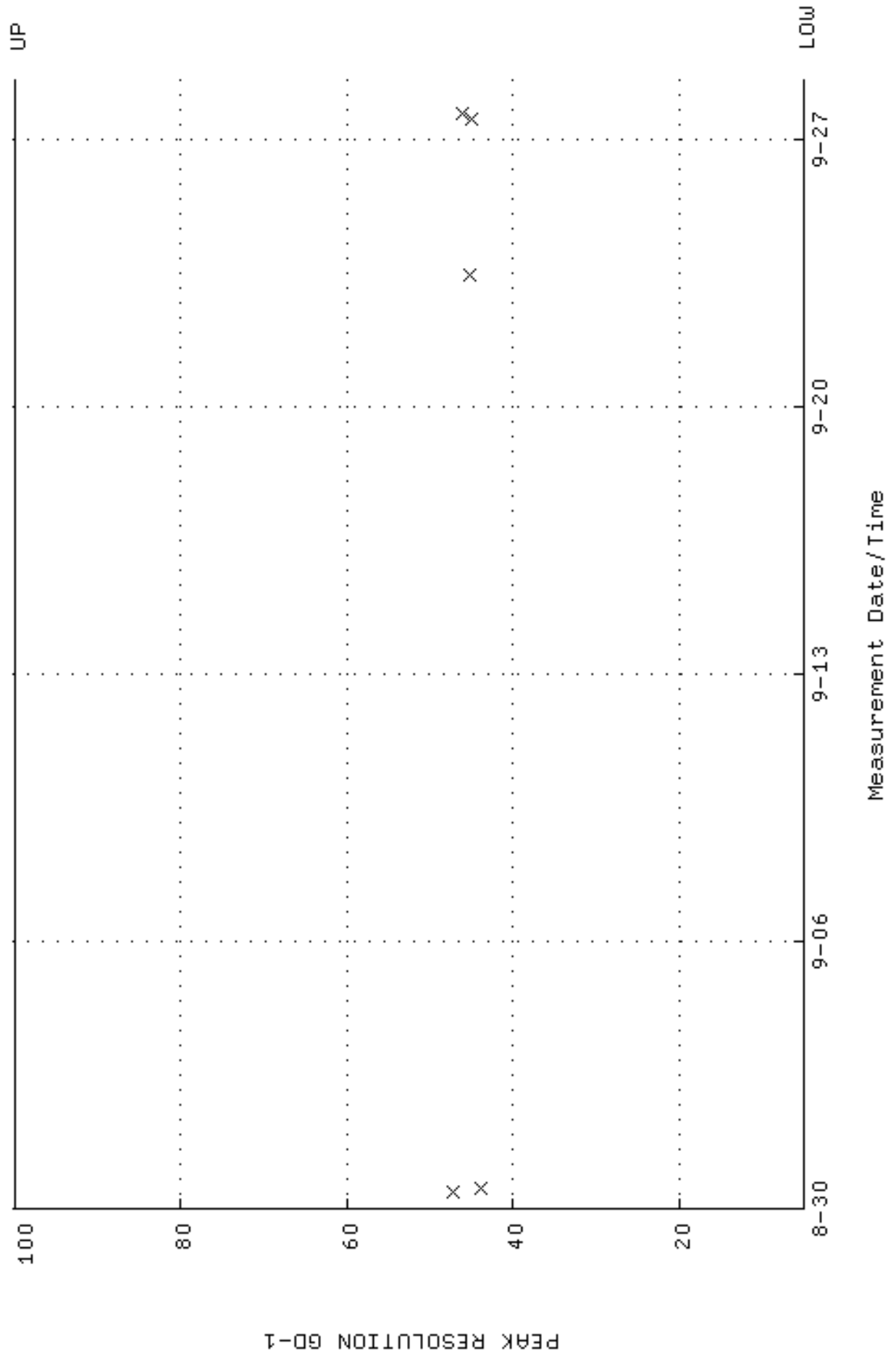
QA filename : DKA100:[ENV_ALPHA.QA.W]W023.QAF;6
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 30-AUG-2016 10:09:39 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.289160 through 0.307050



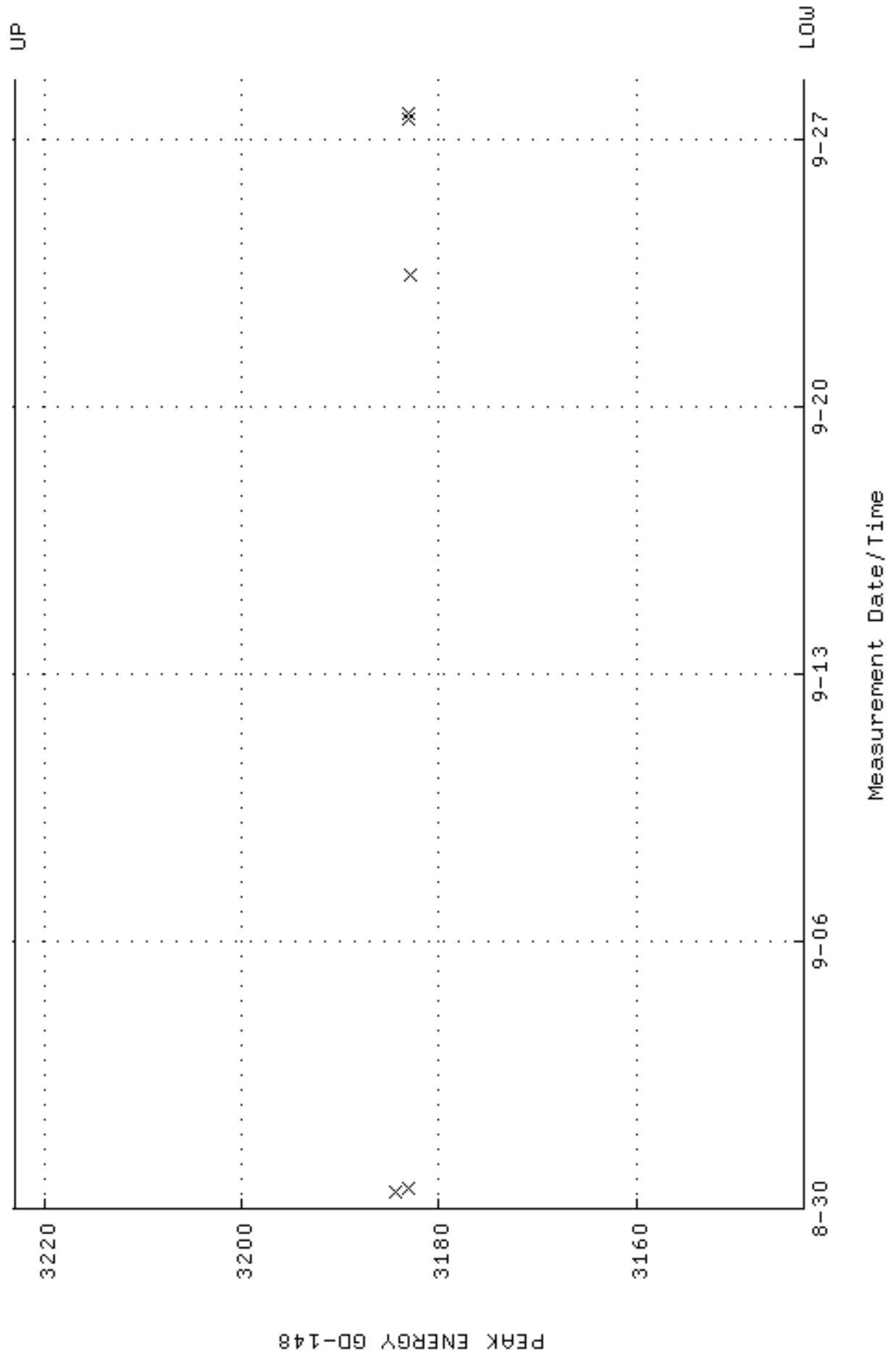
QA filename : DKA100:[ENV_ALPHA.QA.W]W023.QAF;6
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 30-AUG-2016 10:09:39 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



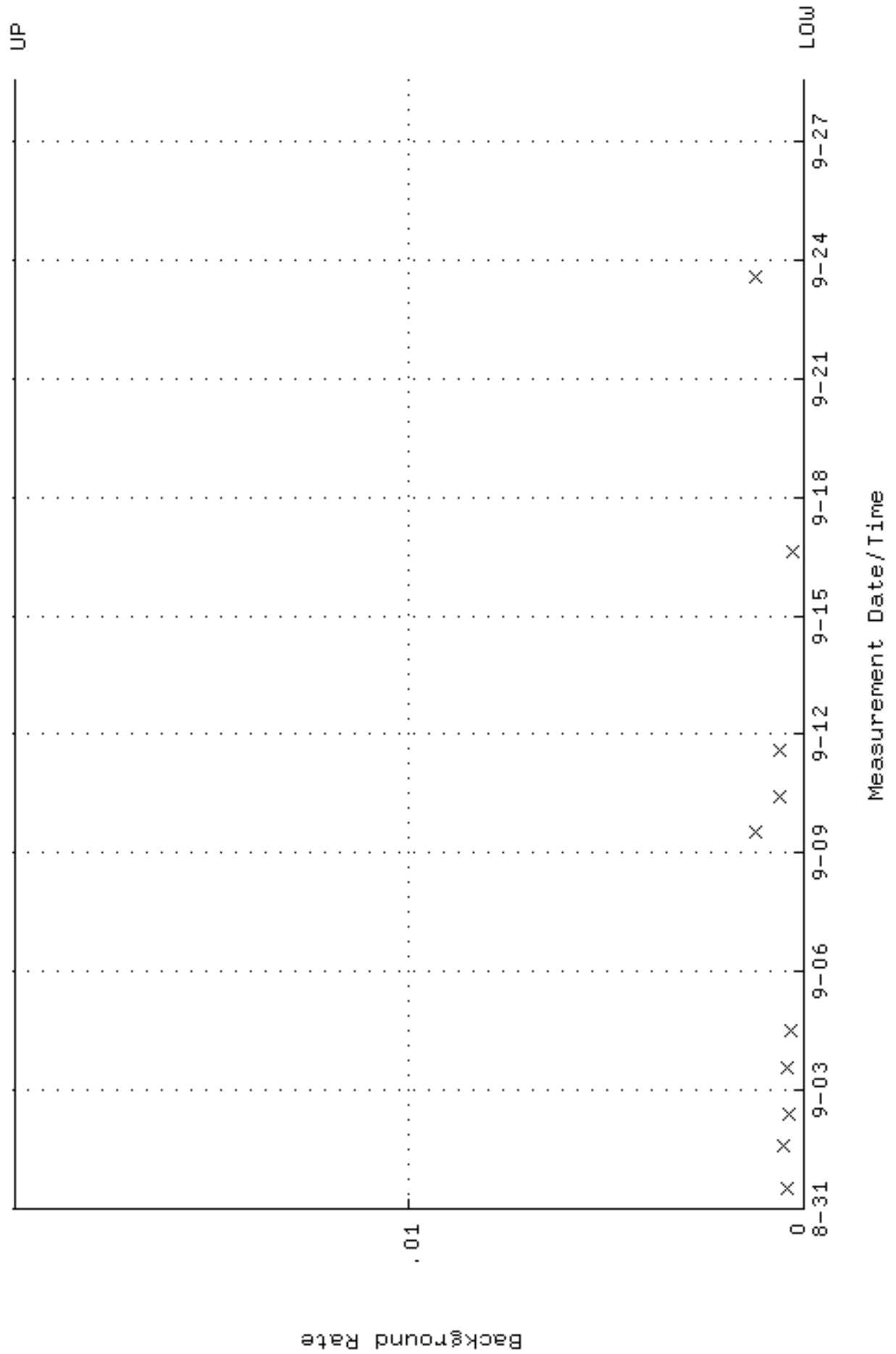
QA filename : DKA100:[ENV_ALPHA.QA.W]W023.QAF;6
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 30-AUG-2016 10:09:39 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



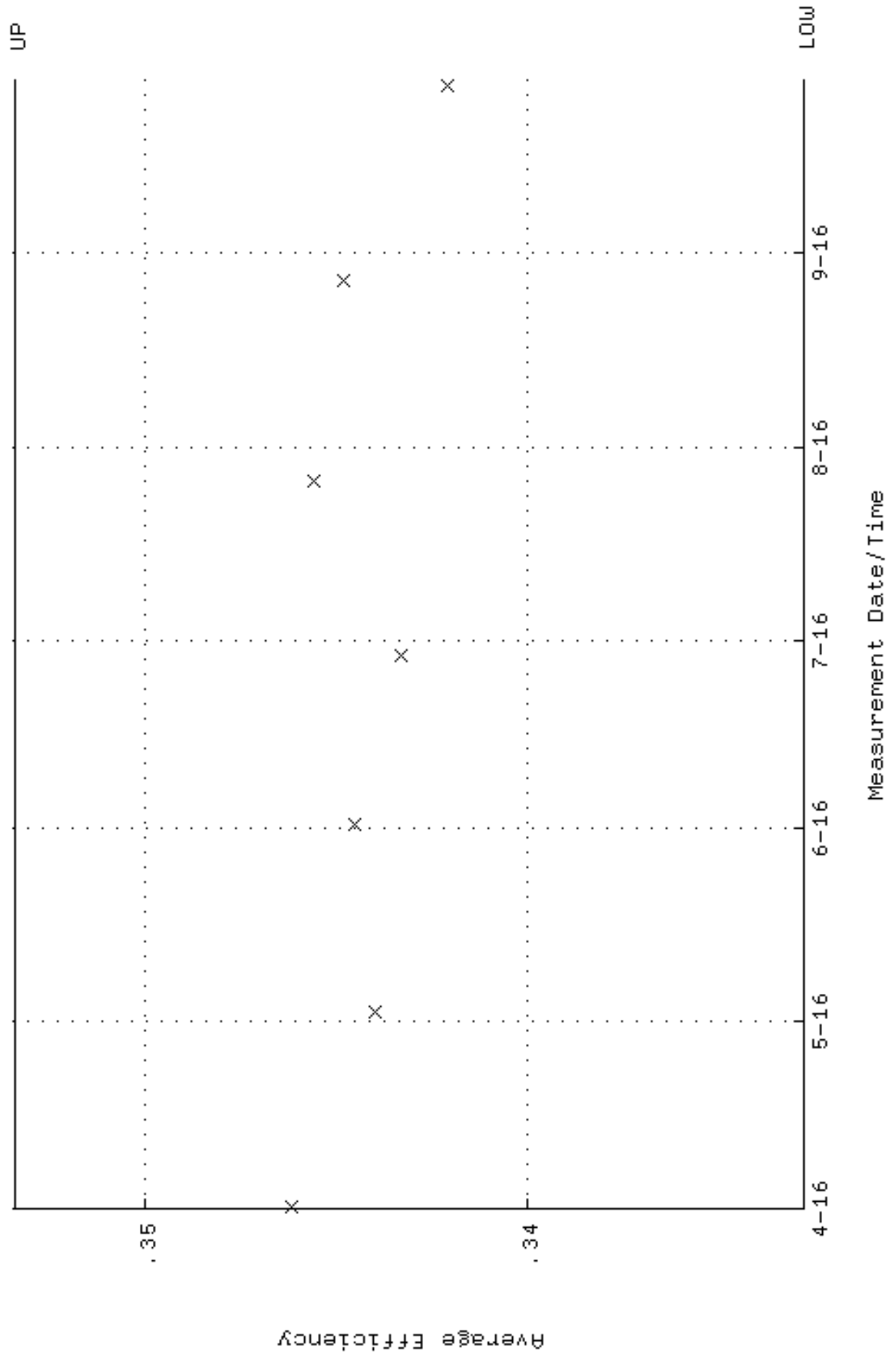
QA filename : DKA100:[ENV_ALPHA.QA.W]W023.QAF;6
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 30-AUG-2016 10:09:39 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



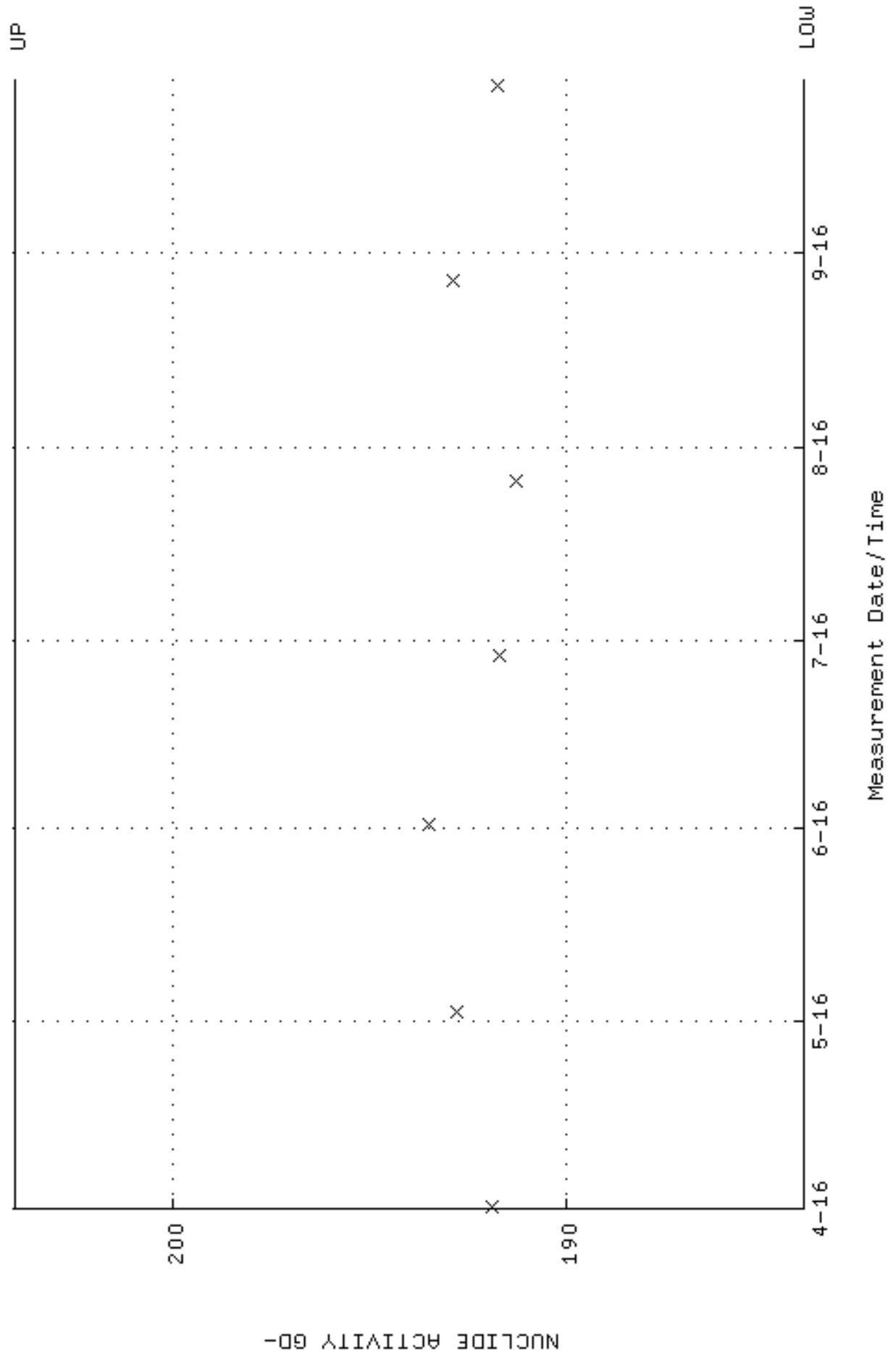
QA filename : DKA100:[ENV_ALPHA.QA.B]B023.QAF;4
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 31-AUG-2016 12:42:18 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



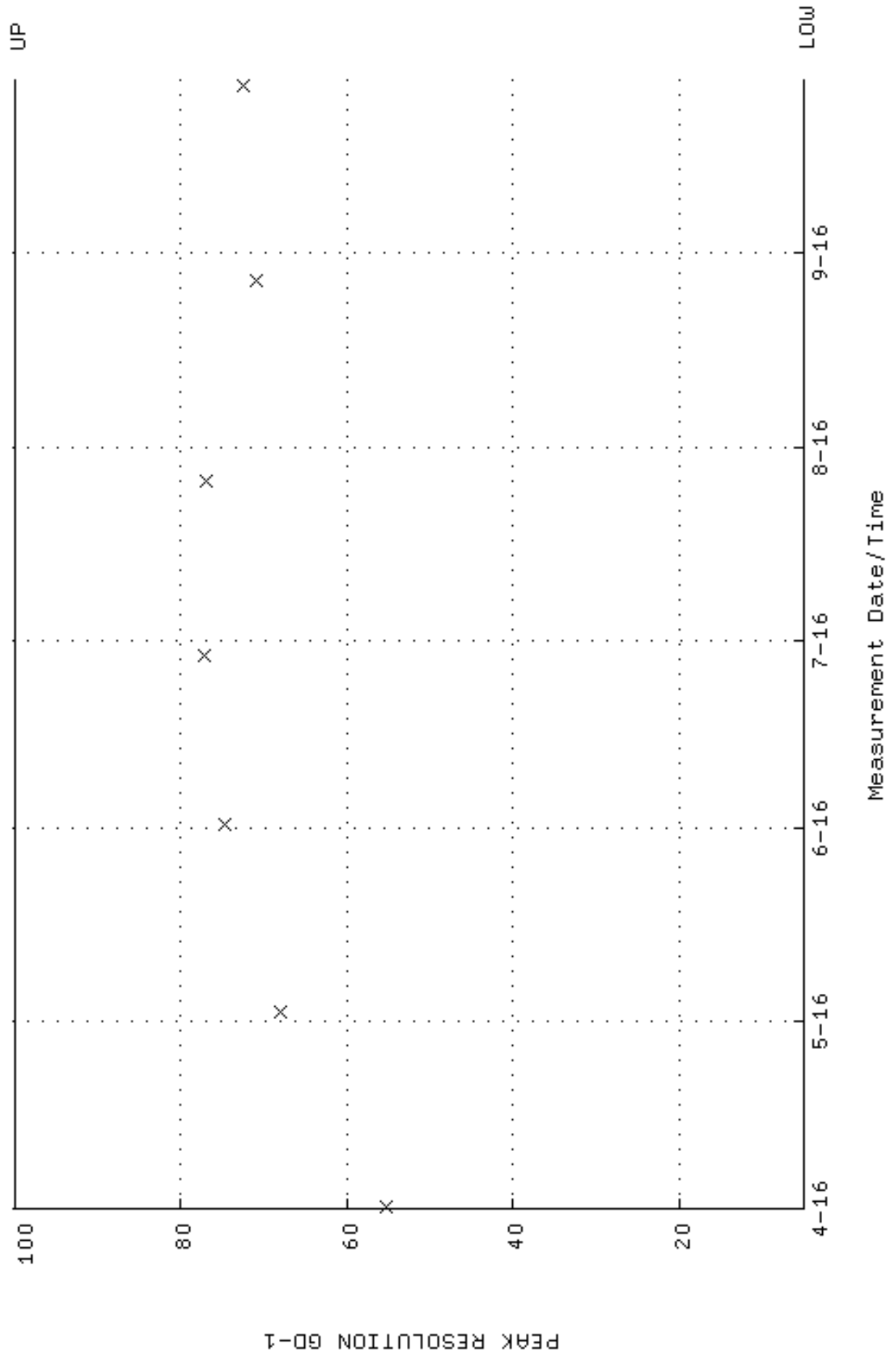
QA filename : DKA100:[ENV_ALPHA.QA.W]W024.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 1-APR-2016 08:54:43 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.332785 through 0.353369



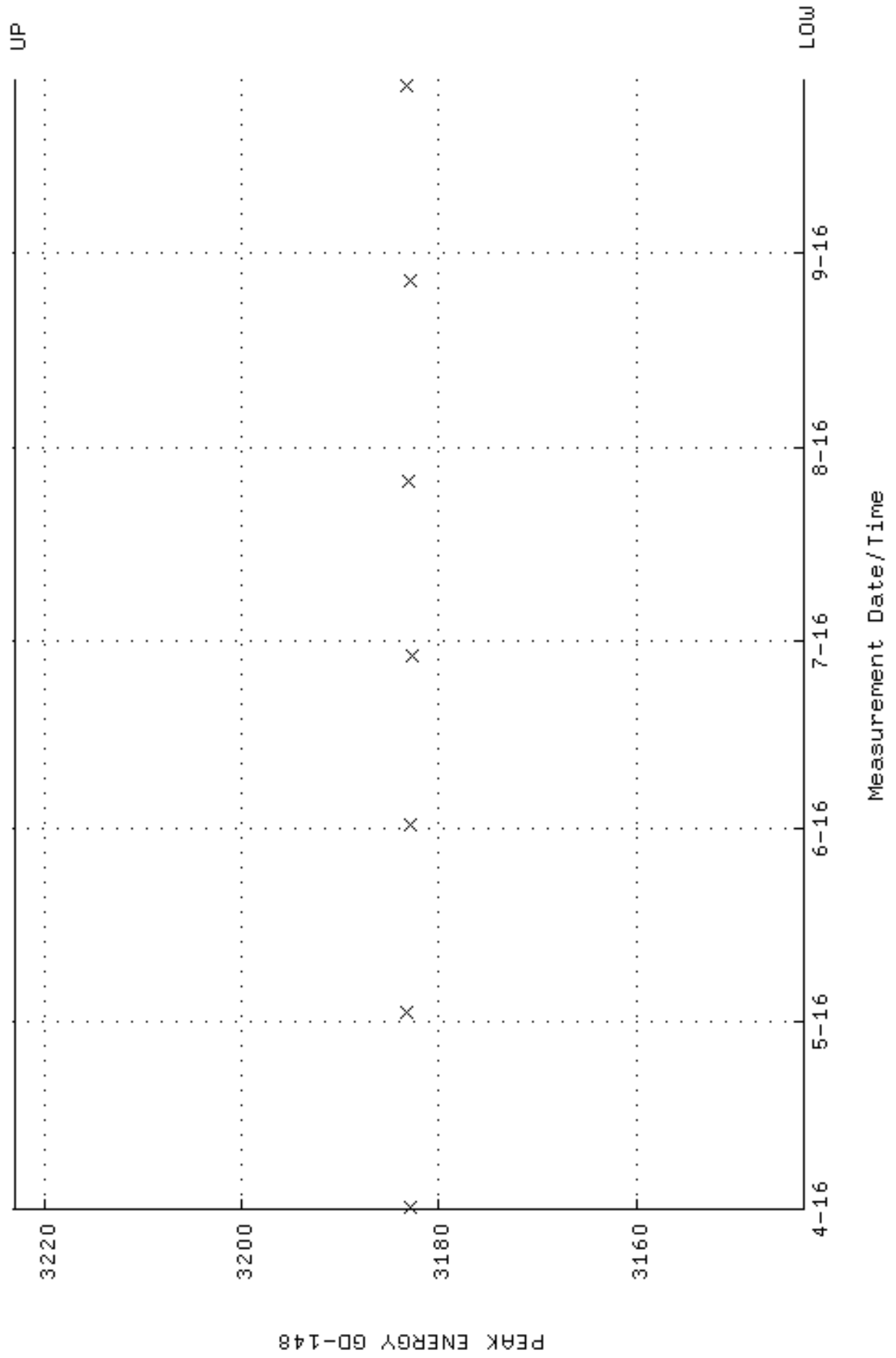
QA filename : DKA100:[ENV_ALPHA.QA.W]W024.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 1-APR-2016 08:54:43 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



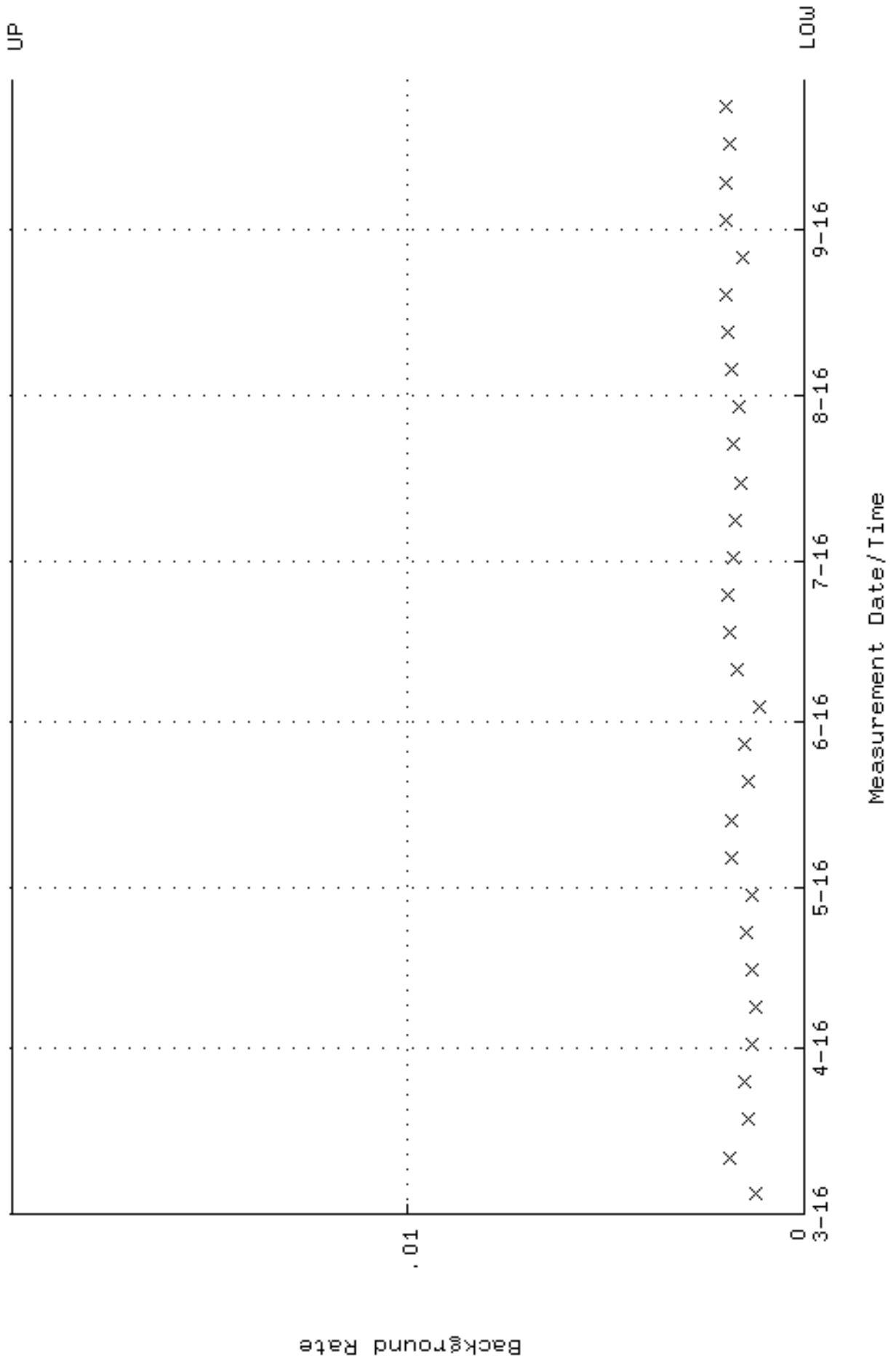
QA filename : DKA100:[ENV_ALPHA.QA.W]W024.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 1-APR-2016 08:54:43 through 28-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



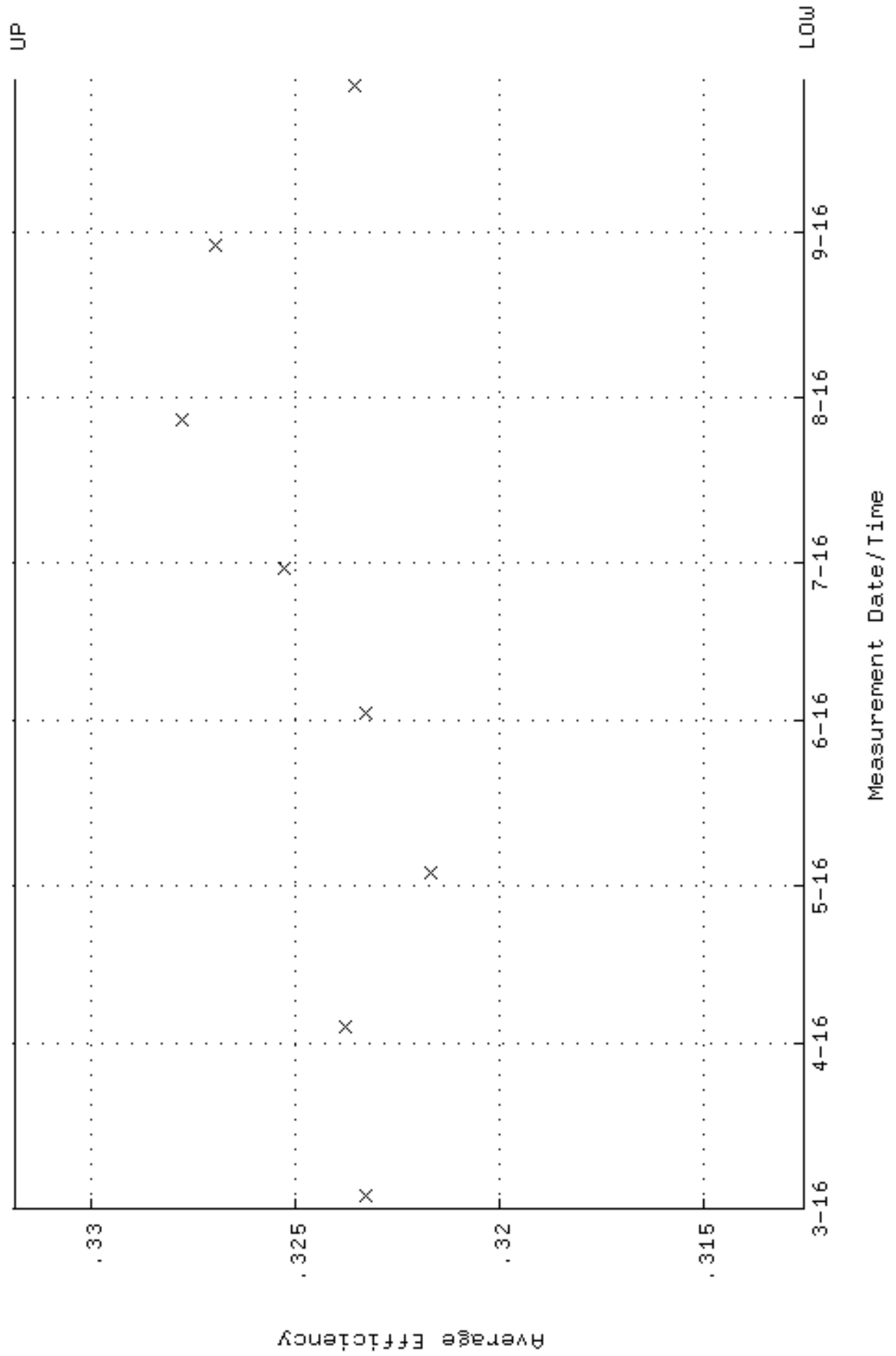
QA filename : DKA100:[ENV_ALPHA.QA.W]W024.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 1-APR-2016 08:54:43 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



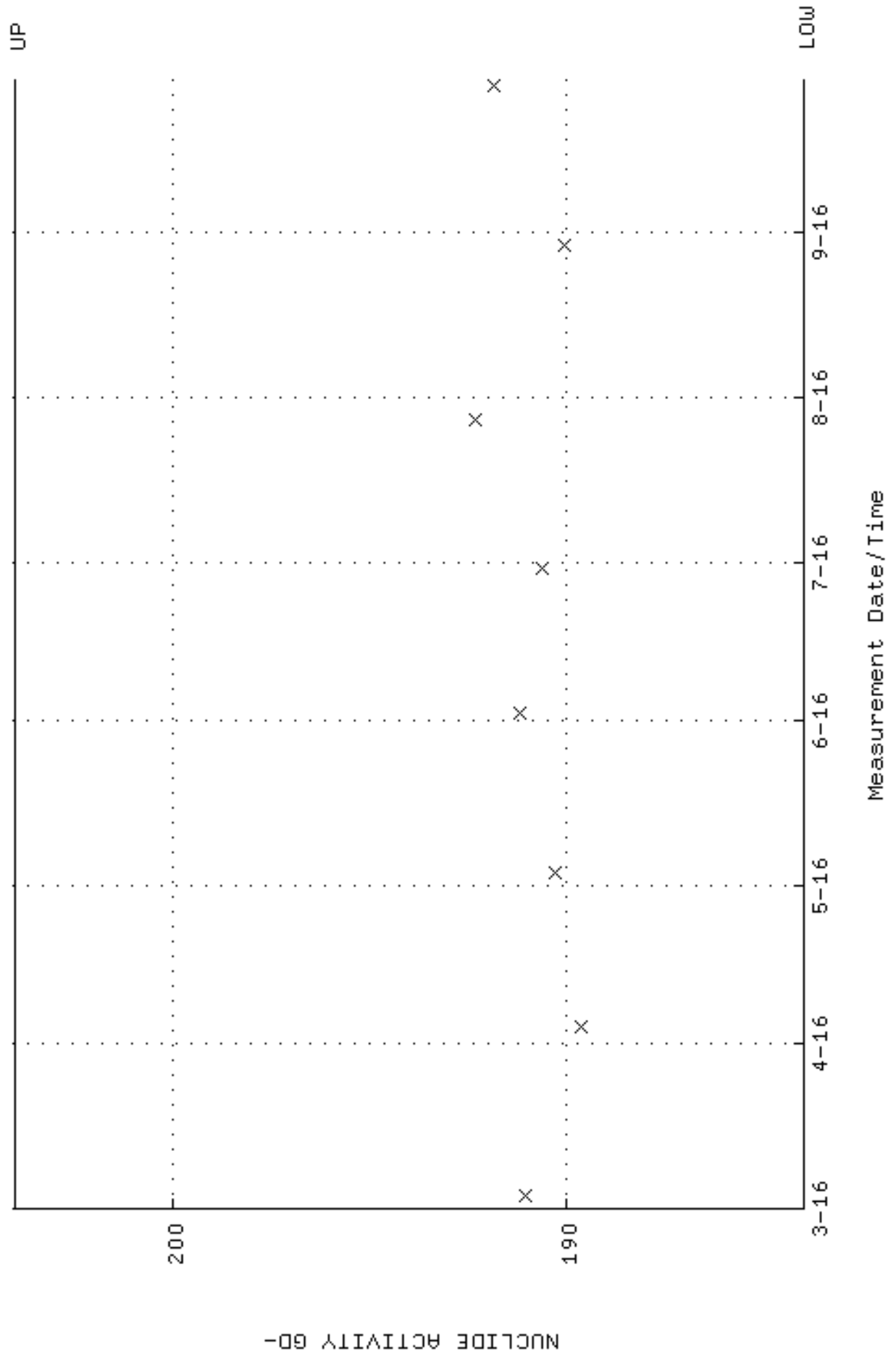
QA filename : DKA100:[ENV_ALPHA.QA.B]B024.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:29:30 through 28-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



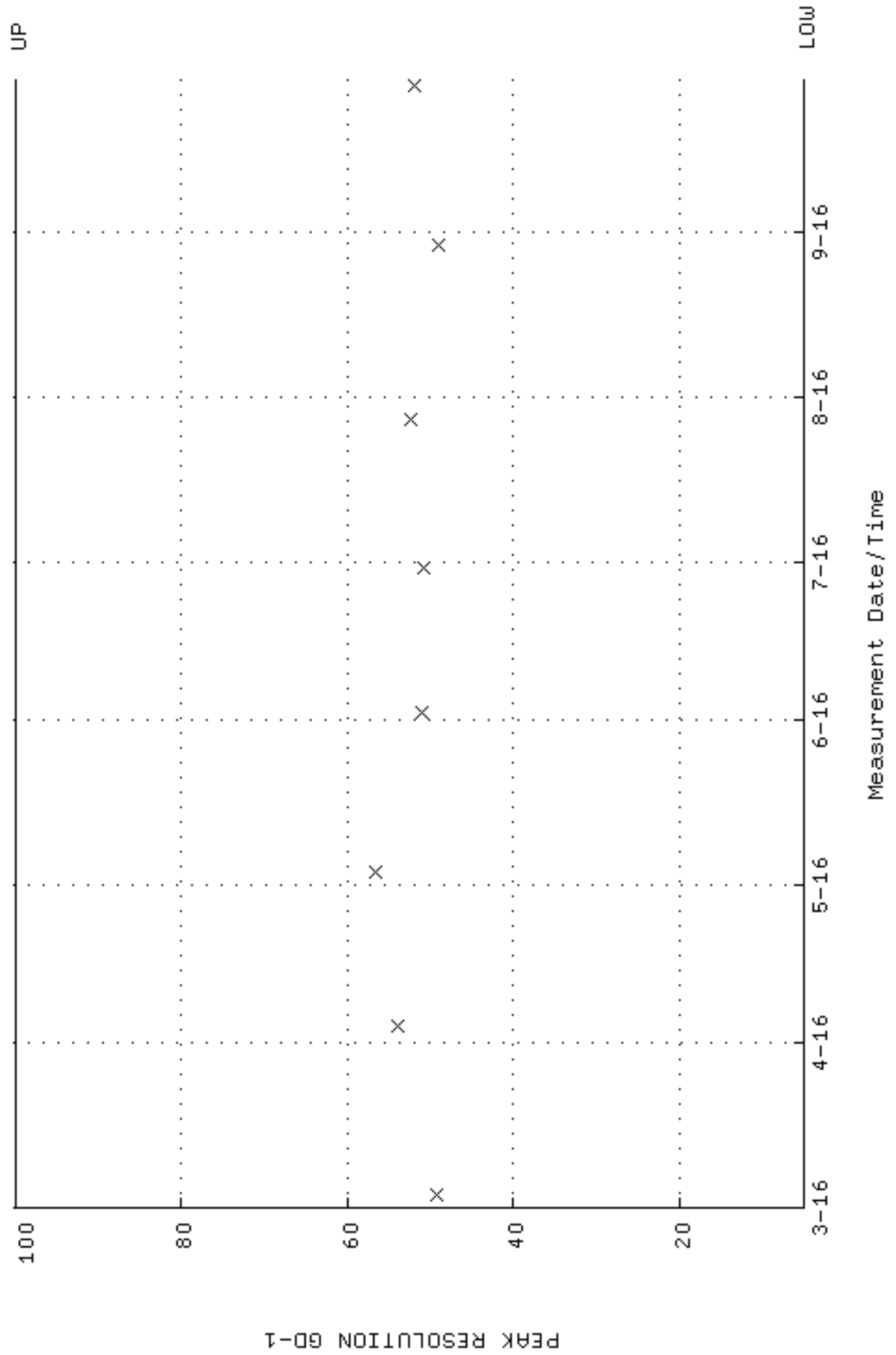
QA filename : DKA100:[ENV_ALPHA.QA.W]W026.QAF;7
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-MAR-2016 08:11:44 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.312549 through 0.331881



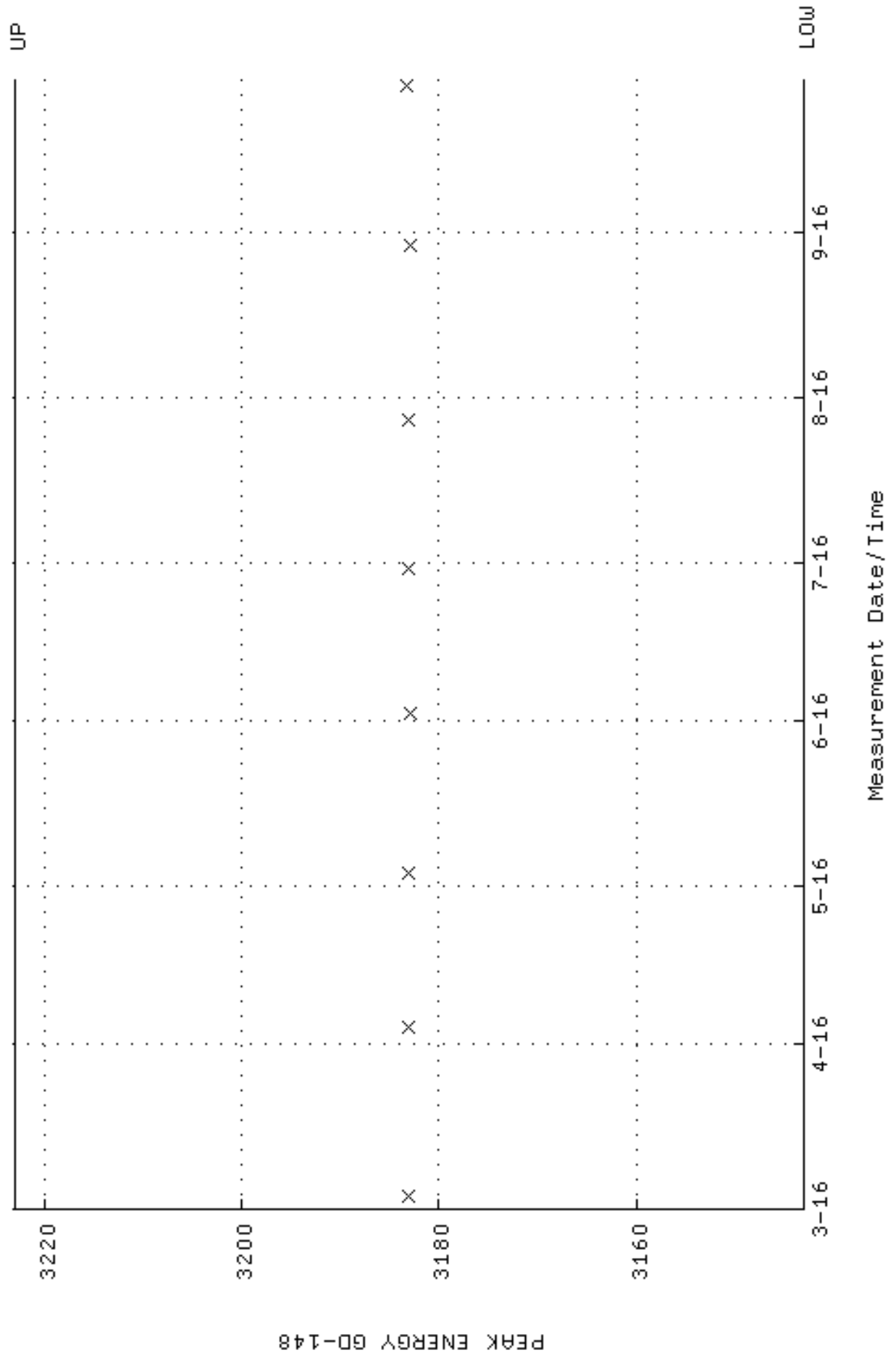
QA filename : DKA100:[ENV_ALPHA.QA.W]W026.QAF;7
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 3-MAR-2016 08:11:44 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



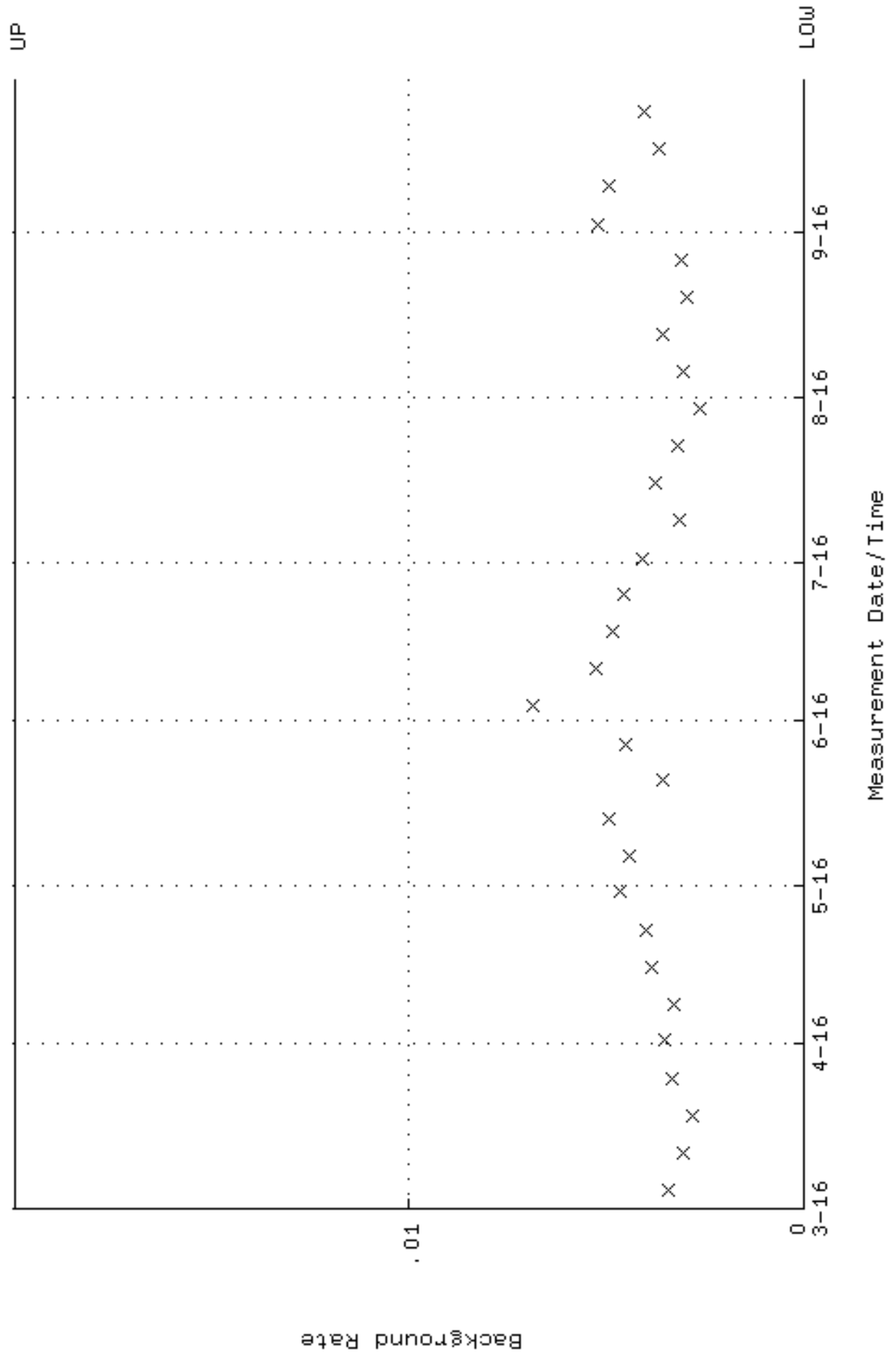
QA filename : DKA100:[ENV_ALPHA.QA.W]W026.QAF;7
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 3-MAR-2016 08:11:44 through 29-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



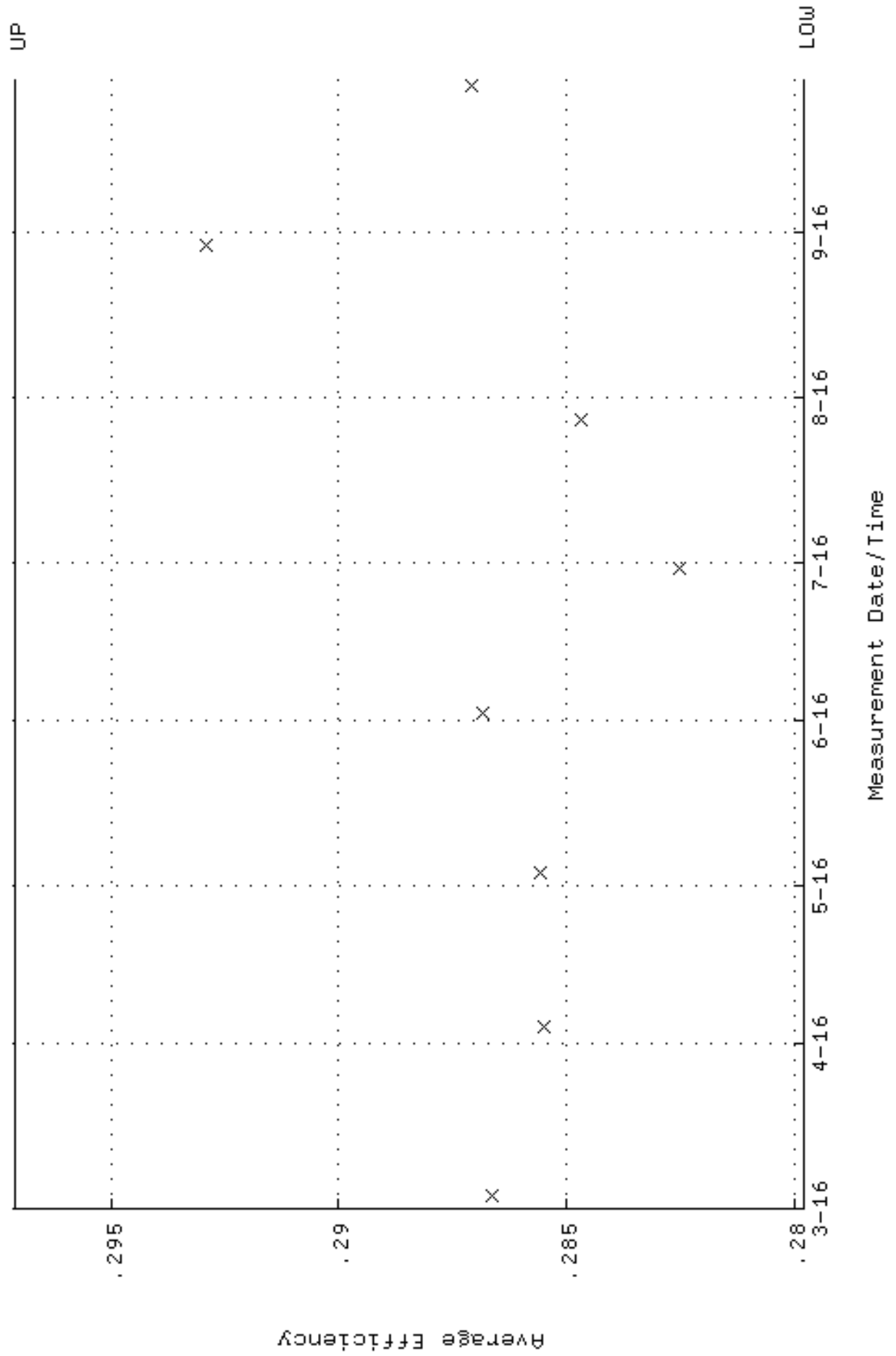
QA filename : DKA100:[ENV_ALPHA.QA.W]W026.QAF;7
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 3-MAR-2016 08:11:44 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



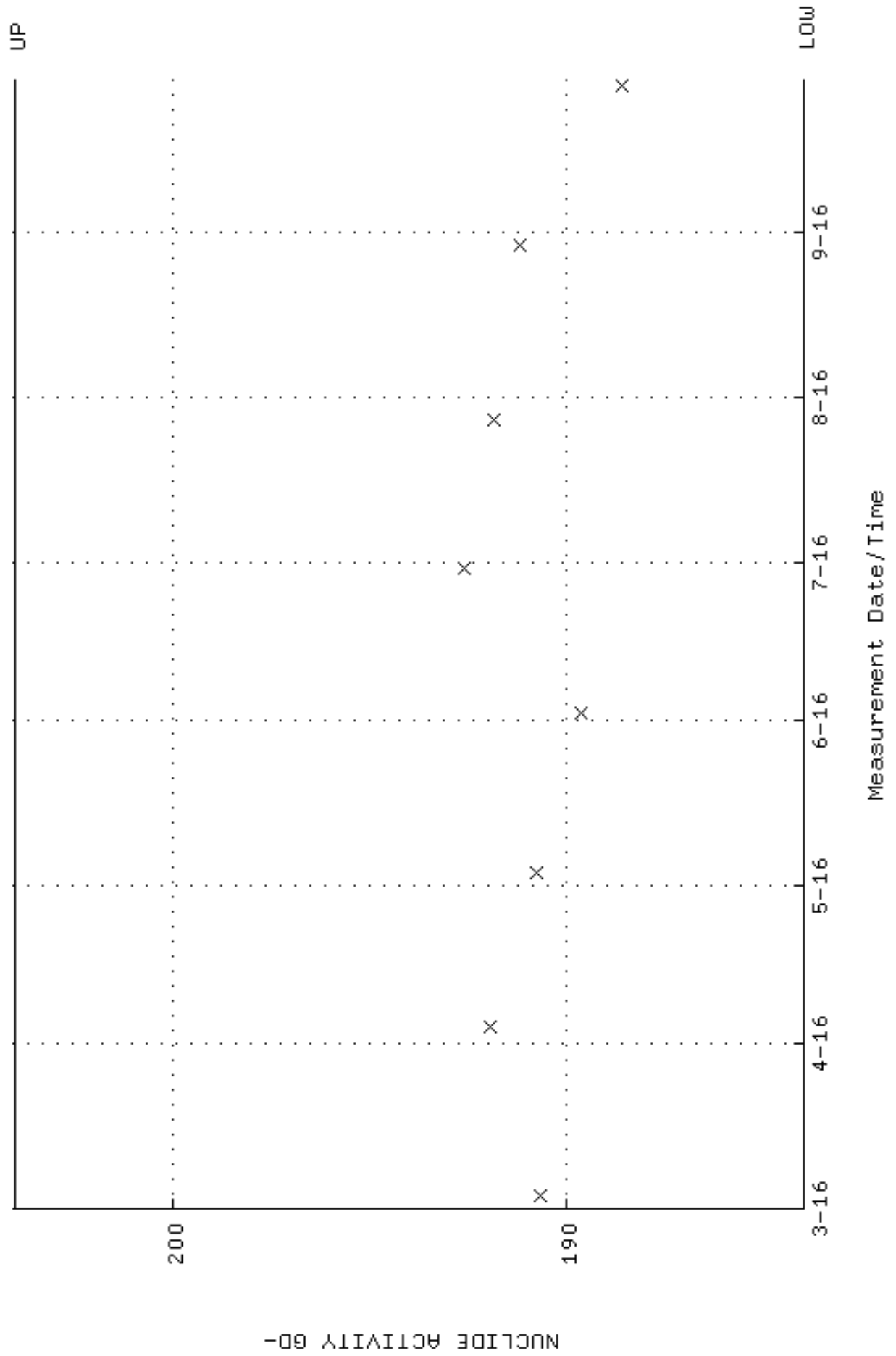
QA filename : DKA100:[ENV_ALPHA.QA.B]B026.QAF;2
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 4-MAR-2016 12:49:26 through 29-SEP-2016 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



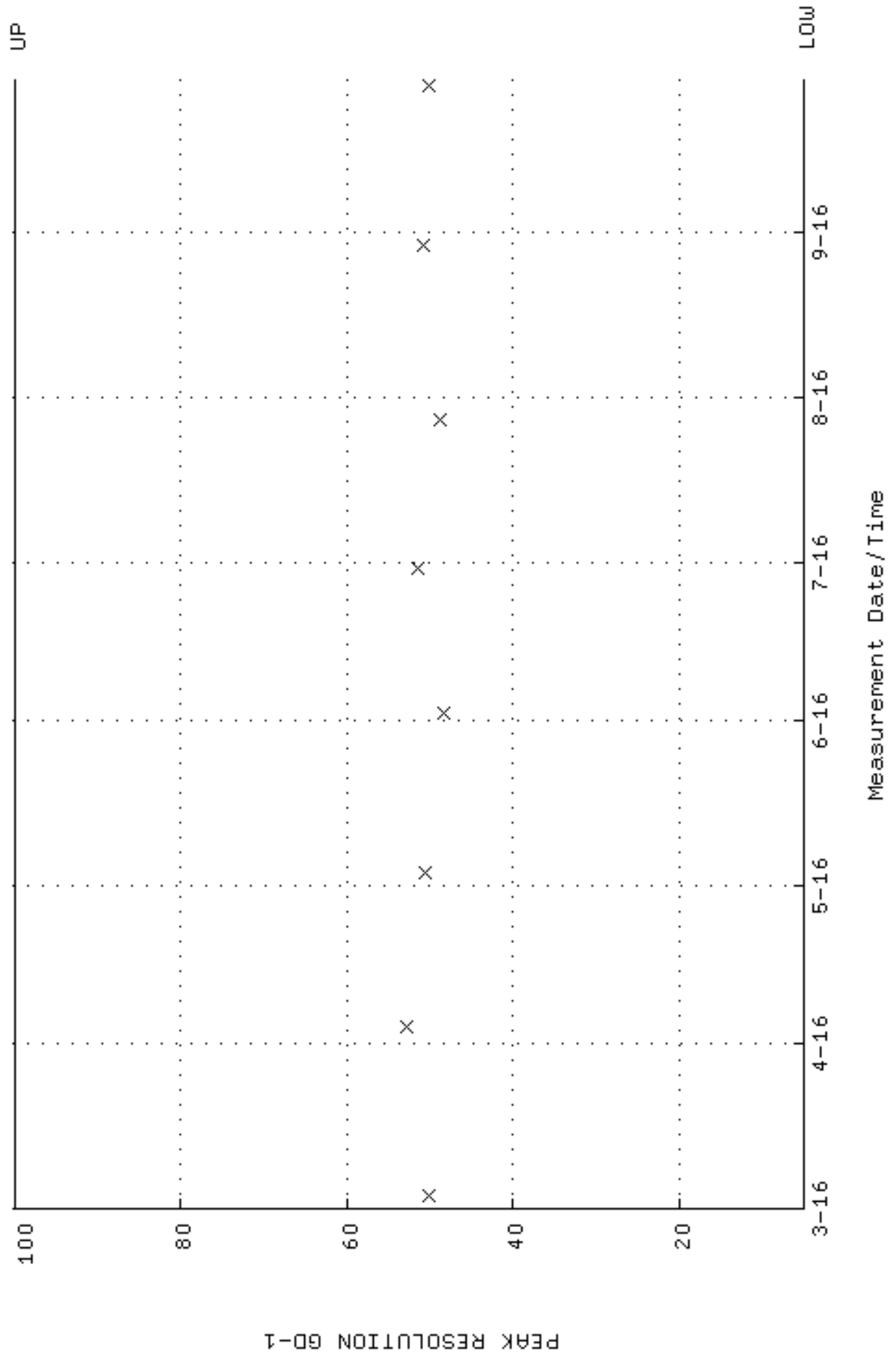
QA filename : DKA100:[ENV_ALPHA.QA.W]W028.QAF;8
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-MAR-2016 08:11:44 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.279800 through 0.297100



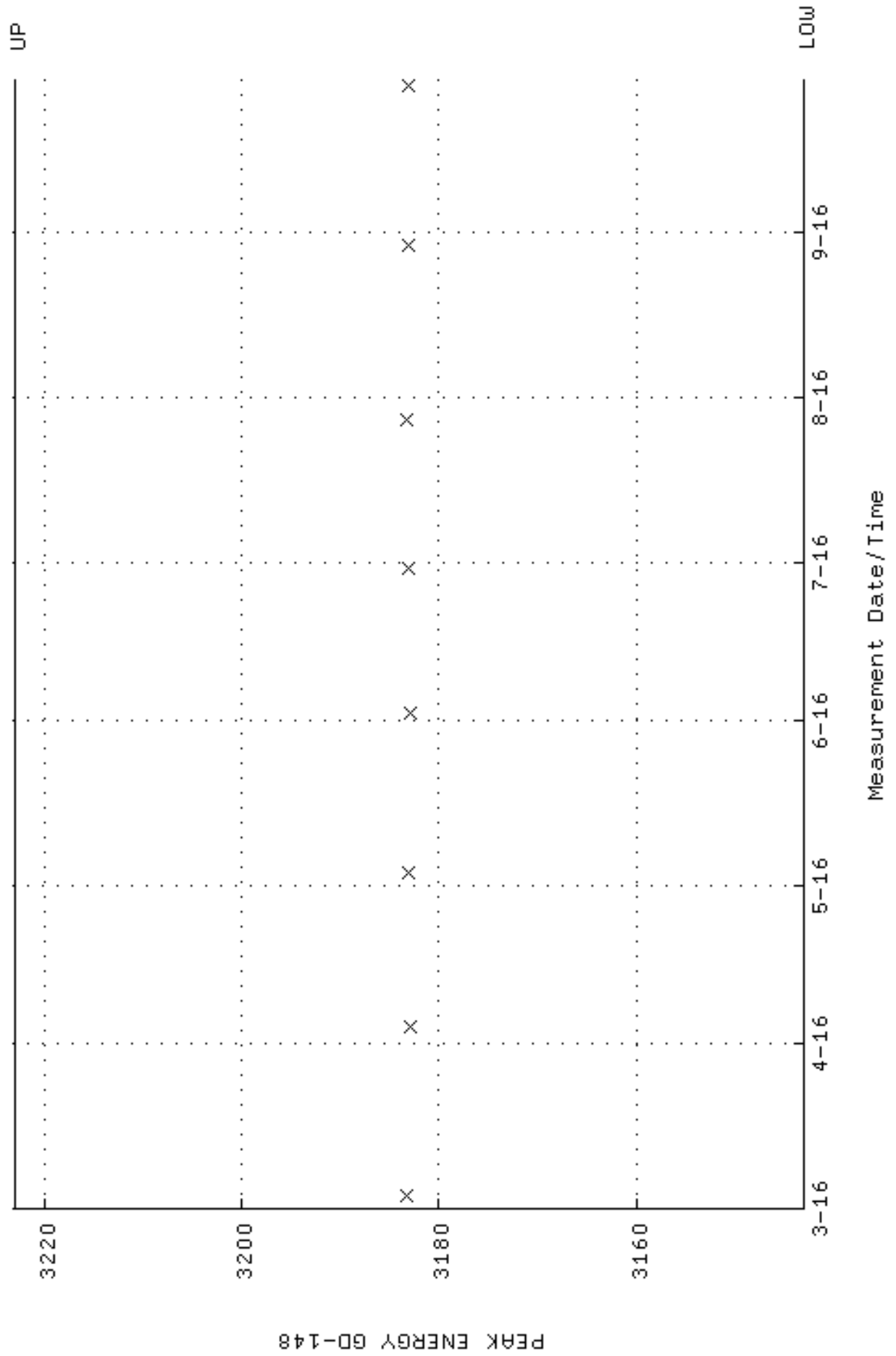
QA filename : DKA100:[ENV_ALPHA.QA.W]W028.QAF;8
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 3-MAR-2016 08:11:44 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



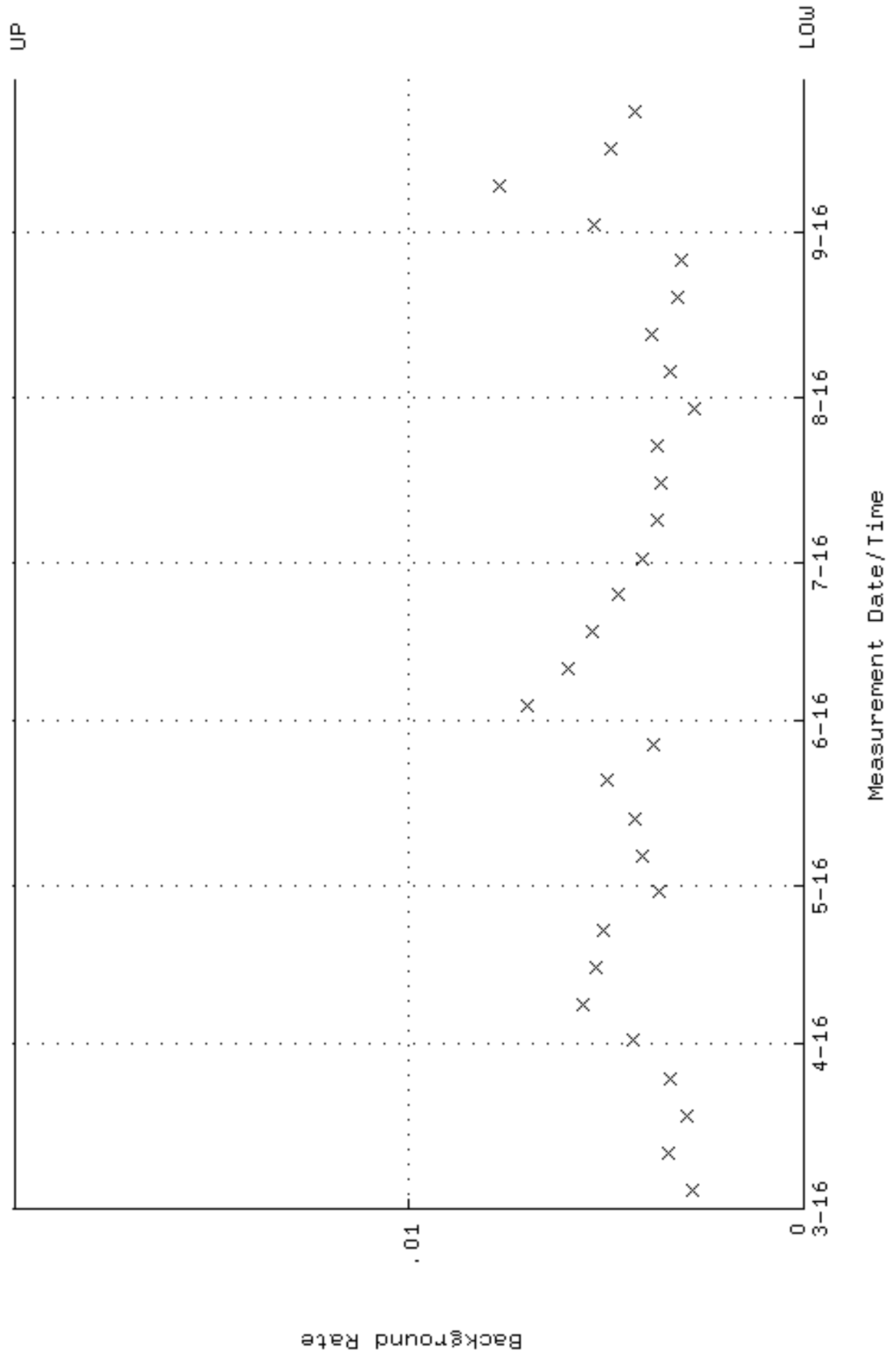
QA filename : DKA100:[ENV_ALPHA.QA.W]W028.QAF;8
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 3-MAR-2016 08:11:44 through 29-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



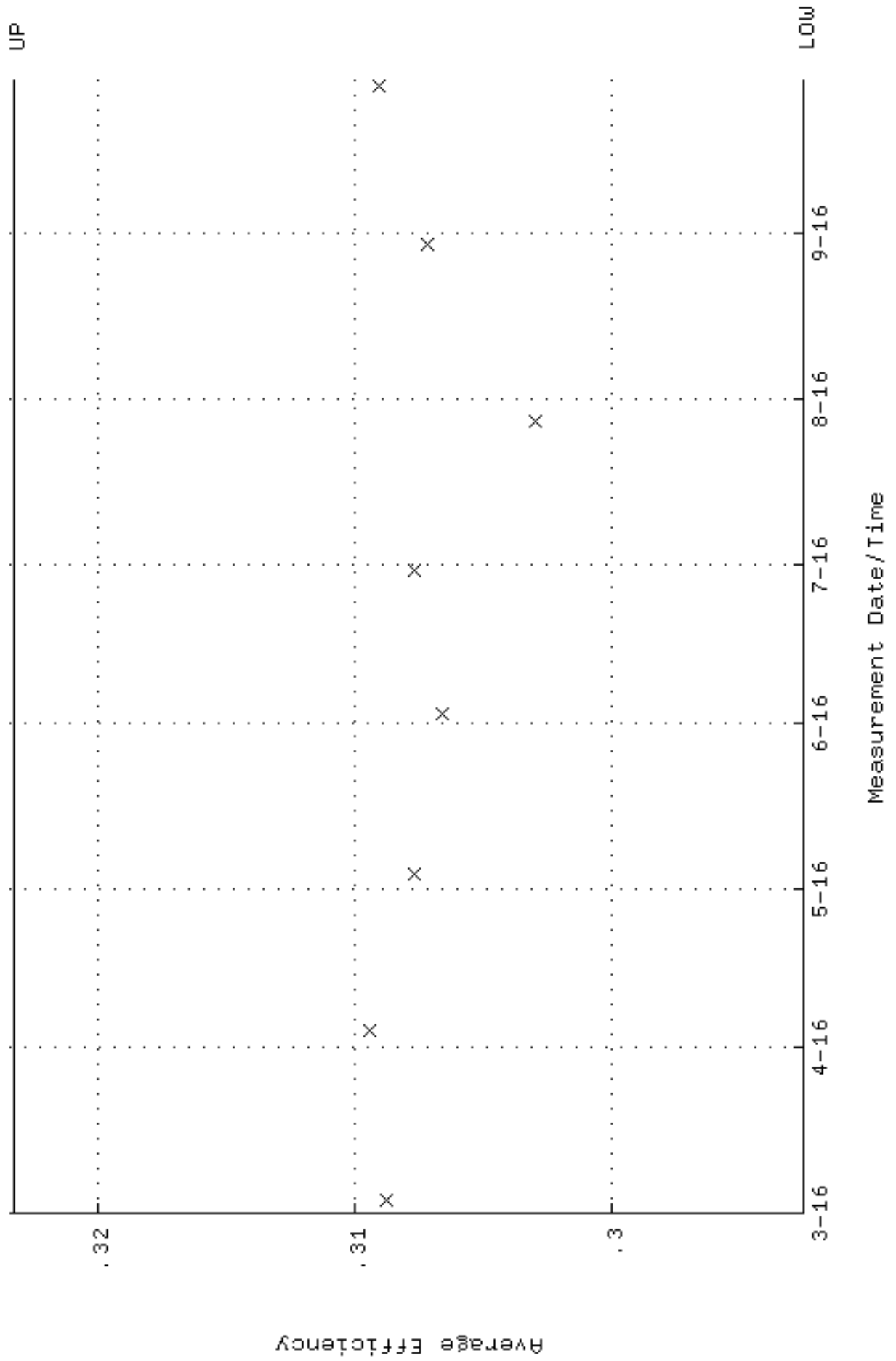
QA filename : DKA100:[ENV_ALPHA.QA.W]W028.QAF;8
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 3-MAR-2016 08:11:44 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



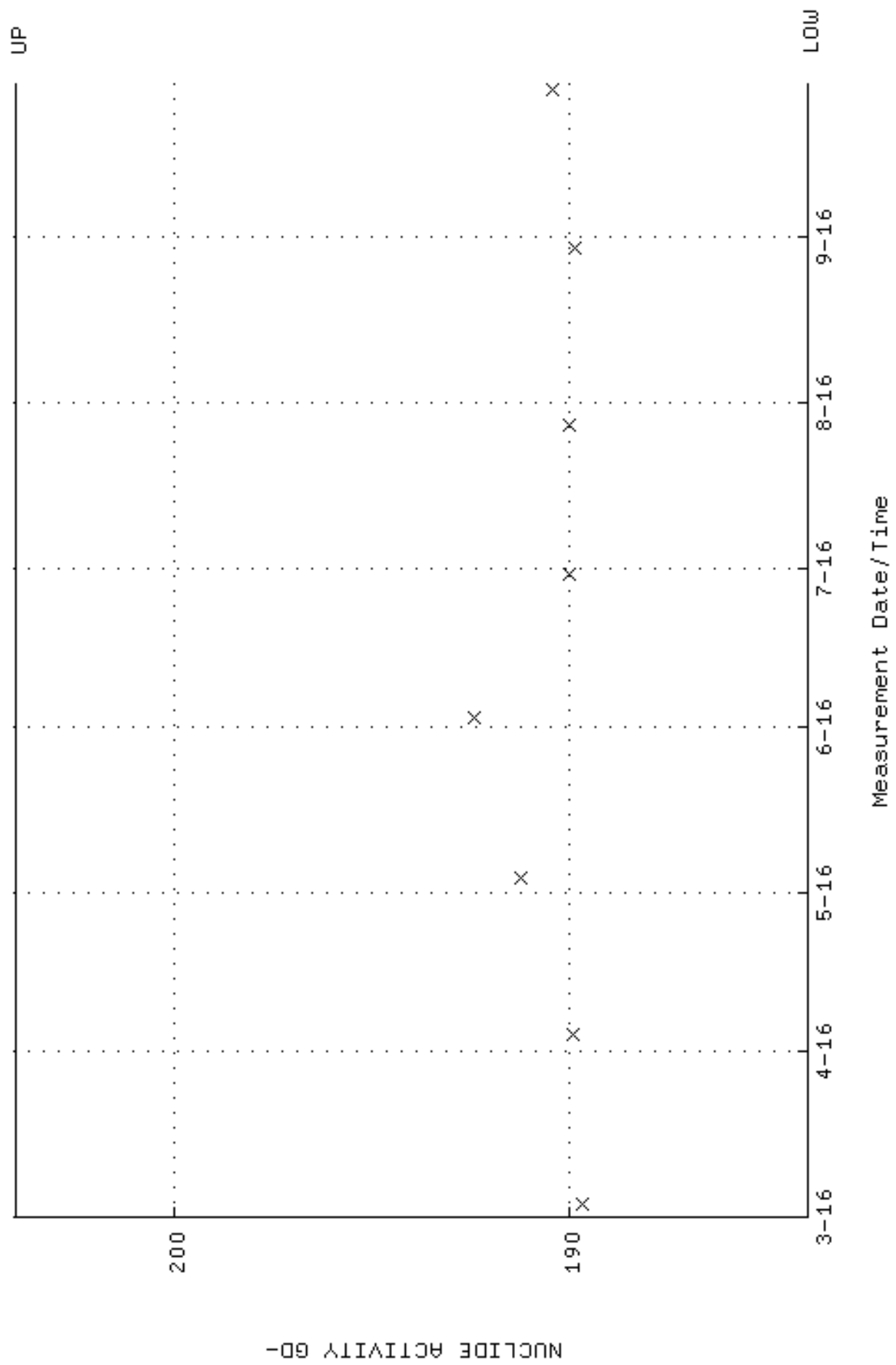
QA filename : DKA100:[ENV_ALPHA.QA.B]B028.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:49:26 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



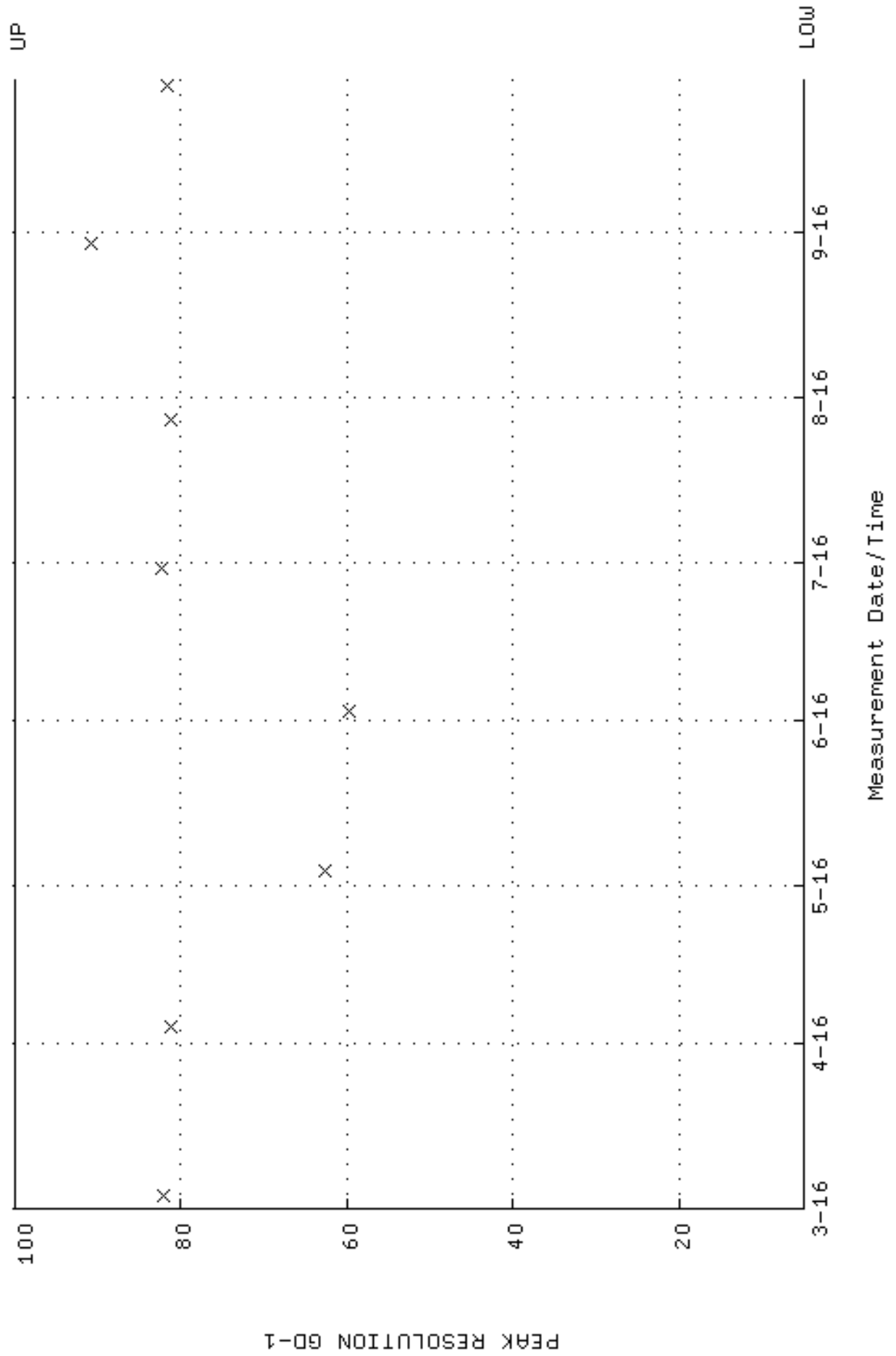
QA filename : DKA100:[ENV_ALPHA.QA.W]W029.QAF;11
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-MAR-2016 14:39:28 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.292500 through 0.323350



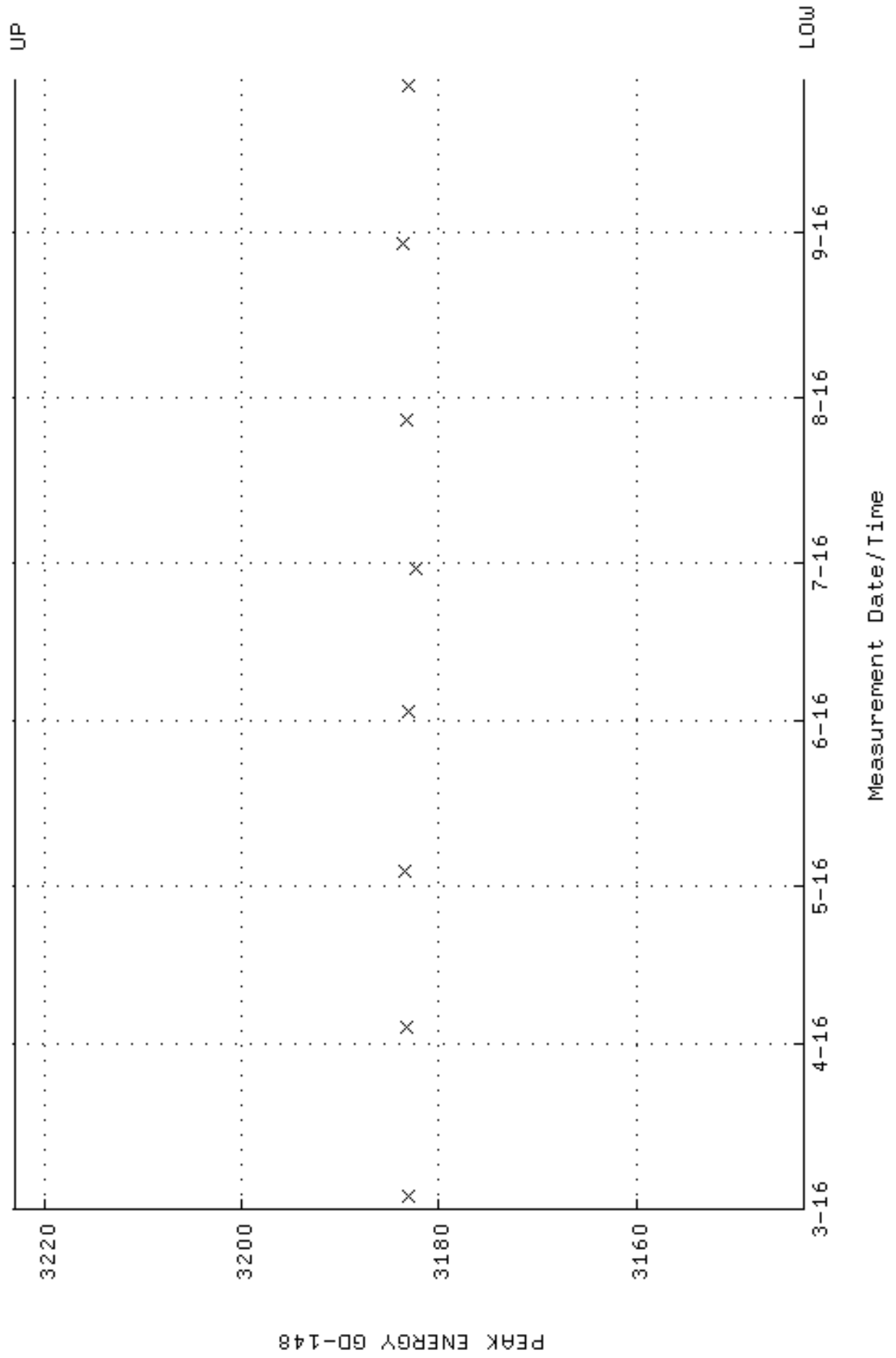
QA filename : DKA100:[ENV_ALPHA.QA.W]W029.QAF;11
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 3-MAR-2016 14:39:28 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



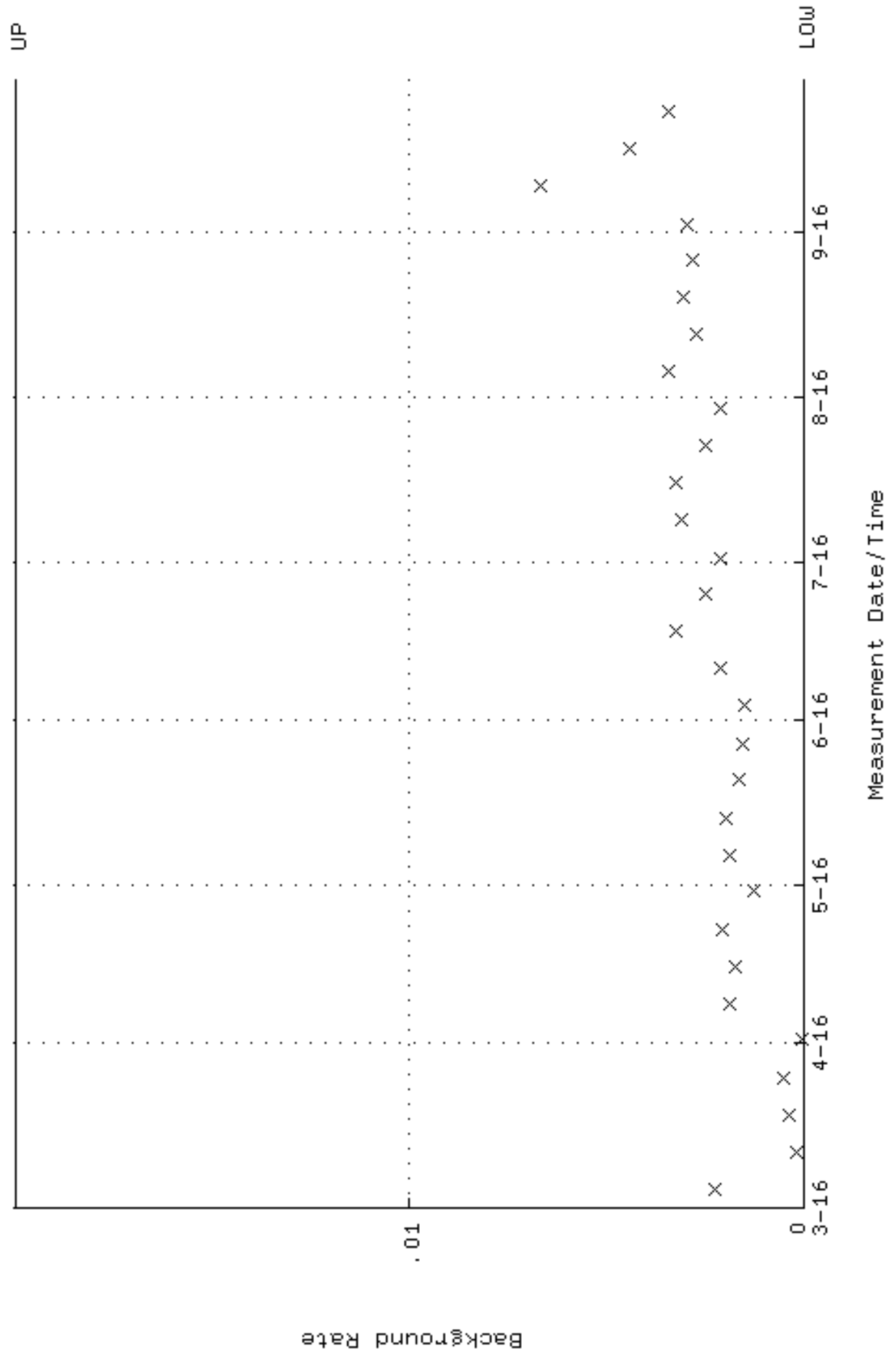
QA filename : DKA100:[ENV_ALPHA.QA.W]W029.QAF;11
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 3-MAR-2016 14:39:28 through 29-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



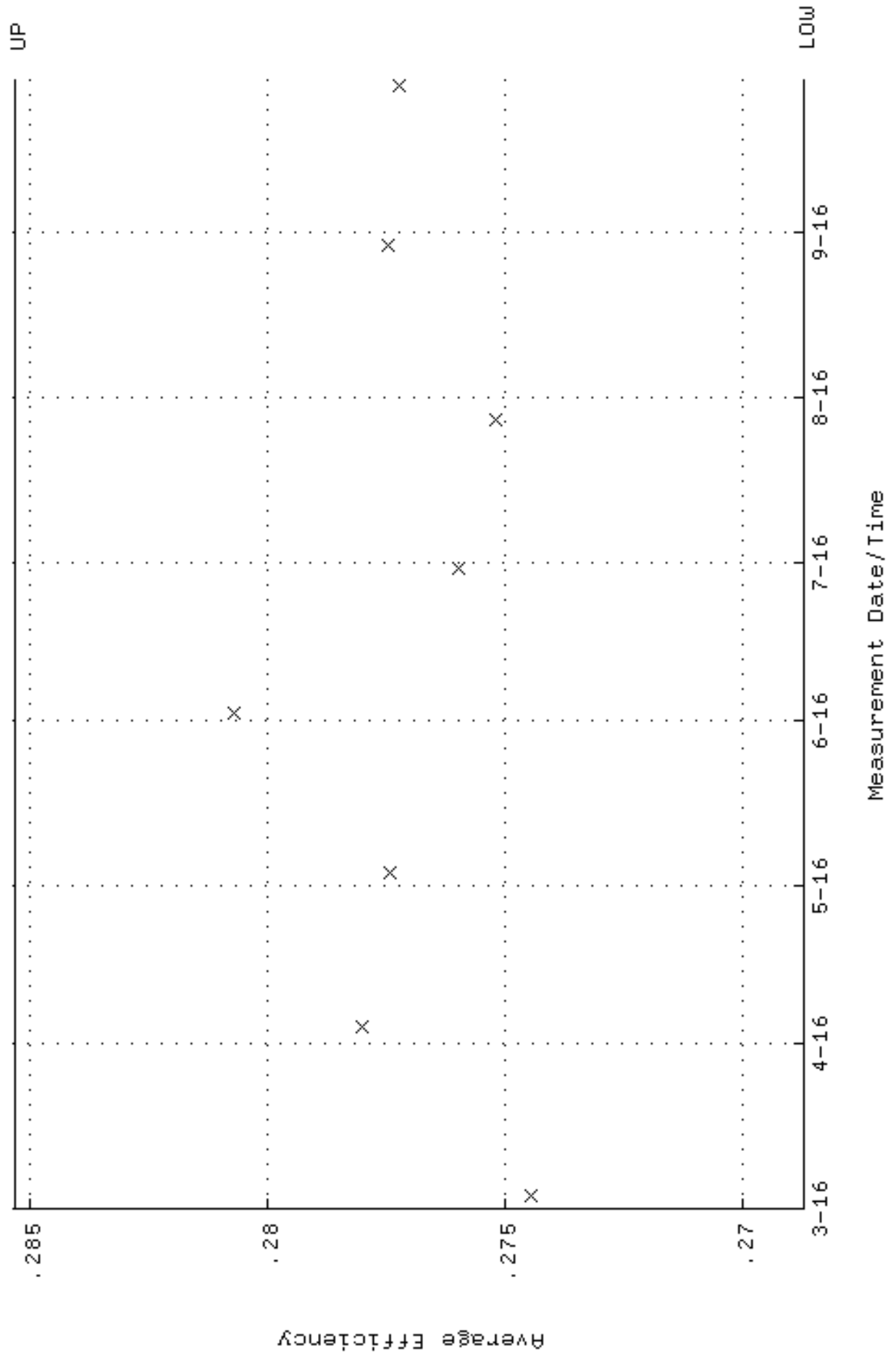
QA filename : DKA100:[ENV_ALPHA.QA.W]W029.QAF;11
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 3-MAR-2016 14:39:28 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



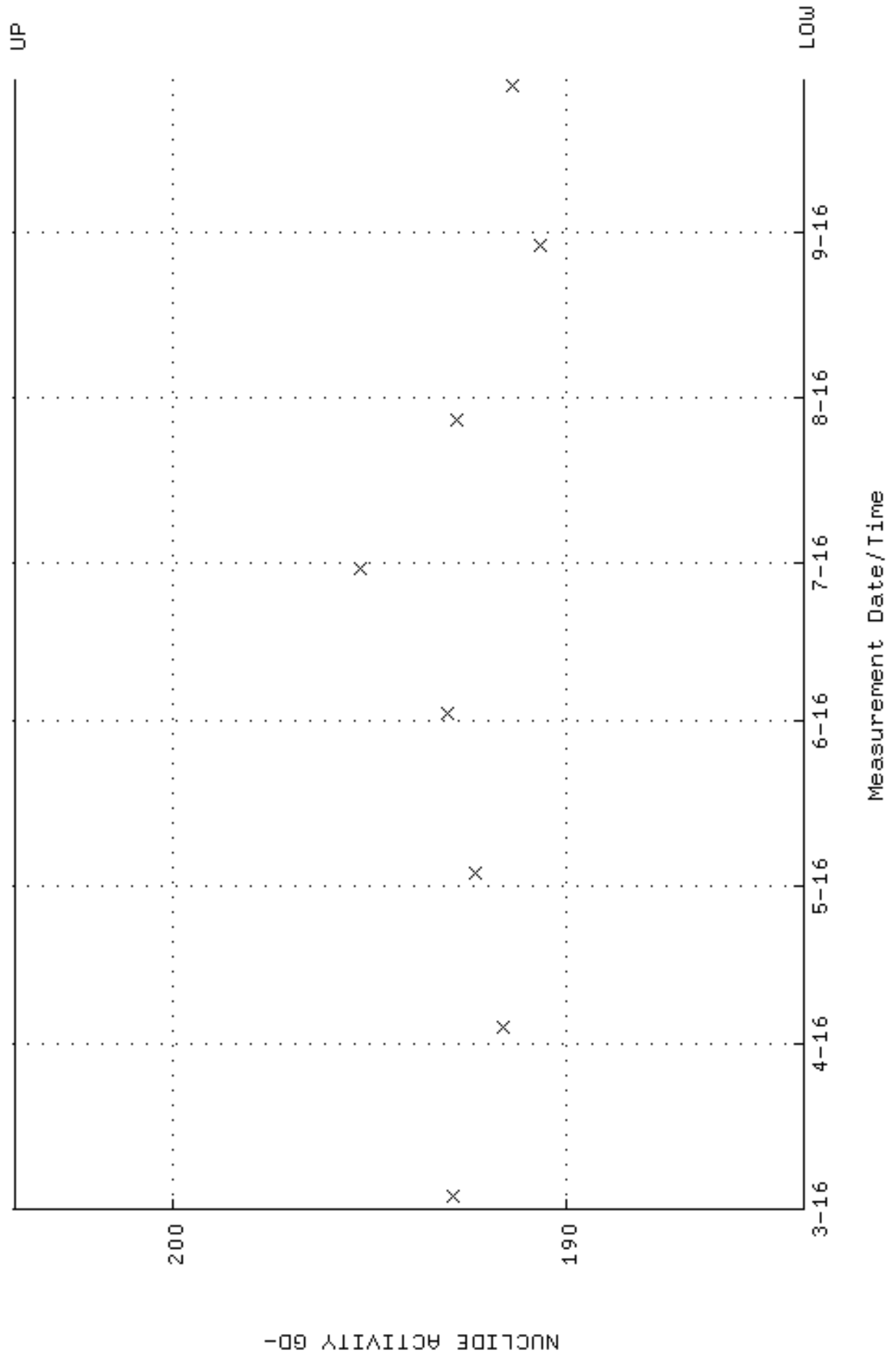
QA filename : DKA100:[ENV_ALPHA.QA.B]B029.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:49:26 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



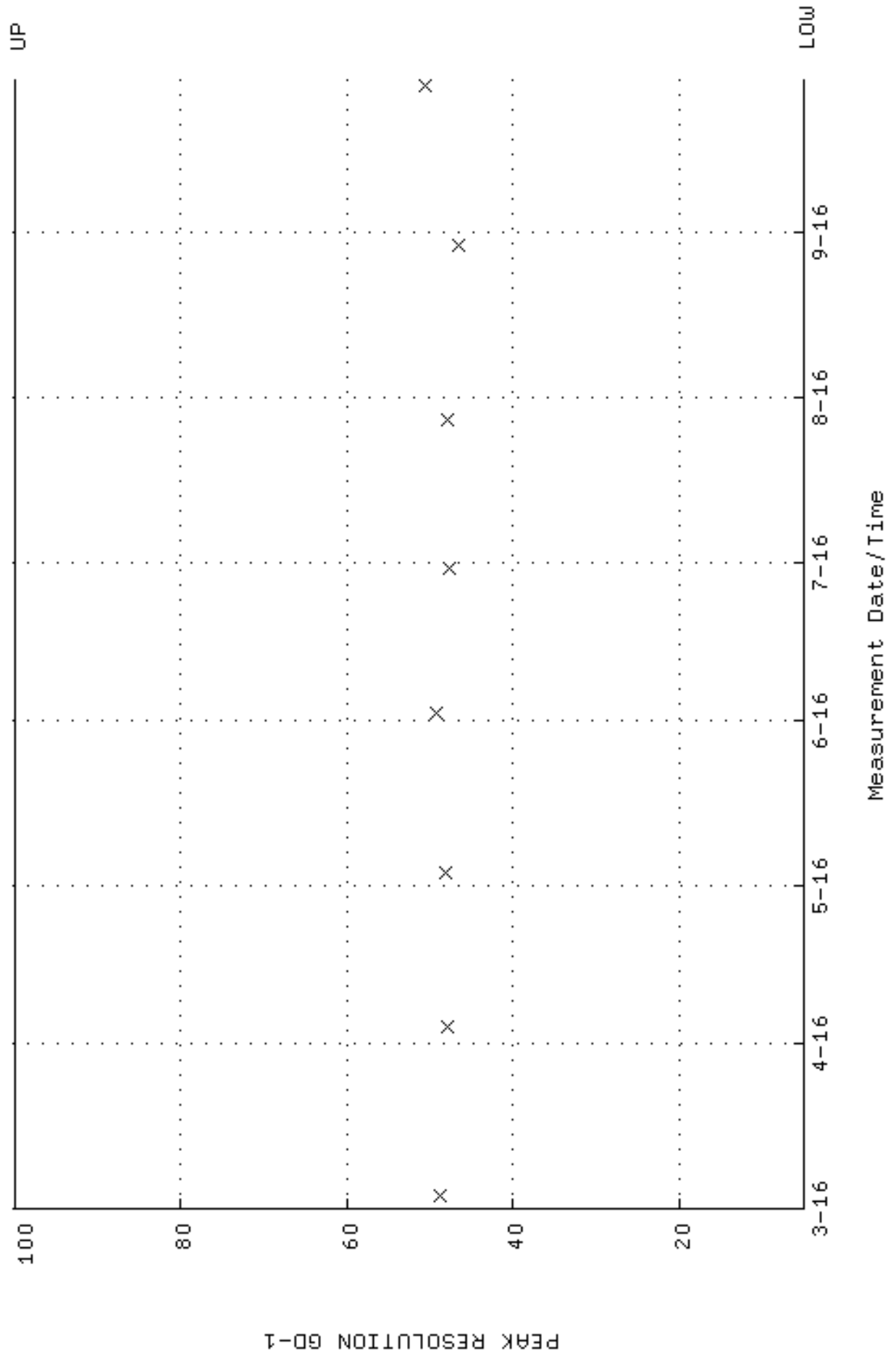
QA filename : DKA100:[ENV_ALPHA.QA.W]W032.QAF;7
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-MAR-2016 08:11:46 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.268707 through 0.285329



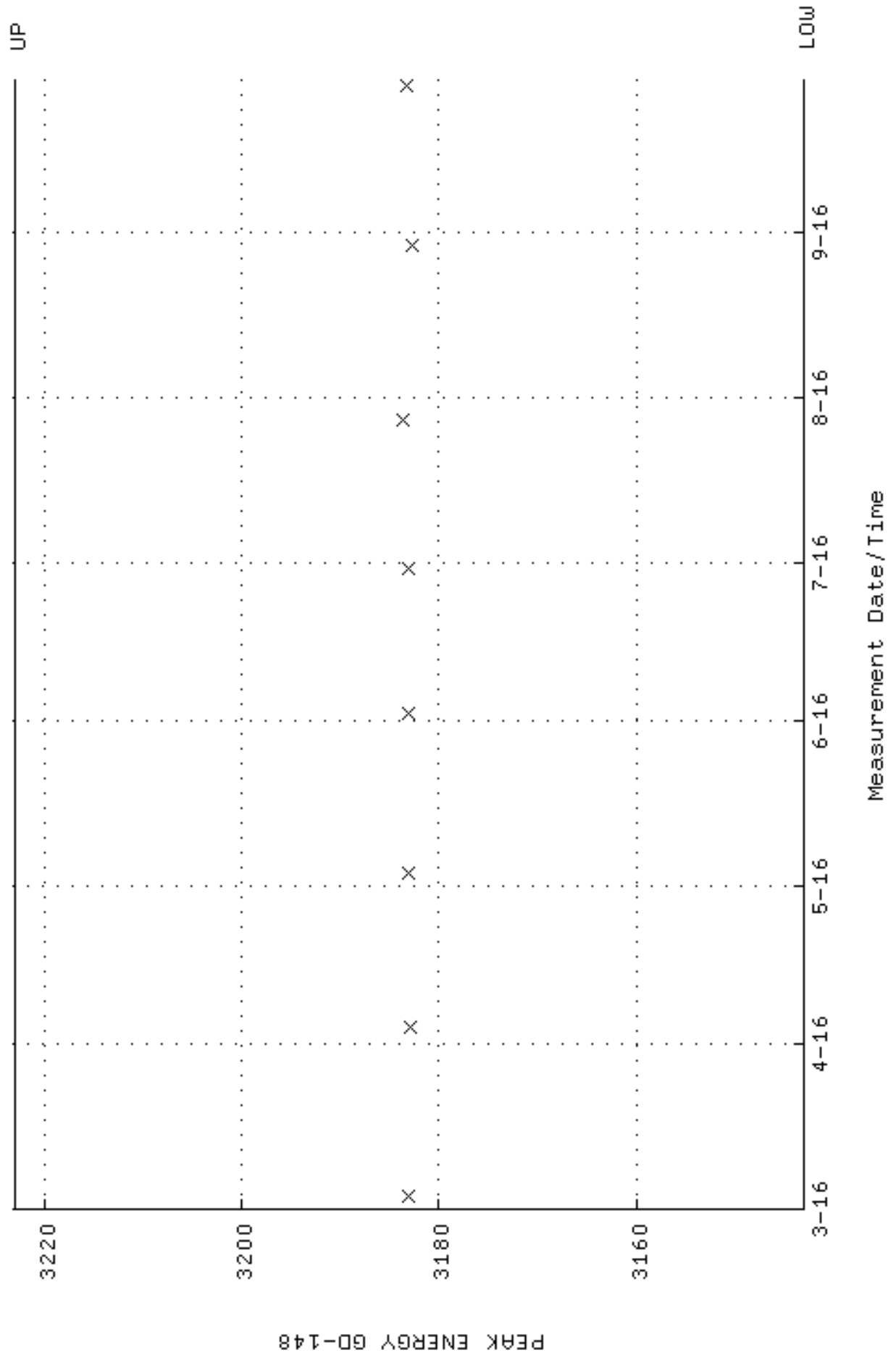
QA filename : DKA100:[ENV_ALPHA.QA.W]W032.QAF;7
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 3-MAR-2016 08:11:46 through 29-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



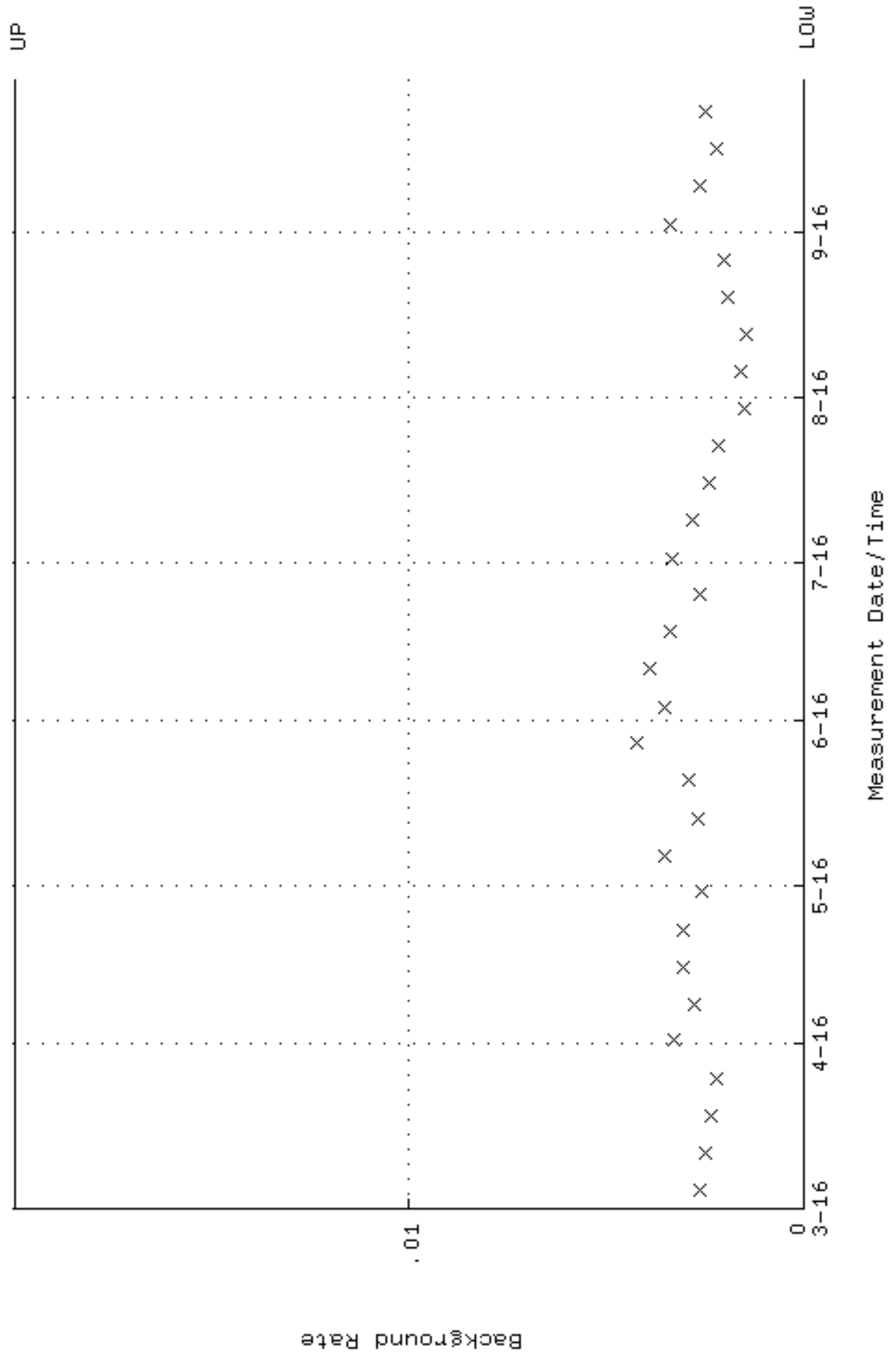
QA filename : DKA100:[ENV_ALPHA.QA.W]W032.QAF;7
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 3-MAR-2016 08:11:46 through 29-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



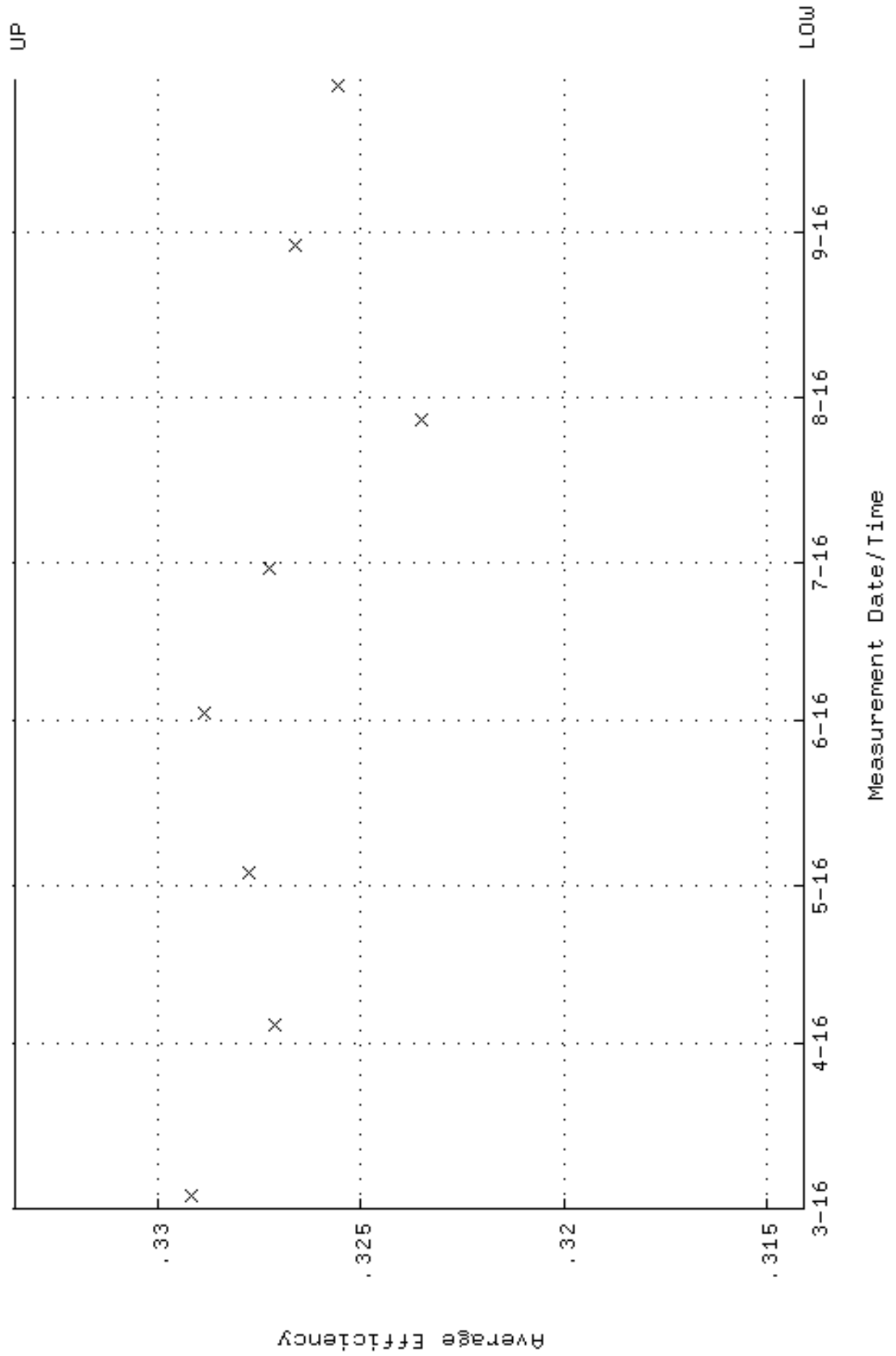
QA filename : DKA100:[ENV_ALPHA.QA.W]W032.QAF;7
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 3-MAR-2016 08:11:46 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



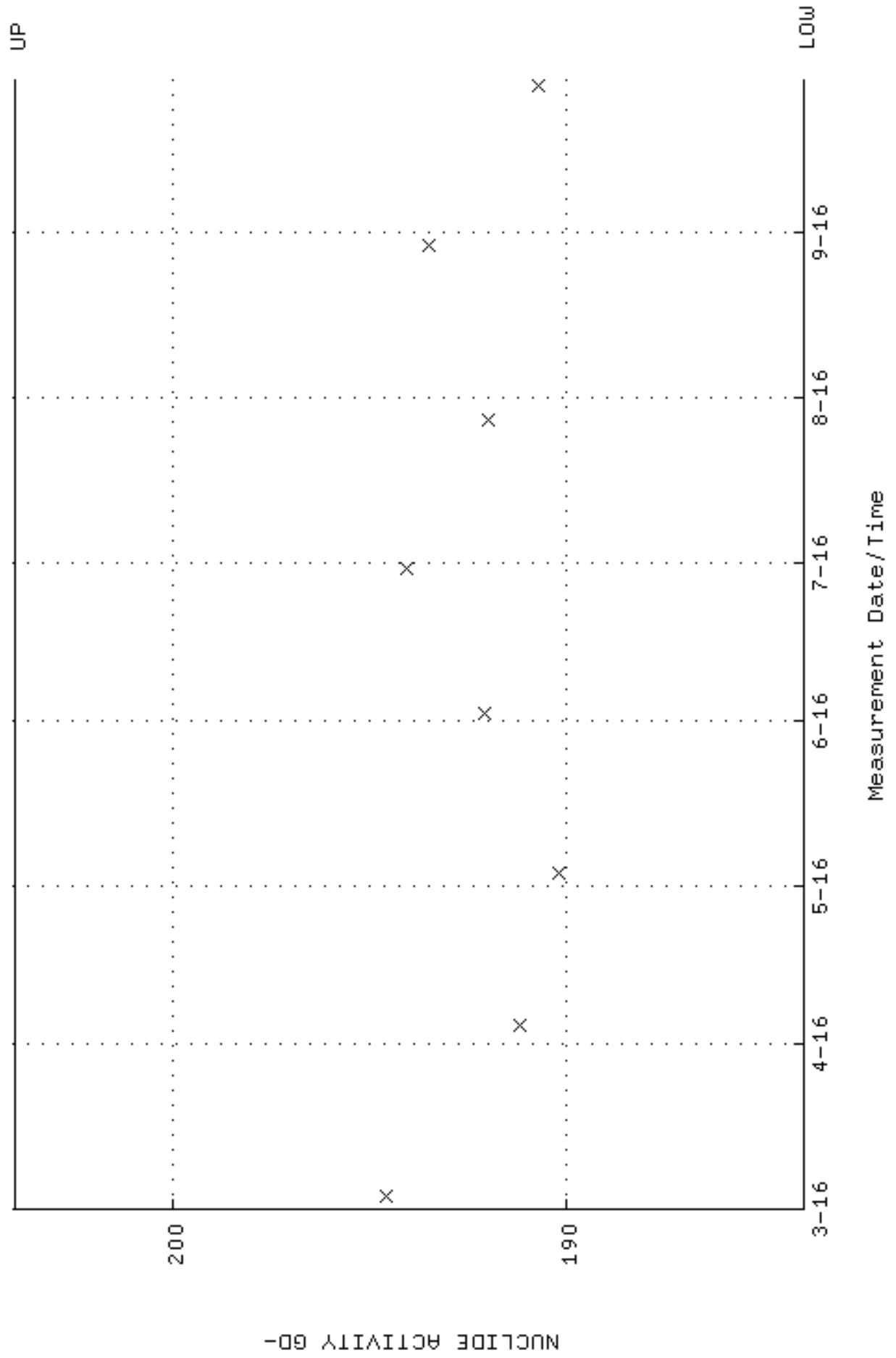
QA filename : DKA100:[ENV_ALPHA.QA.B]B032.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:49:34 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



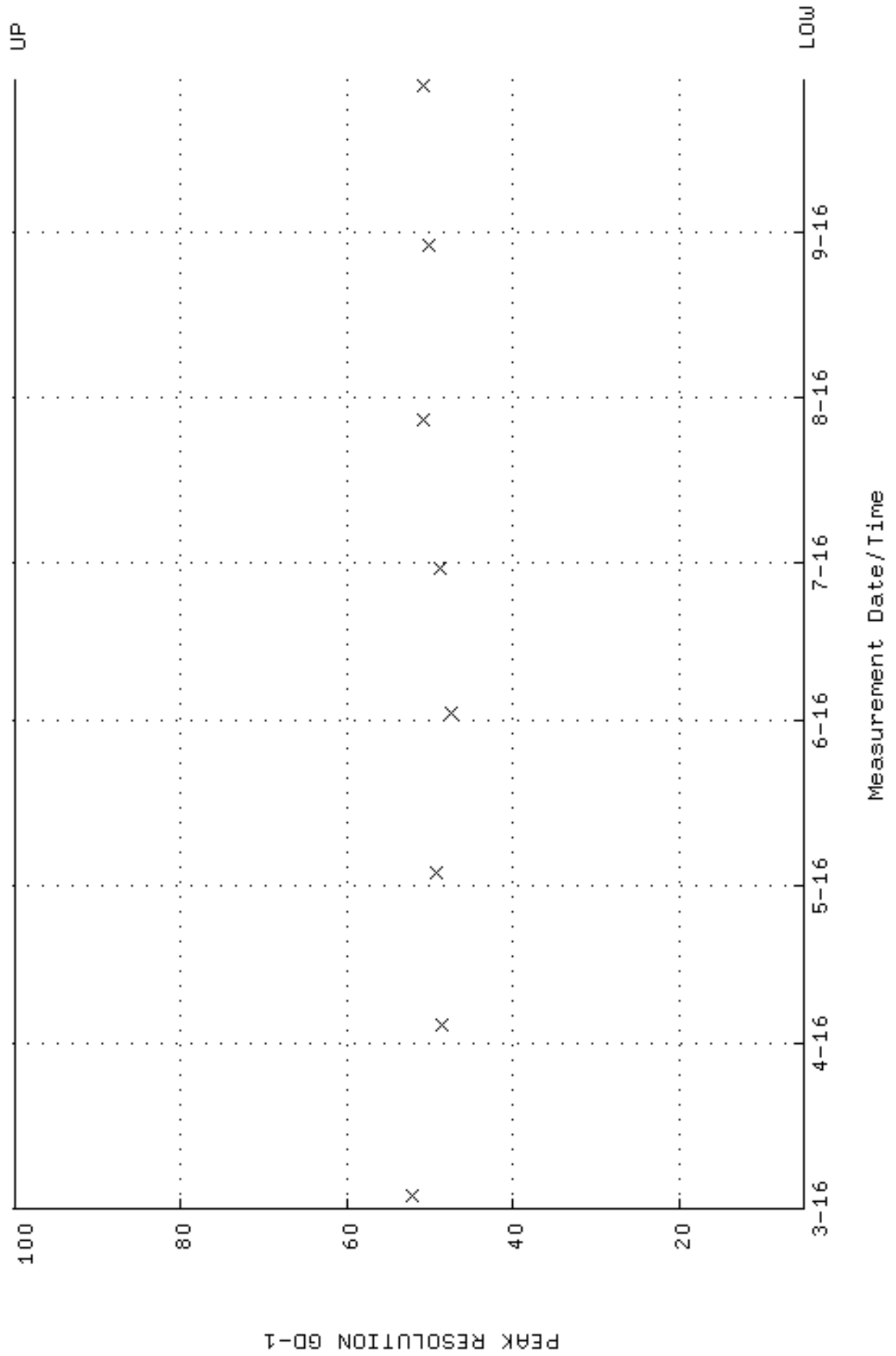
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 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-MAR-2016 08:11:46 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.314090 through 0.333520



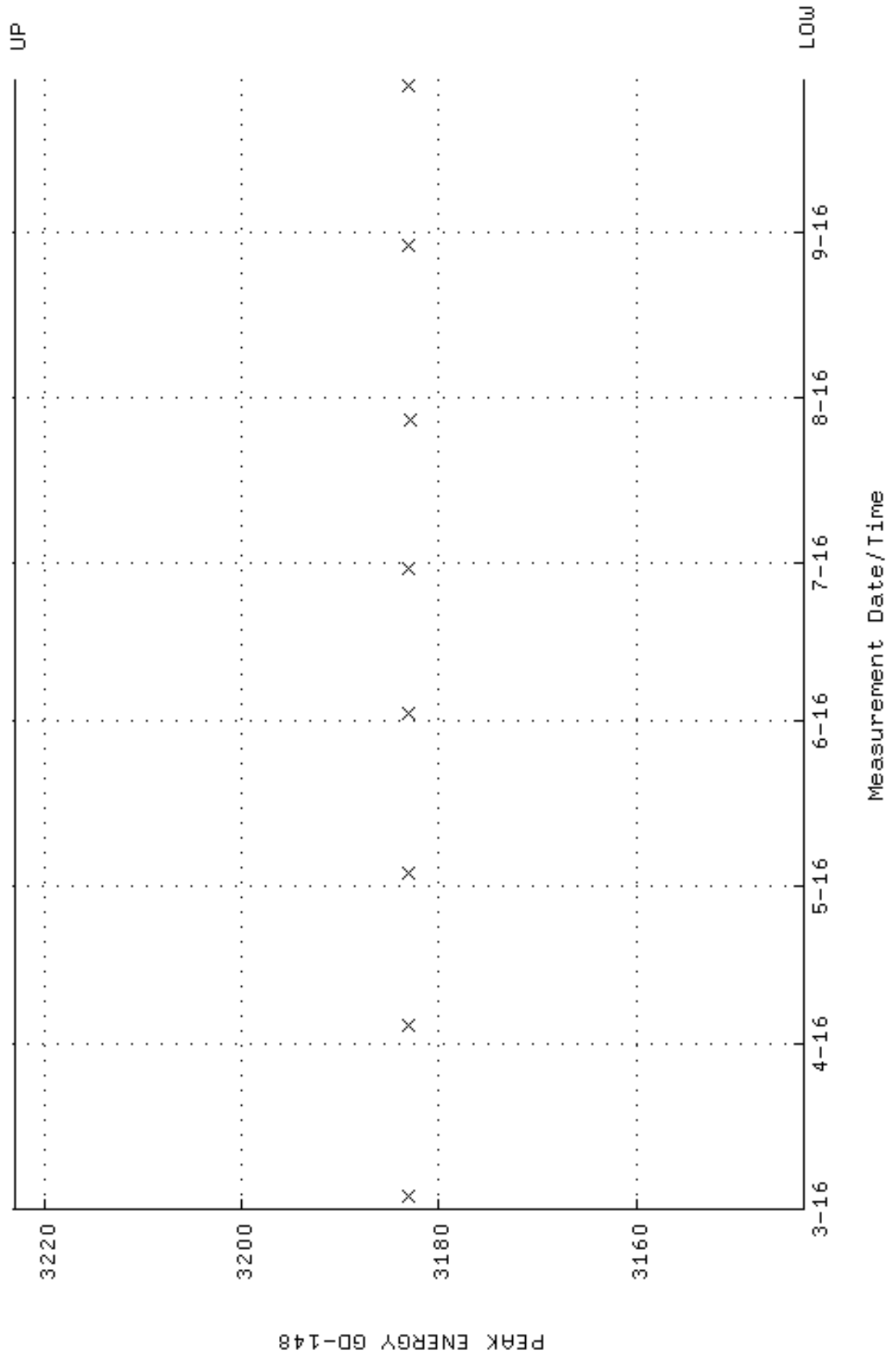
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Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 3-MAR-2016 08:11:46 through 29-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



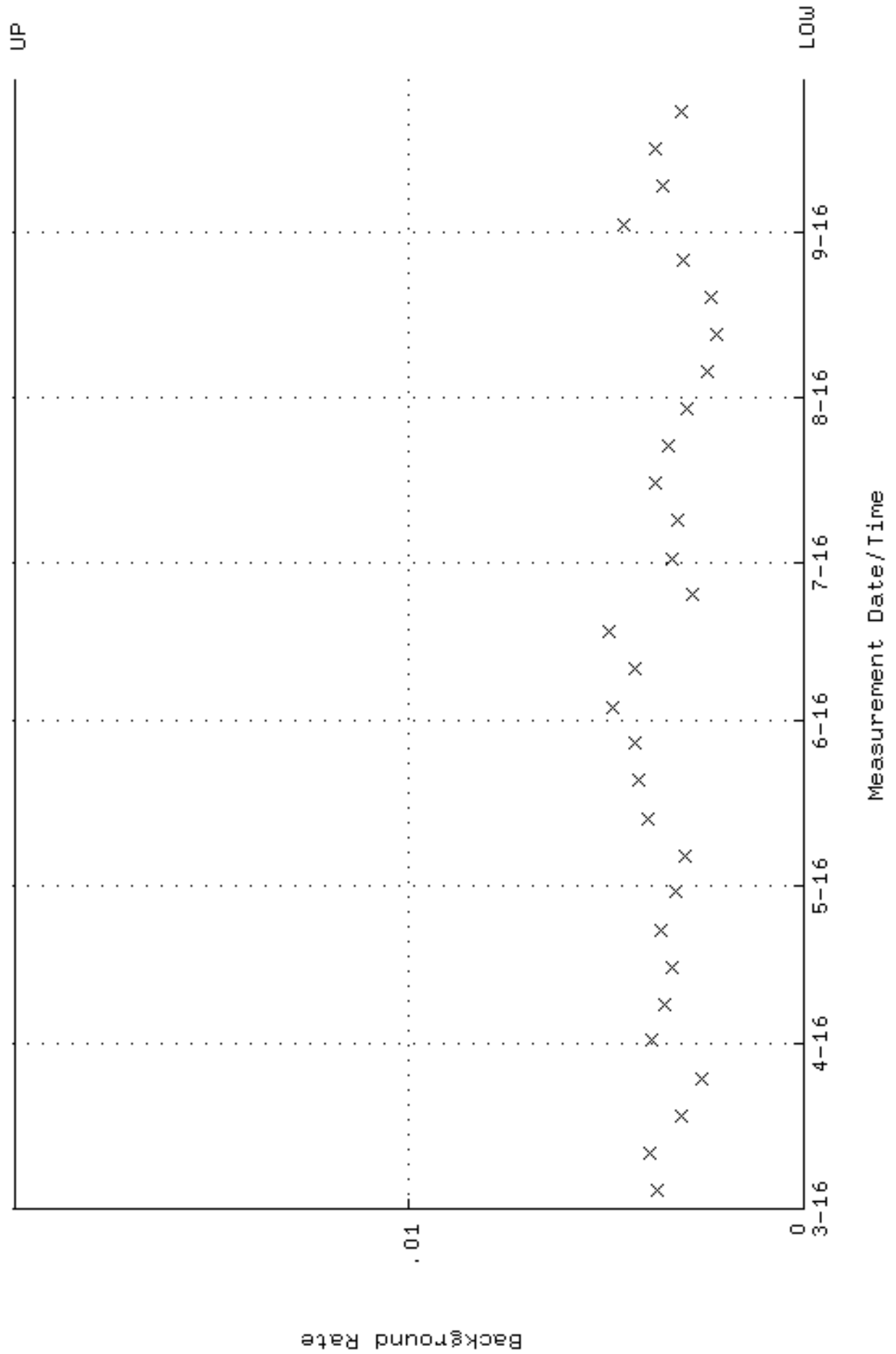
QA filename : DKA100:[ENV_ALPHA.QA.W]W033.QAF;7
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 3-MAR-2016 08:11:46 through 29-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



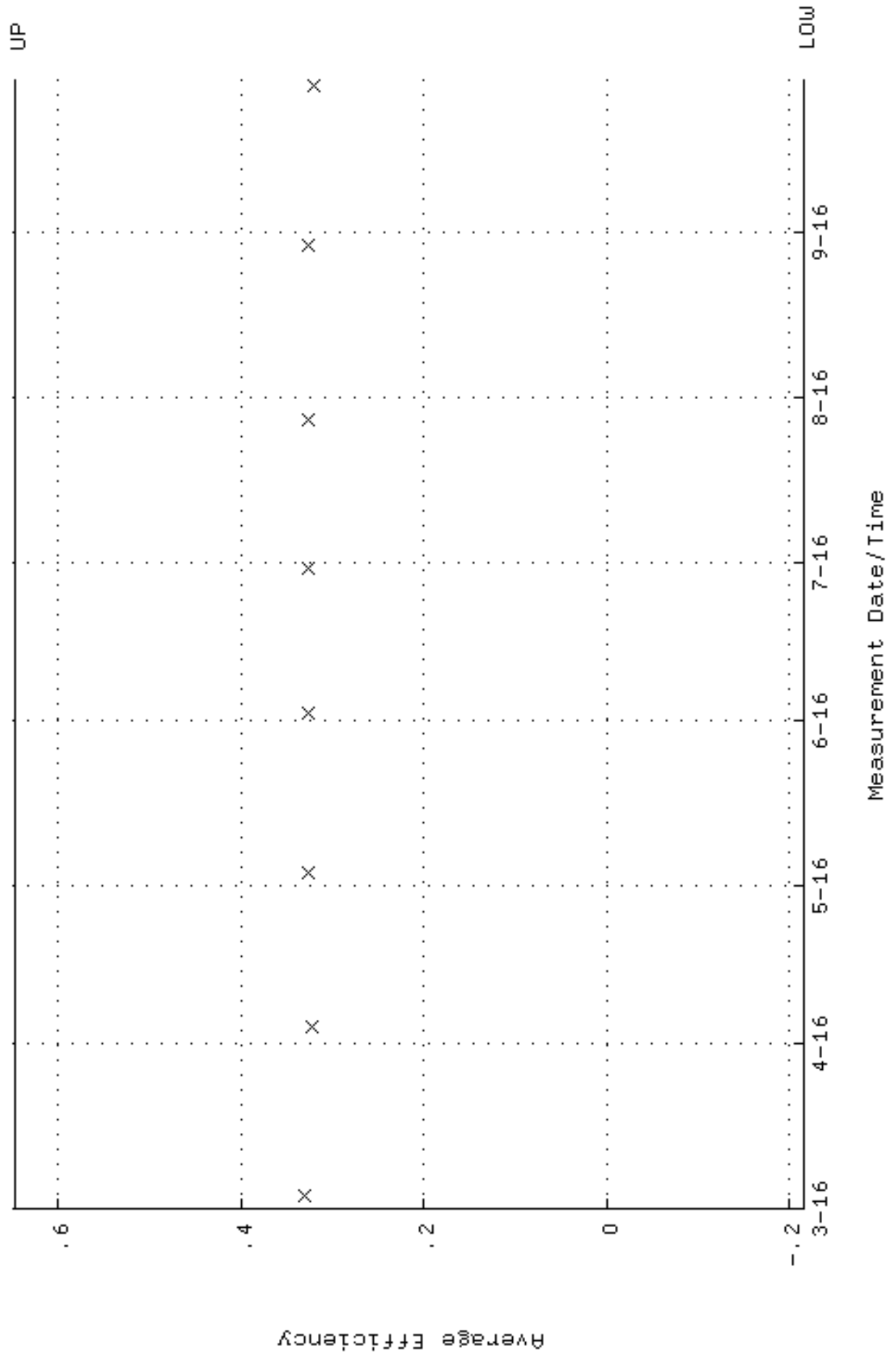
QA filename : DKA100:[ENV_ALPHA.QA.W]W033.QAF;7
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 3-MAR-2016 08:11:46 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



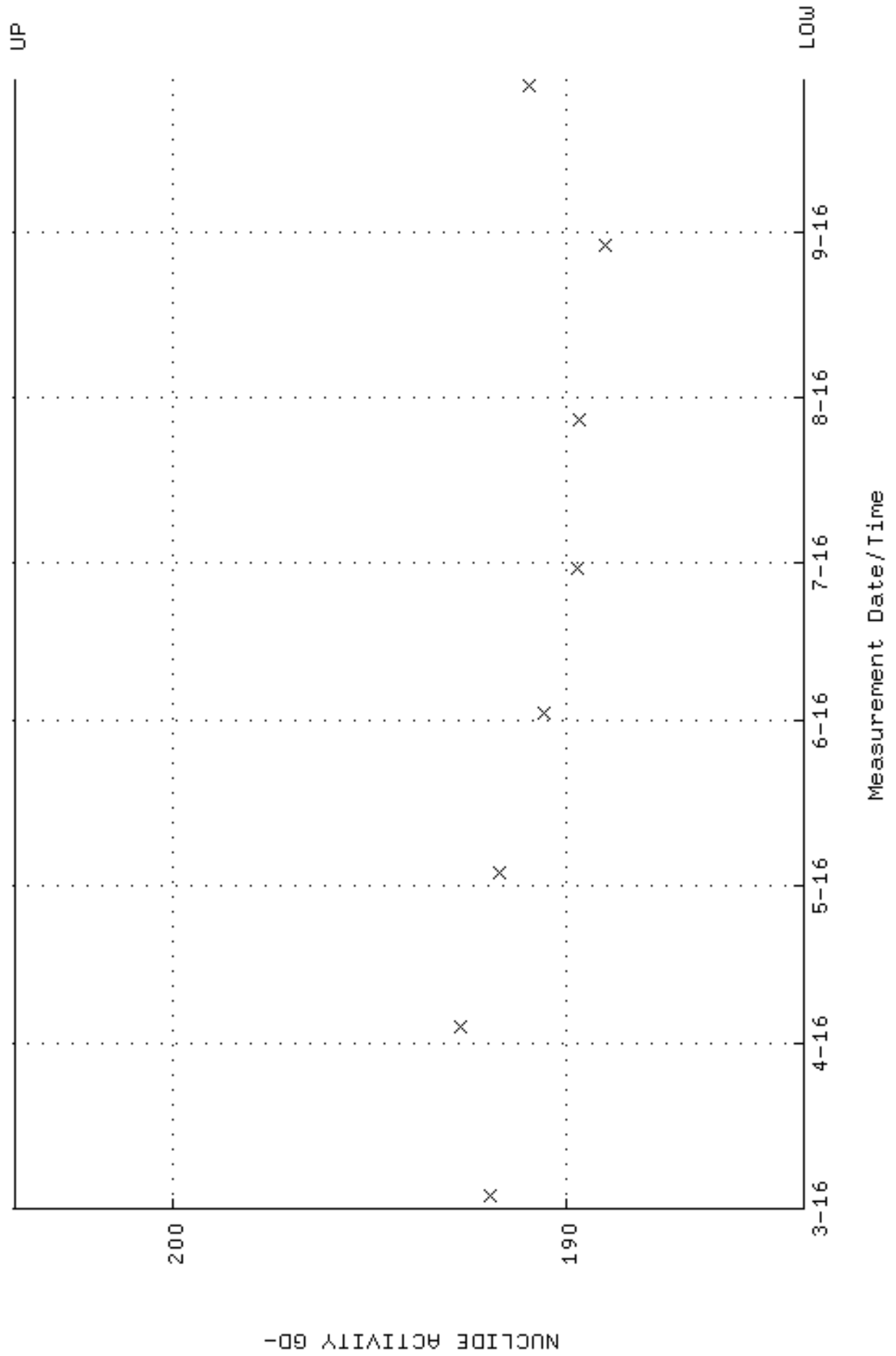
QA filename : DKA100:[ENV_ALPHA.QA.B]B033.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:49:34 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



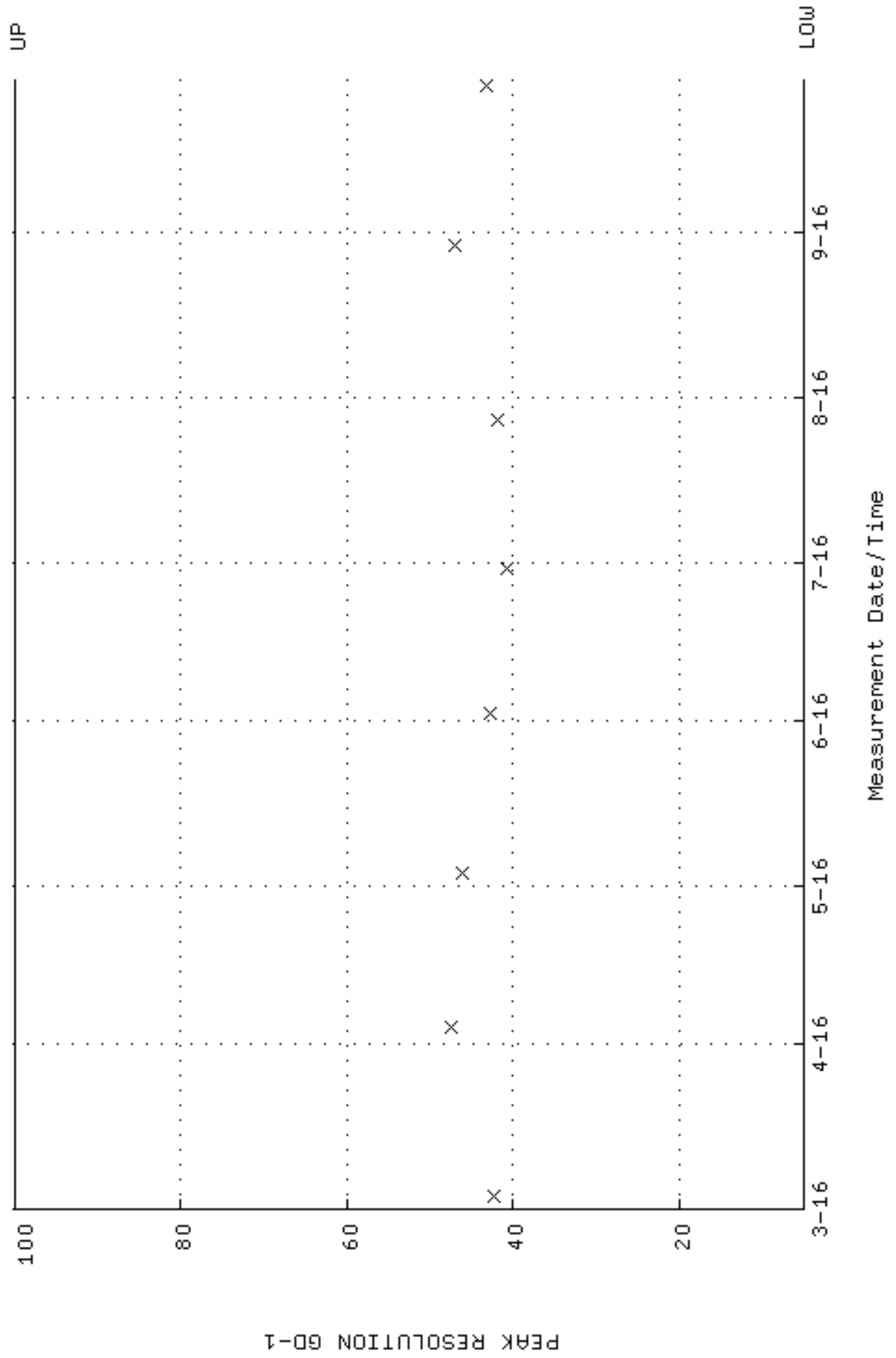
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 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-MAR-2016 08:11:46 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: -0.216325 through 0.647405



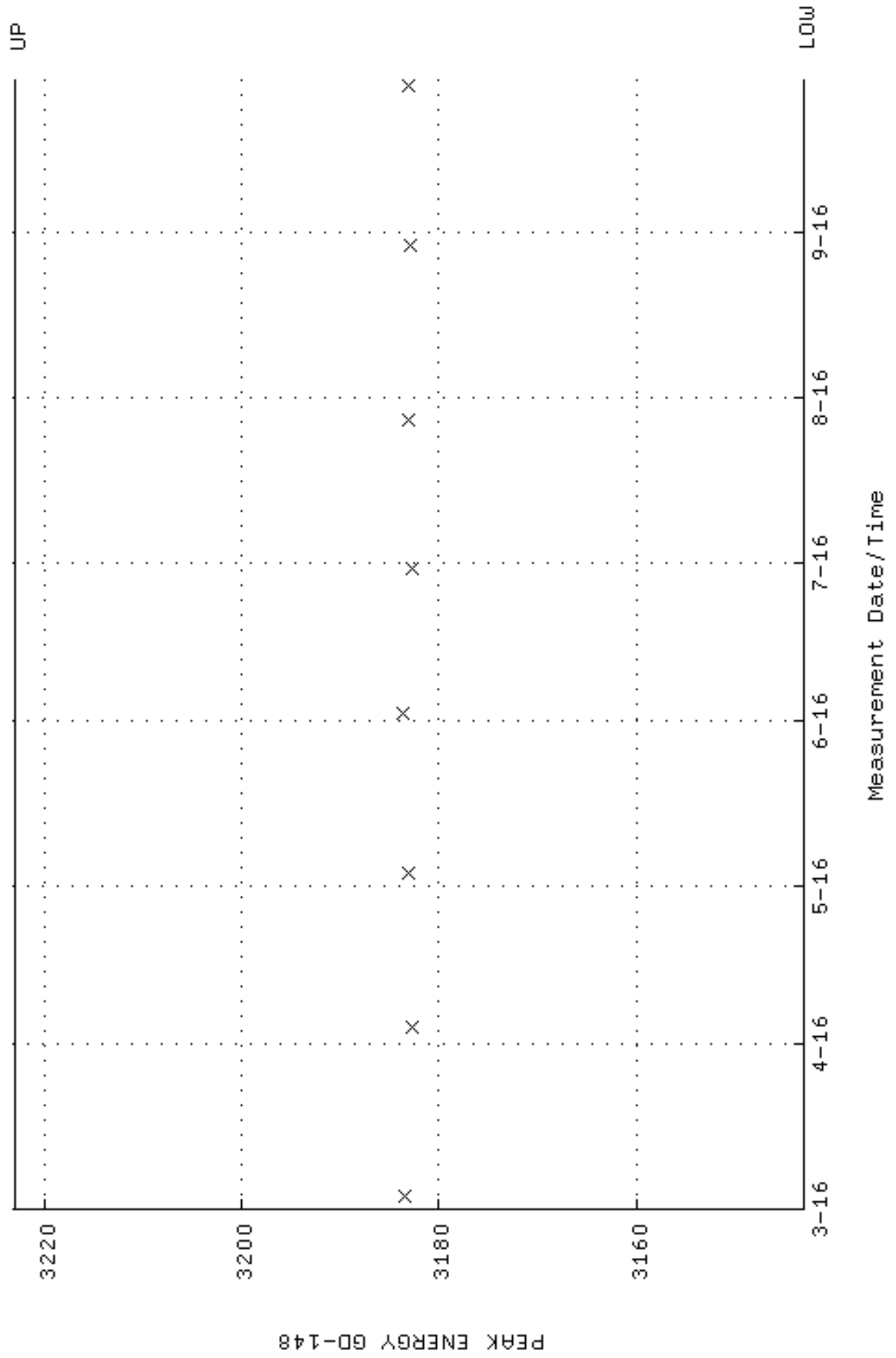
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Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 3-MAR-2016 08:11:46 through 29-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



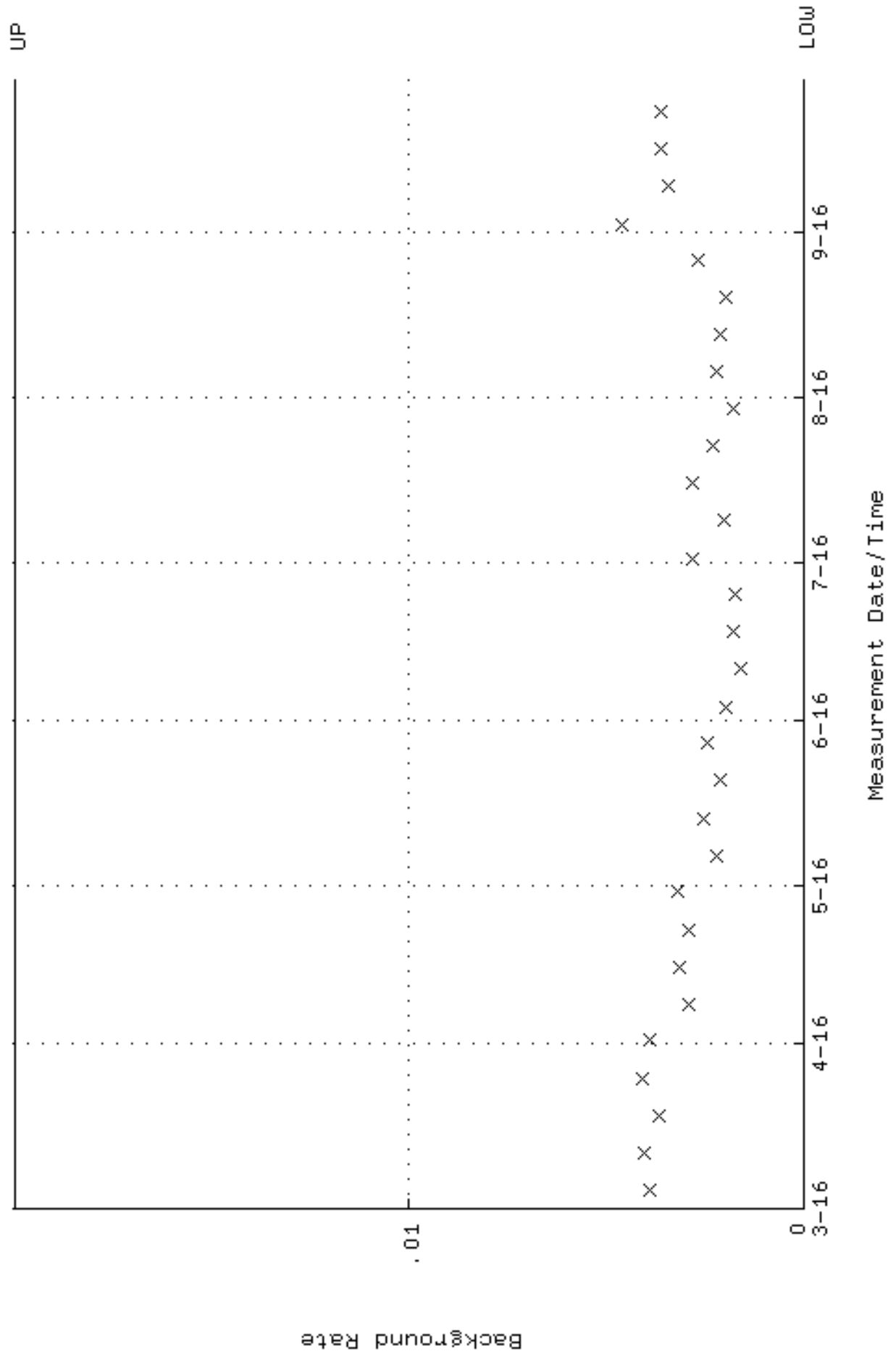
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Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 3-MAR-2016 08:11:46 through 29-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



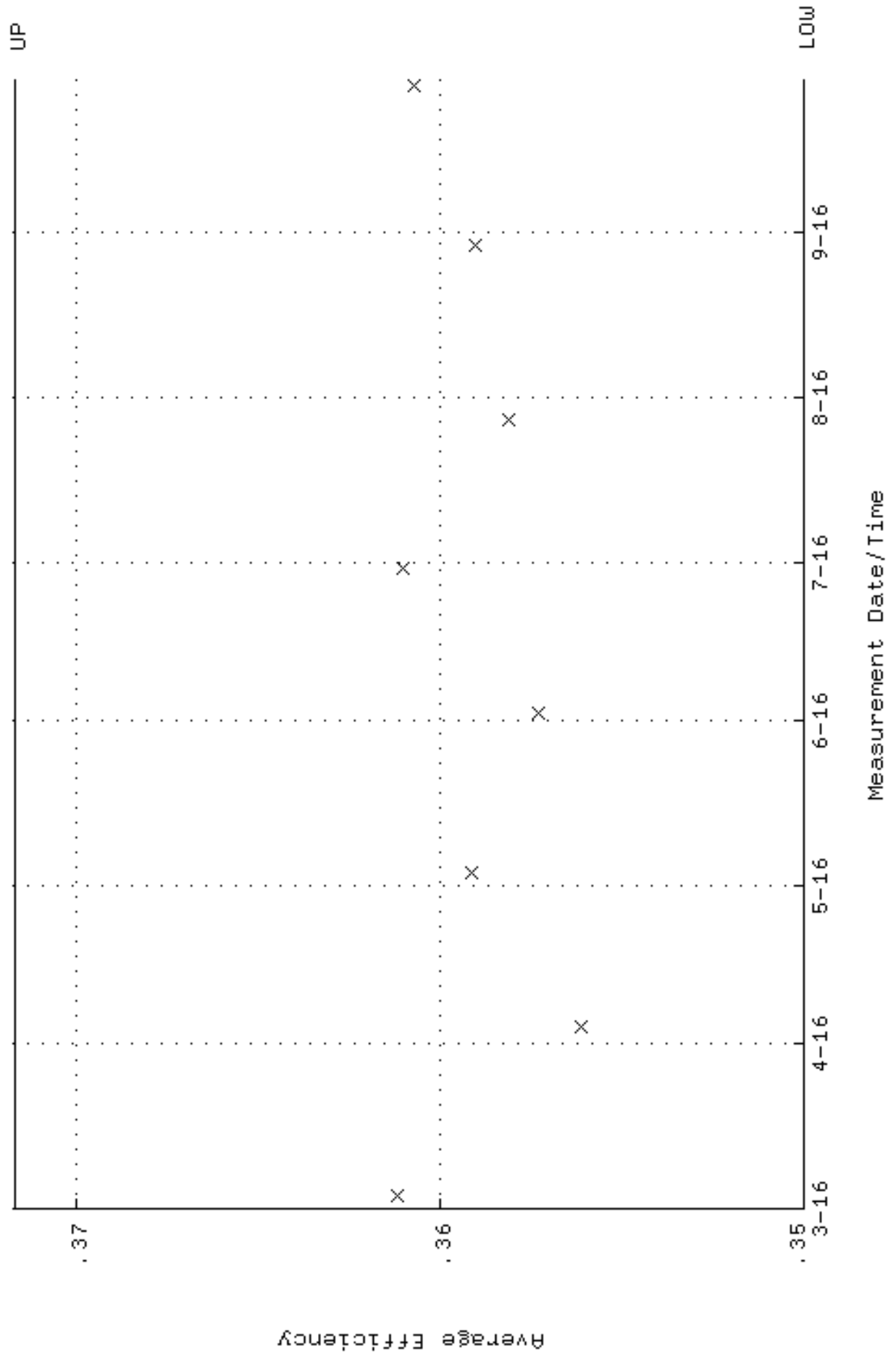
QA filename : DKA100:[ENV_ALPHA.QA.W]W034.QAF;7
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 3-MAR-2016 08:11:46 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



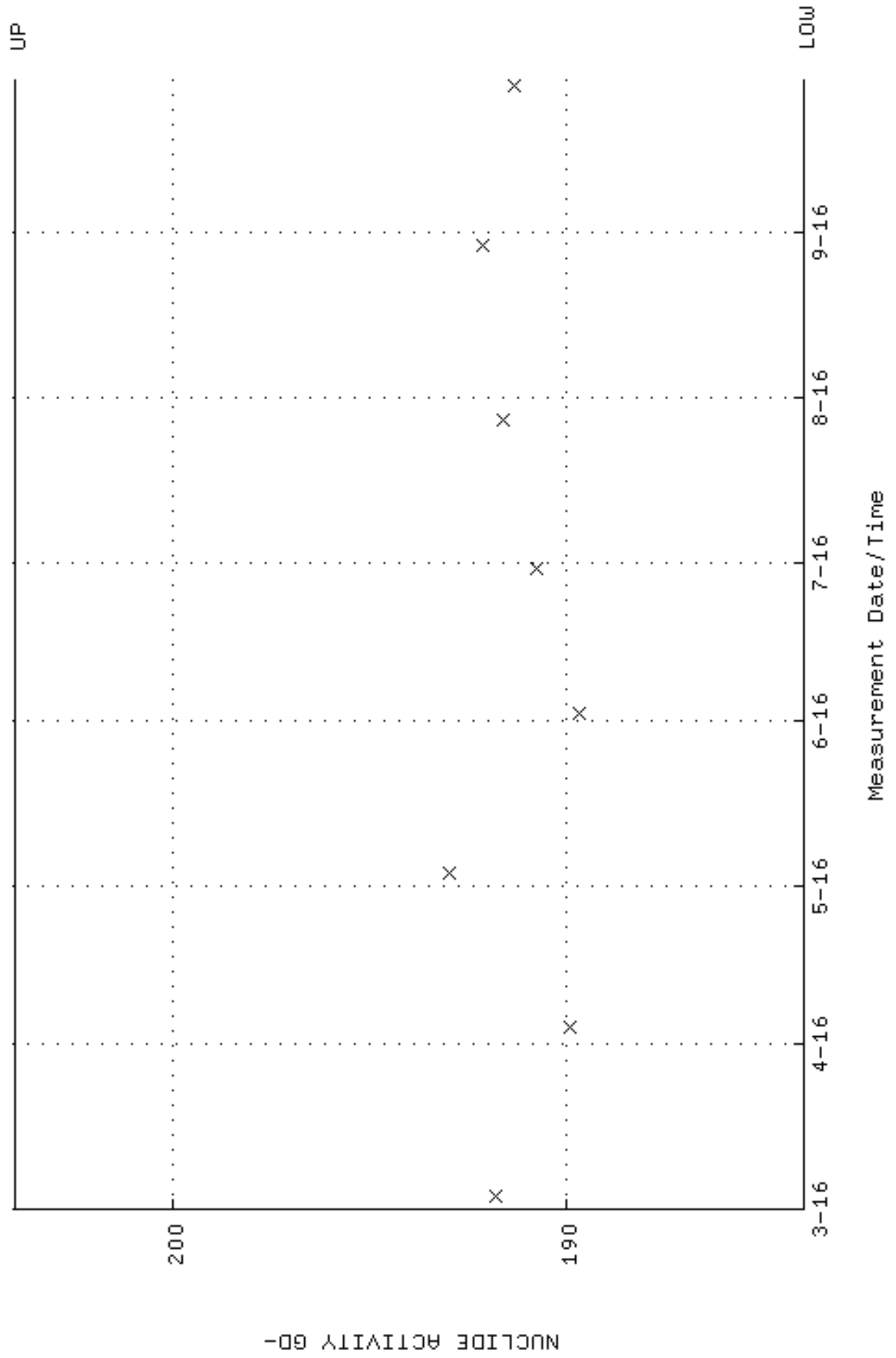
QA filename : DKA100:[ENV_ALPHA.QA.B]B034.QAF;2
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 Start/End Dates : 4-MAR-2016 12:49:34 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



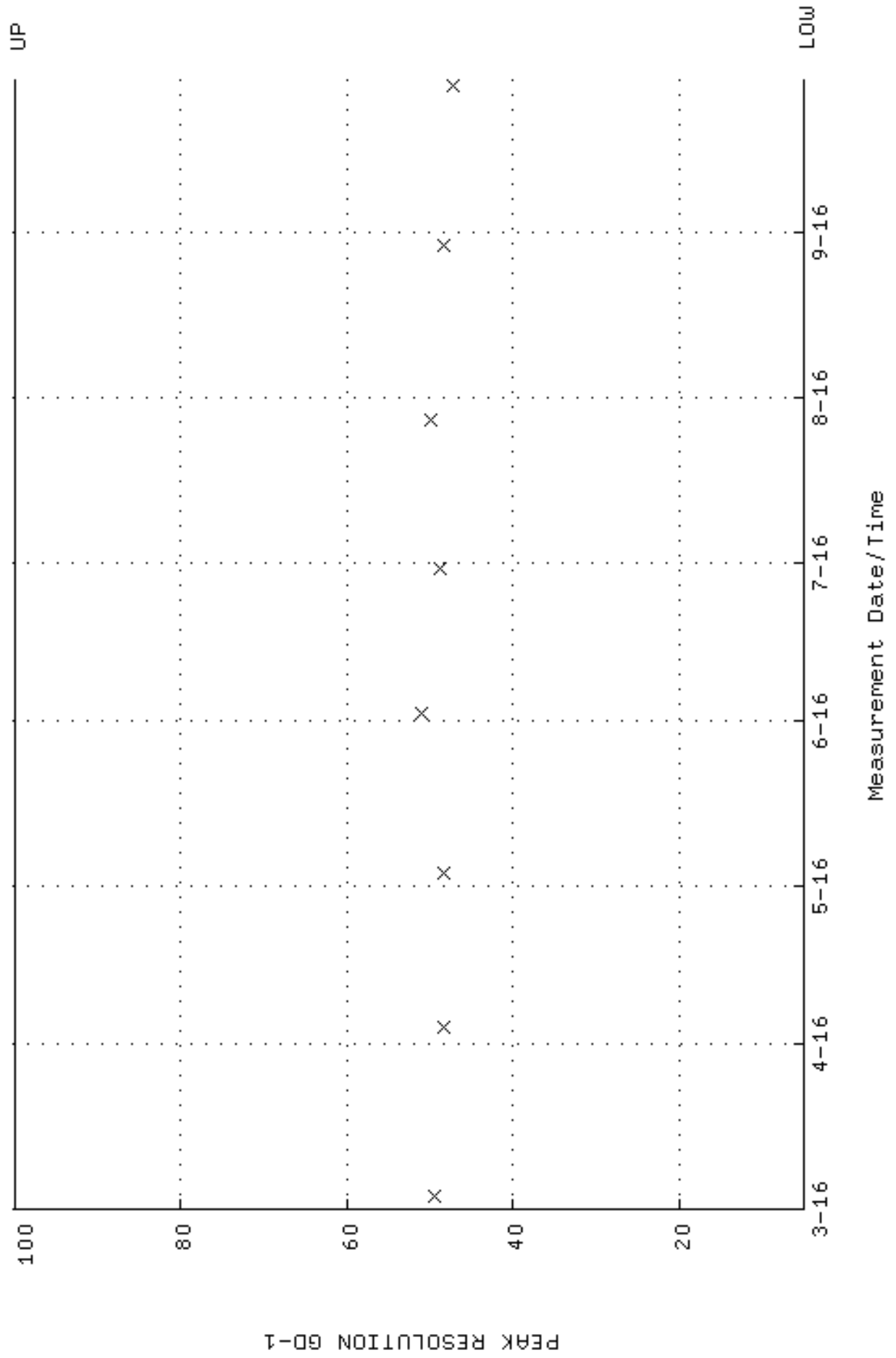
QA filename : DKA100:[ENV_ALPHA.QA.W]W038.QAF;6
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-MAR-2016 08:11:48 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.350000 through 0.371670



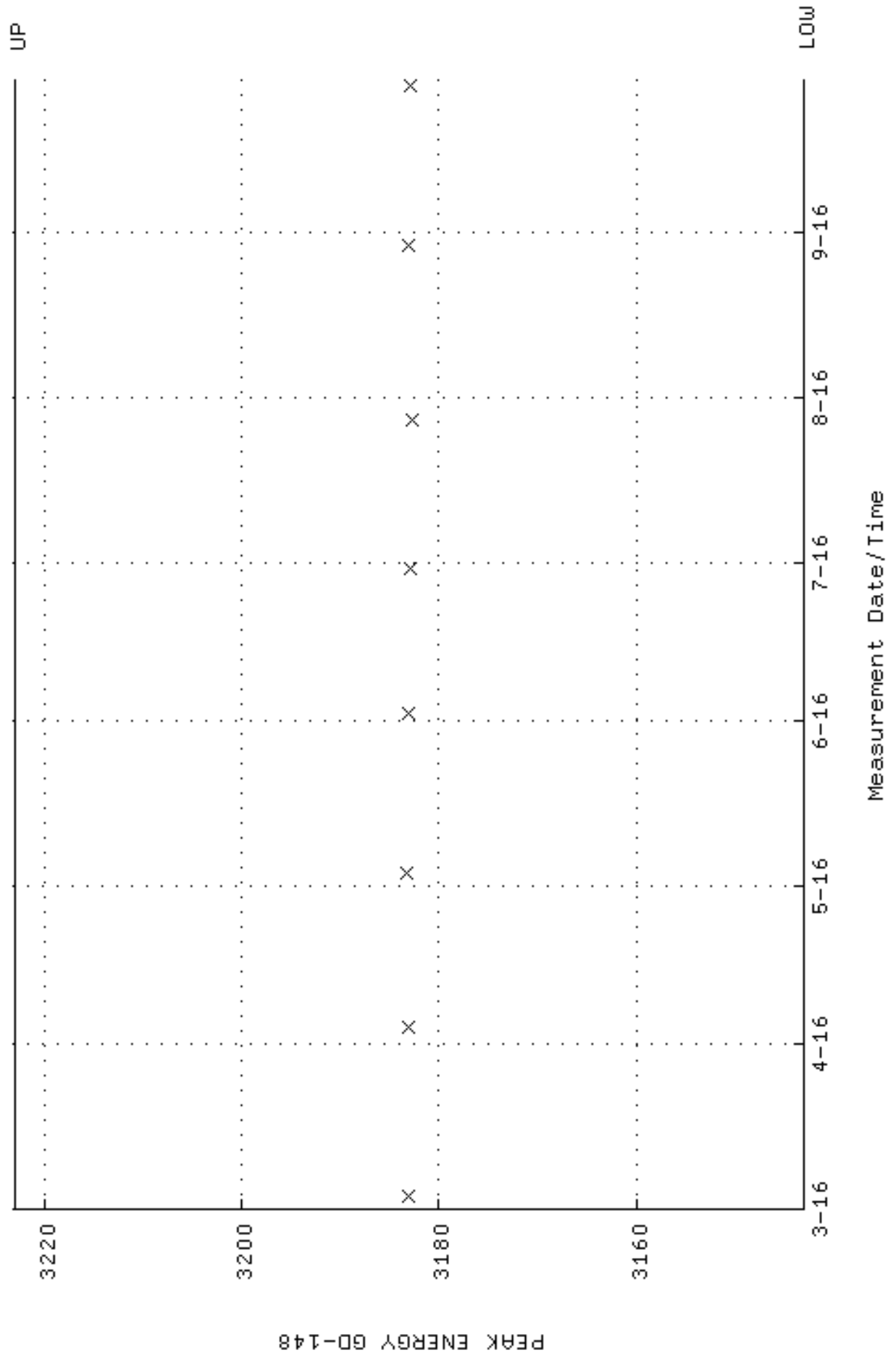
QA filename : DKA100:[ENV_ALPHA.QA.W]W038.QAF;6
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 3-MAR-2016 08:11:48 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



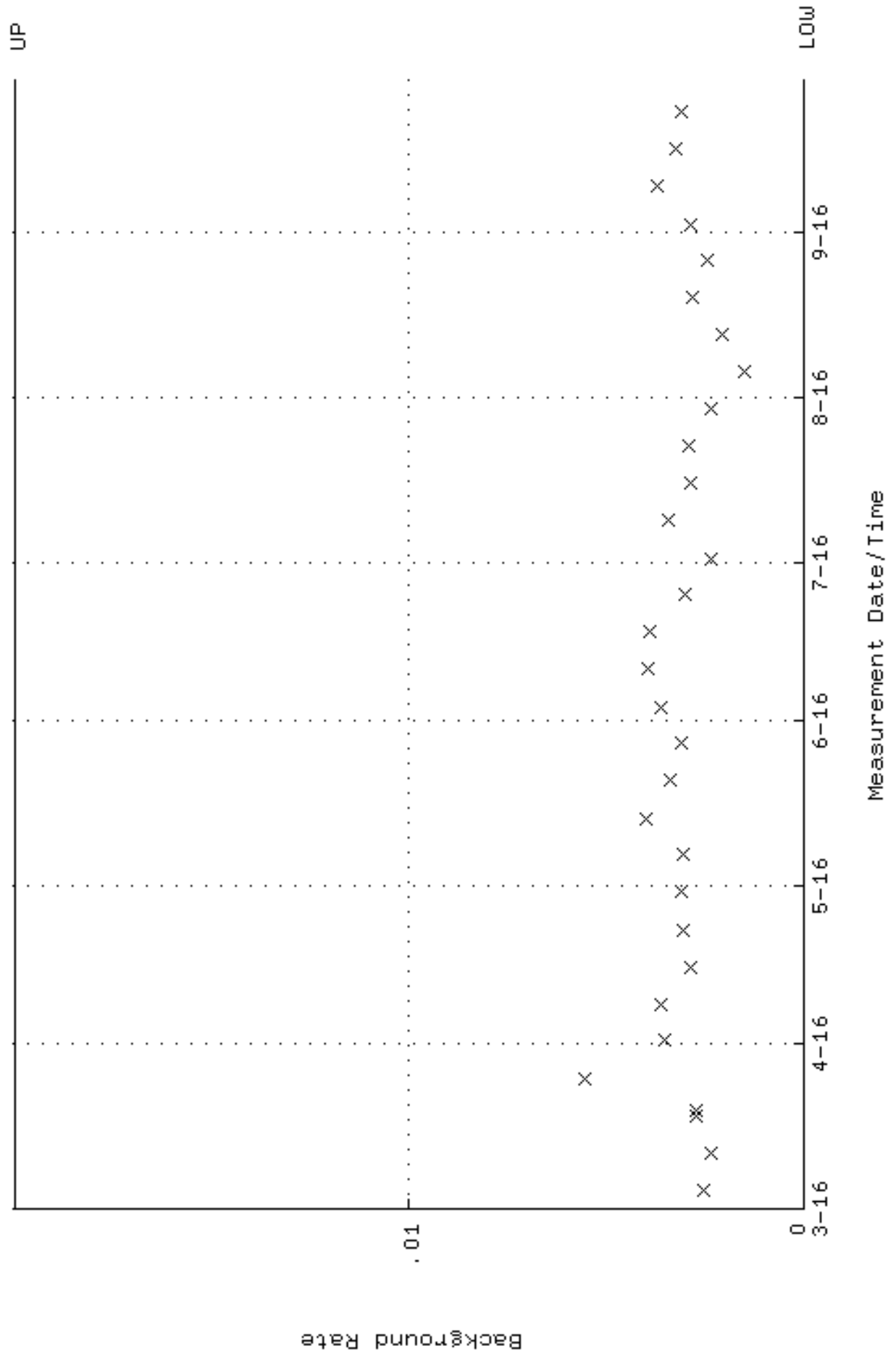
QA filename : DKA100:[ENV_ALPHA.QA.W]W038.QAF;6
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 3-MAR-2016 08:11:48 through 29-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



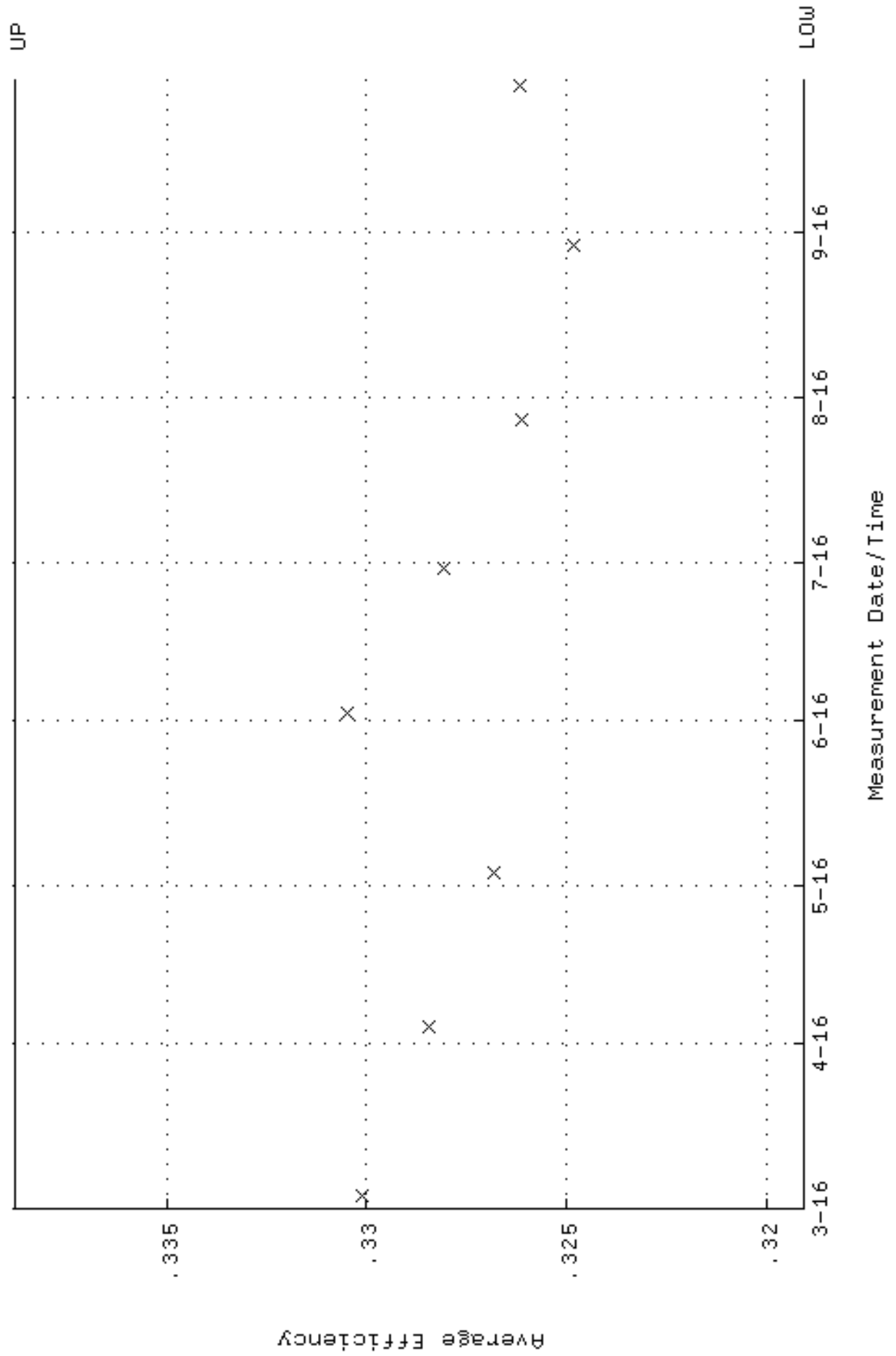
QA filename : DKA100:[ENV_ALPHA.QA.W]W038.QAF;6
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 3-MAR-2016 08:11:48 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



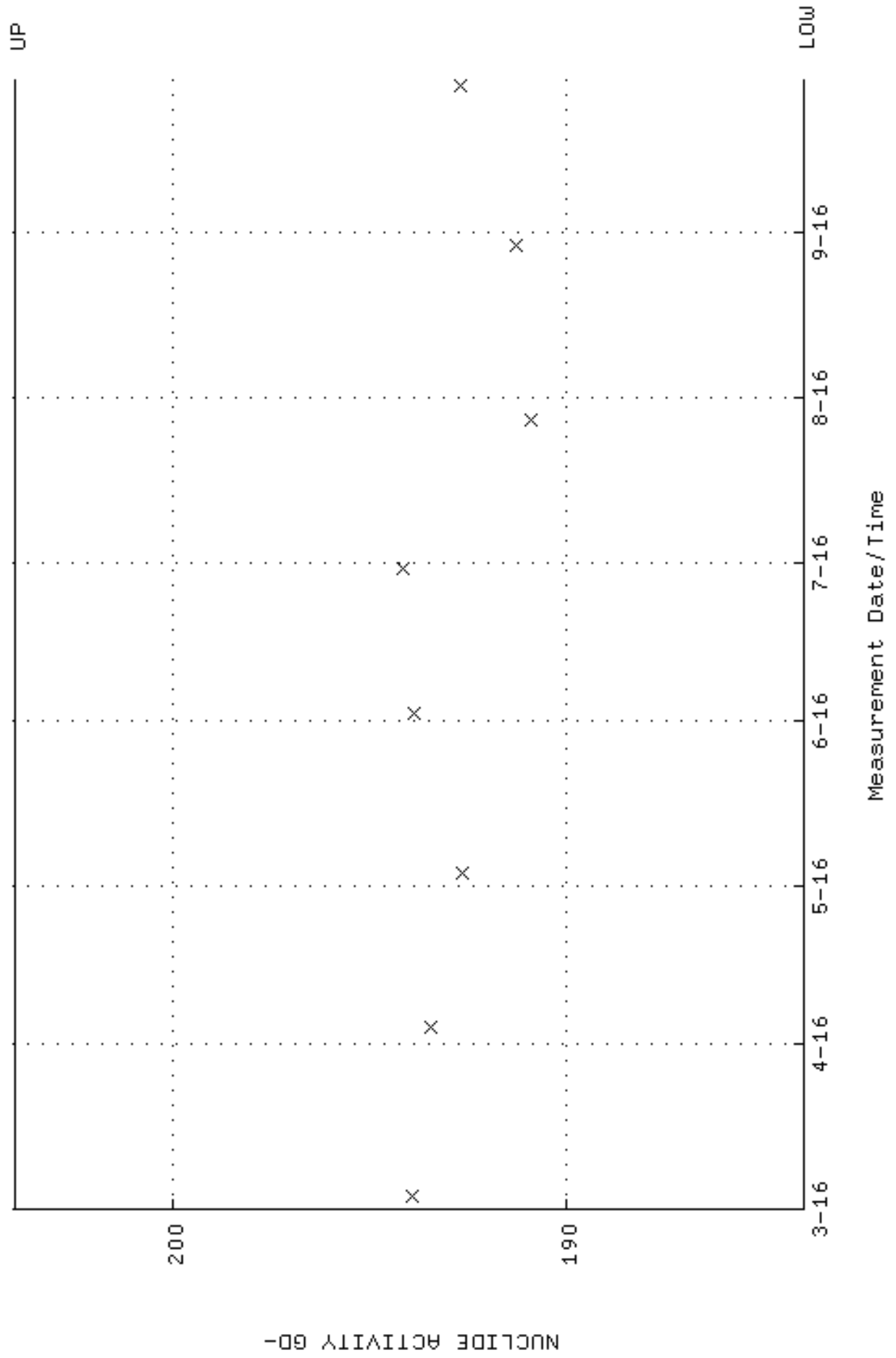
QA filename : DKA100:[ENV_ALPHA.QA.B]B038.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:49:42 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



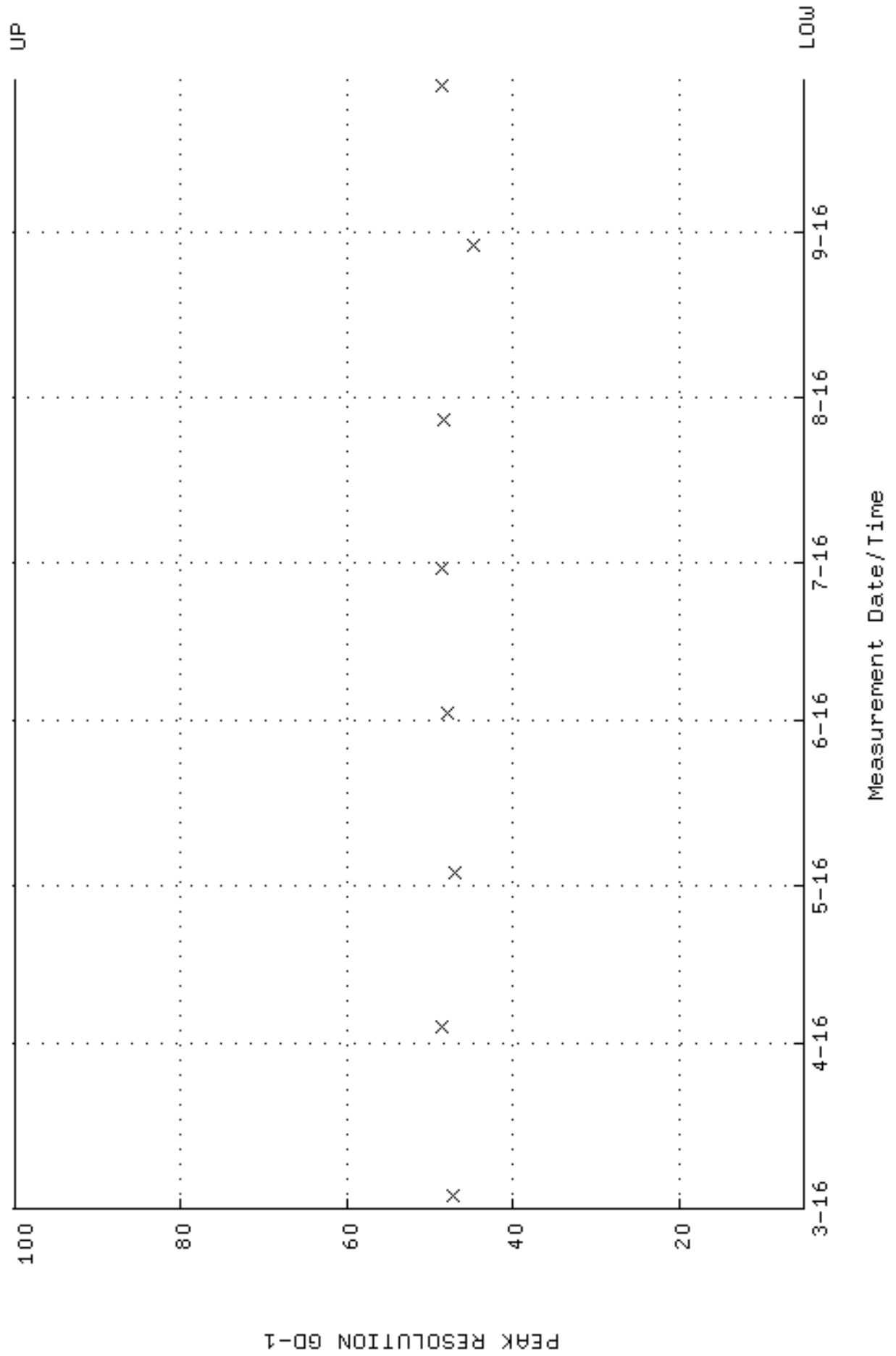
QA filename : DKA100:[ENV_ALPHA.QA.W]W040.QAF;6
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-MAR-2016 08:11:48 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.319060 through 0.338800



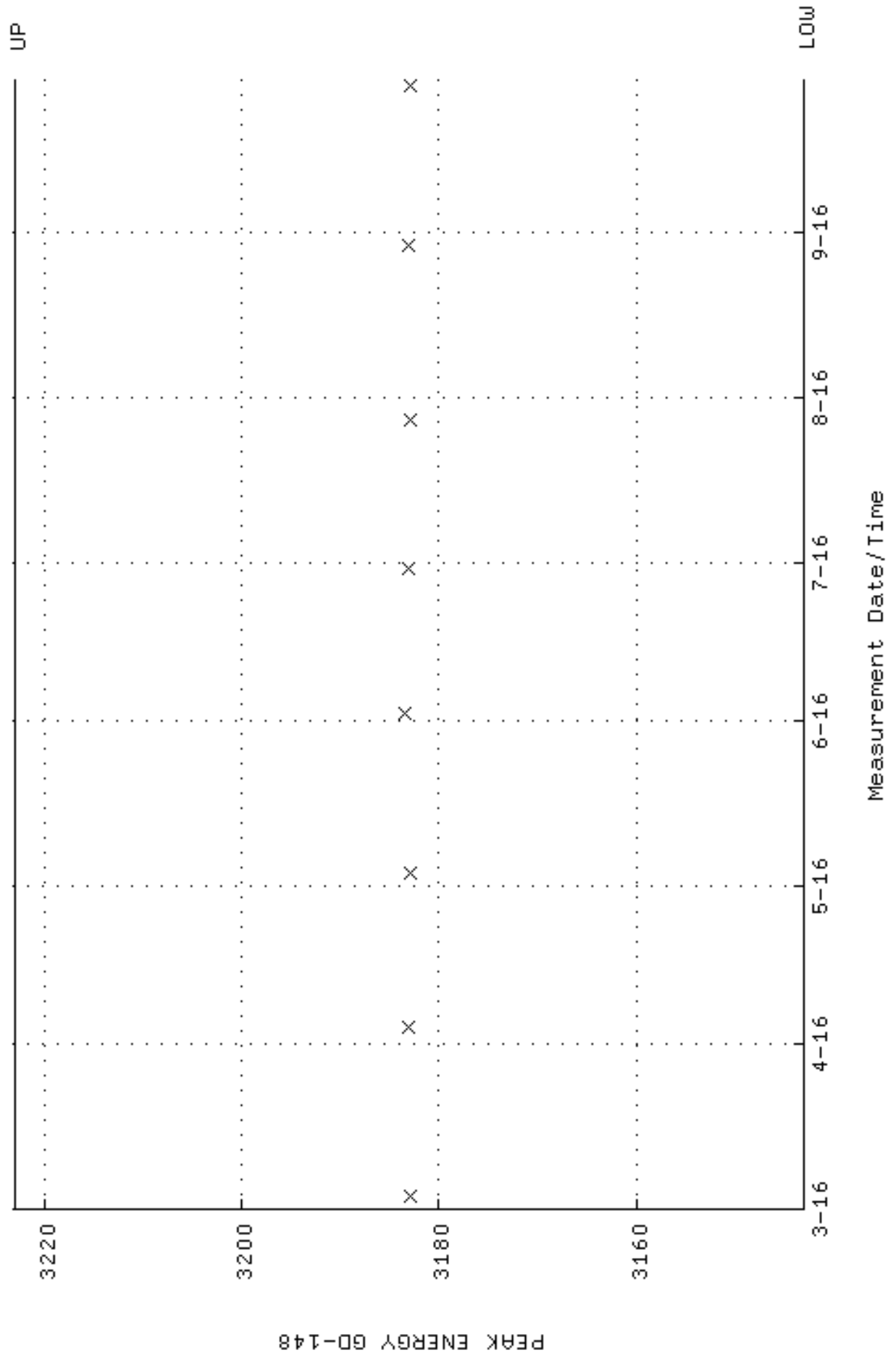
QA filename : DKA100:[ENV_ALPHA.QA.W]W040.QAF;6
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 3-MAR-2016 08:11:48 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



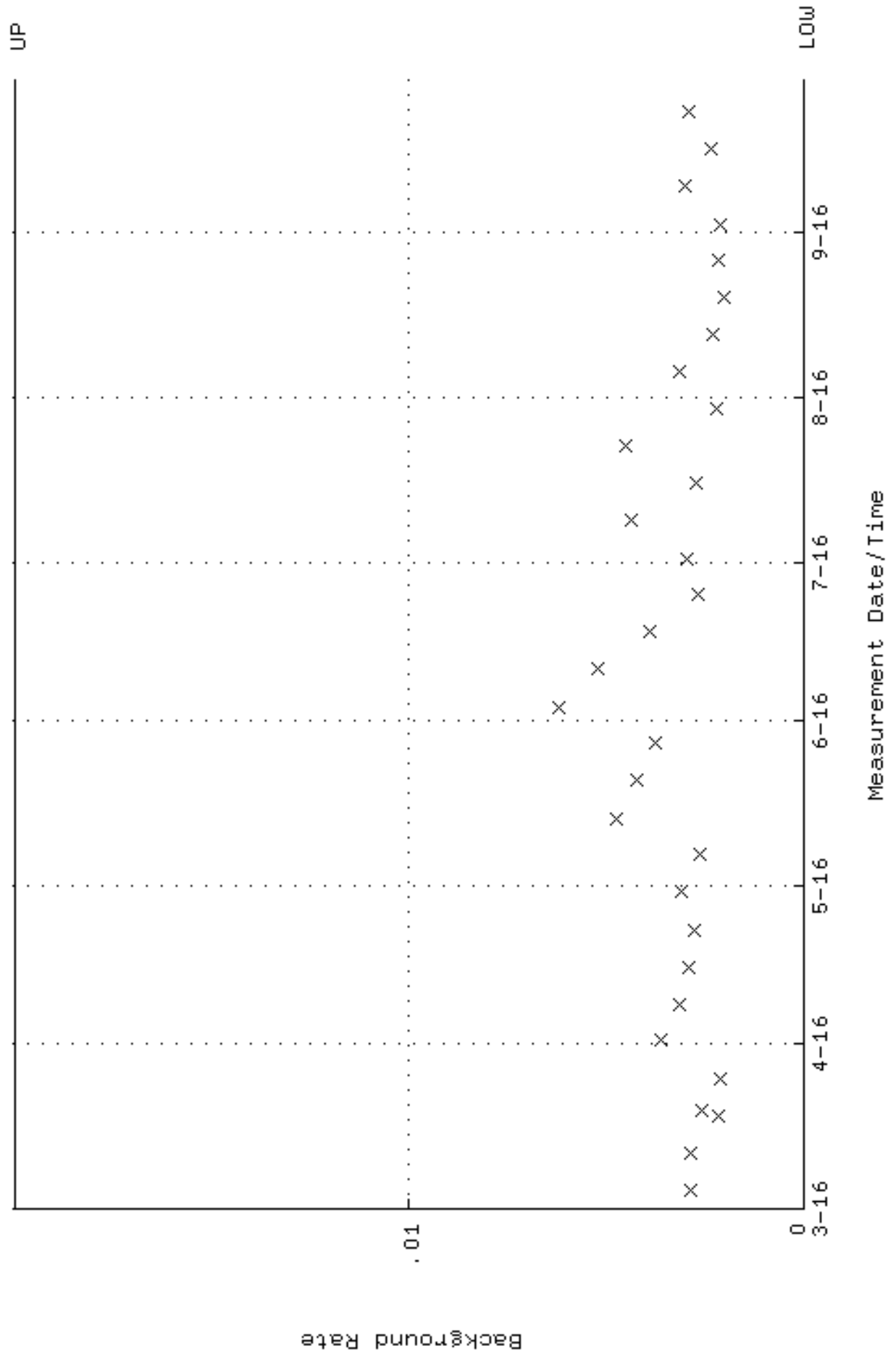
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Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 3-MAR-2016 08:11:48 through 29-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



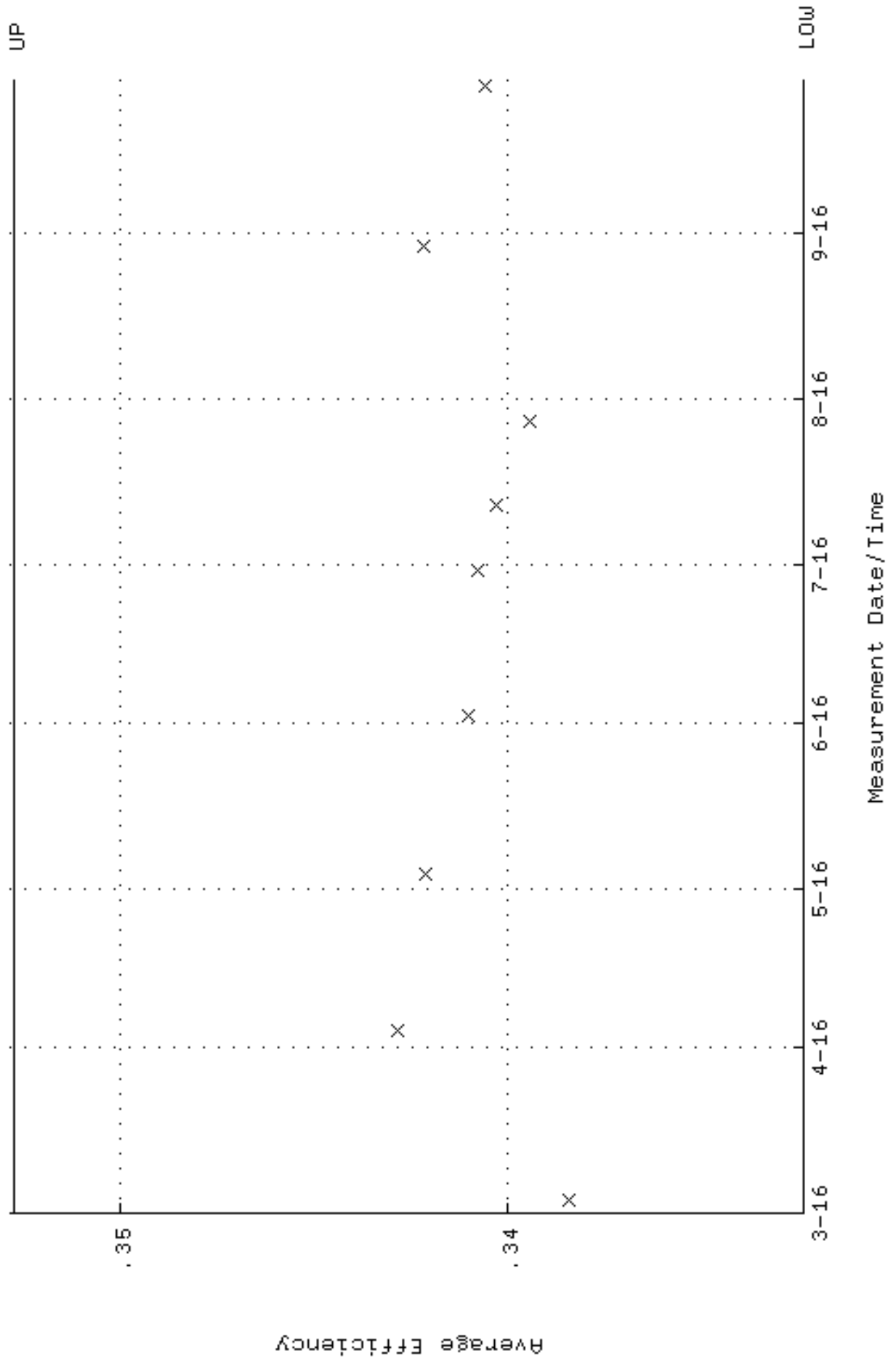
QA filename : DKA100:[ENV_ALPHA.QA.W]W040.QAF;6
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 3-MAR-2016 08:11:48 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



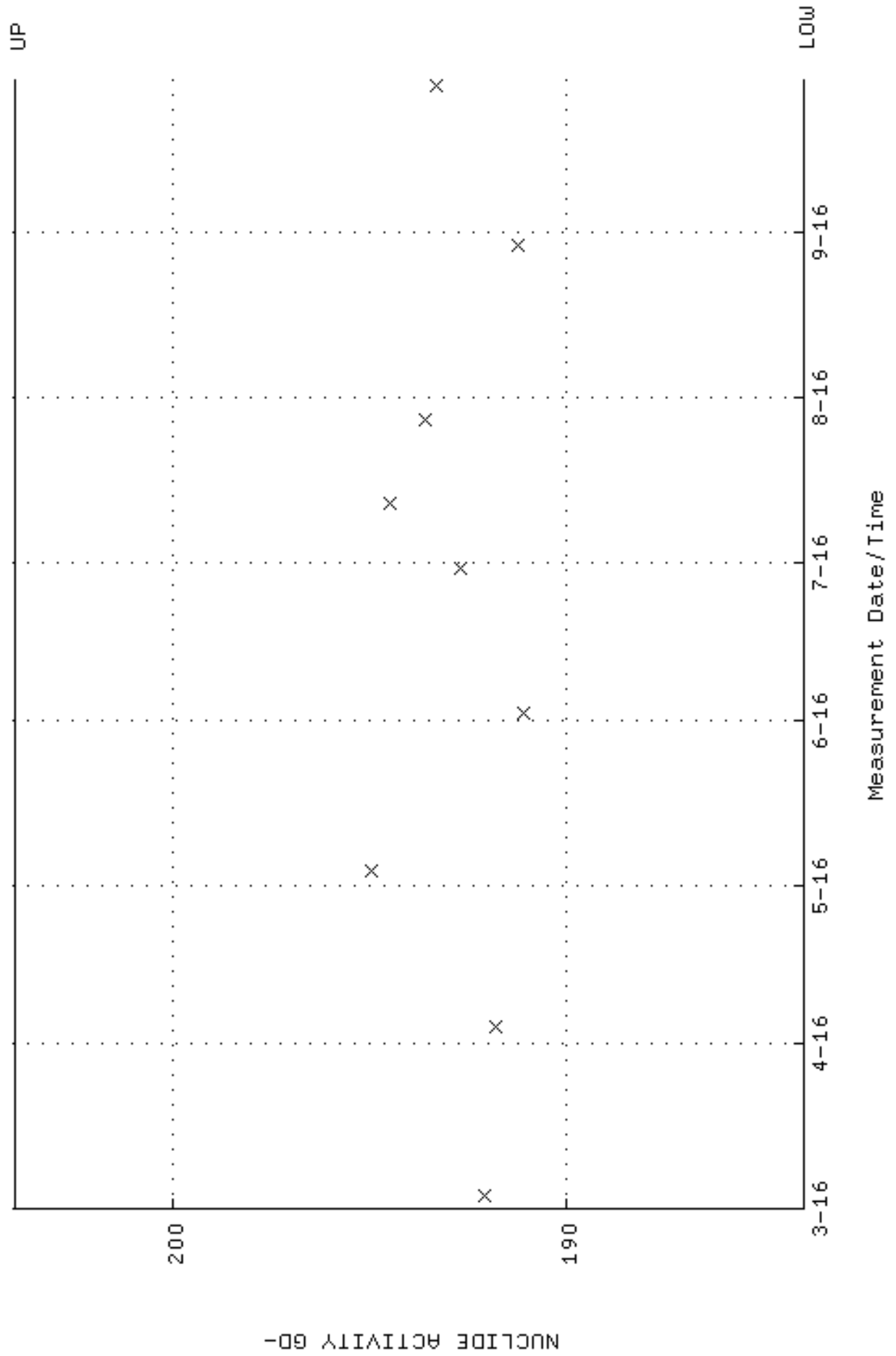
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 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:49:42 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



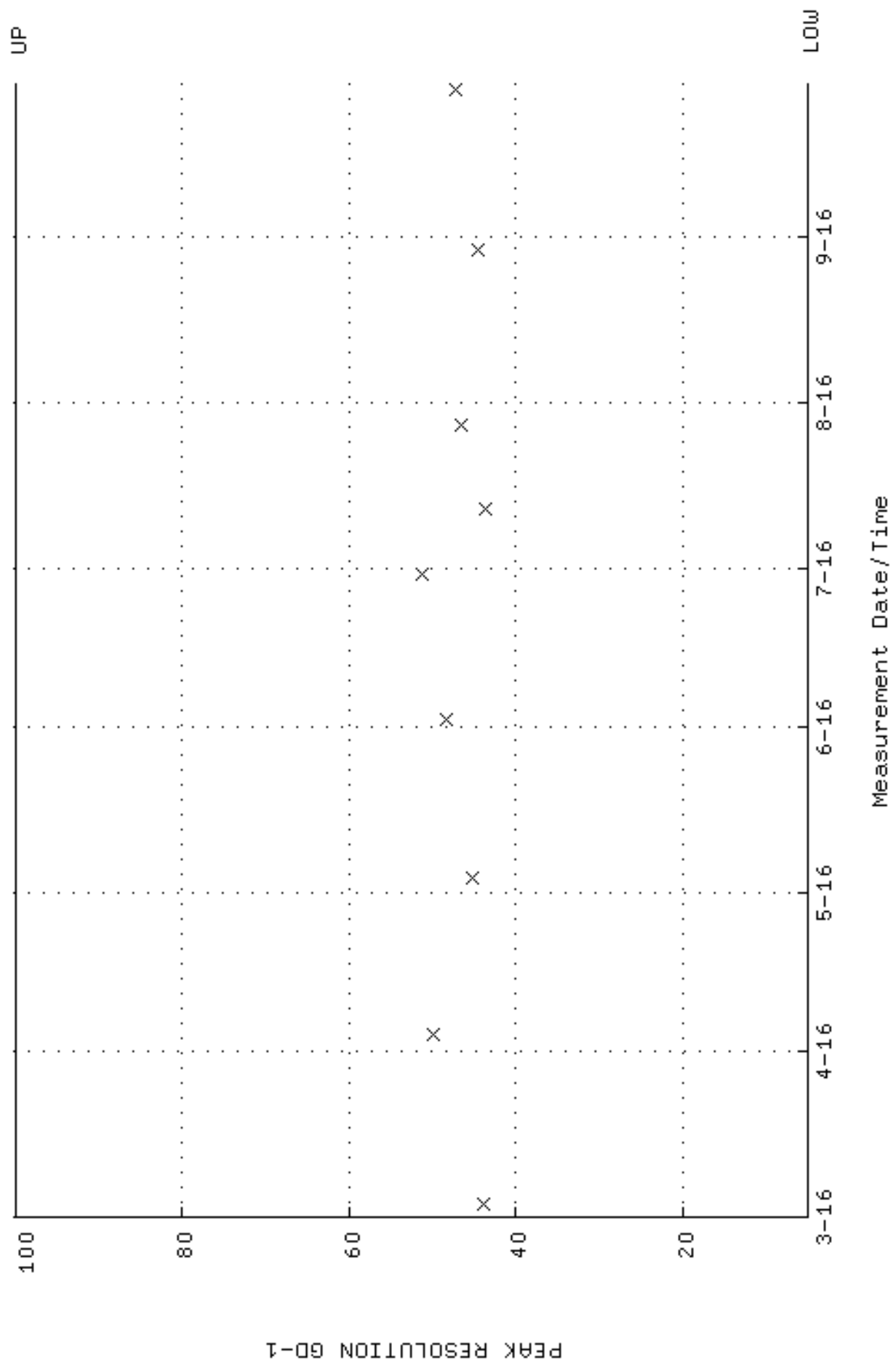
QA filename : DKA100:[ENV_ALPHA.QA.W]W041.QAF;8
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-MAR-2016 08:11:48 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.332337 through 0.352787



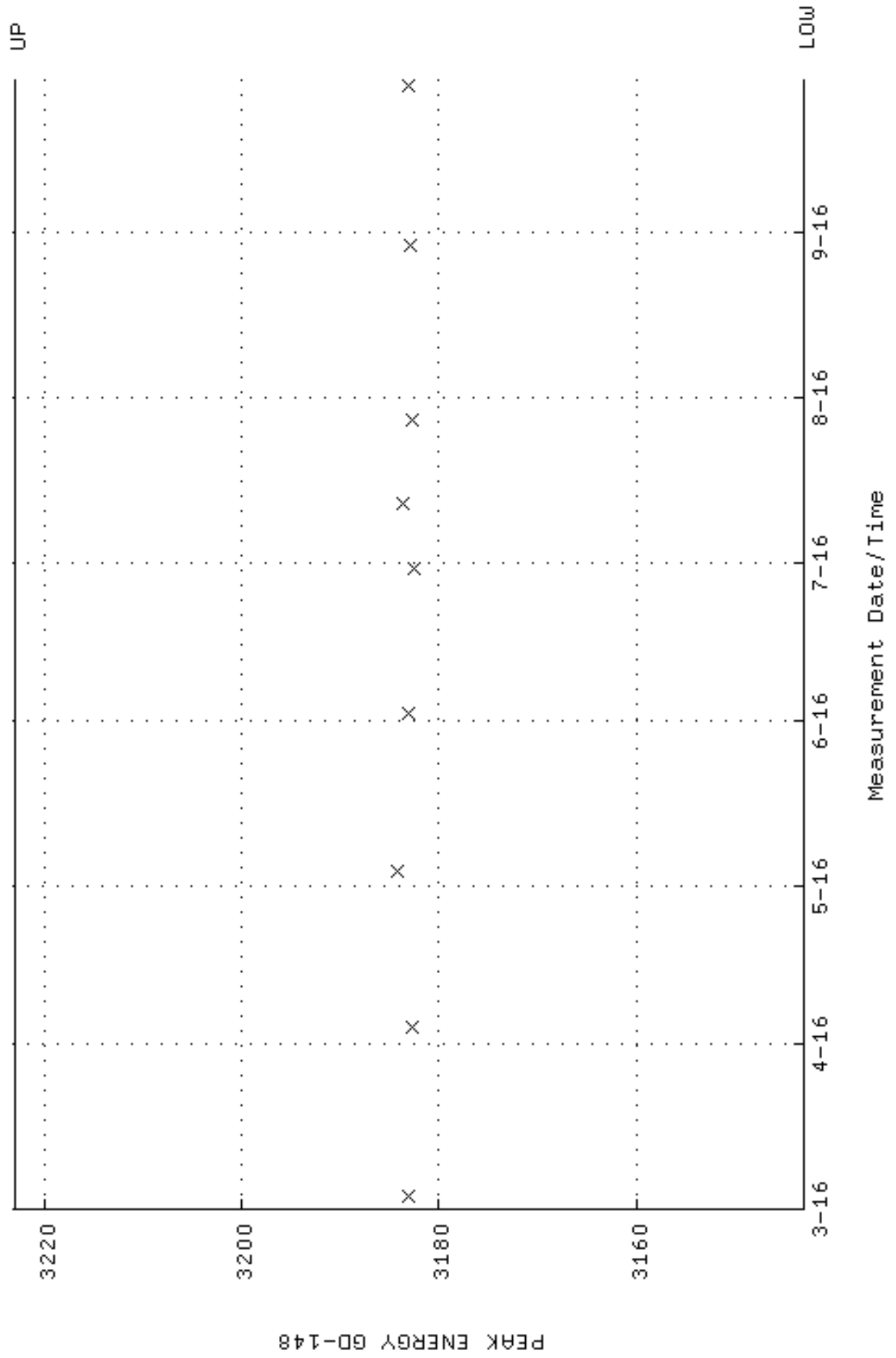
QA filename : DKA100:[ENV_ALPHA.QA.W]W041.QAF;8
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 3-MAR-2016 08:11:48 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



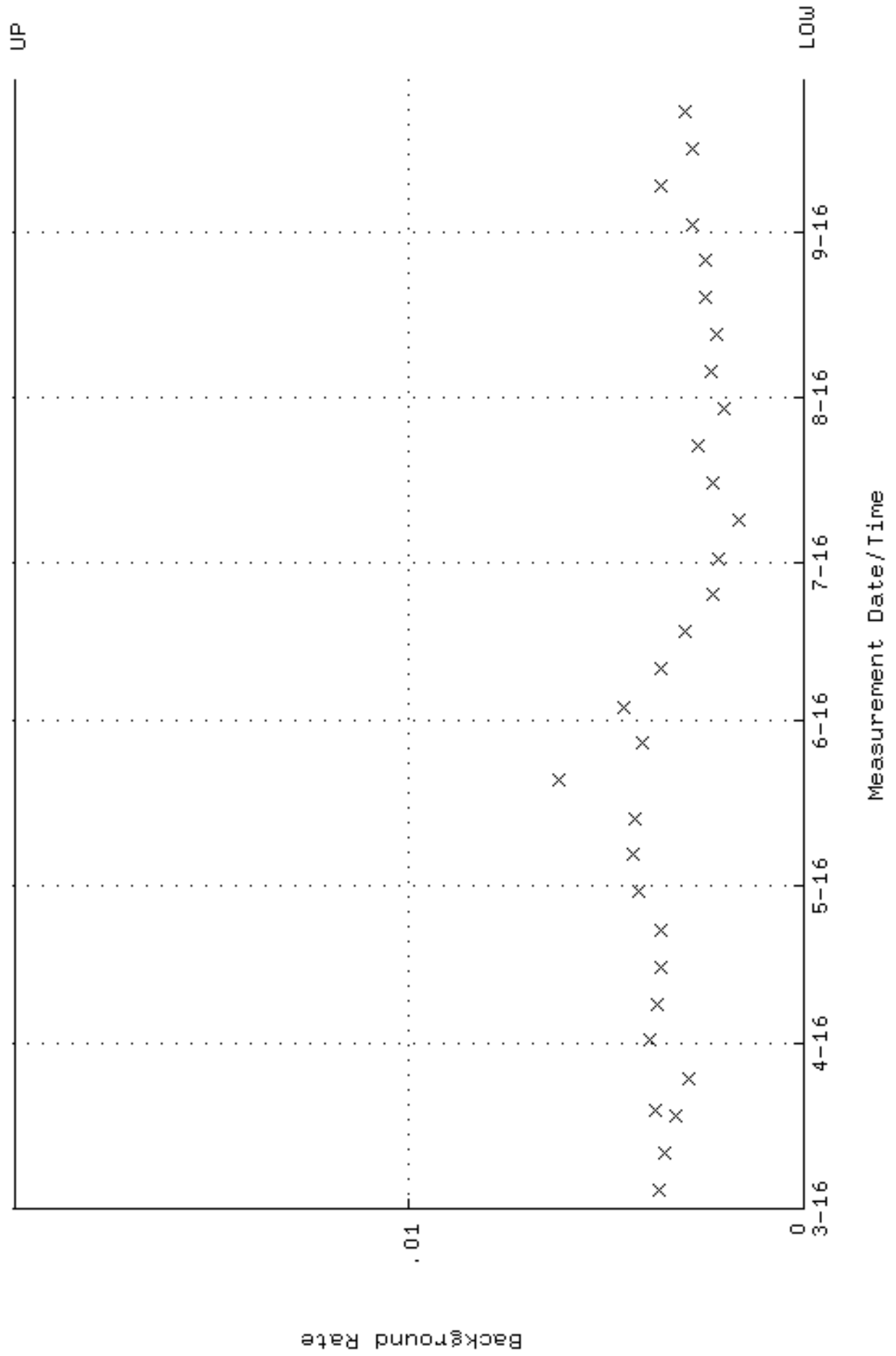
QA filename : DKA100:[ENV_ALPHA.QA.W]W041.QAF;8
 Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 3-MAR-2016 08:11:48 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



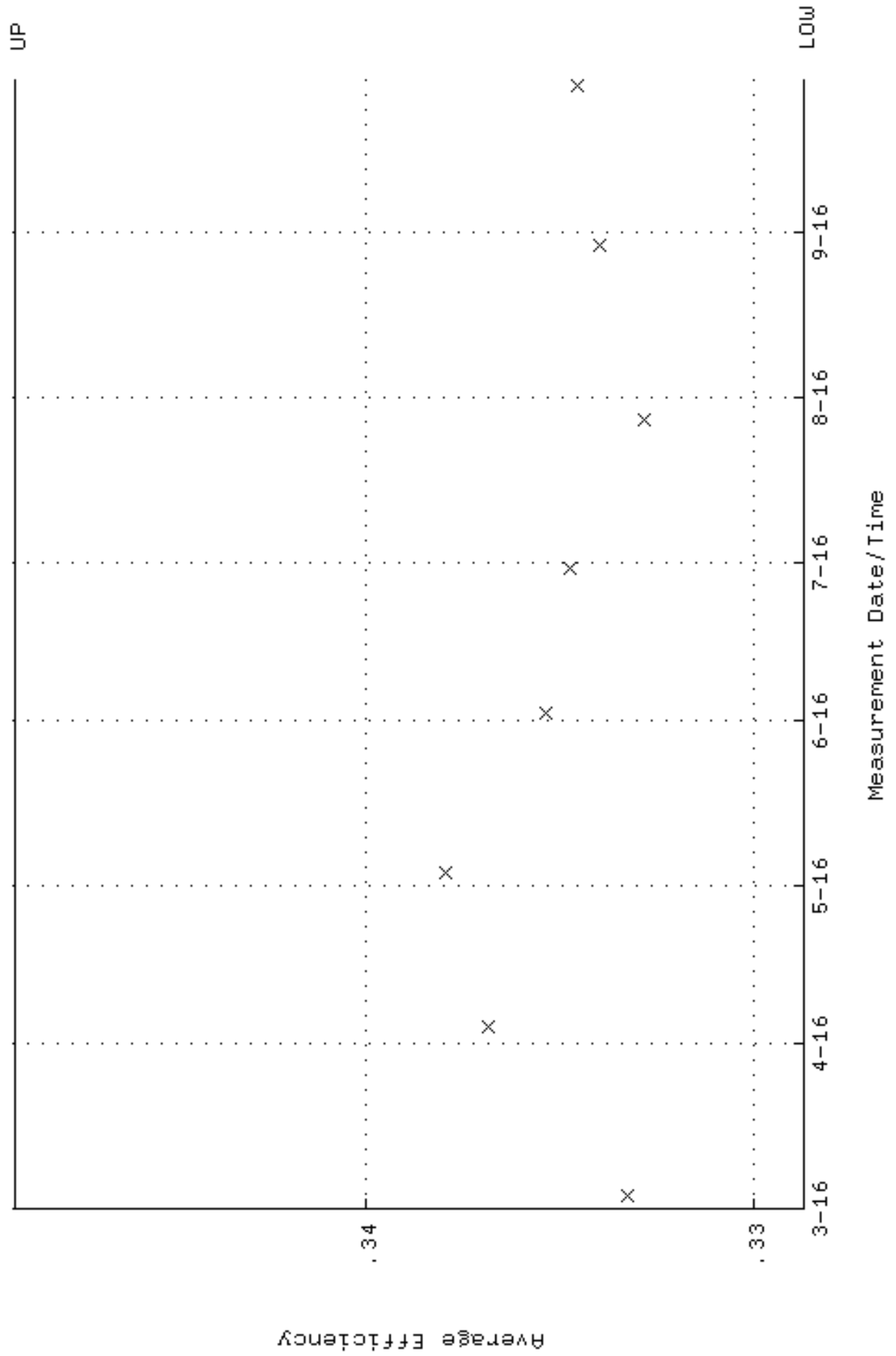
QA filename : DKA100:[ENV_ALPHA.QA.W]W041.QAF;8
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 3-MAR-2016 08:11:48 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



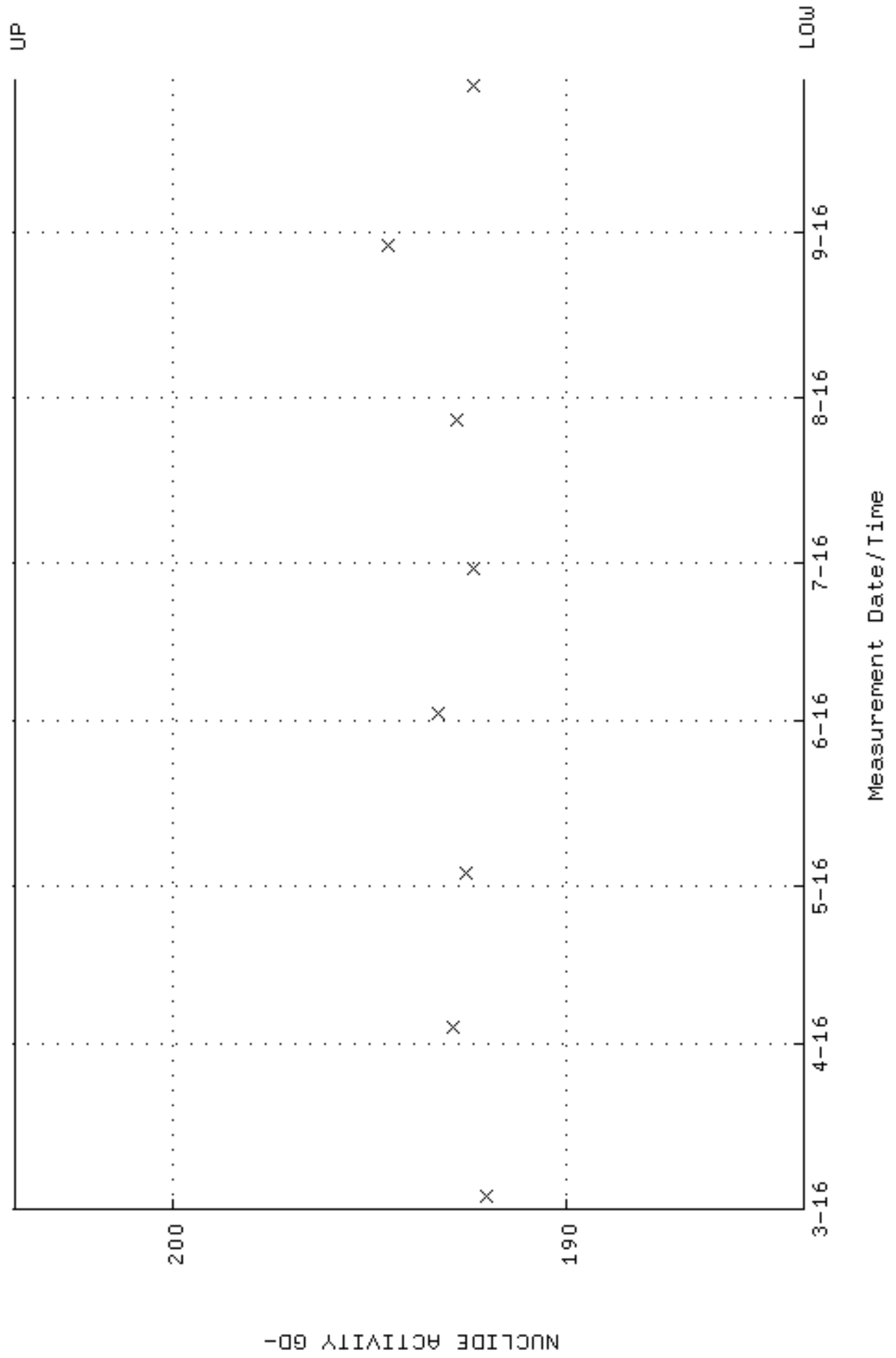
QA filename : DKA100:[ENV_ALPHA.QA.B]B041.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:49:42 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



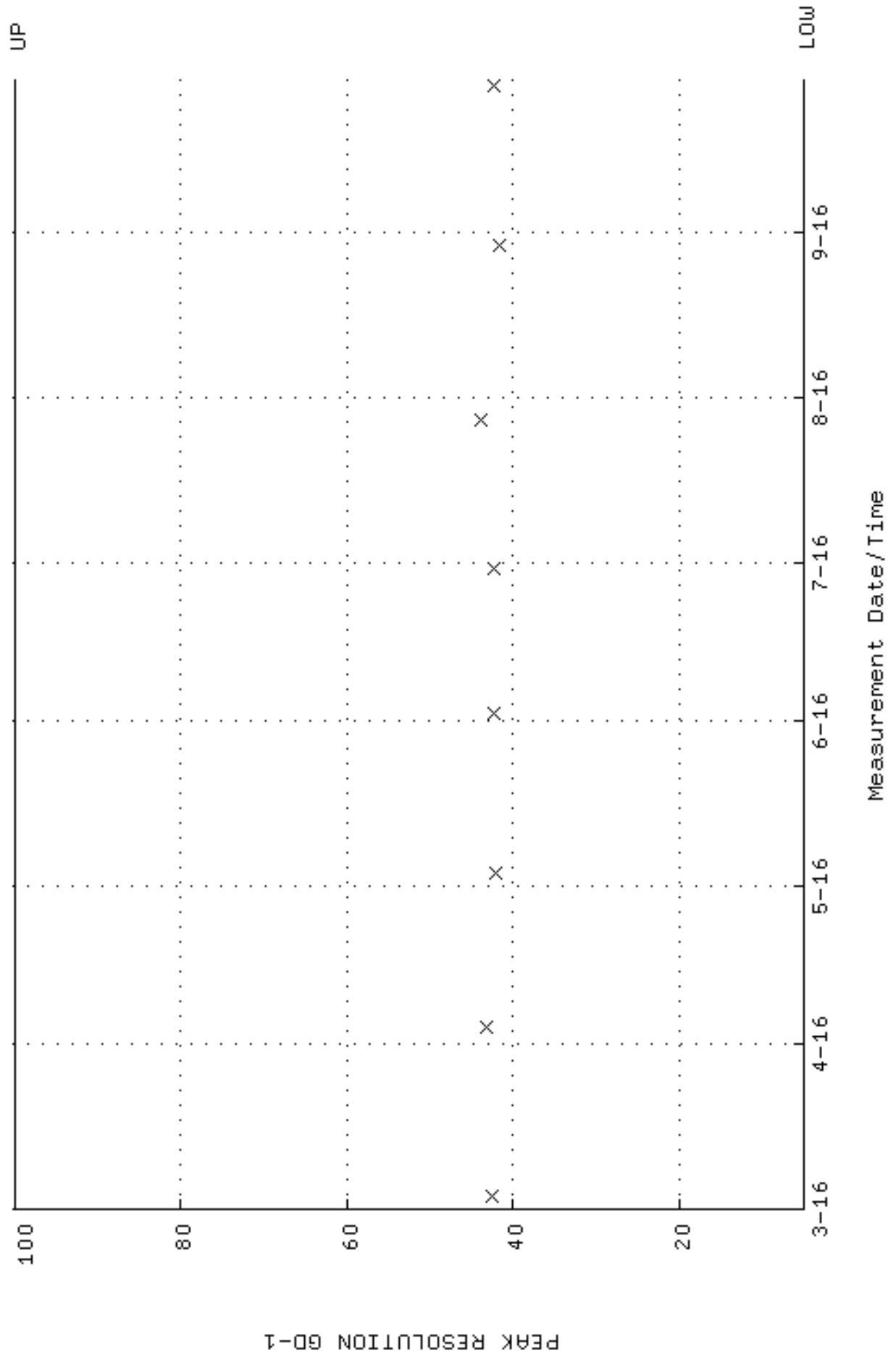
QA filename : DKA100:[ENV_ALPHA.QA.W]W042.QAF;8
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-MAR-2016 08:11:48 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.328730 through 0.349060



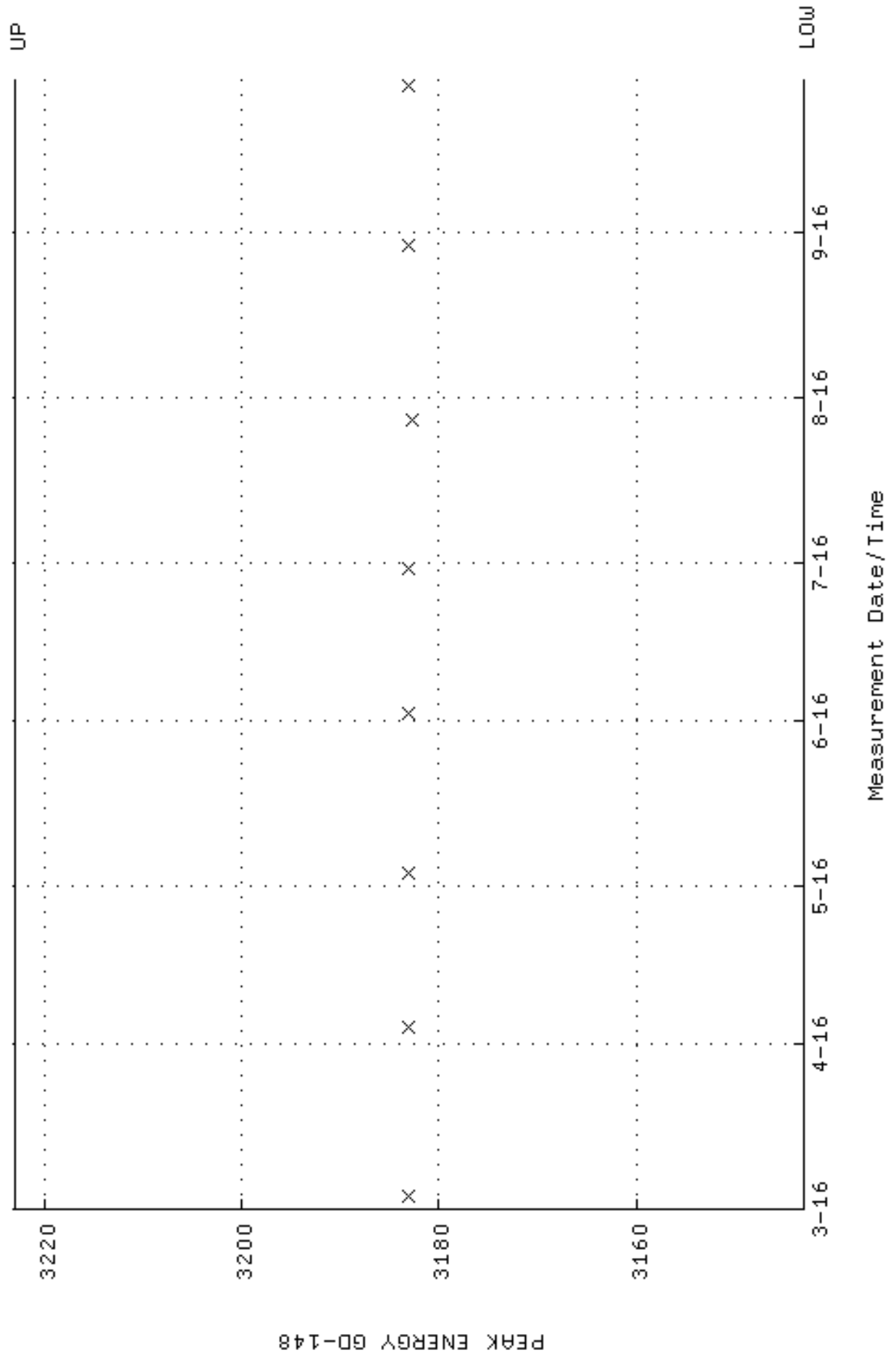
QA filename : DKA100:[ENV_ALPHA.QA.W]W042.QAF;8
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 3-MAR-2016 08:11:48 through 29-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



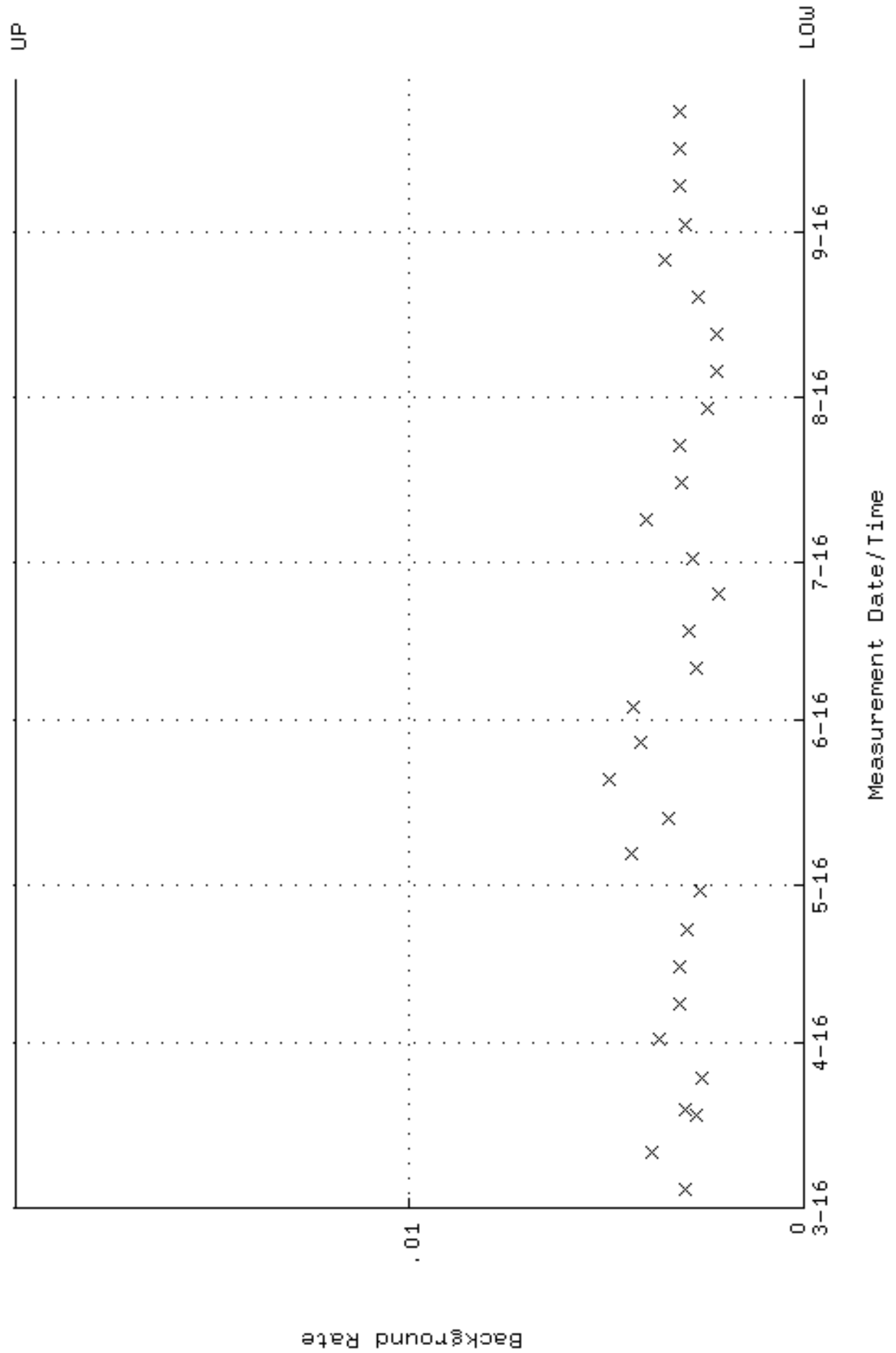
QA filename : DKA100:[ENV_ALPHA.QA.W]W042.QAF;8
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 3-MAR-2016 08:11:48 through 29-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



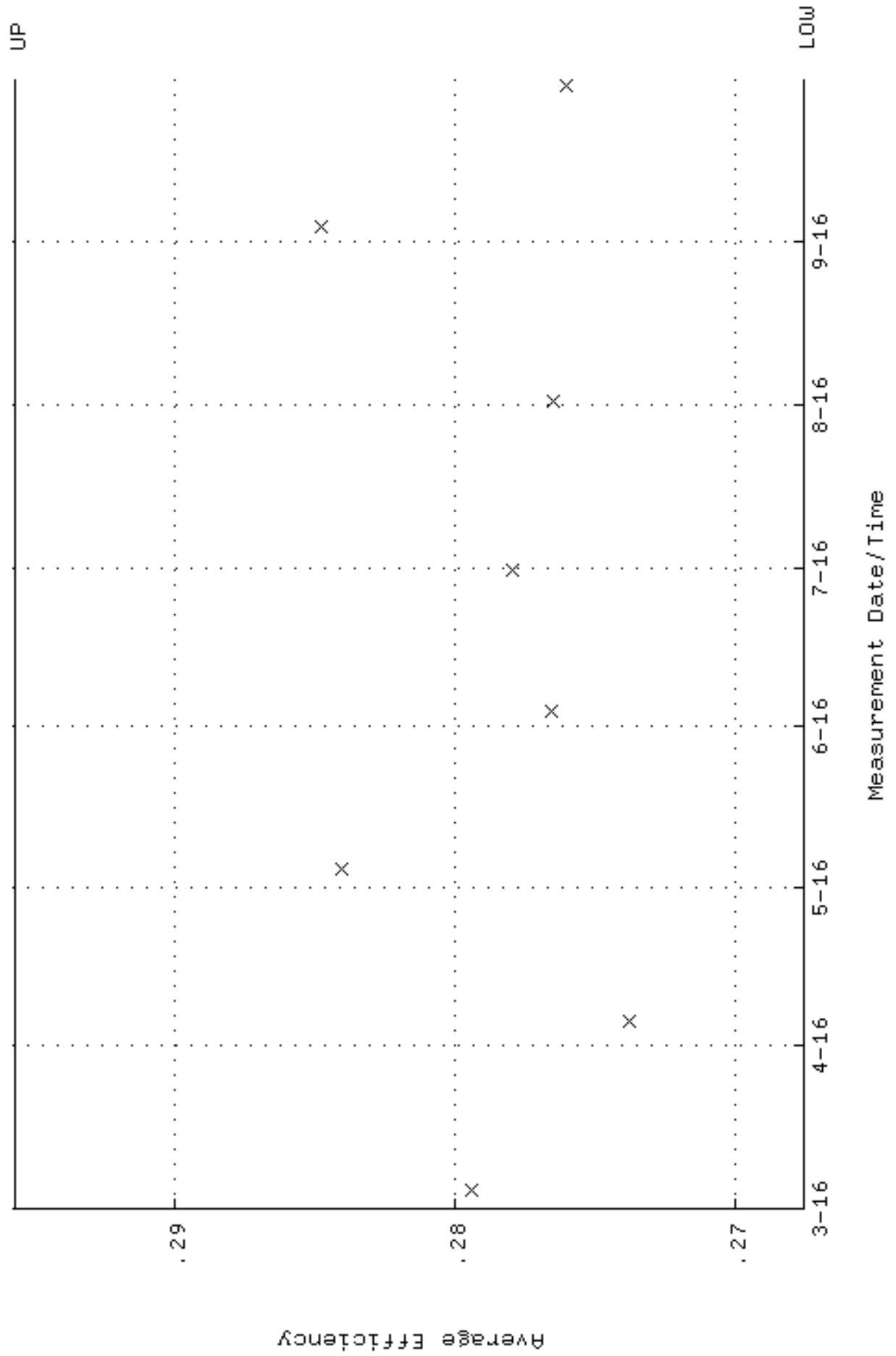
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 3-MAR-2016 08:11:48 through 29-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



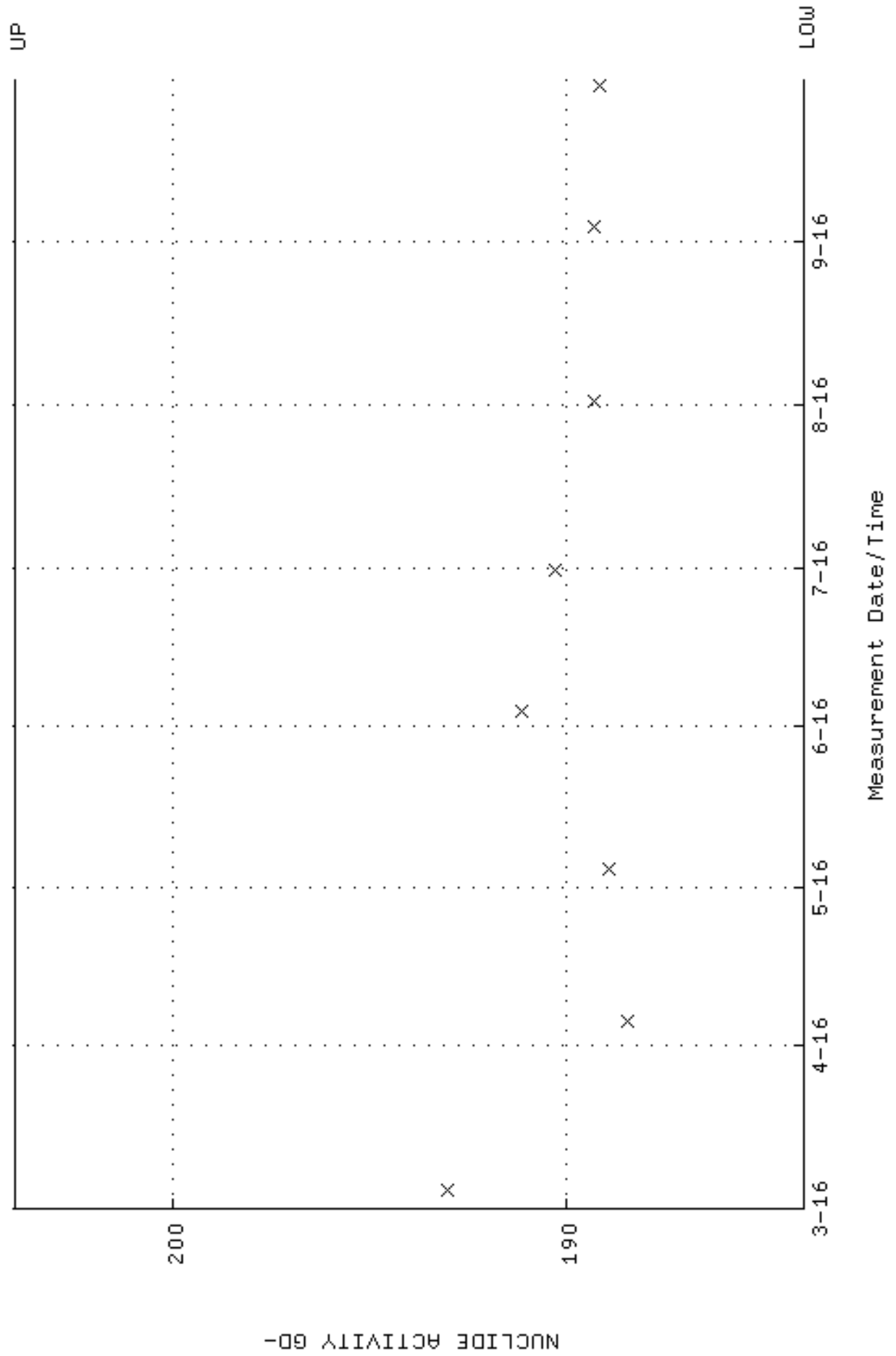
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Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 4-MAR-2016 12:49:42 through 29-SEP-2016 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



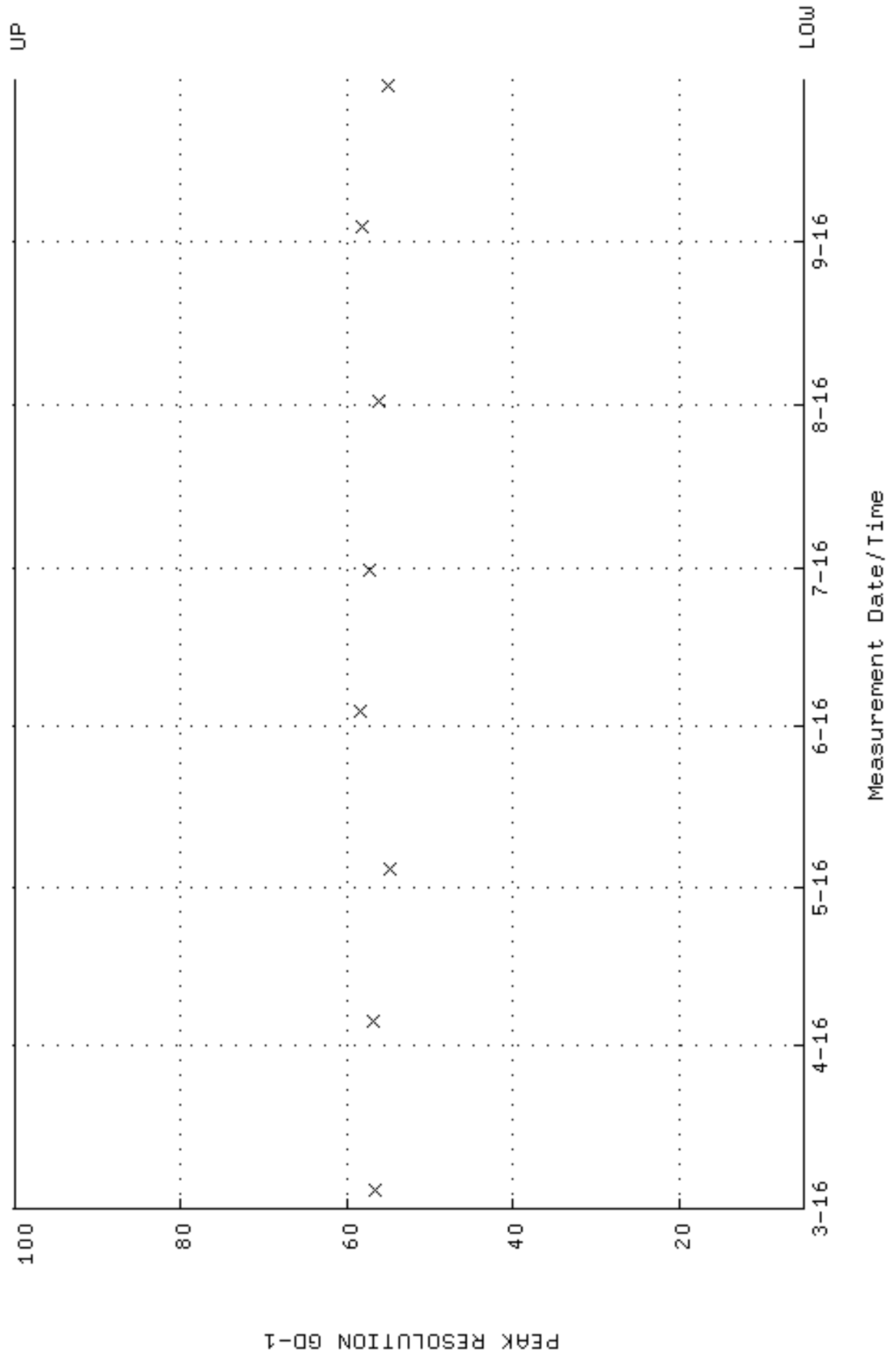
QA filename : DKA100:[ENV_ALPHA.QA.W]W065.QAF;8
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.267564 through 0.295728



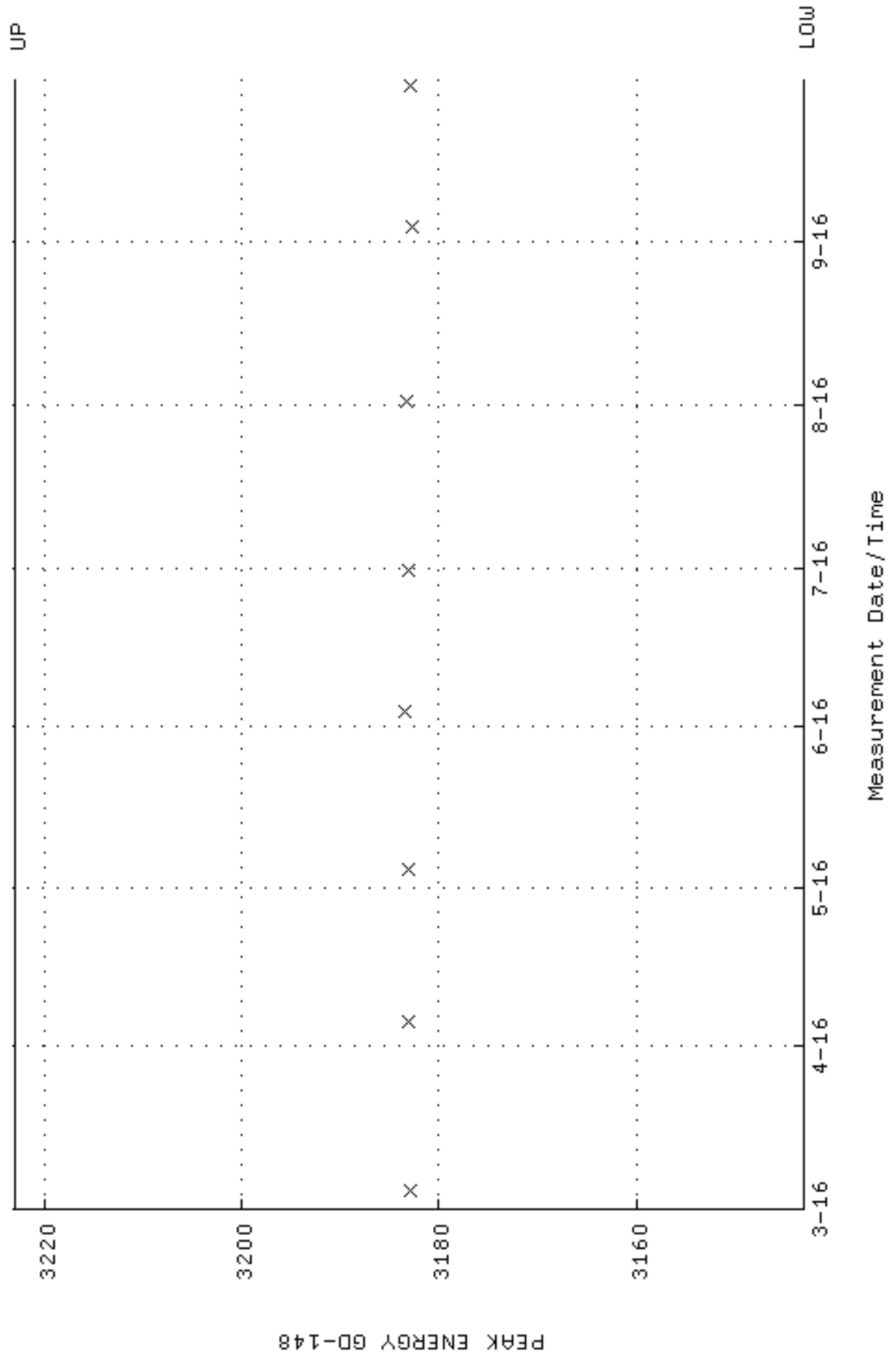
QA filename : DKA100:[ENV_ALPHA.QA.W]W065.QAF;8
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



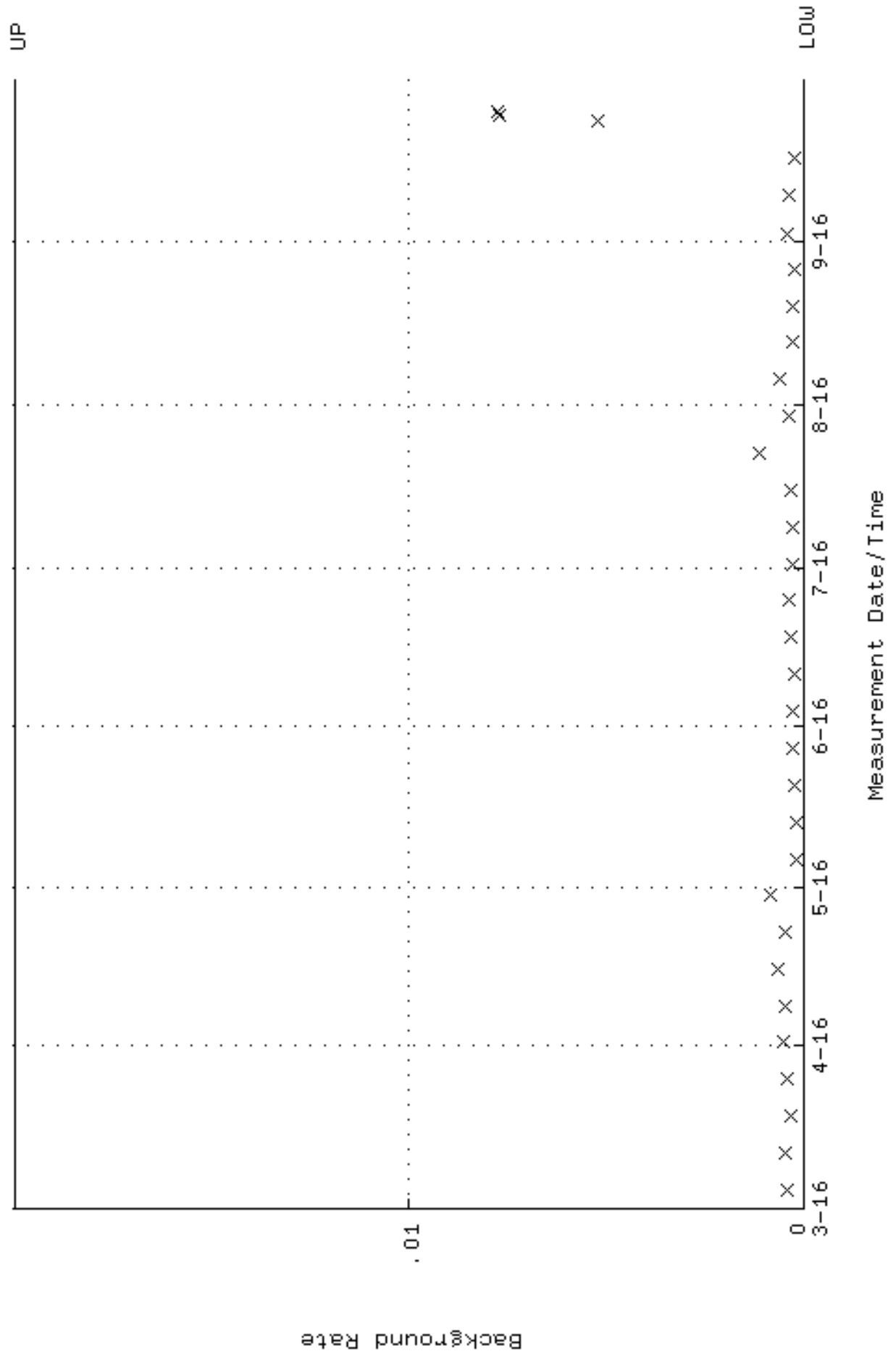
QA filename : DKA100:[ENV_ALPHA.QA.W]W065.QAF;8
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



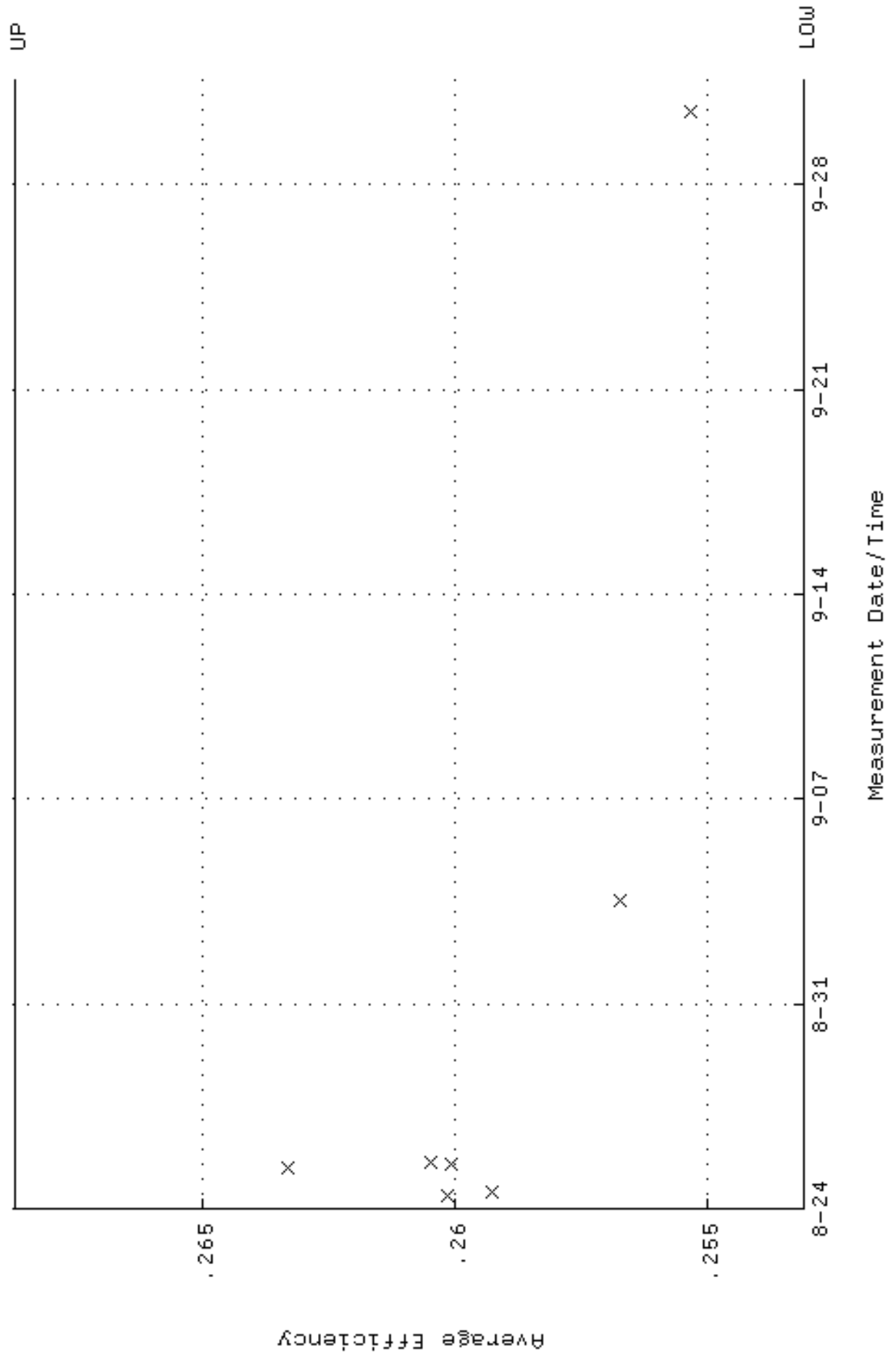
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



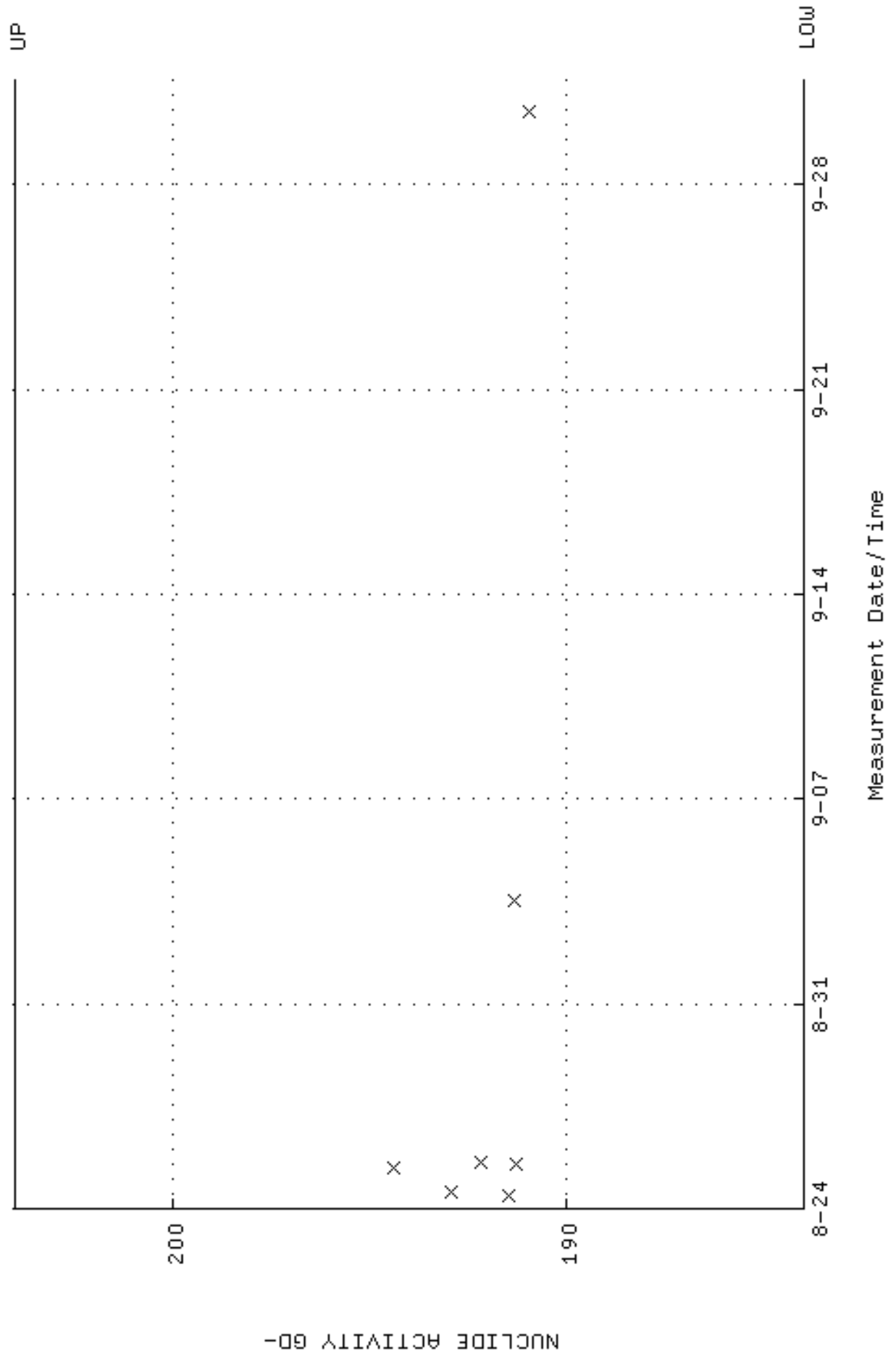
QA filename : DKA100:[ENV_ALPHA.QA.B]B065.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:21:36 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



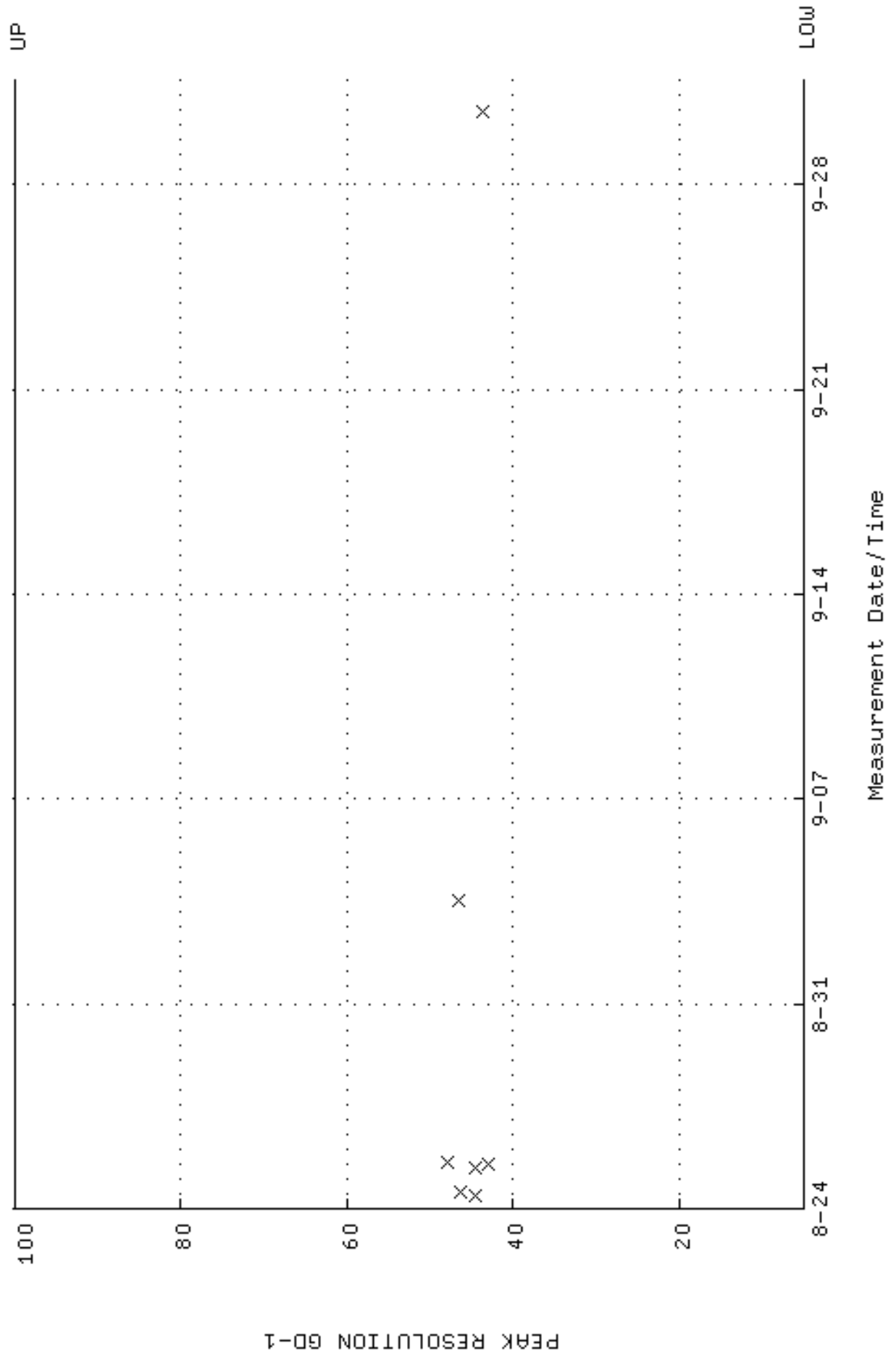
QA filename : DKA100:[ENV_ALPHA.QA.W]W066.QAF;8
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 24-AUG-2016 10:44:17 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.253080 through 0.268734



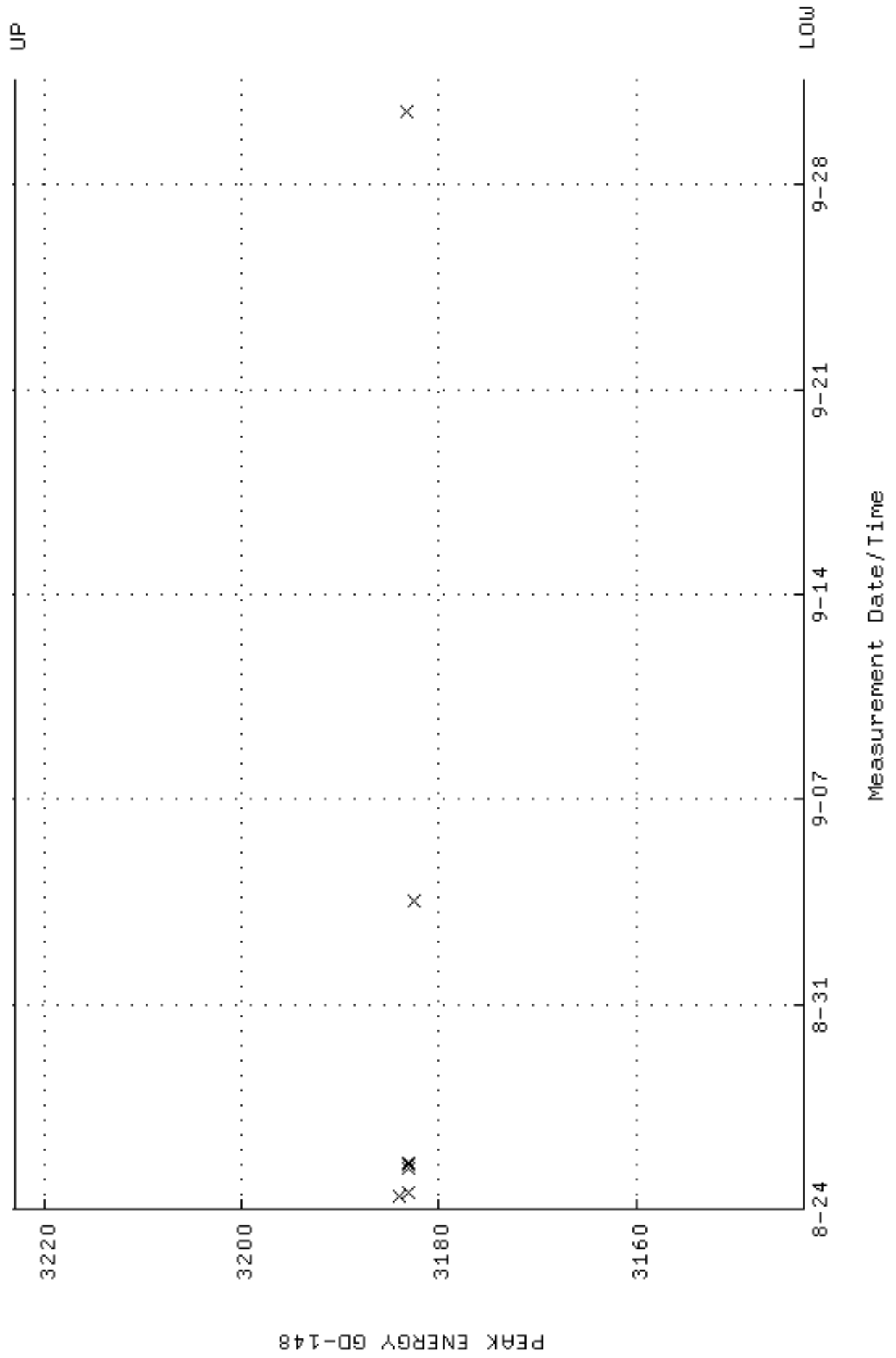
QA filename : DKA100:[ENV_ALPHA.QA.W]W066.QAF;8
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 24-AUG-2016 10:44:17 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



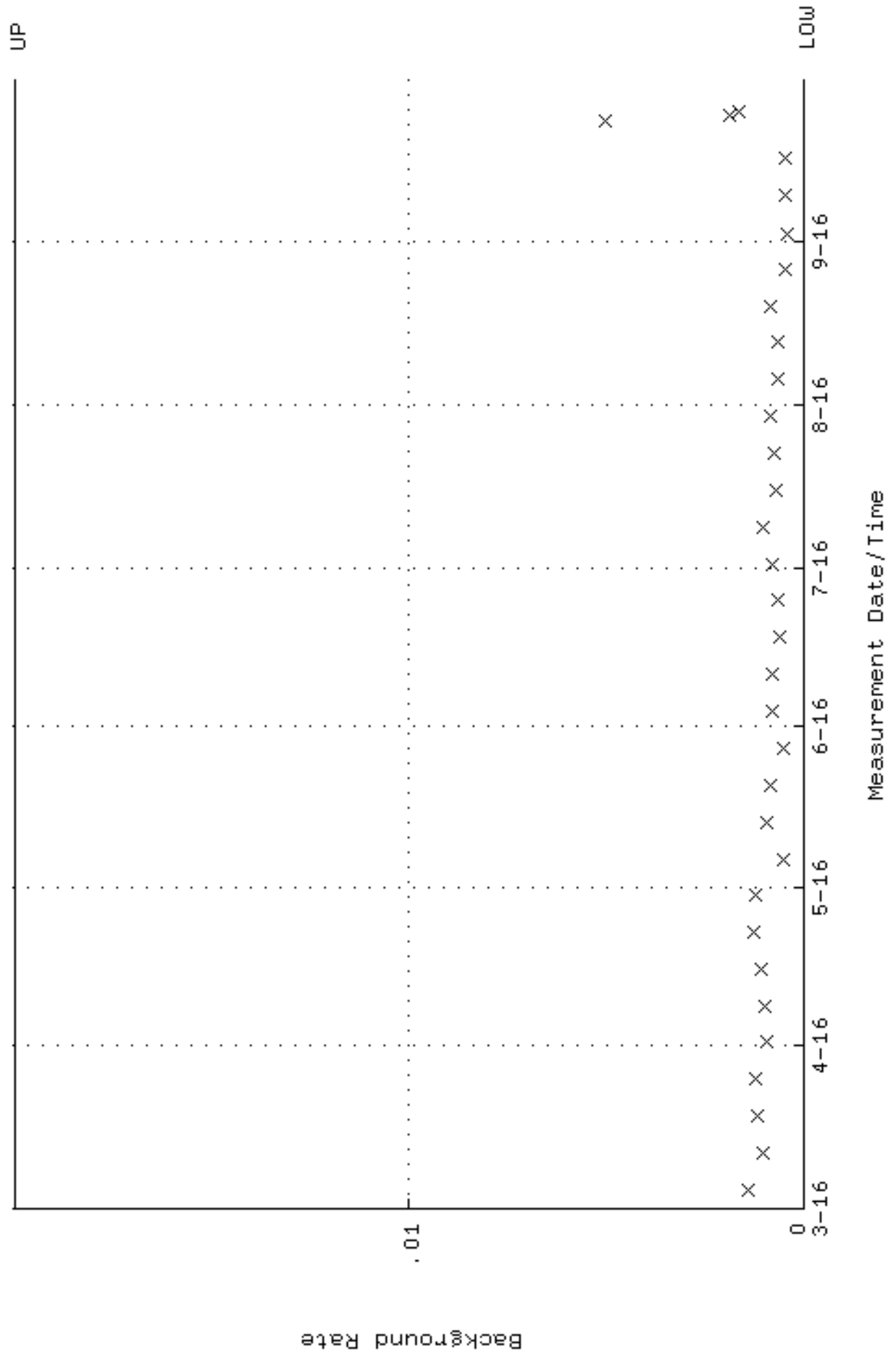
QA filename : DKA100:[ENV_ALPHA.QA.W]W066.QAF;8
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 24-AUG-2016 10:44:17 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



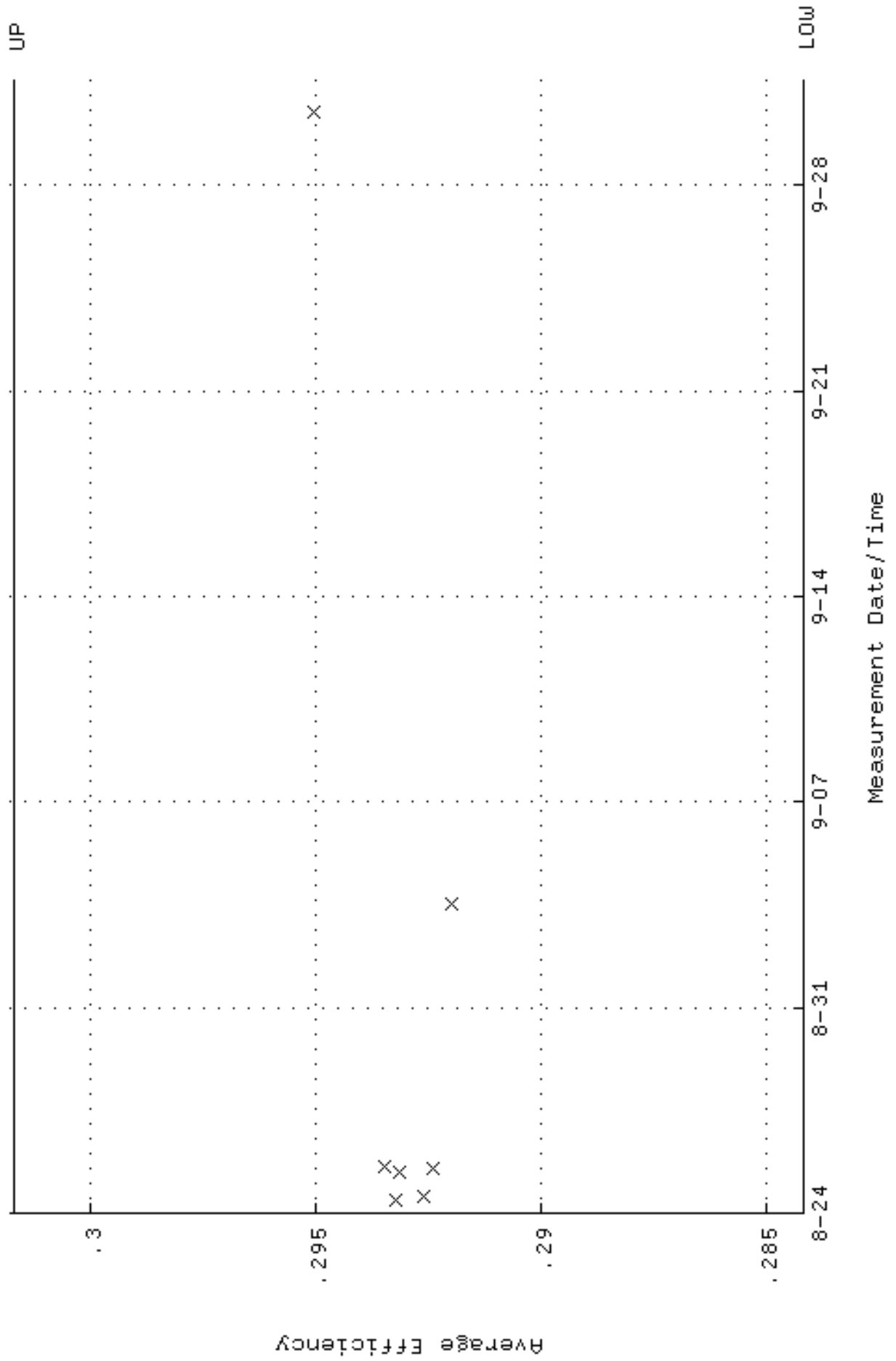
QA filename : DKA100:[ENV_ALPHA.QA.W]W066.QAF;8
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 24-AUG-2016 10:44:17 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



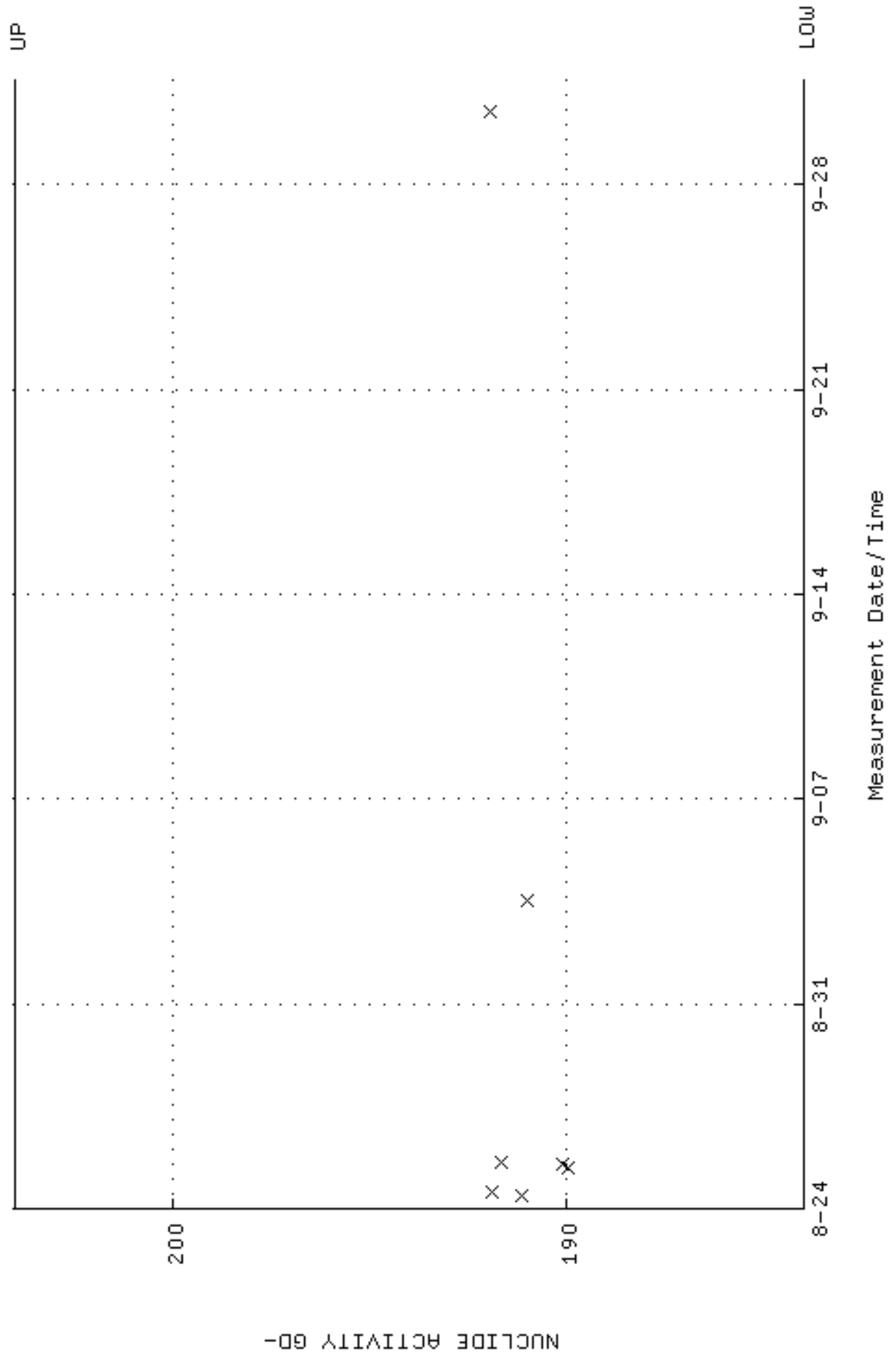
QA filename : DKA100:[ENV_ALPHA.QA.B]B066.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:21:36 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



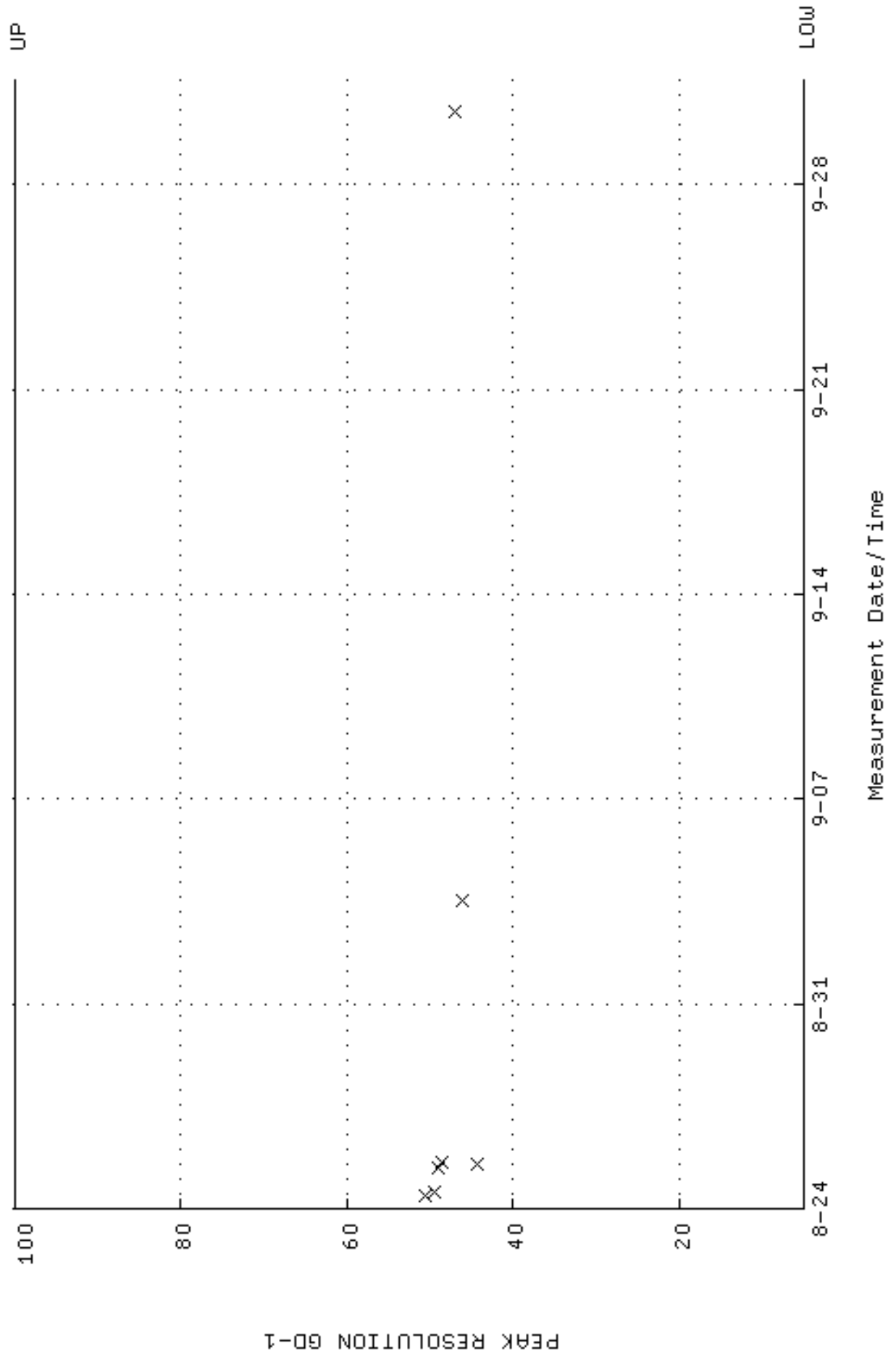
QA filename : DKA100:[ENV_ALPHA.QA.W]W067.QAF;8
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 24-AUG-2016 10:44:17 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.284161 through 0.301737



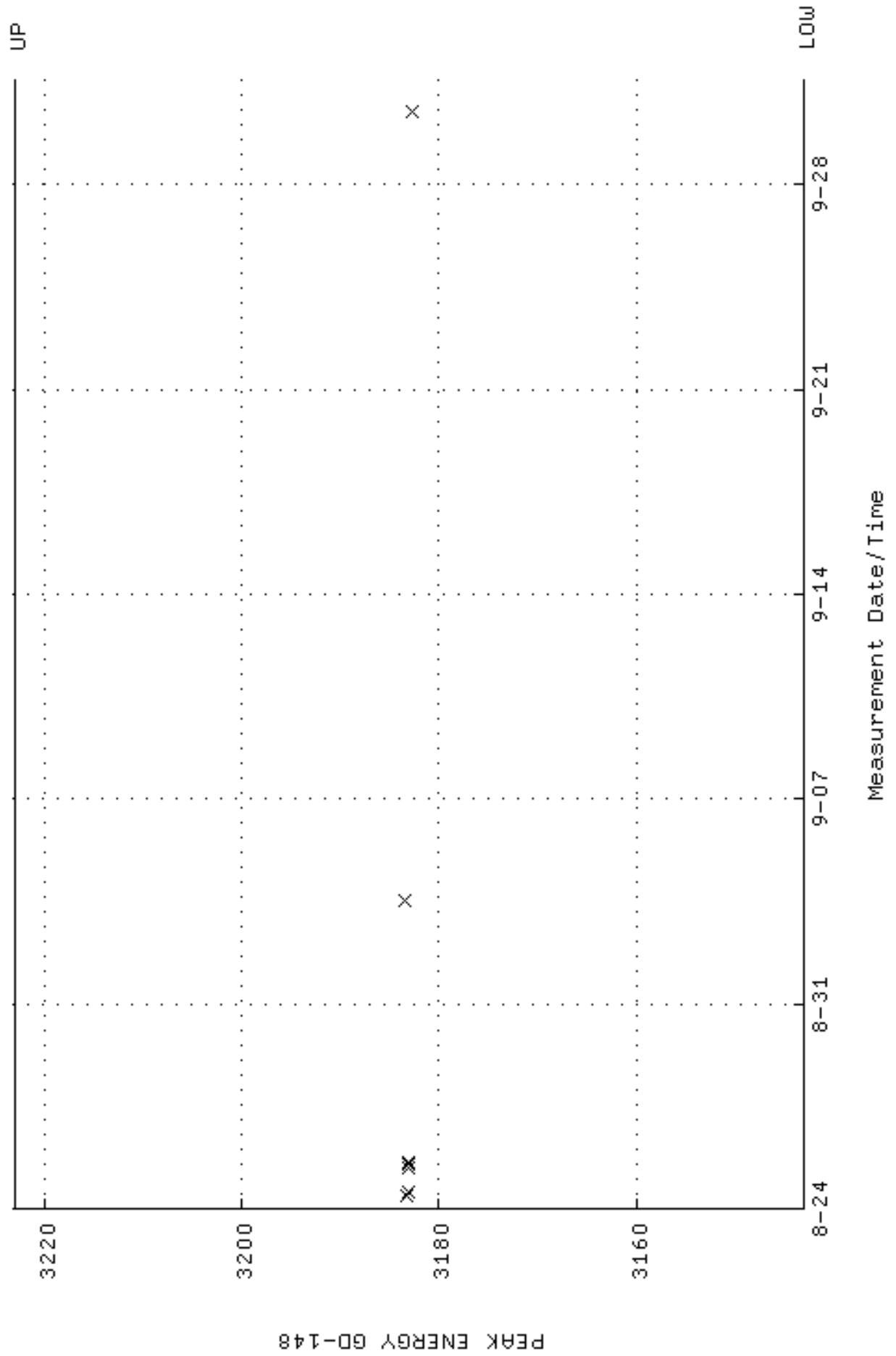
QA filename : DKA100:[ENV_ALPHA.QA.W]W067.QAF;8
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 24-AUG-2016 10:44:17 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



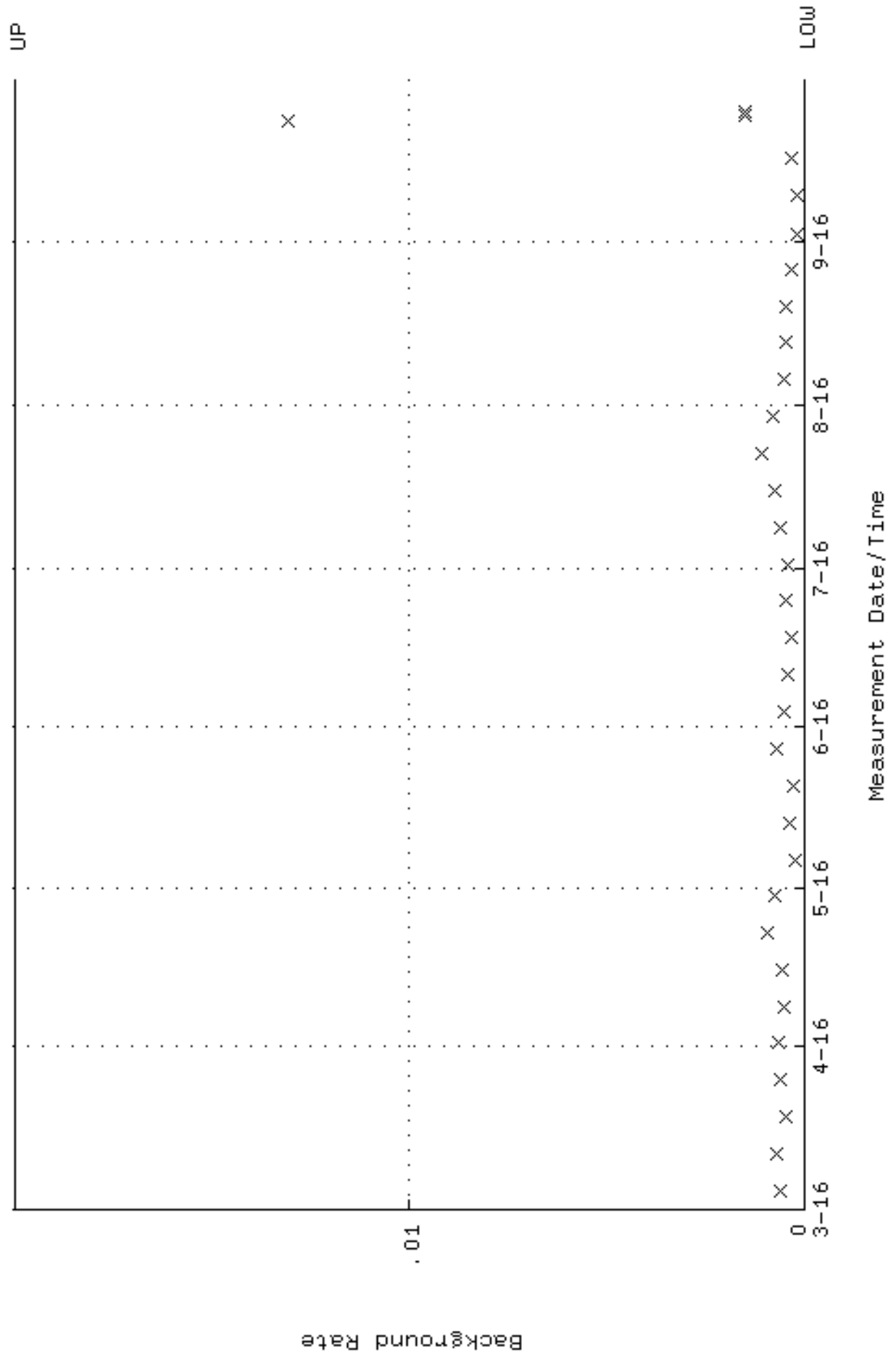
QA filename : DKA100:[ENV_ALPHA.QA.W]W067.QAF;8
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 24-AUG-2016 10:44:17 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.0000



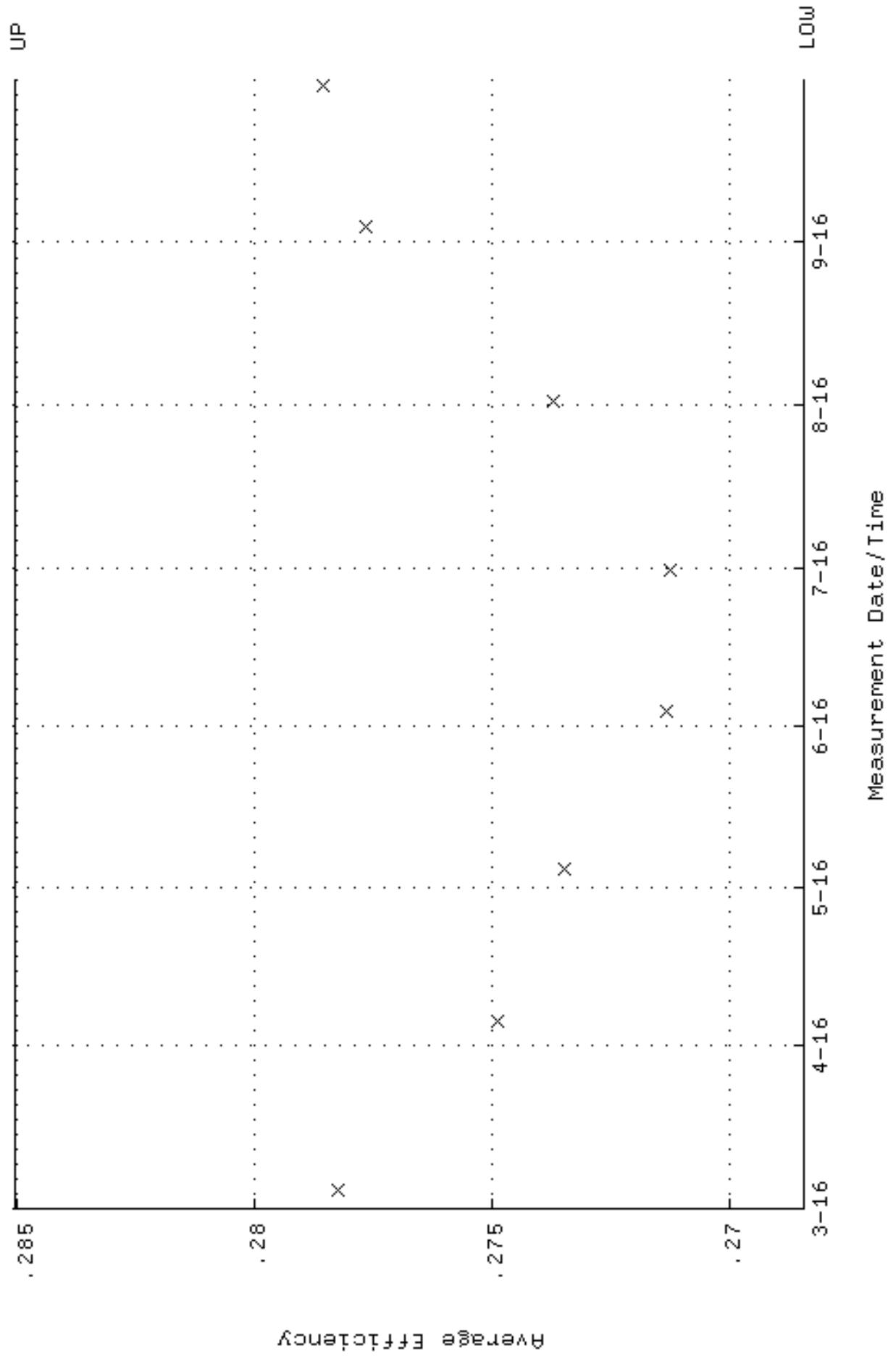
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 24-AUG-2016 10:44:17 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



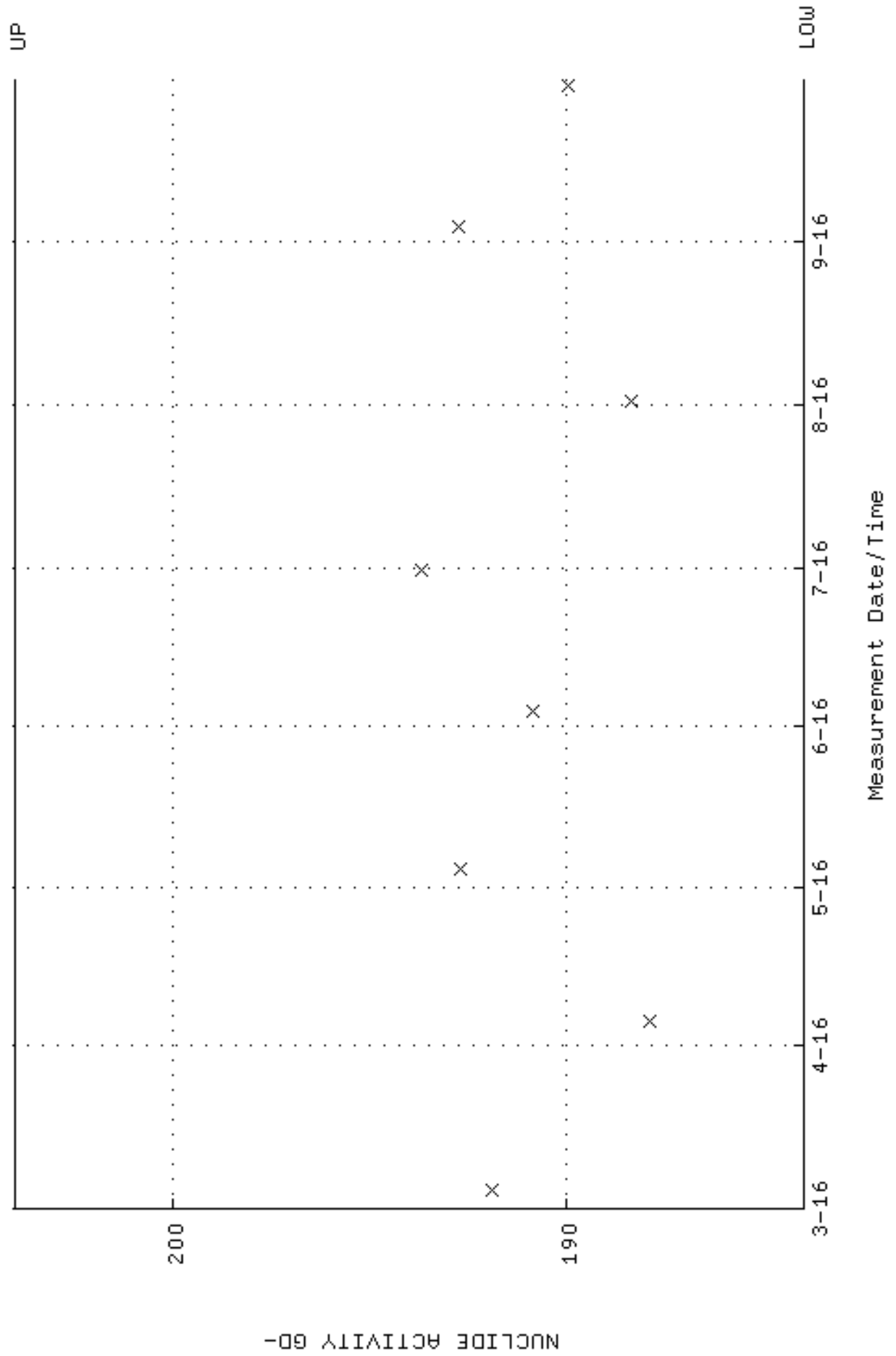
QA filename : DKA100:[ENV_ALPHA.QA.B]B067.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:21:36 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



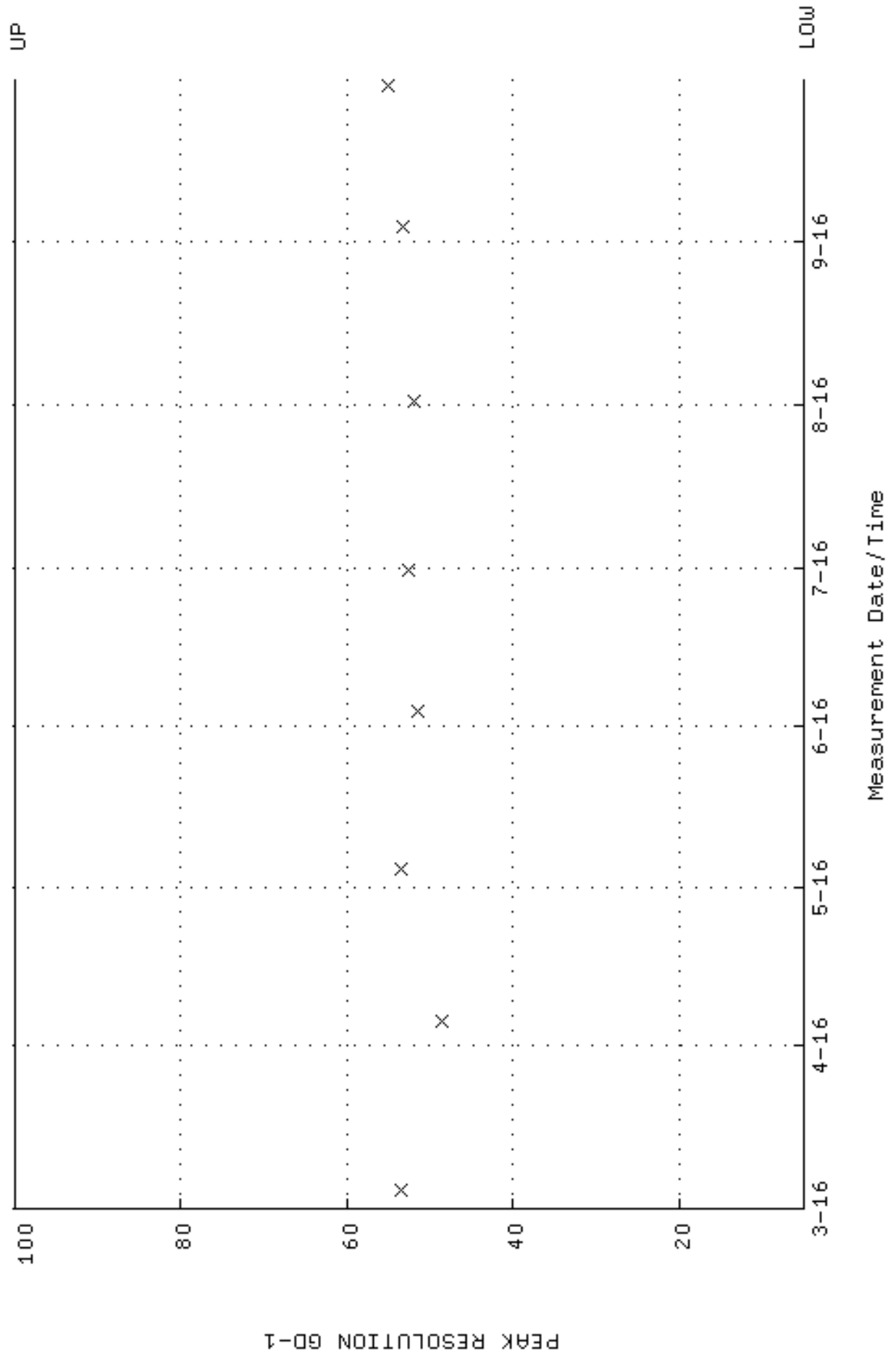
QA filename : DKA100:[ENV_ALPHA.QA.W]W068.QAF;8
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.268440 through 0.285050



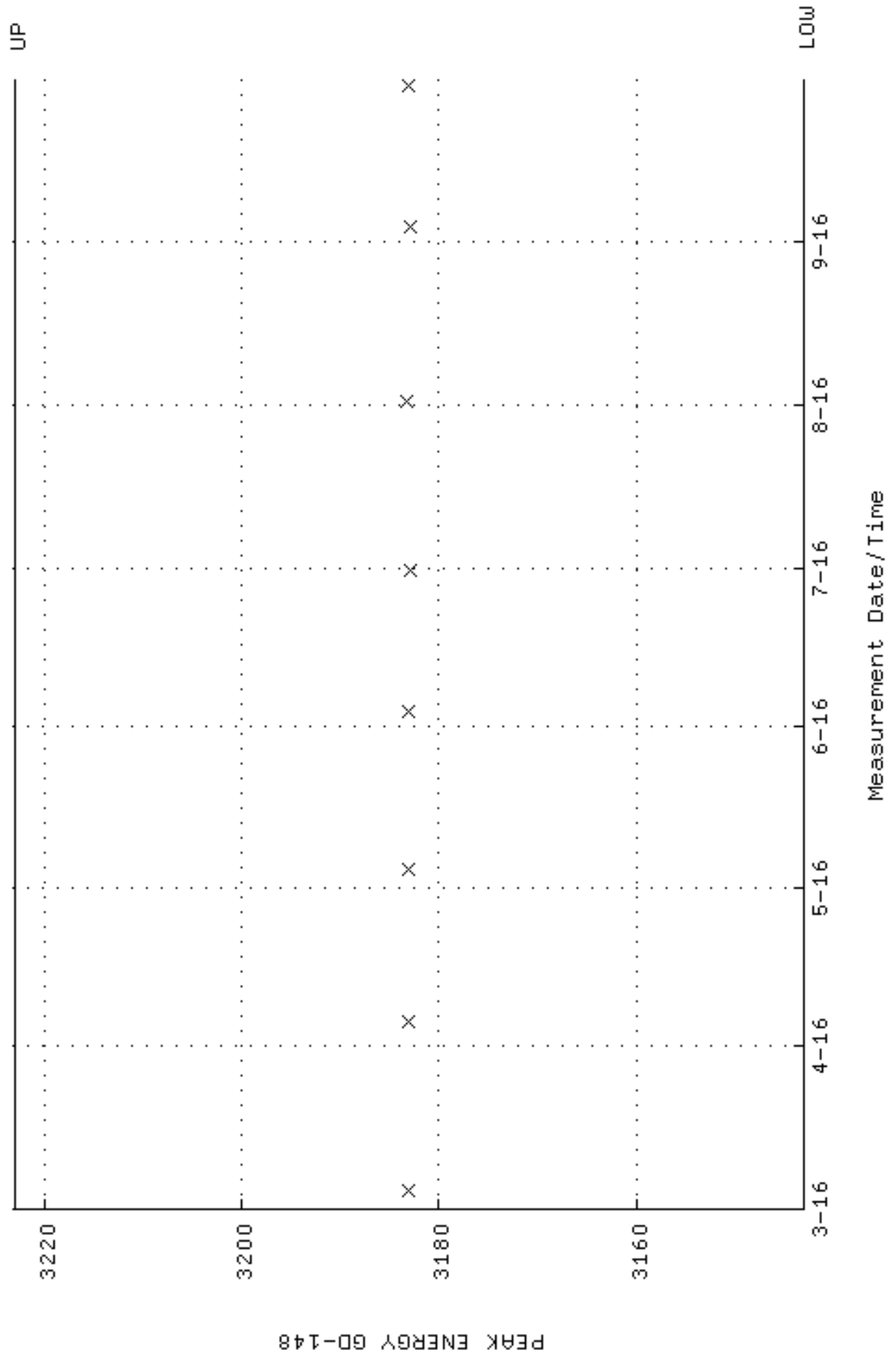
QA filename : DKA100:[ENV_ALPHA.QA.W]W068.QAF;8
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



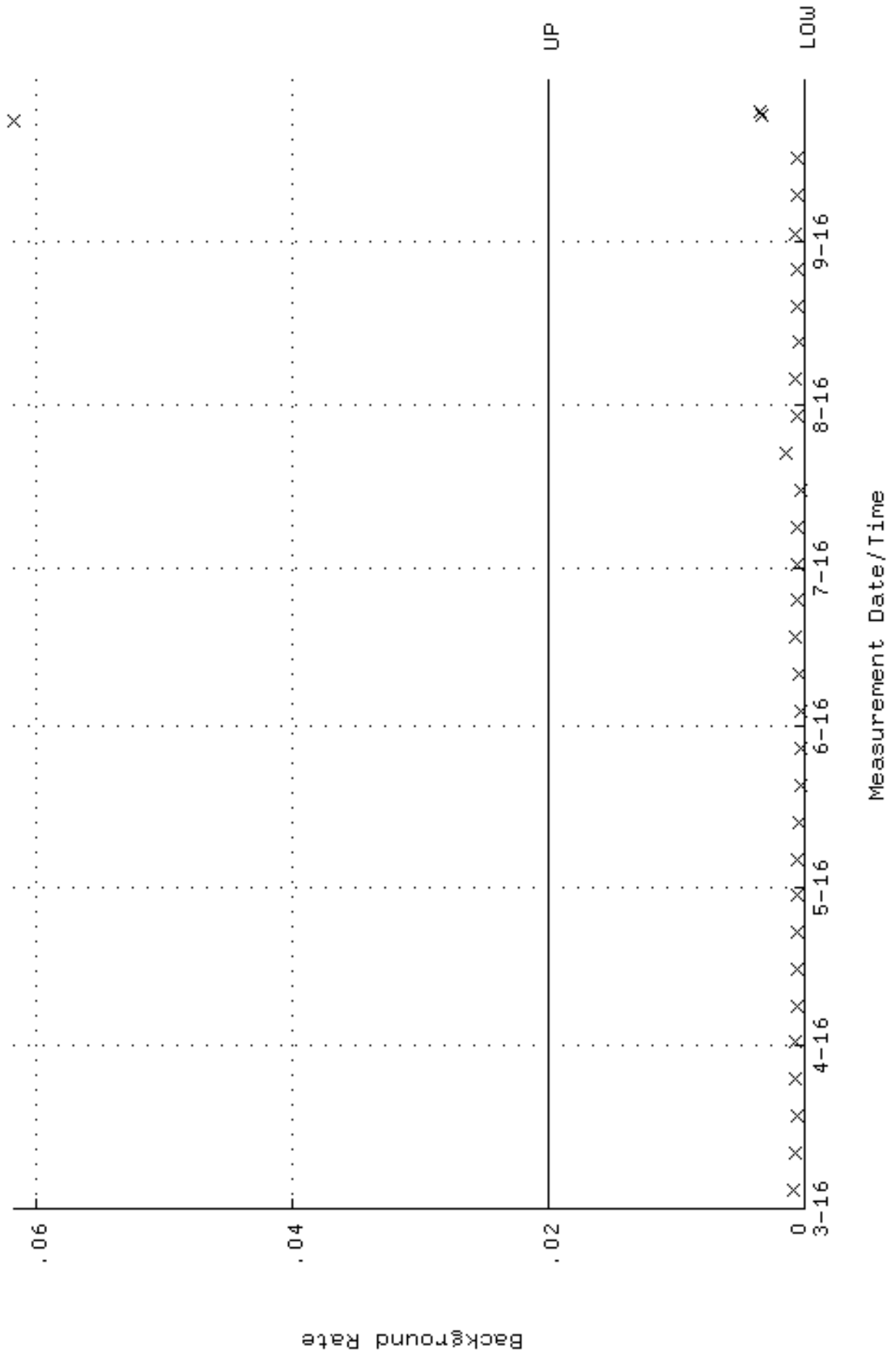
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Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



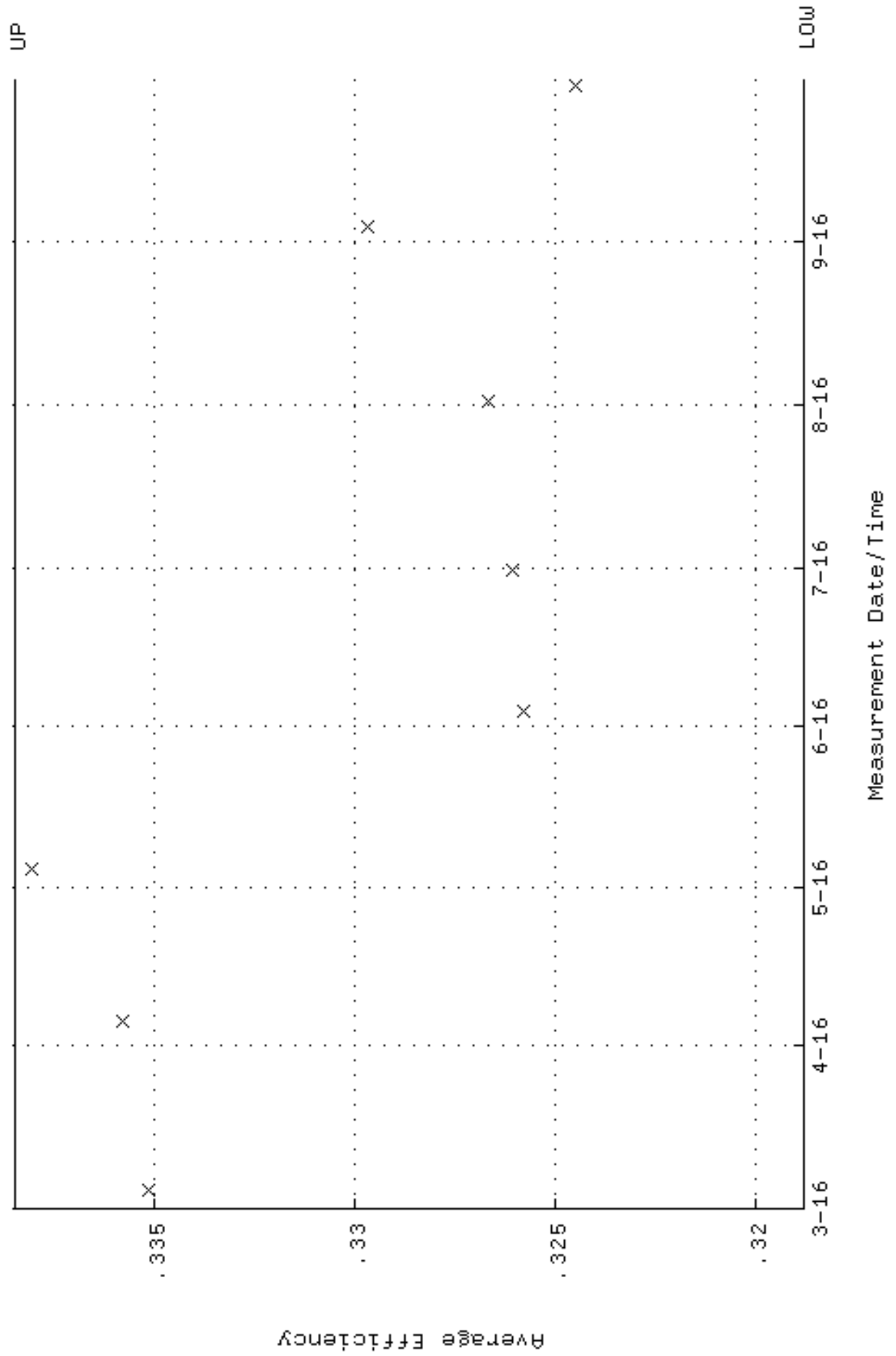
QA filename : DKA100:[ENV_ALPHA.QA.W]W068.QAF;8
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



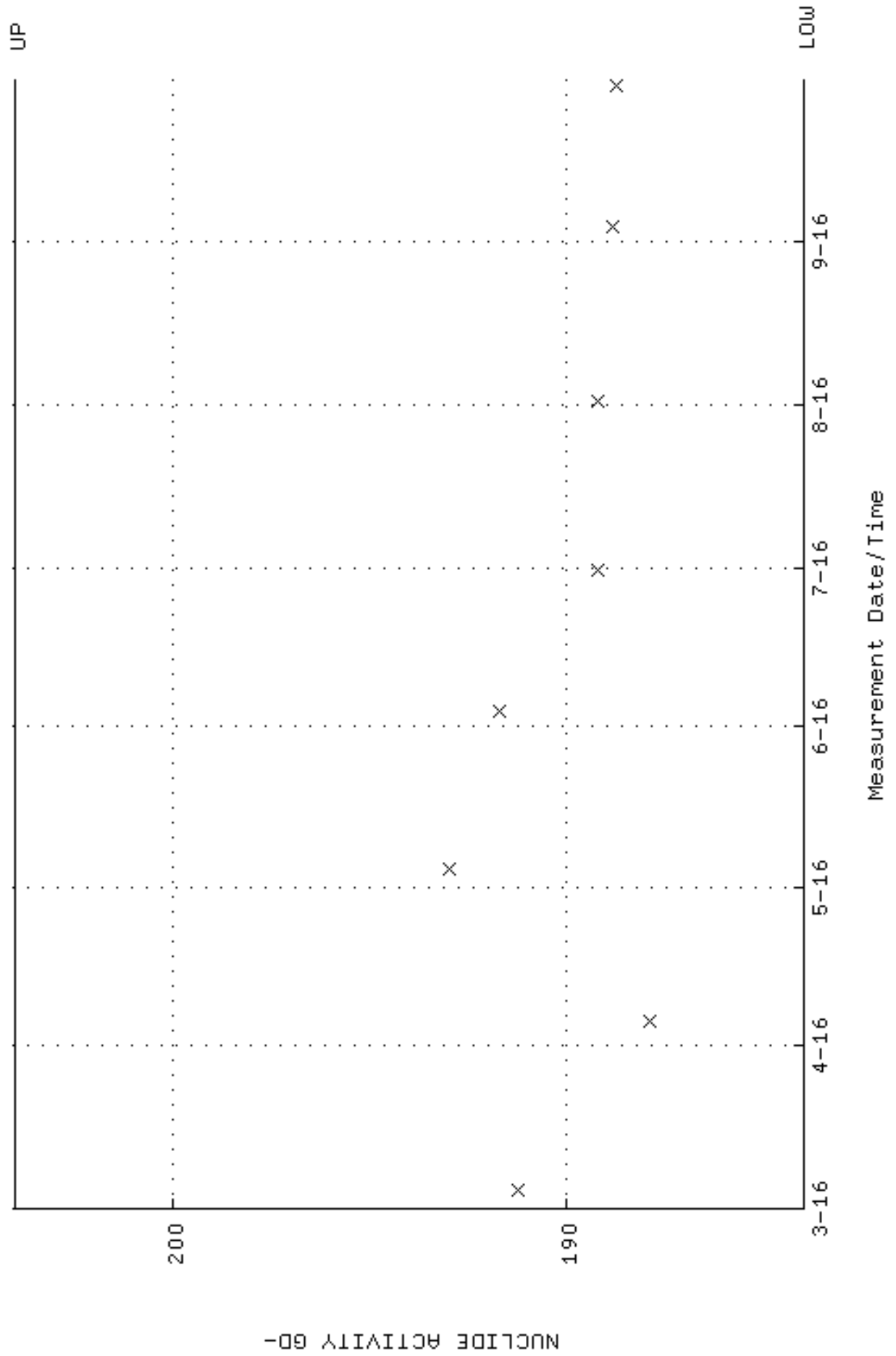
QA filename : DKA100:[ENV_ALPHA.QA.B]B068.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:21:36 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



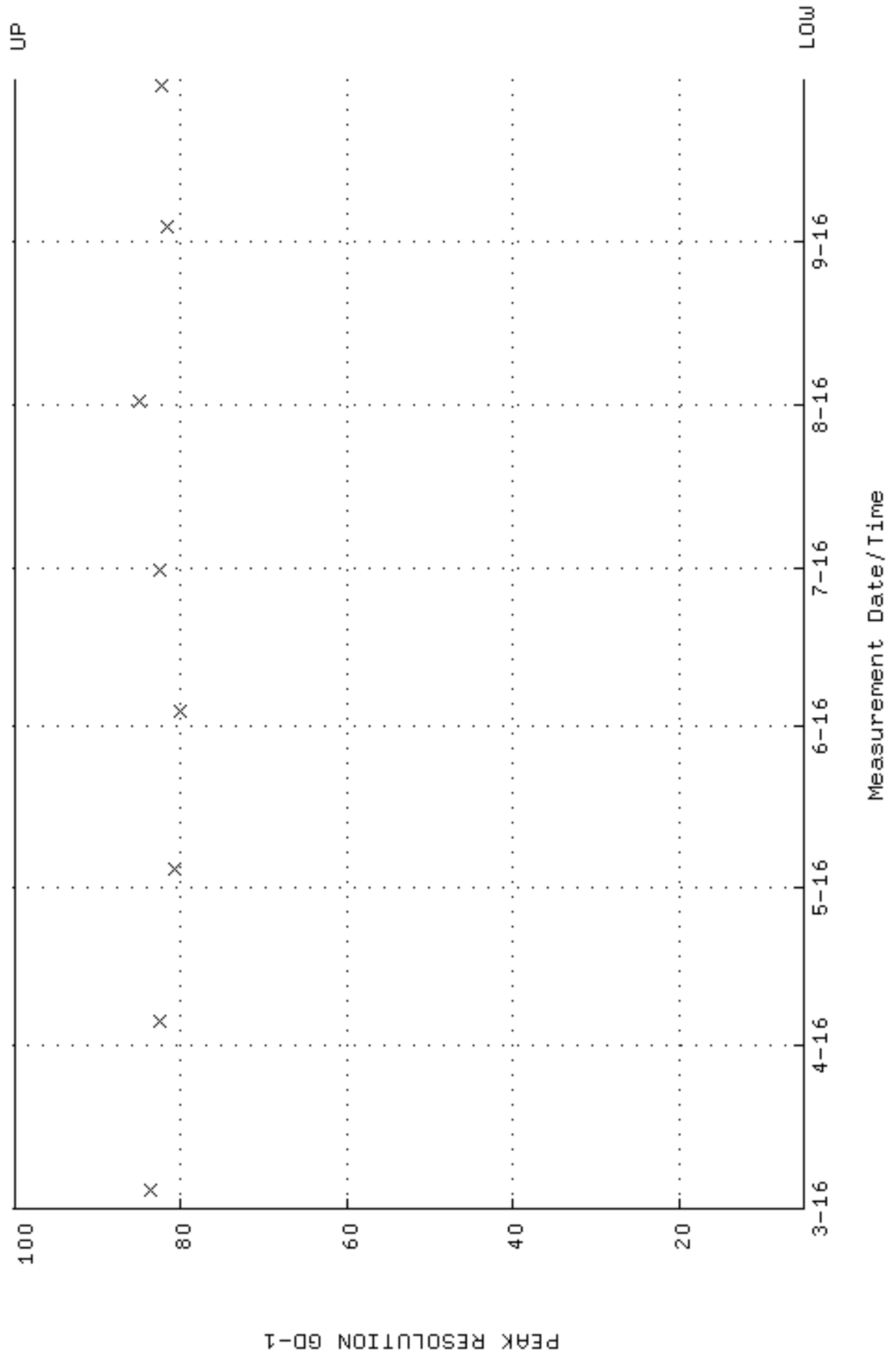
QA filename : DKA100:[ENV_ALPHA.QA.W]W069.QAF;11
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.318777 through 0.338495



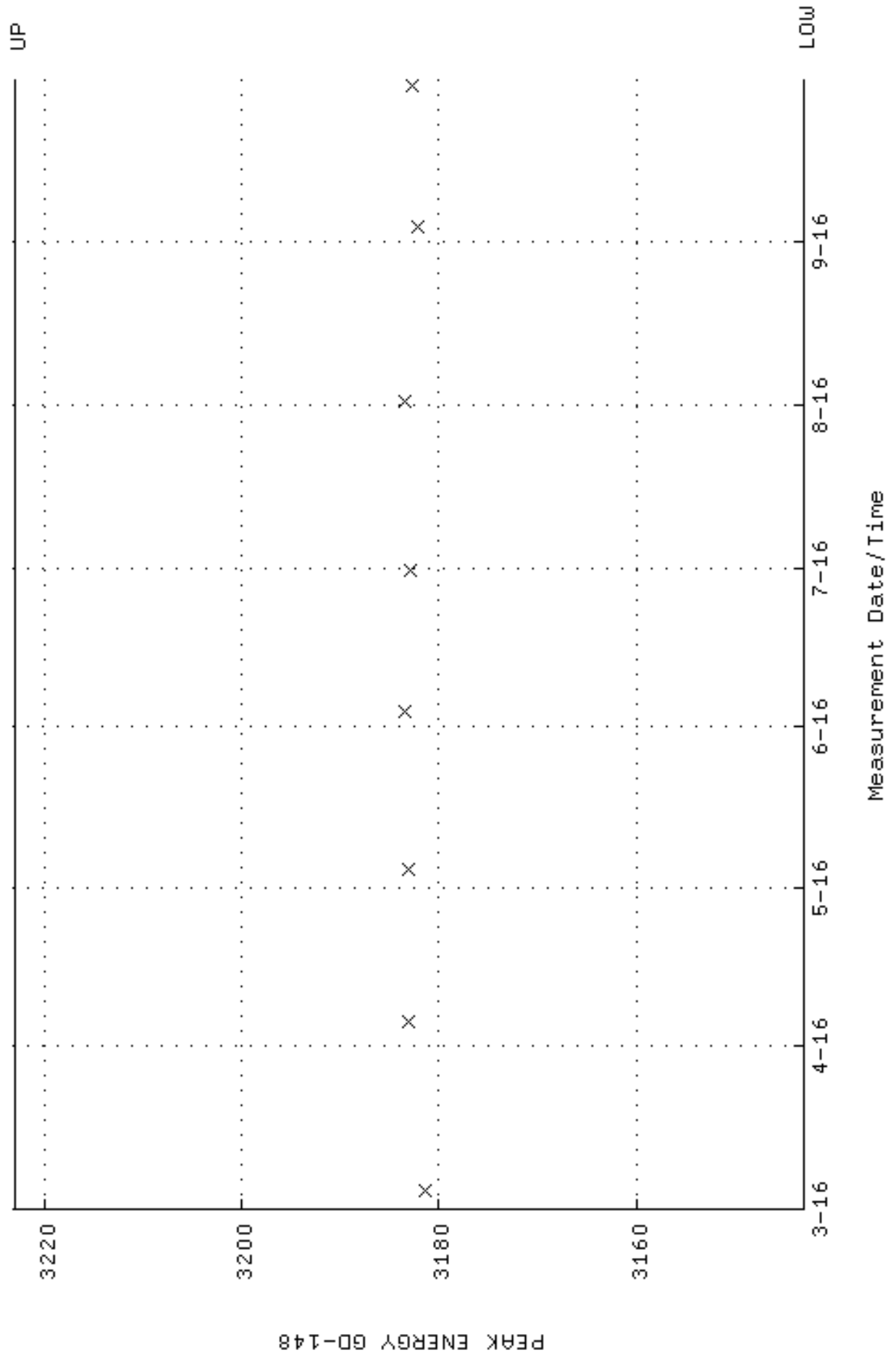
QA filename : DKA100:[ENV_ALPHA.QA.W]W069.QAF;11
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



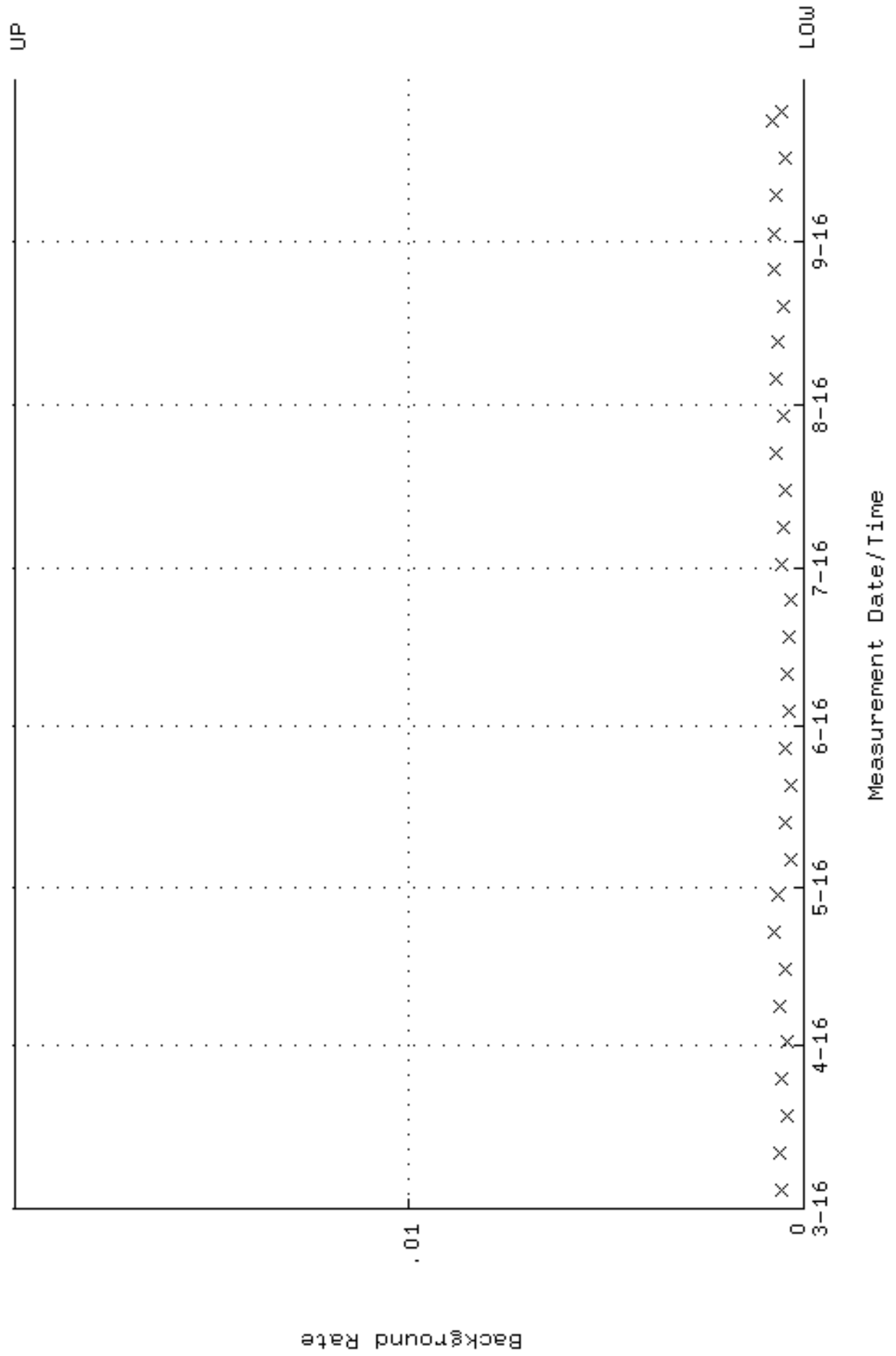
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Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



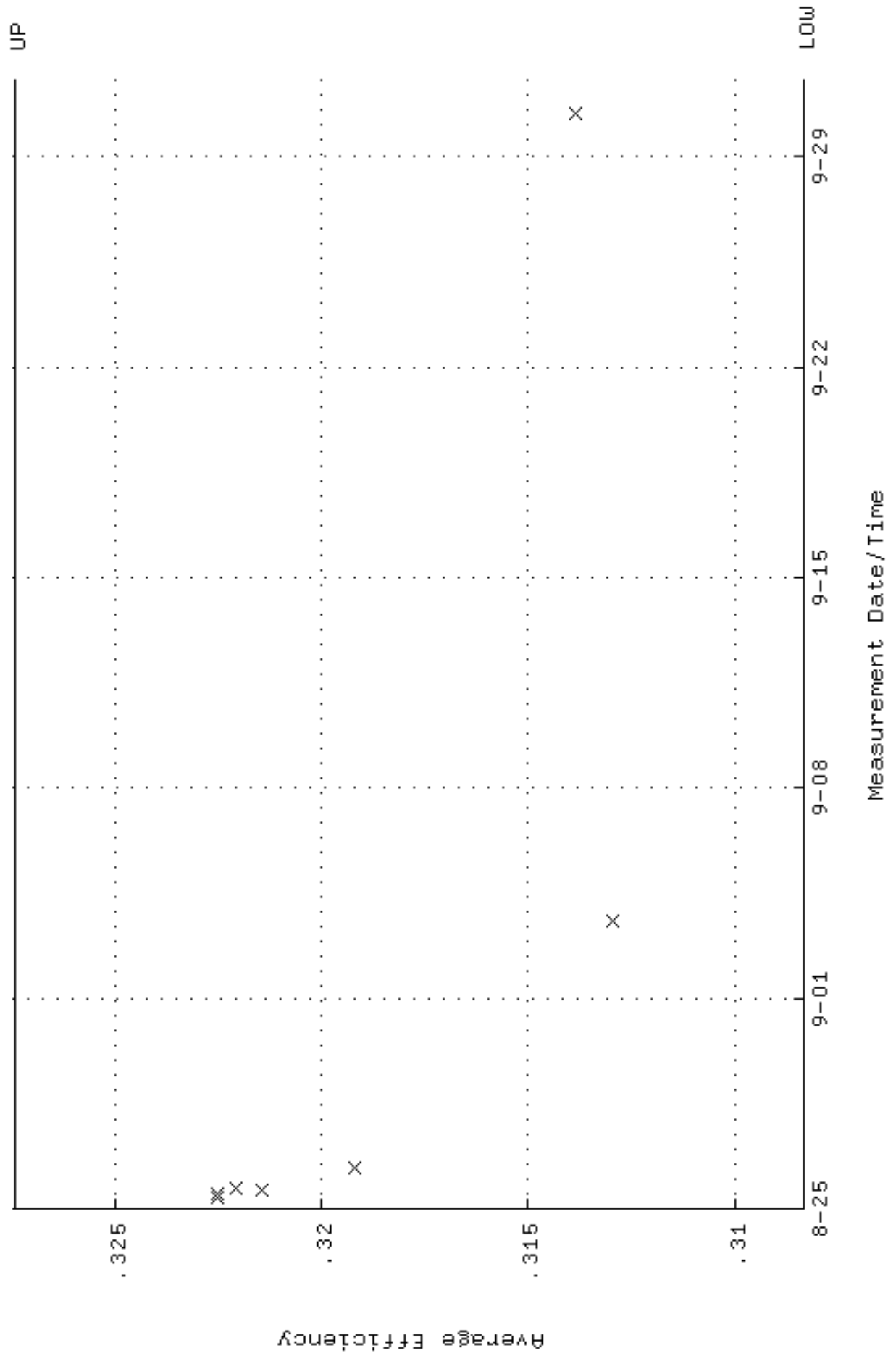
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



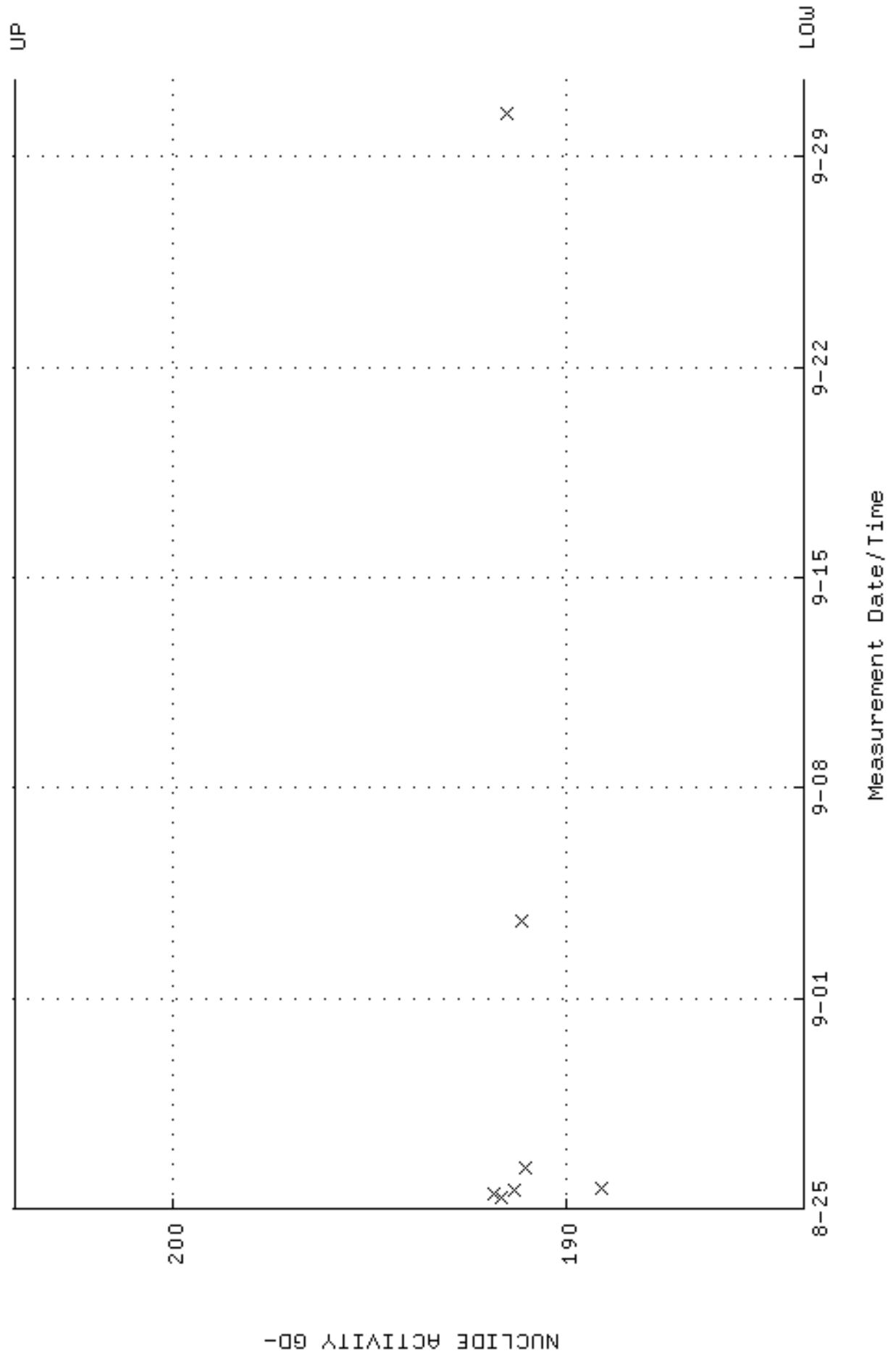
QA filename : DKA100:[ENV_ALPHA.QA.B]B069.QAF;5
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:21:36 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



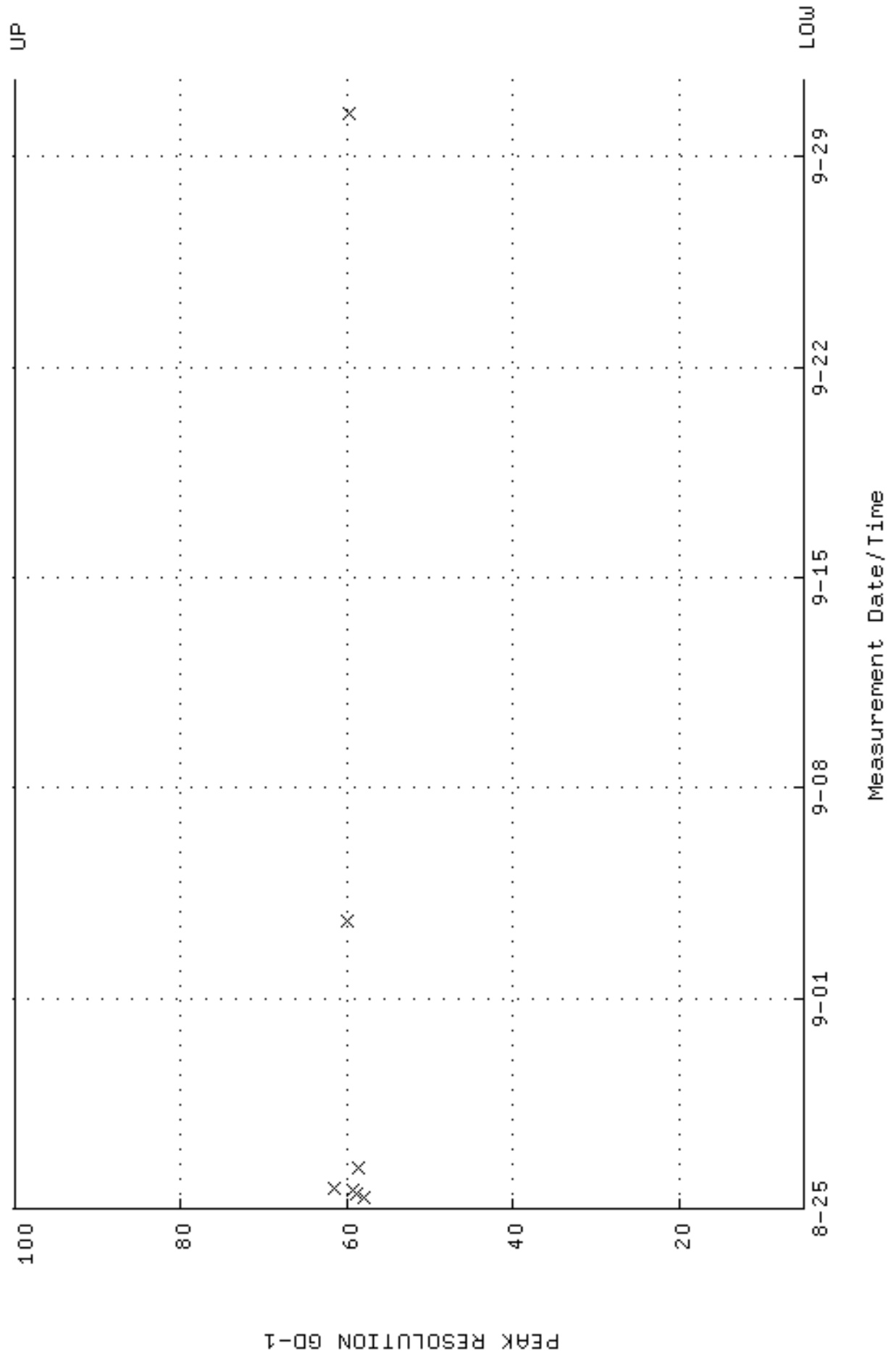
QA filename : DKA100:[ENV_ALPHA.QA.W]W070.QAF;10
 Parameter Name : AVREFF (Average Efficiency)
 Start/End Dates : 25-AUG-2016 08:42:44 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.308333 through 0.327405



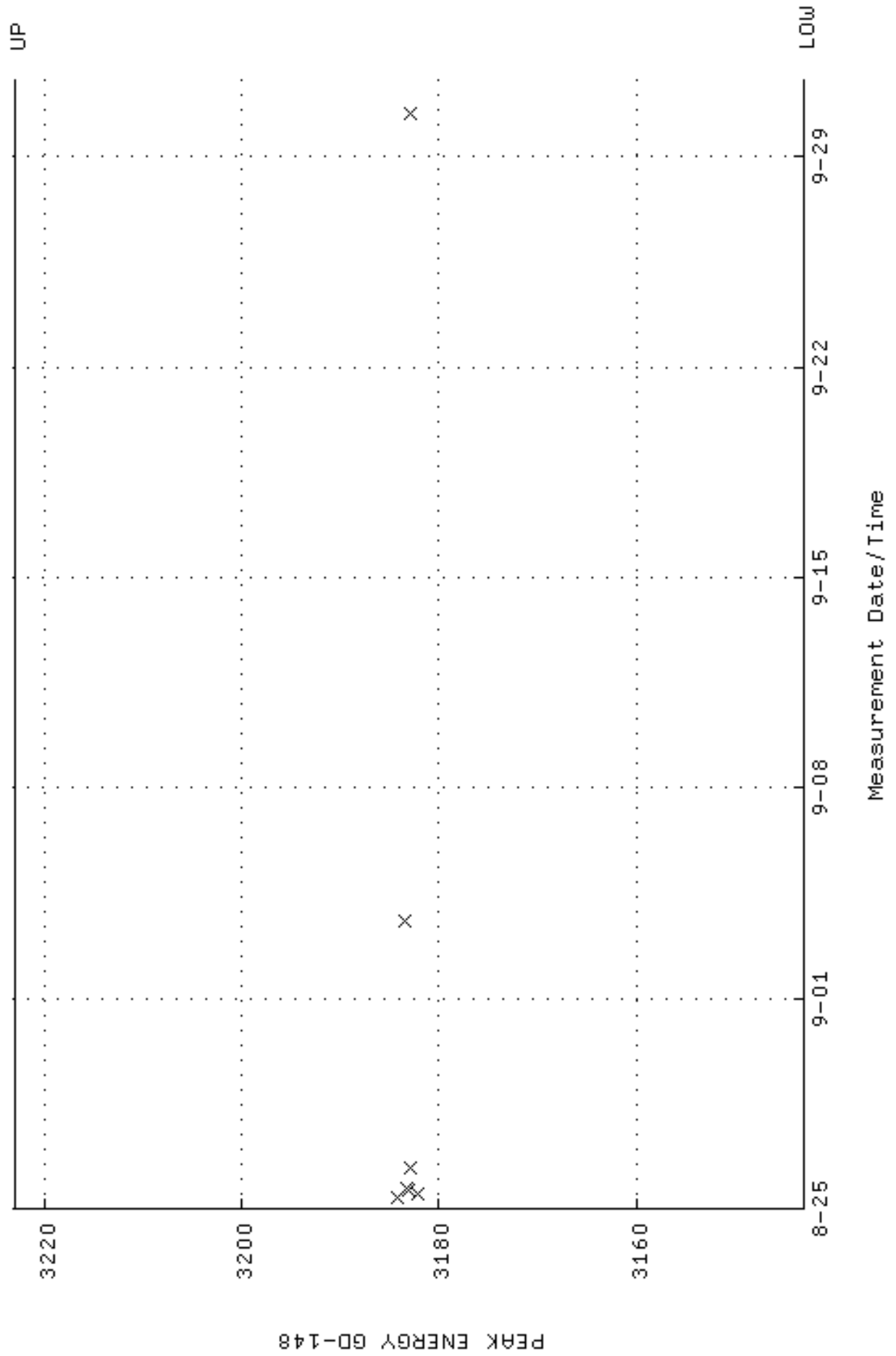
QA filename : DKA100:[ENV_ALPHA.QA.W]W070.QAF;10
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 25-AUG-2016 08:42:44 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



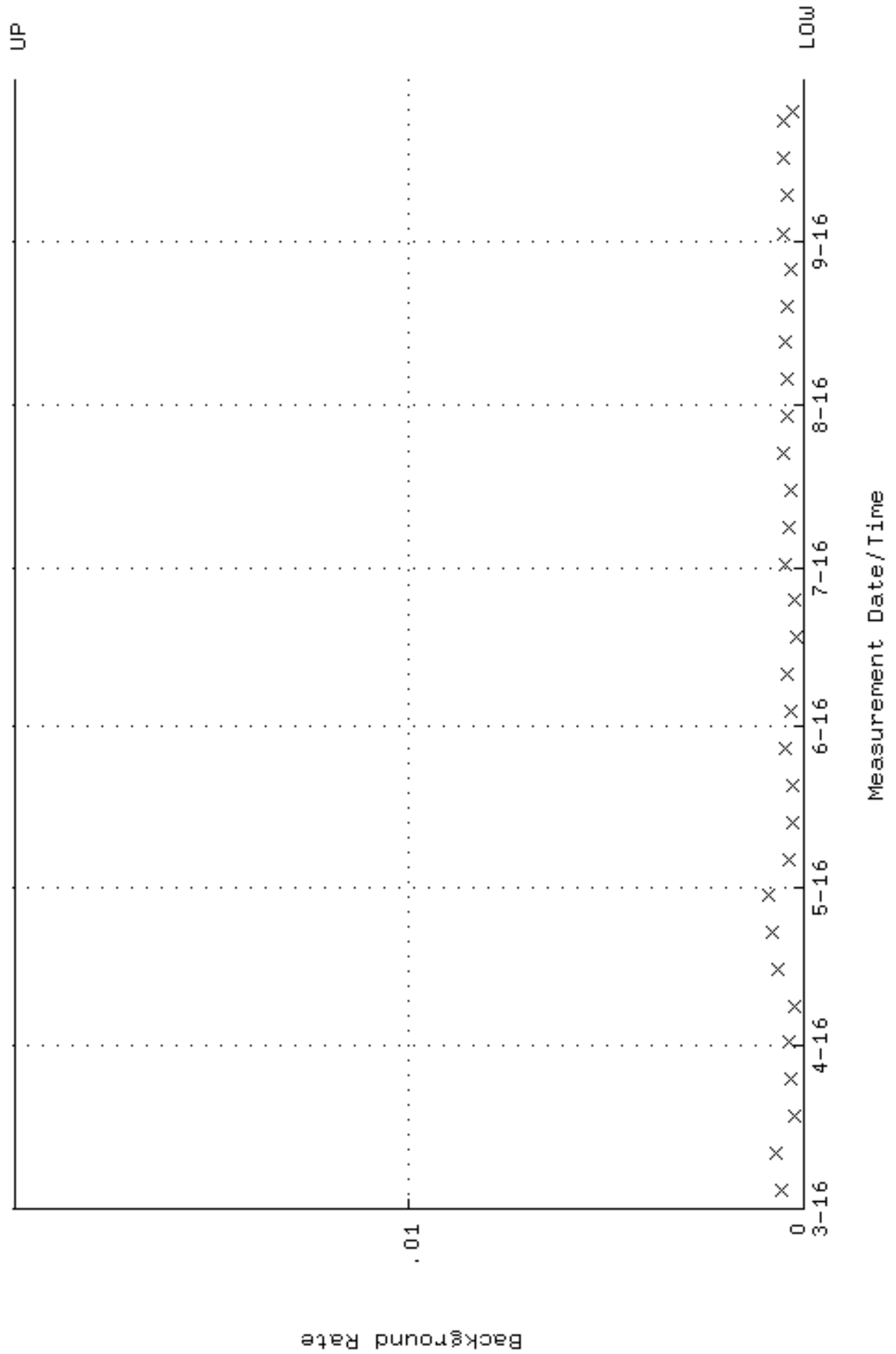
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Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 25-AUG-2016 08:42:44 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



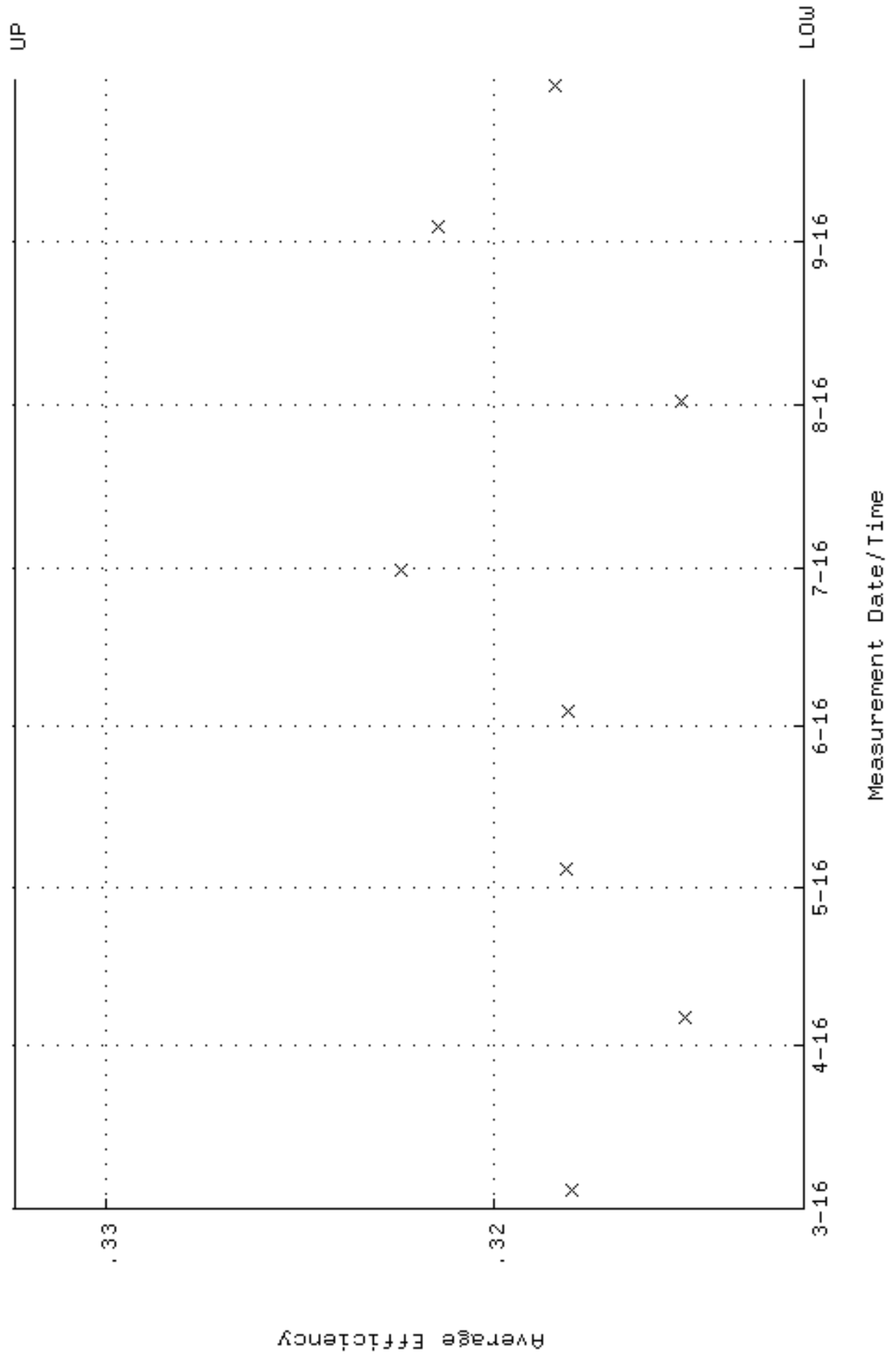
QA filename : DKA100:[ENV_ALPHA.QA.W]W070.QAF;10
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 25-AUG-2016 08:42:44 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



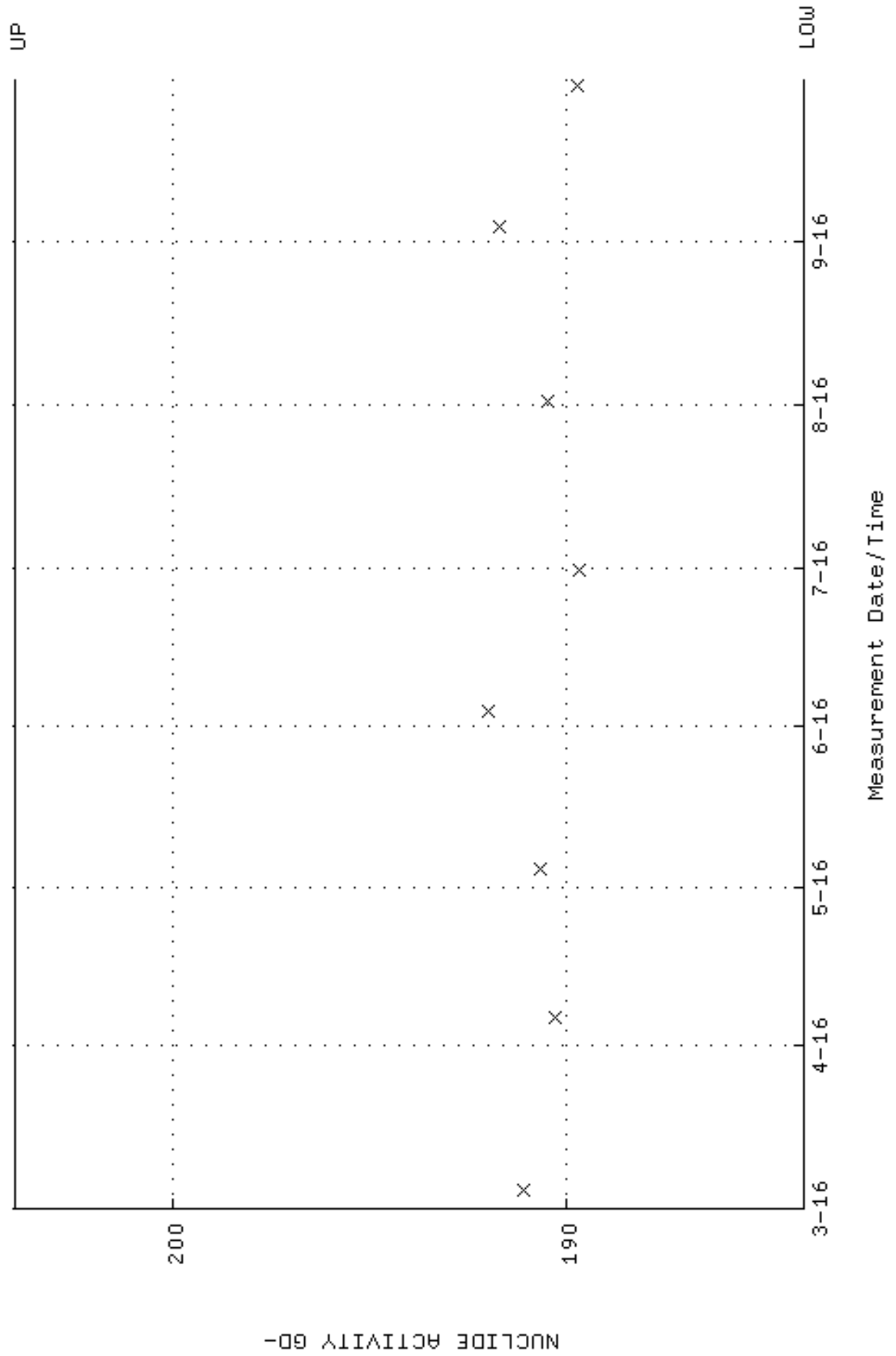
QA filename : DKA100:[ENV_ALPHA.QA.B]B070.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:21:36 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



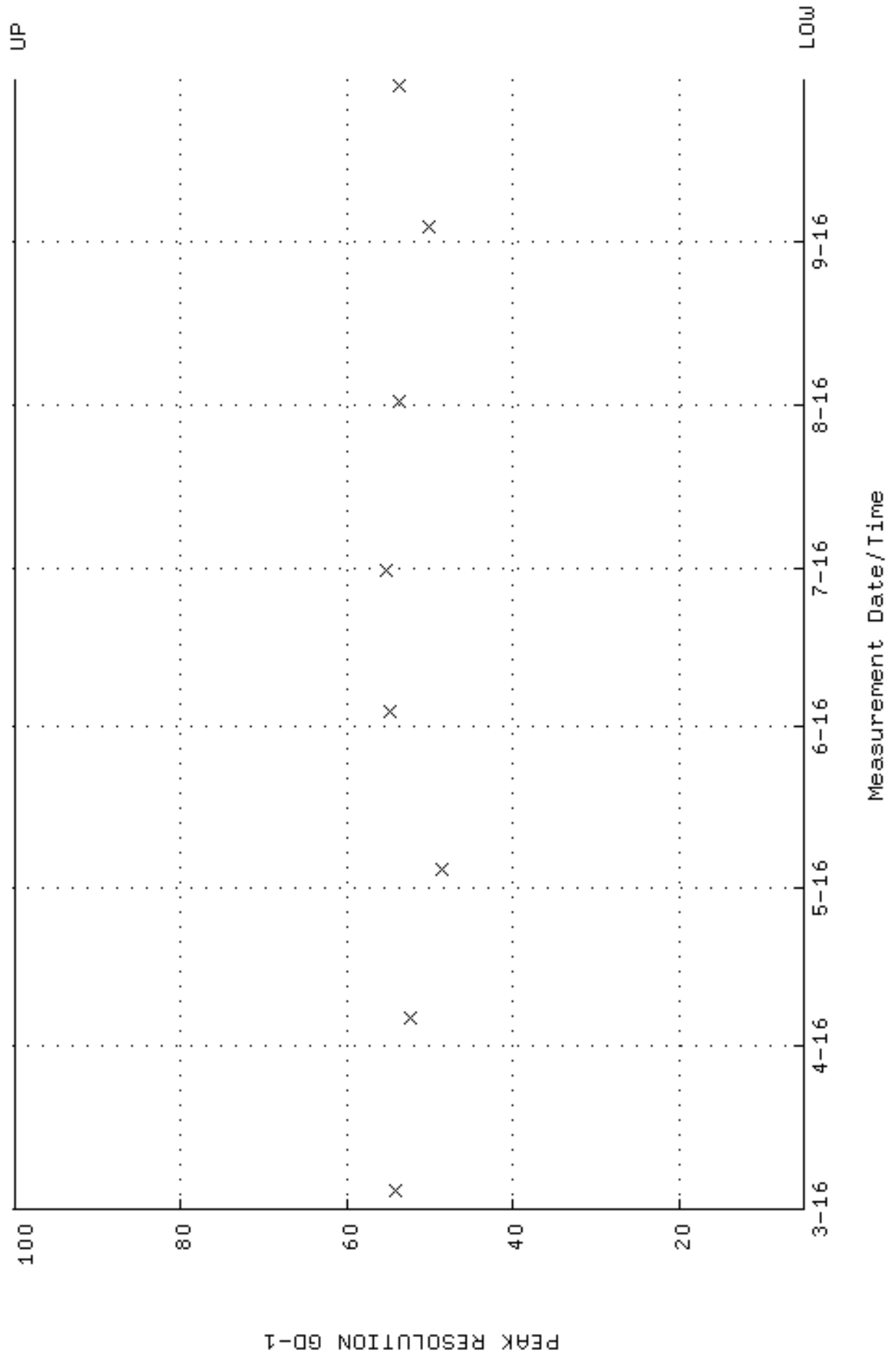
QA filename : DKA100:[ENV_ALPHA.QA.W]W071.QAF;10
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.312000 through 0.332340



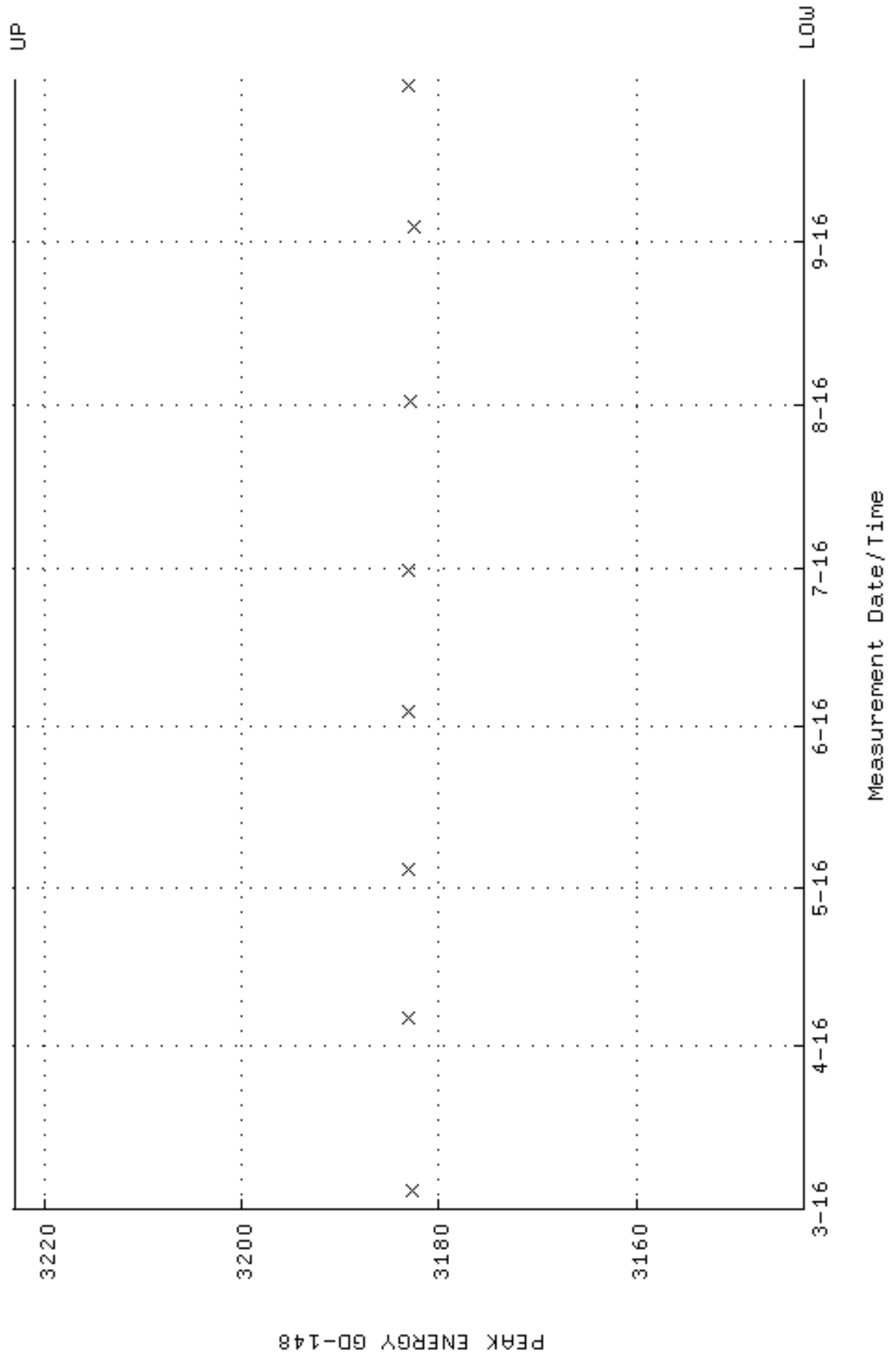
QA filename : DKA100:[ENV_ALPHA.QA.W]W071.QAF;10
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



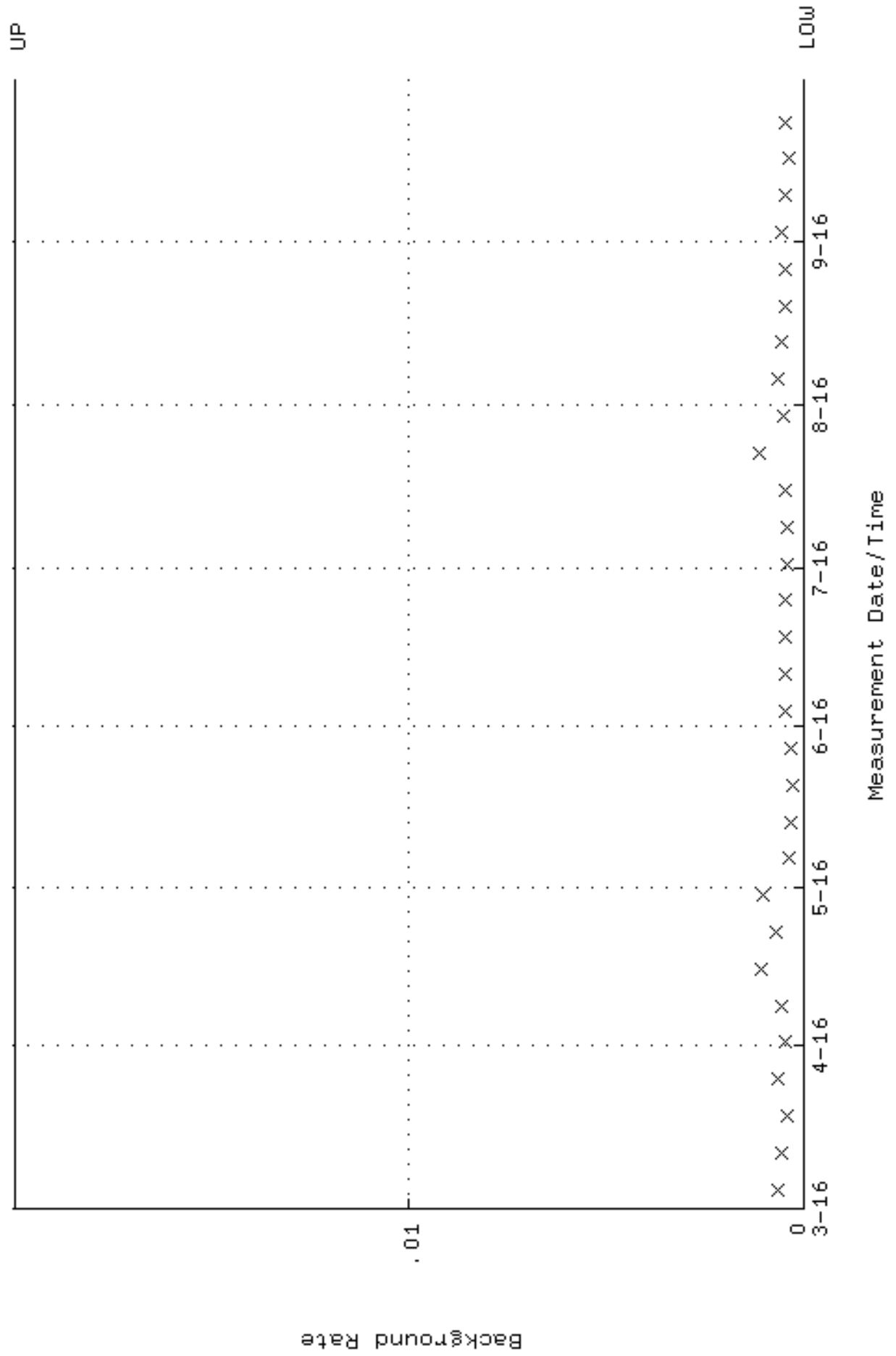
QA filename : DKA100:[ENV_ALPHA.QA.W]W071.QAF;10
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



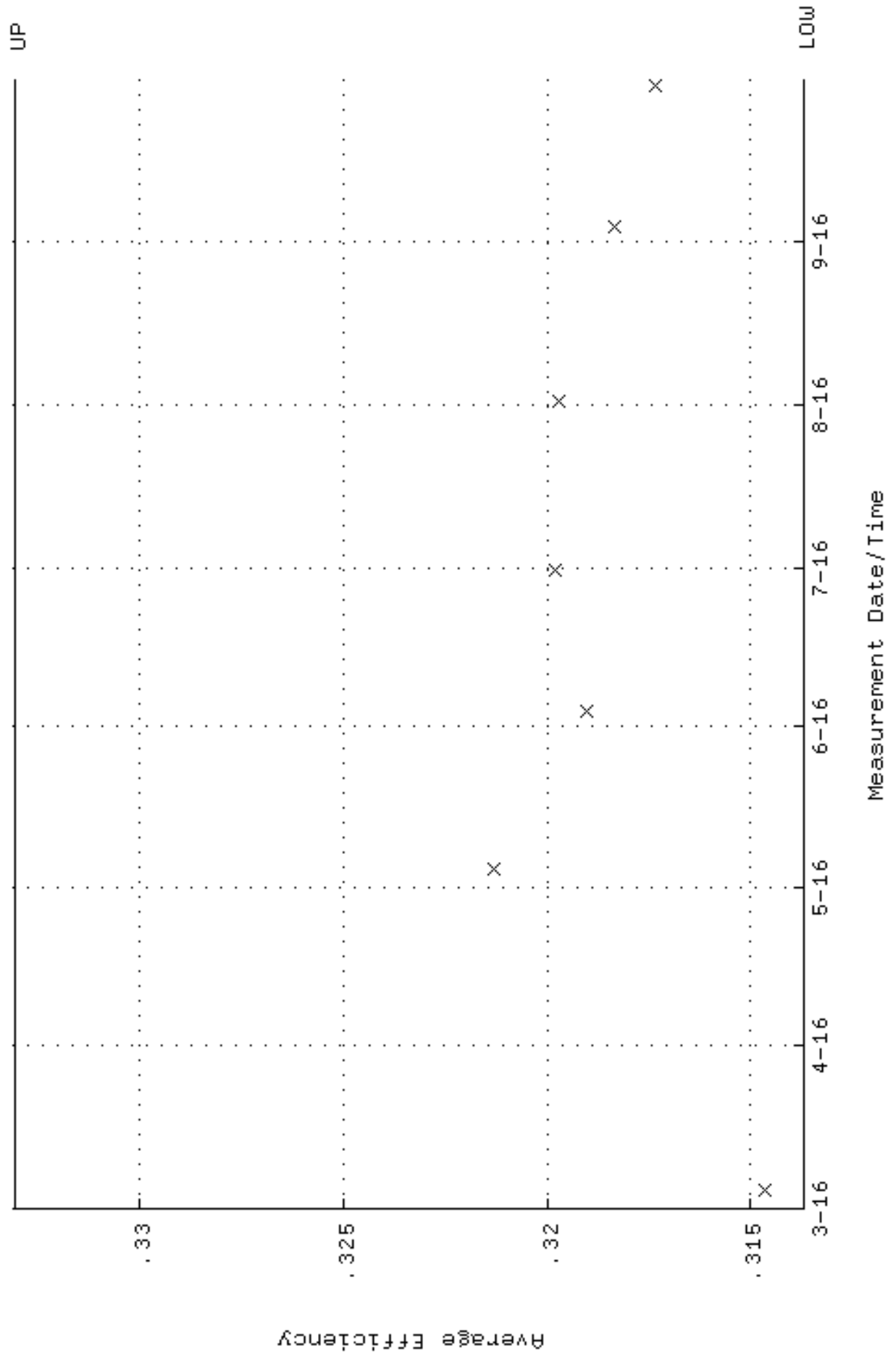
QA filename : DKA100:[ENV_ALPHA.QA.W]W071.QAF;10
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



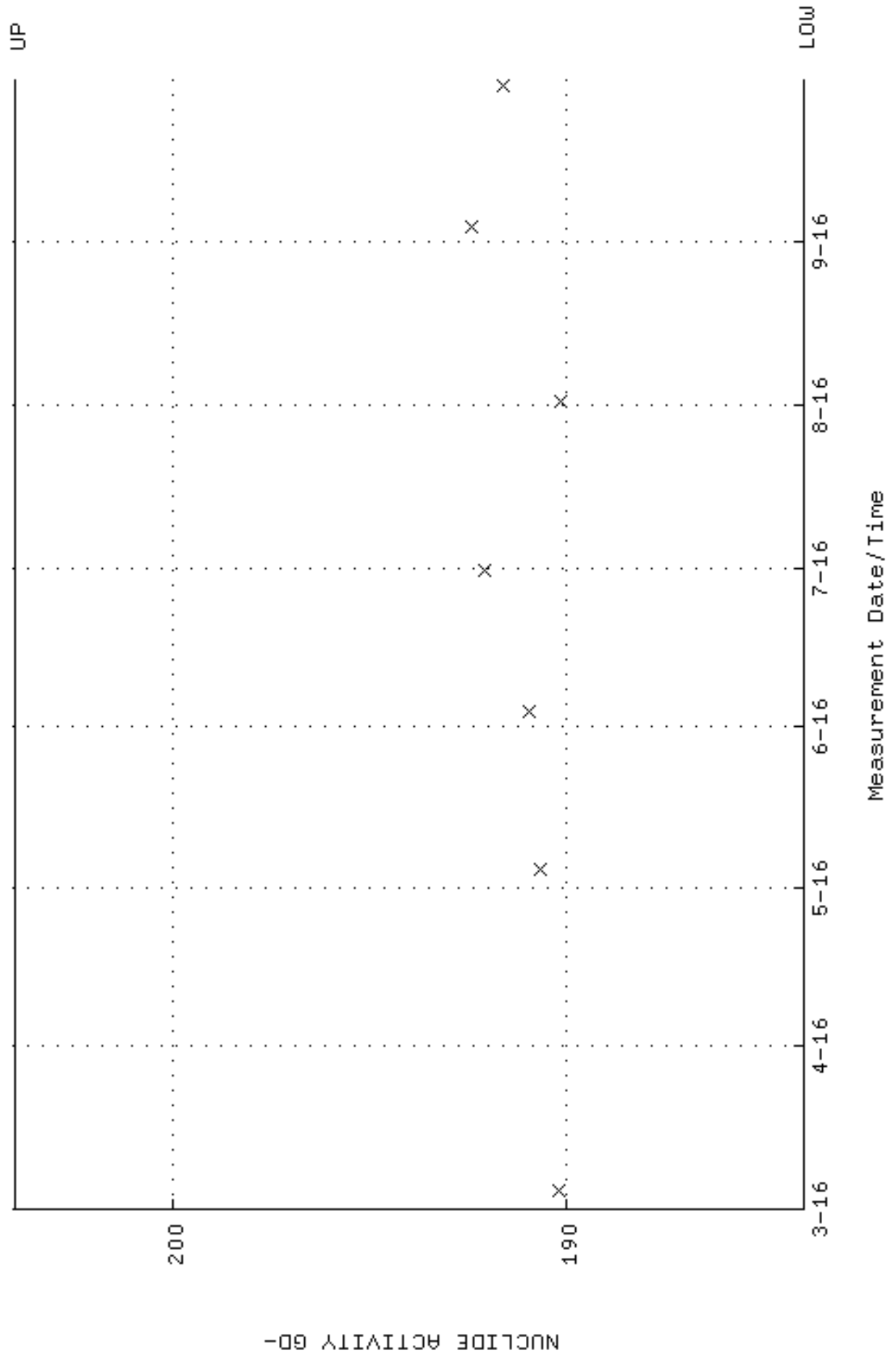
QA filename : DKA100:[ENV_ALPHA.QA.B]B071.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:21:38 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



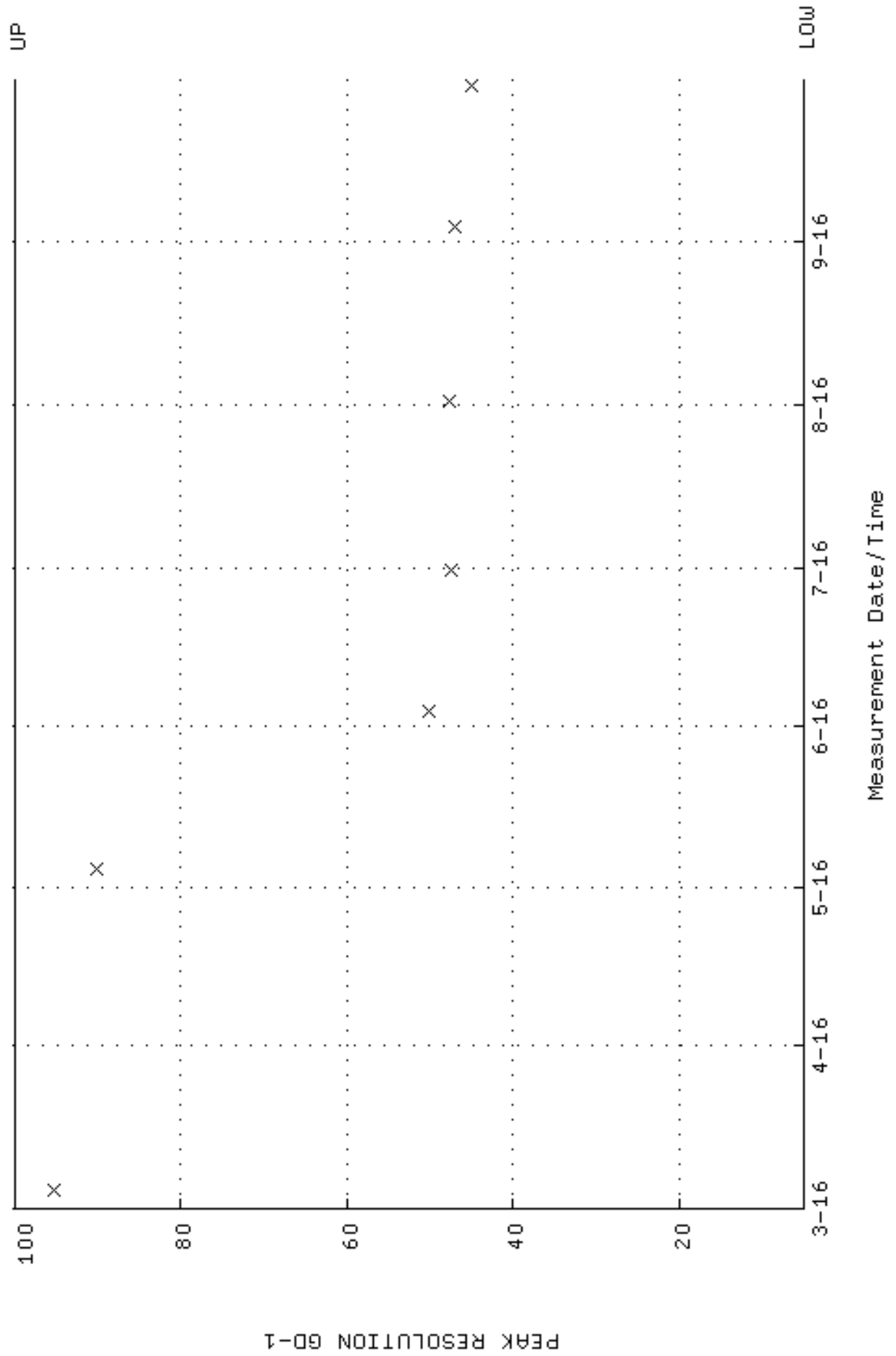
QA filename : DKA100:[ENV_ALPHA.QA.W]W072.QAF;10
 Parameter Name : AVREFF (Average Efficiency)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.313679 through 0.333081



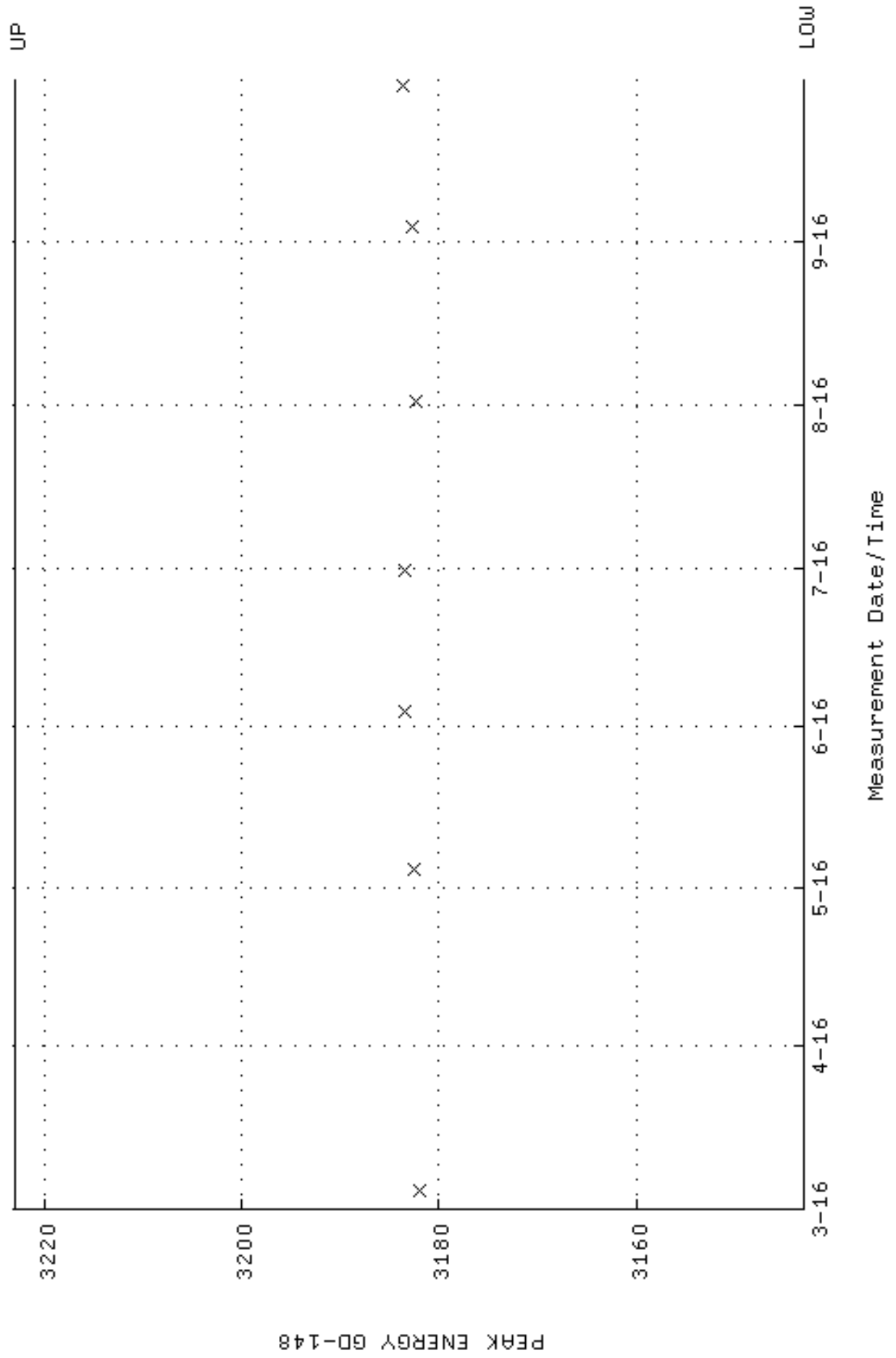
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 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



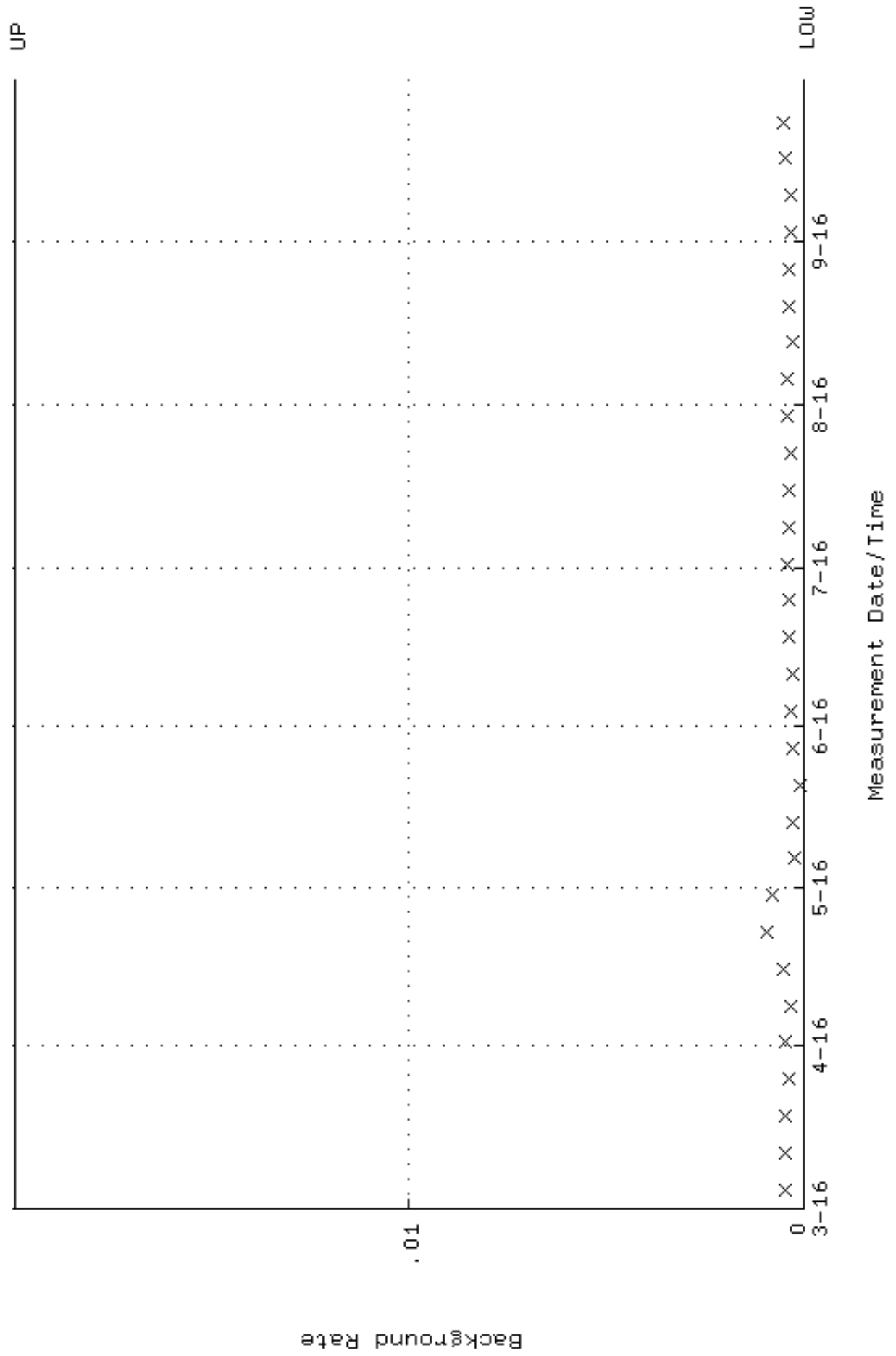
QA filename : DKA100:[ENV_ALPHA.QA.W]W072.QAF;10
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



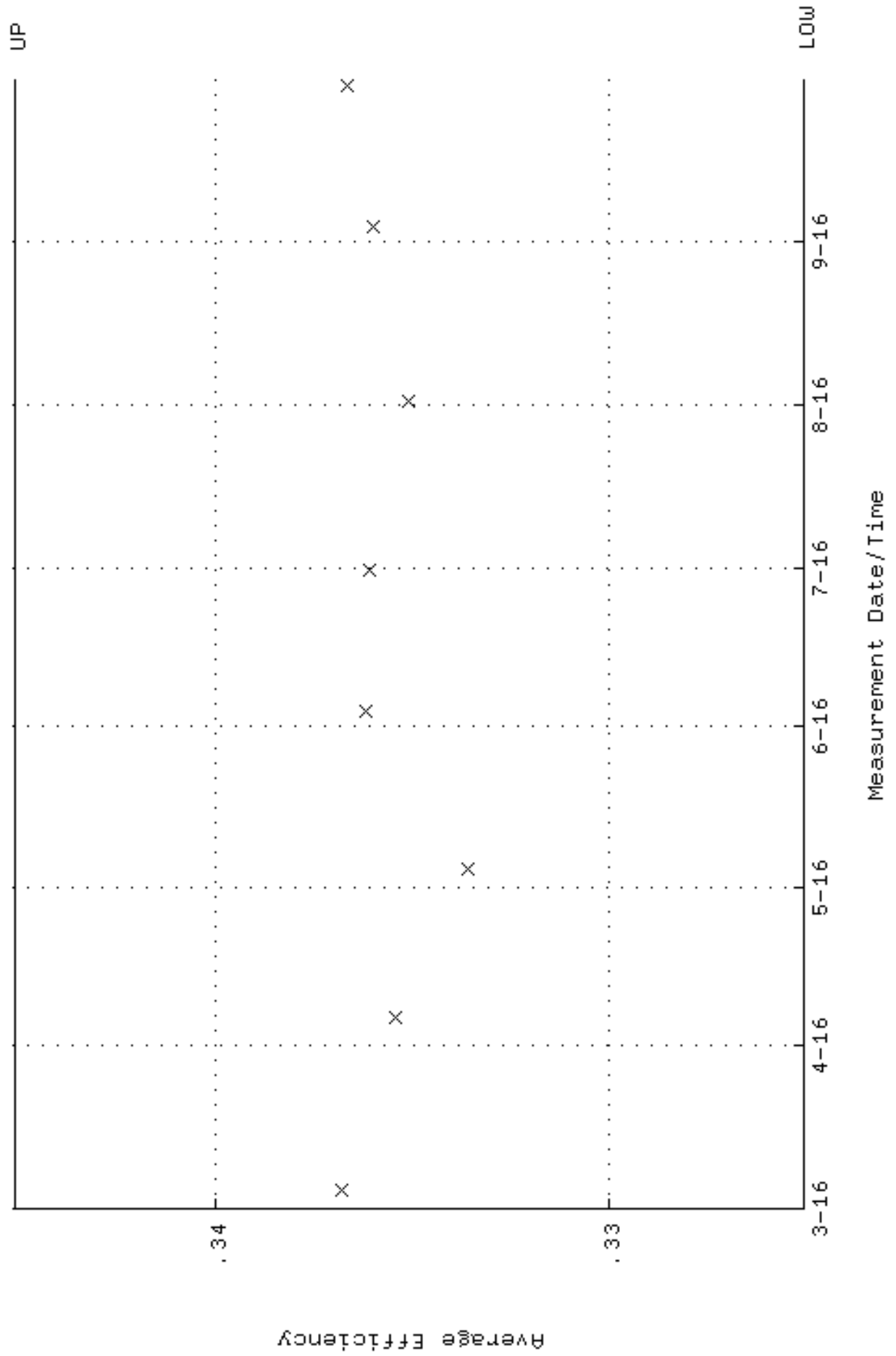
QA filename : DKA100:[ENV_ALPHA.QA.W]W072.QAF;10
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



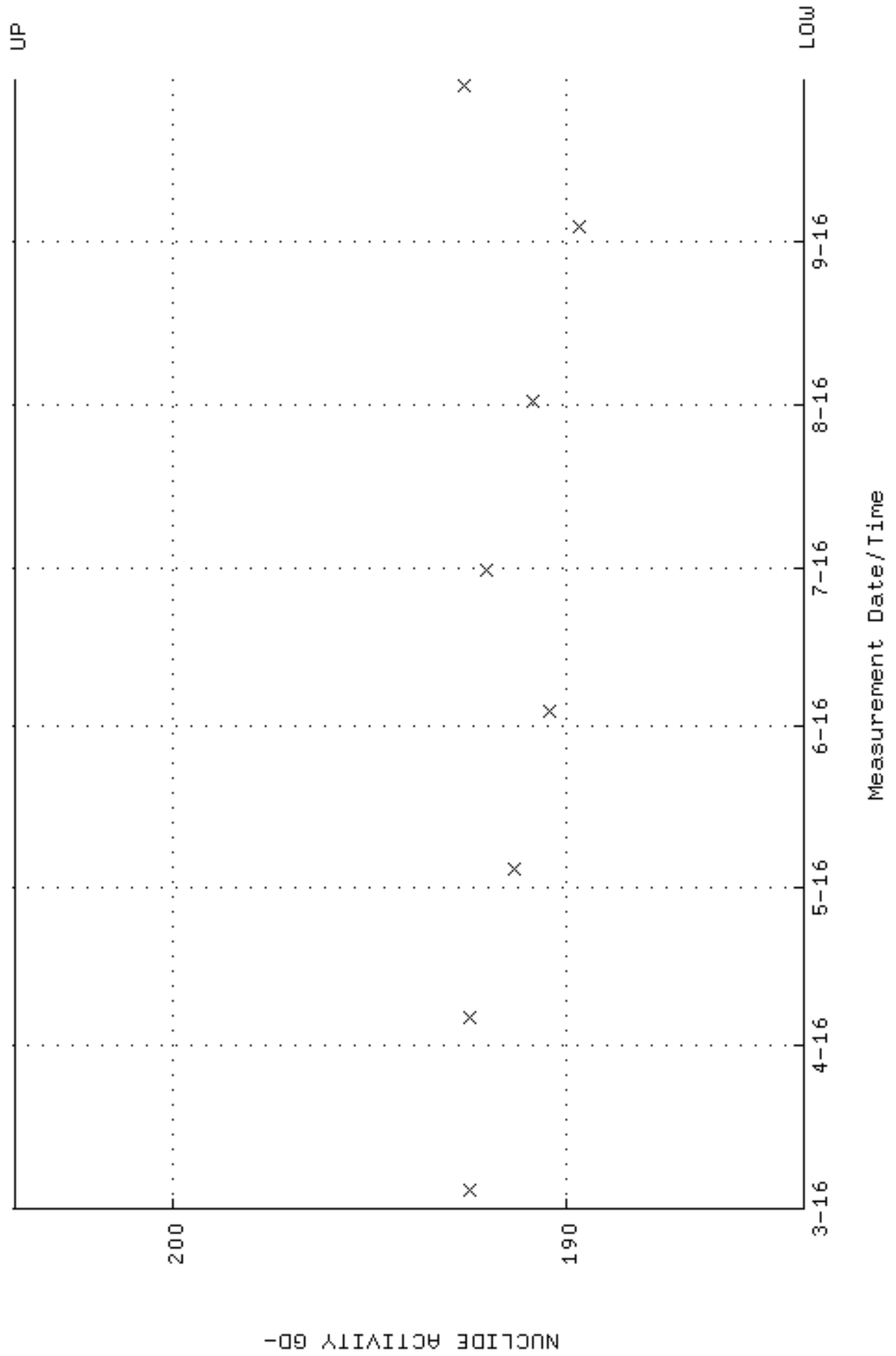
QA filename : DKA100:[ENV_ALPHA.QA.B]B072.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:21:38 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



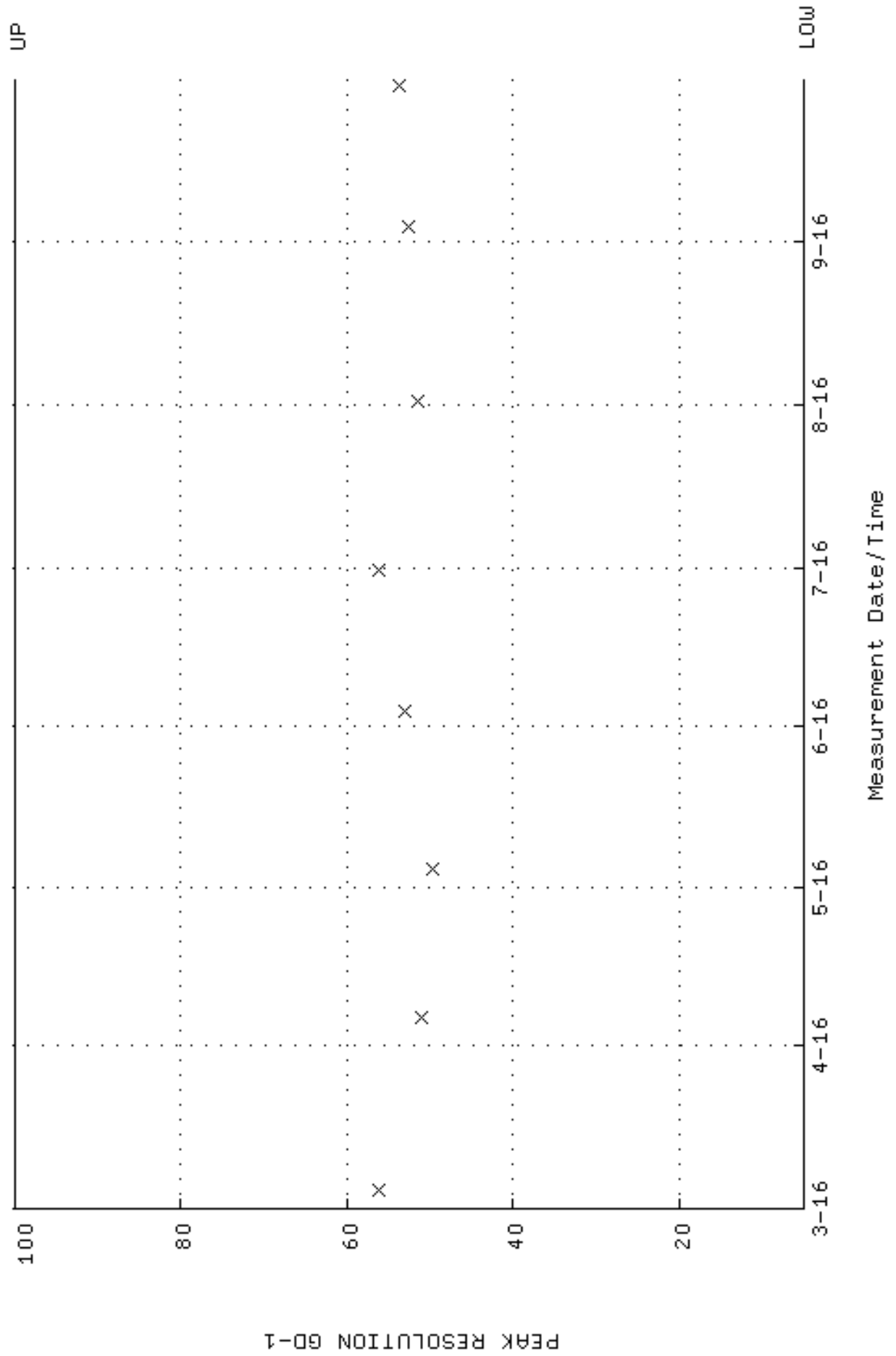
QA filename : DKA100:[ENV_ALPHA.QA.W]W073.QAF;14
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.325020 through 0.345130



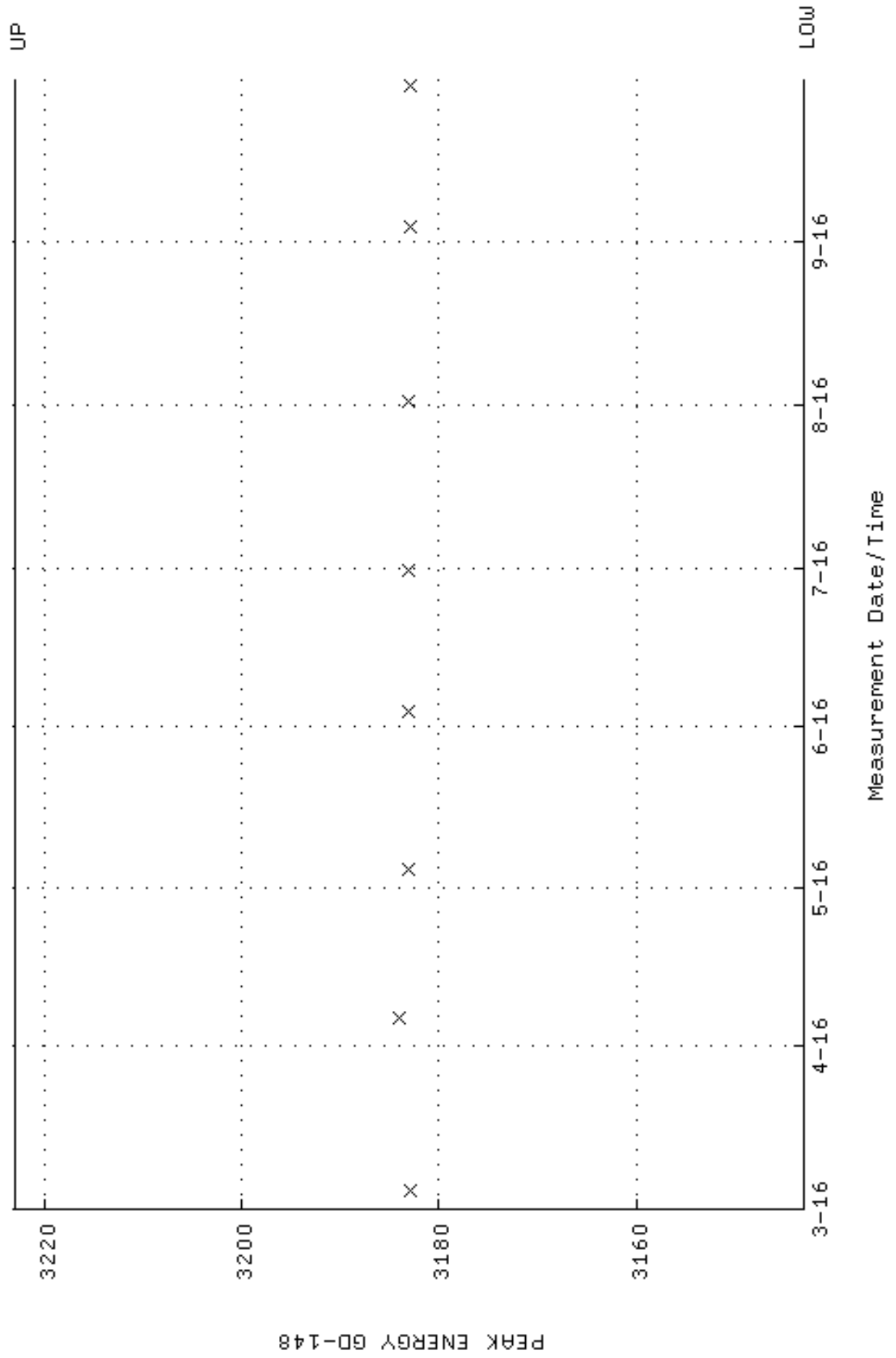
QA filename : DKA100:[ENV_ALPHA.QA.W]W073.QAF;14
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



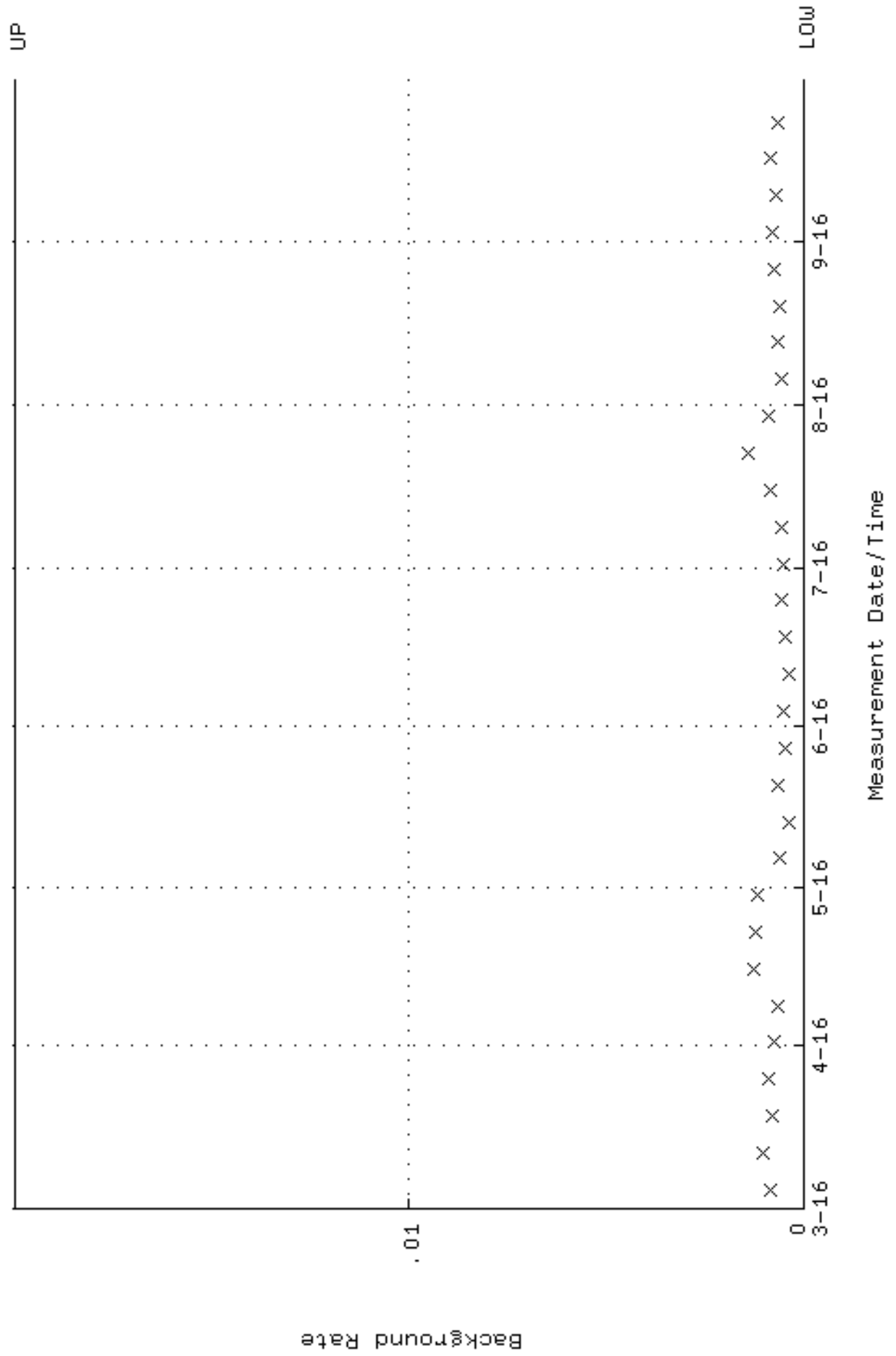
QA filename : DKA100:[ENV_ALPHA.QA.W]W073.QAF;14
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



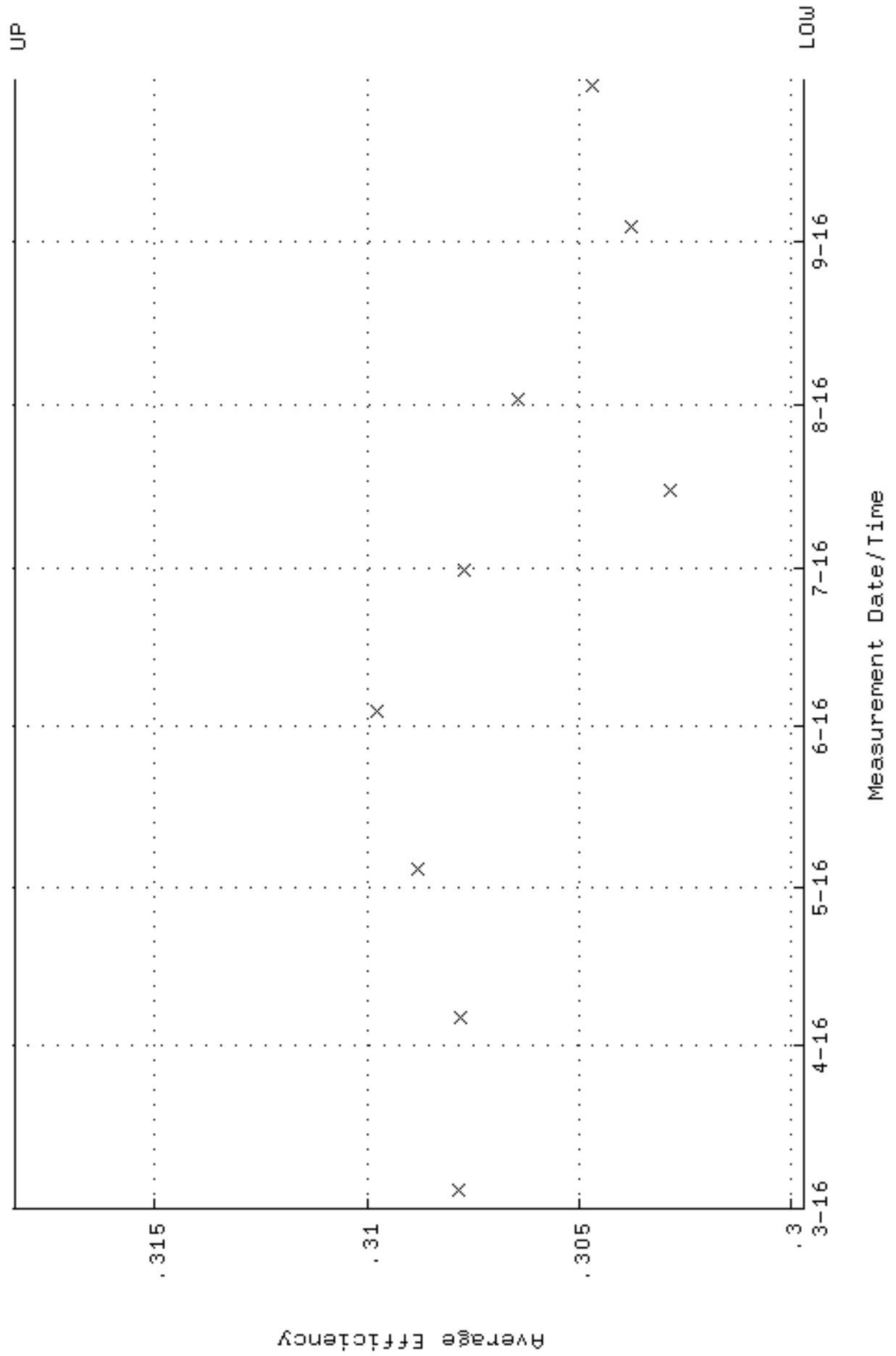
QA filename : DKA100:[ENV_ALPHA.QA.W]W073.QAF;14
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



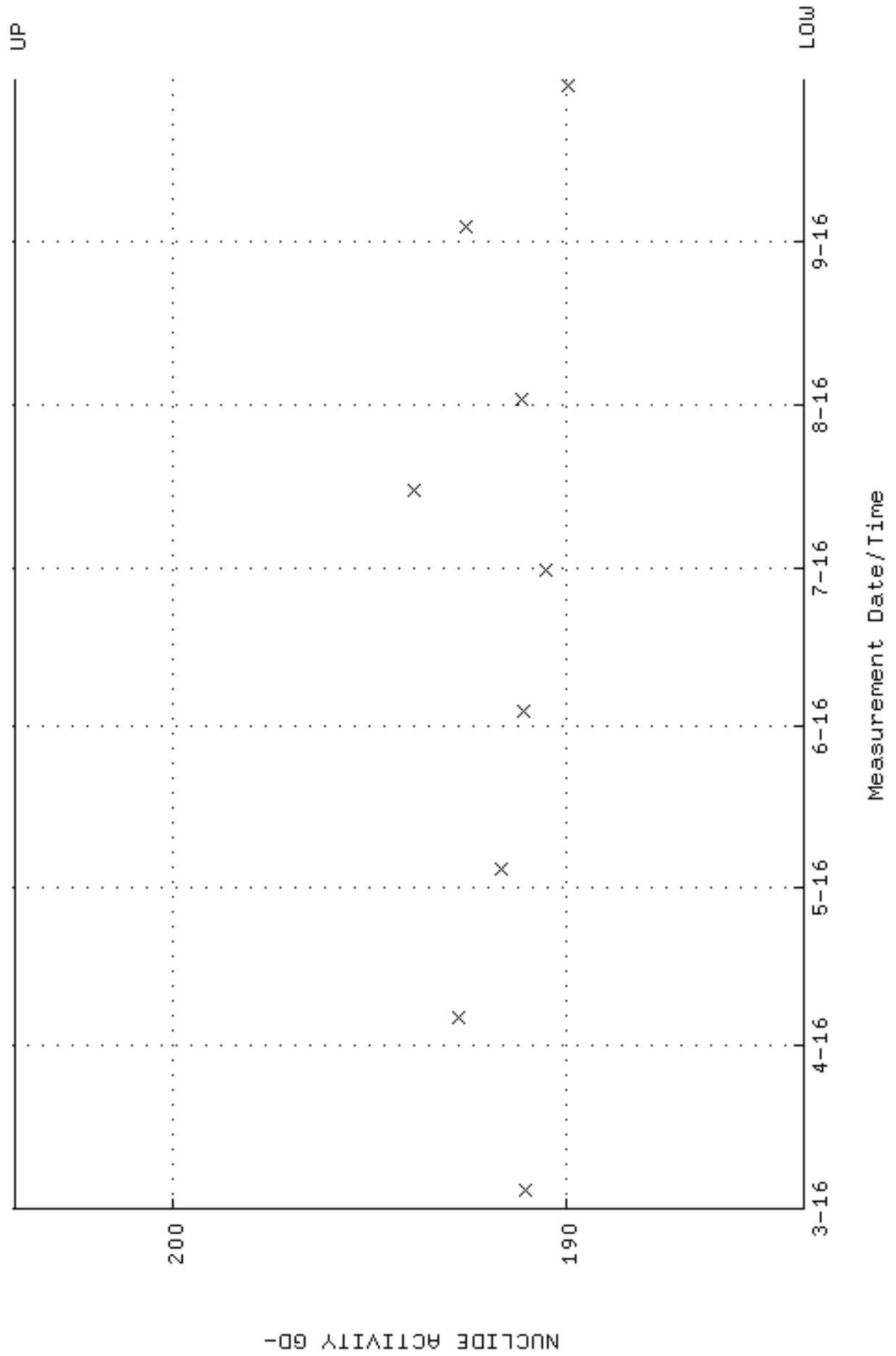
QA filename : DKA100:[ENV_ALPHA.QA.B]B073.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:21:38 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



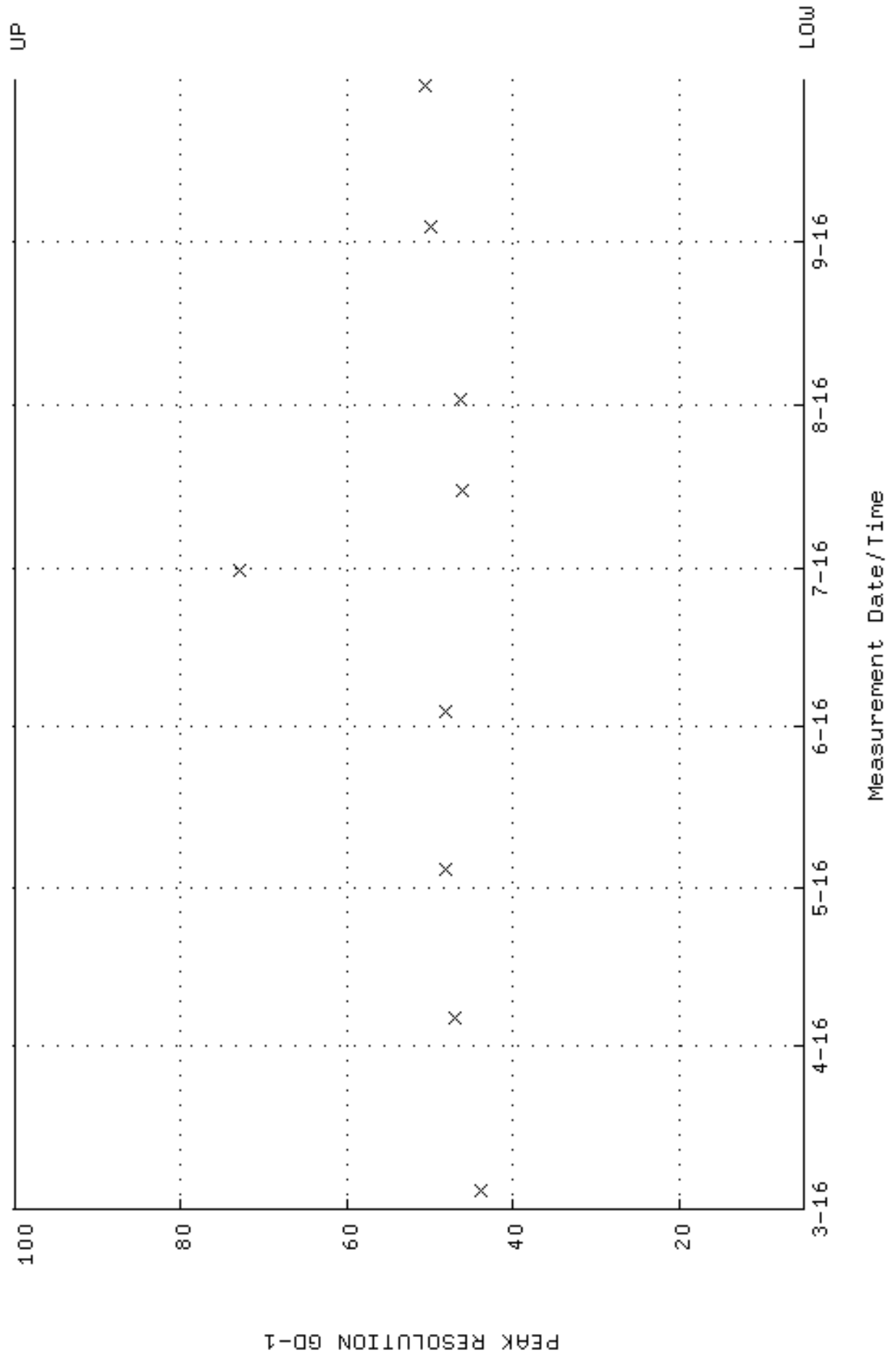
QA filename : DKA100:[ENV_ALPHA.QA.W]W074.QAF;10
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.299700 through 0.318290



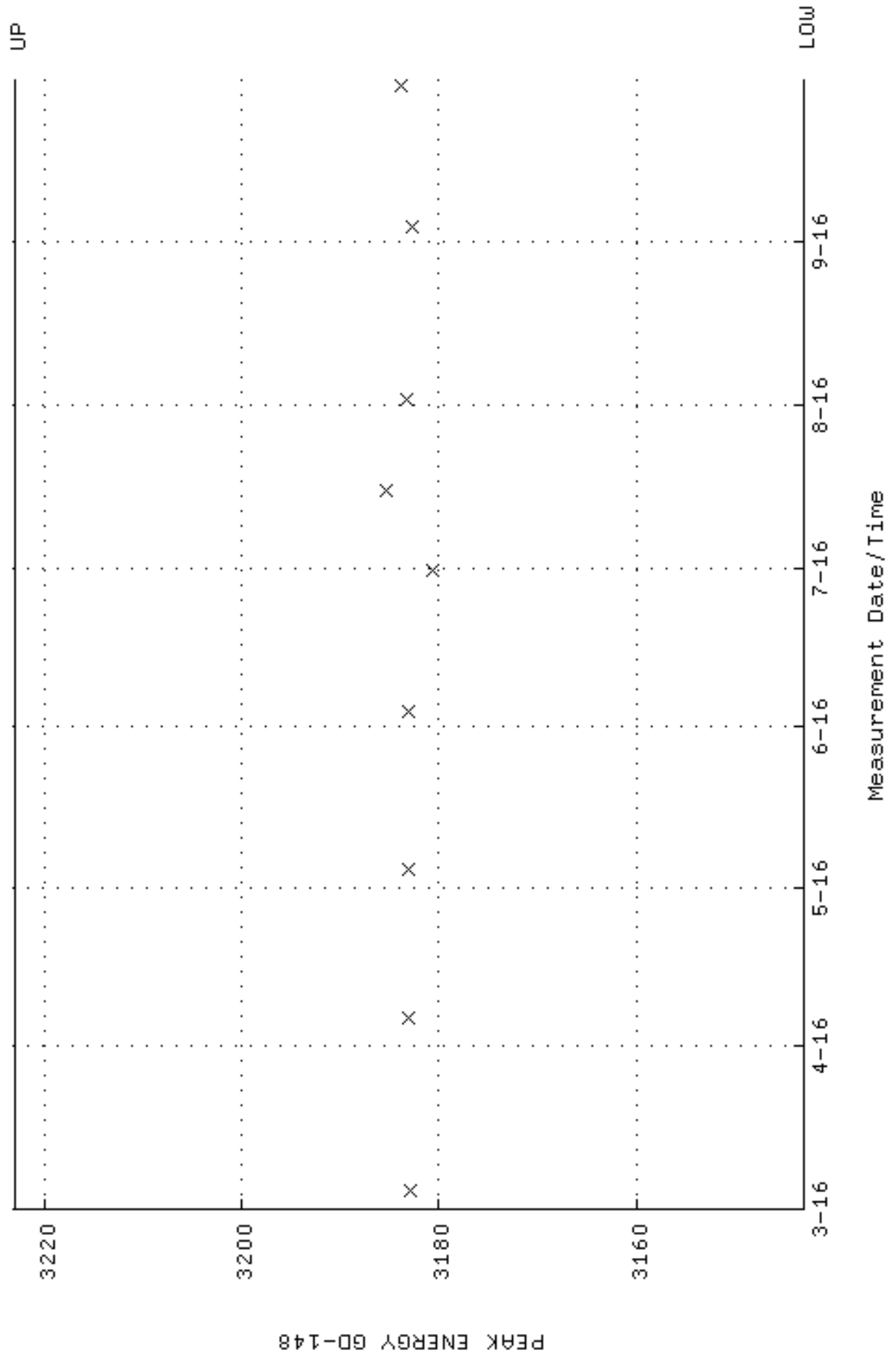
QA filename : DKA100:[ENV_ALPHA.QA.W]W074.QAF;10
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



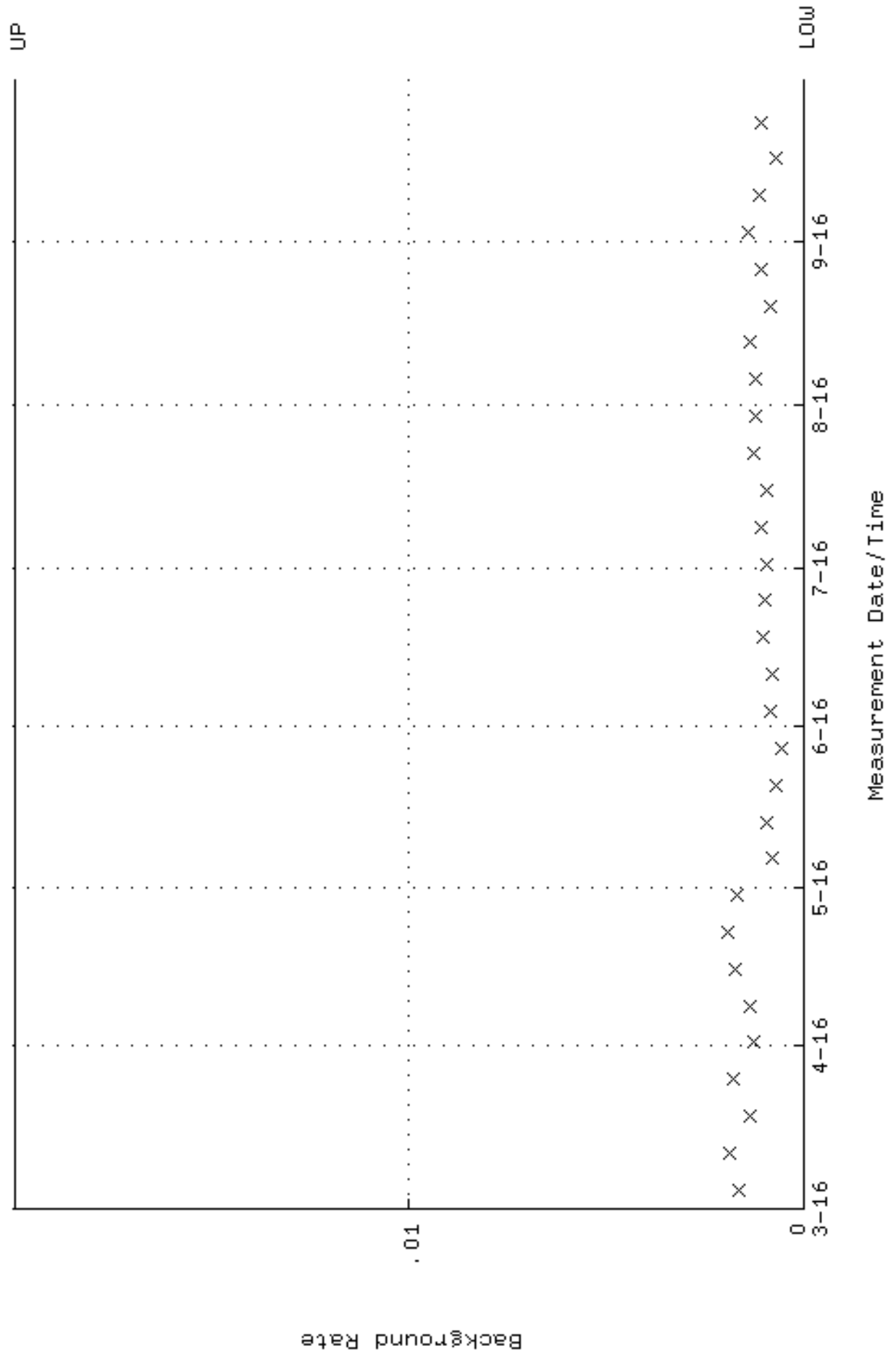
QA filename : DKA100:[ENV_ALPHA.QA.W]W074.QAF;10
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



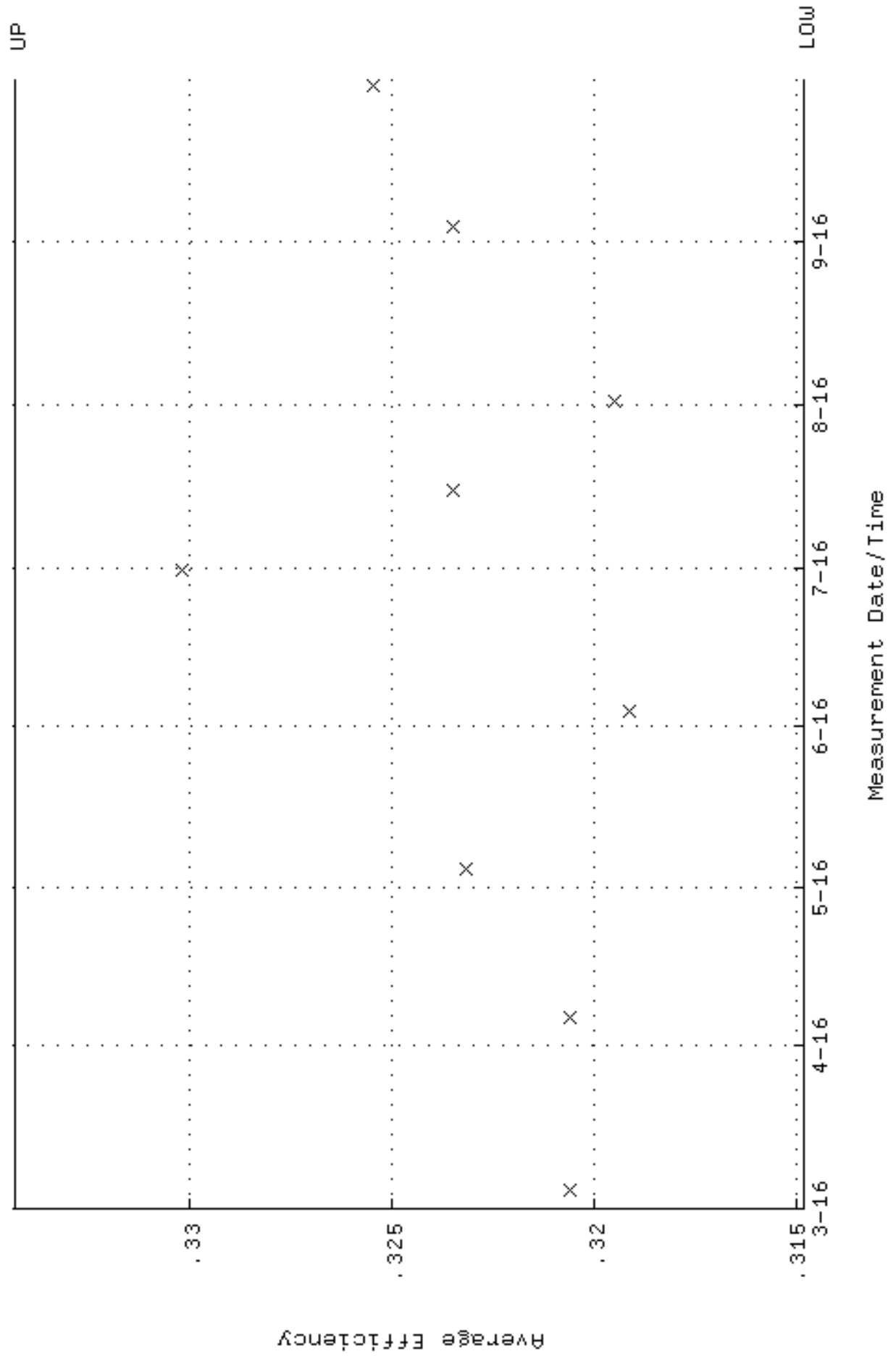
QA filename : DKA100:[ENV_ALPHA.QA.W]W074.QAF;10
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



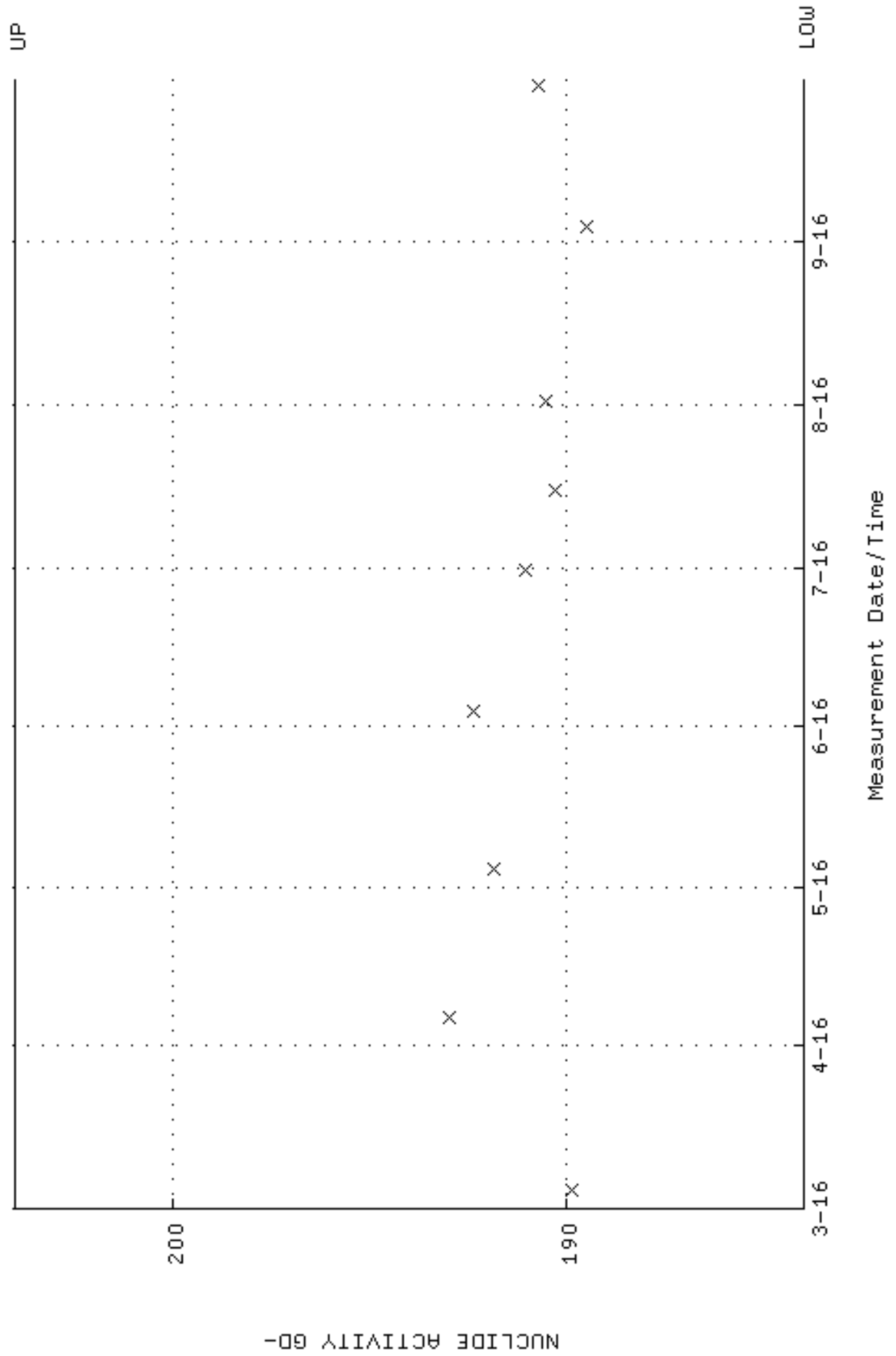
QA filename : DKA100:[ENV_ALPHA.QA.B]B074.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:21:38 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



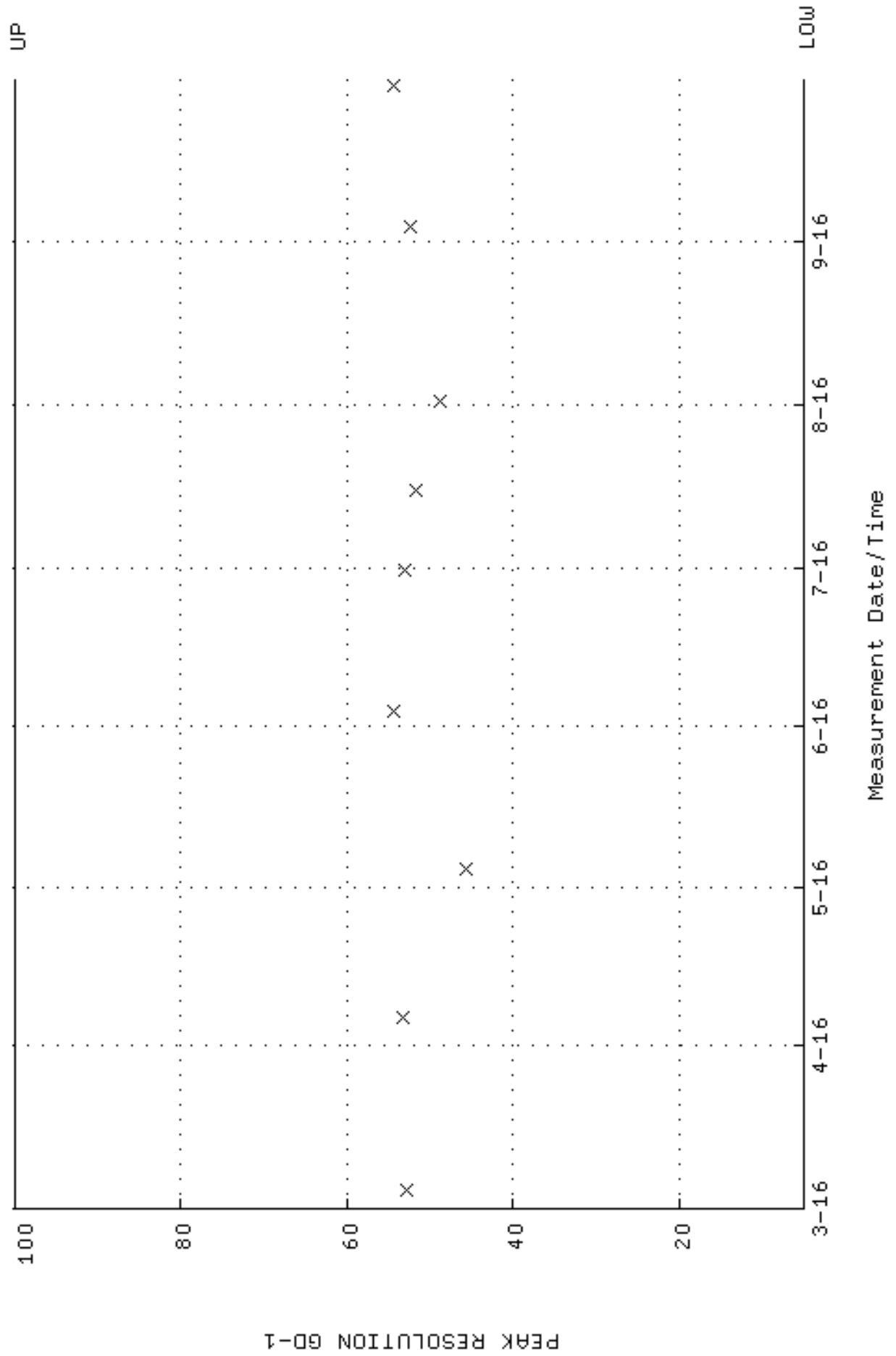
QA filename : DKA100:[ENV_ALPHA.QA.W]W075.QAF;11
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.314814 through 0.334287



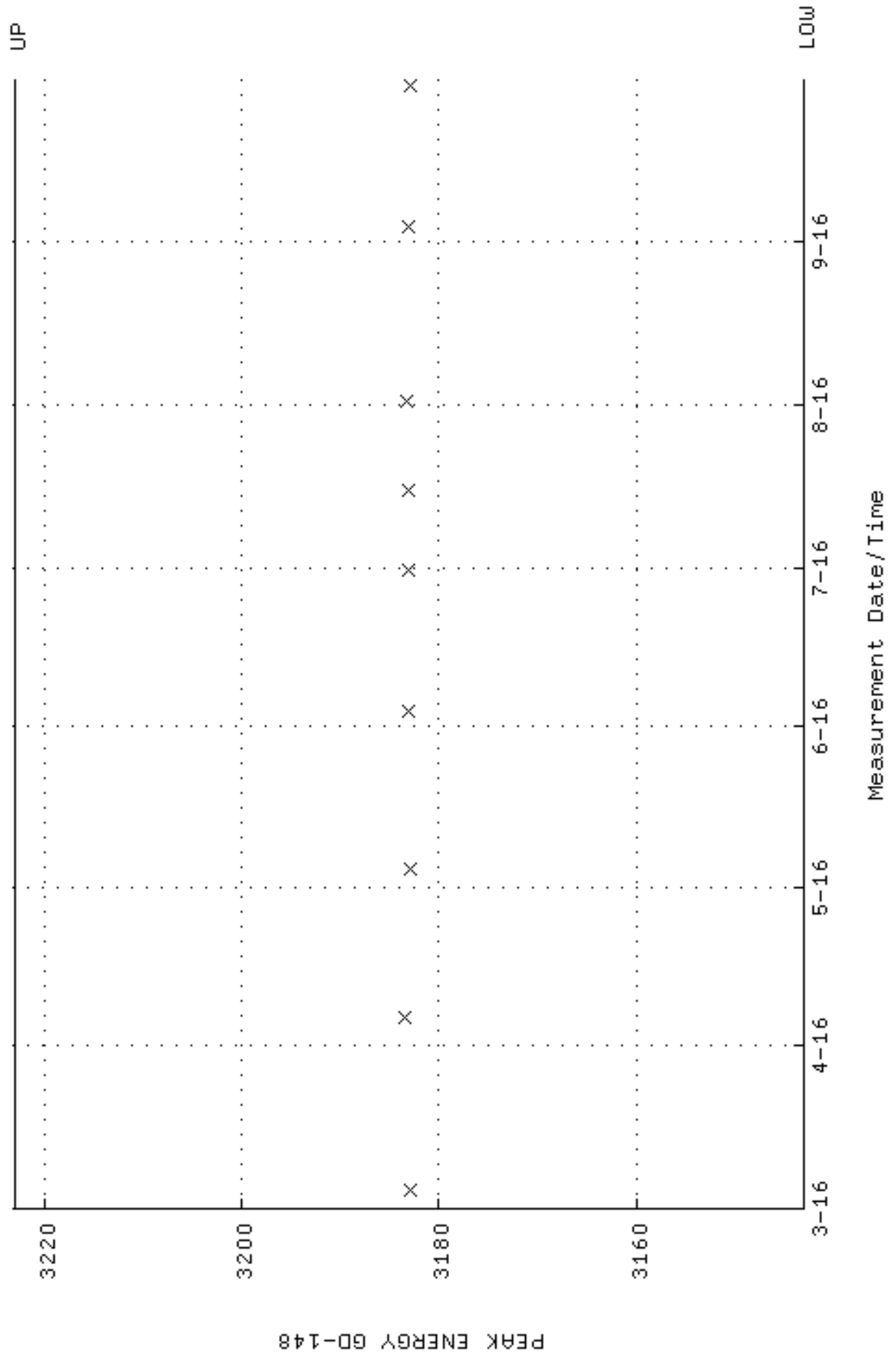
QA filename : DKA100:[ENV_ALPHA.QA.W]W075.QAF;11
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



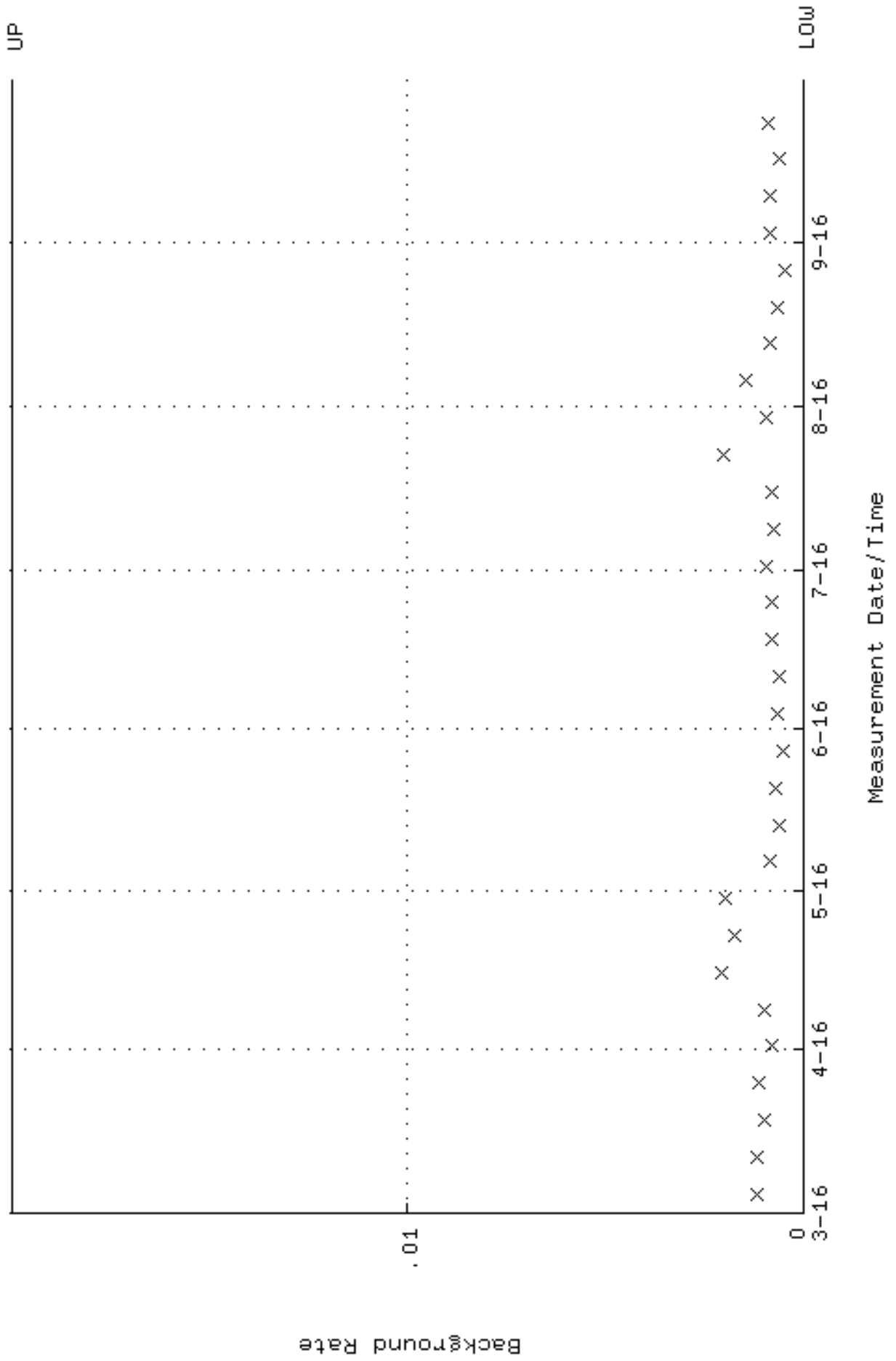
QA filename : DKA100:[ENV_ALPHA.QA.W]W075.QAF;11
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



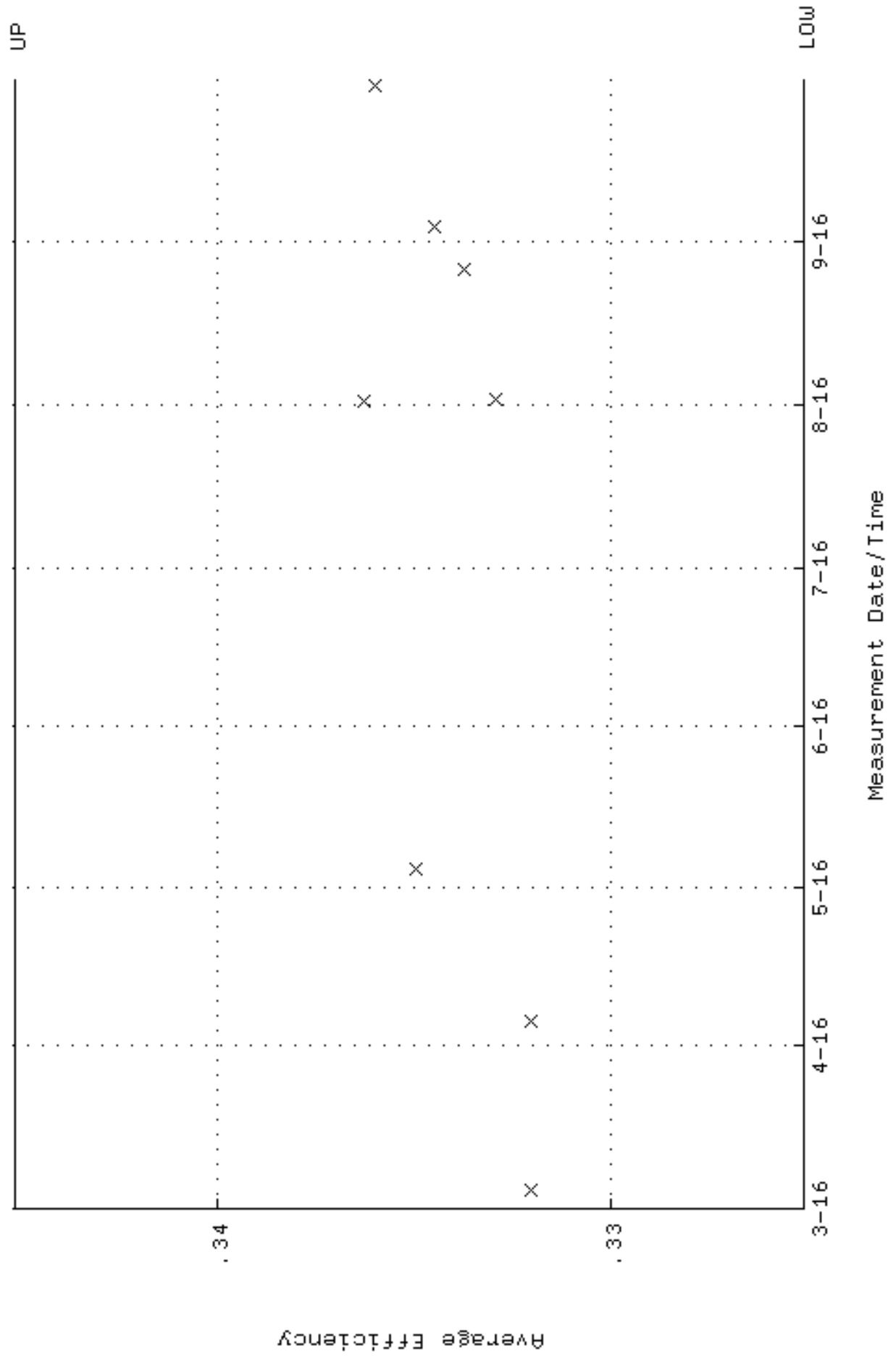
QA filename : DKA100:[ENV_ALPHA.QA.W]W075.QAF;11
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:07 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



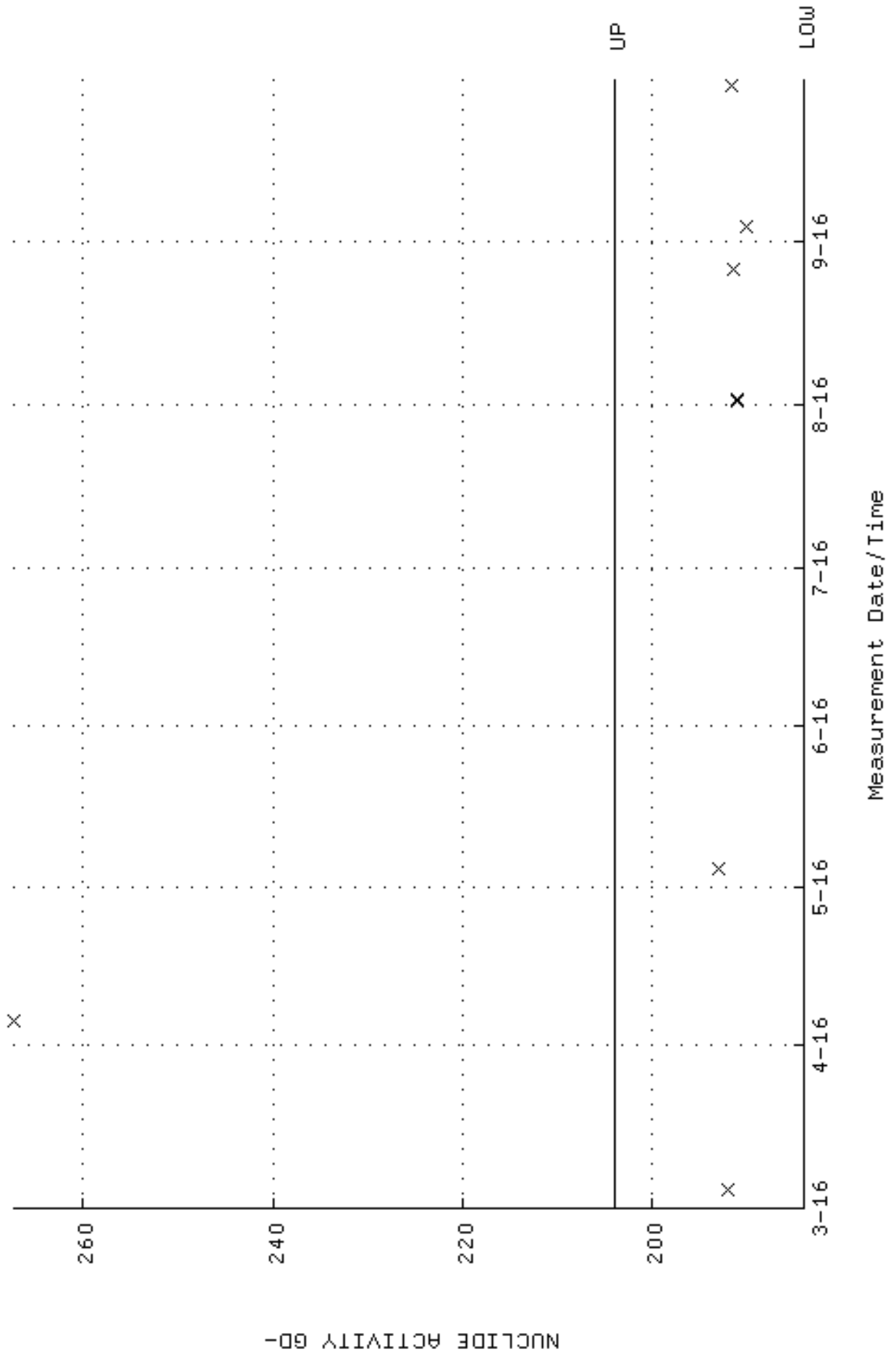
QA filename : DKA100:[ENV_ALPHA.QA.B]B075.QAF;2
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 4-MAR-2016 16:21:38 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



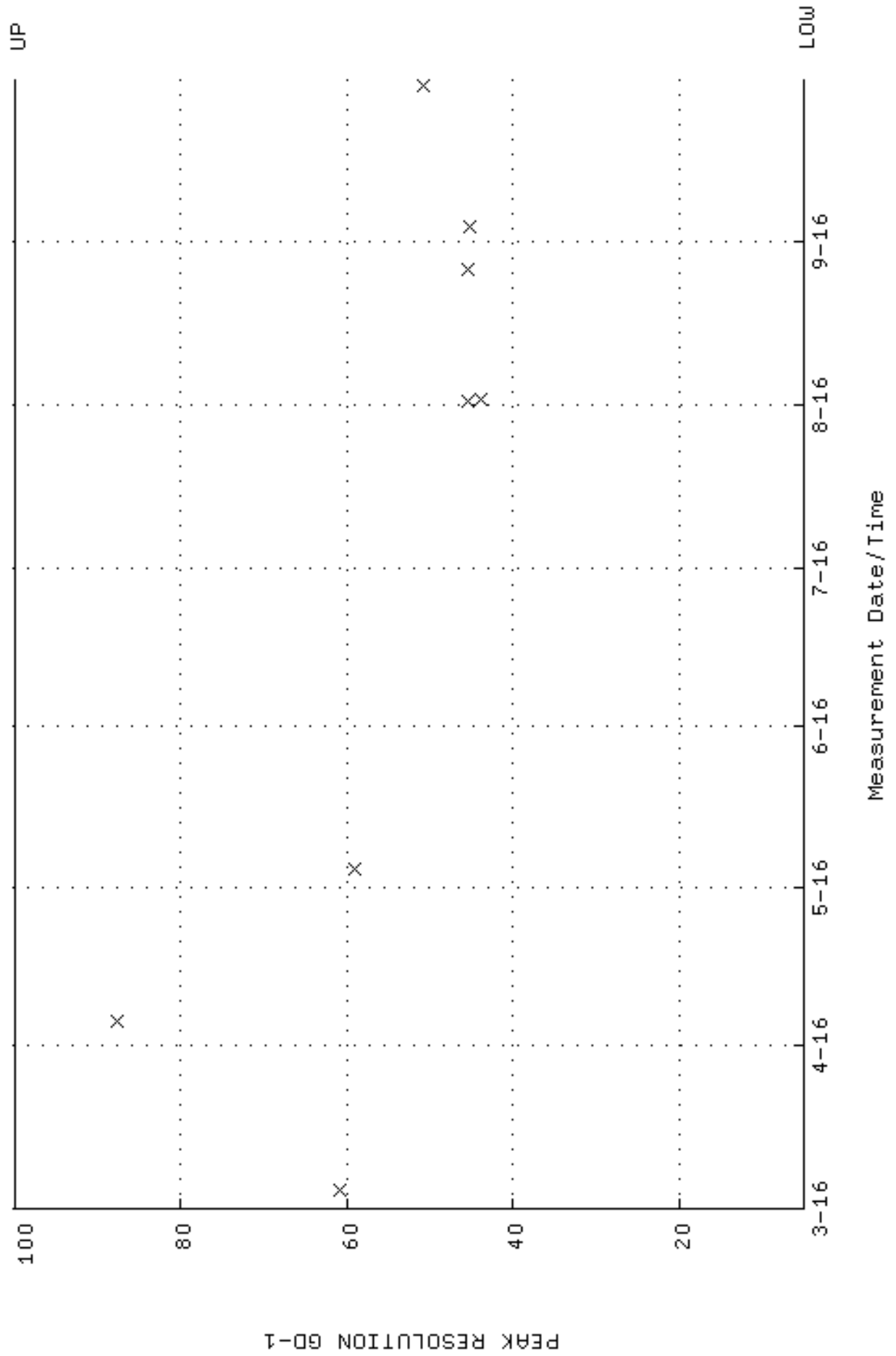
QA filename : DKA100:[ENV_ALPHA.QA.W]W078.QAF;11
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAR-2016 13:27:08 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.325057 through 0.345163



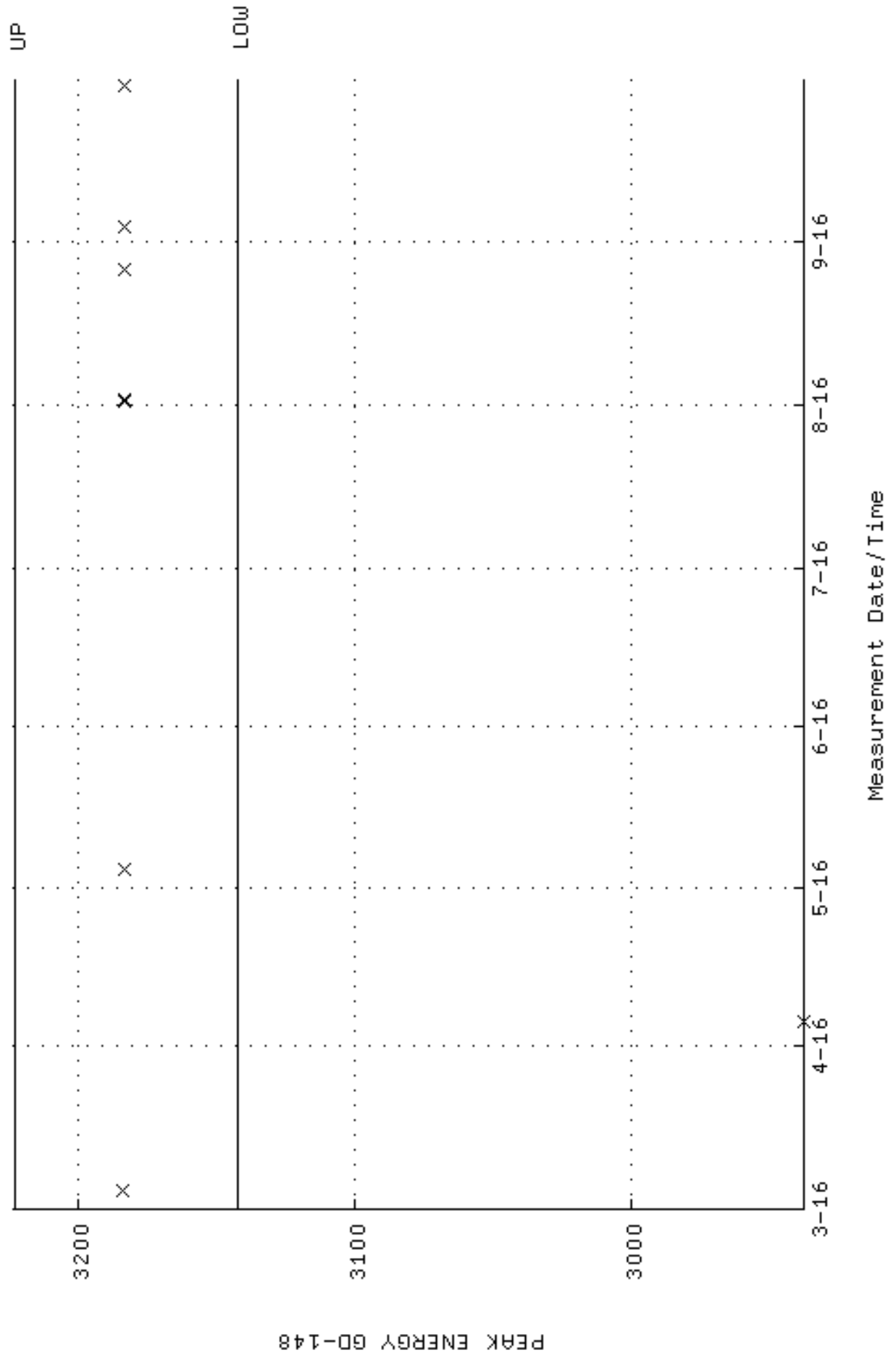
QA filename : DKA100:[ENV_ALPHA.QA.W]w078.QAF;11
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:08 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



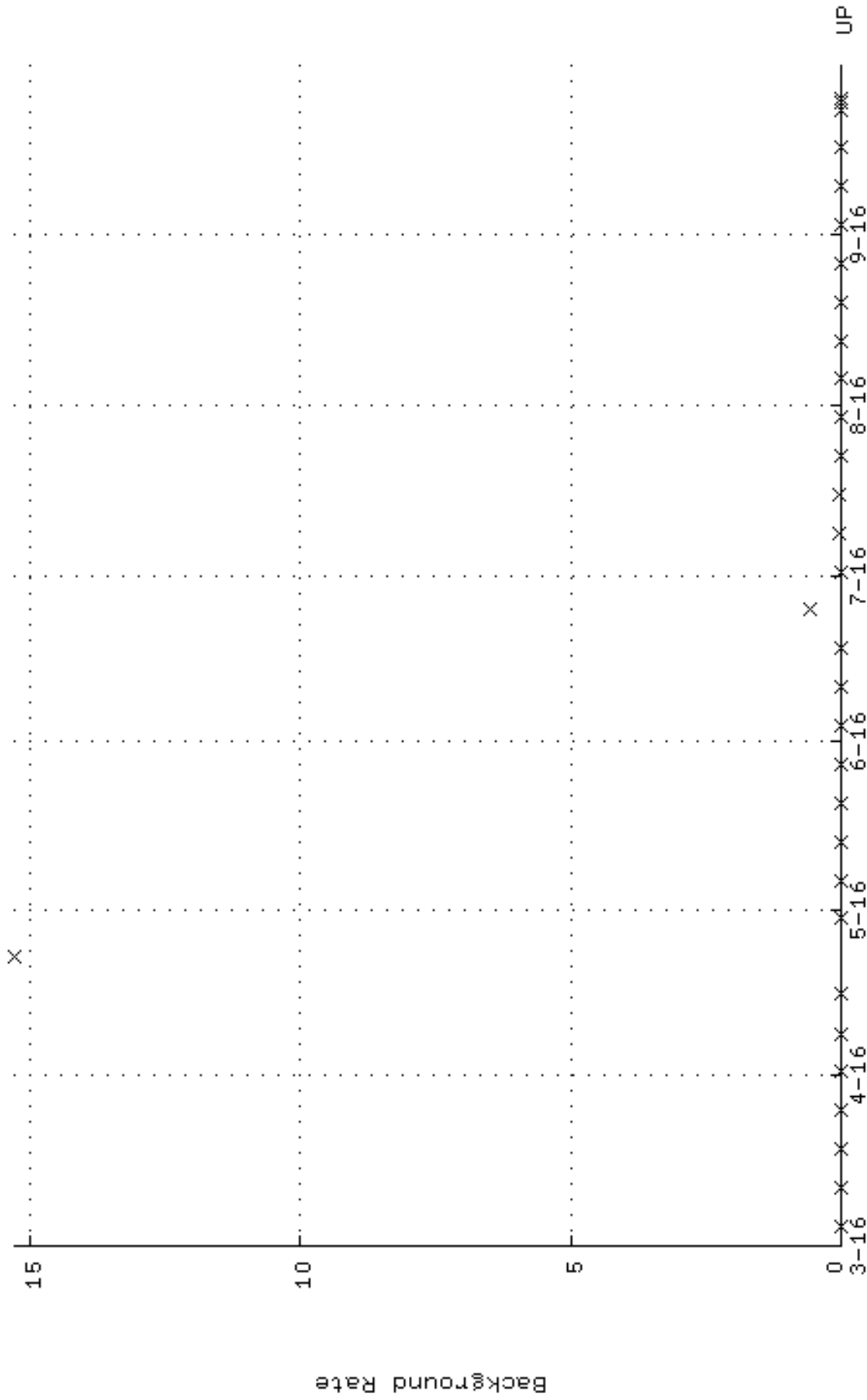
QA filename : DKA100:[ENV_ALPHA.QA.W]W078.QAF;11
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-MAR-2016 13:27:08 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



QA filename : DKA100:[ENV_ALPHA.QA.W]W078.QAF;11
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:08 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00

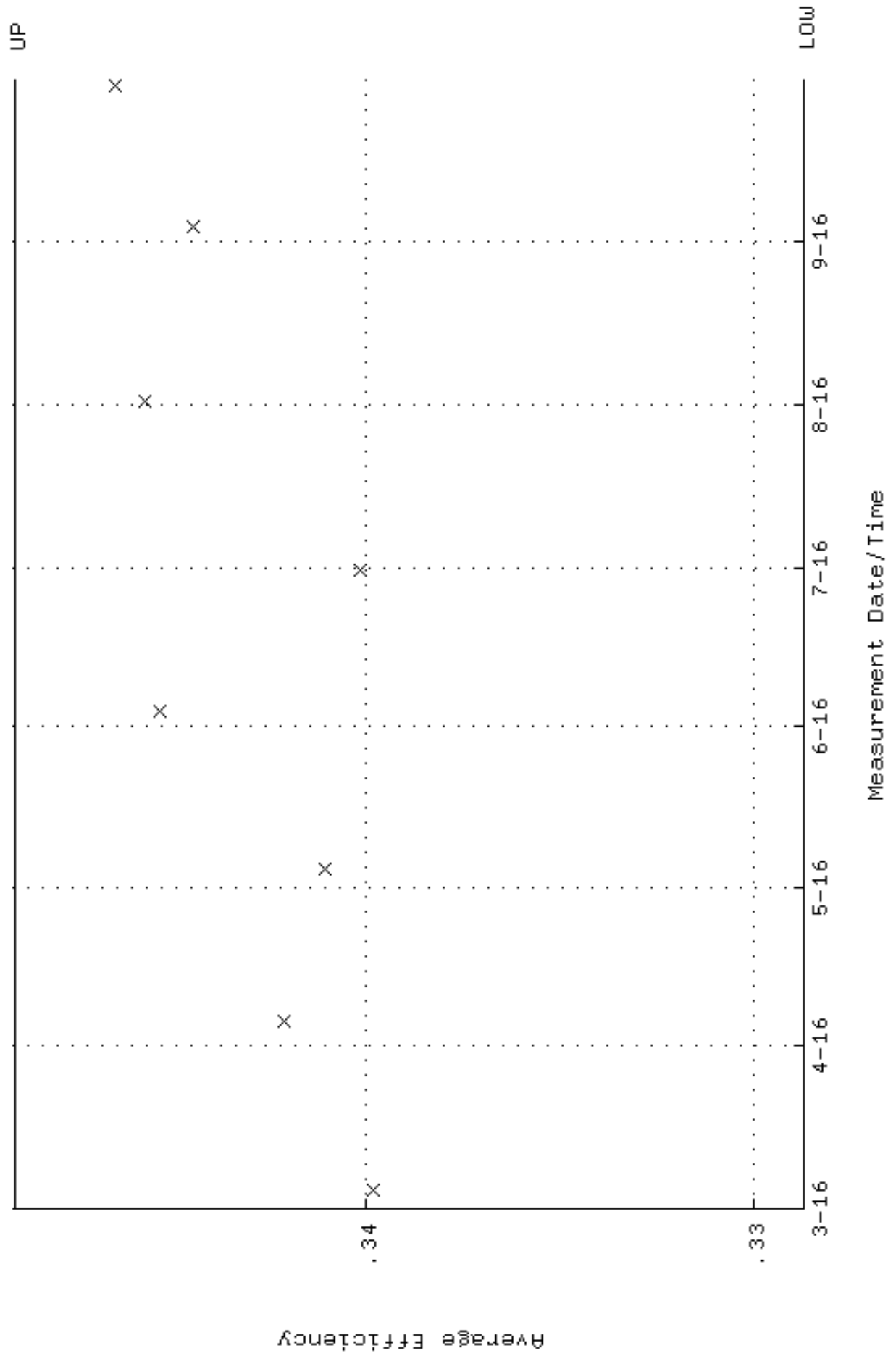


QA filename : DKA100:[ENV_ALPHA.QA.B]B078.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:21:42 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02

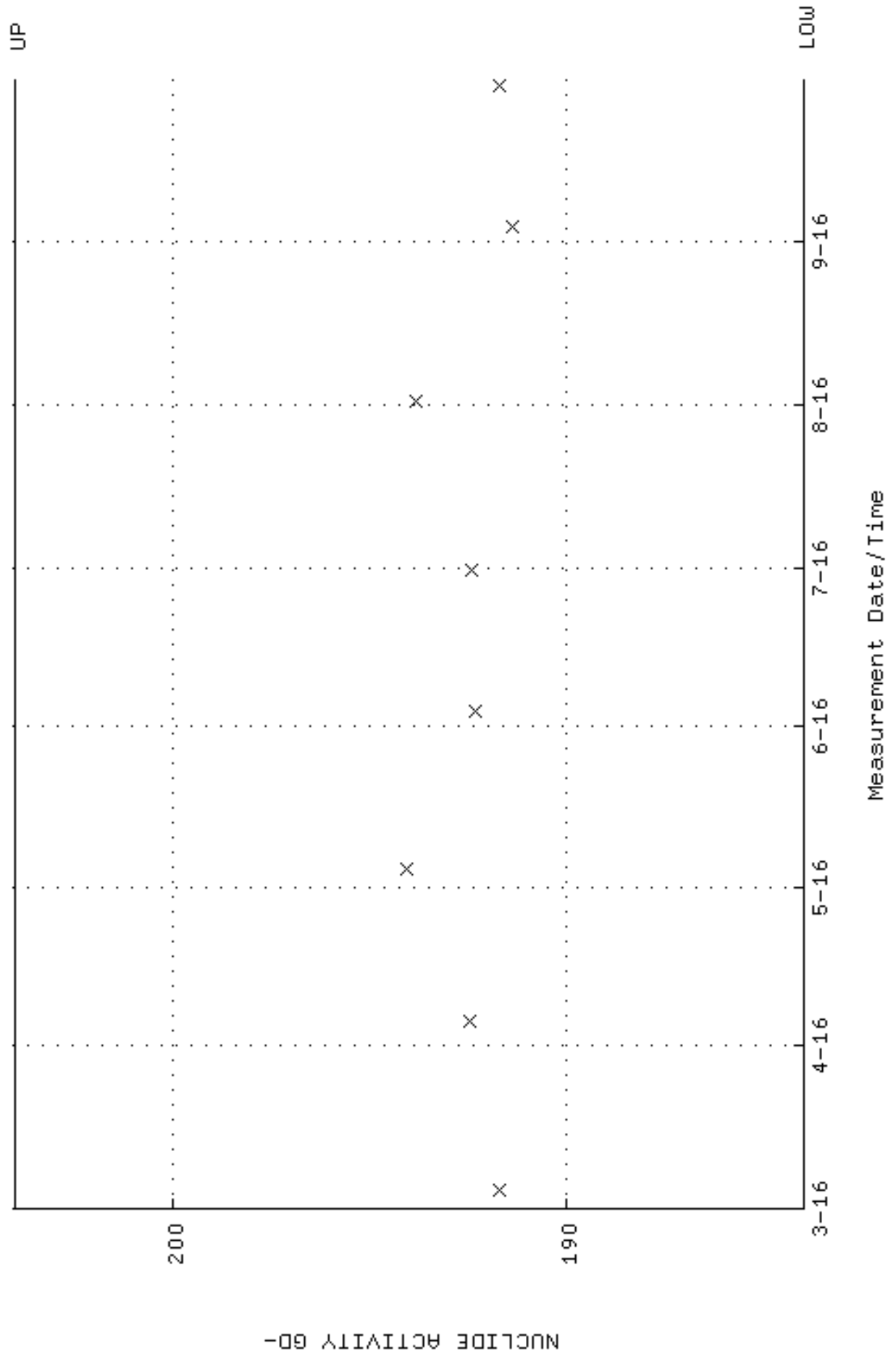


Measurement Date/Time

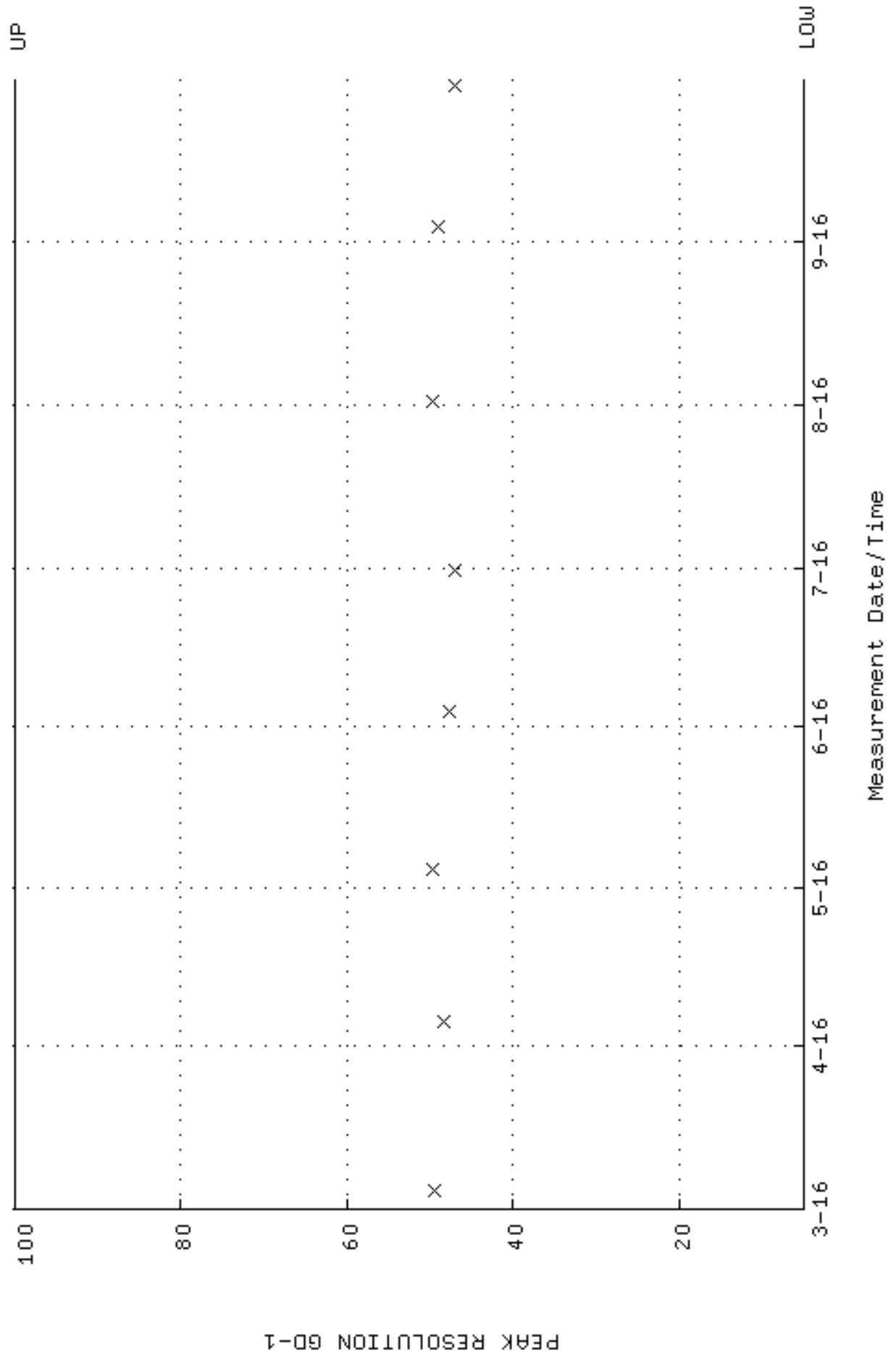
QA filename : DKA100:[ENV_ALPHA.QA.W]W080.QAF;10
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAR-2016 13:27:08 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.328713 through 0.349050



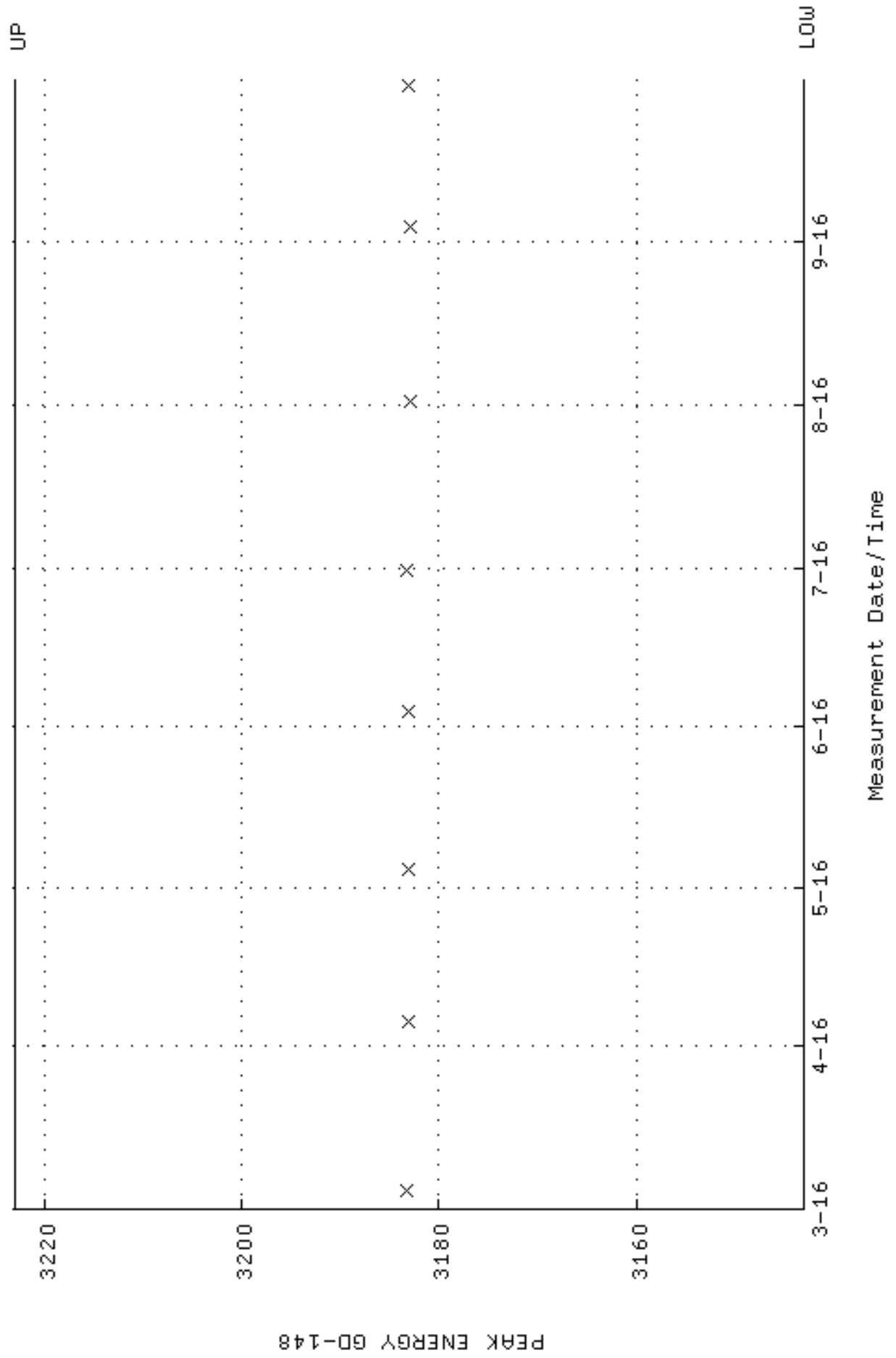
QA filename : DKA100:[ENV_ALPHA.QA.W]W080.QAF;10
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:08 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



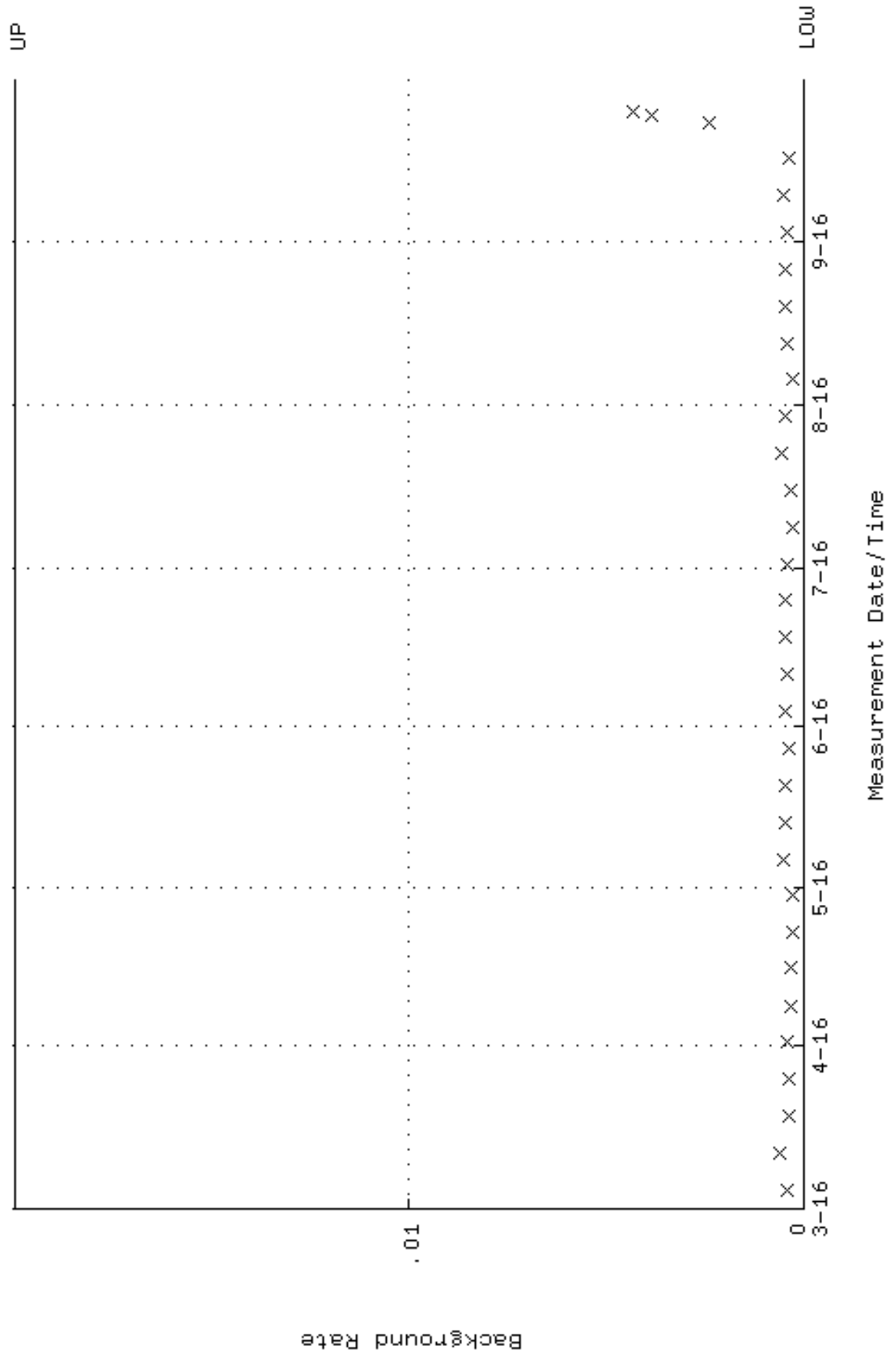
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Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-MAR-2016 13:27:08 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



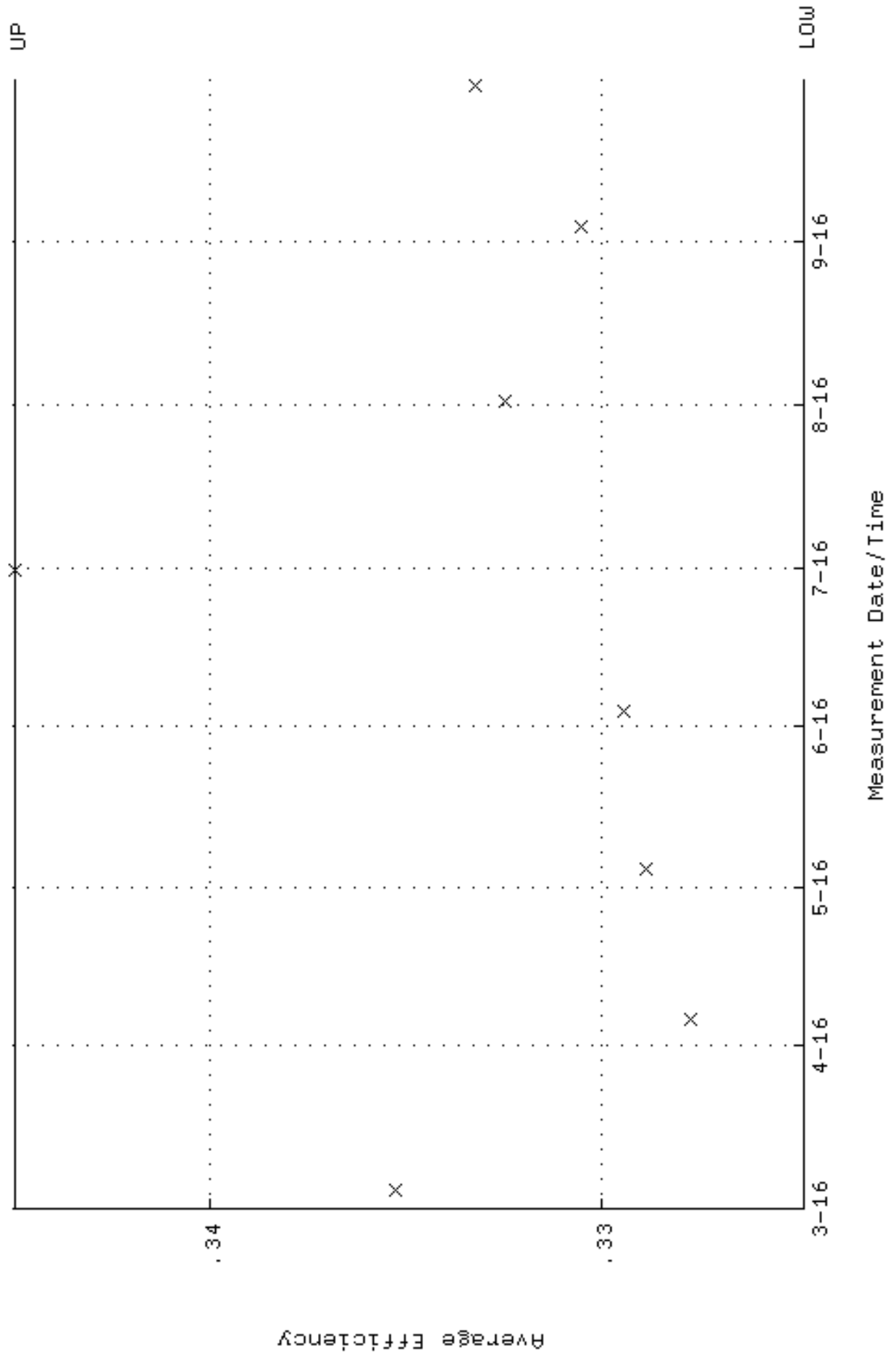
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:08 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



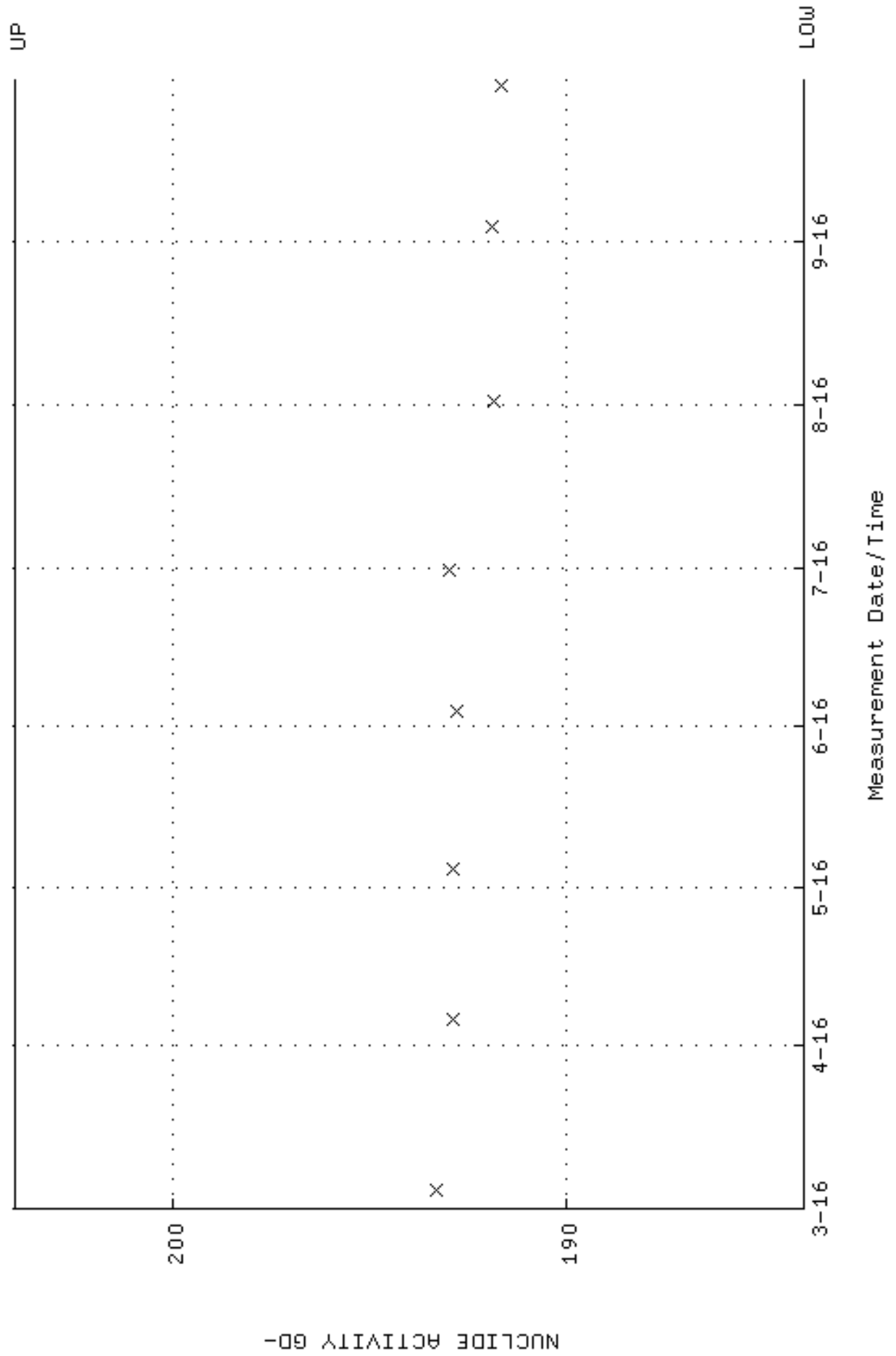
QA filename : DKA100:[ENV_ALPHA.QA.B]B080.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:21:42 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



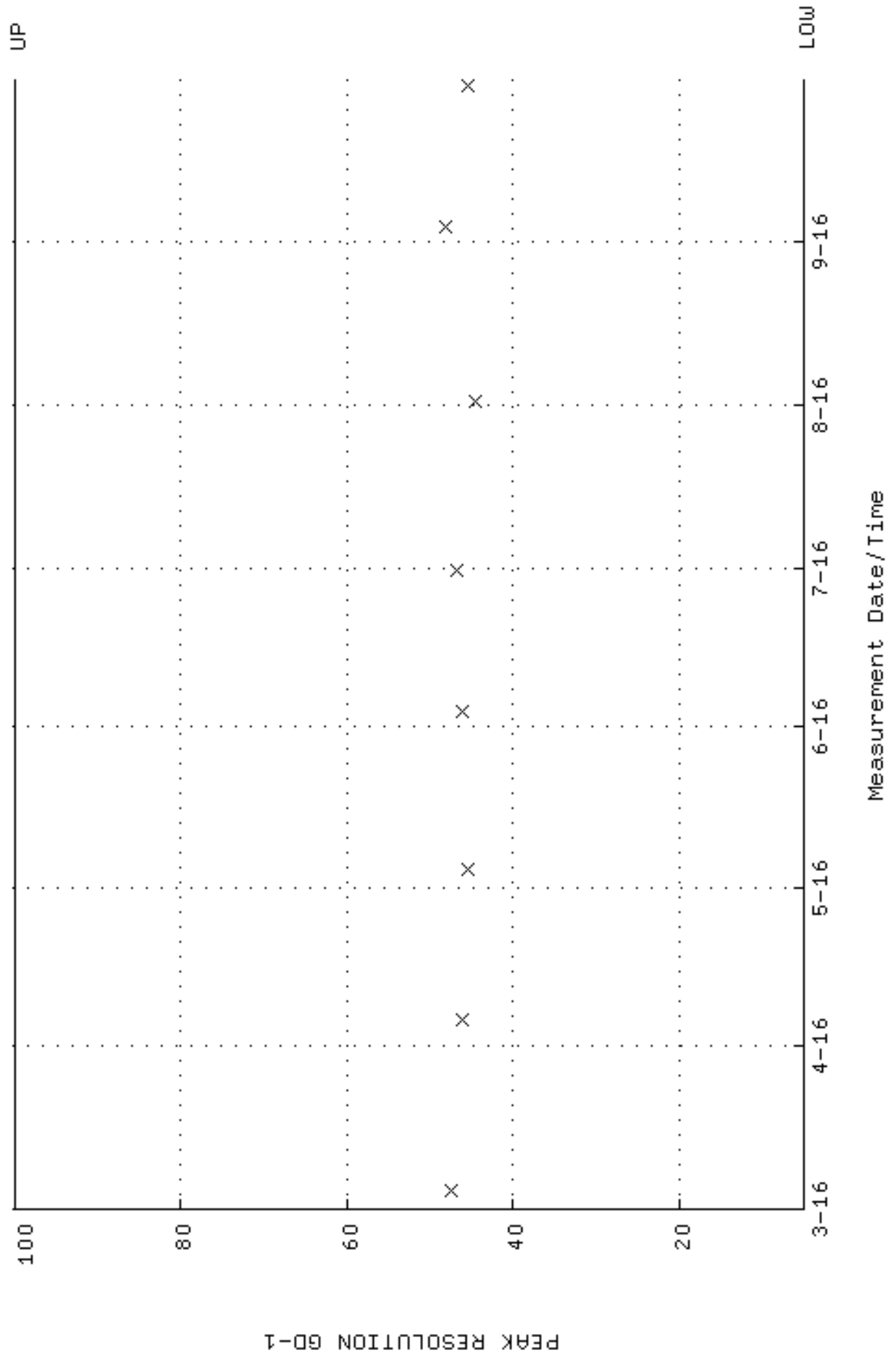
QA filename : DKA100:[ENV_ALPHA.QA.W]W081.QAF;9
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAR-2016 13:27:08 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.324850 through 0.344947



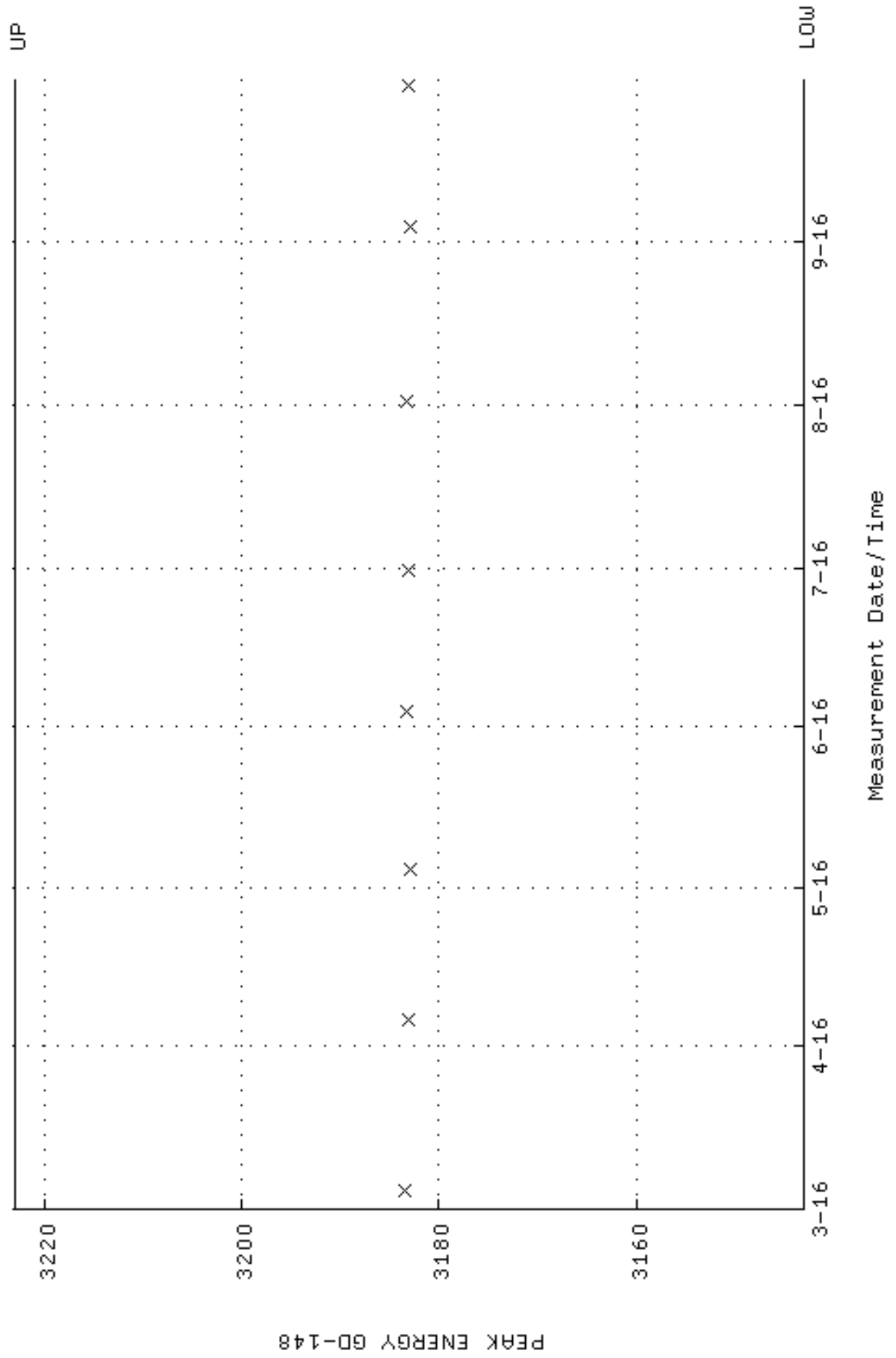
QA filename : DKA100:[ENV_ALPHA.QA.W]W081.QAF;9
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:08 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



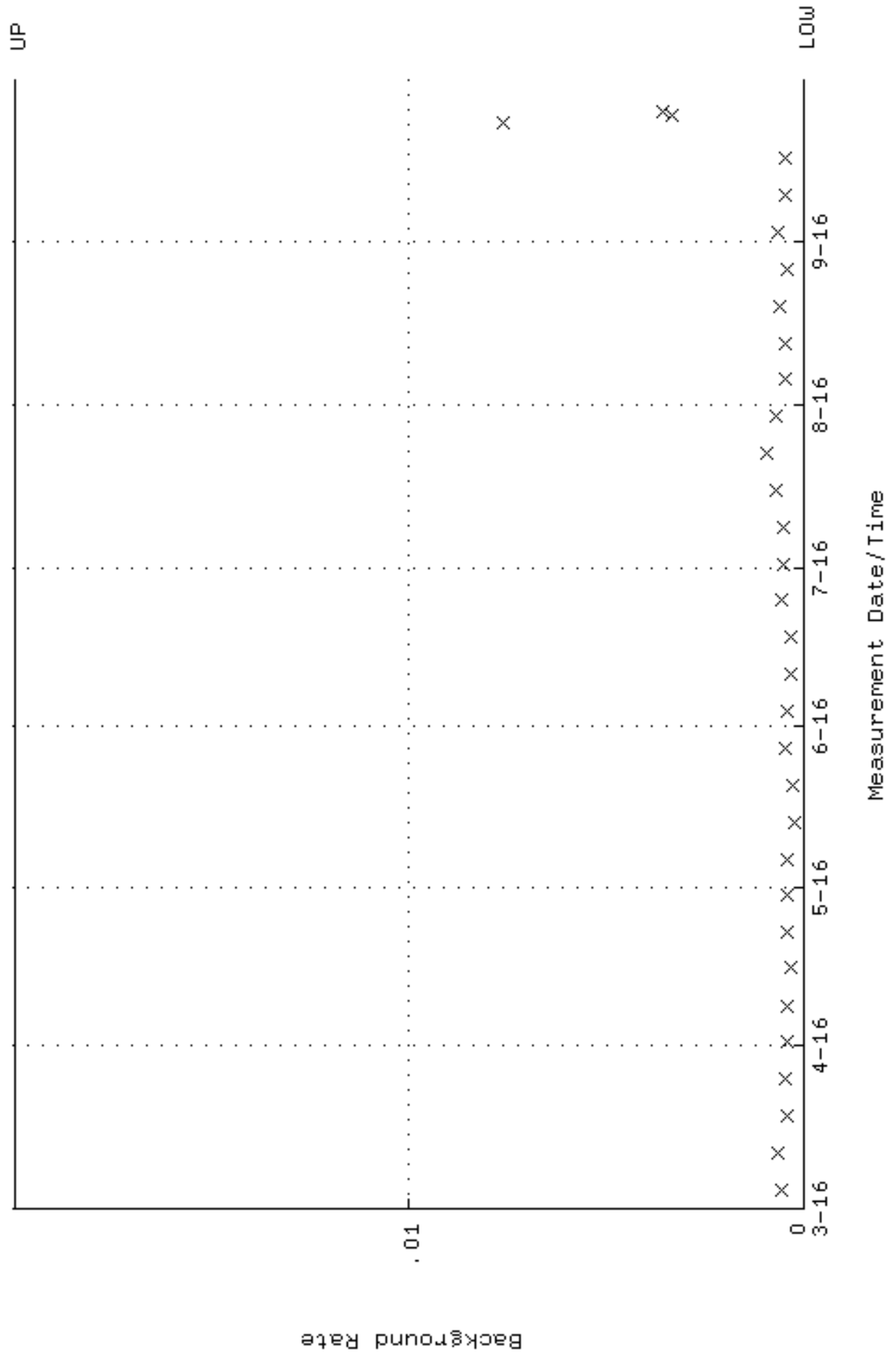
QA filename : DKA100:[ENV_ALPHA.QA.W]W081.QAF;9
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-MAR-2016 13:27:08 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



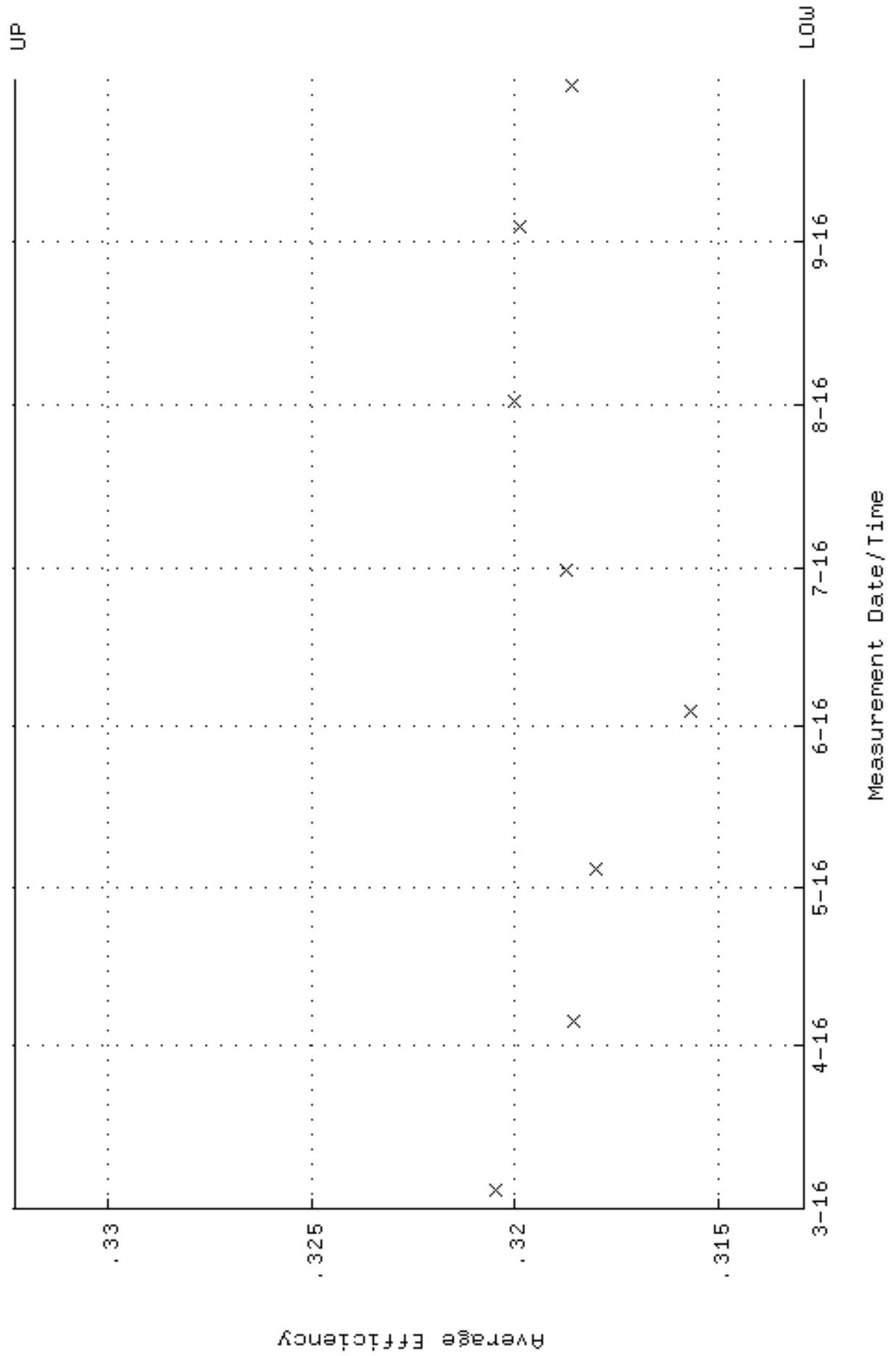
QA filename : DKA100:[ENV_ALPHA.QA.W]W081.QAF;9
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:08 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



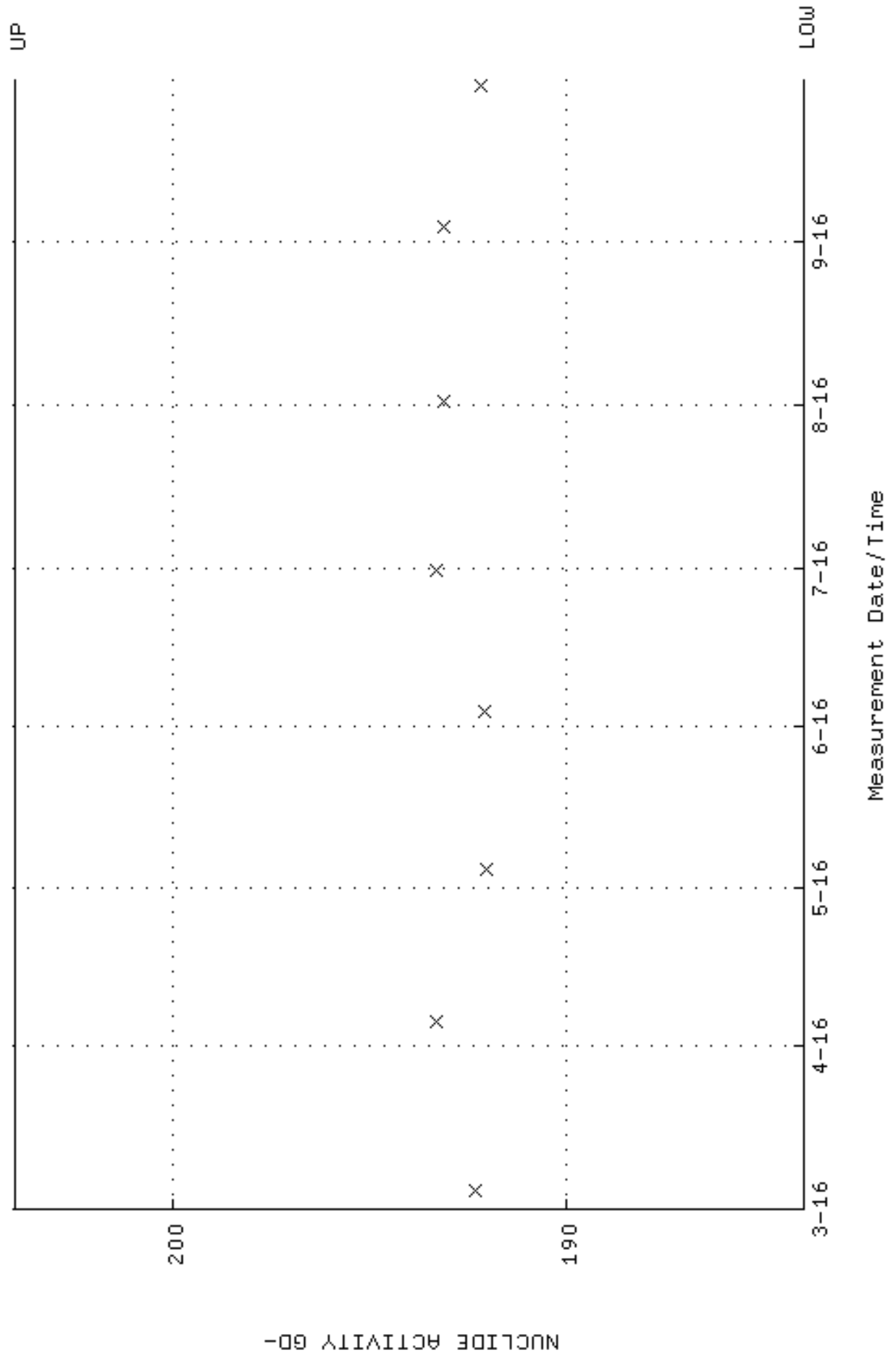
QA filename : DKA100:[ENV_ALPHA.QA.B]B081.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:21:42 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



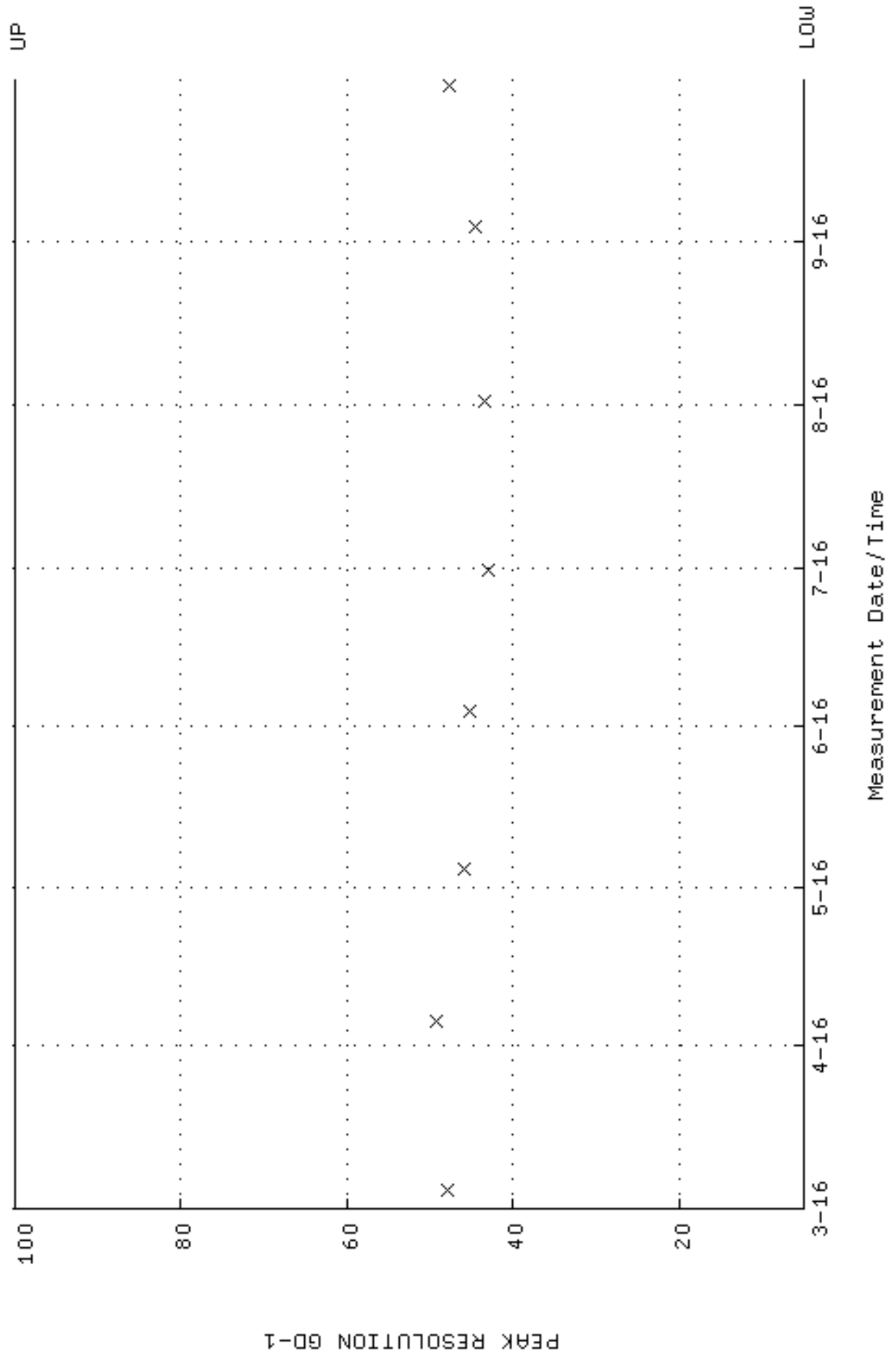
QA filename : DKA100:[ENV_ALPHA.QA.W]W082.QAF;9
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAR-2016 13:27:08 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.312914 through 0.332270



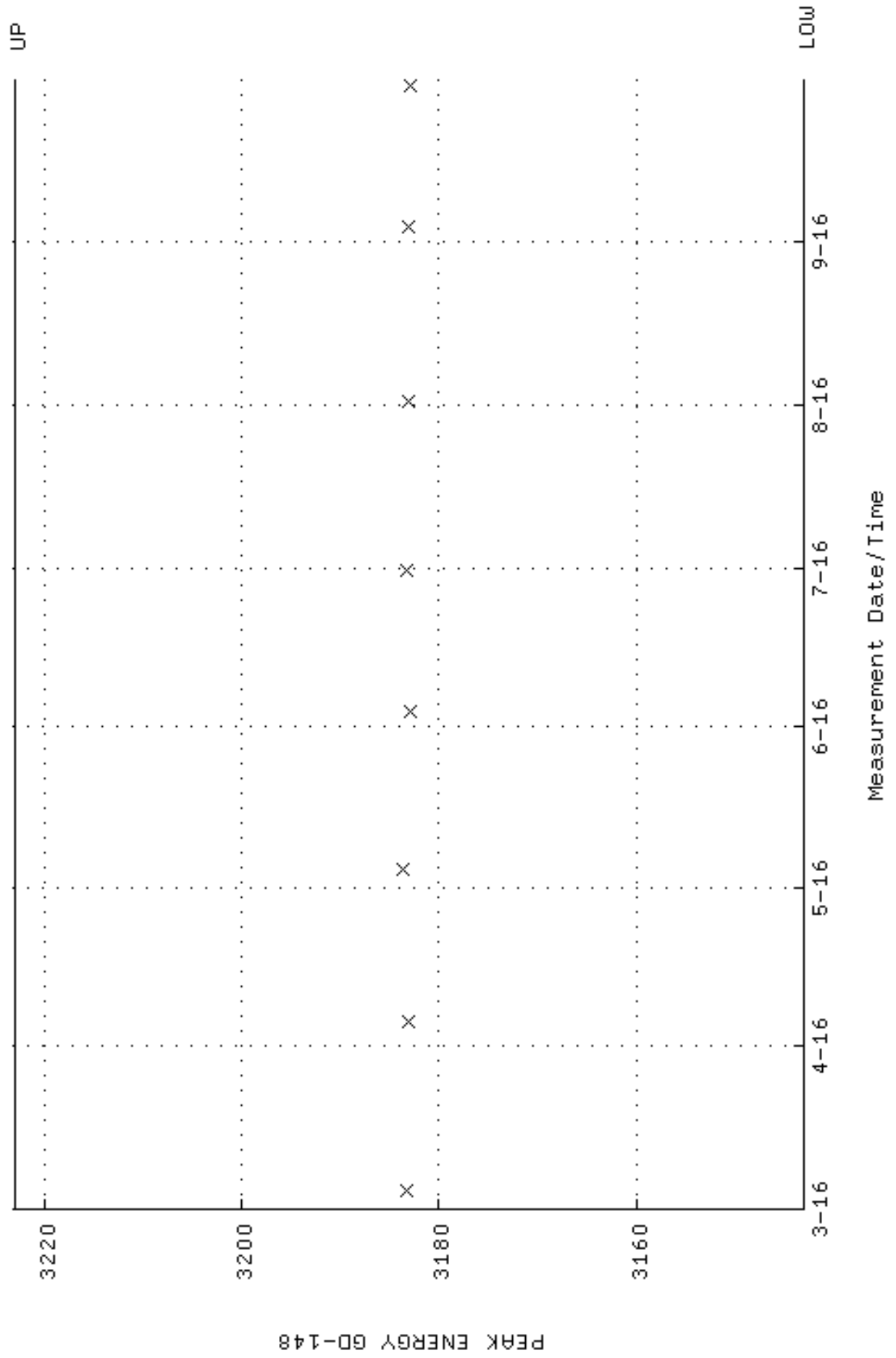
QA filename : DKA100:[ENV_ALPHA.QA.W]W082.QAF;9
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:08 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



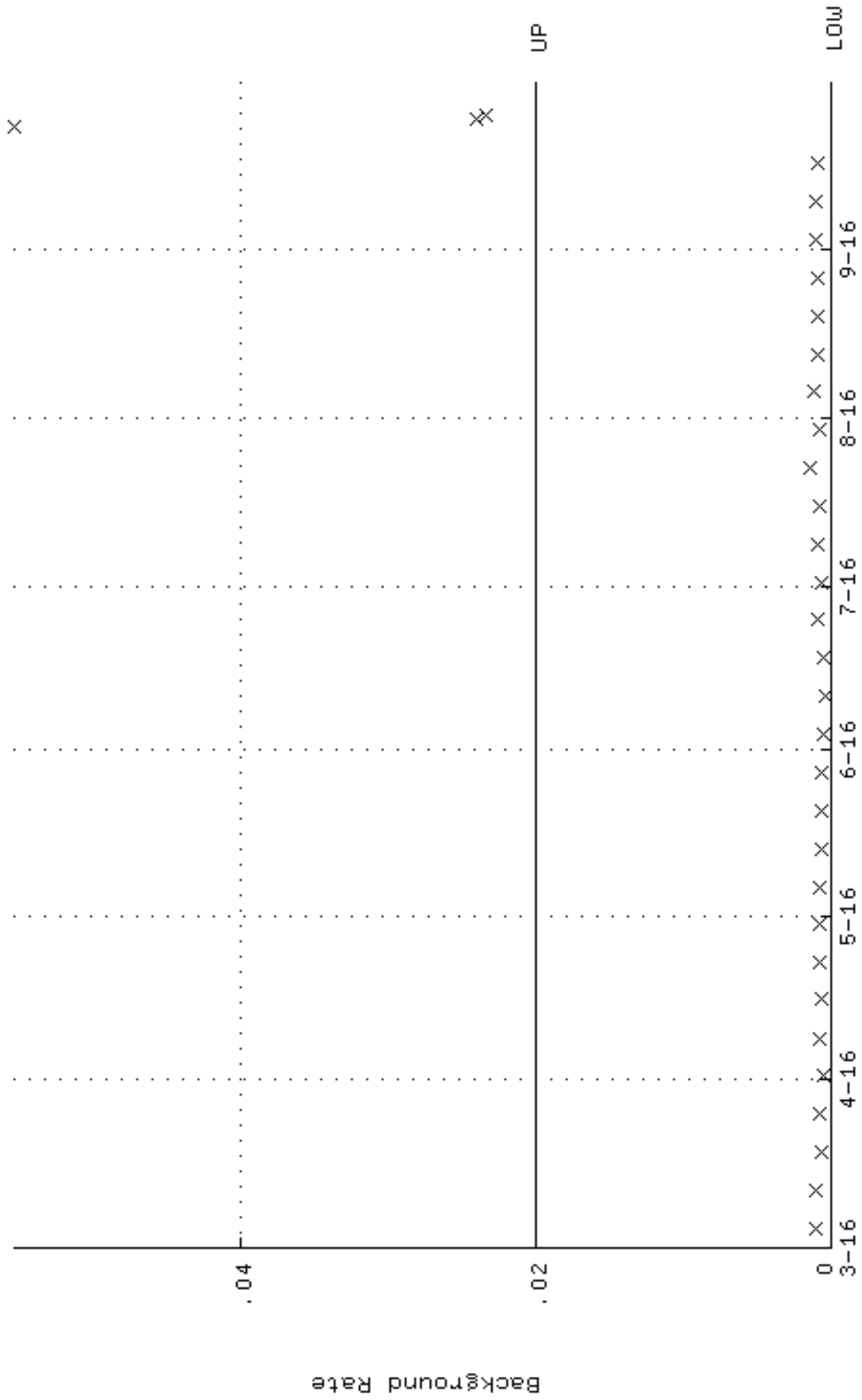
QA filename : DKA100:[ENV_ALPHA.QA.W]W082.QAF;9
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-MAR-2016 13:27:08 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



QA filename : DKA100:[ENV_ALPHA.QA.W]W082.QAF;9
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:08 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00

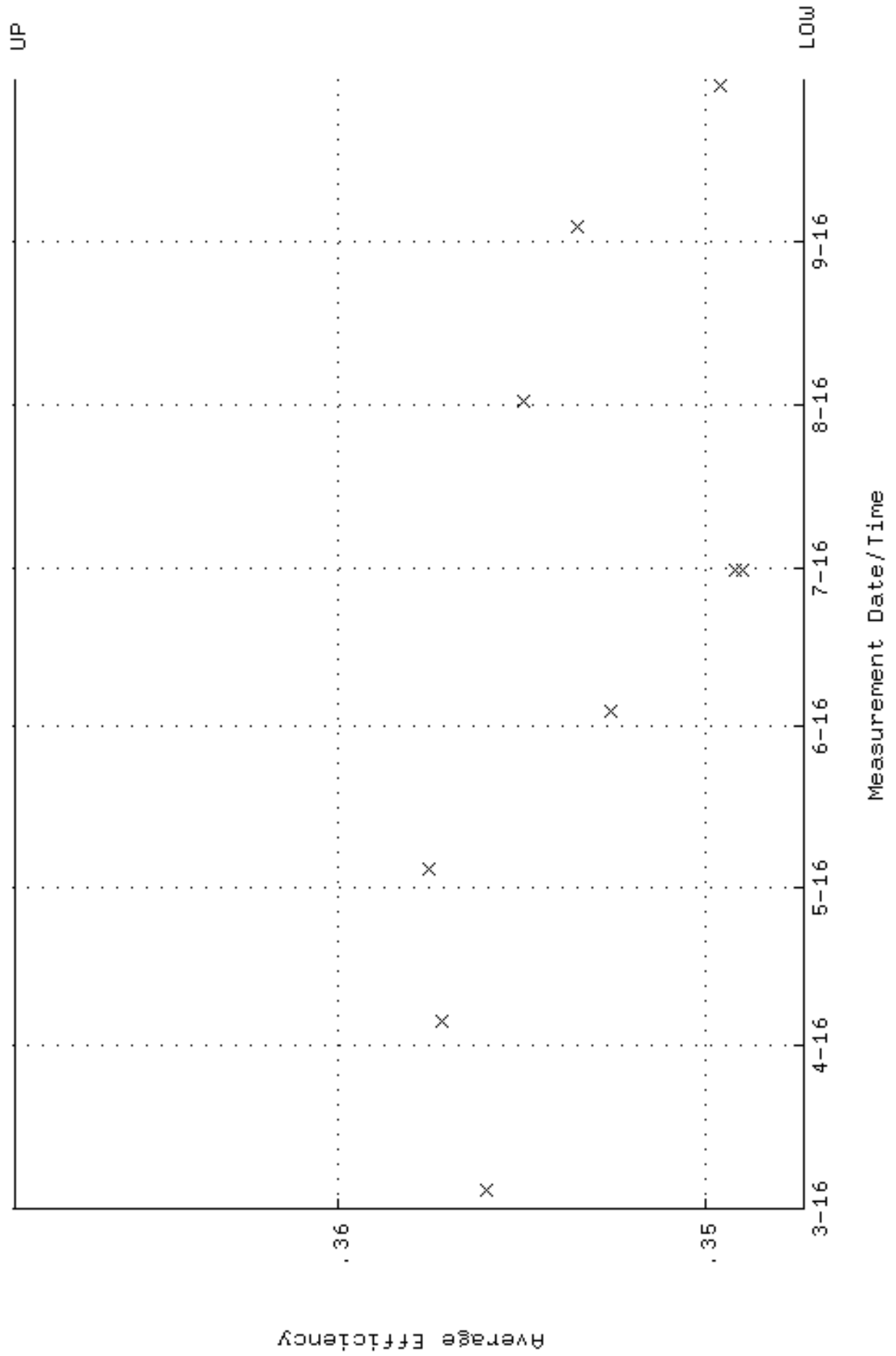


QA filename : DKA100:[ENV_ALPHA.QA.B]B082.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:21:42 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02

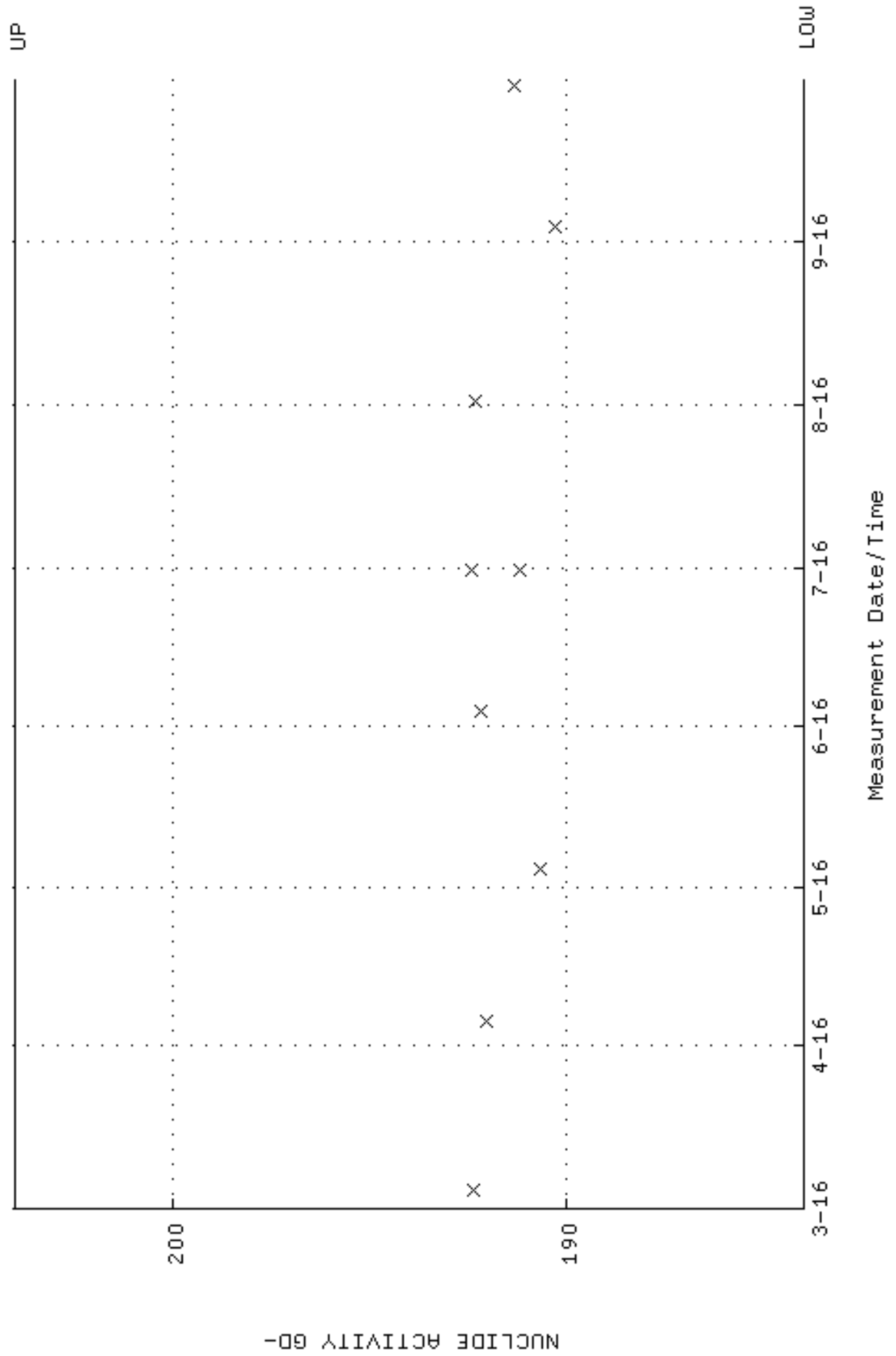


Measurement Date/Time

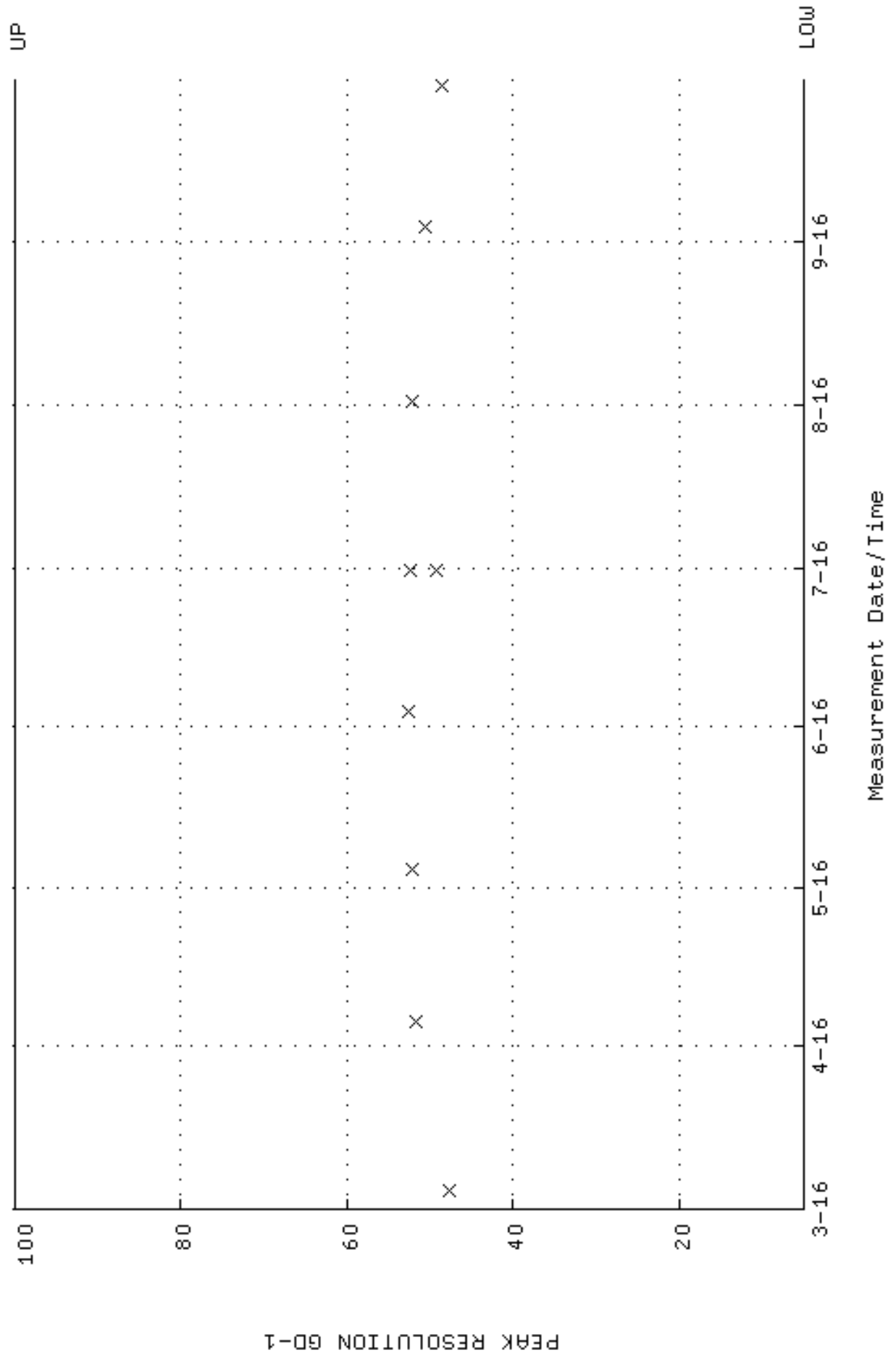
QA filename : DKA100:[ENV_ALPHA.QA.W]W083.QAF;10
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAR-2016 13:27:09 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.347305 through 0.368790



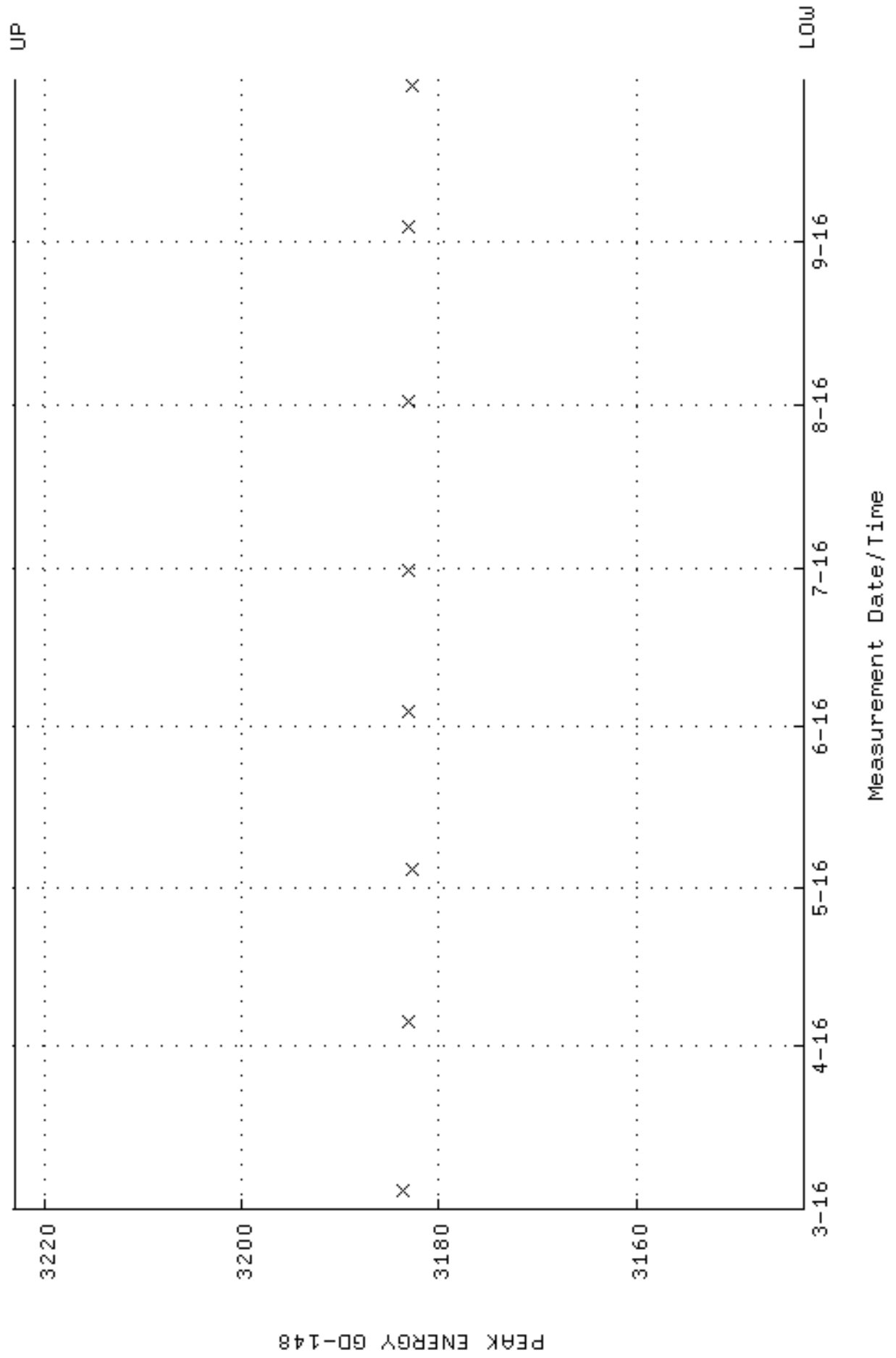
QA filename : DKA100:[ENV_ALPHA.QA.W]W083.QAF;10
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 4-MAR-2016 13:27:09 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



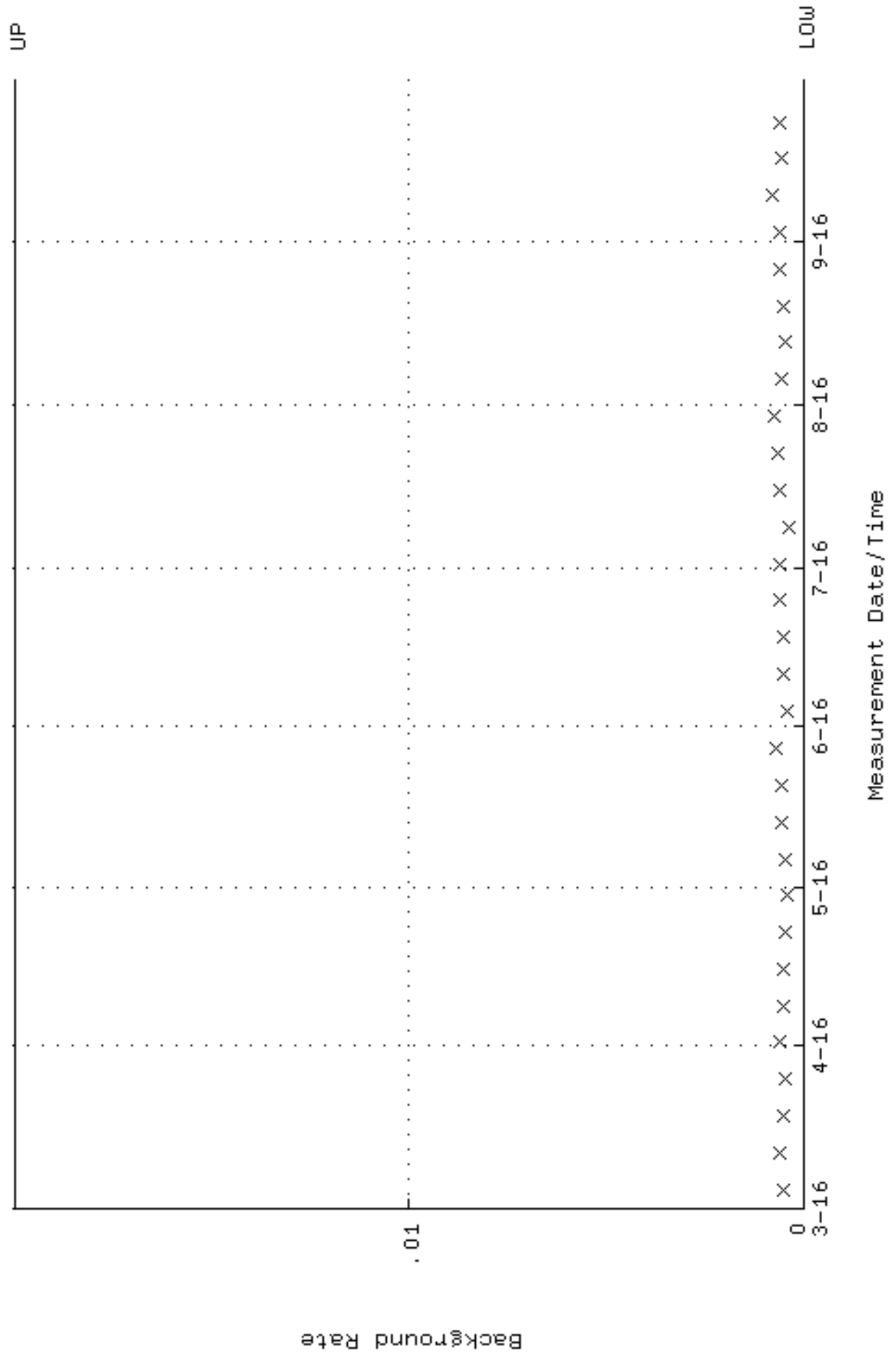
QA filename : DKA100:[ENV_ALPHA.QA.W]W083.QAF;10
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-MAR-2016 13:27:09 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



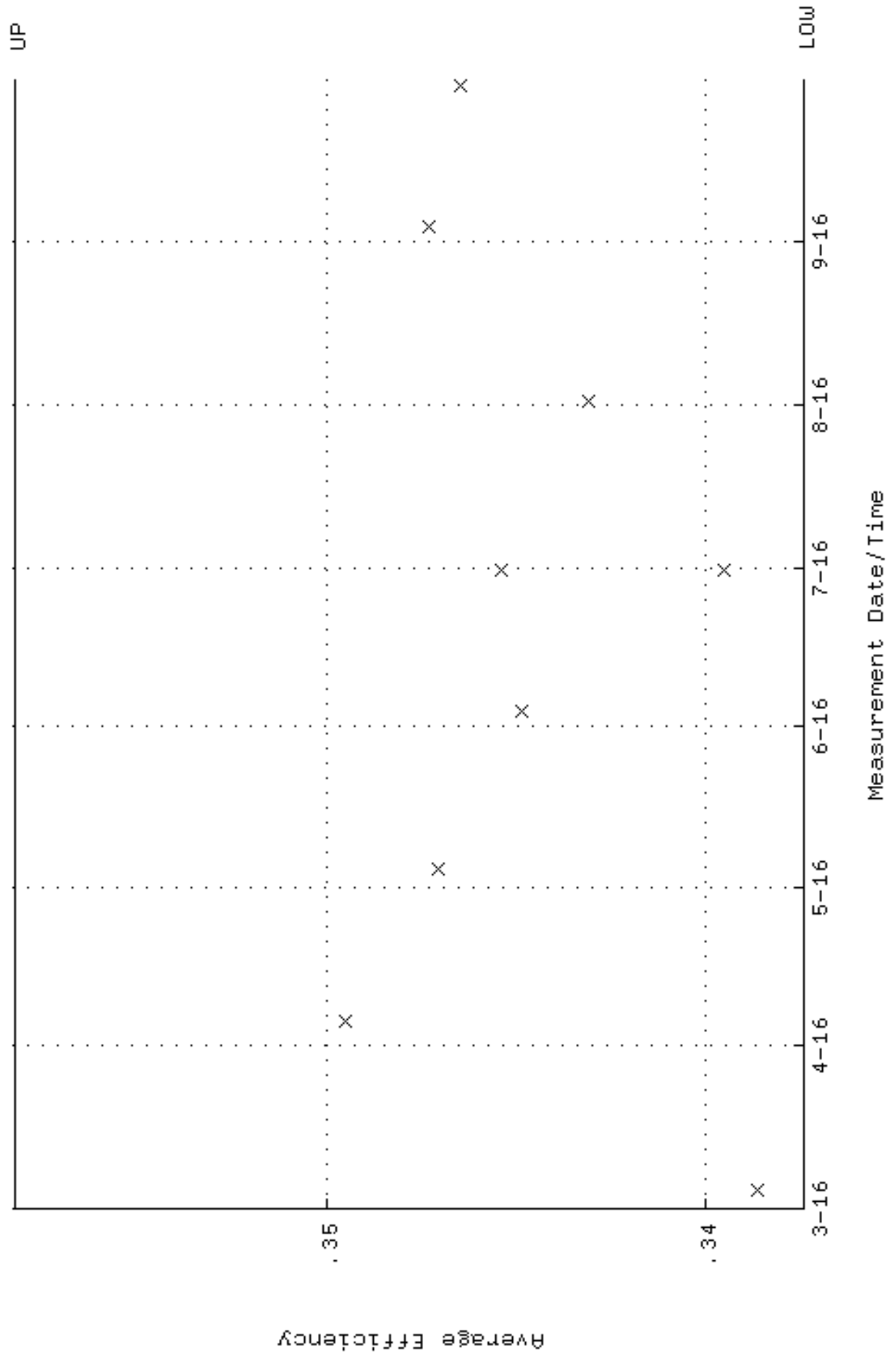
QA filename : DKA100:[ENV_ALPHA.QA.W]W083.QAF;10
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:09 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



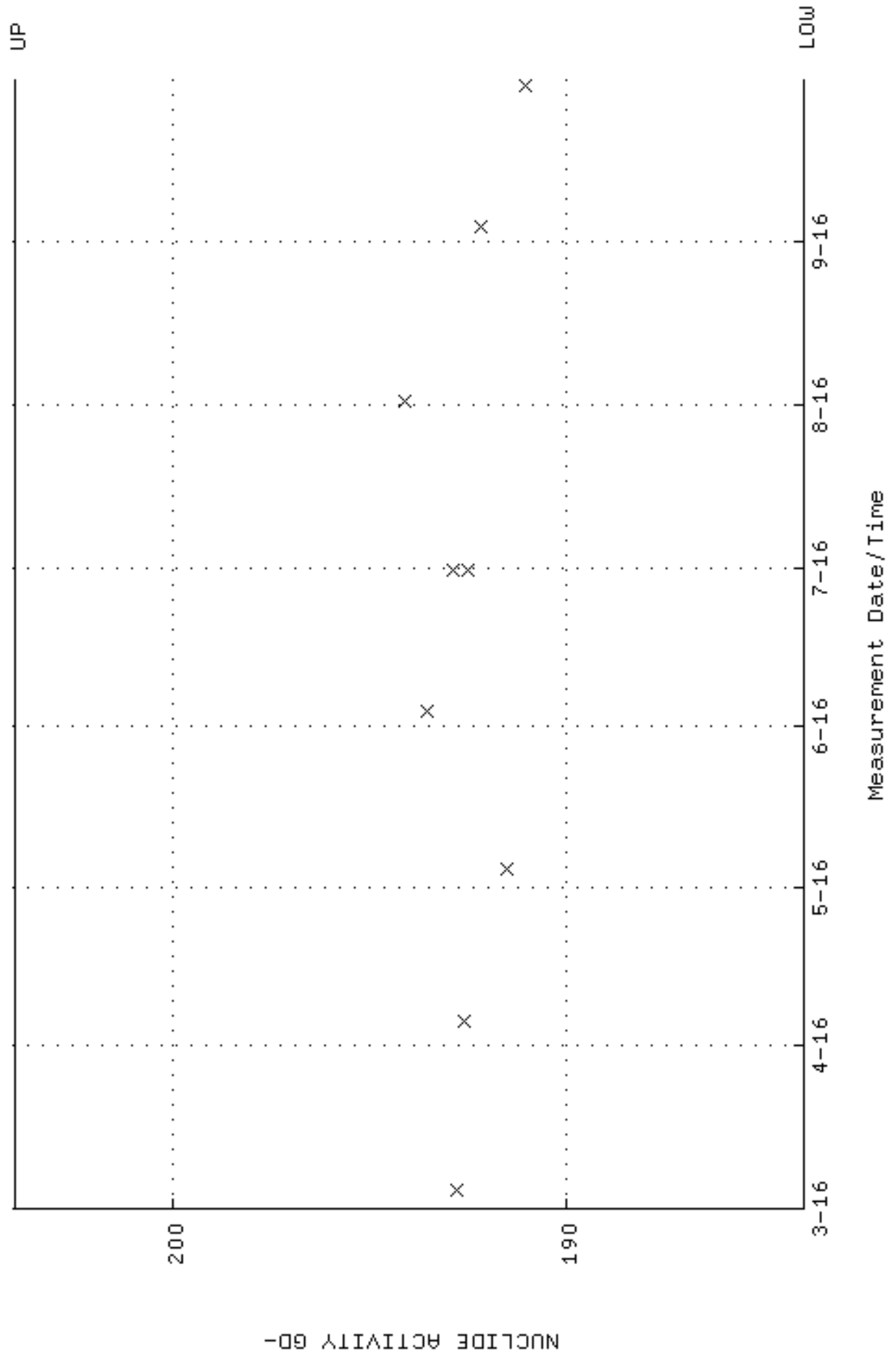
QA filename : DKA100:[ENV_ALPHA.QA.B]B083.QAF;4
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:21:44 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



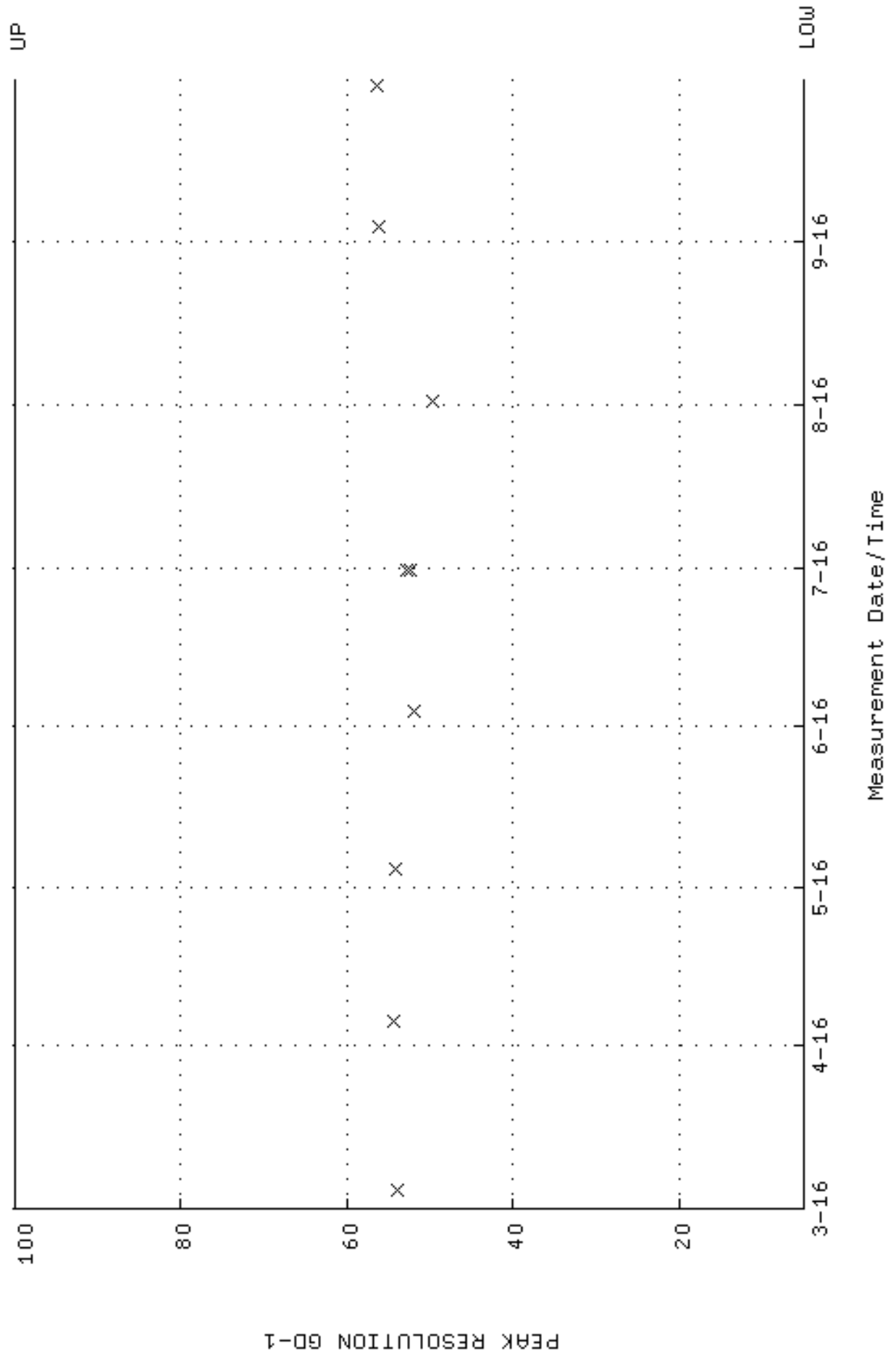
QA filename : DKA100:[ENV_ALPHA.QA.W]W084.QAF;9
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAR-2016 13:27:09 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.337400 through 0.358200



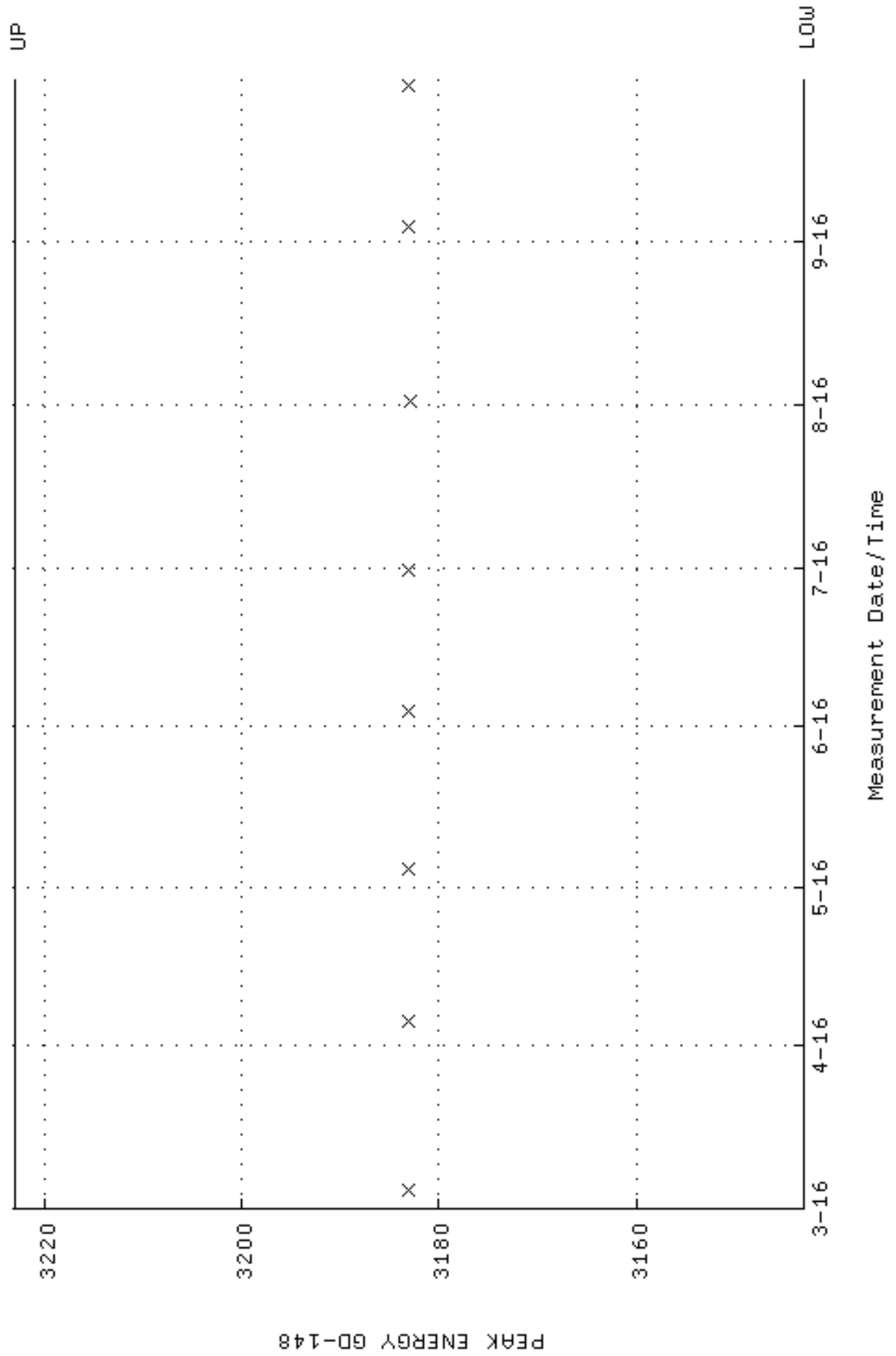
QA filename : DKA100:[ENV_ALPHA.QA.W]W084.QAF;9
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:09 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



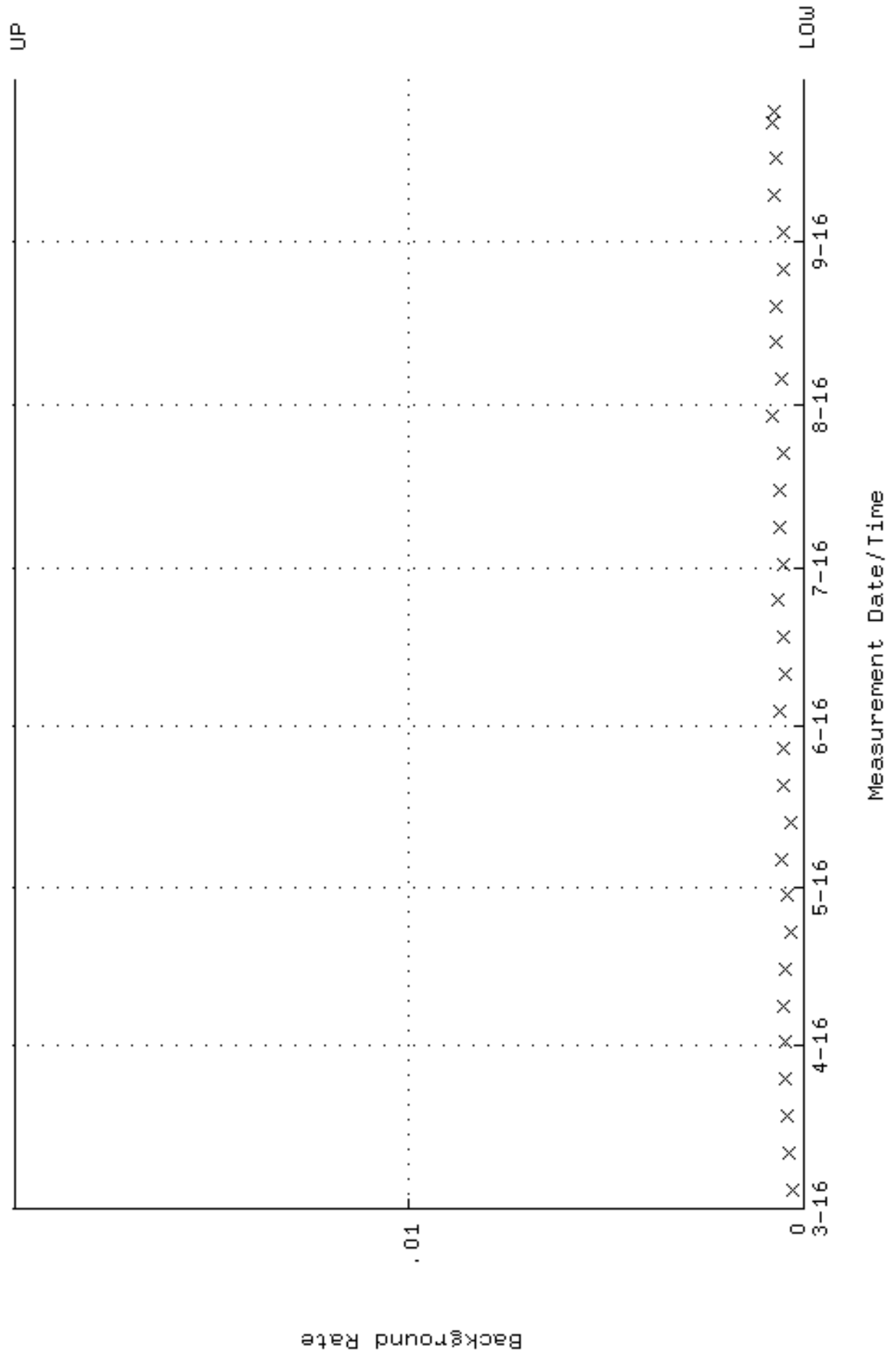
QA filename : DKA100:[ENV_ALPHA.QA.W]W084.QAF;9
 Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 4-MAR-2016 13:27:09 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



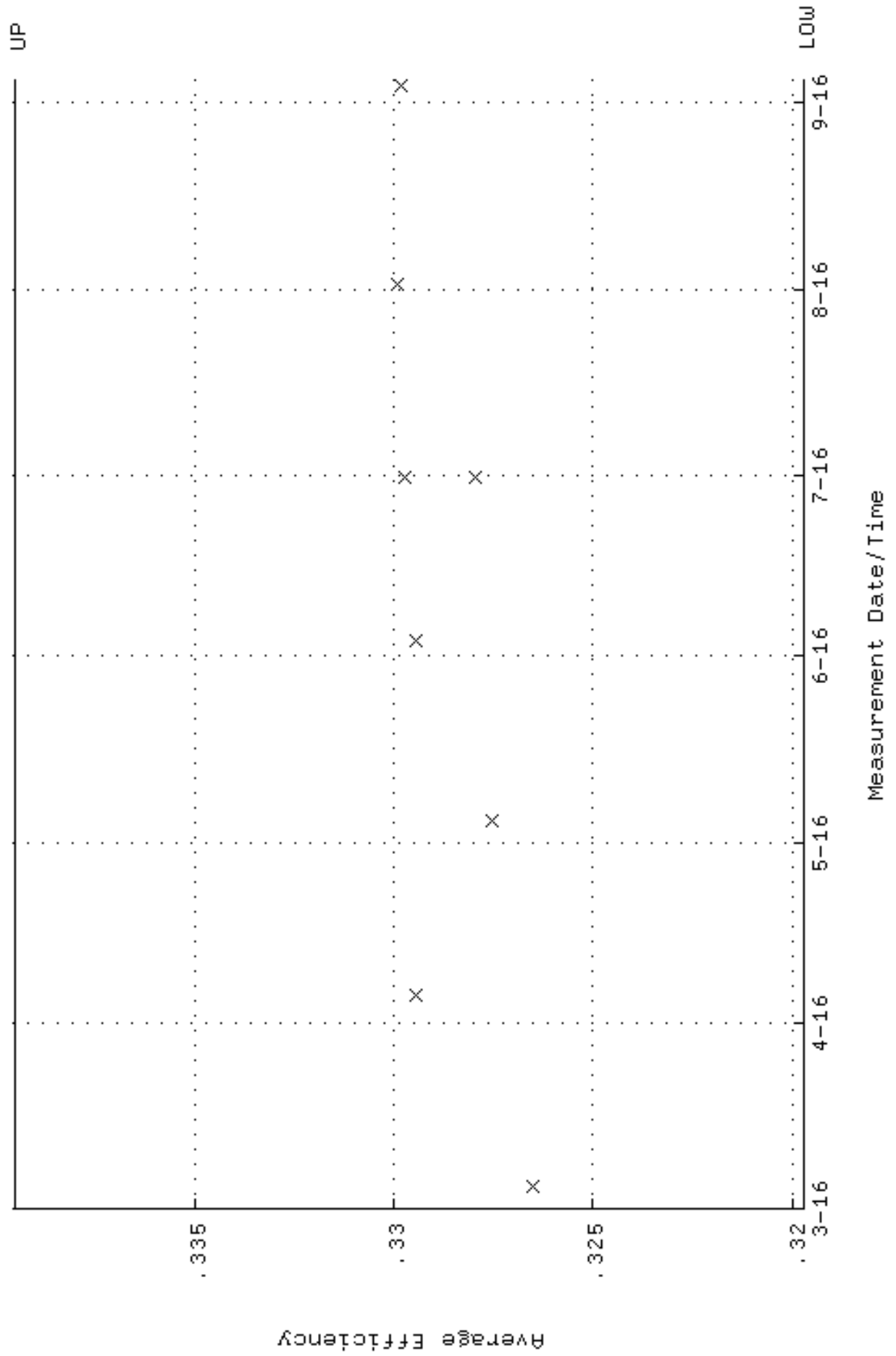
QA filename : DKA100:[ENV_ALPHA.QA.W]W084.QAF;9
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:09 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



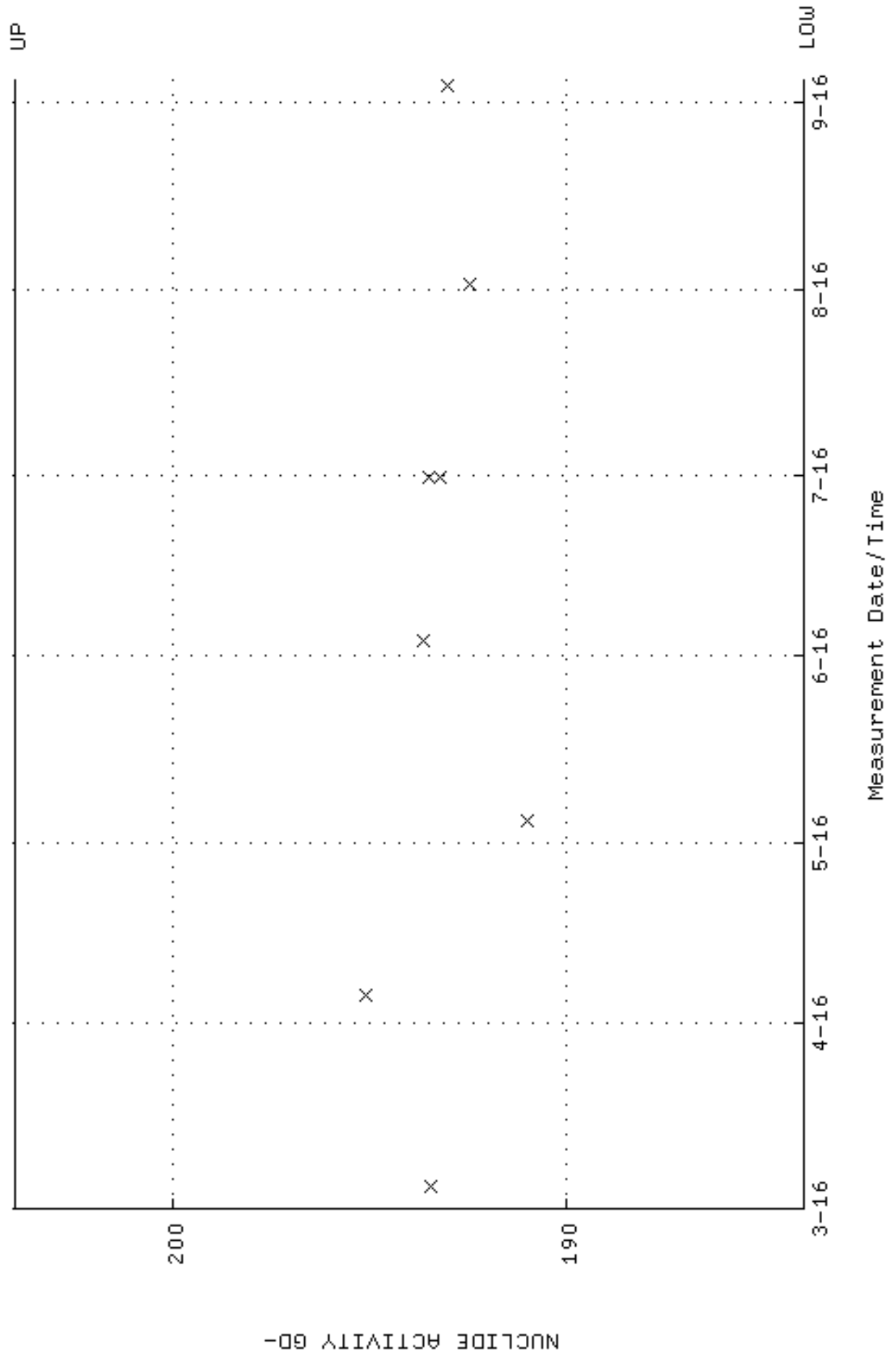
QA filename : DKA100:[ENV_ALPHA.QA.B]B084.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:21:44 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



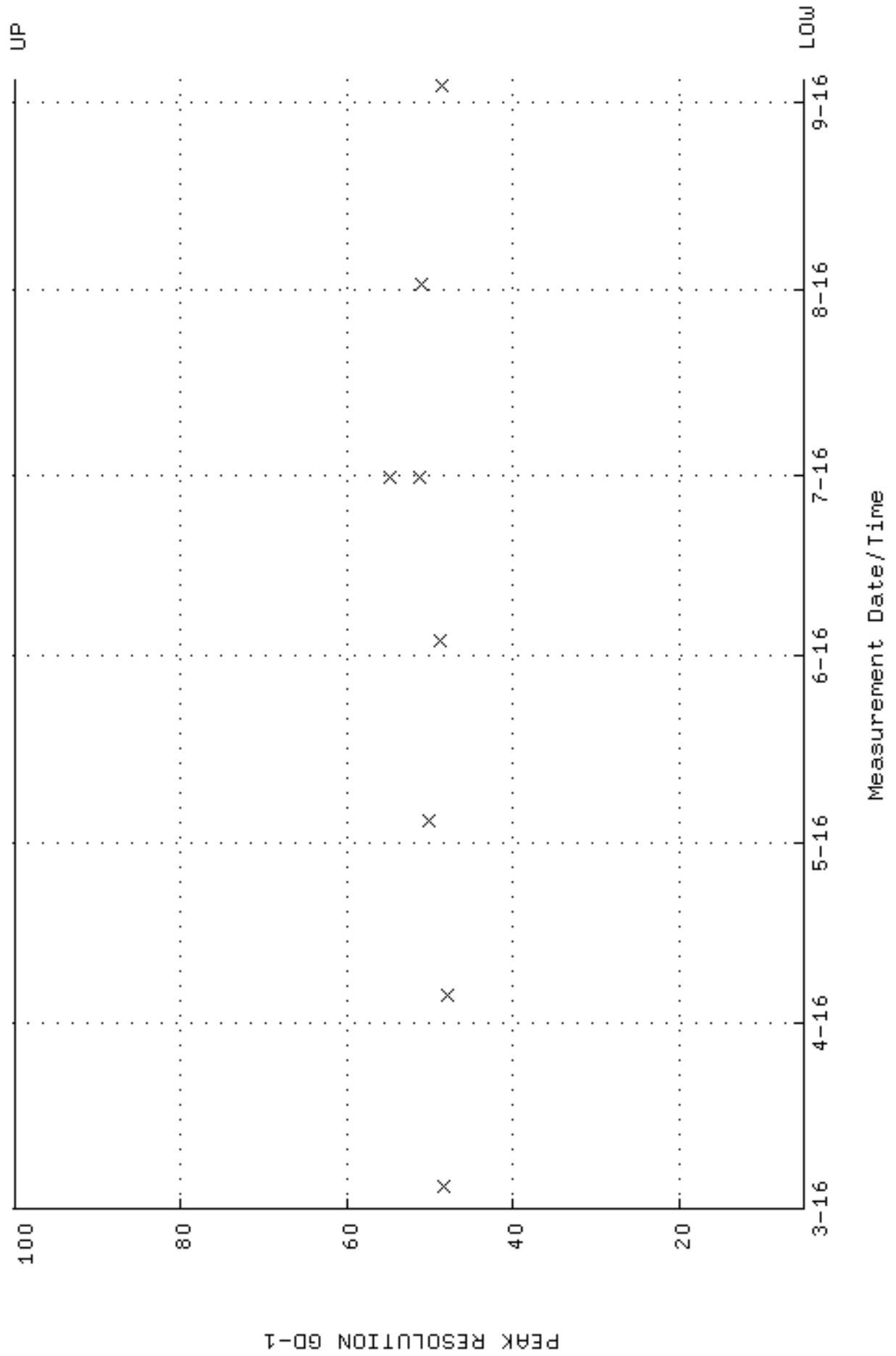
QA filename : DKA100:[ENV_ALPHA.QA.W]W085.QAF;10
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAR-2016 13:27:09 through 4-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.319702 through 0.339500



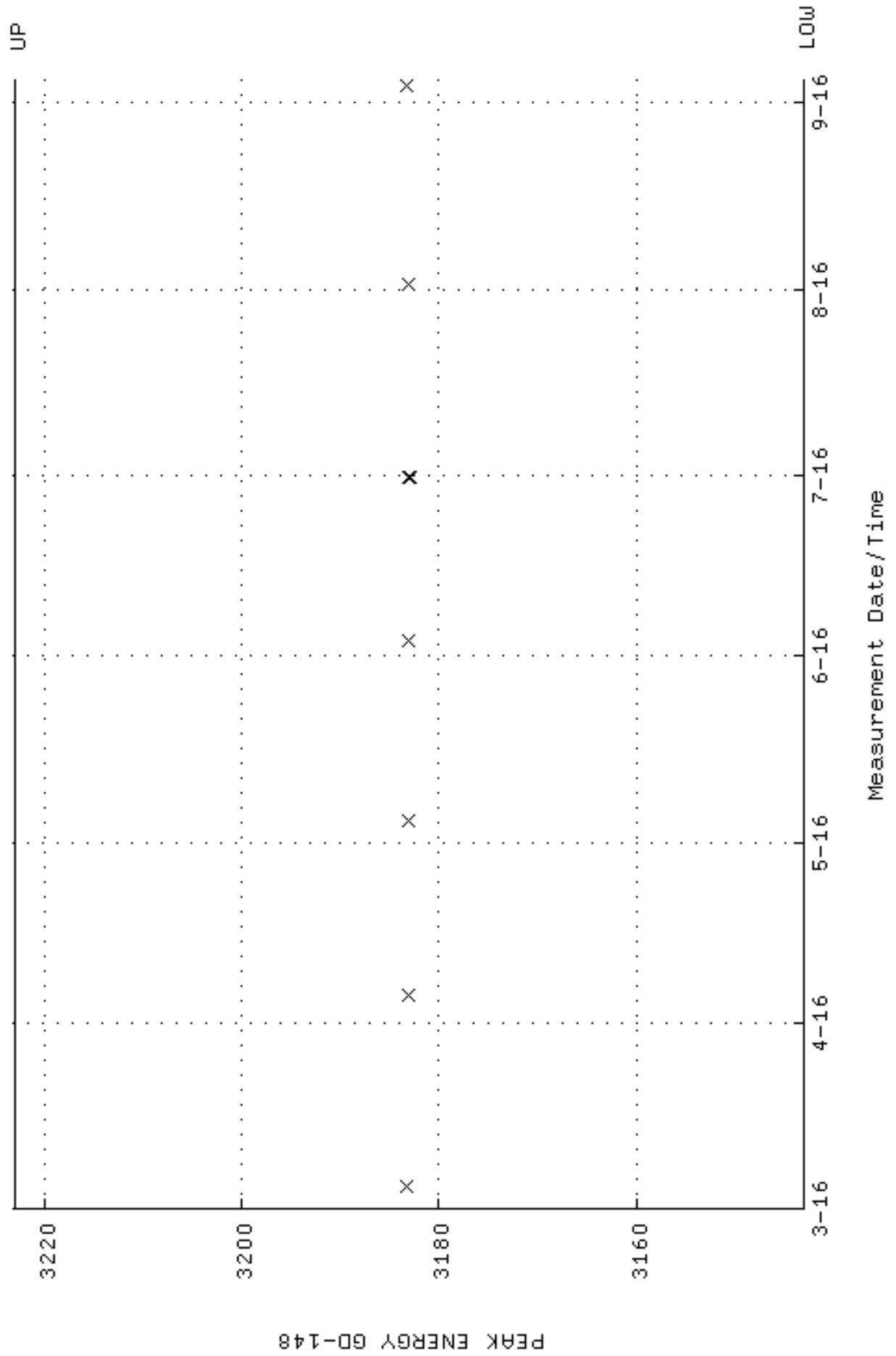
QA filename : DKA100:[ENV_ALPHA.QA.W]W085.QAF;10
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:09 through 4-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



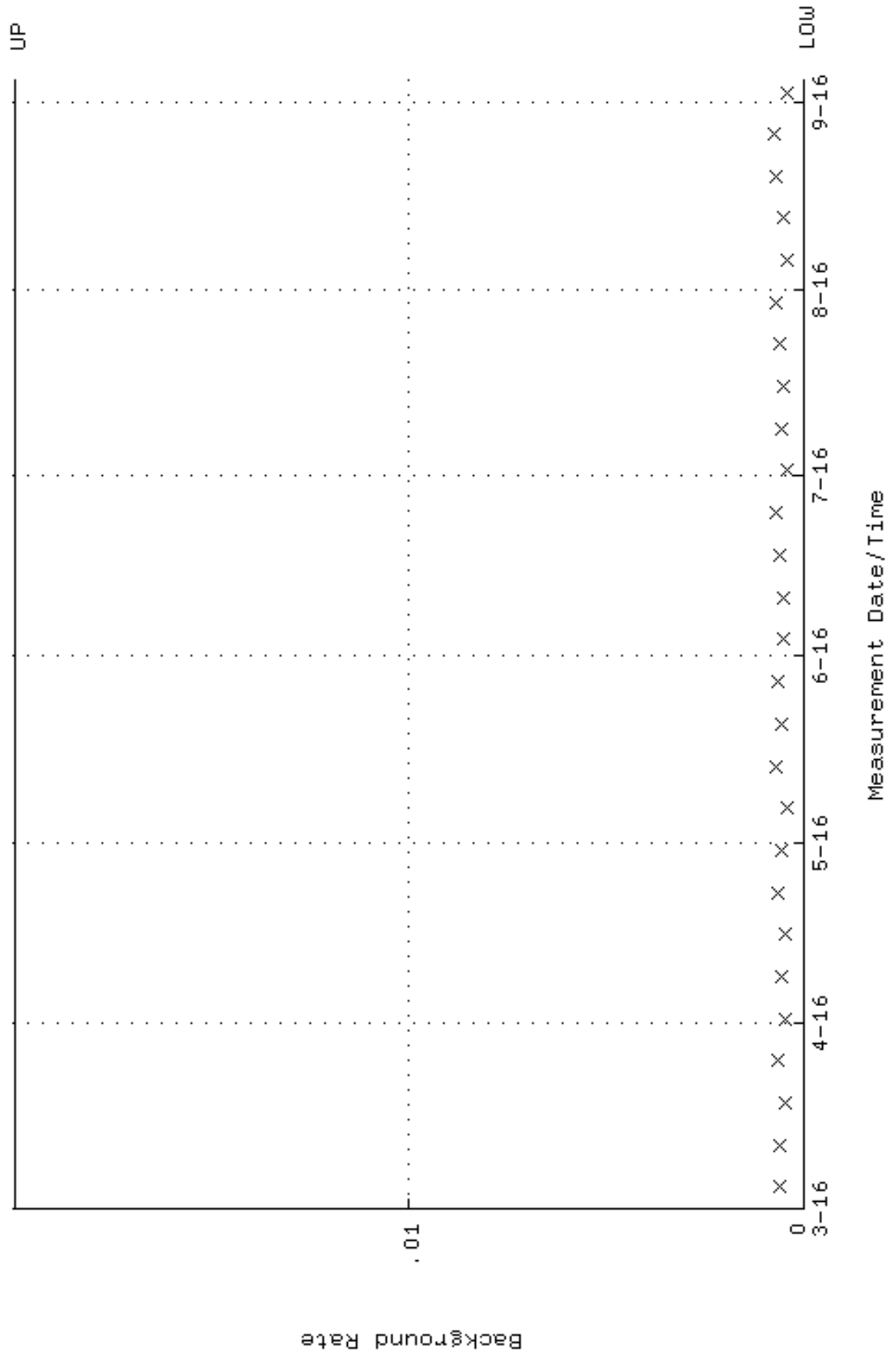
QA filename : DKA100:[ENV_ALPHA.QA.W]W085.QAF;10
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-MAR-2016 13:27:09 through 4-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



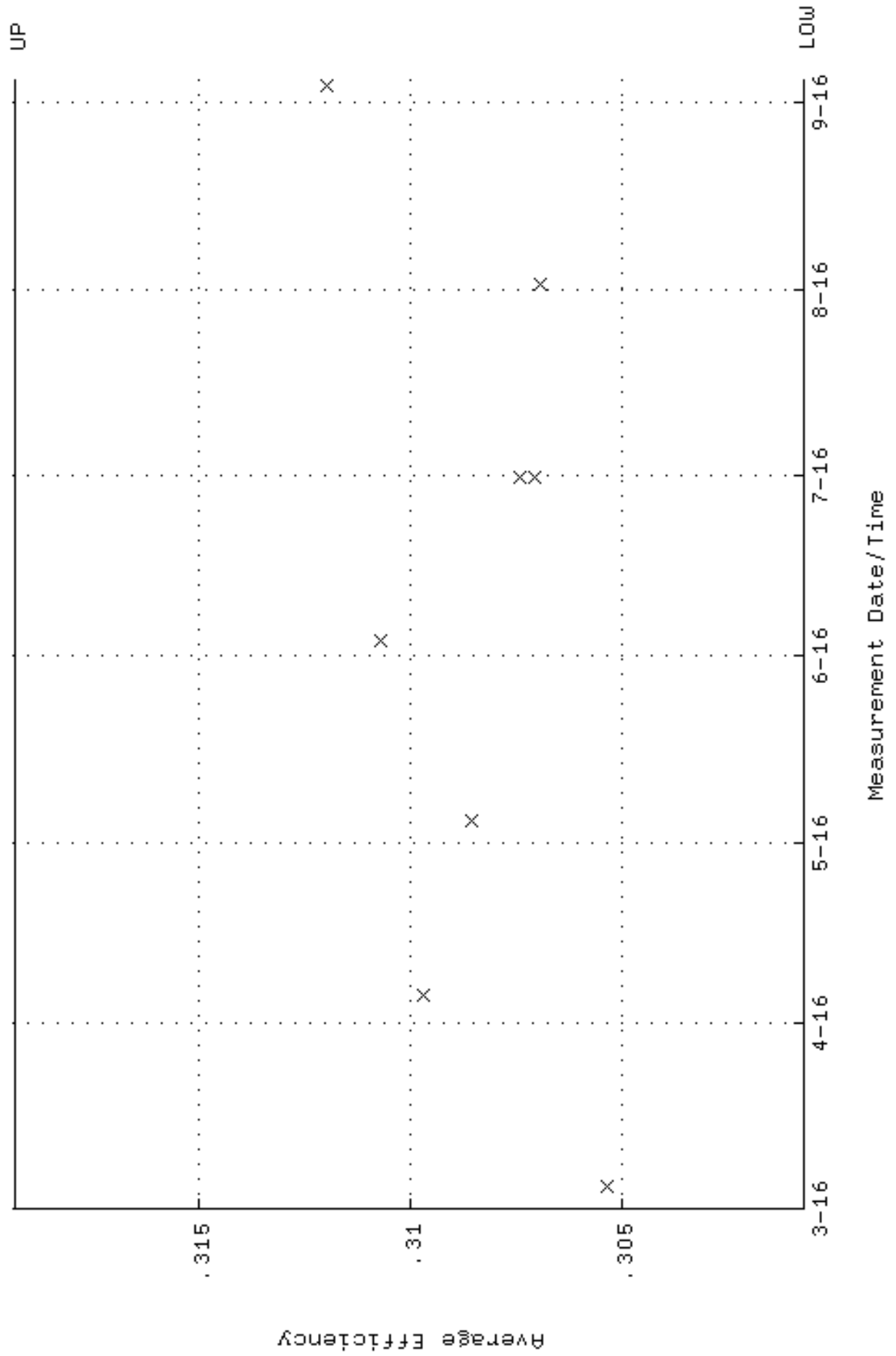
QA filename : DKA100:[ENV_ALPHA.QA.W]W085.QAF;10
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:09 through 4-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



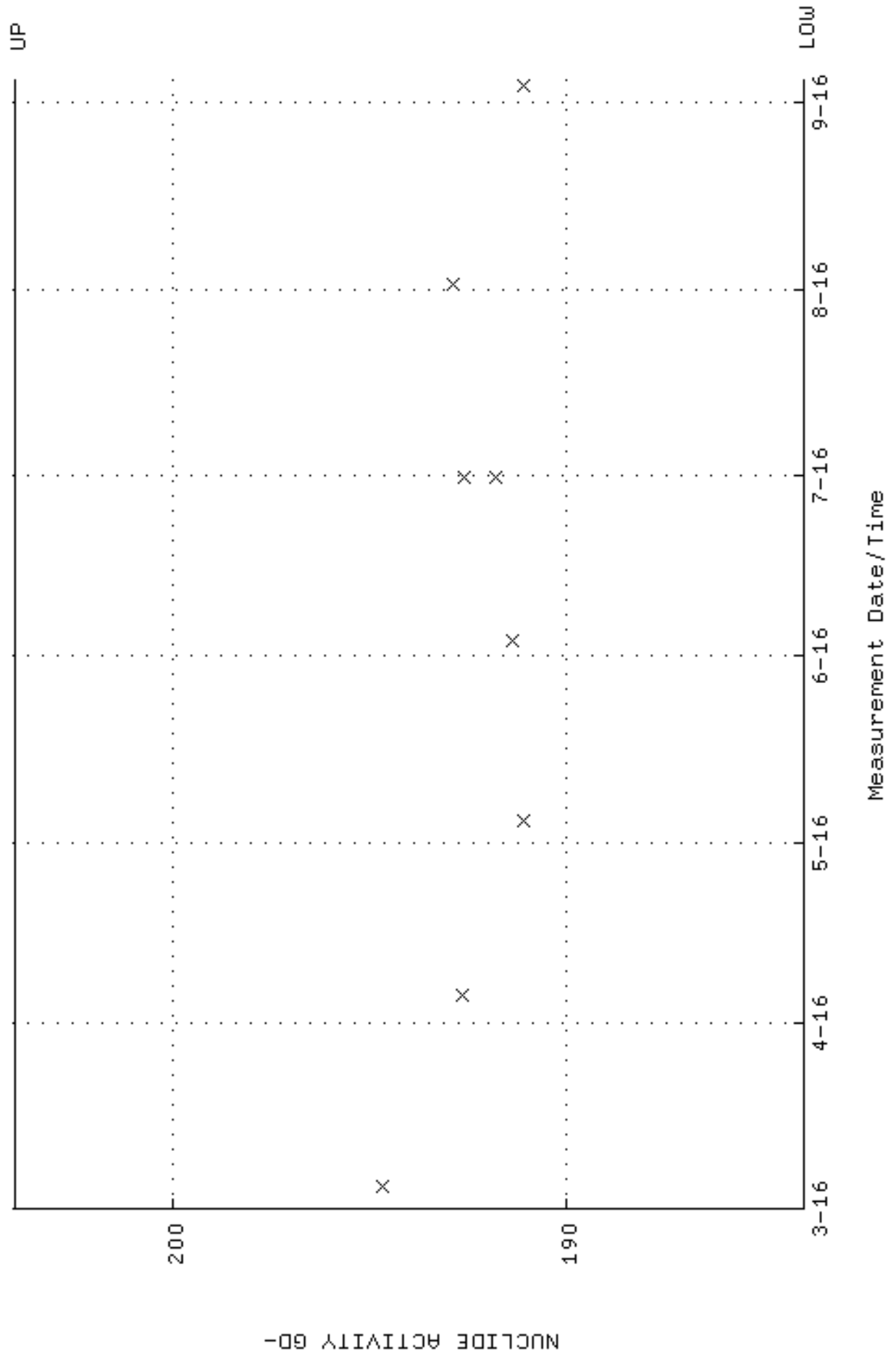
QA filename : DKA100:[ENV_ALPHA.QA.B]B085.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:21:44 through 4-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



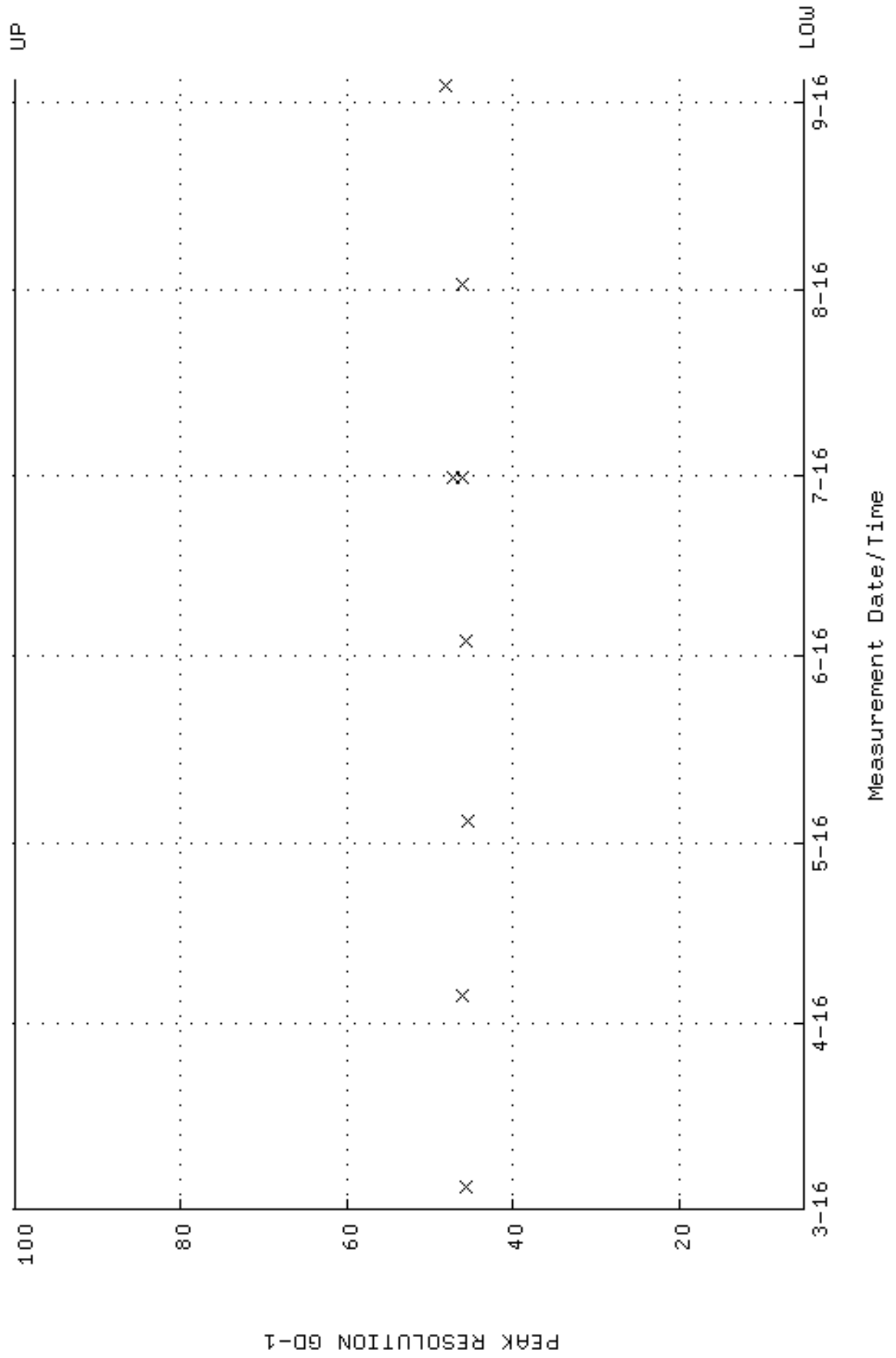
QA filename : DKA100:[ENV_ALPHA.QA.W]W086.QAF;9
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAR-2016 13:27:09 through 4-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.300722 through 0.319324



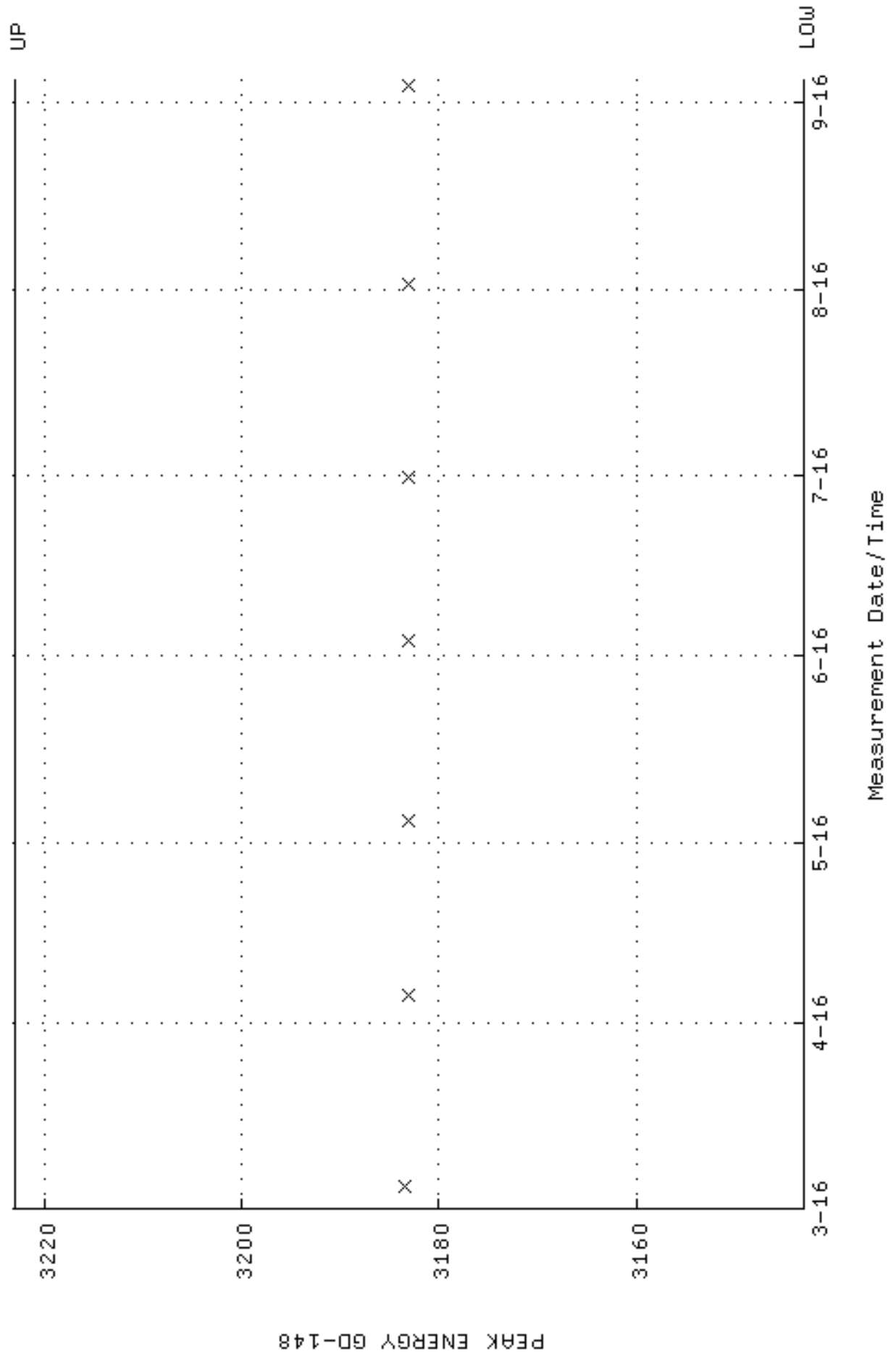
QA filename : DKA100:[ENV_ALPHA.QA.W]W086.QAF;9
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:09 through 4-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



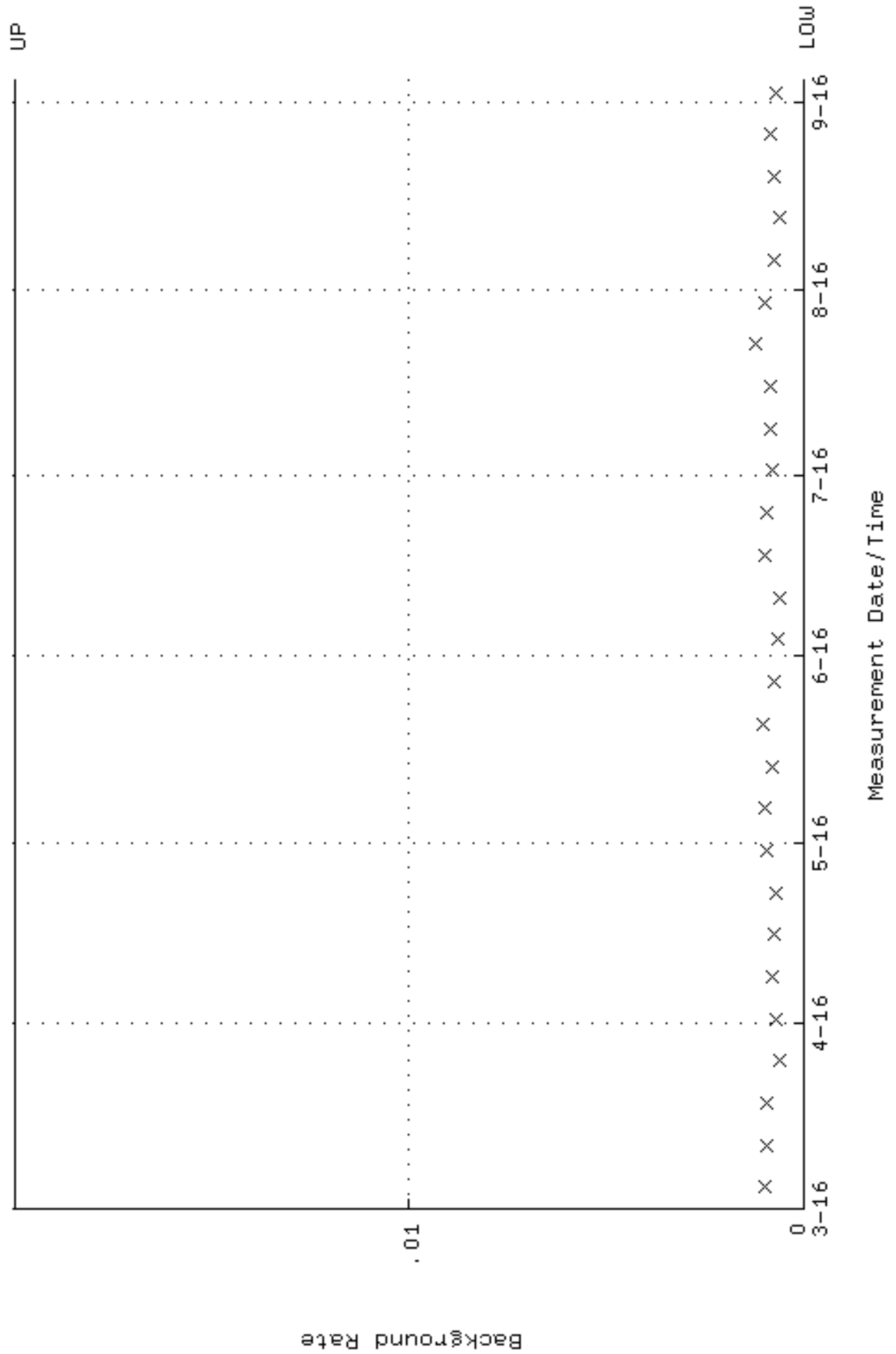
QA filename : DKA100:[ENV_ALPHA.QA.W]W086.QAF;9
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-MAR-2016 13:27:09 through 4-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



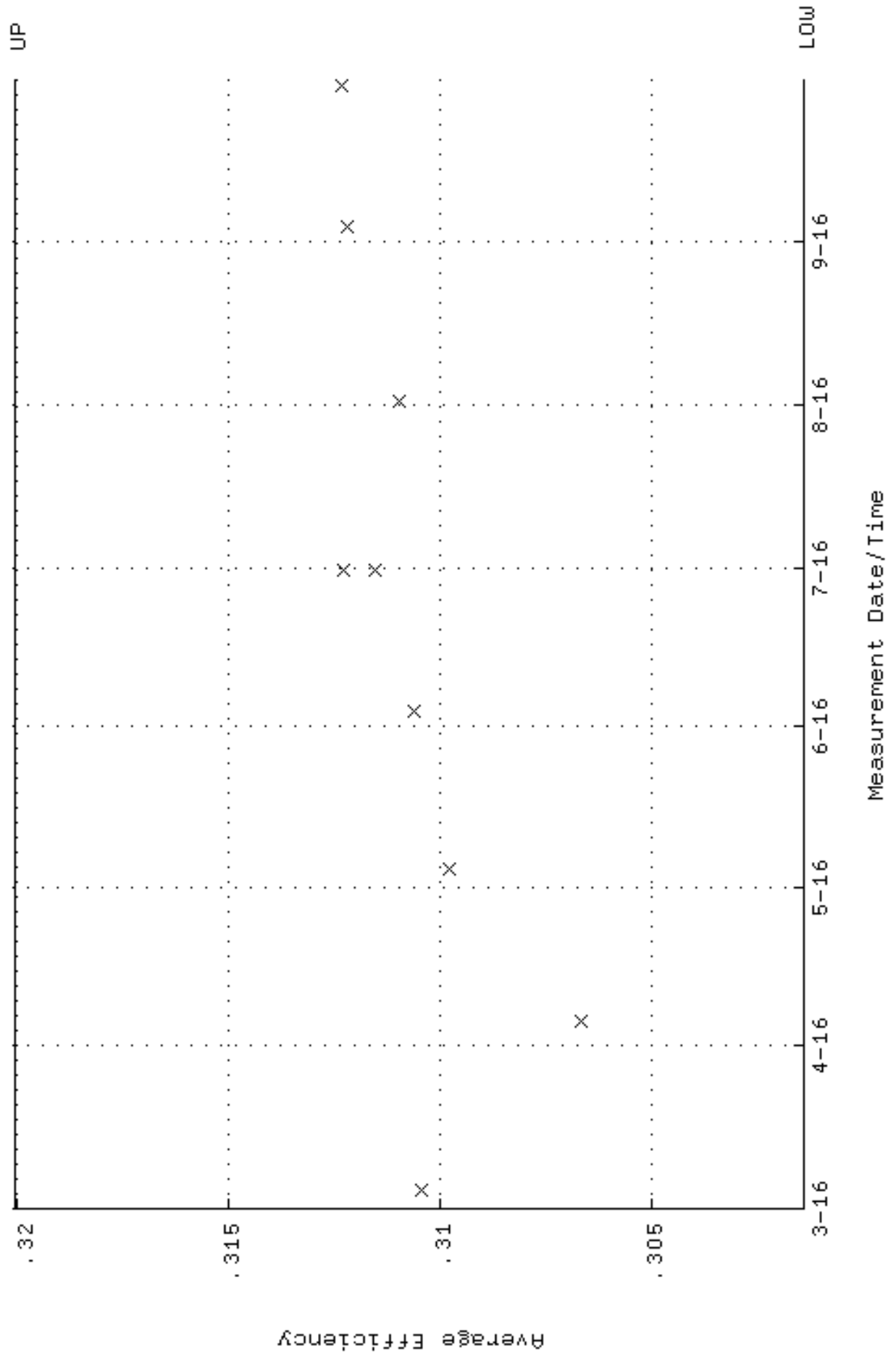
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:09 through 4-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



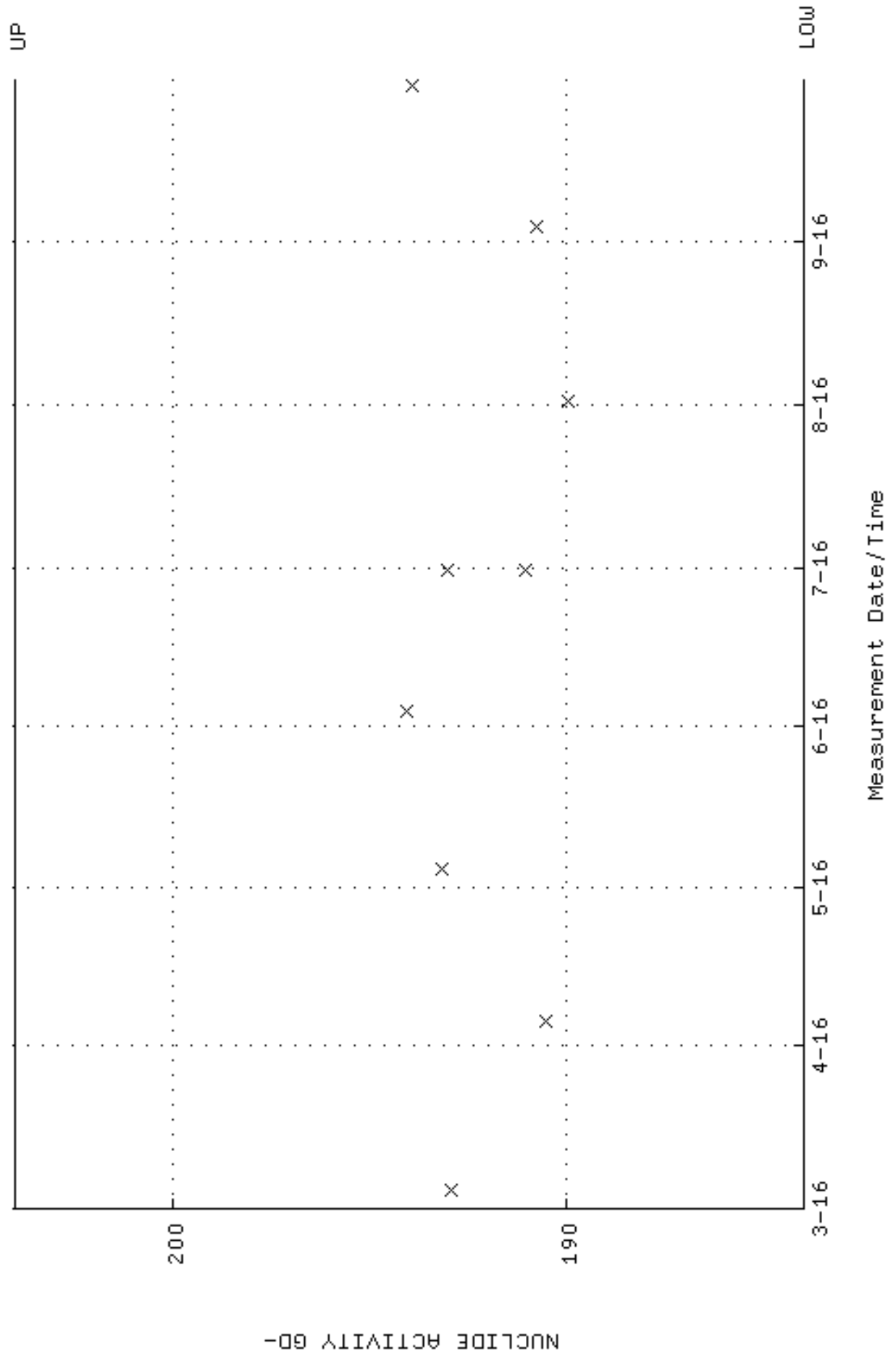
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 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:21:44 through 4-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



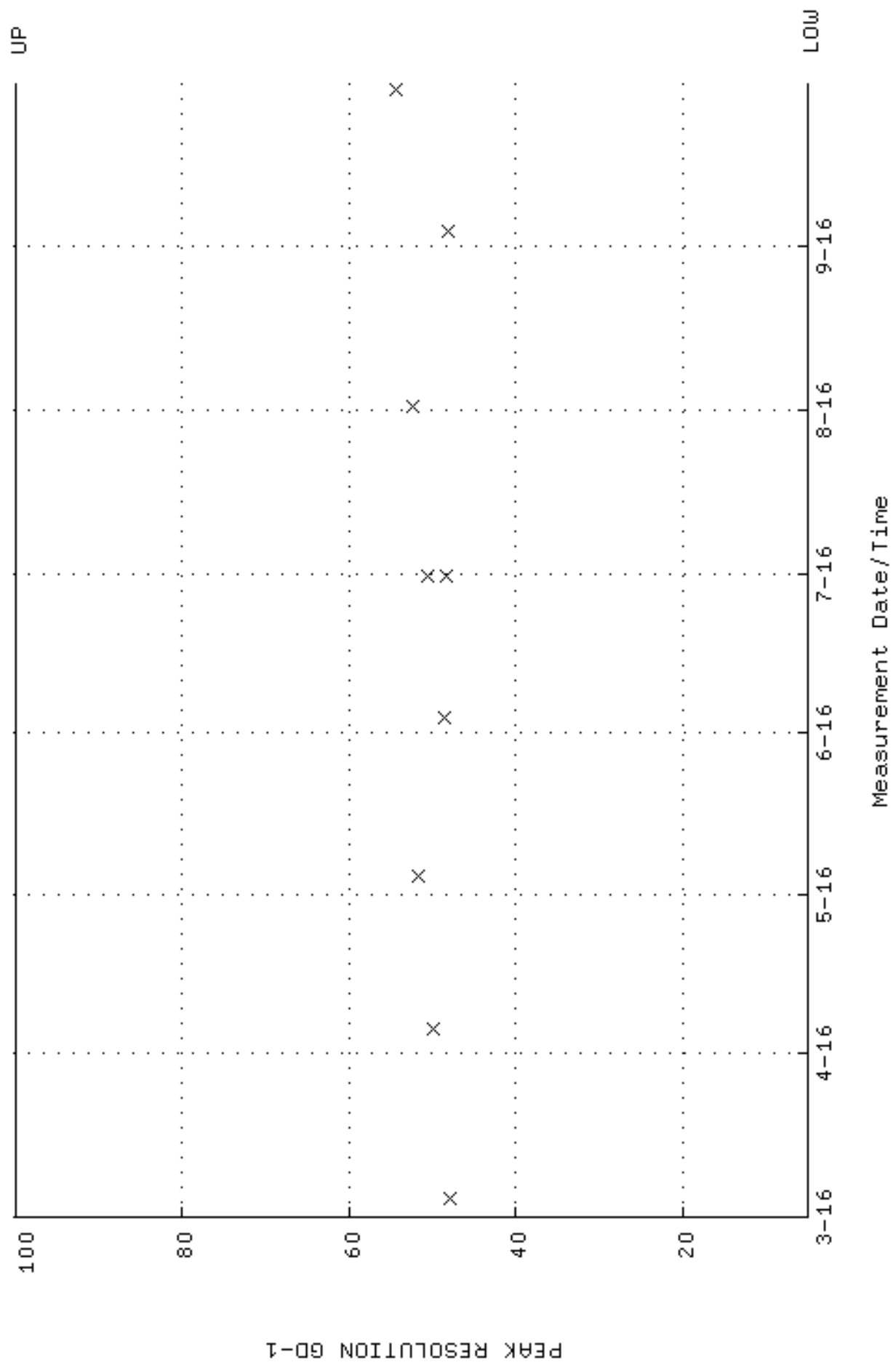
QA filename : DKA100:[ENV_ALPHA.QA.W]W088.QAF;11
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAR-2016 13:27:09 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.301414 through 0.320060



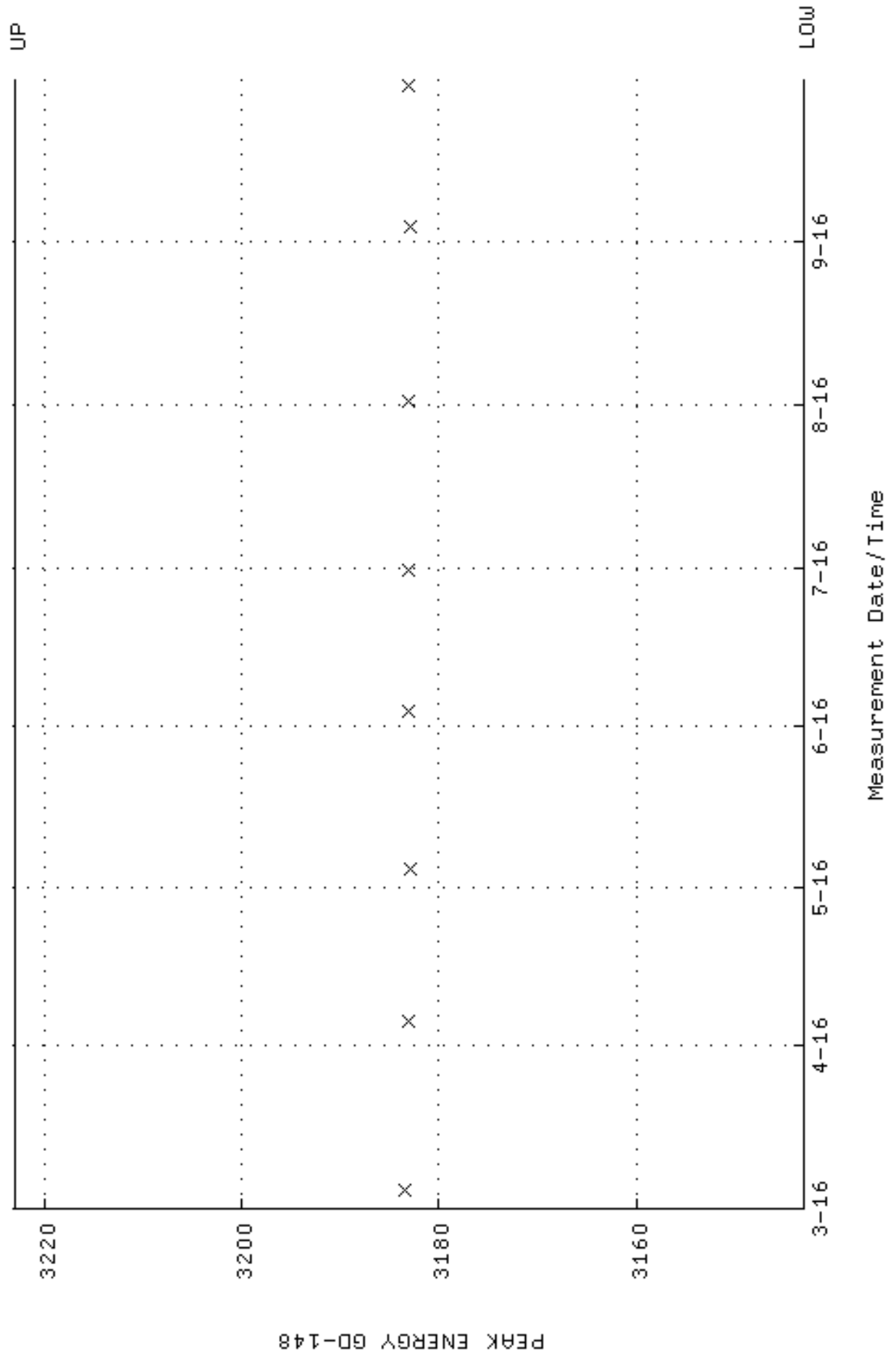
QA filename : DKA100:[ENV_ALPHA.QA.W]W088.QAF;11
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:09 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



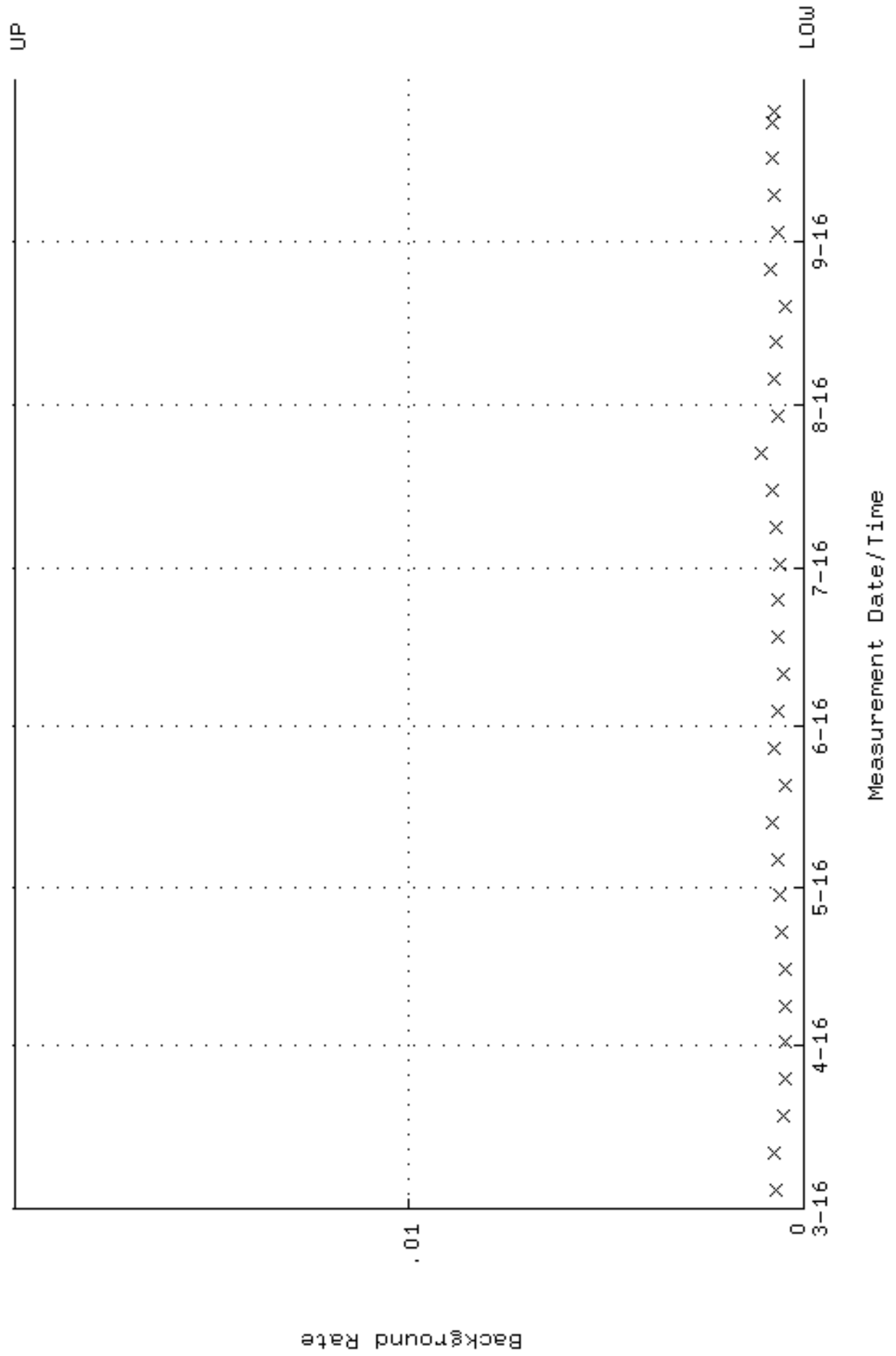
QA filename : DKA100:[ENV_ALPHA.QA.W]W088.QAF;11
 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 4-MAR-2016 13:27:09 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



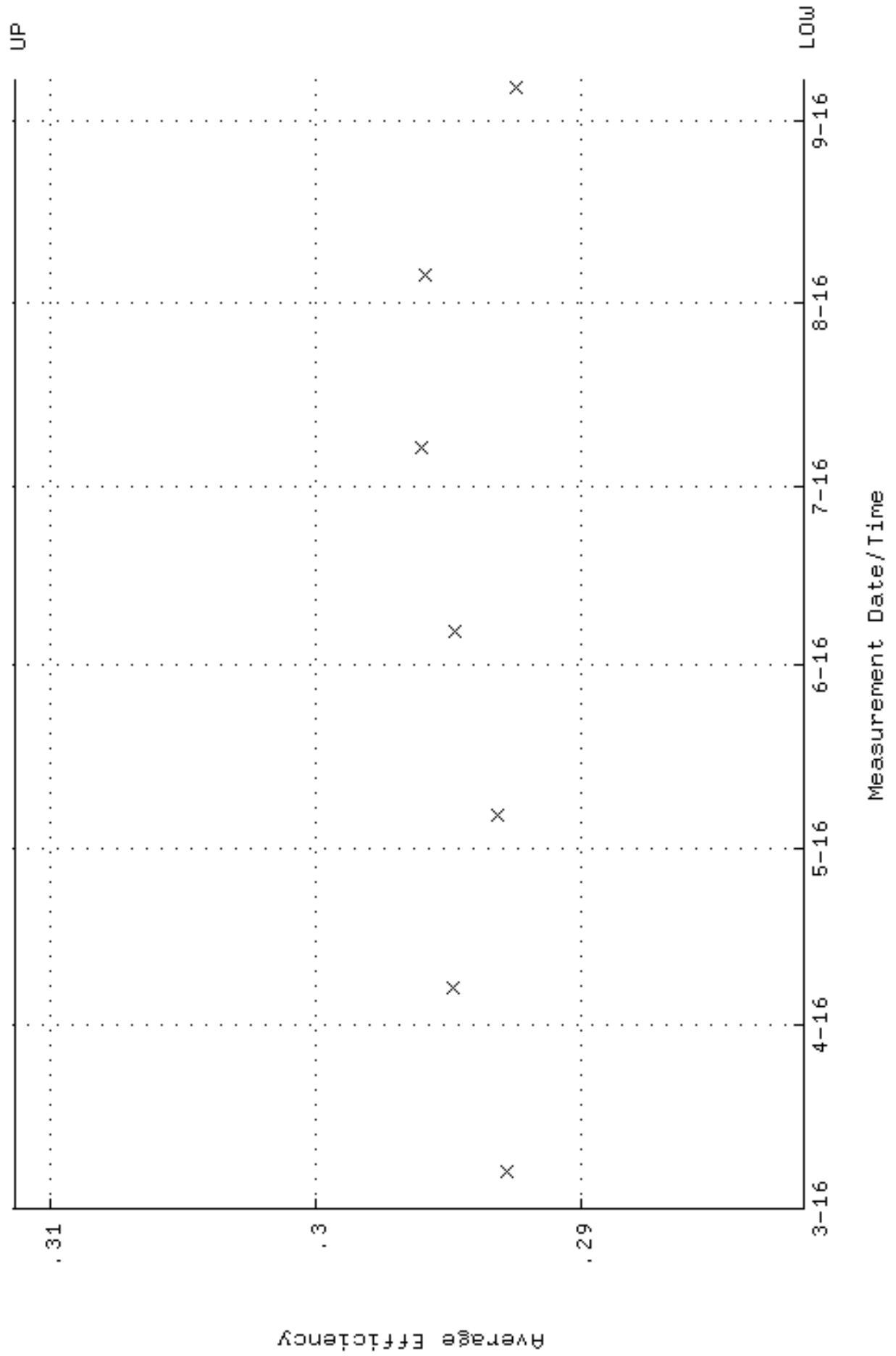
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAR-2016 13:27:09 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



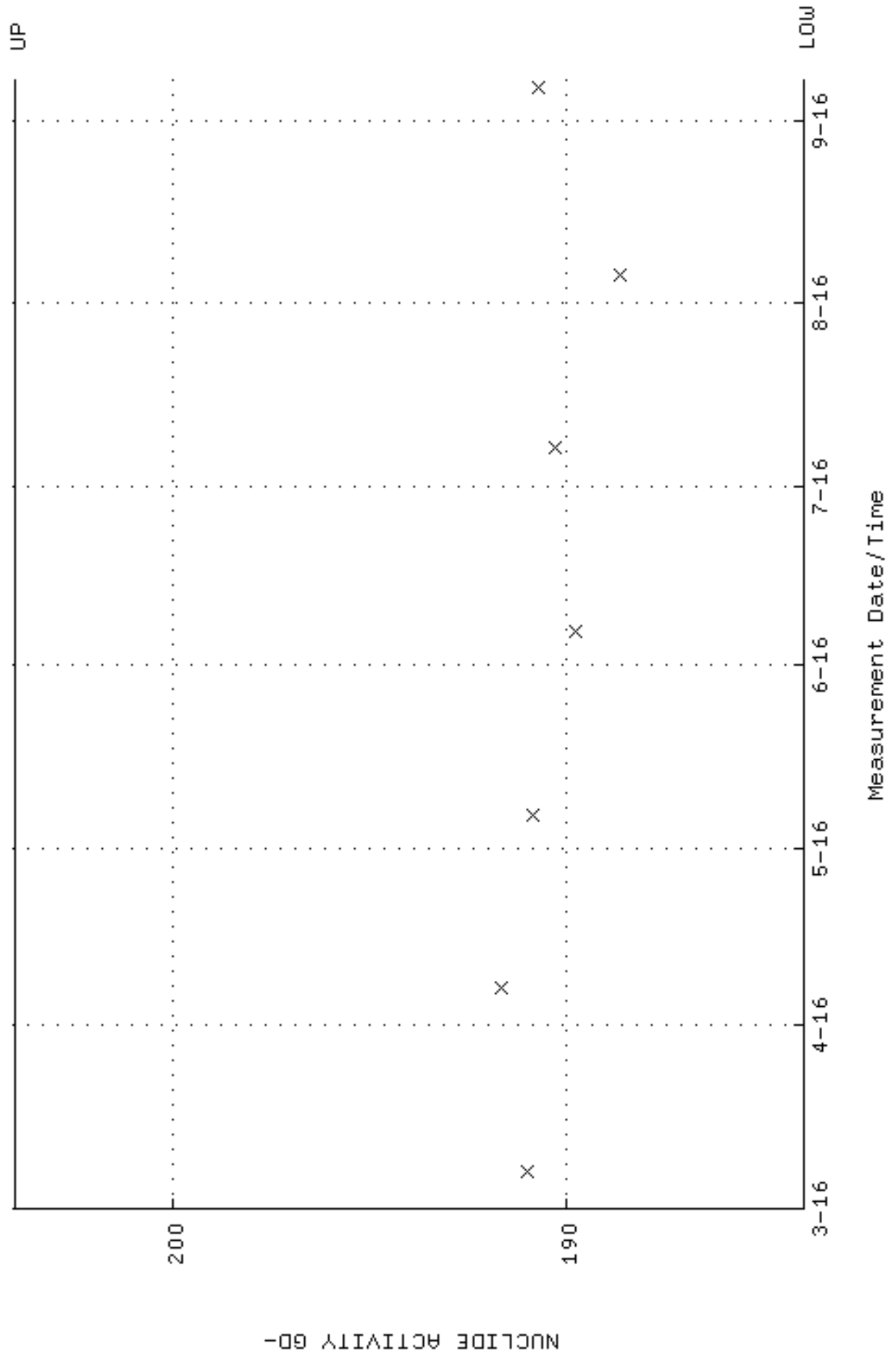
QA filename : DKA100:[ENV_ALPHA.QA.B]B088.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:21:44 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



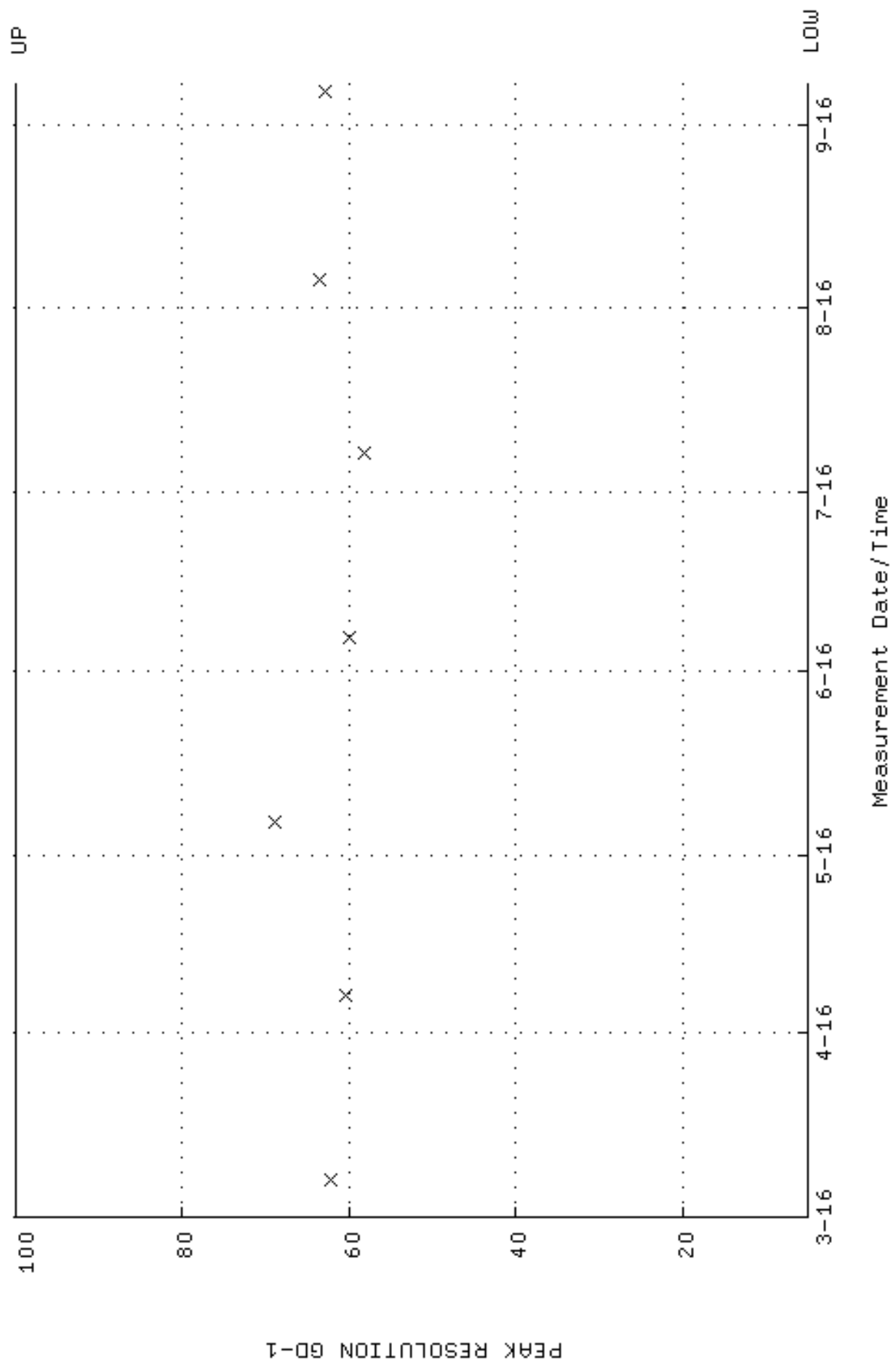
QA filename : DKA100:[ENV_ALPHA.QA.W]W089.QAF;10
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.281646 through 0.311292



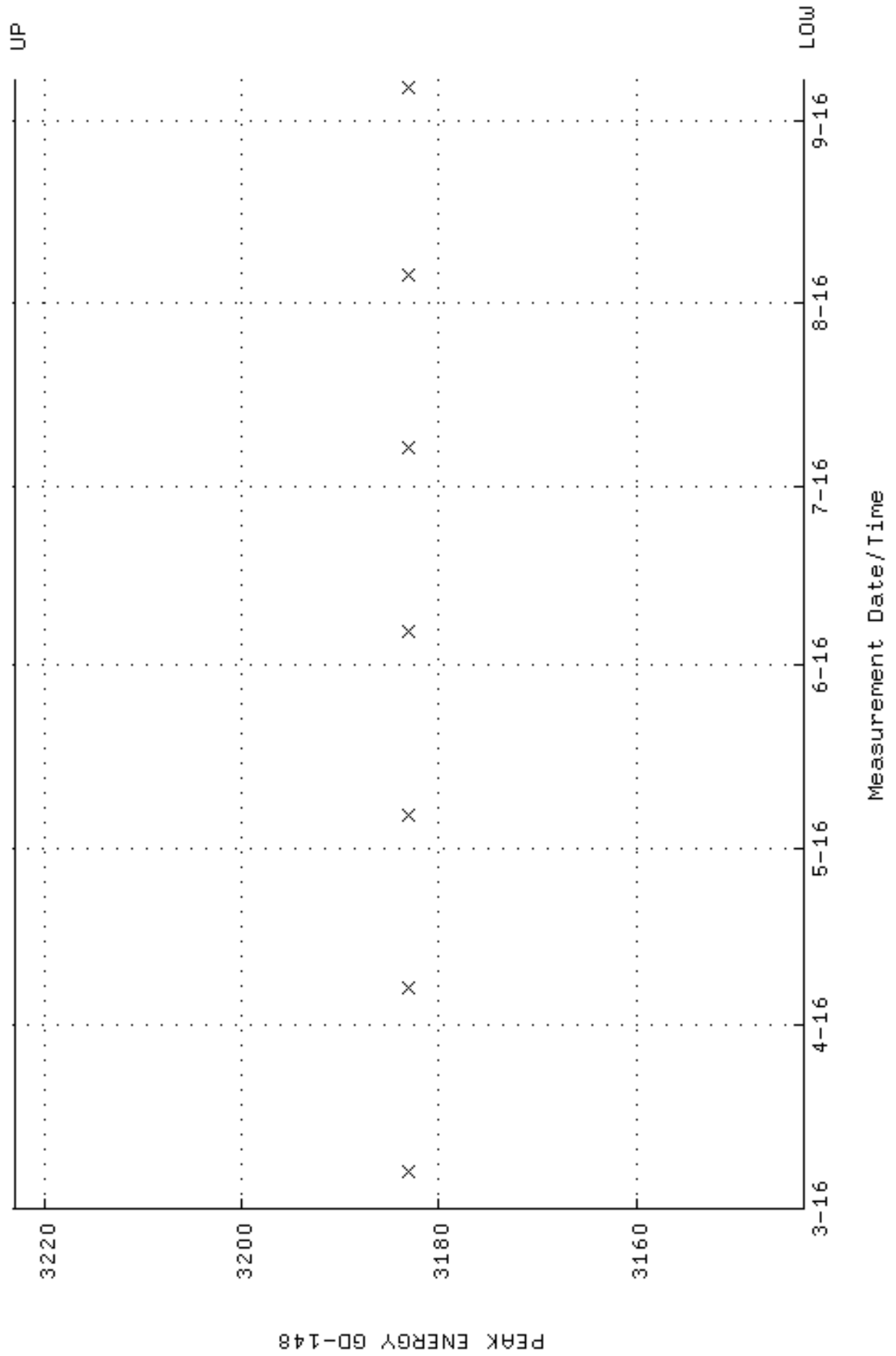
QA filename : DKA100:[ENV_ALPHA.QA.W]W089.QAF;10
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



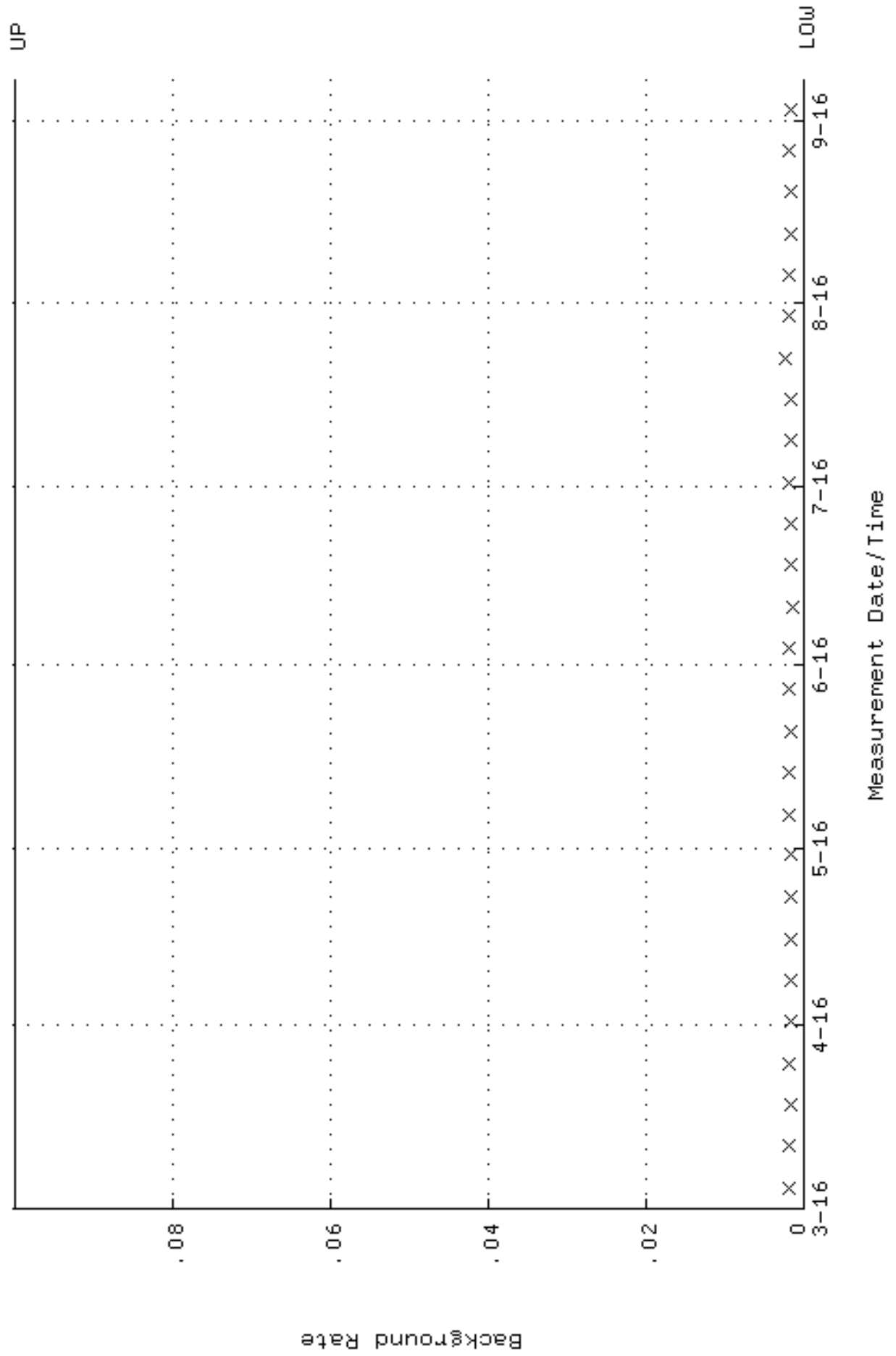
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 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



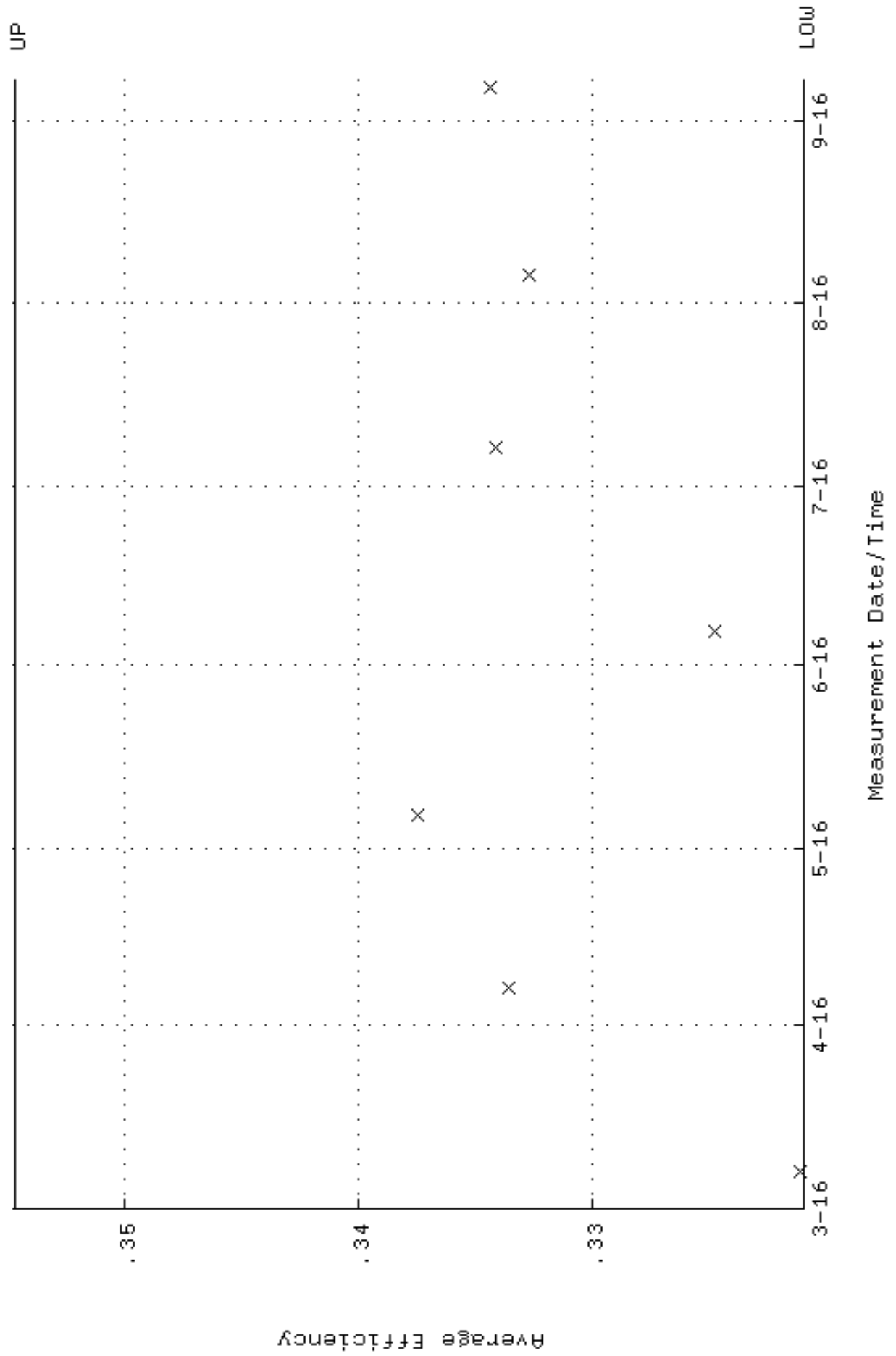
QA filename : DKA100:[ENV_ALPHA.QA.W]W089.QAF;10
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



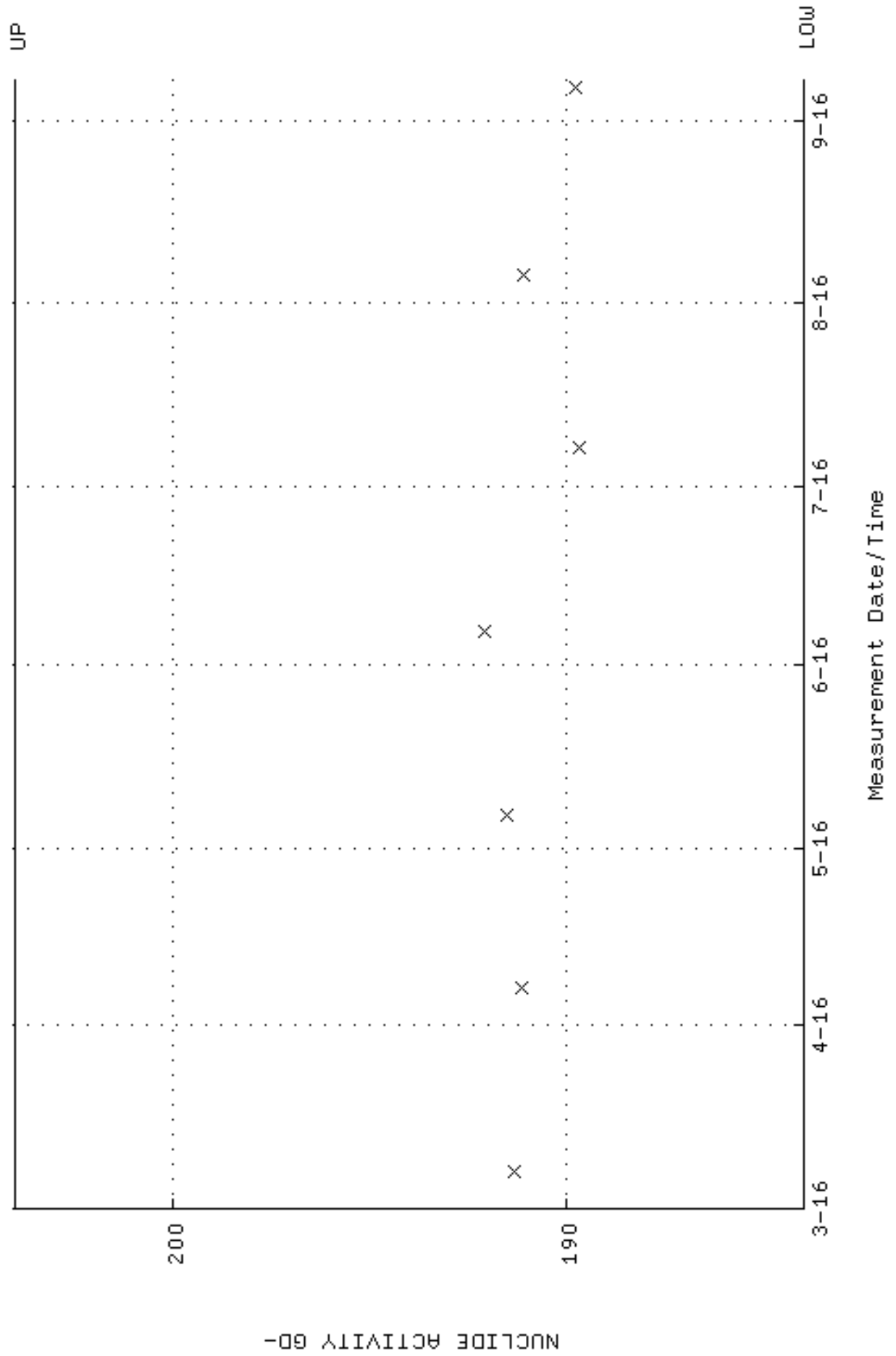
QA filename : DKA100:[ENV_ALPHA.QA.B]B089.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:51:34 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



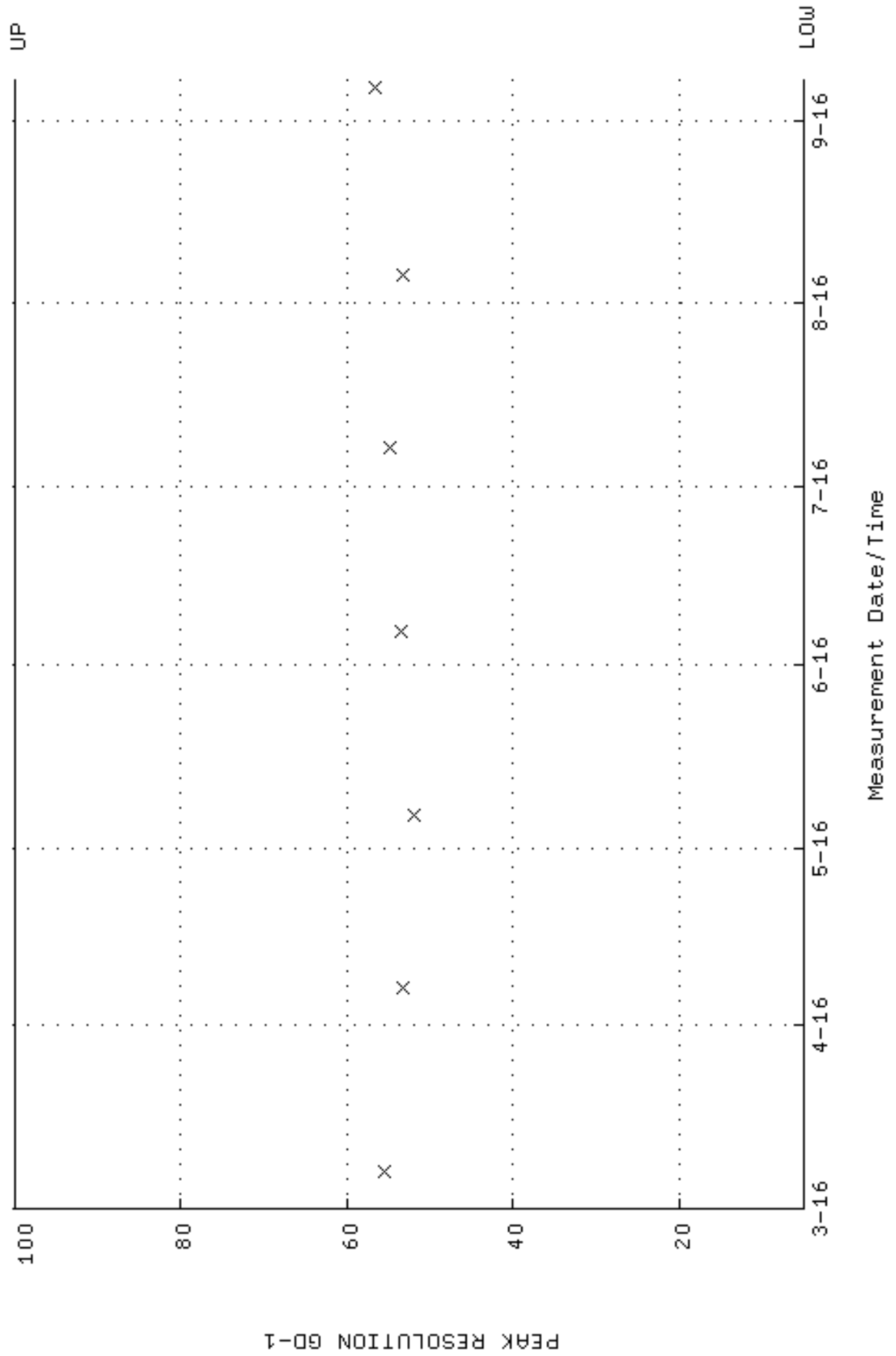
QA filename : DKA100:[ENV_ALPHA.QA.W]W090.QAF;9
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.320935 through 0.354717



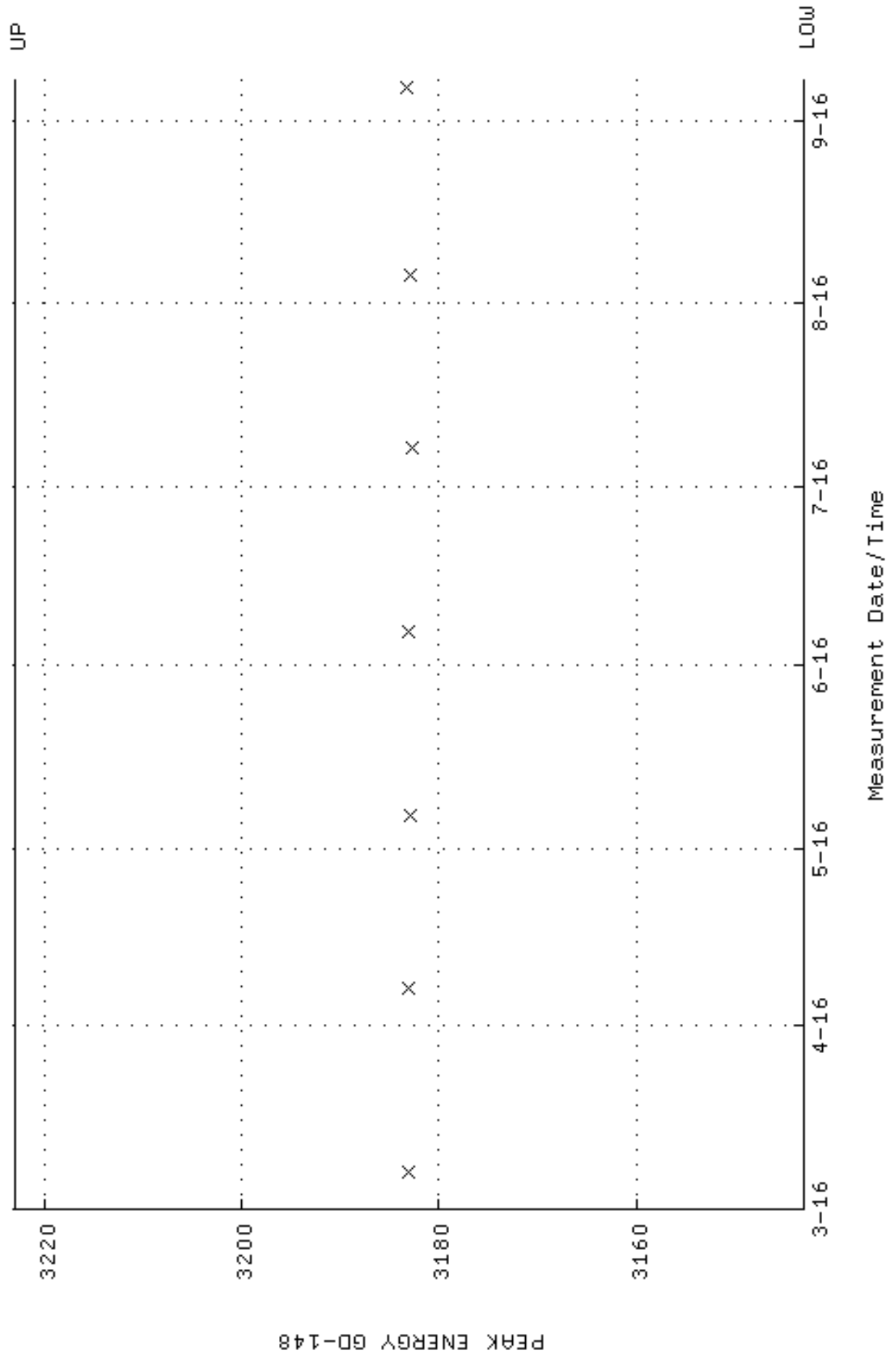
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 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



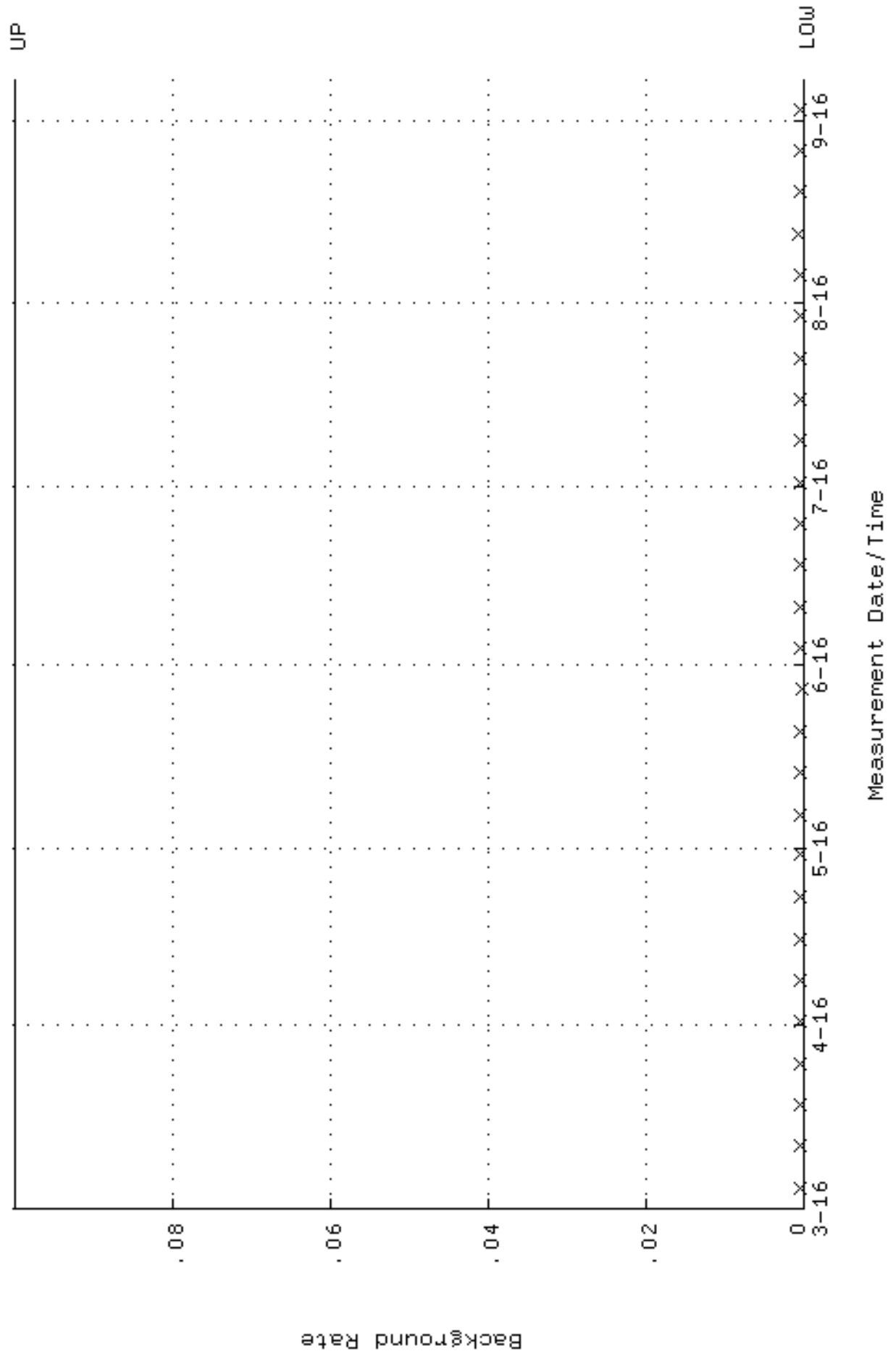
QA filename : DKA100:[ENV_ALPHA.QA.W]W090.QAF;9
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



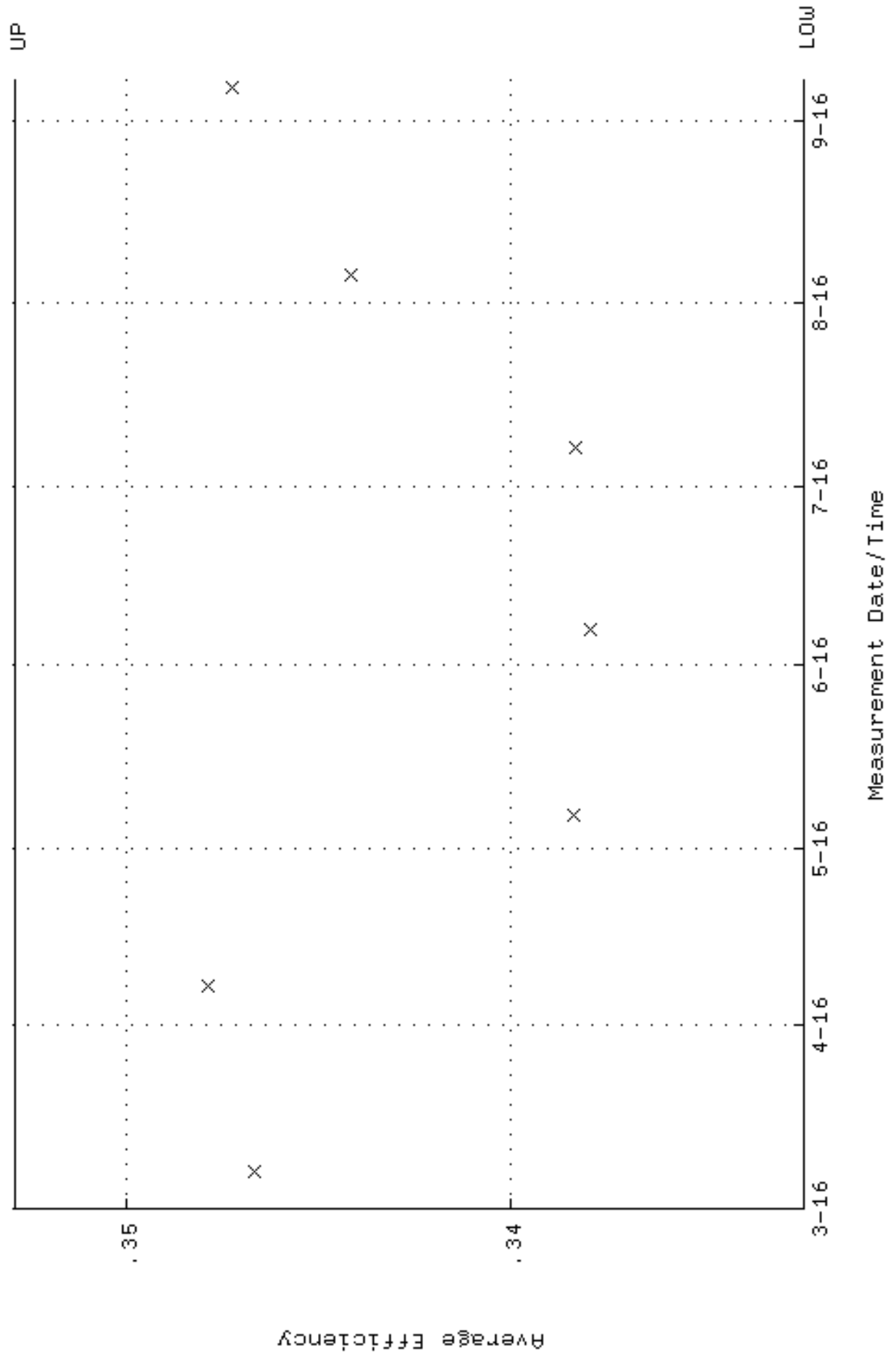
QA filename : DKA100:[ENV_ALPHA.QA.W]W090.QAF;9
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



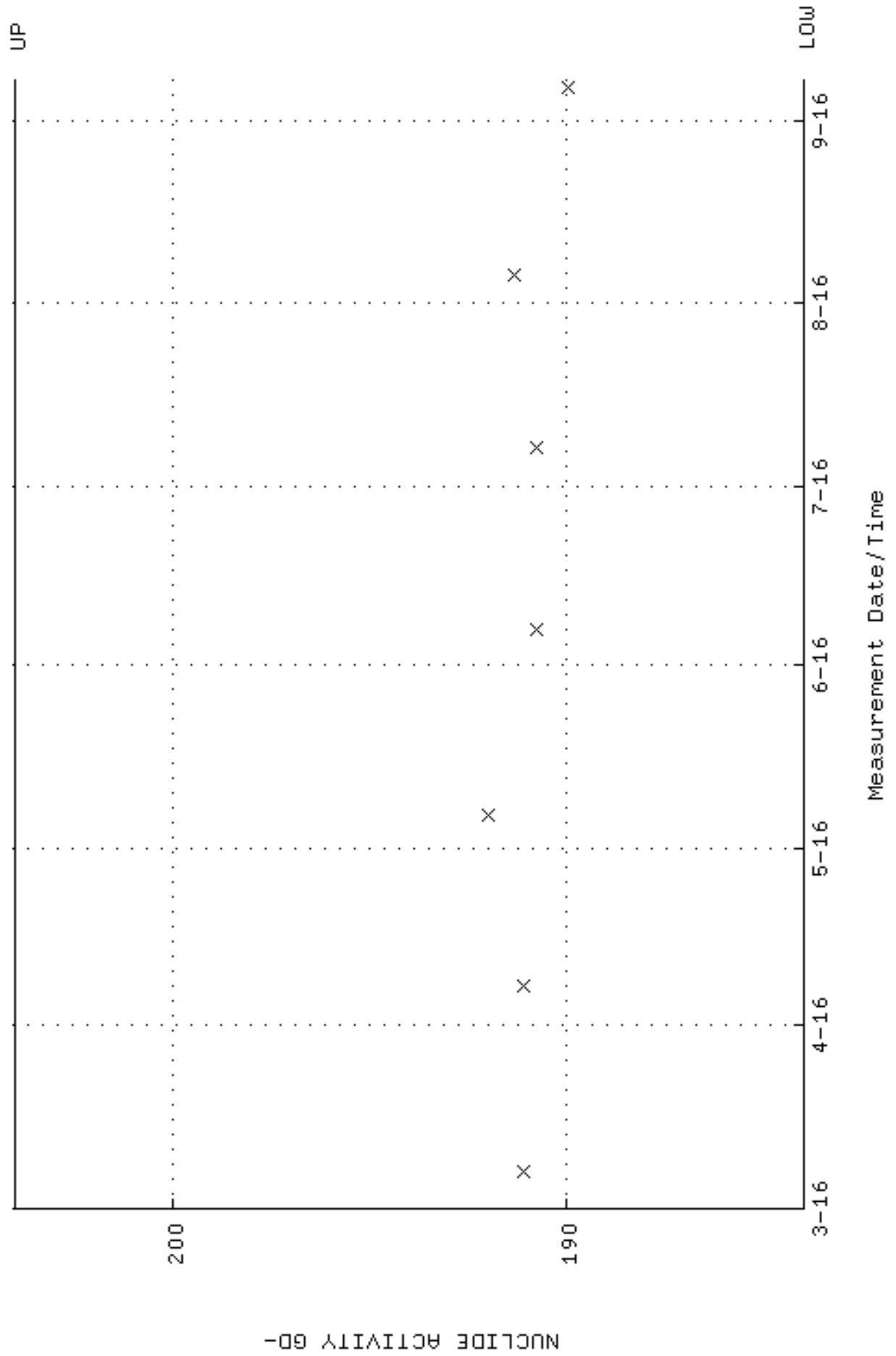
QA filename : DKA100:[ENV_ALPHA.QA.B]B090.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:51:34 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



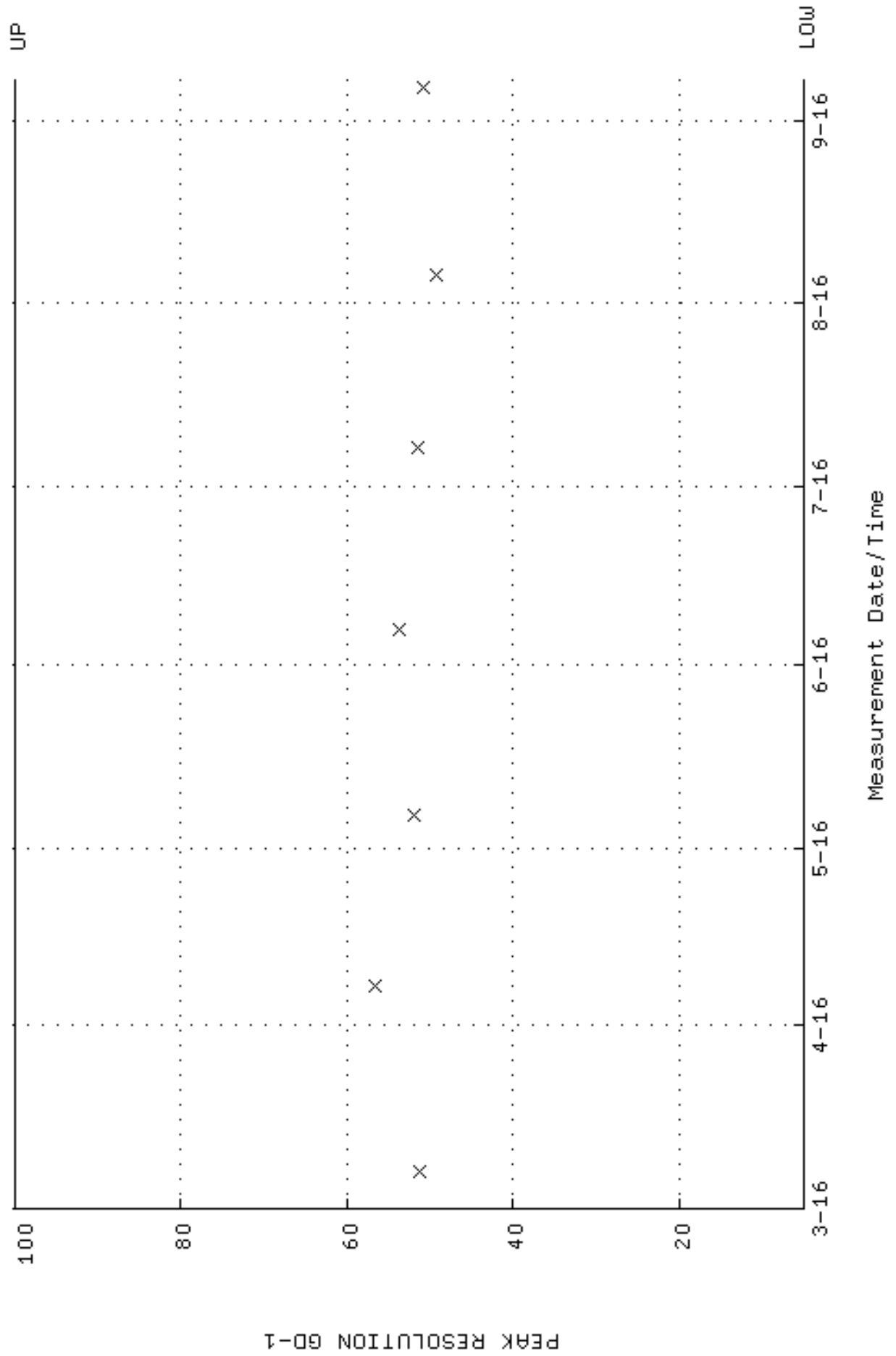
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 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.332363 through 0.352921



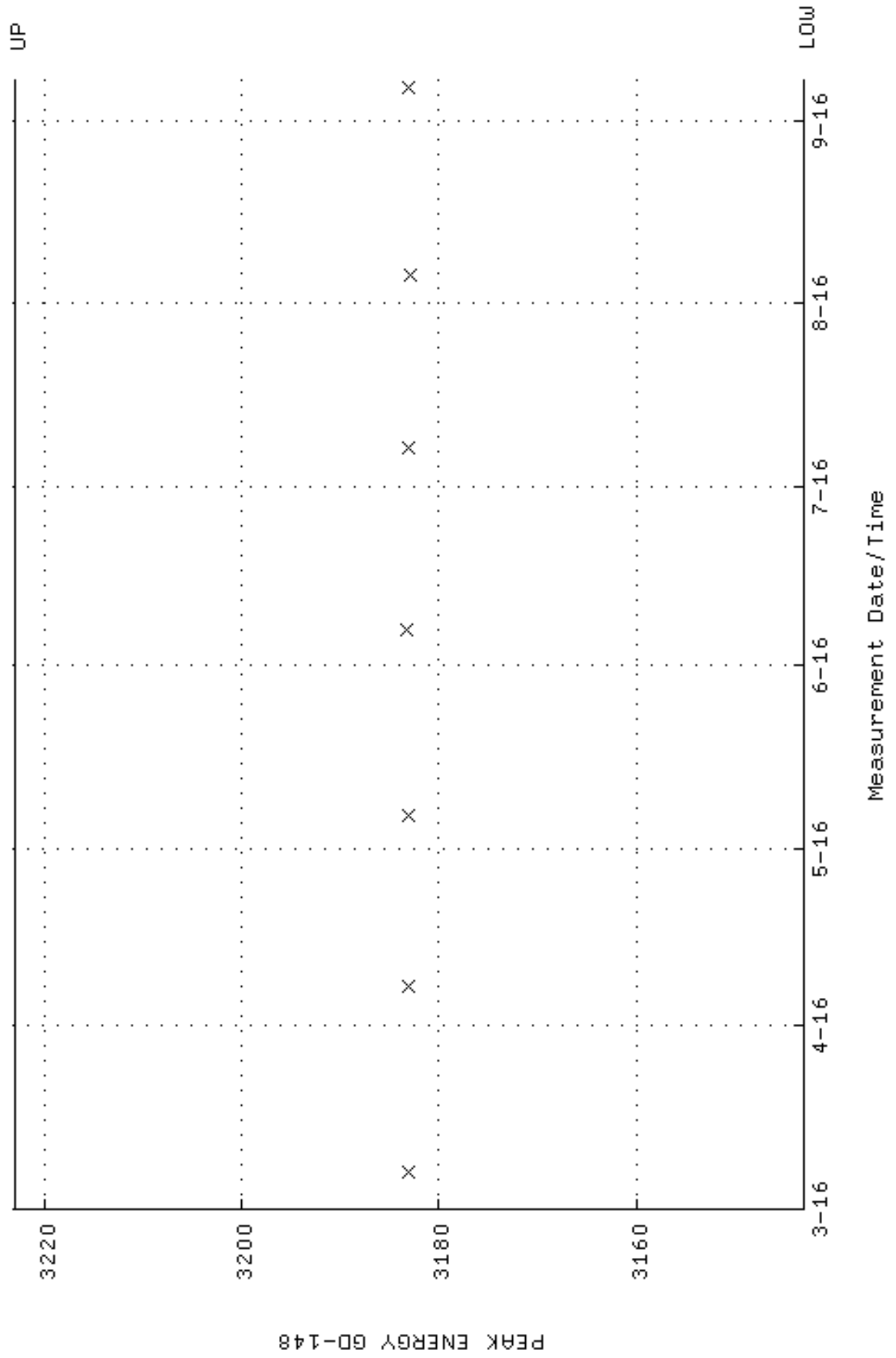
QA filename : DKA100:[ENV_ALPHA.QA.W]W091.QAF;9
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



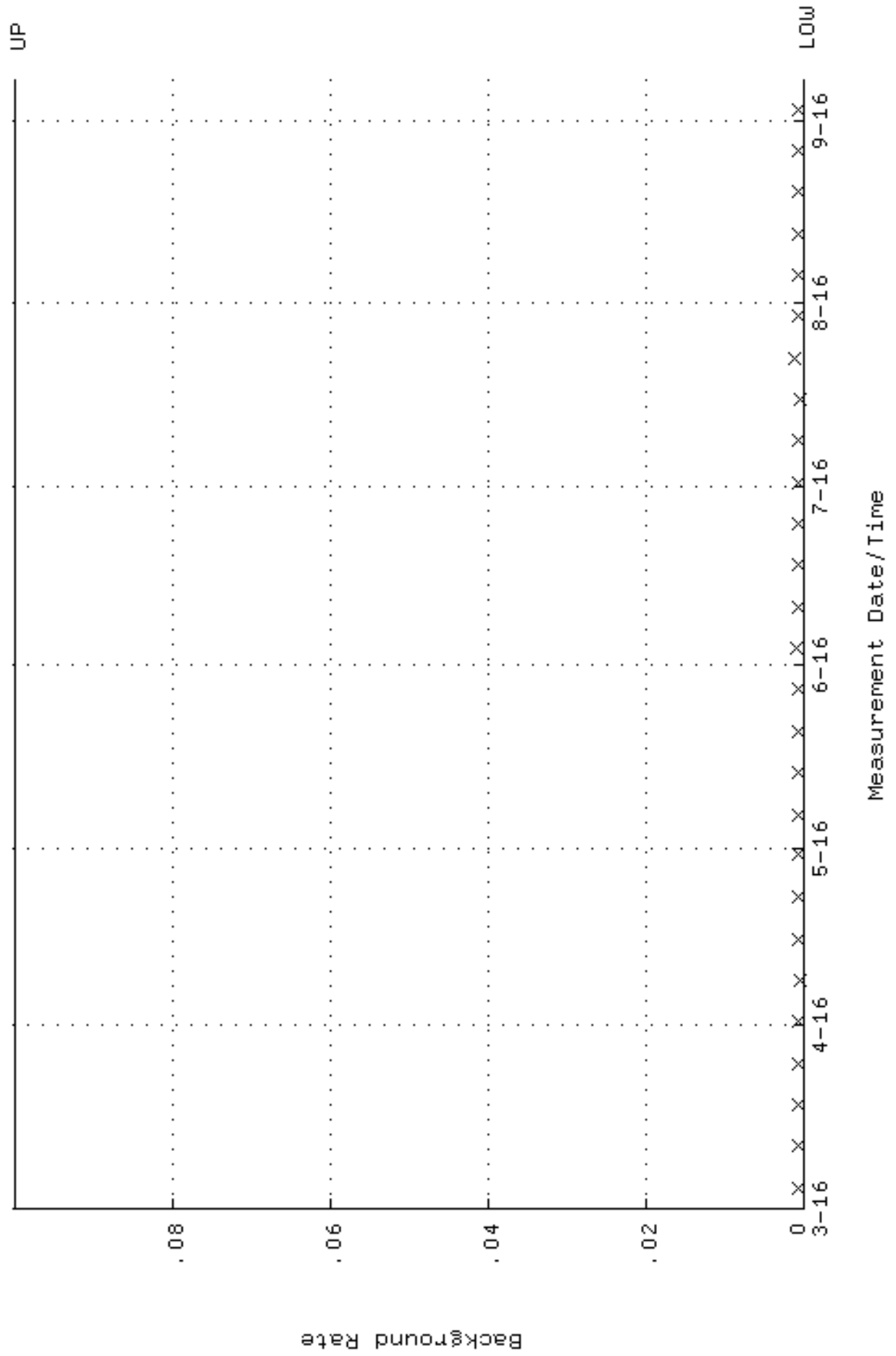
QA filename : DKA100:[ENV_ALPHA.QA.W]W091.QAF;9
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



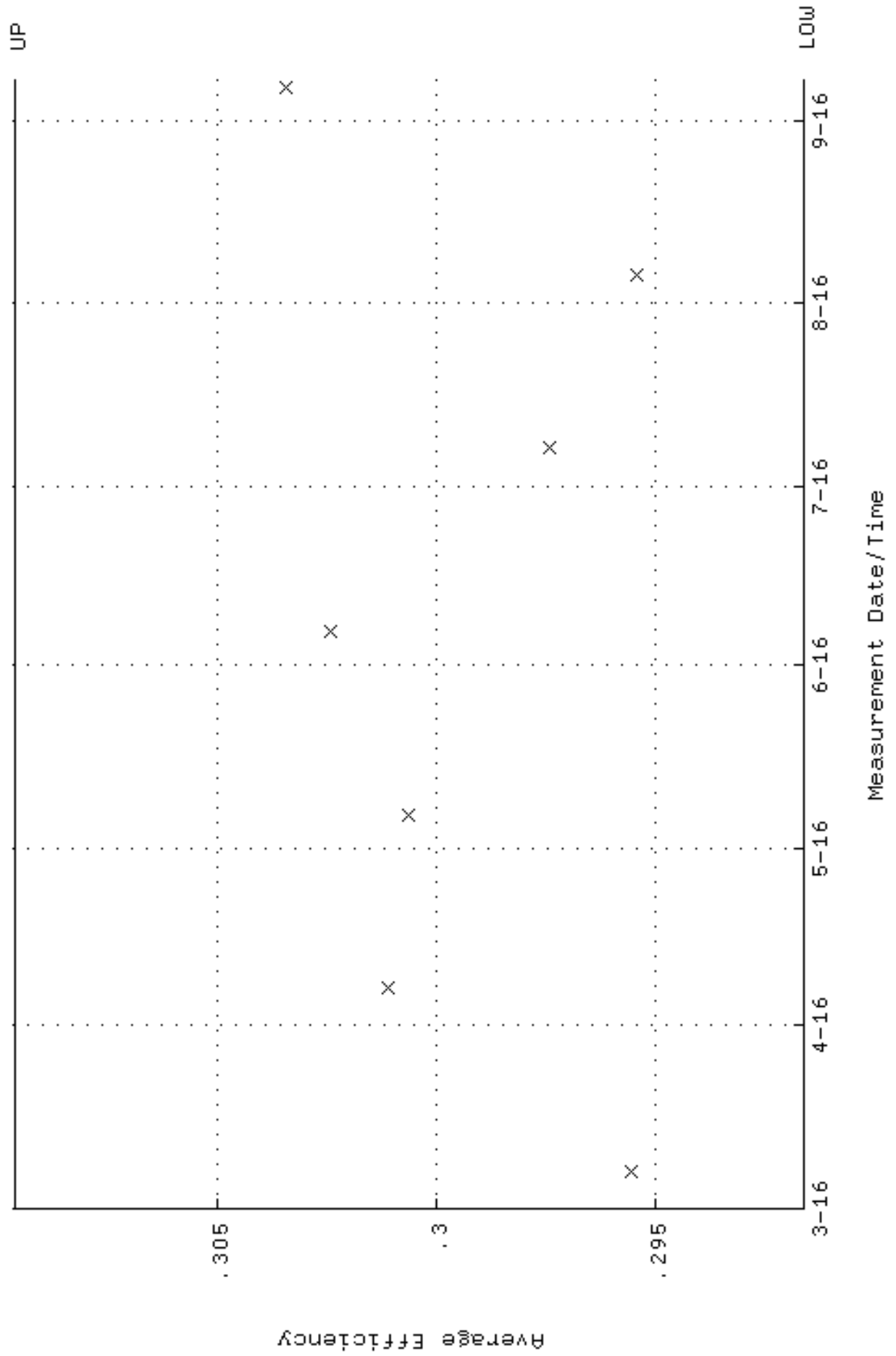
QA filename : DKA100:[ENV_ALPHA.QA.W]W091.QAF;9
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



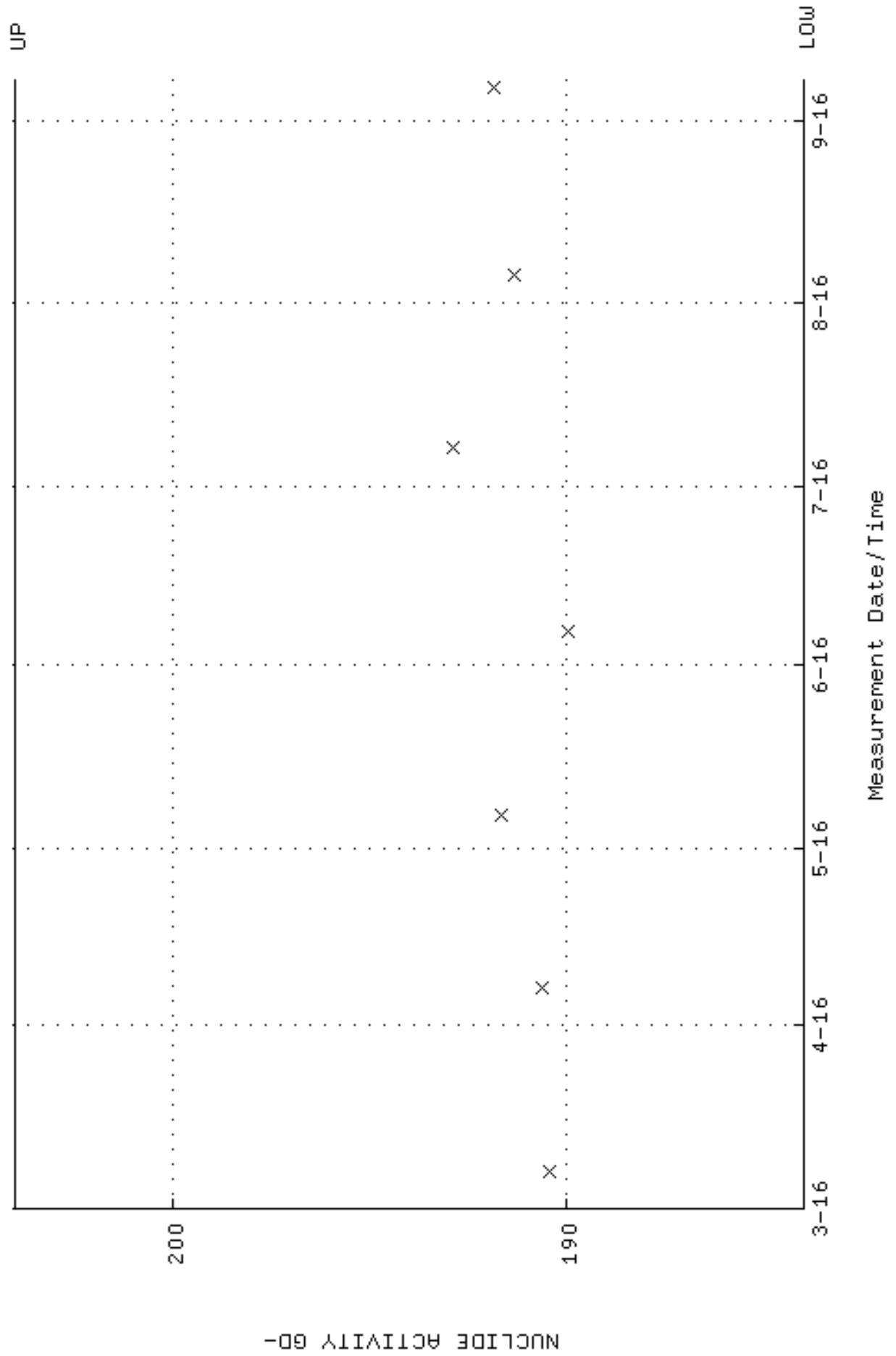
QA filename : DKA100:[ENV_ALPHA.QA.B]B091.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:51:34 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



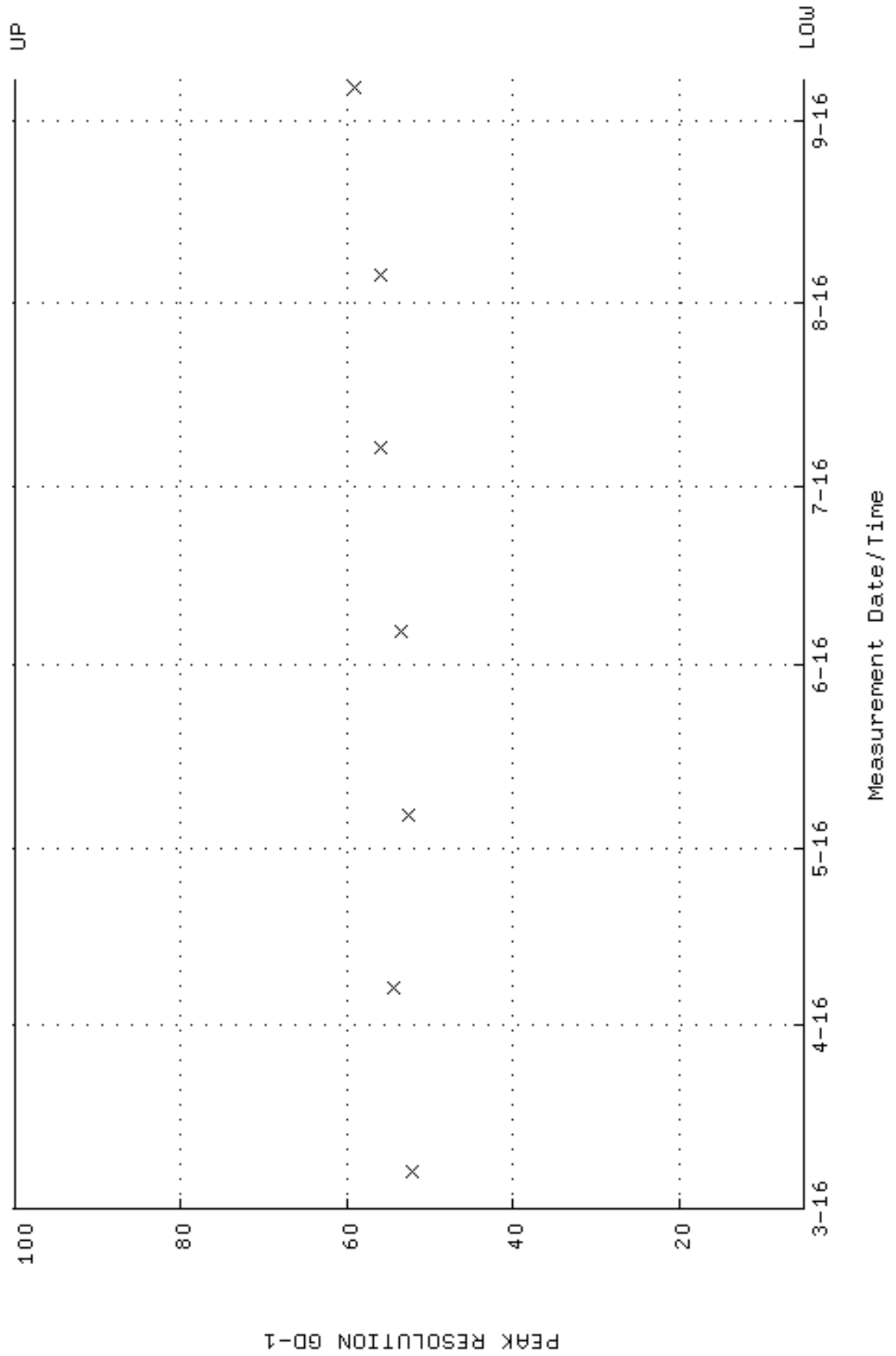
QA filename : DKA100:[ENV_ALPHA.QA.W]W092.QAF;10
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.291600 through 0.309620



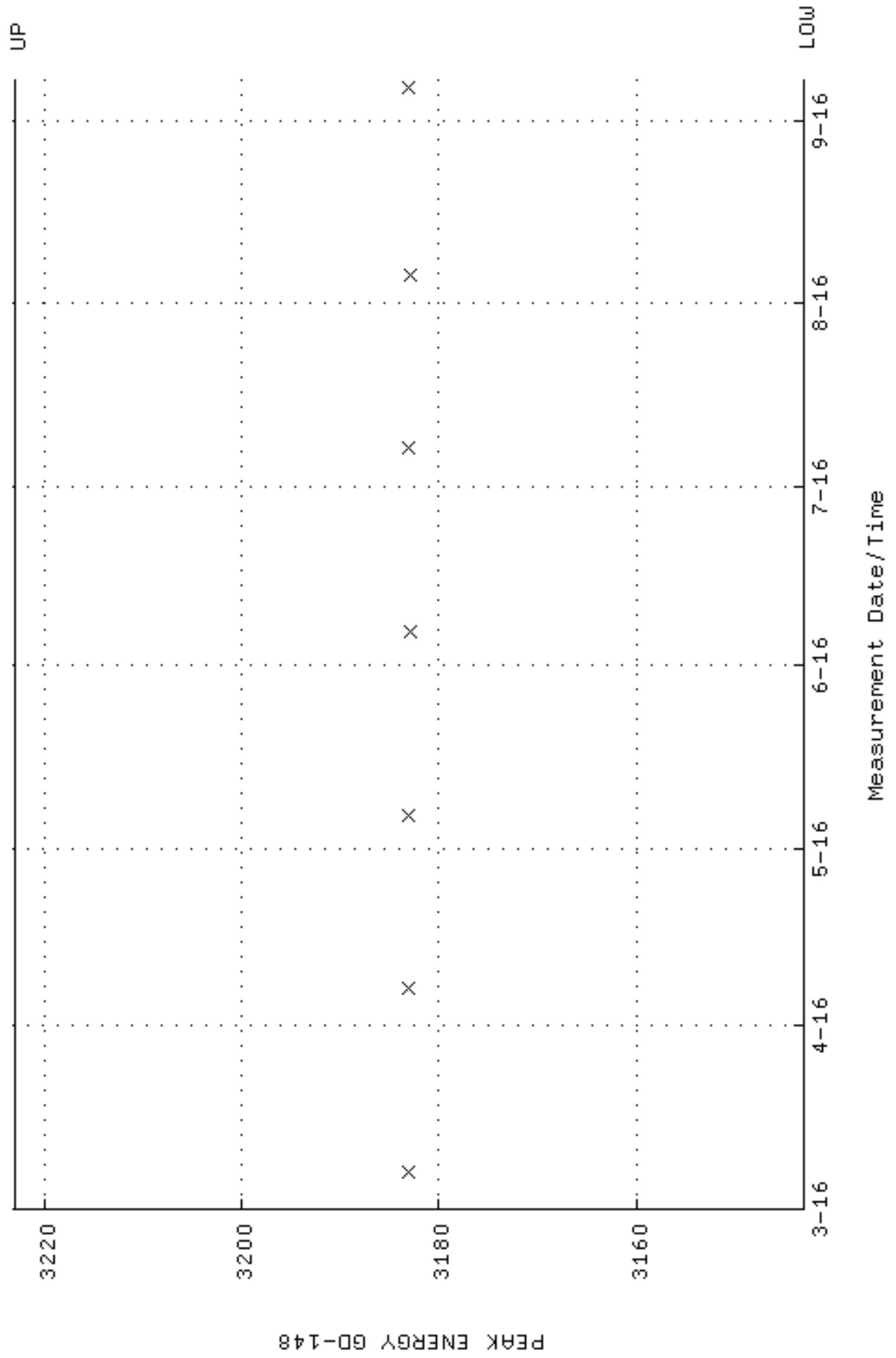
QA filename : DKA100:[ENV_ALPHA.QA.W]W092.QAF;10
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



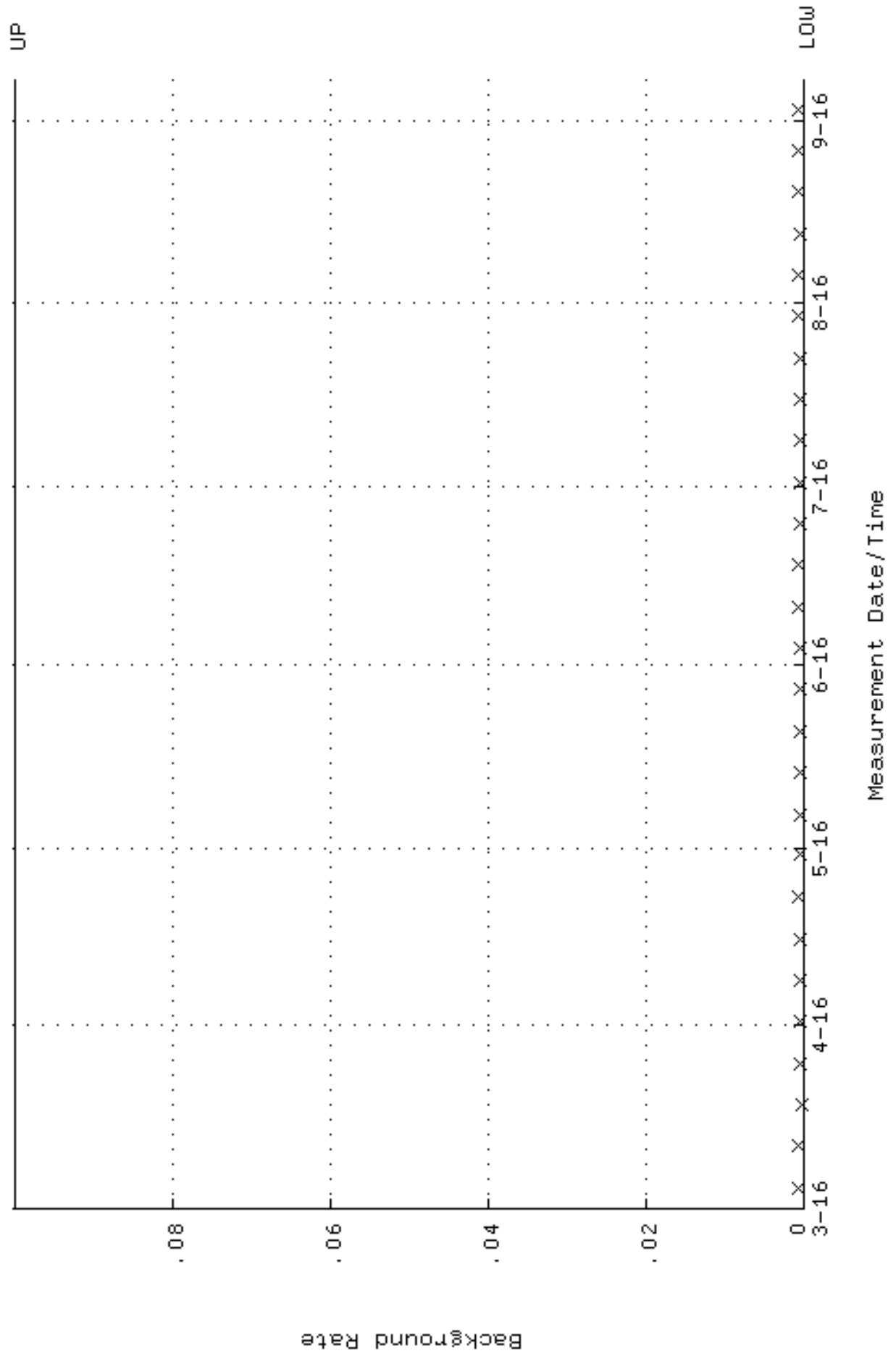
QA filename : DKA100:[ENV_ALPHA.QA.W]W092.QAF;10
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



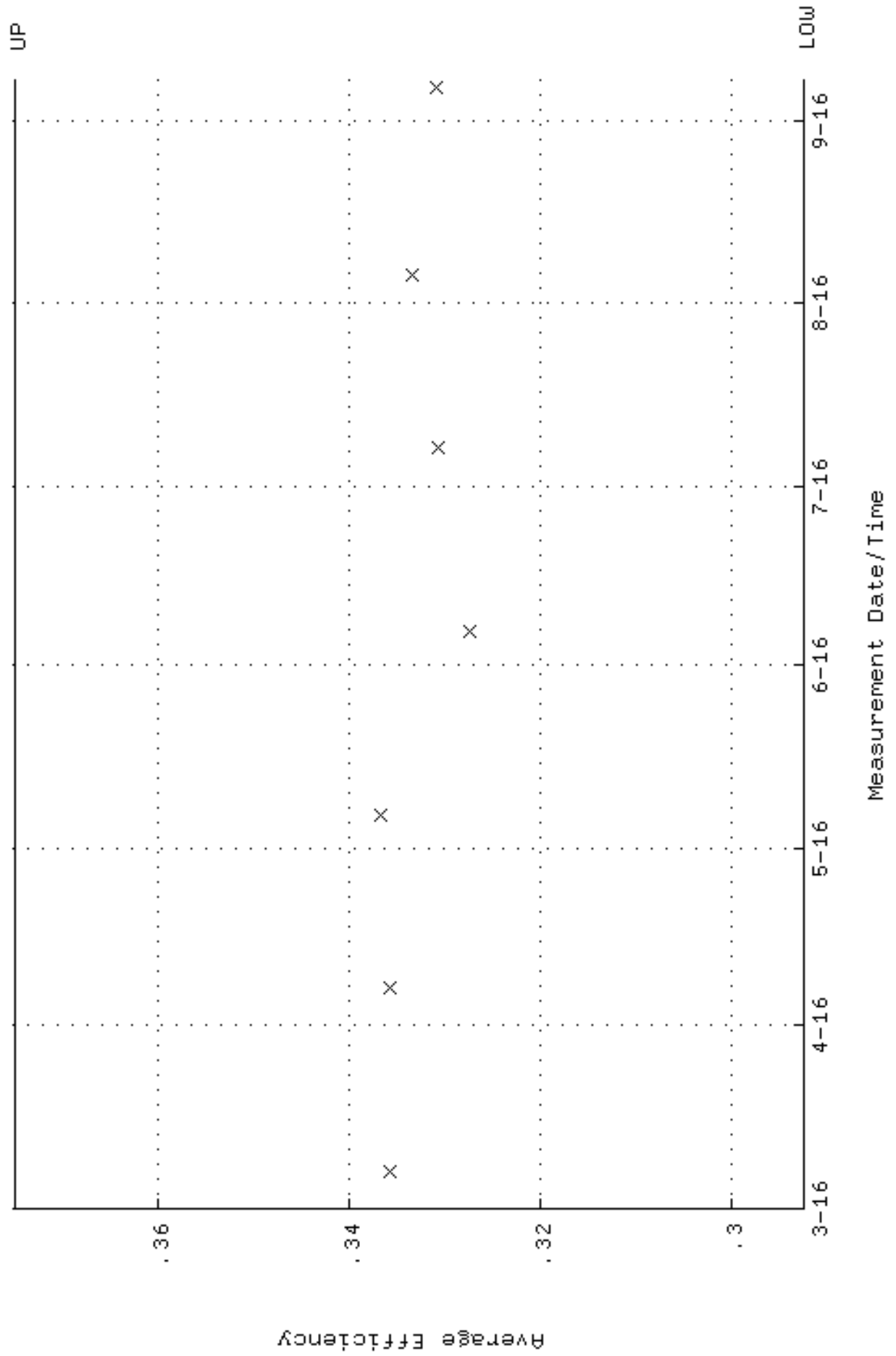
QA filename : DKA100:[ENV_ALPHA.QA.W]W092.QAF;10
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



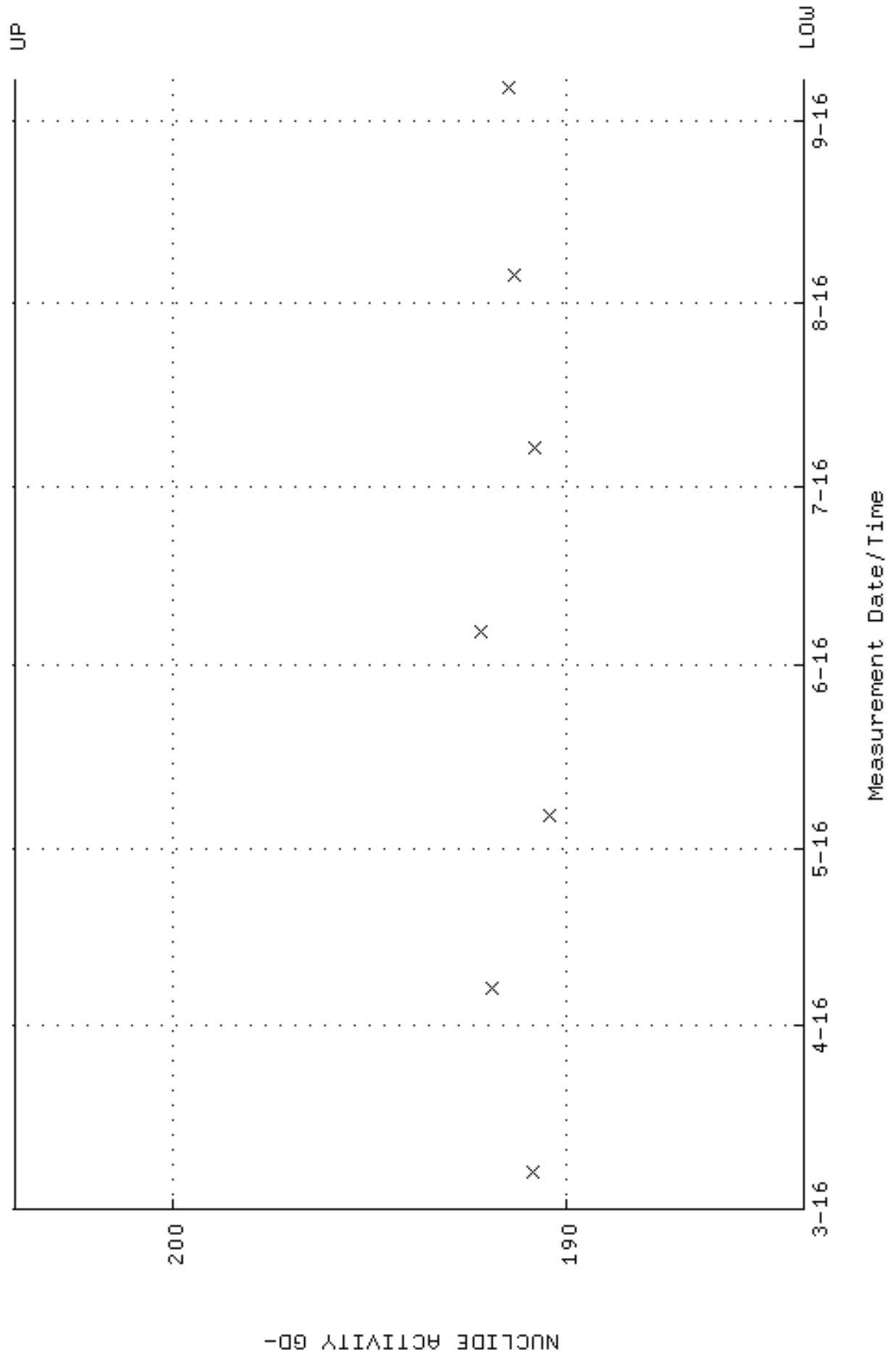
QA filename : DKA100:[ENV_ALPHA.QA.B]B092.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:51:34 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



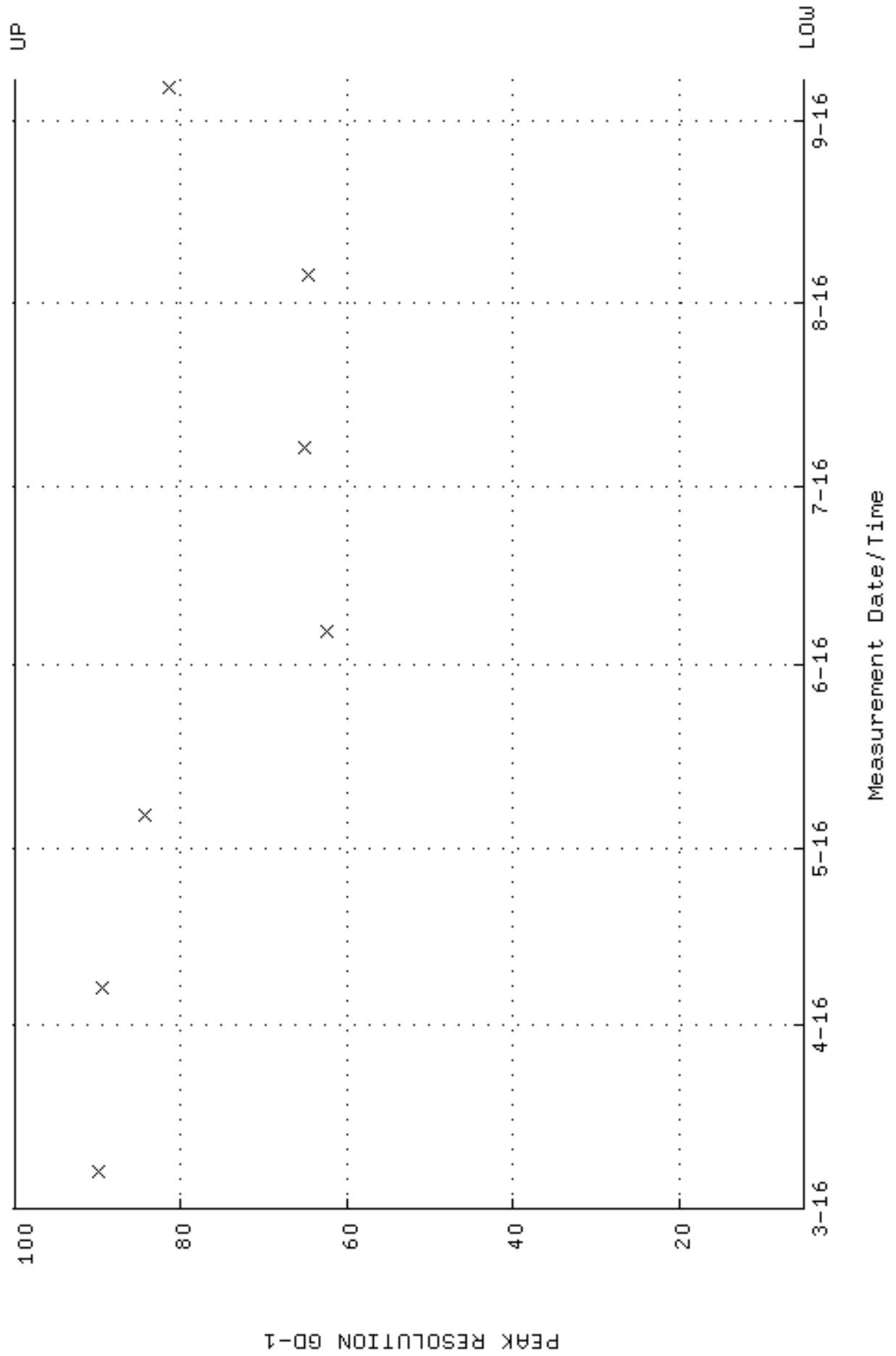
QA filename : DKA100:[ENV_ALPHA.QA.W]W093.QAF;10
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.292468 through 0.375000



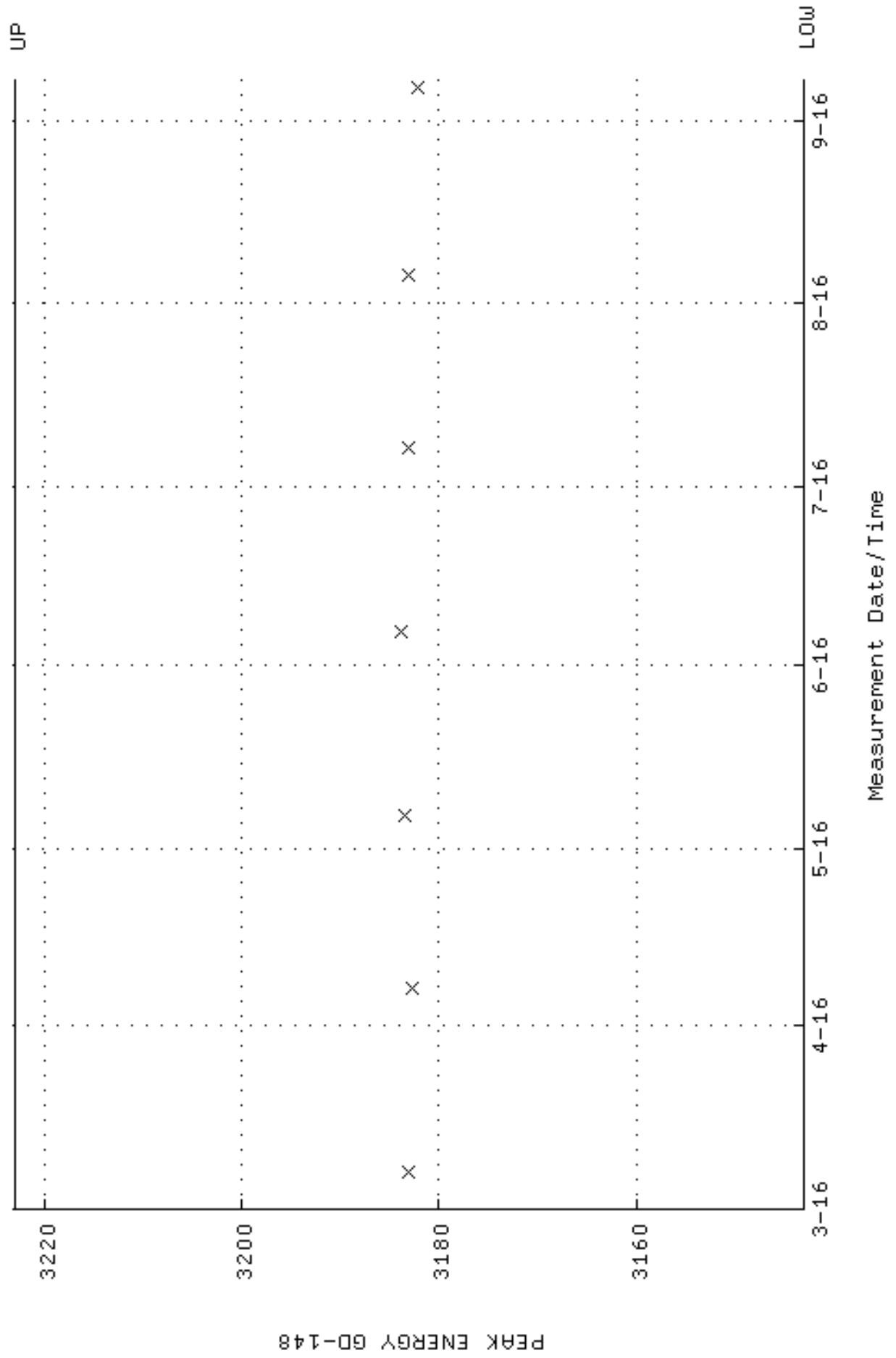
QA filename : DKA100:[ENV_ALPHA.QA.W]W093.QAF;10
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



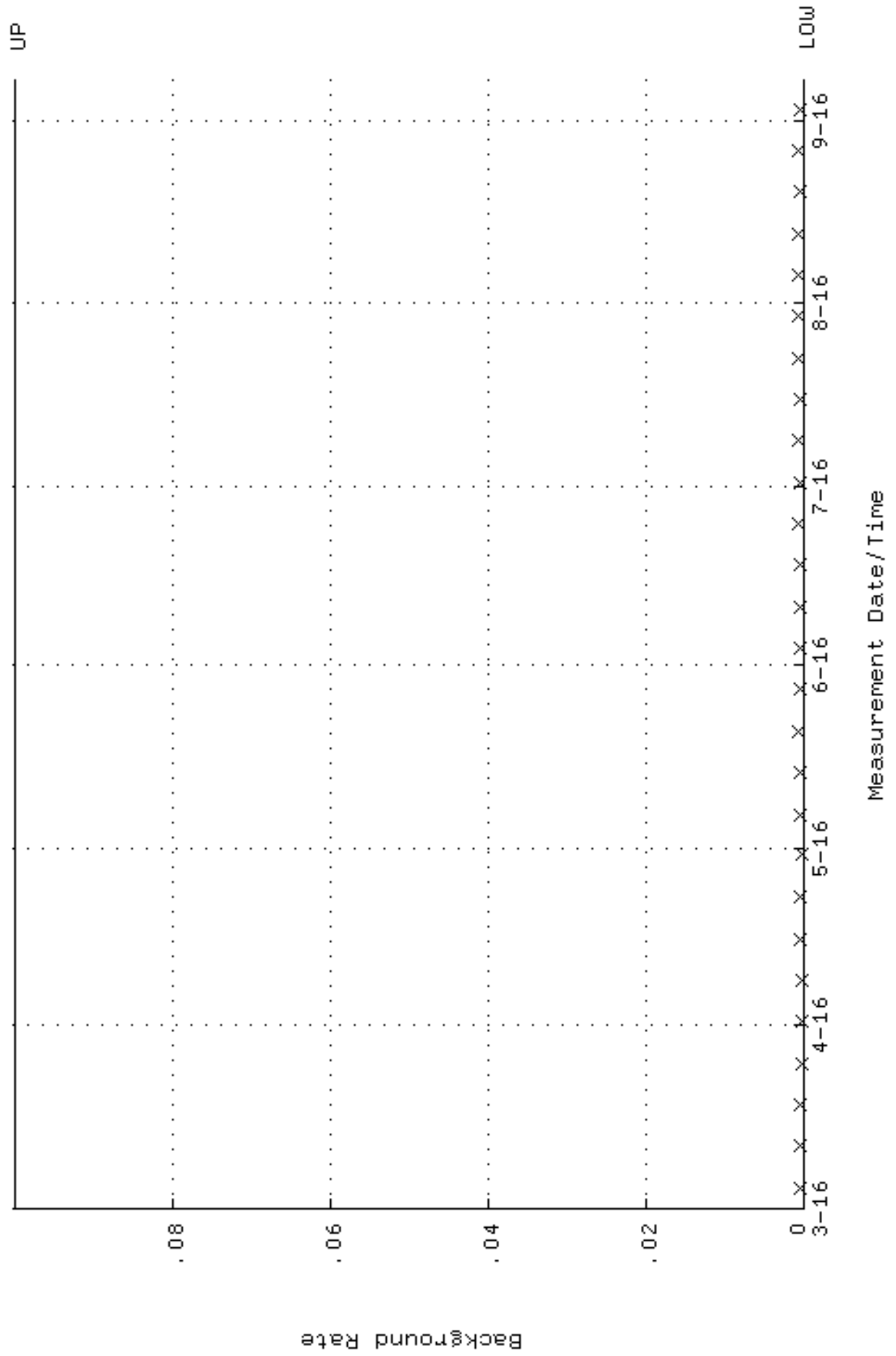
QA filename : DKA100:[ENV_ALPHA.QA.W]W093.QAF;10
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



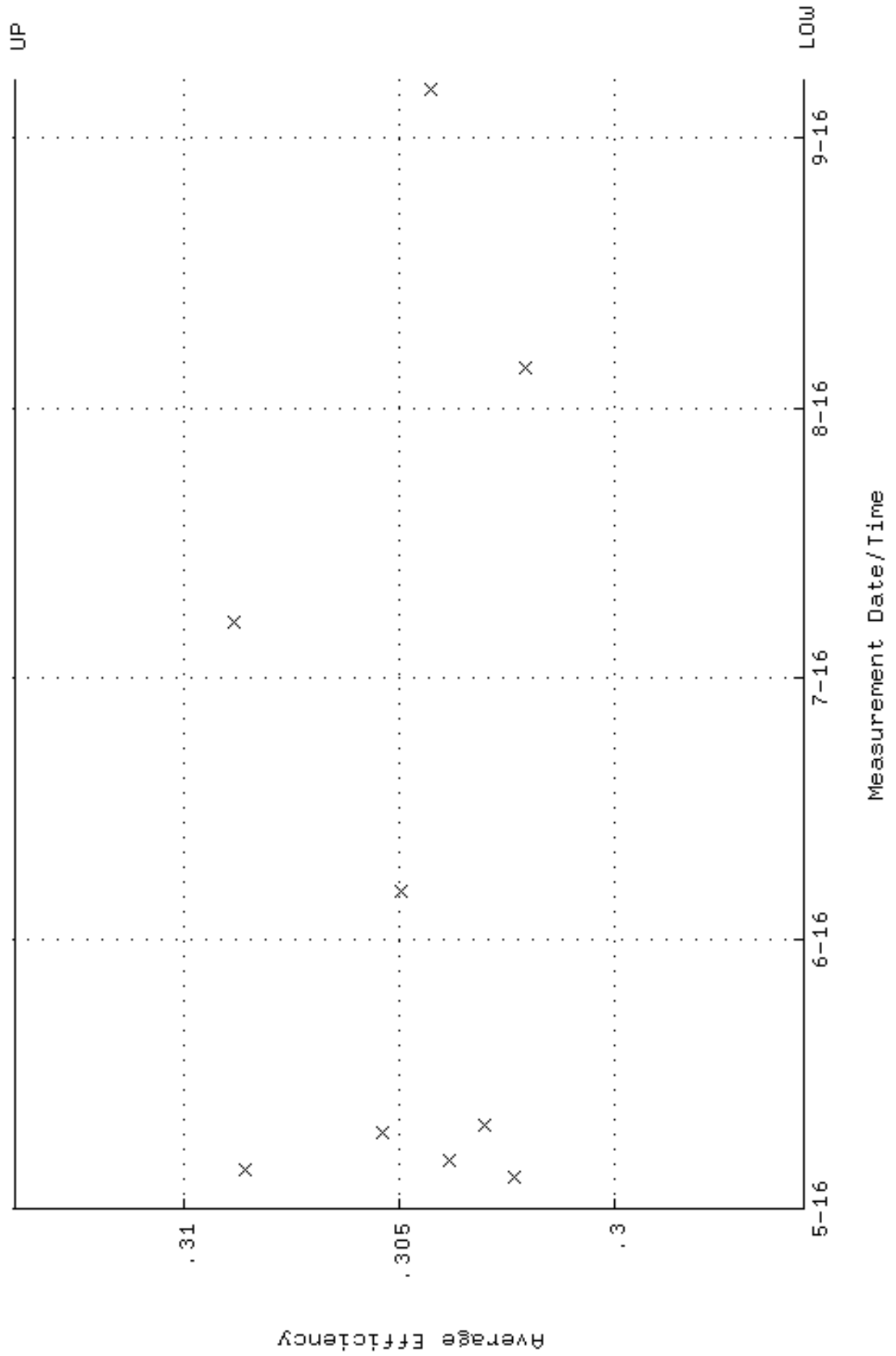
QA filename : DKA100:[ENV_ALPHA.QA.W]W093.QAF;10
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:00 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



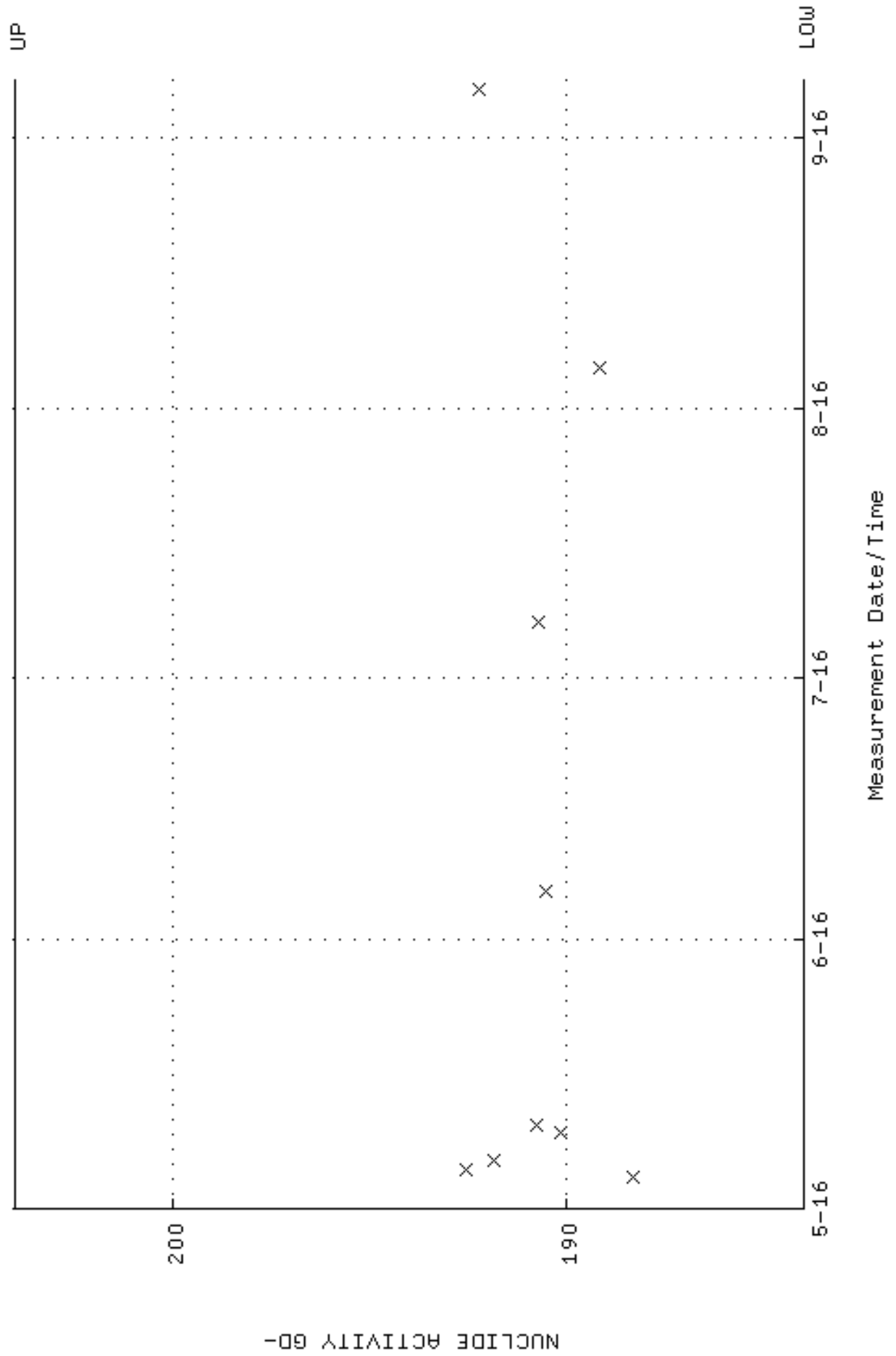
QA filename : DKA100:[ENV_ALPHA.QA.B]B093.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:51:34 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



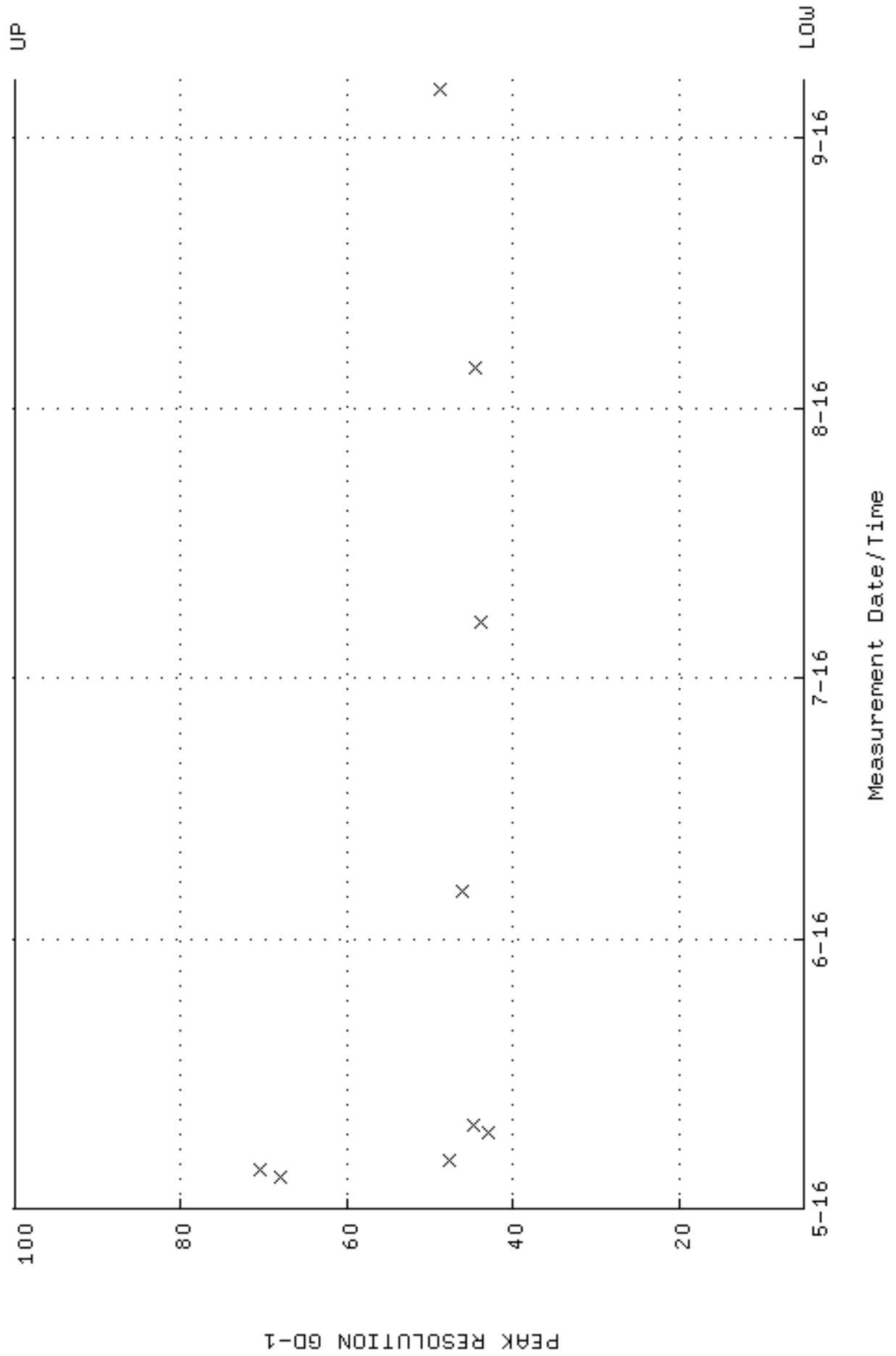
QA filename : DKA100:[ENV_ALPHA.QA.W]W095.QAF;11
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAY-2016 14:17:17 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.295600 through 0.313900



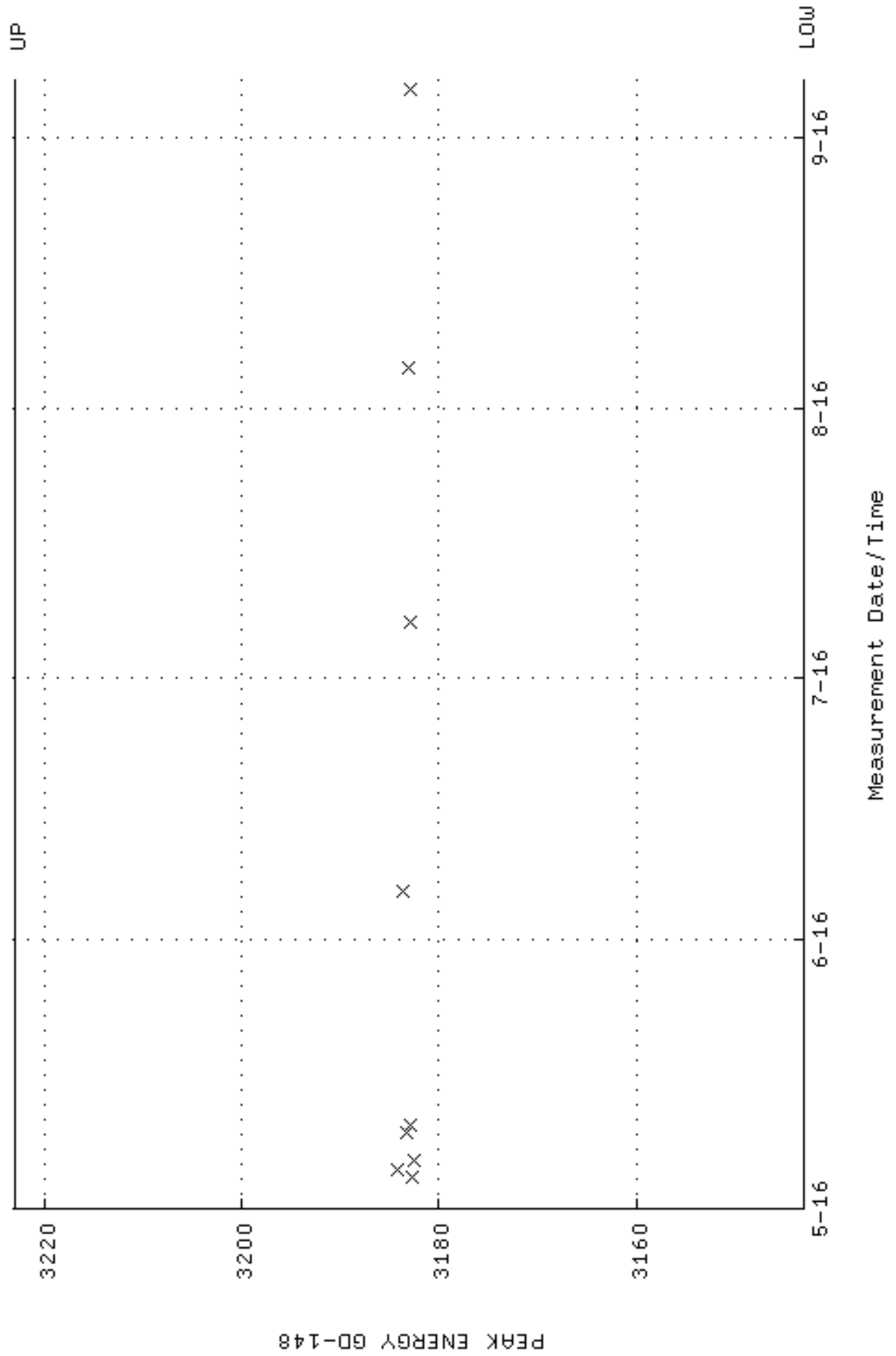
QA filename : DKA100:[ENV_ALPHA.QA.W]W095.QAF;11
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAY-2016 14:17:17 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



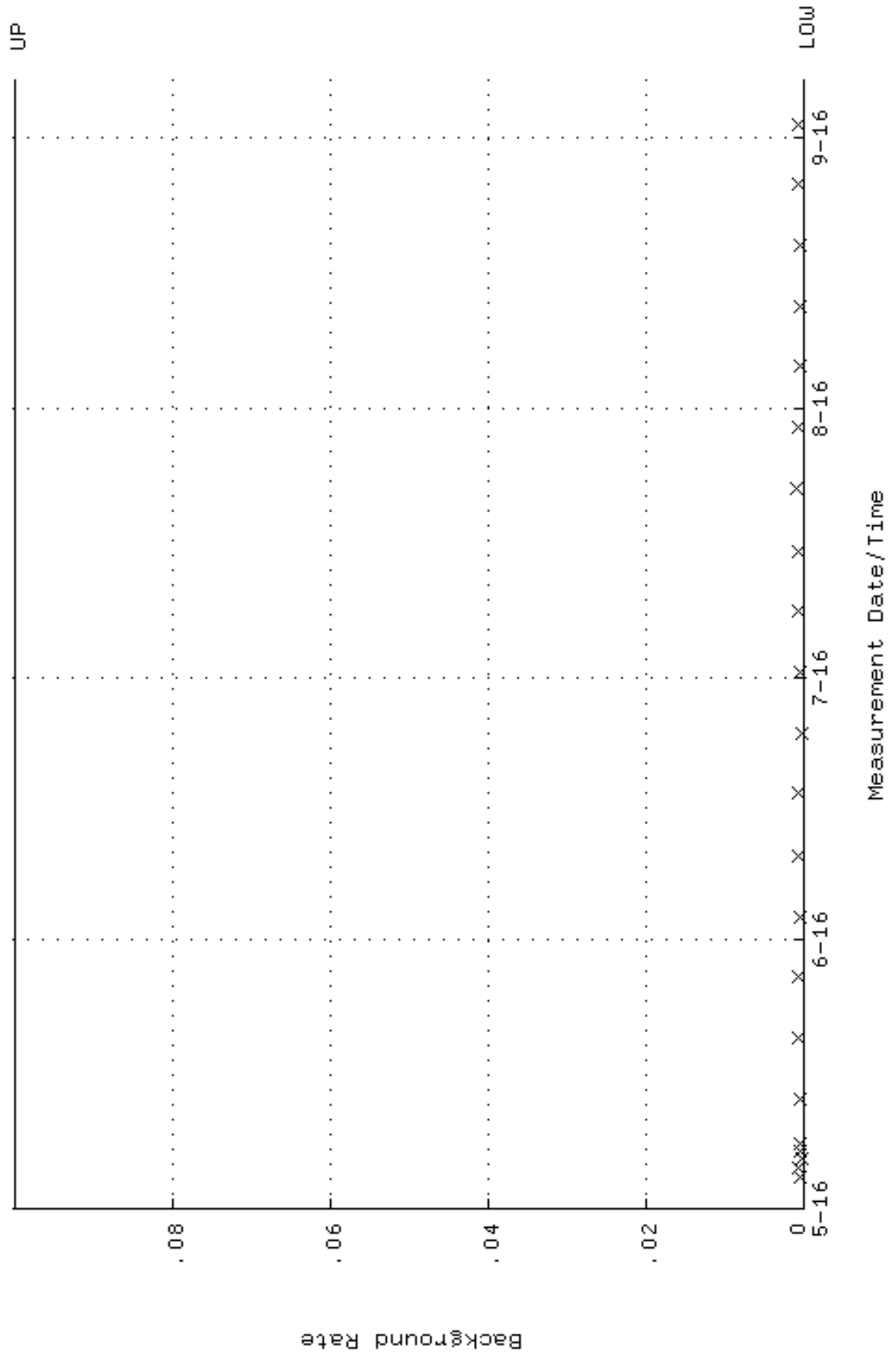
QA filename : DKA100:[ENV_ALPHA.QA.W]W095.QAF;11
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-MAY-2016 14:17:17 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



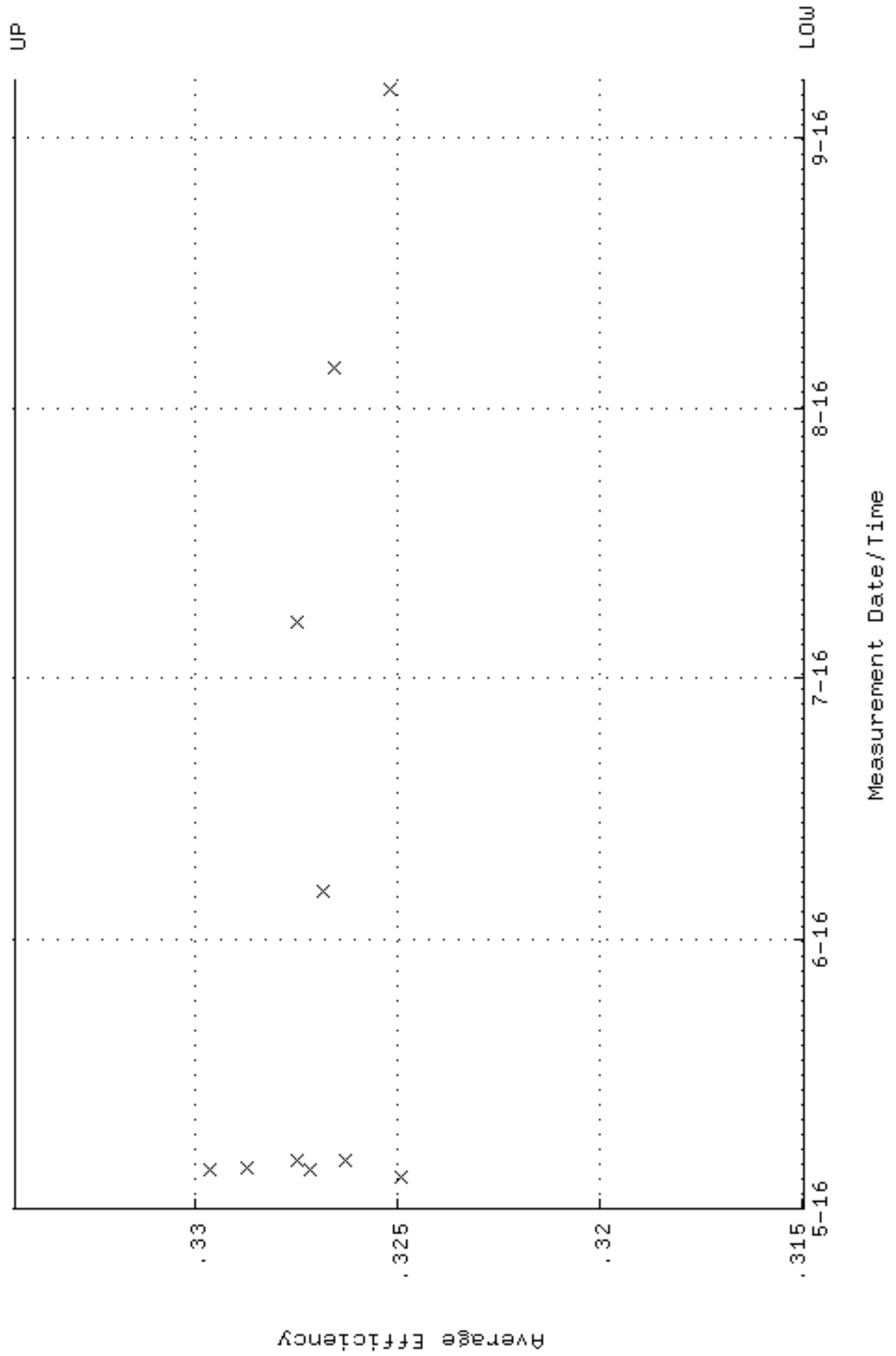
QA filename : DKA100:[ENV_ALPHA.QA.W]W095.QAF;11
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAY-2016 14:17:17 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



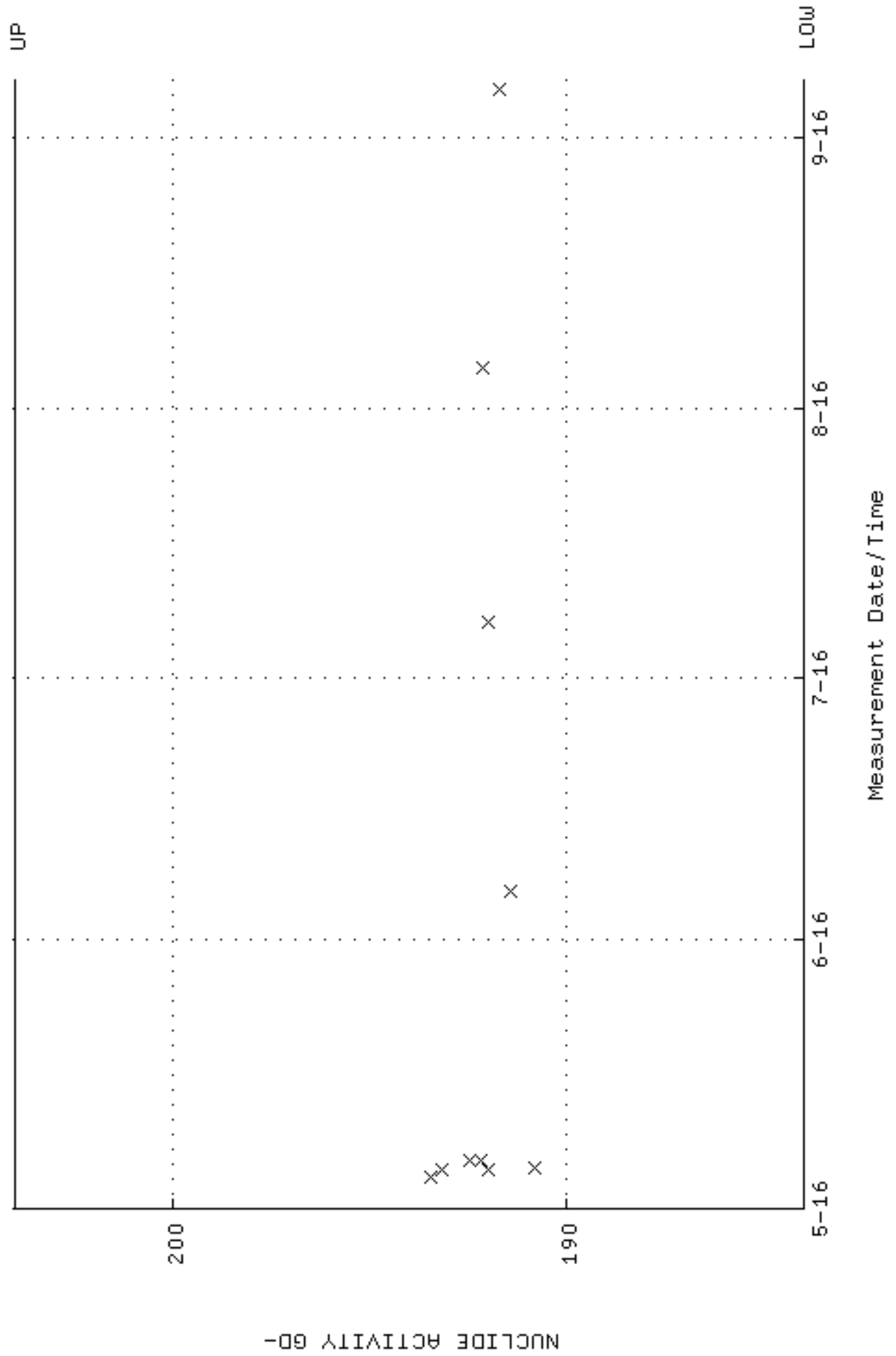
QA filename : DKA100:[ENV_ALPHA.QA.B]B095.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAY-2016 15:23:40 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



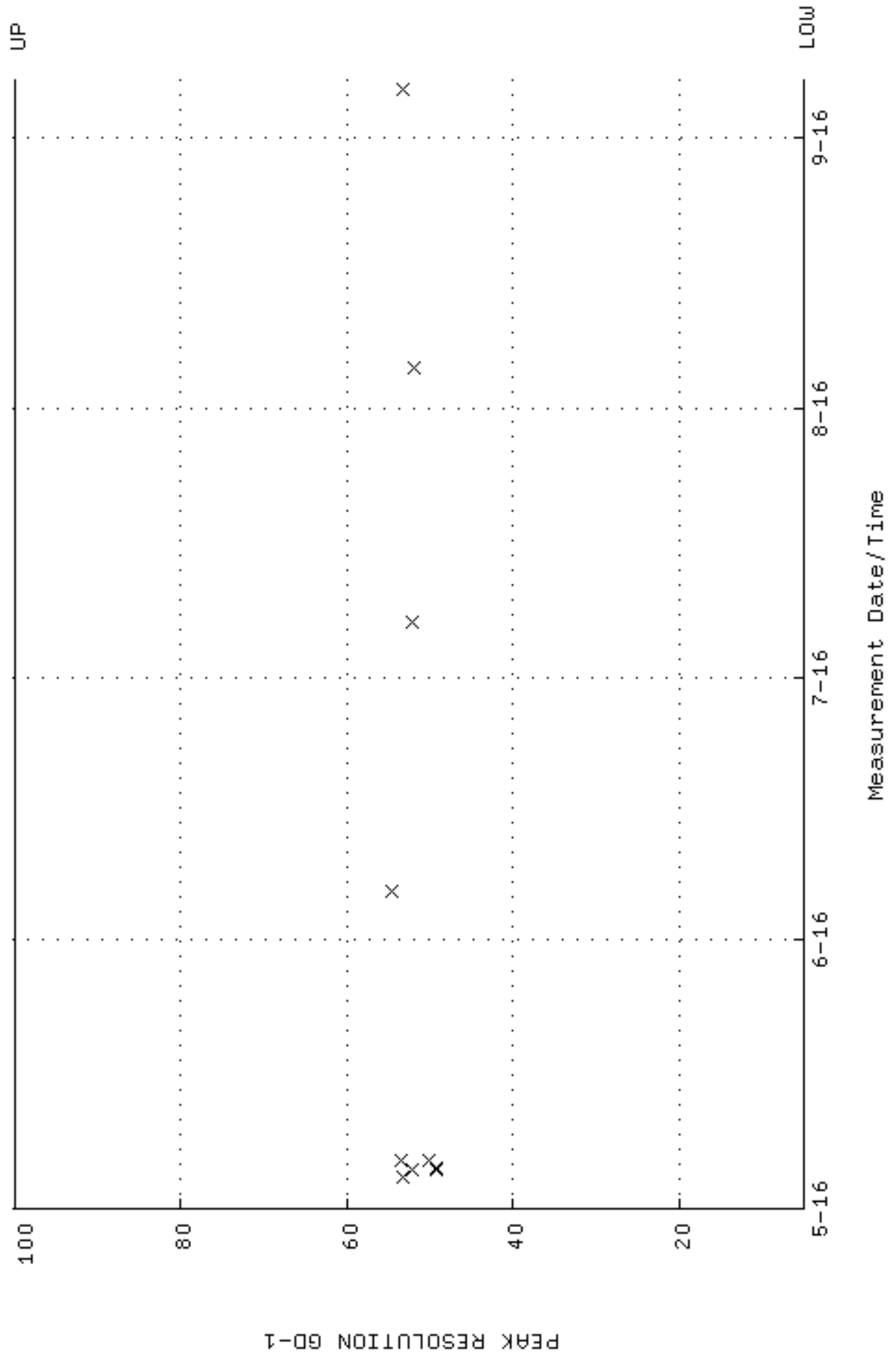
QA filename : DKA100:[ENV_ALPHA.QA.W]W096.QAF;10
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAY-2016 14:17:17 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.314971 through 0.334453



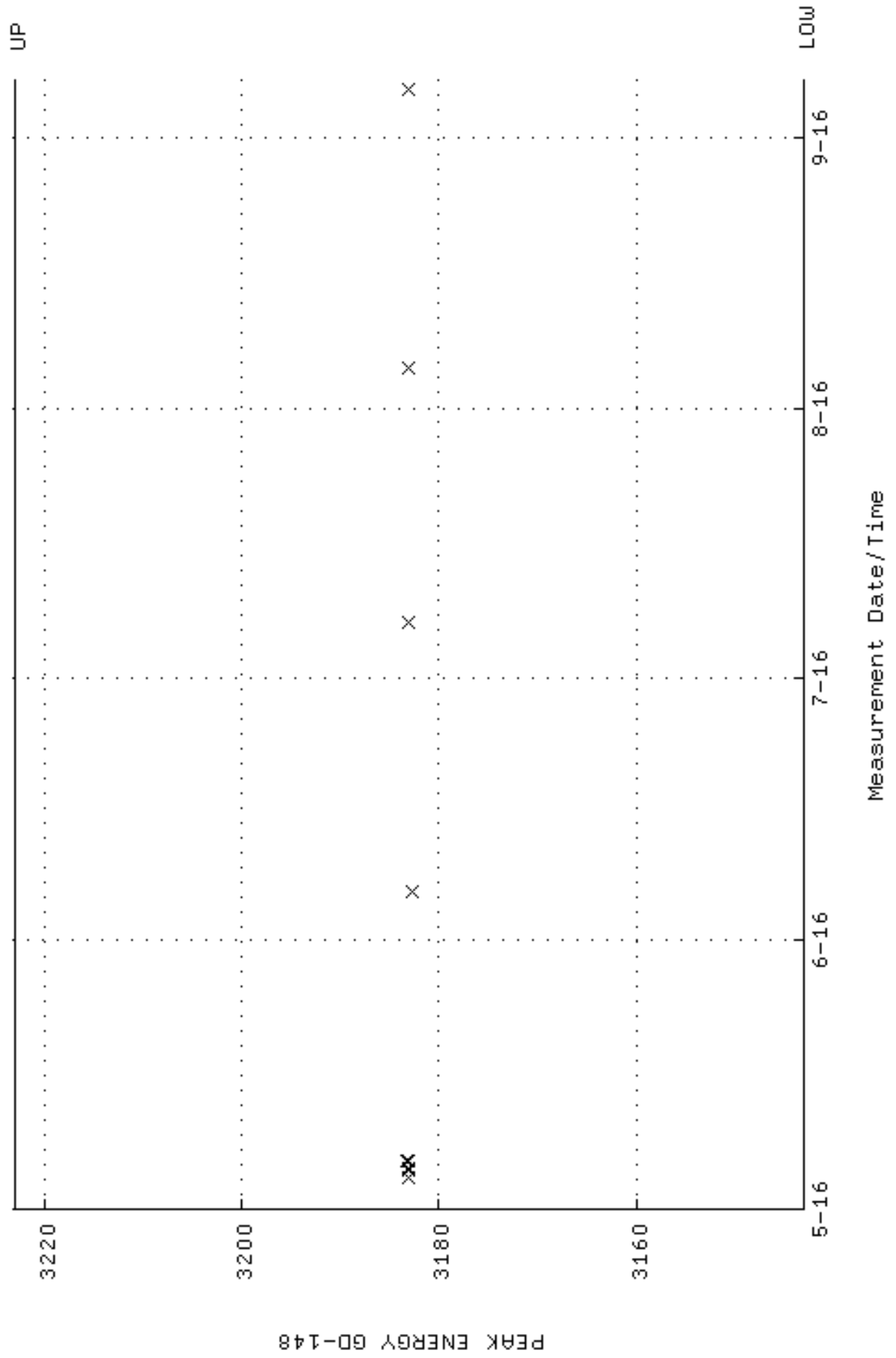
QA filename : DKA100:[ENV_ALPHA.QA.W]W096.QAF;10
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAY-2016 14:17:17 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



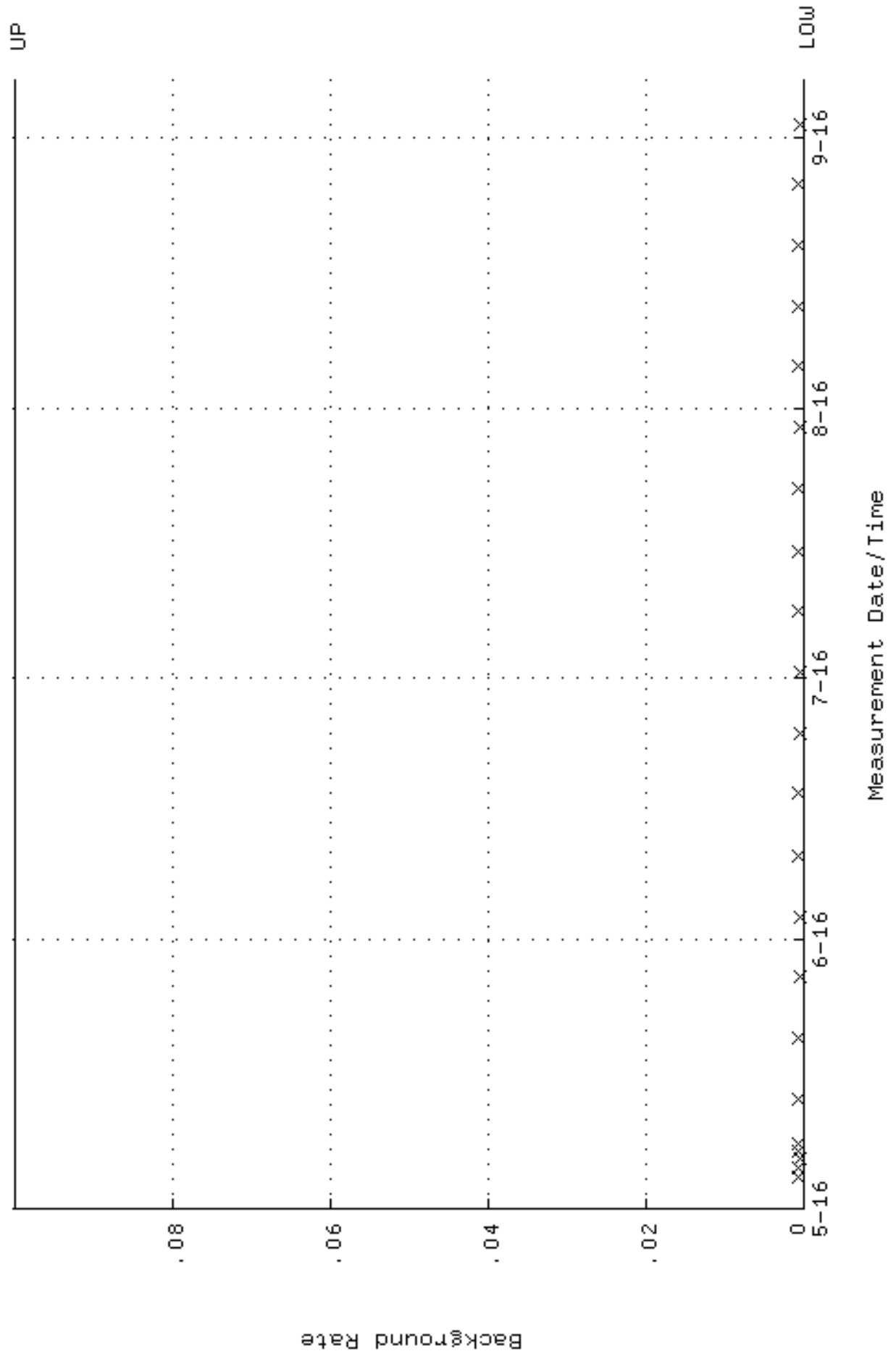
QA filename : DKA100:[ENV_ALPHA.QA.W]W096.QAF;10
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-MAY-2016 14:17:17 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



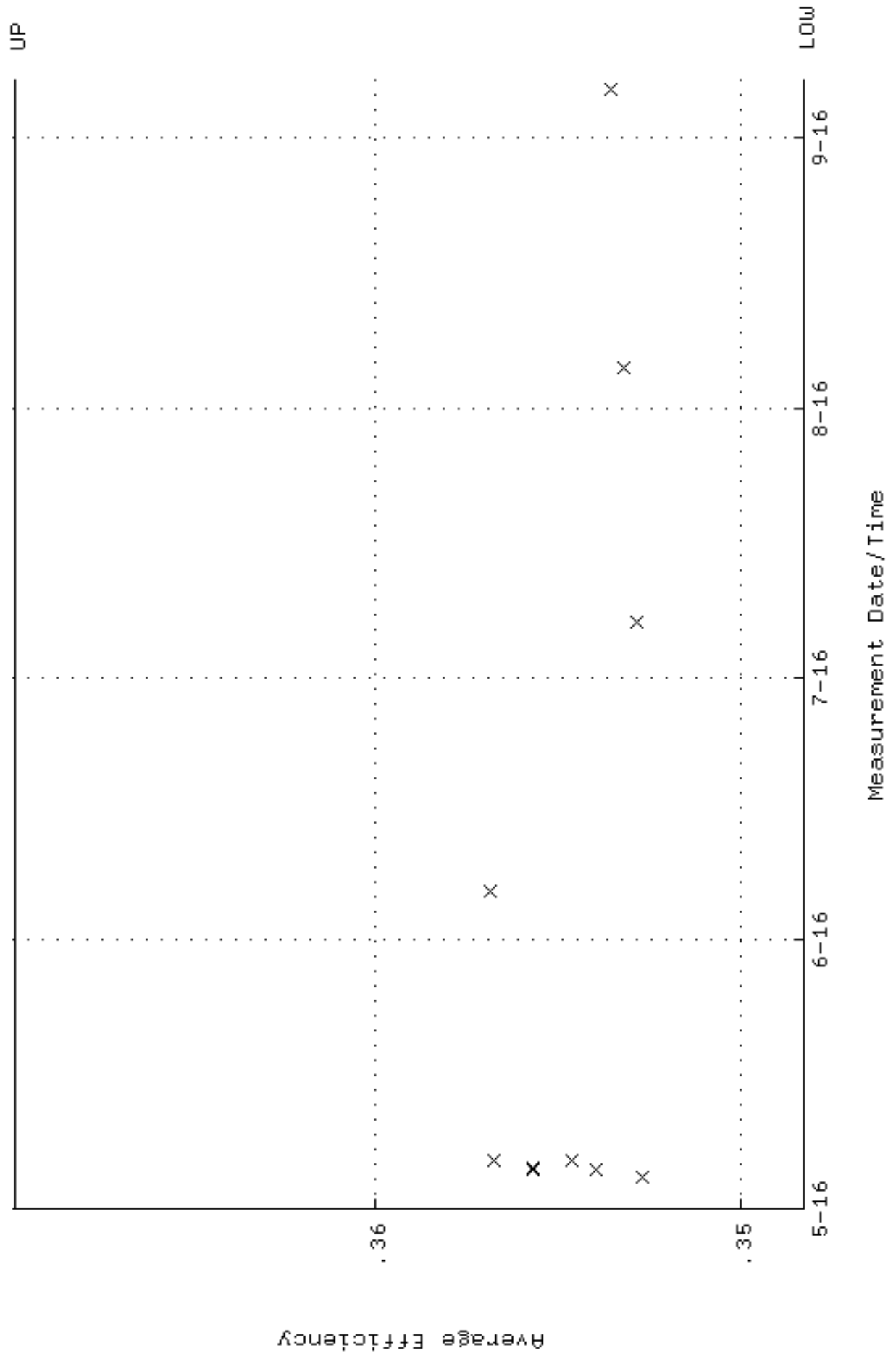
QA filename : DKA100:[ENV_ALPHA.QA.W]W096.QAF;10
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAY-2016 14:17:17 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



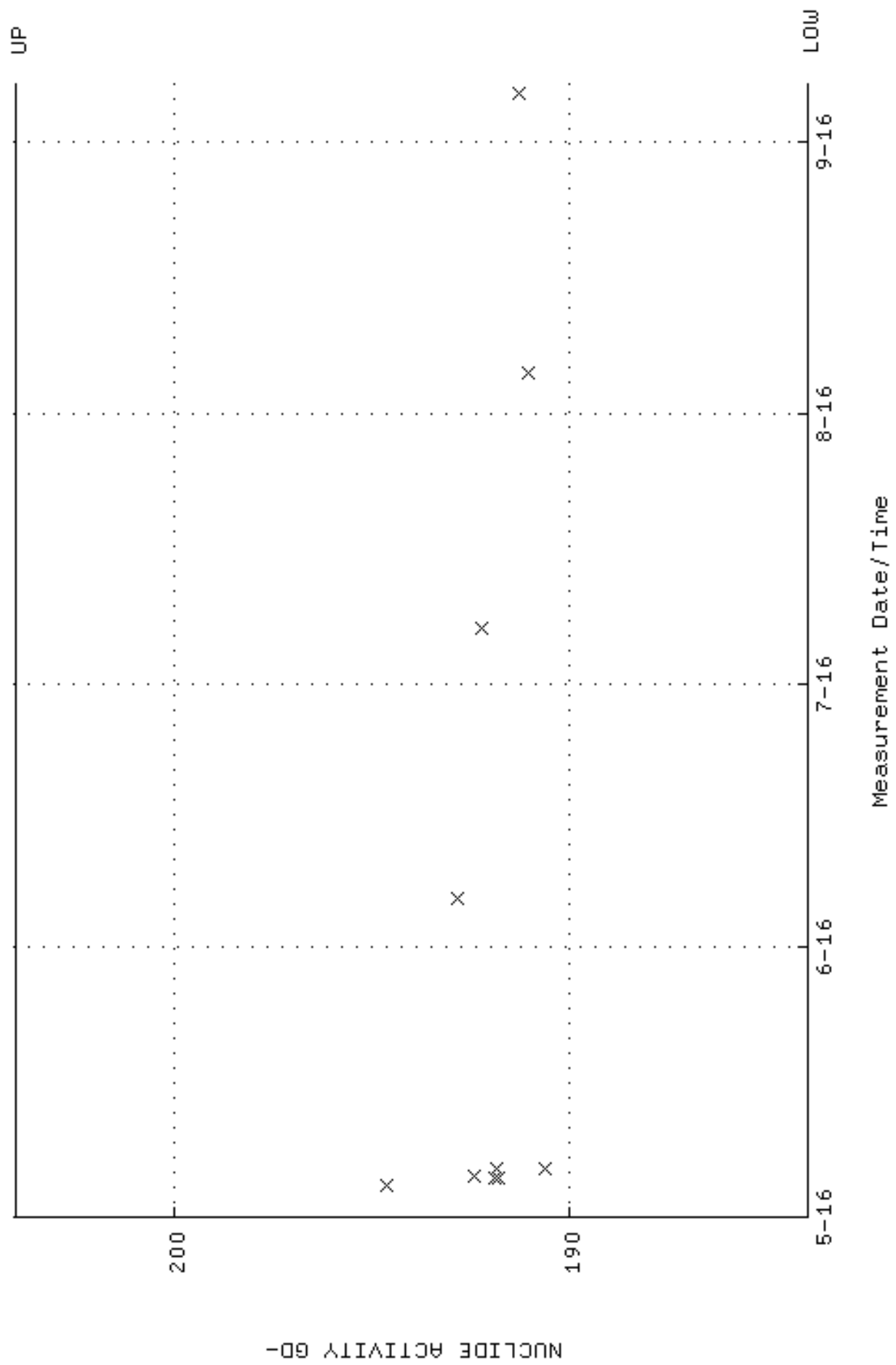
QA filename : DKA100:[ENV_ALPHA.QA.B]B096.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAY-2016 15:23:40 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



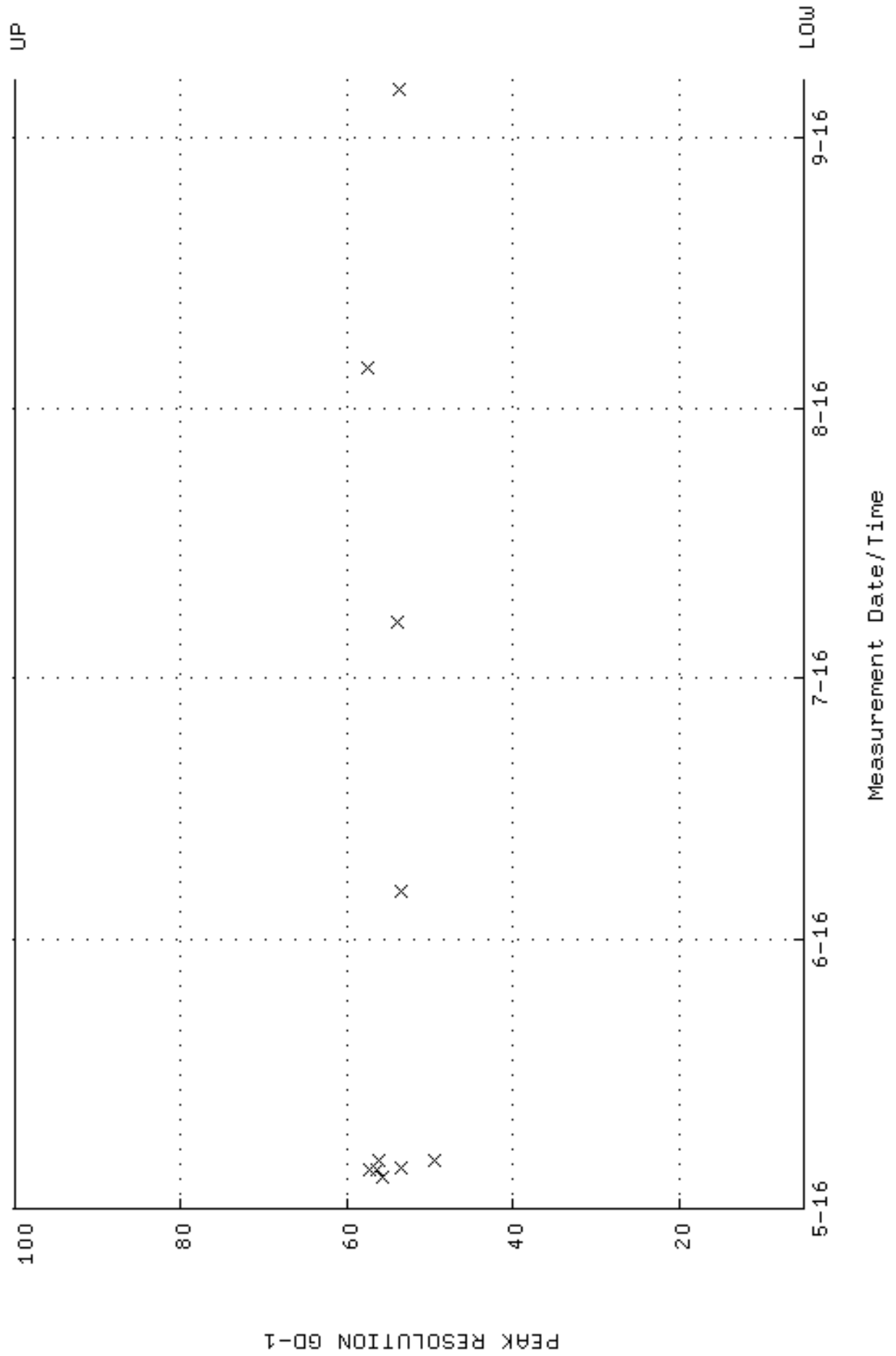
QA filename : DKA100:[ENV_ALPHA.QA.W]W097.QAF;10
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAY-2016 14:17:17 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.348290 through 0.369834



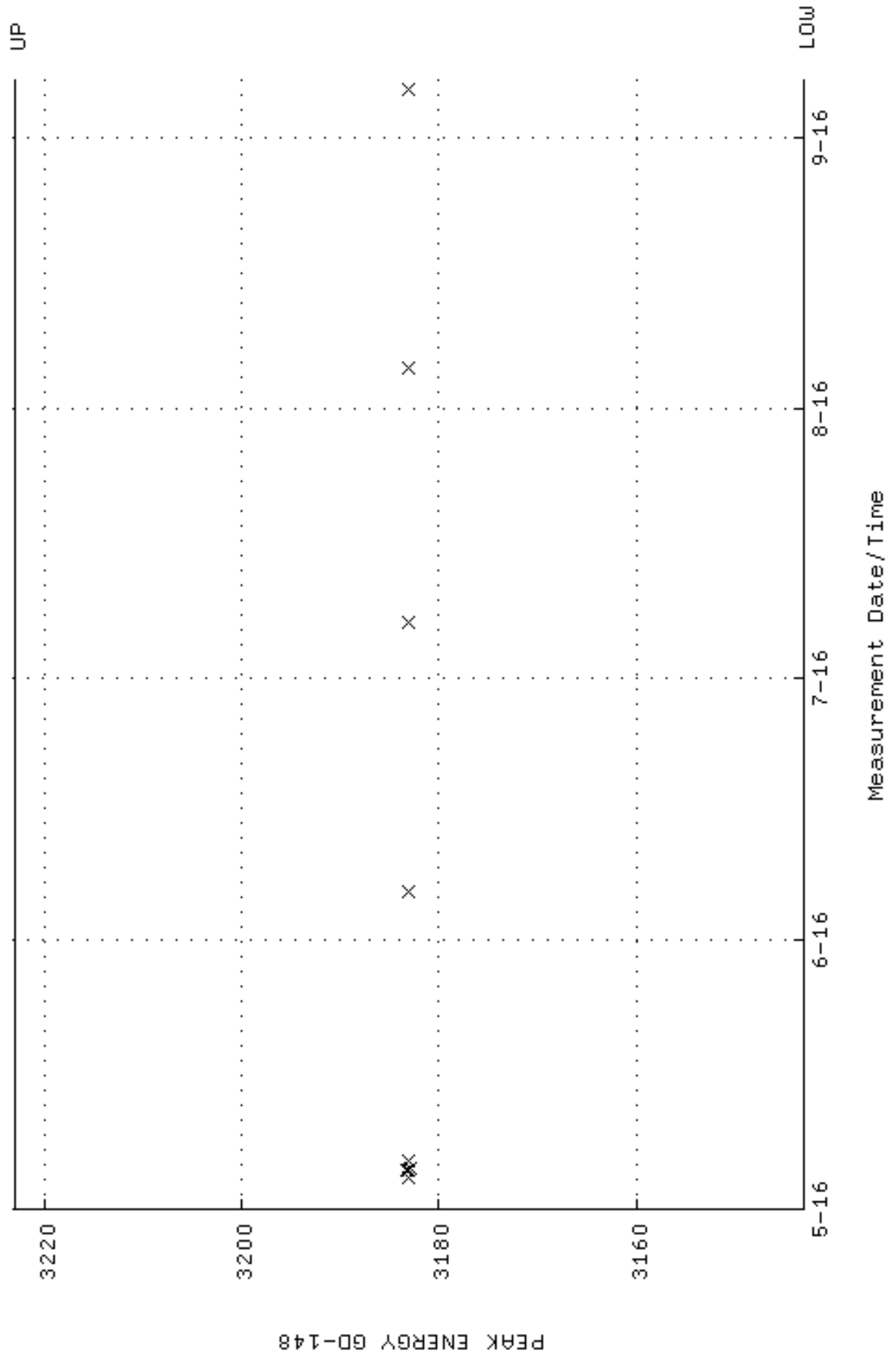
QA filename : DKA100:[ENV_ALPHA.QA.W]w097.QAF;10
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAY-2016 14:17:17 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



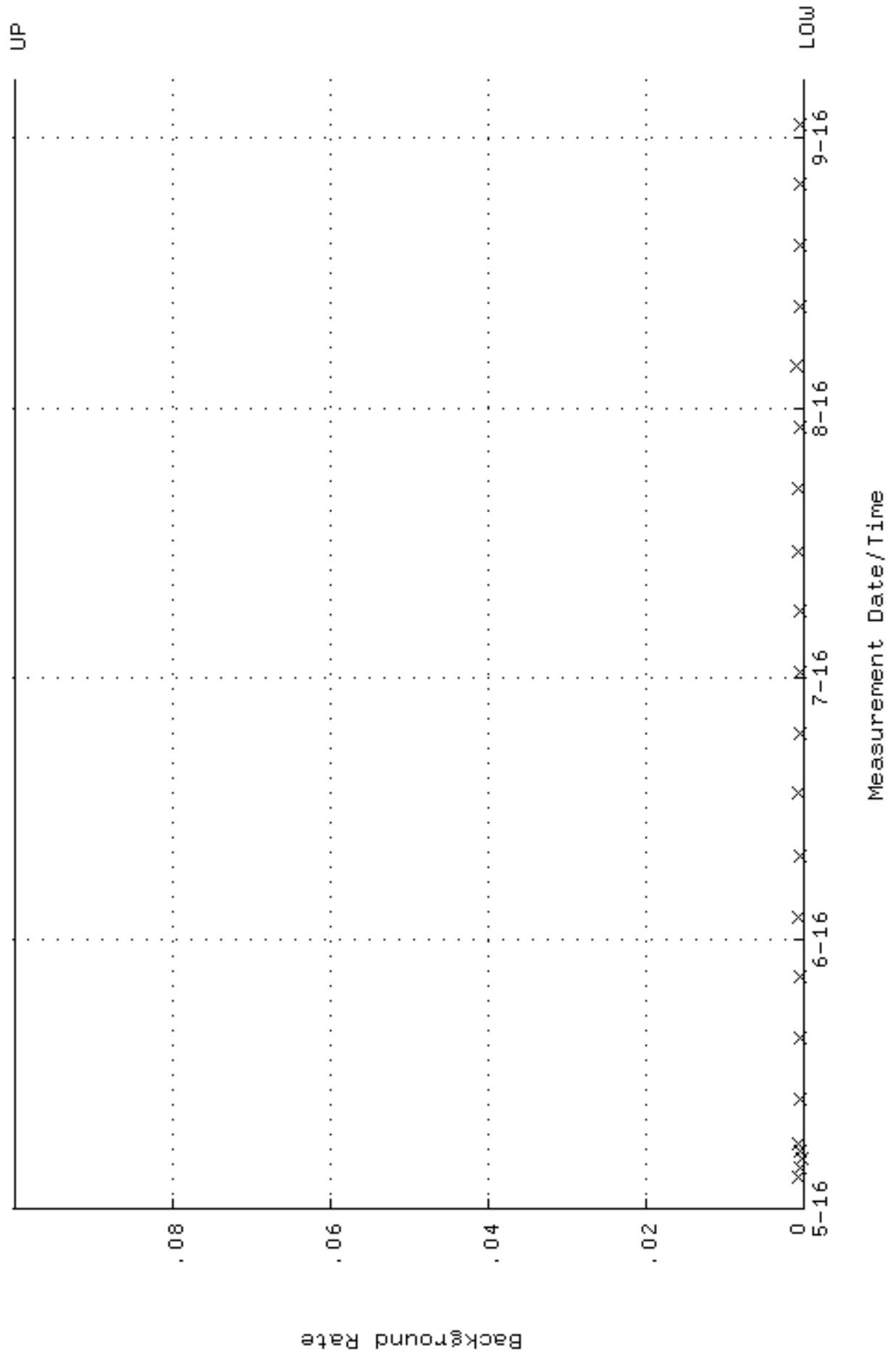
QA filename : DKA100:[ENV_ALPHA.QA.W]W097.QAF;10
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 4-MAY-2016 14:17:17 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



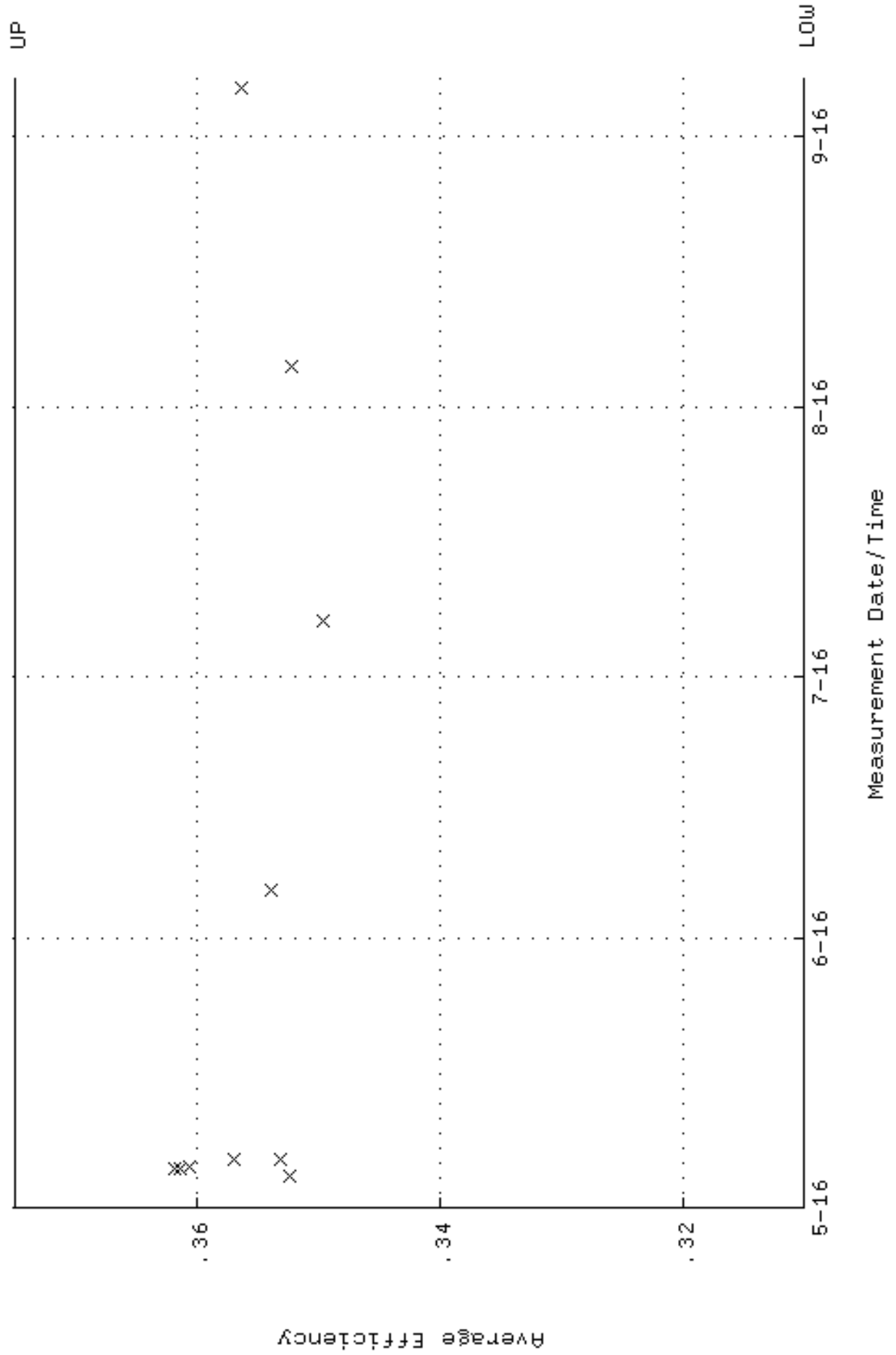
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAY-2016 14:17:17 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



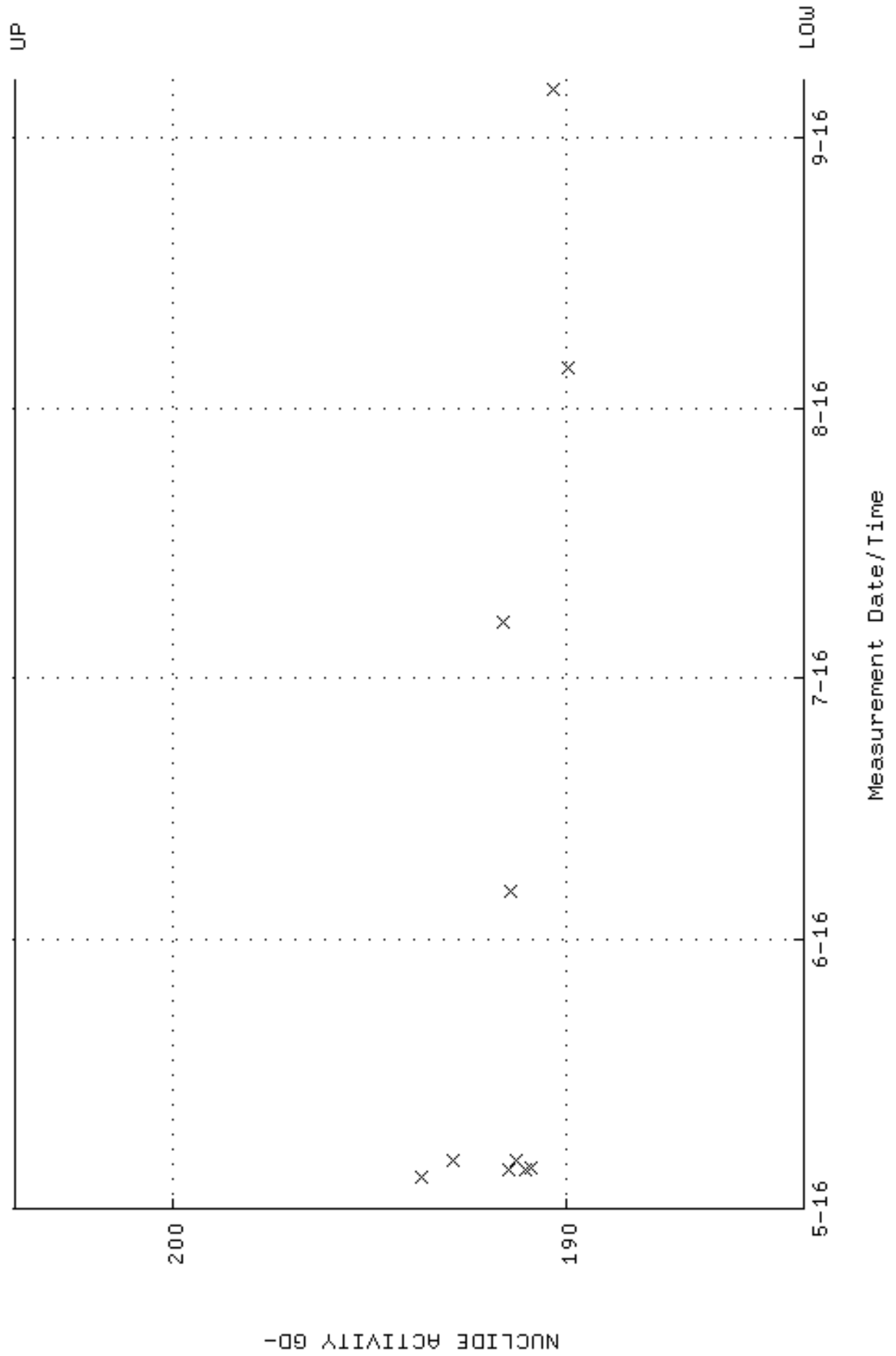
QA filename : DKA100:[ENV_ALPHA.QA.B]B097.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAY-2016 15:23:40 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



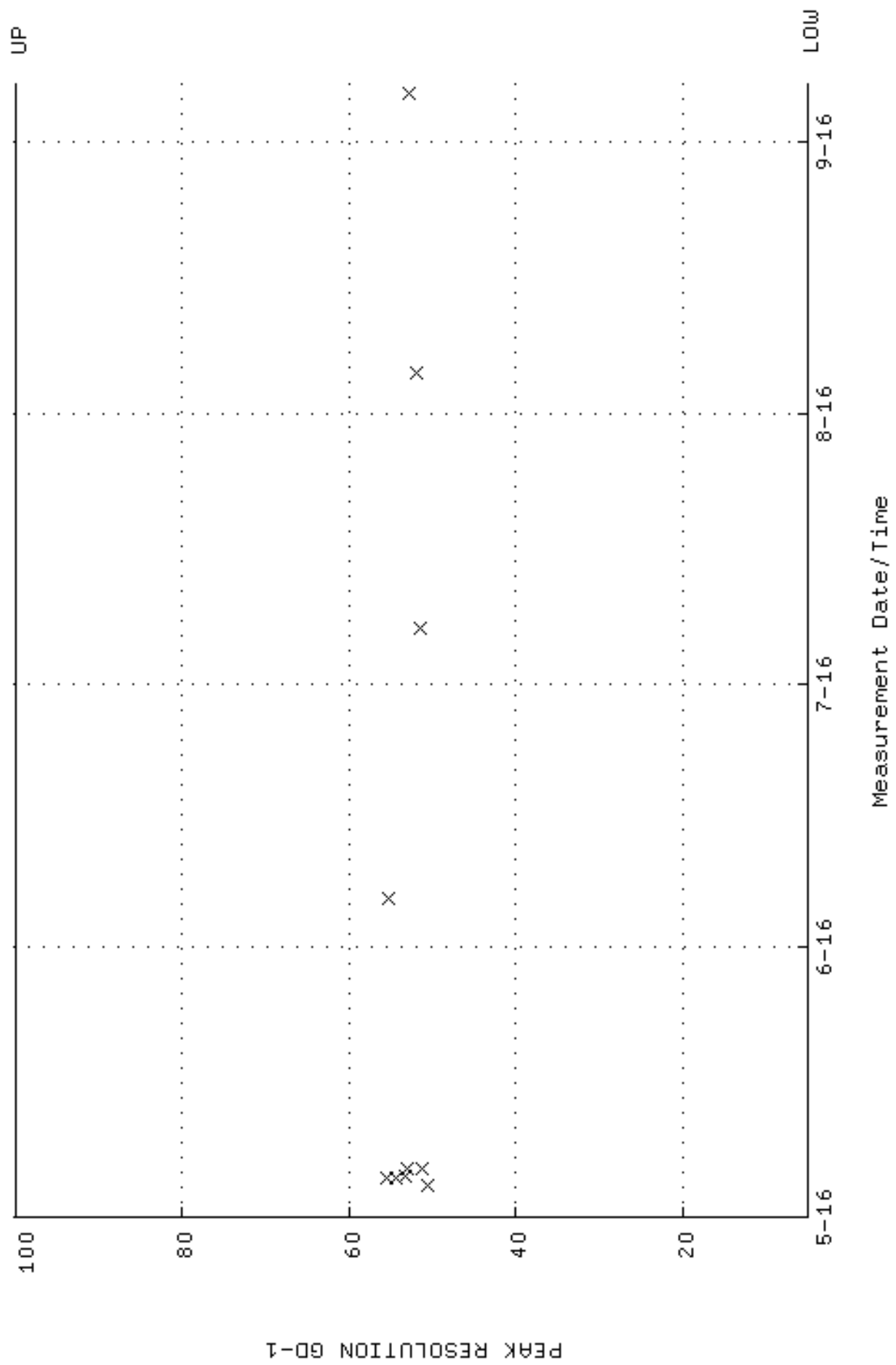
QA filename : DKA100:[ENV_ALPHA.QA.W]w099.QAF;11
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAY-2016 14:17:17 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.310091 through 0.375000



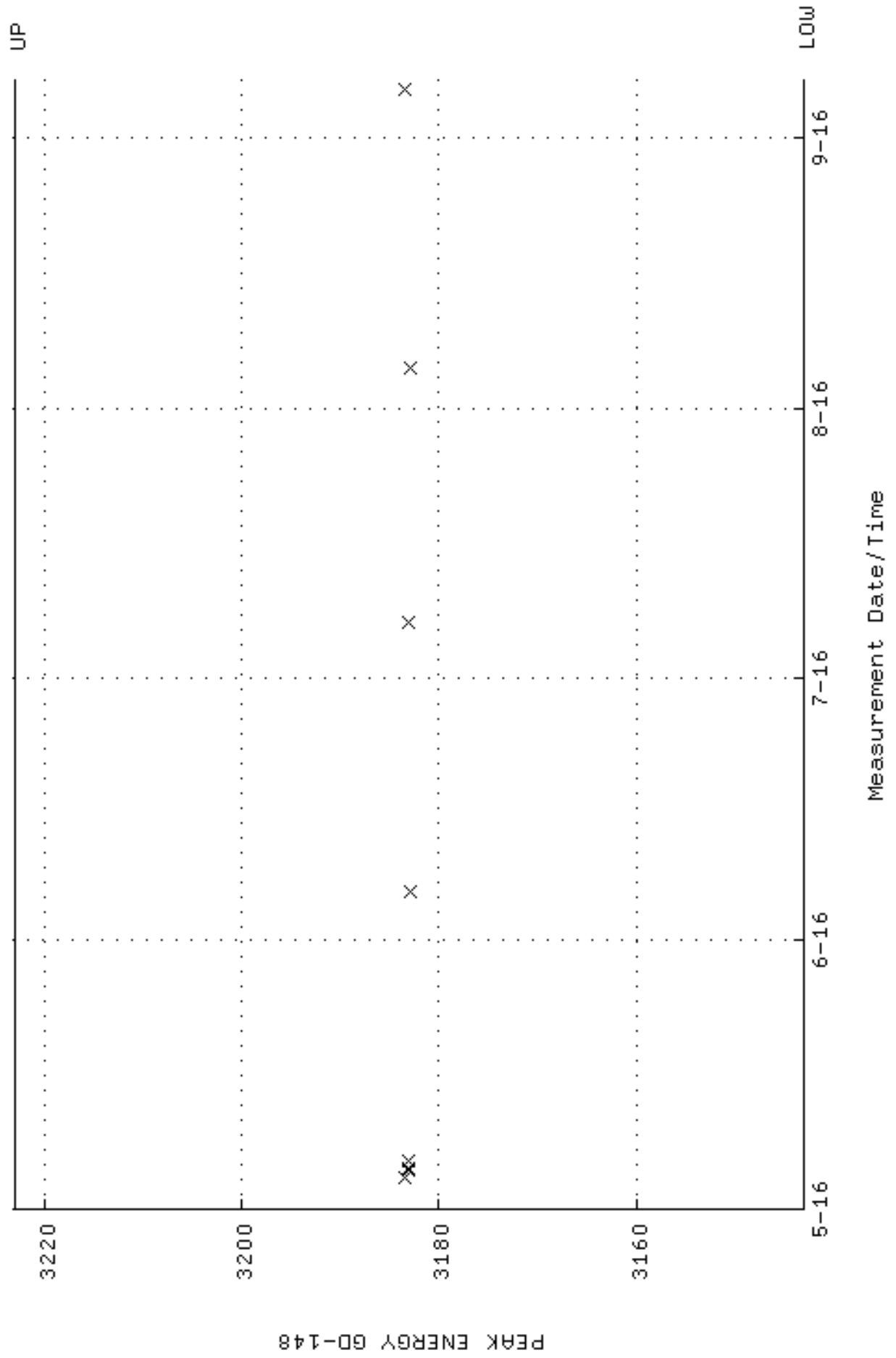
QA filename : DKA100:[ENV_ALPHA.QA.W]W099.QAF;11
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAY-2016 14:17:17 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



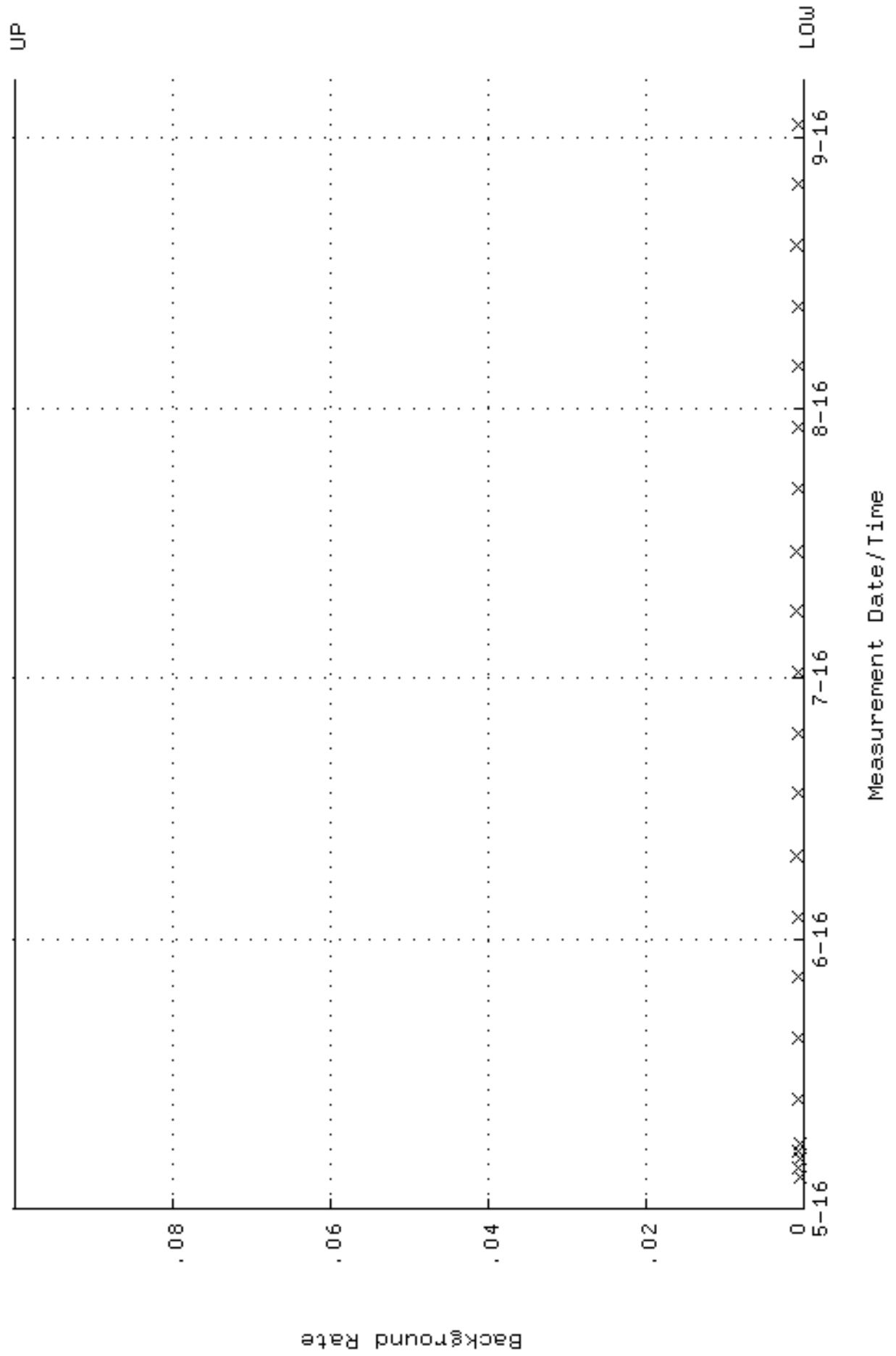
QA filename : DKA100:[ENV_ALPHA.QA.W]W099.QAF;11
 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 4-MAY-2016 14:17:17 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



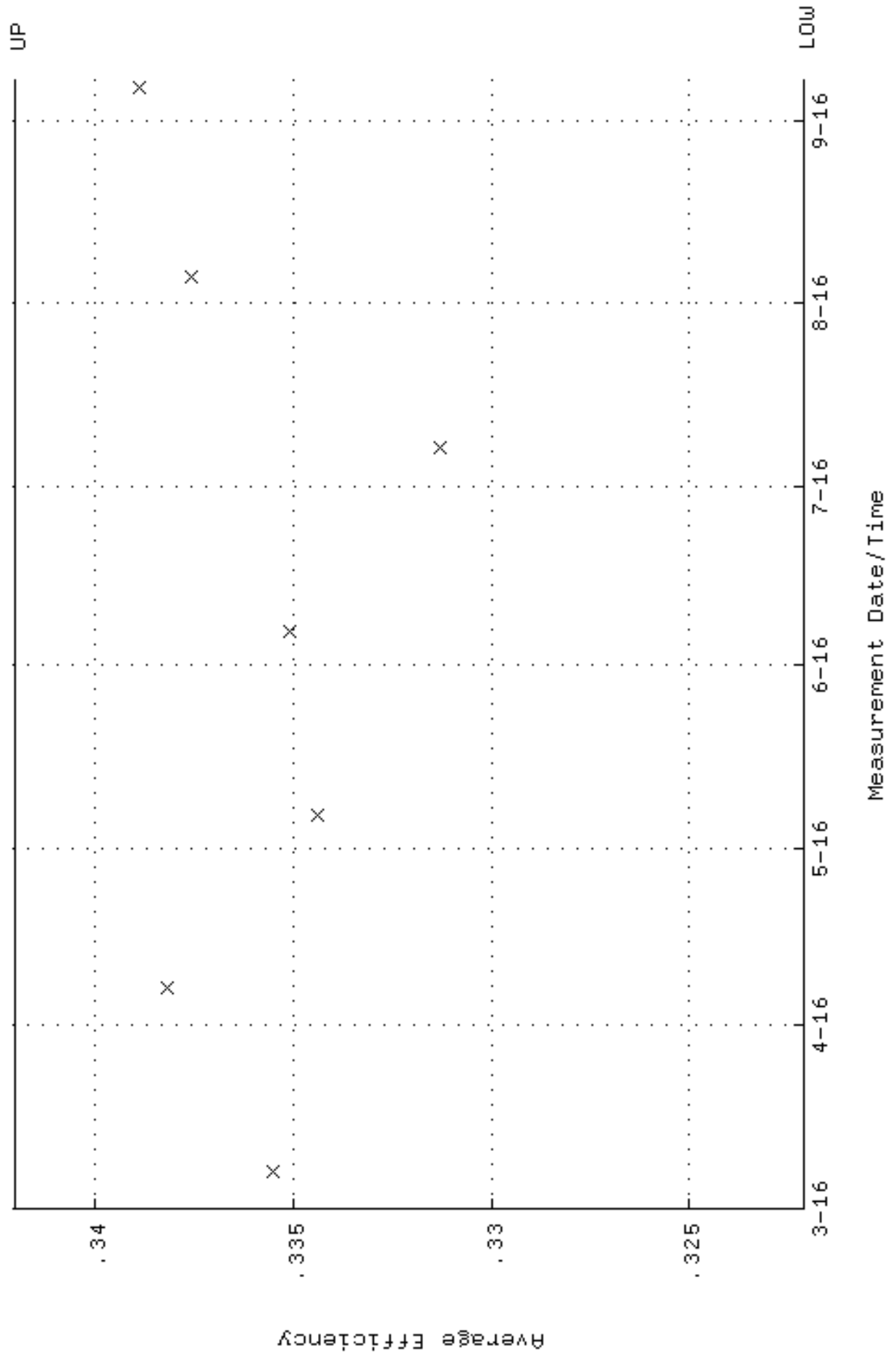
QA filename : DKA100:[ENV_ALPHA.QA.W]W099.QAF;11
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 4-MAY-2016 14:17:17 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



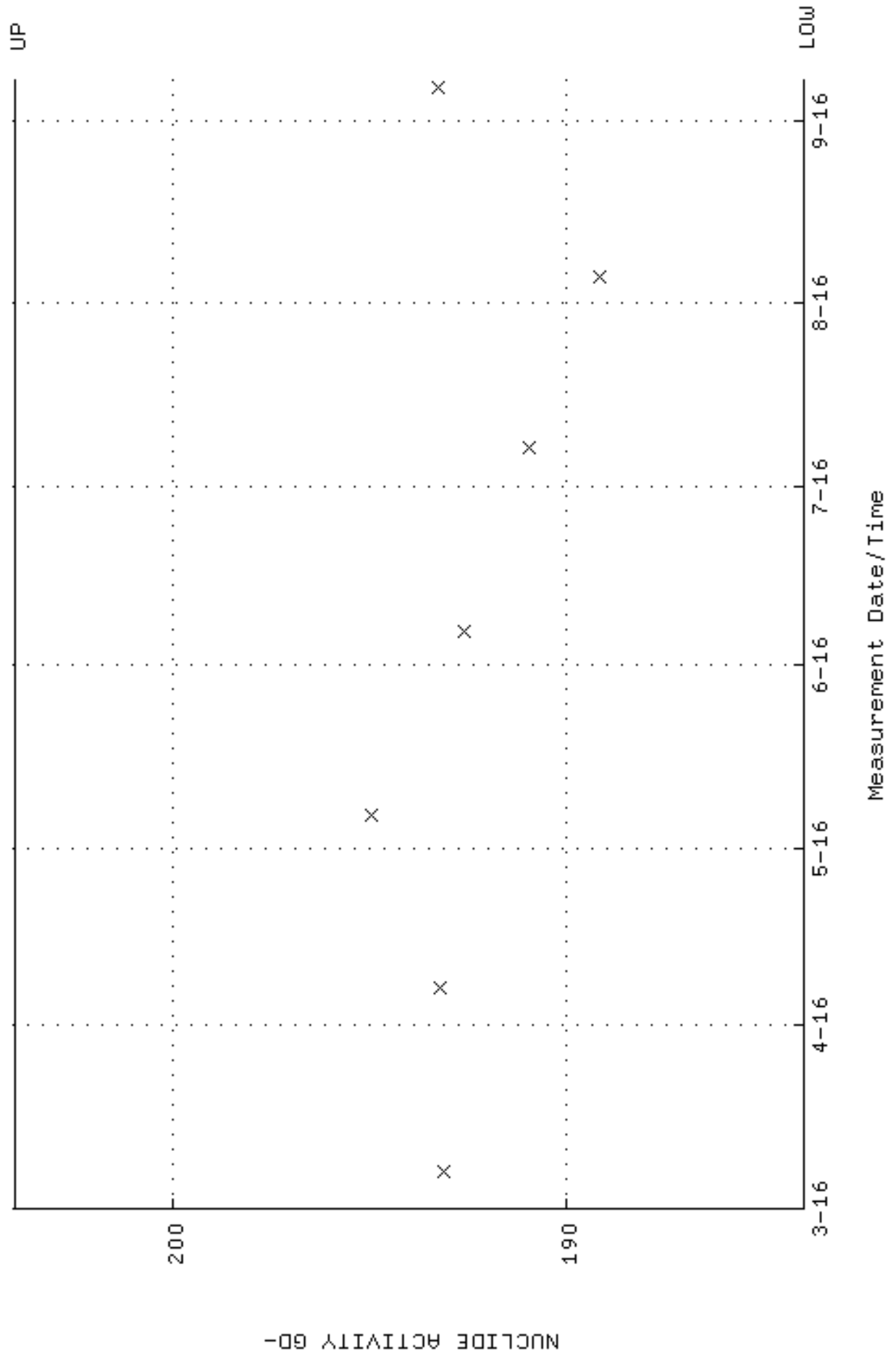
QA filename : DKA100:[ENV_ALPHA.QA.B]B099.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAY-2016 15:23:40 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



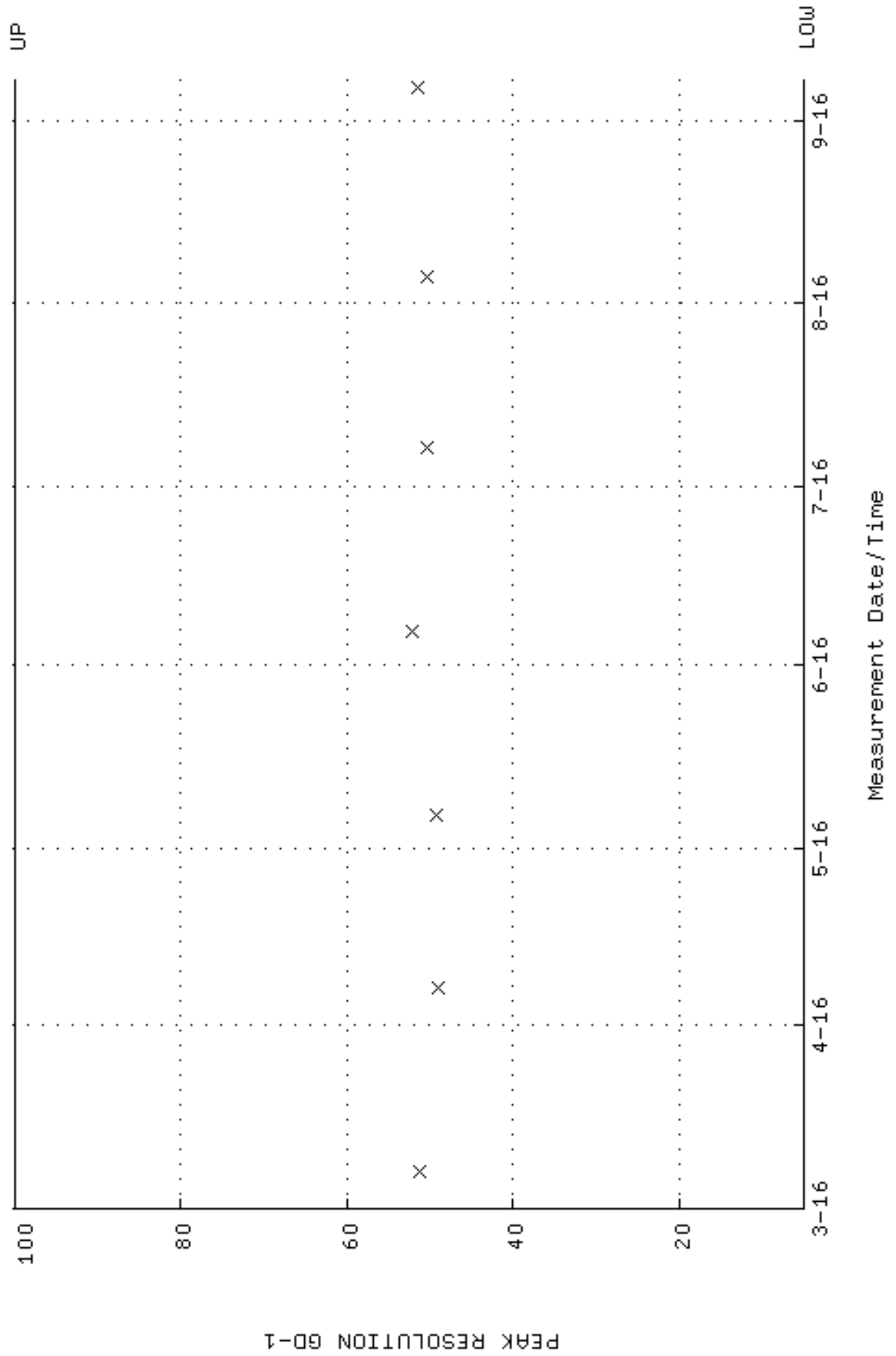
QA filename : DKA100:[ENV_ALPHA.QA.W]W103.QAF;12
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 7-MAR-2016 09:54:02 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.322108 through 0.342032



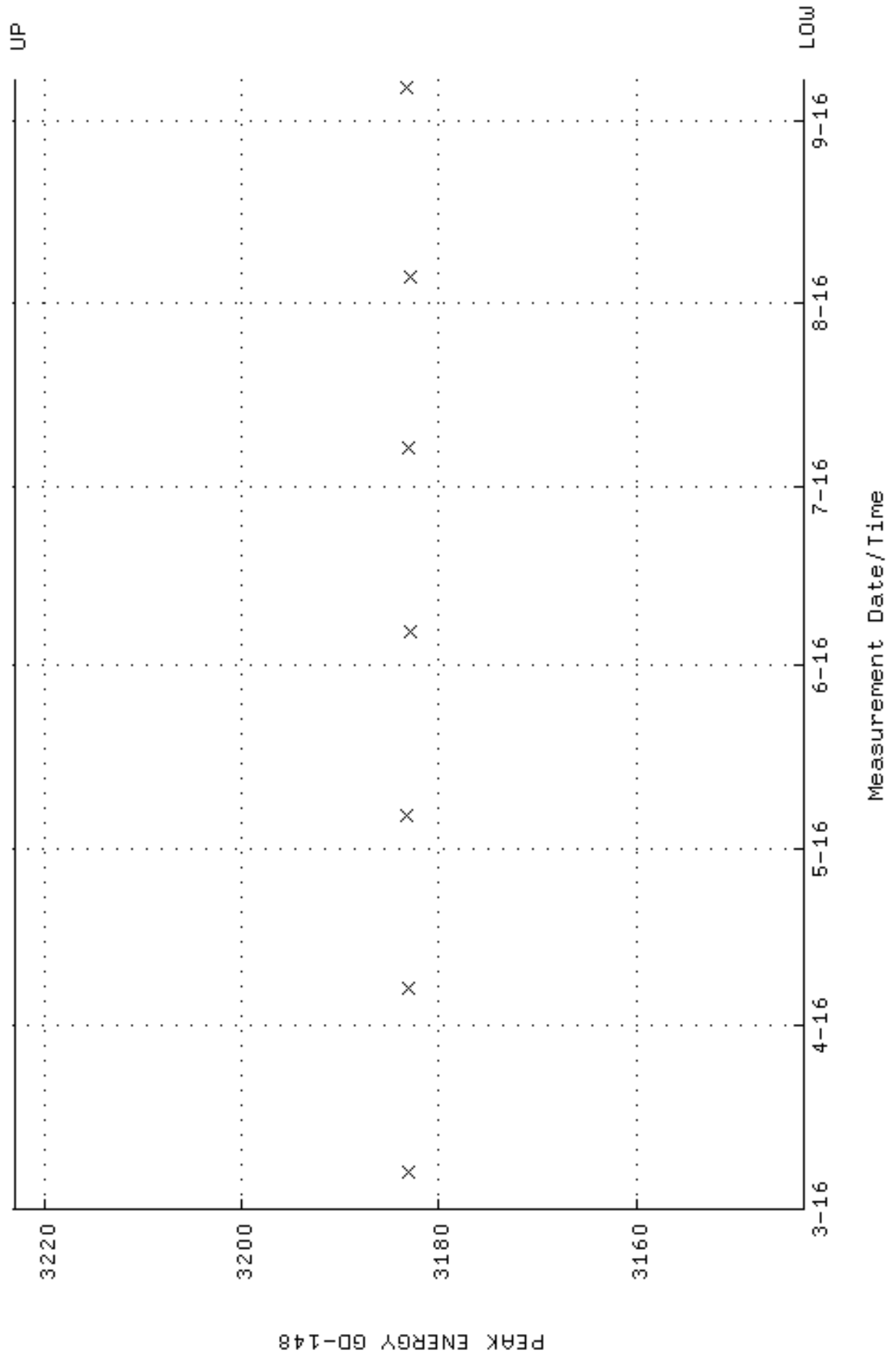
QA filename : DKA100:[ENV_ALPHA.QA.W]W103.QAF;12
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 7-MAR-2016 09:54:02 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



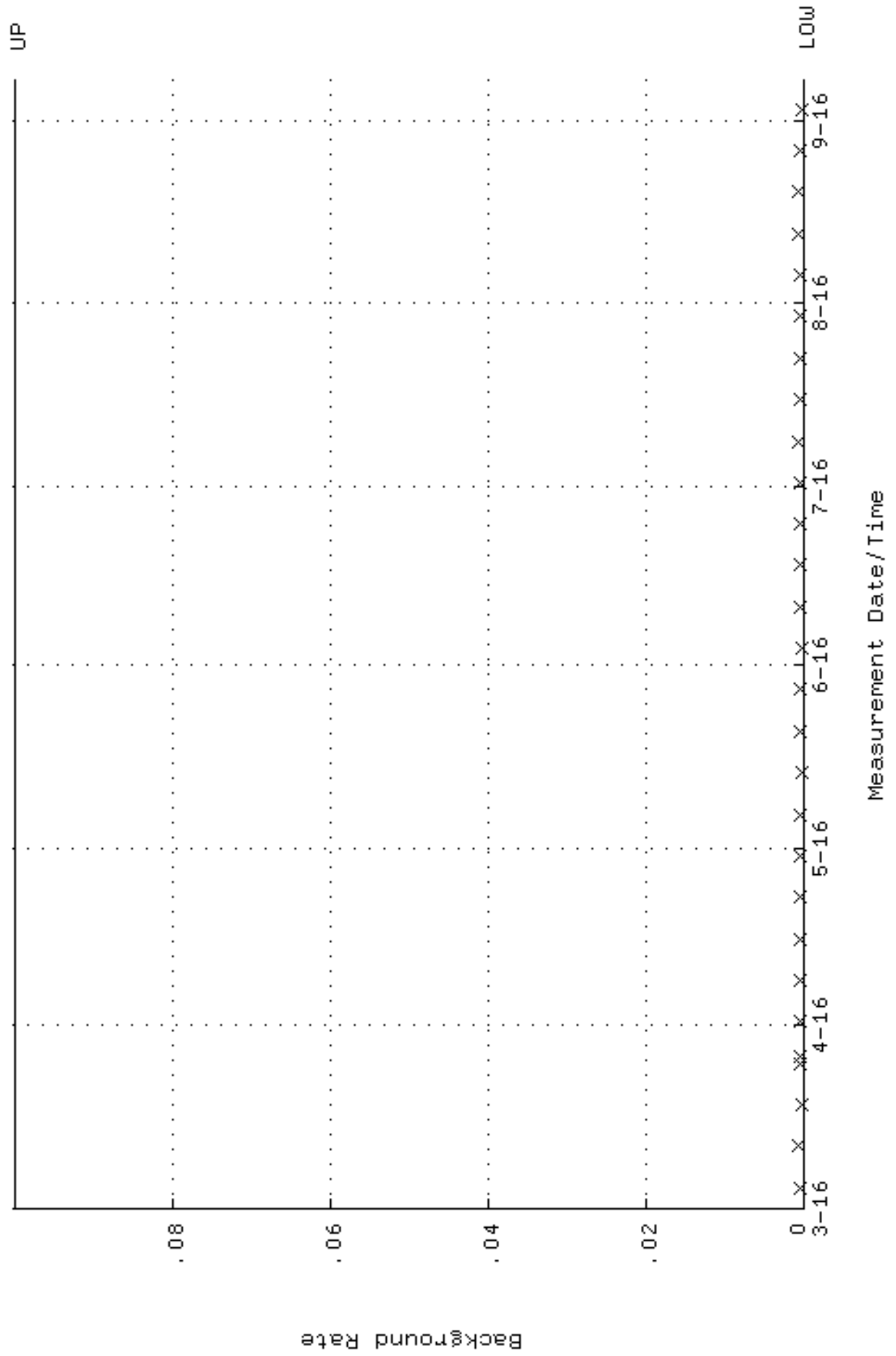
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Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 7-MAR-2016 09:54:02 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



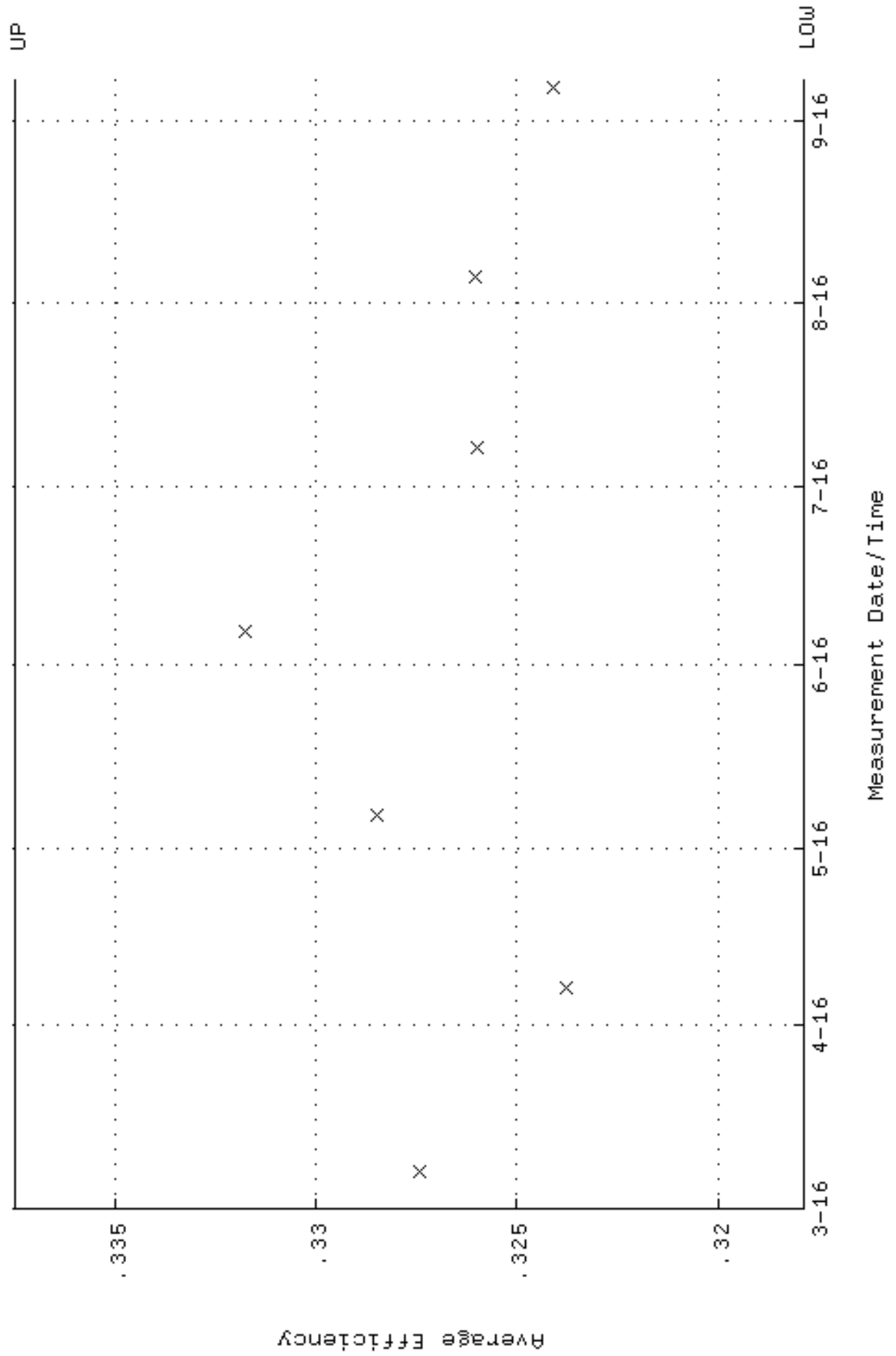
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:02 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



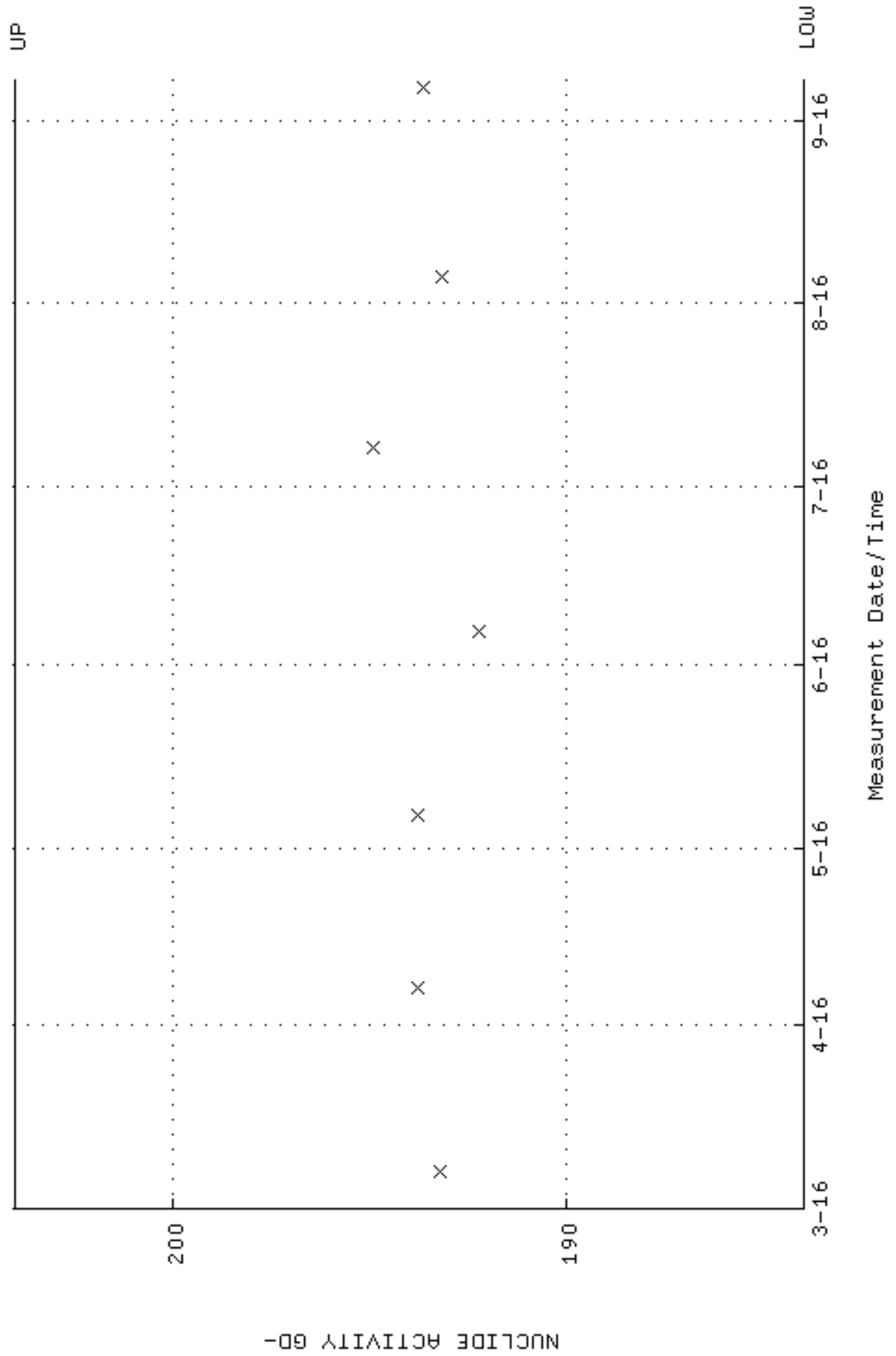
QA filename : DKA100:[ENV_ALPHA.QA.B]B103.QAF;4
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:51:39 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



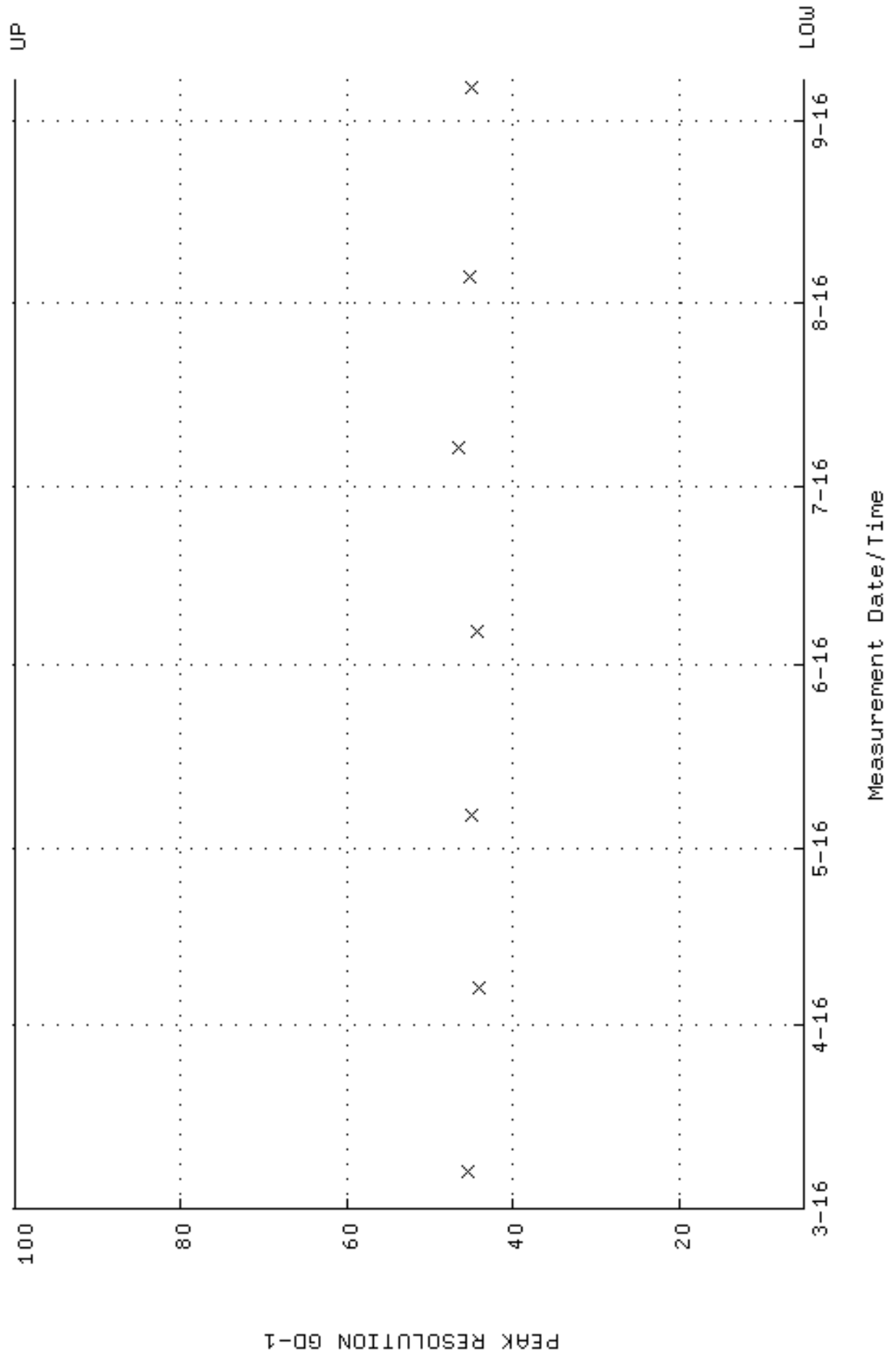
QA filename : DKA100:[ENV_ALPHA.QA.W]W104.QAF;10
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 7-MAR-2016 09:54:02 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.317853 through 0.337513



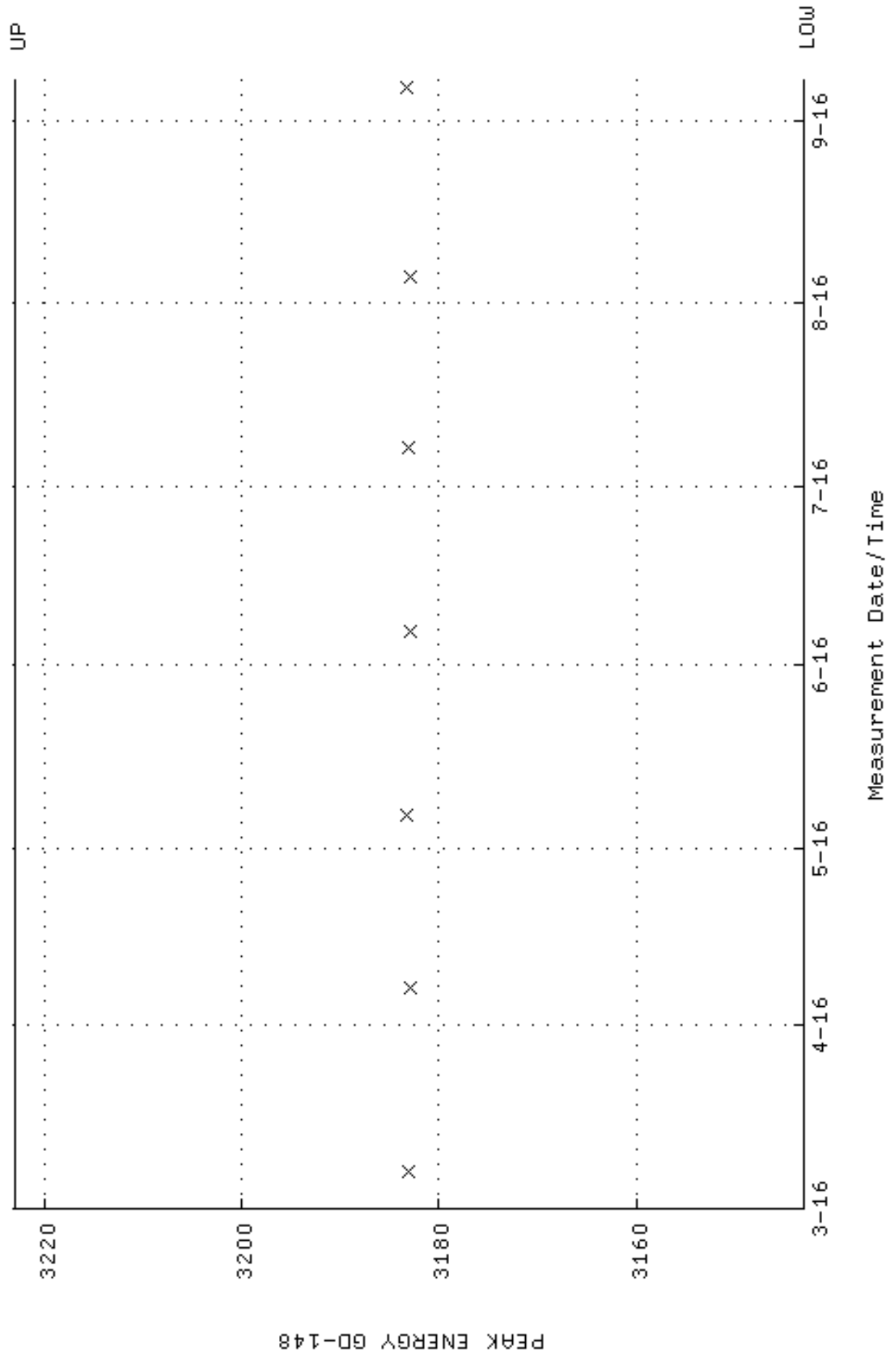
QA filename : DKA100:[ENV_ALPHA.QA.W]W104.QAF;10
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:02 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



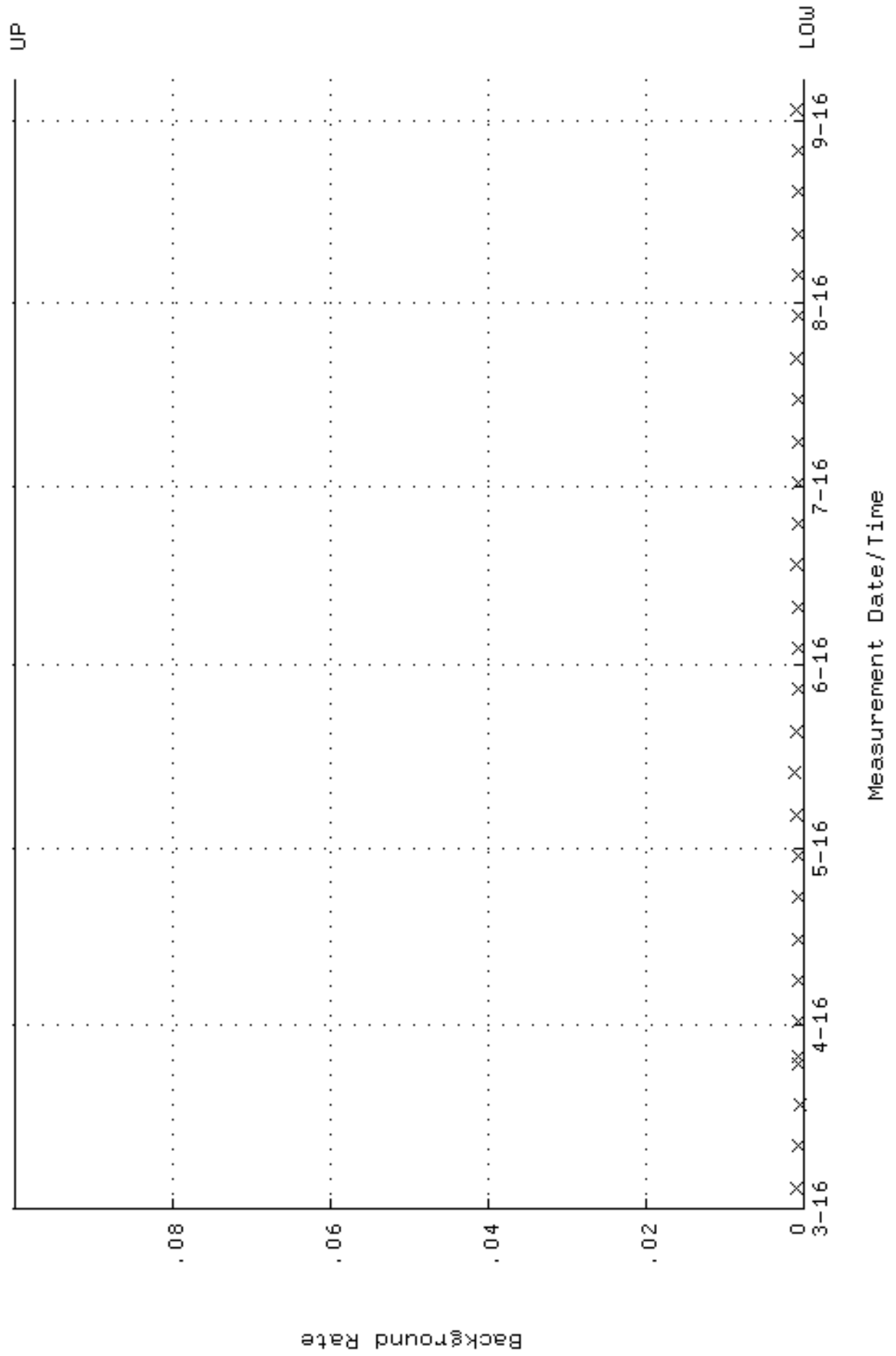
QA filename : DKA100:[ENV_ALPHA.QA.W]W104.QAF;10
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 7-MAR-2016 09:54:02 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



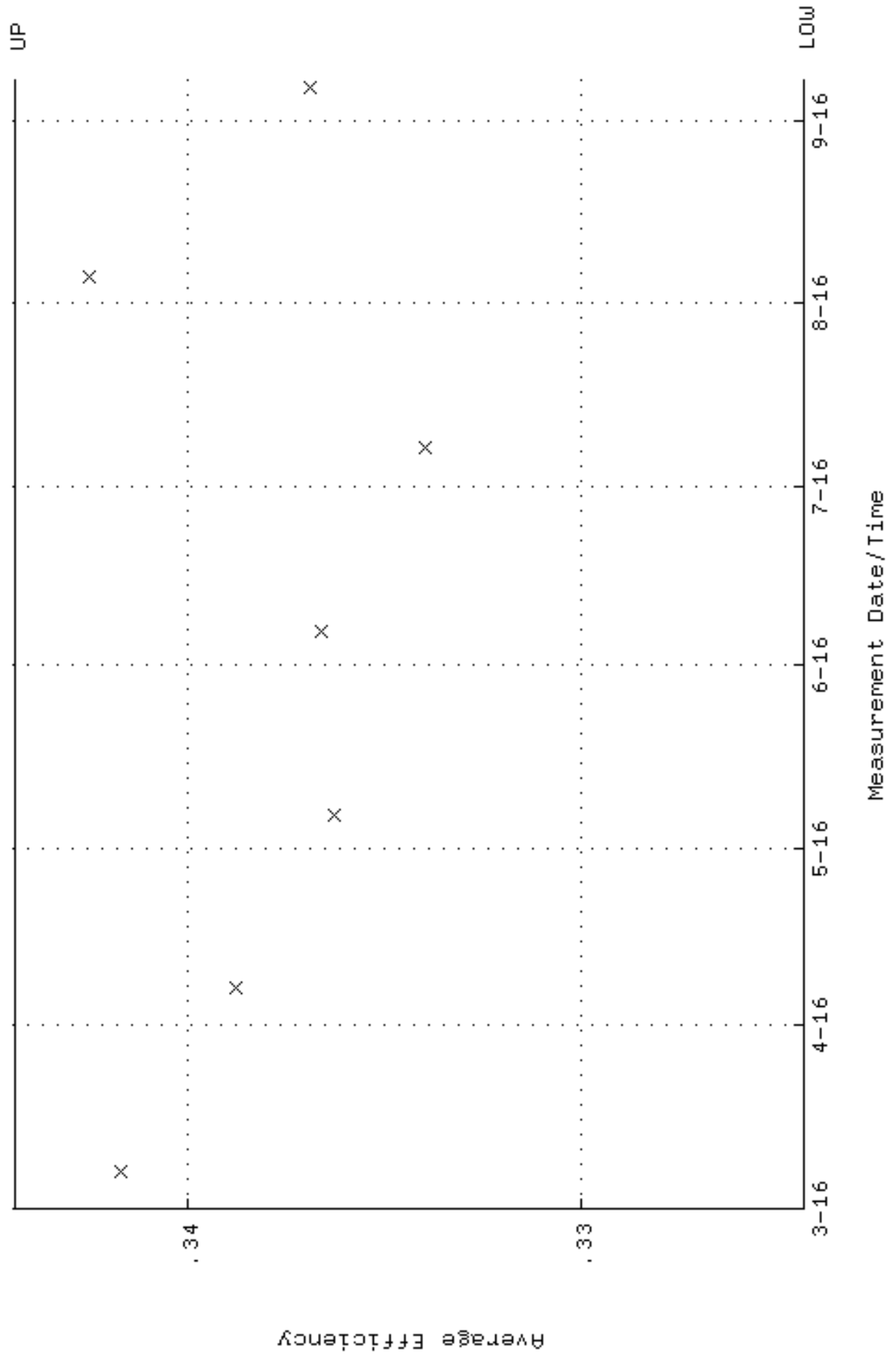
QA filename : DKA100:[ENV_ALPHA.QA.W]W104.QAF;10
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:02 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



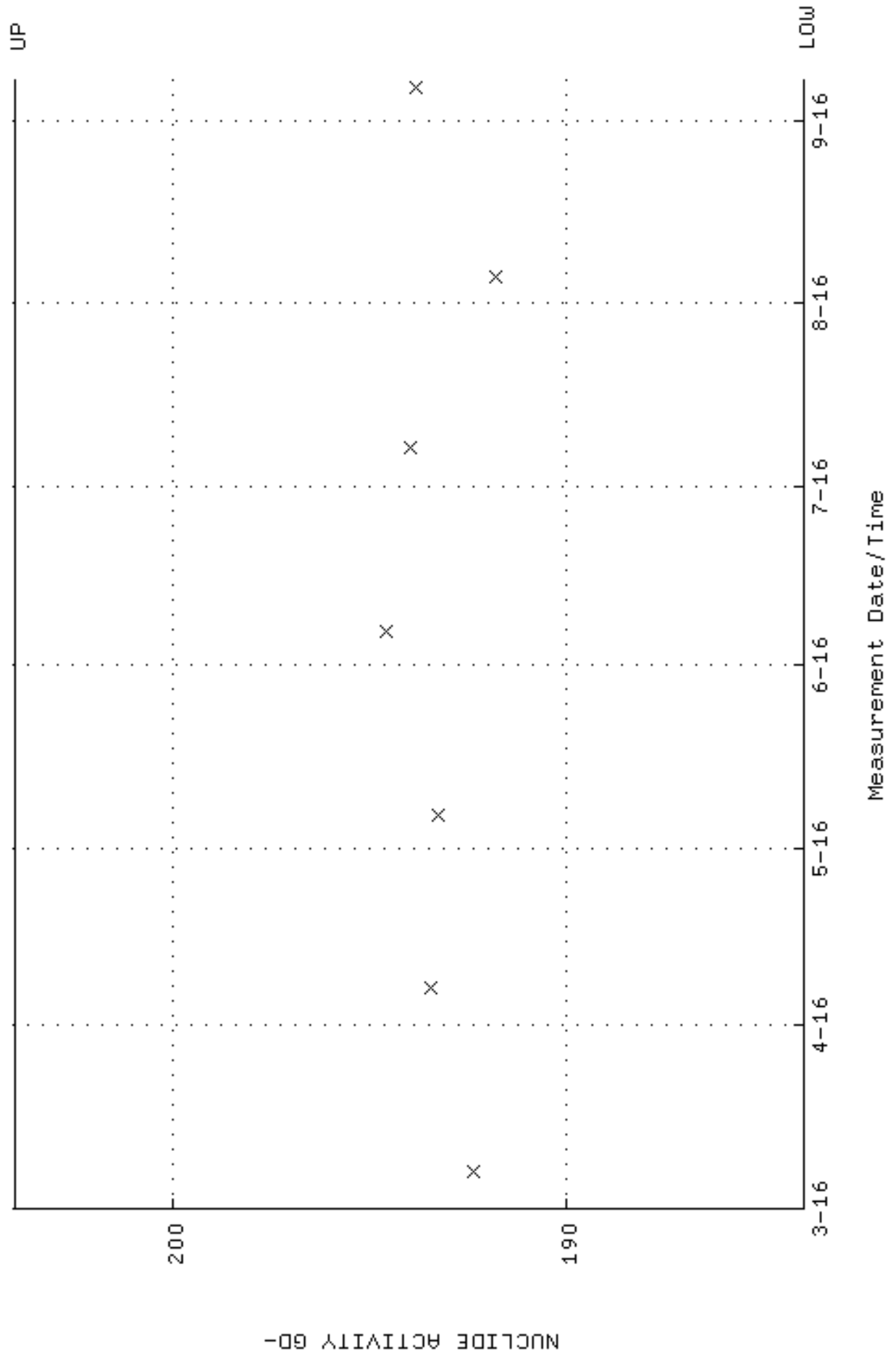
QA filename : DKA100:[ENV_ALPHA.QA.B]B104.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:51:39 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



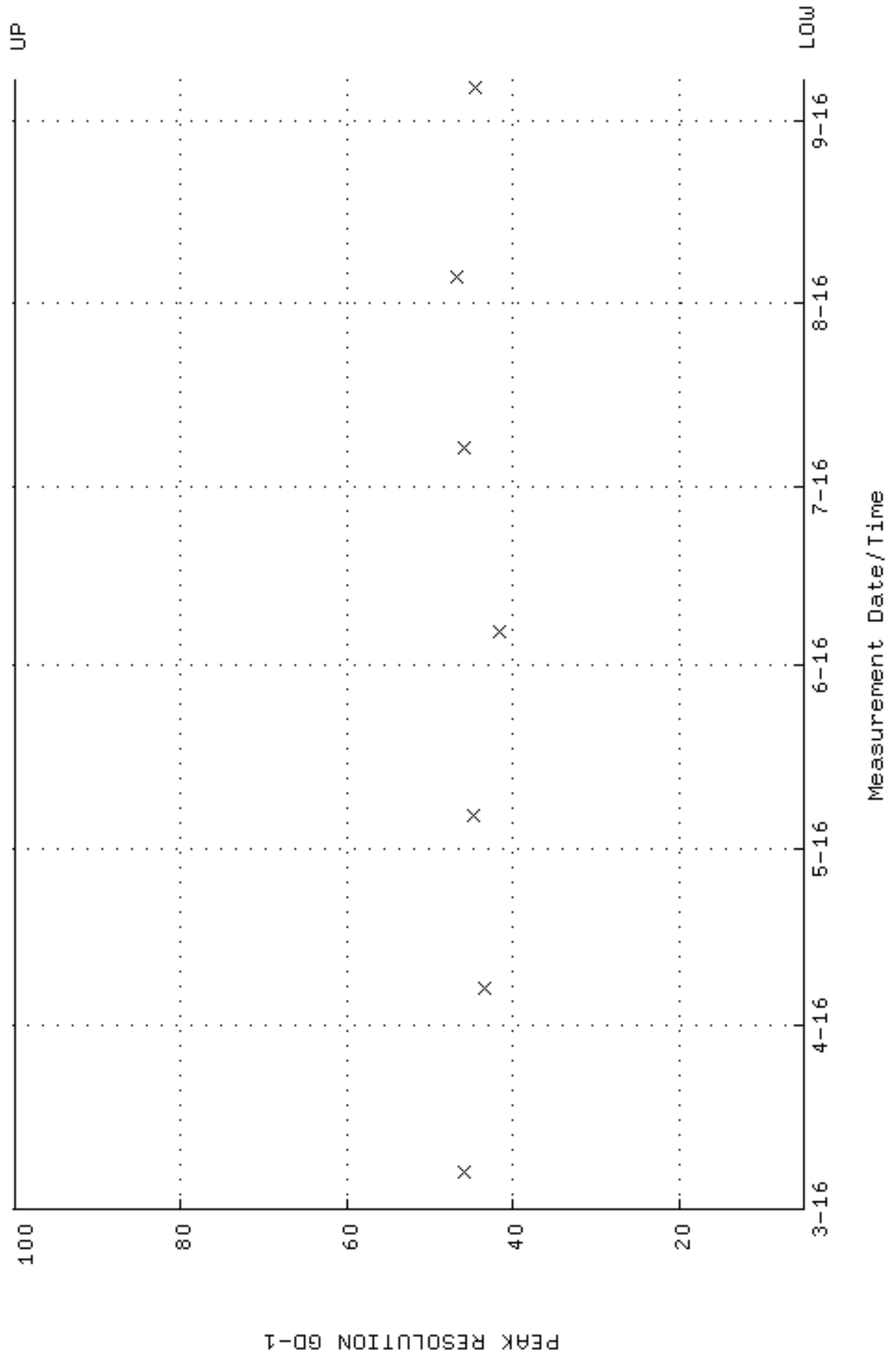
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 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 7-MAR-2016 09:54:02 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.324335 through 0.344400



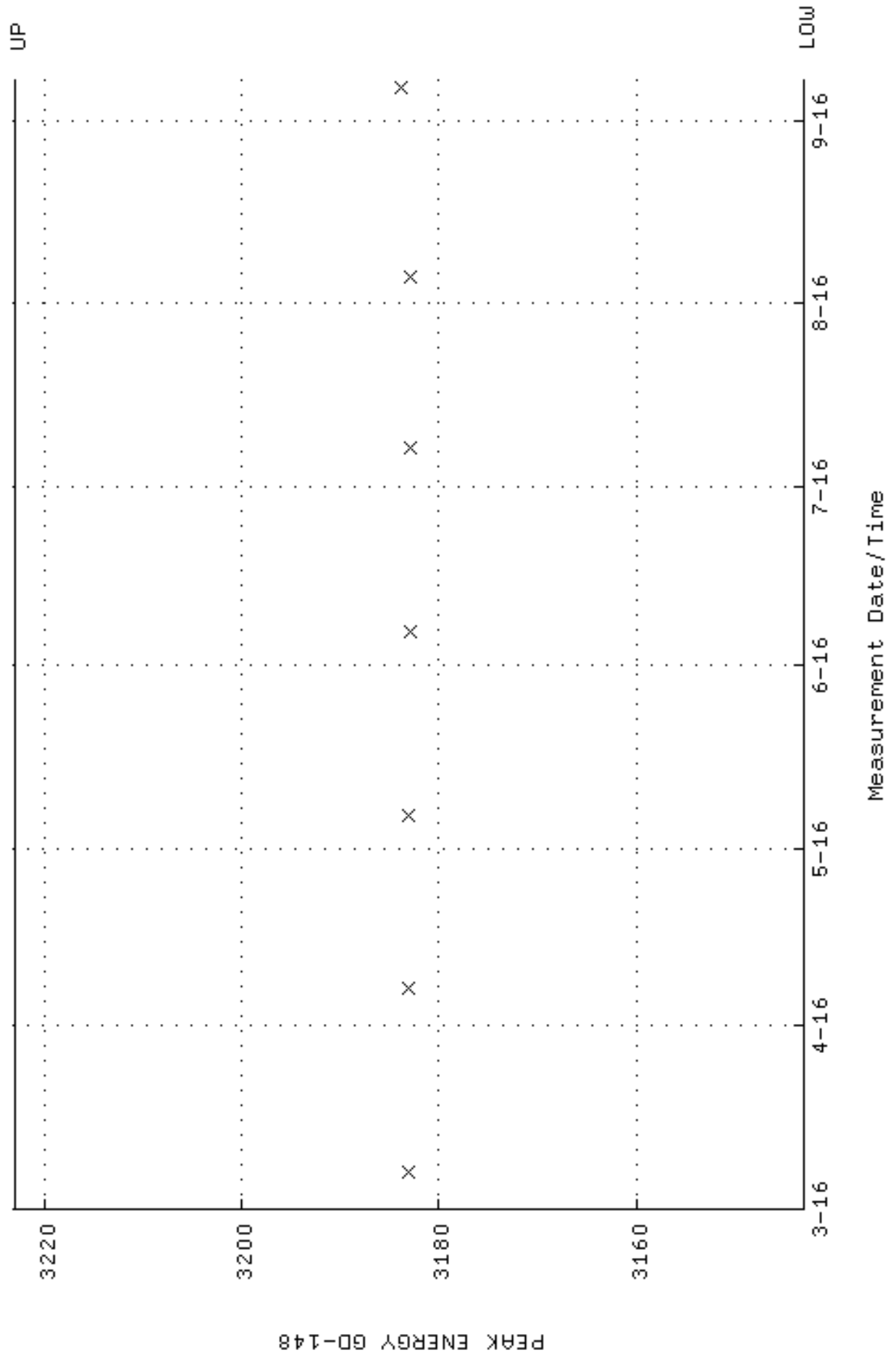
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Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 7-MAR-2016 09:54:02 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



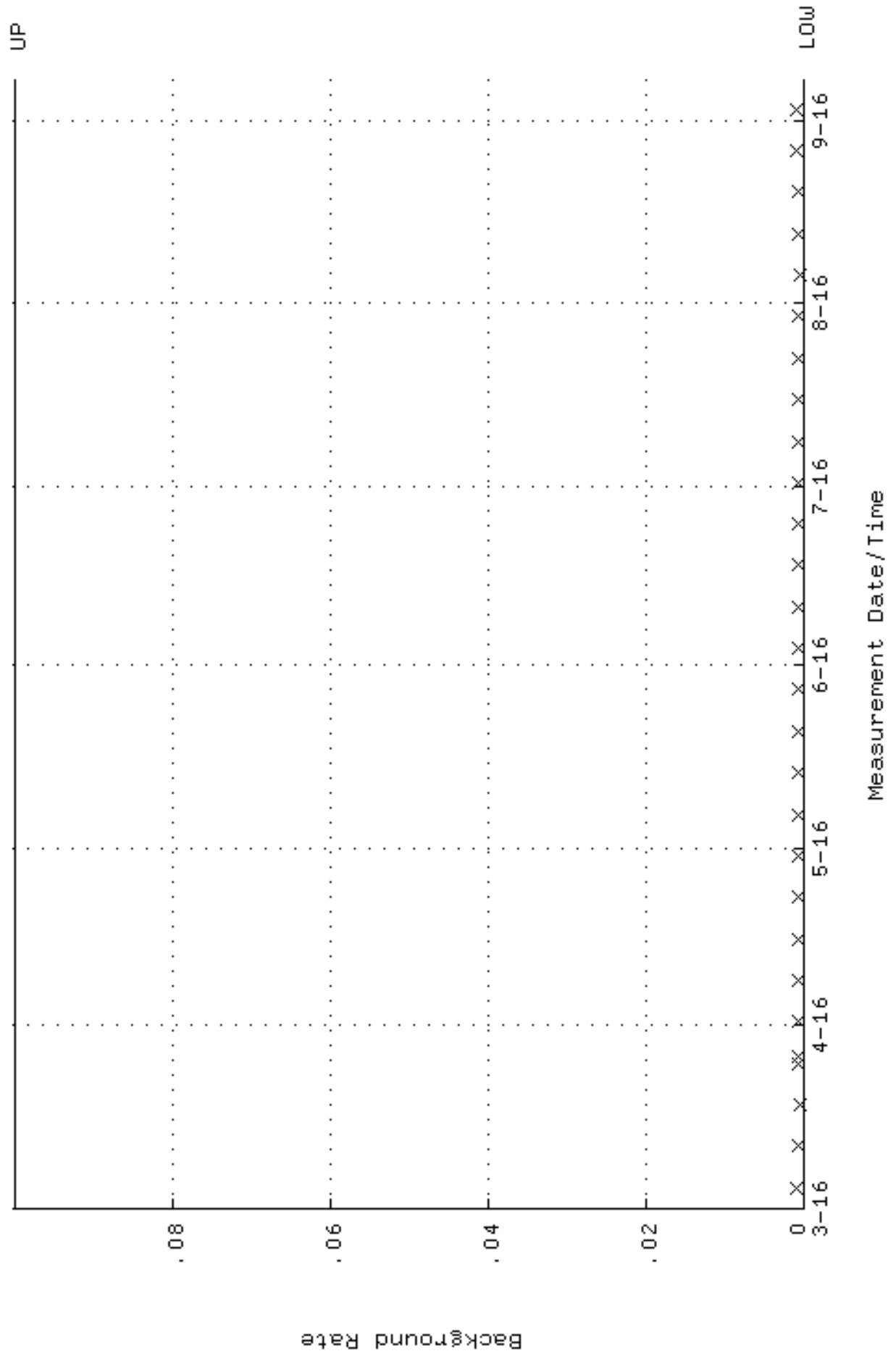
QA filename : DKA100:[ENV_ALPHA.QA.W]W105.QAF;12
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 7-MAR-2016 09:54:02 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



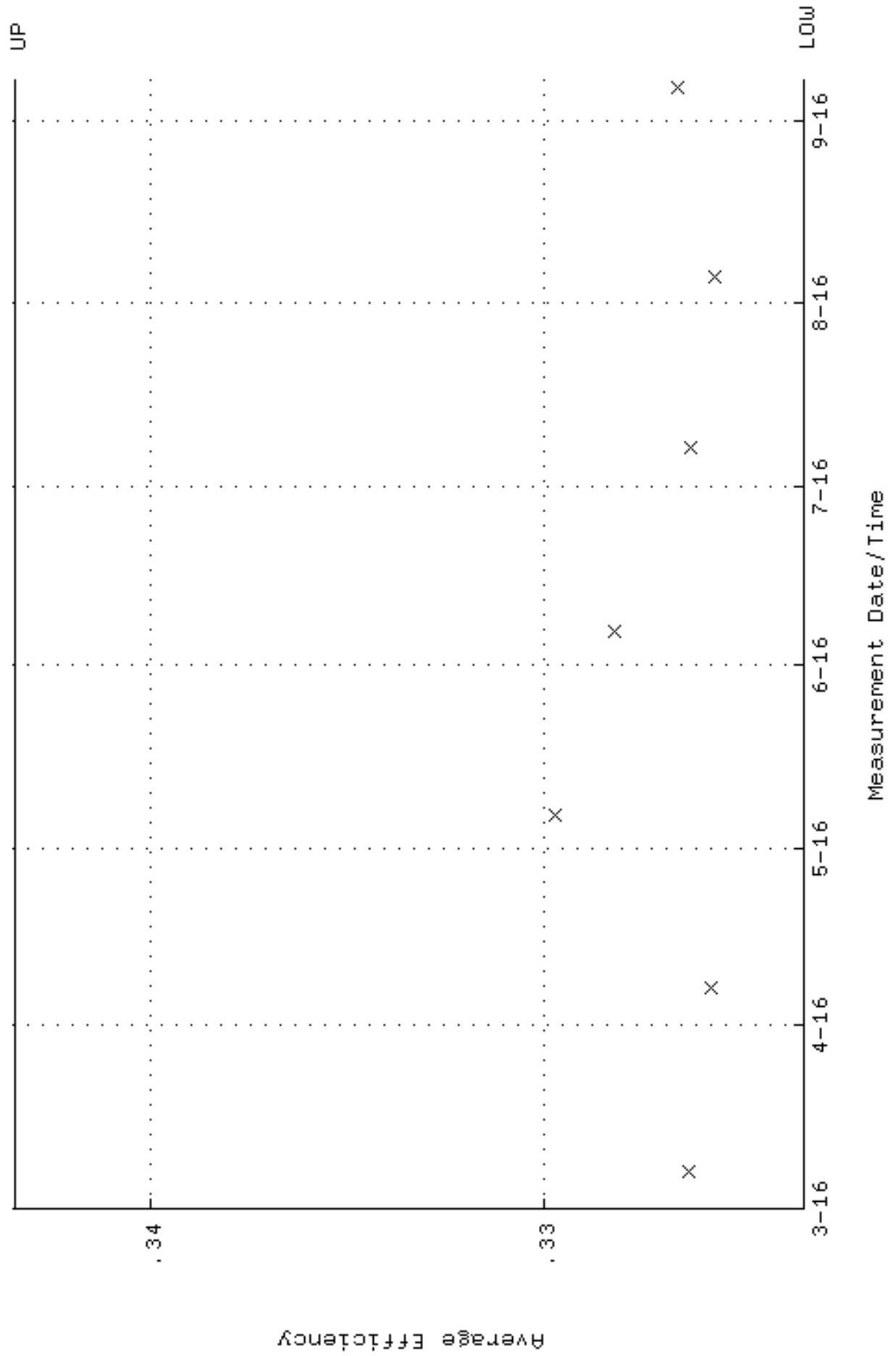
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:02 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



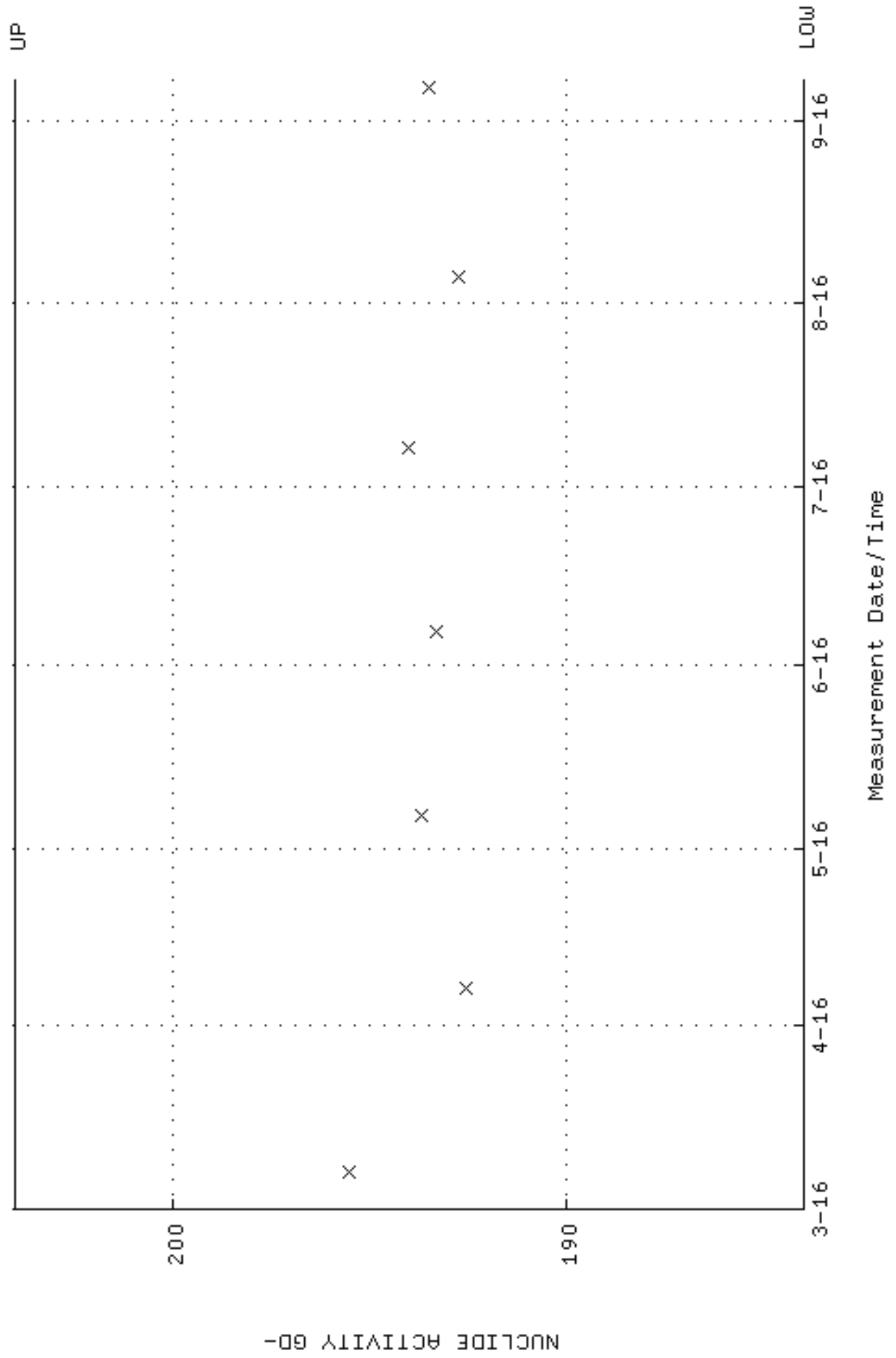
QA filename : DKA100:[ENV_ALPHA.QA.B]B105.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:51:39 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



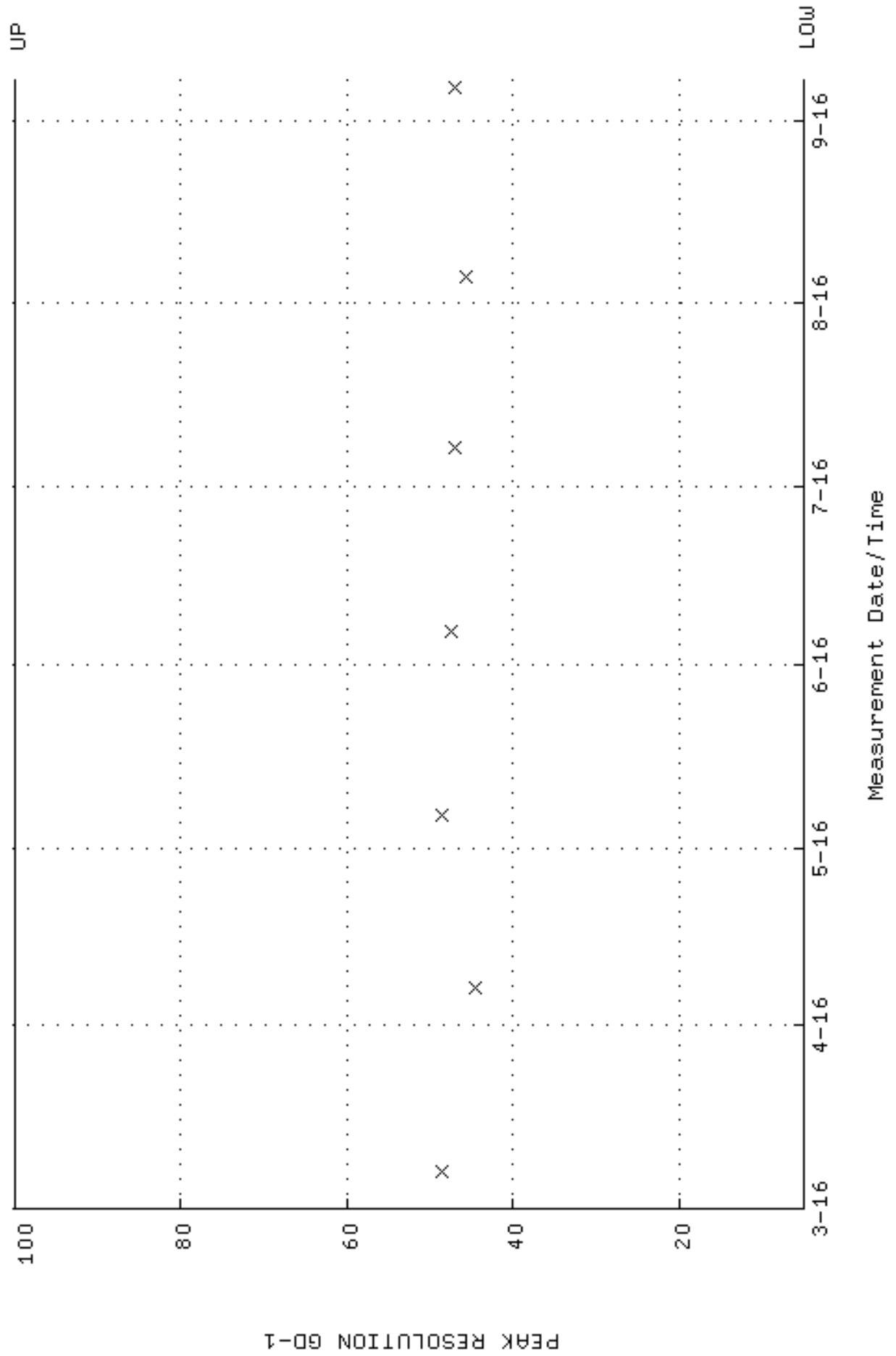
QA filename : DKA100:[ENV_ALPHA.QA.W]W106.QAF;11
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 7-MAR-2016 09:54:02 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.323416 through 0.343420



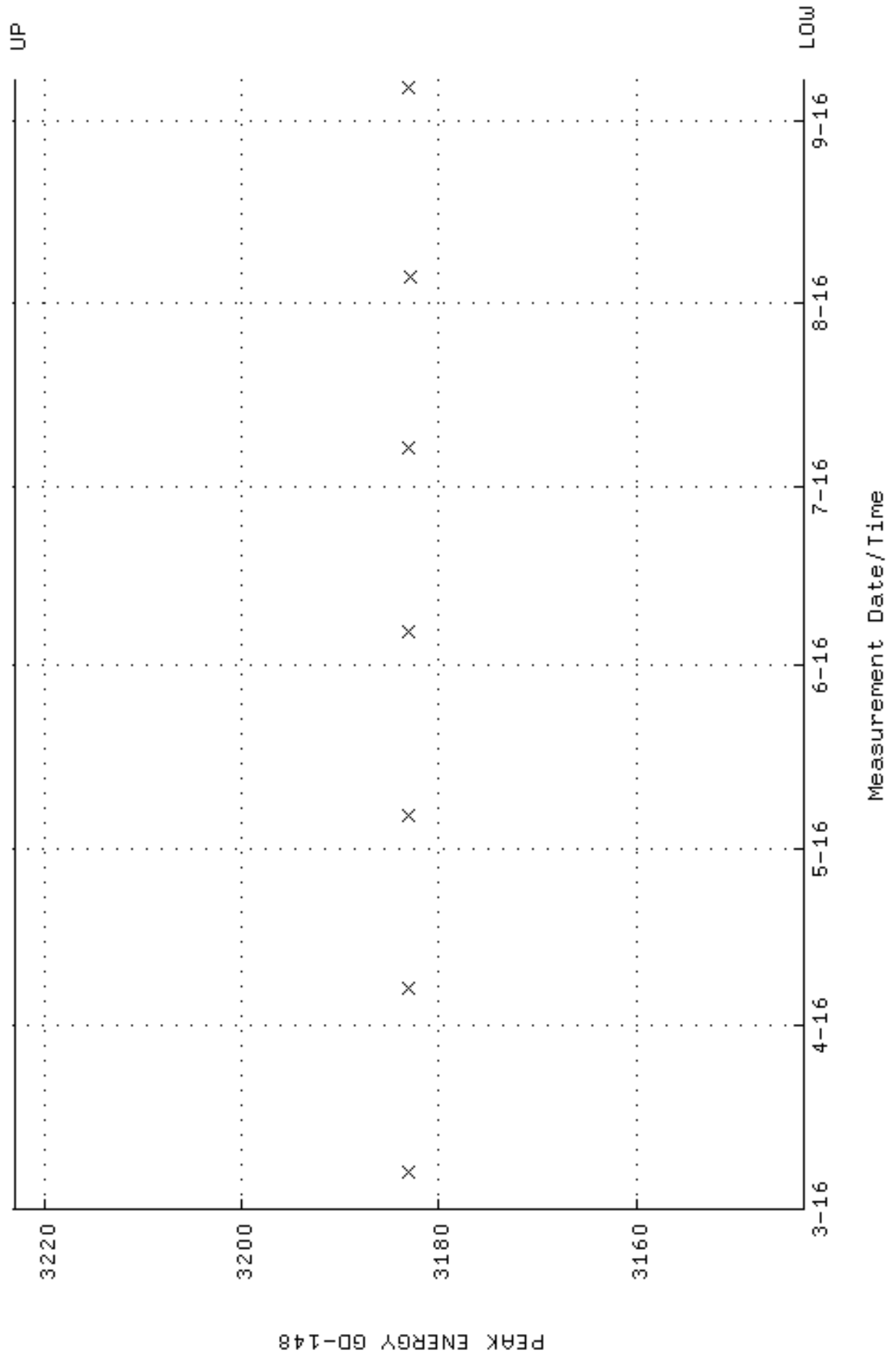
QA filename : DKA100:[ENV_ALPHA.QA.W]W106.QAF;11
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 7-MAR-2016 09:54:02 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



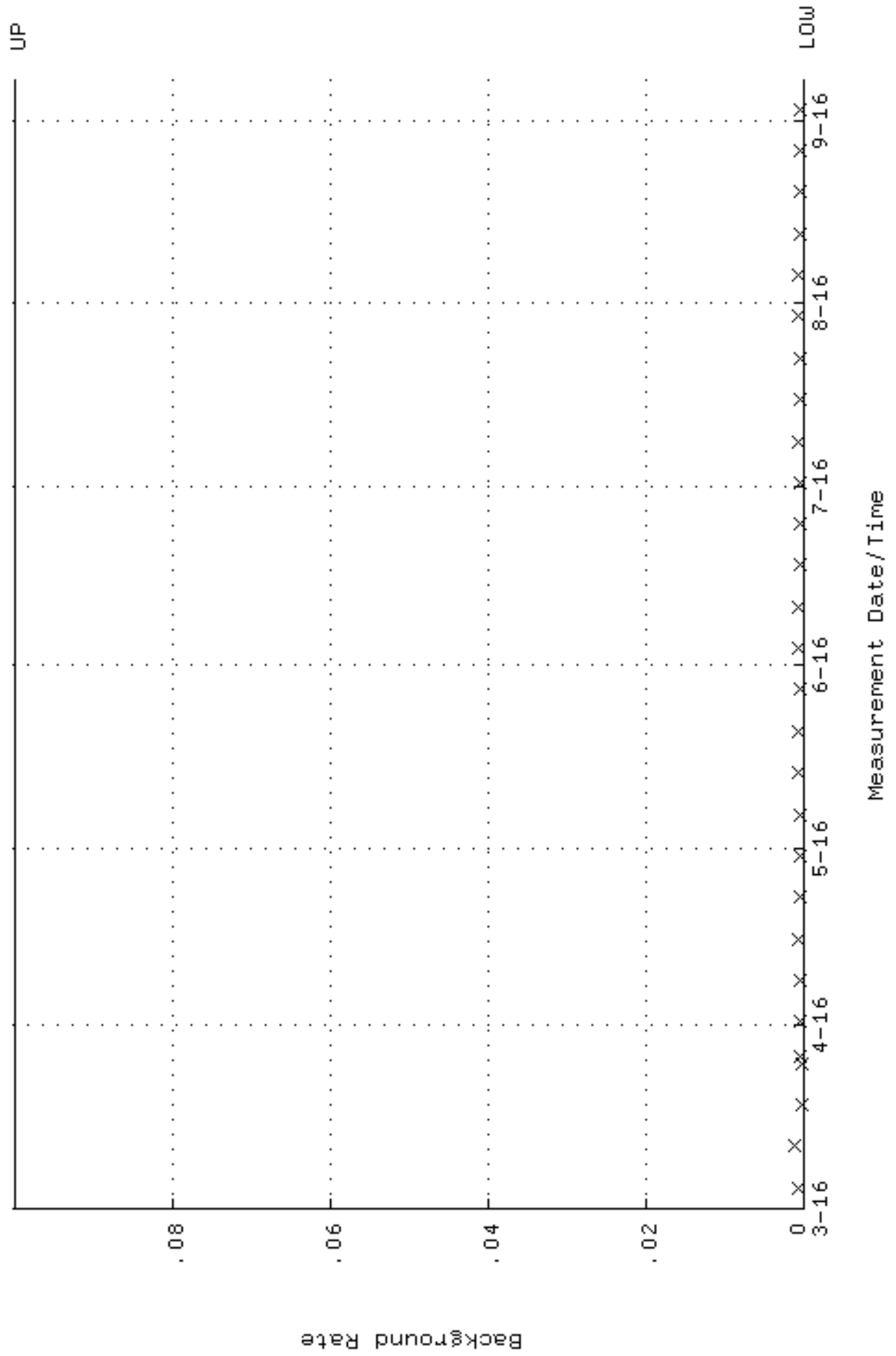
QA filename : DKA100:[ENV_ALPHA.QA.W]W106.QAF;11
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 7-MAR-2016 09:54:02 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



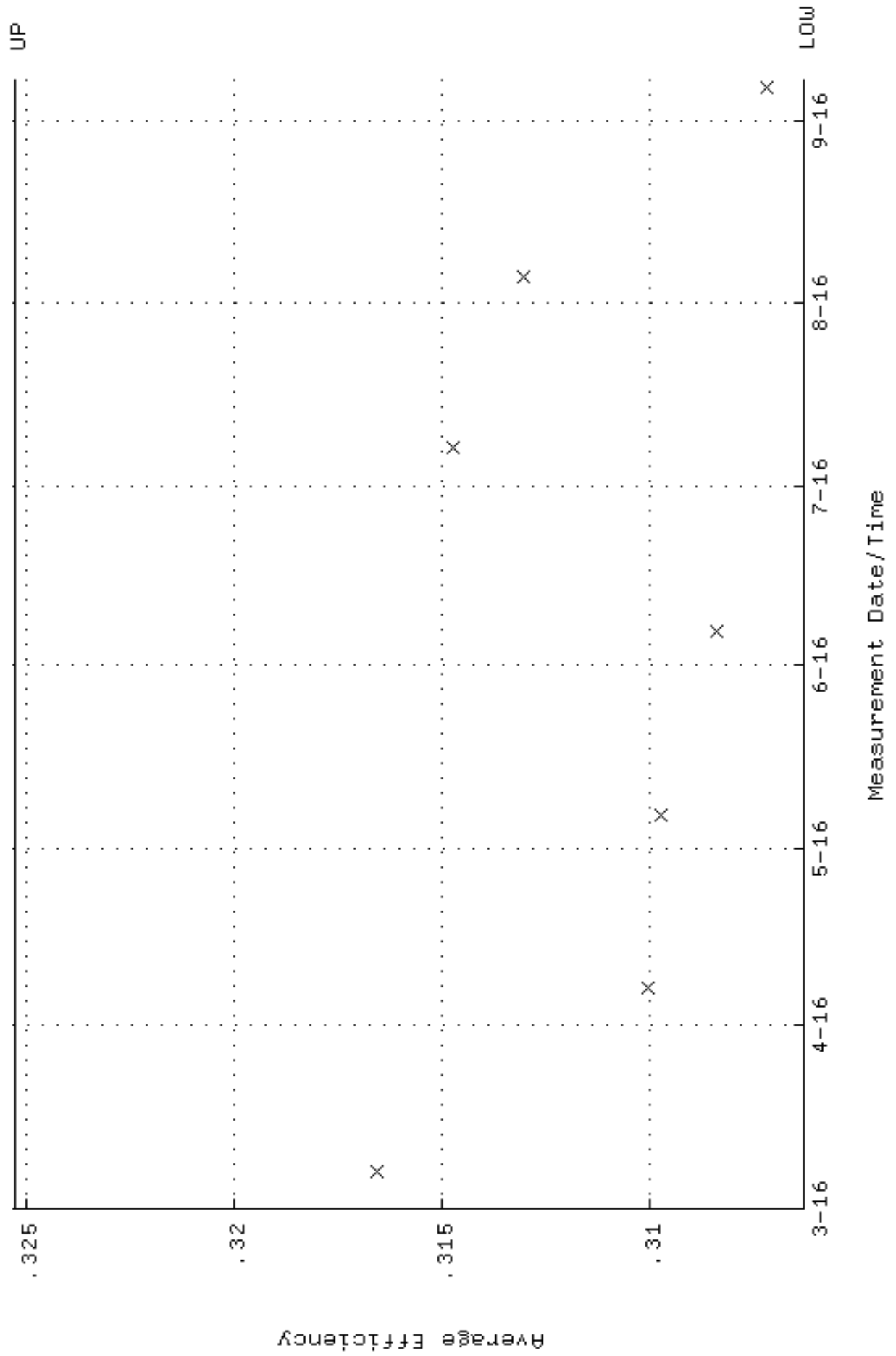
QA filename : DKA100:[ENV_ALPHA.QA.W]W106.QAF;11
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:02 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



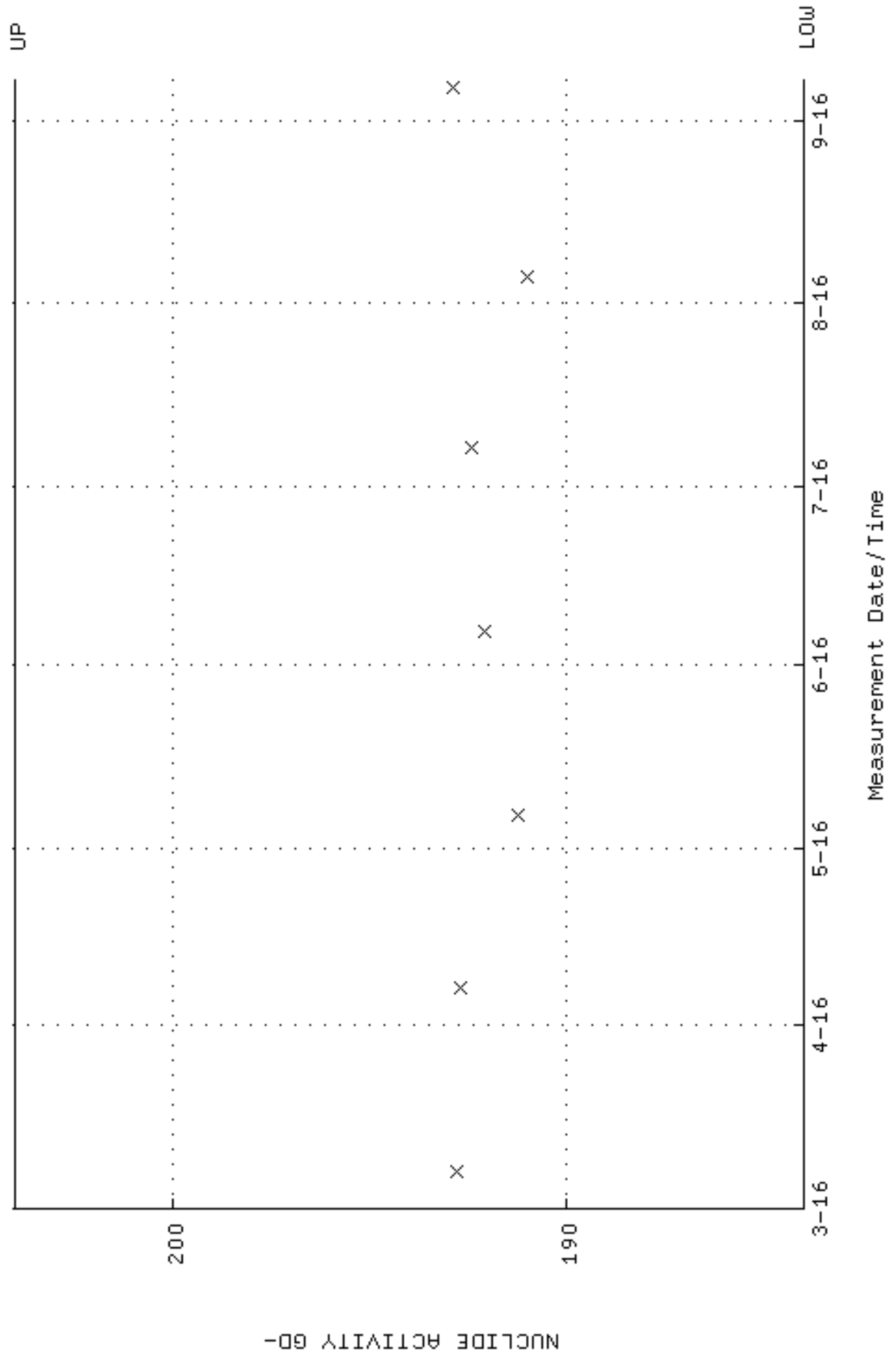
QA filename : DKA100:[ENV_ALPHA.QA.B]B106.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:51:39 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



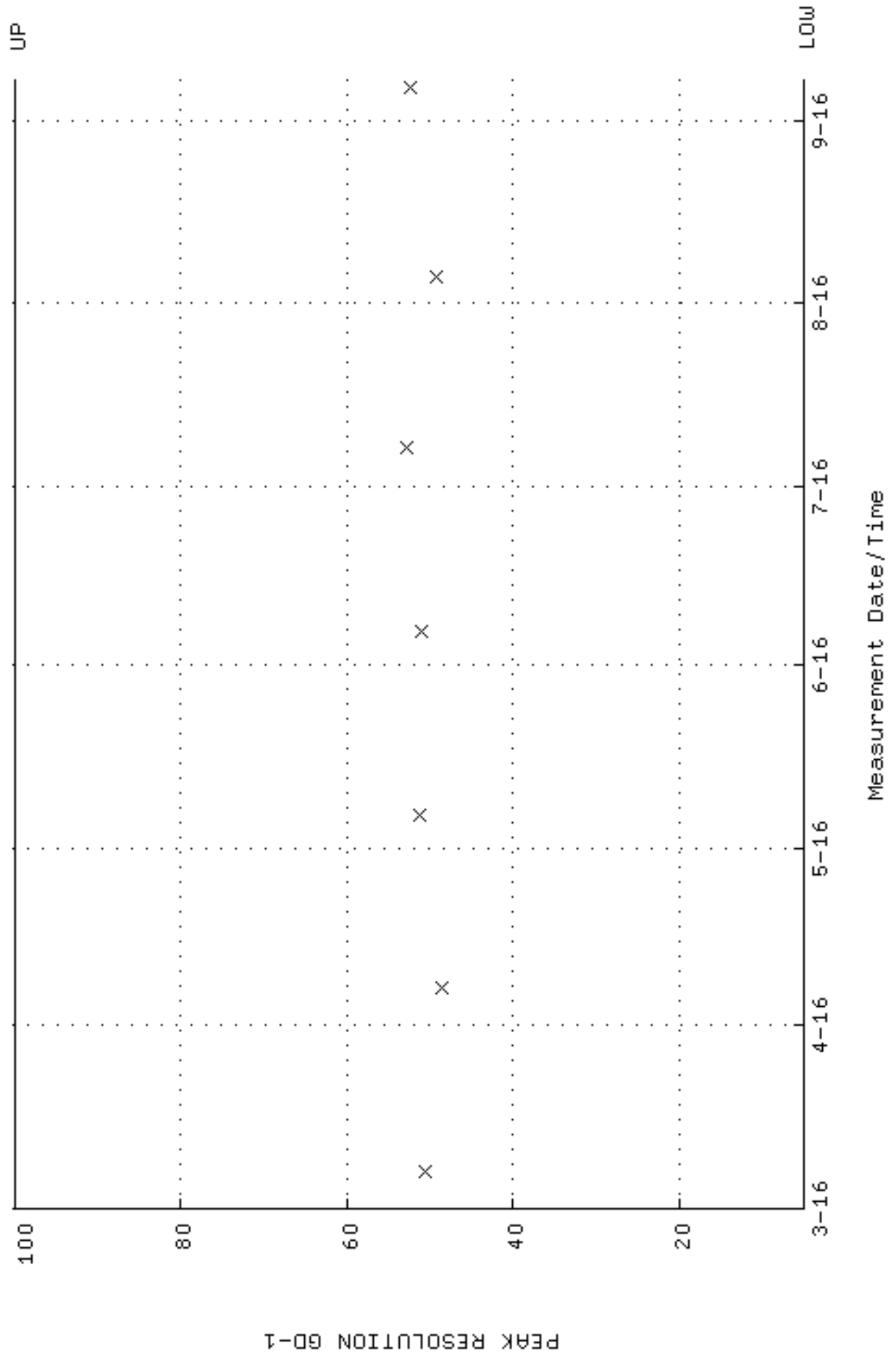
QA filename : DKA100:[ENV_ALPHA.QA.W]W107.QAF;11
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.306300 through 0.325260



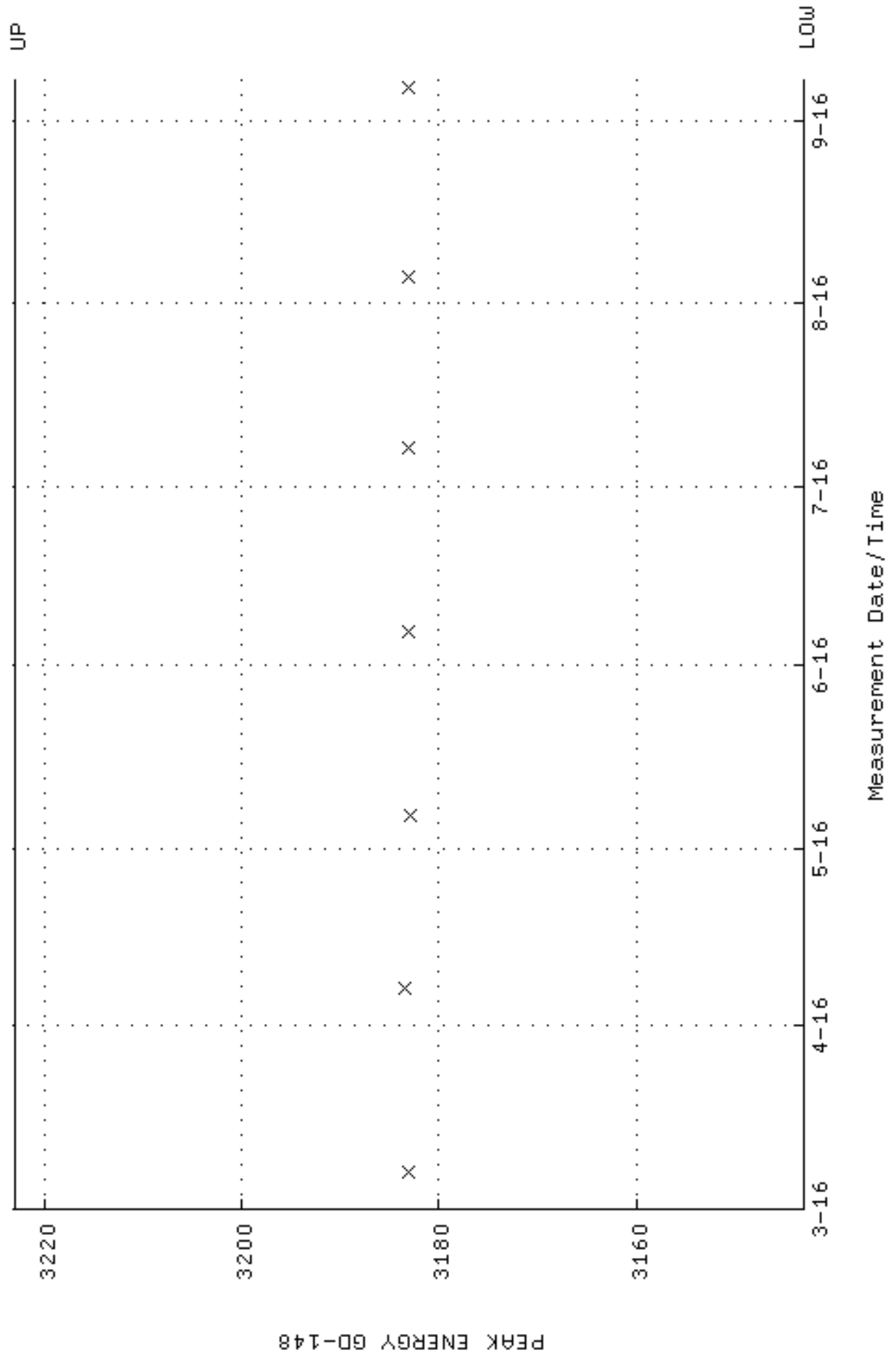
QA filename : DKA100:[ENV_ALPHA.QA.W]W107.QAF;11
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



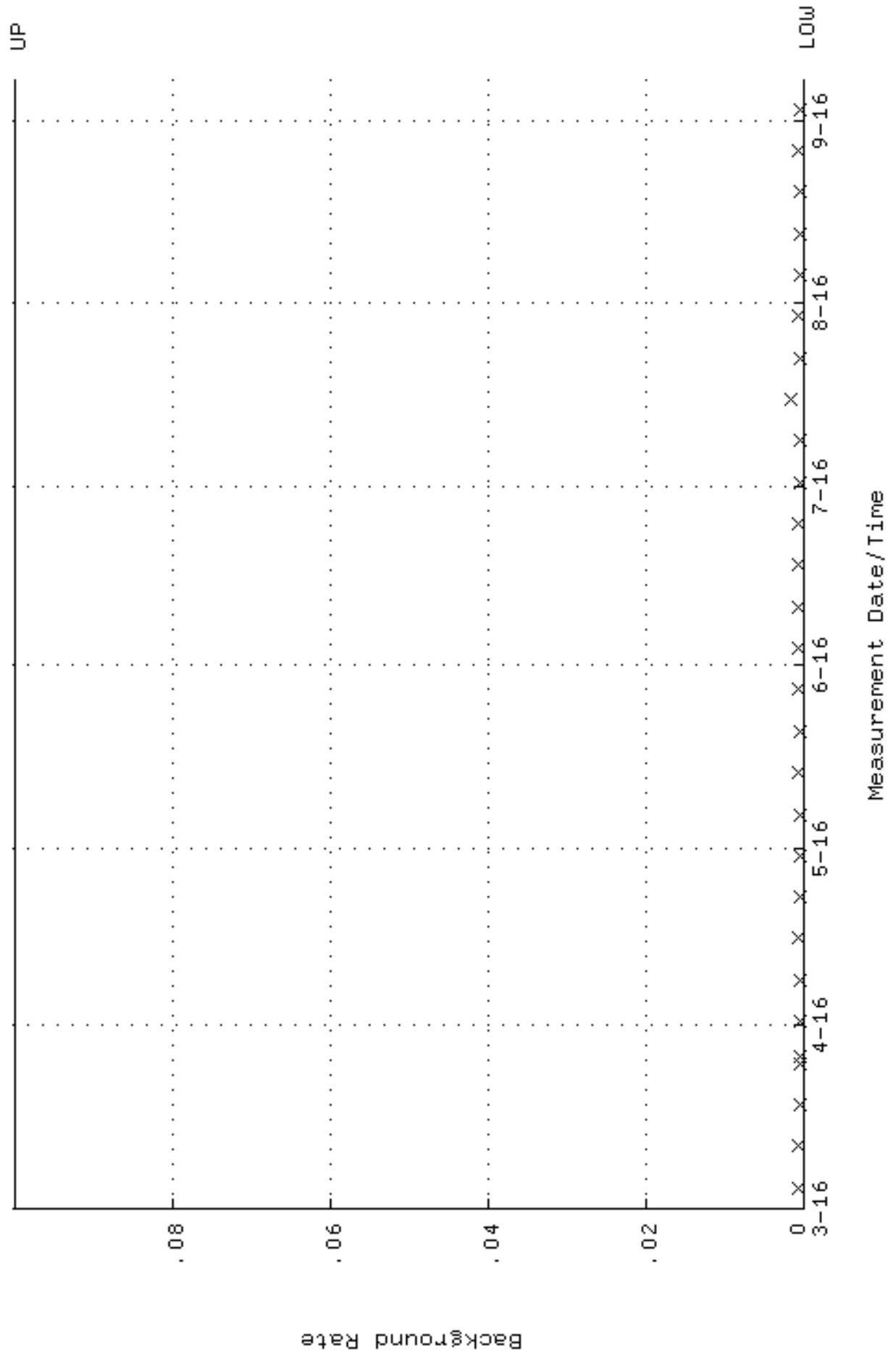
QA filename : DKA100:[ENV_ALPHA.QA.W]W107.QAF;11
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



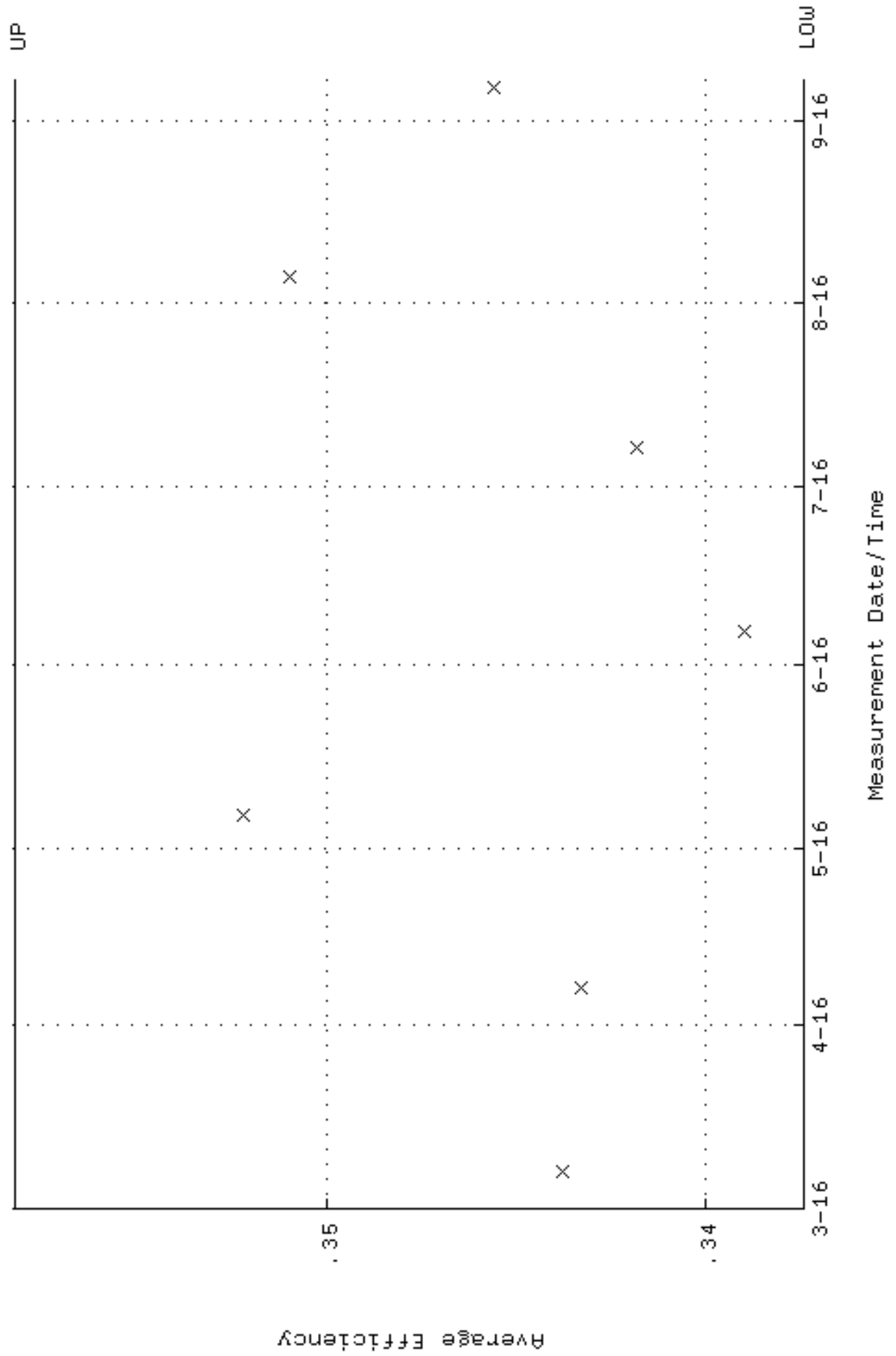
QA filename : DKA100:[ENV_ALPHA.QA.W]W107.QAF;11
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



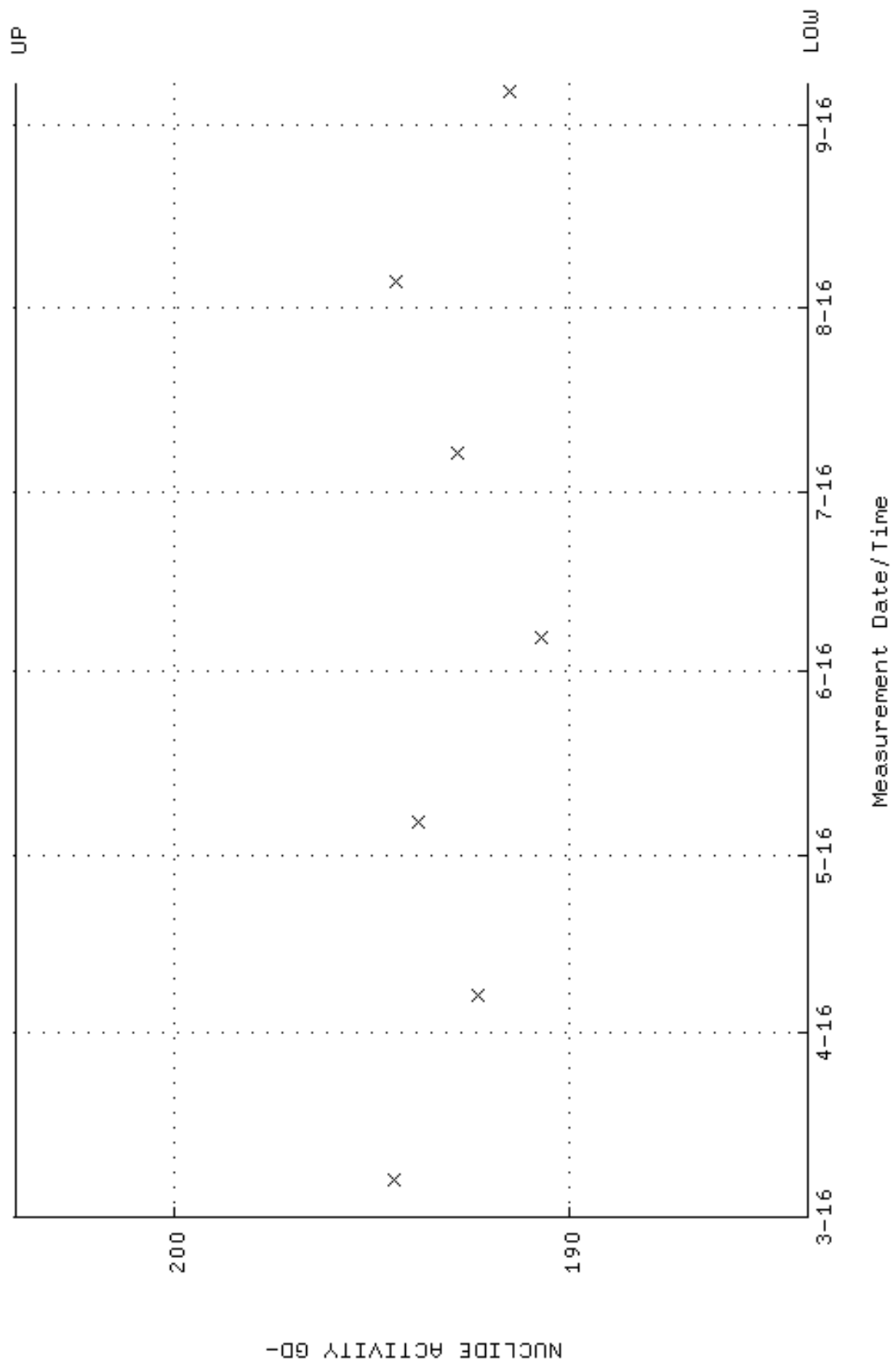
QA filename : DKA100:[ENV_ALPHA.QA.B]B107.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:51:41 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



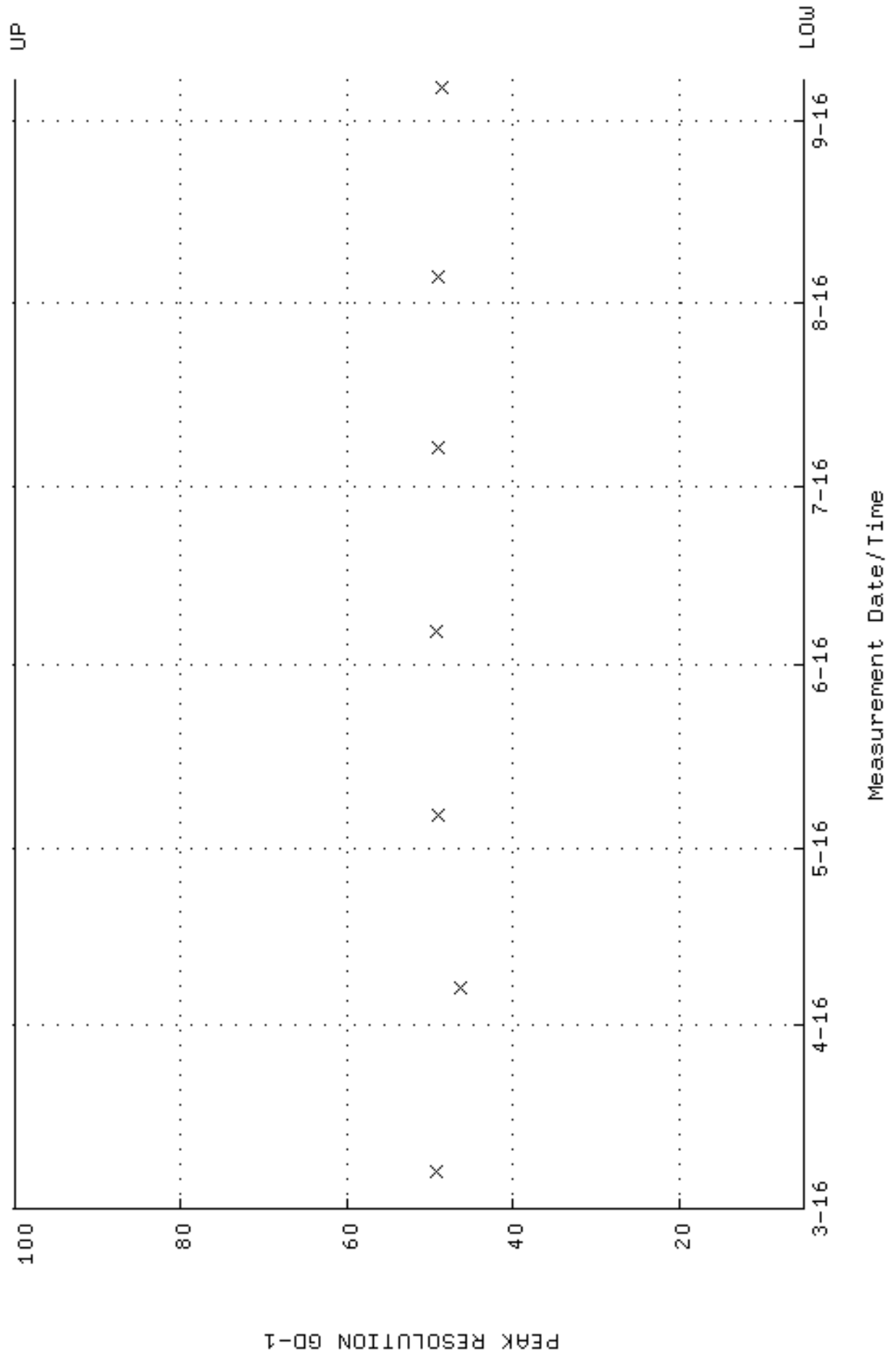
QA filename : DKA100:[ENV_ALPHA.QA.W]W108.QAF;11
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.337380 through 0.358250



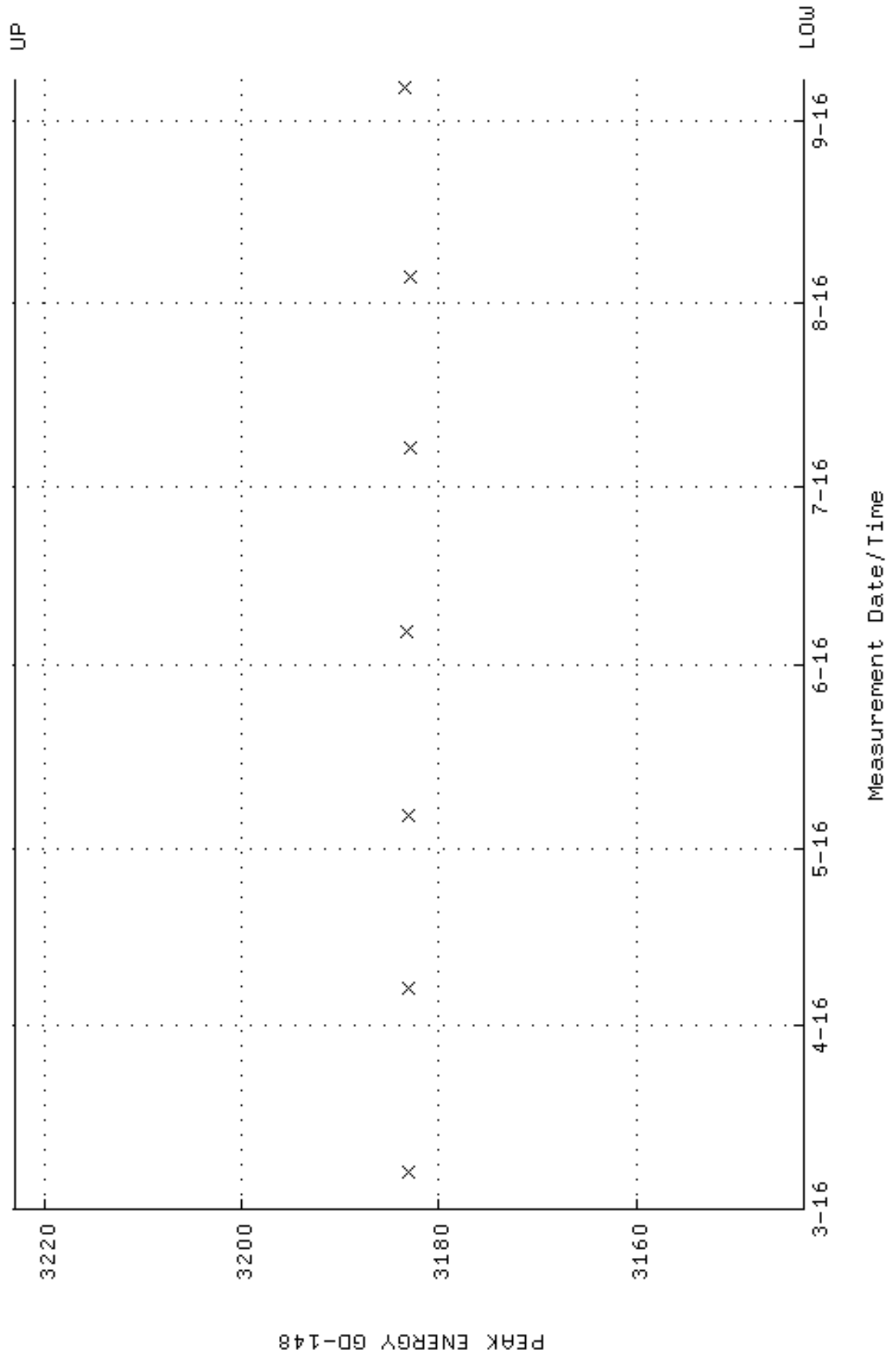
QA filename : DKA100:[ENV_ALPHA.QA.W]W108.QAF;11
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



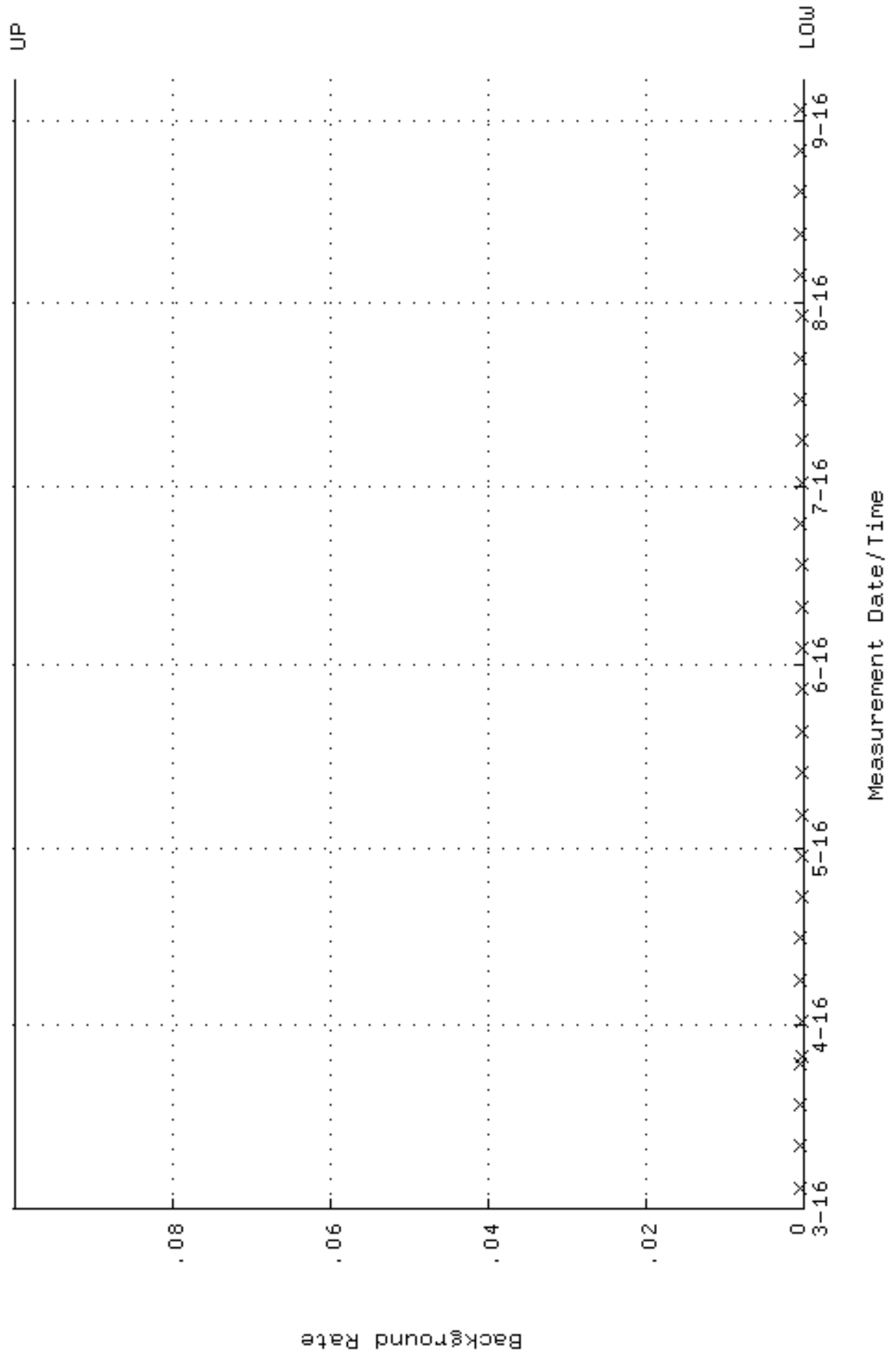
QA filename : DKA100:[ENV_ALPHA.QA.W]W108.QAF;11
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



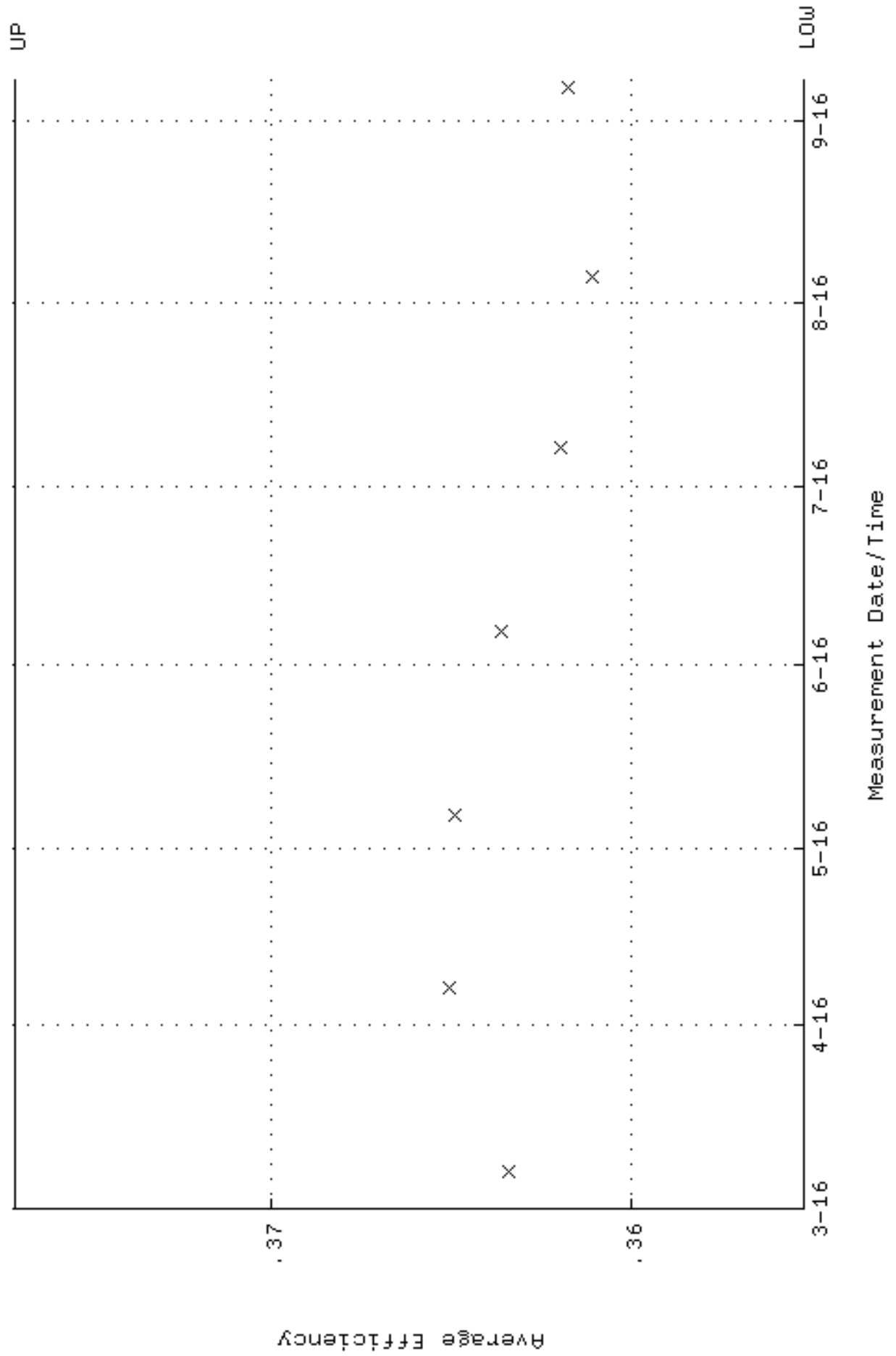
QA filename : DKA100:[ENV_ALPHA.QA.W]W108.QAF;11
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



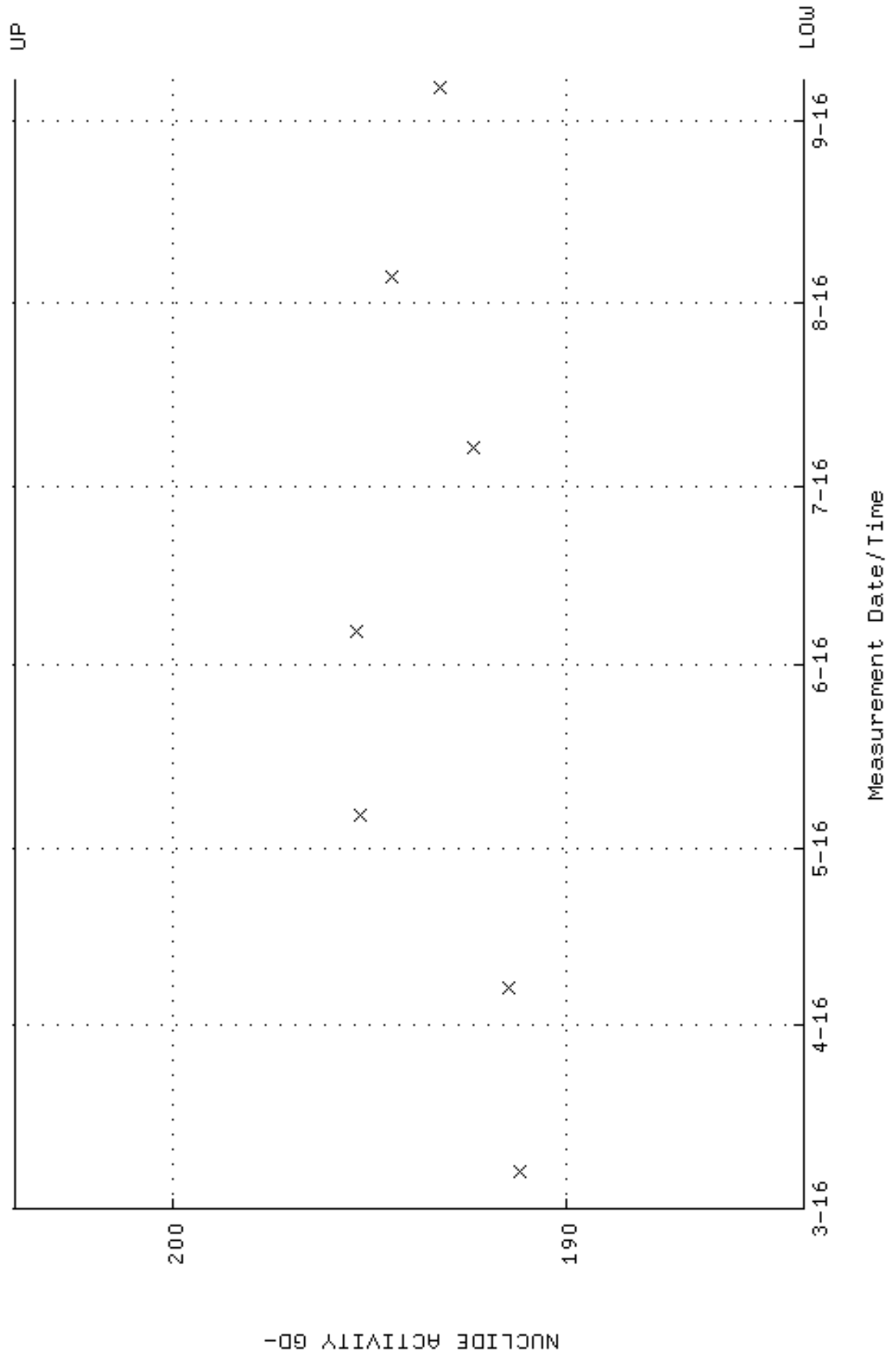
QA filename : DKA100:[ENV_ALPHA.QA.B]B108.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:51:41 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



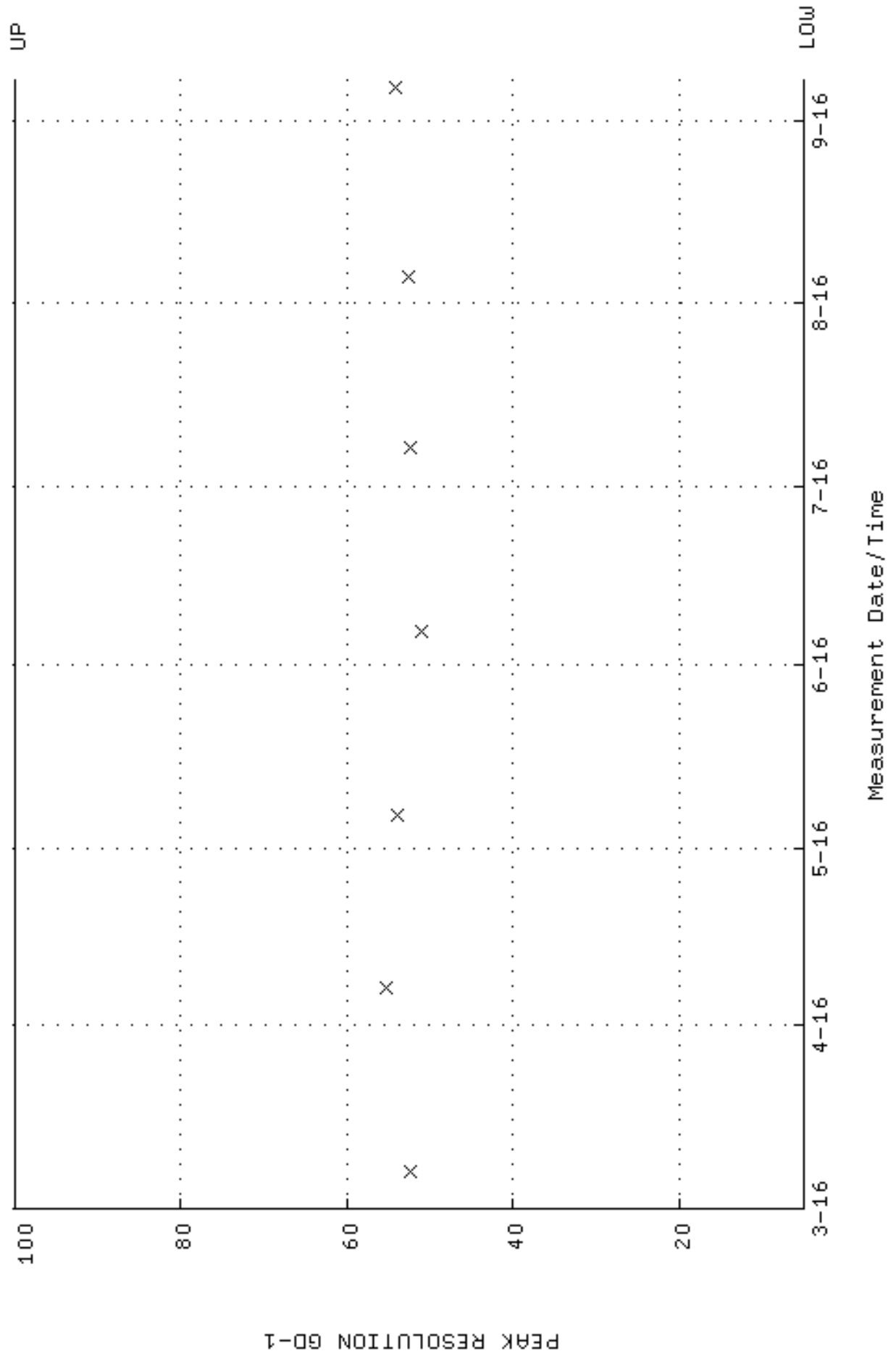
QA filename : DKA100:[ENV_ALPHA.QA.W]W109.QAF;11
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.355179 through 0.377149



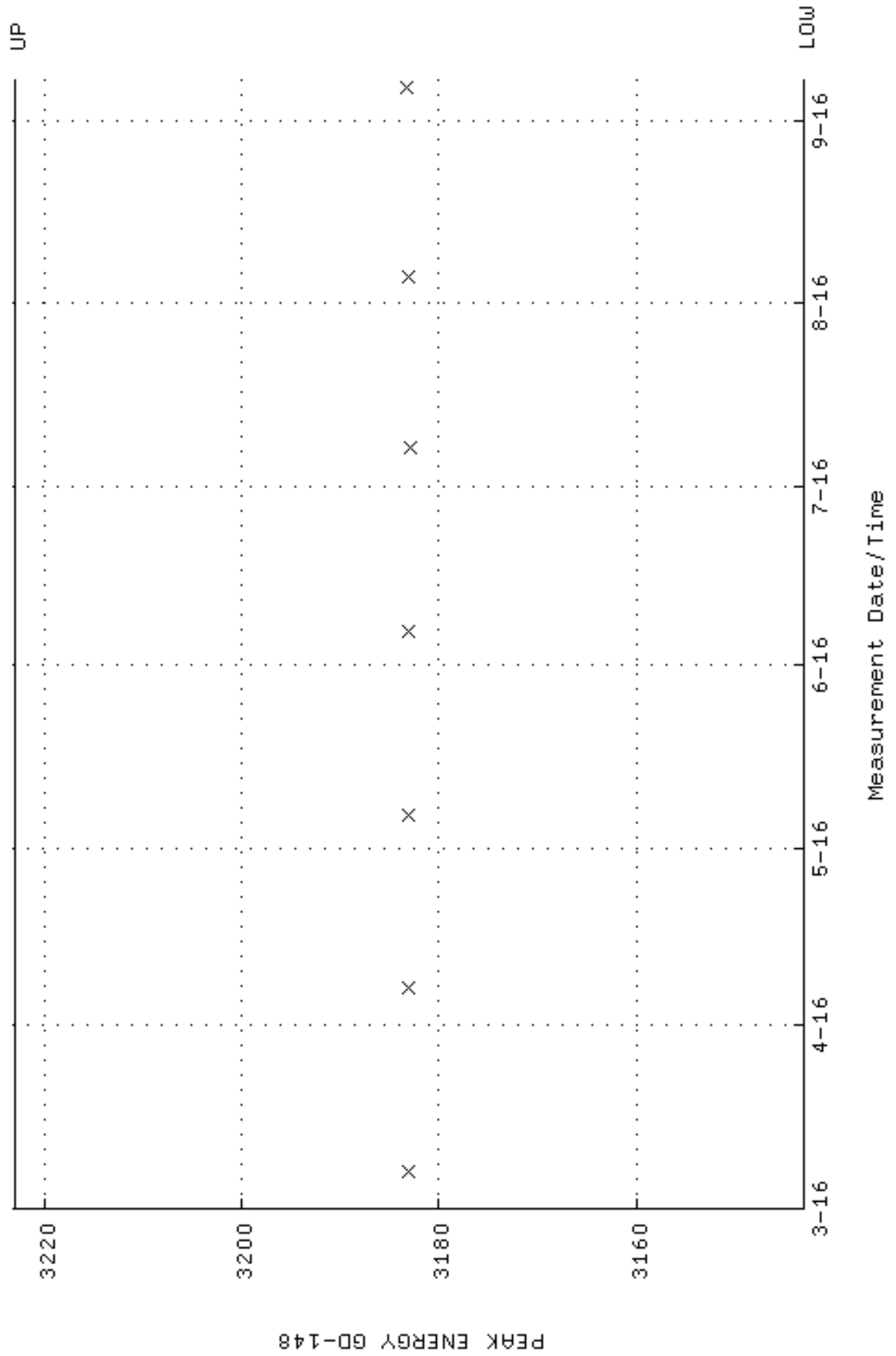
QA filename : DKA100:[ENV_ALPHA.QA.W]W109.QAF;11
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



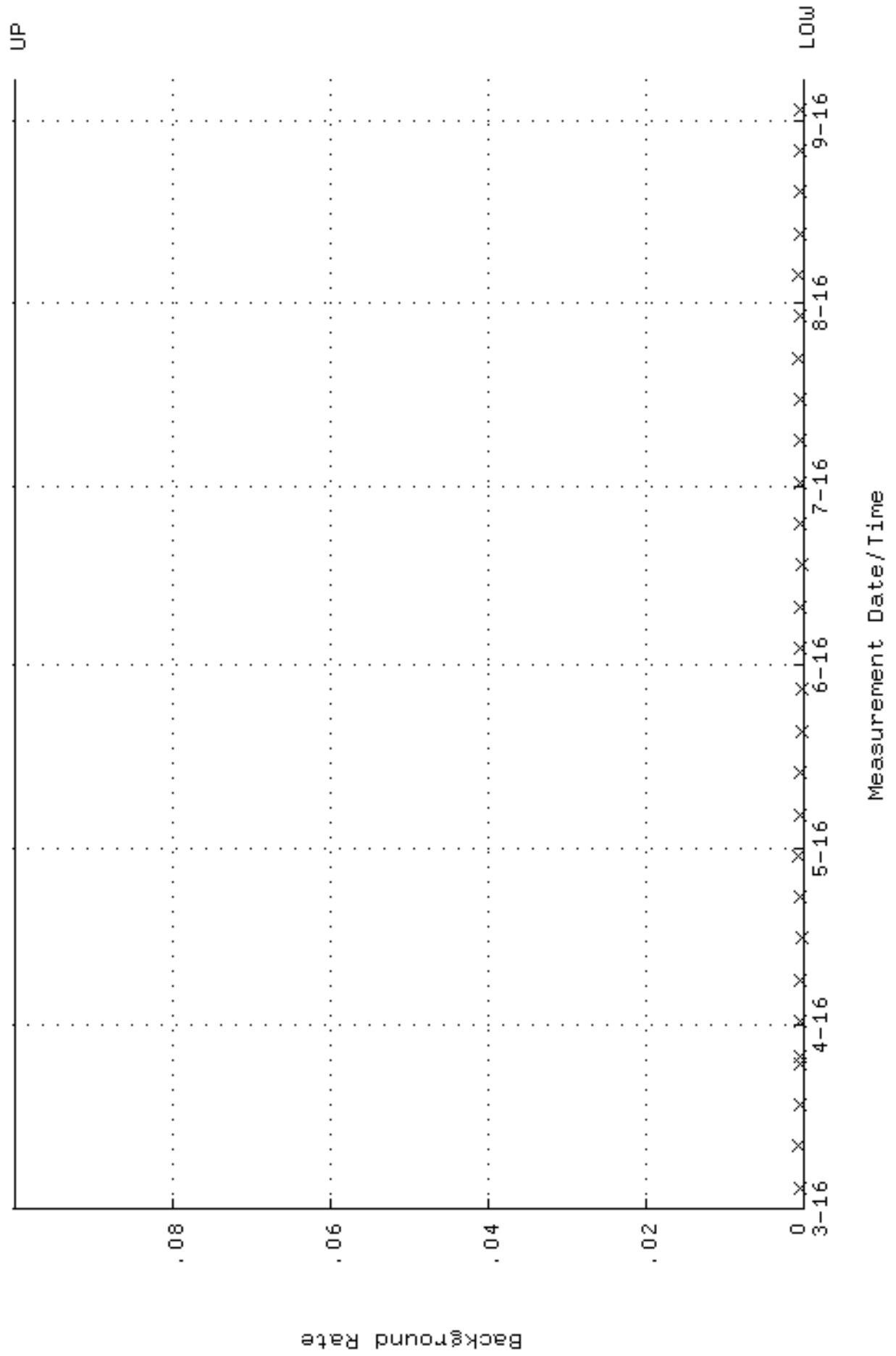
QA filename : DKA100:[ENV_ALPHA.QA.W]W109.QAF;11
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



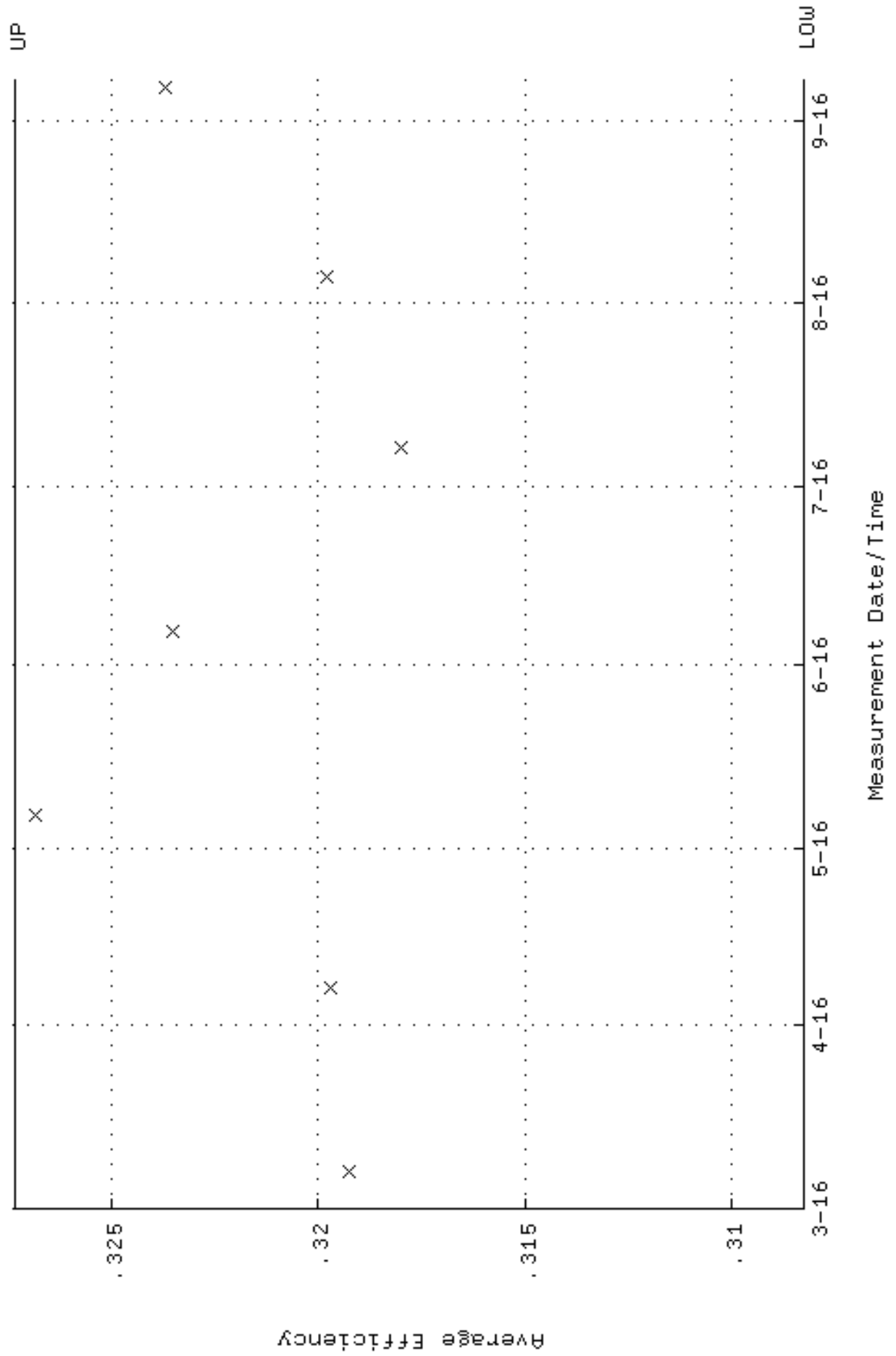
QA filename : DKA100:[ENV_ALPHA.QA.W]W109.QAF;11
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



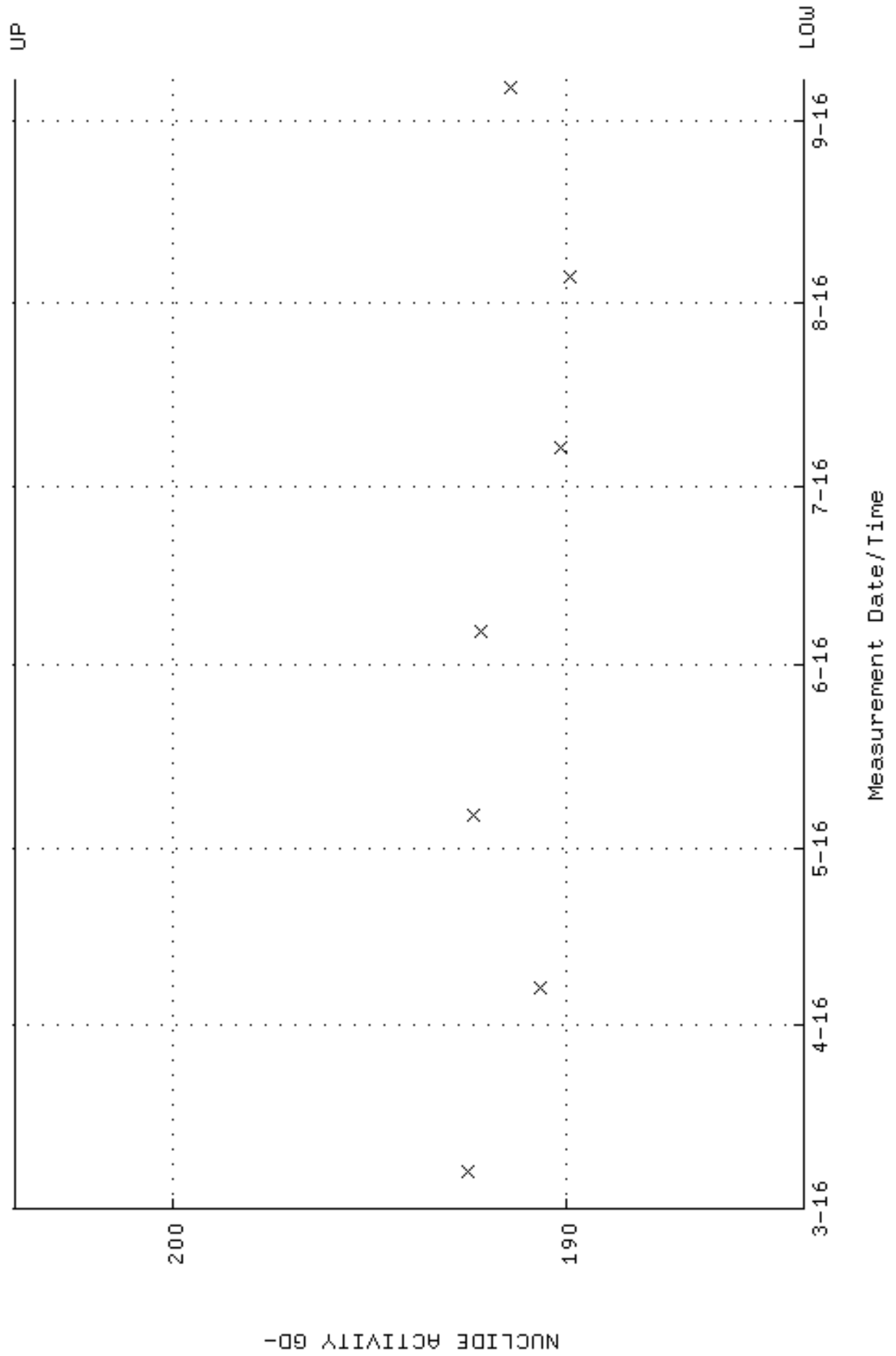
QA filename : DKA100:[ENV_ALPHA.QA.B]B109.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:51:41 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



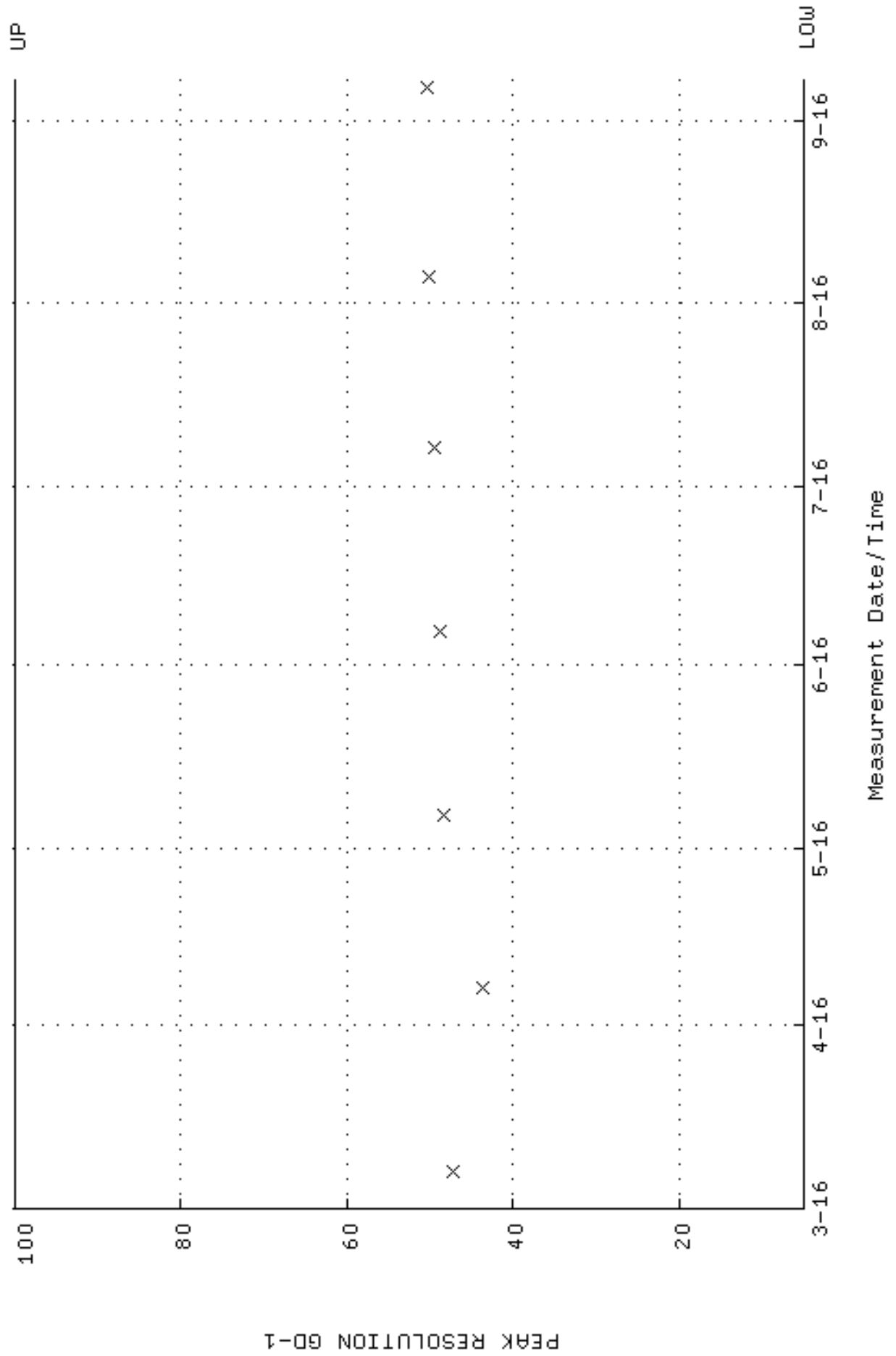
QA filename : DKA100:[ENV_ALPHA.QA.W]W110.QAF;11
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.308266 through 0.327334



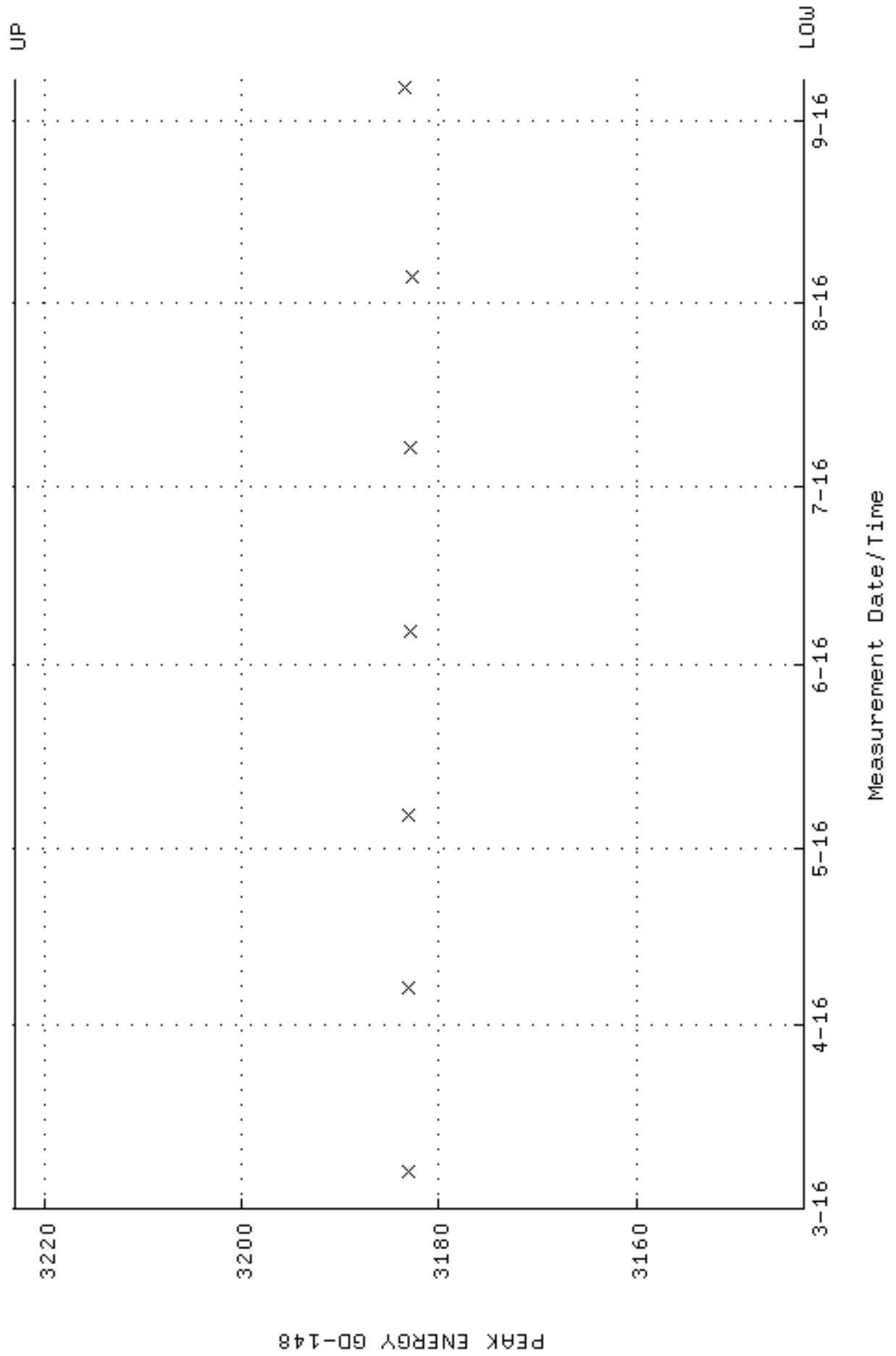
QA filename : DKA100:[ENV_ALPHA.QA.W]W110.QAF;11
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



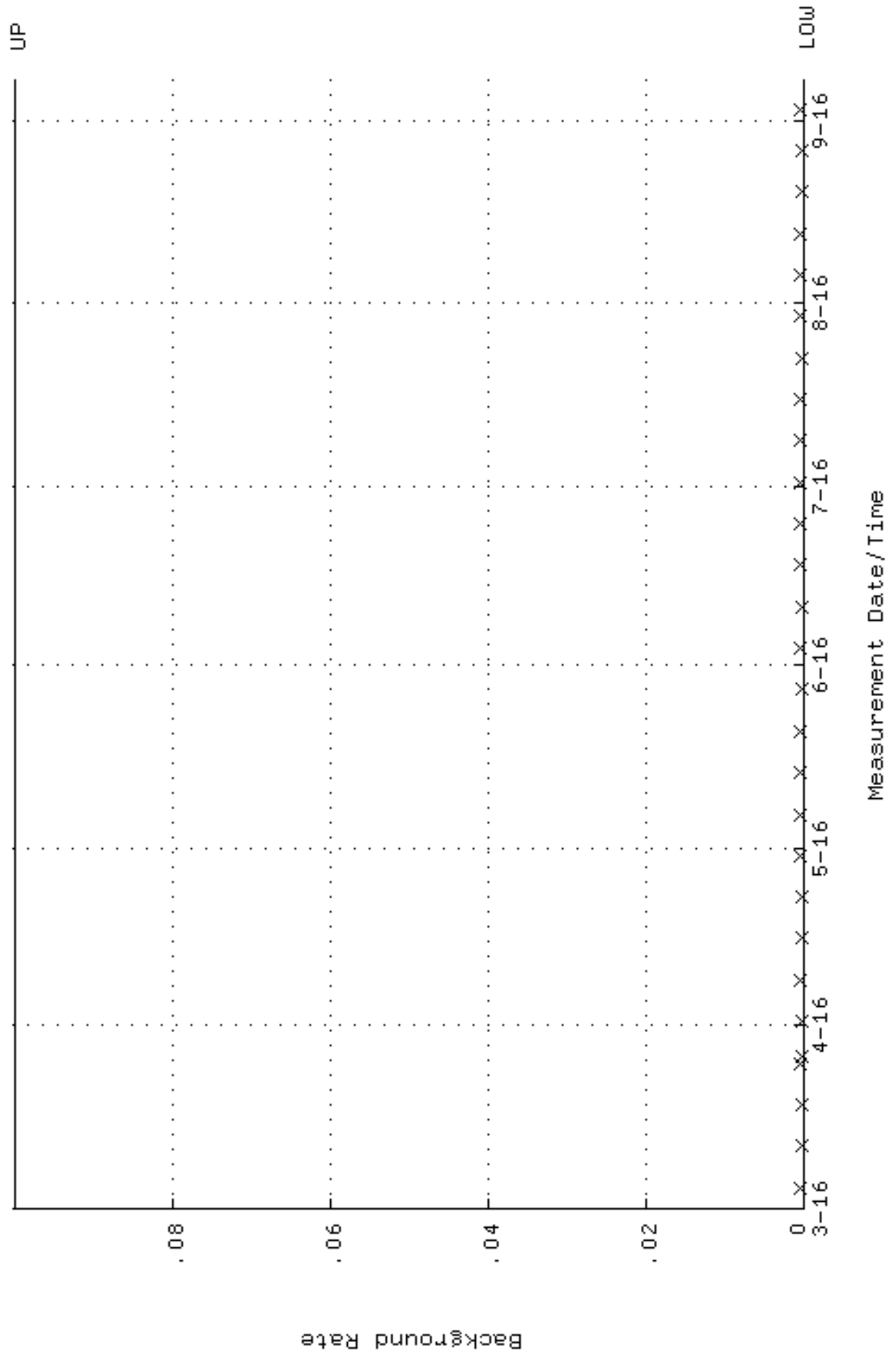
QA filename : DKA100:[ENV_ALPHA.QA.W]W110.QAF;11
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



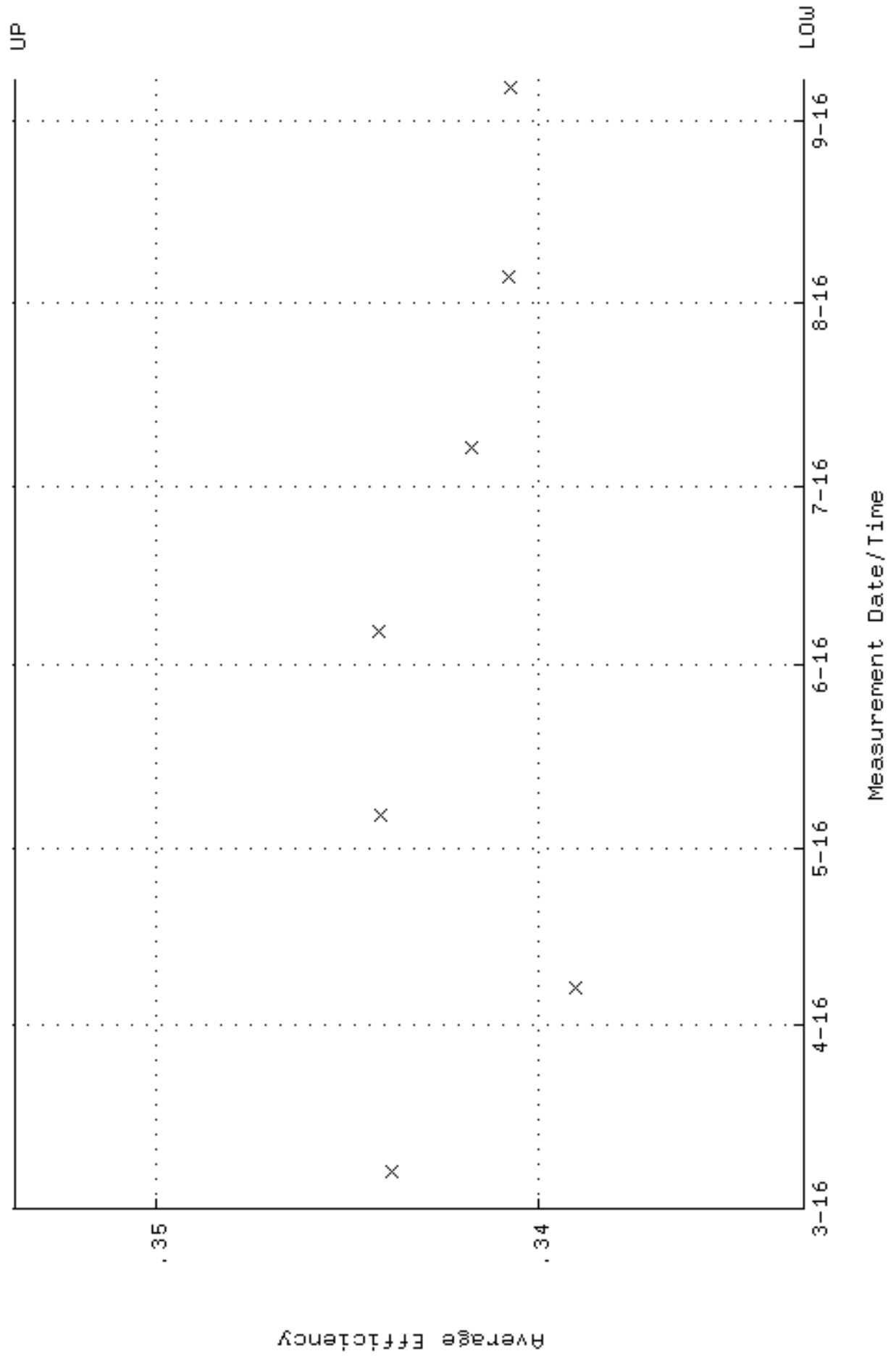
QA filename : DKA100:[ENV_ALPHA.QA.W]W110.QAF;11
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



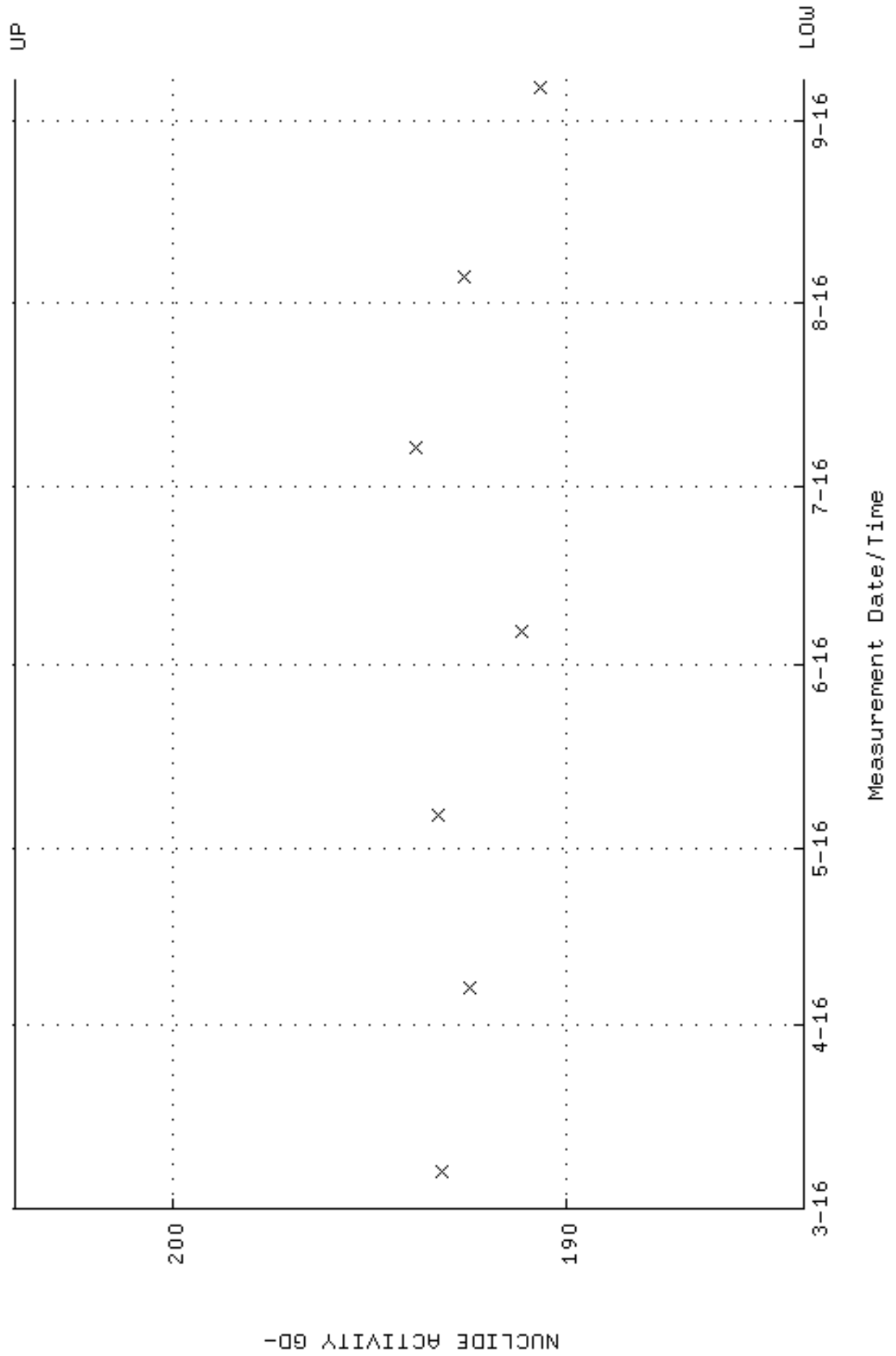
QA filename : DKA100:[ENV_ALPHA.QA.B]B110.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:51:41 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



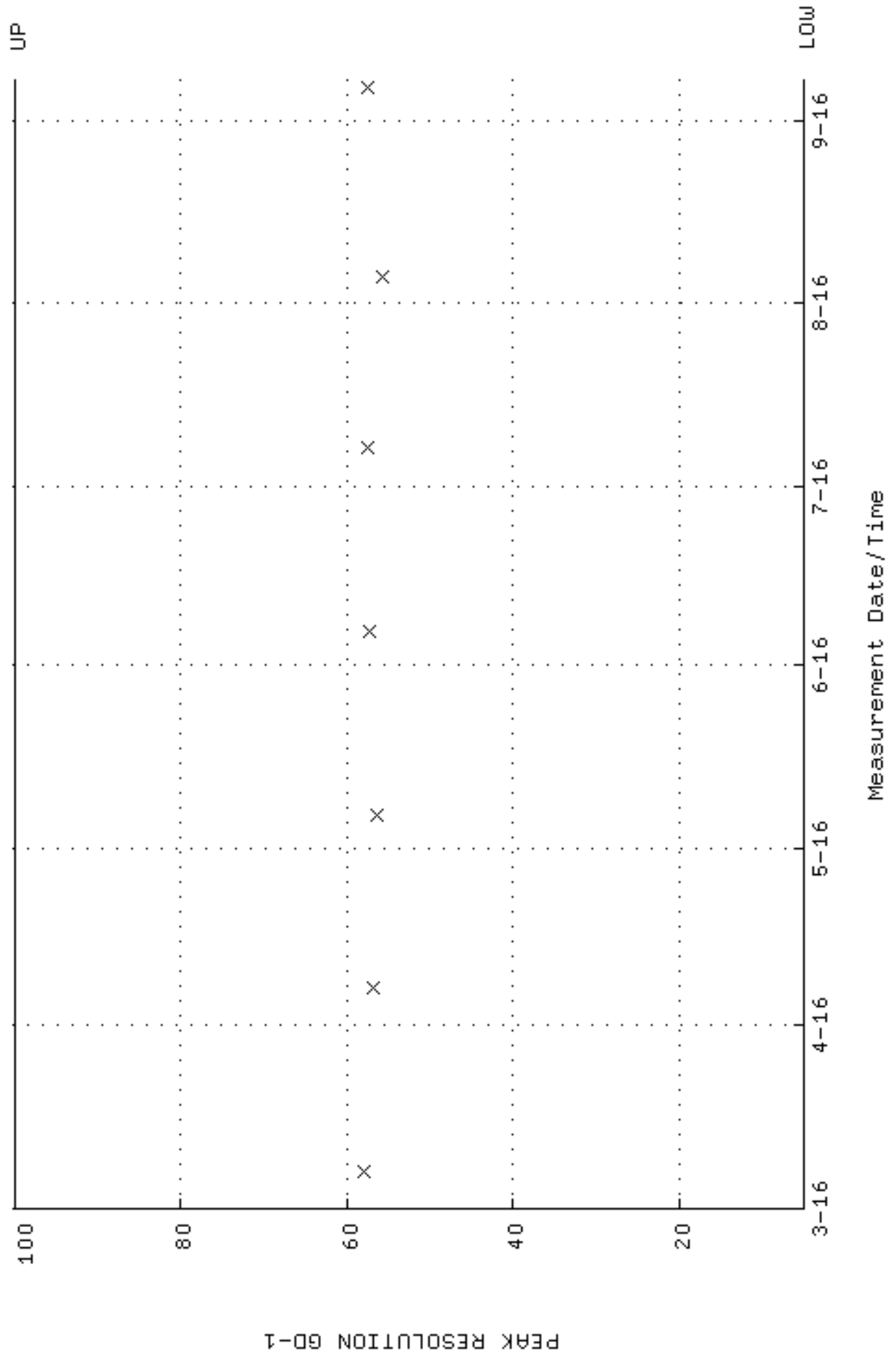
QA filename : DKA100:[ENV_ALPHA.QA.W]W112.QAF;11
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.333084 through 0.353688



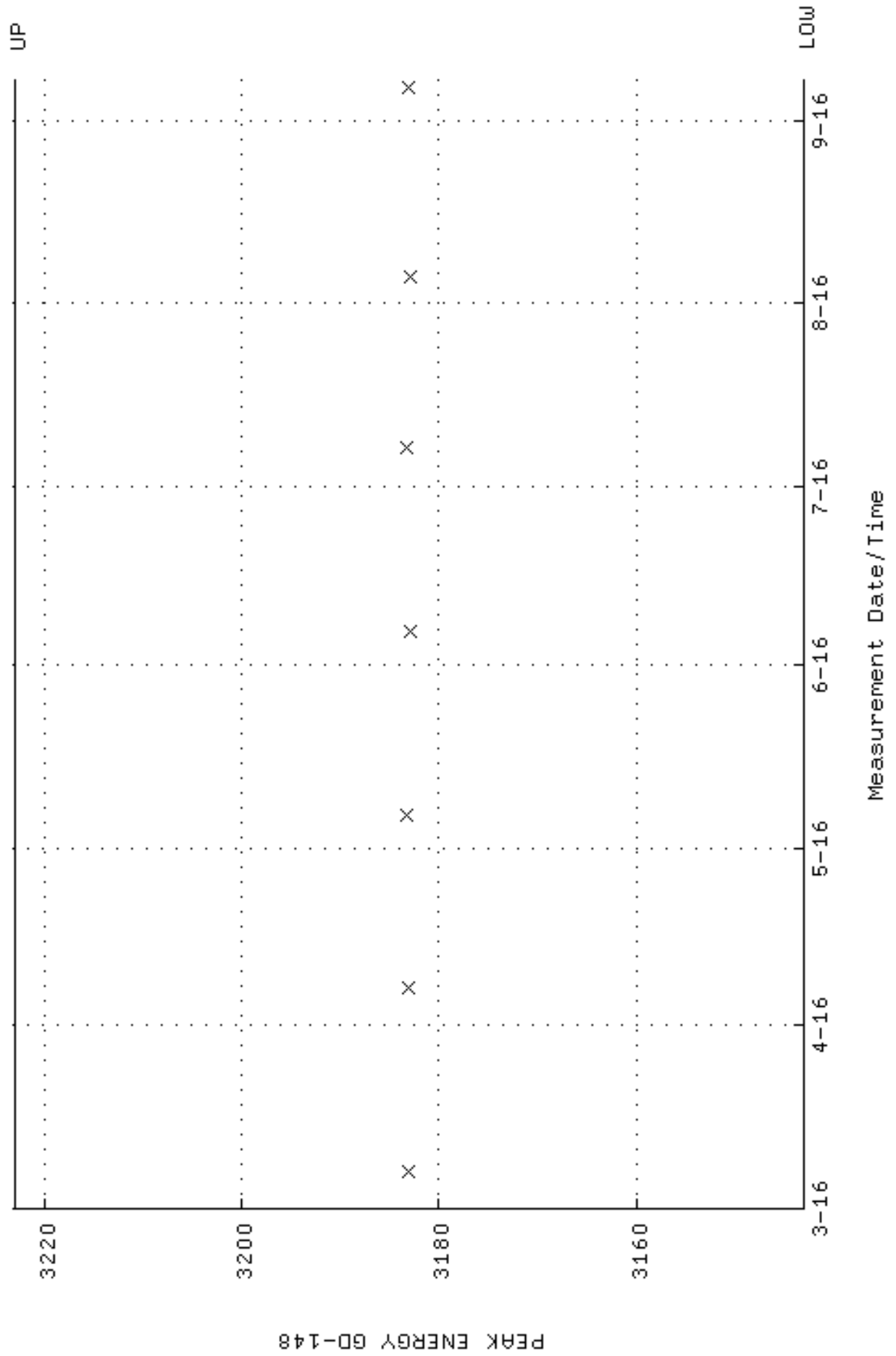
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Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



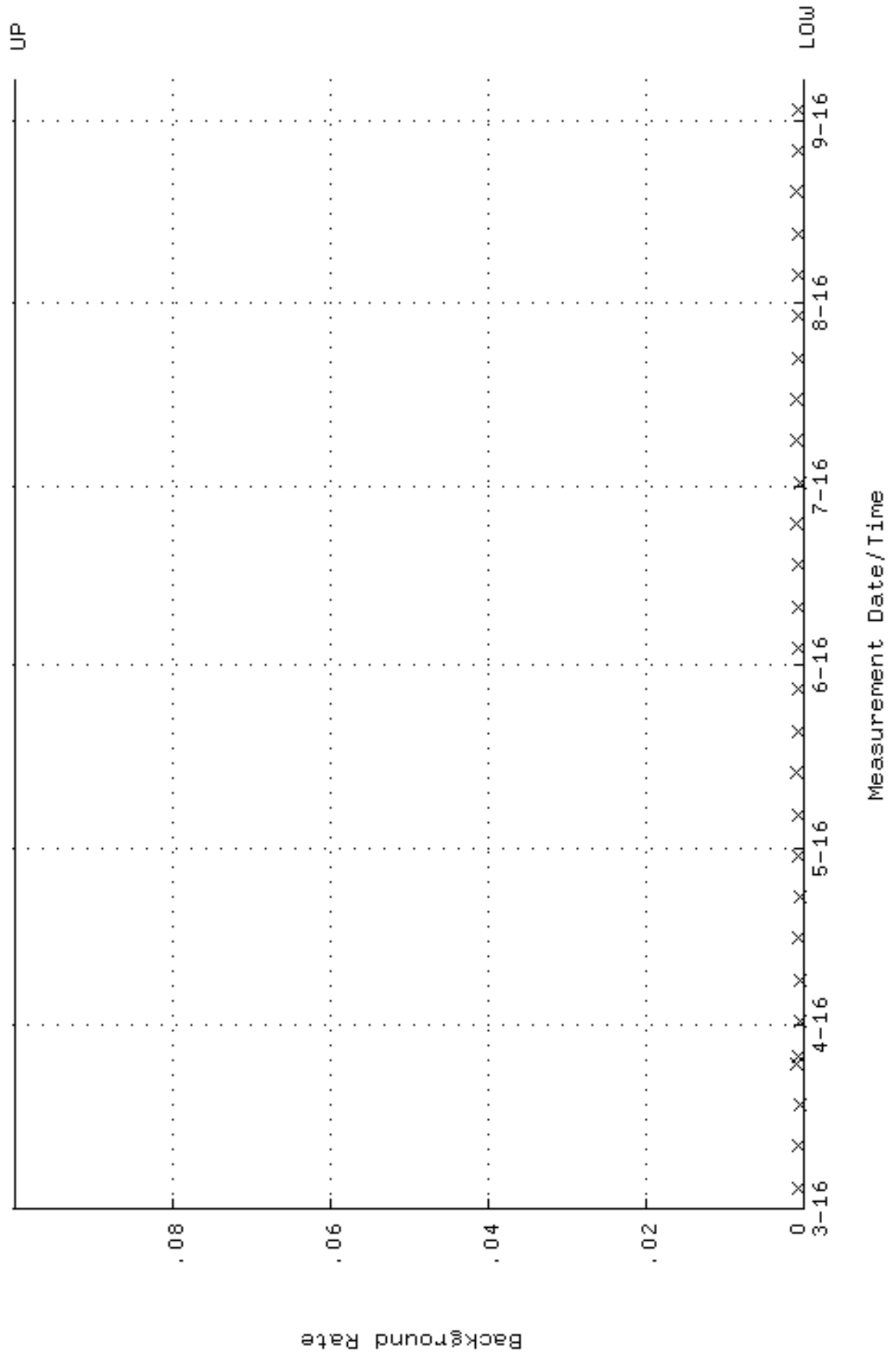
QA filename : DKA100:[ENV_ALPHA.QA.W]W112.QAF;11
 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



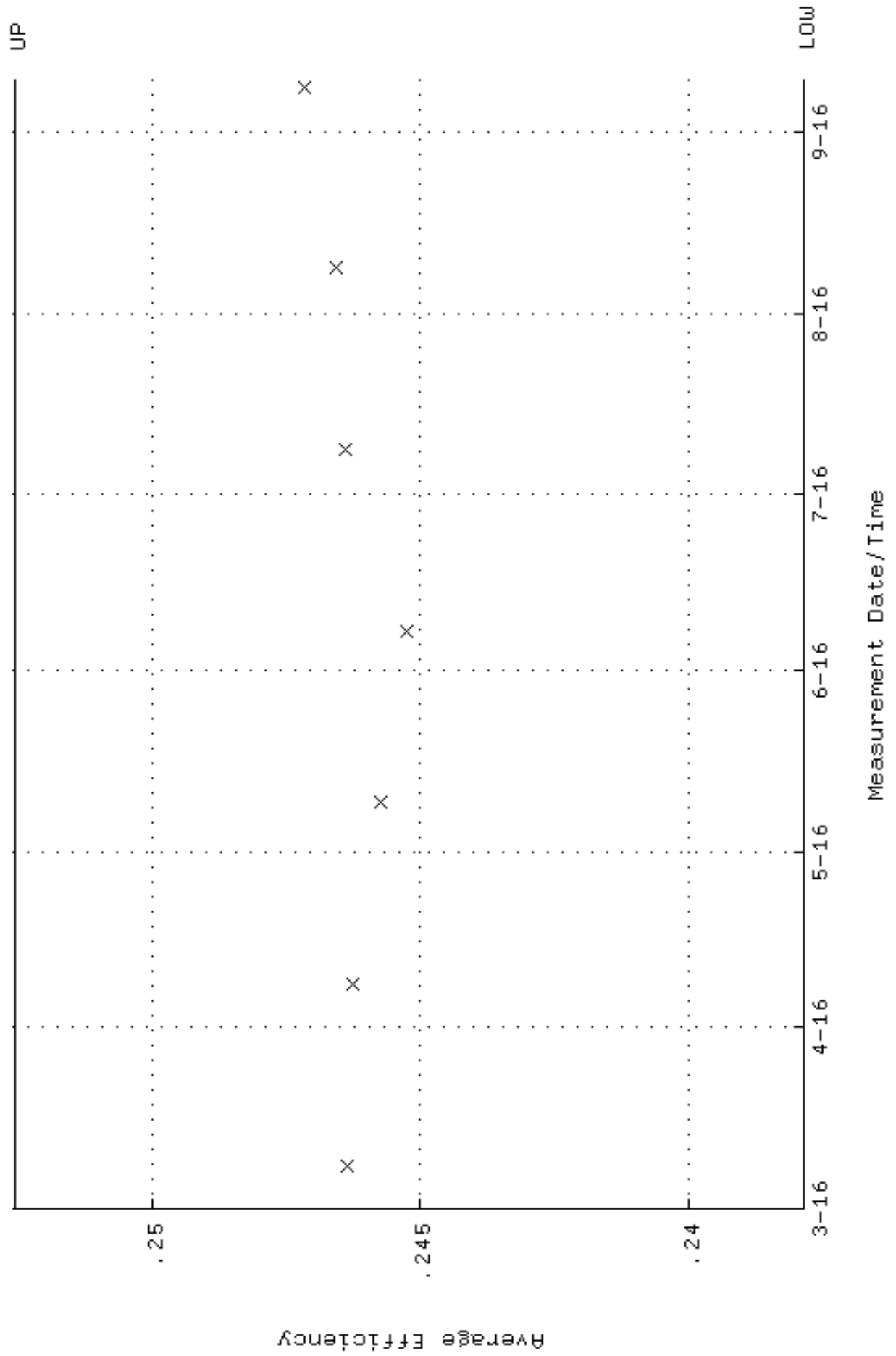
QA filename : DKA100:[ENV_ALPHA.QA.W]W112.QAF;11
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 7-MAR-2016 09:54:03 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



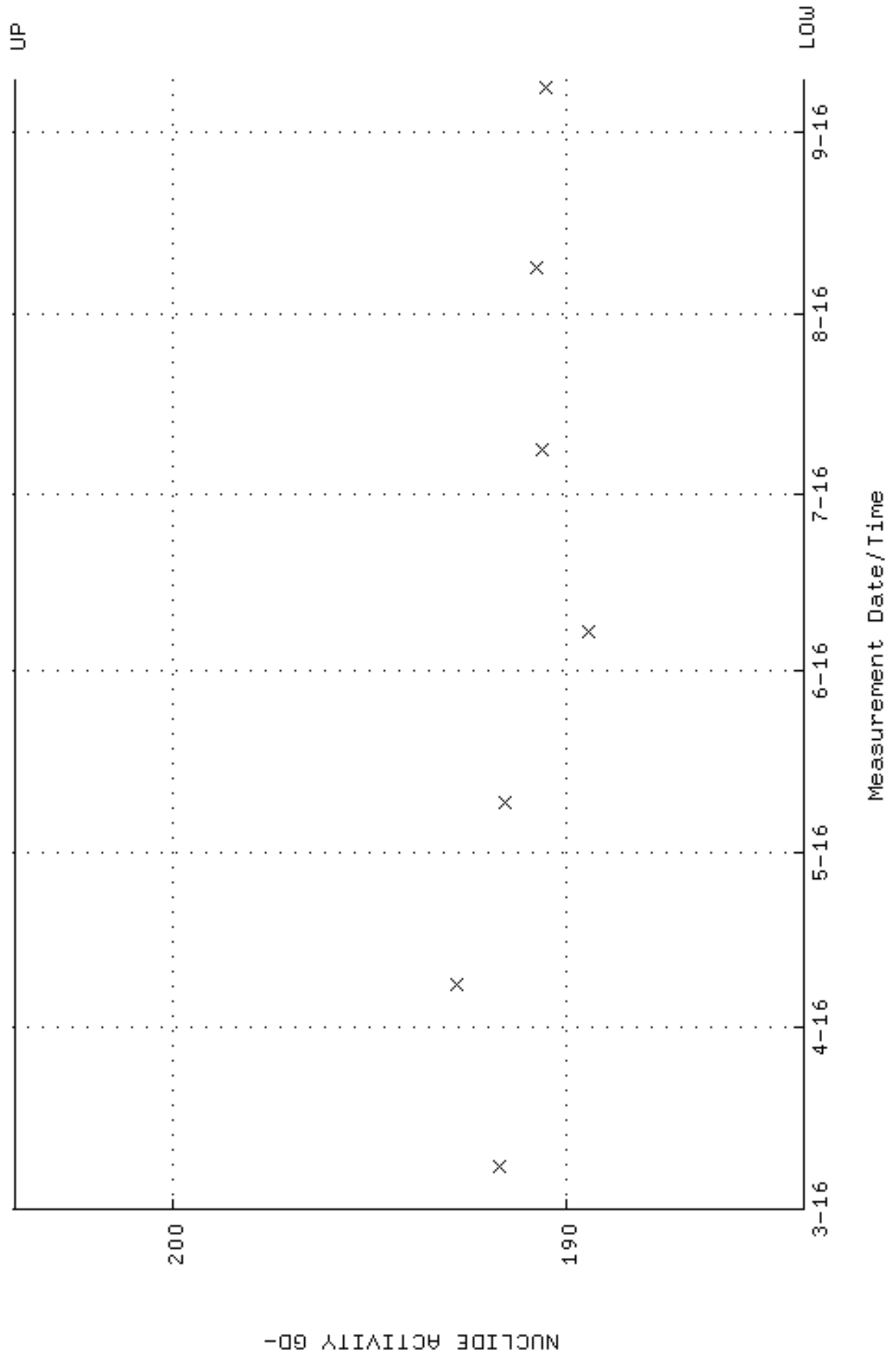
QA filename : DKA100:[ENV_ALPHA.QA.B]B112.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:51:41 through 7-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



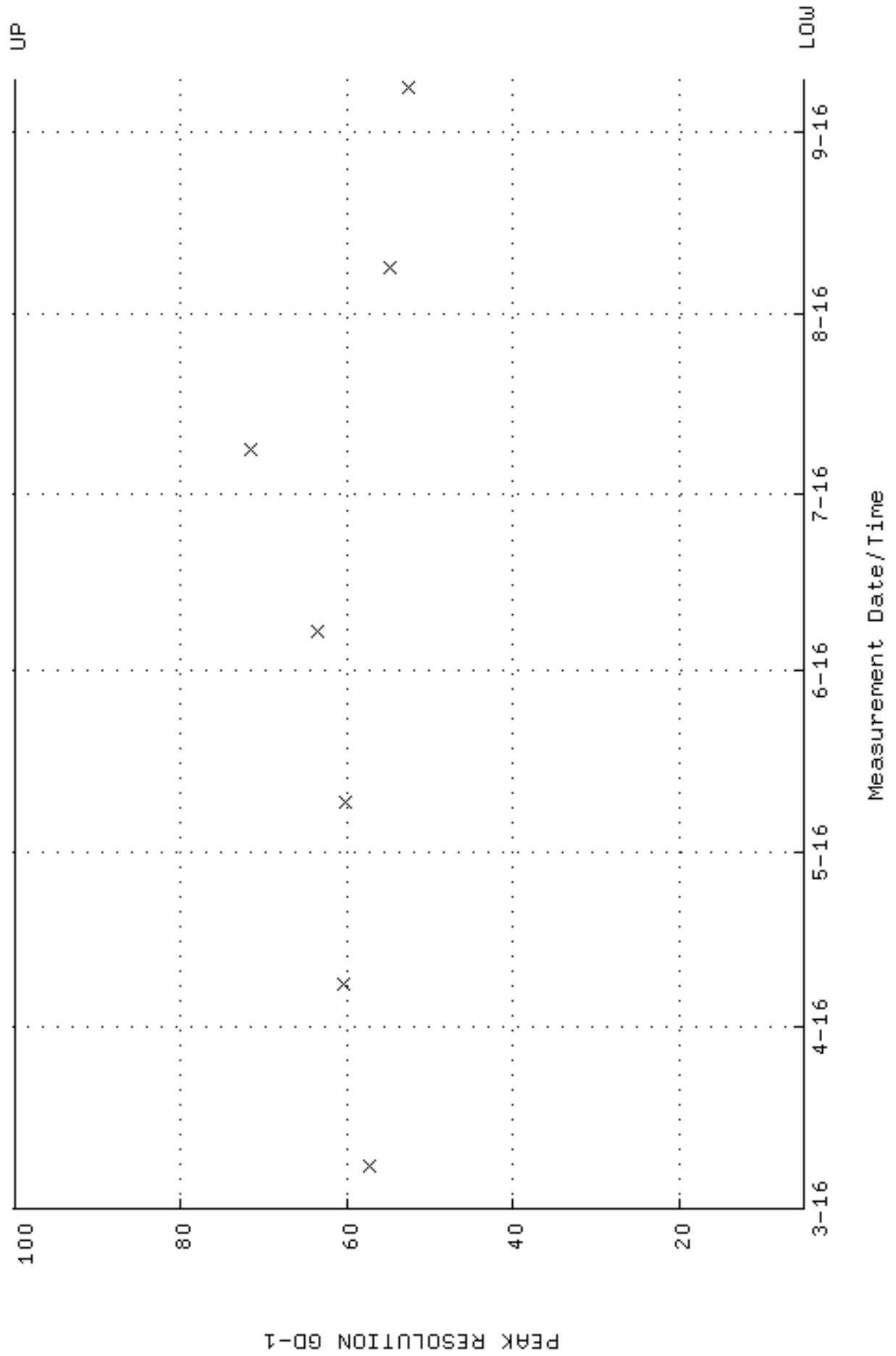
QA filename : DKA100:[ENV_ALPHA.QA.W]W113.QAF;6
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 8-MAR-2016 08:21:15 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.237837 through 0.252549



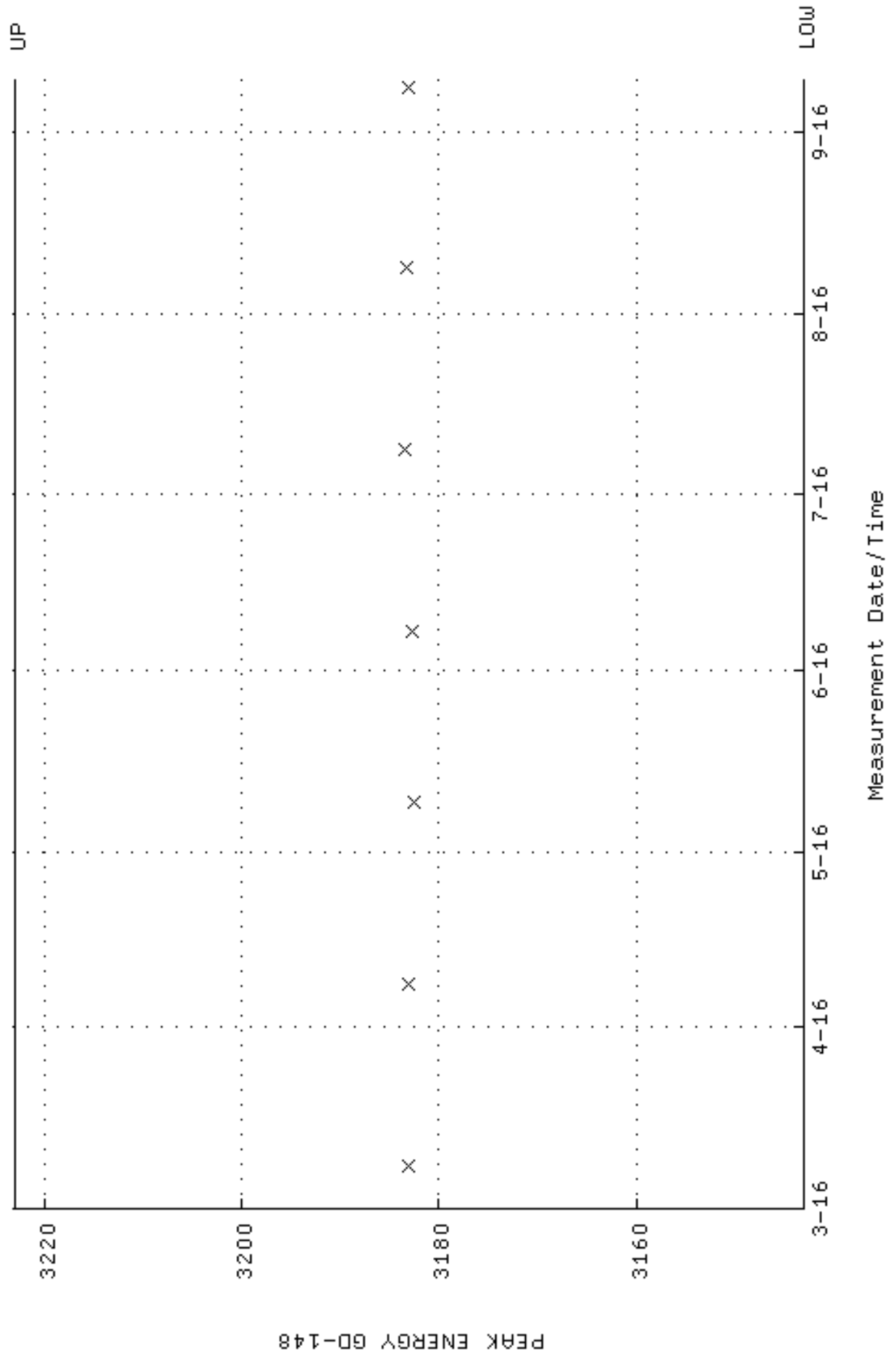
QA filename : DKA100:[ENV_ALPHA.QA.W]W113.QAF;6
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 8-MAR-2016 08:21:15 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



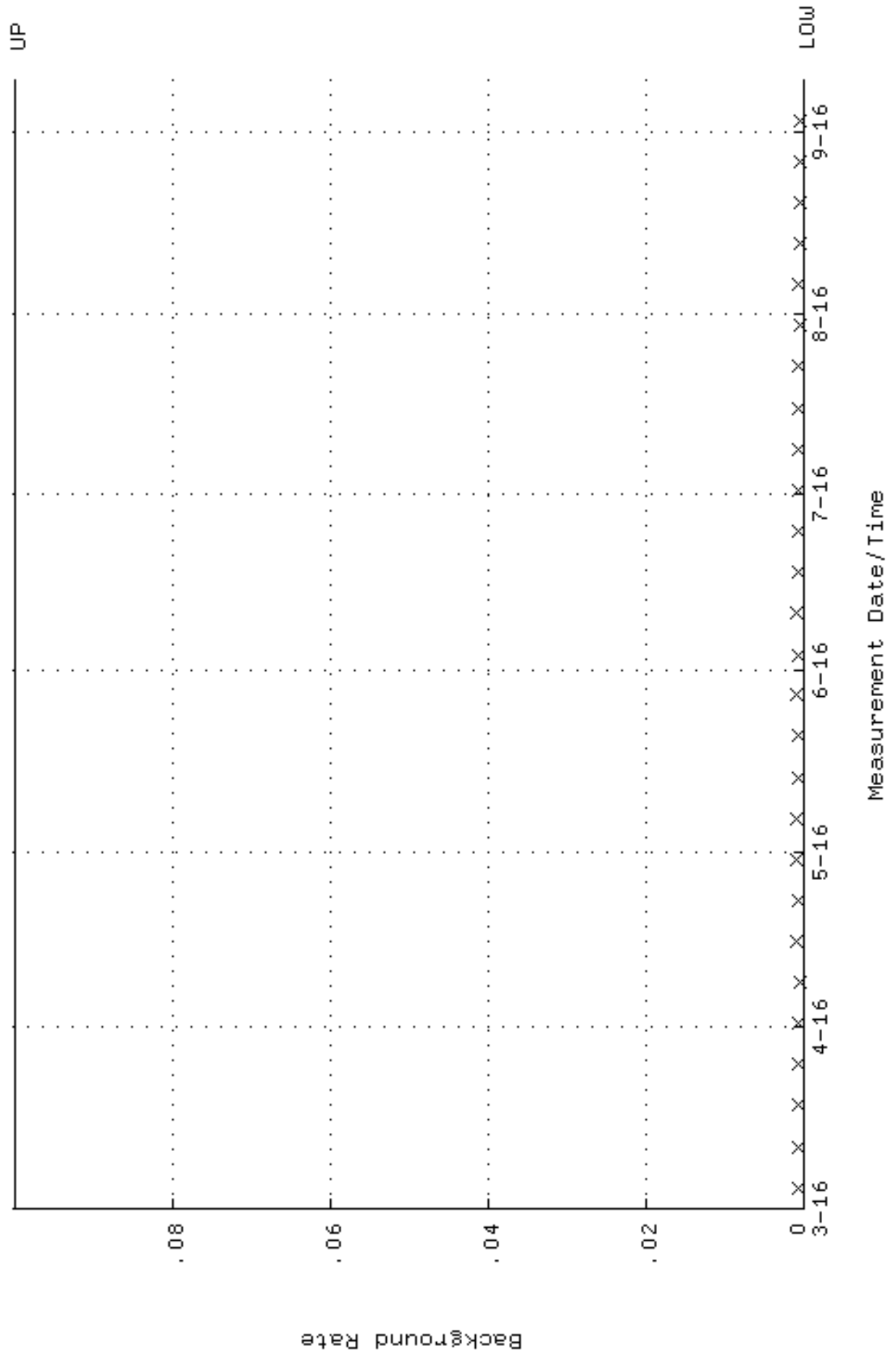
QA filename : DKA100:[ENV_ALPHA.QA.W]W113.QAF;6
 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 8-MAR-2016 08:21:15 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



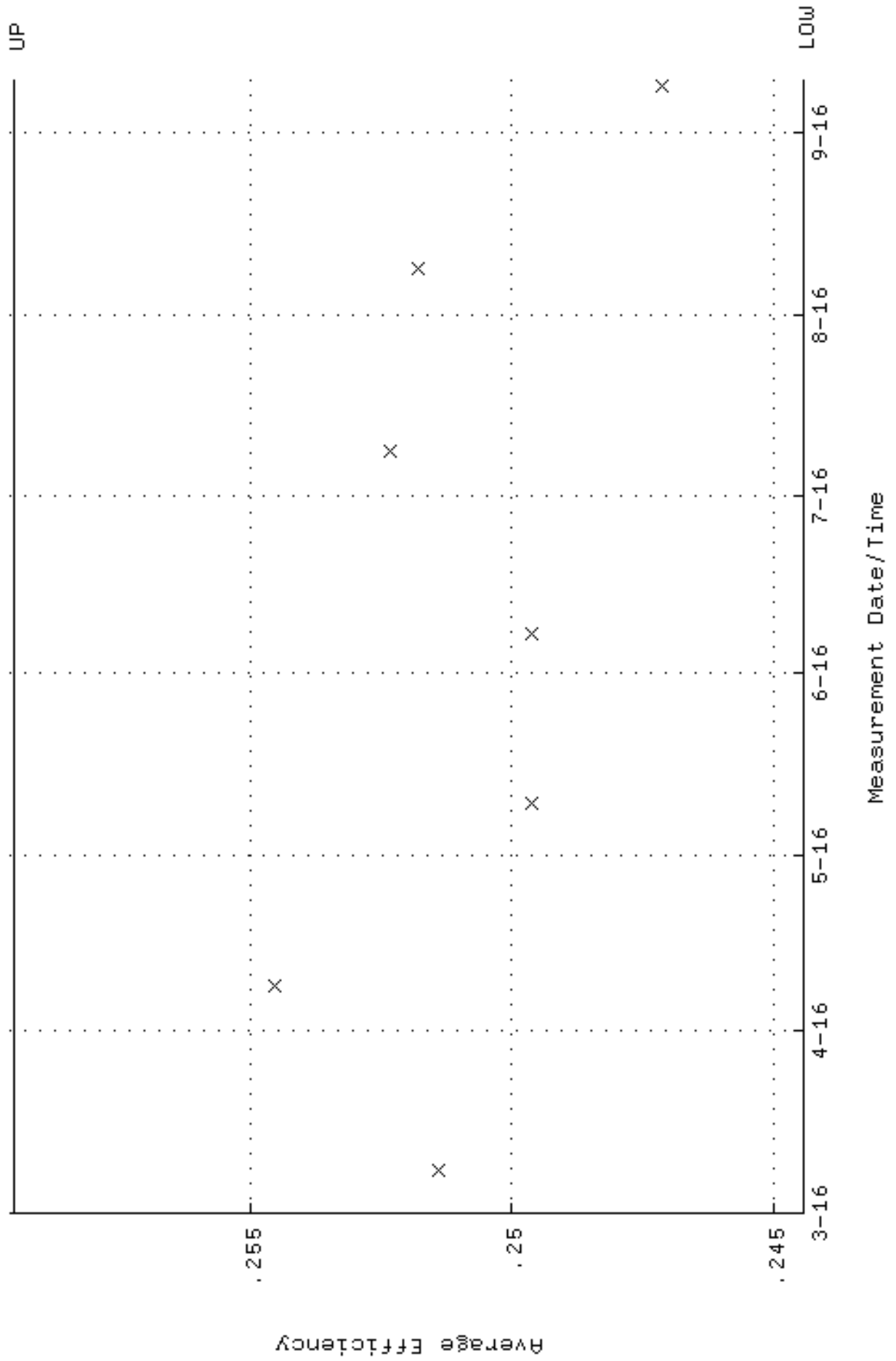
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 8-MAR-2016 08:21:15 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



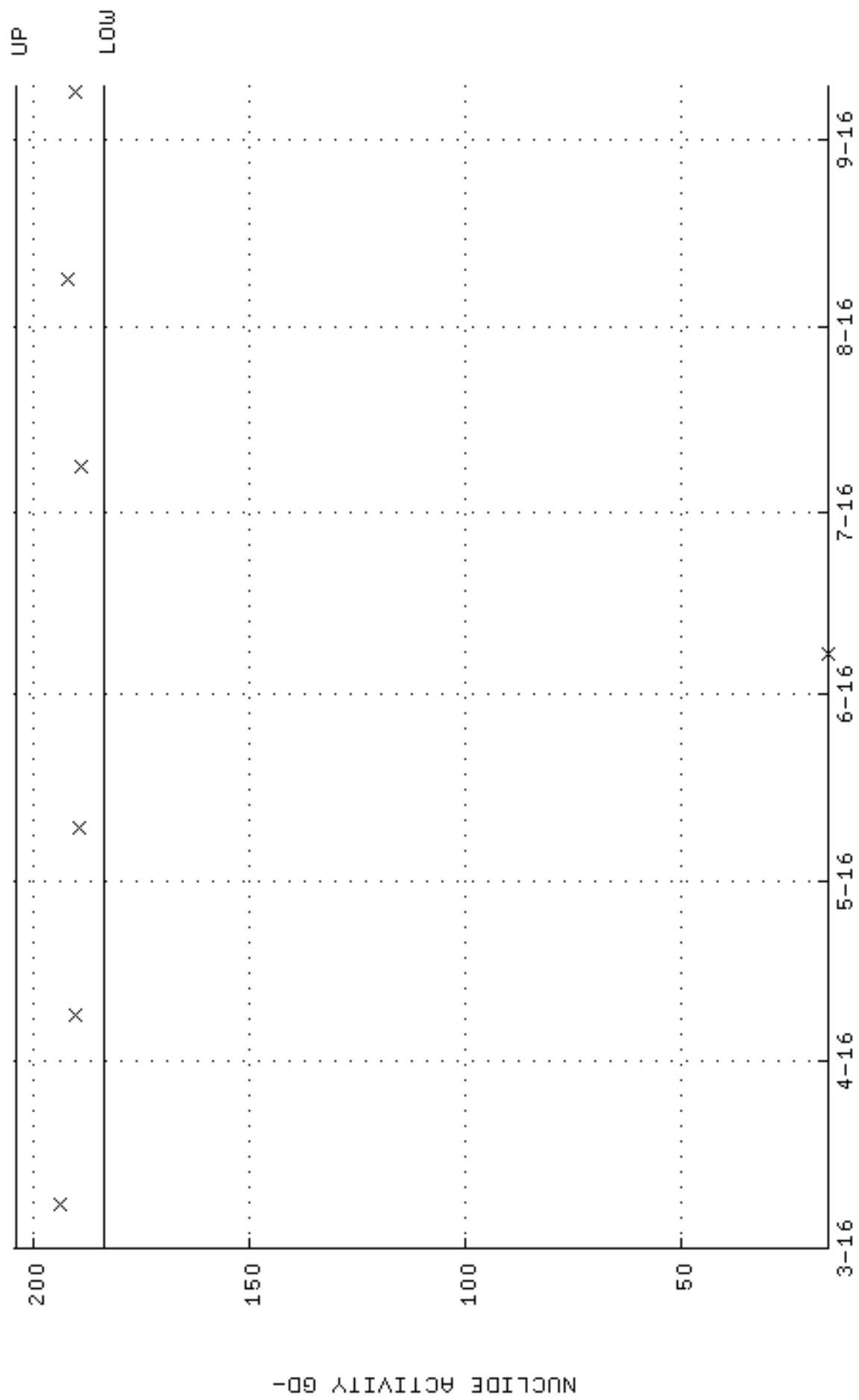
QA filename : DKA100:[ENV_ALPHA.QA.B]B113.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:30:40 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



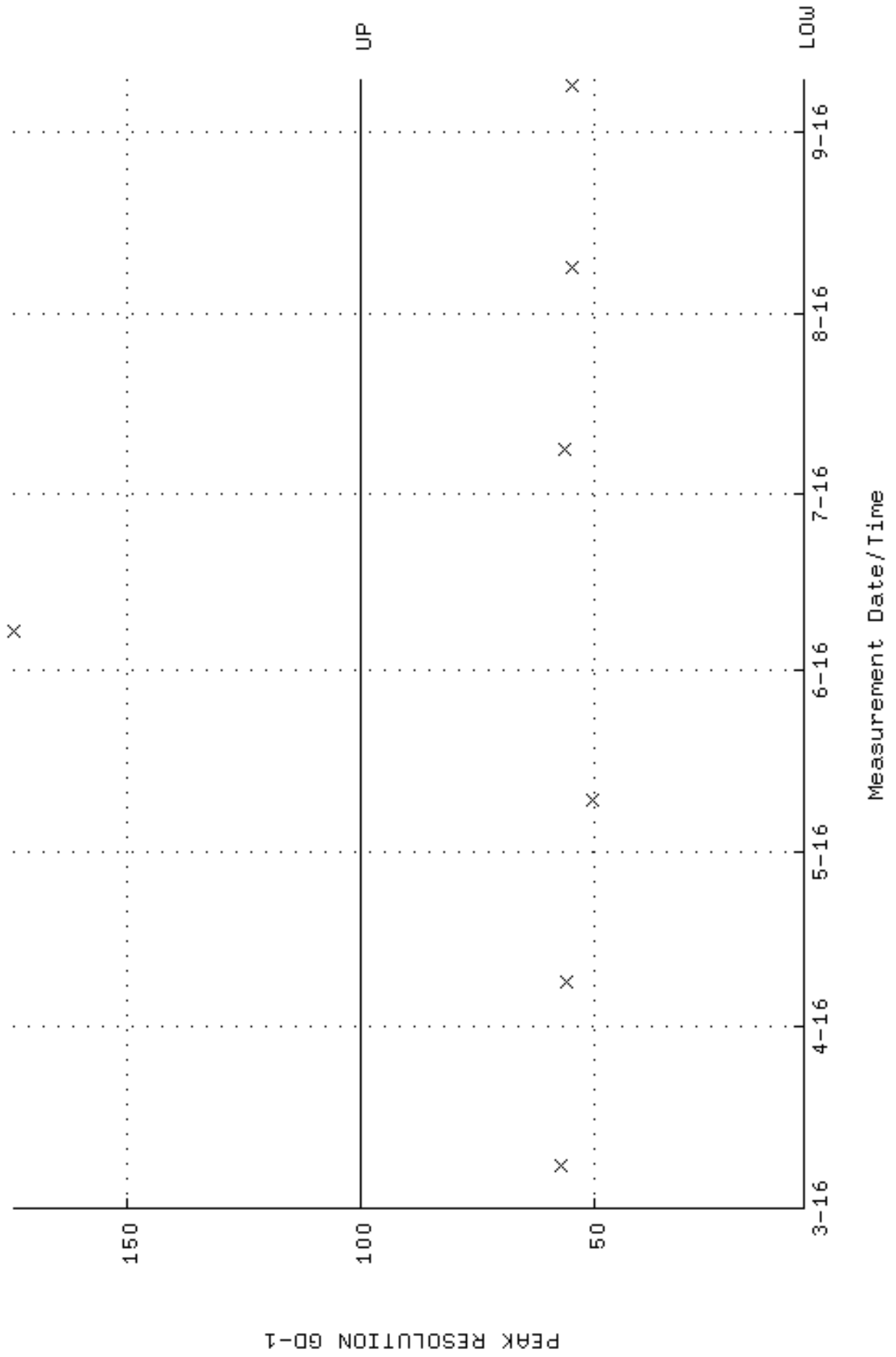
QA filename : DKA100:[ENV_ALPHA.QA.W]W114.QAF;6
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 8-MAR-2016 08:21:20 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.244425 through 0.259545



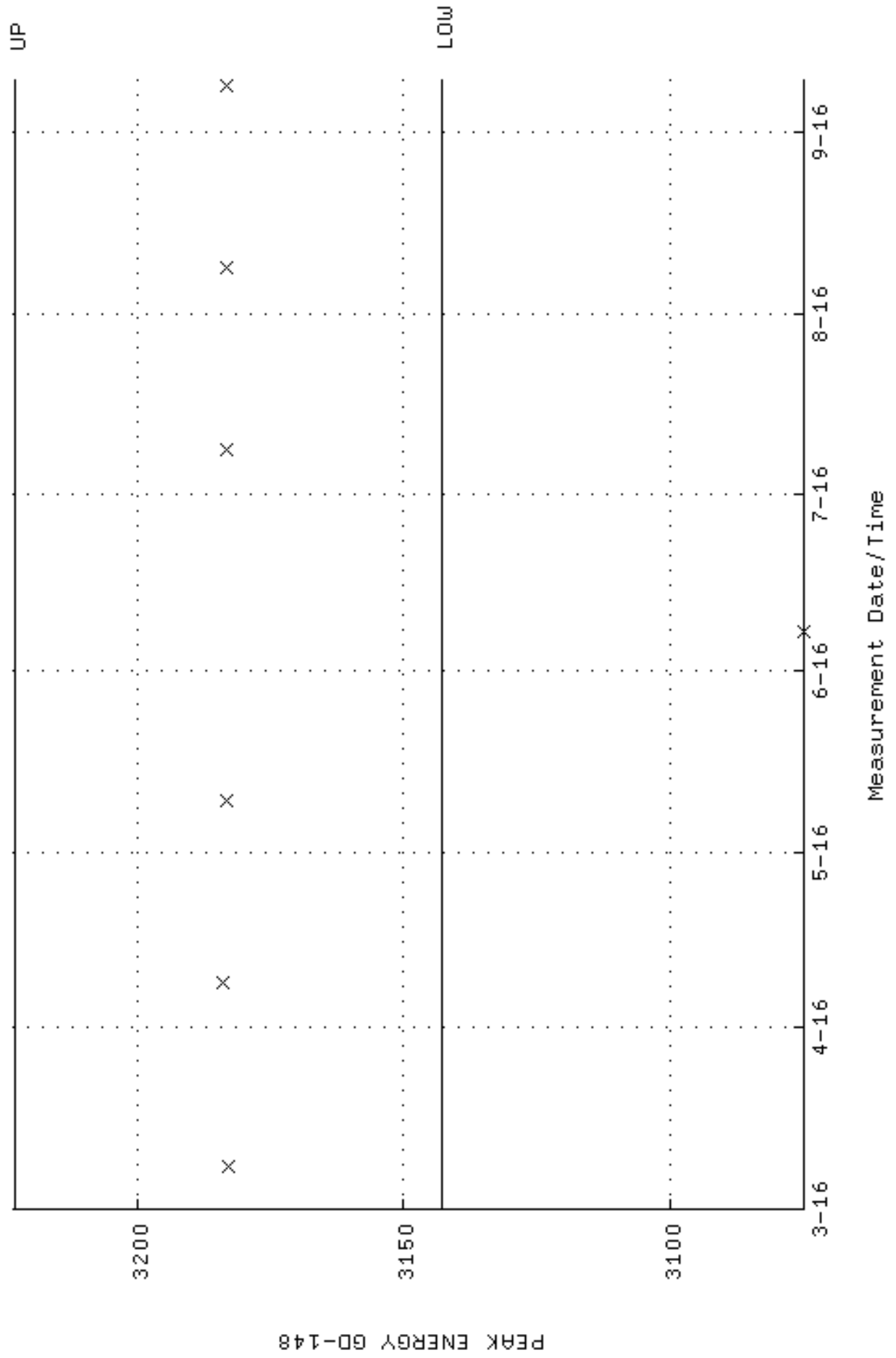
QA filename : DKA100:[ENV_ALPHA.QA.W]W114.QAF;6
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 8-MAR-2016 08:21:20 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



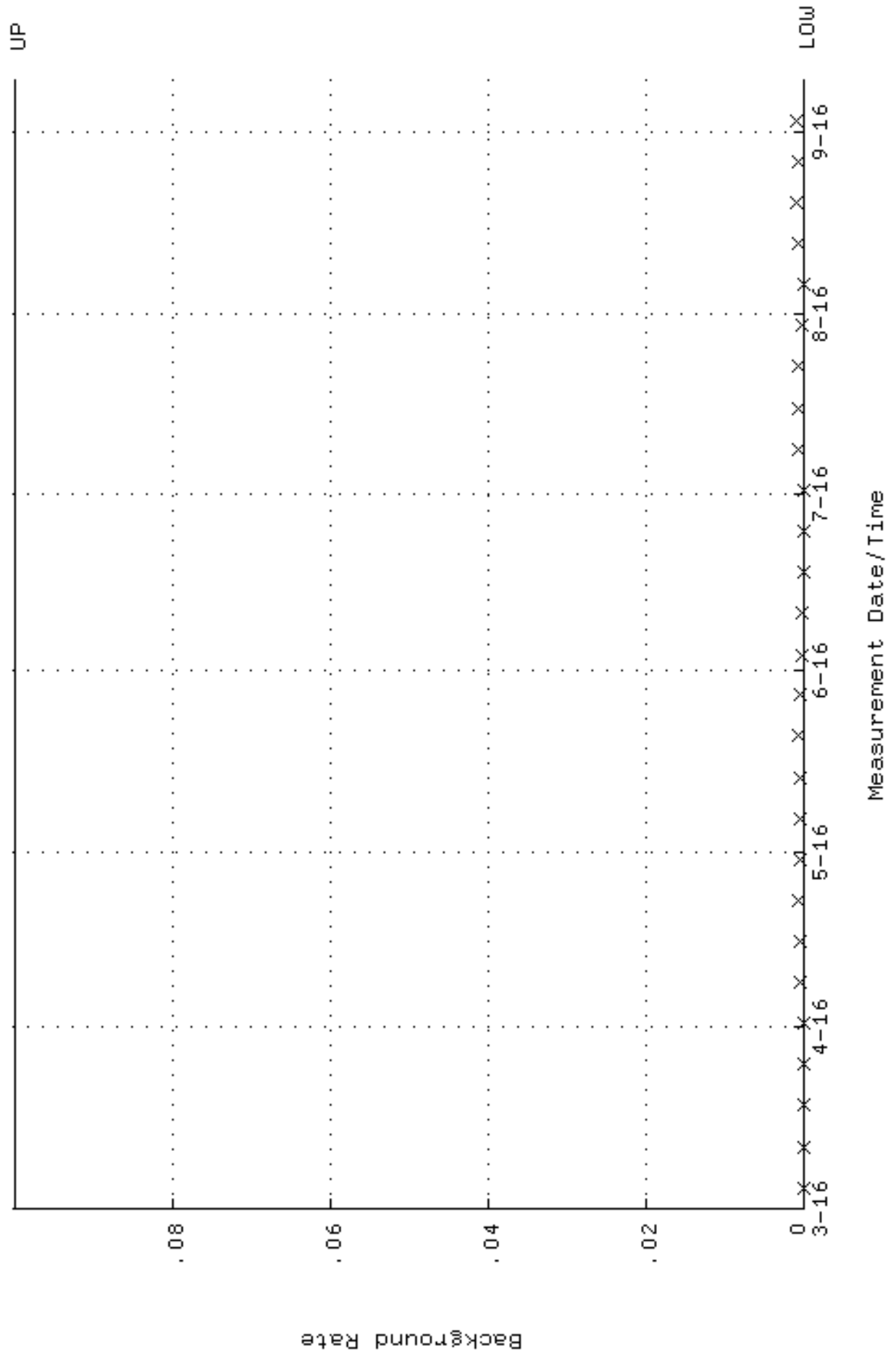
QA filename : DKA100:[ENV_ALPHA.QA.W]W114.QAF;6
 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 8-MAR-2016 08:21:20 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



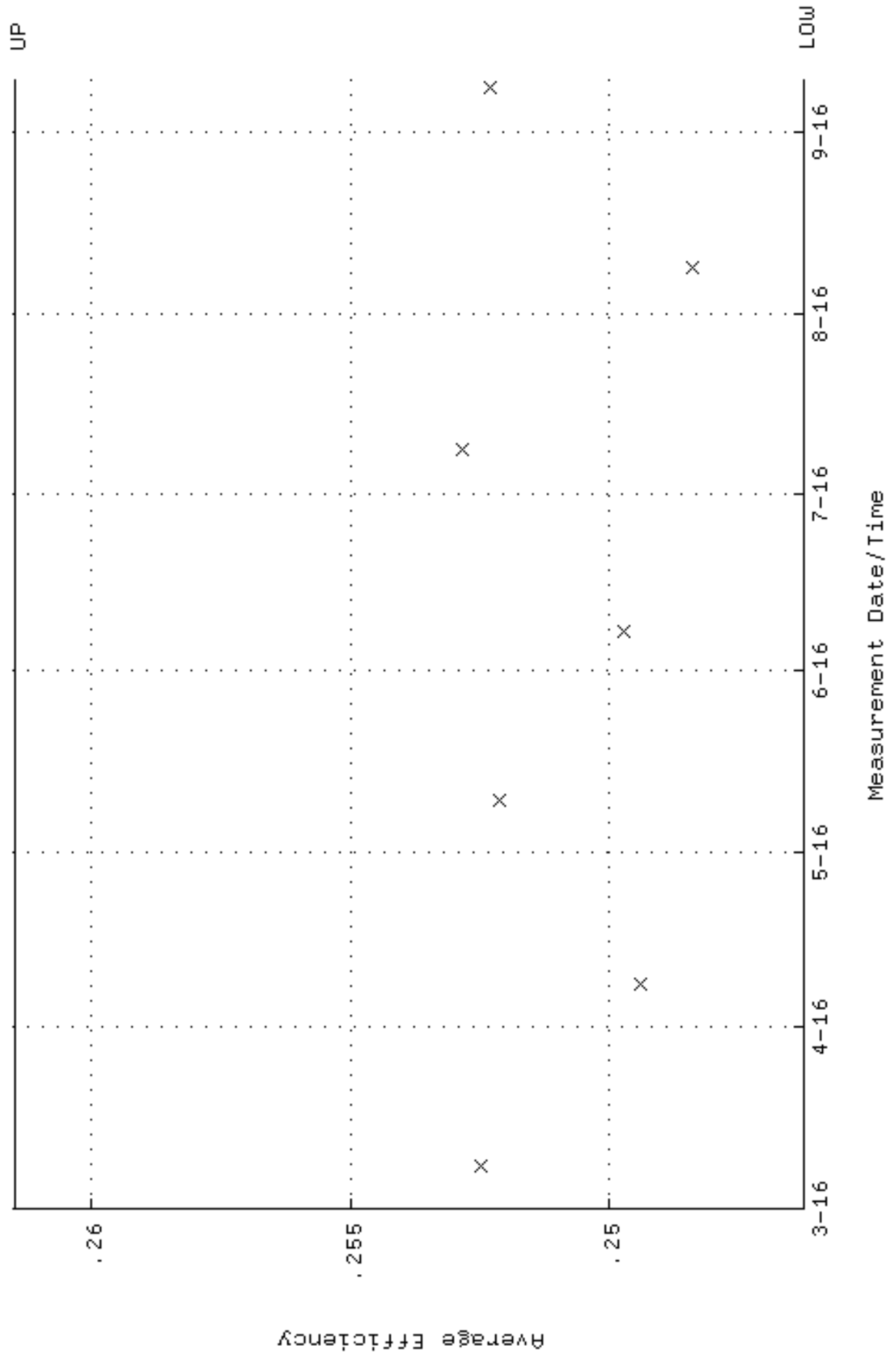
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 8-MAR-2016 08:21:20 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



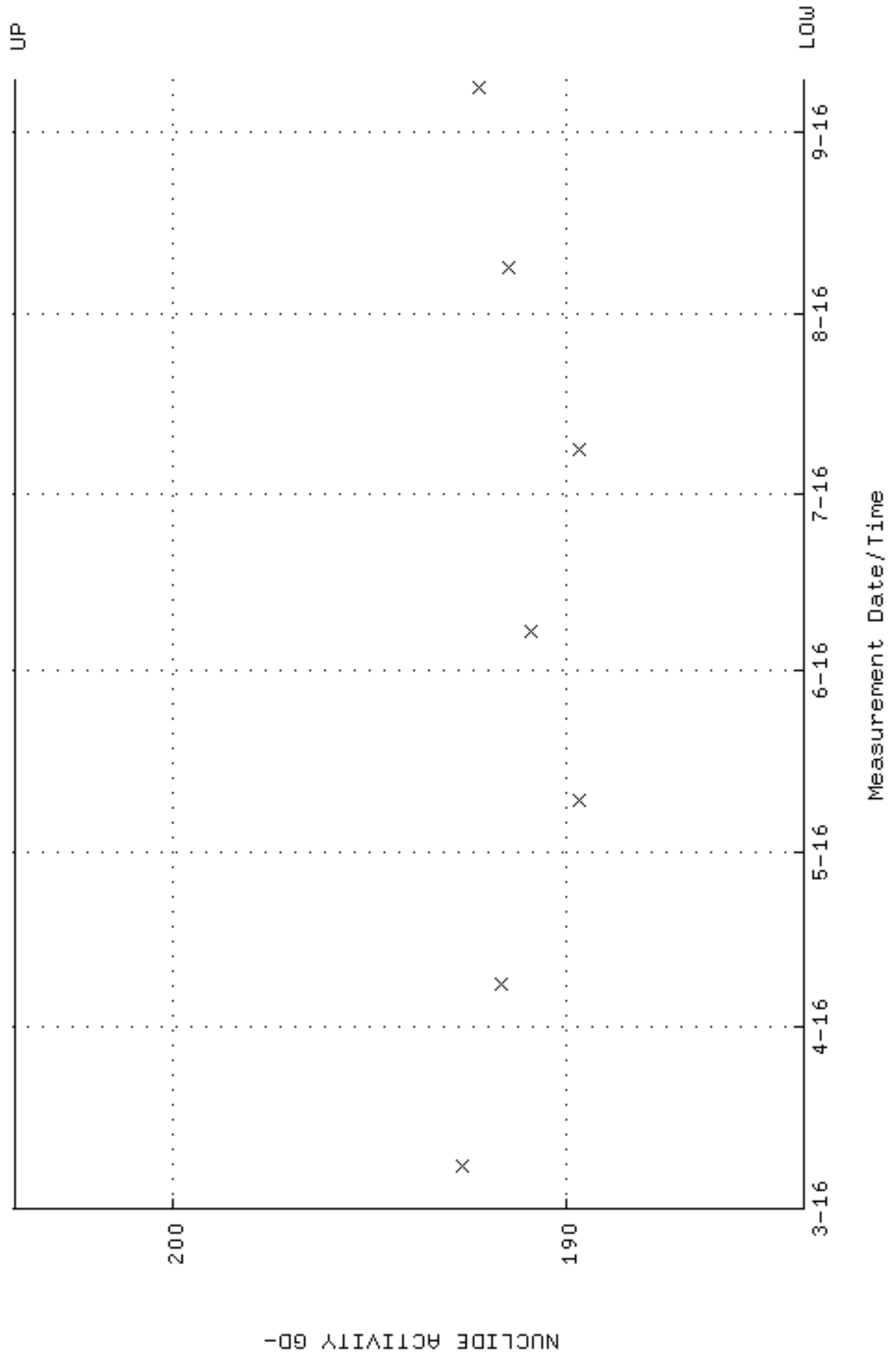
QA filename : DKA100:[ENV_ALPHA.QA.B]B114.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:30:44 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



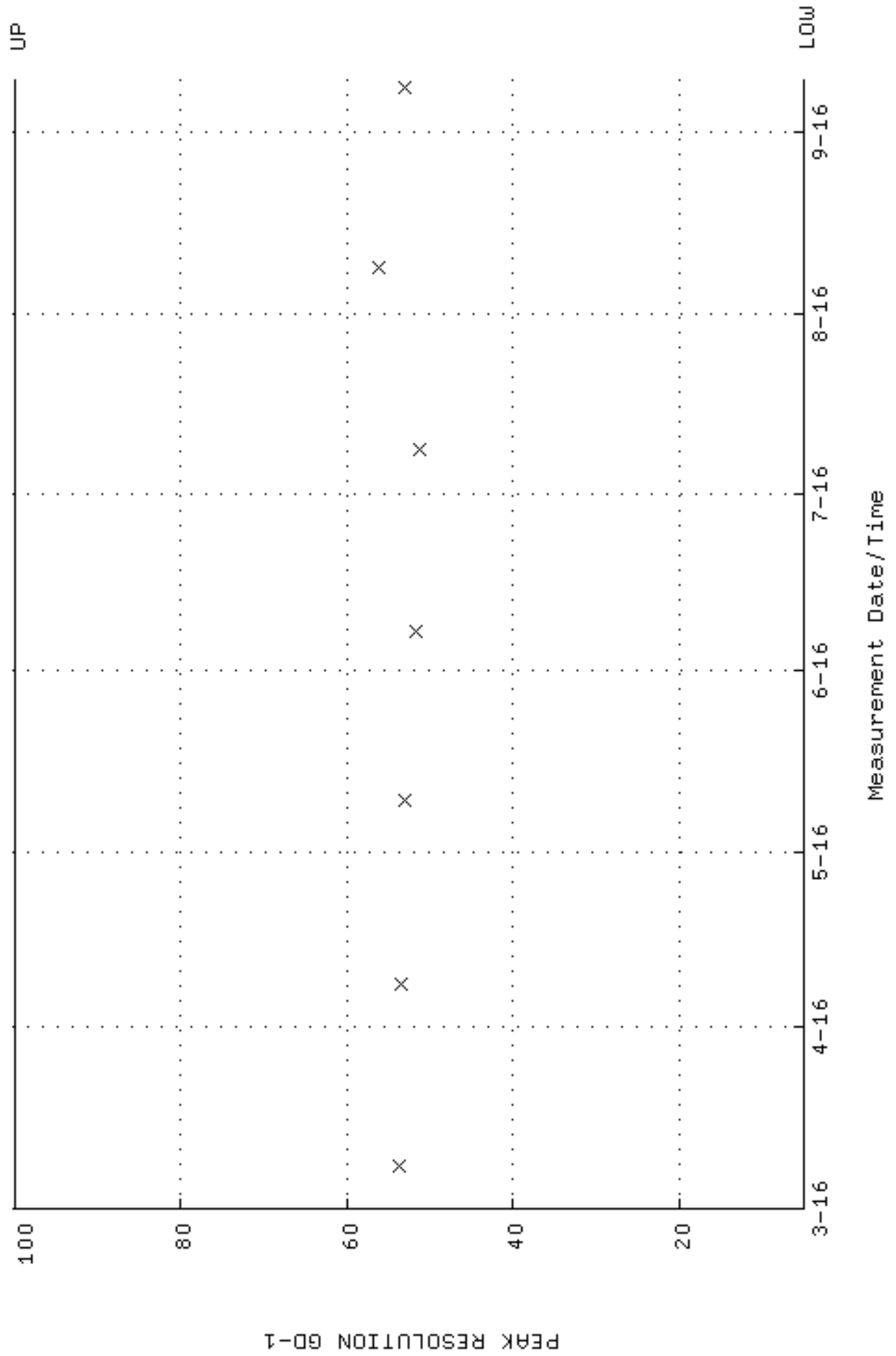
QA filename : DKA100:[ENV_ALPHA.QA.W]W115.QAF;6
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 8-MAR-2016 08:21:23 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.246238 through 0.261470



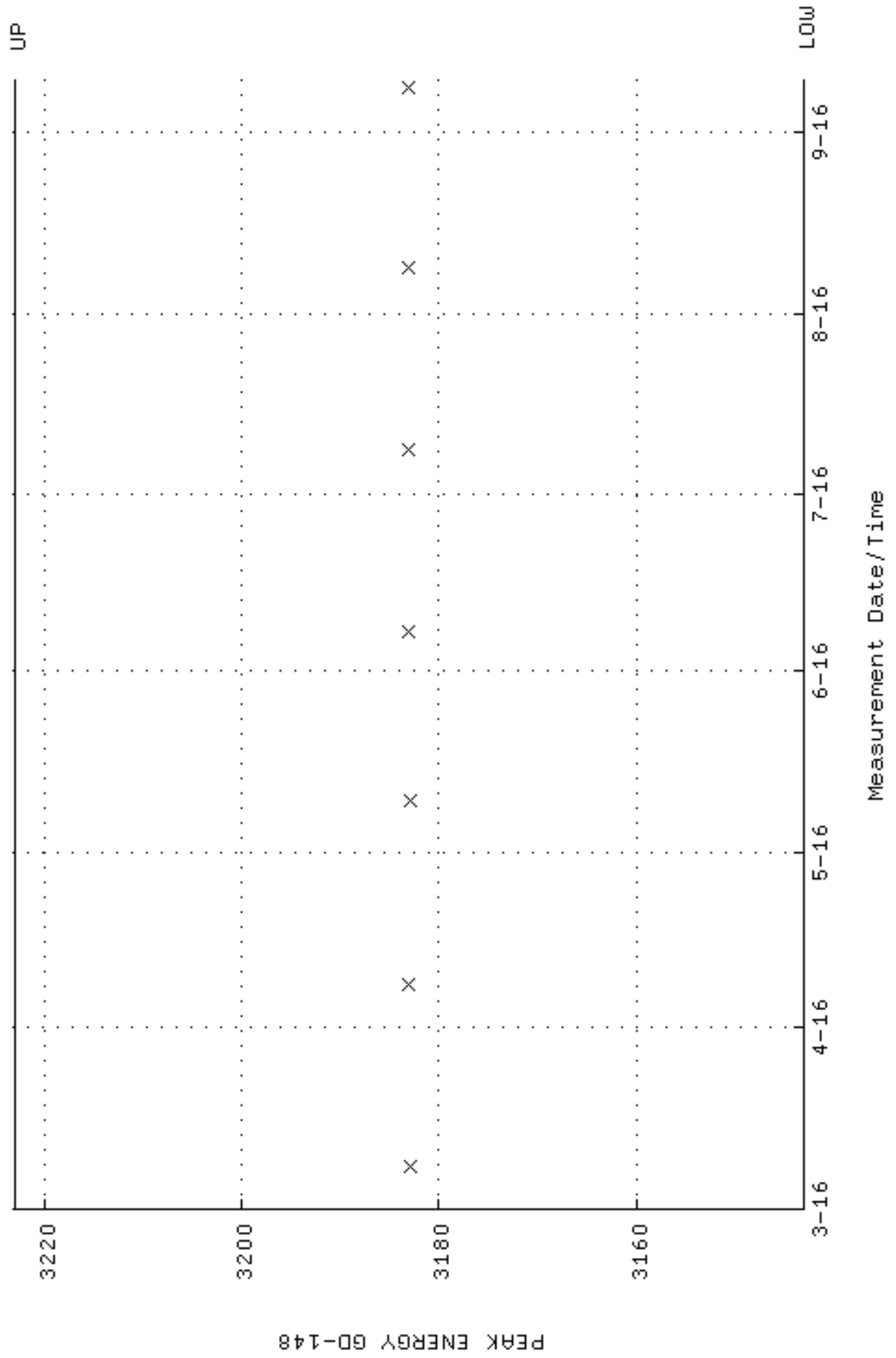
QA filename : DKA100:[ENV_ALPHA.QA.W]W115.QAF;6
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 8-MAR-2016 08:21:23 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



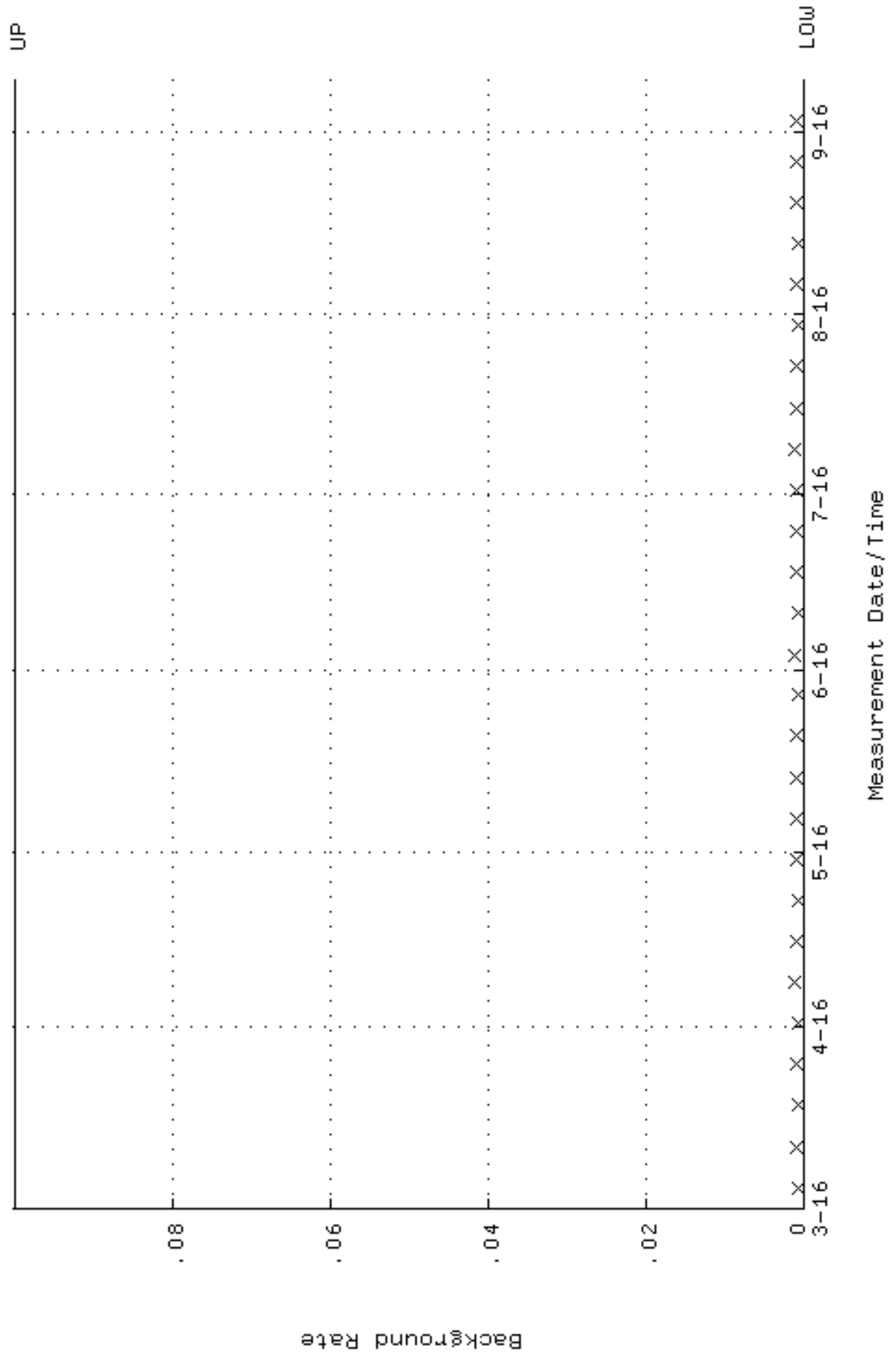
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Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 8-MAR-2016 08:21:23 through 9-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



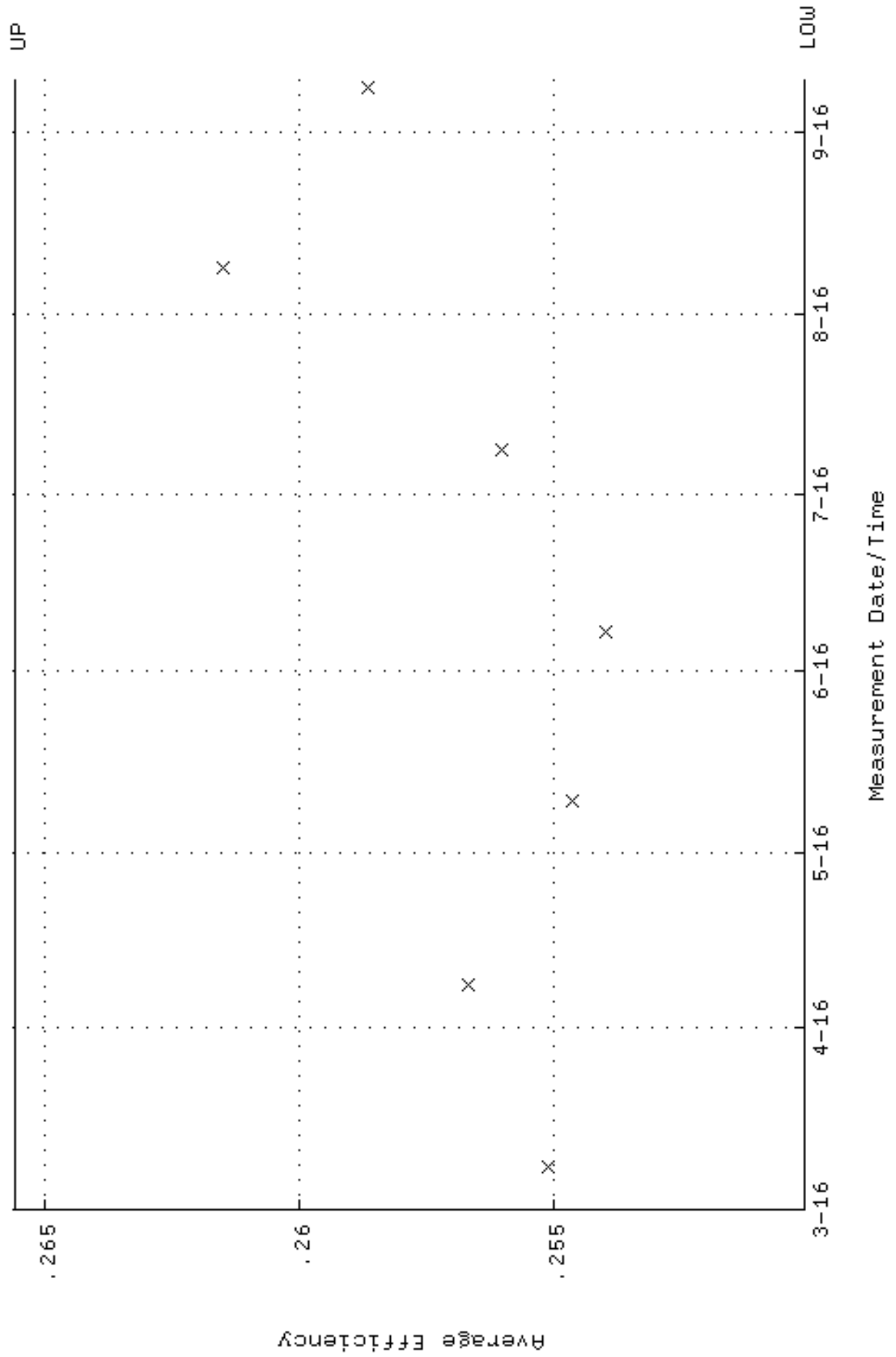
QA filename : DKA100:[ENV_ALPHA.QA.W]W115.QAF;6
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 8-MAR-2016 08:21:23 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



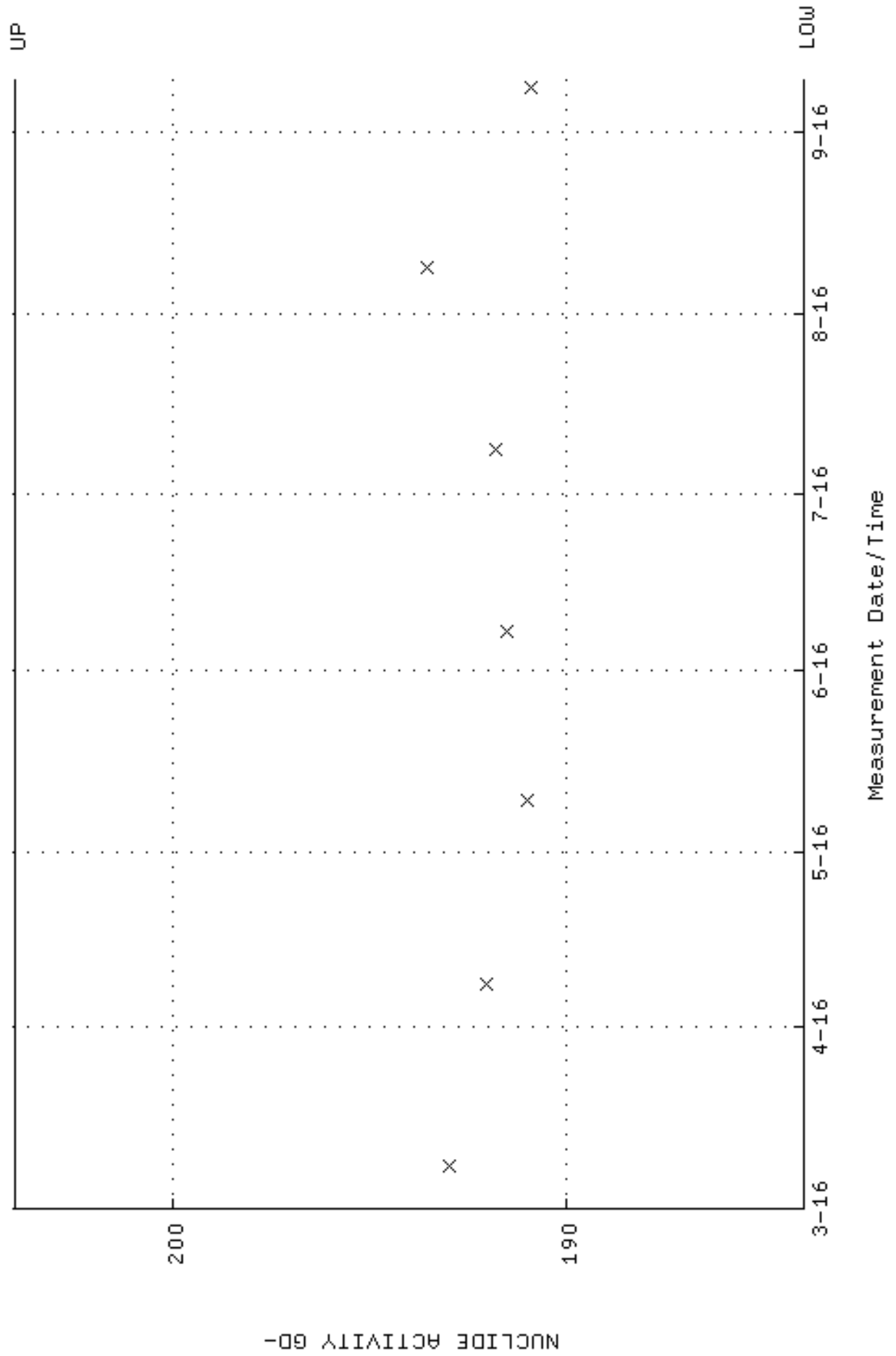
QA filename : DKA100:[ENV_ALPHA.QA.B]B115.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:30:48 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



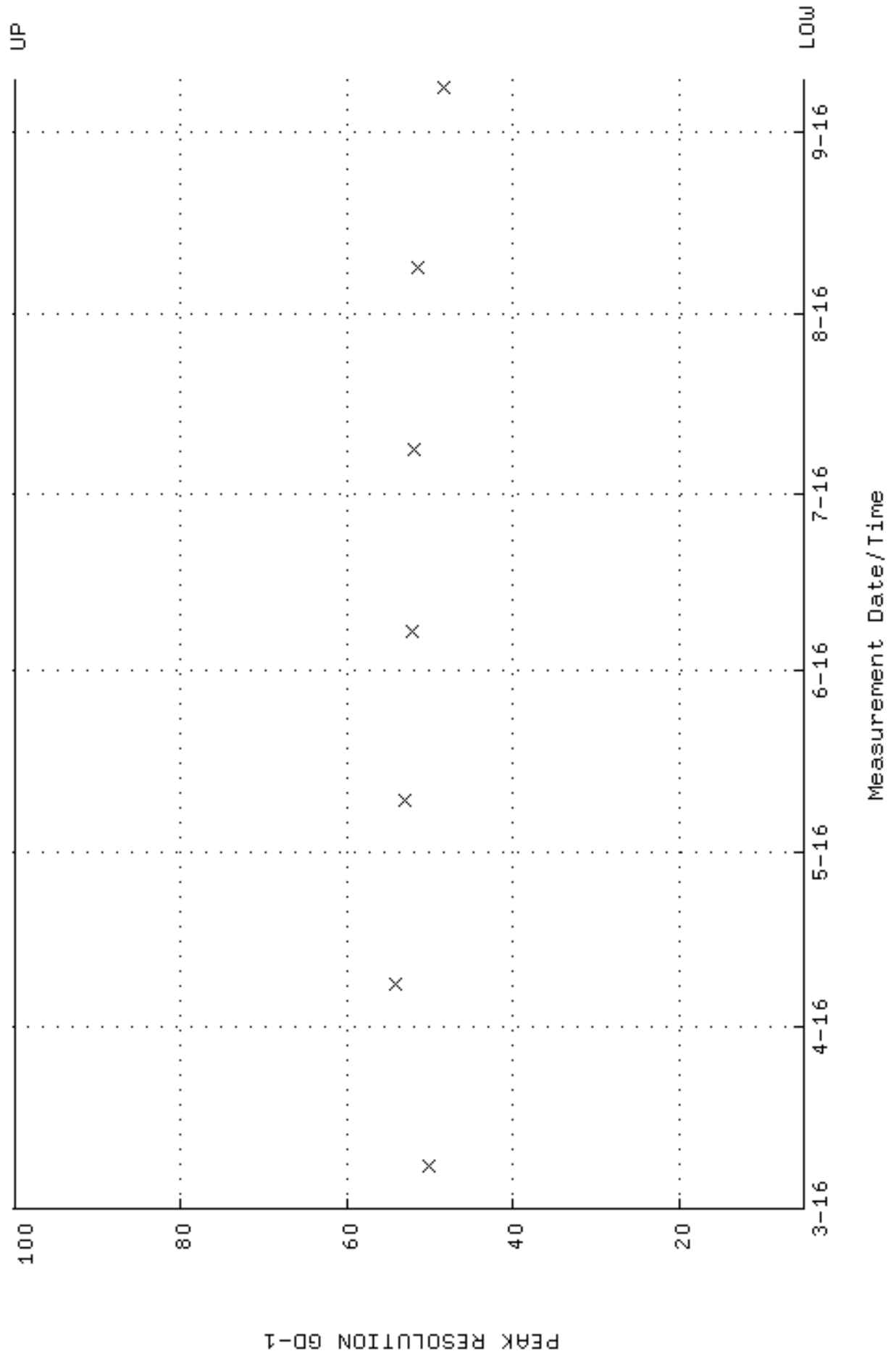
QA filename : DKA100:[ENV_ALPHA.QA.W]W116.QAF;7
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 8-MAR-2016 08:21:27 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.250100 through 0.265570



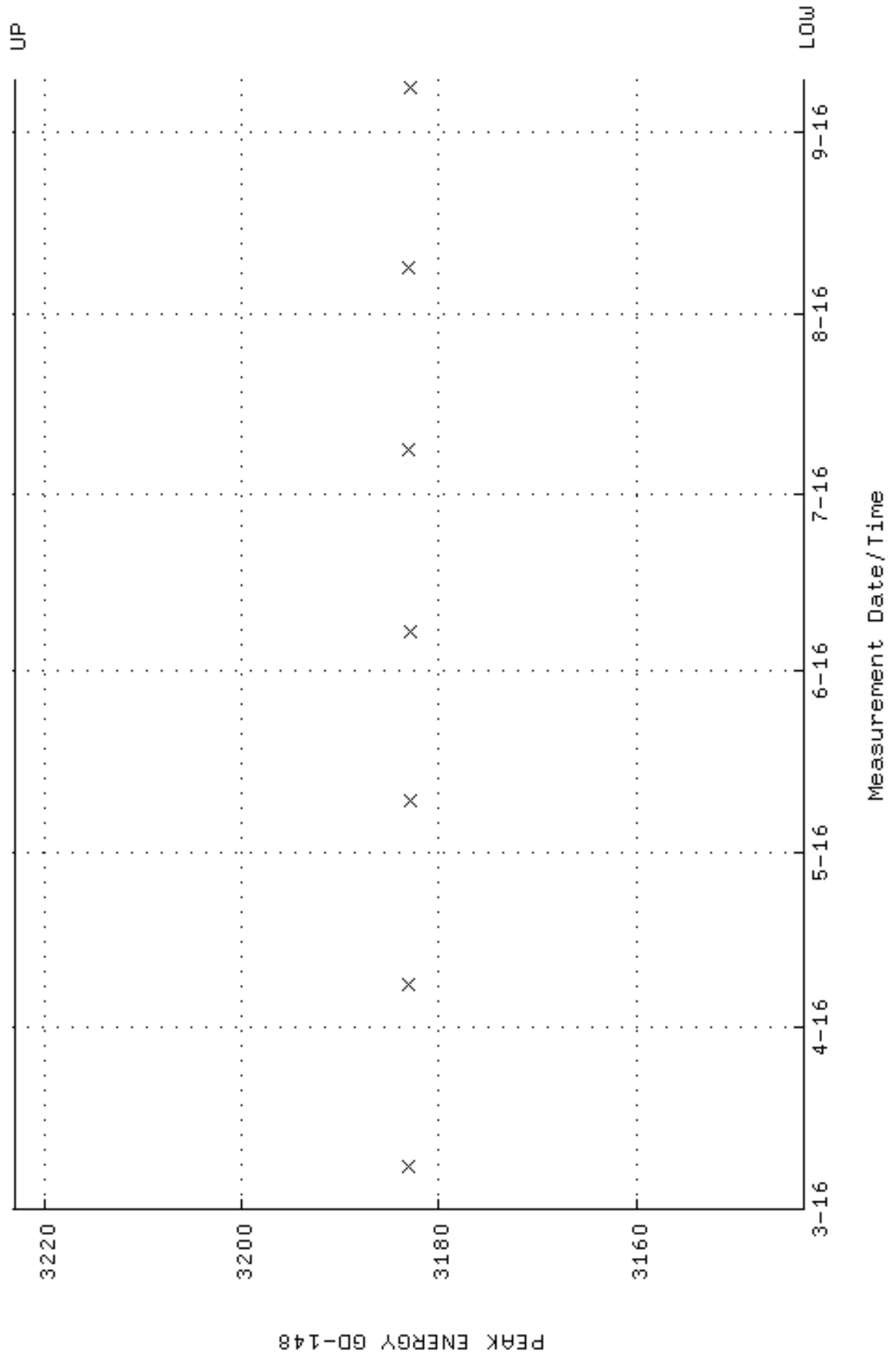
QA filename : DKA100:[ENV_ALPHA.QA.W]W116.QAF;7
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 8-MAR-2016 08:21:27 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



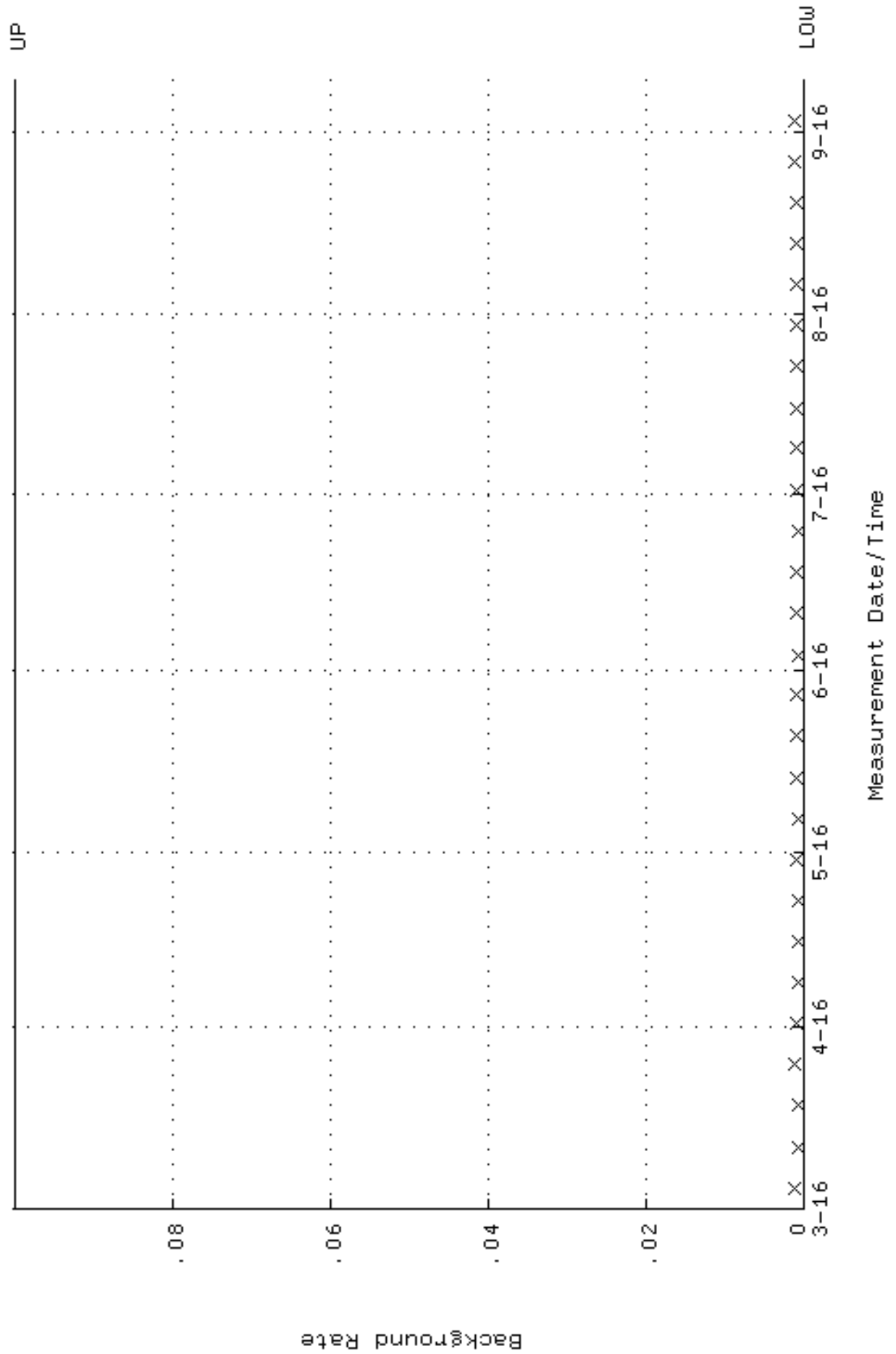
QA filename : DKA100:[ENV_ALPHA.QA.W]W116.QAF;7
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 8-MAR-2016 08:21:27 through 9-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



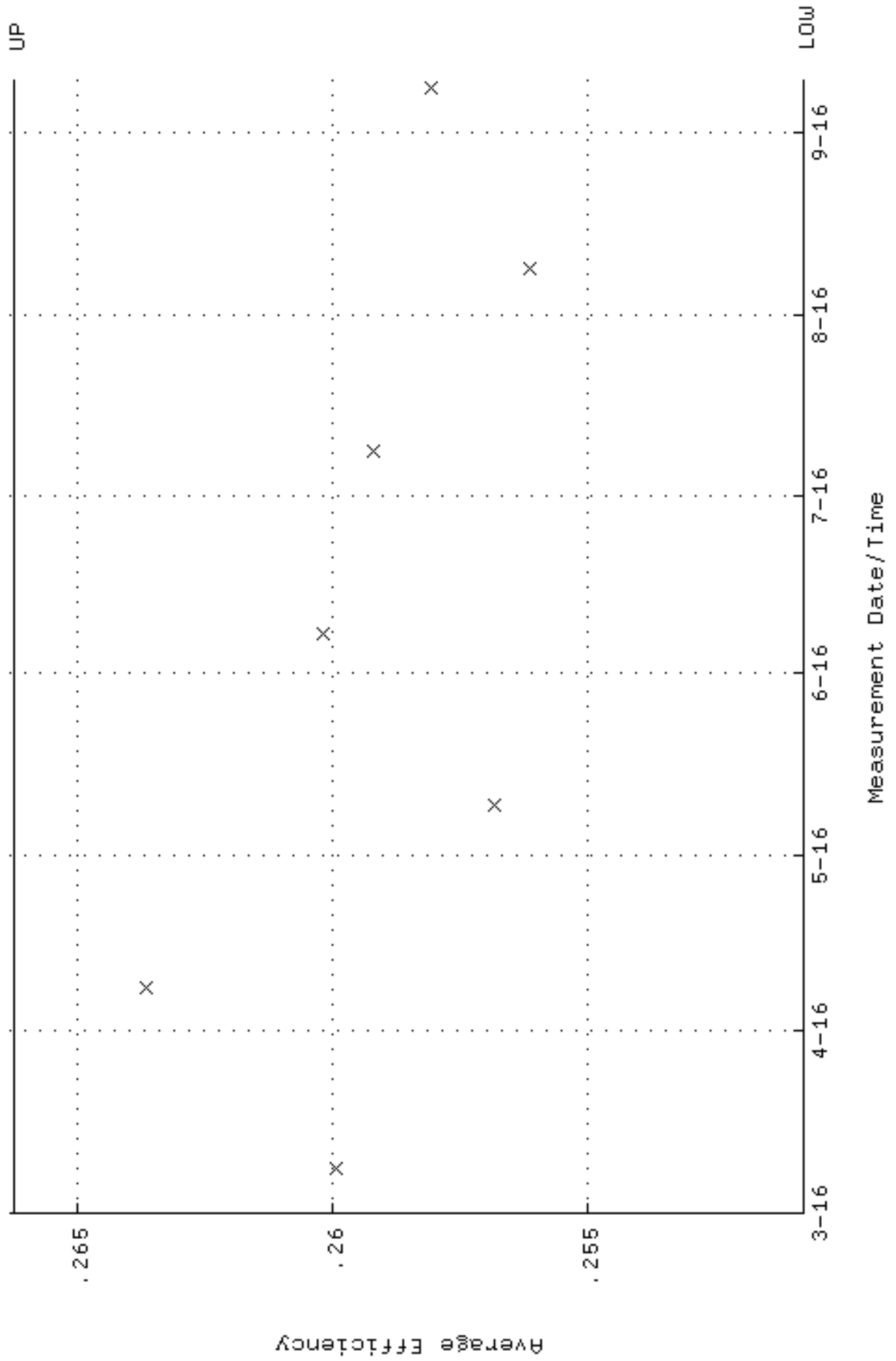
QA filename : DKA100:[ENV_ALPHA.QA.W]W116.QAF;7
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 8-MAR-2016 08:21:27 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



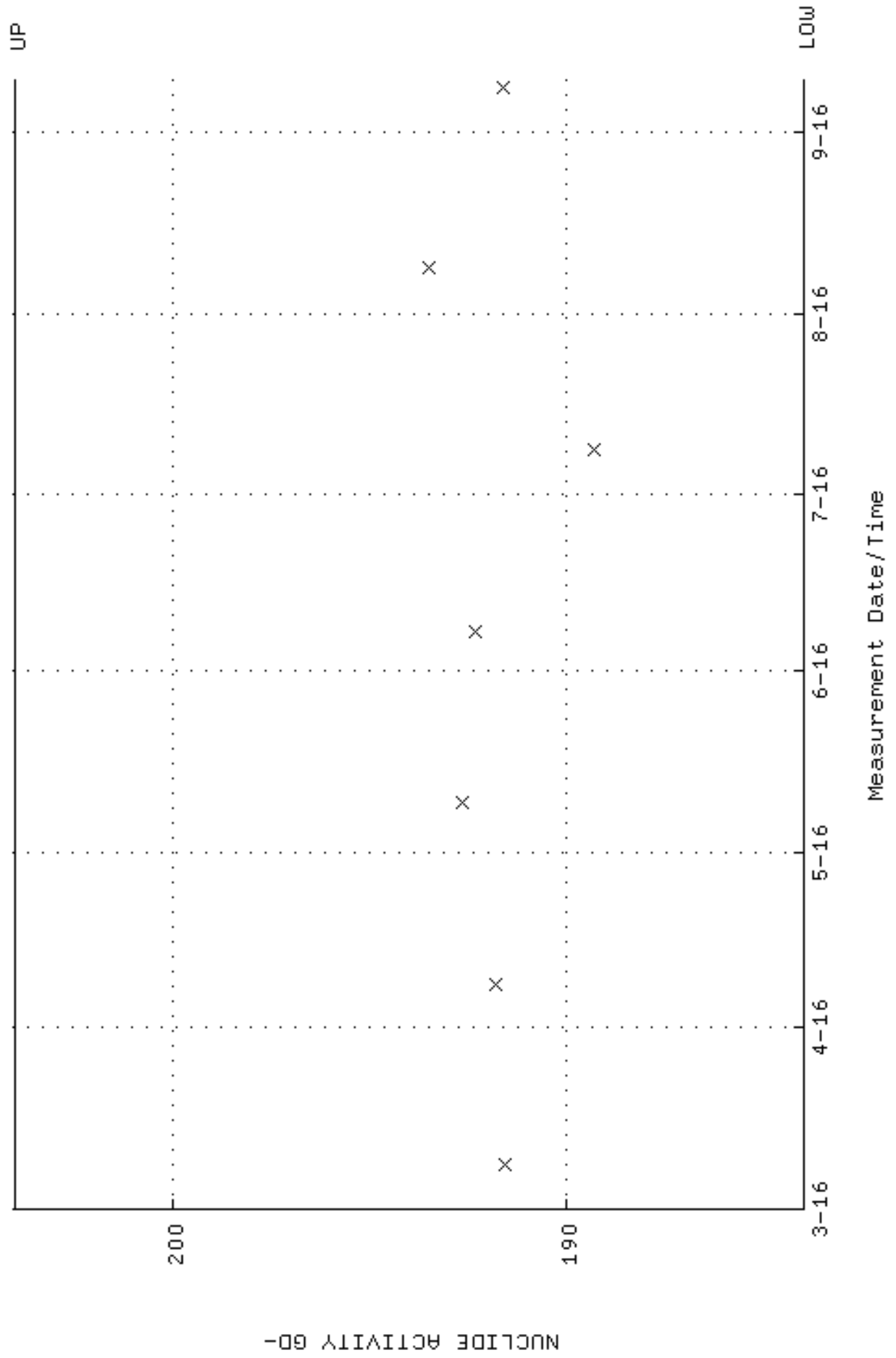
QA filename : DKA100:[ENV_ALPHA.QA.B]B116.QAF;4
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:30:52 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



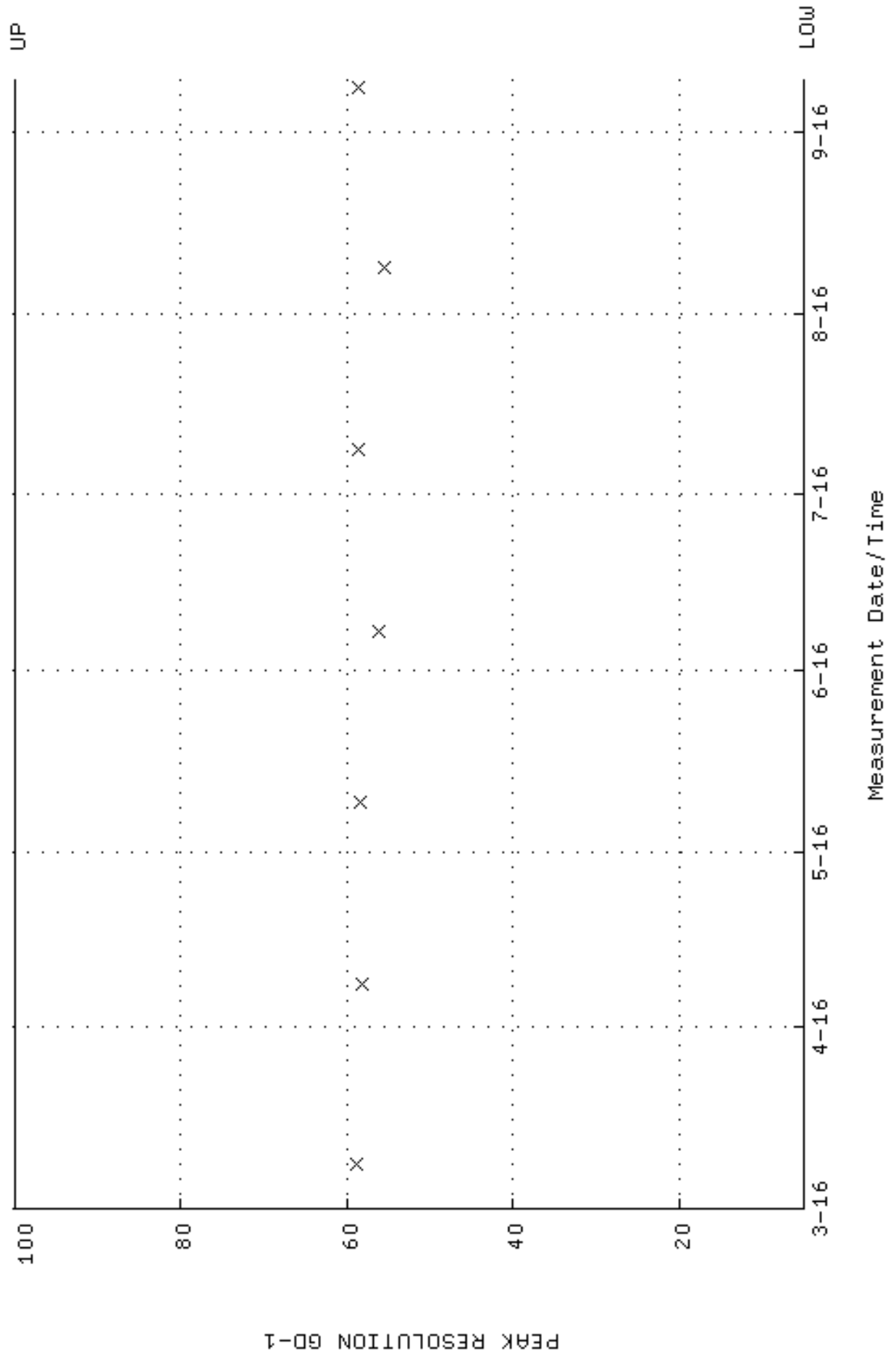
QA filename : DKA100:[ENV_ALPHA.QA.W]W117.QAF;6
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 8-MAR-2016 11:51:37 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.250782 through 0.266290



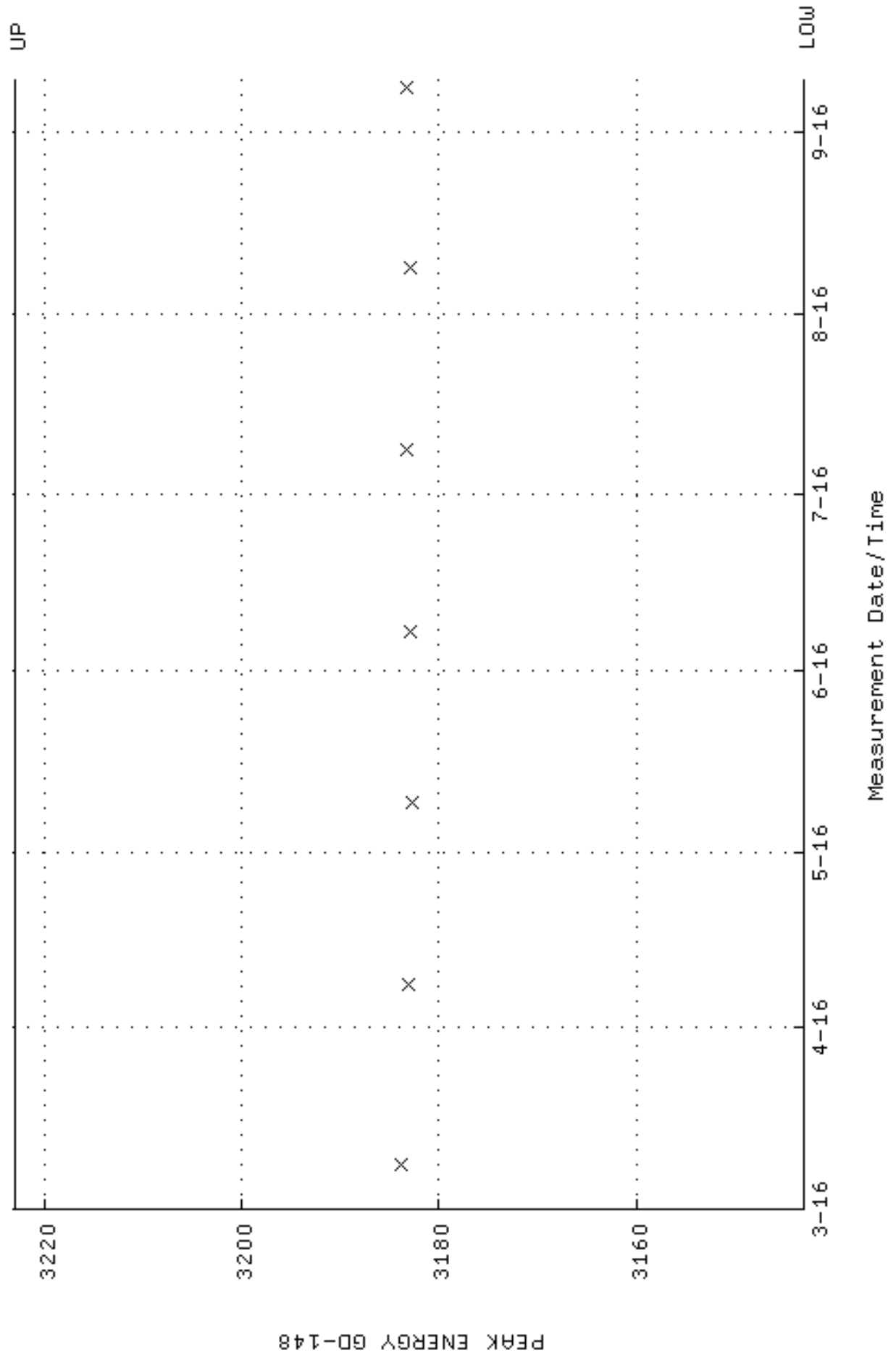
QA filename : DKA100:[ENV_ALPHA.QA.W]W117.QAF;6
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 8-MAR-2016 11:51:37 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



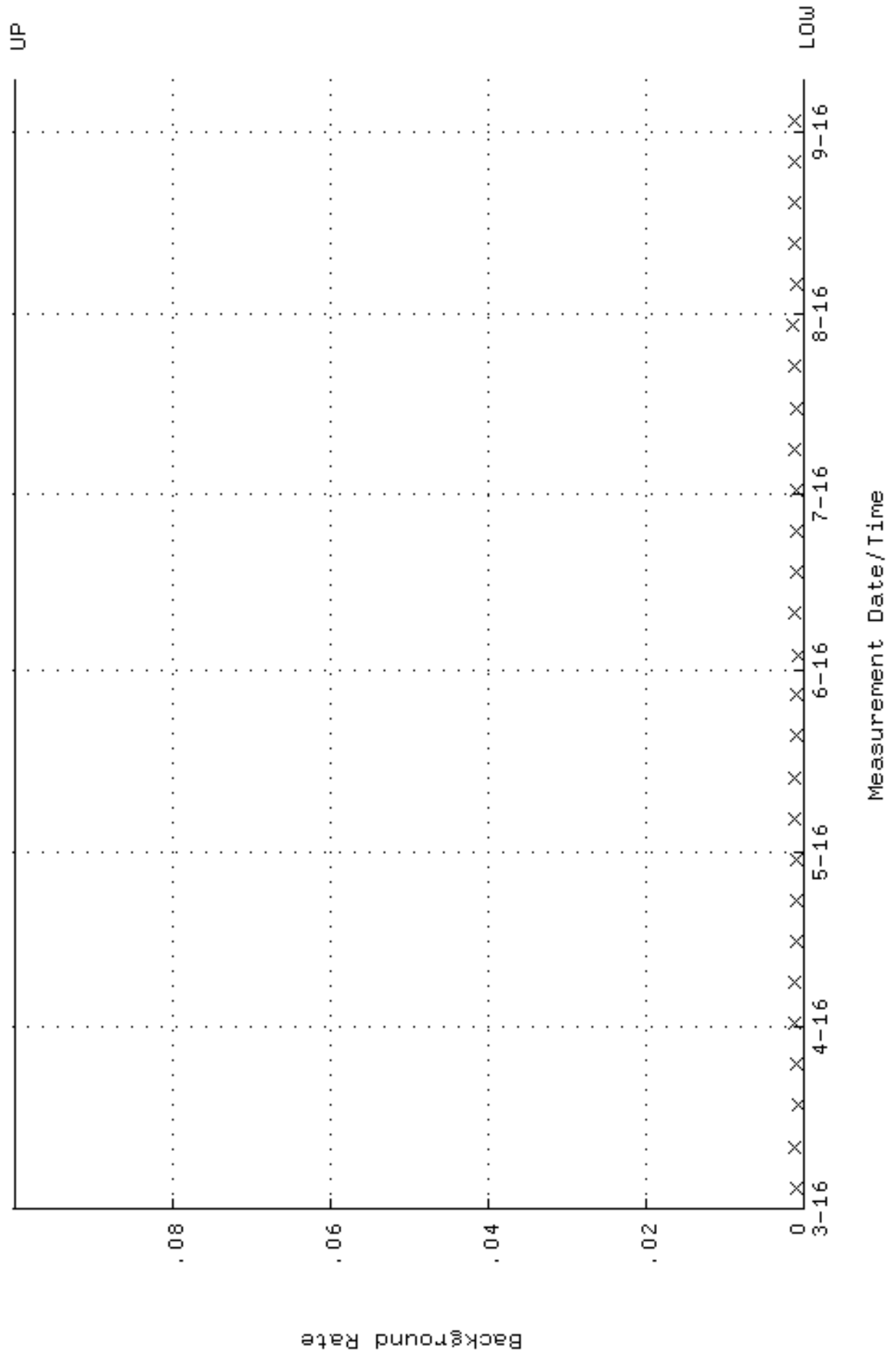
QA filename : DKA100:[ENV_ALPHA.QA.W]W117.QAF;6
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 8-MAR-2016 11:51:37 through 9-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



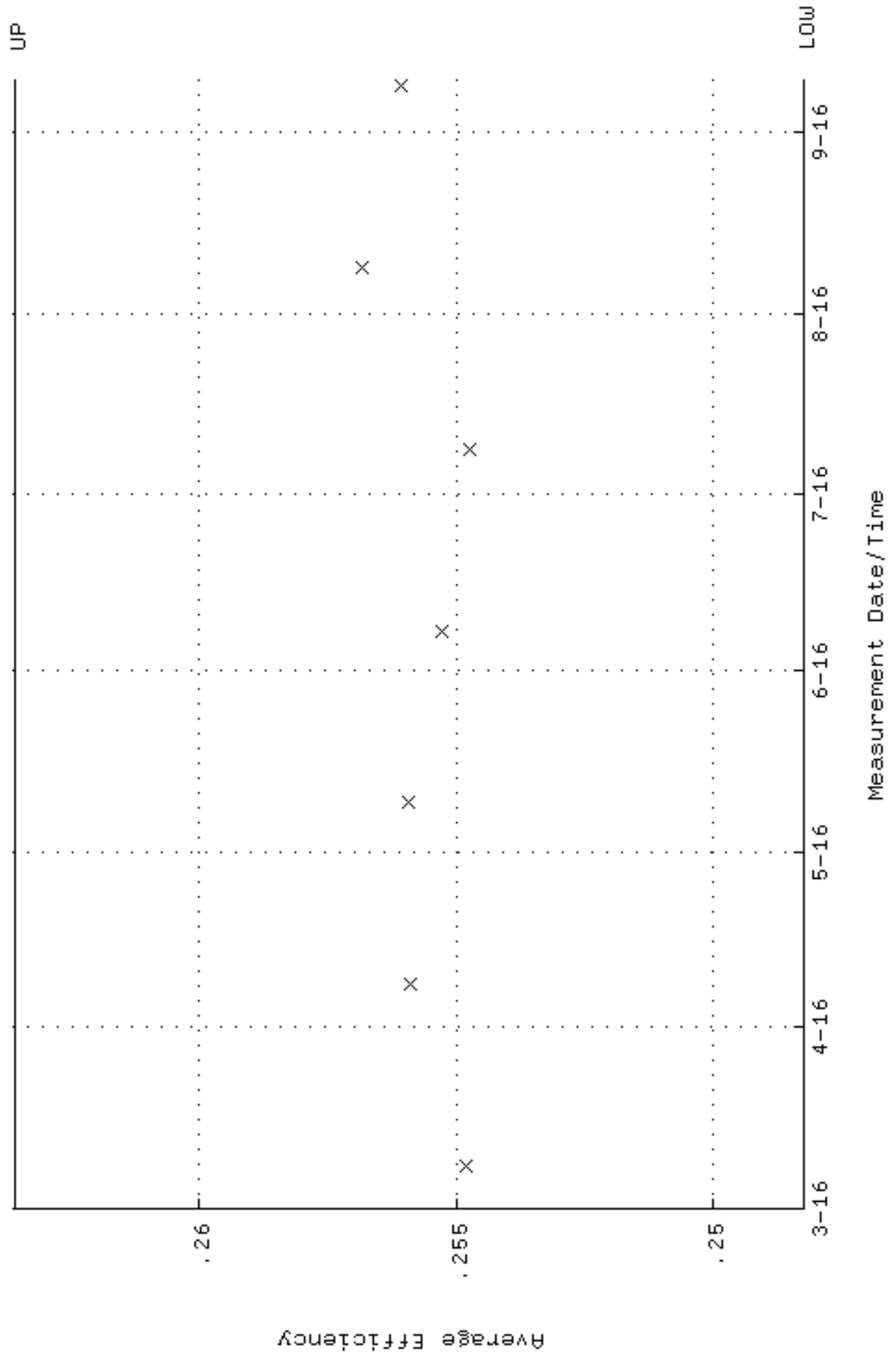
QA filename : DKA100:[ENV_ALPHA.QA.W]W117.QAF;6
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 8-MAR-2016 11:51:37 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



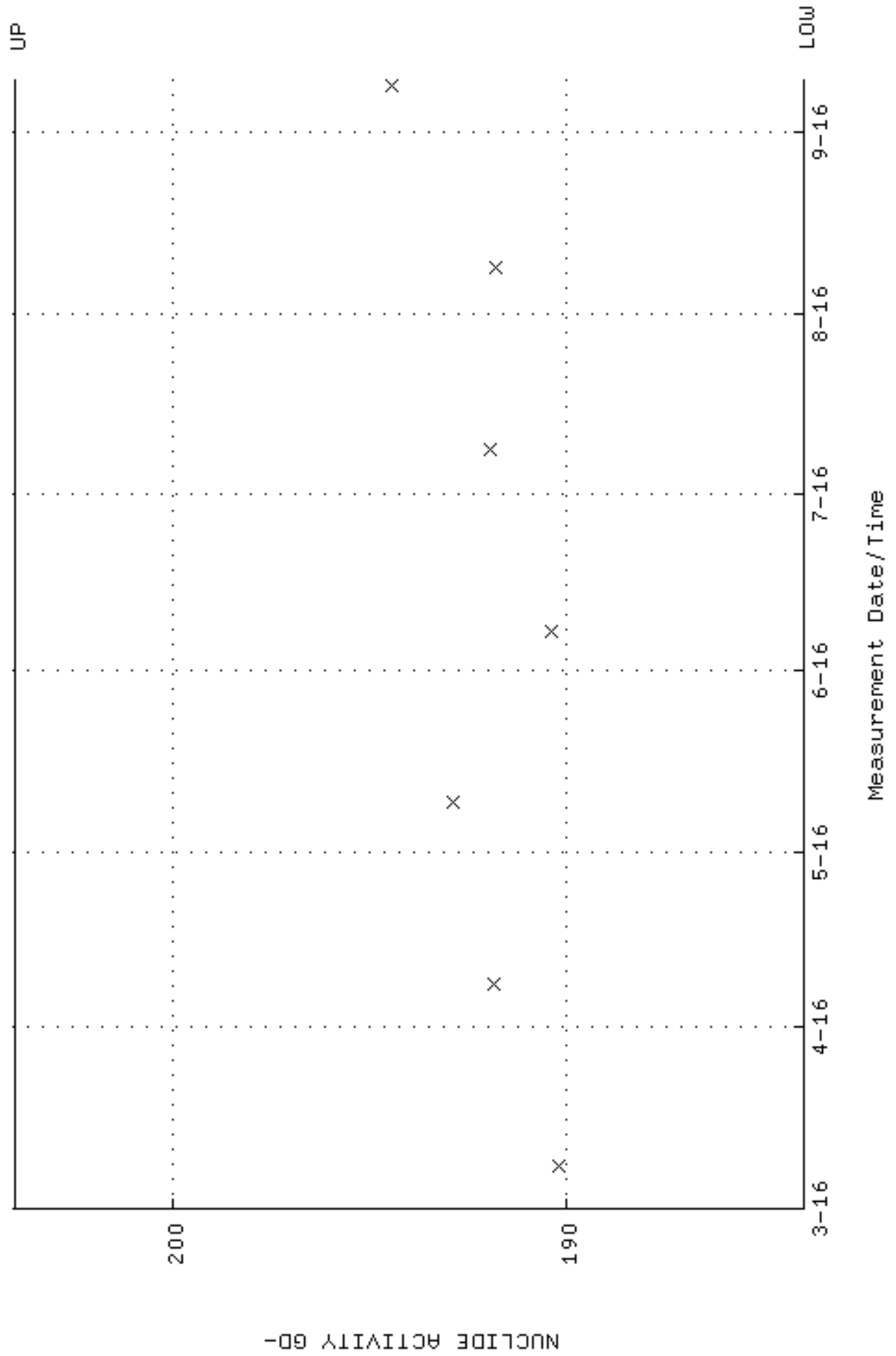
QA filename : DKA100:[ENV_ALPHA.QA.B]B117.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:30:56 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



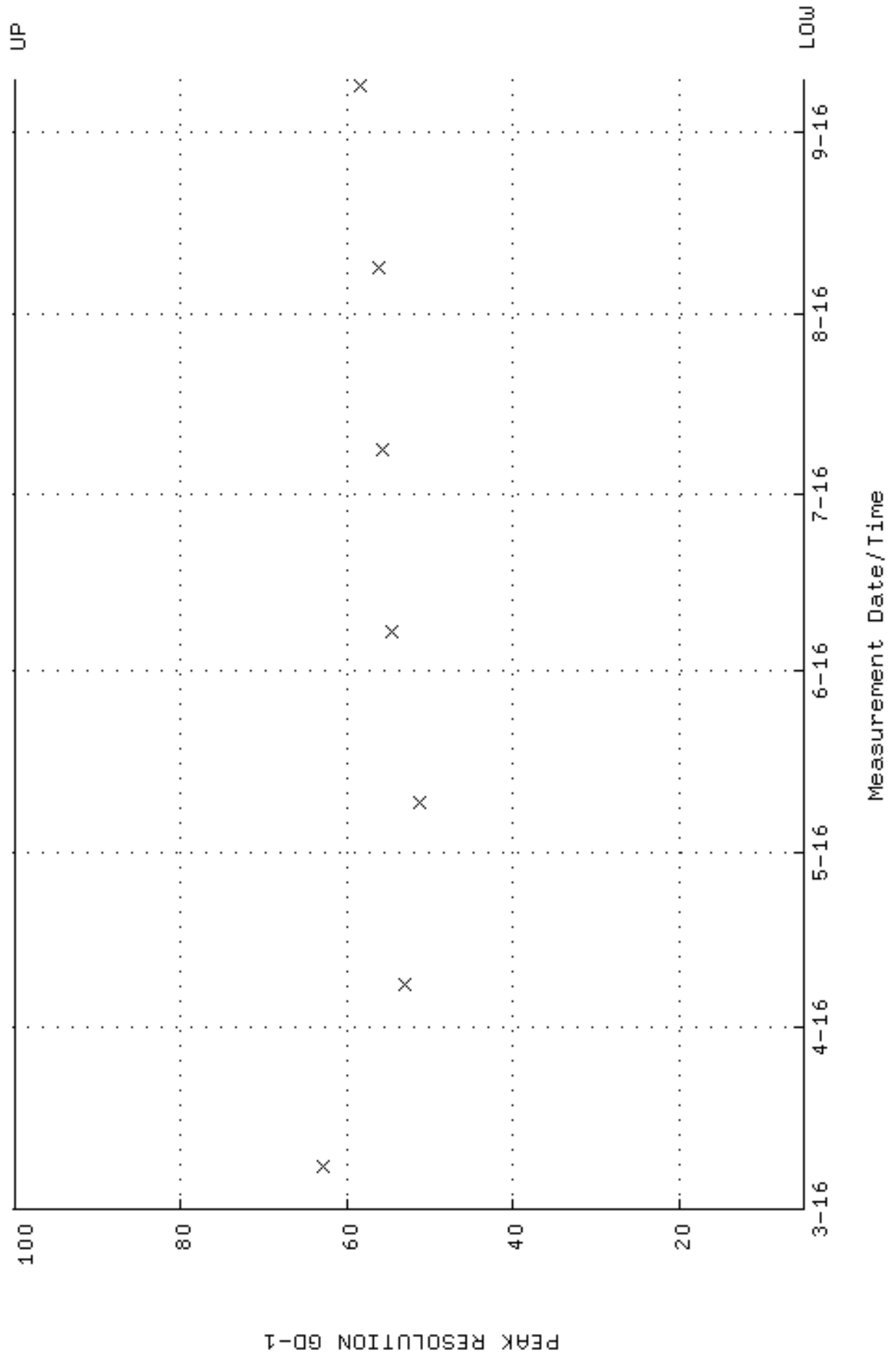
QA filename : DKA100:[ENV_ALPHA.QA.W]W118.QAF;9
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 8-MAR-2016 08:21:36 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.248236 through 0.263590



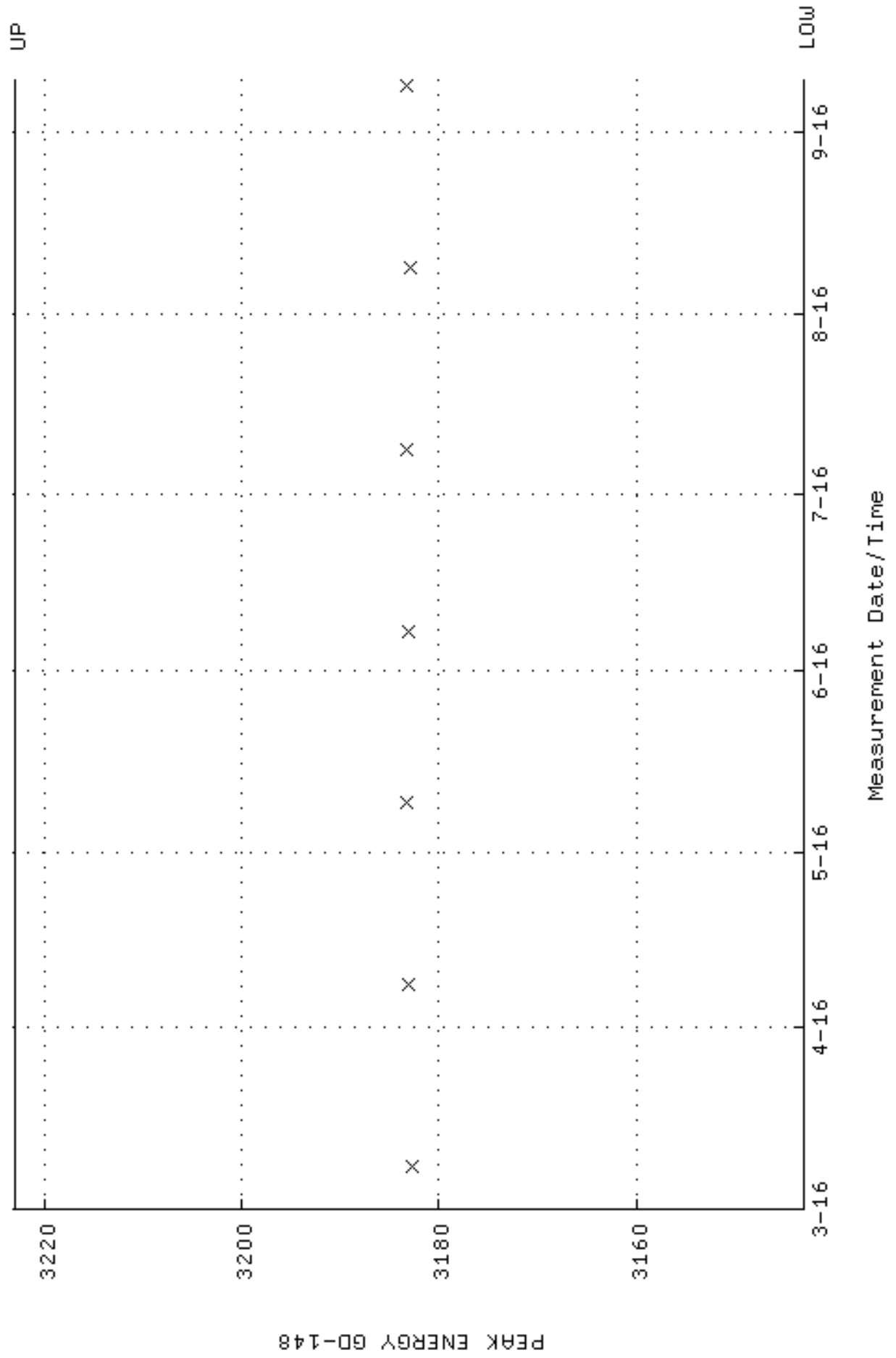
QA filename : DKA100:[ENV_ALPHA.QA.W]W118.QAF;9
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 8-MAR-2016 08:21:36 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



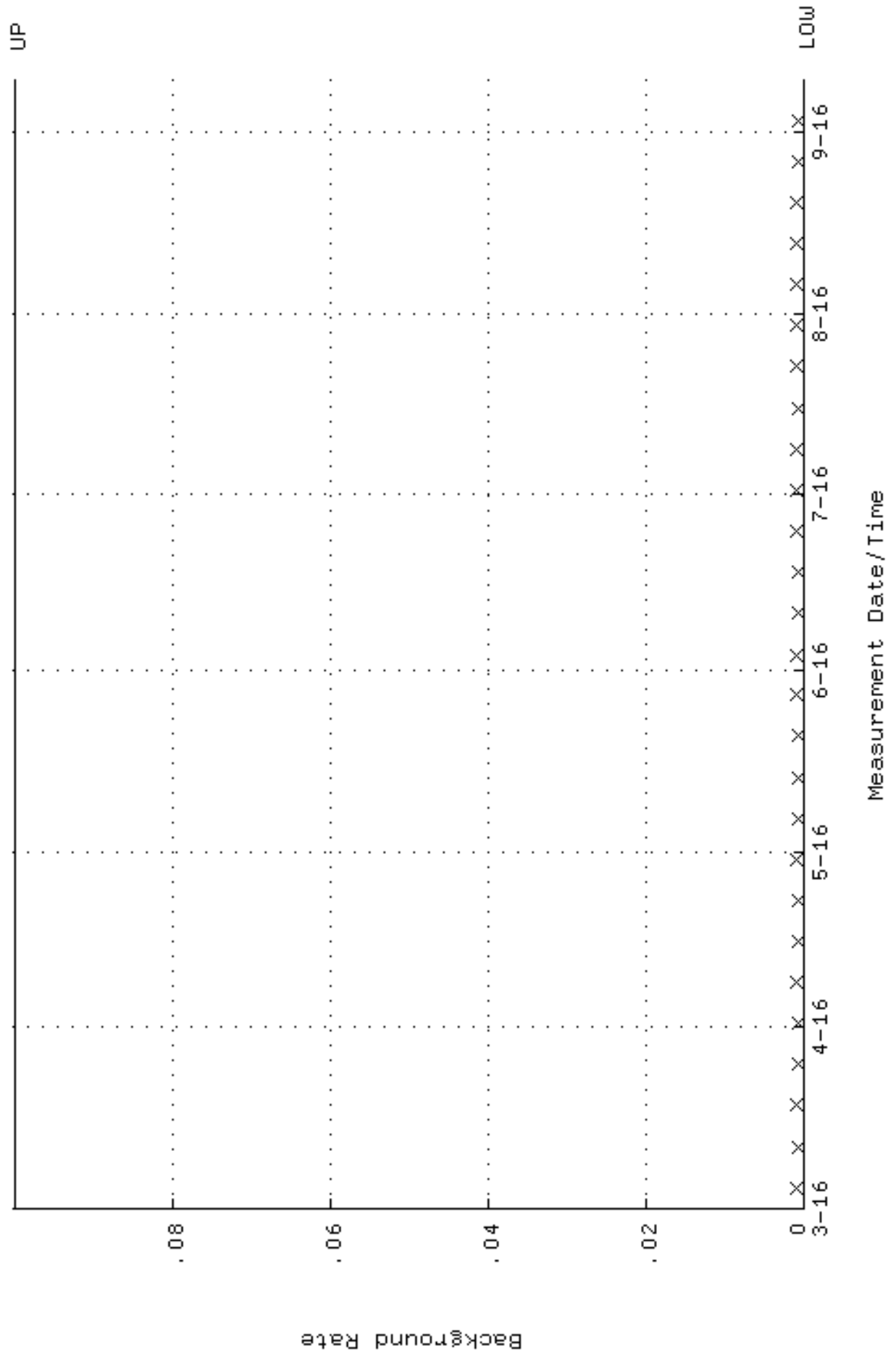
QA filename : DKA100:[ENV_ALPHA.QA.W]W118.QAF;9
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 8-MAR-2016 08:21:36 through 9-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



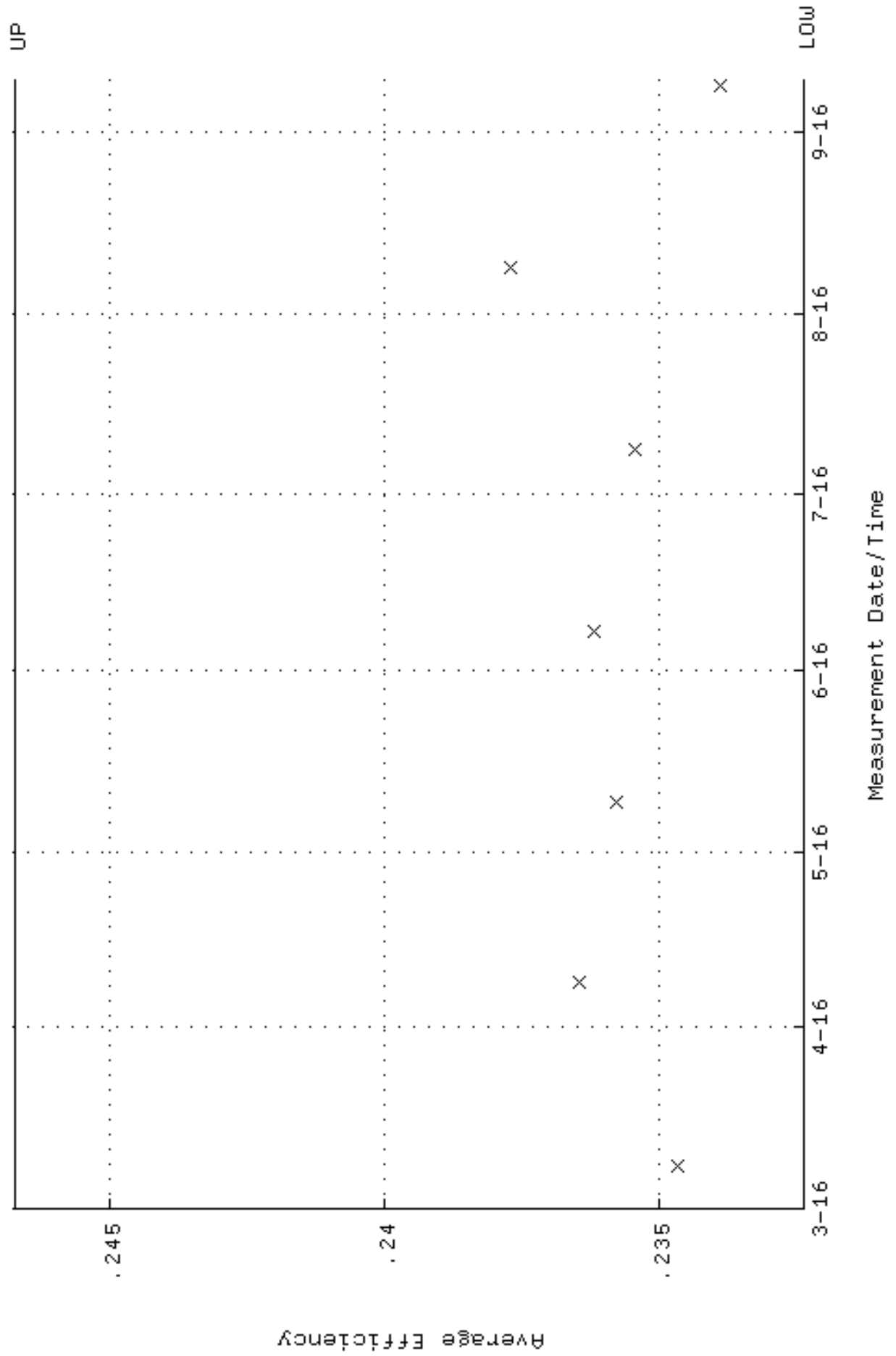
QA filename : DKA100:[ENV_ALPHA.QA.W]W118.QAF;9
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 8-MAR-2016 08:21:36 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



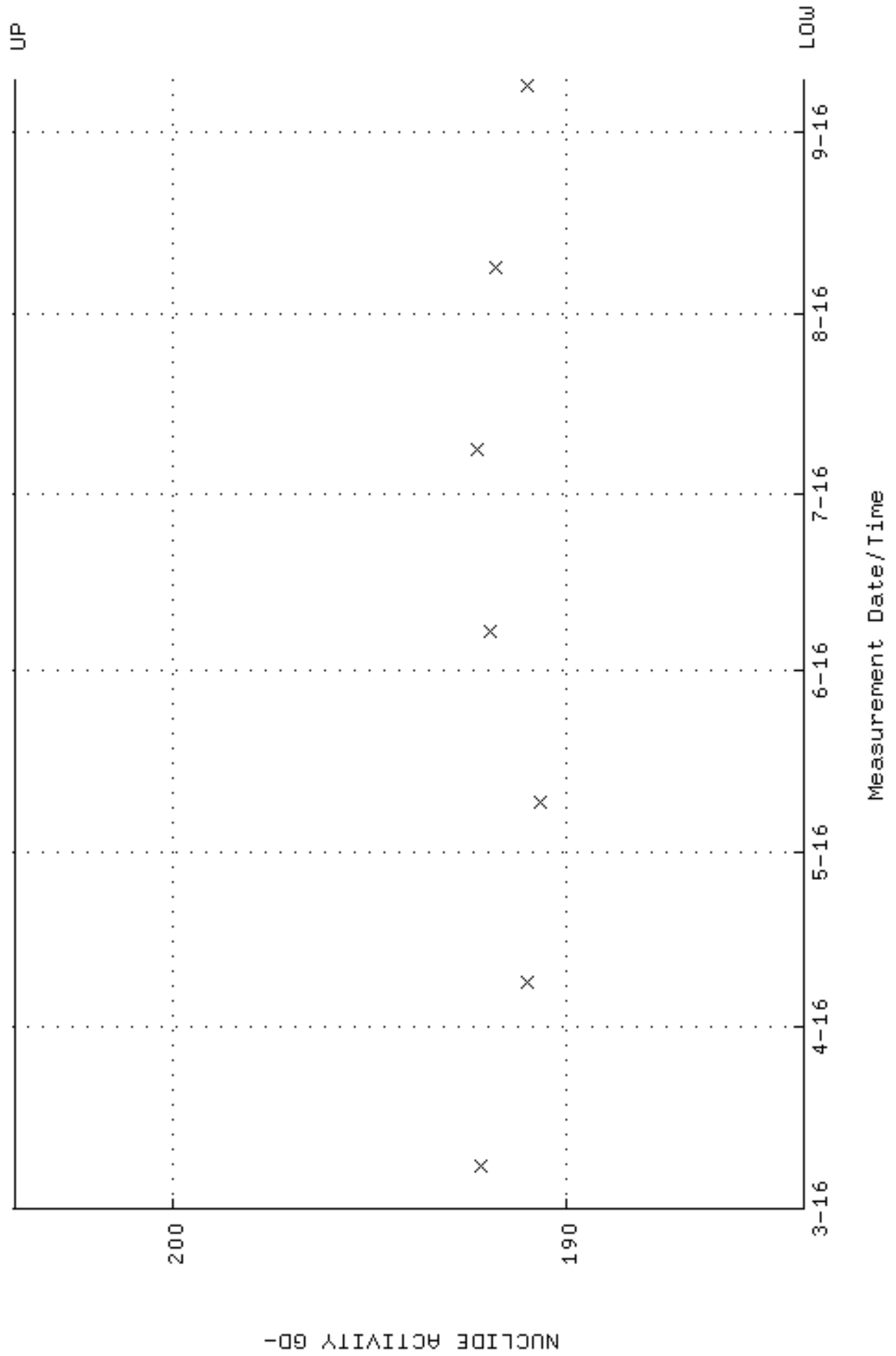
QA filename : DKA100:[ENV_ALPHA.QA.B]B118.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:31:04 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



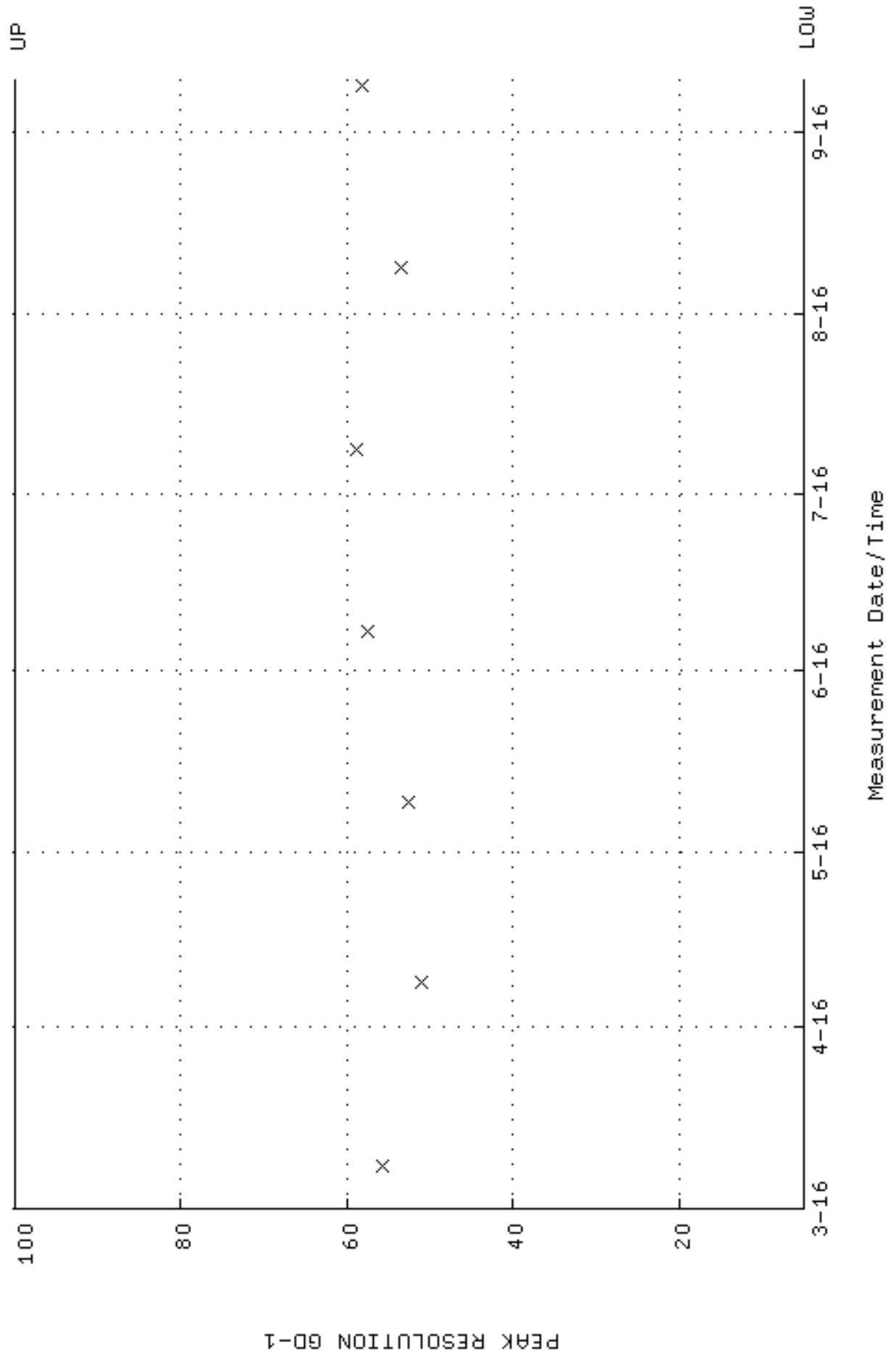
QA filename : DKA100:[ENV_ALPHA.QA.W]W119.QAF;7
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 8-MAR-2016 08:21:40 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.232366 through 0.246740



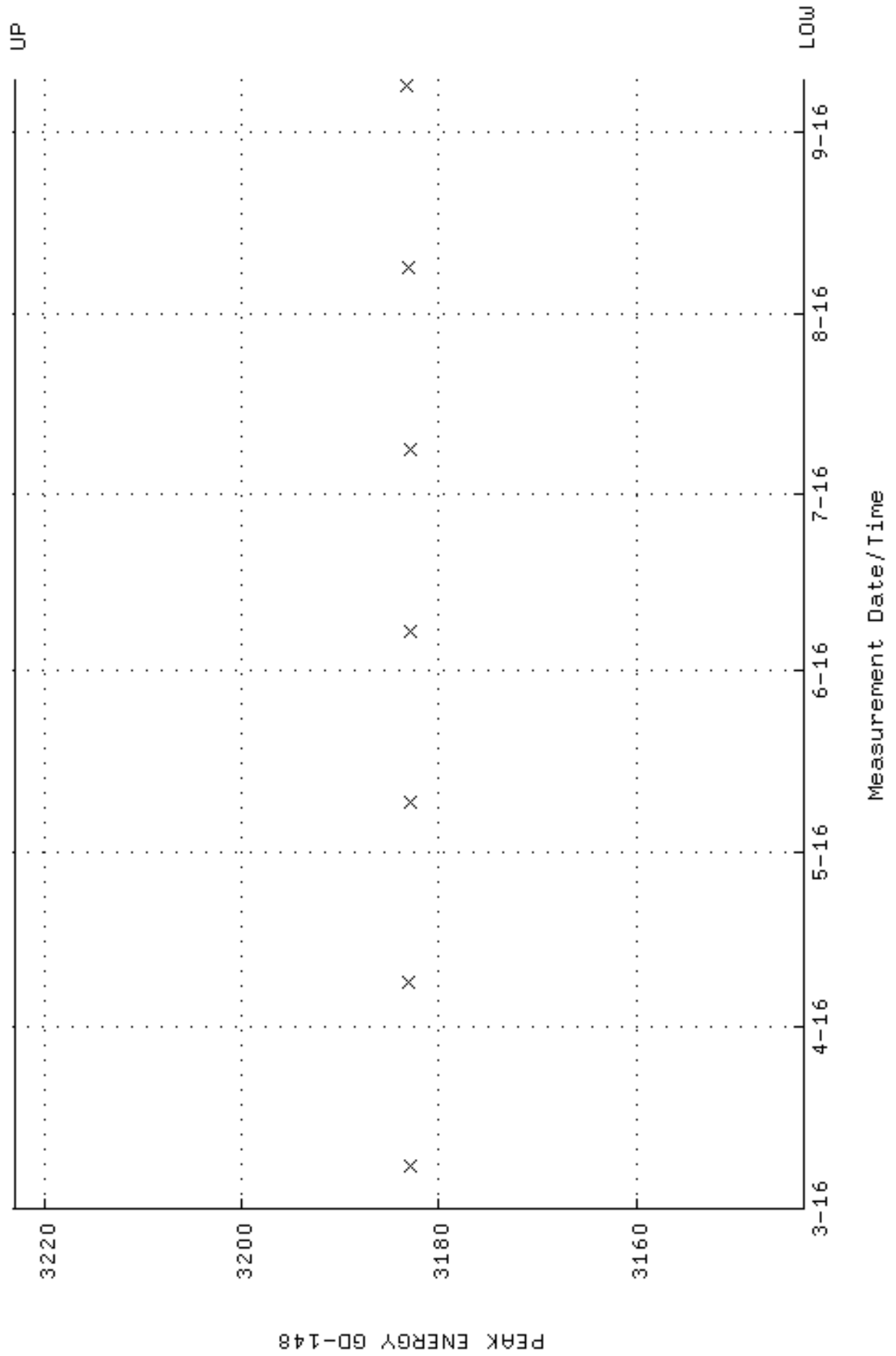
QA filename : DKA100:[ENV_ALPHA.QA.W]W119.QAF;7
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 8-MAR-2016 08:21:40 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



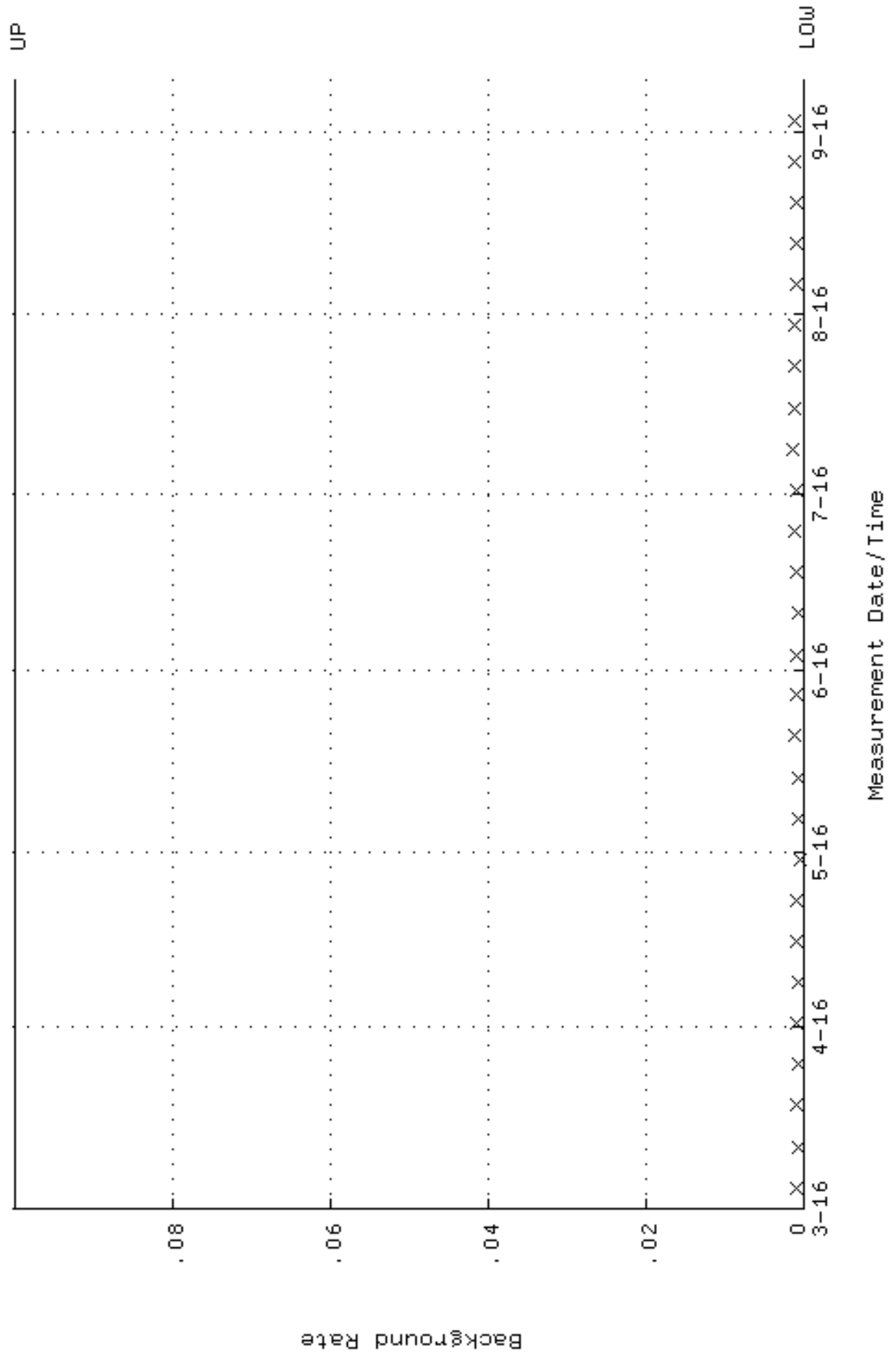
QA filename : DKA100:[ENV_ALPHA.QA.W]W119.QAF;7
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 8-MAR-2016 08:21:40 through 9-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



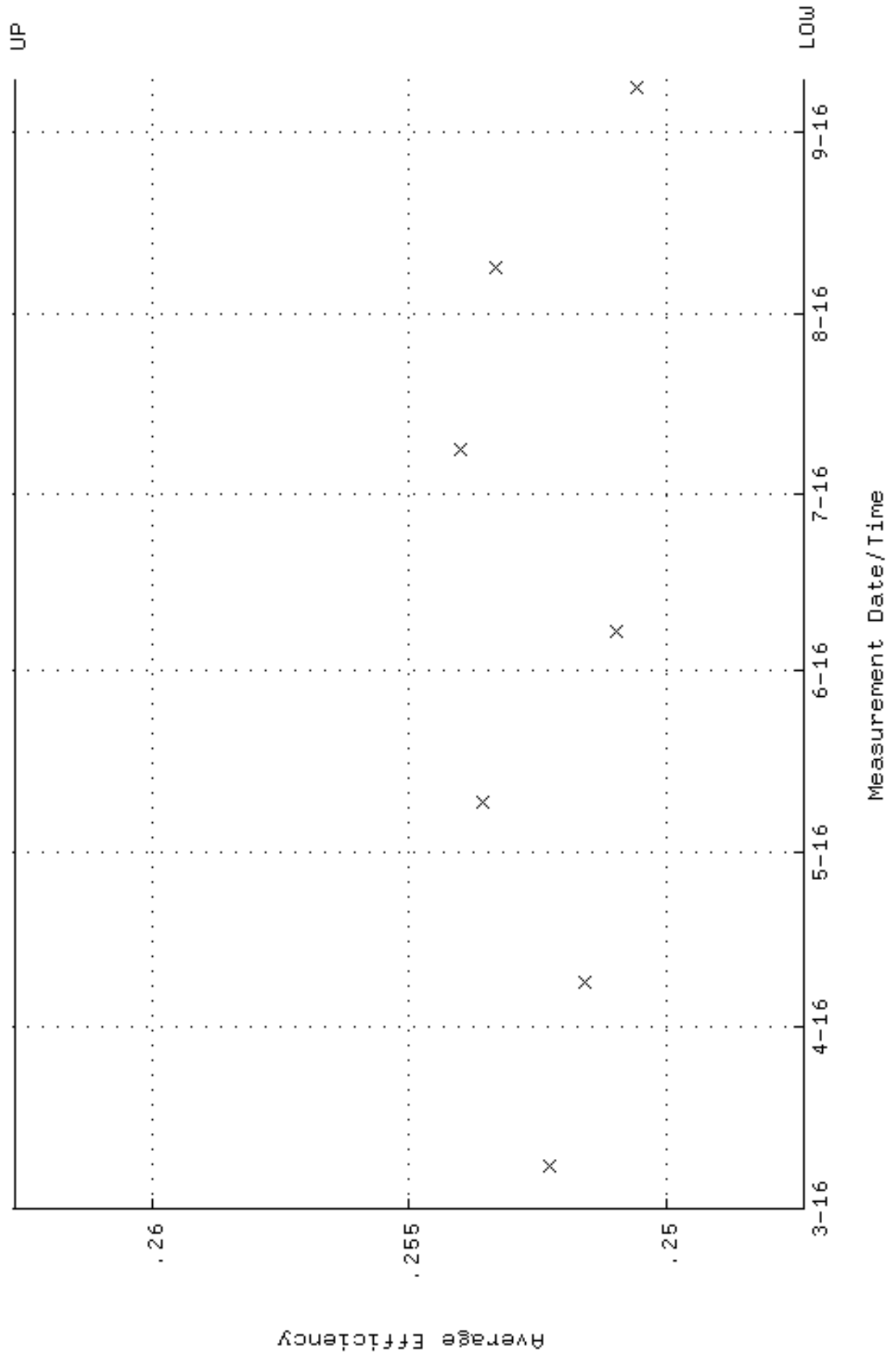
QA filename : DKA100:[ENV_ALPHA.QA.W]W119.QAF;7
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 8-MAR-2016 08:21:40 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



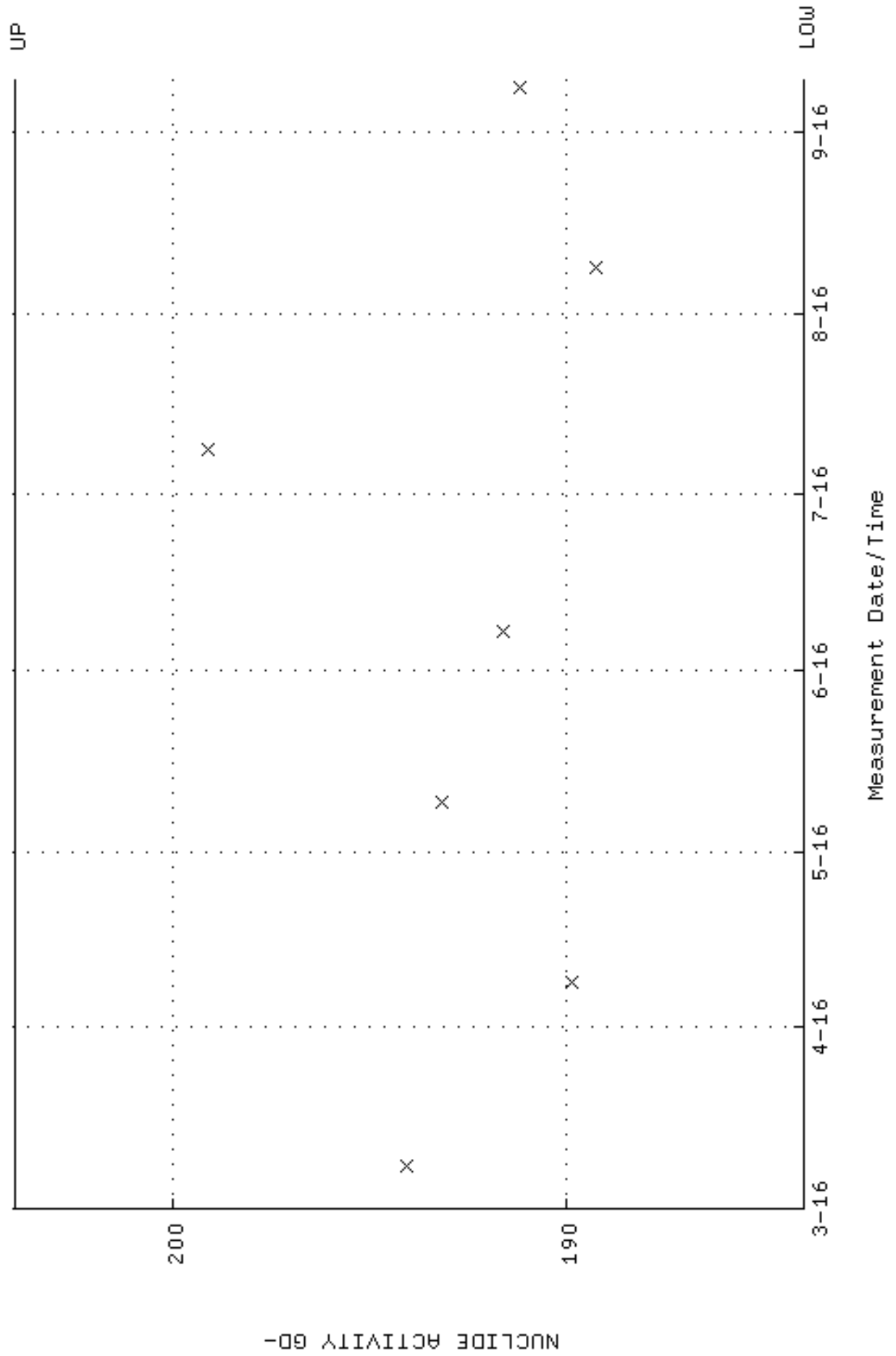
QA filename : DKA100:[ENV_ALPHA.QA.B]B119.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:31:09 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



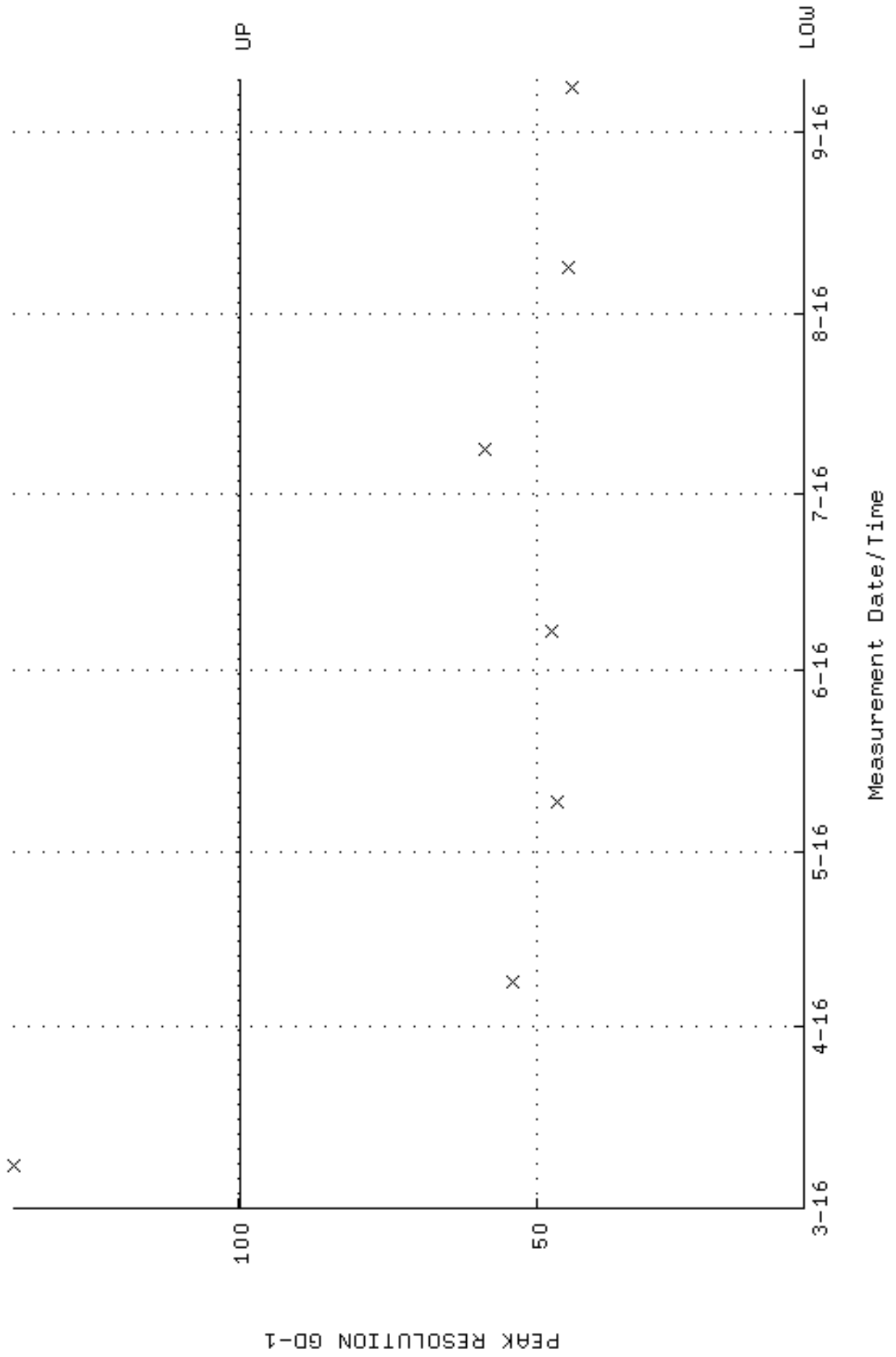
QA filename : DKA100:[ENV_ALPHA.QA.W]W120.QAF;7
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 8-MAR-2016 08:21:44 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.247350 through 0.262650



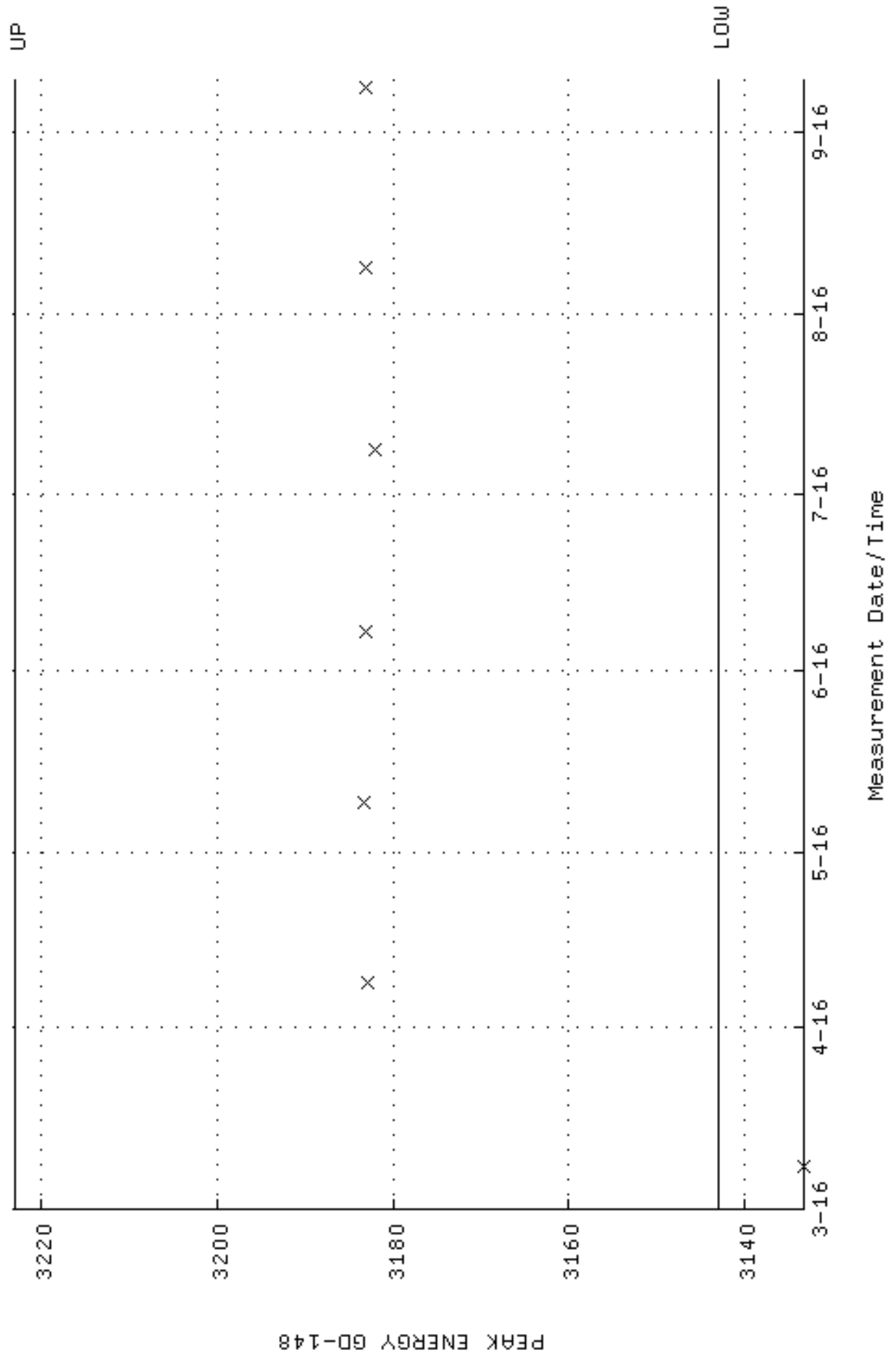
QA filename : DKA100:[ENV_ALPHA.QA.W]W120.QAF;7
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 8-MAR-2016 08:21:44 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



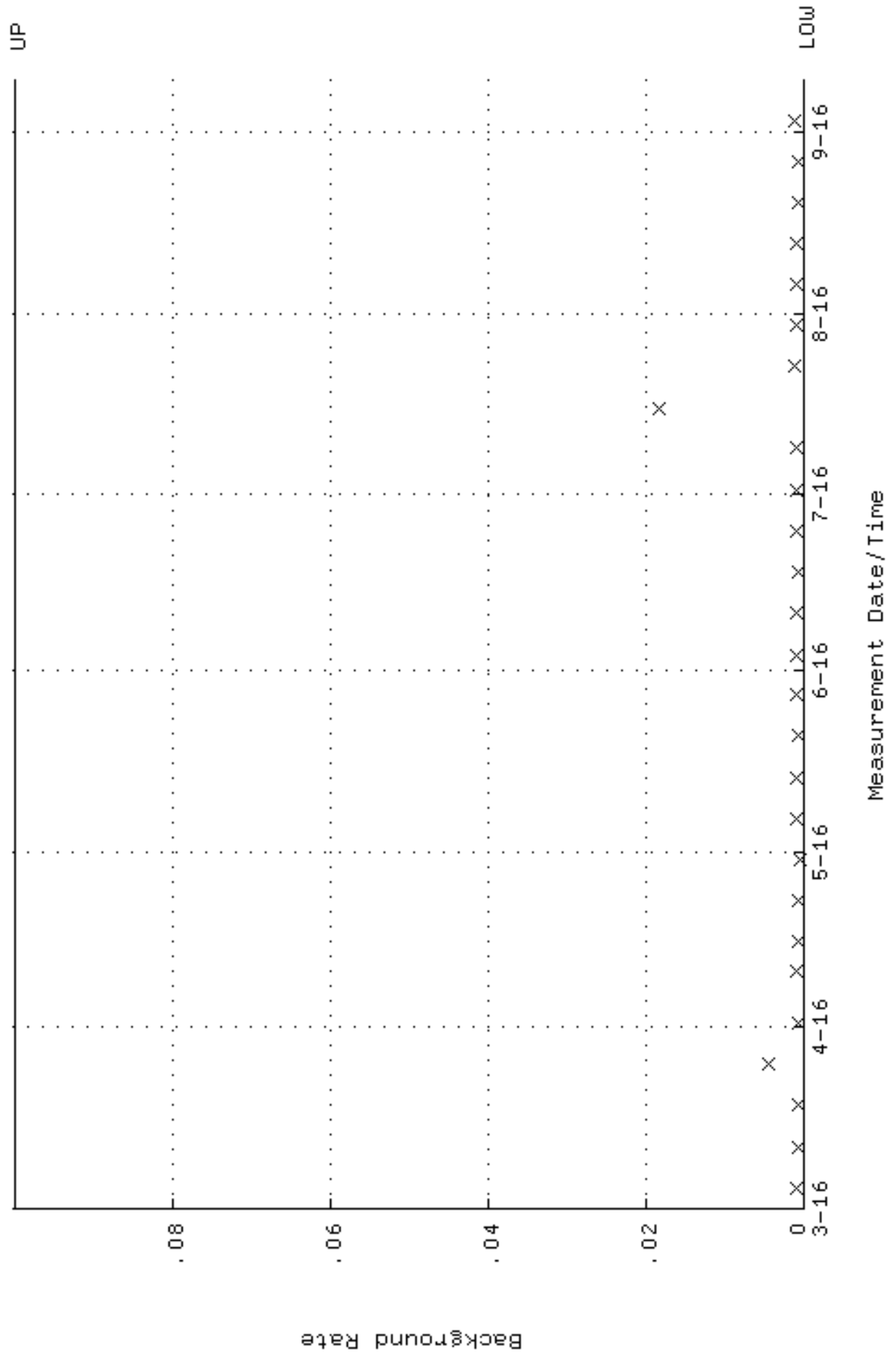
QA filename : DKA100:[ENV_ALPHA.QA.W]W120.QAF;7
 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 8-MAR-2016 08:21:44 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



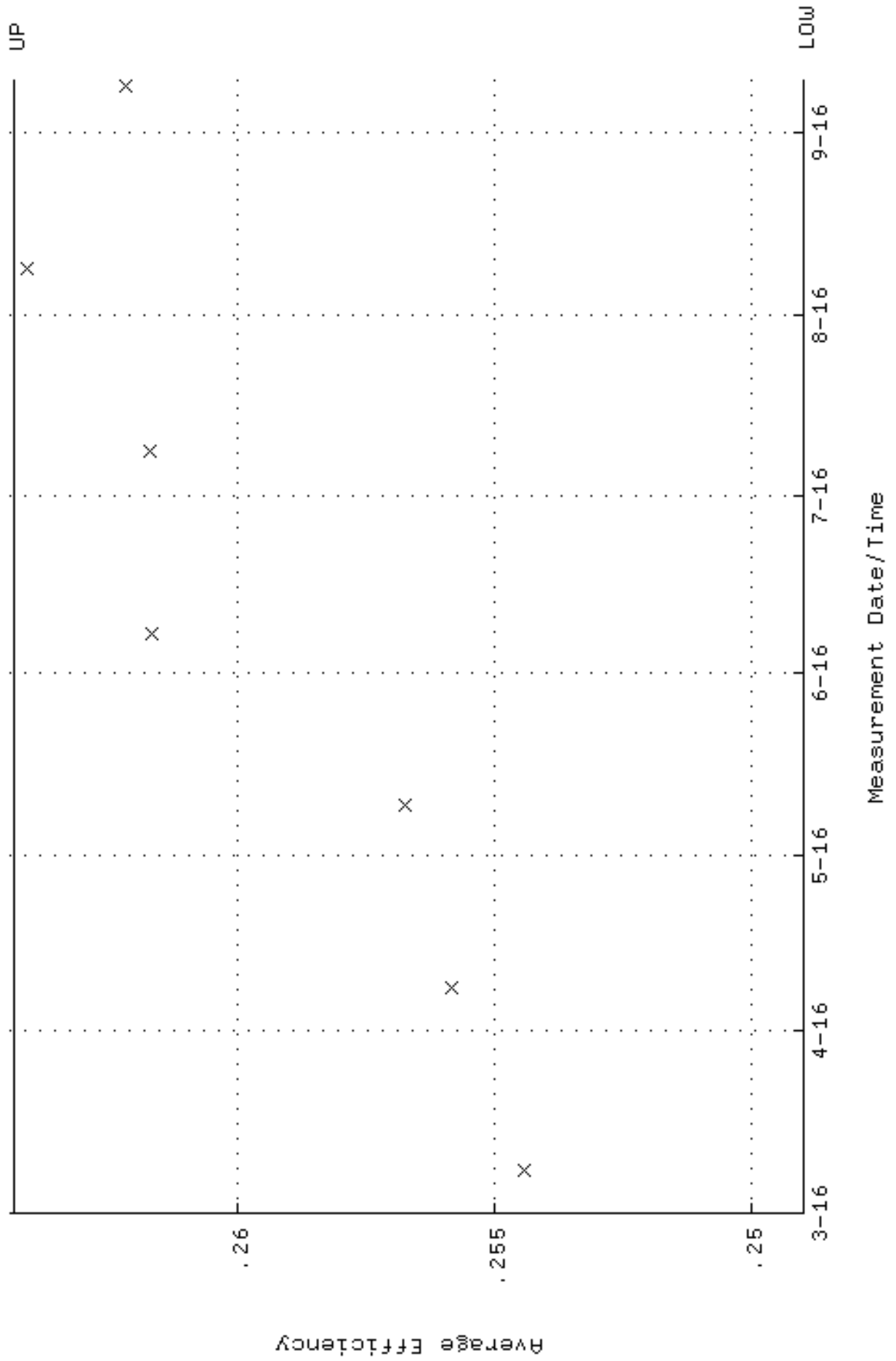
QA filename : DKA100:[ENV_ALPHA.QA.W]W120.QAF;7
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 8-MAR-2016 08:21:44 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



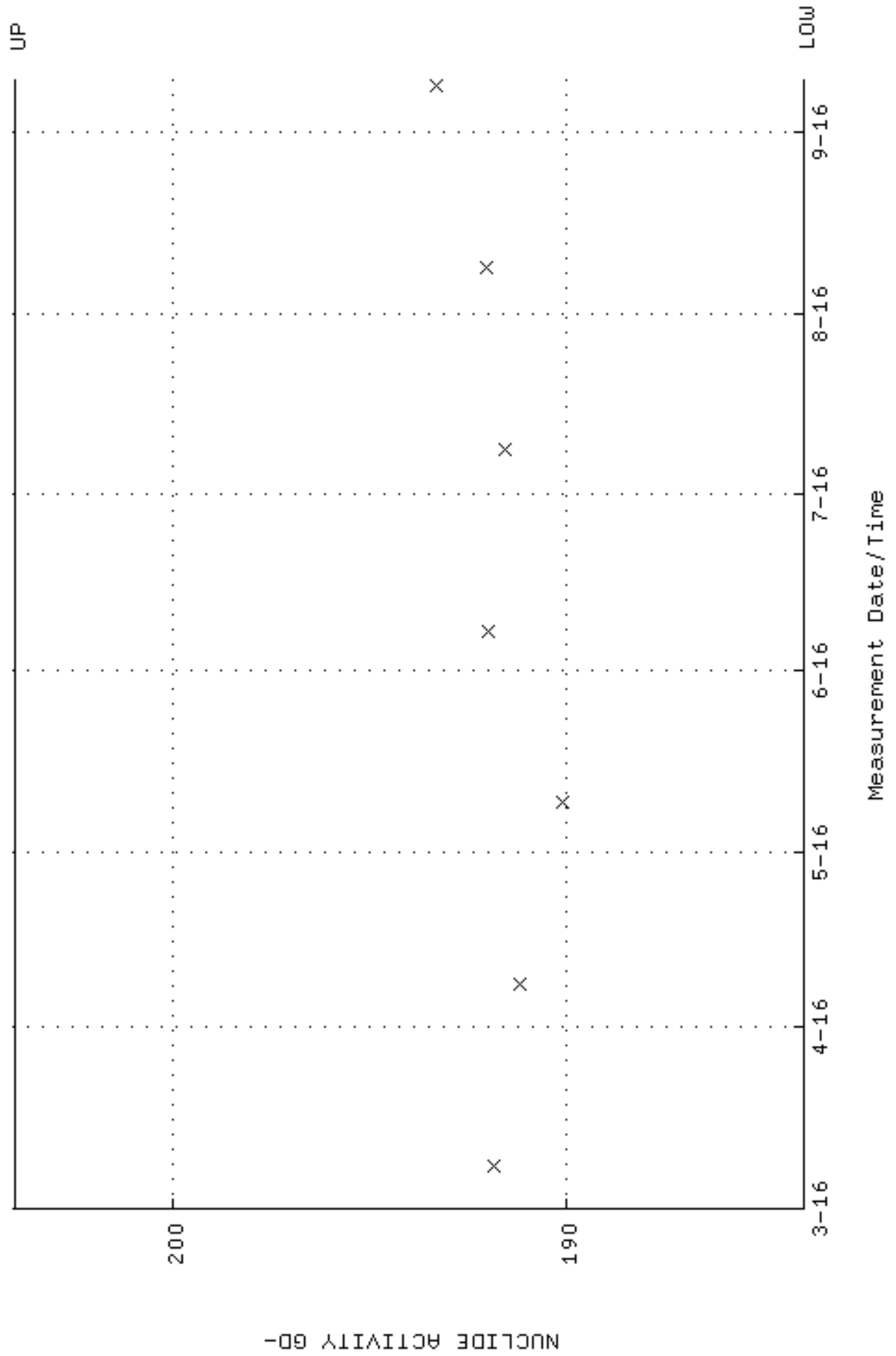
QA filename : DKA100:[ENV_ALPHA.QA.B]B120.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:31:13 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



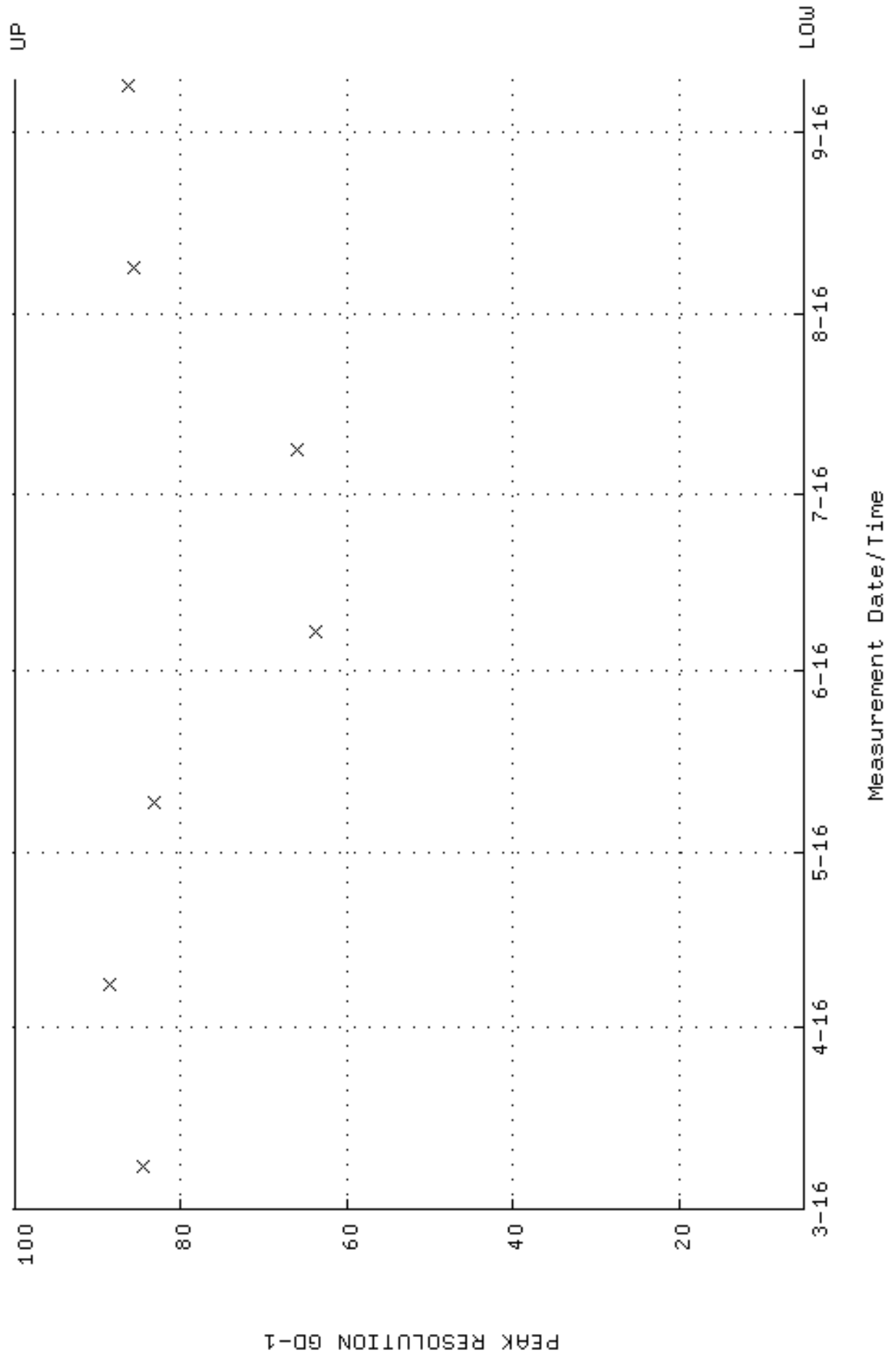
QA filename : DKA100:[ENV_ALPHA.QA.W]W121.QAF;7
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 8-MAR-2016 08:21:48 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.248969 through 0.264369



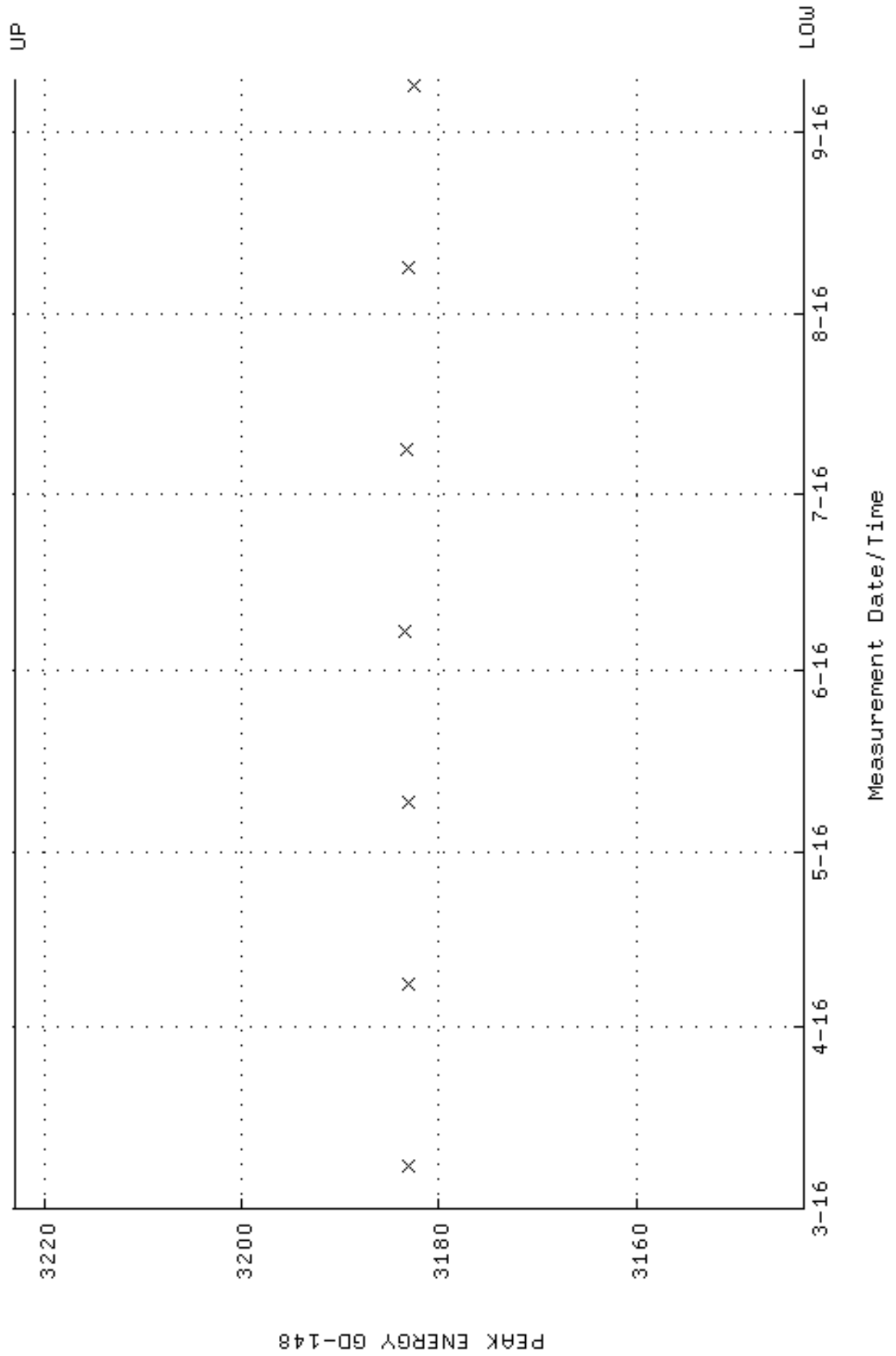
QA filename : DKA100:[ENV_ALPHA.QA.W]W121.QAF;7
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 8-MAR-2016 08:21:48 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



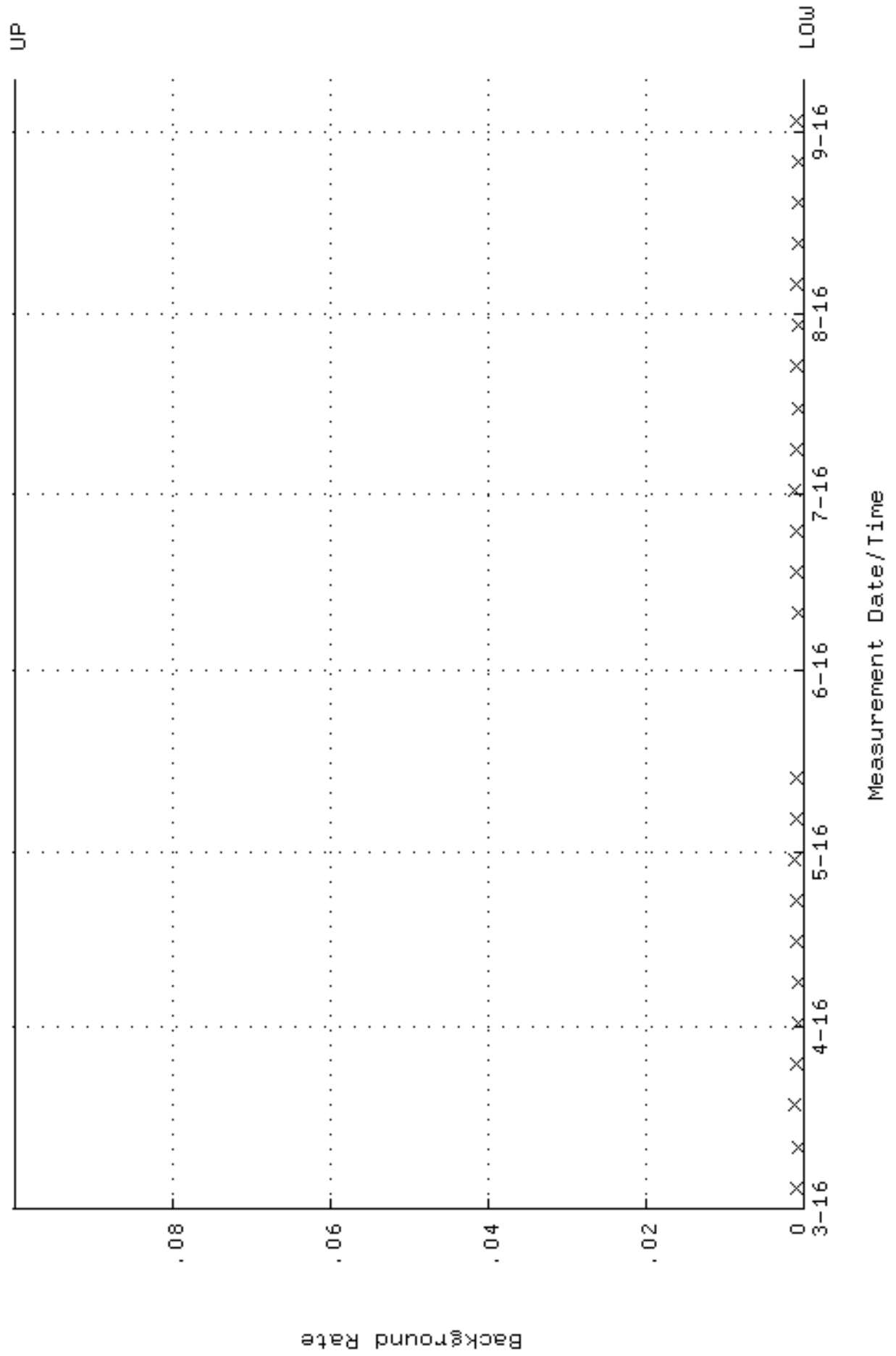
QA filename : DKA100:[ENV_ALPHA.QA.W]W121.QAF;7
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 8-MAR-2016 08:21:48 through 9-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



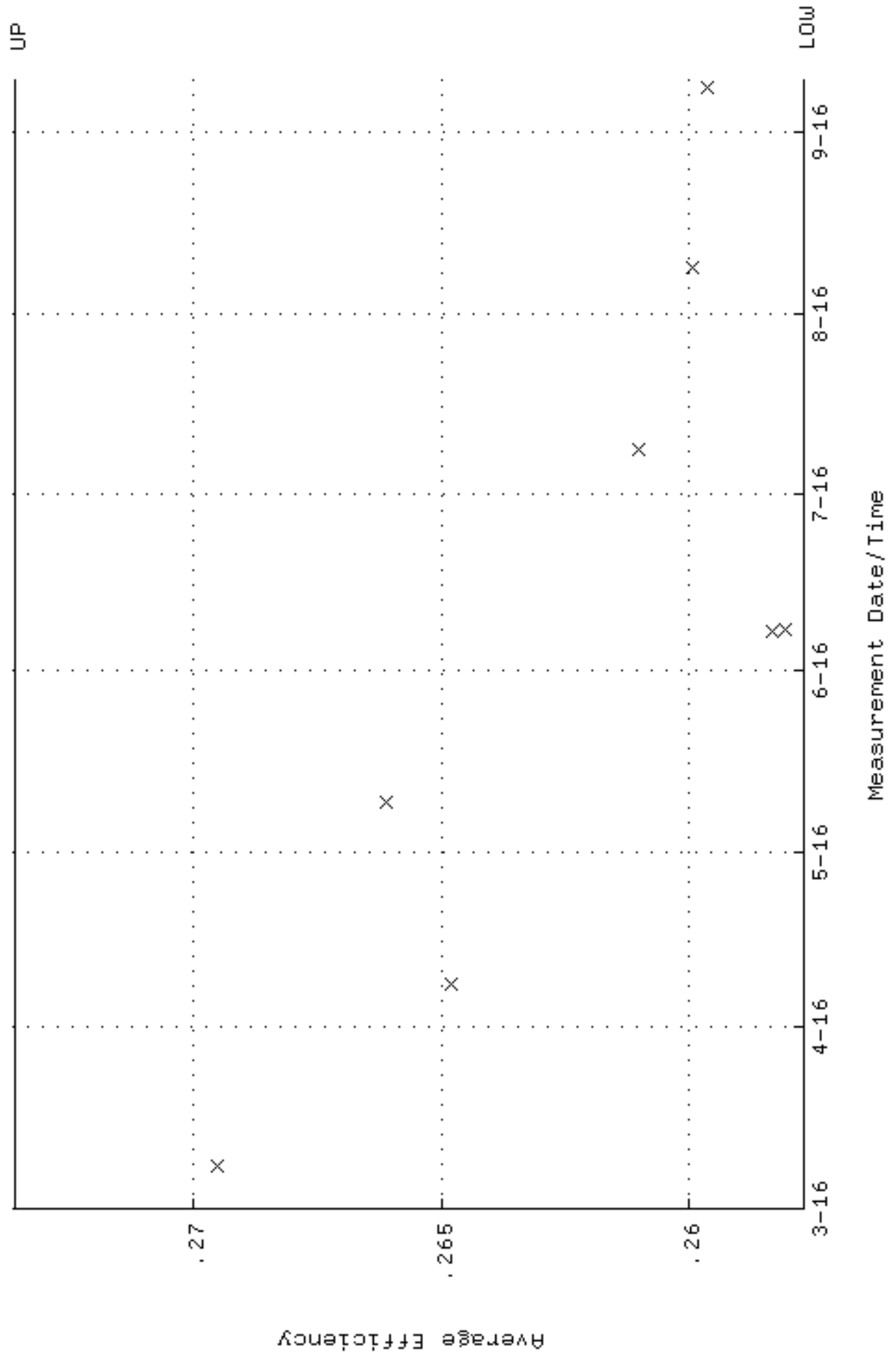
QA filename : DKA100:[ENV_ALPHA.QA.W]W121.QAF;7
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 8-MAR-2016 08:21:48 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



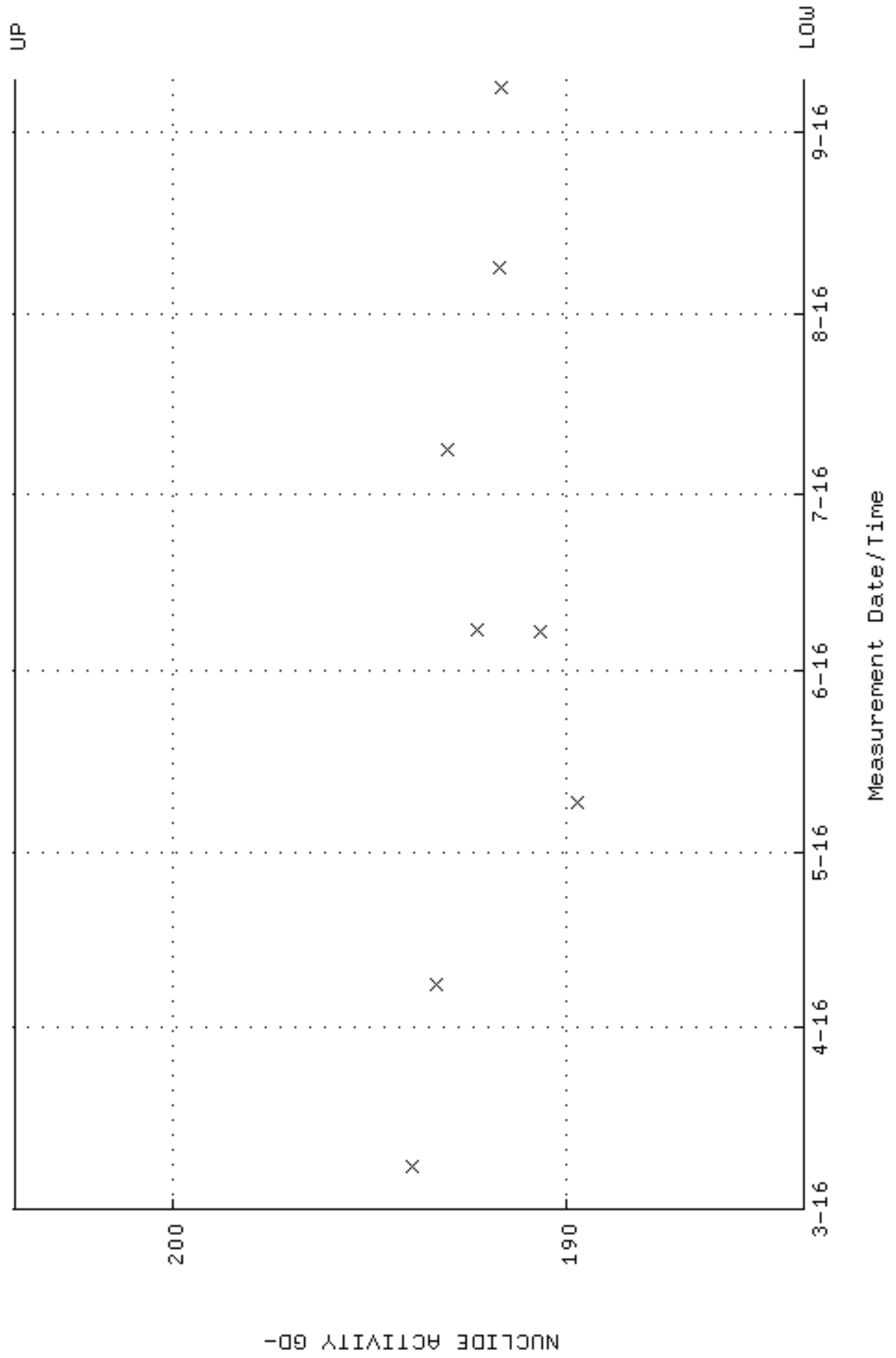
QA filename : DKA100:[ENV_ALPHA.QA.B]B121.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:31:17 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



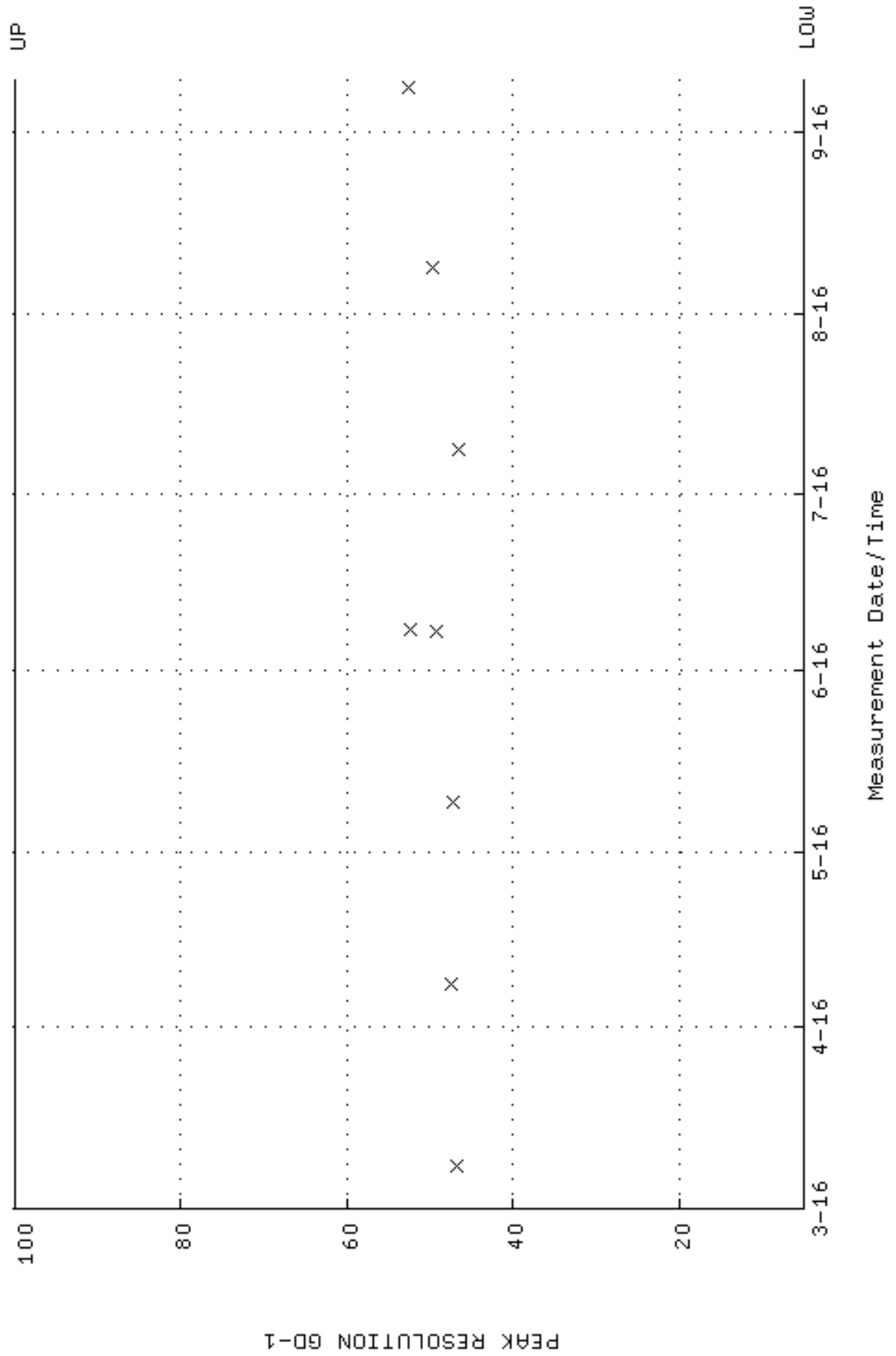
QA filename : DKA100:[ENV_ALPHA.QA.W]W122.QAF;7
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 8-MAR-2016 08:21:53 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.257670 through 0.273610



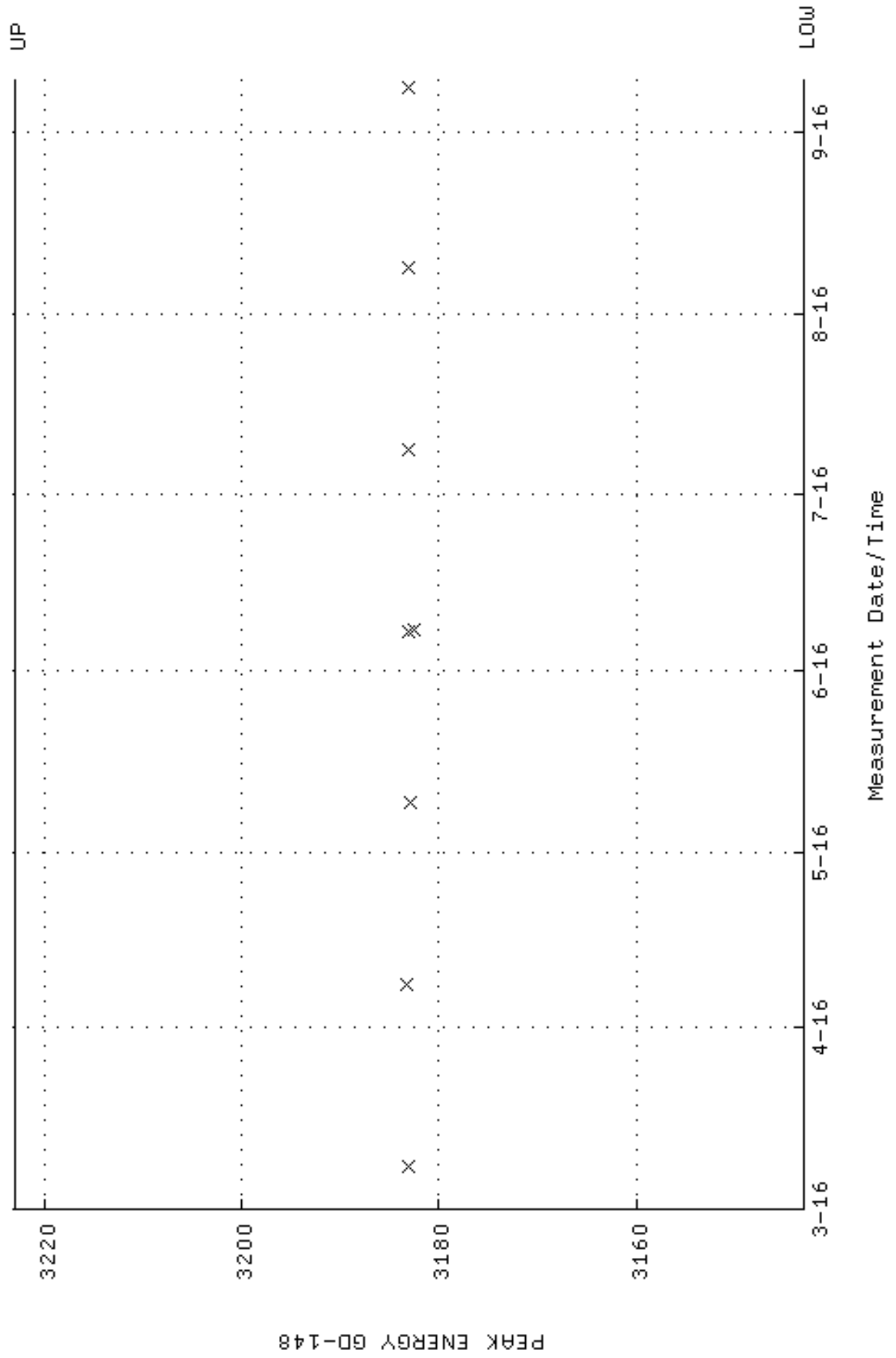
QA filename : DKA100:[ENV_ALPHA.QA.W]W122.QAF;7
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 8-MAR-2016 08:21:53 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



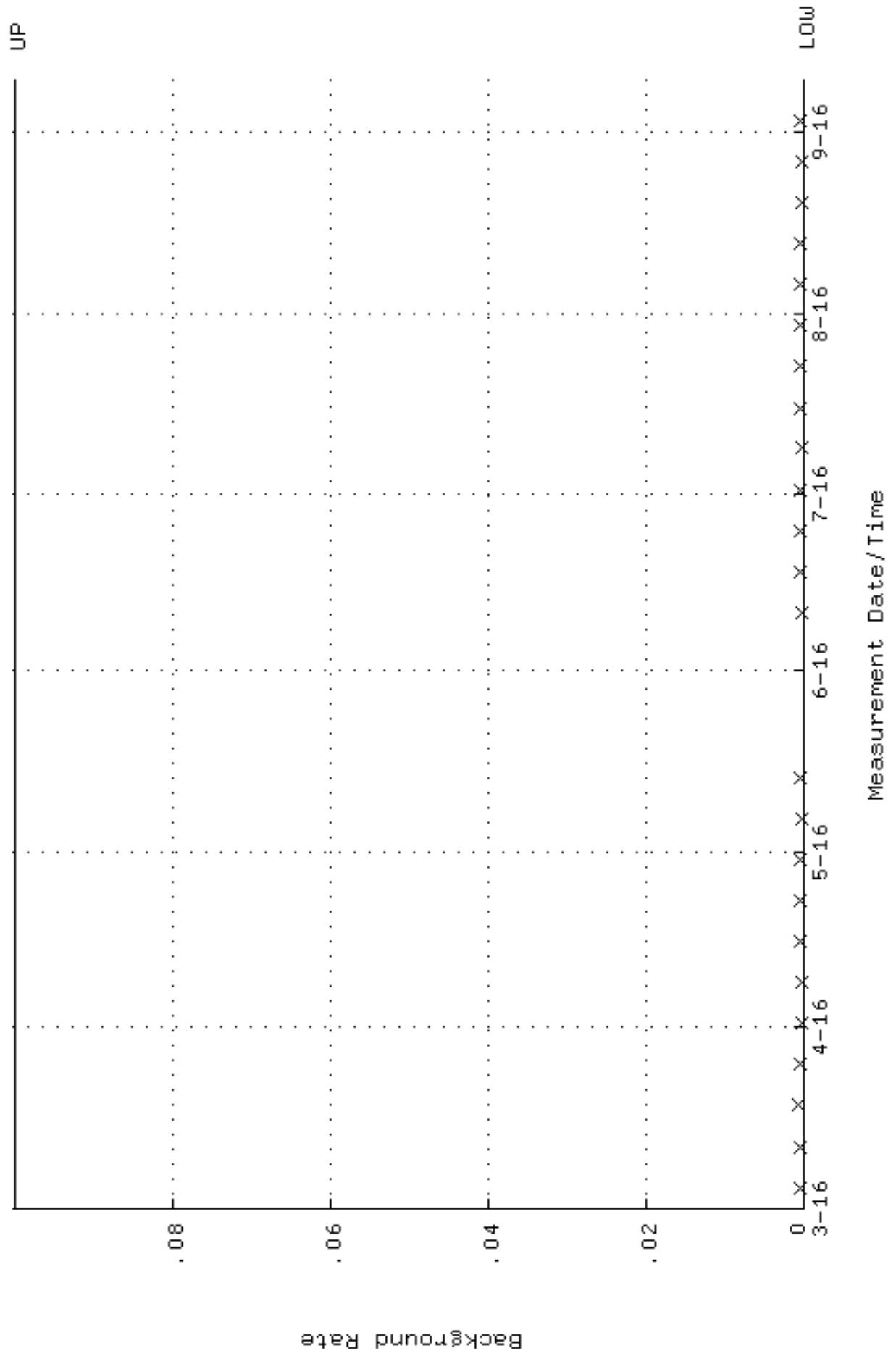
QA filename : DKA100:[ENV_ALPHA.QA.W]W122.QAF;7
 Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 8-MAR-2016 08:21:53 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



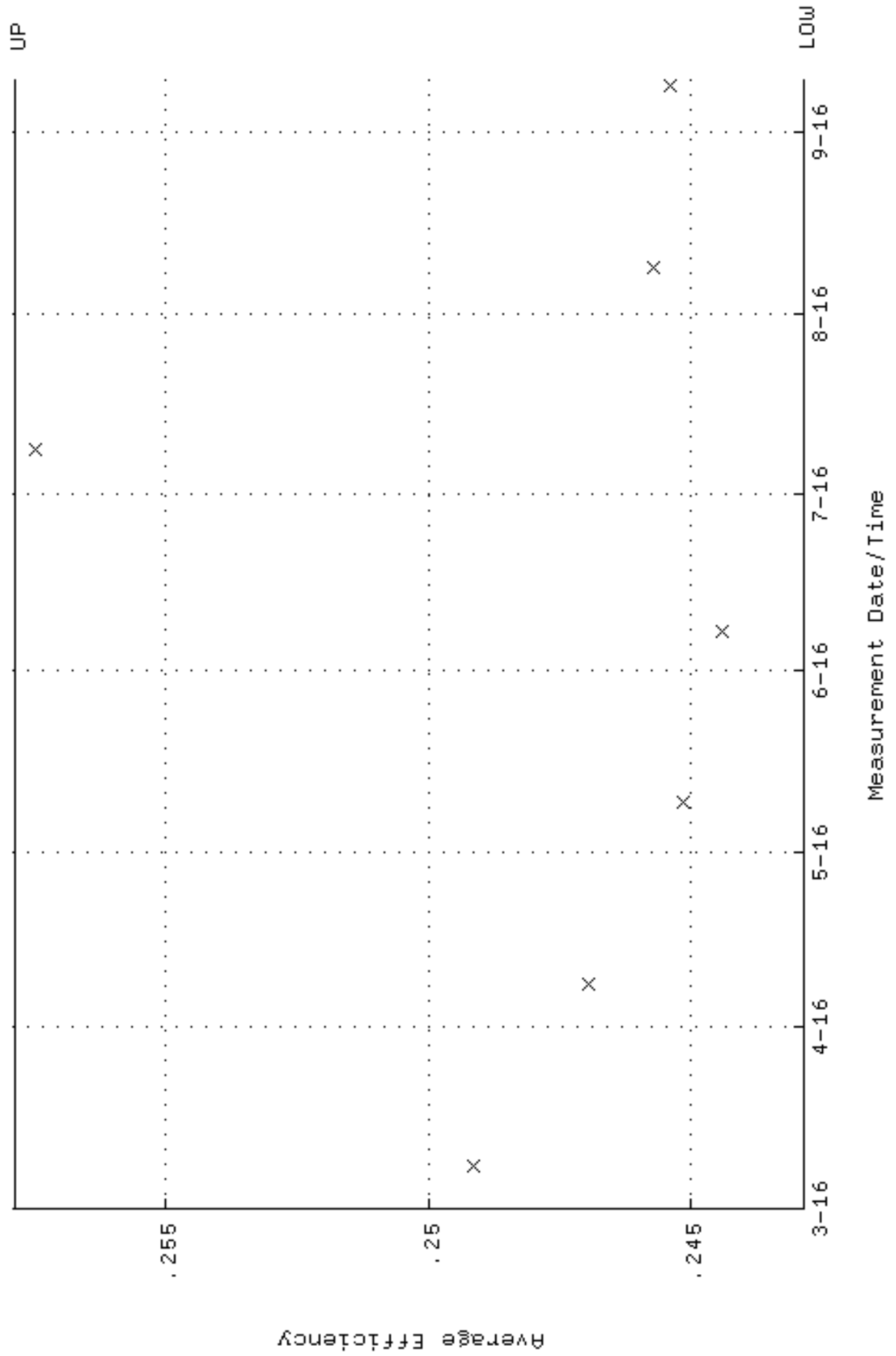
QA filename : DKA100:[ENV_ALPHA.QA.W]W122.QAF;7
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 8-MAR-2016 08:21:53 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



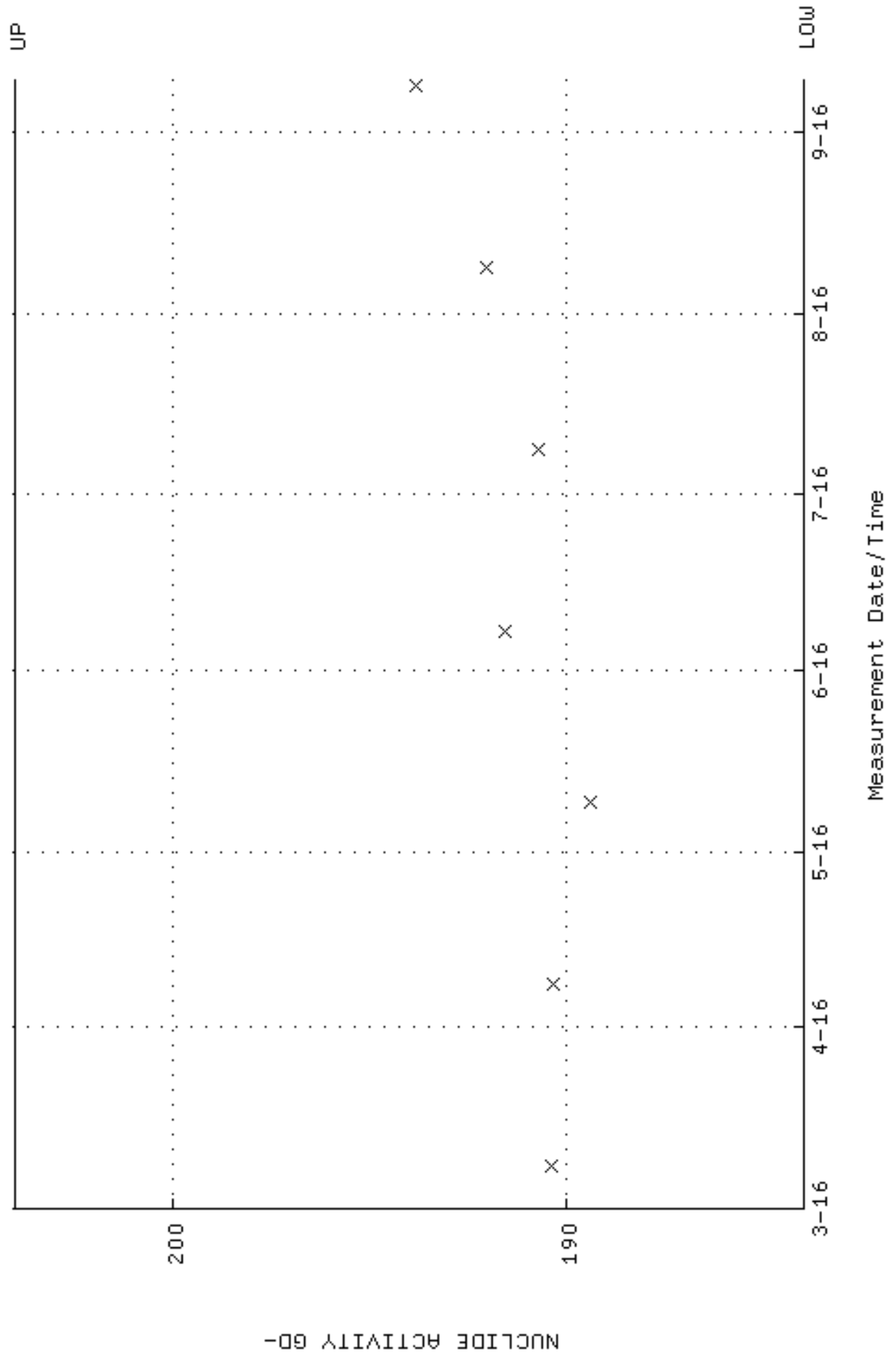
QA filename : DKA100:[ENV_ALPHA.QA.B]B122.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:31:22 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



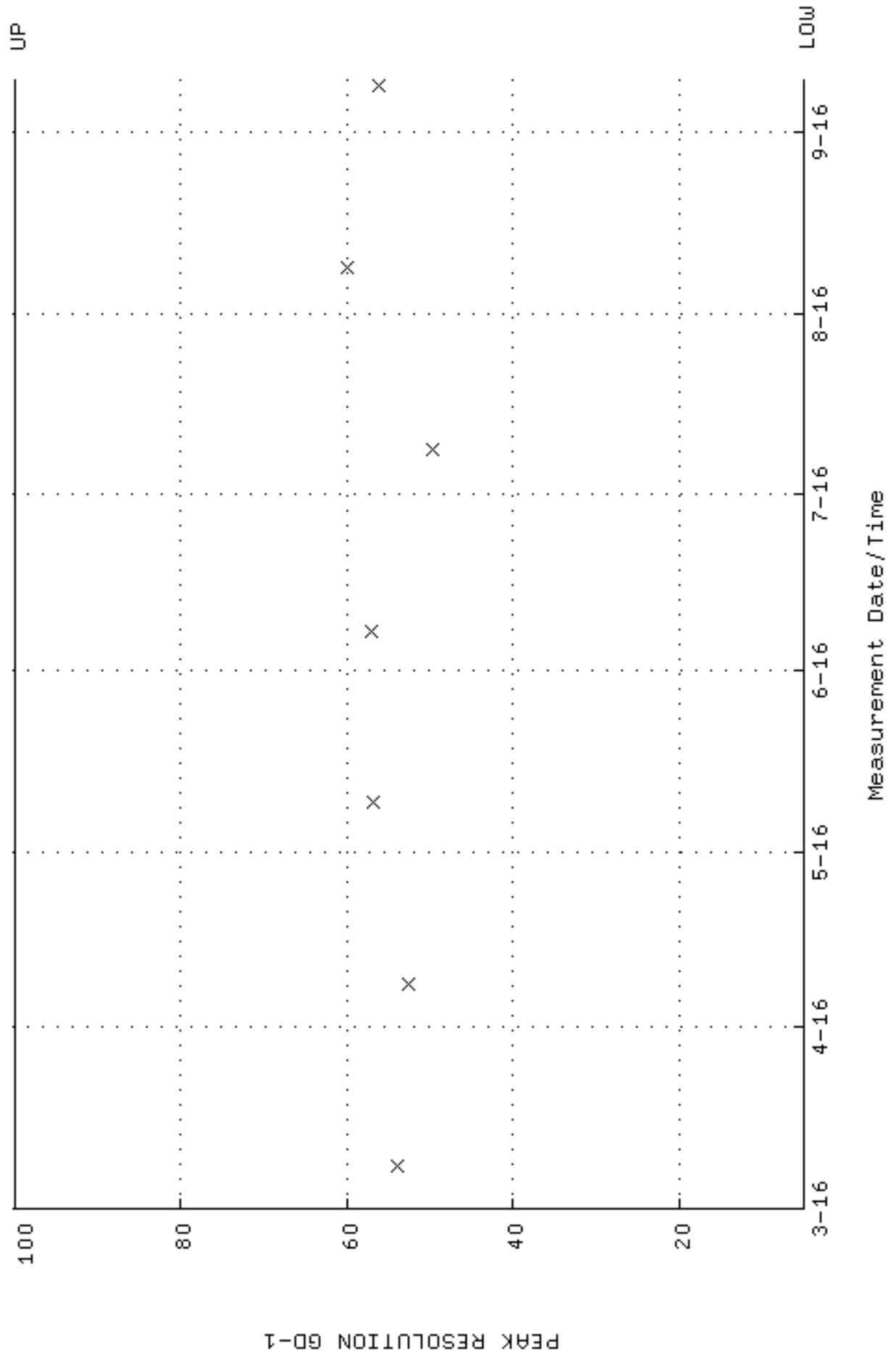
QA filename : DKA100:[ENV_ALPHA.QA.W]W124.QAF;8
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 8-MAR-2016 08:22:01 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.242855 through 0.257877



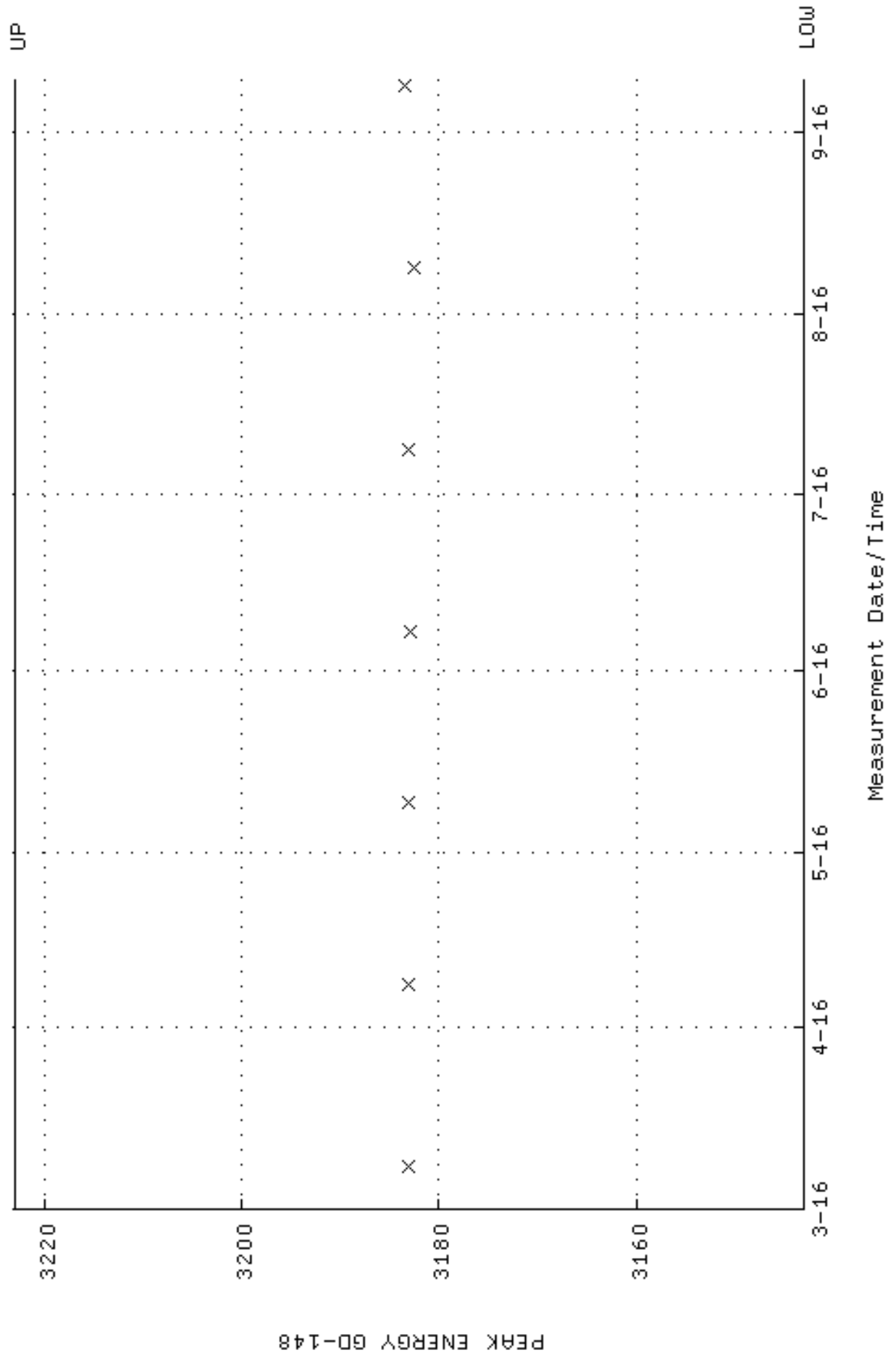
QA filename : DKA100:[ENV_ALPHA.QA.W]W124.QAF;8
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 8-MAR-2016 08:22:01 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



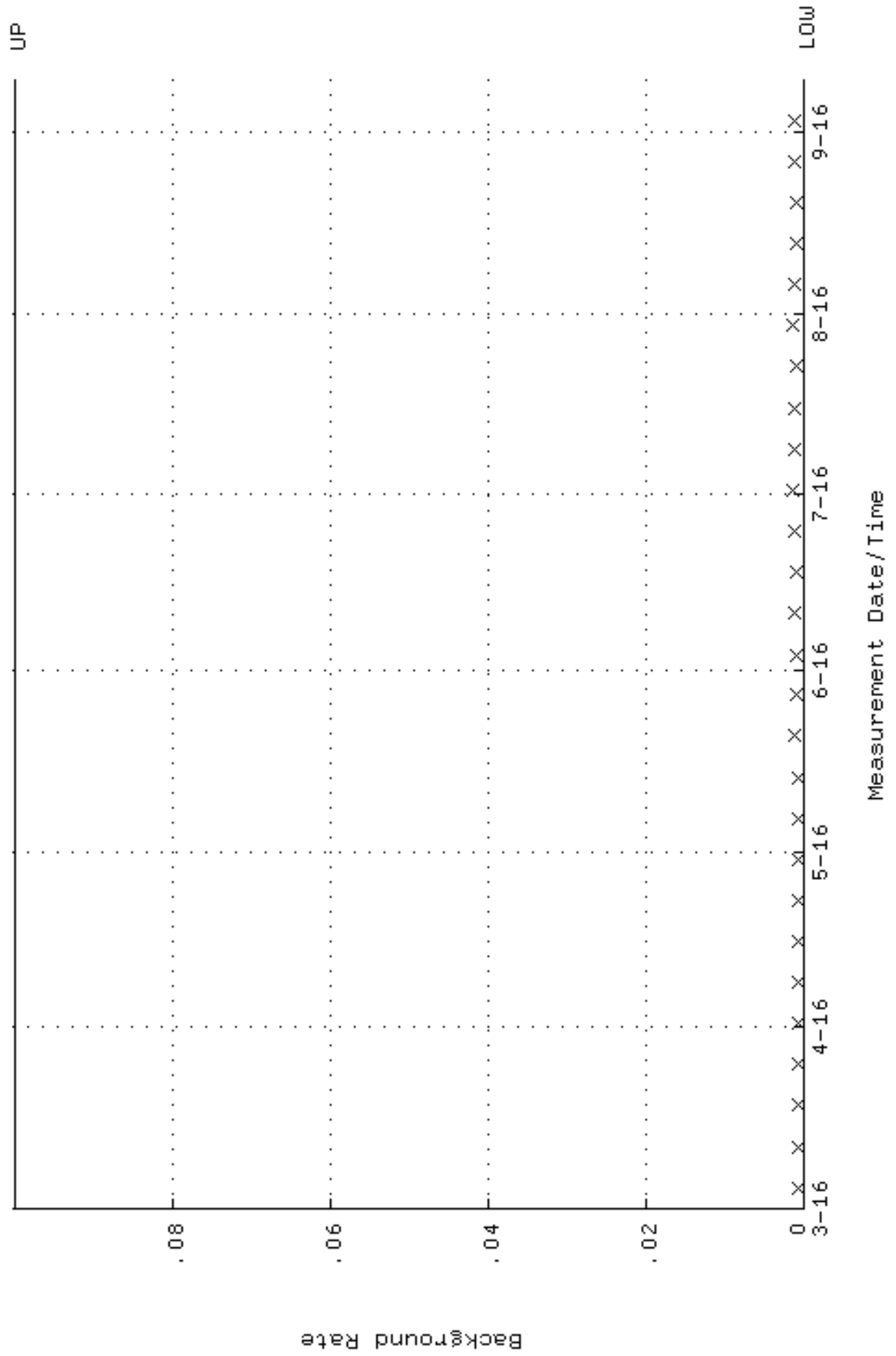
QA filename : DKA100:[ENV_ALPHA.QA.W]W124.QAF;8
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 8-MAR-2016 08:22:01 through 9-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



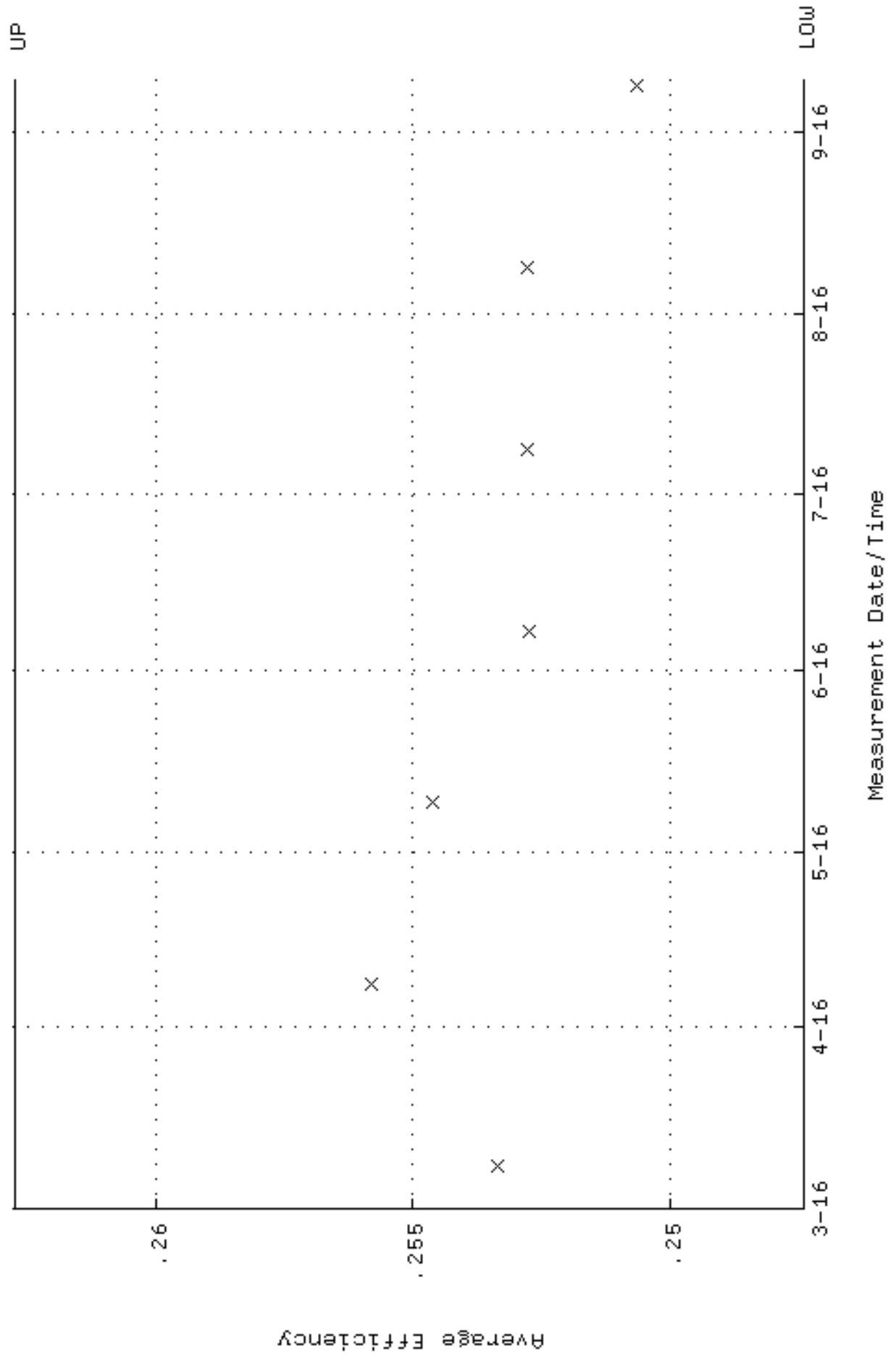
QA filename : DKA100:[ENV_ALPHA.QA.W]W124.QAF;8
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 8-MAR-2016 08:22:01 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



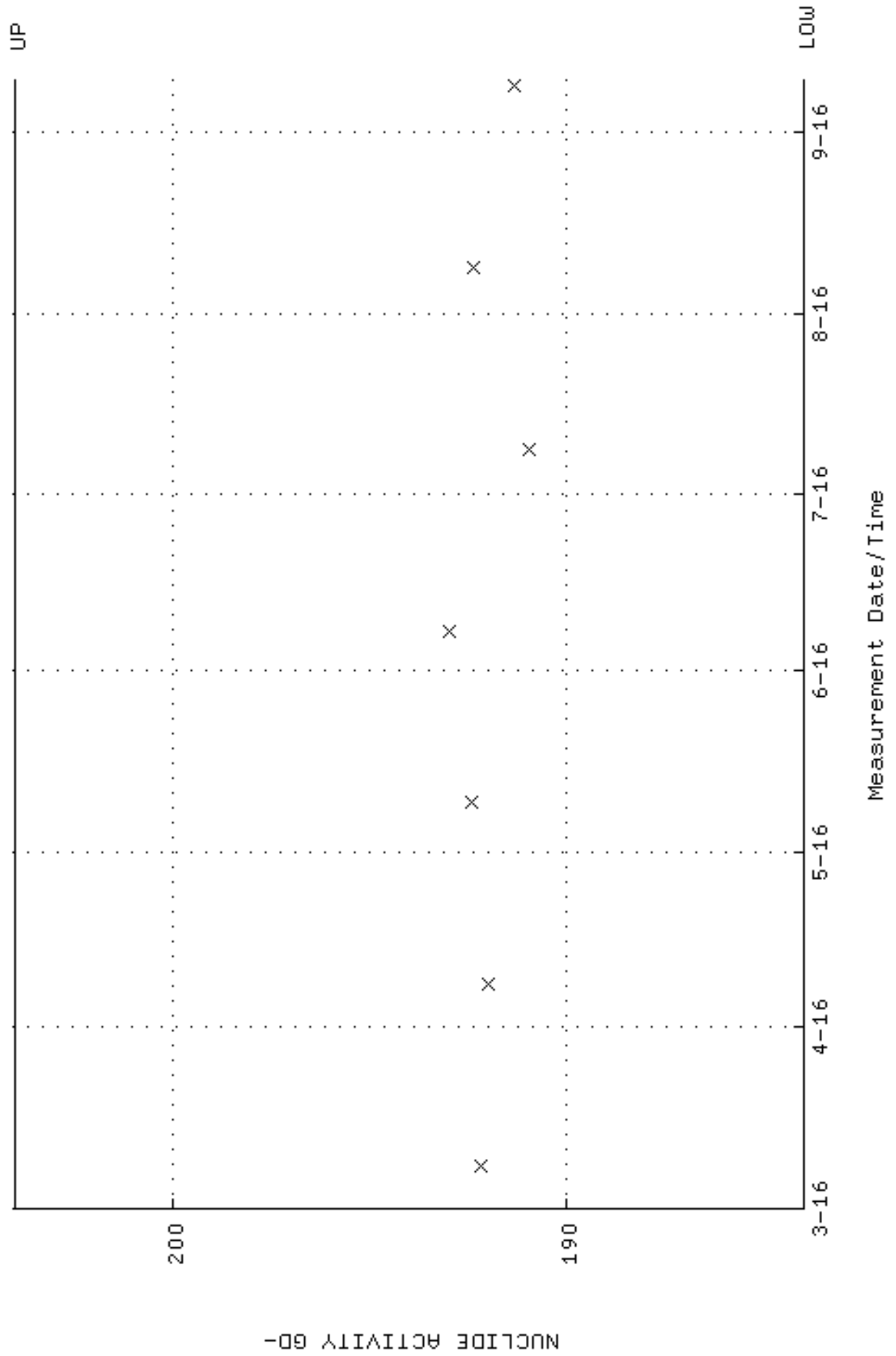
QA filename : DKA100:[ENV_ALPHA.QA.B]B124.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:31:30 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



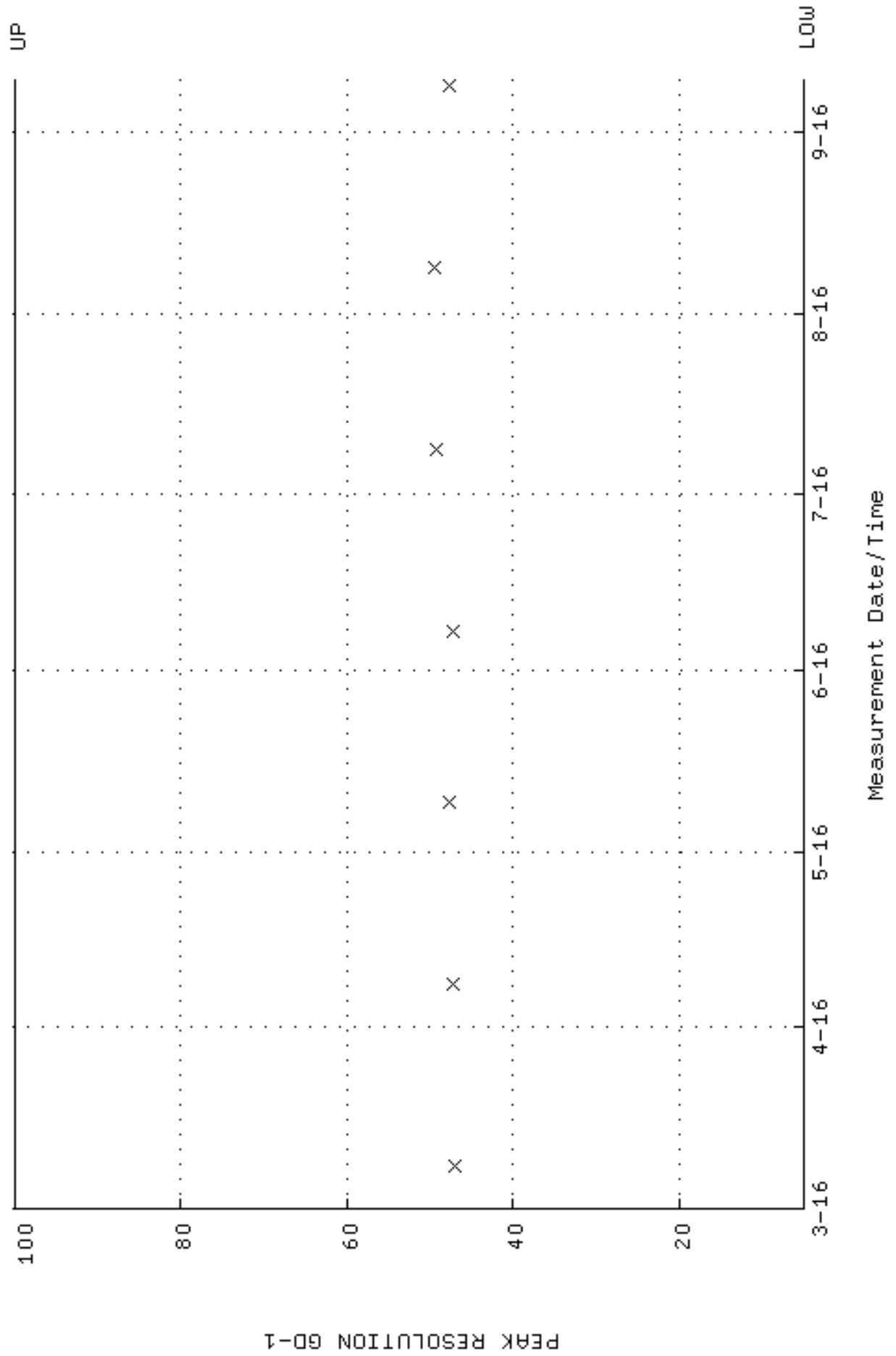
QA filename : DKA100:[ENV_ALPHA.QA.W]W126.QAF;6
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 8-MAR-2016 08:22:09 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.247420 through 0.262720



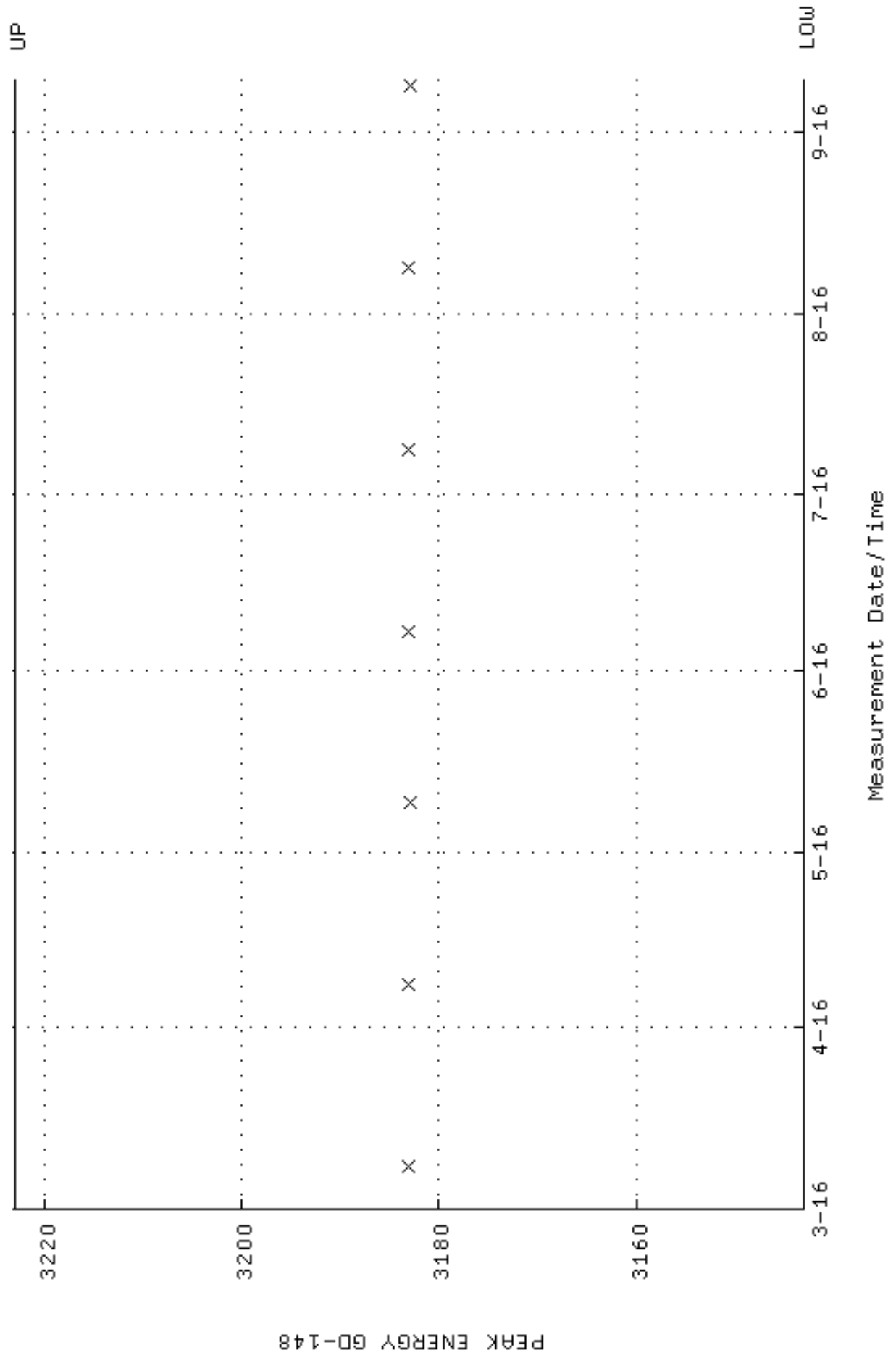
QA filename : DKA100:[ENV_ALPHA.QA.W]W126.QAF;6
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 8-MAR-2016 08:22:09 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



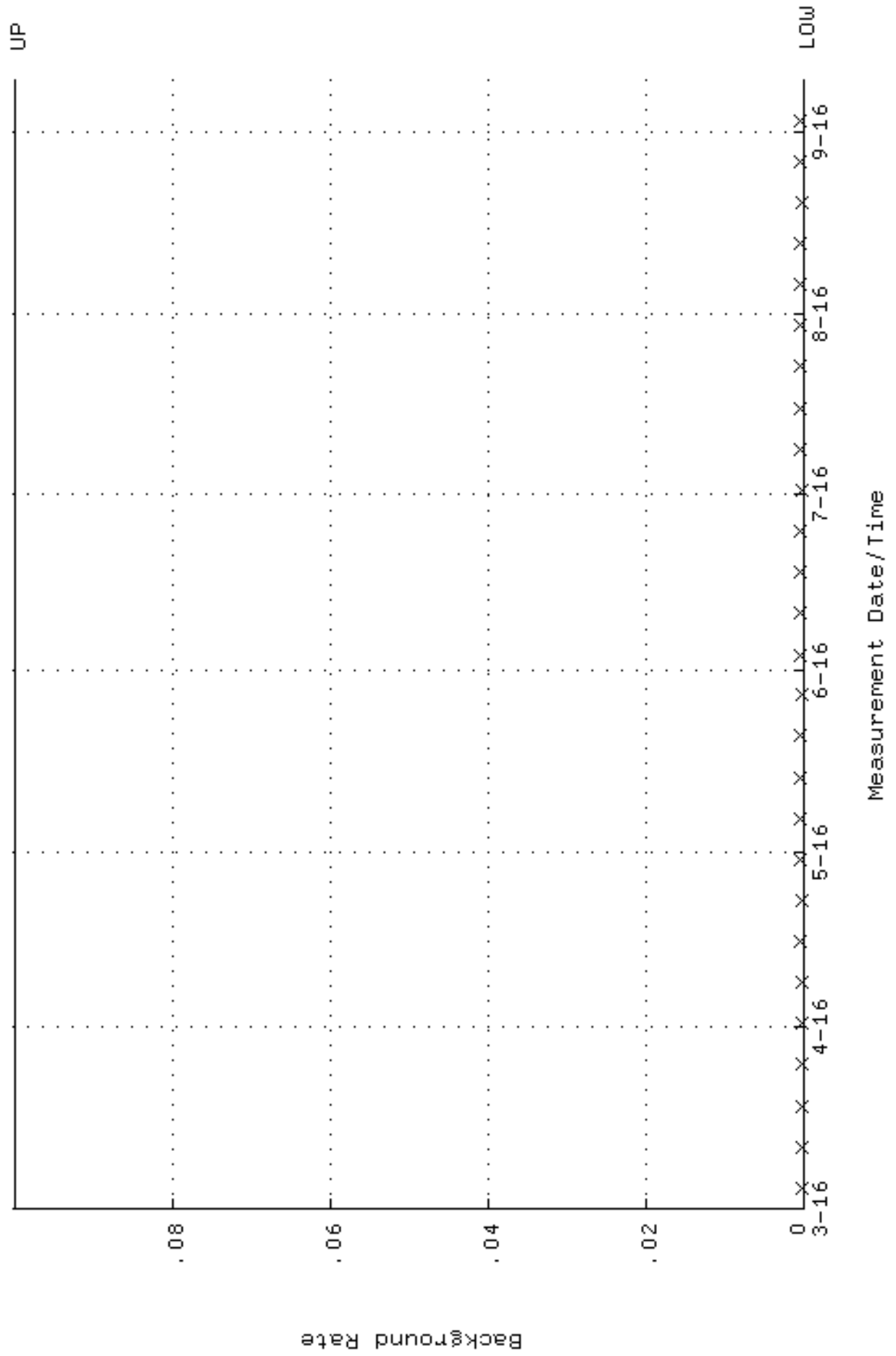
QA filename : DKA100:[ENV_ALPHA.QA.W]W126.QAF;6
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 8-MAR-2016 08:22:09 through 9-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



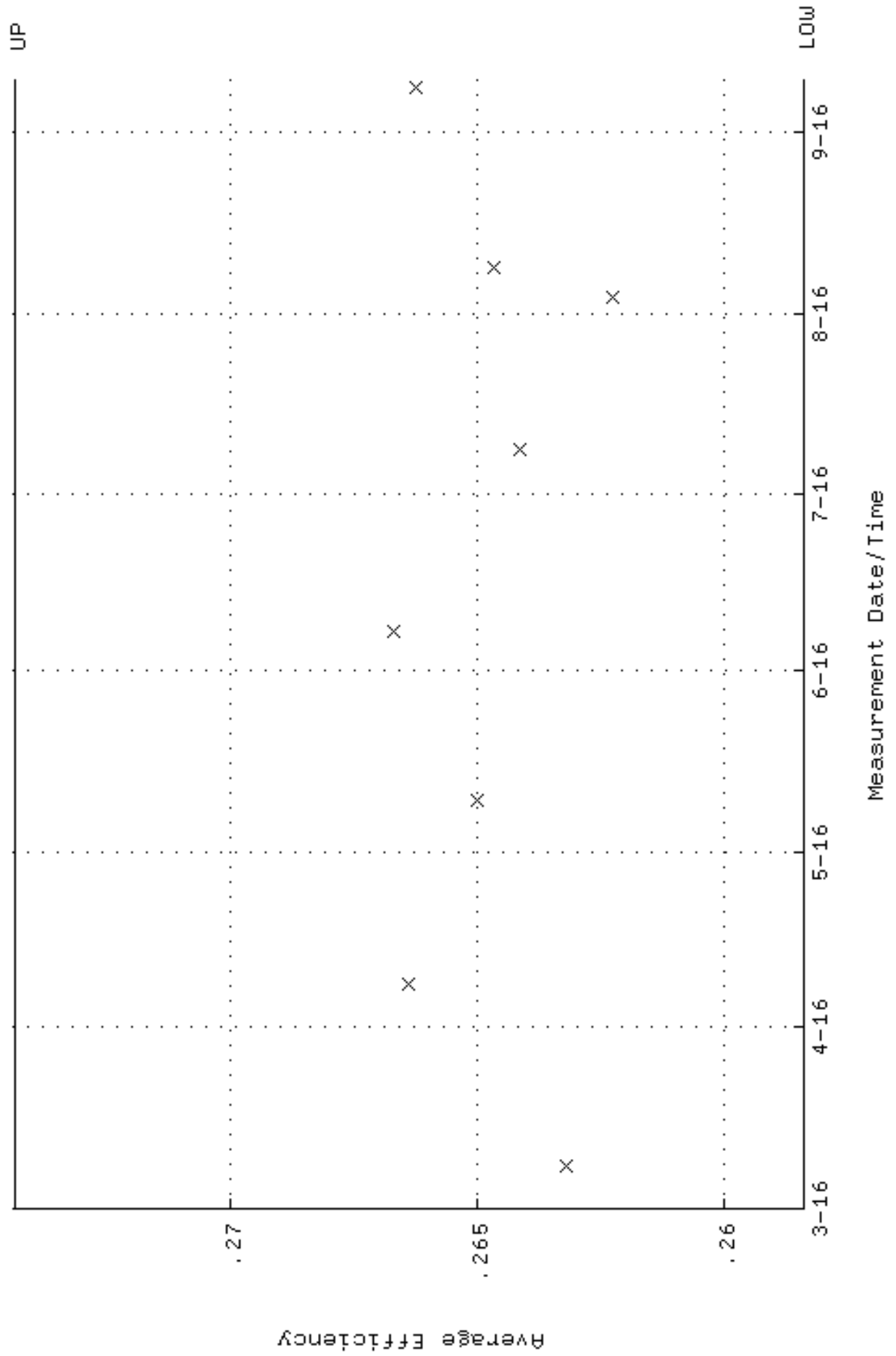
QA filename : DKA100:[ENV_ALPHA.QA.W]W126.QAF;6
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 8-MAR-2016 08:22:09 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



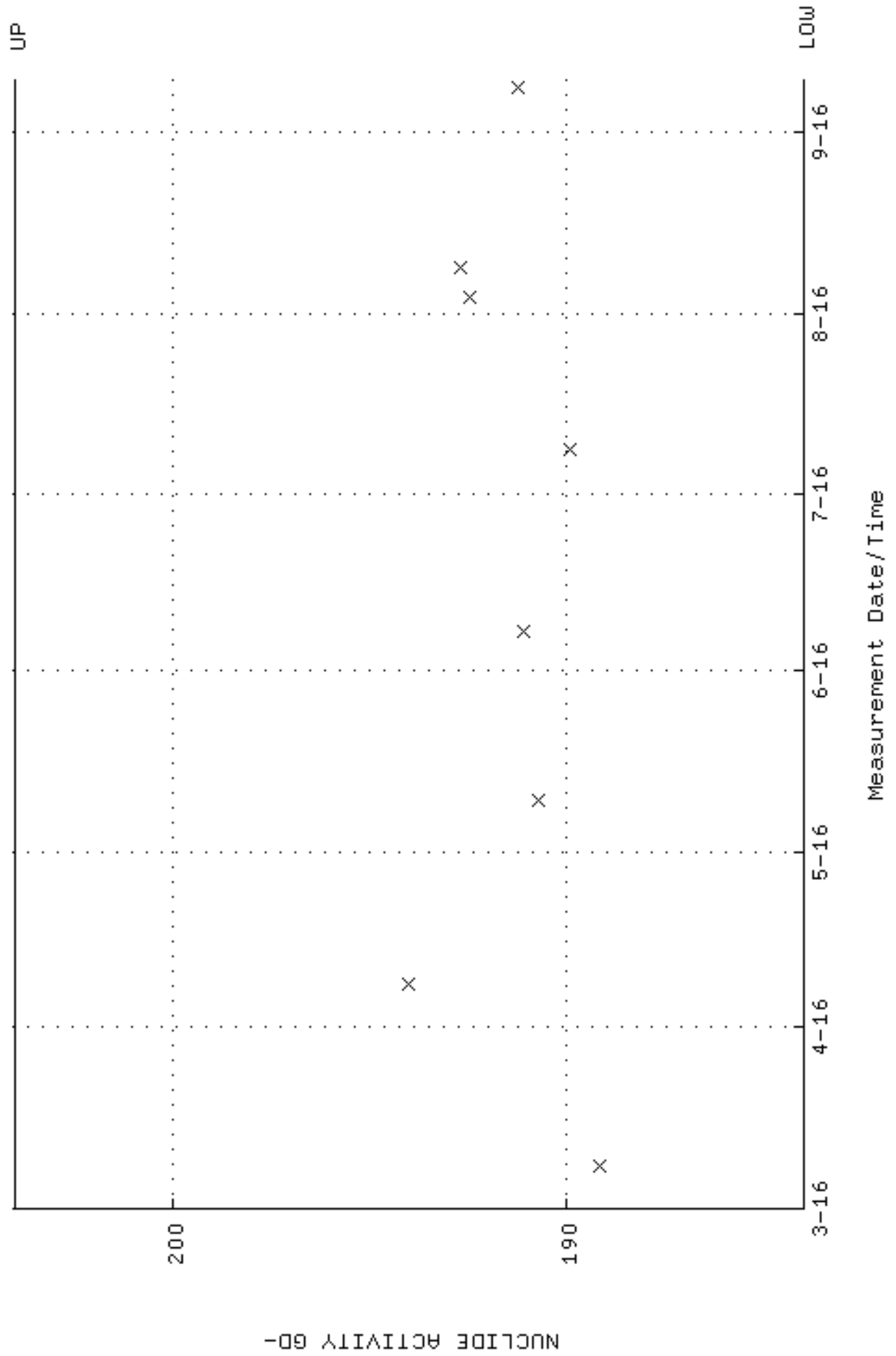
QA filename : DKA100:[ENV_ALPHA.QA.B]B126.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:43:13 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



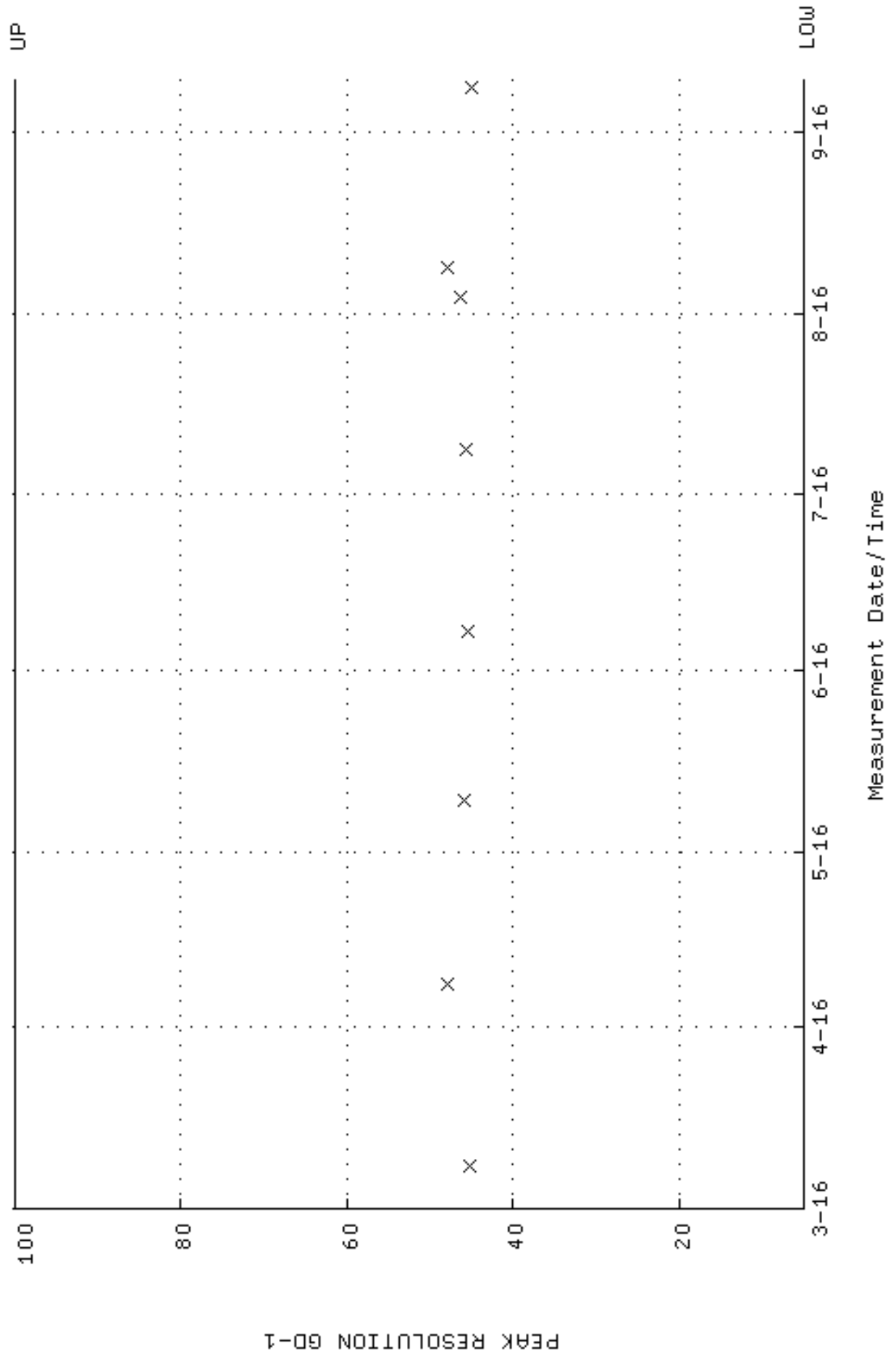
QA filename : DKA100:[ENV_ALPHA.QA.W]W127.QAF;8
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 8-MAR-2016 08:22:12 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.258380 through 0.274360



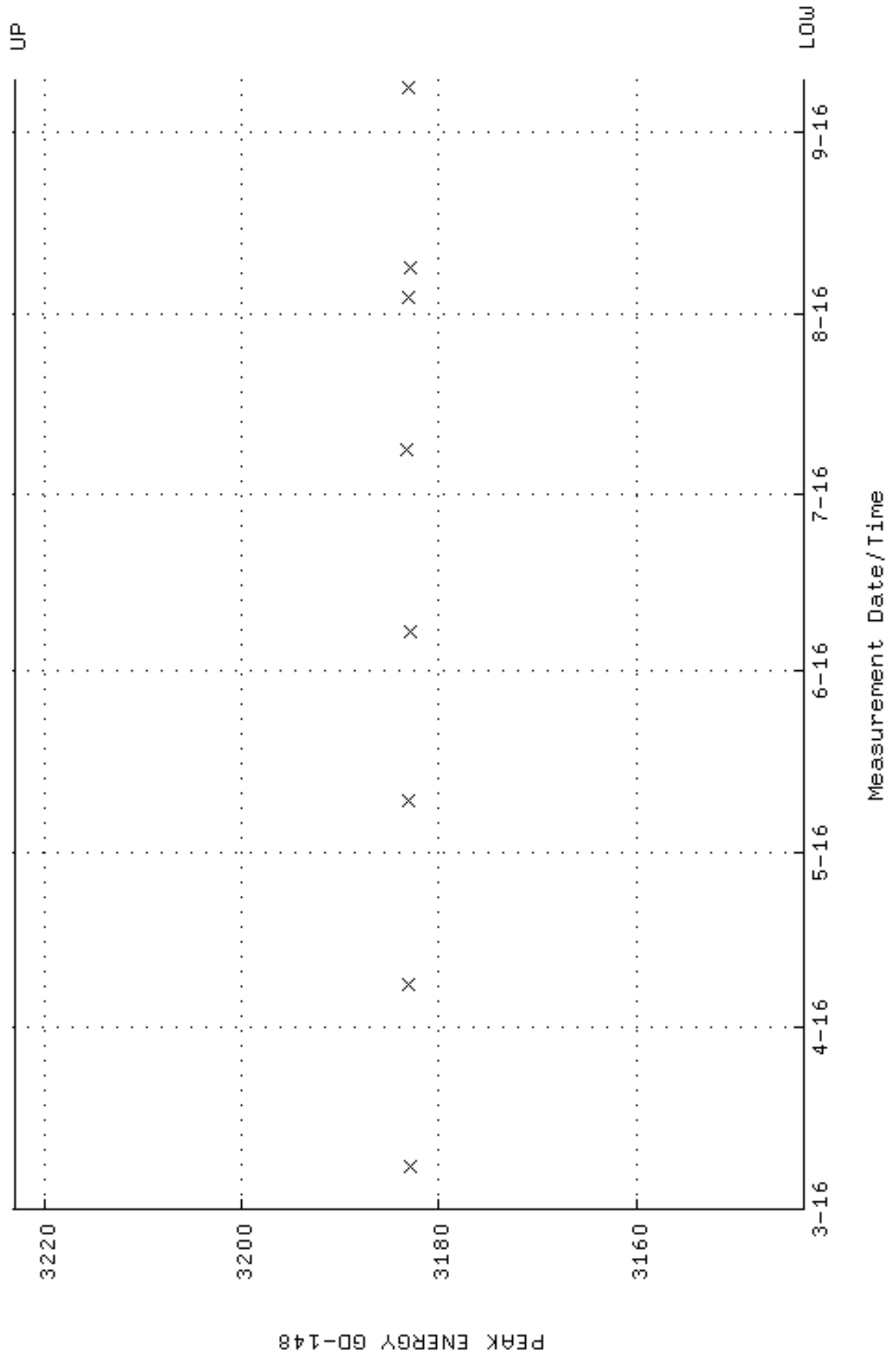
QA filename : DKA100:[ENV_ALPHA.QA.W]W127.QAF;8
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 8-MAR-2016 08:22:12 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



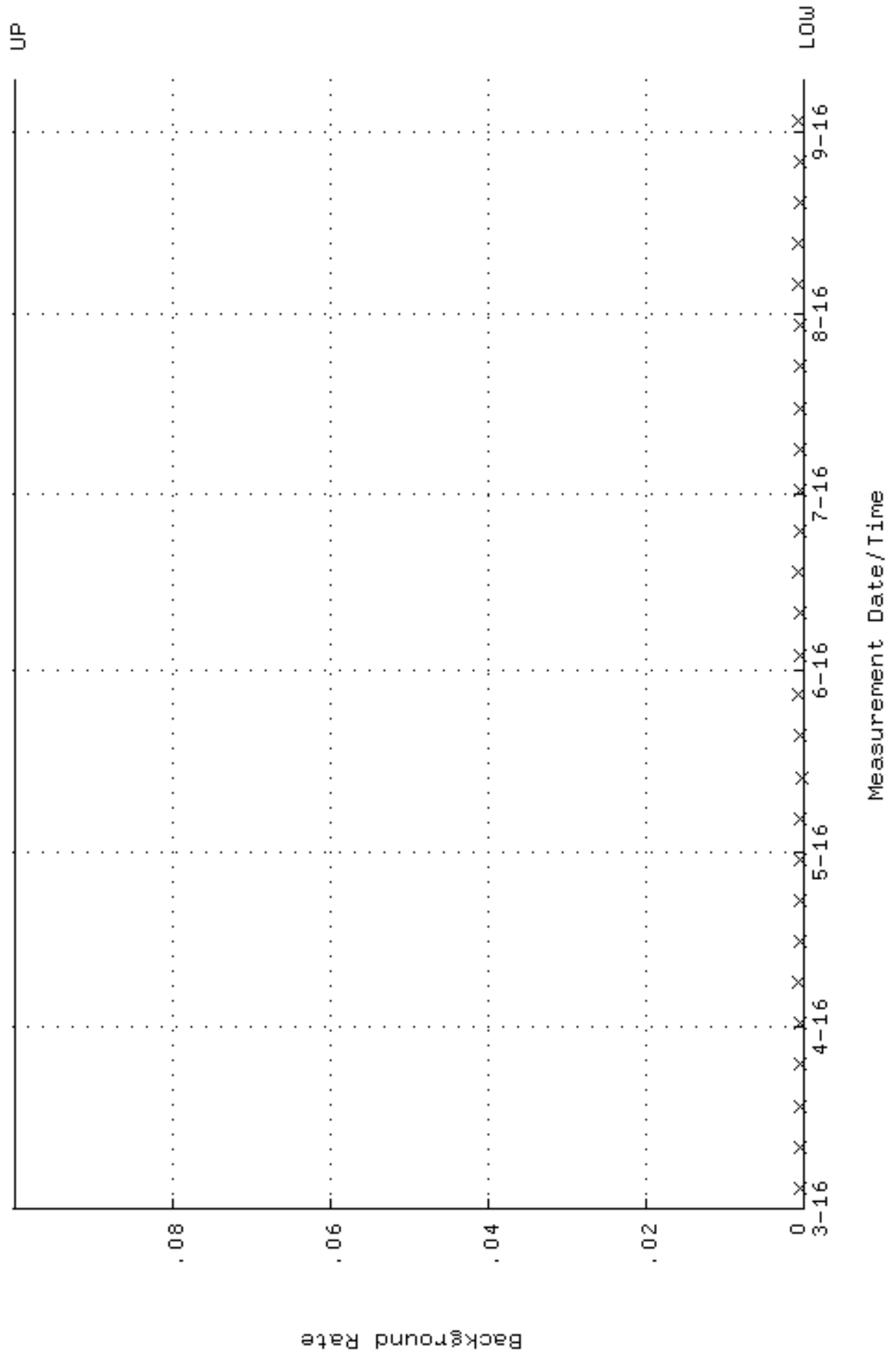
QA filename : DKA100:[ENV_ALPHA.QA.W]W127.QAF;8
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 8-MAR-2016 08:22:12 through 9-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



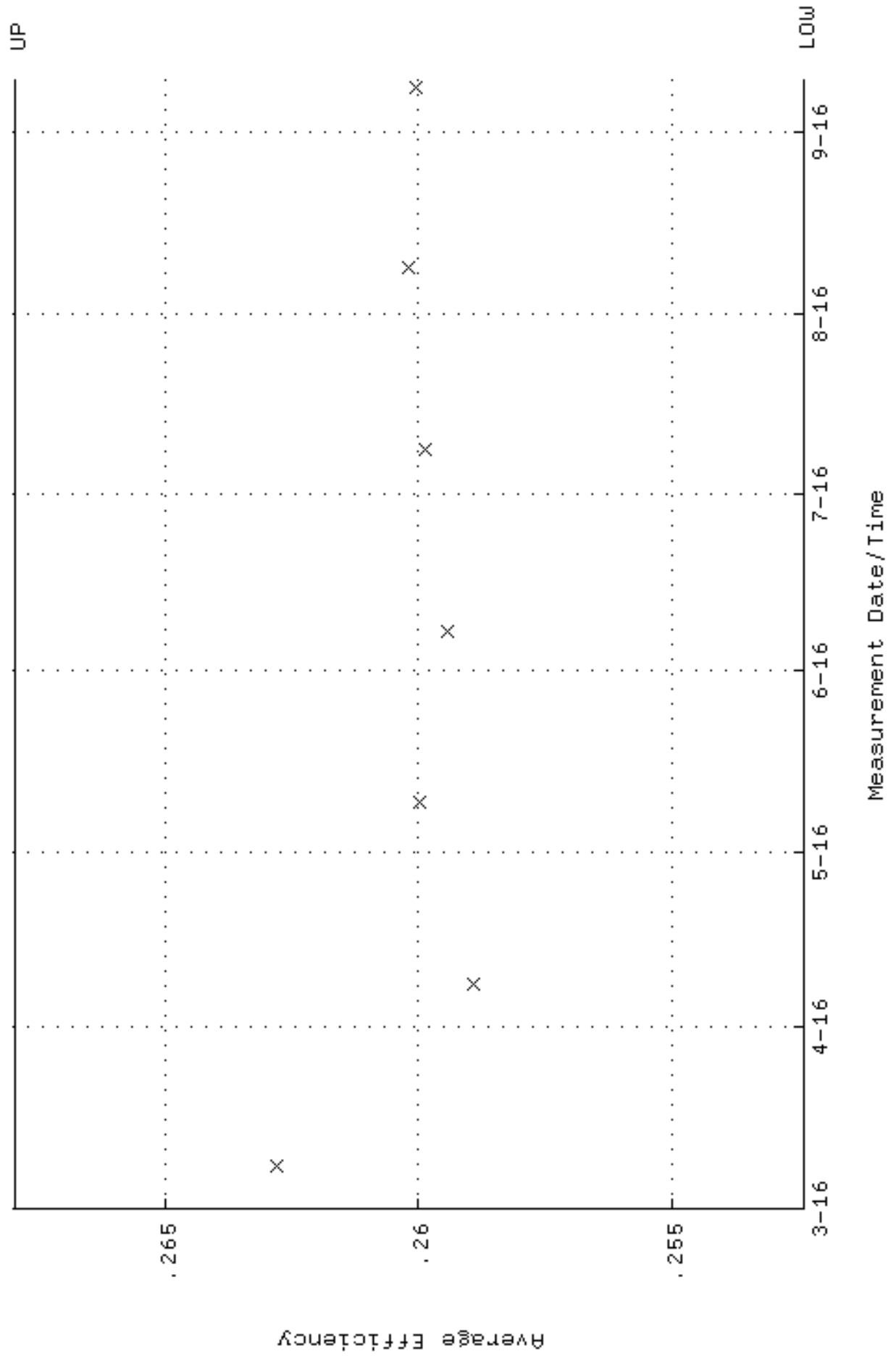
QA filename : DKA100:[ENV_ALPHA.QA.W]W127.QAF;8
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 8-MAR-2016 08:22:12 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



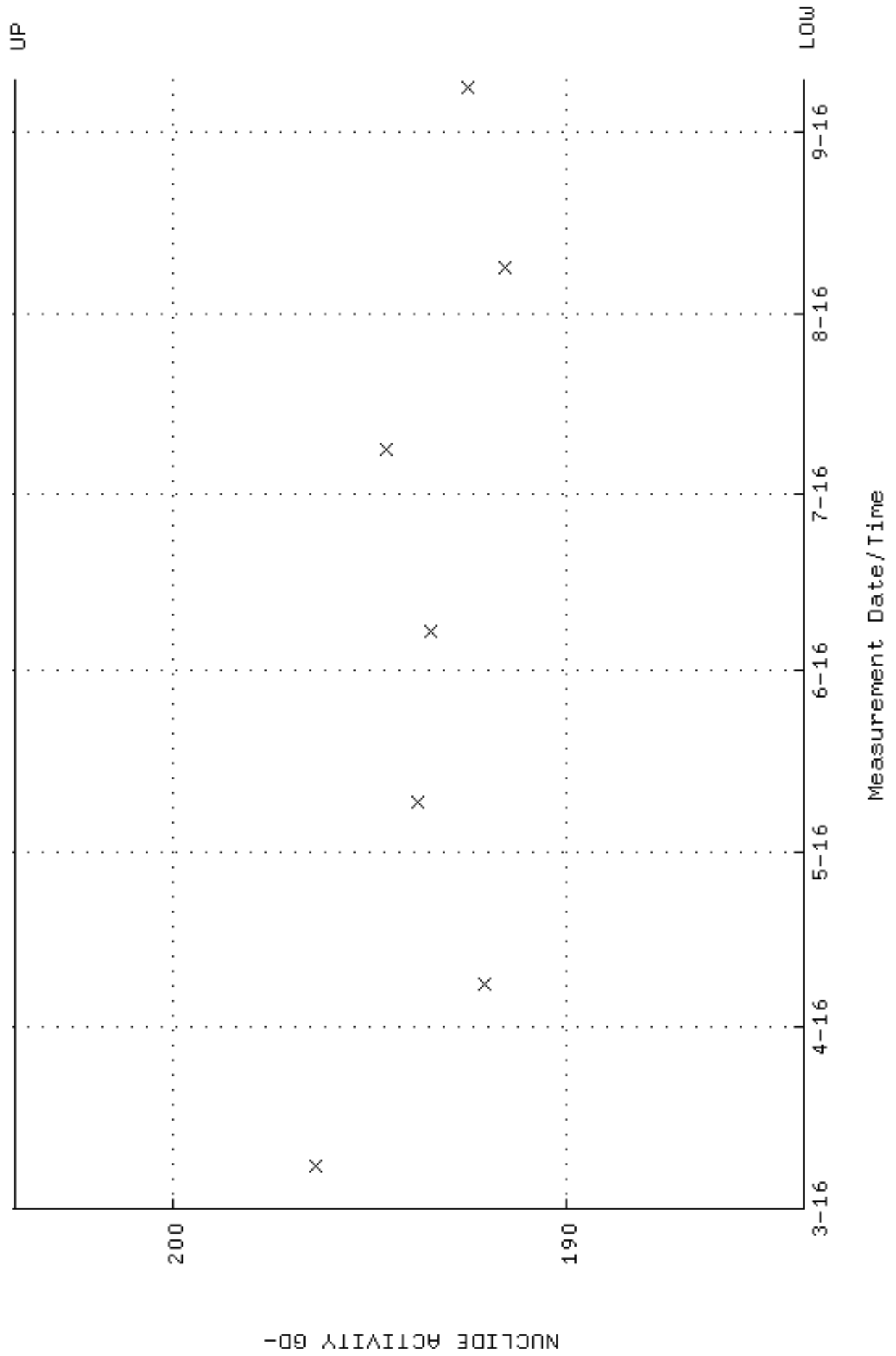
QA filename : DKA100:[ENV_ALPHA.QA.B]B127.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:43:18 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



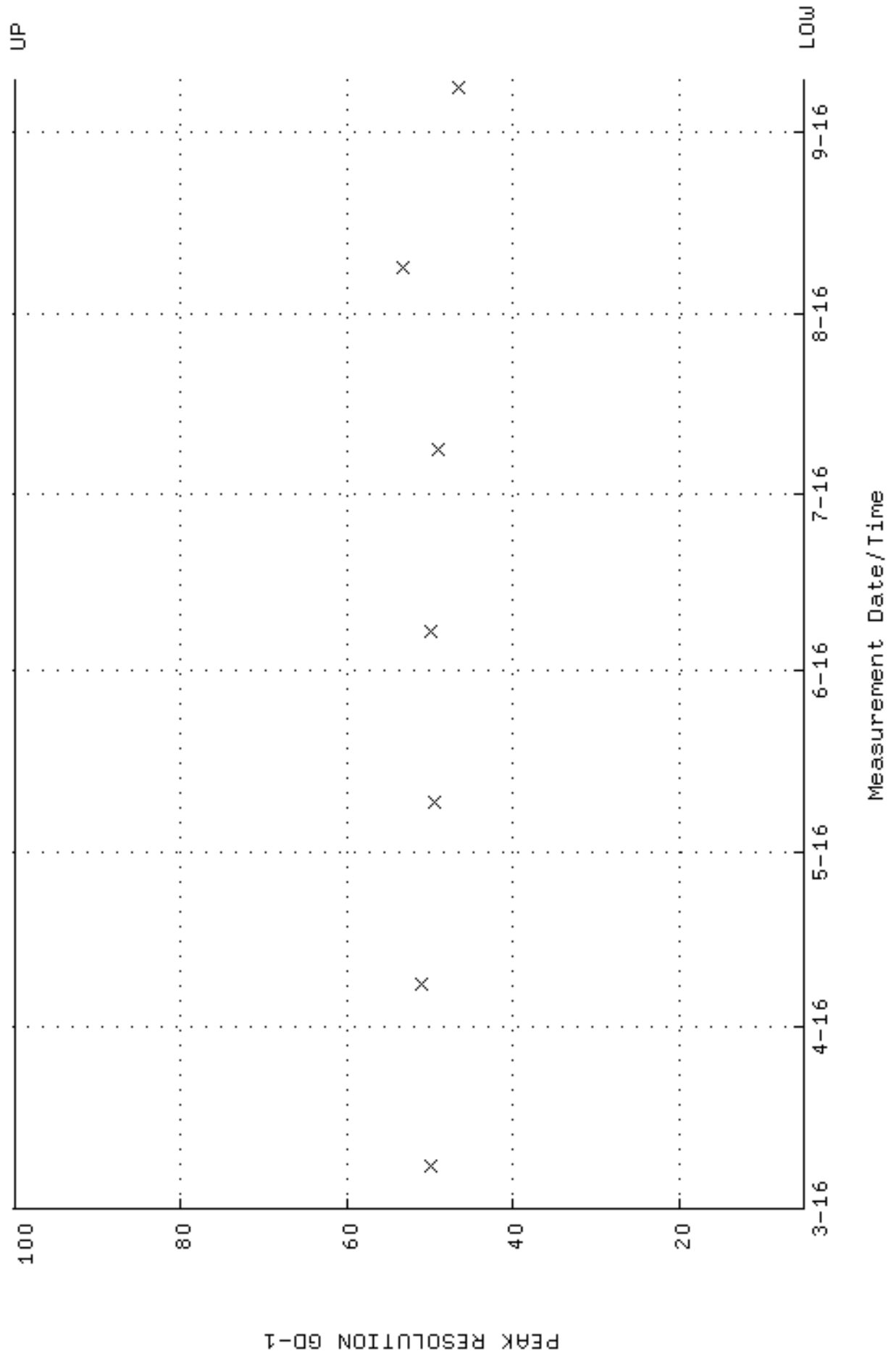
QA filename : DKA100:[ENV_ALPHA.QA.W]W128.QAF;6
 Parameter Name : AVREFF (Average Efficiency)
 Start/End Dates : 8-MAR-2016 08:22:17 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.252400 through 0.267960



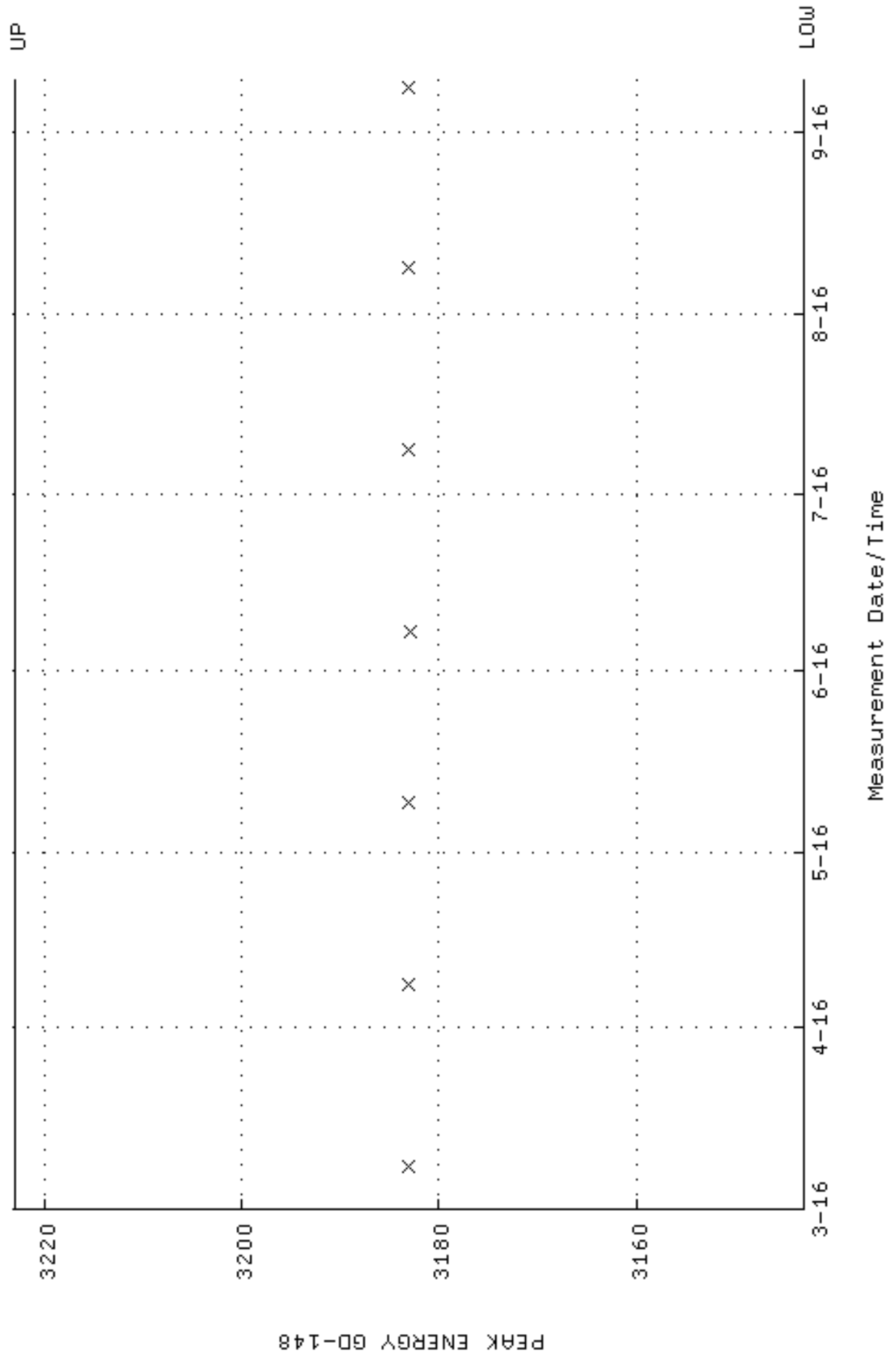
QA filename : DKA100:[ENV_ALPHA.QA.W]W128.QAF;6
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 8-MAR-2016 08:22:17 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



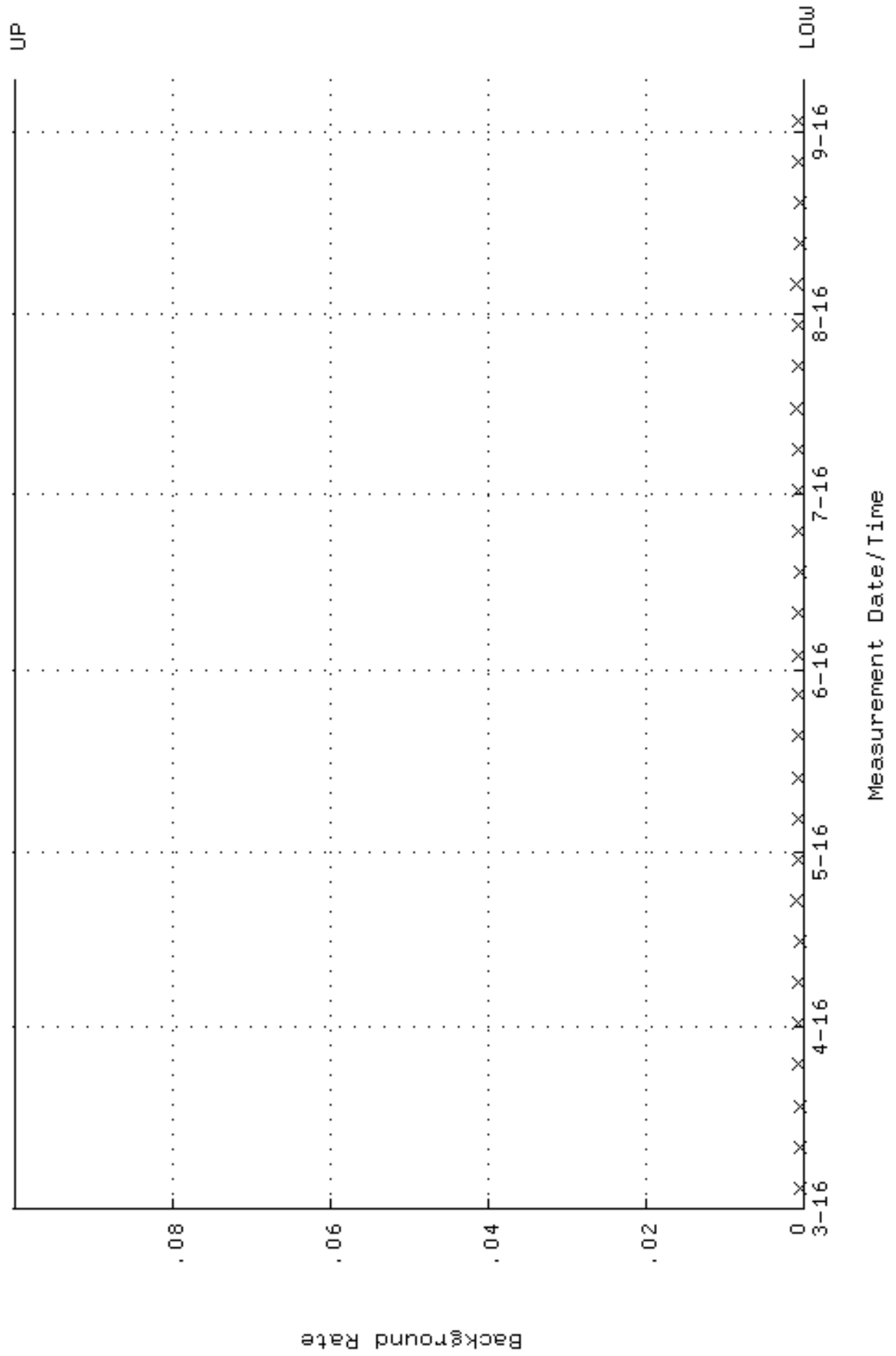
QA filename : DKA100:[ENV_ALPHA.QA.W]W128.QAF;6
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 8-MAR-2016 08:22:17 through 9-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



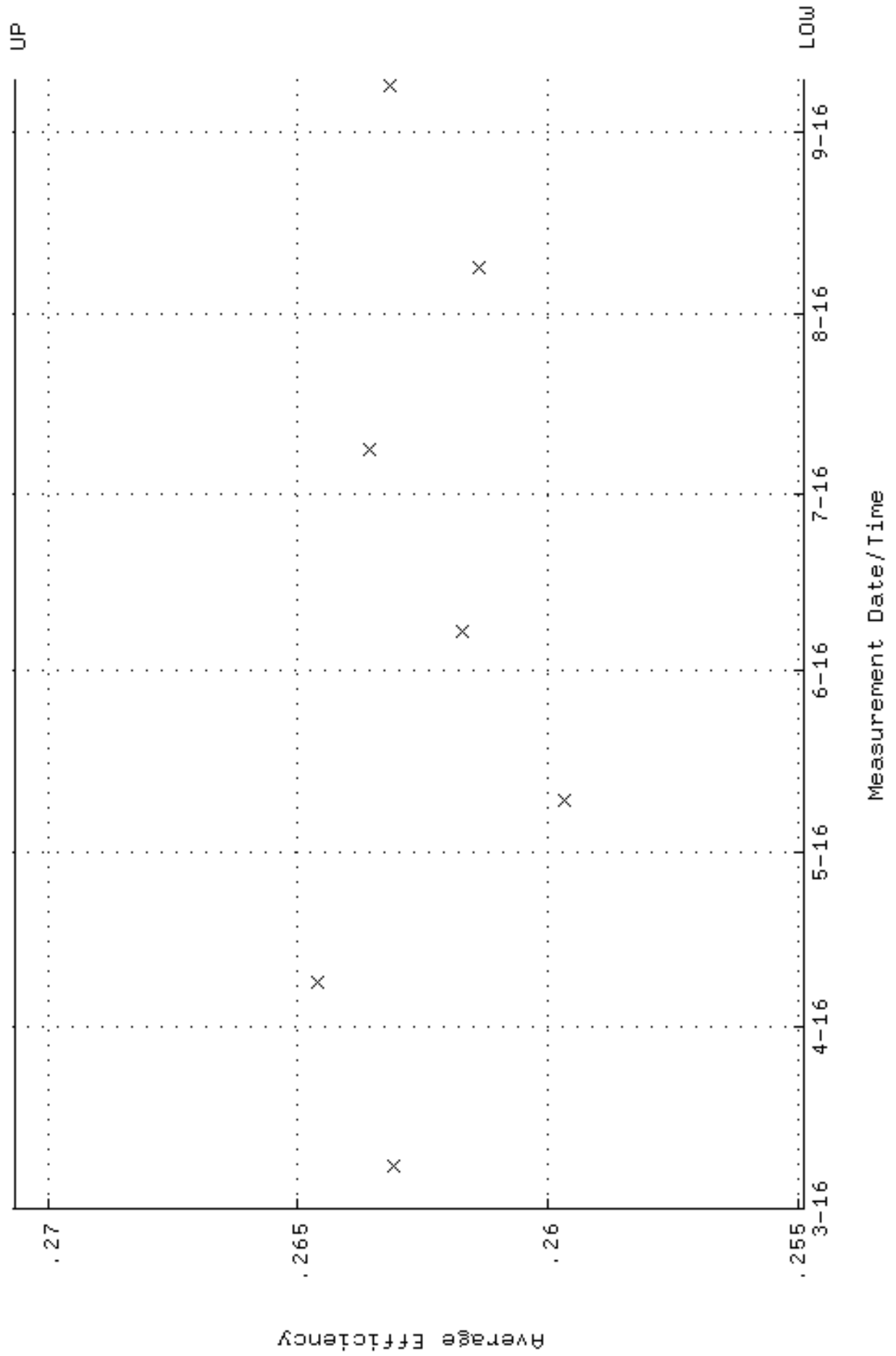
QA filename : DKA100:[ENV_ALPHA.QA.W]W128.QAF;6
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 8-MAR-2016 08:22:17 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



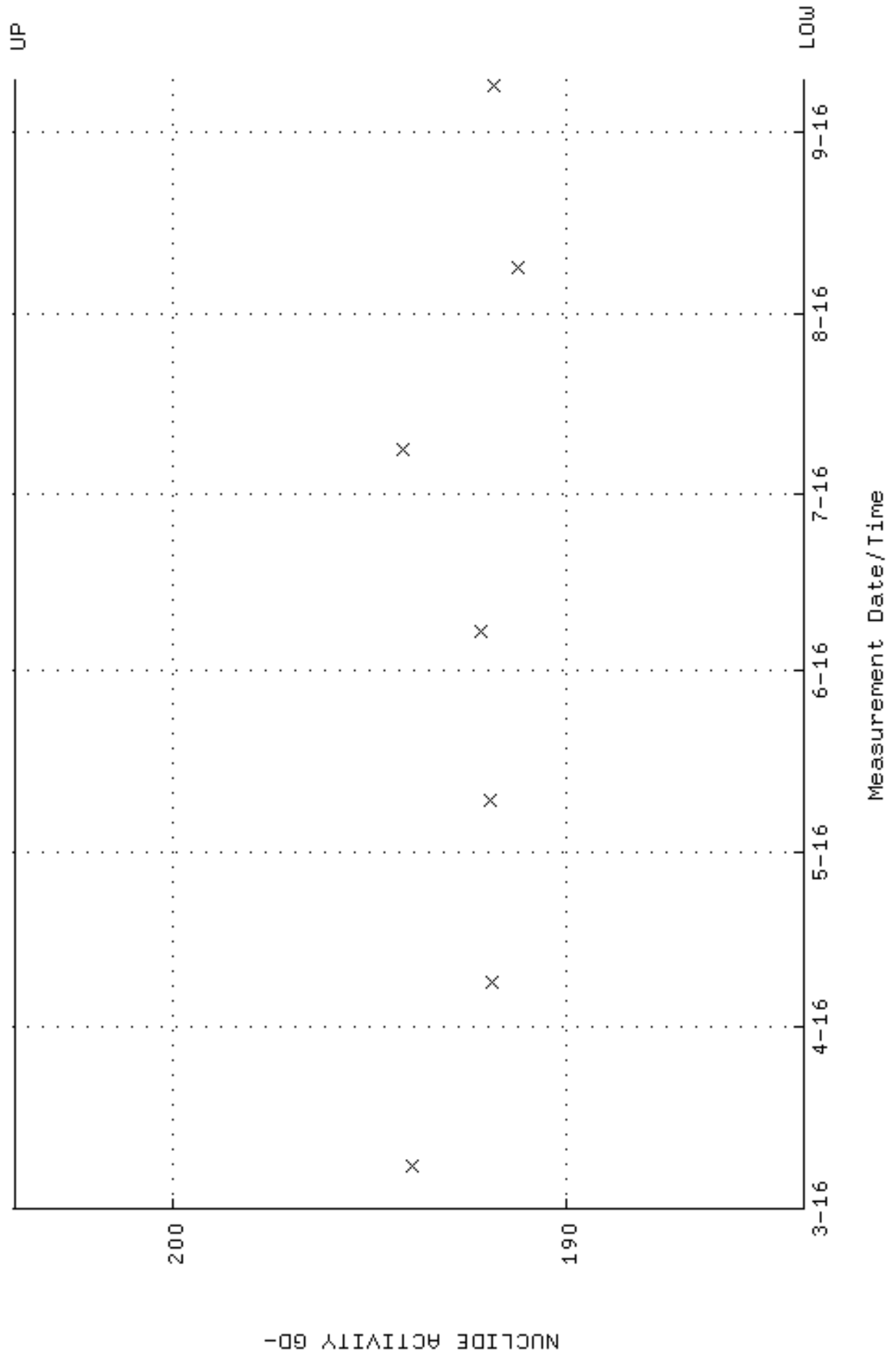
QA filename : DKA100:[ENV_ALPHA.QA.B]B128.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:43:22 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



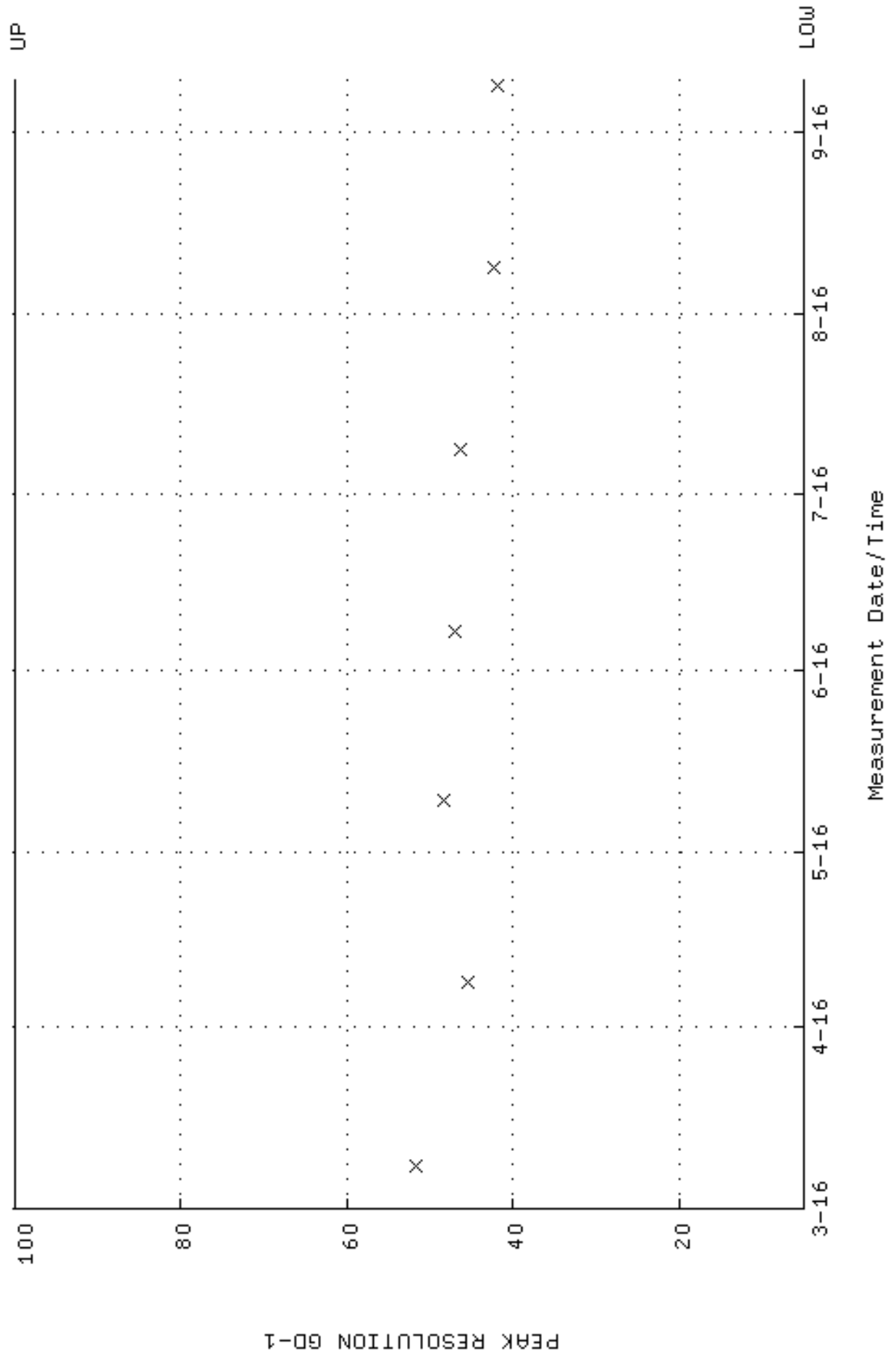
QA filename : DKA100:[ENV_ALPHA.QA.W]W129.QAF;7
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 8-MAR-2016 08:22:21 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.254891 through 0.270657



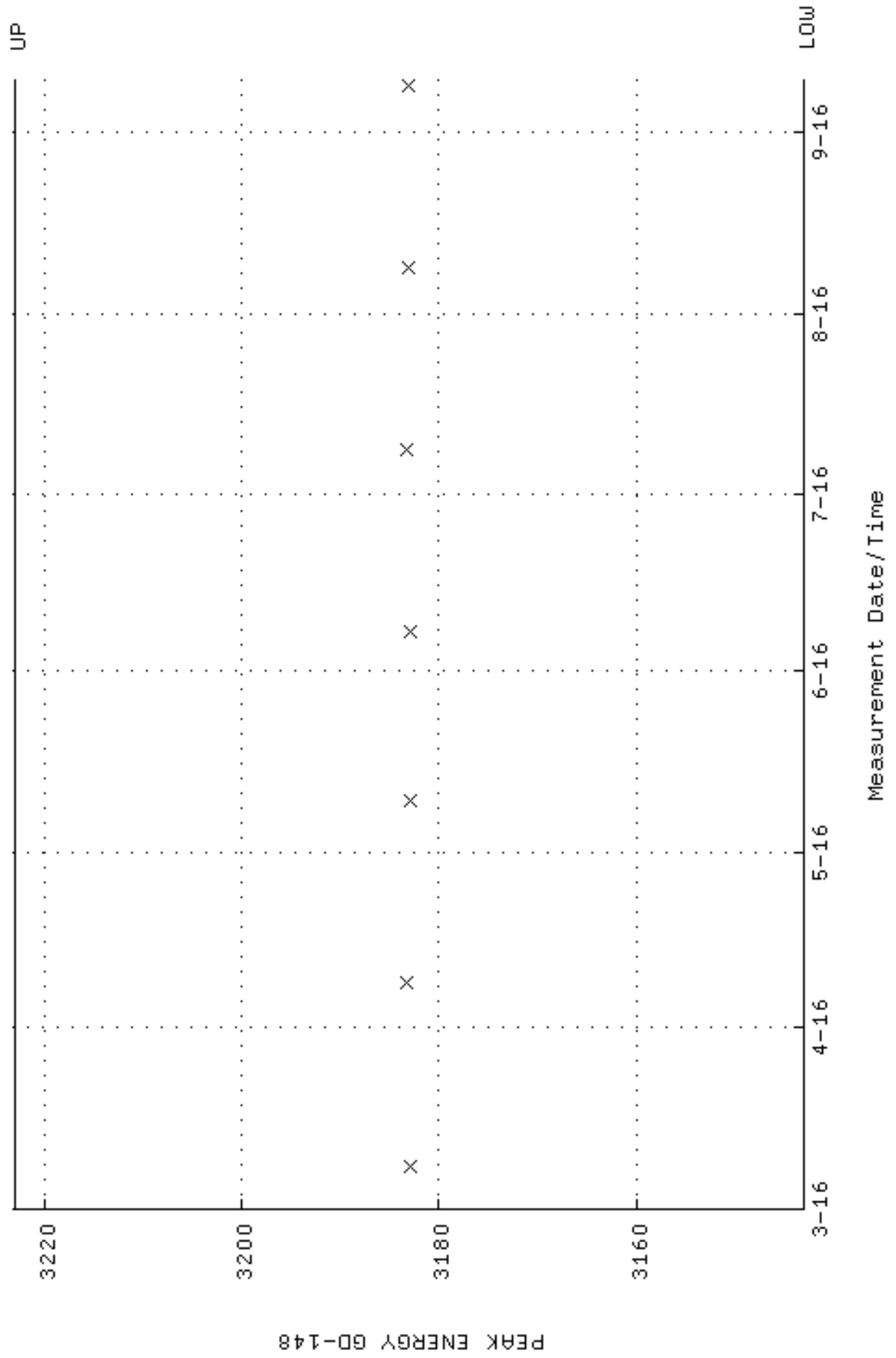
QA filename : DKA100:[ENV_ALPHA.QA.W]W129.QAF;7
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 8-MAR-2016 08:22:21 through 9-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



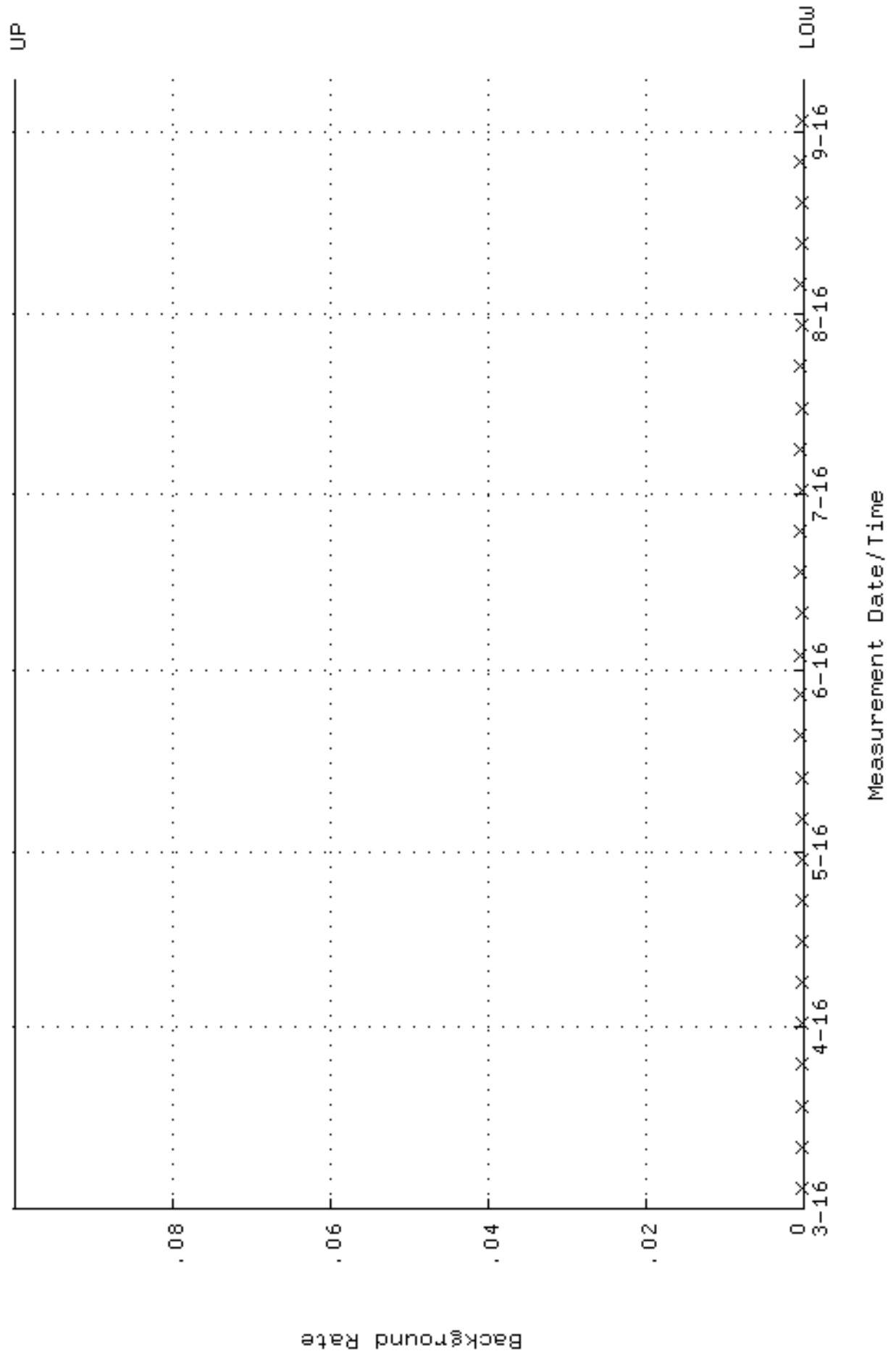
QA filename : DKA100:[ENV_ALPHA.QA.W]W129.QAF;7
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 8-MAR-2016 08:22:21 through 9-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



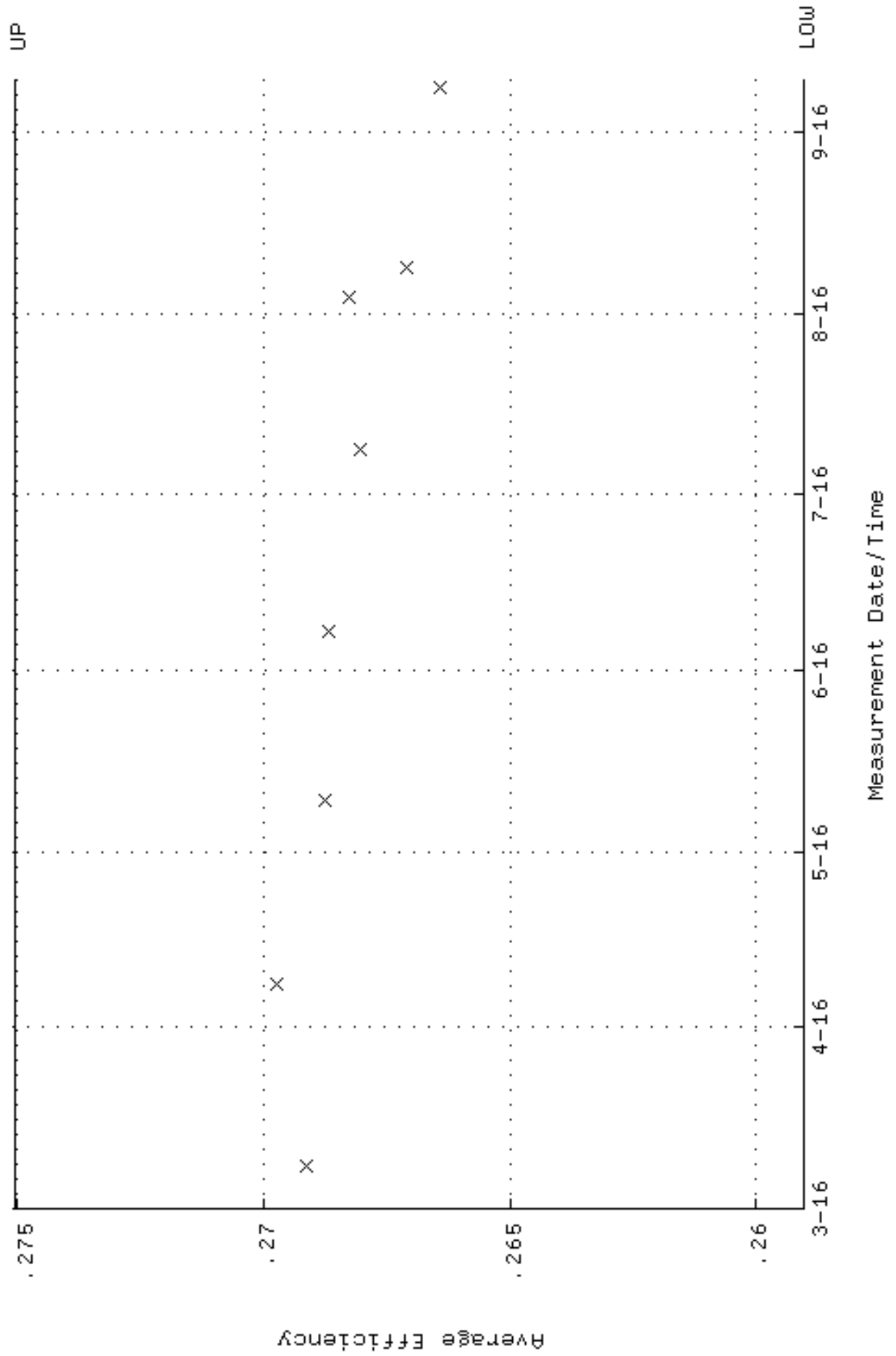
QA filename : DKA100:[ENV_ALPHA.QA.W]W129.QAF;7
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 8-MAR-2016 08:22:21 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



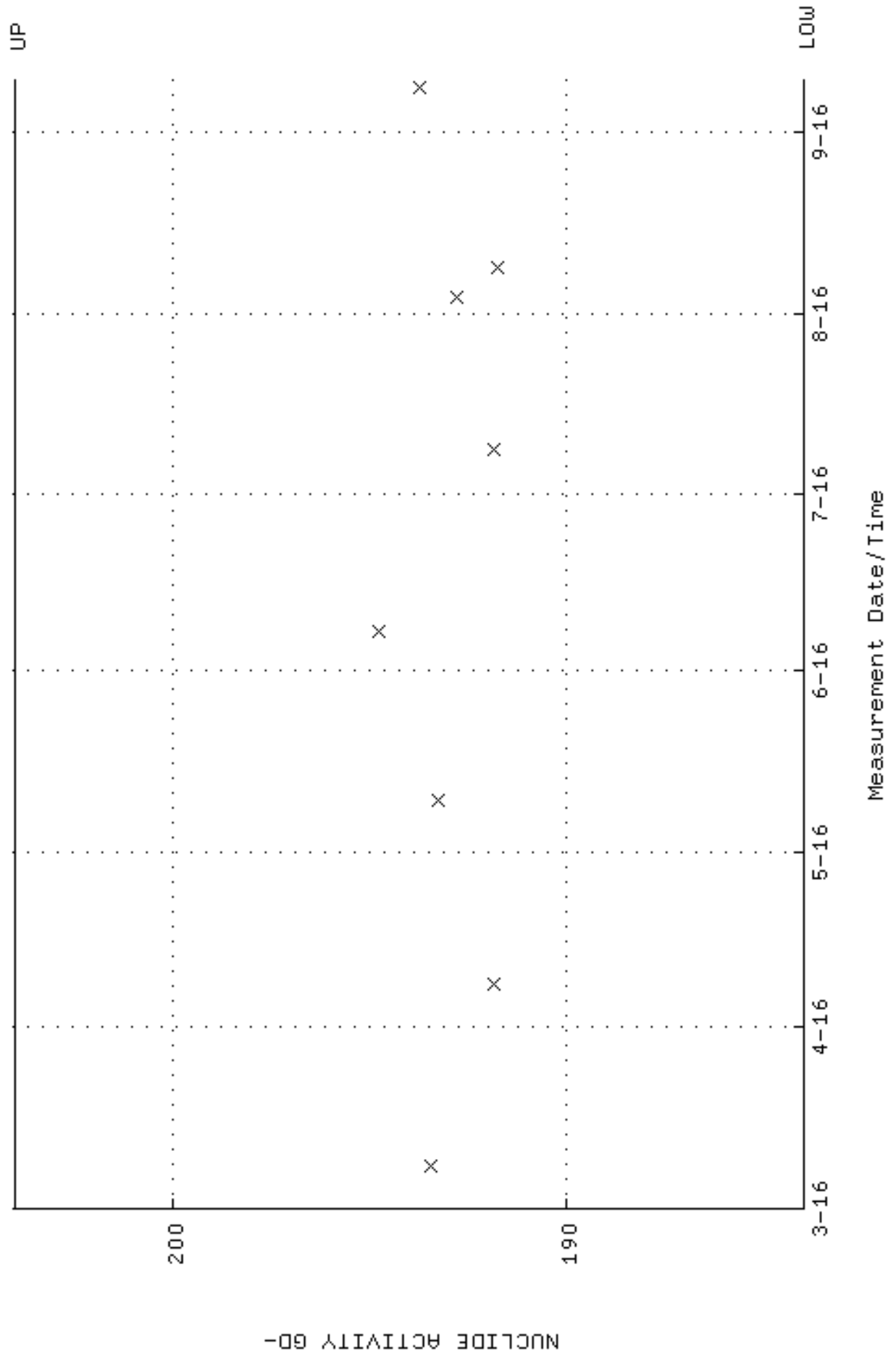
QA filename : DKA100:[ENV_ALPHA.QA.B]B129.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:43:26 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



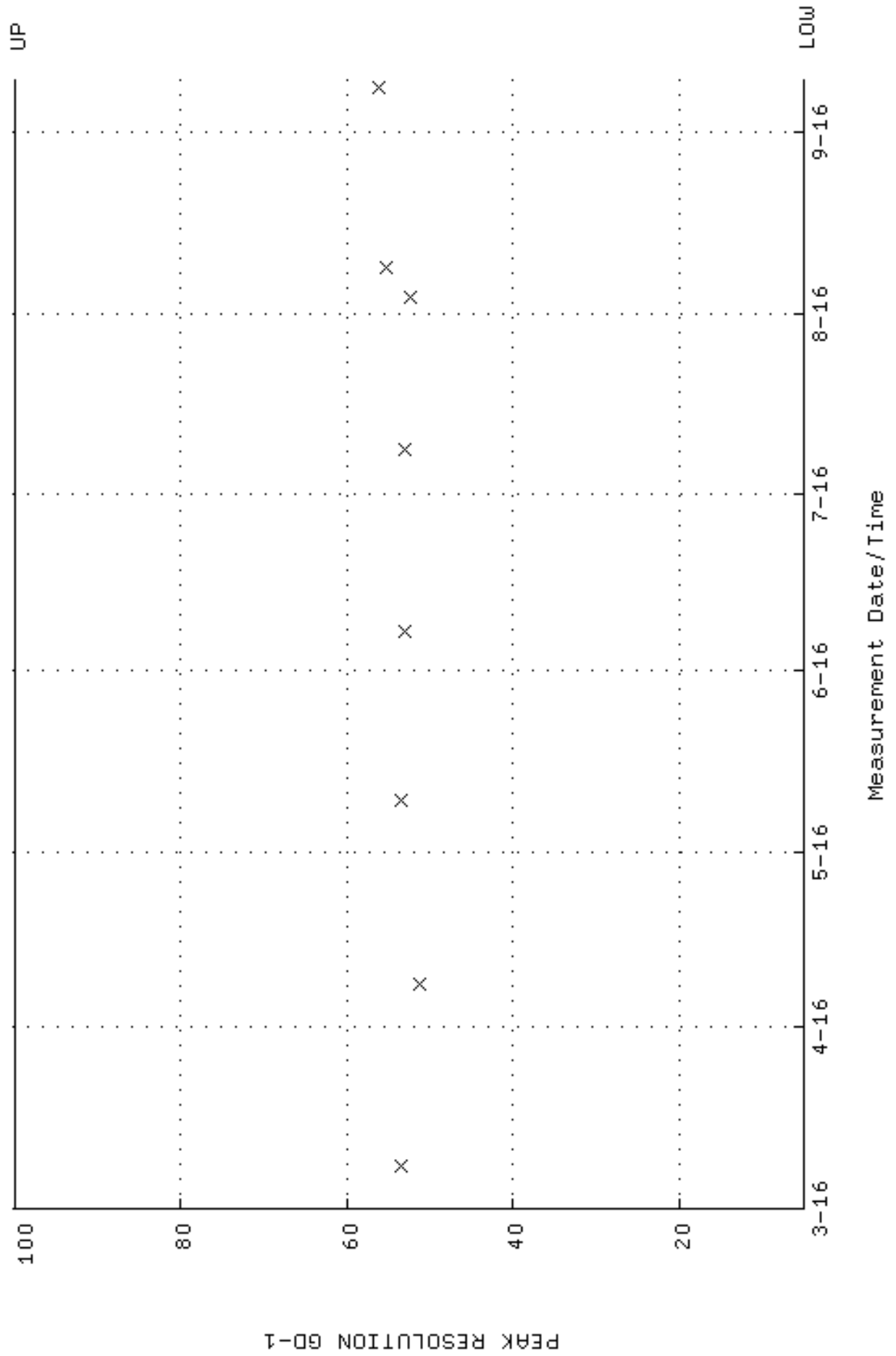
QA filename : DKA100:[ENV_ALPHA.QA.W]W130.QAF;7
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 8-MAR-2016 08:22:25 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.259030 through 0.275050



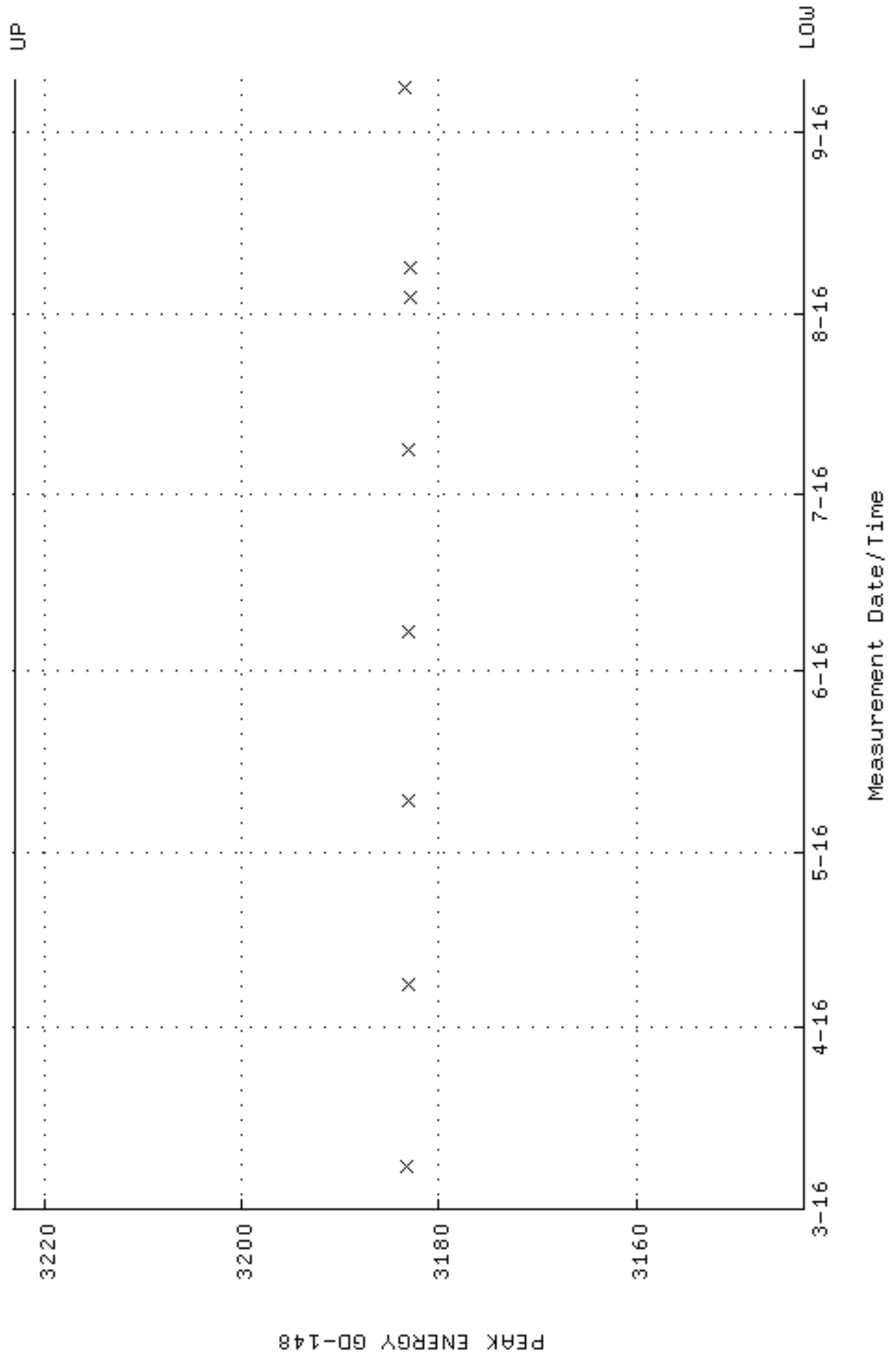
QA filename : DKA100:[ENV_ALPHA.QA.W]W130.QAF;7
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 8-MAR-2016 08:22:25 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



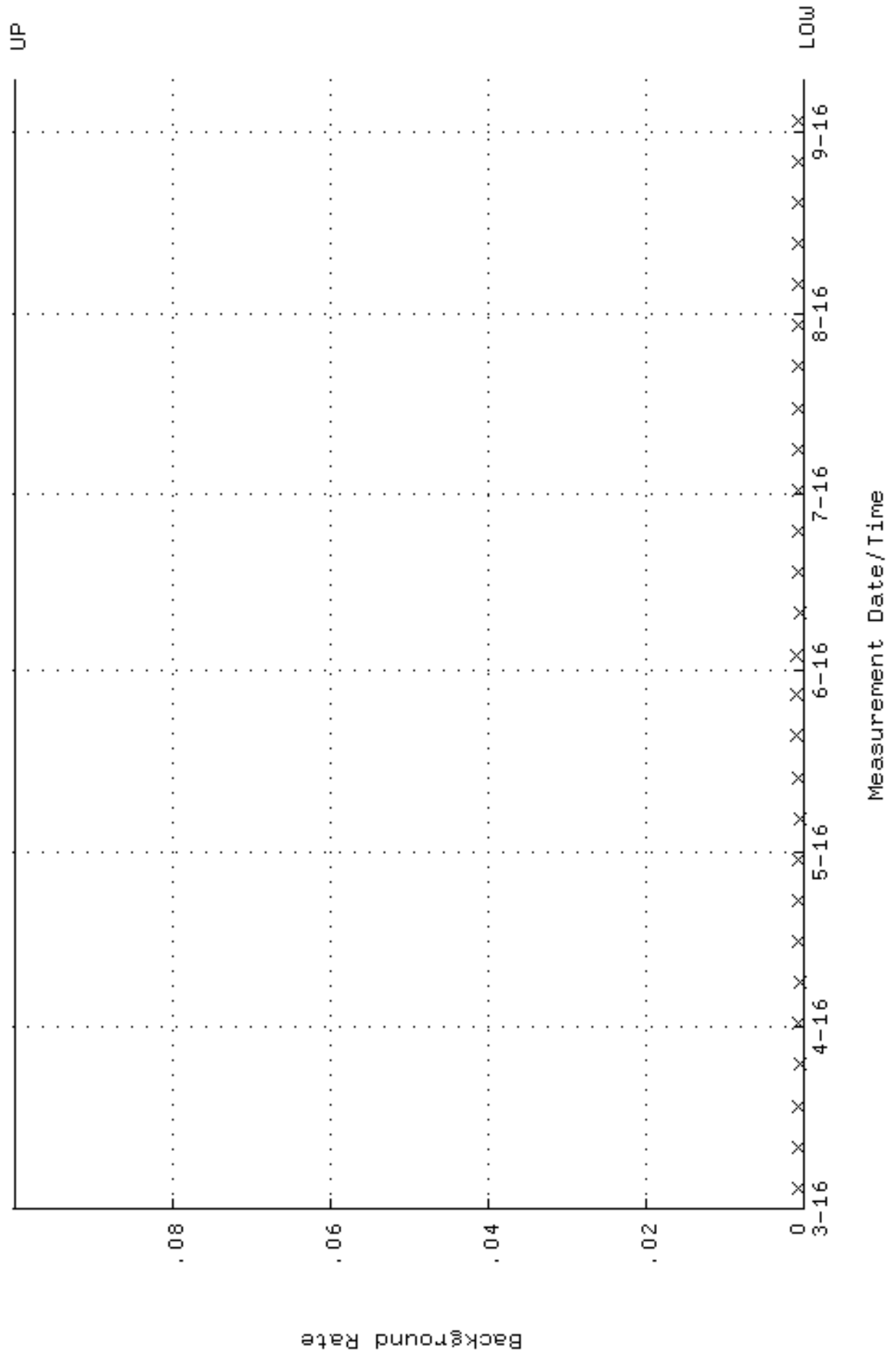
QA filename : DKA100:[ENV_ALPHA.QA.W]W130.QAF;7
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 8-MAR-2016 08:22:25 through 9-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



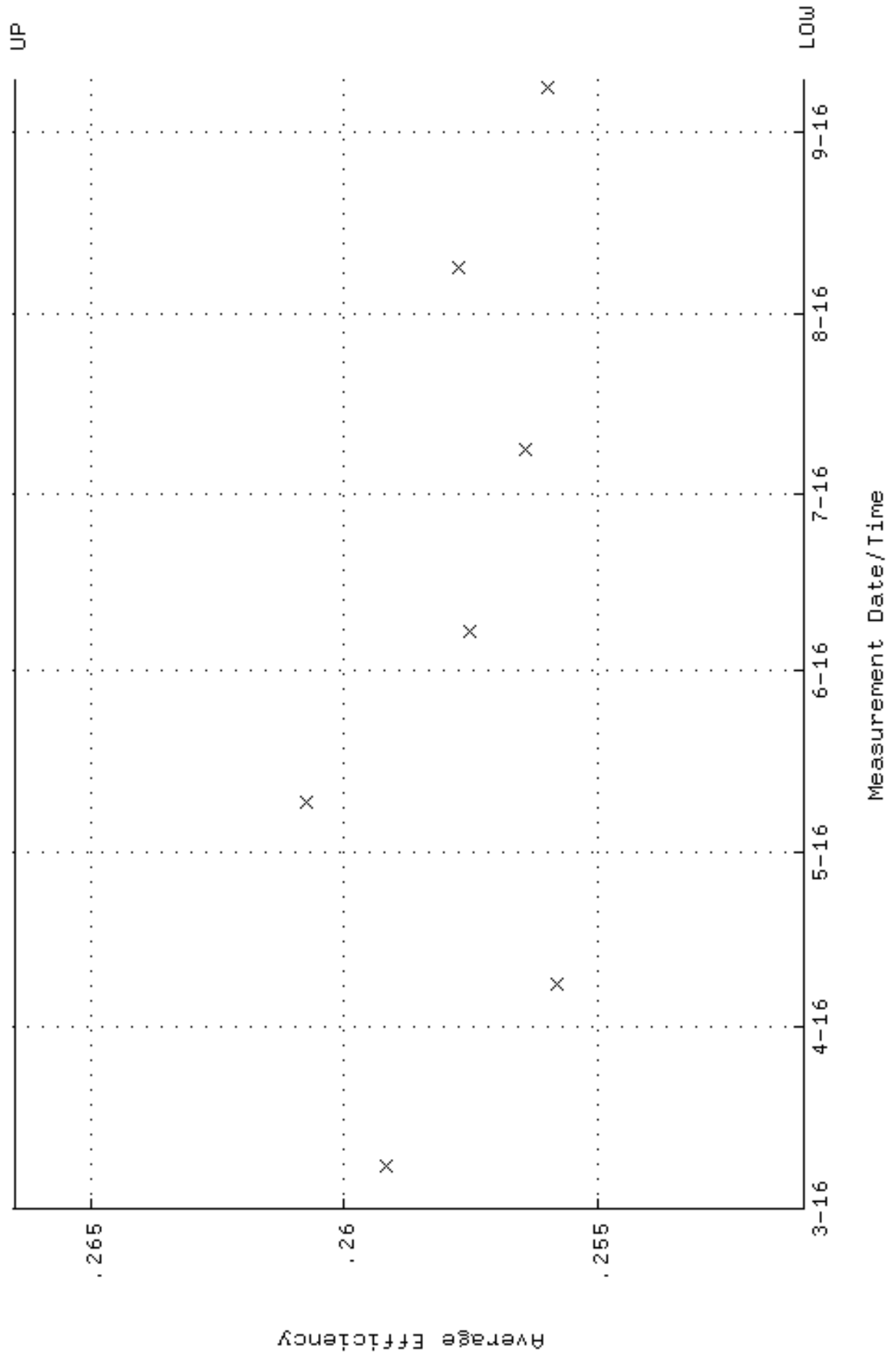
QA filename : DKA100:[ENV_ALPHA.QA.W]W130.QAF;7
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 8-MAR-2016 08:22:25 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



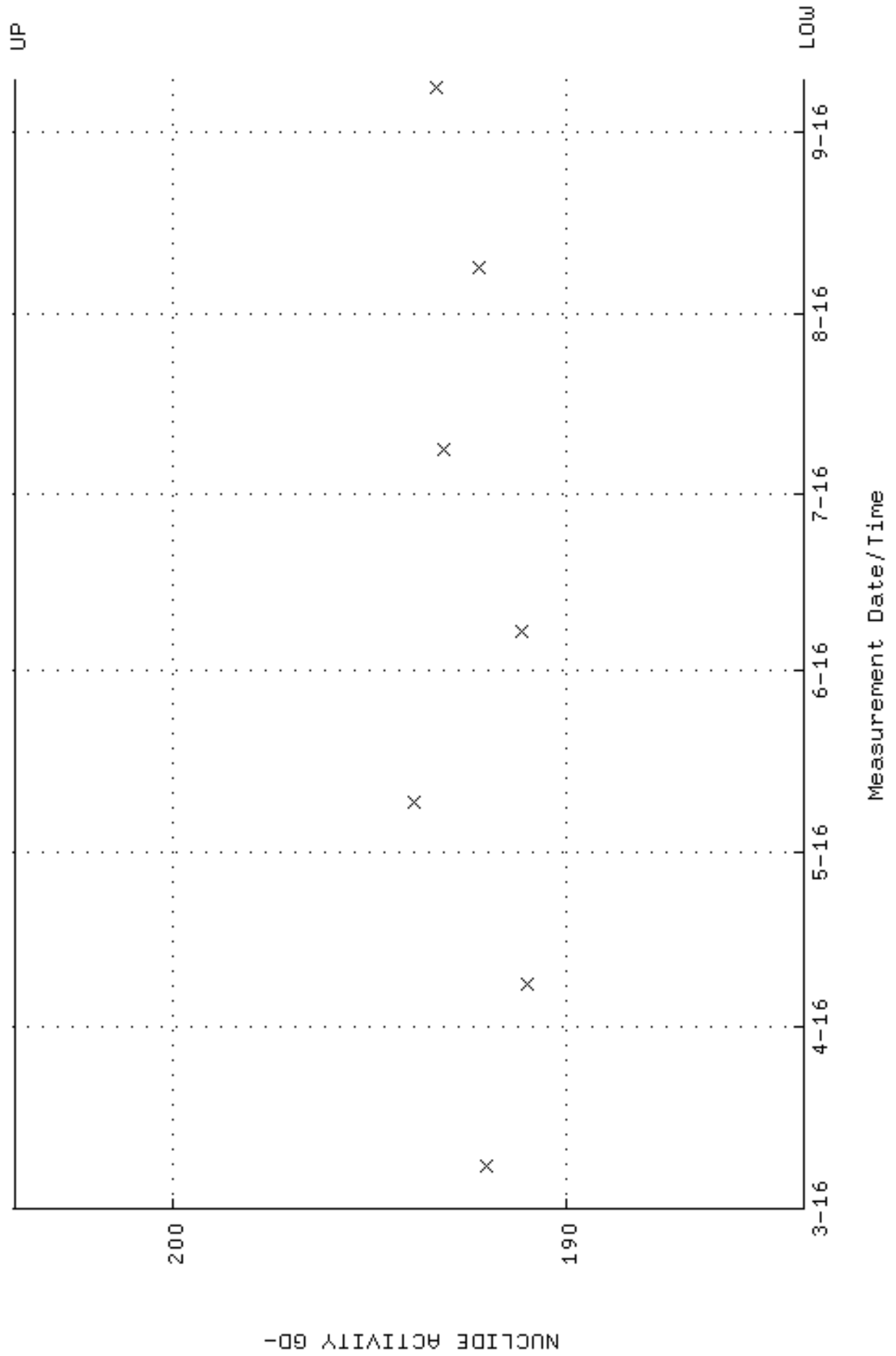
QA filename : DKA100:[ENV_ALPHA.QA.B]B130.QAF;2
 Parameter Name : BACKRATE (Background Rate)
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 Lower/Upper Lmts: 0.000000E+00 through 0.100000



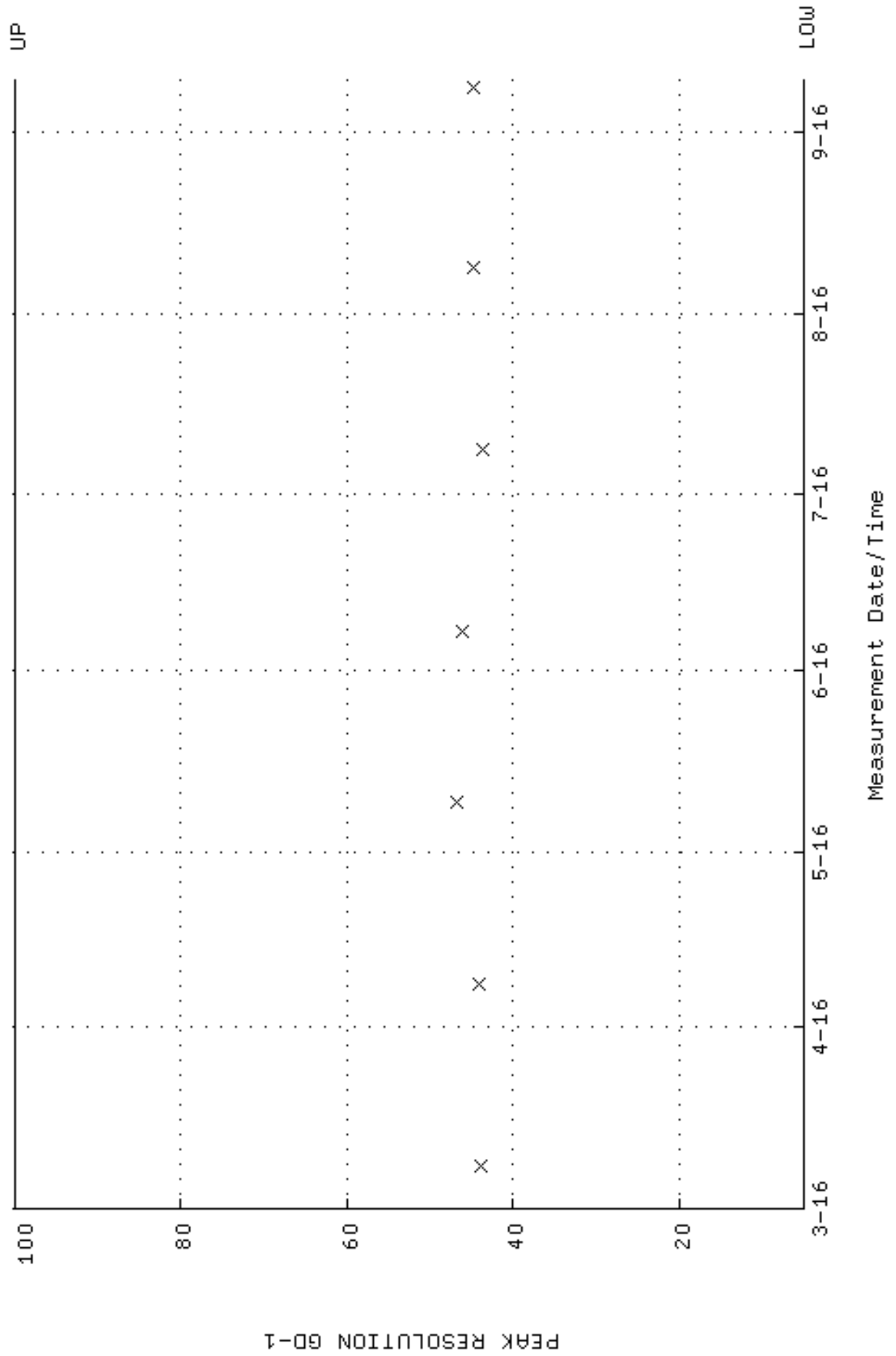
QA filename : DKA100:[ENV_ALPHA.QA.W]W131.QAF;7
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 8-MAR-2016 08:22:28 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.250957 through 0.266481



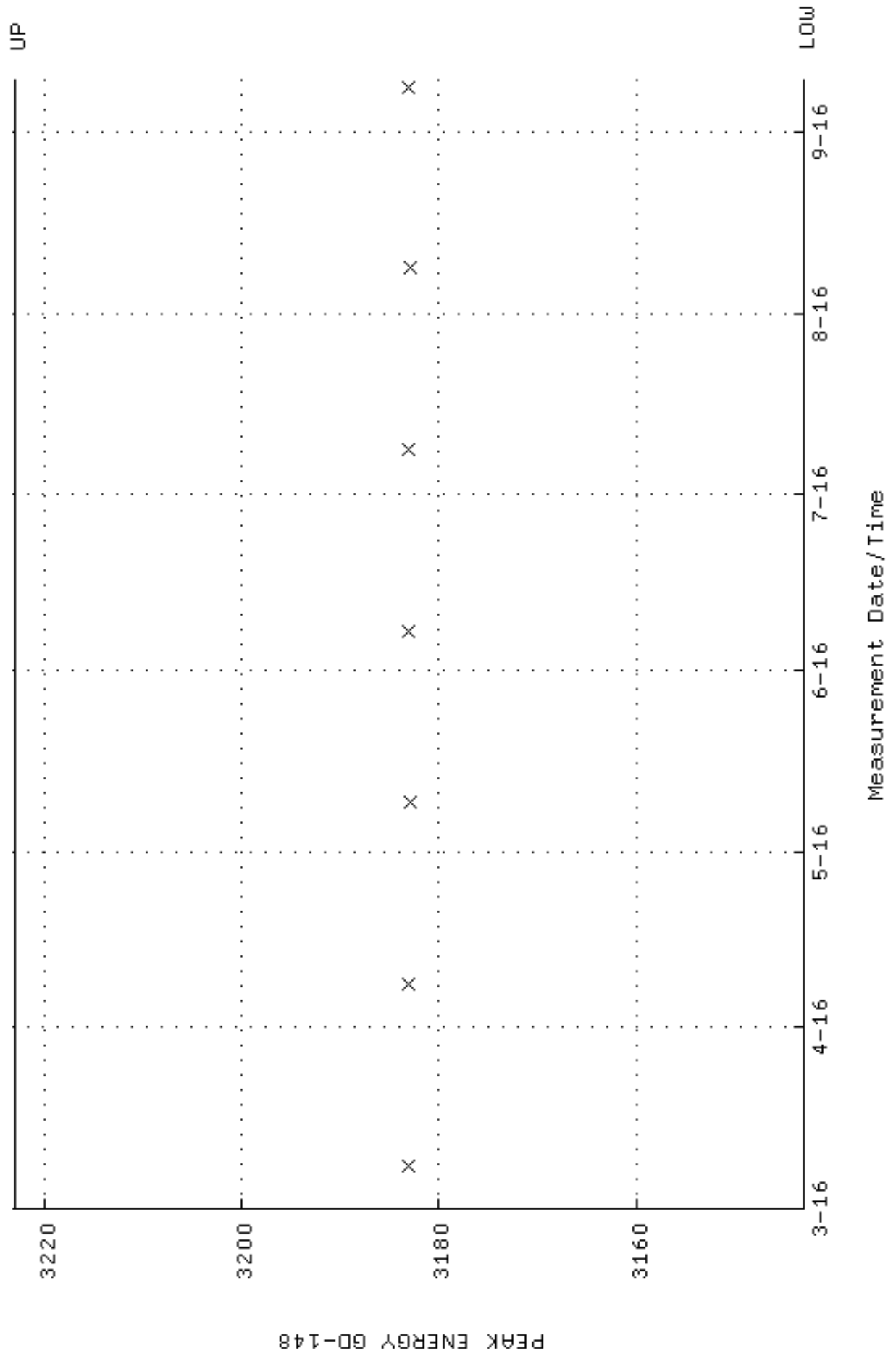
QA filename : DKA100:[ENV_ALPHA.QA.W]W131.QAF;7
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 8-MAR-2016 08:22:28 through 9-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



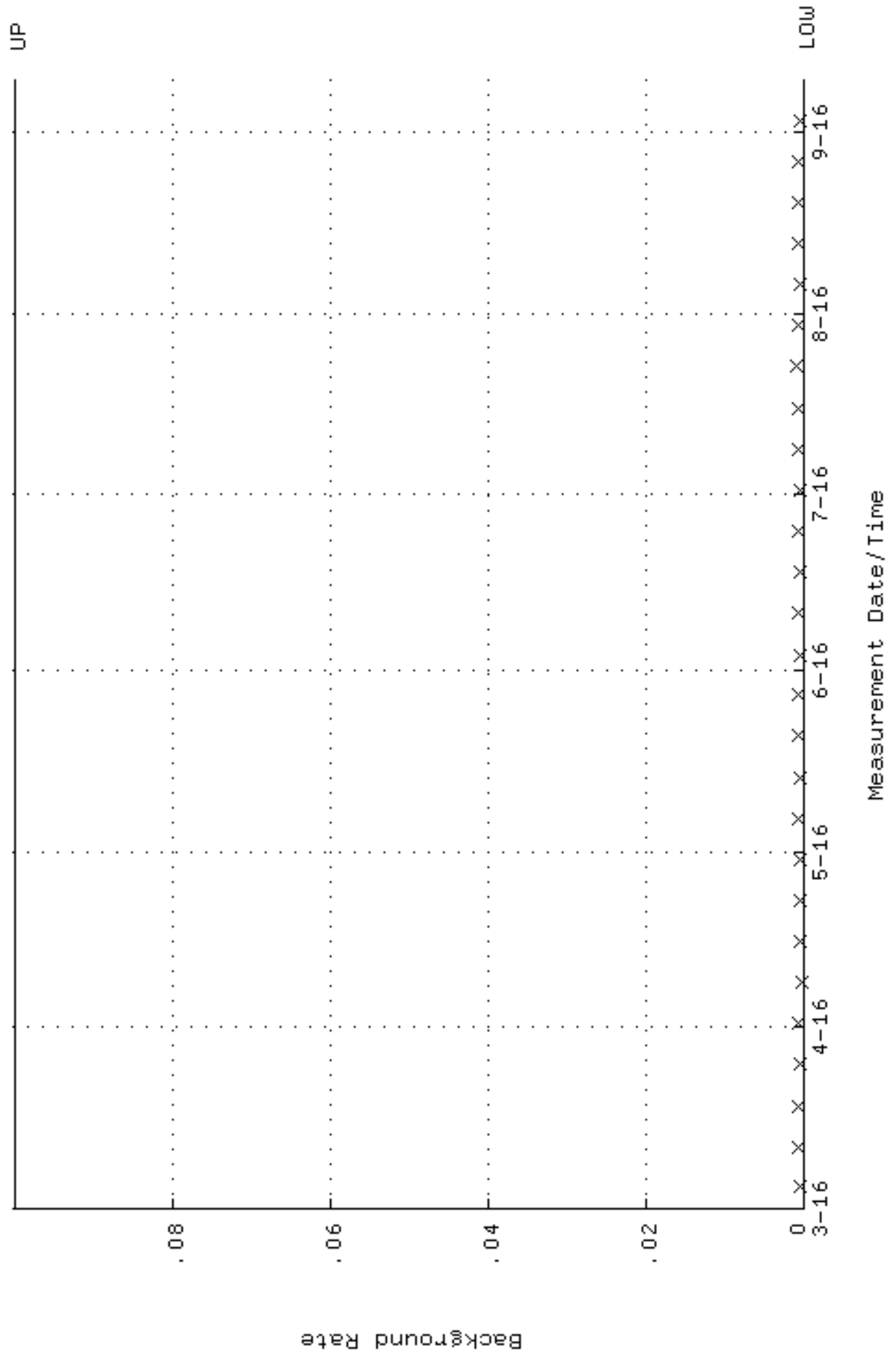
QA filename : DKA100:[ENV_ALPHA.QA.W]W131.QAF;7
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 8-MAR-2016 08:22:28 through 9-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



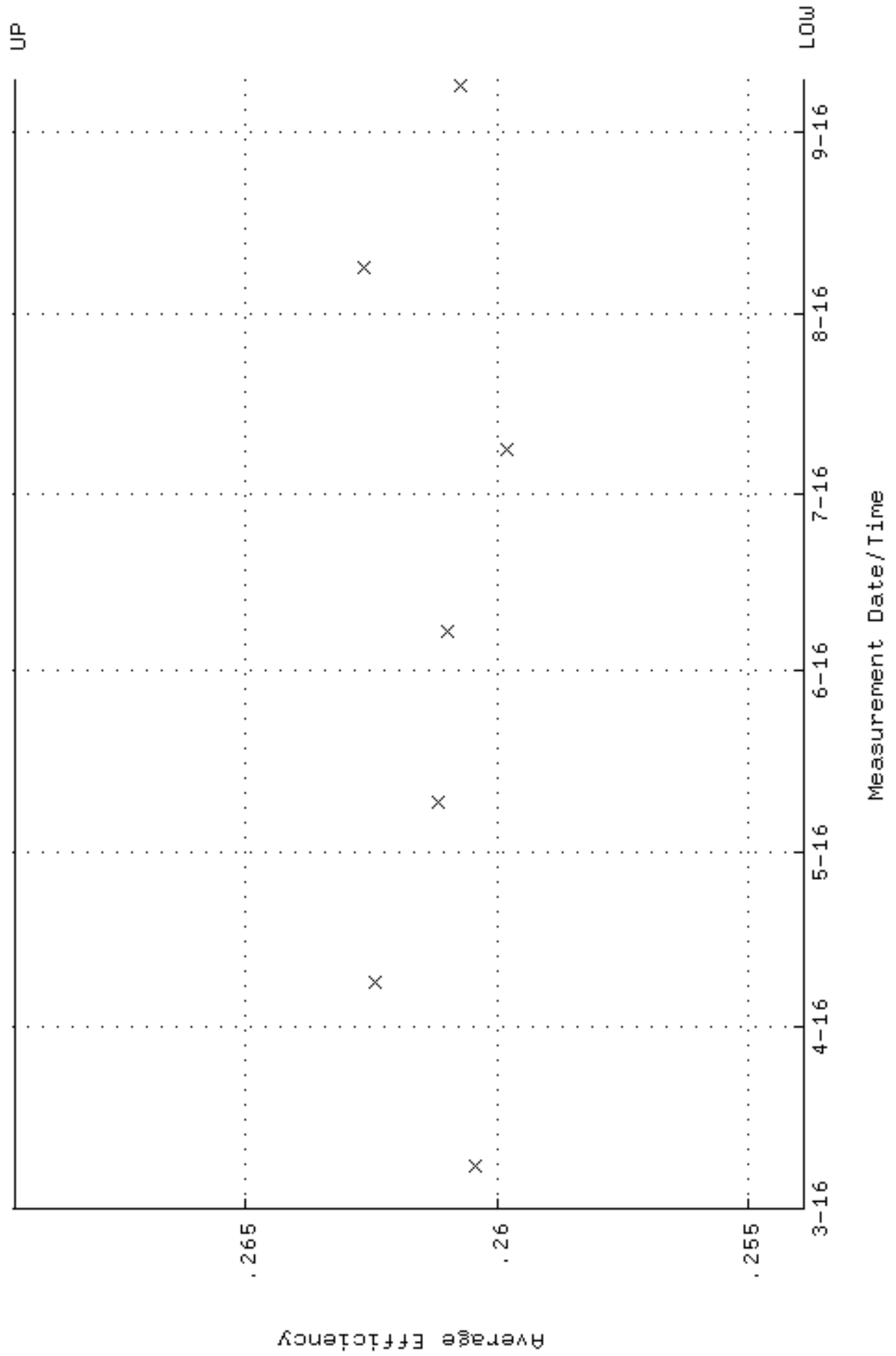
QA filename : DKA100:[ENV_ALPHA.QA.W]W131.QAF;7
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 8-MAR-2016 08:22:28 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



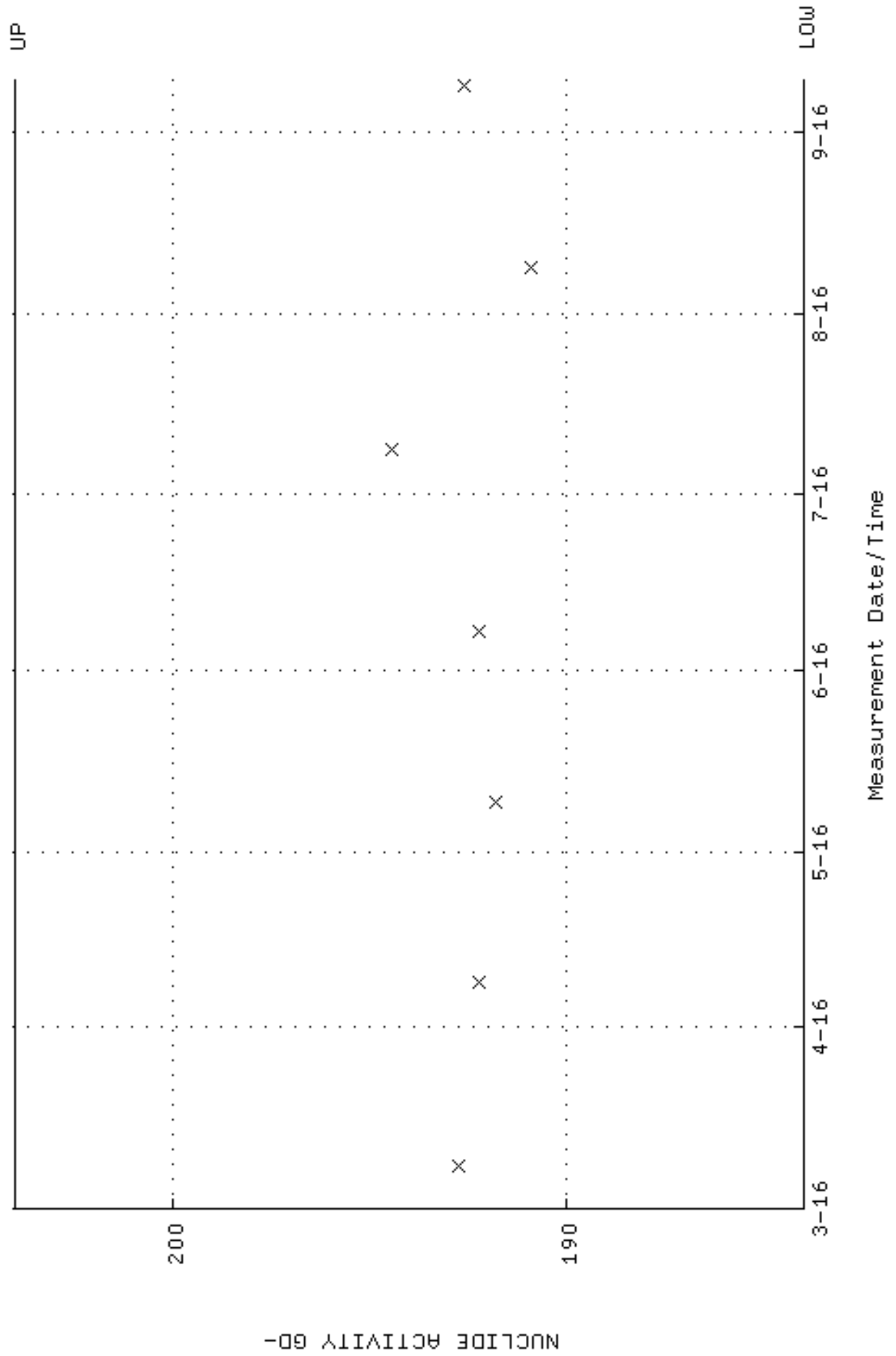
QA filename : DKA100:[ENV_ALPHA.QA.B]B131.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:23:28 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



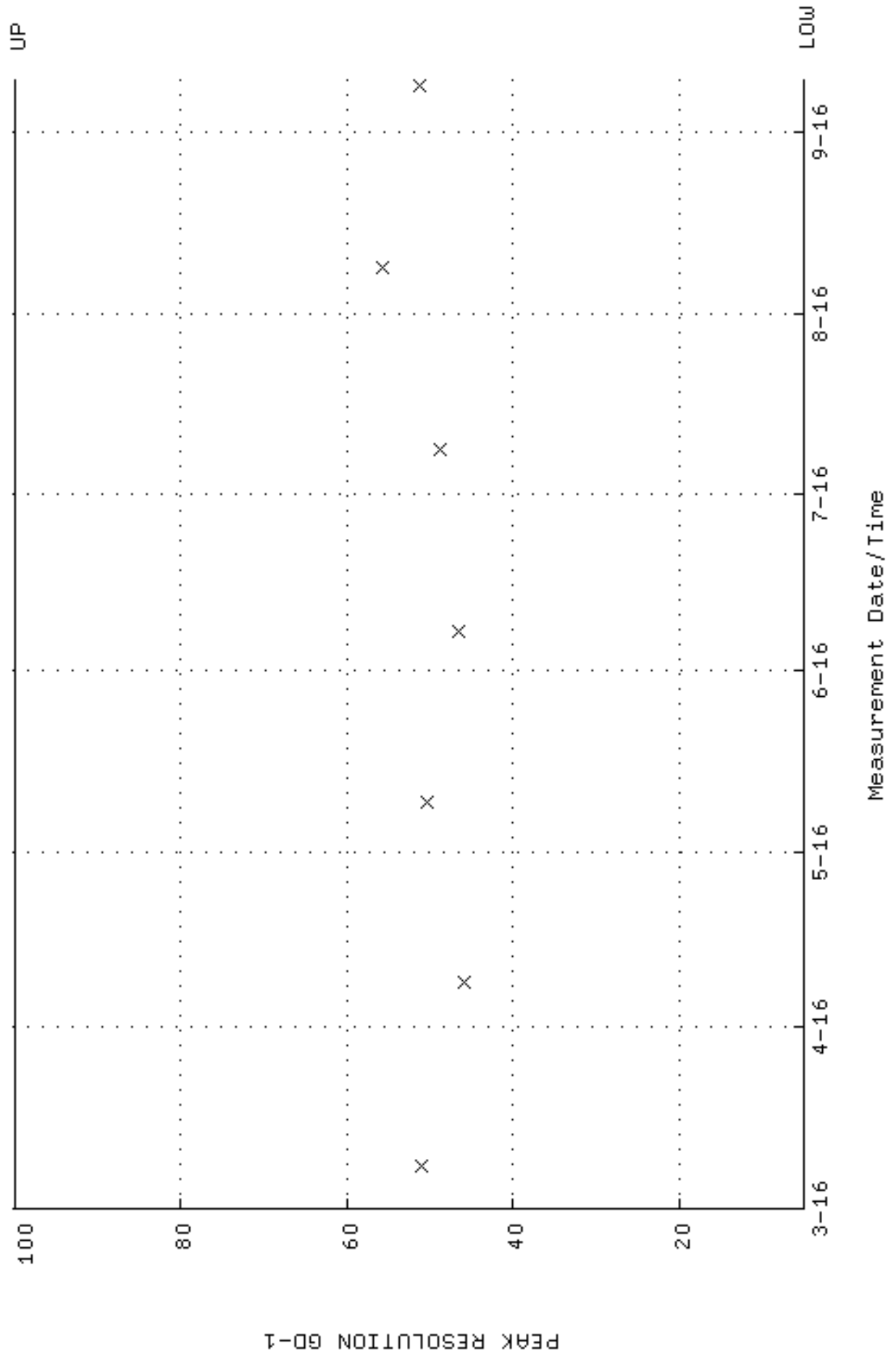
QA filename : DKA100:[ENV_ALPHA.QA.W]W132.QAF;6
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 8-MAR-2016 08:22:33 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.253891 through 0.269595



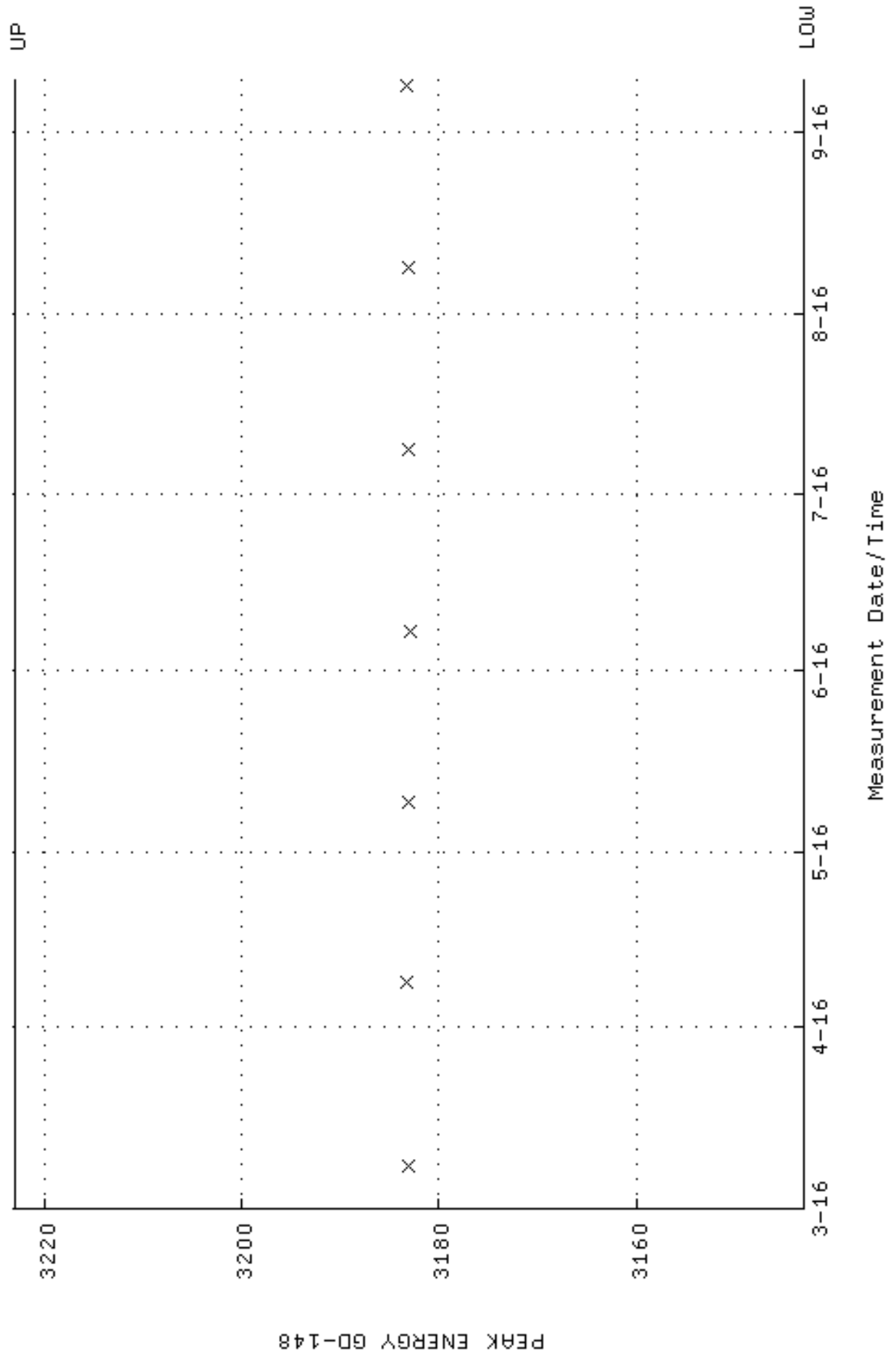
QA filename : DKA100:[ENV_ALPHA.QA.W]W132.QAF;6
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 8-MAR-2016 08:22:33 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



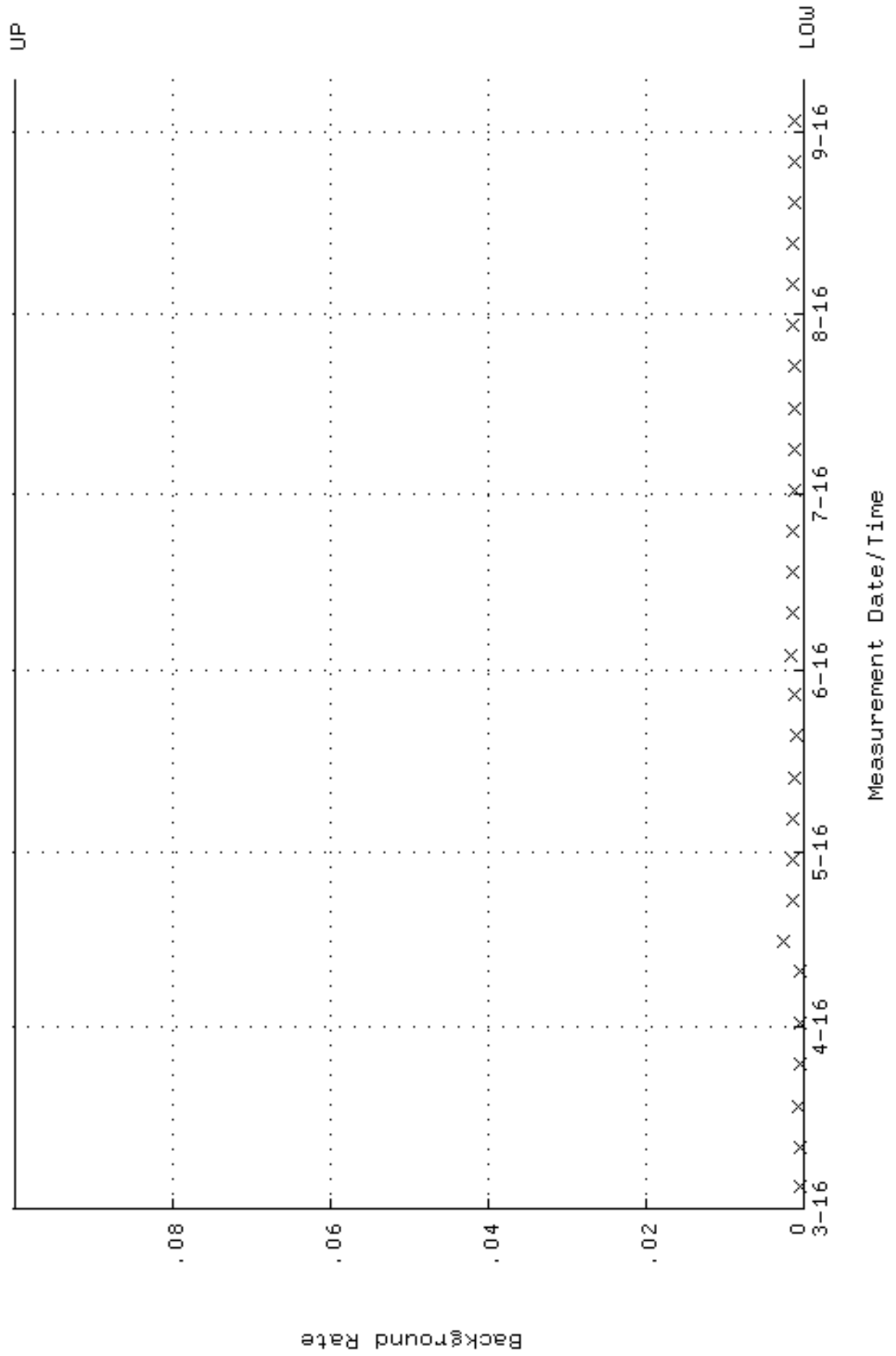
QA filename : DKA100:[ENV_ALPHA.QA.W]W132.QAF;6
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 8-MAR-2016 08:22:33 through 9-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



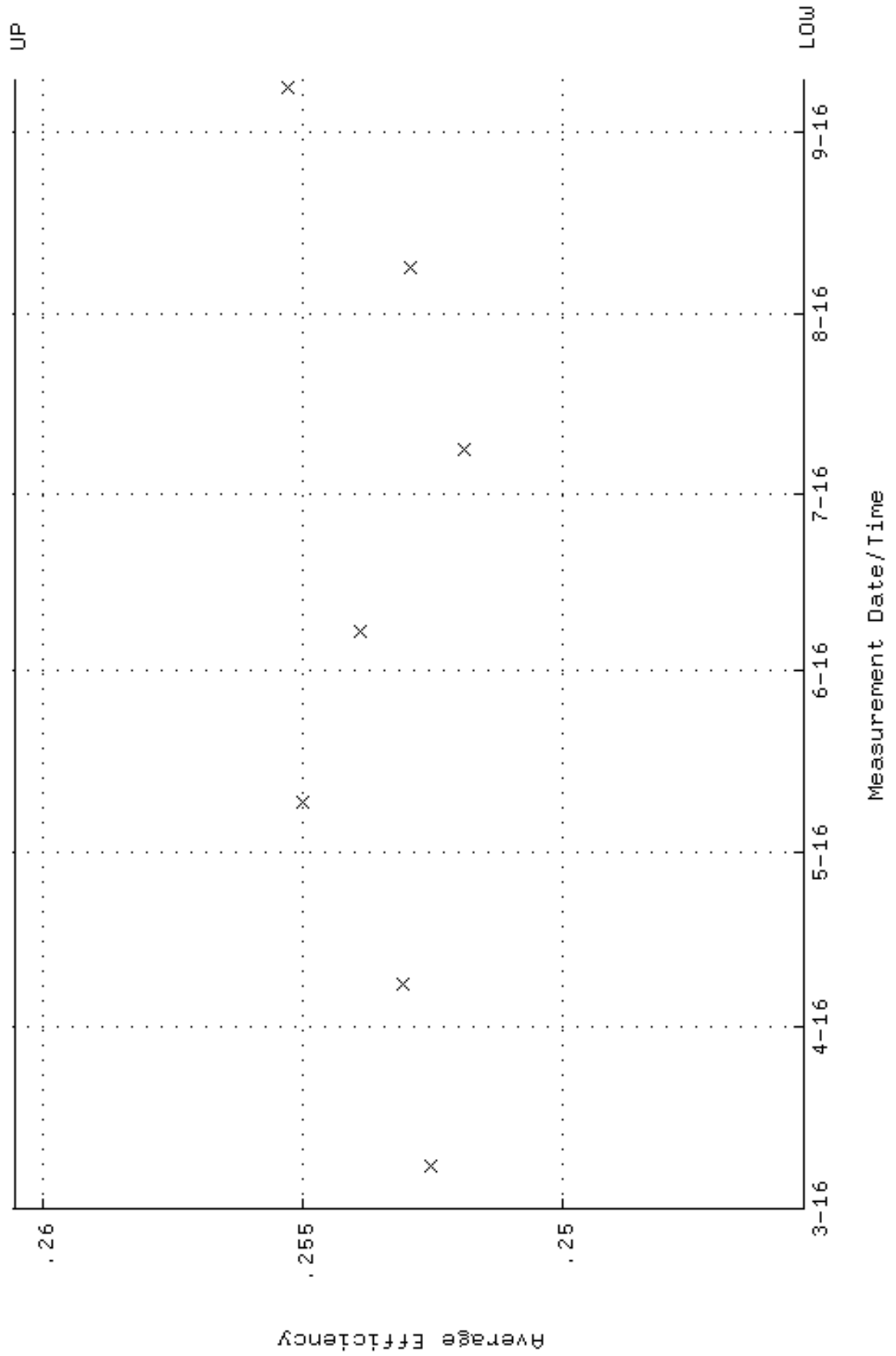
QA filename : DKA100:[ENV_ALPHA.QA.W]W132.QAF;6
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 8-MAR-2016 08:22:33 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



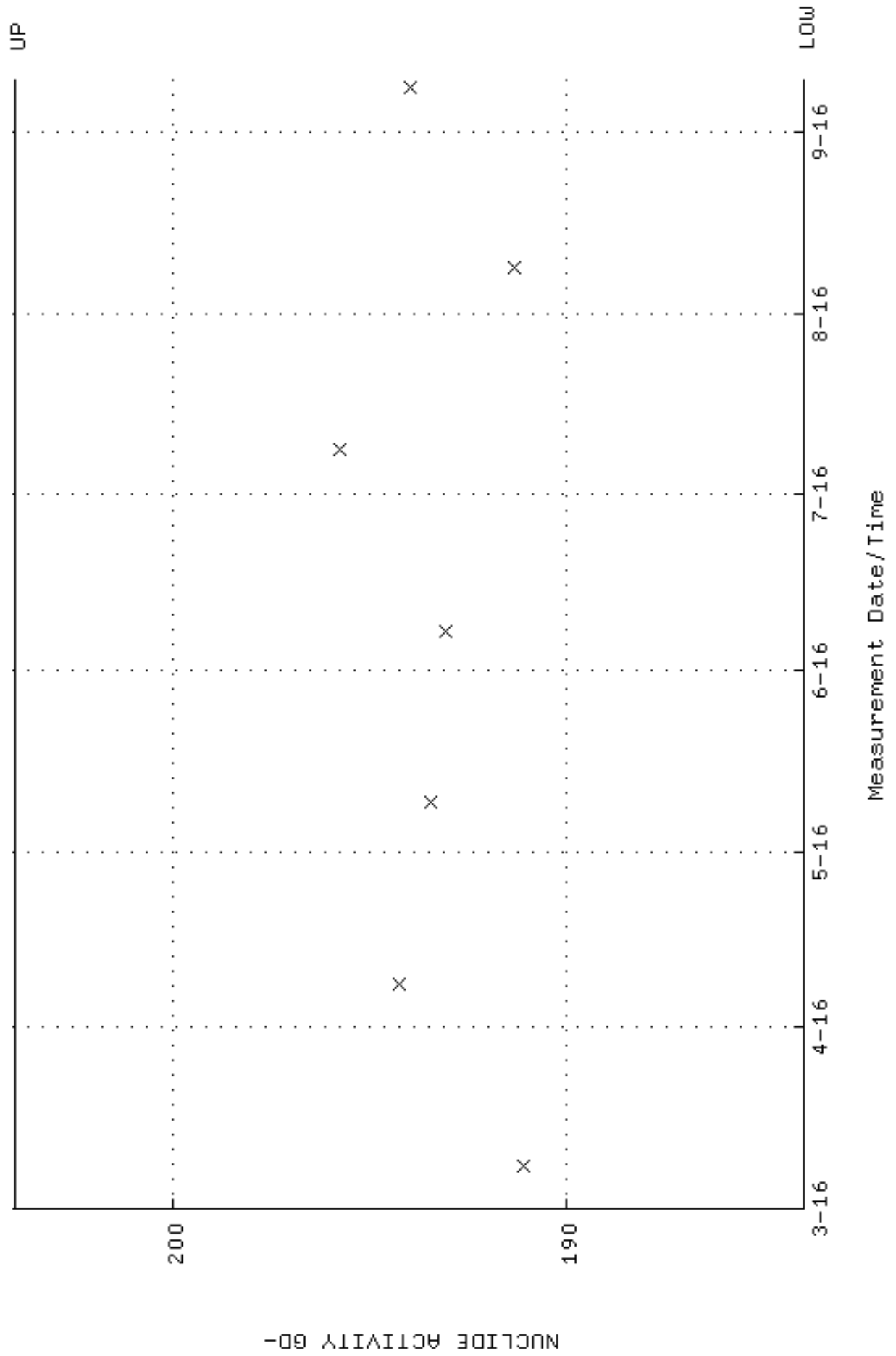
QA filename : DKA100:[ENV_ALPHA.QA.B]B132.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:23:31 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



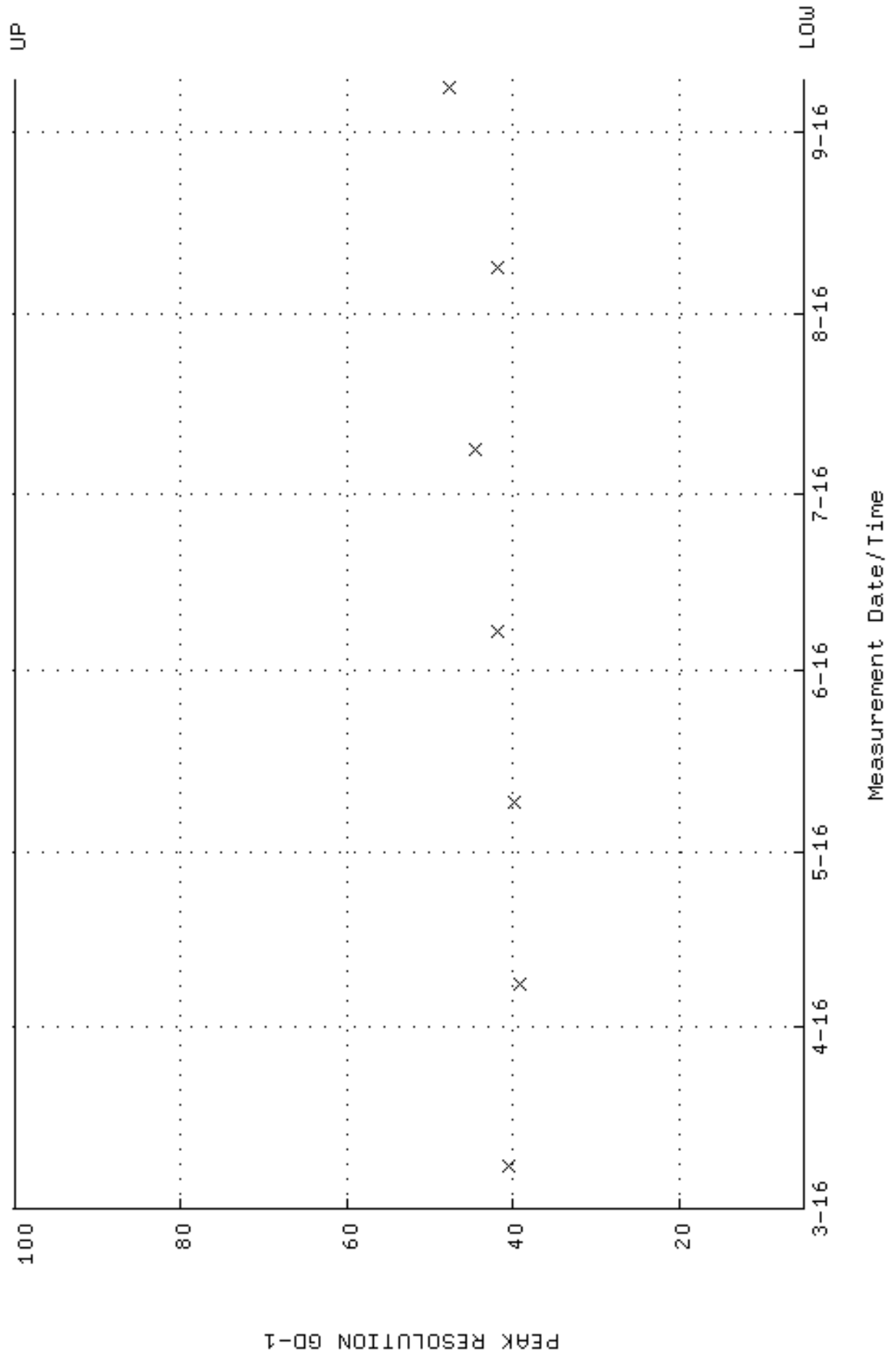
QA filename : DKA100:[ENV_ALPHA.QA.W]W133.QAF;6
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 8-MAR-2016 08:22:37 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.245373 through 0.260550



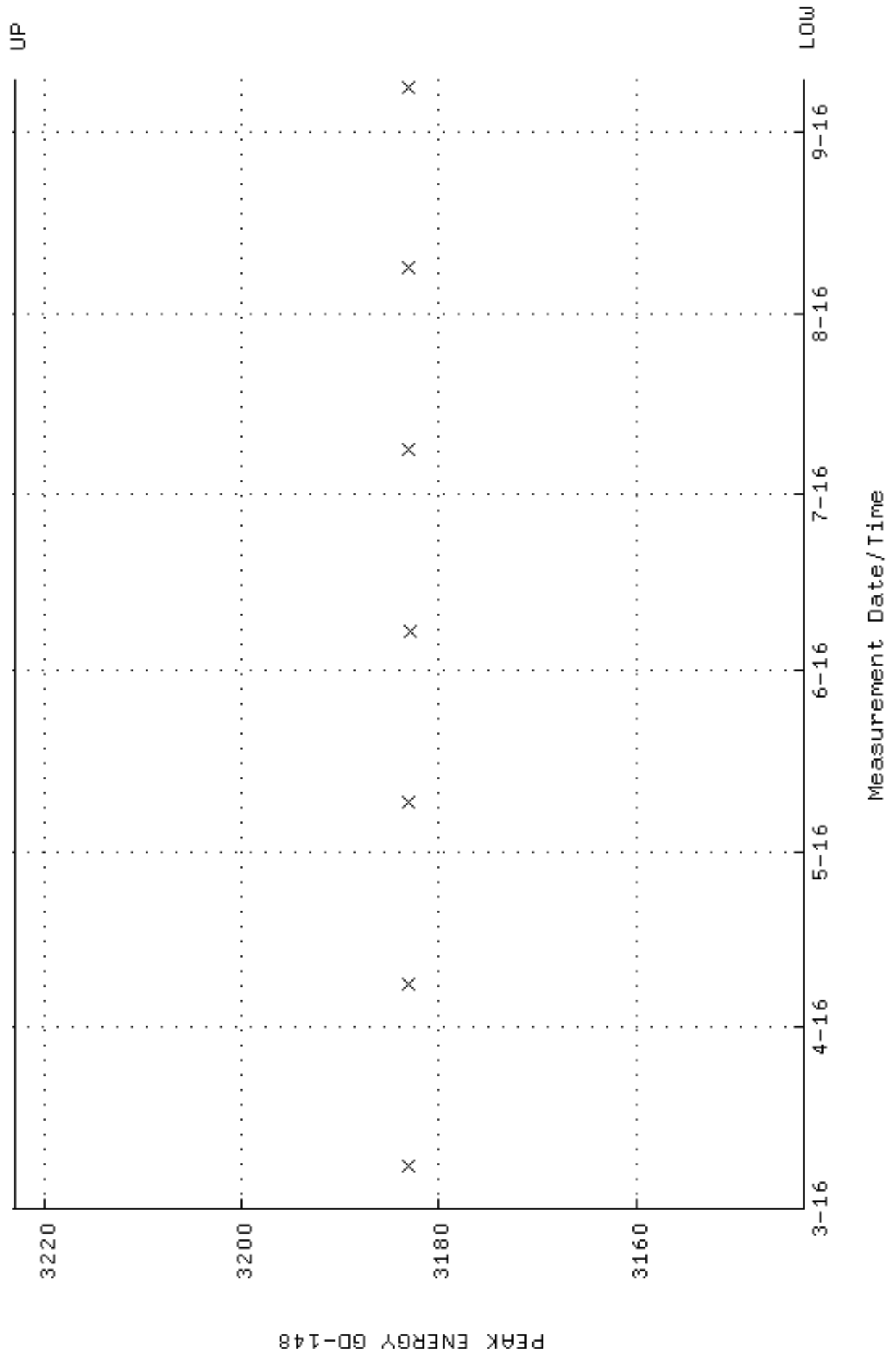
QA filename : DKA100:[ENV_ALPHA.QA.W]W133.QAF;6
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 8-MAR-2016 08:22:37 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



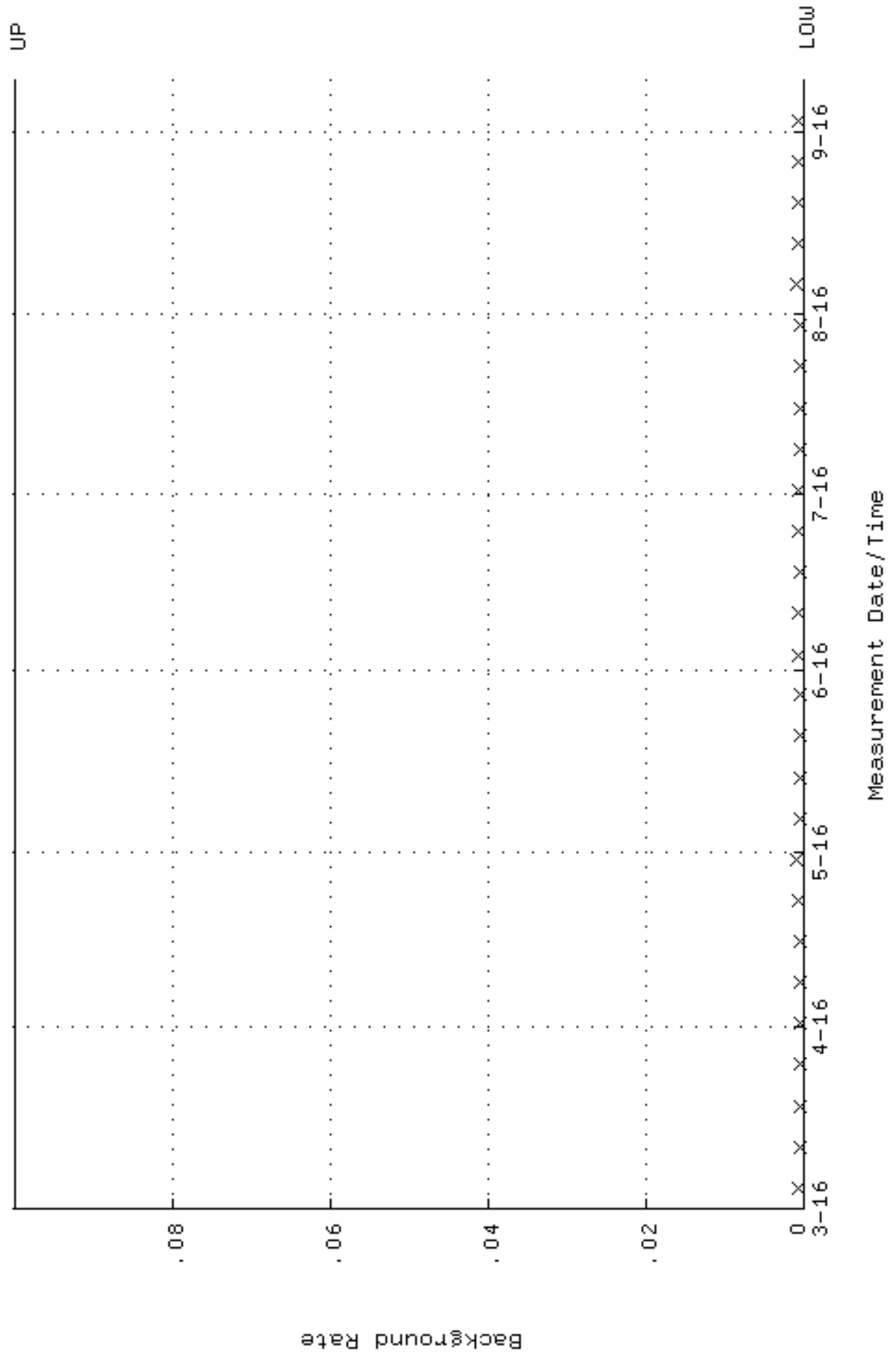
QA filename : DKA100:[ENV_ALPHA.QA.W]W133.QAF;6
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 8-MAR-2016 08:22:37 through 9-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



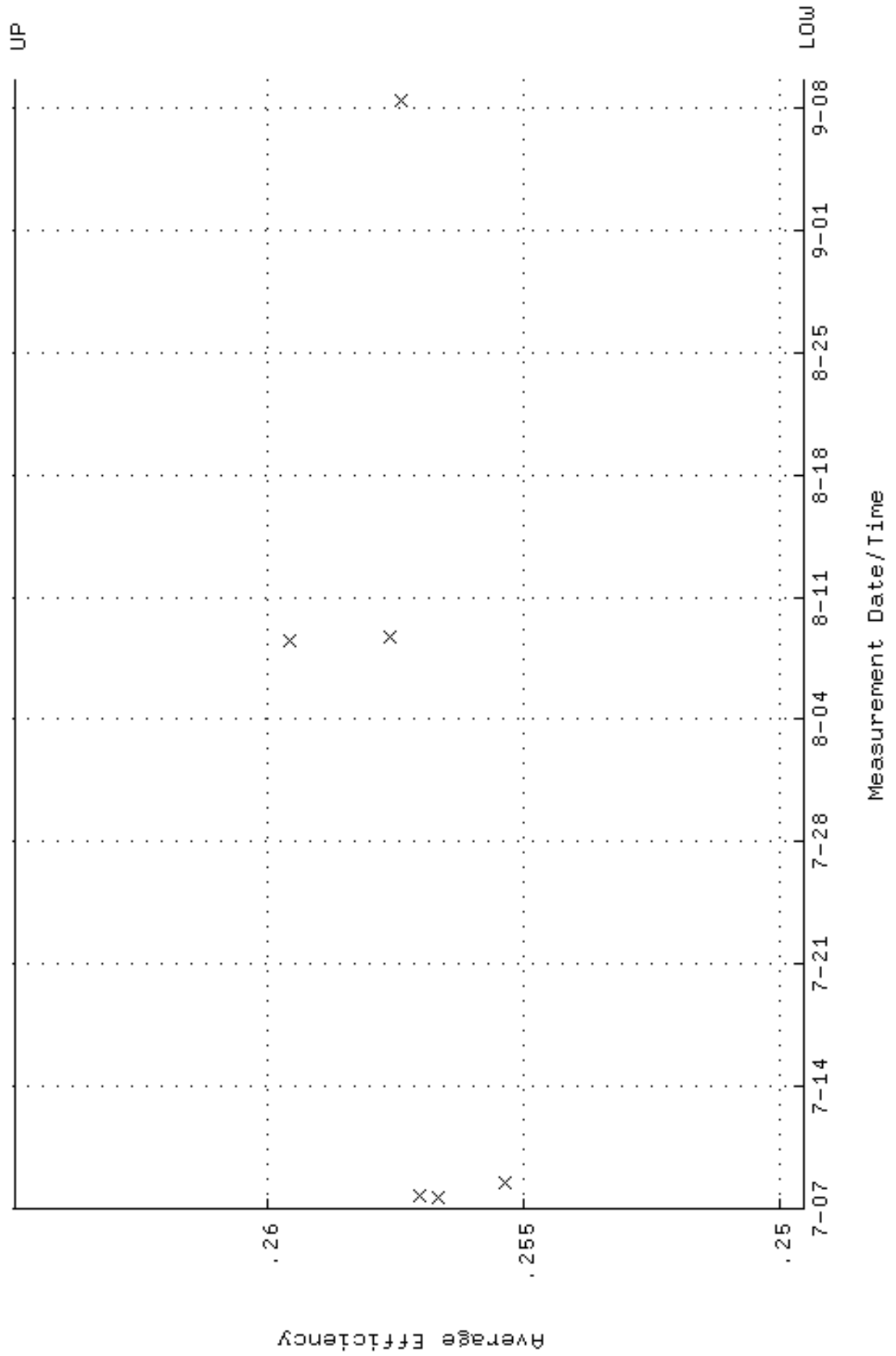
QA filename : DKA100:[ENV_ALPHA.QA.W]W133.QAF;6
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 8-MAR-2016 08:22:37 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



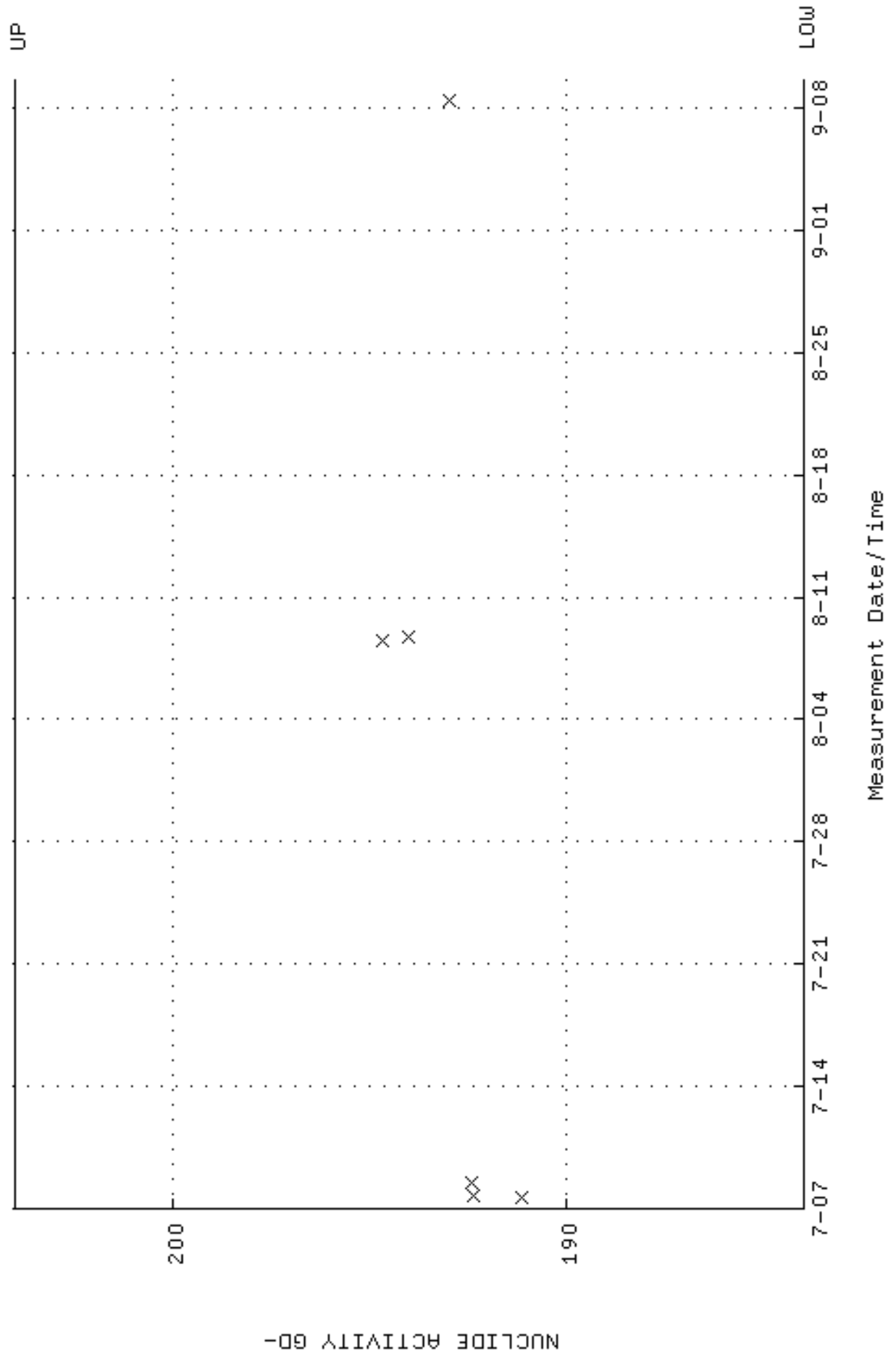
QA filename : DKA100:[ENV_ALPHA.QA.B]B133.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:43:43 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



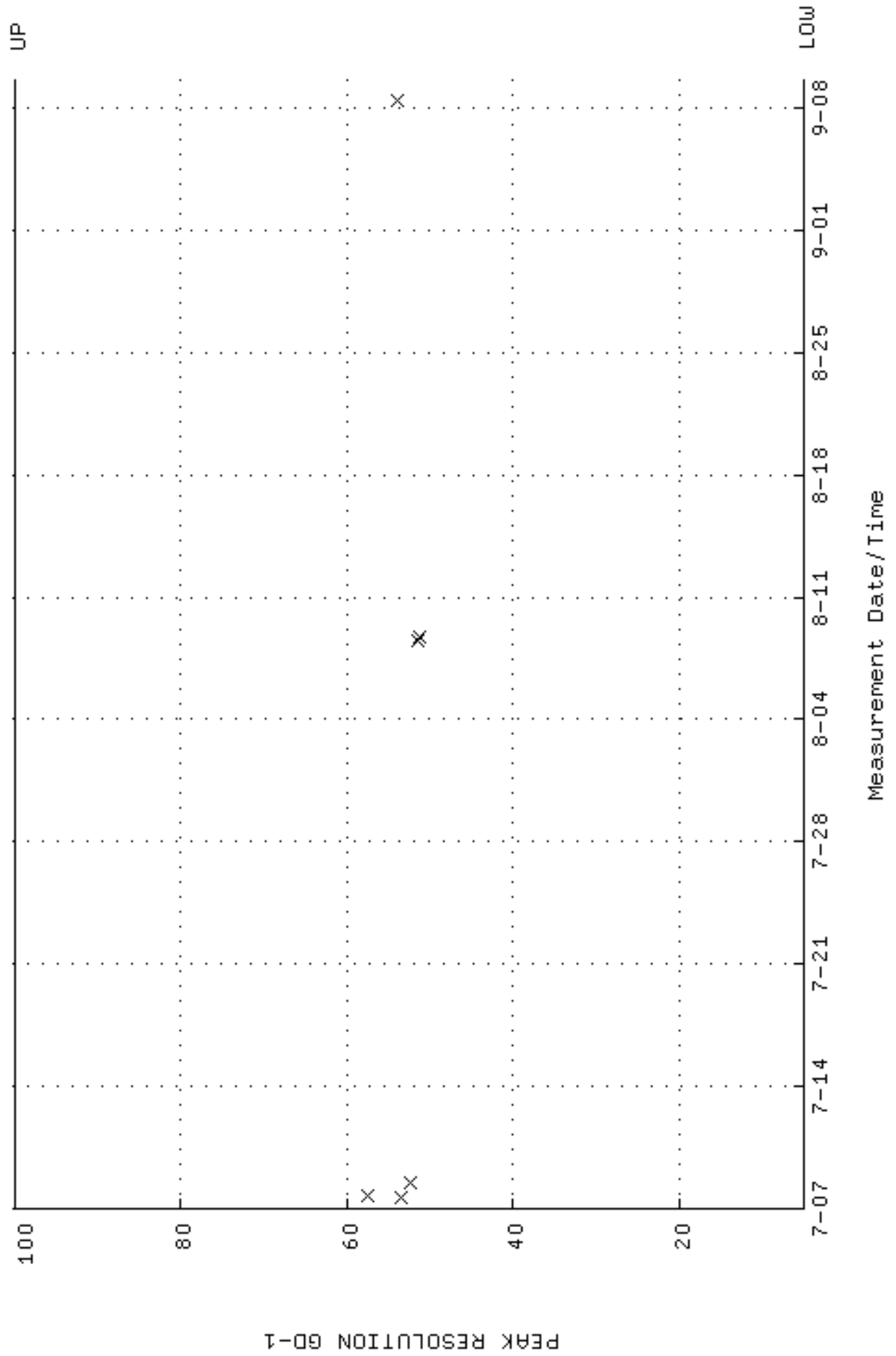
QA filename : DKA100:[ENV_ALPHA.QA.W]W134.QAF;6
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 7-JUL-2016 14:05:23 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.249513 through 0.264950



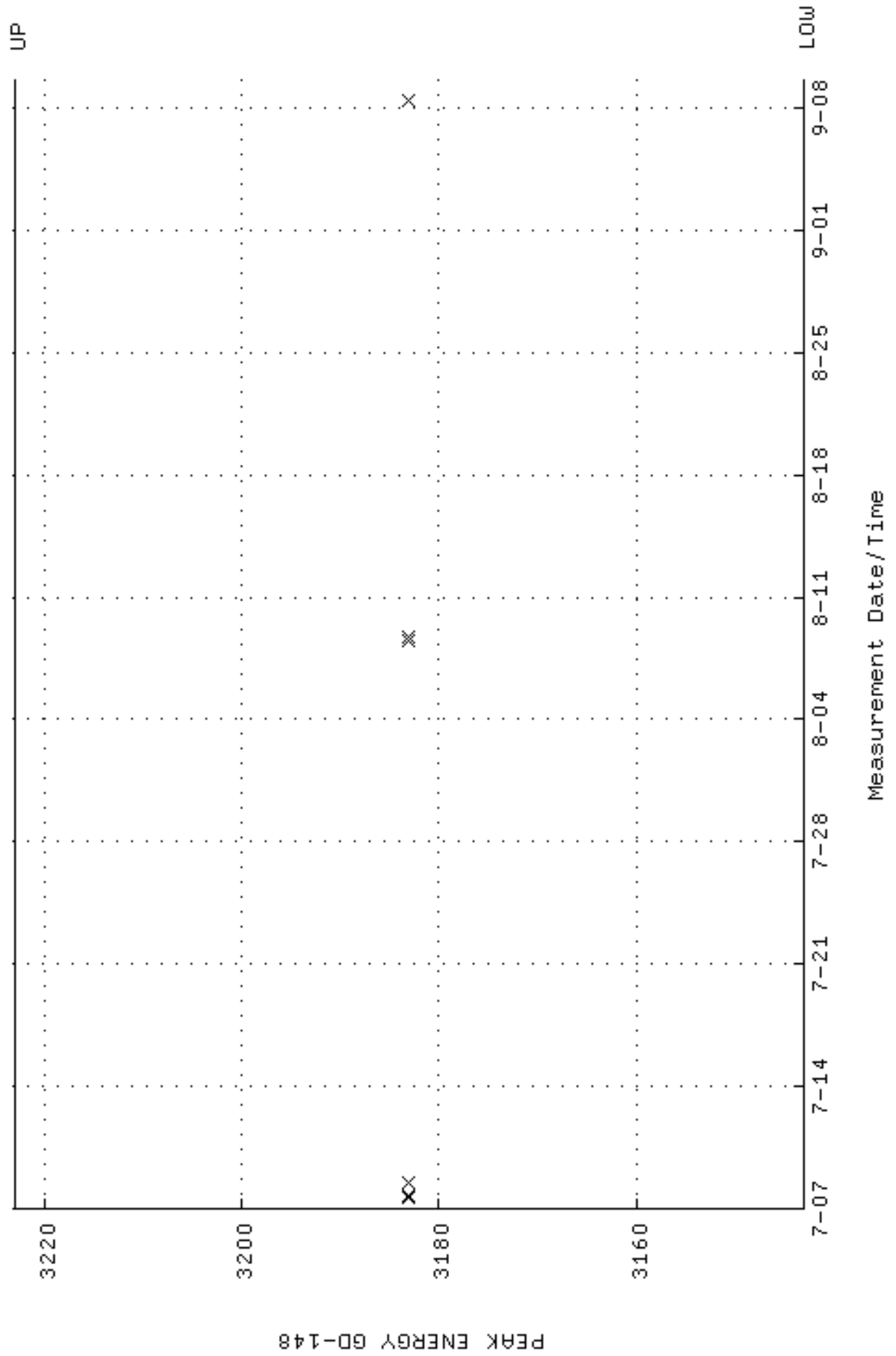
QA filename : DKA100:[ENV_ALPHA.QA.W]W134.QAF;6
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 7-JUL-2016 14:05:23 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



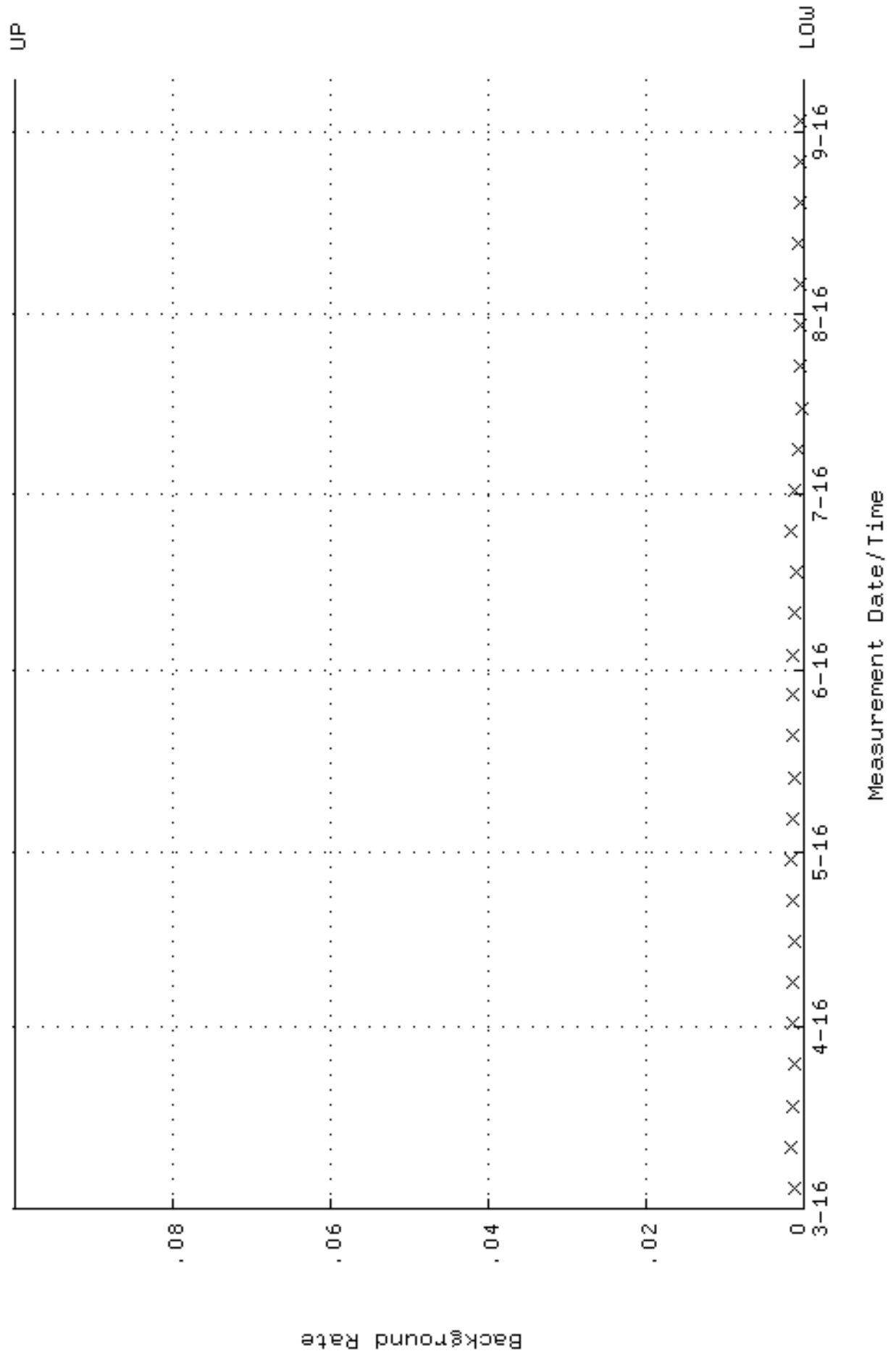
QA filename : DKA100:[ENV_ALPHA.QA.W]W134.QAF;6
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 7-JUL-2016 14:05:23 through 9-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



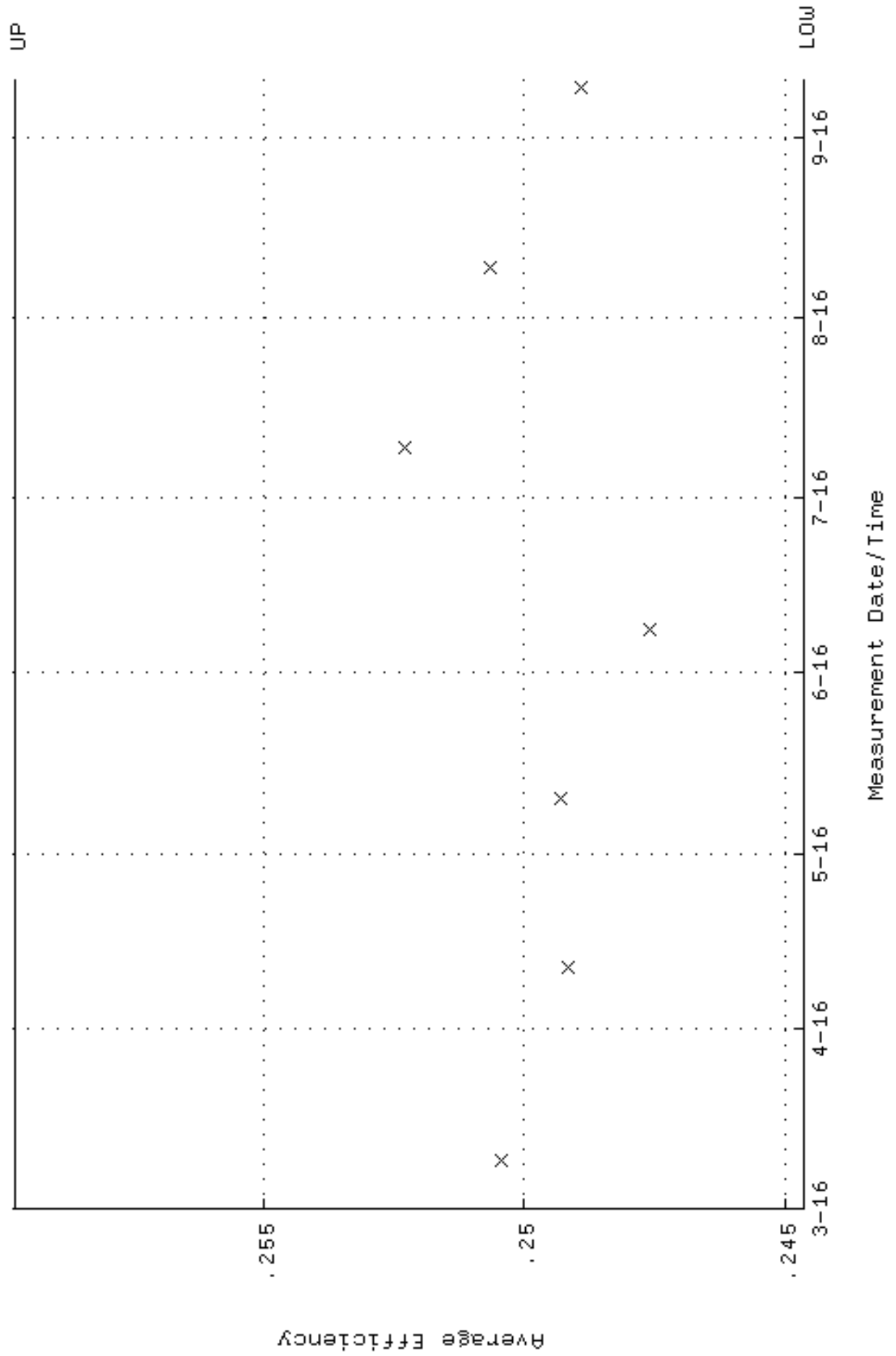
QA filename : DKA100:[ENV_ALPHA.QA.W]W134.QAF;6
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 7-JUL-2016 14:05:23 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



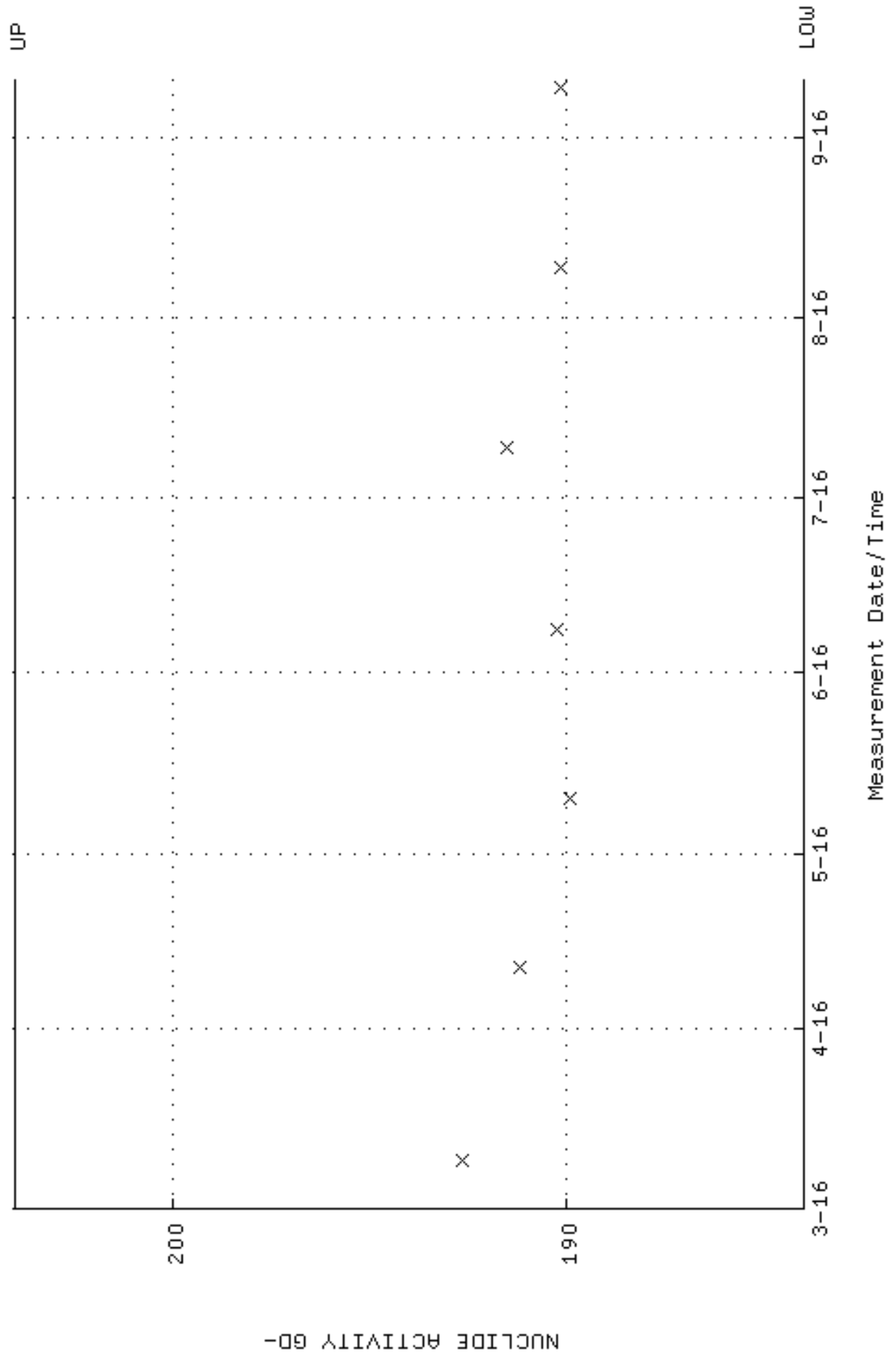
QA filename : DKA100:[ENV_ALPHA.QA.B]B134.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:43:47 through 9-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



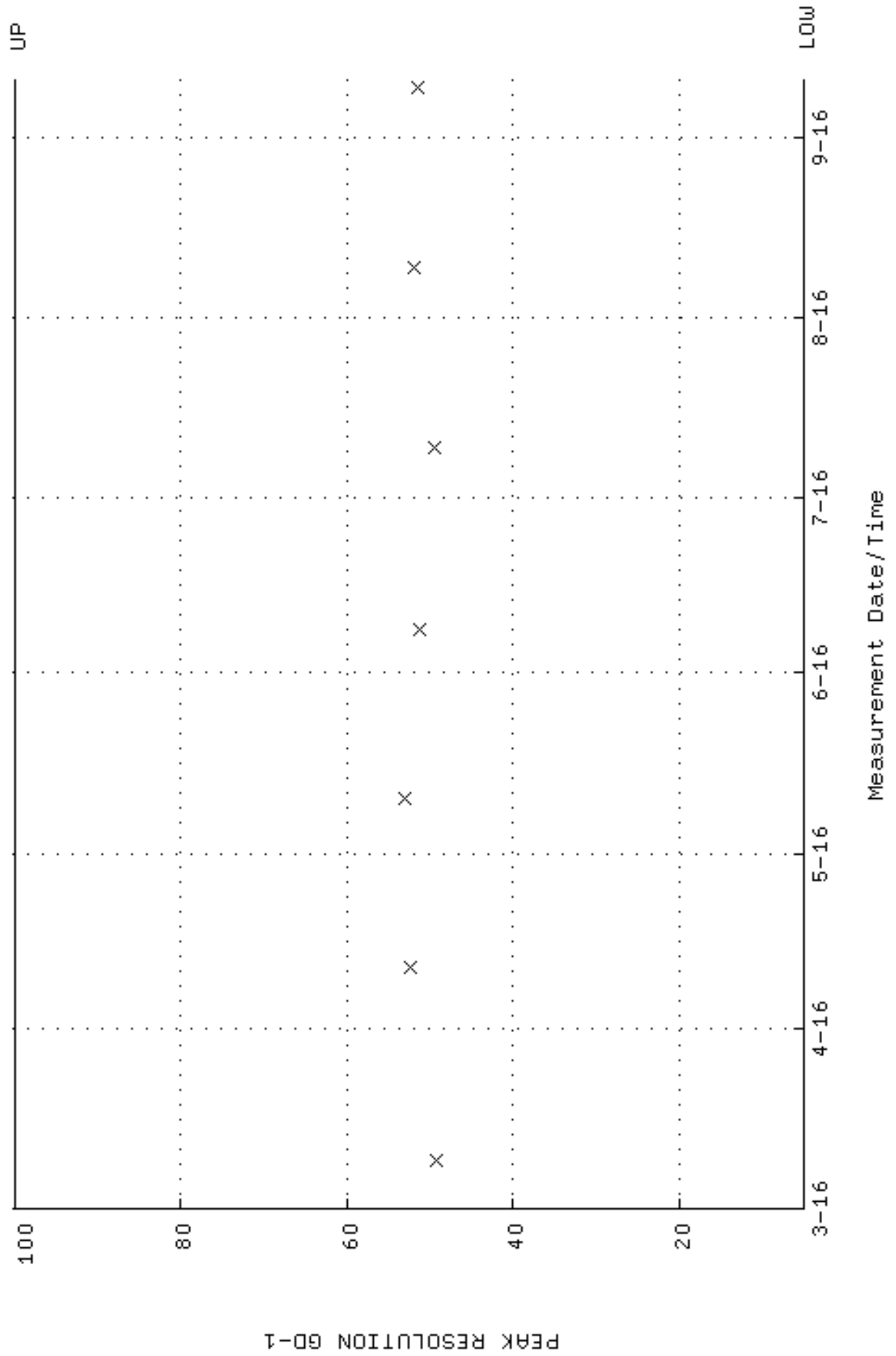
QA filename : DKA100:[ENV_ALPHA.QA.W]W139.QAF;6
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 9-MAR-2016 08:43:08 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.244640 through 0.259770



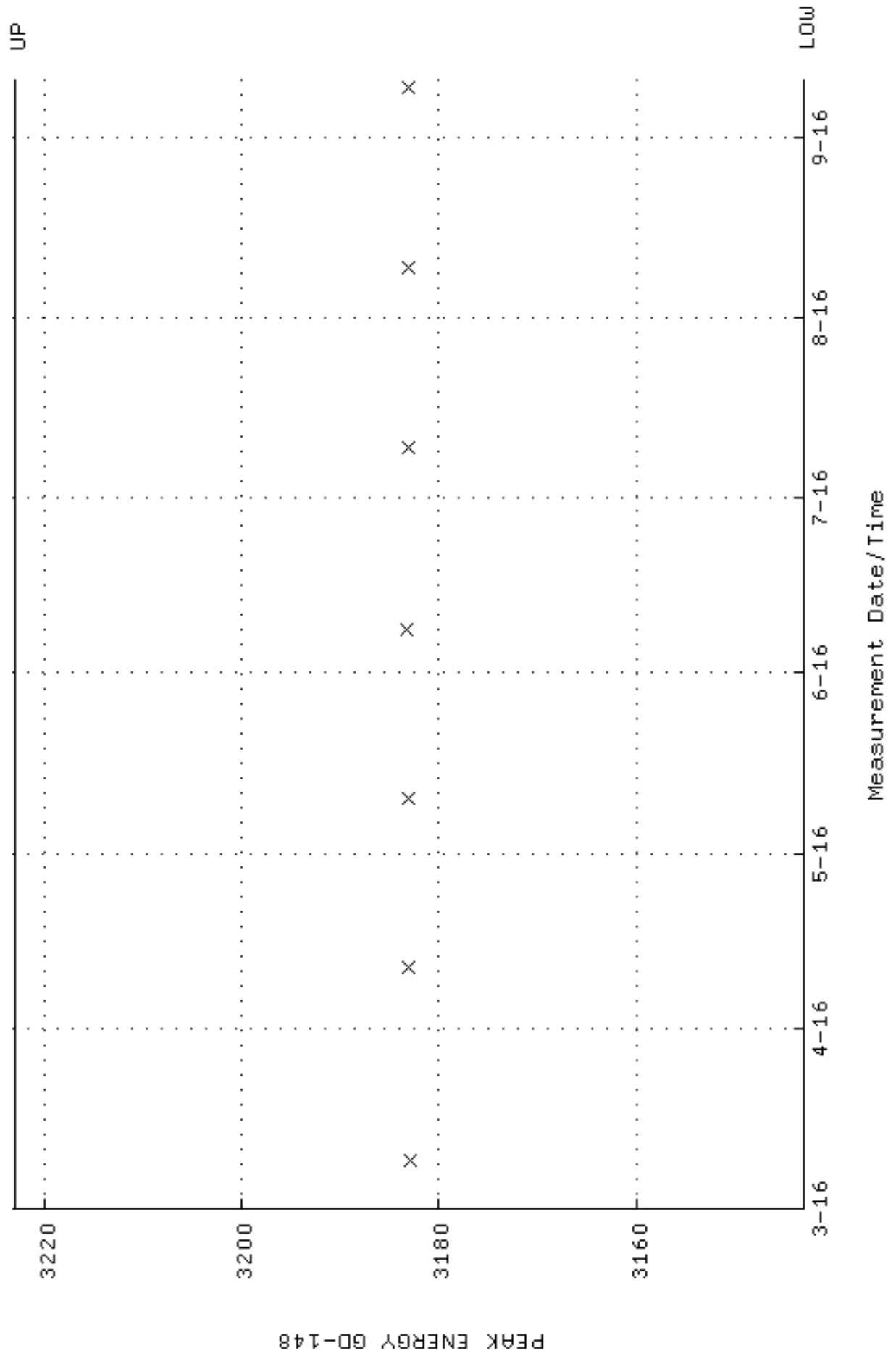
QA filename : DKA100:[ENV_ALPHA.QA.W]W139.QAF;6
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 9-MAR-2016 08:43:08 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



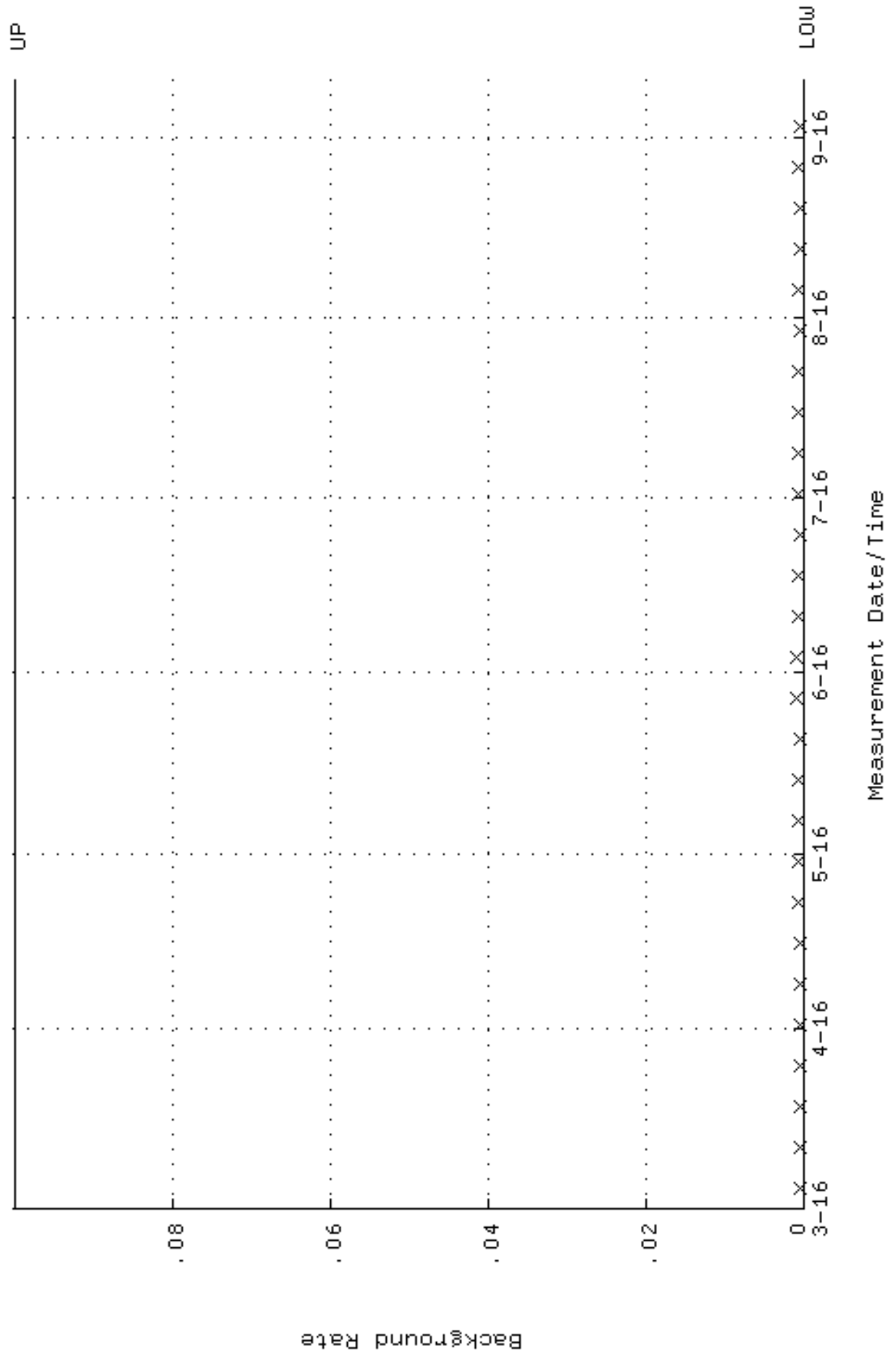
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Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 9-MAR-2016 08:43:08 through 10-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



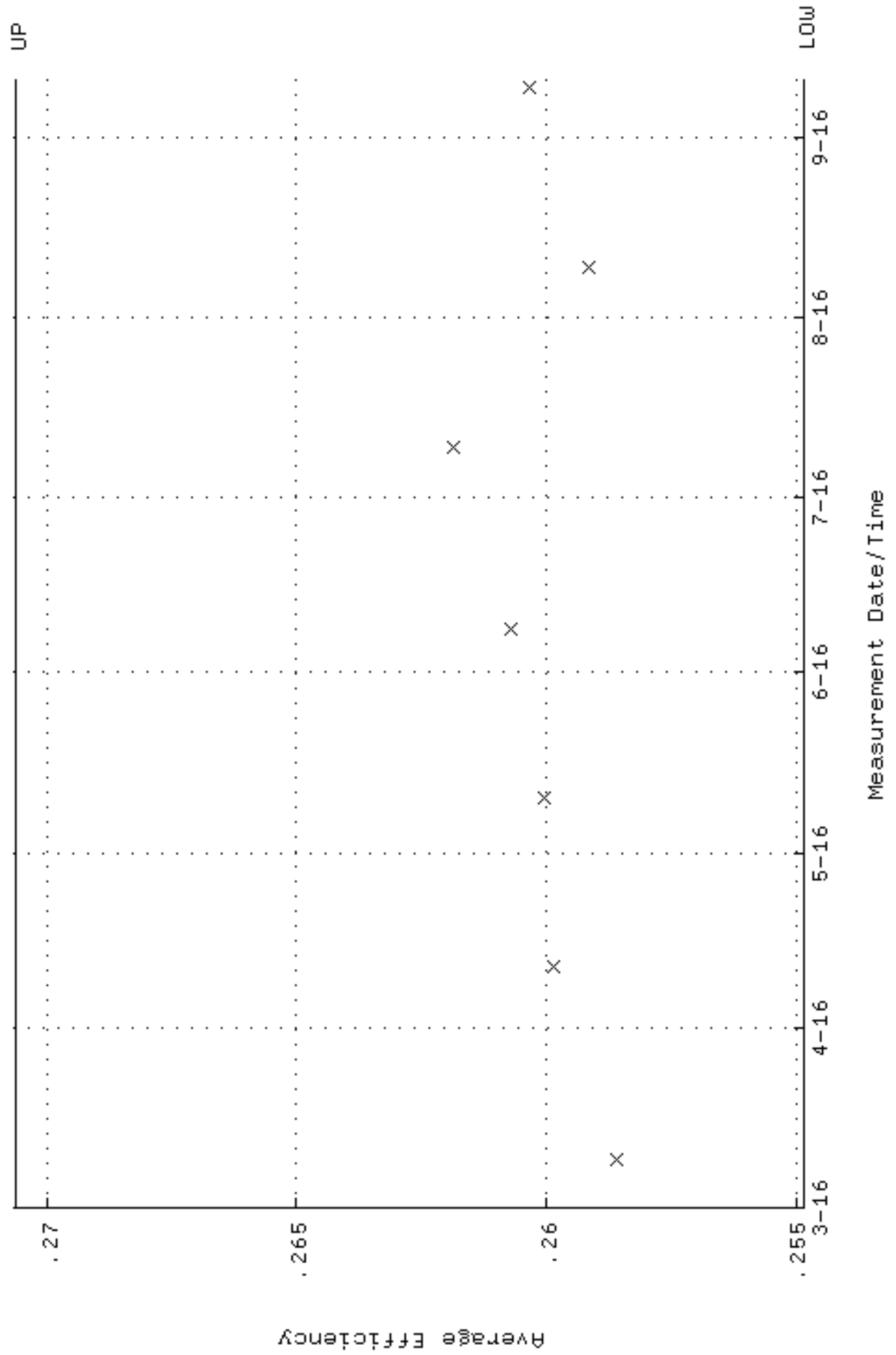
QA filename : DKA100:[ENV_ALPHA.QA.W]W139.QAF;6
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 9-MAR-2016 08:43:08 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



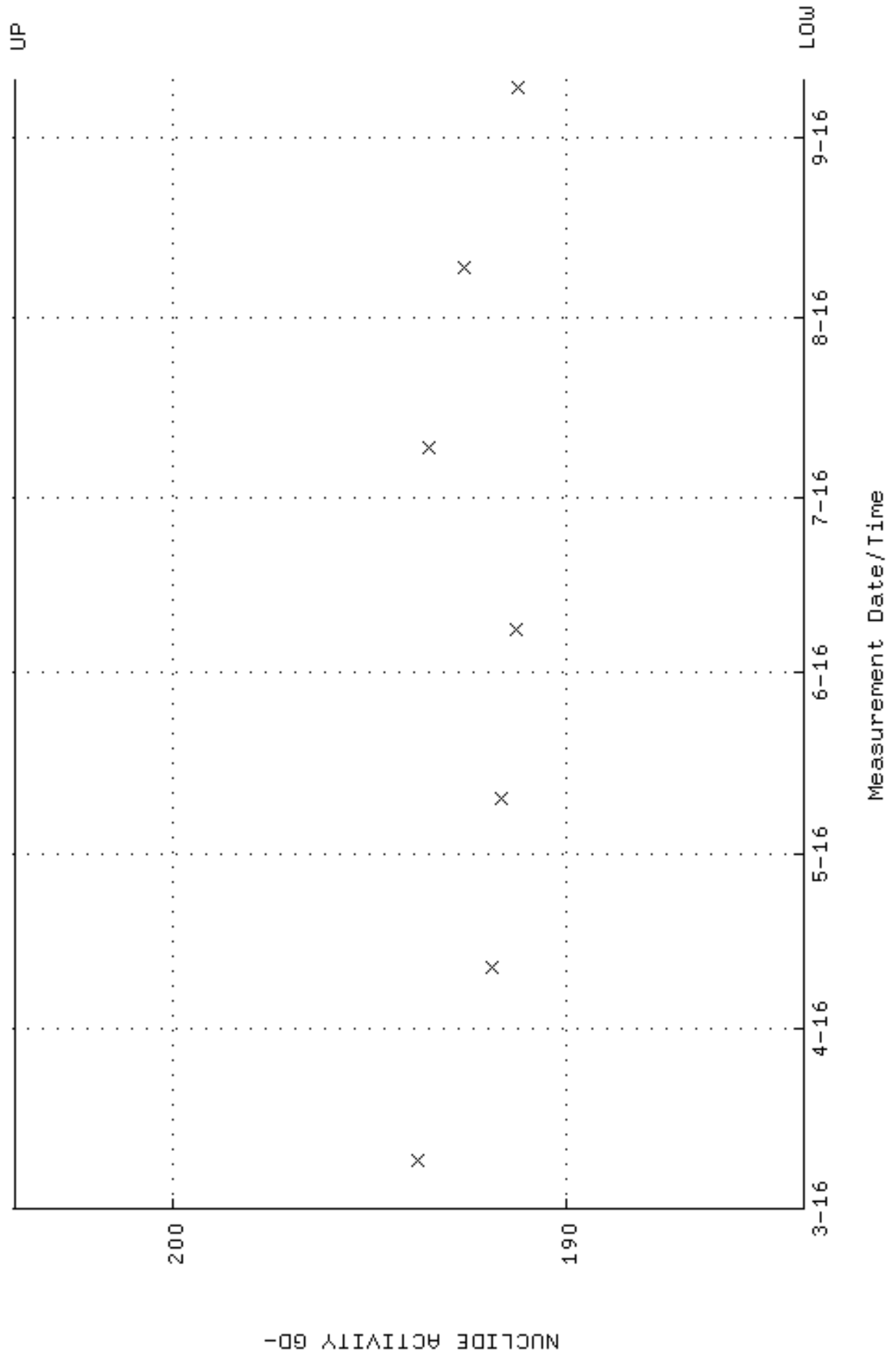
QA filename : DKA100:[ENV_ALPHA.QA.B]B139.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:35:59 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



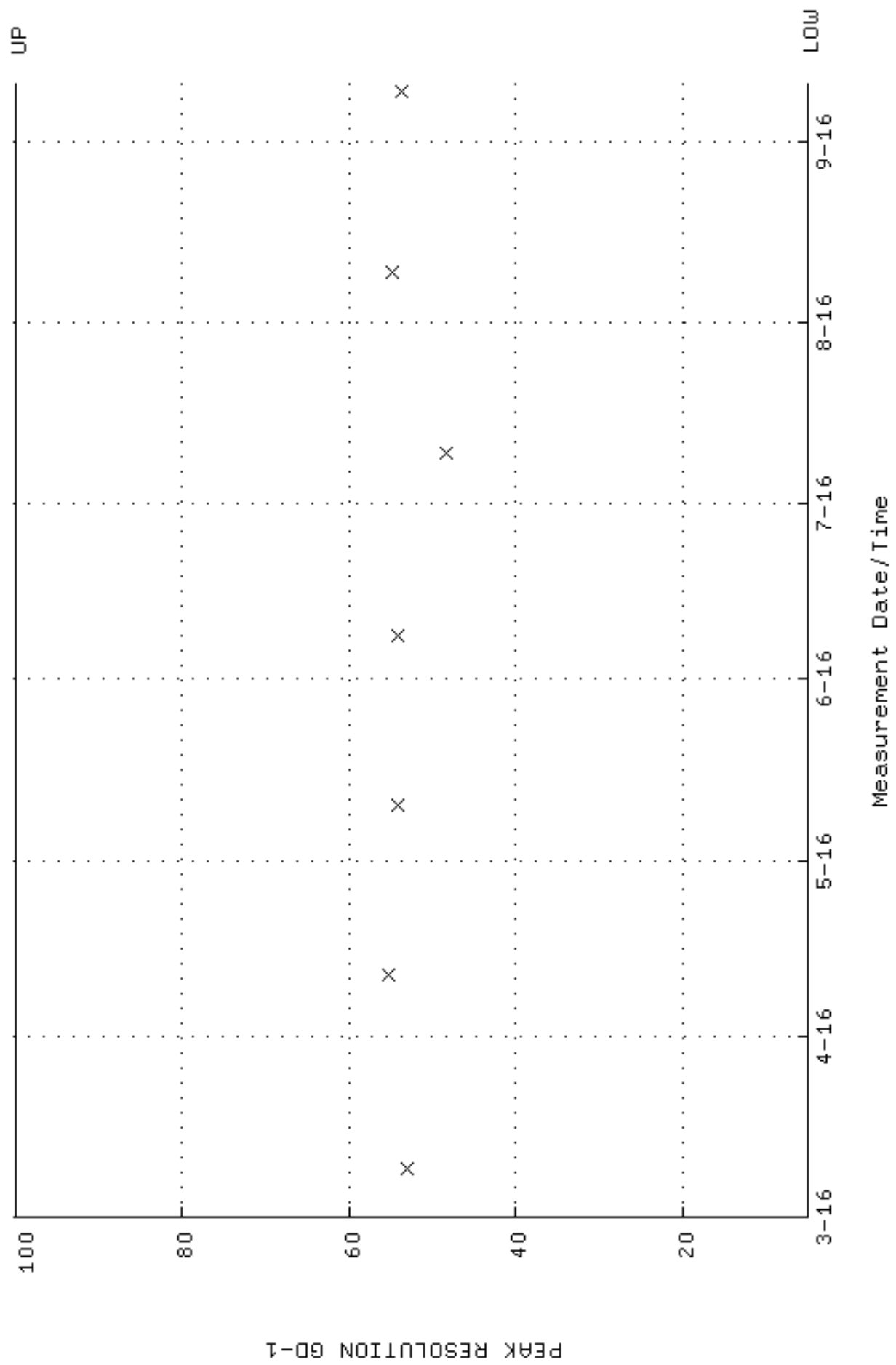
QA filename : DKA100:[ENV_ALPHA.QA.W]W140.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 9-MAR-2016 08:43:14 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.254850 through 0.270613



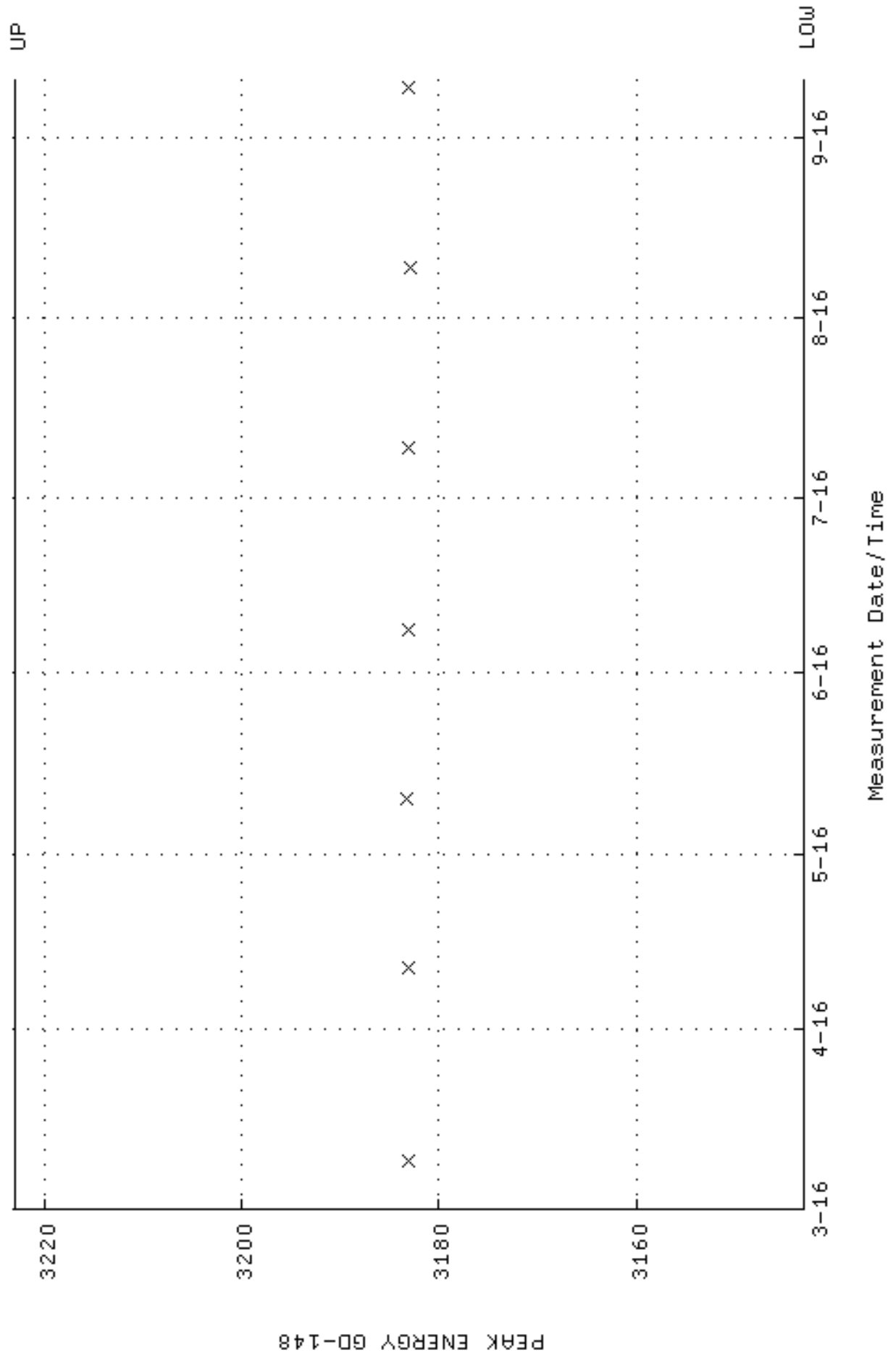
QA filename : DKA100:[ENV_ALPHA.QA.W]W140.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 9-MAR-2016 08:43:14 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



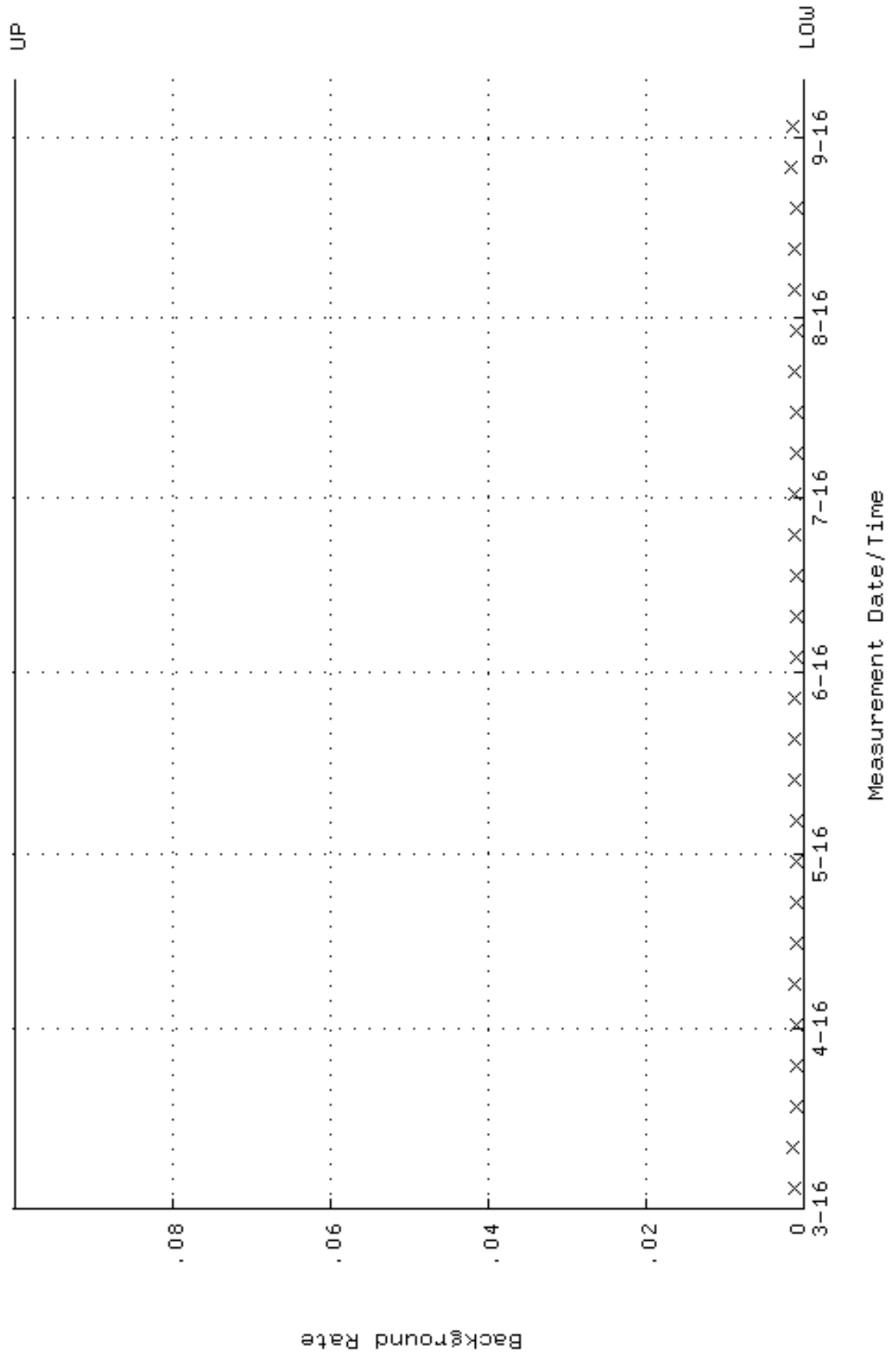
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 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 9-MAR-2016 08:43:14 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



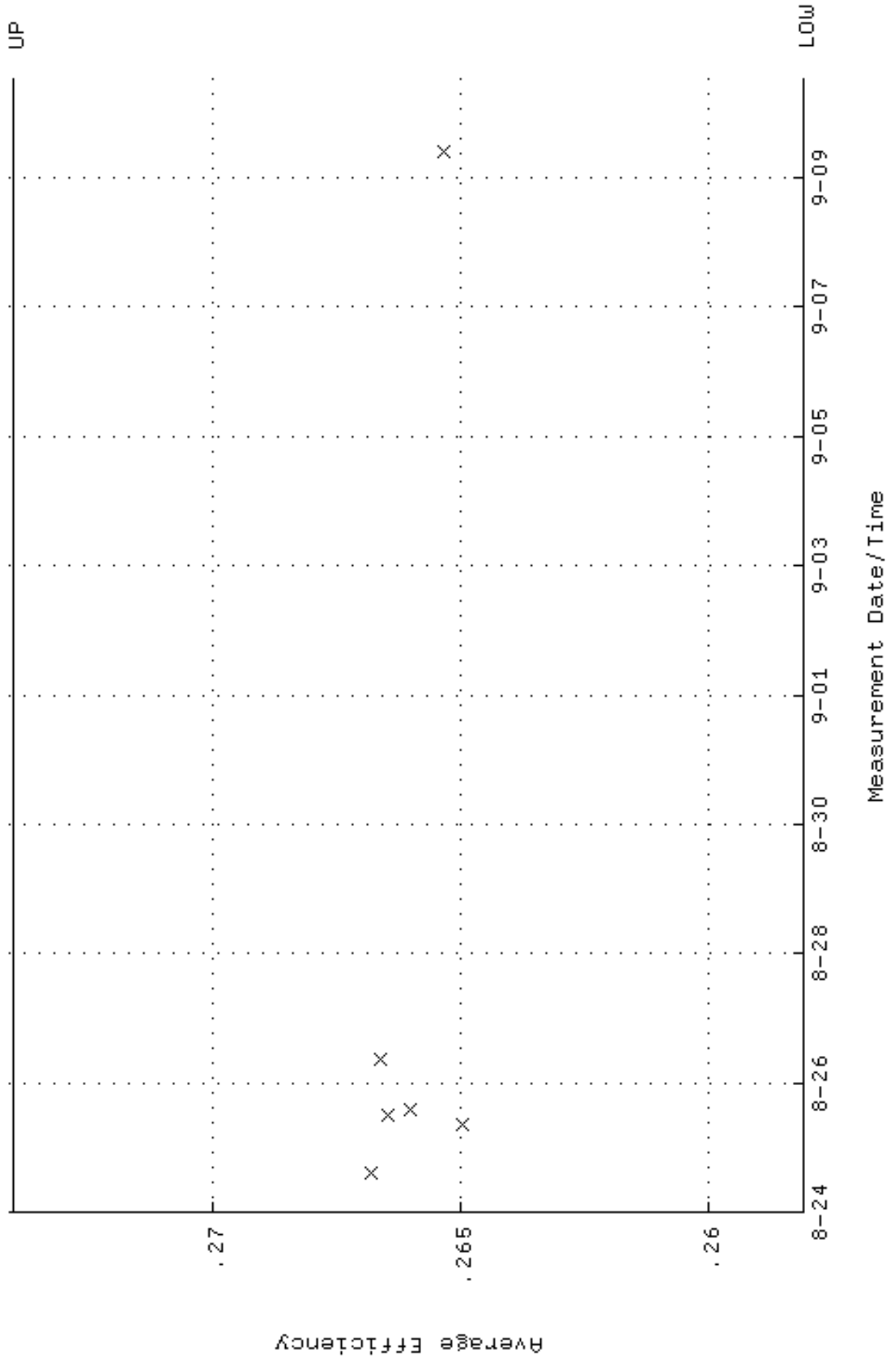
QA filename : DKA100:[ENV_ALPHA.QA.W]W140.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 9-MAR-2016 08:43:14 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



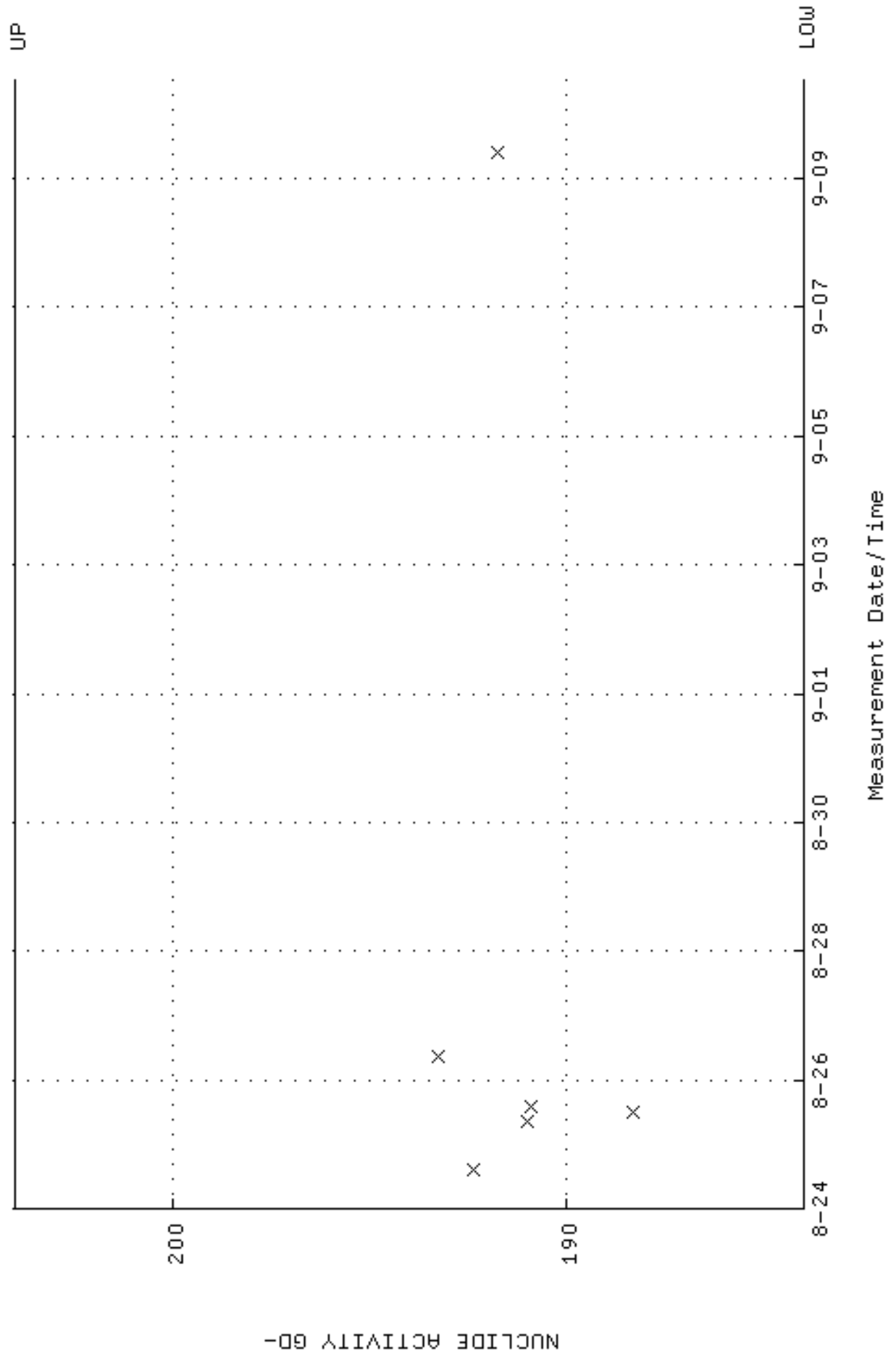
QA filename : DKA100:[ENV_ALPHA.QA.B]B140.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:36:04 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



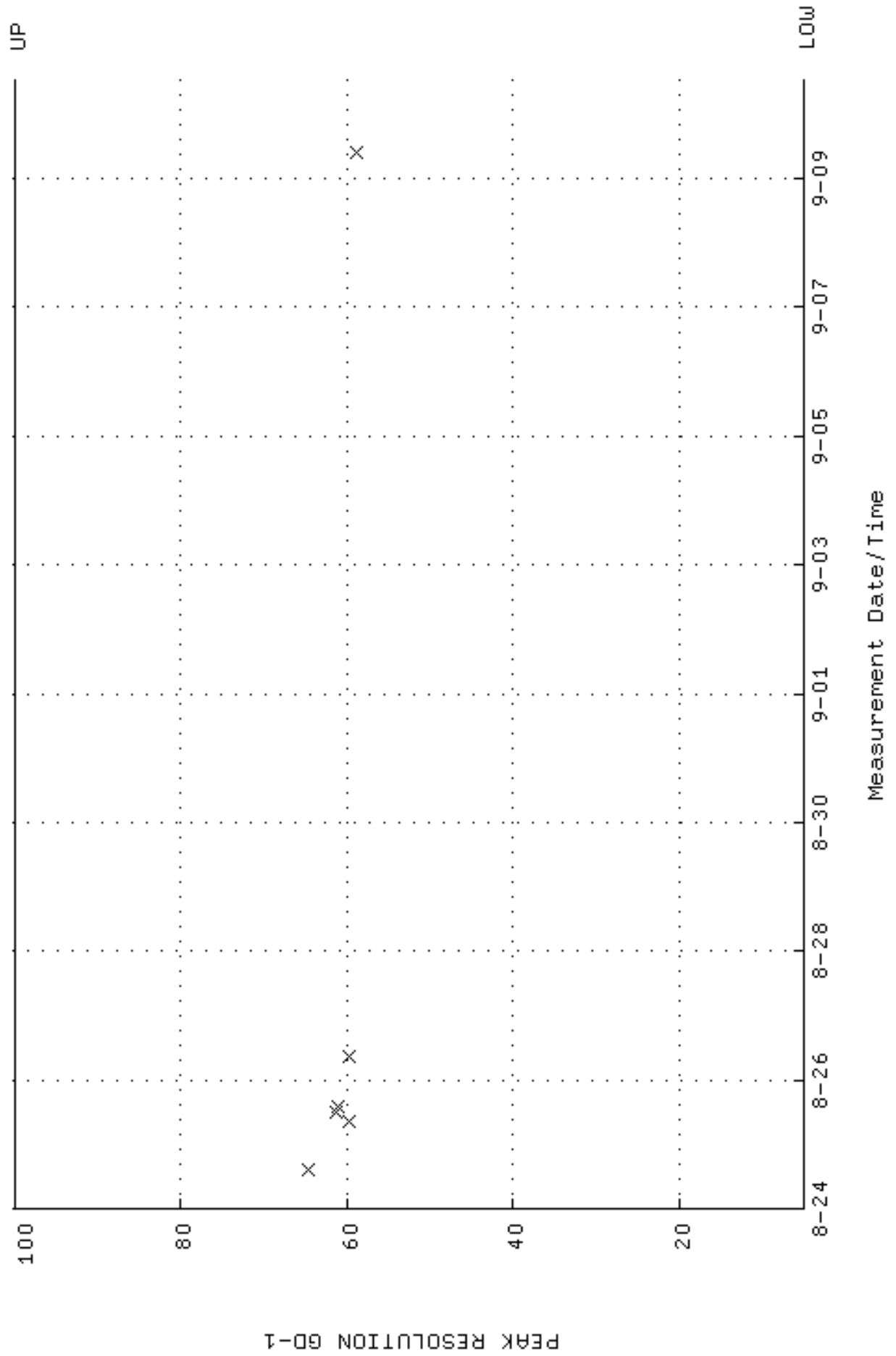
QA filename : DKA100:[ENV_ALPHA.QA.W]W142.QAF;5
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 24-AUG-2016 14:10:42 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.258101 through 0.274067



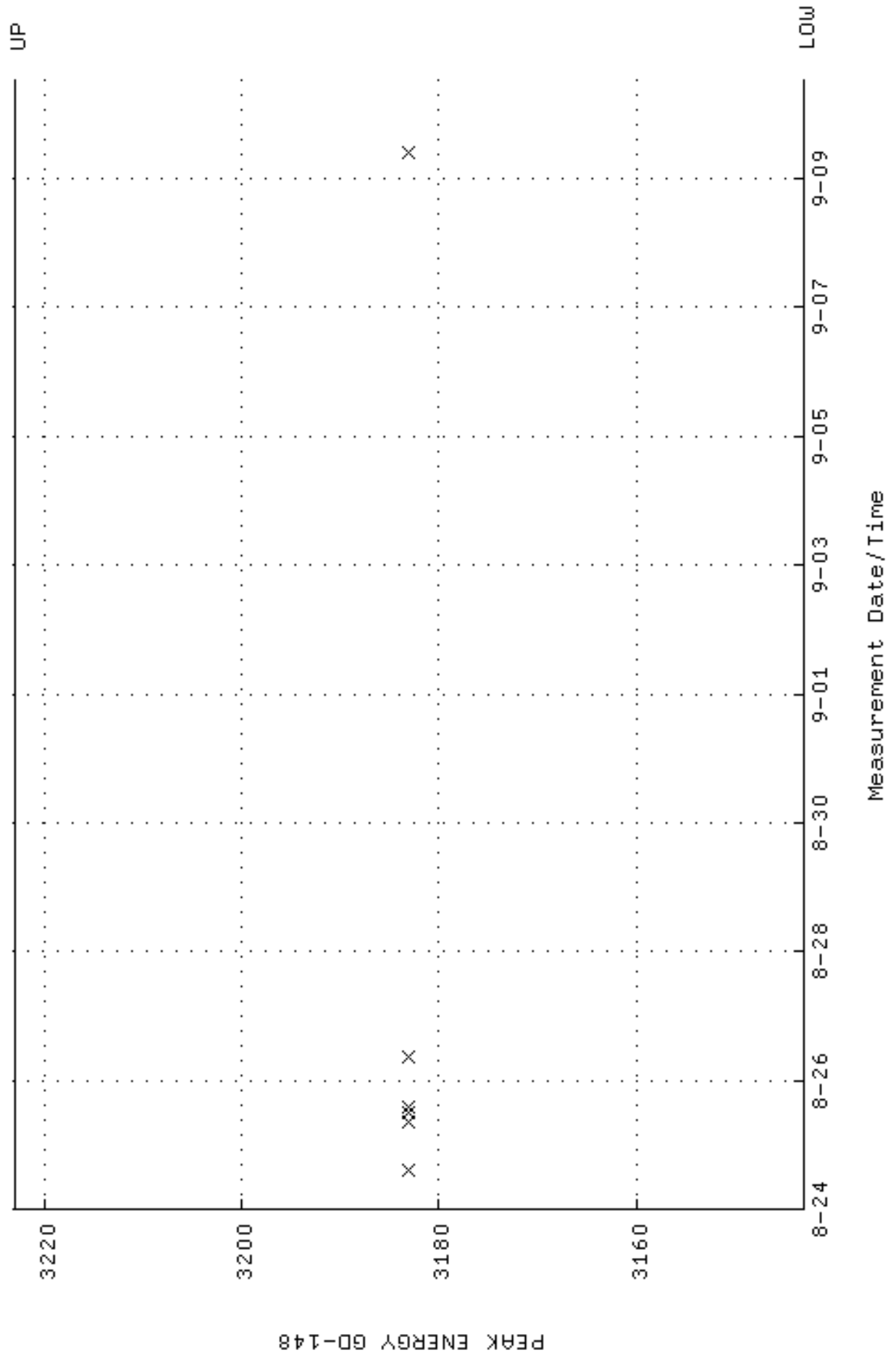
QA filename : DKA100:[ENV_ALPHA.QA.W]W142.QAF;5
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 24-AUG-2016 14:10:42 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



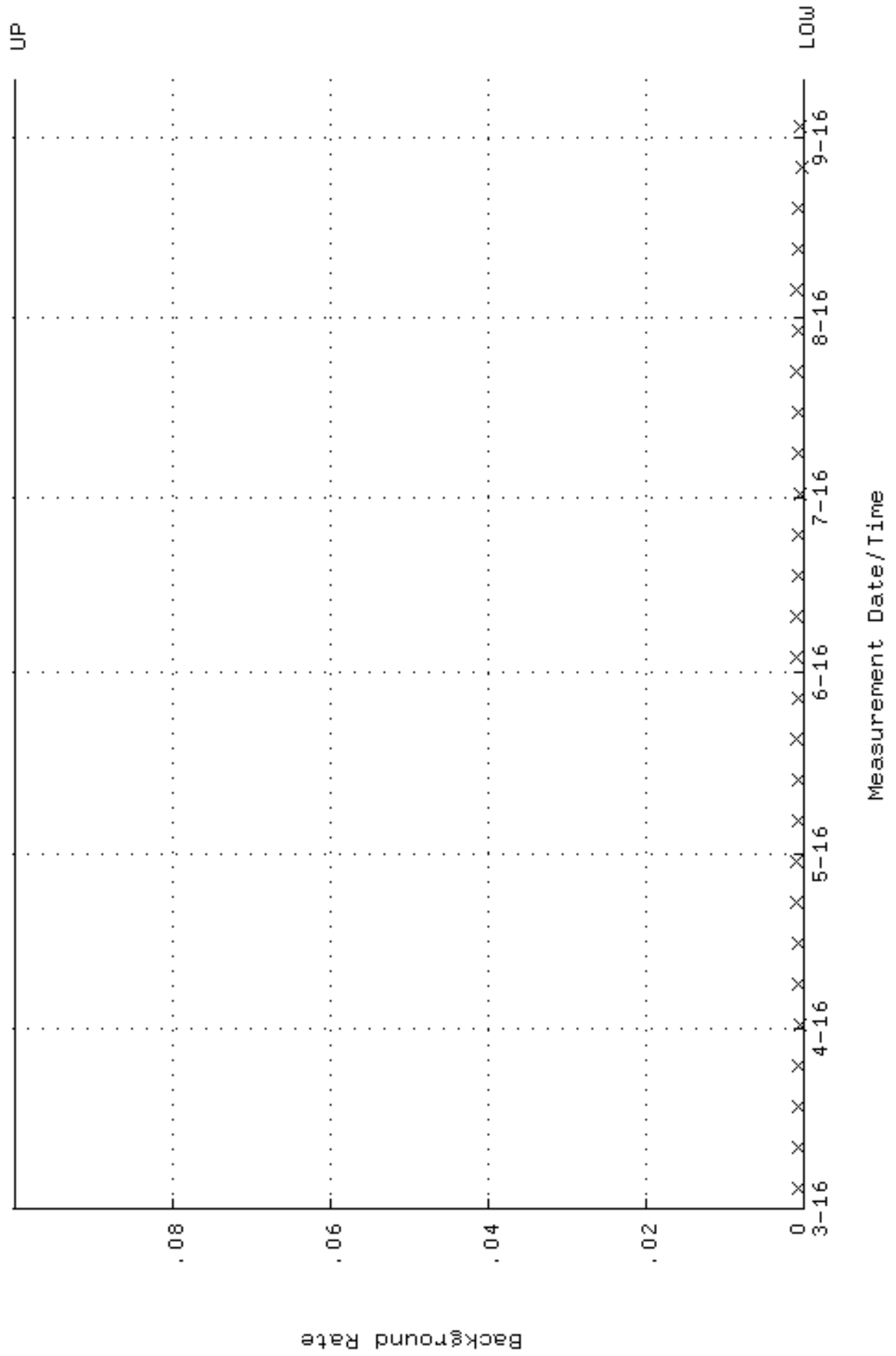
QA filename : DKA100:[ENV_ALPHA.QA.W]W142.QAF;5
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 24-AUG-2016 14:10:42 through 10-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



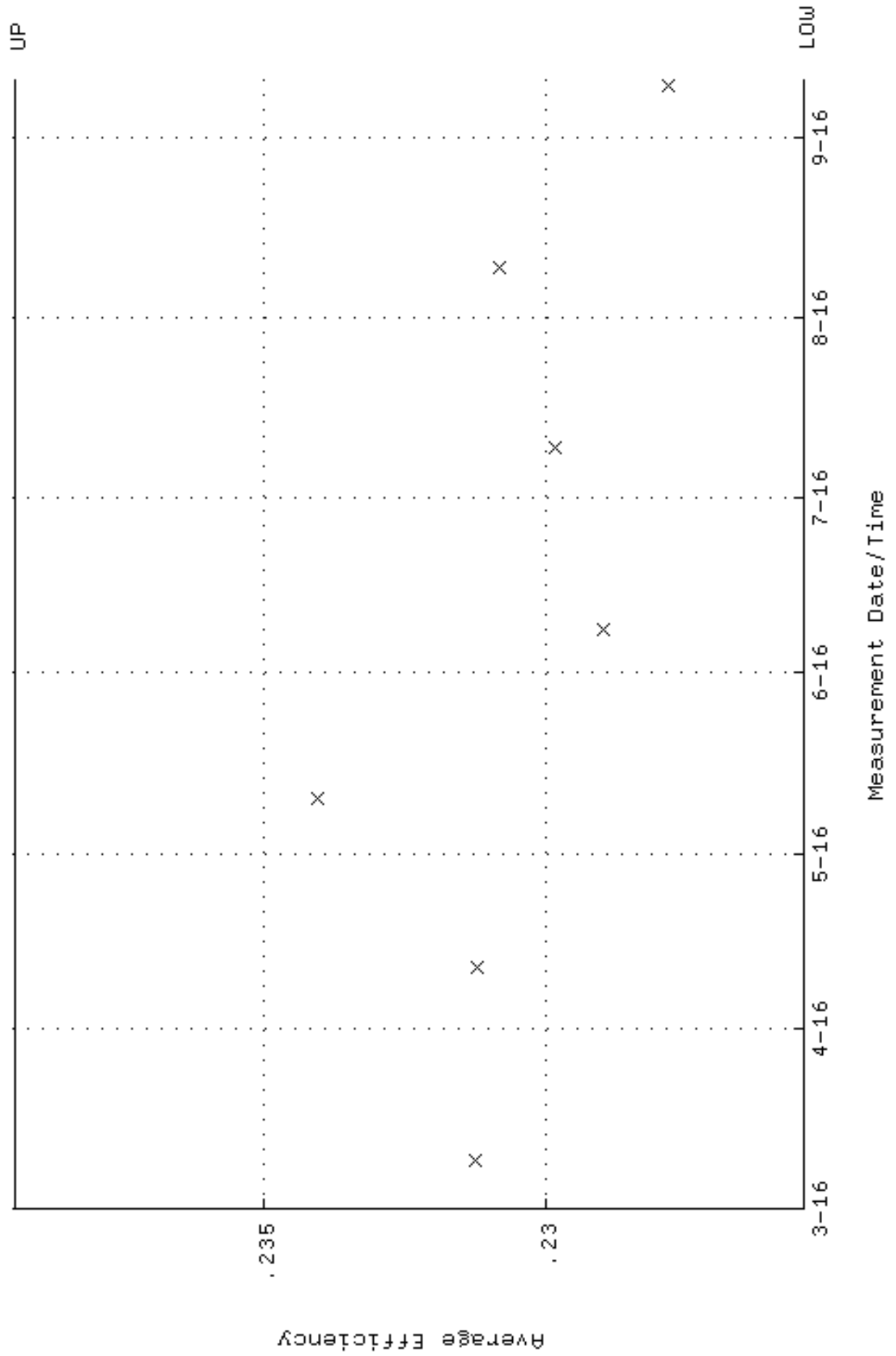
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 24-AUG-2016 14:10:42 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



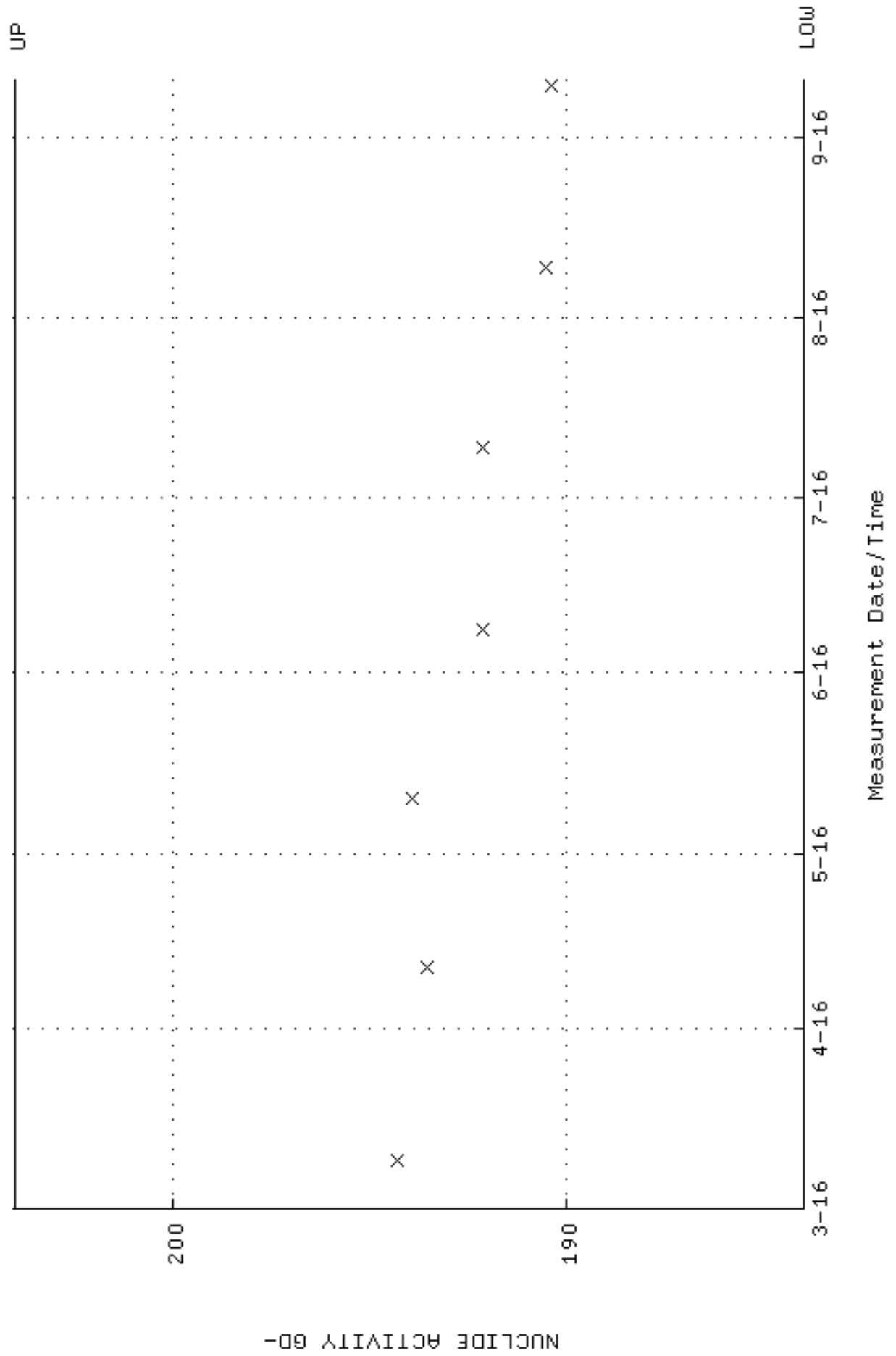
QA filename : DKA100:[ENV_ALPHA.QA.B]B142.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:36:13 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



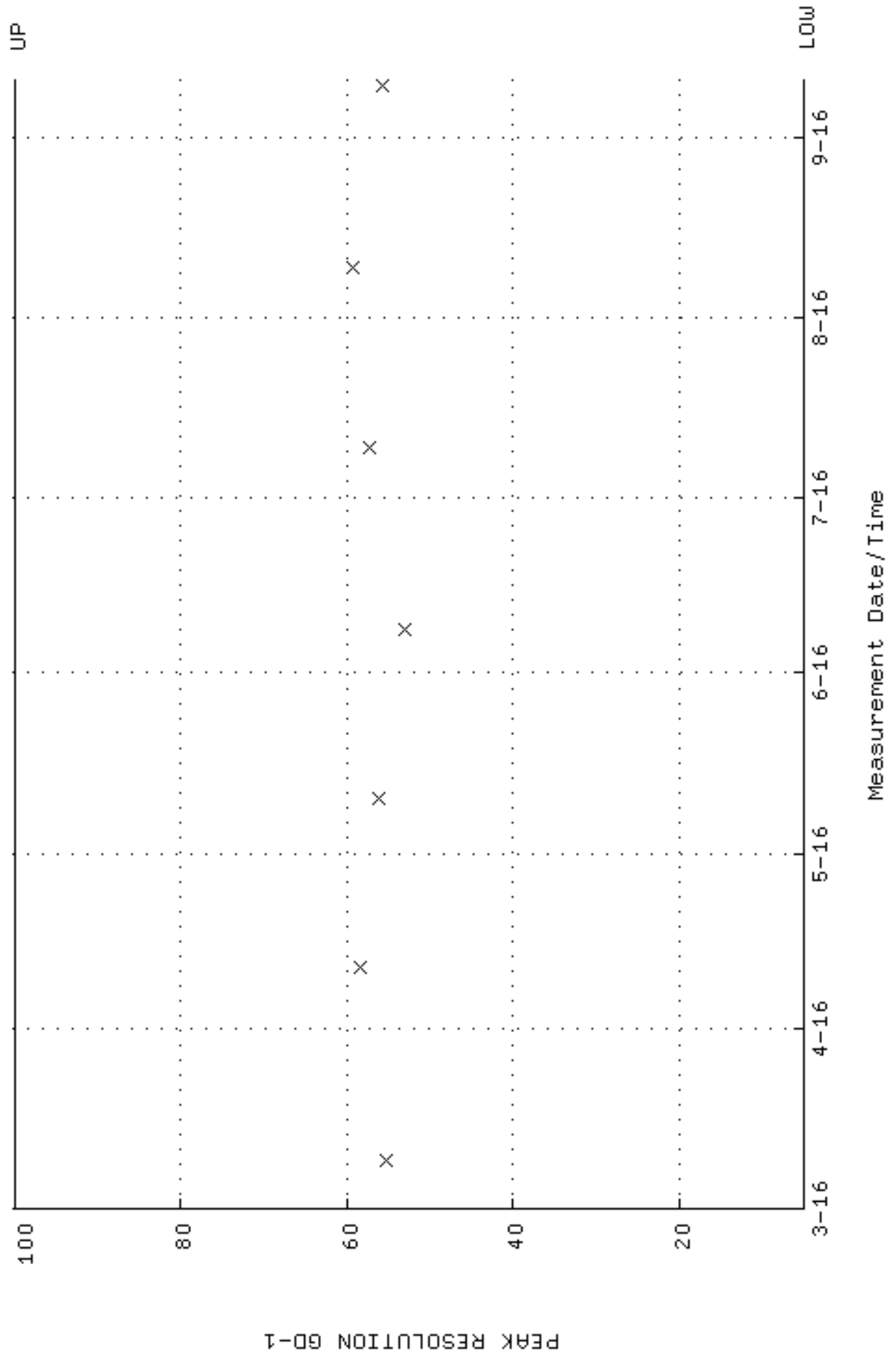
QA filename : DKA100:[ENV_ALPHA.QA.W]W143.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 9-MAR-2016 08:43:32 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.225440 through 0.239384



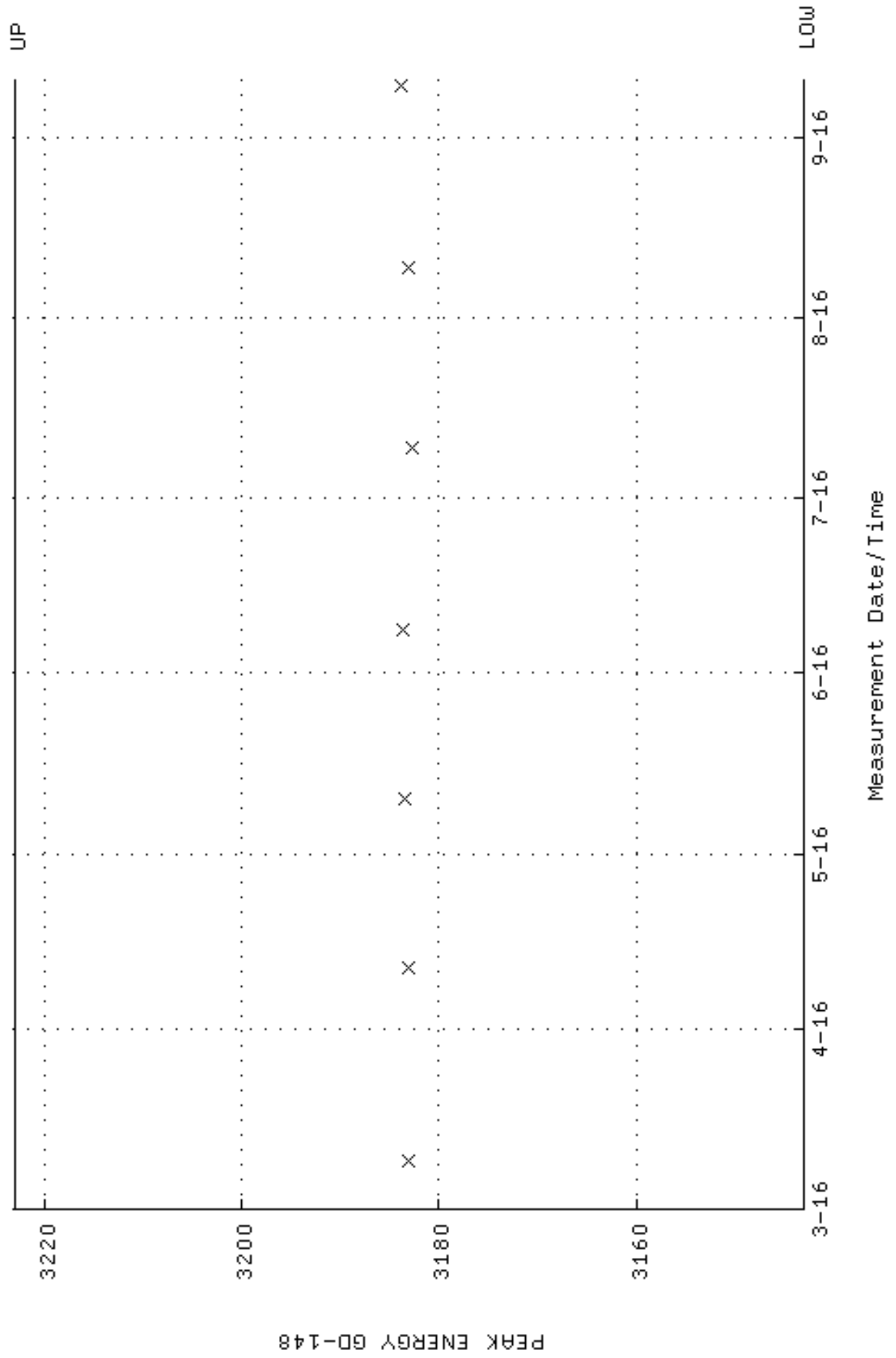
QA filename : DKA100:[ENV_ALPHA.QA.W]W143.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 9-MAR-2016 08:43:32 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



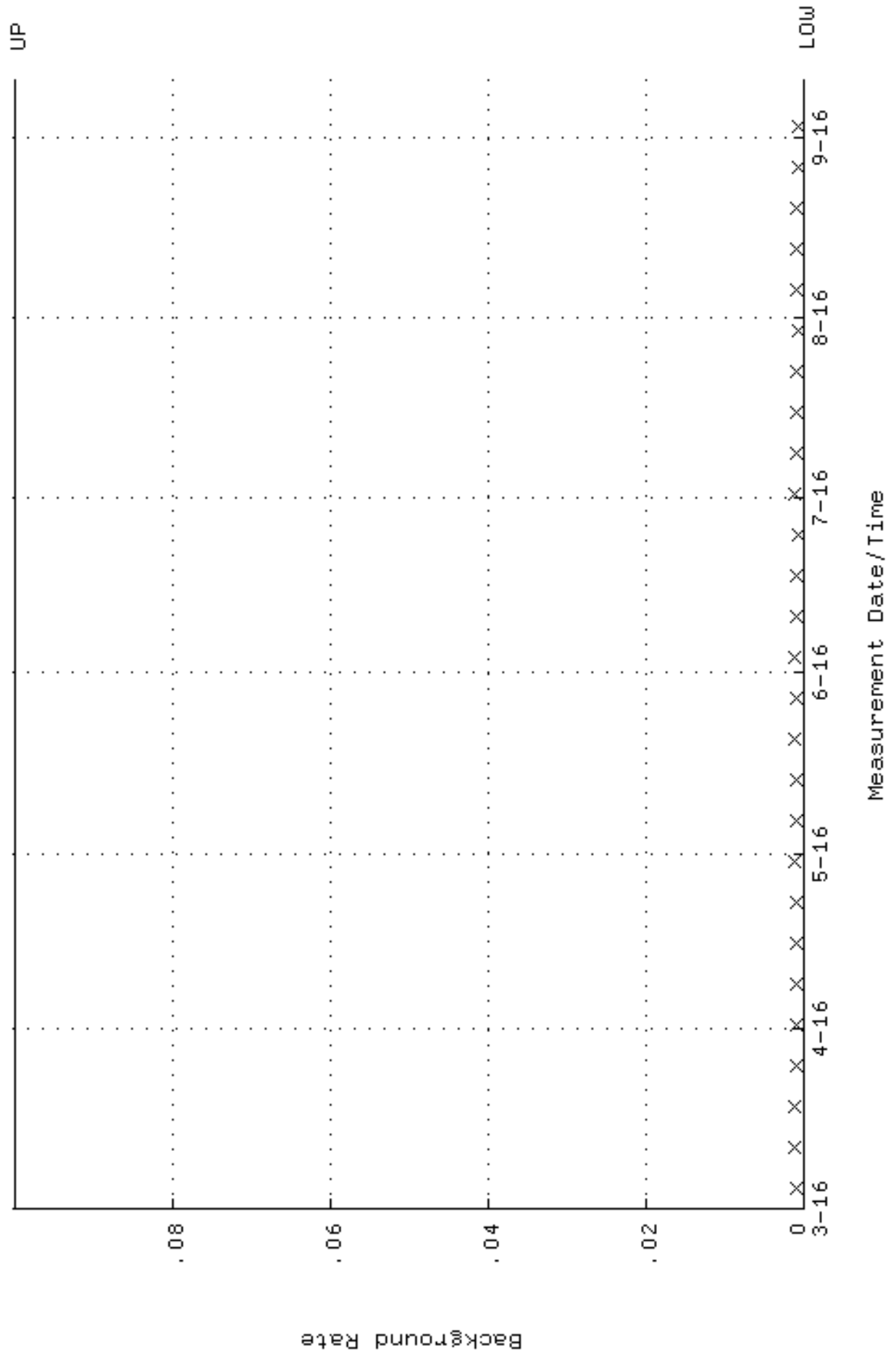
QA filename : DKA100:[ENV_ALPHA.QA.W]W143.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 9-MAR-2016 08:43:32 through 10-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



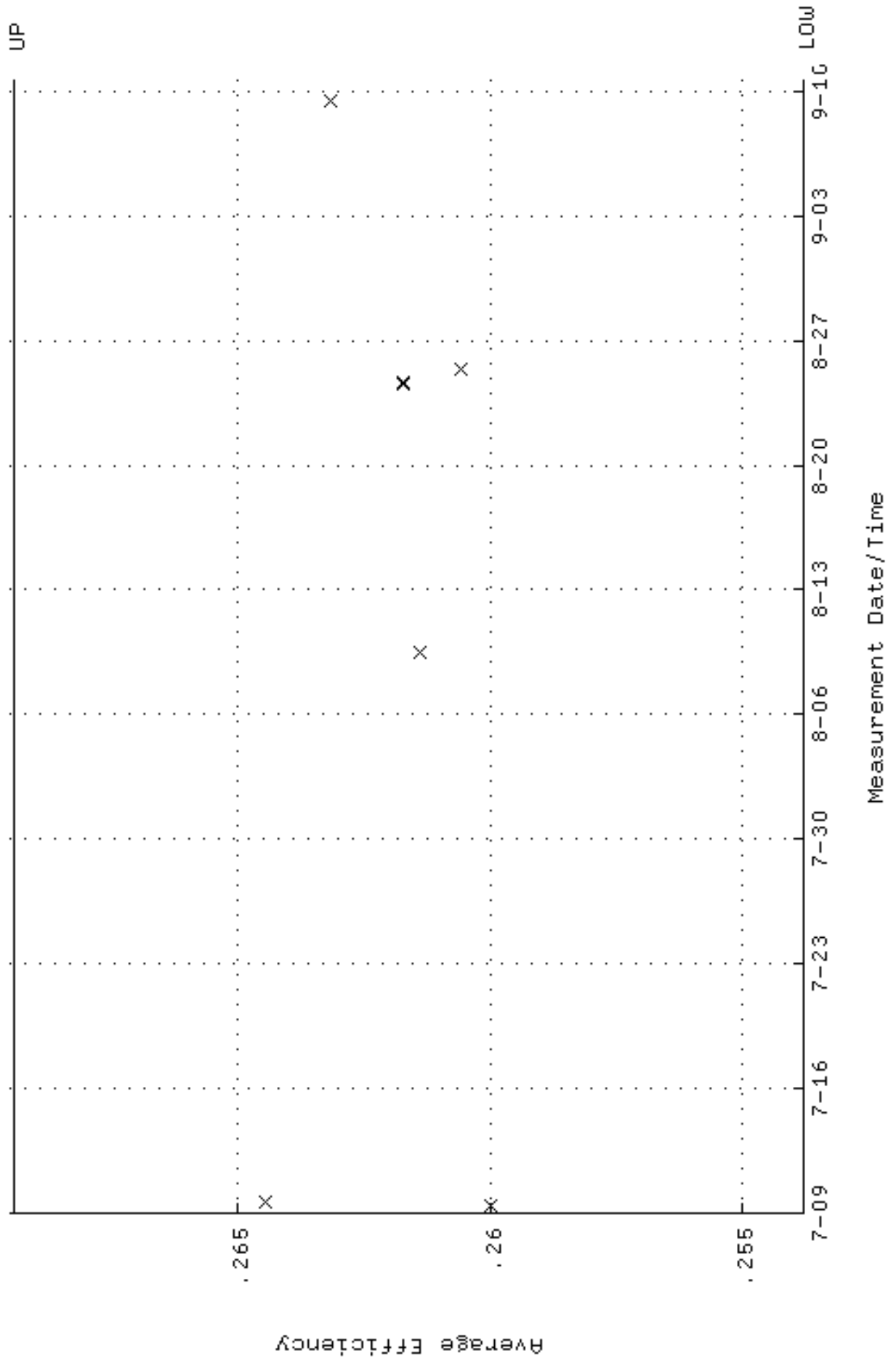
QA filename : DKA100:[ENV_ALPHA.QA.W]W143.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 9-MAR-2016 08:43:32 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



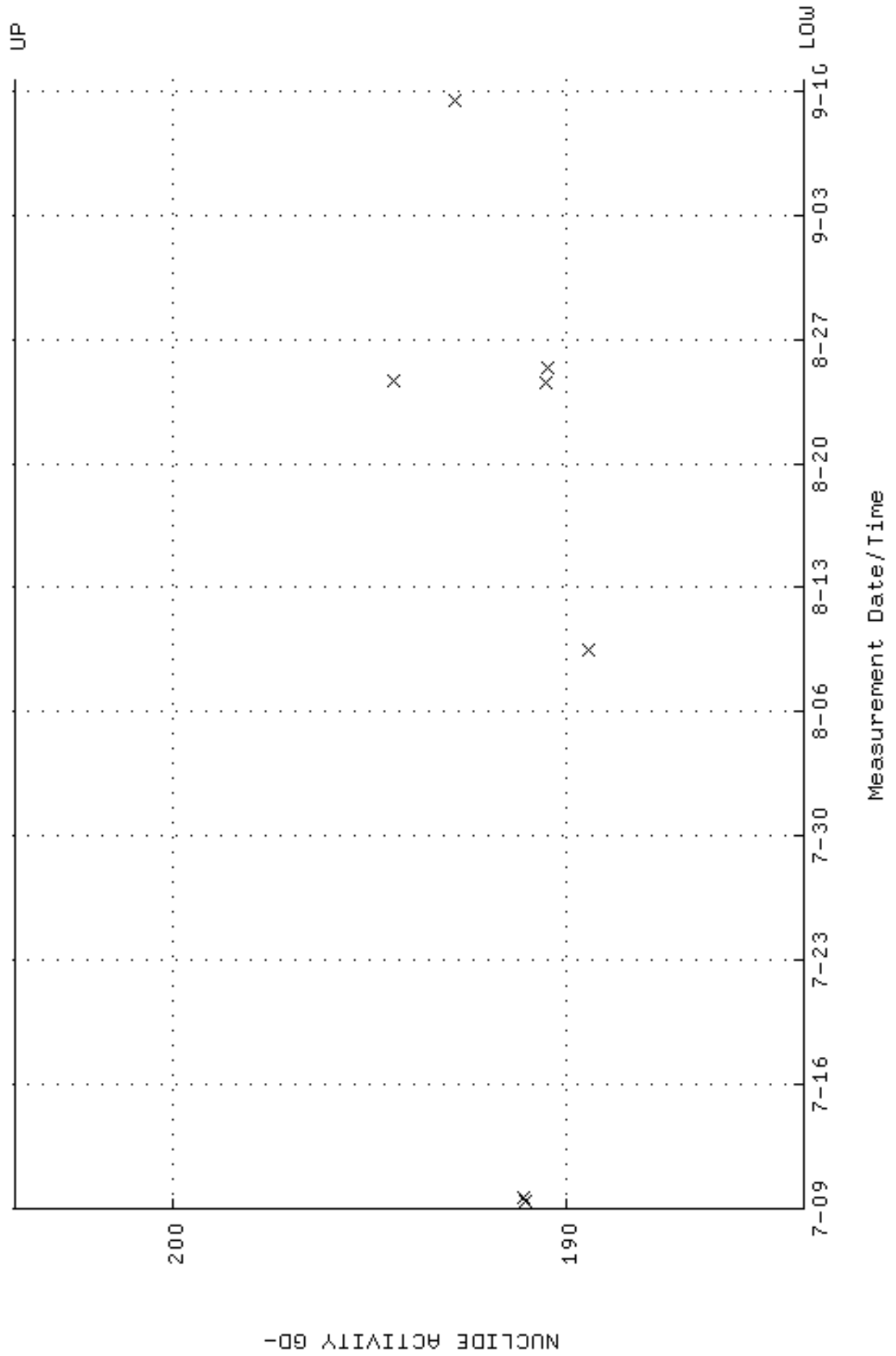
QA filename : DKA100:[ENV_ALPHA.QA.B]B143.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:36:17 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



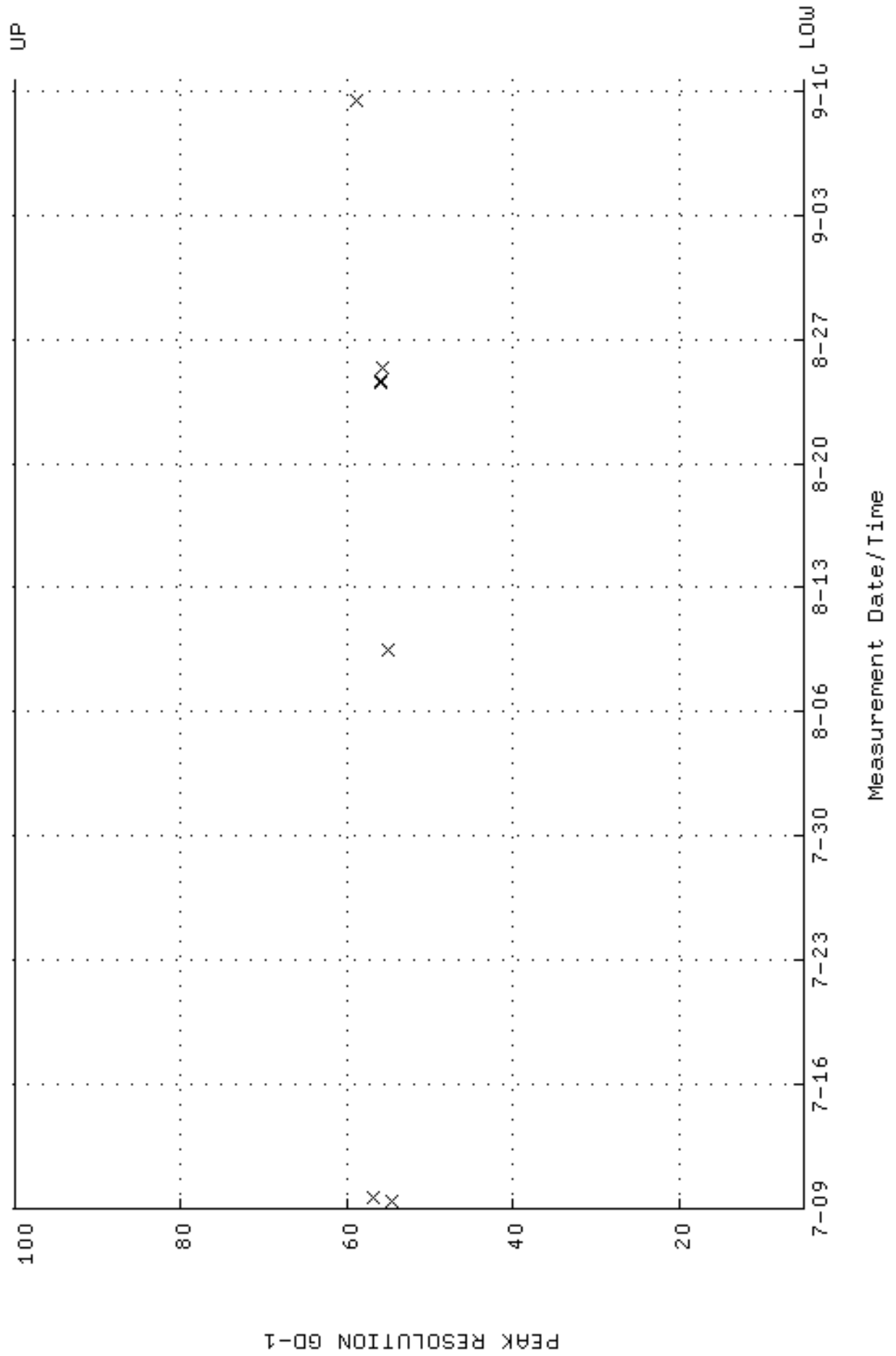
QA filename : DKA100:[ENV_ALPHA.QA.W]W144.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 9-JUL-2016 09:35:58 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.253789 through 0.269487



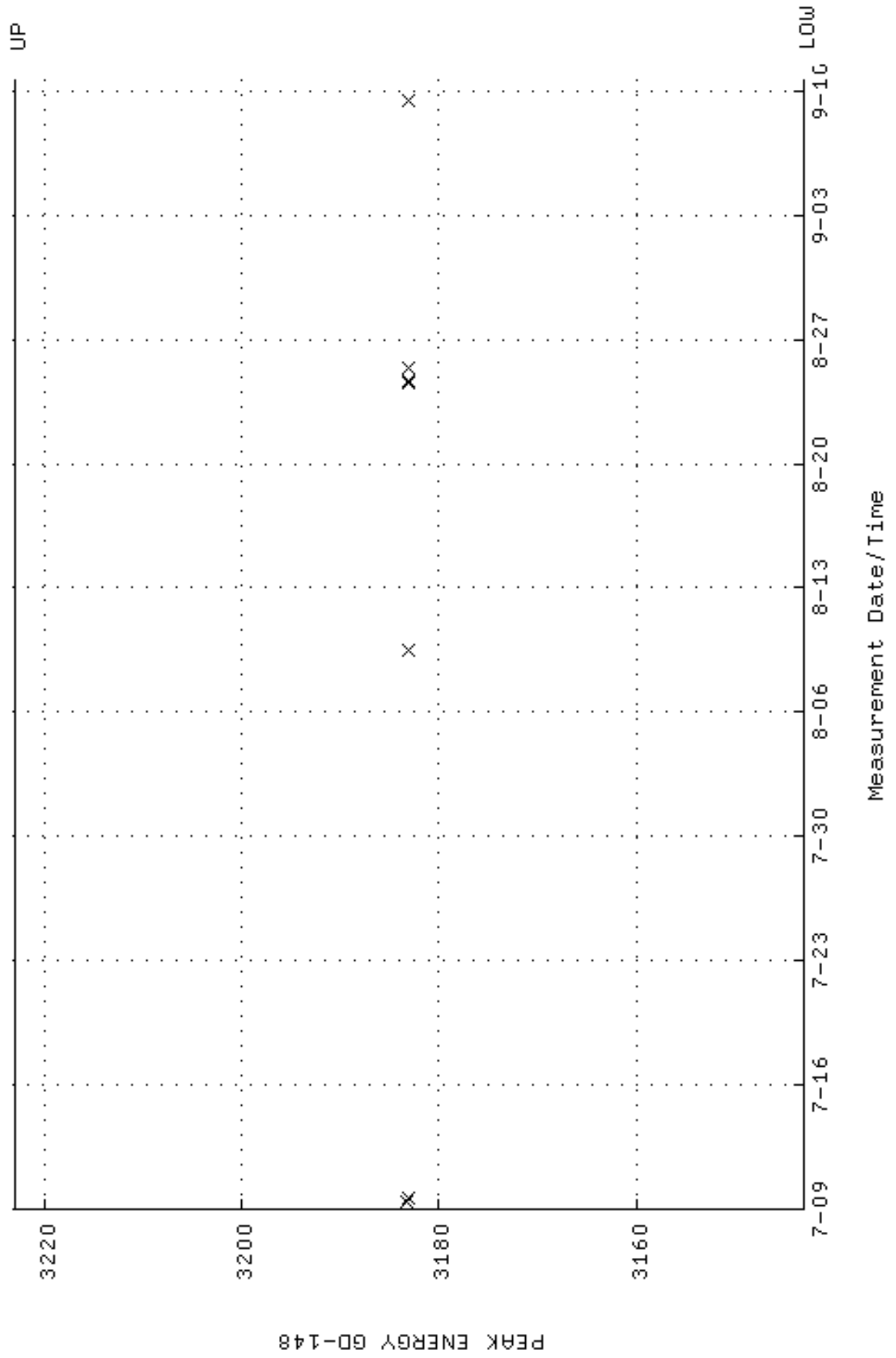
QA filename : DKA100:[ENV_ALPHA.QA.W]W144.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 9-JUL-2016 09:35:58 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



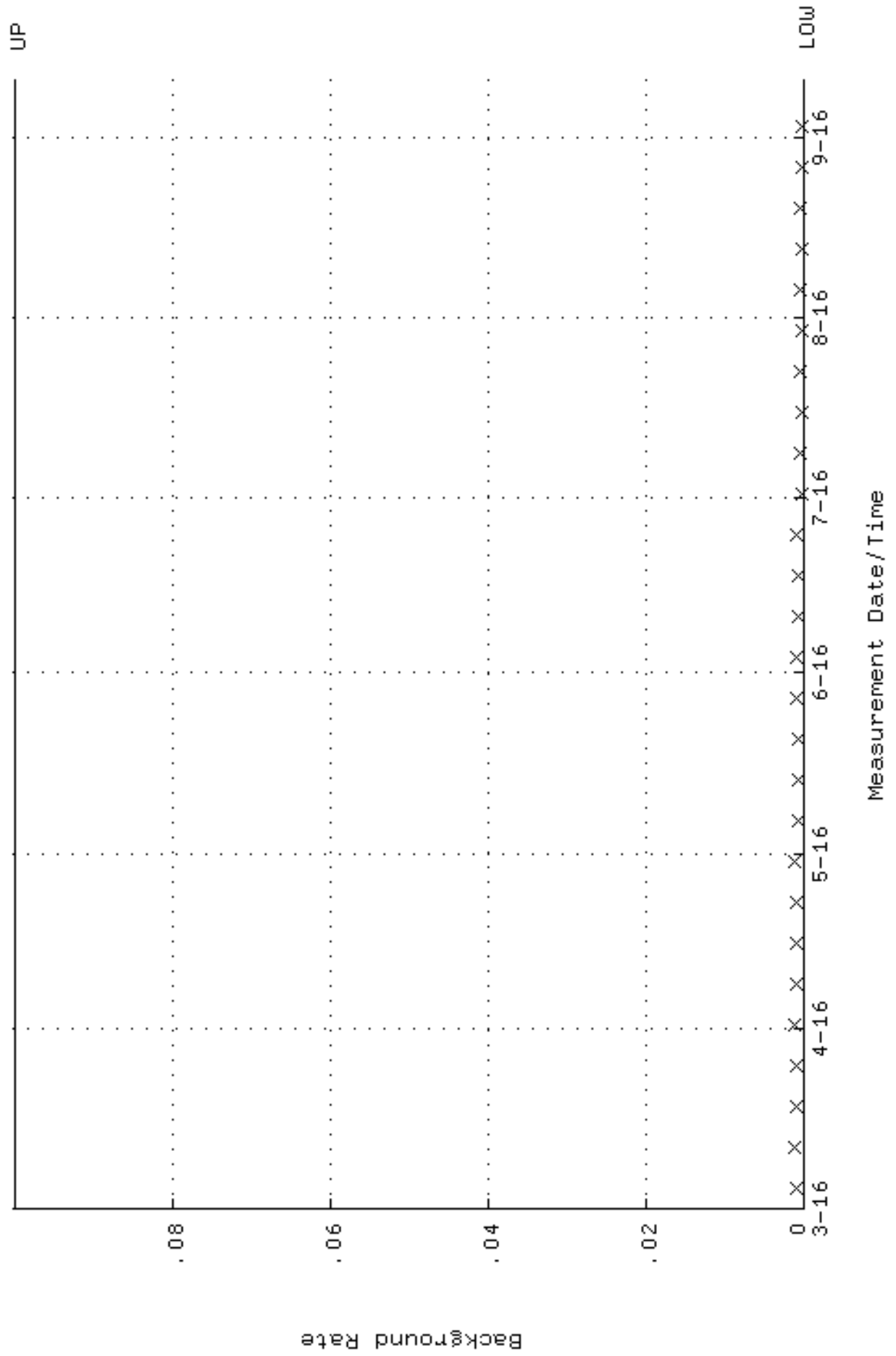
QA filename : DKA100:[ENV_ALPHA.QA.W]W144.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 9-JUL-2016 09:35:58 through 10-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



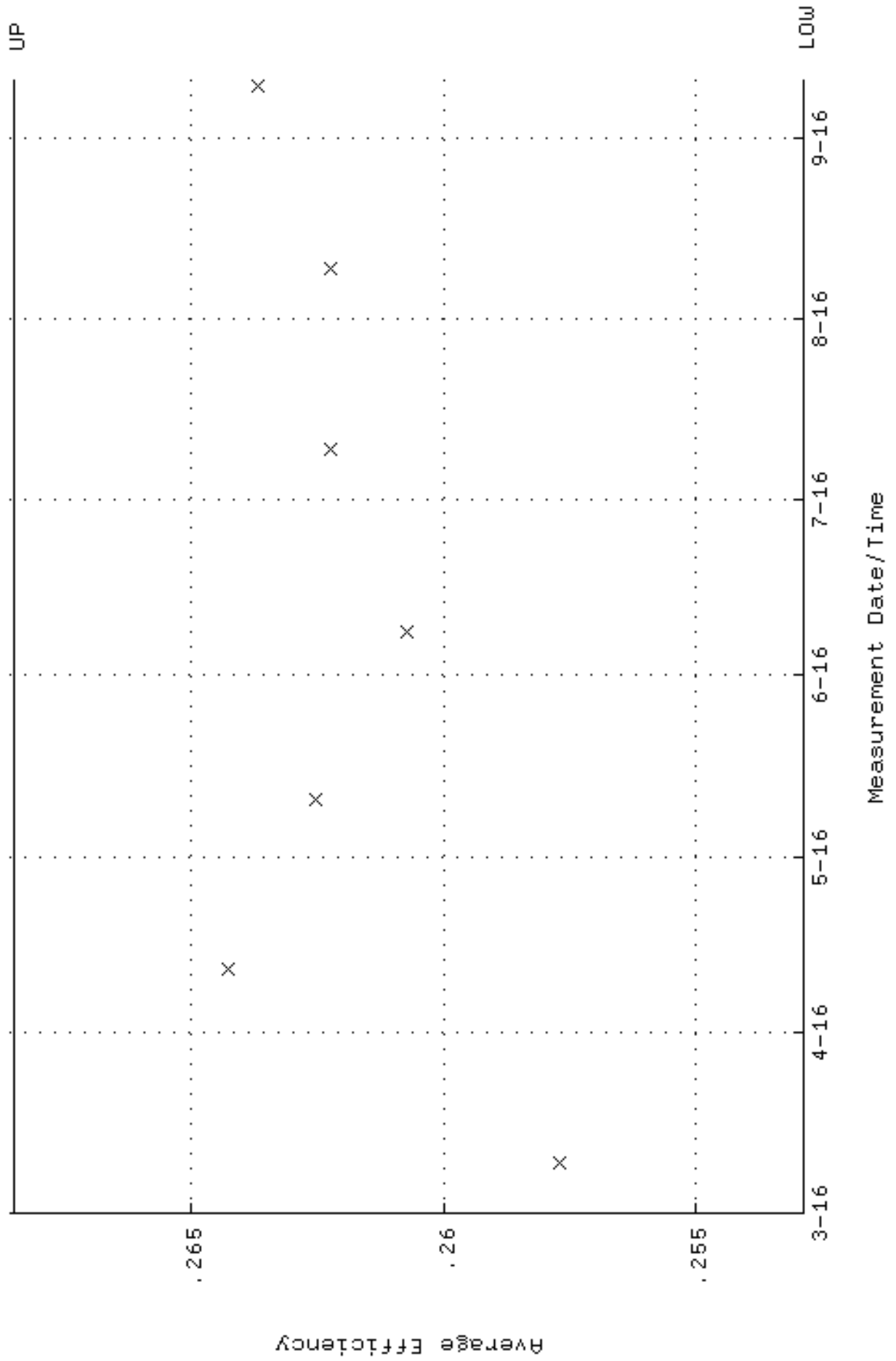
QA filename : DKA100:[ENV_ALPHA.QA.W]W144.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 9-JUL-2016 09:35:58 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



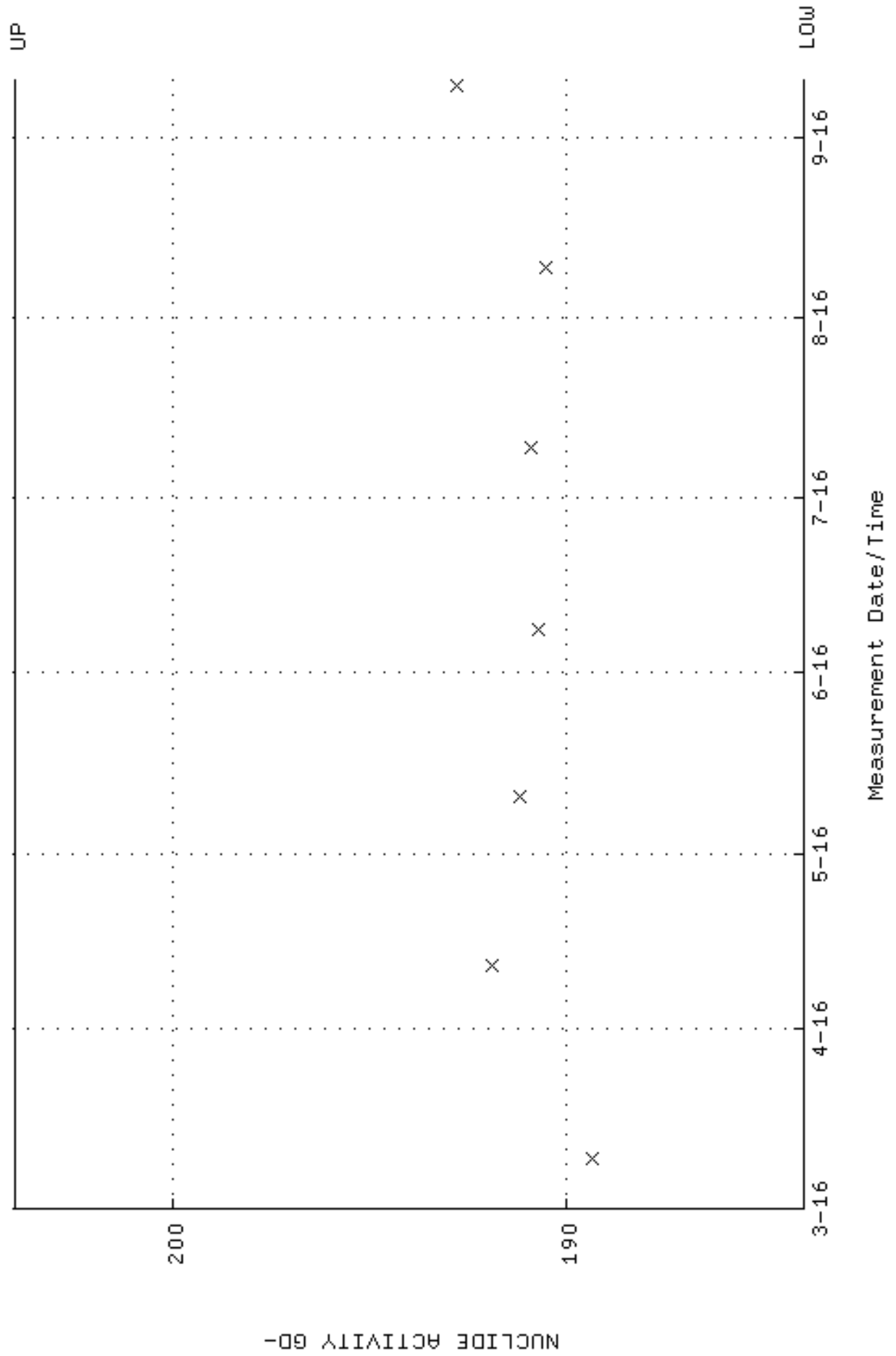
QA filename : DKA100:[ENV_ALPHA.QA.B]B144.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:36:22 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



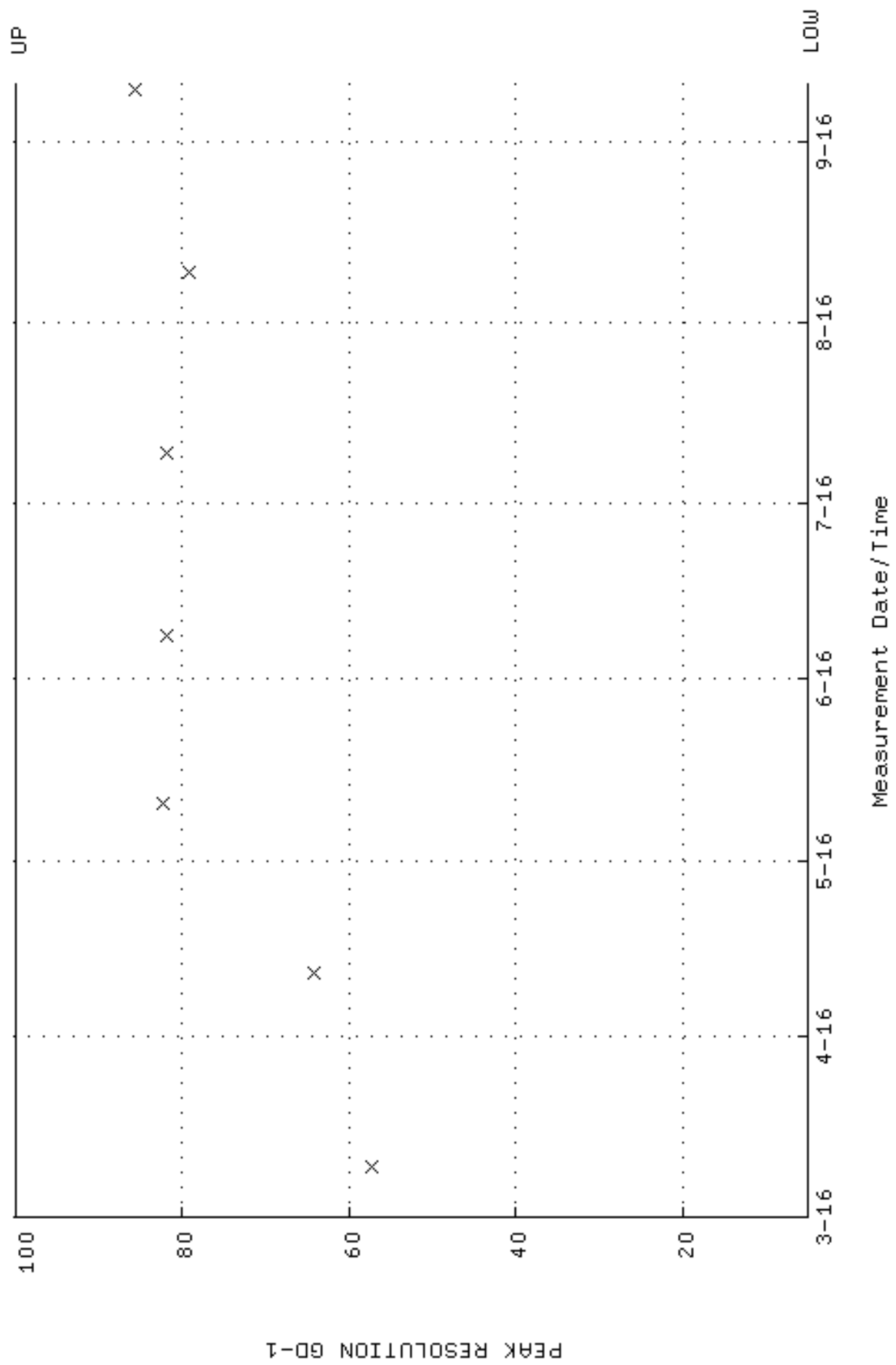
QA filename : DKA100:[ENV_ALPHA.QA.W]W145.QAF;7
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 9-MAR-2016 14:48:03 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.252879 through 0.268521



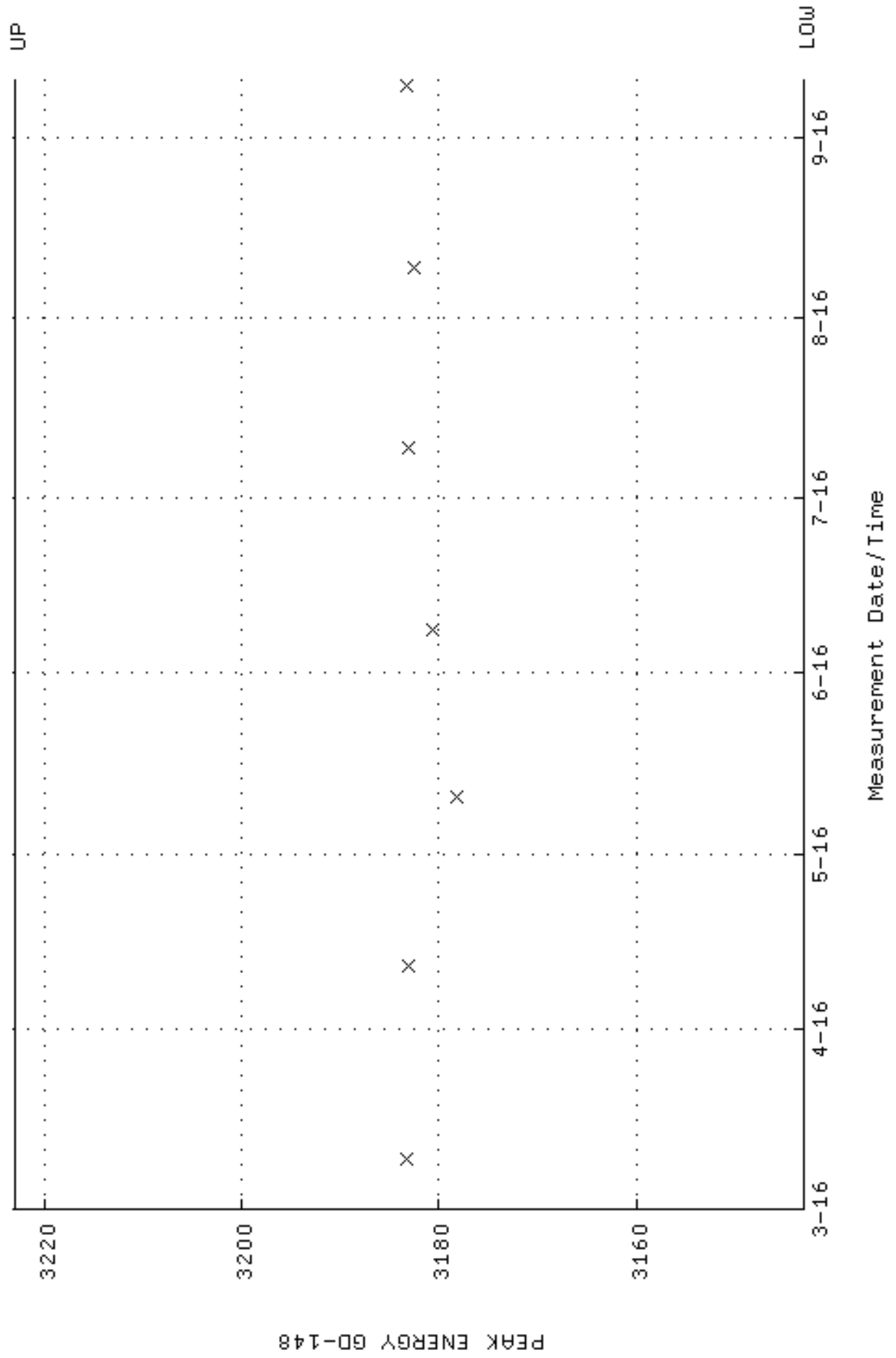
QA filename : DKA100:[ENV_ALPHA.QA.W]W145.QAF;7
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 9-MAR-2016 14:48:03 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



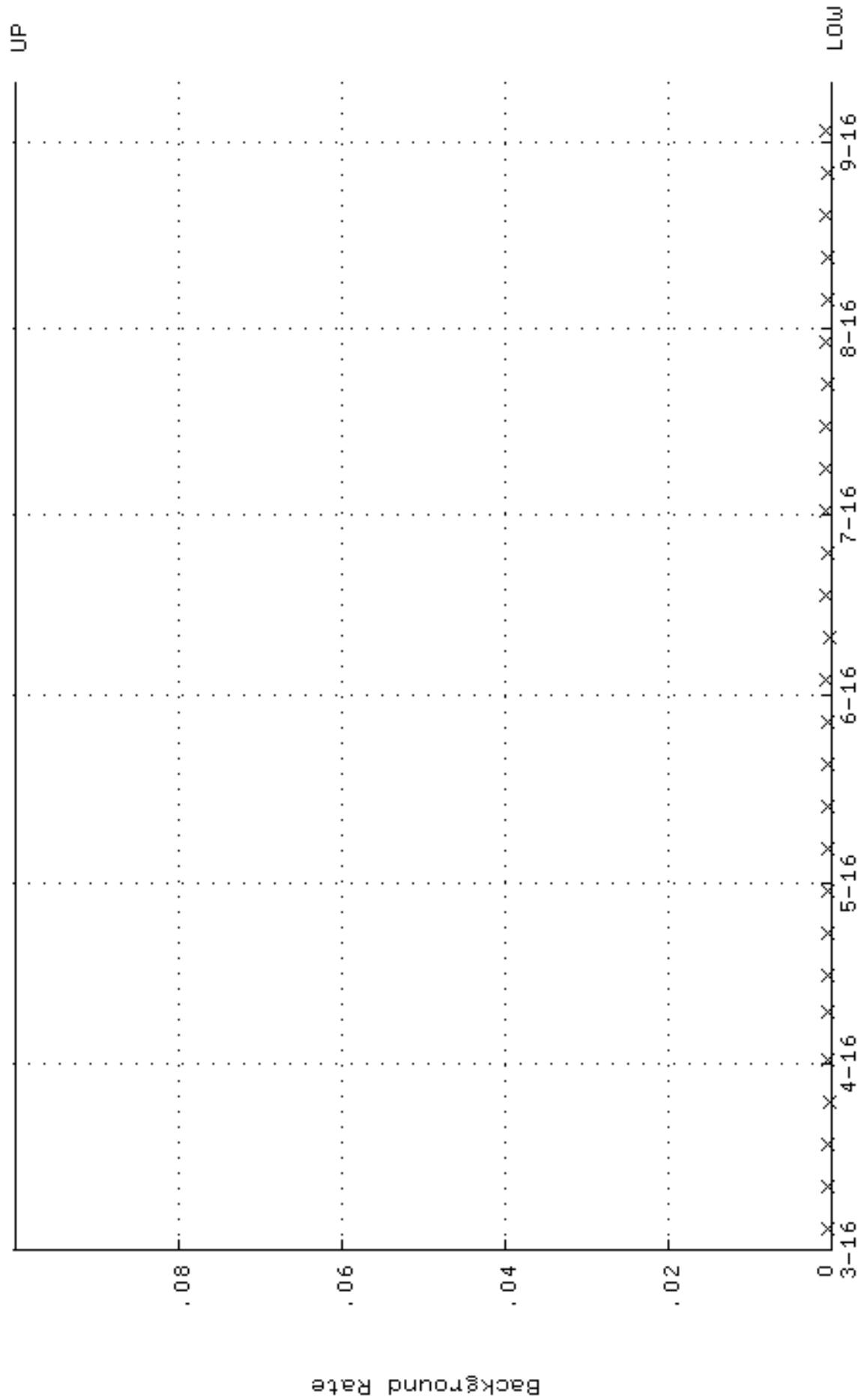
QA filename : DKA100:[ENV_ALPHA.QA.W]W145.QAF;7
 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 9-MAR-2016 14:48:03 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



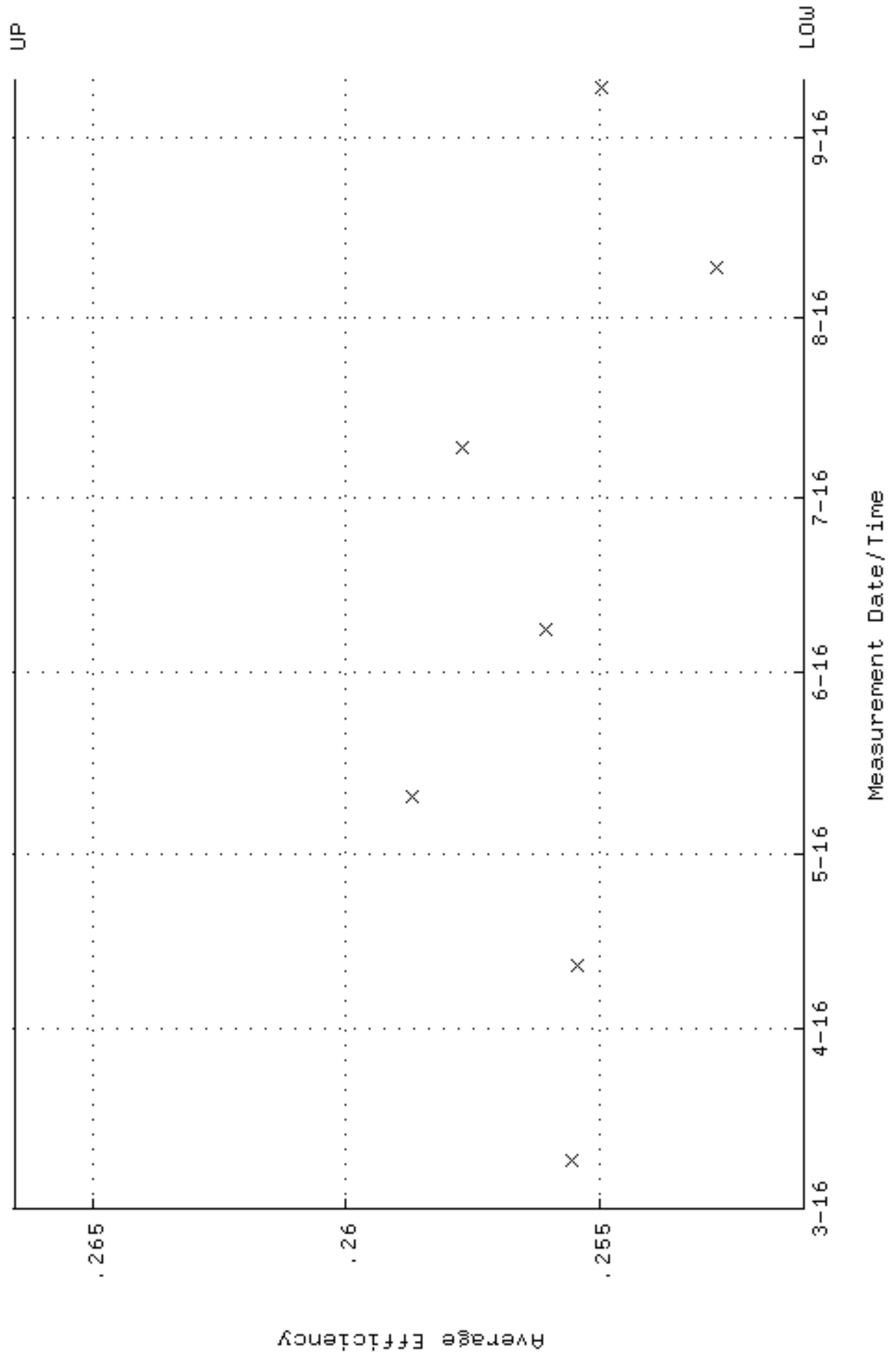
QA filename : DKA100:[ENV_ALPHA.QA.W]W145.QAF;7
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 9-MAR-2016 14:48:03 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



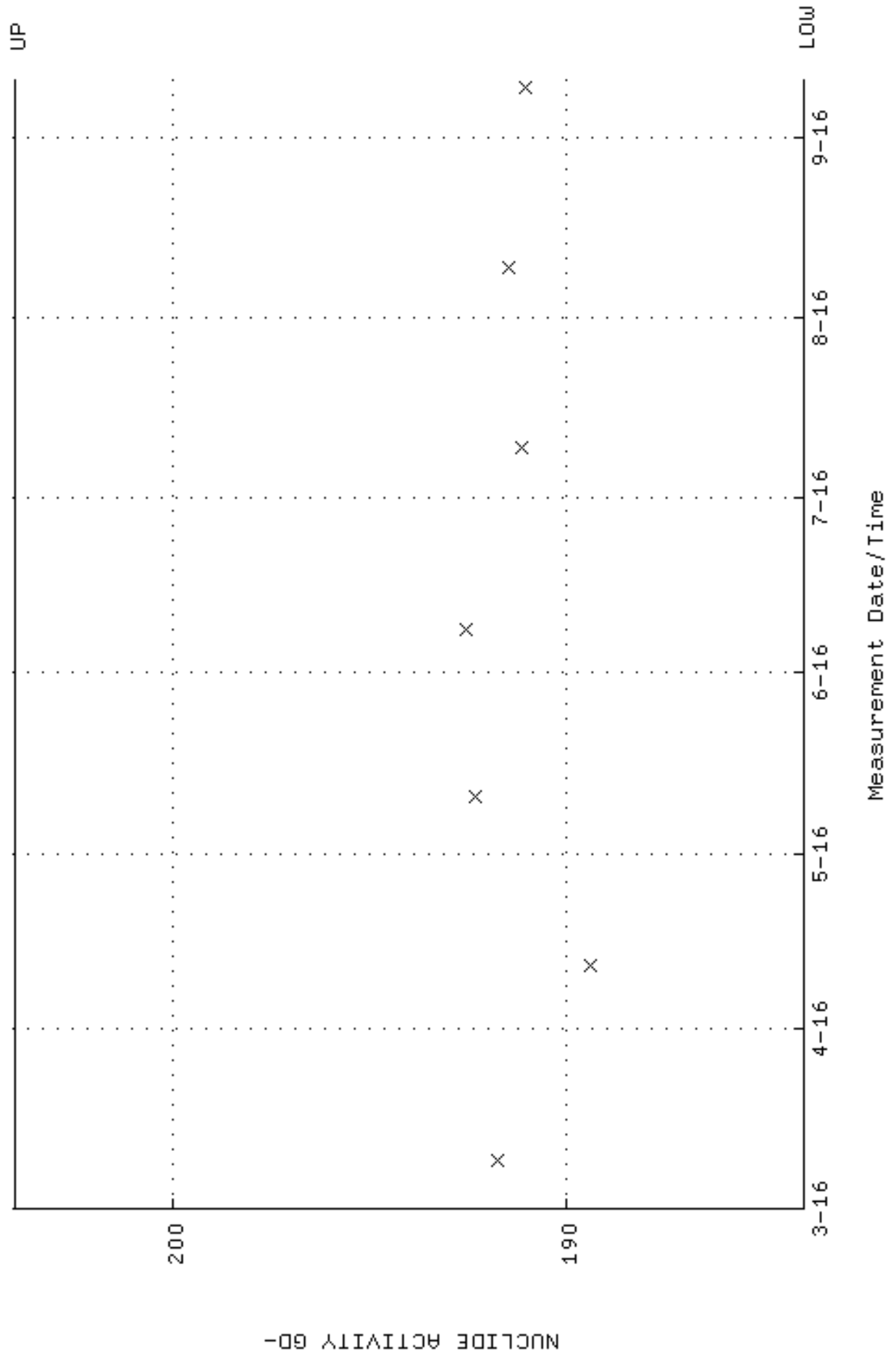
QA filename : DKA100:[ENV_ALPHA.QA.B]B145.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:36:25 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



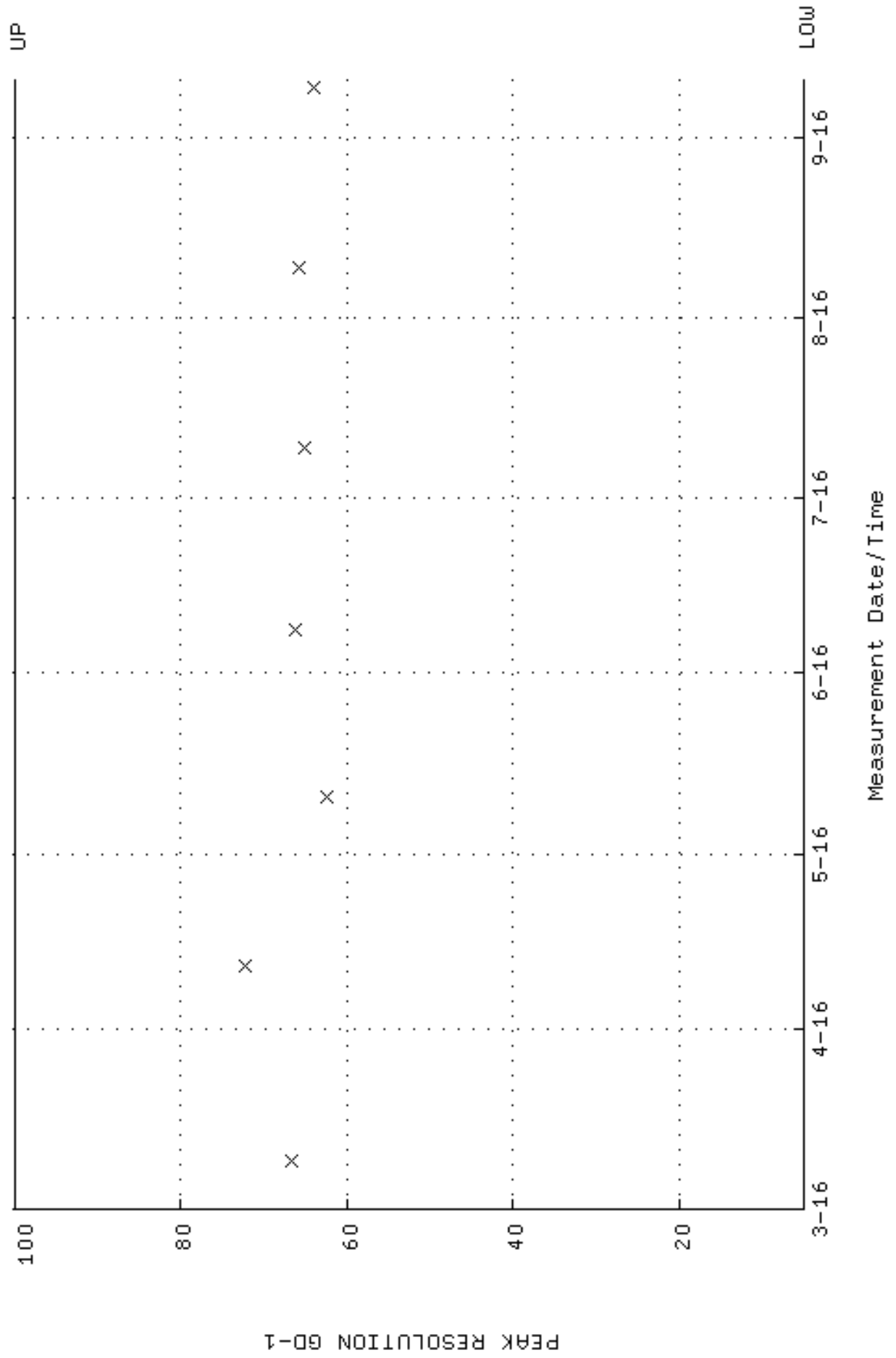
QA filename : DKA100:[ENV_ALPHA.QA.W]W146.QAF;5
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 9-MAR-2016 08:43:50 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.250993 through 0.266519



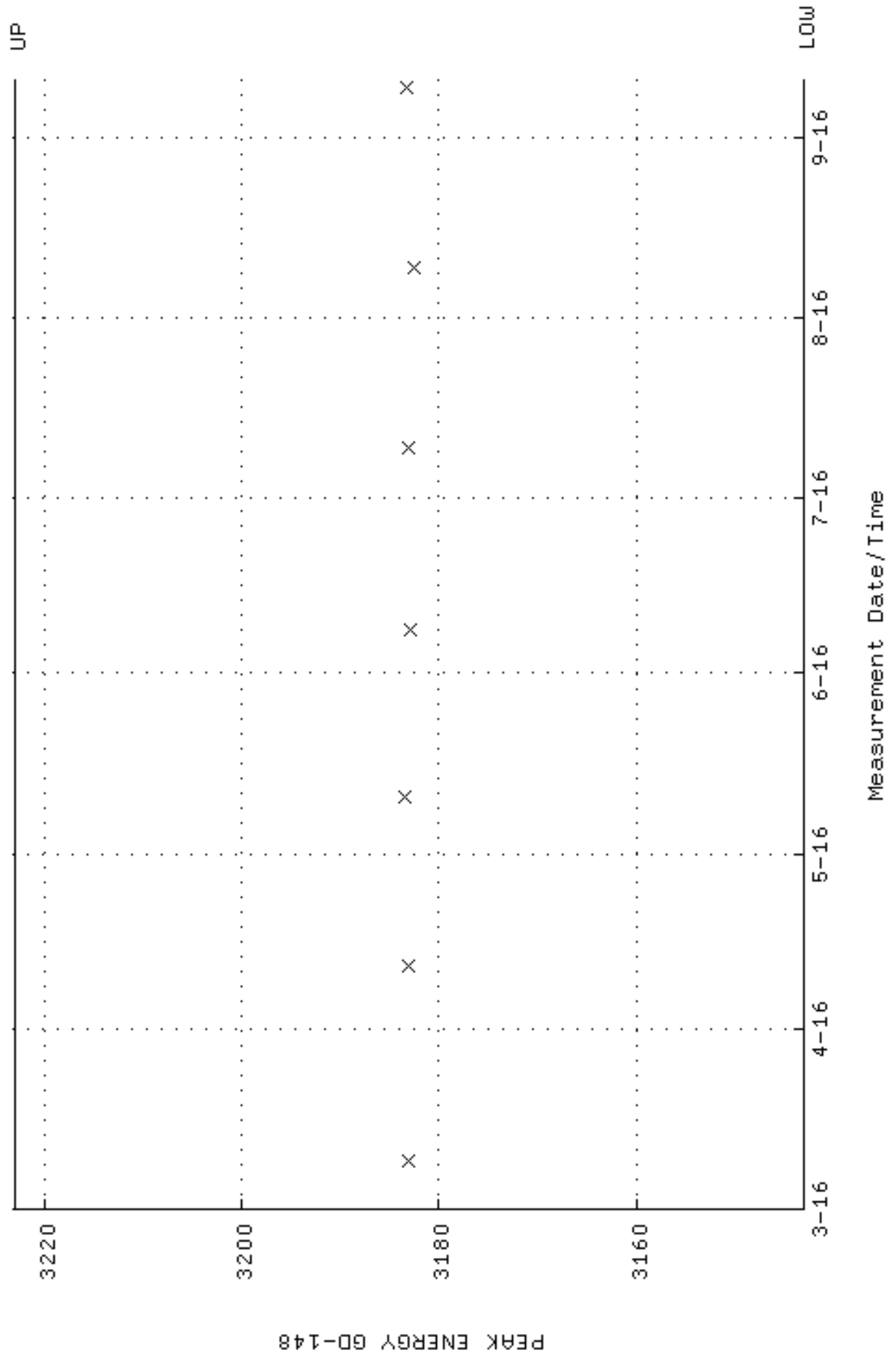
QA filename : DKA100:[ENV_ALPHA.QA.W]W146.QAF;5
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 9-MAR-2016 08:43:50 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



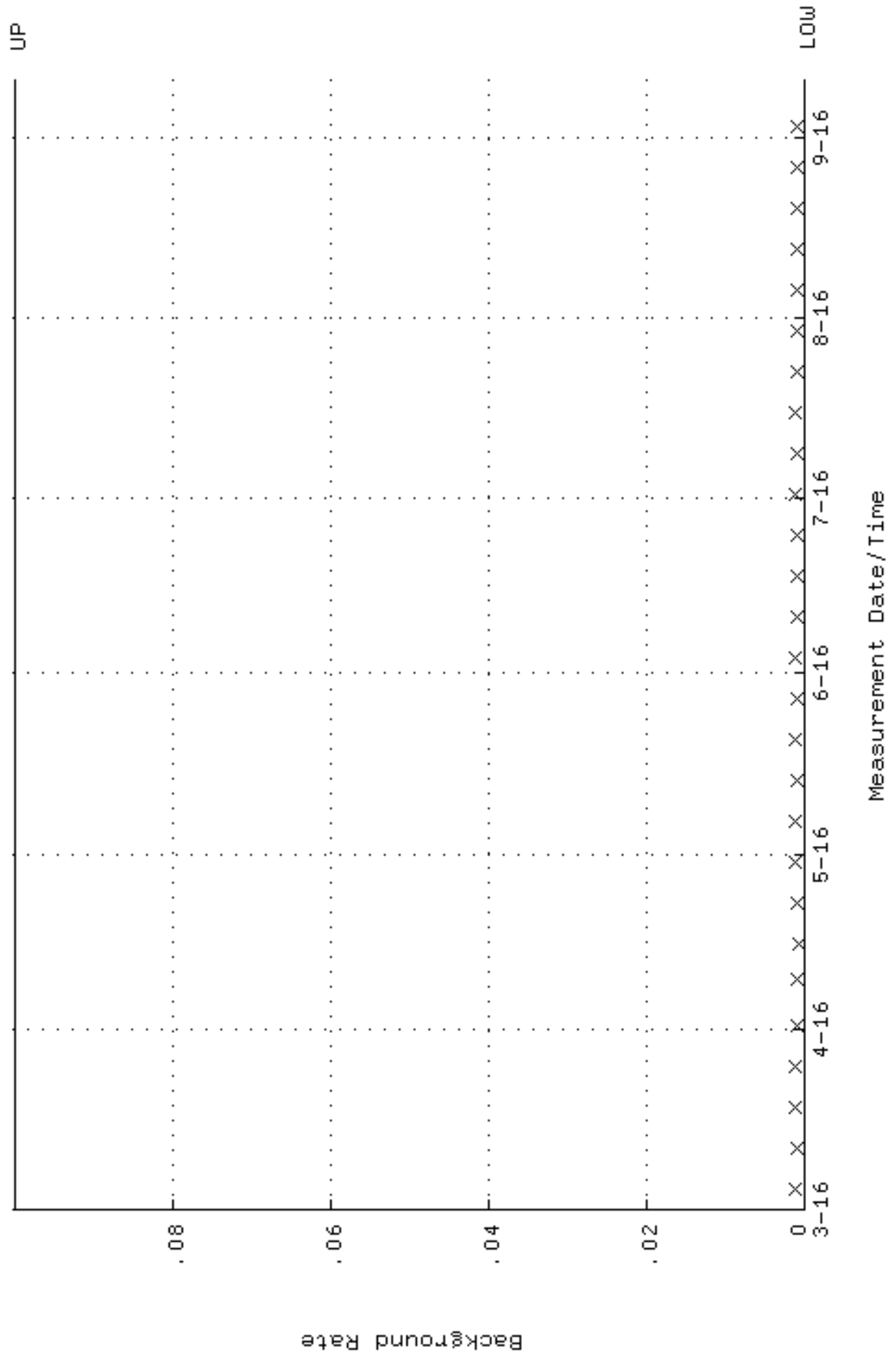
QA filename : DKA100:[ENV_ALPHA.QA.W]W146.QAF;5
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 9-MAR-2016 08:43:50 through 10-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



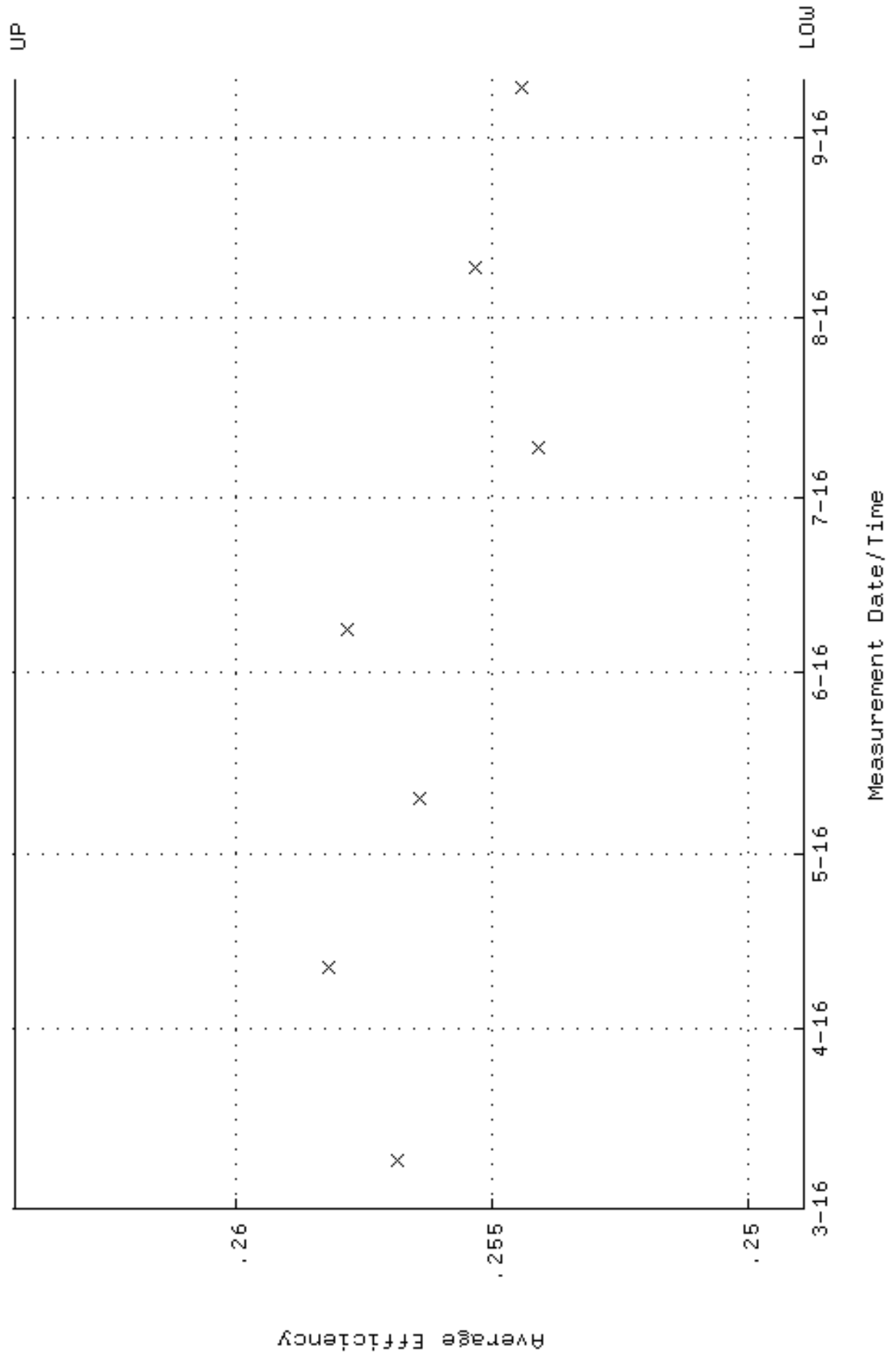
QA filename : DKA100:[ENV_ALPHA.QA.W]W146.QAF;5
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 9-MAR-2016 08:43:50 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



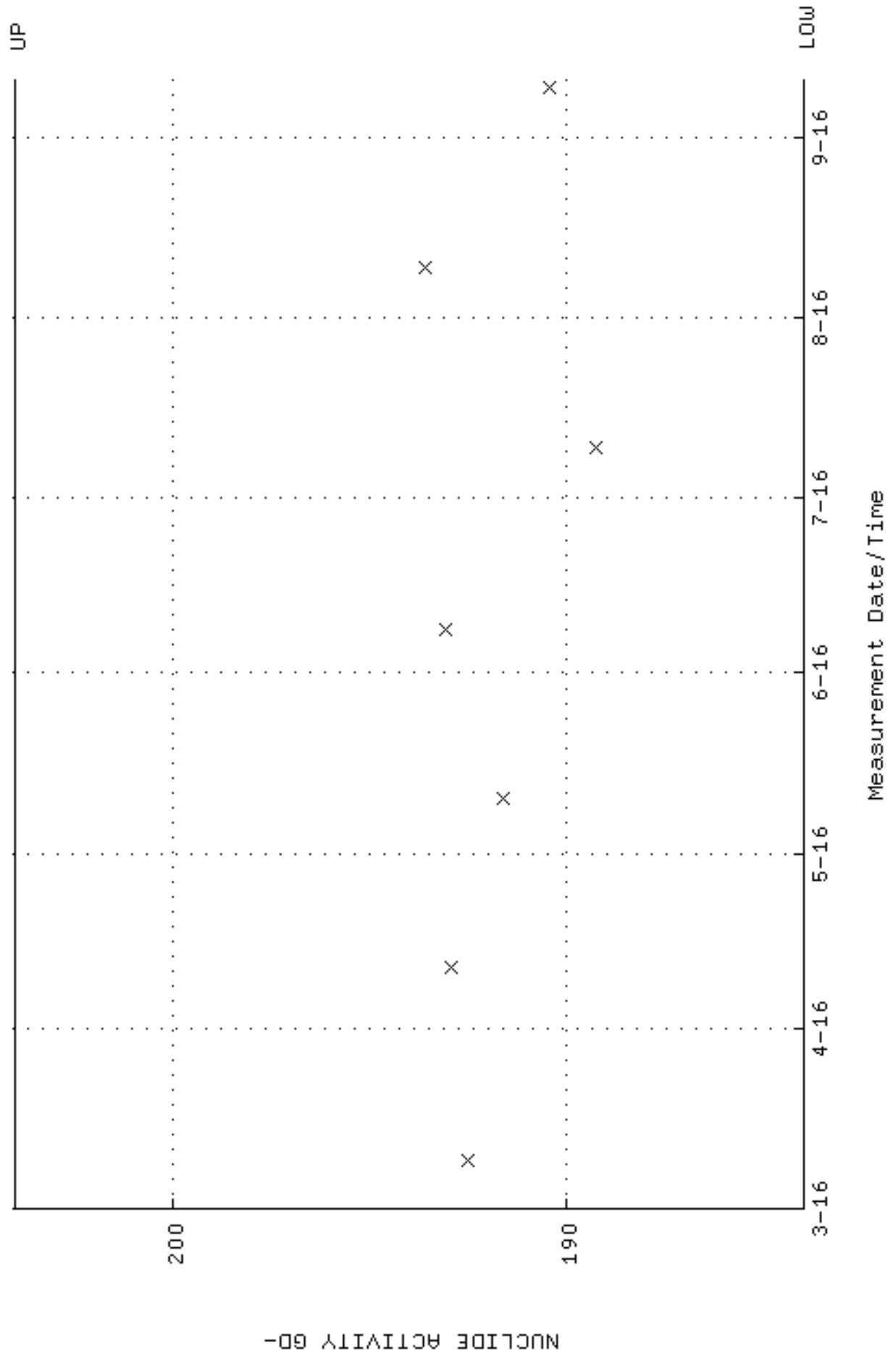
QA filename : DKA100:[ENV_ALPHA.QA.B]B146.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:36:29 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



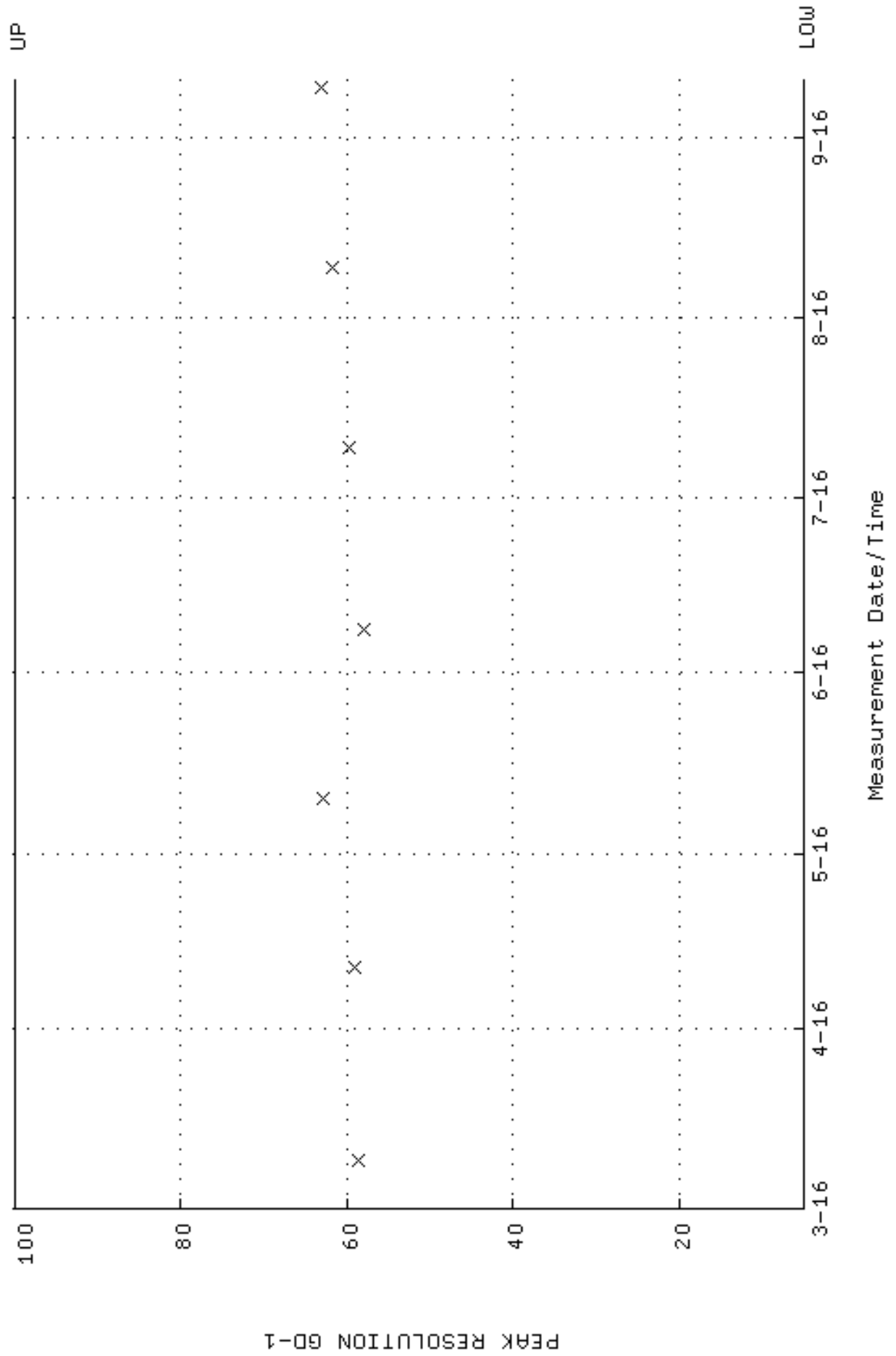
QA filename : DKA100:[ENV_ALPHA.QA.W]W147.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 9-MAR-2016 08:43:57 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.248902 through 0.264298



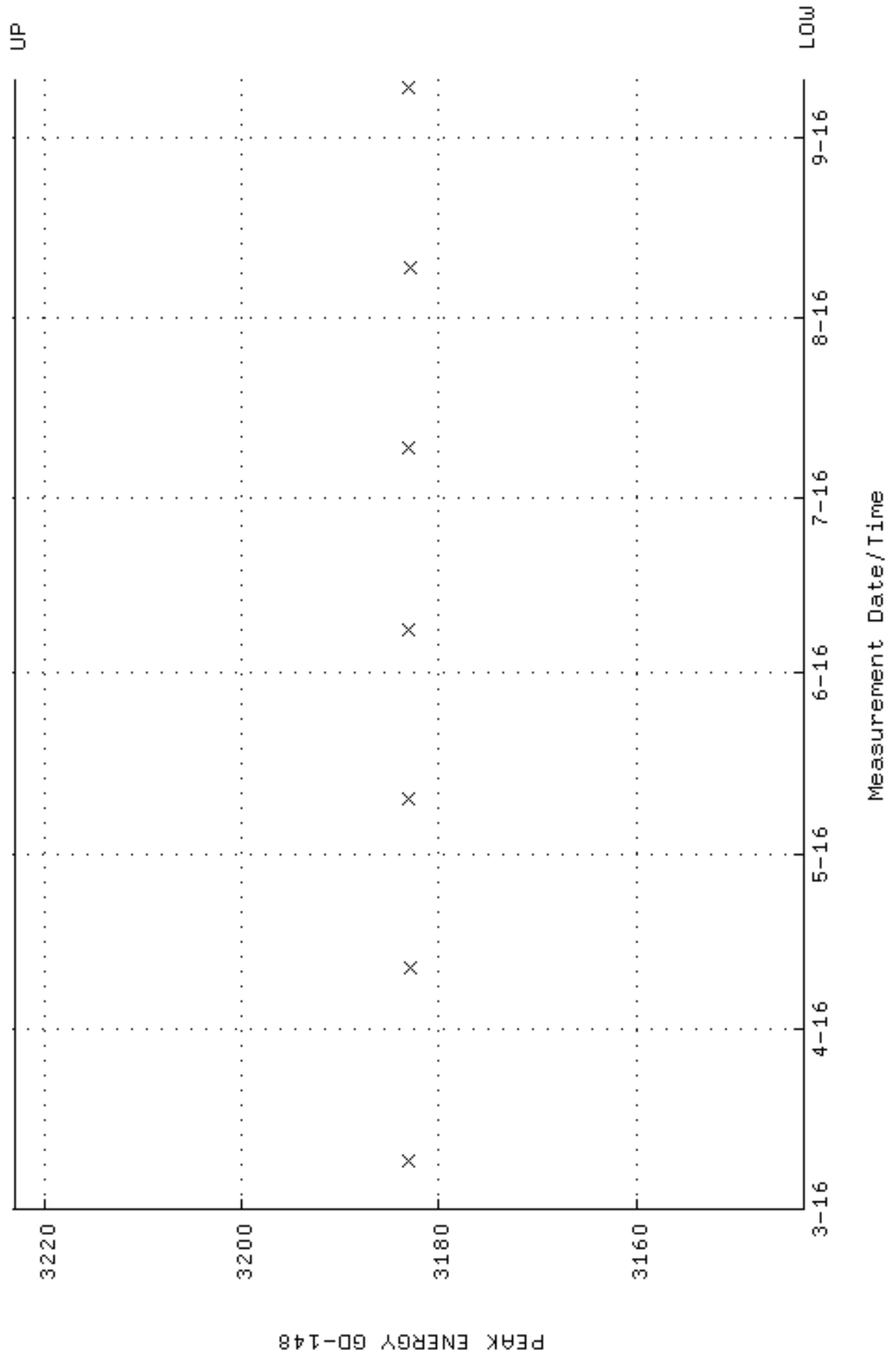
QA filename : DKA100:[ENV_ALPHA.QA.W]W147.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 9-MAR-2016 08:43:57 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



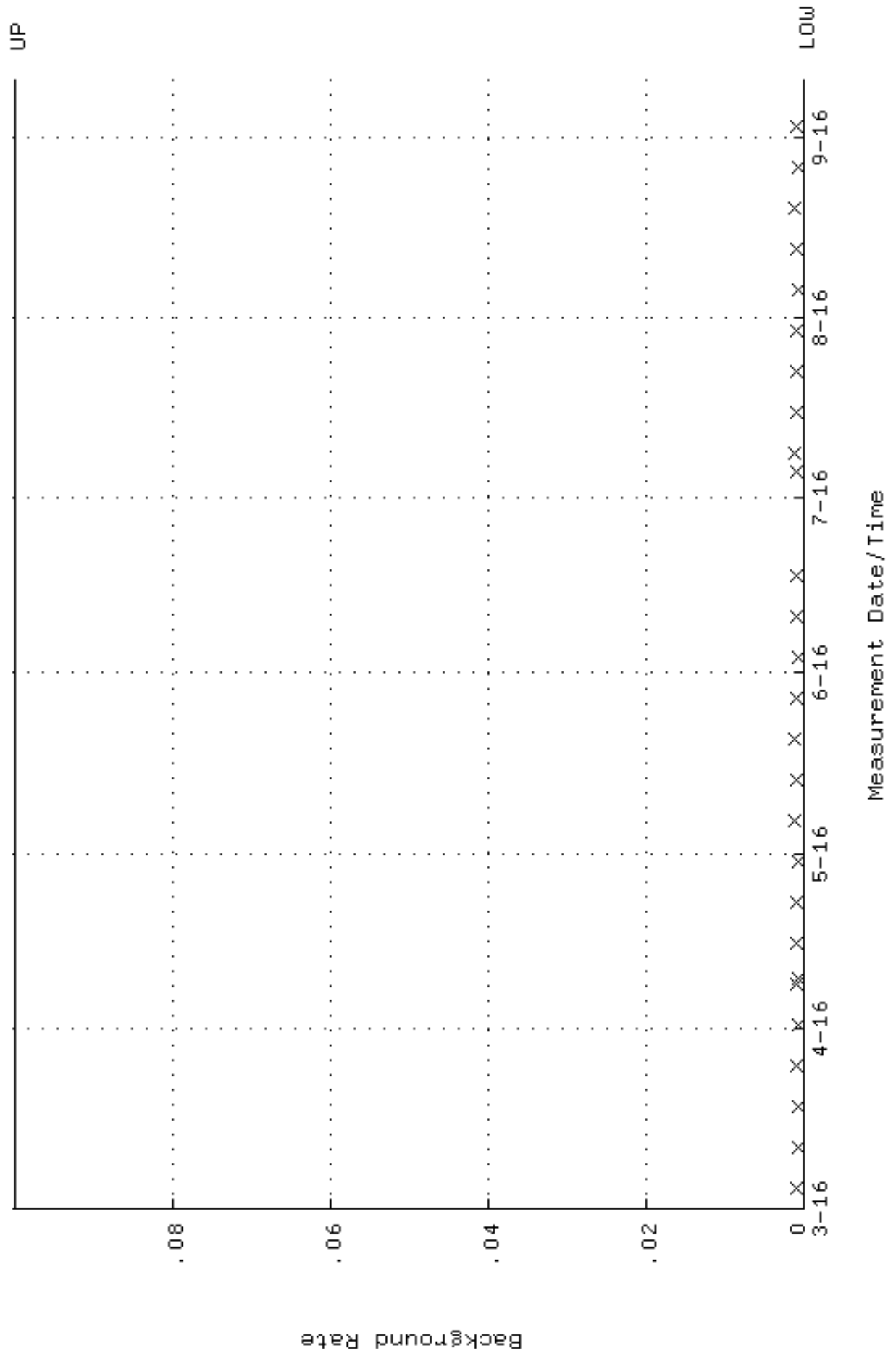
QA filename : DKA100:[ENV_ALPHA.QA.W]W147.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 9-MAR-2016 08:43:57 through 10-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



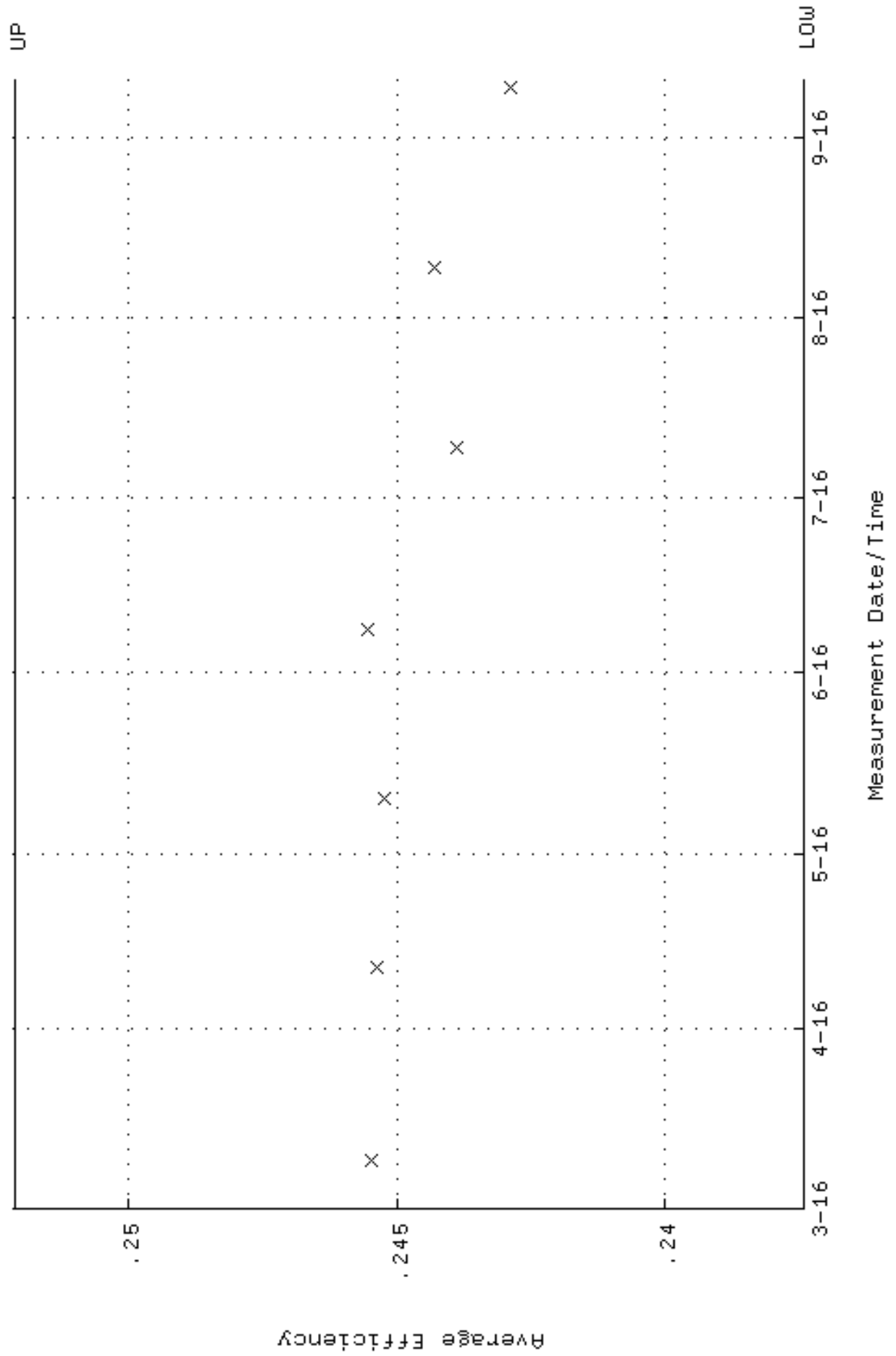
QA filename : DKA100:[ENV_ALPHA.QA.W]W147.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 9-MAR-2016 08:43:57 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



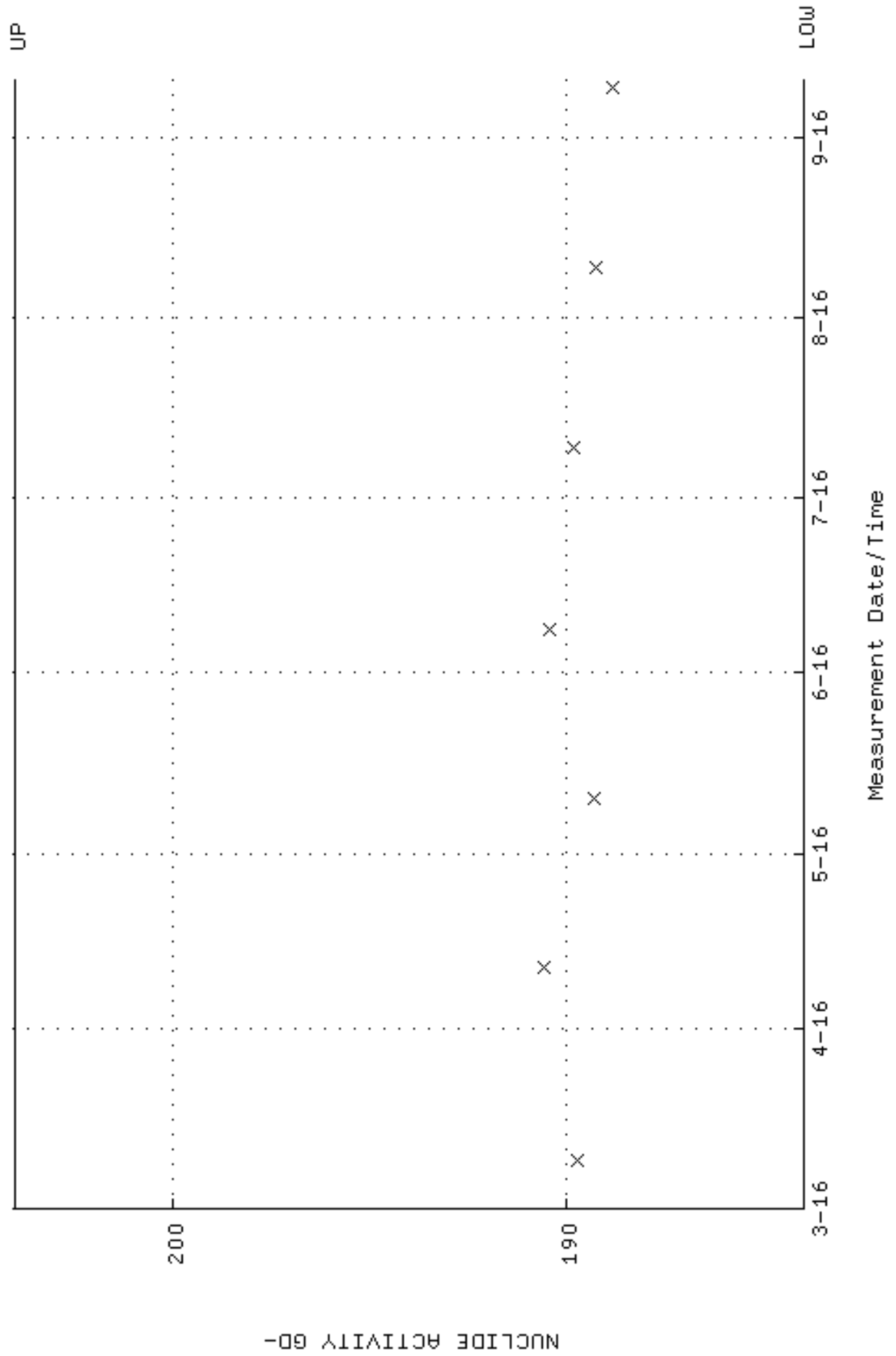
QA filename : DKA100:[ENV_ALPHA.QA.B]B147.QAF;4
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:36:34 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



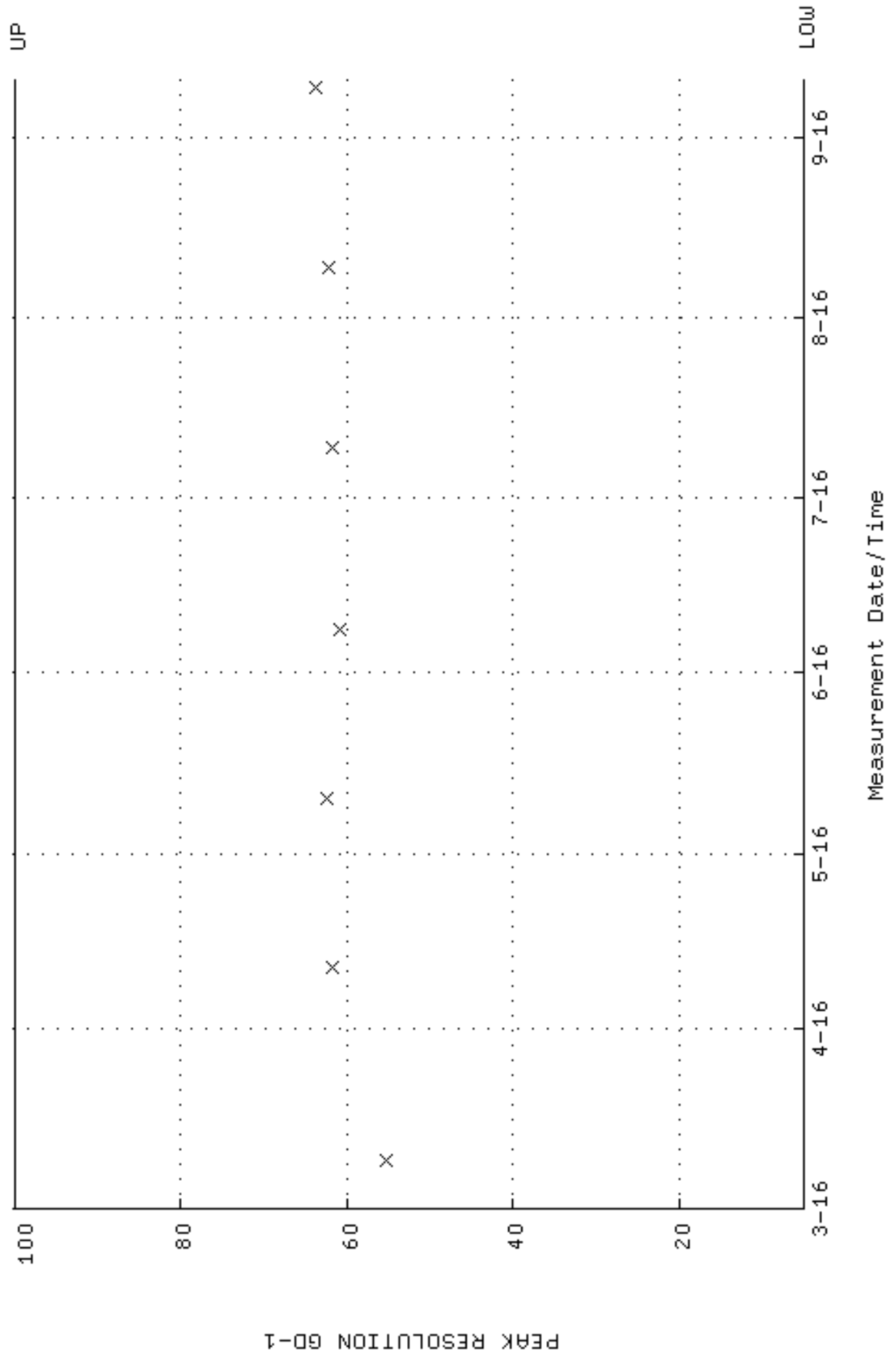
QA filename : DKA100:[ENV_ALPHA.QA.W]W148.QAF;5
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 9-MAR-2016 08:44:04 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.237420 through 0.252100



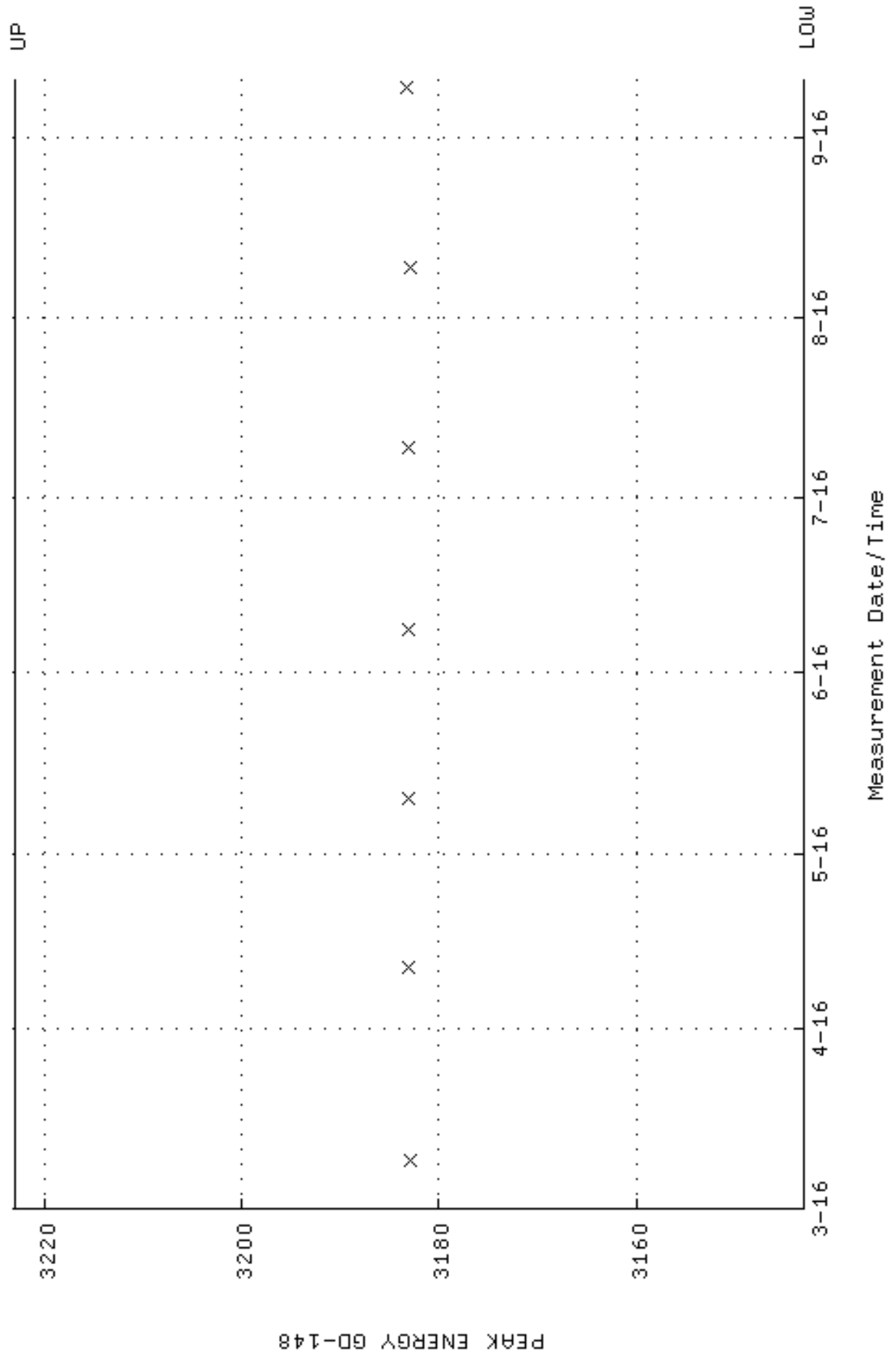
QA filename : DKA100:[ENV_ALPHA.QA.W]W148.QAF;5
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 9-MAR-2016 08:44:04 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



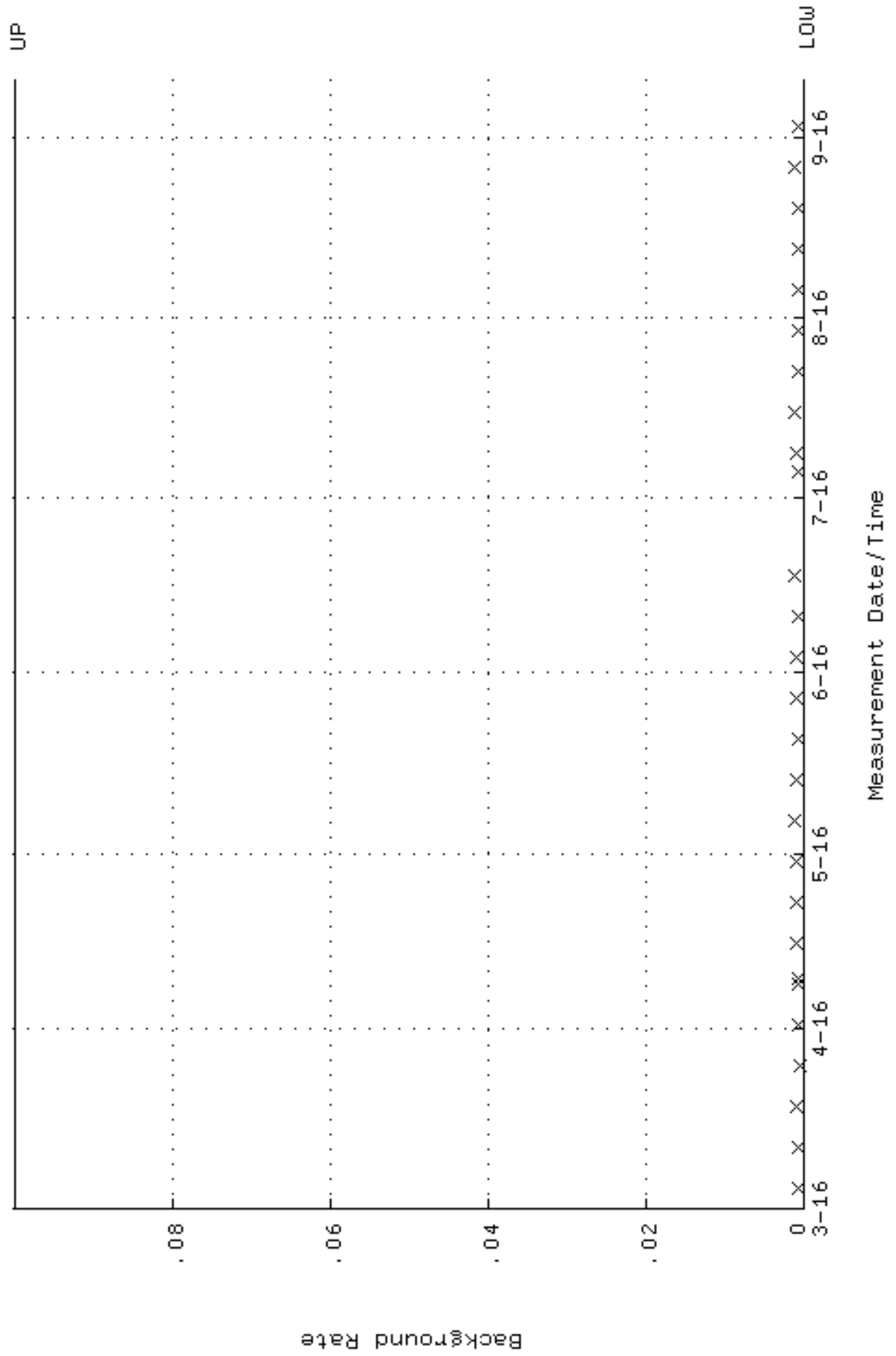
QA filename : DKA100:[ENV_ALPHA.QA.W]W148.QAF;5
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 9-MAR-2016 08:44:04 through 10-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



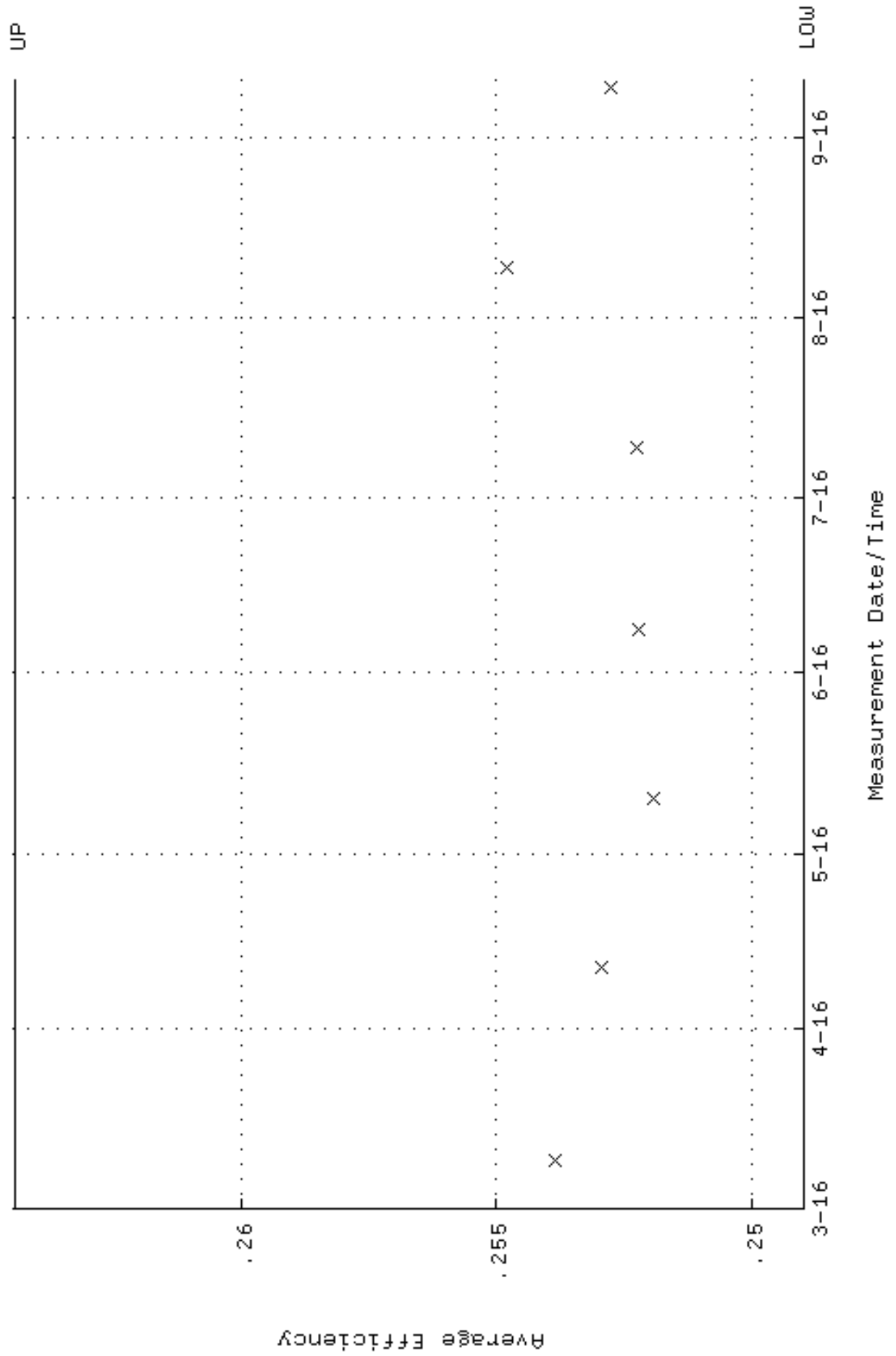
QA filename : DKA100:[ENV_ALPHA.QA.W]W148.QAF;5
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 9-MAR-2016 08:44:04 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



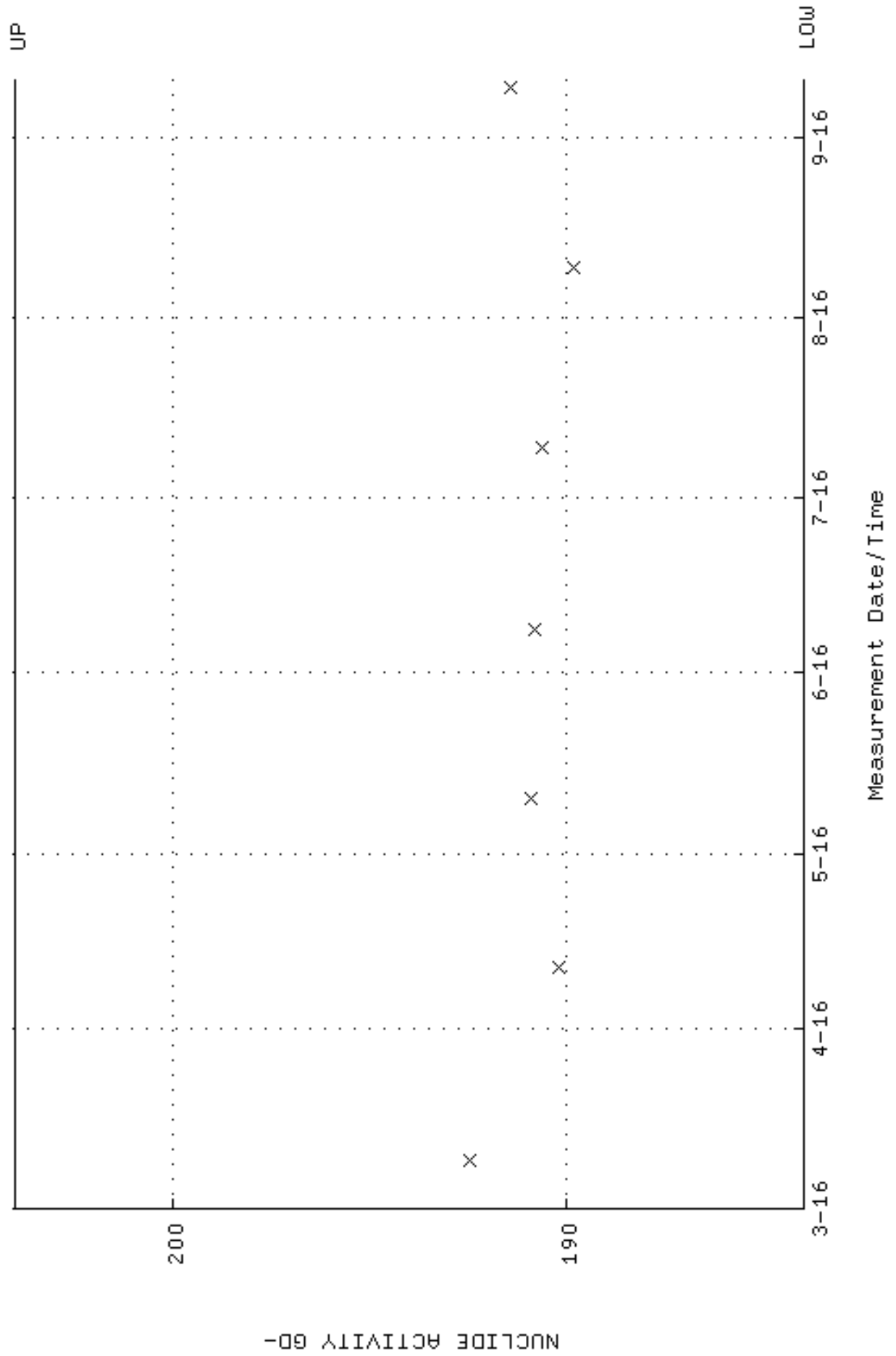
QA filename : DKA100:[ENV_ALPHA.QA.B]B148.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 12:36:38 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



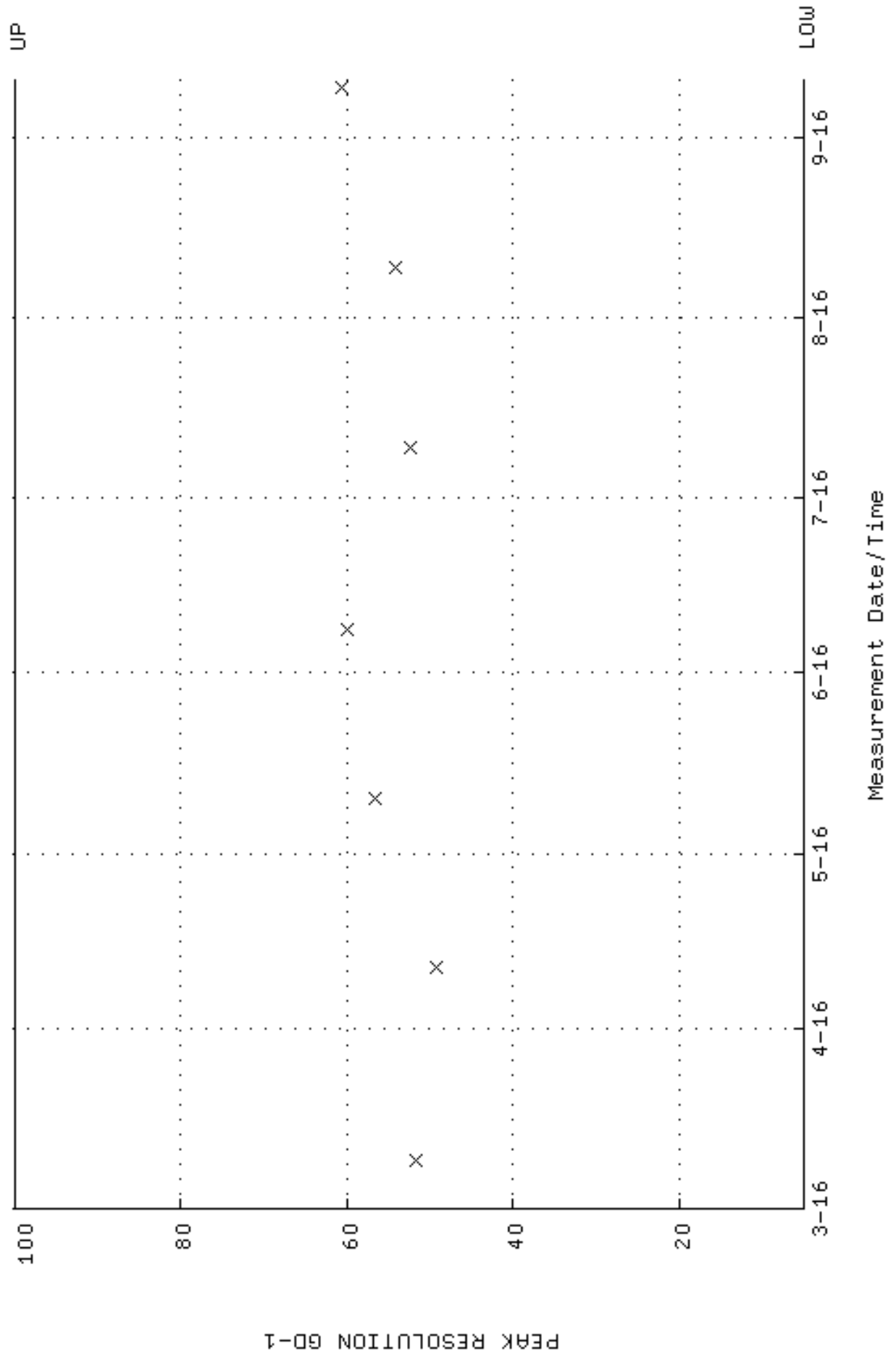
QA filename : DKA100:[ENV_ALPHA.QA.W]W149.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 9-MAR-2016 08:44:10 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.249000 through 0.264407



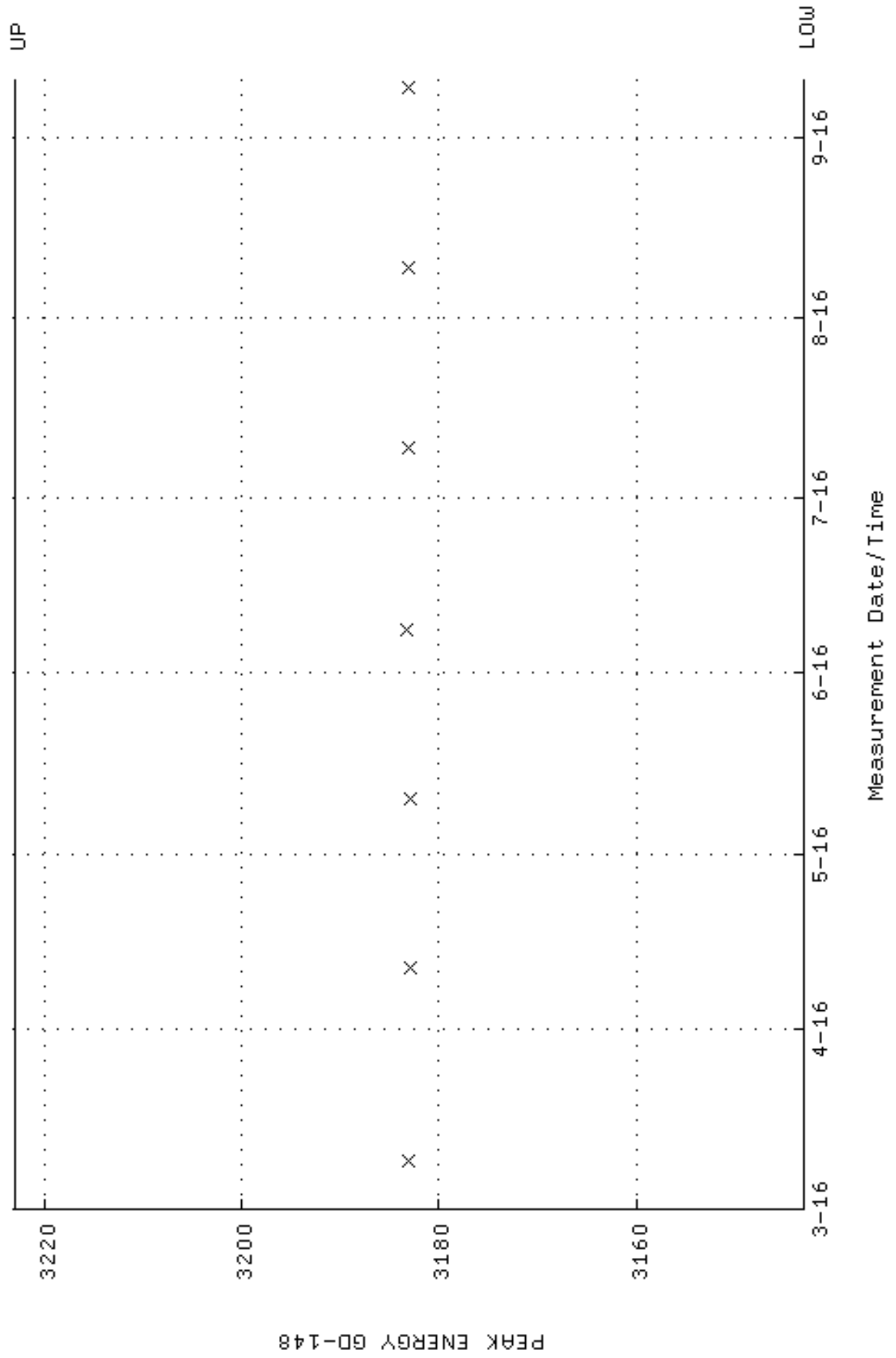
QA filename : DKA100:[ENV_ALPHA.QA.W]W149.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 9-MAR-2016 08:44:10 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



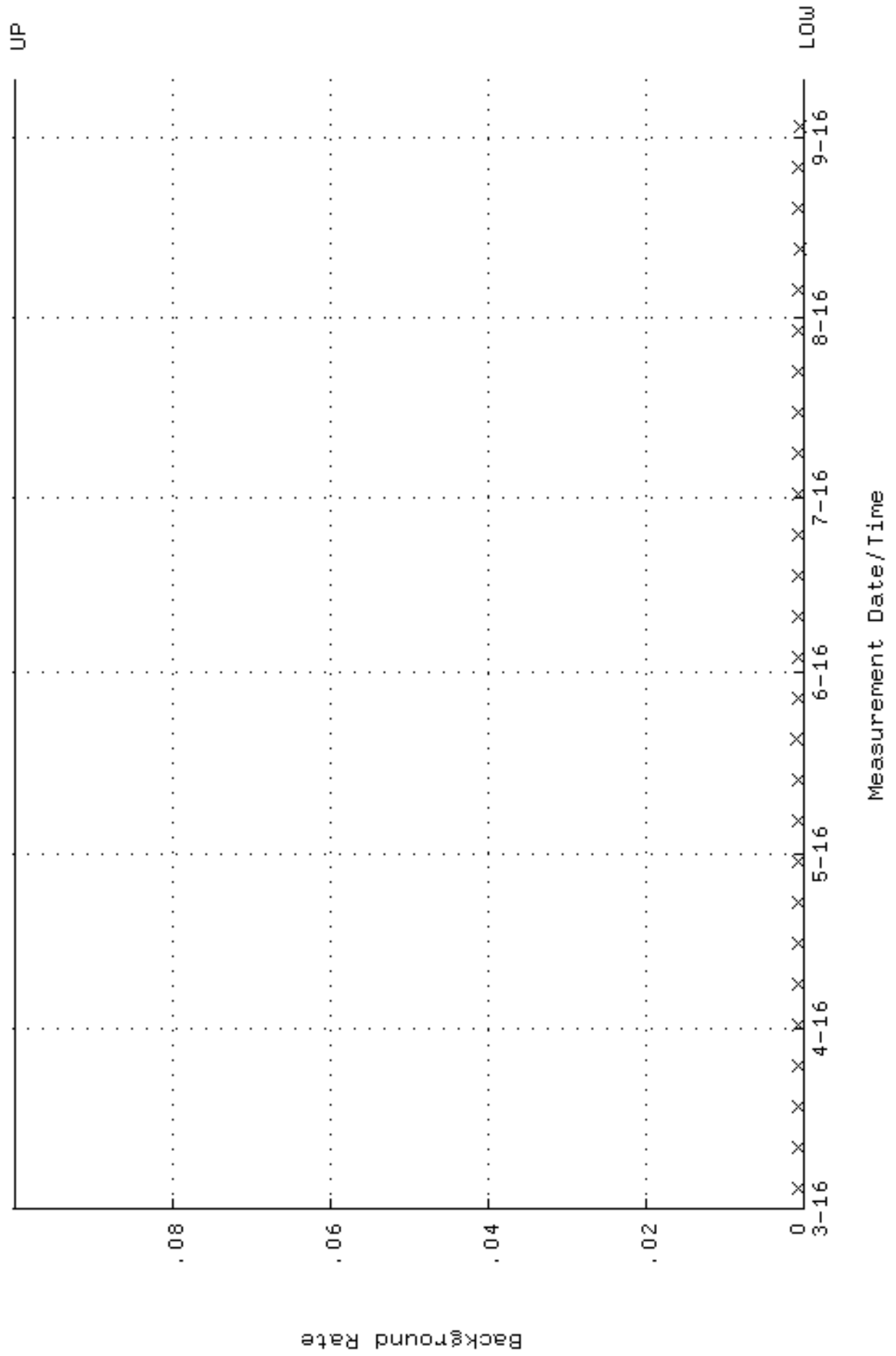
QA filename : DKA100:[ENV_ALPHA.QA.W]W149.QAF;4
 Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 9-MAR-2016 08:44:10 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



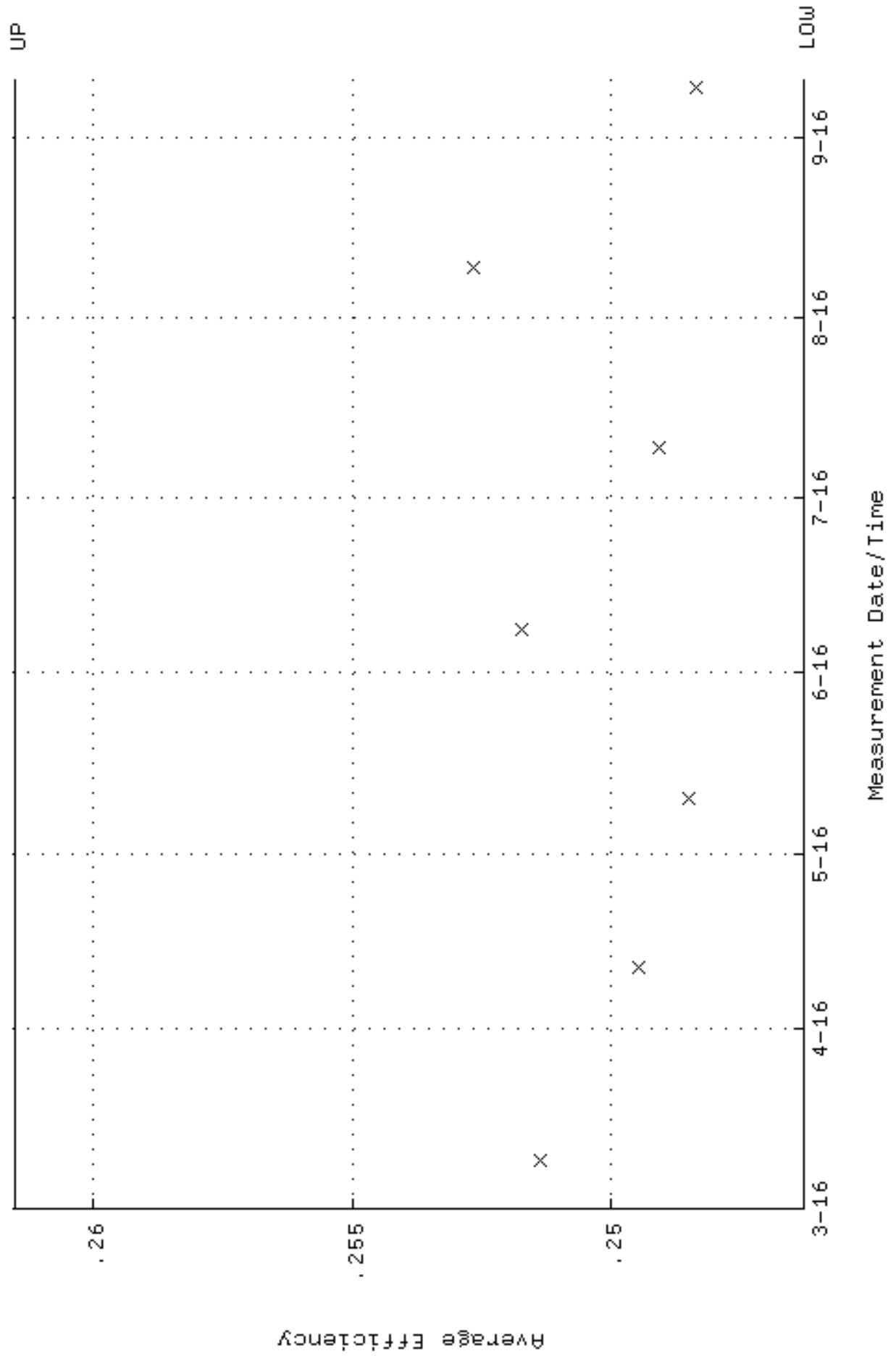
QA filename : DKA100:[ENV_ALPHA.QA.W]W149.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 9-MAR-2016 08:44:10 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



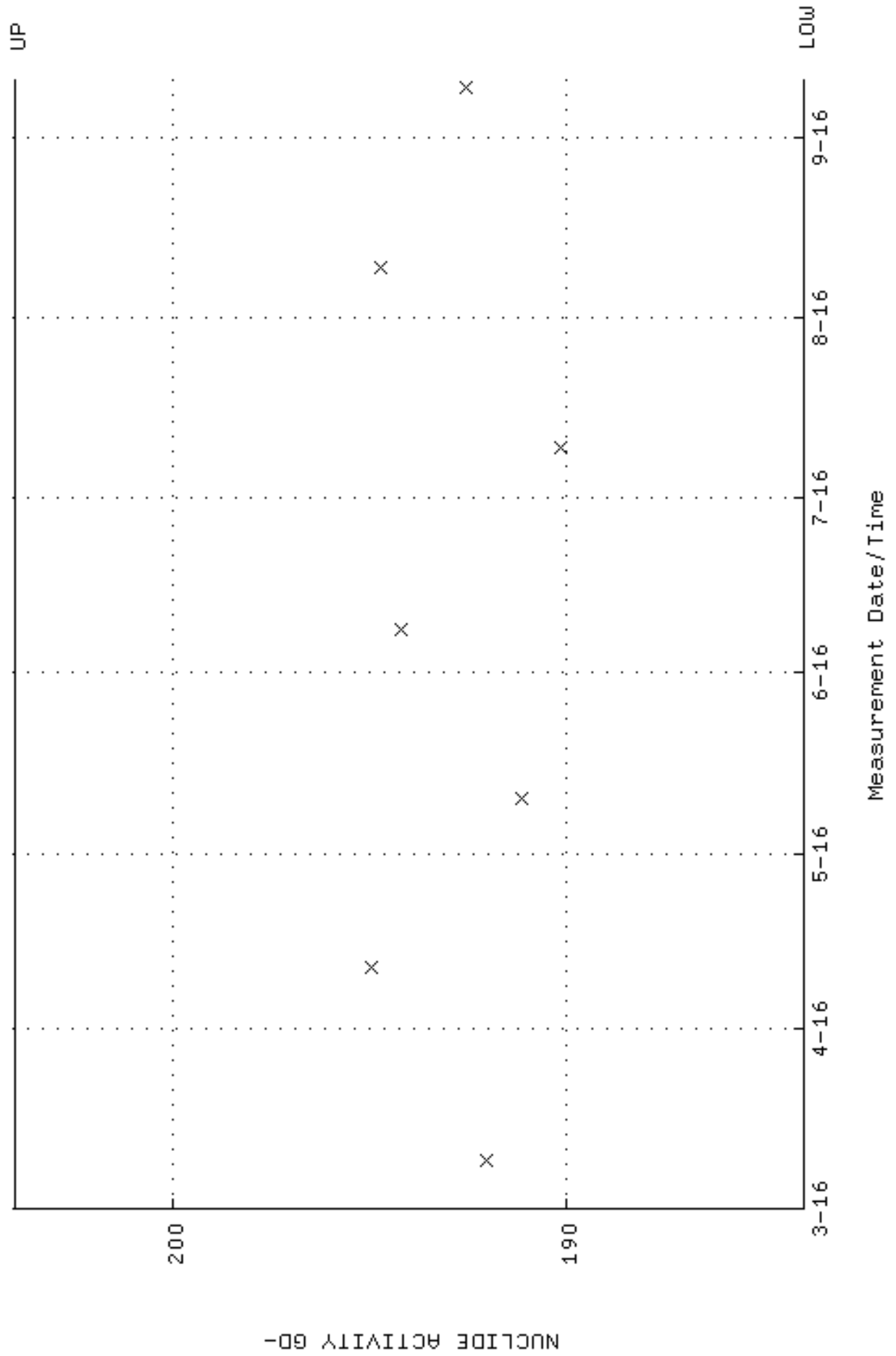
QA filename : DKA100:[ENV_ALPHA.QA.B]B149.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:44:33 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



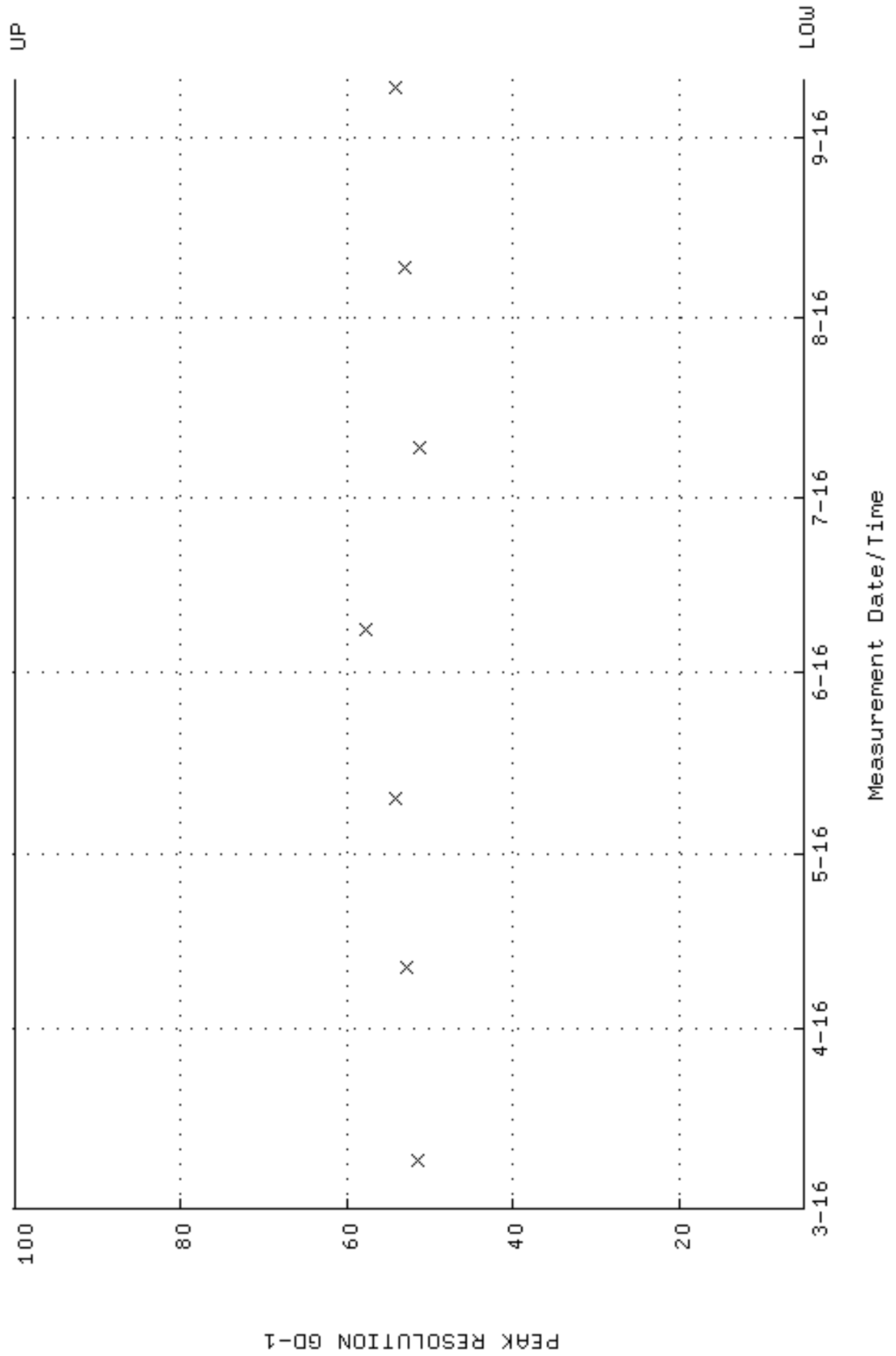
QA filename : DKA100:[ENV_ALPHA.QA.W]W150.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 9-MAR-2016 08:44:16 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.246282 through 0.261516



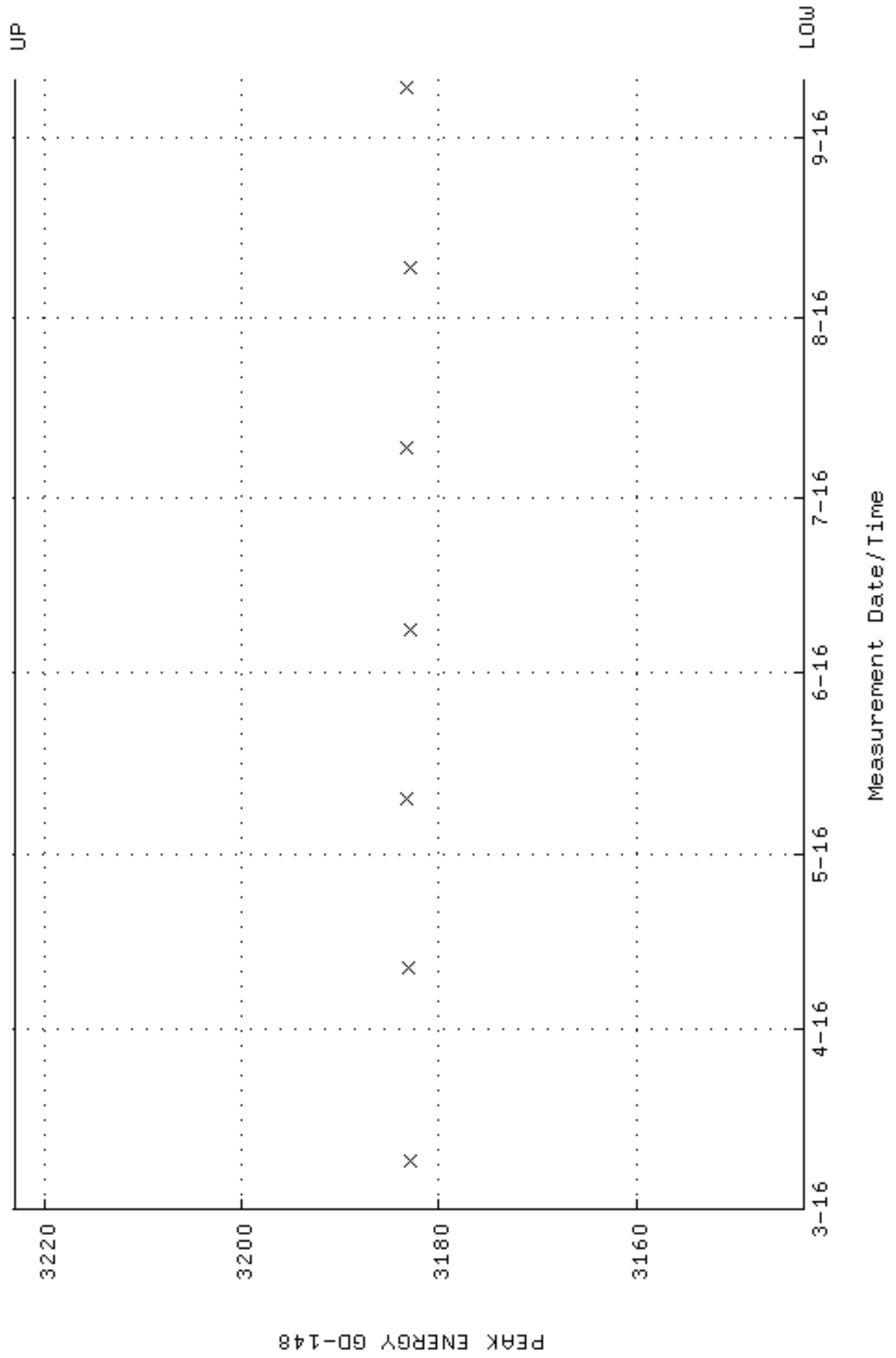
QA filename : DKA100:[ENV_ALPHA.QA.W]W150.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 9-MAR-2016 08:44:16 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



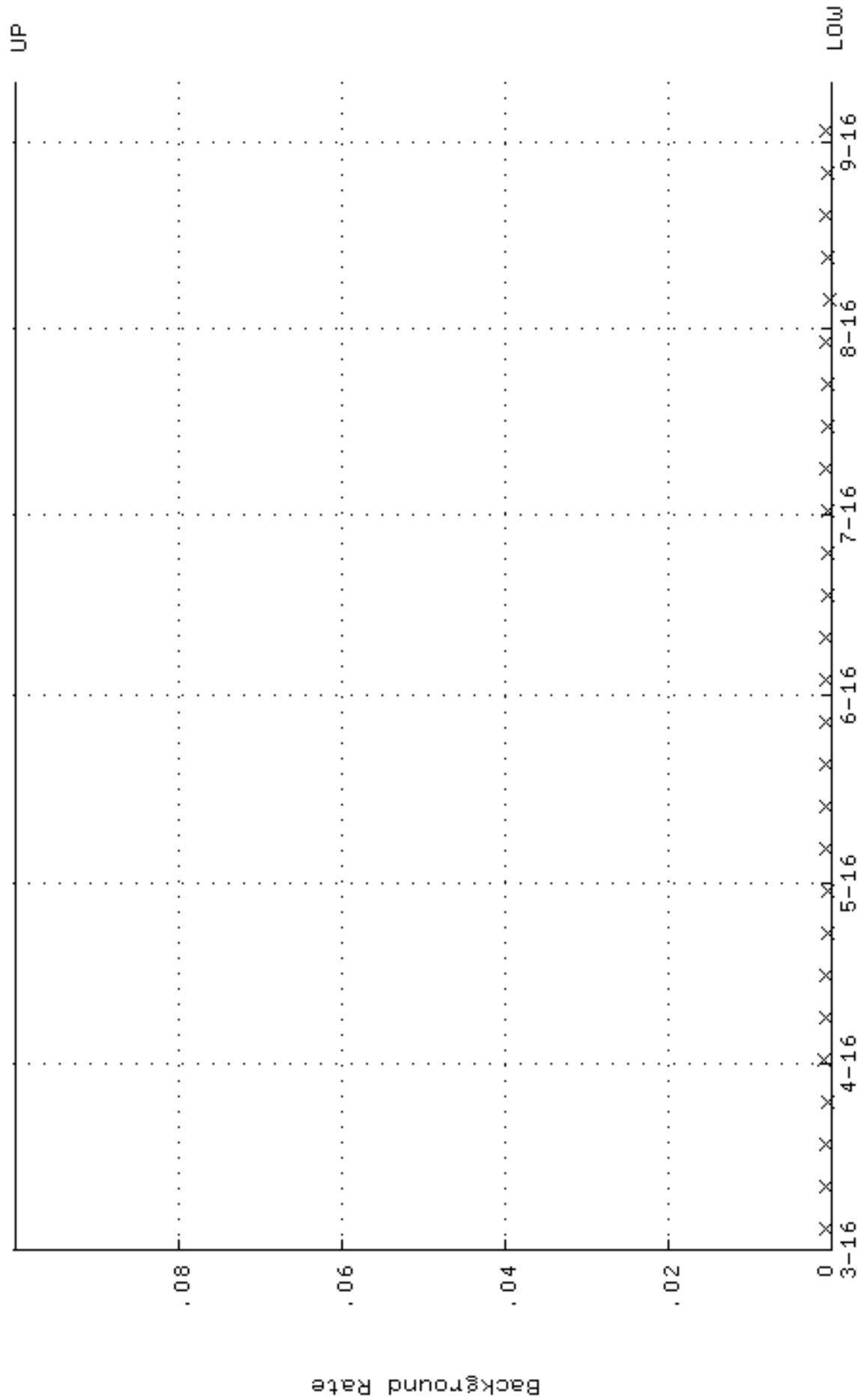
QA filename : DKA100:[ENV_ALPHA.QA.W]W150.QAF;4
 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 9-MAR-2016 08:44:16 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



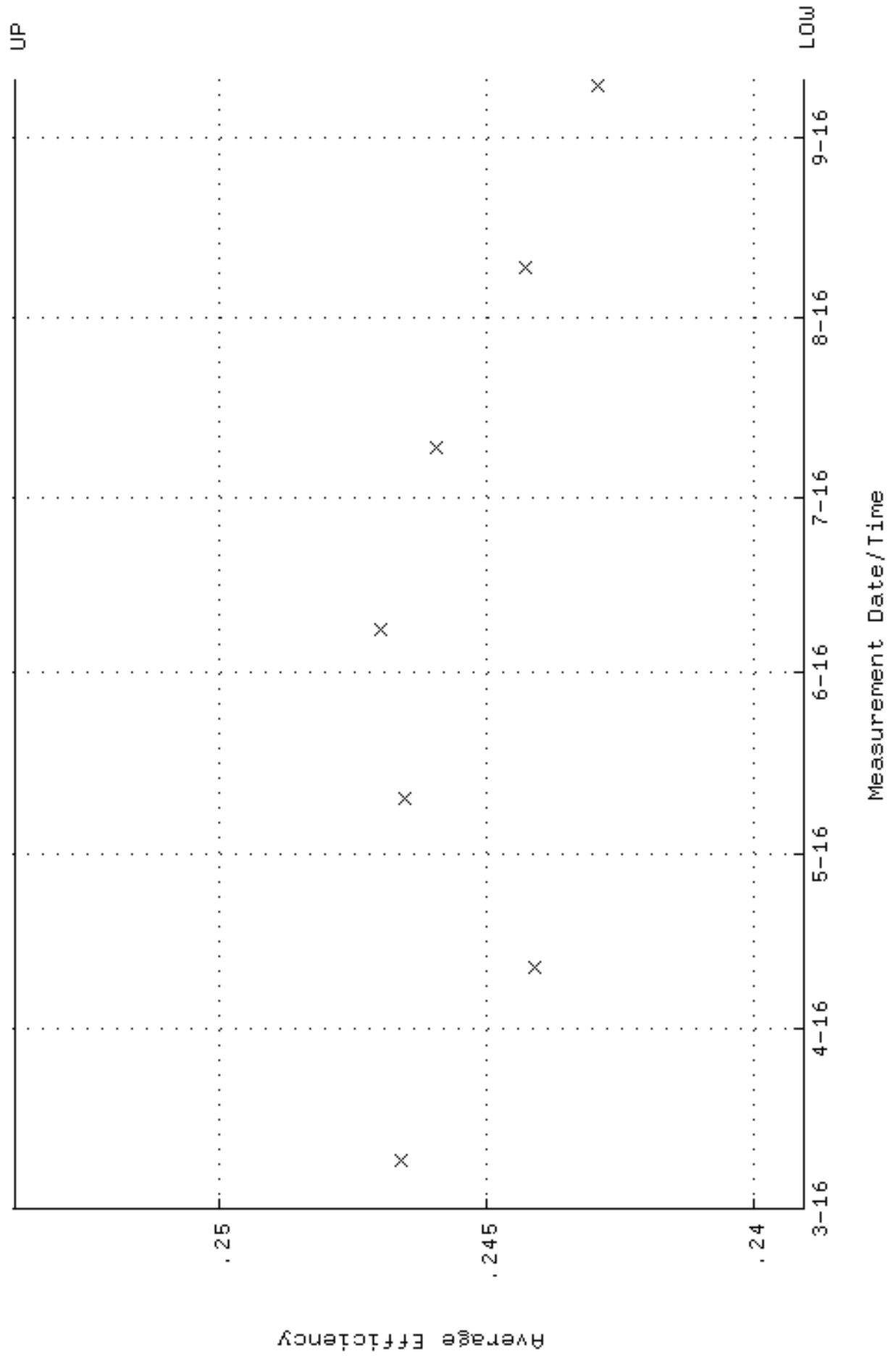
QA filename : DKA100:[ENV_ALPHA.QA.W]W150.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 9-MAR-2016 08:44:16 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



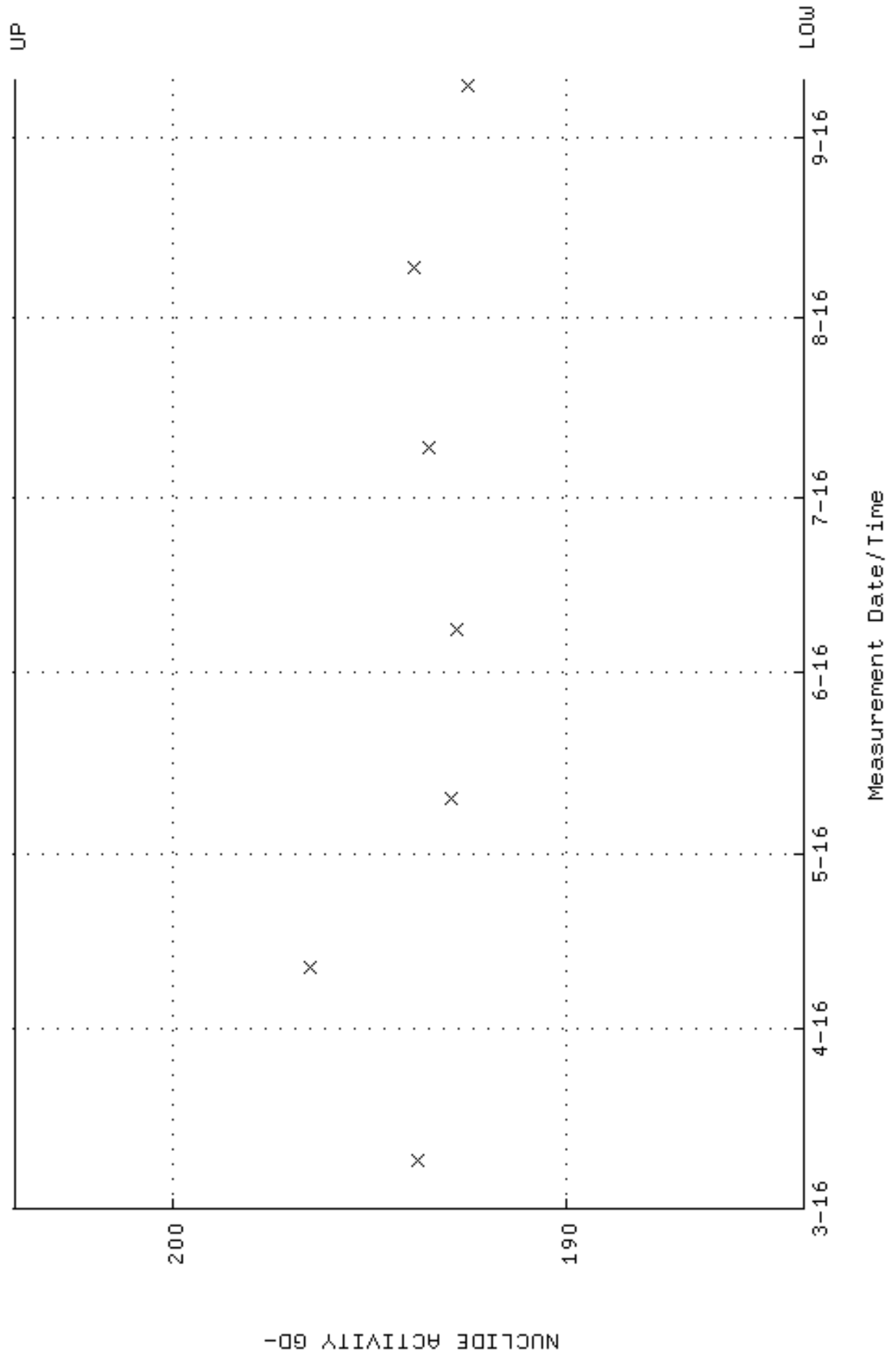
QA filename : DKA100:[ENV_ALPHA.QA.B]B150.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:44:38 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



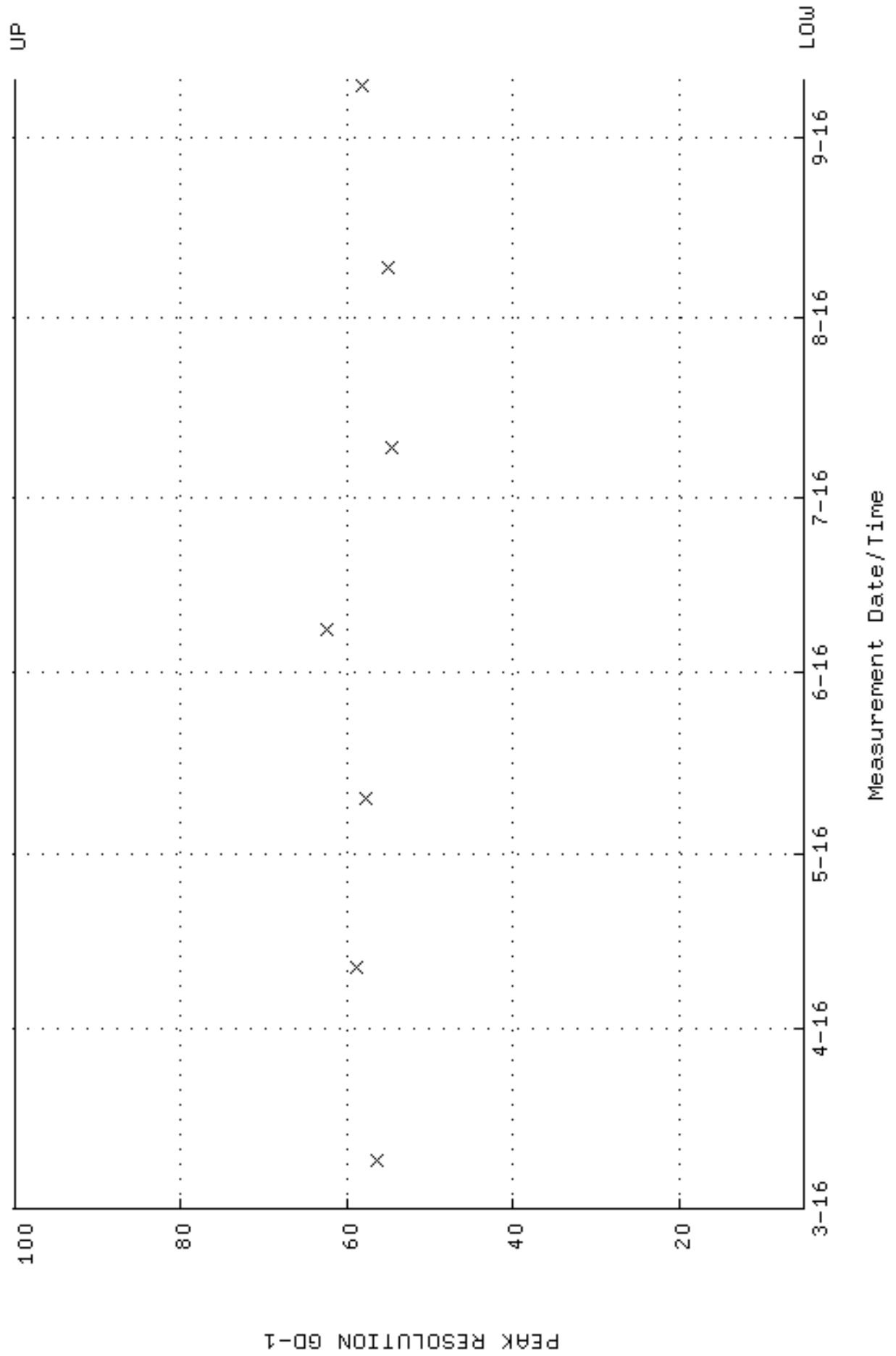
QA filename : DKA100:[ENV_ALPHA.QA.W]W152.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 9-MAR-2016 08:44:31 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.239046 through 0.253832



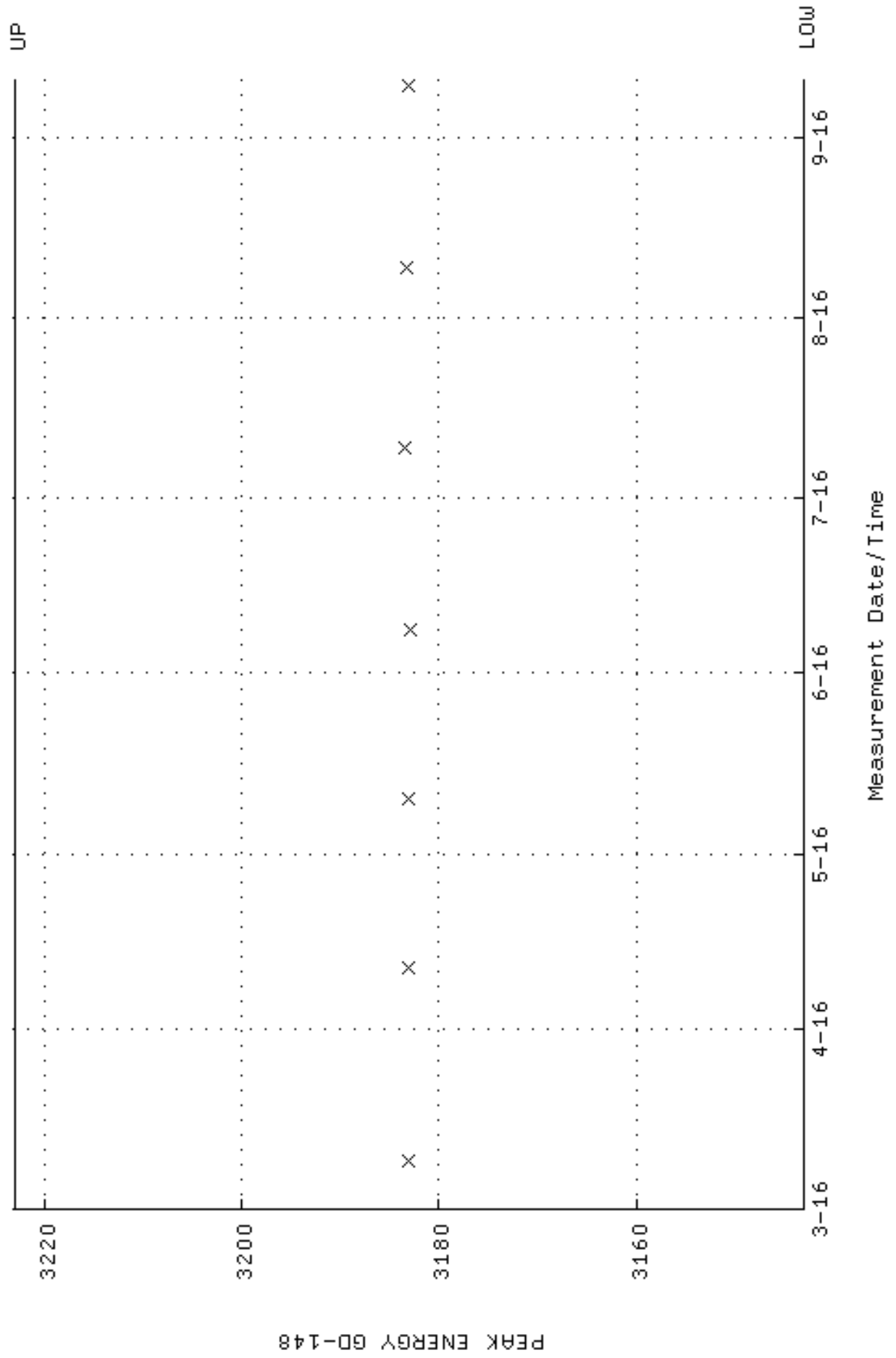
QA filename : DKA100:[ENV_ALPHA.QA.W]W152.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 9-MAR-2016 08:44:31 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



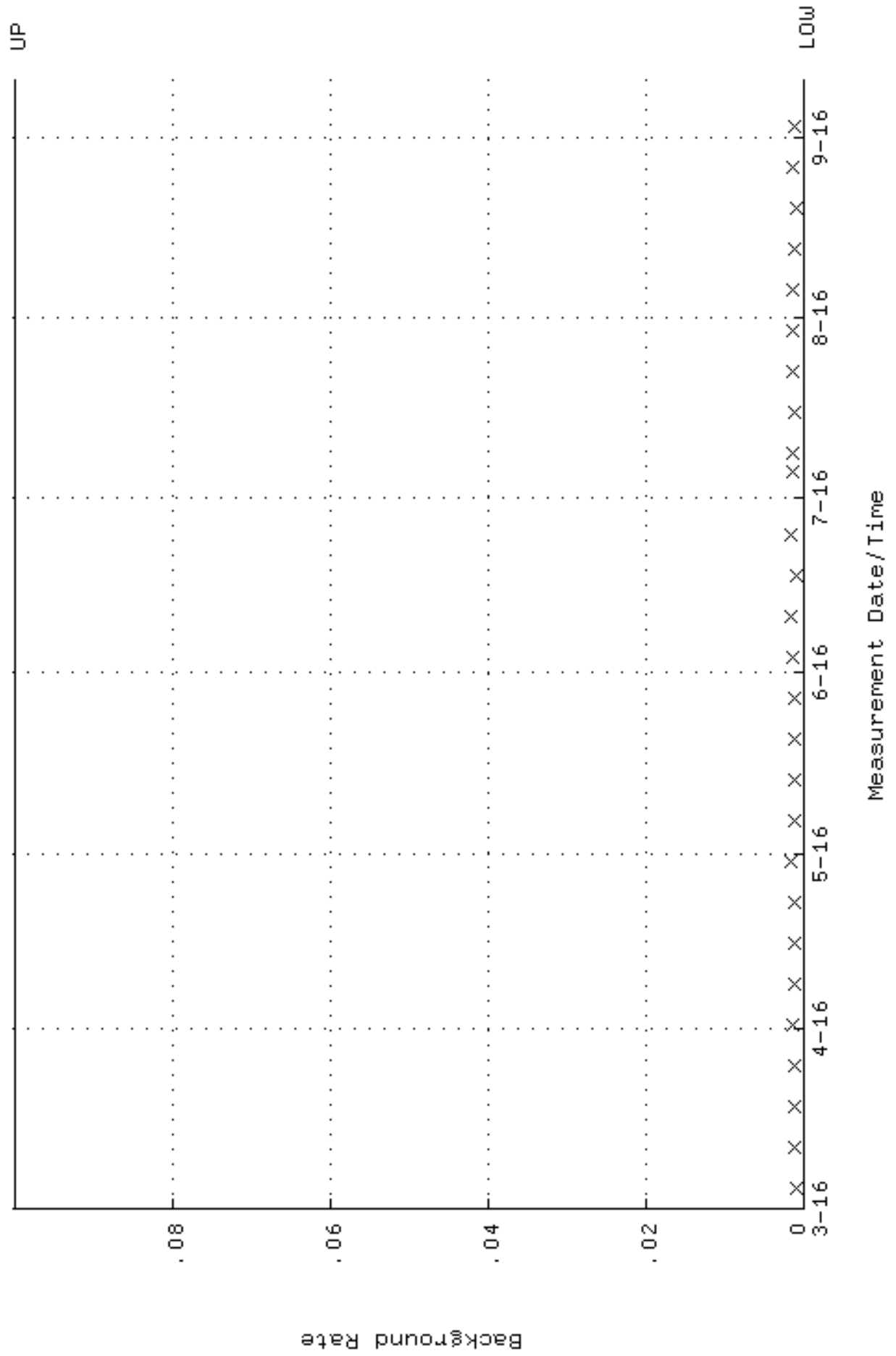
QA filename : DKA100:[ENV_ALPHA.QA.W]W152.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 9-MAR-2016 08:44:31 through 10-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



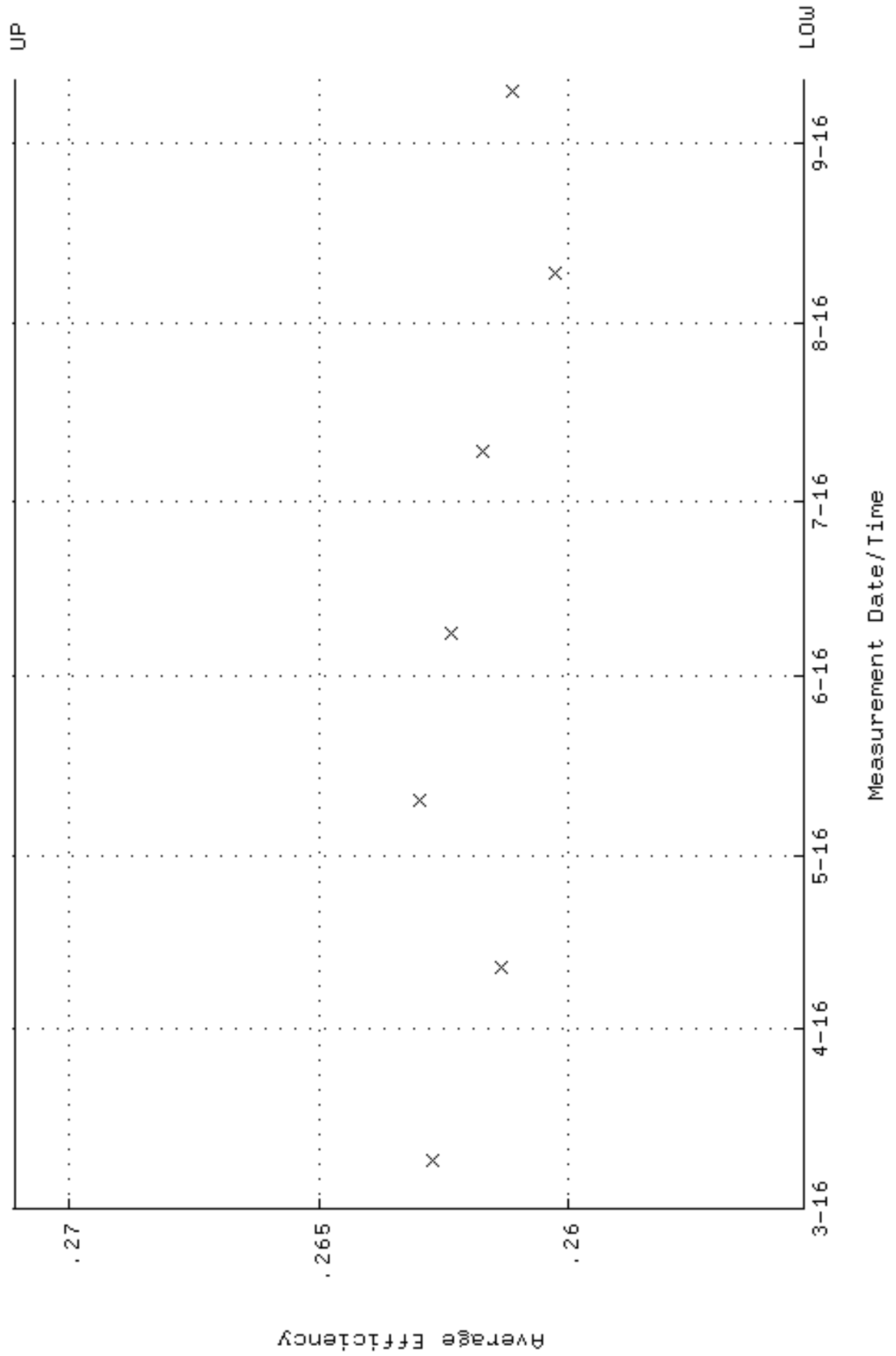
QA filename : DKA100:[ENV_ALPHA.QA.W]W152.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 9-MAR-2016 08:44:31 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



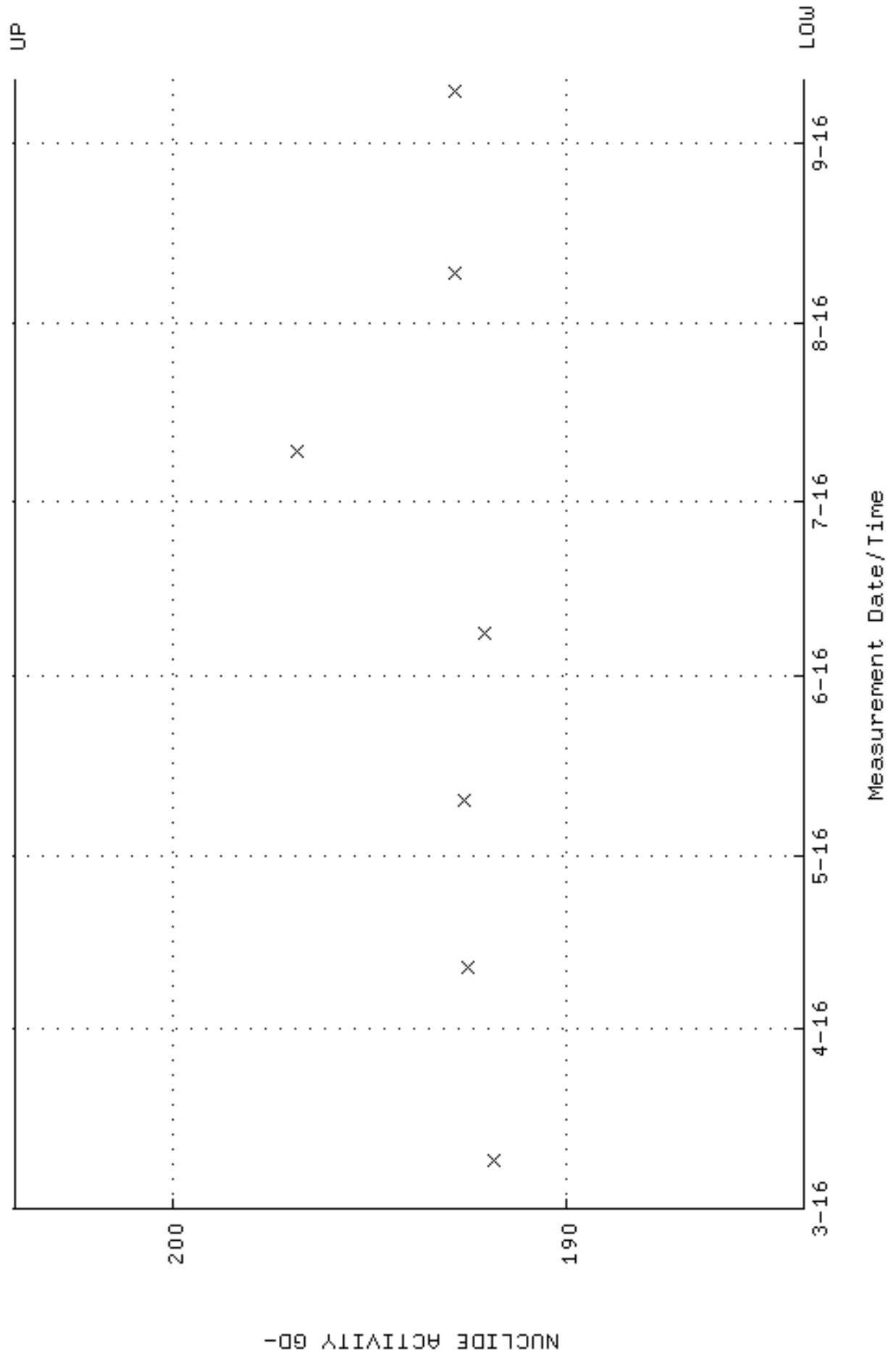
QA filename : DKA100:[ENV_ALPHA.QA.B]B152.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:44:46 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



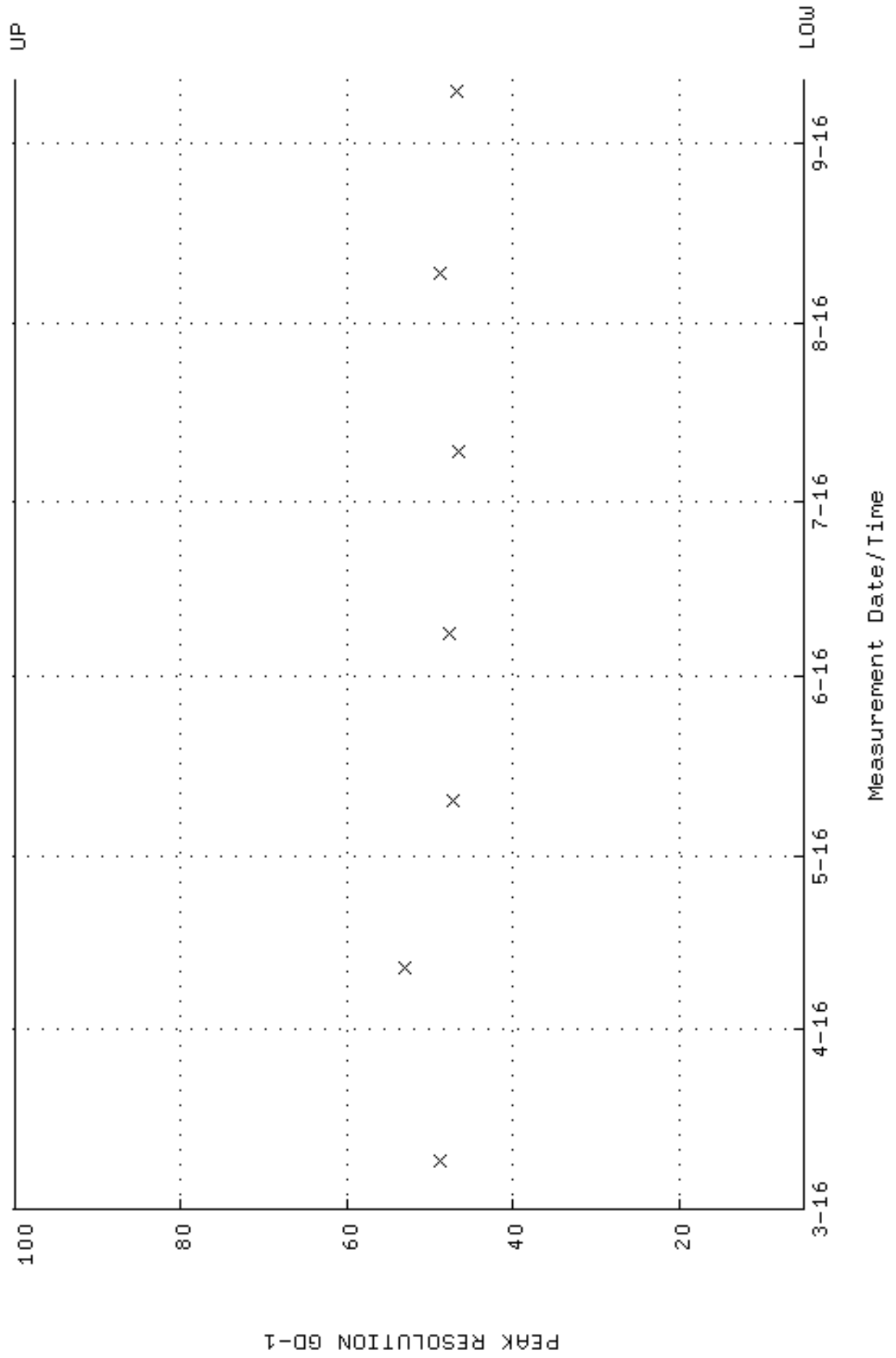
QA filename : DKA100:[ENV_ALPHA.QA.W]W154.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 9-MAR-2016 08:44:45 through 11-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.255298 through 0.271090



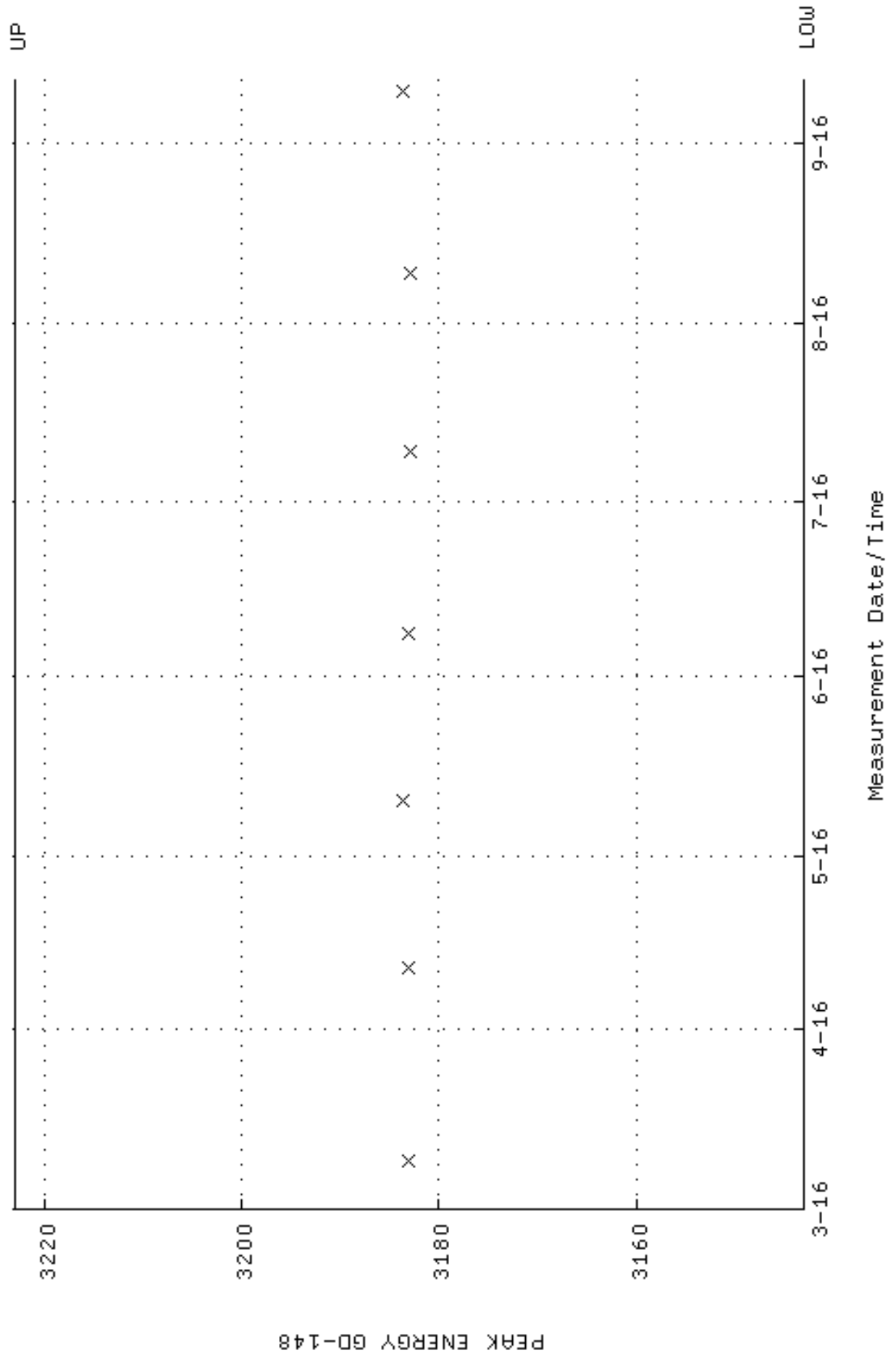
QA filename : DKA100:[ENV_ALPHA.QA.W]W154.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 9-MAR-2016 08:44:45 through 11-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



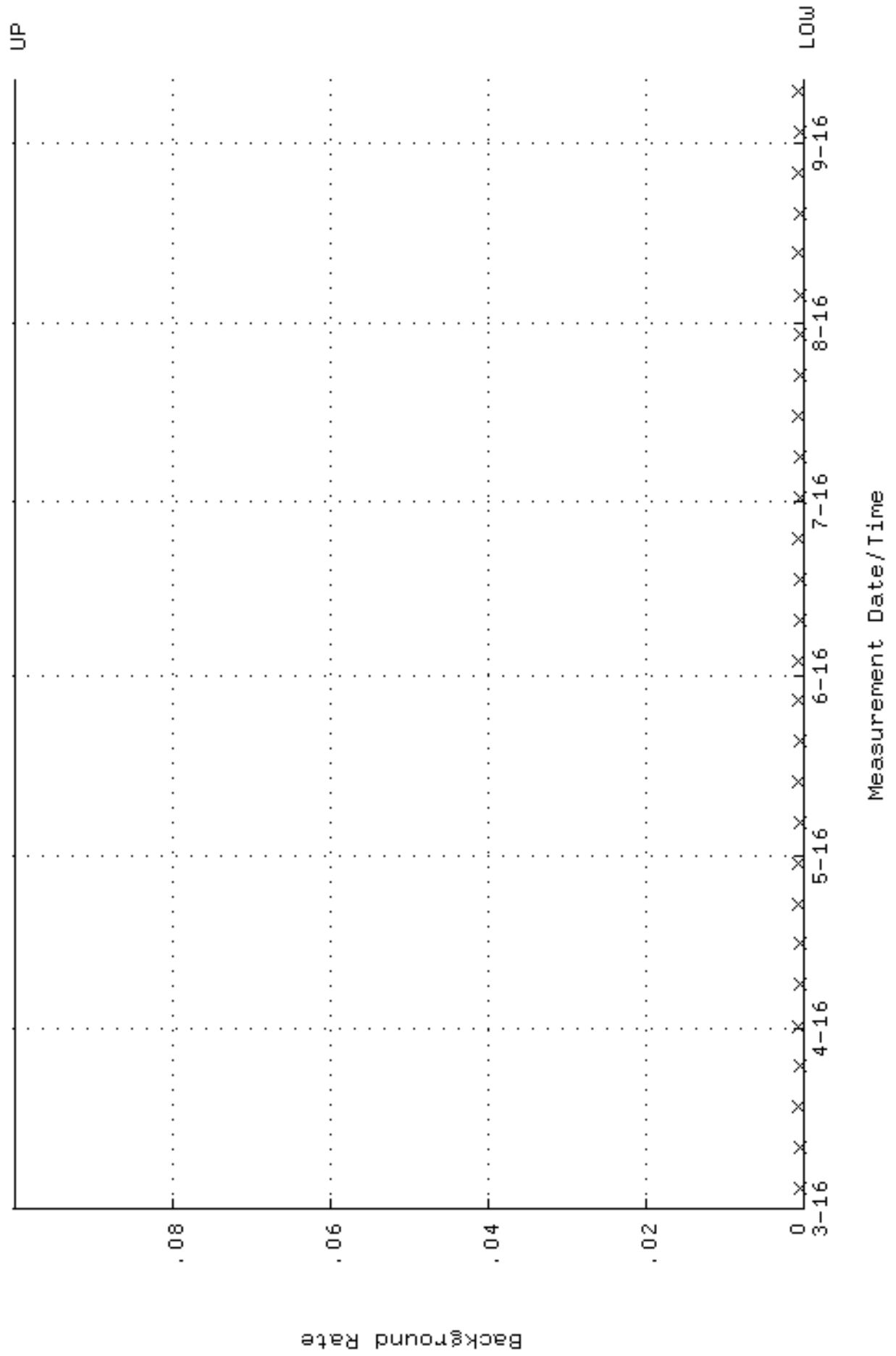
QA filename : DKA100:[ENV_ALPHA.QA.W]W154.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 9-MAR-2016 08:44:45 through 11-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



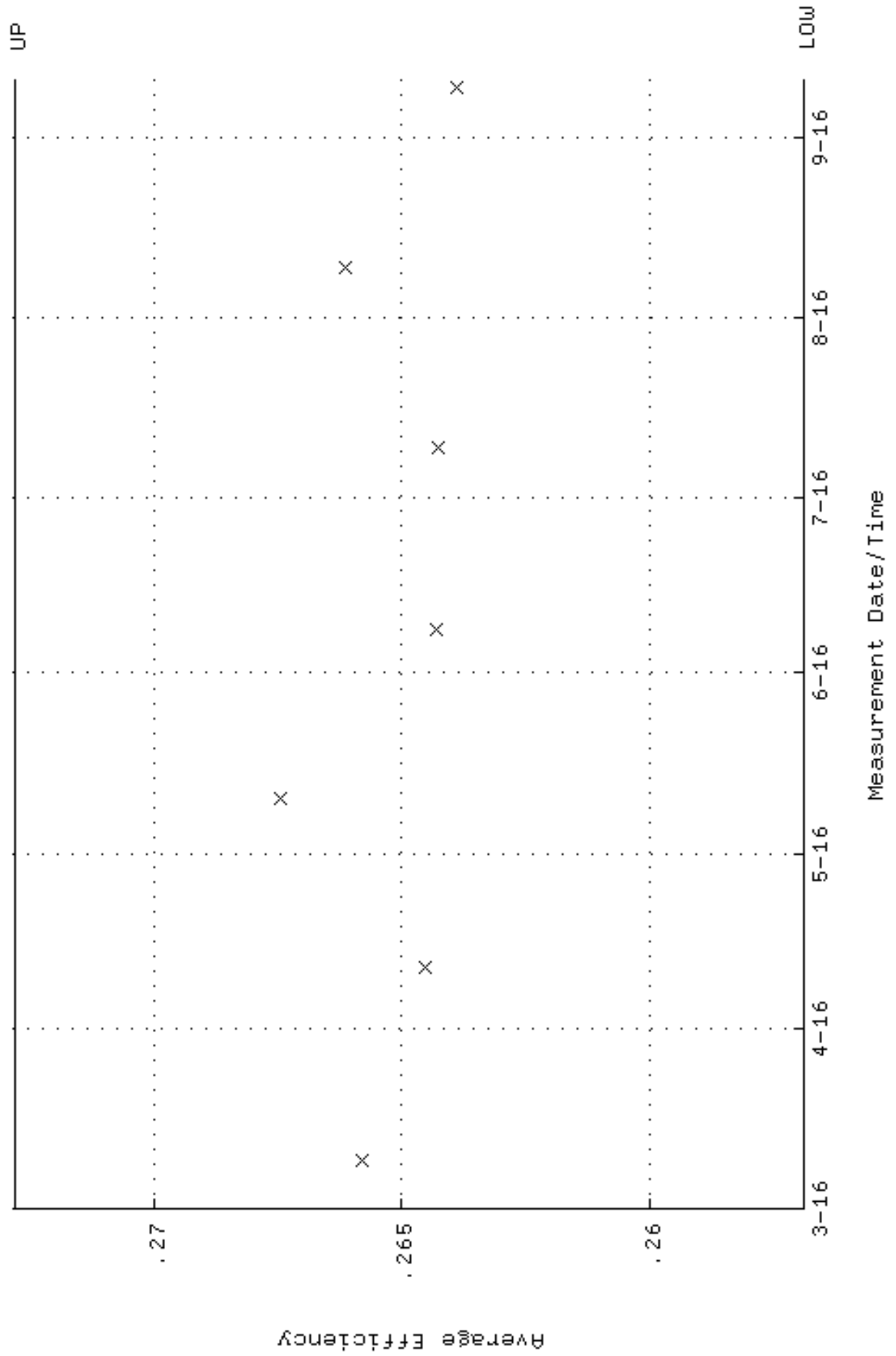
QA filename : DKA100:[ENV_ALPHA.QA.W]W154.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 9-MAR-2016 08:44:45 through 11-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



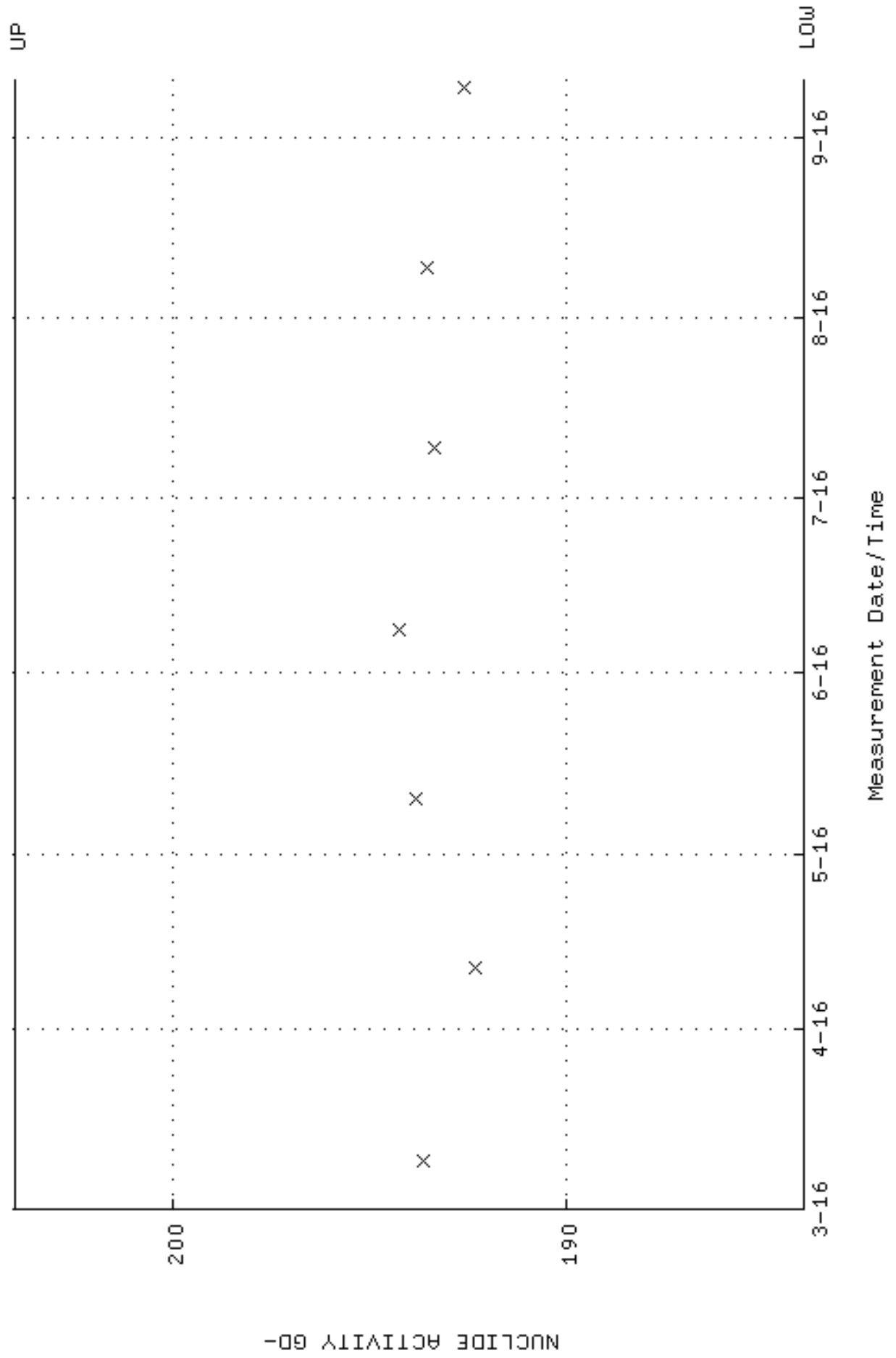
QA filename : DKA100:[ENV_ALPHA.QA.B]B154.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:44:56 through 11-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



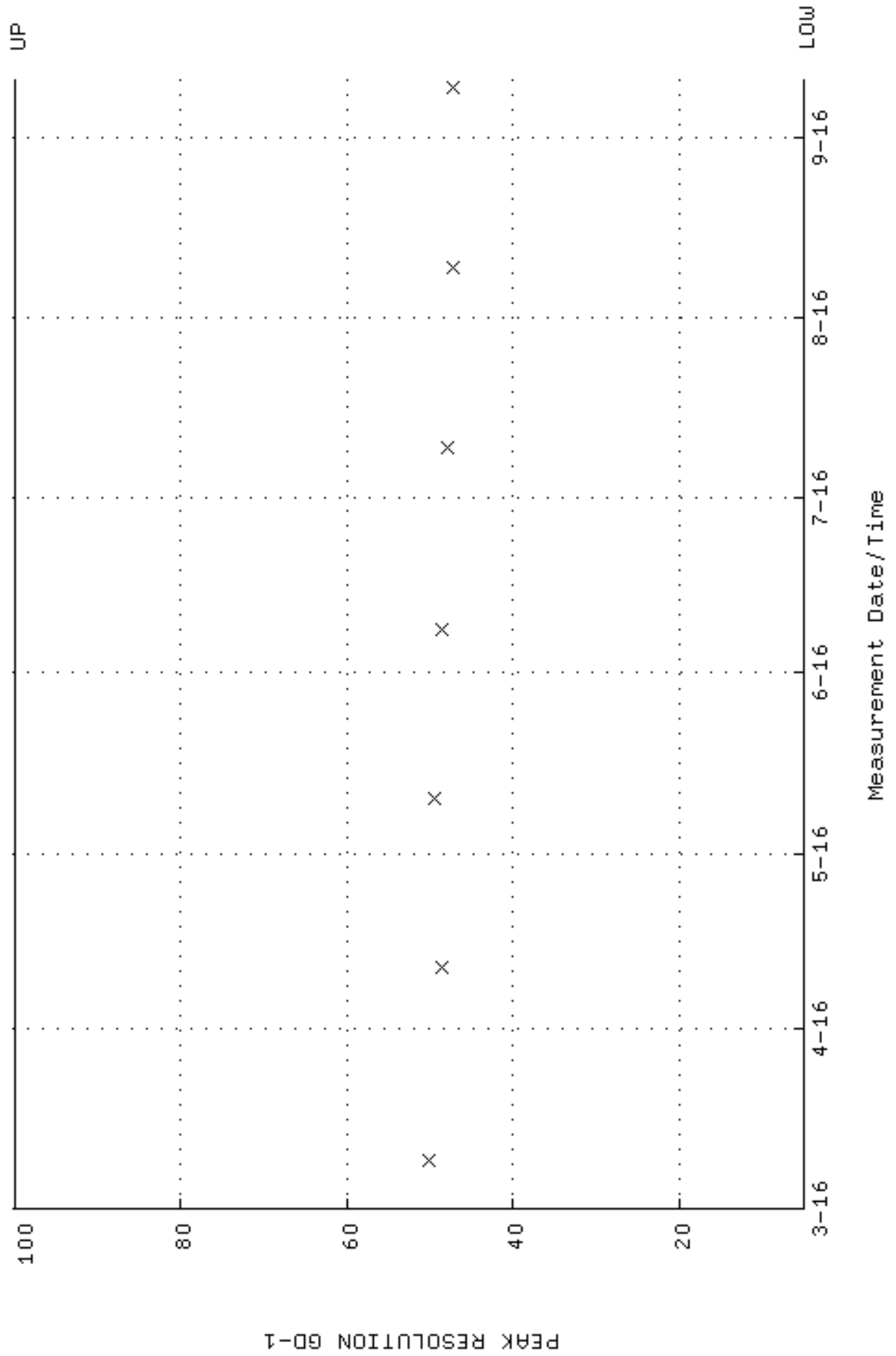
QA filename : DKA100:[ENV_ALPHA.QA.W]W155.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 9-MAR-2016 08:44:52 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.256904 through 0.272794



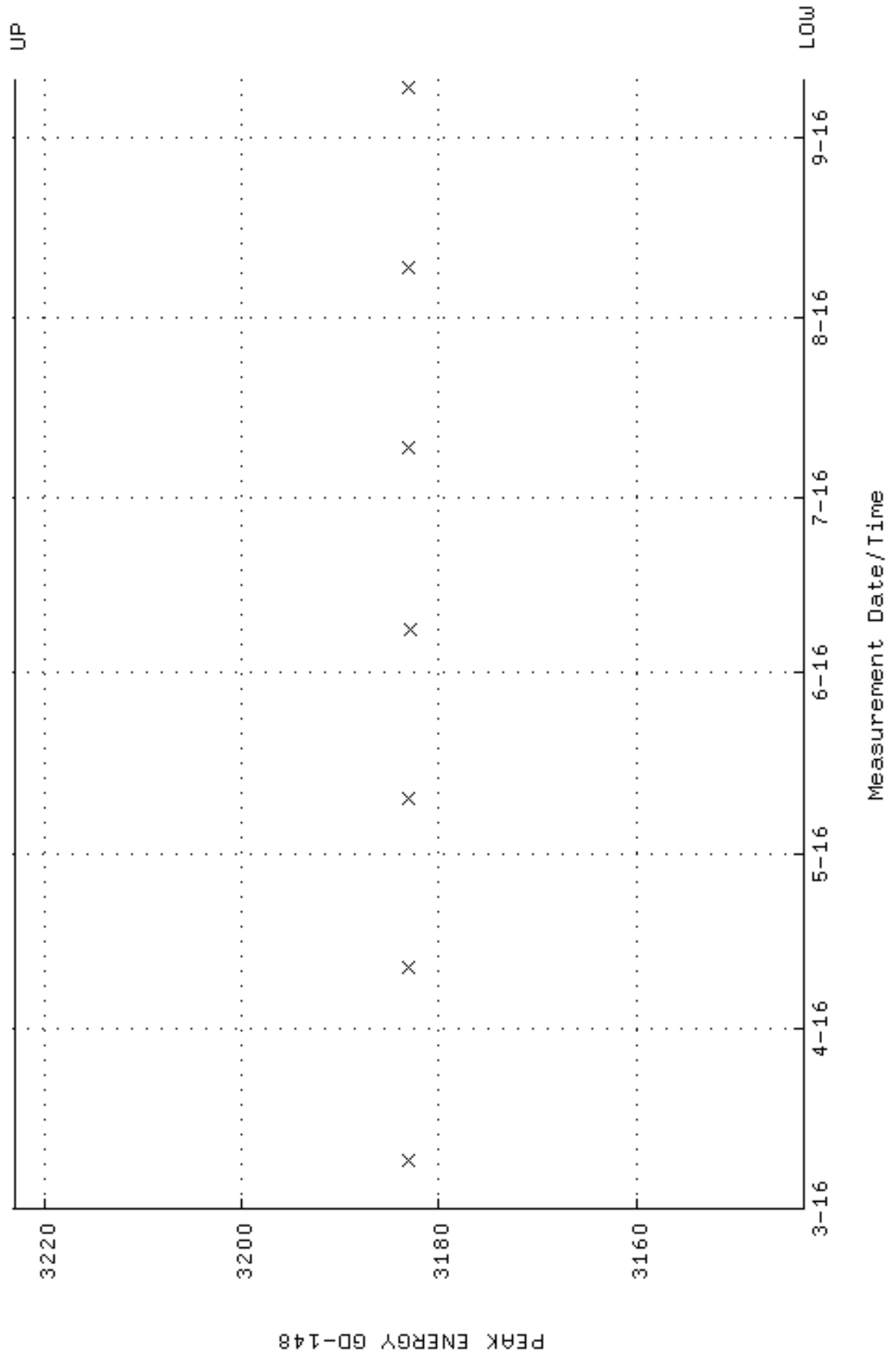
QA filename : DKA100:[ENV_ALPHA.QA.W]W155.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 9-MAR-2016 08:44:52 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



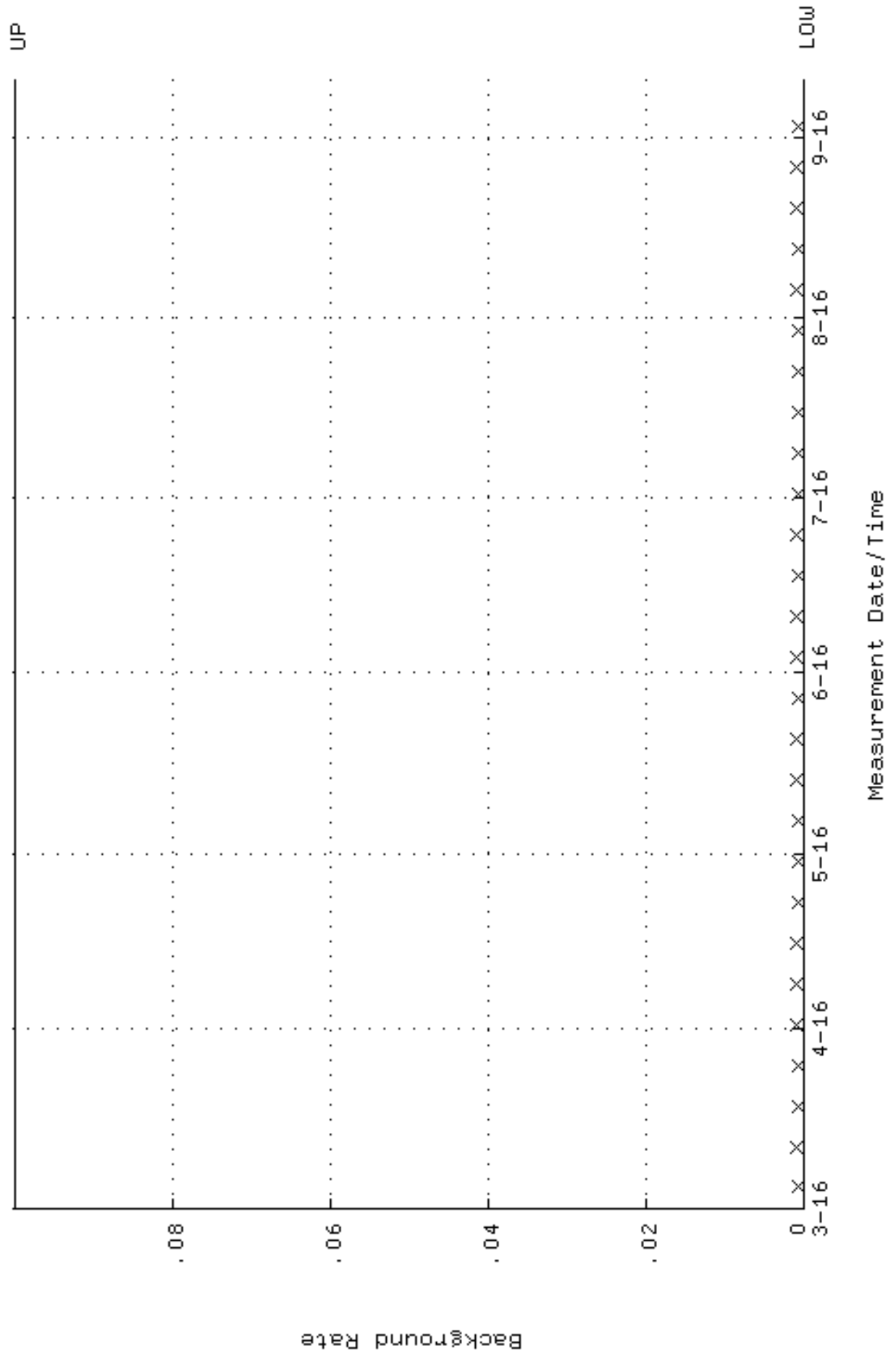
QA filename : DKA100:[ENV_ALPHA.QA.W]W155.QAF;3
 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 9-MAR-2016 08:44:52 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.0000



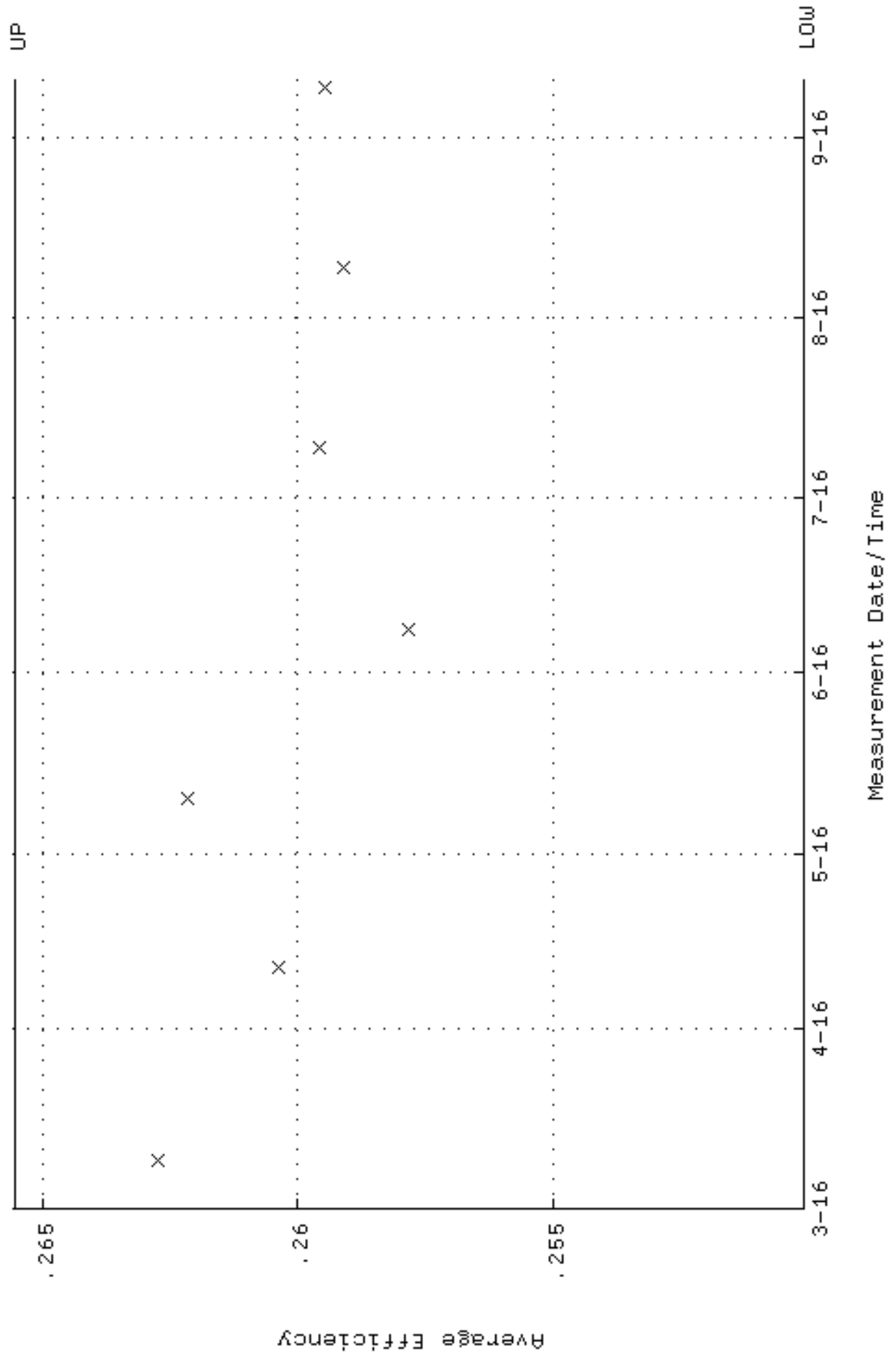
QA filename : DKA100:[ENV_ALPHA.QA.W]W155.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 9-MAR-2016 08:44:52 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



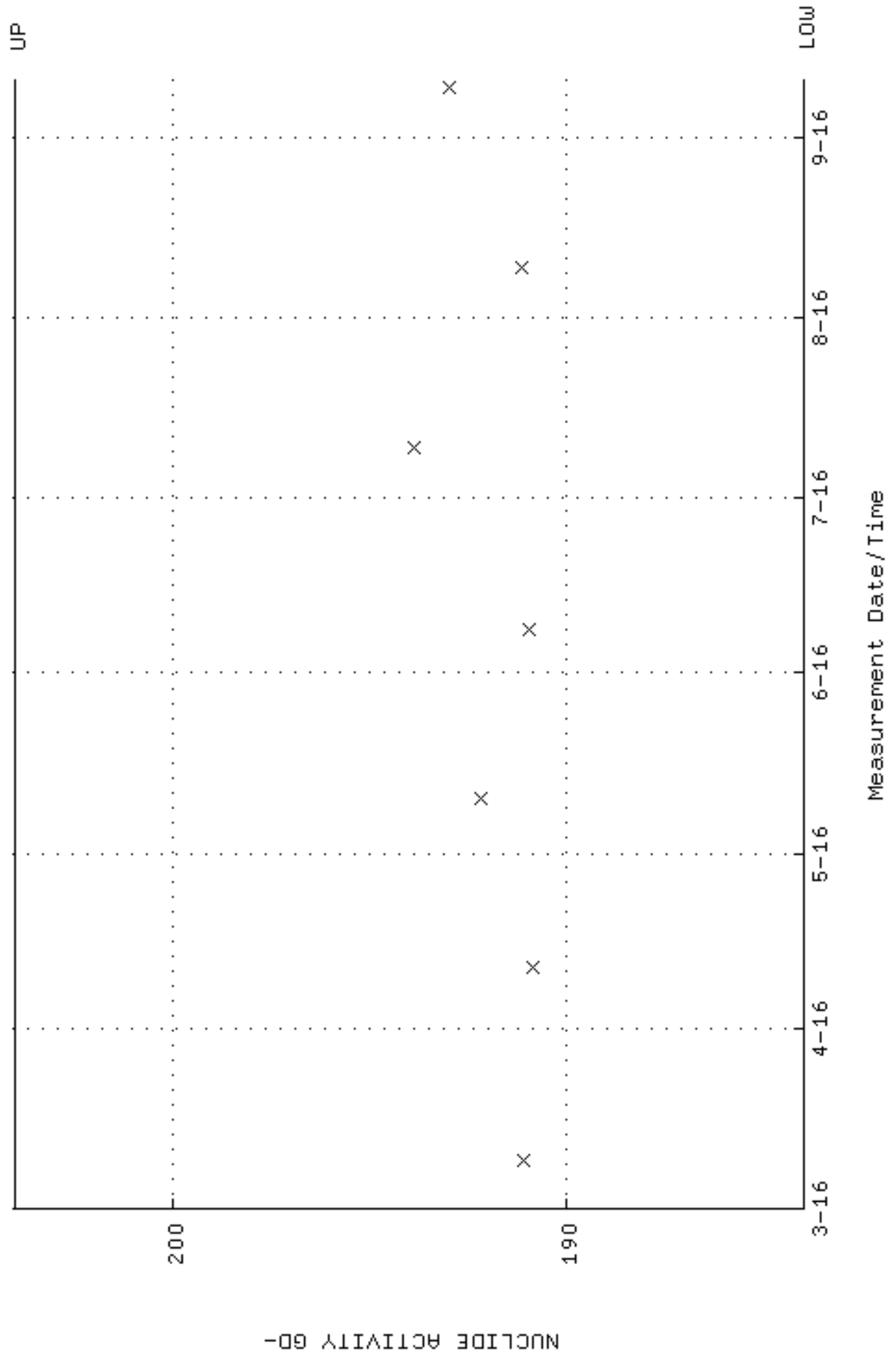
QA filename : DKA100:[ENV_ALPHA.QA.B]B155.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:22:49 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



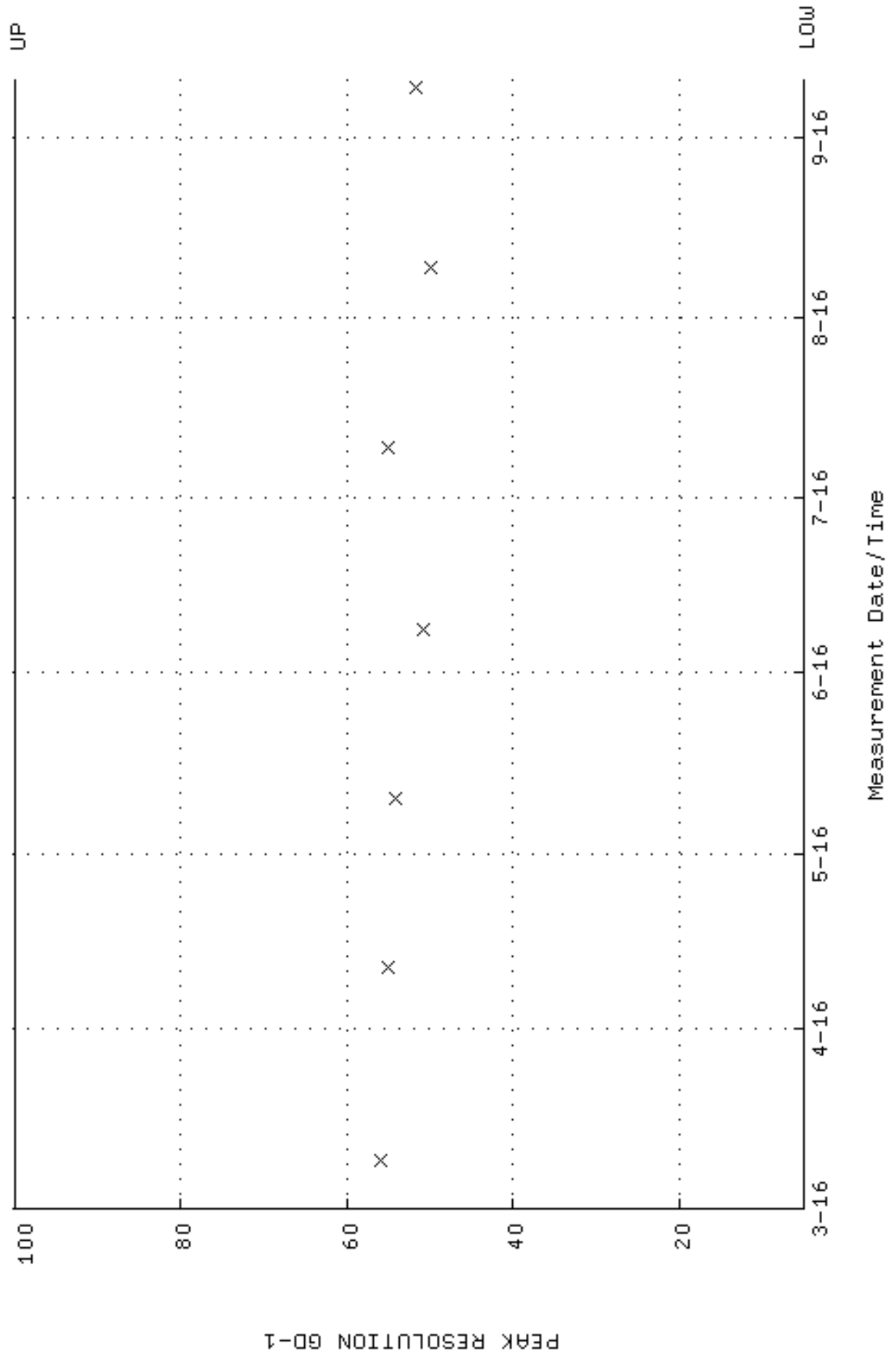
QA filename : DKA100:[ENV_ALPHA.QA.W]W156.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 9-MAR-2016 08:44:59 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.250080 through 0.265548



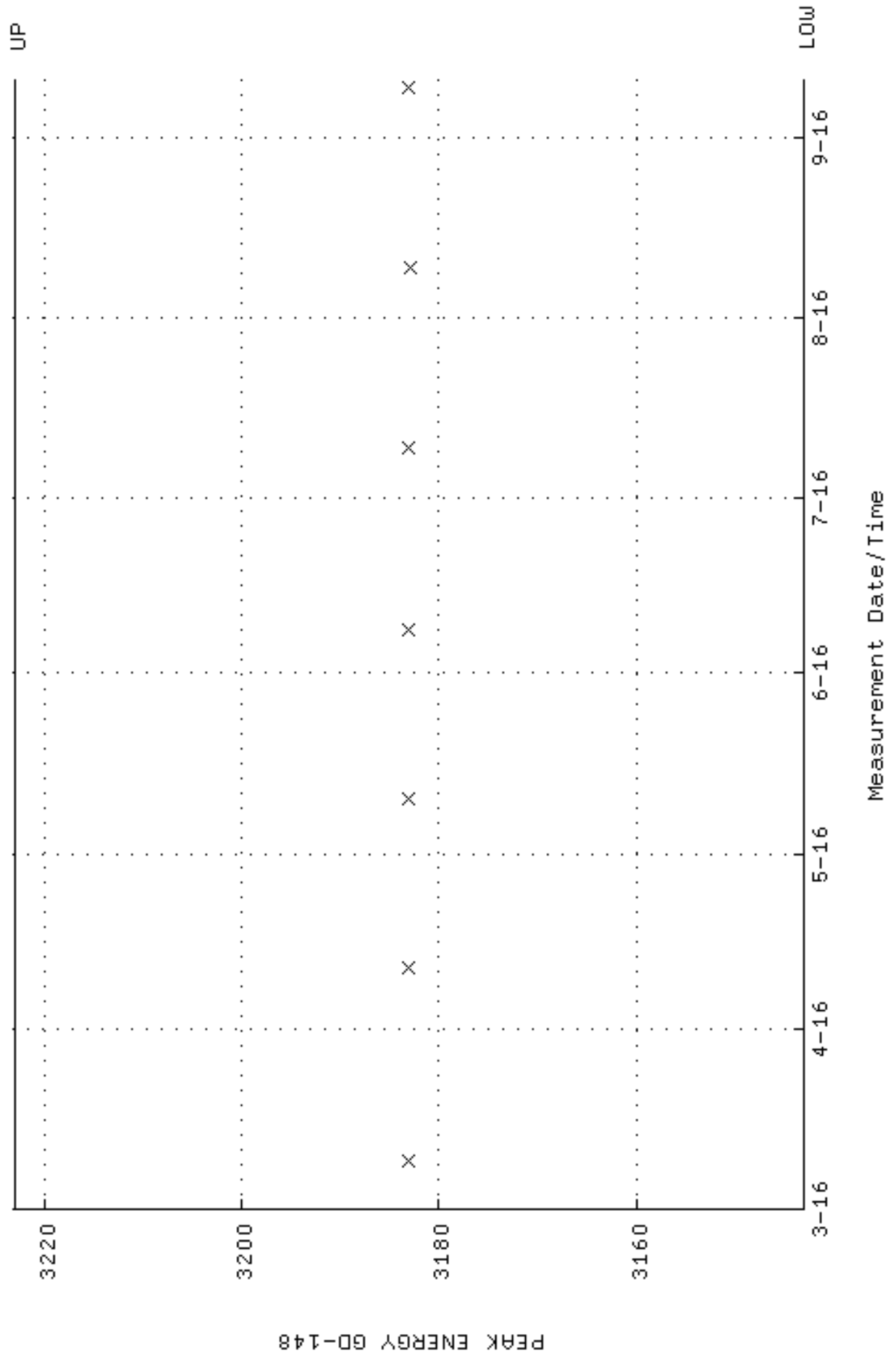
QA filename : DKA100:[ENV_ALPHA.QA.W]W156.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 9-MAR-2016 08:44:59 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



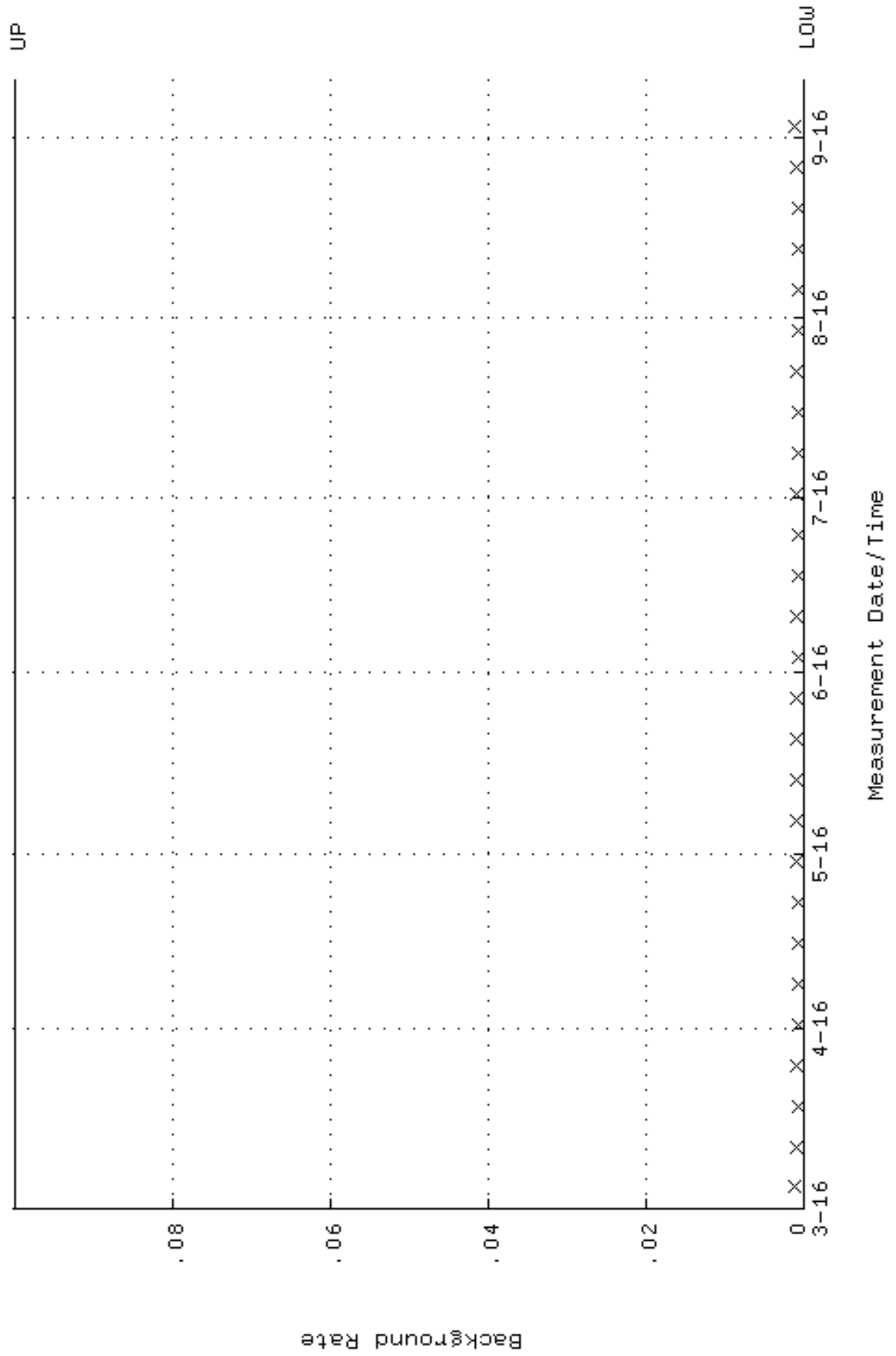
QA filename : DKA100:[ENV_ALPHA.QA.W]W156.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 9-MAR-2016 08:44:59 through 10-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



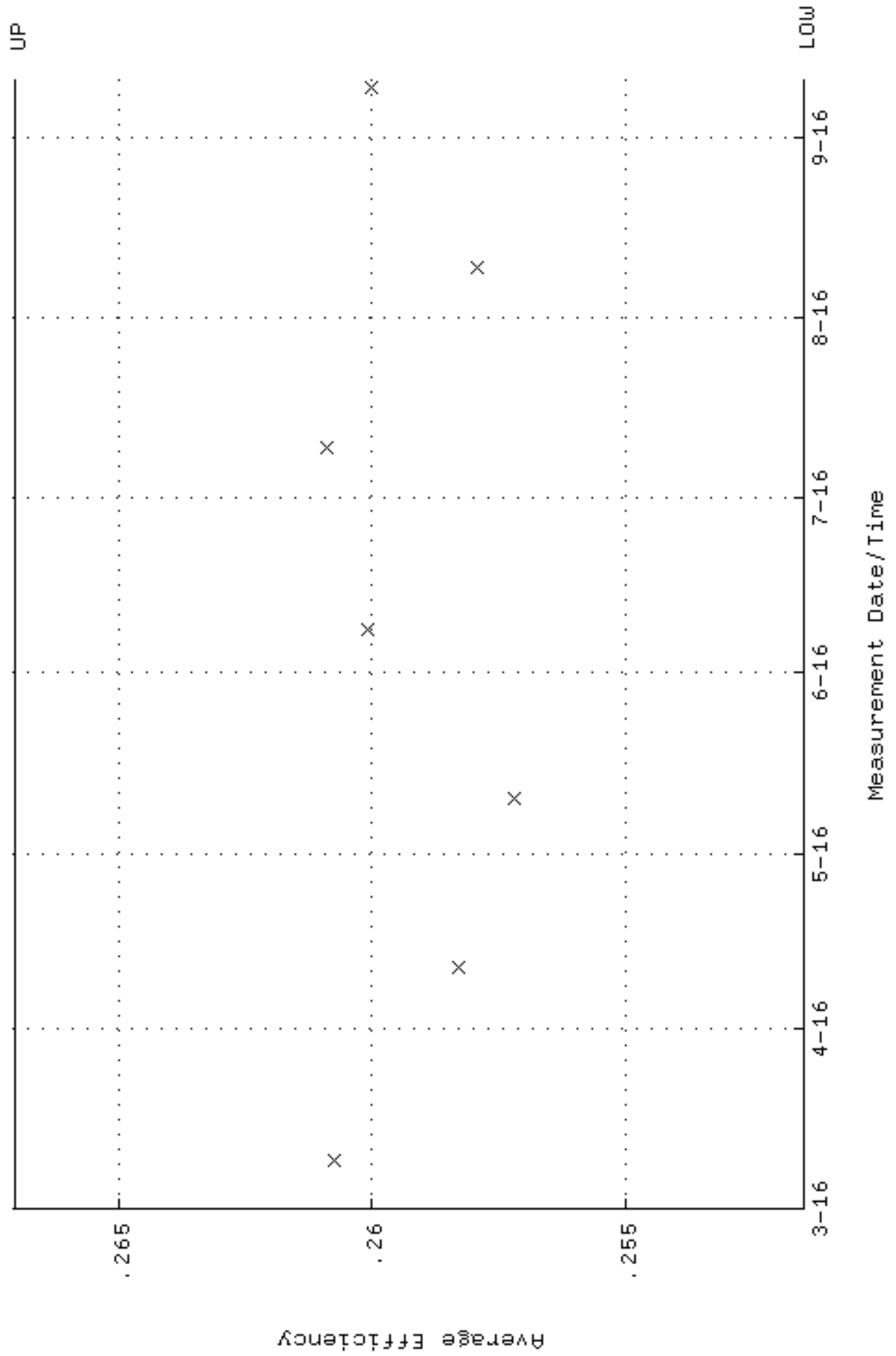
QA filename : DKA100:[ENV_ALPHA.QA.W]W156.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 9-MAR-2016 08:44:59 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



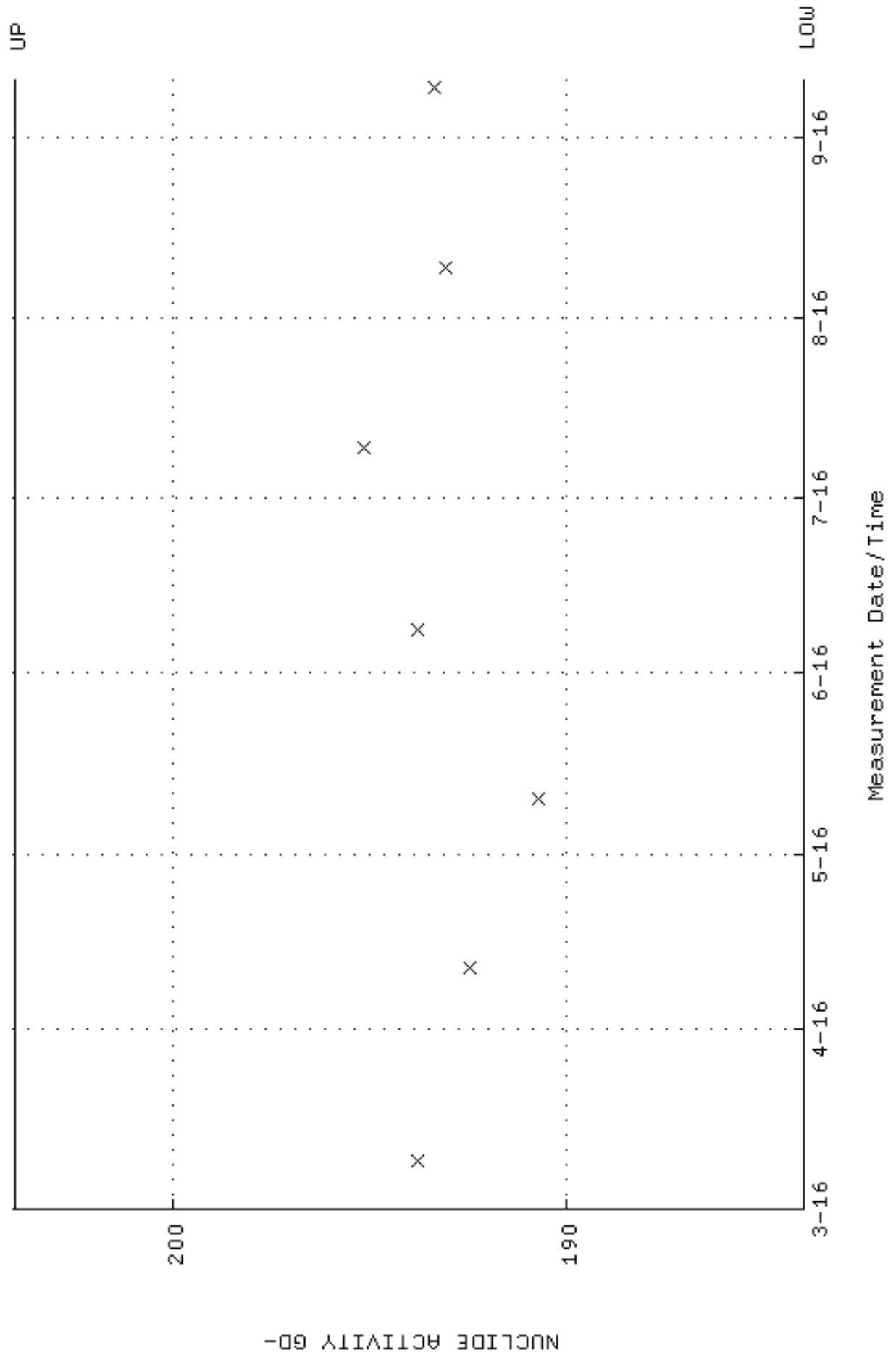
QA filename : DKA100:[ENV_ALPHA.QA.B]B156.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:22:54 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



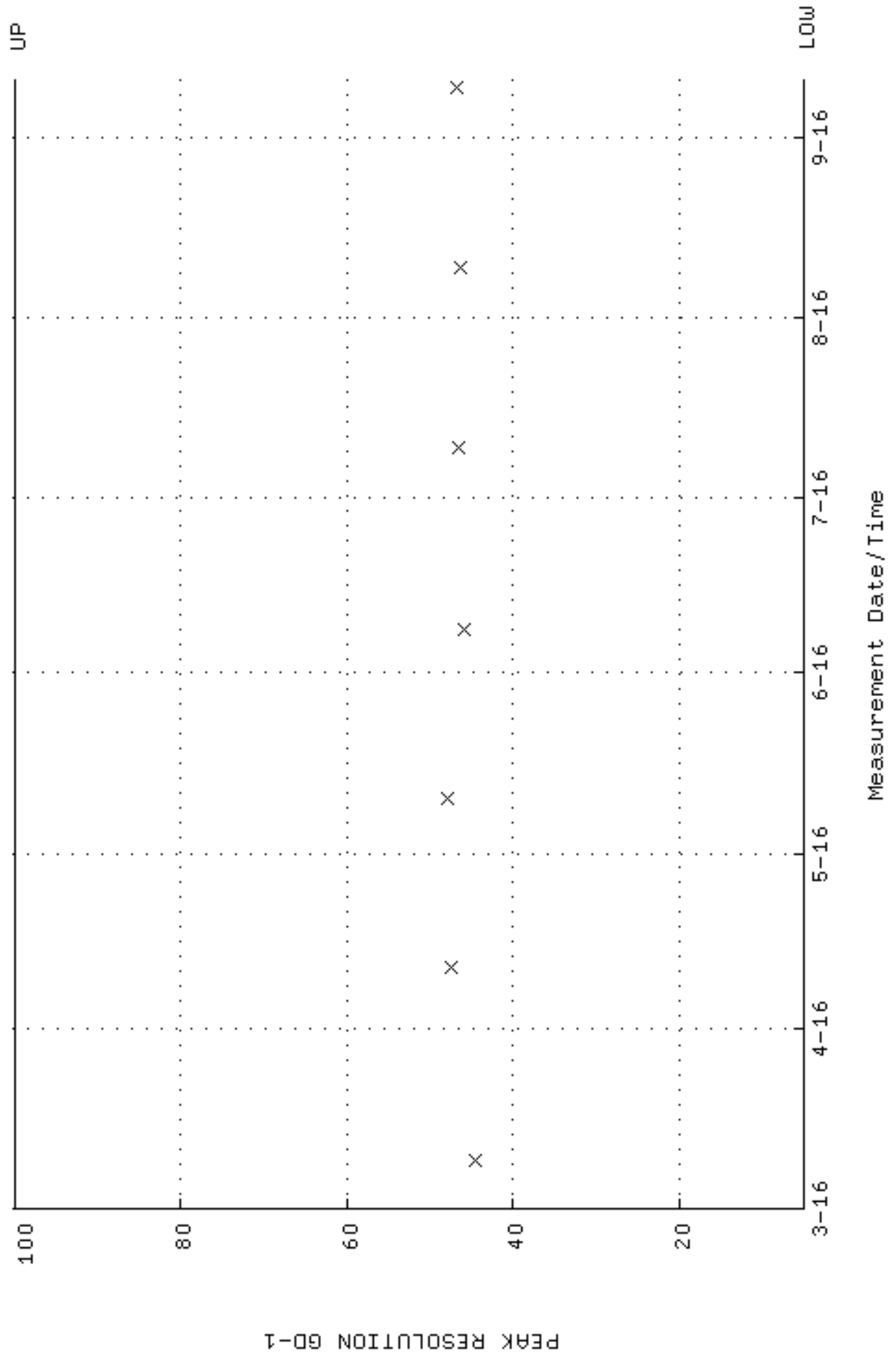
QA filename : DKA100:[ENV_ALPHA.QA.W]W157.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 9-MAR-2016 08:45:04 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.251488 through 0.267040



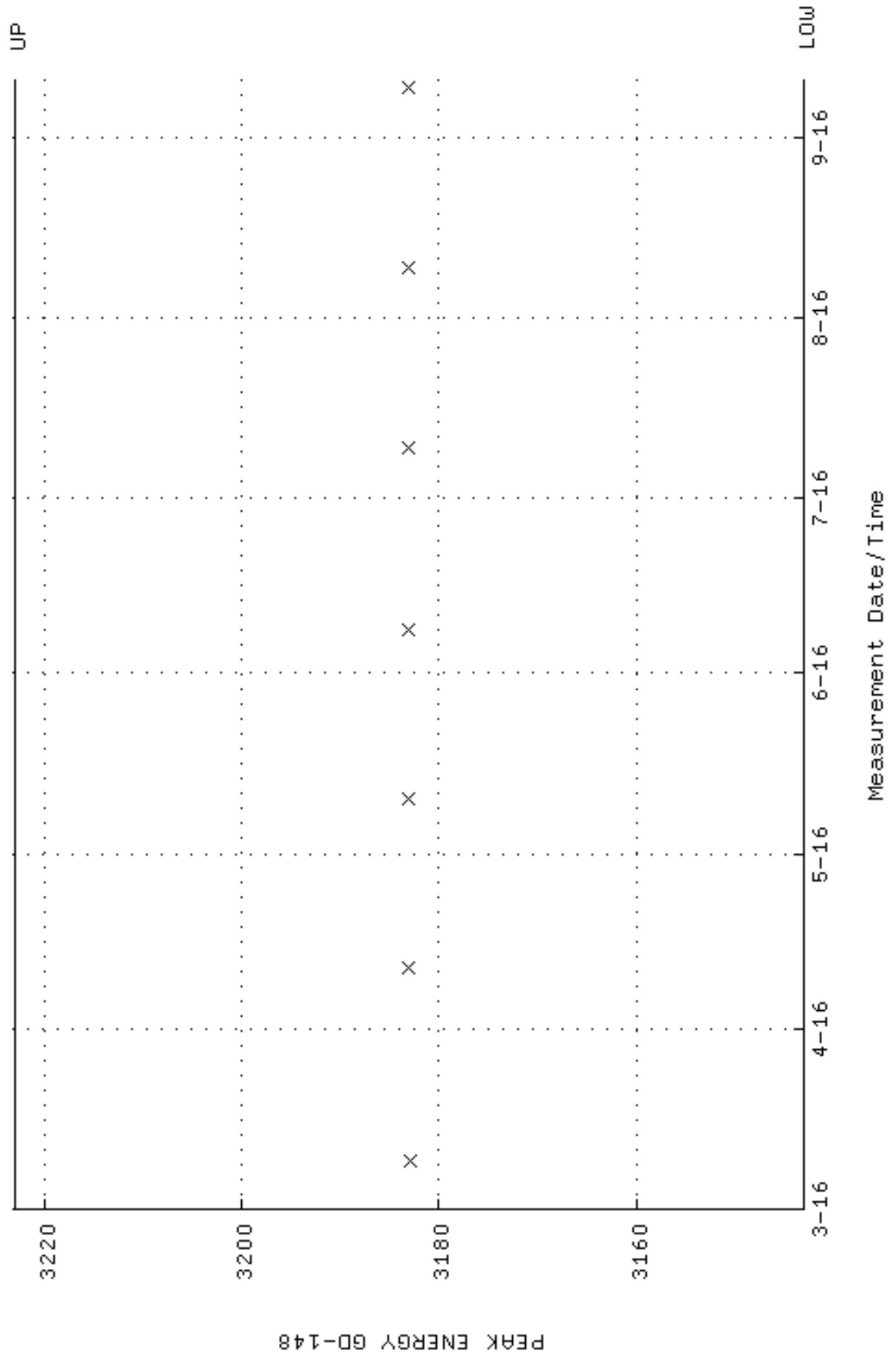
QA filename : DKA100:[ENV_ALPHA.QA.W]W157.QAF;3
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 9-MAR-2016 08:45:04 through 10-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



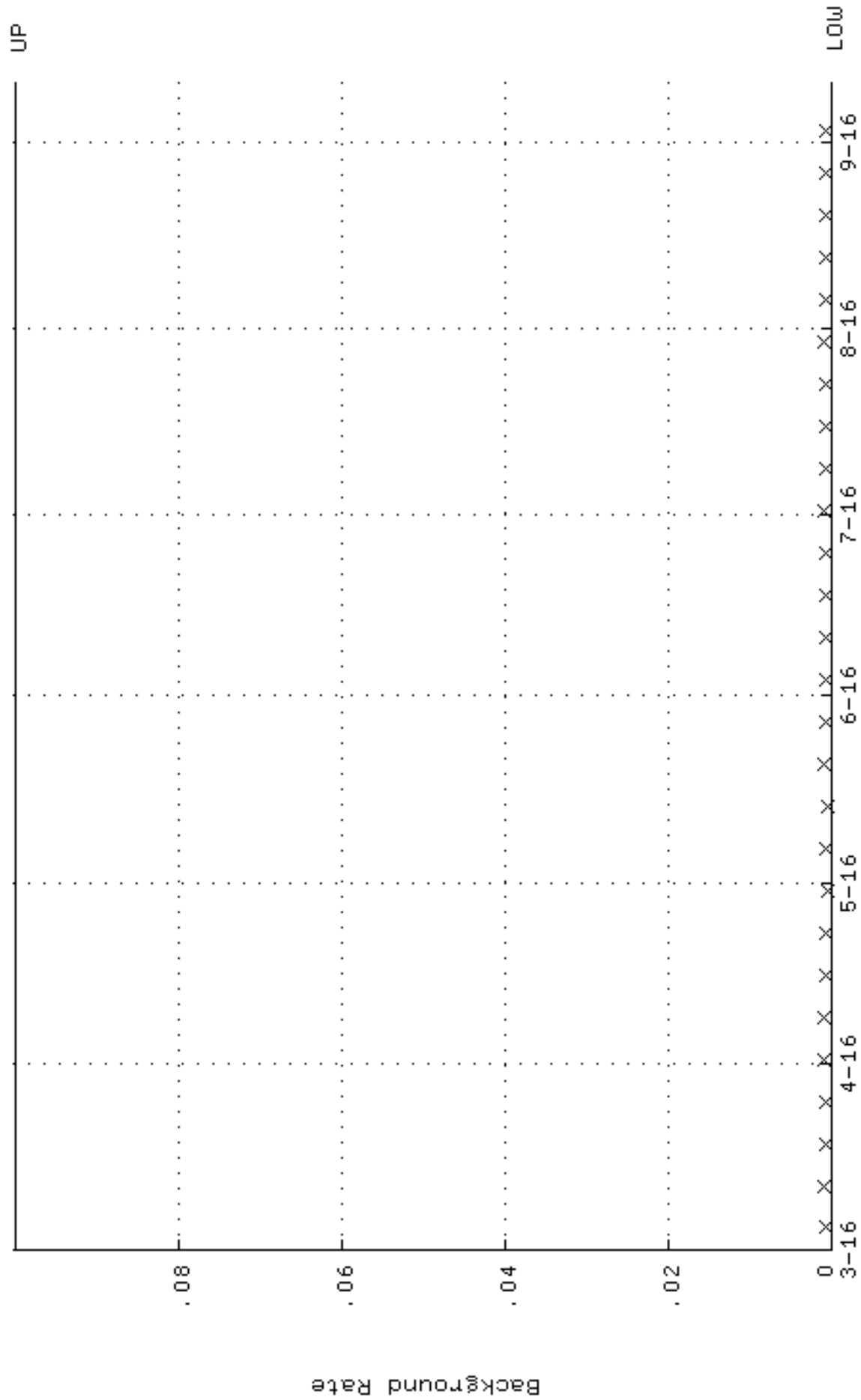
QA filename : DKA100:[ENV_ALPHA.QA.W]W157.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 9-MAR-2016 08:45:04 through 10-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



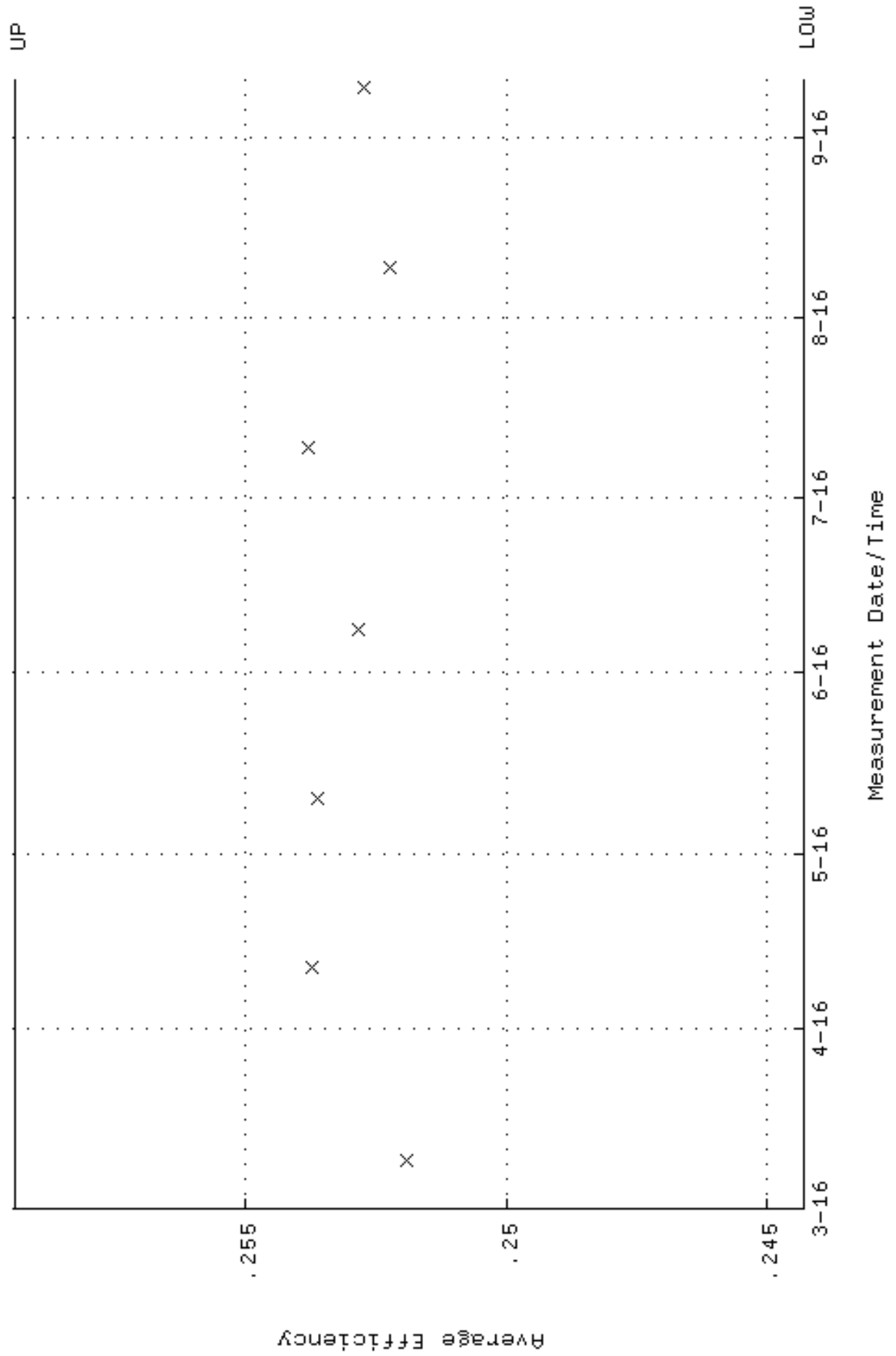
QA filename : DKA100:[ENV_ALPHA.QA.W]W157.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 9-MAR-2016 08:45:04 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



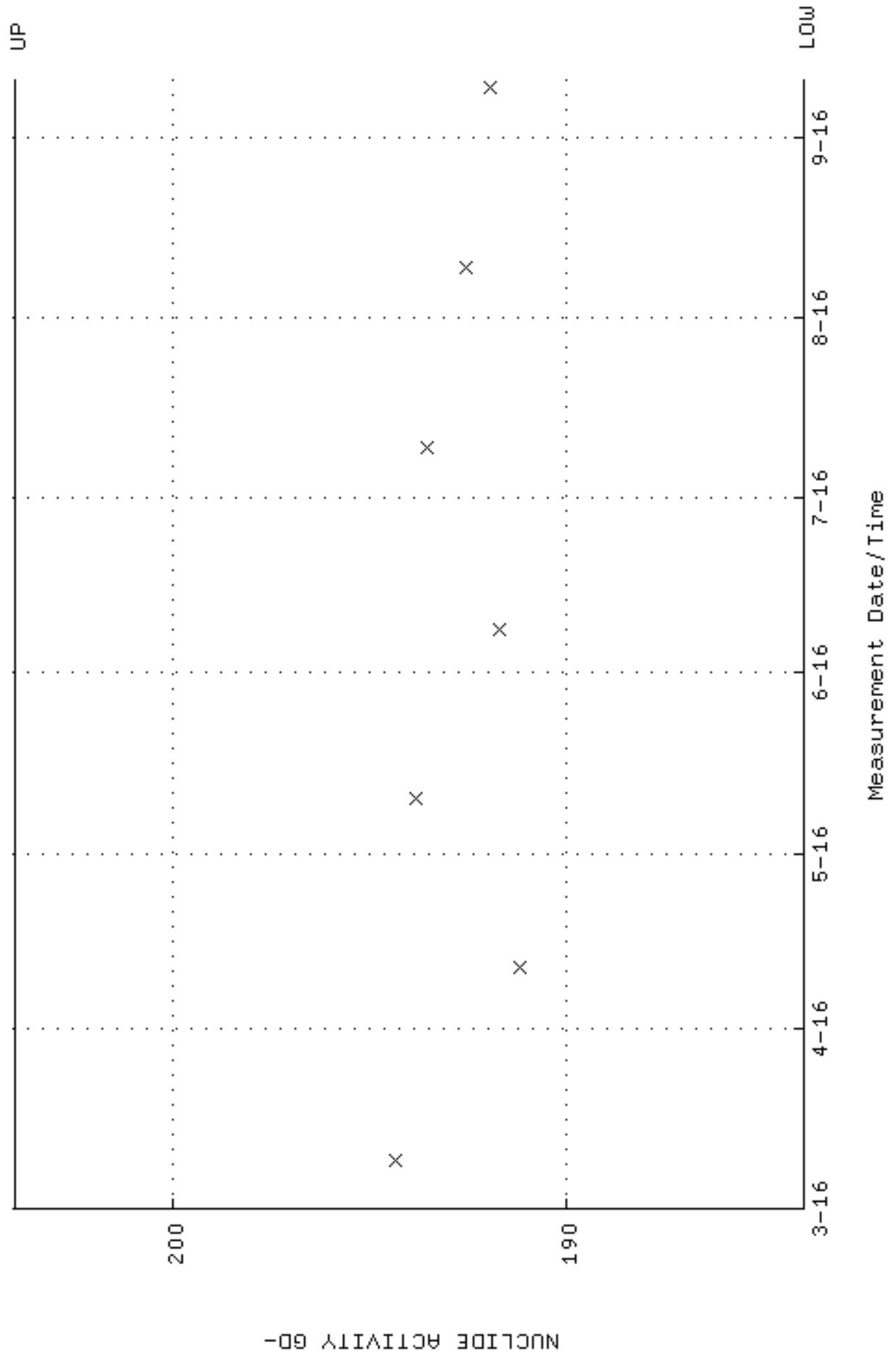
QA filename : DKA100:[ENV_ALPHA.QA.B]B157.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:22:59 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



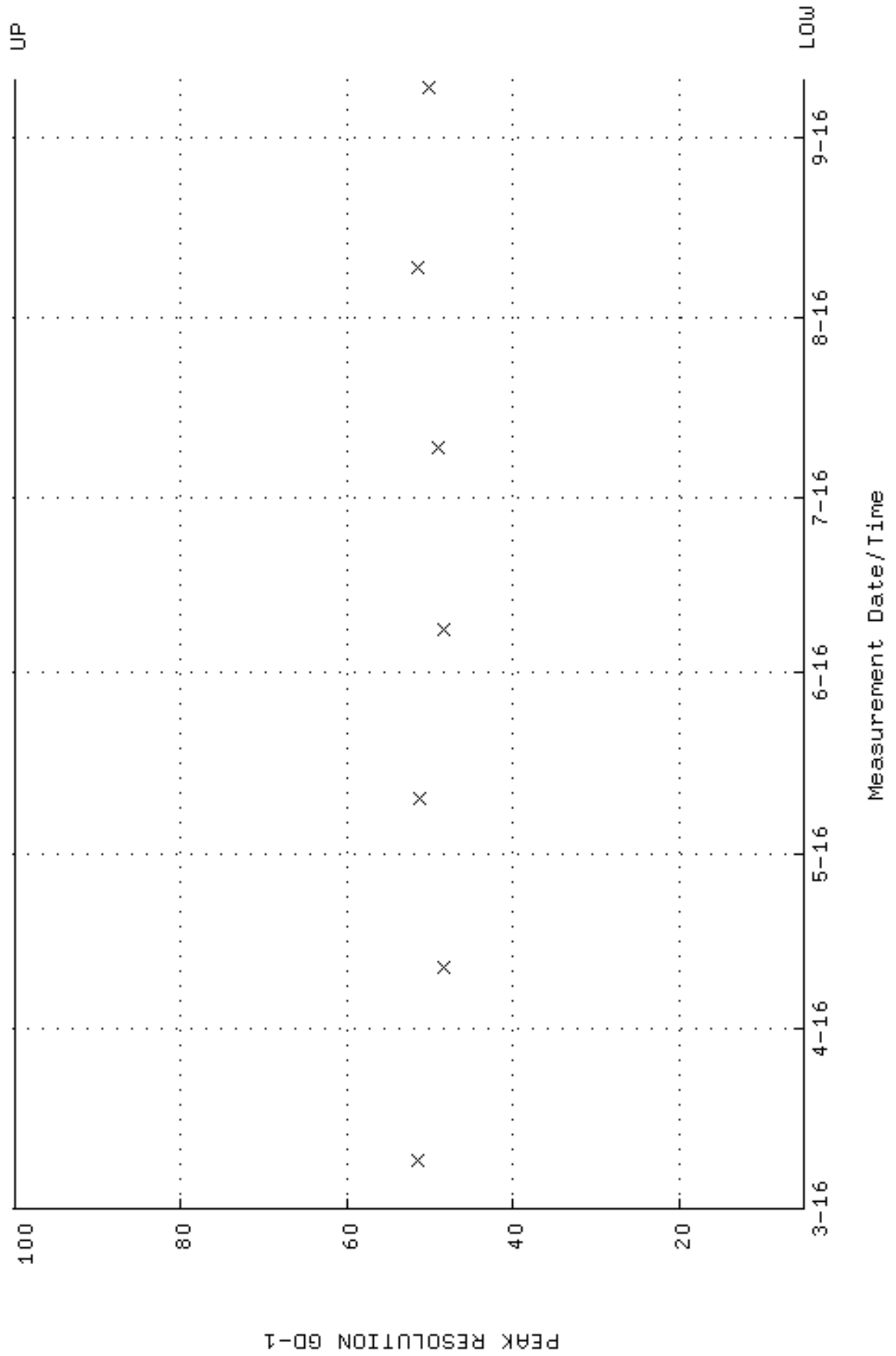
QA filename : DKA100:[ENV_ALPHA.QA.W]W158.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 9-MAR-2016 08:45:10 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.244300 through 0.259410



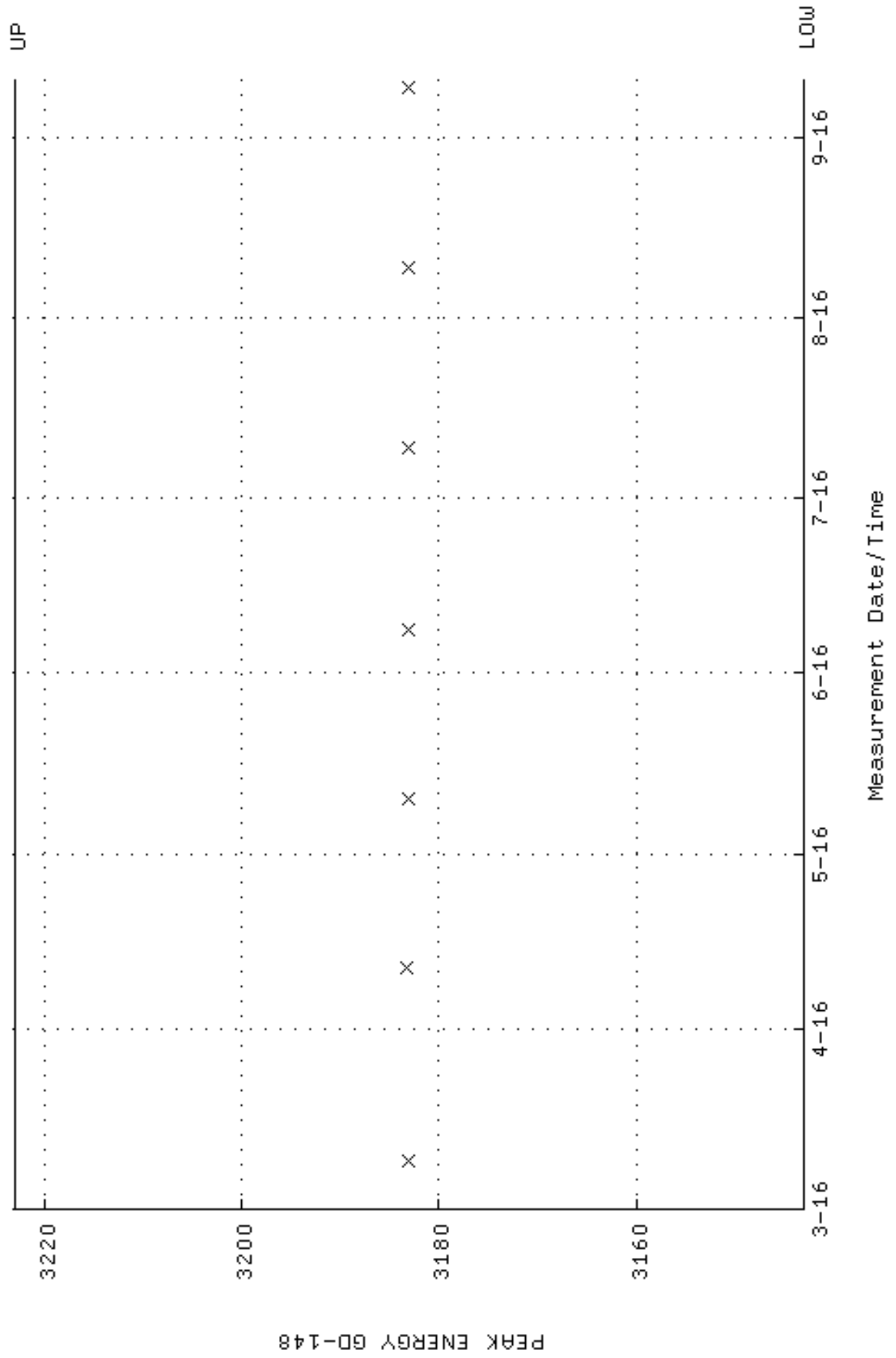
QA filename : DKA100:[ENV_ALPHA.QA.W]W158.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 9-MAR-2016 08:45:10 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



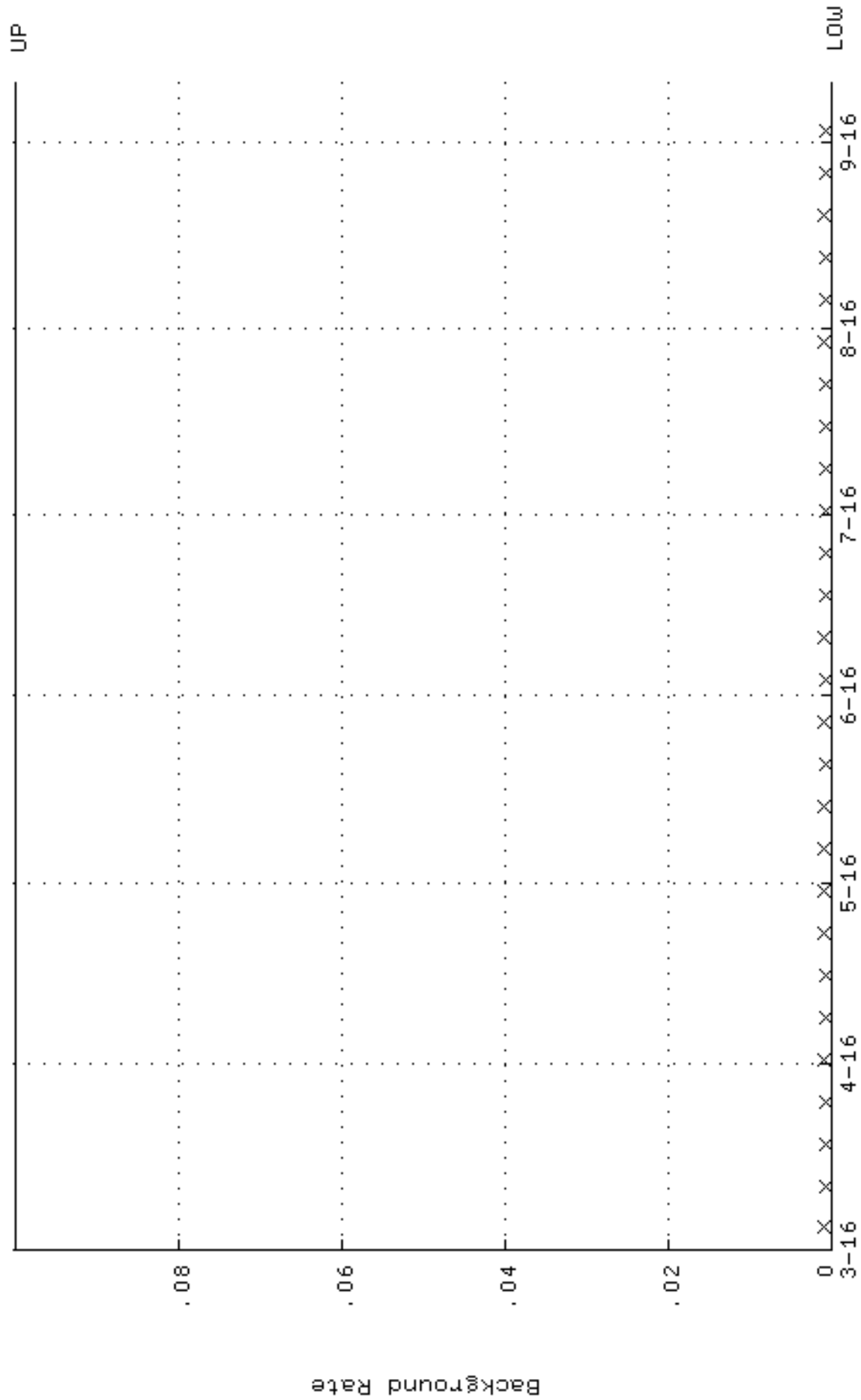
QA filename : DKA100:[ENV_ALPHA.QA.W]W158.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 9-MAR-2016 08:45:10 through 10-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



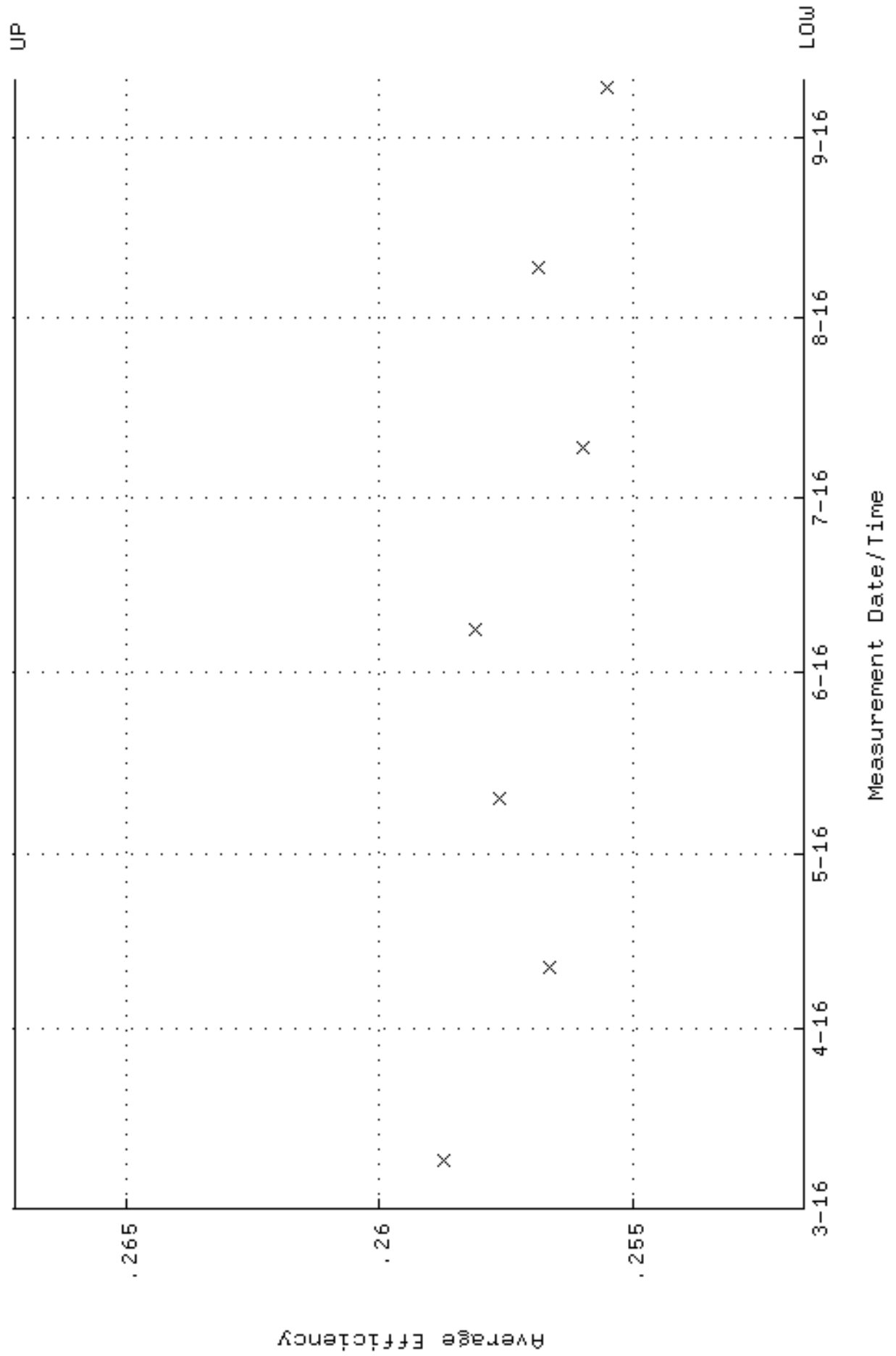
QA filename : DKA100:[ENV_ALPHA.QA.W]W158.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 9-MAR-2016 08:45:10 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



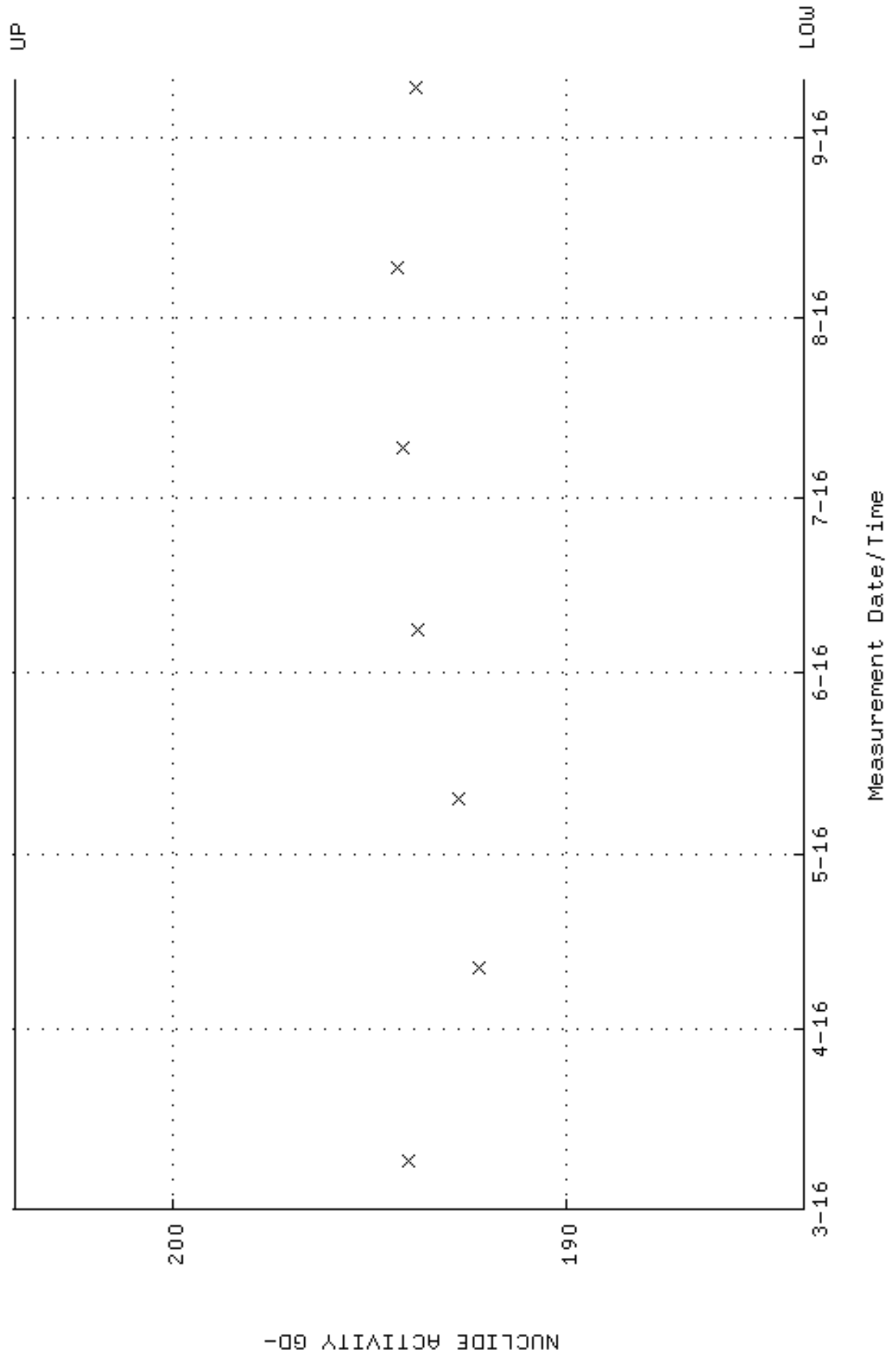
QA filename : DKA100:[ENV_ALPHA.QA.B]B158.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 16:23:03 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



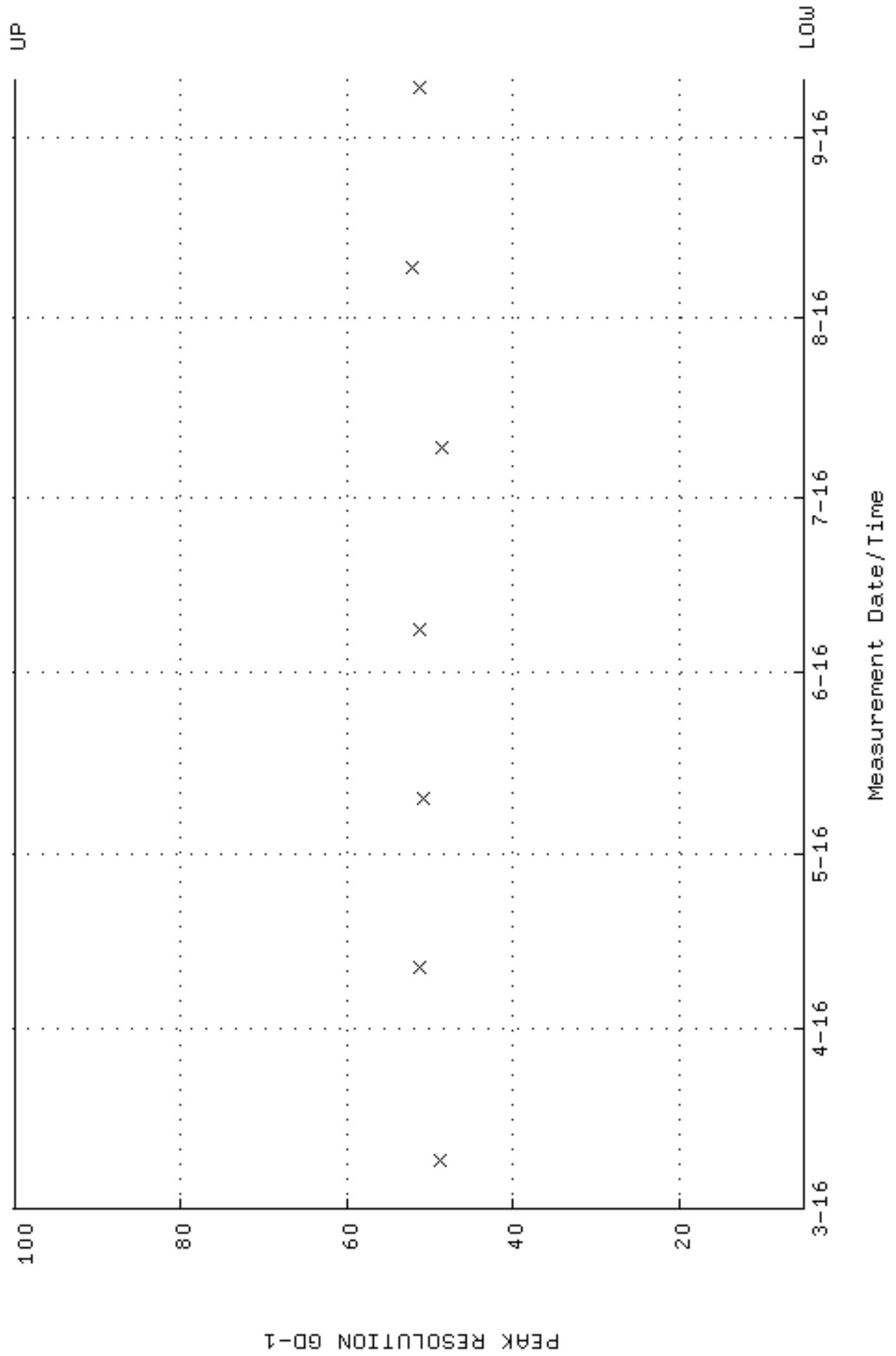
QA filename : DKA100:[ENV_ALPHA.QA.W]W159.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 9-MAR-2016 08:45:15 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.251623 through 0.267187



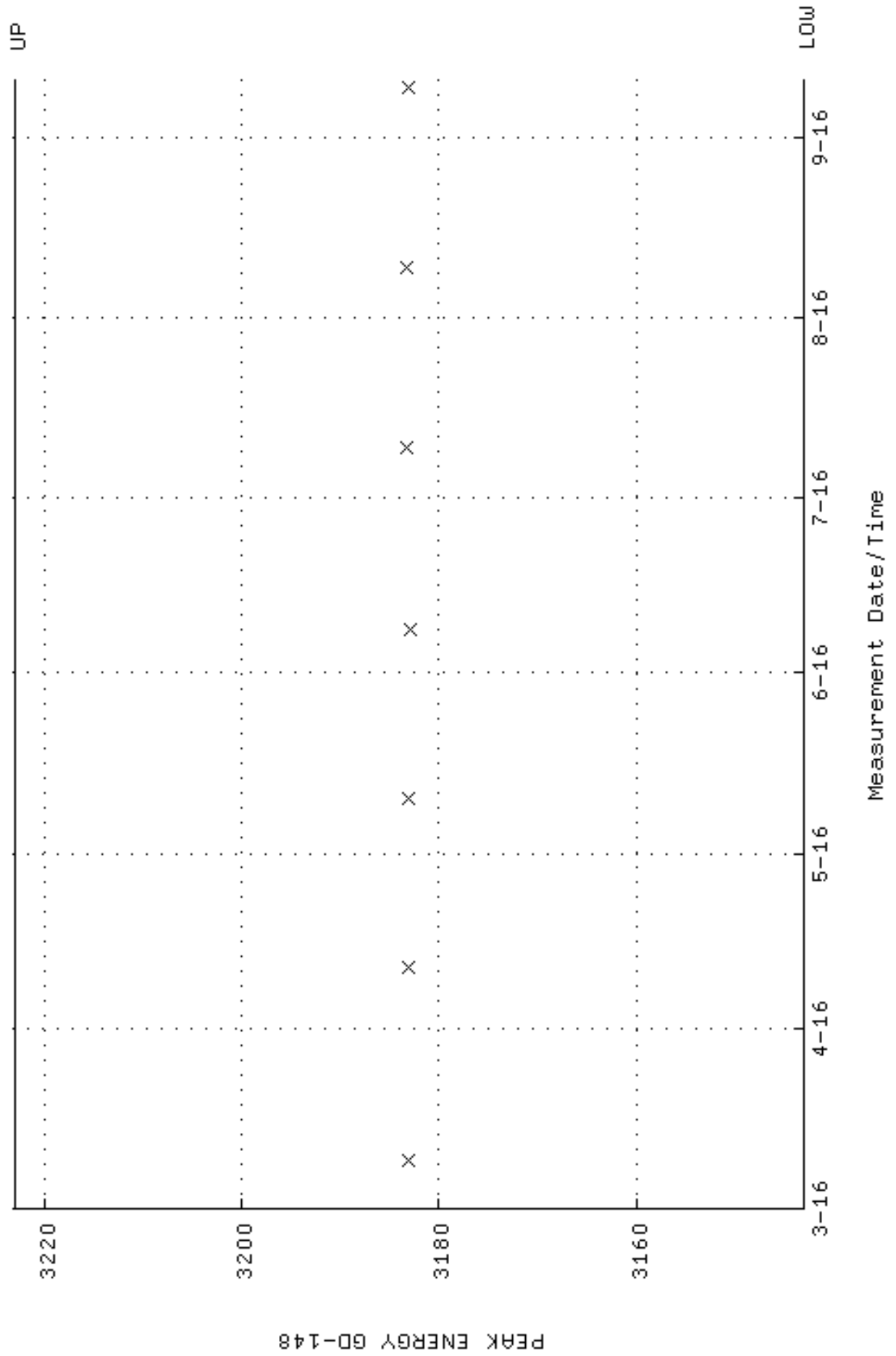
QA filename : DKA100:[ENV_ALPHA.QA.W]W159.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 9-MAR-2016 08:45:15 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



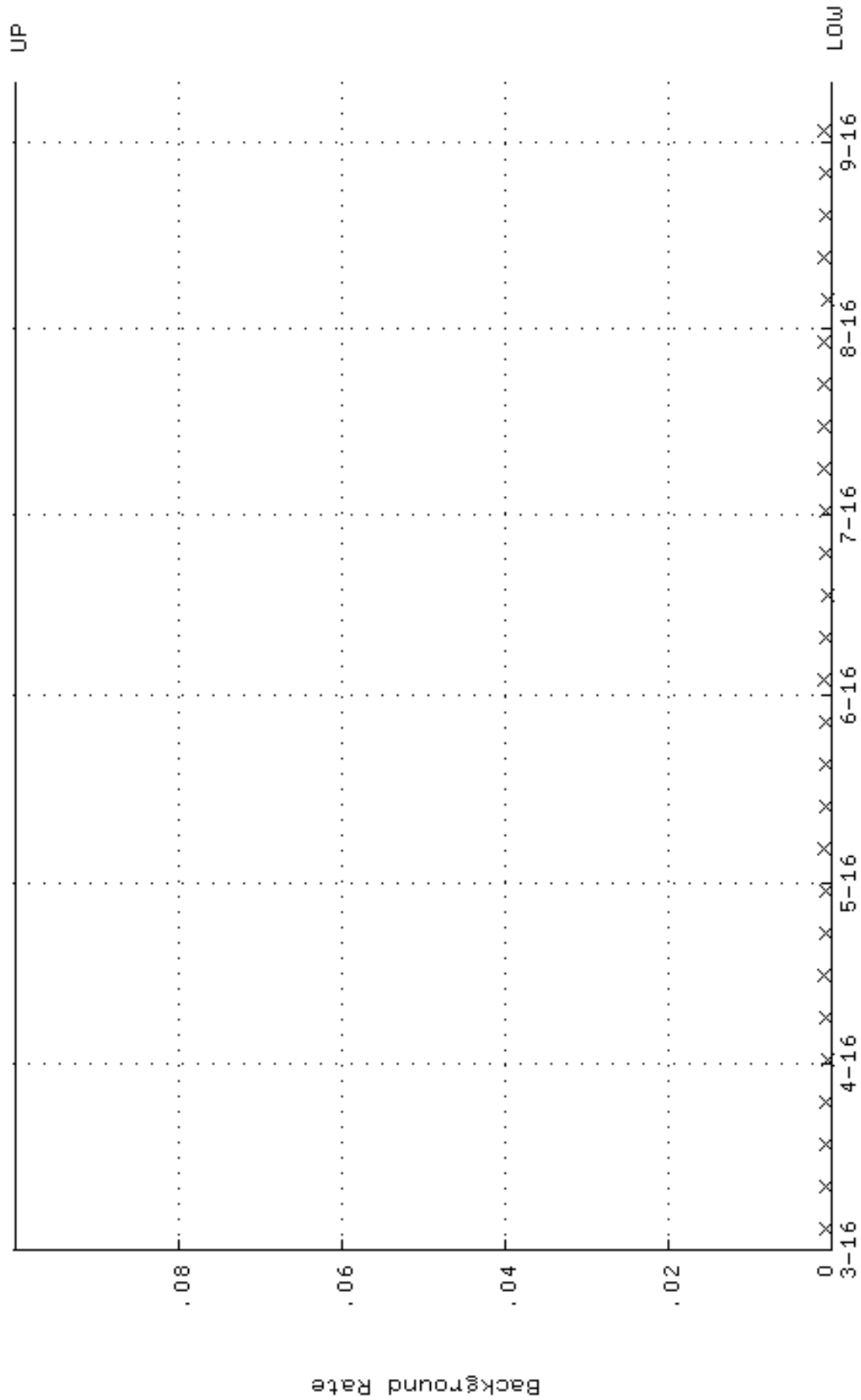
QA filename : DKA100:[ENV_ALPHA.QA.W]W159.QAF;3
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 9-MAR-2016 08:45:15 through 10-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



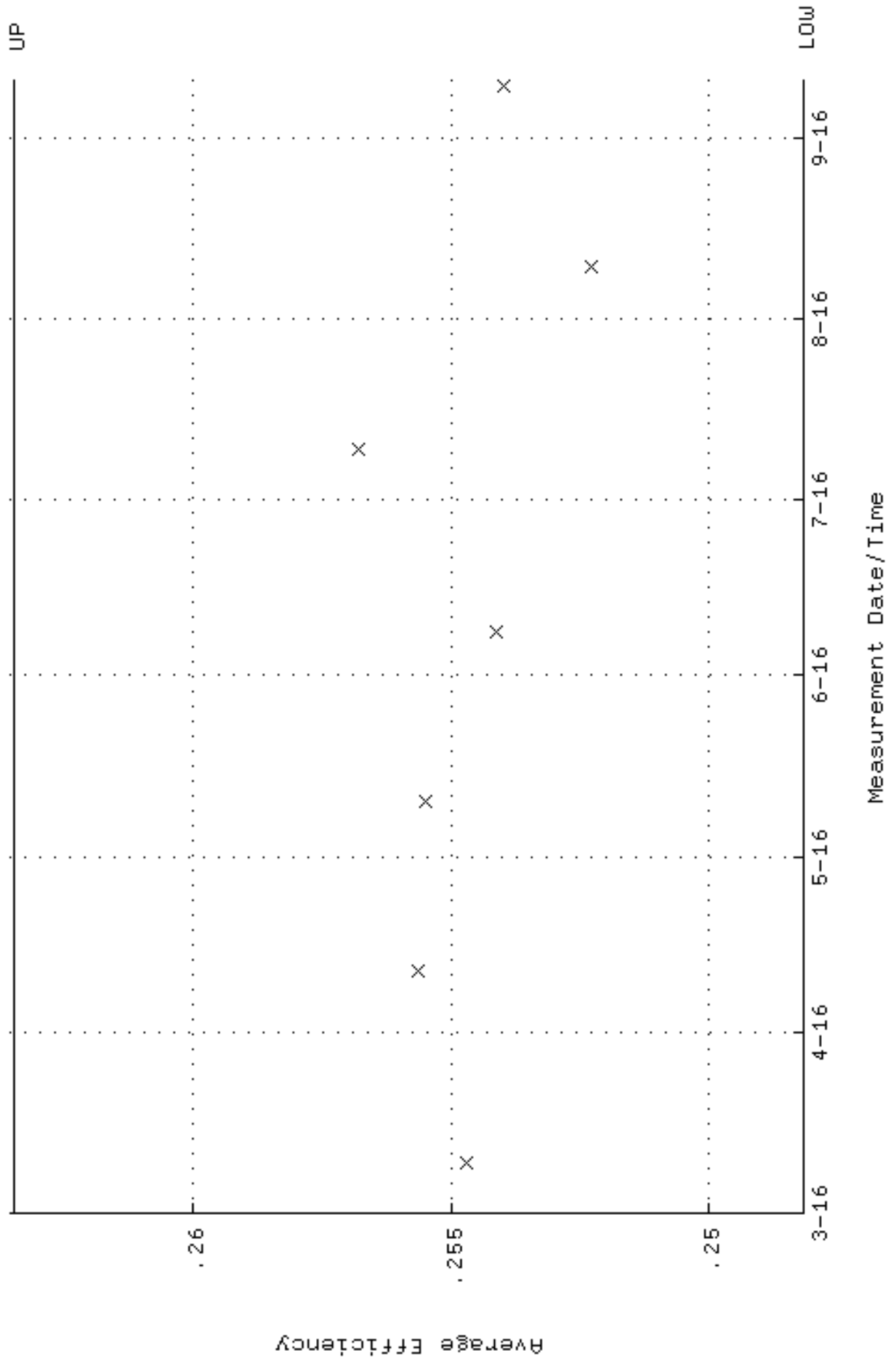
QA filename : DKA100:[ENV_ALPHA.QA.W]W159.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 9-MAR-2016 08:45:15 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



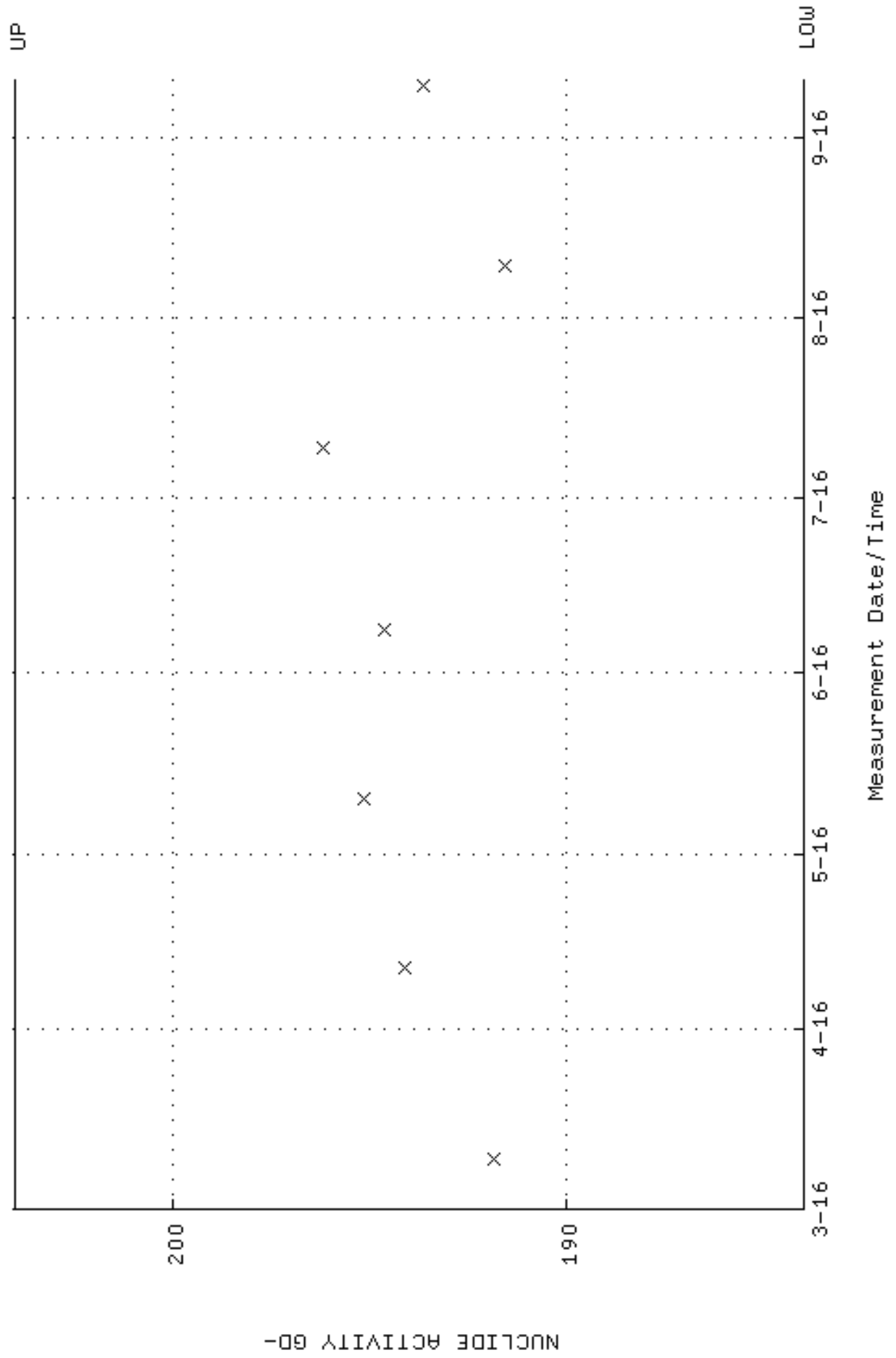
QA filename : DKA100:[ENV_ALPHA.QA.B]B159.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:45:09 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



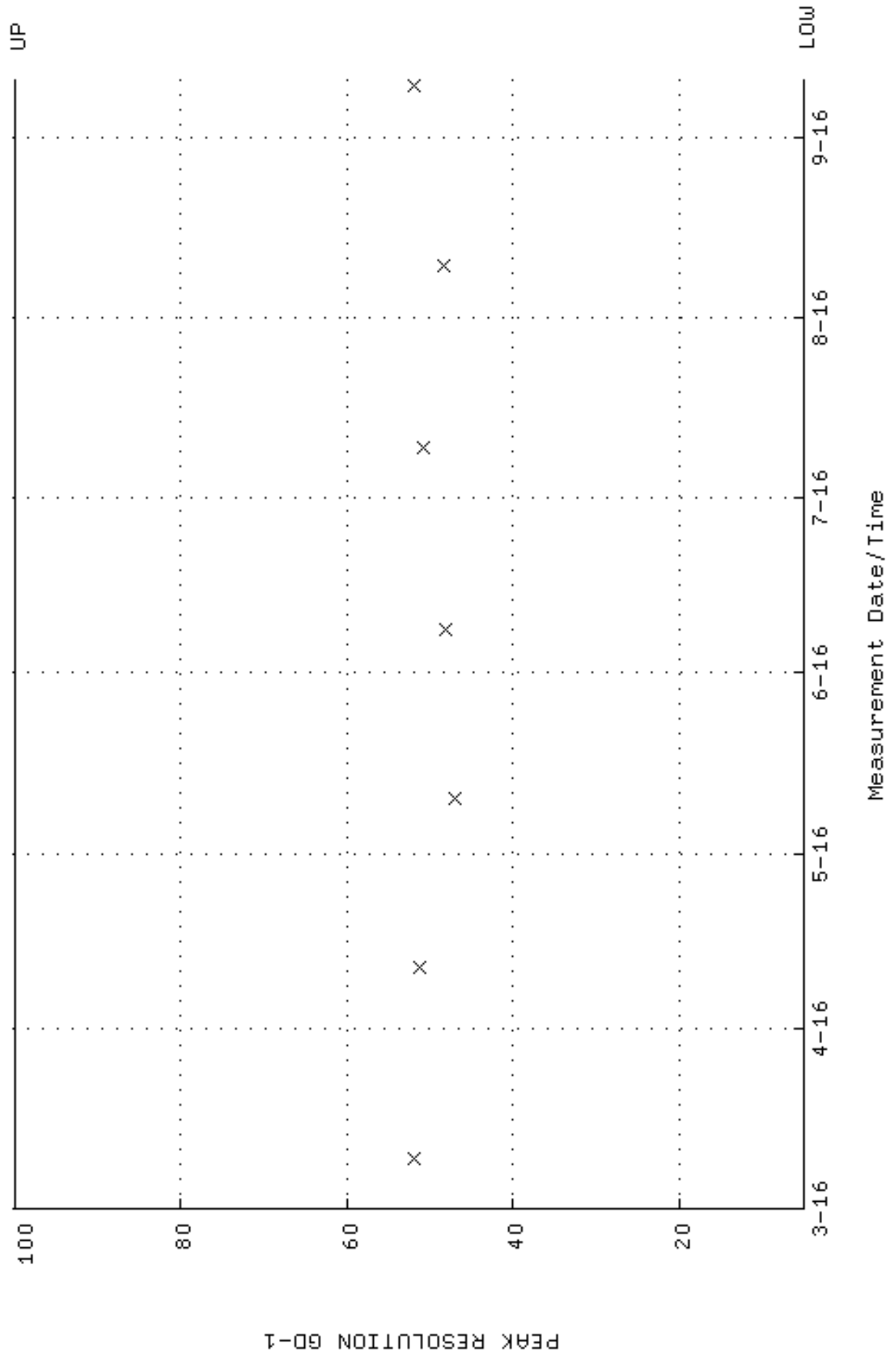
QA filename : DKA100:[ENV_ALPHA.QA.W]W160.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 9-MAR-2016 11:00:19 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.248170 through 0.263520



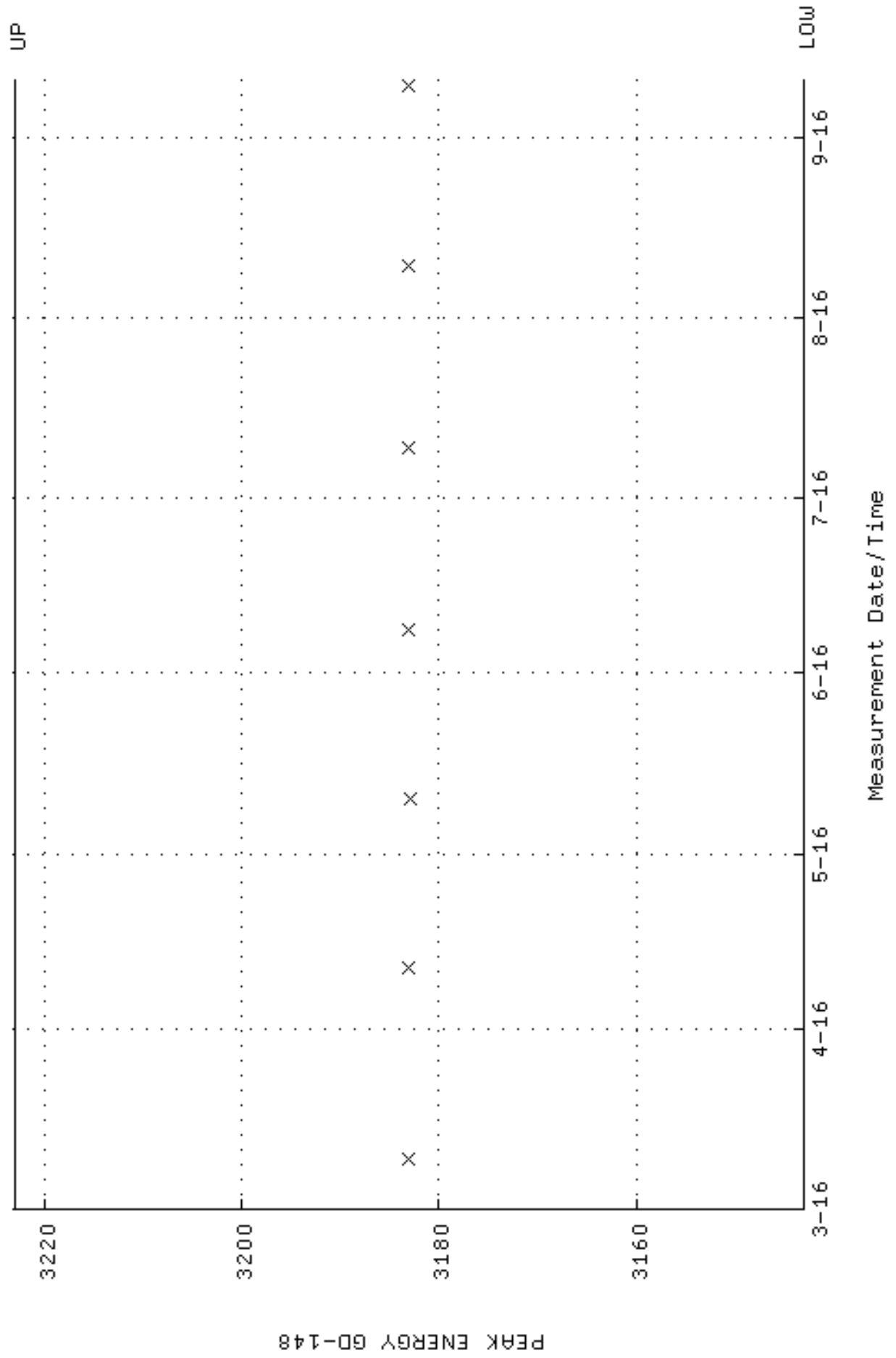
QA filename : DKA100:[ENV_ALPHA.QA.W]W160.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 9-MAR-2016 11:00:19 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



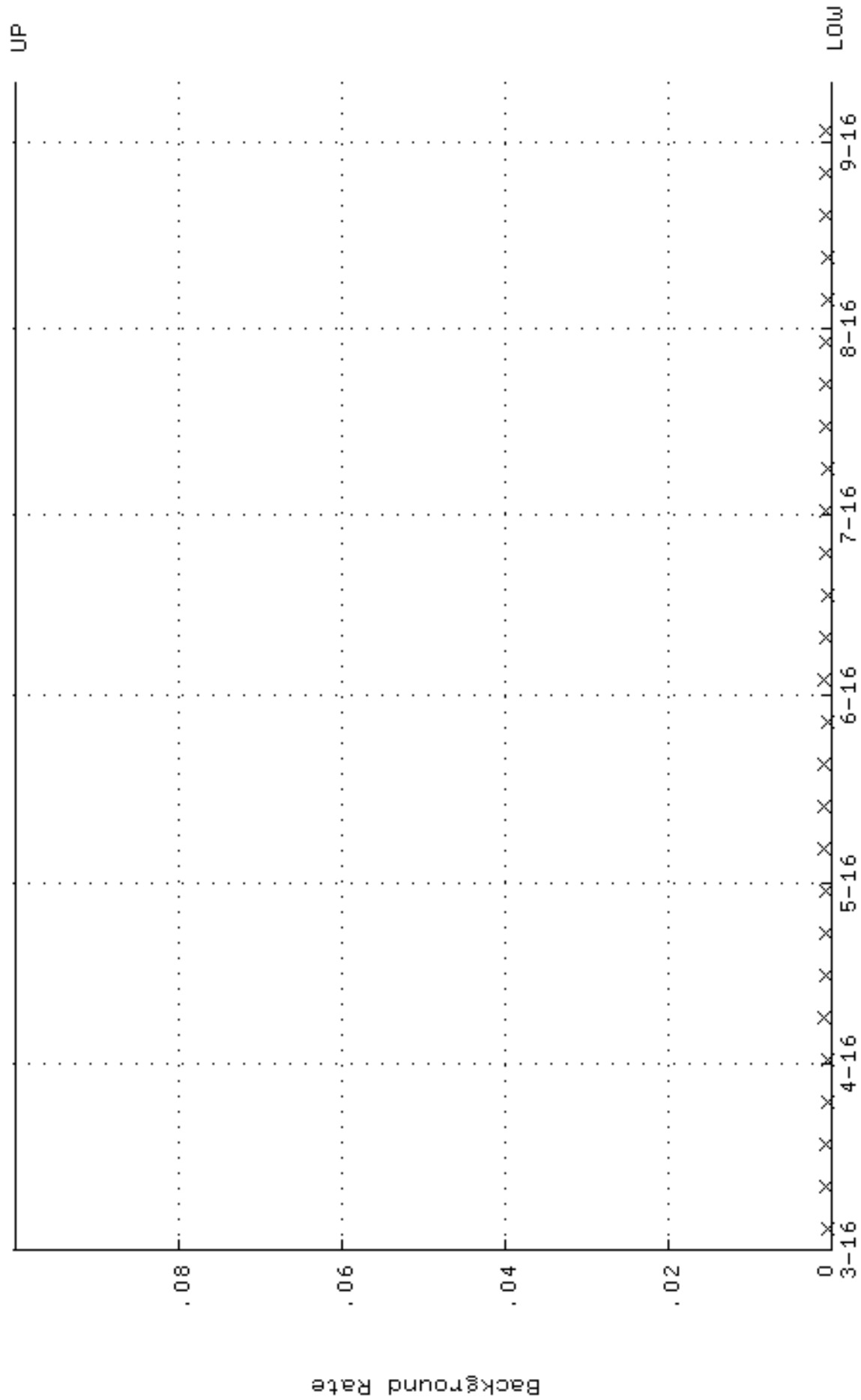
QA filename : DKA100:[ENV_ALPHA.QA.W]W160.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 9-MAR-2016 11:00:19 through 10-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



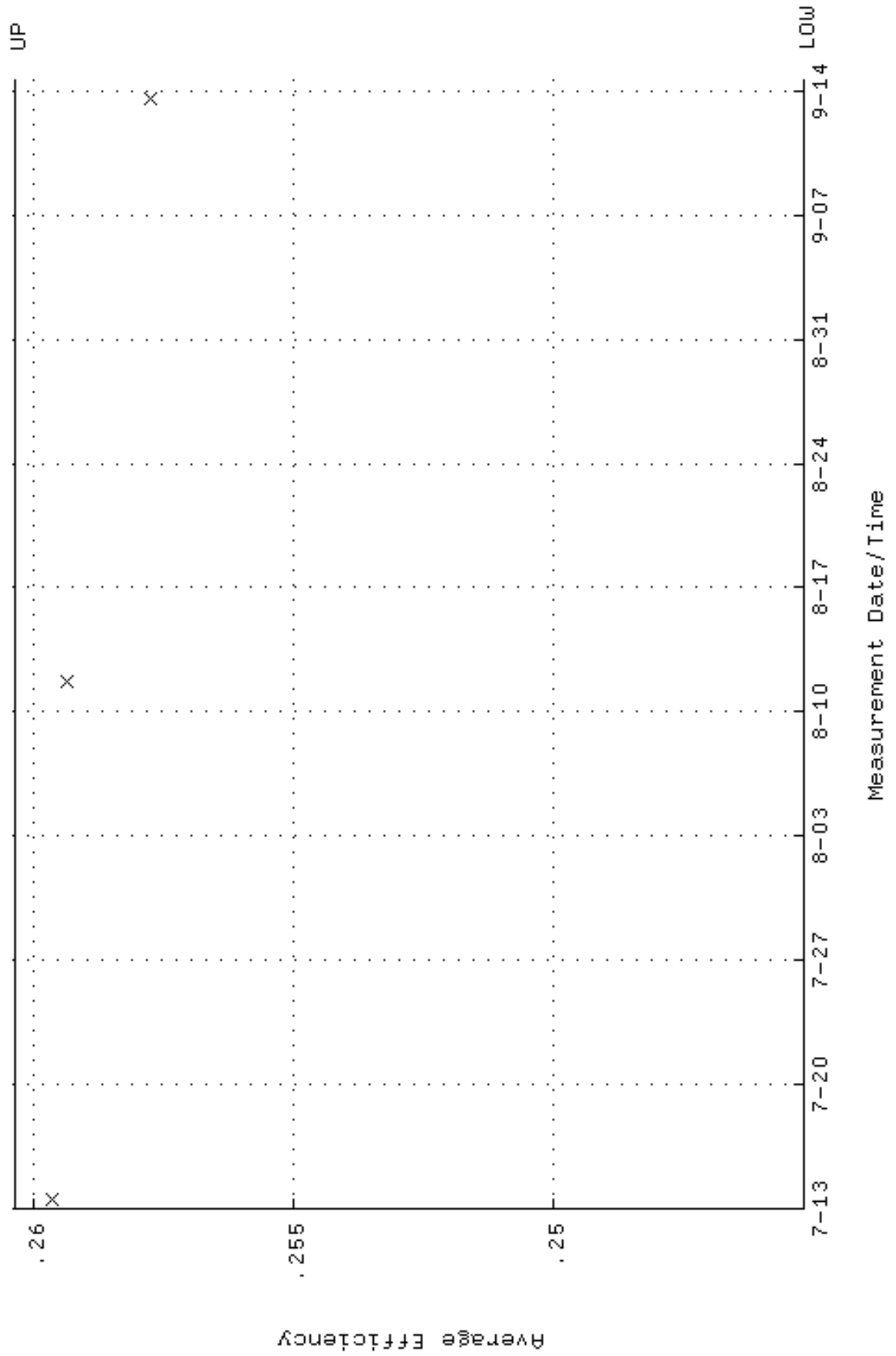
QA filename : DKA100:[ENV_ALPHA.QA.W]W160.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 9-MAR-2016 11:00:19 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



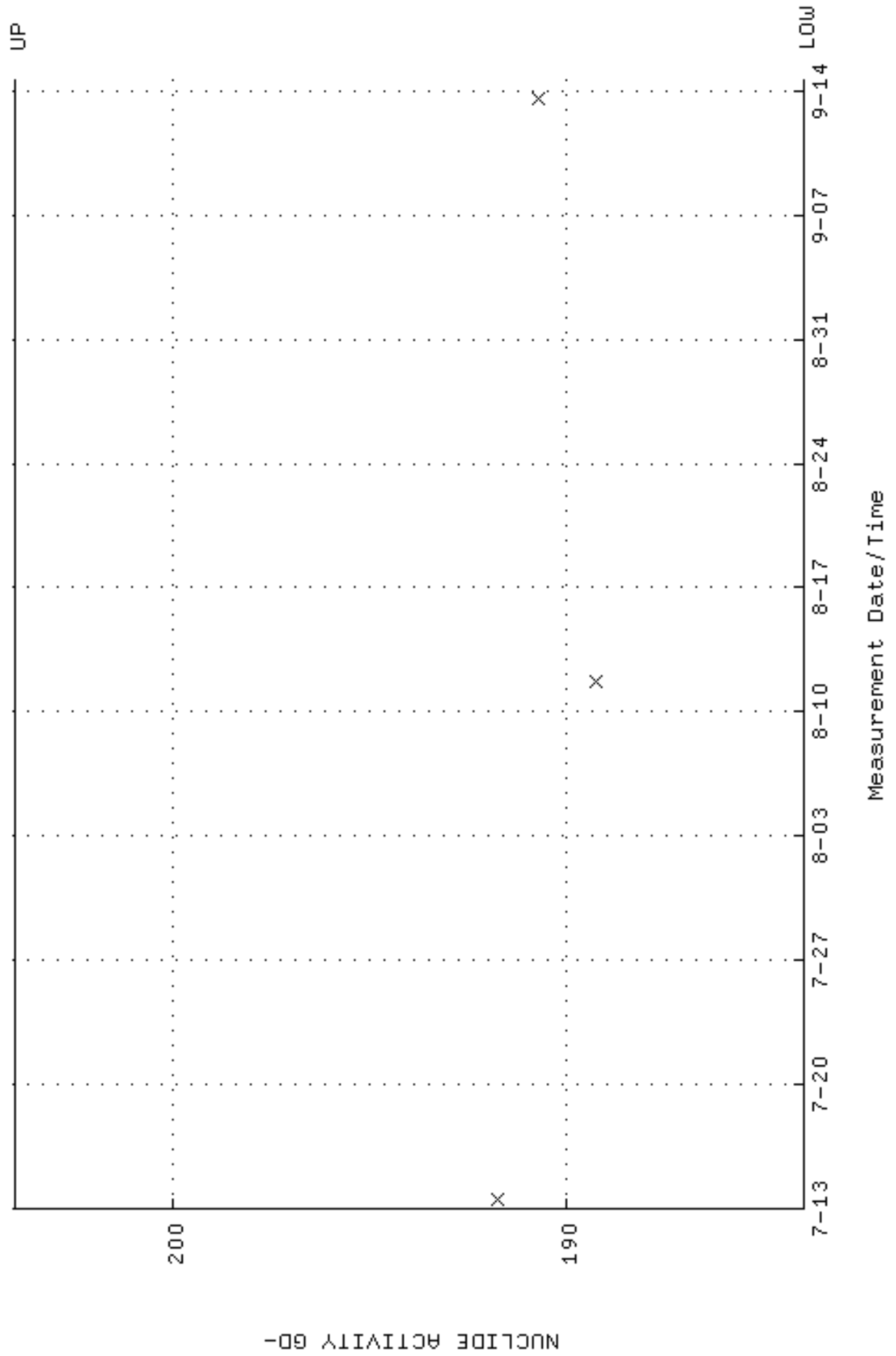
QA filename : DKA100:[ENV_ALPHA.QA.B]B160.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:45:13 through 10-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



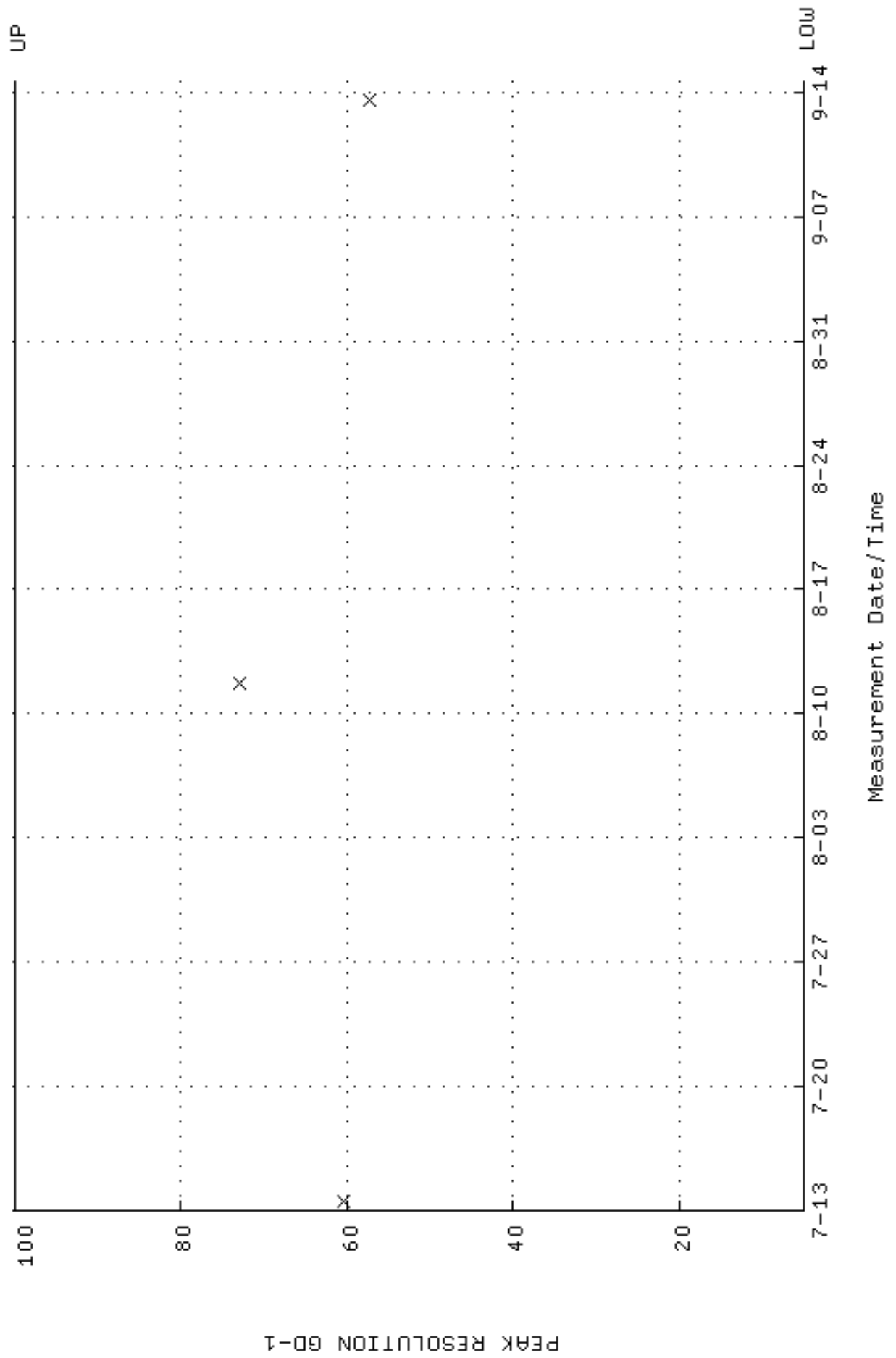
QA filename : DKA100:[ENV_ALPHA.QA.W]W161.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 13-JUL-2016 12:44:02 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.245186 through 0.260352



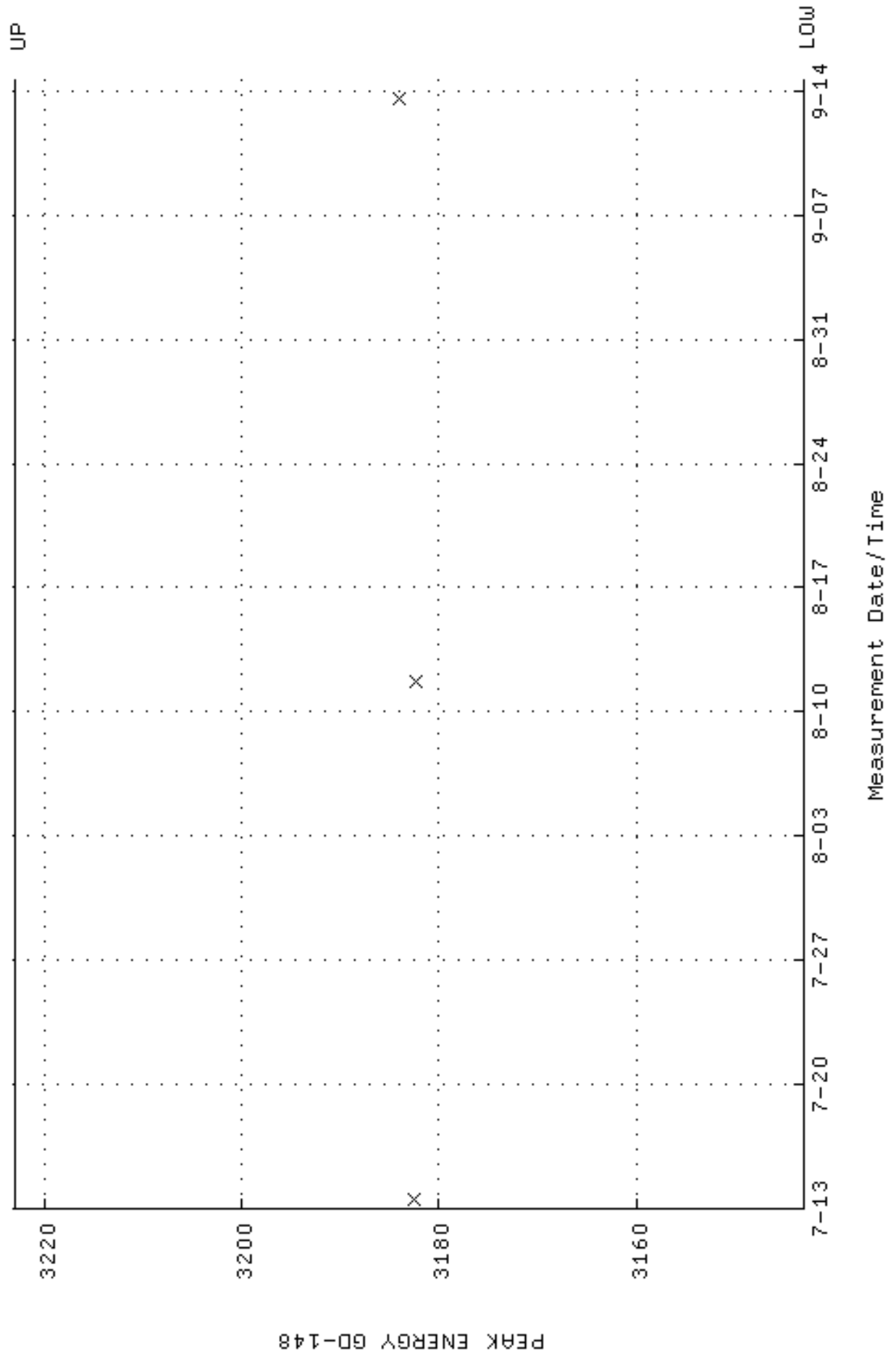
QA filename : DKA100:[ENV_ALPHA.QA.W]w161.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 13-JUL-2016 12:44:02 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



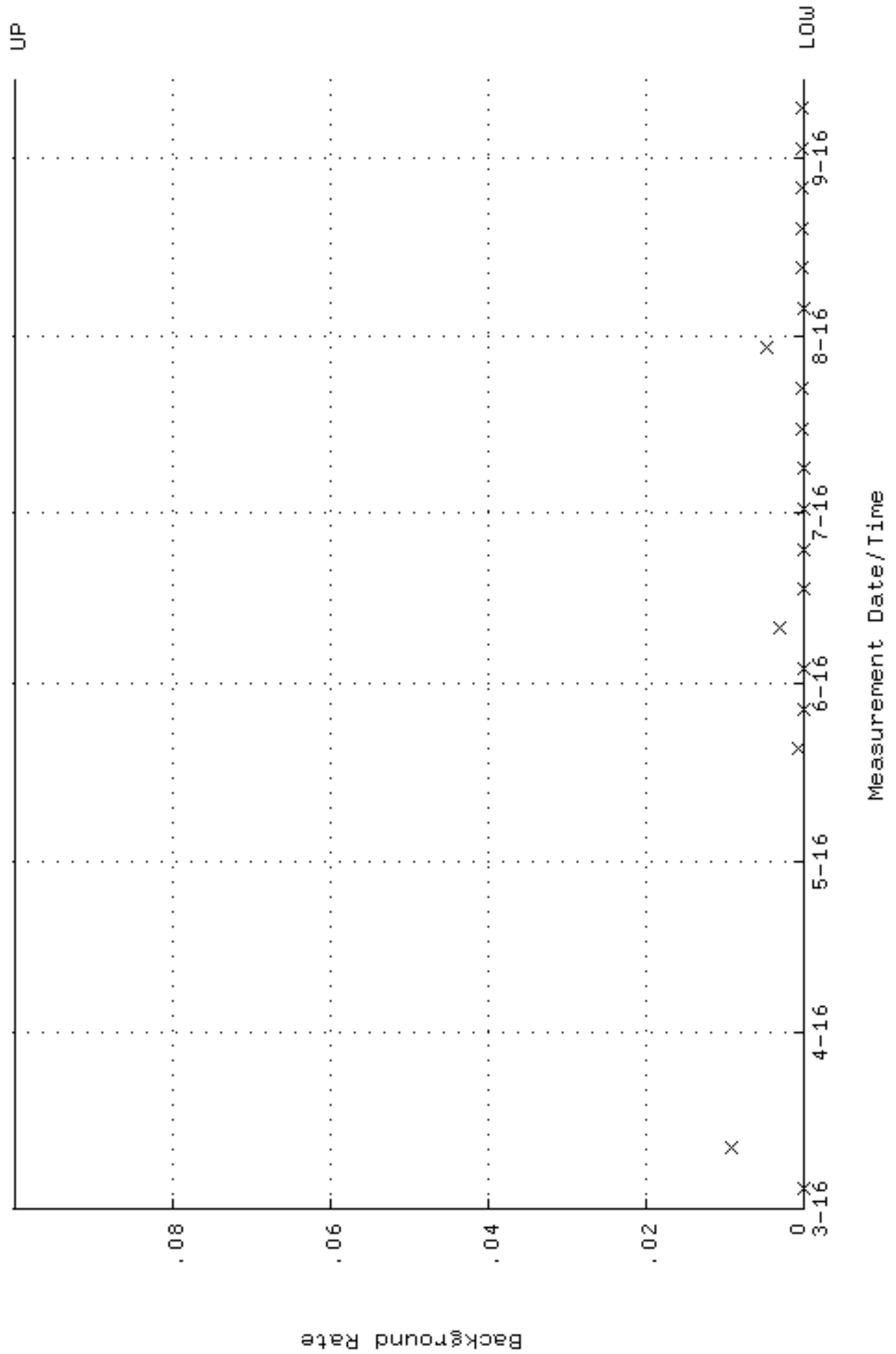
QA filename : DKA100:[ENV_ALPHA.QA.W]W161.QAF;4
Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 13-JUL-2016 12:44:02 through 14-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



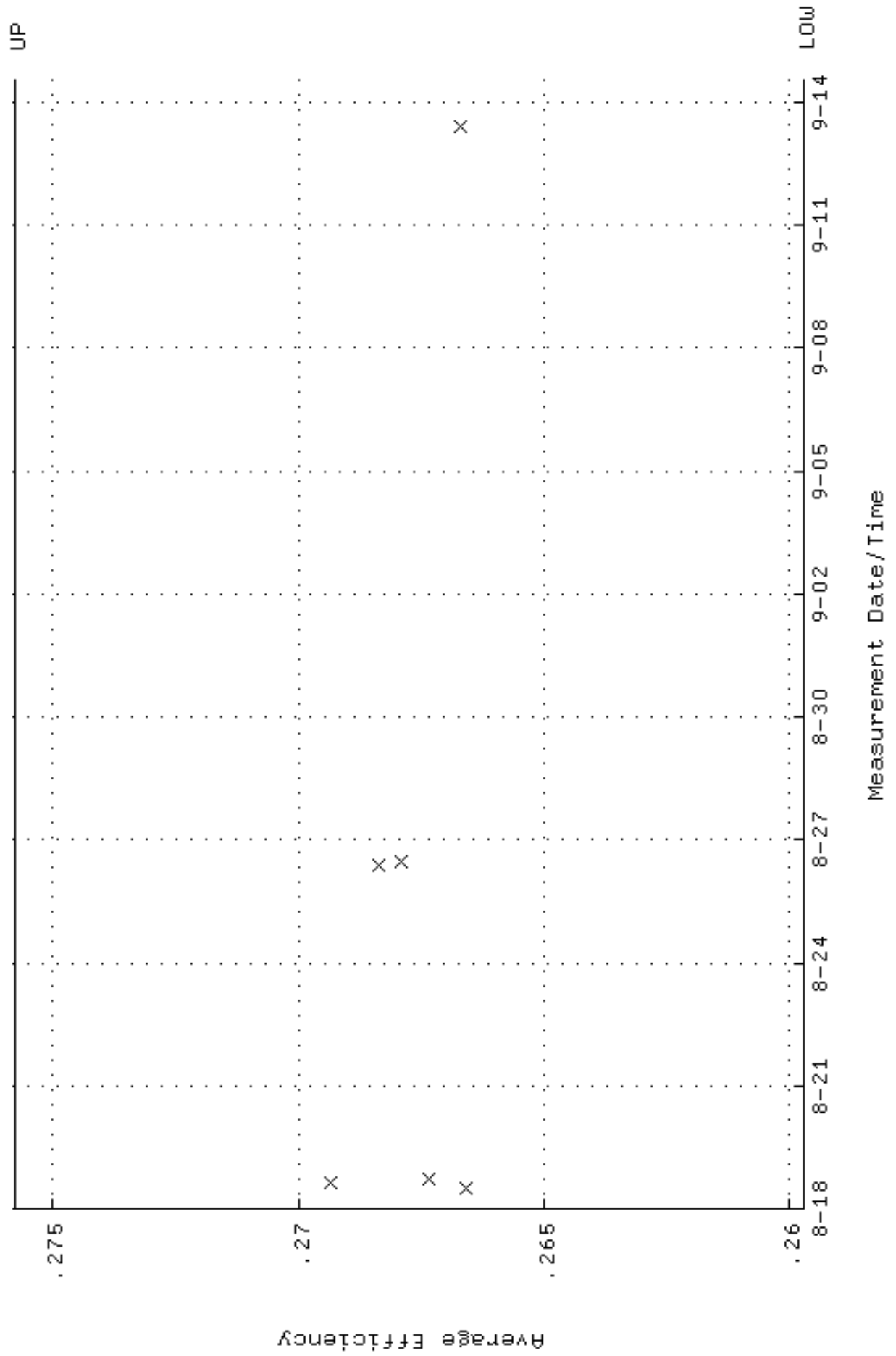
QA filename : DKA100:[ENV_ALPHA.QA.W]W161.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 13-JUL-2016 12:44:02 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



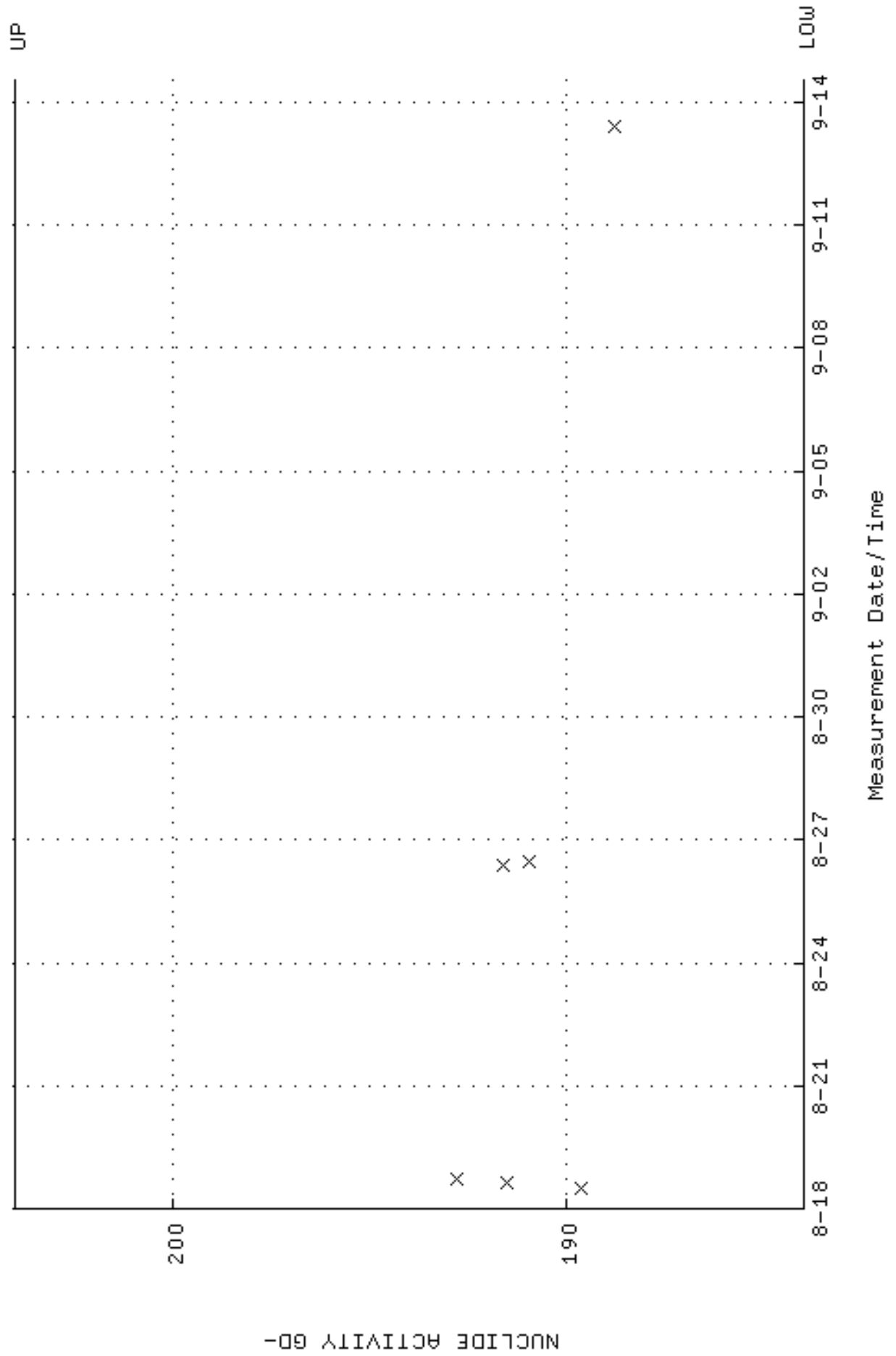
QA filename : DKA100:[ENV_ALPHA.QA.B]B161.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:04:23 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



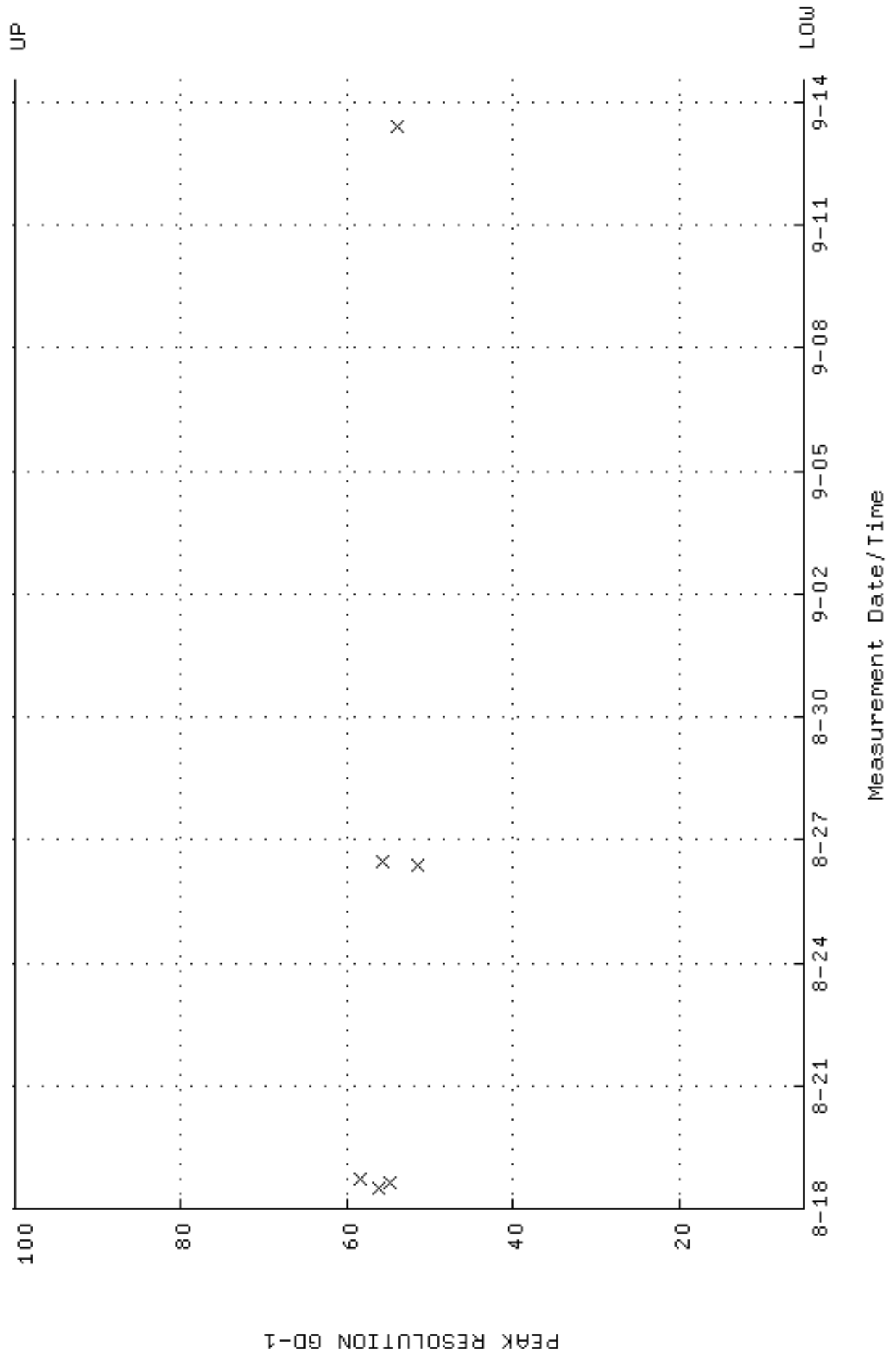
QA filename : DKA100:[ENV_ALPHA.QA.W]W162.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 18-AUG-2016 12:26:31 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.259705 through 0.275769



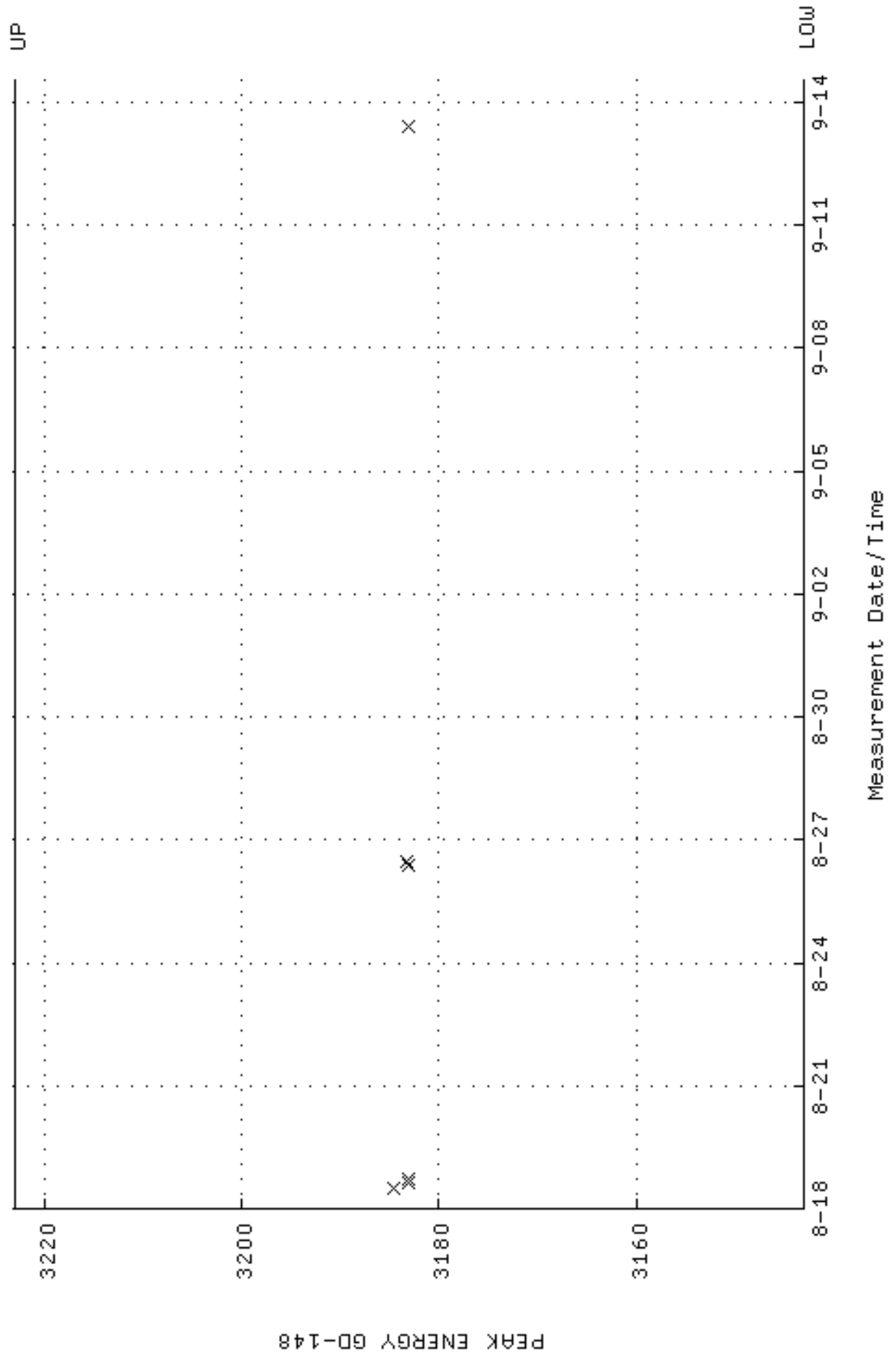
QA filename : DKA100:[ENV_ALPHA.QA.W]W162.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 18-AUG-2016 12:26:31 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



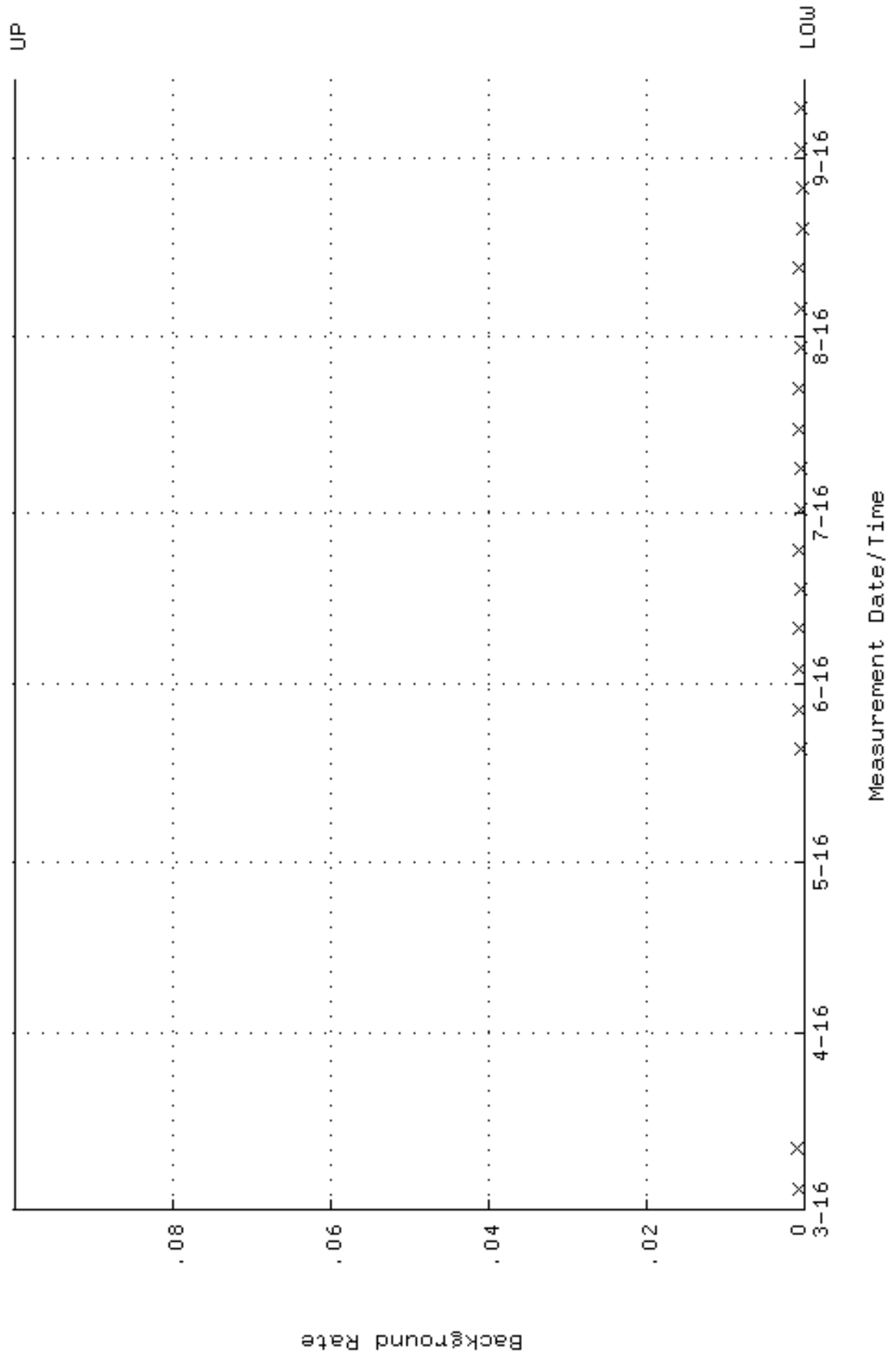
QA filename : DKA100:[ENV_ALPHA.QA.W]W162.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 18-AUG-2016 12:26:31 through 14-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



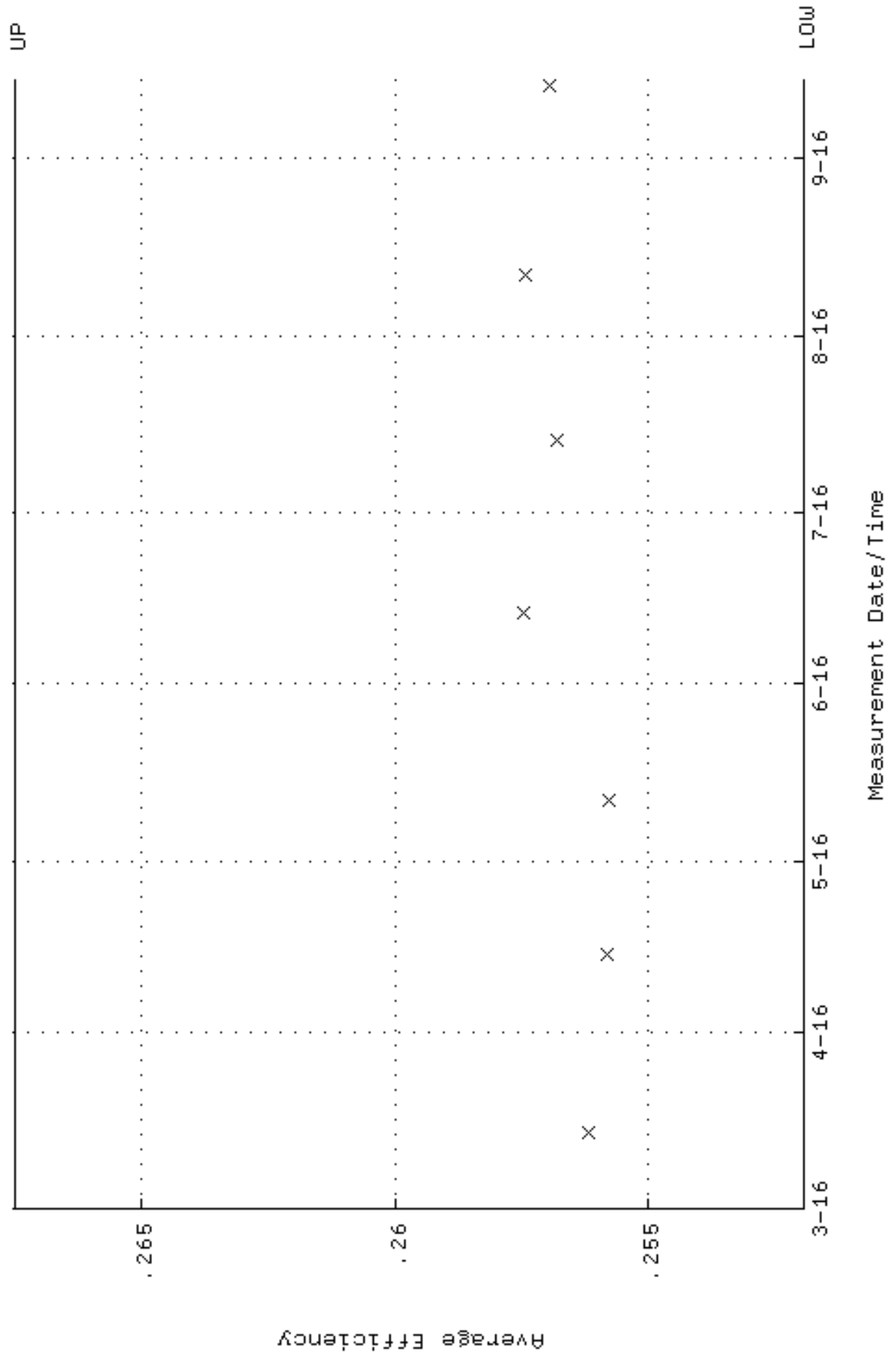
QA filename : DKA100:[ENV_ALPHA.QA.W]W162.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 18-AUG-2016 12:26:31 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



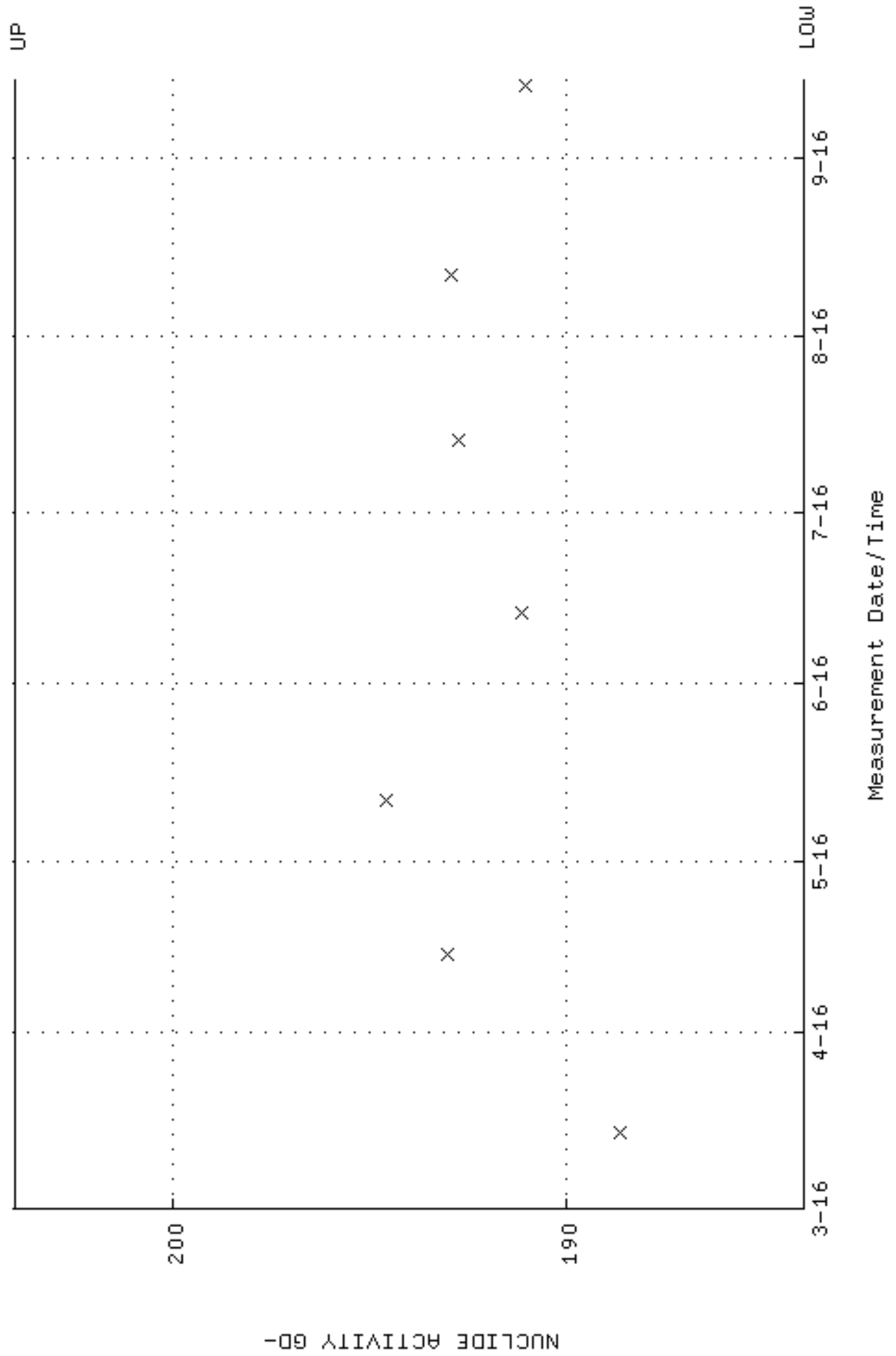
QA filename : DKA100:[ENV_ALPHA.QA.B]B162.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:04:27 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



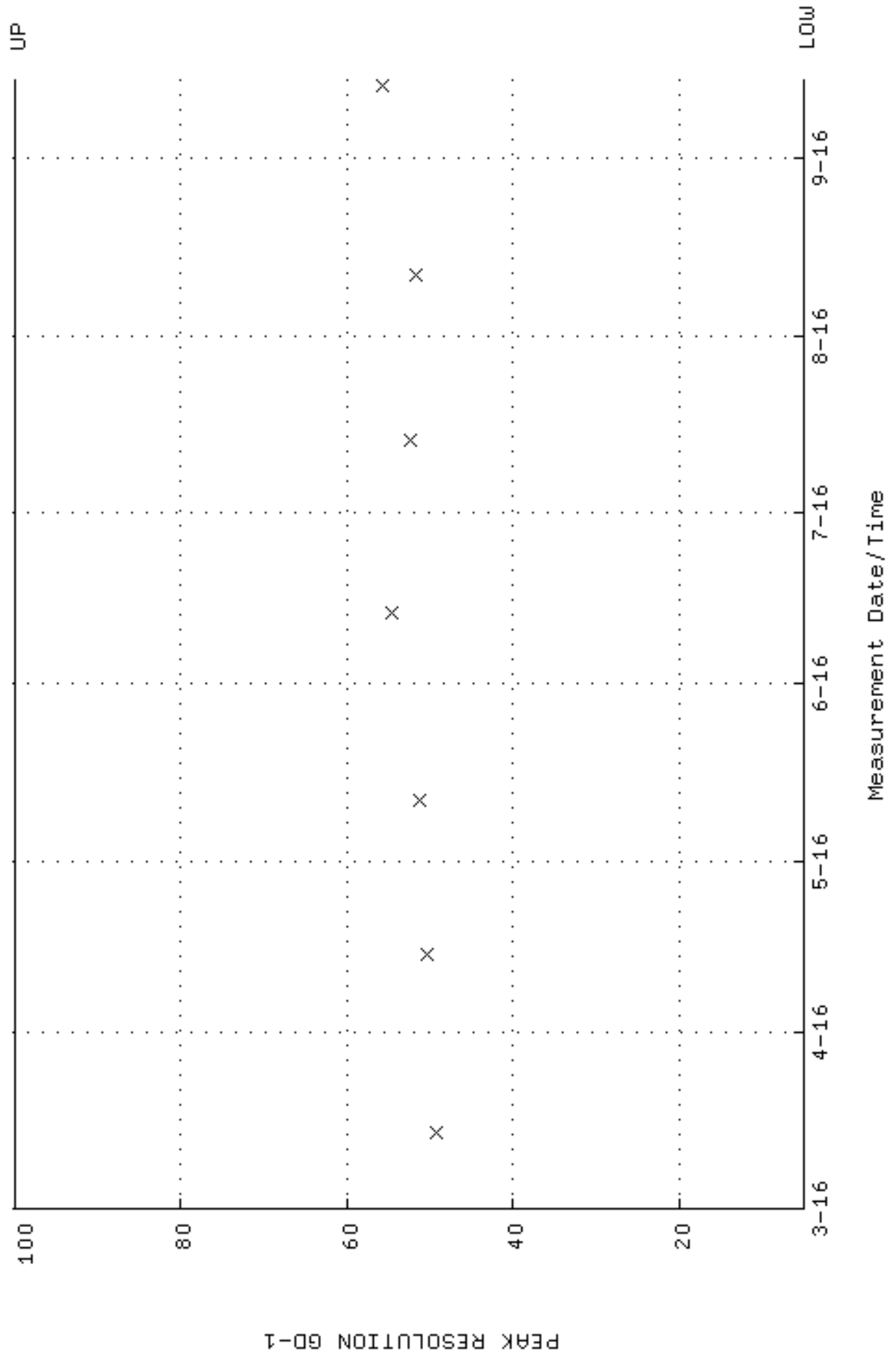
QA filename : DKA100:[ENV_ALPHA.QA.W]W163.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 14-MAR-2016 10:47:13 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.251924 through 0.267506



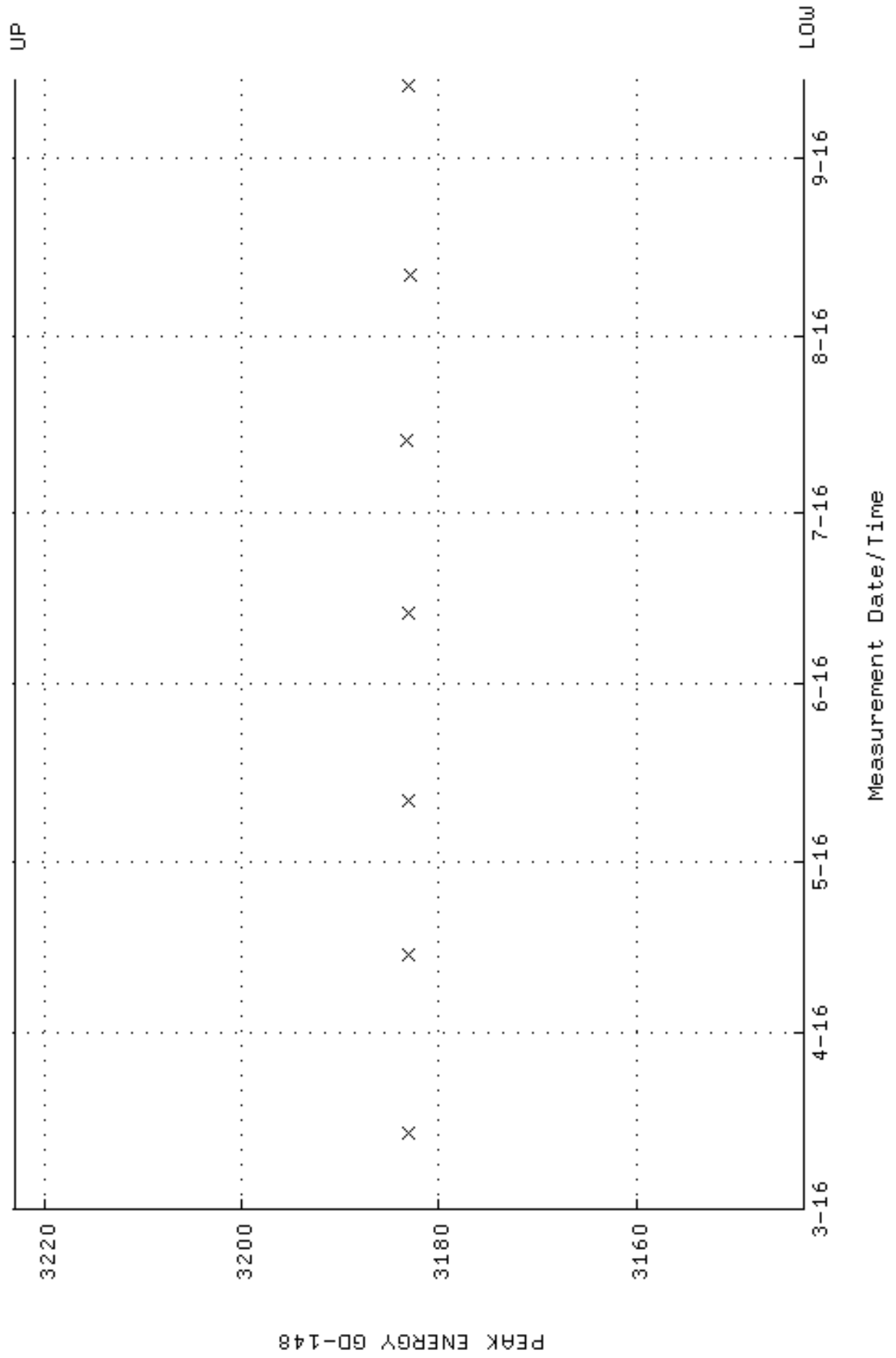
QA filename : DKA100:[ENV_ALPHA.QA.W]W163.QAF;4
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 14-MAR-2016 10:47:13 through 14-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



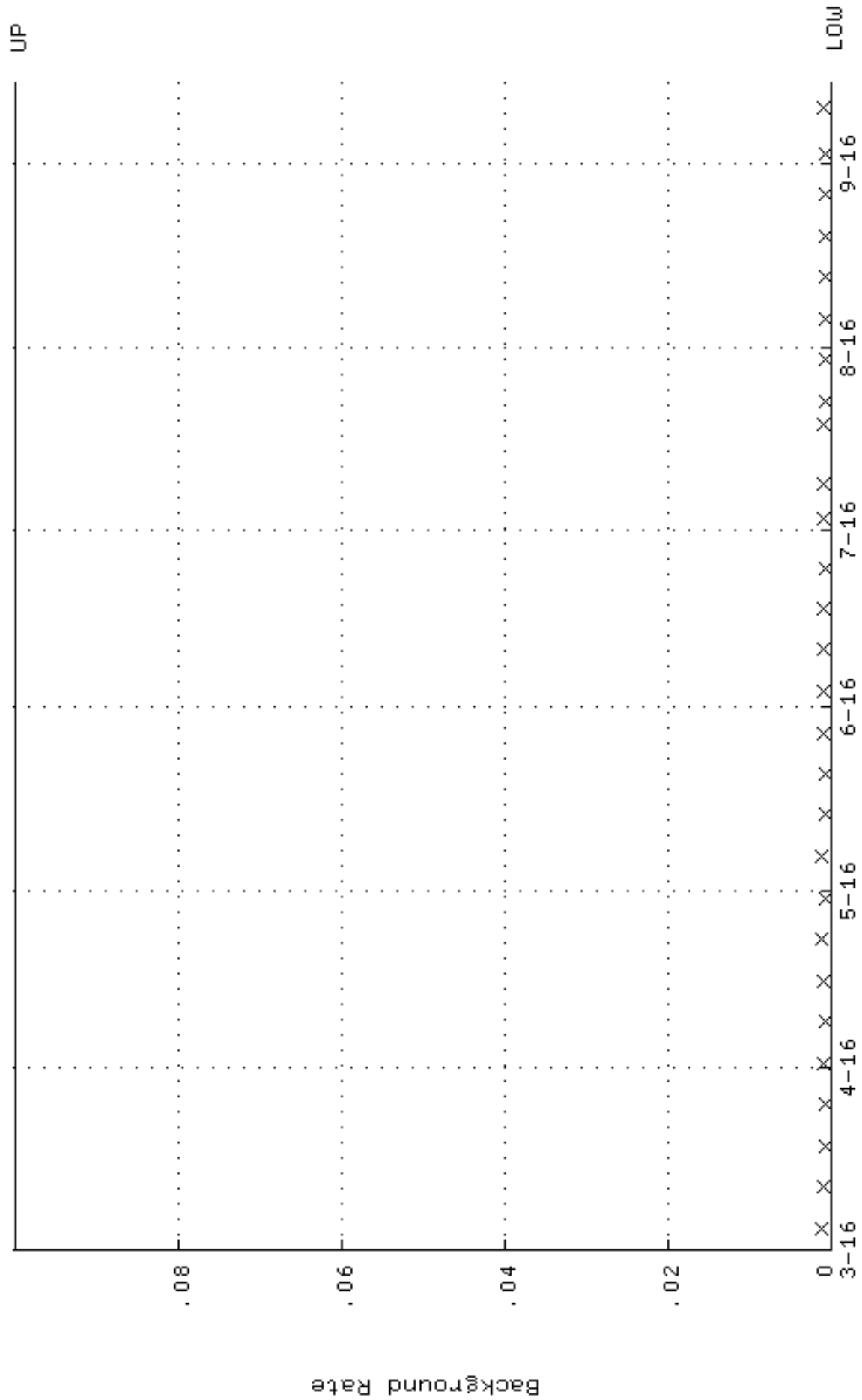
QA filename : DKA100:[ENV_ALPHA.QA.W]W163.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 14-MAR-2016 10:47:13 through 14-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



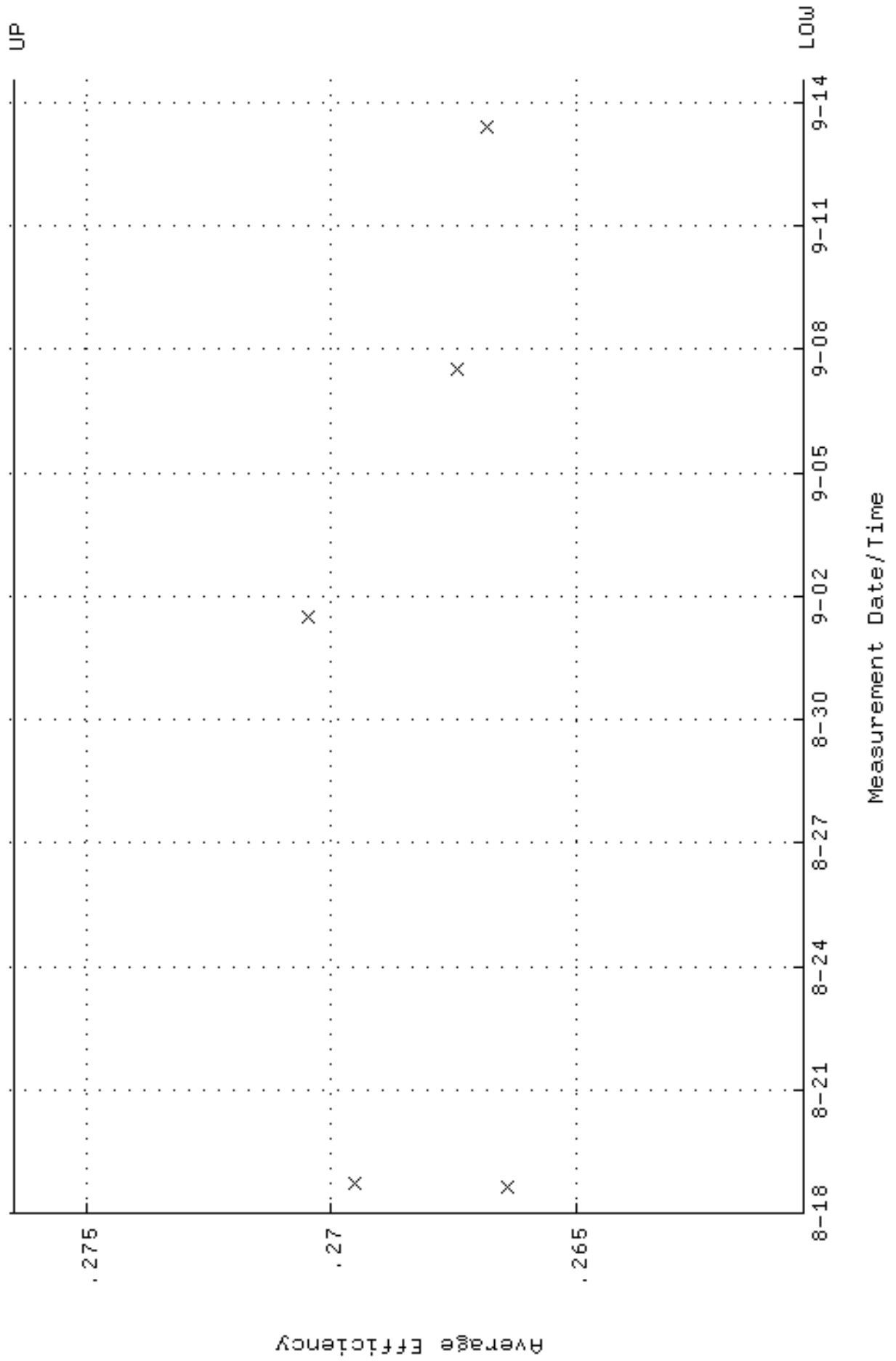
QA filename : DKA100:[ENV_ALPHA.QA.W]W163.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 14-MAR-2016 10:47:13 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



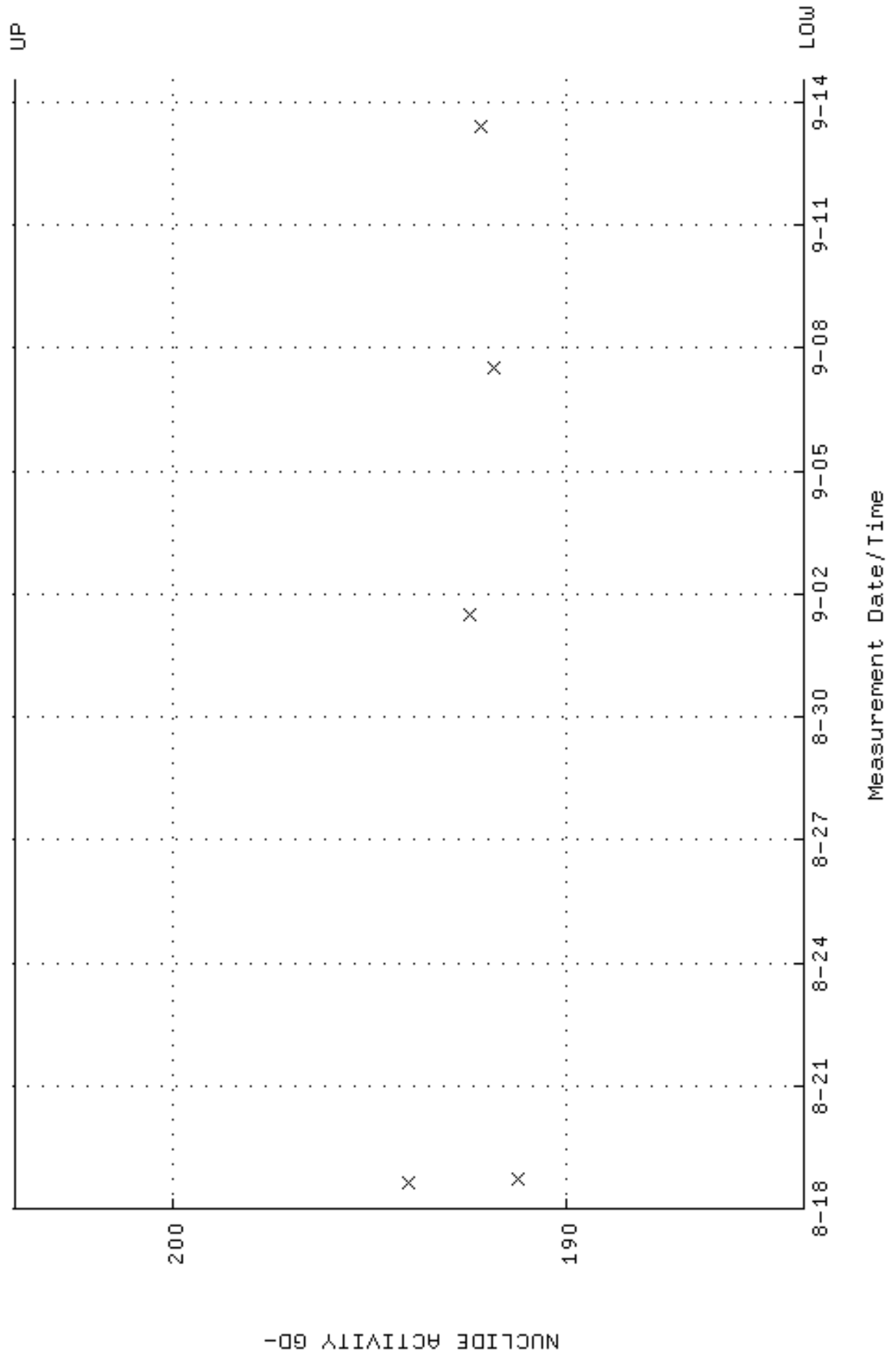
QA filename : DKA100:[ENV_ALPHA.QA.B]B163.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:04:31 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



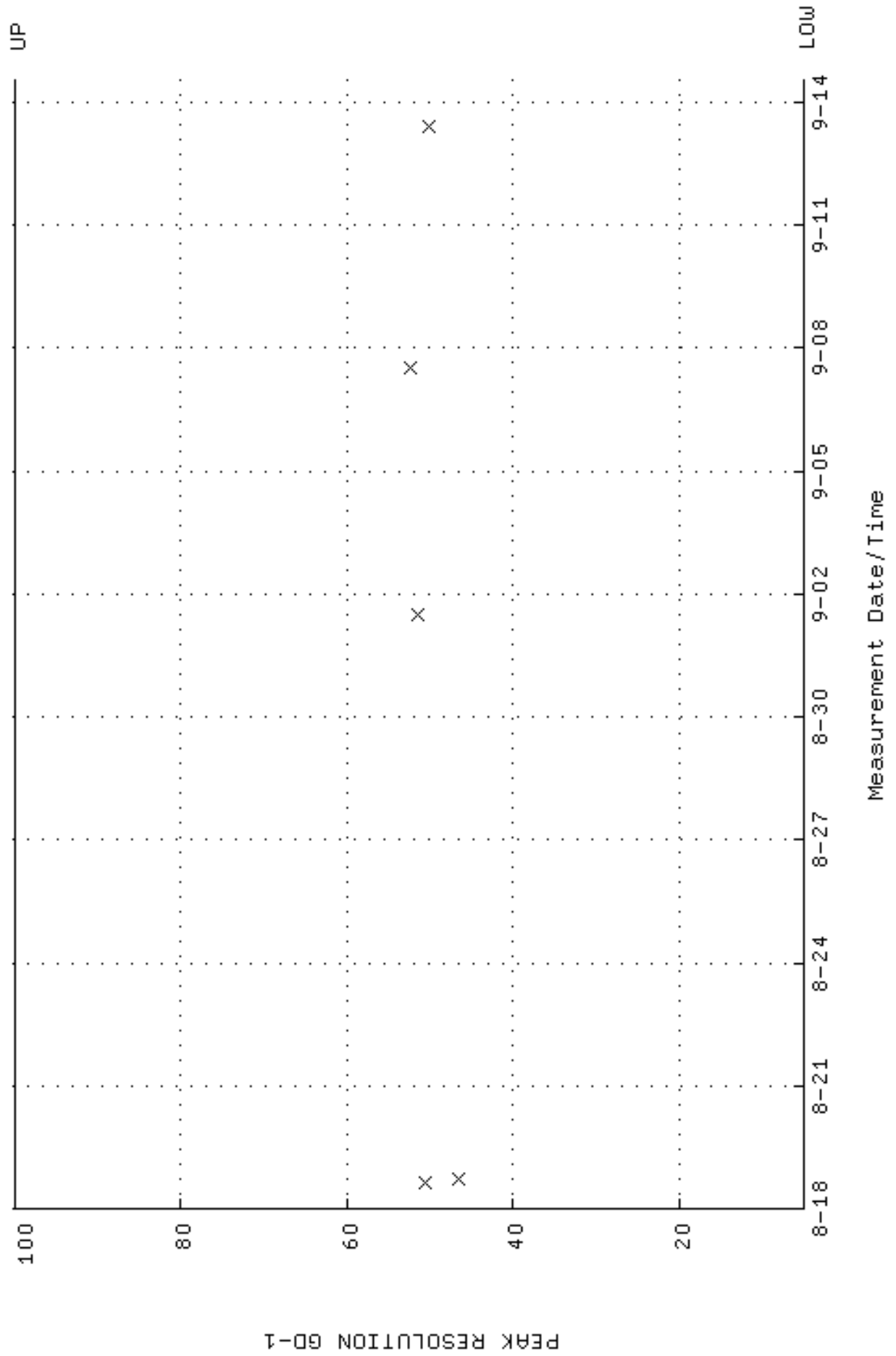
QA filename : DKA100:[ENV_ALPHA.QA.W]W166.QAF;6
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 18-AUG-2016 15:05:24 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.260389 through 0.276500



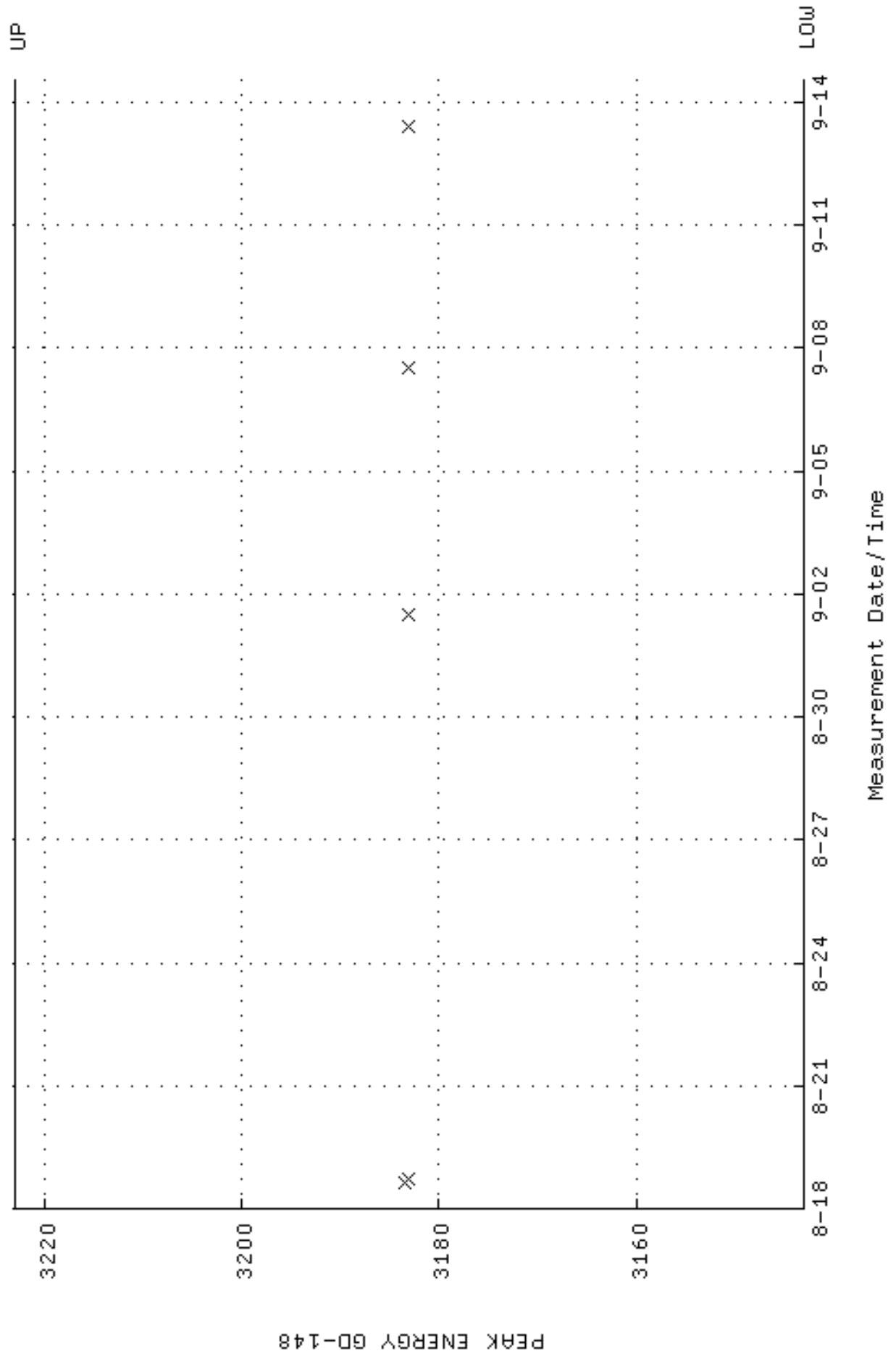
QA filename : DKA100:[ENV_ALPHA.QA.W]W166.QAF;6
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 18-AUG-2016 15:05:24 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



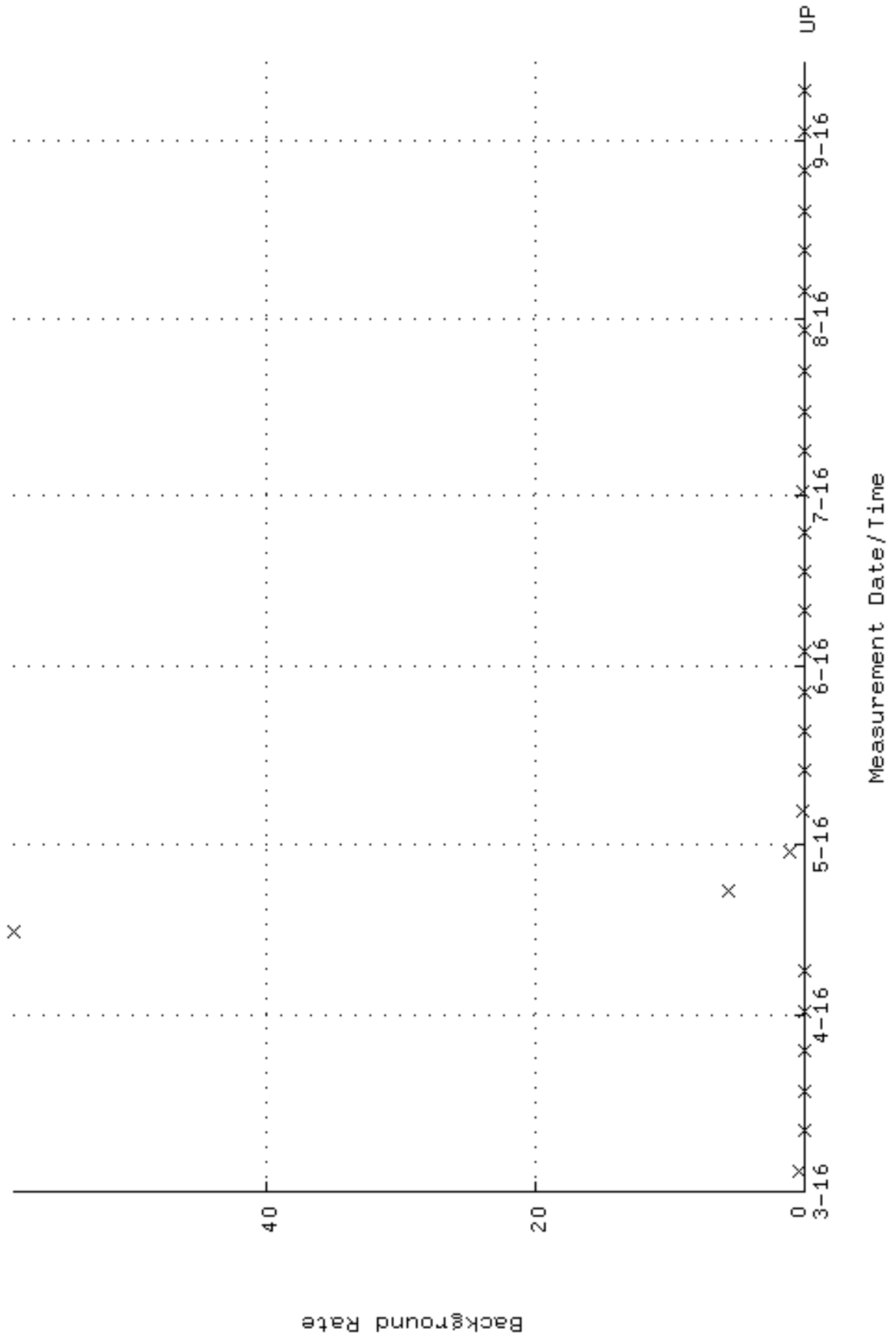
QA filename : DKA100:[ENV_ALPHA.QA.W]W166.QAF;6
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 18-AUG-2016 15:05:24 through 14-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



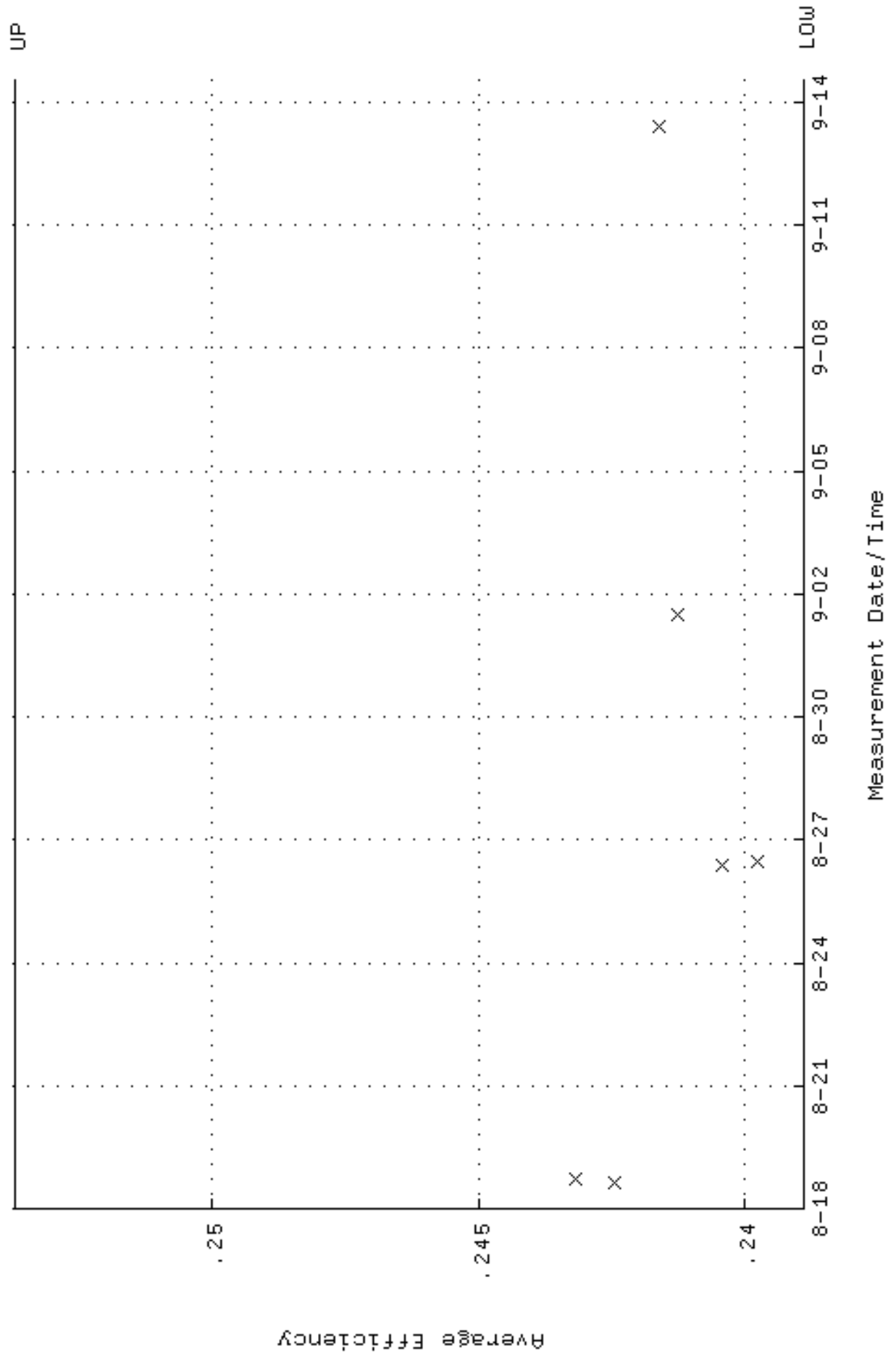
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 18-AUG-2016 15:05:24 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



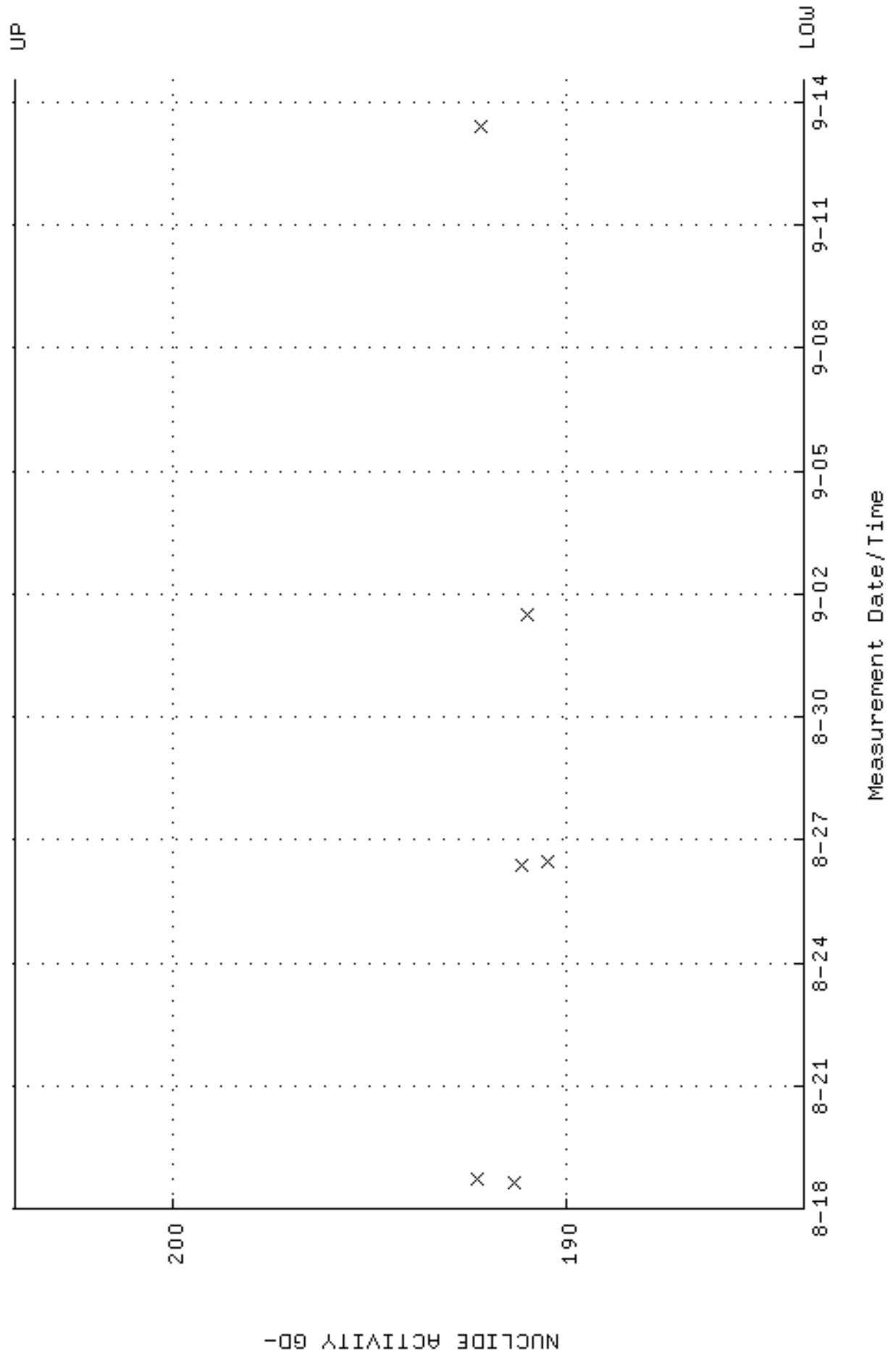
QA filename : DKA100:[ENV_ALPHA.QA.B]B166.QAF;3
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:04:44 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



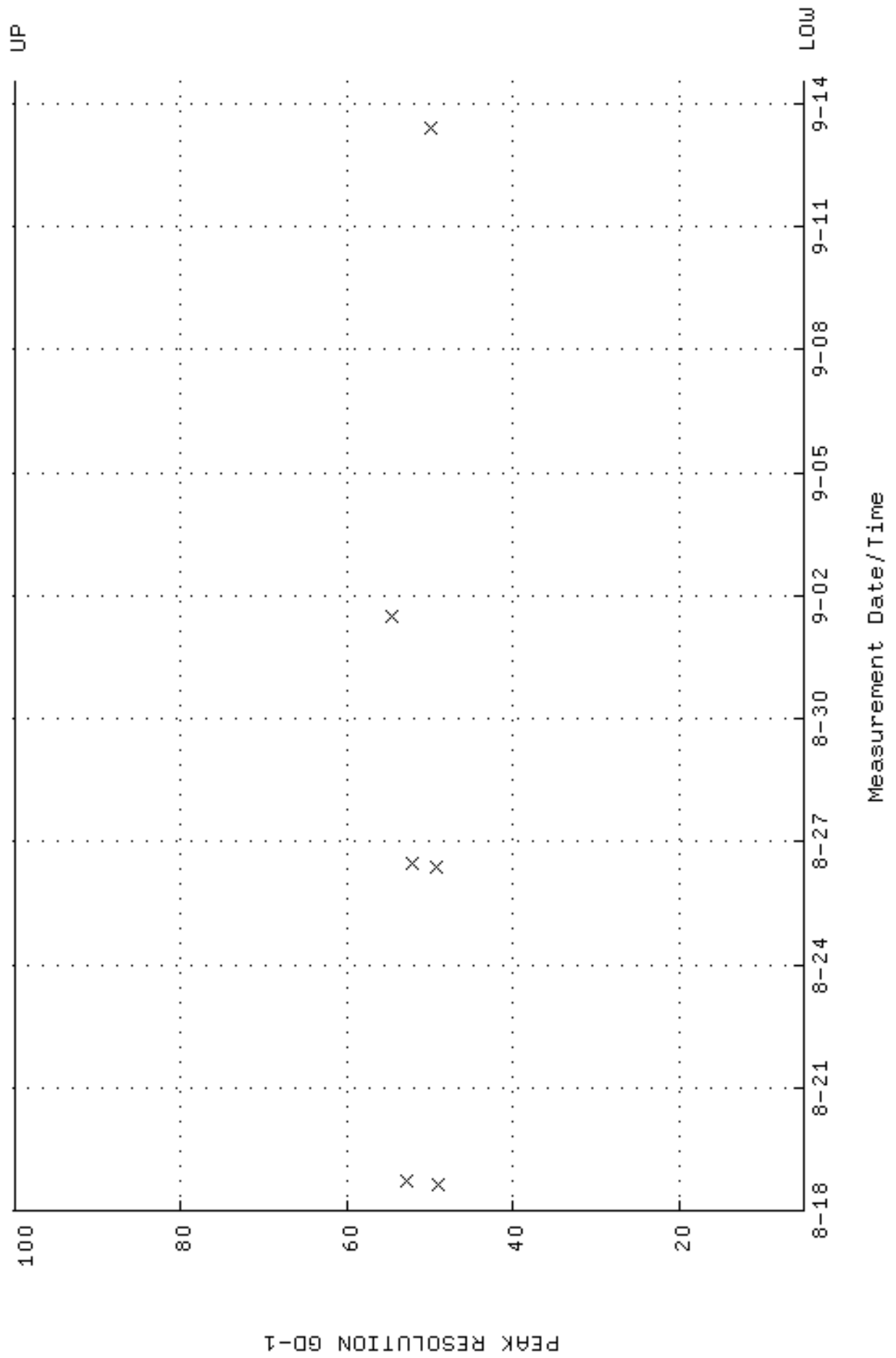
QA filename : DKA100:[ENV_ALPHA.QA.W]W167.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 18-AUG-2016 14:53:57 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.238903 through 0.253681



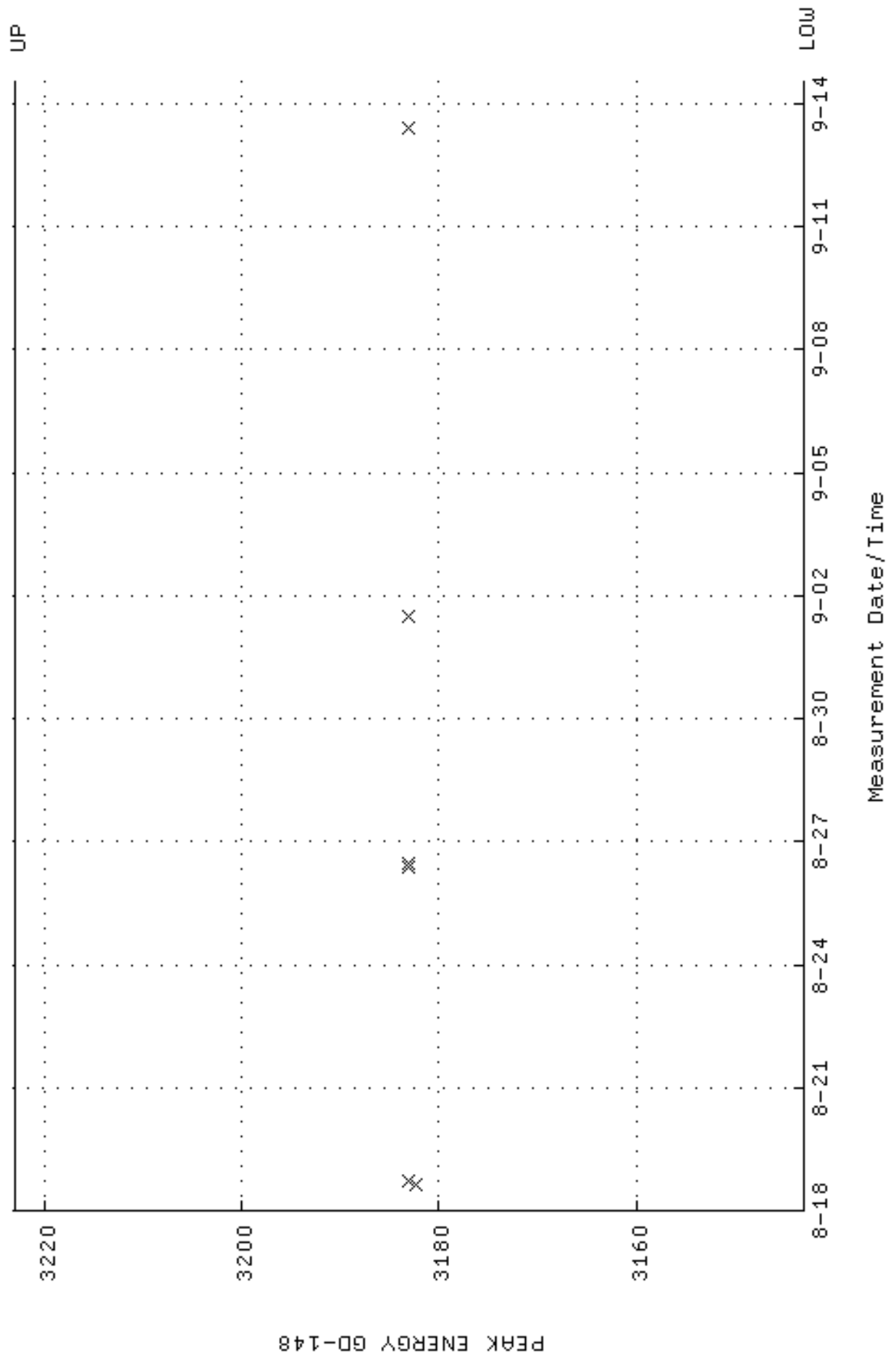
QA filename : DKA100:[ENV_ALPHA.QA.W]W167.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 18-AUG-2016 14:53:57 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



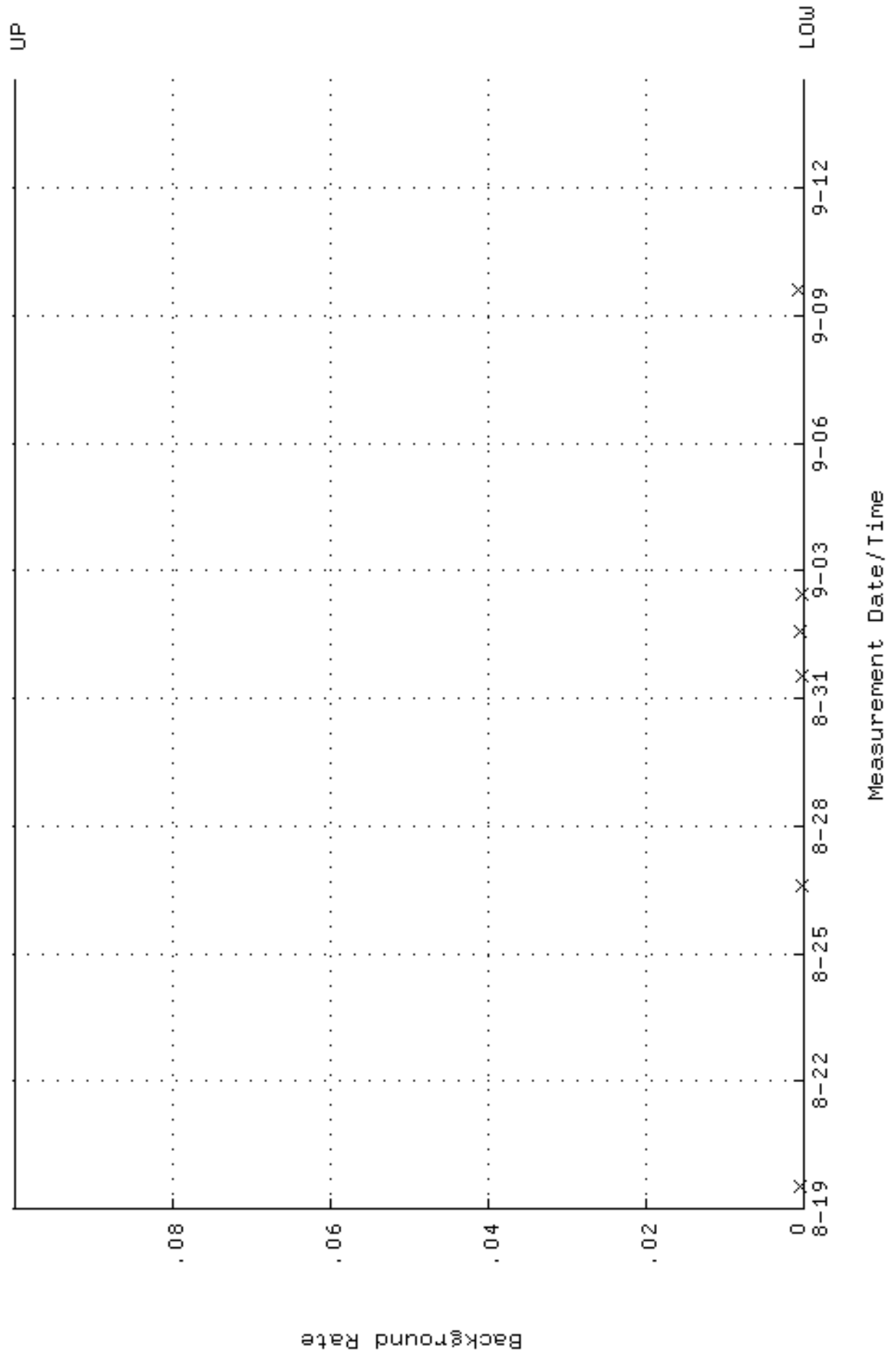
QA filename : DKA100:[ENV_ALPHA.QA.W]W167.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 18-AUG-2016 14:53:57 through 14-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



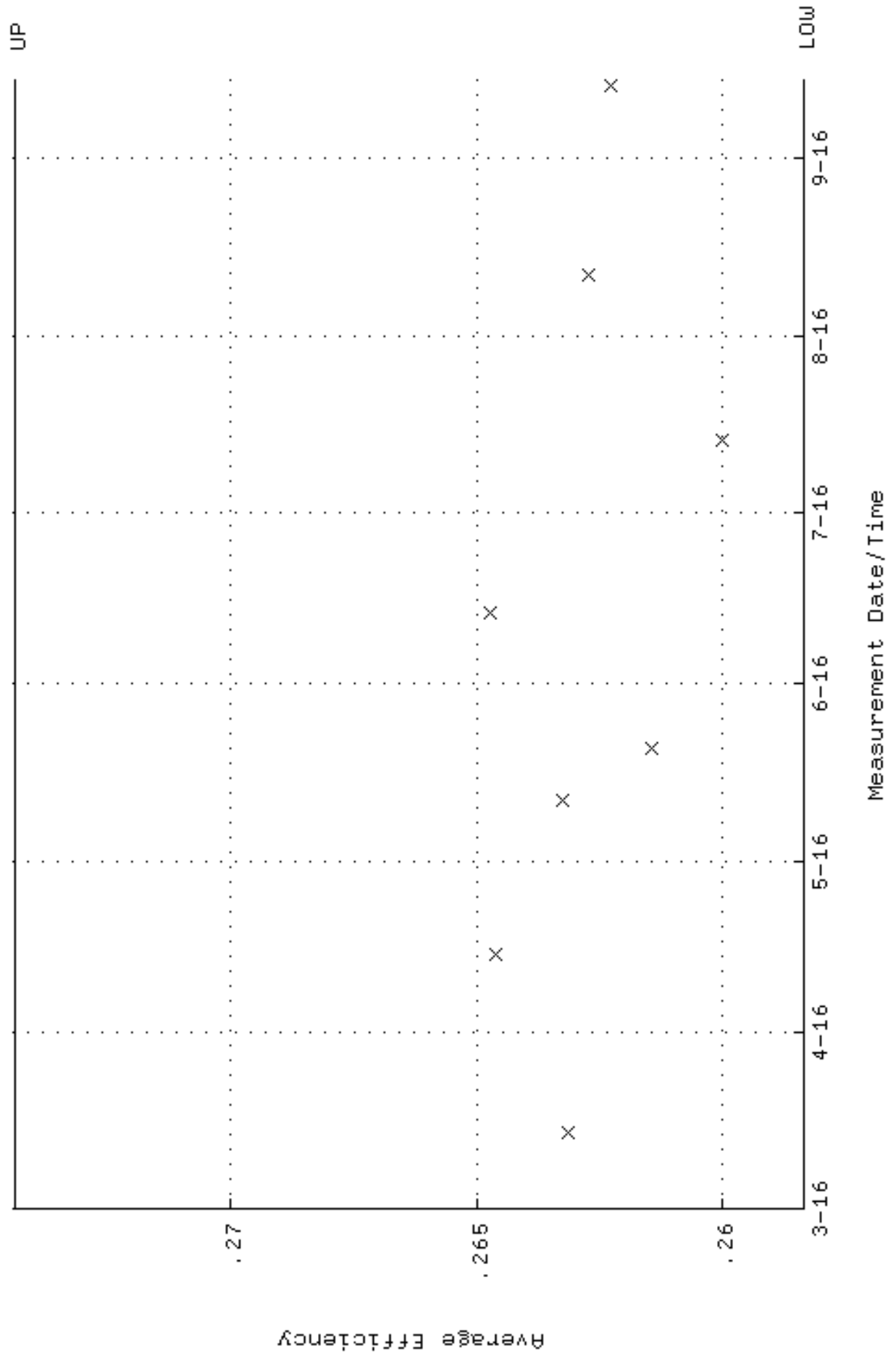
QA filename : DKA100:[ENV_ALPHA.QA.W]W167.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 18-AUG-2016 14:53:57 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



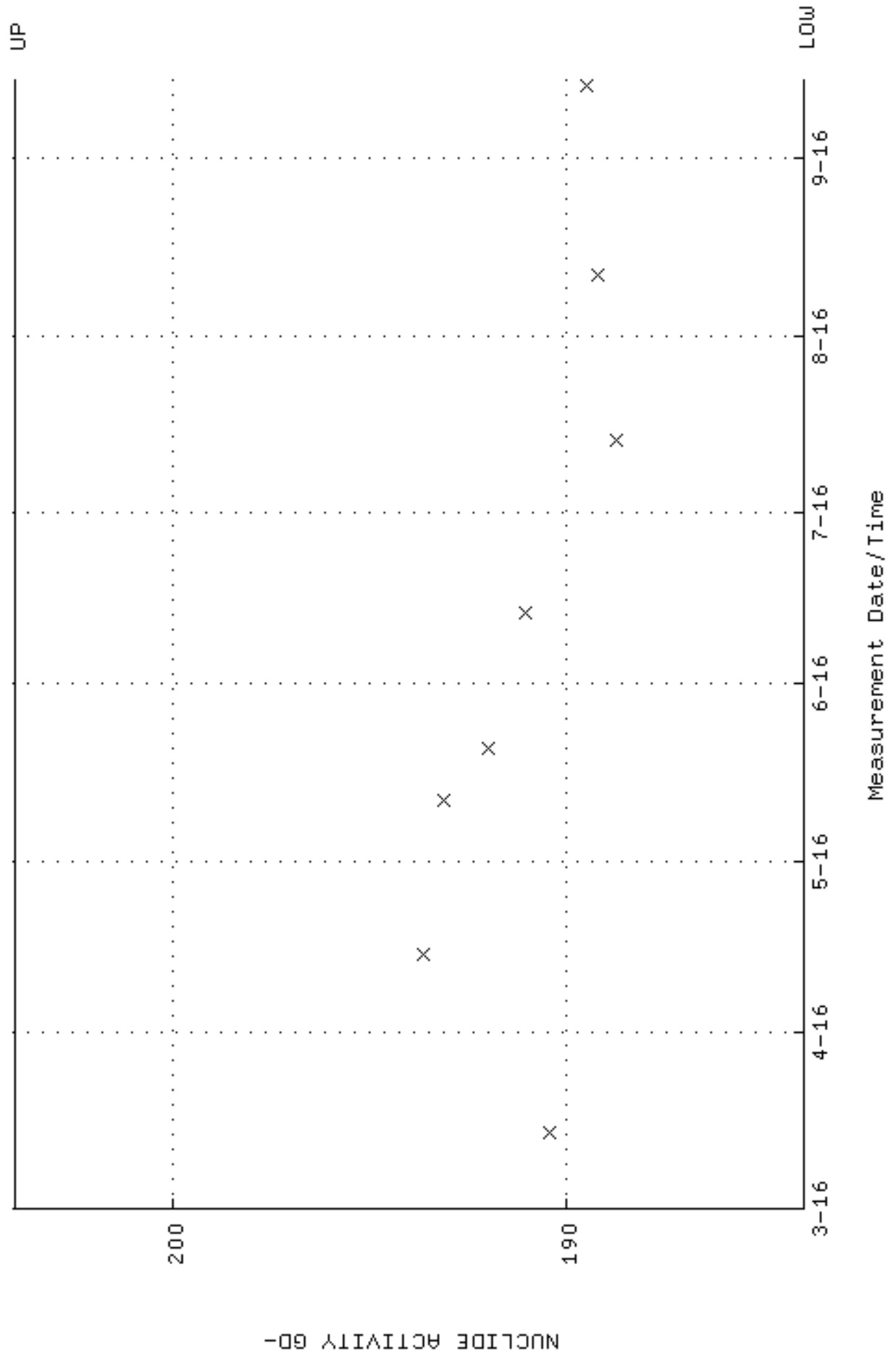
QA filename : DKA100:[ENV_ALPHA.QA.B]B167.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 19-AUG-2016 12:55:14 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



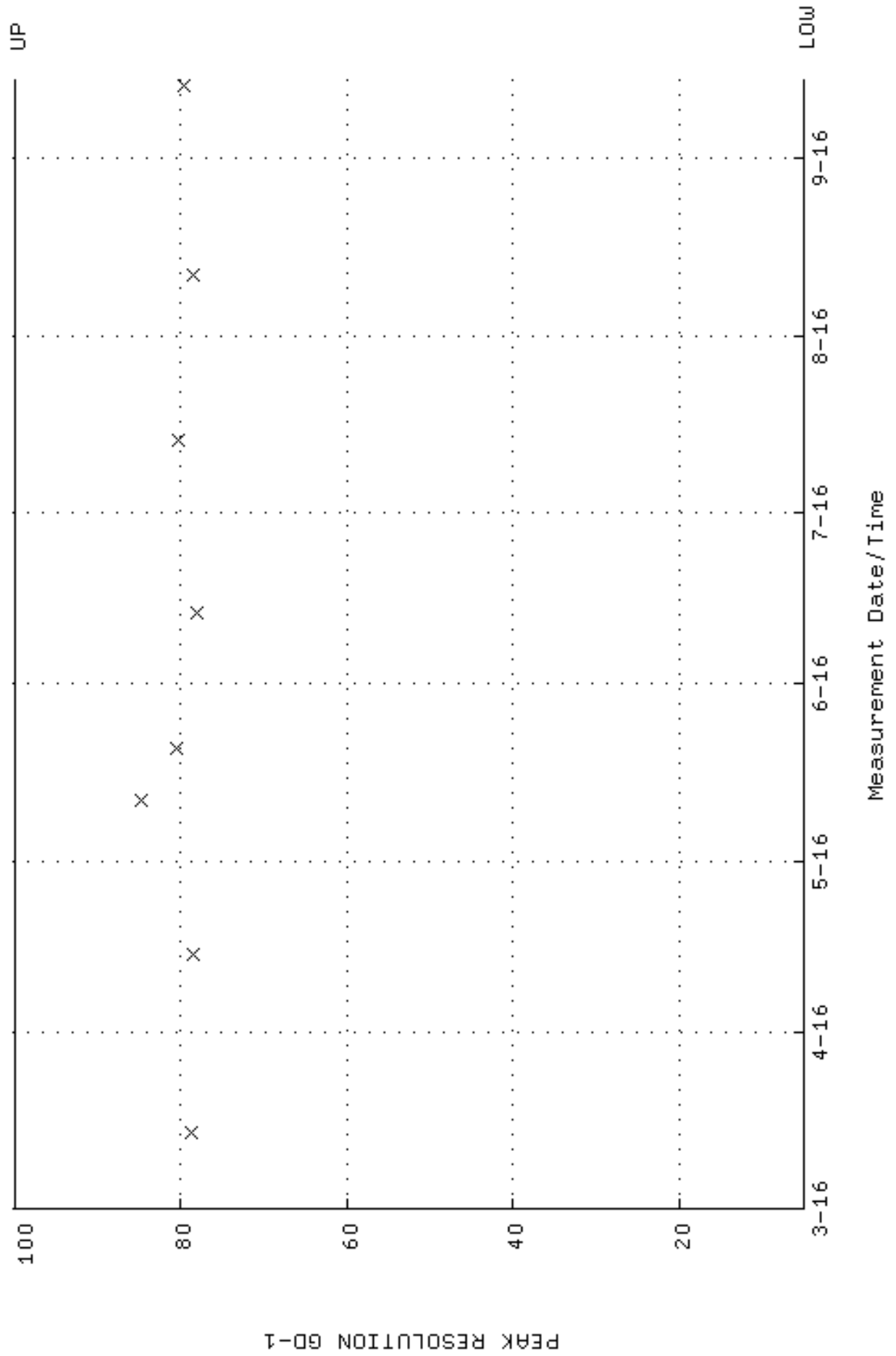
QA filename : DKA100:[ENV_ALPHA.QA.W]W169.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 14-MAR-2016 10:47:36 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.258364 through 0.274346



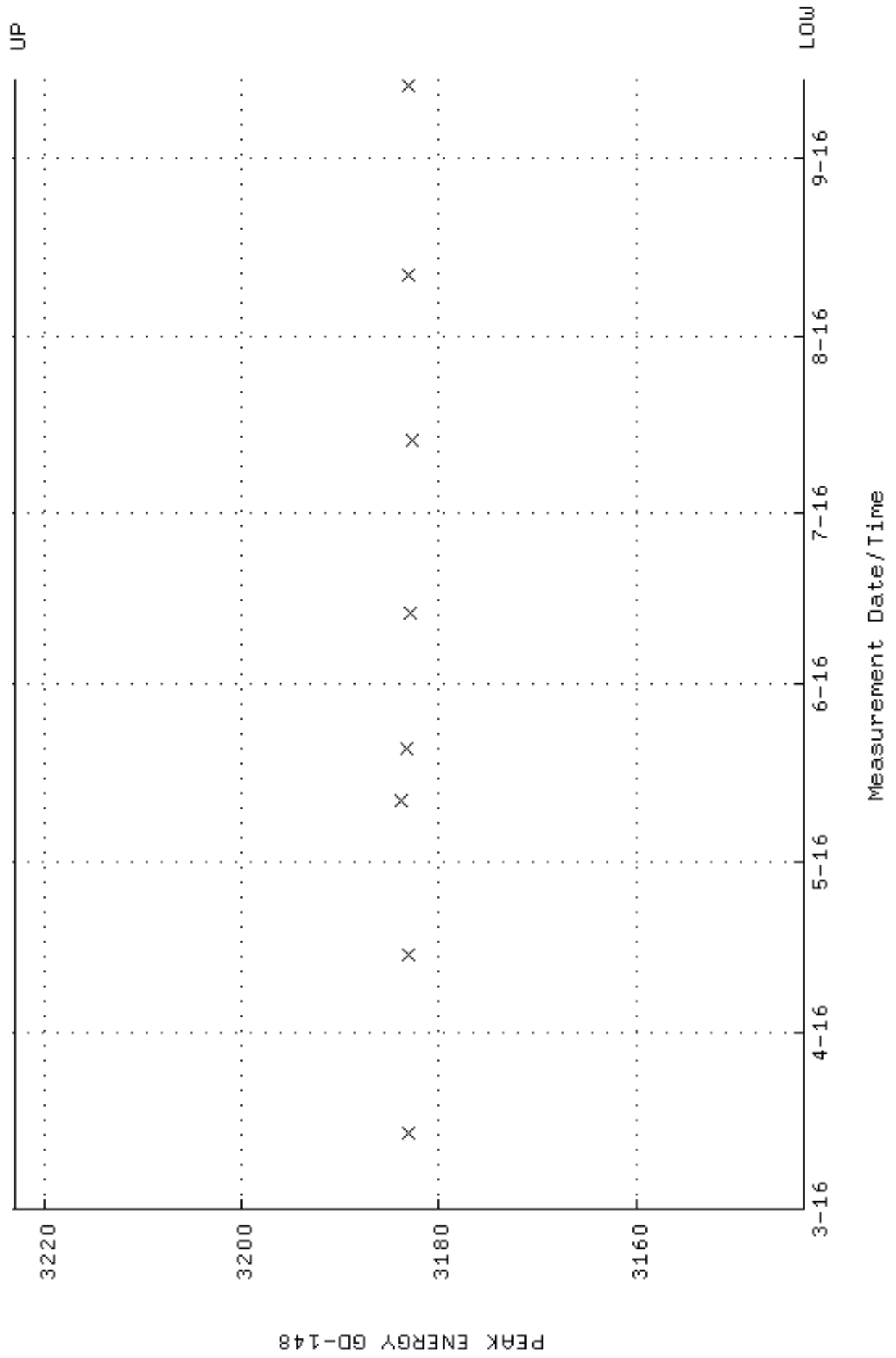
QA filename : DKA100:[ENV_ALPHA.QA.W]W169.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 14-MAR-2016 10:47:36 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



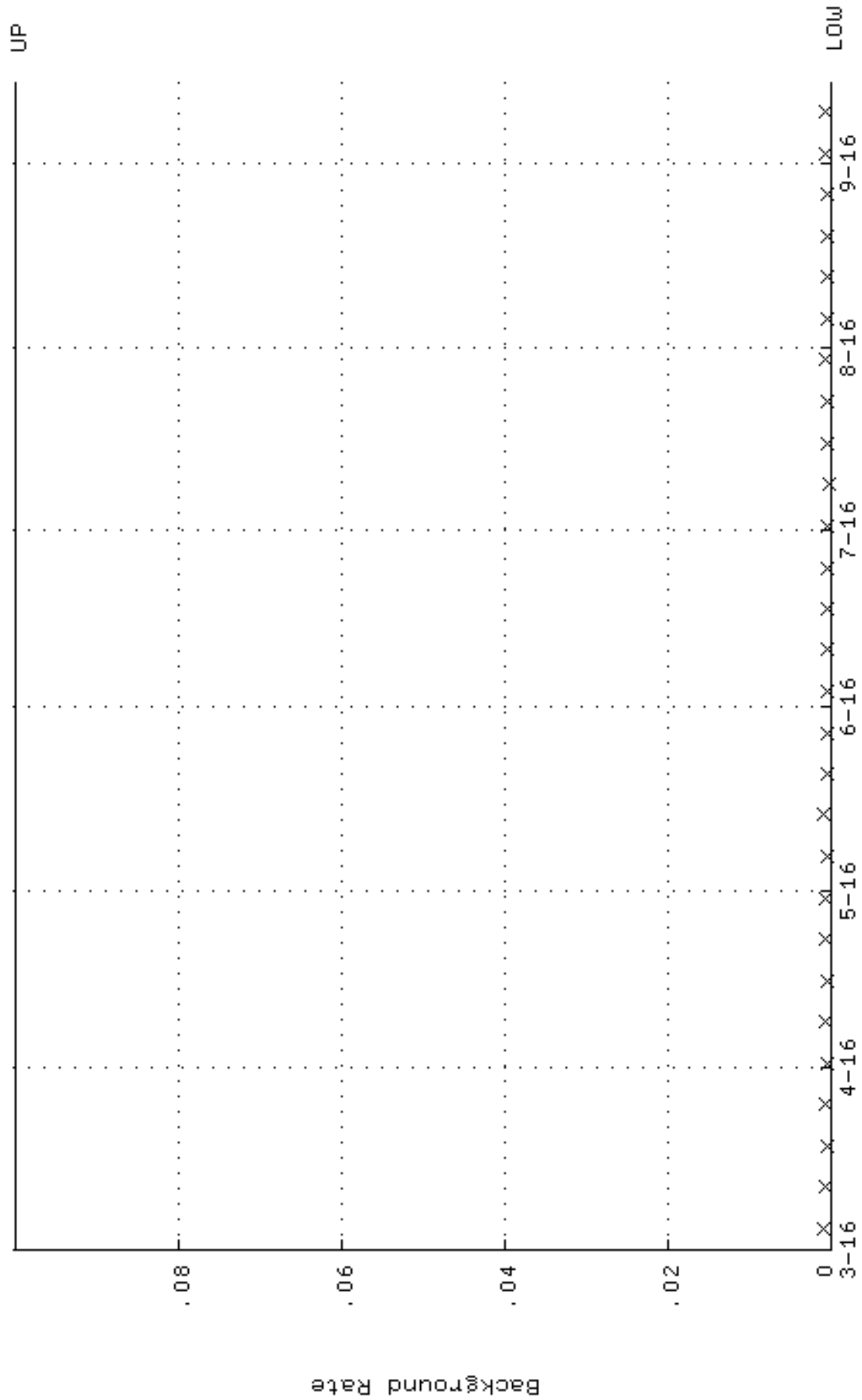
QA filename : DKA100:[ENV_ALPHA.QA.W]W169.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 14-MAR-2016 10:47:36 through 14-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



QA filename : DKA100:[ENV_ALPHA.QA.W]W169.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 14-MAR-2016 10:47:36 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00

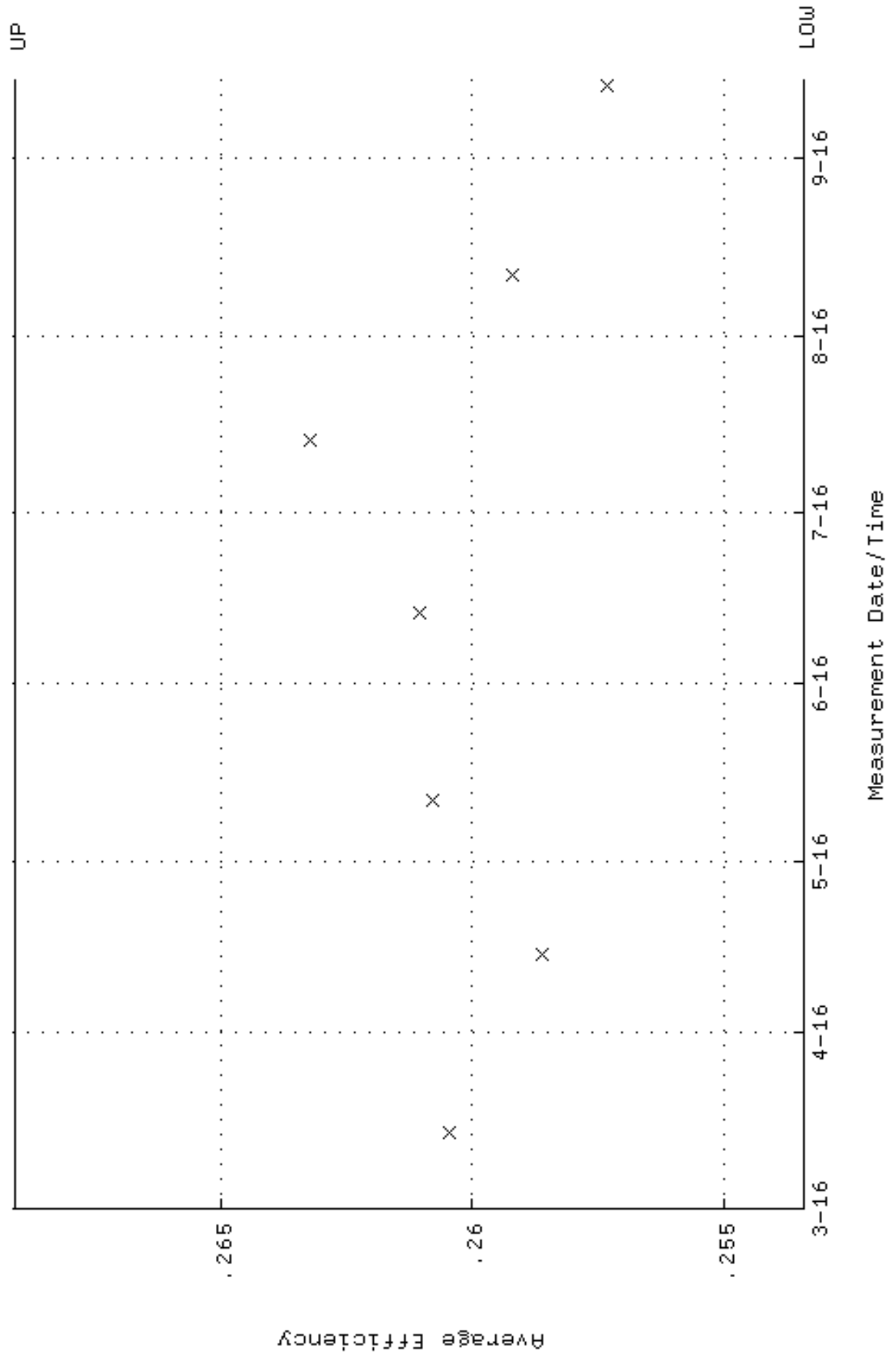


QA filename : DKA100:[ENV_ALPHA.QA.B]B169.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:04:56 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000

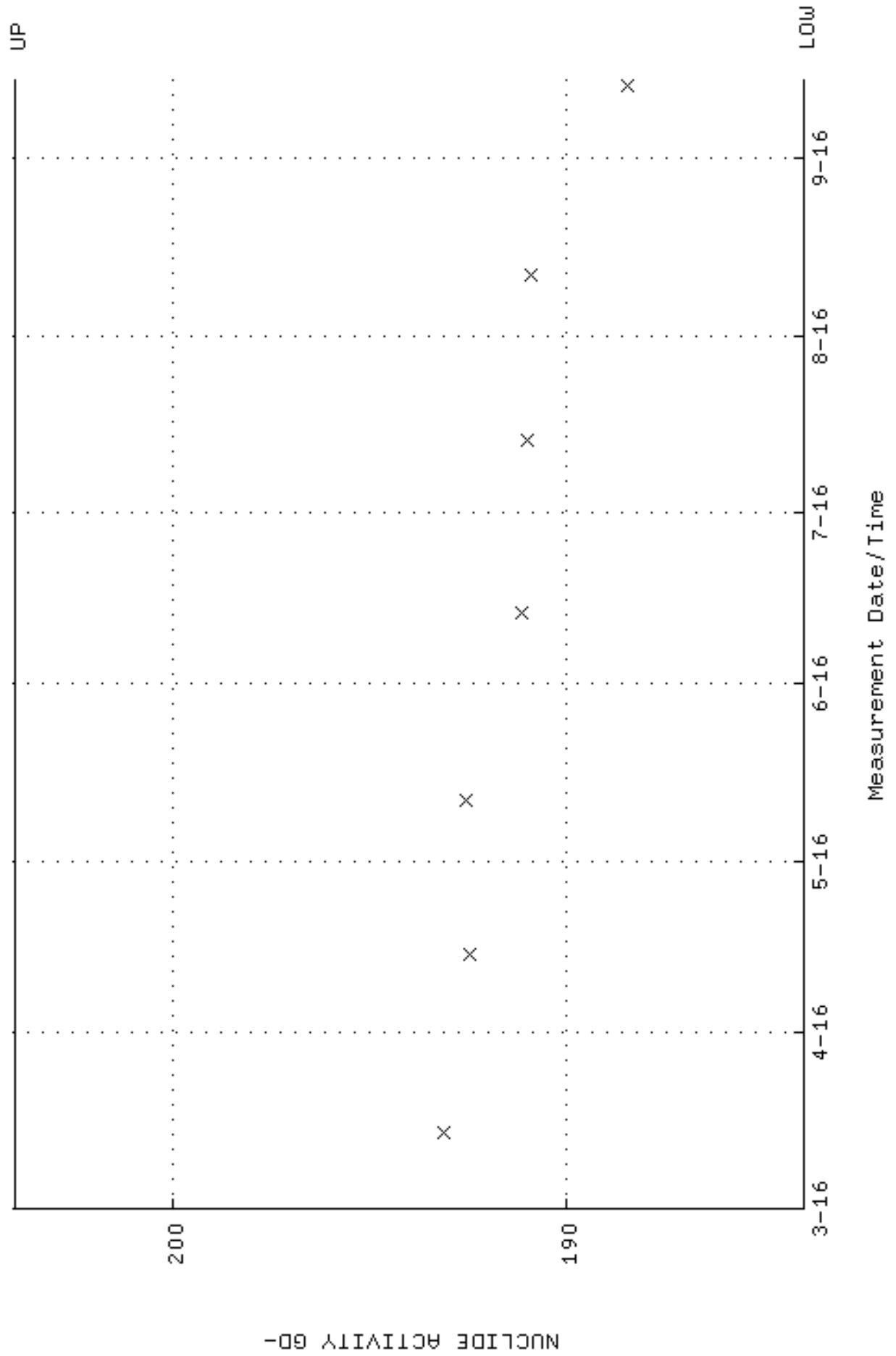


Measurement Date/Time

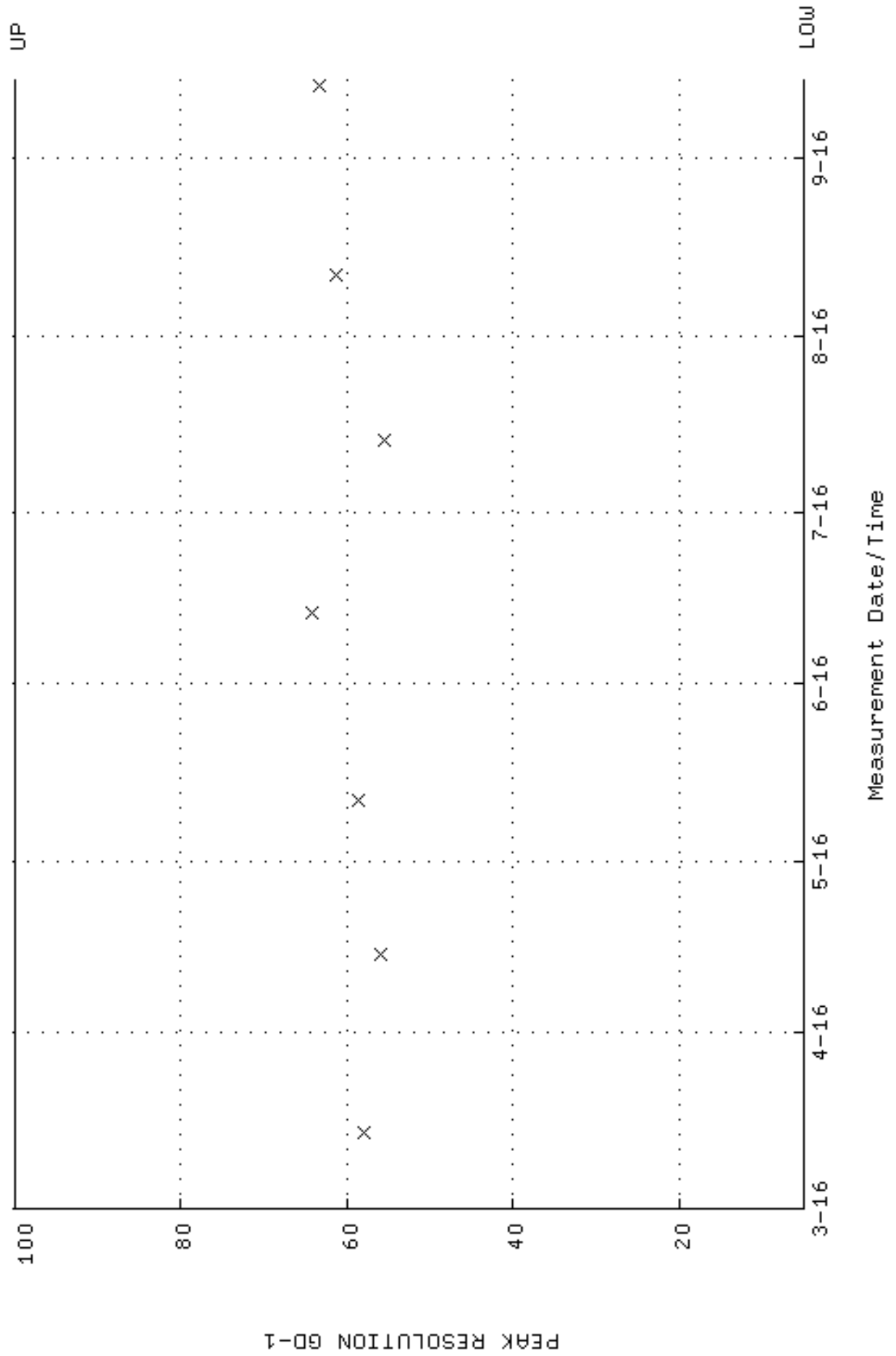
QA filename : DKA100:[ENV_ALPHA.QA.W]W170.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 14-MAR-2016 10:47:40 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.253400 through 0.269100



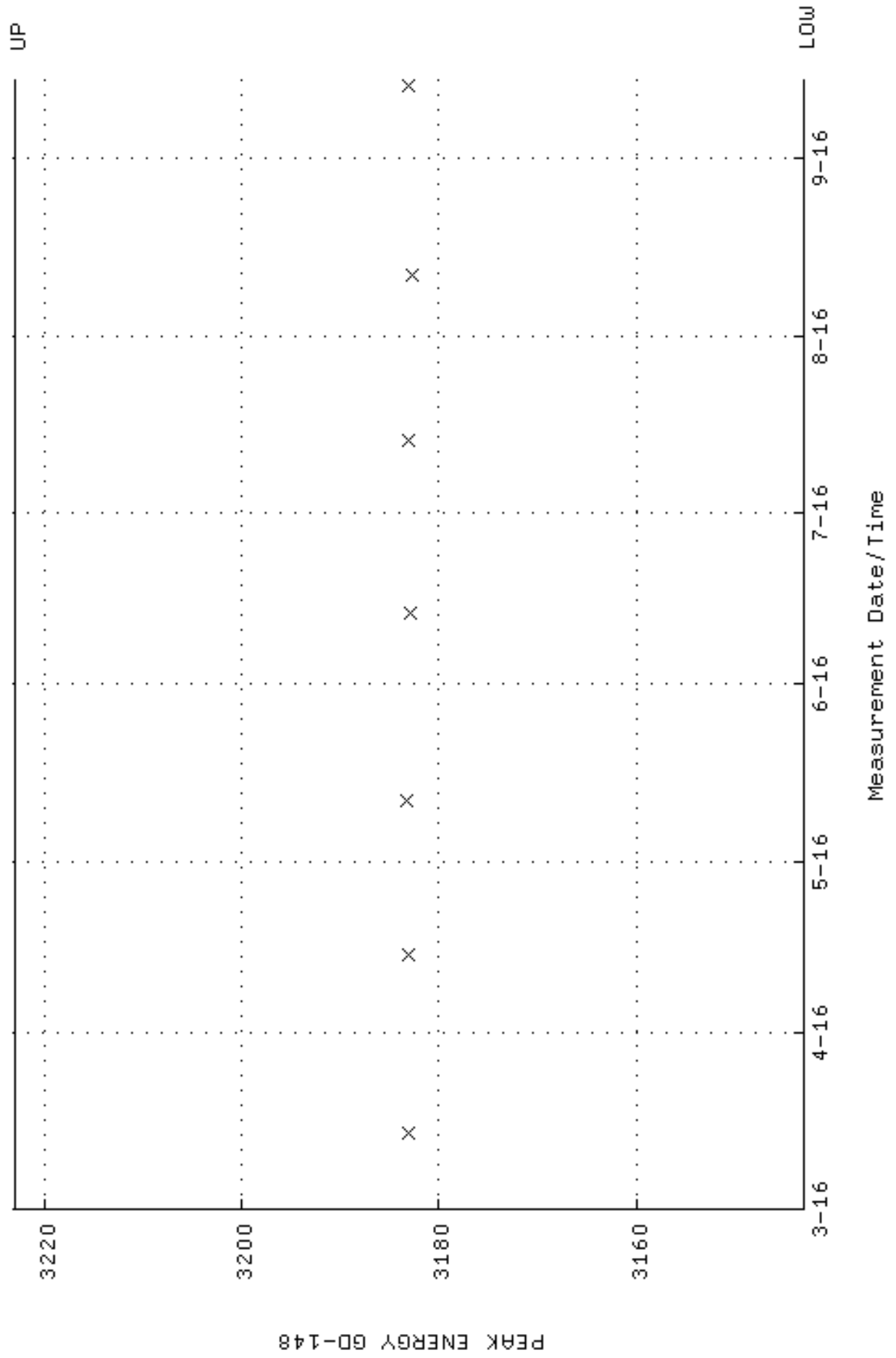
QA filename : DKA100:[ENV_ALPHA.QA.W]W170.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 14-MAR-2016 10:47:40 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



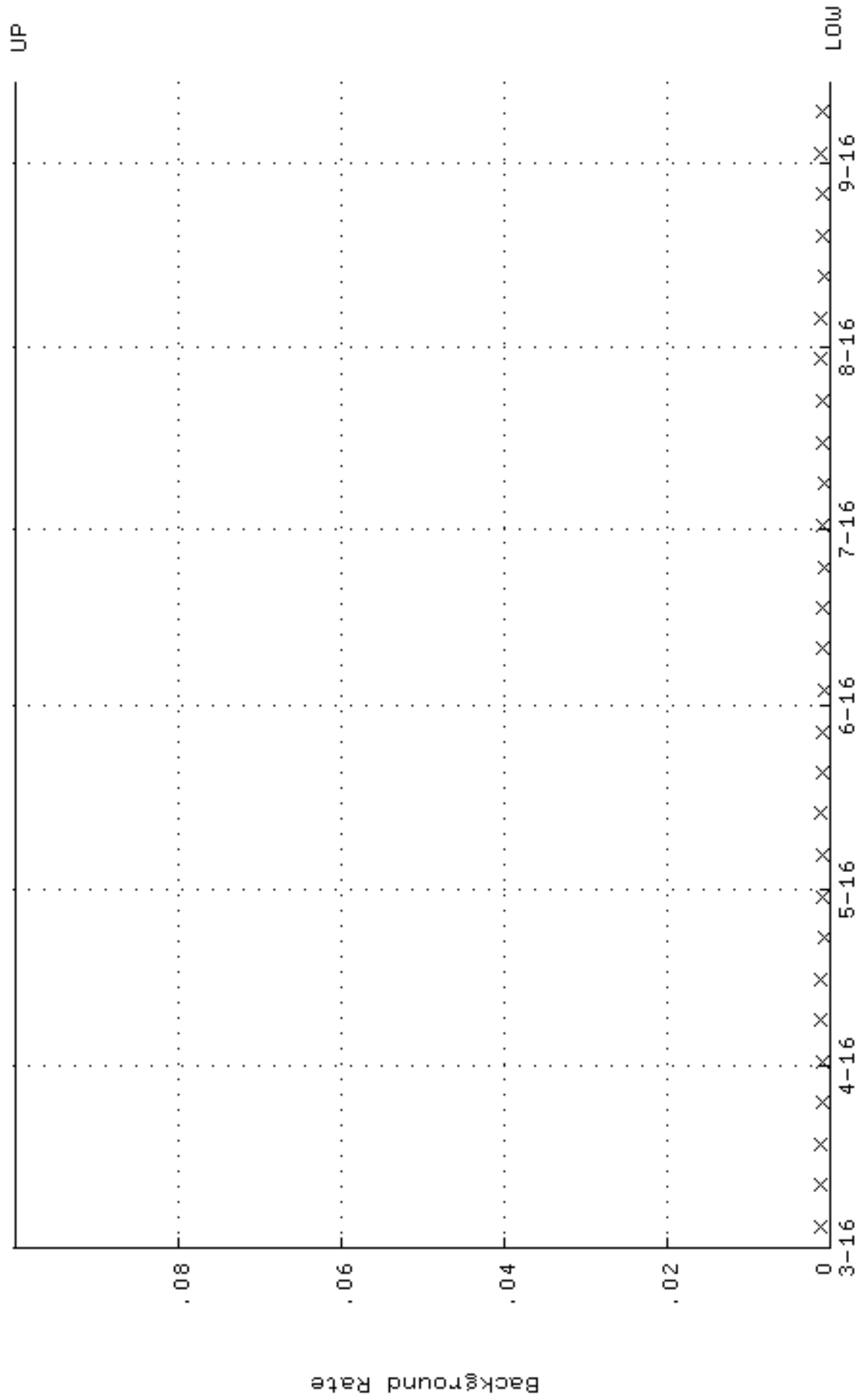
QA filename : DKA100:[ENV_ALPHA.QA.W]W170.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 14-MAR-2016 10:47:40 through 14-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



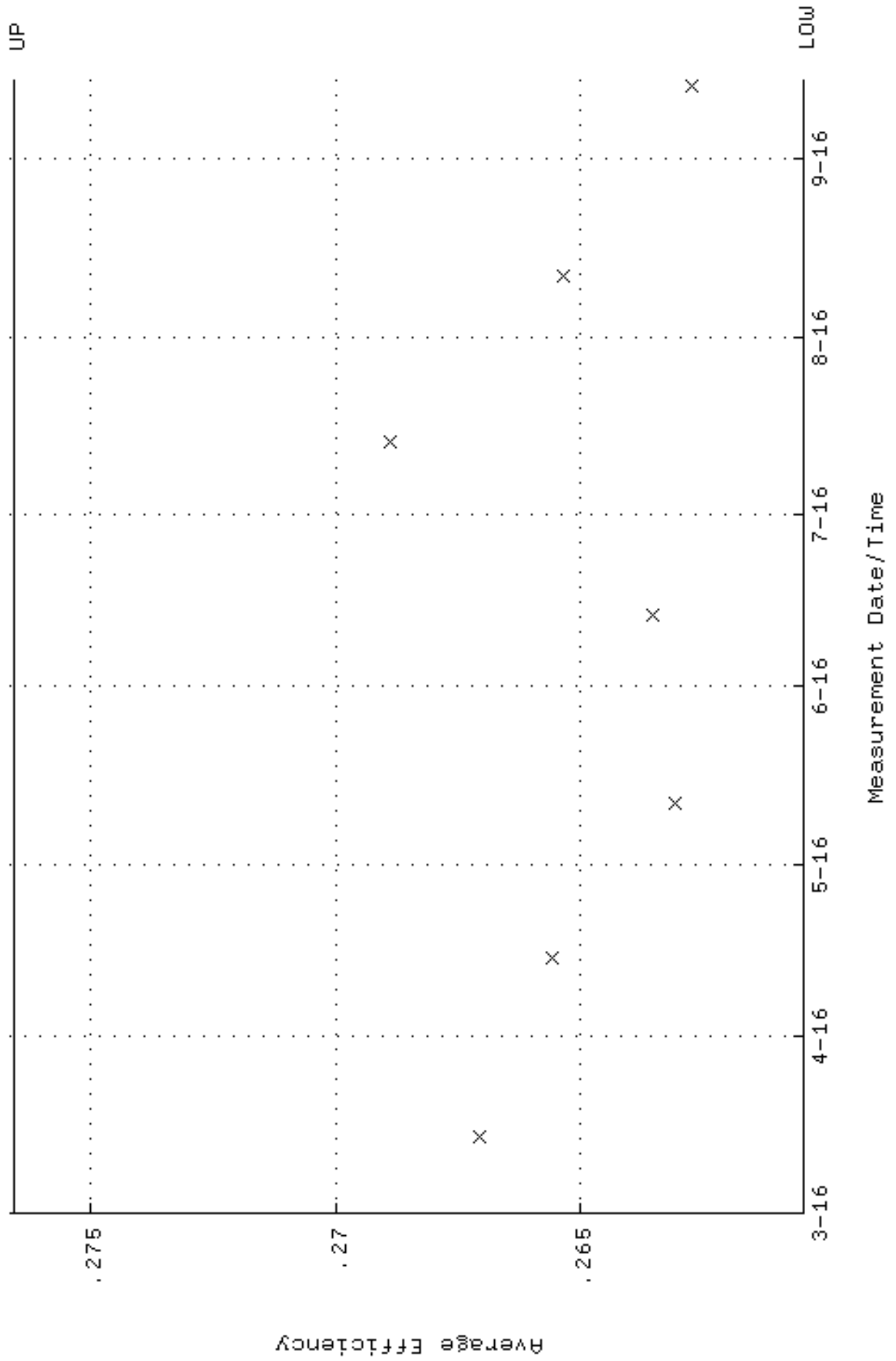
QA filename : DKA100:[ENV_ALPHA.QA.W]W170.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 14-MAR-2016 10:47:40 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



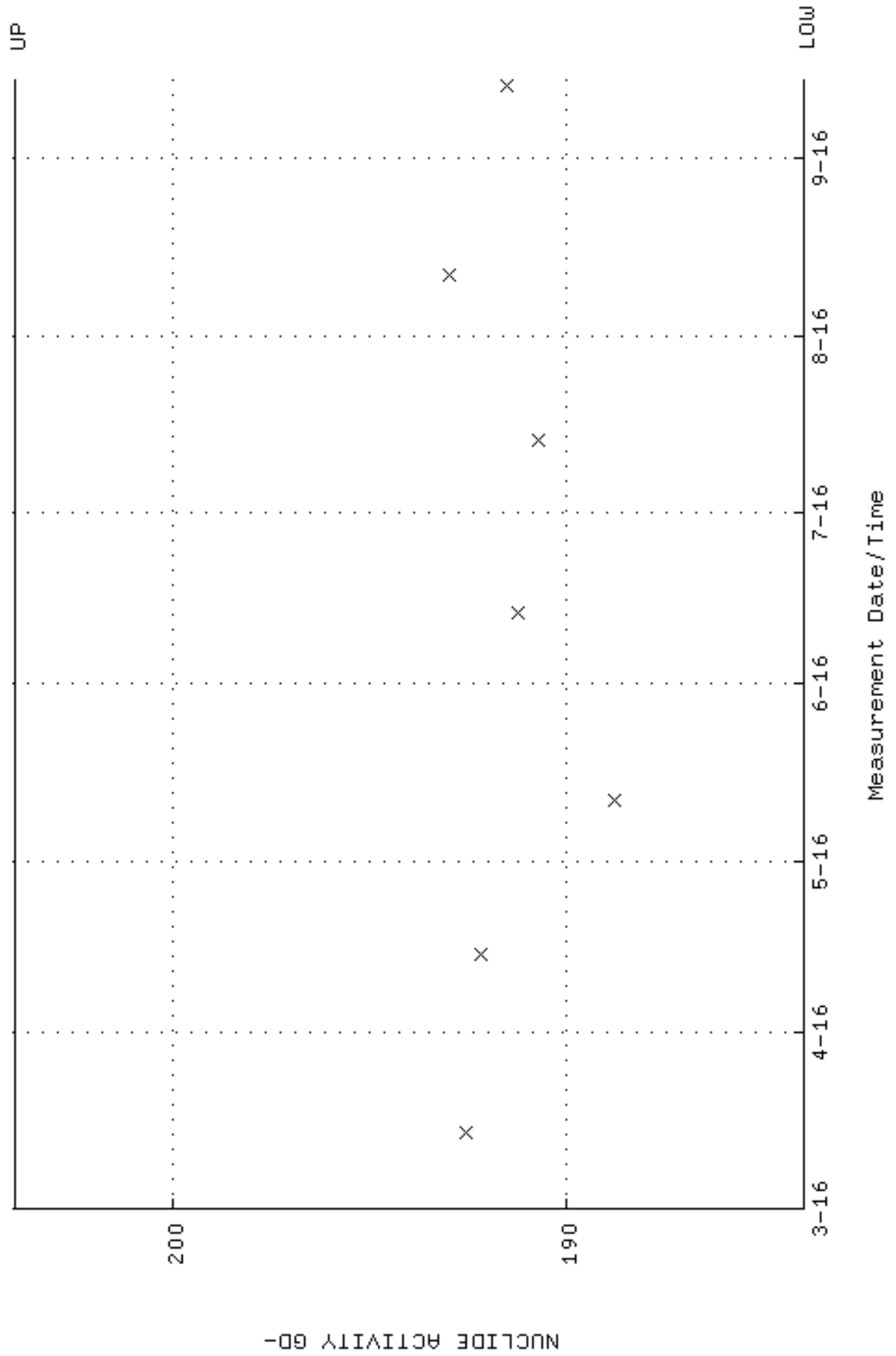
QA filename : DKA100:[ENV_ALPHA.QA.B]B170.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:05:00 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



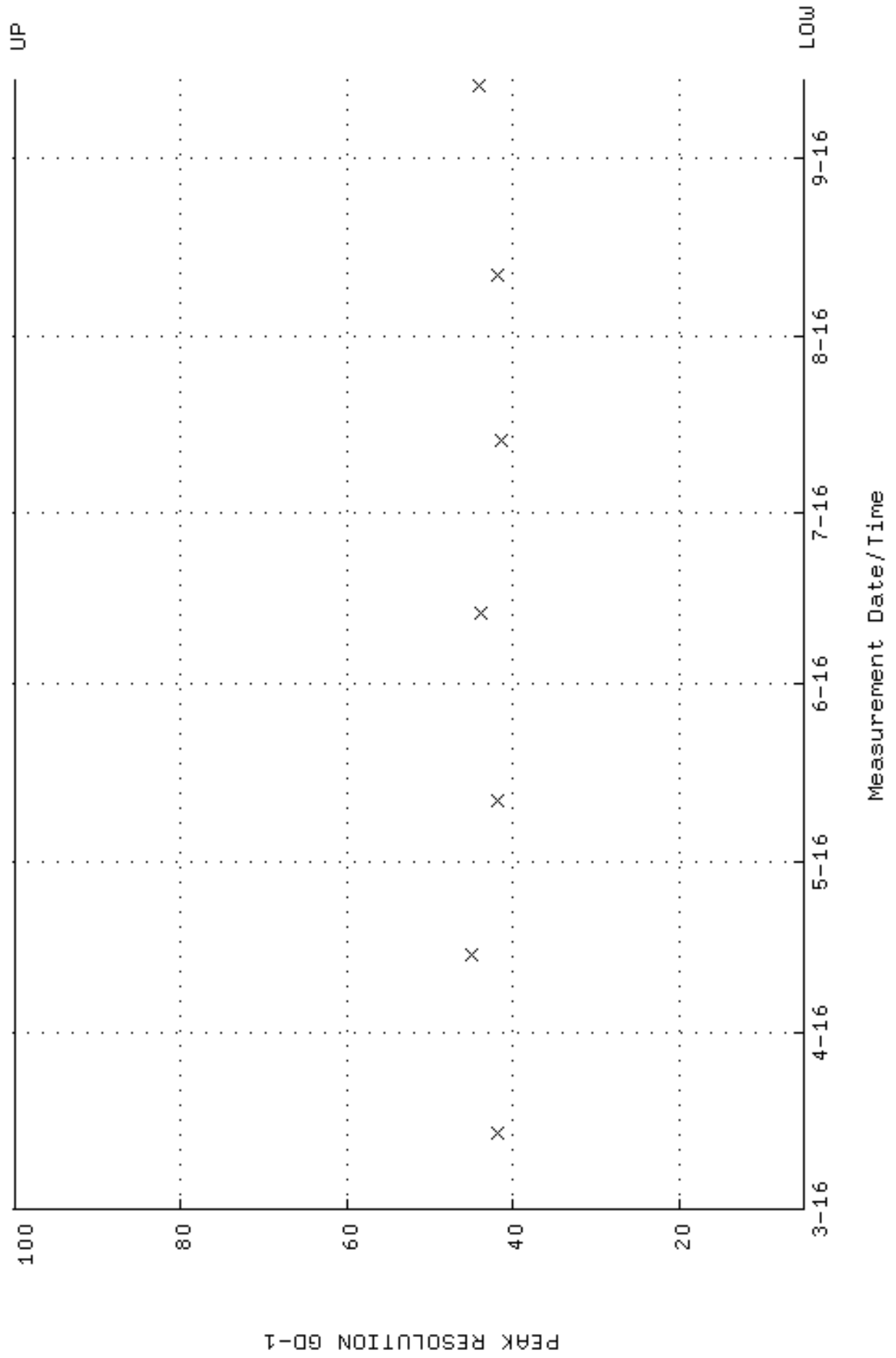
QA filename : DKA100:[ENV_ALPHA.QA.W]W175.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 14-MAR-2016 10:48:01 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.260448 through 0.276590



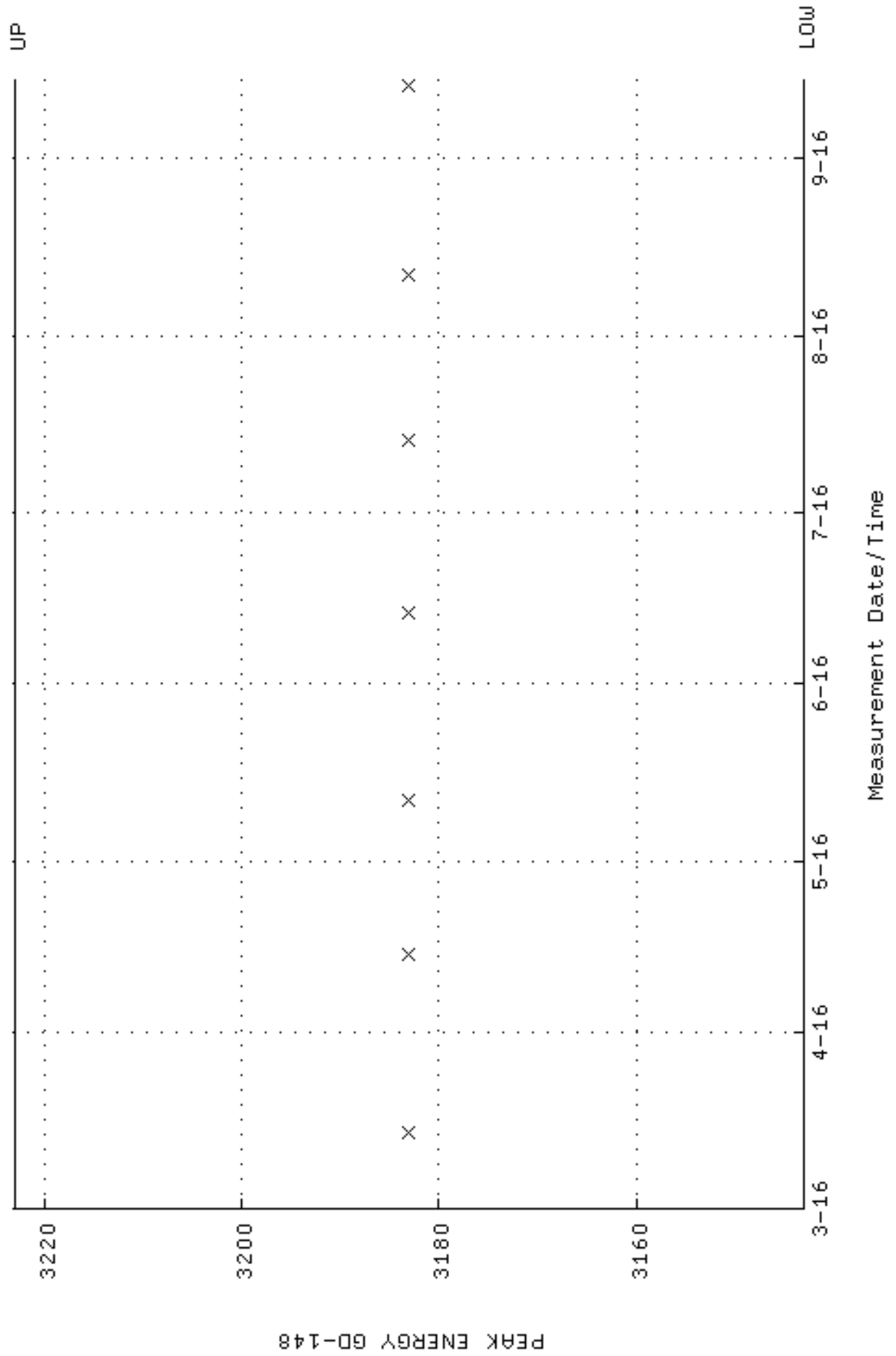
QA filename : DKA100:[ENV_ALPHA.QA.W]W175.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 14-MAR-2016 10:48:01 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



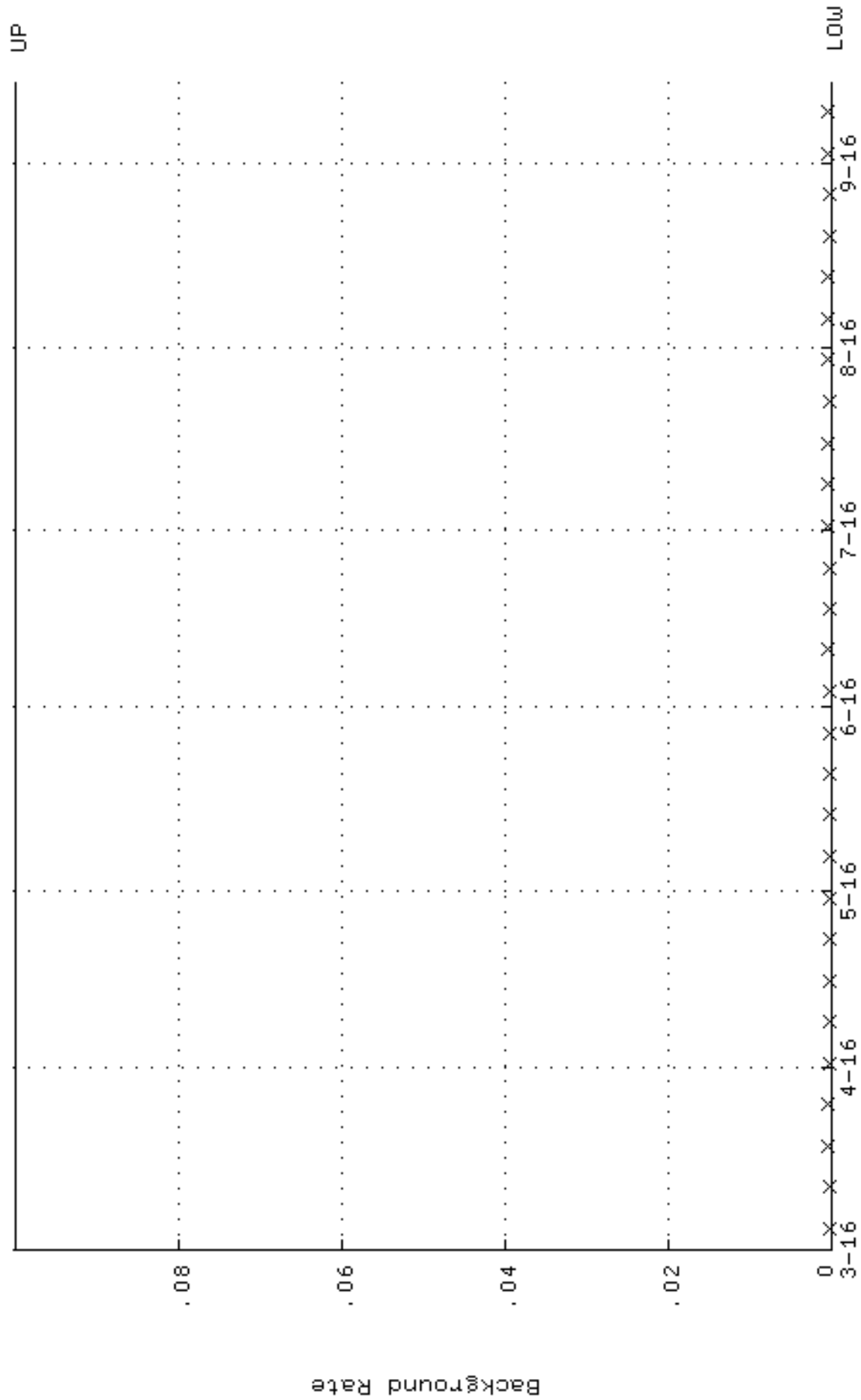
QA filename : DKA100:[ENV_ALPHA.QA.W]W175.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 14-MAR-2016 10:48:01 through 14-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



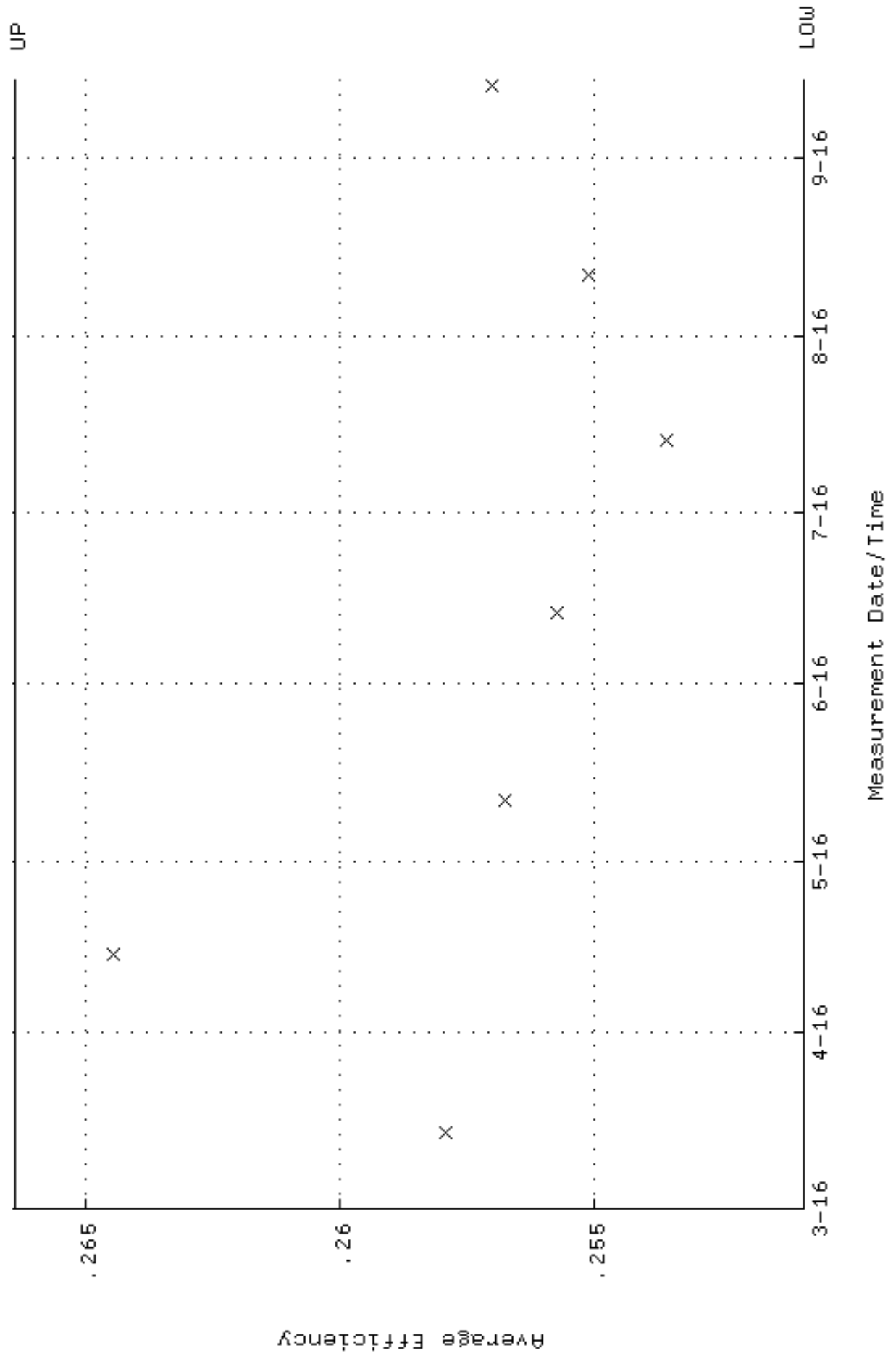
QA filename : DKA100:[ENV_ALPHA.QA.W]W175.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 14-MAR-2016 10:48:01 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



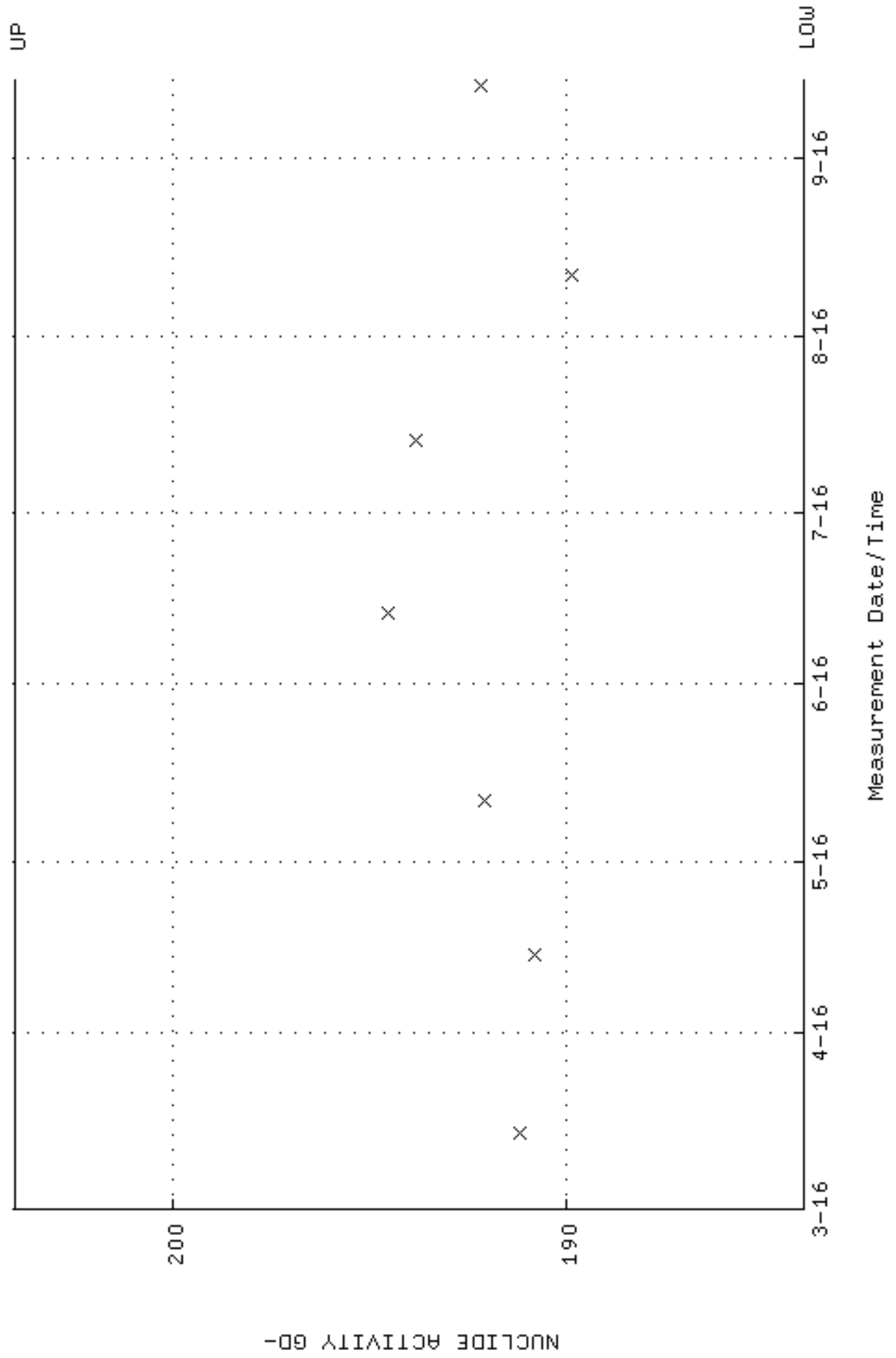
QA filename : DKA100:[ENV_ALPHA.QA.B]B175.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:05:20 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



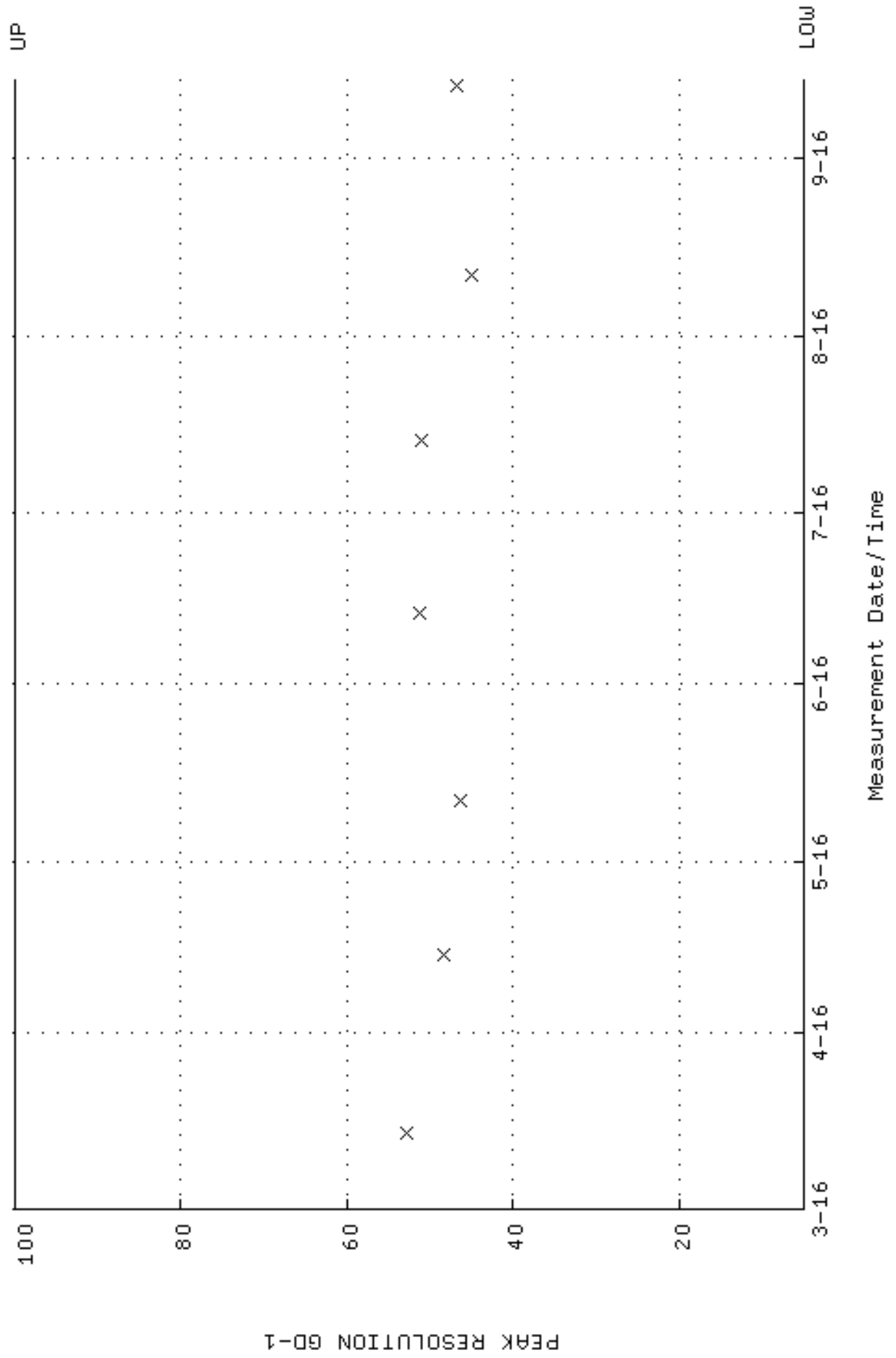
QA filename : DKA100:[ENV_ALPHA.QA.W]W176.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 14-MAR-2016 10:48:05 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.250874 through 0.266392



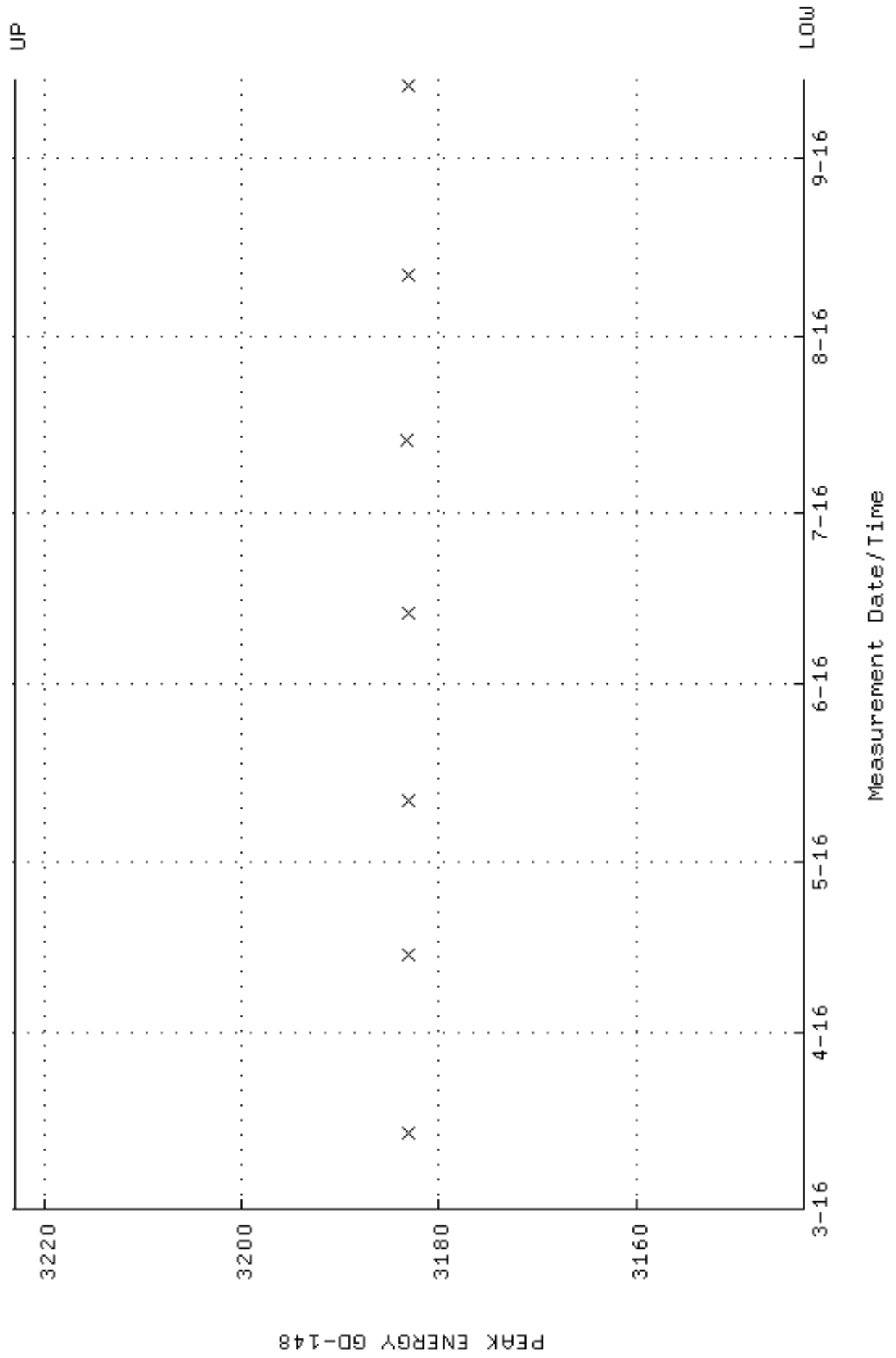
QA filename : DKA100:[ENV_ALPHA.QA.W]W176.QAF;3
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 14-MAR-2016 10:48:05 through 14-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



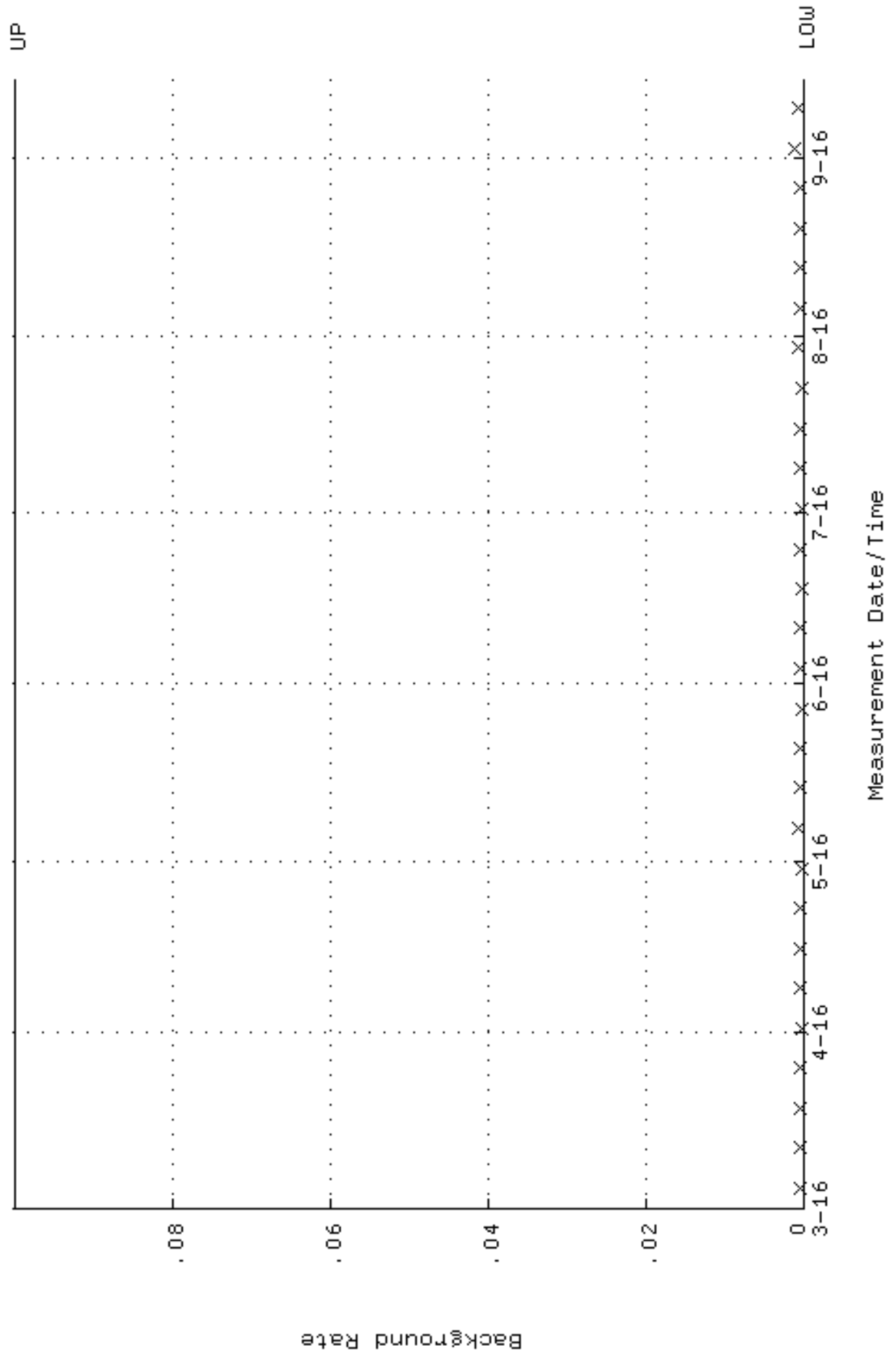
QA filename : DKA100:[ENV_ALPHA.QA.W]W176.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 14-MAR-2016 10:48:05 through 14-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



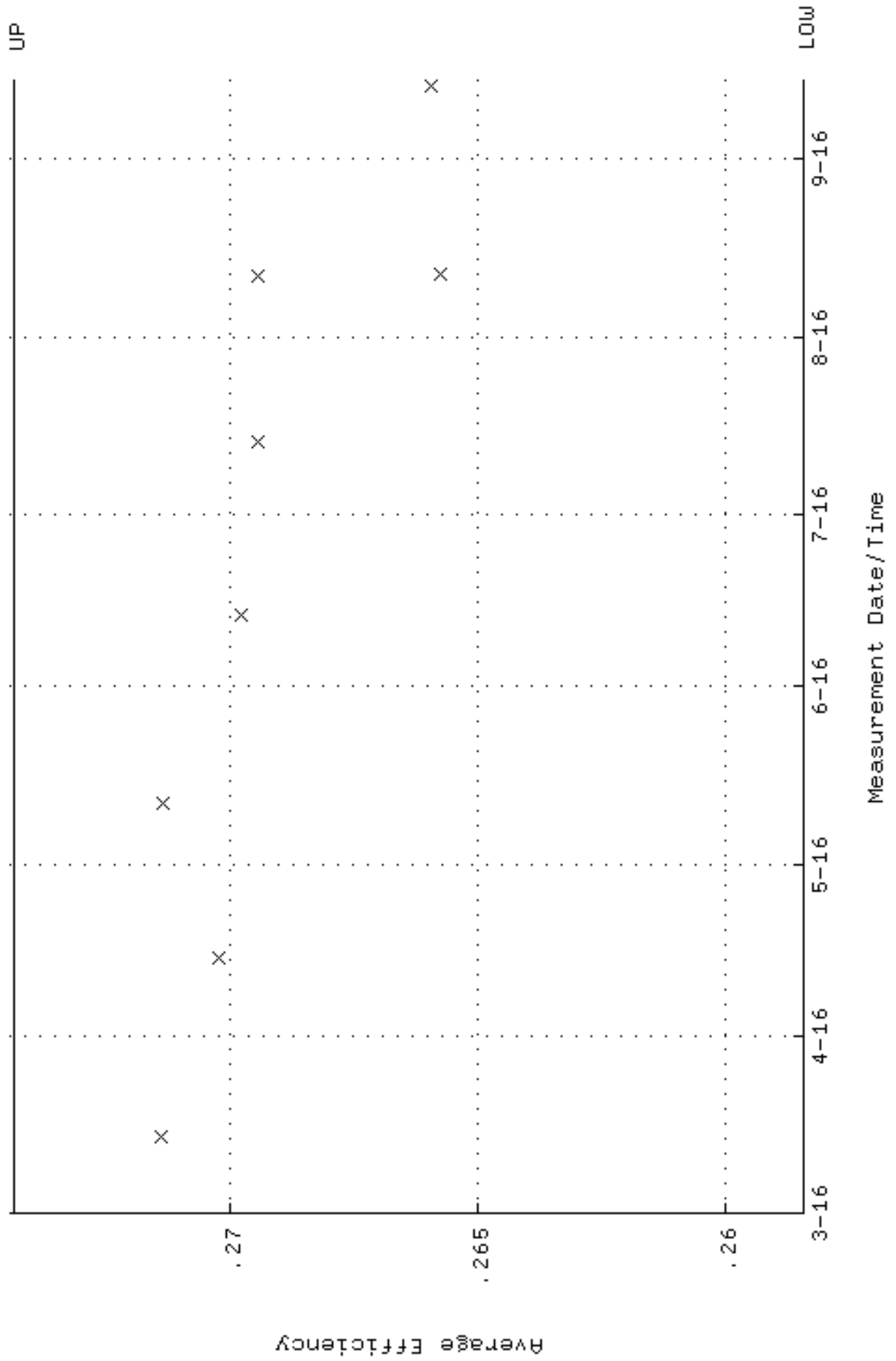
QA filename : DKA100:[ENV_ALPHA.QA.W]W176.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 14-MAR-2016 10:48:05 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



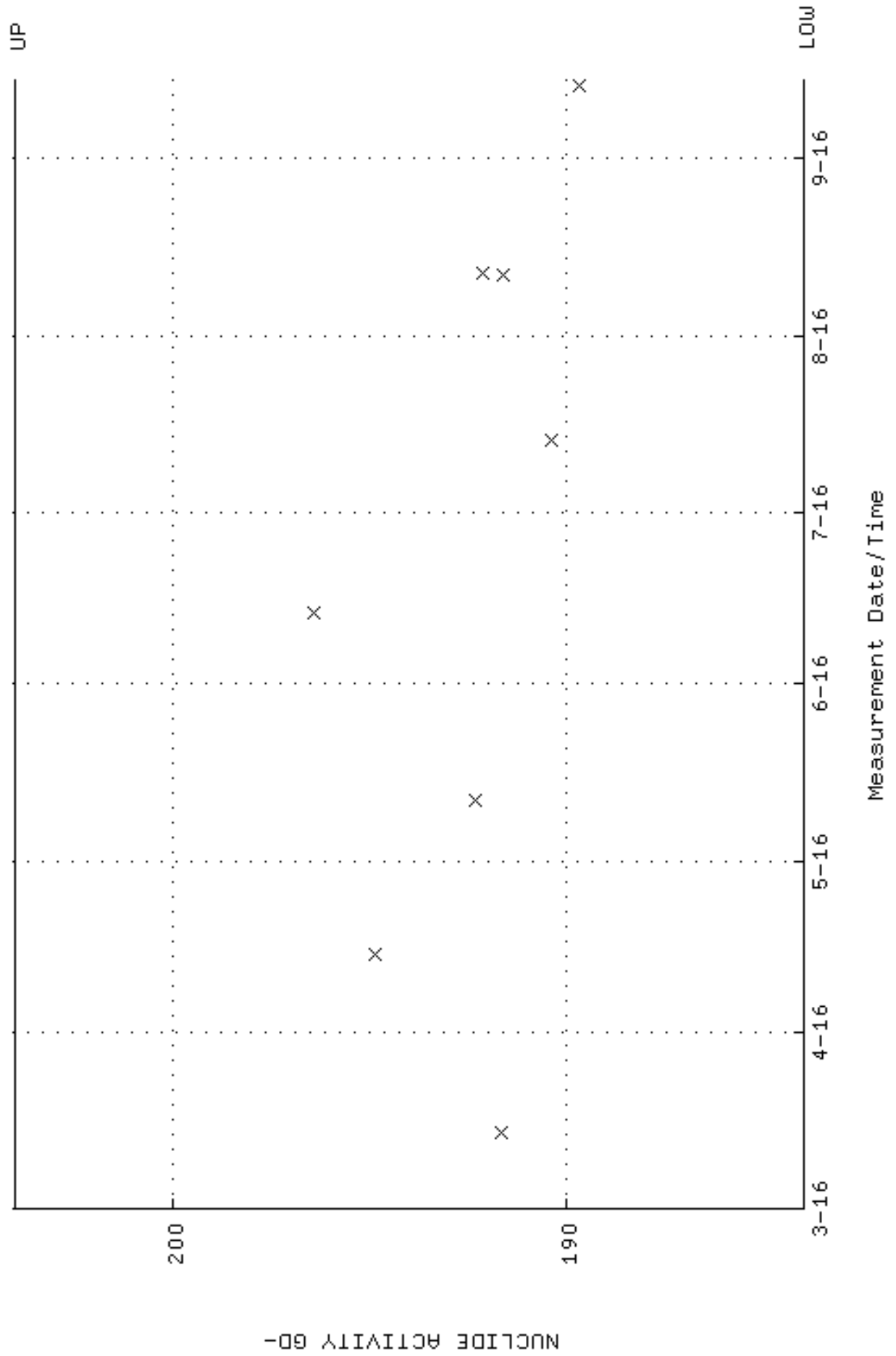
QA filename : DKA100:[ENV_ALPHA.QA.B]B176.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:05:25 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



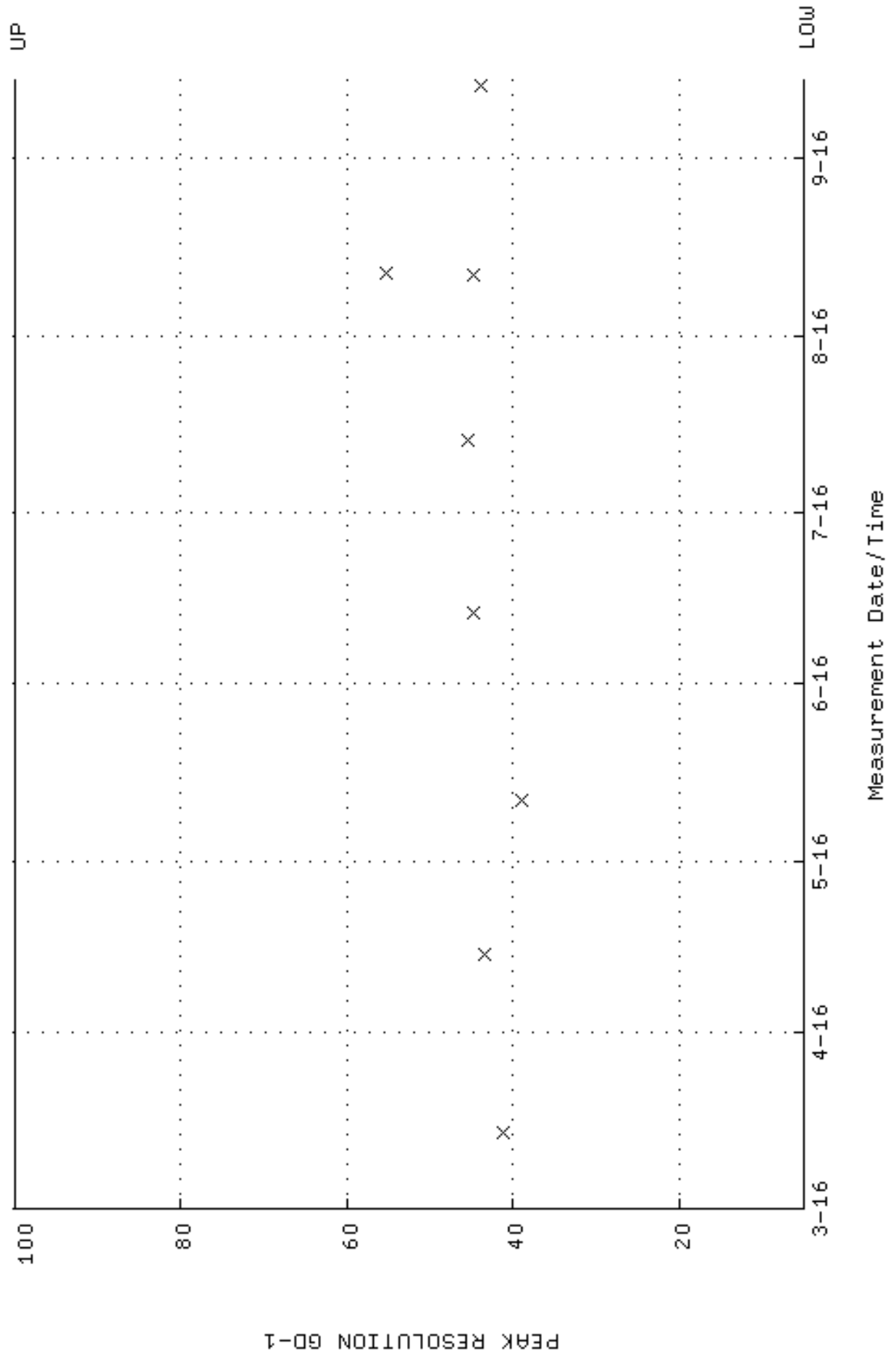
QA filename : DKA100:[ENV_ALPHA.QA.W]W177.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 14-MAR-2016 10:48:09 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.258414 through 0.274398



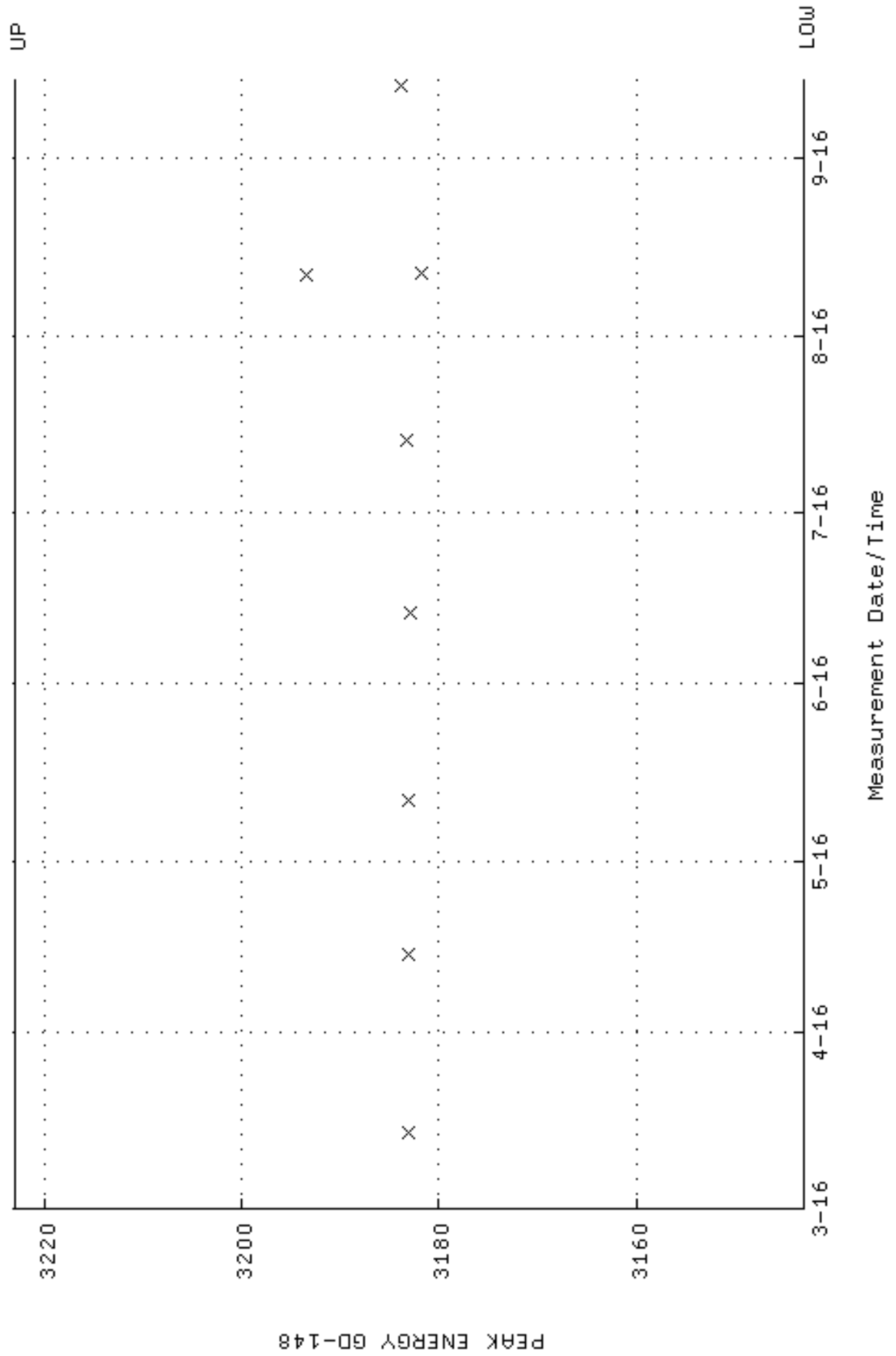
QA filename : DKA100:[ENV_ALPHA.QA.W]W177.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 14-MAR-2016 10:48:09 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



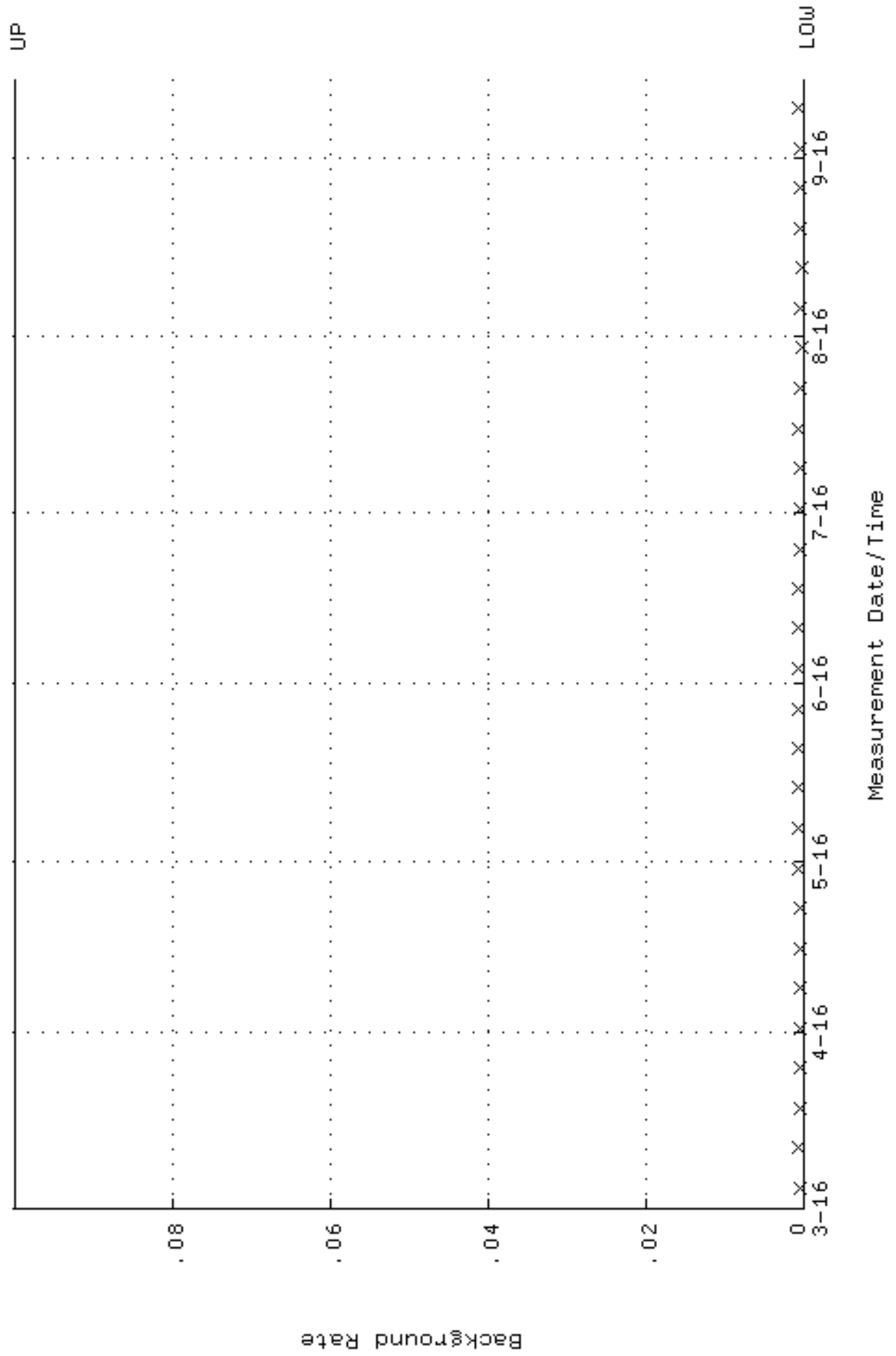
QA filename : DKA100:[ENV_ALPHA.QA.W]W177.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 14-MAR-2016 10:48:09 through 14-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



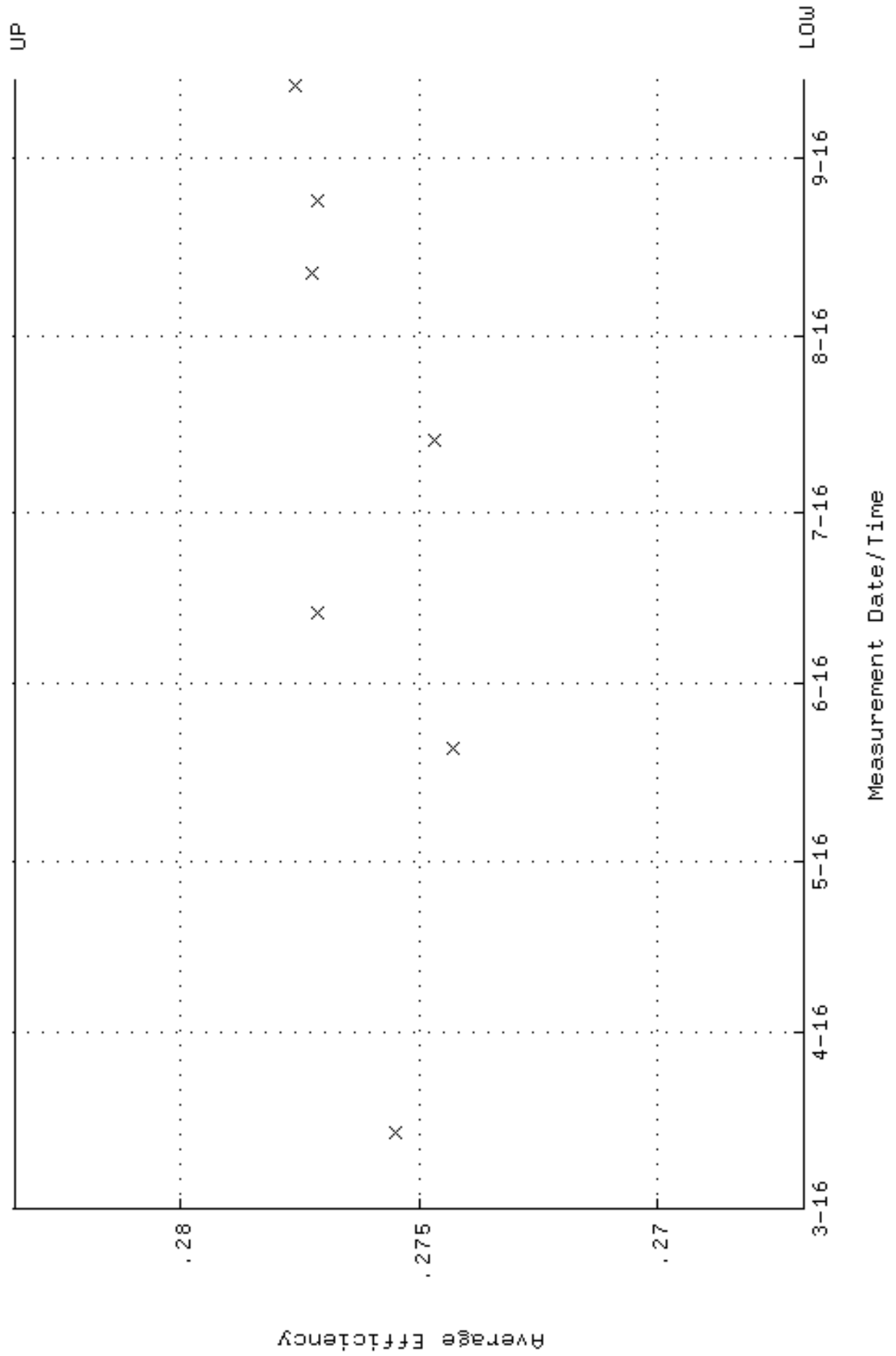
QA filename : DKA100:[ENV_ALPHA.QA.W]W177.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 14-MAR-2016 10:48:09 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



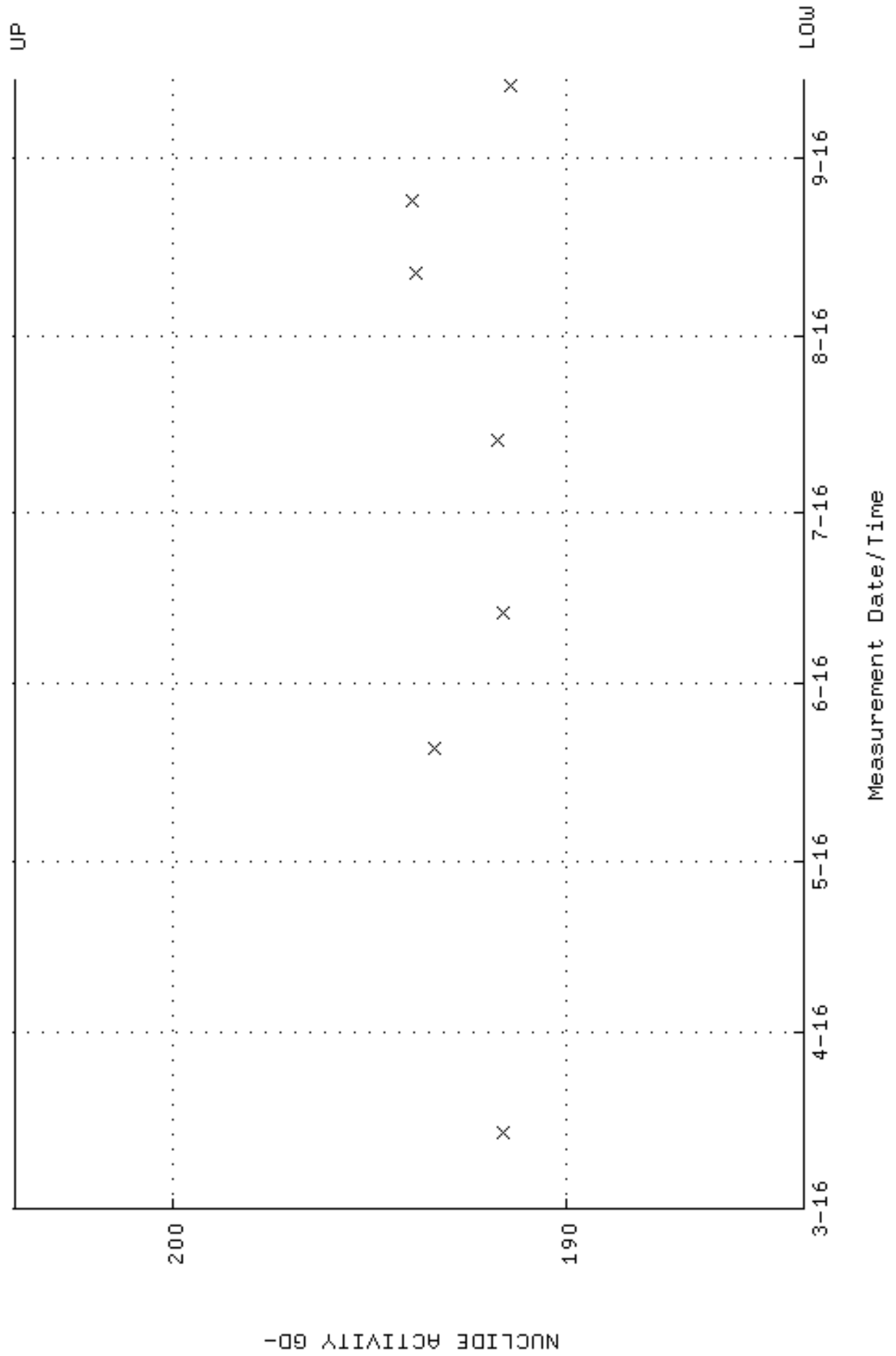
QA filename : DKA100:[ENV_ALPHA.QA.B]B177.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:05:29 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



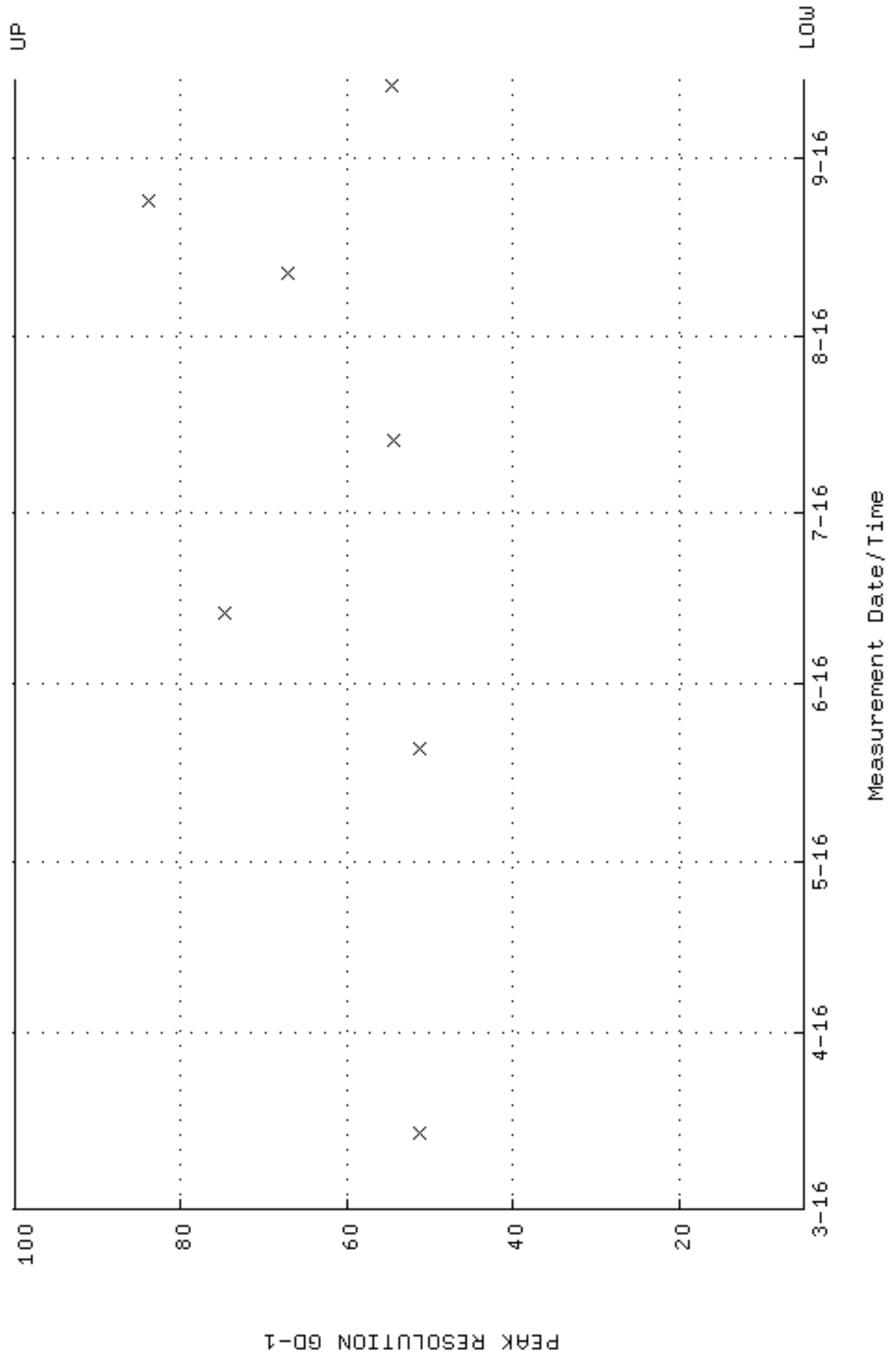
QA filename : DKA100:[ENV_ALPHA.QA.W]W178.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 14-MAR-2016 10:48:13 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.266941 through 0.283453



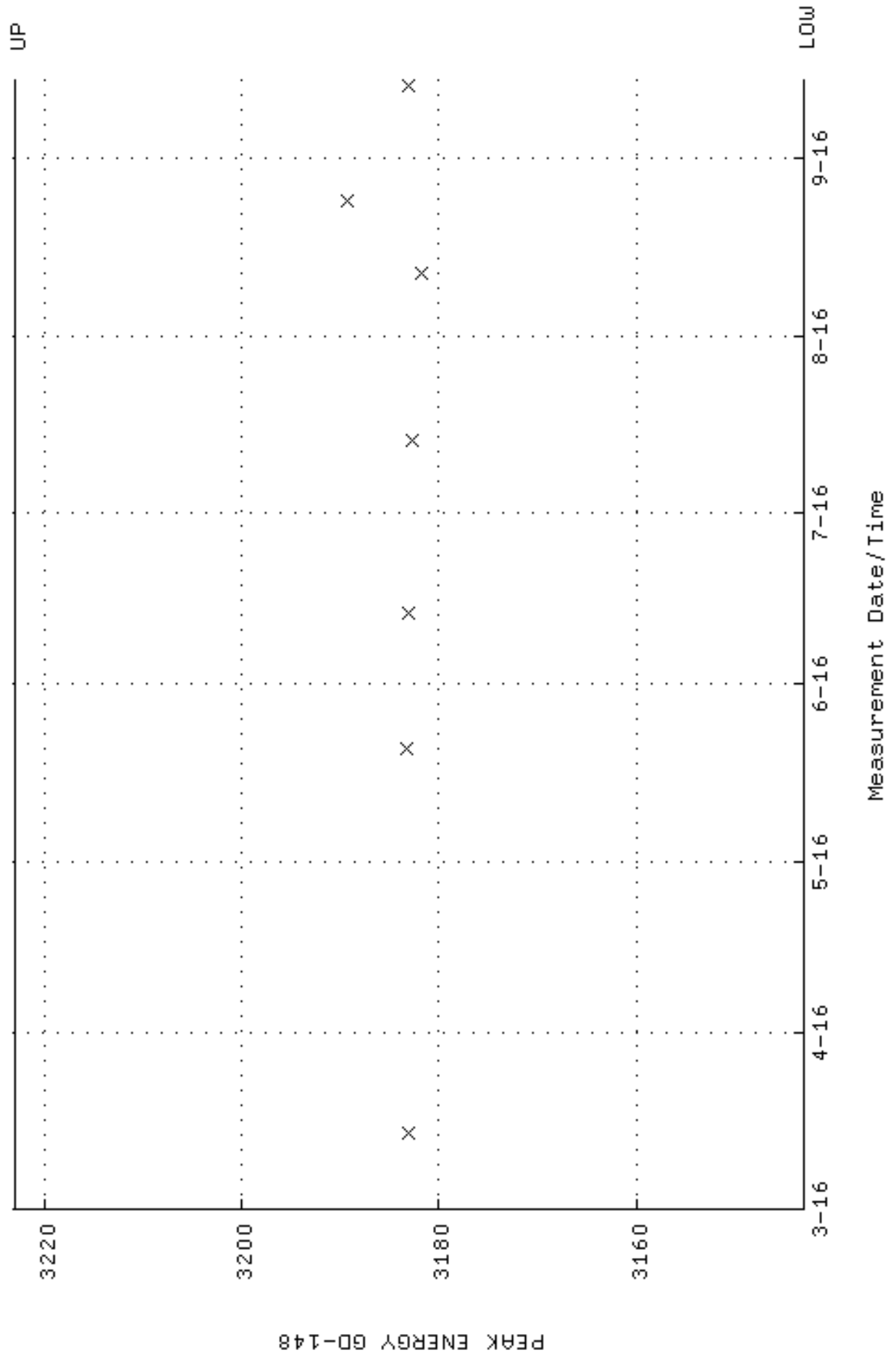
QA filename : DKA100:[ENV_ALPHA.QA.W]W178.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 14-MAR-2016 10:48:13 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



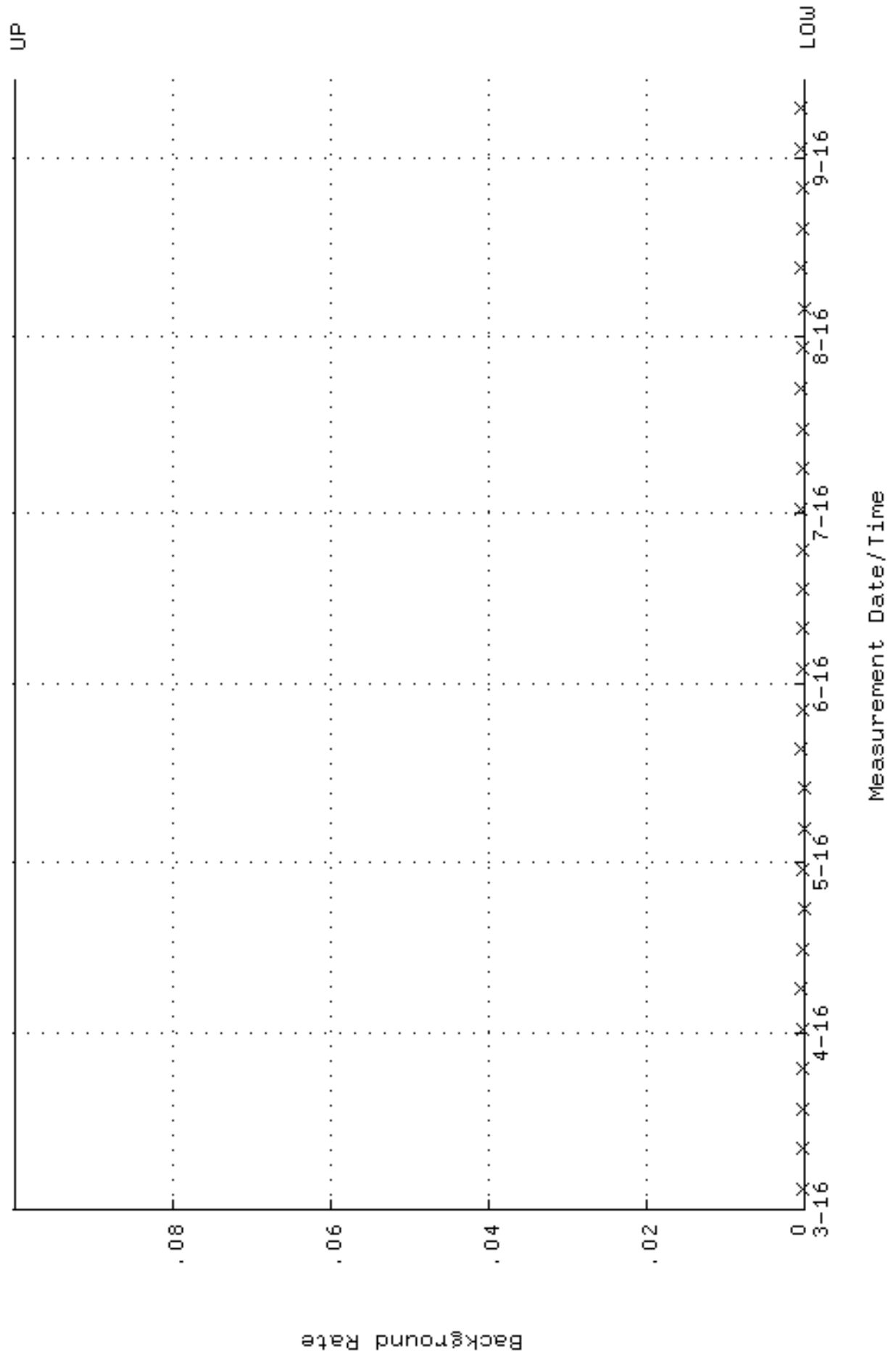
QA filename : DKA100:[ENV_ALPHA.QA.W]W178.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 14-MAR-2016 10:48:13 through 14-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



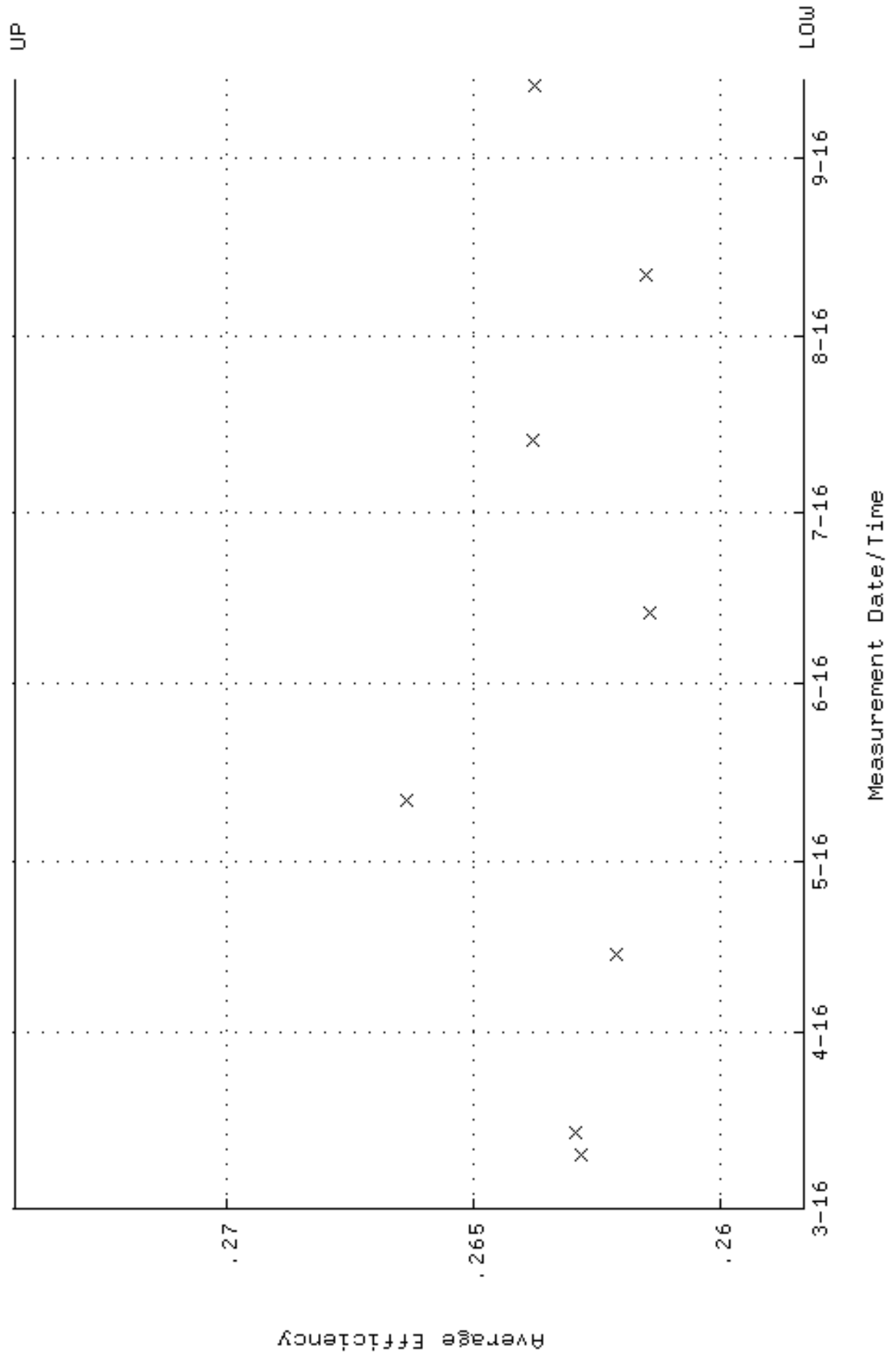
QA filename : DKA100:[ENV_ALPHA.QA.W]W178.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 14-MAR-2016 10:48:13 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



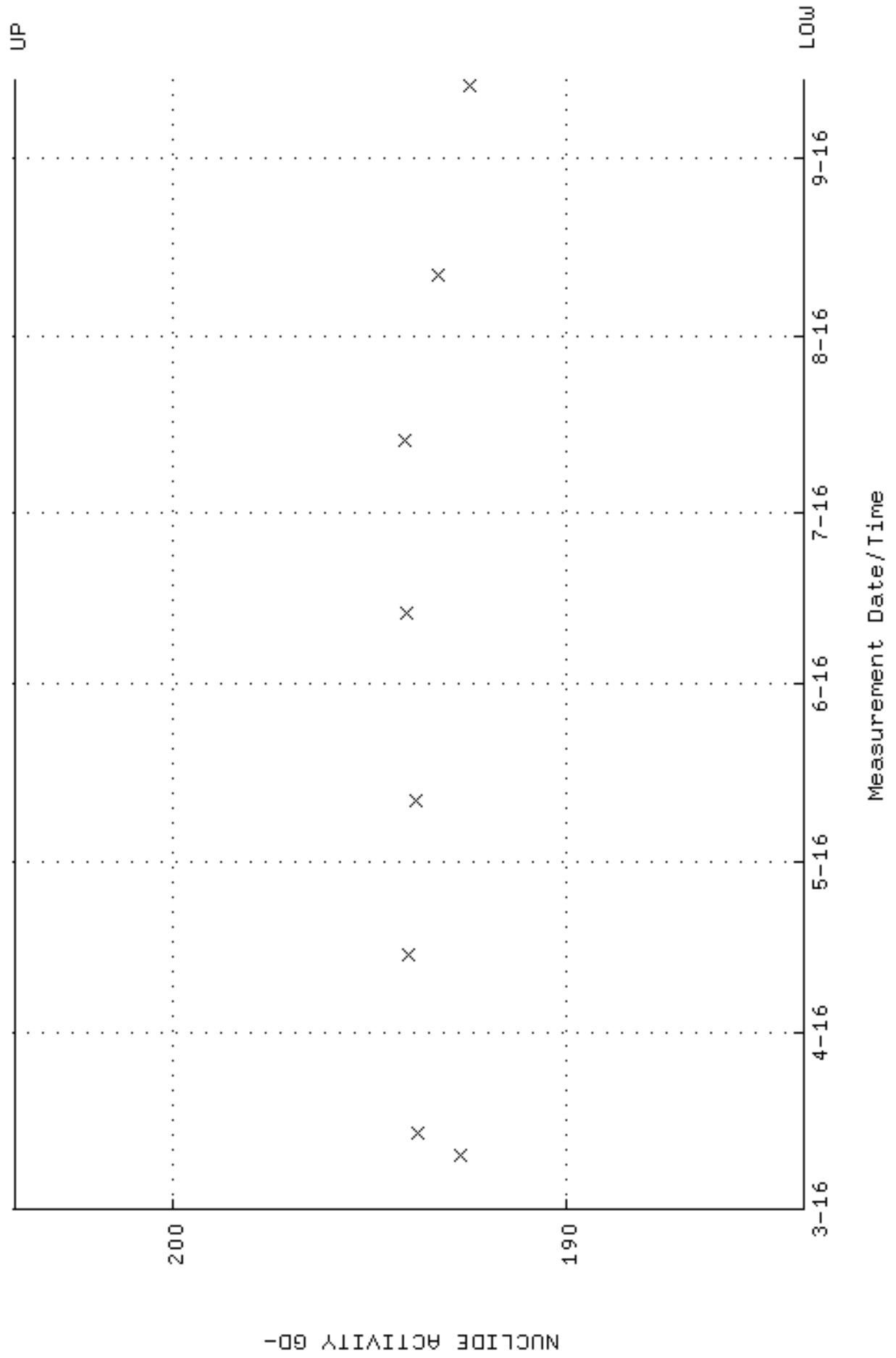
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 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:05:33 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



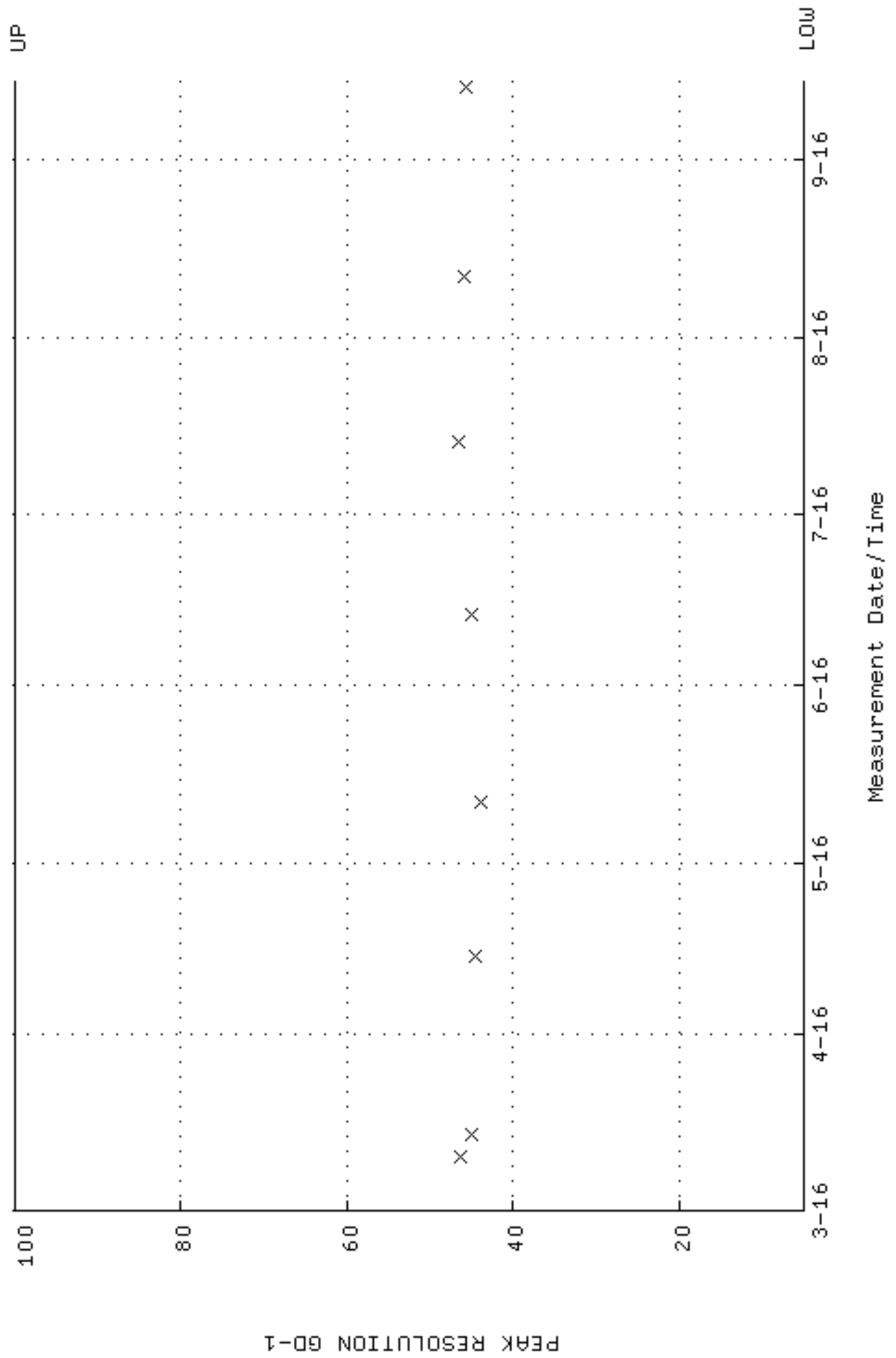
QA filename : DKA100:[ENV_ALPHA.QA.W]W179.QAF;5
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 10-MAR-2016 08:08:34 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.258303 through 0.274280



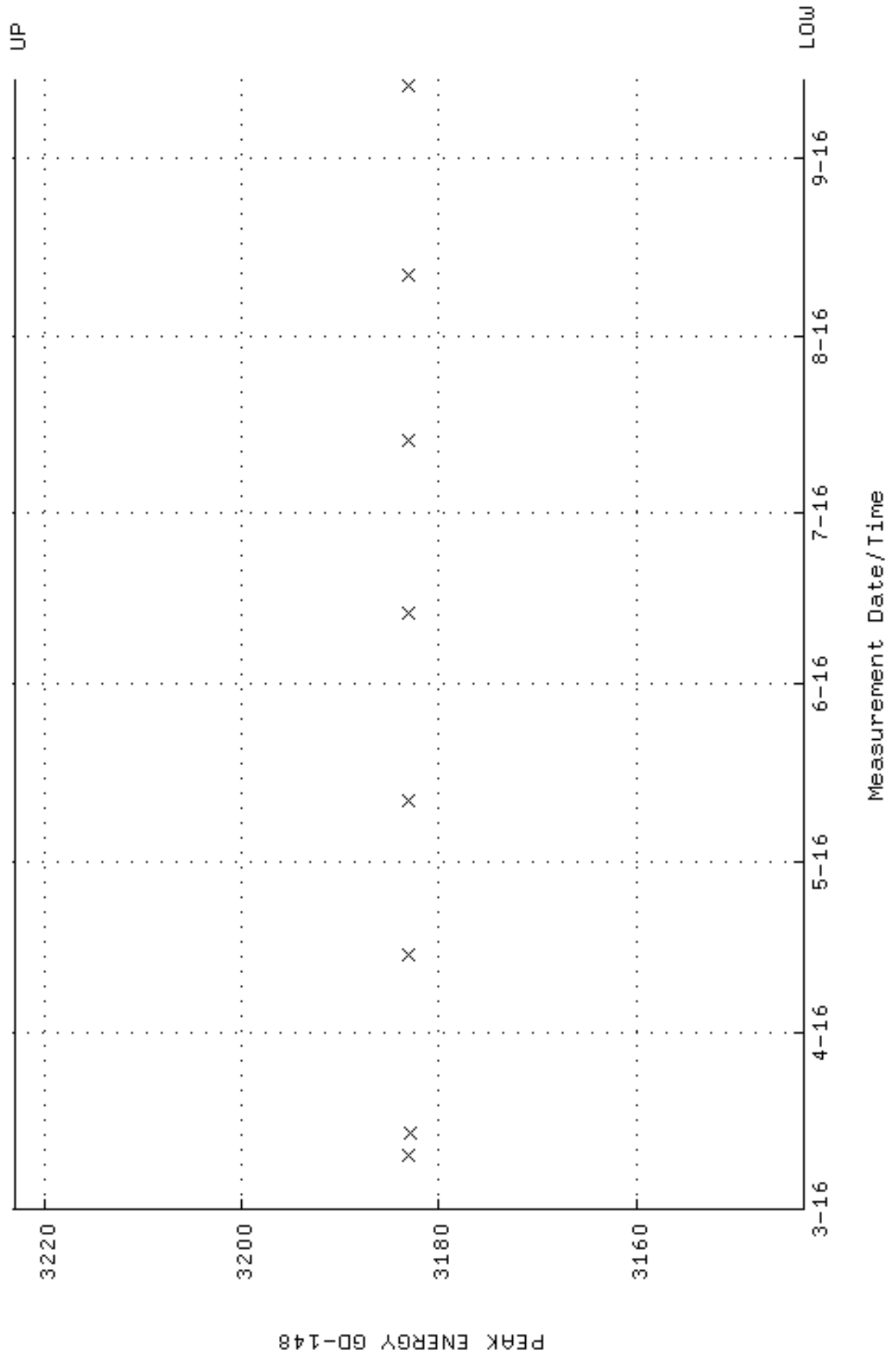
QA filename : DKA100:[ENV_ALPHA.QA.W]W179.QAF;5
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 10-MAR-2016 08:08:34 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



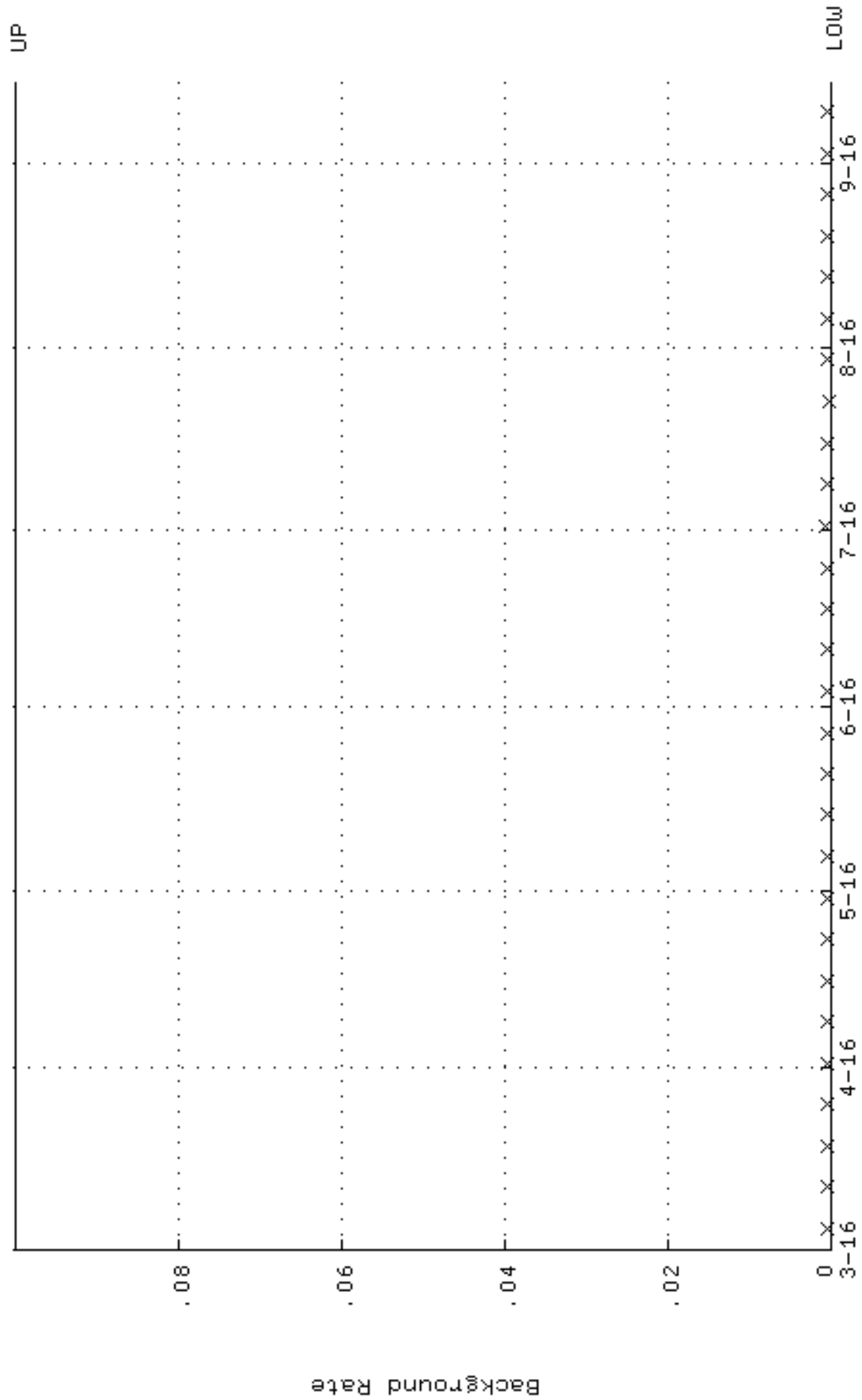
QA filename : DKA100:[ENV_ALPHA.QA.W]W179.QAF;5
 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 10-MAR-2016 08:08:34 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



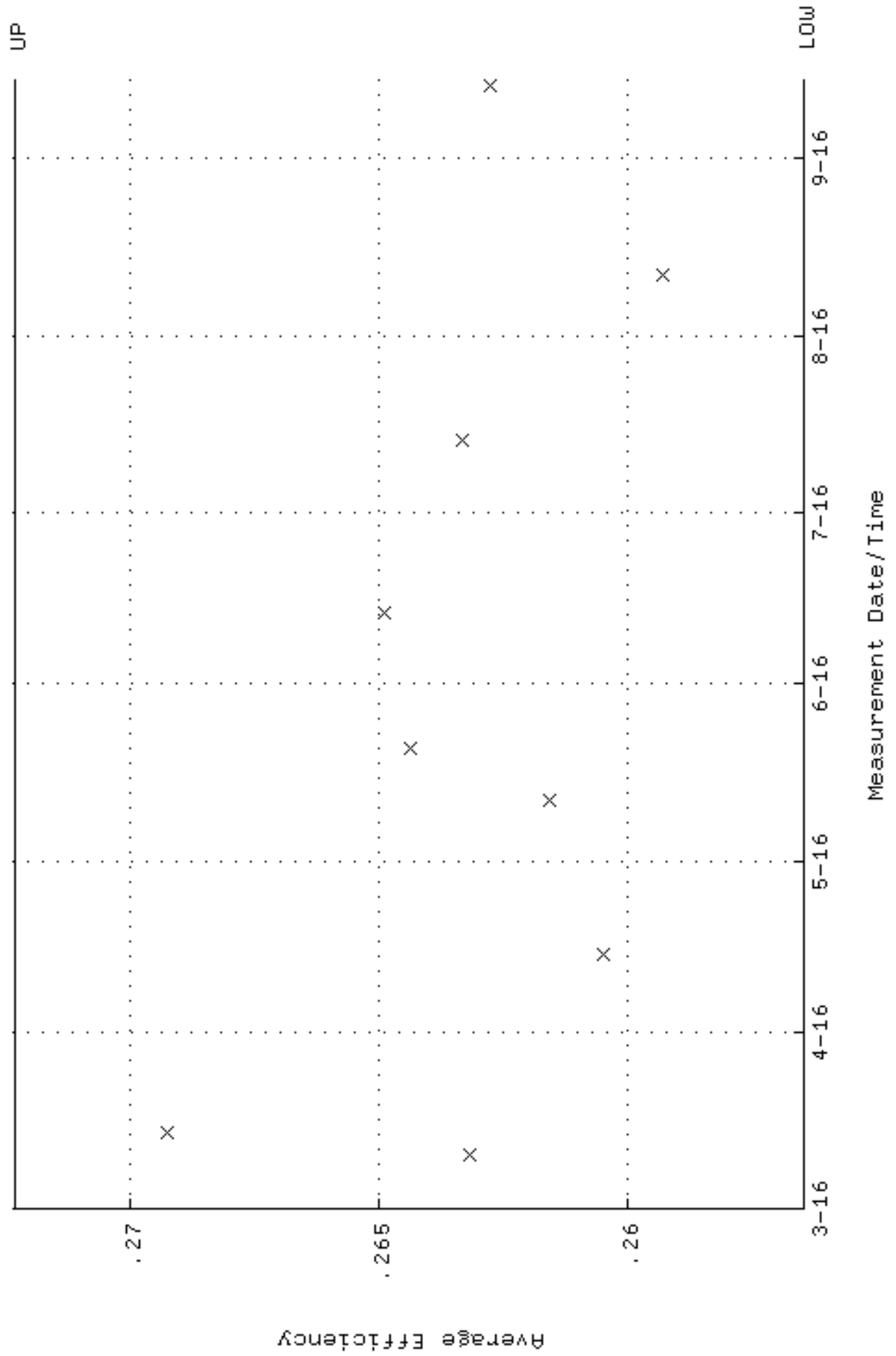
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 10-MAR-2016 08:08:34 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



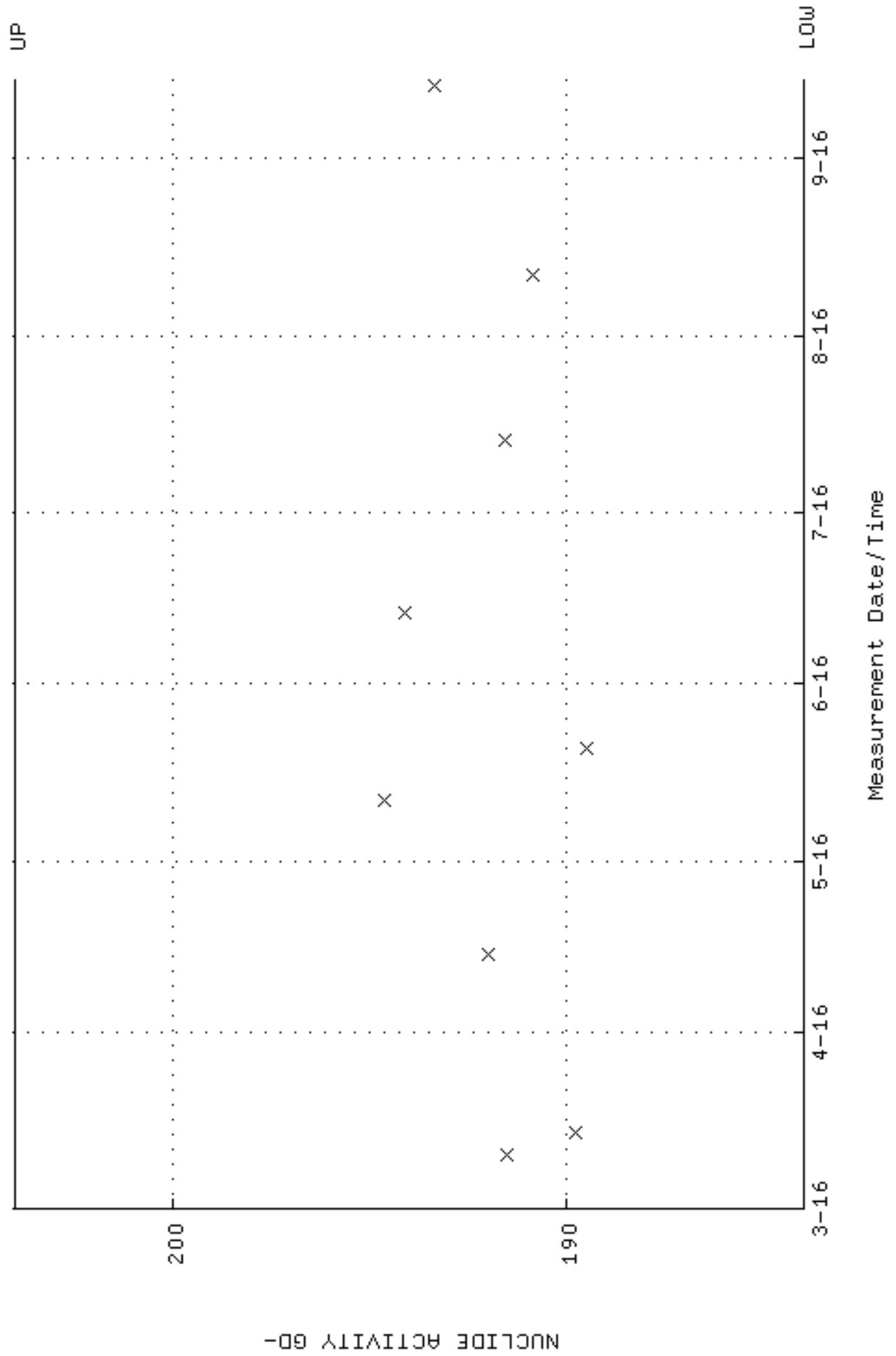
QA filename : DKA100:[ENV_ALPHA.QA.B]B179.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:05:37 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



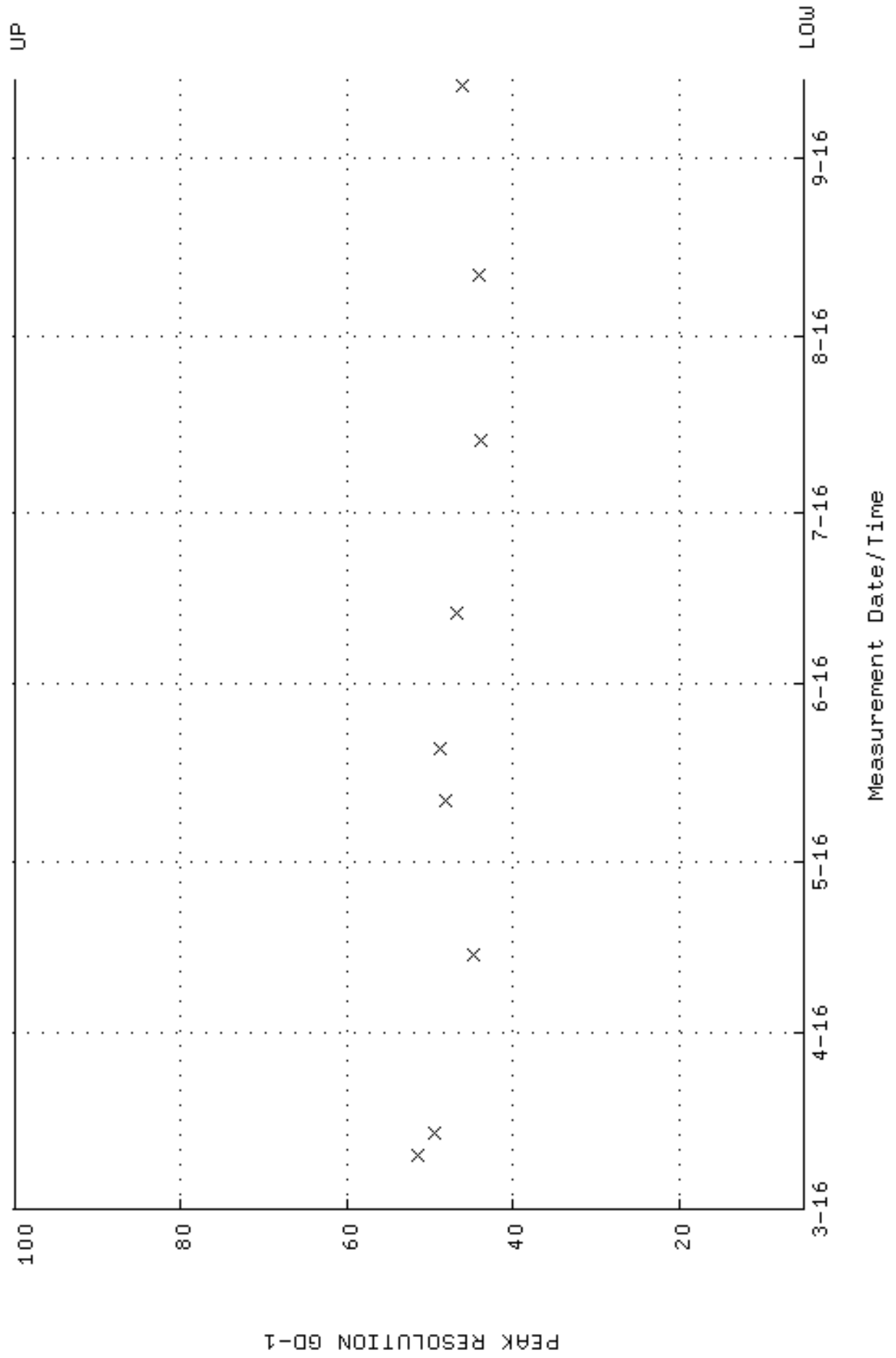
QA filename : DKA100:[ENV_ALPHA.QA.W]W180.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 10-MAR-2016 08:08:37 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.256445 through 0.272307



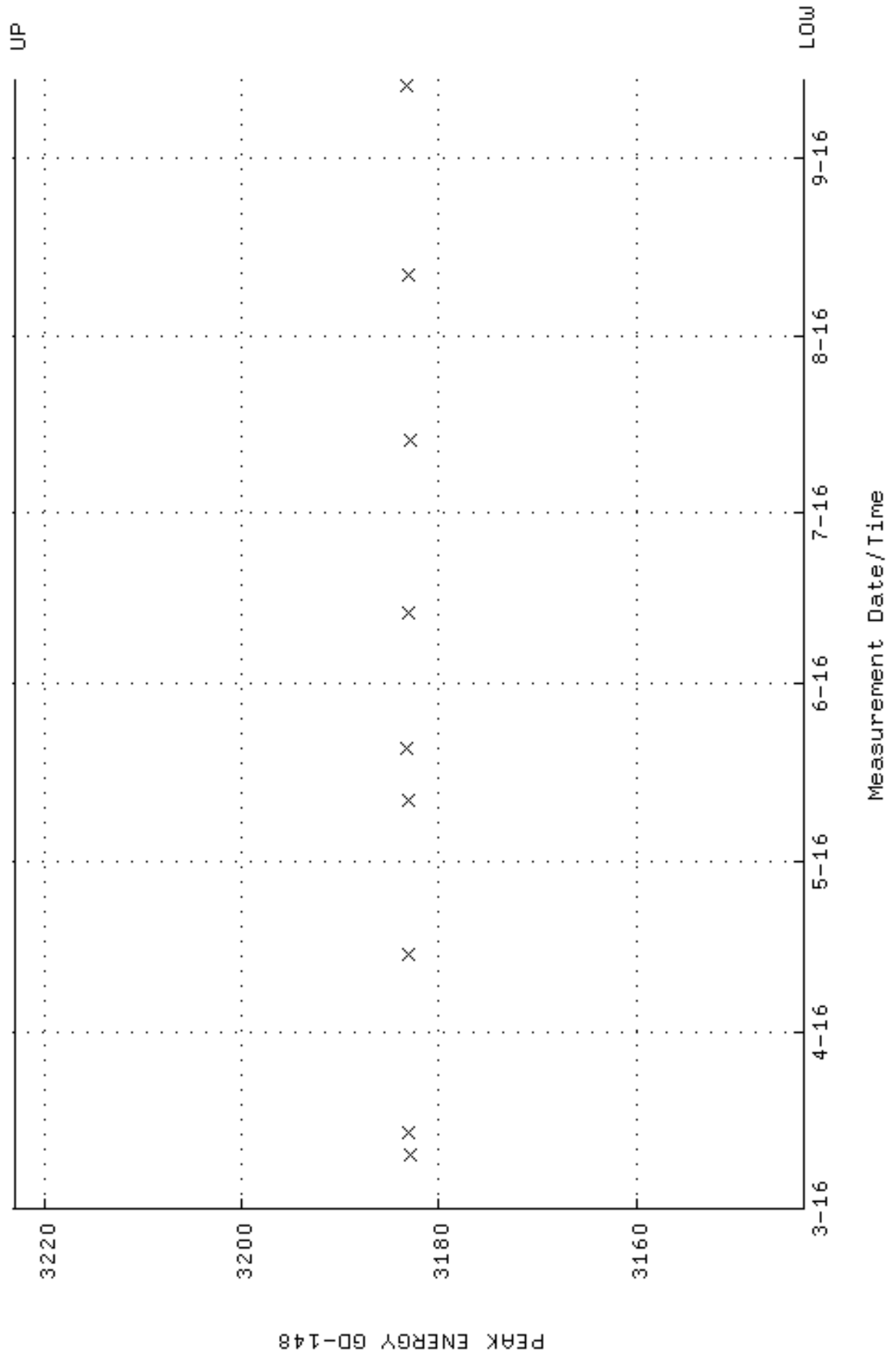
QA filename : DKA100:[ENV_ALPHA.QA.W]W180.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 10-MAR-2016 08:08:37 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



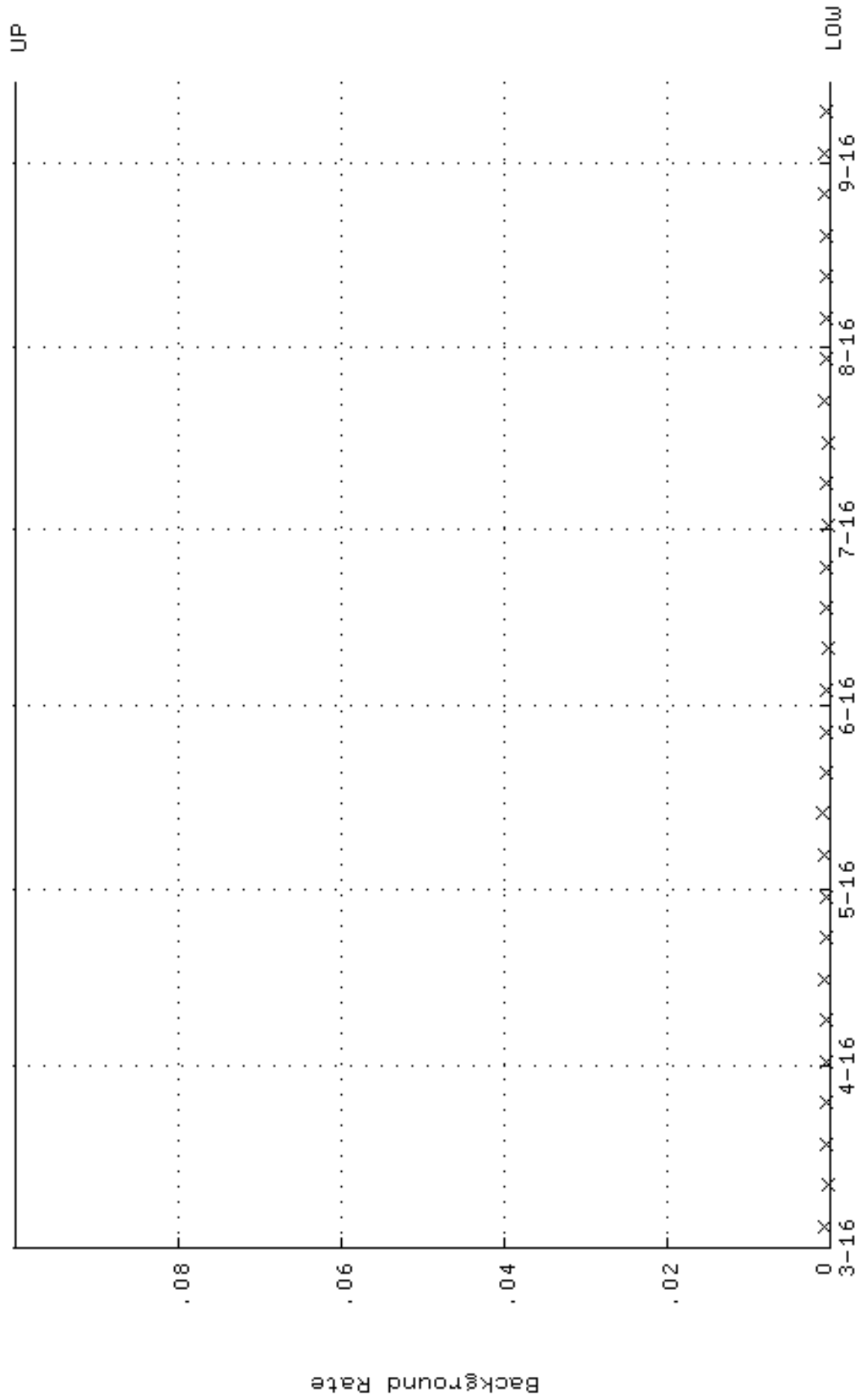
QA filename : DKA100:[ENV_ALPHA.QA.W]W180.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 10-MAR-2016 08:08:37 through 14-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



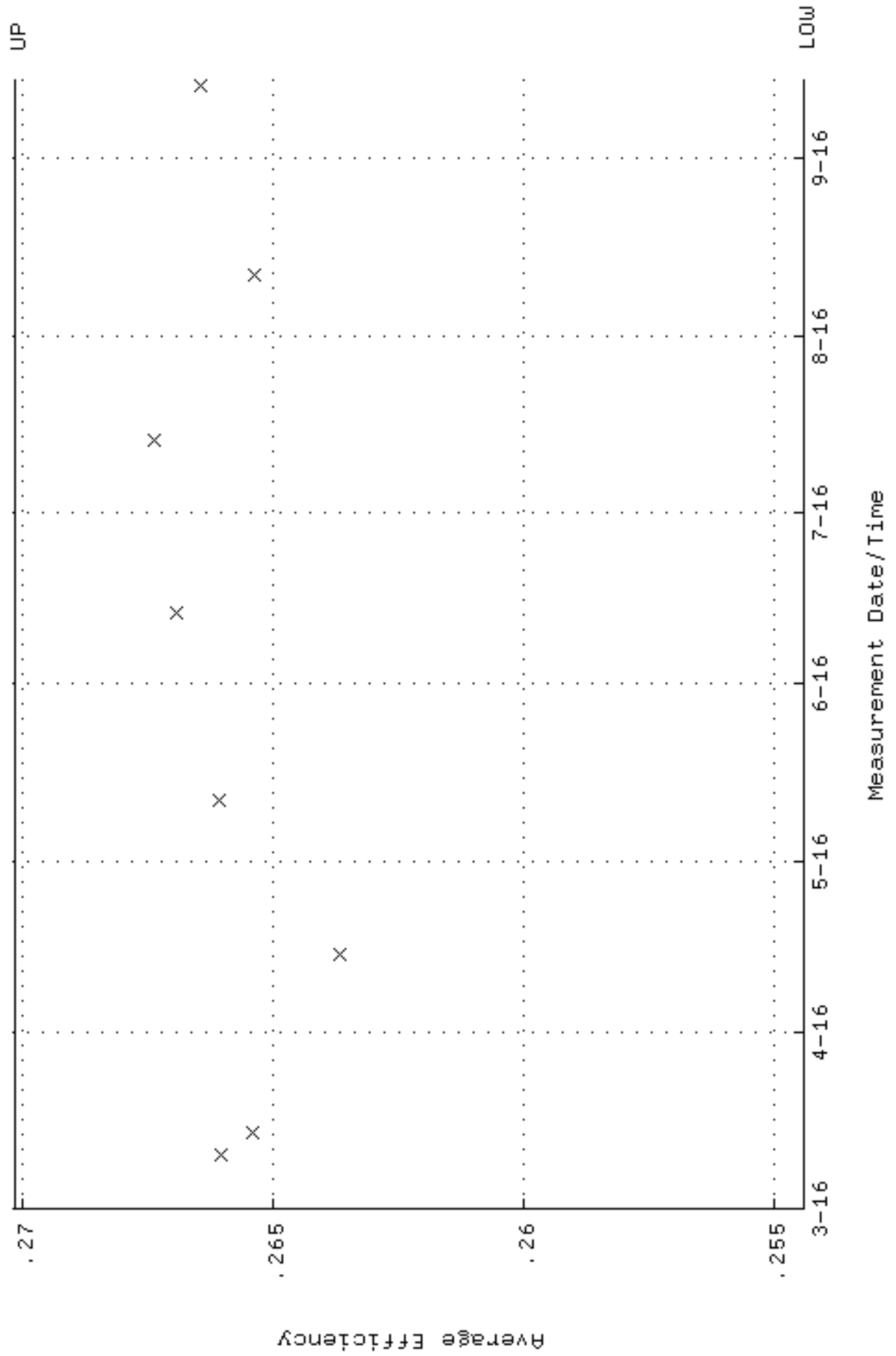
QA filename : DKA100:[ENV_ALPHA.QA.W]W180.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 10-MAR-2016 08:08:37 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



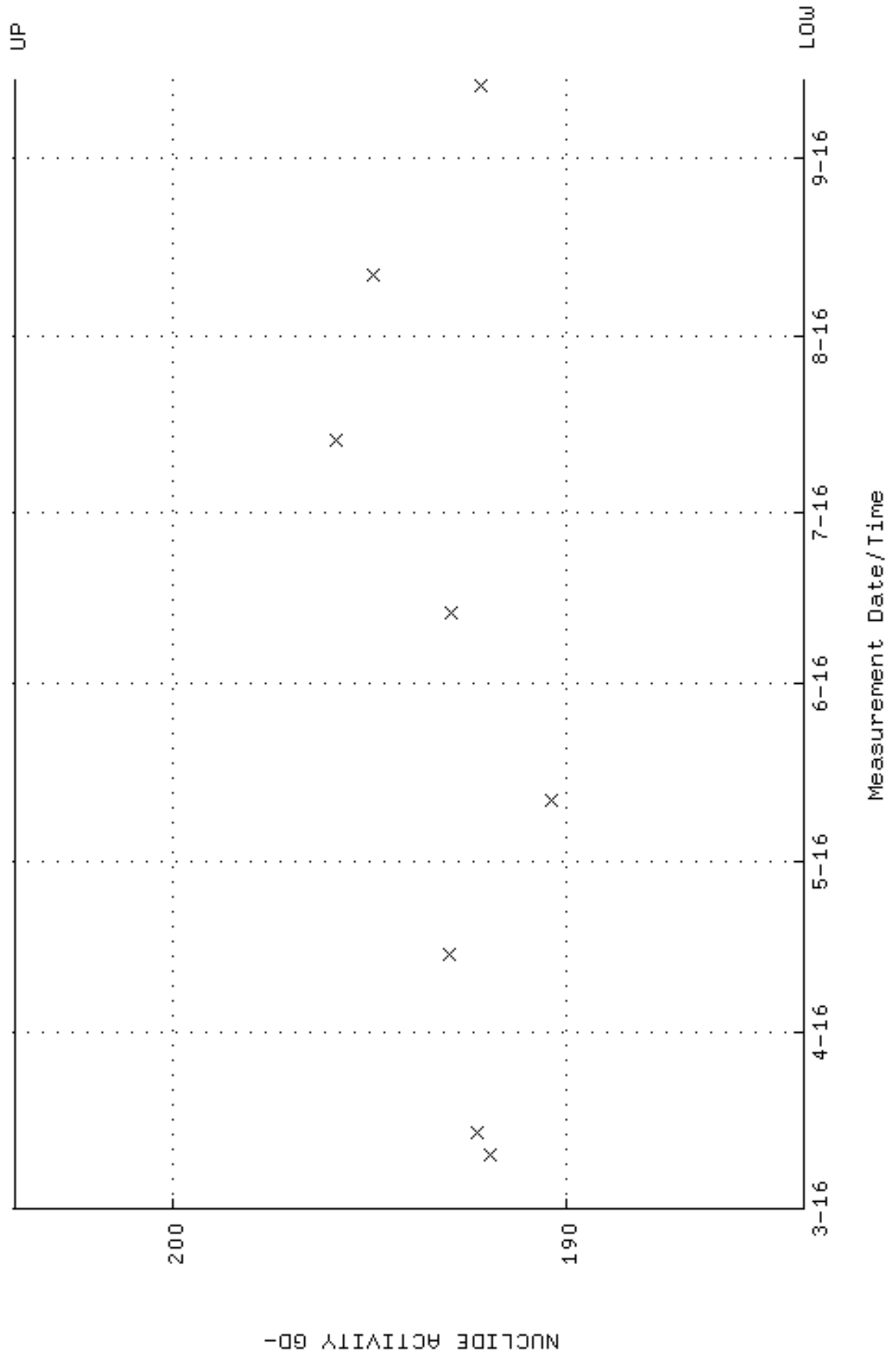
QA filename : DKA100:[ENV_ALPHA.QA.B]B180.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:05:40 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



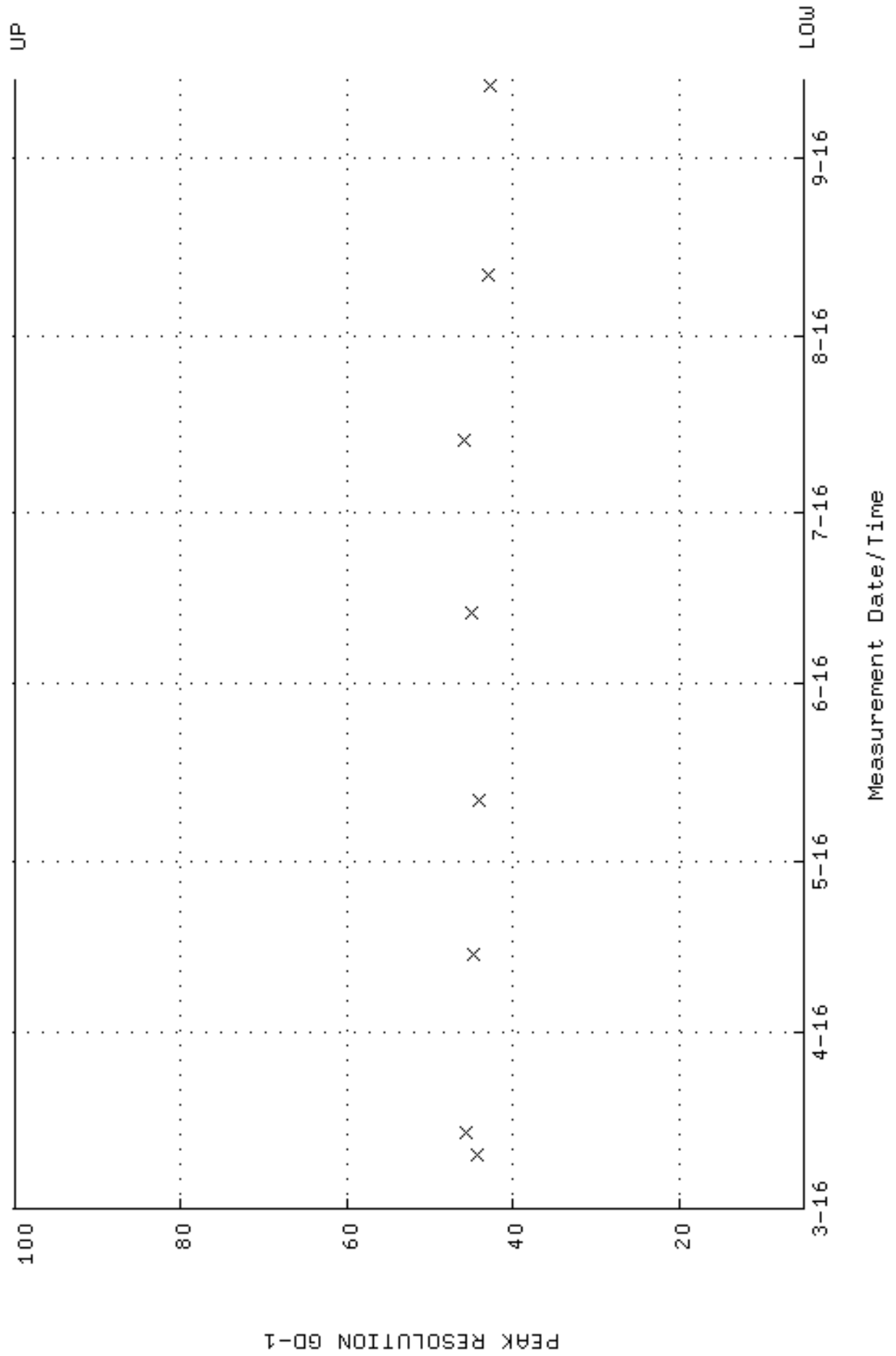
QA filename : DKA100:[ENV_ALPHA.QA.W]W181.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 10-MAR-2016 08:08:42 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.254394 through 0.270130



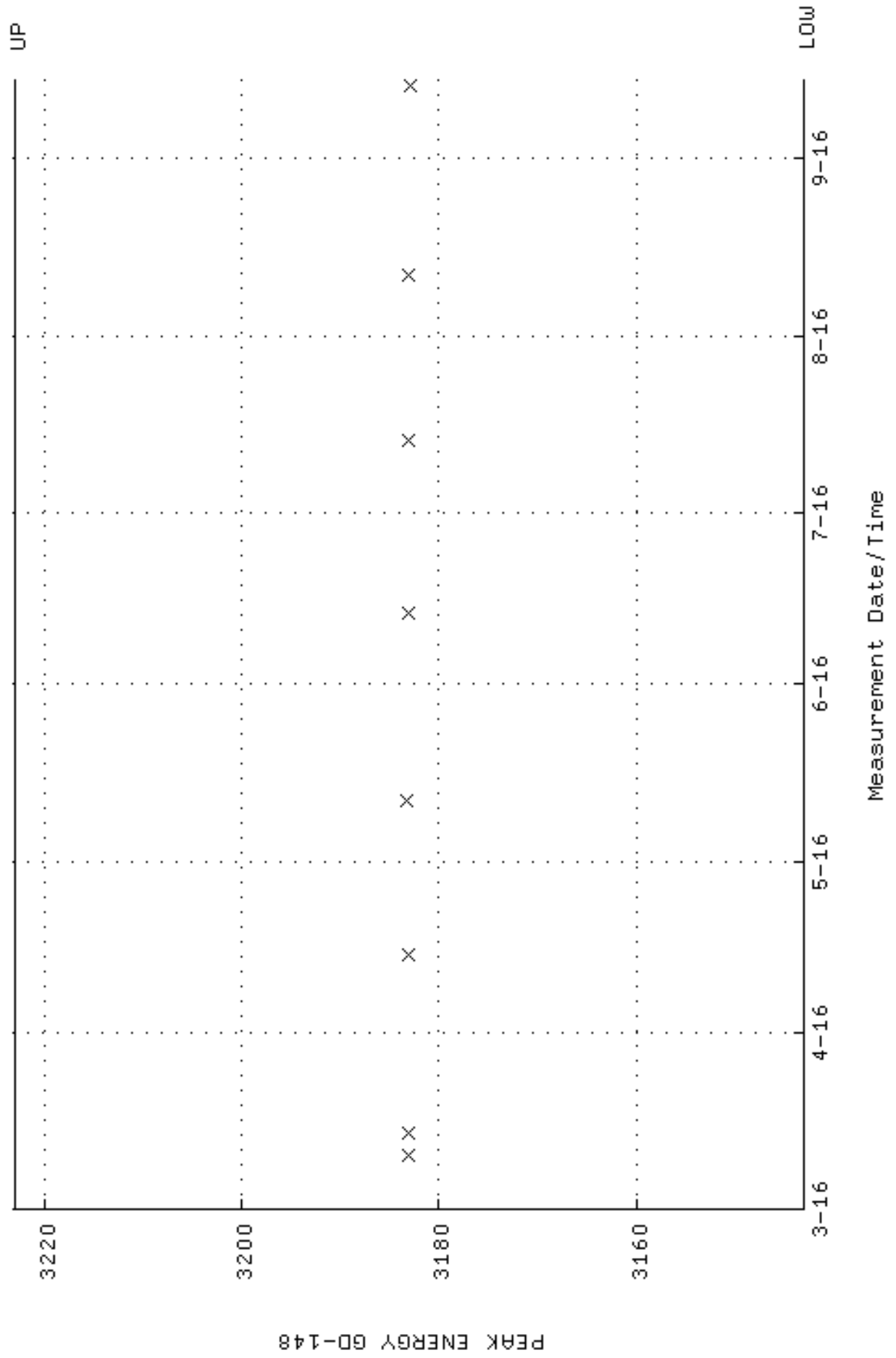
QA filename : DKA100:[ENV_ALPHA.QA.W]W181.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 10-MAR-2016 08:08:42 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



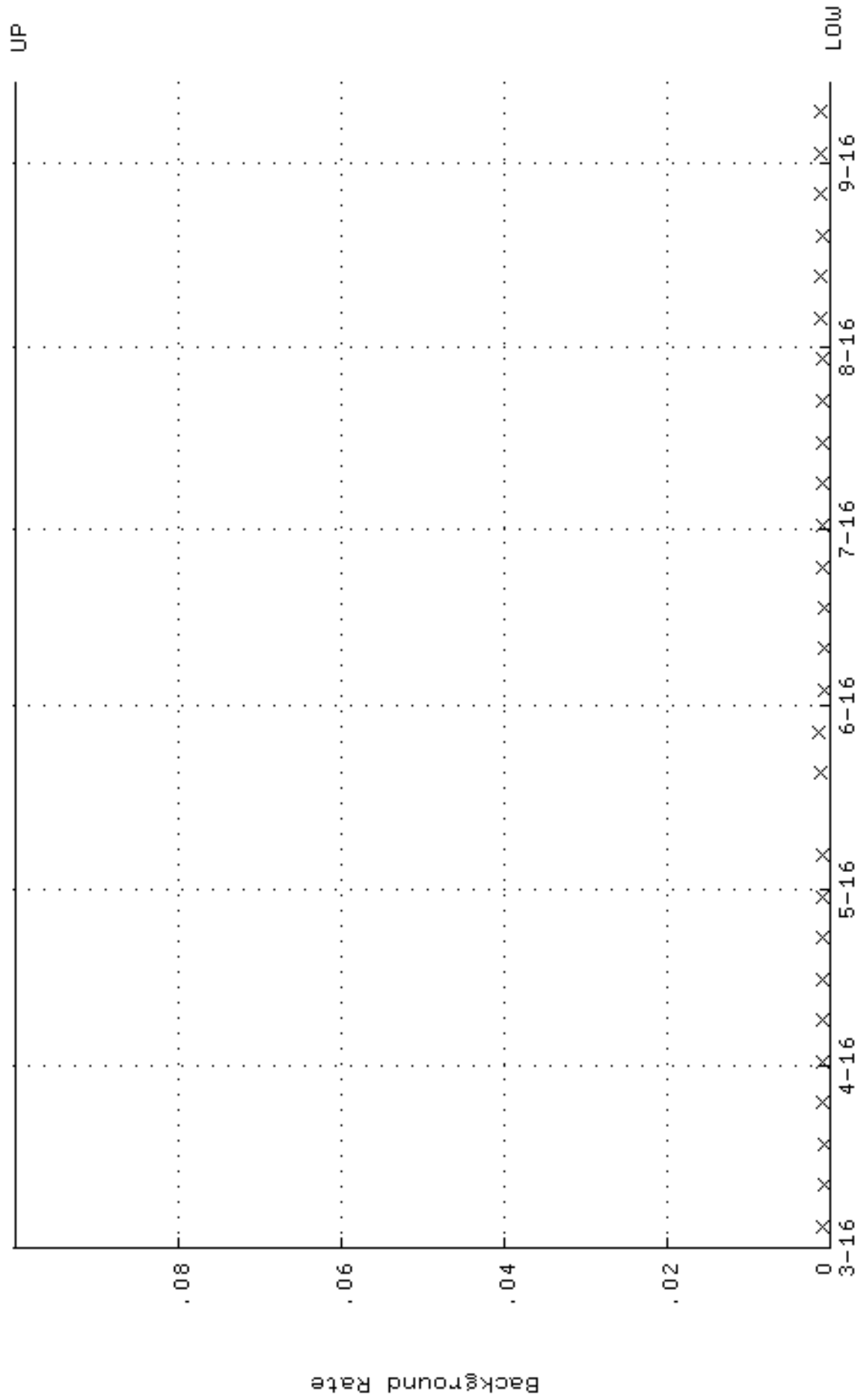
QA filename : DKA100:[ENV_ALPHA.QA.W]W181.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 10-MAR-2016 08:08:42 through 14-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



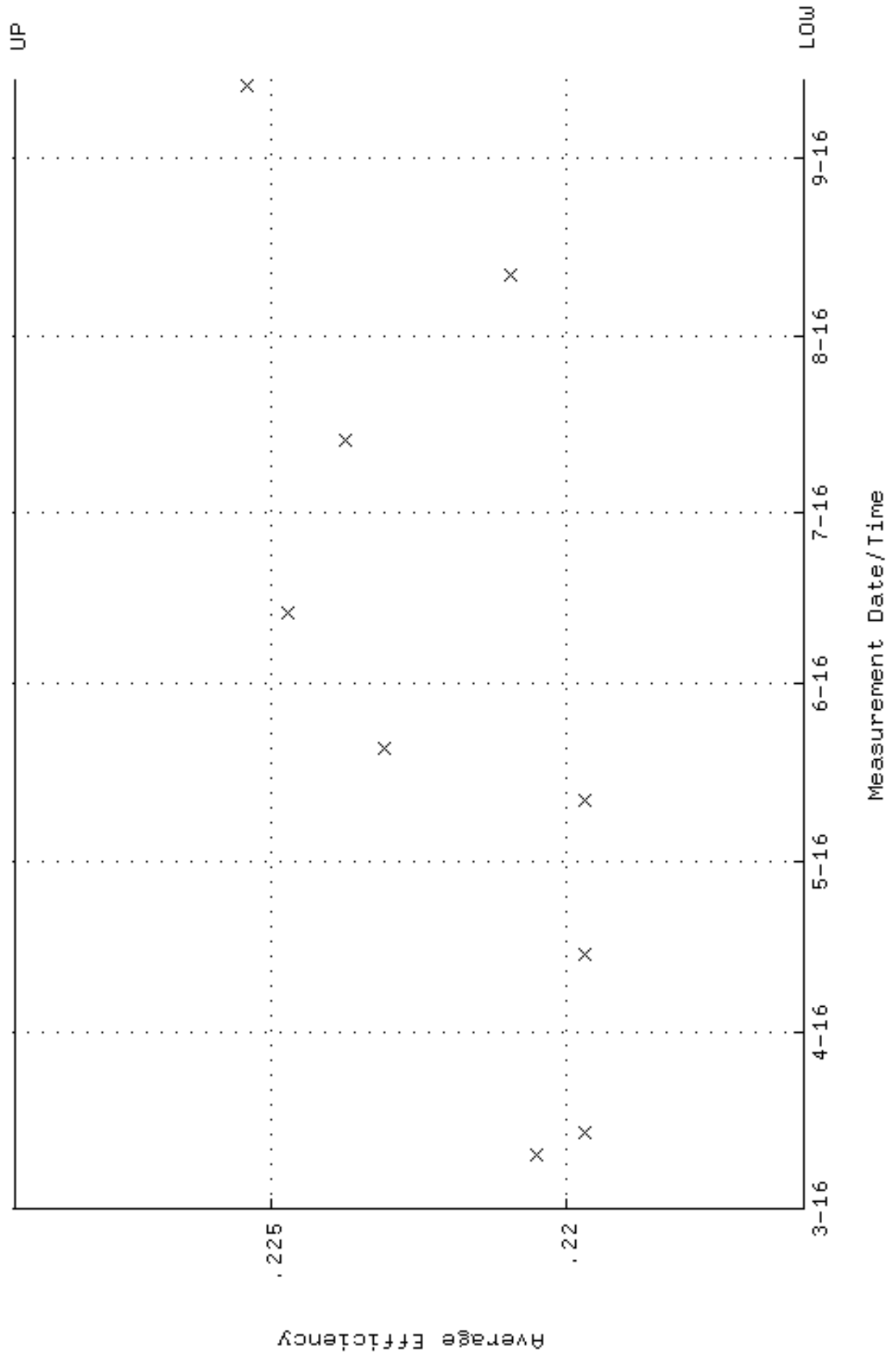
QA filename : DKA100:[ENV_ALPHA.QA.W]W181.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 10-MAR-2016 08:08:42 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



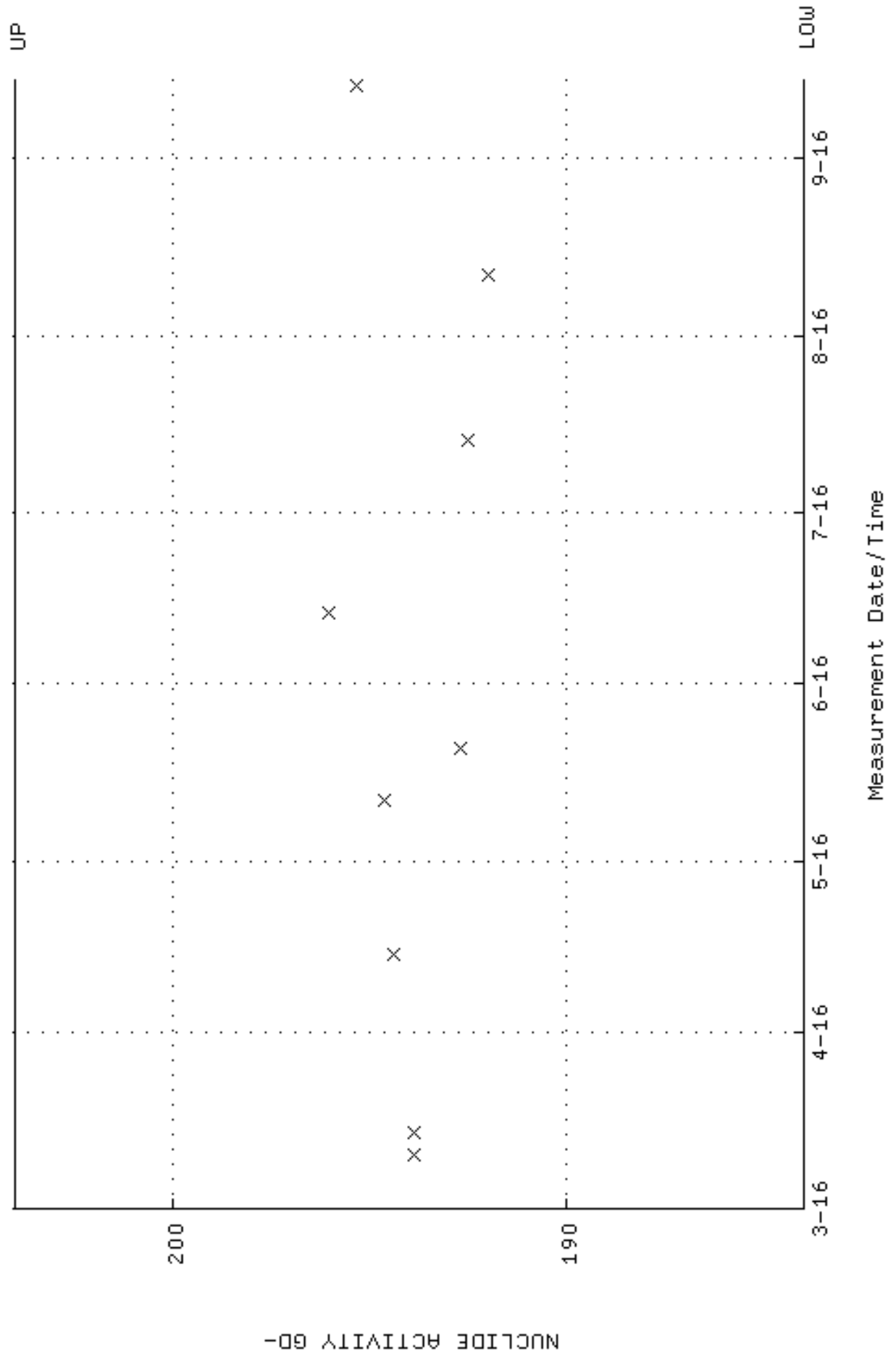
QA filename : DKA100:[ENV_ALPHA.QA.B]B181.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:05:44 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



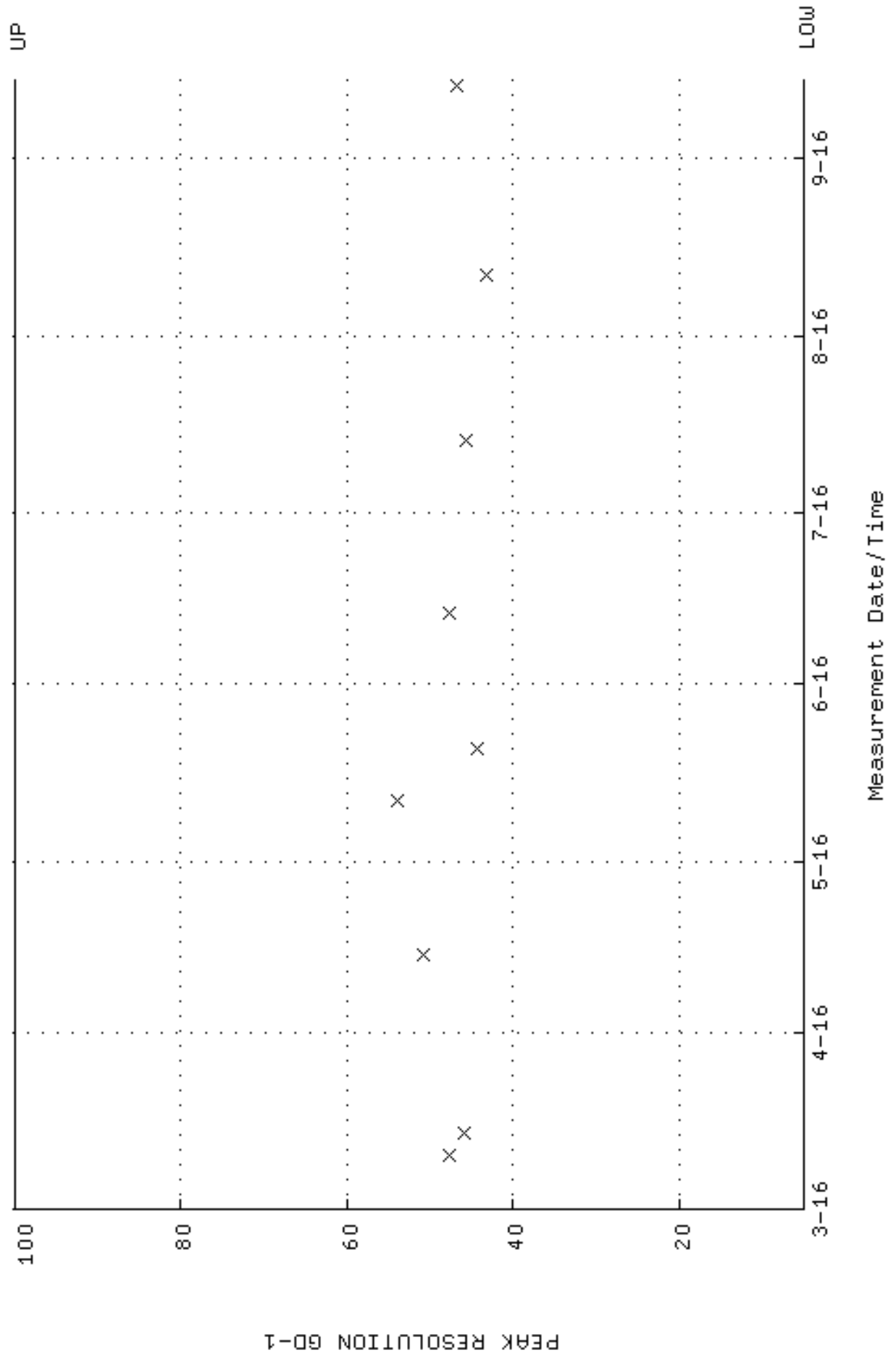
QA filename : DKA100:[ENV_ALPHA.QA.W]W182.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 10-MAR-2016 08:08:46 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.215980 through 0.229340



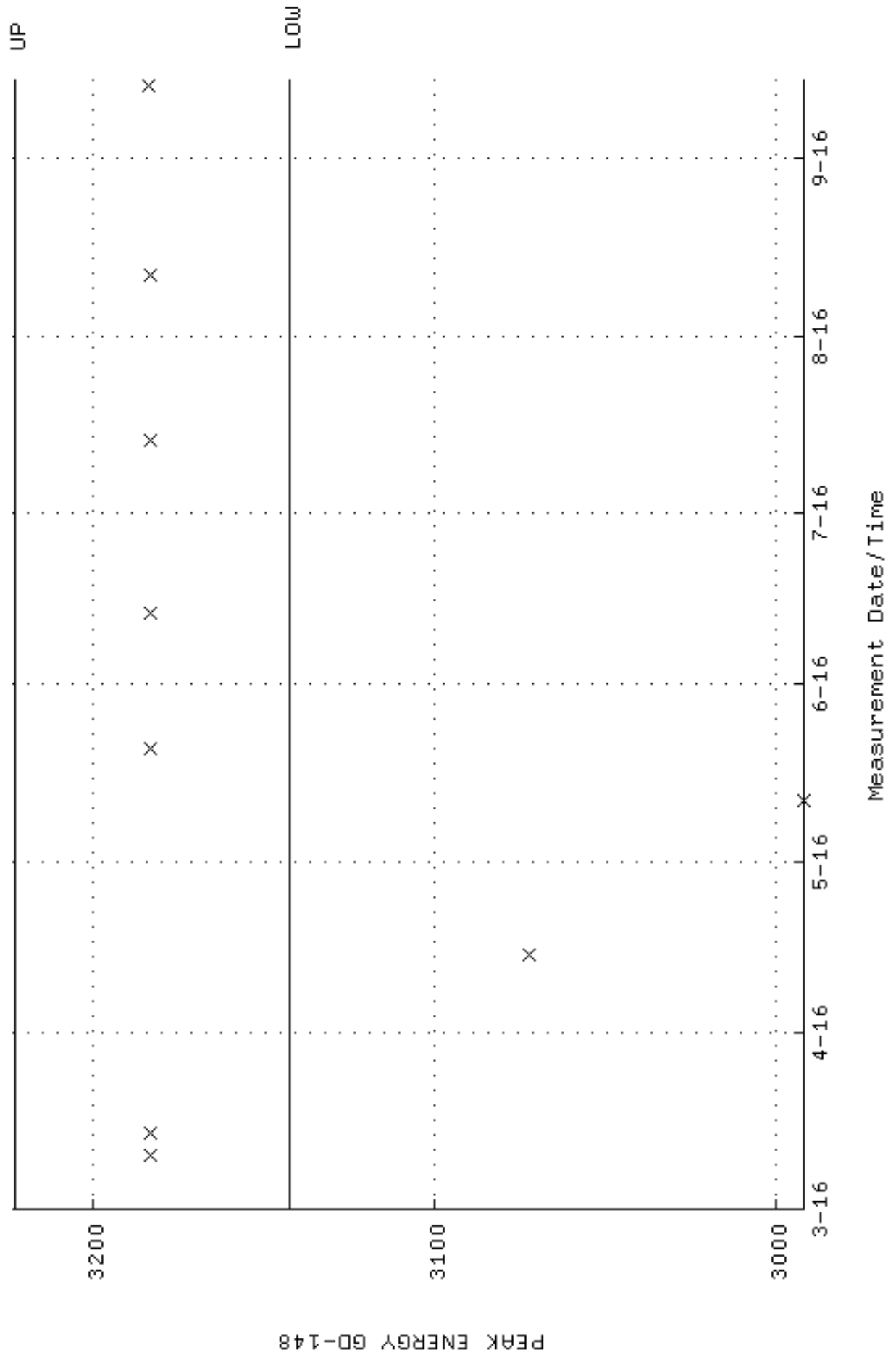
QA filename : DKA100:[ENV_ALPHA.QA.W]W182.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 10-MAR-2016 08:08:46 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



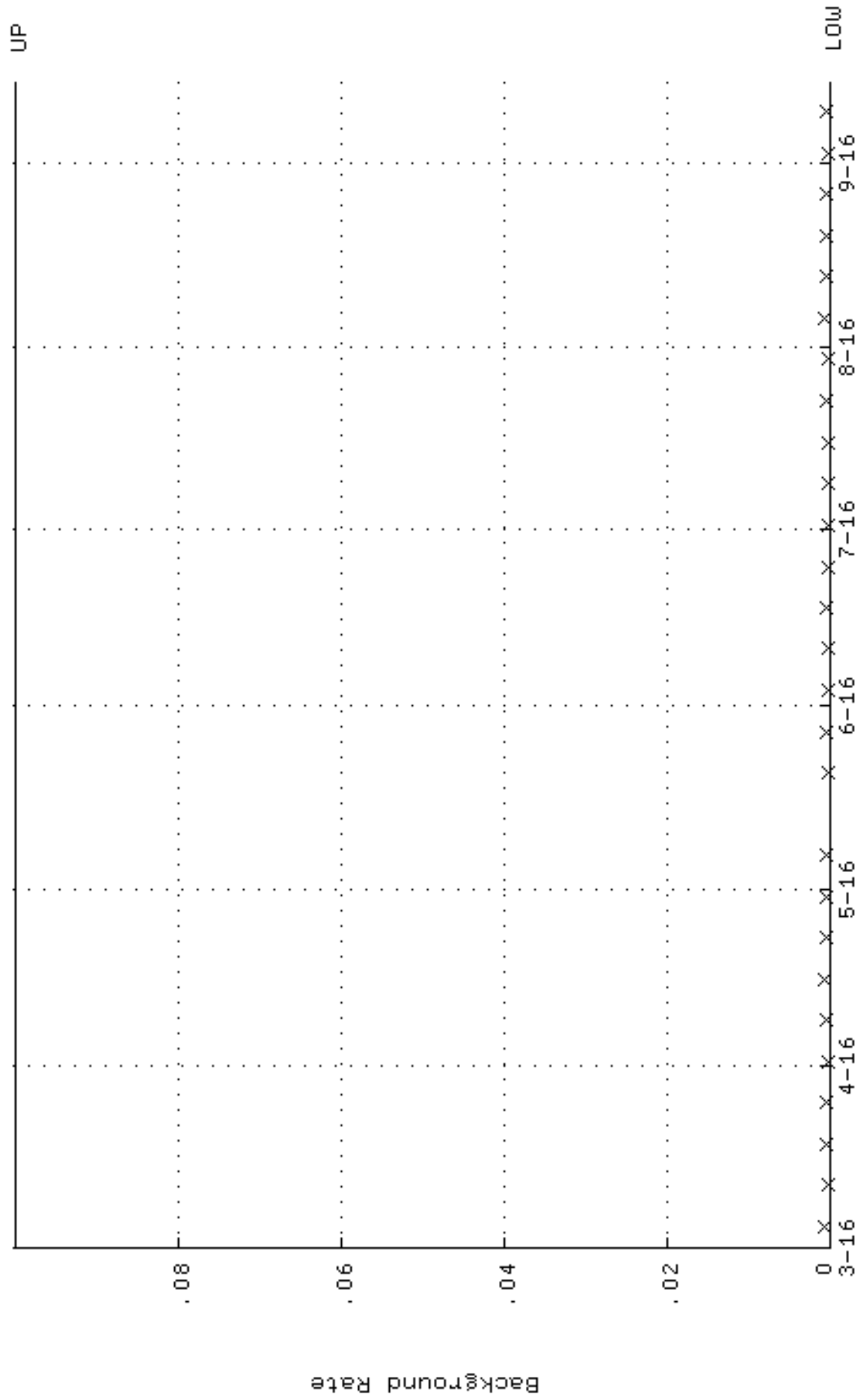
QA filename : DKA100:[ENV_ALPHA.QA.W]W182.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 10-MAR-2016 08:08:46 through 14-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



QA filename : DKA100:[ENV_ALPHA.QA.W]W182.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 10-MAR-2016 08:08:46 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00

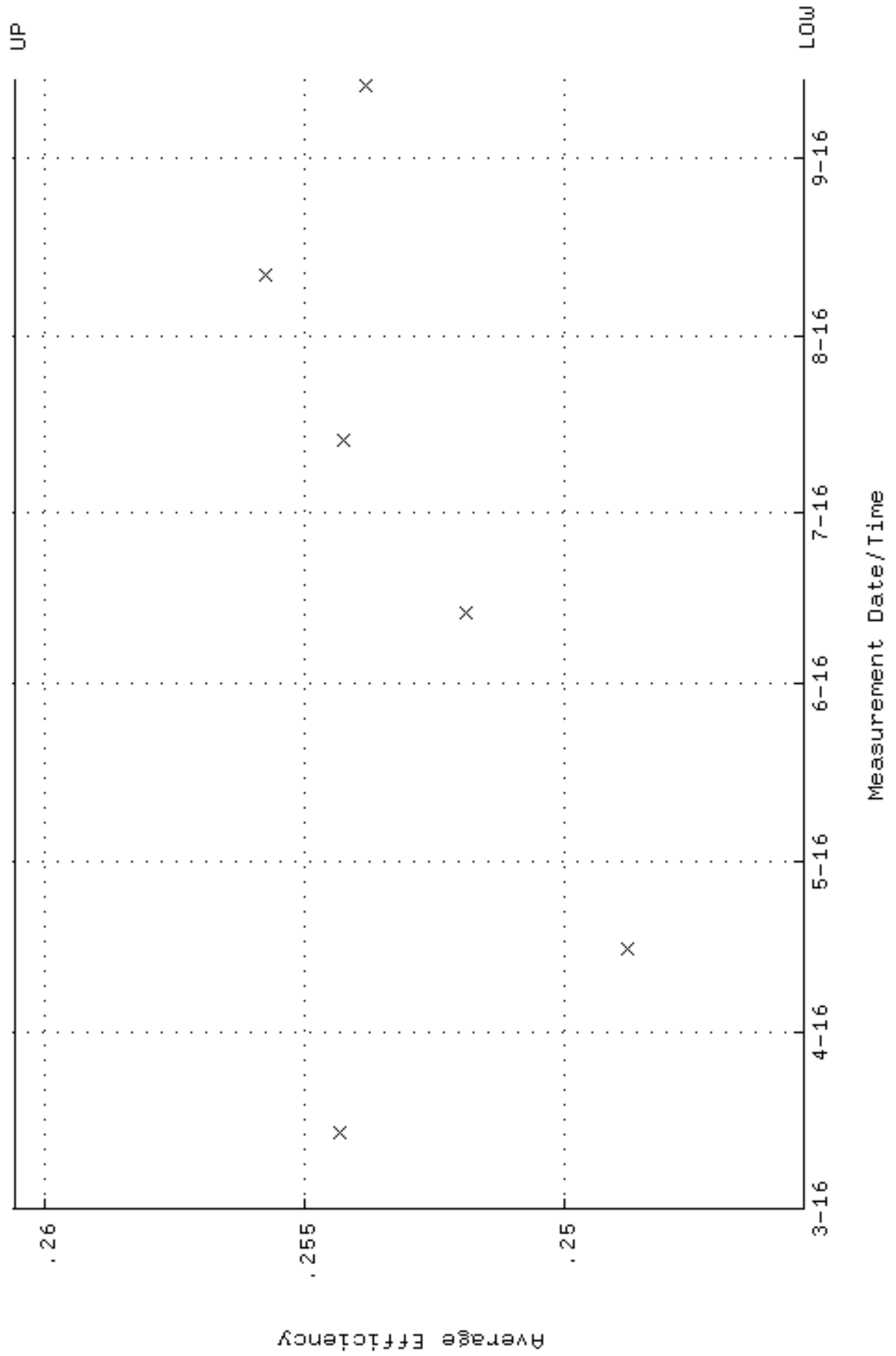


QA filename : DKA100:[ENV_ALPHA.QA.B]B182.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:05:49 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000

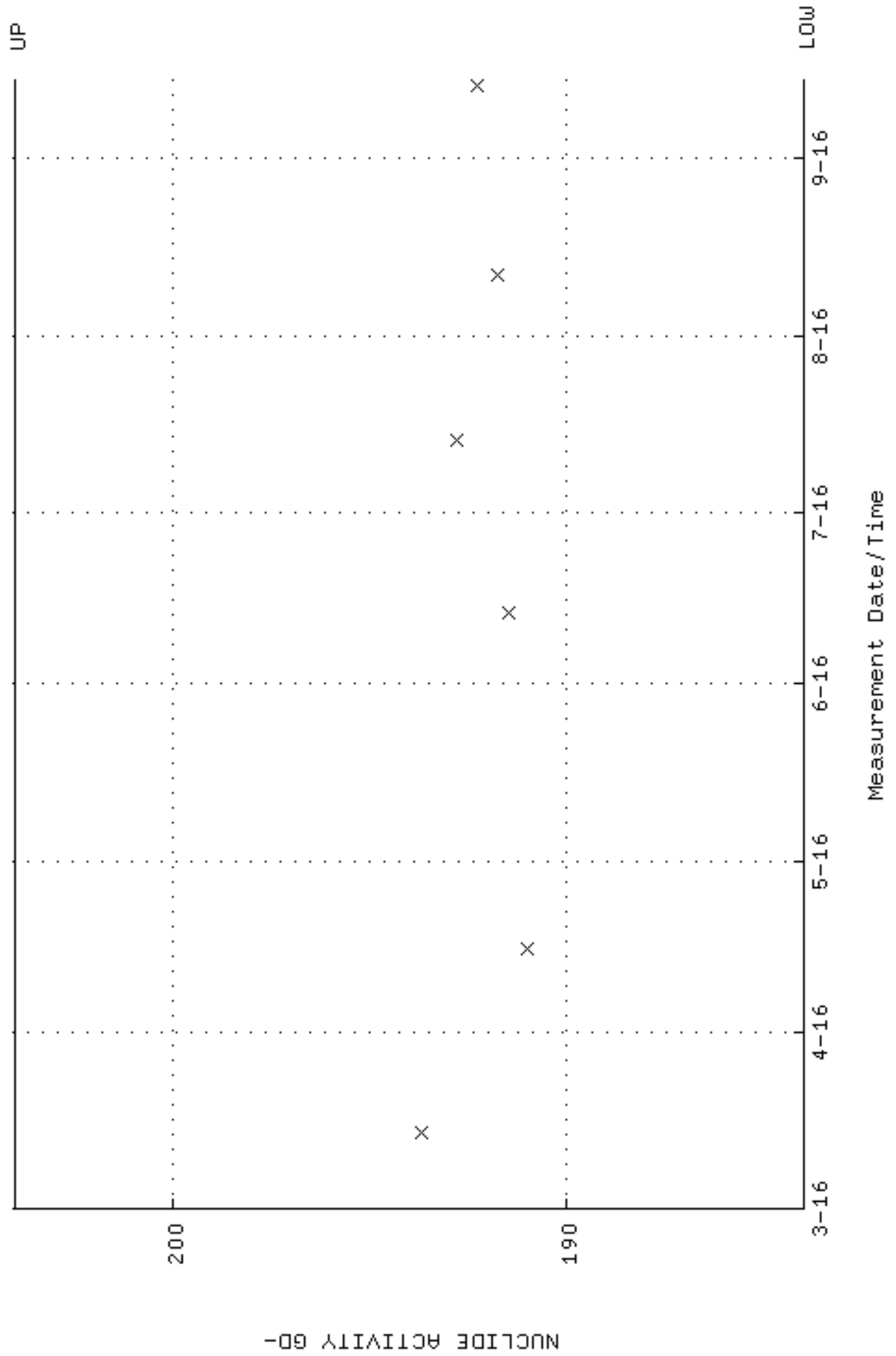


Measurement Date/Time

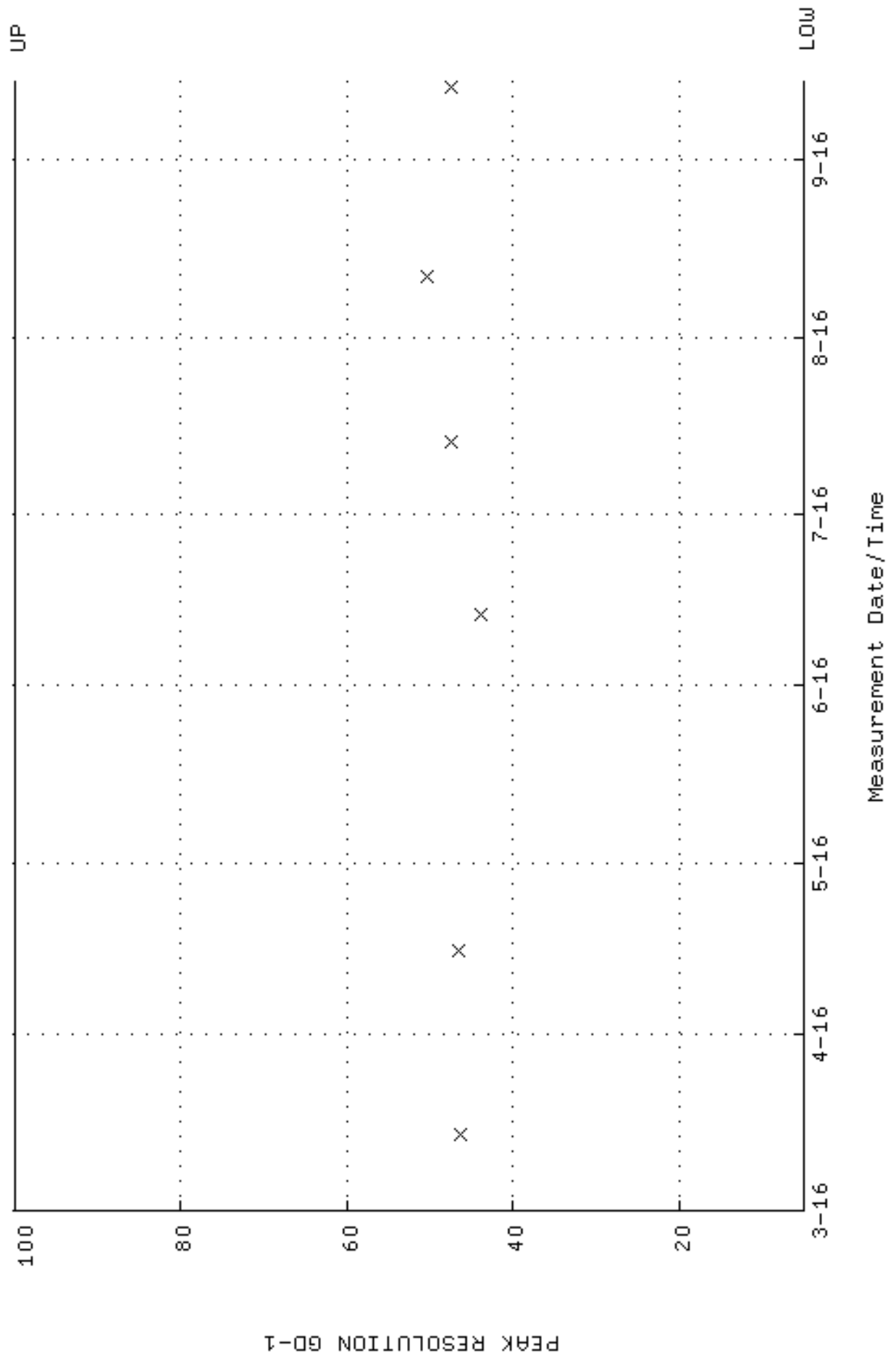
QA filename : DKA100:[ENV_ALPHA.QA.W]W184.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 14-MAR-2016 10:48:38 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.245385 through 0.260560



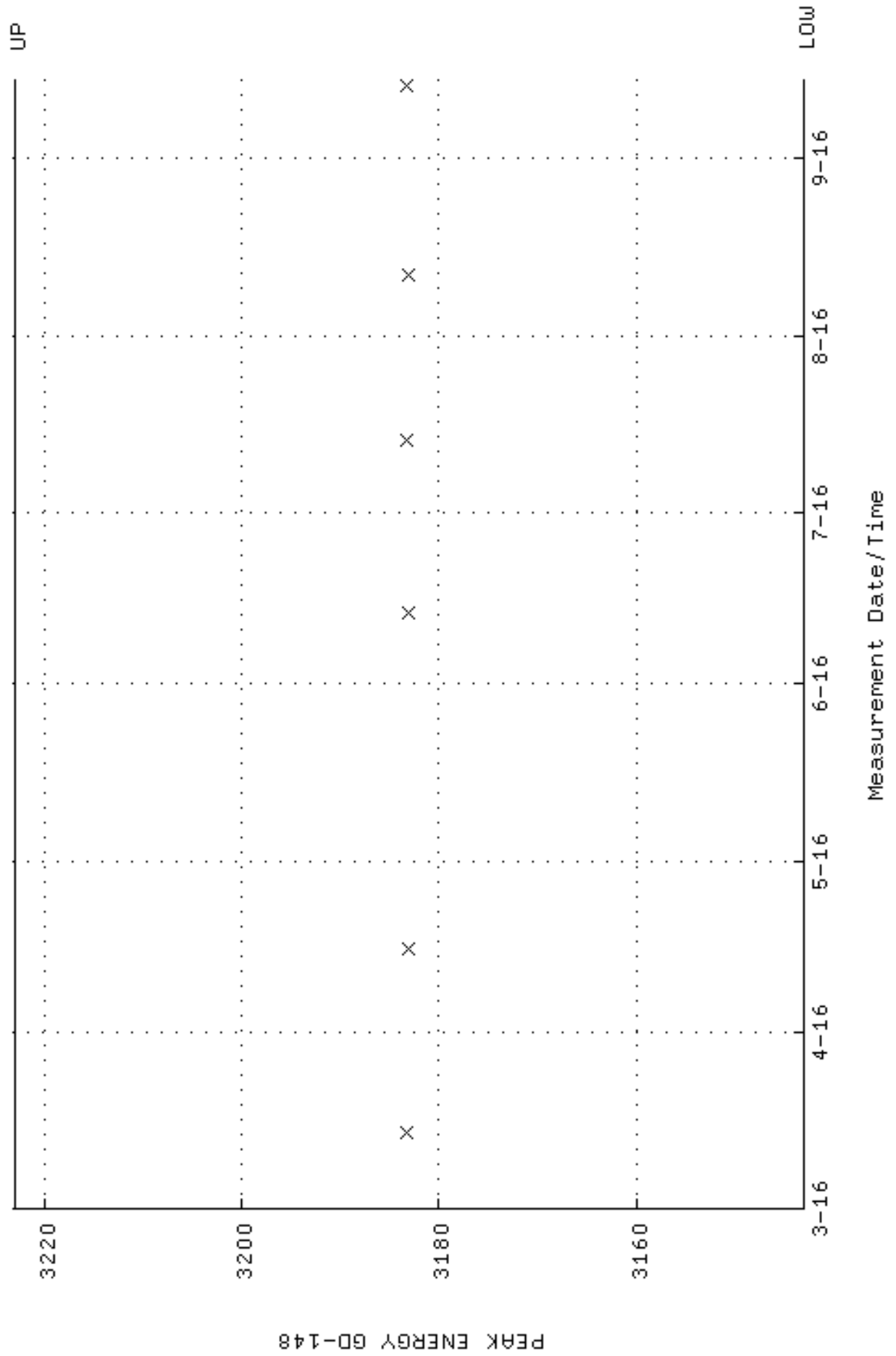
QA filename : DKA100:[ENV_ALPHA.QA.W]W184.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 14-MAR-2016 10:48:38 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



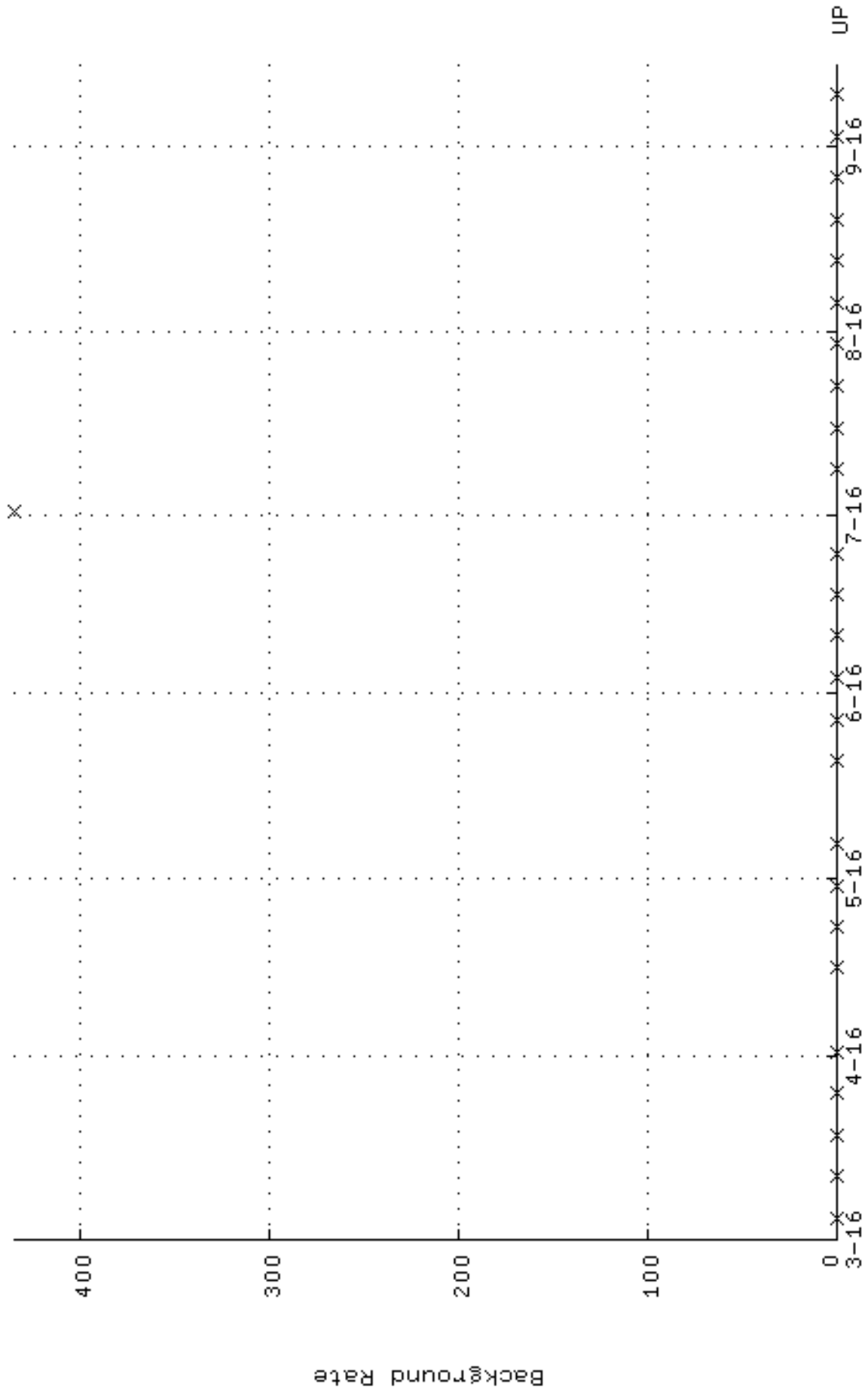
QA filename : DKA100:[ENV_ALPHA.QA.W]W184.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 14-MAR-2016 10:48:38 through 14-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



QA filename : DKA100:[ENV_ALPHA.QA.W]W184.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 14-MAR-2016 10:48:38 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00

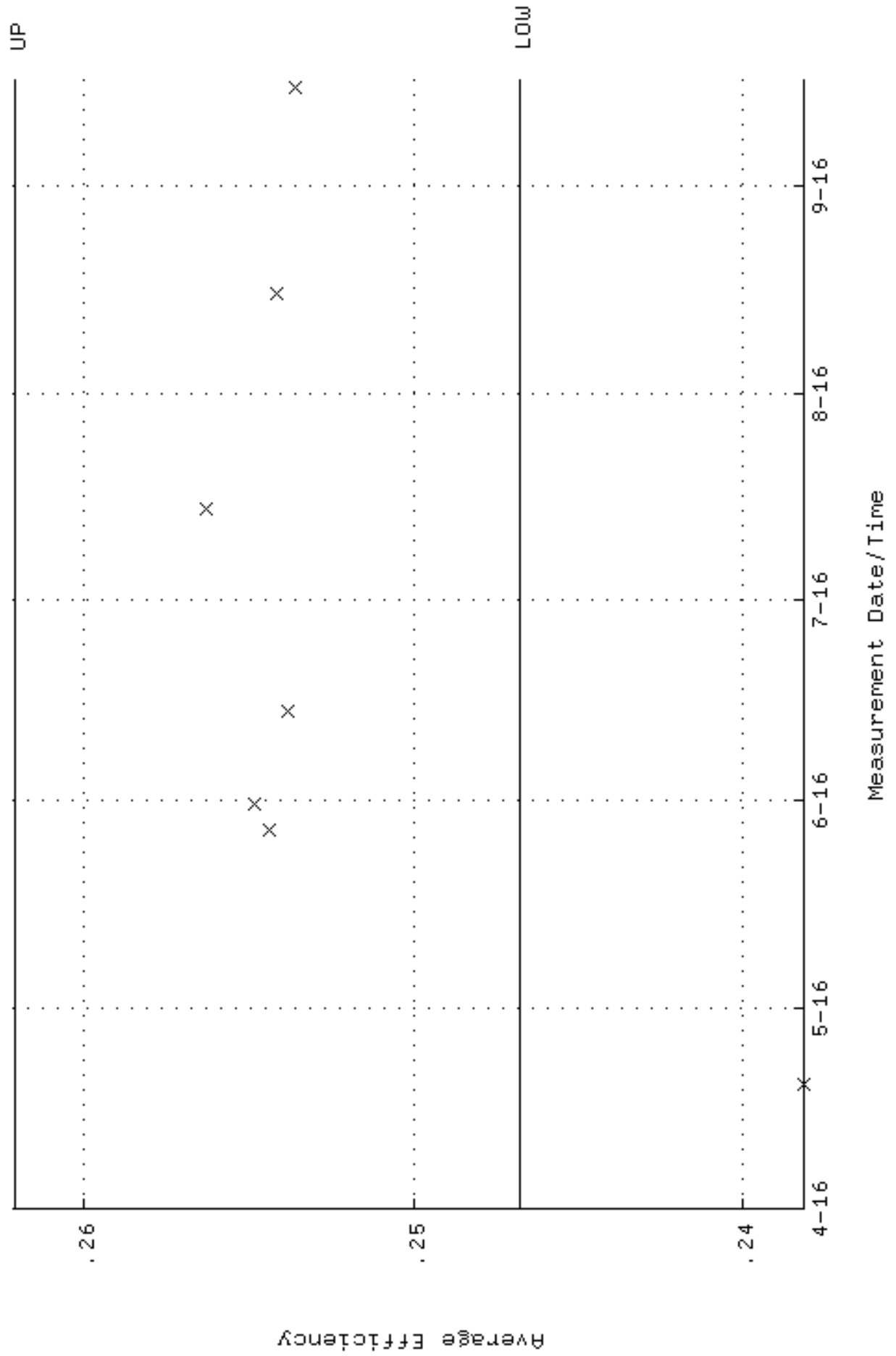


QA filename : DKA100:[ENV_ALPHA.QA.B]B184.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:05:57 through 14-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000

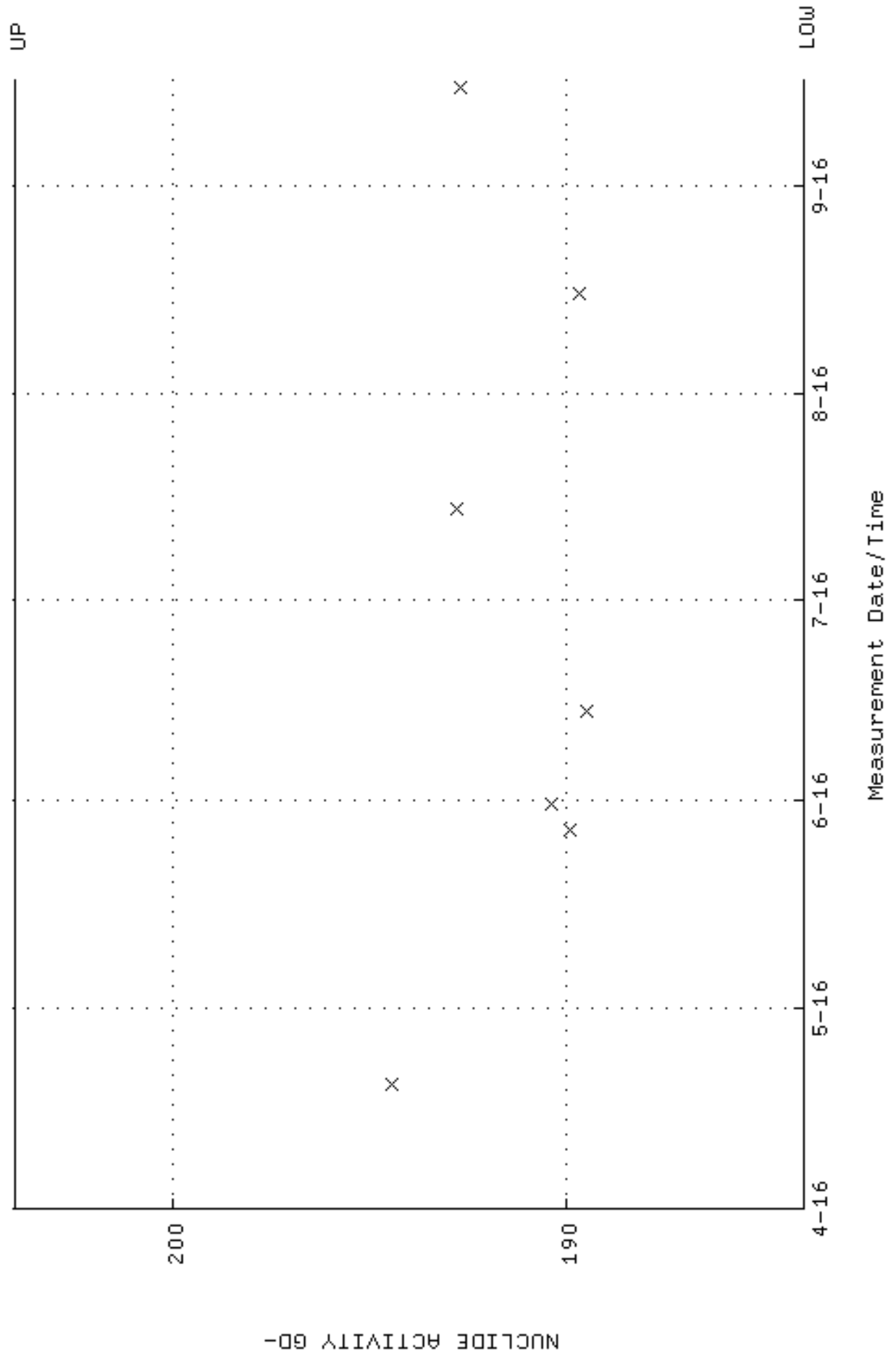


Measurement Date/Time

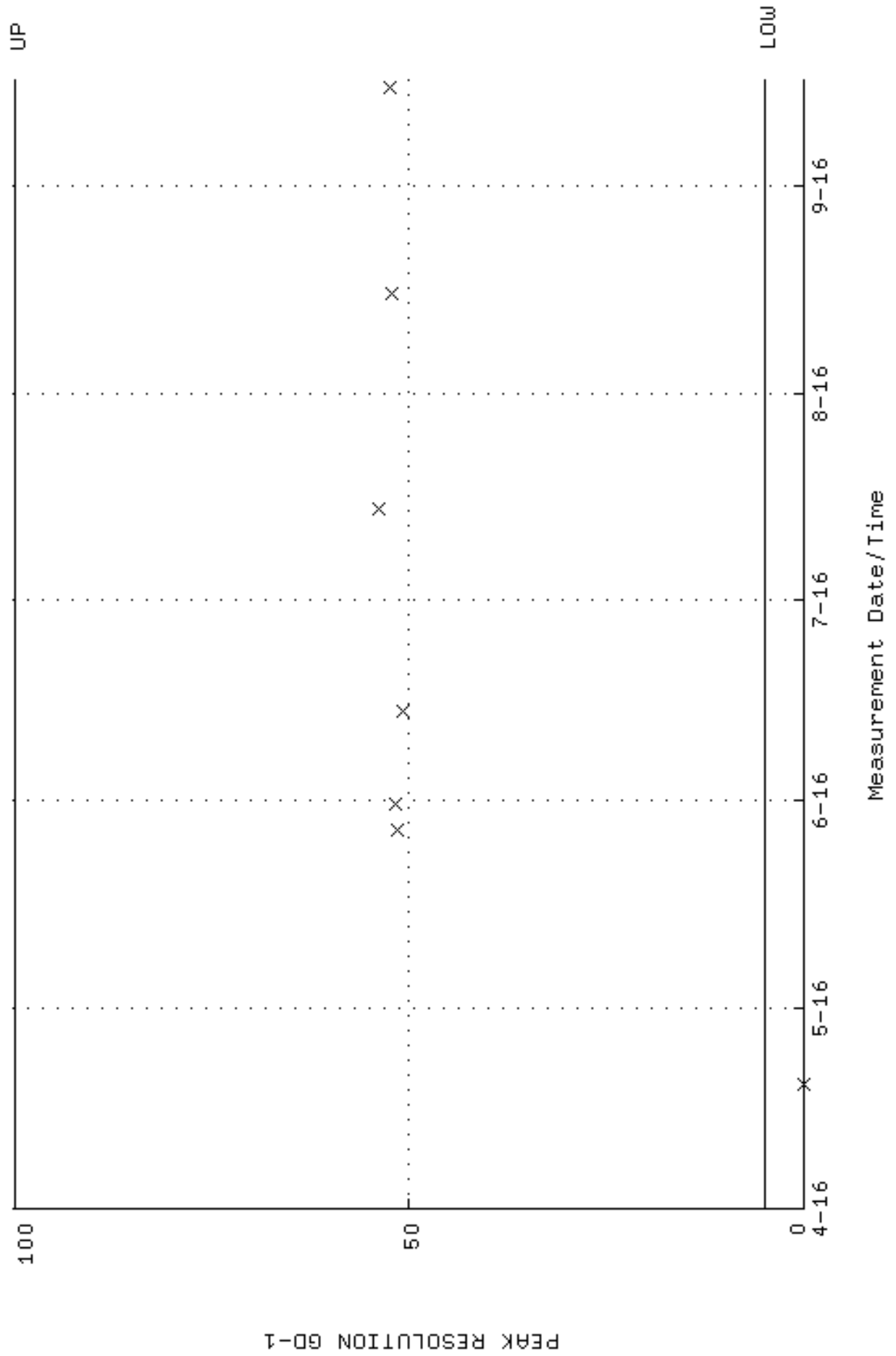
QA filename : DKA100:[ENV_ALPHA.QA.W]W185.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 19-APR-2016 15:41:25 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.246814 through 0.262080



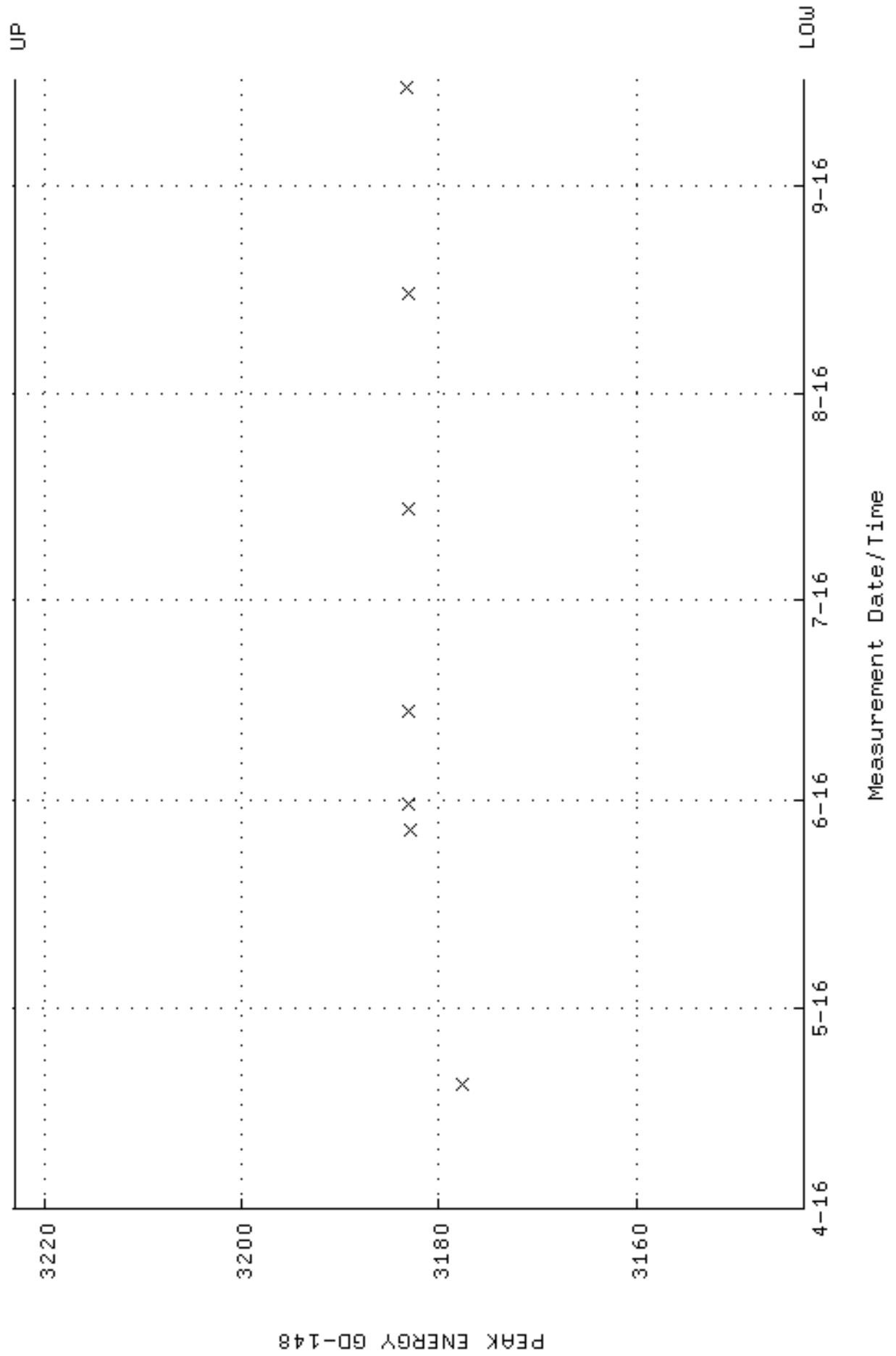
QA filename : DKA100:[ENV_ALPHA.QA.W]W185.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 19-APR-2016 15:41:25 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



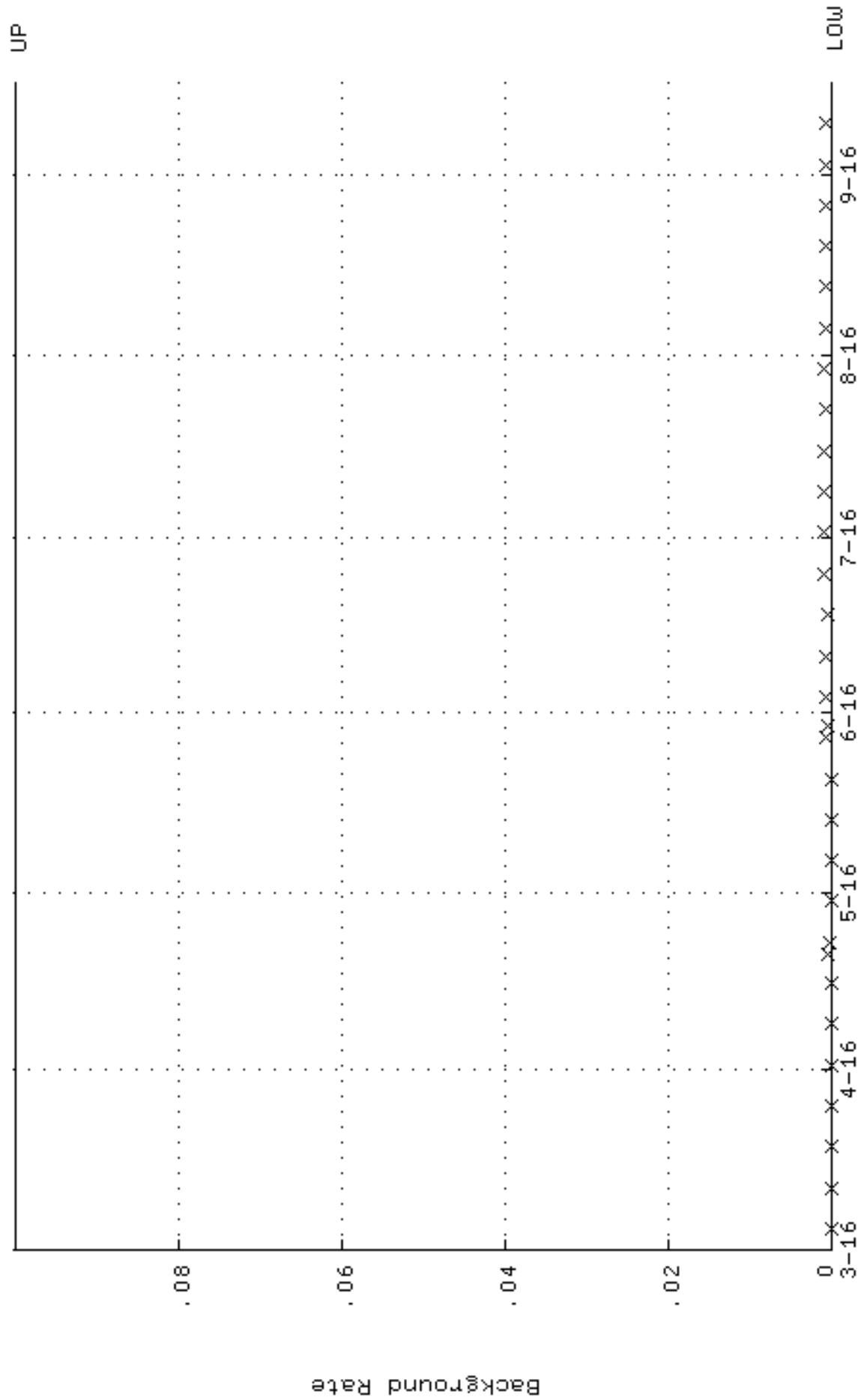
QA filename : DKA100:[ENV_ALPHA.QA.W]W185.QAF;3
 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 19-APR-2016 15:41:25 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



QA filename : DKA100:[ENV_ALPHA.QA.W]W185.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 19-APR-2016 15:41:25 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00

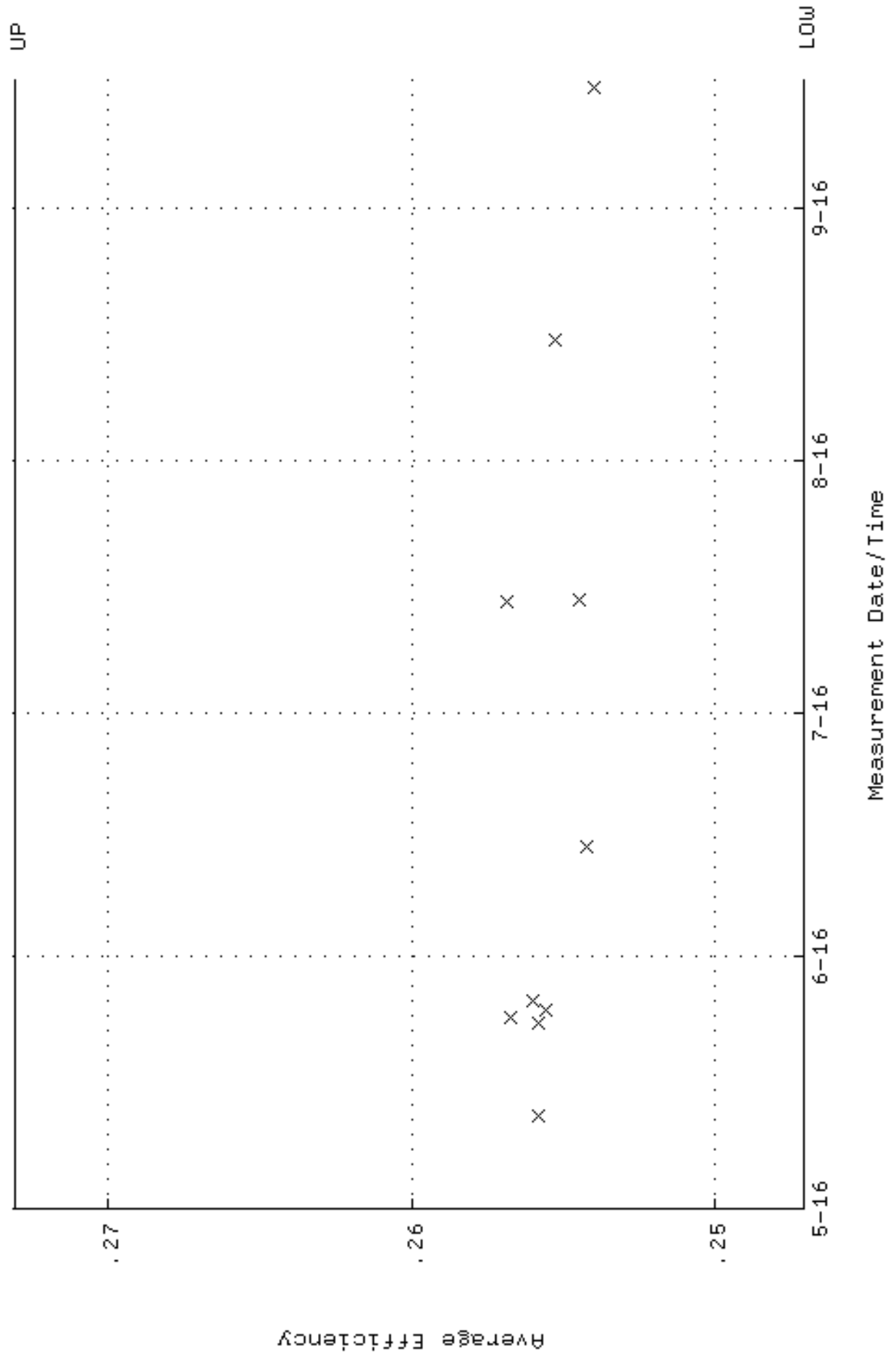


QA filename : DKA100:[ENV_ALPHA.QA.B]B185.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:16:31 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000

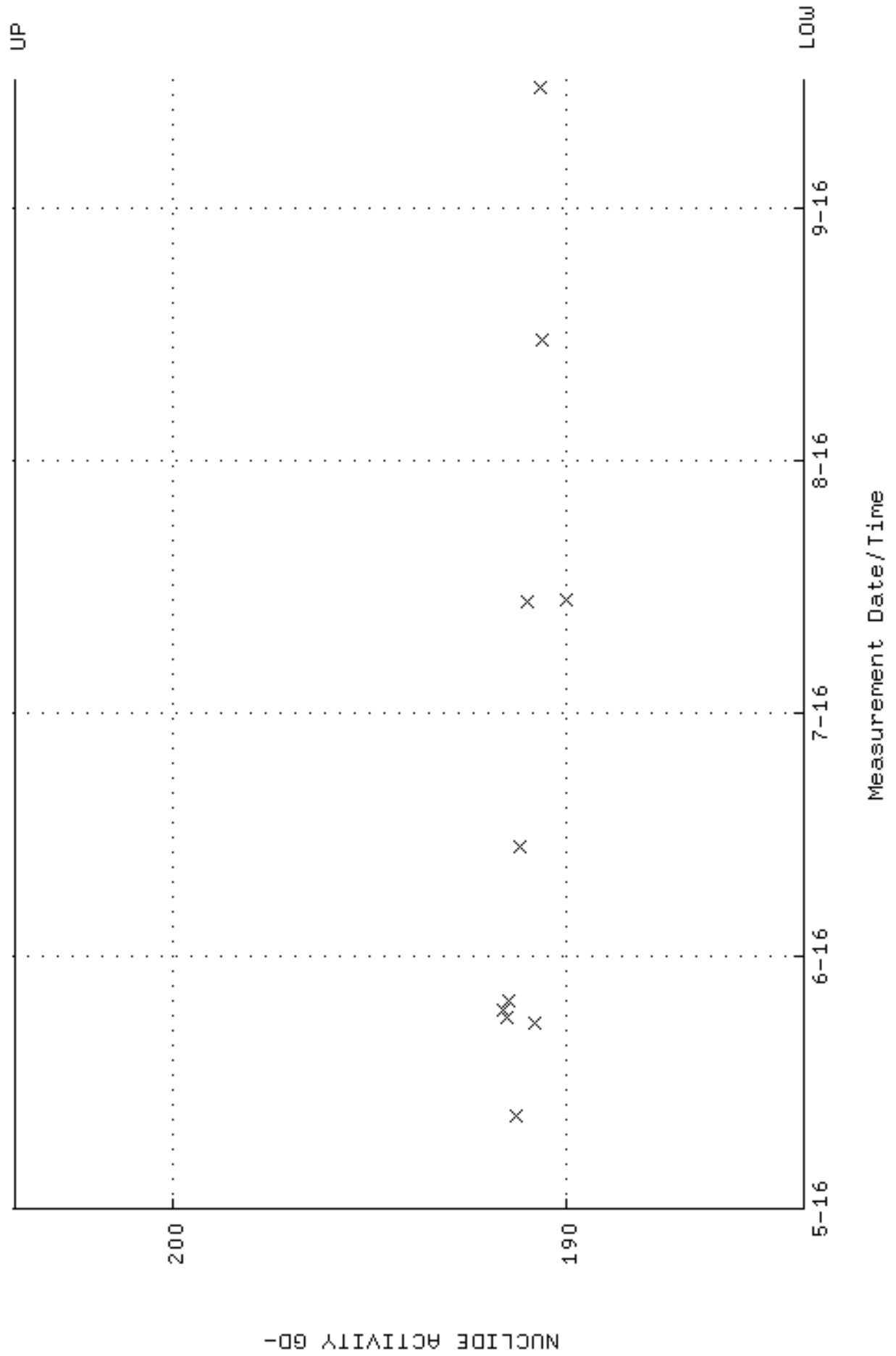


Measurement Date/Time

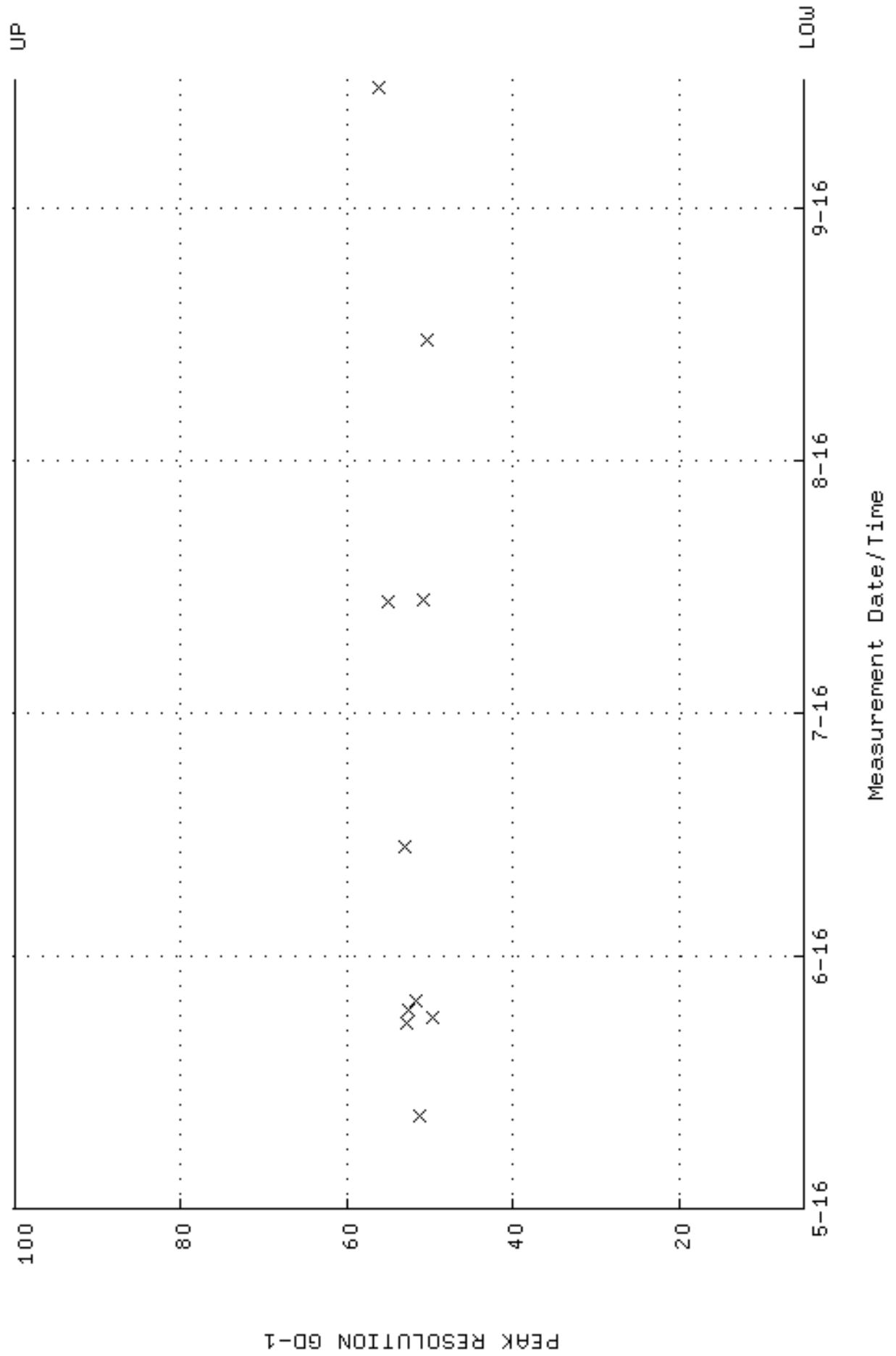
QA filename : DKA100:[ENV_ALPHA.QA.W]W186.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 12-MAY-2016 09:14:47 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.247066 through 0.273072



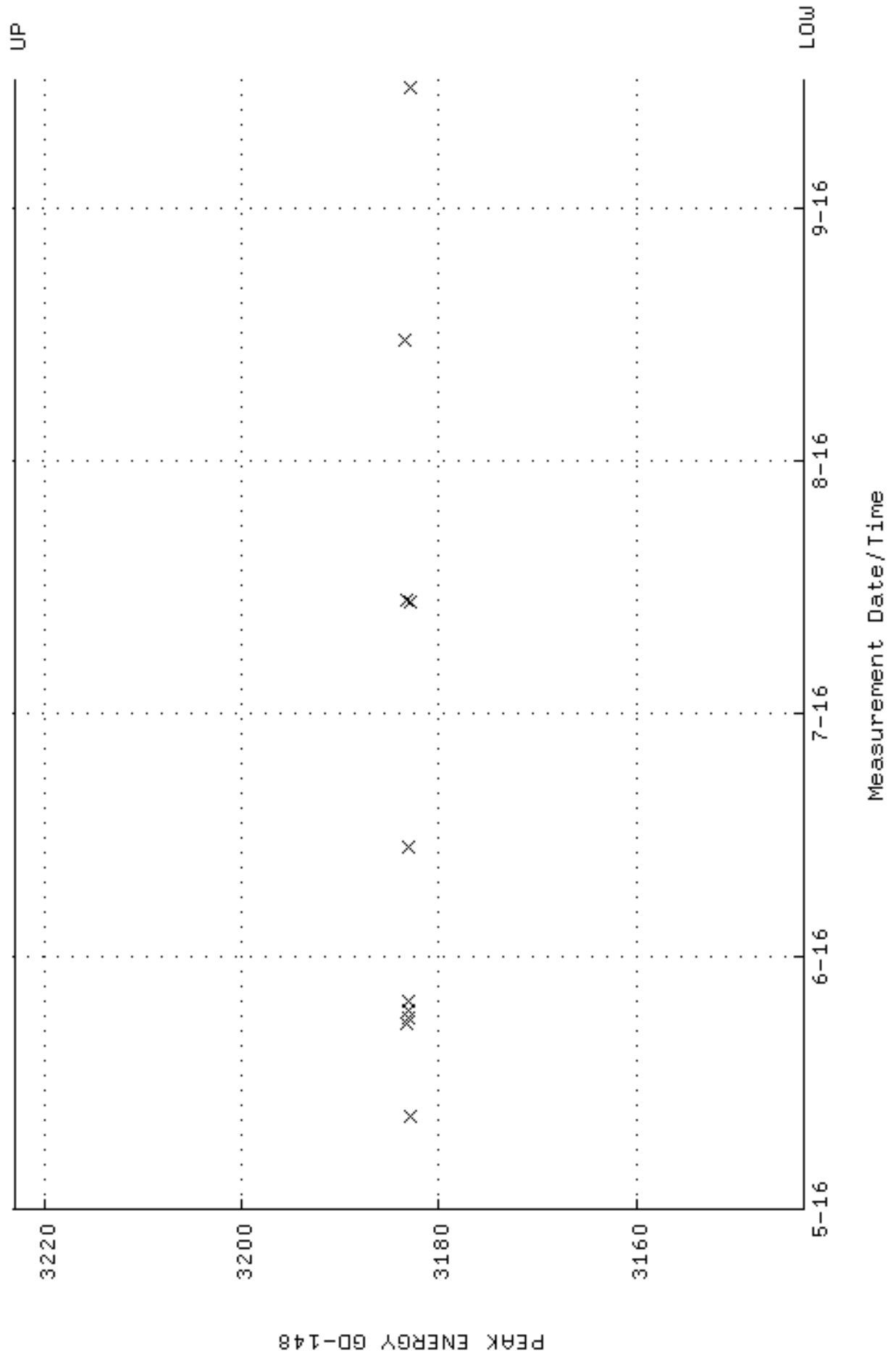
QA filename : DKA100:[ENV_ALPHA.QA.W]W186.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 12-MAY-2016 09:14:47 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



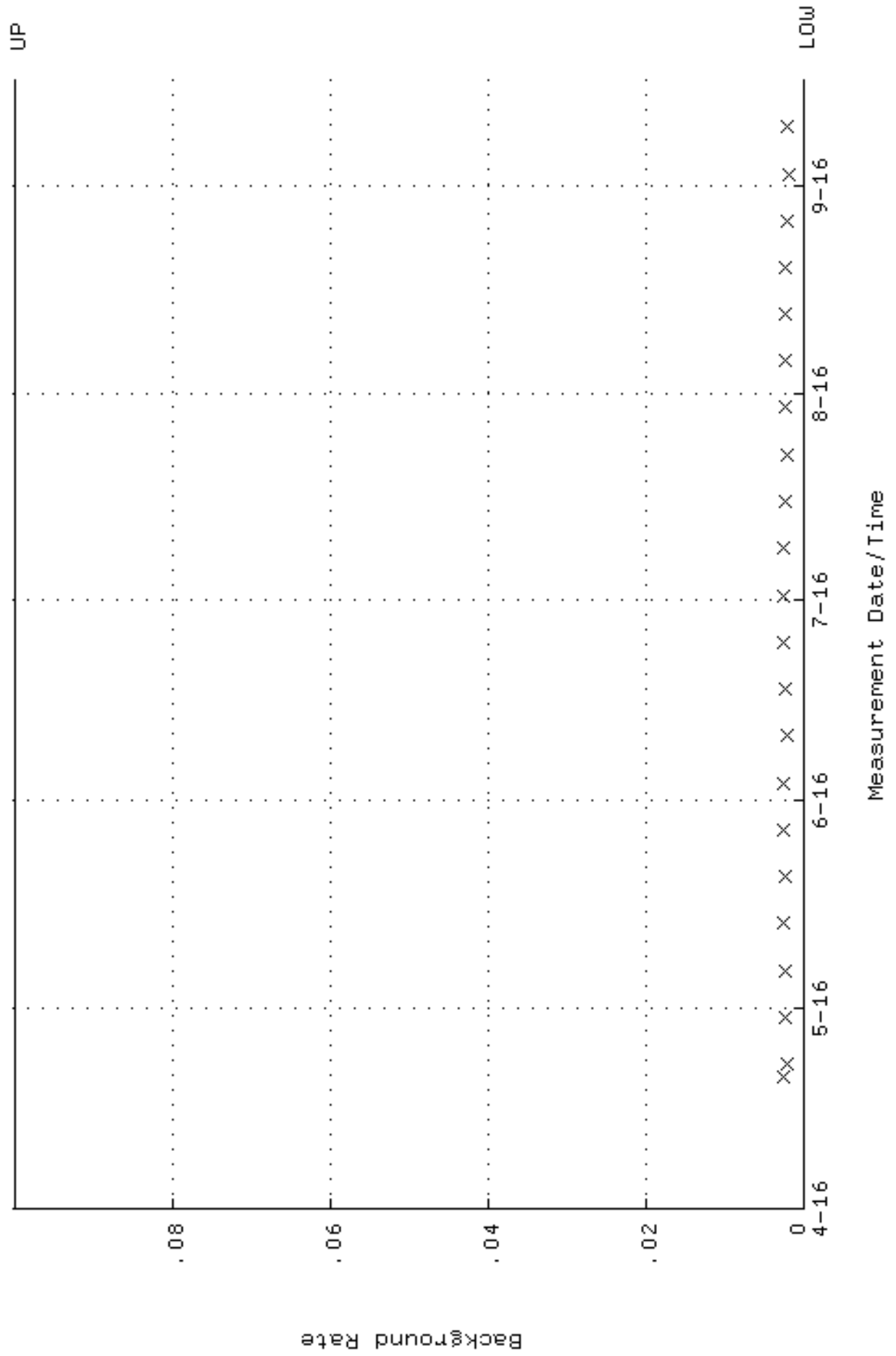
QA filename : DKA100:[ENV_ALPHA.QA.W]W186.QAF;4
 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 12-MAY-2016 09:14:47 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



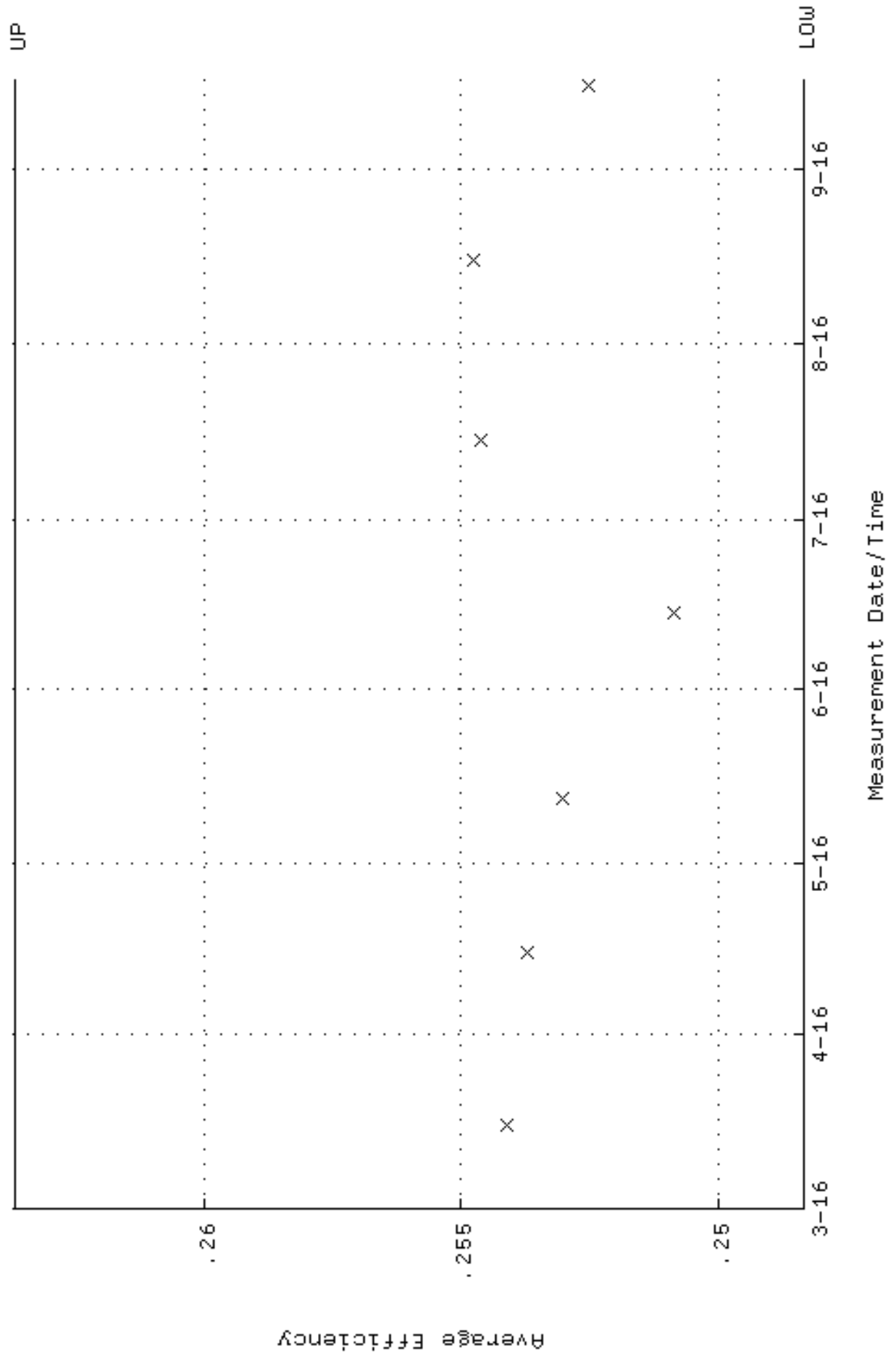
QA filename : DKA100:[ENV_ALPHA.QA.W]W186.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 12-MAY-2016 09:14:47 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



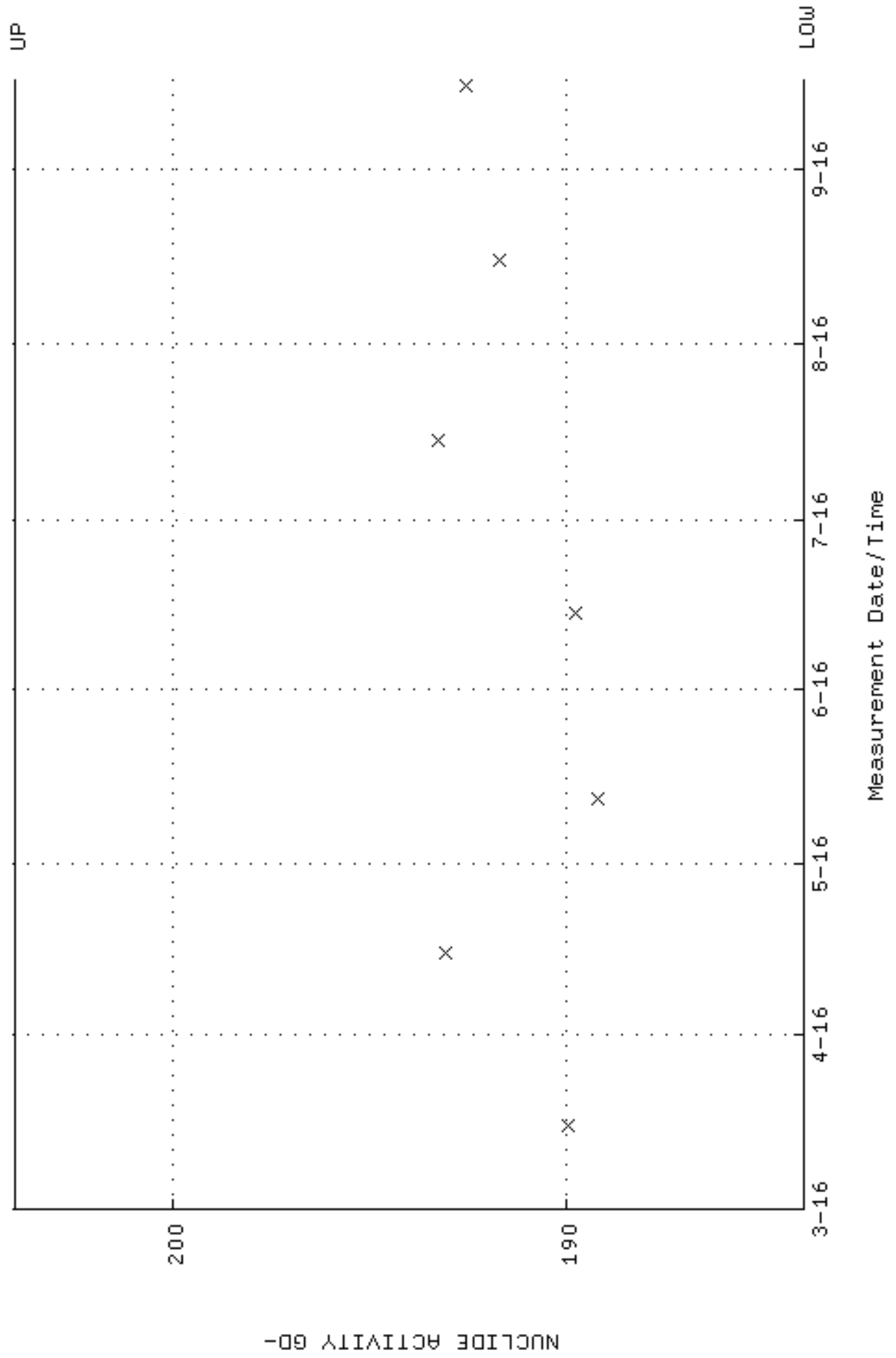
QA filename : DKA100:[ENV_ALPHA.QA.B]B186.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 20-APR-2016 12:57:24 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



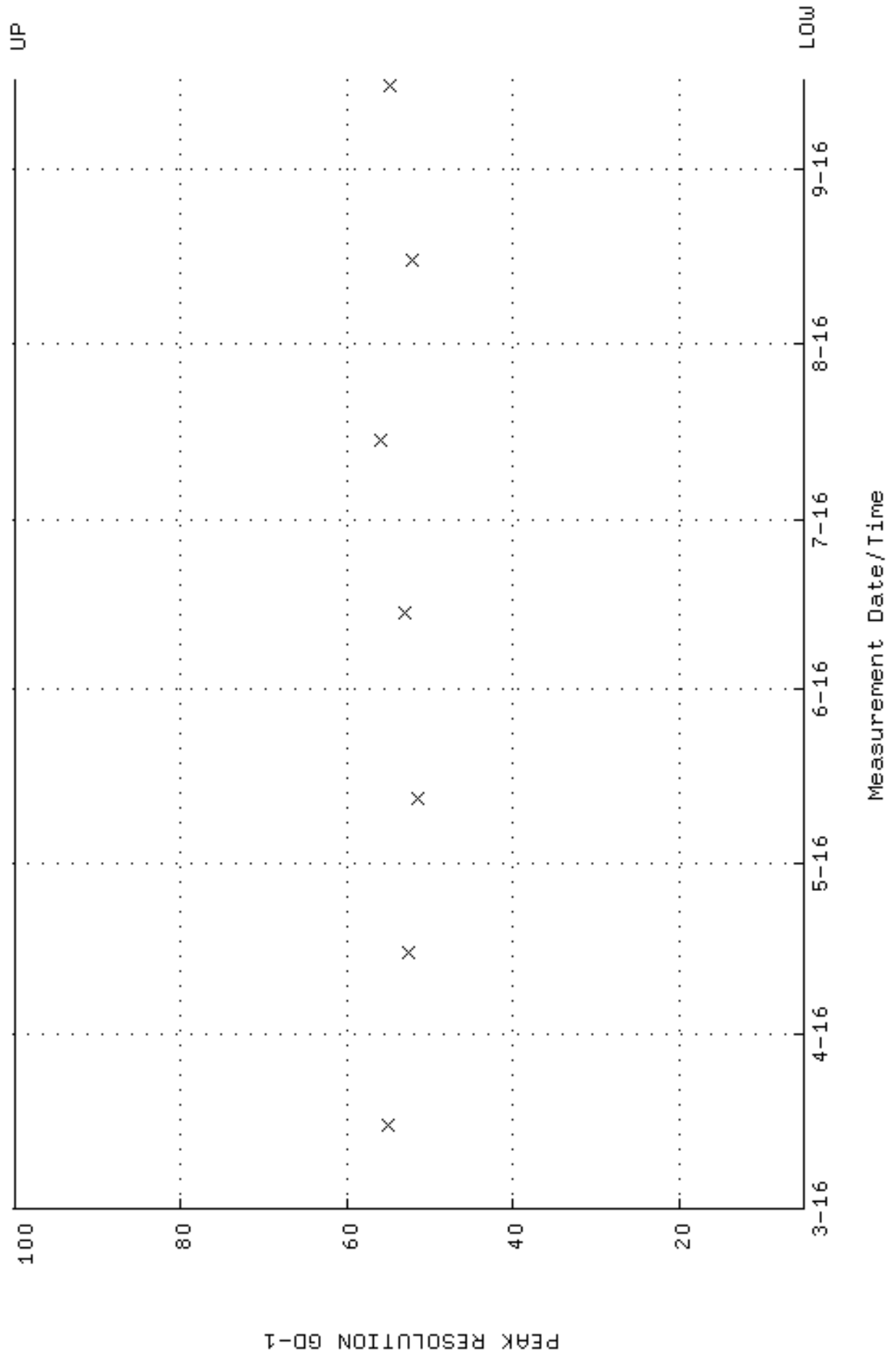
QA filename : DKA100:[ENV_ALPHA.QA.W]W187.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 15-MAR-2016 14:48:31 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.248323 through 0.263683



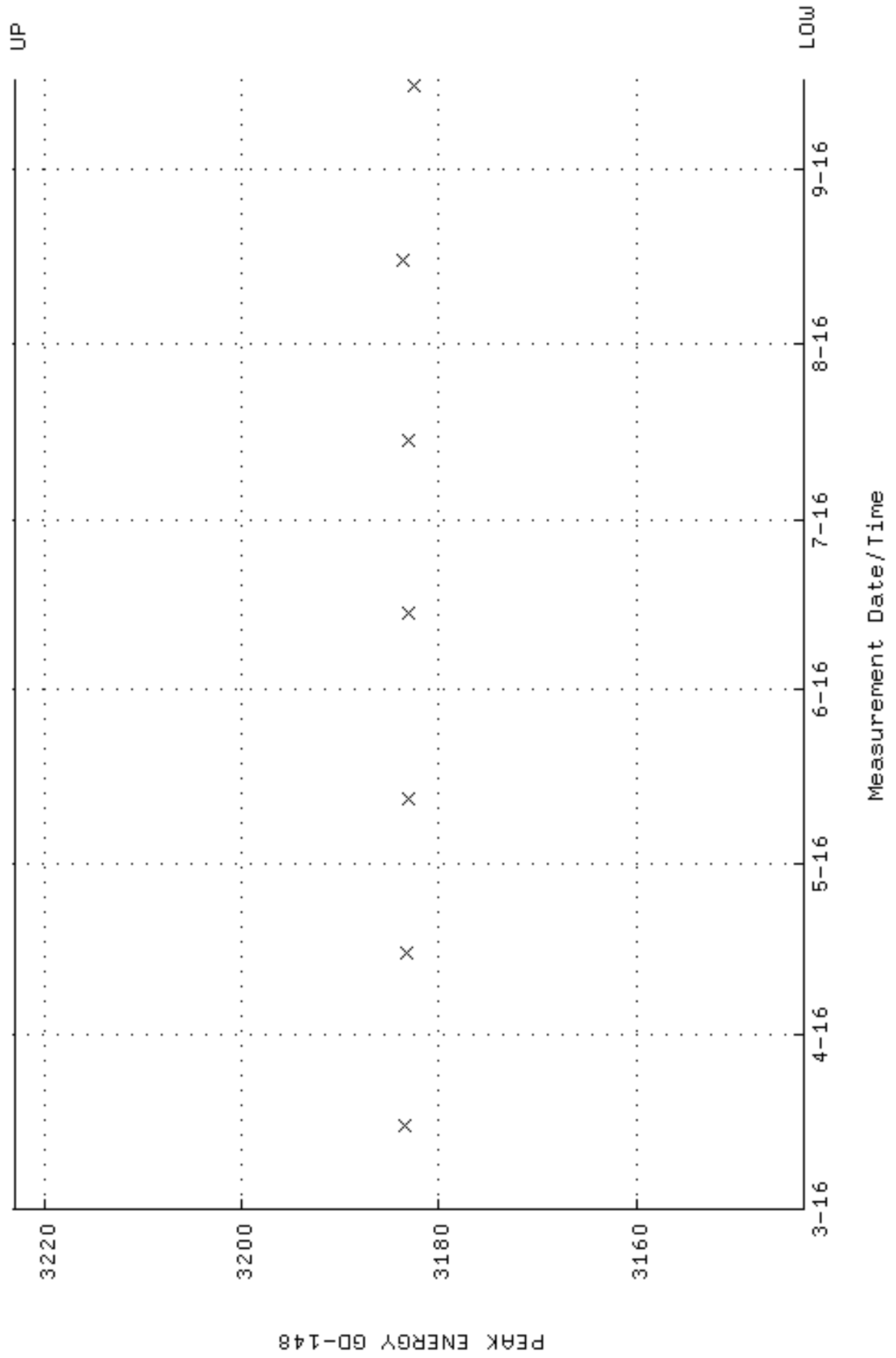
QA filename : DKA100:[ENV_ALPHA.QA.W]w187.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 15-MAR-2016 14:48:31 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



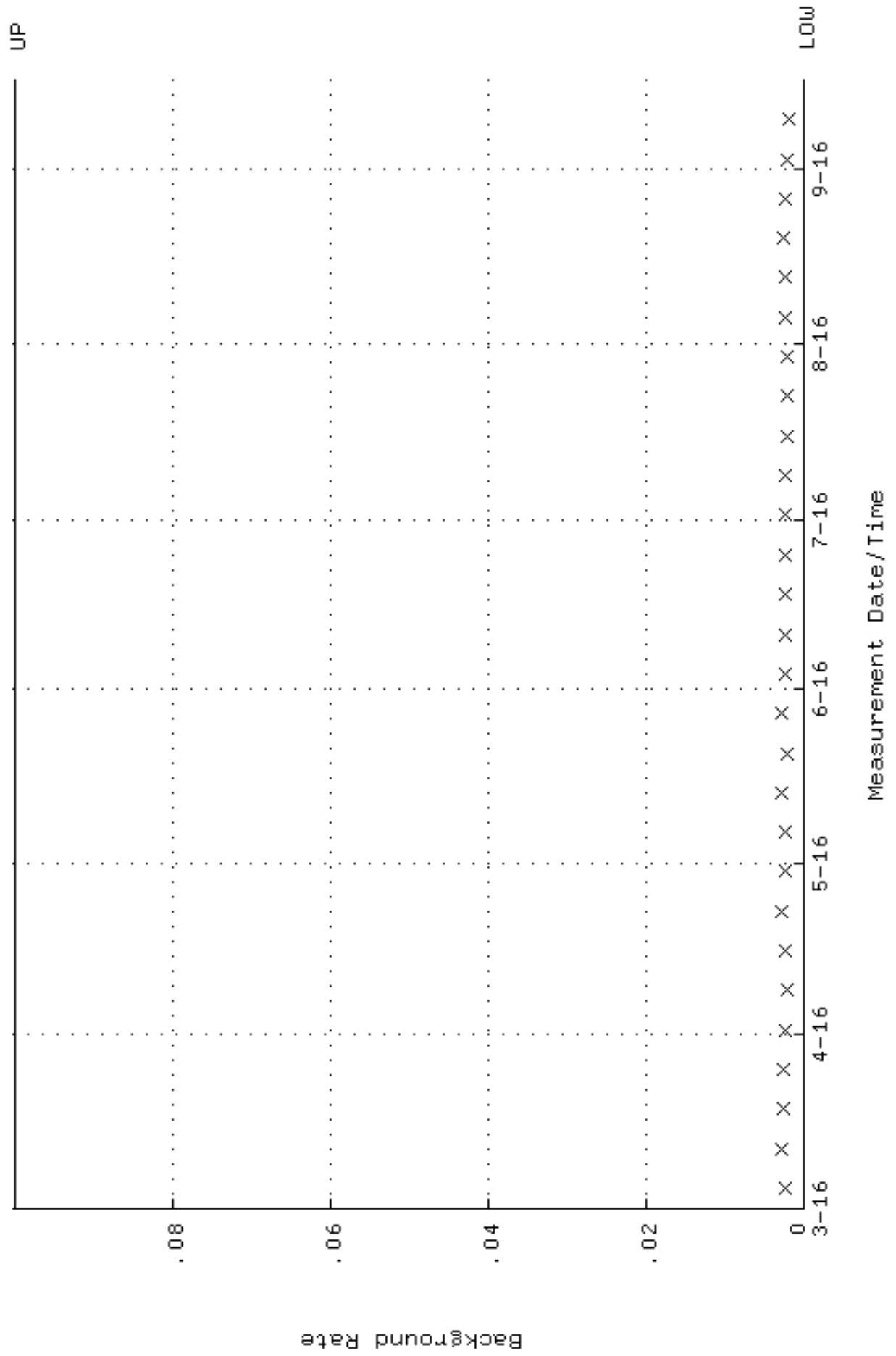
QA filename : DKA100:[ENV_ALPHA.QA.W]w187.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 15-MAR-2016 14:48:31 through 16-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



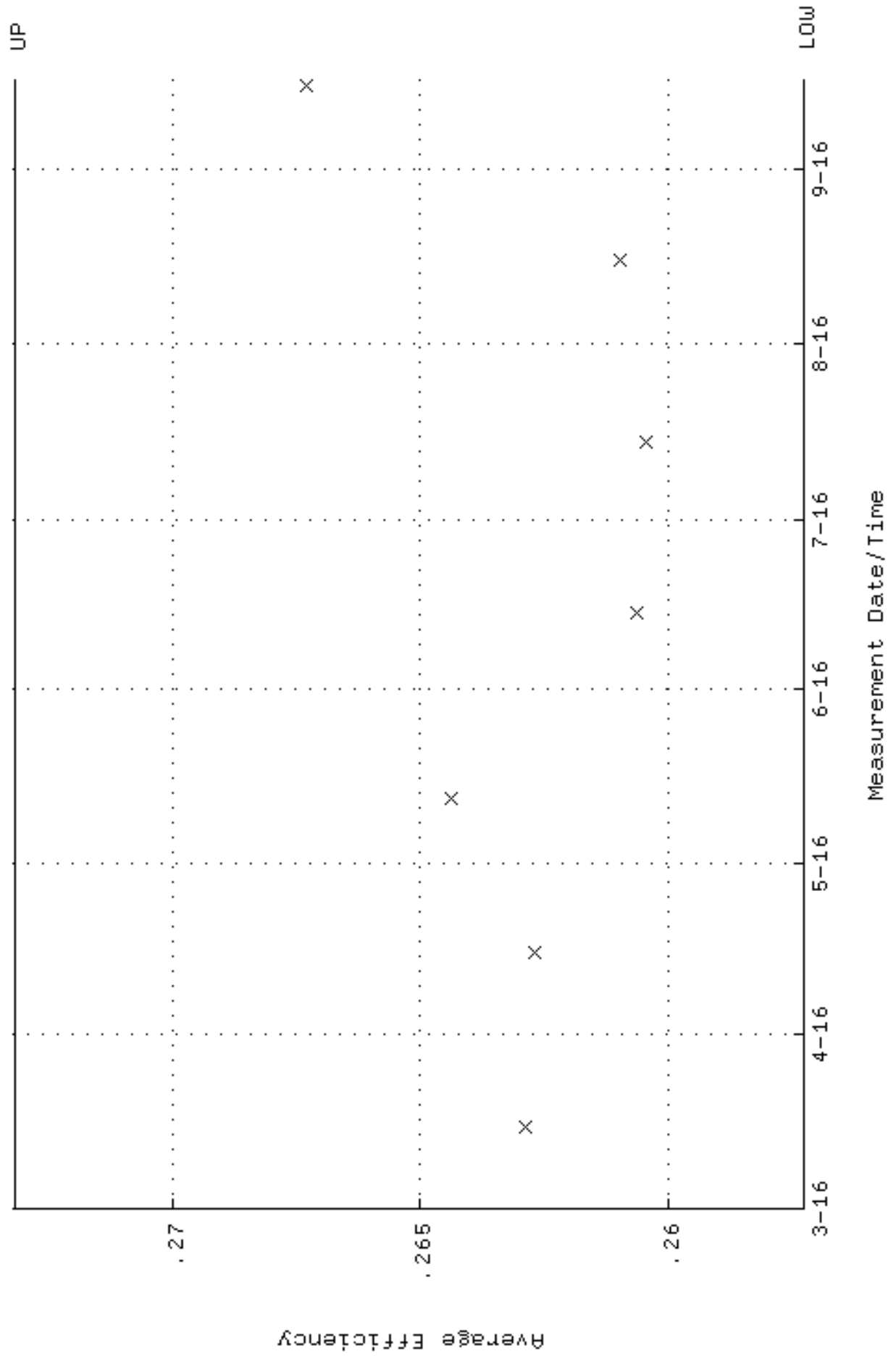
QA filename : DKA100:[ENV_ALPHA.QA.W]W187.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 15-MAR-2016 14:48:31 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



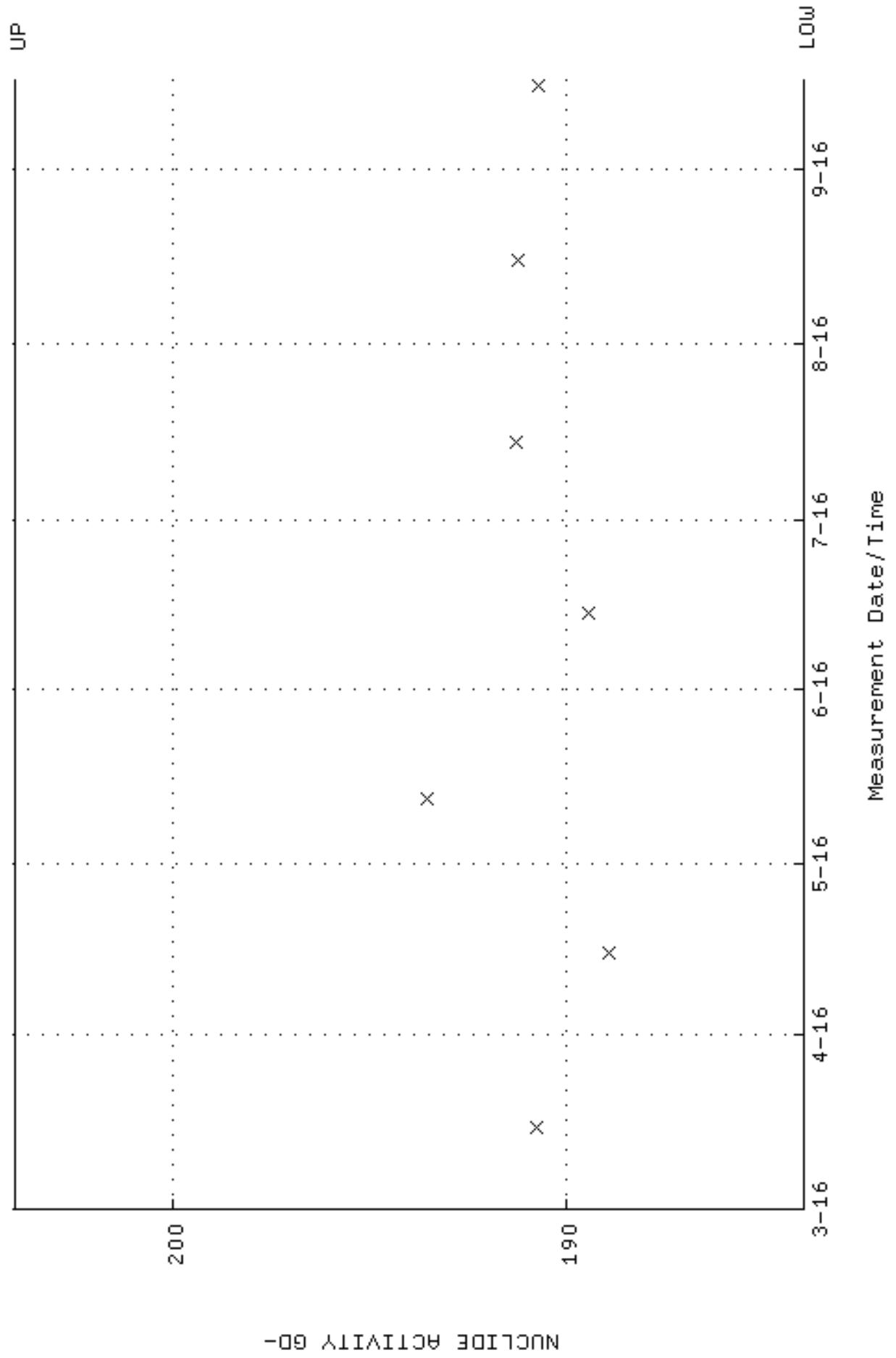
QA filename : DKA100:[ENV_ALPHA.QA.B]B187.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:16:35 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



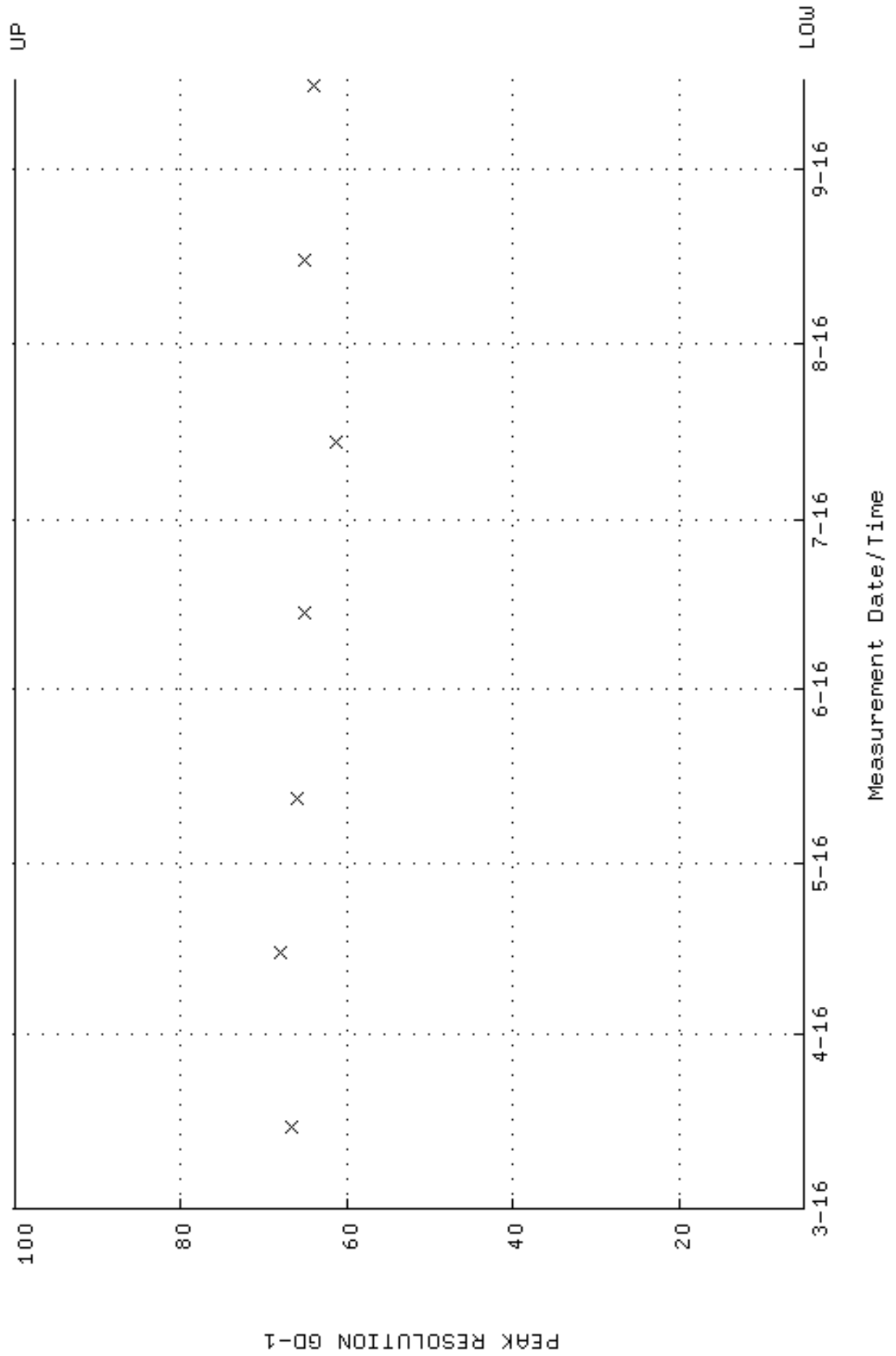
QA filename : DKA100:[ENV_ALPHA.QA.W]W188.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 15-MAR-2016 08:38:24 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.257260 through 0.273174



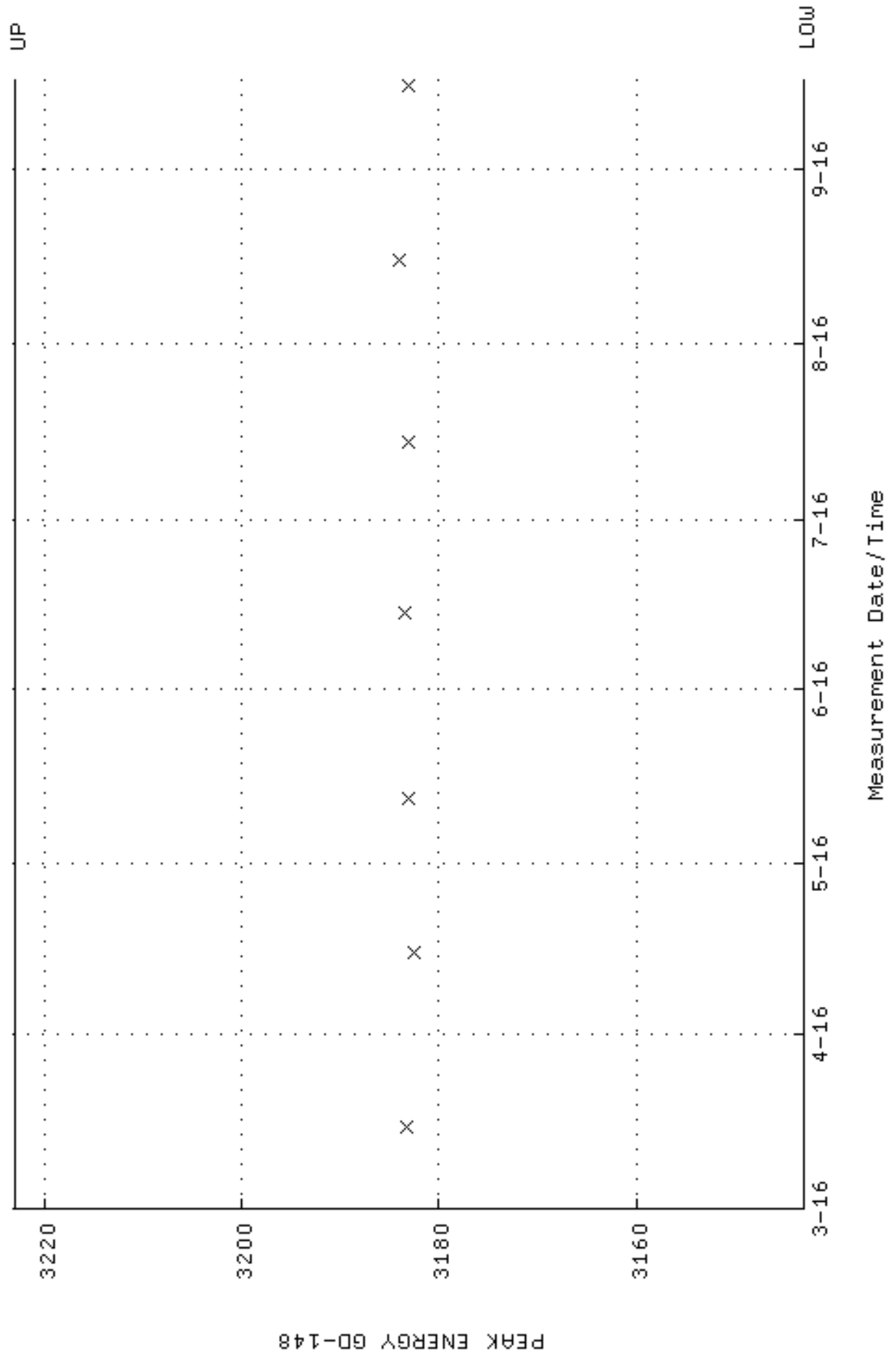
QA filename : DKA100:[ENV_ALPHA.QA.W]w188.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 15-MAR-2016 08:38:24 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



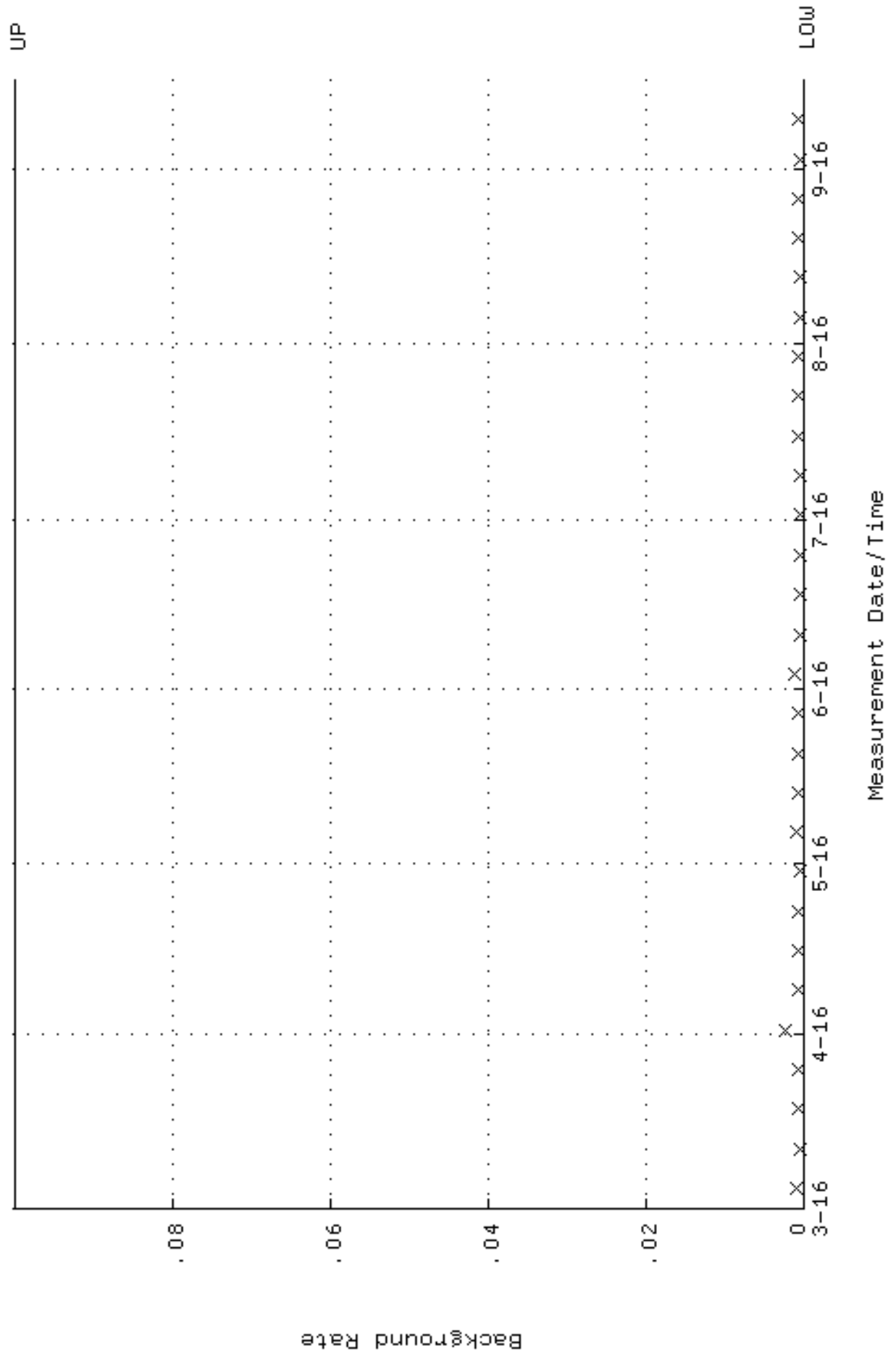
QA filename : DKA100:[ENV_ALPHA.QA.W]W188.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 15-MAR-2016 08:38:24 through 16-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



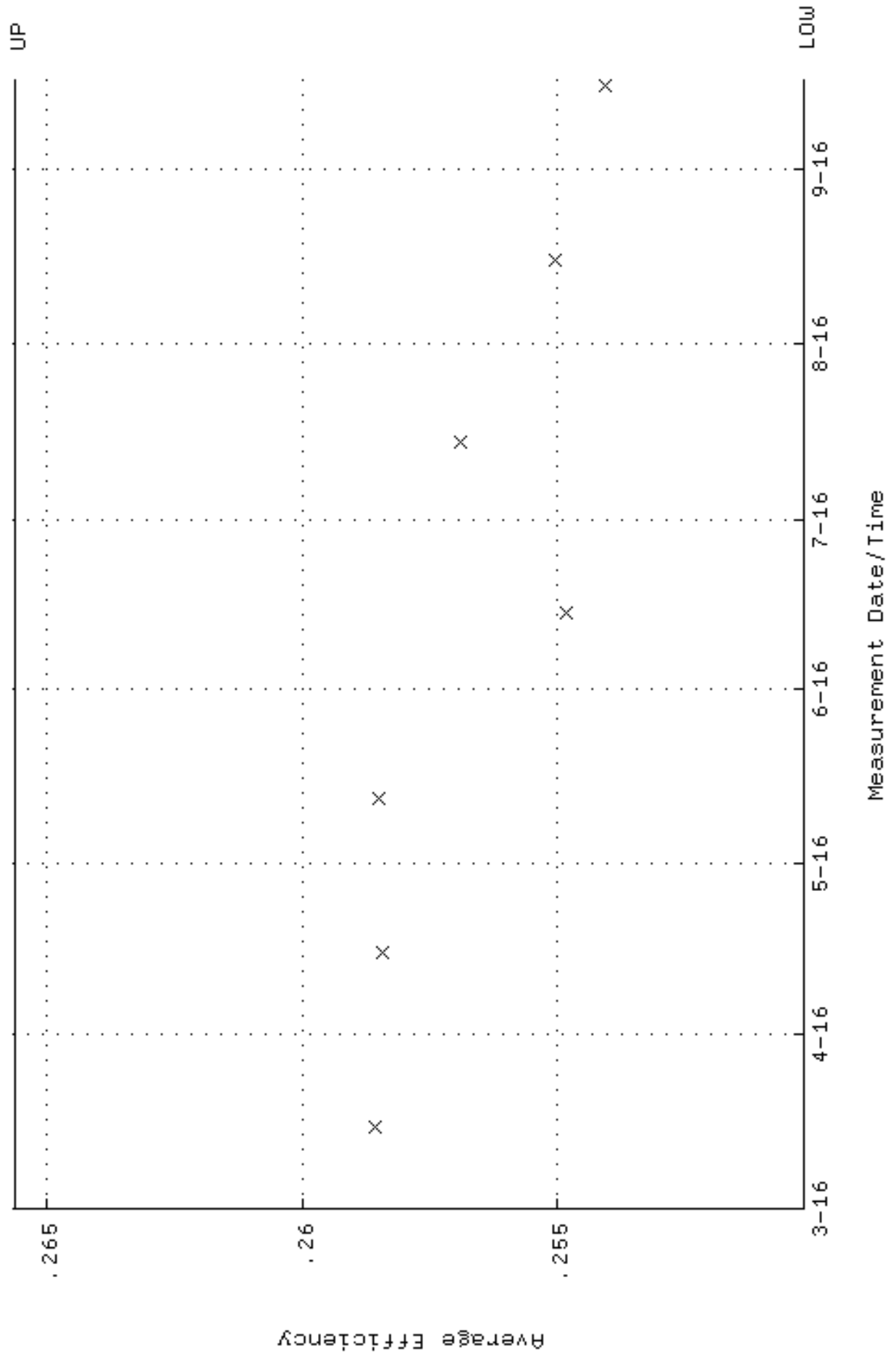
QA filename : DKA100:[ENV_ALPHA.QA.W]W188.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 15-MAR-2016 08:38:24 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



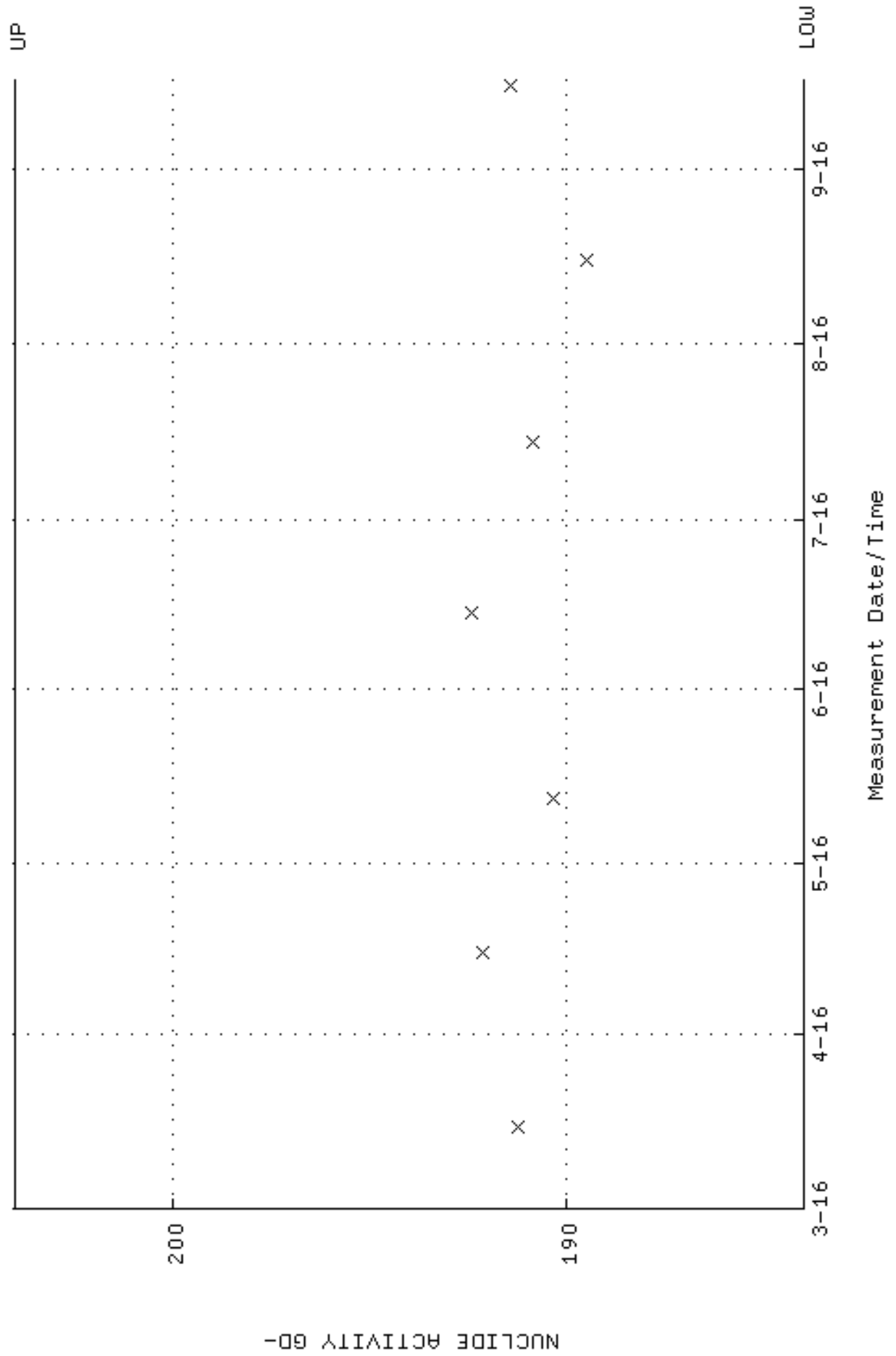
QA filename : DKA100:[ENV_ALPHA.QA.B]B188.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:16:39 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



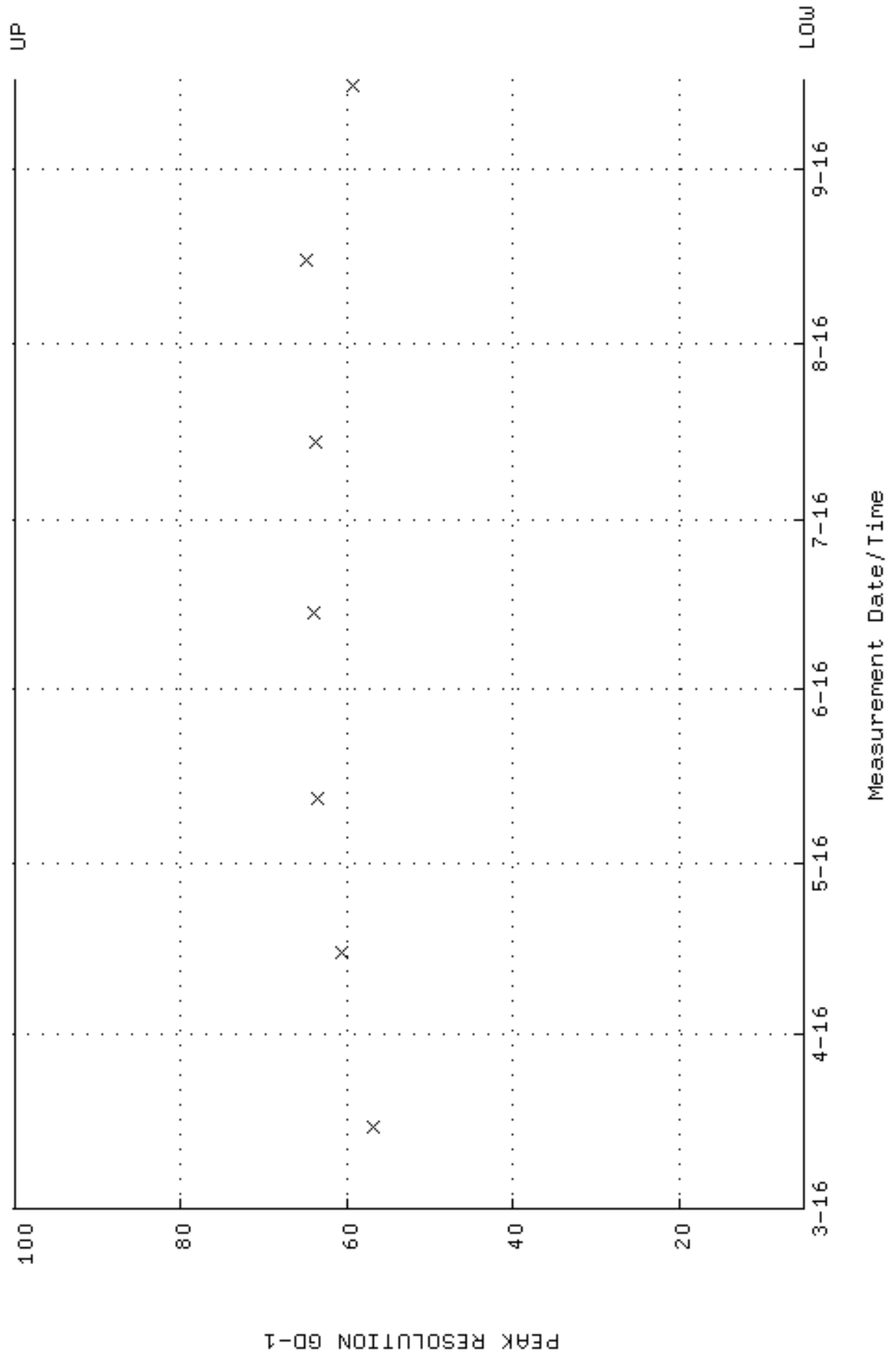
QA filename : DKA100:[ENV_ALPHA.QA.W]W189.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 15-MAR-2016 08:38:28 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.250152 through 0.265626



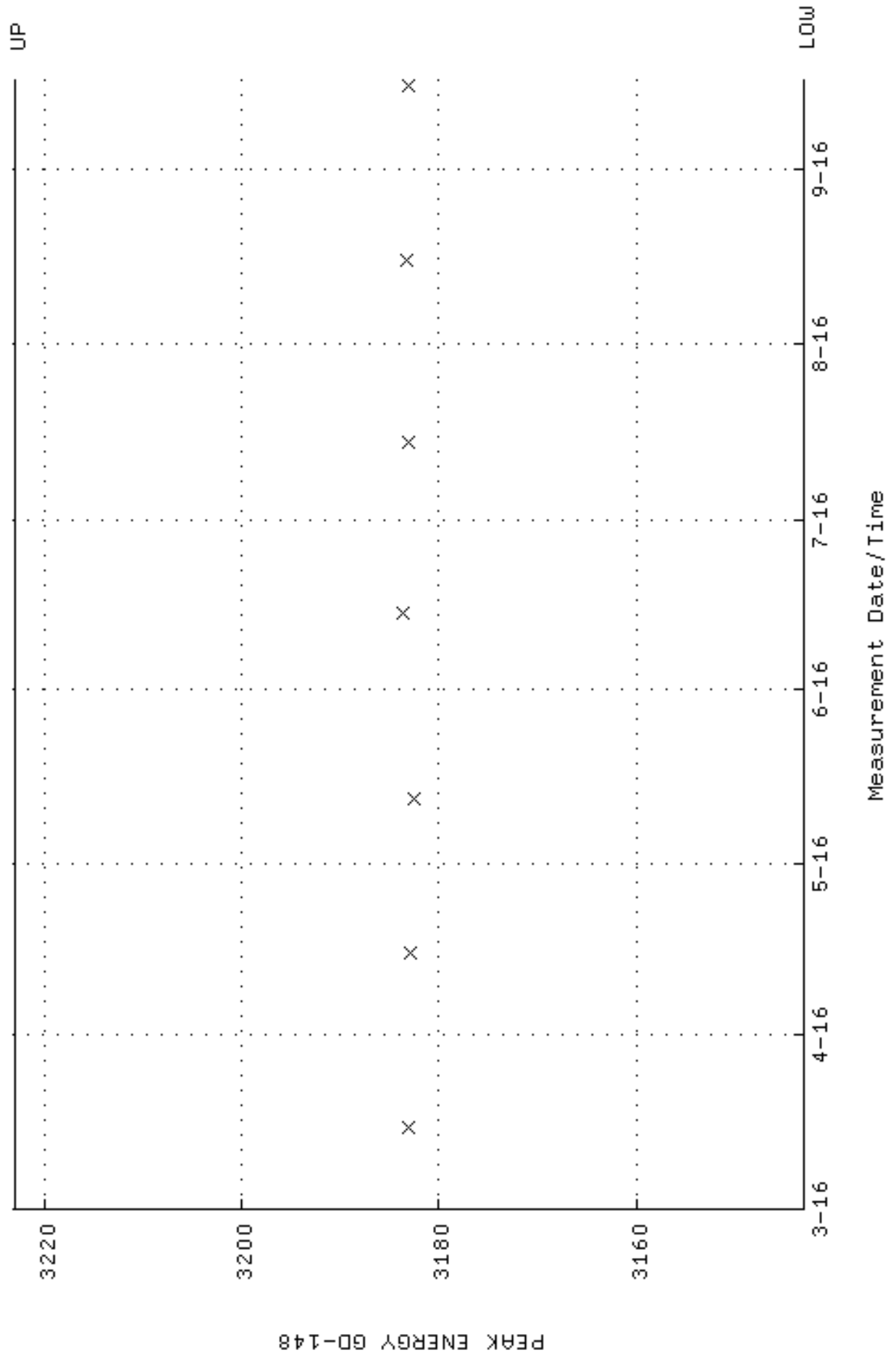
QA filename : DKA100:[ENV_ALPHA.QA.W]W189.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 15-MAR-2016 08:38:28 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



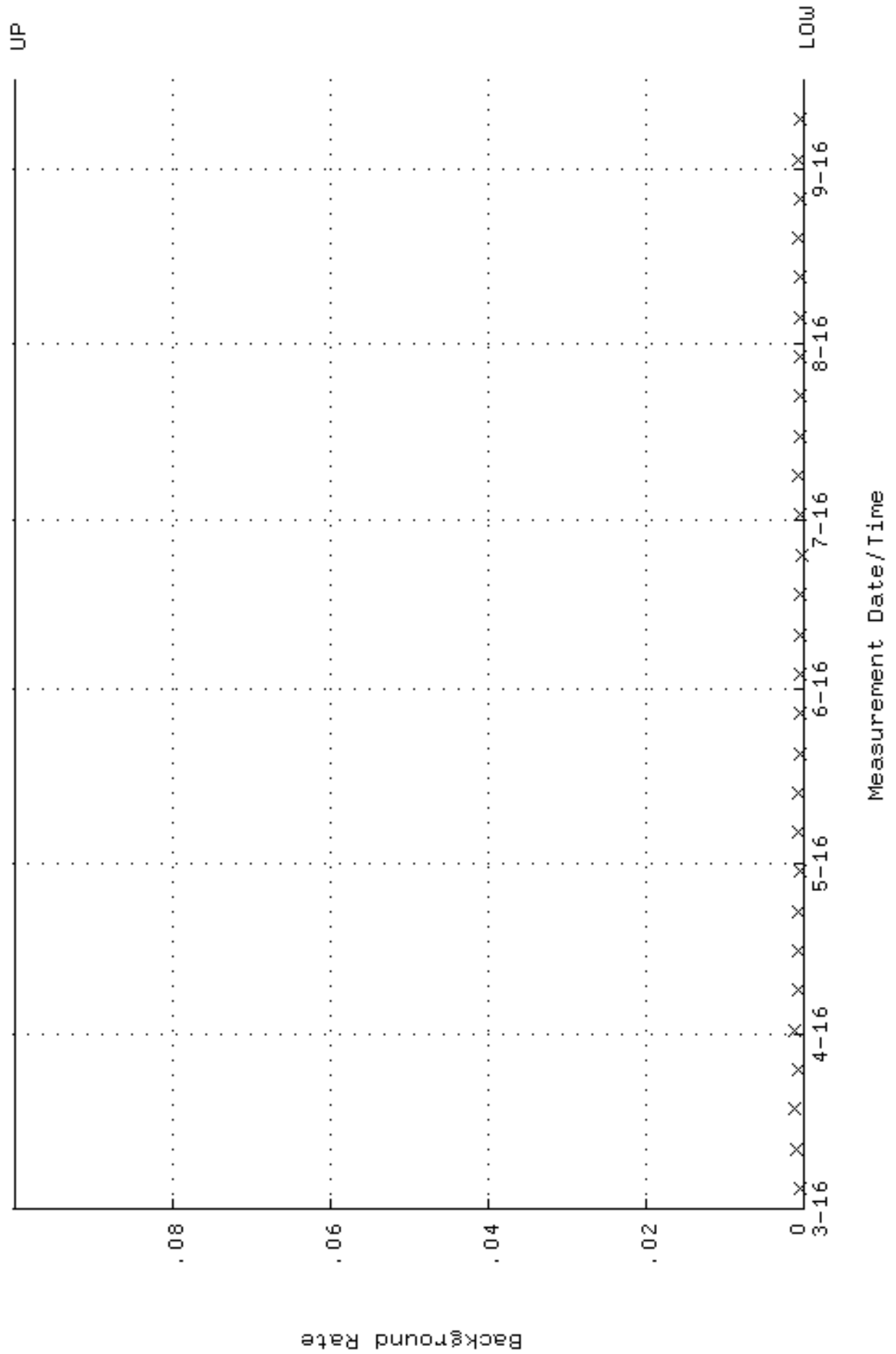
QA filename : DKA100:[ENV_ALPHA.QA.W]W189.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 15-MAR-2016 08:38:28 through 16-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



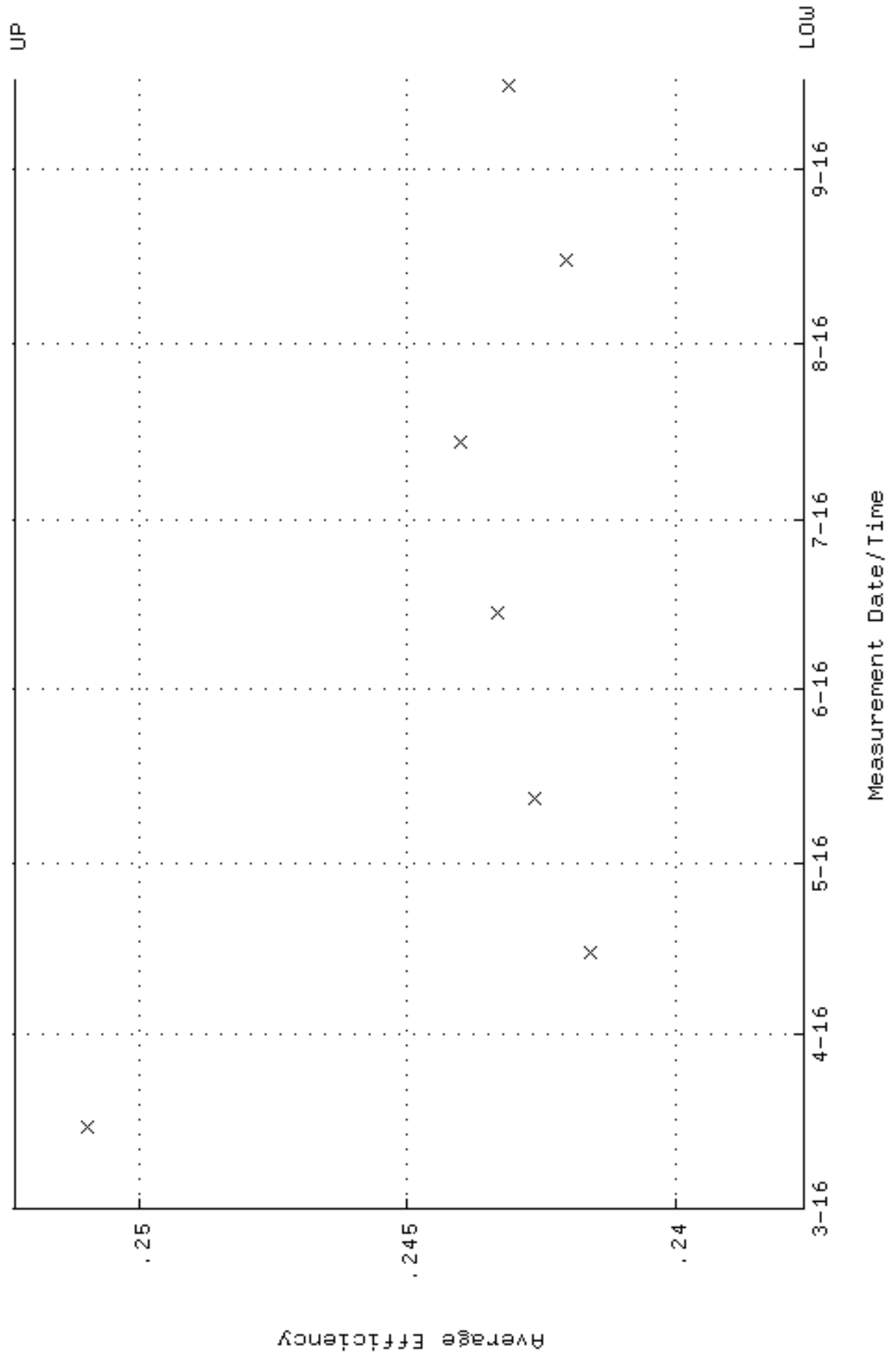
QA filename : DKA100:[ENV_ALPHA.QA.W]W189.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 15-MAR-2016 08:38:28 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



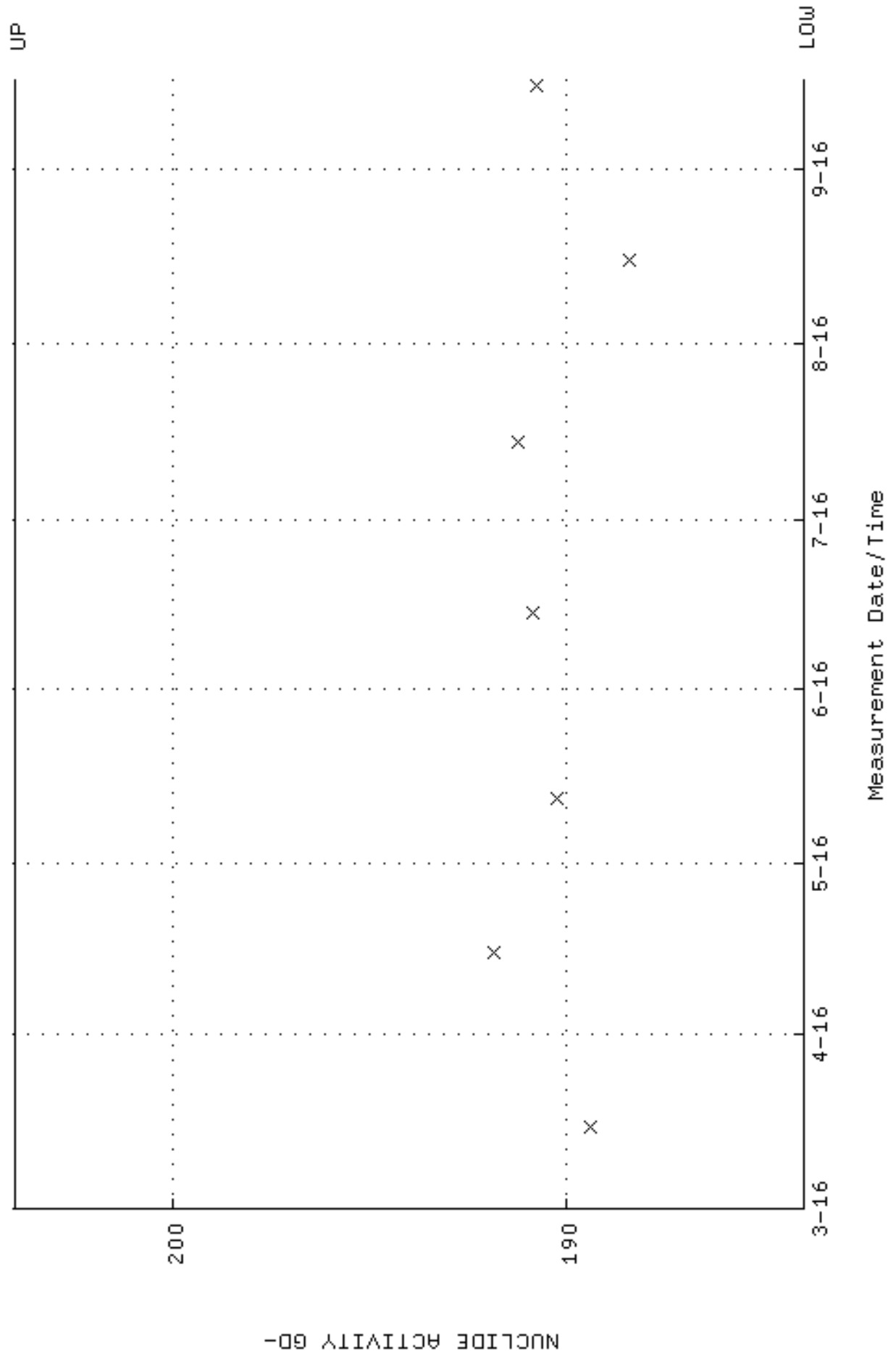
QA filename : DKA100:[ENV_ALPHA.QA.B]B189.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:16:43 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



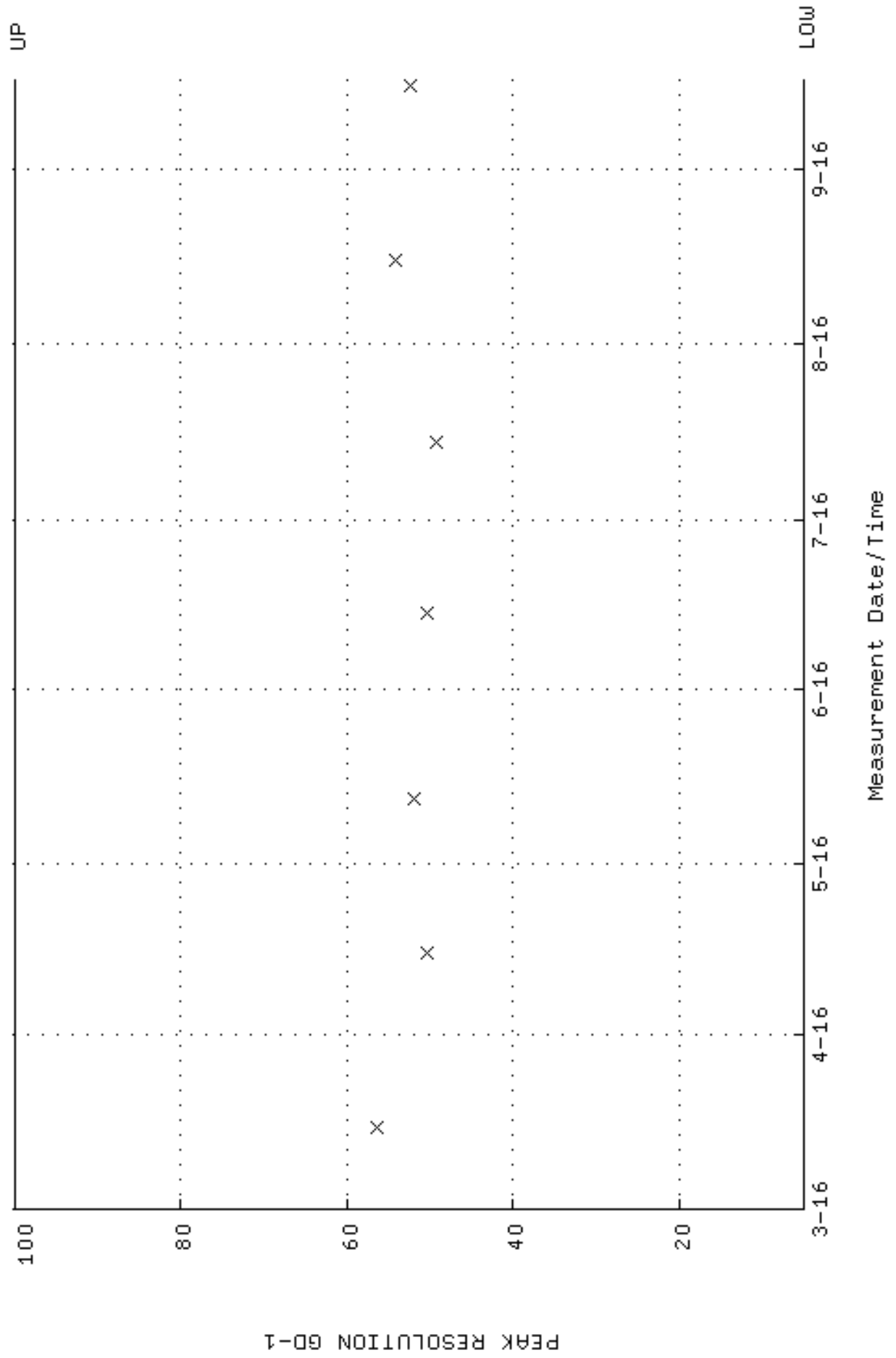
QA filename : DKA100:[ENV_ALPHA.QA.W]W191.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 15-MAR-2016 10:10:22 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.237611 through 0.252309



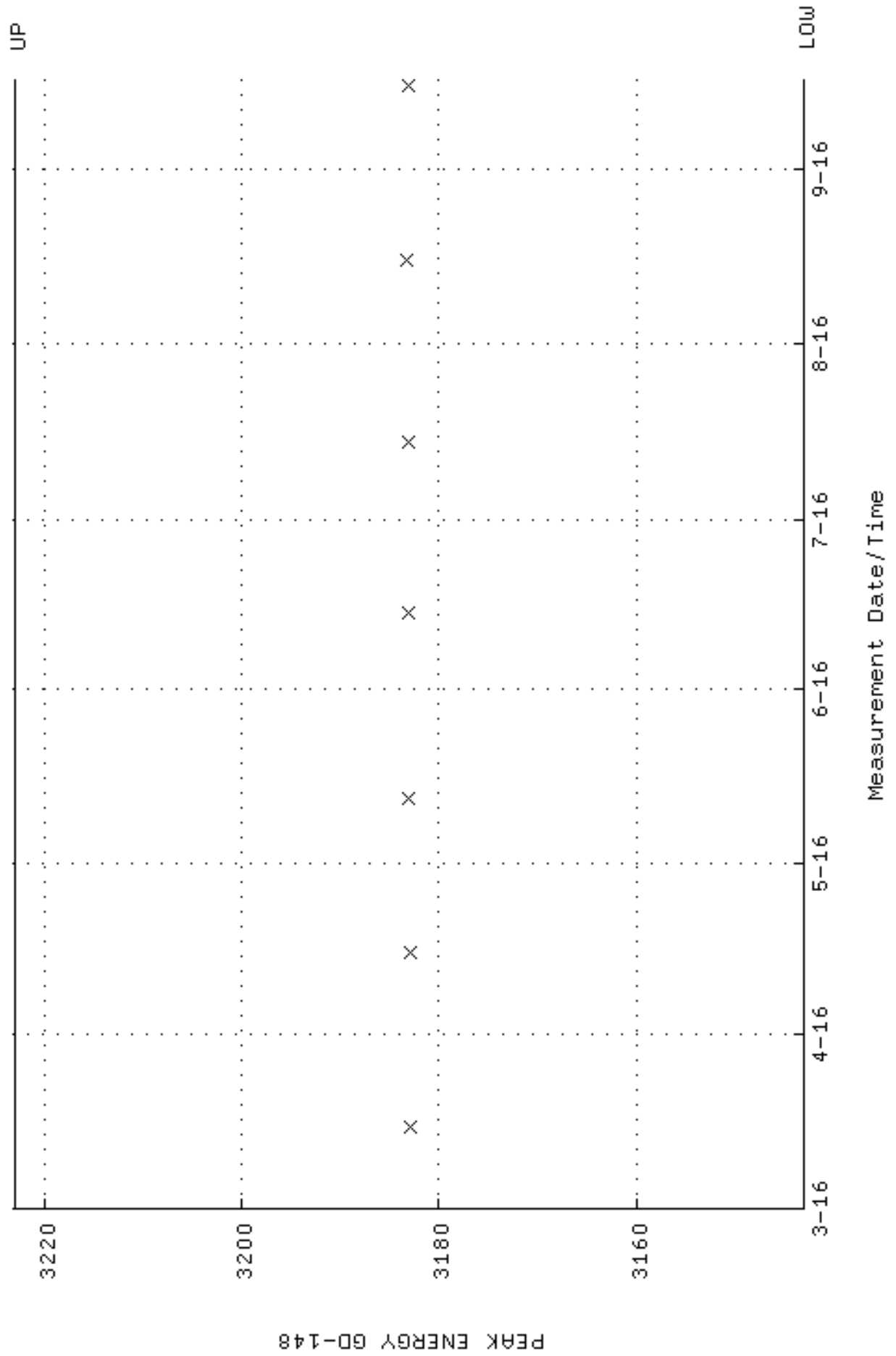
QA filename : DKA100:[ENV_ALPHA.QA.W]w191.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 15-MAR-2016 10:10:22 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



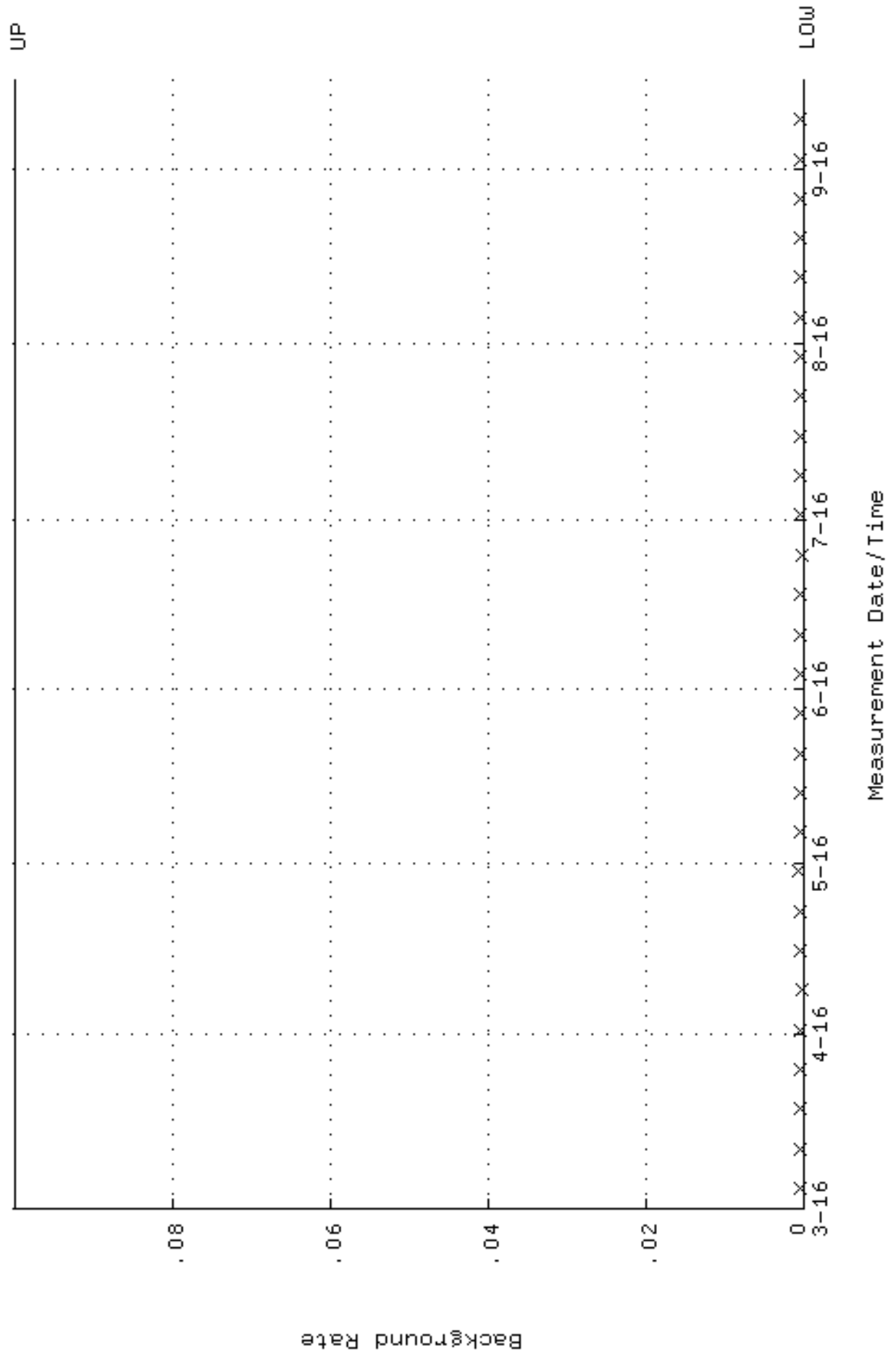
QA filename : DKA100:[ENV_ALPHA.QA.W]W191.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 15-MAR-2016 10:10:22 through 16-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



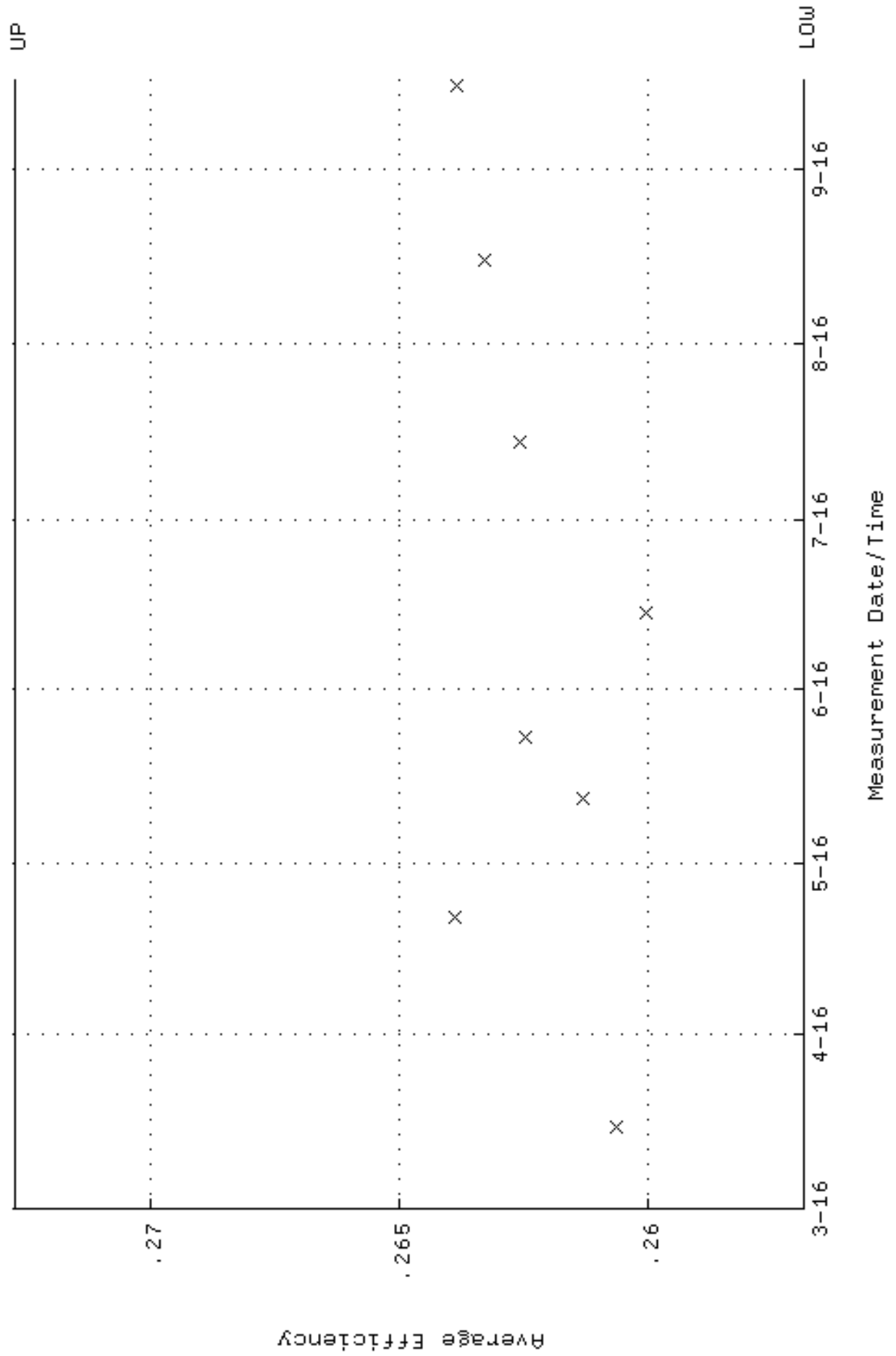
QA filename : DKA100:[ENV_ALPHA.QA.W]W191.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 15-MAR-2016 10:10:22 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



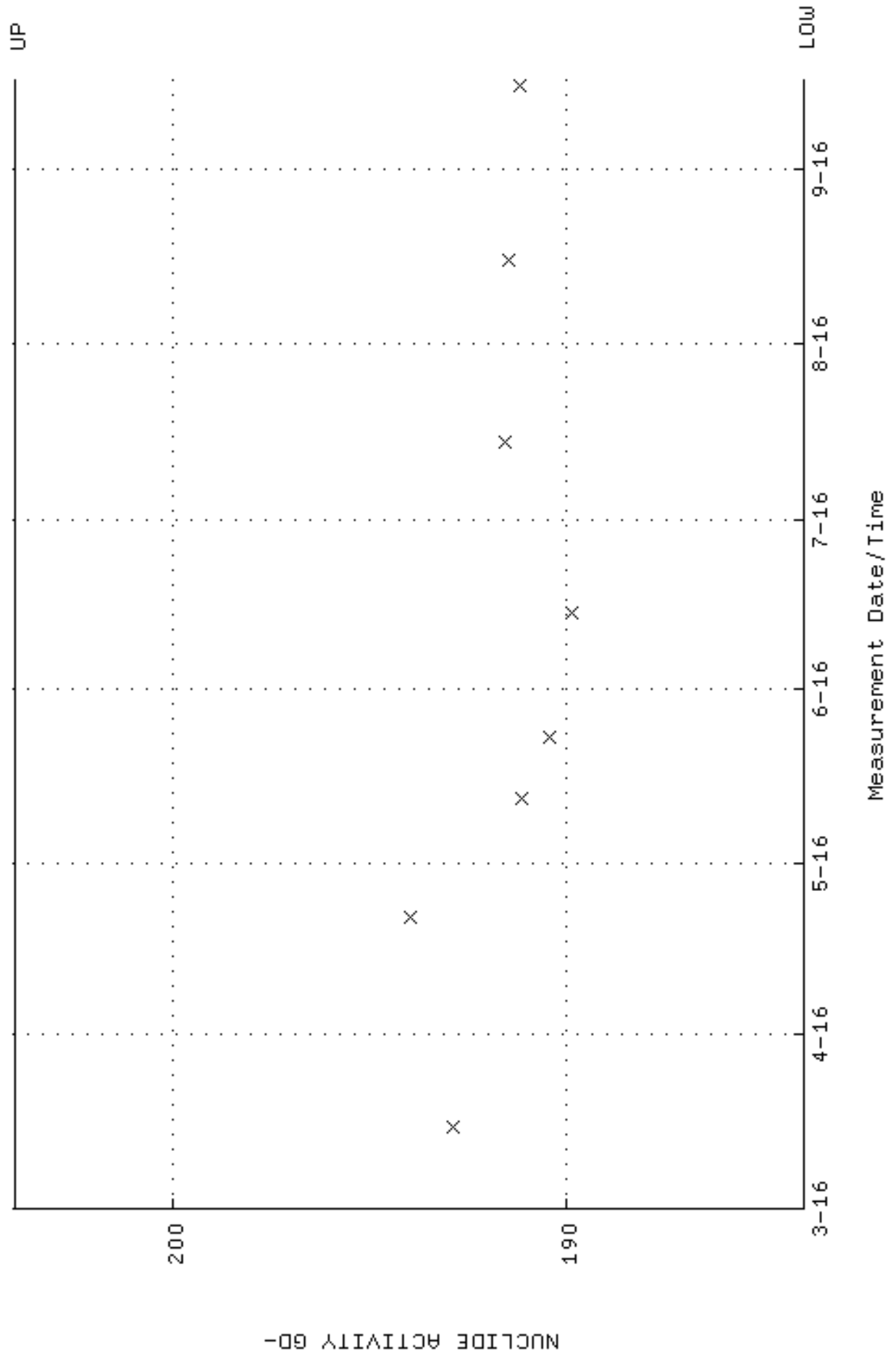
QA filename : DKA100:[ENV_ALPHA.QA.B]B191.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:16:52 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



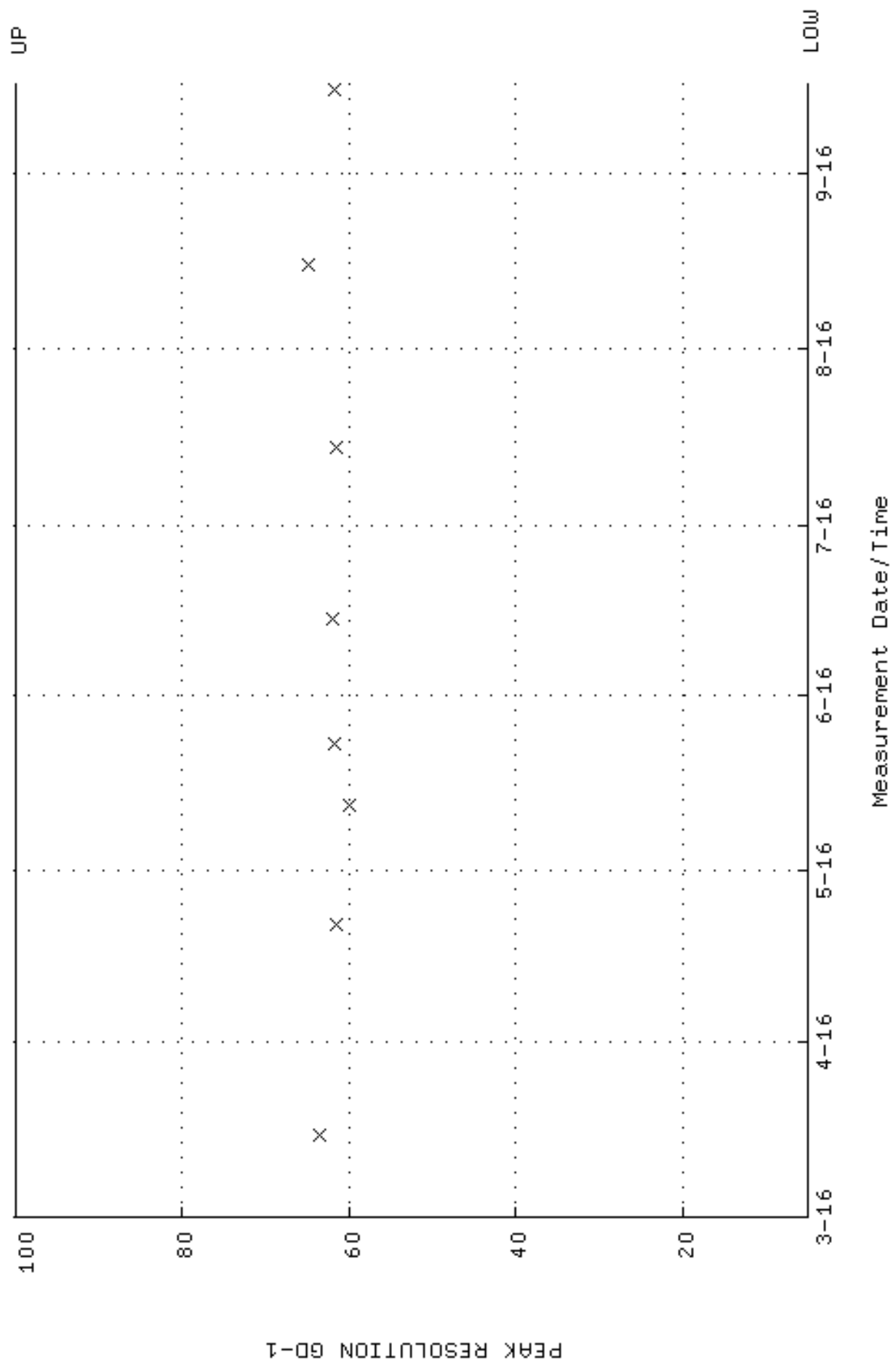
QA filename : DKA100:[ENV_ALPHA.QA.W]W195.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 15-MAR-2016 08:38:54 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.256857 through 0.272745



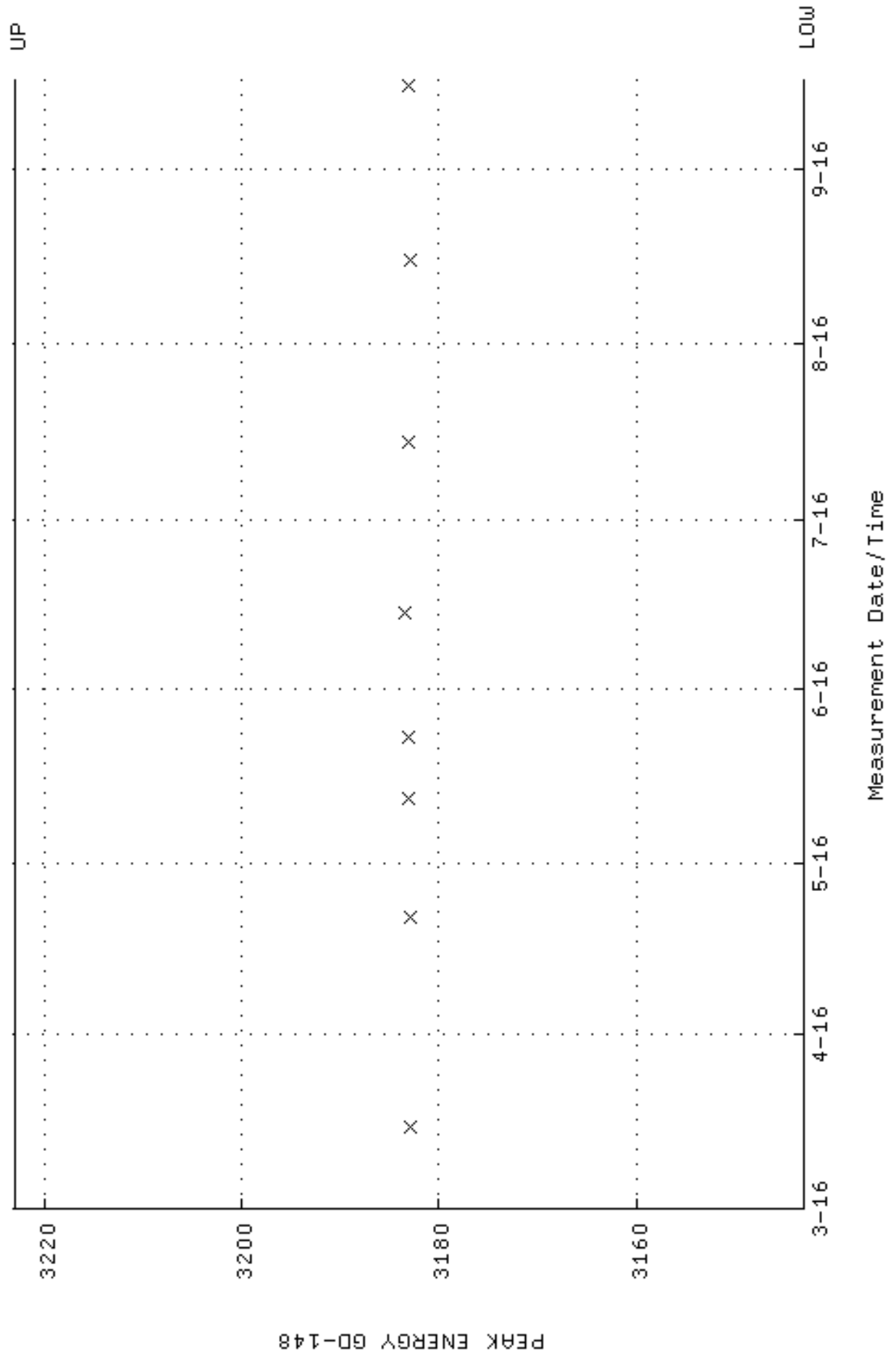
QA filename : DKA100:[ENV_ALPHA.QA.W]W195.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 15-MAR-2016 08:38:54 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



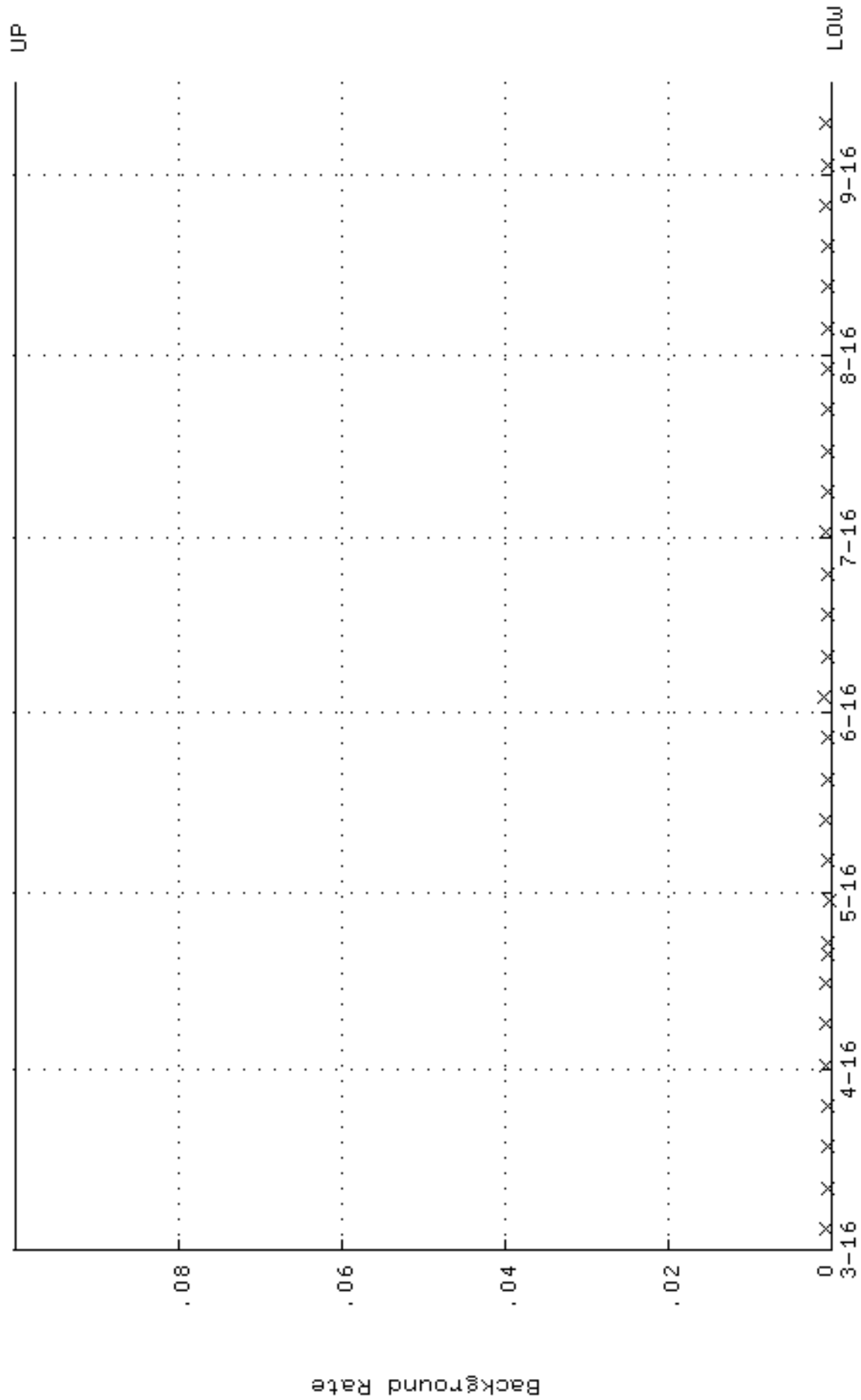
QA filename : DKA100:[ENV_ALPHA.QA.W]W195.QAF;4
 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 15-MAR-2016 08:38:54 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



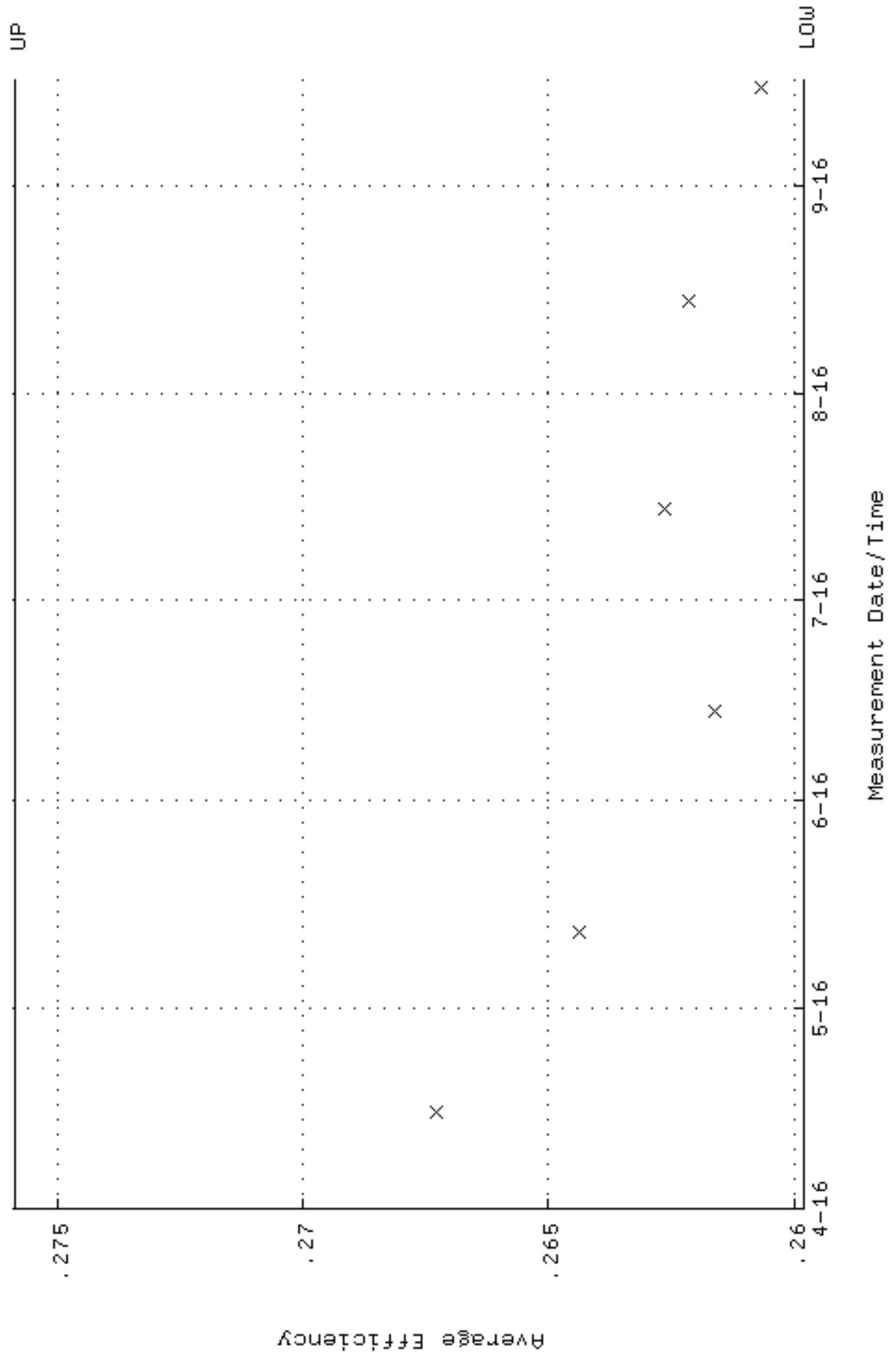
QA filename : DKA100:[ENV_ALPHA.QA.W]W195.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 15-MAR-2016 08:38:54 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



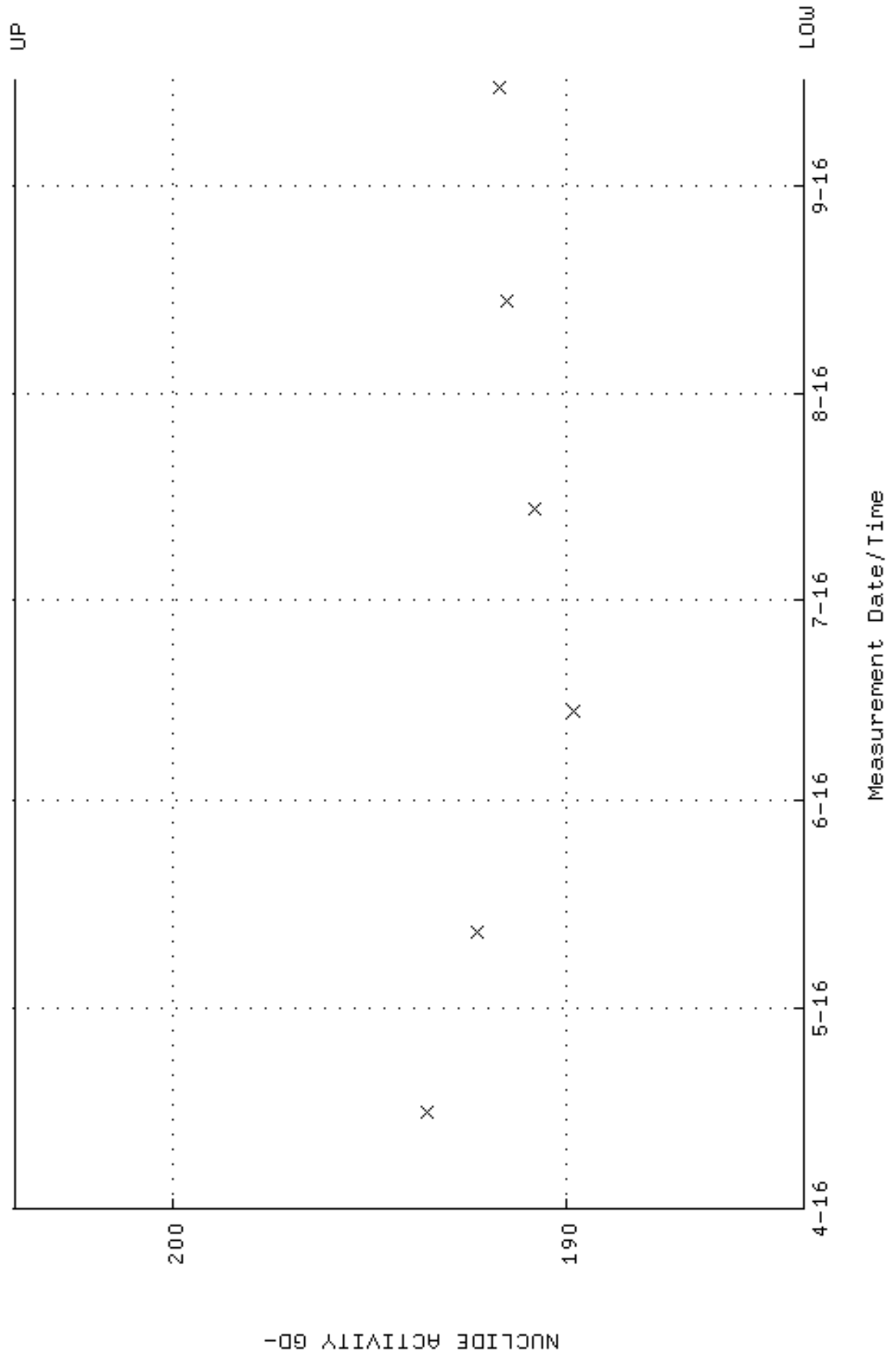
QA filename : DKA100:[ENV_ALPHA.QA.B]B195.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:17:10 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



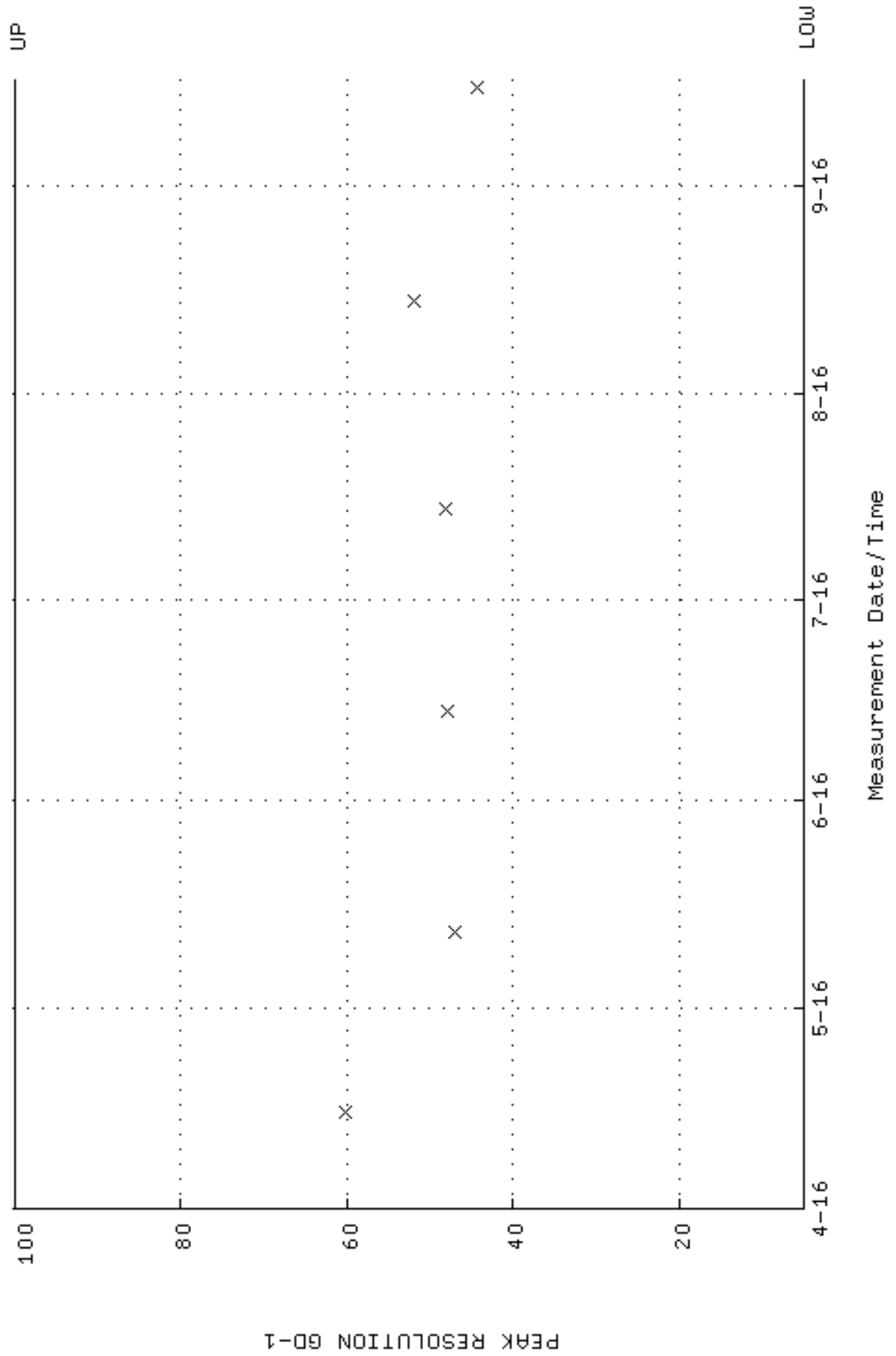
QA filename : DKA100:[ENV_ALPHA.QA.W]W197.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 15-APR-2016 10:36:28 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.259795 through 0.275865



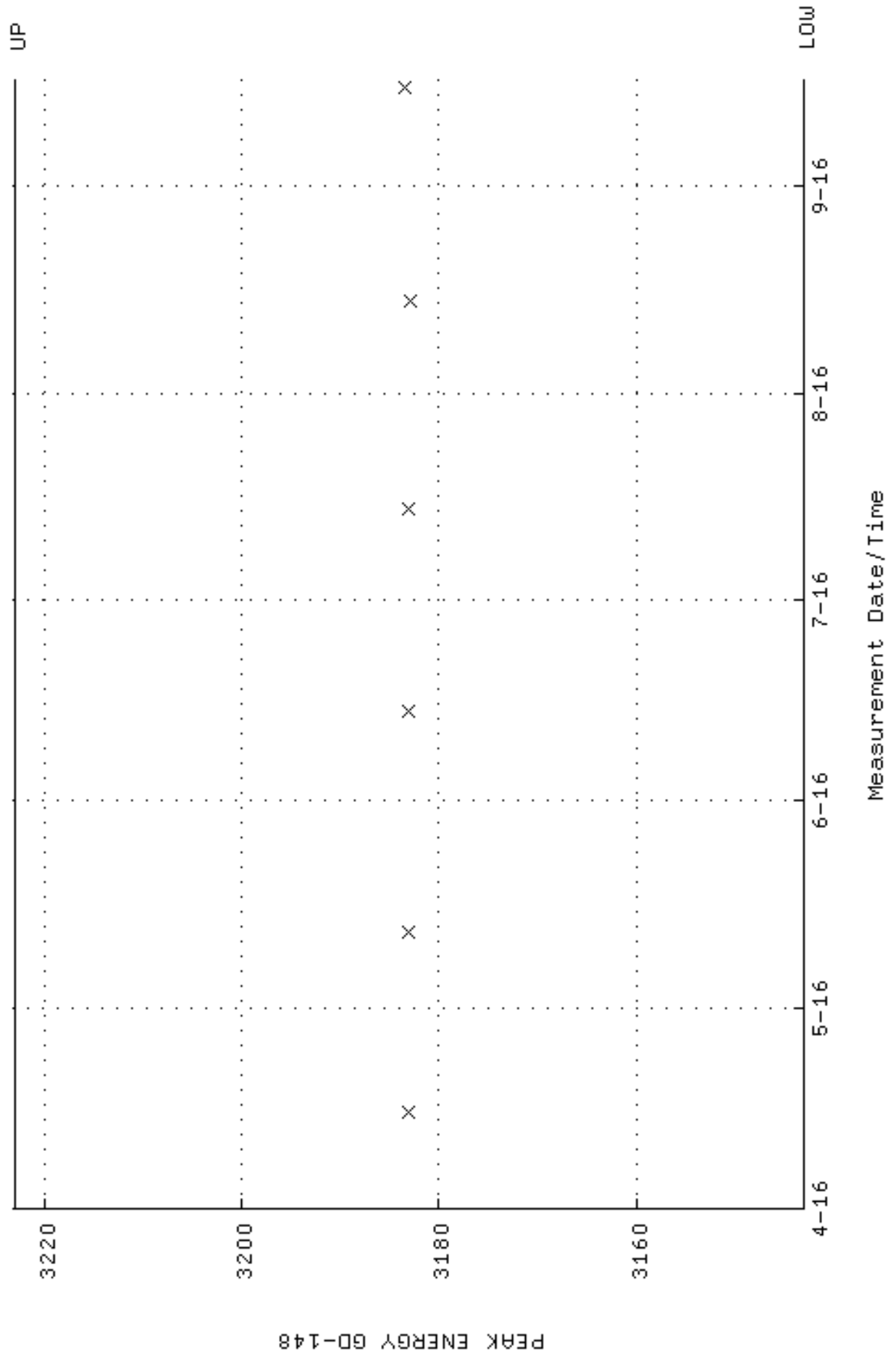
QA filename : DKA100:[ENV_ALPHA.QA.W]W197.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 15-APR-2016 10:36:28 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



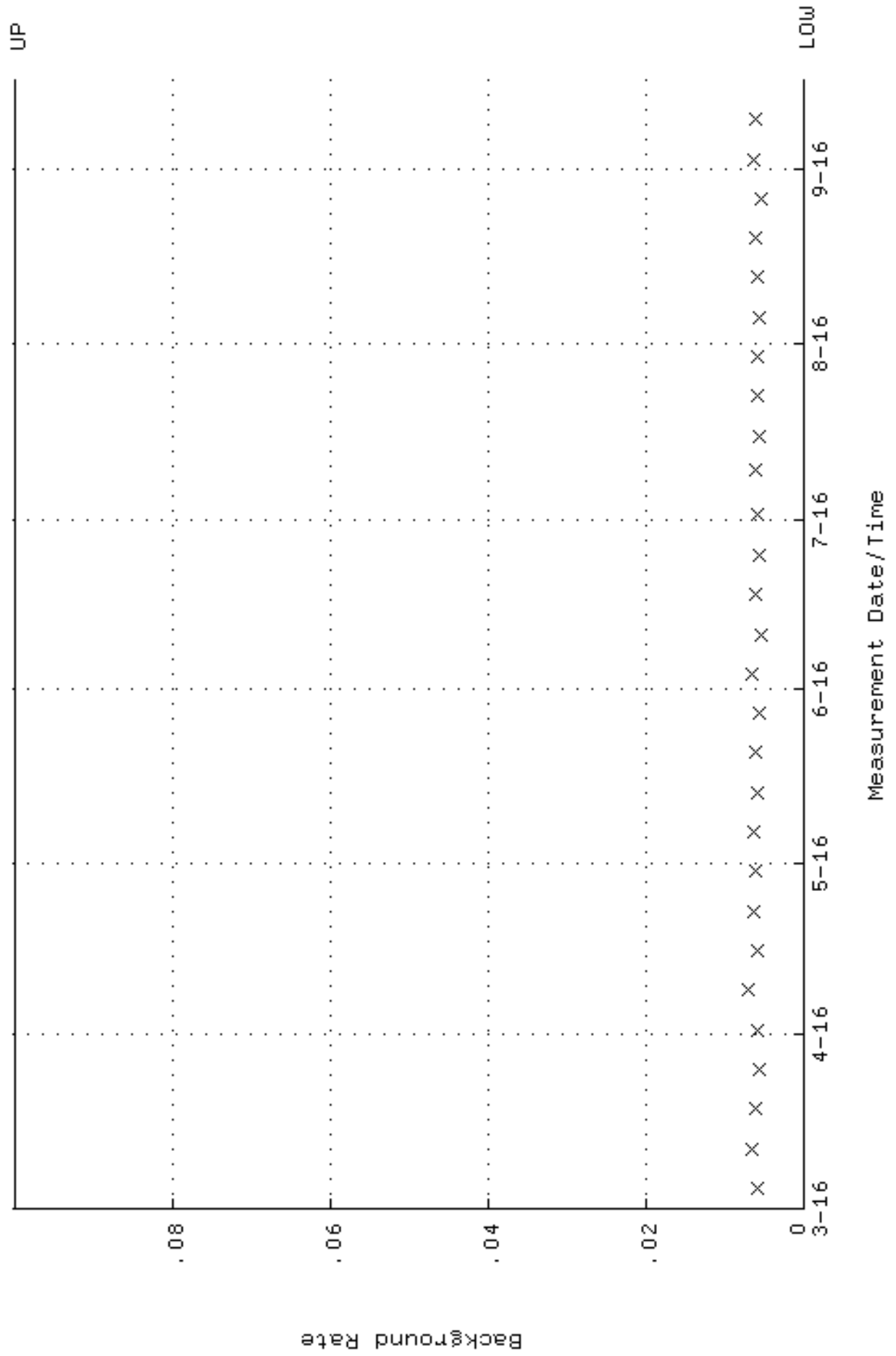
QA filename : DKA100:[ENV_ALPHA.QA.W]W197.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 15-APR-2016 10:36:28 through 16-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



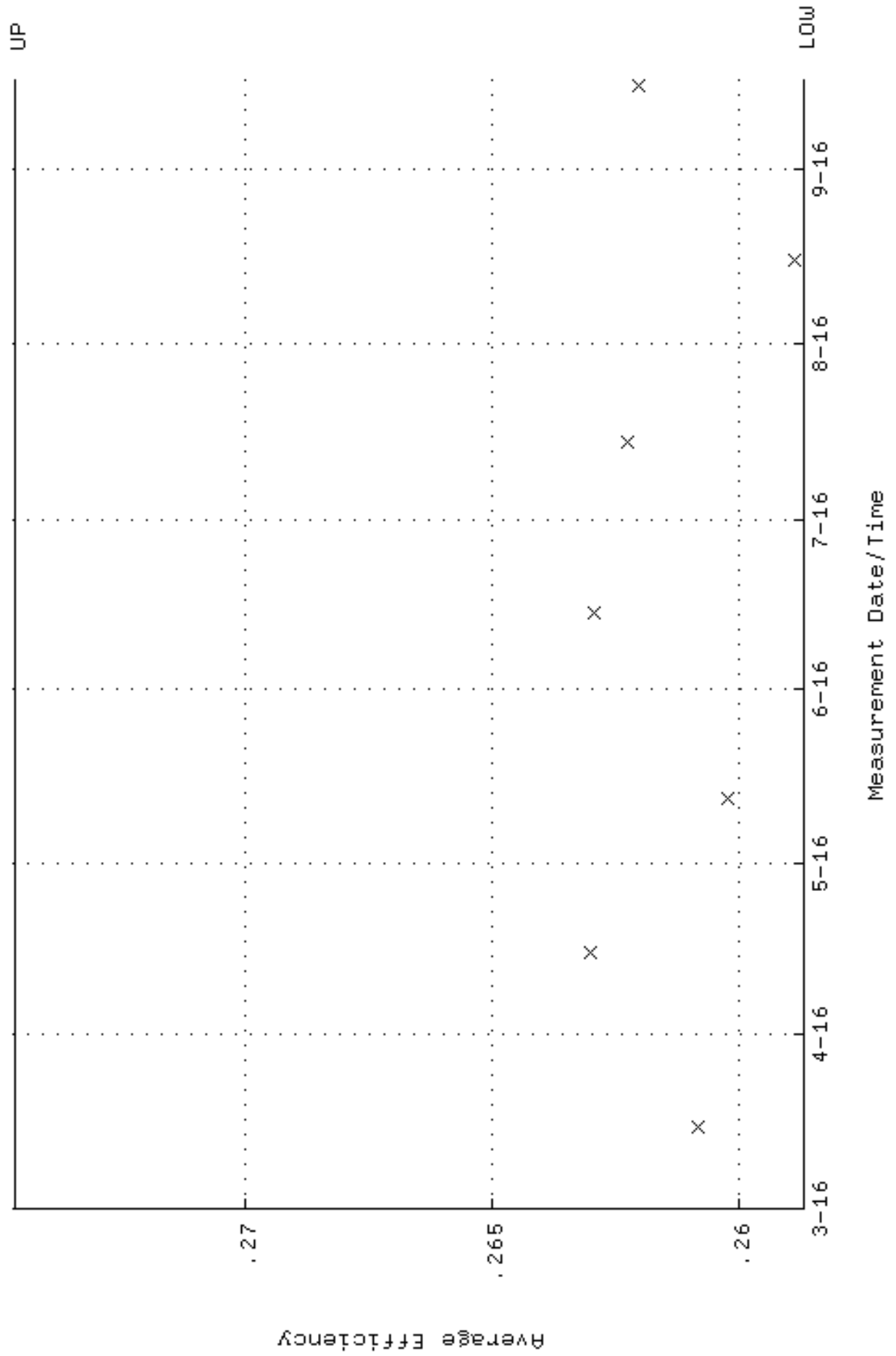
QA filename : DKA100:[ENV_ALPHA.QA.W]W197.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 15-APR-2016 10:36:28 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



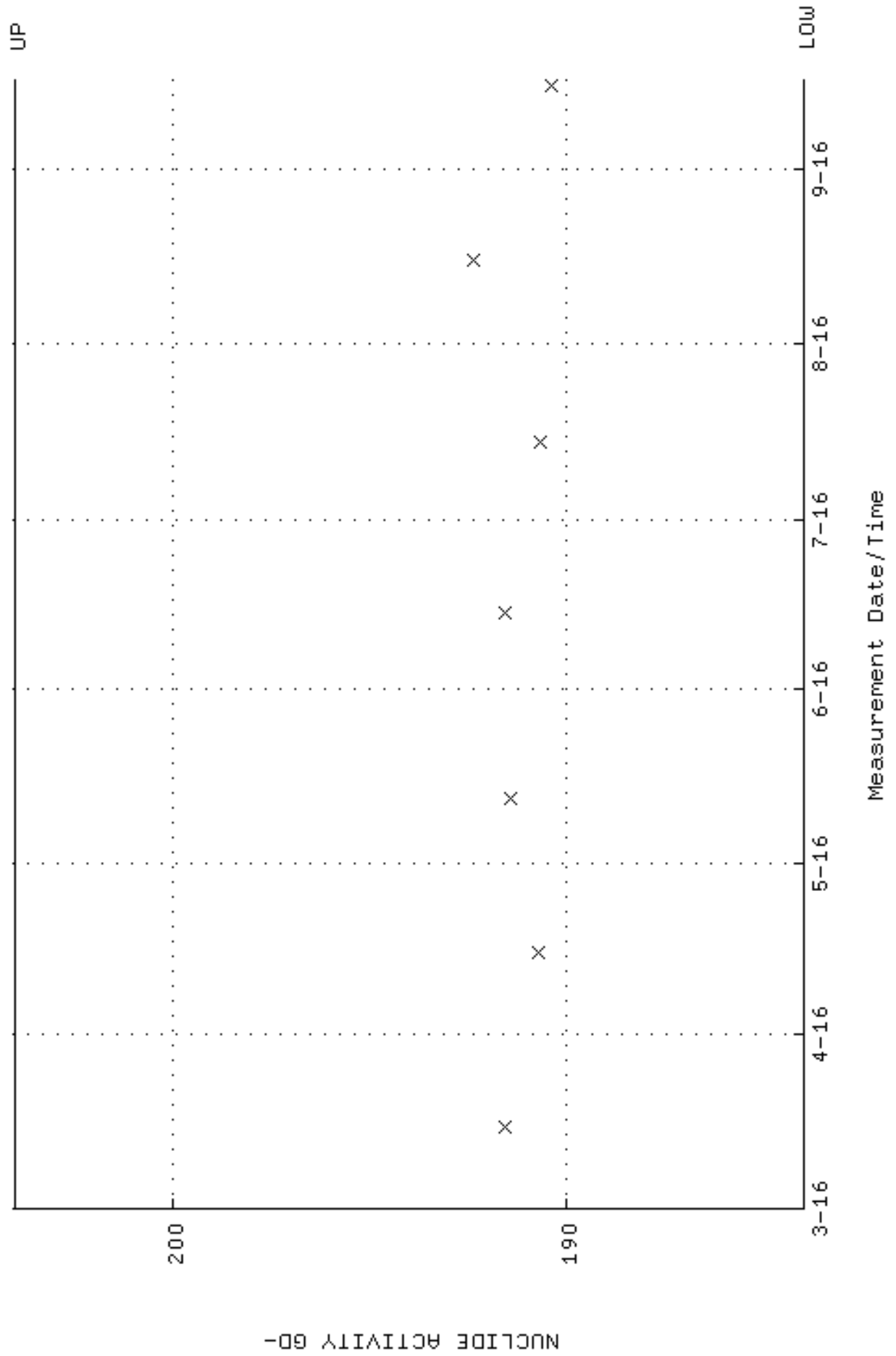
QA filename : DKA100:[ENV_ALPHA.QA.B]B197.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:17:18 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



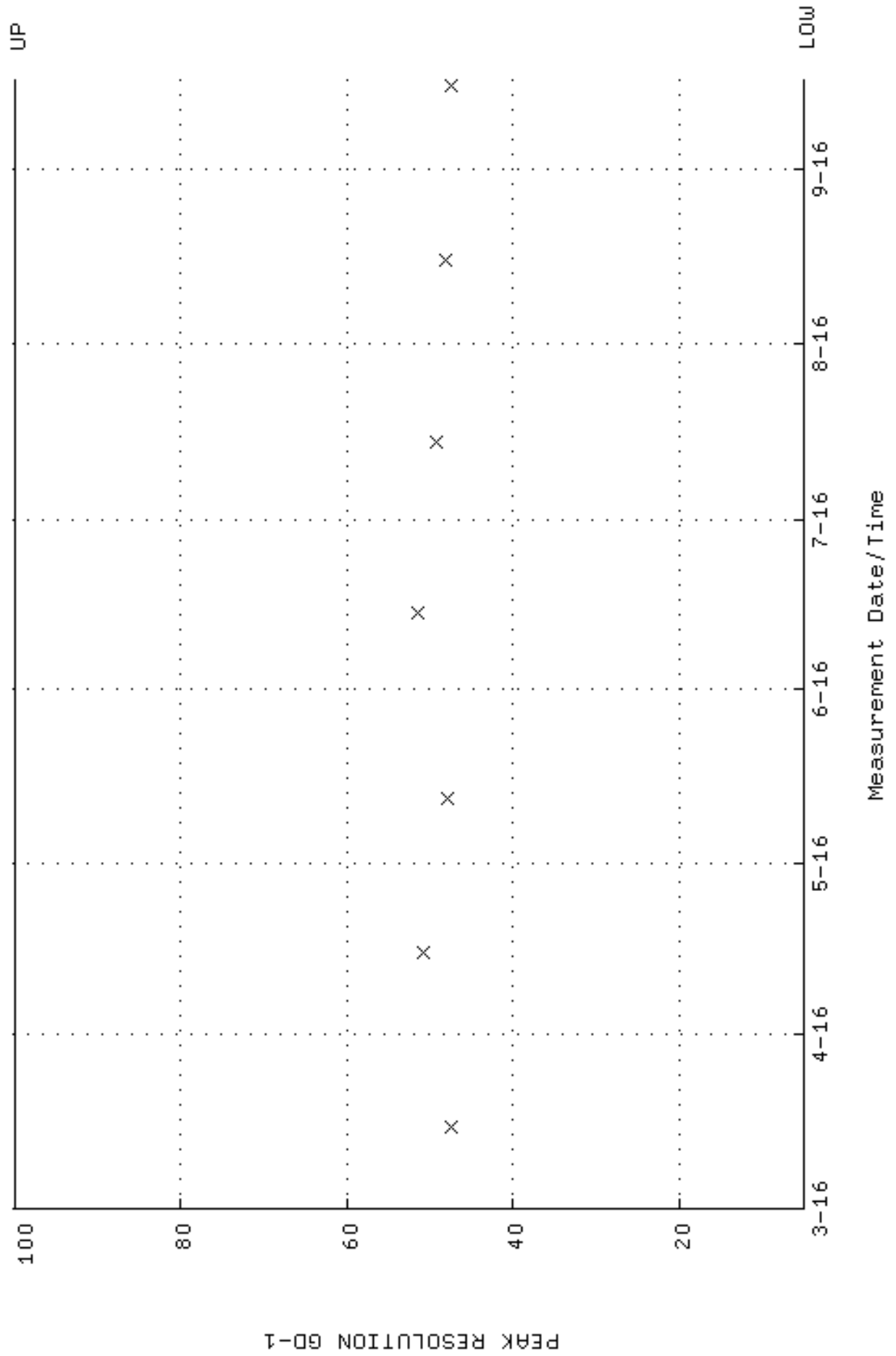
QA filename : DKA100:[ENV_ALPHA.QA.W]W199.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 15-MAR-2016 08:39:06 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.258679 through 0.274679



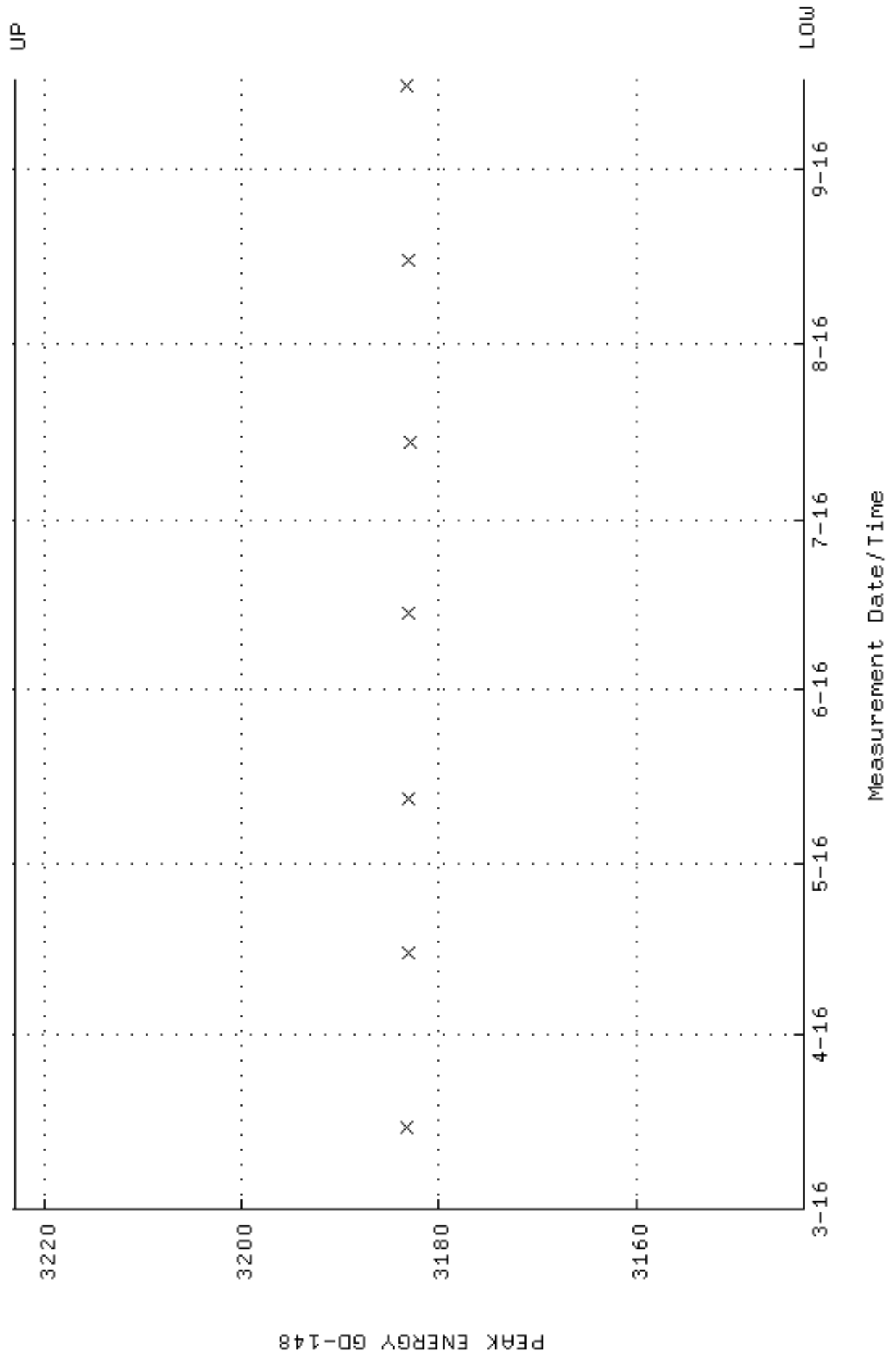
QA filename : DKA100:[ENV_ALPHA.QA.W]w199.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 15-MAR-2016 08:39:06 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



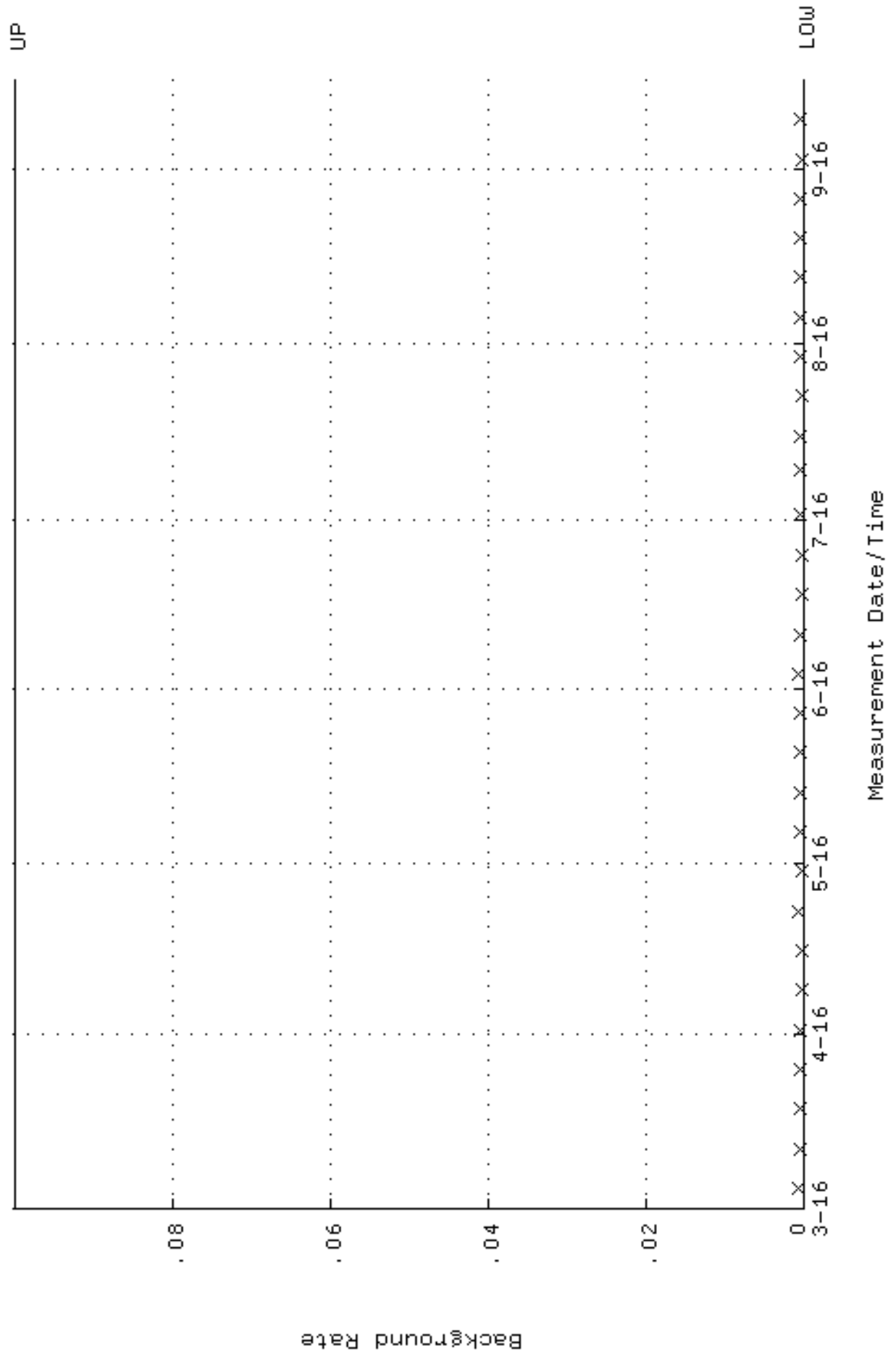
QA filename : DKA100:[ENV_ALPHA.QA.W]W199.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 15-MAR-2016 08:39:06 through 16-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



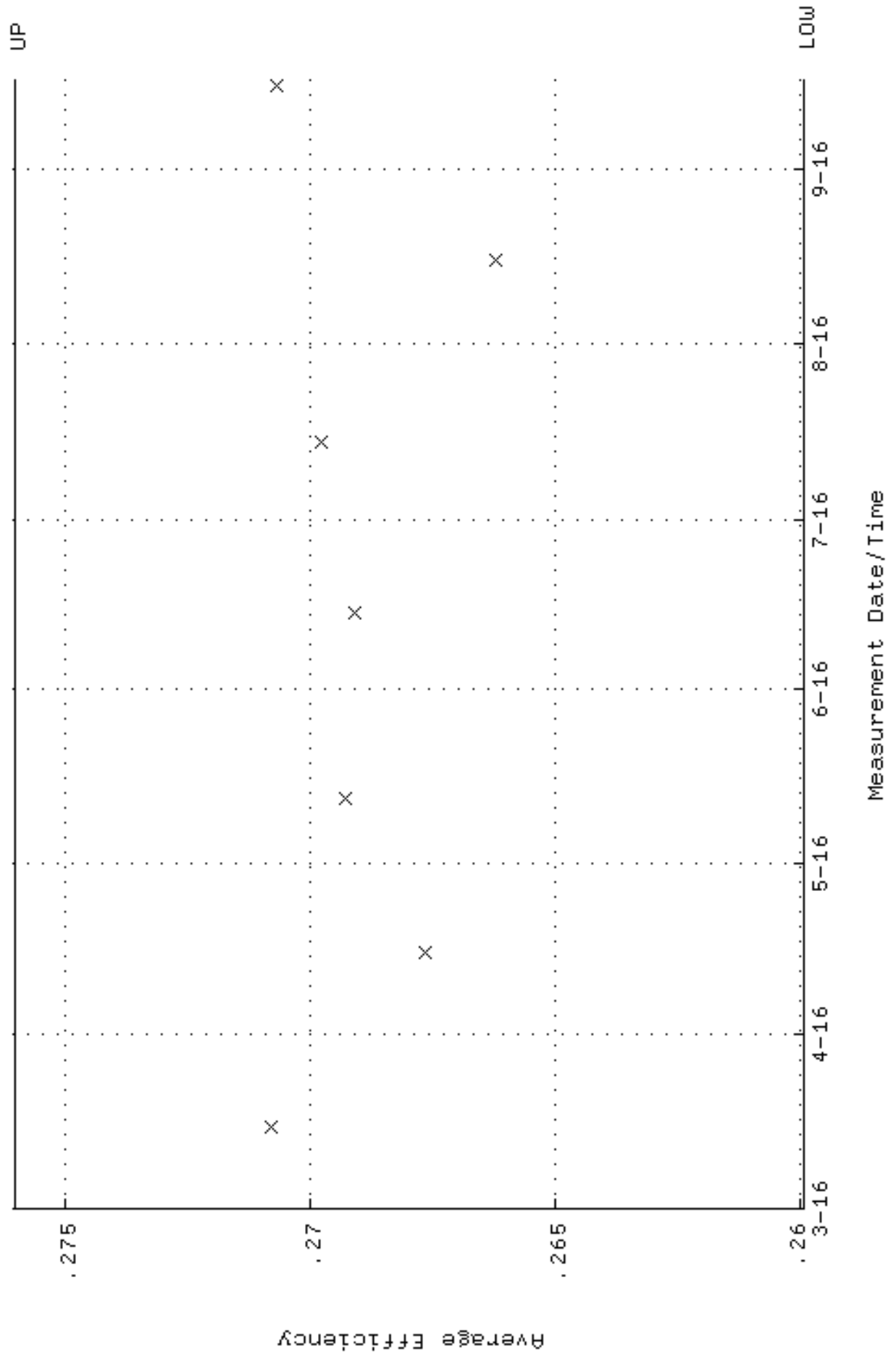
QA filename : DKA100:[ENV_ALPHA.QA.W]W199.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 15-MAR-2016 08:39:06 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



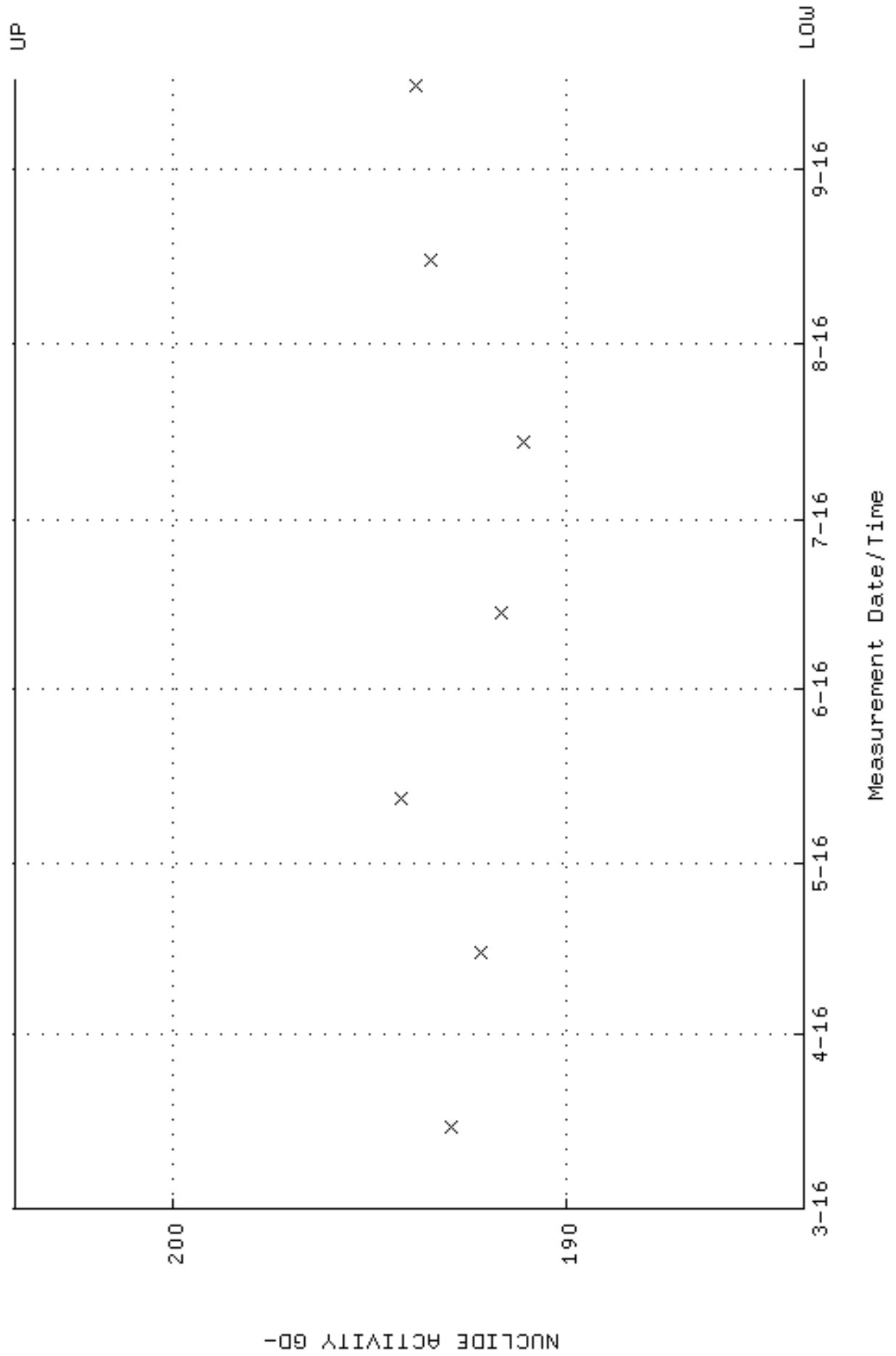
QA filename : DKA100:[ENV_ALPHA.QA.B]B199.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:17:22 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



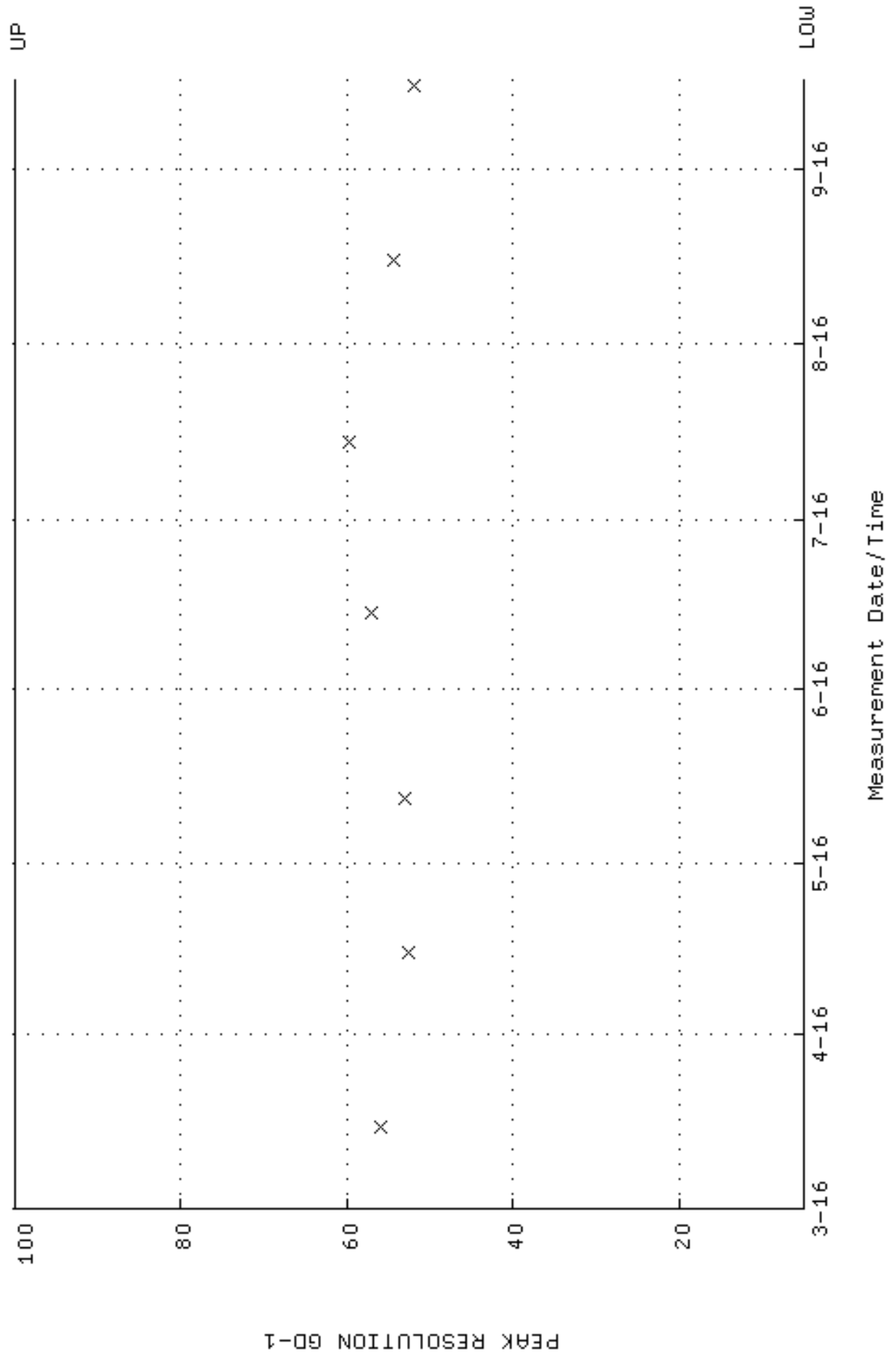
QA filename : DKA100:[ENV_ALPHA.QA.W]W200.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 15-MAR-2016 08:39:09 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.259942 through 0.276020



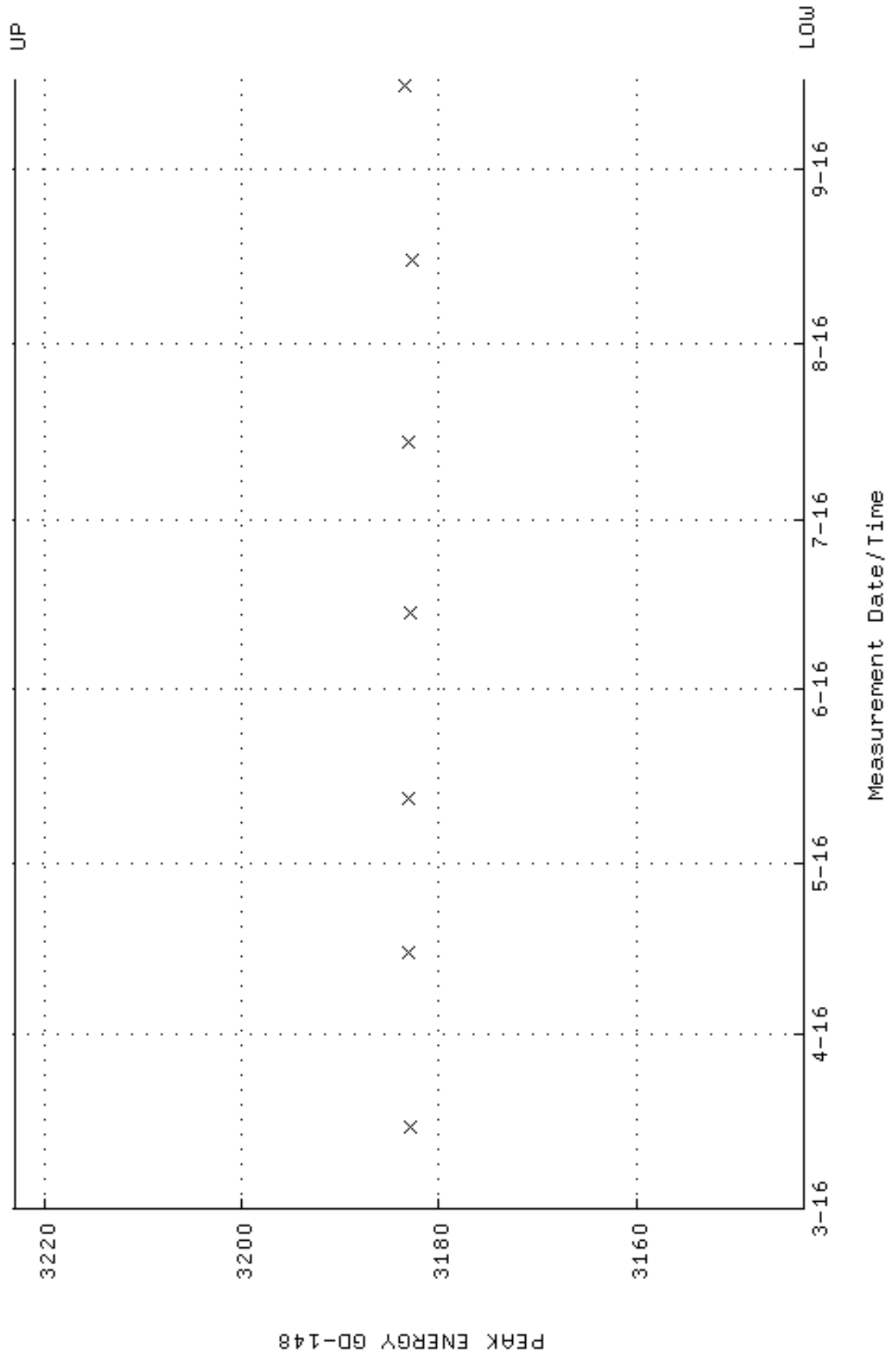
QA filename : DKA100:[ENV_ALPHA.QA.W]w200.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 15-MAR-2016 08:39:09 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



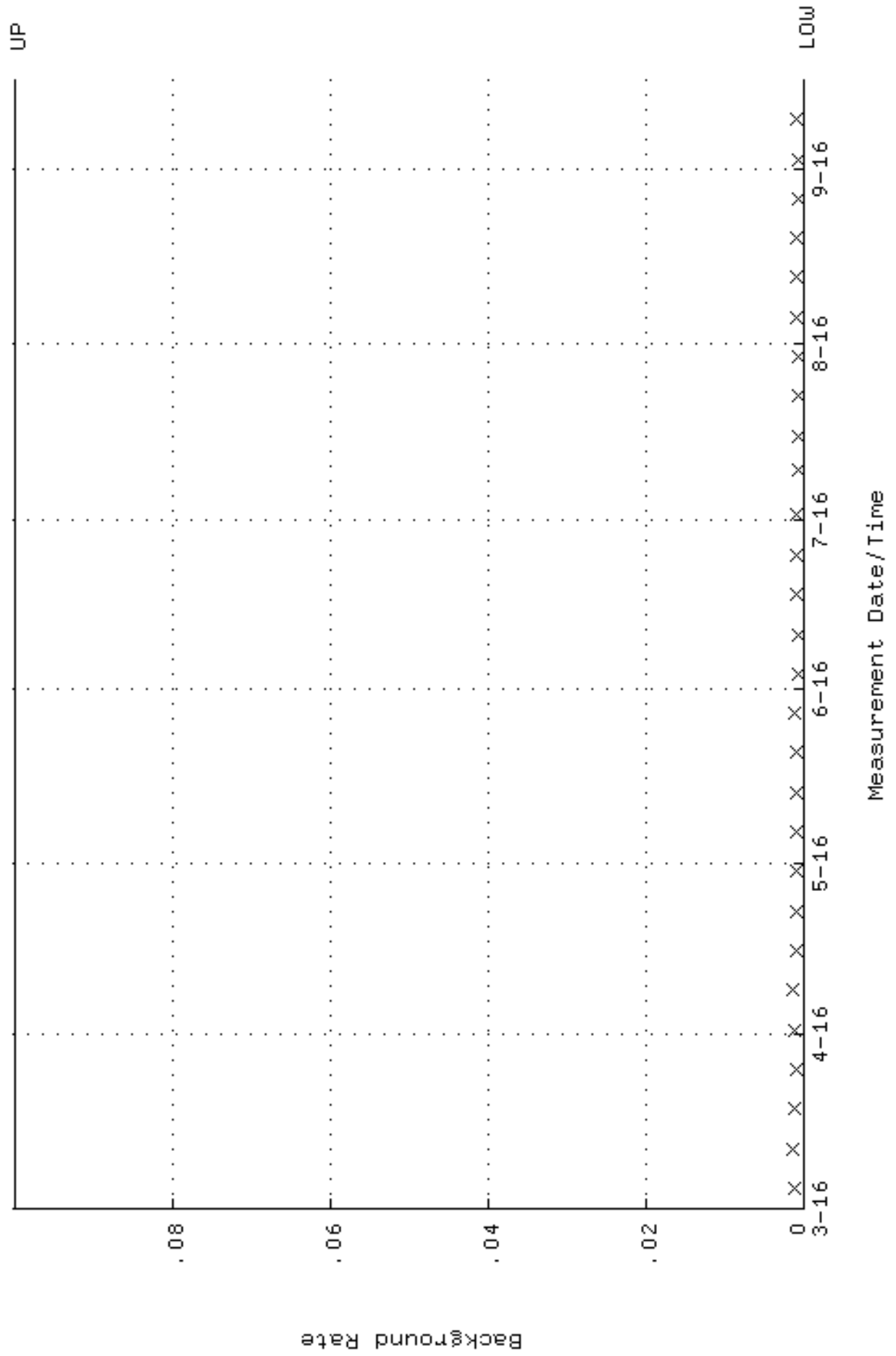
QA filename : DKA100:[ENV_ALPHA.QA.W]W200.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 15-MAR-2016 08:39:09 through 16-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



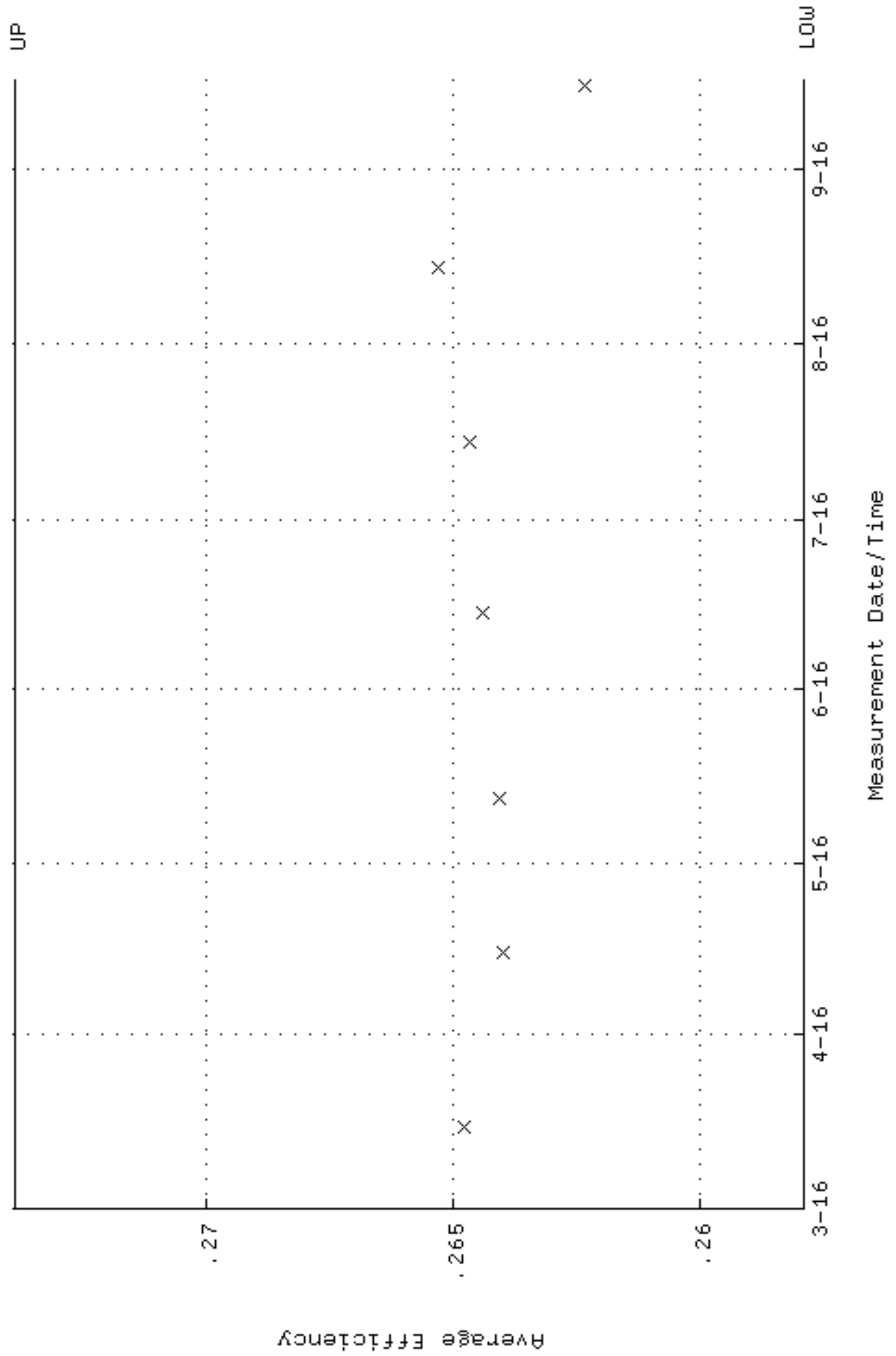
QA filename : DKA100:[ENV_ALPHA.QA.W]W200.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 15-MAR-2016 08:39:09 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



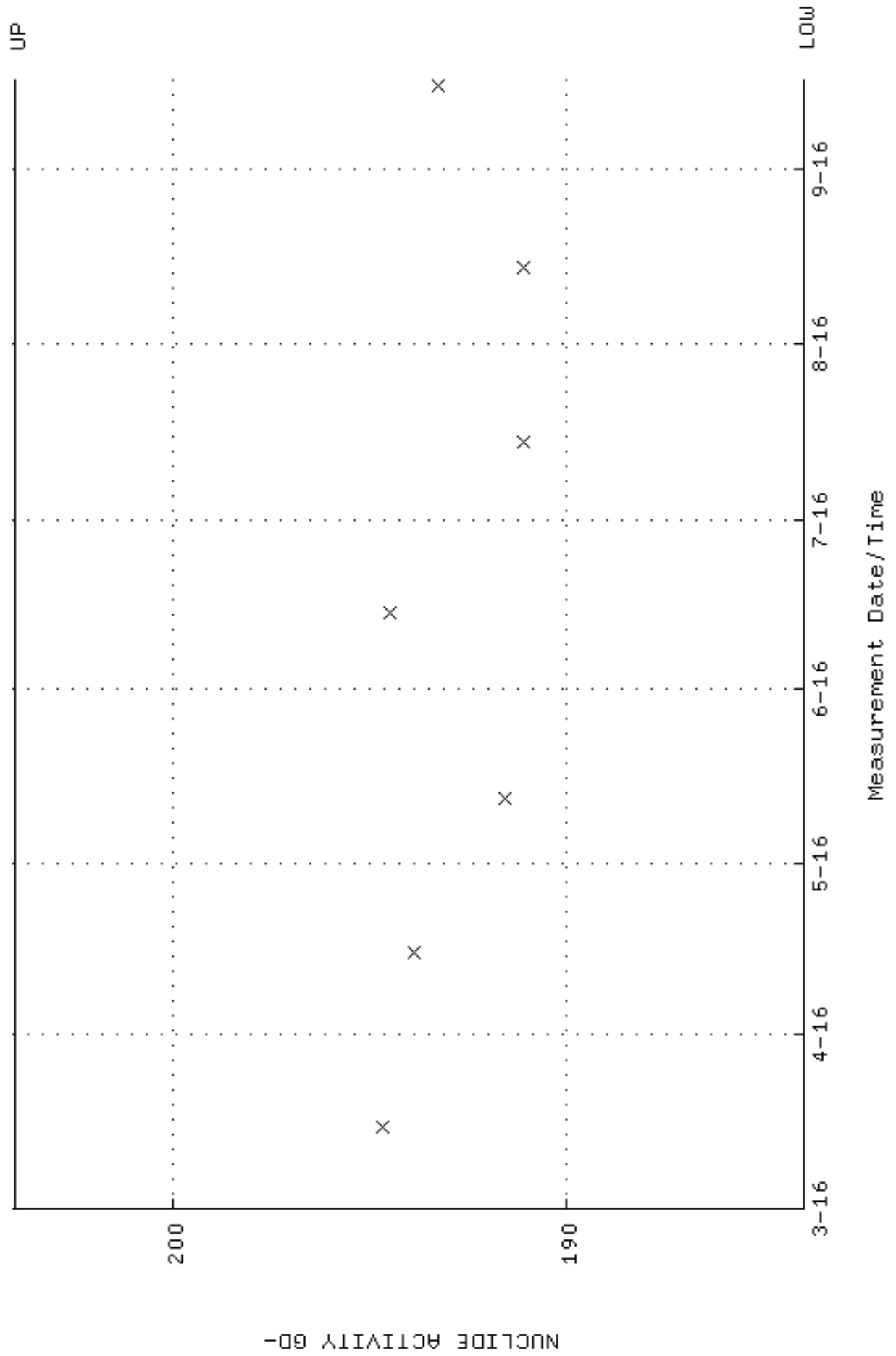
QA filename : DKA100:[ENV_ALPHA.QA.B]B200.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:17:26 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



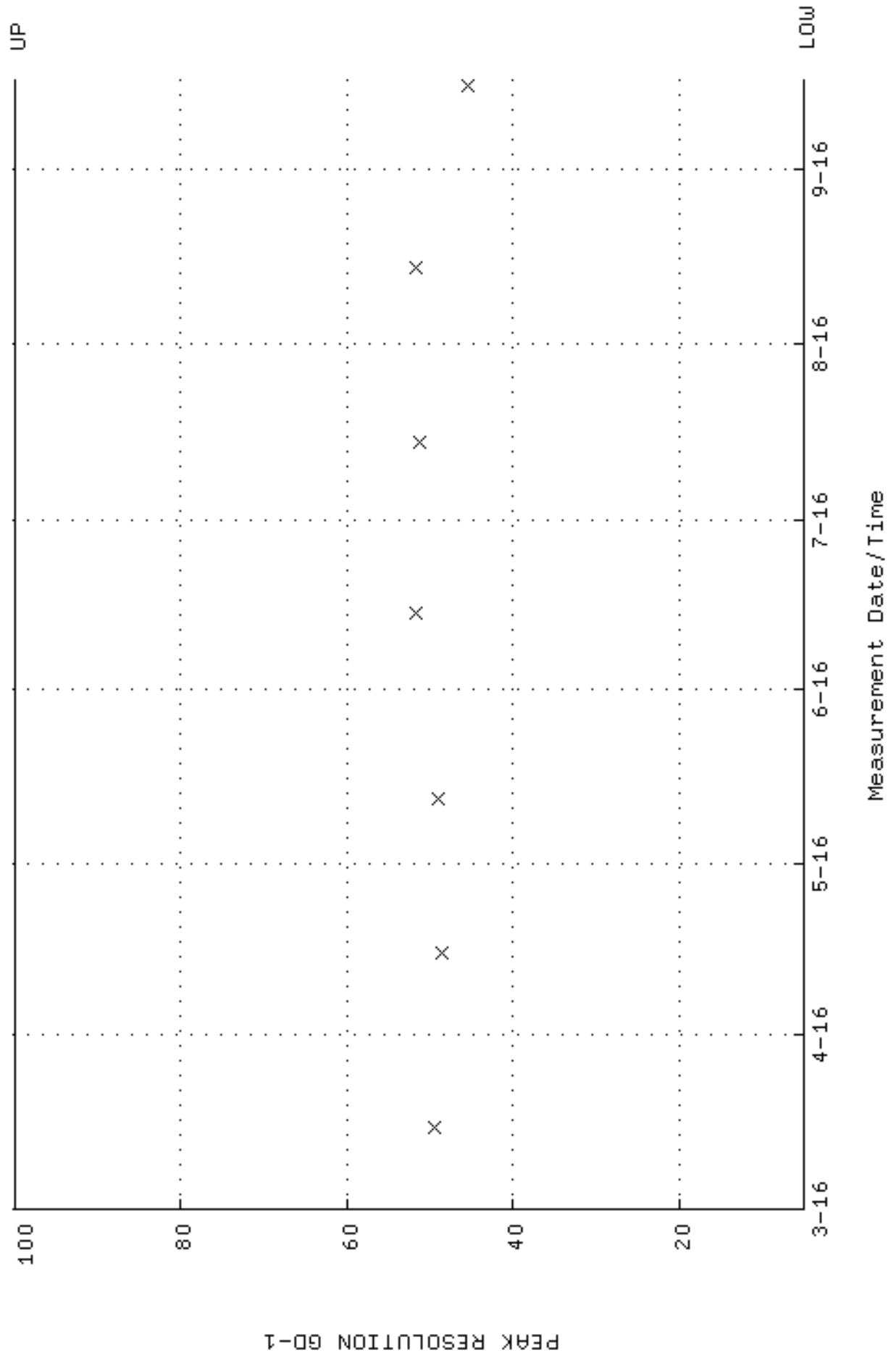
QA filename : DKA100:[ENV_ALPHA.QA.W]w201.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 15-MAR-2016 10:07:54 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.257911 through 0.273865



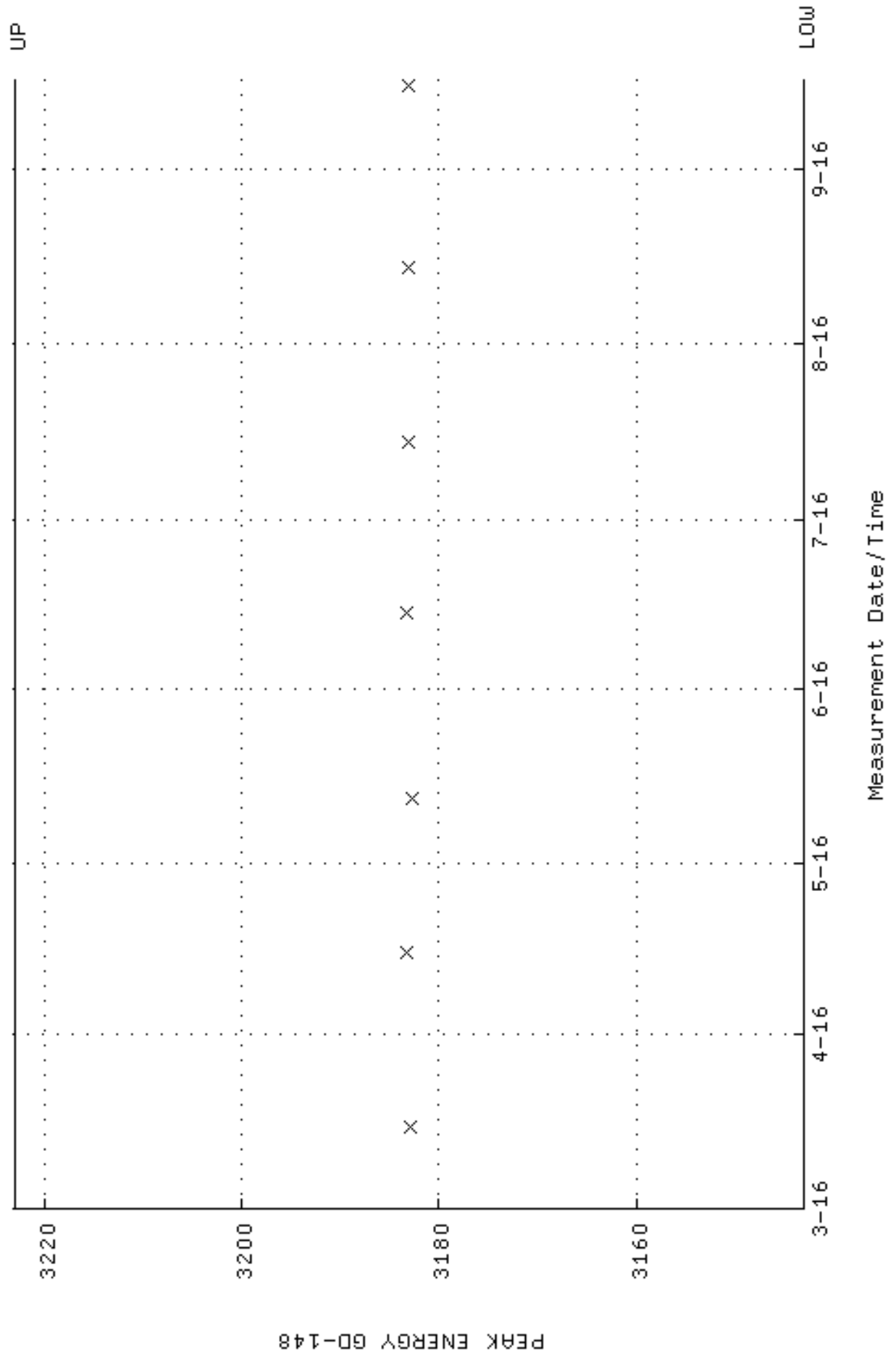
QA filename : DKA100:[ENV_ALPHA.QA.W]w201.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 15-MAR-2016 10:07:54 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



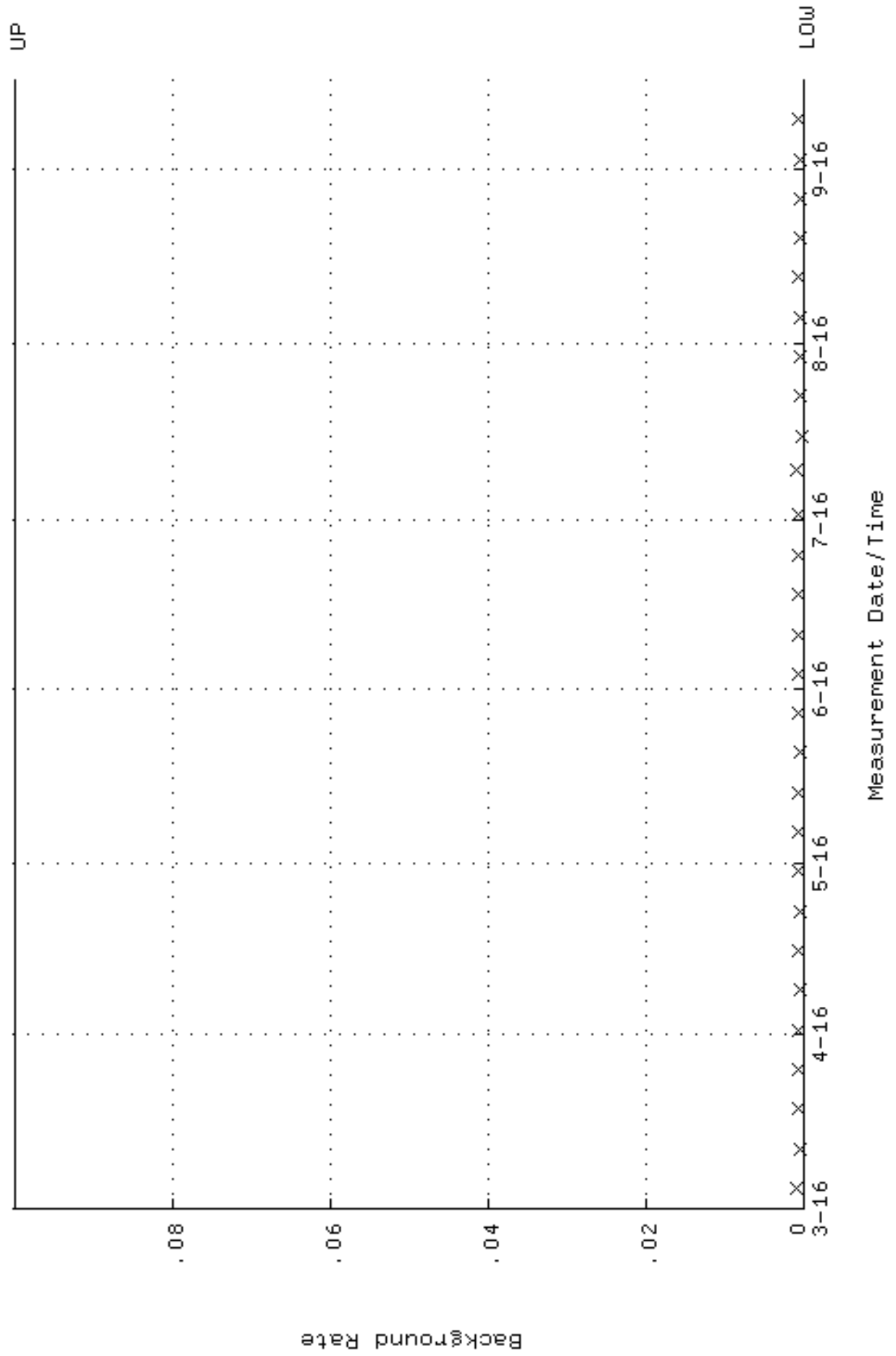
QA filename : DKA100:[ENV_ALPHA.QA.W]W201.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 15-MAR-2016 10:07:54 through 16-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



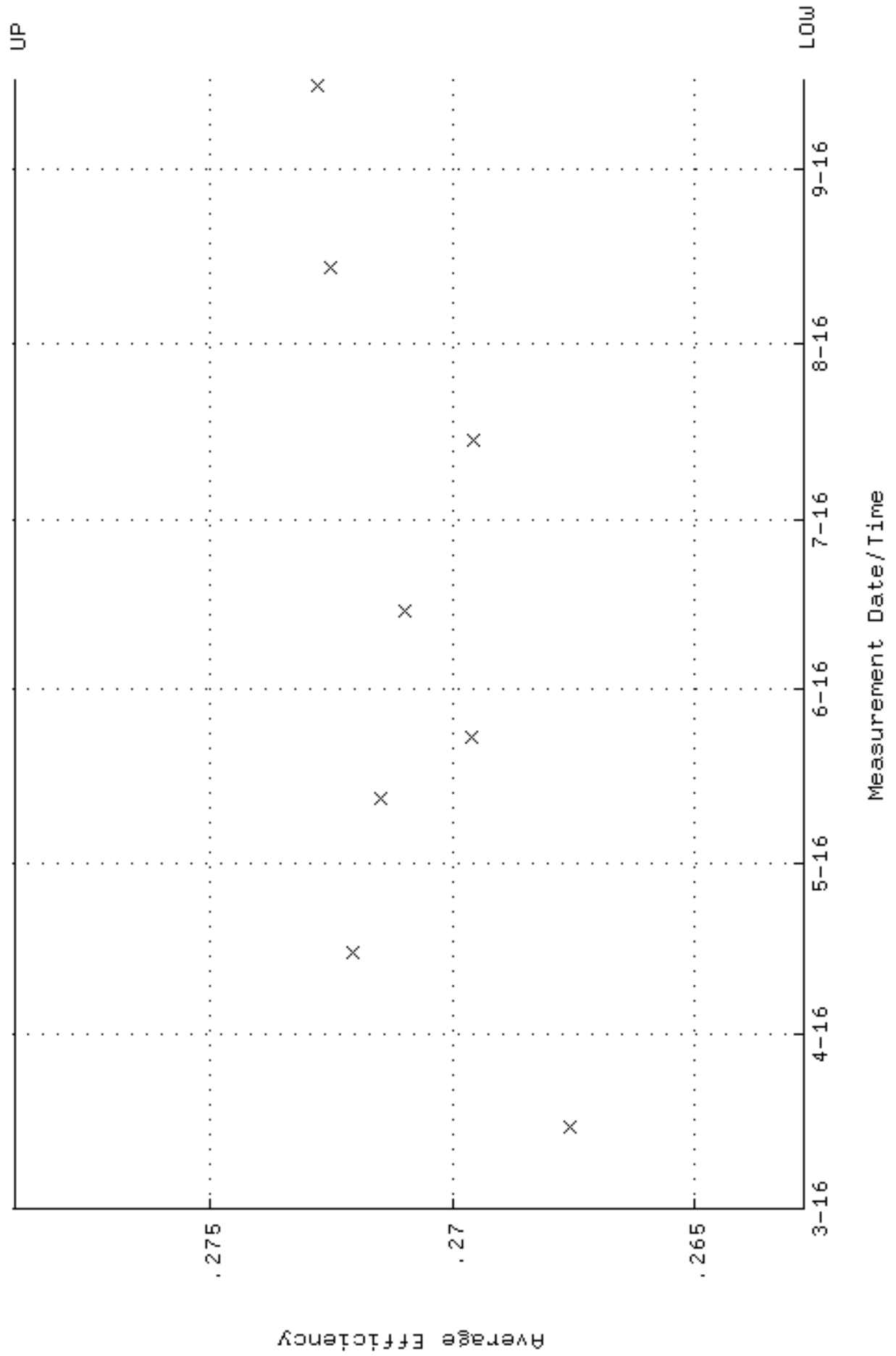
QA filename : DKA100:[ENV_ALPHA.QA.W]w201.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 15-MAR-2016 10:07:54 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



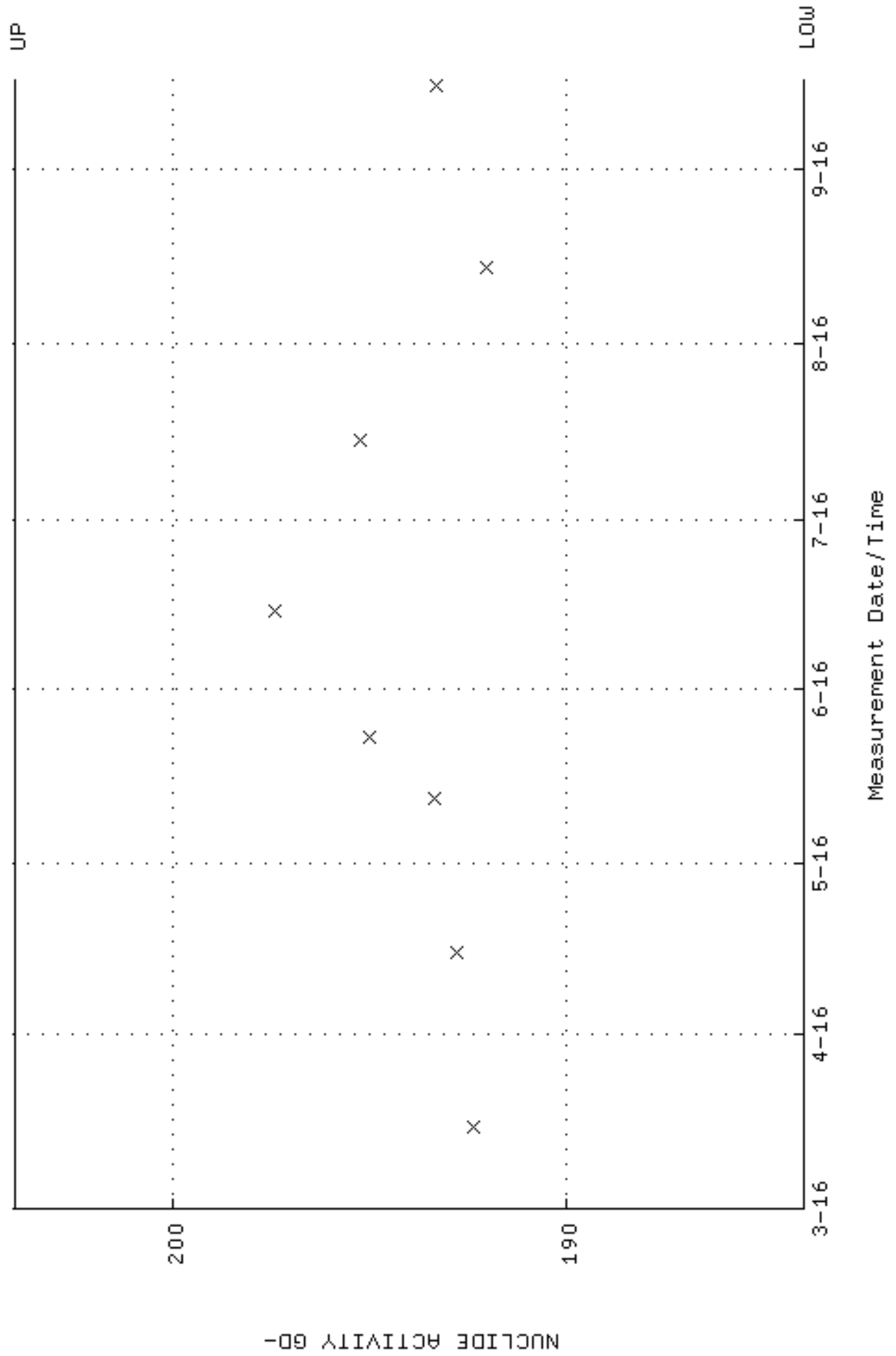
QA filename : DKA100:[ENV_ALPHA.QA.B]B201.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:17:30 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



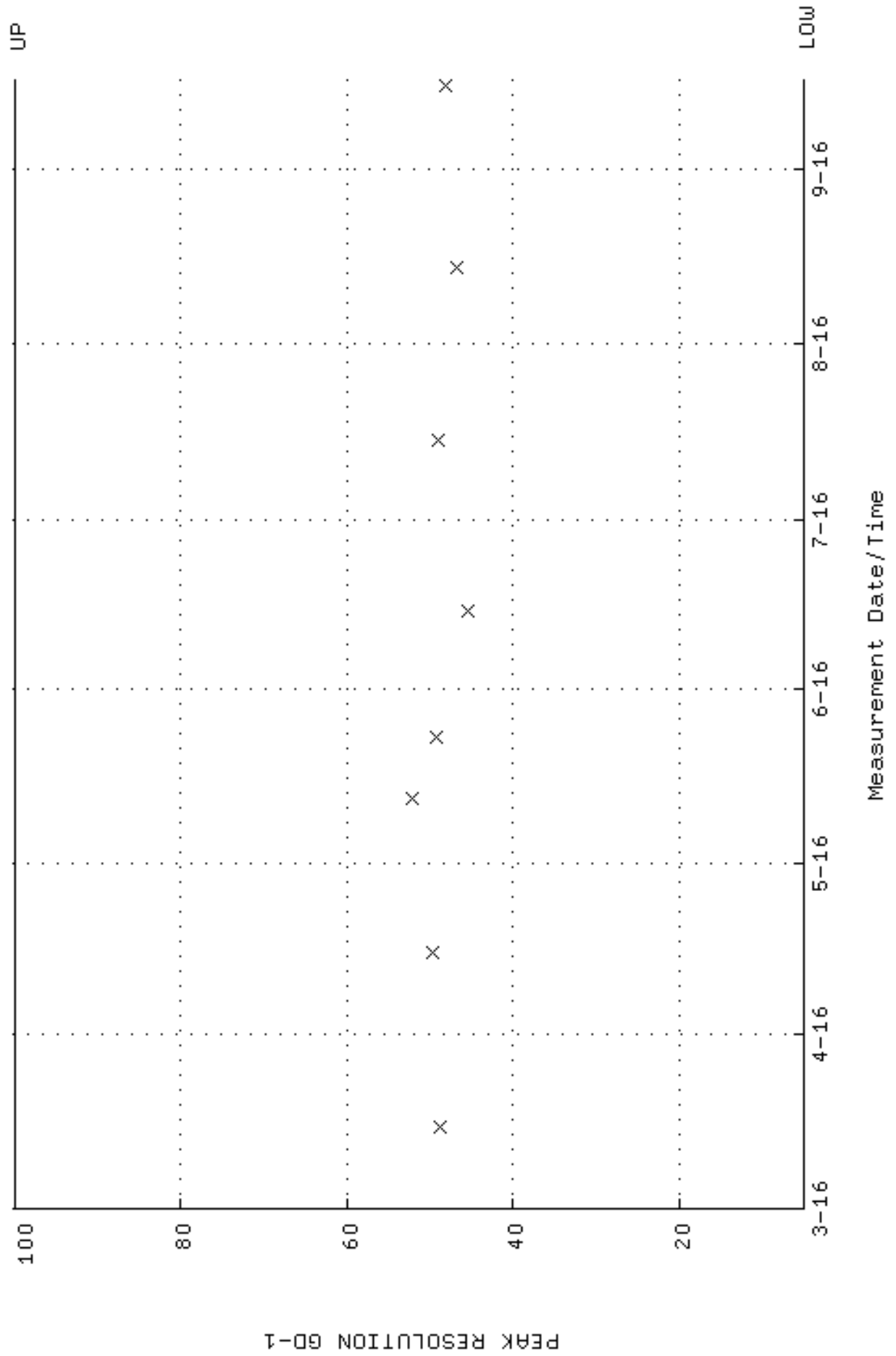
QA filename : DKA100:[ENV_ALPHA.QA.W]W202.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 15-MAR-2016 10:07:31 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.262756 through 0.279008



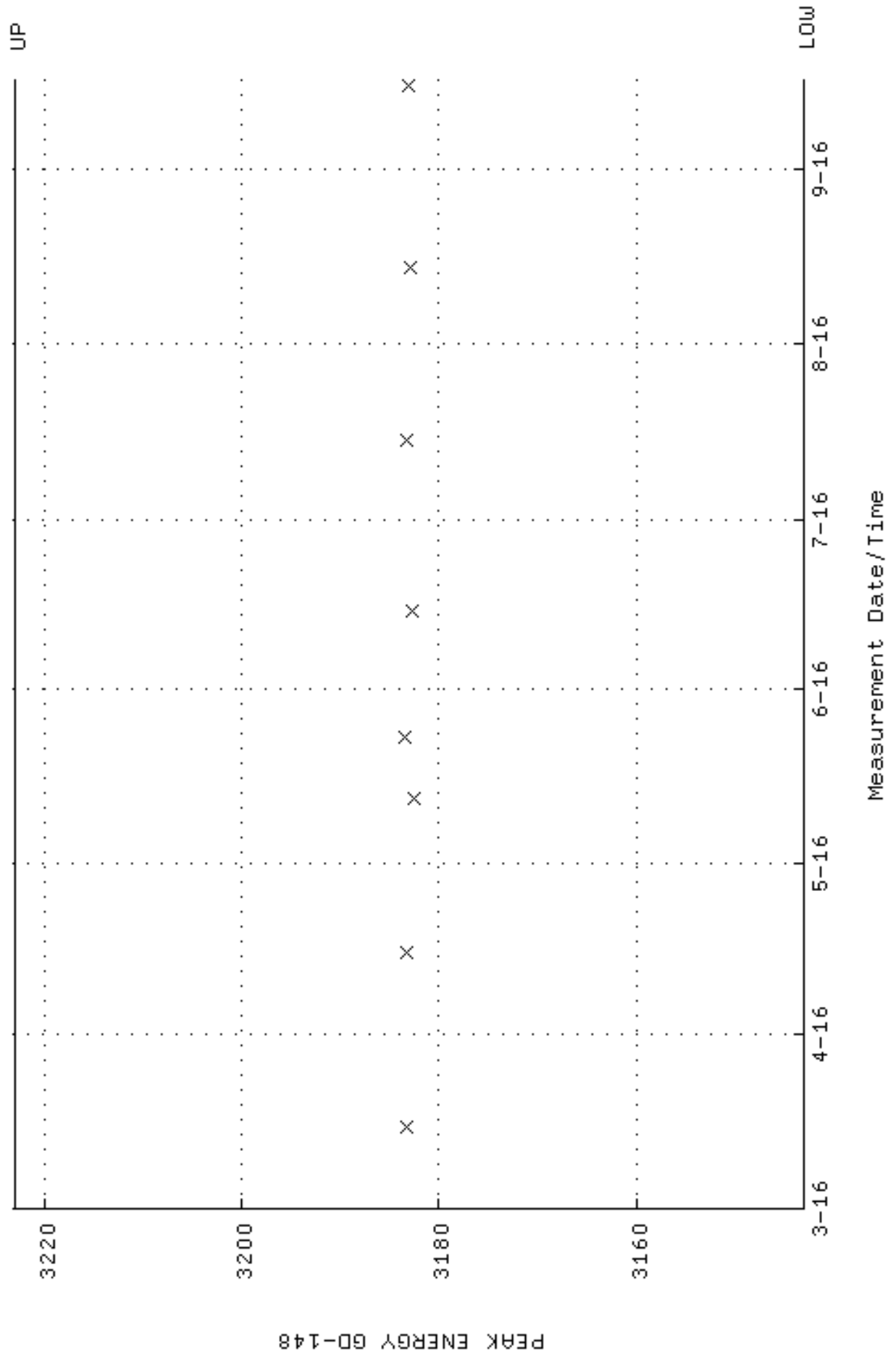
QA filename : DKA100:[ENV_ALPHA.QA.W]w202.QAF;3
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 15-MAR-2016 10:07:31 through 16-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



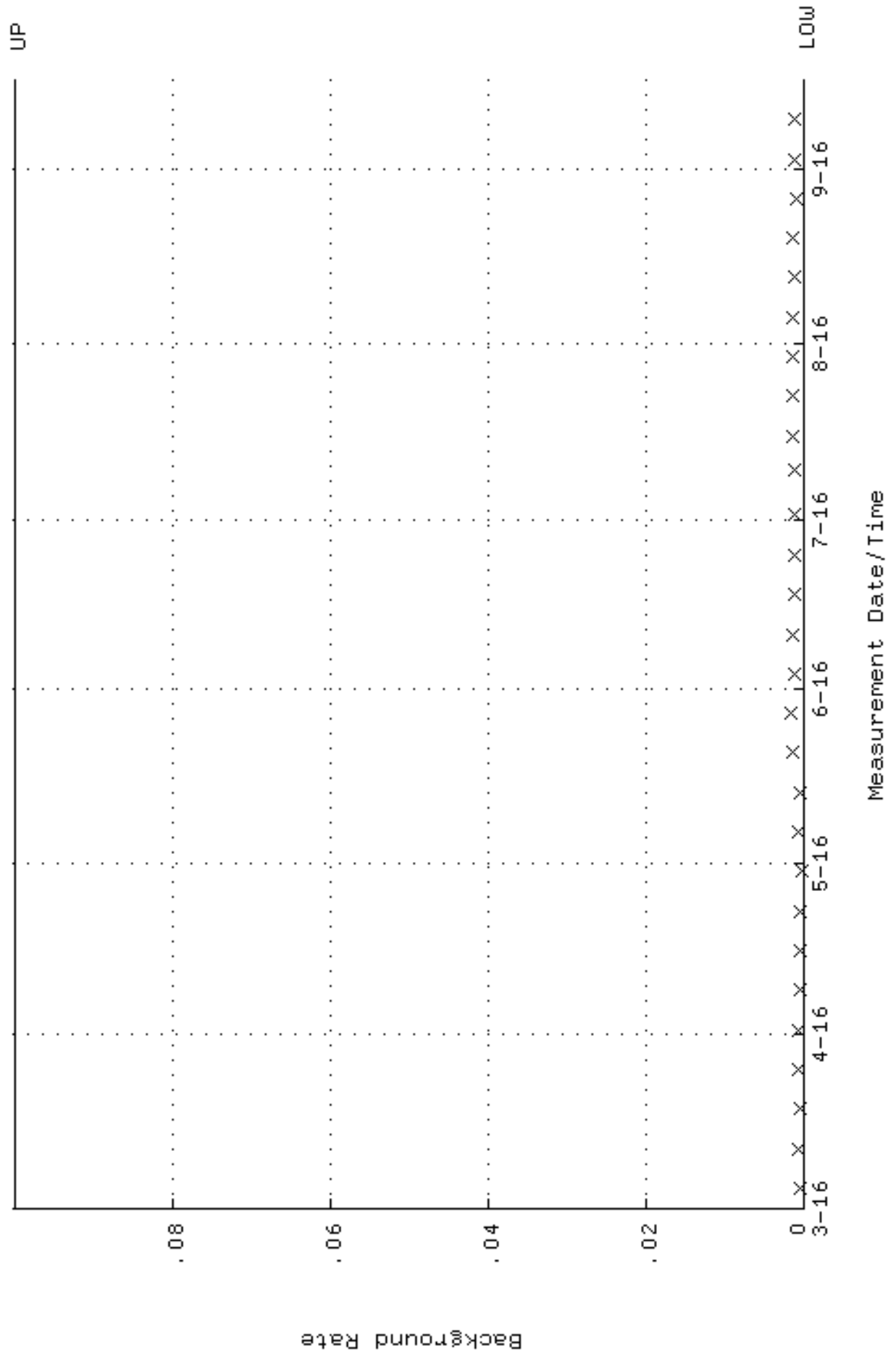
QA filename : DKA100:[ENV_ALPHA.QA.W]W202.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 15-MAR-2016 10:07:31 through 16-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



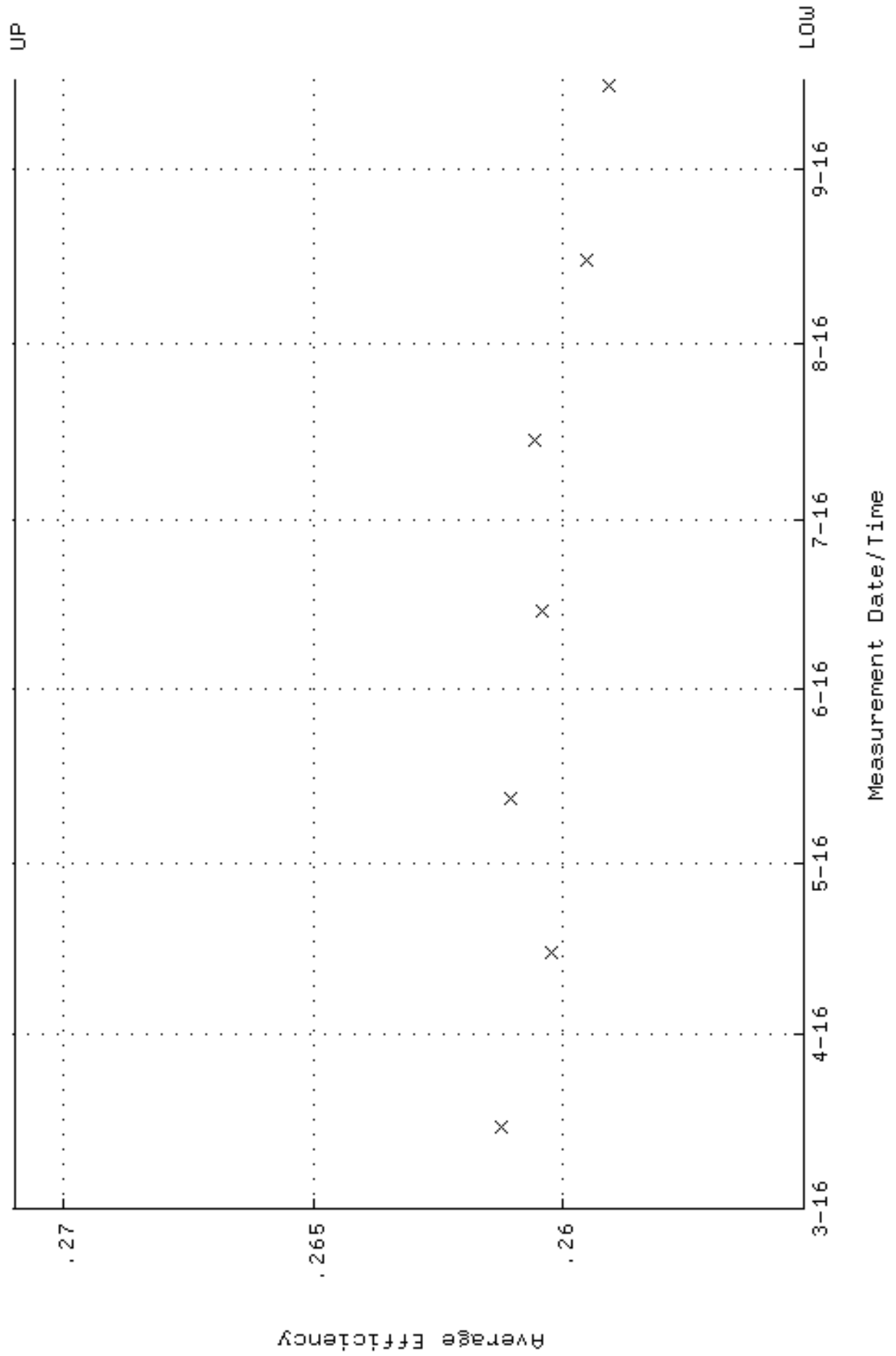
QA filename : DKA100:[ENV_ALPHA.QA.W]W202.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 15-MAR-2016 10:07:31 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



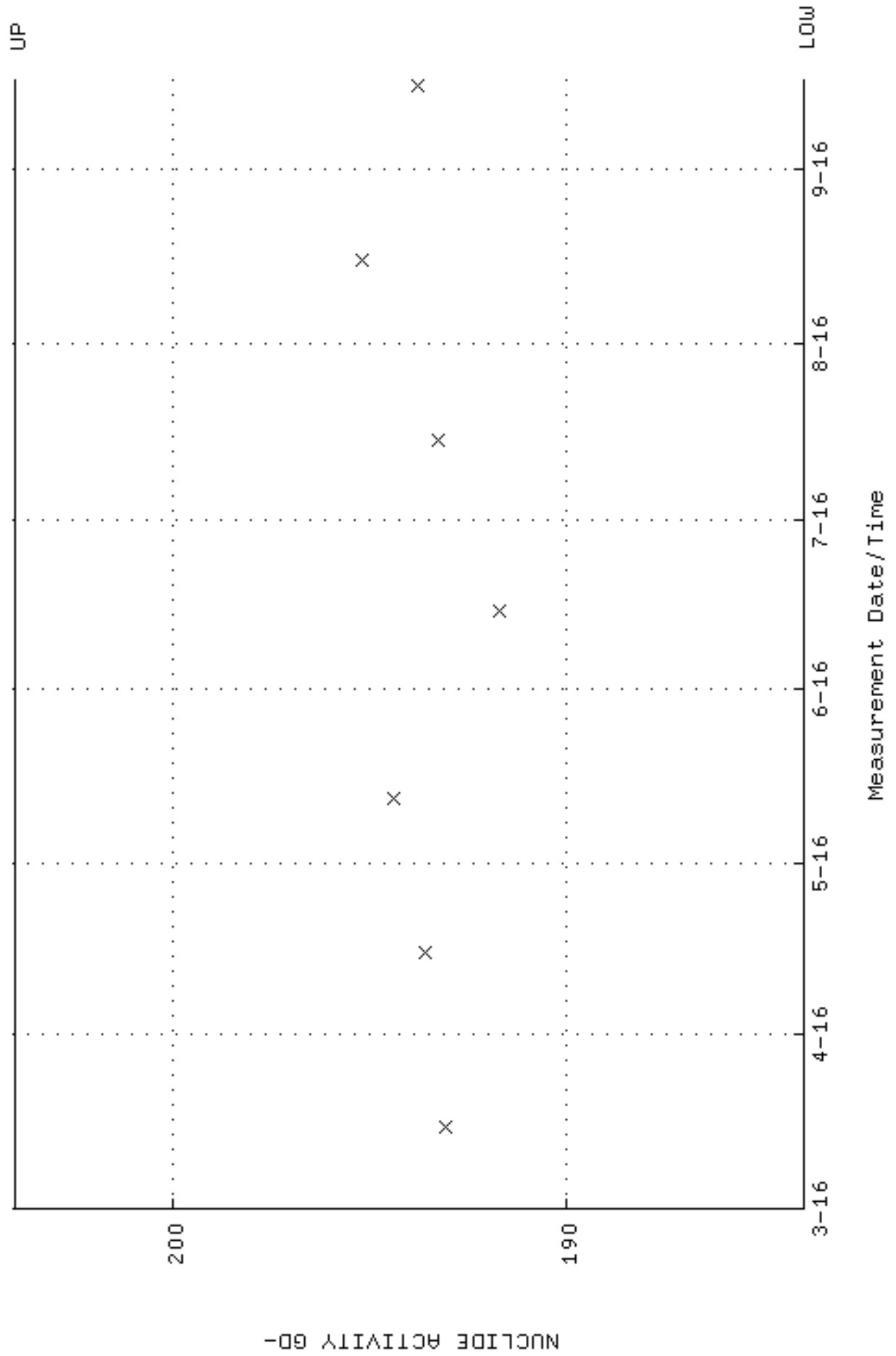
QA filename : DKA100:[ENV_ALPHA.QA.B]B202.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:17:35 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



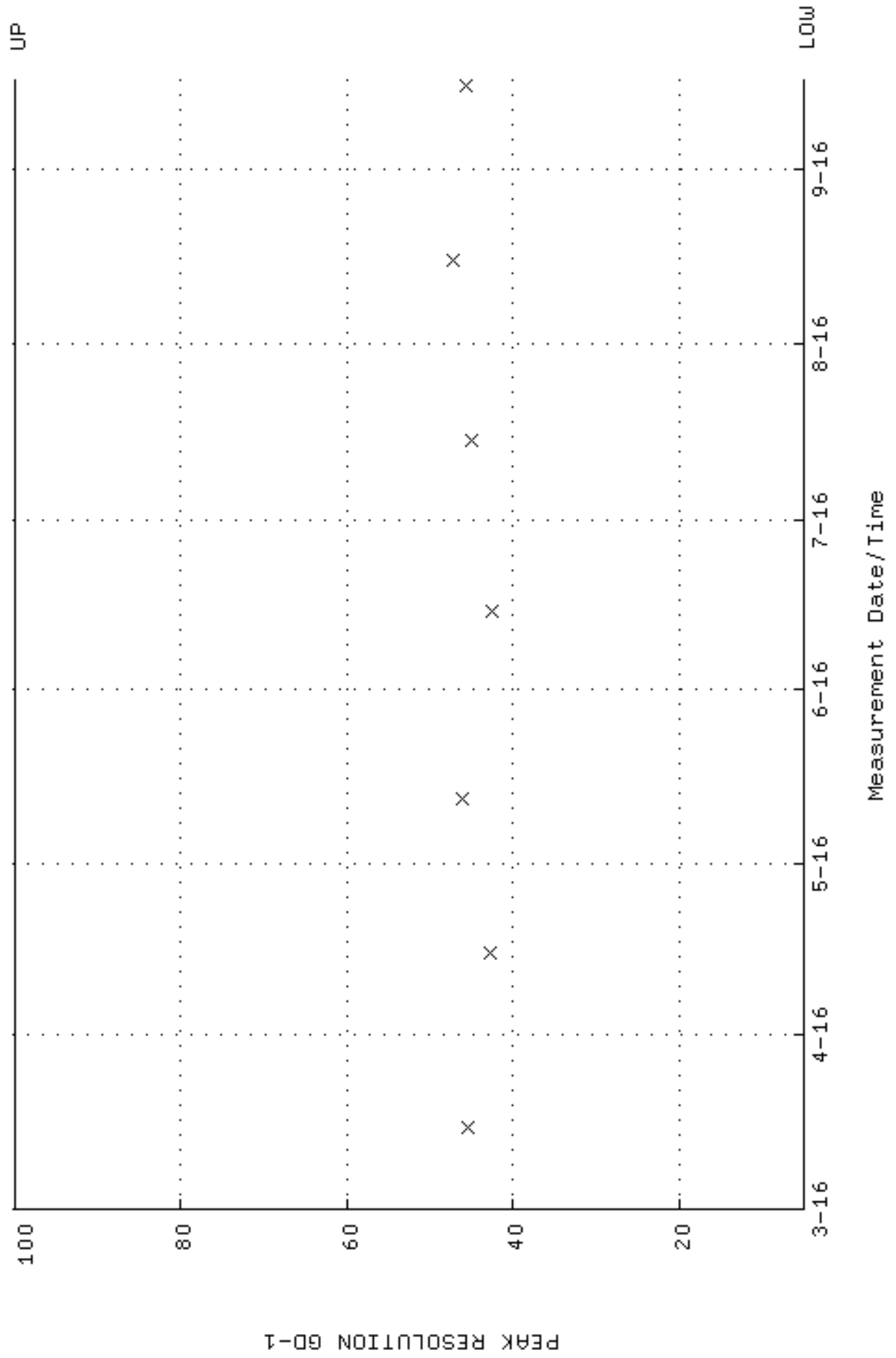
QA filename : DKA100:[ENV_ALPHA.QA.W]W203.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 15-MAR-2016 08:39:21 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.255187 through 0.270971



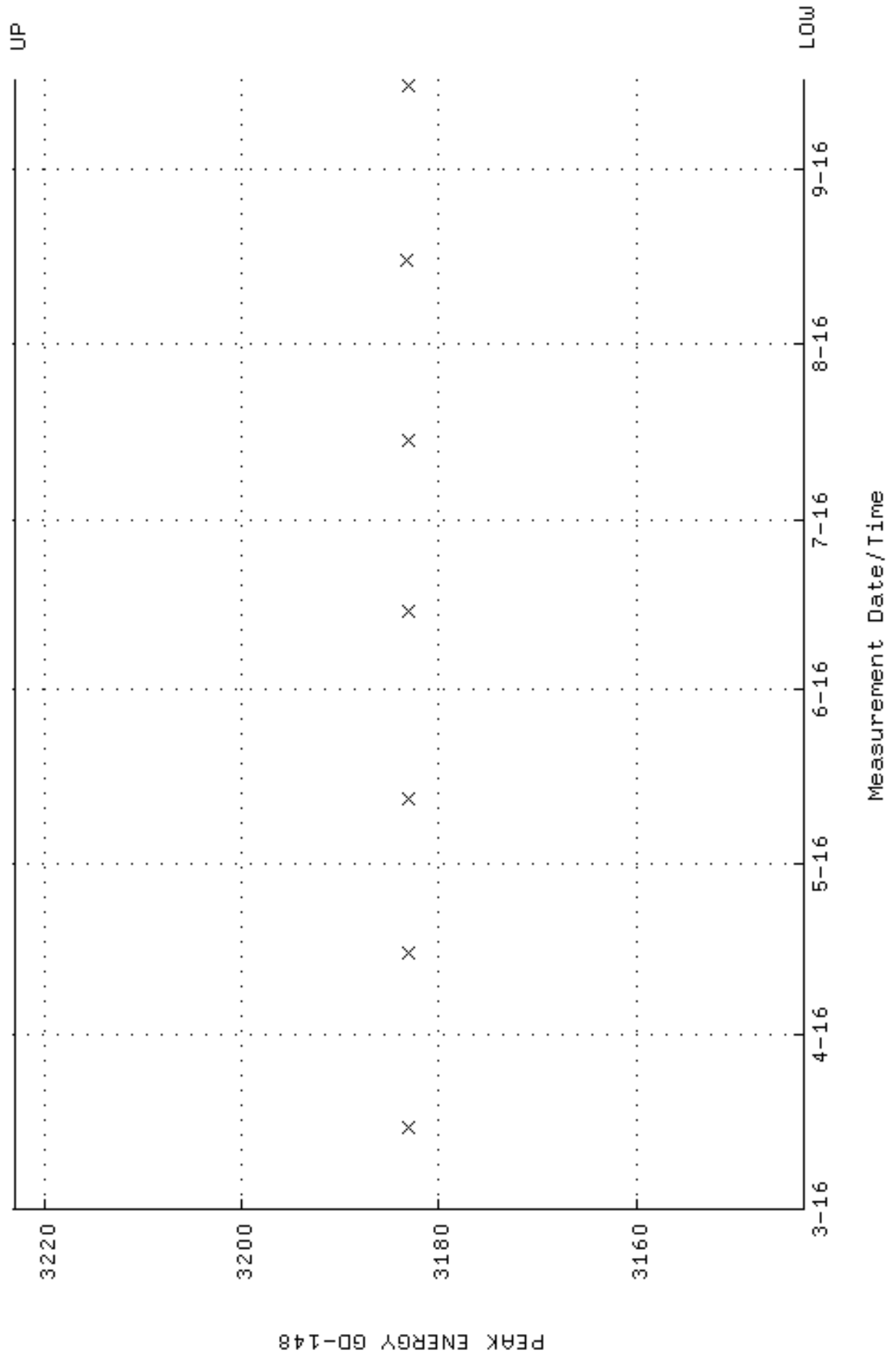
QA filename : DKA100:[ENV_ALPHA.QA.W]W203.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 15-MAR-2016 08:39:21 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



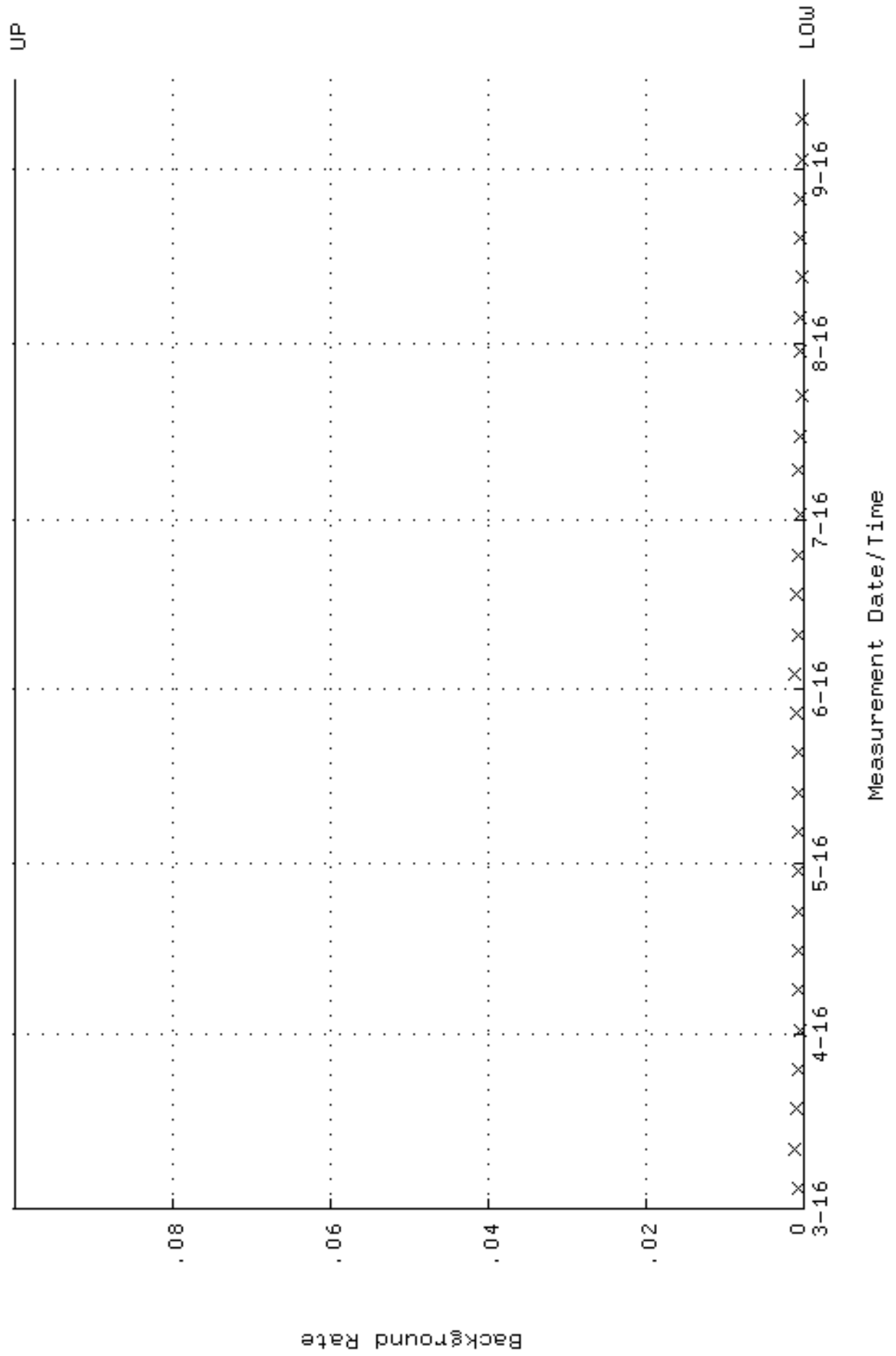
QA filename : DKA100:[ENV_ALPHA.QA.W]W203.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 15-MAR-2016 08:39:21 through 16-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



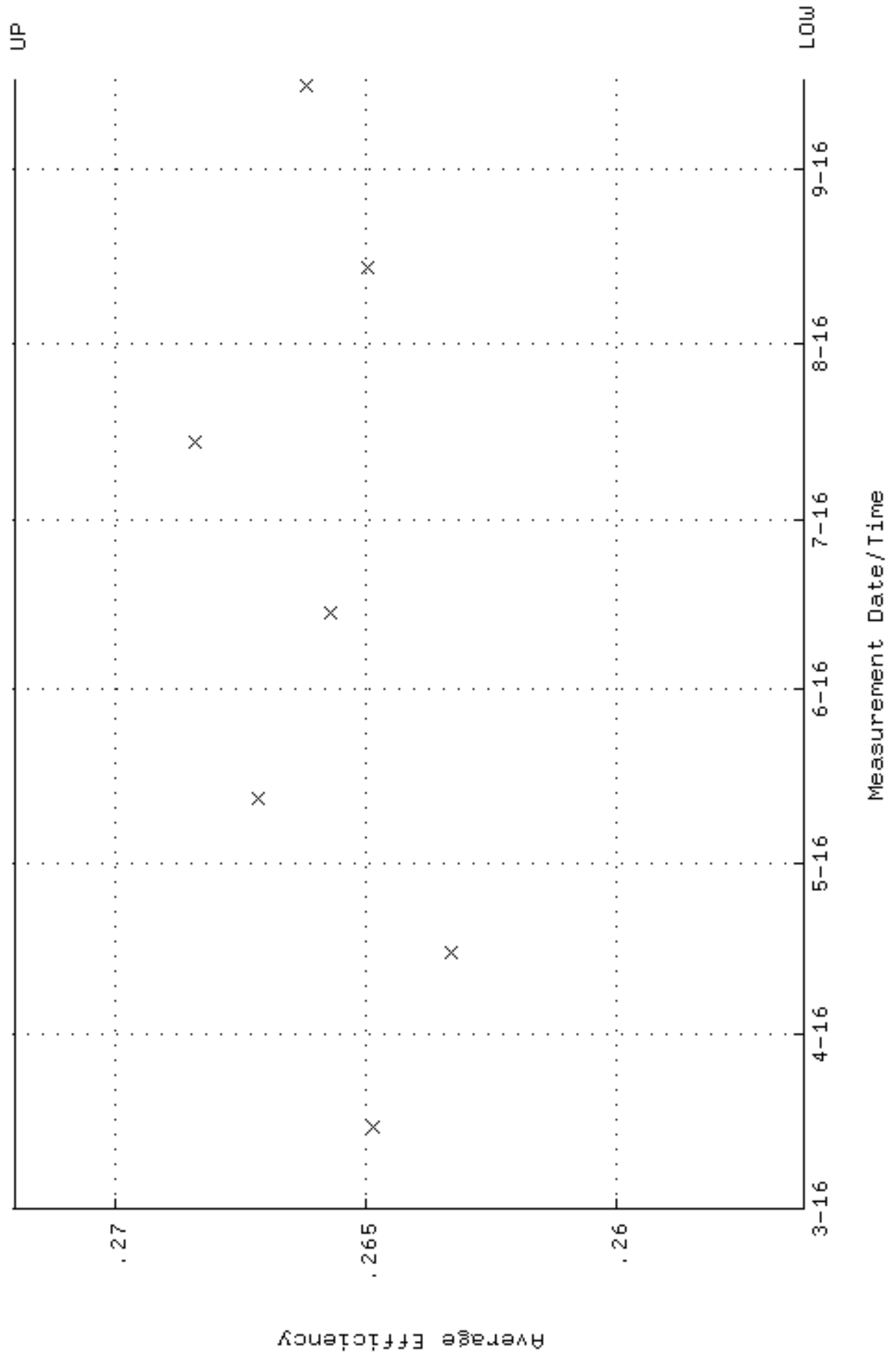
QA filename : DKA100:[ENV_ALPHA.QA.W]W203.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 15-MAR-2016 08:39:21 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



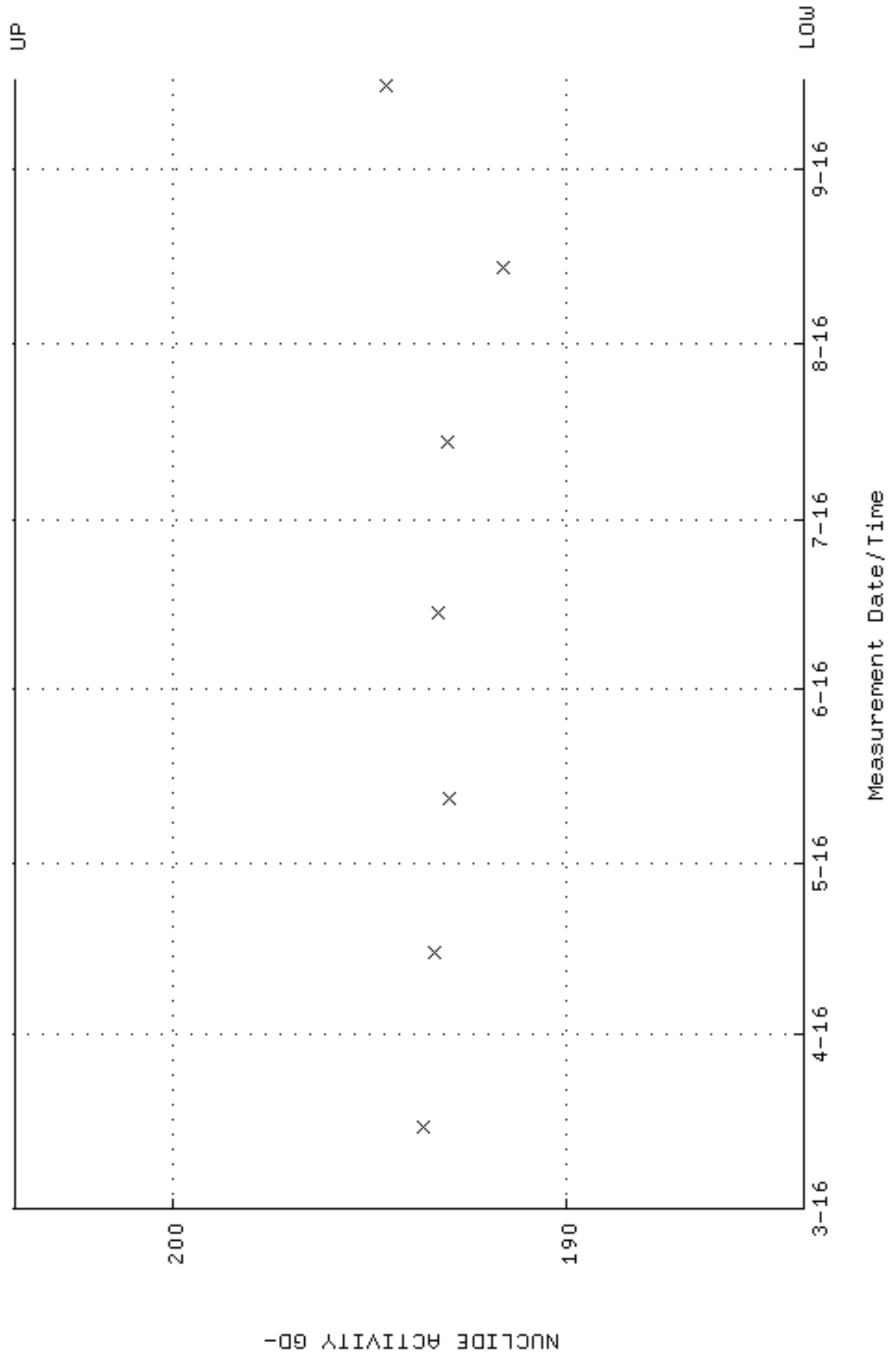
QA filename : DKA100:[ENV_ALPHA.QA.B]B203.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:17:39 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



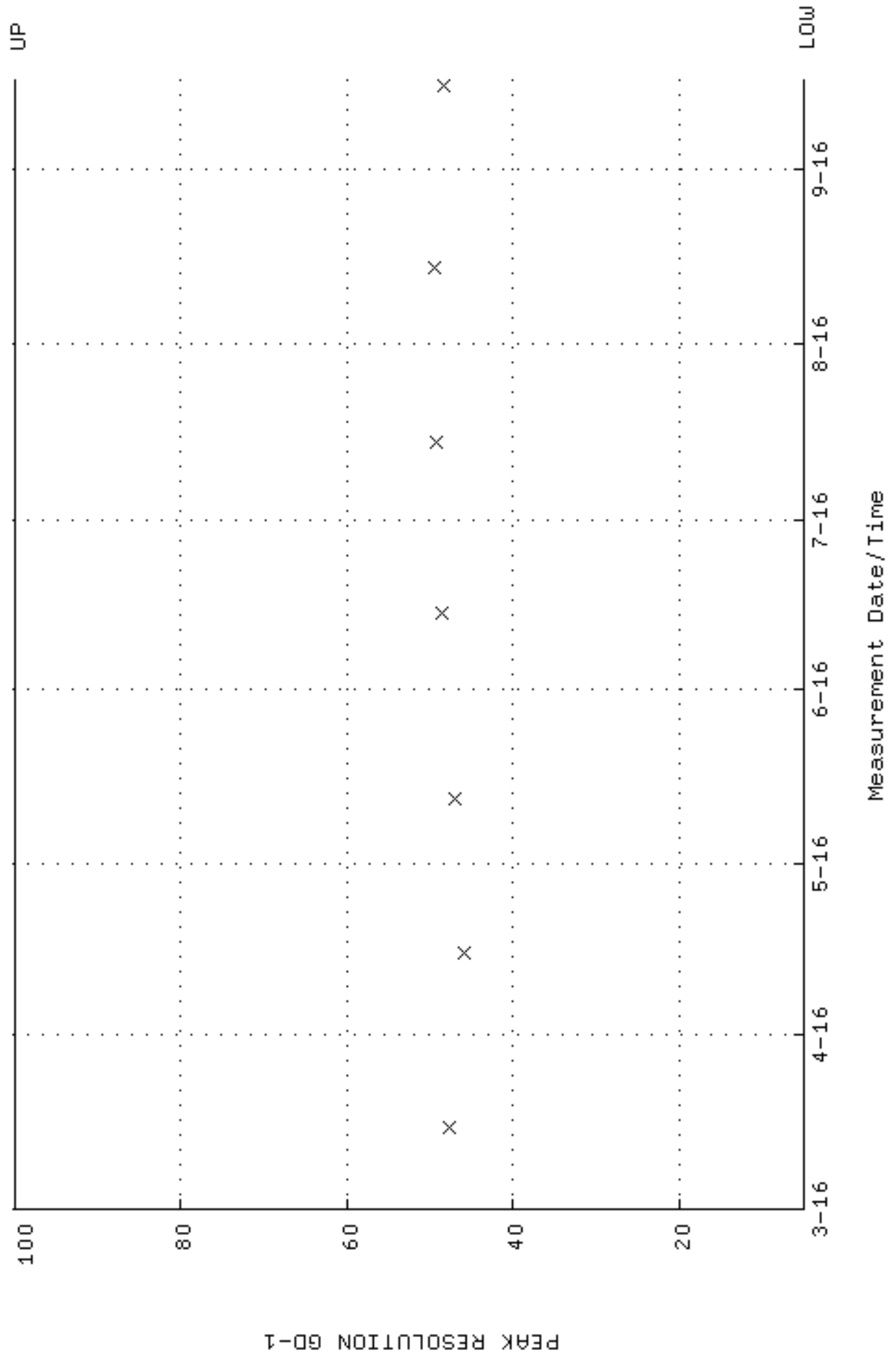
QA filename : DKA100:[ENV_ALPHA.QA.W]W205.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 15-MAR-2016 08:39:30 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.256250 through 0.272000



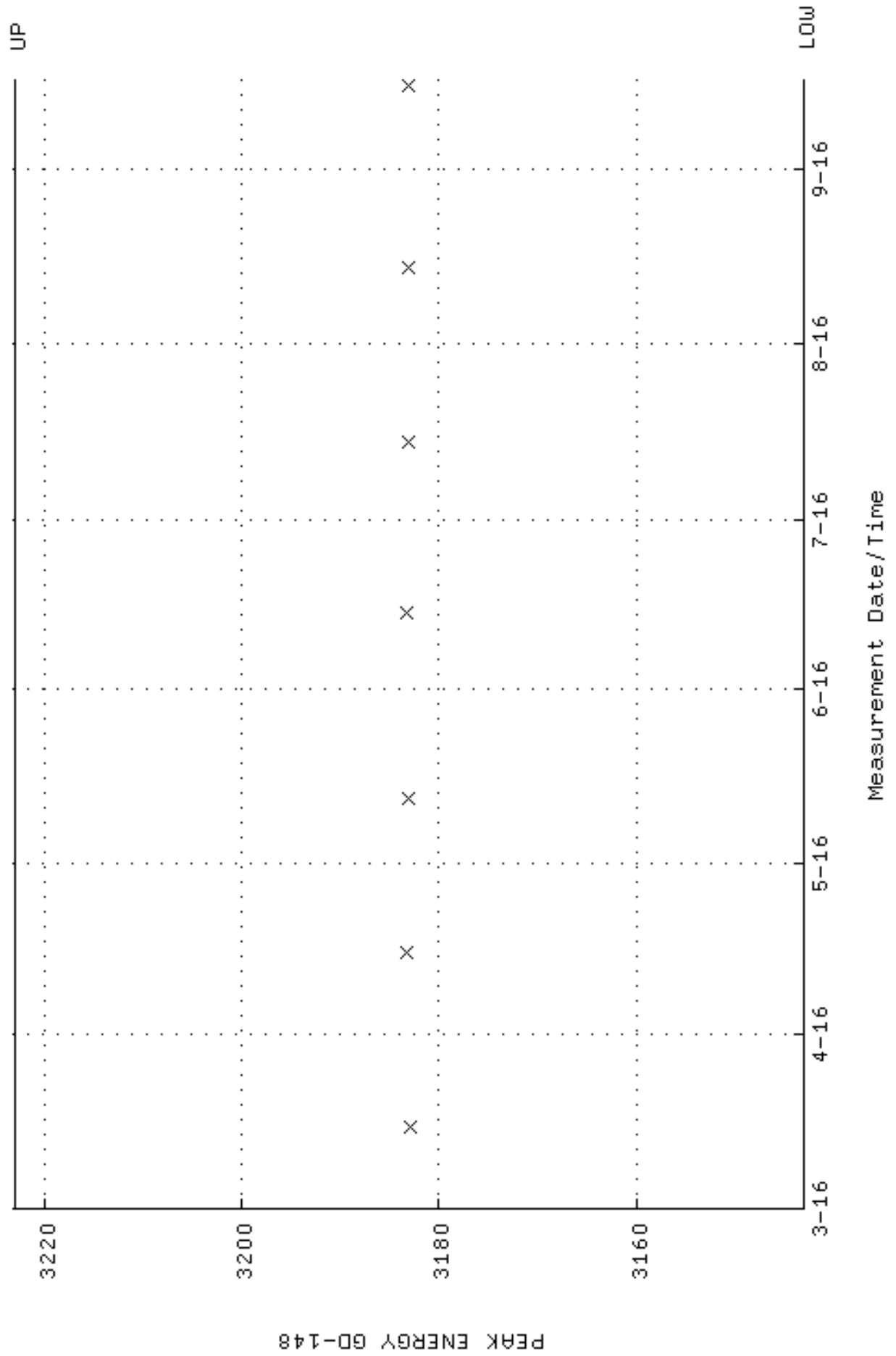
QA filename : DKA100:[ENV_ALPHA.QA.W]W205.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 15-MAR-2016 08:39:30 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



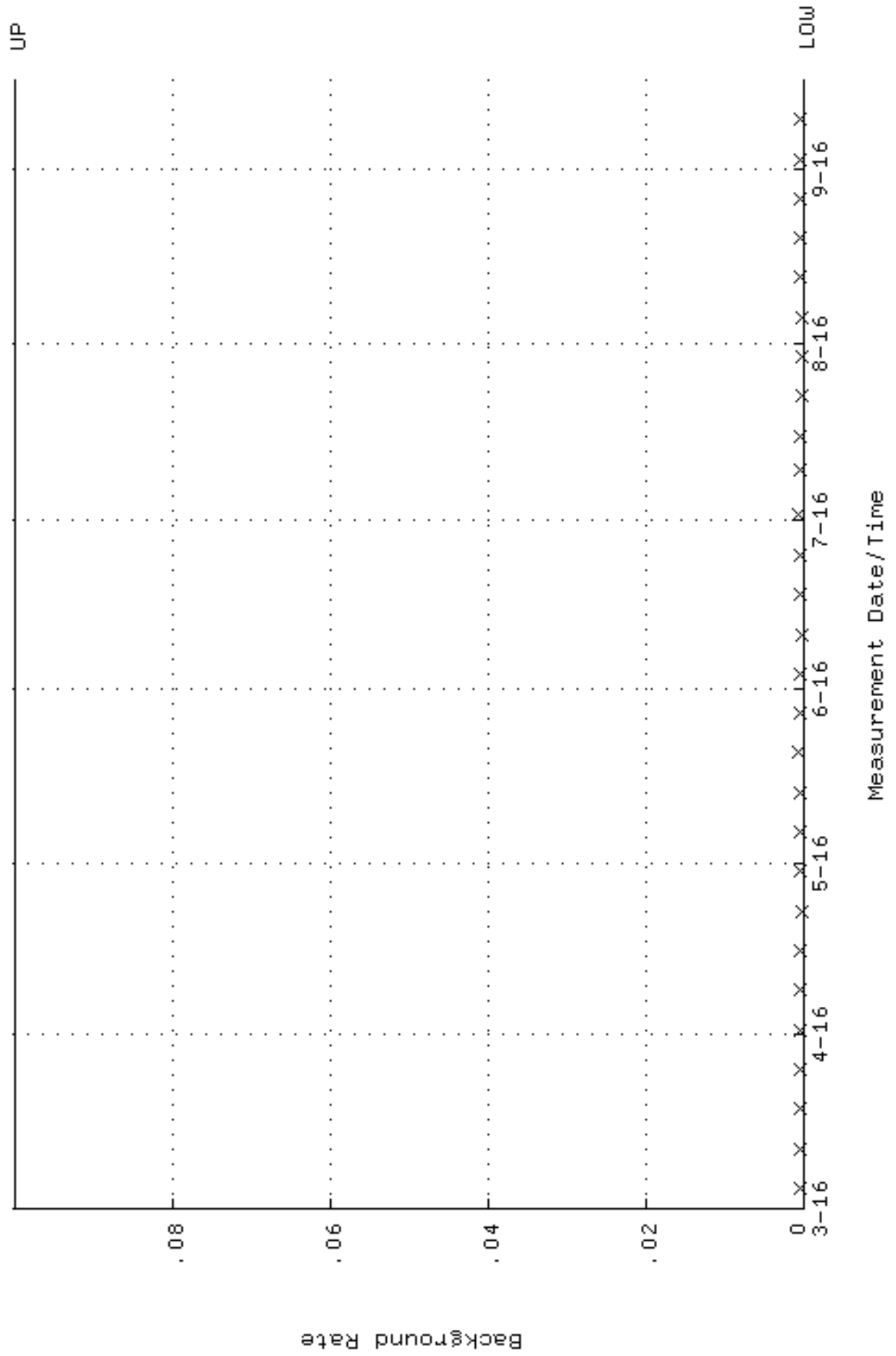
QA filename : DKA100:[ENV_ALPHA.QA.W]W205.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 15-MAR-2016 08:39:30 through 16-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



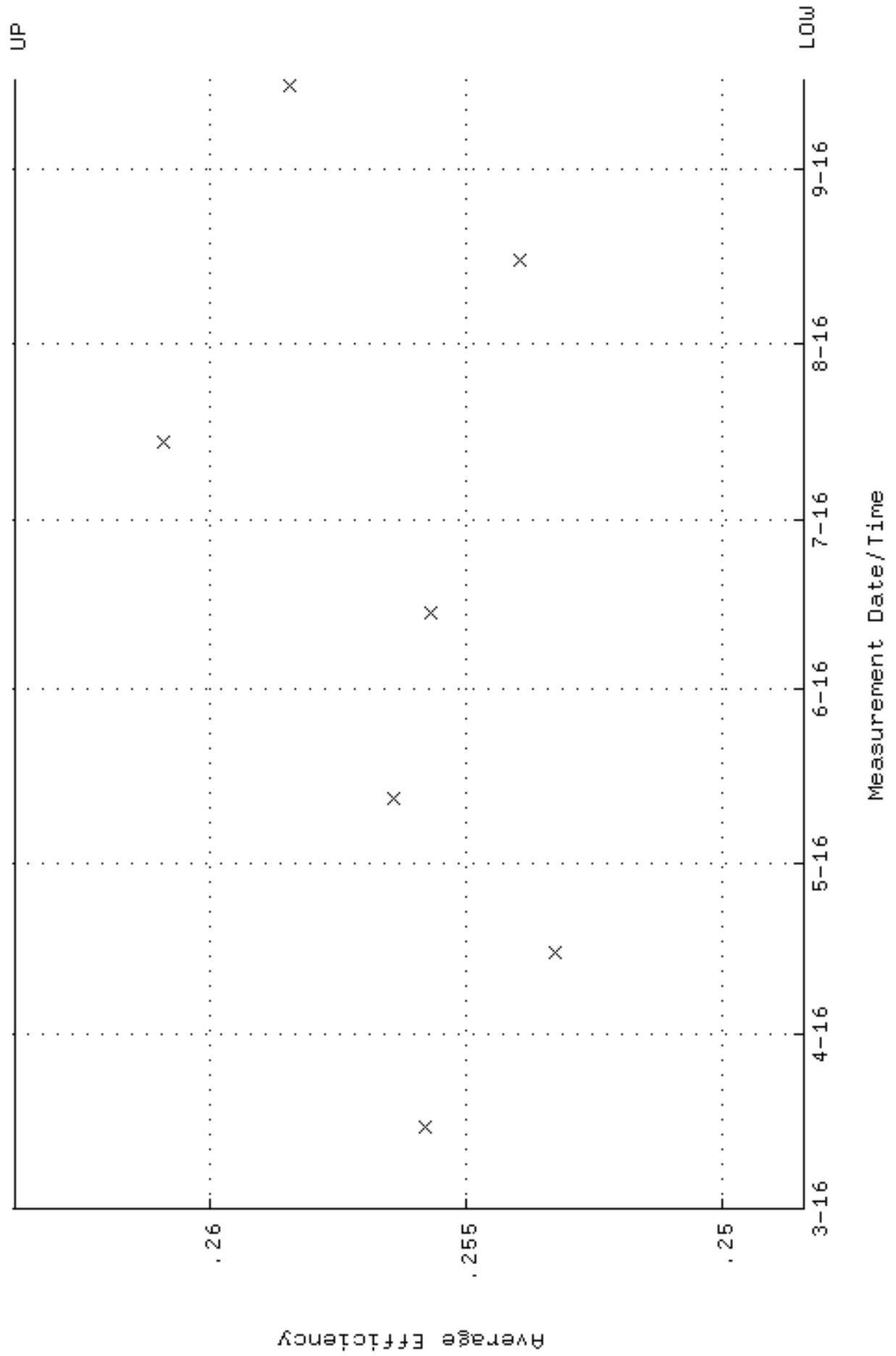
QA filename : DKA100:[ENV_ALPHA.QA.W]W205.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 15-MAR-2016 08:39:30 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



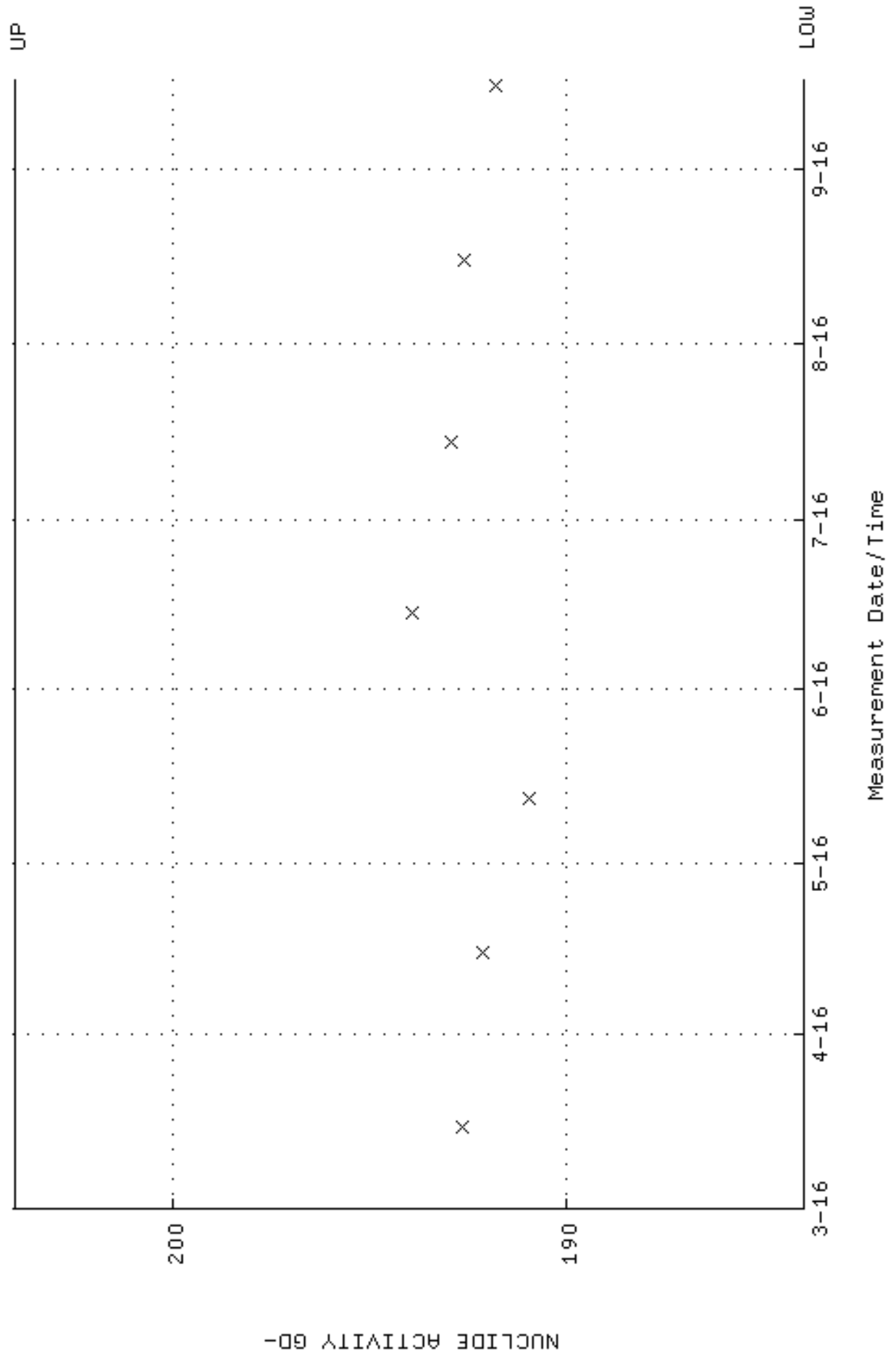
QA filename : DKA100:[ENV_ALPHA.QA.B]B205.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:17:47 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



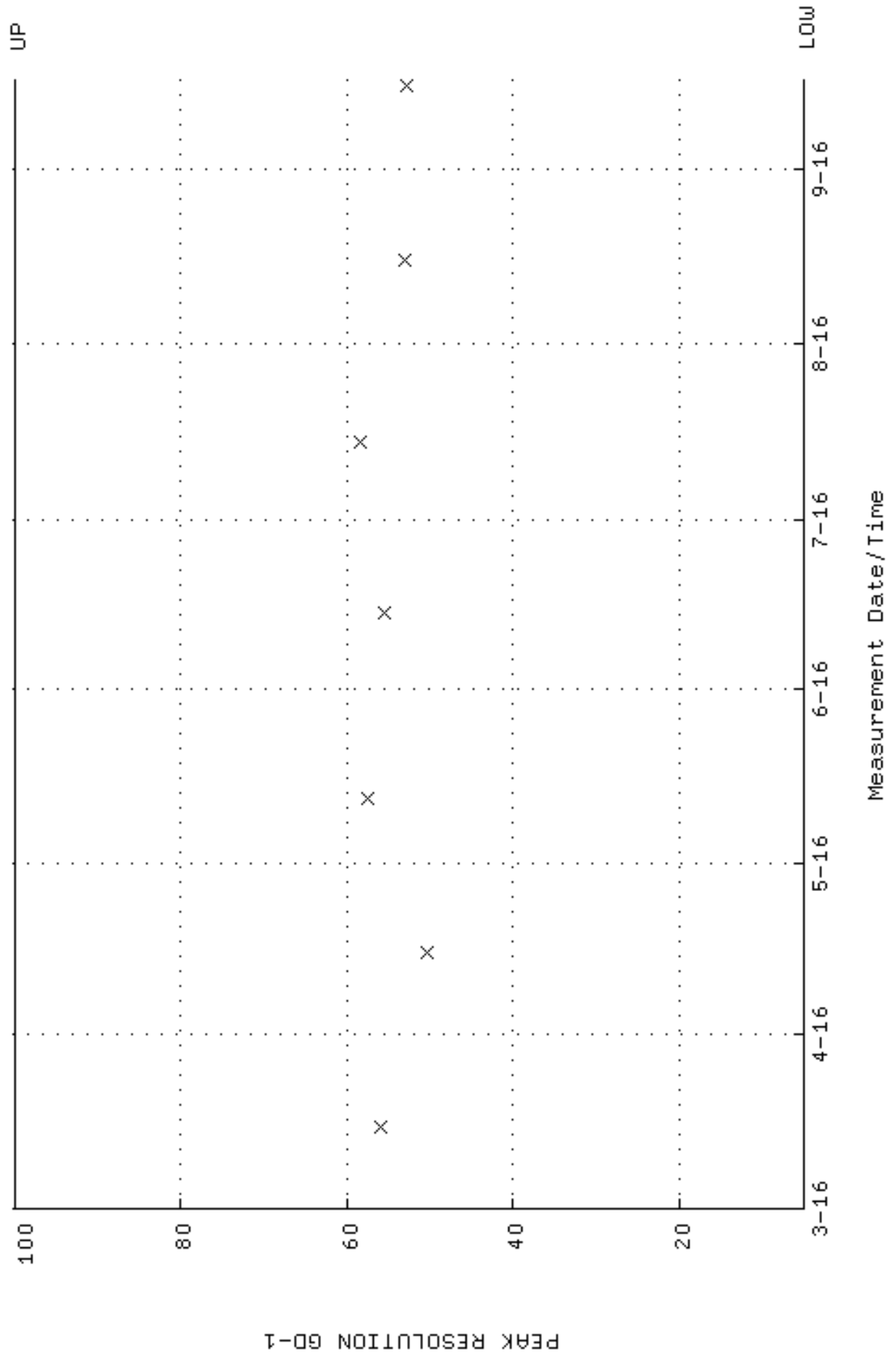
QA filename : DKA100:[ENV_ALPHA.QA.W]W206.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 15-MAR-2016 08:39:33 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.248420 through 0.263785



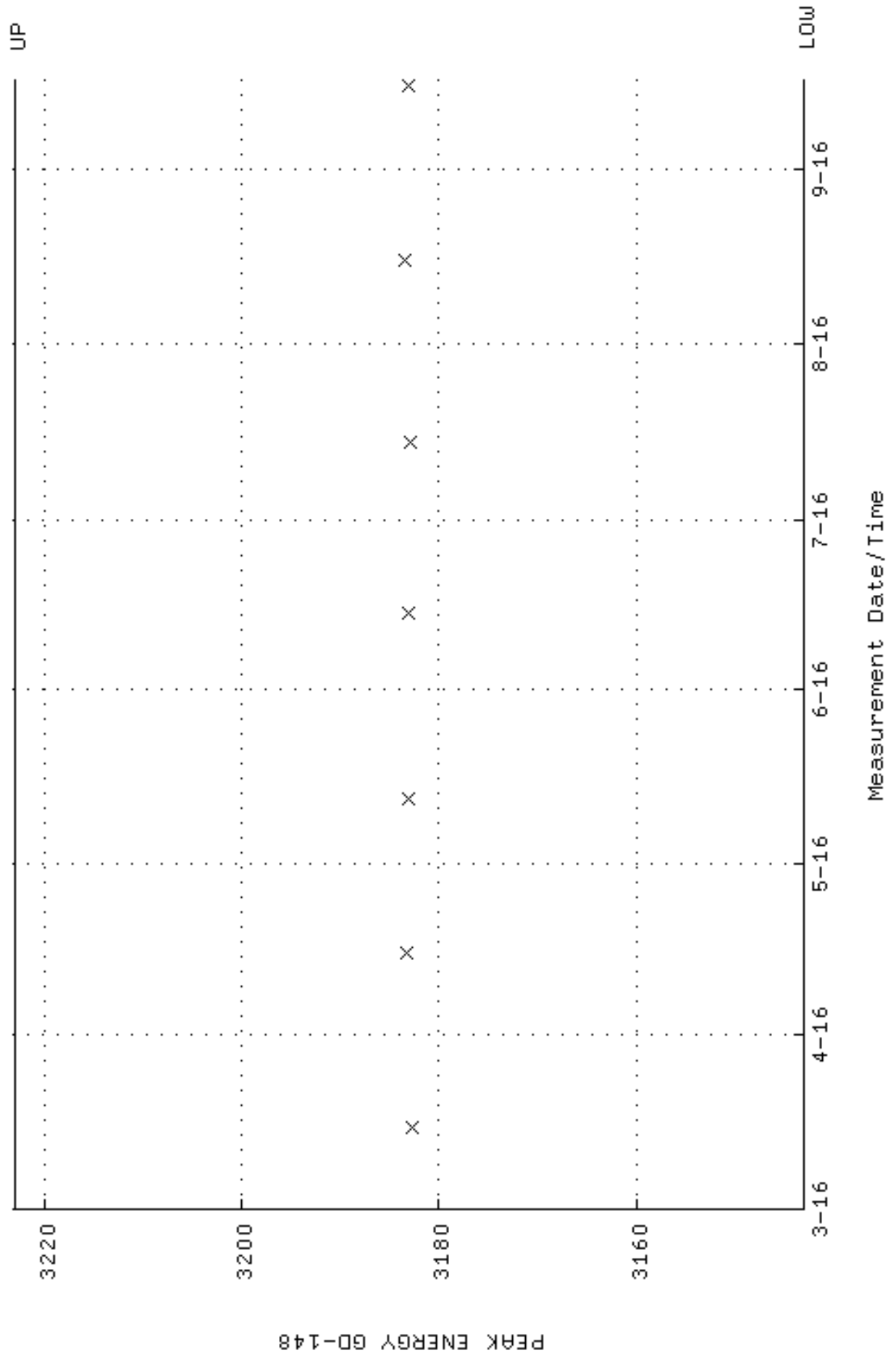
QA filename : DKA100:[ENV_ALPHA.QA.W]w206.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 15-MAR-2016 08:39:33 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



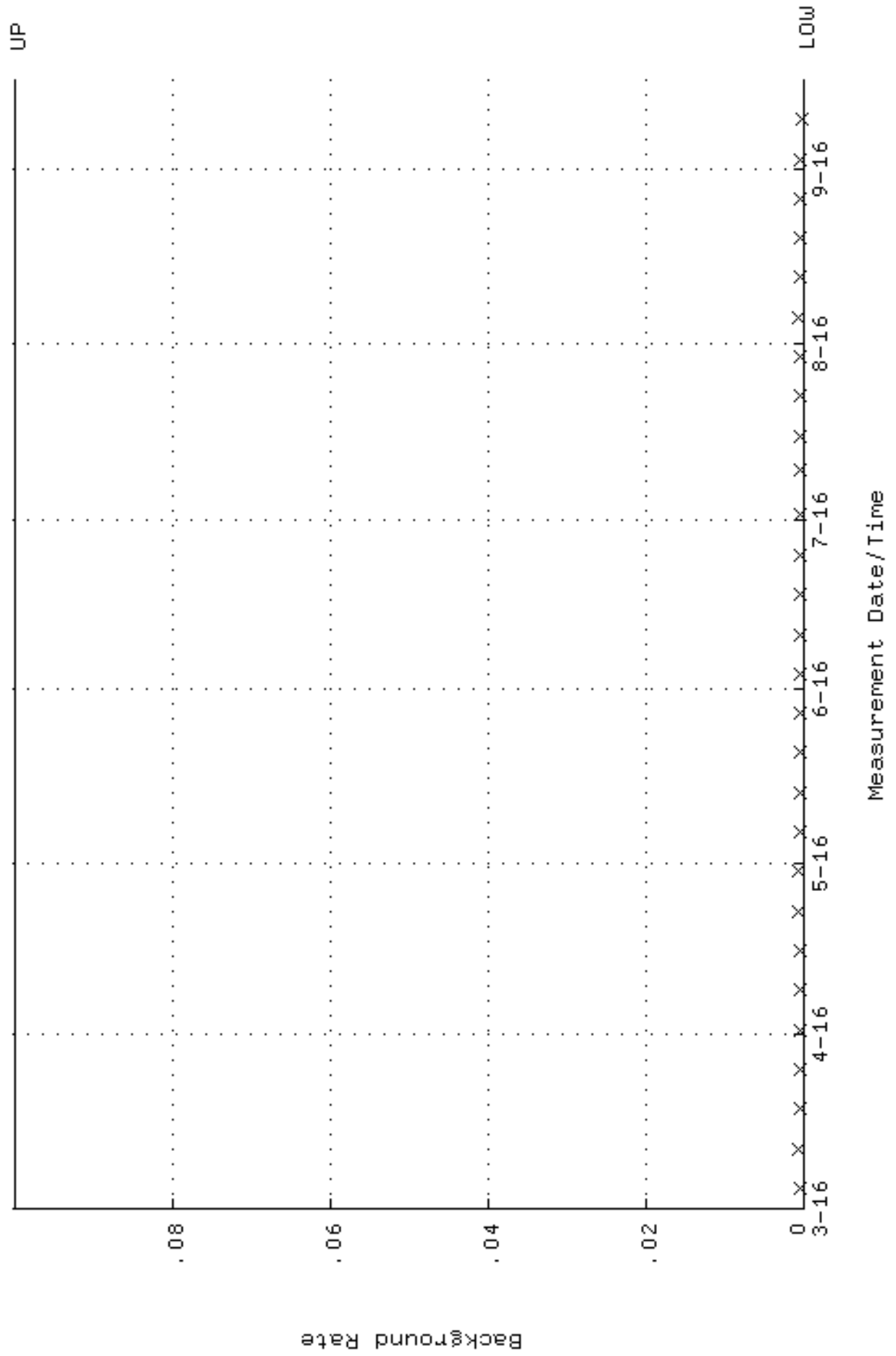
QA filename : DKA100:[ENV_ALPHA.QA.W]W206.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 15-MAR-2016 08:39:33 through 16-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



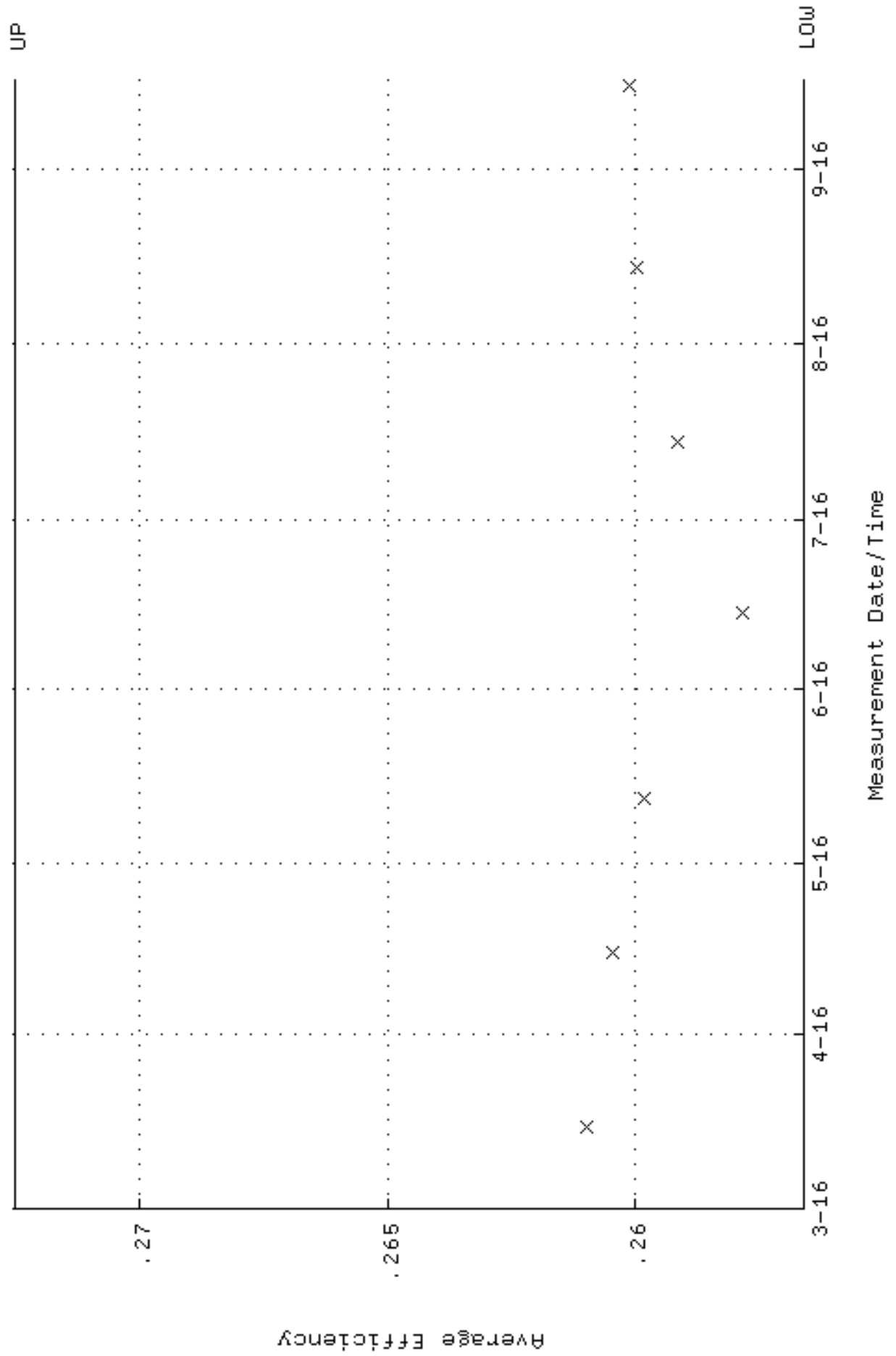
QA filename : DKA100:[ENV_ALPHA.QA.W]W206.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 15-MAR-2016 08:39:33 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



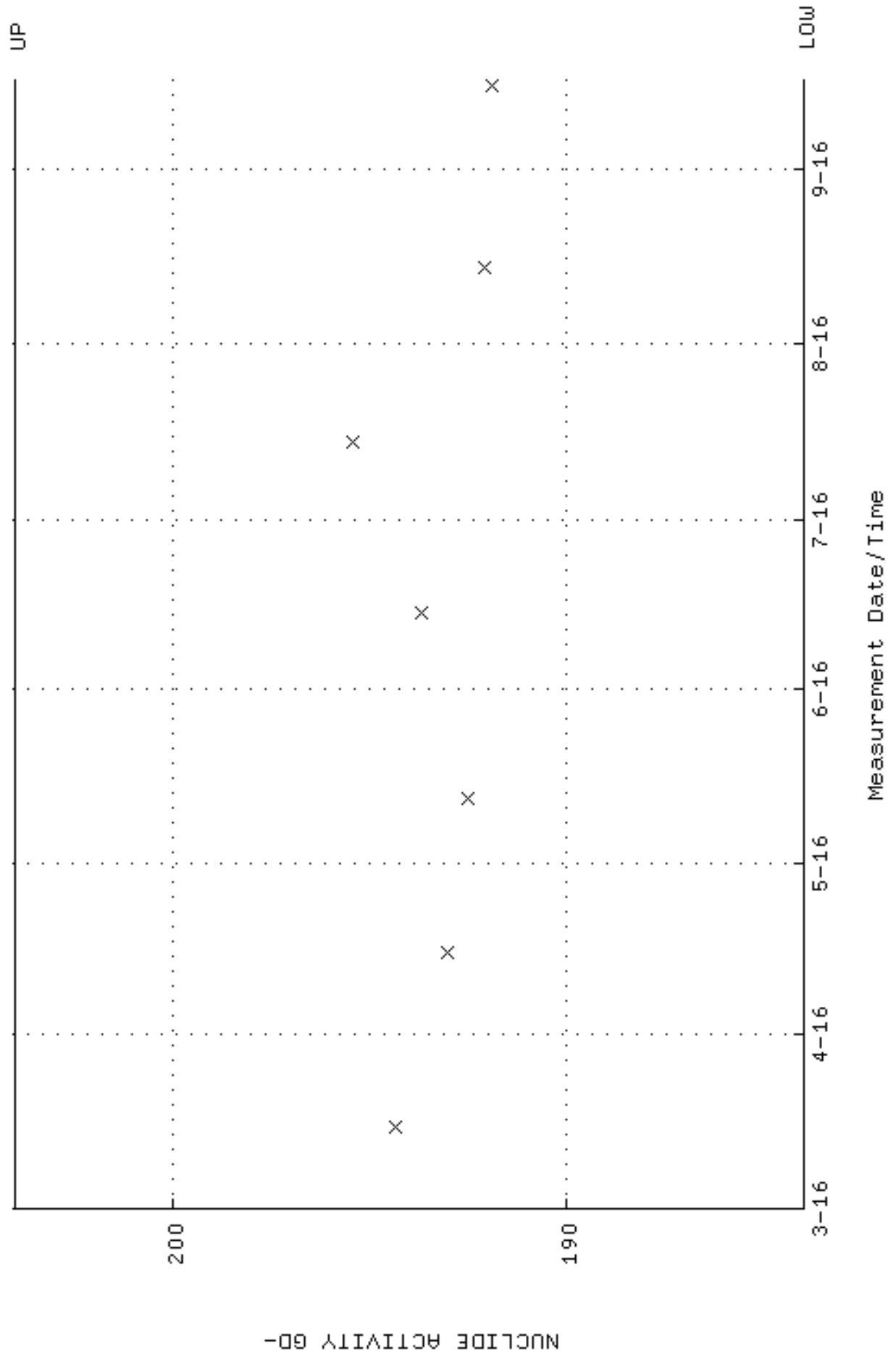
QA filename : DKA100:[ENV_ALPHA.QA.B]B206.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:17:51 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



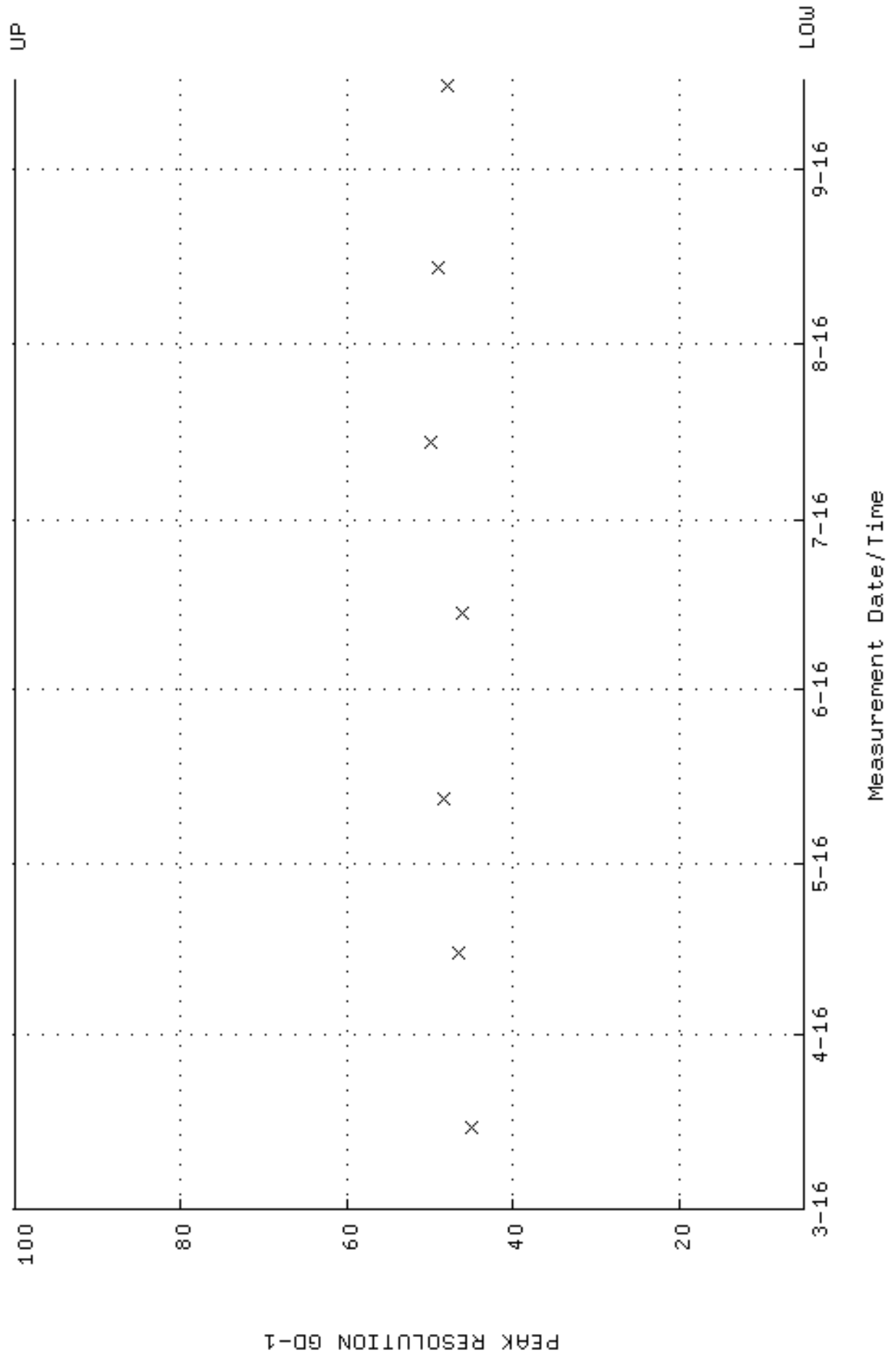
QA filename : DKA100:[ENV_ALPHA.QA.W]W207.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 15-MAR-2016 08:39:37 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.2566618 through 0.272492



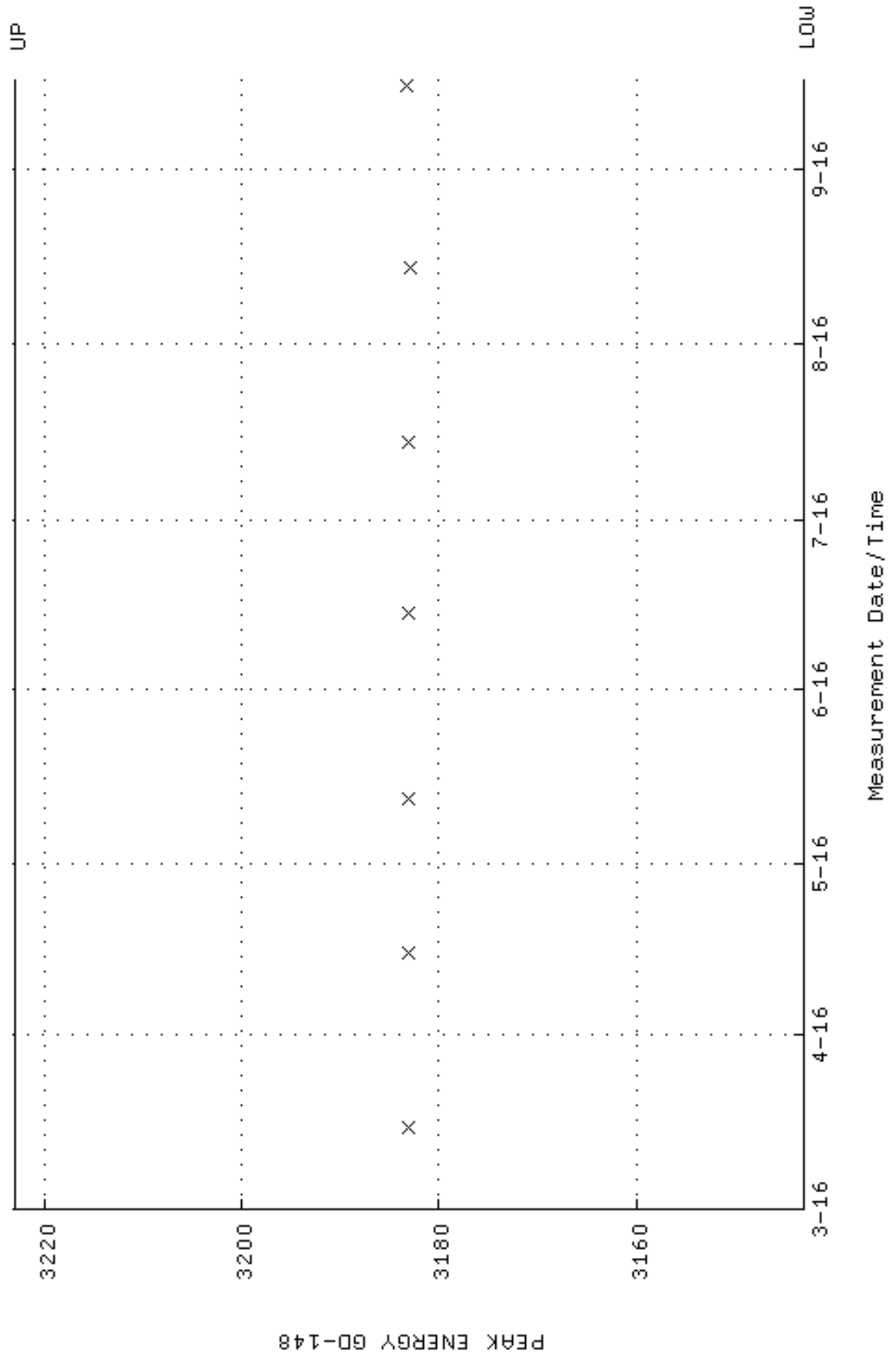
QA filename : DKA100:[ENV_ALPHA.QA.W]w207.QAF;3
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 15-MAR-2016 08:39:37 through 16-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



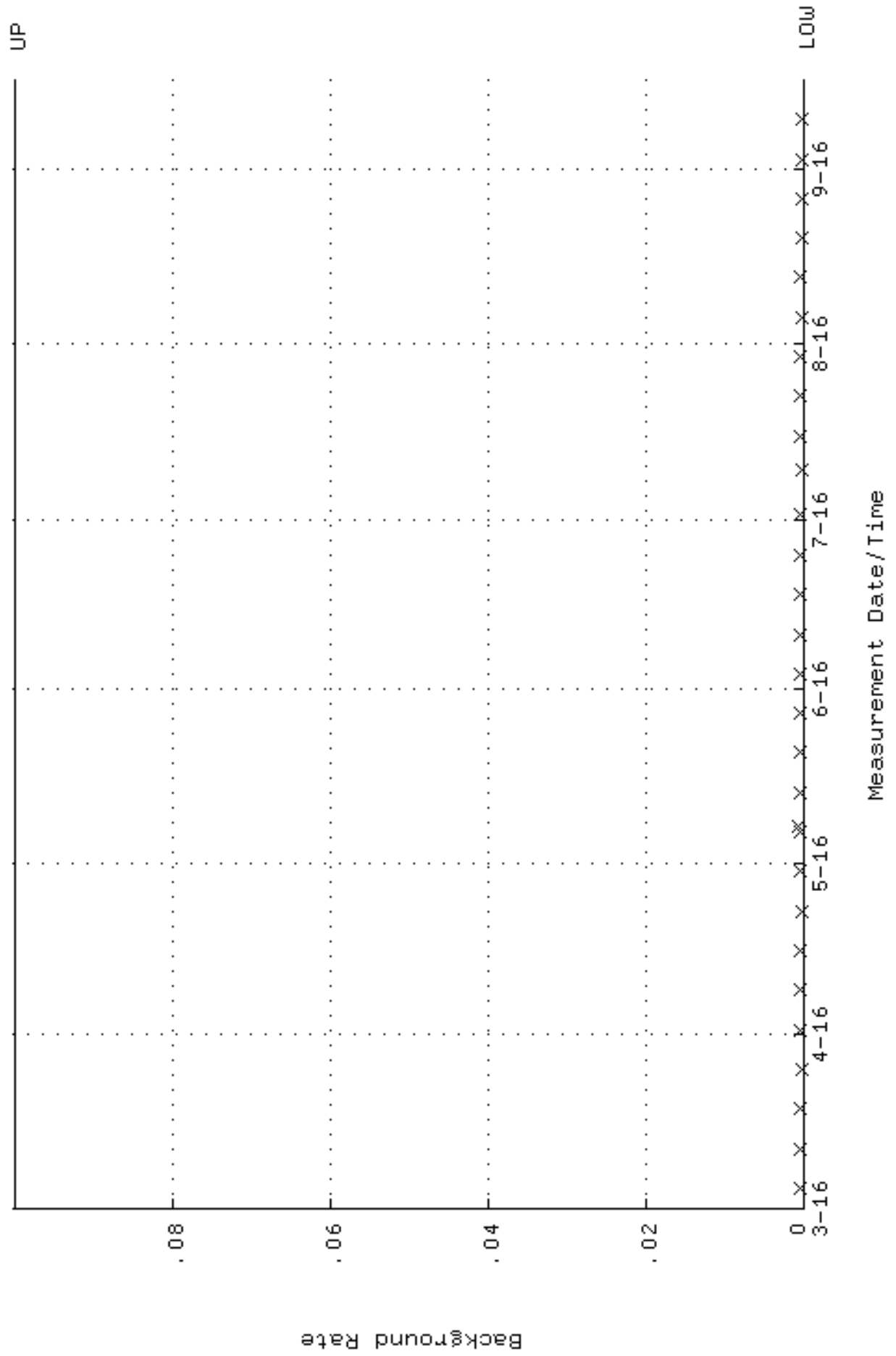
QA filename : DKA100:[ENV_ALPHA.QA.W]W207.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 15-MAR-2016 08:39:37 through 16-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



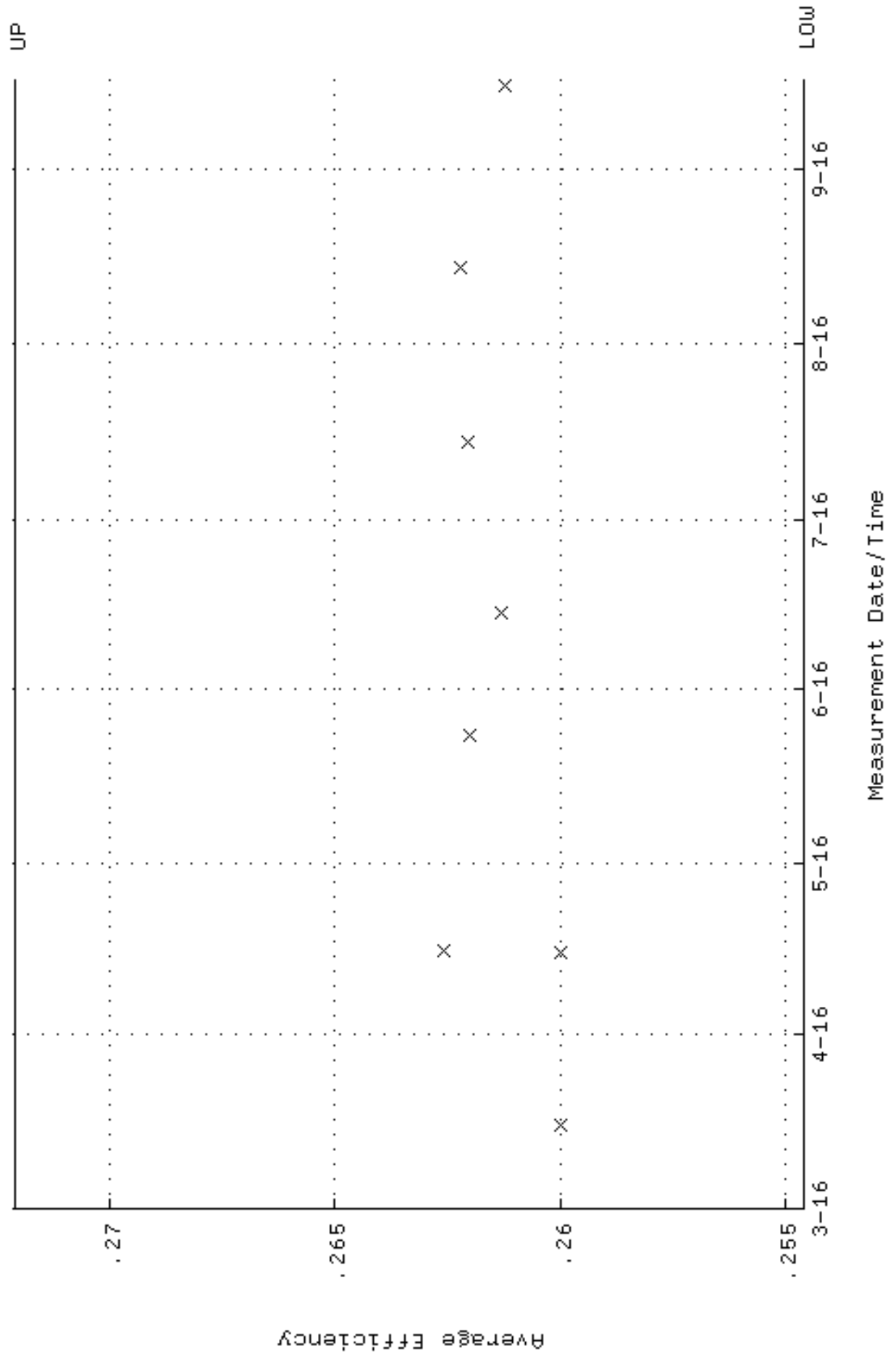
QA filename : DKA100:[ENV_ALPHA.QA.W]W207.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 15-MAR-2016 08:39:37 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



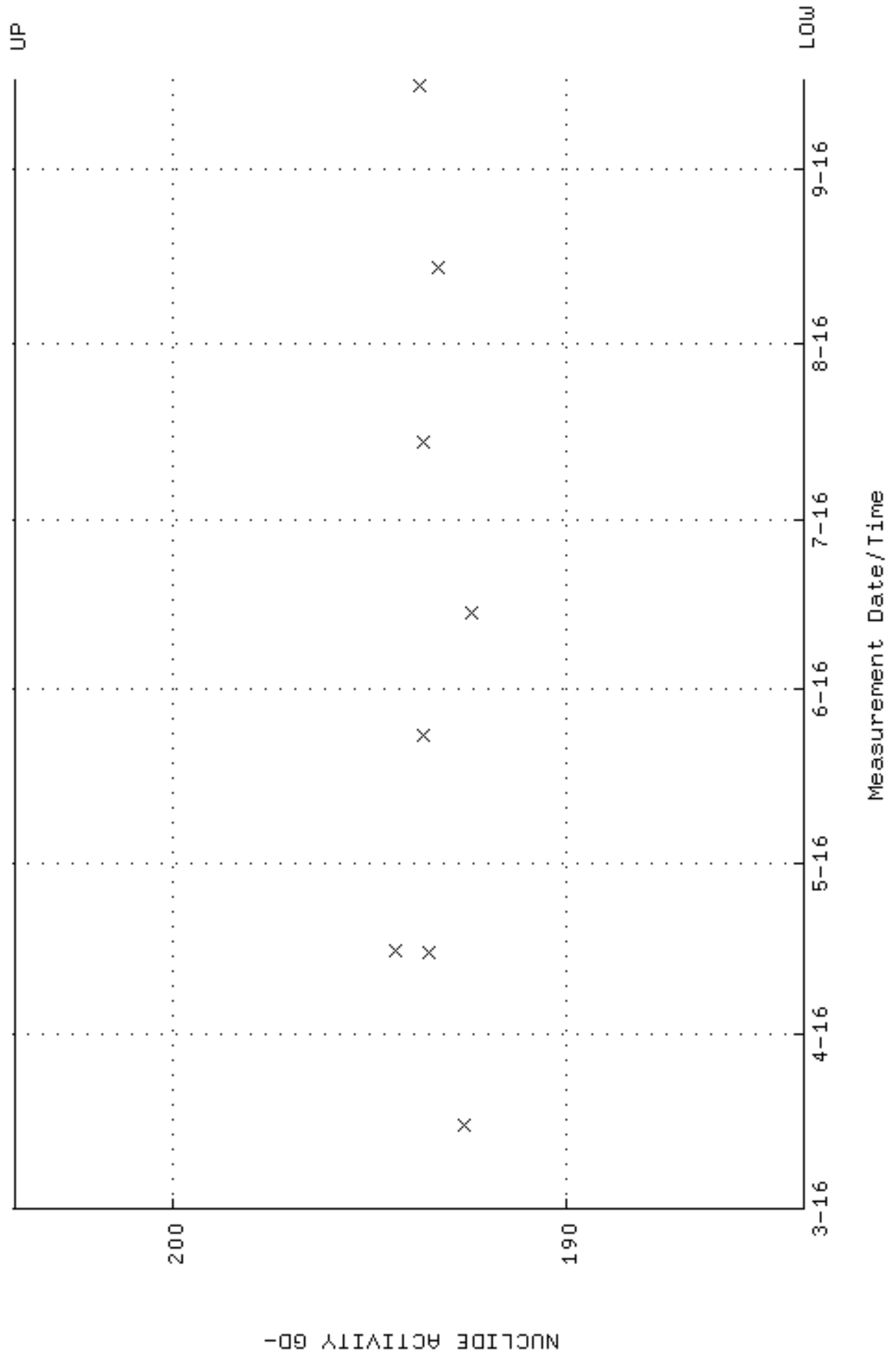
QA filename : DKA100:[ENV_ALPHA.QA.B]B207.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:17:55 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



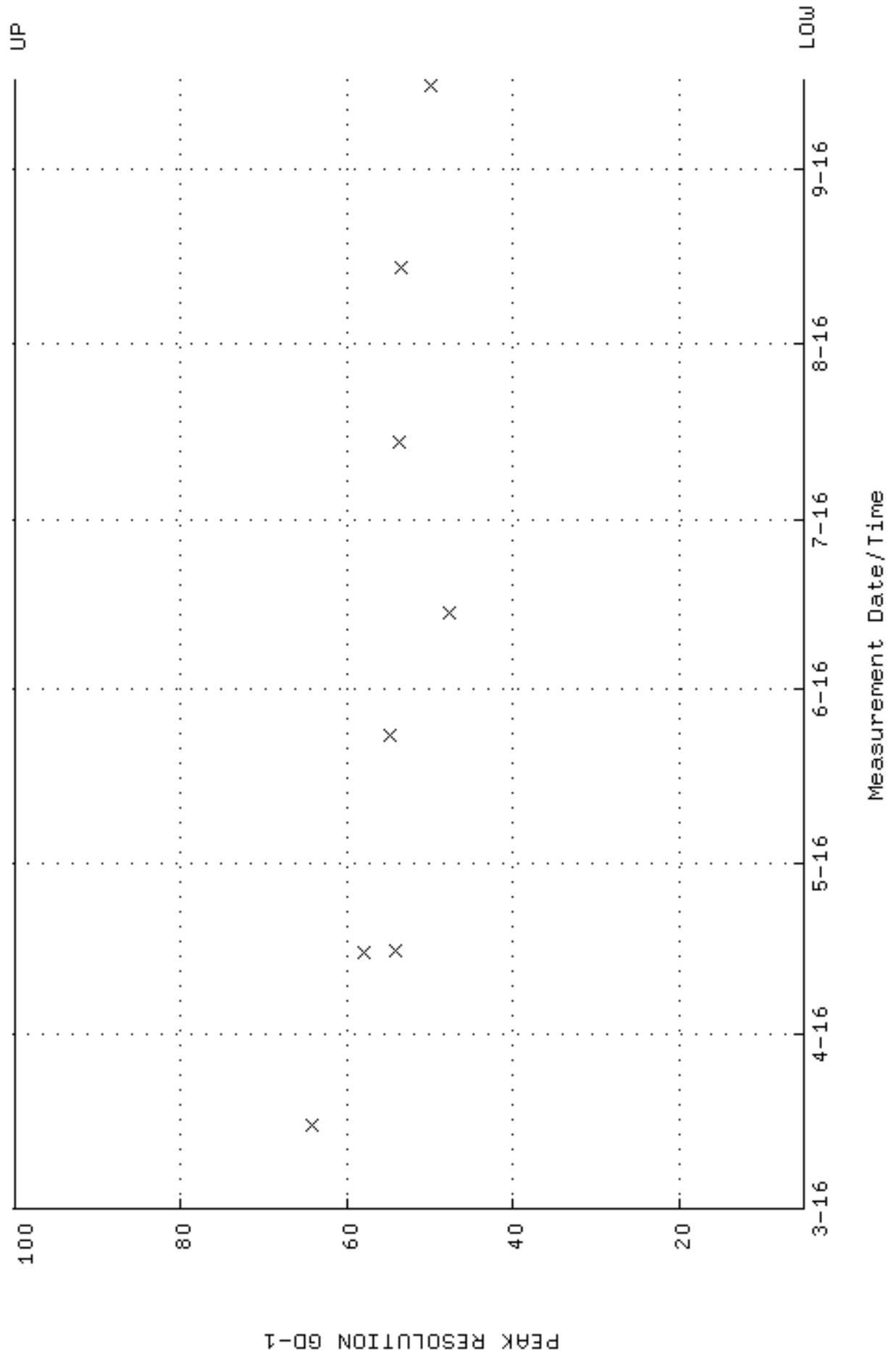
QA filename : DKA100:[ENV_ALPHA.QA.W]W208.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 15-MAR-2016 16:11:10 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.254591 through 0.272100



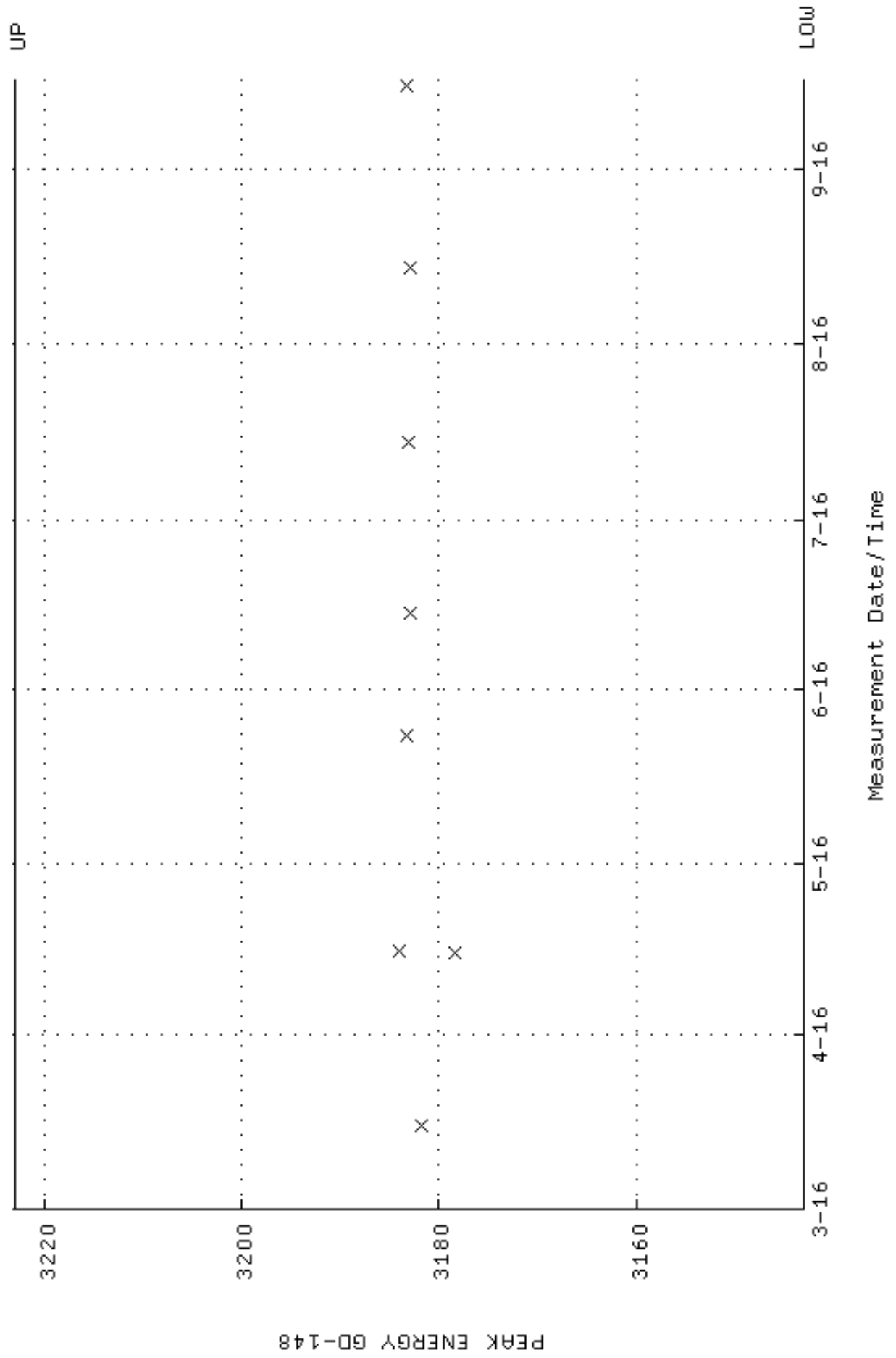
QA filename : DKA100:[ENV_ALPHA.QA.W]w208.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 15-MAR-2016 16:11:10 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



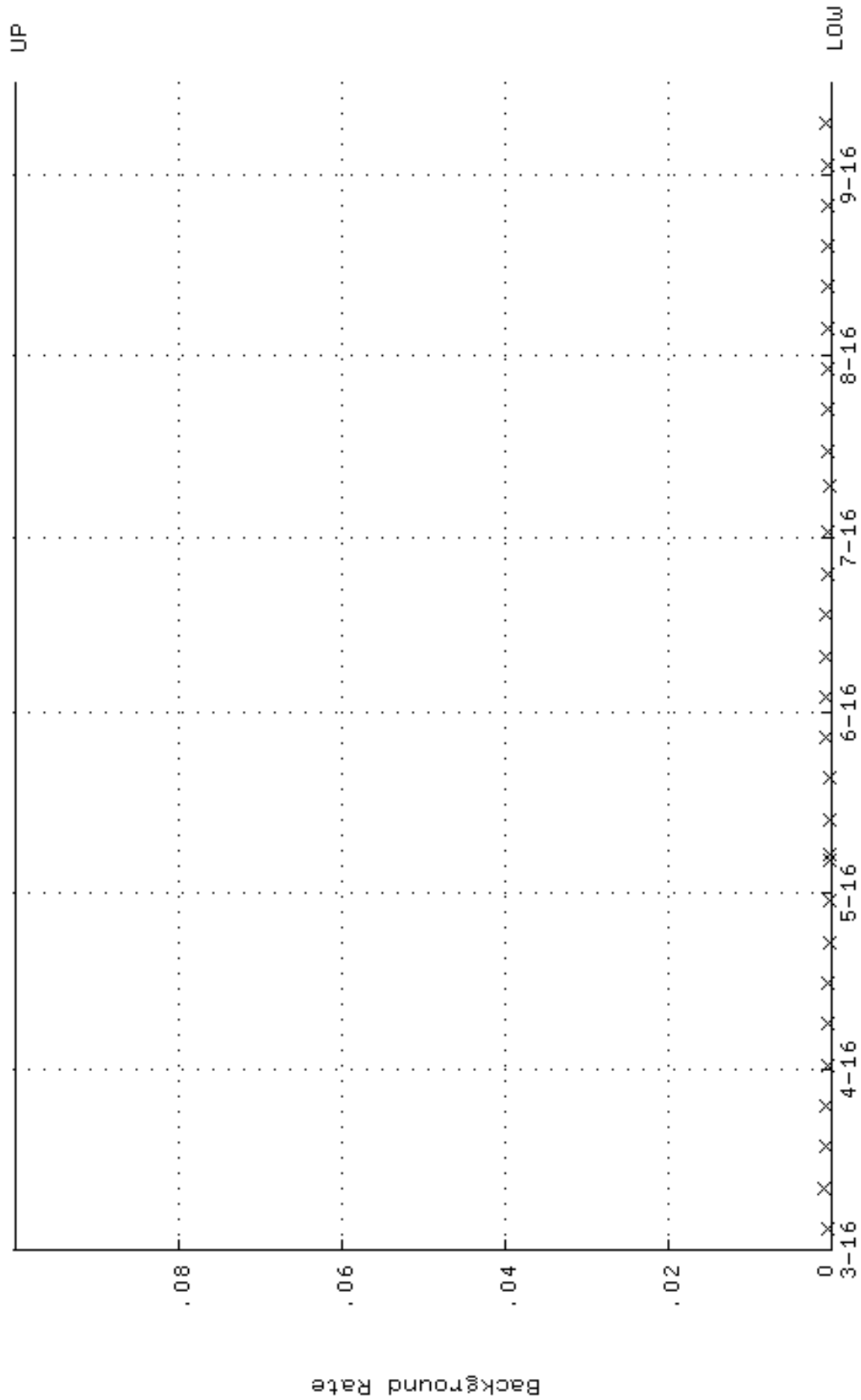
QA filename : DKA100:[ENV_ALPHA.QA.W]W208.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 15-MAR-2016 16:11:10 through 16-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



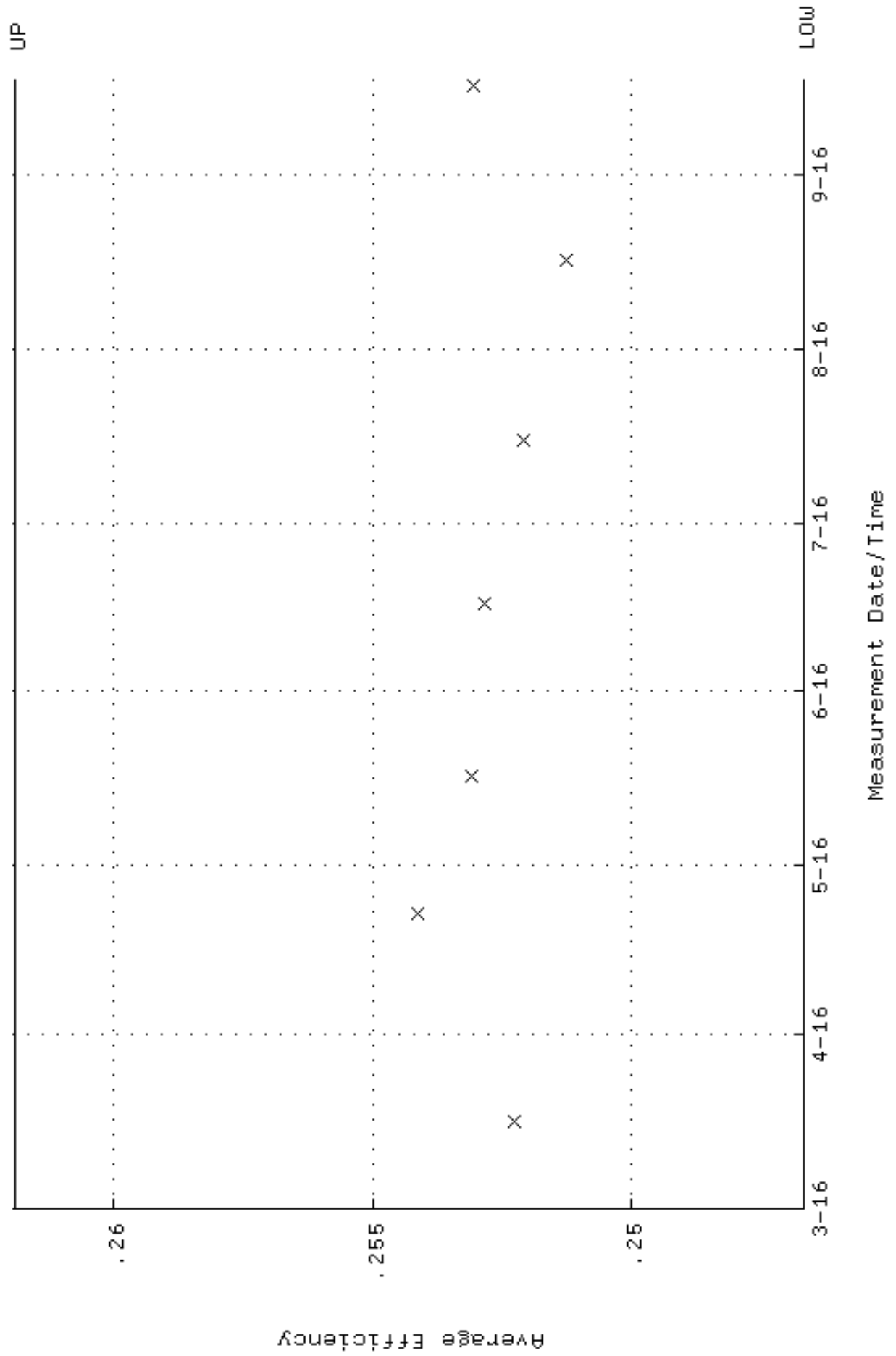
QA filename : DKA100:[ENV_ALPHA.QA.W]w208.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 15-MAR-2016 16:11:10 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



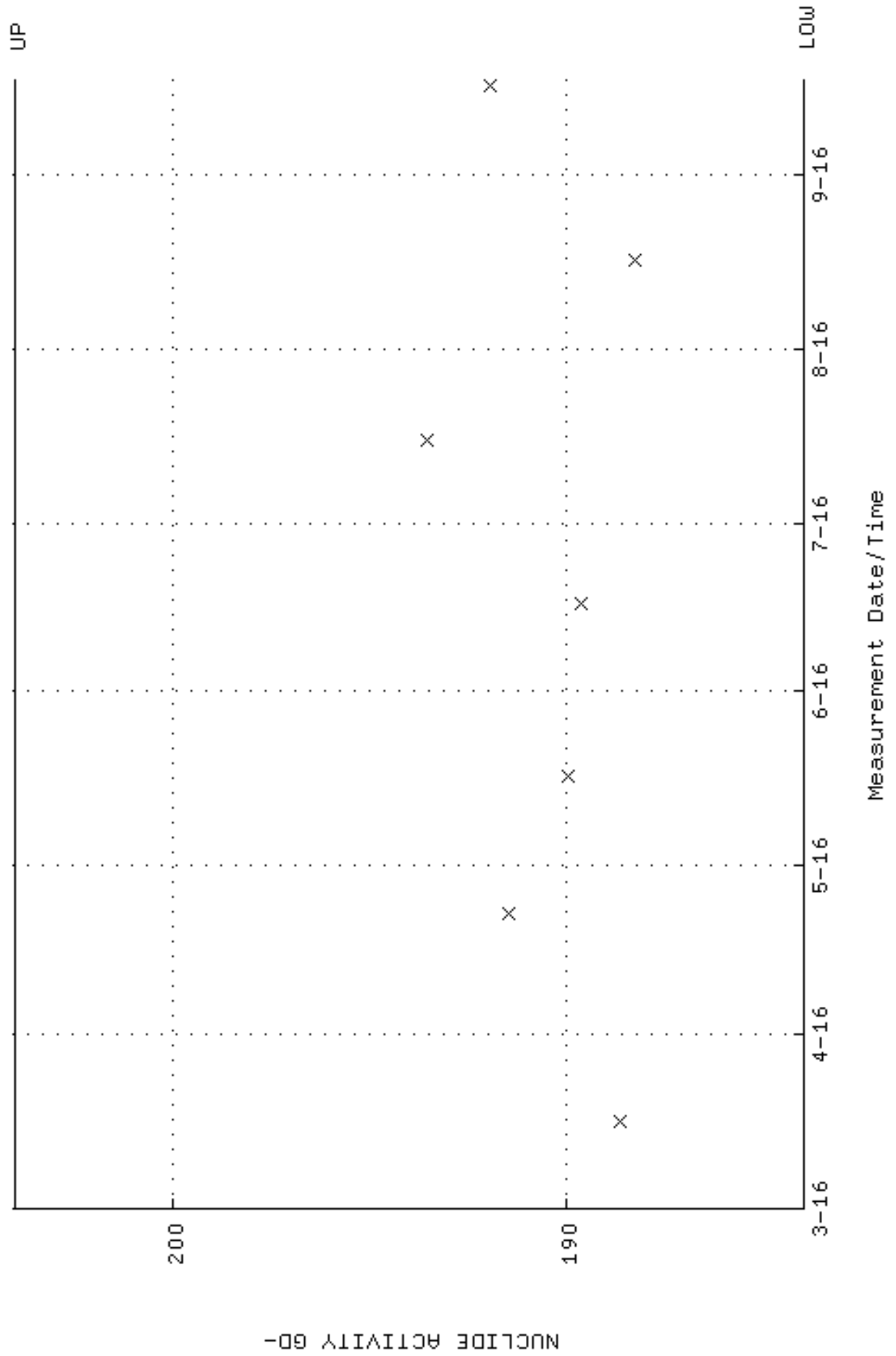
QA filename : DKA100:[ENV_ALPHA.QA.B]B208.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:18:00 through 16-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



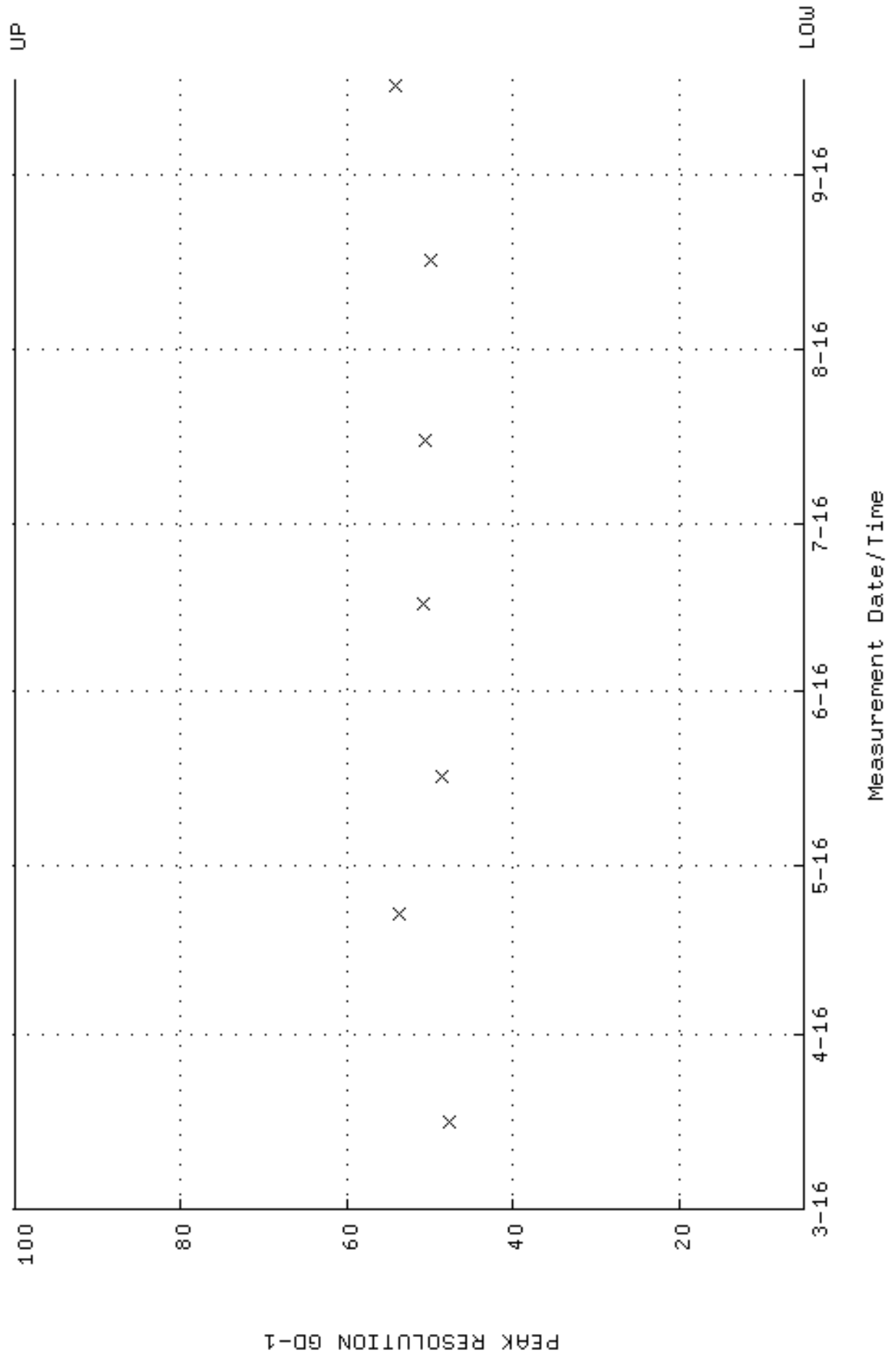
QA filename : DKA100:[ENV_ALPHA.QA.W]W210.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 16-MAR-2016 08:35:29 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.246659 through 0.261915



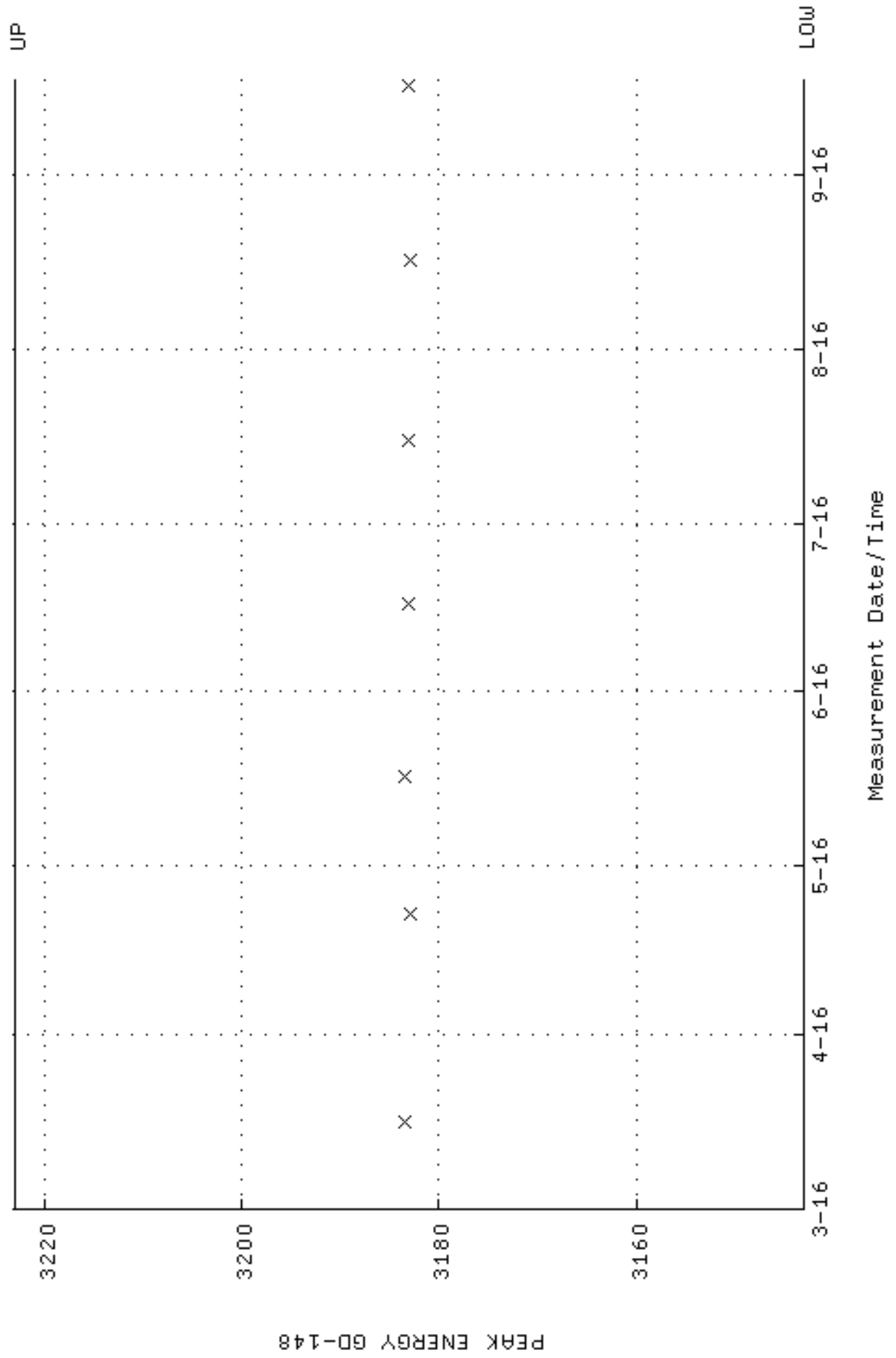
QA filename : DKA100:[ENV_ALPHA.QA.W]W210.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 16-MAR-2016 08:35:29 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



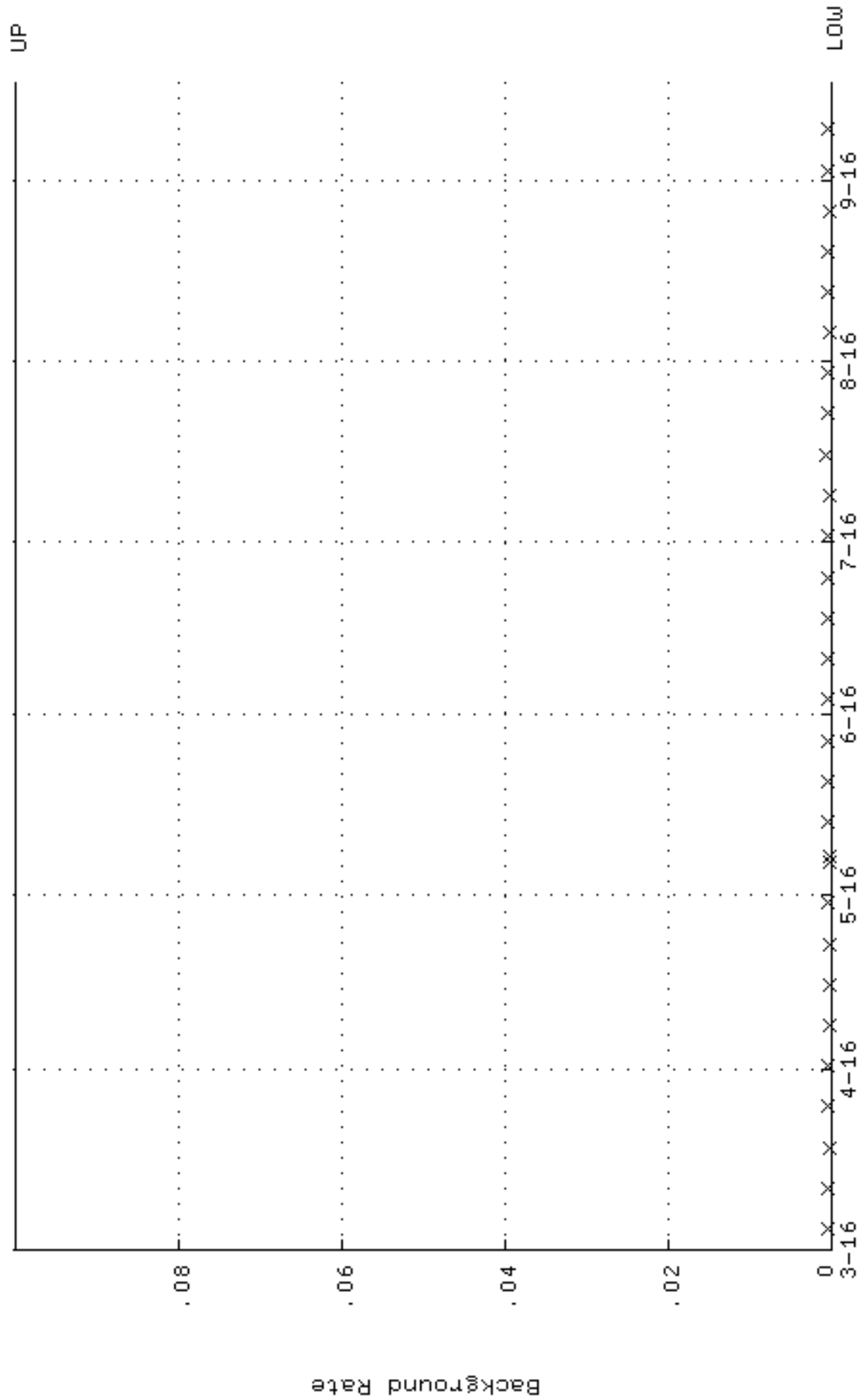
QA filename : DKA100:[ENV_ALPHA.QA.W]W210.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 16-MAR-2016 08:35:29 through 17-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



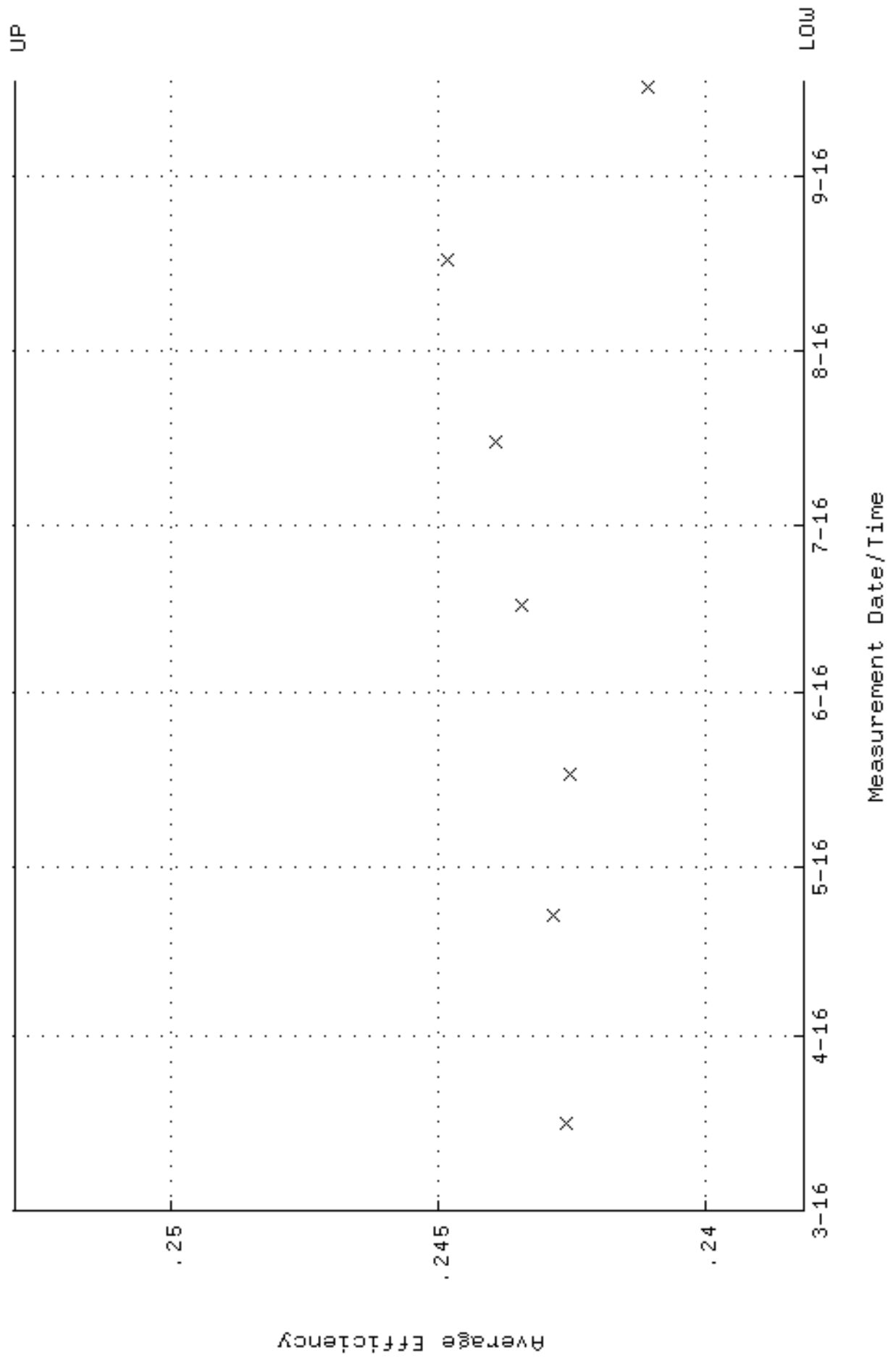
QA filename : DKA100:[ENV_ALPHA.QA.W]W210.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 16-MAR-2016 08:35:29 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



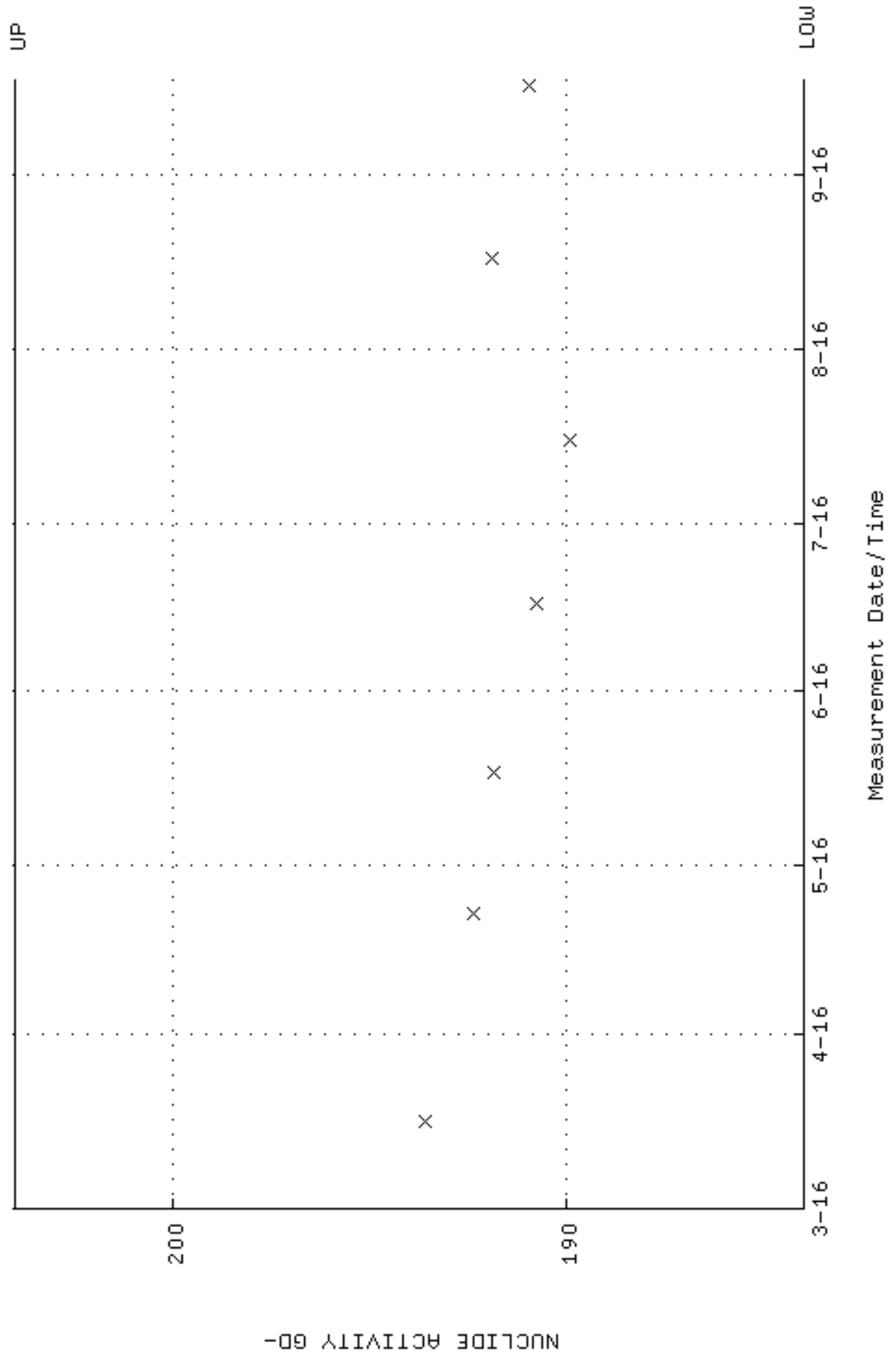
QA filename : DKA100:[ENV_ALPHA.QA.B]B210.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:31:04 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



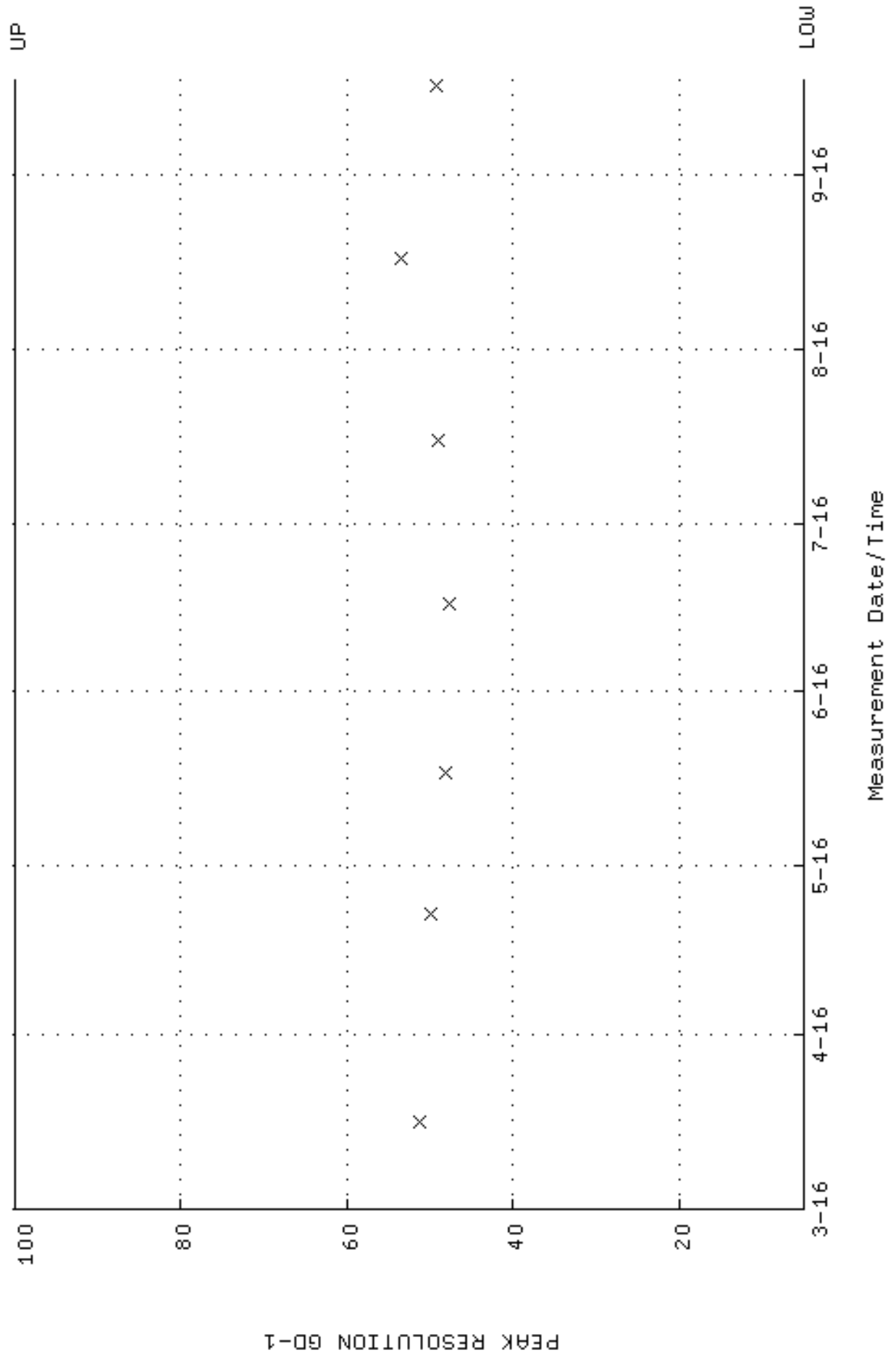
QA filename : DKA100:[ENV_ALPHA.QA.W]W211.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 16-MAR-2016 08:35:34 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.238175 through 0.252907



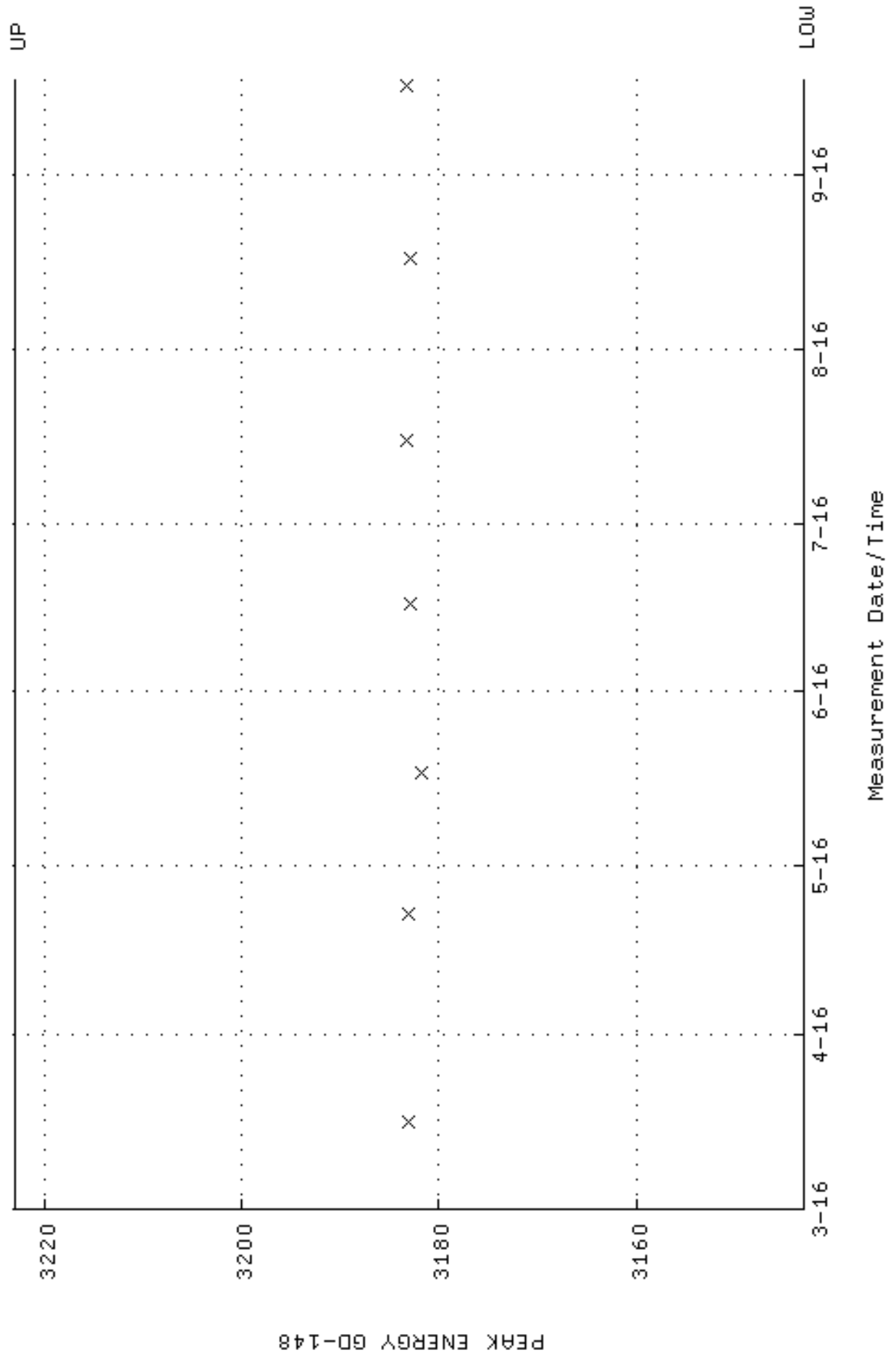
QA filename : DKA100:[ENV_ALPHA.QA.W]w211.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 16-MAR-2016 08:35:34 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



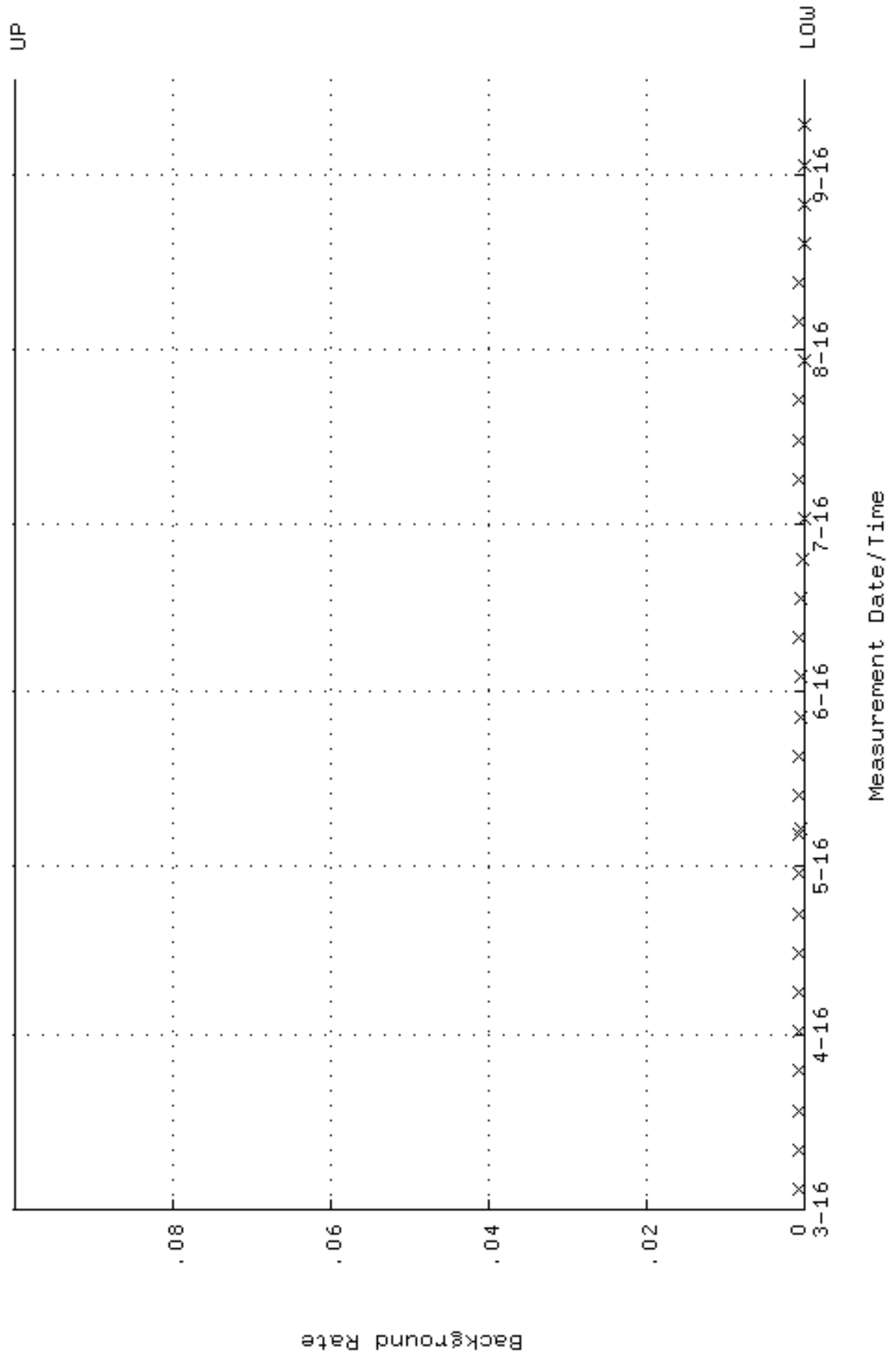
QA filename : DKA100:[ENV_ALPHA.QA.W]W211.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 16-MAR-2016 08:35:34 through 17-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



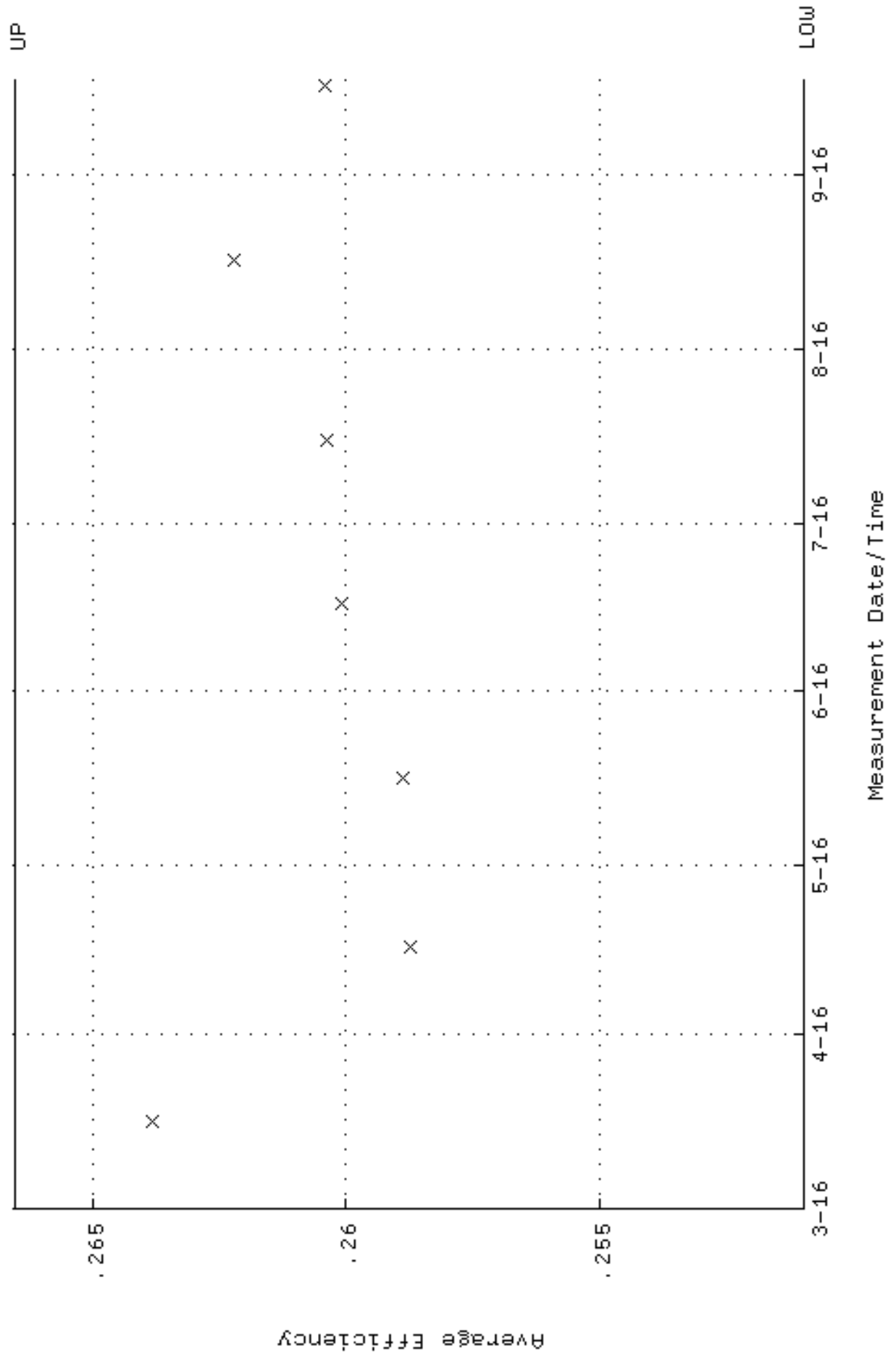
QA filename : DKA100:[ENV_ALPHA.QA.W]W211.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 16-MAR-2016 08:35:34 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



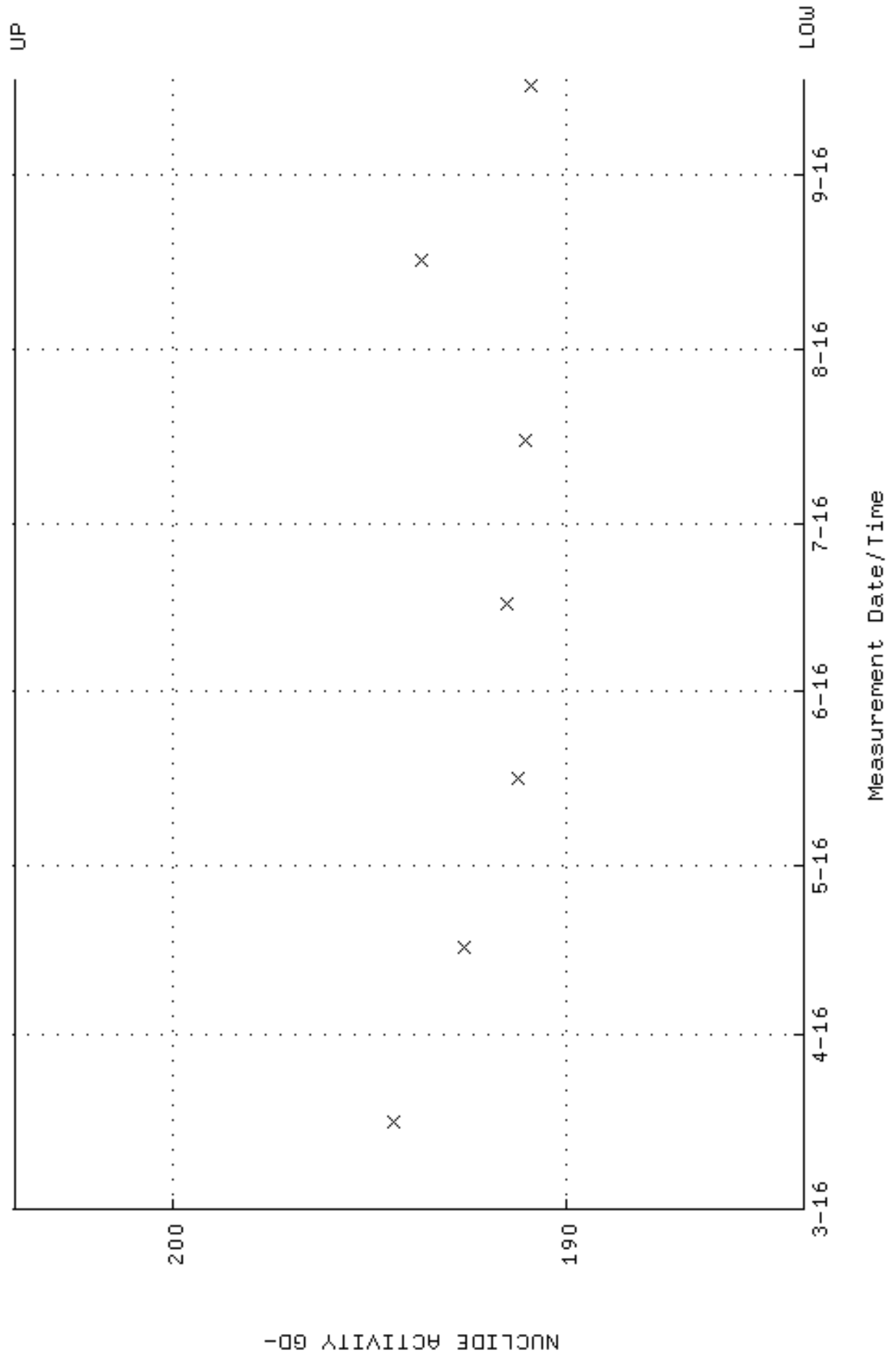
QA filename : DKA100:[ENV_ALPHA.QA.B]B211.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:31:08 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



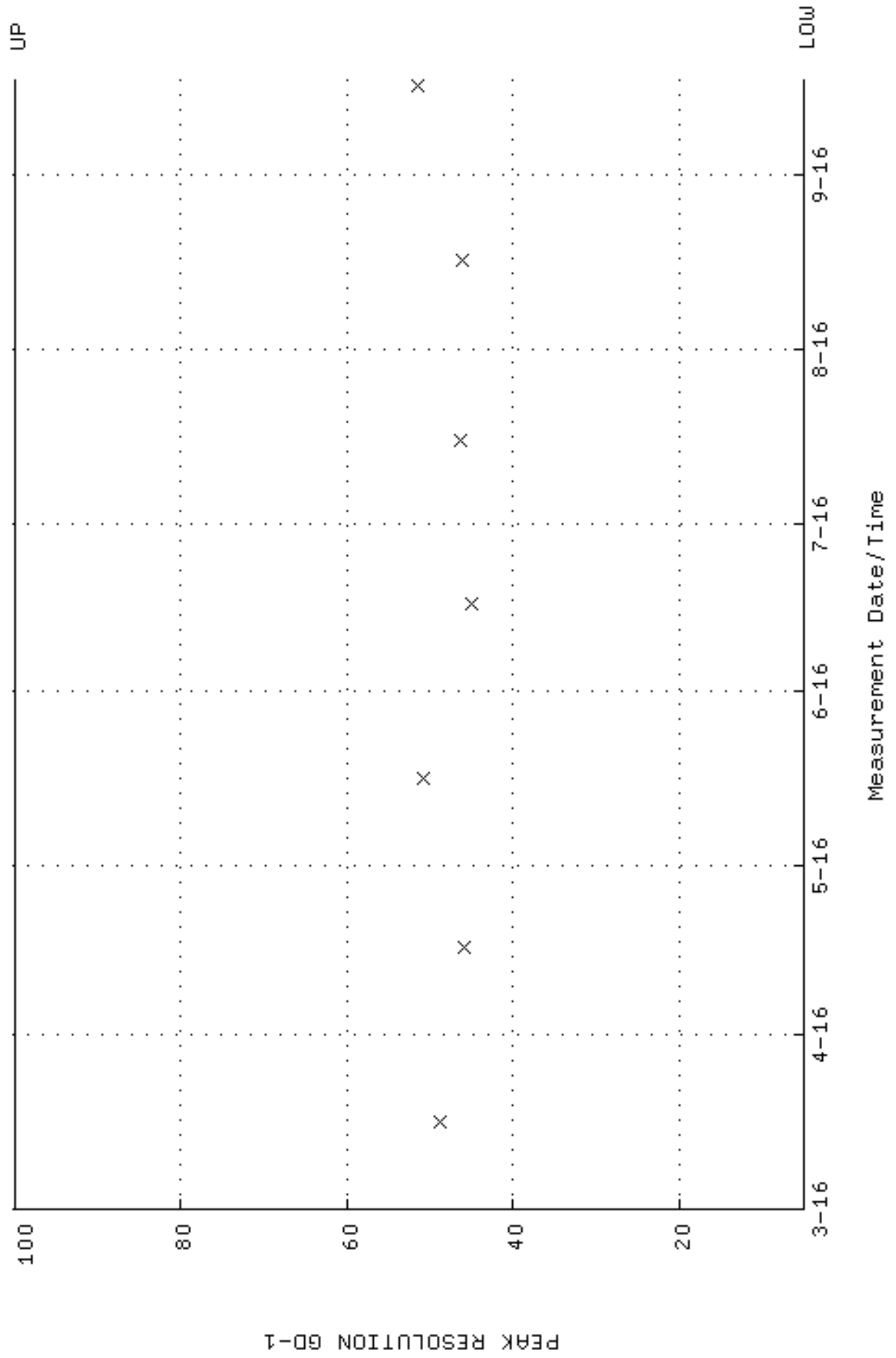
QA filename : DKA100:[ENV_ALPHA.QA.W]W212.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 16-MAR-2016 08:35:38 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.250992 through 0.266518



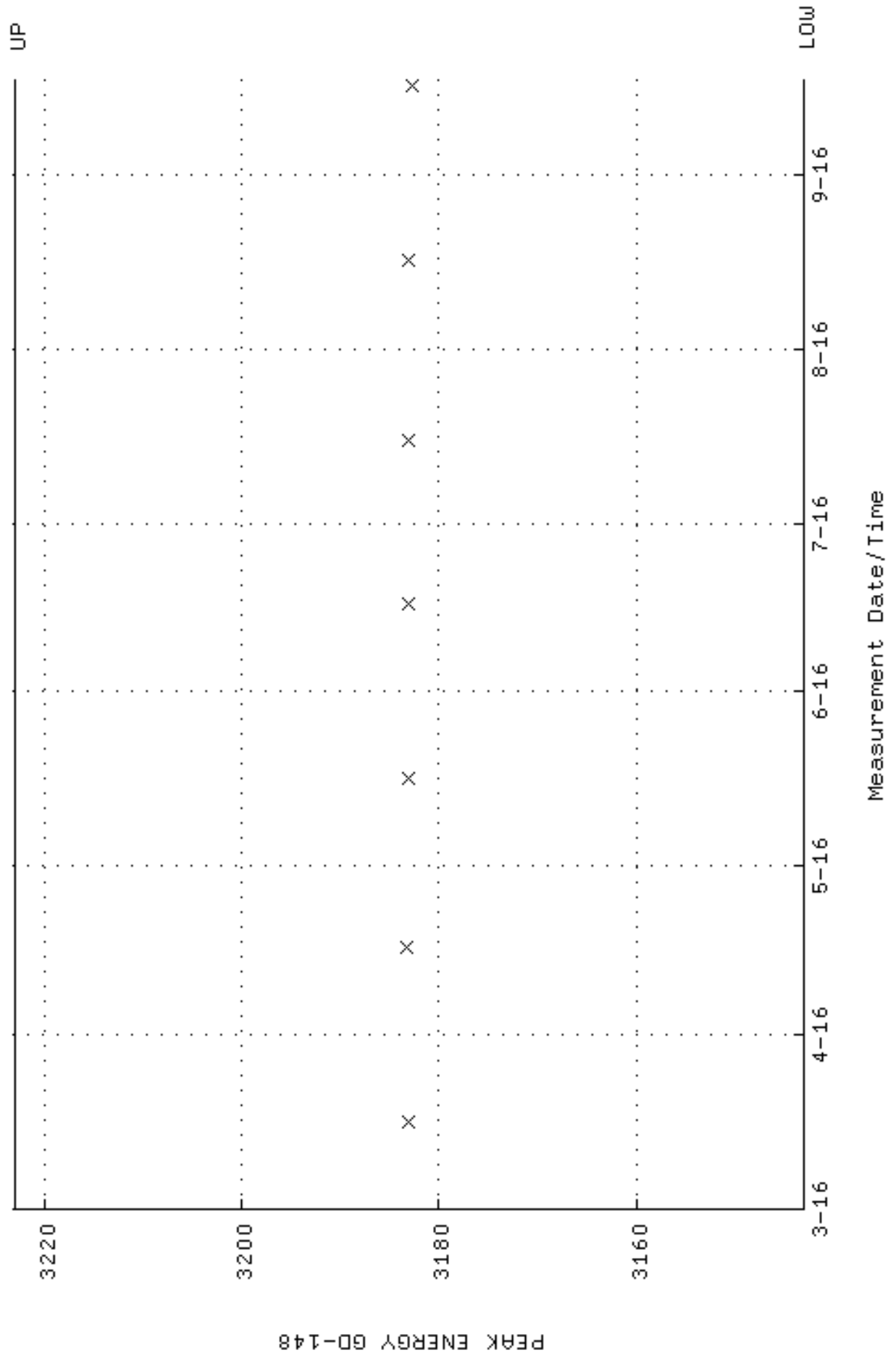
QA filename : DKA100:[ENV_ALPHA.QA.W]w212.QAF;3
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 16-MAR-2016 08:35:38 through 17-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



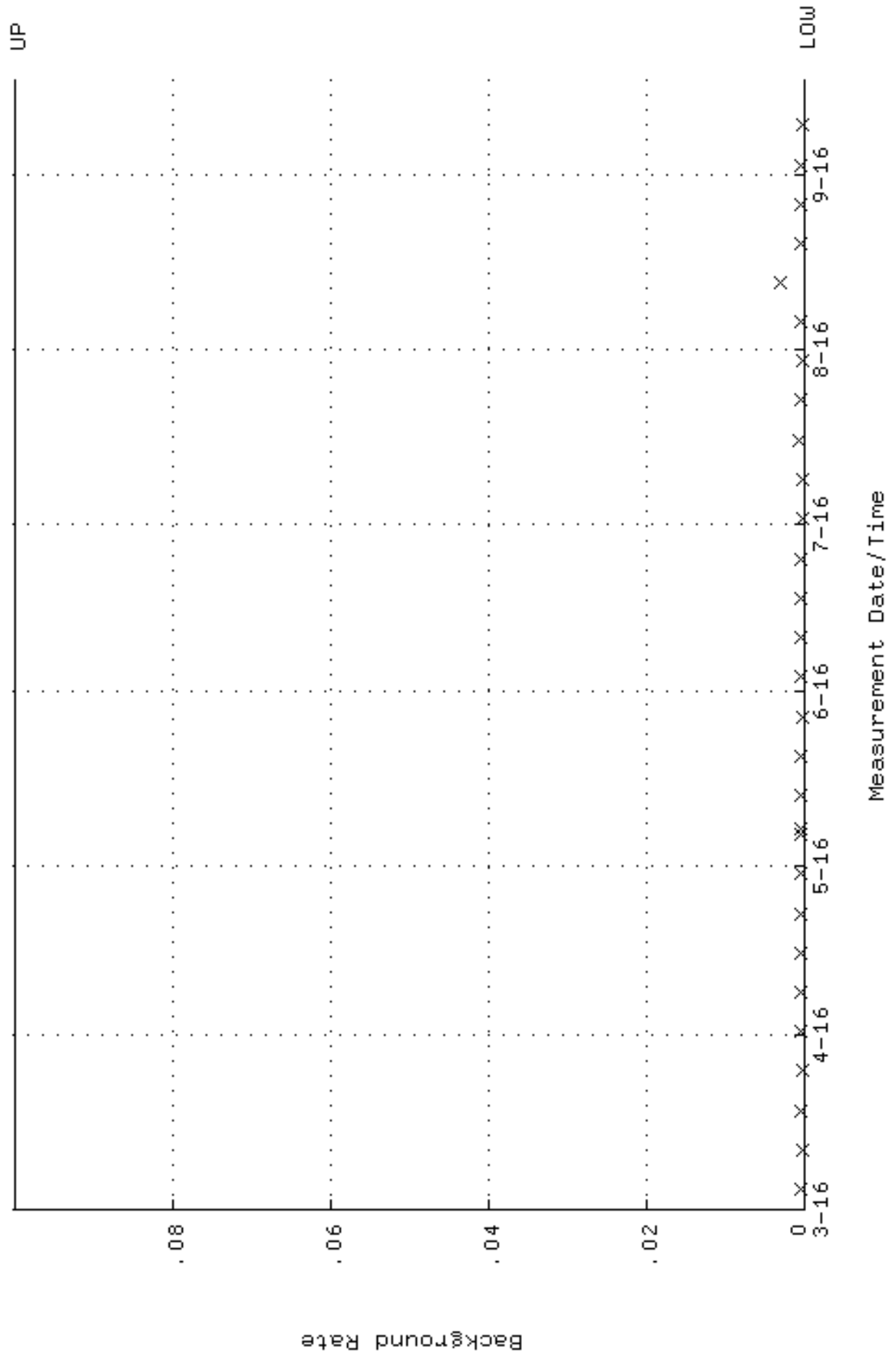
QA filename : DKA100:[ENV_ALPHA.QA.W]W212.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 16-MAR-2016 08:35:38 through 17-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



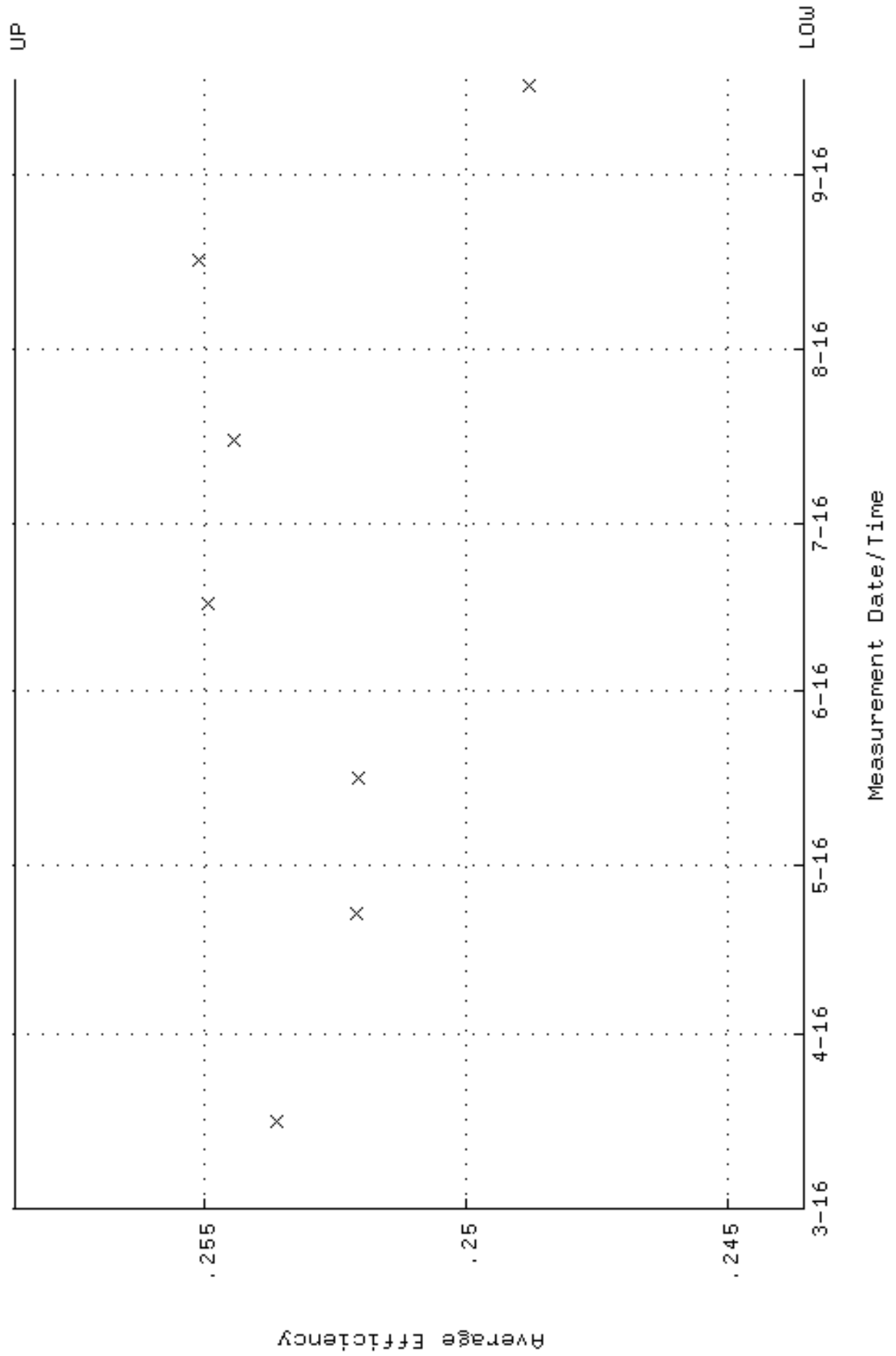
QA filename : DKA100:[ENV_ALPHA.QA.W]W212.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 16-MAR-2016 08:35:38 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



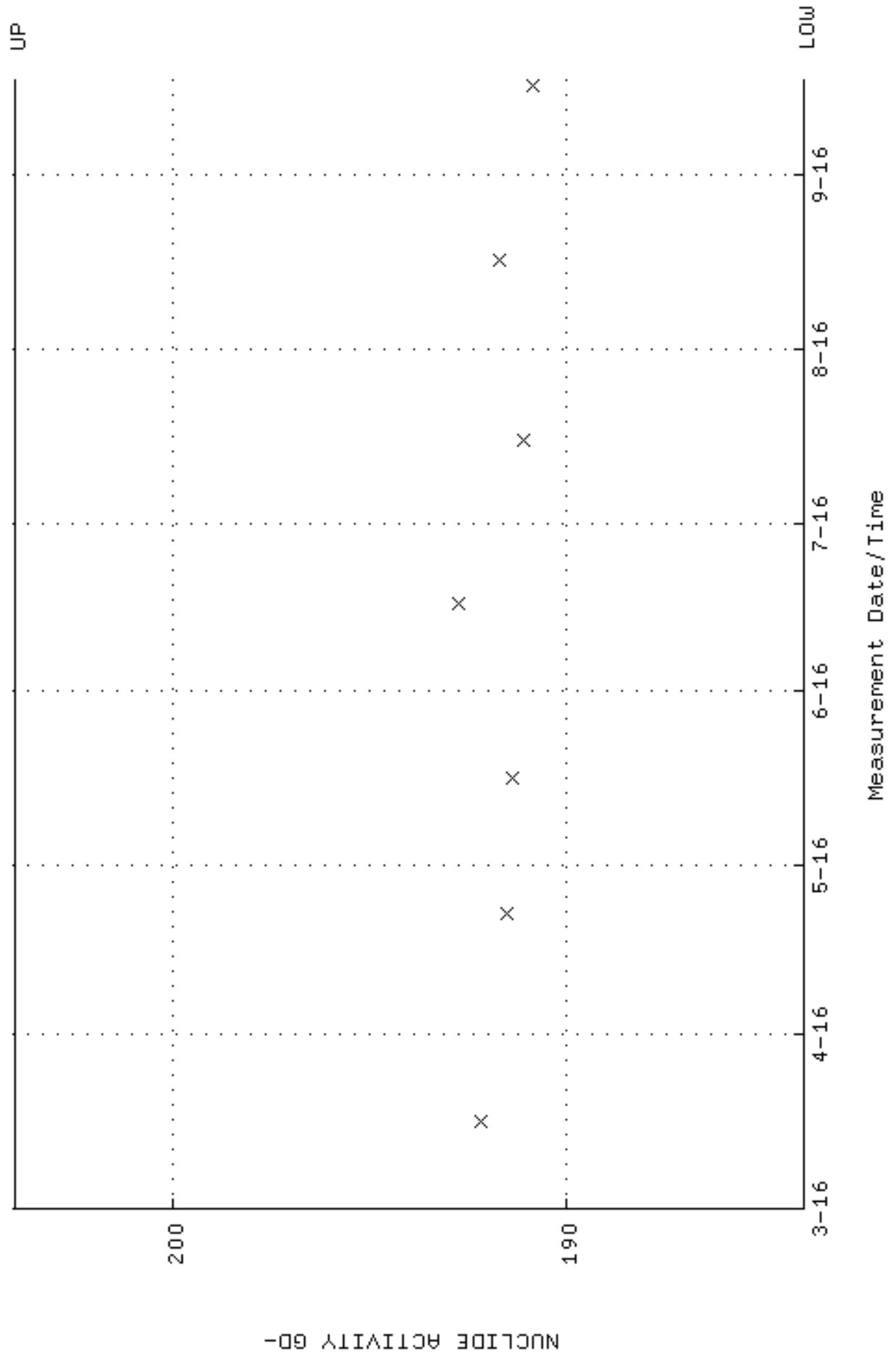
QA filename : DKA100:[ENV_ALPHA.QA.B]B212.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:31:12 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



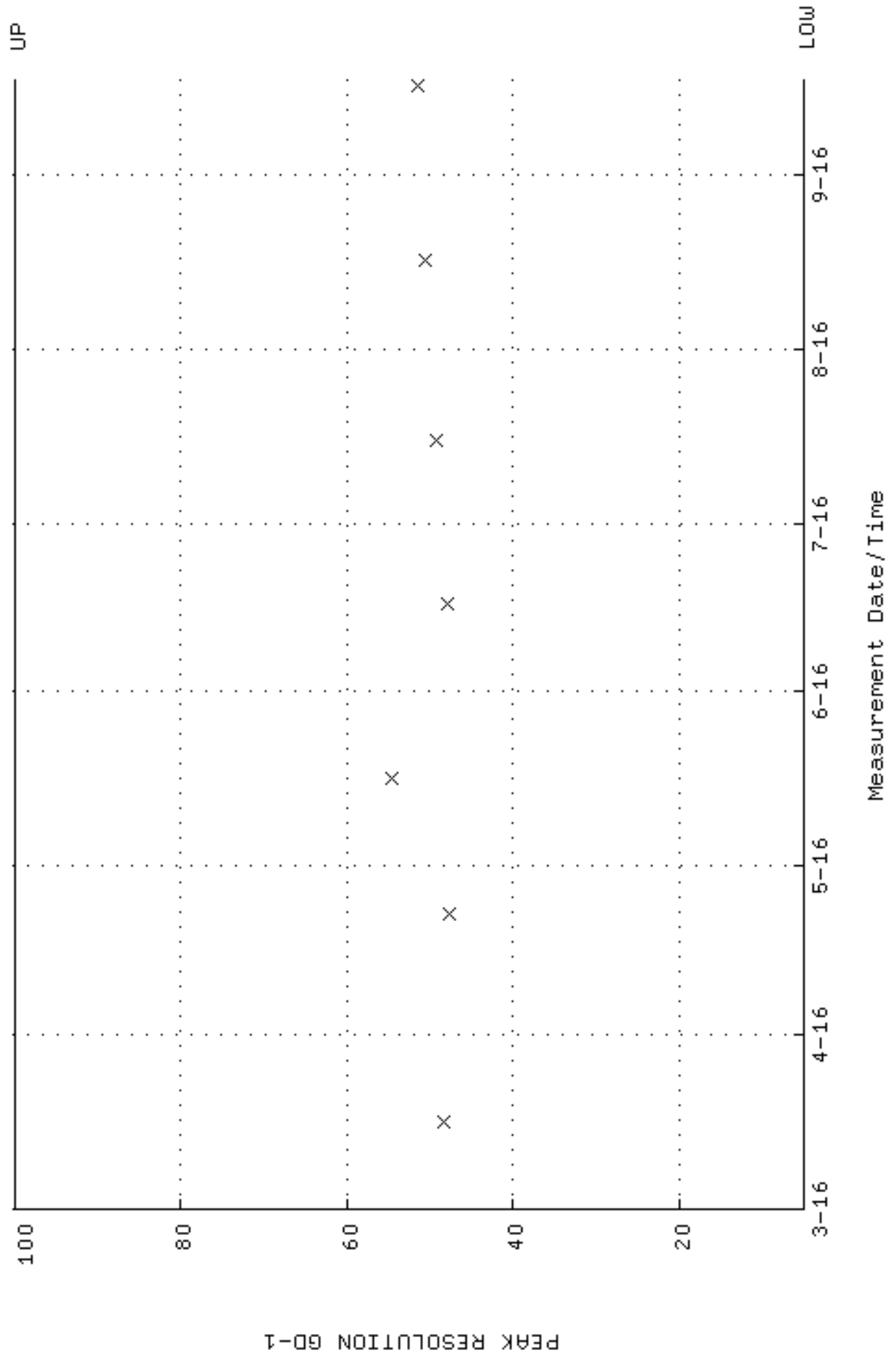
QA filename : DKA100:[ENV_ALPHA.QA.W]W213.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 16-MAR-2016 08:35:43 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.243562 through 0.258628



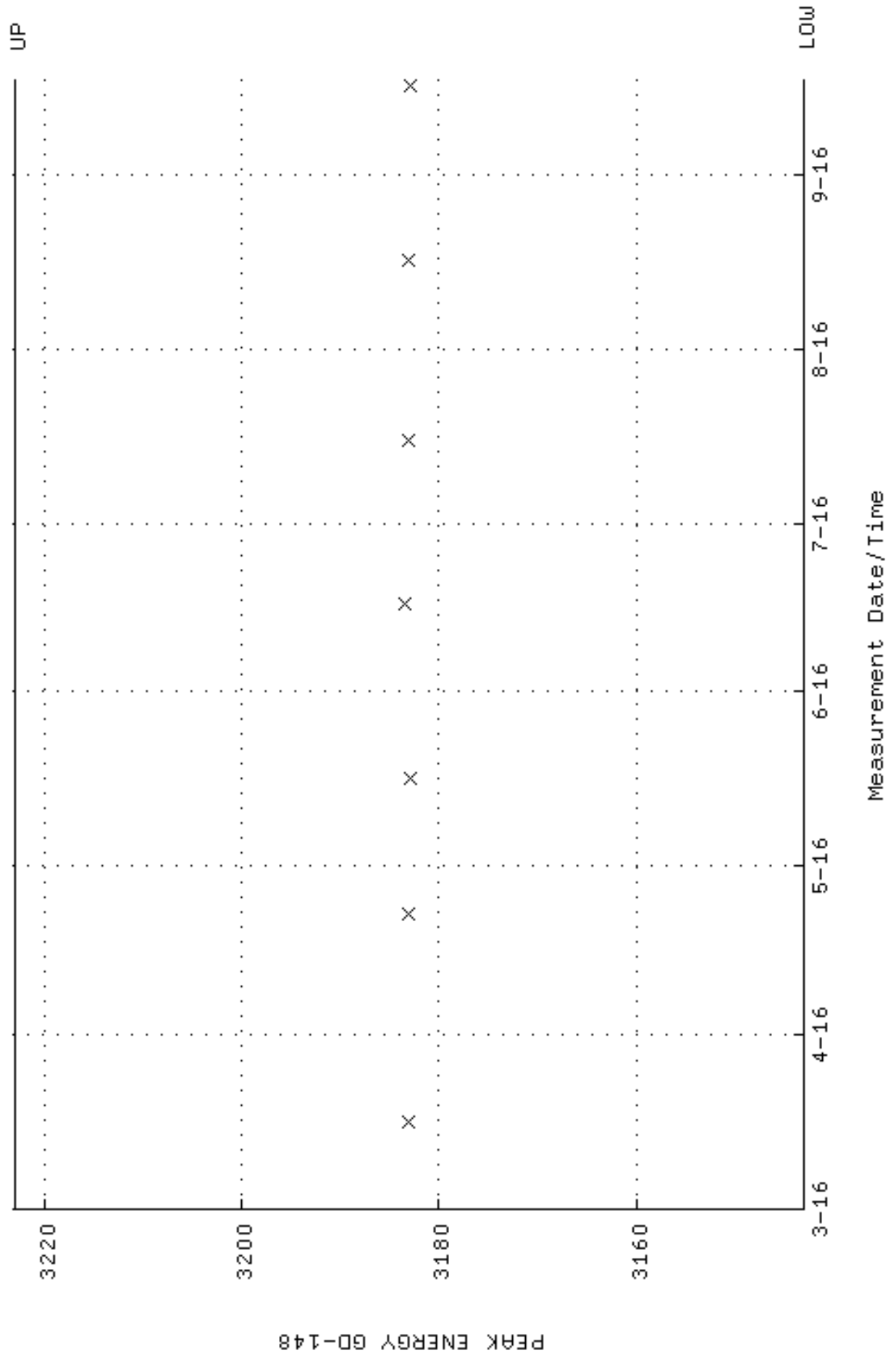
QA filename : DKA100:[ENV_ALPHA.QA.W]w213.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 16-MAR-2016 08:35:43 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



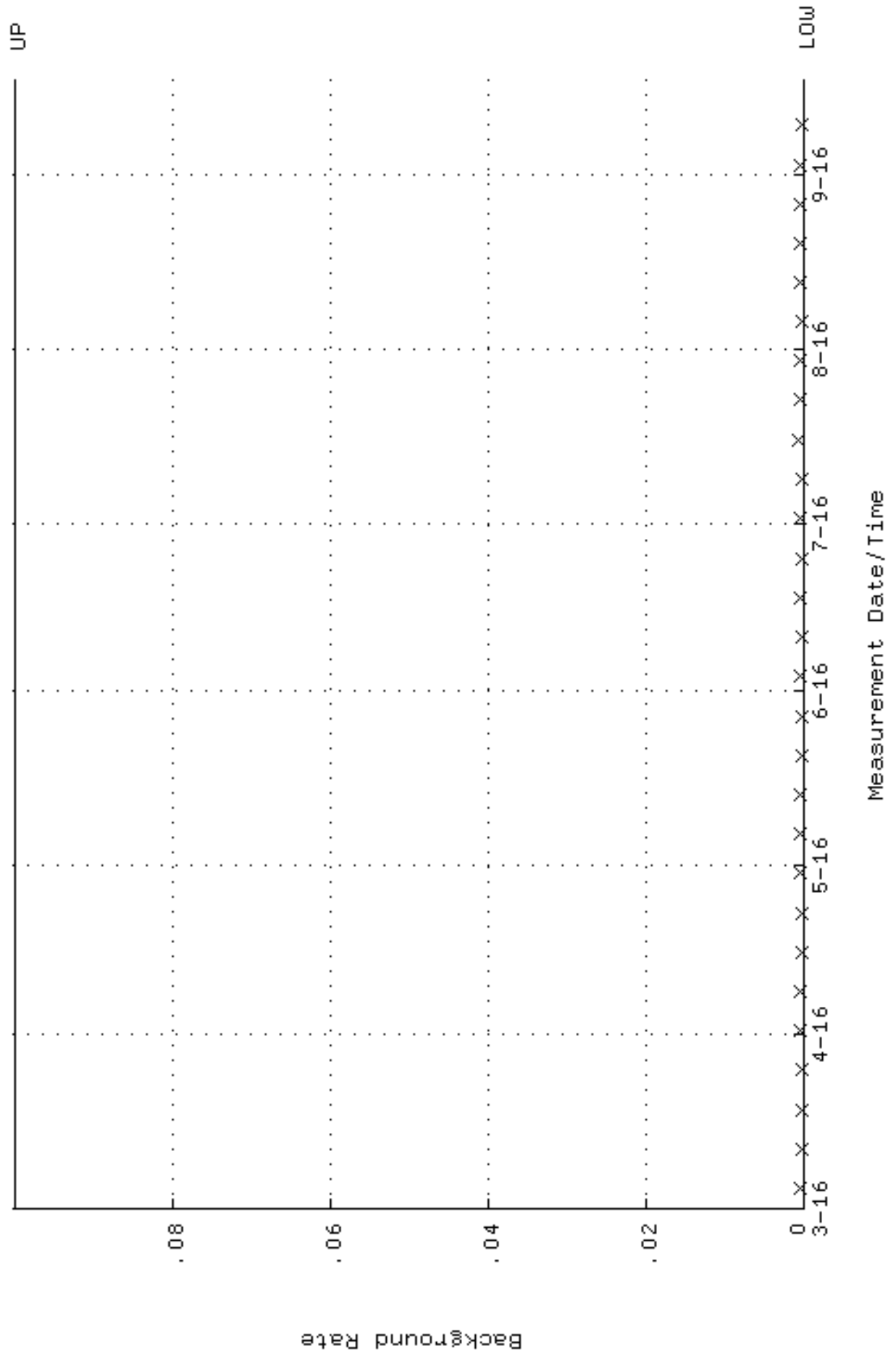
QA filename : DKA100:[ENV_ALPHA.QA.W]W213.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 16-MAR-2016 08:35:43 through 17-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



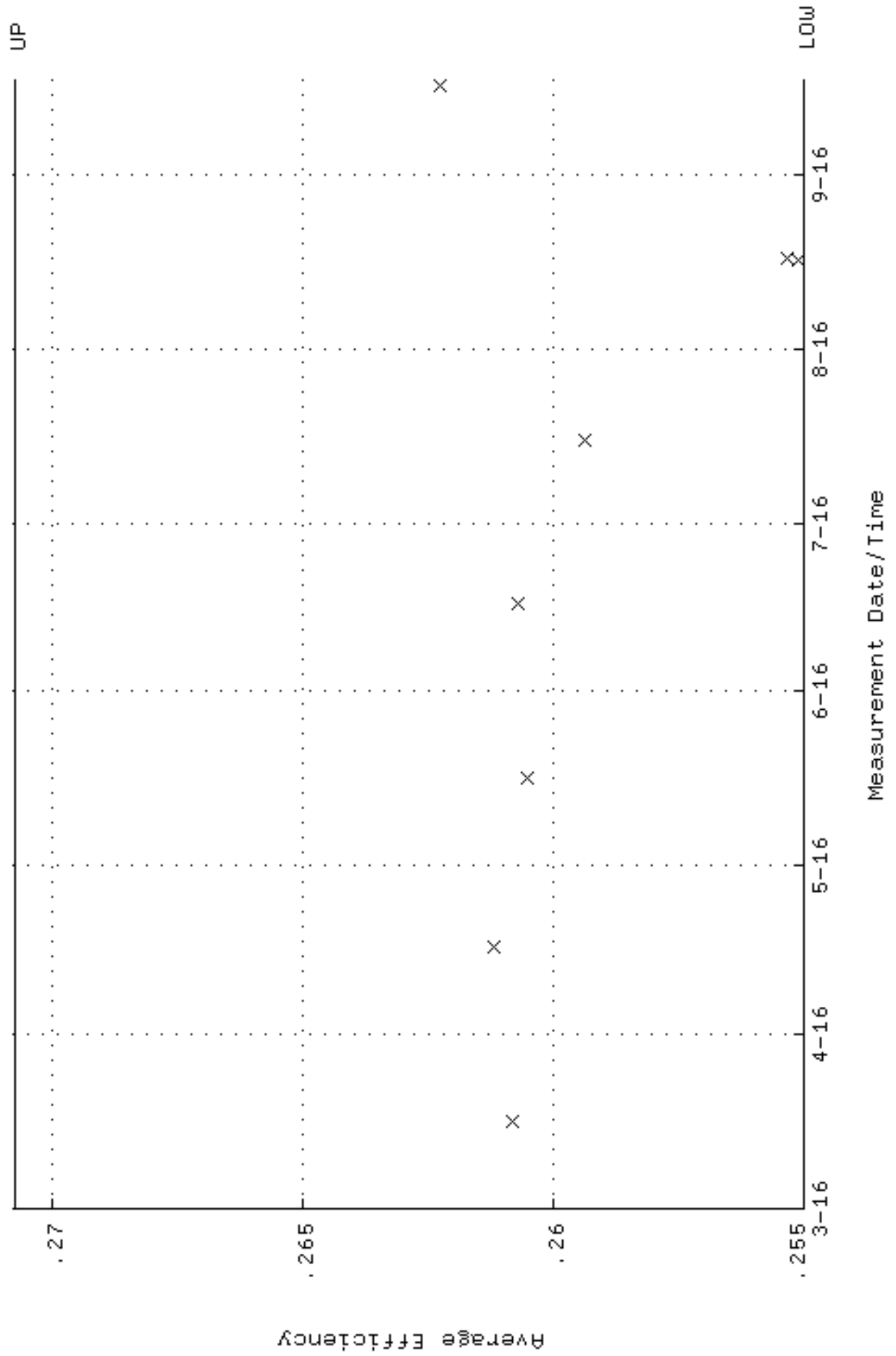
QA filename : DKA100:[ENV_ALPHA.QA.W]W213.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 16-MAR-2016 08:35:43 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



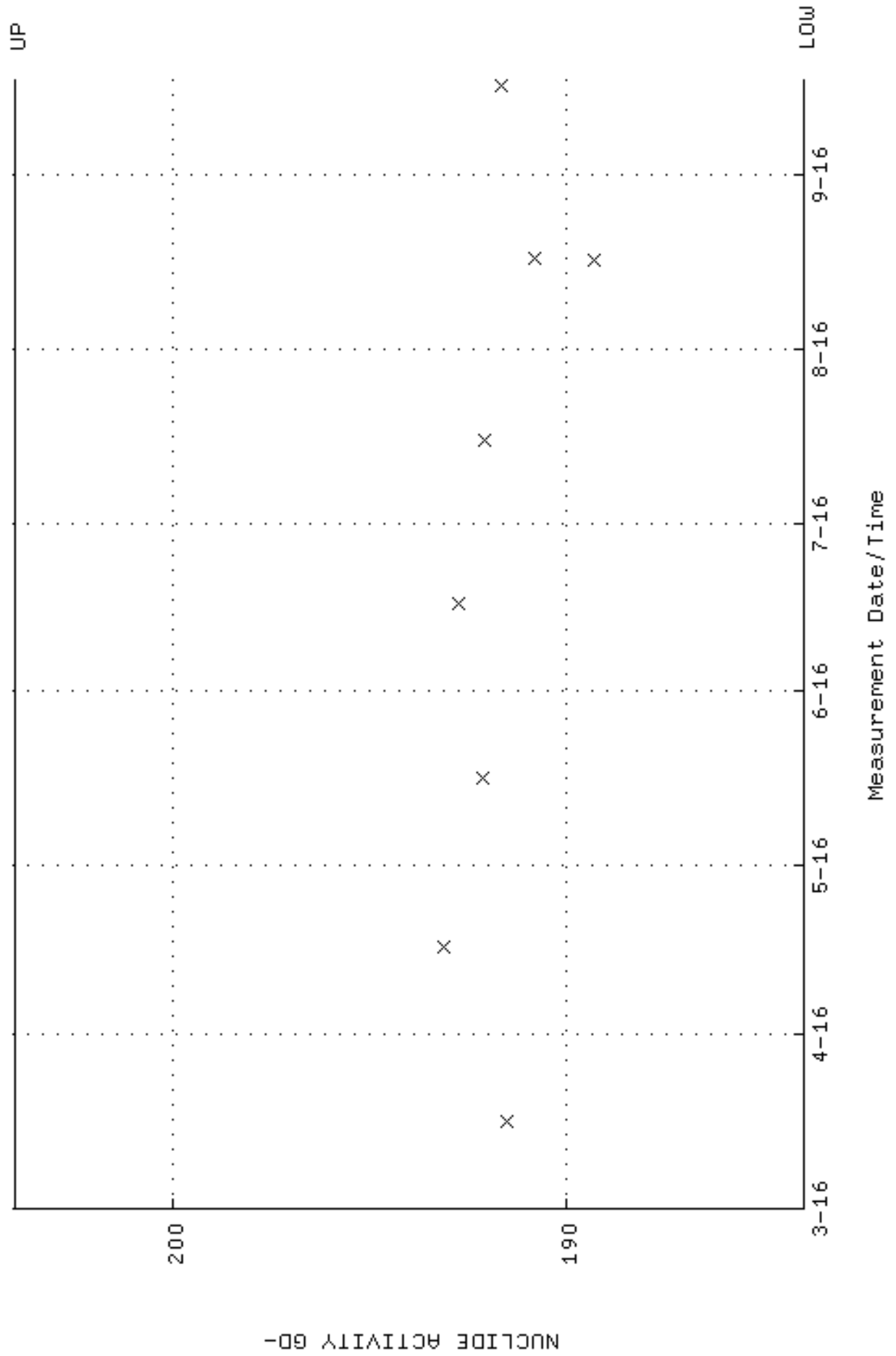
QA filename : DKA100:[ENV_ALPHA.QA.B]B213.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:31:17 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



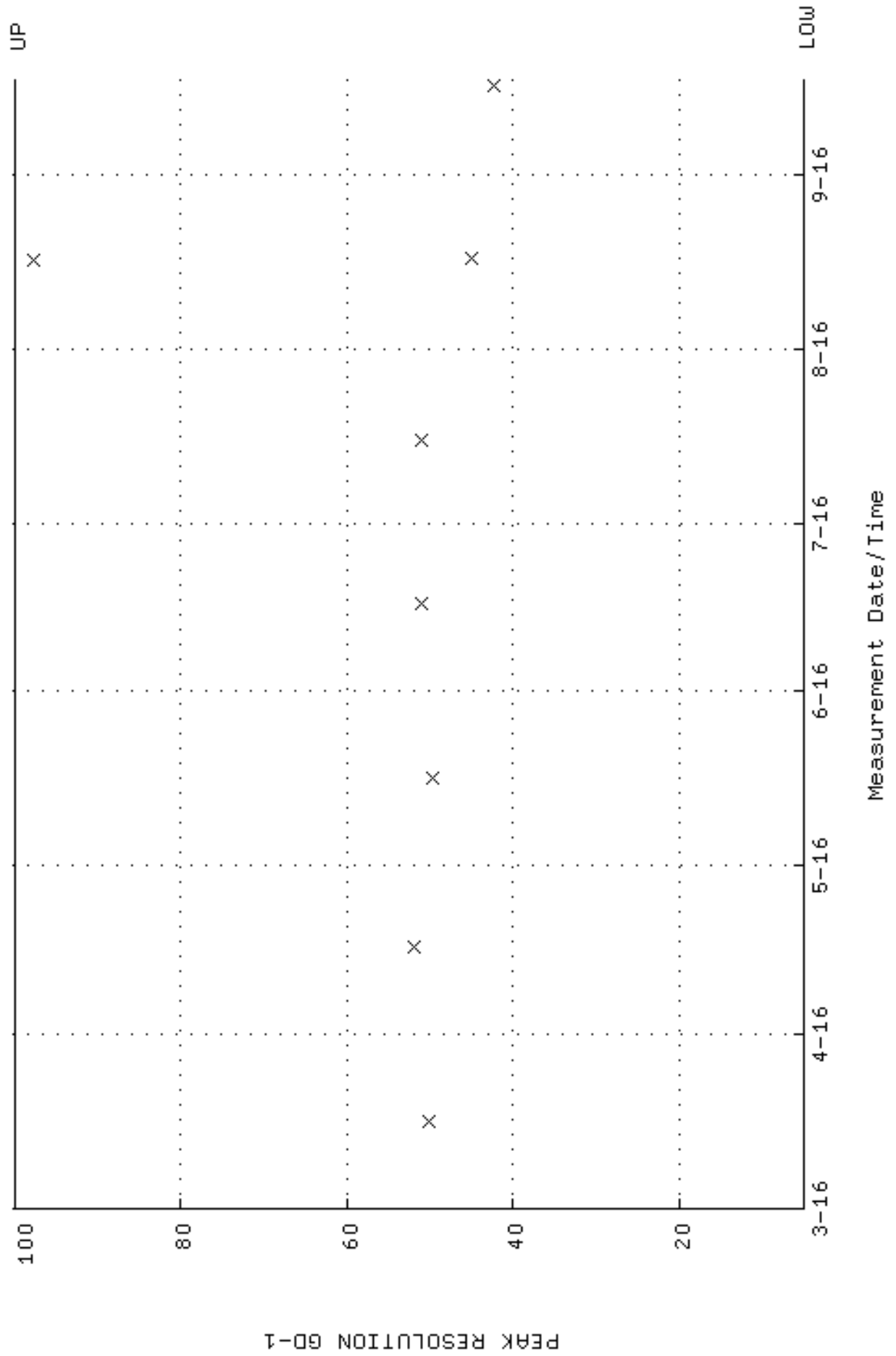
QA filename : DKA100:[ENV_ALPHA.QA.W]W214.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 16-MAR-2016 08:35:47 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.254982 through 0.270754



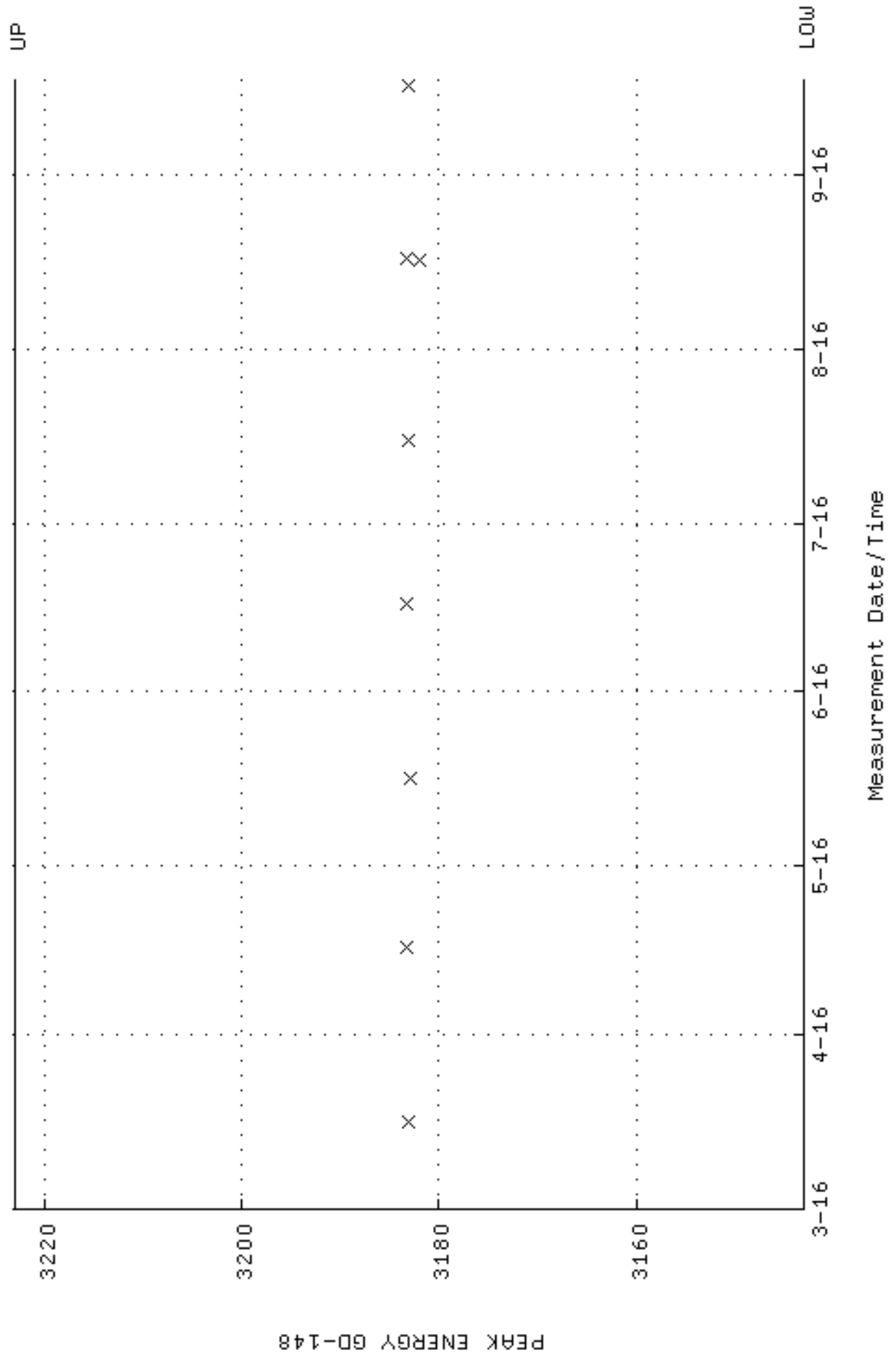
QA filename : DKA100:[ENV_ALPHA.QA.W]w214.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 16-MAR-2016 08:35:47 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



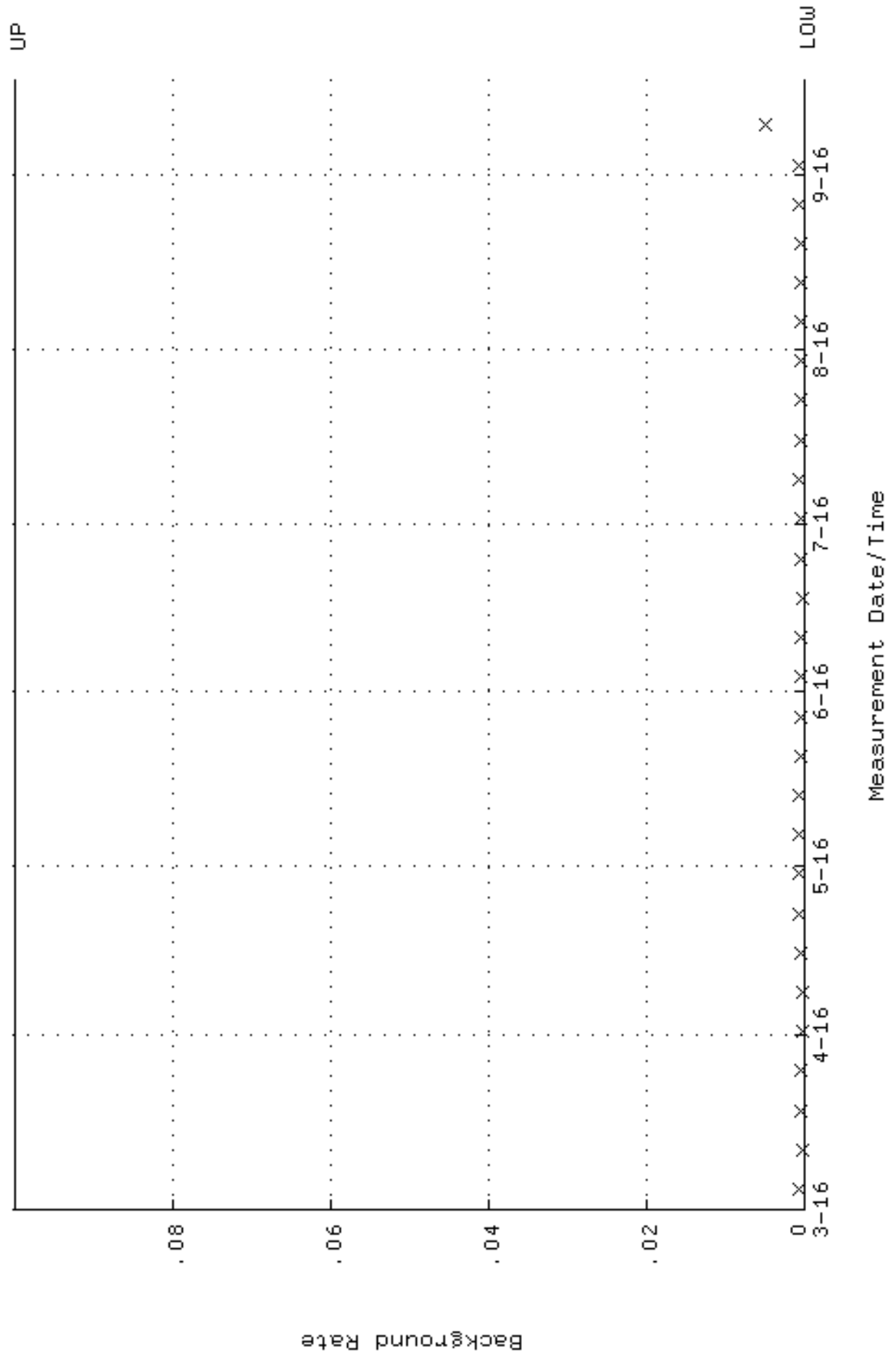
QA filename : DKA100:[ENV_ALPHA.QA.W]W214.QAF;3
 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 16-MAR-2016 08:35:47 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



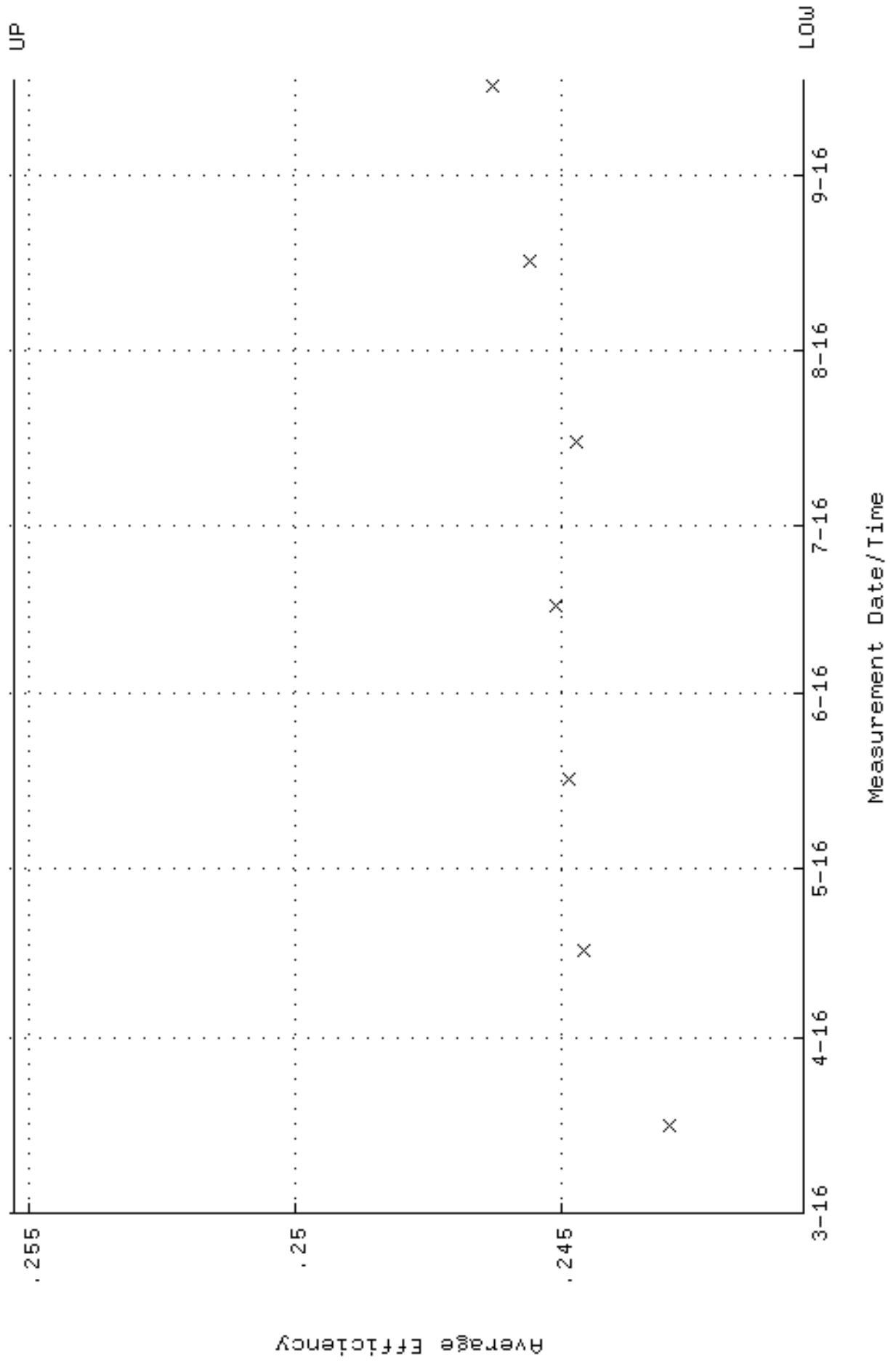
QA filename : DKA100:[ENV_ALPHA.QA.W]W214.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 16-MAR-2016 08:35:47 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



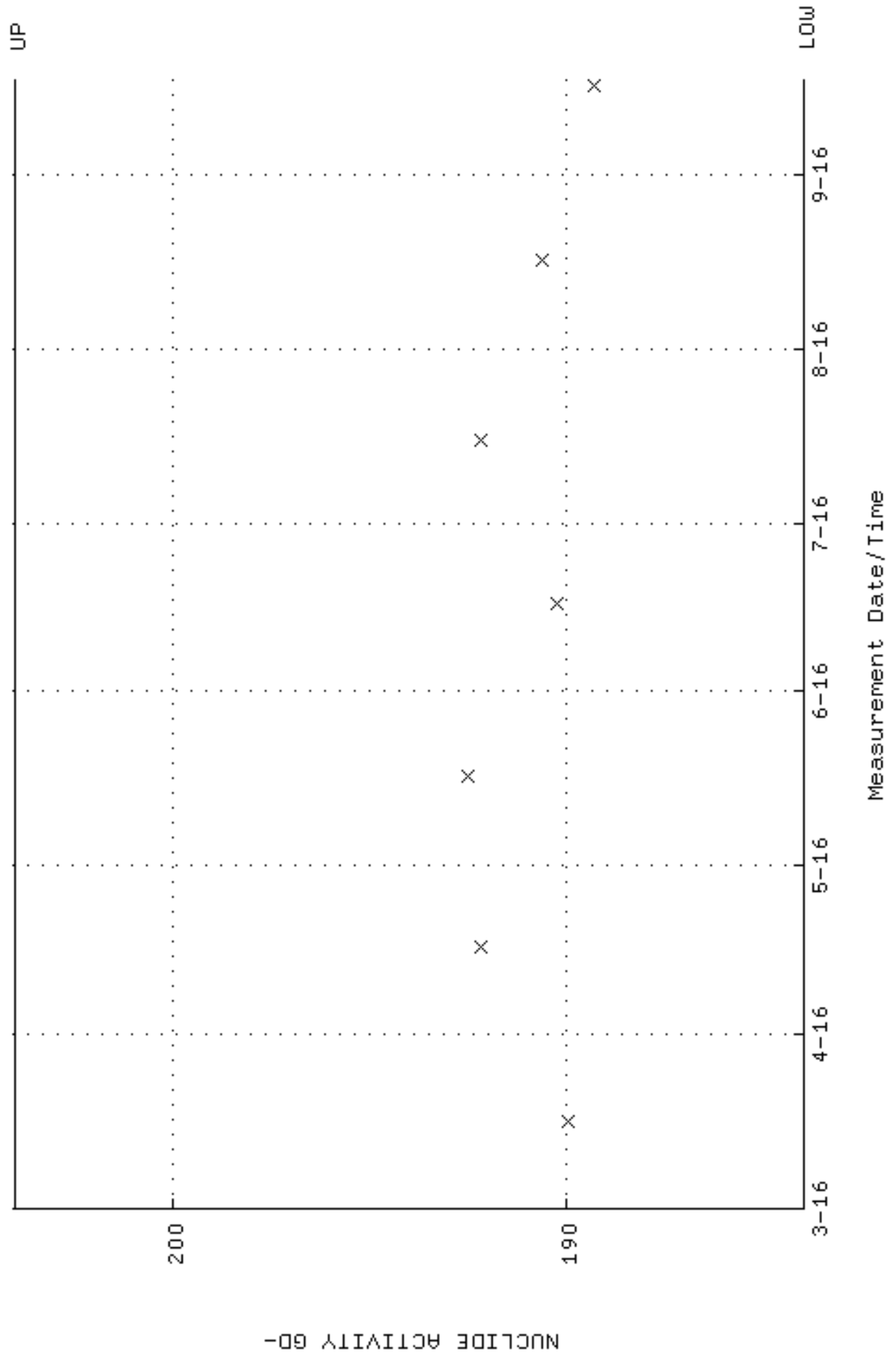
QA filename : DKA100:[ENV_ALPHA.QA.B]B214.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:31:21 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



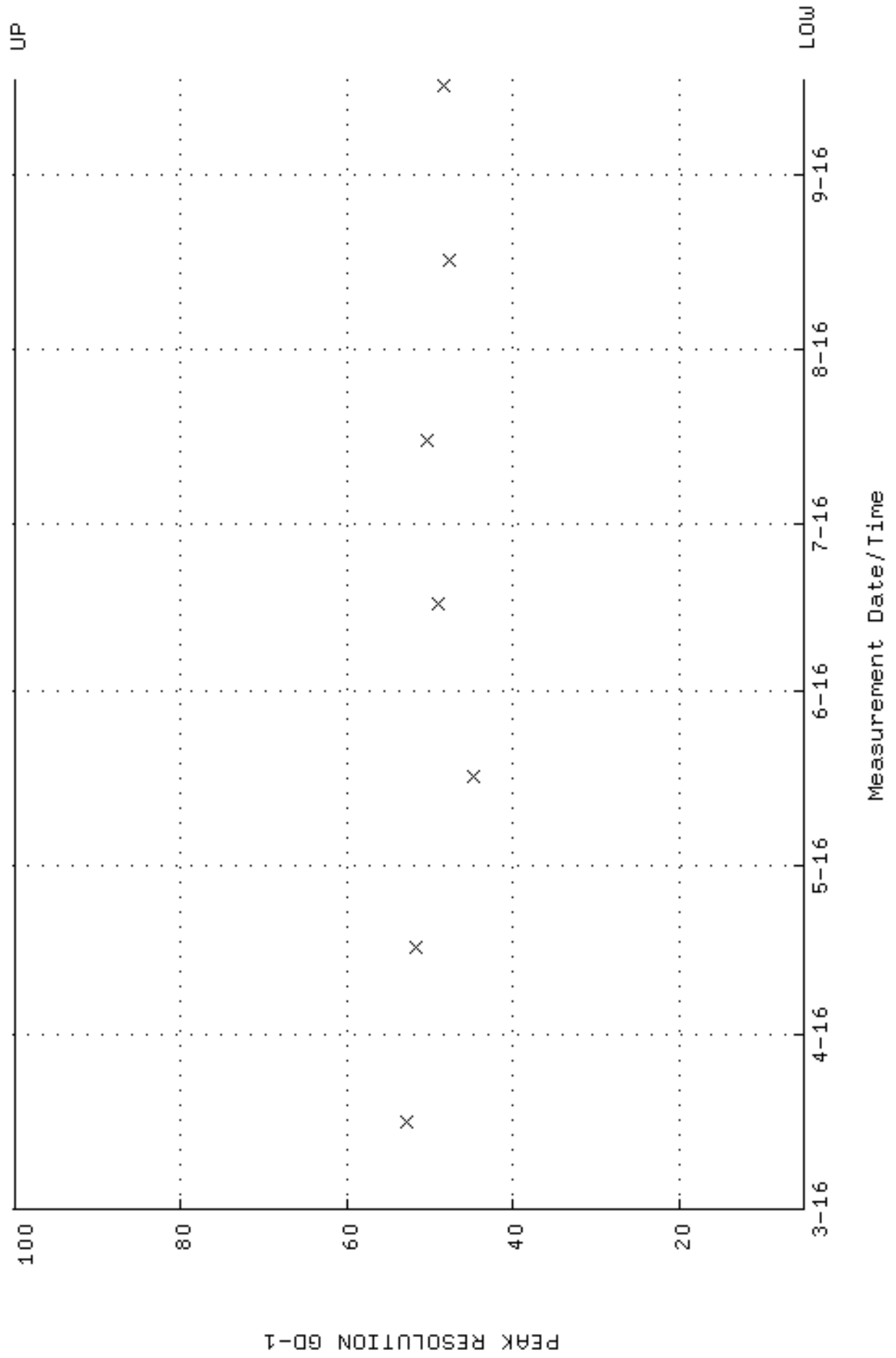
QA filename : DKA100:[ENV_ALPHA.QA.W]W216.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 16-MAR-2016 08:35:56 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.240458 through 0.255332



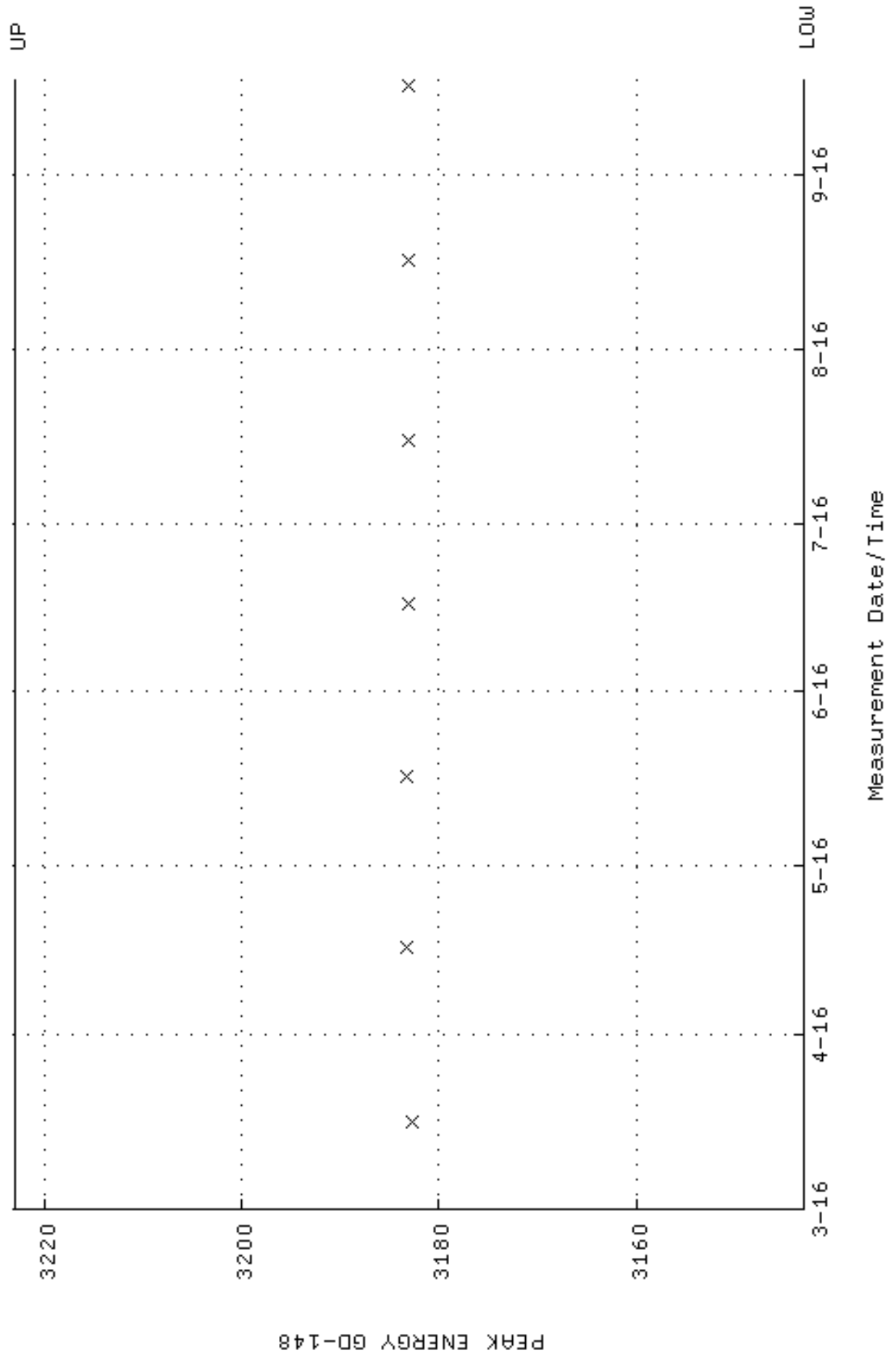
QA filename : DKA100:[ENV_ALPHA.QA.W]w216.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 16-MAR-2016 08:35:56 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



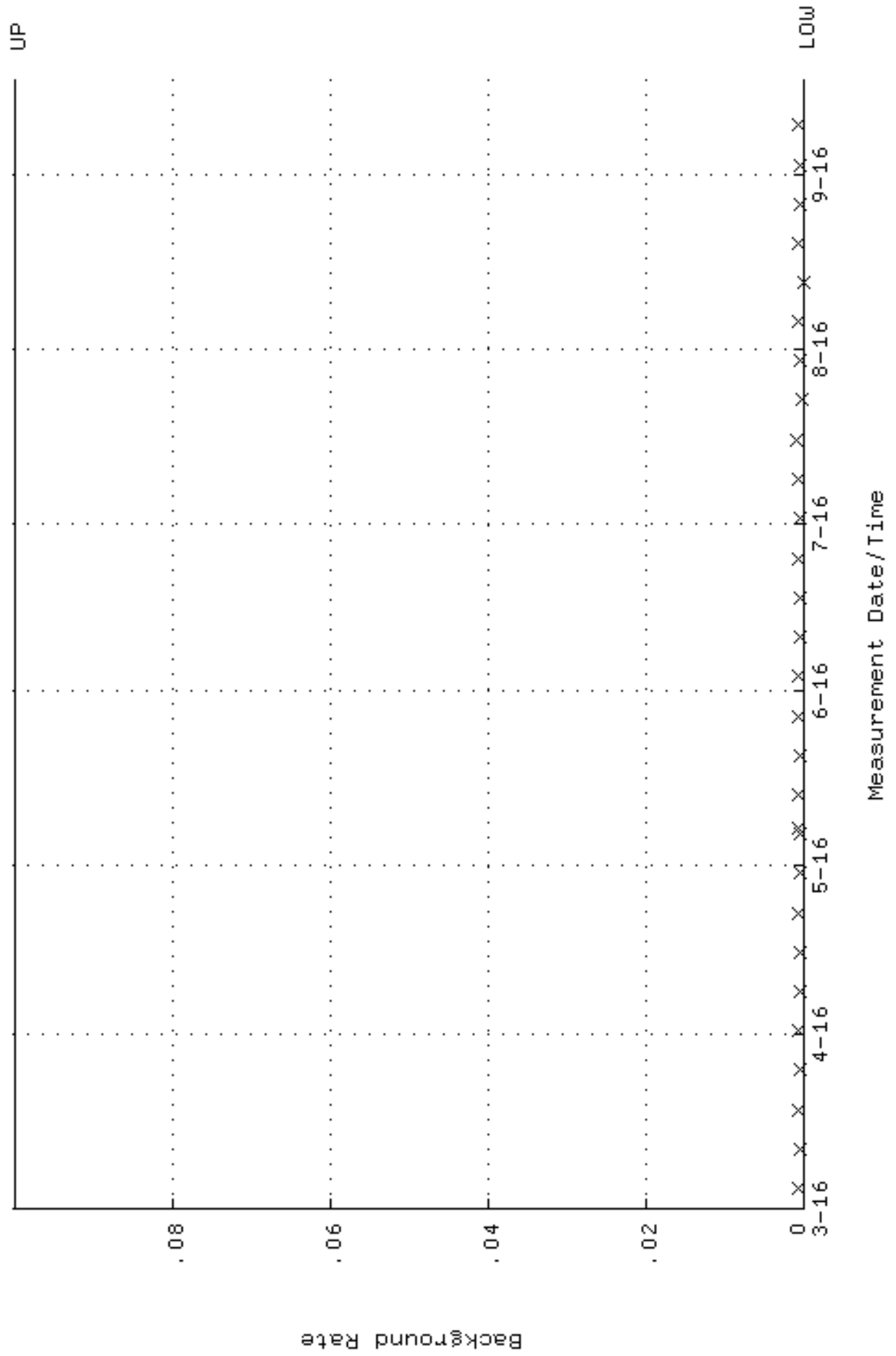
QA filename : DKA100:[ENV_ALPHA.QA.W]W216.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 16-MAR-2016 08:35:56 through 17-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



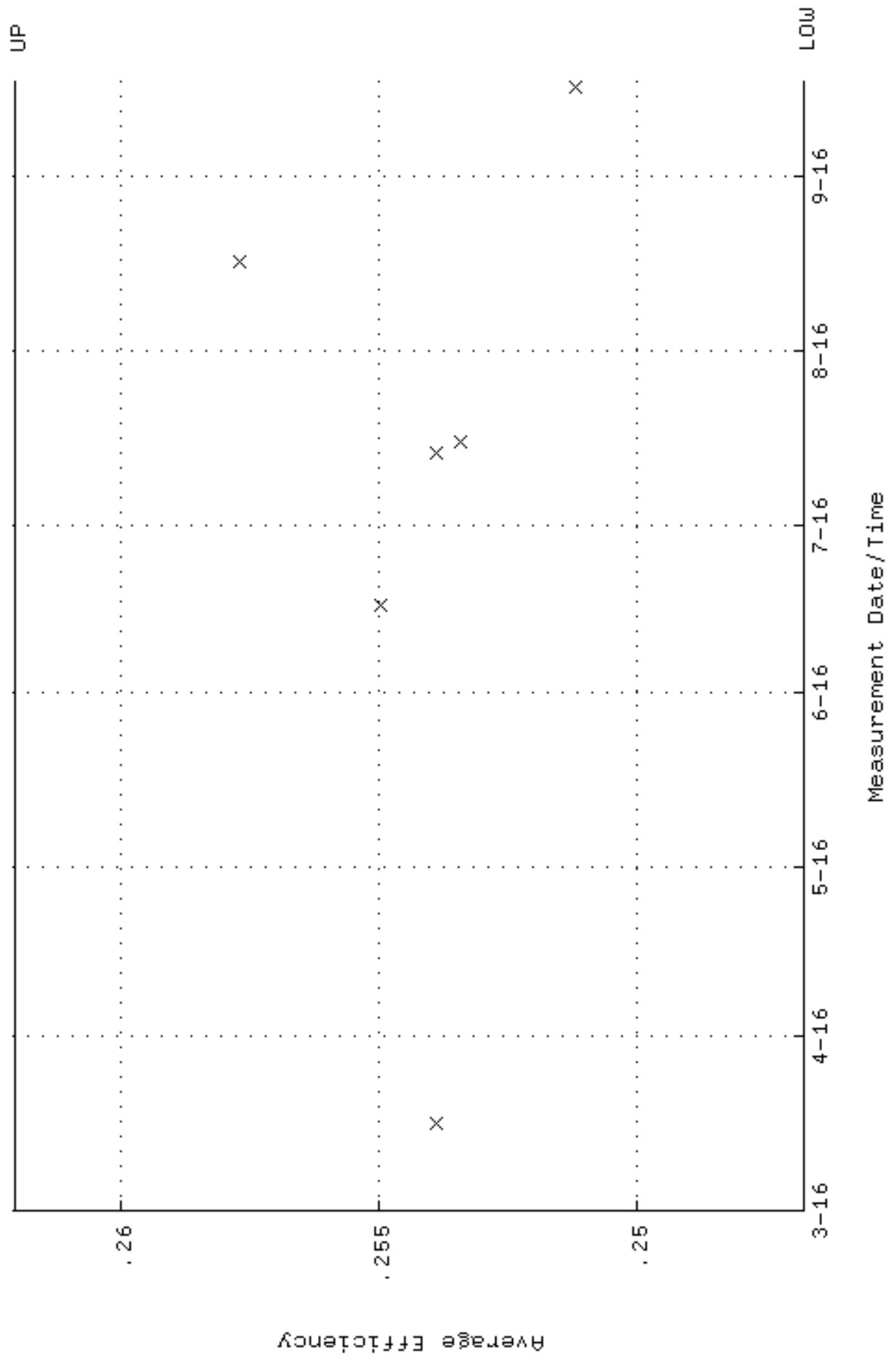
QA filename : DKA100:[ENV_ALPHA.QA.W]W216.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 16-MAR-2016 08:35:56 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



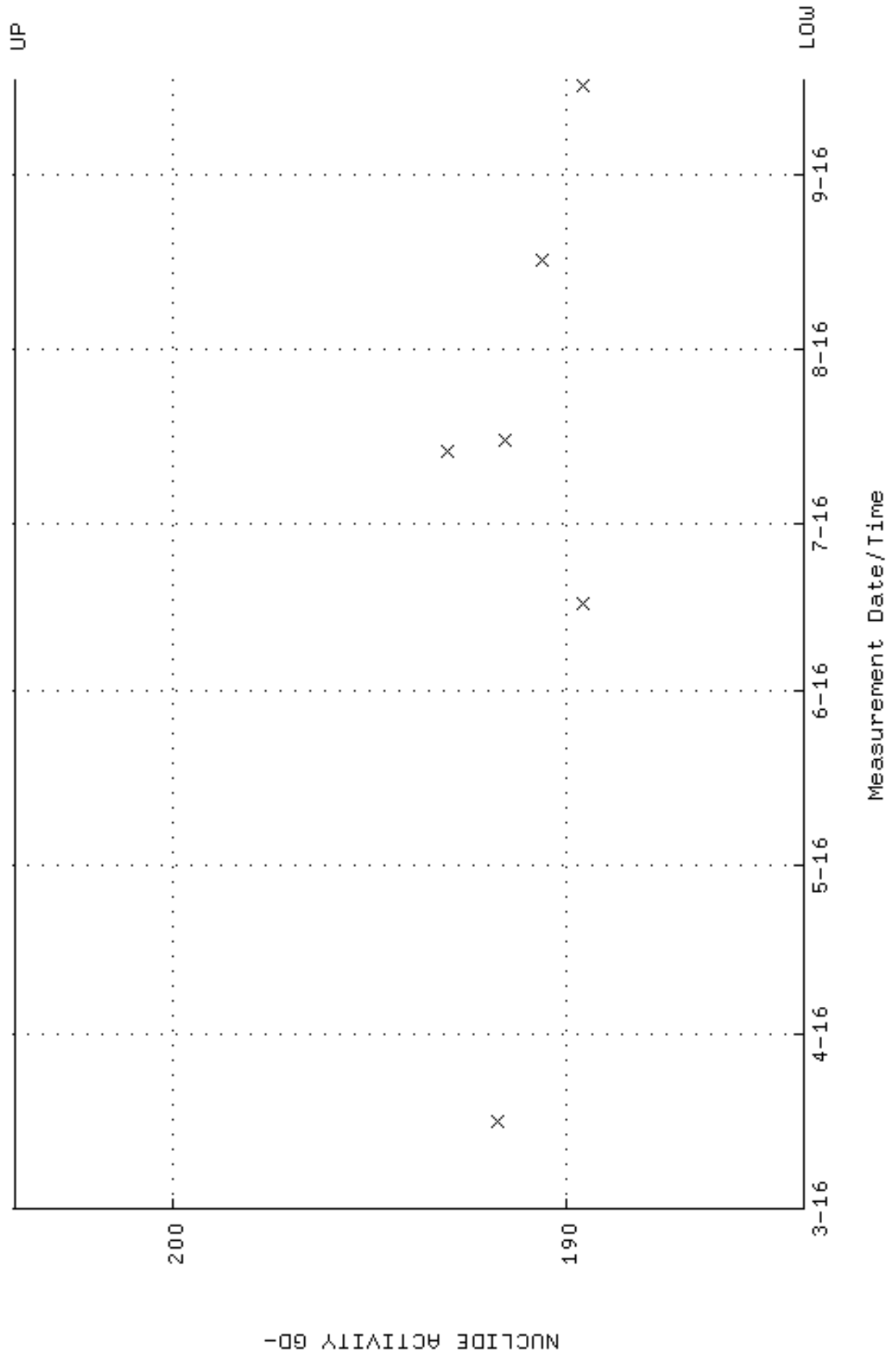
QA filename : DKA100:[ENV_ALPHA.QA.B]B216.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:31:29 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



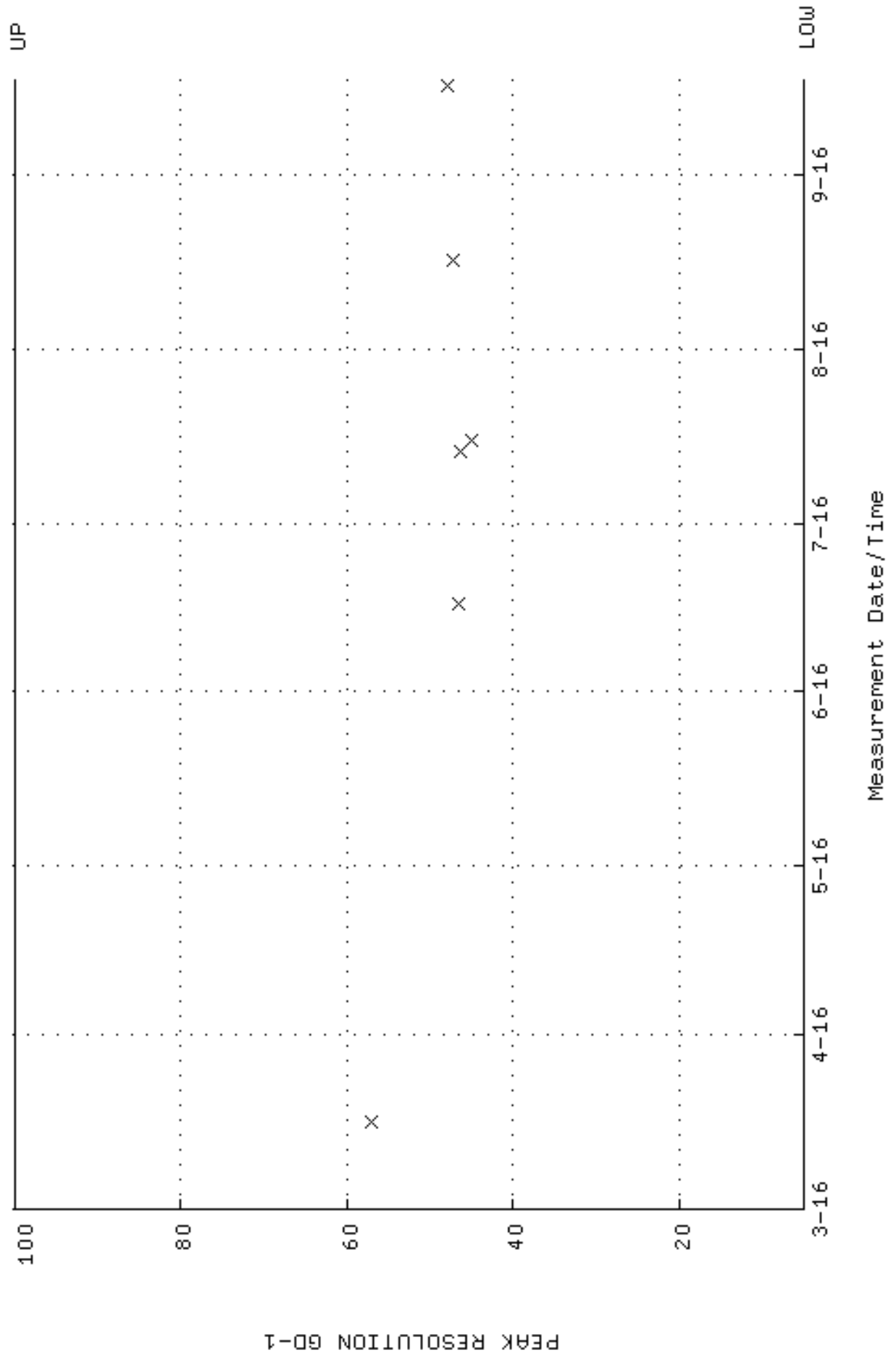
QA filename : DKA100:[ENV_ALPHA.QA.W]W218.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 16-MAR-2016 09:48:51 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.246780 through 0.262040



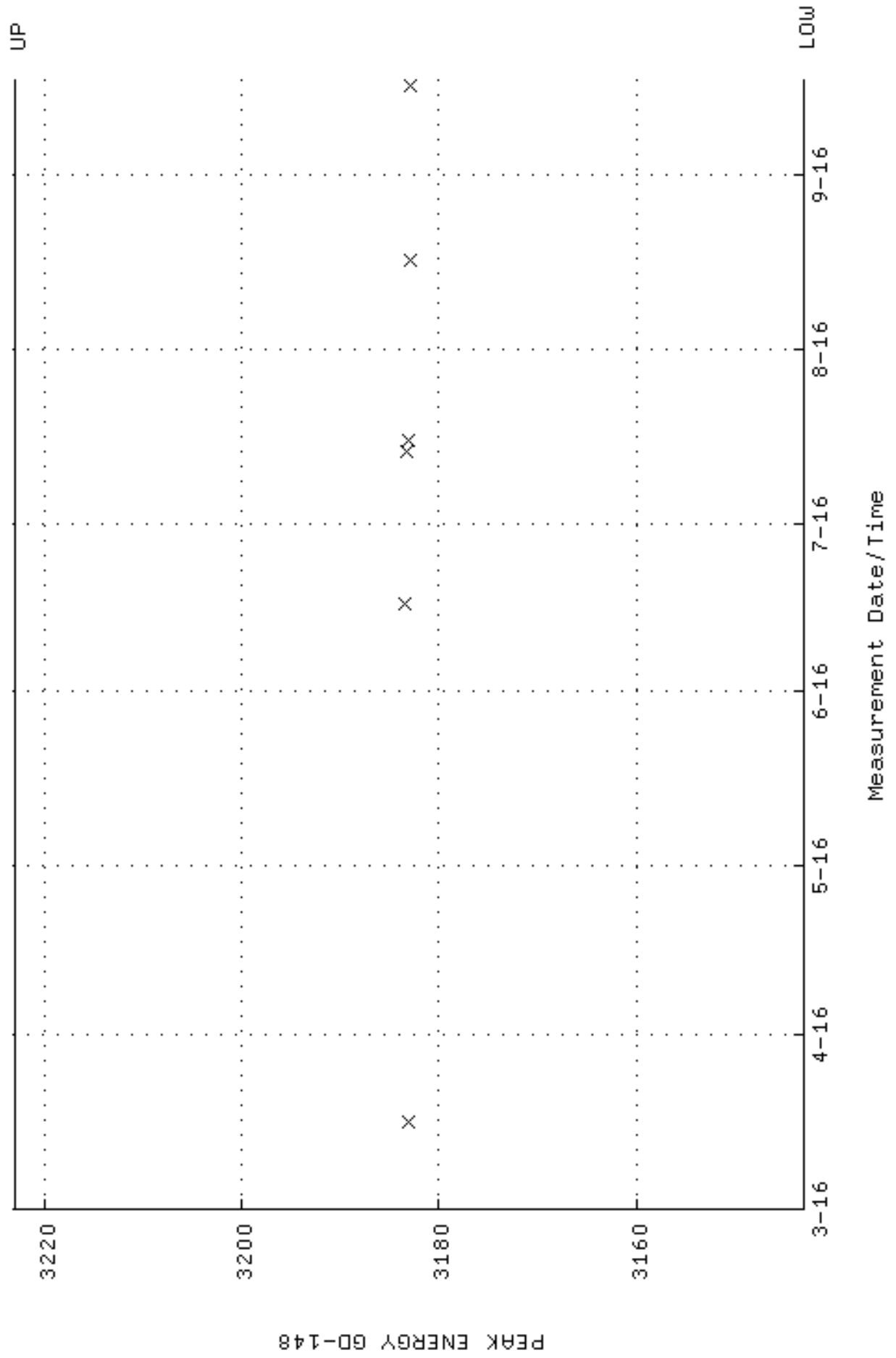
QA filename : DKA100:[ENV_ALPHA.QA.W]w218.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 16-MAR-2016 09:48:51 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



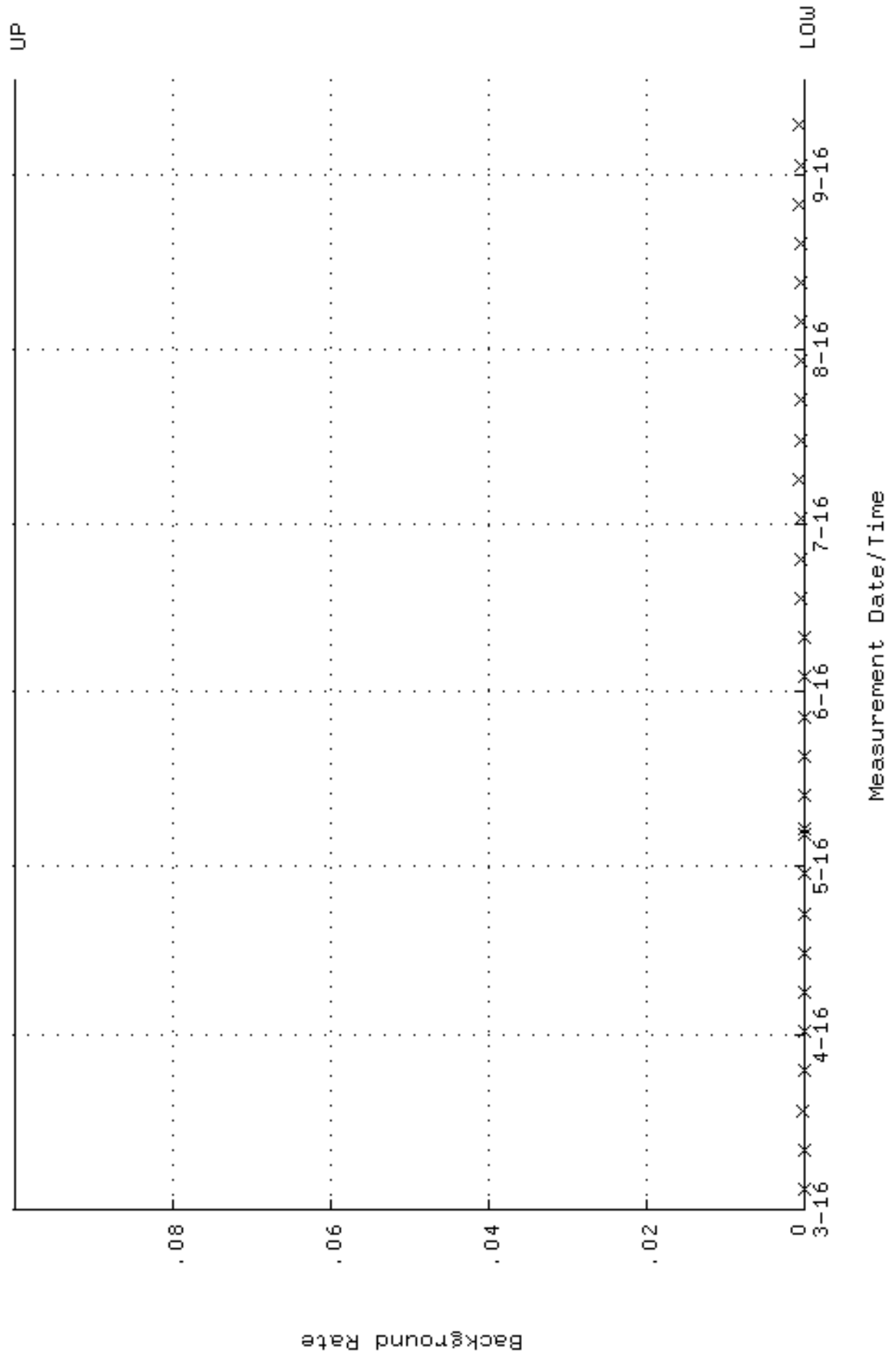
QA filename : DKA100:[ENV_ALPHA.QA.W]W218.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 16-MAR-2016 09:48:51 through 17-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



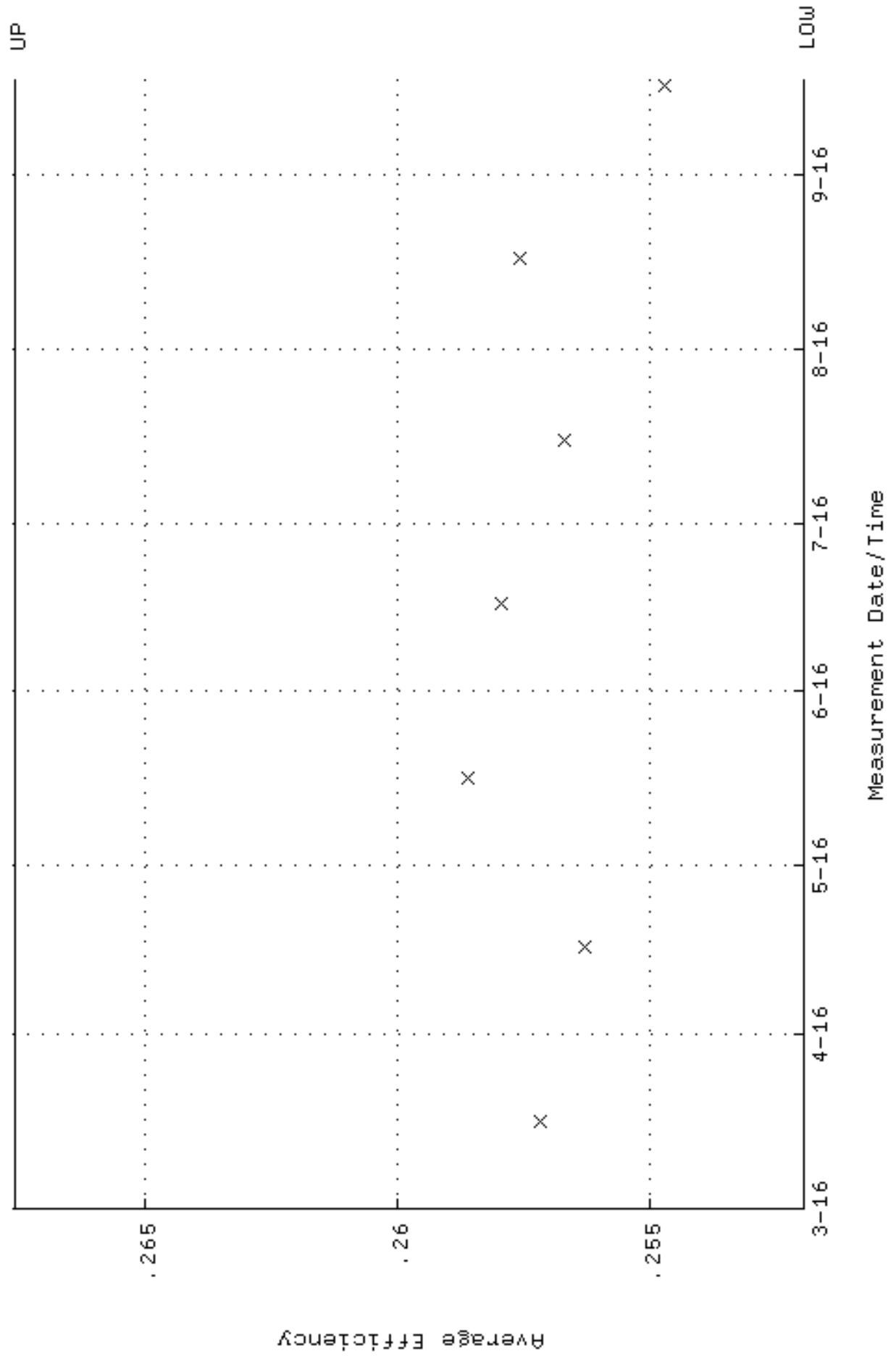
QA filename : DKA100:[ENV_ALPHA.QA.W]W218.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 16-MAR-2016 09:48:51 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



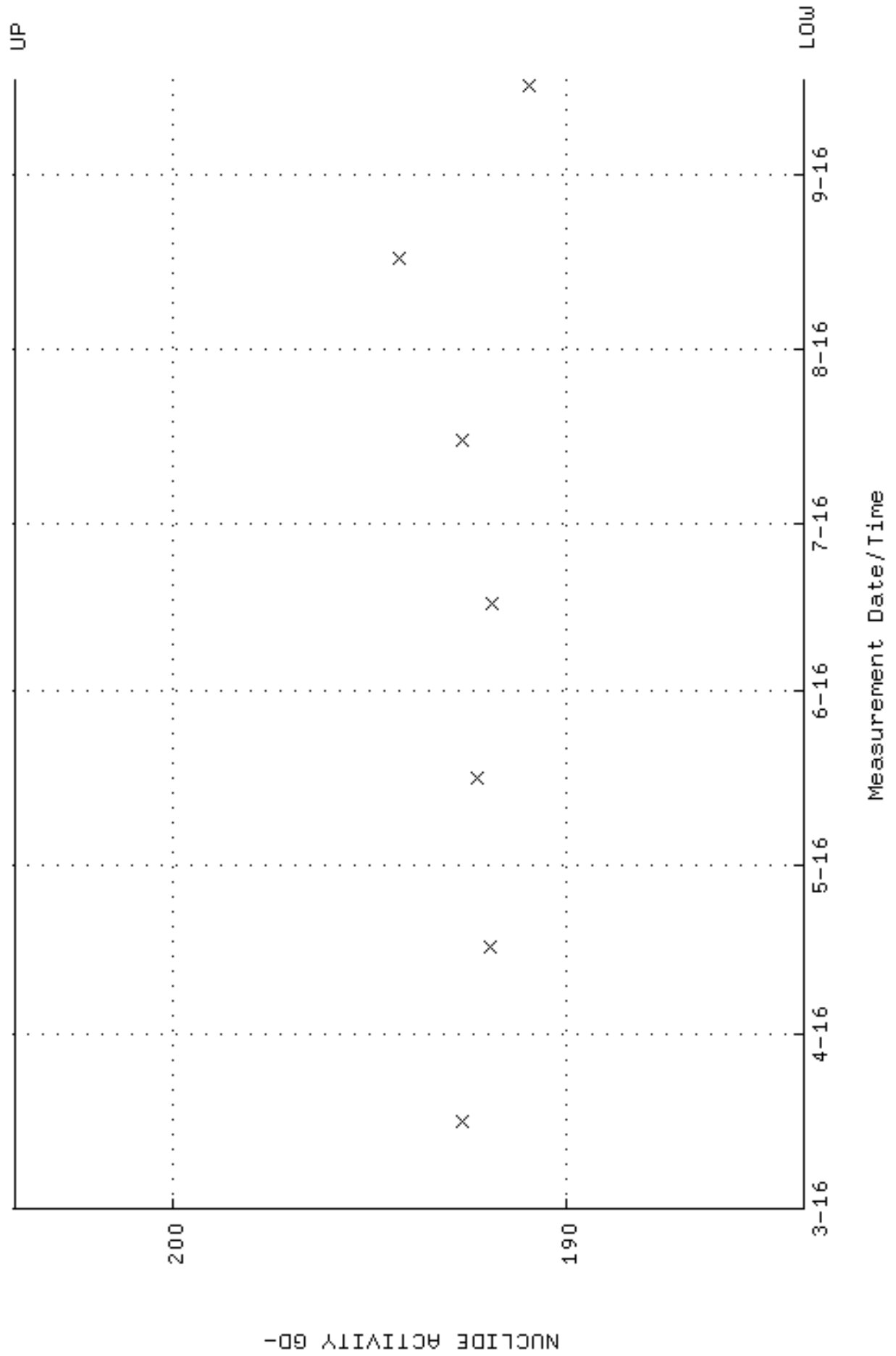
QA filename : DKA100:[ENV_ALPHA.QA.B]B218.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:31:37 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



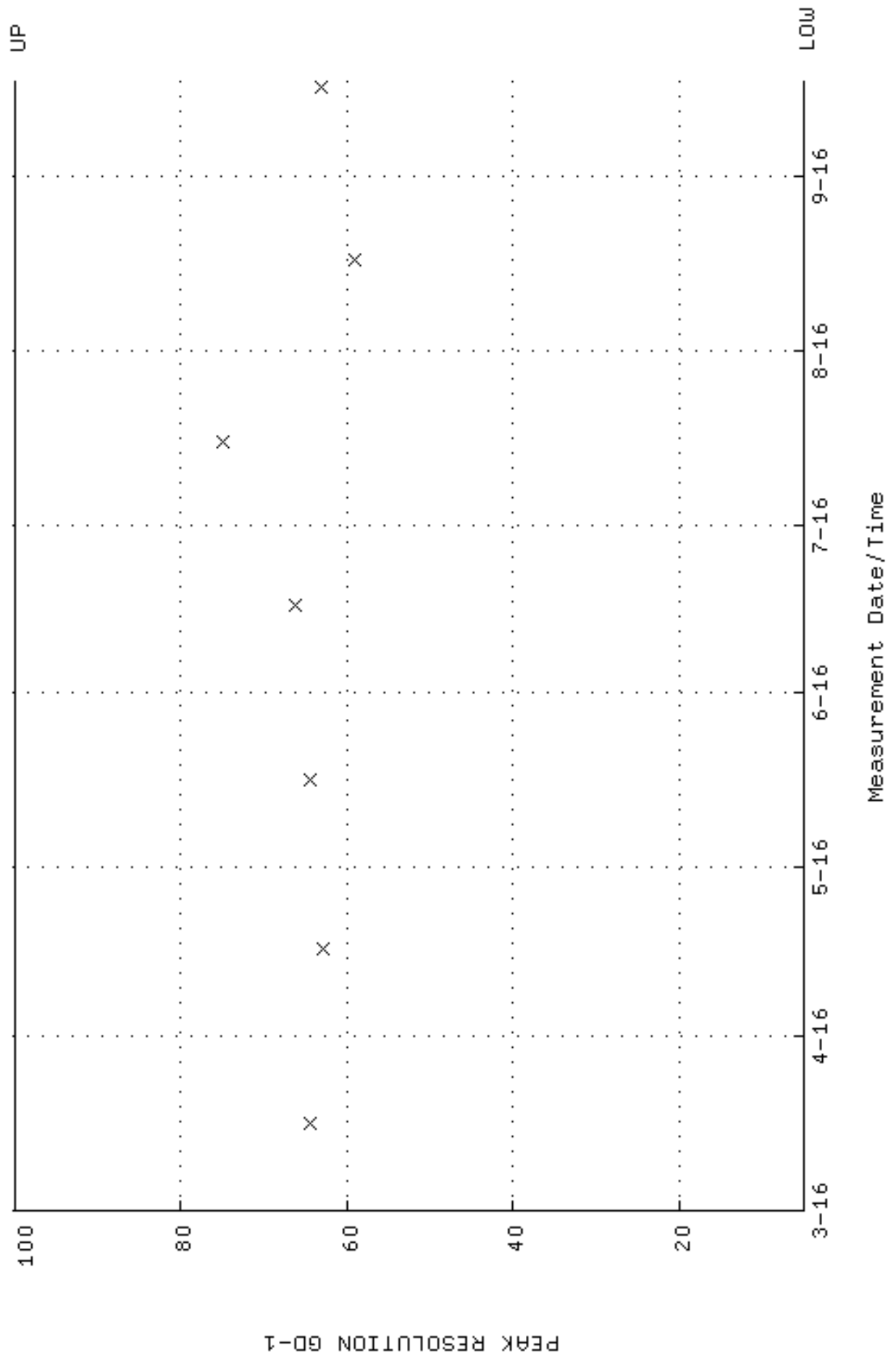
QA filename : DKA100:[ENV_ALPHA.QA.W]W219.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 16-MAR-2016 08:36:12 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.251970 through 0.267550



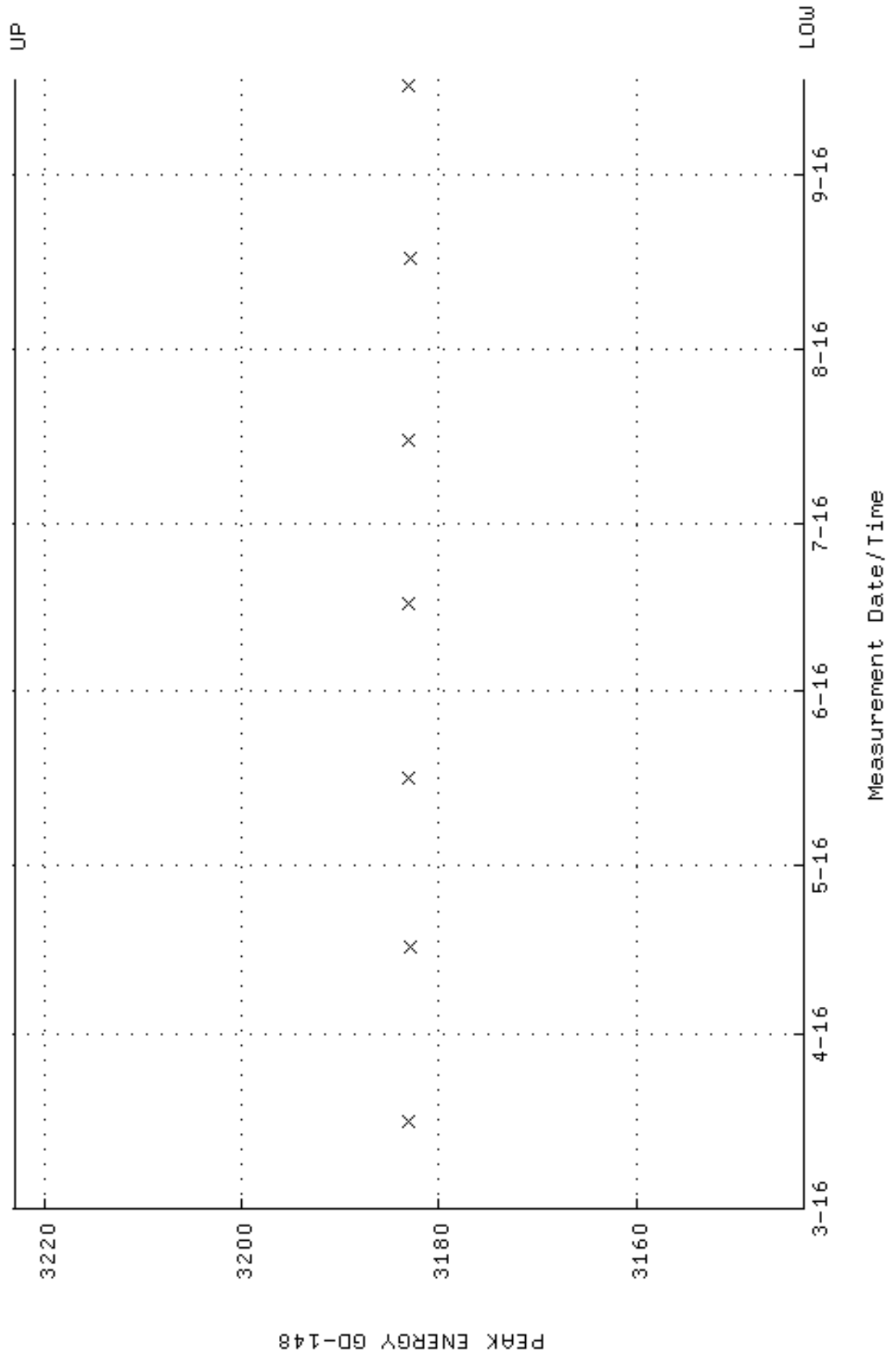
QA filename : DKA100:[ENV_ALPHA.QA.W]w219.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 16-MAR-2016 08:36:12 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



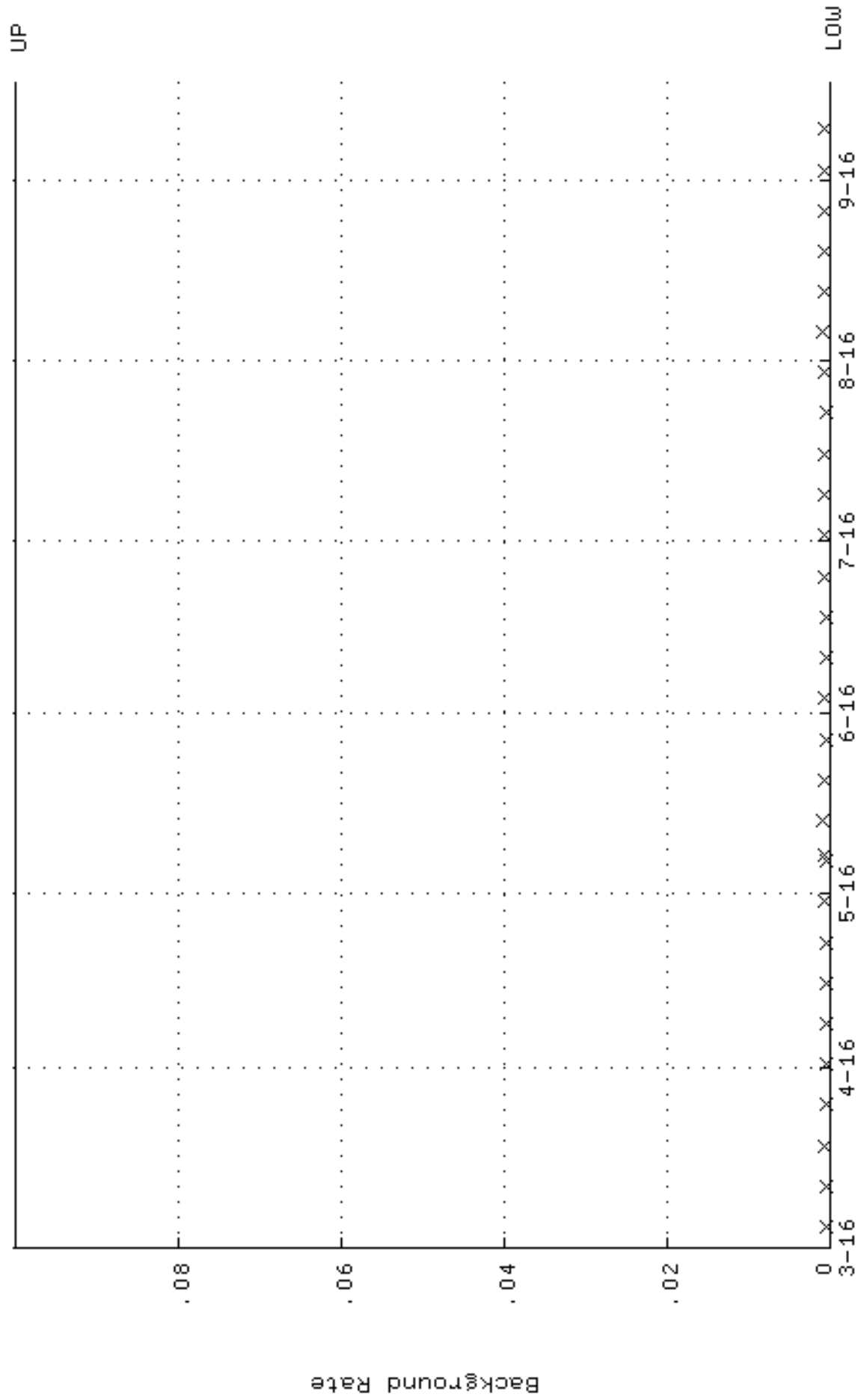
QA filename : DKA100:[ENV_ALPHA.QA.W]W219.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 16-MAR-2016 08:36:12 through 17-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



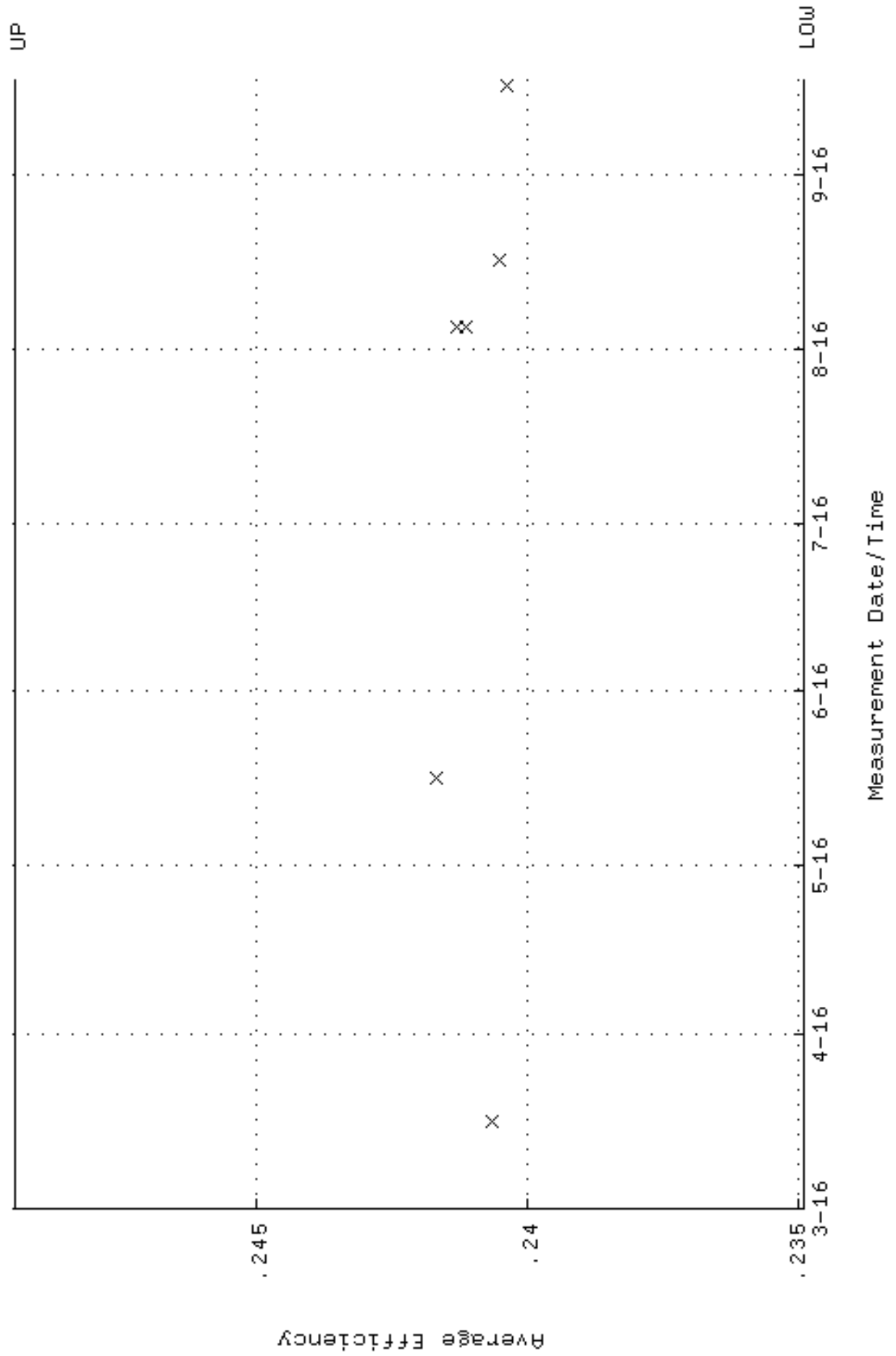
QA filename : DKA100:[ENV_ALPHA.QA.W]W219.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 16-MAR-2016 08:36:12 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



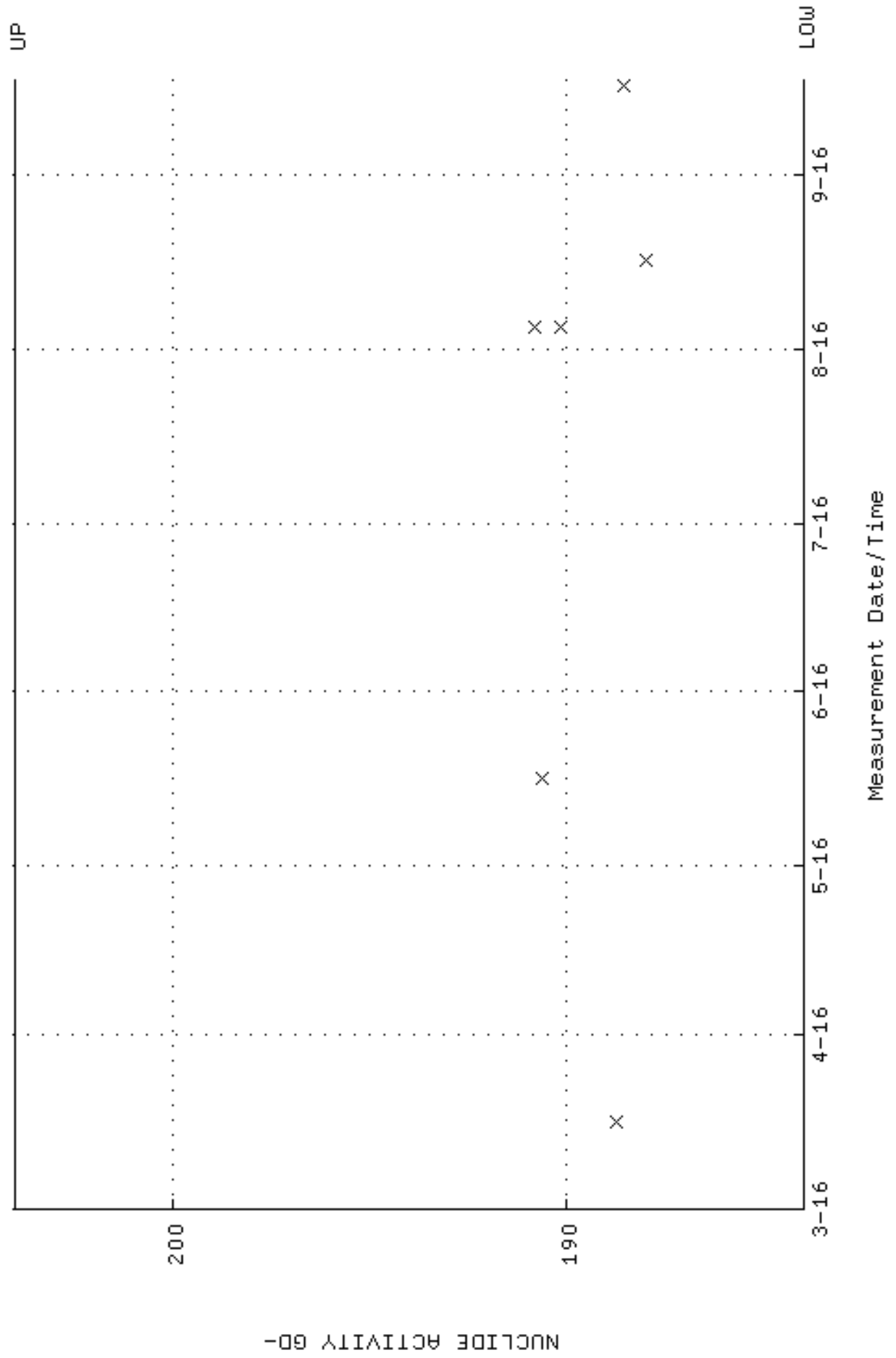
QA filename : DKA100:[ENV_ALPHA.QA.B]B219.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:31:42 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



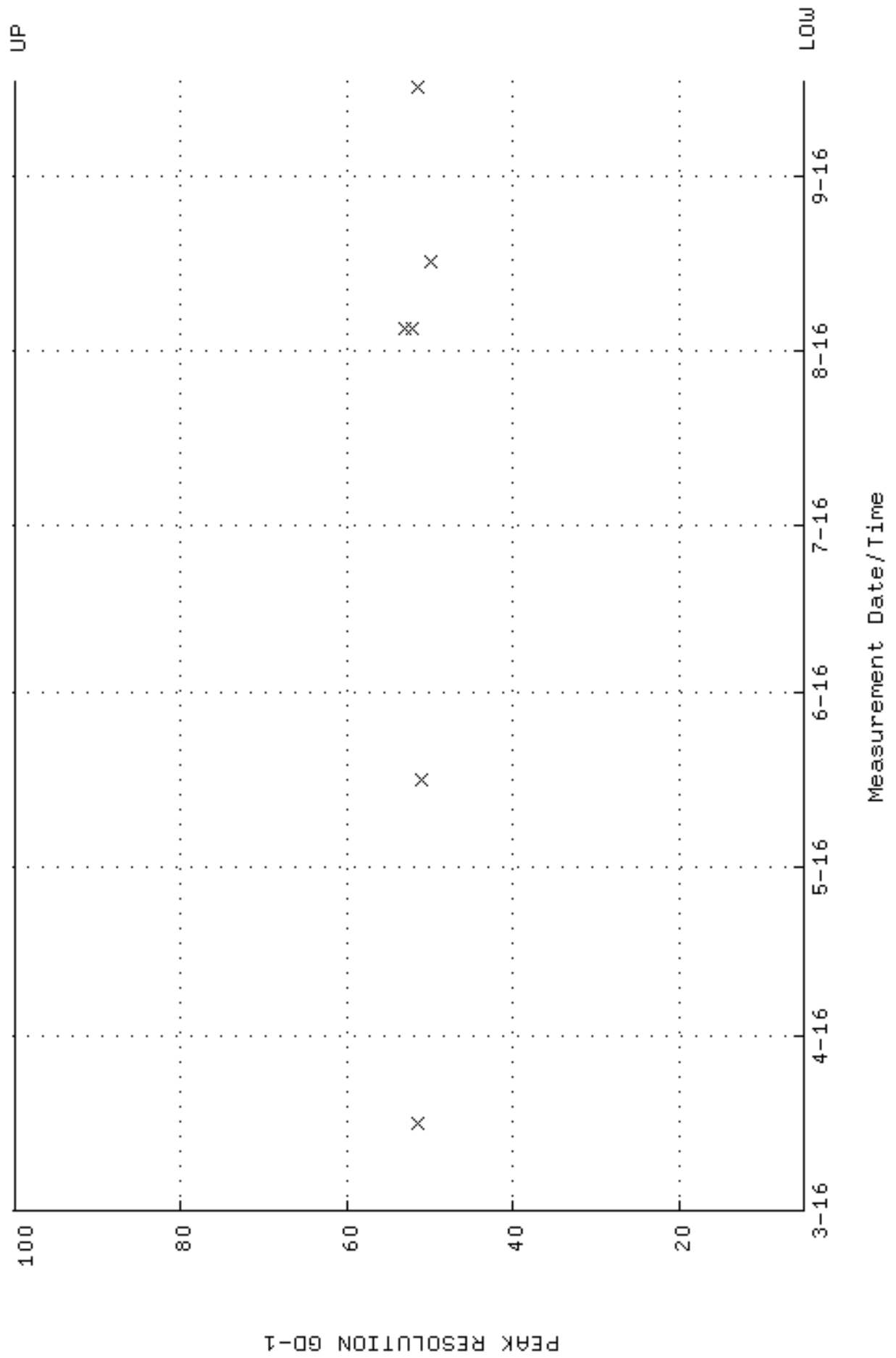
QA filename : DKA100:[ENV_ALPHA.QA.W]W220.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 16-MAR-2016 11:11:34 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.234900 through 0.249440



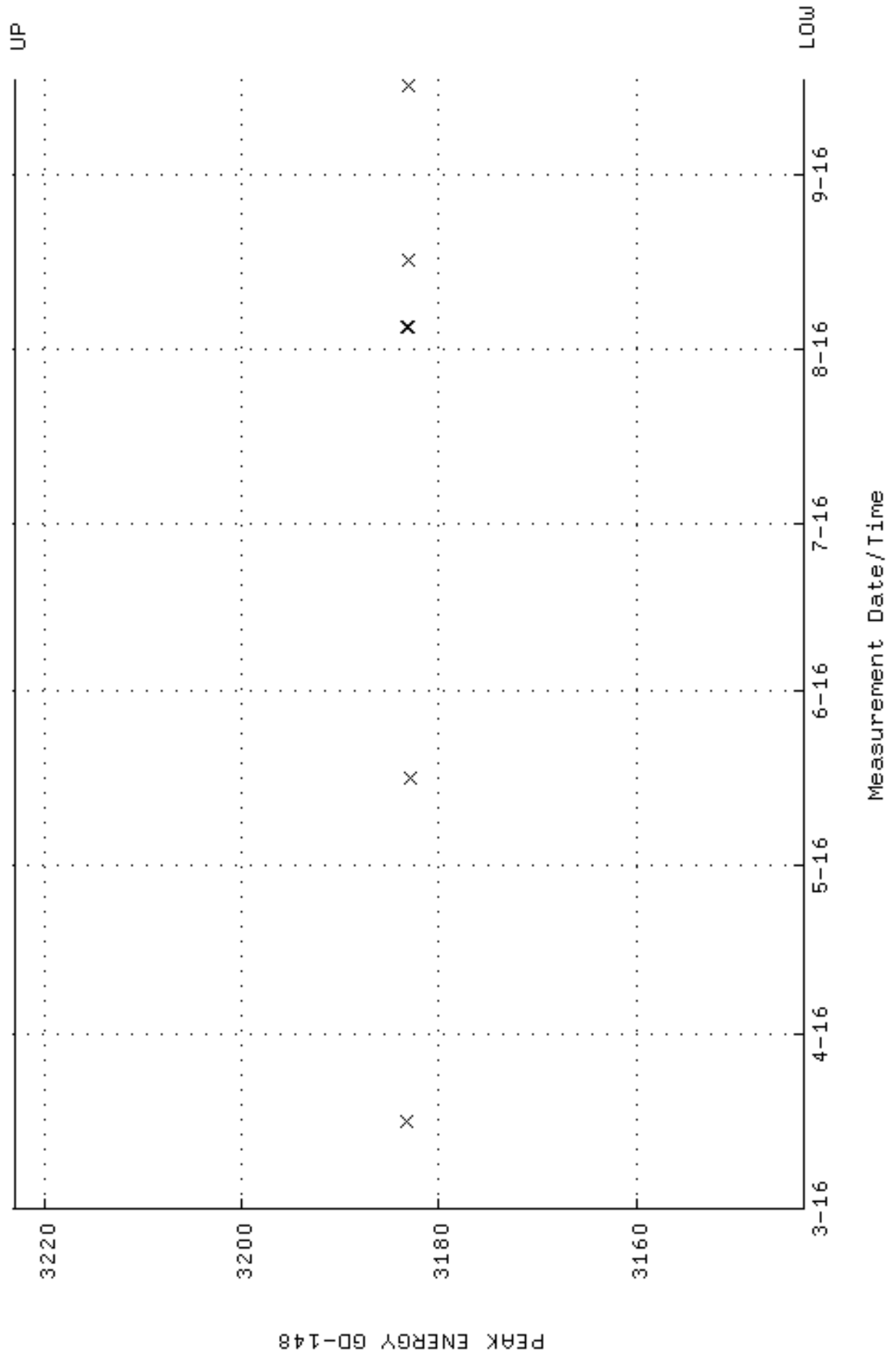
QA filename : DKA100:[ENV_ALPHA.QA.W]W220.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 16-MAR-2016 11:11:34 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



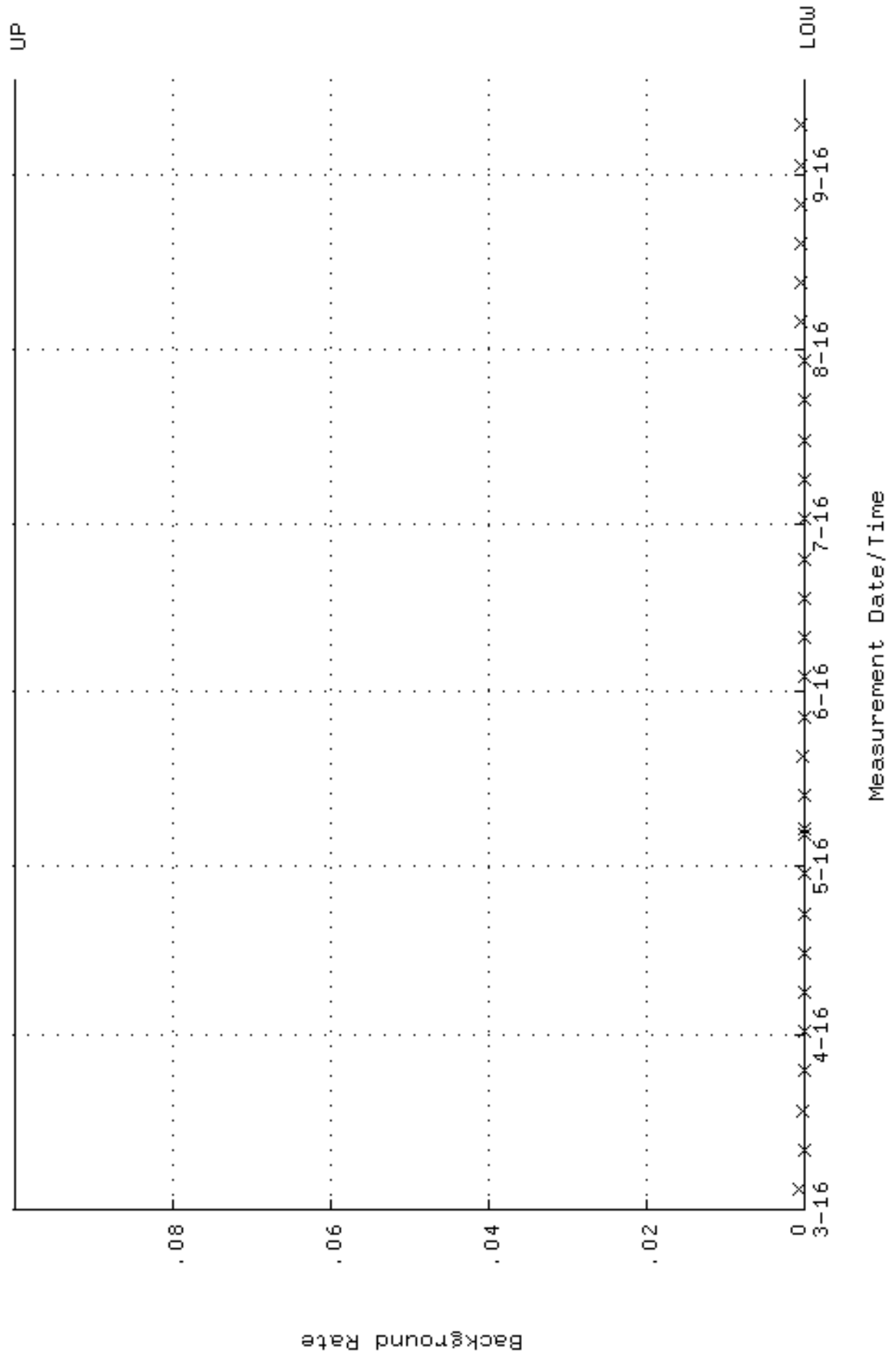
QA filename : DKA100:[ENV_ALPHA.QA.W]W220.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 16-MAR-2016 11:11:34 through 17-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



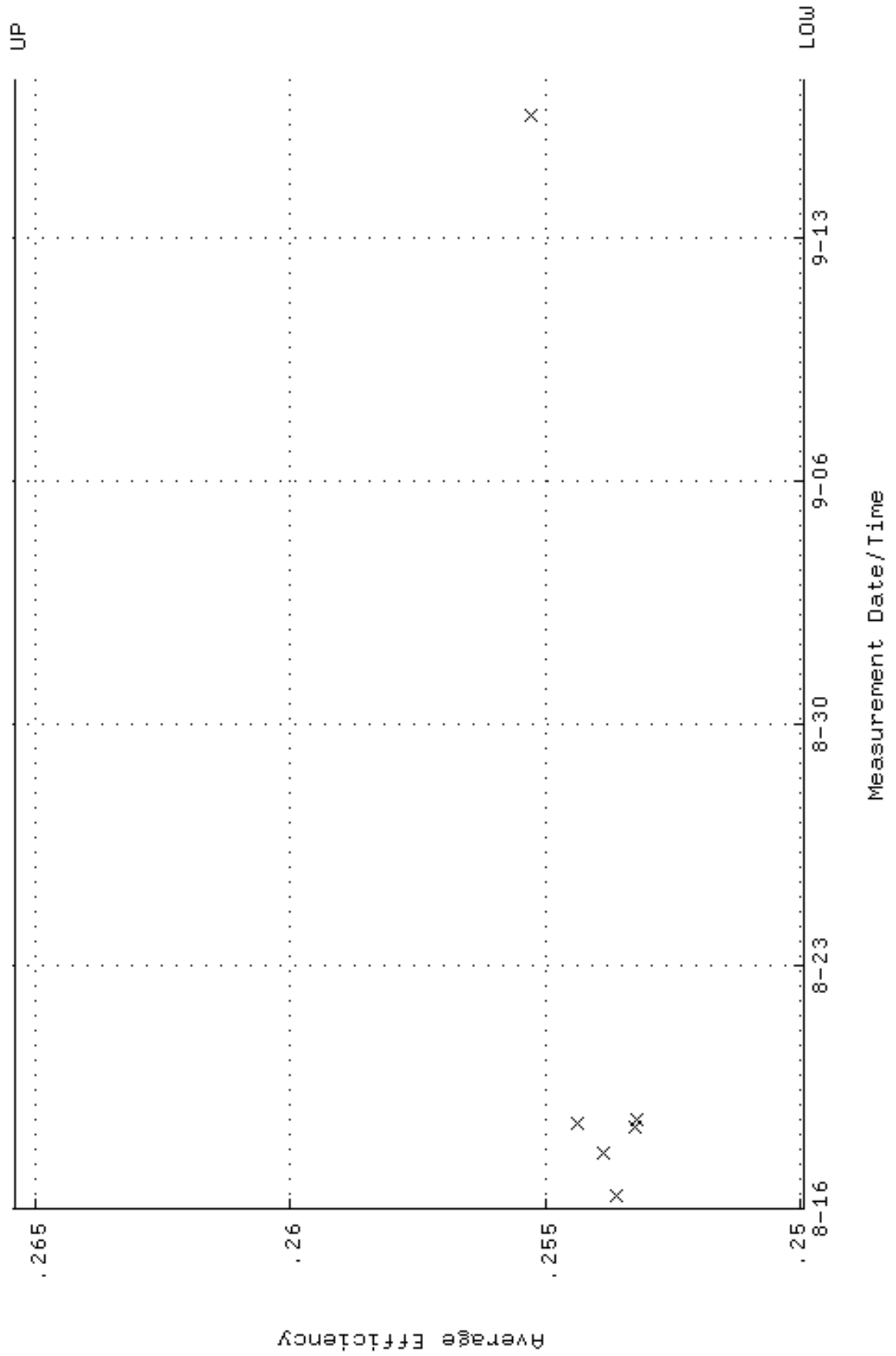
QA filename : DKA100:[ENV_ALPHA.QA.W]W220.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 16-MAR-2016 11:11:34 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



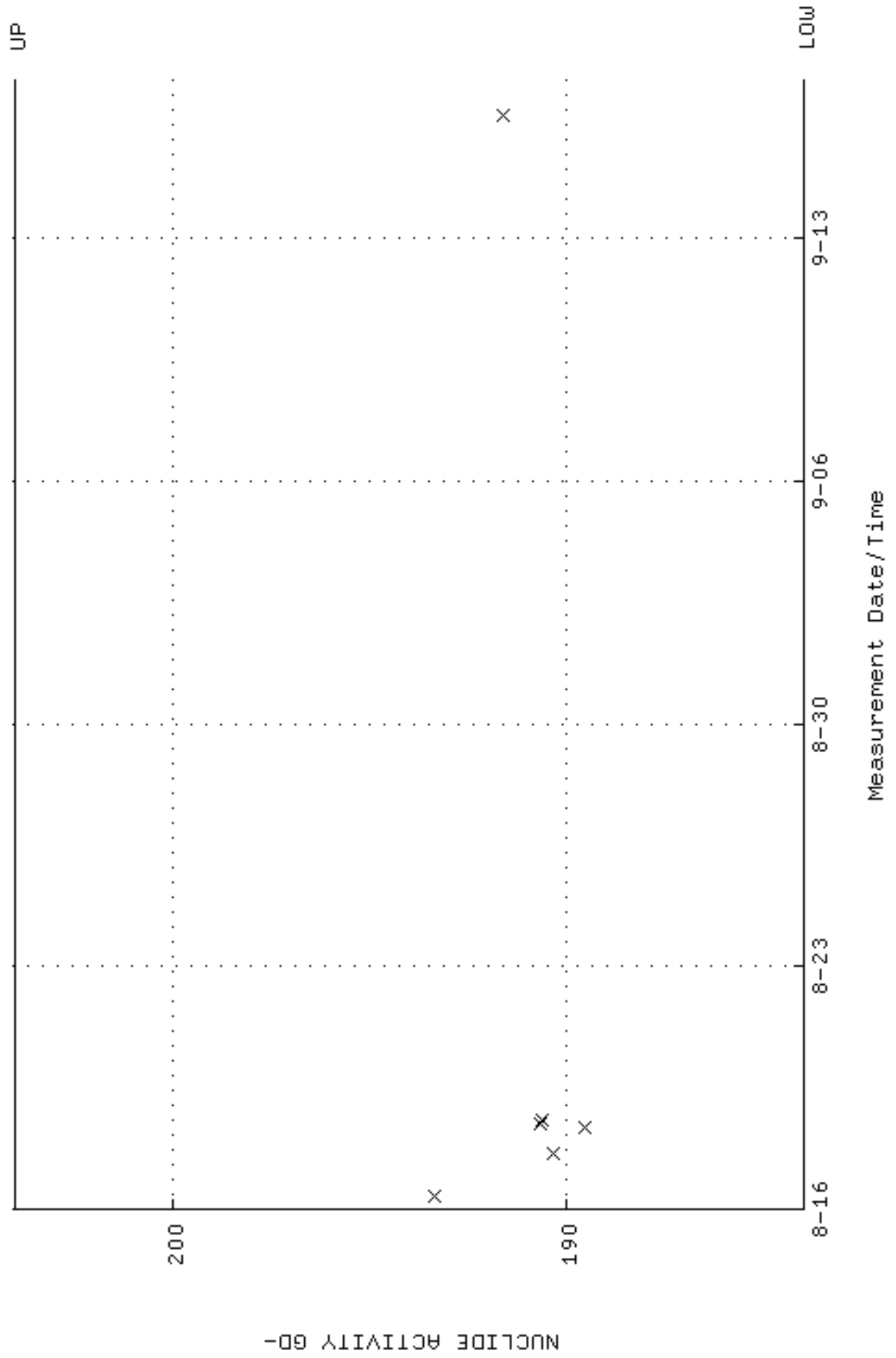
QA filename : DKA100:[ENV_ALPHA.QA.B]B220.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:31:46 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



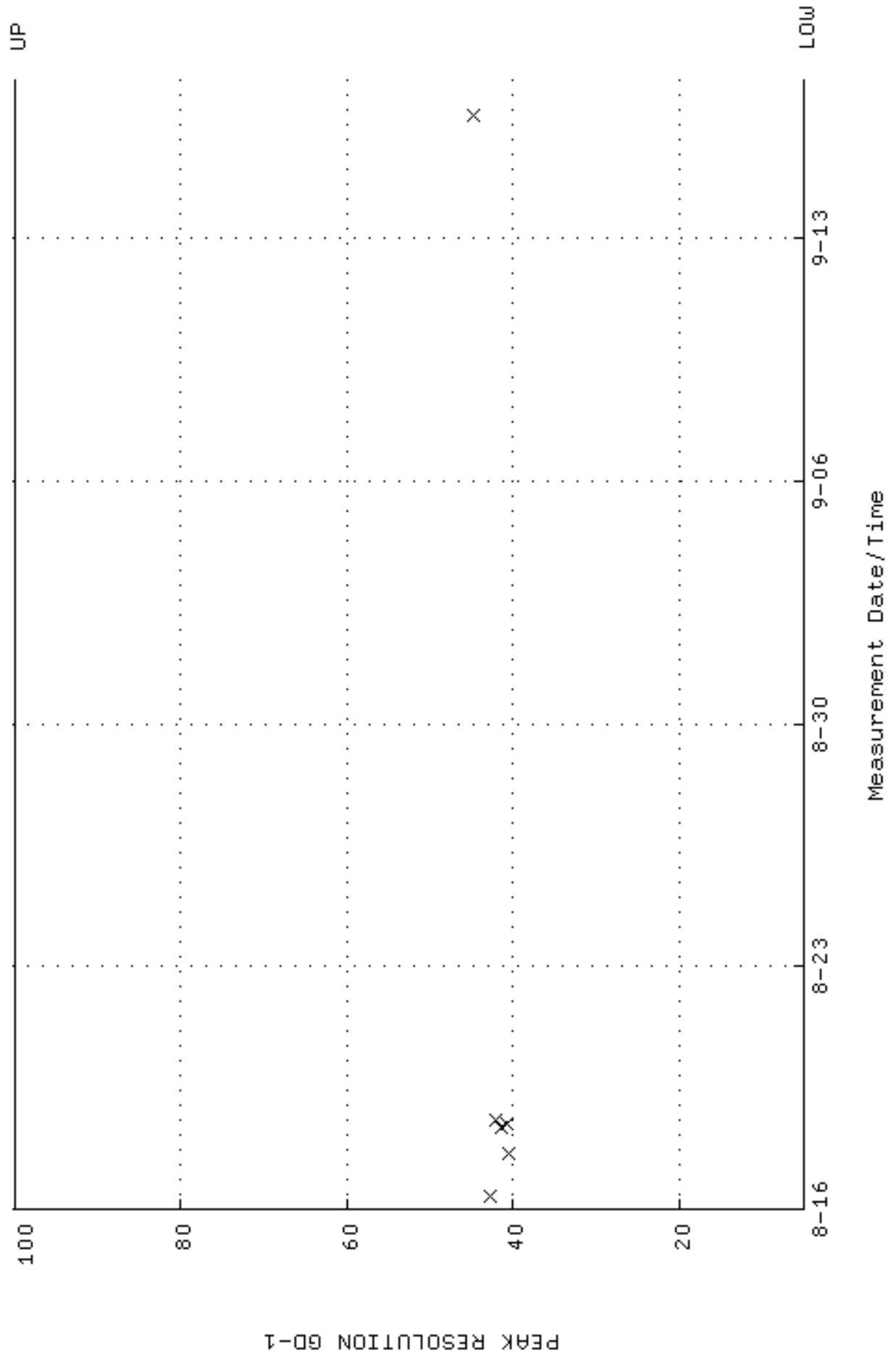
QA filename : DKA100:[ENV_ALPHA.QA.W]W221.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 16-AUG-2016 08:46:48 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.249939 through 0.265399



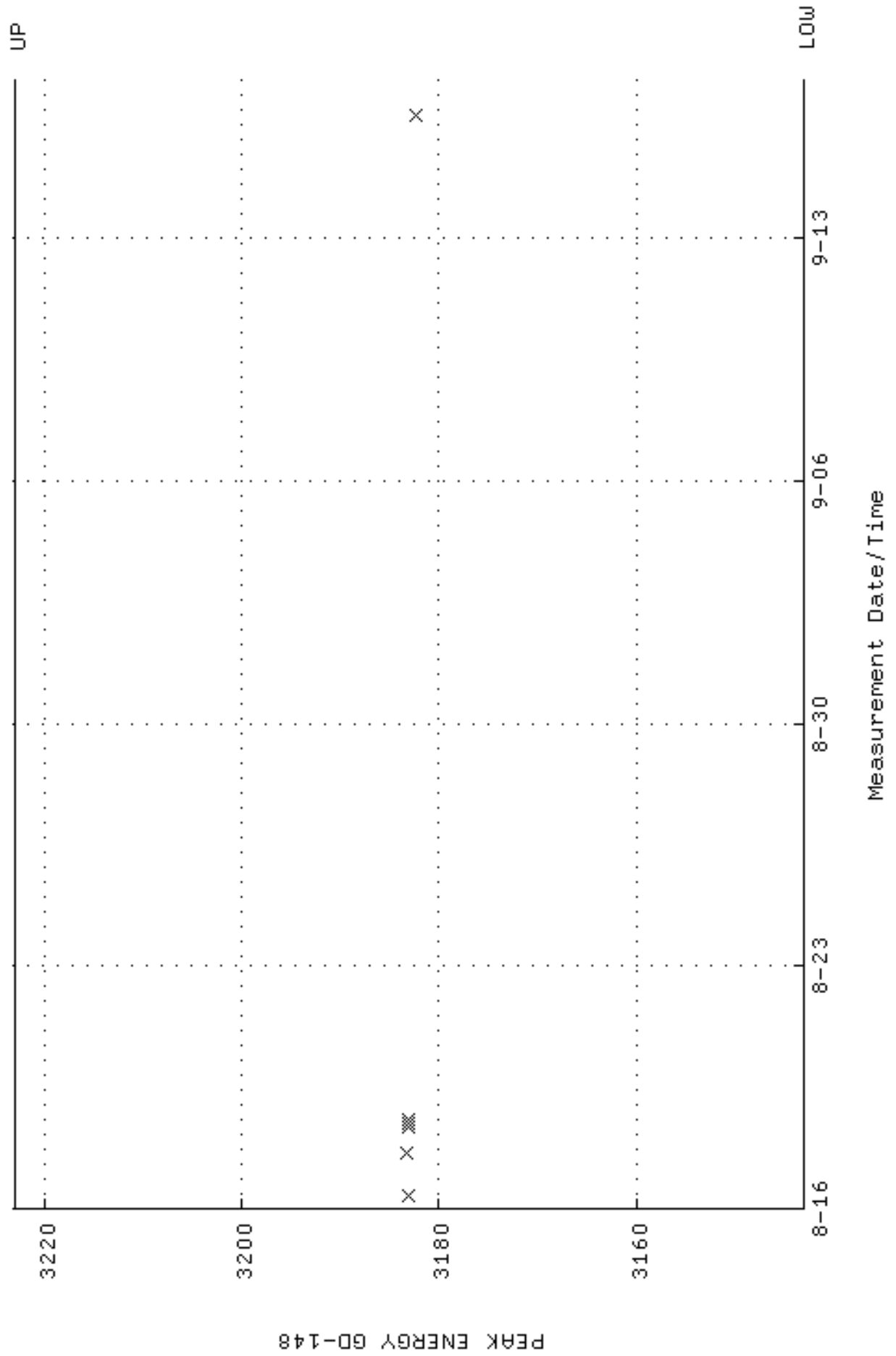
QA filename : DKA100:[ENV_ALPHA.QA.W]W221.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 16-AUG-2016 08:46:48 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



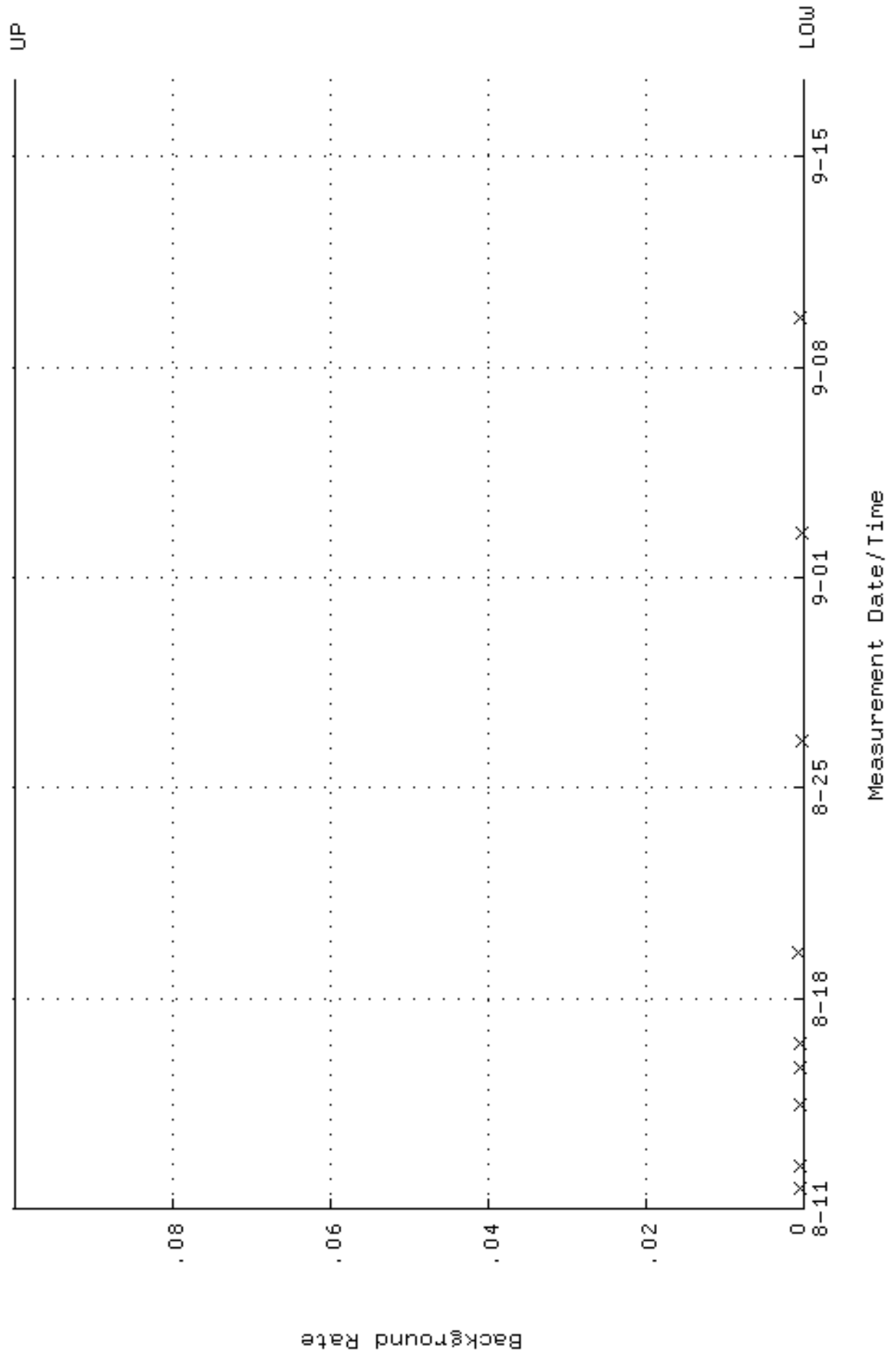
QA filename : DKA100:[ENV_ALPHA.QA.W]W221.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 16-AUG-2016 08:46:48 through 17-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



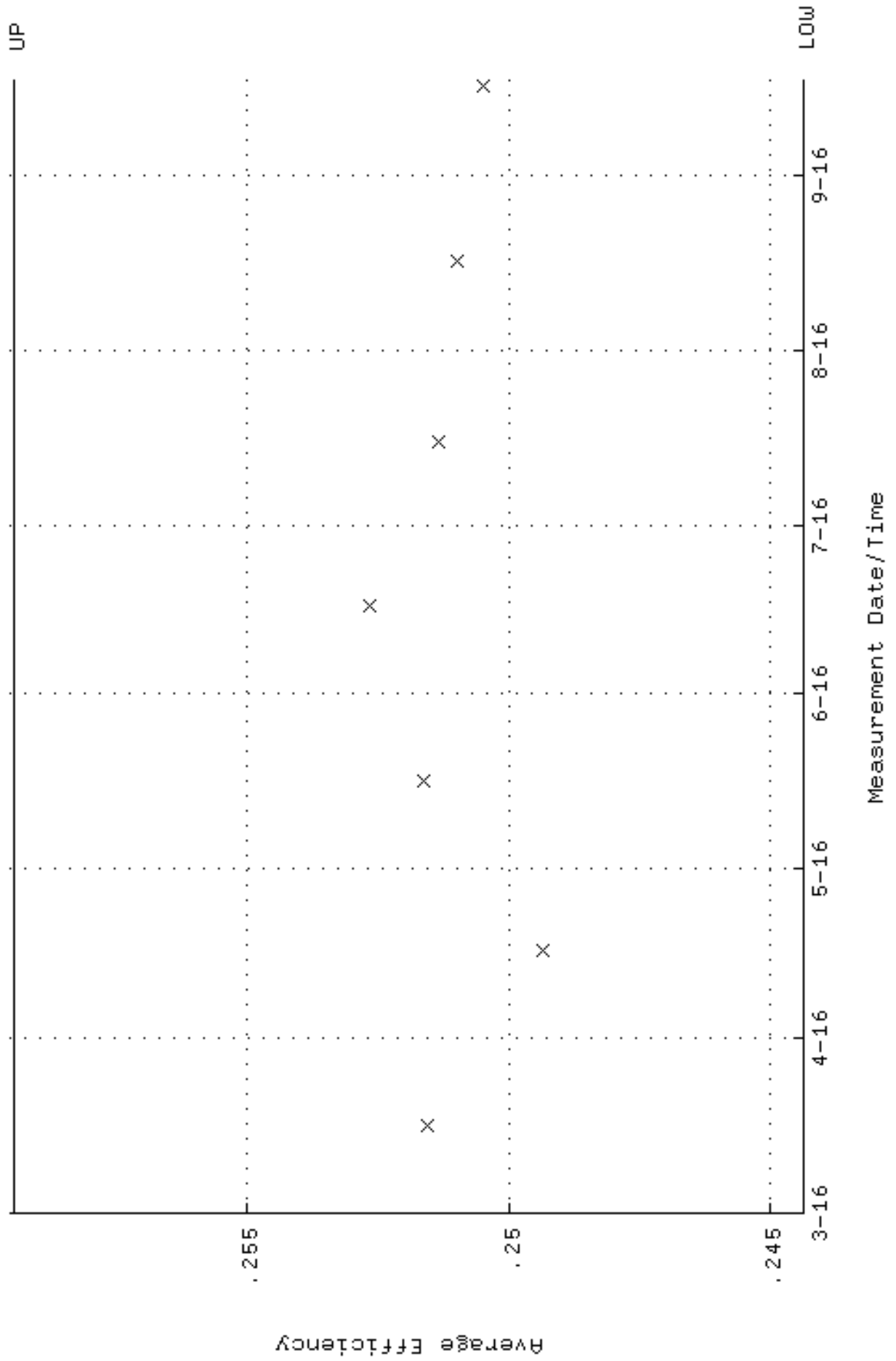
QA filename : DKA100:[ENV_ALPHA.QA.W]W221.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 16-AUG-2016 08:46:48 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



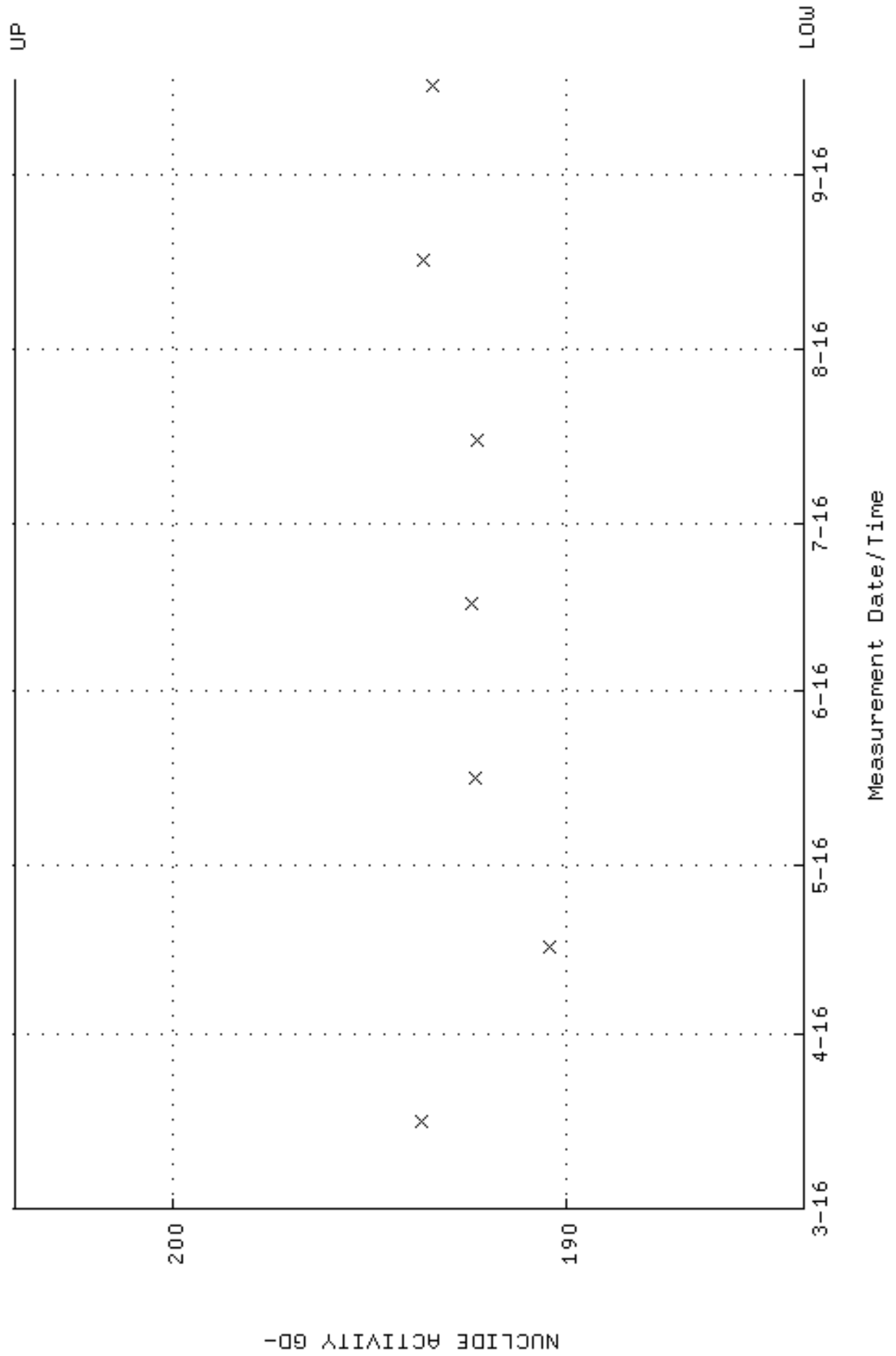
QA filename : DKA100:[ENV_ALPHA.QA.B]B221.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 11-AUG-2016 15:56:48 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



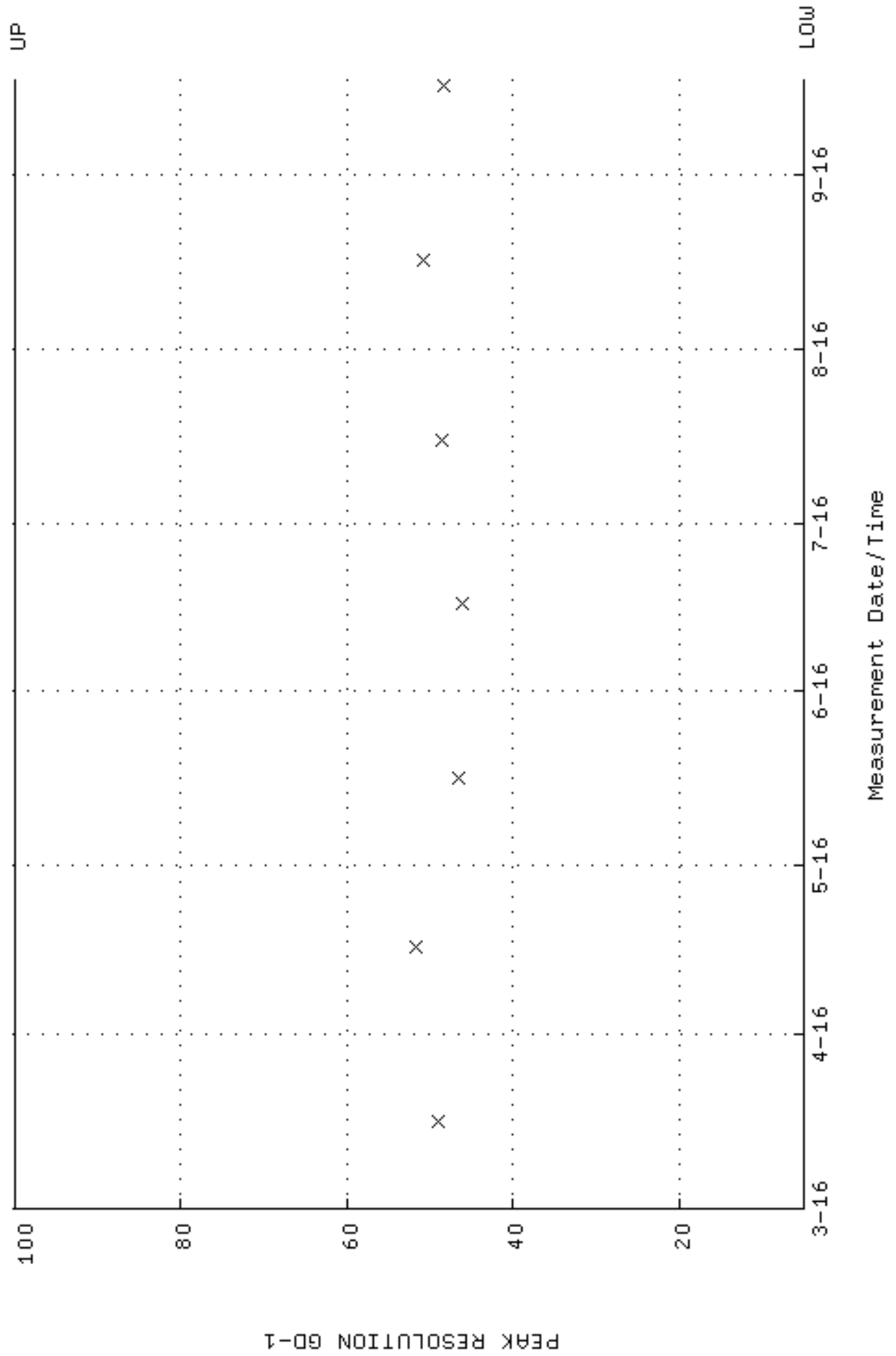
QA filename : DKA100:[ENV_ALPHA.QA.W]W222.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 16-MAR-2016 08:36:25 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.244366 through 0.259480



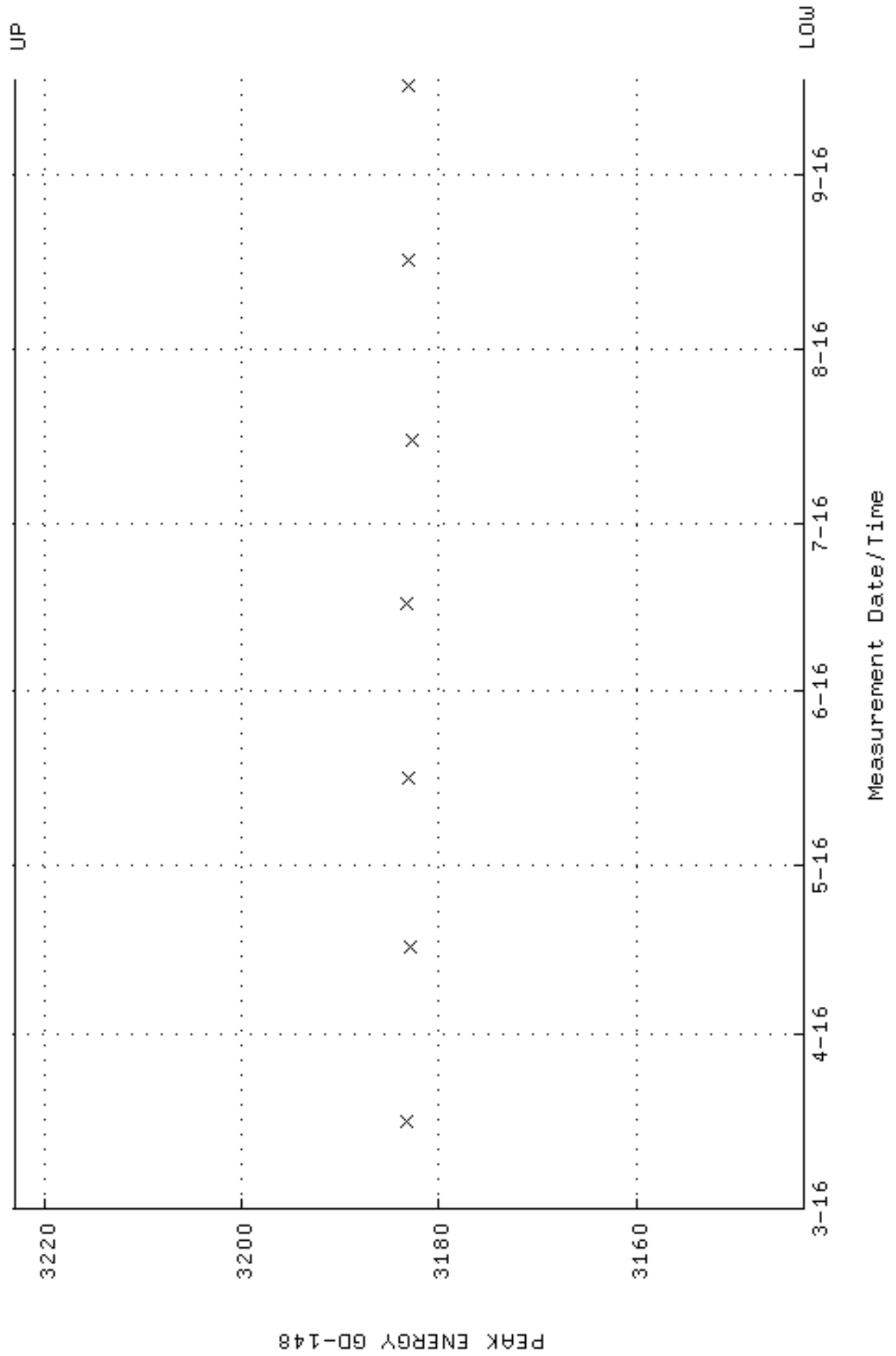
QA filename : DKA100:[ENV_ALPHA.QA.W]W222.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 16-MAR-2016 08:36:25 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



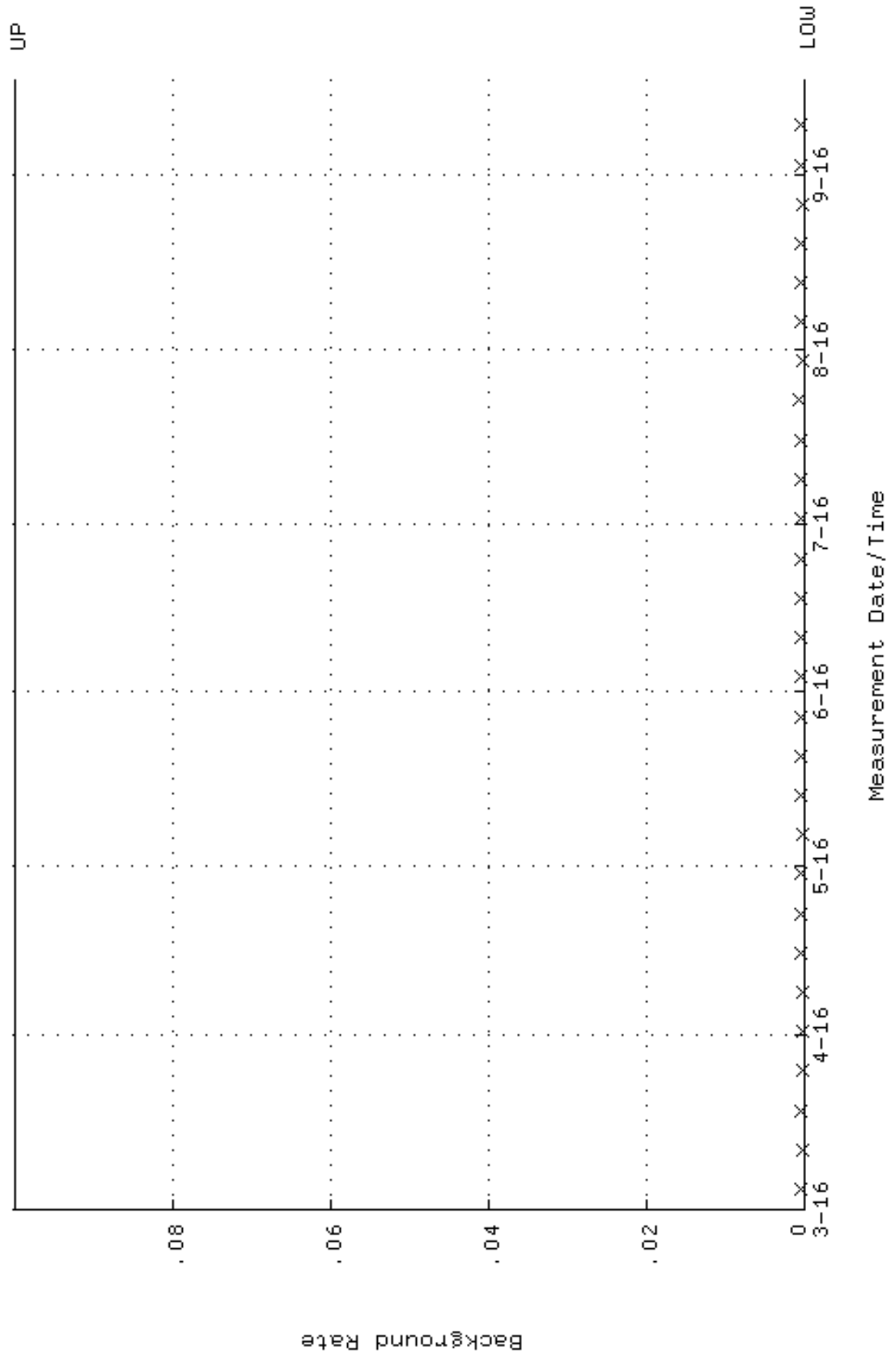
QA filename : DKA100:[ENV_ALPHA.QA.W]W222.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 16-MAR-2016 08:36:25 through 17-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



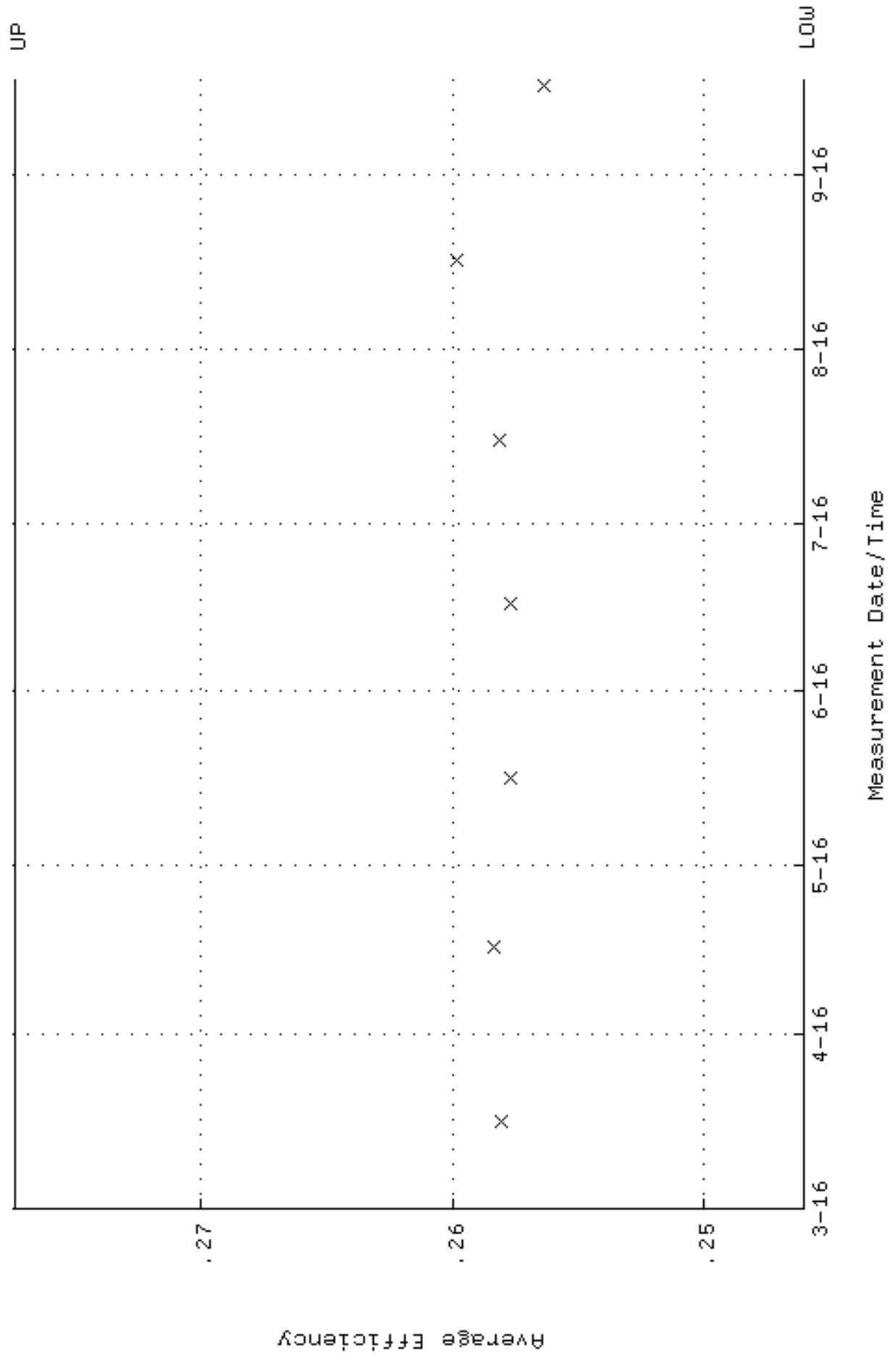
QA filename : DKA100:[ENV_ALPHA.QA.W]W222.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 16-MAR-2016 08:36:25 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



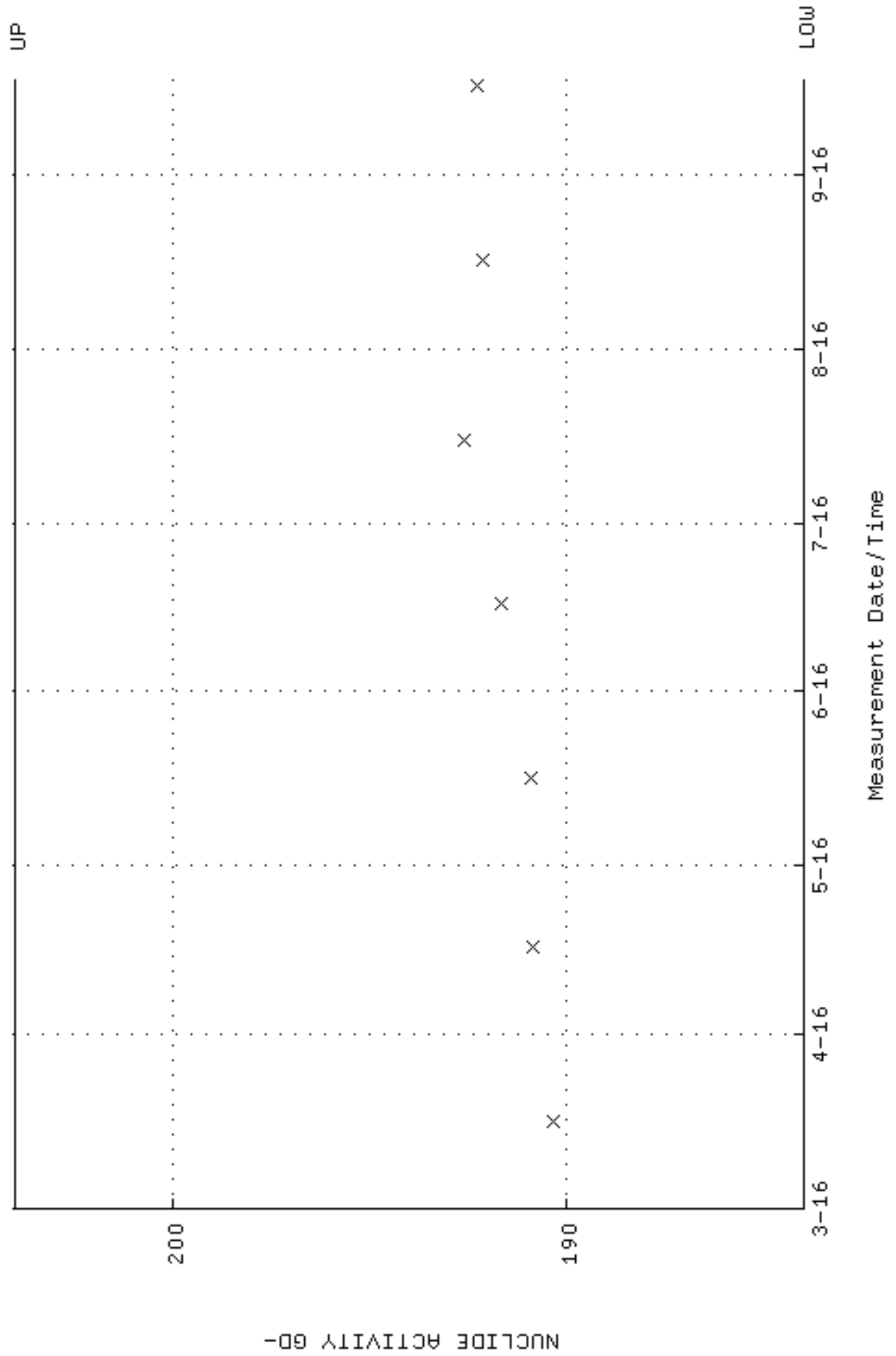
QA filename : DKA100:[ENV_ALPHA.QA.B]B222.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:31:54 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



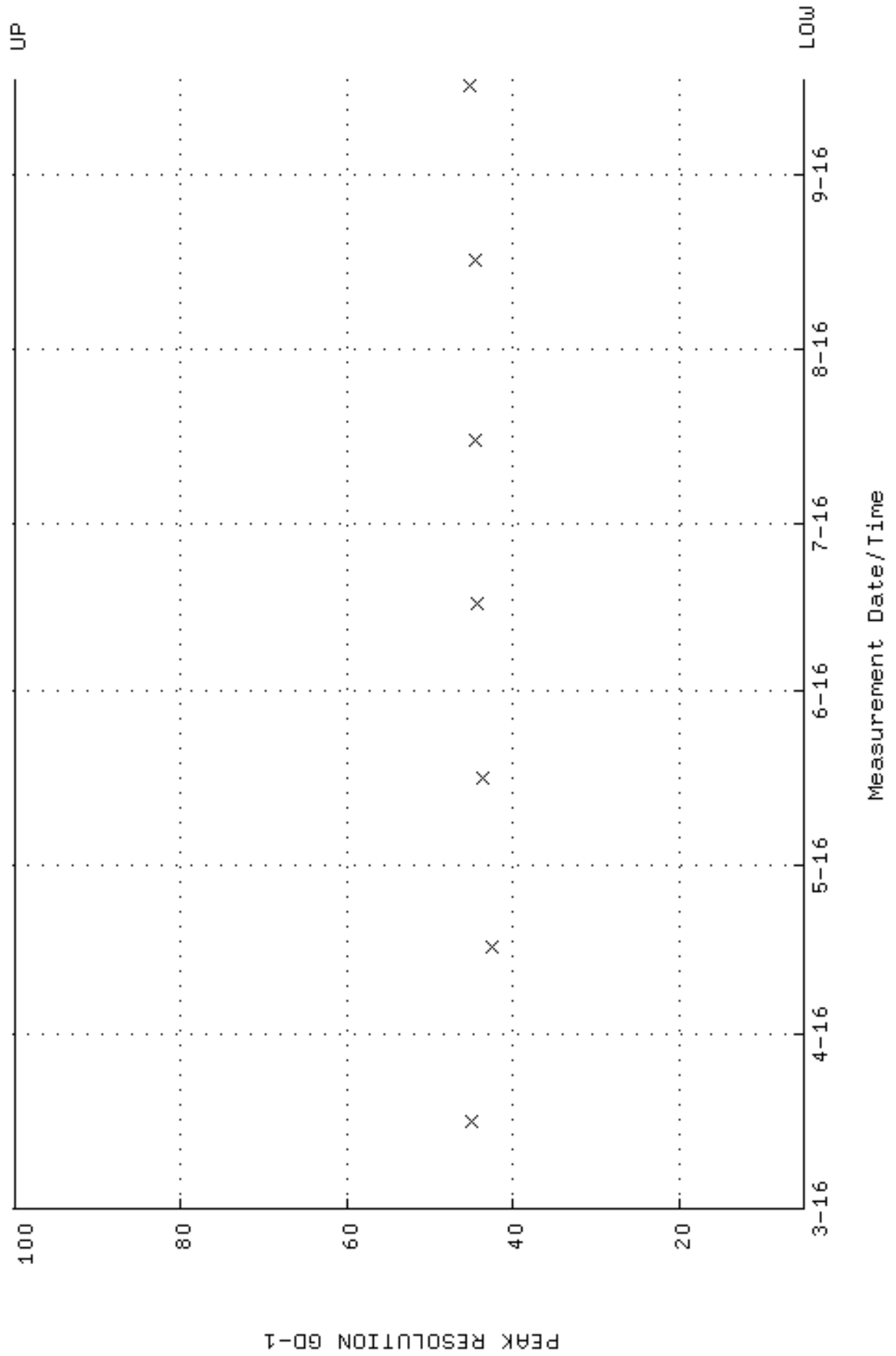
QA filename : DKA100:[ENV_ALPHA.QA.W]W223.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 16-MAR-2016 08:36:30 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.246039 through 0.277420



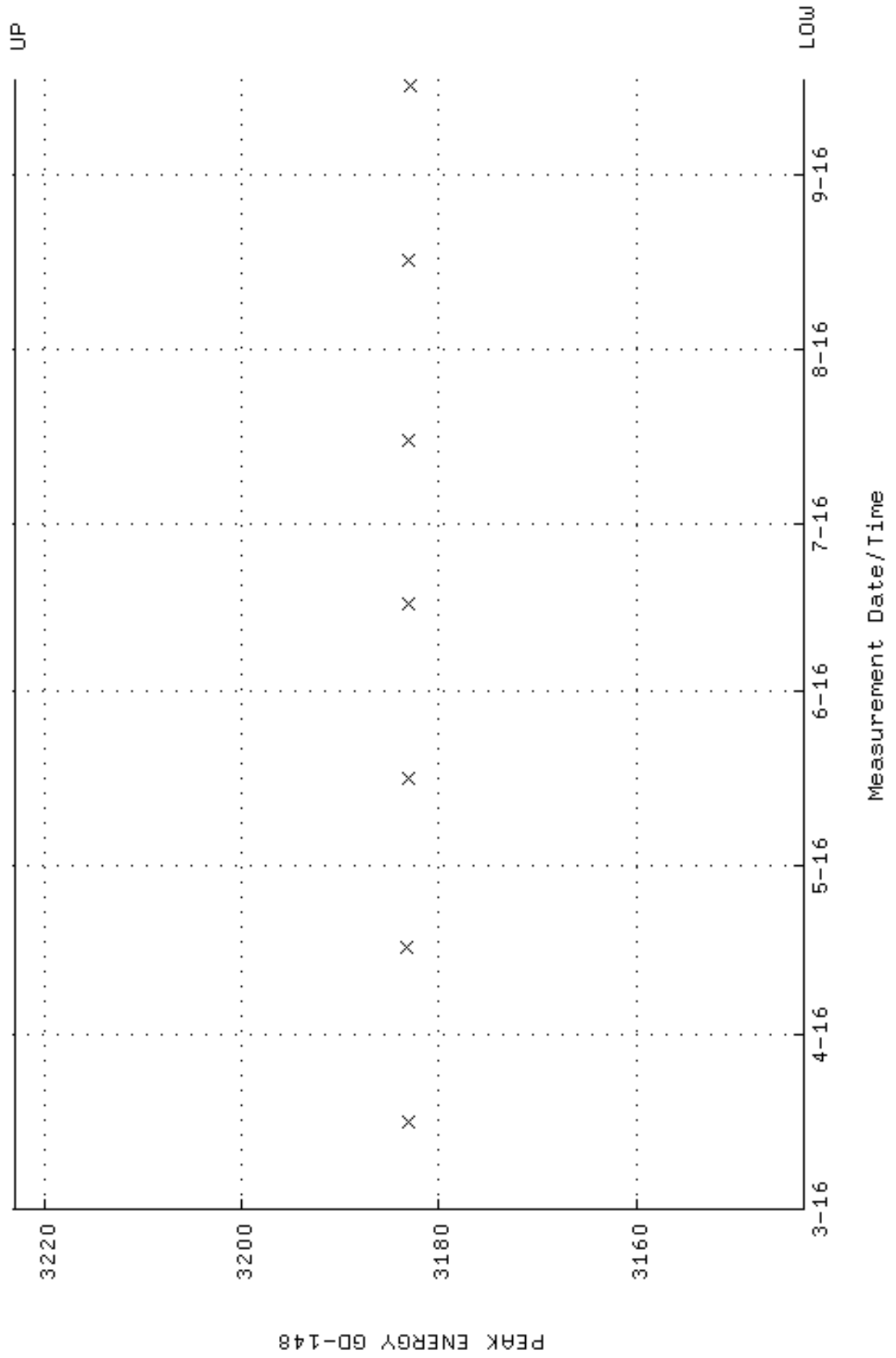
QA filename : DKA100:[ENV_ALPHA.QA.W]W223.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 16-MAR-2016 08:36:30 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



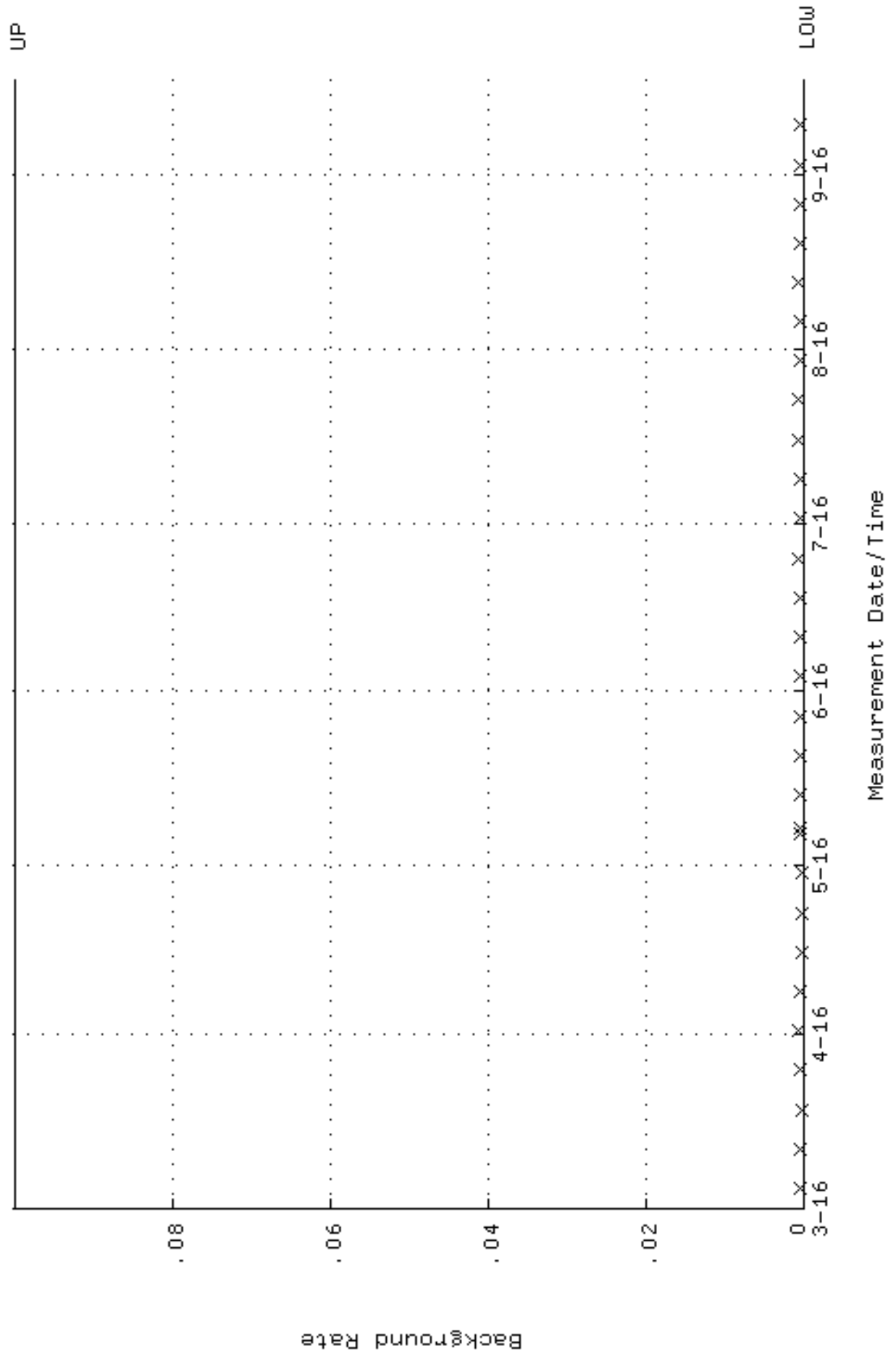
QA filename : DKA100:[ENV_ALPHA.QA.W]W223.QAF;3
 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 16-MAR-2016 08:36:30 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



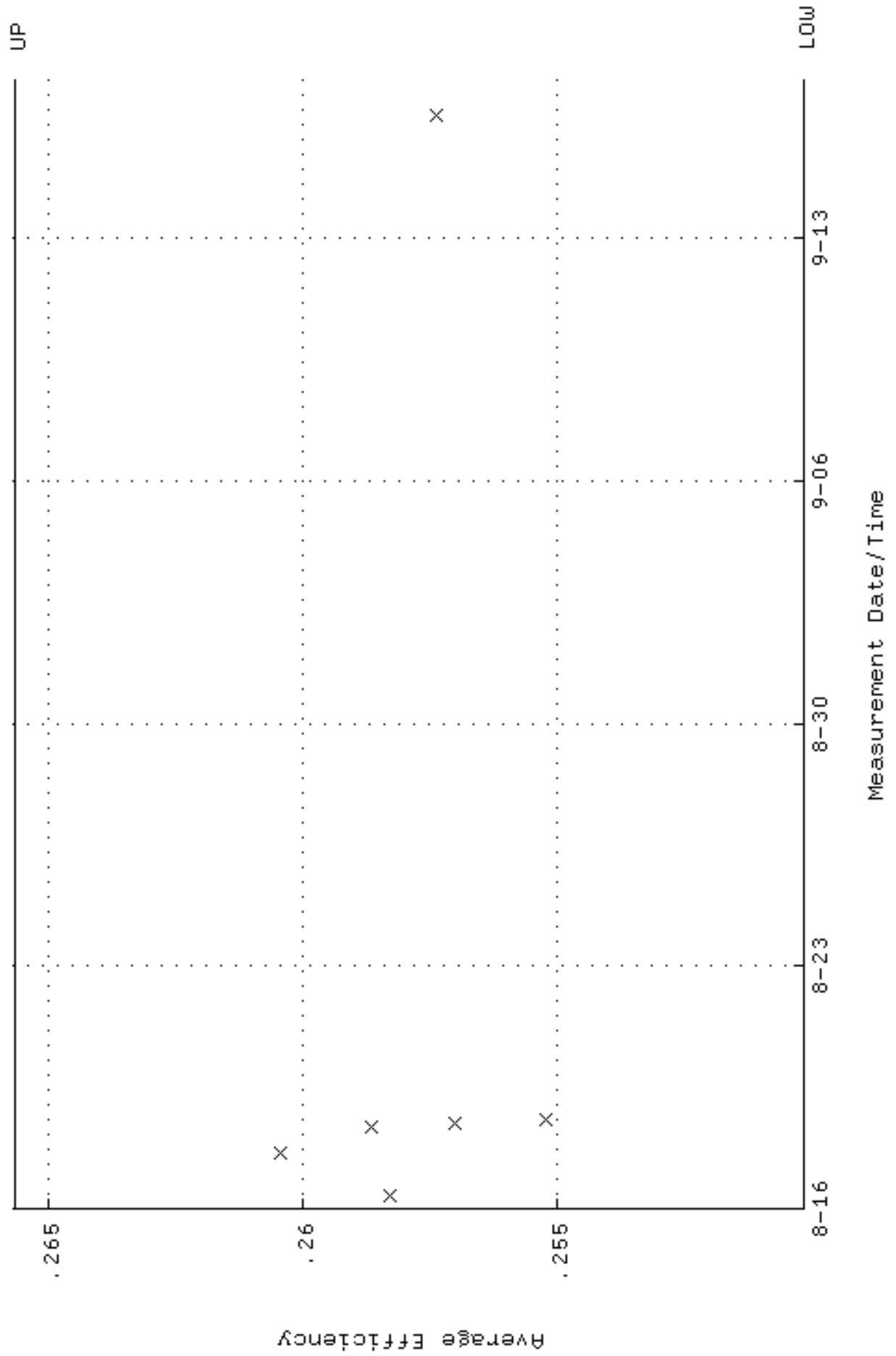
QA filename : DKA100:[ENV_ALPHA.QA.W]W223.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 16-MAR-2016 08:36:30 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



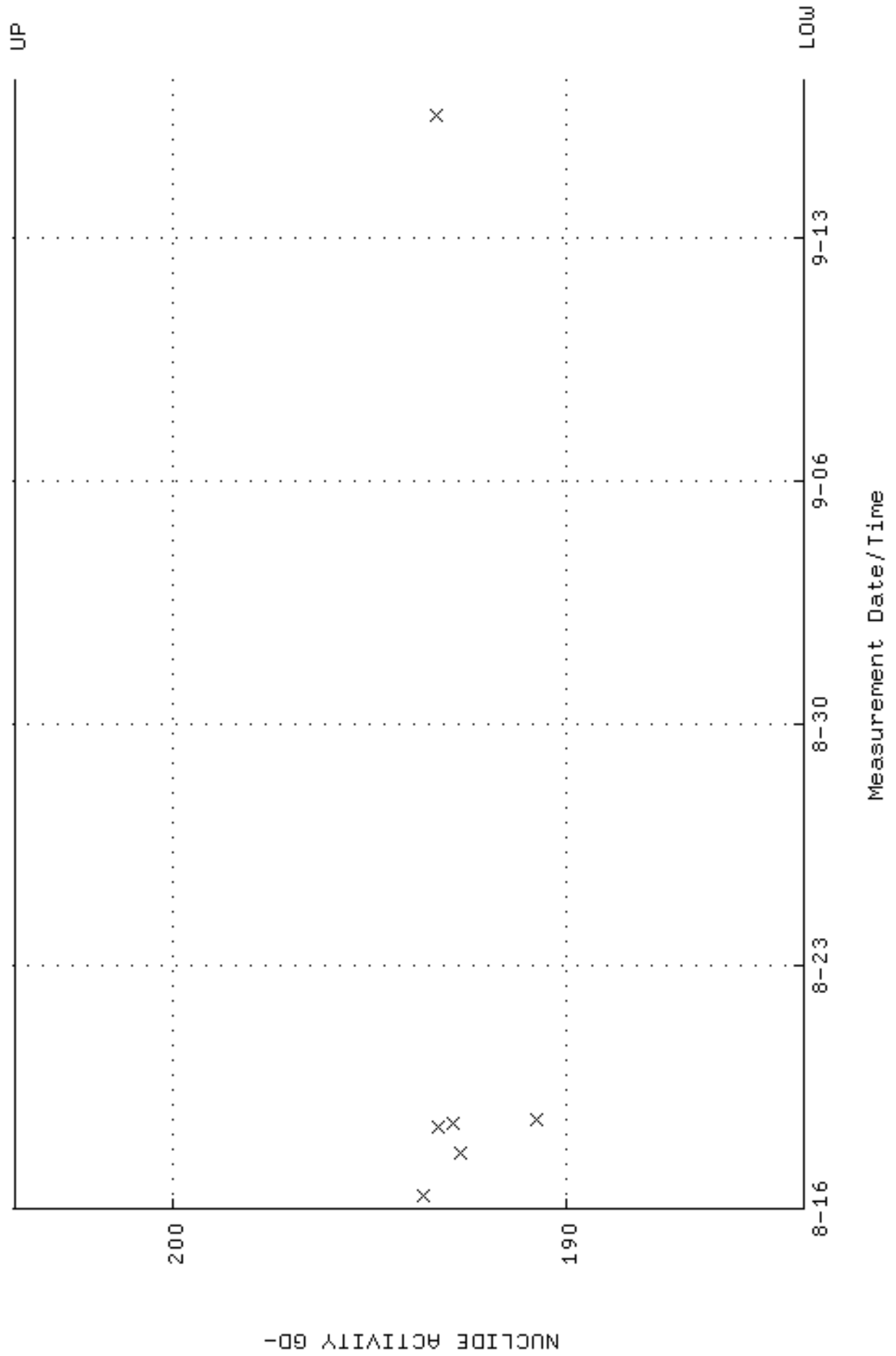
QA filename : DKA100:[ENV_ALPHA.QA.B]B223.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:31:57 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



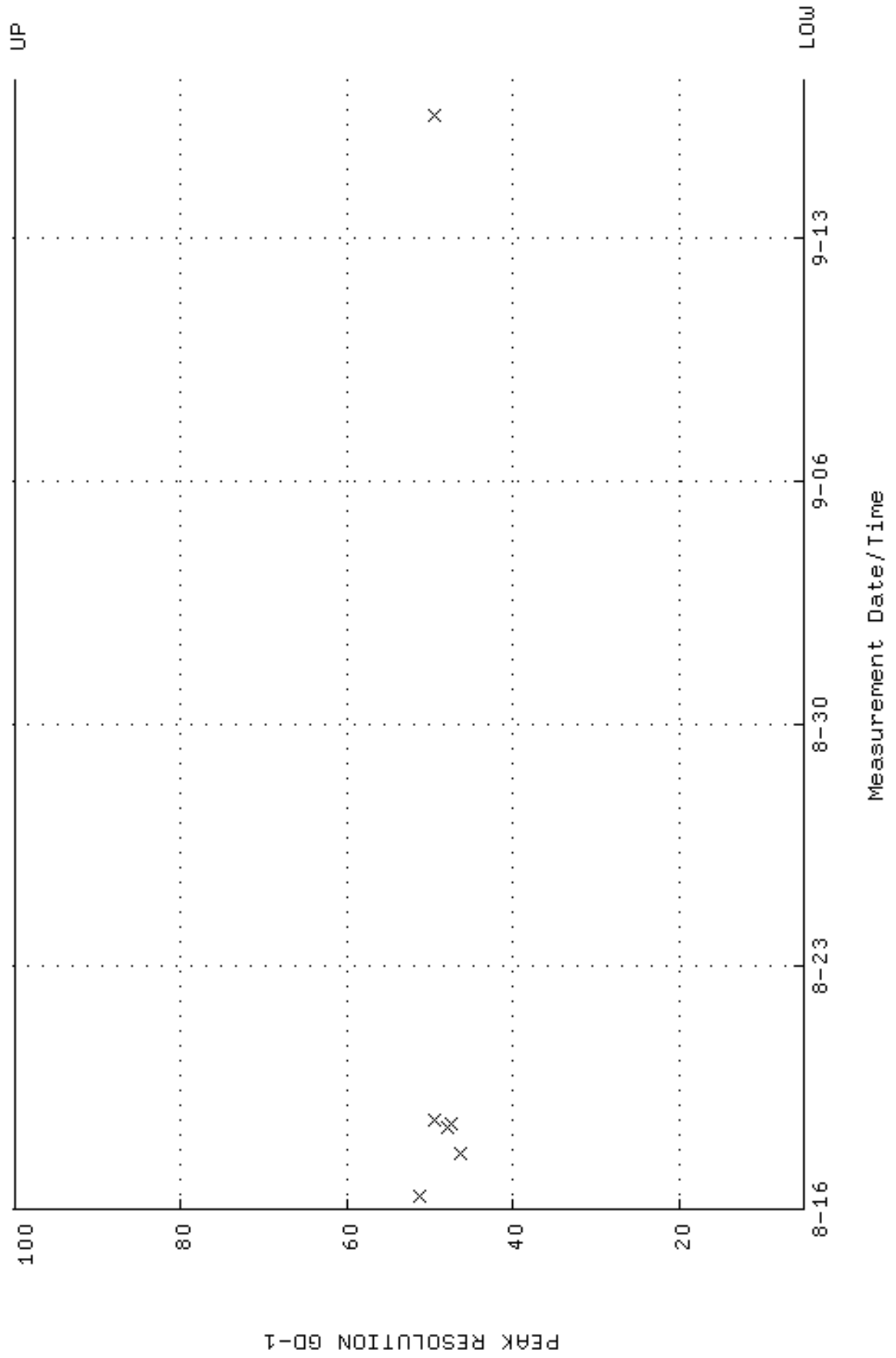
QA filename : DKA100:[ENV_ALPHA.QA.W]W224.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 16-AUG-2016 08:47:00 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.250168 through 0.265640



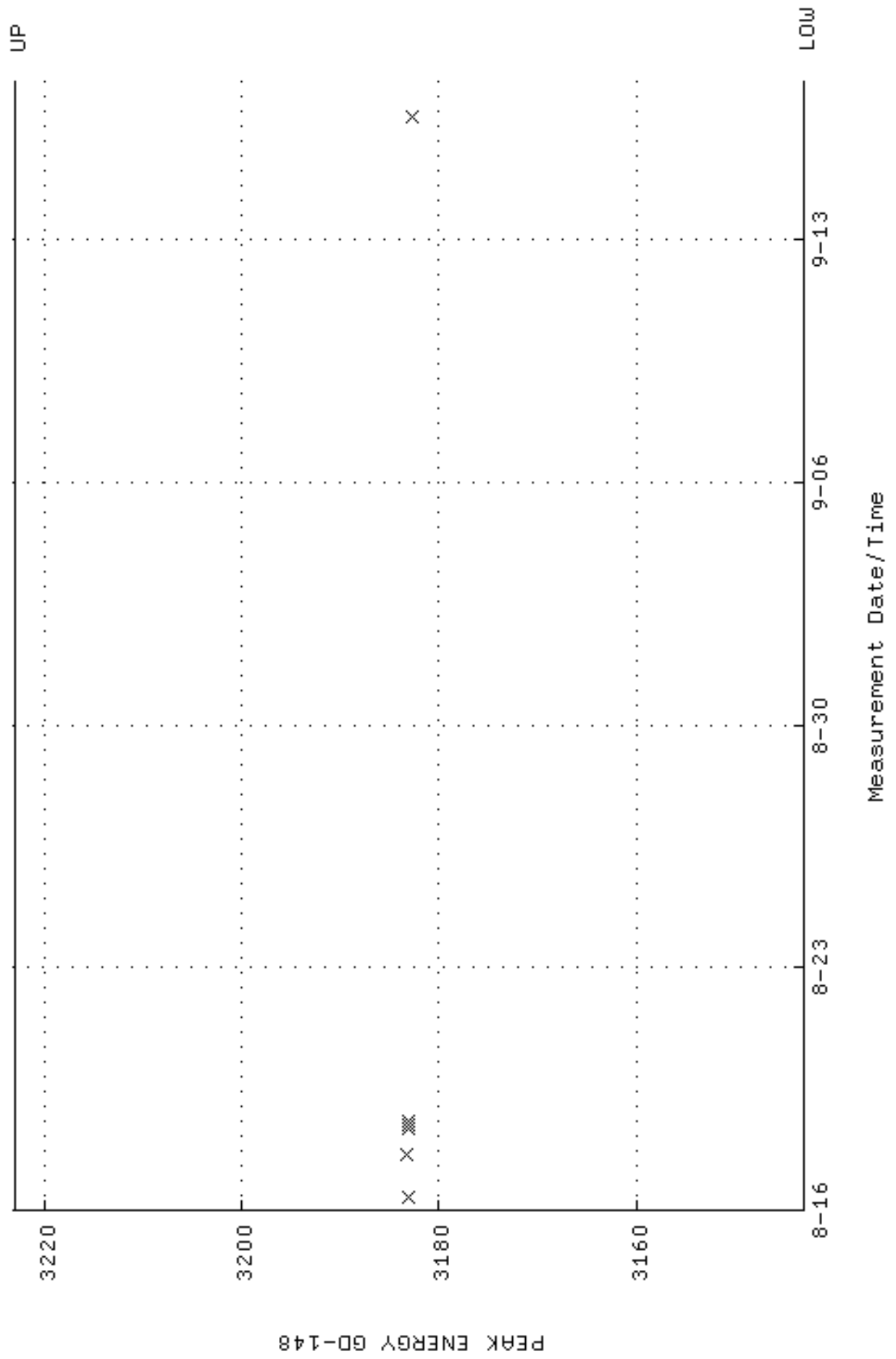
QA filename : DKA100:[ENV_ALPHA.QA.W]W224.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 16-AUG-2016 08:47:00 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



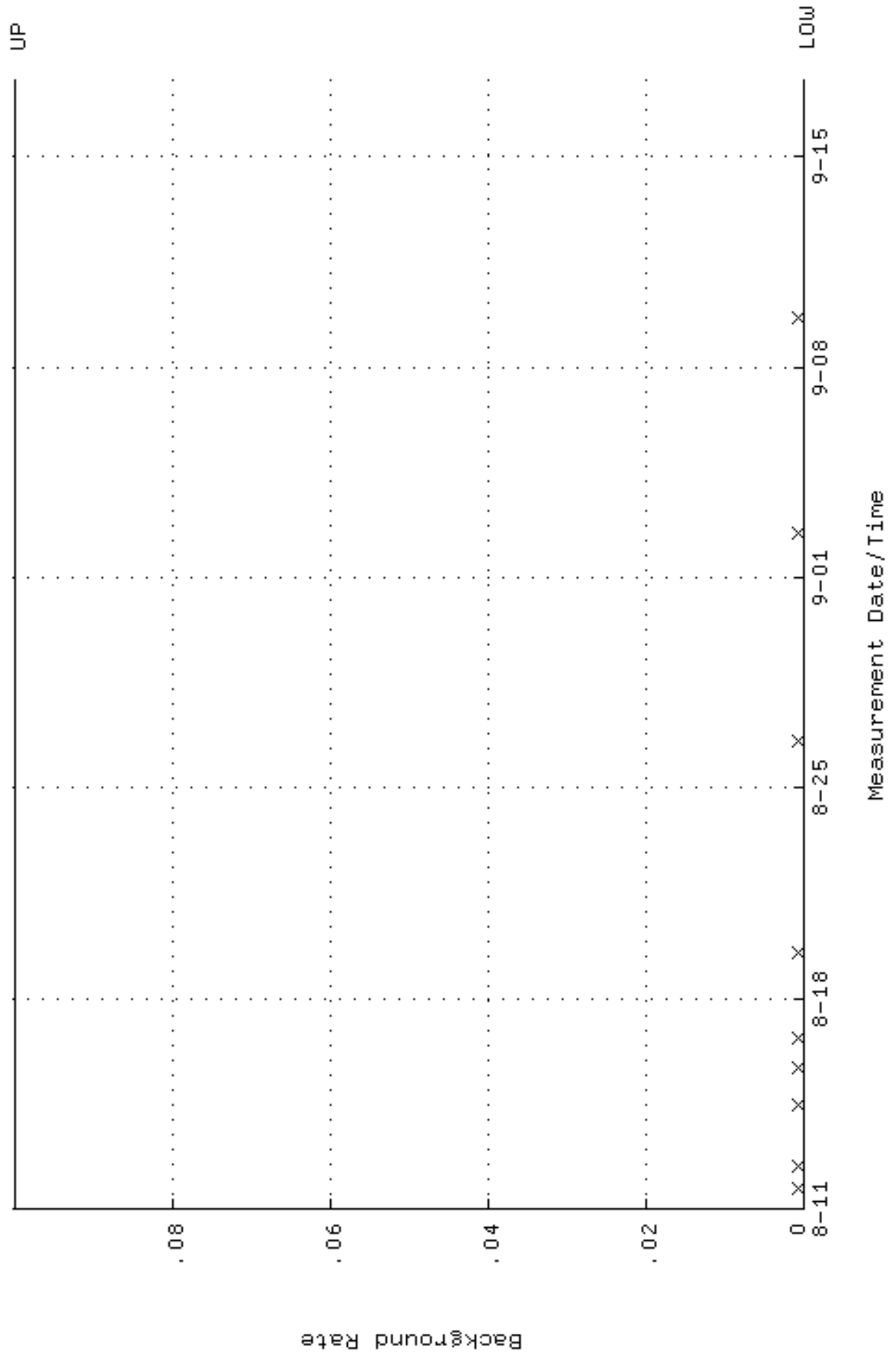
QA filename : DKA100:[ENV_ALPHA.QA.W]W224.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 16-AUG-2016 08:47:00 through 17-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



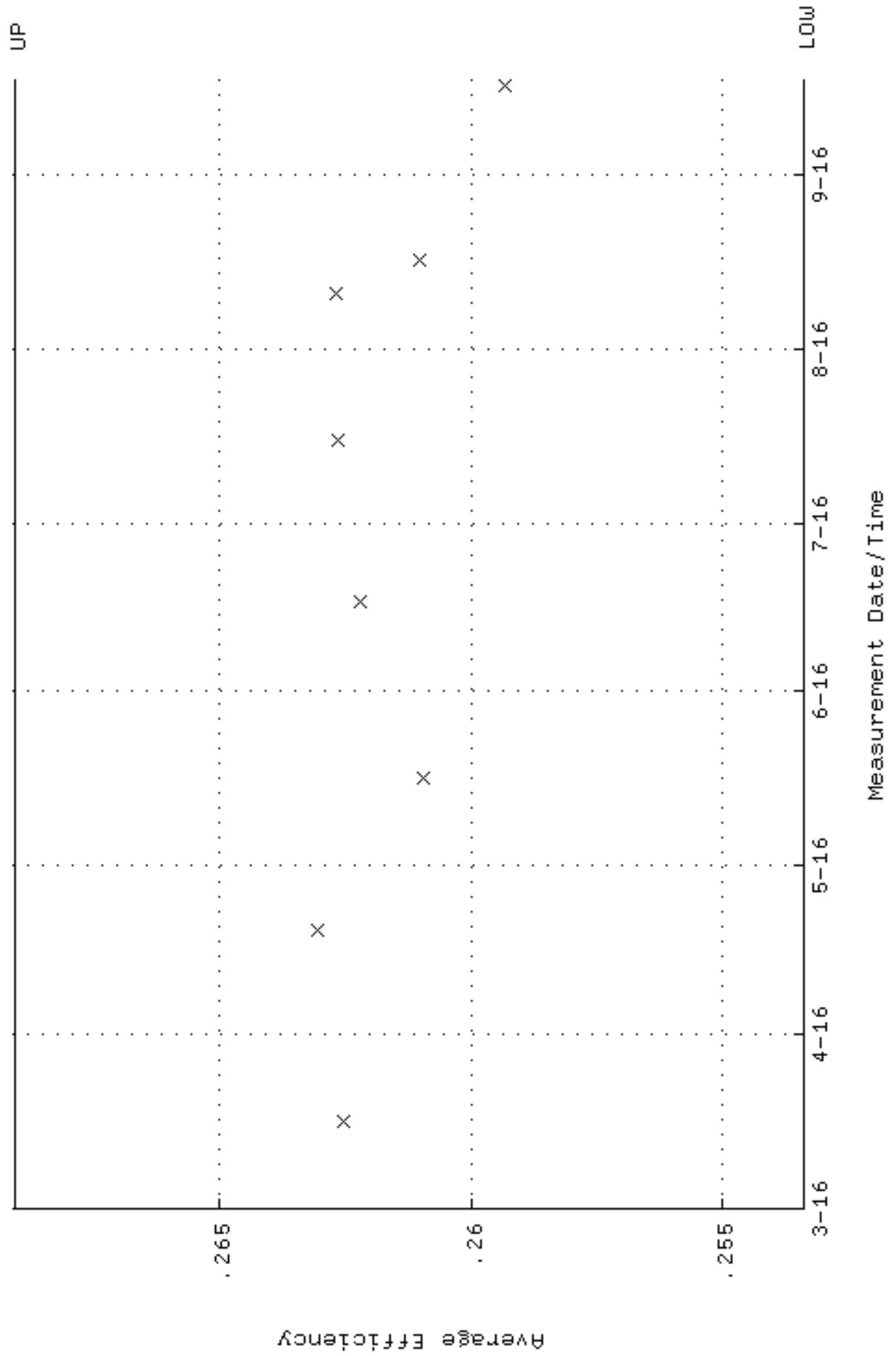
QA filename : DKA100:[ENV_ALPHA.QA.W]W224.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 16-AUG-2016 08:47:00 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



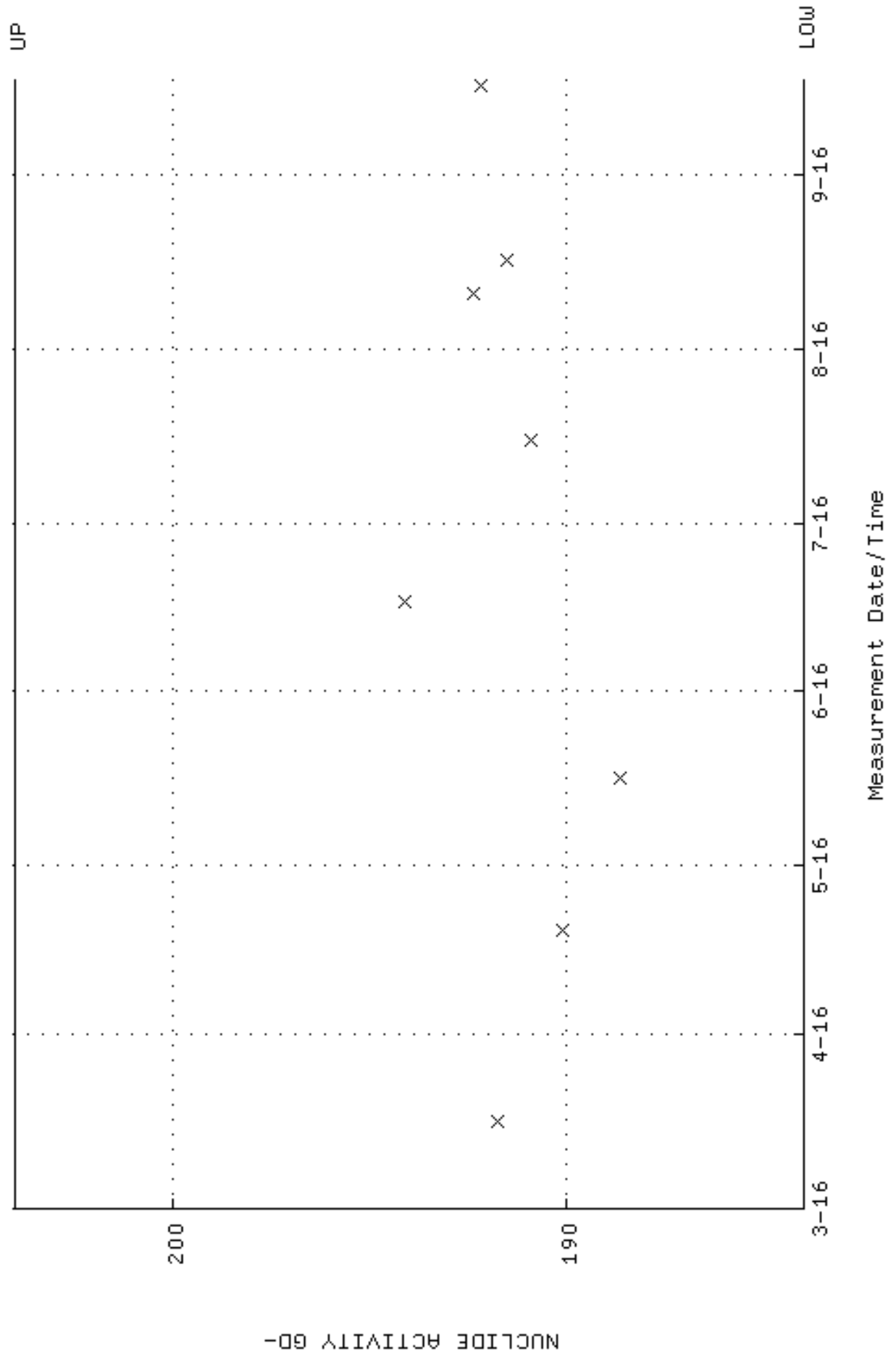
QA filename : DKA100:[ENV_ALPHA.QA.B]B224.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 11-AUG-2016 15:56:52 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



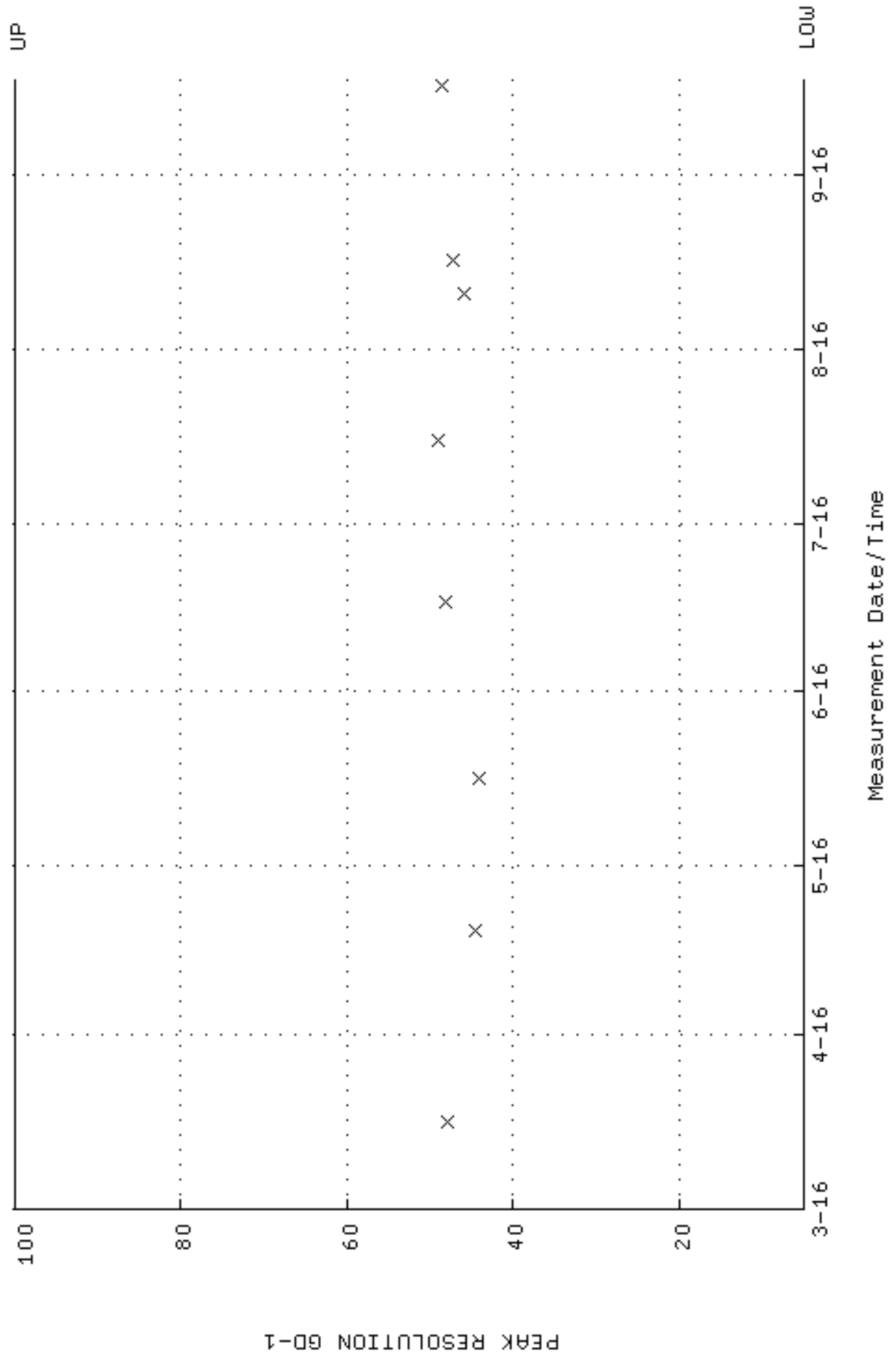
QA filename : DKA100:[ENV_ALPHA.QA.W]W225.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 16-MAR-2016 08:36:41 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.253380 through 0.269055



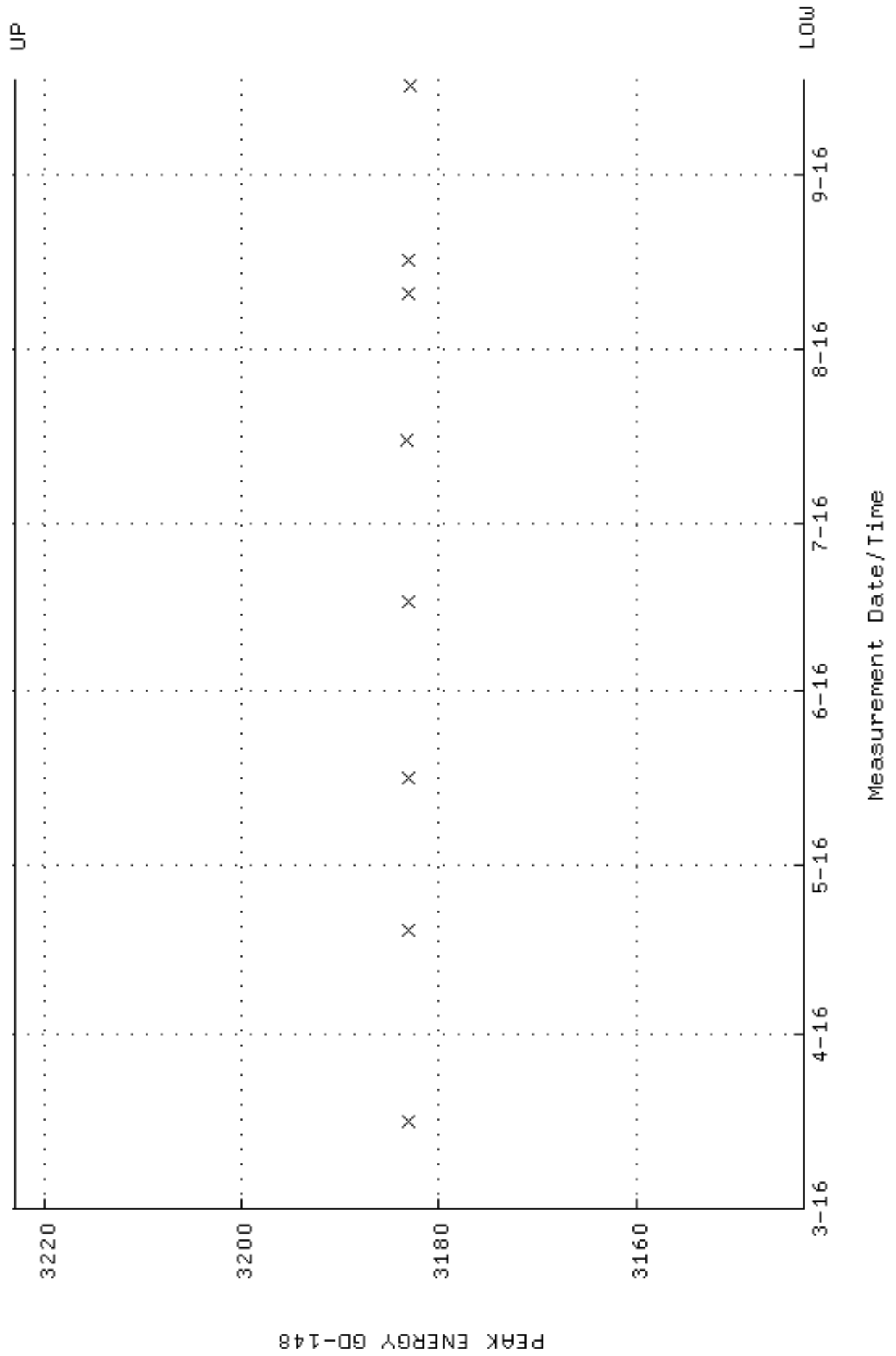
QA filename : DKA100:[ENV_ALPHA.QA.W]W225.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 16-MAR-2016 08:36:41 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



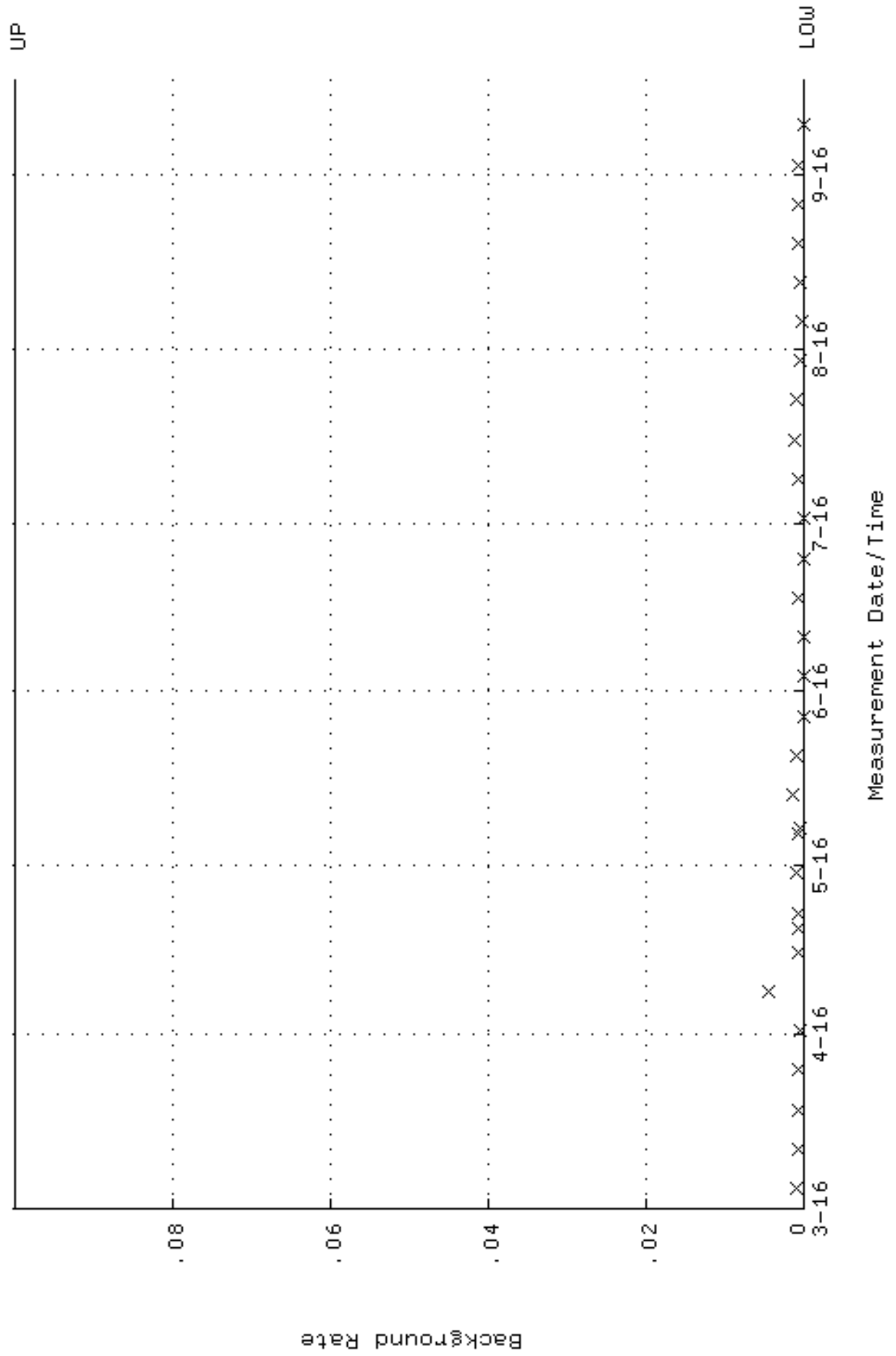
QA filename : DKA100:[ENV_ALPHA.QA.W]W225.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 16-MAR-2016 08:36:41 through 17-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



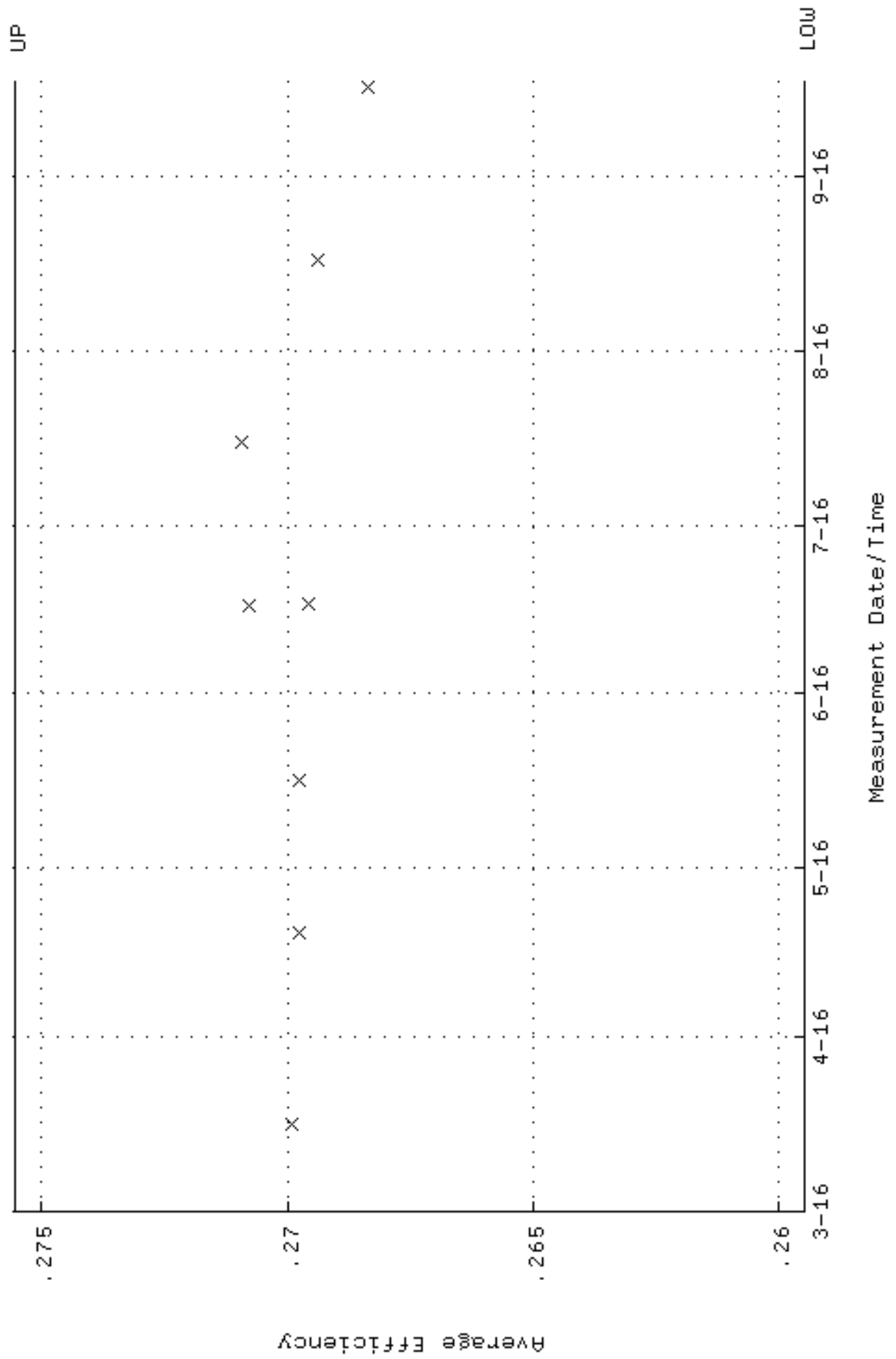
QA filename : DKA100:[ENV_ALPHA.QA.W]W225.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 16-MAR-2016 08:36:41 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



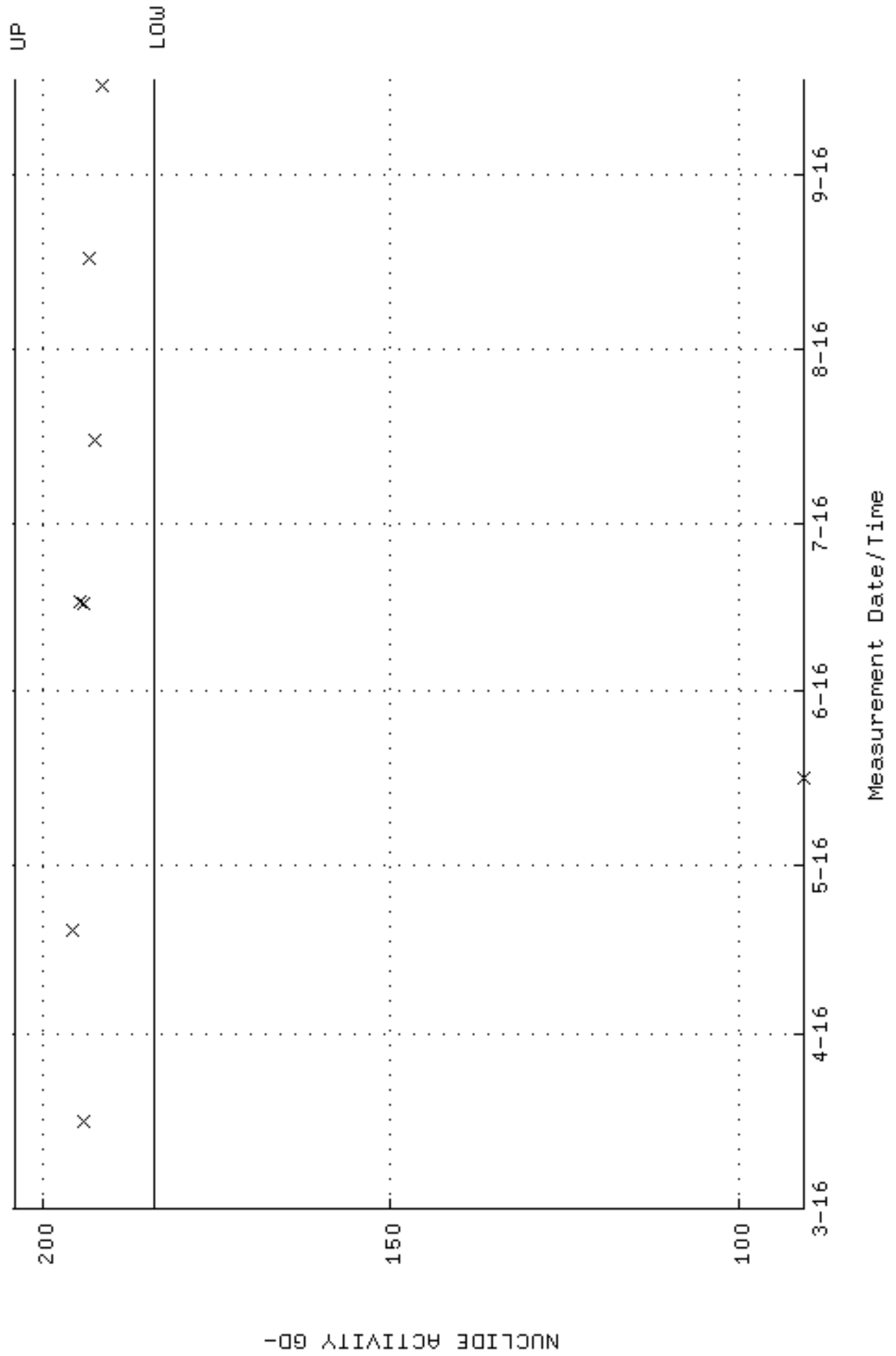
QA filename : DKA100:[ENV_ALPHA.QA.B]B225.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:32:05 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



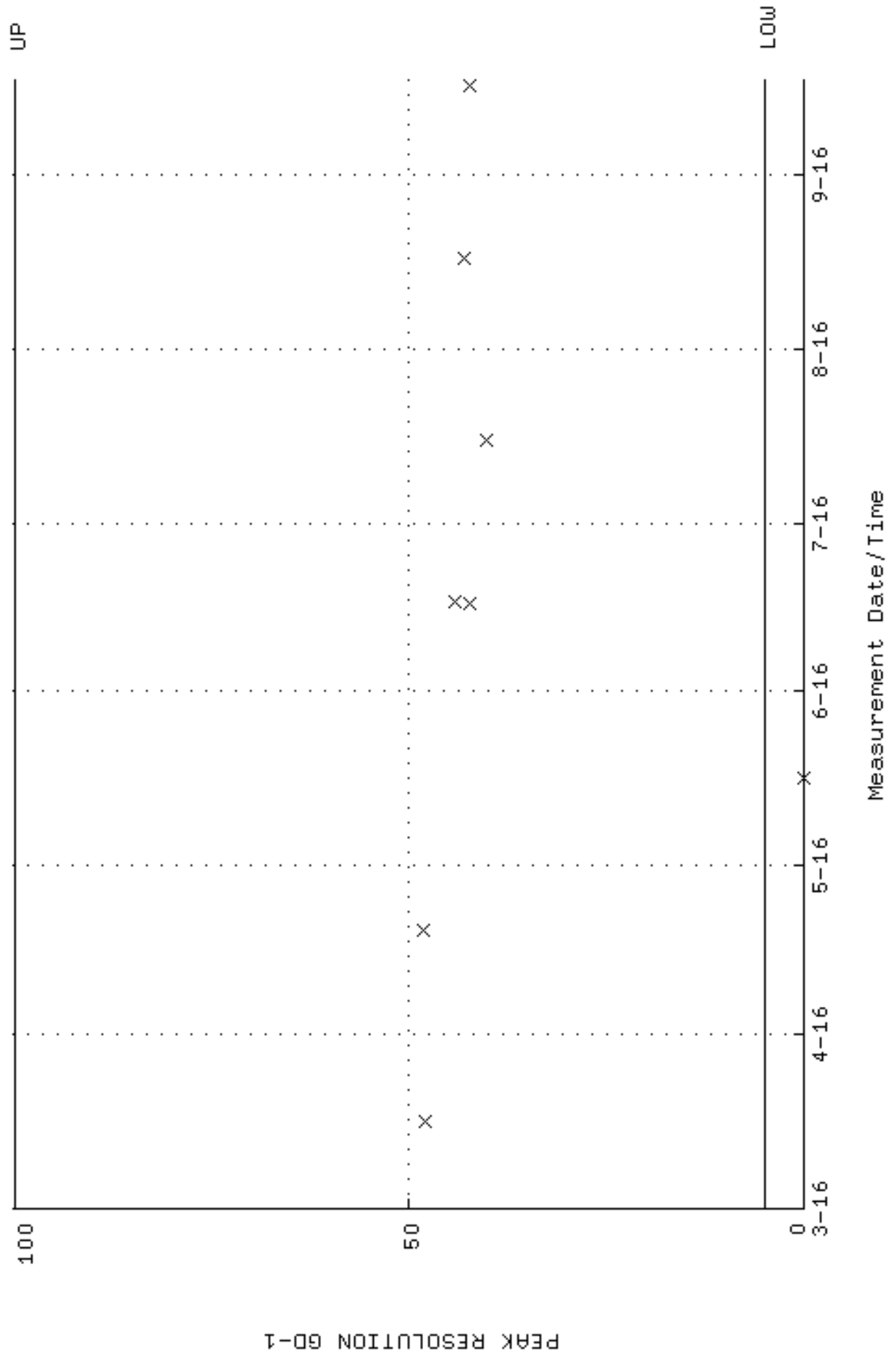
QA filename : DKA100:[ENV_ALPHA.QA.W]W226.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 16-MAR-2016 15:11:24 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.259485 through 0.275535



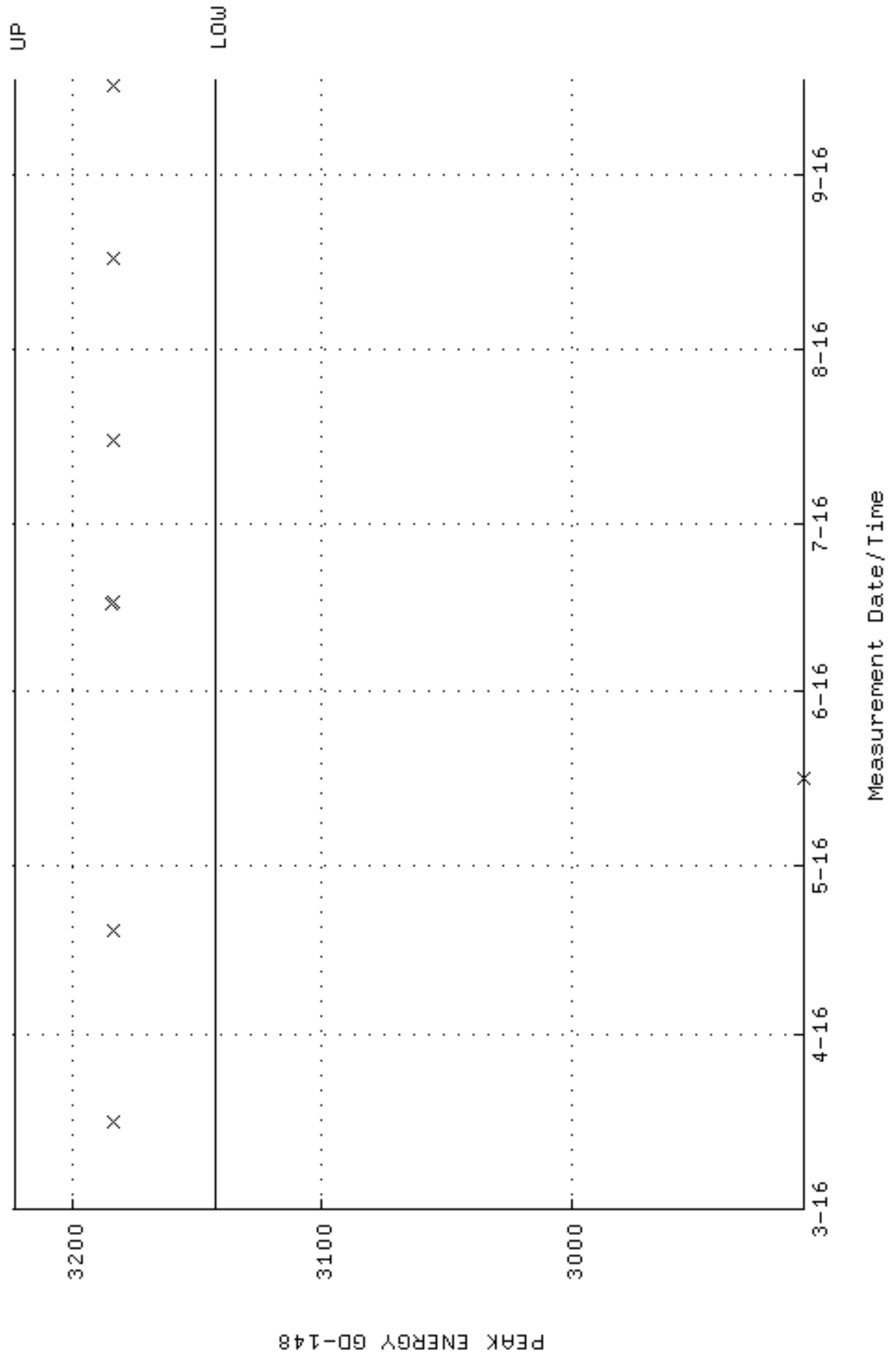
QA filename : DKA100:[ENV_ALPHA.QA.W]W226.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 16-MAR-2016 15:11:24 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



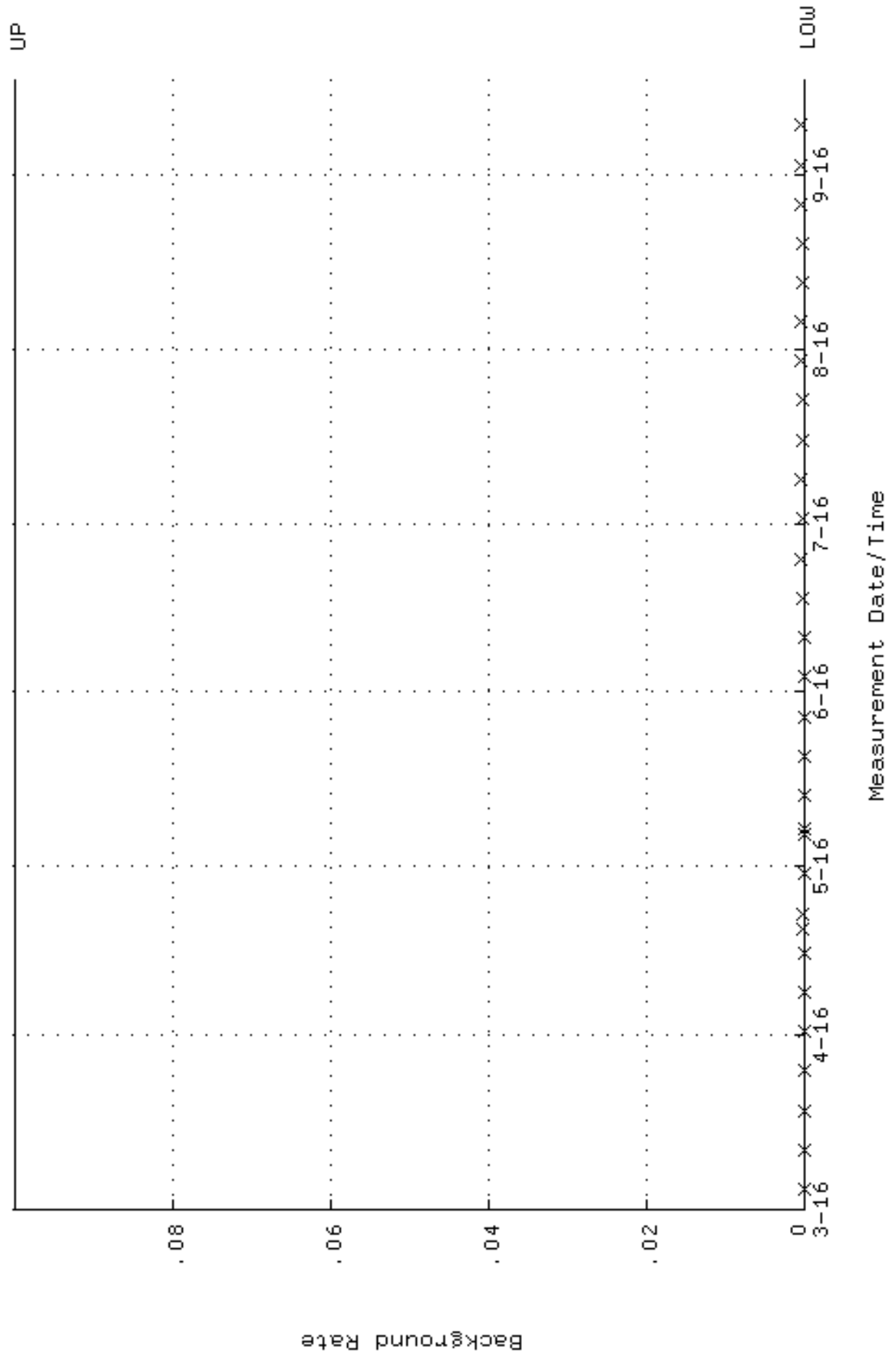
QA filename : DKA100:[ENV_ALPHA.QA.W]W226.QAF;3
 Parameter Name : PSFVHM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 16-MAR-2016 15:11:24 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



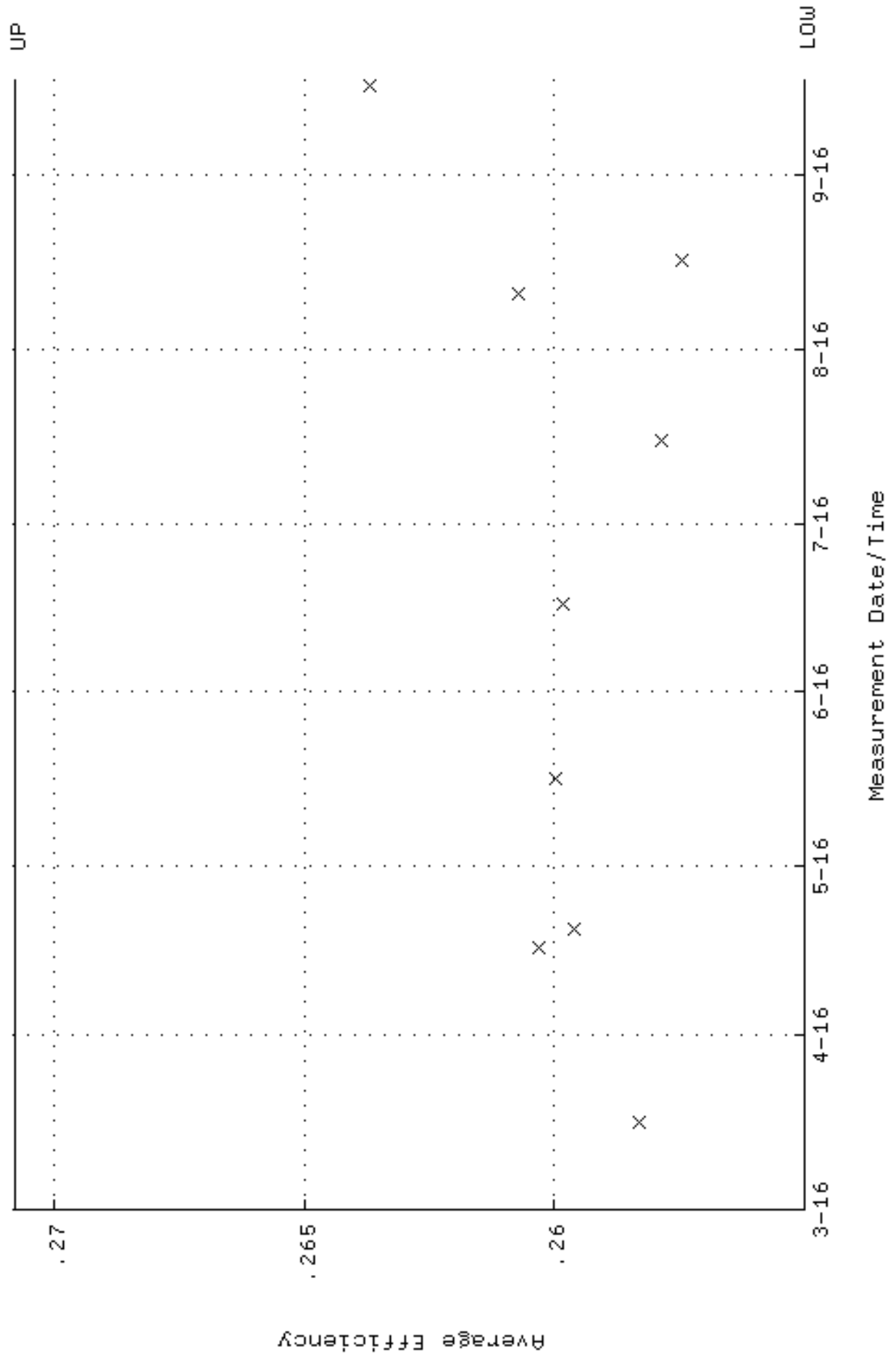
QA filename : DKA100:[ENV_ALPHA.QA.W]W226.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 16-MAR-2016 15:11:24 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



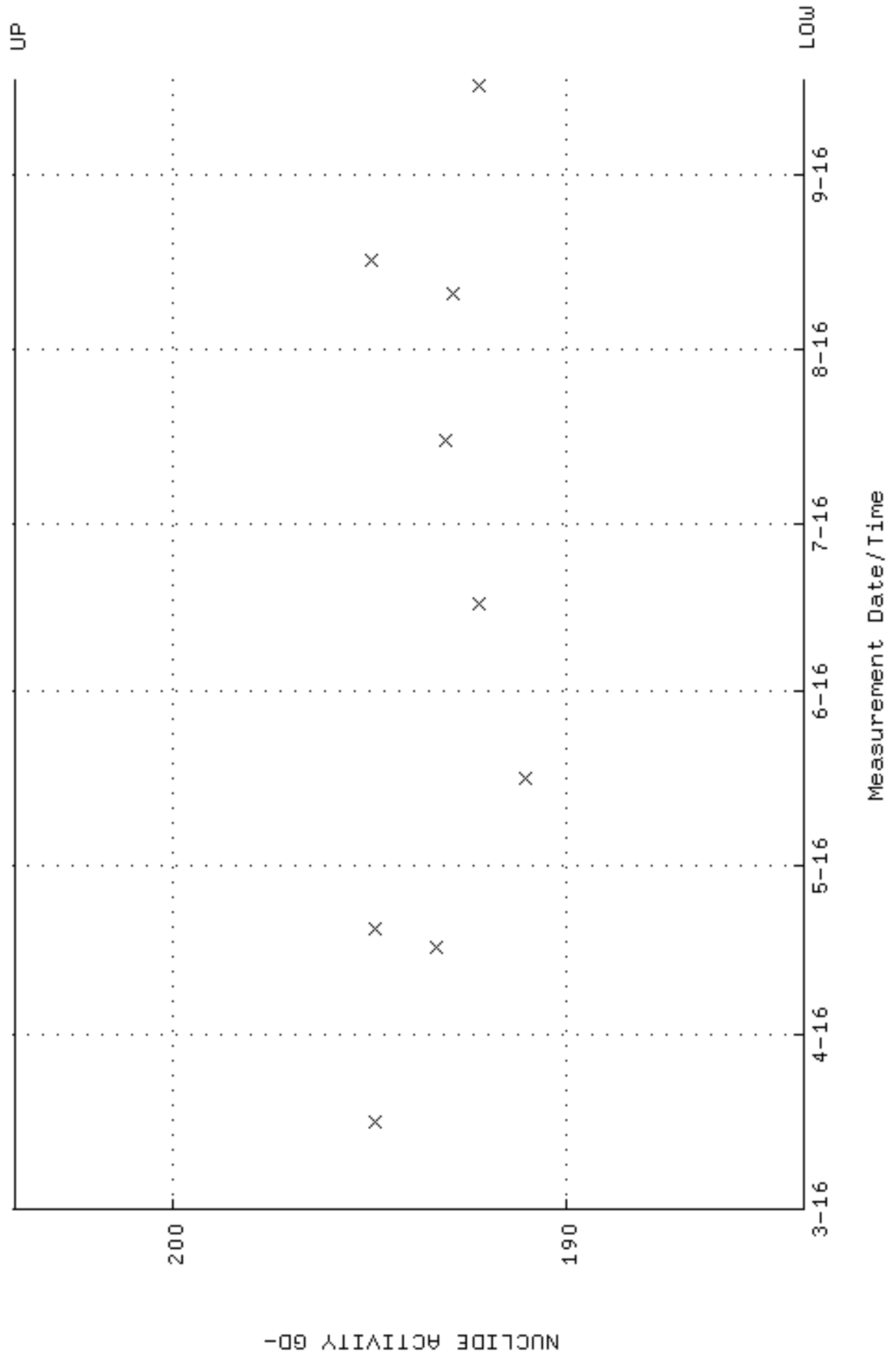
QA filename : DKA100:[ENV_ALPHA.QA.B]B2226.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:32:09 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



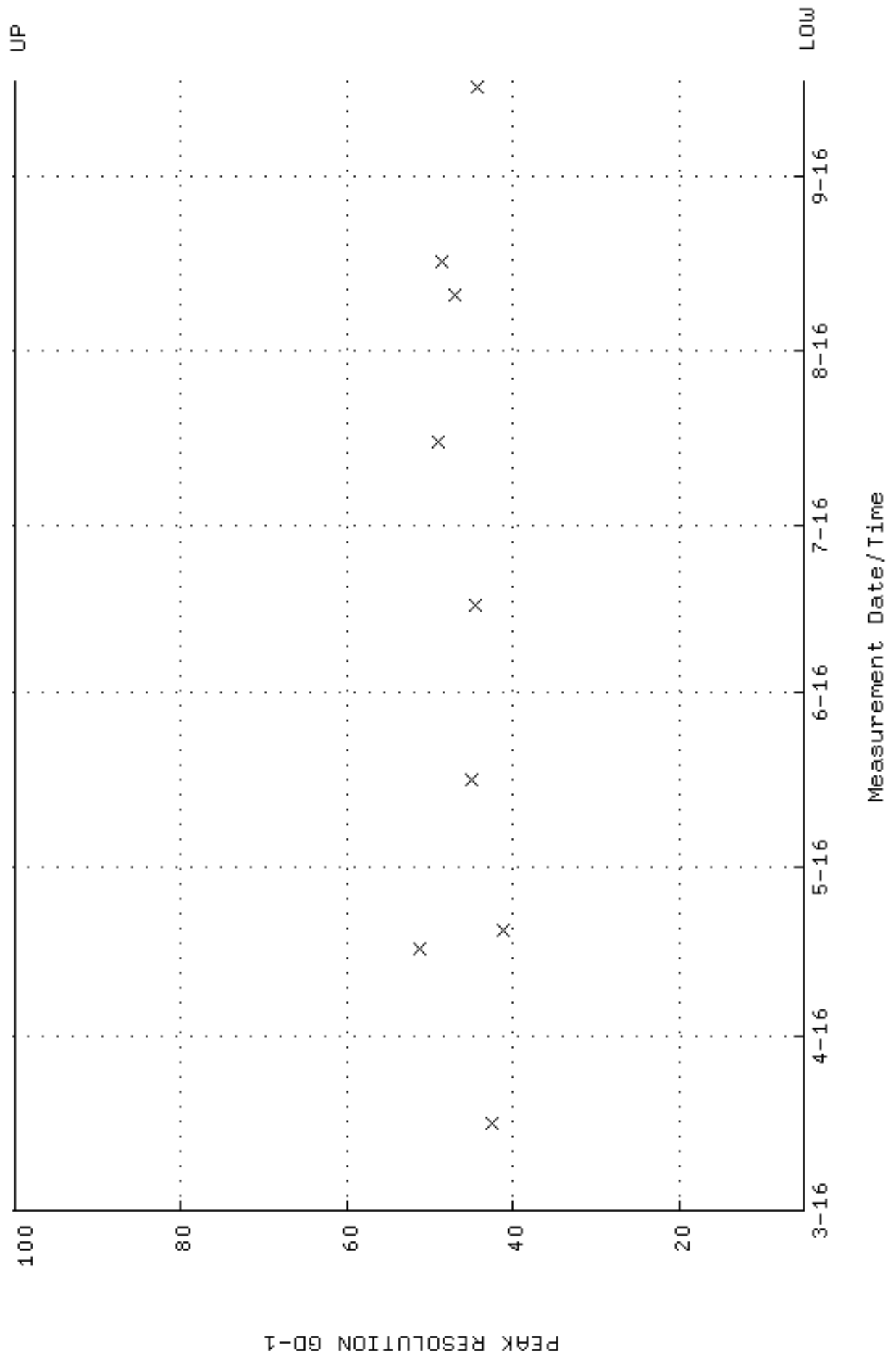
QA filename : DKA100:[ENV_ALPHA.QA.W]W227.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 16-MAR-2016 08:36:54 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.255004 through 0.270778



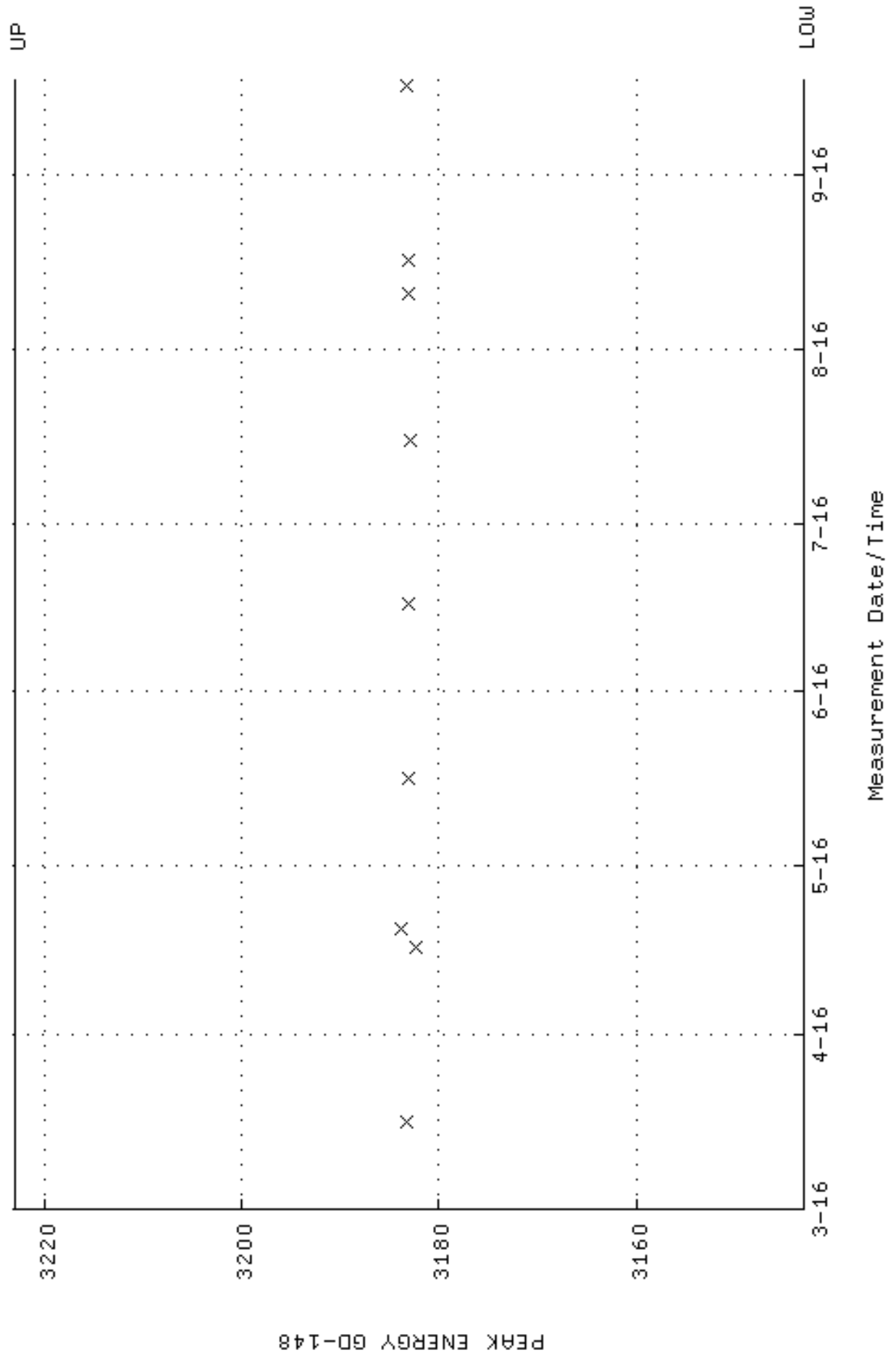
QA filename : DKA100:[ENV_ALPHA.QA.W]W227.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 16-MAR-2016 08:36:54 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



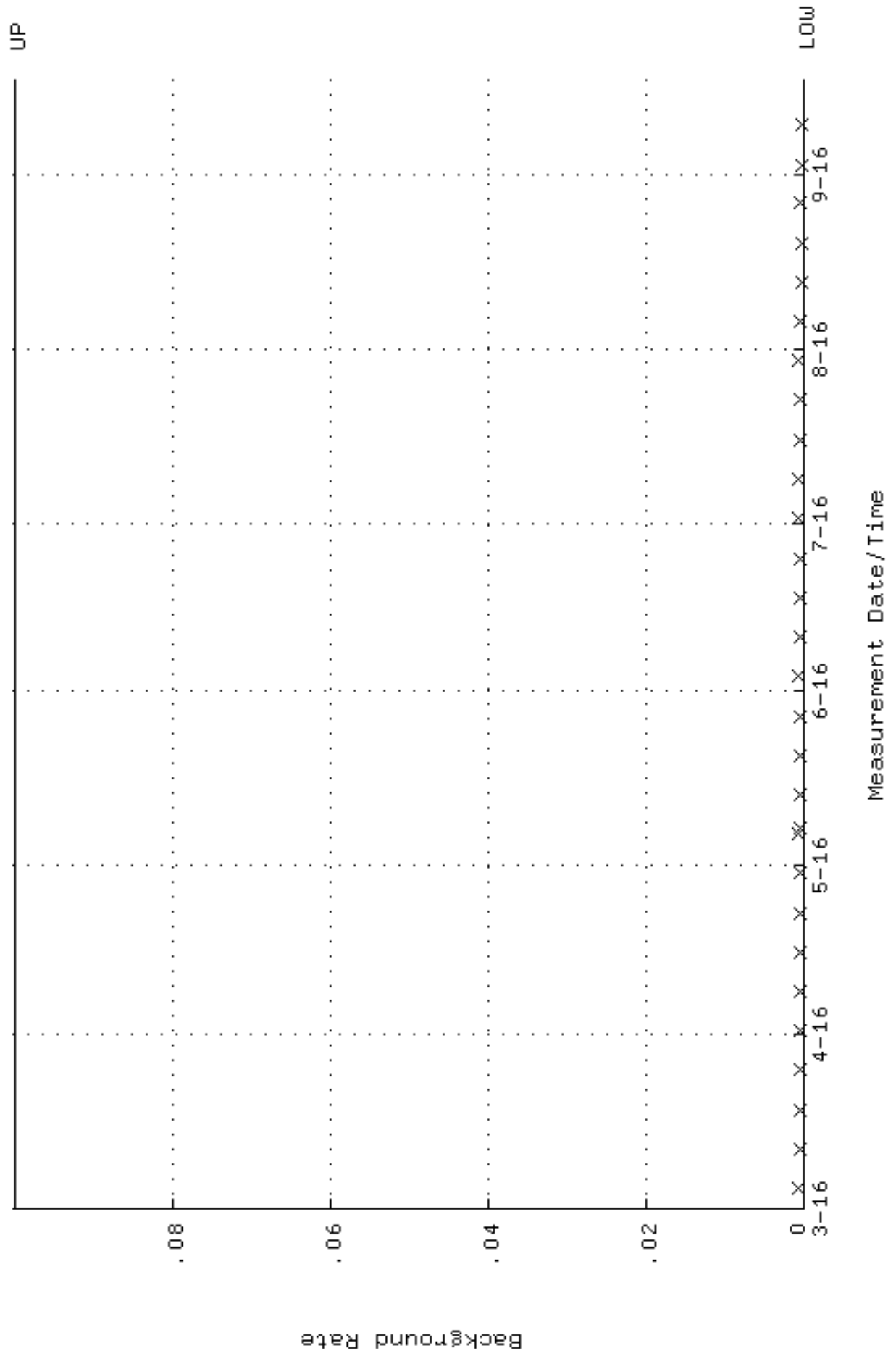
QA filename : DKA100:[ENV_ALPHA.QA.W]W227.QAF;3
 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 16-MAR-2016 08:36:54 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



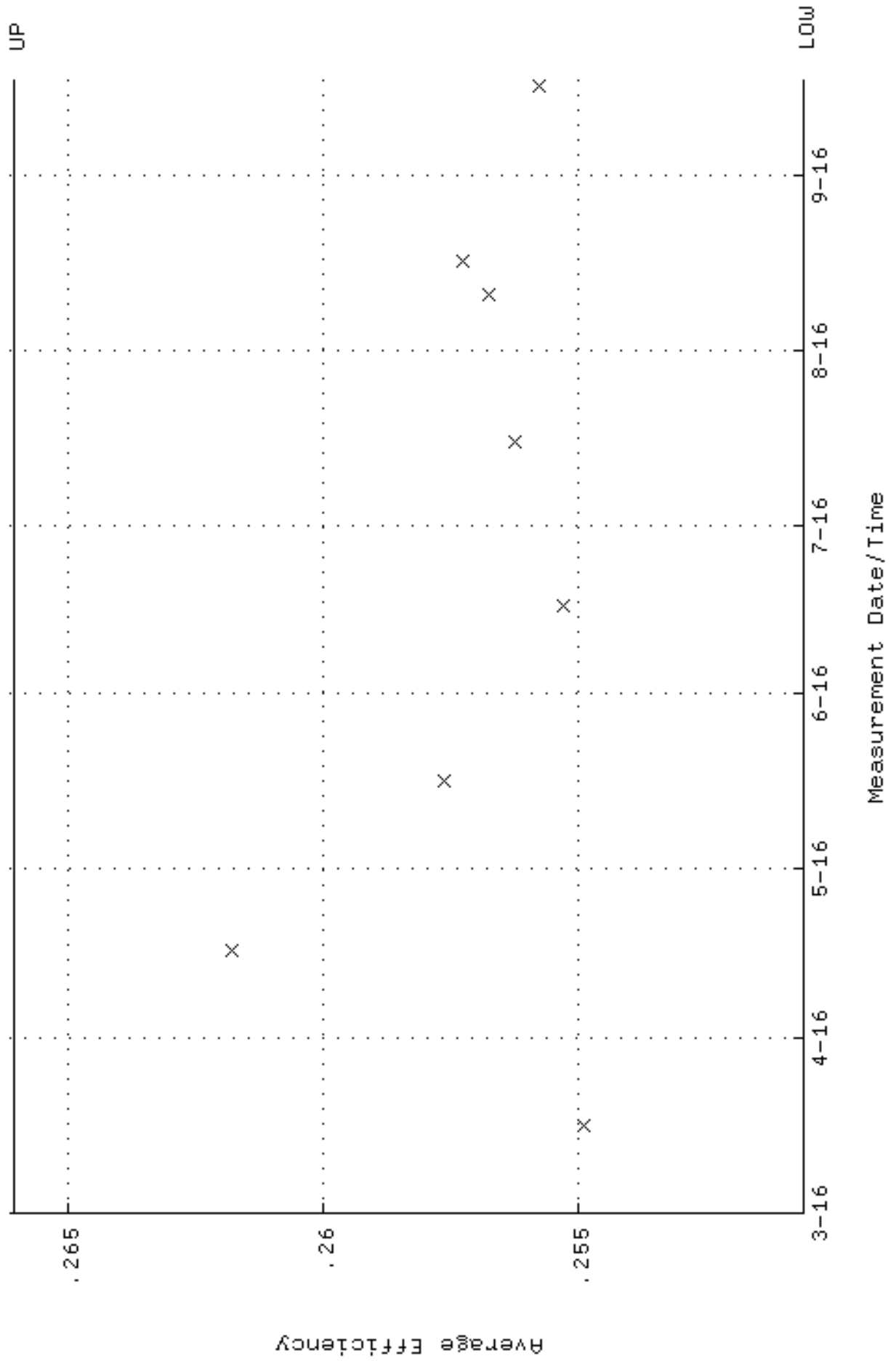
QA filename : DKA100:[ENV_ALPHA.QA.W]W227.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 16-MAR-2016 08:36:54 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



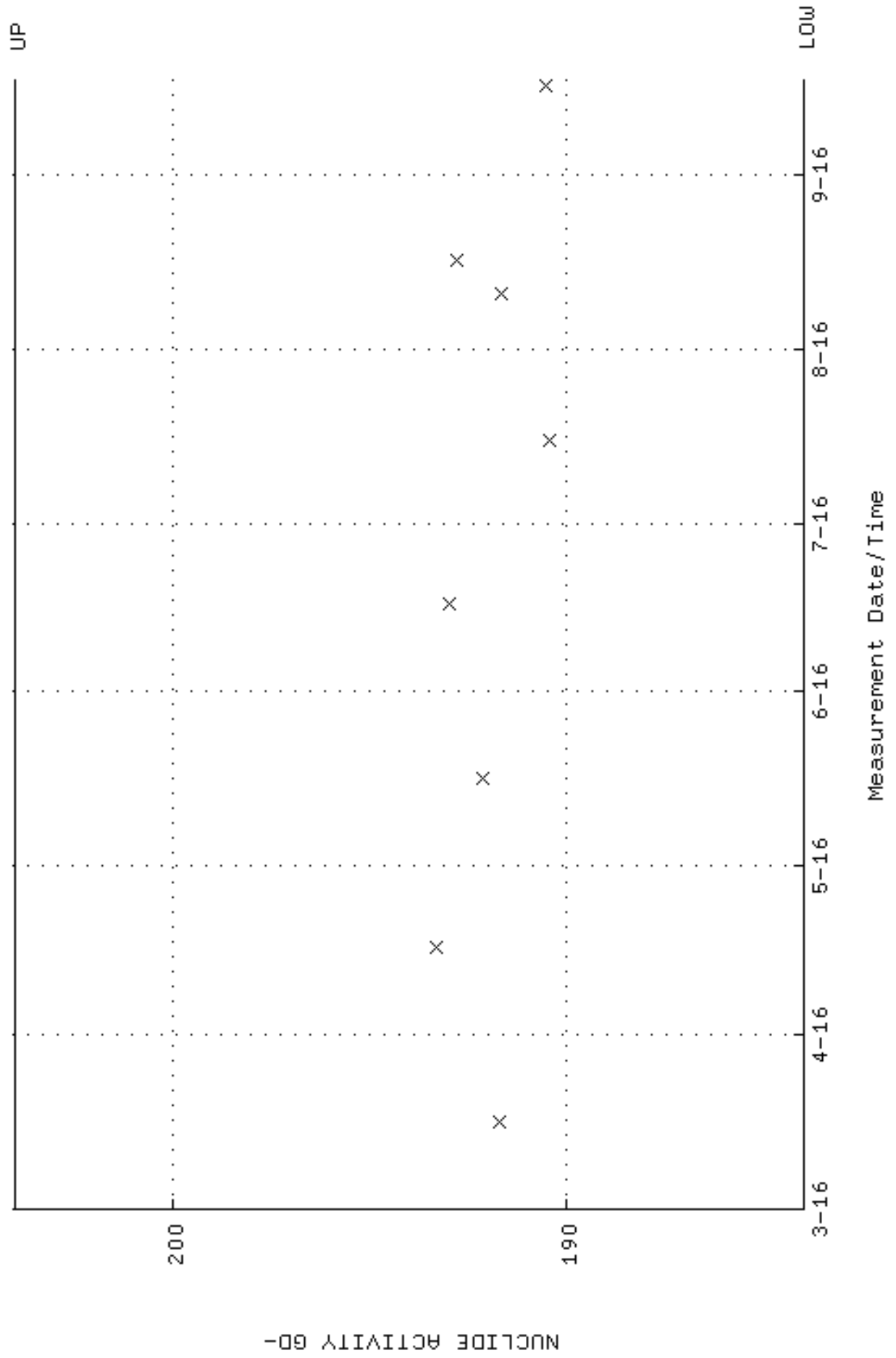
QA filename : DKA100:[ENV_ALPHA.QA.B]B227.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:32:14 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



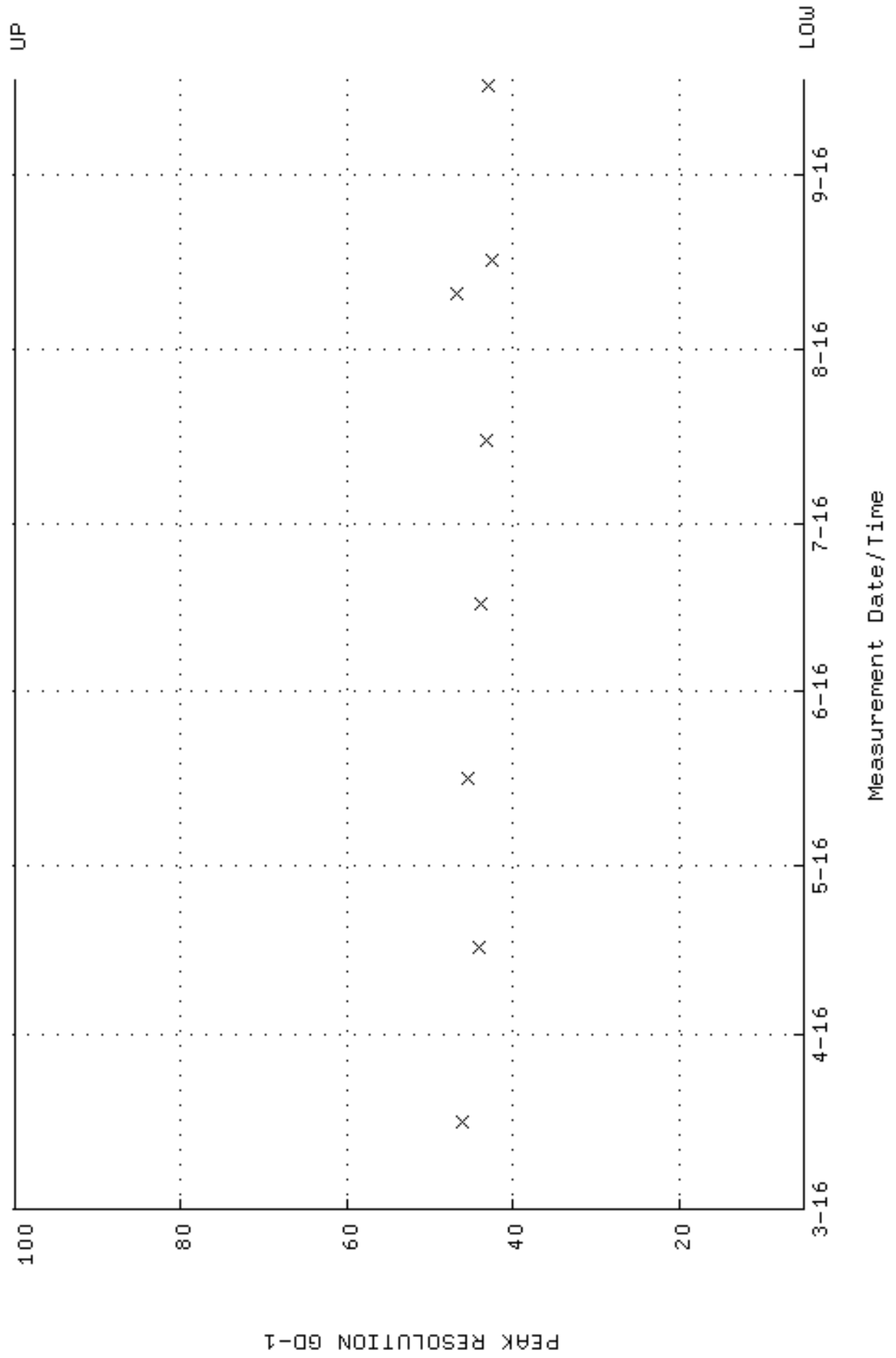
QA filename : DKA100:[ENV_ALPHA.QA.W]W228.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 16-MAR-2016 08:36:59 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.250600 through 0.266100



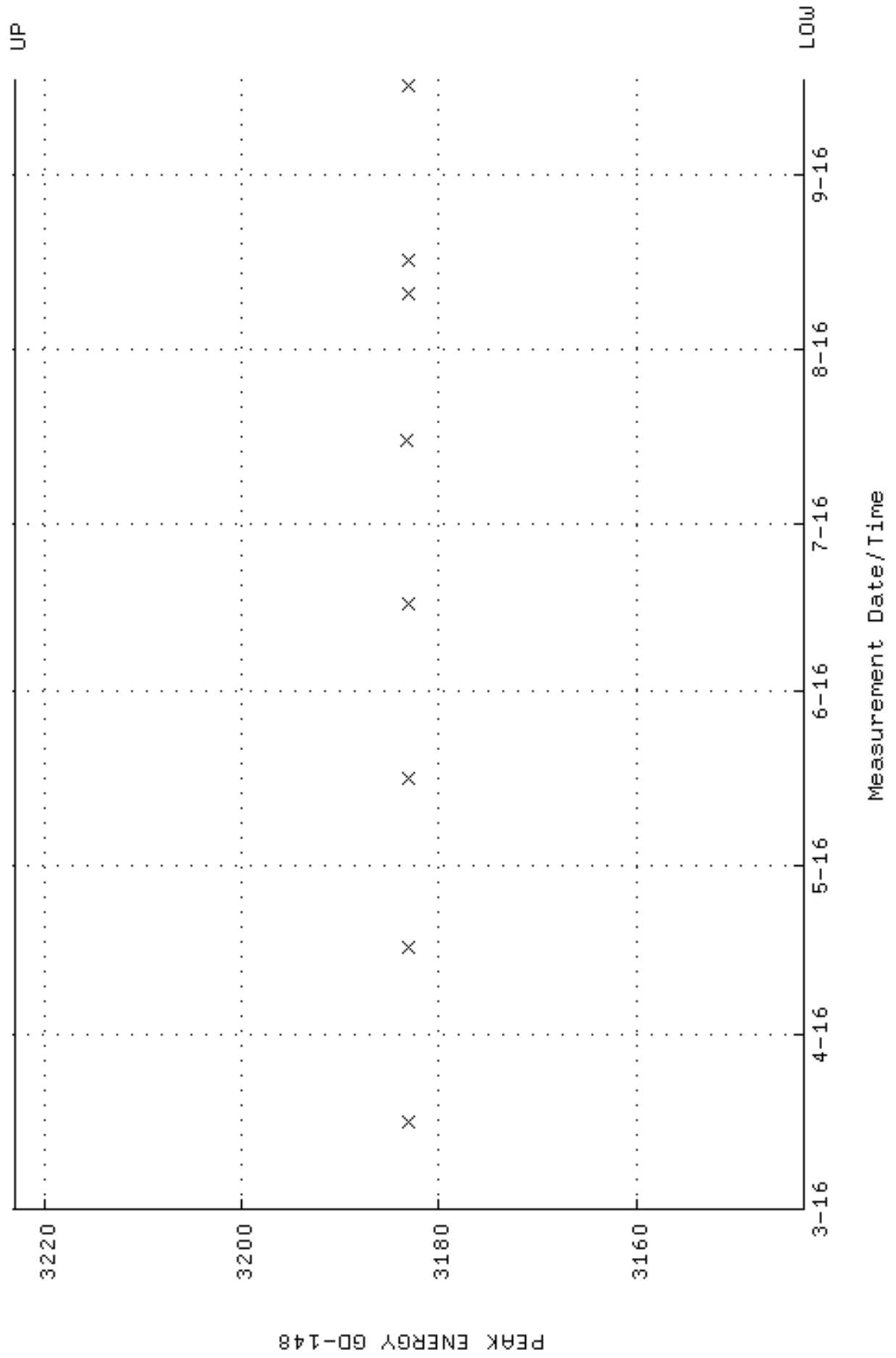
QA filename : DKA100:[ENV_ALPHA.QA.W]w228.QAF;3
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 16-MAR-2016 08:36:59 through 17-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



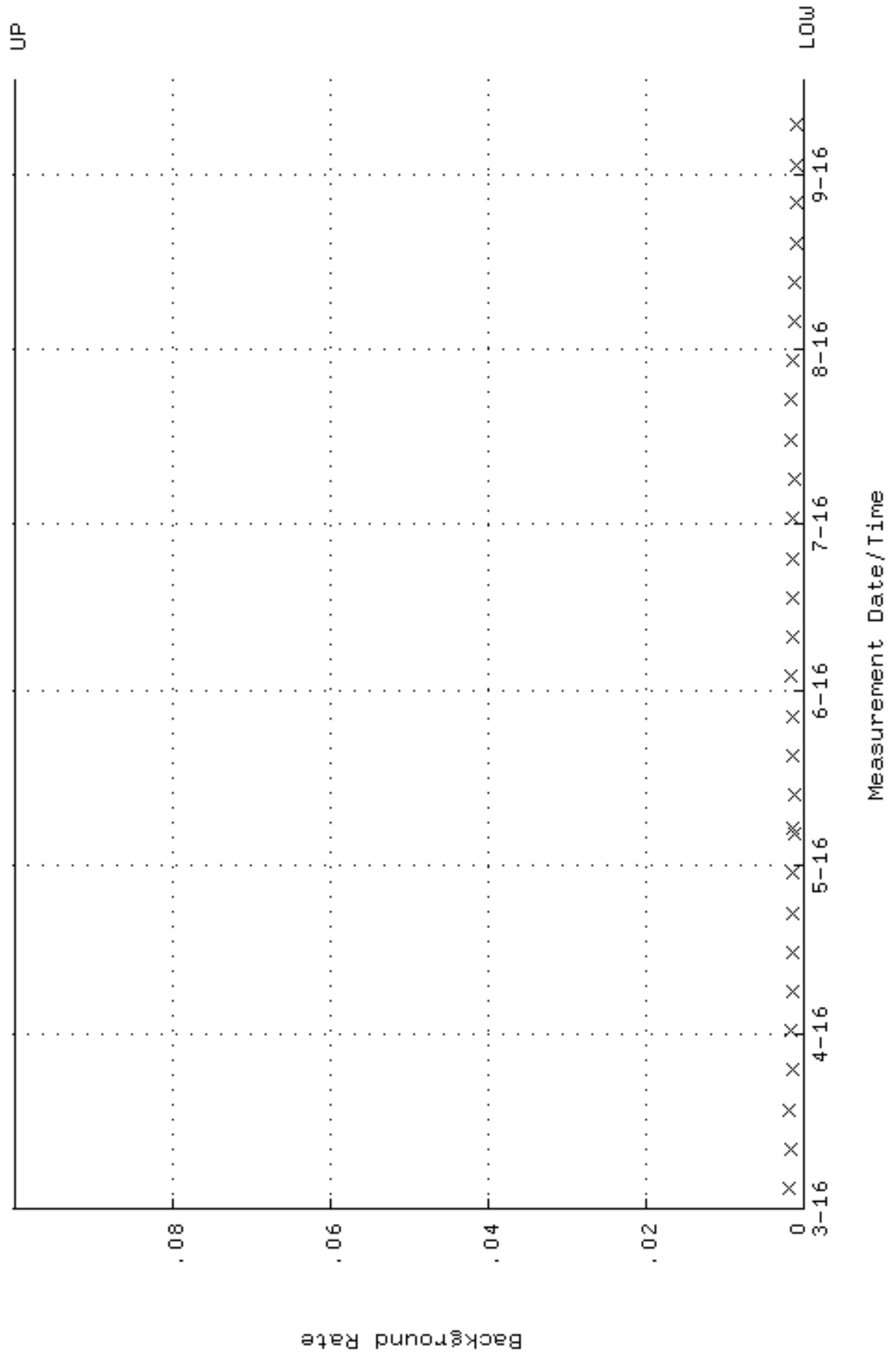
QA filename : DKA100:[ENV_ALPHA.QA.W]W228.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 16-MAR-2016 08:36:59 through 17-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



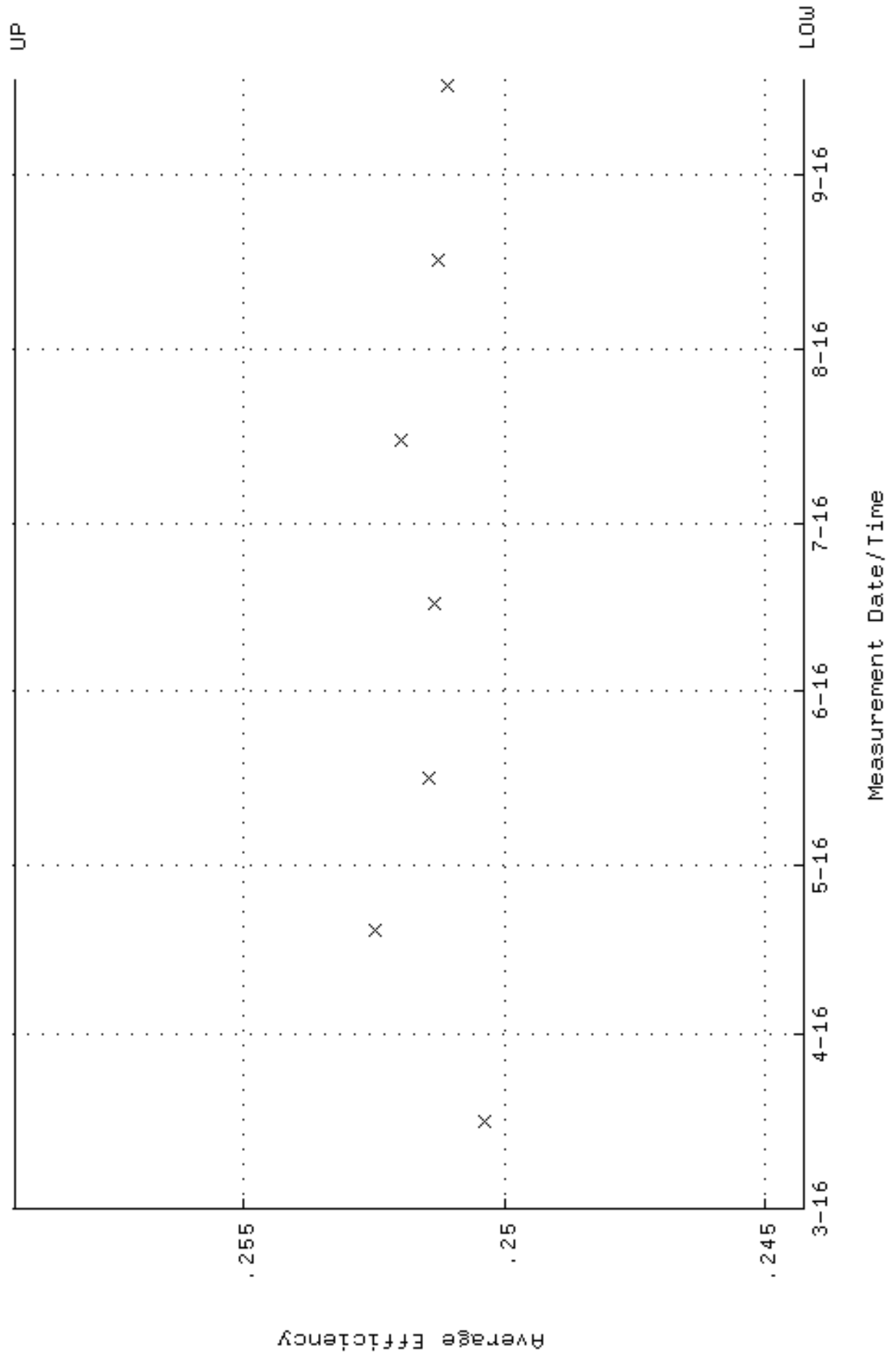
QA filename : DKA100:[ENV_ALPHA.QA.W]W228.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 16-MAR-2016 08:36:59 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



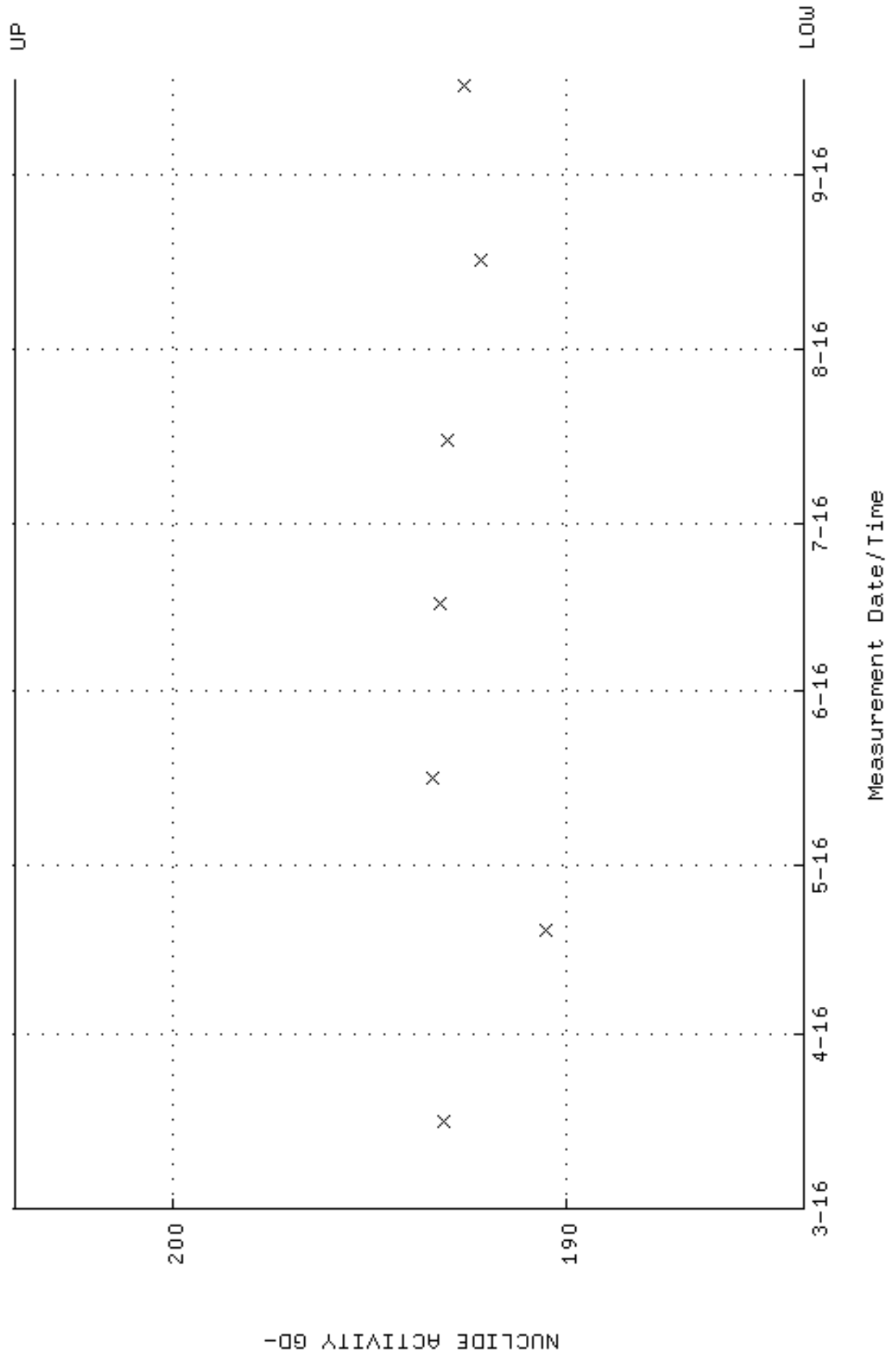
QA filename : DKA100:[ENV_ALPHA.QA.B]B228.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:32:17 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



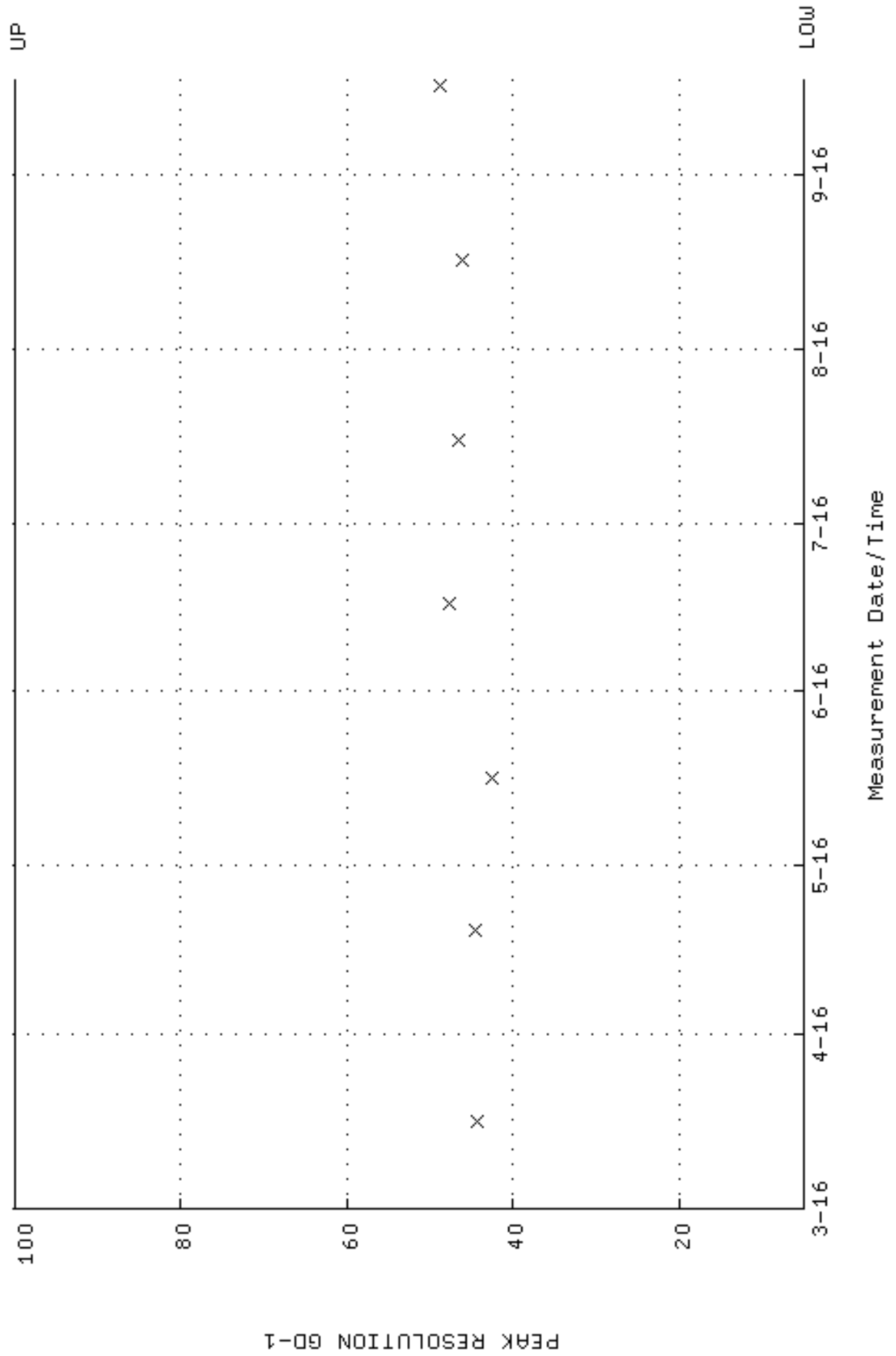
QA filename : DKA100:[ENV_ALPHA.QA.W]W230.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 16-MAR-2016 11:01:29 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.244269 through 0.259380



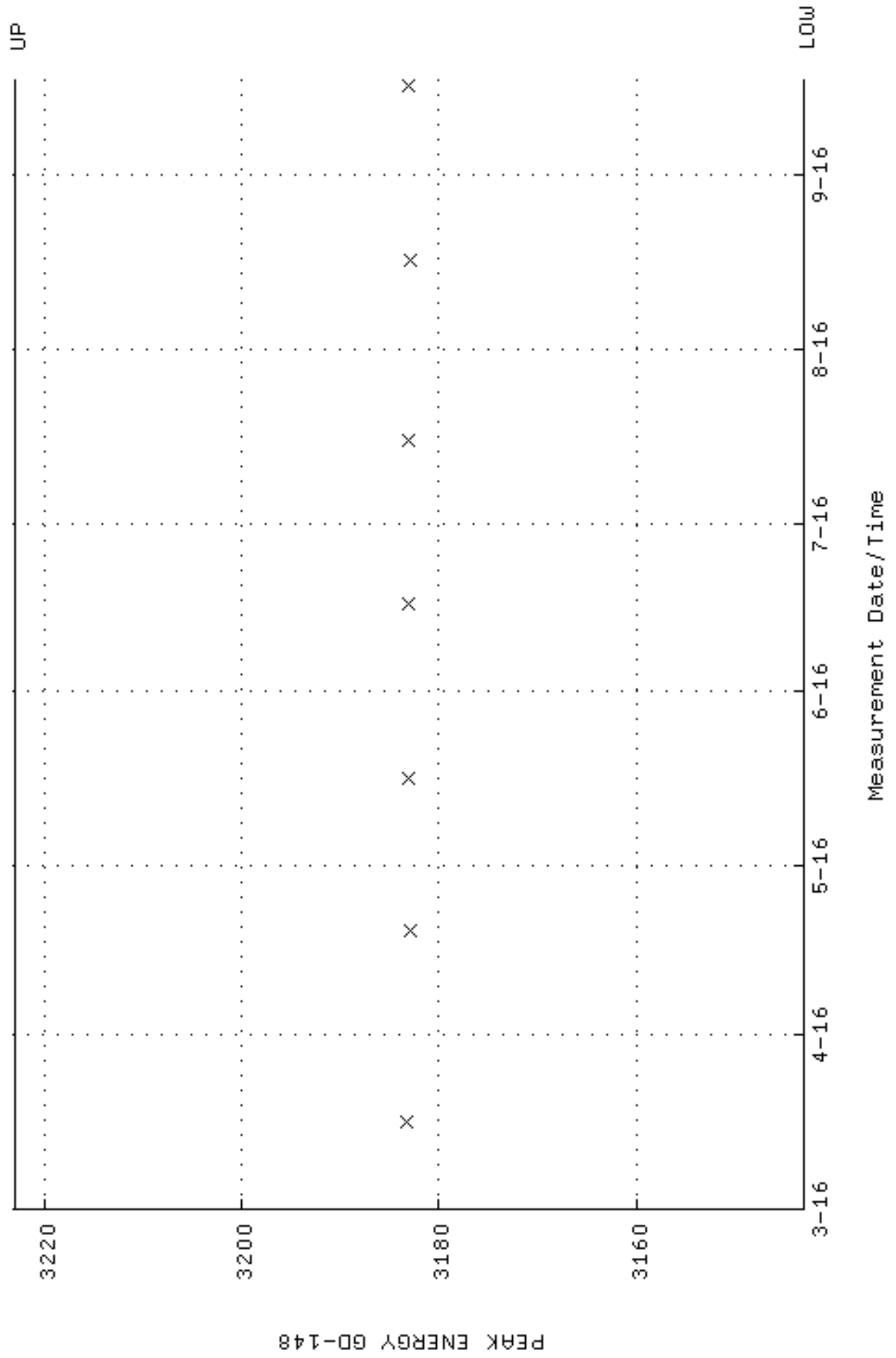
QA filename : DKA100:[ENV_ALPHA.QA.W]W230.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 16-MAR-2016 11:01:29 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



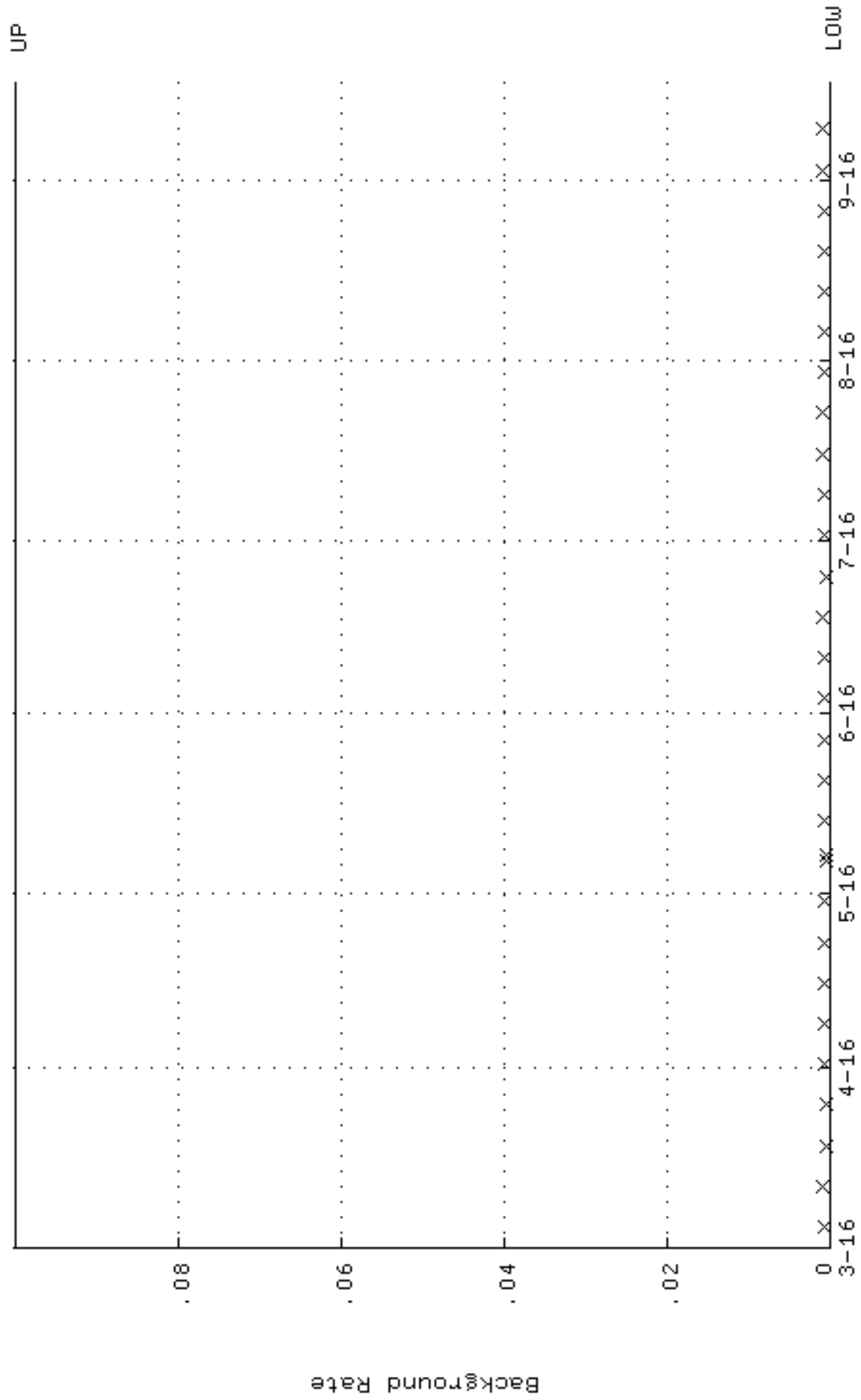
QA filename : DKA100:[ENV_ALPHA.QA.W]W230.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 16-MAR-2016 11:01:29 through 17-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



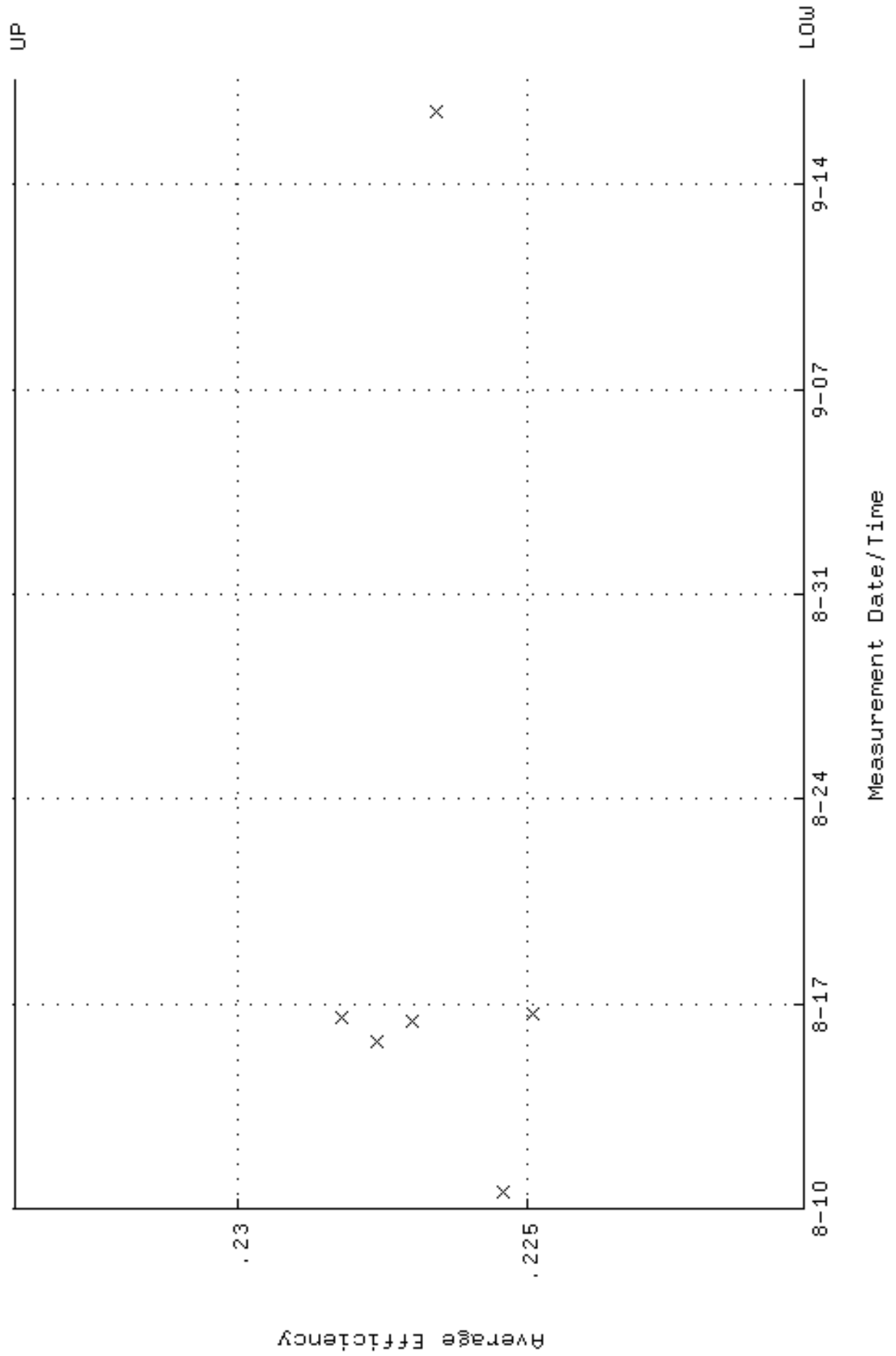
QA filename : DKA100:[ENV_ALPHA.QA.W]W230.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 16-MAR-2016 11:01:29 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



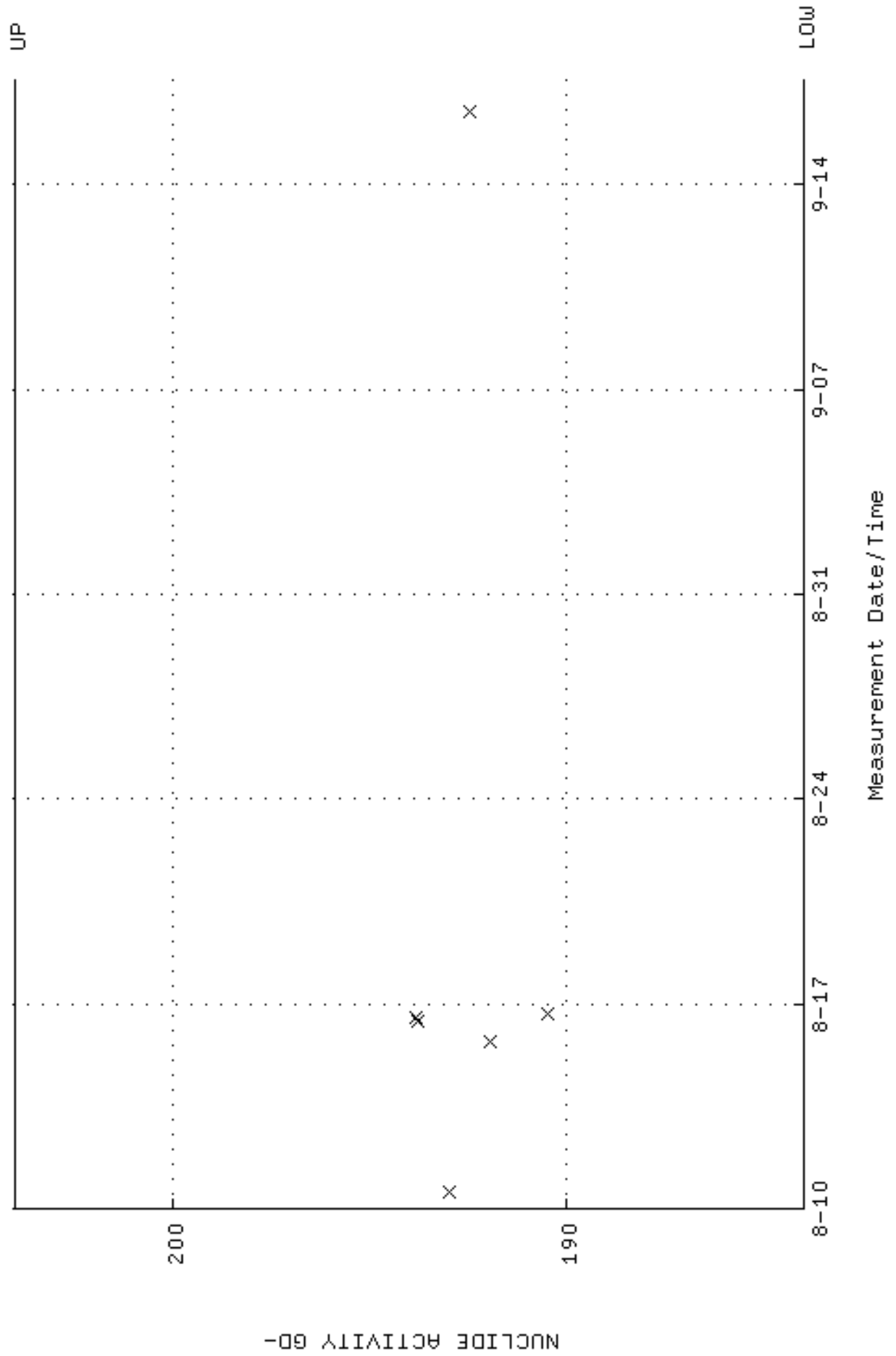
QA filename : DKA100:[ENV_ALPHA.QA.B]B230.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:32:25 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



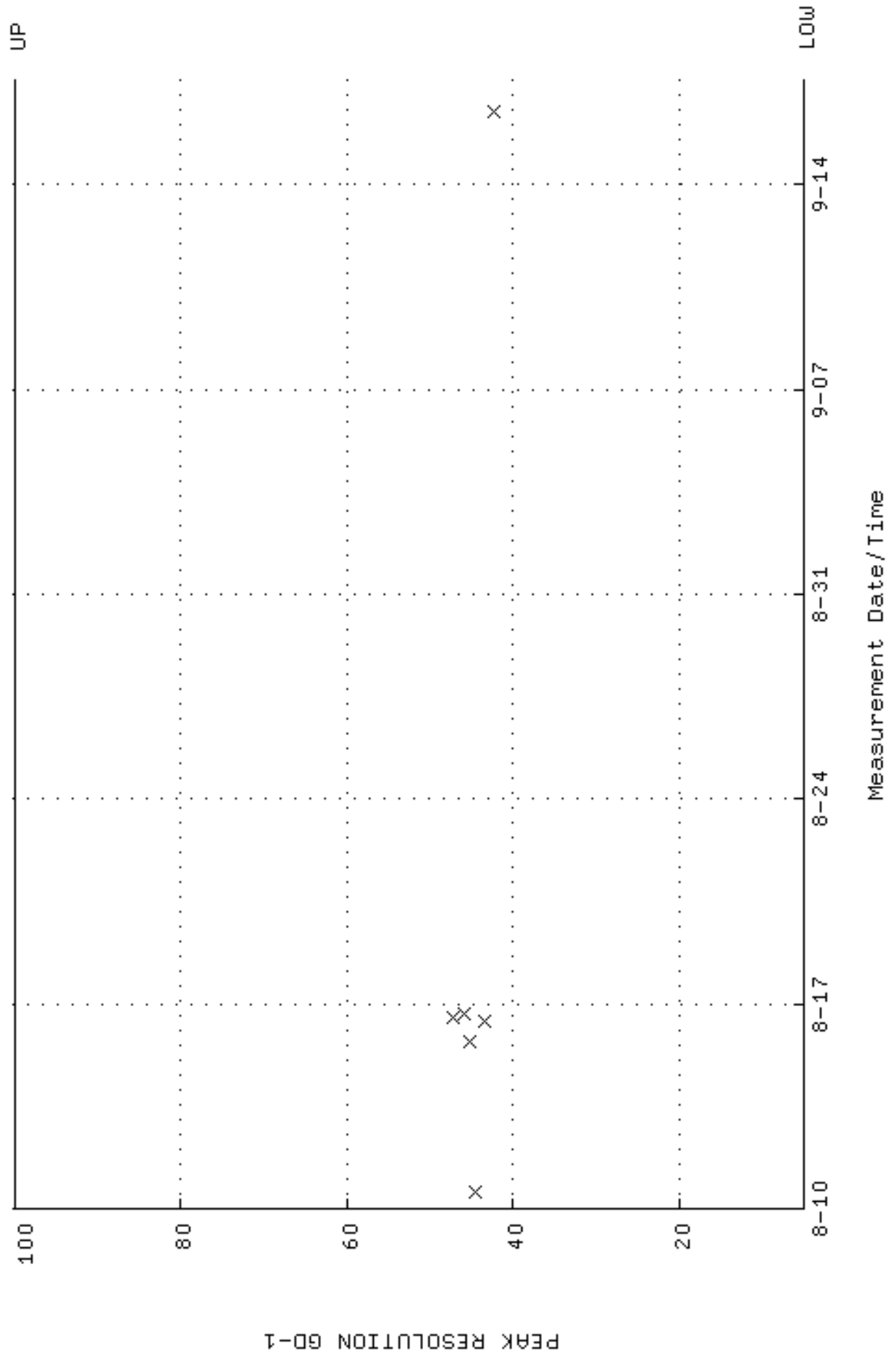
QA filename : DKA100:[ENV_ALPHA.QA.W]W231.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 10-AUG-2016 13:30:04 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.220210 through 0.233830



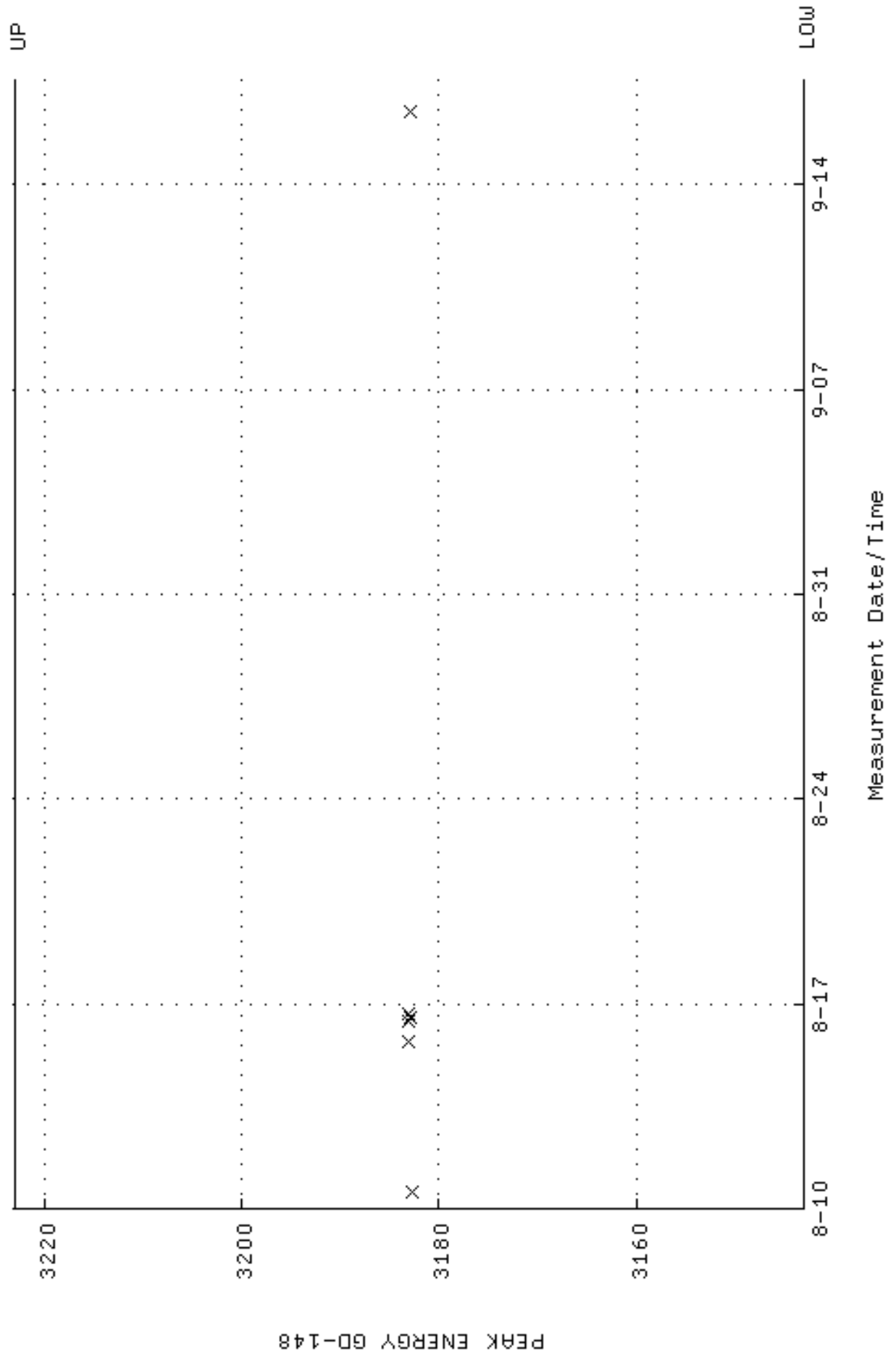
QA filename : DKA100:[ENV_ALPHA.QA.W]w231.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 10-AUG-2016 13:30:04 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



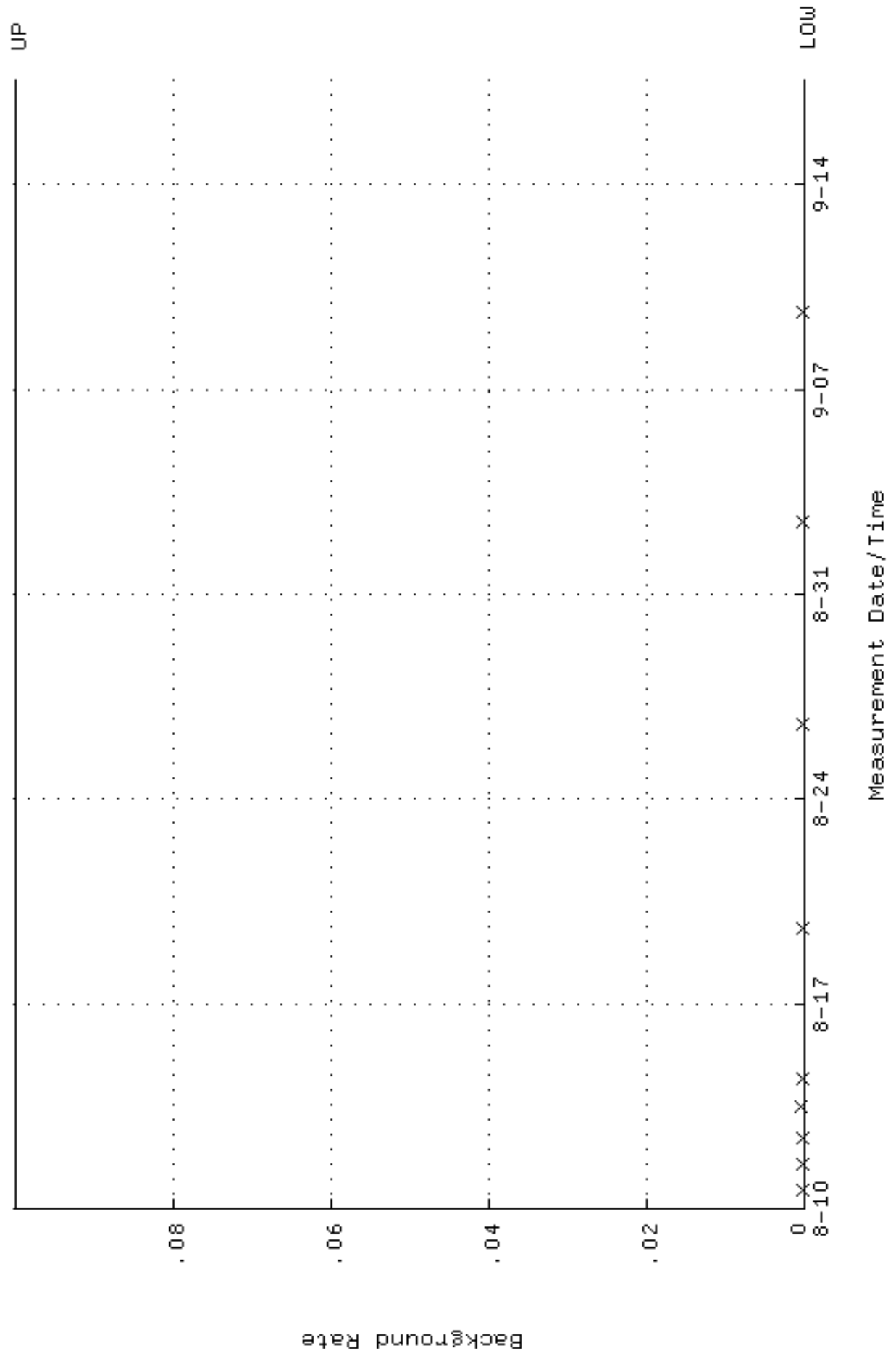
QA filename : DKA100:[ENV_ALPHA.QA.W]W231.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 10-AUG-2016 13:30:04 through 17-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



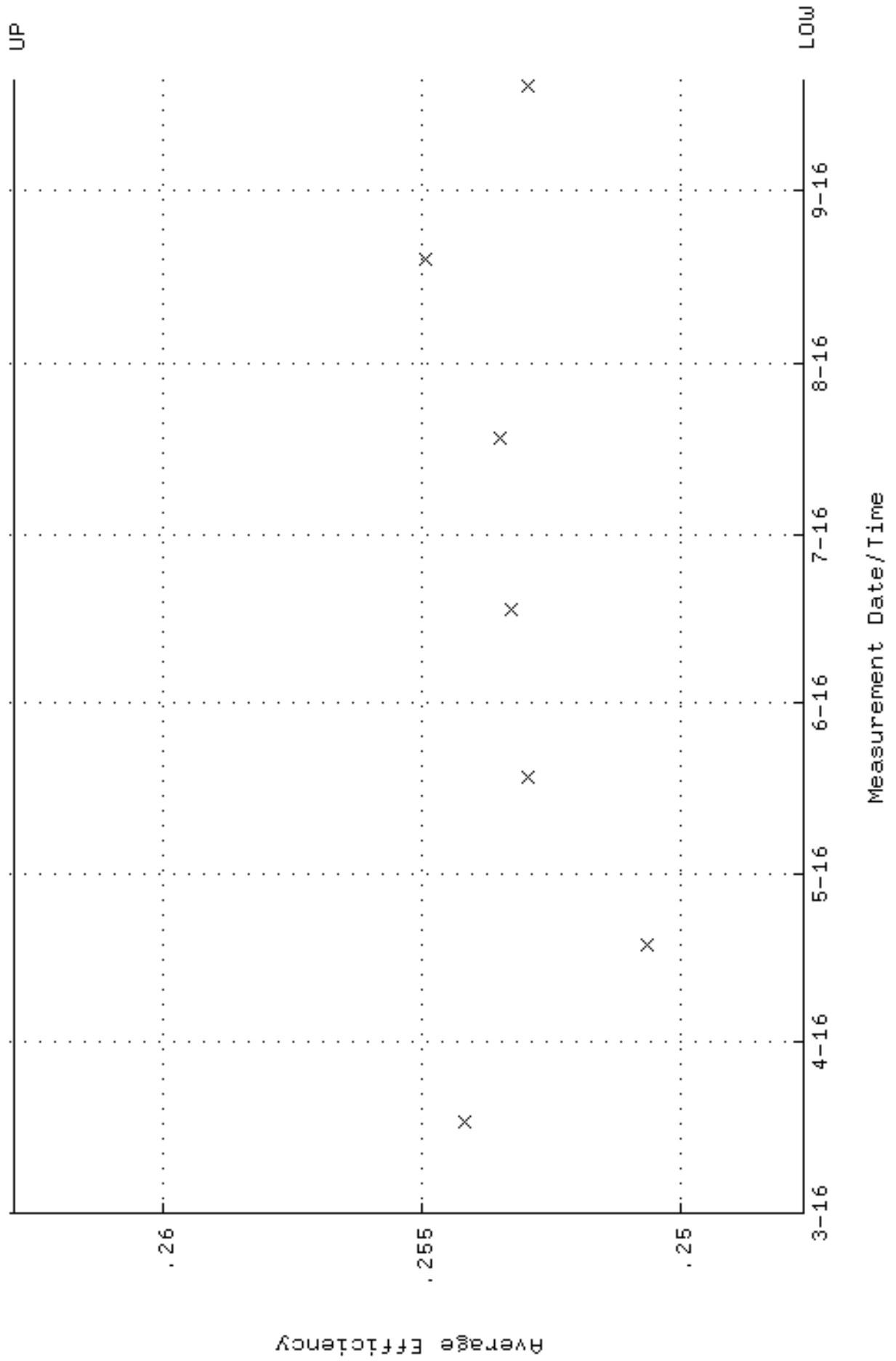
QA filename : DKA100:[ENV_ALPHA.QA.W]W231.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 10-AUG-2016 13:30:04 through 17-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



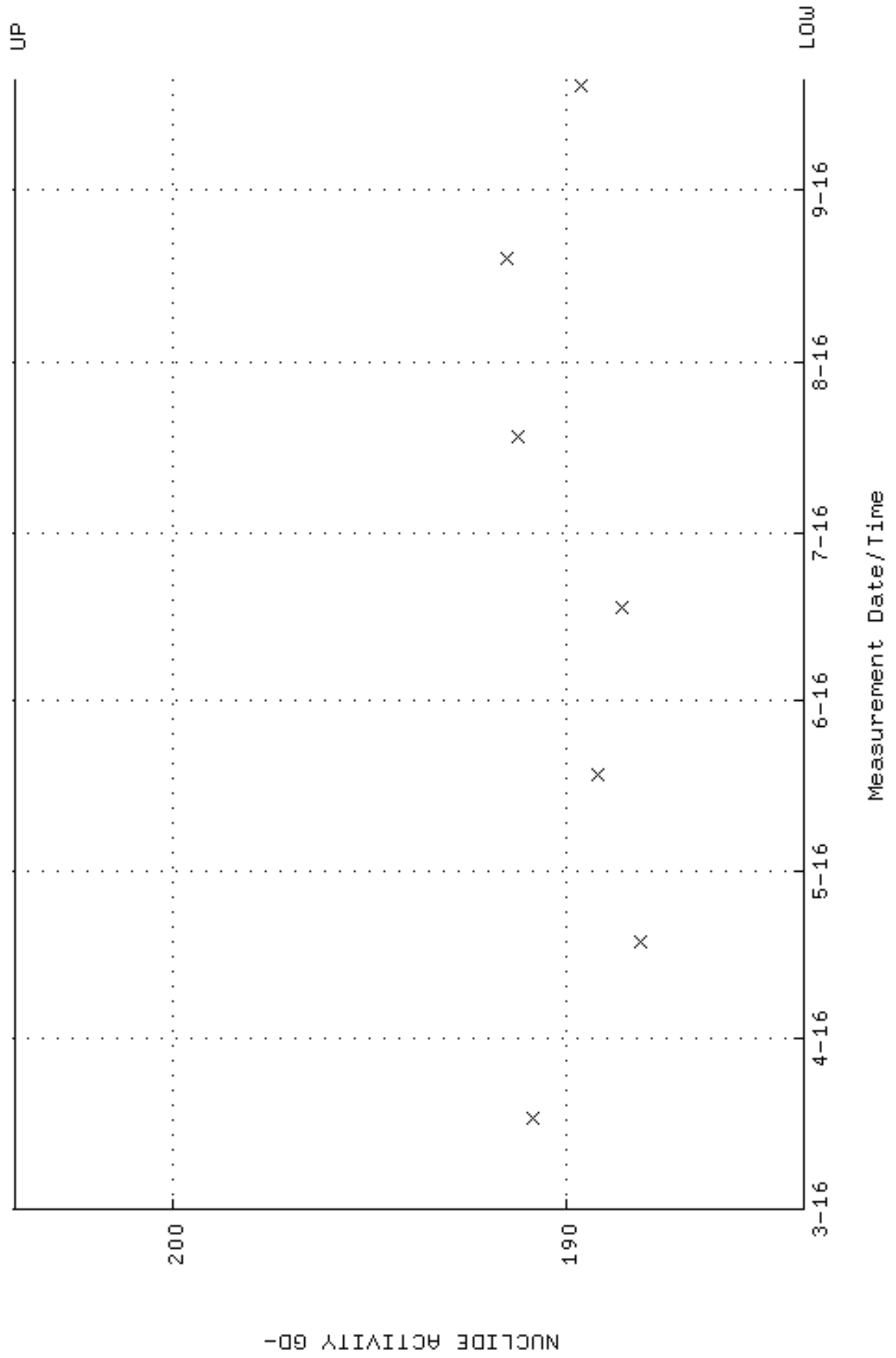
QA filename : DKA100:[ENV_ALPHA.QA.B]B231.QAF;2
Parameter Name : BACKRATE (Background Rate)
Start/End Dates : 10-AUG-2016 15:47:19 through 17-SEP-2016 12:00:00
Lower/Upper Lmts: 0.000000E+00 through 0.100000



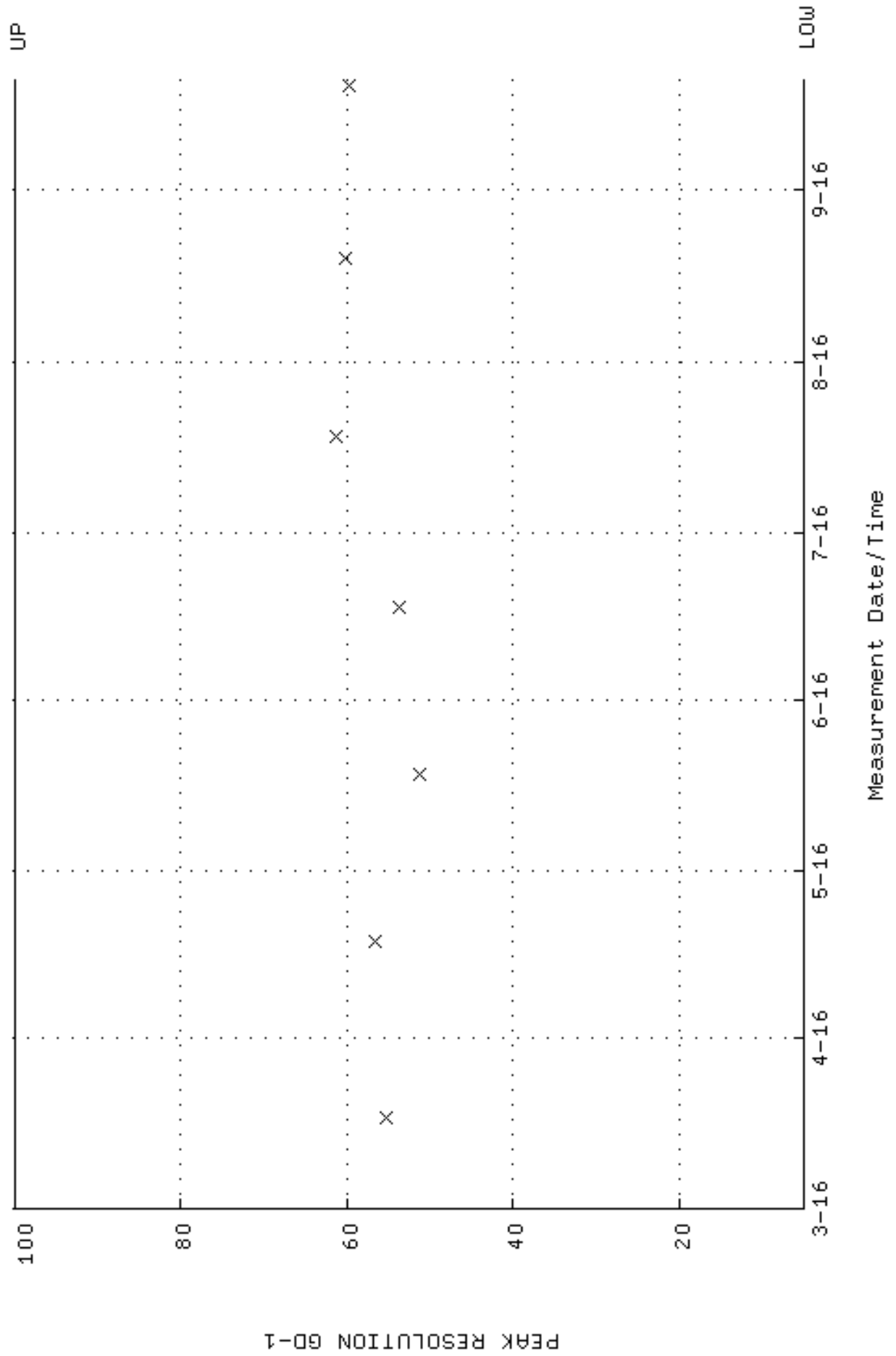
QA filename : DKA100:[ENV_ALPHA.QA.W]W233.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 12:17:05 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.247620 through 0.262936



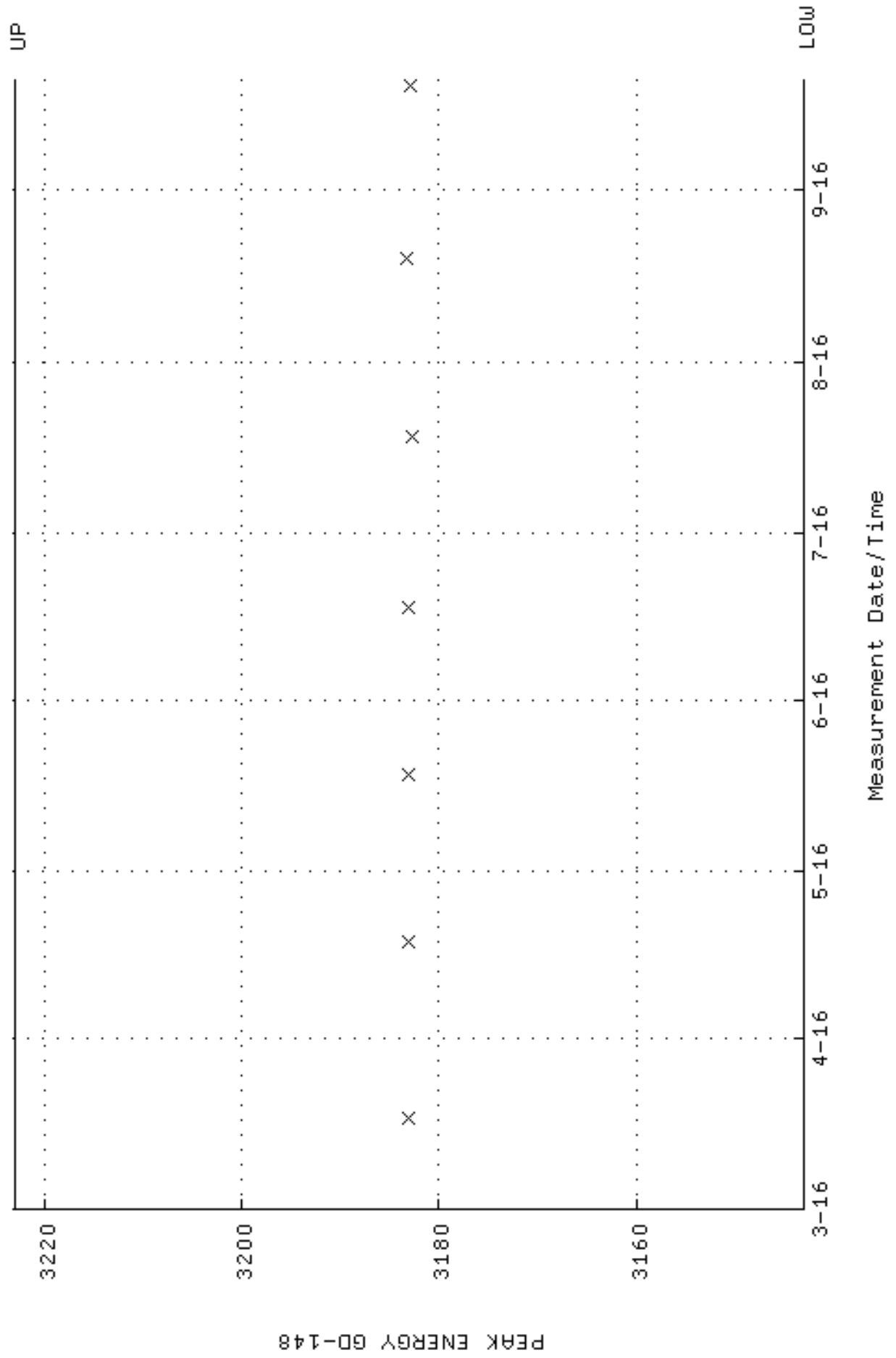
QA filename : DKA100:[ENV_ALPHA.QA.W]w233.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 17-MAR-2016 12:17:05 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



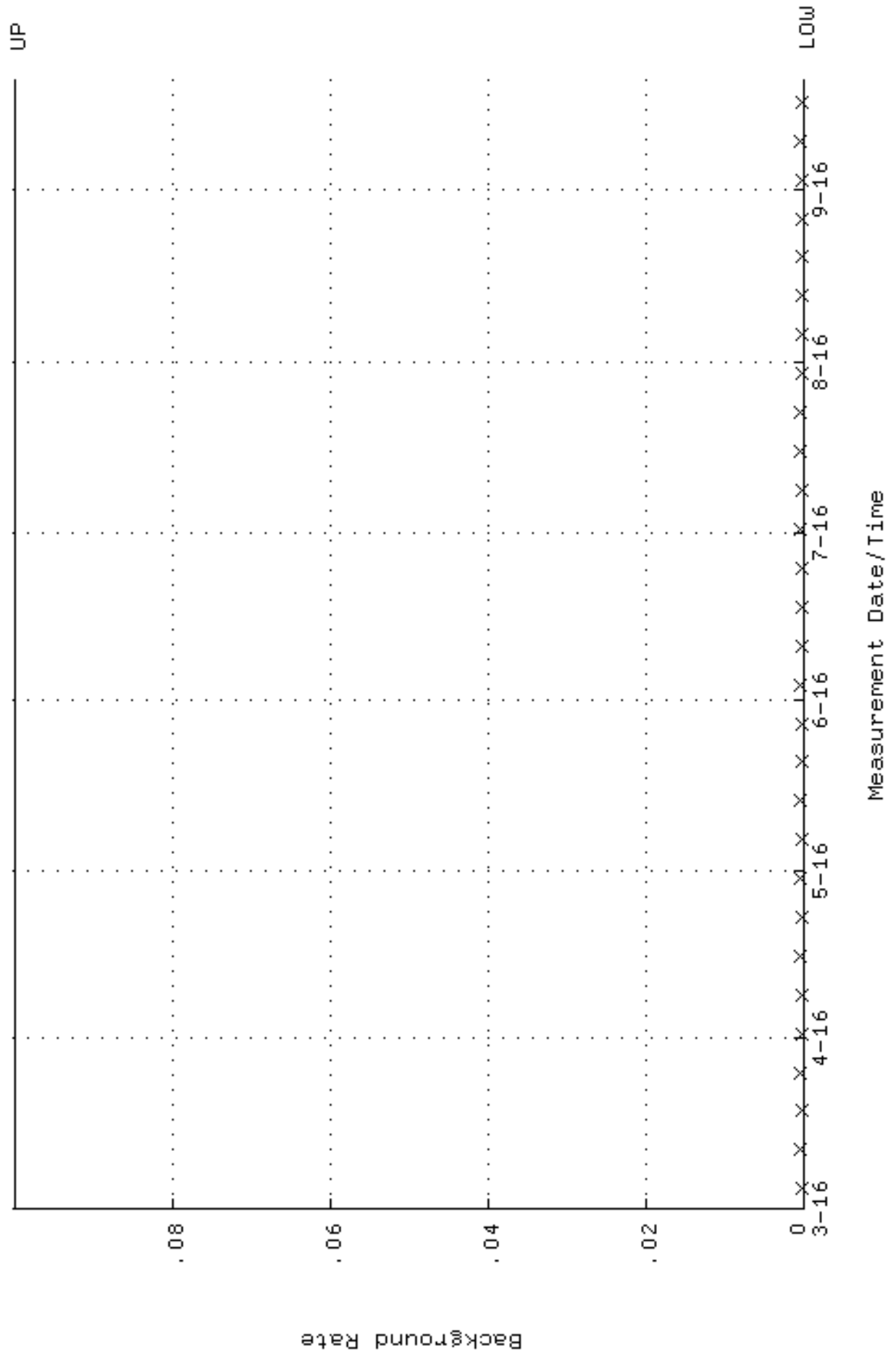
QA filename : DKA100:[ENV_ALPHA.QA.W]W233.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 17-MAR-2016 12:17:05 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



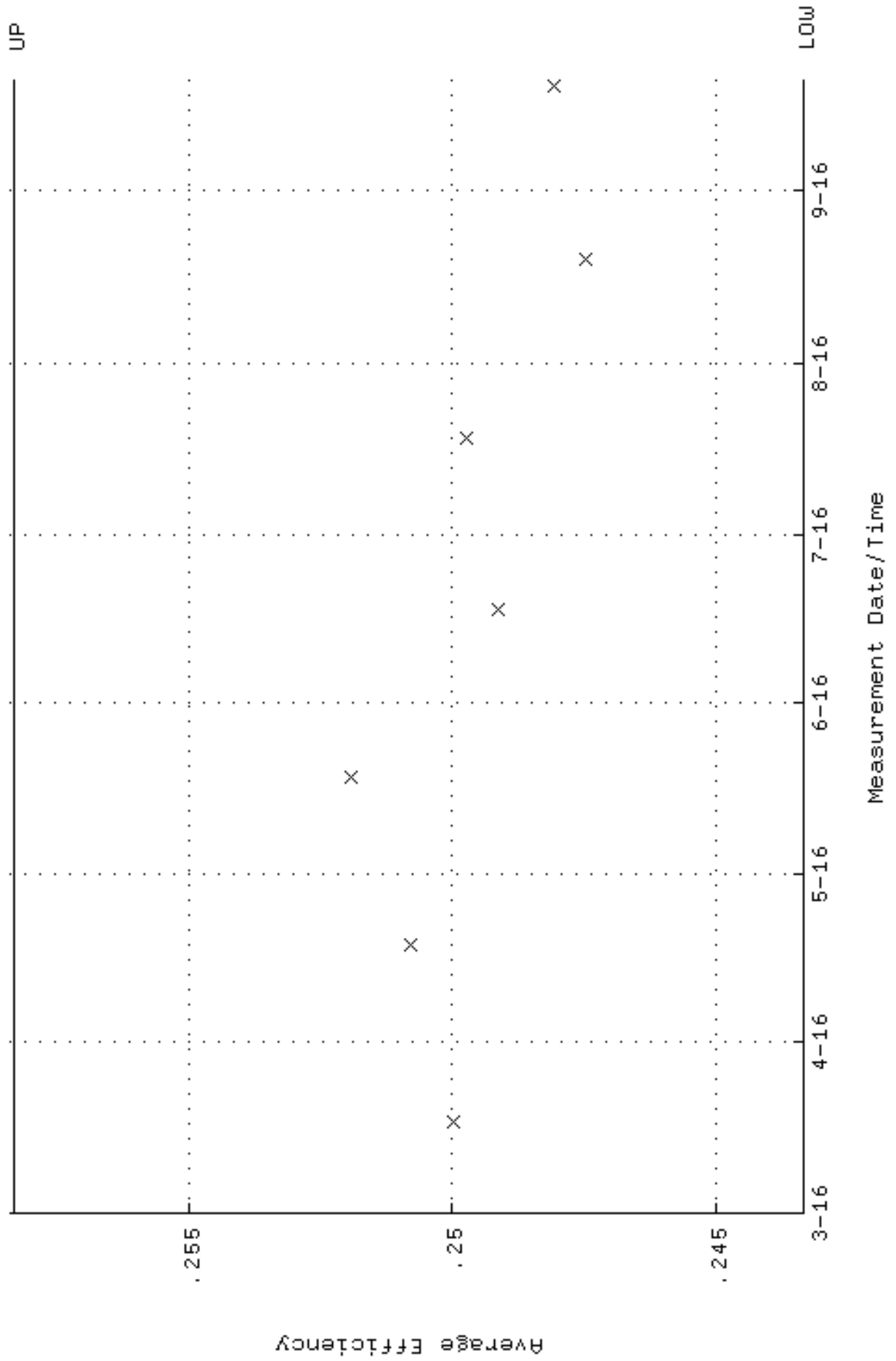
QA filename : DKA100:[ENV_ALPHA.QA.W]W233.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 12:17:05 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



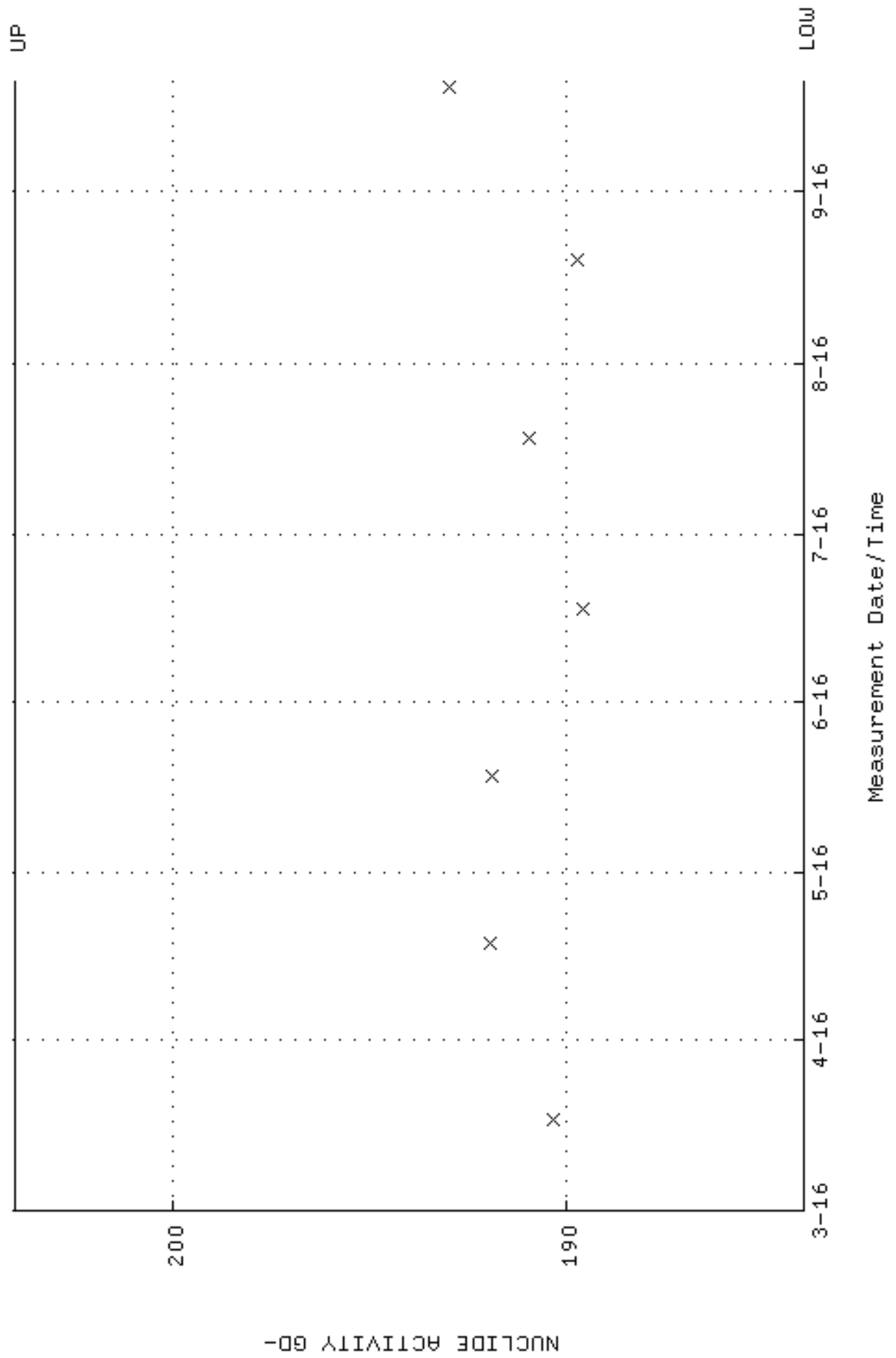
QA filename : DKA100:[ENV_ALPHA.QA.B]B233.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:35:15 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



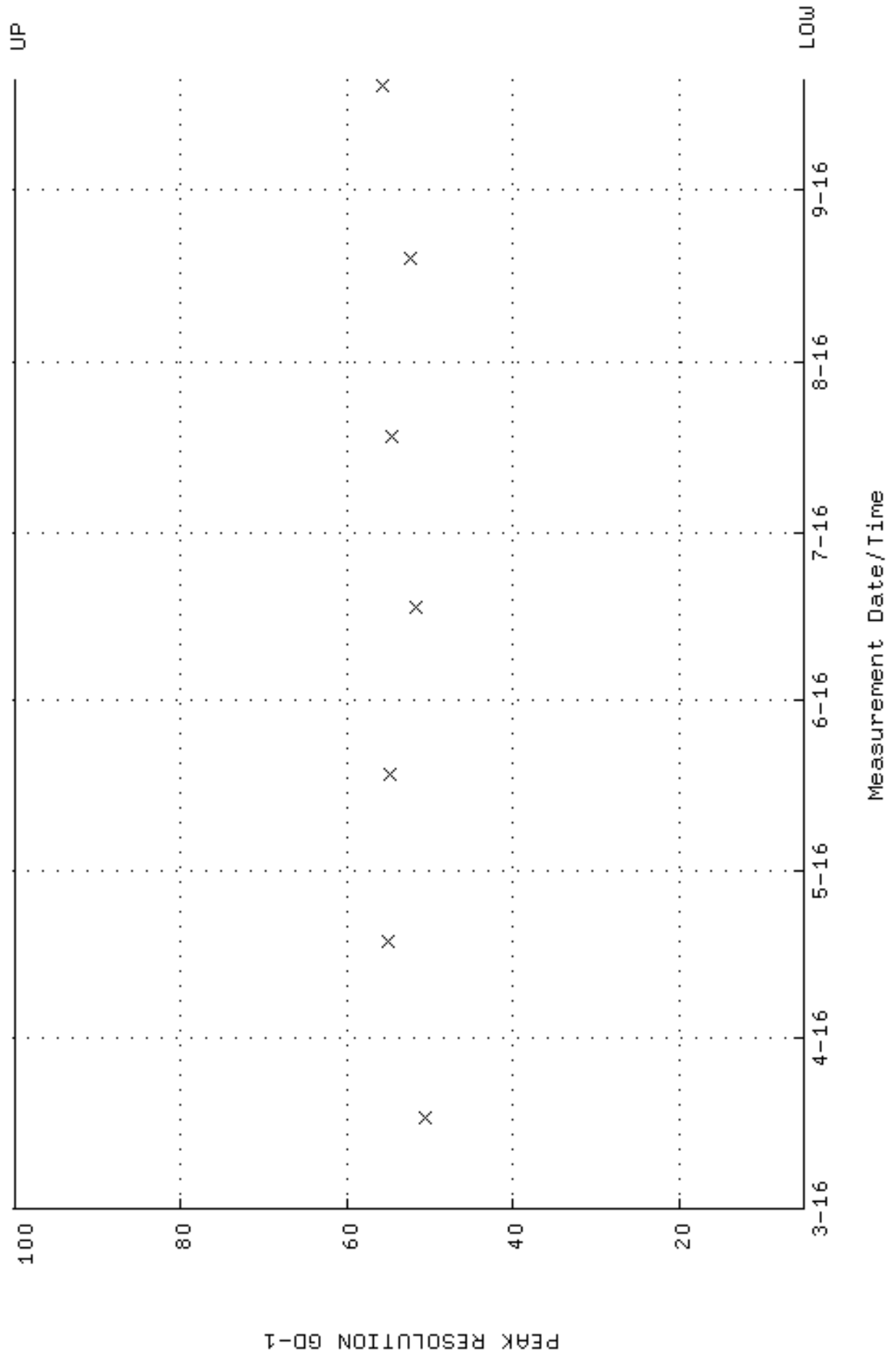
QA filename : DKA100:[ENV_ALPHA.QA.W]W234.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 12:17:09 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.243320 through 0.258370



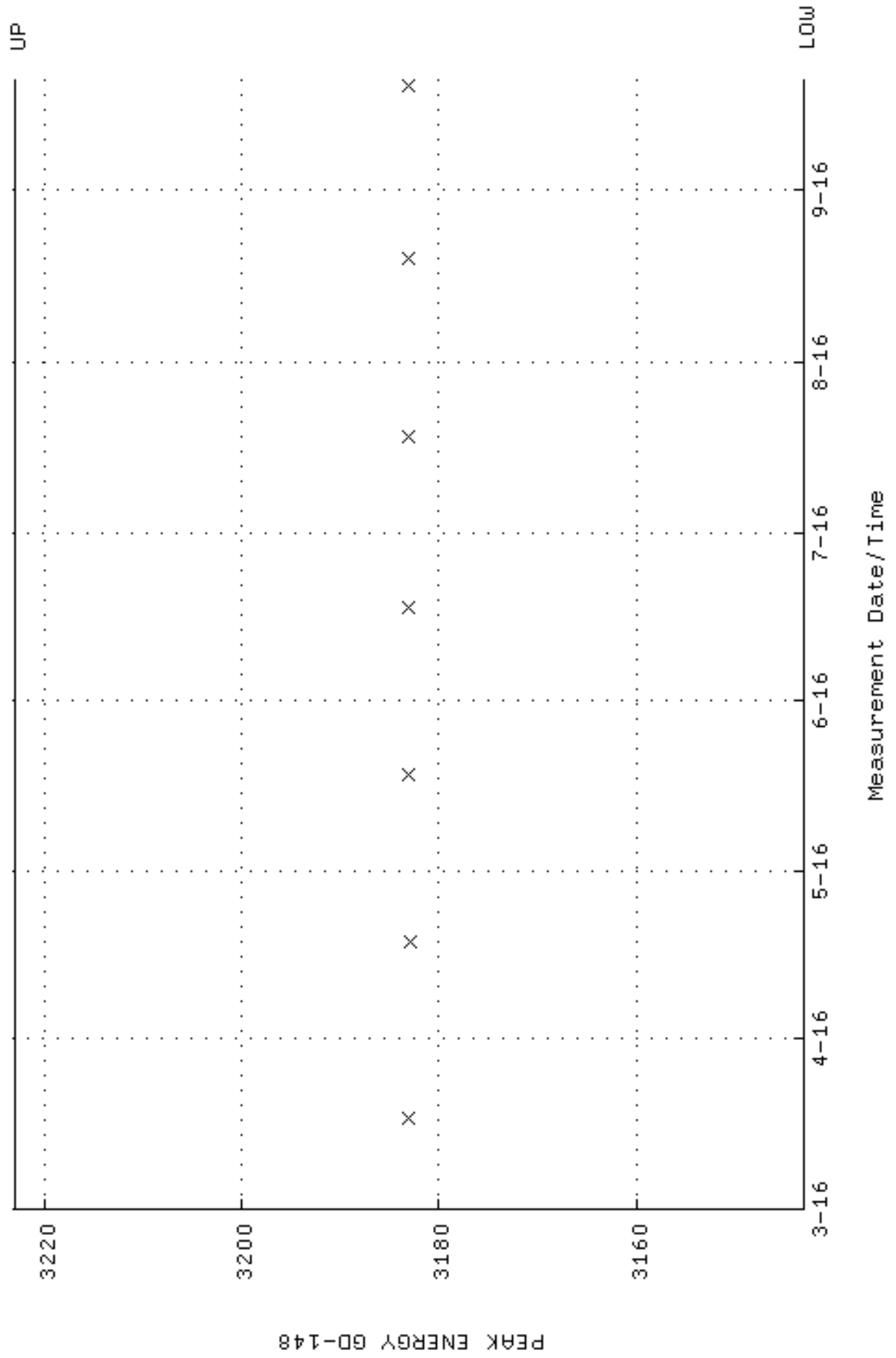
QA filename : DKA100:[ENV_ALPHA.QA.W]w234.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 17-MAR-2016 12:17:09 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



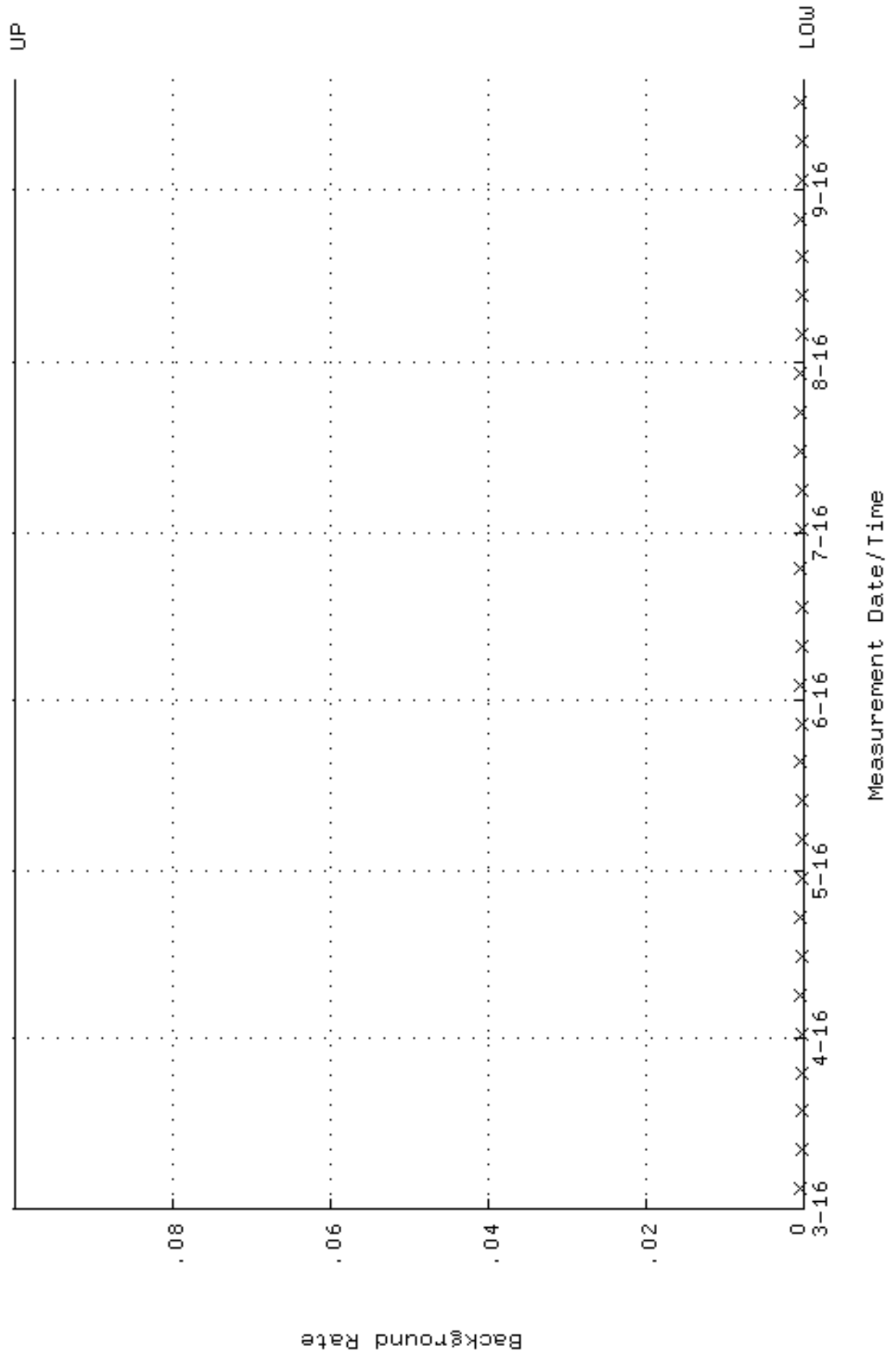
QA filename : DKA100:[ENV_ALPHA.QA.W]W234.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 17-MAR-2016 12:17:09 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



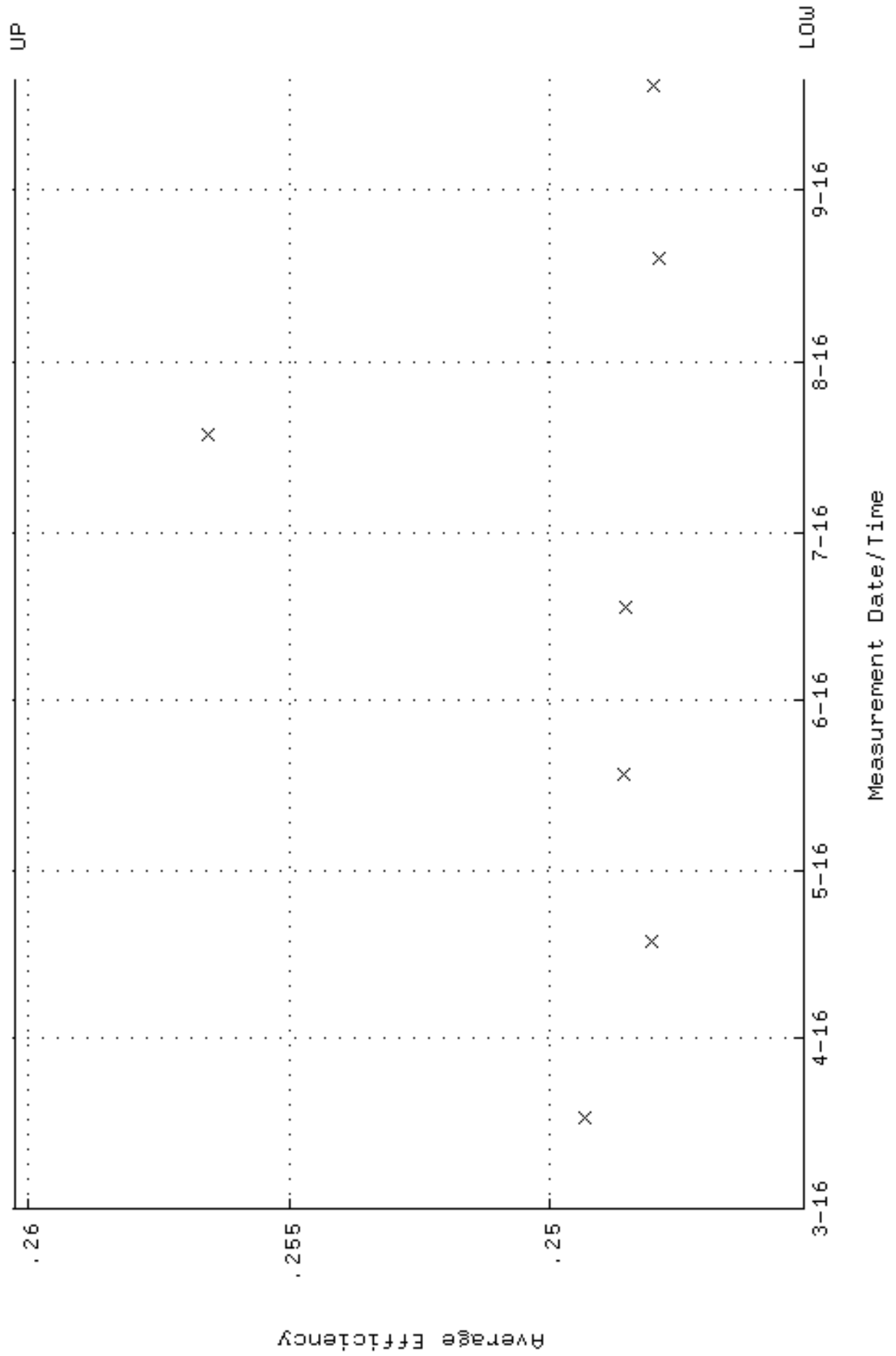
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 12:17:09 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



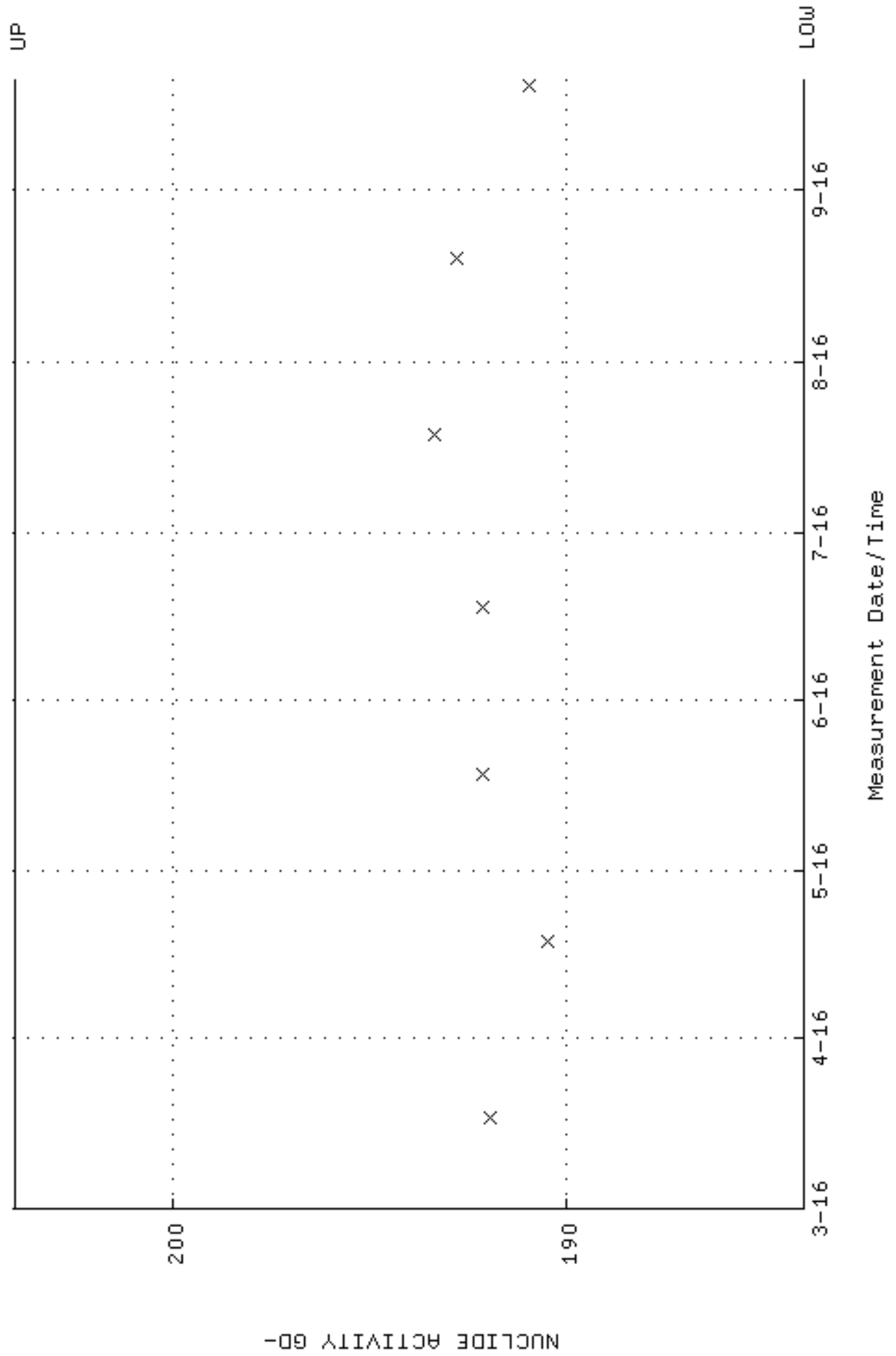
QA filename : DKA100:[ENV_ALPHA.QA.B]B234.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:35:19 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



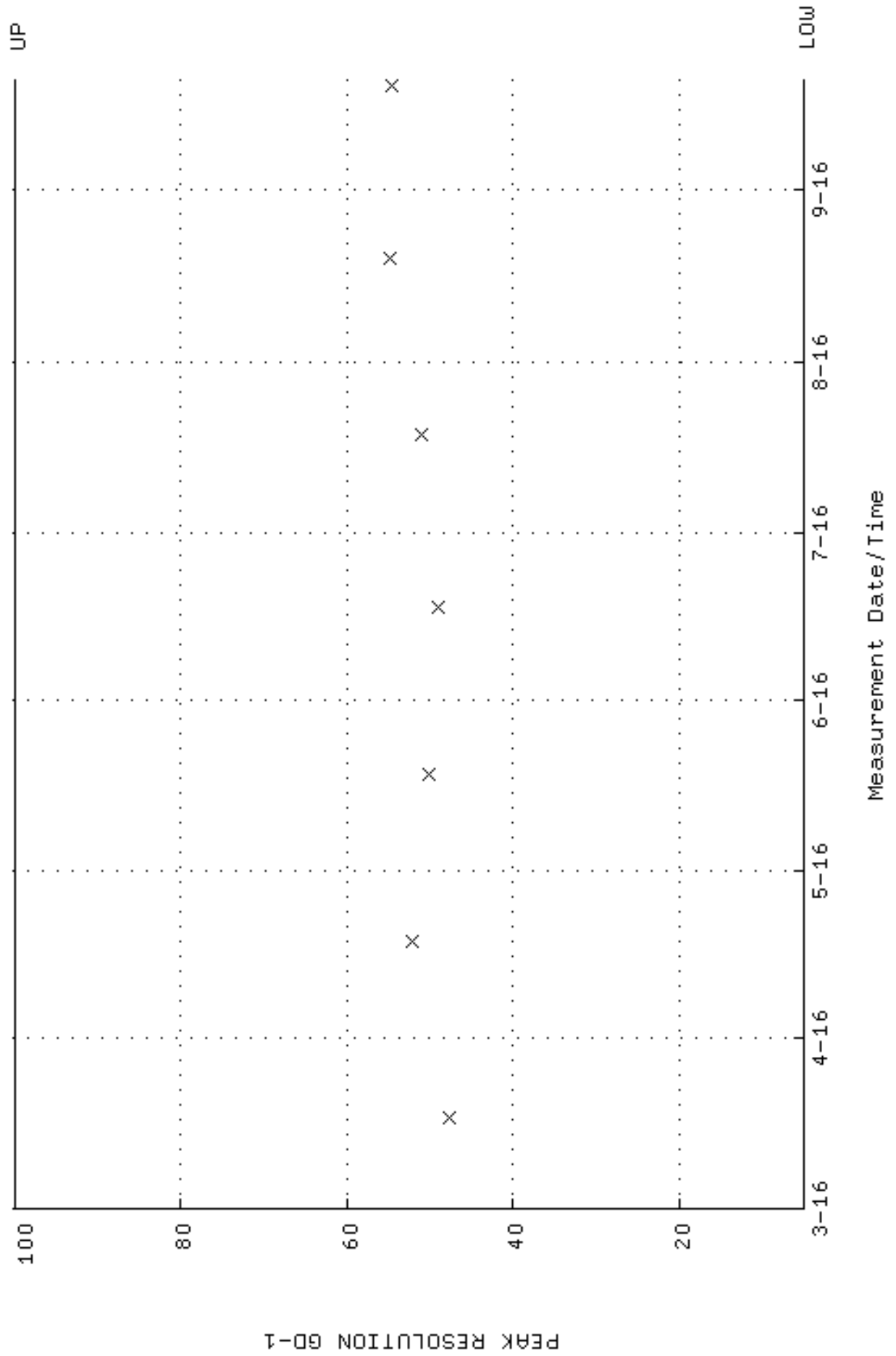
QA filename : DKA100:[ENV_ALPHA.QA.W]W235.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 09:06:18 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.245103 through 0.260263



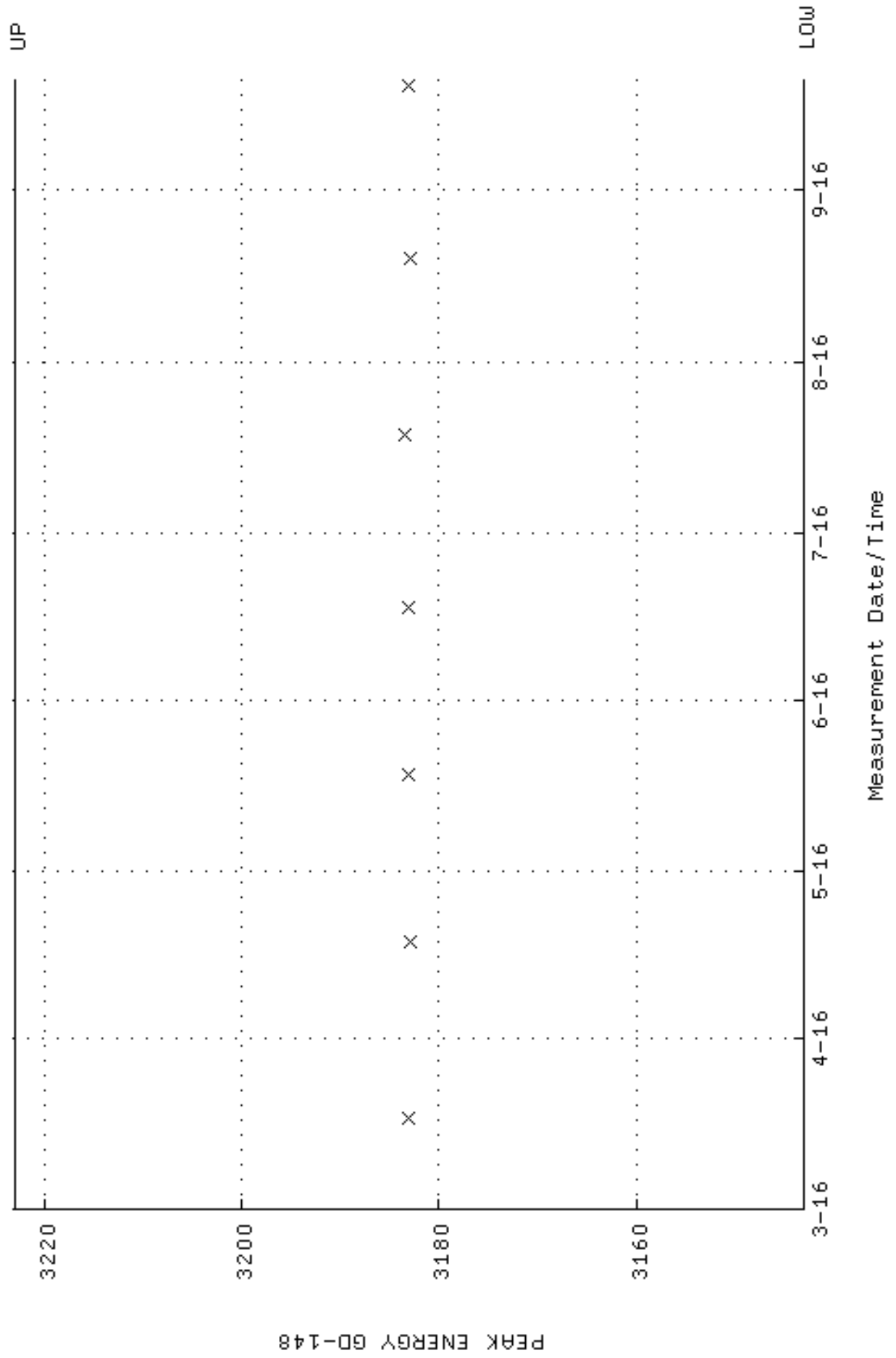
QA filename : DKA100:[ENV_ALPHA.QA.W]W235.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 17-MAR-2016 09:06:18 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



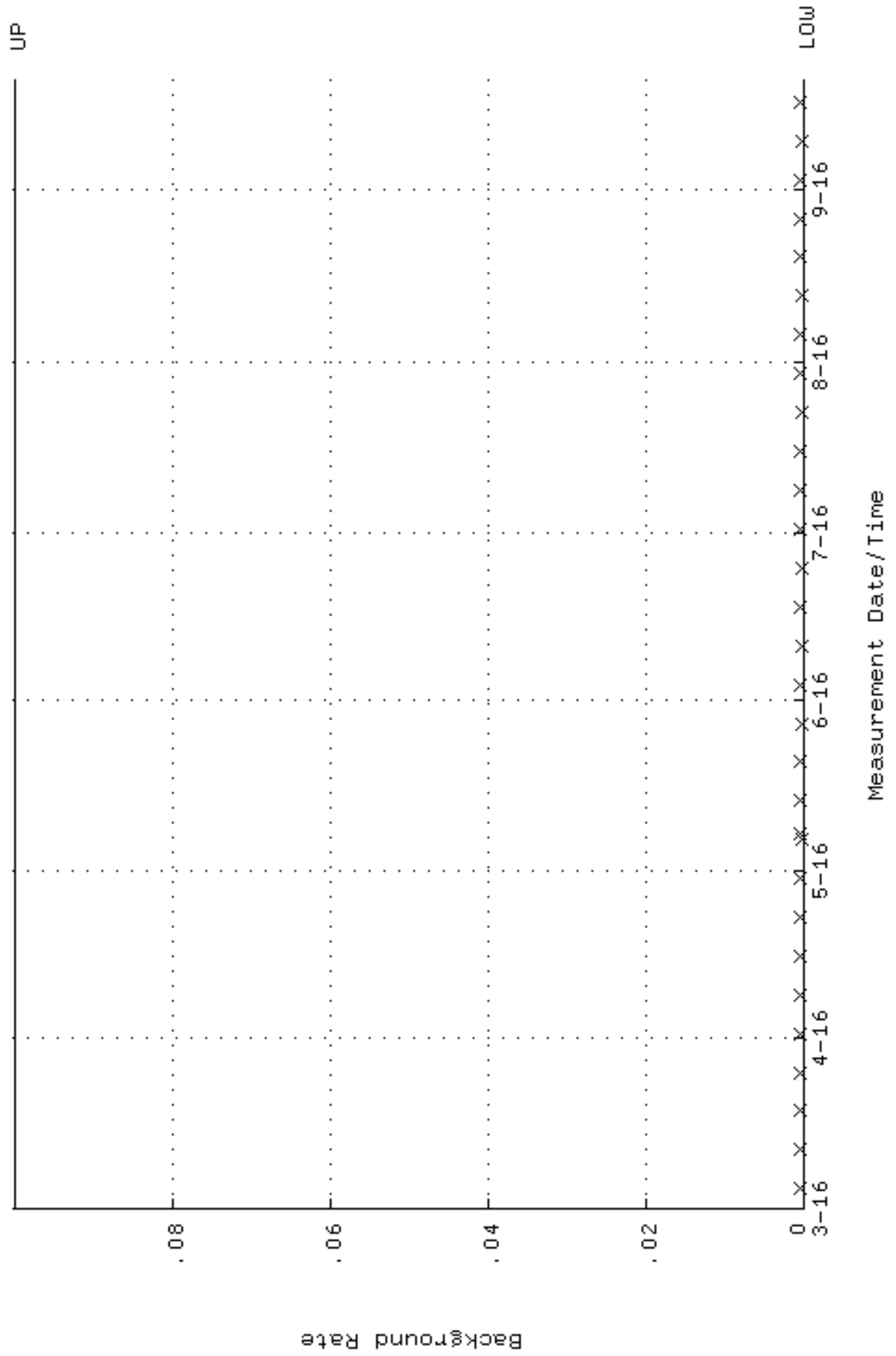
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Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 17-MAR-2016 09:06:18 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



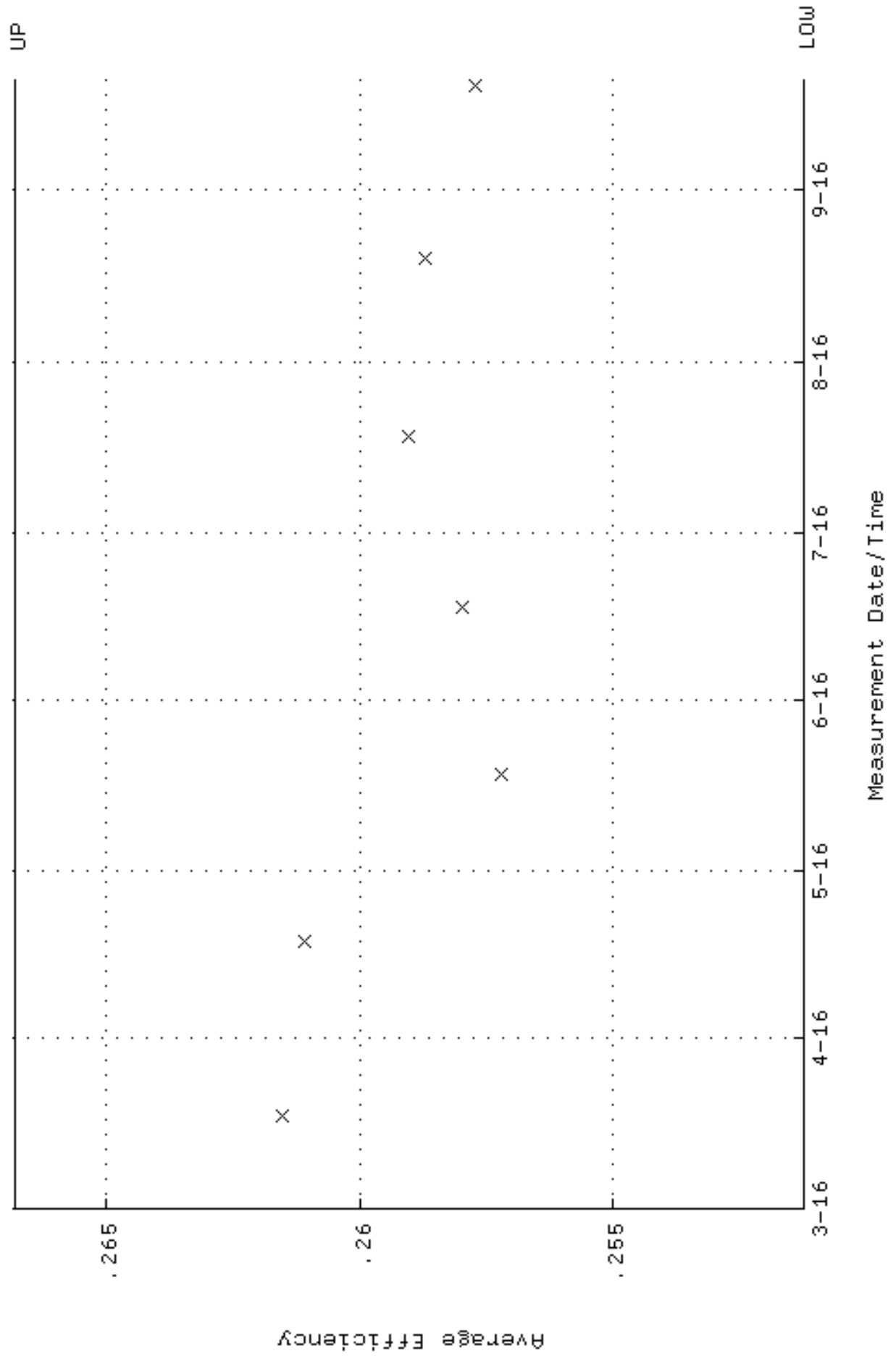
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 09:06:18 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



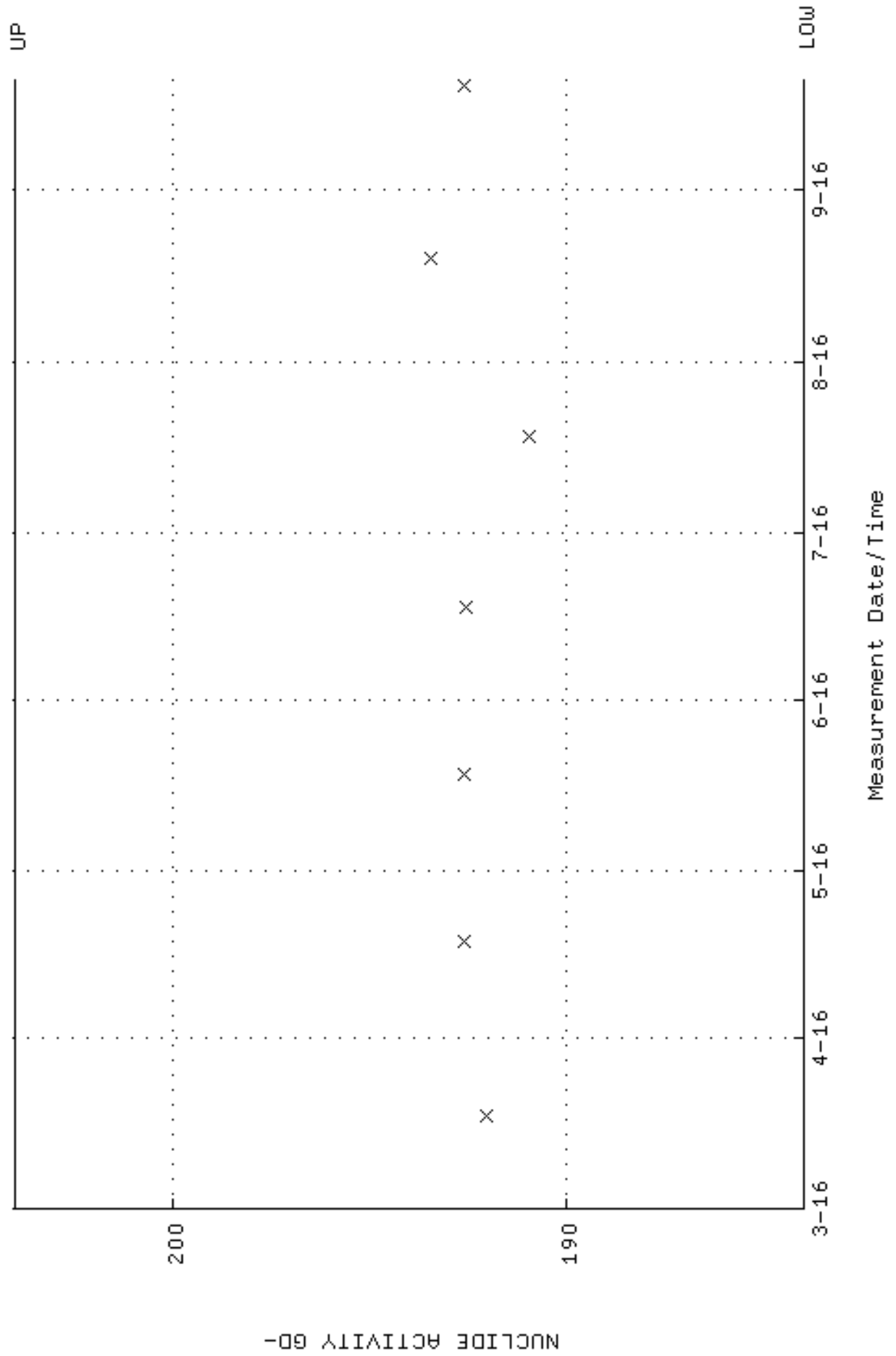
QA filename : DKA100:[ENV_ALPHA.QA.B]B235.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:35:23 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



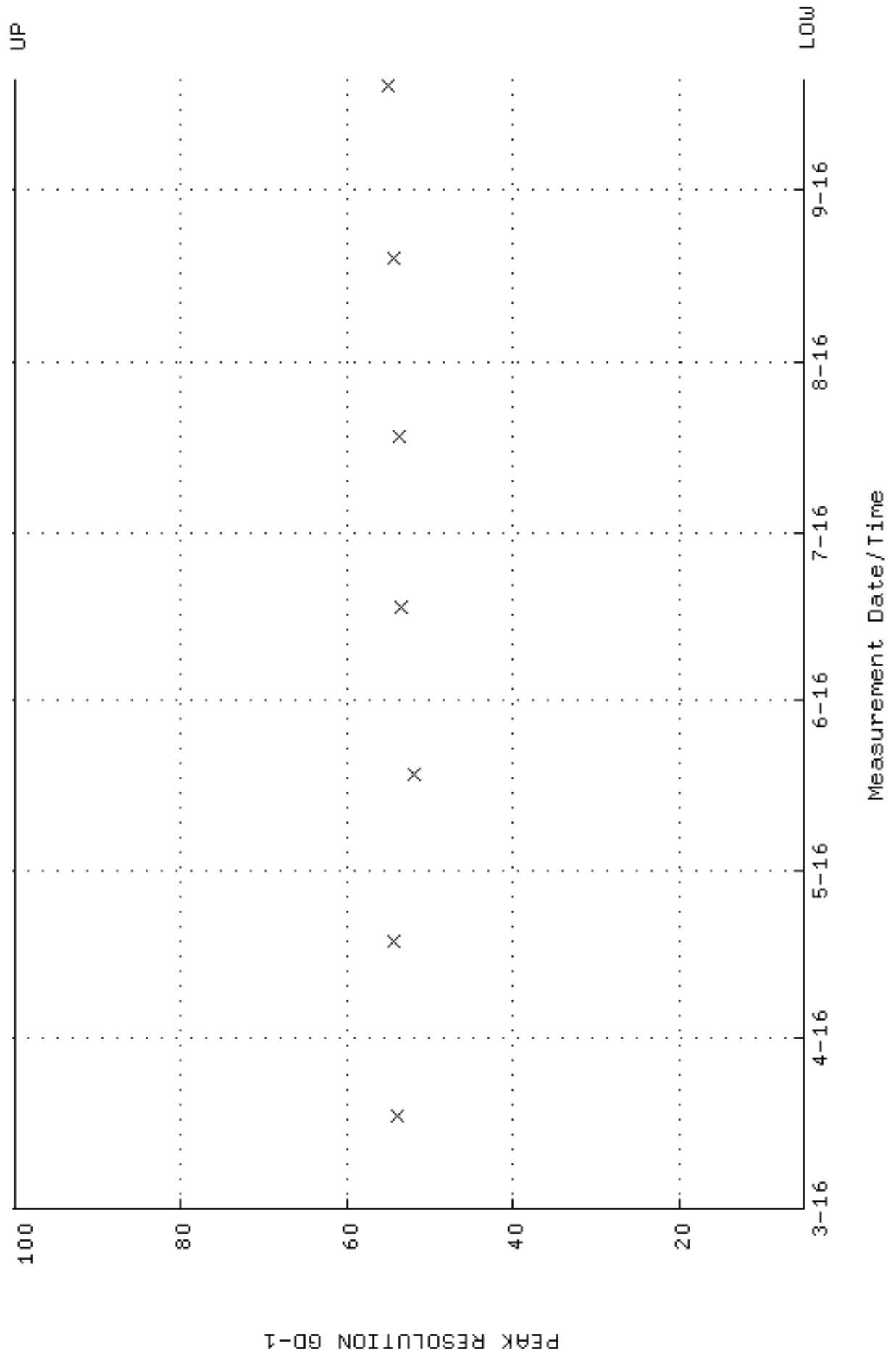
QA filename : DKA100:[ENV_ALPHA.QA.W]W236.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 14:51:08 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.251250 through 0.266790



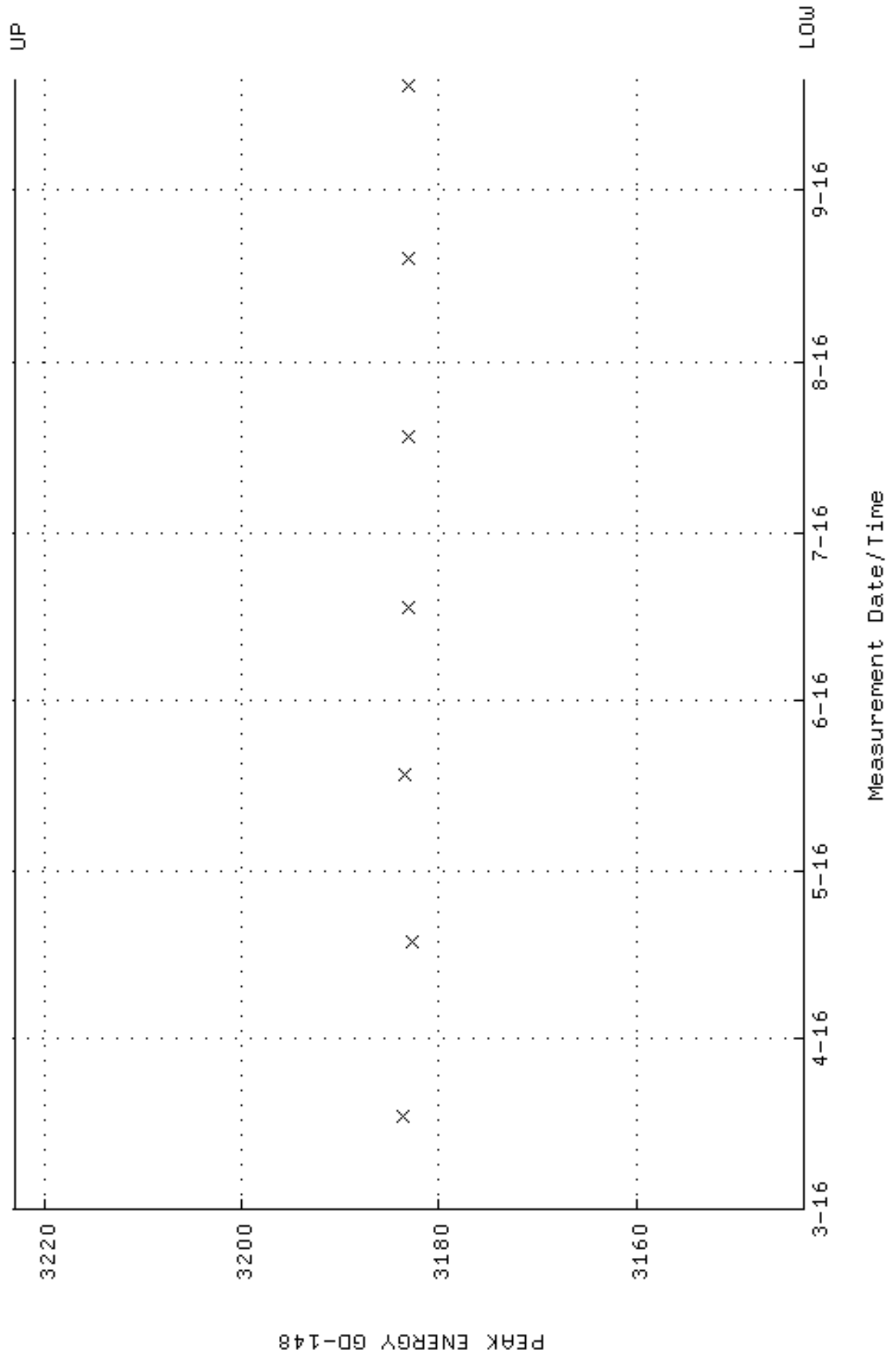
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 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 17-MAR-2016 14:51:08 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



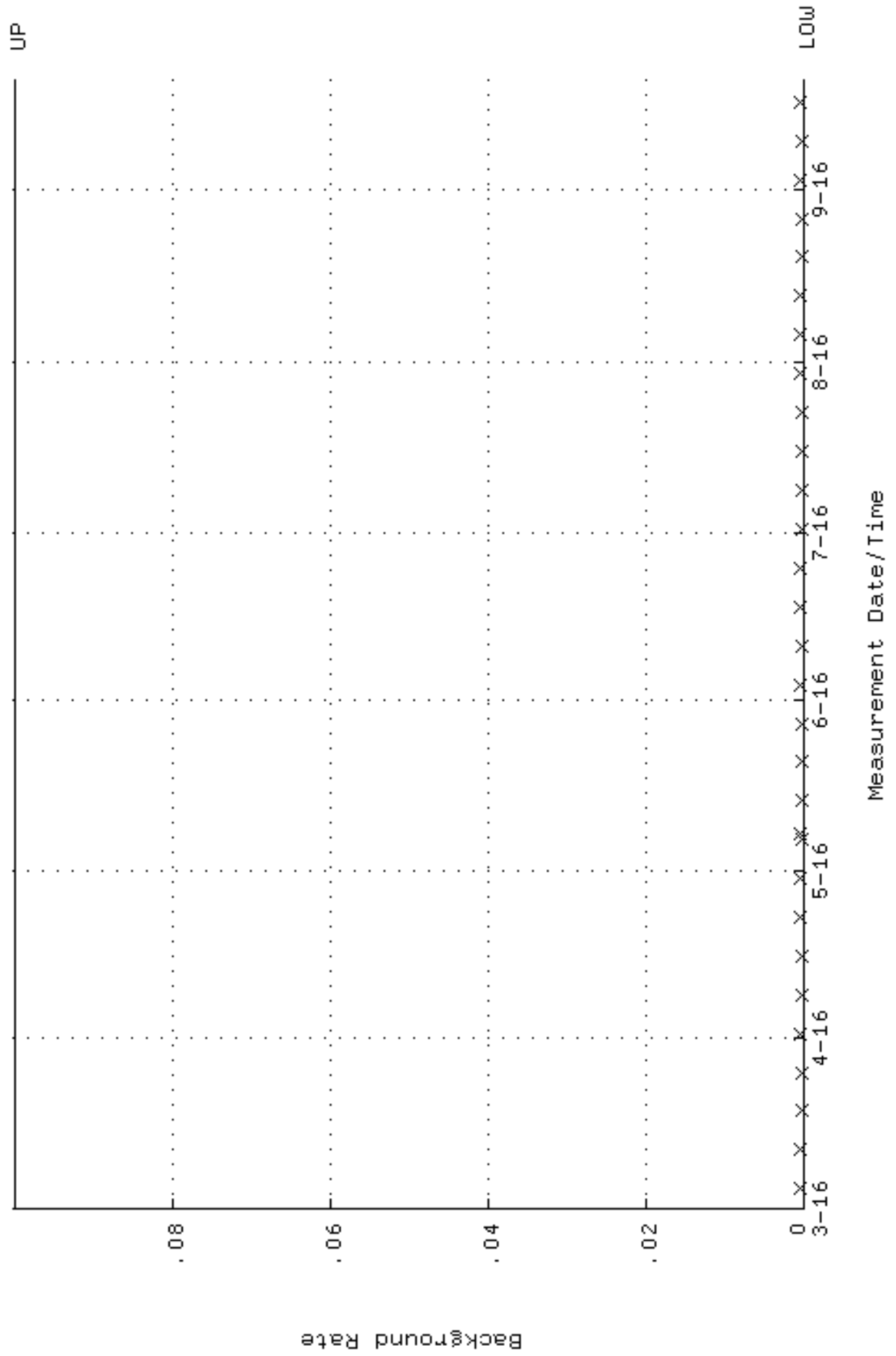
QA filename : DKA100:[ENV_ALPHA.QA.W]W236.QAF;3
 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 17-MAR-2016 14:51:08 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



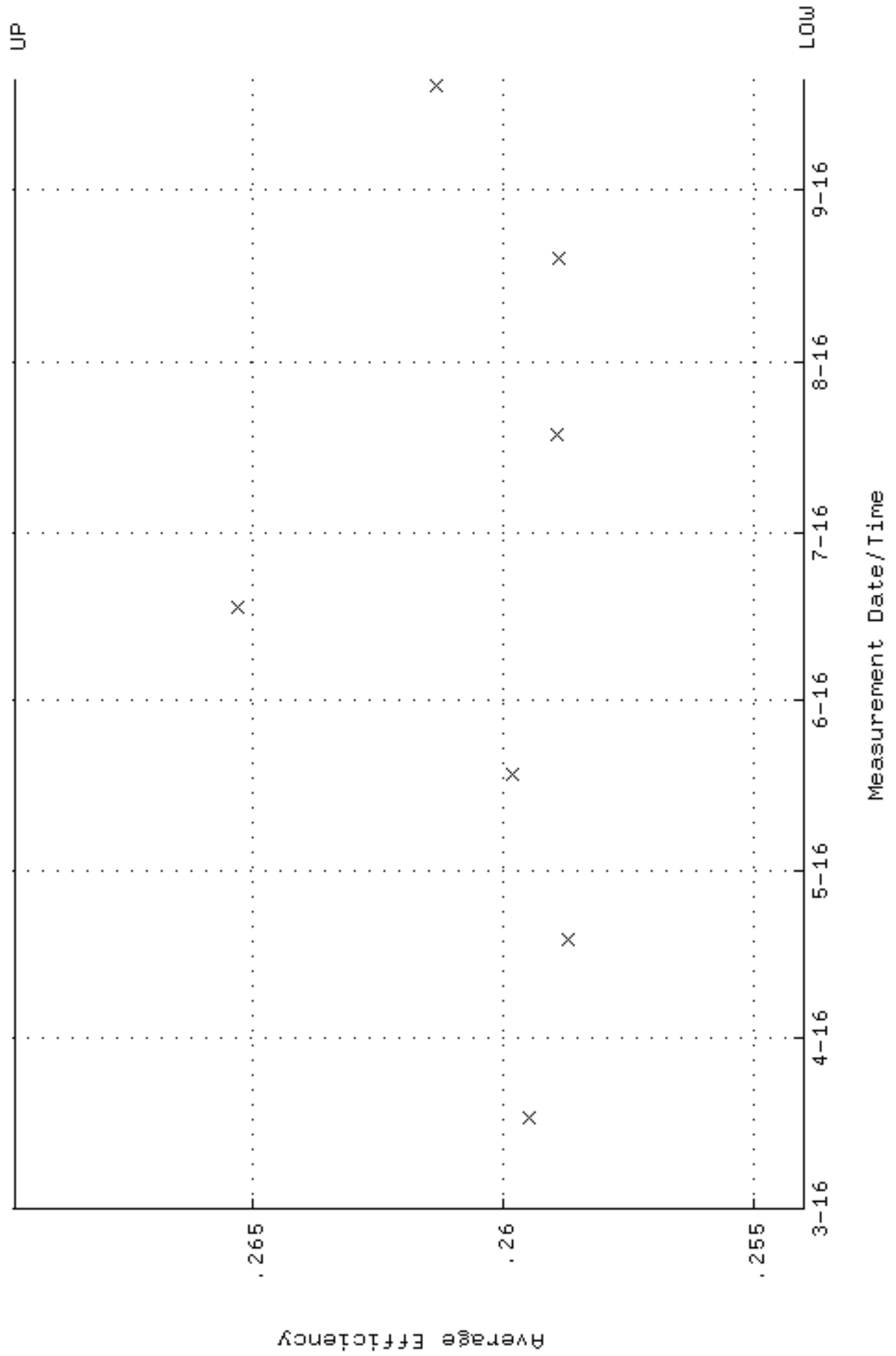
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 14:51:08 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



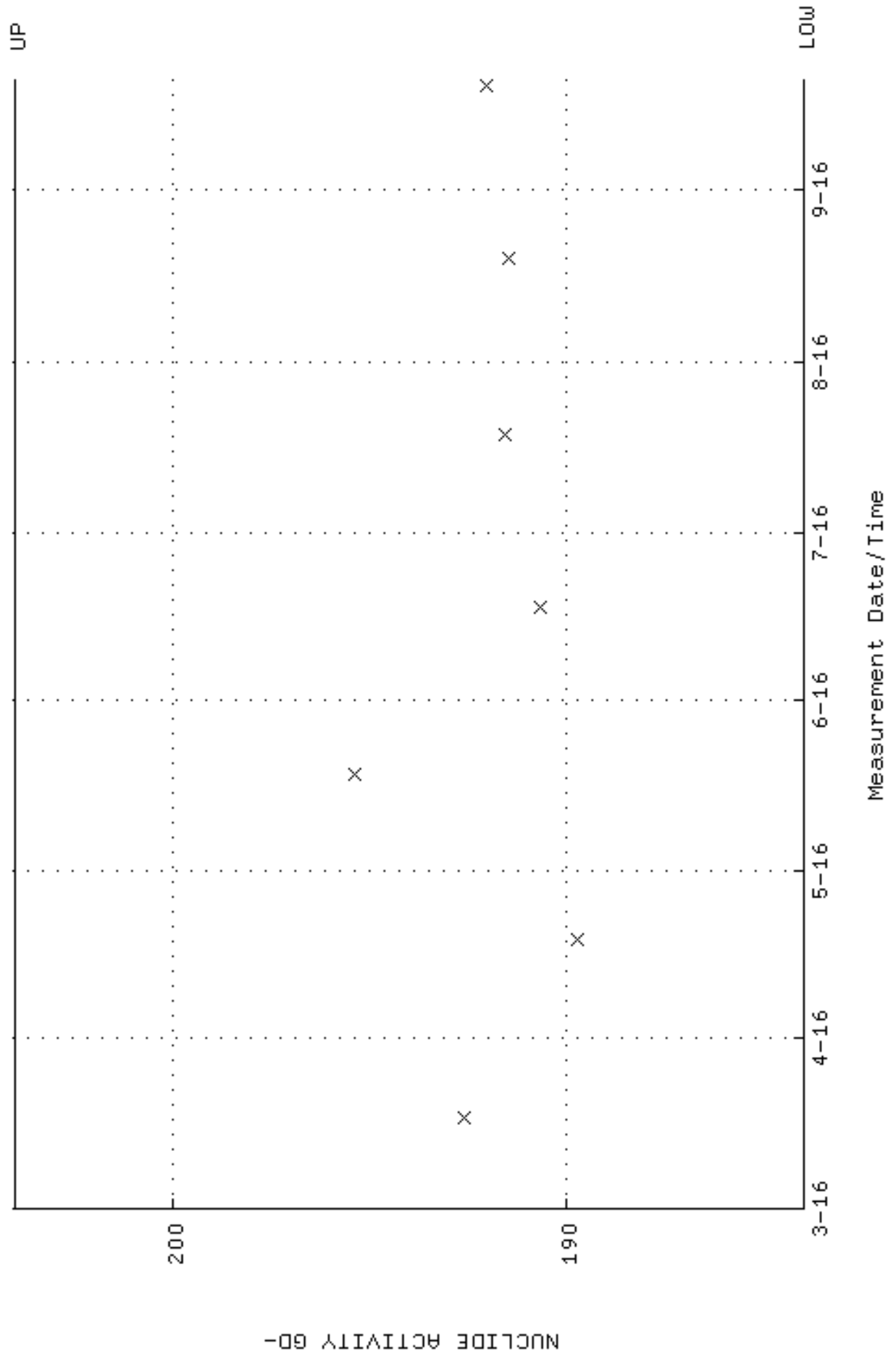
QA filename : DKA100:[ENV_ALPHA.QA.B]B236.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:35:28 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



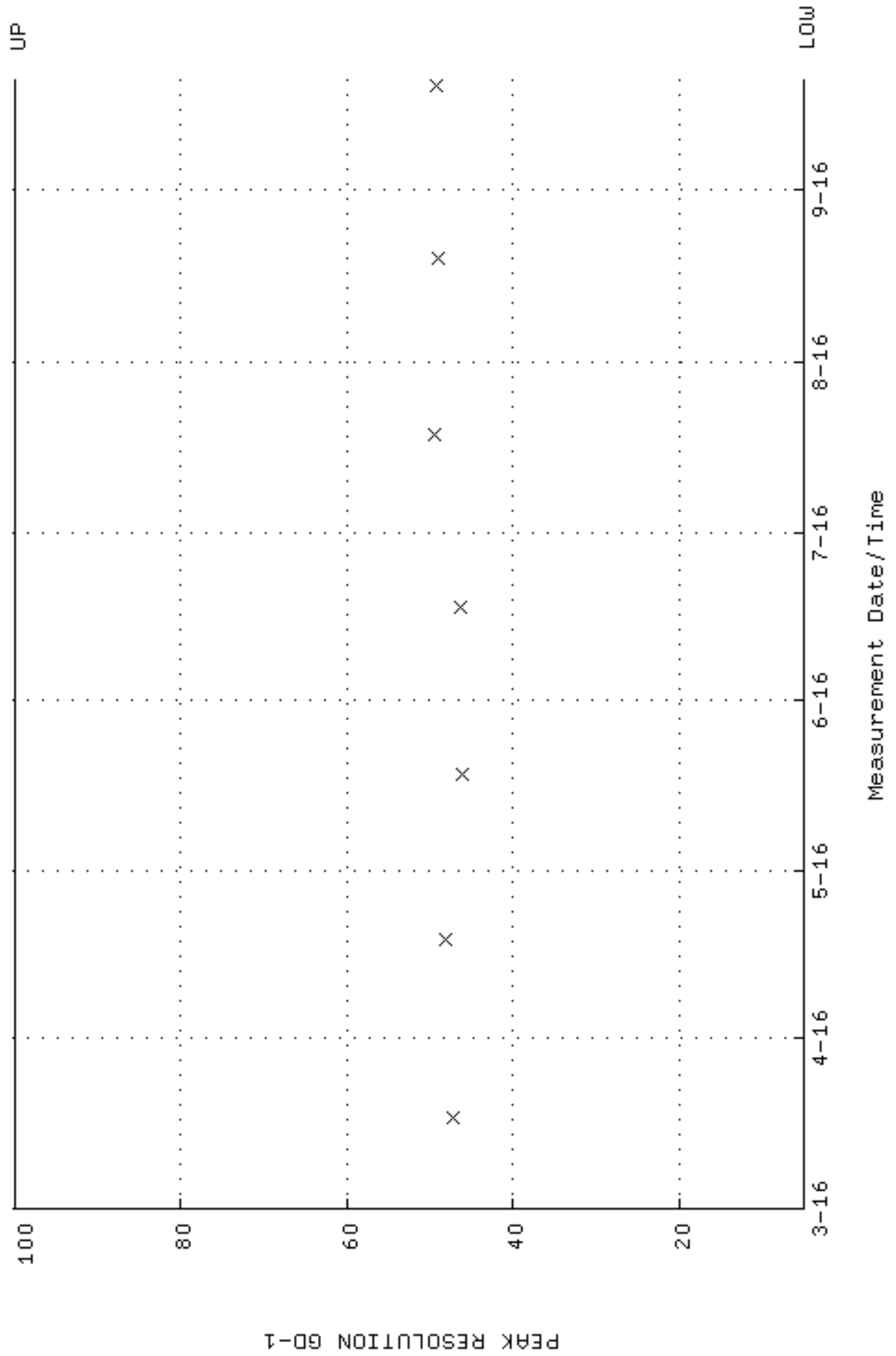
QA filename : DKA100:[ENV_ALPHA.QA.W]W238.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 09:06:30 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.254020 through 0.269732



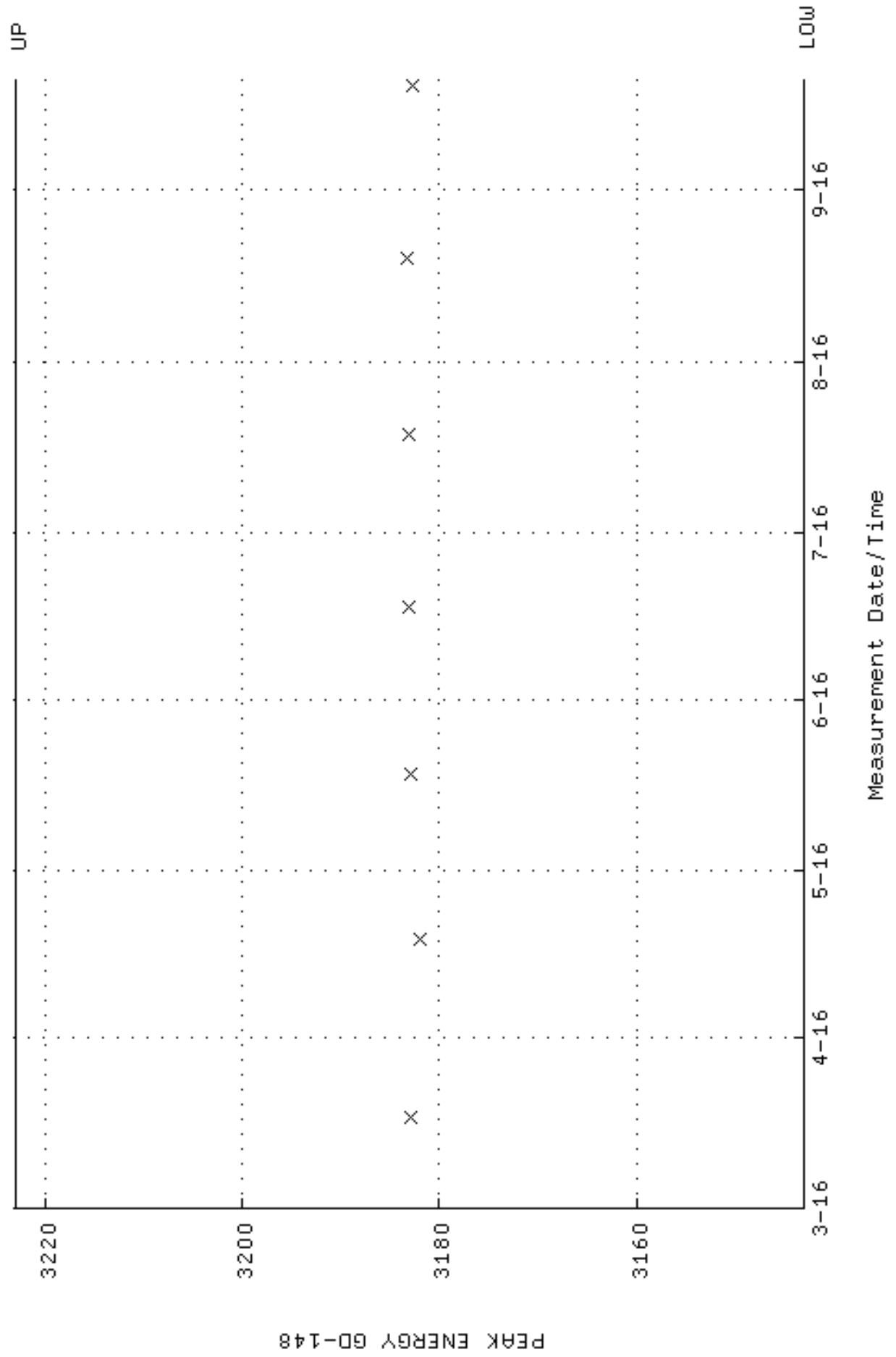
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 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 17-MAR-2016 09:06:30 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



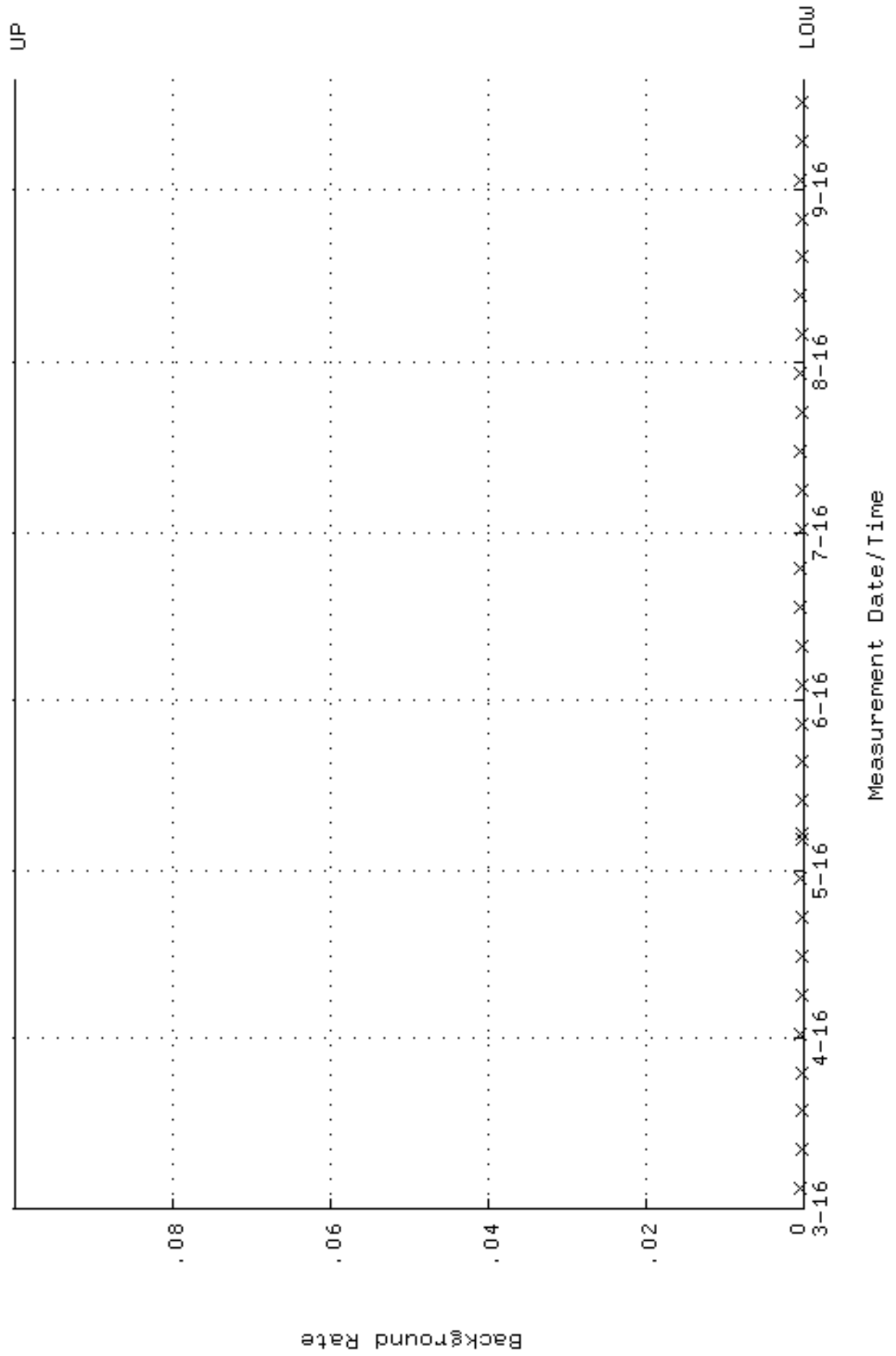
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 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 17-MAR-2016 09:06:30 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



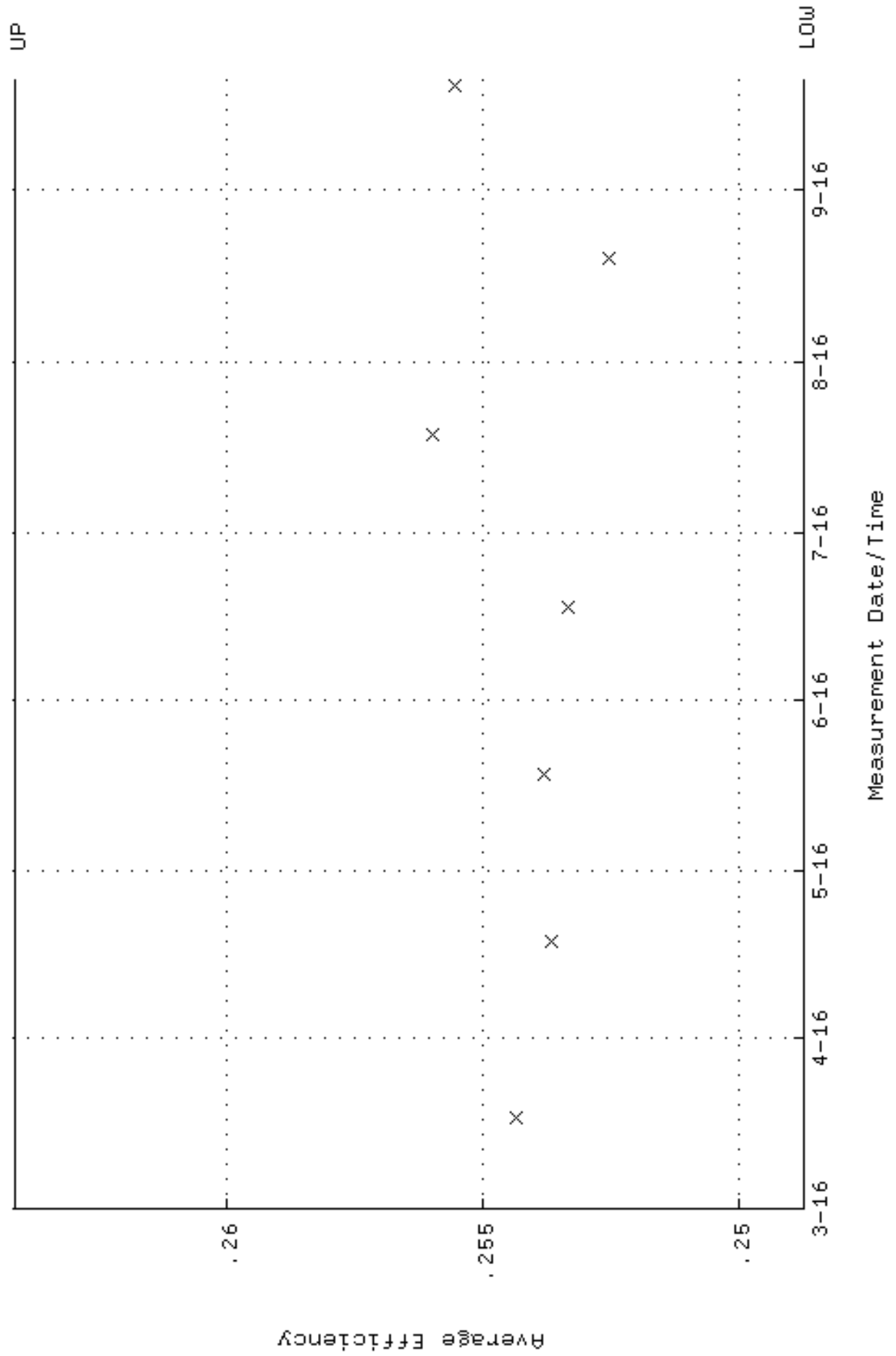
QA filename : DKA100:[ENV_ALPHA.QA.W]w238.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 09:06:30 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



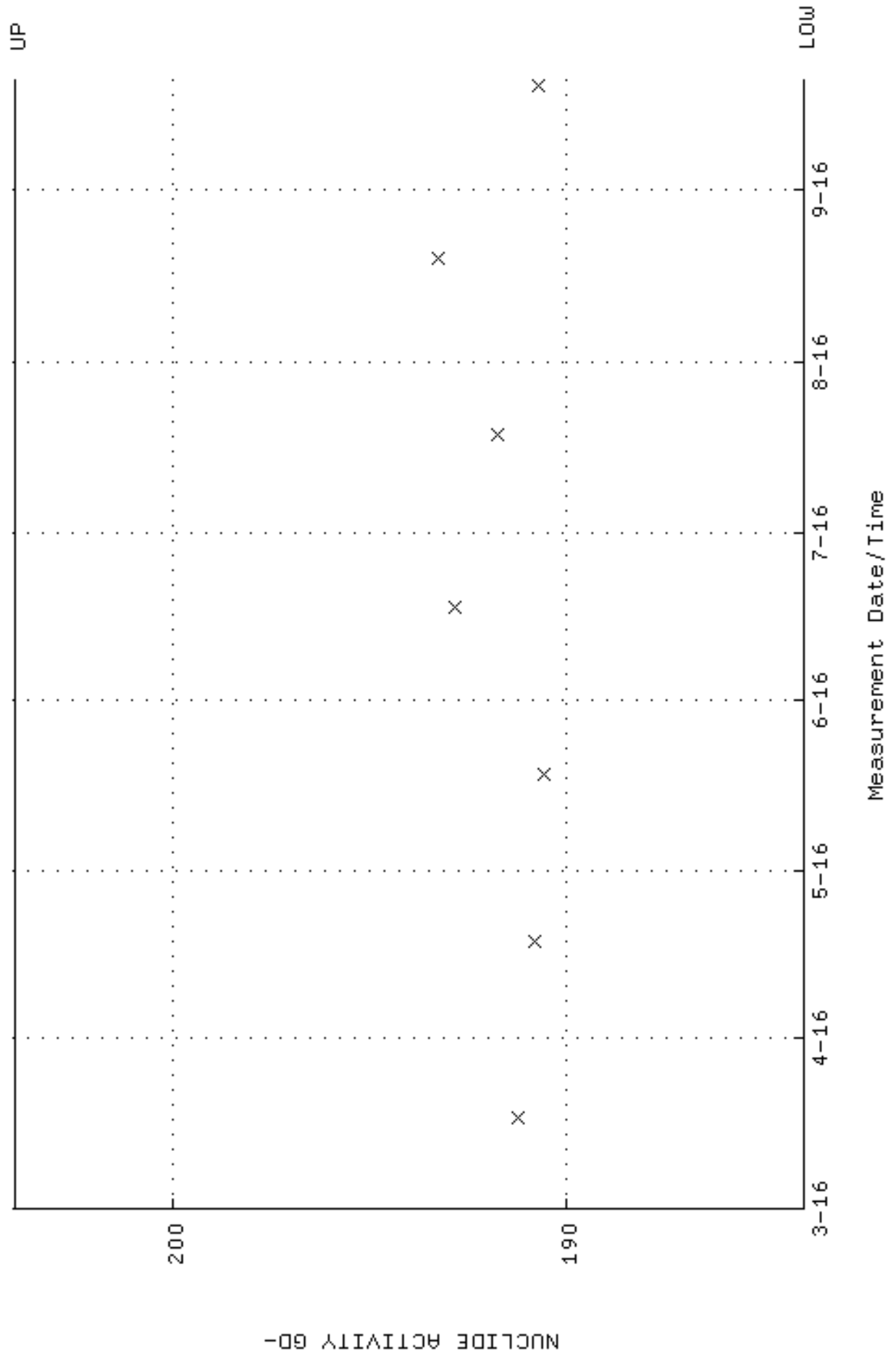
QA filename : DKA100:[ENV_ALPHA.QA.B]B238.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:35:38 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



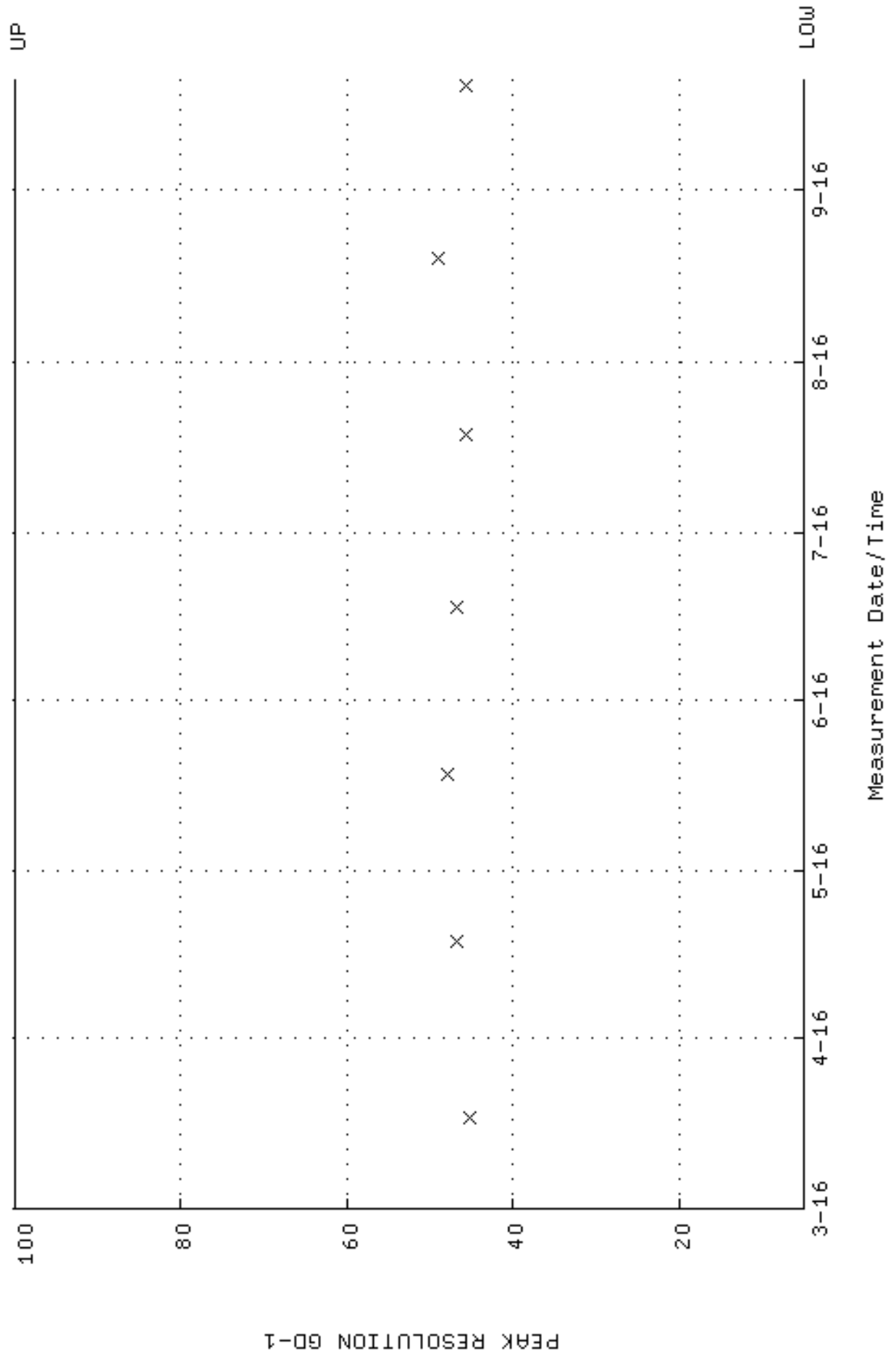
QA filename : DKA100:[ENV_ALPHA.QA.W]W240.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 12:17:27 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.248737 through 0.264123



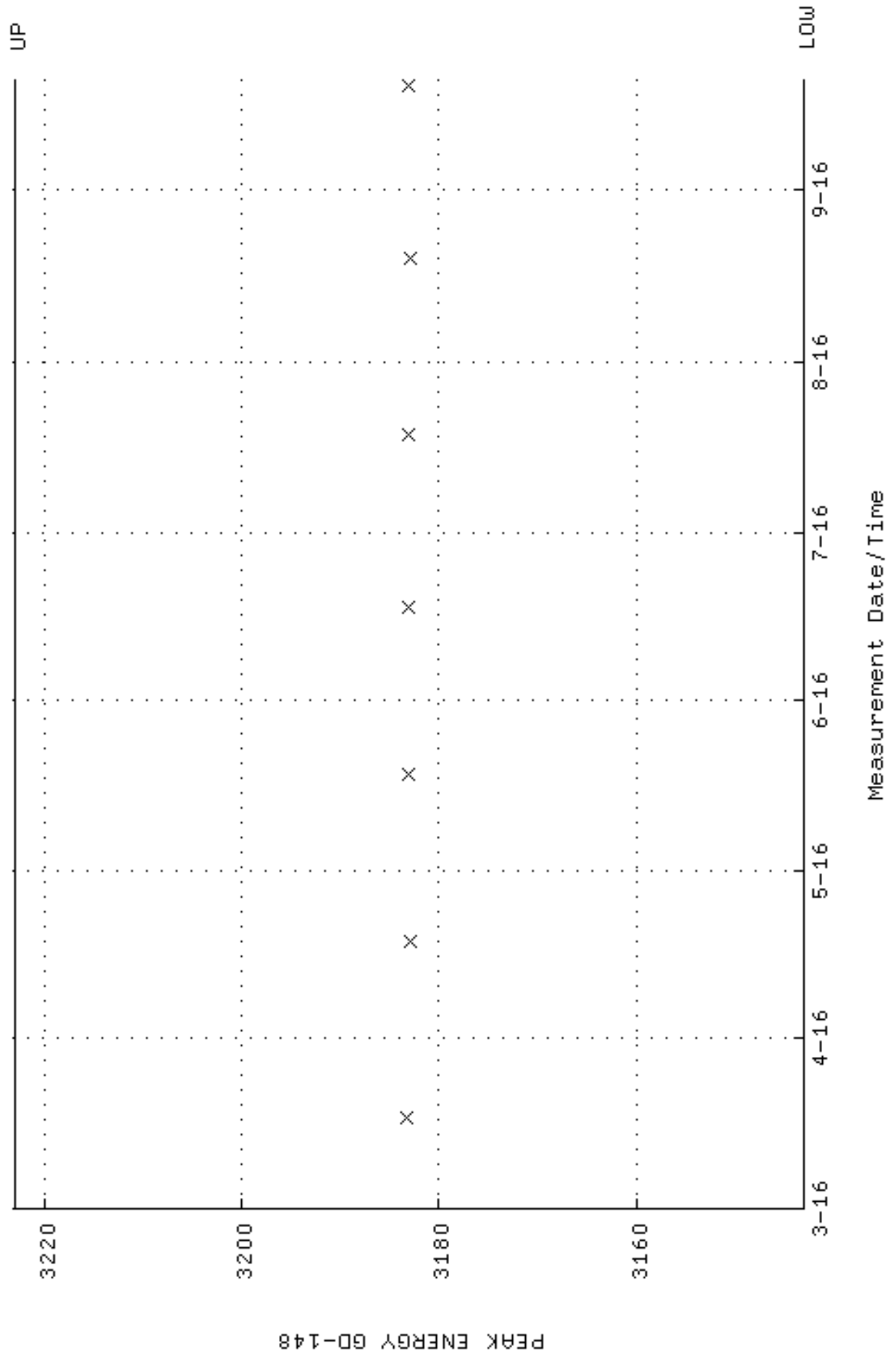
QA filename : DKA100:[ENV_ALPHA.QA.W]w240.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 17-MAR-2016 12:17:27 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



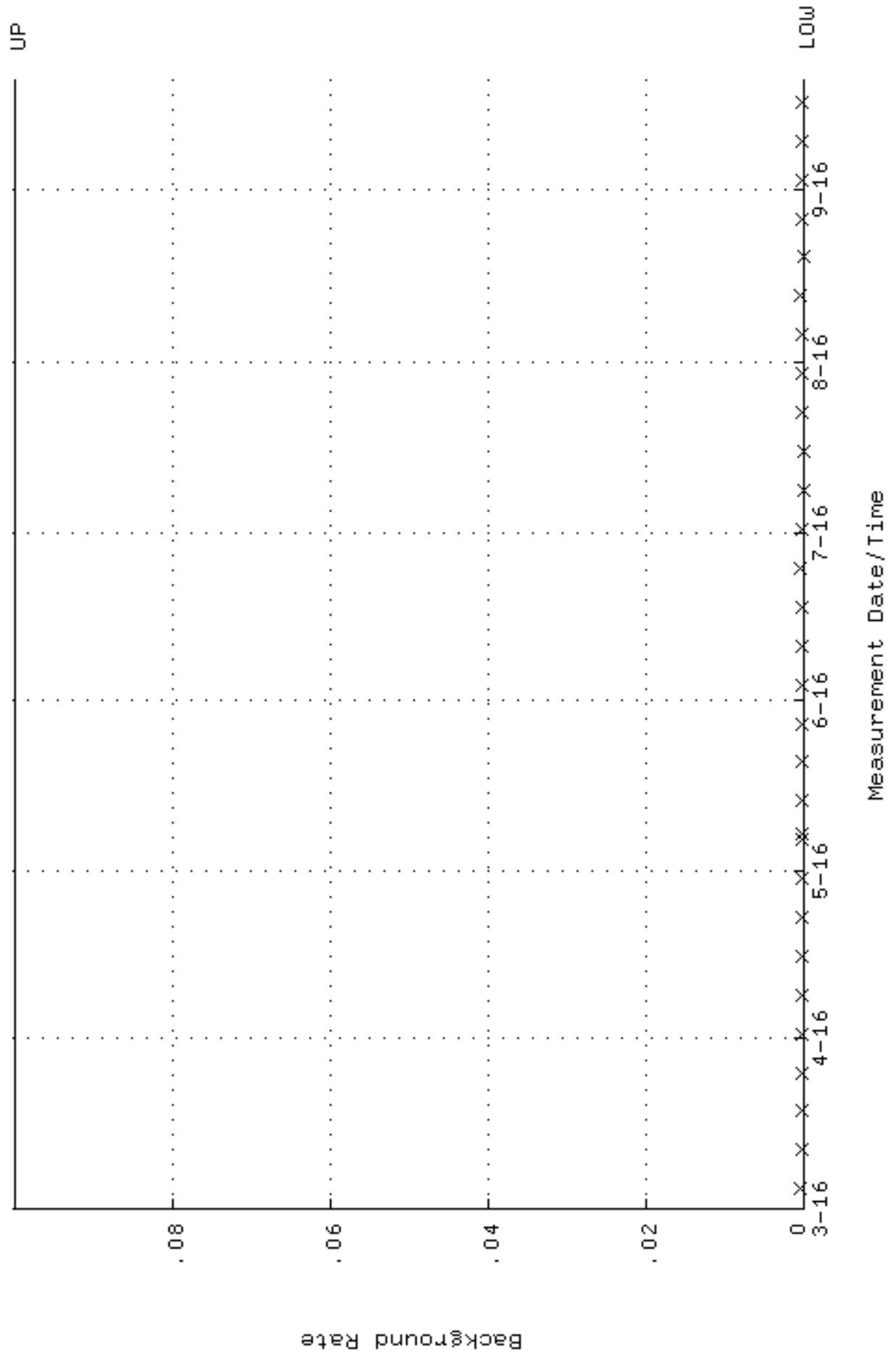
QA filename : DKA100:[ENV_ALPHA.QA.W]W240.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 17-MAR-2016 12:17:27 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



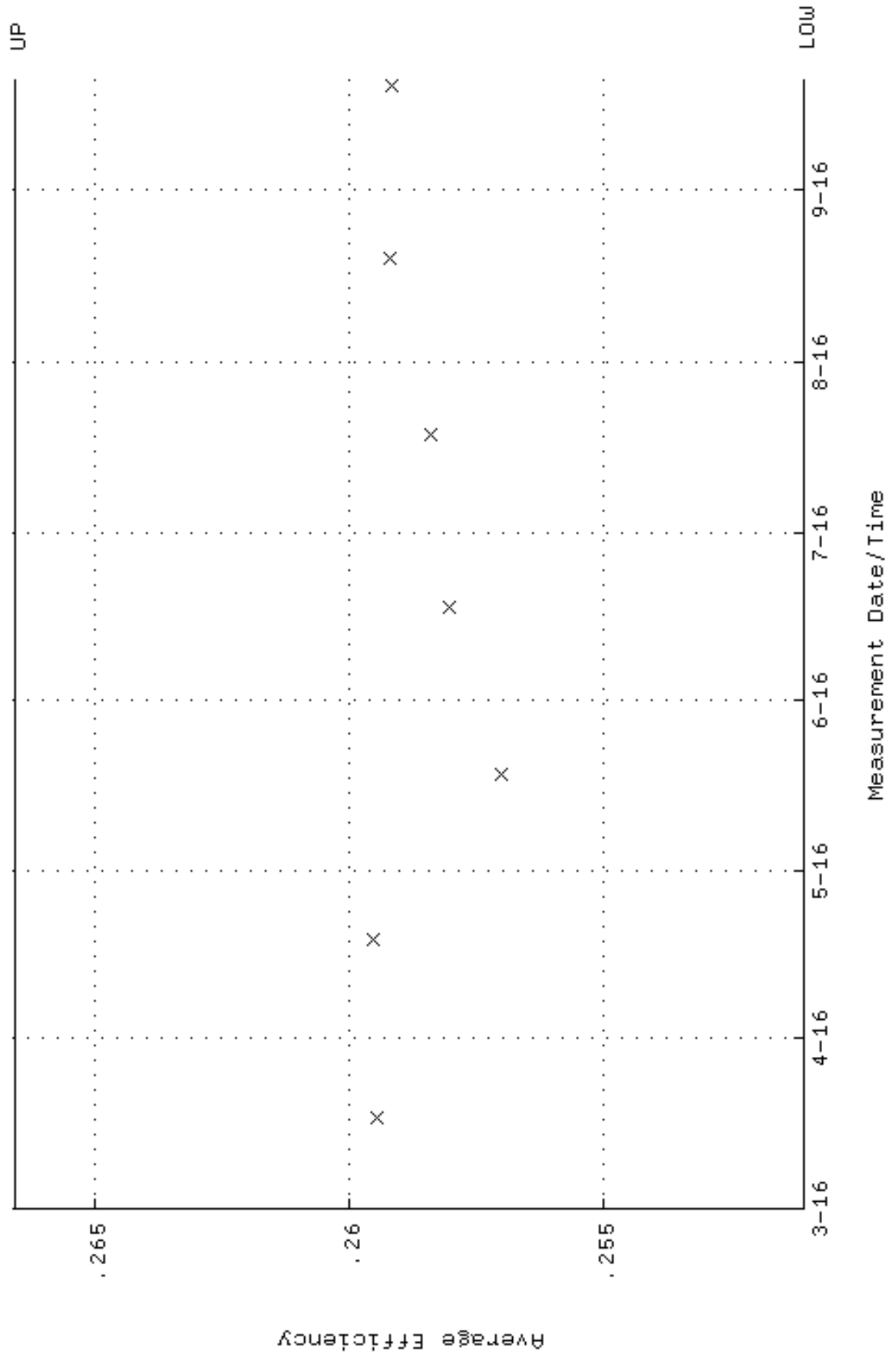
QA filename : DKA100:[ENV_ALPHA.QA.W]W240.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 12:17:27 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



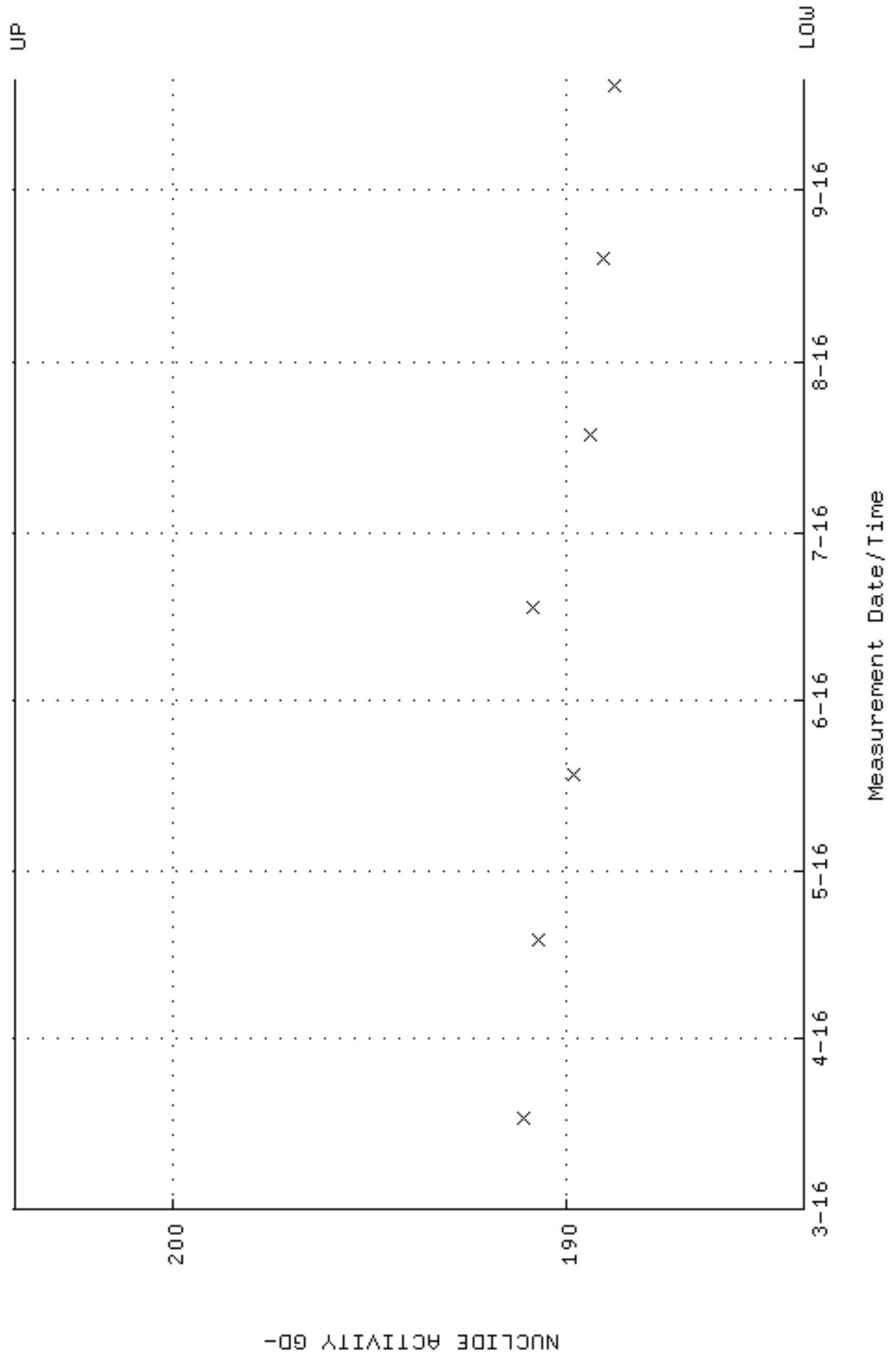
QA filename : DKA100:[ENV_ALPHA.QA.B]B240.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:35:47 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



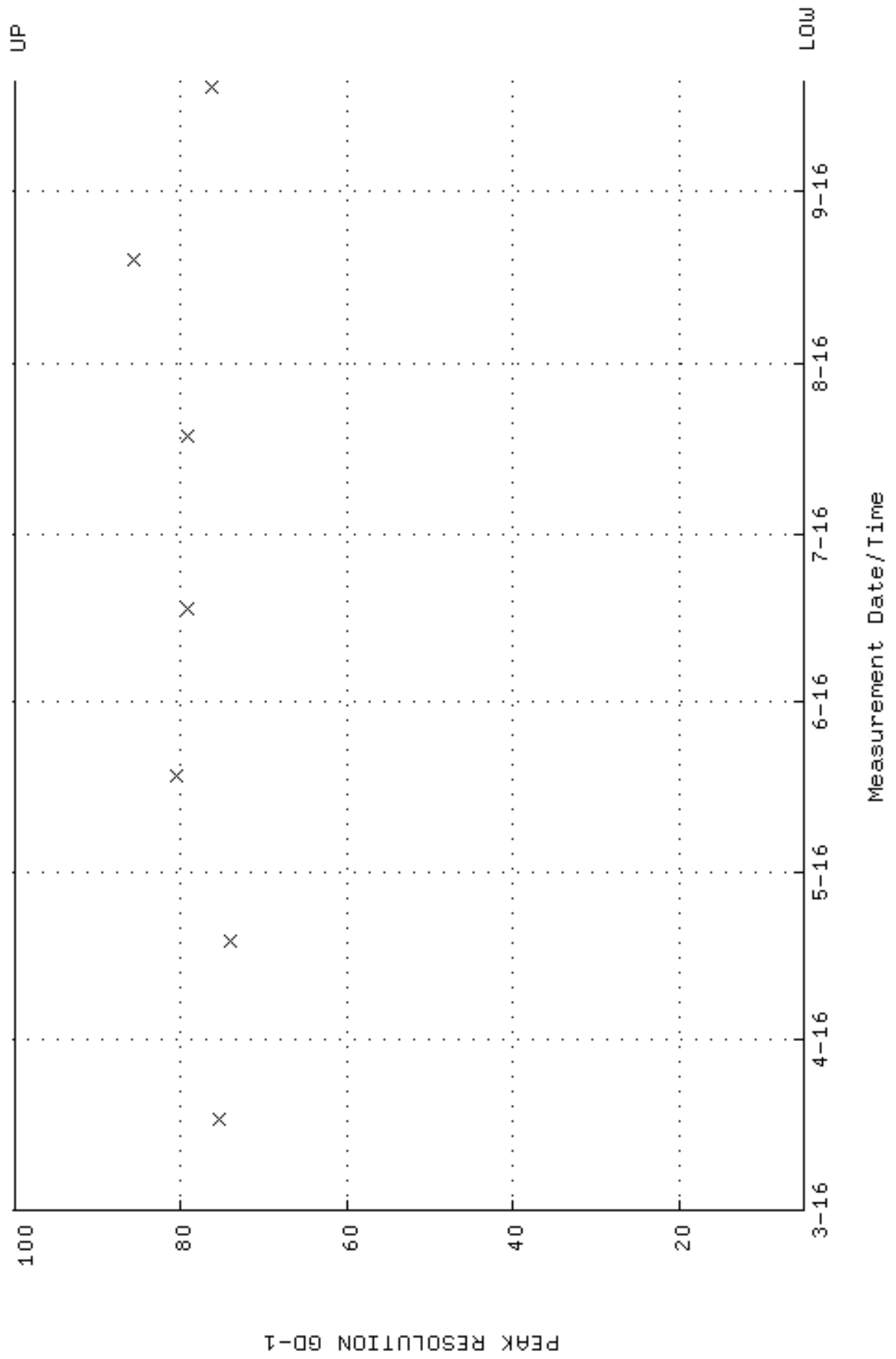
QA filename : DKA100:[ENV_ALPHA.QA.W]W241.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 12:17:36 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.251040 through 0.266570



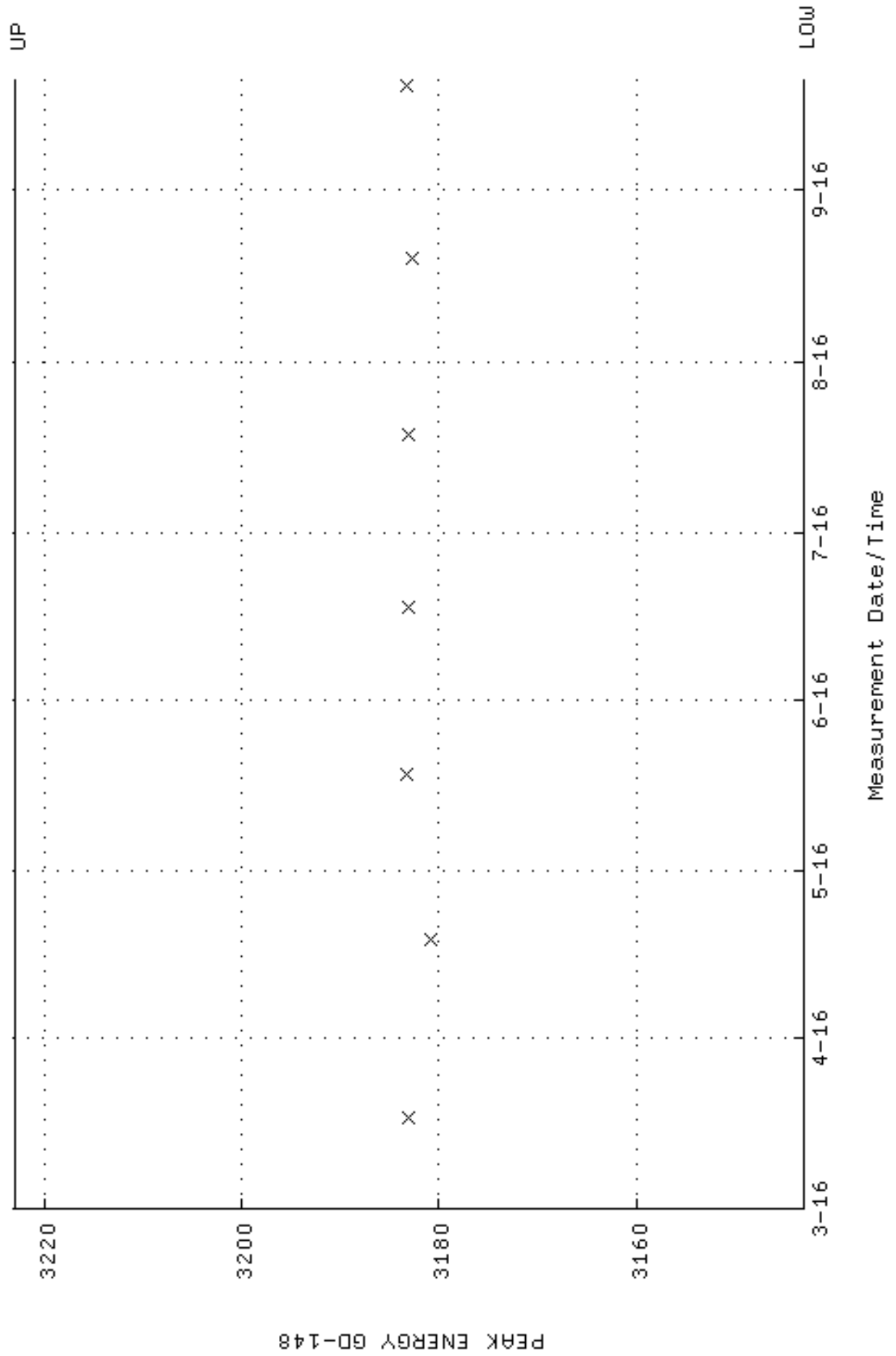
QA filename : DKA100:[ENV_ALPHA.QA.W]w241.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 17-MAR-2016 12:17:36 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



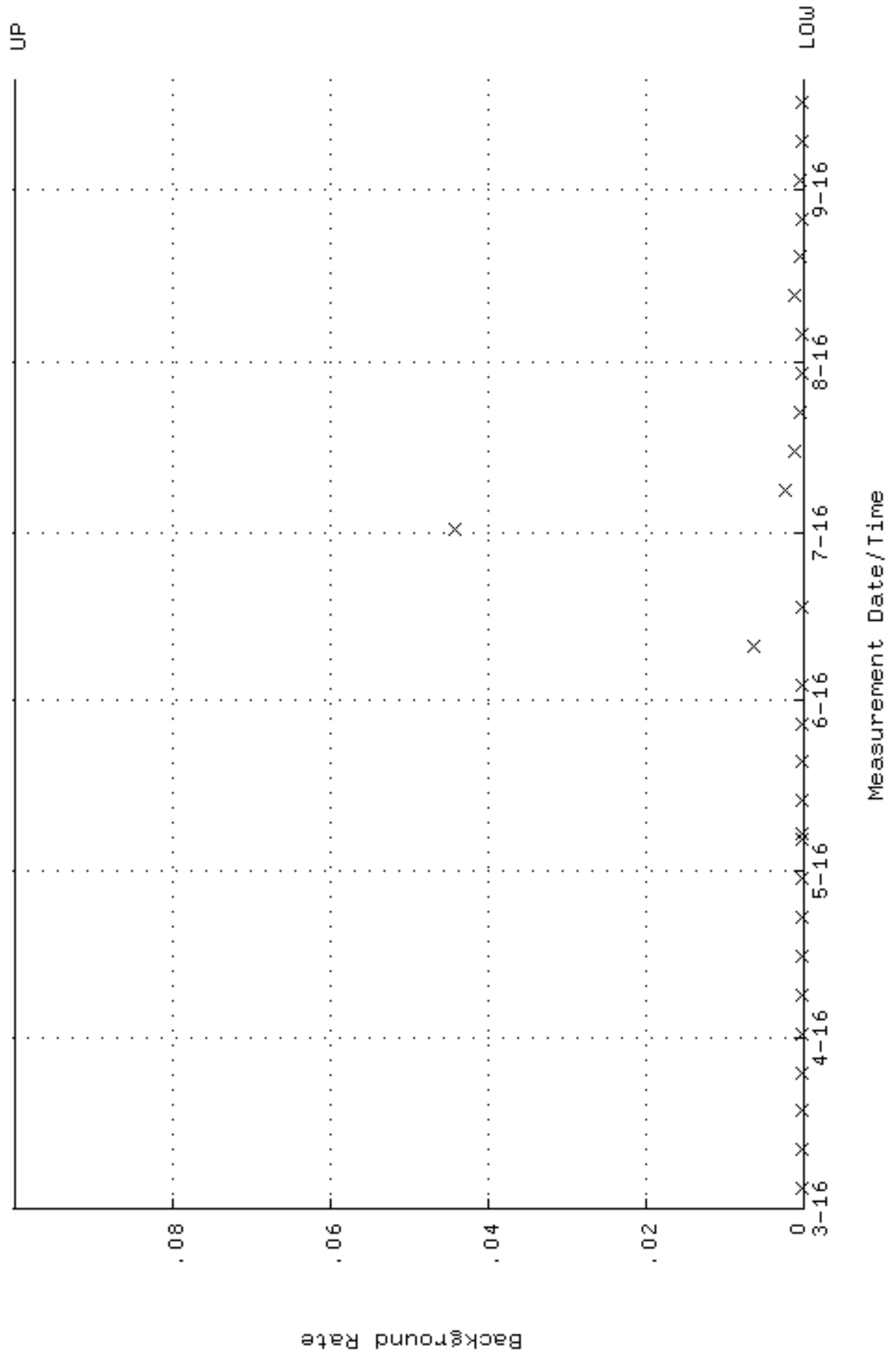
QA filename : DKA100:[ENV_ALPHA.QA.W]W241.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 17-MAR-2016 12:17:36 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



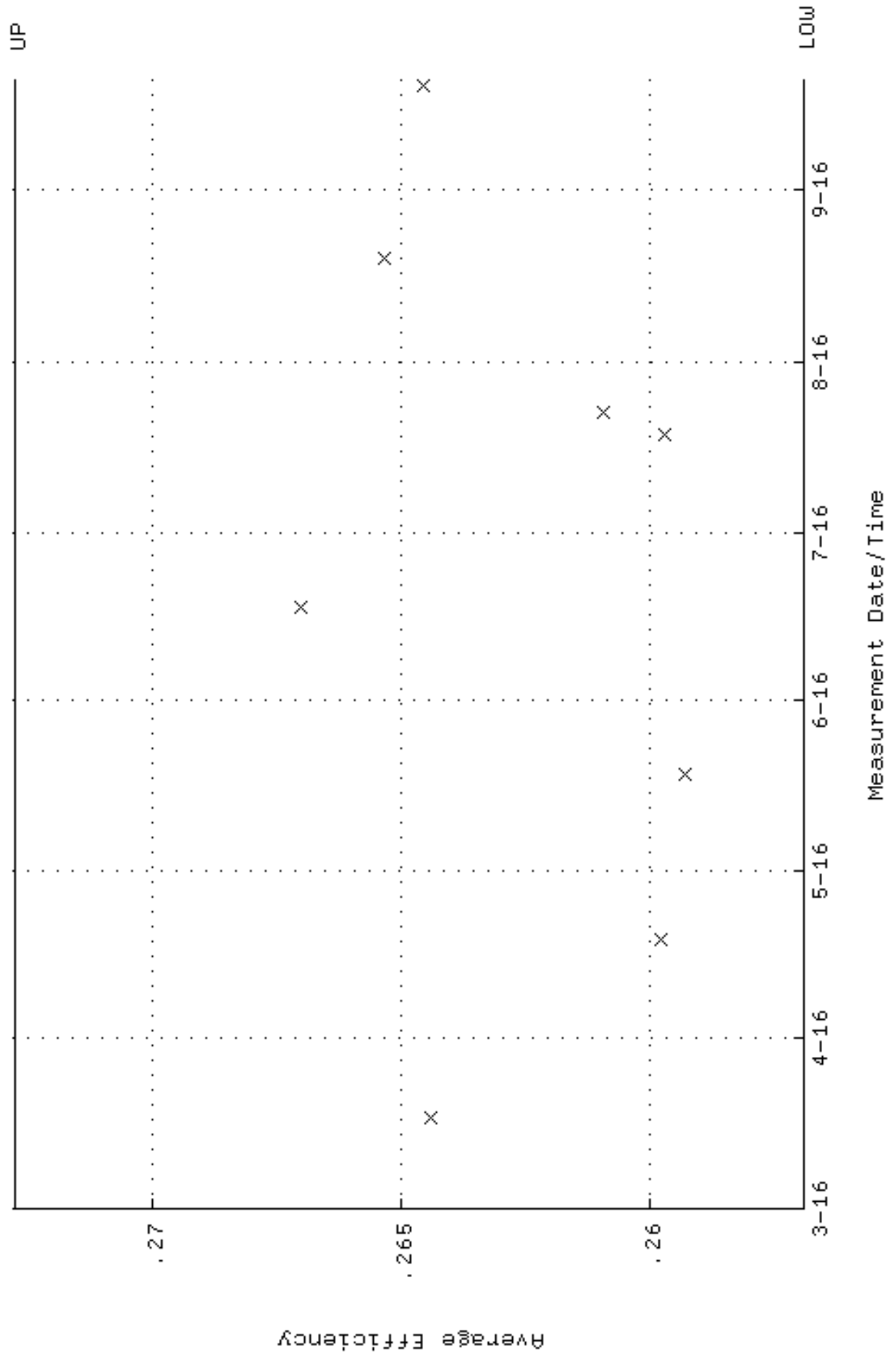
QA filename : DKA100:[ENV_ALPHA.QA.W]W241.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 12:17:36 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



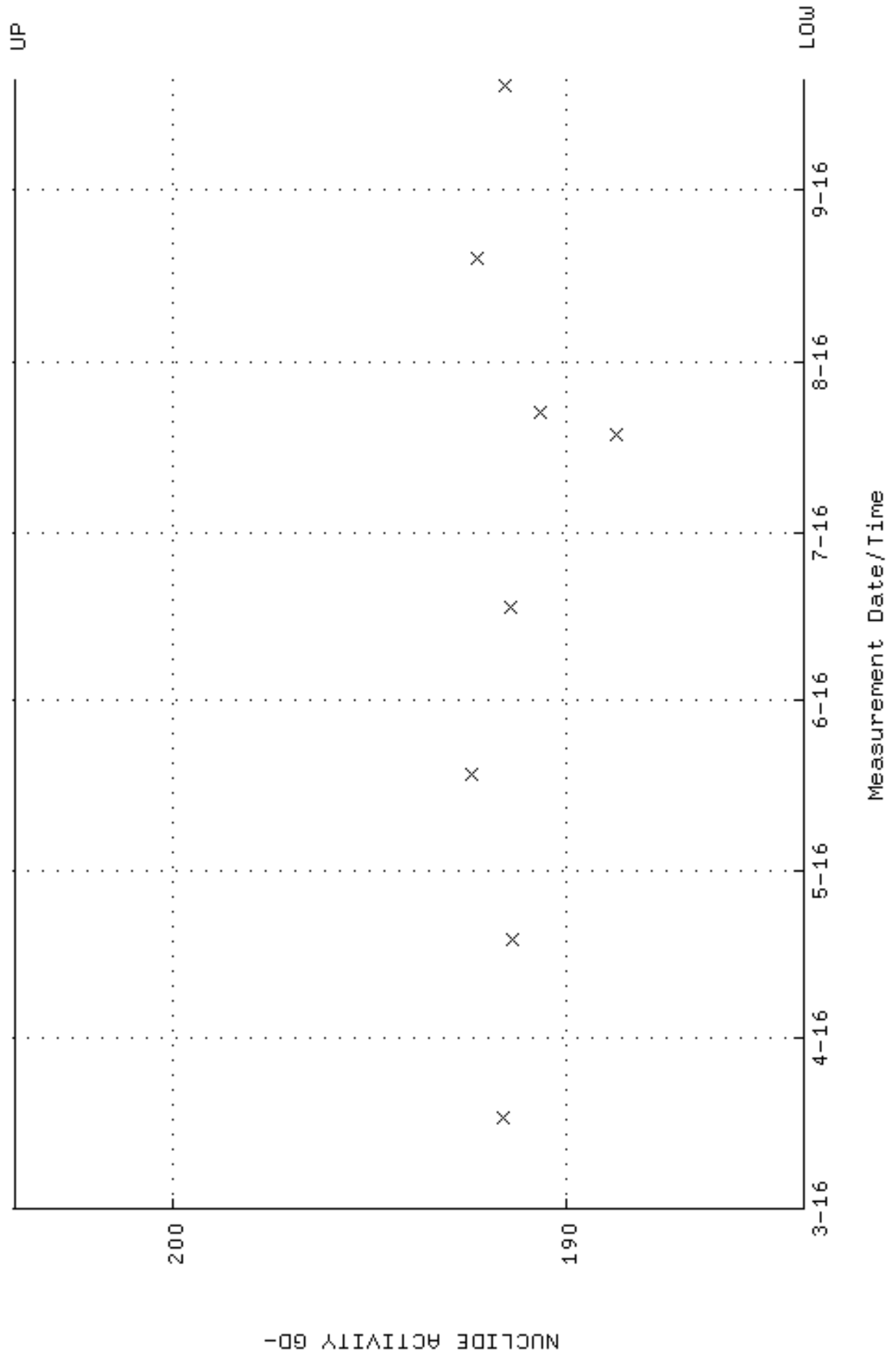
QA filename : DKA100:[ENV_ALPHA.QA.B]B241.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:35:51 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



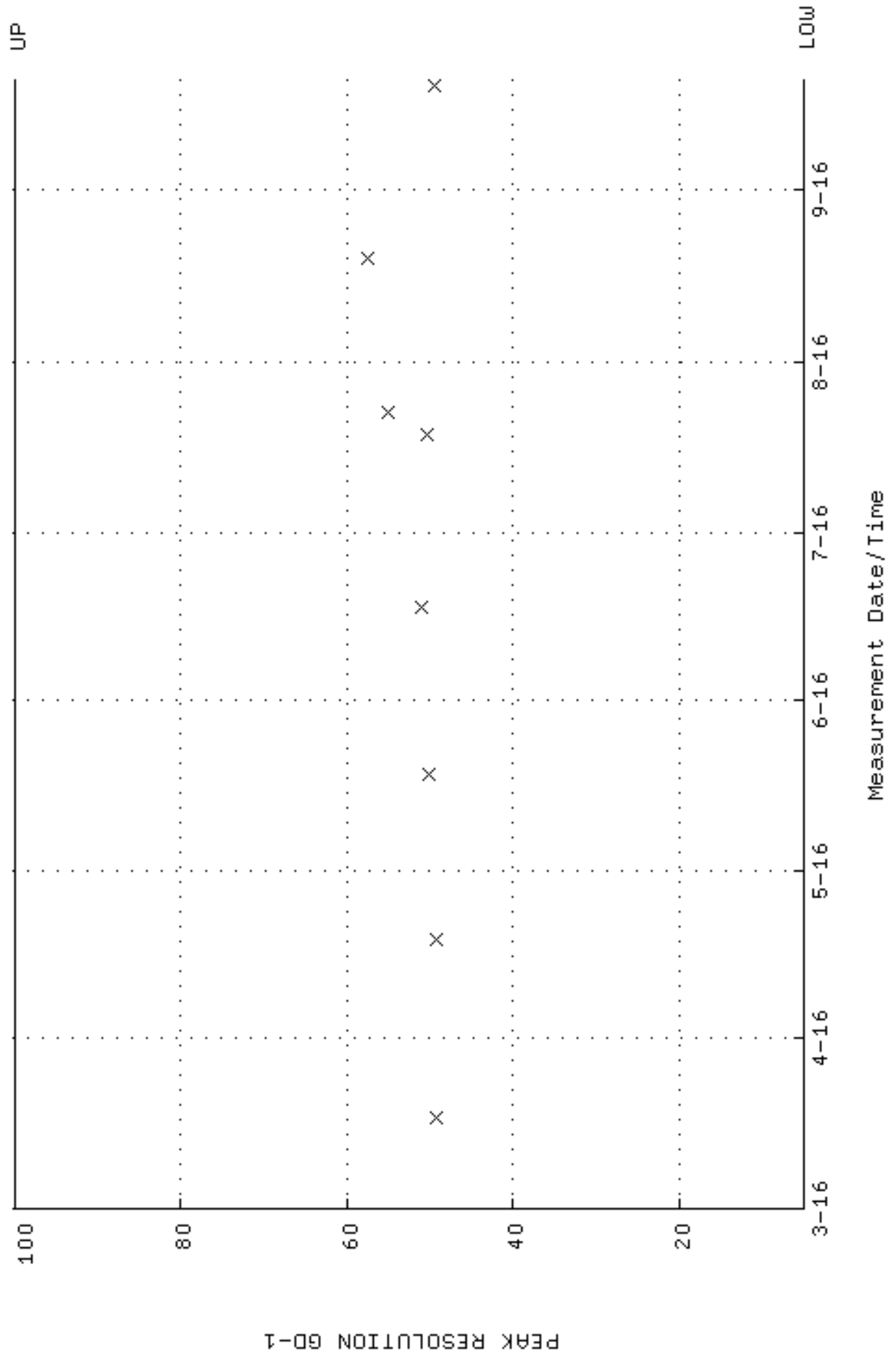
QA filename : DKA100:[ENV_ALPHA.QA.W]W242.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 12:17:40 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.256891 through 0.272781



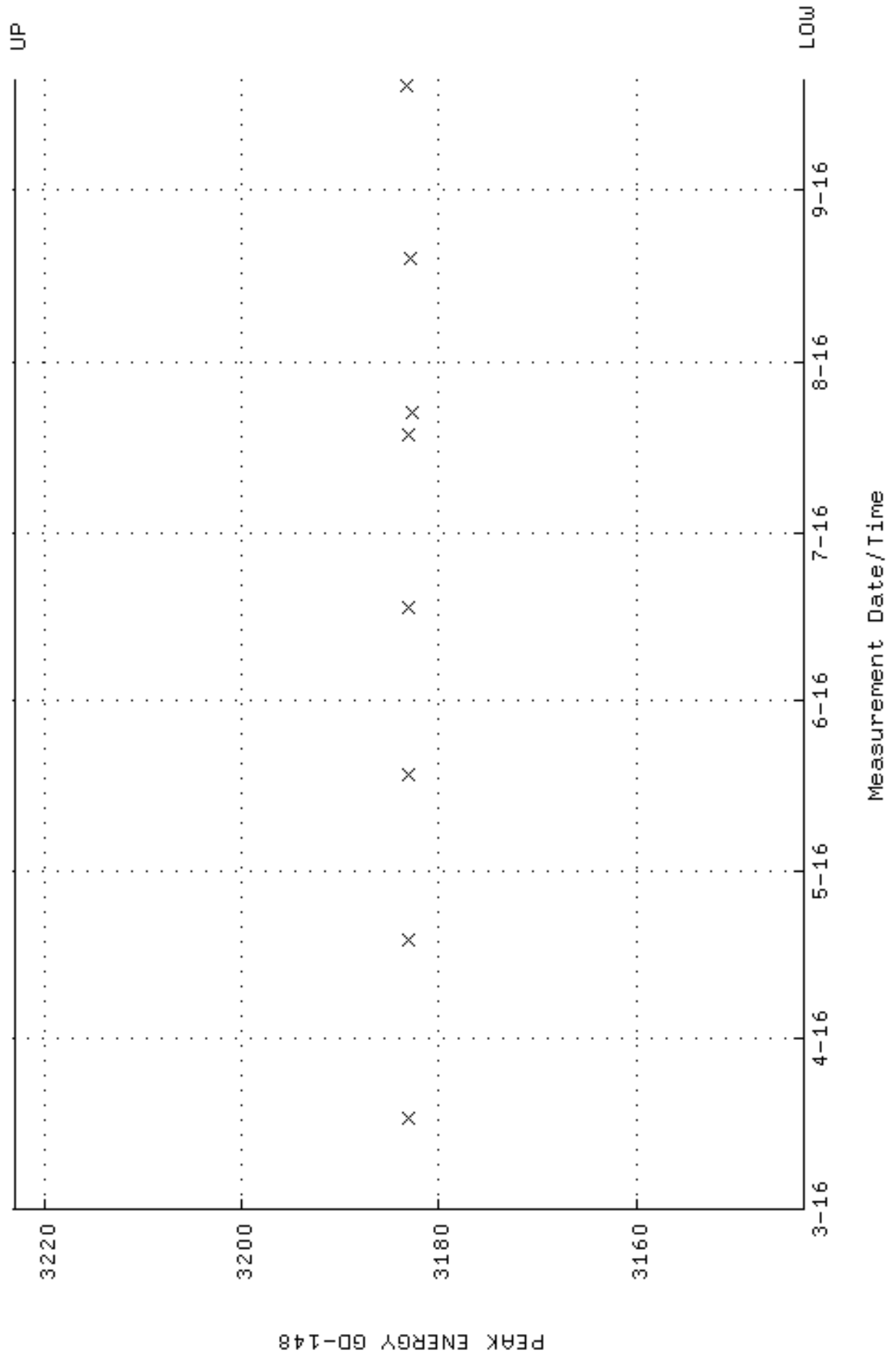
QA filename : DKA100:[ENV_ALPHA.QA.W]w242.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 17-MAR-2016 12:17:40 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



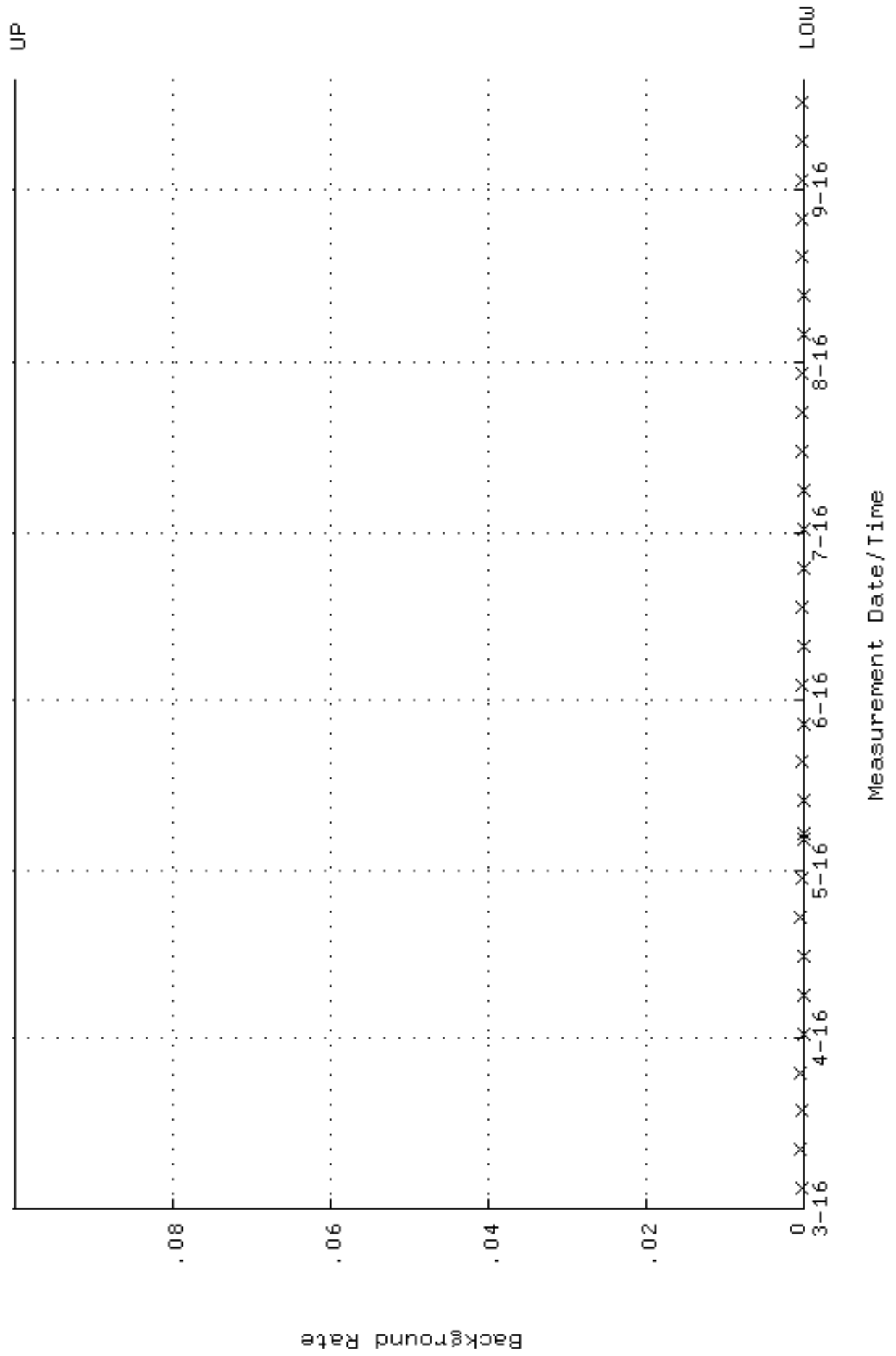
QA filename : DKA100:[ENV_ALPHA.QA.W]W242.QAF;3
 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 17-MAR-2016 12:17:40 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



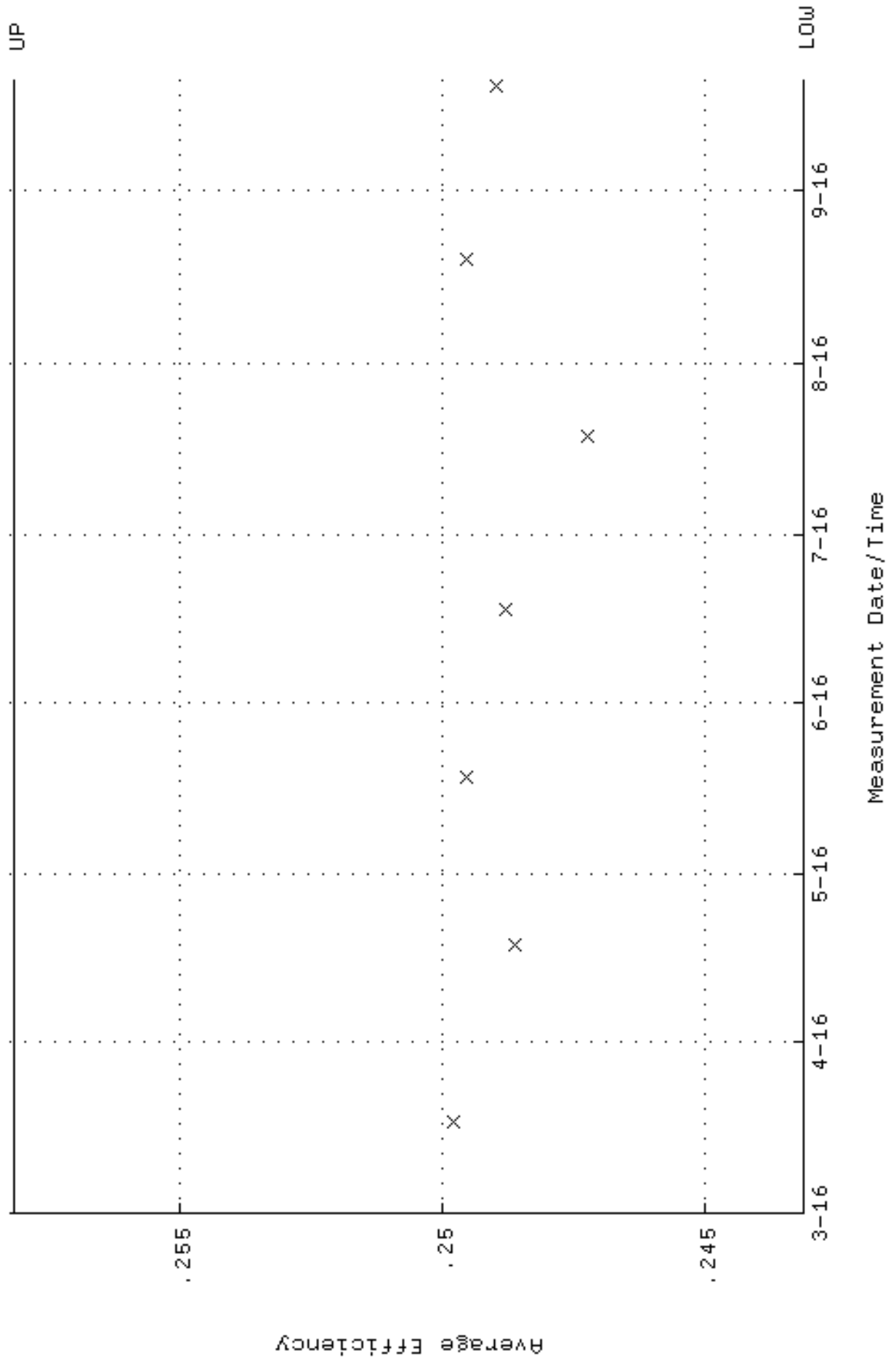
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 12:17:40 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



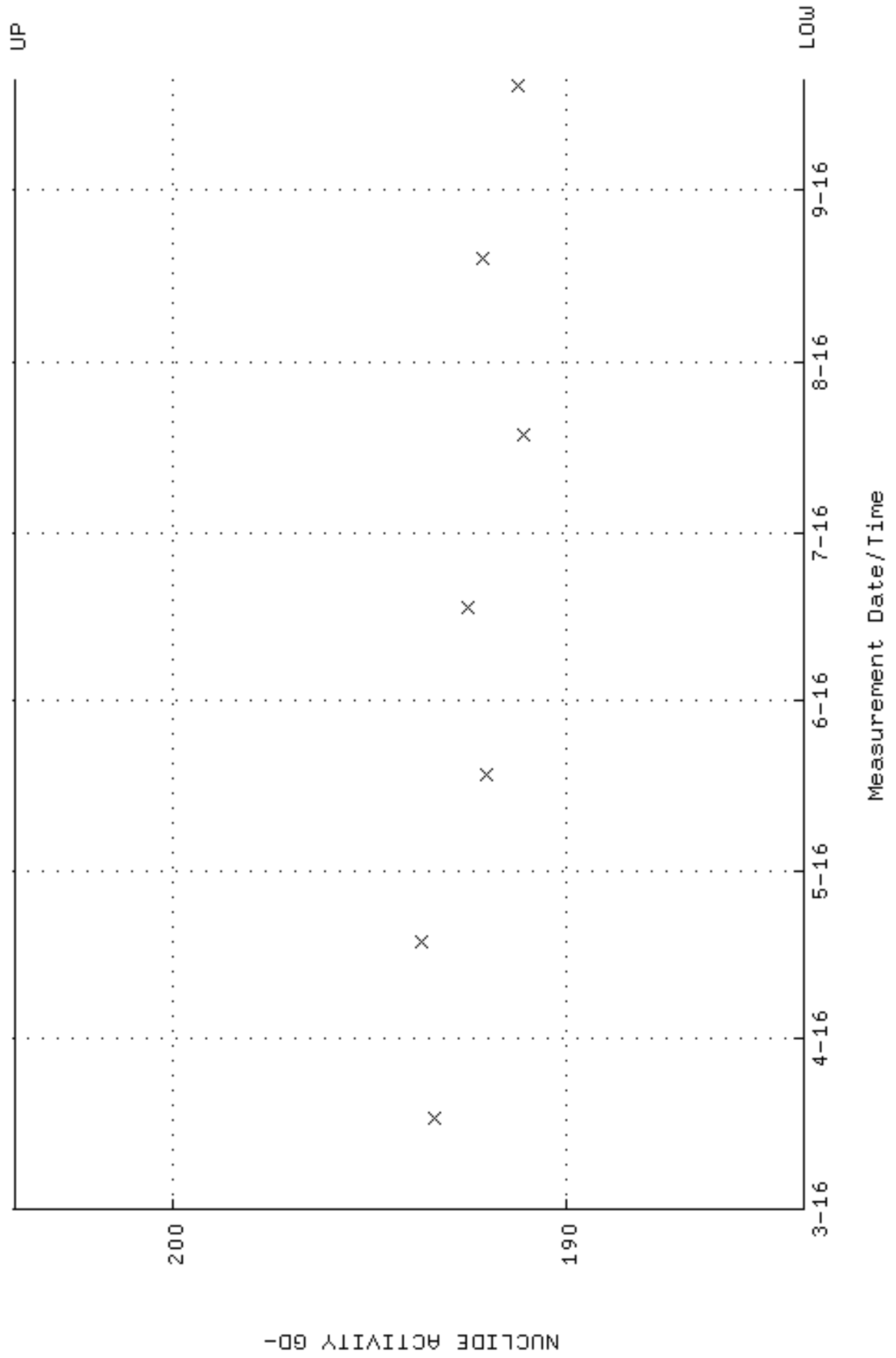
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 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:35:54 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



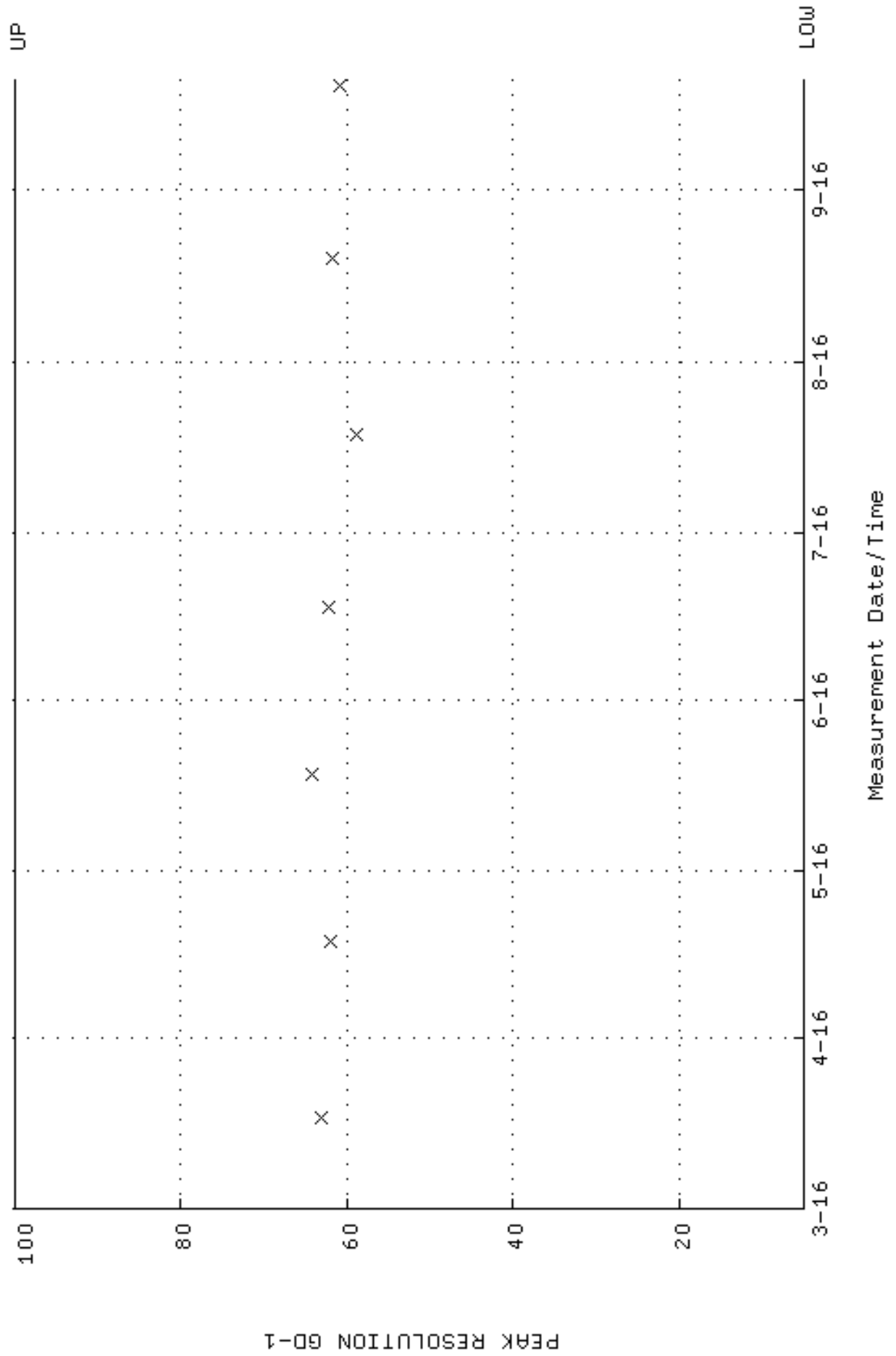
QA filename : DKA100:[ENV_ALPHA.QA.W]W243.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 09:06:51 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.243130 through 0.258200



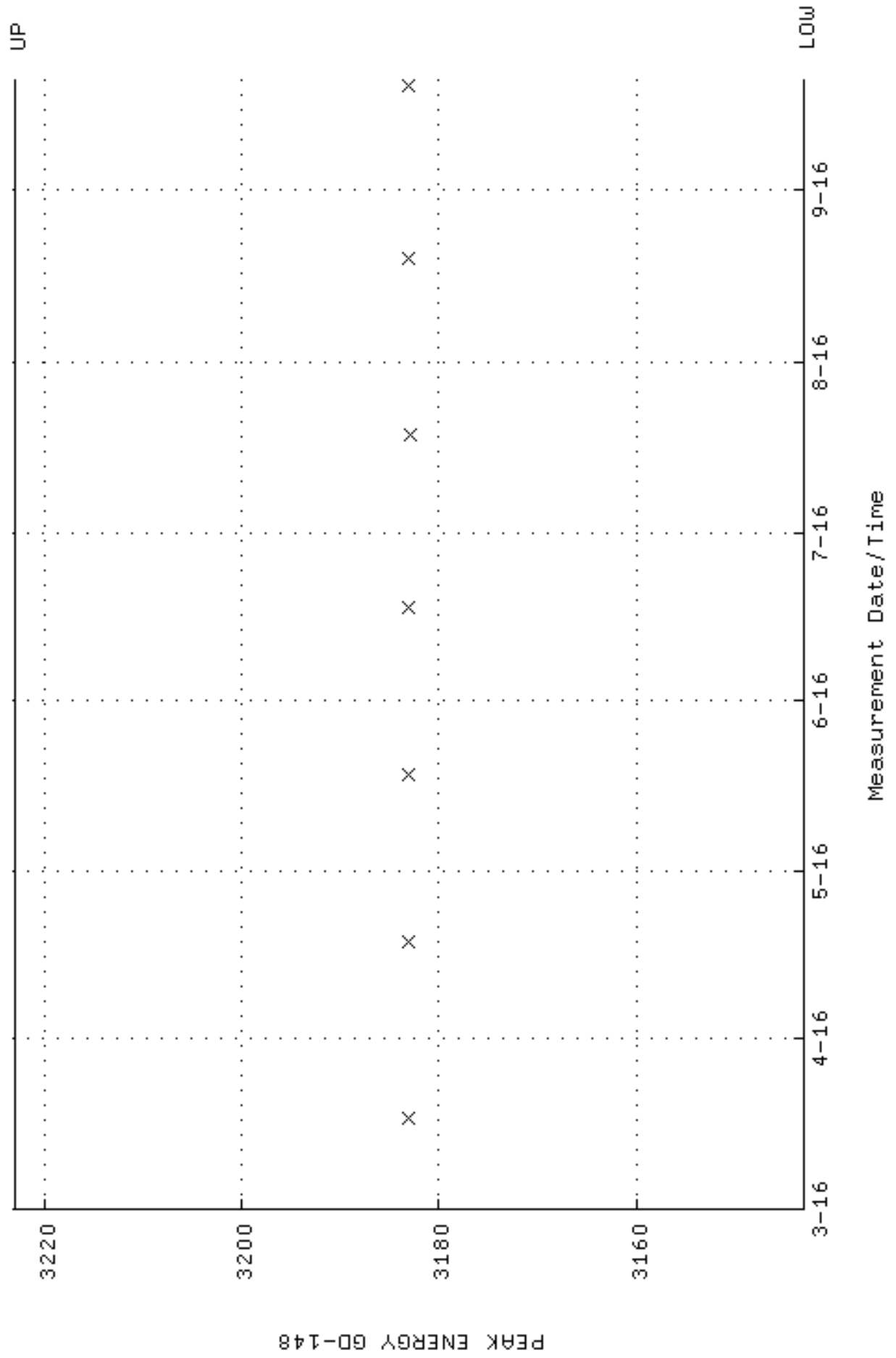
QA filename : DKA100:[ENV_ALPHA.QA.W]w243.QAF;3
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 17-MAR-2016 09:06:51 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



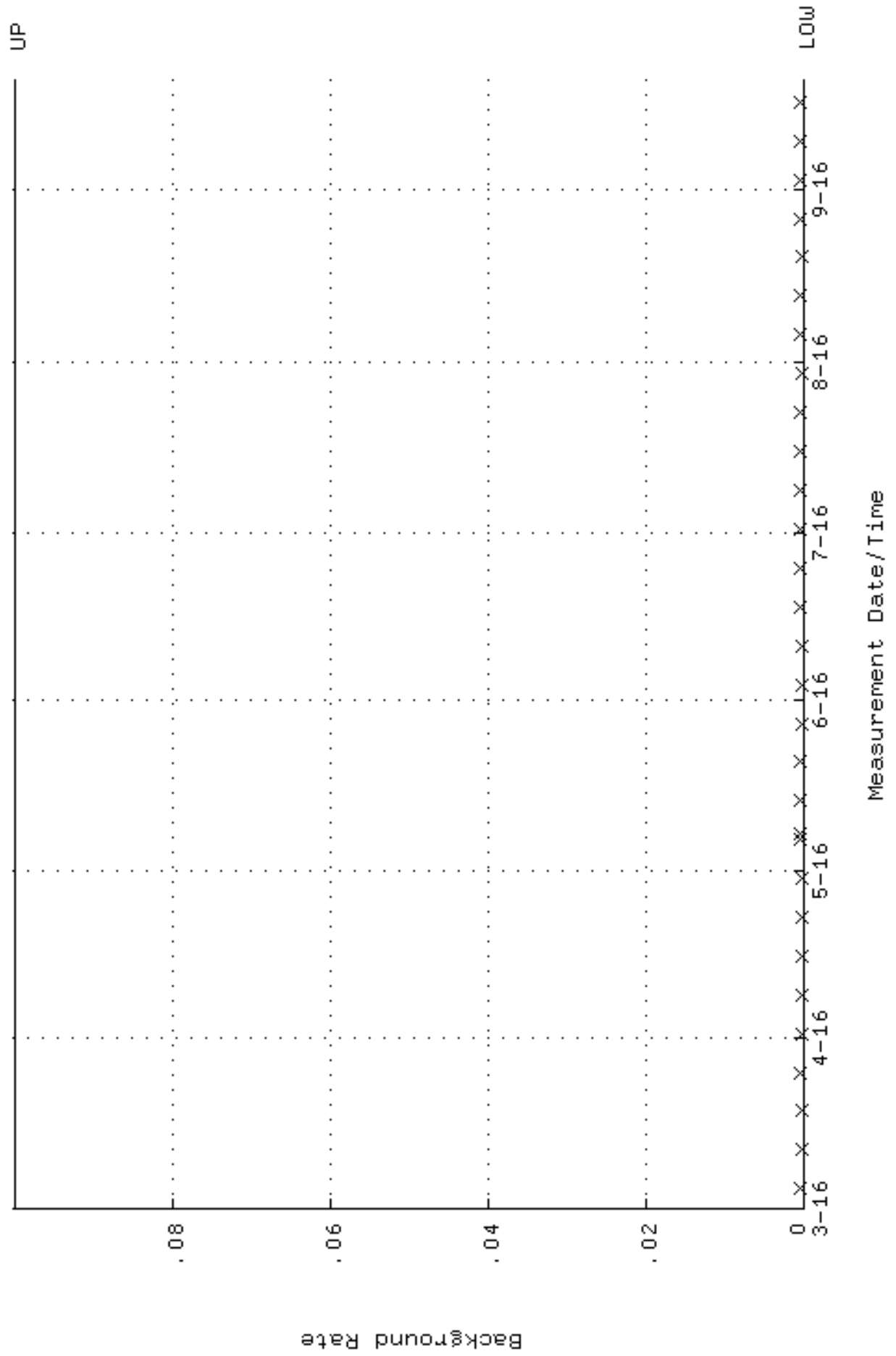
QA filename : DKA100:[ENV_ALPHA.QA.W]W243.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 17-MAR-2016 09:06:51 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



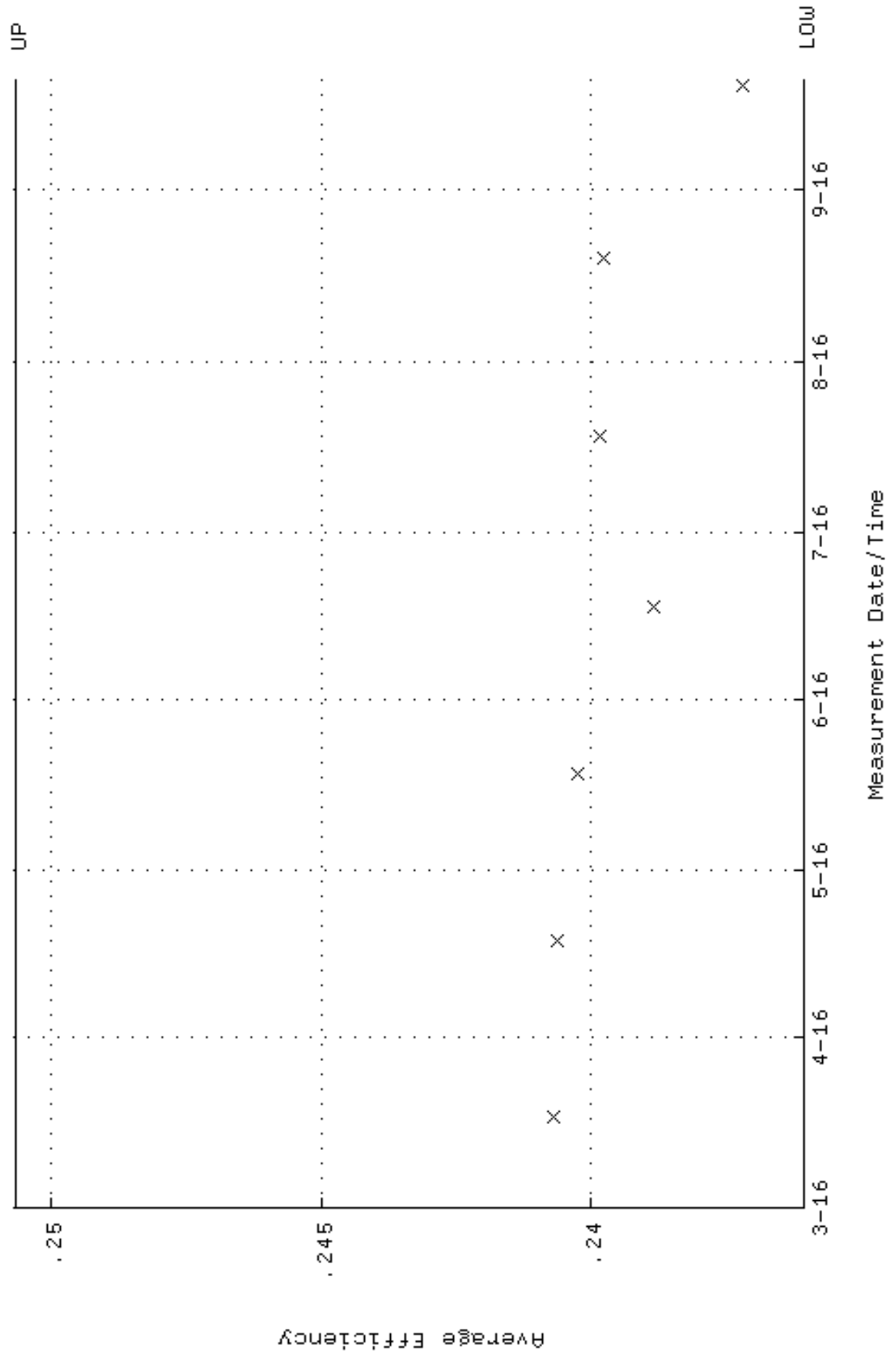
QA filename : DKA100:[ENV_ALPHA.QA.W]W243.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 09:06:51 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



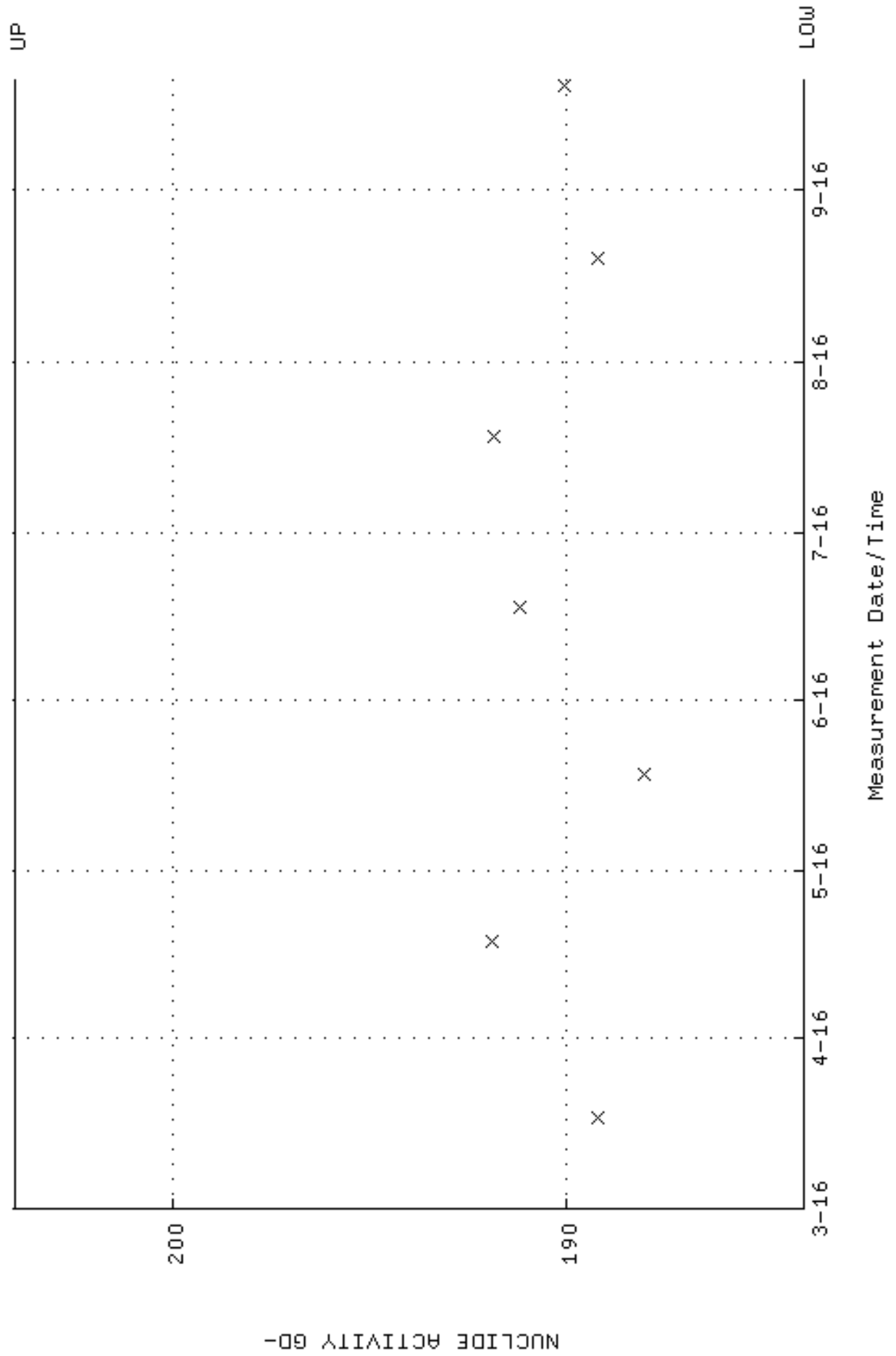
QA filename : DKA100:[ENV_ALPHA.QA.B]B243.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:35:59 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



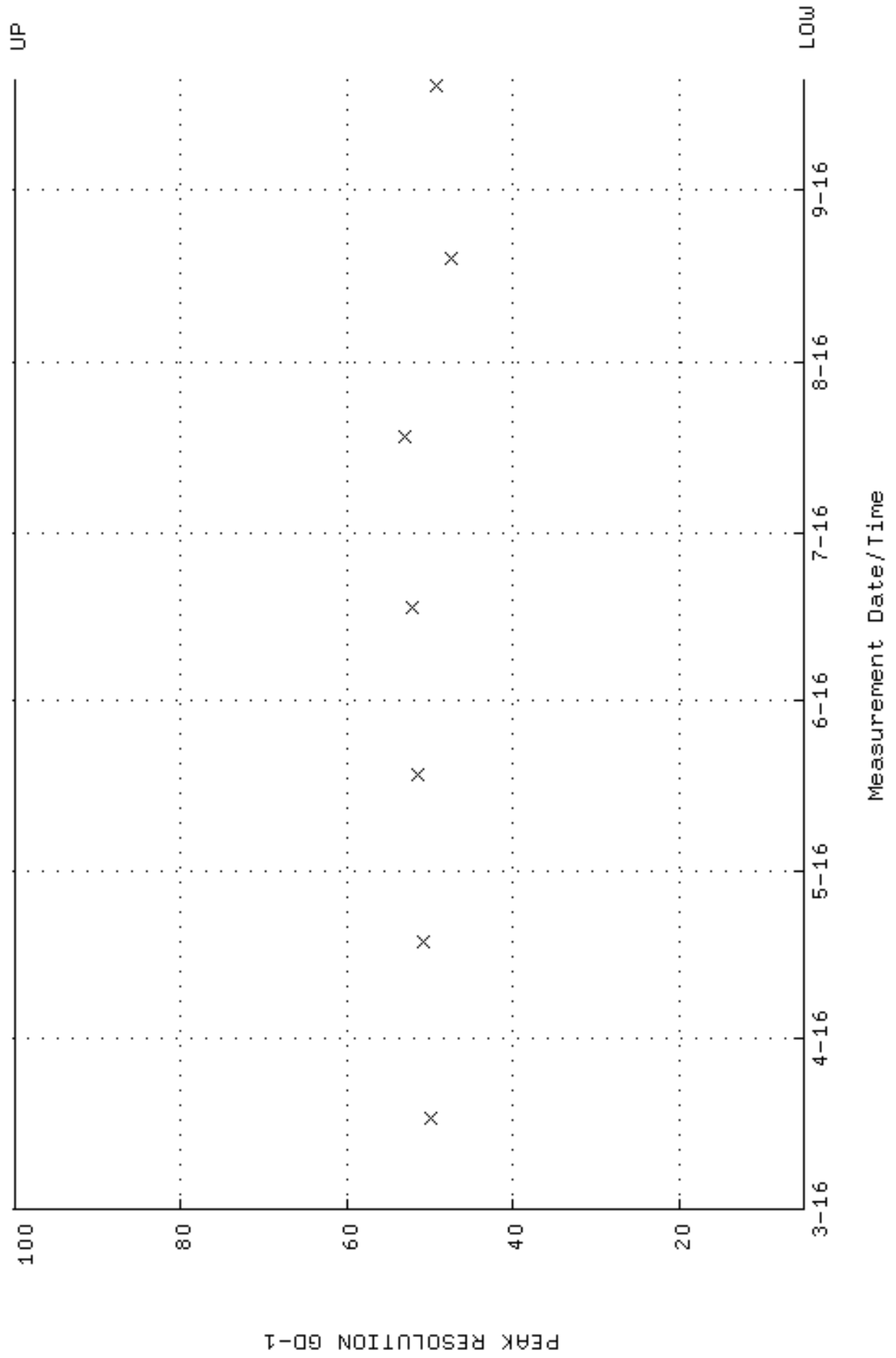
QA filename : DKA100:[ENV_ALPHA.QA.W]W244.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 09:06:55 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.236059 through 0.250661



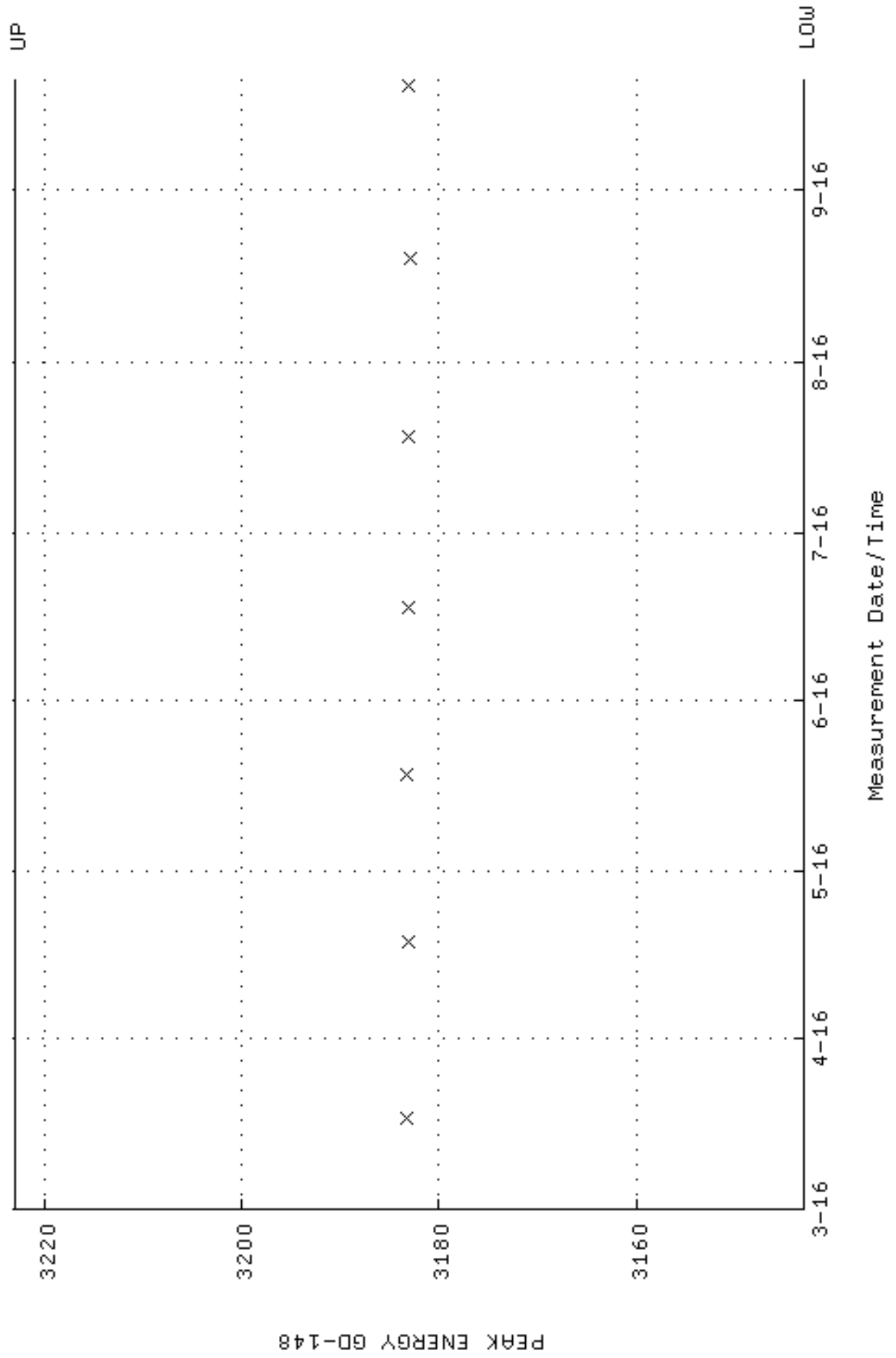
QA filename : DKA100:[ENV_ALPHA.QA.W]w244.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 17-MAR-2016 09:06:55 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



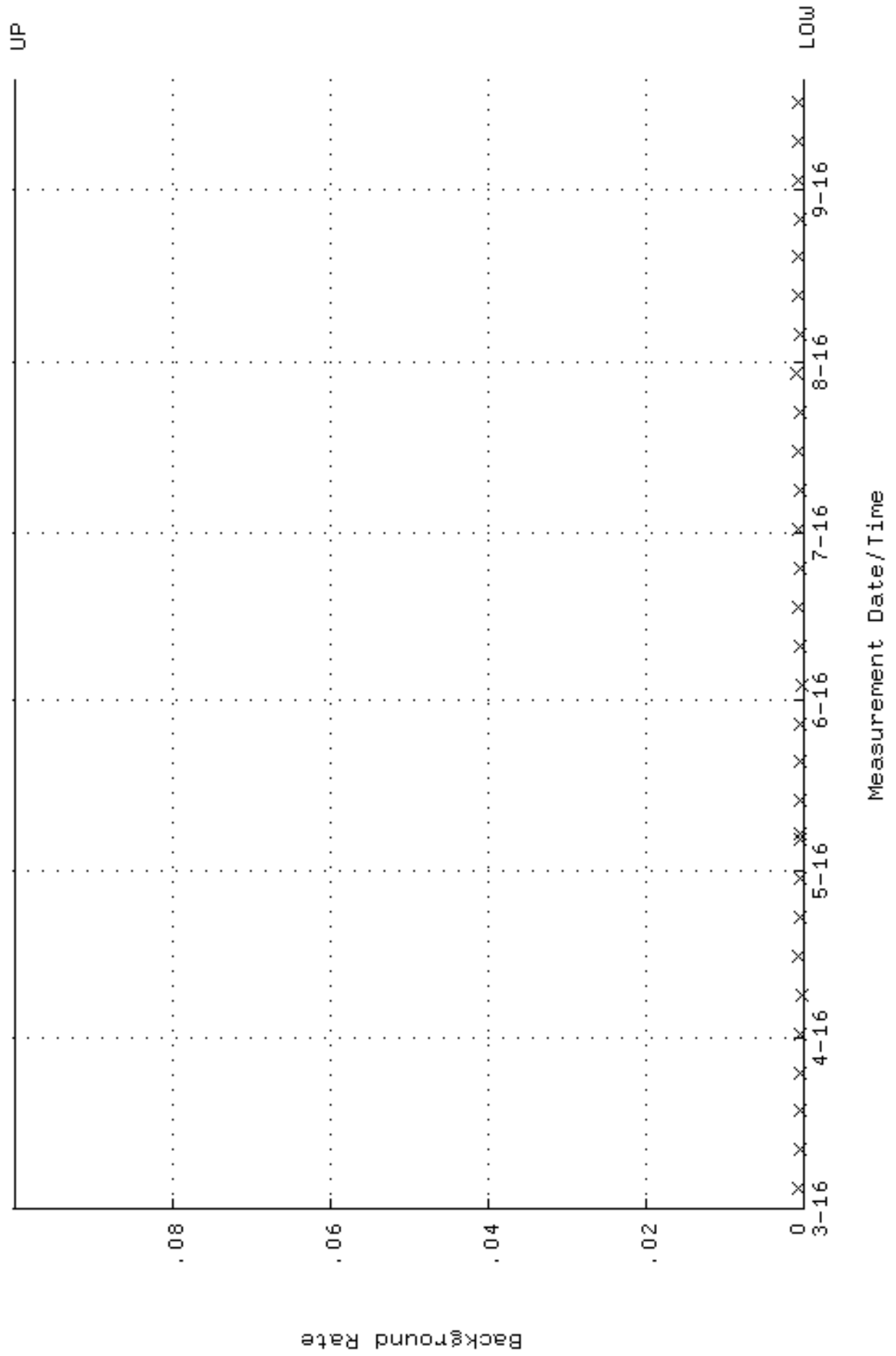
QA filename : DKA100:[ENV_ALPHA.QA.W]W244.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 17-MAR-2016 09:06:55 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



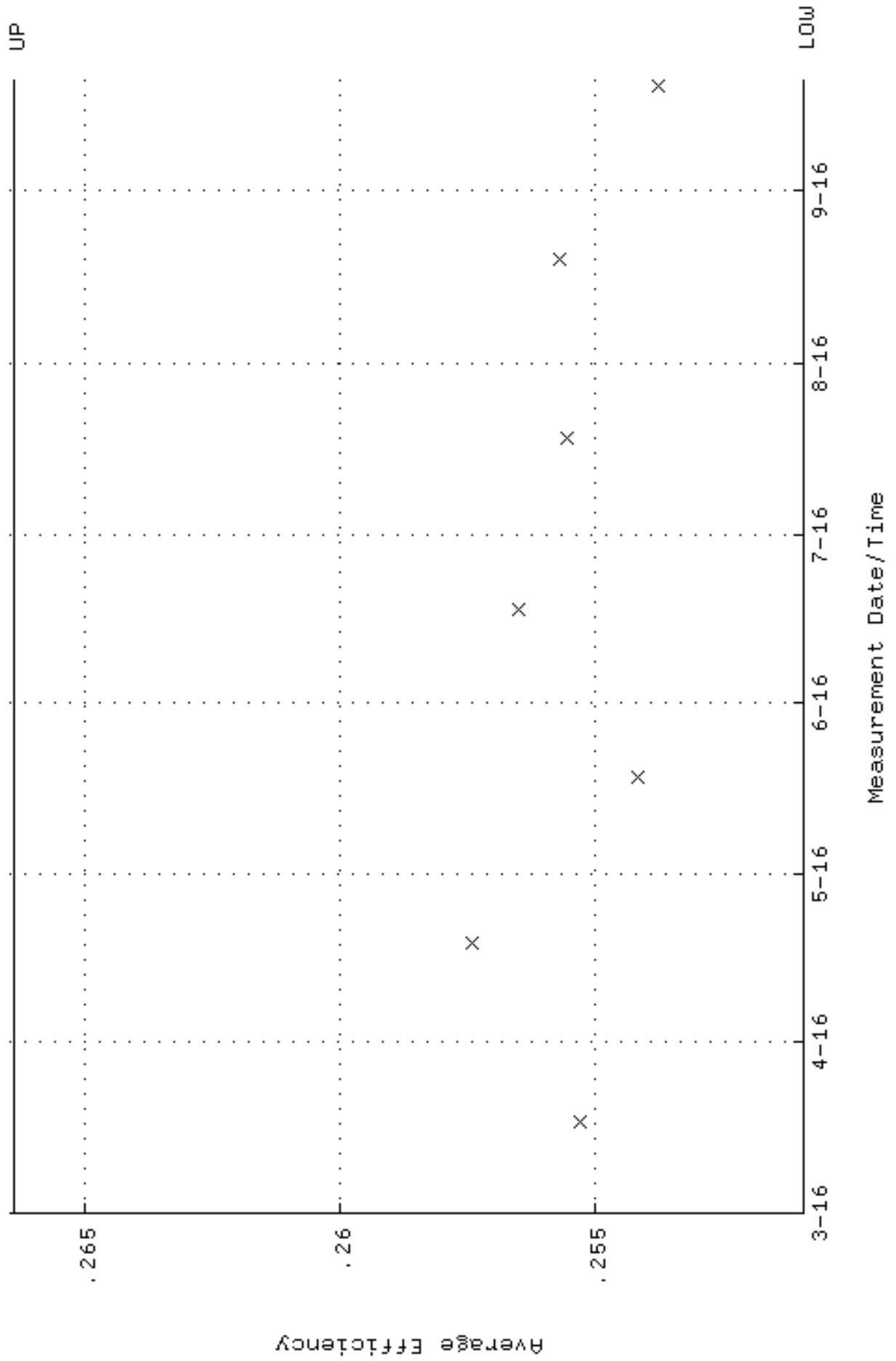
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 09:06:55 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



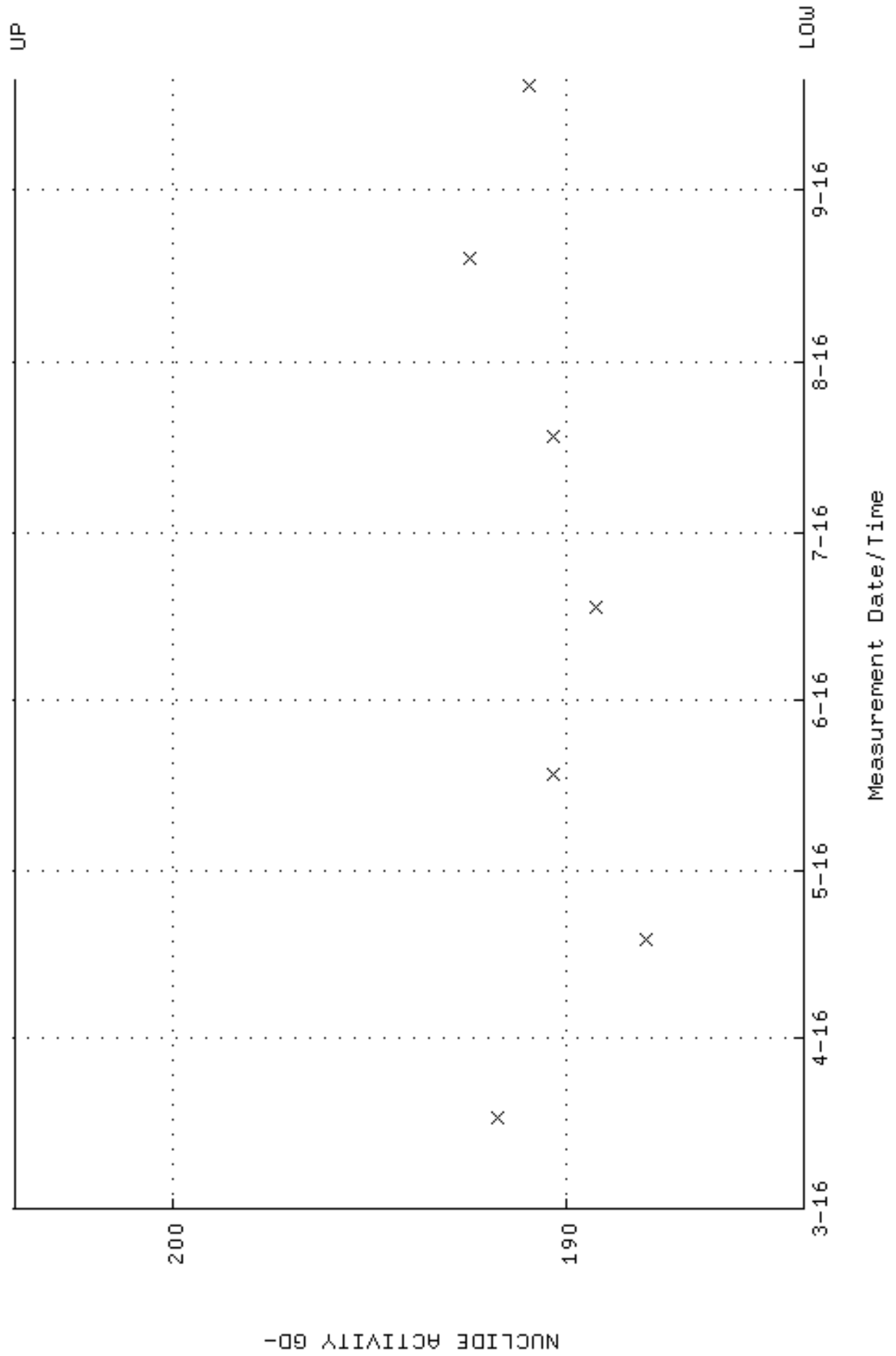
QA filename : DKA100:[ENV_ALPHA.QA.B]B244.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:36:03 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



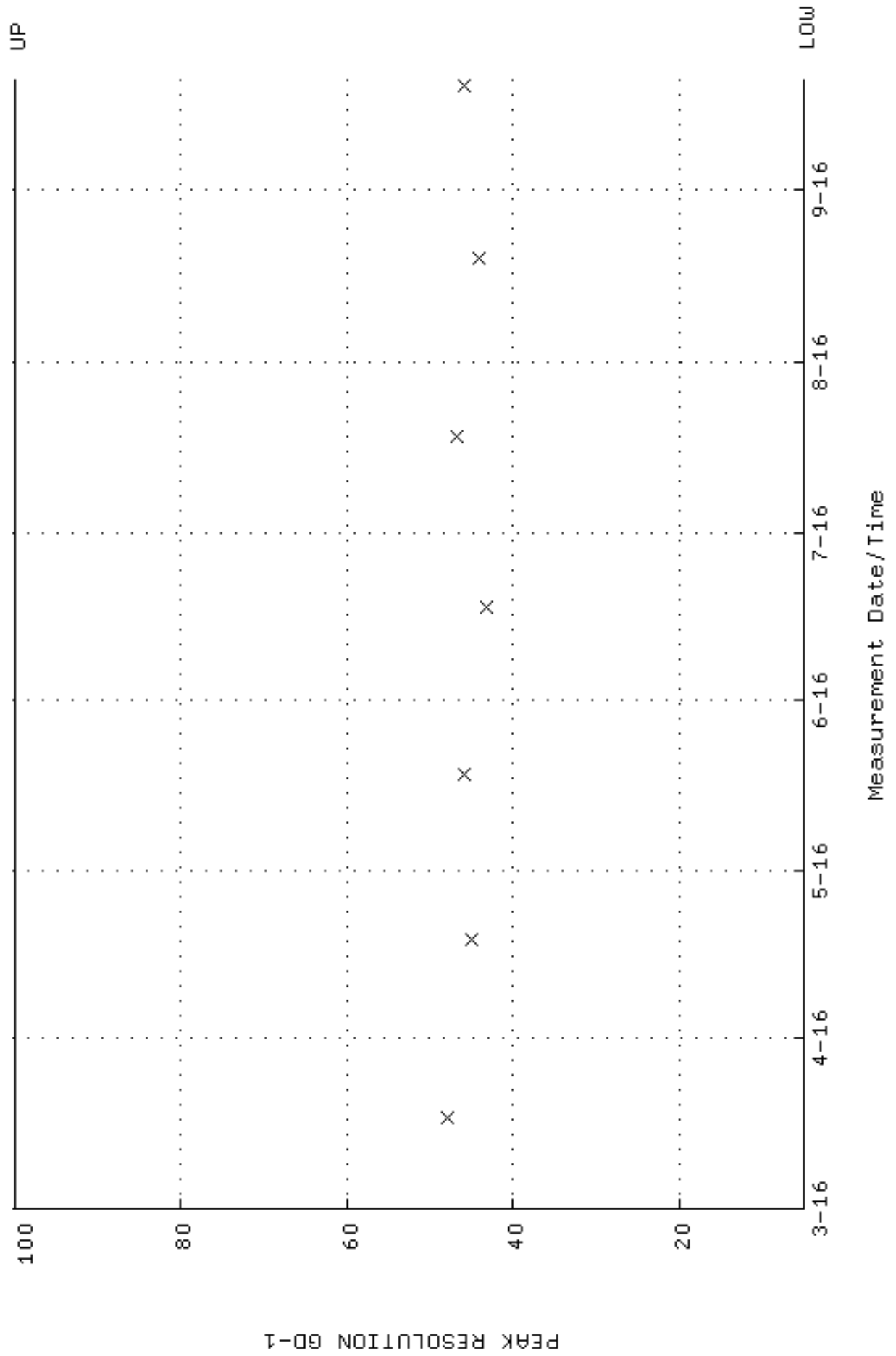
QA filename : DKA100:[ENV_ALPHA.QA.W]W245.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 09:06:59 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.250917 through 0.266437



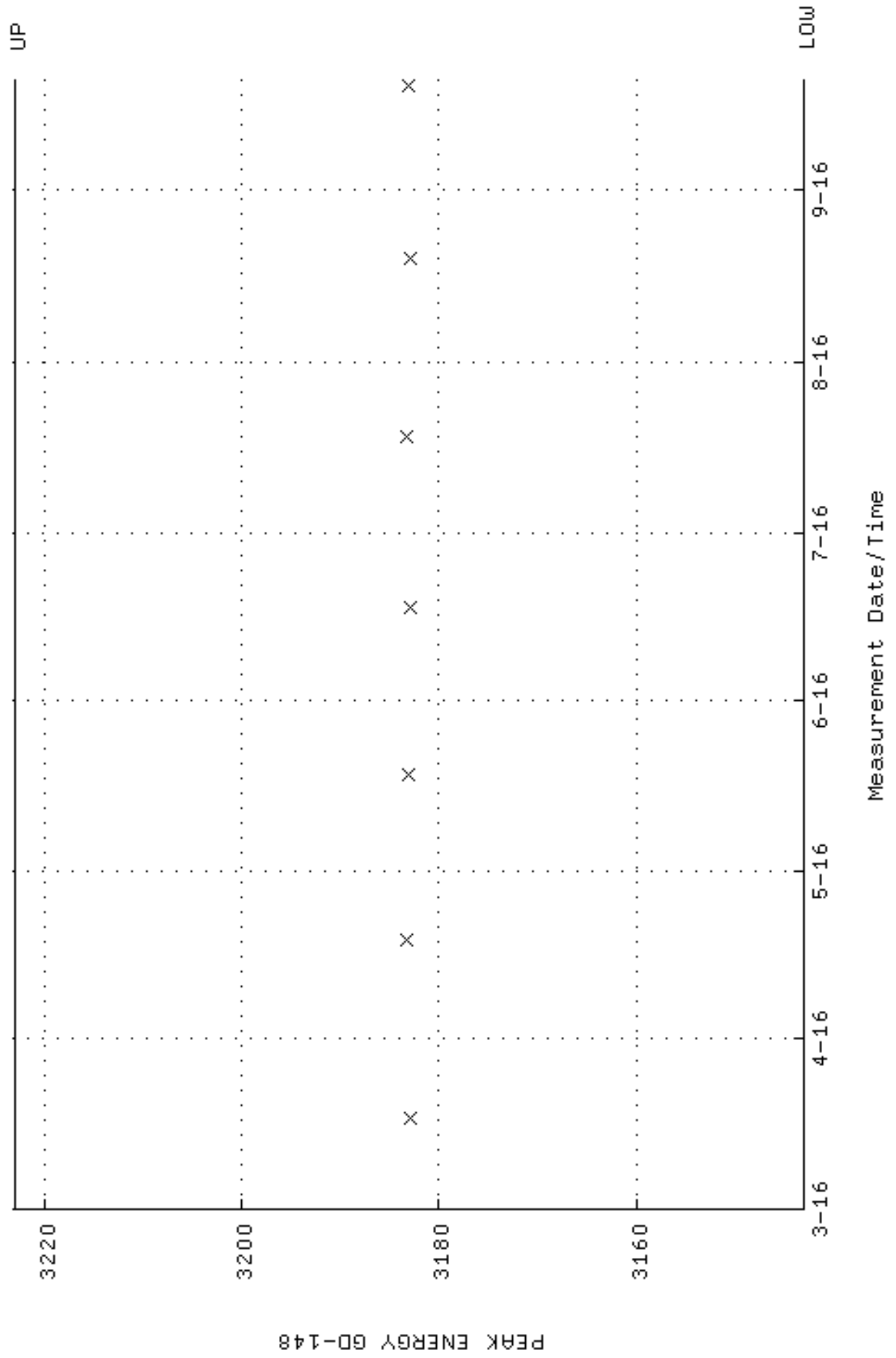
QA filename : DKA100:[ENV_ALPHA.QA.W]W245.QAF;3
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 17-MAR-2016 09:06:59 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



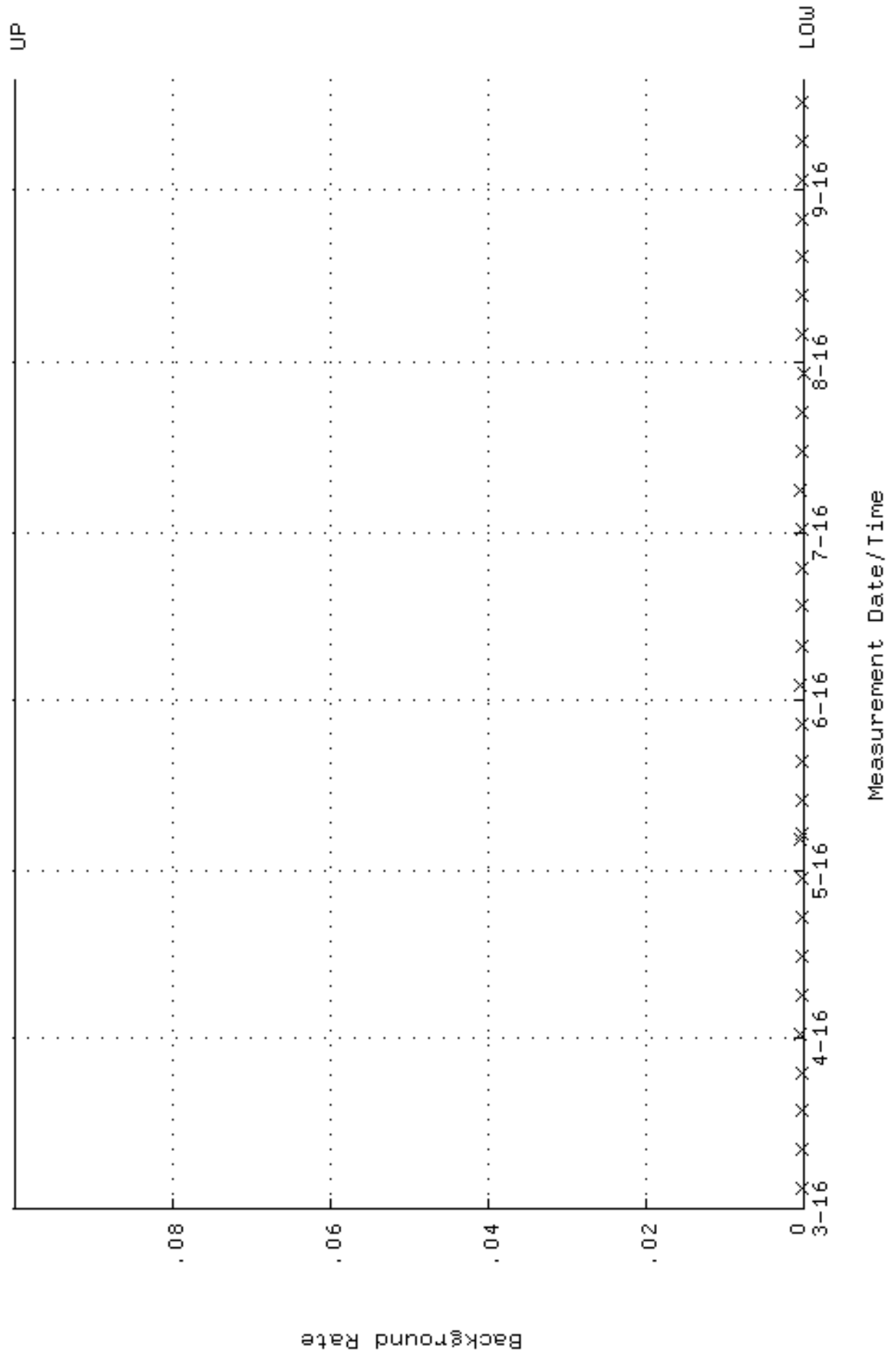
QA filename : DKA100:[ENV_ALPHA.QA.W]W245.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 17-MAR-2016 09:06:59 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



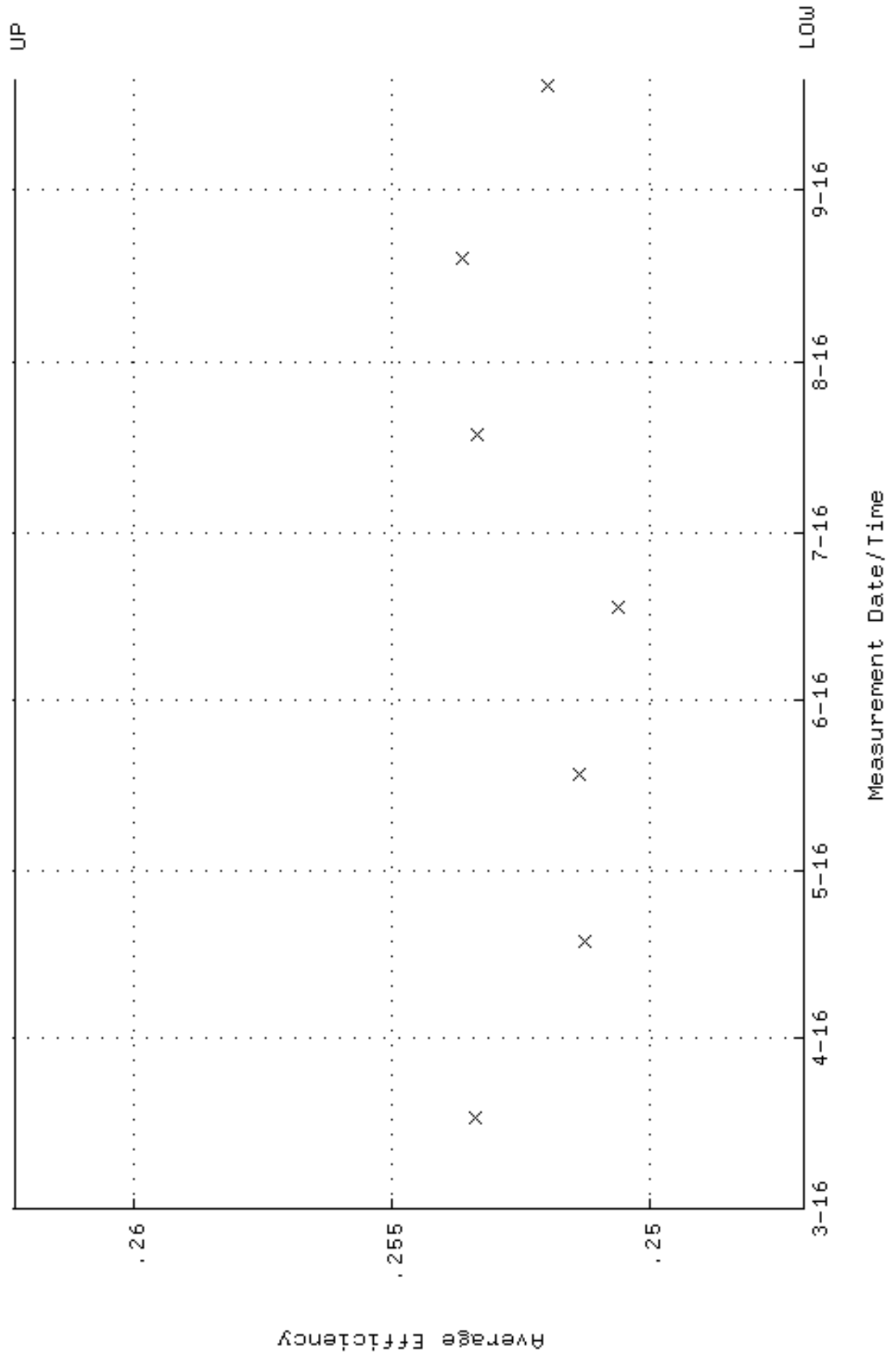
QA filename : DKA100:[ENV_ALPHA.QA.W]W245.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 09:06:59 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



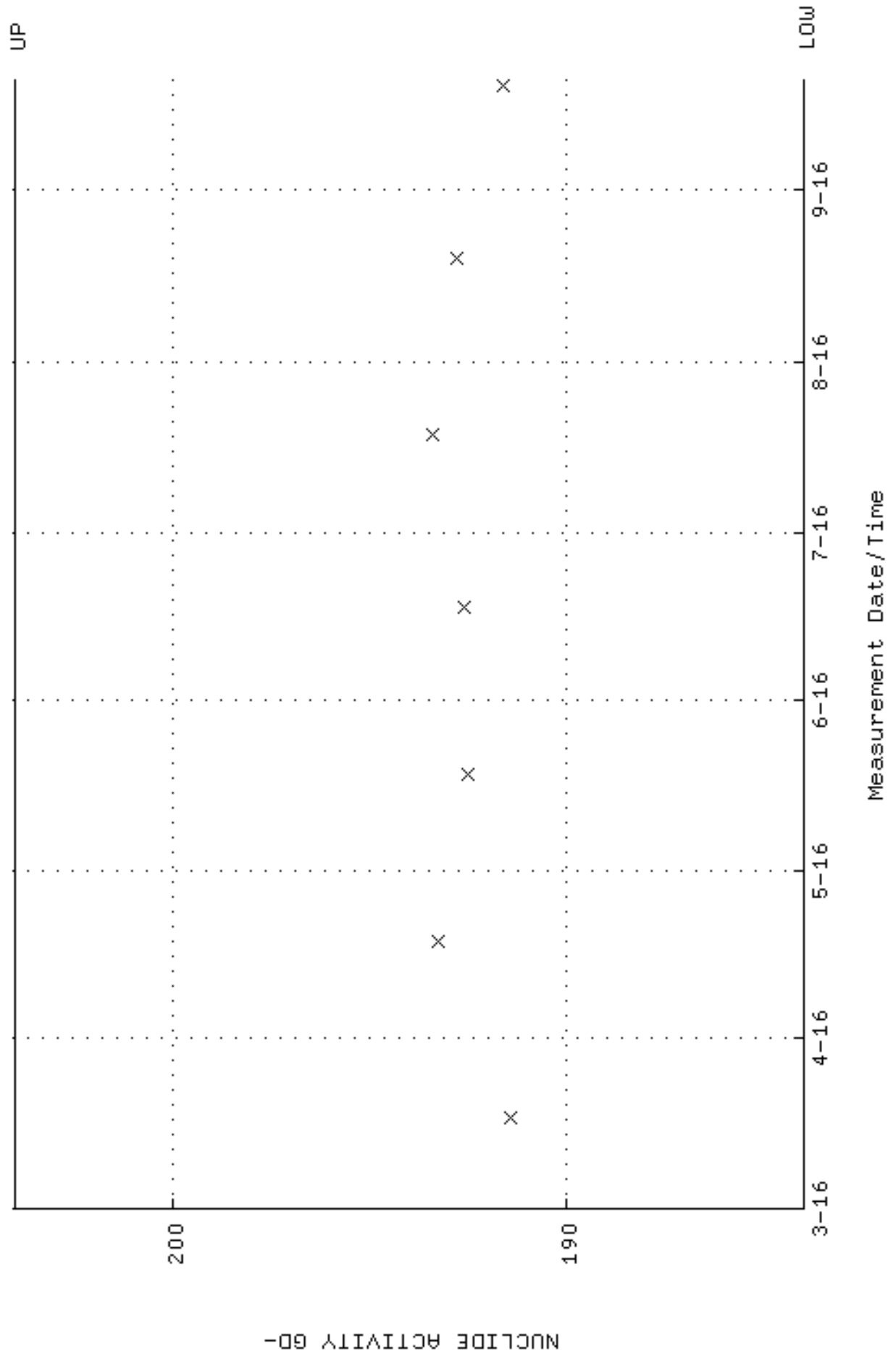
QA filename : DKA100:[ENV_ALPHA.QA.B]B245.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:36:07 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



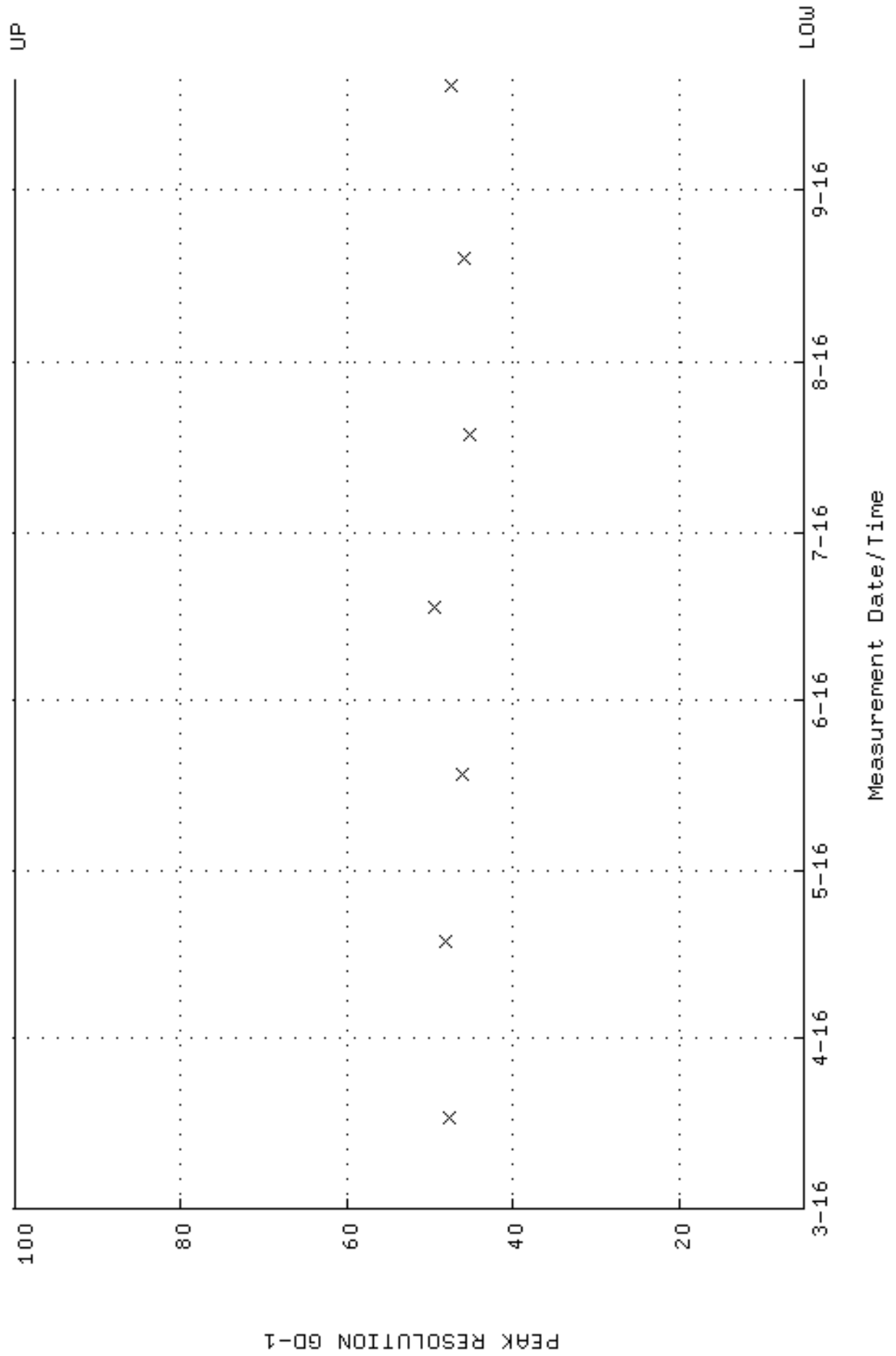
QA filename : DKA100:[ENV_ALPHA.QA.W]W246.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 09:07:03 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.247020 through 0.262301



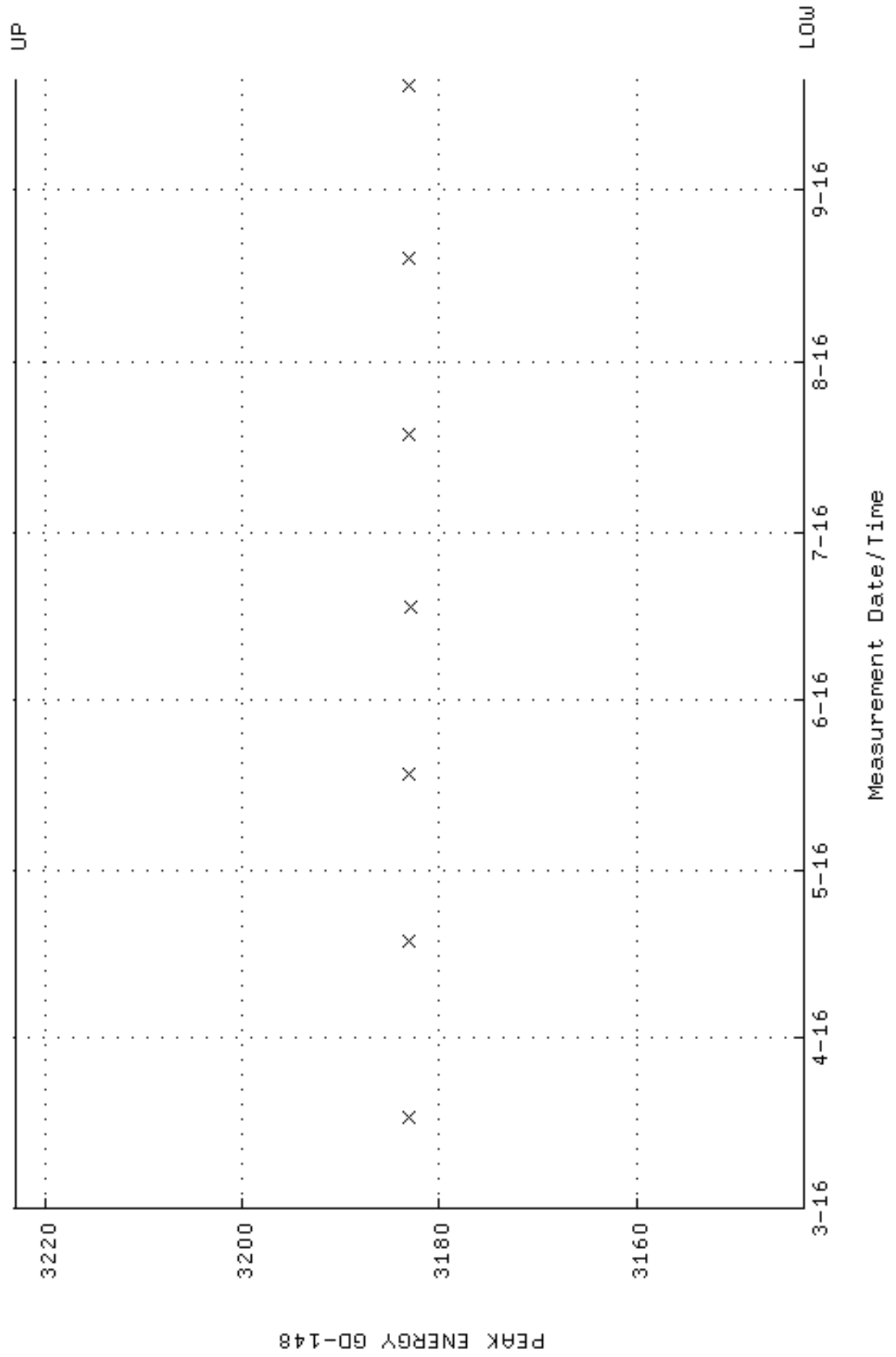
QA filename : DKA100:[ENV_ALPHA.QA.W]w246.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 17-MAR-2016 09:07:03 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



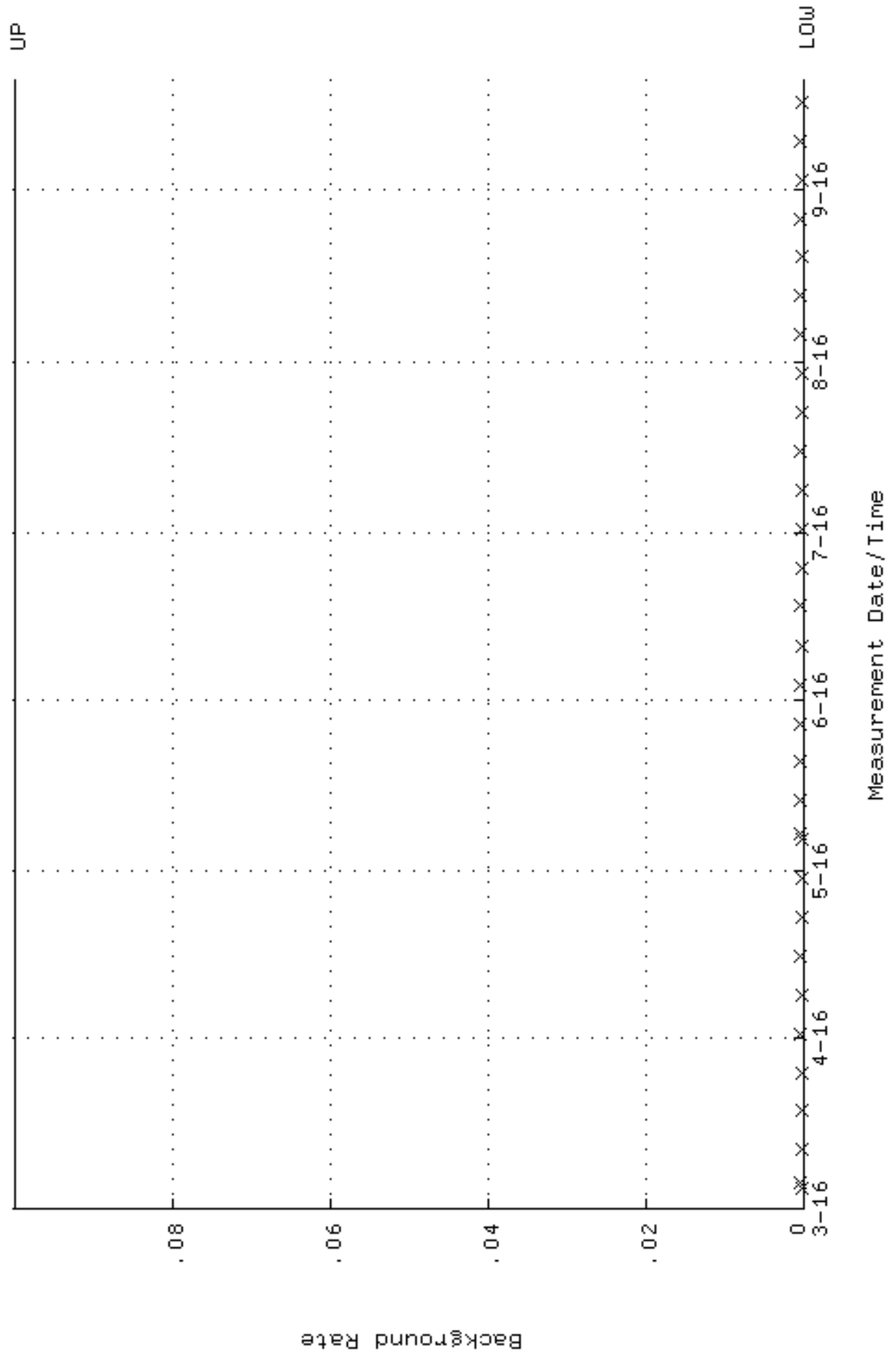
QA filename : DKA100:[ENV_ALPHA.QA.W]W246.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 17-MAR-2016 09:07:03 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



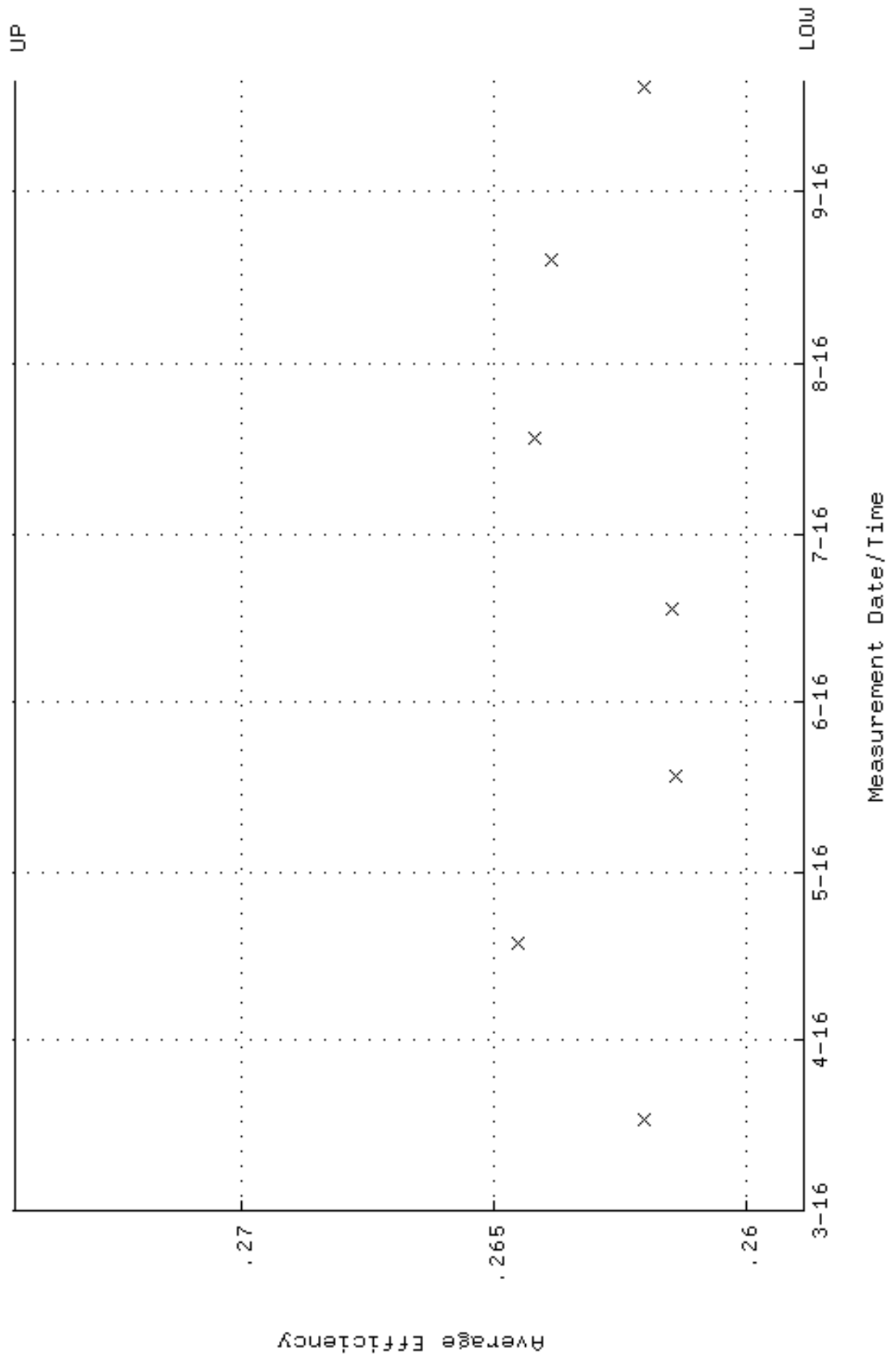
QA filename : DKA100:[ENV_ALPHA.QA.W]W246.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 09:07:03 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



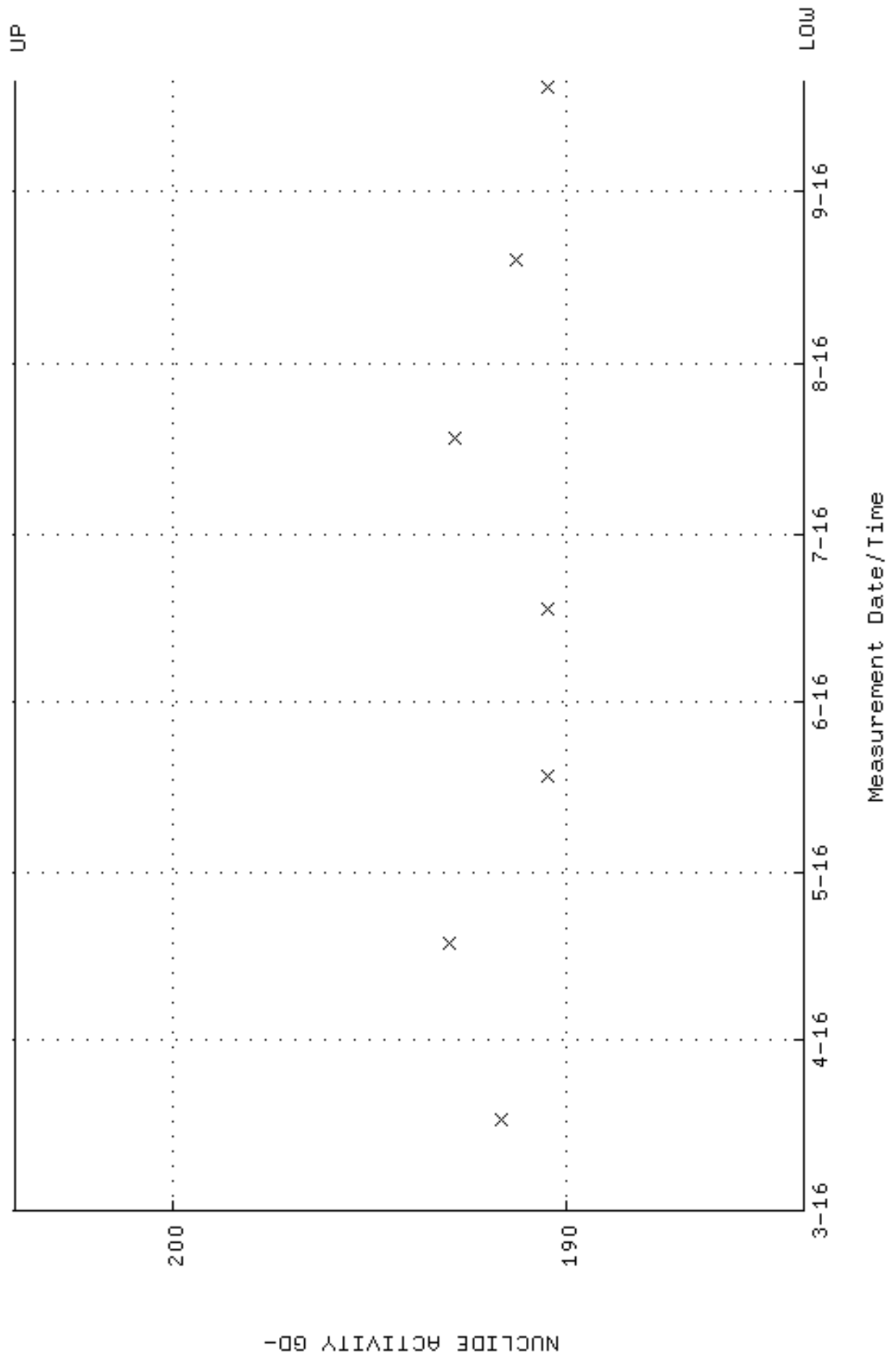
QA filename : DKA100:[ENV_ALPHA.QA.B]B246.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:36:11 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



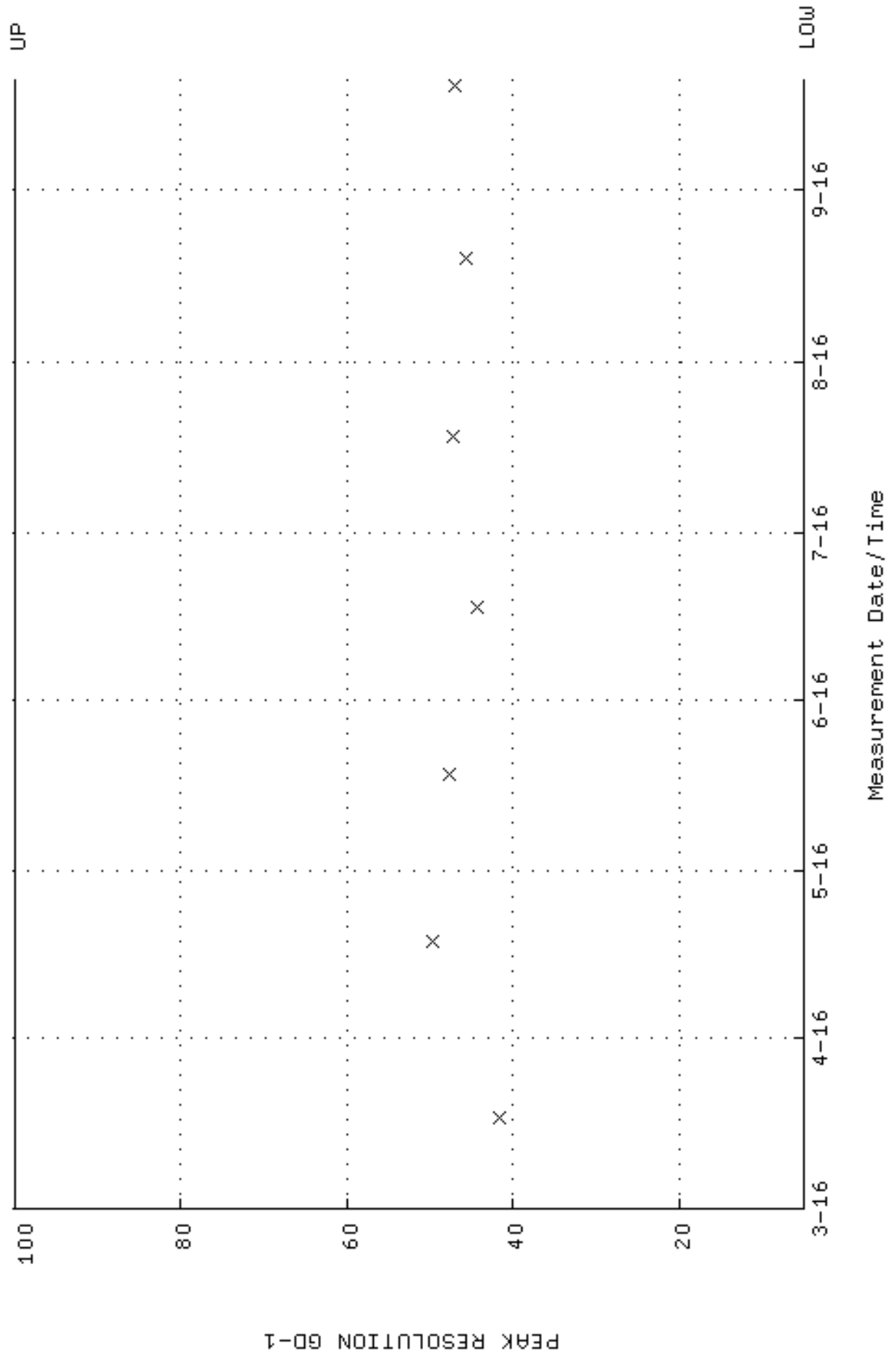
QA filename : DKA100:[ENV_ALPHA.QA.W]W247.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 09:07:07 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.258845 through 0.274486



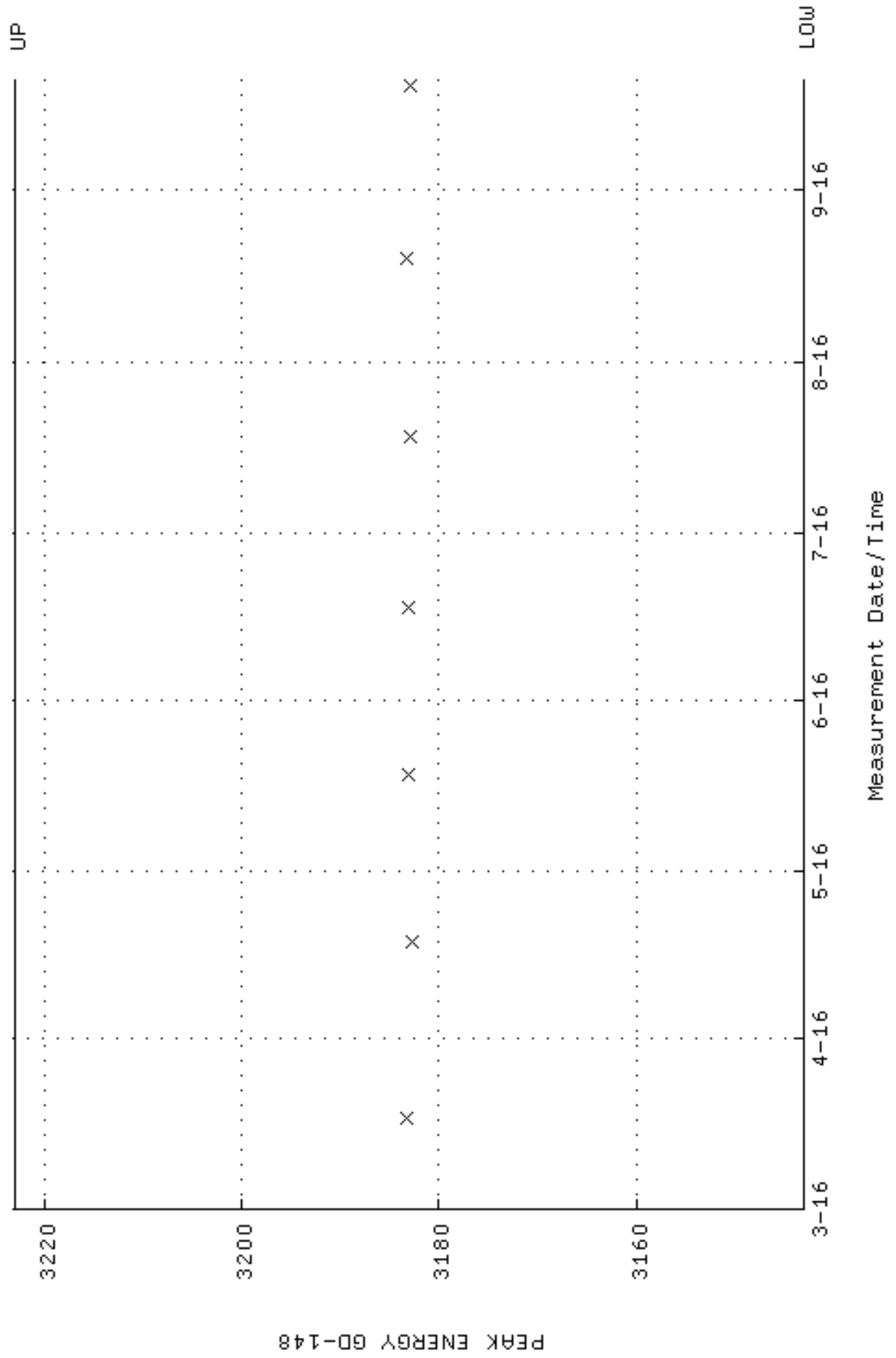
QA filename : DKA100:[ENV_ALPHA.QA.W]w247.QAF;3
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 17-MAR-2016 09:07:07 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



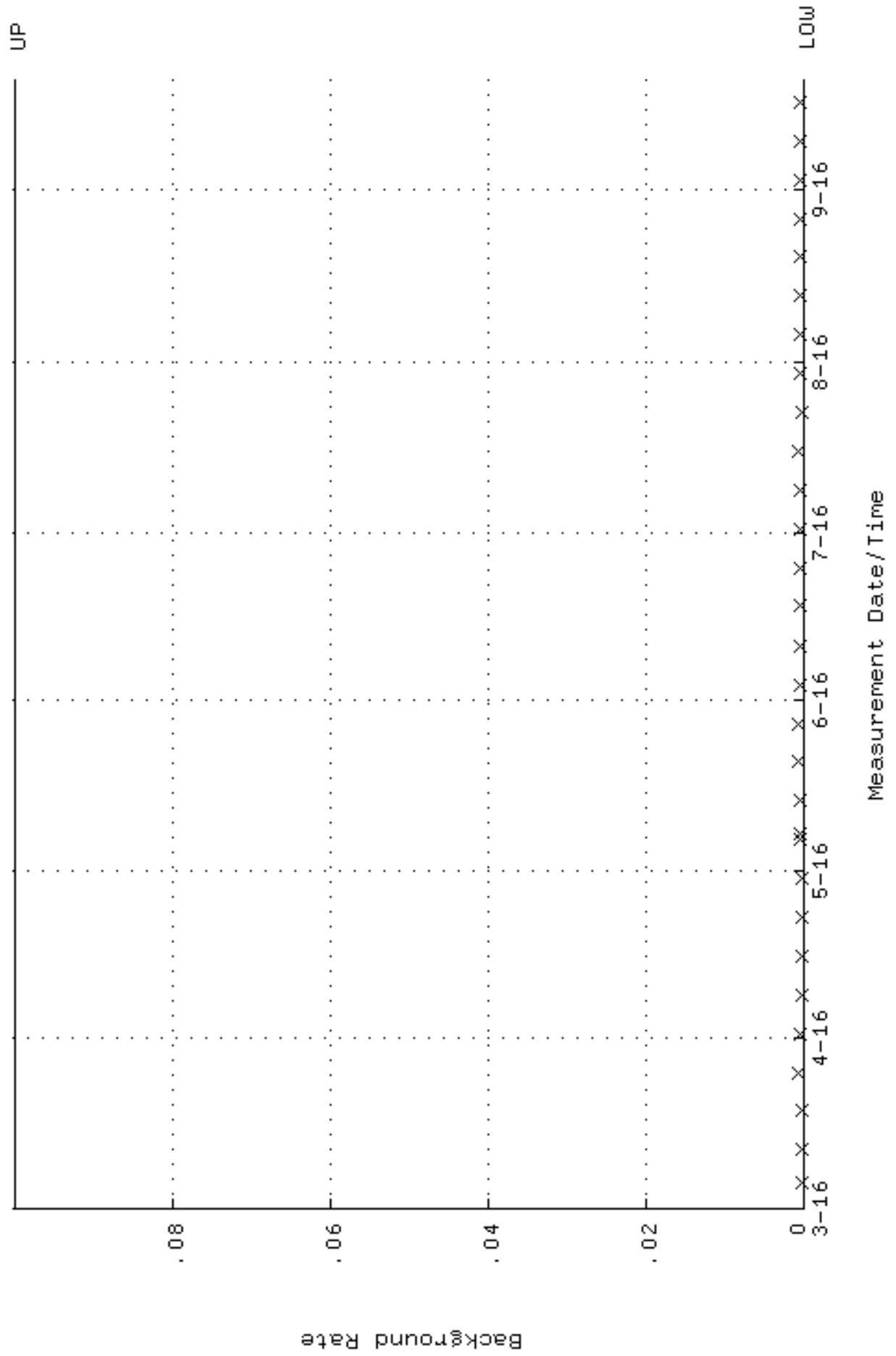
QA filename : DKA100:[ENV_ALPHA.QA.W]W247.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 17-MAR-2016 09:07:07 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



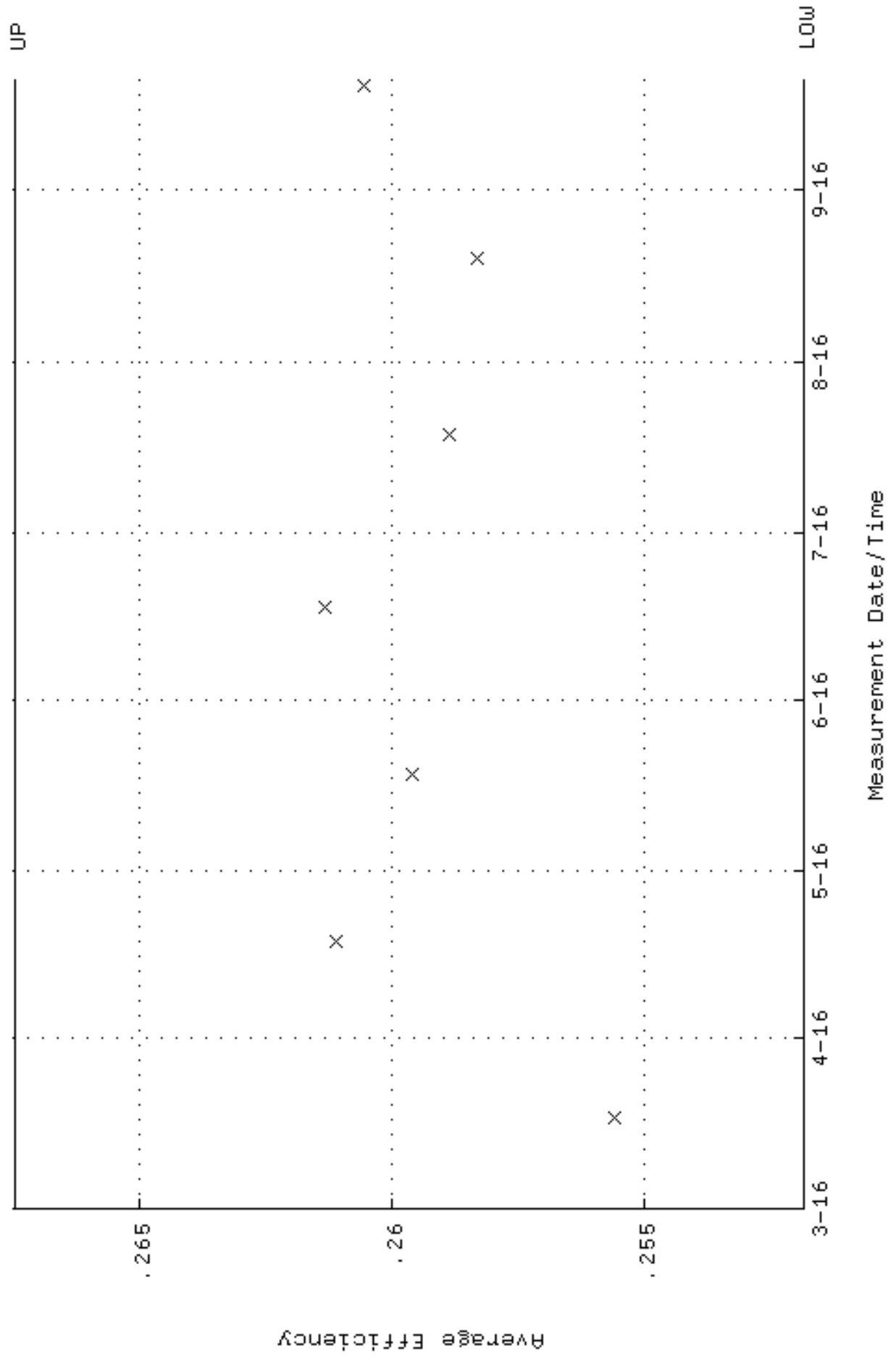
QA filename : DKA100:[ENV_ALPHA.QA.W]W247.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 09:07:07 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



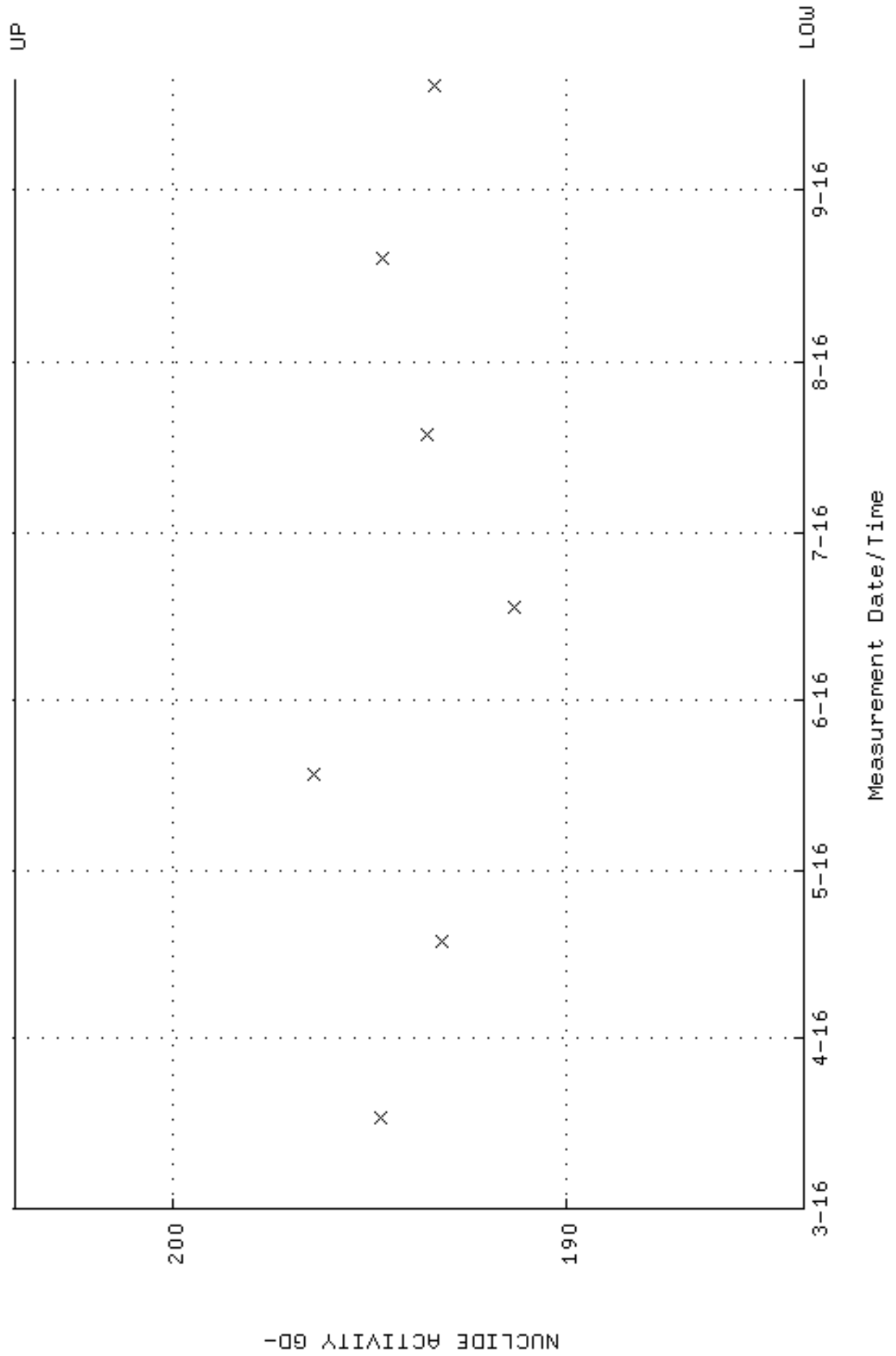
QA filename : DKA100:[ENV_ALPHA.QA.B]B247.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 5-MAR-2016 18:03:24 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



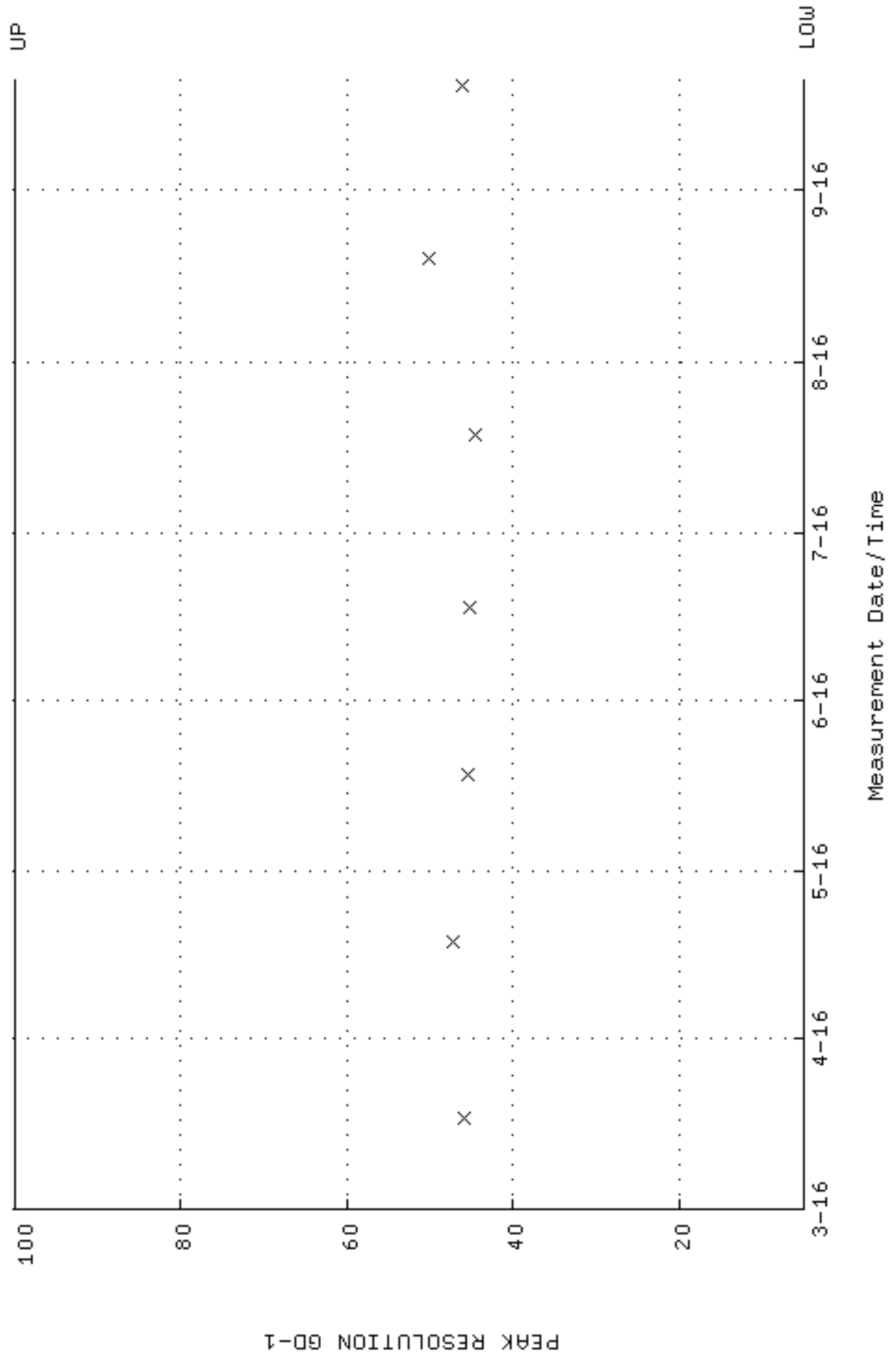
QA filename : DKA100:[ENV_ALPHA.QA.W]W248.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 09:07:11 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.251863 through 0.267443



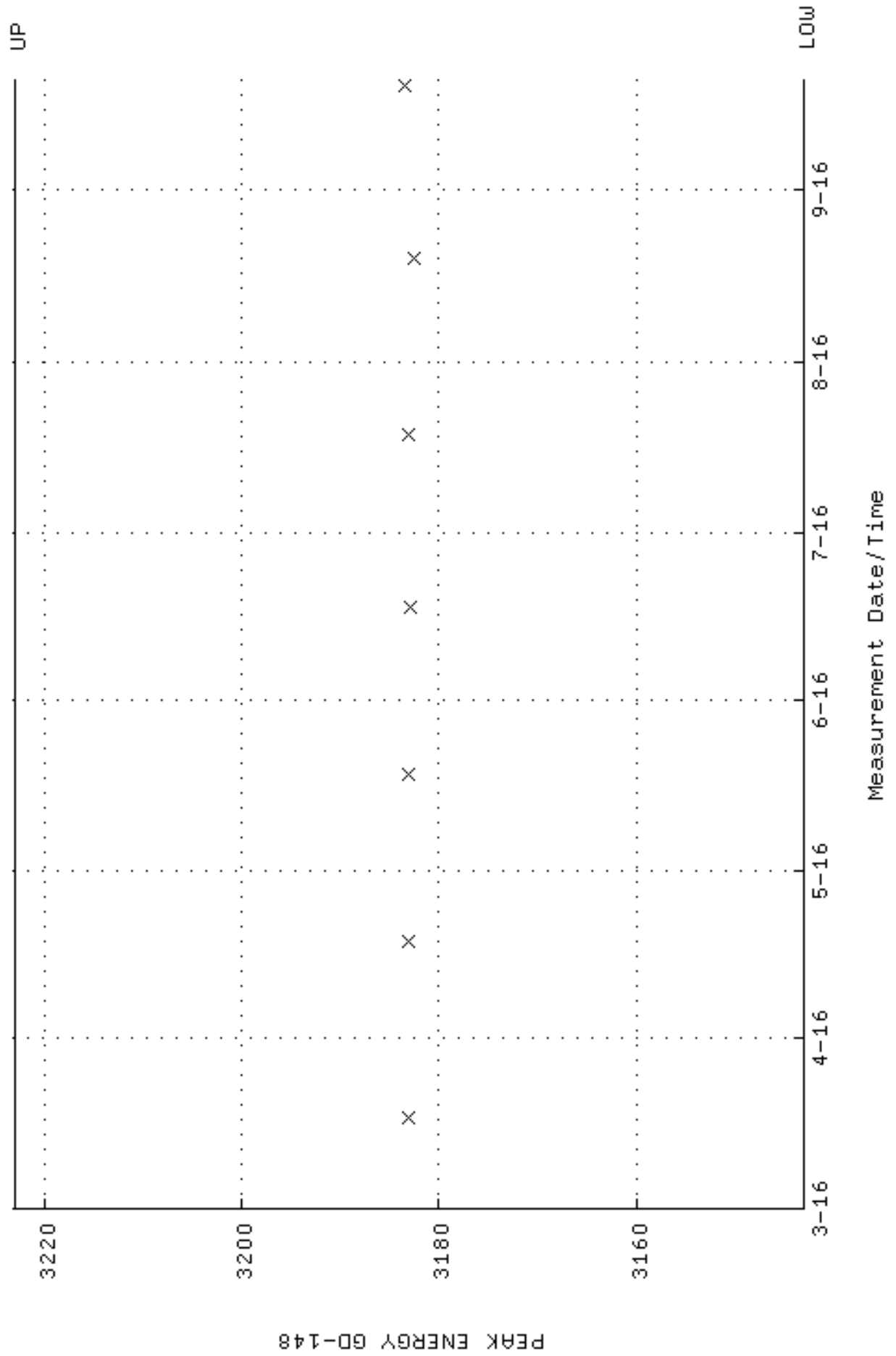
QA filename : DKA100:[ENV_ALPHA.QA.W]w248.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 17-MAR-2016 09:07:11 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



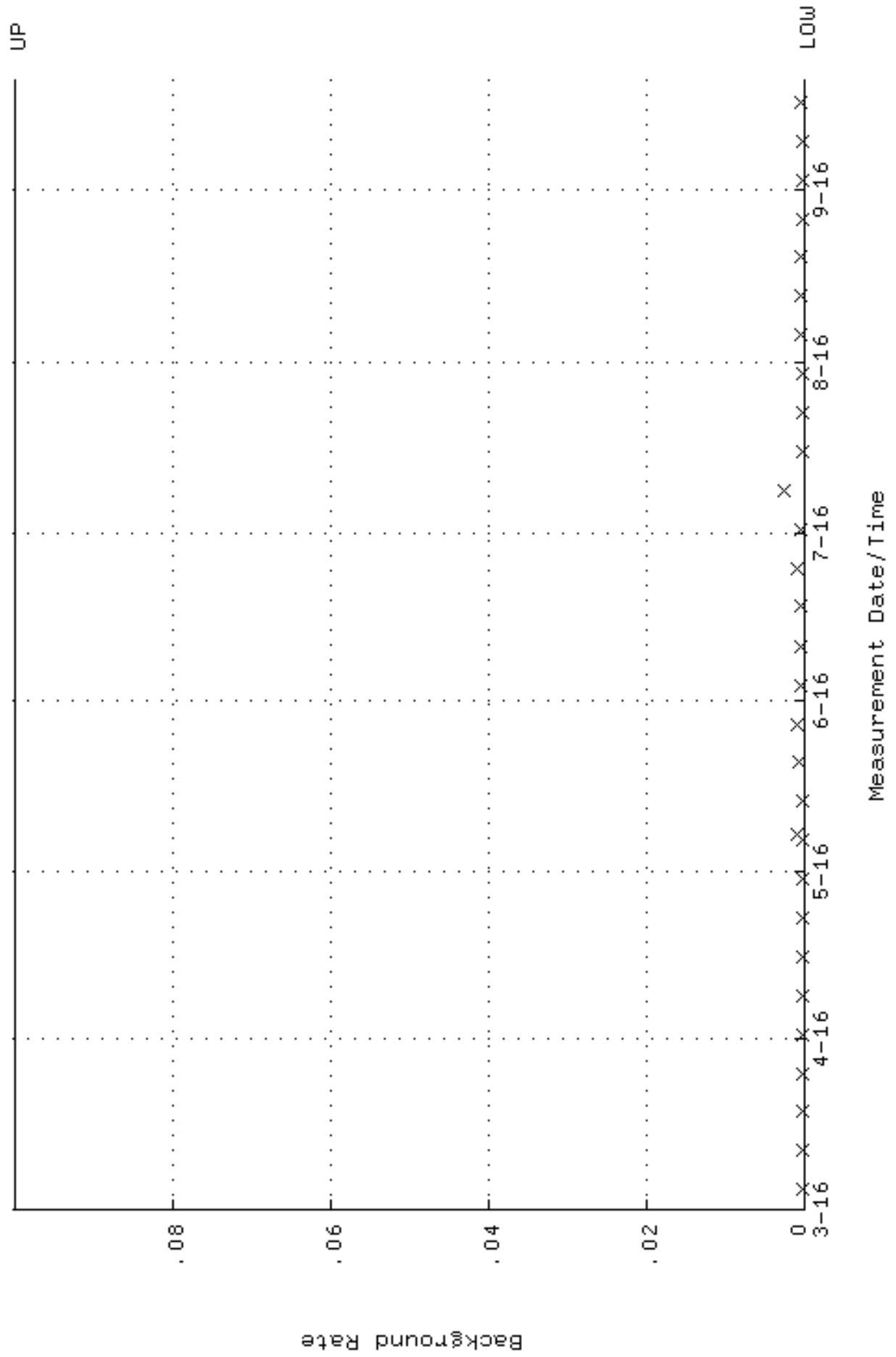
QA filename : DKA100:[ENV_ALPHA.QA.W]W248.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 17-MAR-2016 09:07:11 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



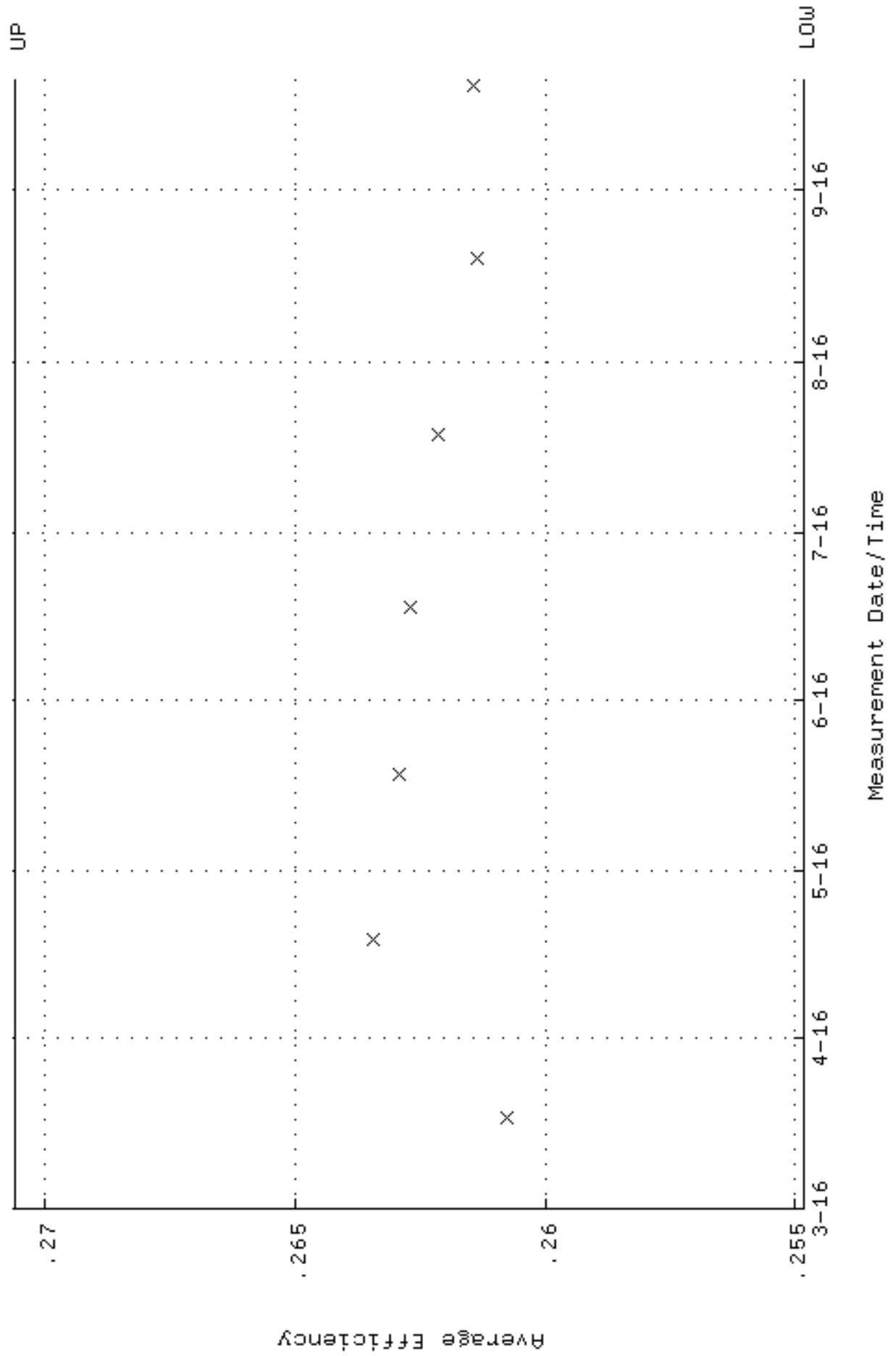
QA filename : DKA100:[ENV_ALPHA.QA.W]W248.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 09:07:11 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



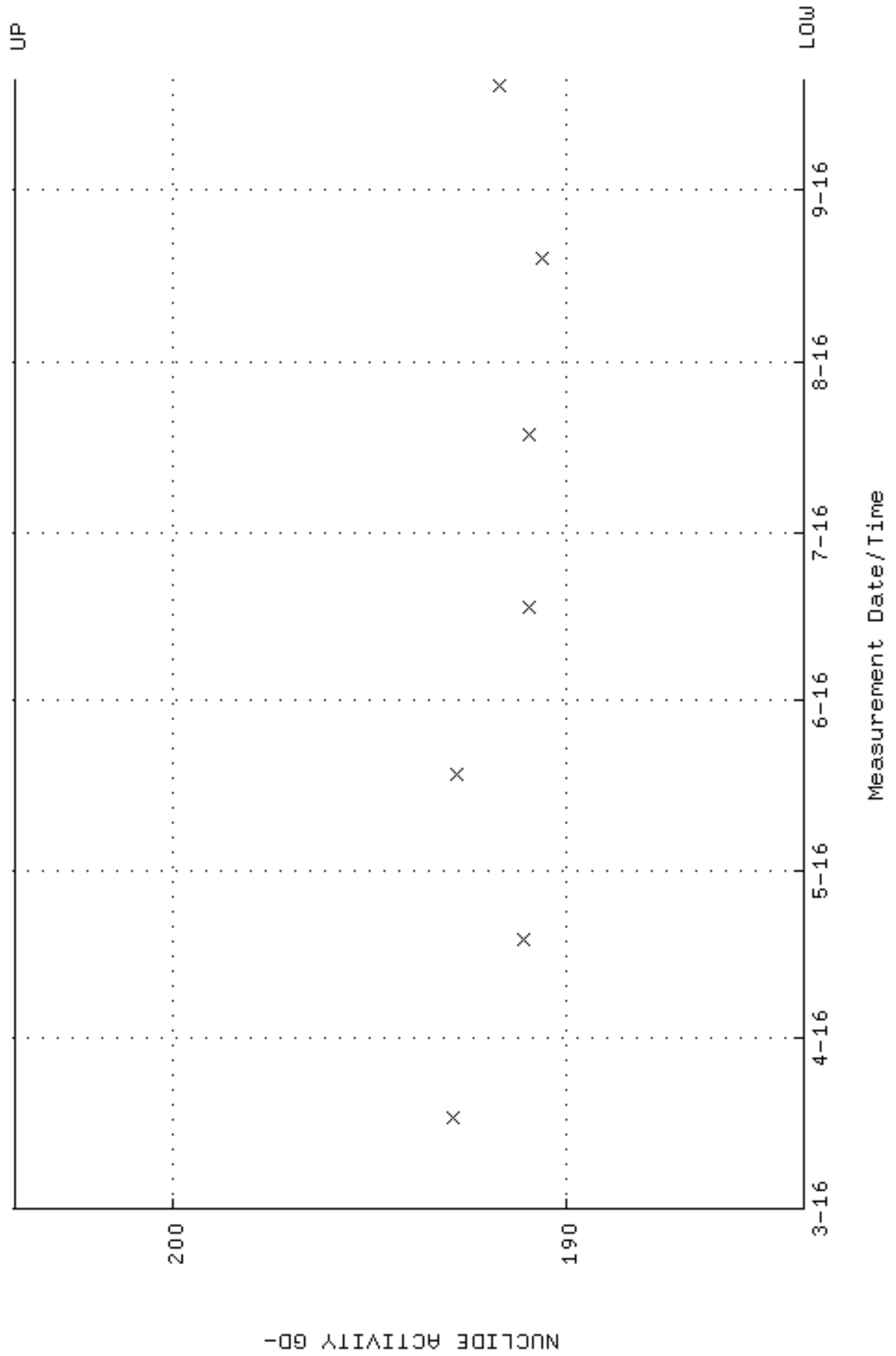
QA filename : DKA100:[ENV_ALPHA.QA.B]B248.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:36:18 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



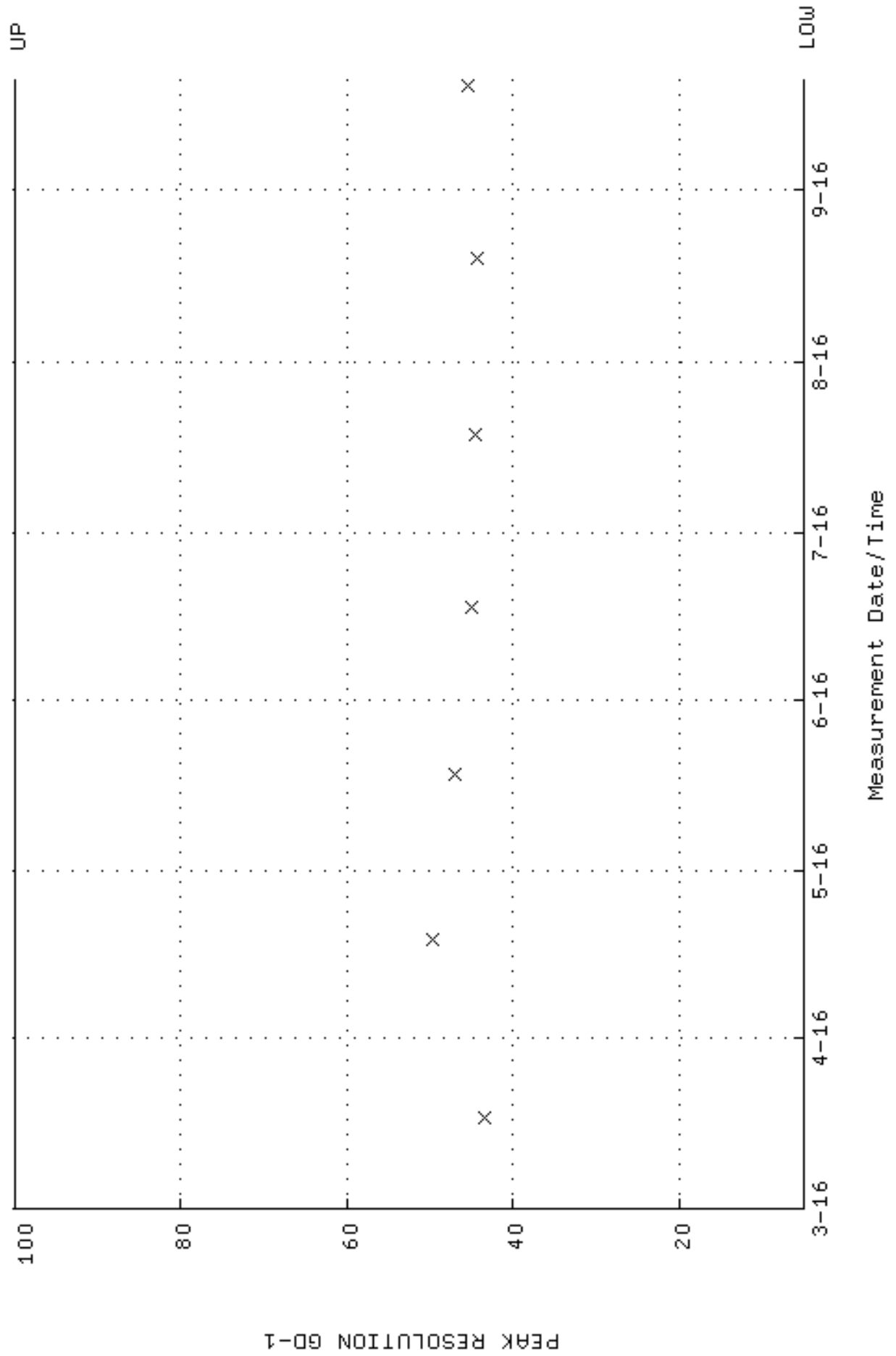
QA filename : DKA100:[ENV_ALPHA.QA.W]W249.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 12:17:44 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.254827 through 0.270589



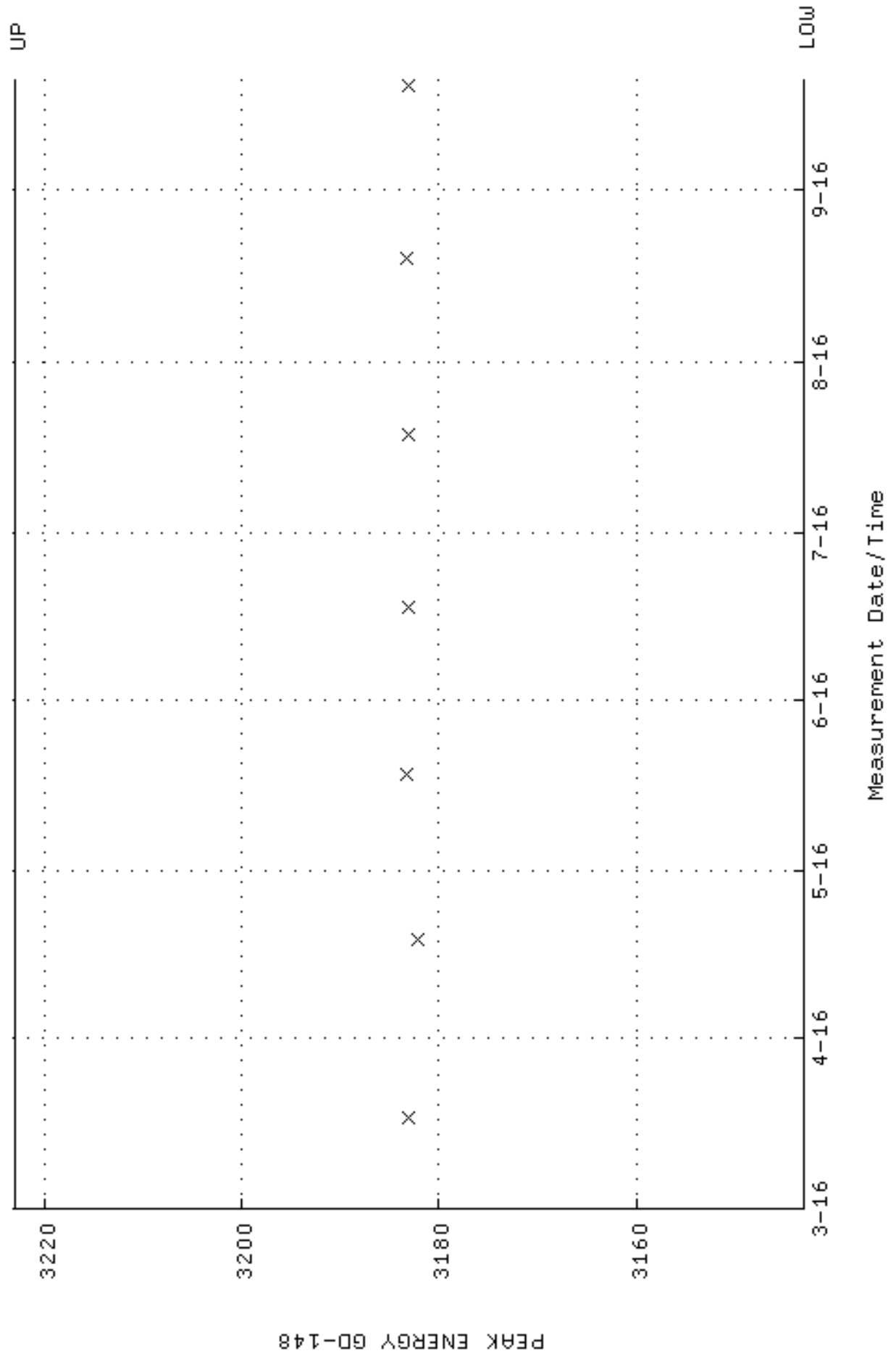
QA filename : DKA100:[ENV_ALPHA.QA.W]w249.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 17-MAR-2016 12:17:44 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



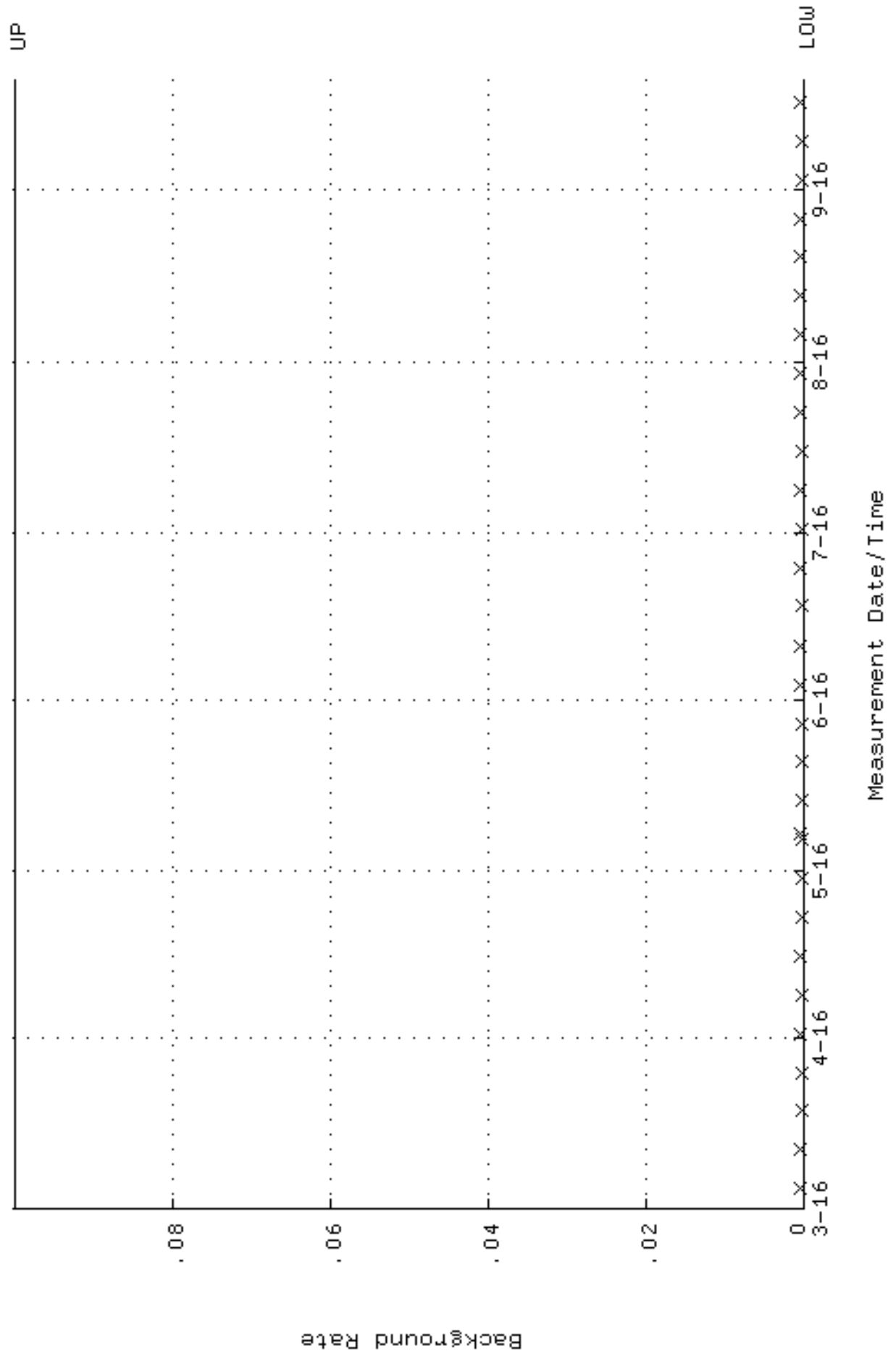
QA filename : DKA100:[ENV_ALPHA.QA.W]W249.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 17-MAR-2016 12:17:44 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



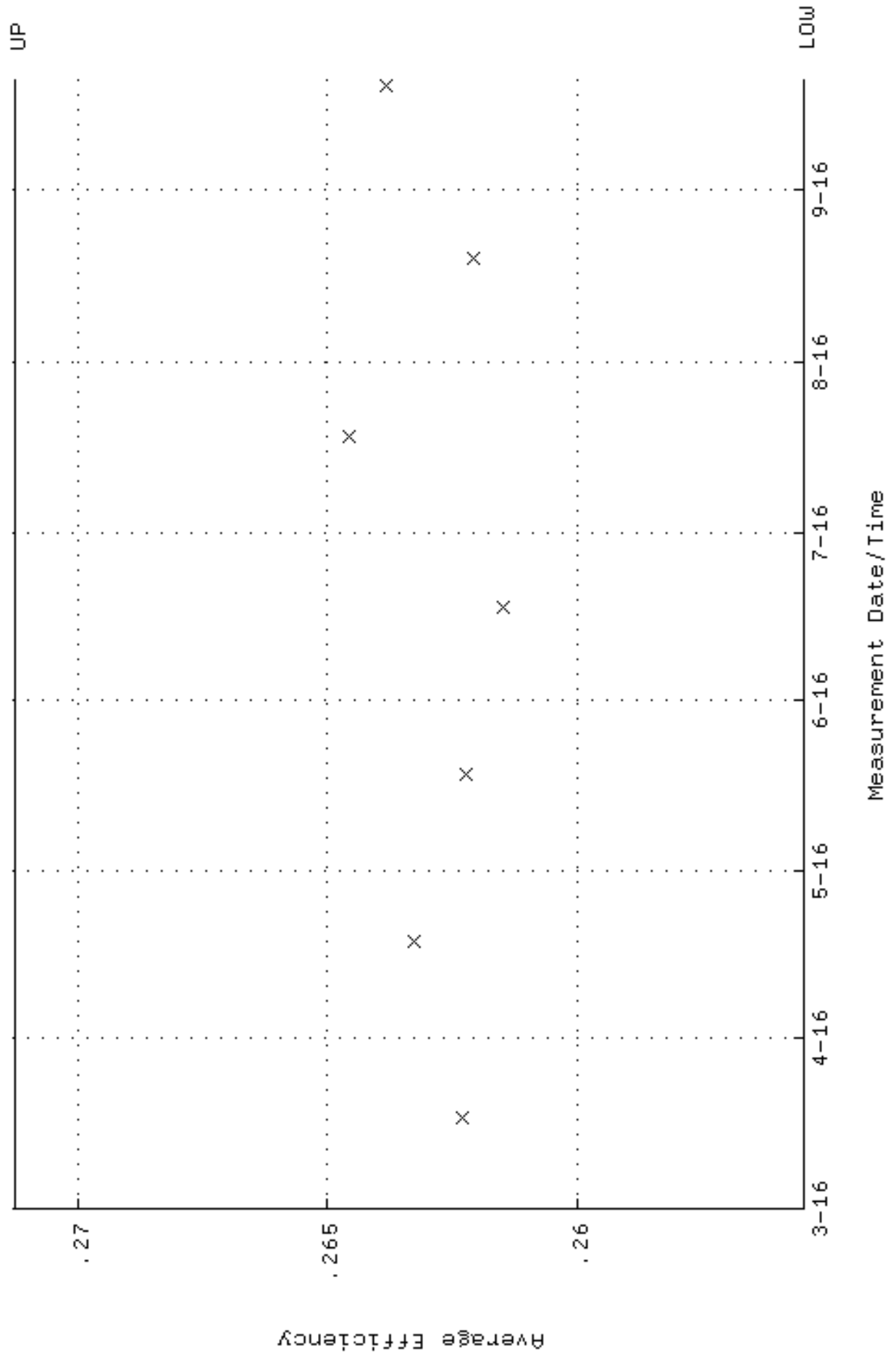
QA filename : DKA100:[ENV_ALPHA.QA.W]W249.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 12:17:44 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



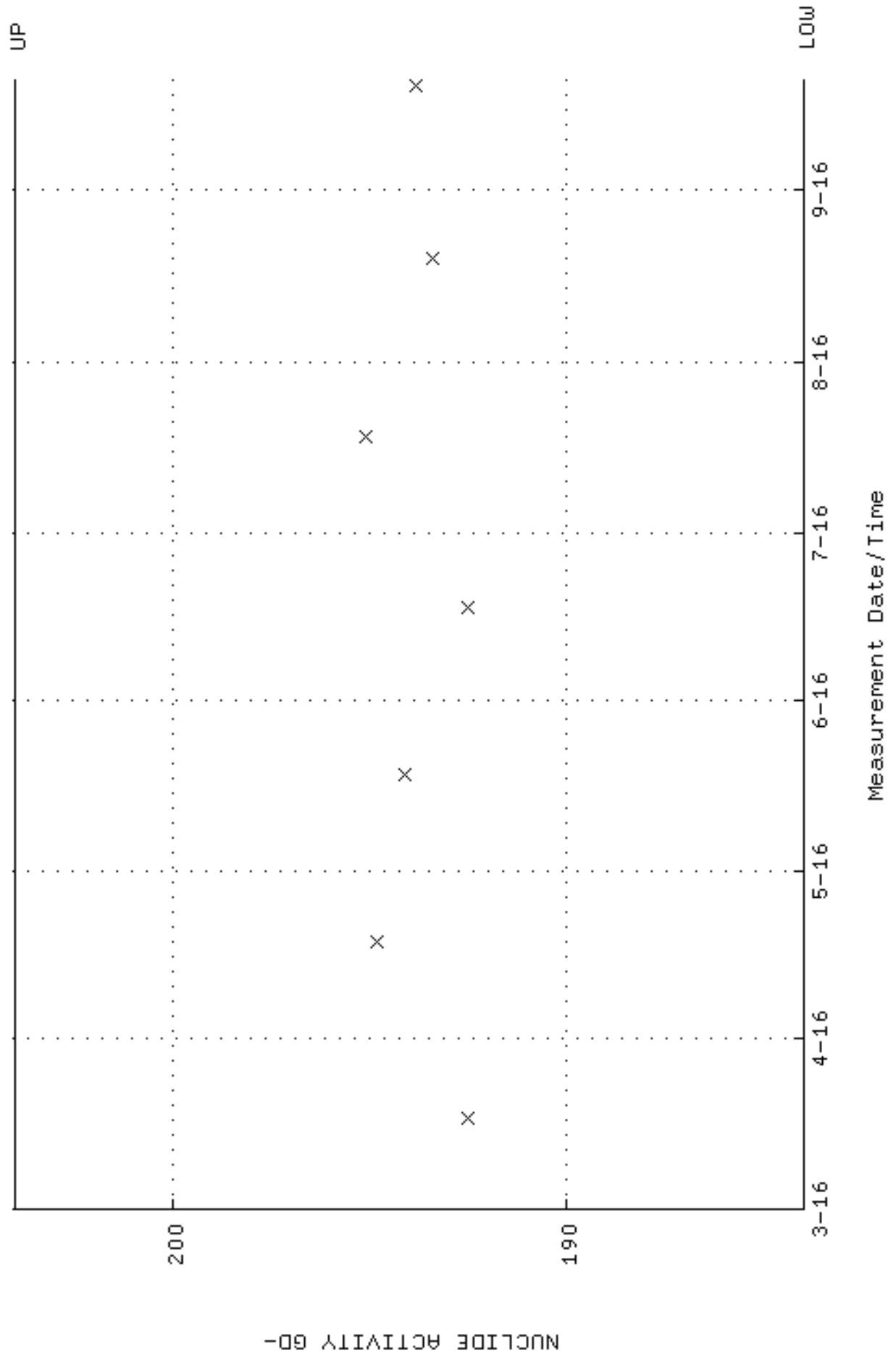
QA filename : DKA100:[ENV_ALPHA.QA.B]B249.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:36:23 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



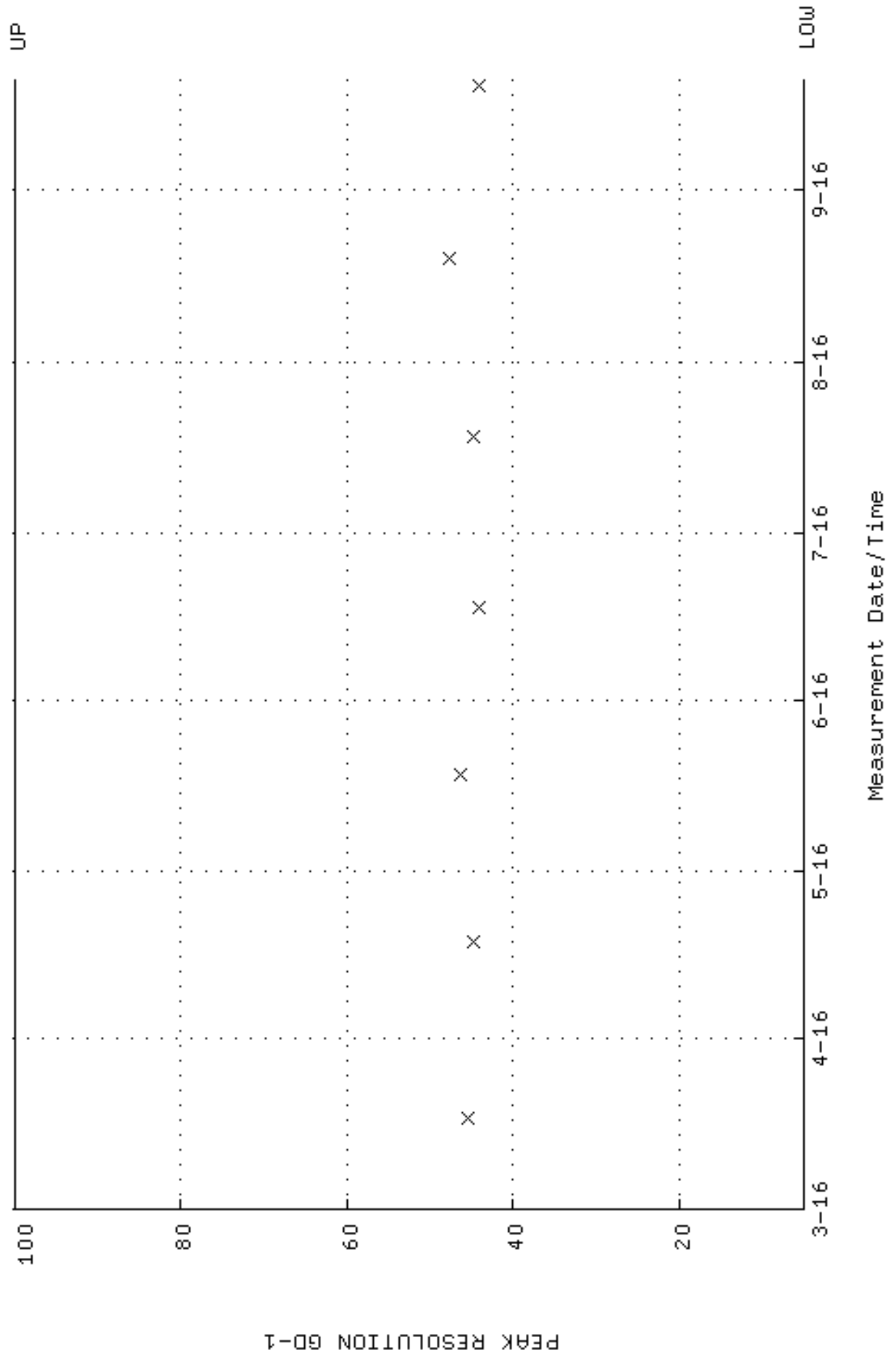
QA filename : DKA100:[ENV_ALPHA.QA.W]W250.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 09:07:19 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.255448 through 0.271248



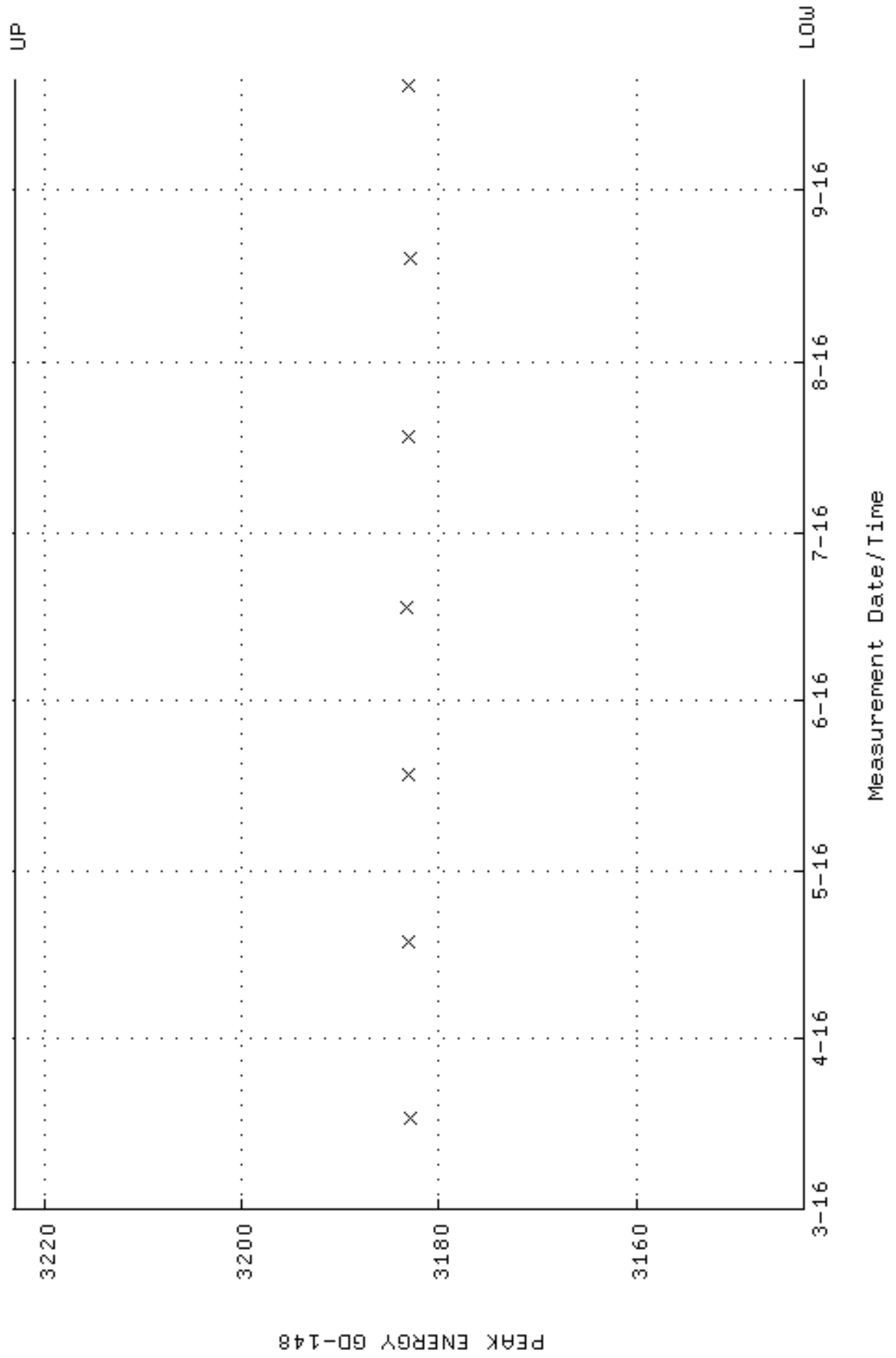
QA filename : DKA100:[ENV_ALPHA.QA.W]w250.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 17-MAR-2016 09:07:19 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



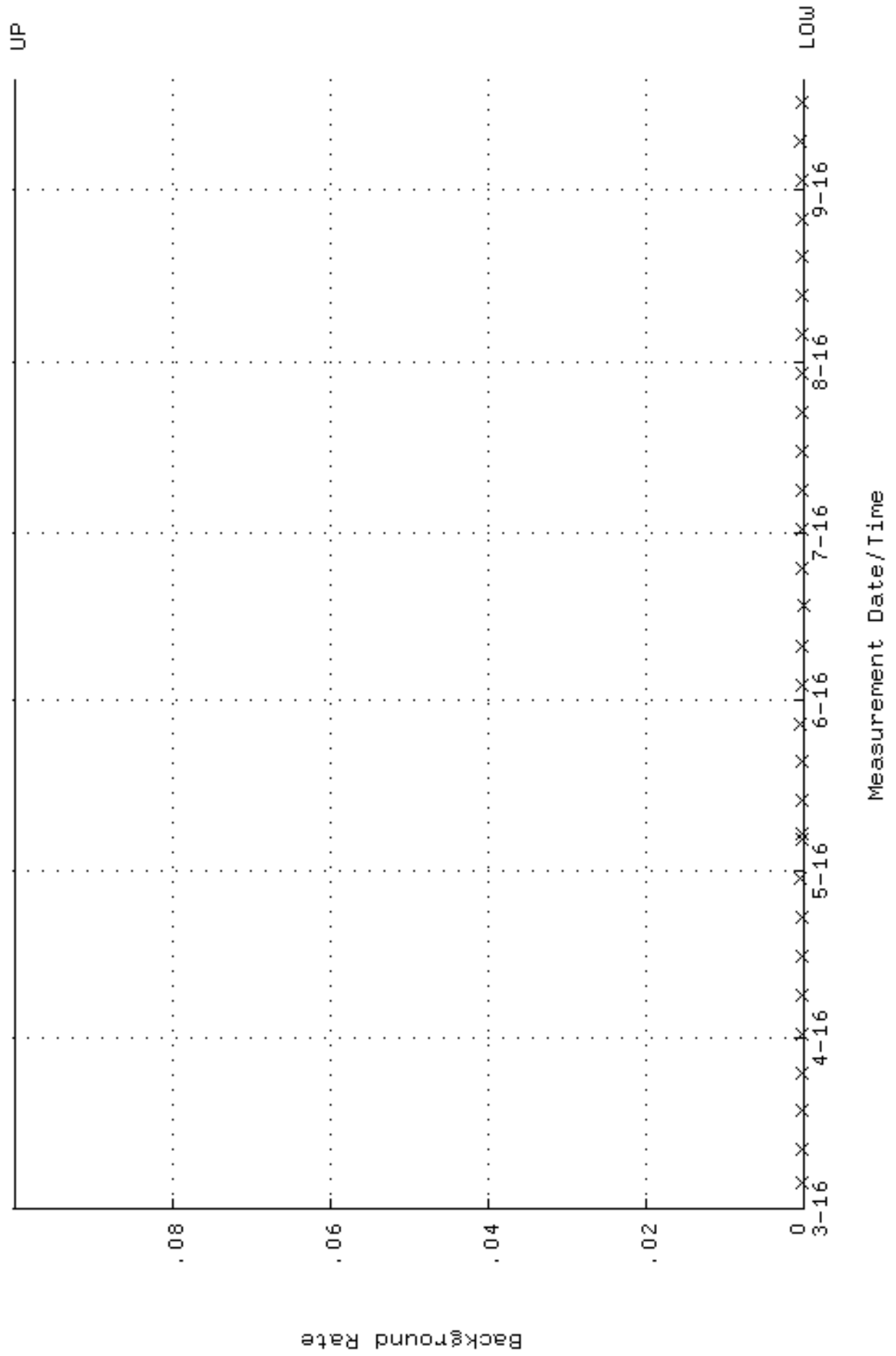
QA filename : DKA100:[ENV_ALPHA.QA.W]W250.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 17-MAR-2016 09:07:19 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



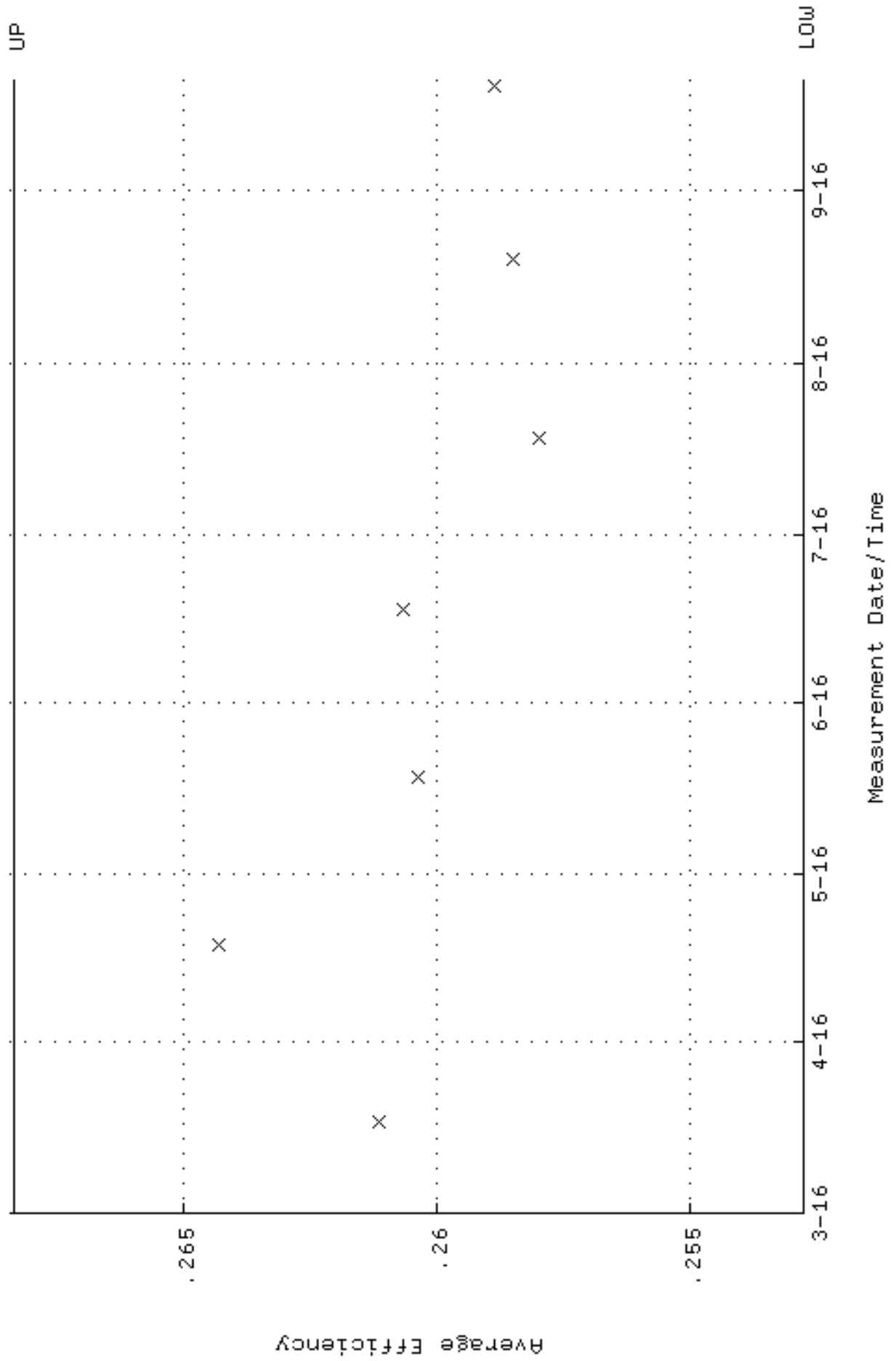
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 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 09:07:19 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



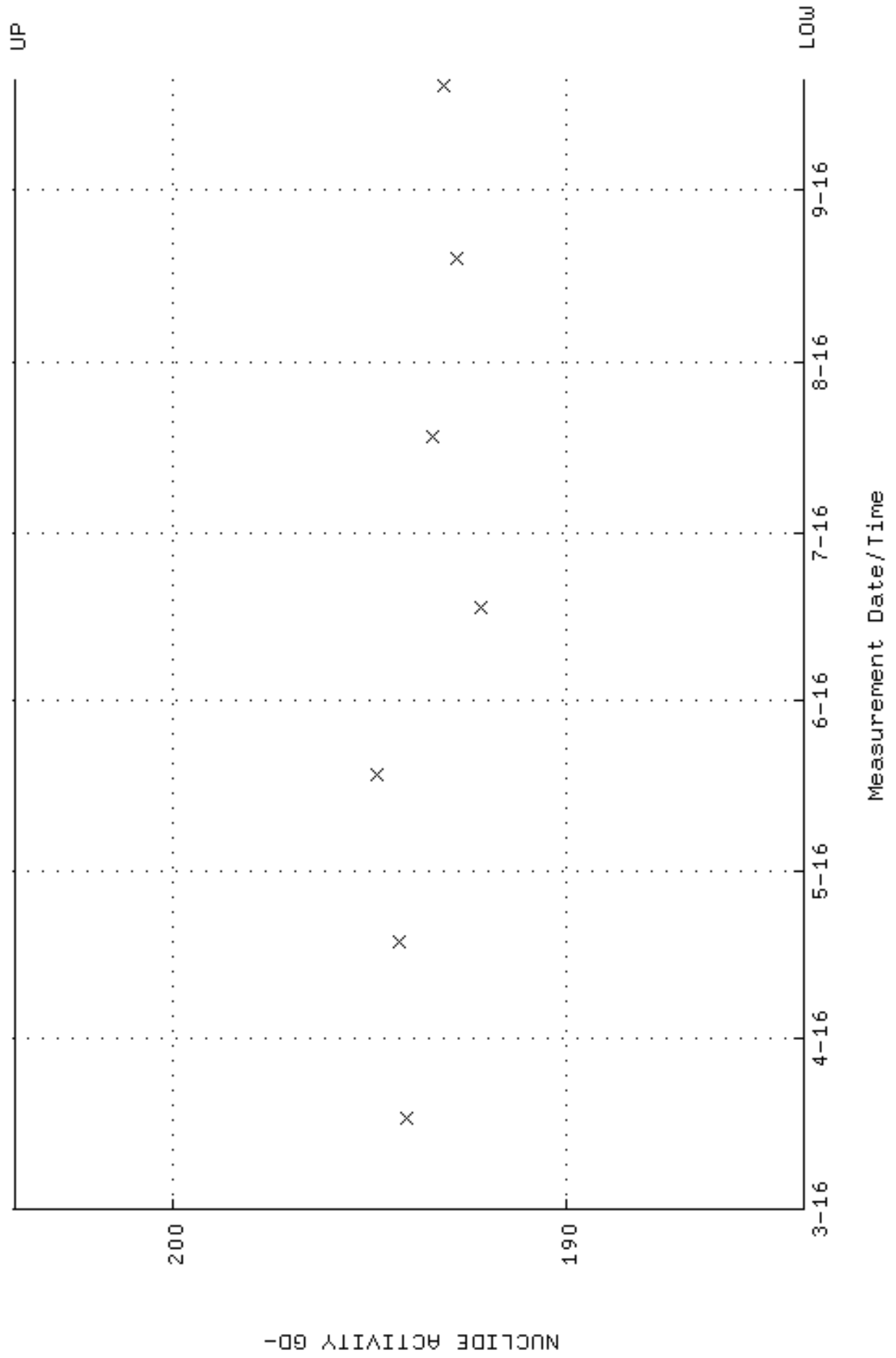
QA filename : DKA100:[ENV_ALPHA.QA.B]B250.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 5-MAR-2016 18:03:28 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



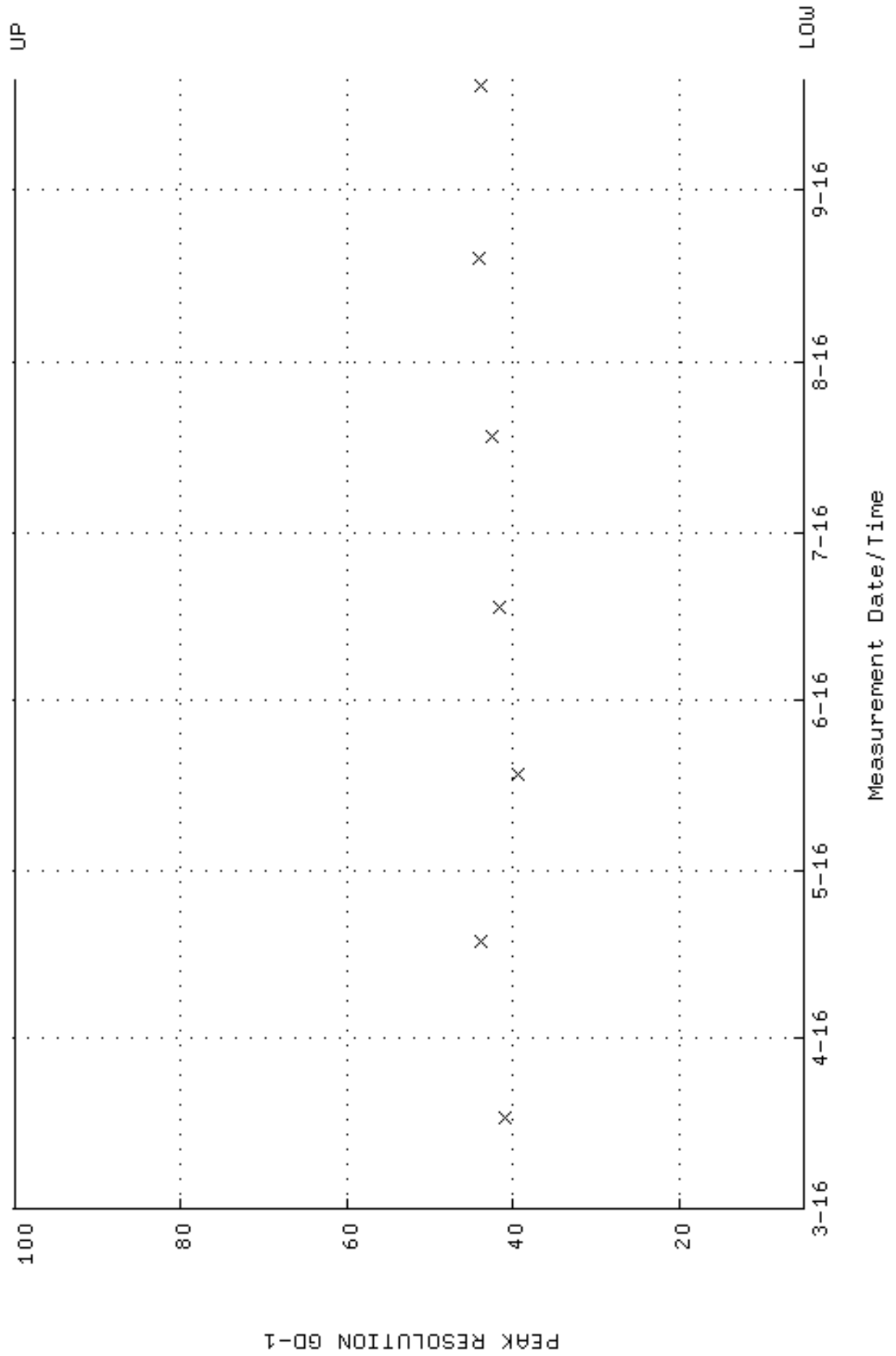
QA filename : DKA100:[ENV_ALPHA.QA.W]W251.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 09:07:23 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.252760 through 0.268394



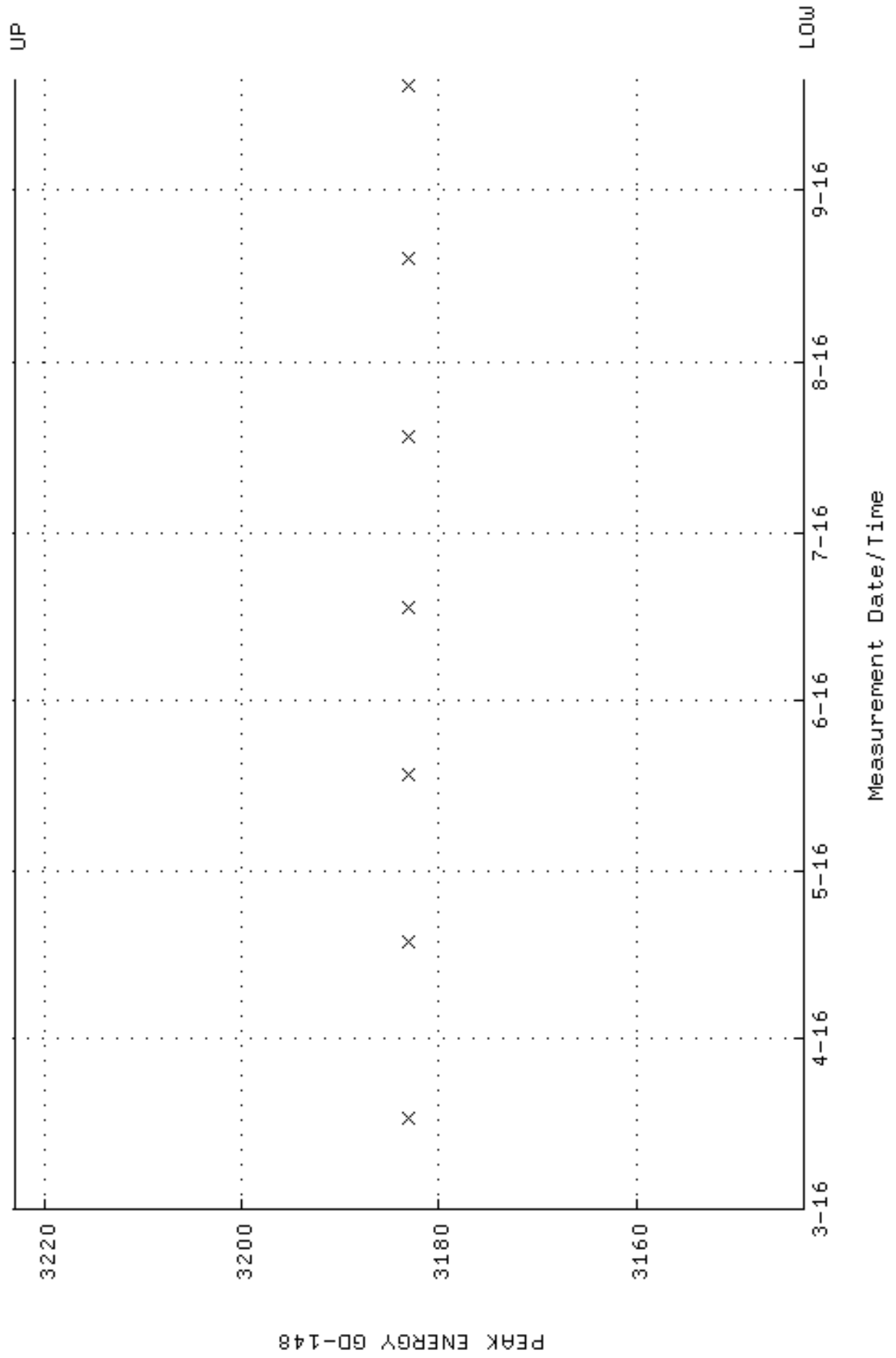
QA filename : DKA100:[ENV_ALPHA.QA.W]w251.QAF;3
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 17-MAR-2016 09:07:23 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



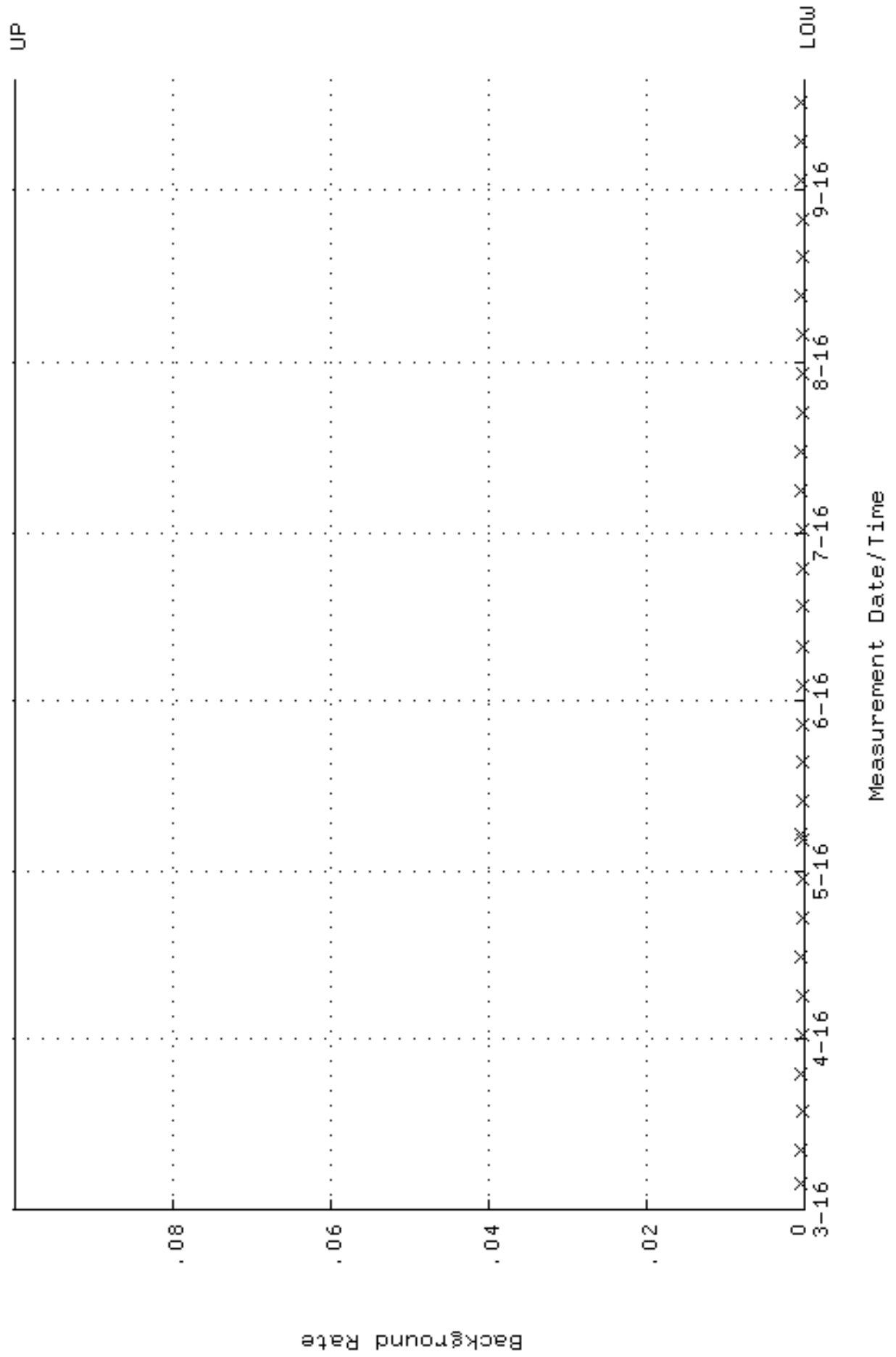
QA filename : DKA100:[ENV_ALPHA.QA.W]w251.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 17-MAR-2016 09:07:23 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



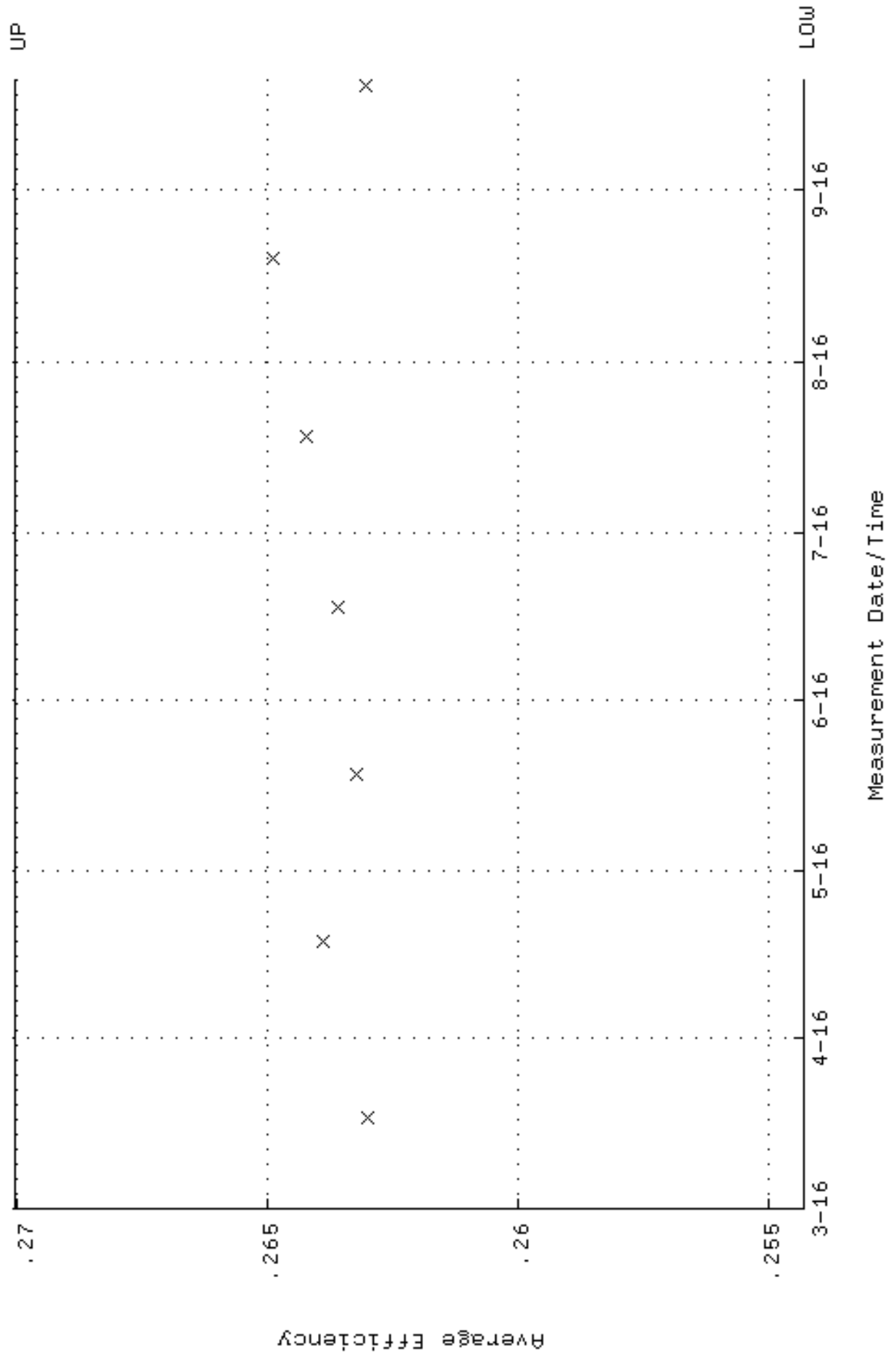
QA filename : DKA100:[ENV_ALPHA.QA.W]w251.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 09:07:23 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



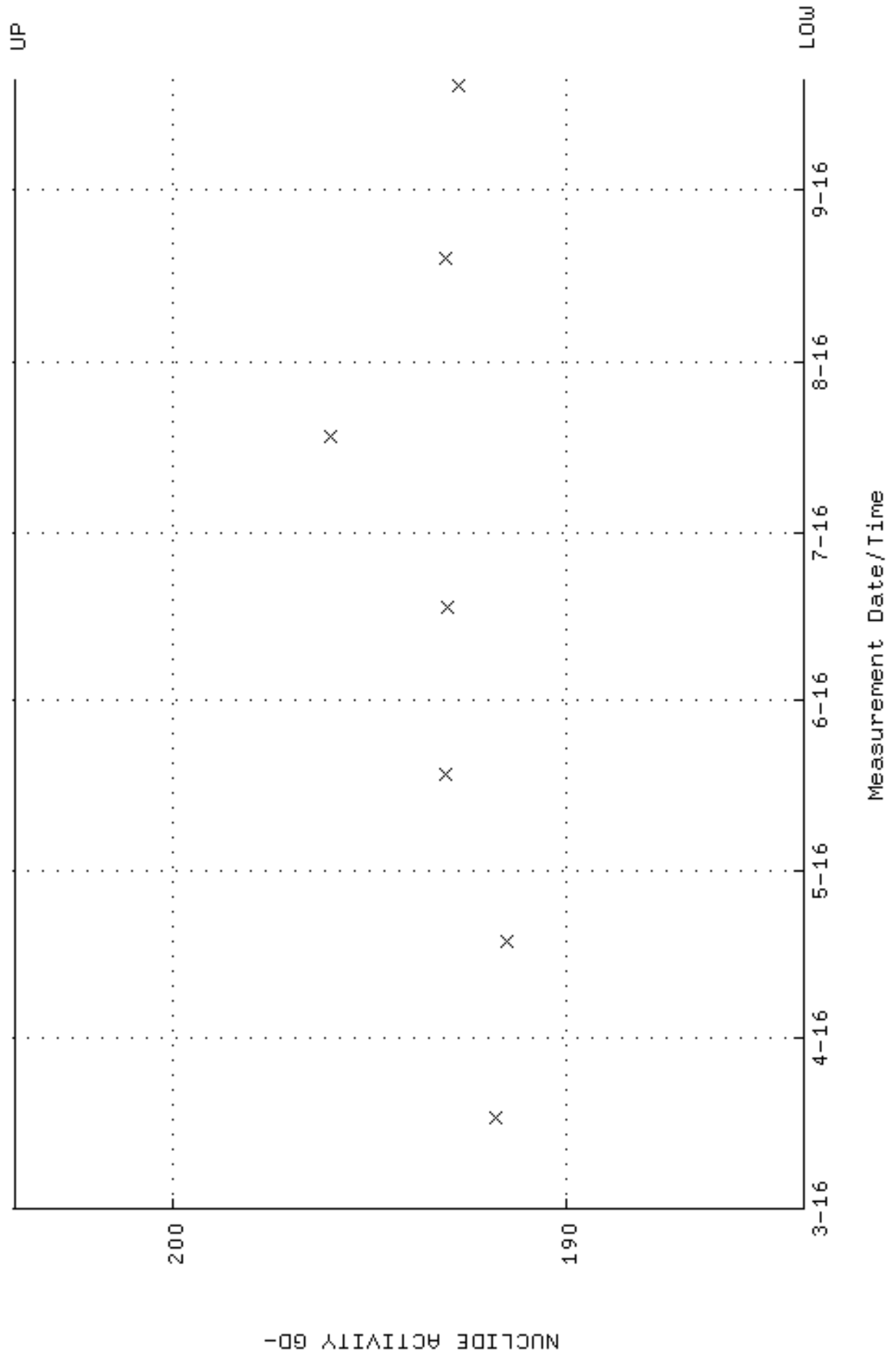
QA filename : DKA100:[ENV_ALPHA.QA.B]B251.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 5-MAR-2016 18:03:32 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



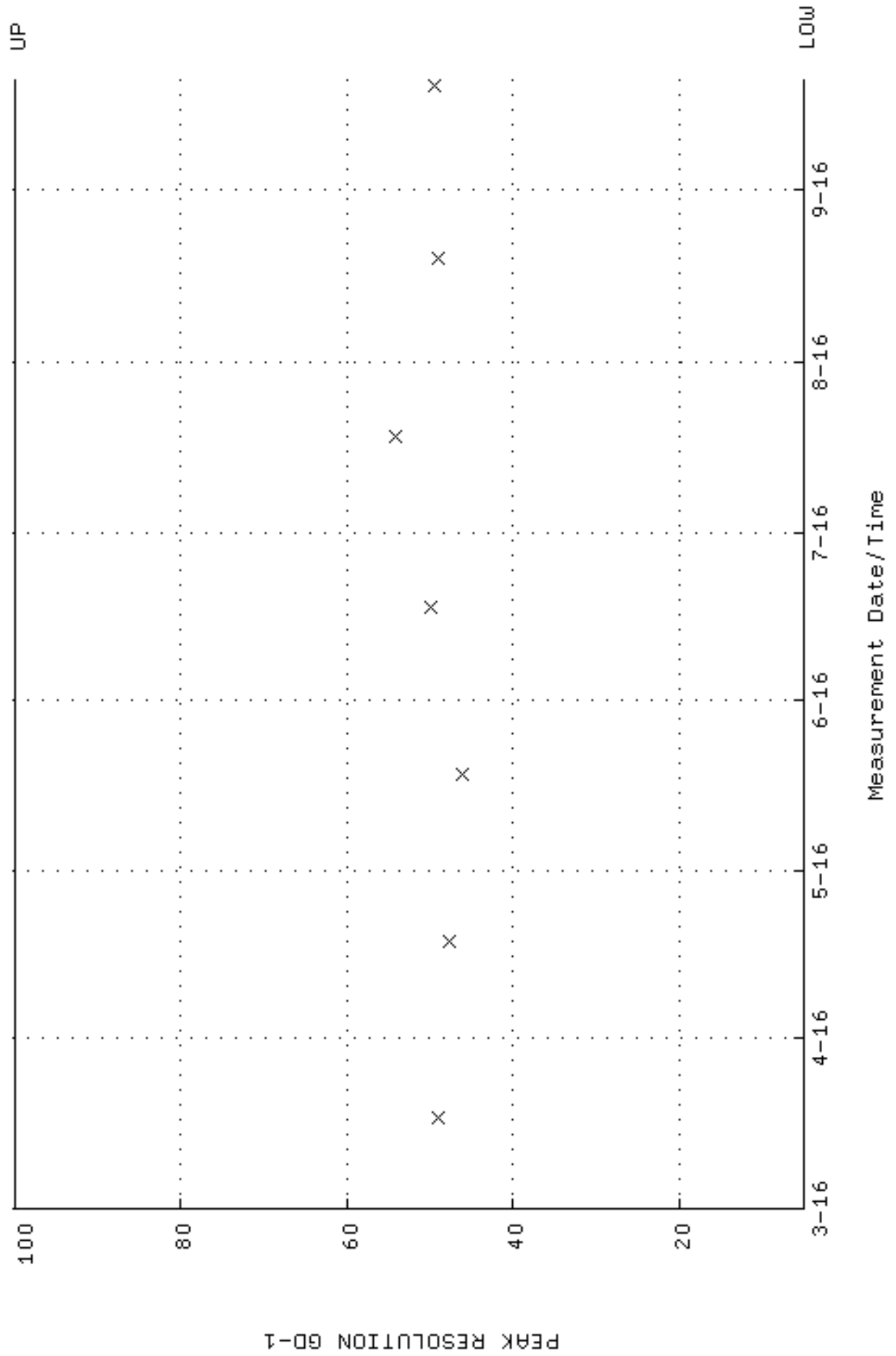
QA filename : DKA100:[ENV_ALPHA.QA.W]W252.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 12:17:49 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.254300 through 0.270020



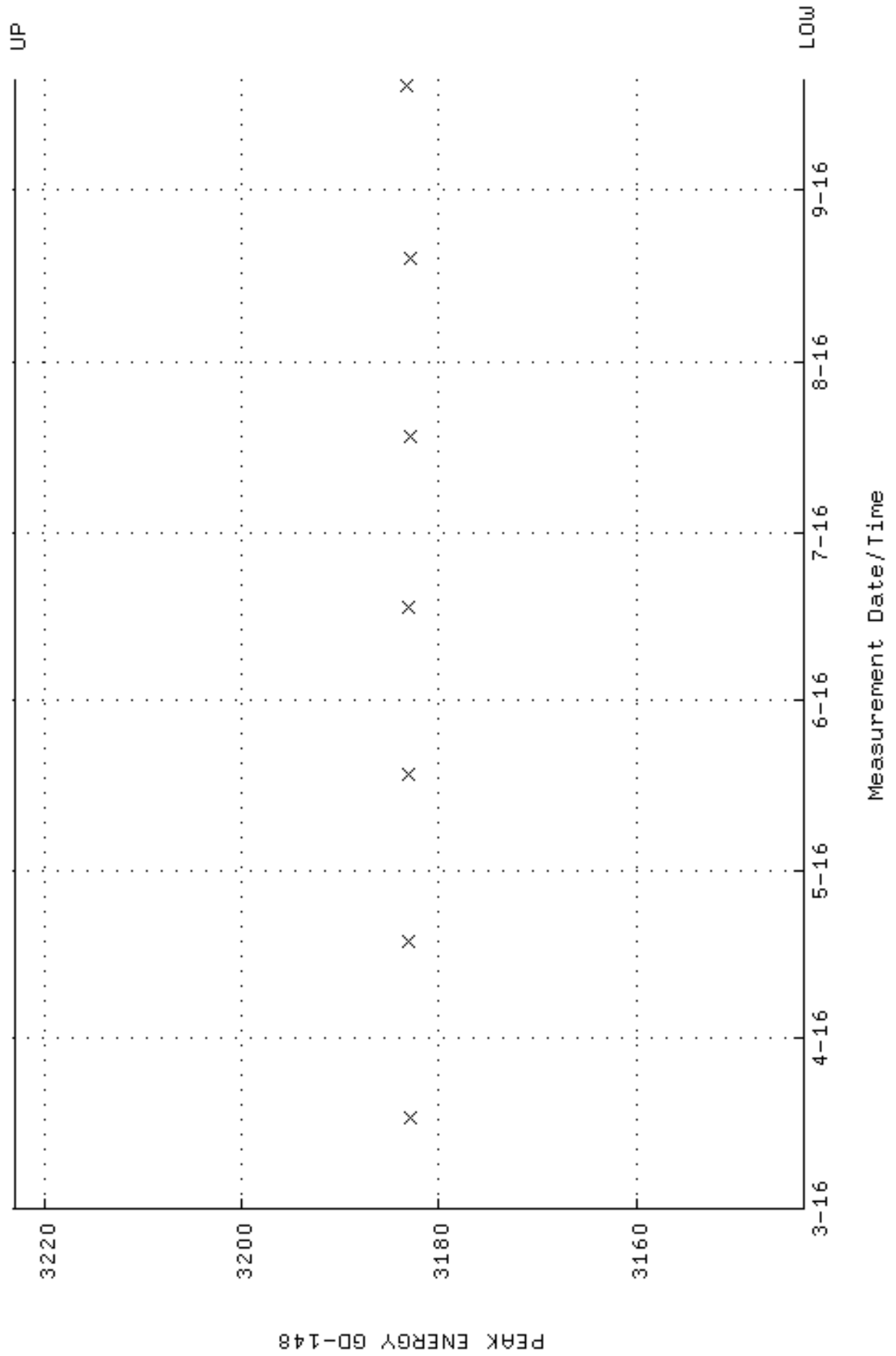
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 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 17-MAR-2016 12:17:49 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



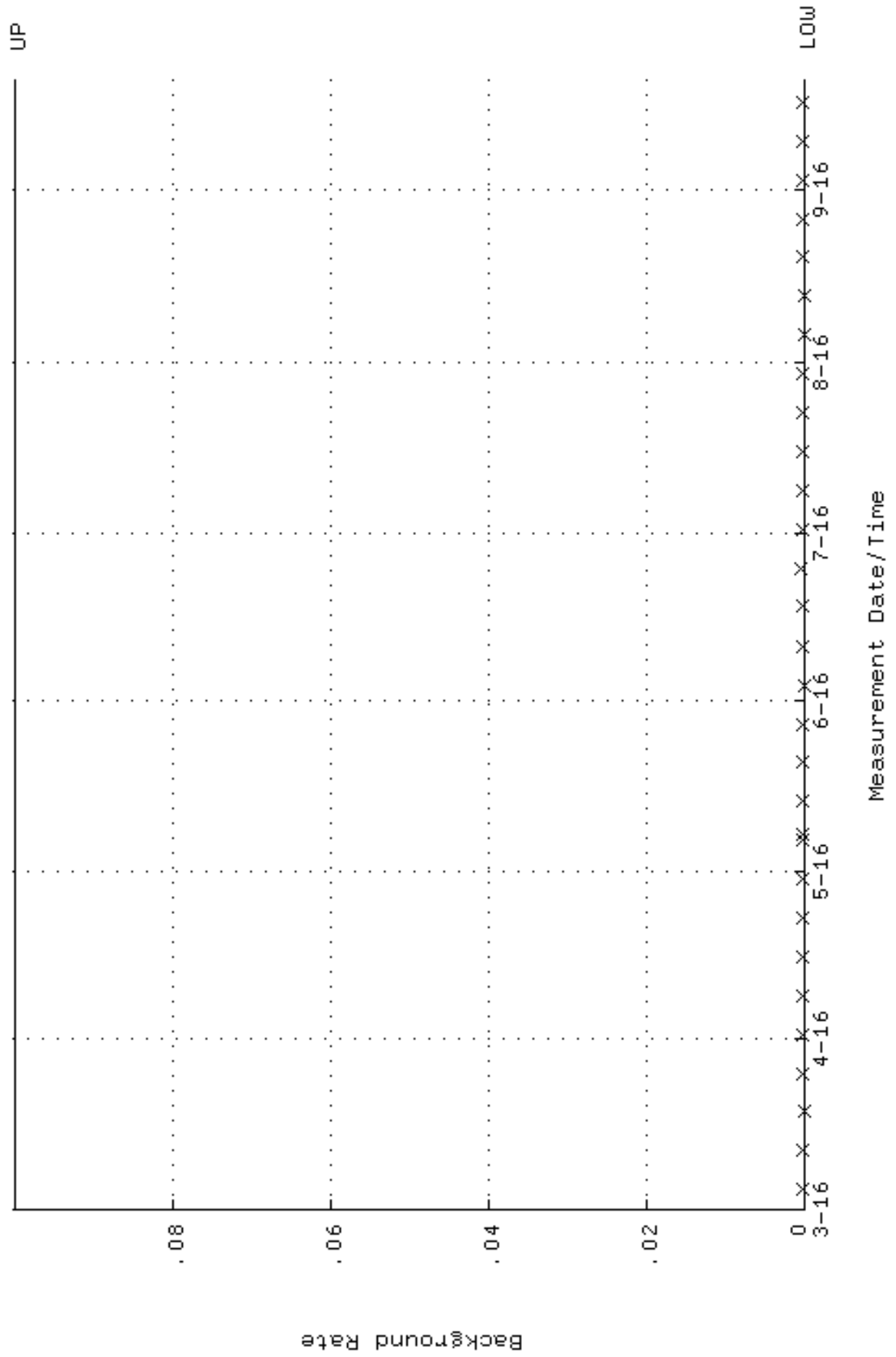
QA filename : DKA100:[ENV_ALPHA.QA.W]W252.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 17-MAR-2016 12:17:49 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



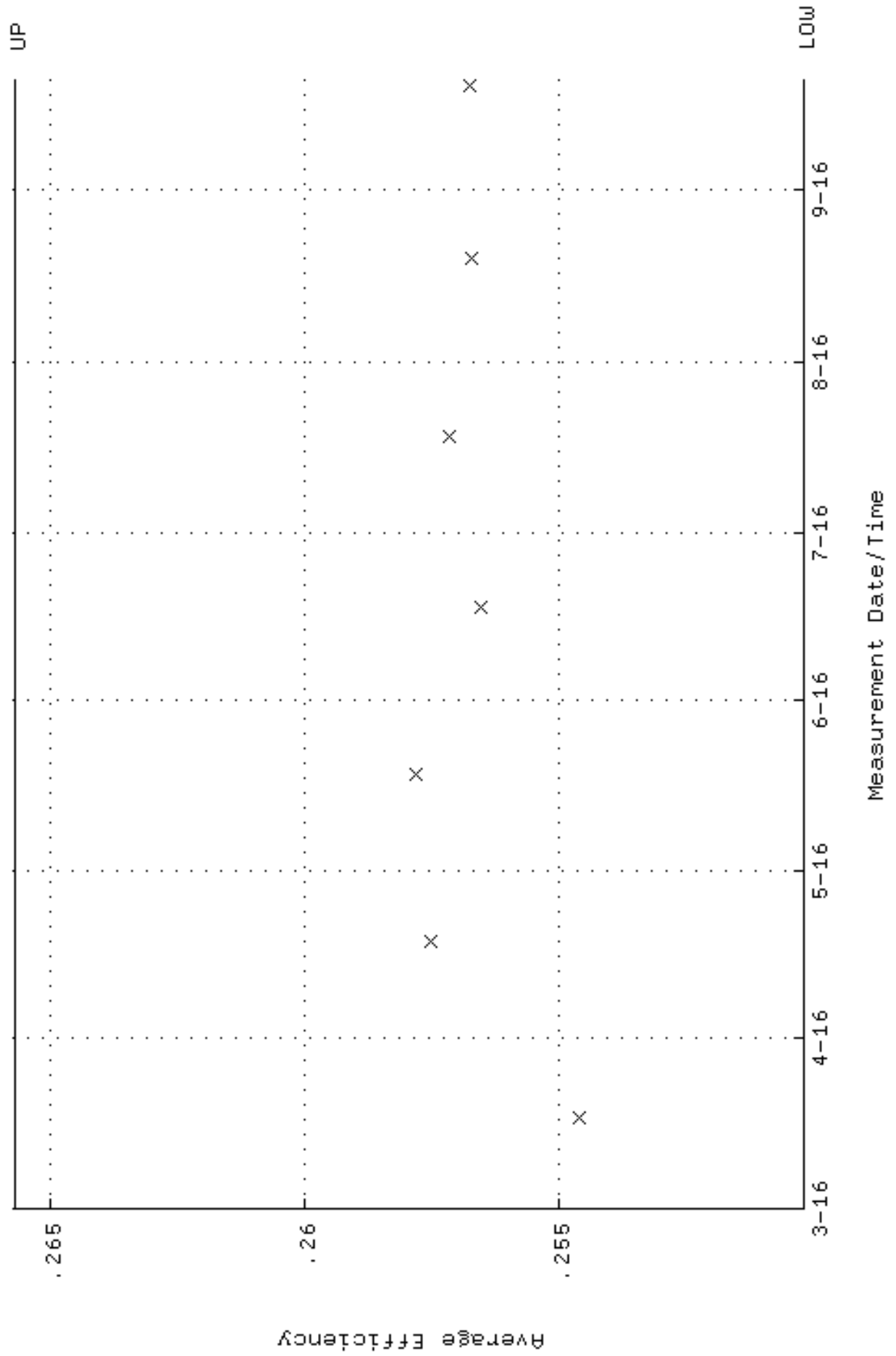
QA filename : DKA100:[ENV_ALPHA.QA.W]W252.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 12:17:49 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



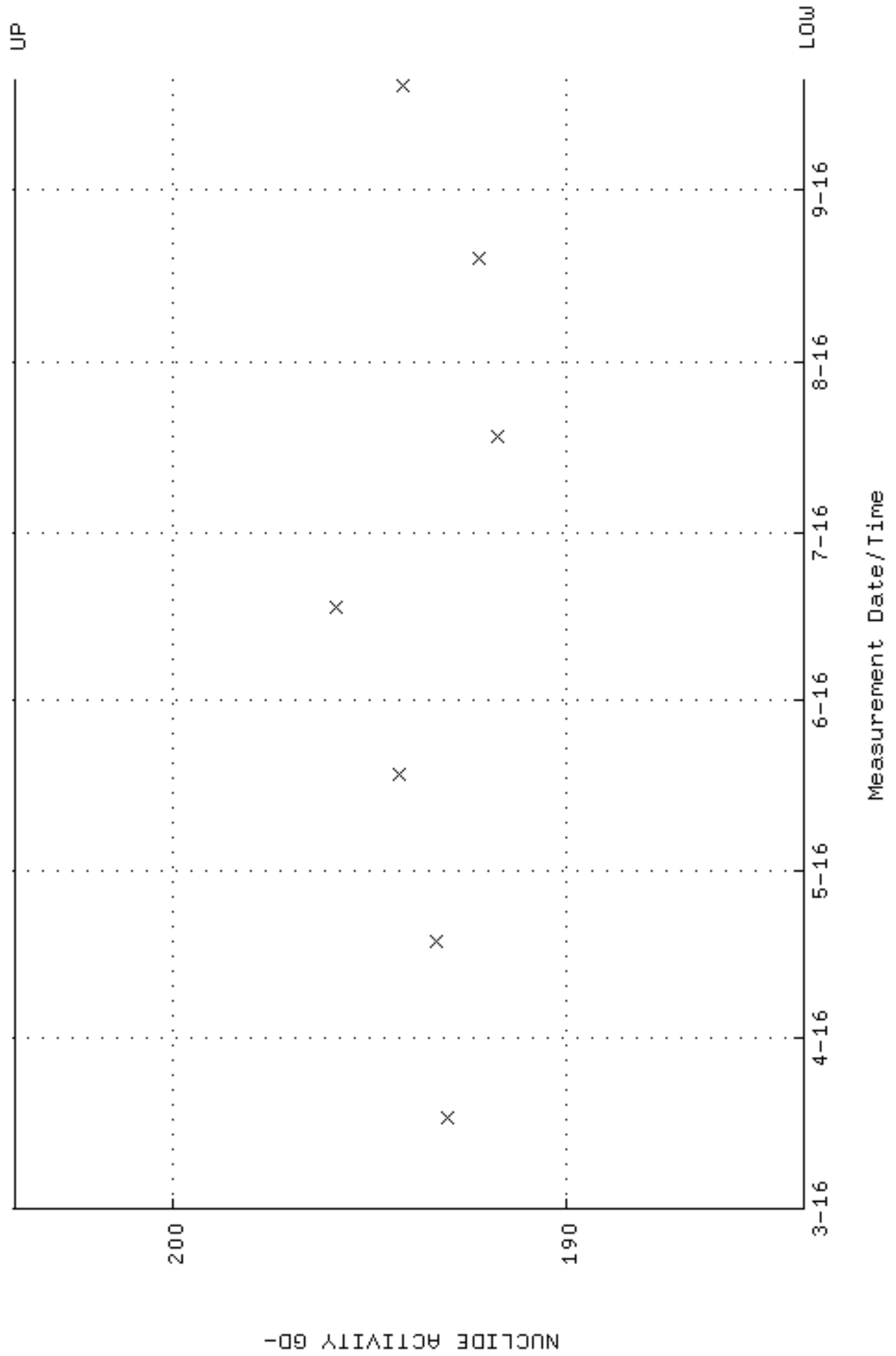
QA filename : DKA100:[ENV_ALPHA.QA.B]B252.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:36:35 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



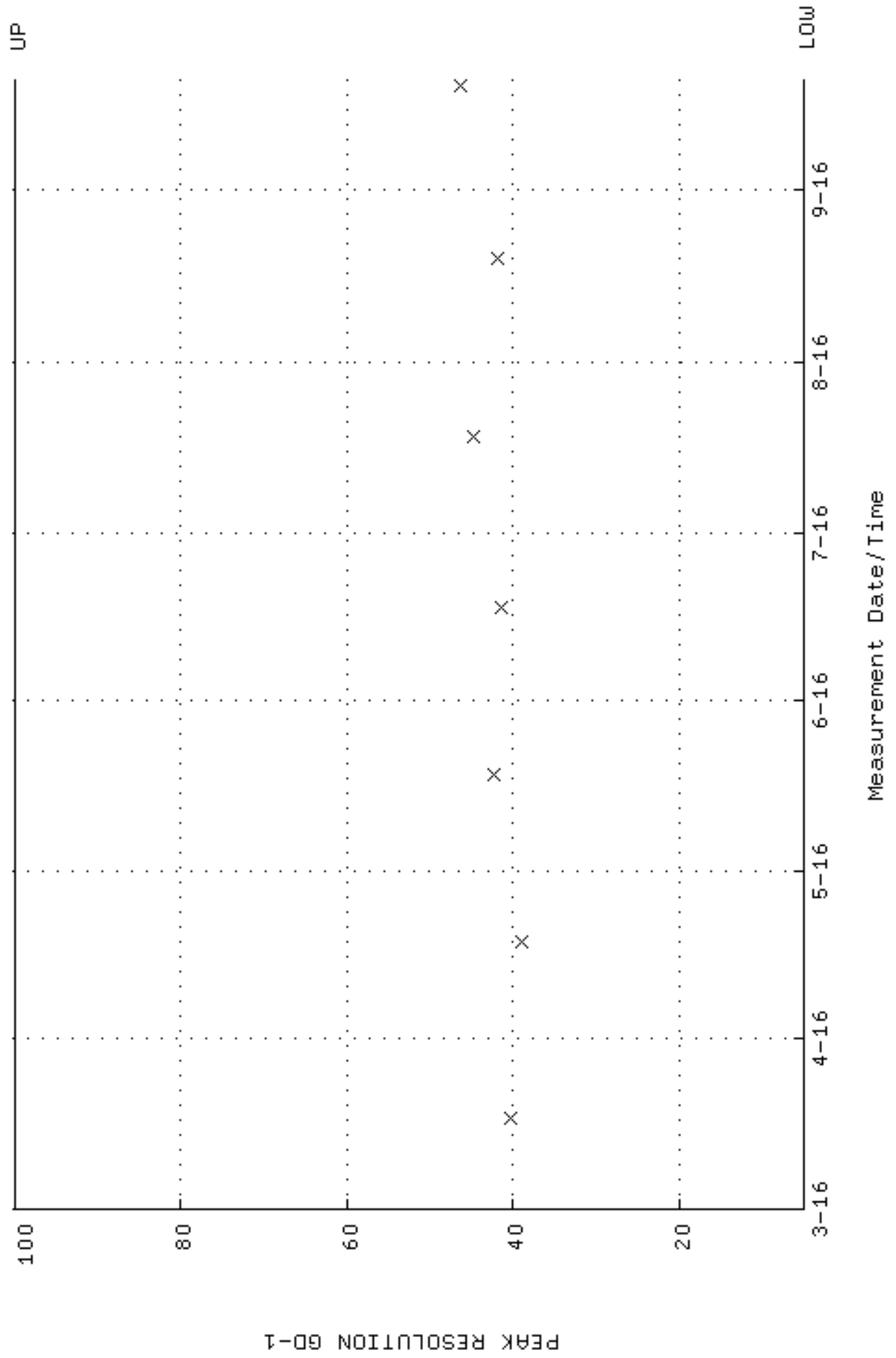
QA filename : DKA100:[ENV_ALPHA.QA.W]W253.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 09:07:31 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.250199 through 0.265675



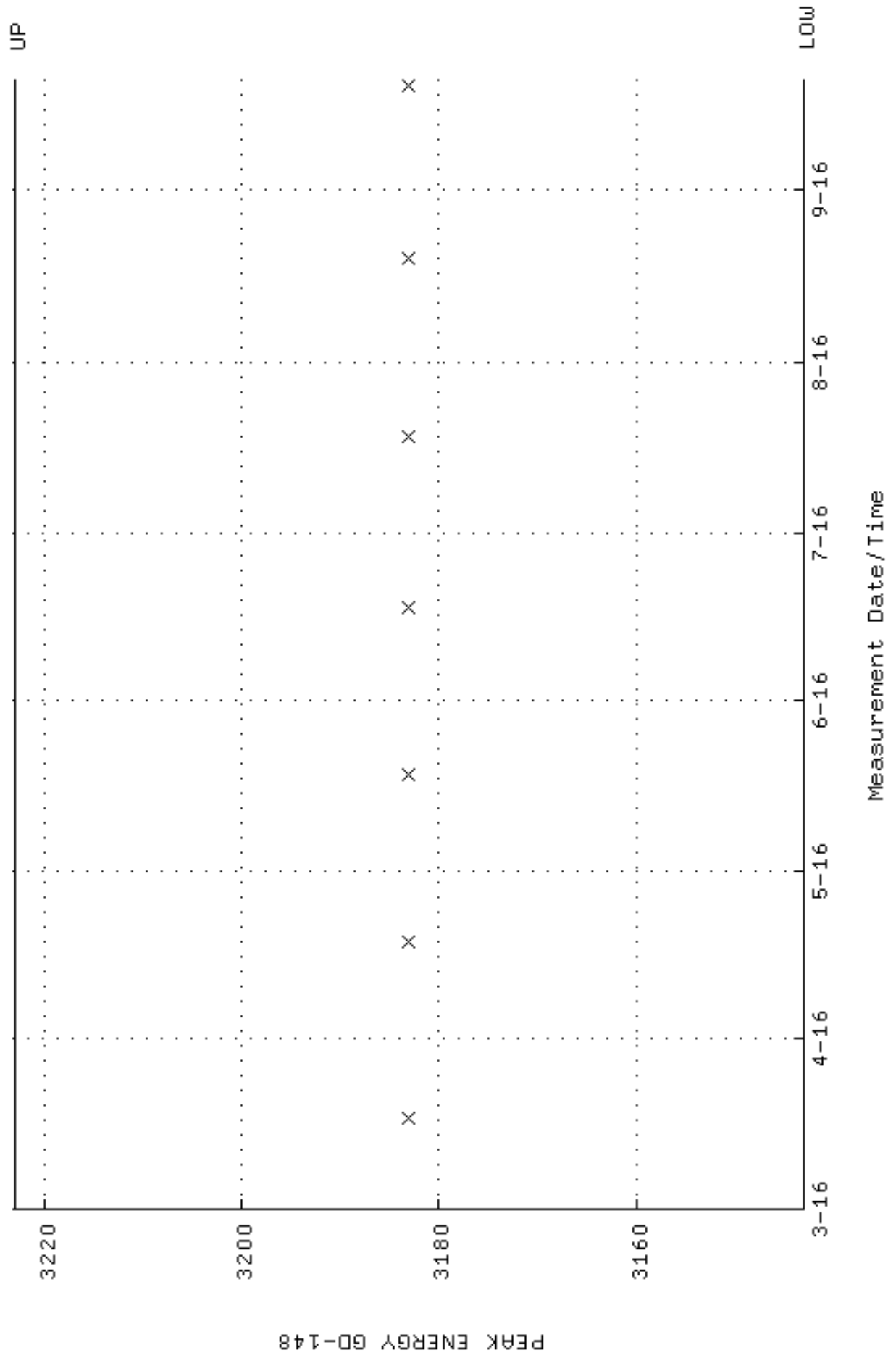
QA filename : DKA100:[ENV_ALPHA.QA.W]w253.QAF;3
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 17-MAR-2016 09:07:31 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 184.000 through 204.000



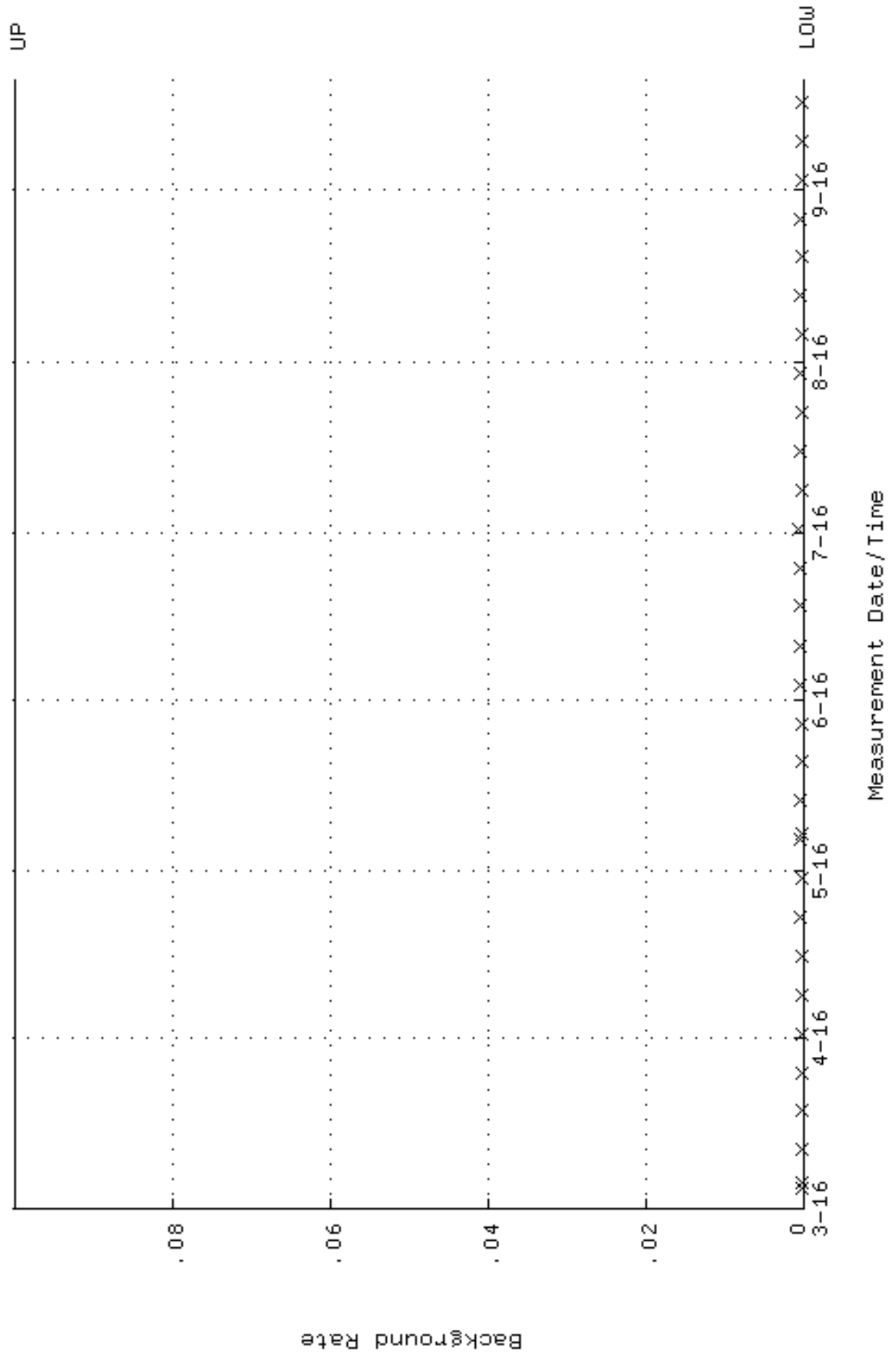
QA filename : DKA100:[ENV_ALPHA.QA.W]W253.QAF;3
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 17-MAR-2016 09:07:31 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



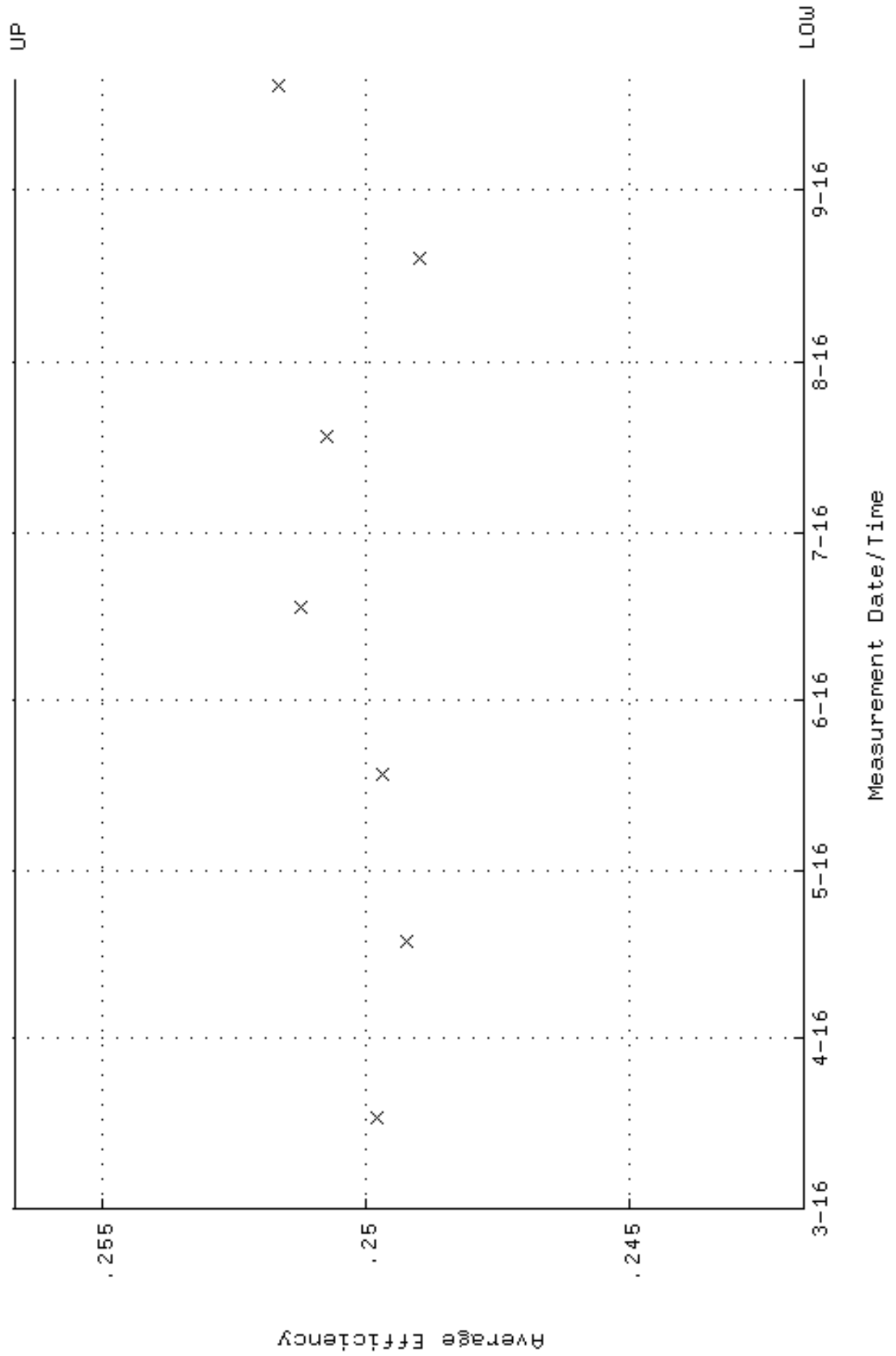
QA filename : DKA100:[ENV_ALPHA.QA.W]W253.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 09:07:31 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



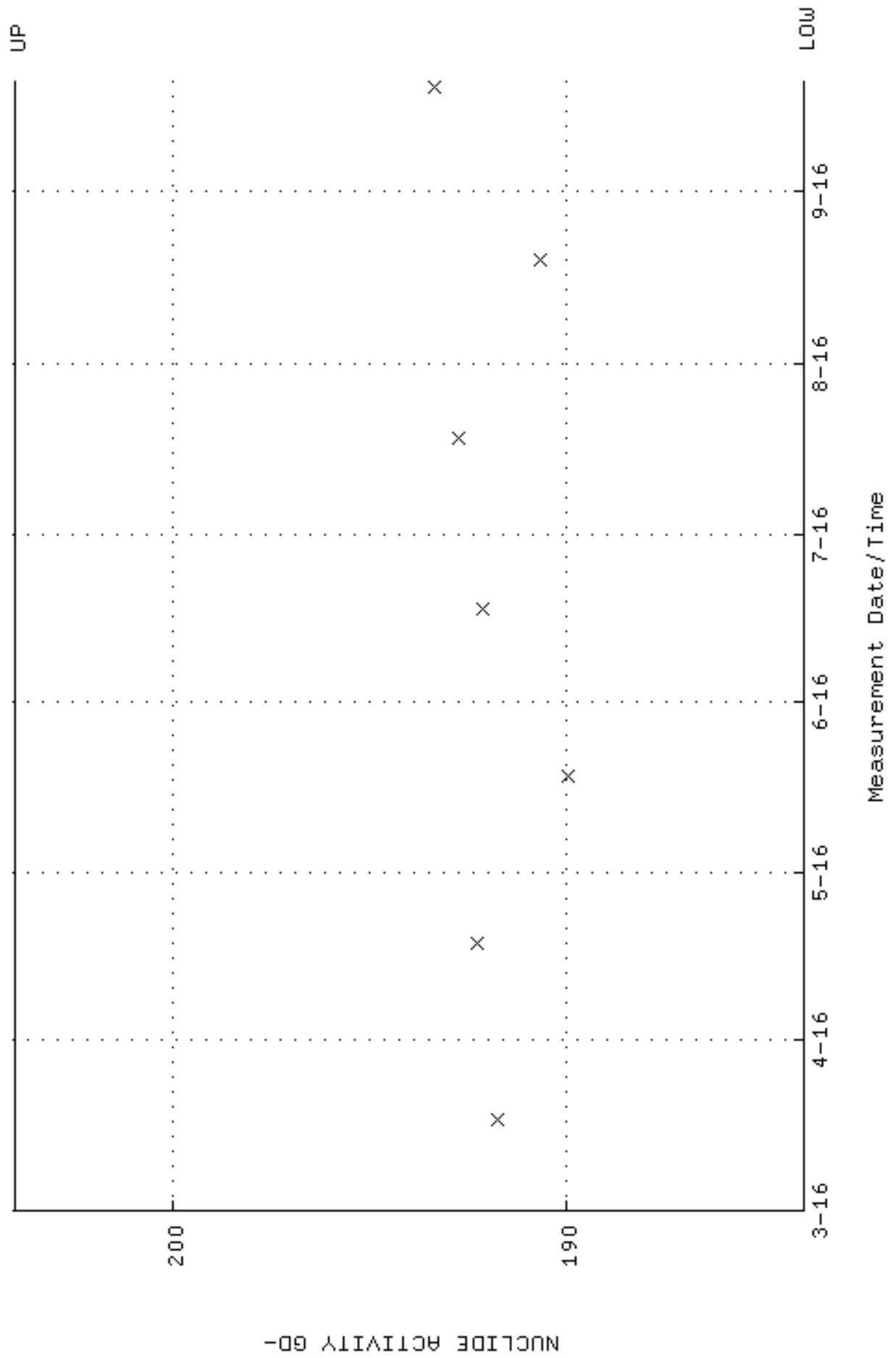
QA filename : DKA100:[ENV_ALPHA.QA.B]B253.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:36:40 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



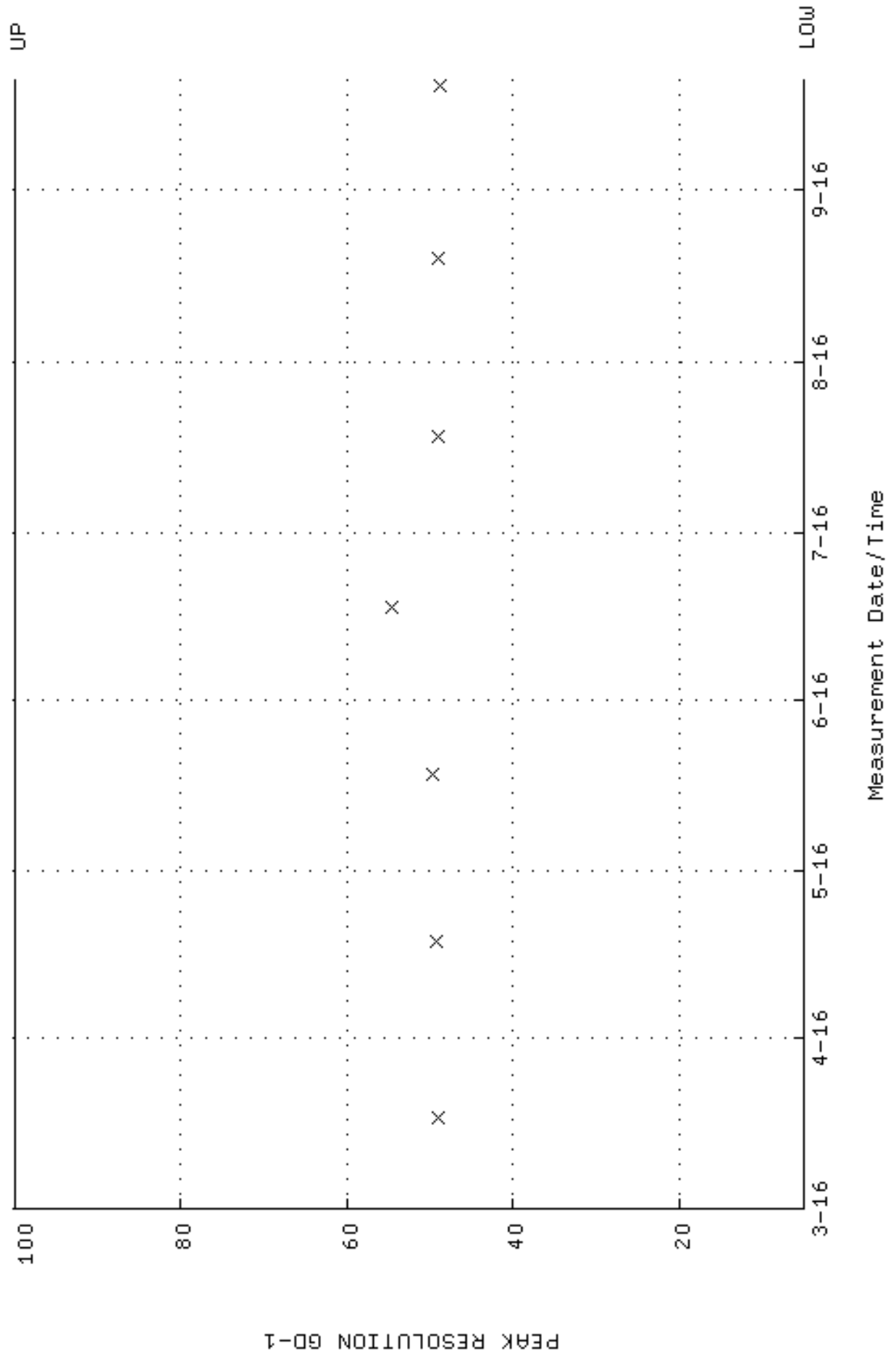
QA filename : DKA100:[ENV_ALPHA.QA.W]W254.QAF;3
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 09:07:35 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.241696 through 0.256646



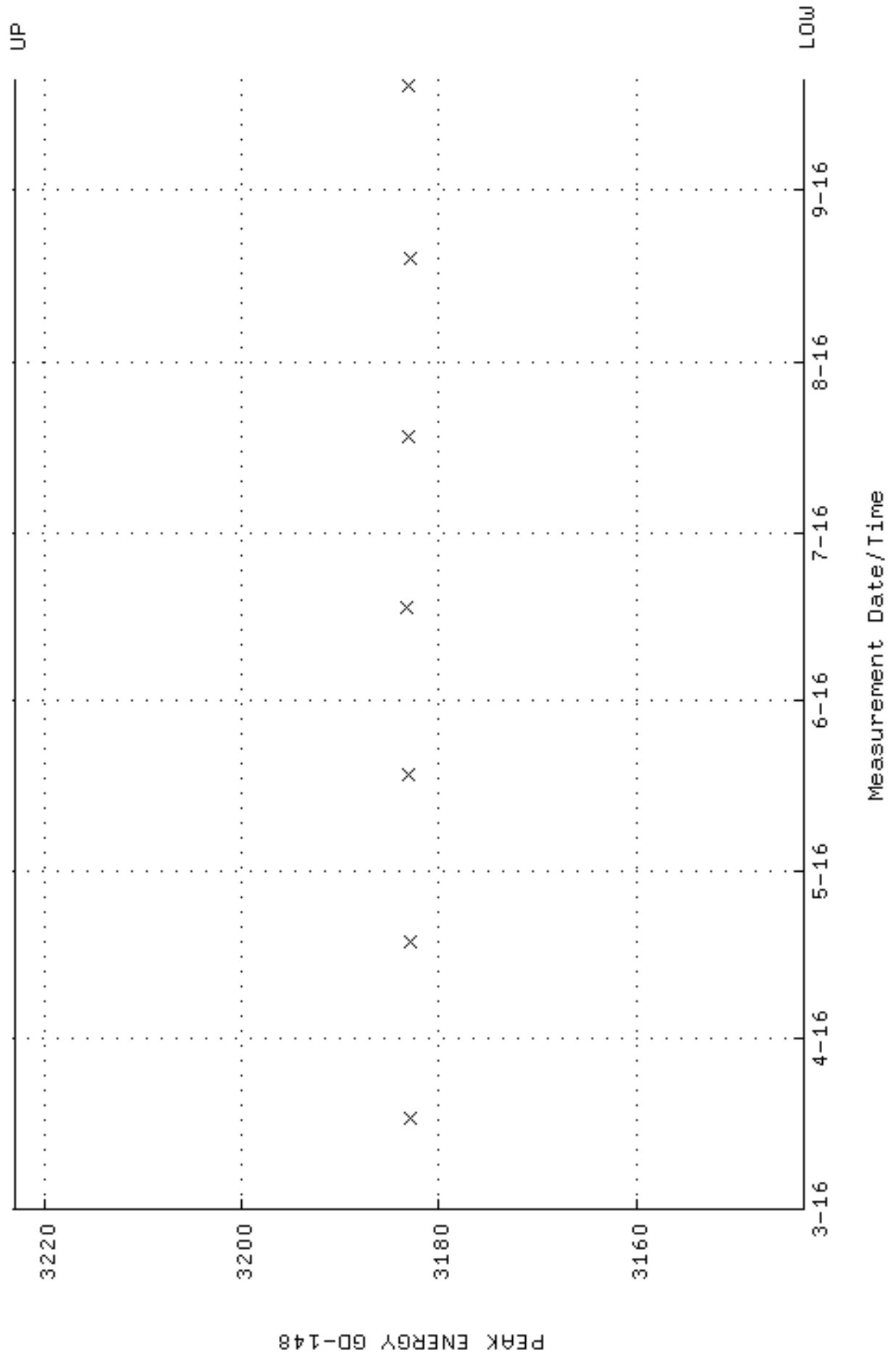
QA filename : DKA100:[ENV_ALPHA.QA.W]w254.QAF;3
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 17-MAR-2016 09:07:35 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



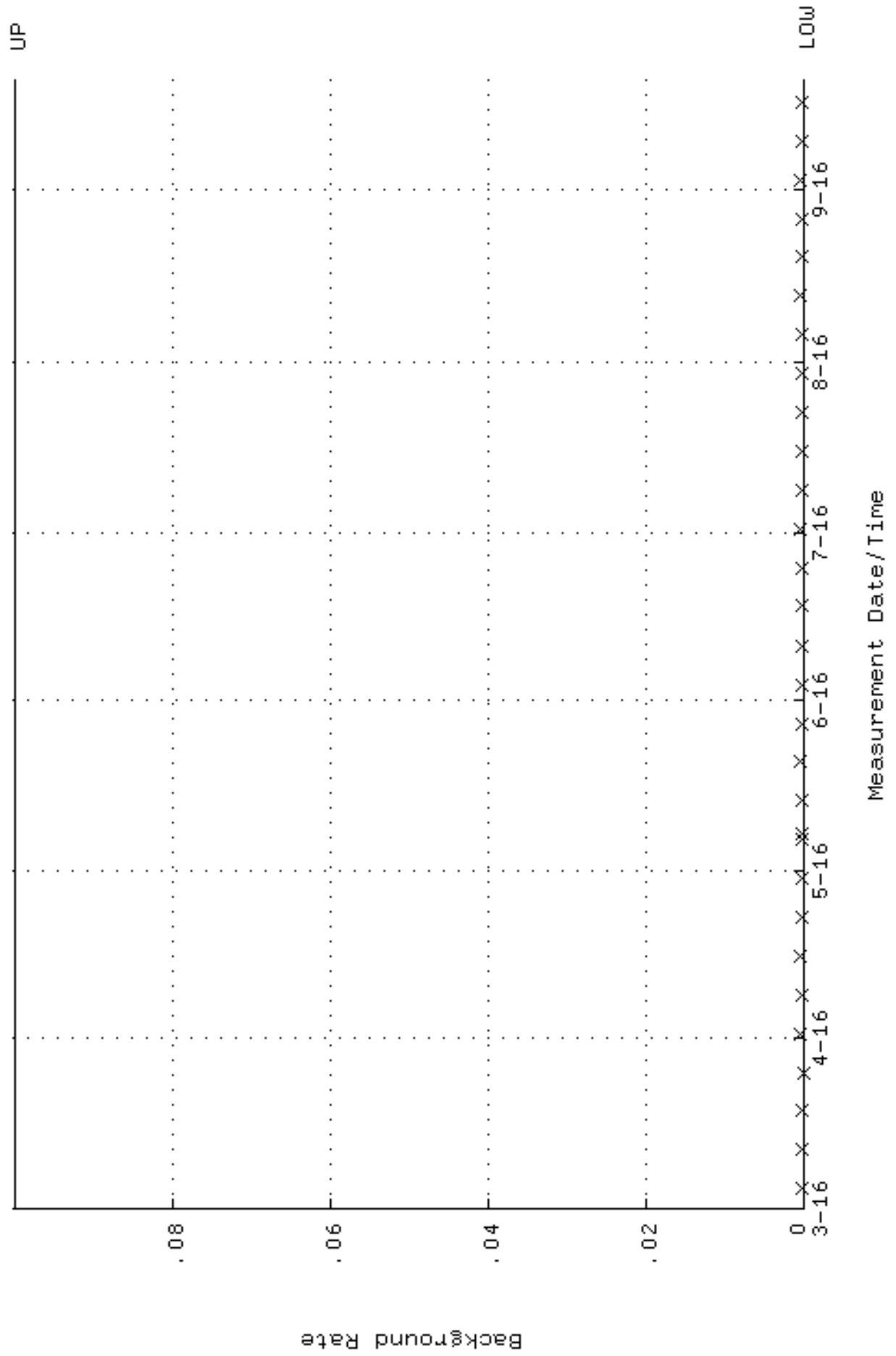
QA filename : DKA100:[ENV_ALPHA.QA.W]W254.QAF;3
 Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
 Start/End Dates : 17-MAR-2016 09:07:35 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 5.00000 through 100.000



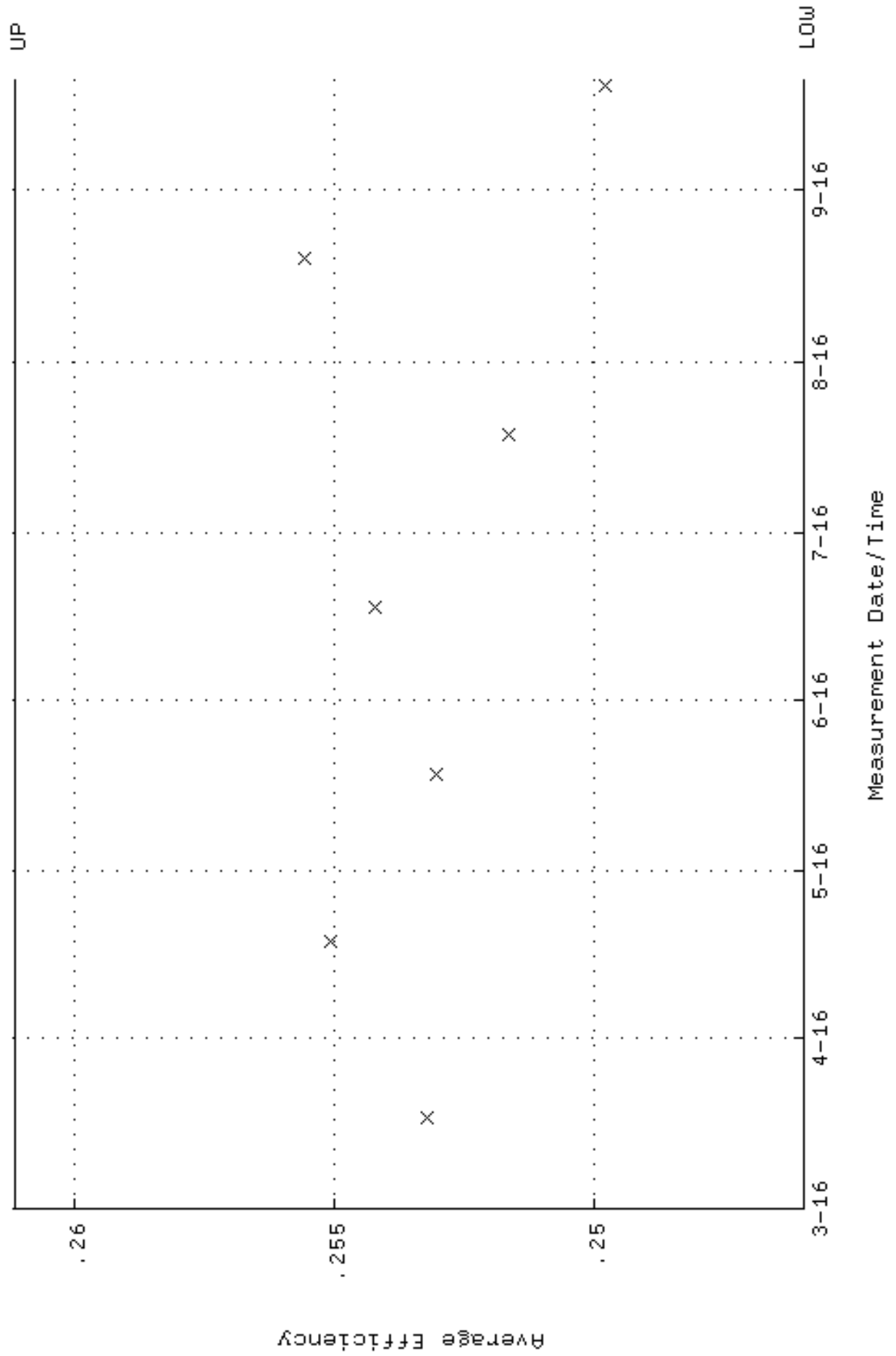
QA filename : DKA100:[ENV_ALPHA.QA.W]W254.QAF;3
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 09:07:35 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



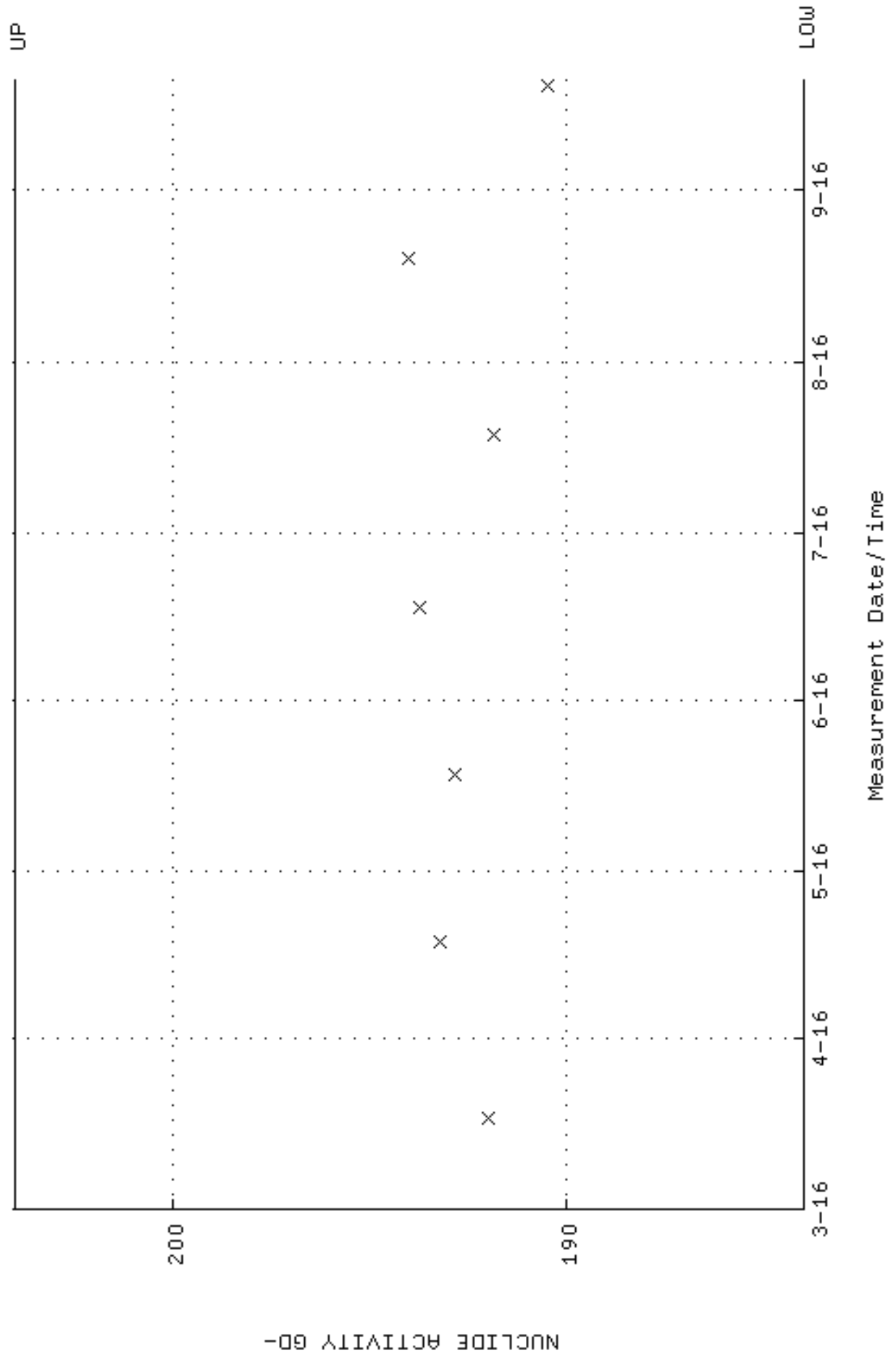
QA filename : DKA100:[ENV_ALPHA.QA.B]B254.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 4-MAR-2016 13:36:44 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



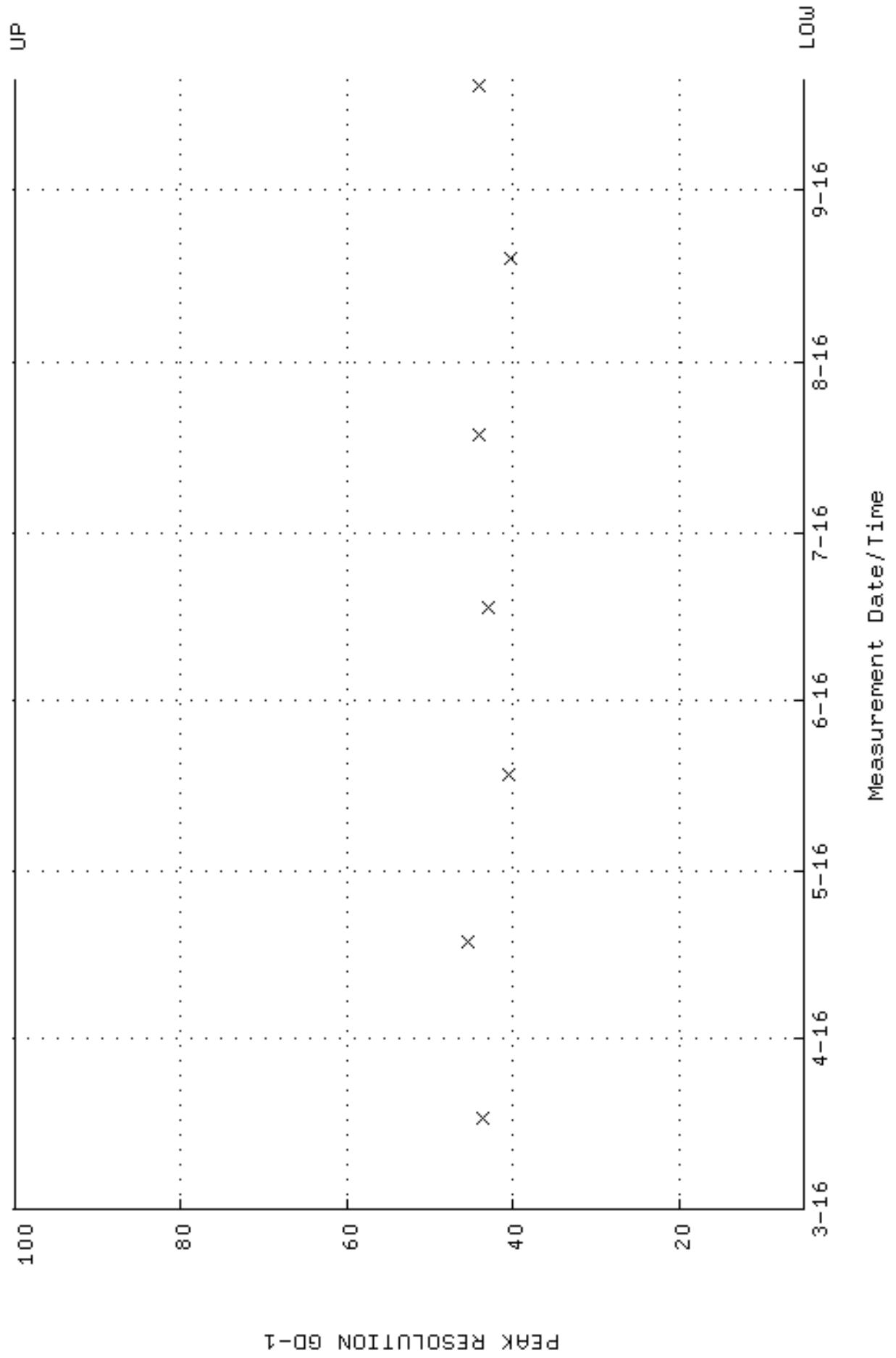
QA filename : DKA100:[ENV_ALPHA.QA.W]W255.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 09:07:39 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.245940 through 0.261150



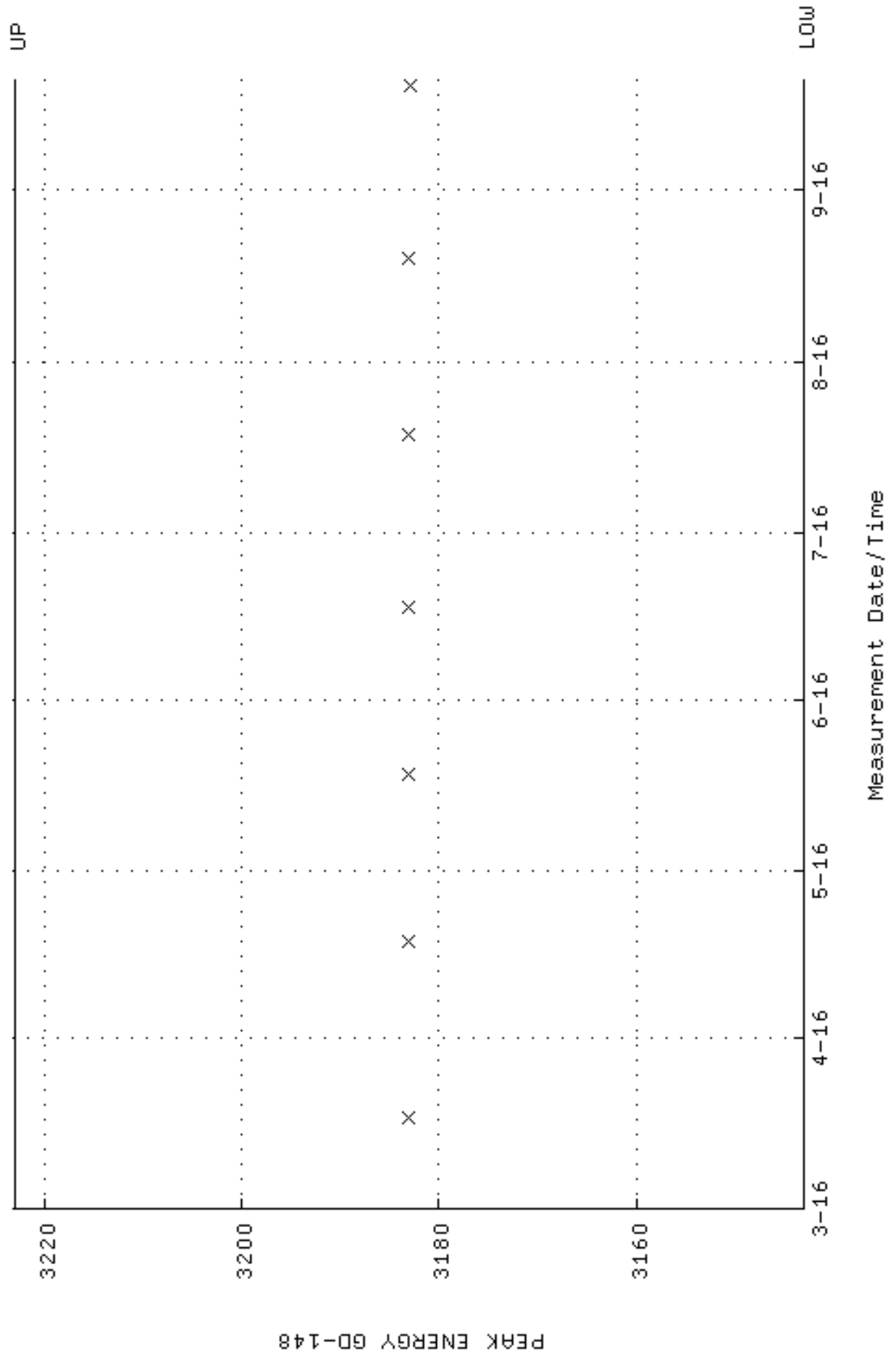
QA filename : DKA100:[ENV_ALPHA.QA.W]w255.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 17-MAR-2016 09:07:39 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



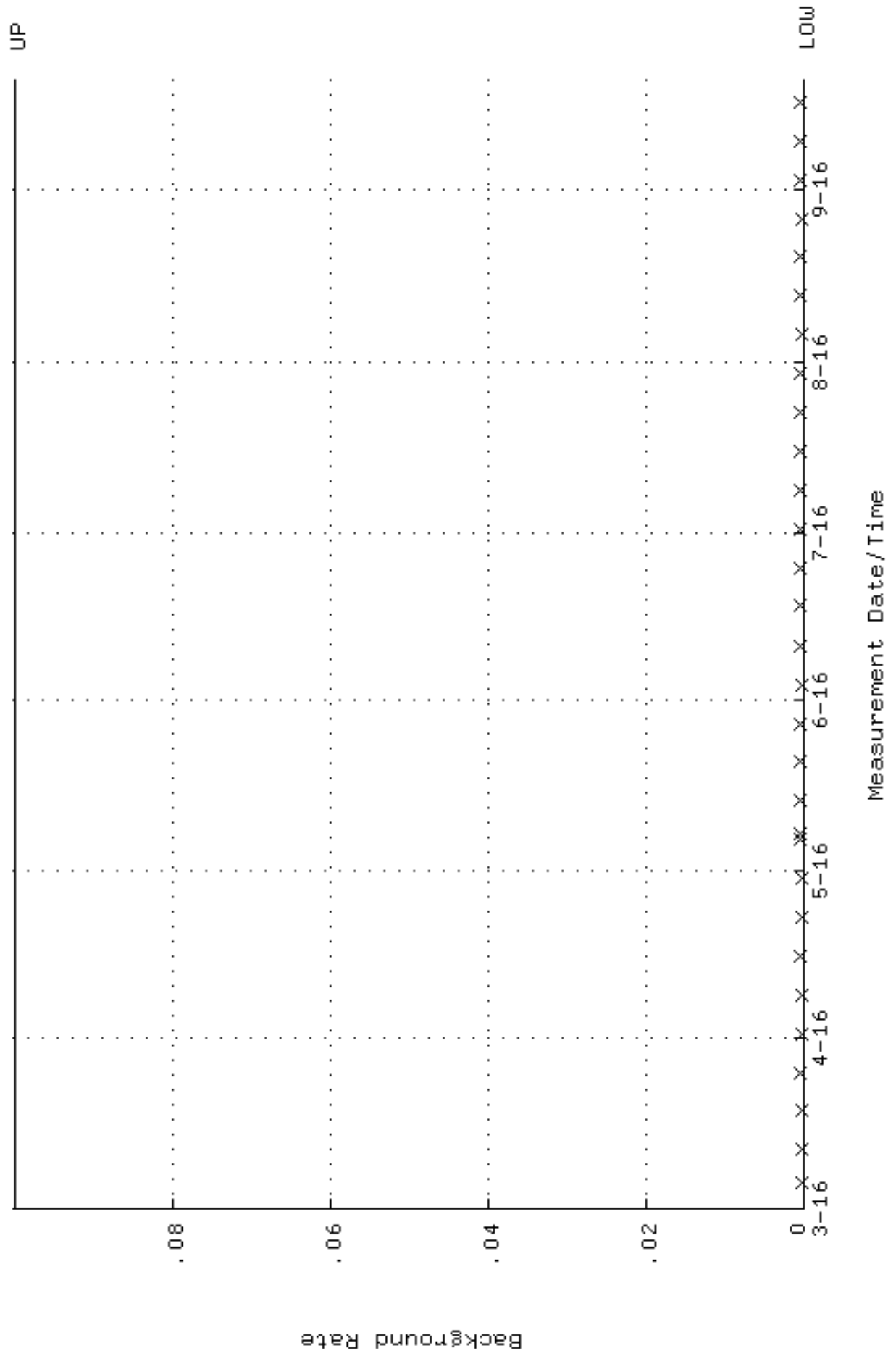
QA filename : DKA100:[ENV_ALPHA.QA.W]W255.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 17-MAR-2016 09:07:39 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



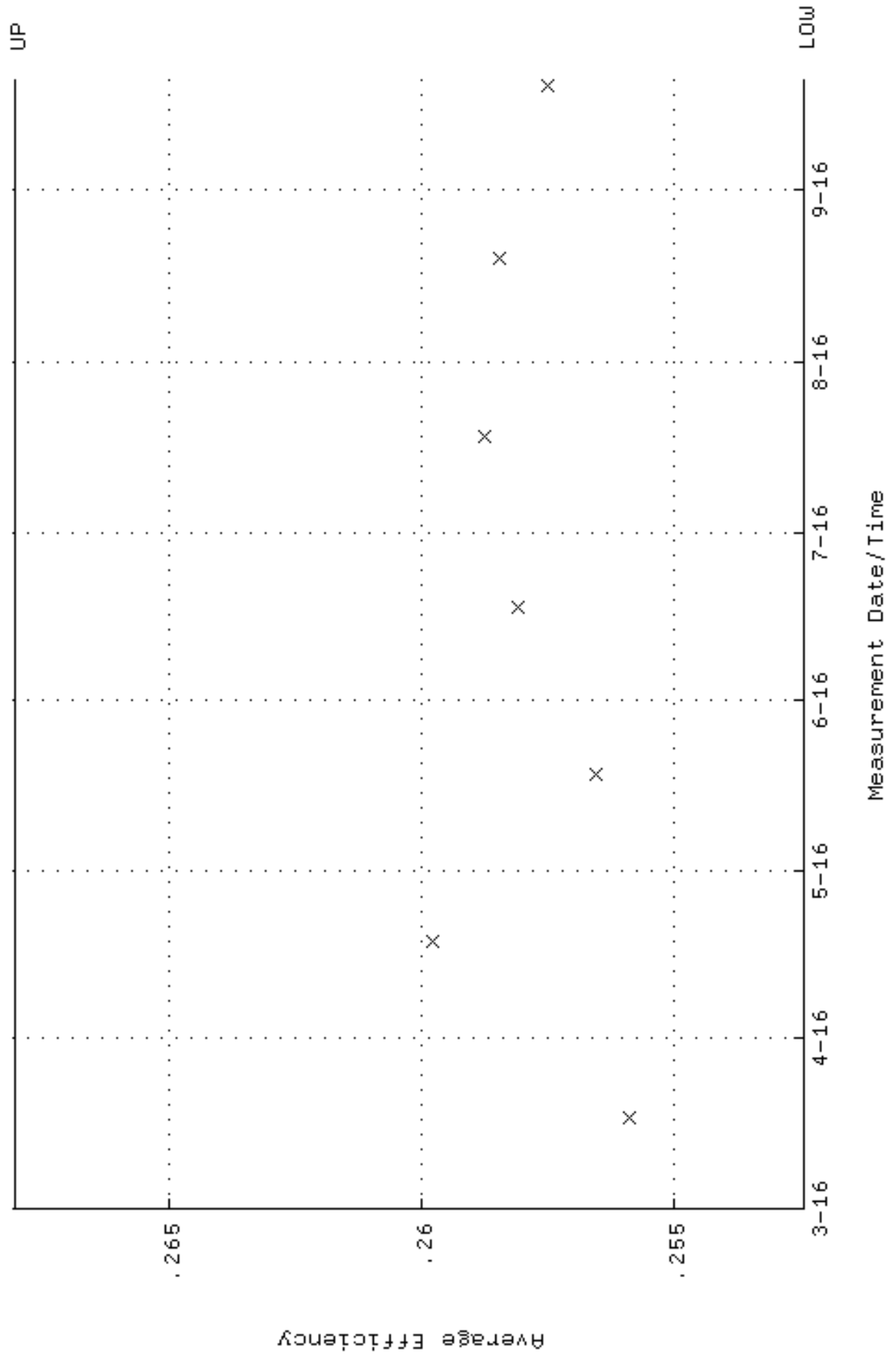
QA filename : DKA100:[ENV_ALPHA.QA.W]W255.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 09:07:39 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



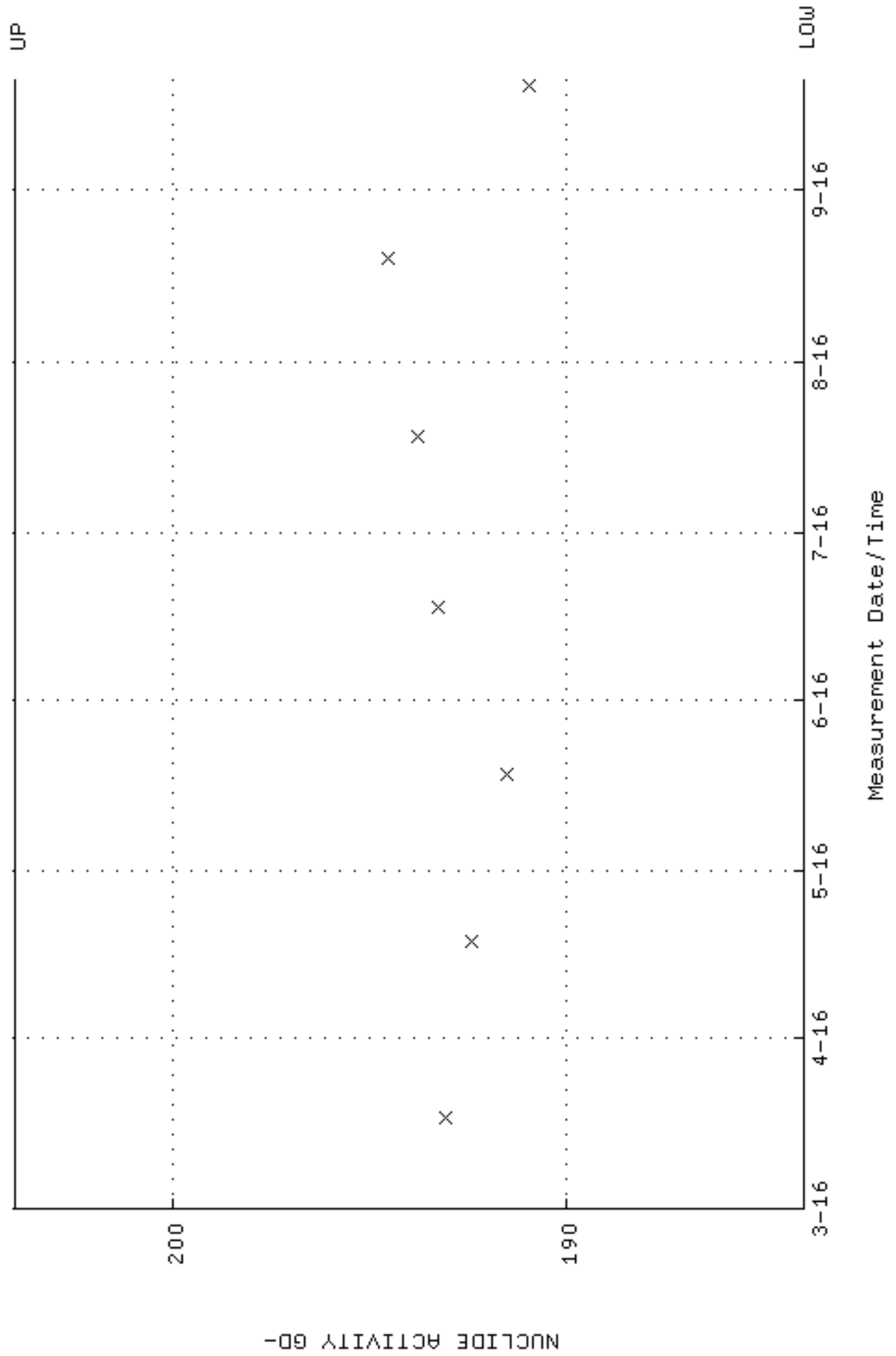
QA filename : DKA100:[ENV_ALPHA.QA.B]B255.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 5-MAR-2016 18:03:39 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



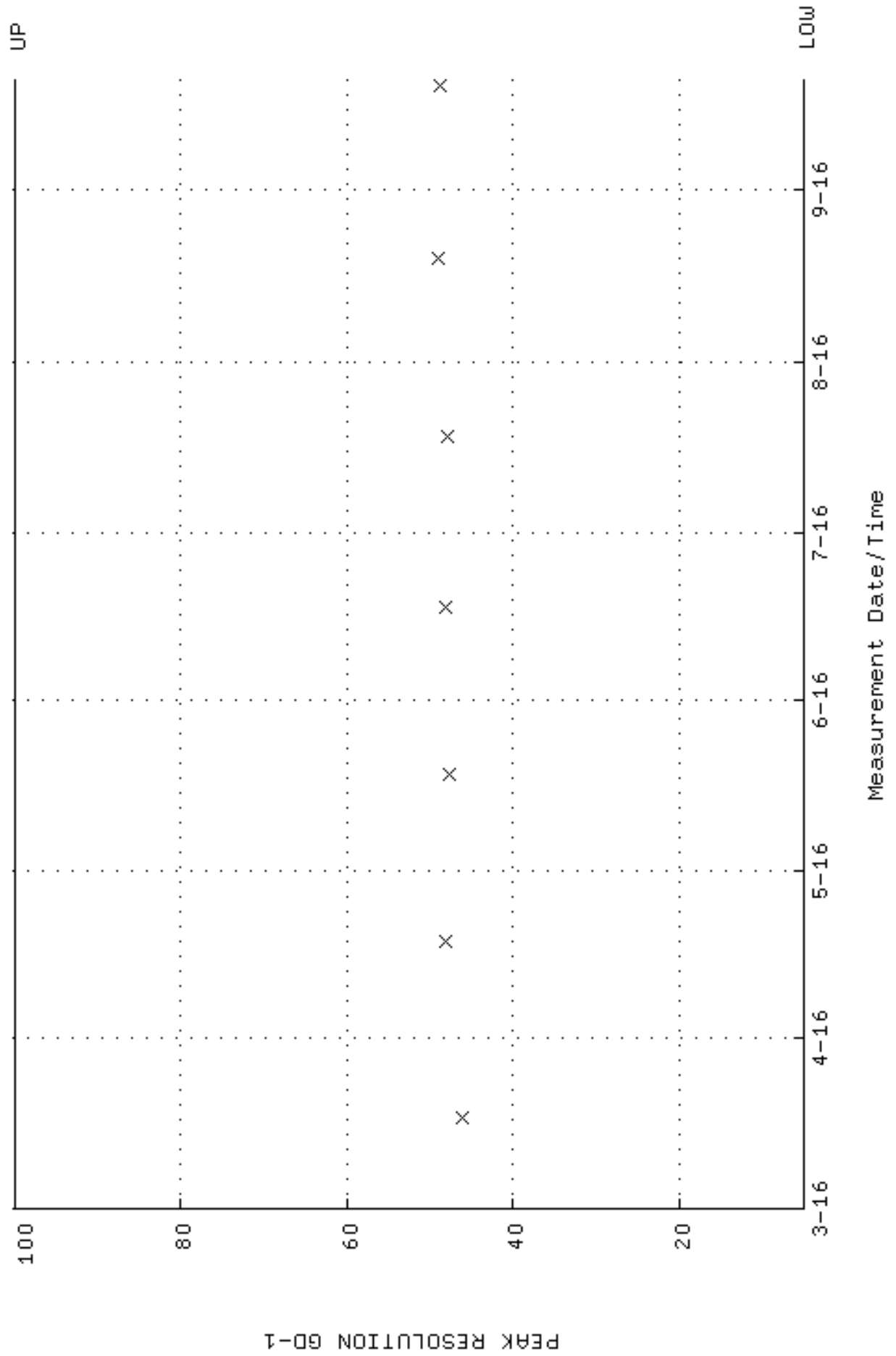
QA filename : DKA100:[ENV_ALPHA.QA.W]W256.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 17-MAR-2016 09:07:43 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.252440 through 0.268050



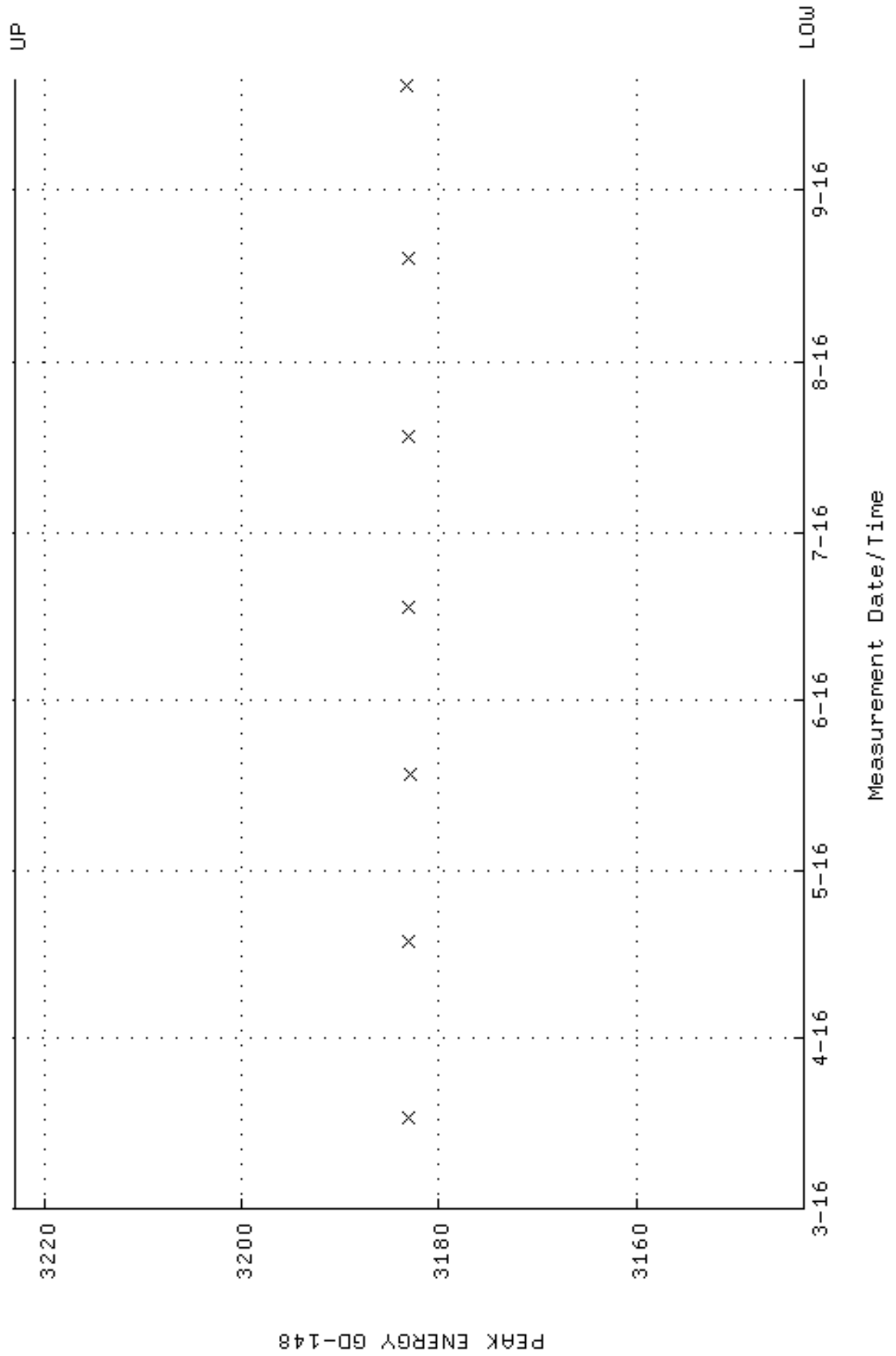
QA filename : DKA100:[ENV_ALPHA.QA.W]w256.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 17-MAR-2016 09:07:43 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 184.000 through 204.000



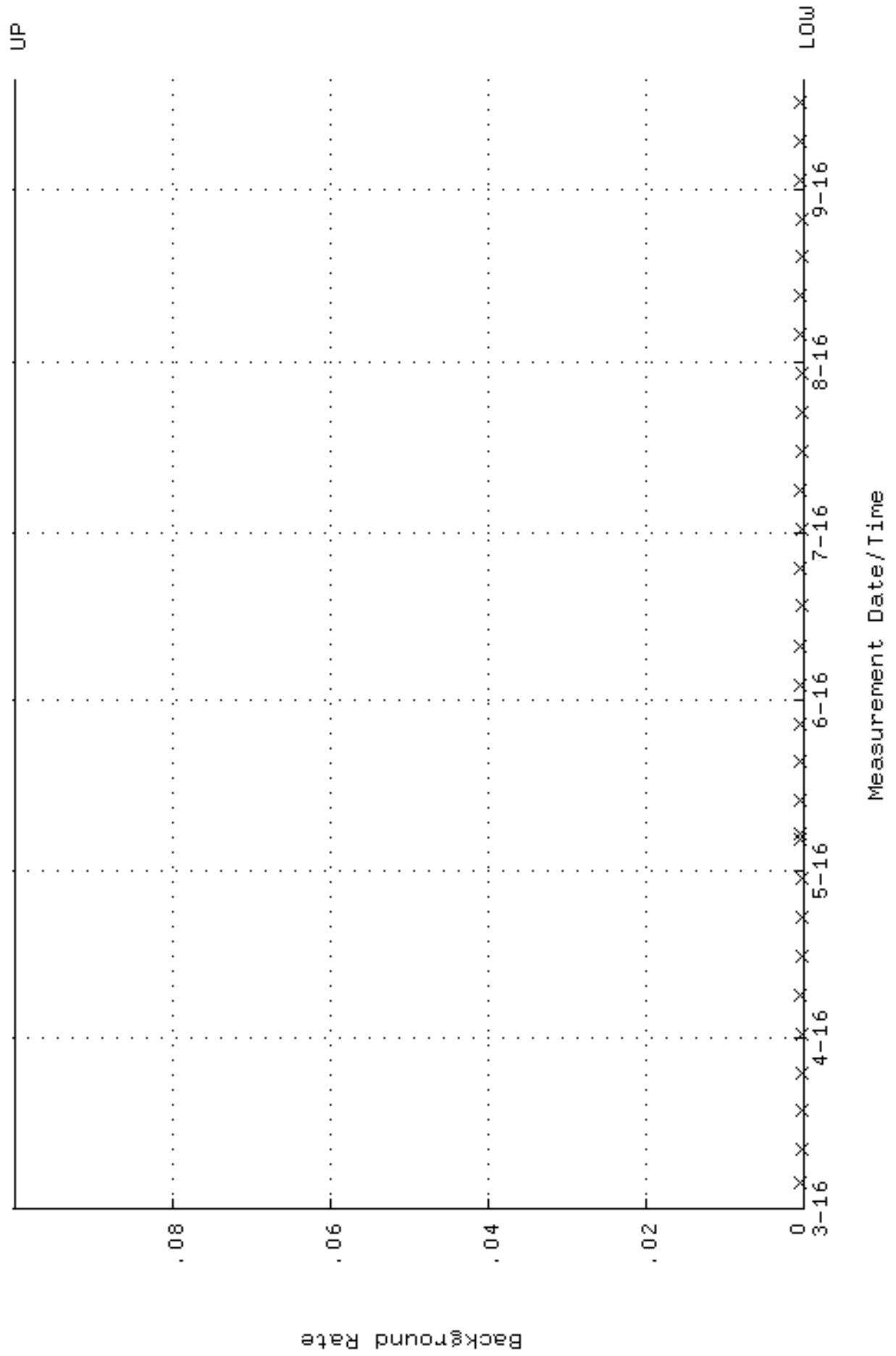
QA filename : DKA100:[ENV_ALPHA.QA.W]w256.QAF;4
Parameter Name : PSFWM-GD148 (PEAK RESOLUTION GD-148)
Start/End Dates : 17-MAR-2016 09:07:43 through 20-SEP-2016 12:00:00
Lower/Upper Lmts: 5.00000 through 100.000



QA filename : DKA100:[ENV_ALPHA.QA.W]W256.QAF;4
 Parameter Name : PSENERGY-GD148 (PEAK ENERGY GD-148)
 Start/End Dates : 17-MAR-2016 09:07:43 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 3143.00 through 3223.00



QA filename : DKA100:[ENV_ALPHA.QA.B]B256.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 5-MAR-2016 18:03:43 through 20-SEP-2016 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



RAD Standards Traceability

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

61762-278

Ac-227 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated using a germanium gamma spectrometer system.

Radionuclide purity and calibration were checked by alpha spectroscopy. The nuclear decay rate and assay date for this source are given below.

Analytics maintains traceability to the National Institute of Standards and Technology through participation in a Measurements Assurance Program as described in USNRC Reg. Guide 4.15, Revision 1, February 1979.

ISOTOPE:	Ac-227
ACTIVITY (dps):	2.085 E5
HALF-LIFE:	21.77 years
CALIBRATION DATE:	June 8, 2001 12:00 EST
TOTAL UNCERTAINTY*:	5.0%
SYSTEMATIC:	2.0%
RANDOM:	3.0%

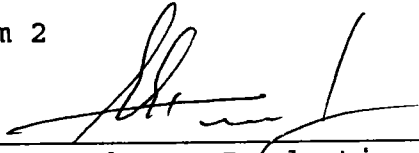
*99% Confidence Level

Impurities: γ -impurities (other than decay products) <0.1%
 α -impurities <0.3%

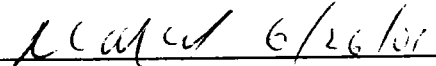
5.3136 grams 2M HNO₃ solution, carrier free.

P O NUMBER 2533RD, Item 2

SOURCE PREPARED BY:


E. A. Taskaev, Production Manager

Q A APPROVED:



RC-S-C34-C49a



Standard Traceability Log Rad

Source Material Info	
Parent Code:	0387
Prepared By:	Angela Johnson
Carrier Conc:	2 M HNO3
Reference Date:	06/08/2001
Ampoule Mass (g):	5.3136 g
Uncertainty:	+/- 5 %
LogBook No:	RC S 034-049a

A Solution Material Info		
Isotope:	Actinium-227	
Prepared By:	Angela Johnson	
Prep Date:	07/17/2001	
Verification Date:	08/02/2011	
Expiration Date:	07/31/2012	
Primary Code:	0387-A	
Dilution(mL):	100 mL	
Mass of Parent(g):	4.7794 g	
Density(g/mL):	1.0370	Balance ID:

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.7794 \text{ g}) * (208500 \text{ dps}) * (60 \text{ dpm/dps}) / (5.3136 \text{ g} * 100 \text{ mL}) = 112523.1369 \text{ dpm/mL}$
$(4.7794 \text{ g}) * (208500 \text{ dps}) * (60 \text{ dpm/dps}) / (1.0370 \text{ g/mL}) / (5.3136 \text{ g} * 100 \text{ mL}) = 108511.1539 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
07/17/2001	Lonnie Morris	.4684	1000	0387-B-102	50.8266 dpm/mL	07/22/2010	07/22/2011
07/17/2001	Lonnie Morris	.4684	1000	0387-B-202	50.827 dpm/mL	07/11/2004	07/11/2005
05/12/2011	Ashley Drochter	.4605	1000	0387-B-302	49.9694 dpm/mL	05/12/2011	05/12/2012
08/01/2011	Ashley Drochter	.4603	1000	0387-B-402	49.9477 dpm/mL	05/31/2016	05/31/2017

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Ac-227 Standard 0387-B-402

v1.2

Analyst	TC1
Verification Prep Date	5/31/2016

Tracer Information	
Isotope	Th-230
Serial Number	1242-H
Amount of Std. (mL)	0.5
Expiration Date	2/11/2017

Standard Information	
Isotope	Ac-227
Serial Number	0387-B-402
Isotope Half-life	21.7730 Y
Reference Date	6/8/2001
Ref. Act. (dpm/mL)	49.9477
Amount of Std. (mL)	0.5
Standard Prep Date	8/1/2011

Std #	Count Date	Activity pCi	Standard dpm/mL
1	5/31/2016	7.280	32.32
2	5/31/2016	7.530	33.43
3	5/31/2016	7.180	31.88

Mean Value = 7.330 32.545
 Stdev = 0.180277564 0.800432383

Certificate Value* = 6.9829 pCi
 Two sigma = 0.3606
 10 % of Mean = 0.7330
 Rule A (Pass/Fail) Pass
 % Recovery 104.97%
 Rule B (Pass/Fail) Pass
 Expiration Date 5/31/2017

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Verification Prep Date.

The analyst prepared three standard verification sources for Ac-227 standard 0387-B-402 using 0.5 mL for each source. Each standard was combined with 0.5 mL of Th-230 standard 1242-H and was diluted in a 50 mL plastic centrifuge tube containing 10 mL of 8M HNO₃. The verification sources were then passed through an AG 1x8 column and eluted with 20mL 9M HCl. The elution was cooked dry, wet ashed and then dissolved in 5mL 2M HCl. The 2M HCl solution was transferred to a disposable centrifuge tube using deionized water and was analyzed following SOP GL-RAD-A-038. 100 micrograms of neodymium and five mL of 48% HF was added to precipitate neodymium (and Actinium) fluoride. After 30 minutes, each sample was filtered following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. DPM values for Ac-227 were calculated by comparison to Th-230 certified values.

TC1

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

65338-278

Am-241 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Am-241
ACTIVITY (dps):	3.920 E4
HALF-LIFE:	4.322 E2 years
CALIBRATION DATE:	January 15, 2003 12:00 EST
TOTAL UNCERTAINTY*:	3.2%
SYSTEMATIC:	2.2%
RANDOM:	1.0%

*99% confidence level.

5.10649 grams 1M HCl solution.

Impurities: γ -impurities <0.1%
 α -impurities <0.1%

P O NUMBER 3213 RD, Item 1

SOURCE PREPARED BY: M. Taskaeva
M. Taskaeva, Radiochemist

Q A APPROVED:

UM [Signature] 1-16-03

RC-S-035-046a



Standard Traceability Log Rad

Source Material Info	
Parent Code:	0533
Prepared By:	Angela Johnson
Carrier Conc:	1 M HCL
Reference Date:	01/15/2003
Ampoule Mass (g):	5.10649 g
Uncertainty:	+/- 1.24 %
LogBook No:	RC S 035 048

A Solution Material Info		
Isotope:	Americium-241	
Prepared By:	Angela Johnson	
Prep Date:	02/05/2003	
Verification Date:	01/22/2016	
Expiration Date:	01/22/2017	
Primary Code:	0533-A	
Dilution(mL):	100 mL	
Mass of Parent(g):	4.8225 g	
Density(g/mL):	1.0139	Balance ID:

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.8225 \text{ g}) * (39200 \text{ dps}) * (60 \text{ dpm/dps}) / (5.10649 \text{ g} * 100 \text{ mL}) = 22211.9695 \text{ dpm/mL}$
$(4.8225 \text{ g}) * (39200 \text{ dps}) * (60 \text{ dpm/dps}) / (1.0139 \text{ g/mL}) / (5.10649 \text{ g} * 100 \text{ mL}) = 21907.2185 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
02/20/2003	Angela Johnson	1.0151	100	0533-B	222.38 dpm/mL	03/01/2006	03/01/2007
01/16/2015	Christina Kimball	.005081	500	0533-BB	.22263 dpm/mL	01/14/2016	01/14/2017
02/20/2003	Angela Johnson	.6819	250	0533-C	59.754 dpm/mL	02/20/2004	02/20/2005
05/04/2015	Tim Chandler	1.02	500	0533-CC	44.6907 dpm/mL	04/21/2016	04/21/2017
05/07/2003	Tim Chandler	.1245	100	0533-D	27.2745 dpm/mL	05/03/2004	05/03/2005
01/22/2016	Christina Kimball	.103	500	0533-DD	4.51289 dpm/mL	01/22/2016	01/22/2017
09/10/2004	Amanda Fehr	.6933	250	0533-E	60.753 dpm/mL	09/10/2005	09/10/2006
12/17/2004	Brenda Burke	.0093	100	0533-F	2.0374 dpm/mL	12/20/2004	12/20/2005

12/21/2004	Brenda Burke	.009273	100	0533-G	2.0315 dpm/mL	12/07/2005	12/07/2006
04/28/2005	Brenda Burke	.1347	100	0533-H	29.4598 dpm/mL	04/27/2006	04/27/2007
10/19/2005	Mary Aders	.6948	250	0533-I	60.7831 dpm/mL	10/18/2006	10/18/2007
05/08/2006	Julie Strock	.0711	100	0533-J	15.576 dpm/mL	05/10/2008	05/10/2009
05/11/2006	Brenda Burke	.00092601	100	0533-K	.20286 dpm/mL	08/02/2007	07/28/2007
11/15/2006	Tara Sides	.132	1000	0533-L	2.88586 dpm/mL	09/15/2015	09/15/2016
06/12/2007	Julie Strock	.000979	100	0533-M	.21448 dpm/mL	05/20/2009	05/20/2010
08/03/2007	Daniel Roy	.7042	250	0533-N	61.7083 dpm/ml	08/02/2008	08/02/2009
09/25/2008	Daniel Roy	1.4561	500	0533-O	63.7982 dpm/ml	09/07/2010	09/07/2011
09/29/2008	Tara Sides	.1004	100	0533-P	21.9948 dpm/mL	09/07/2010	09/07/2011
06/03/2009	Julie Strock	.0009751	100	0533-Q	.2136 dpm/mL	06/01/2010	06/01/2011
11/08/2010	Ashley Drochter	1.4675	500	0533-R	64.2977 dpm/mL	11/08/2010	11/08/2011
11/09/2010	Ashley Drochter	.7295	500	0533-S	31.9626 dpm/mL	10/31/2011	10/31/2012
01/03/2011	Christina Kimball	.097	100	0533-T	21.25 dpm/mL	01/03/2011	01/03/2012
01/05/2011	Christina Kimball	.1009	100	0533-U	22.10438 dpm/mL	12/18/2013	12/18/2014
05/23/2011	Christina Kimball	.001008999	100	0533-V	.2210438 dpm/mL	05/11/2012	05/11/2013
05/11/2012	Christina Kimball	.001016	100	0533-W	.222676 dpm/mL	05/01/2014	05/01/2015
06/13/2012	Ashley Drochter	.728	500	0533-X	31.8969 dpm/mL	06/02/2014	06/02/2015
01/23/2013	Salina Pizarro	2	500	1641	.1498555 dpm/mL	12/19/2013	12/01/2038
07/16/2013	Julie Strock	1	500	1641-A	.07492775 dpm/mL	07/16/2038	07/16/2039
03/17/2014	Christina Kimball	.1013	100	0533-Y	22.19201 dpm/mL	03/14/2016	03/14/2017
05/05/2014	Christina Kimball	.00101595	100	0533-Z	.222567 dpm/mL	05/05/2014	05/05/2015

Verification for Am-241 Standard 0533-CC

v1.2

Analyst	TC1
Verification Prep Date	4/21/2016

Tracer Information	
Isotope	Am-243
Serial Number	1752-B
Amount of Std. (mL)	0.5
Expiration Date	11/23/2016

Standard Information	
Isotope	Am-241
Serial Number	0533-CC
Isotope Halflife	432.6000 Y
Reference Date	1/15/2003
Ref. Act. (dpm/mL)	44.6907
Amount of Std. (mL)	0.5
Standard Prep Date	5/4/2015

Std #	Count Date	Activity pCi	Standard dpm/mL
1	4/21/2016	9.430	41.87
2	4/21/2016	9.520	42.27
3	4/21/2016	9.880	43.87

Mean Value = 9.610 42.668
 Stdev = 0.238117618 1.057242224

pCi 9.8538
 Certificate Value* = 0.4762
 Two sigma = 2.1145
 10 % of Mean = 0.9610
 Rule A (Pass/Fail) Pass
 % Recovery 97.53%
 Rule B (Pass/Fail) Pass
 Expiration Date 4/21/2017

dpm/mL 43.7509
 2.1145
 4.2668
 Pass
 97.53%
 Pass

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Verification Prep Date.

The analyst prepared three standard verification sources for Am-241 standard 0533-CC using 0.5 mL for each source. Each standard was combined with 0.5 mL of Am-243 standard 1752-B and was diluted in a 50 mL plastic centrifuge tube containing 10 mL of 1M HCl. 100 micrograms of neodymium carrier and five mL of 48% HF was added to precipitate neodymium (and Americium) fluoride. After 30 minutes, each sample was filtered following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. DPM values for Am-241 were calculated by comparison to Am-243 certified values.

TC
 4-22-16

CERTIFICATE OF CALIBRATION
Standard Reference Source

1752

101294

Am-243 5 mL Liquid in Flame Sealed Vial



Customer: GEL Laboratories, LLC
P.O. No.: GEL1511998, Item 1 **Product Code:** 8243


This standard radionuclide source was prepared gravimetrically from a master solution calibrated by Eckert & Ziegler Analytics, using a germanium gamma spectrometer system. Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty* , %			Reference Date (12:00 PM EST)
			u _A	u _B	U	
Am-243	2.692E+06	3.809E+04	0.5	1.8	3.7	09/01/2015

***Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

Impurities: γ -impurities (other than decay products) < 0.1%.
5.10328 g 1M HCl solution, carrier free.

Source Prepared by: 
Z. Dimitrova, Radiochemist

QC Approved: 
J. S. Lehr, Spectroscopist

Date: 28 AUG 15



Standard Traceability Log Rad

Source Material Info	
Parent Code:	1752
Prepared By:	Gregory Ramsay
Carrier Conc:	1M HCl
Reference Date:	09/01/2015
Ampoule Mass (g):	5.10528 g
Uncertainty:	+/- 1.85 1
LogBook No:	GL-CED-297-045

A Solution Material Info		
Isotope:	Americium-243	
Prepared By:	Tim Chandler	
Prep Date:	11/23/2015	
Verification Date:	05/26/2016	
Expiration Date:	05/26/2017	
Primary Code:	1752-A	
Dilution(mL):	100 mL	
Mass of Parent(g):	5.0826 g	
Density(g/mL):	1.0282	Balance ID: C31514

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(5.0826 \text{ g}) * (38090 \text{ Bq}) * (60 \text{ dpm/Bq}) / (5.10528 \text{ g} * 100 \text{ mL}) = 22752.4720 \text{ dpm/mL}$
$(5.0826 \text{ g}) * (38090 \text{ Bq}) * (60 \text{ dpm/Bq}) / (1.0282 \text{ g/mL}) / (5.10528 \text{ g} * 100 \text{ mL}) = 22128.4498 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
11/23/2015	Tim Chandler	1.0432	500	1752-B	46.1688 dpm/mL	11/24/2015	11/23/2016
05/26/2016	Tim Chandler	1.072	500	1752-C	47.4434 dpm/mL	05/26/2016	05/26/2017

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Am-243 Standard 1752-C

v1.2

Analyst	TC1
Verification Prep Date	5/26/2016

Tracer Information	
Isotope	Am-241
Serial Number	0533-CC
Amount of Std. (mL)	0.5
Expiration Date	4/21/2017

Standard Information	
Isotope	Am-243
Serial Number	1752-C
Isotope Half-life	7.3700E+03 Y
Reference Date	9/1/2015
Ref. Act. (dpm/mL)	47.4434
Amount of Std. (mL)	0.5
Standard Prep Date	5/26/2016

Std #	Count Date	Activity pCi	Standard dpm/mL
1	5/27/2016	11.100	49.28
2	5/26/2016	10.900	48.40
3	5/26/2016	10.700	47.51

Mean Value = 10.900 48.396
 Stdev = 0.2 0.888

Certificate Value* = 10.6847 pCi
 Two sigma = 0.4000
 10 % of Mean = 1.0900
 Rule A (Pass/Fail) Pass
 % Recovery 102.01%
 Rule B (Pass/Fail) Pass
 Expiration Date 5/26/2017

dpm/mL
 47.4401
 1.7760
 4.8396
 Pass
 102.01%
 Pass

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Verification Prep Date.

The analyst prepared three standard verification sources for Am-243 standard 1752-C using 0.5 mL for each source. Each standard was combined with 0.5 mL of Am-241 standard 0533-CC and was diluted in a 50 mL plastic centrifuge tube containing 15 mL of 1M HCl. 100 micrograms of neodymium carrier and five mL of 48% HF was added to precipitate neodymium (and Americium) fluoride. After 30 minutes, each sample was filtered following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. DPM values for Am-243 were calculated by comparison to Am-241 certified values.

TPC
 5-27-16

CERTIFICATE OF CALIBRATION ALPHA STANDARD SOLUTION

Radionuclide	Am-243	Customer:	GENERAL ENGINEERING LABS
Half Life:	7380 ± 40 years	P.O.No.:	9290-RAD
Catalog No.:	7243	Reference Date:	January 1 1994 12:00 PST.
Source No.:	445-96-2	Contained Radioactivity:	(Am-243) 101.2 μCi
		Contained Radioactivity:	(Am-243) 3750 kBq

Description of Solution

a. Mass of solution:	5.3739 g (in a 5 ml Flame Sealed Ampoule)
b. Chemical form:	Am(NO ₃) ₃ in 2N HNO ₃
c. Carrier content:	None added
d. Density:	1.0651 g/ml @ 20°C.

Radioimpurities None detected

Radioactive Daughters Np-239 (beta active) in equilibrium

Radionuclide Concentration
(Am-243) 18.84 μCi/g

Method of Calibration

Weighed aliquots of the solution were assayed using gamma spectrometry for Np-239:

Energy peak(s) intergrated under:	228, 278	keV.
Branching ratio(s) used:	0.108, 0.1420	gamma rays per decay.

Uncertainty of Measurement

a. Systematic uncertainty in instrument calibration:	±3.0%
b. Random uncertainty in assay:	±0.4%
c. Random uncertainty in weighing(s):	±0.0%
d. Total uncertainty at the 99% confidence level:	±3.0%

NIST Traceability

This calibration is implicitly traceable to the National Institute of Standards and Technology.

Leak Test(s)

See reverse side for Leak Test(s) applied to this source.

Notes

1. Nuclear data were taken from "Table of Radioactive Isotopes", edited by Virginia S. Shirley, 1986.
2. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).



ISOTOPE PRODUCTS LABORATORIES
1800 North Keystone Street
Burbank, California 91504
(818) 843 - 7000

Anna U. Khan
QUALITY CONTROL

Jan 3, 1994
Date Signed

THE LEAK TEST(S) INDICATED BY THE CHECKED BOX(ES) WAS(WERE) APPLIED TO
DETERMINE THE INTEGRITY OF THE SOURCE DESCRIBED ON THE FRONT SIDE

1. STANDARD WIPE TEST

The source is wiped over its entire surface with a moistened filter paper disk. After drying, the disk is checked for activity using a windowless proportional counter or end-window G.M. tube. Activity levels exceeding 0.001 μCi beta-gamma or 0.0001 μCi alpha are cause for rejection of the source.

2. SOAK TEST

The source is immersed in distilled water and maintained at $50 \pm 10^\circ \text{C}$ for a minimum of four hours. After removal of the source, the liquid is a) checked for activity using a liquid scintillation counter, or b) evaporated in a planchet and the residue is checked for activity using a windowless proportional counter or end-window G.M. tube. Activity levels exceeding 0.001 μCi beta-gamma or 0.0001 μCi alpha are cause for rejection of the source.

3. SOAK TEST -- BERYLLIUM WINDOW

The source is immersed in distilled water and maintained at $50 \pm 10^\circ \text{C}$ for 20 minutes. The entire surface of the source is then wiped with a moistened cotton swab or filter paper disk. After drying, the swab or disk is checked for activity using a windowless proportional counter or end-window G.M. tube. Activity levels exceeding 0.001 μCi beta-gamma or 0.0001 μCi alpha are cause for rejection of the source.

4. GAS SOURCE TEST (Radioactive Gas)

The source is placed in a vacuum desiccator and maintained at a pressure of less than 1 mm Hg for not less than 12 hours. The activity is checked by introducing air into the desiccator and monitoring the air with an end-window G.M. tube. Activity levels exceeding 1000 cpm are cause for rejection of the source.

5. OTHER LEAK TEST

The ampoule is kept in an inverted position on a filter paper disk for a minimum of 16 hours. The filter paper disk is then checked for activity using a windowless proportional counter or end-window G.M. tube. Activity levels exceeding 0.001 μCi beta-gamma or 0.0001 μCi alpha are cause for rejection of the source.

6. LEAK TEST NOT APPLICABLE

The active area of this source is uncovered or is protected by a very thin coating. Although the deposit is adherent, it is not designed or certified to pass a standard leak test. The inactive portions of the source have been checked using the standard wipe test. Levels of removable activity did not exceed 0.001 μCi beta-gamma or 0.0001 μCi alpha at the time of shipment.



Standard Traceability Log Rad

Source Material Info	
Parent Code:	445-96-2
Prepared By:	Genie Bost
Carrier Conc:	2M HNO3
Reference Date:	01/01/1994
Ampoule Mass (g):	5.3739 g
Uncertainty:	+/- 3 %
LogBook No:	RC S 005 032

A Solution Material Info			
Isotope:	Americium-243		
Prepared By:	Angela Johnson		
Prep Date:	01/05/1994		
Verification Date:	08/01/2016		
Expiration Date:	08/01/2017		
Primary Code:	445-96-2-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	5.3419 g		
Density(g/mL):	1.0785	Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (uCi/g)}) * (\text{conversion dpm to uCi}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (uCi/g)}) * (\text{conversion dpm to uCi}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(5.3419 \text{ g}) * (18.8317609 \text{ uCi/g}) * (2220000 \text{ dpm/uCi}) / (100 \text{ mL}) = 2233261.9148 \text{ dpm/mL}$
$(5.3419 \text{ g}) * (18.8317609 \text{ uCi/g}) * (2220000 \text{ dpm/uCi}) / (1.0785 \text{ g/mL}) / (100 \text{ mL}) = 2070711.0942 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
01/05/1994	Genie Bost	.0058	100	445-96-2-B	120.1 dpm/ml	01/05/1995	01/05/1996
09/10/2004	Amanda Fehr	.0325	1000	445-96-2-BB	67.328 dpm/mL	09/10/2005	09/10/2006
06/29/2011	Christina Kimball	.0010549	500	445-96-2-BBB	4.37074 dpm/mL	06/29/2011	06/29/2012
01/05/1994	Genie Bost	.0025	100	445-96-2-C	51.77 dpm/ml	01/05/1995	01/05/1996
05/27/2005	Brenda Burke	.000246	100	445-96-2-CC	5.10613 dpm/mL	05/31/2005	05/31/2006
05/07/2012	Christina Kimball	.001059	500	445-96-2-CCC	4.38535 dpm/mL	05/01/2013	05/01/2014
03/25/1994	Genie Bost	.0064	100	445-96-2-D	132.53 dpm/ml	01/05/1995	01/05/1996
08/16/2005	Brenda Burke	.001224	500	445-96-2-DD	5.07144 dpm/mL	08/18/2007	08/18/2008

06/13/2012	Christina Kimball	.00001105	100	445-96-2-DDD	.2288308 dpm/mL	07/29/2016	07/29/2017
08/04/1994	Genie Bost	.0094	100	445-96-2-E	194.65 dpm/ml	01/05/1995	01/05/1996
10/13/2005	Brenda Burke	.0017	500	445-96-2-EE	7.0435 dpm/mL	11/15/2005	11/15/2006
11/15/2012	Ashley Drochter	2.0992	1000	445-96-2-EEE	4346.8367 dpm/mL	11/21/2014	11/21/2015
03/21/2015	Christina Kimball	.00106557	500	445-96-2-GGG	4.41297 dpm/mL	03/17/2016	03/17/2017
07/20/2015	Christina Kimball	.00631239	500	445-96-2-HHH	26.14226 dpm/mL	07/18/2016	07/18/2017
08/04/1994	Genie Bost	.0046	100	445-96-2-F	95.25 dpm/ml	01/05/1995	01/05/1996
10/14/2005	Mary Aders	.0141	500	445-96-2-FF	58.4196 dpm/mL	10/14/2005	10/14/2006
09/01/1994	Genie Bost	.0031	100	445-96-2-G	64.19 dpm/ml	01/05/1995	01/05/1996
05/10/2006	Mary Aders	2.0753	1000	445-96-2-GG	4299.227 dpm/mL	09/30/2008	09/30/2009
10/17/1994	Genie Bost	.0969	100	445-96-2-H	2006.52 dpm/ml	01/05/1995	01/05/1996
06/07/2006	Mary Aders	.0365	1000	445-96-2-HH	75.614 dpm/mL	06/19/2006	06/19/2007
02/06/1995	Genie Bost	.0043	100	445-96-2-I	89.04 dpm/ml	01/05/1995	01/05/1996
05/11/2006	Brenda Burke	.000009739	100	445-96-2-II	.201761 dpm/mL	07/26/2006	07/26/2007
09/30/2015	Tim Chandler	1.0796	500	445-96-2-III	4471.0794 dpm/mL	09/21/2016	09/21/2017
07/20/1995	Theresa Austin	.0041	100	445-96-2-J	84.9 dpm/ml	01/05/1995	01/05/1996
05/01/2007	Daniel Roy	.0352	1000	445-96-2-JJ	72.9209 dpm/ml	04/30/2008	04/30/2009
05/31/2016	Christina Kimball	.0010641	500	445-96-2-JJJ	4.40688 dpm/mL	05/31/2016	05/31/2017
08/10/1995	Garret Ray	.0952	100	445-96-2-K	1971.32 dpm/ml	01/05/1995	01/05/1996
06/12/2007	Julie Strock	.01038	250	445-96-2-KK	22.1496 dpm/mL	05/28/2008	05/28/2009
08/01/2016	Christina Kimball	.0057457	100	445-96-2-KKK	.23521 dpm/mL	08/01/2016	08/01/2017
09/11/1995	Theresa Austin	1.0525	100	445-96-2-L	21794.23 dpm/ml	01/05/1995	01/05/1996

09/11/1995	Theresa Austin	.5107	100	445-96-2-L-1	111.3 dpm/ml	01/05/1995	01/05/1996
04/28/1998	Richard Kinney	.1264	100	445-96-2-M	2617.4 dpm/ml	04/28/1998	04/28/1999
11/01/2007	Eric Williamson	.001274	500	445-96-2-MM	5.27945 dpm/mL	04/06/2008	04/06/2010
10/12/1998	Gregory Smith	.1348	100	445-96-2-N	2791.32 dpm/mL	01/05/1995	01/05/1996
01/25/1999	Gregory Smith	1.9382	100	445-96-2-N-1	50.16 dpm/ml	01/05/1995	01/05/1996
04/19/2008	Daniel Roy	.0424	1000	445-96-2-NN	87.8366 dpm/ml	04/16/2009	04/16/2010
04/21/1999	Greg Smith	.1645	100	445-96-2-O	3406.32 dpm/mL	04/21/1999	04/21/2000
07/27/1999	Gregory Smith	1.567	100	445-96-2-O-2	50.56 dpm/ml	05/13/1999	05/13/2000
10/12/1999	Richard Kinney	1.5589	100	445-96-2-O-3	50.31 dpm/mL	05/13/1999	05/13/2000
04/21/1999	Greg Smith	1.5309	100	445-96-2-O-1	49.4 dpm/mL	04/21/1999	04/21/2000
02/23/2011	Christina Kimball	.0005294	250	445-96-2-OO	4.3866 dpm/mL	02/23/2011	02/23/2012
11/10/1999	Joe Davis	.1809	100	445-96-2-P	3745.92 dpm/mL	05/13/1999	05/13/2000
01/04/2008	Julie Strock	.00001005	100	445-96-2-PP	.20819 dpm/mL	12/29/2008	12/29/2009
01/28/2000	Angela Johnson	.0354	1000	445-96-2-Q	73.3 dpm/mL	02/08/2001	02/08/2002
09/29/2008	Tara Sides	.0025219	250	445-96-2-QQ	20.8977 dpm/mL	09/14/2009	09/14/2010
04/18/2000	Robert Timm	.429	250	445-96-2-R	3553.34 dpm/mL	04/18/2000	04/18/2001
04/23/2009	Tina Schoneman	.001251	500	445-96-2-RR	4.8075 dpm/mL	04/09/2010	04/09/2011
04/13/2001	Angela Johnson	.1869	100	445-96-2-S	3870.16 dpm/mL	04/13/2001	04/13/2002
05/08/2009	Mary Aders	.0141	1000	445-96-2-SS	29.2098 dpm/ml	05/11/2009	05/11/2010
07/03/2001	Lonnie Morris	2.0057	1000	445-96-2-T-103	4153.225 dpm/mL	07/03/2002	07/03/2003
07/03/2001	Lonnie Morris	2.0057	1000	445-96-2-T-203	4153.225 dpm/mL	07/03/2002	07/03/2003
07/03/2001	Lonnie Morris	2.0057	1000	445-96-2-T-303	4153.225 dpm/mL	07/03/2002	07/03/2003

06/03/2009	Julie Strock	.00000927	100	445-96-2-TT	.1923 dpm/mL	06/02/2011	06/02/2012
08/23/2001	Angela Johnson	.0194	500	445-96-2-U-103	80.34 dpm/mL	08/23/2001	08/23/2002
08/23/2001	Angela Johnson	.0194	500	445-96-2-U-203	80.34 dpm/mL	08/23/2001	08/23/2002
08/23/2001	Angela Johnson	.0194	500	445-96-2-U-303	80.34 dpm/ml	08/23/2001	08/23/2002
06/02/2009	Mary Aders	2.1177	1000	445-96-2-UU	4387.0634 dpm/ml	05/18/2011	05/18/2012
08/27/2001	Angela Johnson	.0394	1000	445-96-2-V-103	81.586 dpm/mL	08/27/2002	08/27/2003
08/27/2001	Angela Johnson	.0394	1000	445-96-2-V-203	81.586 dpm/mL	08/27/2002	08/27/2003
08/27/2001	Angela Johnson	.0394	1000	445-96-2-V-303	81.586 dpm/mL	08/27/2002	08/27/2003
03/09/2010	Ashley Drochter	.011	1000	445-96-2-VV	22.7878 dpm/mL	02/06/2015	02/06/2016
09/06/2013	Christina Kimball	.0010458	500	445-96-2-FFF	4.33111 dpm/mL	08/30/2014	08/30/2015
03/17/2003	Angela Johnson	2.1108	1000	445-96-2-W	4370.857 dpm/mL	03/14/2006	03/14/2007
03/23/2010	Ashley Drochter	.0163	1000	445-96-2-WW	33.7674 dpm/mL	03/23/2010	03/23/2011
04/14/2003	Lonnie Morris	.0315	1000	445-96-2-X	65.2559 dpm/mL	04/14/2004	04/14/2005
09/13/2010	Julie Strock	.00049678	250	445-96-2-XX	4.1166 dpm/mL	09/13/2010	09/13/2011
05/03/2003	Tim Chandler	.0103	1000	445-96-2-Y	21.3376 dpm/mL	05/05/2003	05/05/2004
10/20/2010	Ashley Drochter	.0146	1000	445-96-2-YY	30.2456 dpm/mL	10/20/2010	10/20/2011
05/05/2003	Eric Williamson	.011	1000	445-96-2-Z	22.7877 dpm/mL	04/03/2007	04/03/2008
11/23/2010	Ashley Drochter	2.1175	1000	445-96-2-ZZ	4386.6491 dpm/mL	06/14/2012	06/14/2013

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Am-243 Standard 445-96-2-III

v1.2

Analyst	TC1
Verification Prep Date	9/21/2016

Tracer Information	
Isotope	Cm-244
Serial Number	1216-G
Amount of Std. (mL)	0.2
Expiration Date	9/30/2016

Standard Information	
Isotope	Am-243
Serial Number	445-96-2-III
Isotope Half-life	7.3700E+03 Y
Reference Date	1/1/1994
Ref. Act. (dpm/mL)	4471.0794
Amount of Std. (mL)	0.0
Standard Prep Date	9/30/2015

Std #	Count Date	Activity pCi	Standard dpm/mL
1	9/21/2016	9.660	4289.04
2	9/21/2016	9.640	4280.16
3	9/21/2016	9.360	4155.84

Mean Value = 9.553 4241.680
 Stdev = 0.167729942 74.4720941

Certificate Value* = 10.0485 pCi dpm/mL
 Two sigma = 0.3355 148.9442
 10 % of Mean = 0.9553 424.1680
 Rule A (Pass/Fail) Pass Pass
 % Recovery 95.07% 95.07%
 Rule B (Pass/Fail) Pass Pass
 Expiration Date 9/21/2017

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Verification Prep Date.

The analyst prepared three standard verification sources for Am-243 standard 445-96-2-III using 0.005 mL for each source. Each standard was combined with 0.2 mL of Cm-244 standard 1216-G and was diluted in a 50 mL plastic centrifuge tube containing 20 mL of 1M HCl, 100 micrograms of neodymium carrier and five mL of 48% HF was added to precipitate neodymium (and Americium) fluoride. After 30 minutes, each sample was filtered following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. DPM values for Am-243 were calculated by comparison to Cm-244 certified values.

9-22-16



Eckert & Ziegler

Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analytiscinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

1216

77573-278

Cm-244 5 mL Liquid in Flame Sealed Vial

Customer: General Engineering Labs
P.O. No.: 7308 RD, Item 9

This standard radionuclide source was prepared gravimetrically from a calibrated master liquid radionuclide solution source. The master source was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Cm-244
ACTIVITY (Bq):	1.950 E4
HALF-LIFE:	1.810 E1 years
CALIBRATION DATE:	June 19, 2008 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	2.0%

Comments:

Impurities: γ -impurities <0.1%
Pu-238 <41 Bq
Pu-240 ~59 Bq

5.03182 grams 1M HCl solution.

Source Prepared By: M. I. Taskaeva
M. I. Taskaeva, Radiochemist

QA Approved: D. M. Montgomery
D. M. Montgomery, QA Manager

Date: 6-20-08



RC-5-048-097



Standard Traceability Log Rad

Source Material Info	
Parent Code:	1216
Prepared By:	Daniel Roy
Carrier Conc:	1M HCL
Reference Date:	06/19/2008
Ampoule Mass (g):	5.03182 g
Uncertainty:	+/- 1 %
LogBook No:	RC-S-048-097

A Solution Material Info			
Isotope:	Curium-244		
Prepared By:	Daniel Roy		
Prep Date:	06/24/2008		
Verification Date:	09/24/2014		
Expiration Date:	09/24/2015		
Primary Code:	1216-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	4.882 g		
Density(g/mL):	1.0153	Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.882 \text{ g}) * (19500 \text{ Bq}) * (60 \text{ dpm/Bq}) / (5.03182 \text{ g} * 100 \text{ mL}) = 11351.6382 \text{ dpm/mL}$
$(4.882 \text{ g}) * (19500 \text{ Bq}) * (60 \text{ dpm/Bq}) / (1.0153 \text{ g/mL}) / (5.03182 \text{ g} * 100 \text{ mL}) = 11181.0599 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
06/28/2008	Daniel Roy	7.0442	1000	1216-B	78.7616 dpm/ml	06/07/2011	06/07/2012
10/05/2009	Tara Sides	9.9307	100	1216-C	1110.36 dpm/mL	11/17/2011	11/17/2012
12/14/2011	Julie Strock	1		ASCS2012-001	1110.36 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	1		ASCS2012-002	1110.36 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	1		ASCS2012-004	1110.36 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	1		ASCS2012-005	1110.36 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	1		ASCS2012-007	1110.36 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	1		ASCS2012-008	1110.36 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	1		ASCS2012-009	1110.36 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	1		ASCS2012-016	1110.36 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	1		ASCS2012-017	1110.36 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	1		ASCS2012-018	1110.36 dpm	12/14/2020	12/14/2021

10/05/2009	Tara Sides	.0496535	100	1216-D	5.5518 dpm/mL	09/13/2010	09/13/2011
01/03/2011	Christina Kimball	.044	100	1216-E	4.9197 dpm/mL	01/03/2011	01/03/2012
01/05/2011	Christina Kimball	.0508	100	1216-F	5.67998 dpm/mL	12/21/2012	12/21/2013
10/31/2011	Ashley Drochter	7.0911	1000	1216-G	79.2860138 dpm/mL	09/21/2016	09/21/2017
06/08/2016	Christina Kimball	.0513	100	2416618	5.73588 dpm/mL	01/22/2016	01/22/2017
03/08/2012	Christina Kimball	.009948	250	1216-H	.4449 dpm/mL	03/08/2012	03/08/2013
04/30/2012	Christina Kimball	.00535	250	1216-I	.239466 dpm/mL	04/25/2016	04/25/2017
05/21/2012	Christina Kimball	.0501	100	1216-J	5.601711 dpm/mL	12/12/2014	12/12/2015
09/24/2014	Christina Kimball	.0513	100	1216-K	5.73588 dpm/mL	01/22/2016	01/22/2017

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Cm-244 Standard 1216-G

v1.2

Analyst	TC1
Verification Prep Date	9/21/2016

Tracer Information	
Isotope	Am-243
Serial Number	1752-C
Amount of Std. (mL)	0.5
Expiration Date	5/26/2017

Standard Information	
Isotope	Cm-244
Serial Number	1216-G
Isotope Halflife	18.1100 Y
Reference Date	6/19/2008
Ref. Act. (dpm/mL)	79.2860138
Amount of Std. (mL)	0.2
Standard Prep Date	10/31/2011

Std #	Count Date	Activity pCi	Standard dpm/mL
1	9/22/2016	5.050	56.06
2	9/22/2016	5.450	60.50
3	9/22/2016	5.280	58.61

Mean Value = 5.260 58.386
Stdev = 0.200748599 2.228309449

	pCi	dpm/mL
Certificate Value* =	5.2074	57.8017
Two sigma =	0.4015	4.4566
10 % of Mean =	0.5260	5.8386
Rule A (Pass/Fail)	Pass	Pass
% Recovery	101.01%	101.01%
Rule B (Pass/Fail)	Pass	Pass
Expiration Date	9/21/2017	

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

*** Certificate Value is decay corrected to Verification Prep Date.**

The analyst prepared three standard verification sources for Cm-244 standard 1216-G using 0.2 mL for each source. Each standard was combined with 0.5 mL of Am-243 standard 1752-C and was diluted in a 50 mL plastic centrifuge tube containing 20 mL of 1M HCl, 100 micrograms of neodymium carrier and five mL of 48% HF was added to precipitate neodymium (and Curium) fluoride. After 30 minutes, each sample was filtered following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. DPM values for Cm-244 were calculated by comparison to Am-243 certified values.



ISSUED
BY:

Amersham plc
Radiation & Radioactivity
Calibration Laboratory
The Grove Centre
White Lion Road
Amersham
Buckinghamshire
HP7 9LL

ISSUED
FOR:

AEA Technology plc
Isotrak
329 Harwell
Didcot
Oxfordshire
OX11 0QJ

Description

Principal radionuclide: Neptunium-237
Daughter radionuclide: Protactinium-233

Product code: NGZ44
Solution number: S5/31/100

Measurement

Reference time:

1200 GMT on 27 November 1995

Radioactive concentration of neptunium-237:

45.86 kilobecquerels per gram of solution

which is equivalent to:

1.240 microcuries per gram of solution

Mass of solution:

5.0201 grams

Total activity of neptunium-237:

230.2 kilobecquerels

which is equivalent to:

6.22 microcuries

Method of measurement used:

4π coincidence and anticoincidence counting using a gas flow proportional counter.

Calibration date(s): 25 November 1995 to 1 December 1995

The calibration date is provided for added information only, and must not be confused with the reference date. It is the reference date that must be used in all calculations relating to the values of activity.

Uncertainty

Expanded uncertainty in the radioactive concentration quoted above: ± 1.79 %

Combined Type A uncertainty: ± 0.24 %

Combined Type B uncertainty: ± 0.87 %

Approved
Signatory

Date of
issue

11th March 2002

UKAS ACCREDITED CALIBRATION LABORATORY No. 0146

Radionuclidic Purity The estimated activities of any radioactive impurities found by high-resolution gamma ray spectrometry, or in any other examination of the solution, are listed below expressed as percentages of the activity of the principal radionuclide at the reference time.

Plutonium-238 0.14(2)%

Chemical Composition 0.1M HCl containing 1.82 milligrams of neptunium per ml.

Physical Data Recommended half life: $(2.14 \pm 0.01) \times 10^6$ years (1 year = 365.25 days)

This measurement was based on the following assumptions about the decay scheme of neptunium-237 and protactinium-233:

Neptunium-237: 100% alpha particle emission followed by prompt L X-rays of Protactinium-233.

Protactinium-233: 100% beta particle emission. Half life 27.0 days.

Remarks This product meets the quality assurance requirements for achieving traceability to NIST as defined in ANSI N42.22-1995.

Nuclear data quoted on this certificate are taken from the Joint European File, Version 2.2.

The daughter nuclide protactinium-233 was chemically separated from the neptunium-237 at 0814 GMT on 22 November 1995. At any time t days from the time of separation, the ratio

$\frac{\text{activity of Pa-233}}{\text{activity of Np-237}}$ in the ampoule is given by $(1 - e^{-0.02567t})$

There can be no guarantee that the protactinium will remain in solution.

Expression of Uncertainties The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k = 2.00$, which for a t -distribution with $\nu_{\text{eff}} = \infty$ effective degrees of freedom corresponds to a coverage probability of approximately 95 %. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Unless indicated, all other uncertainties are expressed at the confidence level associated with one standard uncertainty.

The format used for the uncertainties in the values of radionuclidic purity is illustrated in the following examples;

6.5(21) = 6.5 ± 2.1
6.54(21) = 6.54 ± 0.21
6.543(21) = 6.543 ± 0.021



Standard Traceability Log Rad

Source Material Info	
Parent Code:	0518
Prepared By:	Penet Melton
Carrier Conc:	0.1 M HCL
Reference Date:	11/27/1995
Ampoule Mass (g):	5.02014 g
Uncertainty:	+/- 1.79 %
LogBook No:	RC S 035 033

A Solution Material Info			
Isotope:	Neptunium-237		
Prepared By:	Angela Johnson		
Prep Date:	12/20/2002		
Verification Date:	07/24/2015		
Expiration Date:	07/24/2016		
Primary Code:	0518-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	3.003 g		
Density(g/mL):	0.9992	Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(3.003 \text{ g}) * (45.86 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 82630.5480 \text{ dpm/mL}$
$(3.003 \text{ g}) * (45.86 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (0.9992 \text{ g/mL}) / (100 \text{ mL}) = 82693.3120 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
09/05/2003	Amanda Fehr	.1004	100	0518-B	83.0241 dpm/mL	09/10/2004	09/10/2005
01/19/2004	Tim Chandler	.1612	250	0518-C	53.3206 dpm/mL	01/18/2004	01/18/2005
11/23/2004	Amanda Fehr	.25	250	0518-D	82.69 dpm/mL	11/30/2007	11/29/2008
04/16/2008	Daniel Roy	.1312	100	0518-E	108.4936 dpm/ml	08/23/2008	04/16/2009
12/05/2008	Julie Strock	.096	250	0518-F	31.7542 dpm/mL	12/05/2008	12/05/2009
12/05/2008	Julie Strock	.0060406148	250	0518-G	.02555 dpm/mL	12/05/2008	12/05/2009
10/14/2008	Daniel Roy	.2195	250	0518-H	72.6047 dpm/ml	10/14/2008	10/14/2009
02/02/2009	Christina Kimball	.001312	500	0518-I	.216872 dpm/mL	03/17/2016	03/17/2017

02/11/2009	Tina Schoneman	.0569	250	0518-J	18.821 dpm/mL	02/11/2009	02/11/2010
07/10/2009	Mary Aders	.2642	250	0518-K	87.3903 dpm/mL	07/13/2010	07/13/2011
10/06/2009	Robert Timm	1.5146	100	0518-L	1252.47 dpm/mL	03/21/2015	03/21/2016
03/21/2015	Christina Kimball	.006099	100	0518-R	5.04428 dpm/mL	03/21/2016	03/21/2017
12/14/2011	Julie Strock	.5		ASCS2012-001	626.235 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	.5		ASCS2012-002	626.235 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	.5		ASCS2012-004	626.235 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	.5		ASCS2012-005	626.235 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	.5		ASCS2012-007	626.235 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	.5		ASCS2012-008	626.235 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	.5		ASCS2012-009	626.235 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	.5		ASCS2012-016	626.235 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	.5		ASCS2012-017	626.235 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	.5		ASCS2012-018	626.235 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	.5		ASCS2012-019	626.235 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	.5		ASCS2012-020	626.235 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	.5		ASCS2012-021	626.235 dpm	12/14/2020	12/14/2021
12/14/2011	Julie Strock	.5		ASCS2012-023	626.235 dpm	12/14/2020	12/14/2021
12/23/2011	Julie Strock	.5		ASCS2012-025	626.235 dpm	12/23/2020	12/23/2021
12/23/2011	Julie Strock	.5		ASCS2012-026	626.235 dpm	12/23/2020	12/23/2021
12/23/2011	Julie Strock	.5		ASCS2012-027	626.235 dpm	12/23/2020	12/23/2021
12/23/2011	Julie Strock	.5		ASCS2012-028	626.235 dpm	12/23/2020	12/23/2021

12/23/2011	Julie Strock	.5		ASCS2012-029	626.235 dpm	12/23/2020	12/23/2021
12/23/2011	Julie Strock	.5		ASCS2012-030	626.235 dpm	12/23/2020	12/23/2021
12/23/2011	Julie Strock	.5		ASCS2012-031	626.235 dpm	12/23/2020	12/23/2021
12/23/2011	Julie Strock	.5		ASCS2012-032	626.235 dpm	12/23/2020	12/23/2021
12/23/2011	Julie Strock	.5		ASCS2012-033	626.235 dpm	12/23/2020	12/23/2021
12/23/2011	Julie Strock	.5		ASCS2012-034	626.235 dpm	12/23/2020	12/23/2021
03/13/2012	Julie Strock	.25		ASCS2012-037	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-038	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-039	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-040	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-041	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-042	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-043	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-044	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-045	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-046	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-047	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-048	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-049	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-050	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-051	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-052	626.235 dpm	03/13/2021	03/13/2022

03/13/2012	Julie Strock	.25		ASCS2012-053	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-054	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-055	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-056	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-057	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-058	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-059	626.235 dpm	03/13/2021	03/13/2022
03/13/2012	Julie Strock	.25		ASCS2012-060	626.235 dpm	03/13/2021	03/13/2022
03/02/2010	Julie Strock	.095	250	0518-M	31.4235 dpm/mL	03/02/2010	03/02/2011
03/17/2010	Ashley Drochter	.2751	250	0518-N	90.9957 dpm/mL	01/23/2013	01/23/2014
06/03/2010	Julie Strock	.00532519	100	0518-O	4.4036 dpm/mL	05/23/2014	05/23/2015
08/16/2011	Ashley Drochter	.2893	250	0518-P	95.6927 dpm/mL	08/03/2015	08/03/2016
02/14/2012	Christina Kimball	.00174	500	0518-Q	.287518 dpm/mL	03/26/2012	03/26/2013
07/24/2015	Tim Chandler	.2997	250	0518-S	99.1327 dpm/mL	07/18/2016	07/18/2017

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Np-237 Standard 0518-S

v1.2

Analyst	TC1
Verification Prep Date	7/18/2016

Tracer Information	
Isotope	Cm-244
Serial Number	1216-G
Amount of Std. (mL)	0.2
Expiration Date	9/30/2016

Standard Information	
Isotope	Np-237
Serial Number	0518-S
Isotope Half-life	2.1400E+06 Y
Reference Date	11/27/1995
Ref. Act. (dpm/mL)	99.1327
Amount of Std. (mL)	0.2
Standard Prep Date	7/24/2015

Std #	Count Date	Activity pCi	Standard dpm/mL
1	7/18/2016	8.770	97.35
2	7/18/2016	9.520	105.67
3	7/18/2016	8.800	97.68

Mean Value = 9.030 100.233
 Stdev = 0.424617475 4.713253972

Certificate Value* = 8.9308 pCi
 Two sigma = 0.8492
 10 % of Mean = 0.9030
 Rule A (Pass/Fail) Pass
 % Recovery 101.11%
 Rule B (Pass/Fail) Pass
 Expiration Date 7/18/2017

dpm/mL
 99.1320
 9.4265
 10.0233
 Pass
 101.11%
 Pass

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Verification Prep Date.

The analyst prepared three standard verification sources for Np-237 standard 0518-S using 0.2 mL for each source. Each standard was combined with 0.2 mL of Cm-244 standard 1216-G and was diluted in a 50 mL plastic centrifuge tube containing 15 mL of 1M HCl. To each source, 0.5 mL of H₂O₂, 100 micrograms of neodymium carrier and five mL of 48% HF was added to precipitate neodymium (and Neptunium) fluoride. After 30 minutes, each sample was filtered following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. DPM values for Np-237 were calculated by comparison to Cm-244 certified values.

7-14-16

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

60513-278

Pu-239 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared using an aliquot measured gravimetrically from a master radionuclide solution standard. The master radionuclide solution standard was calibrated by the Department Des Applications Et De La Metrologie Des Rayonnements Ionisants (DAMRI), Paris, France, as Number 24148.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Pu-239
ACTIVITY (dps):	3.674 E4
HALF-LIFE:	24131 years
CALIBRATION DATE:	October 30, 2000 12:00 EST
TOTAL UNCERTAINTY*:	5.0%

*99% confidence level.

5.45541 grams 3M HNO₃ solution.

Impurities detected (activity in dps/vial on Oct. 30, 2000):

Am-241	297.28
Pu-240	1208.8
Pu-241	2010.7
Pu-242	0.17

See reverse side for additional information.

P O NUMBER 2528RD, Item 1

PREPARED BY:

M. Taskaeva
M. Taskaeva, Radiochemist

Q A APPROVED:

RCM 11/13/00

RC-5-028-167



Standard Traceability Log Rad

Source Material Info	
Parent Code:	0338
Prepared By:	Penet Melton
Carrier Conc:	3 M HNO3
Reference Date:	10/30/2000
Ampoule Mass (g):	5.45541 g
Uncertainty:	+/- 1.953 %
LogBook No:	RC-S-029-134

A Solution Material Info			
Isotope:	Plutonium-239		
Prepared By:	Penet Melton		
Prep Date:	12/01/2000		
Verification Date:	07/27/2015		
Expiration Date:	05/31/2017		
Primary Code:	0338-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	5.1674 g		
Density(g/mL):	1.0121	Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(5.1674 \text{ g}) * (36740 \text{ dps}) * (60 \text{ dpm/dps}) / (5.45541 \text{ g} * 100 \text{ mL}) = 20880.2208 \text{ dpm/mL}$
$(5.1674 \text{ g}) * (36740 \text{ dps}) * (60 \text{ dpm/dps}) / (1.0121 \text{ g/mL}) / (5.45541 \text{ g} * 100 \text{ mL}) = 20630.6111 \text{ dpm/g}$
$(5.1674 \text{ g}) * (37948.8 \text{ dps}) * (60 \text{ dpm/dps}) / (5.45541 \text{ g} * 100 \text{ mL}) = 21567.2108 \text{ dpm/mL}$
$(5.1674 \text{ g}) * (37948.8 \text{ dps}) * (60 \text{ dpm/dps}) / (1.0121 \text{ g/mL}) / (5.45541 \text{ g} * 100 \text{ mL}) = 21309.3885 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
06/23/2009	Mary Aders	.591	250	0338-BB	50.3753 dpm/mL	06/23/2009	06/23/2010
03/09/2010	Ashley Drochter	.5127	250	0338-CC	43.7013 dpm/mL	03/09/2010	03/09/2011
01/12/2011	Ashley Drochter	.5302	250	0338-DD	45.193 dpm/mL	01/06/2012	01/06/2013
10/29/2001	Tim Chandler	.3032	250	0338-E		10/16/2003	10/16/2004
04/18/2011	Ashley Drochter	.528	250	0338-EE	45.0054 dpm/mL	03/29/2012	03/29/2013
05/17/2011	Christina Kimball	.101	500	0338-FF	4.3045 dpm/mL	09/19/2016	09/19/2017
05/15/2012	Christina Kimball	.256	250	0338-GG	21.82081 dpm/mL	09/27/2016	09/27/2017

09/04/2012	Ashley Drochter	1.0264	500	0338-HH	43.7439 dpm/mL	07/22/2016	07/22/2017
12/30/2002	Tim Chandler	10.0252	100	0338-I		10/24/2003	10/24/2004
01/22/2013	Christina Kimball	.248	250	0338-II	21.1389 dpm/mL	01/22/2013	09/11/2013
01/07/2015	Christina Kimball	.119	500	0338-JJ	5.0716 dpm/mL	01/07/2015	01/07/2016
08/12/2003	Amanda Fehr	.2282	100	0338-K		08/12/2003	08/12/2004
01/07/2015	Christina Kimball	.0052	500	0338-KK	.22166 dpm/mL	01/04/2016	01/04/2017
12/09/2003	Amanda Fehr	.2409	100	0338-L		12/09/2003	12/09/2004
01/07/2015	Christina Kimball	.052	500	0338-LL	2.2162 dpm/mL	01/04/2016	01/04/2017
03/18/2004	Tim Chandler	10.0192	500	0338-M		03/18/2004	03/18/2005
07/24/2015	Tim Chandler	1.0298	500	0338-MM	42.8888 dpm/mL	07/20/2016	07/20/2017
04/26/2004	Amanda Fehr	.643	250	0338-N		04/26/2005	04/26/2006
05/31/2016	Christina Kimball	.005109	500	0338-NN	.21776 dpm/mL	05/31/2016	05/31/2017
05/26/2004	Eric Williamson	.355	250	0338-O	30.2619 dpm/mL	05/17/2007	05/17/2008
12/20/2004	Brenda Burke	.01957	100	0338-P	4.16992 dpm/mL	12/19/2006	12/19/2007
03/16/2005	Julie Strock	10.0395	100	0338-Q	2139.558 dpm/mL	06/12/2008	06/12/2009
07/19/2005	Amanda Fehr	.677	250	0338-R		07/10/2006	07/10/2007
05/11/2006	Brenda Burke	.0009935	100	0338-S	.21172 dpm/mL	07/30/2007	07/28/2007
01/04/2007	Julie Strock	.050286	250	0338-T	4.2887 dpm/mL	12/31/2007	12/31/2008
01/05/2007	Daniel Roy	.7285	250	0338-U		01/05/2008	01/05/2009
03/16/2007	Julie Strock	.010175	1000	0338-V	.216847 dpm/mL	03/21/2015	03/21/2016
05/15/2007	Eric Williamson	.253	250	0338-W	21.567 dpm/mL	05/02/2012	05/05/2013
07/31/2007	Julie Strock	.0010045	100	0338-X	.21379 dpm/mL	12/31/2007	12/31/2008
12/10/2008	Daniel Roy	.7715	250	0338-Y		12/10/2008	12/10/2009
09/29/2008	Tara Sides	.0504	250	0338-Z	4.29599 dpm/mL	09/01/2010	09/01/2011

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Pu-239 Standard 0338-MM

v1.2

Analyst	TC1
Verification Prep Date	7/20/2016

Tracer Information	
Isotope	Pu-242
Serial Number	1769-A
Amount of Std. (mL)	0.2
Expiration Date	5/2/2017

Standard Information	
Isotope	Pu-239
Serial Number	0338-MM
Isotope Half-life	2.4131E+04 Y
Reference Date	11/15/2011
Ref. Act. (dpm/mL)	43.8888
Amount of Std. (mL)	0.2
Standard Prep Date	7/24/2015

Std #	Count Date	Activity pCi	Standard dpm/mL
1	7/20/2016	3.990	44.29
2	7/20/2016	4.140	45.95
3	7/20/2016	4.050	44.96

Mean Value = 4.060 45.066
 Stdev = 0.075498344 0.838031622

Certificate Value* = 3.9534 pCi
 Two sigma = 0.1510
 10 % of Mean = 0.4060
 Rule A (Pass/Fail) Pass
 % Recovery 102.70%
 Rule B (Pass/Fail) Pass
 Expiration Date 7/20/2017

dpm/mL
 43.8829
 1.6761
 4.5066
 Pass
 102.70%
 Pass

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Verification Prep Date.

The analyst prepared three standard verification sources for Pu-239 standard 0338-MM using 0.2 mL for each source. Each standard was combined with 0.2 mL of Pu-242 standard 1769-A and was diluted in a 50 mL plastic centrifuge tube containing 15 mL of 1M HCl. To each source, 6 drops of 25% hydrazine dichloride, 100 micrograms of neodymium carrier and five mL of 48% HF was added to precipitate neodymium (and Plutonium) fluoride. After 30 minutes, each sample was filtered following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. DPM values for Pu-239 were calculated by comparison to Pu-242 certified values.

THC
 7-21-16



National Institute of Standards & Technology

Certificate

Standard Reference Material[®] 4334I 1770

Plutonium-242 Radioactivity Standard

This Standard Reference Material (SRM) consists of a solution of a standardized and certified quantity of radioactive plutonium-242 in a suitably stable and homogeneous matrix. It is intended primarily for the calibration of instruments that are used to measure radioactivity and for the monitoring of radiochemical procedures. A unit consists of a solution, whose composition is specified in Table 1, contained in a flame-sealed 5 mL borosilicate-glass ampoule (see Note 1)*.

The certified **Plutonium-242** massic activity value, at a **Reference Time of 1200 EST, 01 January 2010**, is:

$$(26.77 \pm 0.18) \text{ Bq}\cdot\text{g}^{-1}.$$

Additional physical, chemical, and radiological properties for this SRM, as well as details on the standardization method, are given in Table 1. Uncertainties for the certified quantities are expanded ($k=2$). The uncertainties are calculated according to the ISO Guide (see Note 2). Table 2 contains a specification of the components that comprise the uncertainty analyses.

Expiration of Certification: The certification of **SRM 4334I** is valid indefinitely provided the SRM is handled and stored properly and that no evaporation or change in composition has occurred. The solution matrix, in an unopened ampoule, is homogeneous and stable within its half-life-dependent useful lifetime provided the SRM is handled in accordance with instructions given in this certificate (see "Instructions for Storage and Handling"). The certification is nullified if the SRM is damaged, contaminated, or otherwise modified.

Maintenance of Certification: NIST will monitor this SRM over the period of its certification. If substantive technical changes occur that affect the certification before the expiration of this certificate, NIST will notify the purchaser. Registration (see attached sheet) will facilitate notification.

This SRM may represent a radiological hazard and a chemical hazard. Consult the Material Safety Data Sheet (MSDS), enclosed with the SRM shipment, for details.

This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, M.P. Unterweger, Group Leader. The overall technical direction and physical measurement leading to certification were provided by L. Lucas of the NIST Radioactivity Group.

Support aspects involved in the issuance of this SRM were coordinated through the NIST Measurement Services Division.

INSTRUCTIONS FOR STORAGE AND HANDLING

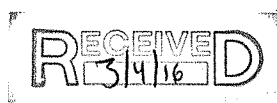
Storage: SRM 4334I should be stored and used at a temperature between 5 °C and 65 °C. The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material.

Handling: If the ampoule is transported, it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) because of both the radioactivity and the strong acid. The ampoule should be opened only by persons qualified to handle both radioactive material and alkaline and/or acidic solutions. Appropriate shielding and/or distance should be used to minimize personnel exposure. Refer to MSDS for further information.

Lisa R. Karam, Chief
Ionizing Radiation Division

Gaithersburg, MD 20899
Certificate Issue Date: 30 June 2010

Robert L. Watters, Jr., Chief
Measurement Services Division



GL-CED-297-063

* Notes and references may be found on pages 4 and 5.
SRM 4334I

Table 1. Properties of SRM 4334I

Certified values

Radionuclide	Plutonium-242
Reference time	1200 EST, 1 January 2010 (See Note 3) *
Massic activity of the solution	26.77 Bq·g ⁻¹
Relative expanded uncertainty ($k = 2$)	0.68 % (see Note 2)

Uncertified information

Source description	Liquid in a flame-sealed 5 mL borosilicate-glass ampoule (see Note 1)
Solution composition	3.2 mol L ⁻¹ HNO ₃
Solution density	(1.105 ± 0.002) g mL ⁻¹ at 22 °C (see Note 4)
Solution mass	Approximately 5.5 g
Alpha-particle- emitting impurities	²⁴¹ Am : (0.0016 ± 0.0003) Bq g ⁻¹ (See Note 3, 5 and 6)
Beta-particle- emitting impurities	²⁴¹ Pu : (0.044 ± 0.009) Bq g ⁻¹ (see Note 4)
Photon-emitting impurities	None detected (see Note 7)
Half-lives used	²⁴² Pu : (373 500 ± 1100) a (see Note 8) [1] ²⁴¹ Pu : (14.290 ± 0.006) a ²⁴⁰ Pu : (6 561 ± 7) a ²³⁹ Pu : (24 110 ± 30) a ²³⁸ Pu : (87.7 ± 0.1) a ²⁴¹ Am : (432.6 ± 0.6) a
Calibration methods (and instruments)	The certified massic activity for ²⁴² Pu was obtained by 4π α liquid scintillation (LS) spectrometry using four commercial LS counters, a calibrated germanium detector system, and a silicon surface-barrier detector.

* Notes and references may be found on pages 4 and 5.
SRM 4334I

Table 2. Uncertainty evaluation for the massic activity of SRM 4334I

Uncertainty component		Assessment Type [†]	Relative standard uncertainty contribution on massic activity of ²⁴² Pu (%)
1	Massic alpha-particle emission rate, corrected for background and decay. Standard deviation of the mean for 180 4π liquid-scintillation measurements.	A	0.06
2	Half life of ²⁴² Pu; standard uncertainty of the half life	B	3 × 10 ⁻⁶
3	Decay-scheme data; standard uncertainty of the probability of decay by alpha-particle emission	B	0.001
4	Extrapolation of the alpha-particle-count-rate-versus-energy to zero energy	B	0.25
5	Gravimetric measurements	B	0.10
6	Live time	B	0.10
7	Alpha-particle detection efficiency of scintillators	B	0.10
8	²⁴¹ Pu detection efficiency of scintillators	B	0.04
9	Alpha-particle emitting impurities; limit of detection	B	0.10
10	²⁴¹ Pu impurity	B	0.02
11	Photon emitting impurities; limit of detection	B	0.10
Relative combined standard uncertainty			0.34
Relative expanded uncertainty (k = 2)			0.68

[†] = (A) denotes evaluation by statistical methods; (B) denotes evaluation by other methods.

Note 1. Refer to <http://physics.nist.gov/Divisions/Div846/srm.html> (accessed Jun 2010) for assistance and instructions on how to properly open an ampoule. Information on additional storage and handling requirements is also included on the website. This SRM is contained in a generic borosilicate-glass ampoule and not in the standard NIST ampoule.

Note 2. The uncertainties on certified values are expanded uncertainties, $U = ku_c$. The quantity u_c is the combined standard uncertainty calculated according to the ISO Guides [2-3]. The combined standard uncertainty is multiplied by a coverage factor of $k = 2$ and was chosen to obtain an approximate 95 % level of confidence.

Note 3. The ^{242}Pu was chemically purified 07 June 1994 at the Lawrence Livermore National Laboratory (LLNL). Americium-241, the daughter of ^{241}Pu , was removed but has been growing in since that time.

Note 4. The stated uncertainty is two times the standard uncertainty. See reference 3.

Note 5. The estimated limits of detection for alpha-particle-emitting impurities, expressed as massic alpha-particle emission rates (number of alpha-particles emission rates per second per gram), are:

- 0.003 $\text{s}^{-1} \text{g}^{-1}$ for energies less than 3.1 MeV,
- 0.03 $\text{s}^{-1} \text{g}^{-1}$ for energies between 3.1 MeV and 4.4 keV, and
- 0.003 $\text{s}^{-1} \text{g}^{-1}$ for energies greater than 5.0 MeV

Note 6. The ^{242}Pu was chemically purified 07 June 1994. The relative massic activities of radionuclidic impurities after purification follow;

Radionuclide	Relative Activity As Determined By	
	LLNL	NIST
^{242}Pu	1	1
^{241}Pu	--	$(3.5 \pm 0.4) \times 10^{-3}$ (a)
$^{240}\text{Pu} + ^{239}\text{Pu}$	$< 10^{-6}$ (b)	$(2.0 \pm 2.1) \times 10^{-5}$ (c)
$^{238}\text{Pu} + ^{241}\text{Am}$	$< 1.6 \times 10^{-5}$ (b)	$(9 \pm 16) \times 10^{-6}$ (c)
^{241}Am	--	assumed 0 (a)

- (a) The stated uncertainty is the standard uncertainty. The ^{241}Pu activity was calculated from a gamma-ray measurement of the ^{241}Am ingrowth as of 25 November 1998, assuming that ^{241}Am was completely removed at the time of chemical purification.
- (b) Using alpha-particle spectrometry. The value shown is an estimated upper limit based upon background and counting statistics. Measurements were made at the Lawrence Livermore National Laboratory (LLNL) in July of 1994.
- (c) Using alpha-particle spectrometry. The stated uncertainty is the standard uncertainty. Measurements were made at the National Institute of Standards and Technology (NIST) in June and July 1999.

Note 7. The estimated limits of detection for photon-emitting impurities, expressed as massic photon emission rates (numbers of photons per second per gram), are:

- $5 \times 10^{-5} \text{ s}^{-1} \text{ g}^{-1}$ for energies between 19 keV and 39 keV,
- $7 \times 10^{-5} \text{ s}^{-1} \text{ g}^{-1}$ for energies between 49 keV and 92 keV,
- $2 \times 10^{-5} \text{ s}^{-1} \text{ g}^{-1}$ for energies between 106 keV and 507 keV,
- $1 \times 10^{-5} \text{ s}^{-1} \text{ g}^{-1}$ for energies between 515 keV and 1456 keV, and
- $5 \times 10^{-6} \text{ s}^{-1} \text{ g}^{-1}$ for energies between 1465 keV and 2750 keV.

provided that the photons are separated in energy by 4 keV or more from photons emitted in the decay of ^{242}Pu , ^{241}Pu , or ^{241}Am .

Note 8. The stated uncertainty is the standard uncertainty. See reference 2.

REFERENCES

- [1] Evaluated Nuclear Structure Data File (ENSDF), online database, National Nuclear Center, Brookhaven National Laboratory (Upton, NY), accessed November 2009. Refer to <http://www.nndc.bnl.gov/nudat2/> (accessed Jun 2010).
- [2] JCGM 100:2008; *Evaluation of Measurement Data — Guide to the Expression of Uncertainty in Measurement* (ISO GUM 1995 with Minor Corrections); Joint Committee for Guides in Metrology (2008); available at http://www.bipm.org/utls/common/documents/jcgm/JCGM_100_2008_E.pdf (accessed May 2010); see also Taylor, B.N.; Kuyatt, C.E.; *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*; NIST Technical Note 1297; U.S. Government Printing Office: Washington, DC (1994); available at <http://www.nist.gov/physlab/pubs/index.cfm> (accessed Jun 2010).
- [3] Thompson, A.; Taylor, B.N.; *Guide for the Use of the International System of Units (SI)*; NIST Special Publication 811; U.S. Government Printing Office: Washington, DC (2008); available at: http://ts.nist.gov/WeightsAndMeasures/Metric/mpo_pubs.cfm (accessed Jun 2010).

Users of this SRM should ensure that the Certificate in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 926-4751; e-mail srminfo@nist.gov; or via the Internet at <http://www.nist.gov/srm>.



Standard Traceability Log Rad

Source Material Info	
Parent Code:	1770
Prepared By:	Gregory Ramsay
Carrier Conc:	3.2M HNO3
Reference Date:	01/01/2010
Ampoule Mass (g):	5.5 g
Uncertainty:	+/- .34 %
LogBook No:	GL-CED-297-063

A Solution Material Info			
Isotope:	Plutonium-242		
Prepared By:	Tim Chandler		
Prep Date:	08/03/2016		
Verification Date:	08/03/2016		
Expiration Date:	08/03/2017		
Primary Code:	1770-A		
Dilution(mL):	200 mL		
Mass of Parent(g):	5.4578 g		
Density(g/mL):	1.0312	Balance ID:	C31514

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq/g)}) * (\text{conversion dpm to Bq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq/g)}) * (\text{conversion dpm to Bq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(5.4578 \text{ g}) * (26.77 \text{ Bq/g}) * (60 \text{ dpm/Bq}) / (200 \text{ mL}) = 43.8316 \text{ dpm/mL}$
$(5.4578 \text{ g}) * (26.77 \text{ Bq/g}) * (60 \text{ dpm/Bq}) / (1.0312 \text{ g/mL}) / (200 \text{ mL}) = 42.5054 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
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GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Pu-242 Standard 1770-A

v1.2

Analyst	TC1
Verification Prep Date	8/3/2016

Tracer Information	
Isotope	Pu-239
Serial Number	0338-MM
Amount of Std. (mL)	0.5
Expiration Date	7/20/2017

Standard Information	
Isotope	Pu-242
Serial Number	1770-A
Isotope Half-life	3.7350E+05 Y
Reference Date	1/1/2010
Ref. Act. (dpm/mL)	43.8316
Amount of Std. (mL)	0.5
Standard Prep Date	8/3/2016

Std #	Count Date	Activity pCi	Standard dpm/mL
1	8/4/2016	9.460	42.00
2	8/4/2016	9.440	41.91
3	8/4/2016	9.830	43.65

Mean Value = 9.577 42.520
 Stdev = 0.219620885 0.975116731

pCi
 Certificate Value* = 9.8719
 Two sigma = 0.4392
 10 % of Mean = 0.9577
 Rule A (Pass/Fail) Pass
 % Recovery 97.01%
 Rule B (Pass/Fail) Pass
 Expiration Date 8/3/2017

dpm/mL
 43.8311
 1.9502
 4.2520
 Pass
 97.01%
 Pass

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Verification Prep Date.

The analyst prepared three standard verification sources for Pu-242 standard 1770-A using 0.5 mL for each source. Each standard was combined with 0.5 mL of Pu-239 standard 0338-MM and was diluted in a 50 mL plastic centrifuge tube containing 10 mL of 2M HCl. Five drops of 25% hydrazine dichloride, 100 micrograms of neodymium carrier and three mL of 48% HF was added to precipitate neodymium (and Plutonium) fluoride. After 30 minutes, each sample was filtered following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. DPM values for Pu-242 were calculated by comparison to Pu-239 certified values.

8-5-16

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

1242

78148-278

Th-230 5 mL Liquid in Flame Sealed Vial

Customer: General Engineerings Labs
P.O. No.: 7311RD, Item 1

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

Isotope:	Th-230
Activity (Bq):	4.021 E4
Half-Life:	7.538 E4 years
Calibration Date:	August 25, 2008 12:00 EST
Relative Expanded Uncertainty (k=2):	2.0%

Comments:

Impurities: γ -impurities <0.1%, α -impurities <0.04%
5.07467 grams 0.5M HNO3 solution.

Source Prepared By: M. I. Taskaeva
M. I. Taskaeva, Radiochemist

QA Approved: D. M. Montgomery
D. M. Montgomery, QA Manager

Date: 9-4-08

End of Certificate

RECEIVED
9/11/08

RC-5-048-123
Laboratory



Standard Traceability Log Rad

Source Material Info	
Parent Code:	1242
Prepared By:	Daniel Roy
Carrier Conc:	0.5M HNO ₃
Reference Date:	08/25/2008
Ampoule Mass (g):	5.07467 g
Uncertainty:	+/- 2 %
LogBook No:	RC-S-048-123

A Solution Material Info			
Isotope:	Thorium-230		
Prepared By:	Ashley Drochter		
Prep Date:	11/10/2009		
Verification Date:	06/24/2015		
Expiration Date:	06/24/2016		
Primary Code:	1242-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	4.8836 g		
Density(g/mL):	1.0597	Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parent Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parent Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.8836 \text{ g}) * (40210 \text{ Bq}) * (60 \text{ dpm/Bq}) / (5.07467 \text{ g} * 100 \text{ mL}) = 23217.6149 \text{ dpm/mL}$
$(4.8836 \text{ g}) * (40210 \text{ Bq}) * (60 \text{ dpm/Bq}) / (1.0597 \text{ g/mL}) / (5.07467 \text{ g} * 100 \text{ mL}) = 21908.6601 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
12/01/2009	Bethany Fiem	6.3855	500	1242-B	279.79548 dpm/mL	12/02/2009	12/02/2010
08/03/2010	Gregory Ramsay	12.8745	1000	1242-C	282.063 dpm/mL	07/30/2013	07/30/2014
07/05/2011	Bethany Fiem	12.1975	1000	1242-D	267.2309 dpm/mL	06/22/2012	06/22/2013
01/12/2012	Christina Kimball	.105	500	1242-E	4.6008 dpm/mL	01/13/2015	01/13/2016
01/08/2013	Bethany Fiem	12.5093	1000	1242-F	274.062 dpm/mL	01/07/2014	01/07/2015
08/26/2013	Christina Kimball	.012512	100	1242-G	2.74129 dpm/mL	08/25/2014	08/25/2015
02/17/2014	Tim Chandler	.2121	100	1242-H	46.46827 dpm/mL	02/11/2016	02/11/2017
08/11/2014	Gregory Ramsay	6.16	500	1242-I	269.9147 dpm/mL	08/06/2015	08/06/2016

Verification for Th-230 Standard 1242-H

V1.0.2

Instrument	GREEN
Analyst	TC1
Verification Prep Date	2/11/2016

Standard Information	
Isotope	Th-230
Serial Number	1242-H
Isotope Half-life	7.5380E+04 Y
Reference Date	8/25/2008
Ref. Act. (DPM/mL)	46.46827
Amount of Std. (mL)	1.0
Standard Prep Date	11/10/2009

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	2/11/2016	117.00	95.32	47.60
2	2/11/2016	117.00	93.02	47.60
3	2/11/2016	117.00	95.52	47.60

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	47.72	1.014300	47.05	47.05
2	45.42	1.014300	44.78	44.78
3	47.92	1.014300	47.24	47.24

Mean Value = 46.36
 Stdev = 1.369658179
 Certificate Value* = 46.5
 Two sigma = 2.739
 10 % of Mean = 4.636
 Rule A (Pass/Fail) Pass
 % Recovery 99.77%
 Rule B (Pass/Fail) Pass
 Expiration Date 2/11/2017

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for Th-230 source 1242-H by transferring 1 mL portions of the standard into glass liquid scintillation vials. 15 mL of Ecoscint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 15 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCGREEN for Th-230 source standard verification. The Th-230 efficiency calibration which was used for verification calculations was performed on 2/11/2016 using Th-230 source 1493-A.

Standard results for each verification source was calculated as follows:

$$\text{Source dpm/mL} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency (cpm/dpm), and
- D = volume used for standard verification.

RAD-M-001

722
2-12-16

1564

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

85621-278

5 mL Liquid in Flame Sealed Vial

Customer: General Engineering Labs/Charleston, SC
P.O. No.: 936814RD, Item 1

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by the Department Des Applications Et De La Metrologie Des Rayonnements Ionisants (DAMRI), Paris, France. Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty*, %			Reference Date (12:00 PM EST)
			u_A	u_B	U	
U-232	2.517E+04	3.393E+04	0.5	2.4	4.9	09/12/2011

***Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

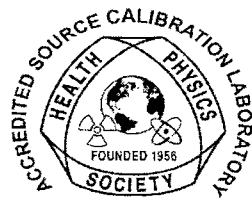
Impurities: γ -impurities (other than decay products) < 0.1 %, U-233 < 1.20E2 Bq, Am-241 < 5.8E1 Bq. 5.06048 grams 2M HNO3 solution.

Source Prepared by: M. I. Taskaeva
M. I. Taskaeva, Radiochemist

QA Approved: J. D. McCorvey
J. D. McCorvey, QA Manager Alternate

Date: 9/12/11

RECEIVED
9/14/11
JMS





Standard Traceability Log Rad

Source Material Info	
Parent Code:	1564
Prepared By:	Ashley Drochter
Carrier Conc:	2M HNO3
Reference Date:	09/12/2011
Ampoule Mass (g):	5.06048 g
Uncertainty:	+/- 2.45 %
LogBook No:	RC-S-060-109

A Solution Material Info			
Isotope:	Uranium-232		
Prepared By:	Ashley Drochter		
Prep Date:	11/15/2012		
Verification Date:	09/21/2016		
Expiration Date:	09/21/2017		
Primary Code:	1564-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	4.9067 g		
Density(g/mL):	1.0615	Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.9067 \text{ g}) * (33930 \text{ Bq}) * (60 \text{ dpm/Bq}) / (5.06048 \text{ g} * 100 \text{ mL}) = 19739.3525 \text{ dpm/mL}$
$(4.9067 \text{ g}) * (33930 \text{ Bq}) * (60 \text{ dpm/Bq}) / (1.0615 \text{ g/mL}) / (5.06048 \text{ g} * 100 \text{ mL}) = 18595.7160 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
11/16/2012	Ashley Drochter	2.6179	1000	1564-B	48.6817 dpm/mL	11/13/2013	11/13/2014
01/15/2013	Christina Kimball	.265	250	1564-C	19.7115 dpm/mL	01/13/2014	01/13/2015
02/18/2013	Christina Kimball	.116	500	1564-D	4.31421 dpm/mL	02/16/2015	02/13/2016
01/02/2014	Gregory Ramsay	2.6936	1000	1564-E	50.08942 dpm/mL	12/10/2014	12/10/2015
03/17/2014	Christina Kimball	.266	250	1564-F	19.78584 dpm/mL	03/25/2015	03/25/2016
12/10/2014	Tim Chandler	2.6312	1000	1564-G	48.929 dpm/mL	12/10/2014	12/10/2015
07/20/2015	Christina Kimball	.266	250	1564-H	19.78584 dpm/mL	07/25/2016	07/25/2017
11/23/2015	Tim Chandler	2.6117	1000	1564-I	48.5664 dpm/mL	11/23/2015	11/23/2016

01/05/2016	Christina Kimball	.119	500	1564-J	4.4258 dpm/mL	01/05/2016	01/05/2017
09/20/2016	Tim Chandler	2.6389	1000	1564-K	49.0722 dpm/mL	09/21/2016	09/21/2017

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for U-232 Standard 1564-I

v1.2

Analyst	TC1
Verification Prep Date	11/23/2015

Tracer Information	
Isotope	U-238
Serial Number	1600-E
Amount of Std. (mL)	0.5
Expiration Date	7/24/2016

Standard Information	
Isotope	U-232
Serial Number	1564-I
Isotope Half-life	68.9000 Y
Reference Date	9/12/2011
Ref. Act. (dpm/mL)	48.5664
Amount of Std. (mL)	0.5
Standard Prep Date	11/23/2015

Std #	Count Date	Activity pCi	Standard dpm/mL
1	11/23/2015	10.100	44.84
2	11/23/2015	10.600	47.06
3	11/23/2015	10.600	47.06

Mean Value = 10.433 46.324
 Stdev = 0.288675135 1.281717598

Certificate Value* = 10.4861 pCi dpm/mL
 Two sigma = 0.5774 2.5634
 10 % of Mean = 1.0433 4.6324
 Rule A (Pass/Fail) Pass
 % Recovery 99.50%
 Rule B (Pass/Fail) Pass
 Expiration Date 11/23/2016

Verification Rules

- Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Verification Prep Date.

The analyst prepared three standard verification sources for U-232 standard 1564-I using 0.5 mL for each source. Each standard was combined with 0.5 mL of U-238 standard 1600-E and was diluted in a 50 mL plastic centrifuge tube containing 15 mL of 1M HCl, 1 mL of TICl3. 100 micrograms of neodymium carrier and five mL of 48% HF was added to precipitate neodymium (and Uranium) fluoride. After 30 minutes, each sample was filtered following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. DPM values for U-232 were calculated by comparison to U-238 certified values.

11-24-15

CERTIFICATE OF CALIBRATION ALPHA STANDARD SOLUTION

Radionuclide:	U-236	Customer:	GENERAL ENGINEERING LABS.
Half-life:	(2.342 ± 0.003)E+07 years	P.O. No.:	936817RD
Catalog No.:	7336	Reference Date:	15-Nov-11 12:00 PST
Source No.:	1555-47	Contained Radioactivity:	100.5 nCi 3719 Bq

Physical Description:

A. Mass of solution:	5.00824 g in 5 mL flame-sealed ampoule
B. Chemical form:	UO ₂ (NO ₃) ₂ in 0.1M HNO ₃
C. Carrier content:	None
D. Density:	1.0016 g/mL @ 20°C

Radioimpurities:

See Technical Data Sheet

Radionuclide Concentration: 20.07 nCi/g, 742.6 Bq/g

Method of Calibration:

This source was prepared from a weighed aliquot of solution whose activity in $\mu\text{Ci/g}$ was determined using a liquid scintillation counter.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	± 1.3 %
B. Type B (systematic) uncertainty:	± 3.0 %
C. Uncertainty in aliquot weighing:	± 0.1 %
D. Total uncertainty at the 99% confidence level:	± 3.3 %



Notes:

- See reverse side for leak test(s) performed on this source.
- EZIP participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (as in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This solution has a working life of 5 years.

Daniel James Van Dalsen
Quality Control

14-OCT-11
Date

EZIP Ref. No.: 1555-47

PC-S-060-115a

ISO 9001 CERTIFIED

Medical Imaging Laboratory

24937 Avenue Tibbitts Valencia, California 91355

Industrial Gauging Laboratory

1800 North Keystone Street Burbank, California 91504

U-236 Technical Data

The U-236 used to prepare your order was taken from Isotope Products Laboratories Lot #30130.01 and had the following composition as of 8 Jul 05:

<u>Nuclide</u>	<u>Mass %</u>	<u>Activity %</u>
U-235	0.046	0.0015
U-236	99.657	99.997
U-238	0.297	0.0015

Isotopic composition provided by Techsnabexport Co. Ltd.

If you have any question, please contact IPL Technical Service:
(661) 309-1010.



Standard Traceability Log Rad

Source Material Info	
Parent Code:	1570
Prepared By:	Ashley Drochter
Carrier Conc:	0.1M HNO3
Reference Date:	11/15/2011
Ampoule Mass (g):	5.00824 g
Uncertainty:	+/- 1.289 %
LogBook No:	RC-S-060-115

A Solution Material Info			
Isotope:	Uranium-236		
Prepared By:	Jesse Craig		
Prep Date:	10/31/2011		
Verification Date:	10/03/2016		
Expiration Date:	10/03/2017		
Primary Code:	1570-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	4.852 g		
Density(g/mL):	0.9993	Balance ID:	1113021018

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq/g)}) * (\text{conversion dpm to Bq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq/g)}) * (\text{conversion dpm to Bq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(4.852 \text{ g}) * (742.6 \text{ Bq/g}) * (60 \text{ dpm/Bq}) / (100 \text{ mL}) = 2161.8571 \text{ dpm/mL}$
$(4.852 \text{ g}) * (742.6 \text{ Bq/g}) * (60 \text{ dpm/Bq}) / (0.9993 \text{ g/mL}) / (100 \text{ mL}) = 2163.3715 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
11/29/2011	Ashley Drochter	10.2782	200	1570-B	111.1778 dpm/mL	11/13/2013	11/13/2014
03/06/2012	Christina Kimball	.2059854	100	1570-C	4.4562 dpm/mL	02/19/2016	02/19/2017
03/27/2014	Tim Chandler	5.0353	100	1570-D	108.9322 dpm/mL	03/18/2015	03/18/2016
07/24/2015	Tim Chandler	5.1415	100	1570-E	111.2297 dpm/mL	07/18/2016	07/18/2017
10/03/2016	Tim Chandler	12.8711	250	1570-F	111.3799 dpm/mL	10/03/2016	10/03/2017
10/31/2011	Paul Boyd	6.64	10	IMS121016-01	10 mg/L	07/28/2016	07/28/2017
10/16/2012	Paul Boyd	.05	50	WMS121016-100	10 ug/L	10/17/2011	10/17/2012
11/10/2012	Paul Boyd	.05	50	WMS121110-100	10 ug/L	11/11/2011	11/11/2012
11/10/2012	Paul Boyd	5	50	WMS121110-100a	1 ug/L	11/11/2011	11/11/2012
11/10/2012	Paul Boyd	.025	50	WMS121110-104	5 ug/L	11/11/2011	11/11/2012
11/11/2012	Paul Boyd	.05	50	WMS121111-100	10 ug/L	11/12/2011	11/12/2012

11/11/2012	Paul Boyd	5	50	WMS121111-100a	1 ug/L	11/12/2011	11/12/2012
11/11/2012	Paul Boyd	.025	50	WMS121111-104	5 ug/L	11/12/2011	11/12/2012
11/12/2012	Paul Boyd	.05	50	WMS121112-100	10 ug/L	11/13/2011	11/13/2012
11/12/2012	Paul Boyd	5	50	WMS121112-100a	1 ug/L	11/13/2011	11/13/2012
11/12/2012	Paul Boyd	.025	50	WMS121112-104	5 ug/L	11/13/2011	11/13/2012
11/13/2012	Paul Boyd	.05	50	WMS121113-100	10 ug/L	11/14/2011	11/14/2012
11/13/2012	Paul Boyd	5	50	WMS121113-100a	1 ug/L	11/14/2011	11/14/2012
11/13/2012	Paul Boyd	.025	50	WMS121113-104	5 ug/L	11/14/2011	11/14/2012
11/14/2012	Paul Boyd	.05	50	WMS121114-100	10 ug/L	11/15/2011	11/15/2012
11/14/2012	Paul Boyd	5	50	WMS121114-100a	1 ug/L	11/15/2011	11/15/2012
11/14/2012	Paul Boyd	.025	50	WMS121114-104	5 ug/L	11/15/2011	11/15/2012
11/15/2012	Paul Boyd	.05	50	WMS121115-100	10 ug/L	11/16/2011	11/16/2012
11/15/2012	Paul Boyd	5	50	WMS121115-100a	1 ug/L	11/16/2011	11/16/2012
11/15/2012	Paul Boyd	.025	50	WMS121115-104	5 ug/L	11/16/2011	11/16/2012
11/16/2012	Paul Boyd	.05	50	WMS121116-100	10 ug/L	11/17/2011	11/17/2012
11/16/2012	Paul Boyd	5	50	WMS121116-100a	1 ug/L	11/17/2011	11/17/2012
11/16/2012	Paul Boyd	.025	50	WMS121116-104	5 ug/L	11/17/2011	11/17/2012
11/17/2012	Paul Boyd	.05	50	WMS121117-100	10 ug/L	11/18/2011	11/18/2012
11/17/2012	Paul Boyd	5	50	WMS121117-100a	1 ug/L	11/18/2011	11/18/2012
11/17/2012	Paul Boyd	.025	50	WMS121117-104	5 ug/L	11/18/2011	11/18/2012
11/18/2012	Paul Boyd	.05	50	WMS121118-100	10 ug/L	11/19/2011	11/19/2012
11/18/2012	Paul Boyd	5	50	WMS121118-100a	1 ug/L	11/19/2011	11/19/2012
11/18/2012	Paul Boyd	.025	50	WMS121118-104	5 ug/L	11/19/2011	11/19/2012
11/19/2012	Paul Boyd	.05	50	WMS121119-100	10 ug/L	11/20/2011	11/20/2012
11/19/2012	Paul Boyd	5	50	WMS121119-100a	1 ug/L	11/20/2011	11/20/2012
11/19/2012	Paul Boyd	.025	50	WMS121119-104	5 ug/L	11/20/2011	11/20/2012
11/20/2012	Paul Boyd	.05	50	WMS121120-100	10 ug/L	11/21/2011	11/21/2012
11/20/2012	Paul Boyd	5	50	WMS121120-100a	1 ug/L	11/21/2011	11/21/2012
11/20/2012	Paul Boyd	.025	50	WMS121120-104	5 ug/L	11/21/2011	11/21/2012
12/31/2012	Elizabeth Janssen	.05	50	WMS121231-100	10 ug/L	01/01/2012	01/01/2013
12/31/2012	Elizabeth Janssen	5	50	WMS121231-100a	1 ug/L	01/01/2012	01/01/2013
12/31/2012	Elizabeth Janssen	.025	50	WMS121231-104	5 ug/L	01/01/2012	01/01/2013
01/03/2013	Elizabeth Janssen	.05	50	WMS130103-100	10 ug/L	01/04/2012	01/04/2013
01/03/2013	Elizabeth Janssen	5	50	WMS130103-100a	1 ug/L	01/04/2012	01/04/2013

01/03/2013	Elizabeth Janssen	.025	50	WMS130103-104	5 ug/L	01/04/2012	01/04/2013
01/07/2013	Paul Boyd	.05	50	WMS130107-100	10 ug/L	01/08/2012	01/08/2013
01/07/2013	Paul Boyd	5	50	WMS130107-100a	1 ug/L	01/08/2012	01/08/2013
01/07/2013	Paul Boyd	.025	50	WMS130107-104	5 ug/L	01/08/2012	01/08/2013
01/08/2013	Paul Boyd	.05	50	WMS130108-100	10 ug/L	01/09/2012	01/09/2013
01/08/2013	Paul Boyd	5	50	WMS130108-100a	1 ug/L	01/09/2012	01/09/2013
01/08/2013	Paul Boyd	.025	50	WMS130108-104	5 ug/L	01/09/2012	01/09/2013
01/09/2013	Paul Boyd	.05	50	WMS130109-100	10 ug/L	01/10/2012	01/10/2013
01/09/2013	Paul Boyd	5	50	WMS130109-100a	1 ug/L	01/10/2012	01/10/2013
01/09/2013	Paul Boyd	.025	50	WMS130109-104	5 ug/L	01/10/2012	01/10/2013
01/10/2013	Paul Boyd	.05	50	WMS130110-100	10 ug/L	01/11/2012	01/11/2013
01/10/2013	Paul Boyd	5	50	WMS130110-100a	1 ug/L	01/11/2012	01/11/2013
01/10/2013	Paul Boyd	.025	50	WMS130110-104	5 ug/L	01/11/2012	01/11/2013
02/05/2013	Paul Boyd	.05	50	WMS130205-100	10 ug/L	02/06/2012	02/06/2013
02/05/2013	Paul Boyd	5	50	WMS130205-100a	1 ug/L	02/06/2012	02/06/2013
02/05/2013	Paul Boyd	.025	50	WMS130205-104	5 ug/L	02/06/2012	02/06/2013
02/06/2013	Paul Boyd	.05	50	WMS130206-100	10 ug/L	02/07/2012	02/07/2013
02/06/2013	Paul Boyd	5	50	WMS130206-100a	1 ug/L	02/07/2012	02/07/2013
02/06/2013	Paul Boyd	.025	50	WMS130206-104	5 ug/L	02/07/2012	02/07/2013
02/25/2013	Paul Boyd	.05	50	WMS130225-100	10 ug/L	02/26/2012	02/26/2013
02/25/2013	Paul Boyd	5	50	WMS130225-100a	1 ug/L	02/26/2012	02/26/2013
02/25/2013	Paul Boyd	.025	50	WMS130225-104	5 ug/L	02/26/2012	02/26/2013
04/03/2013	Paul Boyd	.05	50	WMS130403-100	10 ug/L	04/04/2012	04/04/2013
04/03/2013	Paul Boyd	5	50	WMS130403-100a	1 ug/L	04/04/2012	04/04/2013
04/03/2013	Paul Boyd	.025	50	WMS130403-104	5 ug/L	04/04/2012	04/04/2013
04/05/2013	Elizabeth Janssen	.05	50	WMS130405-100	10 ug/L	04/06/2012	04/06/2013
04/05/2013	Elizabeth Janssen	5	50	WMS130405-100a	1 ug/L	04/06/2012	04/06/2013
04/05/2013	Elizabeth Janssen	.025	50	WMS130405-104	5 ug/L	04/06/2012	04/06/2013
04/09/2013	Paul Boyd	.05	50	WMS130409-100	10 ug/L	04/10/2012	04/10/2013
04/09/2013	Paul Boyd	5	50	WMS130409-100a	1 ug/L	04/10/2012	04/10/2013
04/09/2013	Paul Boyd	.025	50	WMS130409-104	5 ug/L	04/10/2012	04/10/2013
04/10/2013	Paul Boyd	.05	50	WMS130410-100	10 ug/L	04/11/2012	04/11/2013
04/10/2013	Paul Boyd	5	50	WMS130410-100a	1 ug/L	04/11/2012	04/11/2013
04/10/2013	Paul Boyd	.025	50	WMS130410-104	5 ug/L	04/11/2012	04/11/2013
04/11/2013	Paul Boyd	.05	50	WMS130411-100	10 ug/L	04/12/2012	04/12/2013

04/11/2013	Paul Boyd	5	50	WMS130411-100a	1 ug/L	04/12/2012	04/12/2013
04/11/2013	Paul Boyd	.025	50	WMS130411-104	5 ug/L	04/12/2012	04/12/2013
04/15/2013	Paul Boyd	.05	50	WMS130415-100	10 ug/L	04/16/2012	04/16/2013
04/15/2013	Paul Boyd	5	50	WMS130415-100a	1 ug/L	04/16/2012	04/16/2013
04/15/2013	Paul Boyd	.025	50	WMS130415-104	5 ug/L	04/16/2012	04/16/2013
04/16/2013	Paul Boyd	.05	50	WMS130416-100	10 ug/L	04/17/2012	04/17/2013
04/16/2013	Paul Boyd	5	50	WMS130416-100a	1 ug/L	04/17/2012	04/17/2013
04/16/2013	Paul Boyd	.025	50	WMS130416-104	5 ug/L	04/17/2012	04/17/2013
04/17/2013	Paul Boyd	.05	50	WMS130417-100	10 ug/L	04/18/2012	04/18/2013
04/17/2013	Paul Boyd	5	50	WMS130417-100a	1 ug/L	04/18/2012	04/18/2013
04/17/2013	Paul Boyd	.025	50	WMS130417-104	5 ug/L	04/18/2012	04/18/2013
05/28/2013	Paul Boyd	.05	50	WMS130528-100	10 ug/L	05/29/2012	05/29/2013
05/28/2013	Paul Boyd	5	50	WMS130528-100a	1 ug/L	05/29/2012	05/29/2013
05/28/2013	Paul Boyd	.025	50	WMS130528-104	5 ug/L	05/29/2012	05/29/2013
05/29/2013	Paul Boyd	.05	50	WMS130529-100	10 ug/L	05/30/2012	05/30/2013
05/29/2013	Paul Boyd	5	50	WMS130529-100a	1 ug/L	05/30/2012	05/30/2013
05/29/2013	Paul Boyd	.025	50	WMS130529-104	5 ug/L	05/30/2012	05/30/2013
07/08/2013	Elizabeth Janssen	.05	50	WMS130708-100	10 ug/L	07/09/2012	07/09/2013
07/08/2013	Elizabeth Janssen	5	50	WMS130708-100a	1 ug/L	07/09/2012	07/09/2013
07/08/2013	Elizabeth Janssen	.025	50	WMS130708-104	5 ug/L	07/09/2012	07/09/2013
07/10/2013	Elizabeth Janssen	.05	50	WMS130710-100	10 ug/L	07/11/2012	07/11/2013
07/10/2013	Elizabeth Janssen	5	50	WMS130710-100a	1 ug/L	07/11/2012	07/11/2013
07/10/2013	Elizabeth Janssen	.025	50	WMS130710-104	5 ug/L	07/11/2012	07/11/2013
07/11/2013	Paul Boyd	.05	50	WMS130711-100	10 ug/L	07/12/2012	07/12/2013
07/11/2013	Paul Boyd	5	50	WMS130711-100a	1 ug/L	07/12/2012	07/12/2013
07/11/2013	Paul Boyd	.025	50	WMS130711-104	5 ug/L	07/12/2012	07/12/2013
08/01/2013	Paul Boyd	.05	50	WMS130801-100	10 ug/L	08/02/2012	08/02/2013
08/01/2013	Paul Boyd	5	50	WMS130801-100a	1 ug/L	08/02/2012	08/02/2013
08/01/2013	Paul Boyd	.025	50	WMS130801-104	5 ug/L	08/02/2012	08/02/2013
10/11/2013	Paul Boyd	.05	50	WMS131011-100	10 ug/L	10/12/2012	10/12/2013
10/11/2013	Paul Boyd	5	50	WMS131011-100a	1 ug/L	10/12/2012	10/12/2013
10/11/2013	Paul Boyd	.025	50	WMS131011-104	5 ug/L	10/12/2012	10/12/2013
10/14/2013	Paul Boyd	.05	50	WMS131014-100	10 ug/L	10/15/2012	10/15/2013
10/14/2013	Paul Boyd	5	50	WMS131014-100a	1 ug/L	10/15/2012	10/15/2013

10/14/2013	Paul Boyd	.025	50	WMS131014-104	5 ug/L	10/15/2012	10/15/2013
10/15/2013	Paul Boyd	.05	50	WMS131015-100	10 ug/L	10/16/2012	10/16/2013
10/15/2013	Paul Boyd	5	50	WMS131015-100a	1 ug/L	10/16/2012	10/16/2013
10/15/2013	Paul Boyd	.025	50	WMS131015-104	5 ug/L	10/16/2012	10/16/2013
10/16/2013	Paul Boyd	.05	50	WMS131016-100	10 ug/L	10/17/2012	10/17/2013
10/16/2013	Paul Boyd	5	50	WMS131016-100a	1 ug/L	10/17/2012	10/17/2013
10/16/2013	Paul Boyd	.025	50	WMS131016-104	5 ug/L	10/17/2012	10/17/2013
10/17/2013	Paul Boyd	.05	50	WMS131017-100	10 ug/L	10/18/2012	10/18/2013
10/17/2013	Paul Boyd	5	50	WMS131017-100a	1 ug/L	10/18/2012	10/18/2013
10/17/2013	Paul Boyd	.025	50	WMS131017-104	5 ug/L	10/18/2012	10/18/2013
11/05/2013	Paul Boyd	.05	50	WMS131105-100	10 ug/L	11/06/2012	11/06/2013
11/05/2013	Paul Boyd	5	50	WMS131105-100a	1 ug/L	11/06/2012	11/06/2013
11/05/2013	Paul Boyd	.025	50	WMS131105-104	5 ug/L	11/06/2012	11/06/2013
11/06/2013	Paul Boyd	.05	50	WMS131106-100	10 ug/L	11/07/2012	11/07/2013
11/06/2013	Paul Boyd	5	50	WMS131106-100a	1 ug/L	11/07/2012	11/07/2013
11/06/2013	Paul Boyd	.025	50	WMS131106-104	5 ug/L	11/07/2012	11/07/2013
12/17/2013	Paul Boyd	.05	50	WMS131217-100	10 ug/L	12/18/2012	12/18/2013
12/17/2013	Paul Boyd	5	50	WMS131217-100a	1 ug/L	12/18/2012	12/18/2013
12/17/2013	Paul Boyd	.025	50	WMS131217-104	5 ug/L	12/18/2012	12/18/2013
01/08/2014	Paul Boyd	.05	50	WMS140108-100	10 ug/L	01/09/2013	01/09/2014
01/08/2014	Paul Boyd	5	50	WMS140108-100a	1 ug/L	01/09/2013	01/09/2014
01/08/2014	Paul Boyd	.025	50	WMS140108-104	5 ug/L	01/09/2013	01/09/2014
01/09/2014	Paul Boyd	.05	50	WMS140109-100	10 ug/L	01/10/2013	01/10/2014
01/09/2014	Paul Boyd	5	50	WMS140109-100a	1 ug/L	01/10/2013	01/10/2014
01/09/2014	Paul Boyd	.025	50	WMS140109-104	5 ug/L	01/10/2013	01/10/2014
01/10/2014	Paul Boyd	.05	50	WMS140110-100	10 ug/L	01/10/2013	01/10/2014
01/10/2014	Paul Boyd	5	50	WMS140110-100a	1 ug/L	01/10/2013	01/10/2014
01/10/2014	Paul Boyd	.025	50	WMS140110-104	5 ug/L	01/10/2013	01/10/2014
01/14/2014	Paul Boyd	.05	50	WMS140114-100	10 ug/L	01/15/2013	01/15/2014
01/14/2014	Paul Boyd	5	50	WMS140114-100a	1 ug/L	01/15/2013	01/15/2014
01/14/2014	Paul Boyd	.025	50	WMS140114-104	5 ug/L	01/15/2013	01/15/2014
01/15/2014	Paul Boyd	.05	50	WMS140115-100	10 ug/L	01/16/2013	01/16/2014
01/15/2014	Paul Boyd	5	50	WMS140115-100a	1 ug/L	01/16/2013	01/16/2014
01/15/2014	Paul Boyd	.025	50	WMS140115-104	5 ug/L	01/16/2013	01/16/2014
01/16/2014	Paul Boyd	.05	50	WMS140116-100	10 ug/L	01/17/2013	01/17/2014
01/16/2014	Paul Boyd	5	50	WMS140116-100a	1 ug/L	01/17/2013	01/17/2014
01/16/2014	Paul Boyd	.025	50	WMS140116-104	5 ug/L	01/17/2013	01/17/2014
01/17/2014	Paul Boyd	.05	50	WMS140117-100	10 ug/L	01/18/2013	01/18/2014

01/17/2014	Paul Boyd	5	50	WMS140117-100a	1 ug/L	01/18/2013	01/18/2014
01/17/2014	Paul Boyd	.025	50	WMS140117-104	5 ug/L	01/18/2013	01/18/2014
01/28/2014	Paul Boyd	.05	50	WMS140128-100	10 ug/L	01/29/2013	01/29/2014
01/28/2014	Paul Boyd	5	50	WMS140128-100a	1 ug/L	01/29/2013	01/29/2014
01/28/2014	Paul Boyd	.025	50	WMS140128-104	5 ug/L	01/29/2013	01/29/2014
01/30/2014	Paul Boyd	.05	50	WMS140130-100	10 ug/L	01/31/2013	01/31/2014
01/30/2014	Paul Boyd	5	50	WMS140130-100a	1 ug/L	01/31/2013	01/31/2014
01/30/2014	Paul Boyd	.025	50	WMS140130-104	5 ug/L	01/31/2013	01/31/2014
01/31/2014	Paul Boyd	.05	50	WMS140131-100	10 ug/L	02/01/2013	02/01/2014
01/31/2014	Paul Boyd	5	50	WMS140131-100a	1 ug/L	02/01/2013	02/01/2014
01/31/2014	Paul Boyd	.025	50	WMS140131-104	5 ug/L	02/01/2013	02/01/2014
02/03/2014	Paul Boyd	.05	50	WMS140203-100	10 ug/L	02/04/2013	02/04/2014
02/03/2014	Paul Boyd	5	50	WMS140203-100a	1 ug/L	02/04/2013	02/04/2014
02/03/2014	Paul Boyd	.025	50	WMS140203-104	5 ug/L	02/04/2013	02/04/2014
02/21/2014	Paul Boyd	.05	50	WMS140221-100	10 ug/L	02/22/2013	02/22/2014
02/21/2014	Paul Boyd	5	50	WMS140221-100a	1 ug/L	02/22/2013	02/22/2014
02/21/2014	Paul Boyd	.025	50	WMS140221-104	5 ug/L	02/22/2013	02/22/2014
02/24/2014	Paul Boyd	.05	50	WMS140224-100	10 ug/L	02/25/2013	02/25/2014
02/24/2014	Paul Boyd	5	50	WMS140224-100a	1 ug/L	02/25/2013	02/25/2014
02/24/2014	Paul Boyd	.025	50	WMS140224-104	5 ug/L	02/25/2013	02/25/2014
04/07/2014	Paul Boyd	.05	50	WMS140407-100	10 ug/L	04/08/2013	04/08/2014
04/07/2014	Paul Boyd	5	50	WMS140407-100a	1 ug/L	04/08/2013	04/08/2014
04/07/2014	Paul Boyd	.025	50	WMS140407-104	5 ug/L	04/08/2013	04/08/2014
04/08/2014	Paul Boyd	.05	50	WMS140408-100	10 ug/L	04/09/2013	04/09/2014
04/08/2014	Paul Boyd	5	50	WMS140408-100a	1 ug/L	04/09/2013	04/09/2014
04/08/2014	Paul Boyd	.025	50	WMS140408-104	5 ug/L	04/09/2013	04/09/2014
04/09/2014	Paul Boyd	.05	50	WMS140409-100	10 ug/L	04/10/2013	04/10/2014
04/09/2014	Paul Boyd	5	50	WMS140409-100a	1 ug/L	04/10/2013	04/10/2014
04/09/2014	Paul Boyd	.025	50	WMS140409-104	5 ug/L	04/10/2013	04/10/2014
04/10/2014	Paul Boyd	.05	50	WMS140410-100	10 ug/L	04/11/2013	04/11/2014
04/10/2014	Paul Boyd	5	50	WMS140410-100a	1 ug/L	04/11/2013	04/11/2014
04/10/2014	Paul Boyd	.025	50	WMS140410-104	5 ug/L	04/11/2013	04/11/2014
04/11/2014	Paul Boyd	.05	50	WMS140411-100	10 ug/L	04/12/2013	04/12/2014
04/11/2014	Paul Boyd	5	50	WMS140411-100a	1 ug/L	04/12/2013	04/12/2014
04/11/2014	Paul Boyd	.025	50	WMS140411-104	5 ug/L	04/12/2013	04/12/2014
04/14/2014	Paul Boyd	.05	50	WMS140414-100	10 ug/L	04/15/2013	04/15/2014
04/14/2014	Paul Boyd	5	50	WMS140414-100a	1 ug/L	04/15/2013	04/15/2014
04/14/2014	Paul Boyd	.025	50	WMS140414-104	5 ug/L	04/15/2013	04/15/2014

04/15/2014	Paul Boyd	.05	50	WMS140415-100	10 ug/L	04/16/2013	04/16/2014
04/15/2014	Paul Boyd	5	50	WMS140415-100a	1 ug/L	04/16/2013	04/16/2014
04/15/2014	Paul Boyd	.025	50	WMS140415-104	5 ug/L	04/16/2013	04/16/2014
04/16/2014	Paul Boyd	.05	50	WMS140416-100	10 ug/L	04/17/2013	04/17/2014
04/16/2014	Paul Boyd	5	50	WMS140416-100a	1 ug/L	04/17/2013	04/17/2014
04/16/2014	Paul Boyd	.025	50	WMS140416-104	5 ug/L	04/17/2013	04/17/2014
04/17/2014	Paul Boyd	.05	50	WMS140417-100	10 ug/L	04/18/2013	04/18/2014
04/17/2014	Paul Boyd	5	50	WMS140417-100a	1 ug/L	04/18/2013	04/18/2014
04/17/2014	Paul Boyd	.025	50	WMS140417-104	5 ug/L	04/18/2013	04/18/2014
06/05/2014	Paul Boyd	.05	50	WMS140605-100	10 ug/L	06/06/2013	06/06/2014
06/05/2014	Paul Boyd	5	50	WMS140605-100a	1 ug/L	06/06/2013	06/06/2014
06/05/2014	Paul Boyd	.025	50	WMS140605-104	5 ug/L	06/06/2013	06/06/2014
06/14/2014	Paul Boyd	.05	50	WMS140614-100	10 ug/L	06/15/2013	06/15/2014
06/14/2014	Paul Boyd	5	50	WMS140614-100a	1 ug/L	06/15/2013	06/15/2014
06/14/2014	Paul Boyd	.025	50	WMS140614-104	5 ug/L	06/15/2013	06/15/2014
06/20/2014	Paul Boyd	.05	50	WMS140620-100	10 ug/L	06/21/2013	06/21/2014
06/20/2014	Paul Boyd	5	50	WMS140620-100a	1 ug/L	06/21/2013	06/21/2014
06/20/2014	Paul Boyd	.025	50	WMS140620-104	5 ug/L	06/21/2013	06/21/2014
07/01/2014	Paul Boyd	.05	50	WMS140701-100	10 ug/L	07/02/2013	07/02/2014
07/01/2014	Paul Boyd	5	50	WMS140701-100a	1 ug/L	07/02/2013	07/02/2014
07/01/2014	Paul Boyd	.025	50	WMS140701-104	5 ug/L	07/02/2013	07/02/2014
07/02/2014	Paul Boyd	.05	50	WMS140702-100	10 ug/L	07/03/2013	07/03/2014
07/02/2014	Paul Boyd	5	50	WMS140702-100a	1 ug/L	07/03/2013	07/03/2014
07/02/2014	Paul Boyd	.025	50	WMS140702-104	5 ug/L	07/03/2013	07/03/2014
07/03/2014	Paul Boyd	.05	50	WMS140703-100	10 ug/L	07/04/2013	07/04/2014
07/03/2014	Paul Boyd	5	50	WMS140703-100a	1 ug/L	07/04/2013	07/04/2014
07/03/2014	Paul Boyd	.025	50	WMS140703-104	5 ug/L	07/04/2013	07/04/2014
07/05/2014	Elizabeth Janssen	.05	50	WMS140705-100	10 ug/L	07/06/2013	07/06/2014
07/05/2014	Elizabeth Janssen	5	50	WMS140705-100a	1 ug/L	07/06/2013	07/06/2014
07/05/2014	Elizabeth Janssen	.025	50	WMS140705-104	5 ug/L	07/06/2013	07/06/2014
07/08/2014	Elizabeth Janssen	.05	50	WMS140708-100	10 ug/L	07/09/2013	07/09/2014
07/08/2014	Elizabeth Janssen	5	50	WMS140708-100a	1 ug/L	07/09/2013	07/09/2014
07/09/2014	Bryan Davis	5	50	WMS140709-100a	1 ug/L	07/09/2013	07/09/2014

07/08/2014	Elizabeth Janssen	.025	50	WMS140708-104	5 ug/L	07/09/2013	07/09/2014
07/09/2014	Bryan Davis	.05	50	WMS140709-100	10 ug/L	07/10/2013	07/10/2014
07/09/2014	Bryan Davis	.025	50	WMS140709-104	5 ug/L	07/10/2013	07/10/2014
07/10/2014	Bryan Davis	.05	50	WMS140710-100	10 ug/L	07/11/2013	07/11/2014
07/10/2014	Bryan Davis	.025	50	WMS140710-104	5 ug/L	07/11/2013	07/11/2014
07/14/2014	Bryan Davis	.05	50	WMS140714-100	10 ug/L	07/15/2013	07/15/2014
07/14/2014	Bryan Davis	.025	50	WMS140714-104	5 ug/L	07/15/2013	07/15/2014
07/15/2014	Bryan Davis	.05	50	WMS140715-100	10 ug/L	07/16/2013	07/16/2014
07/15/2014	Bryan Davis	.025	50	WMS140715-104	5 ug/L	07/16/2013	07/16/2014
07/16/2014	Bryan Davis	.05	50	WMS140716-100	10 ug/L	07/17/2013	07/17/2014
07/16/2014	Bryan Davis	.025	50	WMS140716-104	5 ug/L	07/17/2013	07/17/2014
07/17/2014	Bryan Davis	.05	50	WMS140717-100	10 ug/L	07/18/2013	07/18/2014
07/17/2014	Bryan Davis	.025	50	WMS140717-104	5 ug/L	07/18/2013	07/18/2014
07/18/2014	Bryan Davis	.05	50	WMS140718-100	10 ug/L	07/19/2013	07/19/2014
07/18/2014	Bryan Davis	.025	50	WMS140718-104	5 ug/L	07/19/2013	07/19/2014
07/19/2014	Elizabeth Janssen	.05	50	WMS140719-100	10 ug/L	07/20/2013	07/20/2014
07/19/2014	Elizabeth Janssen	5	50	WMS140719-100a	1 ug/L	07/20/2013	07/20/2014
07/19/2014	Elizabeth Janssen	.025	50	WMS140719-104	5 ug/L	07/20/2013	07/20/2014
08/28/2014	Bryan Davis	.05	50	WMS140828-100	10 ug/L	08/29/2013	08/29/2014
08/28/2014	Bryan Davis	5	50	WMS140828-100a	1 ug/L	08/29/2013	08/29/2014
08/28/2014	Bryan Davis	.025	50	WMS140828-104	5 ug/L	08/29/2013	08/29/2014
09/26/2014	Paul Boyd	.05	50	WMS140926-100	10 ug/L	09/27/2013	09/27/2014
09/26/2014	Paul Boyd	5	50	WMS140926-100a	1 ug/L	09/27/2013	09/27/2014
09/26/2014	Paul Boyd	.025	50	WMS140926-104	5 ug/L	09/27/2013	09/27/2014

10/13/2014	Samantha Jacobs	.05	50	WMS141013-100	10 ug/L	10/14/2013	10/14/2014
10/13/2014	Samantha Jacobs	5	50	WMS141013-100a	1 ug/L	10/14/2013	10/14/2014
10/13/2014	Samantha Jacobs	.025	50	WMS141013-104	5 ug/L	10/14/2013	10/14/2014
10/14/2014	Samantha Jacobs	.05	50	WMS141014-100	10 ug/L	10/15/2013	10/15/2014
10/14/2014	Samantha Jacobs	5	50	WMS141014-100a	1 ug/L	10/15/2013	10/15/2014
10/14/2014	Samantha Jacobs	.025	50	WMS141014-104	5 ug/L	10/15/2013	10/15/2014
10/15/2014	Samantha Jacobs	.05	50	WMS141015-100	10 ug/L	10/16/2013	10/16/2014
10/15/2014	Samantha Jacobs	5	50	WMS141015-100a	1 ug/L	10/16/2013	10/16/2014
10/15/2014	Samantha Jacobs	.025	50	WMS141015-104	5 ug/L	10/16/2013	10/16/2014
10/16/2014	Samantha Jacobs	.05	50	WMS141016-100	10 ug/L	10/17/2013	10/17/2014
10/16/2014	Samantha Jacobs	5	50	WMS141016-100a	1 ug/L	10/17/2013	10/17/2014
10/16/2014	Samantha Jacobs	.025	50	WMS141016-104	5 ug/L	10/17/2013	10/17/2014
10/17/2014	Samantha Jacobs	.05	50	WMS141017-100	10 ug/L	10/18/2013	10/18/2014
10/17/2014	Samantha Jacobs	5	50	WMS141017-100a	1 ug/L	10/18/2013	10/18/2014
10/17/2014	Samantha Jacobs	.025	50	WMS141017-104	5 ug/L	10/18/2013	10/18/2014
10/21/2014	Samantha Jacobs	.05	50	WMS141021-100	10 ug/L	10/22/2013	10/22/2014
10/21/2014	Samantha Jacobs	5	50	WMS141021-100a	1 ug/L	10/22/2013	10/22/2014
10/21/2014	Samantha Jacobs	.025	50	WMS141021-104	5 ug/L	10/22/2013	10/22/2014
10/22/2014	Samantha Jacobs	.05	50	WMS141022-100	10 ug/L	10/23/2013	10/23/2014
10/22/2014	Samantha Jacobs	5	50	WMS141022-100a	1 ug/L	10/23/2013	10/23/2014
10/22/2014	Samantha Jacobs	.025	50	WMS141022-104	5 ug/L	10/23/2013	10/23/2014
10/23/2014	Samantha Jacobs	.05	50	WMS141023-100	10 ug/L	10/24/2013	10/24/2014

10/23/2014	Samantha Jacobs	5	50	WMS141023-100a	1 ug/L	10/24/2013	10/24/2014
10/23/2014	Samantha Jacobs	.025	50	WMS141023-104	5 ug/L	10/24/2013	10/24/2014
10/24/2014	Samantha Jacobs	.05	50	WMS141024-100	10 ug/L	10/25/2013	10/25/2014
10/24/2014	Samantha Jacobs	5	50	WMS141024-100a	1 ug/L	10/25/2013	10/25/2014
10/24/2014	Samantha Jacobs	.025	50	WMS141024-104	5 ug/L	10/25/2013	10/25/2014
10/27/2014	Samantha Jacobs	.05	50	WMS141027-100	10 ug/L	10/28/2013	10/28/2014
10/27/2014	Samantha Jacobs	5	50	WMS141027-100a	1 ug/L	10/28/2013	10/28/2014
10/27/2014	Samantha Jacobs	.025	50	WMS141027-104	5 ug/L	10/28/2013	10/28/2014
11/03/2014	Samantha Jacobs	.05	50	WMS141103-100	10 ug/L	11/04/2013	11/04/2014
11/03/2014	Samantha Jacobs	5	50	WMS141103-100a	1 ug/L	11/04/2013	11/04/2014
11/03/2014	Samantha Jacobs	.025	50	WMS141103-104	5 ug/L	11/04/2013	11/04/2014
11/04/2014	Samantha Jacobs	.05	50	WMS141104-100	10 ug/L	11/05/2013	11/05/2014
11/04/2014	Samantha Jacobs	5	50	WMS141104-100a	1 ug/L	11/05/2013	11/05/2014
11/04/2014	Samantha Jacobs	.025	50	WMS141104-104	5 ug/L	11/05/2013	11/05/2014
11/06/2014	Samantha Jacobs	.05	50	WMS141106-100	10 ug/L	11/07/2013	11/07/2014
11/06/2014	Samantha Jacobs	5	50	WMS141106-100a	1 ug/L	11/07/2013	11/07/2014
11/06/2014	Samantha Jacobs	.025	50	WMS141106-104	5 ug/L	11/07/2013	11/07/2014
11/12/2014	Samantha Jacobs	.05	50	WMS141112-100	10 ug/L	11/13/2013	11/13/2014
11/12/2014	Samantha Jacobs	5	50	WMS141112-100a	1 ug/L	11/13/2013	11/13/2014
11/12/2014	Samantha Jacobs	.025	50	WMS141112-104	5 ug/L	11/13/2013	11/13/2014
02/27/2015	Samantha Jacobs	.05	50	WMS150227-100	10 ug/L	02/28/2014	02/28/2015
02/27/2015	Samantha Jacobs	5	50	WMS150227-100a	1 ug/L	02/28/2014	02/28/2015

02/27/2015	Samantha Jacobs	.025	50	WMS150227-104	5 ug/L	02/28/2014	02/28/2015
03/12/2015	Samantha Jacobs	.05	50	WMS150312-100	10 ug/L	03/13/2014	03/13/2015
03/12/2015	Samantha Jacobs	5	50	WMS150312-100a	1 ug/L	03/13/2014	03/13/2015
03/12/2015	Samantha Jacobs	.025	50	WMS150312-104	5 ug/L	03/13/2014	03/13/2015
04/13/2015	Samantha Jacobs	.05	50	WMS150413-100	10 ug/L	04/14/2014	04/14/2015
04/13/2015	Samantha Jacobs	5	50	WMS150413-100a	1 ug/L	04/14/2014	04/14/2015
04/13/2015	Samantha Jacobs	.025	50	WMS150413-104	5 ug/L	04/14/2014	04/14/2015
06/09/2015	Paul Boyd	.05	50	WMS150609-100	10 ug/L	06/10/2014	06/10/2015
06/09/2015	Paul Boyd	5	50	WMS150609-100a	1 ug/L	06/10/2014	06/10/2015
06/09/2015	Paul Boyd	.025	50	WMS150609-104	5 ug/L	06/10/2014	06/10/2015
06/10/2015	Paul Boyd	.05	50	WMS150610-100	10 ug/L	06/11/2014	06/11/2015
06/10/2015	Paul Boyd	5	50	WMS150610-100a	1 ug/L	06/11/2014	06/11/2015
06/10/2015	Paul Boyd	.025	50	WMS150610-104	5 ug/L	06/11/2014	06/11/2015
06/11/2015	Paul Boyd	.05	50	WMS150611-100	10 ug/L	06/12/2014	06/12/2015
06/11/2015	Paul Boyd	5	50	WMS150611-100a	1 ug/L	06/12/2014	06/12/2015
06/11/2015	Paul Boyd	.025	50	WMS150611-104	5 ug/L	06/12/2014	06/12/2015
06/18/2015	Paul Boyd	.05	50	WMS150618-100	10 ug/L	06/19/2014	06/19/2015
06/18/2015	Paul Boyd	5	50	WMS150618-100a	1 ug/L	06/19/2014	06/19/2015
06/18/2015	Paul Boyd	.025	50	WMS150618-104	5 ug/L	06/19/2014	06/19/2015
06/25/2015	Paul Boyd	.05	50	WMS150625-100	10 ug/L	06/26/2014	06/26/2015
06/25/2015	Paul Boyd	5	50	WMS150625-100a	1 ug/L	06/26/2014	06/26/2015
06/25/2015	Paul Boyd	.025	50	WMS150625-104	5 ug/L	06/26/2014	06/26/2015
07/01/2015	Paul Boyd	.05	50	WMS150701-100	10 ug/L	07/02/2014	07/02/2015
07/01/2015	Paul Boyd	5	50	WMS150701-100a	1 ug/L	07/02/2014	07/02/2015
07/01/2015	Paul Boyd	.025	50	WMS150701-104	5 ug/L	07/02/2014	07/02/2015
07/08/2015	Paul Boyd	.05	50	WMS150708-100	10 ug/L	07/09/2014	07/09/2015
07/08/2015	Paul Boyd	5	50	WMS150708-100a	1 ug/L	07/09/2014	07/09/2015
07/08/2015	Paul Boyd	.025	50	WMS150708-104	5 ug/L	07/09/2014	07/09/2015
07/09/2015	Paul Boyd	.05	50	WMS150709-100	10 ug/L	07/10/2014	07/10/2015
07/09/2015	Paul Boyd	5	50	WMS150709-100a	1 ug/L	07/10/2014	07/10/2015
07/09/2015	Paul Boyd	.025	50	WMS150709-104	5 ug/L	07/10/2014	07/10/2015
07/10/2015	Paul Boyd	.05	50	WMS150710-100	10 ug/L	07/11/2014	07/11/2015
07/10/2015	Paul Boyd	5	50	WMS150710-100a	1 ug/L	07/11/2014	07/11/2015

07/10/2015	Paul Boyd	.025	50	WMS150710-104	5 ug/L	07/11/2014	07/11/2015
07/13/2015	Paul Boyd	.05	50	WMS150713-100	10 ug/L	07/14/2014	07/14/2015
07/13/2015	Paul Boyd	5	50	WMS150713-100a	1 ug/L	07/14/2014	07/14/2015
07/13/2015	Paul Boyd	.025	50	WMS150713-104	5 ug/L	07/14/2014	07/14/2015
07/14/2015	Paul Boyd	.05	50	WMS150714-100	10 ug/L	07/15/2014	07/15/2015
07/14/2015	Paul Boyd	5	50	WMS150714-100a	1 ug/L	07/15/2014	07/15/2015
07/14/2015	Paul Boyd	.025	50	WMS150714-104	5 ug/L	07/15/2014	07/15/2015
07/15/2015	Paul Boyd	.05	50	WMS150715-100	10 ug/L	07/16/2014	07/16/2015
07/15/2015	Paul Boyd	5	50	WMS150715-100a	1 ug/L	07/16/2014	07/16/2015
07/15/2015	Paul Boyd	.025	50	WMS150715-104	5 ug/L	07/16/2014	07/16/2015
07/16/2015	Paul Boyd	.05	50	WMS150716-100	10 ug/L	07/17/2014	07/17/2015
07/16/2015	Paul Boyd	5	50	WMS150716-100a	1 ug/L	07/17/2014	07/17/2015
07/16/2015	Paul Boyd	.025	50	WMS150716-104	5 ug/L	07/17/2014	07/17/2015
07/17/2015	Paul Boyd	.05	50	WMS150717-100	10 ug/L	07/18/2014	07/18/2015
07/17/2015	Paul Boyd	5	50	WMS150717-100a	1 ug/L	07/18/2014	07/18/2015
07/17/2015	Paul Boyd	.025	50	WMS150717-104	5 ug/L	07/18/2014	07/18/2015
07/28/2015	Paul Boyd	.05	50	WMS150728-100	10 ug/L	07/29/2014	07/29/2015
07/28/2015	Paul Boyd	5	50	WMS150728-100a	1 ug/L	07/29/2014	07/29/2015
07/28/2015	Paul Boyd	.025	50	WMS150728-104	5 ug/L	07/29/2014	07/29/2015
10/09/2015	Paul Boyd	.05	50	WMS151009-100	10 ug/L	10/10/2014	10/10/2015
10/09/2015	Paul Boyd	5	50	WMS151009-100a	1 ug/L	10/10/2014	10/10/2015
10/09/2015	Paul Boyd	.025	50	WMS151009-104	5 ug/L	10/10/2014	10/10/2015
10/10/2015	Paul Boyd	.05	50	WMS151010-100	10 ug/L	10/11/2014	10/11/2015
10/10/2015	Paul Boyd	5	50	WMS151010-100a	1 ug/L	10/11/2014	10/11/2015
10/10/2015	Paul Boyd	.025	50	WMS151010-104	5 ug/L	10/11/2014	10/11/2015
10/12/2015	Paul Boyd	.05	50	WMS151012-100	10 ug/L	10/13/2014	10/13/2015
10/12/2015	Paul Boyd	5	50	WMS151012-100a	1 ug/L	10/13/2014	10/13/2015
10/12/2015	Paul Boyd	.025	50	WMS151012-104	5 ug/L	10/13/2014	10/13/2015
10/13/2015	Paul Boyd	.05	50	WMS151013-100	10 ug/L	10/14/2014	10/14/2015
10/13/2015	Paul Boyd	5	50	WMS151013-100a	1 ug/L	10/14/2014	10/14/2015
10/13/2015	Paul Boyd	.025	50	WMS151013-104	5 ug/L	10/14/2014	10/14/2015
10/14/2015	Paul Boyd	.05	50	WMS151014-100	10 ug/L	10/15/2014	10/15/2015
10/14/2015	Paul Boyd	5	50	WMS151014-100a	1 ug/L	10/15/2014	10/15/2015
10/14/2015	Paul Boyd	.025	50	WMS151014-104	5 ug/L	10/15/2014	10/15/2015
10/15/2015	Paul Boyd	.05	50	WMS151015-100	10 ug/L	10/16/2014	10/16/2015
10/15/2015	Paul Boyd	5	50	WMS151015-100a	1 ug/L	10/16/2014	10/16/2015
10/15/2015	Paul Boyd	.025	50	WMS151015-104	5 ug/L	10/16/2014	10/16/2015
10/22/2015	Paul Boyd	.05	50	WMS151022-100	10 ug/L	10/23/2014	10/23/2015

10/22/2015	Paul Boyd	5	50	WMS151022-100a	1 ug/L	10/23/2014	10/23/2015
10/22/2015	Paul Boyd	.025	50	WMS151022-104	5 ug/L	10/23/2014	10/23/2015
12/04/2015	Paul Boyd	.05	50	WMS151204-100	10 ug/L	12/05/2014	12/05/2015
12/04/2015	Paul Boyd	5	50	WMS151204-100a	1 ug/L	12/05/2014	12/05/2015
12/04/2015	Paul Boyd	.025	50	WMS151204-104	5 ug/L	12/05/2014	12/05/2015
01/11/2016	Paul Boyd	.05	50	WMS160111-100	10 ug/L	01/12/2015	01/12/2016
01/11/2016	Paul Boyd	5	50	WMS160111-100a	1 ug/L	01/12/2015	01/12/2016
01/11/2016	Paul Boyd	.01	50	WMS160111-104	5 ug/L	01/12/2015	01/12/2016
01/12/2016	Paul Boyd	.05	50	WMS160112-100	10 ug/L	01/13/2015	01/13/2016
01/12/2016	Paul Boyd	5	50	WMS160112-100a	1 ug/L	01/13/2015	01/13/2016
01/12/2016	Paul Boyd	.01	50	WMS160112-104	5 ug/L	01/13/2015	01/13/2016
02/12/2016	Paul Boyd	.05	50	WMS160212-100	10 ug/L	02/13/2015	02/13/2016
02/12/2016	Paul Boyd	5	50	WMS160212-100a	1 ug/L	02/13/2015	02/13/2016
02/12/2016	Paul Boyd	.01	50	WMS160212-104	5 ug/L	02/13/2015	02/13/2016
02/16/2016	Paul Boyd	.05	50	WMS160216-100	10 ug/L	02/17/2015	02/17/2016
02/16/2016	Paul Boyd	5	50	WMS160216-100a	1 ug/L	02/17/2015	02/17/2016
02/16/2016	Paul Boyd	.01	50	WMS160216-104	5 ug/L	02/17/2015	02/17/2016
02/17/2016	Paul Boyd	.05	50	WMS160217-100	10 ug/L	02/18/2015	02/18/2016
02/17/2016	Paul Boyd	5	50	WMS160217-100a	1 ug/L	02/18/2015	02/18/2016
02/17/2016	Paul Boyd	.01	50	WMS160217-104	5 ug/L	02/18/2015	02/18/2016
02/18/2016	Paul Boyd	.05	50	WMS160218-100	10 ug/L	02/19/2015	02/19/2016
02/18/2016	Paul Boyd	5	50	WMS160218-100a	1 ug/L	02/19/2015	02/19/2016
02/18/2016	Paul Boyd	.01	50	WMS160218-104	5 ug/L	02/19/2015	02/19/2016
02/22/2016	Paul Boyd	.05	50	WMS160222-100	10 ug/L	02/23/2015	02/23/2016
02/22/2016	Paul Boyd	5	50	WMS160222-100a	1 ug/L	02/23/2015	02/23/2016
02/23/2016	Paul Boyd	.05	50	WMS160223-100	10 ug/L	02/24/2015	02/24/2016
02/23/2016	Paul Boyd	5	50	WMS160223-100a	1 ug/L	02/24/2015	02/24/2016
03/07/2016	Paul Boyd	.05	50	WMS160307-100	10 ug/L	03/08/2015	03/08/2016
03/07/2016	Paul Boyd	5	50	WMS160307-100a	1 ug/L	03/08/2015	03/08/2016
03/07/2016	Paul Boyd	.01	50	WMS160307-104	5 ug/L	03/08/2015	03/08/2016
03/09/2016	Paul Boyd	.05	50	WMS160309-100	10 ug/L	03/10/2015	03/10/2016
03/09/2016	Paul Boyd	5	50	WMS160309-100a	1 ug/L	03/10/2015	03/10/2016
03/10/2016	Paul Boyd	.05	50	WMS160310-100	10 ug/L	03/11/2015	03/11/2016
03/10/2016	Paul Boyd	5	50	WMS160310-100a	1 ug/L	03/11/2015	03/11/2016
03/14/2016	Paul Boyd	.05	50	WMS160314-100	10 ug/L	03/15/2015	03/15/2016
03/14/2016	Paul Boyd	5	50	WMS160314-100a	1 ug/L	03/15/2015	03/15/2016
03/15/2016	Paul Boyd	.05	50	WMS160315-100	10 ug/L	03/16/2015	03/16/2016
03/15/2016	Paul Boyd	5	50	WMS160315-100a	1 ug/L	03/16/2015	03/16/2016

04/07/2016	Paul Boyd	.05	50	WMS160407-100	10 ug/L	04/08/2015	04/08/2016
04/07/2016	Paul Boyd	5	50	WMS160407-100a	1 ug/L	04/08/2015	04/08/2016
04/08/2016	Paul Boyd	.05	50	WMS160408-100	10 ug/L	04/09/2015	04/09/2016
04/08/2016	Paul Boyd	5	50	WMS160408-100a	1 ug/L	04/09/2015	04/09/2016
04/08/2016	Paul Boyd	.01	50	WMS160408-104	5 ug/L	04/09/2015	04/09/2016
04/11/2016	Paul Boyd	.05	50	WMS160411-100	10 ug/L	04/12/2015	04/12/2016
04/11/2016	Paul Boyd	5	50	WMS160411-100a	1 ug/L	04/12/2015	04/12/2016
04/11/2016	Paul Boyd	.01	50	WMS160411-104	5 ug/L	04/12/2015	04/12/2016
04/12/2016	Paul Boyd	.05	50	WMS160412-100	10 ug/L	04/13/2015	04/13/2016
04/12/2016	Paul Boyd	5	50	WMS160412-100a	1 ug/L	04/13/2015	04/13/2016
04/12/2016	Paul Boyd	.01	50	WMS160412-104	5 ug/L	04/13/2015	04/13/2016
04/13/2016	Paul Boyd	.05	50	WMS160413-100	10 ug/L	04/14/2015	04/14/2016
04/13/2016	Paul Boyd	5	50	WMS160413-100a	1 ug/L	04/14/2015	04/14/2016
04/13/2016	Paul Boyd	.01	50	WMS160413-104	5 ug/L	04/14/2015	04/14/2016
04/14/2016	Paul Boyd	.05	50	WMS160414-100	10 ug/L	04/15/2015	04/15/2016
04/14/2016	Paul Boyd	5	50	WMS160414-100a	1 ug/L	04/15/2015	04/15/2016
04/14/2016	Paul Boyd	.01	50	WMS160414-104	5 ug/L	04/15/2015	04/15/2016
04/15/2016	Paul Boyd	.05	50	WMS160415-100	10 ug/L	04/16/2015	04/16/2016
04/15/2016	Paul Boyd	5	50	WMS160415-100a	1 ug/L	04/16/2015	04/16/2016
04/15/2016	Paul Boyd	.01	50	WMS160415-104	5 ug/L	04/16/2015	04/16/2016
04/19/2016	Paul Boyd	.05	50	WMS160419-100	10 ug/L	04/20/2015	04/20/2016
04/19/2016	Paul Boyd	5	50	WMS160419-100a	1 ug/L	04/20/2015	04/20/2016
04/19/2016	Paul Boyd	.01	50	WMS160419-104	5 ug/L	04/20/2015	04/20/2016
04/20/2016	Paul Boyd	.05	50	WMS160420-100	10 ug/L	04/21/2015	04/21/2016
04/20/2016	Paul Boyd	5	50	WMS160420-100a	1 ug/L	04/21/2015	04/21/2016
04/20/2016	Paul Boyd	.01	50	WMS160420-104	5 ug/L	04/21/2015	04/21/2016
04/21/2016	Paul Boyd	.05	50	WMS160421-100	10 ug/L	04/22/2015	04/22/2016
04/21/2016	Paul Boyd	5	50	WMS160421-100a	1 ug/L	04/22/2015	04/22/2016
04/21/2016	Paul Boyd	.01	50	WMS160421-104	5 ug/L	04/22/2015	04/22/2016
05/05/2016	Paul Boyd	.05	50	WMS160505-100	10 ug/L	05/06/2015	05/06/2016
05/05/2016	Paul Boyd	5	50	WMS160505-100a	1 ug/L	05/06/2015	05/06/2016
05/05/2016	Paul Boyd	.01	50	WMS160505-104	5 ug/L	05/06/2015	05/06/2016
05/12/2016	Elizabeth Janssen	.05	50	WMS160512-100	10 ug/L	05/13/2015	05/13/2016
05/12/2016	Elizabeth Janssen	5	50	WMS160512-100a	1 ug/L	05/13/2015	05/13/2016
05/12/2016	Elizabeth Janssen	.01	50	WMS160512-104	5 ug/L	05/13/2015	05/13/2016
06/16/2016	Paul Boyd	.05	50	WMS160616-100	10 ug/L	06/17/2015	06/17/2016

06/16/2016	Paul Boyd	5	50	WMS160616-100a	1 ug/L	06/17/2015	06/17/2016
06/16/2016	Paul Boyd	.01	50	WMS160616-104	5 ug/L	06/17/2015	06/17/2016
06/21/2016	Paul Boyd	.05	50	WMS160621-100	10 ug/L	06/22/2015	06/22/2016
06/21/2016	Paul Boyd	5	50	WMS160621-100a	1 ug/L	06/22/2015	06/22/2016
06/21/2016	Paul Boyd	.01	50	WMS160621-104	5 ug/L	06/22/2015	06/22/2016
06/22/2016	Paul Boyd	.05	50	WMS160622-100	10 ug/L	06/23/2015	06/23/2016
06/22/2016	Paul Boyd	5	50	WMS160622-100a	1 ug/L	06/23/2015	06/23/2016
06/22/2016	Paul Boyd	.01	50	WMS160622-104	5 ug/L	06/23/2015	06/23/2016
06/23/2016	Paul Boyd	.05	50	WMS160623-100	10 ug/L	06/24/2015	06/24/2016
06/23/2016	Paul Boyd	5	50	WMS160623-100a	1 ug/L	06/24/2015	06/24/2016
06/23/2016	Paul Boyd	.01	50	WMS160623-104	5 ug/L	06/24/2015	06/24/2016
06/24/2016	Paul Boyd	.05	50	WMS160624-100	10 ug/L	06/25/2015	06/25/2016
06/24/2016	Paul Boyd	5	50	WMS160624-100a	1 ug/L	06/25/2015	06/25/2016
06/24/2016	Paul Boyd	.01	50	WMS160624-104	5 ug/L	06/25/2015	06/25/2016
06/27/2016	Paul Boyd	.05	50	WMS160627-100	10 ug/L	06/28/2015	06/28/2016
06/27/2016	Paul Boyd	5	50	WMS160627-100a	1 ug/L	06/28/2015	06/28/2016
06/27/2016	Paul Boyd	.01	50	WMS160627-104	5 ug/L	06/28/2015	06/28/2016
06/28/2016	Paul Boyd	.05	50	WMS160628-100	10 ug/L	06/29/2015	06/29/2016
06/28/2016	Paul Boyd	5	50	WMS160628-100a	1 ug/L	06/29/2015	06/29/2016
06/28/2016	Paul Boyd	.01	50	WMS160628-104	5 ug/L	06/29/2015	06/29/2016
06/29/2016	Paul Boyd	.05	50	WMS160629-100	10 ug/L	06/30/2015	06/30/2016
06/29/2016	Paul Boyd	5	50	WMS160629-100a	1 ug/L	06/30/2015	06/30/2016
06/29/2016	Paul Boyd	.01	50	WMS160629-104	5 ug/L	06/30/2015	06/30/2016
07/08/2016	Paul Boyd	.05	50	WMS160708-100	10 ug/L	07/09/2015	07/09/2016
07/08/2016	Paul Boyd	5	50	WMS160708-100a	1 ug/L	07/09/2015	07/09/2016
07/08/2016	Paul Boyd	.01	50	WMS160708-104	5 ug/L	07/09/2015	07/09/2016
07/11/2016	Paul Boyd	.05	50	WMS160711-100	10 ug/L	07/12/2015	07/12/2016
07/11/2016	Paul Boyd	5	50	WMS160711-100a	1 ug/L	07/12/2015	07/12/2016
07/11/2016	Paul Boyd	.01	50	WMS160711-104	5 ug/L	07/12/2015	07/12/2016
07/14/2016	Paul Boyd	.05	50	WMS160714-100	10 ug/L	07/15/2015	07/15/2016
07/14/2016	Paul Boyd	5	50	WMS160714-100a	1 ug/L	07/15/2015	07/15/2016
07/14/2016	Paul Boyd	.01	50	WMS160714-104	5 ug/L	07/15/2015	07/15/2016
07/26/2016	Paul Boyd	.05	50	WMS160726-100	10 ug/L	07/27/2015	07/27/2016
07/26/2016	Paul Boyd	5	50	WMS160726-100a	1 ug/L	07/27/2015	07/27/2016
07/26/2016	Paul Boyd	.01	50	WMS160726-104	5 ug/L	07/27/2015	07/27/2016
07/27/2016	Paul Boyd	.05	50	WMS160727-100	10 ug/L	07/27/2015	07/27/2016
07/27/2016	Paul Boyd	5	50	WMS160727-100a	1 ug/L	07/27/2015	07/27/2016
07/27/2016	Paul Boyd	.01	50	WMS160727-104	5 ug/L	07/27/2015	07/27/2016

07/28/2016	Paul Boyd	.05	50	WMS160729-100	10 ug/L	07/29/2015	07/29/2016
07/28/2016	Paul Boyd	5	50	WMS160729-100a	1 ug/L	07/29/2015	07/29/2016
08/09/2016	Paul Boyd	.05	50	WMS160809-100	10 ug/L	08/10/2015	08/10/2016
08/09/2016	Paul Boyd	5	50	WMS160809-100a	1 ug/L	08/10/2015	08/10/2016
08/16/2016	Paul Boyd	.05	50	WMS160816-100	10 ug/L	08/17/2015	08/17/2016
08/16/2016	Paul Boyd	5	50	WMS160816-100a	1 ug/L	08/17/2015	08/17/2016
08/17/2016	Paul Boyd	.05	50	WMS160817-100	10 ug/L	08/18/2015	08/18/2016
08/17/2016	Paul Boyd	5	50	WMS160817-100a	1 ug/L	08/18/2015	08/18/2016
08/24/2016	Paul Boyd	.05	50	WMS160824-100	10 ug/L	08/25/2015	08/25/2016
08/24/2016	Paul Boyd	5	50	WMS160824-100a	1 ug/L	08/25/2015	08/25/2016
08/25/2016	Paul Boyd	.05	50	WMS160825-100	10 ug/L	08/26/2015	08/26/2016
08/25/2016	Paul Boyd	5	50	WMS160825-100a	1 ug/L	08/26/2015	08/26/2016
09/01/2016	Paul Boyd	.05	50	WMS160901-100	10 ug/L	09/02/2015	09/02/2016
09/01/2016	Paul Boyd	5	50	WMS160901-100a	1 ug/L	09/02/2015	09/02/2016
09/08/2016	Paul Boyd	.05	50	WMS160908-100	10 ug/L	09/09/2015	09/09/2016
09/08/2016	Paul Boyd	5	50	WMS160908-100a	1 ug/L	09/09/2015	09/09/2016
09/09/2016	Paul Boyd	.05	50	WMS160909-100	10 ug/L	09/10/2015	09/10/2016
09/09/2016	Paul Boyd	5	50	WMS160909-100a	1 ug/L	09/10/2015	09/10/2016
09/13/2016	Paul Boyd	.05	50	WMS160913-100	10 ug/L	09/14/2015	09/14/2016
09/13/2016	Paul Boyd	5	50	WMS160913-100a	1 ug/L	09/14/2015	09/14/2016
09/14/2016	Paul Boyd	.05	50	WMS160914-100	10 ug/L	09/15/2015	09/15/2016
09/14/2016	Paul Boyd	5	50	WMS160914-100a	1 ug/L	09/15/2015	09/15/2016
09/15/2016	Paul Boyd	.05	50	WMS160915-100	10 ug/L	09/16/2015	09/16/2016
09/15/2016	Paul Boyd	5	50	WMS160915-100a	1 ug/L	09/16/2015	09/16/2016
09/16/2016	Paul Boyd	5	50	WMS160916-100a	1 ug/L	09/16/2015	09/16/2016
09/16/2016	Paul Boyd	.05	50	WMS160916-100	10 ug/L	09/17/2015	09/17/2016
09/21/2016	Paul Boyd	.05	50	WMS160921-100	10 ug/L	09/22/2015	09/22/2016
09/21/2016	Paul Boyd	5	50	WMS160921-100a	1 ug/L	09/22/2015	09/22/2016
09/22/2016	Paul Boyd	.05	50	WMS160922-100	10 ug/L	09/23/2015	09/23/2016
09/22/2016	Paul Boyd	5	50	WMS160922-100a	1 ug/L	09/23/2015	09/23/2016
09/23/2016	Paul Boyd	.05	50	WMS160923-100	10 ug/L	09/24/2015	09/24/2016
09/23/2016	Paul Boyd	5	50	WMS160923-100a	1 ug/L	09/24/2015	09/24/2016
09/27/2016	Paul Boyd	.05	50	WMS160927-100	10 ug/L	09/28/2015	09/28/2016
09/27/2016	Paul Boyd	5	50	WMS160927-100a	1 ug/L	09/28/2015	09/28/2016
09/28/2016	Paul Boyd	.05	50	WMS160928-100	10 ug/L	09/29/2015	09/29/2016
09/28/2016	Paul Boyd	5	50	WMS160928-100a	1 ug/L	09/29/2015	09/29/2016
06/16/2016	Paul Boyd	.05	50	WMS2419735-100	10 ug/L	06/17/2015	06/17/2016
06/16/2016	Paul Boyd	5	50	WMS2419737-100a	1 ug/L	06/17/2015	06/17/2016

06/16/2016	Paul Boyd	.01	50	WMS2419743-104	5 ug/L	06/17/2015	06/17/2016
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GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for U-236 Standard 1570-E

v1.2

Analyst	TC1
Verification Prep Date	7/18/2016

Tracer Information	
Isotope	U-232
Serial Number	1564-I
Amount of Std. (mL)	0.2
Expiration Date	11/23/2016

Standard Information	
Isotope	U-236
Serial Number	1570-E
Isotope Half-life	2.3420E+07 Y
Reference Date	11/15/2011
Ref. Act. (dpm/mL)	111.2297
Amount of Std. (mL)	0.2
Standard Prep Date	7/24/2015

Std #	Count Date	Activity pCi	Standard dpm/mL
1	7/20/2016	10.700	118.77
2	7/20/2016	9.920	110.11
3	7/20/2016	10.000	111.00

Mean Value = 10.207 113.294
 Stdev = 0.429107601 4.763094372

Certificate Value* = 10.0207 pCi
 Two sigma = 0.8582
 10 % of Mean = 1.0207
 Rule A (Pass/Fail) Pass
 % Recovery 101.86%
 Rule B (Pass/Fail) Pass
 Expiration Date 7/18/2017

dpm/mL
 111.2297
 9.5262
 11.3294
 Pass
 101.86%
 Pass

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Verification Prep Date.

The analyst prepared three standard verification sources for U-236 standard 1570-E using 0.2 mL for each source. Each standard was combined with 0.2 mL of U-232 standard 1564-I and was diluted in a 50mL plastic centrifuge tube containing 15mL of 1M HCL. In each source, 0.5mL of TiCl₃, 100 micrograms of neodymium carrier and three mL of 48% HF was added to precipitate neodymium (and Uranium) fluoride. After 30 minutes, each sample was filtered following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. DPM values for U-236 were calculated by comparison to U-232 certified values.

TPC
 7-20-16

*HS 1600
Apr 30/12*

CERTIFICATE OF CALIBRATION ALPHA STANDARD SOLUTION

Radionuclide: U-238 (Nat)	Customer: GENERAL ENGINEERING LABS.
Half-life: (4.468 ± 0.005)E+09 years	P.O. No.: 936823 RD
Catalog No.: 7338	Reference Date: 15-Apr-12 12:00 PST
Source No.: 1577-71-2	Contained Radioactivity: 1.023 µCi 37.85 kBq (Total Uranium)

Physical Description:

- A. Mass of solution: 7.05210 g in 10 mL flame-sealed ampoule
- B. Chemical form: UO₂(NO₃)₂ in dilute HNO₃
- C. Carrier content: None
- D. Density: Approximately 1.41 g/mL @ 20°C

Radioimpurities:

See Technical Data Sheet

Radionuclide Concentration: 0.1451 µCi/g, 5.369 kBq/g

Method of Calibration:

Activity calculations are based upon known specific activity and mass.

Uncertainty of Measurement:

- A. Type A (random) uncertainty: ± 0.0 %
- B. Type B (systematic) uncertainty: ± 3.0 %
- C. Uncertainty in aliquot weighing: ± 0.0 %
- D. Total uncertainty at the 99% confidence level: ± 3.0 %

Notes:

- See reverse side for leak test(s) performed on this source.
- EZIP participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (as in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This solution has a working life of 5 years.

Daniel James Van Dalserm
Quality Control

21-MAR-12
Date

EZIP Ref. No.: 1577-71

RC-S-065-030a

ISO 9001 CERTIFIED

U-238 Natural Technical Data

The U-238 Natural used to prepare your order was taken from Eckert & Ziegler Isotope Products Lot #4550102. It had the following composition as of 9 Feb 10:

<u>Nuclide</u>	<u>Atom %</u>	<u>Activity %</u>
U-234	0.0055	49.086
U-235	0.7200	2.241
U-238	99.274	48.673

Isotopic composition provided by New Brunswick Laboratory.

If you have any question, please contact Eckert & Ziegler Isotope Products Technical Service: (661) 309-1010



Standard Traceability Log Rad

Source Material Info	
Parent Code:	1600
Prepared By:	Ashley Drochter
Carrier Conc:	UO ₂ (NO ₃) ₂ in dilute HNO ₃
Reference Date:	04/15/2012
Ampoule Mass (g):	7.0521 g
Uncertainty:	+/- 1.17 %
LogBook No:	RC-S-065-030

A Solution Material Info			
Isotope:	Uranium-238		
Prepared By:	Ashley Drochter		
Prep Date:	09/04/2012		
Verification Date:	07/24/2015		
Expiration Date:	07/24/2016		
Primary Code:	1600-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	6.8204 g		
Density(g/mL):	1.0789	Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (kbq)}) * (\text{conversion dpm to kbq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (kbq)}) * (\text{conversion dpm to kbq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(6.8204 \text{ g}) * (18.42 \text{ kbq}) * (60000 \text{ dpm/kbq}) / (7.0521 \text{ g} * 100 \text{ mL}) = 10688.8814 \text{ dpm/mL}$
$(6.8204 \text{ g}) * (18.42 \text{ kbq}) * (60000 \text{ dpm/kbq}) / (1.0789 \text{ g/mL}) / (7.0521 \text{ g} * 100 \text{ mL}) = 9907.0626 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
09/04/2012	Ashley Drochter	1.4579	500	1600-B	28.8913 dpm/mL	09/04/2012	09/04/2013
09/11/2012	Ashley Drochter	3.0288	500	1600-C	60.0219 dpm/mL	09/04/2013	09/04/2014
03/27/2014	Tim Chandler	3.0445	500	1600-D	60.3241 dpm/mL	03/18/2015	03/18/2016
07/24/2015	Tim Chandler	3.0177	500	1600-E	59.7931 dpm/mL	07/12/2016	07/12/2017

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for U-238 Standard 1600-E

v1.2

Analyst	TC1
Verification Prep Date	7/12/2016

Tracer Information	
Isotope	U-232
Serial Number	1564-I
Amount of Std. (mL)	0.2
Expiration Date	11/23/2016

Standard Information	
Isotope	U-238
Serial Number	1600-E
Isotope Half-life	4.4680E+09 Y
Reference Date	4/15/2012
Ref. Act. (dpm/mL)	59.7931
Amount of Std. (mL)	0.2
Standard Prep Date	7/24/2015

Std #	Count Date	Activity pCi	Standard dpm/mL
1	7/12/2016	5.160	57.28
2	7/12/2016	5.530	61.38
3	7/12/2016	5.420	60.16

Mean Value = 5.370 59.607
 Stdev = 0.19 2.109

pCi 5.3868
 Certificate Value* = 59.7931
 Two sigma = 4.2180
 10 % of Mean = 5.9607
 Rule A (Pass/Fail) Pass
 % Recovery 99.69%
 Rule B (Pass/Fail) Pass
 Expiration Date 7/12/2017

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Verification Prep Date.

The analyst prepared three standard verification sources for U-238 standard 1600-E using 0.2 mL for each source. Each standard was combined with 0.2 mL of U-232 standard 1564-I and was diluted in a 50mL plastic centrifuge tube containing 15 mL of 1M HCl. One milliliter of TIC13, 100 micrograms of neodymium carrier and five mL of 48% HF was added to precipitate neodymium (and Uranium) fluoride. After 30 minutes, each sample was filtered following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. DPM values for U-238 were calculated by comparison to U-232 certified values.

TC
7-18-16

Runlogs

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1596388

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235001	SAMPLE	JXH2	1040	SEP-28-16 14:05:07	DUSE		28-SEP-16 13:05
405235002	SAMPLE	JXH2	1041	SEP-28-16 14:05:07	DONE		28-SEP-16 13:05
405235003	SAMPLE	JXH2	1042	SEP-28-16 14:05:07	DONE		28-SEP-16 13:05
1203621688	MB	JXH2	1038	SEP-28-16 14:05:07	DONE		28-SEP-16 13:04
405235004	SAMPLE	JXH2	1166	SEP-28-16 14:06:35	DONE		13-SEP-16 11:30
405235005	SAMPLE	JXH2	1167	SEP-28-16 14:06:38	DONE		13-SEP-16 11:21
405235006	SAMPLE	JXH2	1169	SEP-28-16 14:06:41	DONE		13-SEP-16 11:21
405235007	SAMPLE	JXH2	1170	SEP-28-16 14:06:43	DONE		13-SEP-16 11:21
405235008	SAMPLE	JXH2	1175	SEP-28-16 14:06:45	DONE		13-SEP-16 11:21
405235009	SAMPLE	JXH2	1176	SEP-28-16 14:06:48	DONE		13-SEP-16 11:22
405235010	SAMPLE	JXH2	1178	SEP-28-16 14:06:50	DUSE		13-SEP-16 13:06
405235011	SAMPLE	JXH2	1179	SEP-28-16 14:06:53	DONE		13-SEP-16 11:22
405235012	SAMPLE	JXH2	1180	SEP-28-16 14:06:55	DUSE		13-SEP-16 11:22
405235014	SAMPLE	JXH2	1184	SEP-28-16 14:06:58	DUSE		13-SEP-16 11:23
405235015	SAMPLE	JXH2	1185	SEP-28-16 14:07:01	DONE		15-SEP-16 12:01
405235016	SAMPLE	JXH2	1186	SEP-28-16 14:07:03	DONE		15-SEP-16 17:13
405235017	SAMPLE	JXH2	1187	SEP-28-16 14:07:06	DONE		15-SEP-16 17:13
405235018	SAMPLE	JXH2	1188	SEP-28-16 14:07:08	DONE		15-SEP-16 17:13
405235019	SAMPLE	JXH2	1189	SEP-28-16 14:07:11	DONE		15-SEP-16 12:01
405235020	SAMPLE	JXH2	1195	SEP-28-16 14:07:13	DONE		15-SEP-16 12:02
1203621689	DUP	JXH2	1197	SEP-28-16 14:07:15	DONE		15-SEP-16 13:09
1203621690	LCS	JXH2	1199	SEP-28-16 14:07:18	DONE		15-SEP-16 12:02
405235013	SAMPLE	JXH2	1182	SEP-28-16 14:27:22	DUSE		14-SEP-16 09:53
405235001	SAMPLE	JXH2	1177	OCT-01-16 12:54:07	DONE		13-SEP-16 12:10
405235010	SAMPLE	JXH2	1179	OCT-01-16 12:54:09	DONE		13-SEP-16 11:22
405235012	SAMPLE	JXH2	1205	OCT-01-16 12:54:11	DONE		15-SEP-16 12:03
405235013	SAMPLE	JXH2	1189	OCT-01-16 12:54:14	DONE		15-SEP-16 12:01
405235014	SAMPLE	JXH2	1207	OCT-01-16 12:54:17	DONE		15-SEP-16 12:04

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1596389

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235001	SAMPLE	JXH2	1007	SEP-29-16 09:13:18	DONE		27-SEP-16 14:31
405235002	SAMPLE	JXH2	1008	SEP-29-16 09:13:18	DONE		27-SEP-16 14:31
405235003	SAMPLE	JXH2	1009	SEP-29-16 09:13:18	DONE		27-SEP-16 14:31
405235004	SAMPLE	JXH2	1010	SEP-29-16 09:13:18	DONE		27-SEP-16 14:31
1203621691	MB	JXH2	1011	SEP-29-16 09:13:18	DONE		27-SEP-16 17:14
1203621691	MB	JXH2	1012	SEP-29-16 09:13:18	DONE		27-SEP-16 14:33
405235005	SAMPLE	JXH2	1013	SEP-29-16 09:13:19	DONE		27-SEP-16 14:33
405235006	SAMPLE	JXH2	1014	SEP-29-16 09:13:19	DONE		27-SEP-16 14:34
405235007	SAMPLE	JXH2	1015	SEP-29-16 09:13:19	DONE		27-SEP-16 14:34
405235008	SAMPLE	JXH2	1016	SEP-29-16 09:13:19	DONE		27-SEP-16 14:34
405235009	SAMPLE	JXH2	1017	SEP-29-16 09:13:19	DONE		27-SEP-16 14:34
405235010	SAMPLE	JXH2	1018	SEP-29-16 09:13:19	DONE		27-SEP-16 14:34
405235011	SAMPLE	JXH2	1020	SEP-29-16 09:13:20	DONE		27-SEP-16 14:34
405235012	SAMPLE	JXH2	1021	SEP-29-16 09:13:20	DONE		27-SEP-16 14:35
405235013	SAMPLE	JXH2	1023	SEP-29-16 09:13:20	DONE		27-SEP-16 17:14
405235014	SAMPLE	JXH2	1024	SEP-29-16 09:13:20	DONE		27-SEP-16 14:35
405235015	SAMPLE	JXH2	1113	SEP-29-16 09:20:16	DONE		08-SEP-16 11:00
405235016	SAMPLE	JXH2	1115	SEP-29-16 09:20:17	DONE		08-SEP-16 11:00
405235017	SAMPLE	JXH2	1116	SEP-29-16 09:20:21	DONE		08-SEP-16 11:01
405235018	SAMPLE	JXH2	1117	SEP-29-16 09:20:23	DONE		08-SEP-16 11:01
405235019	SAMPLE	JXH2	1118	SEP-29-16 09:20:26	DONE		08-SEP-16 12:36
405235020	SAMPLE	JXH2	1119	SEP-29-16 09:20:28	DONE		08-SEP-16 12:37
1203621692	DUP	JXH2	1121	SEP-29-16 09:20:31	DONE		08-SEP-16 12:37
1203621693	LCS	JXH2	1122	SEP-29-16 09:20:33	DONE		08-SEP-16 11:01
405235001	SAMPLE	JXH2	1124	SEP-29-16 09:20:35	DONE		08-SEP-16 12:37
405235002	SAMPLE	JXH2	1126	SEP-29-16 09:20:38	DONE		08-SEP-16 12:37
405235003	SAMPLE	JXH2	1127	SEP-29-16 09:20:41	DONE		08-SEP-16 11:02
405235004	SAMPLE	JXH2	1128	SEP-29-16 09:20:43	DONE		08-SEP-16 11:02
405235006	SAMPLE	JXH2	1132	SEP-29-16 09:20:46	DONE		08-SEP-16 12:38
405235007	SAMPLE	JXH2	1133	SEP-29-16 09:20:48	DONE		08-SEP-16 11:03
405235008	SAMPLE	JXH2	1134	SEP-29-16 09:20:50	DONE		08-SEP-16 11:03
405235009	SAMPLE	JXH2	1139	SEP-29-16 09:20:52	DONE		09-SEP-16 11:41
405235010	SAMPLE	JXH2	1140	SEP-29-16 09:20:55	DONE		09-SEP-16 11:41
405235011	SAMPLE	JXH2	1142	SEP-29-16 09:20:58	DONE		09-SEP-16 11:42
405235012	SAMPLE	JXH2	1143	SEP-29-16 09:21:00	DONE		09-SEP-16 13:32
405235013	SAMPLE	JXH2	1144	SEP-29-16 09:21:03	DONE		09-SEP-16 11:43
405235014	SAMPLE	JXH2	1145	SEP-29-16 09:21:05	DONE		09-SEP-16 13:32
405235015	SAMPLE	JXH2	1146	SEP-29-16 09:21:07	DONE		09-SEP-16 11:43
405235016	SAMPLE	JXH2	1147	SEP-29-16 09:21:11	DONE		09-SEP-16 11:43
405235017	SAMPLE	JXH2	1148	SEP-29-16 09:21:13	DONE		09-SEP-16 11:44
405235018	SAMPLE	JXH2	1149	SEP-29-16 09:21:16	DONE		09-SEP-16 11:44
405235019	SAMPLE	JXH2	1150	SEP-29-16 09:21:17	DONE		09-SEP-16 11:44
405235020	SAMPLE	JXH2	1152	SEP-29-16 09:21:21	DONE		09-SEP-16 12:25
1203621692	DUP	JXH2	1154	SEP-29-16 09:21:23	DONE		09-SEP-16 12:25

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1203621693	LCS	JXH2	1155	SEP-29-16 09:21:25	DONE		09-SEP-16 11:44
405235005	SAMPLE	JXH2	1131	SEP-29-16 09:41:50	DONE		08-SEP-16 11:02

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1596390

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1203621694	MB	JXH2	1095	SEP-29-16 21:26:43	DONE		06-SEP-16 11:01
405235001	SAMPLE	JXH2	1213	SEP-29-16 21:50:31	DONE		16-SEP-16 12:45
405235002	SAMPLE	JXH2	1214	SEP-29-16 21:50:34	DONE		16-SEP-16 12:45
405235009	SAMPLE	JXH2	1218	SEP-29-16 21:50:36	DONE		16-SEP-16 12:46
405235003	SAMPLE	JXH2	1221	SEP-29-16 21:50:41	DONE		16-SEP-16 14:16
405235004	SAMPLE	JXH2	1223	SEP-29-16 21:50:45	DONE		16-SEP-16 14:05
405235005	SAMPLE	JXH2	1224	SEP-29-16 21:50:48	DONE		16-SEP-16 14:17
405235006	SAMPLE	JXH2	1226	SEP-29-16 21:50:50	DONE		16-SEP-16 11:38
405235007	SAMPLE	JXH2	1227	SEP-29-16 21:50:52	DONE		16-SEP-16 14:05
405235008	SAMPLE	JXH2	1228	SEP-29-16 21:50:56	DONE		16-SEP-16 11:38
405235010	SAMPLE	JXH2	1231	SEP-29-16 21:51:01	DONE		16-SEP-16 12:46
405235011	SAMPLE	JXH2	1233	SEP-29-16 21:51:59	DUSE		19-SEP-16 15:36
405235012	SAMPLE	JXH2	1234	SEP-29-16 21:52:02	DONE		19-SEP-16 15:36
405235013	SAMPLE	JXH2	1235	SEP-29-16 21:52:04	DONE		19-SEP-16 15:37
405235014	SAMPLE	JXH2	1236	SEP-29-16 21:52:07	DONE		19-SEP-16 15:37
405235015	SAMPLE	JXH2	1241	SEP-29-16 21:52:09	DUSE		19-SEP-16 15:37
405235016	SAMPLE	JXH2	1242	SEP-29-16 21:52:11	DUSE		19-SEP-16 15:38
405235017	SAMPLE	JXH2	1243	SEP-29-16 21:52:14	DONE		19-SEP-16 15:38
405235018	SAMPLE	JXH2	1244	SEP-29-16 21:52:17	DONE		19-SEP-16 15:38
405235019	SAMPLE	JXH2	1245	SEP-29-16 21:52:20	DONE		19-SEP-16 15:38
405235020	SAMPLE	JXH2	1246	SEP-29-16 21:52:22	DONE		19-SEP-16 15:38
1203621695	DUP	JXH2	1247	SEP-29-16 21:52:25	DONE		19-SEP-16 15:39
1203621696	LCS	JXH2	1248	SEP-29-16 21:52:28	DONE		19-SEP-16 15:39
405235015	SAMPLE	JXH2	1071	OCT-01-16 13:23:22	DONE		30-SEP-16 12:07
405235016	SAMPLE	JXH2	1072	OCT-01-16 13:23:22	DONE		30-SEP-16 12:07
405235011	SAMPLE	JXH2	1070	OCT-01-16 13:23:25	DONE		30-SEP-16 12:06

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1596392

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235001	SAMPLE	JXH2	1161	SEP-30-16 08:59:52	DONE		13-SEP-16 13:45
405235002	SAMPLE	JXH2	1162	SEP-30-16 08:59:54	DONE		13-SEP-16 11:19
405235003	SAMPLE	JXH2	1178	SEP-30-16 08:59:57	DONE		13-SEP-16 13:06
405235005	SAMPLE	JXH2	1167	SEP-30-16 08:59:59	DONE		13-SEP-16 11:21
405235006	SAMPLE	JXH2	1169	SEP-30-16 09:00:01	DONE		13-SEP-16 11:21
405235007	SAMPLE	JXH2	1170	SEP-30-16 09:00:03	DONE		13-SEP-16 11:21
405235008	SAMPLE	JXH2	1175	SEP-30-16 09:00:05	DONE		13-SEP-16 11:21
405235009	SAMPLE	JXH2	1176	SEP-30-16 09:00:08	DONE		13-SEP-16 11:22
405235010	SAMPLE	JXH2	1177	SEP-30-16 09:00:10	DONE		13-SEP-16 12:10
405235011	SAMPLE	JXH2	1179	SEP-30-16 09:00:13	DONE		13-SEP-16 11:22
405235012	SAMPLE	JXH2	1180	SEP-30-16 09:00:16	DONE		13-SEP-16 11:22
405235013	SAMPLE	JXH2	1185	SEP-30-16 09:00:18	DONE		15-SEP-16 12:01
405235014	SAMPLE	JXH2	1186	SEP-30-16 09:00:20	DONE		15-SEP-16 17:13
405235015	SAMPLE	JXH2	1188	SEP-30-16 09:00:22	DONE		15-SEP-16 17:13
405235016	SAMPLE	JXH2	1195	SEP-30-16 09:00:25	DONE		15-SEP-16 12:02
405235017	SAMPLE	JXH2	1197	SEP-30-16 09:00:27	DONE		15-SEP-16 13:09
405235018	SAMPLE	JXH2	1199	SEP-30-16 09:00:30	DONE		15-SEP-16 12:02
405235019	SAMPLE	JXH2	1182	SEP-30-16 09:00:32	DONE		14-SEP-16 09:53
405235020	SAMPLE	JXH2	1200	SEP-30-16 09:00:34	DONE		15-SEP-16 12:03
1203621697	MB	JXH2	1166	SEP-30-16 09:00:37	DONE		13-SEP-16 11:30
1203621698	DUP	JXH2	1234	SEP-30-16 09:00:39	DONE		19-SEP-16 15:36
1203621699	LCS	JXH2	1189	SEP-30-16 09:00:42	DONE		15-SEP-16 12:01
405235004	SAMPLE	JXH2	1175	OCT-01-16 12:54:30	DONE		13-SEP-16 11:21

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1596393

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235001	SAMPLE	JXH2	1103	SEP-29-16 09:18:29	DONE		06-SEP-16 11:02
405235002	SAMPLE	JXH2	1104	SEP-29-16 09:18:29	DONE		06-SEP-16 11:02
405235003	SAMPLE	JXH2	1105	SEP-29-16 09:18:29	DONE		06-SEP-16 11:02
405235004	SAMPLE	JXH2	1106	SEP-29-16 09:18:29	DONE		06-SEP-16 11:02
405235005	SAMPLE	JXH2	1107	SEP-29-16 09:18:30	DONE		06-SEP-16 11:02
405235006	SAMPLE	JXH2	1108	SEP-29-16 09:18:30	DONE		06-SEP-16 11:02
405235007	SAMPLE	JXH2	1109	SEP-29-16 09:18:30	DONE		06-SEP-16 11:02
405235008	SAMPLE	JXH2	1110	SEP-29-16 09:18:30	DONE		06-SEP-16 11:02
405235009	SAMPLE	JXH2	1112	SEP-29-16 09:18:30	DONE		06-SEP-16 11:03
405235010	SAMPLE	JXH2	1210	SEP-29-16 09:23:32	DONE		16-SEP-16 11:37
405235011	SAMPLE	JXH2	1212	SEP-29-16 09:23:34	DONE		16-SEP-16 12:45
405235012	SAMPLE	JXH2	1213	SEP-29-16 09:23:37	DONE		16-SEP-16 12:45
405235013	SAMPLE	JXH2	1214	SEP-29-16 09:23:39	DONE		16-SEP-16 12:45
405235014	SAMPLE	JXH2	1218	SEP-29-16 09:23:41	DONE		16-SEP-16 12:46
405235016	SAMPLE	JXH2	1220	SEP-29-16 09:23:45	DONE		16-SEP-16 11:38
405235017	SAMPLE	JXH2	1221	SEP-29-16 09:23:48	DONE		16-SEP-16 14:16
405235018	SAMPLE	JXH2	1223	SEP-29-16 09:23:51	DONE		16-SEP-16 14:05
405235019	SAMPLE	JXH2	1224	SEP-29-16 09:23:52	DONE		16-SEP-16 14:17
405235020	SAMPLE	JXH2	1226	SEP-29-16 09:23:54	DONE		16-SEP-16 11:38
1203621701	DUP	JXH2	1228	SEP-29-16 09:23:57	DONE		16-SEP-16 11:38
1203621700	MB	JXH2	1227	SEP-29-16 09:24:00	DONE		16-SEP-16 14:05
1203621702	LCS	JXH2	1233	SEP-29-16 09:24:03	DUSE		19-SEP-16 15:36
405235015	SAMPLE	JXH2	1235	SEP-29-16 09:44:15	DONE		19-SEP-16 15:37
1203621702	LCS	JXH2	1177	SEP-29-16 14:16:08	DONE		13-SEP-16 12:10

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1596395

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235021	SAMPLE	MXS2	1033	SEP-24-16 13:16:16	DONE		29-AUG-16 12:37
1203621706	MB	MXS2	1034	SEP-24-16 13:16:16	DONE		29-AUG-16 12:37
405235022	SAMPLE	MXS2	1038	SEP-24-16 13:16:17	DONE		29-AUG-16 12:38
405235023	SAMPLE	MXS2	1040	SEP-24-16 13:16:17	DONE		29-AUG-16 12:38
405235024	SAMPLE	MXS2	1041	SEP-24-16 13:16:17	DONE		29-AUG-16 12:38
405235025	SAMPLE	MXS2	1042	SEP-24-16 13:16:17	DONE		29-AUG-16 12:38
405235026	SAMPLE	MXS2	1161	SEP-24-16 13:17:52	DONE		13-SEP-16 13:45
405235027	SAMPLE	MXS2	1162	SEP-24-16 13:17:55	DONE		13-SEP-16 11:19
405235028	SAMPLE	MXS2	1166	SEP-24-16 13:17:57	DONE		13-SEP-16 11:30
405235029	SAMPLE	MXS2	1167	SEP-24-16 13:17:59	DONE		13-SEP-16 11:21
405235030	SAMPLE	MXS2	1169	SEP-24-16 13:18:02	DONE		13-SEP-16 11:21
405235031	SAMPLE	MXS2	1170	SEP-24-16 13:18:04	DONE		13-SEP-16 11:21
405235032	SAMPLE	MXS2	1175	SEP-24-16 13:18:06	DONE		13-SEP-16 11:21
405235033	SAMPLE	MXS2	1176	SEP-24-16 13:18:08	DONE		13-SEP-16 11:22
405235034	SAMPLE	MXS2	1177	SEP-24-16 13:18:10	DONE		13-SEP-16 12:10
405235036	SAMPLE	MXS2	1179	SEP-24-16 13:18:15	DONE		13-SEP-16 11:22
405235037	SAMPLE	MXS2	1180	SEP-24-16 13:18:18	DONE		13-SEP-16 11:22
405235038	SAMPLE	MXS2	1182	SEP-24-16 13:18:20	DONE		14-SEP-16 09:53
405235040	SAMPLE	MXS2	1185	SEP-24-16 13:18:25	DONE		15-SEP-16 12:01
1203621708	LCS	MXS2	1187	SEP-24-16 13:18:31	DONE		15-SEP-16 17:13
1203621707	DUP	MXS2	1201	SEP-28-16 17:56:47	DONE		15-SEP-16 12:03
405235035	SAMPLE	MXS2	1207	SEP-28-16 17:56:50	DONE		15-SEP-16 12:04
405235039	SAMPLE	MXS2	1208	SEP-28-16 17:56:52	DONE		15-SEP-16 14:36

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1596396

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235021	SAMPLE	MXS2	1128	SEP-24-16 13:19:38	DONE		08-SEP-16 11:02
405235024	SAMPLE	MXS2	1131	SEP-24-16 13:19:46	DONE		08-SEP-16 11:02
405235025	SAMPLE	MXS2	1134	SEP-24-16 13:19:49	DONE		08-SEP-16 11:03
405235026	SAMPLE	MXS2	1139	SEP-24-16 13:19:52	DONE		09-SEP-16 11:41
405235027	SAMPLE	MXS2	1140	SEP-24-16 13:19:54	DONE		09-SEP-16 11:41
405235028	SAMPLE	MXS2	1142	SEP-24-16 13:19:57	DONE		09-SEP-16 11:42
405235029	SAMPLE	MXS2	1143	SEP-24-16 13:19:59	DONE		09-SEP-16 13:32
405235030	SAMPLE	MXS2	1144	SEP-24-16 13:20:01	DONE		09-SEP-16 11:43
405235031	SAMPLE	MXS2	1145	SEP-24-16 13:20:04	DONE		09-SEP-16 13:32
405235032	SAMPLE	MXS2	1146	SEP-24-16 13:20:06	DONE		09-SEP-16 11:43
405235033	SAMPLE	MXS2	1147	SEP-24-16 13:20:09	DONE		09-SEP-16 11:43
405235034	SAMPLE	MXS2	1148	SEP-24-16 13:20:11	DONE		09-SEP-16 11:44
405235035	SAMPLE	MXS2	1149	SEP-24-16 13:20:13	DONE		09-SEP-16 11:44
405235036	SAMPLE	MXS2	1150	SEP-24-16 13:20:16	DONE		09-SEP-16 11:44
405235037	SAMPLE	MXS2	1152	SEP-24-16 13:20:18	DONE		09-SEP-16 12:25
405235038	SAMPLE	MXS2	1154	SEP-24-16 13:20:21	DONE		09-SEP-16 12:25
405235039	SAMPLE	MXS2	1155	SEP-24-16 13:20:22	DONE		09-SEP-16 11:44
405235040	SAMPLE	MXS2	1156	SEP-24-16 13:20:25	DONE		09-SEP-16 11:44
1203621711	LCS	MXS2	1158	SEP-24-16 13:20:30	DONE		09-SEP-16 11:46
405235021	SAMPLE	MXS2	1159	SEP-24-16 13:20:33	DONE		09-SEP-16 11:46
405235022	SAMPLE	MXS2	1160	SEP-24-16 13:20:35	DONE		09-SEP-16 11:46
1203621709	MB	MXS2	1127	SEP-24-16 13:49:22	DONE		08-SEP-16 11:02
1203621709	MB	MXS2	1132	SEP-24-16 13:49:58	DONE		08-SEP-16 12:38
405235023	SAMPLE	MXS2	1001	SEP-25-16 15:53:59	DONE		27-AUG-16 14:30
405235024	SAMPLE	MXS2	1002	SEP-25-16 15:53:59	DONE		27-AUG-16 14:30
405235025	SAMPLE	MXS2	1003	SEP-25-16 15:53:59	DONE		28-AUG-16 16:08
405235026	SAMPLE	MXS2	1005	SEP-25-16 15:53:59	DONE		27-AUG-16 14:31
405235027	SAMPLE	MXS2	1006	SEP-25-16 15:53:59	DONE		27-AUG-16 14:31
405235028	SAMPLE	MXS2	1007	SEP-25-16 15:54:03	DONE		23-SEP-16 11:42
405235029	SAMPLE	MXS2	1008	SEP-25-16 15:54:03	DONE		27-AUG-16 14:31
405235030	SAMPLE	MXS2	1009	SEP-25-16 15:54:03	DONE		23-SEP-16 11:42
405235031	SAMPLE	MXS2	1010	SEP-25-16 15:54:03	DONE		28-AUG-16 16:08
405235032	SAMPLE	MXS2	1011	SEP-25-16 15:54:03	DONE		27-AUG-16 14:32
405235033	SAMPLE	MXS2	1012	SEP-25-16 15:54:03	DONE		27-AUG-16 14:32
405235034	SAMPLE	MXS2	1013	SEP-25-16 15:54:08	DONE		27-AUG-16 14:32
405235035	SAMPLE	MXS2	1014	SEP-25-16 15:54:08	DONE		27-AUG-16 14:32
405235036	SAMPLE	MXS2	1015	SEP-25-16 15:54:08	DONE		27-AUG-16 14:32
405235037	SAMPLE	MXS2	1016	SEP-25-16 15:54:08	DONE		27-AUG-16 14:32
405235038	SAMPLE	MXS2	1017	SEP-25-16 15:54:08	DONE		27-AUG-16 14:32
405235039	SAMPLE	MXS2	1018	SEP-25-16 15:54:08	DONE		28-AUG-16 16:08
405235040	SAMPLE	MXS2	1113	SEP-25-16 15:54:41	DONE		08-SEP-16 11:00
1203621711	LCS	MXS2	1115	SEP-25-16 15:54:46	DONE		08-SEP-16 11:00
405235022	SAMPLE	MXS2	1157	SEP-28-16 17:55:25	DONE		09-SEP-16 11:46
405235023	SAMPLE	MXS2	1158	SEP-28-16 17:55:27	DONE		09-SEP-16 11:46

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1203621710	DUP	MXS2	1159	SEP-28-16 17:55:29	DONE		09-SEP-16 11:46
1203621710	DUP	MXS2	1157	SEP-29-16 14:04:04	DONE		09-SEP-16 11:46

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1596399

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235021	SAMPLE	MXS2	1205	SEP-24-16 13:14:29	DUSE		15-SEP-16 12:03
405235022	SAMPLE	MXS2	1206	SEP-24-16 13:14:31	DUSE		15-SEP-16 12:03
405235023	SAMPLE	MXS2	1207	SEP-24-16 13:14:34	DUSE		15-SEP-16 12:04
405235024	SAMPLE	MXS2	1208	SEP-24-16 13:14:36	DUSE		15-SEP-16 14:36
405235025	SAMPLE	MXS2	1026	SEP-25-16 15:53:37	DUSE		29-AUG-16 12:35
405235026	SAMPLE	MXS2	1028	SEP-25-16 15:53:37	DUSE		29-AUG-16 12:35
405235027	SAMPLE	MXS2	1029	SEP-25-16 15:53:37	DUSE		29-AUG-16 16:41
405235028	SAMPLE	MXS2	1030	SEP-25-16 15:53:37	DUSE		29-AUG-16 16:41
405235029	SAMPLE	MXS2	1032	SEP-25-16 15:53:42	DUSE		29-AUG-16 12:36
405235030	SAMPLE	MXS2	1033	SEP-25-16 15:53:42	DUSE		29-AUG-16 12:37
405235031	SAMPLE	MXS2	1034	SEP-25-16 15:53:42	DUSE		29-AUG-16 12:37
405235032	SAMPLE	MXS2	1038	SEP-25-16 15:53:46	DUSE		29-AUG-16 12:38
405235033	SAMPLE	MXS2	1040	SEP-25-16 15:53:46	DUSE		29-AUG-16 12:38
405235034	SAMPLE	MXS2	1041	SEP-25-16 15:53:46	DUSE		29-AUG-16 12:38
405235035	SAMPLE	MXS2	1042	SEP-25-16 15:53:46	DUSE		29-AUG-16 12:38
405235036	SAMPLE	MXS2	1161	SEP-25-16 15:54:22	DUSE		13-SEP-16 13:45
405235037	SAMPLE	MXS2	1162	SEP-25-16 15:54:24	DUSE		13-SEP-16 11:19
405235038	SAMPLE	MXS2	1166	SEP-25-16 15:54:25	DUSE		13-SEP-16 11:30
405235039	SAMPLE	MXS2	1167	SEP-25-16 15:54:29	DUSE		13-SEP-16 11:21
405235040	SAMPLE	MXS2	1169	SEP-25-16 15:54:31	DUSE		13-SEP-16 11:21
1203621715	MB	MXS2	1170	SEP-25-16 15:54:32	DUSE		13-SEP-16 11:21
1203621716	DUP	MXS2	1175	SEP-25-16 15:54:36	DUSE		13-SEP-16 11:21
1203621717	LCS	MXS2	1176	SEP-25-16 15:54:38	DUSE		13-SEP-16 11:22
1203621717	LCS	MXS2	1180	SEP-26-16 11:53:52	DONE		13-SEP-16 11:22
405235032	SAMPLE	MXS2	1161	SEP-26-16 17:09:37	DONE		13-SEP-16 13:45
405235033	SAMPLE	MXS2	1162	SEP-26-16 17:09:39	DONE		13-SEP-16 11:19
405235035	SAMPLE	MXS2	1166	SEP-26-16 17:09:43	DONE		13-SEP-16 11:30
405235036	SAMPLE	MXS2	1167	SEP-26-16 17:09:46	DONE		13-SEP-16 11:21
405235037	SAMPLE	MXS2	1169	SEP-26-16 17:09:48	DONE		13-SEP-16 11:21
405235038	SAMPLE	MXS2	1170	SEP-26-16 17:09:51	DONE		13-SEP-16 11:21
405235039	SAMPLE	MXS2	1175	SEP-26-16 17:11:08	DONE		13-SEP-16 11:21
405235040	SAMPLE	MXS2	1176	SEP-26-16 17:11:10	DONE		13-SEP-16 11:22
1203621715	MB	MXS2	1177	SEP-26-16 17:11:13	DONE		13-SEP-16 12:10
405235021	SAMPLE	MXS2	1185	SEP-26-16 17:11:18	DONE		15-SEP-16 12:01
405235022	SAMPLE	MXS2	1186	SEP-26-16 17:11:20	DONE		15-SEP-16 17:13
405235023	SAMPLE	MXS2	1188	SEP-26-16 17:11:23	DONE		15-SEP-16 17:13
405235024	SAMPLE	MXS2	1189	SEP-26-16 17:11:25	DONE		15-SEP-16 12:01
405235025	SAMPLE	MXS2	1195	SEP-26-16 17:11:27	DONE		15-SEP-16 12:02
405235027	SAMPLE	MXS2	1199	SEP-26-16 17:11:32	DONE		15-SEP-16 12:02
405235028	SAMPLE	MXS2	1200	SEP-26-16 17:11:35	DONE		15-SEP-16 12:03
405235029	SAMPLE	MXS2	1201	SEP-26-16 17:11:37	DONE		15-SEP-16 12:03
405235030	SAMPLE	MXS2	1202	SEP-26-16 17:11:40	DONE		15-SEP-16 13:09
405235031	SAMPLE	MXS2	1203	SEP-26-16 17:11:43	DONE		15-SEP-16 17:14
405235034	SAMPLE	MXS2	1182	SEP-26-16 17:35:29	DONE		14-SEP-16 09:53

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235026	SAMPLE	MXS2	1069	SEP-29-16 14:05:23	DONE		03-SEP-16 15:23
1203621716	DUP	MXS2	1070	SEP-29-16 14:05:23	DONE		03-SEP-16 15:23

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1596400

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235030	SAMPLE	MXS2	1253	SEP-24-16 20:51:04	DONE		19-SEP-16 15:40
405235031	SAMPLE	MXS2	1254	SEP-24-16 20:51:06	DONE		19-SEP-16 15:40
405235032	SAMPLE	MXS2	1255	SEP-24-16 20:51:08	DONE		19-SEP-16 15:40
405235033	SAMPLE	MXS2	1256	SEP-24-16 20:51:11	DONE		19-SEP-16 15:40
1203621720	LCS	MXS2	1226	SEP-24-16 20:54:04	DONE		16-SEP-16 11:38
405235034	SAMPLE	MXS2	1233	SEP-24-16 20:54:08	DONE		19-SEP-16 15:36
405235035	SAMPLE	MXS2	1234	SEP-24-16 20:54:11	DONE		19-SEP-16 15:36
405235036	SAMPLE	MXS2	1235	SEP-24-16 20:54:13	DONE		19-SEP-16 15:37
405235037	SAMPLE	MXS2	1236	SEP-24-16 20:54:15	DUSE		19-SEP-16 15:37
405235038	SAMPLE	MXS2	1238	SEP-24-16 20:54:18	DONE		19-SEP-16 15:37
405235039	SAMPLE	MXS2	1240	SEP-24-16 20:54:20	DUSE		19-SEP-16 15:37
405235040	SAMPLE	MXS2	1241	SEP-24-16 20:54:22	DONE		19-SEP-16 15:37
1203621718	MB	MXS2	1243	SEP-24-16 20:54:24	DONE		19-SEP-16 15:38
1203621719	DUP	MXS2	1244	SEP-24-16 20:54:26	DONE		19-SEP-16 15:38
405235021	SAMPLE	MXS2	1089	SEP-24-16 20:54:51	DONE		06-SEP-16 10:59
405235022	SAMPLE	MXS2	1090	SEP-24-16 20:54:51	DONE		06-SEP-16 11:00
405235023	SAMPLE	MXS2	1091	SEP-24-16 20:54:51	DONE		06-SEP-16 11:00
405235024	SAMPLE	MXS2	1092	SEP-24-16 20:54:51	DONE		06-SEP-16 11:00
405235025	SAMPLE	MXS2	1093	SEP-24-16 20:54:51	DONE		06-SEP-16 11:00
405235026	SAMPLE	MXS2	1095	SEP-24-16 20:54:52	DONE		06-SEP-16 11:01
405235027	SAMPLE	MXS2	1096	SEP-24-16 20:54:52	DONE		06-SEP-16 11:01
405235028	SAMPLE	MXS2	1097	SEP-24-16 20:54:52	DONE		06-SEP-16 11:01
405235029	SAMPLE	MXS2	1099	SEP-24-16 20:54:52	DONE		06-SEP-16 11:01
405235037	SAMPLE	MXS2	1255	SEP-26-16 13:55:05	DONE		19-SEP-16 15:40
405235039	SAMPLE	MXS2	1256	SEP-26-16 13:55:07	DONE		19-SEP-16 15:40

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1596407

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235045	SAMPLE	HAKB	1199	SEP-22-16 09:57:35	DONE		15-SEP-16 12:02
405235041	SAMPLE	HAKB	1038	SEP-22-16 09:57:38	DUSE		29-AUG-16 12:38
405235042	SAMPLE	HAKB	1040	SEP-22-16 09:57:38	DONE		29-AUG-16 12:38
405235044	SAMPLE	HAKB	1042	SEP-22-16 09:57:38	DONE		29-AUG-16 12:38
405235046	SAMPLE	HAKB	1200	SEP-22-16 09:57:38	DONE		15-SEP-16 12:03
405235047	SAMPLE	HAKB	1201	SEP-22-16 09:57:40	DONE		15-SEP-16 12:03
405235048	SAMPLE	HAKB	1202	SEP-22-16 09:57:43	DONE		15-SEP-16 13:09
405235049	SAMPLE	HAKB	1203	SEP-22-16 09:57:45	DUSE		15-SEP-16 17:14
405235050	SAMPLE	HAKB	1204	SEP-22-16 09:57:47	DUSE		15-SEP-16 14:00
405235051	SAMPLE	HAKB	1205	SEP-22-16 09:57:50	DUSE		15-SEP-16 12:03
405235052	SAMPLE	HAKB	1206	SEP-22-16 09:57:53	DONE		15-SEP-16 12:03
405235053	SAMPLE	HAKB	1207	SEP-22-16 09:57:55	DONE		15-SEP-16 12:04
405235054	SAMPLE	HAKB	1208	SEP-22-16 09:57:57	DONE		15-SEP-16 14:36
405235055	SAMPLE	HAKB	1026	SEP-22-16 13:44:15	DONE		29-AUG-16 12:35
405235056	SAMPLE	HAKB	1028	SEP-22-16 13:44:15	DONE		29-AUG-16 12:35
405235057	SAMPLE	HAKB	1029	SEP-22-16 13:44:15	DONE		29-AUG-16 16:41
405235058	SAMPLE	HAKB	1030	SEP-22-16 13:44:15	DUSE		29-AUG-16 16:41
405235059	SAMPLE	HAKB	1032	SEP-22-16 13:44:16	DONE		29-AUG-16 12:36
405235060	SAMPLE	HAKB	1033	SEP-22-16 13:44:16	DONE		29-AUG-16 12:37
1203621736	MB	HAKB	1034	SEP-22-16 13:44:16	DONE		29-AUG-16 12:37
1203621737	DUP	HAKB	1169	SEP-22-16 14:25:33	DONE		13-SEP-16 11:21
1203621738	LCS	HAKB	1170	SEP-22-16 14:25:35	DONE		13-SEP-16 11:21
405235049	SAMPLE	HAKB	1162	SEP-26-16 12:01:33	DONE		13-SEP-16 11:19
405235050	SAMPLE	HAKB	1163	SEP-26-16 12:01:36	DONE		13-SEP-16 11:20
405235051	SAMPLE	HAKB	1169	SEP-26-16 12:01:38	DONE		13-SEP-16 11:21
405235058	SAMPLE	HAKB	1176	SEP-26-16 12:01:41	DONE		13-SEP-16 11:22
405235041	SAMPLE	HAKB	1188	SEP-27-16 17:12:36	DONE		15-SEP-16 17:13
405235043	SAMPLE	HAKB	1189	SEP-27-16 17:12:39	DONE		15-SEP-16 12:01

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1596408

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235041	SAMPLE	HAKB	1015	SEP-22-16 10:00:17	DONE		27-AUG-16 14:32
405235042	SAMPLE	HAKB	1016	SEP-22-16 10:00:17	DONE		27-AUG-16 14:32
405235043	SAMPLE	HAKB	1017	SEP-22-16 10:00:17	DONE		27-AUG-16 14:32
405235044	SAMPLE	HAKB	1018	SEP-22-16 10:00:17	DONE		28-AUG-16 16:08
405235045	SAMPLE	HAKB	1020	SEP-22-16 10:00:19	DONE		27-AUG-16 14:33
405235046	SAMPLE	HAKB	1021	SEP-22-16 10:00:19	DONE		27-AUG-16 14:33
405235047	SAMPLE	HAKB	1024	SEP-22-16 10:00:19	DONE		27-AUG-16 14:34
405235048	SAMPLE	HAKB	1113	SEP-22-16 10:02:46	DONE		08-SEP-16 11:00
405235049	SAMPLE	HAKB	1114	SEP-22-16 10:02:49	DONE		08-SEP-16 15:33
405235050	SAMPLE	HAKB	1115	SEP-22-16 10:02:51	DONE		08-SEP-16 11:00
405235051	SAMPLE	HAKB	1116	SEP-22-16 10:02:54	DUSE		08-SEP-16 11:01
405235052	SAMPLE	HAKB	1117	SEP-22-16 10:02:56	DONE		08-SEP-16 11:01
405235053	SAMPLE	HAKB	1118	SEP-22-16 10:02:58	DONE		08-SEP-16 12:36
405235054	SAMPLE	HAKB	1119	SEP-22-16 10:03:00	DONE		08-SEP-16 12:37
405235056	SAMPLE	HAKB	1121	SEP-22-16 10:03:06	DONE		08-SEP-16 12:37
405235057	SAMPLE	HAKB	1122	SEP-22-16 10:03:08	DONE		08-SEP-16 11:01
405235058	SAMPLE	HAKB	1124	SEP-22-16 10:03:10	DONE		08-SEP-16 12:37
405235059	SAMPLE	HAKB	1126	SEP-22-16 10:03:12	DONE		08-SEP-16 12:37
405235060	SAMPLE	HAKB	1127	SEP-22-16 10:03:15	DONE		08-SEP-16 11:02
1203621739	MB	HAKB	1128	SEP-22-16 10:03:17	DONE		08-SEP-16 11:02
405235042	SAMPLE	HAKB	1132	SEP-22-16 10:03:28	DONE		08-SEP-16 12:38
405235043	SAMPLE	HAKB	1133	SEP-22-16 10:03:29	DONE		08-SEP-16 11:03
405235044	SAMPLE	HAKB	1134	SEP-22-16 10:03:32	DONE		08-SEP-16 11:03
405235045	SAMPLE	HAKB	1139	SEP-22-16 10:03:34	DONE		09-SEP-16 11:41
405235046	SAMPLE	HAKB	1140	SEP-22-16 10:03:37	DONE		09-SEP-16 11:41
405235047	SAMPLE	HAKB	1142	SEP-22-16 10:03:39	DONE		09-SEP-16 11:42
405235048	SAMPLE	HAKB	1143	SEP-22-16 10:03:42	DONE		09-SEP-16 13:32
405235049	SAMPLE	HAKB	1144	SEP-22-16 10:03:44	DONE		09-SEP-16 11:43
405235050	SAMPLE	HAKB	1145	SEP-22-16 10:03:47	DONE		09-SEP-16 13:32
405235051	SAMPLE	HAKB	1146	SEP-22-16 10:03:49	DUSE		09-SEP-16 11:43
405235052	SAMPLE	HAKB	1147	SEP-22-16 10:03:52	DONE		09-SEP-16 11:43
405235053	SAMPLE	HAKB	1148	SEP-22-16 10:03:54	DONE		09-SEP-16 11:44
405235054	SAMPLE	HAKB	1149	SEP-22-16 10:03:57	DONE		09-SEP-16 11:44
405235055	SAMPLE	HAKB	1150	SEP-22-16 10:03:59	DONE		09-SEP-16 11:44
405235056	SAMPLE	HAKB	1152	SEP-22-16 10:04:02	DONE		09-SEP-16 12:25
405235057	SAMPLE	HAKB	1154	SEP-22-16 10:04:04	DONE		09-SEP-16 12:25
405235058	SAMPLE	HAKB	1155	SEP-22-16 10:04:06	DONE		09-SEP-16 11:44
405235059	SAMPLE	HAKB	1156	SEP-22-16 10:04:10	DONE		09-SEP-16 11:44
405235060	SAMPLE	HAKB	1157	SEP-22-16 10:04:12	DONE		09-SEP-16 11:46
1203621739	MB	HAKB	1158	SEP-22-16 10:04:13	DONE		09-SEP-16 11:46
1203621740	DUP	HAKB	1159	SEP-22-16 10:04:16	DONE		09-SEP-16 11:46
1203621741	LCS	HAKB	1160	SEP-22-16 10:04:19	DONE		09-SEP-16 11:46
405235041	SAMPLE	HAKB	1016	SEP-22-16 14:24:56	DONE		27-AUG-16 14:32
405235055	SAMPLE	HAKB	1013	SEP-22-16 14:24:56	DONE		27-AUG-16 14:32

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1203621740	DUP	HAKB	1014	SEP-22-16 14:24:56	DONE		27-AUG-16 14:32
1203621741	LCS	HAKB	1015	SEP-22-16 14:24:56	DONE		27-AUG-16 14:32

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1596410

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235042	SAMPLE	HAKB	1209	SEP-22-16 09:55:59	DUSE		16-SEP-16 12:45
405235043	SAMPLE	HAKB	1210	SEP-22-16 09:56:00	DONE		16-SEP-16 11:37
405235044	SAMPLE	HAKB	1211	SEP-22-16 09:56:03	DONE		16-SEP-16 14:05
405235045	SAMPLE	HAKB	1212	SEP-22-16 09:56:06	DONE		16-SEP-16 12:45
405235046	SAMPLE	HAKB	1213	SEP-22-16 09:56:08	DONE		16-SEP-16 12:45
405235047	SAMPLE	HAKB	1214	SEP-22-16 09:56:10	DONE		16-SEP-16 12:45
405235048	SAMPLE	HAKB	1215	SEP-22-16 09:56:13	DUSE		16-SEP-16 12:46
405235041	SAMPLE	HAKB	1106	SEP-22-16 09:56:16	DONE		06-SEP-16 11:02
405235049	SAMPLE	HAKB	1216	SEP-22-16 09:56:16	DUSE		16-SEP-16 12:46
405235050	SAMPLE	HAKB	1217	SEP-22-16 09:56:18	DUSE		16-SEP-16 12:46
405235051	SAMPLE	HAKB	1218	SEP-22-16 09:56:21	DONE		16-SEP-16 12:46
405235052	SAMPLE	HAKB	1219	SEP-22-16 09:56:24	DONE		16-SEP-16 11:38
405235053	SAMPLE	HAKB	1220	SEP-22-16 09:56:27	DONE		16-SEP-16 11:38
405235054	SAMPLE	HAKB	1221	SEP-22-16 09:56:29	DONE		16-SEP-16 14:16
405235055	SAMPLE	HAKB	1222	SEP-22-16 09:56:32	DONE		16-SEP-16 12:49
405235056	SAMPLE	HAKB	1223	SEP-22-16 09:56:35	DONE		16-SEP-16 14:05
405235057	SAMPLE	HAKB	1224	SEP-22-16 09:56:37	DONE		16-SEP-16 14:17
405235058	SAMPLE	HAKB	1225	SEP-22-16 09:56:40	DONE		16-SEP-16 14:05
405235059	SAMPLE	HAKB	1226	SEP-22-16 09:56:43	DONE		16-SEP-16 11:38
405235060	SAMPLE	HAKB	1227	SEP-22-16 09:56:45	DONE		16-SEP-16 14:05
1203621745	MB	HAKB	1228	SEP-22-16 09:56:47	DONE		16-SEP-16 11:38
1203621747	LCS	HAKB	1230	SEP-22-16 09:56:52	DONE		16-SEP-16 11:38
405235042	SAMPLE	HAKB	1233	SEP-22-16 16:14:38	DONE		19-SEP-16 15:36
405235048	SAMPLE	HAKB	1234	SEP-22-16 16:14:39	DONE		19-SEP-16 15:36
405235049	SAMPLE	HAKB	1235	SEP-22-16 16:14:41	DONE		19-SEP-16 15:37
405235050	SAMPLE	HAKB	1236	SEP-22-16 16:14:43	DONE		19-SEP-16 15:37
1203621746	DUP	HAKB	1238	SEP-22-16 16:14:46	DONE		19-SEP-16 15:37

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1596411

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235056	SAMPLE	HAKB	1197	SEP-22-16 15:53:48	DUSE		15-SEP-16 13:09
405235057	SAMPLE	HAKB	1199	SEP-22-16 15:53:49	DONE		15-SEP-16 12:02
405235058	SAMPLE	HAKB	1200	SEP-22-16 15:53:52	DONE		15-SEP-16 12:03
405235059	SAMPLE	HAKB	1201	SEP-22-16 15:53:55	DONE		15-SEP-16 12:03
405235060	SAMPLE	HAKB	1202	SEP-22-16 15:53:57	DONE		15-SEP-16 13:09
1203621748	MB	HAKB	1203	SEP-22-16 15:54:00	DONE		15-SEP-16 17:14
1203621749	DUP	HAKB	1205	SEP-22-16 15:54:02	DONE		15-SEP-16 12:03
1203621750	LCS	HAKB	1206	SEP-22-16 15:54:05	DONE		15-SEP-16 12:03
405235041	SAMPLE	HAKB	1210	SEP-22-16 15:55:09	DONE		16-SEP-16 11:37
405235042	SAMPLE	HAKB	1211	SEP-22-16 15:55:11	DONE		16-SEP-16 14:05
405235043	SAMPLE	HAKB	1212	SEP-22-16 15:55:13	DONE		16-SEP-16 12:45
405235044	SAMPLE	HAKB	1213	SEP-22-16 15:55:16	DONE		16-SEP-16 12:45
405235045	SAMPLE	HAKB	1214	SEP-22-16 15:55:18	DONE		16-SEP-16 12:45
405235046	SAMPLE	HAKB	1216	SEP-22-16 15:55:21	DONE		16-SEP-16 12:46
405235047	SAMPLE	HAKB	1218	SEP-22-16 15:55:23	DONE		16-SEP-16 12:46
405235048	SAMPLE	HAKB	1219	SEP-22-16 15:55:26	DONE		16-SEP-16 11:38
405235049	SAMPLE	HAKB	1220	SEP-22-16 15:55:28	DONE		16-SEP-16 11:38
405235050	SAMPLE	HAKB	1221	SEP-22-16 15:55:56	DONE		16-SEP-16 14:16
405235051	SAMPLE	HAKB	1222	SEP-22-16 15:55:58	DUSE		16-SEP-16 12:49
405235052	SAMPLE	HAKB	1223	SEP-22-16 15:55:59	DONE		16-SEP-16 14:05
405235053	SAMPLE	HAKB	1224	SEP-22-16 15:56:03	DONE		16-SEP-16 14:17
405235054	SAMPLE	HAKB	1225	SEP-22-16 15:56:05	DONE		16-SEP-16 14:05
405235055	SAMPLE	HAKB	1226	SEP-22-16 15:56:08	DONE		16-SEP-16 11:38
405235051	SAMPLE	HAKB	1166	SEP-26-16 11:51:54	DONE		13-SEP-16 11:30
405235056	SAMPLE	HAKB	1178	SEP-26-16 11:51:56	DONE		13-SEP-16 13:06

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1596412

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1203621752	DUP	HAKB	1103	SEP-22-16 09:56:16	DONE		06-SEP-16 11:02
1203621753	LCS	HAKB	1104	SEP-22-16 09:56:16	DONE		06-SEP-16 11:02
405235041	SAMPLE	HAKB	1067	SEP-22-16 09:56:19	DONE		03-SEP-16 15:22
405235042	SAMPLE	HAKB	1069	SEP-22-16 09:56:19	DONE		03-SEP-16 15:23
405235043	SAMPLE	HAKB	1070	SEP-22-16 09:56:19	DONE		03-SEP-16 15:23
405235044	SAMPLE	HAKB	1071	SEP-22-16 09:56:24	DONE		03-SEP-16 15:23
405235045	SAMPLE	HAKB	1072	SEP-22-16 09:56:24	DONE		03-SEP-16 15:23
405235046	SAMPLE	HAKB	1073	SEP-22-16 09:56:24	DONE		03-SEP-16 15:23
405235047	SAMPLE	HAKB	1074	SEP-22-16 09:56:24	DONE		03-SEP-16 15:23
405235048	SAMPLE	HAKB	1075	SEP-22-16 09:56:24	DONE		03-SEP-16 15:24
405235049	SAMPLE	HAKB	1078	SEP-22-16 09:56:26	DONE		03-SEP-16 15:24
405235050	SAMPLE	HAKB	1080	SEP-22-16 09:56:26	DONE		03-SEP-16 15:24
405235051	SAMPLE	HAKB	1081	SEP-22-16 09:56:26	DONE		03-SEP-16 15:24
405235052	SAMPLE	HAKB	1082	SEP-22-16 09:56:26	DONE		03-SEP-16 15:24
405235053	SAMPLE	HAKB	1089	SEP-22-16 09:56:29	DONE		06-SEP-16 10:59
405235054	SAMPLE	HAKB	1090	SEP-22-16 09:56:29	DONE		06-SEP-16 11:00
405235055	SAMPLE	HAKB	1091	SEP-22-16 09:56:29	DONE		06-SEP-16 11:00
405235056	SAMPLE	HAKB	1092	SEP-22-16 09:56:29	DONE		06-SEP-16 11:00
405235057	SAMPLE	HAKB	1093	SEP-22-16 09:56:29	DONE		06-SEP-16 11:00
405235058	SAMPLE	HAKB	1095	SEP-22-16 09:56:32	DONE		06-SEP-16 11:01
405235059	SAMPLE	HAKB	1096	SEP-22-16 09:56:32	DONE		06-SEP-16 11:01
405235060	SAMPLE	HAKB	1097	SEP-22-16 09:56:32	DONE		06-SEP-16 11:01
1203621751	MB	HAKB	1099	SEP-22-16 09:56:32	DONE		06-SEP-16 11:01

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1596417

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235077	SAMPLE	KXB2	1206	SEP-19-16 17:40:59	DUSE		15-SEP-16 12:03
405235078	SAMPLE	KXB2	1207	SEP-19-16 17:41:01	DONE		15-SEP-16 12:04
1203621757	MB	KXB2	1208	SEP-19-16 17:41:04	DUSE		15-SEP-16 14:36
405235061	SAMPLE	KXB2	1161	SEP-19-16 17:41:44	DONE		13-SEP-16 13:45
405235062	SAMPLE	KXB2	1162	SEP-19-16 17:41:46	DONE		13-SEP-16 11:19
405235064	SAMPLE	KXB2	1166	SEP-19-16 17:41:51	DONE		13-SEP-16 11:30
405235065	SAMPLE	KXB2	1167	SEP-19-16 17:41:54	DONE		13-SEP-16 11:21
405235066	SAMPLE	KXB2	1169	SEP-19-16 17:41:55	DONE		13-SEP-16 11:21
405235067	SAMPLE	KXB2	1170	SEP-19-16 17:41:58	DONE		13-SEP-16 11:21
405235068	SAMPLE	KXB2	1175	SEP-19-16 17:42:00	DONE		13-SEP-16 11:21
405235069	SAMPLE	KXB2	1176	SEP-19-16 17:42:03	DONE		13-SEP-16 11:22
405235070	SAMPLE	KXB2	1177	SEP-19-16 17:42:05	DONE		13-SEP-16 12:10
405235072	SAMPLE	KXB2	1179	SEP-19-16 17:49:57	DONE		13-SEP-16 11:22
405235073	SAMPLE	KXB2	1180	SEP-19-16 17:49:59	DONE		13-SEP-16 11:22
405235074	SAMPLE	KXB2	1181	SEP-19-16 17:50:00	DONE		13-SEP-16 12:10
405235075	SAMPLE	KXB2	1182	SEP-19-16 17:50:04	DONE		14-SEP-16 09:53
405235076	SAMPLE	KXB2	1184	SEP-19-16 17:50:05	DONE		13-SEP-16 11:23
405235071	SAMPLE	KXB2	1195	SEP-19-16 17:50:08	DONE		15-SEP-16 12:02
1203621758	DUP	KXB2	1189	SEP-19-16 17:56:38	DONE		15-SEP-16 12:01
1203621759	LCS	KXB2	1191	SEP-19-16 17:56:39	DUSE		15-SEP-16 13:09
405235063	SAMPLE	KXB2	1188	SEP-19-16 18:03:46	DONE		15-SEP-16 17:13
405235077	SAMPLE	KXB2	1205	SEP-20-16 11:28:57	DONE		15-SEP-16 12:03
1203621757	MB	KXB2	1207	SEP-20-16 11:28:59	DONE		15-SEP-16 12:04
1203621759	LCS	KXB2	1208	SEP-20-16 11:29:02	DONE		15-SEP-16 14:36

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1596418

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235061	SAMPLE	KXB2	1001	SEP-17-16 11:42:39	DONE		27-AUG-16 14:30
405235062	SAMPLE	KXB2	1002	SEP-17-16 11:42:39	DONE		27-AUG-16 14:30
405235063	SAMPLE	KXB2	1003	SEP-17-16 11:42:39	DONE		28-AUG-16 16:08
405235065	SAMPLE	KXB2	1006	SEP-17-16 11:42:39	DONE		27-AUG-16 14:31
1203621760	MB	KXB2	1004	SEP-17-16 11:42:39	DONE		27-AUG-16 14:31
405235066	SAMPLE	KXB2	1010	SEP-17-16 11:42:40	DONE		28-AUG-16 16:08
405235067	SAMPLE	KXB2	1011	SEP-17-16 11:42:40	DONE		27-AUG-16 14:32
405235068	SAMPLE	KXB2	1012	SEP-17-16 11:42:40	DONE		27-AUG-16 14:32
1203621760	MB	KXB2	1008	SEP-17-16 11:42:40	DONE		27-AUG-16 14:31
405235069	SAMPLE	KXB2	1013	SEP-17-16 11:42:41	DONE		27-AUG-16 14:32
405235070	SAMPLE	KXB2	1014	SEP-17-16 11:42:41	DONE		27-AUG-16 14:32
405235071	SAMPLE	KXB2	1015	SEP-17-16 11:42:41	DONE		27-AUG-16 14:32
405235072	SAMPLE	KXB2	1016	SEP-17-16 11:42:41	DONE		27-AUG-16 14:32
405235073	SAMPLE	KXB2	1017	SEP-17-16 11:42:41	DONE		27-AUG-16 14:32
405235074	SAMPLE	KXB2	1018	SEP-17-16 11:42:41	DONE		28-AUG-16 16:08
405235075	SAMPLE	KXB2	1020	SEP-17-16 11:42:42	DONE		27-AUG-16 14:33
405235076	SAMPLE	KXB2	1021	SEP-17-16 11:42:42	DONE		27-AUG-16 14:33
405235077	SAMPLE	KXB2	1024	SEP-17-16 11:42:42	DONE		27-AUG-16 14:34
405235078	SAMPLE	KXB2	1113	SEP-17-16 11:44:34	DONE		08-SEP-16 11:00
1203621761	DUP	KXB2	1114	SEP-17-16 11:44:37	DONE		08-SEP-16 15:33
1203621762	LCS	KXB2	1115	SEP-17-16 11:44:39	DONE		08-SEP-16 11:00
405235061	SAMPLE	KXB2	1116	SEP-17-16 11:44:41	DONE		08-SEP-16 11:01
405235062	SAMPLE	KXB2	1117	SEP-17-16 11:44:44	DONE		08-SEP-16 11:01
405235063	SAMPLE	KXB2	1118	SEP-17-16 11:44:46	DONE		08-SEP-16 12:36
405235064	SAMPLE	KXB2	1119	SEP-17-16 11:44:49	DONE		08-SEP-16 12:37
405235065	SAMPLE	KXB2	1120	SEP-17-16 11:44:52	DONE		08-SEP-16 11:01
405235066	SAMPLE	KXB2	1121	SEP-17-16 11:44:54	DONE		08-SEP-16 12:37
405235067	SAMPLE	KXB2	1122	SEP-17-16 11:44:56	DONE		08-SEP-16 11:01
405235068	SAMPLE	KXB2	1124	SEP-17-16 11:44:59	DONE		08-SEP-16 12:37
405235069	SAMPLE	KXB2	1126	SEP-17-16 11:45:01	DONE		08-SEP-16 12:37
405235070	SAMPLE	KXB2	1127	SEP-17-16 11:45:04	DONE		08-SEP-16 11:02
405235071	SAMPLE	KXB2	1128	SEP-17-16 11:45:06	DONE		08-SEP-16 11:02
405235072	SAMPLE	KXB2	1129	SEP-17-16 11:45:08	DONE		08-SEP-16 15:34
405235073	SAMPLE	KXB2	1130	SEP-17-16 11:45:10	DONE		08-SEP-16 11:02
405235074	SAMPLE	KXB2	1131	SEP-17-16 11:45:13	DONE		08-SEP-16 11:02
405235075	SAMPLE	KXB2	1132	SEP-17-16 11:45:16	DONE		08-SEP-16 12:38
405235076	SAMPLE	KXB2	1133	SEP-17-16 11:45:18	DONE		08-SEP-16 11:03
405235077	SAMPLE	KXB2	1134	SEP-17-16 11:45:20	DONE		08-SEP-16 11:03
405235078	SAMPLE	KXB2	1139	SEP-17-16 11:45:23	DONE		09-SEP-16 11:41
1203621761	DUP	KXB2	1140	SEP-17-16 11:45:25	DONE		09-SEP-16 11:41
1203621762	LCS	KXB2	1142	SEP-17-16 11:45:28	DONE		09-SEP-16 11:42
405235064	SAMPLE	KXB2	1154	SEP-19-16 15:47:38	DONE		09-SEP-16 12:25

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1596420

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235061	SAMPLE	KXB2	1162	SEP-22-16 09:59:26	DONE		13-SEP-16 11:19
405235062	SAMPLE	KXB2	1163	SEP-22-16 09:59:28	DONE		13-SEP-16 11:20
405235063	SAMPLE	KXB2	1166	SEP-22-16 09:59:30	DONE		13-SEP-16 11:30
405235064	SAMPLE	KXB2	1167	SEP-22-16 09:59:33	DONE		13-SEP-16 11:21
405235065	SAMPLE	KXB2	1169	SEP-22-16 09:59:35	DONE		13-SEP-16 11:21
405235066	SAMPLE	KXB2	1170	SEP-22-16 09:59:38	DONE		13-SEP-16 11:21
405235067	SAMPLE	KXB2	1175	SEP-22-16 09:59:40	DONE		13-SEP-16 11:21
405235068	SAMPLE	KXB2	1176	SEP-22-16 09:59:42	DONE		13-SEP-16 11:22
405235069	SAMPLE	KXB2	1177	SEP-22-16 09:59:45	DONE		13-SEP-16 12:10
405235070	SAMPLE	KXB2	1179	SEP-22-16 09:59:48	DONE		13-SEP-16 11:22
405235071	SAMPLE	KXB2	1180	SEP-22-16 09:59:50	DONE		13-SEP-16 11:22
405235072	SAMPLE	KXB2	1181	SEP-22-16 09:59:52	DONE		13-SEP-16 12:10
405235073	SAMPLE	KXB2	1182	SEP-22-16 09:59:55	DONE		14-SEP-16 09:53
405235074	SAMPLE	KXB2	1184	SEP-22-16 09:59:57	DONE		13-SEP-16 11:23
405235075	SAMPLE	KXB2	1185	SEP-22-16 10:00:00	DONE		15-SEP-16 12:01
405235076	SAMPLE	KXB2	1186	SEP-22-16 10:00:02	DONE		15-SEP-16 17:13
405235078	SAMPLE	KXB2	1189	SEP-22-16 10:00:04	DONE		15-SEP-16 12:01
1203621766	MB	KXB2	1191	SEP-22-16 10:00:10	DONE		15-SEP-16 13:09
1203621767	DUP	KXB2	1195	SEP-22-16 10:00:12	DONE		15-SEP-16 12:02
1203621768	LCS	KXB2	1197	SEP-22-16 10:00:14	DONE		15-SEP-16 13:09
405235077	SAMPLE	KXB2	1188	SEP-22-16 10:30:55	DONE		15-SEP-16 17:13

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1596421

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235061	SAMPLE	KXB2	1065	SEP-17-16 11:42:34	DONE		03-SEP-16 15:22
405235062	SAMPLE	KXB2	1066	SEP-17-16 11:42:34	DONE		03-SEP-16 15:22
405235063	SAMPLE	KXB2	1067	SEP-17-16 11:42:34	DONE		03-SEP-16 15:22
405235064	SAMPLE	KXB2	1068	SEP-17-16 11:42:34	DONE		03-SEP-16 15:23
405235065	SAMPLE	KXB2	1069	SEP-17-16 11:42:34	DONE		03-SEP-16 15:23
405235066	SAMPLE	KXB2	1070	SEP-17-16 11:42:34	DONE		03-SEP-16 15:23
405235067	SAMPLE	KXB2	1071	SEP-17-16 11:42:35	DONE		03-SEP-16 15:23
405235068	SAMPLE	KXB2	1072	SEP-17-16 11:42:35	DONE		03-SEP-16 15:23
405235069	SAMPLE	KXB2	1073	SEP-17-16 11:42:35	DONE		03-SEP-16 15:23
405235070	SAMPLE	KXB2	1074	SEP-17-16 11:42:35	DONE		03-SEP-16 15:23
405235071	SAMPLE	KXB2	1075	SEP-17-16 11:42:35	DONE		03-SEP-16 15:24
405235072	SAMPLE	KXB2	1078	SEP-17-16 11:42:36	DONE		03-SEP-16 15:24
405235073	SAMPLE	KXB2	1080	SEP-17-16 11:42:36	DONE		03-SEP-16 15:24
405235074	SAMPLE	KXB2	1081	SEP-17-16 11:42:36	DONE		03-SEP-16 15:24
405235075	SAMPLE	KXB2	1082	SEP-17-16 11:42:36	DONE		03-SEP-16 15:24
405235076	SAMPLE	KXB2	1083	SEP-17-16 11:42:37	DONE		03-SEP-16 15:24
405235077	SAMPLE	KXB2	1084	SEP-17-16 11:42:37	DONE		03-SEP-16 15:24
405235078	SAMPLE	KXB2	1085	SEP-17-16 11:42:37	DONE		03-SEP-16 15:25
1203621769	MB	KXB2	1086	SEP-17-16 11:42:37	DONE		03-SEP-16 15:25
1203621770	DUP	KXB2	1088	SEP-17-16 11:42:37	DONE		03-SEP-16 15:25
1203621771	LCS	KXB2	1169	SEP-17-16 11:44:20	DONE		13-SEP-16 11:21

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1599981

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235078	SAMPLE	KXB2	1078	SEP-22-16 17:52:55	DONE		03-SEP-16 15:24
1203630763	MB	KXB2	1080	SEP-22-16 17:52:55	DONE		03-SEP-16 15:24
1203630764	DUP	KXB2	1081	SEP-22-16 17:52:55	DONE		03-SEP-16 15:24
1203630765	LCS	KXB2	1082	SEP-22-16 17:52:55	DONE		03-SEP-16 15:24
405235061	SAMPLE	KXB2	1240	SEP-22-16 17:53:41	DONE		19-SEP-16 15:37
405235062	SAMPLE	KXB2	1241	SEP-22-16 17:53:42	DONE		19-SEP-16 15:37
405235063	SAMPLE	KXB2	1242	SEP-22-16 17:53:46	DONE		19-SEP-16 15:38
405235064	SAMPLE	KXB2	1243	SEP-22-16 17:53:48	DONE		19-SEP-16 15:38
405235065	SAMPLE	KXB2	1244	SEP-22-16 17:53:51	DONE		19-SEP-16 15:38
405235066	SAMPLE	KXB2	1245	SEP-22-16 17:55:36	DONE		19-SEP-16 15:38
405235067	SAMPLE	KXB2	1246	SEP-22-16 17:55:38	DONE		19-SEP-16 15:38
405235068	SAMPLE	KXB2	1247	SEP-22-16 17:55:39	DONE		19-SEP-16 15:39
405235069	SAMPLE	KXB2	1248	SEP-22-16 17:55:43	DONE		19-SEP-16 15:39
405235070	SAMPLE	KXB2	1249	SEP-22-16 17:55:45	DONE		19-SEP-16 15:39
405235071	SAMPLE	KXB2	1250	SEP-22-16 17:55:47	DONE		19-SEP-16 15:39
405235072	SAMPLE	KXB2	1251	SEP-22-16 17:55:50	DONE		19-SEP-16 15:39
405235073	SAMPLE	KXB2	1252	SEP-22-16 17:55:53	DONE		19-SEP-16 15:40
405235074	SAMPLE	KXB2	1253	SEP-22-16 17:55:55	DONE		19-SEP-16 15:40
405235075	SAMPLE	KXB2	1254	SEP-22-16 17:55:56	DONE		19-SEP-16 15:40
405235076	SAMPLE	KXB2	1255	SEP-22-16 17:55:59	DONE		19-SEP-16 15:40
405235077	SAMPLE	KXB2	1256	SEP-22-16 17:56:01	DONE		19-SEP-16 15:40

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1601257

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235051	SAMPLE	KXB2	1007	SEP-29-16 14:04:46	DONE		27-SEP-16 14:31
405235051	SAMPLE	KXB2	1012	SEP-29-16 14:04:46	DONE		27-SEP-16 14:33
1203633742	MB	KXB2	1009	SEP-29-16 14:04:46	DONE		27-SEP-16 14:31
1203633742	MB	KXB2	1011	SEP-29-16 14:04:46	DONE		27-SEP-16 17:14
1203633743	DUP	KXB2	1008	SEP-29-16 14:04:46	DONE		27-SEP-16 14:31
1203633744	LCS	KXB2	1010	SEP-29-16 14:04:46	DONE		27-SEP-16 14:31
1203633743	DUP	KXB2	1020	SEP-29-16 14:04:55	DONE		27-SEP-16 14:34
1203633744	LCS	KXB2	1021	SEP-29-16 14:04:55	DONE		27-SEP-16 14:35

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1602285

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235021	SAMPLE	MXS2	1069	SEP-29-16 21:26:39	DONE		03-SEP-16 15:23
405235022	SAMPLE	MXS2	1070	SEP-29-16 21:26:39	DONE		03-SEP-16 15:23
405235023	SAMPLE	MXS2	1084	SEP-29-16 21:26:41	DONE		03-SEP-16 15:24
405235024	SAMPLE	MXS2	1088	SEP-29-16 21:26:41	DONE		03-SEP-16 15:25
405235025	SAMPLE	MXS2	1089	SEP-29-16 21:26:42	DONE		06-SEP-16 10:59
405235026	SAMPLE	MXS2	1090	SEP-29-16 21:26:42	DONE		06-SEP-16 11:00
405235027	SAMPLE	MXS2	1091	SEP-29-16 21:26:42	DONE		06-SEP-16 11:00
405235028	SAMPLE	MXS2	1093	SEP-29-16 21:26:42	DONE		06-SEP-16 11:00
1203636290	MB	MXS2	1092	SEP-29-16 21:26:42	DONE		06-SEP-16 11:00
405235029	SAMPLE	MXS2	1096	SEP-29-16 21:26:43	DONE		06-SEP-16 11:01
405235030	SAMPLE	MXS2	1097	SEP-29-16 21:26:43	DONE		06-SEP-16 11:01
405235031	SAMPLE	MXS2	1099	SEP-29-16 21:26:43	DONE		06-SEP-16 11:01
405235032	SAMPLE	MXS2	1107	SEP-29-16 21:26:44	DONE		06-SEP-16 11:02
405235033	SAMPLE	MXS2	1108	SEP-29-16 21:26:44	DONE		06-SEP-16 11:02
405235034	SAMPLE	MXS2	1109	SEP-29-16 21:26:44	DONE		06-SEP-16 11:02
405235035	SAMPLE	MXS2	1110	SEP-29-16 21:26:44	DONE		06-SEP-16 11:02
405235036	SAMPLE	MXS2	1112	SEP-29-16 21:26:44	DONE		06-SEP-16 11:03
405235037	SAMPLE	MXS2	1249	SEP-29-16 21:52:30	DUSE		19-SEP-16 15:39
405235038	SAMPLE	MXS2	1250	SEP-29-16 21:52:33	DONE		19-SEP-16 15:39
405235039	SAMPLE	MXS2	1251	SEP-29-16 21:52:36	DONE		19-SEP-16 15:39
405235040	SAMPLE	MXS2	1252	SEP-29-16 21:52:38	DONE		19-SEP-16 15:40
1203636291	DUP	MXS2	1253	SEP-29-16 21:52:41	DONE		19-SEP-16 15:40
1203636292	LCS	MXS2	1254	SEP-29-16 21:52:42	DONE		19-SEP-16 15:40
405235037	SAMPLE	MXS2	1069	OCT-01-16 13:23:25	DONE		30-SEP-16 12:06

Gamma Spectroscopy Raw Data

Batch# 1598647 Product: I-129 / MJWC Date: 09/30/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			n/a
Samples have been blank corrected (if required). Blank correction reported included (if required).			n/a
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			n/a
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	DER 1563266
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			n/a
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.	✓		
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)	✓		
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER 1563266
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		
Aliquot Correction completed if required.			n/a
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: gl- 9/30/16

Secondary Review Performed By: BW 9/30/16

DATA EXCEPTION REPORT

Mo.Day Yr. 30-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GAMMA SPECTROMETER	Test / Method: DOE EML HASL-300,I-01 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1598647	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>Sample received out of holding:</p> <p>405235 041,042,043,044,045,046,047,048,049, 050,051,052,053,054,055,056,057,058, 059,060</p> <p>QC 1203627503DUP,1203627504MS</p>		<p>Samples analyzed in a timely manner upon receipt. Reporting results.</p>	

Originator's Name:
Spencer Collins 30-SEP-16

Data Validator/Group Leader:
Bryan Williams 30-SEP-16

I-129 Queue Sheet

09/14/2016

Batch #: 1598647

Analyst: MJH1 First Client Due Date: 10/04/2016 Internal Due Date: 09/30/2016

Spike Isotope: I-129 Spike Code: J470-K Expiration Date: 3-30-17

LCS Isotope: I-129 LCS Code: J470-K Expiration Date: 3-30-17

Nominal Concentration: NA

Nominal Concentration: NA

Prep Date: 9-27-16 Initials: WWSH Pipette ID: J429503
184359Z


Witness: NA Balance: 17955156

Sample ID	Client Description	Type	Hazard Code	RDL	Client	Matrix	Weight Aliquot (g)	Collect Date	Aliquot (mL of g)	Detector
405235041-1	4.4D.R.1.4	SAMPLE		1 pCi/g	MJWC001	SOIL	3.64	30-NOV-15 13:27 D1	3.10	X6 MS
405235042-1	4.4D.R.2.3	SAMPLE		1 pCi/g	MJWC001	SOIL	3.82	30-NOV-15 13:53 D2	3.40	X1 MS
405235043-1	4.4D.R.2.4	SAMPLE		1 pCi/g	MJWC001	SOIL	3.51	30-NOV-15 13:59 D3	2.57	X2 MS
405235044-1	4.4D.R.4.2	SAMPLE		1 pCi/g	MJWC001	SOIL	3.27	30-NOV-15 13:50 D4	2.46	X4 MS
405235045-1	4.4D.R.5.2	SAMPLE		1 pCi/g	MJWC001	SOIL	4.15	30-NOV-15 14:15 D5	3.22	X5 MS
405235046-1	4.5A.R.1.3	SAMPLE		1 pCi/g	MJWC001	SOIL	3.92	07-DEC-15 10:02 D6	3.19	X6 MS
405235047-1	4.5A.R.1.4	SAMPLE		1 pCi/g	MJWC001	SOIL	4.38	07-DEC-15 10:10 D7	3.47	X1 MS
405235048-1	4.5B.R.1.2	SAMPLE		1 pCi/g	MJWC001	SOIL	3.85	07-DEC-15 13:28 D8	2.95	X2 MS
405235049-1	4.5B.R.1.3	SAMPLE		1 pCi/g	MJWC001	SOIL	4.44	07-DEC-15 13:33 D9	3.61	X4 MS
405235050-1	4.5B.R.1.4	SAMPLE		1 pCi/g	MJWC001	SOIL	3.30	07-DEC-15 13:42 D10	2.94	X5 MS
405235051-1	4.5B.R.2.3	SAMPLE		1 pCi/g	MJWC001	SOIL	4.13	07-DEC-15 13:02 D11	3.40	X6 MS
405235052-1	4.5B.R.2.4	SAMPLE		1 pCi/g	MJWC001	SOIL	3.26	07-DEC-15 13:11 D12	2.75	X1 MS
405235053-1	4.5C.R.5.2	SAMPLE		1 pCi/g	MJWC001	SOIL	3.10	01-DEC-15 14:24 D13	2.16	X2 MS
405235054-1	4.5C.R.1.3	SAMPLE		1 pCi/g	MJWC001	SOIL	3.85	02-DEC-15 14:51 D14	3.15	X4 MS
405235055-1	4.5C.R.1.4	SAMPLE		1 pCi/g	MJWC001	SOIL	3.17	02-DEC-15 14:59 D15	2.56	X5 MS
405235056-1	4.5C.R.2.2	SAMPLE		1 pCi/g	MJWC001	SOIL	3.85	02-DEC-15 14:59 D16	2.62	X6 MS
405235057-1	4.5C.R.2.3	SAMPLE		1 pCi/g	MJWC001	SOIL	3.28	02-DEC-15 14:55 D17	2.39	X1 MS
405235058-1	4.5C.R.2.4	SAMPLE		1 pCi/g	MJWC001	SOIL	4.21	02-DEC-15 15:00 D18	2.59	X2 MS
405235059-1	5.1A.R.1.2	SAMPLE		1 pCi/g	MJWC001	SOIL	3.75	16-DEC-15 12:26 D19	3.70	X4 MS
405235060-1	5.1A.R.1.3	SAMPLE		1 pCi/g	MJWC001	SOIL	3.75	16-DEC-15 12:33 D20	3.39	X5 MS
1203627502-1	MB for batch 1598647	MB		1 pCi/g	QC ACCOUNT	SOIL		9-27-16		
1203627503-1	4.4D.R.1.4(405235041DUP)	DUP		1 pCi/g	QC ACCOUNT	SOIL	3.41			
1203627504-1	4.4D.R.1.4(405235041MS)	MS		1 pCi/g	QC ACCOUNT	SOIL	3.40	30-NOV-15 13:27 D21	3.00	5
1203627505-1	LCS for batch 1598647	LCS		1 pCi/g	QC ACCOUNT	SOIL		9-27-16		
										X1 MS
										X2 MS
										X4 MS
										X5 MS
										X6 MS
										9/24/16


Se- 9/30/16

GEL Laboratories LLC, Radiochemistry Division

Data Reviewed By:



Weight/Loss Aliquot Correction Report



Select What to Correct Aliquot to

Ash Dry Weight Dry Weight Wet Weight

Submit

Batch ID: 1598647

Calculate Corrected Aliquot

Aliquot Correction to Dry Weight for Batch 1598647

Sample Id	Aliquot (G)	Sample Type	Parent Sample Id	Loss (Dec)	Corrected Aliquot (G)
405235041	3.64	SAMPLE	NA	.1197	3.204136818956985
405235042	3.82	SAMPLE	NA	.1097	3.400653019479009
405235043	3.01	SAMPLE	NA	.1453	2.572426206419619
405235044	3.27	SAMPLE	NA	.2477	2.459928899242991
405235045	4.15	SAMPLE	NA	.2237	3.221299225287384
405235046	3.92	SAMPLE	NA	.1864	3.189154732989702
405235047	4.38	SAMPLE	NA	.2069	3.473592139594150
405235048	3.83	SAMPLE	NA	.2288	2.953618118159512
405235049	4.44	SAMPLE	NA	.1878	3.605787308118374
405235050	3.30	SAMPLE	NA	.1103	2.935721900620517
405235051	4.13	SAMPLE	NA	.1766	3.400632510187733
405235052	3.26	SAMPLE	NA	.1547	2.755459316329990
405235053	3.10	SAMPLE	NA	.3036	2.158740016564712
405235054	3.85	SAMPLE	NA	.1820	3.149034767257346
405235055	3.17	SAMPLE	NA	.1930	2.557895602052467
405235056	3.85	SAMPLE	NA	.3183	2.624525328055127
405235057	3.28	SAMPLE	NA	.2713	2.389871233785726
405235058	3.23	SAMPLE	NA	.1980	2.590262140976851
405235059	4.21	SAMPLE	NA	.1201	3.704239949544081
405235060	3.75	SAMPLE	NA	.0963	3.388545931847190
1203627502		MB	NA	NA	
1203627503	3.41	DUP	405235041	.1197	3.001677624352560
1203627504	3.60	MS	405235041	.1197	3.168926524243172
1203627505		LCS	NA	NA	

GEL Laboratories LLC

[Handwritten Signature] 9/29/16

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 13:20:37.15

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235041.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY6.CNF;215
Background date    : 25-SEP-2016 12:23:20
Sample date        : 30-NOV-2015 13:27:00 Acquisition date : 28-SEP-2016 12:50:10
Sample ID          : I405235041 Sample quantity      : 3.20000E+00 GRAM
Detector name      : XRAY6 Detector geometry       : I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time : 0 00:30:00.04 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials    : MJH1
Abundance limit   : 75.00000 Sensitivity      : 3.00000
Batch ID          : 1598647 Detector SN#      :
Matrix Spike ID   : 1470-K LCS ID                  : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found


```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235041.CNF;1
* Acquisition date   : 28-SEP-2016 12:50:10 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.04 Half life ratio  : *****
* Sample date        : 30-NOV-2015 13:27:00 Analyst initials: MJH1
* Sample ID          : I405235041 Sample Quantity : 3.2000E+00 GRAM
* Batch Number       : 1598647 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-8.575E-01		5.574E+00	1.189E+01	NOT IDENT.
I-129	1.760E-01		2.439E-01	8.172E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235041

Page : 2
Acquisition date : 28-SEP-2016 12:50:10

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235041

Page : 3
Acquisition date : 28-SEP-2016 12:50:10

None

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235041.CNF;1 *
* Acquisition date : 28-SEP-2016 12:50:10 Sensitivity : 3.000 *
* Detector ID : XRAY6 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.04 Half life ratio : ***** *
* Sample date : 30-NOV-2015 13:27:00 Nuclide Library : IODINE *
* Sample ID : I405235041 Analyst initials: MJH1 *
* Batch Number : 1598647 Sample Quantity : 3.2000E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 26-JAN-2016 10:07:09 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 3.685E+00 NOT IDENT.
I-129 2.895E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235041.CNF;1
* Acquisition date   : 28-SEP-2016 12:50:10 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.04 Half life ratio  : *****
* Sample date        : 30-NOV-2015 13:27:00 Nuclide Library : IODINE
* Sample ID          : I405235041 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity  : 3.2000E+00 GRAM
*                   : Quantity Err(%) : 3.1250E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity          Act Error          TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
              Activity          K.L Act error      TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)
I-125        -8.575E-01          5.574E+00          5.588E+00  NOT IDENT.
I-129        1.760E-01          2.446E-01          2.571E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	1.4157				
29.62	0.0000				
27.34	0.0000				
29.62	0.0000				
35.49	0.7906				
39.58	3.3136				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 14:05:00.31

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235042.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY1.CNF;415
Background date    : 25-SEP-2016 12:22:54
Sample date        : 30-NOV-2015 13:53:00 Acquisition date : 28-SEP-2016 13:34:32
Sample ID          : I405235042 Sample quantity      : 3.40000E+00 GRAM
Detector name      : XRAY1 Detector geometry       : I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.14 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials    : MJH1
Abundance limit   : 75.00000 Sensitivity       : 3.00000
Batch ID          : 1598647 Detector SN#      :
Matrix Spike ID   : 1470-K LCS ID                 : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235042.CNF;1
* Acquisition date   : 28-SEP-2016 13:34:32 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.14 Half life ratio  : *****
* Sample date        : 30-NOV-2015 13:53:00 Analyst initials: MJH1
* Sample ID          : I405235042 Sample Quantity : 3.4000E+00 GRAM
* Batch Number       : 1598647 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	1.769E+00		5.068E+00	1.058E+01	NOT IDENT.
I-129	-9.360E-02		1.811E-01	3.549E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235042

Page : 2
Acquisition date : 28-SEP-2016 13:34:32

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235042

Page : 3
Acquisition date : 28-SEP-2016 13:34:32

None

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235042.CNF;1 *
* Acquisition date : 28-SEP-2016 13:34:32 Sensitivity : 3.000 *
* Detector ID : XRAY1 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.14 Half life ratio : ***** *
* Sample date : 30-NOV-2015 13:53:00 Nuclide Library : IODINE *
* Sample ID : I405235042 Analyst initials: MJH1 *
* Batch Number : 1598647 Sample Quantity : 3.4000E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 4.429E+00 NOT IDENT.
I-129 1.294E-01 NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235042.CNF;1
* Acquisition date   : 28-SEP-2016 13:34:32 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.14 Half life ratio  : *****
* Sample date        : 30-NOV-2015 13:53:00 Nuclide Library : IODINE
* Sample ID          : I405235042 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity  : 3.4000E+00 GRAM
*                    : Quantity Err(%) : 2.9412E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                    : Standard Weight  : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 9-JUN-2016 11:39:23 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        1.769E+00      5.078E+00      5.140E+00 NOT IDENT.
I-129        -9.360E-02      1.814E-01      1.862E-01 NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	6.1327				
29.62	5.0891				
27.34	3.4625				
29.62	1.7970				
35.49	1.8430				
39.58	3.8759				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 14:05:27.19

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235043.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY2.CNF;379
Background date    : 25-SEP-2016 12:22:59
Sample date       : 30-NOV-2015 13:59:00 Acquisition date : 28-SEP-2016 13:34:57
Sample ID        : I405235043 Sample quantity : 2.57000E+00 GRAM
Detector name    : XRAY2 Detector geometry: I129
Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:00.09 0.0%
Energy tolerance : 1.00000 keV Analyst Initials : MJH1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1598647 Detector SN# :
Matrix Spike ID  : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	16.37*	2	2	0.37	80.85	78	6	1.38E-03	173.7	
2	0	93.14*	5	0	0.29	465.23	461	9	2.61E-03	81.5	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235043.CNF;1
* Acquisition date   : 28-SEP-2016 13:34:57 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.09 Half life ratio  : *****
* Sample date        : 30-NOV-2015 13:59:00 Analyst initials: MJH1
* Sample ID          : I405235043 Sample Quantity : 2.5700E+00 GRAM
* Batch Number       : 1598647 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	3.895E+00		7.942E+00	2.152E+01	NOT IDENT.
I-129	-9.043E-02		3.926E-01	7.694E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	16.37	10	2	0.37	80.85	78	6	5.32E-03	42.4	
2	0	93.14	13	0	0.29	465.23	461	9	7.22E-03	27.7	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235043

Page : 2
Acquisition date : 28-SEP-2016 13:34:57

Total number of lines in spectrum	2	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235043

Page : 3
Acquisition date : 28-SEP-2016 13:34:57

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	16.37	2	2	0.37	80.85	78	6	1.38E-03	****	3.42E-04	
0	93.14	5	0	0.29	465.23	461	9	2.61E-03	****	3.15E-08	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235043.CNF;1
* Acquisition date   : 28-SEP-2016 13:34:57 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.09 Half life ratio  : *****
* Sample date        : 30-NOV-2015 13:59:00 Nuclide Library : IODINE
* Sample ID          : I405235043 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity  : 2.5700E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	8.057E+00	NOT IDENT.
I-129	2.976E-01	NOT IDENT.


```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235043.CNF;1
* Acquisition date   : 28-SEP-2016 13:34:57 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.09 Half life ratio  : *****
* Sample date        : 30-NOV-2015 13:59:00 Nuclide Library : IODINE
* Sample ID          : I405235043 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity  : 2.5700E+00 GRAM
*                   : Quantity Err(%) : 3.8911E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
```

CALIBRATION INFORMATION

```
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```
---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
```

---- Non-Identified Nuclides ----

```
Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        3.895E+00      7.971E+00      8.162E+00 NOT IDENT.
I-129        -9.043E-02      3.927E-01      3.948E-01 NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	1.0519				
29.62	5.3517				
27.34	4.3235				
29.62	2.2015				
35.49	3.3440				
39.58	2.2868				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 14:05:51.73

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235044.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY4.CNF;433
Background date    : 25-SEP-2016 12:23:10
Sample date       : 30-NOV-2015 13:50:00 Acquisition date : 28-SEP-2016 13:35:27
Sample ID        : I405235044 Sample quantity : 2.46000E+00 GRAM
Detector name    : XRAY4 Detector geometry: I129
Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:00.09 0.0%
Energy tolerance : 1.00000 keV Analyst Initials : MJH1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID         : 1598647 Detector SN# :
Matrix Spike ID  : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	12.94*	1	3	0.56	64.13	61	6	3.33E-04	716.8	
2	0	16.27*	5	2	0.47	80.80	78	6	2.64E-03	77.9	
3	0	63.21*	6	0	0.23	316.00	312	8	3.18E-03	50.8	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235044.CNF;1
* Acquisition date   : 28-SEP-2016 13:35:27 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.09 Half life ratio  : *****
* Sample date        : 30-NOV-2015 13:50:00 Analyst initials: MJH1
* Sample ID          : I405235044 Sample Quantity : 2.4600E+00 GRAM
* Batch Number       : 1598647 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	---------------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	6.477E+00	6.092E+00	1.849E+01	NOT IDENT.
I-129	1.401E-02	3.270E-01	7.505E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	12.94	8	3	0.56	64.13	61	6	4.44E-03	49.2	
2	0	16.27	8	2	0.47	80.80	78	6	4.64E-03	41.9	
3	0	63.21	8	0	0.23	316.00	312	8	4.44E-03	35.4	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235044

Page : 2
Acquisition date : 28-SEP-2016 13:35:27

Total number of lines in spectrum	3	
Number of unidentified lines	3	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235044

Page : 3
Acquisition date : 28-SEP-2016 13:35:27

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	12.94	1	3	0.56	64.13	61	6	3.33E-04	****	2.26E-01	
0	16.27	5	2	0.47	80.80	78	6	2.64E-03	****	1.35E+00	
0	63.21	6	0	0.23	316.00	312	8	3.18E-03	****	5.21E+00	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235044.CNF;1 *
* Acquisition date : 28-SEP-2016 13:35:27 Sensitivity : 3.000 *
* Detector ID : XRAY4 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.09 Half life ratio : ***** *
* Sample date : 30-NOV-2015 13:50:00 Nuclide Library : IODINE *
* Sample ID : I405235044 Analyst initials: MJH1 *
* Batch Number : 1598647 Sample Quantity : 2.4600E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 17-JUN-2016 08:18:14 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 7.230E+00 NOT IDENT.
I-129 2.729E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235044.CNF;1
* Acquisition date   : 28-SEP-2016 13:35:27 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.09 Half life ratio  : *****
* Sample date        : 30-NOV-2015 13:50:00 Nuclide Library : IODINE
* Sample ID          : I405235044 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity : 2.4600E+00 GRAM
*                   : Quantity Err(%) : 4.0650E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        6.477E+00      6.196E+00      6.849E+00 NOT IDENT.
I-129        1.401E-02      3.270E-01      3.271E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.0000				
29.62	2.2178				
27.34	3.3663				
29.62	2.2941				
35.49	3.4934				
39.58	2.4010				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 14:06:16.39

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                 *
*                               Charleston, SC 29407                             *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235045.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY5.CNF;58
Background date    : 25-SEP-2016 12:23:15
Sample date        : 30-NOV-2015 14:15:00 Acquisition date : 28-SEP-2016 13:35:51
Sample ID          : I405235045 Sample quantity : 3.22000E+00 GRAM
Detector name      : XRAY5 Detector geometry: I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.02 0.0%
Energy tolerance   : 1.00000 keV Analyst Initials : MJH1
Abundance limit    : 75.00000 Sensitivity : 3.00000
Batch ID           : 1598647 Detector SN# :
Matrix Spike ID    : 1470-K LCS ID : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235045.CNF;1
* Acquisition date   : 28-SEP-2016 13:35:51 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.02 Half life ratio  : *****
* Sample date        : 30-NOV-2015 14:15:00 Analyst initials: MJH1
* Sample ID          : I405235045 Sample Quantity : 3.2200E+00 GRAM
* Batch Number       : 1598647 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	0.000E+00		3.540E+00	4.895E+00	NOT IDENT.
I-129	1.357E-02		2.408E-01	6.873E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235045

Page : 2
Acquisition date : 28-SEP-2016 13:35:51

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235045

Page : 3
Acquisition date : 28-SEP-2016 13:35:51

None

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235045.CNF;1
* Acquisition date   : 28-SEP-2016 13:35:51 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.02 Half life ratio  : *****
* Sample date        : 30-NOV-2015 14:15:00 Nuclide Library : IODINE
* Sample ID          : I405235045 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity  : 3.2200E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	0.000E+00	NOT IDENT.
I-129	2.172E-01	NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235045.CNF;1
* Acquisition date   : 28-SEP-2016 13:35:51 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.02 Half life ratio  : *****
* Sample date        : 30-NOV-2015 14:15:00 Nuclide Library : IODINE
* Sample ID          : I405235045 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity  : 3.2200E+00 GRAM
*                   : Quantity Err(%) : 3.1056E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )    (1.96-sigma)  (1.96-sigma)
```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line Activity      K.L Act error      TPU
             (pCi/GRAM )    (1.96-sigma)  (1.96-sigma)
I-125        0.000E+00    0.000E+00    0.000E+00  NOT IDENT.
I-129        1.357E-02    2.408E-01    2.409E-01  NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.0000				
29.62	0.8547				
27.34	0.0000				
29.62	0.9231				
35.49	0.9543				
39.58	1.0189				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 14:06:40.17

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235046.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY6.CNF;215
Background date    : 25-SEP-2016 12:23:20
Sample date       : 7-DEC-2015 10:02:00. Acquisition date : 28-SEP-2016 13:36:13
Sample ID        : I405235046. Sample quantity : 3.19000E+00 GRAM
Detector name    : XRAY6. Detector geometry: I129
Elapsed live time: 0 00:30:00.00. Elapsed real time: 0 00:30:00.04 0.0%
Energy tolerance : 1.00000 keV. Analyst Initials : MJH1
Abundance limit  : 75.00000. Sensitivity : 3.00000
Batch ID         : 1598647. Detector SN# :
Matrix Spike ID  : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	8.15*	4	0	0.57	40.00	38	5	2.40E-03	59.0	
2	0	63.26*	6	1	0.43	315.73	313	6	3.36E-03	58.7	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235046.CNF;1
* Acquisition date   : 28-SEP-2016 13:36:13 Sensitivity      : 3.000
* Detector ID       : XRAY6 Energy tolerance: 1.000
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:30:00.04 Half life ratio  : *****
* Sample date       : 7-DEC-2015 10:02:00 Analyst initials: MJH1
* Sample ID         : I405235046 Sample Quantity : 3.1900E+00 GRAM
* Batch Number      : 1598647 Carrier Weight  : 0.00000
* Recovery          : 1.00000 Standard Weight : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	---------------------	--------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)	
I-125	-6.563E+00		7.427E+00		4.188E+00	NOT IDENT.
I-129	-1.293E-01		2.534E-01		2.392E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	8.15	6	0	0.57	40.00	38	5	3.33E-03	40.8	
2	0	63.26	9	1	0.43	315.73	313	6	4.86E-03	40.0	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235046

Page : 2
Acquisition date : 28-SEP-2016 13:36:13

Total number of lines in spectrum	2	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235046

Page : 3
Acquisition date : 28-SEP-2016 13:36:13

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	8.15	4	0	0.57	40.00	38	5	2.40E-03	****	8.98E-03	
0	63.26	6	1	0.43	315.73	313	6	3.36E-03	****	3.09E+00	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235046.CNF;1
* Acquisition date   : 28-SEP-2016 13:36:13 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.04 Half life ratio  : *****
* Sample date        : 7-DEC-2015 10:02:00 Nuclide Library : IODINE
* Sample ID          : I405235046 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity  : 3.1900E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

	Lc	
Nuclide	(pCi/GRAM)	

---- Non-Identified Nuclides ----

	Lc	
Nuclide	(pCi/GRAM)	
I-125	0.000E+00	NOT IDENT.
I-129	0.000E+00	NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235046.CNF;1
* Acquisition date   : 28-SEP-2016 13:36:13 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.04 Half life ratio  : *****
* Sample date        : 7-DEC-2015 10:02:00 Nuclide Library : IODINE
* Sample ID          : I405235046 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity  : 3.1900E+00 GRAM
*                   : Quantity Err(%) : 3.1348E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity          Act Error          TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)
```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
              Activity          K.L Act error      TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)
I-125        -6.563E+00          7.449E+00          8.015E+00  NOT IDENT.
I-129        -1.293E-01          2.537E-01          2.603E-01  NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	4.2472				
29.62	1.4643				
27.34	0.0000				
29.62	1.5445				
35.49	1.5811				
39.58	1.6568				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 15:10:08.66

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235047.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY1.CNF;415
Background date    : 25-SEP-2016 12:22:54
Sample date        : 7-DEC-2015 10:10:00. Acquisition date : 28-SEP-2016 14:39:43
Sample ID          : I405235047. Sample quantity : 3.47000E+00 GRAM
Detector name      : XRAY1. Detector geometry: I129
Elapsed live time  : 0 00:30:00.00. Elapsed real time: 0 00:30:00.11 0.0%
Energy tolerance  : 1.00000 keV. Analyst Initials : MJH1
Abundance limit   : 75.00000. Sensitivity : 3.00000
Batch ID          : 1598647. Detector SN# :
Matrix Spike ID   : 1470-K. LCS ID : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235047.CNF;1
* Acquisition date   : 28-SEP-2016 14:39:43 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.11 Half life ratio  : *****
* Sample date        : 7-DEC-2015 10:10:00 Analyst initials: MJH1
* Sample ID          : I405235047 Sample Quantity : 3.4700E+00 GRAM
* Batch Number       : 1598647 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 9-JUN-2016 11:39:23 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-1.191E+00		5.034E+00	9.039E+00	NOT IDENT.
I-129	2.076E-01		1.872E-01	5.167E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235047

Page : 2
Acquisition date : 28-SEP-2016 14:39:43

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235047

Page : 3
Acquisition date : 28-SEP-2016 14:39:43

None

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235047.CNF;1 *
* Acquisition date : 28-SEP-2016 14:39:43 Sensitivity : 3.000 *
* Detector ID : XRAY1 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.11 Half life ratio : ***** *
* Sample date : 7-DEC-2015 10:10:00 Nuclide Library : IODINE *
* Sample ID : I405235047 Analyst initials: MJH1 *
* Batch Number : 1598647 Sample Quantity : 3.4700E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 3.739E+00 NOT IDENT.
I-129 2.113E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235047.CNF;1
* Acquisition date   : 28-SEP-2016 14:39:43 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.11 Half life ratio  : *****
* Sample date        : 7-DEC-2015 10:10:00 Nuclide Library : IODINE
* Sample ID          : I405235047 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity  : 3.4700E+00 GRAM
*                   : Quantity Err(%) : 2.8818E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        -1.191E+00      5.038E+00      5.067E+00 NOT IDENT.
I-129        2.076E-01      1.883E-01      2.103E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	9.8124				
29.62	0.8482				
27.34	6.9250				
29.62	2.6955				
35.49	2.7645				
39.58	7.7519				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 15:10:35.16

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235048.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY2.CNF;379
Background date    : 25-SEP-2016 12:22:59
Sample date        : 7-DEC-2015 13:28:00. Acquisition date : 28-SEP-2016 14:40:07
Sample ID          : I405235048. Sample quantity : 2.95000E+00 GRAM
Detector name      : XRAY2. Detector geometry: I129
Elapsed live time  : 0 00:30:00.00. Elapsed real time: 0 00:30:00.11 0.0%
Energy tolerance  : 1.00000 keV. Analyst Initials : MJH1
Abundance limit   : 75.00000. Sensitivity : 3.00000
Batch ID          : 1598647. Detector SN# :
Matrix Spike ID   : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	6.47	22	32	0.45	31.29	29	6	1.24E-02	45.4	

Flag: "*" = Peak area was modified by background subtraction

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235048.CNF;1
* Acquisition date   : 28-SEP-2016 14:40:07 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.11 Half life ratio  : *****
* Sample date        : 7-DEC-2015 13:28:00 Analyst initials: MJH1
* Sample ID          : I405235048 Sample Quantity : 2.9500E+00 GRAM
* Batch Number       : 1598647 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-3.373E+00		1.037E+01	1.969E+01	NOT IDENT.
I-129	-7.582E-02		3.429E-01	6.737E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	6.47	22	32	0.45	31.29	29	6	1.24E-02	45.4	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235048

Page : 2
Acquisition date : 28-SEP-2016 14:40:07

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235048

Page : 3
Acquisition date : 28-SEP-2016 14:40:07

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	6.47	22	32	0.45	31.29	29	6	1.24E-02	90.8	1.02E-28	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235048.CNF;1 *
* Acquisition date : 28-SEP-2016 14:40:07 Sensitivity : 3.000 *
* Detector ID : XRAY2 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.11 Half life ratio : ***** *
* Sample date : 7-DEC-2015 13:28:00 Nuclide Library : IODINE *
* Sample ID : I405235048 Analyst initials: MJH1 *
* Batch Number : 1598647 Sample Quantity : 2.9500E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 27-JUL-2016 12:15:07 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 7.670E+00 NOT IDENT.
I-129 2.610E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235048.CNF;1
* Acquisition date   : 28-SEP-2016 14:40:07 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.11 Half life ratio  : *****
* Sample date        : 7-DEC-2015 13:28:00 Nuclide Library : IODINE
* Sample ID          : I405235048 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity : 2.9500E+00 GRAM
*                    : Quantity Err(%) : 3.3898E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                    : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity          Act Error          TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
              Activity          K.L Act error      TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)
I-125        -3.373E+00          1.039E+01          1.050E+01  NOT IDENT.
I-129        -7.582E-02          3.430E-01          3.447E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	6.3114				
29.62	5.3517				
27.34	4.3235				
29.62	1.1008				
35.49	1.1147				
39.58	3.4302				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 15:10:58.63

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235049.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY4.CNF;433
Background date    : 25-SEP-2016 12:23:10
Sample date        : 7-DEC-2015 13:33:00. Acquisition date : 28-SEP-2016 14:40:29
Sample ID          : I405235049. Sample quantity : 3.61000E+00 GRAM
Detector name      : XRAY4. Detector geometry: I129
Elapsed live time  : 0 00:30:00.00. Elapsed real time: 0 00:30:00.12 0.0%
Energy tolerance   : 1.00000 keV. Analyst Initials : MJH1
Abundance limit    : 75.00000. Sensitivity : 3.00000
Batch ID           : 1598647. Detector SN# :
Matrix Spike ID    : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	76.95	7	0	0.54	384.86	380	8	3.89E-03	37.8	

Flag: "*" = Peak area was modified by background subtraction


```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235049.CNF;1
* Acquisition date   : 28-SEP-2016 14:40:29 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.12 Half life ratio  : *****
* Sample date        : 7-DEC-2015 13:33:00 Analyst initials: MJH1
* Sample ID          : I405235049 Sample Quantity : 3.6100E+00 GRAM
* Batch Number       : 1598647 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt Uncert	MDA (pCi/GRAM)	
I-125	3.053E+00		4.316E+00	1.162E+01	NOT IDENT.
I-129	9.547E-03		2.228E-01	5.114E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	76.95	7	0	0.54	384.86	380	8	3.89E-03	37.8	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235049

Page : 2
Acquisition date : 28-SEP-2016 14:40:29

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235049

Page : 3
Acquisition date : 28-SEP-2016 14:40:29

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	76.95	7	0	0.54	384.86	380	8	3.89E-03	75.6	1.88E+00	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235049.CNF;1
* Acquisition date   : 28-SEP-2016 14:40:29 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.12 Half life ratio  : *****
* Sample date        : 7-DEC-2015 13:33:00 Nuclide Library : IODINE
* Sample ID          : I405235049 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity  : 3.6100E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	4.544E+00	NOT IDENT.
I-129	1.859E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235049.CNF;1 *
 * Acquisition date : 28-SEP-2016 14:40:29 Sensitivity : 3.000 *
 * Detector ID : XRAY4 Energy tolerance: 1.000 *
 * Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 00:30:00.12 Half life ratio : ***** *
 * Sample date : 7-DEC-2015 13:33:00 Nuclide Library : IODINE *
 * Sample ID : I405235049 Analyst initials: MJH1 *
 * Batch Number : 1598647 Sample Quantity : 3.6100E+00 GRAM *
 * Quantity Err(%) : 2.7701E-03 % *
 * Recovery : 1.00000 Carrier Weight : 0.00000 *
 * Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 17-JUN-2016 08:18:14 Eff. Geometry : I129 *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
---------	-------------------------	---------------------------	---------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
I-125	3.053E+00	4.349E+00	4.562E+00	NOT IDENT.
I-129	9.547E-03	2.228E-01	2.229E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	1.0858				
29.62	2.2178				
27.34	2.2442				
29.62	3.4411				
35.49	1.1645				
39.58	2.4010				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 15:11:23.01

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235050.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY5.CNF;58
Background date    : 25-SEP-2016 12:23:15
Sample date        : 7-DEC-2015 13:42:00. Acquisition date : 28-SEP-2016 14:40:52
Sample ID          : I405235050. Sample quantity : 2.94000E+00 GRAM
Detector name      : XRAY5. Detector geometry: I129
Elapsed live time  : 0 00:30:00.00. Elapsed real time: 0 00:30:00.03 0.0%
Energy tolerance  : 1.00000 keV. Analyst Initials : MJH1
Abundance limit   : 75.00000. Sensitivity : 3.00000
Batch ID          : 1598647. Detector SN# :
Matrix Spike ID   : 1470-K. LCS ID : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235050.CNF;1
* Acquisition date   : 28-SEP-2016 14:40:52 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.03 Half life ratio  : *****
* Sample date        : 7-DEC-2015 13:42:00 Analyst initials: MJH1
* Sample ID          : I405235050 Sample Quantity : 2.9400E+00 GRAM
* Batch Number       : 1598647 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt Uncert	MDA (pCi/GRAM)	
I-125	1.564E+00		3.311E+00	1.280E+01	NOT IDENT.
I-129	-8.741E-02		1.713E-01	2.772E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235050

Page : 2
Acquisition date : 28-SEP-2016 14:40:52

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235050

Page : 3
Acquisition date : 28-SEP-2016 14:40:52

None

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235050.CNF;1 *
* Acquisition date : 28-SEP-2016 14:40:52 Sensitivity : 3.000 *
* Detector ID : XRAY5 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.03 Half life ratio : ***** *
* Sample date : 7-DEC-2015 13:42:00 Nuclide Library : IODINE *
* Sample ID : I405235050 Analyst initials: MJH1 *
* Batch Number : 1598647 Sample Quantity : 2.9400E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 30-AUG-2016 11:41:11 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 3.930E+00 NOT IDENT.
I-129 0.000E+00 NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235050.CNF;1
* Acquisition date   : 28-SEP-2016 14:40:52 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.03 Half life ratio  : *****
* Sample date        : 7-DEC-2015 13:42:00 Nuclide Library : IODINE
* Sample ID          : I405235050 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity  : 2.9400E+00 GRAM
*                   : Quantity Err(%) : 3.4014E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        1.564E+00      3.322E+00      3.396E+00 NOT IDENT.
I-129        -8.741E-02      1.716E-01      1.760E-01 NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.0000				
29.62	0.8547				
27.34	0.0000				
29.62	0.9231				
35.49	1.9087				
39.58	0.0000				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 15:11:47.02

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235051.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY6.CNF;215
Background date    : 25-SEP-2016 12:23:20
Sample date        : 7-DEC-2015 13:02:00. Acquisition date : 28-SEP-2016 14:41:12
Sample ID          : I405235051. Sample quantity : 3.40000E+00 GRAM
Detector name      : XRAY6. Detector geometry: I129
Elapsed live time  : 0 00:30:00.00. Elapsed real time: 0 00:30:00.07 0.0%
Energy tolerance  : 1.00000 keV. Analyst Initials : MJH1
Abundance limit   : 75.00000. Sensitivity : 3.00000
Batch ID          : 1598647. Detector SN# :
Matrix Spike ID   : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.52*	4	1	0.59	317.02	314	6	2.22E-03	81.7	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235051.CNF;1
* Acquisition date   : 28-SEP-2016 14:41:12 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.07 Half life ratio  : *****
* Sample date        : 7-DEC-2015 13:02:00 Analyst initials: MJH1
* Sample ID          : I405235051 Sample Quantity : 3.4000E+00 GRAM
* Batch Number       : 1598647 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	---------------------	--------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)	
I-125	-6.022E-01		4.921E+00		1.066E+01	NOT IDENT.
I-129	-8.983E-02		2.579E-01		4.618E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.52	7	1	0.59	317.02	314	6	3.72E-03	47.9	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235051

Page : 2
Acquisition date : 28-SEP-2016 14:41:12

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235051

Page : 3
Acquisition date : 28-SEP-2016 14:41:12

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	63.52	4	1	0.59	317.02	314	6	2.22E-03	****	3.04E+00	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235051.CNF;1 *
* Acquisition date : 28-SEP-2016 14:41:12 Sensitivity : 3.000 *
* Detector ID : XRAY6 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.07 Half life ratio : ***** *
* Sample date : 7-DEC-2015 13:02:00 Nuclide Library : IODINE *
* Sample ID : I405235051 Analyst initials: MJH1 *
* Batch Number : 1598647 Sample Quantity : 3.4000E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 26-JAN-2016 10:07:09 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 3.370E+00 NOT IDENT.
I-129 1.188E-01 NOT IDENT.


```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235051.CNF;1
* Acquisition date   : 28-SEP-2016 14:41:12 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.07 Half life ratio  : *****
* Sample date        : 7-DEC-2015 13:02:00 Nuclide Library : IODINE
* Sample ID          : I405235051 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity : 3.4000E+00 GRAM
*                   : Quantity Err(%) : 2.9412E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity          Act Error          TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
              Activity          K.L Act error      TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)
I-125        -6.022E-01          4.921E+00          4.929E+00 NOT IDENT.
I-129        -8.983E-02          2.581E-01          2.612E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	1.4157				
29.62	1.4643				
27.34	0.0000				
29.62	1.5445				
35.49	0.7906				
39.58	1.6568				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 15:44:27.50

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235052.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY1.CNF;415
Background date    : 25-SEP-2016 12:22:54
Sample date        : 7-DEC-2015 13:11:00. Acquisition date : 28-SEP-2016 15:14:01
Sample ID          : I405235052. Sample quantity : 2.75000E+00 GRAM
Detector name      : XRAY1. Detector geometry: I129
Elapsed live time  : 0 00:30:00.00. Elapsed real time: 0 00:30:00.13 0.0%
Energy tolerance   : 1.00000 keV. Analyst Initials : MJH1
Abundance limit    : 75.00000. Sensitivity : 3.00000
Batch ID           : 1598647. Detector SN# :
Matrix Spike ID    : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	27.69	10	2	0.60	138.88	135	7	5.69E-03	37.9	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235052.CNF;1
* Acquisition date   : 28-SEP-2016 15:14:01 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.13 Half life ratio  : *****
* Sample date        : 7-DEC-2015 13:11:00 Analyst initials: MJH1
* Sample ID          : I405235052 Sample Quantity : 2.7500E+00 GRAM
* Batch Number       : 1598647 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
I-125	7.386E+00	5.481E+00	5.720E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-129	-4.391E-02		2.495E-01	5.319E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	27.69	10	2	0.60	138.88	135	7	5.69E-03	37.9	

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
I-125	27.34	10	114.10*	2.103E+01	2.332E-01	7.386E+00	75.73
	30.97	-----	20.30	2.245E+01	-----	Line Not Found	-----
	35.49	-----	6.68	2.317E+01	-----	Line Not Found	-----

Flag: "*" = Keyline

Total number of lines in spectrum 1
Number of unidentified lines 0
Number of lines tentatively identified by NID 1 100.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
I-125	59.40D	31.7	2.332E-01	7.386E+00	5.593E+00	75.73	
Total Activity :			2.332E-01	7.386E+00			

Grand Total Activity : 2.332E-01 7.386E+00

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235052

Page : 3
Acquisition date : 28-SEP-2016 15:14:01

None

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235052.CNF;1 *
* Acquisition date : 28-SEP-2016 15:14:01 Sensitivity : 3.000 *
* Detector ID : XRAY1 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.13 Half life ratio : ***** *
* Sample date : 7-DEC-2015 13:11:00 Nuclide Library : IODINE *
* Sample ID : I405235052 Analyst initials: MJH1 *
* Batch Number : 1598647 Sample Quantity : 2.7500E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

 Lc
Nuclide (pCi/GRAM)
I-125 1.875E+00

---- Non-Identified Nuclides ----

 Lc
Nuclide (pCi/GRAM)
I-129 2.066E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235052.CNF;1
* Acquisition date   : 28-SEP-2016 15:14:01 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.13 Half life ratio  : *****
* Sample date        : 7-DEC-2015 13:11:00 Nuclide Library : IODINE
* Sample ID          : I405235052 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity : 2.7500E+00 GRAM
*                   : Quantity Err(%) : 3.6364E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
I-125	7.386E+00	5.598E+00	5.598E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
I-129	-4.391E-02	2.496E-01	2.503E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	1.2265				
29.62	5.0891				
30.97	4.3281				
33.59	1.7970				
35.49	2.7645				
39.58	0.9690				

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235053.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY2.CNF;379
Background date    : 25-SEP-2016 12:22:59
Sample date        : 1-DEC-2015 14:24:00. Acquisition date : 28-SEP-2016 15:14:23
Sample ID          : I405235053. Sample quantity : 2.16000E+00 GRAM
Detector name      : XRAY2. Detector geometry: I129
Elapsed live time  : 0 00:30:00.00. Elapsed real time: 0 00:30:00.13 0.0%
Energy tolerance  : 1.00000 keV. Analyst Initials : MJH1
Abundance limit   : 75.00000. Sensitivity : 3.00000
Batch ID          : 1598647. Detector SN# :
Matrix Spike ID   : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	6.83	17	23	0.27	33.11	31	5	9.24E-03	51.9	
2	0	63.40*	6	0	0.25	316.33	311	9	3.55E-03	49.4	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235053.CNF;1
* Acquisition date   : 28-SEP-2016 15:14:23 Sensitivity      : 3.000
* Detector ID       : XRAY2 Energy tolerance: 1.000
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:30:00.13 Half life ratio  : *****
* Sample date       : 1-DEC-2015 14:24:00 Analyst initials: MJH1
* Sample ID         : I405235053 Sample Quantity : 2.1600E+00 GRAM
* Batch Number      : 1598647 Carrier Weight  : 0.00000
* Recovery          : 1.00000 Standard Weight  : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	---------------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	7.573E+00	8.273E+00	2.600E+01	NOT IDENT.
I-129	1.925E-01	5.065E-01	1.136E+00	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	6.83	17	23	0.27	33.11	31	5	9.24E-03	51.9	
2	0	63.40	9	0	0.25	316.33	311	9	5.00E-03	33.3	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235053

Page : 2
Acquisition date : 28-SEP-2016 15:14:23

Total number of lines in spectrum 2
Number of unidentified lines 2
Number of lines tentatively identified by NID 0 0.00%
**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235053

Page : 3
Acquisition date : 28-SEP-2016 15:14:23

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	6.83	17	23	0.27	33.11	31	5	9.24E-03	****	1.93E-26	
0	63.40	6	0	0.25	316.33	311	9	3.55E-03	98.7	1.69E-02	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235053.CNF;1 *
* Acquisition date : 28-SEP-2016 15:14:23 Sensitivity : 3.000 *
* Detector ID : XRAY2 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.13 Half life ratio : ***** *
* Sample date : 1-DEC-2015 14:24:00 Nuclide Library : IODINE *
* Sample ID : I405235053 Analyst initials: MJH1 *
* Batch Number : 1598647 Sample Quantity : 2.1600E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 27-JUL-2016 12:15:07 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 9.820E+00 NOT IDENT.
I-129 4.645E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235053.CNF;1
* Acquisition date   : 28-SEP-2016 15:14:23 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.13 Half life ratio  : *****
* Sample date        : 1-DEC-2015 14:24:00 Nuclide Library : IODINE
* Sample ID          : I405235053 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity  : 2.1600E+00 GRAM
*                   : Quantity Err(%) : 4.6296E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity          Act Error          TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
              Activity          K.L Act error      TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)
I-125        7.573E+00          8.379E+00          9.048E+00  NOT IDENT.
I-129        1.925E-01          5.068E-01          5.142E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.0000				
29.62	4.2814				
27.34	8.6471				
29.62	0.0000				
35.49	2.2293				
39.58	4.5736				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 15:45:19.29

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235054.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY4.CNF;433
Background date    : 25-SEP-2016 12:23:10
Sample date        : 2-DEC-2015 14:51:00. Acquisition date : 28-SEP-2016 15:14:44
Sample ID          : I405235054. Sample quantity : 3.15000E+00 GRAM
Detector name      : XRAY4. Detector geometry: I129
Elapsed live time  : 0 00:30:00.00. Elapsed real time: 0 00:30:00.12 0.0%
Energy tolerance   : 1.00000 keV. Analyst Initials : MJH1
Abundance limit    : 75.00000. Sensitivity : 3.00000
Batch ID           : 1598647. Detector SN# :
Matrix Spike ID    : 1470-K. LCS ID : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235054.CNF;1
* Acquisition date   : 28-SEP-2016 15:14:44 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.12 Half life ratio  : *****
* Sample date        : 2-DEC-2015 14:51:00 Analyst initials: MJH1
* Sample ID          : I405235054 Sample Quantity : 3.1500E+00 GRAM
* Batch Number       : 1598647 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	---------------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-8.401E-01	4.343E+00	9.421E+00	NOT IDENT.
I-129	-1.375E-01	2.508E-01	4.349E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235054

Page : 2
Acquisition date : 28-SEP-2016 15:14:44

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235054

Page : 3
Acquisition date : 28-SEP-2016 15:14:44

None

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235054.CNF;1
* Acquisition date   : 28-SEP-2016 15:14:44 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.12 Half life ratio  : *****
* Sample date        : 2-DEC-2015 14:51:00 Nuclide Library : IODINE
* Sample ID          : I405235054 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity  : 3.1500E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	3.170E+00	NOT IDENT.
I-129	1.375E-01	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235054.CNF;1
* Acquisition date   : 28-SEP-2016 15:14:44 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.12 Half life ratio  : *****
* Sample date        : 2-DEC-2015 14:51:00 Nuclide Library : IODINE
* Sample ID          : I405235054 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity  : 3.1500E+00 GRAM
*                   : Quantity Err(%) : 3.1746E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
              Activity      K.L Act error      TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
I-125        -8.401E-01      4.346E+00      4.362E+00  NOT IDENT.
I-129        -1.375E-01      2.512E-01      2.587E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	2.1715				
29.62	3.3266				
27.34	0.0000				
29.62	2.2941				
35.49	2.3289				
39.58	3.6015				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 15:45:44.20

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235055.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY5.CNF;58
Background date    : 25-SEP-2016 12:23:15
Sample date        : 2-DEC-2015 14:59:00. Acquisition date : 28-SEP-2016 15:15:08
Sample ID          : I405235055. Sample quantity : 2.56000E+00 GRAM
Detector name      : XRAY5. Detector geometry: I129
Elapsed live time  : 0 00:30:00.00. Elapsed real time: 0 00:30:00.03 0.0%
Energy tolerance  : 1.00000 keV. Analyst Initials : MJH1
Abundance limit   : 75.00000. Sensitivity : 3.00000
Batch ID          : 1598647. Detector SN# :
Matrix Spike ID   : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.53*	5	2	0.33	231.34	227	7	2.51E-03	75.0	
2	0	63.31*	9	0	0.32	314.92	310	8	4.83E-03	40.9	

Flag: "*" = Peak area was modified by background subtraction

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235055.CNF;1
* Acquisition date   : 28-SEP-2016 15:15:08 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.03 Half life ratio  : *****
* Sample date        : 2-DEC-2015 14:59:00 Analyst initials: MJH1
* Sample ID          : I405235055 Sample Quantity : 2.5600E+00 GRAM
* Batch Number       : 1598647 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
```

CALIBRATION INFORMATION

```
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-5.121E-01		7.176E+00	1.822E+01	NOT IDENT.
I-129	-8.332E-02		3.612E-01	8.645E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.53	7	2	0.33	231.34	227	7	3.61E-03	51.2	
2	0	63.31	12	0	0.32	314.92	310	8	6.67E-03	28.9	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235055

Page : 2
Acquisition date : 28-SEP-2016 15:15:08

Total number of lines in spectrum	2	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235055

Page : 3
Acquisition date : 28-SEP-2016 15:15:08

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	46.53	5	2	0.33	231.34	227	7	2.51E-03	****	7.90E+00	
0	63.31	9	0	0.32	314.92	310	8	4.83E-03	81.8	3.20E+00	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235055.CNF;1 *
* Acquisition date : 28-SEP-2016 15:15:08 Sensitivity : 3.000 *
* Detector ID : XRAY5 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.03 Half life ratio : ***** *
* Sample date : 2-DEC-2015 14:59:00 Nuclide Library : IODINE *
* Sample ID : I405235055 Analyst initials: MJH1 *
* Batch Number : 1598647 Sample Quantity : 2.5600E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 30-AUG-2016 11:41:11 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 6.103E+00 NOT IDENT.
I-129 2.732E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235055.CNF;1
* Acquisition date   : 28-SEP-2016 15:15:08 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.03 Half life ratio  : *****
* Sample date        : 2-DEC-2015 14:59:00 Nuclide Library : IODINE
* Sample ID          : I405235055 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity : 2.5600E+00 GRAM
*                   : Quantity Err(%) : 3.9063E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        -5.121E-01      7.176E+00      7.180E+00 NOT IDENT.
I-129        -8.332E-02      3.612E-01      3.632E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	1.6265				
29.62	1.7094				
27.34	0.0000				
29.62	0.9231				
35.49	0.9543				
39.58	0.0000				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 15:46:08.22

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                 *
*                               Charleston, SC 29407                            *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235056.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY6.CNF;215
Background date    : 25-SEP-2016 12:23:20
Sample date        : 2-DEC-2015 14:50:00. Acquisition date : 28-SEP-2016 15:15:30
Sample ID          : I405235056. Sample quantity : 2.62000E+00 GRAM
Detector name      : XRAY6. Detector geometry: I129
Elapsed live time  : 0 00:30:00.00. Elapsed real time: 0 00:30:00.03 0.0%
Energy tolerance  : 1.00000 keV. Analyst Initials : MJH1
Abundance limit   : 75.00000. Sensitivity : 3.00000
Batch ID          : 1598647. Detector SN# :
Matrix Spike ID   : 1470-K. LCS ID : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235056.CNF;1
* Acquisition date   : 28-SEP-2016 15:15:30 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.03 Half life ratio  : *****
* Sample date        : 2-DEC-2015 14:50:00 Analyst initials: MJH1
* Sample ID          : I405235056 Sample Quantity : 2.6200E+00 GRAM
* Batch Number       : 1598647 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	1.796E+00		3.706E+00	1.419E+01	NOT IDENT.
I-129	1.665E-01		2.622E-01	9.133E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235056

Page : 2
Acquisition date : 28-SEP-2016 15:15:30

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235056

Page : 3
Acquisition date : 28-SEP-2016 15:15:30

None

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235056.CNF;1
* Acquisition date   : 28-SEP-2016 15:15:30 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.03 Half life ratio  : *****
* Sample date        : 2-DEC-2015 14:50:00 Nuclide Library : IODINE
* Sample ID          : I405235056 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity  : 2.6200E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	4.399E+00	NOT IDENT.
I-129	3.112E-01	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235056.CNF;1
* Acquisition date   : 28-SEP-2016 15:15:30 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.03 Half life ratio  : *****
* Sample date        : 2-DEC-2015 14:50:00 Nuclide Library : IODINE
* Sample ID          : I405235056 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity  : 2.6200E+00 GRAM
*                   : Quantity Err(%) : 3.8168E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
I-125        1.796E+00      3.710E+00      3.797E+00 NOT IDENT.
I-129        1.665E-01      2.627E-01      2.732E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.0000				
29.62	0.0000				
27.34	1.4921				
29.62	1.5445				
35.49	1.5811				
39.58	3.3136				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 16:49:10.89

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235057.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY1.CNF;415
Background date    : 25-SEP-2016 12:22:54
Sample date        : 2-DEC-2015 14:55:00. Acquisition date : 28-SEP-2016 15:48:44
Sample ID          : I405235057. Sample quantity : 2.39000E+00 GRAM
Detector name      : XRAY1. Detector geometry: I129
Elapsed live time  : 0 01:00:00.00. Elapsed real time: 0 01:00:00.21 0.0%
Energy tolerance   : 1.00000 keV. Analyst Initials : MJH1
Abundance limit    : 75.00000. Sensitivity : 3.00000
Batch ID           : 1598647. Detector SN# :
Matrix Spike ID    : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	65.19*	6	6	0.29	327.85	321	11	1.67E-03	88.7	
2	0	109.39*	6	3	1.84	550.57	543	14	1.69E-03	93.3	

Flag: "*" = Peak area was modified by background subtraction


```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235057.CNF;1
* Acquisition date   : 28-SEP-2016 15:48:44 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.21 Half life ratio  : *****
* Sample date        : 2-DEC-2015 14:55:00 Analyst initials: MJH1
* Sample ID          : I405235057 Sample Quantity : 2.3900E+00 GRAM
* Batch Number       : 1598647 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 9-JUN-2016 11:39:23 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	---------------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	2.848E-01	3.588E+00	7.038E+00	NOT IDENT.
I-129	6.578E-02	1.475E-01	3.561E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	65.19	7	6	0.29	327.85	321	11	1.81E-03	80.1	
2	0	109.39	13	3	1.84	550.57	543	14	3.52E-03	42.0	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235057

Page : 2
Acquisition date : 28-SEP-2016 15:48:44

Total number of lines in spectrum	2	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235057

Page : 3
Acquisition date : 28-SEP-2016 15:48:44

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	65.19	6	6	0.29	327.85	321	11	1.67E-03	****	1.39E+01	
0	109.39	6	3	1.84	550.57	543	14	1.69E-03	****	3.36E+00	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235057.CNF;1 *
* Acquisition date : 28-SEP-2016 15:48:44 Sensitivity : 3.000 *
* Detector ID : XRAY1 Energy tolerance: 1.000 *
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 01:00:00.21 Half life ratio : ***** *
* Sample date : 2-DEC-2015 14:55:00 Nuclide Library : IODINE *
* Sample ID : I405235057 Analyst initials: MJH1 *
* Batch Number : 1598647 Sample Quantity : 2.3900E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 2.919E+00 NOT IDENT.
I-129 1.439E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235057.CNF;1
* Acquisition date   : 28-SEP-2016 15:48:44 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.21 Half life ratio  : *****
* Sample date        : 2-DEC-2015 14:55:00 Nuclide Library : IODINE
* Sample ID          : I405235057 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity : 2.3900E+00 GRAM
*                   : Quantity Err(%) : 4.1841E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
I-125        2.848E-01      3.589E+00      3.591E+00 NOT IDENT.
I-129        6.578E-02      1.476E-01      1.506E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	7.3593				
29.62	3.3927				
27.34	2.5969				
29.62	8.0864				
35.49	4.6075				
39.58	5.8139				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 16:49:43.65

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235058.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY2.CNF;379
Background date    : 25-SEP-2016 12:22:59
Sample date        : 2-DEC-2015 15:00:00. Acquisition date : 28-SEP-2016 15:49:08
Sample ID          : I405235058. Sample quantity : 2.59000E+00 GRAM
Detector name      : XRAY2. Detector geometry: I129
Elapsed live time  : 0 01:00:00.00. Elapsed real time: 0 01:00:00.19 0.0%
Energy tolerance  : 1.00000 keV. Analyst Initials : MJH1
Abundance limit   : 75.00000. Sensitivity : 3.00000
Batch ID          : 1598647. Detector SN# :
Matrix Spike ID   : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	16.08*	11	10	0.73	79.41	75	9	2.93E-03	78.4	
2	0	53.73	9	2	0.58	267.90	264	7	2.60E-03	40.0	
3	0	64.26*	1	7	0.90	320.62	313	9	3.30E-04	475.1	
4	0	89.35*	11	12	0.44	446.25	436	16	3.06E-03	78.1	
5	0	95.86	6	9	0.53	478.85	474	8	1.64E-03	111.1	
6	0	141.04	16	3	1.53	705.09	698	14	4.40E-03	35.3	
7	0	147.26	15	9	1.93	736.23	726	18	4.17E-03	53.5	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235058.CNF;1
* Acquisition date   : 28-SEP-2016 15:49:08 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.19 Half life ratio  : *****
* Sample date        : 2-DEC-2015 15:00:00 Analyst initials: MJH1
* Sample ID          : I405235058 Sample Quantity : 2.5900E+00 GRAM
* Batch Number       : 1598647 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	---------------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-1.117E+01	9.119E+00	1.302E+01	NOT IDENT.
I-129	-1.884E-01	2.848E-01	4.781E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	13.34	7	24	0.19	65.67	62	8	1.82E-03	135.7	
2	0	16.08	25	10	0.73	79.41	75	9	6.88E-03	31.4	
3	0	53.73	9	2	0.58	267.90	264	7	2.60E-03	40.0	
4	0	64.26	6	7	0.90	320.62	313	9	1.78E-03	82.7	
5	0	89.35	12	12	0.44	446.25	436	16	3.36E-03	70.2	
6	0	95.86	6	9	0.53	478.85	474	8	1.64E-03	111.1	
7	0	141.04	16	3	1.53	705.09	698	14	4.40E-03	35.3	
8	0	147.26	15	9	1.93	736.23	726	18	4.17E-03	53.5	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235058

Page : 2
Acquisition date : 28-SEP-2016 15:49:08

Total number of lines in spectrum	7	
Number of unidentified lines	7	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	16.08	11	10	0.73	79.41	75	9	2.93E-03	****	1.94E-04	
0	53.73	9	2	0.58	267.90	264	7	2.60E-03	80.1	5.58E-01	
0	64.26	1	7	0.90	320.62	313	9	3.30E-04	****	1.21E-02	
0	89.35	11	12	0.44	446.25	436	16	3.06E-03	****	1.92E-07	
0	95.86	6	9	0.53	478.85	474	8	1.64E-03	****	8.51E-09	
0	141.04	16	3	1.53	705.09	698	14	4.40E-03	70.6	9.62E-19	
0	147.26	15	9	1.93	736.23	726	18	4.17E-03	****	3.70E-20	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235058.CNF;1 *
* Acquisition date : 28-SEP-2016 15:49:08 Sensitivity : 3.000 *
* Detector ID : XRAY2 Energy tolerance: 1.000 *
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 01:00:00.19 Half life ratio : ***** *
* Sample date : 2-DEC-2015 15:00:00 Nuclide Library : IODINE *
* Sample ID : I405235058 Analyst initials: MJH1 *
* Batch Number : 1598647 Sample Quantity : 2.5900E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 27-JUL-2016 12:15:07 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 5.200E+00 NOT IDENT.
I-129 1.959E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235058.CNF;1
* Acquisition date   : 28-SEP-2016 15:49:08 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.19 Half life ratio  : *****
* Sample date        : 2-DEC-2015 15:00:00 Nuclide Library : IODINE
* Sample ID          : I405235058 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity : 2.5900E+00 GRAM
*                   : Quantity Err(%) : 3.8610E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity          Act Error          TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
              Activity          K.L Act error      TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)
I-125        -1.117E+01          9.327E+00          1.060E+01  NOT IDENT.
I-129        -1.884E-01          2.855E-01          2.978E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	16.8305				
29.62	12.8441				
27.34	6.4853				
29.62	5.5038				
35.49	7.8027				
39.58	5.7170				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 16:50:08.90

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235059.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY4.CNF;433
Background date  : 25-SEP-2016 12:23:10
Sample date     : 16-DEC-2015 12:26:00 Acquisition date : 28-SEP-2016 15:49:42
Sample ID      : I405235059 Sample quantity   : 3.70000E+00 GRAM
Detector name   : XRAY4 Detector geometry: I129
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.20 0.0%
Energy tolerance: 1.00000 keV Analyst Initials : MJH1
Abundance limit : 75.00000 Sensitivity   : 3.00000
Batch ID       : 1598647 Detector SN#    :
Matrix Spike ID : 1470-K LCS ID       : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	10.08*	30	15	1.29	49.76	44	12	8.37E-03	33.2	
2	0	19.09*	5	13	0.45	94.89	89	13	1.41E-03	158.7	
3	0	97.51	9	0	0.55	487.89	484	8	2.50E-03	33.3	
4	0	107.46	4	5	0.55	537.76	532	7	1.16E-03	102.4	
5	0	165.55	12	5	0.62	828.89	824	10	3.30E-03	45.7	
6	0	238.83	9	0	0.53	1196.22	1191	10	2.50E-03	33.3	
7	0	242.32	10	6	0.39	1213.71	1204	12	2.66E-03	61.0	
8	0	260.16	4	3	0.34	1303.15	1295	10	1.19E-03	84.9	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235059.CNF;1
* Acquisition date   : 28-SEP-2016 15:49:42 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.20 Half life ratio : *****
* Sample date        : 16-DEC-2015 12:26:00 Analyst initials: MJH1
* Sample ID          : I405235059 Sample Quantity : 3.7000E+00 GRAM
* Batch Number       : 1598647 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	---------------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-1.003E+00	2.079E+00	3.765E+00	NOT IDENT.
I-129	-5.757E-03	1.284E-01	2.740E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	10.08	37	15	1.29	49.76	44	12	1.02E-02	26.8	
2	0	19.09	8	13	0.45	94.89	89	13	2.10E-03	105.4	
3	0	97.51	9	0	0.55	487.89	484	8	2.50E-03	33.3	
4	0	107.46	4	5	0.55	537.76	532	7	1.16E-03	102.4	
5	0	165.55	12	5	0.62	828.89	824	10	3.30E-03	45.7	
6	0	238.83	9	0	0.53	1196.22	1191	10	2.50E-03	33.3	
7	0	242.32	10	6	0.39	1213.71	1204	12	2.66E-03	61.0	
8	0	260.16	4	3	0.34	1303.15	1295	10	1.19E-03	84.9	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235059

Page : 2
Acquisition date : 28-SEP-2016 15:49:42

Total number of lines in spectrum	8	
Number of unidentified lines	8	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	10.08	30	15	1.29	49.76	44	12	8.37E-03	66.5	1.59E-02	
0	19.09	5	13	0.45	94.89	89	13	1.41E-03	****	3.41E+00	
0	97.51	9	0	0.55	487.89	484	8	2.50E-03	66.7	3.36E-01	
0	107.46	4	5	0.55	537.76	532	7	1.16E-03	****	1.39E-01	
0	165.55	12	5	0.62	828.89	824	10	3.30E-03	91.4	5.85E-04	
0	238.83	9	0	0.53	1196.22	1191	10	2.50E-03	66.7	4.36E-07	
0	242.32	10	6	0.39	1213.71	1204	12	2.66E-03	****	3.08E-07	
0	260.16	4	3	0.34	1303.15	1295	10	1.19E-03	****	5.22E-08	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235059.CNF;1
* Acquisition date   : 28-SEP-2016 15:49:42 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.20 Half life ratio  : *****
* Sample date        : 16-DEC-2015 12:26:00 Nuclide Library : IODINE
* Sample ID          : I405235059 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity  : 3.7000E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	1.325E+00	NOT IDENT.
I-129	1.030E-01	NOT IDENT.


```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235059.CNF;1
* Acquisition date   : 28-SEP-2016 15:49:42 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.20 Half life ratio  : *****
* Sample date        : 16-DEC-2015 12:26:00 Nuclide Library : IODINE
* Sample ID          : I405235059 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity  : 3.7000E+00 GRAM
*                   : Quantity Err(%) : 2.7027E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
              Activity      K.L Act error      TPU
              (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        -1.003E+00      2.086E+00      2.135E+00  NOT IDENT.
I-129        -5.757E-03      1.284E-01      1.285E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	4.3431				
29.62	3.3266				
27.34	2.2442				
29.62	3.4411				
35.49	3.4934				
39.58	4.8019				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 16:50:32.94

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235060.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY5.CNF;58
Background date    : 25-SEP-2016 12:23:15
Sample date       : 16-DEC-2015 12:33:00 Acquisition date : 28-SEP-2016 15:50:06
Sample ID        : I405235060 Sample quantity   : 3.39000E+00 GRAM
Detector name    : XRAY5 Detector geometry: I129
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.05 0.0%
Energy tolerance : 1.00000 keV Analyst Initials : MJH1
Abundance limit  : 75.00000 Sensitivity   : 3.00000
Batch ID        : 1598647 Detector SN#    :
Matrix Spike ID : 1470-K LCS ID           : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	26.17	4	3	0.31	129.90	127	5	1.23E-03	71.9	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235060.CNF;1
* Acquisition date   : 28-SEP-2016 15:50:06 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.05 Half life ratio  : *****
* Sample date        : 16-DEC-2015 12:33:00 Analyst initials: MJH1
* Sample ID          : I405235060 Sample Quantity : 3.3900E+00 GRAM
* Batch Number       : 1598647 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	---------------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	9.795E-01	2.906E+00	7.677E+00	NOT IDENT.
I-129	-5.724E-02	1.192E-01	2.536E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	26.17	4	3	0.31	129.90	127	5	1.23E-03	71.9	
2	0	92.44	10	2	0.57	459.98	455	9	2.72E-03	42.2	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235060

Page : 2
Acquisition date : 28-SEP-2016 15:50:06

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235060

Page : 3
Acquisition date : 28-SEP-2016 15:50:06

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	26.17	4	3	0.31	129.90	127	5	1.23E-03	****	7.10E+00	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235060.CNF;1 *
* Acquisition date : 28-SEP-2016 15:50:06 Sensitivity : 3.000 *
* Detector ID : XRAY5 Energy tolerance: 1.000 *
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 01:00:00.05 Half life ratio : ***** *
* Sample date : 16-DEC-2015 12:33:00 Nuclide Library : IODINE *
* Sample ID : I405235060 Analyst initials: MJH1 *
* Batch Number : 1598647 Sample Quantity : 3.3900E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 30-AUG-2016 11:41:11 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide Lc
(pCi/GRAM)

---- Non-Identified Nuclides ----

Nuclide Lc
(pCi/GRAM)

I-125 2.874E+00 NOT IDENT.
I-129 6.677E-02 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235060.CNF;1
* Acquisition date   : 28-SEP-2016 15:50:06 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.05 Half life ratio  : *****
* Sample date        : 16-DEC-2015 12:33:00 Nuclide Library : IODINE
* Sample ID          : I405235060 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity : 3.3900E+00 GRAM
*                   : Quantity Err(%) : 2.9499E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
              Activity      K.L Act error      TPU
              (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        9.795E-01      2.911E+00      2.945E+00 NOT IDENT.
I-129        -5.724E-02      1.193E-01      1.221E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	1.6265				
29.62	1.7094				
27.34	0.0000				
29.62	4.6154				
35.49	1.9087				
39.58	1.0189				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 16:50:57.88

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627502.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY6.CNF;215
Background date    : 25-SEP-2016 12:23:20
Sample date        : 27-SEP-2016 00:00:00 Acquisition date : 28-SEP-2016 15:50:32
Sample ID          : I1203627502 Sample quantity      : 3.70000E+00 GRAM
Detector name      : XRAY6 Detector geometry         : I129
Elapsed live time  : 0 01:00:00.00 Elapsed real time: 0 01:00:00.08 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials     : MJH1
Abundance limit    : 75.00000 Sensitivity         : 3.00000
Batch ID           : 1598647 Detector SN#         :
Matrix Spike ID    : 1470-K LCS ID                   : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.64*	2	2	0.28	232.54	230	7	5.49E-04	190.6	
2	0	66.61	7	1	0.49	332.47	329	6	1.84E-03	48.3	
3	0	92.79*	9	6	0.57	463.44	459	8	2.44E-03	69.6	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627502.CNF;1
* Acquisition date   : 28-SEP-2016 15:50:32 Sensitivity      : 3.000
* Detector ID       : XRAY6 Energy tolerance: 1.000
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.08 Half life ratio : *****
* Sample date       : 27-SEP-2016 00:00:00 Analyst initials: MJH1
* Sample ID         : I1203627502 Sample Quantity : 3.7000E+00 GRAM
* Batch Number      : 1598647 Carrier Weight : 0.00000
* Recovery          : 1.00000 Standard Weight : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
*
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt Uncert	MDA (pCi/GRAM)	
I-125	-2.144E-02		1.015E-01	1.930E-01	NOT IDENT.
I-129	-1.527E-01		1.947E-01	2.122E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.64	8	2	0.28	232.54	230	7	2.17E-03	46.3	
2	0	66.61	7	1	0.49	332.47	329	6	1.84E-03	48.3	
3	0	92.79	16	6	0.57	463.44	459	8	4.46E-03	36.3	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I1203627502

Page : 2
Acquisition date : 28-SEP-2016 15:50:32

Total number of lines in spectrum	3	
Number of unidentified lines	3	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I1203627502

Page : 3
Acquisition date : 28-SEP-2016 15:50:32

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	46.64	2	2	0.28	232.54	230	7	5.49E-04	****	7.69E+00	
0	66.61	7	1	0.49	332.47	329	6	1.84E-03	96.7	2.49E+00	
0	92.79	9	6	0.57	463.44	459	8	2.44E-03	****	4.08E-01	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627502.CNF;1
* Acquisition date   : 28-SEP-2016 15:50:32 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.08 Half life ratio  : *****
* Sample date        : 27-SEP-2016 00:00:00 Nuclide Library : IODINE
* Sample ID          : I1203627502 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity : 3.7000E+00 GRAM
* Recovery           : 1.00000 Carrier Weight  : 0.00000
*                   Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	6.750E-02	NOT IDENT.
I-129	5.456E-02	NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627502.CNF;1
* Acquisition date   : 28-SEP-2016 15:50:32 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.08 Half life ratio  : *****
* Sample date        : 27-SEP-2016 00:00:00 Nuclide Library : IODINE
* Sample ID          : I1203627502 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity  : 3.7000E+00 GRAM
*                    : Quantity Err(%) : 2.7027E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                    : Standard Weight  : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
              (pCi/GRAM )    (1.96-sigma)  (1.96-sigma)
```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line Activity      K.L Act error      TPU
              (pCi/GRAM )    (1.96-sigma)  (1.96-sigma)
I-125        -2.144E-02      1.016E-01      1.020E-01  NOT IDENT.
I-129        -1.527E-01      1.953E-01      2.071E-01  NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	2.8315				
29.62	4.3929				
27.34	0.0000				
29.62	0.7722				
35.49	3.1623				
39.58	2.4852				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 20:04:52.22

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                   *
*                               Charleston, SC 29407                             *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627503.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM05.CNF;476
Background date  : 25-SEP-2016 12:20:17
Sample date      : 30-NOV-2015 13:27:00 Acquisition date : 28-SEP-2016 19:04:24
Sample ID       : I1203627503 Sample quantity  : 3.00000E+00 GRAM
Detector name   : GAM05 Detector geometry: I129
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.33 0.0%
Energy tolerance: 1.00000 keV Analyst Initials : MJH1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1598647 Detector SN# :
Matrix Spike ID: 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	38.74	12	39	0.74	79.32	75	7	3.33E-03	91.8	
2	2	49.67	11	31	0.95	101.15	89	16	3.10E-03	87.1	8.55E-01
3	3	62.67*	14	27	1.09	127.13	122	18	3.98E-03	84.3	9.80E-01
4	3	65.88	20	25	1.10	133.55	122	18	5.44E-03	51.3	
5	0	72.21	7	31	1.01	146.21	143	6	1.90E-03	135.2	
6	0	77.43*	15	48	0.90	156.64	153	9	4.20E-03	90.6	
7	0	86.72*	14	18	1.03	175.20	173	6	3.85E-03	58.4	
8	0	92.55*	18	52	1.20	186.86	183	9	4.99E-03	92.0	
9	0	185.60*	11	38	1.26	372.82	368	10	3.02E-03	120.6	
10	0	197.79*	8	25	1.28	397.20	392	8	2.24E-03	126.1	
11	0	202.84	8	21	0.76	407.28	404	6	2.31E-03	97.0	
12	3	238.07*	18	12	1.50	477.69	470	21	5.03E-03	51.9	9.88E-01
13	3	241.10*	12	20	1.50	483.75	470	21	3.37E-03	75.3	
14	0	277.03	14	12	1.41	555.56	551	8	4.02E-03	48.9	
15	0	352.06	29	18	1.19	705.52	700	13	8.04E-03	36.3	
16	0	387.13	13	8	1.64	775.60	770	11	3.56E-03	51.6	
17	0	451.80	7	18	3.79	904.86	897	13	1.96E-03	125.3	
18	0	570.07	9	3	0.94	1141.25	1138	6	2.57E-03	43.9	
19	0	583.32*	7	9	0.95	1167.73	1163	9	1.97E-03	92.1	
20	0	620.48	9	3	1.30	1242.00	1239	6	2.62E-03	43.1	
21	0	685.86	7	7	3.58	1372.67	1365	10	1.82E-03	87.6	
22	0	799.61	12	2	2.65	1600.02	1596	8	3.32E-03	35.5	
23	0	878.70	9	0	3.94	1758.11	1753	10	2.50E-03	33.3	
24	0	903.81	8	3	0.73	1808.29	1804	8	2.12E-03	57.1	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627503.CNF;1
* Acquisition date   : 28-SEP-2016 19:04:24 Sensitivity      : 3.000
* Detector ID       : GAM05 Energy tolerance: 1.000
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.33 Half life ratio : *****
* Sample date       : 30-NOV-2015 13:27:00 Analyst initials: MJH1
* Sample ID         : I1203627503 Sample Quantity : 3.0000E+00 GRAM
* Batch Number      : 1598647 Carrier Weight : 0.00000
* Recovery          : 1.00000 Standard Weight : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 6-SEP-2016 11:51:40 Eff. Geometry    : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM05_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-9.645E+00		9.502E+00	1.343E+01	NOT IDENT.
I-129	-1.528E-01		3.226E-01	4.971E-01	FAIL ABUN

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	38.74	12	39	0.74	79.32	75	7	3.33E-03	91.8	
2	2	45.93	46	35	0.94	93.67	89	16	1.27E-02	26.6	8.55E-01
3	2	49.67	11	31	0.95	101.15	89	16	3.10E-03	87.1	
4	3	62.67	48	27	1.09	127.13	122	18	1.32E-02	24.6	9.80E-01
5	3	65.88	20	25	1.10	133.55	122	18	5.44E-03	51.3	
6	0	72.21	7	31	1.01	146.21	143	6	1.90E-03	135.2	
7	0	77.43	25	48	0.90	156.64	153	9	6.81E-03	55.3	
8	0	86.72	18	18	1.03	175.20	173	6	5.12E-03	42.3	
9	0	92.55	70	52	1.20	186.86	183	9	1.94E-02	23.1	
10	0	185.60	33	38	1.26	372.82	368	10	9.19E-03	38.8	
11	0	197.79	18	25	1.28	397.20	392	8	4.96E-03	54.5	
12	0	202.84	8	21	0.76	407.28	404	6	2.31E-03	97.0	
13	3	238.07	31	12	1.50	477.69	470	21	8.63E-03	29.4	9.88E-01
14	3	241.10	16	20	1.50	483.75	470	21	4.37E-03	57.0	
15	0	277.03	14	12	1.41	555.56	551	8	4.02E-03	48.9	
16	0	352.06	29	18	1.19	705.52	700	13	8.04E-03	36.3	
17	0	387.13	13	8	1.64	775.60	770	11	3.56E-03	51.6	
18	0	451.80	7	18	3.79	904.86	897	13	1.96E-03	125.3	
19	0	511.16	81	19	2.78	1023.50	1016	16	2.26E-02	16.5	
20	0	570.07	9	3	0.94	1141.25	1138	6	2.57E-03	43.9	
21	0	583.32	11	9	0.95	1167.73	1163	9	2.97E-03	59.3	
22	0	620.48	9	3	1.30	1242.00	1239	6	2.62E-03	43.1	
23	0	685.86	7	7	3.58	1372.67	1365	10	1.82E-03	87.6	
24	0	799.61	12	2	2.65	1600.02	1596	8	3.32E-03	35.5	
25	0	878.70	9	0	3.94	1758.11	1753	10	2.50E-03	33.3	
26	0	903.81	8	3	0.73	1808.29	1804	8	2.12E-03	57.1	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I1203627503

Page : 2
Acquisition date : 28-SEP-2016 19:04:24

Total number of lines in spectrum	24	
Number of unidentified lines	23	
Number of lines tentatively identified by NID	1	4.17%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	38.74	12	39	0.74	79.32	75	7	3.33E-03	****	2.73E+01	T
2	49.67	11	31	0.95	101.15	89	16	3.10E-03	****	3.17E+00	
3	62.67	14	27	1.09	127.13	122	18	3.98E-03	****	5.16E-02	
3	65.88	20	25	1.10	133.55	122	18	5.44E-03	****	1.60E-02	
0	72.21	7	31	1.01	146.21	143	6	1.90E-03	****	1.41E-03	
0	77.43	15	48	0.90	156.64	153	9	4.20E-03	****	1.72E-04	
0	86.72	14	18	1.03	175.20	173	6	3.85E-03	****	3.45E-06	
0	92.55	18	52	1.20	186.86	183	9	4.99E-03	****	2.72E-07	
0	185.60	11	38	1.26	372.82	368	10	3.02E-03	****	1.64E-26	
0	197.79	8	25	1.28	397.20	392	8	2.24E-03	****	3.94E-29	
0	202.84	8	21	0.76	407.28	404	6	2.31E-03	****	3.23E-30	
3	238.07	18	12	1.50	477.69	470	21	5.03E-03	****	0.00E+00	
3	241.10	12	20	1.50	483.75	470	21	3.37E-03	****	0.00E+00	
0	277.03	14	12	1.41	555.56	551	8	4.02E-03	97.8	0.00E+00	
0	352.06	29	18	1.19	705.52	700	13	8.04E-03	72.6	0.00E+00	
0	387.13	13	8	1.64	775.60	770	11	3.56E-03	****	0.00E+00	
0	451.80	7	18	3.79	904.86	897	13	1.96E-03	****	0.00E+00	
0	570.07	9	3	0.94	1141.25	1138	6	2.57E-03	87.8	0.00E+00	
0	583.32	7	9	0.95	1167.73	1163	9	1.97E-03	****	0.00E+00	
0	620.48	9	3	1.30	1242.00	1239	6	2.62E-03	86.3	0.00E+00	
0	685.86	7	7	3.58	1372.67	1365	10	1.82E-03	****	0.00E+00	
0	799.61	12	2	2.65	1600.02	1596	8	3.32E-03	70.9	0.00E+00	
0	878.70	9	0	3.94	1758.11	1753	10	2.50E-03	66.7	0.00E+00	
0	903.81	8	3	0.73	1808.29	1804	8	2.12E-03	****	0.00E+00	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627503.CNF;1
* Acquisition date   : 28-SEP-2016 19:04:24 Sensitivity      : 3.000
* Detector ID        : GAM05 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.33 Half life ratio  : *****
* Sample date        : 30-NOV-2015 13:27:00 Nuclide Library : IODINE
* Sample ID          : I1203627503 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity : 3.0000E+00 GRAM
* Recovery           : 1.00000 Carrier Weight  : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 6-SEP-2016 11:51:40 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM05_I129.CNF;15
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	5.978E+00	NOT IDENT.
I-129	2.234E-01	FAIL ABUN

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627503.CNF;1
* Acquisition date   : 28-SEP-2016 19:04:24 Sensitivity      : 3.000
* Detector ID        : GAM05 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.33 Half life ratio  : *****
* Sample date        : 30-NOV-2015 13:27:00 Nuclide Library : IODINE
* Sample ID          : I1203627503 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity : 3.0000E+00 GRAM
*                   : Quantity Err(%) : 3.3333E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 6-SEP-2016 11:51:40 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM05_I129.CNF;15
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )    (1.96-sigma)  (1.96-sigma)
```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line Activity      K.L Act error      TPU
             (pCi/GRAM )    (1.96-sigma)    (1.96-sigma)
I-125        -9.645E+00      9.649E+00      1.058E+01  NOT IDENT.
I-129        -1.528E-01      3.230E-01      3.303E-01  FAIL ABUN
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	39.8805				
29.62	30.2741				
27.34	17.4184				
29.62	27.9341				
35.49	14.8329				
39.58	14.0959				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 20:05:48.51

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627504.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY1.CNF;415
Background date    : 25-SEP-2016 12:22:54
Sample date        : 30-NOV-2015 13:27:00 Acquisition date : 28-SEP-2016 19:05:16
Sample ID          : I1203627504 Sample quantity      : 3.17000E+00 GRAM
Detector name      : XRAY1 Detector geometry       : I129
Elapsed live time  : 0 01:00:00.00 Elapsed real time: 0 01:00:00.24 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials    : MJH1
Abundance limit   : 75.00000 Sensitivity      : 3.00000
Batch ID          : 1598647 Detector SN#       :
Matrix Spike ID   : 1470-K LCS ID                  : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	29.69	740	84	0.84	148.92	141	20	2.06E-01	4.9	
2	0	33.71	159	24	0.56	169.19	161	16	4.42E-02	10.5	
3	0	39.62	99	19	0.66	199.00	194	10	2.74E-02	13.1	
4	0	42.88	7	7	0.17	215.40	208	9	1.99E-03	75.3	
5	0	140.71	7	5	0.21	708.39	700	12	1.83E-03	83.2	
6	0	163.52*	10	0	0.33	823.38	817	14	2.72E-03	39.7	

Flag: "*" = Peak area was modified by background subtraction

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627504.CNF;1
* Acquisition date   : 28-SEP-2016 19:05:16 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.24 Half life ratio  : *****
* Sample date        : 30-NOV-2015 13:27:00 Analyst initials: MJH1
* Sample ID          : I1203627504 Sample Quantity : 3.1700E+00 GRAM
* Batch Number       : 1598647 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
```

CALIBRATION INFORMATION

```
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
I-129	1.408E+01	1.357E+00	6.167E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	3.274E+00		7.012E+00	1.189E+01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	29.69	740	84	0.84	148.92	141	20	2.06E-01	4.9	
2	0	33.71	159	24	0.56	169.19	161	16	4.42E-02	10.5	
3	0	39.62	99	19	0.66	199.00	194	10	2.74E-02	13.1	
4	0	42.88	7	7	0.17	215.40	208	9	1.99E-03	75.3	
5	0	140.71	7	5	0.21	708.39	700	12	1.83E-03	83.2	
6	0	163.52	13	0	0.33	823.38	817	14	3.61E-03	27.7	

Nuclide Line Activity Report

Nuclide Type: FISSION

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
I-129	29.62	740	56.60*	2.200E+01	1.408E+01	1.408E+01	9.83
	33.59	159	10.04	2.304E+01	1.628E+01	1.628E+01	21.01
	39.58	99	7.51	2.288E+01	1.360E+01	1.360E+01	26.27

Flag: "*" = Keyline

Total number of lines in spectrum 6
 Number of unidentified lines 3
 Number of lines tentatively identified by NID 3 50.00%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
I-129	1.57E+07Y	1.00	1.408E+01	1.408E+01	0.138E+01	9.83	
Total Activity :			1.408E+01	1.408E+01			

Grand Total Activity : 1.408E+01 1.408E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	42.88	7	7	0.17	215.40	208	9	1.99E-03	****	2.22E+01	
0	140.71	7	5	0.21	708.39	700	12	1.83E-03	****	1.09E+00	
0	163.52	10	0	0.33	823.38	817	14	2.72E-03	79.4	4.69E-01	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627504.CNF;1 *
* Acquisition date : 28-SEP-2016 19:05:16 Sensitivity : 3.000 *
* Detector ID : XRAY1 Energy tolerance: 1.000 *
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 01:00:00.24 Half life ratio : ***** *
* Sample date : 30-NOV-2015 13:27:00 Nuclide Library : IODINE *
* Sample ID : I1203627504 Analyst initials: MJH1 *
* Batch Number : 1598647 Sample Quantity : 3.1700E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide Lc
(pCi/GRAM)
I-129 2.827E-01

---- Non-Identified Nuclides ----

Nuclide Lc
(pCi/GRAM)
I-125 5.482E+00 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627504.CNF;1
* Acquisition date   : 28-SEP-2016 19:05:16 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.24 Half life ratio  : *****
* Sample date        : 30-NOV-2015 13:27:00 Nuclide Library : IODINE
* Sample ID          : I1203627504 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity : 3.1700E+00 GRAM
*                   : Quantity Err(%) : 3.1546E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 9-JUN-2016 11:39:23 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
(pCi/GRAM )  (1.96-sigma)  (1.96-sigma)
I-129        1.408E+01     1.945E+00     1.945E+00

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line Activity      K.L Act error      TPU
(pCi/GRAM )  (1.96-sigma)  (1.96-sigma)
I-125        3.274E+00     7.035E+00     7.188E+00 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	37.6141				
29.62	40.7126				
27.34	41.5498				
29.62	8.0864				
35.49	4.1467				
39.58	13.5658				

VAX/VMS Nuclide Identification Report Generated 29-SEP-2016 10:10:51.66

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627505.CNF;2
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY1.CNF;415
Background date  : 25-SEP-2016 12:22:54
Sample date     : 27-SEP-2016 00:00:00 Acquisition date : 29-SEP-2016 09:10:18
Sample ID      : I1203627505 Sample quantity   : 3.70000E+00 GRAM
Detector name   : XRAY1 Detector geometry: I129
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.29 0.0%
Energy tolerance: 1.00000 keV Analyst Initials : MJH1
Abundance limit : 75.00000 Sensitivity    : 3.00000
Batch ID       : 1598647 Detector SN#     :
Matrix Spike ID : 1470-K LCS ID           : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	9	26.89	13	21	0.64	134.80	132	27	3.72E-03	62.4	4.89E+00
2	9	27.44	35	34	0.66	137.61	132	27	9.72E-03	36.8	
3	9	28.12	23	24	0.49	141.00	132	27	6.30E-03	48.1	
4	9	29.59	636	48	1.18	148.42	132	27	1.77E-01	5.0	
5	0	33.81	180	39	0.87	169.67	163	16	5.00E-02	11.3	
6	0	39.74	71	26	0.91	199.57	193	14	1.97E-02	19.7	
7	0	108.39	11	2	0.58	545.53	540	10	2.93E-03	41.6	
8	0	113.43	9	3	0.60	570.92	565	11	2.62E-03	47.0	

Flag: "*" = Peak area was modified by background subtraction

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627505.CNF;2
* Acquisition date   : 29-SEP-2016 09:10:18 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.29 Half life ratio  : *****
* Sample date        : 27-SEP-2016 00:00:00 Analyst initials: MJH1
* Sample ID          : I1203627505 Sample Quantity : 3.7000E+00 GRAM
* Batch Number       : 1598647 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
```

CALIBRATION INFORMATION

```
* Eff. Cal. date    : 9-JUN-2016 11:39:23 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
I-125	3.064E-01	2.210E-01	2.103E-01
I-129	1.039E+01	1.027E+00	4.395E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	9	26.89	13	21	0.64	134.80	132	27	3.72E-03	62.4	4.89E+00
2	9	27.44	35	34	0.66	137.61	132	27	9.72E-03	36.8	
3	9	28.12	23	24	0.49	141.00	132	27	6.30E-03	48.1	
4	9	29.59	636	48	1.18	148.42	132	27	1.77E-01	5.0	
5	0	33.81	180	39	0.87	169.67	163	16	5.00E-02	11.3	
6	0	39.74	71	26	0.91	199.57	193	14	1.97E-02	19.7	
7	0	108.39	11	2	0.58	545.53	540	10	2.93E-03	41.6	
8	0	113.43	9	3	0.60	570.92	565	11	2.62E-03	47.0	

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
I-125	27.34	35	114.10*	2.088E+01	2.980E-01	3.064E-01	73.58
	30.97	-----	20.30	2.245E+01	-----	Line Not Found	-----
	35.49	-----	6.68	2.317E+01	-----	Line Not Found	-----

Nuclide Type: FISSION

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
I-129	29.62	636	56.60*	2.195E+01	1.039E+01	1.039E+01	10.08
	33.59	180	10.04	2.305E+01	1.577E+01	1.577E+01	22.53
	39.58	71	7.51	2.286E+01	8.399E+00	8.399E+00	39.30

Flag: "*" = Keyline

Total number of lines in spectrum 8
 Number of unidentified lines 4
 Number of lines tentatively identified by NID 4 50.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
I-125	59.40D	1.03	2.980E-01	3.064E-01	2.255E-01	73.58	
Total Activity :			2.980E-01	3.064E-01			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
I-129	1.57E+07Y	1.00	1.039E+01	1.039E+01	0.105E+01	10.08	
Total Activity :			1.039E+01	1.039E+01			

Grand Total Activity : 1.069E+01 1.070E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I1203627505

Page : 3
Acquisition date : 29-SEP-2016 09:10:18

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
9	26.89	13	21	0.64	134.80	132	27	3.72E-03	***	2.05E+01	
9	28.12	23	24	0.49	141.00	132	27	6.30E-03	96.1	2.13E+01	
0	108.39	11	2	0.58	545.53	540	10	2.93E-03	83.3	3.48E+00	
0	113.43	9	3	0.60	570.92	565	11	2.62E-03	93.9	2.92E+00	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627505.CNF;2 *
* Acquisition date : 29-SEP-2016 09:10:18 Sensitivity : 3.000 *
* Detector ID : XRAY1 Energy tolerance: 1.000 *
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 01:00:00.29 Half life ratio : ***** *
* Sample date : 27-SEP-2016 00:00:00 Nuclide Library : IODINE *
* Sample ID : I1203627505 Analyst initials: MJH1 *
* Batch Number : 1598647 Sample Quantity : 3.7000E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
I-125	9.331E-02
I-129	1.978E-01

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627505.CNF;2
* Acquisition date   : 29-SEP-2016 09:10:18 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.29 Half life ratio  : *****
* Sample date        : 27-SEP-2016 00:00:00 Nuclide Library : IODINE
* Sample ID          : I1203627505 Analyst initials: MJH1
* Batch Number       : 1598647 Sample Quantity : 3.7000E+00 GRAM
*                   : Quantity Err(%) : 2.7027E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
I-125	3.064E-01	2.269E-01	2.269E-01
I-129	1.039E+01	1.465E+00	1.465E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)
---------	-------------------------------------	-------------------------------	---------------------

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	20.8513				
29.62	27.1418				
30.97	27.6999				
33.59	21.5637				
35.49	5.5290				
39.58	13.5658				

09/29/16

Batch# 1598663 Product: I-129 / MJWC Date: 09/29/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			n/a
Samples have been blank corrected (if required). Blank correction reported included (if required).			n/a
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			n/a
Method blank is less than the RDL/ LLD. (If rad samples. < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	DER 1562850
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			n/a
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.	✓		
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stused.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hlt notification complete (if necessary)	✓		
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER 1562850
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		
Aliquot Correction completed if required.			n/a
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: *[Signature]* 9/29/16

Secondary Review Performed By: *[Signature]* 9/29/16

DATA EXCEPTION REPORT

Mo.Day Yr. 29-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GAMMA SPECTROMETER	Test / Method: DOE EML HASL-300,I-01 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1598663	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>Sample received out of holding:</p> <p>405235 061,062,063,064,065,066,067,068,069, 070,071,072,073,074,075,076,077,078,</p> <p>QC 1203627532DUP,1203627533MS</p>		<p>Samples were analyzed in a timely manner upon receipt. Reporting results.</p>	

Originator's Name:

Spencer Collins 29-SEP-16

Data Validator/Group Leader:

Bryan Williams 30-SEP-16

I-129 Queue Sheet

09/27/2016

Batch #: 1598663

Analyst: MJH1

First Client Due Date: 10/04/2016

Internal Due Date: 09/30/2016

Spike Isotope: I-129 Spike Code: 1470-K Expiration Date: 3-30-17

Nominal Concentration: NA

LCS Isotope: I-129 LCS Code: 1470-K Expiration Date: 3-30-17

Nominal Concentration: NA


Prep Date: 9-27-16 Initials: mmh Pipette ID: 1429303


Witness: NA

Balance: 17955156

D.P.M

Sample ID	Client Description	Type	Hazard Code	RDL	Client	Matrix	Wet Aliquot (g)	Collect Date	Aliquot (mL of g)	Detector
405235061-1	5.1B.R.2.2	SAMPLE	1 pCi/g		MJWC001	SOIL	3.70	14-DEC-15 13:47 E	3.05	X4
405235062-1	5.2.A.R.1.2	SAMPLE	1 pCi/g		MJWC001	SOIL	5.46	14-DEC-15 13:10 E	2.79	X5
405235063-1	5.2.A.R.1.3	SAMPLE	1 pCi/g		MJWC001	SOIL	4.27	14-DEC-15 13:15 E	5.82	X6
405235064-1	5.2.A.R.1.4	SAMPLE	1 pCi/g		MJWC001	SOIL	3.17	14-DEC-15 13:25 E	2.91	5 RR
405235065-1	5.2.A.R.2.3	SAMPLE	1 pCi/g		MJWC001	SOIL	4.70	14-DEC-15 13:56 E	4.25	X1 RR
405235066-1	5.2.A.R.2.4	SAMPLE	1 pCi/g		MJWC001	SOIL	3.49	14-DEC-15 14:00 E	3.55	X2 RR
405235067-1	5.2.A.R.6.2	SAMPLE	1 pCi/g		MJWC001	SOIL	5.95	11-DEC-15 11:30 E	3.40	X4 RR
405235068-1	5.2.A.R.4.2	SAMPLE	1 pCi/g		MJWC001	SOIL	5.16	11-DEC-15 10:27 E	2.72	X6 RR
405235069-1	5.2.B.R.1.4	SAMPLE	1 pCi/g		MJWC001	SOIL	3.50	16-DEC-15 12:45 E	3.15	X3 RR
405235070-1	5.2.B.R.3.2	SAMPLE	1 pCi/g		MJWC001	SOIL	4.02	11-DEC-15 10:10 E	3.26	X1 RR
405235071-1	5.2.B.R.4.2	SAMPLE	1 pCi/g		MJWC001	SOIL	3.18	11-DEC-15 10:25 E	2.65	X2 RR
405235072-1	5.2.B.R.2.4	SAMPLE	1 pCi/g		MJWC001	SOIL	3.01	15-DEC-15 13:35 E	2.76	X4 RR
405235073-1	5.2.B.R.8.2	SAMPLE	1 pCi/g		MJWC001	SOIL	3.70	11-DEC-15 11:35 E	3.00	X5 RR
405235074-1	5.3.A.R.1.3	SAMPLE	1 pCi/g		MJWC001	SOIL	3.65	15-DEC-15 14:10 E	3.26	X6 RR
405235075-1	5.4.A.R.1.3	SAMPLE	1 pCi/g		MJWC001	SOIL	3.56	16-DEC-15 09:31 E	3.10	X1 RR
405235076-1	5.4.A.R.4.2	SAMPLE	1 pCi/g		MJWC001	SOIL	3.48	11-DEC-15 14:19 E	2.77	5 RR
405235077-1	5.5.A.R.1.3	SAMPLE	1 pCi/g		MJWC001	SOIL	3.17	17-DEC-15 13:30 E	2.56	X1 RR
405235078-1	5.6.A.R.1.3	SAMPLE	1 pCi/g		MJWC001	SOIL	3.88	17-DEC-15 12:40 E	3.25	X2 RR
1205627531-1	MB for batch 1598663	MB	1 pCi/g		QC ACCOUNT	SOIL		9-27-16 E	3.67	X4
1205627532-1	5.1B.R.2.2(405235061DUP)	DUP	1 pCi/g		QC ACCOUNT	SOIL	5.42	14-DEC-15 13:47 E	2.82	X5
1205627533-1	5.1B.R.2.2(405235061MS)	MS	1 pCi/g		QC ACCOUNT	SOIL	3.62	14-DEC-15 13:47 E	2.98	X6
1205627534-1	LCS for batch 1598663	LCS	1 pCi/g		QC ACCOUNT	SOIL		9-27-16 E	4.25	X1

Data Reviewed By:  9/29/16



Weight/Loss Aliquot Correction Report



Select What to Correct Aliquot to

Ash Dry Weight
 Dry Weight
 Wet Weight

Submit

Batch ID: 1598663

Calculate Corrected Aliquot

Aliquot Correction to Dry Weight for Batch 1598663

Sample Id	Aliquot (G)	Sample Type	Parent Sample Id	Loss (Dec)	Corrected Aliquot (G)
405235061	3.70	SAMPLE	NA	.1759	3.049114616405934
405235062	3.46	SAMPLE	NA	.1935	2.790206613763970
405235063	4.27	SAMPLE	NA	.1051	3.821103897809974
405235064	3.17	SAMPLE	NA	.0816	2.911301714305975
405235065	4.70	SAMPLE	NA	.1005	4.2273961761153
405235066	3.69	SAMPLE	NA	.0929	3.347074883307074
405235067	3.95	SAMPLE	NA	.1385	3.402626157374366
405235068	3.16	SAMPLE	NA	.1387	2.721577663311981
405235069	3.50	SAMPLE	NA	.1061	3.128465437949653
405235070	4.02	SAMPLE	NA	.1885	3.261936451874178
405235071	3.18	SAMPLE	NA	.1655	2.653444163300698
405235072	3.01	SAMPLE	NA	.0816	2.764099518422303
405235073	3.70	SAMPLE	NA	.1890	3.000427282492979
405235074	3.65	SAMPLE	NA	.1067	3.260325215597129
405235075	3.56	SAMPLE	NA	.1072	3.178109811129473
405235076	3.48	SAMPLE	NA	.2054	2.765052961173293
405235077	3.17	SAMPLE	NA	.0992	2.855398681908791
405235078	3.88	SAMPLE	NA	.1613	3.254030506658277
1203627531		MB	NA	NA	
1203627532	3.42	DUP	405235061	.1759	2.818370807596836
1203627533	3.62	MS	405235061	.1759	2.983187813889049
1203627534		LCS	NA	NA	

GEL Laboratories LLC

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 20:09:48.81

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235061.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY4.CNF;433
Background date : 25-SEP-2016 12:23:10
Sample date     : 14-DEC-2015 13:47:00 Acquisition date : 28-SEP-2016 19:09:16
Sample ID      : I405235061 Sample quantity : 3.05000E+00 GRAM
Detector name  : XRAY4 Detector geometry: I129
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.19 0.0%
Energy tolerance : 1.00000 keV Analyst Initials : MJH1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1598663 Detector SN# :
Matrix Spike ID : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	16.56*	4	14	0.78	82.24	77	9	1.05E-03	207.6	
2	0	30.56	7	7	0.55	152.38	145	10	1.83E-03	87.1	
3	0	92.77*	6	4	0.54	464.14	459	8	1.69E-03	90.3	
4	0	110.04	13	3	0.23	550.67	546	10	3.71E-03	35.3	
5	7	125.51	9	0	0.93	628.23	627	11	2.63E-03	21.1	4.91E-01
6	7	126.80	9	0	0.61	634.69	627	11	2.49E-03	33.4	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235061.CNF;1
* Acquisition date   : 28-SEP-2016 19:09:16 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.19 Half life ratio  : *****
* Sample date        : 14-DEC-2015 13:47:00 Analyst initials: MJH1
* Sample ID          : I405235061 Sample Quantity : 3.0500E+00 GRAM
* Batch Number       : 1598663 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
I-129	1.919E-01	3.276E-01	4.487E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-2.902E-01		2.926E+00	6.017E+00	FAIL ABUN

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	16.56	11	14	0.78	82.24	77	9	3.04E-03	67.9	
2	0	30.56	7	7	0.55	152.38	145	10	1.83E-03	87.1	
3	0	92.77	14	4	0.54	464.14	459	8	3.89E-03	36.4	
4	0	110.04	13	3	0.23	550.67	546	10	3.71E-03	35.3	
5	7	125.51	9	0	0.93	628.23	627	11	2.63E-03	21.1	4.91E-01
6	7	126.80	9	0	0.61	634.69	627	11	2.49E-03	33.4	

Nuclide Line Activity Report

Nuclide Type: FISSION

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
I-129	29.62	7	56.60*	1.489E+01	1.919E-01	1.919E-01	174.17
	33.59	-----	10.04	1.626E+01	-----	Line Not Found	-----
	39.58	-----	7.51	1.619E+01	-----	Line Not Found	-----

Flag: "*" = Keyline

Total number of lines in spectrum 6
 Number of unidentified lines 5
 Number of lines tentatively identified by NID 1 16.67%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
I-129	1.57E+07Y	1.00	1.919E-01	1.919E-01	3.343E-01	174.17	
Total Activity :			1.919E-01	1.919E-01			

Grand Total Activity : 1.919E-01 1.919E-01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	16.56	4	14	0.78	82.24	77	9	1.05E-03	****	1.51E+00	
0	92.77	6	4	0.54	464.14	459	8	1.69E-03	****	5.07E-01	
0	110.04	13	3	0.23	550.67	546	10	3.71E-03	70.7	1.10E-01	
7	125.51	9	0	0.93	628.23	627	11	2.63E-03	42.2	2.65E-02	
7	126.80	9	0	0.61	634.69	627	11	2.49E-03	66.9	2.35E-02	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235061.CNF;1
* Acquisition date   : 28-SEP-2016 19:09:16 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.19 Half life ratio  : *****
* Sample date        : 14-DEC-2015 13:47:00 Nuclide Library : IODINE
* Sample ID          : I405235061 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 3.0500E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
I-129	1.831E-01

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
I-125	2.316E+00 FAIL ABUN

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235061.CNF;1
* Acquisition date   : 28-SEP-2016 19:09:16 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.19 Half life ratio  : *****
* Sample date        : 14-DEC-2015 13:47:00 Nuclide Library : IODINE
* Sample ID          : I405235061 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 3.0500E+00 GRAM
*                   : Quantity Err(%) : 3.2787E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
I-129        1.919E-01          3.281E-01      3.281E-01

---- Non-Identified Nuclides ----
Nuclide      Key-Line
              Activity      K.L Act error  TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
I-125        -2.902E-01          2.926E+00      2.929E+00  FAIL ABUN

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	4.3431				
29.62	6.6533				
27.34	2.9923				
29.62	2.2941				
35.49	10.4803				
39.58	1.2005				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 20:10:13.08

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                 *
*                               Charleston, SC 29407                            *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235062.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY5.CNF;58
Background date    : 25-SEP-2016 12:23:15
Sample date       : 14-DEC-2015 13:10:00 Acquisition date : 28-SEP-2016 19:09:43
Sample ID        : I405235062 Sample quantity : 2.79000E+00 GRAM
Detector name    : XRAY5 Detector geometry: I129
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.06 0.0%
Energy tolerance : 1.00000 keV Analyst Initials : MJH1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1598663 Detector SN# :
Matrix Spike ID : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	35.39	7	0	0.33	175.86	173	6	1.94E-03	37.8	
2	0	77.33*	3	3	0.27	384.75	381	7	9.45E-04	119.3	
3	0	90.59	5	5	0.36	450.77	443	9	1.47E-03	84.6	
4	0	92.65*	4	6	0.60	461.01	454	11	9.85E-04	186.7	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235062.CNF;1
* Acquisition date   : 28-SEP-2016 19:09:43 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.06 Half life ratio  : *****
* Sample date        : 14-DEC-2015 13:10:00 Analyst initials: MJH1
* Sample ID          : I405235062 Sample Quantity : 2.7900E+00 GRAM
* Batch Number       : 1598663 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	---------------------	--------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)	
I-125	-6.833E-01		2.570E+00		6.231E+00	FAIL ABUN
I-129	-6.332E-03		1.280E-01		3.612E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	35.39	7	0	0.33	175.86	173	6	1.94E-03	37.8	
2	0	77.33	6	3	0.27	384.75	381	7	1.70E-03	63.6	
3	0	90.59	5	5	0.36	450.77	443	9	1.47E-03	84.6	
4	0	92.65	18	6	0.60	461.01	454	11	5.03E-03	34.5	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235062

Page : 2
Acquisition date : 28-SEP-2016 19:09:43

Total number of lines in spectrum	4	
Number of unidentified lines	3	
Number of lines tentatively identified by NID	1	25.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235062

Page : 3
Acquisition date : 28-SEP-2016 19:09:43

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	35.39	7	0	0.33	175.86	173	6	1.94E-03	75.6	9.99E+00	T
0	77.33	3	3	0.27	384.75	381	7	9.45E-04	****	1.19E+00	
0	90.59	5	5	0.36	450.77	443	9	1.47E-03	****	4.23E-01	
0	92.65	4	6	0.60	461.01	454	11	9.85E-04	****	3.58E-01	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235062.CNF;1
* Acquisition date   : 28-SEP-2016 19:09:43 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.06 Half life ratio  : *****
* Sample date        : 14-DEC-2015 13:10:00 Nuclide Library : IODINE
* Sample ID          : I405235062 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 2.7900E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	1.913E+00	FAIL ABUN
I-129	1.076E-01	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235062.CNF;1
* Acquisition date   : 28-SEP-2016 19:09:43 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.06 Half life ratio  : *****
* Sample date        : 14-DEC-2015 13:10:00 Nuclide Library : IODINE
* Sample ID          : I405235062 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 2.7900E+00 GRAM
*                   : Quantity Err(%) : 3.5842E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        -6.833E-01      2.573E+00      2.591E+00  FAIL ABUN
I-129        -6.332E-03      1.280E-01      1.280E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	1.6265				
29.62	0.8547				
27.34	1.7568				
29.62	2.7692				
35.49	0.9543				
39.58	3.0566				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 20:10:37.27

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235063.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY6.CNF;215
Background date    : 25-SEP-2016 12:23:20
Sample date       : 14-DEC-2015 13:15:00 Acquisition date : 28-SEP-2016 19:10:13
Sample ID        : I405235063 Sample quantity   : 3.82000E+00 GRAM
Detector name     : XRAY6 Detector geometry: I129
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.07 0.0%
Energy tolerance : 1.00000 keV Analyst Initials  : MJH1
Abundance limit  : 75.00000 Sensitivity   : 3.00000
Batch ID         : 1598663 Detector SN#   :
Matrix Spike ID  : 1470-K LCS ID             : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	19.31	6	0	0.55	95.83	94	5	1.67E-03	40.8	
2	0	63.33*	7	0	0.23	316.08	312	8	1.84E-03	55.7	
3	0	92.82*	1	4	0.45	463.59	460	7	3.38E-04	380.8	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235063.CNF;1
* Acquisition date   : 28-SEP-2016 19:10:13 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.07 Half life ratio  : *****
* Sample date        : 14-DEC-2015 13:15:00 Analyst initials: MJH1
* Sample ID          : I405235063 Sample Quantity : 3.8200E+00 GRAM
* Batch Number       : 1598663 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-2.529E+00		2.861E+00	1.613E+00	NOT IDENT.
I-129	1.760E-02		2.004E-01	4.162E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	19.31	6	0	0.55	95.83	94	5	1.67E-03	40.8	
2	0	63.33	12	0	0.23	316.08	312	8	3.33E-03	28.9	
3	0	92.82	9	4	0.45	463.59	460	7	2.36E-03	50.1	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235063

Page : 2
Acquisition date : 28-SEP-2016 19:10:13

Total number of lines in spectrum	3	
Number of unidentified lines	3	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235063

Page : 3
Acquisition date : 28-SEP-2016 19:10:13

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	19.31	6	0	0.55	95.83	94	5	1.67E-03	81.6	3.23E+00	
0	63.33	7	0	0.23	316.08	312	8	1.84E-03	****	3.08E+00	
0	92.82	1	4	0.45	463.59	460	7	3.38E-04	****	4.07E-01	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235063.CNF;1 *
* Acquisition date : 28-SEP-2016 19:10:13 Sensitivity : 3.000 *
* Detector ID : XRAY6 Energy tolerance: 1.000 *
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 01:00:00.07 Half life ratio : ***** *
* Sample date : 14-DEC-2015 13:15:00 Nuclide Library : IODINE *
* Sample ID : I405235063 Analyst initials: MJH1 *
* Batch Number : 1598663 Sample Quantity : 3.8200E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 26-JAN-2016 10:07:09 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 0.000E+00 NOT IDENT.
I-129 1.583E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235063.CNF;1
* Acquisition date   : 28-SEP-2016 19:10:13 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.07 Half life ratio  : *****
* Sample date        : 14-DEC-2015 13:15:00 Nuclide Library : IODINE
* Sample ID          : I405235063 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 3.8200E+00 GRAM
*                   : Quantity Err(%) : 2.6178E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
I-125        -2.529E+00      2.870E+00      3.088E+00 NOT IDENT.
I-129        1.760E-02      2.004E-01      2.006E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	4.2472				
29.62	2.9286				
27.34	2.9842				
29.62	3.0889				
35.49	1.5811				
39.58	0.8284				

VAX/VMS Nuclide Identification Report Generated 29-SEP-2016 07:50:09.17

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235064.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM05.CNF;476
Background date  : 25-SEP-2016 12:20:17
Sample date     : 14-DEC-2015 13:25:00 Acquisition date : 29-SEP-2016 06:19:44
Sample ID      : I405235064 Sample quantity   : 2.91000E+00 GRAM
Detector name   : GAM05 Detector geometry:  I129
Elapsed live time: 0 01:30:00.00 Elapsed real time: 0 01:30:00.52 0.0%
Energy tolerance: 1.00000 keV Analyst Initials : MJH1
Abundance limit : 75.00000 Sensitivity   : 3.00000
Batch ID       : 1598663 Detector SN#   :
Matrix Spike ID : 1470-K LCS ID           : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	43.45	14	36	1.33	88.72	86	5	2.61E-03	69.4	
2	0	46.15*	1	47	0.90	94.13	91	7	1.70E-04	*****	
3	0	52.92	20	64	0.91	107.66	105	7	3.62E-03	71.4	
4	0	62.81*	0	63	0.99	127.41	125	6	1.62E-05	*****	
5	0	77.13*	40	30	1.62	156.03	153	7	7.39E-03	30.2	
6	0	92.74*	11	98	1.47	187.24	182	11	2.02E-03	204.7	
7	0	179.85	20	31	0.79	361.34	358	6	3.77E-03	49.3	
8	0	186.62	47	83	1.36	374.86	367	12	8.75E-03	41.4	
9	0	295.92*	16	40	1.28	593.31	587	13	3.05E-03	85.0	
10	0	351.79*	29	30	0.95	704.98	701	10	5.46E-03	42.6	
11	0	395.00	14	14	1.88	791.35	788	9	2.55E-03	55.6	
12	0	459.39	10	13	1.09	920.04	916	8	1.93E-03	68.4	
13	4	497.13	17	12	2.06	995.47	987	17	3.17E-03	47.4	5.13E-01
14	4	500.15	12	5	1.24	1001.50	987	17	2.21E-03	38.5	
15	0	543.86	15	8	1.79	1088.87	1085	8	2.78E-03	41.6	
16	0	584.48	9	20	0.61	1170.06	1164	11	1.71E-03	98.0	
17	2	608.99*	20	8	1.81	1219.03	1212	19	3.68E-03	43.9	5.68E-01
18	2	612.42	19	10	1.82	1225.90	1212	19	3.51E-03	41.8	
19	0	712.33	10	3	0.66	1425.58	1423	6	1.81E-03	45.5	
20	0	751.65	12	0	1.97	1504.17	1499	9	2.22E-03	28.9	
21	0	763.83	9	10	0.58	1528.50	1523	10	1.73E-03	71.2	
22	0	822.88	9	4	1.15	1646.53	1643	7	1.57E-03	50.1	
23	0	860.44	9	2	1.07	1721.62	1718	7	1.73E-03	40.0	
24	0	871.69	11	0	0.73	1744.09	1740	8	2.04E-03	30.2	
25	0	886.29	6	9	0.82	1773.28	1767	12	1.12E-03	107.4	
26	0	937.91	9	0	0.63	1876.44	1874	6	1.67E-03	33.3	
27	0	967.93	16	3	3.45	1936.46	1930	11	2.98E-03	32.1	
28	0	1200.60	7	2	1.03	2401.50	2398	7	1.20E-03	51.2	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235064.CNF;1
* Acquisition date   : 29-SEP-2016 06:19:44 Sensitivity      : 3.000
* Detector ID        : GAM05 Energy tolerance: 1.000
* Elapsed live time  : 0 01:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:30:00.52 Half life ratio  : *****
* Sample date        : 14-DEC-2015 13:25:00 Analyst initials: MJH1
* Sample ID          : I405235064 Sample Quantity : 2.9100E+00 GRAM
* Batch Number       : 1598663 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 6-SEP-2016 11:51:40 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM05_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-1.670E-01		6.042E+00	1.004E+01	NOT IDENT.
I-129	-4.873E-02		2.436E-01	3.776E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	43.45	14	36	1.33	88.72	86	5	2.61E-03	69.4	
2	0	46.15	74	47	0.90	94.13	91	7	1.37E-02	19.3	
3	0	52.92	20	64	0.91	107.66	105	7	3.62E-03	71.4	
4	0	62.81	50	63	0.99	127.41	125	6	9.26E-03	28.8	
5	0	77.13	54	30	1.62	156.03	153	7	9.99E-03	21.6	
6	0	92.74	88	98	1.47	187.24	182	11	1.64E-02	24.4	
7	0	179.85	20	31	0.79	361.34	358	6	3.77E-03	49.3	
8	0	186.62	47	83	1.36	374.86	367	12	8.75E-03	41.4	
9	0	295.92	19	40	1.28	593.31	587	13	3.53E-03	71.4	
10	0	351.79	42	30	0.95	704.98	701	10	7.78E-03	28.9	
11	0	395.00	14	14	1.88	791.35	788	9	2.55E-03	55.6	
12	0	459.39	10	13	1.09	920.04	916	8	1.93E-03	68.4	
13	4	497.13	17	12	2.06	995.47	987	17	3.17E-03	47.4	5.13E-01
14	4	500.15	12	5	1.24	1001.50	987	17	2.21E-03	38.5	
15	0	510.64	97	61	2.11	1022.47	1015	16	1.80E-02	20.5	
16	0	543.86	15	8	1.79	1088.87	1085	8	2.78E-03	41.6	
17	0	584.48	9	20	0.61	1170.06	1164	11	1.71E-03	98.0	
18	2	608.99	27	8	1.81	1219.03	1212	19	4.93E-03	30.9	5.68E-01
19	2	612.42	19	10	1.82	1225.90	1212	19	3.51E-03	41.8	
20	0	712.33	10	3	0.66	1425.58	1423	6	1.81E-03	45.5	
21	0	751.65	12	0	1.97	1504.17	1499	9	2.22E-03	28.9	
22	0	763.83	9	10	0.58	1528.50	1523	10	1.73E-03	71.2	
23	0	822.88	9	4	1.15	1646.53	1643	7	1.57E-03	50.1	
24	0	860.44	9	2	1.07	1721.62	1718	7	1.73E-03	40.0	
25	0	871.69	11	0	0.73	1744.09	1740	8	2.04E-03	30.2	
26	0	886.29	6	9	0.82	1773.28	1767	12	1.12E-03	107.4	
27	0	937.91	9	0	0.63	1876.44	1874	6	1.67E-03	33.3	
28	0	967.93	16	3	3.45	1936.46	1930	11	2.98E-03	32.1	
29	0	1200.60	7	2	1.03	2401.50	2398	7	1.20E-03	51.2	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235064

Page : 2
Acquisition date : 29-SEP-2016 06:19:44

Total number of lines in spectrum	28	
Number of unidentified lines	28	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	43.45	14	36	1.33	88.72	86	5	2.61E-03	****	1.33E+01	
0	46.15	1	47	0.90	94.13	91	7	1.70E-04	****	7.56E+00	
0	52.92	20	64	0.91	107.66	105	7	3.62E-03	****	1.27E+00	
0	77.13	40	30	1.62	156.03	153	7	7.39E-03	60.5	1.95E-04	
0	92.74	11	98	1.47	187.24	182	11	2.02E-03	****	2.50E-07	
0	179.85	20	31	0.79	361.34	358	6	3.77E-03	98.5	2.78E-25	
0	186.62	47	83	1.36	374.86	367	12	8.75E-03	82.7	9.89E-27	
0	295.92	16	40	1.28	593.31	587	13	3.05E-03	****	0.00E+00	
0	351.79	29	30	0.95	704.98	701	10	5.46E-03	85.2	0.00E+00	
0	395.00	14	14	1.88	791.35	788	9	2.55E-03	****	0.00E+00	
0	459.39	10	13	1.09	920.04	916	8	1.93E-03	****	0.00E+00	
4	497.13	17	12	2.06	995.47	987	17	3.17E-03	94.8	0.00E+00	
4	500.15	12	5	1.24	1001.50	987	17	2.21E-03	77.1	0.00E+00	
0	543.86	15	8	1.79	1088.87	1085	8	2.78E-03	83.3	0.00E+00	
0	584.48	9	20	0.61	1170.06	1164	11	1.71E-03	****	0.00E+00	
2	608.99	20	8	1.81	1219.03	1212	19	3.68E-03	87.8	0.00E+00	
2	612.42	19	10	1.82	1225.90	1212	19	3.51E-03	83.7	0.00E+00	
0	712.33	10	3	0.66	1425.58	1423	6	1.81E-03	91.0	0.00E+00	
0	751.65	12	0	1.97	1504.17	1499	9	2.22E-03	57.7	0.00E+00	
0	763.83	9	10	0.58	1528.50	1523	10	1.73E-03	****	0.00E+00	
0	822.88	9	4	1.15	1646.53	1643	7	1.57E-03	****	0.00E+00	
0	860.44	9	2	1.07	1721.62	1718	7	1.73E-03	80.1	0.00E+00	
0	871.69	11	0	0.73	1744.09	1740	8	2.04E-03	60.3	0.00E+00	
0	886.29	6	9	0.82	1773.28	1767	12	1.12E-03	****	0.00E+00	
0	937.91	9	0	0.63	1876.44	1874	6	1.67E-03	66.7	0.00E+00	
0	967.93	16	3	3.45	1936.46	1930	11	2.98E-03	64.1	0.00E+00	
0	1200.60	7	2	1.03	2401.50	2398	7	1.20E-03	****	0.00E+00	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235064.CNF;1
* Acquisition date   : 29-SEP-2016 06:19:44 Sensitivity      : 3.000
* Detector ID        : GAM05 Energy tolerance: 1.000
* Elapsed live time  : 0 01:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:30:00.52 Half life ratio  : *****
* Sample date        : 14-DEC-2015 13:25:00 Nuclide Library : IODINE
* Sample ID          : I405235064 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 2.9100E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 6-SEP-2016 11:51:40 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM05_I129.CNF;15
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	4.587E+00	NOT IDENT.
I-129	1.715E-01	NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235064.CNF;1
* Acquisition date   : 29-SEP-2016 06:19:44 Sensitivity      : 3.000
* Detector ID        : GAM05 Energy tolerance: 1.000
* Elapsed live time  : 0 01:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:30:00.52 Half life ratio  : *****
* Sample date        : 14-DEC-2015 13:25:00 Nuclide Library : IODINE
* Sample ID          : I405235064 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 2.9100E+00 GRAM
*                    : Quantity Err(%) : 3.4364E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                    : Standard Weight  : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 6-SEP-2016 11:51:40 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM05_I129.CNF;15
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
I-125        -1.670E-01      6.042E+00      6.042E+00 NOT IDENT.
I-129        -4.873E-02      2.437E-01      2.447E-01 NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	38.4562				
29.62	30.2741				
27.34	31.9338				
29.62	27.9341				
35.49	40.0489				
39.58	22.6542				

VAX/VMS Nuclide Identification Report Generated 29-SEP-2016 06:50:38.27

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235065.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY1.CNF;415
Background date   : 25-SEP-2016 12:22:54
Sample date       : 14-DEC-2015 13:56:00 Acquisition date : 29-SEP-2016 06:20:10
Sample ID         : I405235065 Sample quantity      : 4.23000E+00 GRAM
Detector name     : XRAY1 Detector geometry       : I129
Elapsed live time : 0 00:30:00.00 Elapsed real time: 0 00:30:00.13 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials   : MJH1
Abundance limit   : 75.00000 Sensitivity      : 3.00000
Batch ID          : 1598663 Detector SN#     :
Matrix Spike ID   : 1470-K LCS ID                 : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found


```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235065.CNF;1
* Acquisition date   : 29-SEP-2016 06:20:10 Sensitivity      : 3.000
* Detector ID       : XRAY1 Energy tolerance: 1.000
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:30:00.13 Half life ratio : *****
* Sample date       : 14-DEC-2015 13:56:00 Analyst initials: MJH1
* Sample ID         : I405235065 Sample Quantity : 4.2300E+00 GRAM
* Batch Number      : 1598663 Carrier Weight : 0.00000
* Recovery          : 1.00000 Standard Weight : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	---------------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-1.856E+00	2.642E+00	4.009E+00	NOT IDENT.
I-129	-5.535E-02	2.074E-01	4.169E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235065

Page : 2
Acquisition date : 29-SEP-2016 06:20:10

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235065

Page : 3
Acquisition date : 29-SEP-2016 06:20:10

None

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235065.CNF;1 *
* Acquisition date : 29-SEP-2016 06:20:10 Sensitivity : 3.000 *
* Detector ID : XRAY1 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.13 Half life ratio : ***** *
* Sample date : 14-DEC-2015 13:56:00 Nuclide Library : IODINE *
* Sample ID : I405235065 Analyst initials: MJH1 *
* Batch Number : 1598663 Sample Quantity : 4.2300E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 1.410E+00 NOT IDENT.
I-129 1.699E-01 NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235065.CNF;1 *
 * Acquisition date : 29-SEP-2016 06:20:10 Sensitivity : 3.000 *
 * Detector ID : XRAY1 Energy tolerance: 1.000 *
 * Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 00:30:00.13 Half life ratio : ***** *
 * Sample date : 14-DEC-2015 13:56:00 Nuclide Library : IODINE *
 * Sample ID : I405235065 Analyst initials: MJH1 *
 * Batch Number : 1598663 Sample Quantity : 4.2300E+00 GRAM *
 * Quantity Err(%) : 2.3641E-03 % *
 * Recovery : 1.00000 Carrier Weight : 0.00000 *
 * Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
---------	-------------------------	---------------------------	---------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
I-125	-1.856E+00	2.662E+00	2.791E+00	NOT IDENT.
I-129	-5.535E-02	2.075E-01	2.089E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	6.1327				
29.62	8.4818				
27.34	2.5969				
29.62	1.7970				
35.49	1.8430				
39.58	0.9690				

VAX/VMS Nuclide Identification Report Generated 29-SEP-2016 07:01:07.53

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235066.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY2.CNF;379
Background date    : 25-SEP-2016 12:22:59
Sample date        : 14-DEC-2015 14:00:00 Acquisition date : 29-SEP-2016 06:30:34
Sample ID          : I405235066 Sample quantity : 3.35000E+00 GRAM
Detector name      : XRAY2 Detector geometry: I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.10 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials : MJH1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1598663 Detector SN# :
Matrix Spike ID   : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	16.53*	5	4	0.64	81.63	77	8	2.93E-03	96.8	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235066.CNF;1
* Acquisition date   : 29-SEP-2016 06:30:34 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.10 Half life ratio  : *****
* Sample date        : 14-DEC-2015 14:00:00 Analyst initials: MJH1
* Sample ID          : I405235066 Sample Quantity : 3.3500E+00 GRAM
* Batch Number       : 1598663 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-2.233E+00		1.016E+01	1.939E+01	NOT IDENT.
I-129	1.204E-02		2.922E-01	6.225E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	16.53	12	4	0.64	81.63	77	8	6.87E-03	39.6	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235066

Page : 2
Acquisition date : 29-SEP-2016 06:30:34

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235066

Page : 3
Acquisition date : 29-SEP-2016 06:30:34

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	16.53	5	4	0.64	81.63	77	8	2.93E-03	****	4.60E-04	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235066.CNF;1 *
* Acquisition date : 29-SEP-2016 06:30:34 Sensitivity : 3.000 *
* Detector ID : XRAY2 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.10 Half life ratio : ***** *
* Sample date : 14-DEC-2015 14:00:00 Nuclide Library : IODINE *
* Sample ID : I405235066 Analyst initials: MJH1 *
* Batch Number : 1598663 Sample Quantity : 3.3500E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 27-JUL-2016 12:15:07 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 7.918E+00 NOT IDENT.
I-129 2.445E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235066.CNF;1
* Acquisition date   : 29-SEP-2016 06:30:34 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.10 Half life ratio  : *****
* Sample date        : 14-DEC-2015 14:00:00 Nuclide Library : IODINE
* Sample ID          : I405235066 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity : 3.3500E+00 GRAM
*                   : Quantity Err(%) : 2.9851E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        -2.233E+00      1.017E+01      1.021E+01  NOT IDENT.
I-129        1.204E-02      2.922E-01      2.922E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	8.4152				
29.62	4.2814				
27.34	2.1618				
29.62	3.3023				
35.49	2.2293				
39.58	3.4302				

VAX/VMS Nuclide Identification Report Generated 29-SEP-2016 07:05:10.87

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235067.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY4.CNF;433
Background date    : 25-SEP-2016 12:23:10
Sample date        : 11-DEC-2015 11:30:00 Acquisition date : 29-SEP-2016 06:34:44
Sample ID          : I405235067 Sample quantity      : 3.40000E+00 GRAM
Detector name      : XRAY4 Detector geometry       : I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.11 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials   : MJH1
Abundance limit   : 75.00000 Sensitivity      : 3.00000
Batch ID          : 1598663 Detector SN#      :
Matrix Spike ID   : 1470-K LCS ID                  : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	12.86*	3	2	0.46	63.72	60	7	1.61E-03	146.8	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235067.CNF;1
* Acquisition date   : 29-SEP-2016 06:34:44 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.11 Half life ratio  : *****
* Sample date        : 11-DEC-2015 11:30:00 Analyst initials: MJH1
* Sample ID          : I405235067 Sample Quantity : 3.4000E+00 GRAM
* Batch Number       : 1598663 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	---------------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-2.162E+00	3.999E+00	7.051E+00	NOT IDENT.
I-129	-1.192E-02	2.266E-01	5.084E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	12.86	10	2	0.46	63.72	60	7	5.72E-03	37.7	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235067

Page : 2
Acquisition date : 29-SEP-2016 06:34:44

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235067

Page : 3
Acquisition date : 29-SEP-2016 06:34:44

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	12.86	3	2	0.46	63.72	60	7	1.61E-03	****	2.14E-01	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235067.CNF;1
* Acquisition date   : 29-SEP-2016 06:34:44 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.11 Half life ratio  : *****
* Sample date        : 11-DEC-2015 11:30:00 Nuclide Library : IODINE
* Sample ID          : I405235067 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 3.4000E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	2.229E+00	NOT IDENT.
I-129	1.801E-01	NOT IDENT.


```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235067.CNF;1
* Acquisition date   : 29-SEP-2016 06:34:44 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.11 Half life ratio  : *****
* Sample date        : 11-DEC-2015 11:30:00 Nuclide Library : IODINE
* Sample ID          : I405235067 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 3.4000E+00 GRAM
*                   : Quantity Err(%) : 2.9412E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity          Act Error          TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
              Activity          K.L Act error      TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)
I-125        -2.162E+00          4.017E+00          4.134E+00  NOT IDENT.
I-129        -1.192E-02          2.266E-01          2.267E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	3.2573				
29.62	2.2178				
27.34	3.3663				
29.62	1.1470				
35.49	1.1645				
39.58	2.4010				

VAX/VMS Nuclide Identification Report Generated 29-SEP-2016 07:15:53.35

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235068.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY6.CNF;215
Background date    : 25-SEP-2016 12:23:20
Sample date        : 11-DEC-2015 10:27:00 Acquisition date : 29-SEP-2016 06:45:27
Sample ID          : I405235068 Sample quantity      : 2.72000E+00 GRAM
Detector name      : XRAY6 Detector geometry       : I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.05 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials    : MJH1
Abundance limit   : 75.00000 Sensitivity      : 3.00000
Batch ID          : 1598663 Detector SN#      :
Matrix Spike ID   : 1470-K LCS ID                  : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	77.18*	9	4	0.43	385.35	381	8	4.79E-03	54.7	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235068.CNF;1
* Acquisition date   : 29-SEP-2016 06:45:27 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.05 Half life ratio  : *****
* Sample date        : 11-DEC-2015 10:27:00 Analyst initials: MJH1
* Sample ID          : I405235068 Sample Quantity : 2.7200E+00 GRAM
* Batch Number       : 1598663 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-2.469E+00		4.839E+00	4.726E+00	NOT IDENT.
I-129	3.932E-02		1.251E-01	5.773E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	77.18	10	4	0.43	385.35	381	8	5.79E-03	45.0	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235068

Page : 2
Acquisition date : 29-SEP-2016 06:45:27

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235068

Page : 3
Acquisition date : 29-SEP-2016 06:45:27

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	77.18	9	4	0.43	385.35	381	8	4.79E-03	****	1.22E+00	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235068.CNF;1 *
* Acquisition date : 29-SEP-2016 06:45:27 Sensitivity : 3.000 *
* Detector ID : XRAY6 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.05 Half life ratio : ***** *
* Sample date : 11-DEC-2015 10:27:00 Nuclide Library : IODINE *
* Sample ID : I405235068 Analyst initials: MJH1 *
* Batch Number : 1598663 Sample Quantity : 2.7200E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 26-JAN-2016 10:07:09 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 0.000E+00 NOT IDENT.
I-129 1.484E-01 NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235068.CNF;1
* Acquisition date   : 29-SEP-2016 06:45:27 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.05 Half life ratio  : *****
* Sample date        : 11-DEC-2015 10:27:00 Nuclide Library : IODINE
* Sample ID          : I405235068 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 2.7200E+00 GRAM
*                   : Quantity Err(%) : 3.6765E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
```

CALIBRATION INFORMATION

```
*
* Eff. Cal. date    : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
---------	-------------------------	---------------------------	---------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
I-125	-2.469E+00	4.844E+00	4.970E+00	NOT IDENT.
I-129	3.932E-02	1.251E-01	1.264E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	1.4157				
29.62	0.0000				
27.34	2.9842				
29.62	0.7722				
35.49	0.0000				
39.58	2.4852				

VAX/VMS Nuclide Identification Report Generated 29-SEP-2016 07:17:14.24

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235069.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY5.CNF;58
Background date    : 25-SEP-2016 12:23:15
Sample date        : 16-DEC-2015 12:45:00 Acquisition date : 29-SEP-2016 06:46:52
Sample ID          : I405235069 Sample quantity      : 3.13000E+00 GRAM
Detector name      : XRAY5 Detector geometry      : I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.03 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials   : MJH1
Abundance limit   : 75.00000 Sensitivity     : 3.00000
Batch ID          : 1598663 Detector SN#     :
Matrix Spike ID   : 1470-K LCS ID                 : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235069.CNF;1
* Acquisition date   : 29-SEP-2016 06:46:52 Sensitivity      : 3.000
* Detector ID       : XRAY5 Energy tolerance: 1.000
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:30:00.03 Half life ratio : *****
* Sample date       : 16-DEC-2015 12:45:00 Analyst initials: MJH1
* Sample ID         : I405235069 Sample Quantity : 3.1300E+00 GRAM
* Batch Number      : 1598663 Carrier Weight : 0.00000
* Recovery          : 1.00000 Standard Weight : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	2.889E+00		4.155E+00	1.407E+01	NOT IDENT.
I-129	-5.419E-02		3.855E-01	8.921E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235069

Page : 2
Acquisition date : 29-SEP-2016 06:46:52

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235069

Page : 3
Acquisition date : 29-SEP-2016 06:46:52

None

Flags: "T" = Tentatively associated

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235069.CNF;1
* Acquisition date   : 29-SEP-2016 06:46:52 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.03 Half life ratio  : *****
* Sample date        : 16-DEC-2015 12:45:00 Nuclide Library : IODINE
* Sample ID          : I405235069 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 3.1300E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   Standard Weight  : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	4.932E+00	NOT IDENT.
I-129	3.161E-01	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235069.CNF;1
* Acquisition date   : 29-SEP-2016 06:46:52 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.03 Half life ratio  : *****
* Sample date        : 16-DEC-2015 12:45:00 Nuclide Library : IODINE
* Sample ID          : I405235069 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 3.1300E+00 GRAM
*                   : Quantity Err(%) : 3.1949E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        2.889E+00      4.186E+00      4.384E+00 NOT IDENT.
I-129        -5.419E-02      3.855E-01      3.863E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.0000				
29.62	2.5641				
27.34	2.6352				
29.62	0.0000				
35.49	0.0000				
39.58	2.0378				

VAX/VMS Nuclide Identification Report Generated 29-SEP-2016 07:23:38.12

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                 *
*                               Charleston, SC 29407                            *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235070.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY1.CNF;415
Background date    : 25-SEP-2016 12:22:54
Sample date        : 11-DEC-2015 10:10:00 Acquisition date : 29-SEP-2016 06:53:16
Sample ID          : I405235070 Sample quantity : 3.26000E+00 GRAM
Detector name      : XRAY1 Detector geometry: I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.13 0.0%
Energy tolerance   : 1.00000 keV Analyst Initials : MJH1
Abundance limit    : 75.00000 Sensitivity : 3.00000
Batch ID           : 1598663 Detector SN# :
Matrix Spike ID    : 1470-K LCS ID : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235070.CNF;1
* Acquisition date   : 29-SEP-2016 06:53:16 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.13 Half life ratio  : *****
* Sample date        : 11-DEC-2015 10:10:00 Analyst initials: MJH1
* Sample ID          : I405235070 Sample Quantity : 3.2600E+00 GRAM
* Batch Number       : 1598663 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-1.469E+00		4.321E+00	7.672E+00	NOT IDENT.
I-129	-1.179E-01		1.811E-01	3.383E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235070

Page : 2
Acquisition date : 29-SEP-2016 06:53:16

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235070

Page : 3
Acquisition date : 29-SEP-2016 06:53:16

None

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235070.CNF;1 *
* Acquisition date : 29-SEP-2016 06:53:16 Sensitivity : 3.000 *
* Detector ID : XRAY1 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.13 Half life ratio : ***** *
* Sample date : 11-DEC-2015 10:10:00 Nuclide Library : IODINE *
* Sample ID : I405235070 Analyst initials: MJH1 *
* Batch Number : 1598663 Sample Quantity : 3.2600E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 3.037E+00 NOT IDENT.
I-129 1.190E-01 NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235070.CNF;1
* Acquisition date   : 29-SEP-2016 06:53:16 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.13 Half life ratio  : *****
* Sample date        : 11-DEC-2015 10:10:00 Nuclide Library : IODINE
* Sample ID          : I405235070 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 3.2600E+00 GRAM
*                   : Quantity Err(%) : 3.0675E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 9-JUN-2016 11:39:23 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )    (1.96-sigma)  (1.96-sigma)
```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line Activity      K.L Act error      TPU
             (pCi/GRAM )    (1.96-sigma)  (1.96-sigma)
I-125        -1.469E+00      4.328E+00      4.379E+00  NOT IDENT.
I-129        -1.179E-01      1.815E-01      1.891E-01  NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	7.3593				
29.62	5.0891				
27.34	0.0000				
29.62	0.8985				
35.49	0.9215				
39.58	0.9690				

VAX/VMS Nuclide Identification Report Generated 29-SEP-2016 07:34:51.75

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235071.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY2.CNF;379
Background date    : 25-SEP-2016 12:22:59
Sample date        : 11-DEC-2015 10:25:00 Acquisition date : 29-SEP-2016 07:04:23
Sample ID          : I405235071 Sample quantity      : 2.65000E+00 GRAM
Detector name      : XRAY2 Detector geometry       : I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.10 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials    : MJH1
Abundance limit   : 75.00000 Sensitivity      : 3.00000
Batch ID          : 1598663 Detector SN#      :
Matrix Spike ID   : 1470-K LCS ID                  : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	28.59	7	0	0.38	142.00	137	9	3.89E-03	37.8	
2	0	165.17	6	3	1.74	825.94	818	12	3.40E-03	69.4	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235071.CNF;1
* Acquisition date   : 29-SEP-2016 07:04:23 Sensitivity      : 3.000
* Detector ID       : XRAY2 Energy tolerance: 1.000
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:30:00.10 Half life ratio : *****
* Sample date       : 11-DEC-2015 10:25:00 Analyst initials: MJH1
* Sample ID         : I405235071 Sample Quantity : 2.6500E+00 GRAM
* Batch Number      : 1598663 Carrier Weight : 0.00000
* Recovery          : 1.00000 Standard Weight : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-9.957E-01		6.309E+00	1.268E+01	NOT IDENT.
I-129	2.826E-01		2.604E-01	7.869E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	28.59	7	0	0.38	142.00	137	9	3.89E-03	37.8	
2	0	165.17	6	3	1.74	825.94	818	12	3.40E-03	69.4	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235071

Page : 2
Acquisition date : 29-SEP-2016 07:04:23

Total number of lines in spectrum	2	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235071

Page : 3
Acquisition date : 29-SEP-2016 07:04:23

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	28.59	7	0	0.38	142.00	137	9	3.89E-03	75.6	1.27E+01	
0	165.17	6	3	1.74	825.94	818	12	3.40E-03	****	2.85E-24	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235071.CNF;1 *
* Acquisition date : 29-SEP-2016 07:04:23 Sensitivity : 3.000 *
* Detector ID : XRAY2 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.10 Half life ratio : ***** *
* Sample date : 11-DEC-2015 10:25:00 Nuclide Library : IODINE *
* Sample ID : I405235071 Analyst initials: MJH1 *
* Batch Number : 1598663 Sample Quantity : 2.6500E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 27-JUL-2016 12:15:07 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide Lc
(pCi/GRAM)

---- Non-Identified Nuclides ----

Nuclide Lc
(pCi/GRAM)
I-125 4.008E+00 NOT IDENT.
I-129 3.090E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235071.CNF;1
* Acquisition date   : 29-SEP-2016 07:04:23 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.10 Half life ratio  : *****
* Sample date        : 11-DEC-2015 10:25:00 Nuclide Library : IODINE
* Sample ID          : I405235071 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 2.6500E+00 GRAM
*                   : Quantity Err(%) : 3.7736E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity          Act Error          TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
              Activity          K.L Act error      TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)
I-125        -9.957E-01          6.311E+00          6.327E+00  NOT IDENT.
I-129        2.826E-01          2.619E-01          2.912E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	1.5779				
29.62	0.0000				
27.34	6.4853				
29.62	3.3023				
35.49	2.2293				
39.58	4.5736				

VAX/VMS Nuclide Identification Report Generated 29-SEP-2016 07:41:40.11

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235072.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY4.CNF;433
Background date    : 25-SEP-2016 12:23:10
Sample date        : 15-DEC-2015 13:35:00 Acquisition date : 29-SEP-2016 07:11:09
Sample ID          : I405235072 Sample quantity      : 2.76000E+00 GRAM
Detector name      : XRAY4 Detector geometry       : I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.11 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials    : MJH1
Abundance limit   : 75.00000 Sensitivity      : 3.00000
Batch ID          : 1598663 Detector SN#      :
Matrix Spike ID   : 1470-K LCS ID                  : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.31*	4	0	0.23	316.50	312	7	2.07E-03	68.2	
2	0	73.99	6	0	0.57	370.00	365	8	3.33E-03	40.8	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235072.CNF;1
* Acquisition date   : 29-SEP-2016 07:11:09 Sensitivity      : 3.000
* Detector ID       : XRAY4 Energy tolerance: 1.000
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:30:00.11 Half life ratio : *****
* Sample date       : 15-DEC-2015 13:35:00 Analyst initials: MJH1
* Sample ID         : I405235072 Sample Quantity : 2.7600E+00 GRAM
* Batch Number      : 1598663 Carrier Weight : 0.00000
* Recovery          : 1.00000 Standard Weight : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	---------------------	--------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)	
I-125	1.903E+00		4.387E+00		1.177E+01	NOT IDENT.
I-129	5.145E-03		3.520E-01		7.613E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	13.83	7	4	0.57	68.55	65	6	3.69E-03	63.5	
2	0	63.31	6	0	0.23	316.50	312	7	3.33E-03	40.8	
3	0	73.99	6	0	0.57	370.00	365	8	3.33E-03	40.8	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235072

Page : 2
Acquisition date : 29-SEP-2016 07:11:09

Total number of lines in spectrum	2	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235072

Page : 3
Acquisition date : 29-SEP-2016 07:11:09

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	63.31	4	0	0.23	316.50	312	7	2.07E-03	****	5.17E+00	
0	73.99	6	0	0.57	370.00	365	8	3.33E-03	81.6	2.37E+00	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235072.CNF;1 *
* Acquisition date : 29-SEP-2016 07:11:09 Sensitivity : 3.000 *
* Detector ID : XRAY4 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.11 Half life ratio : ***** *
* Sample date : 15-DEC-2015 13:35:00 Nuclide Library : IODINE *
* Sample ID : I405235072 Analyst initials: MJH1 *
* Batch Number : 1598663 Sample Quantity : 2.7600E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 17-JUN-2016 08:18:14 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 4.363E+00 NOT IDENT.
I-129 2.894E-01 NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235072.CNF;1
* Acquisition date   : 29-SEP-2016 07:11:09 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.11 Half life ratio  : *****
* Sample date        : 15-DEC-2015 13:35:00 Nuclide Library : IODINE
* Sample ID          : I405235072 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 2.7600E+00 GRAM
*                    : Quantity Err(%) : 3.6232E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                    : Standard Weight  : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
---------	-------------------------	---------------------------	---------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
I-125	1.903E+00	4.400E+00	4.483E+00	NOT IDENT.
I-129	5.145E-03	3.520E-01	3.520E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	1.0858				
29.62	3.3266				
27.34	2.2442				
29.62	0.0000				
35.49	1.1645				
39.58	6.0024				

VAX/VMS Nuclide Identification Report Generated 29-SEP-2016 07:48:50.19

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                 *
*                               Charleston, SC 29407                            *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235073.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY5.CNF;58
Background date    : 25-SEP-2016 12:23:15
Sample date        : 11-DEC-2015 11:35:00 Acquisition date : 29-SEP-2016 07:18:28
Sample ID          : I405235073 Sample quantity : 3.00000E+00 GRAM
Detector name      : XRAY5 Detector geometry: I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.03 0.0%
Energy tolerance   : 1.00000 keV Analyst Initials : MJH1
Abundance limit    : 75.00000 Sensitivity : 3.00000
Batch ID           : 1598663 Detector SN# :
Matrix Spike ID    : 1470-K LCS ID : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found


```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235073.CNF;1
* Acquisition date   : 29-SEP-2016 07:18:28 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.03 Half life ratio  : *****
* Sample date        : 11-DEC-2015 11:35:00 Analyst initials: MJH1
* Sample ID          : I405235073 Sample Quantity : 3.0000E+00 GRAM
* Batch Number       : 1598663 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	---------------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	1.722E+00	3.375E+00	1.267E+01	NOT IDENT.
I-129	-1.148E-01	3.733E-01	8.268E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235073

Page : 2
Acquisition date : 29-SEP-2016 07:18:28

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235073

Page : 3
Acquisition date : 29-SEP-2016 07:18:28

None

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235073.CNF;1 *
* Acquisition date : 29-SEP-2016 07:18:28 Sensitivity : 3.000 *
* Detector ID : XRAY5 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.03 Half life ratio : ***** *
* Sample date : 11-DEC-2015 11:35:00 Nuclide Library : IODINE *
* Sample ID : I405235073 Analyst initials: MJH1 *
* Batch Number : 1598663 Sample Quantity : 3.0000E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 30-AUG-2016 11:41:11 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 4.006E+00 NOT IDENT.
I-129 2.777E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235073.CNF;1
* Acquisition date   : 29-SEP-2016 07:18:28 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.03 Half life ratio  : *****
* Sample date        : 11-DEC-2015 11:35:00 Nuclide Library : IODINE
* Sample ID          : I405235073 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 3.0000E+00 GRAM
*                   : Quantity Err(%) : 3.3333E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        1.722E+00      3.389E+00      3.477E+00  NOT IDENT.
I-129        -1.148E-01      3.734E-01      3.770E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.0000				
29.62	2.5641				
27.34	3.5136				
29.62	0.0000				
35.49	0.9543				
39.58	2.0378				

VAX/VMS Nuclide Identification Report Generated 29-SEP-2016 07:49:16.91

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235074.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY6.CNF;215
Background date    : 25-SEP-2016 12:23:20
Sample date        : 15-DEC-2015 14:10:00 Acquisition date : 29-SEP-2016 07:18:54
Sample ID          : I405235074 Sample quantity      : 3.26000E+00 GRAM
Detector name      : XRAY6 Detector geometry       : I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.04 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials    : MJH1
Abundance limit   : 75.00000 Sensitivity      : 3.00000
Batch ID          : 1598663 Detector SN#      :
Matrix Spike ID   : 1470-K LCS ID                  : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235074.CNF;1
* Acquisition date   : 29-SEP-2016 07:18:54 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.04 Half life ratio  : *****
* Sample date        : 15-DEC-2015 14:10:00 Analyst initials: MJH1
* Sample ID          : I405235074 Sample Quantity : 3.2600E+00 GRAM
* Batch Number       : 1598663 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	---------------------	--------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)	
I-125	6.738E-01		5.371E+00		1.265E+01	NOT IDENT.
I-129	-7.909E-02		2.779E-01		5.317E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235074

Page : 2
Acquisition date : 29-SEP-2016 07:18:54

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235074

Page : 3
Acquisition date : 29-SEP-2016 07:18:54

None

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235074.CNF;1 *
* Acquisition date : 29-SEP-2016 07:18:54 Sensitivity : 3.000 *
* Detector ID : XRAY6 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.04 Half life ratio : ***** *
* Sample date : 15-DEC-2015 14:10:00 Nuclide Library : IODINE *
* Sample ID : I405235074 Analyst initials: MJH1 *
* Batch Number : 1598663 Sample Quantity : 3.2600E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 26-JAN-2016 10:07:09 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 4.448E+00 NOT IDENT.
I-129 1.489E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235074.CNF;1
* Acquisition date   : 29-SEP-2016 07:18:54 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.04 Half life ratio  : *****
* Sample date        : 15-DEC-2015 14:10:00 Nuclide Library : IODINE
* Sample ID          : I405235074 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 3.2600E+00 GRAM
*                   : Quantity Err(%) : 3.0675E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        6.738E-01      5.371E+00      5.380E+00 NOT IDENT.
I-129        -7.909E-02      2.780E-01      2.802E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	1.4157				
29.62	1.4643				
27.34	2.9842				
29.62	0.7722				
35.49	0.0000				
39.58	0.8284				

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235075.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY1.CNF;415
Background date    : 25-SEP-2016 12:22:54
Sample date        : 16-DEC-2015 09:31:00 Acquisition date : 29-SEP-2016 07:24:37
Sample ID          : I405235075 Sample quantity : 3.18000E+00 GRAM
Detector name      : XRAY1 Detector geometry: I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.12 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials : MJH1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1598663 Detector SN# :
Matrix Spike ID   : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	25.28	9	6	0.39	126.70	124	7	4.72E-03	56.7	
2	0	31.37	13	0	0.63	157.38	153	9	7.22E-03	27.7	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235075.CNF;1
* Acquisition date   : 29-SEP-2016 07:24:37 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.12 Half life ratio : *****
* Sample date        : 16-DEC-2015 09:31:00 Analyst initials: MJH1
* Sample ID          : I405235075 Sample Quantity : 3.1800E+00 GRAM
* Batch Number       : 1598663 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	---------------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	4.425E-01	4.259E+00	8.541E+00	FAIL ABUN
I-129	1.760E-01	2.402E-01	5.760E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	25.28	9	6	0.39	126.70	124	7	4.72E-03	56.7	
2	0	31.37	13	0	0.63	157.38	153	9	7.22E-03	27.7	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235075

Page : 2
Acquisition date : 29-SEP-2016 07:24:37

Total number of lines in spectrum	2	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	1	50.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235075

Page : 3
Acquisition date : 29-SEP-2016 07:24:37

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	25.28	9	6	0.39	126.70	124	7	4.72E-03	****	1.94E+01	
0	31.37	13	0	0.63	157.38	153	9	7.22E-03	55.5	2.26E+01	T

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235075.CNF;1 *
* Acquisition date : 29-SEP-2016 07:24:37 Sensitivity : 3.000 *
* Detector ID : XRAY1 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.12 Half life ratio : ***** *
* Sample date : 16-DEC-2015 09:31:00 Nuclide Library : IODINE *
* Sample ID : I405235075 Analyst initials: MJH1 *
* Batch Number : 1598663 Sample Quantity : 3.1800E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 3.498E+00 FAIL ABUN
I-129 2.367E-01 NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235075.CNF;1 *
 * Acquisition date : 29-SEP-2016 07:24:37 Sensitivity : 3.000 *
 * Detector ID : XRAY1 Energy tolerance: 1.000 *
 * Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 00:30:00.12 Half life ratio : ***** *
 * Sample date : 16-DEC-2015 09:31:00 Nuclide Library : IODINE *
 * Sample ID : I405235075 Analyst initials: MJH1 *
 * Batch Number : 1598663 Sample Quantity : 3.1800E+00 GRAM *
 * Quantity Err(%) : 3.1447E-03 % *
 * Recovery : 1.00000 Carrier Weight : 0.00000 *
 * Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
---------	-------------------------	---------------------------	---------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
I-125	4.425E-01	4.260E+00	4.265E+00	FAIL ABUN
I-129	1.760E-01	2.408E-01	2.536E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	6.1327				
29.62	2.5445				
27.34	3.4625				
29.62	4.4924				
35.49	5.5290				
39.58	0.9690				

VAX/VMS Nuclide Identification Report Generated 29-SEP-2016 09:01:54.25

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235076.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM05.CNF;476
Background date : 25-SEP-2016 12:20:17
Sample date     : 11-DEC-2015 14:19:00 Acquisition date : 29-SEP-2016 08:01:20
Sample ID      : I405235076 Sample quantity   : 2.77000E+00 GRAM
Detector name  : GAM05 Detector geometry   : I129
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.34 0.0%
Energy tolerance : 1.00000 keV Analyst Initials : MJH1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1598663 Detector SN#   :
Matrix Spike ID : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.43*	6	62	0.79	94.69	90	10	1.57E-03	298.0	
2	0	63.42*	11	82	1.00	128.64	125	11	2.93E-03	176.8	
3	0	92.32*	14	50	1.43	186.40	181	9	3.83E-03	112.6	
4	0	177.19	27	23	3.57	356.02	352	10	7.51E-03	38.1	
5	0	185.94*	4	39	1.11	373.51	368	10	1.05E-03	346.4	
6	0	242.72	9	29	0.60	486.99	482	8	2.36E-03	115.9	
7	0	351.42*	20	19	1.02	704.24	699	11	5.63E-03	50.7	
8	0	511.11*	16	26	2.21	1023.40	1017	17	4.32E-03	105.8	
9	0	609.20*	15	8	1.47	1219.45	1215	9	4.20E-03	47.6	
10	0	695.53	7	11	0.58	1392.00	1386	11	1.94E-03	99.2	
11	0	776.38	10	2	1.15	1553.60	1549	8	2.84E-03	39.2	
12	0	803.21*	1	4	1.59	1607.21	1602	8	3.65E-04	359.2	
13	0	998.33	9	0	0.58	1997.22	1993	8	2.50E-03	33.3	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235076.CNF;1
* Acquisition date   : 29-SEP-2016 08:01:20 Sensitivity      : 3.000
* Detector ID        : GAM05 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.34 Half life ratio  : *****
* Sample date        : 11-DEC-2015 14:19:00 Analyst initials: MJH1
* Sample ID          : I405235076 Sample Quantity : 2.7700E+00 GRAM
* Batch Number       : 1598663 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 6-SEP-2016 11:51:40 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM05_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-1.691E+00		8.090E+00	1.328E+01	NOT IDENT.
I-129	-1.005E-01		3.487E-01	5.543E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.43	54	62	0.79	94.69	90	10	1.51E-02	30.3	
2	0	63.42	44	82	1.00	128.64	125	11	1.22E-02	41.9	
3	0	92.32	66	50	1.43	186.40	181	9	1.82E-02	23.0	
4	0	177.19	27	23	3.57	356.02	352	10	7.51E-03	38.1	
5	0	185.94	26	39	1.11	373.51	368	10	7.23E-03	49.4	
6	0	242.72	9	29	0.60	486.99	482	8	2.36E-03	115.9	
7	0	351.42	29	19	1.02	704.24	699	11	7.95E-03	35.1	
8	0	511.11	100	26	2.21	1023.40	1017	17	2.77E-02	15.9	
9	0	609.20	20	8	1.47	1219.45	1215	9	5.46E-03	35.4	
10	0	695.53	7	11	0.58	1392.00	1386	11	1.94E-03	99.2	
11	0	776.38	10	2	1.15	1553.60	1549	8	2.84E-03	39.2	
12	0	803.21	7	4	1.59	1607.21	1602	8	1.94E-03	62.3	
13	0	998.33	9	0	0.58	1997.22	1993	8	2.50E-03	33.3	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235076

Page : 2
Acquisition date : 29-SEP-2016 08:01:20

Total number of lines in spectrum 13
Number of unidentified lines 13
Number of lines tentatively identified by NID 0 0.00%
**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	46.43	6	62	0.79	94.69	90	10	1.57E-03	****	7.09E+00	
0	63.42	11	82	1.00	128.64	125	11	2.93E-03	****	3.93E-02	
0	92.32	14	50	1.43	186.40	181	9	3.83E-03	****	3.01E-07	
0	177.19	27	23	3.57	356.02	352	10	7.51E-03	76.3	1.03E-24	
0	185.94	4	39	1.11	373.51	368	10	1.05E-03	****	1.38E-26	
0	242.72	9	29	0.60	486.99	482	8	2.36E-03	****	0.00E+00	
0	351.42	20	19	1.02	704.24	699	11	5.63E-03	****	0.00E+00	
0	511.11	16	26	2.21	1023.40	1017	17	4.32E-03	****	0.00E+00	
0	609.20	15	8	1.47	1219.45	1215	9	4.20E-03	95.3	0.00E+00	
0	695.53	7	11	0.58	1392.00	1386	11	1.94E-03	****	0.00E+00	
0	776.38	10	2	1.15	1553.60	1549	8	2.84E-03	78.4	0.00E+00	
0	803.21	1	4	1.59	1607.21	1602	8	3.65E-04	****	0.00E+00	
0	998.33	9	0	0.58	1997.22	1993	8	2.50E-03	66.7	0.00E+00	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235076.CNF;1 *
* Acquisition date : 29-SEP-2016 08:01:20 Sensitivity : 3.000 *
* Detector ID : GAM05 Energy tolerance: 1.000 *
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 01:00:00.34 Half life ratio : ***** *
* Sample date : 11-DEC-2015 14:19:00 Nuclide Library : IODINE *
* Sample ID : I405235076 Analyst initials: MJH1 *
* Batch Number : 1598663 Sample Quantity : 2.7700E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 6-SEP-2016 11:51:40 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM05_I129.CNF;15 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 5.935E+00 NOT IDENT.
I-129 2.499E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235076.CNF;1
* Acquisition date   : 29-SEP-2016 08:01:20 Sensitivity      : 3.000
* Detector ID        : GAM05 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.34 Half life ratio  : *****
* Sample date        : 11-DEC-2015 14:19:00 Nuclide Library : IODINE
* Sample ID          : I405235076 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 2.7700E+00 GRAM
*                   : Quantity Err(%) : 3.6101E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 6-SEP-2016 11:51:40 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM05_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        -1.691E+00      8.095E+00      8.131E+00 NOT IDENT.
I-129        -1.005E-01      3.489E-01      3.518E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	27.0618				
29.62	28.8325				
27.34	17.4184				
29.62	20.5830				
35.49	22.2494				
39.58	20.3887				

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235077.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY1.CNF;415
Background date    : 25-SEP-2016 12:22:54
Sample date        : 17-DEC-2015 13:30:00 Acquisition date : 29-SEP-2016 08:02:10
Sample ID          : I405235077 Sample quantity      : 2.86000E+00 GRAM
Detector name      : XRAY1 Detector geometry       : I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.15 0.0%
Energy tolerance   : 1.00000 keV Analyst Initials   : MJH1
Abundance limit    : 75.00000 Sensitivity      : 3.00000
Batch ID           : 1598663 Detector SN#      :
Matrix Spike ID    : 1470-K LCS ID                 : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	24.92	9	12	0.25	124.88	121	9	4.89E-03	81.4	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235077.CNF;1
* Acquisition date   : 29-SEP-2016 08:02:10 Sensitivity      : 3.000
* Detector ID       : XRAY1 Energy tolerance: 1.000
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:30:00.15 Half life ratio : 8.000
* Sample date       : 17-DEC-2015 13:30:00 Analyst initials: MJH1
* Sample ID         : I405235077 Sample Quantity : 2.8600E+00 GRAM
* Batch Number      : 1598663 Carrier Weight : 0.00000
* Recovery          : 1.00000 Standard Weight : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	---------------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-8.546E-02	4.302E+00	9.029E+00	NOT IDENT.
I-129	8.824E-02	3.016E-01	6.633E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	24.92	9	12	0.25	124.88	121	9	4.89E-03	81.4	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235077

Page : 2
Acquisition date : 29-SEP-2016 08:02:10

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235077

Page : 3
Acquisition date : 29-SEP-2016 08:02:10

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	24.92	9	12	0.25	124.88	121	9	4.89E-03	81.4	1.91E+01	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235077.CNF;1 *
* Acquisition date : 29-SEP-2016 08:02:10 Sensitivity : 3.000 *
* Detector ID : XRAY1 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.15 Half life ratio : 8.000 *
* Sample date : 17-DEC-2015 13:30:00 Nuclide Library : IODINE *
* Sample ID : I405235077 Analyst initials: MJH1 *
* Batch Number : 1598663 Sample Quantity : 2.8600E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 3.666E+00 NOT IDENT.
I-129 2.746E-01 NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235077.CNF;1
* Acquisition date   : 29-SEP-2016 08:02:10 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.15 Half life ratio  : 8.000
* Sample date        : 17-DEC-2015 13:30:00 Nuclide Library : IODINE
* Sample ID          : I405235077 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 2.8600E+00 GRAM
*                   : Quantity Err(%) : 3.4965E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 9-JUN-2016 11:39:23 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
              Activity      K.L Act error      TPU
              (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        -8.546E-02      4.302E+00      4.302E+00 NOT IDENT.
I-129        8.824E-02      3.017E-01      3.043E-01 NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	6.4394				
29.62	5.7252				
27.34	0.9738				
29.62	2.0216				
35.49	4.1467				
39.58	4.3604				

VAX/VMS Nuclide Identification Report Generated 29-SEP-2016 08:33:20.95

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235078.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY2.CNF;379
Background date    : 25-SEP-2016 12:22:59
Sample date        : 17-DEC-2015 12:40:00 Acquisition date : 29-SEP-2016 08:02:53
Sample ID          : I405235078 Sample quantity : 3.25000E+00 GRAM
Detector name      : XRAY2 Detector geometry: I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.11 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials : MJH1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1598663 Detector SN# :
Matrix Spike ID   : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	13.37*	6	0	0.25	65.80	63	7	3.09E-03	60.6	
2	0	63.14*	5	0	0.60	315.00	311	7	2.99E-03	55.5	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****

```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235078.CNF;1
* Acquisition date   : 29-SEP-2016 08:02:53 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.11 Half life ratio : *****
* Sample date        : 17-DEC-2015 12:40:00 Analyst initials: MJH1
* Sample ID          : I405235078 Sample Quantity : 3.2500E+00 GRAM
* Batch Number       : 1598663 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****

```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	1.105E+00		6.942E+00	1.572E+01	NOT IDENT.
I-129	-9.825E-02		3.019E-01	5.760E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	13.37	10	0	0.25	65.80	63	7	5.56E-03	31.6	
2	0	63.14	8	0	0.60	315.00	311	7	4.44E-03	35.4	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235078

Page : 2
Acquisition date : 29-SEP-2016 08:02:53

Total number of lines in spectrum 2
Number of unidentified lines 2
Number of lines tentatively identified by NID 0 0.00%
**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235078

Page : 3
Acquisition date : 29-SEP-2016 08:02:53

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	13.37	6	0	0.25	65.80	63	7	3.09E-03	****	2.01E-07	
0	63.14	5	0	0.60	315.00	311	7	2.99E-03	****	1.88E-02	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235078.CNF;1 *
* Acquisition date : 29-SEP-2016 08:02:53 Sensitivity : 3.000 *
* Detector ID : XRAY2 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.11 Half life ratio : ***** *
* Sample date : 17-DEC-2015 12:40:00 Nuclide Library : IODINE *
* Sample ID : I405235078 Analyst initials: MJH1 *
* Batch Number : 1598663 Sample Quantity : 3.2500E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 27-JUL-2016 12:15:07 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 6.091E+00 NOT IDENT.
I-129 2.191E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235078.CNF;1
* Acquisition date   : 29-SEP-2016 08:02:53 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.11 Half life ratio  : *****
* Sample date        : 17-DEC-2015 12:40:00 Nuclide Library : IODINE
* Sample ID          : I405235078 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 3.2500E+00 GRAM
*                   : Quantity Err(%) : 3.0769E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
I-125        1.105E+00      6.945E+00      6.963E+00 NOT IDENT.
I-129        -9.825E-02      3.020E-01      3.053E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	3.1557				
29.62	5.3517				
27.34	2.1618				
29.62	6.6046				
35.49	2.2293				
39.58	3.4302				

VAX/VMS Nuclide Identification Report Generated 29-SEP-2016 08:34:00.09

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627531.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY4.CNF;433
Background date    : 25-SEP-2016 12:23:10
Sample date        : 27-SEP-2016 00:00:00 Acquisition date : 29-SEP-2016 08:03:29
Sample ID          : I1203627531 Sample quantity      : 4.23000E+00 GRAM
Detector name      : XRAY4 Detector geometry         : I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.10 0.0%
Energy tolerance   : 1.00000 keV Analyst Initials    : MJH1
Abundance limit    : 75.00000 Sensitivity       : 3.00000
Batch ID           : 1598663 Detector SN#       :
Matrix Spike ID    : 1470-K LCS ID                   : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4.49	17	12	0.58	21.76	19	7	9.62E-03	42.3	
2	0	13.13*	1	2	0.29	65.07	63	5	6.11E-04	346.5	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627531.CNF;1
* Acquisition date   : 29-SEP-2016 08:03:29 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.10 Half life ratio  : *****
* Sample date        : 27-SEP-2016 00:00:00 Analyst initials: MJH1
* Sample ID          : I1203627531 Sample Quantity : 4.2300E+00 GRAM
* Batch Number       : 1598663 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-2.228E-03		7.514E-02	1.912E-01	NOT IDENT.
I-129	3.357E-03		2.297E-01	4.967E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4.49	17	12	0.58	21.76	19	7	9.62E-03	42.3	
2	0	13.13	9	2	0.29	65.07	63	5	4.72E-03	40.0	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I1203627531

Page : 2
Acquisition date : 29-SEP-2016 08:03:29

Total number of lines in spectrum 2
Number of unidentified lines 2
Number of lines tentatively identified by NID 0 0.00%
**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I1203627531

Page : 3
Acquisition date : 29-SEP-2016 08:03:29

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	4.49	17	12	0.58	21.76	19	7	9.62E-03	84.5	1.76E-09	
0	13.13	1	2	0.29	65.07	63	5	6.11E-04	****	2.58E-01	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627531.CNF;1 *
* Acquisition date : 29-SEP-2016 08:03:29 Sensitivity : 3.000 *
* Detector ID : XRAY4 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.10 Half life ratio : ***** *
* Sample date : 27-SEP-2016 00:00:00 Nuclide Library : IODINE *
* Sample ID : I1203627531 Analyst initials: MJH1 *
* Batch Number : 1598663 Sample Quantity : 4.2300E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 17-JUN-2016 08:18:14 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 6.042E-02 NOT IDENT.
I-129 1.888E-01 NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627531.CNF;1
* Acquisition date   : 29-SEP-2016 08:03:29 Sensitivity       : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.10 Half life ratio  : *****
* Sample date        : 27-SEP-2016 00:00:00 Nuclide Library : IODINE
* Sample ID          : I1203627531 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity : 4.2300E+00 GRAM
*                    : Quantity Err(%) : 2.3641E-03 %
* Recovery           : 1.00000 Carrier Weight  : 0.00000
*                    : Standard Weight : 0.00000
*****
```

CALIBRATION INFORMATION

```
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```
---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
```

```
---- Non-Identified Nuclides ----
Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        -2.228E-03      7.514E-02      7.515E-02 NOT IDENT.
I-129        3.357E-03      2.297E-01      2.297E-01 NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	1.0858				
29.62	3.3266				
27.34	2.2442				
29.62	2.2941				
35.49	1.1645				
39.58	1.2005				

VAX/VMS Nuclide Identification Report Generated 29-SEP-2016 08:34:28.93

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                 *
*                               Charleston, SC 29407                            *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627532.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY5.CNF;58
Background date    : 25-SEP-2016 12:23:15
Sample date        : 14-DEC-2015 13:47:00 Acquisition date : 29-SEP-2016 08:03:56
Sample ID          : I1203627532 Sample quantity      : 2.82000E+00 GRAM
Detector name      : XRAY5 Detector geometry         : I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time : 0 00:30:00.03 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials    : MJH1
Abundance limit   : 75.00000 Sensitivity       : 3.00000
Batch ID          : 1598663 Detector SN#      :
Matrix Spike ID   : 1470-K LCS ID                   : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627532.CNF;1
* Acquisition date   : 29-SEP-2016 08:03:56 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.03 Half life ratio : *****
* Sample date        : 14-DEC-2015 13:47:00 Analyst initials: MJH1
* Sample ID          : I1203627532 Sample Quantity : 2.8200E+00 GRAM
* Batch Number       : 1598663 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	1.768E+00		3.465E+00	1.301E+01	NOT IDENT.
I-129	3.395E-02		1.179E-01	5.687E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I1203627532

Page : 2
Acquisition date : 29-SEP-2016 08:03:56

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I1203627532

Page : 3
Acquisition date : 29-SEP-2016 08:03:56

None

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627532.CNF;1
* Acquisition date   : 29-SEP-2016 08:03:56 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.03 Half life ratio  : *****
* Sample date        : 14-DEC-2015 13:47:00 Nuclide Library : IODINE
* Sample ID          : I1203627532 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 2.8200E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

	Lc	
Nuclide	(pCi/GRAM)	

---- Non-Identified Nuclides ----

	Lc	
Nuclide	(pCi/GRAM)	
I-125	4.112E+00	NOT IDENT.
I-129	1.400E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627532.CNF;1 *
 * Acquisition date : 29-SEP-2016 08:03:56 Sensitivity : 3.000 *
 * Detector ID : XRAY5 Energy tolerance: 1.000 *
 * Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 00:30:00.03 Half life ratio : ***** *
 * Sample date : 14-DEC-2015 13:47:00 Nuclide Library : IODINE *
 * Sample ID : I1203627532 Analyst initials: MJH1 *
 * Batch Number : 1598663 Sample Quantity : 2.8200E+00 GRAM *
 * Quantity Err(%) : 3.5461E-03 % *
 * Recovery : 1.00000 Carrier Weight : 0.00000 *
 * Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 30-AUG-2016 11:41:11 Eff. Geometry : I129 *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
---------	-------------------------	---------------------------	---------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
I-125	1.768E+00	3.479E+00	3.569E+00	NOT IDENT.
I-129	3.395E-02	1.180E-01	1.190E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.0000				
29.62	0.0000				
27.34	0.8784				
29.62	1.8461				
35.49	1.9087				
39.58	1.0189				

VAX/VMS Nuclide Identification Report Generated 29-SEP-2016 08:35:01.08

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627533.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY6.CNF;215
Background date    : 25-SEP-2016 12:23:20
Sample date        : 14-DEC-2015 13:47:00 Acquisition date : 29-SEP-2016 08:04:21
Sample ID          : I1203627533 Sample quantity      : 2.98000E+00 GRAM
Detector name      : XRAY6 Detector geometry         : I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time : 0 00:30:00.03 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials      : MJH1
Abundance limit   : 75.00000 Sensitivity         : 3.00000
Batch ID          : 1598663 Detector SN#         :
Matrix Spike ID   : 1470-K LCS ID                    : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	29.69	129	13	0.58	147.75	143	11	7.15E-02	10.4	
2	0	34.44	8	4	0.20	171.54	170	5	4.54E-03	52.3	
3	0	39.58	23	0	0.43	197.26	194	7	1.28E-02	20.9	

Flag: "*" = Peak area was modified by background subtraction


```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627533.CNF;1
* Acquisition date   : 29-SEP-2016 08:04:21 Sensitivity      : 3.000
* Detector ID       : XRAY6 Energy tolerance: 1.000
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:30:00.03 Half life ratio : *****
* Sample date       : 14-DEC-2015 13:47:00 Analyst initials: MJH1
* Sample ID        : I1203627533 Sample Quantity : 2.9800E+00 GRAM
* Batch Number     : 1598663 Carrier Weight : 0.00000
* Recovery         : 1.00000 Standard Weight : 0.00000
* Nuclide Library  : IODINE.NLB;1
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
I-129	1.213E+01	2.478E+00	1.320E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-7.798E+00		1.043E+01	1.426E+01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	29.69	129	13	0.58	147.75	143	11	7.15E-02	10.4	
2	0	34.44	8	4	0.20	171.54	170	5	4.54E-03	52.3	
3	0	39.58	23	0	0.43	197.26	194	7	1.28E-02	20.9	

Nuclide Line Activity Report

Nuclide Type: FISSION

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
I-129	29.62	129	56.60*	9.442E+00	1.213E+01	1.213E+01	20.84
	33.59	8	10.04	1.026E+01	3.995E+00	3.995E+00	104.62
	39.58	23	7.51	9.700E+00	1.591E+01	1.591E+01	41.70

Flag: "*" = Keyline

Total number of lines in spectrum 3
Number of unidentified lines 0
Number of lines tentatively identified by NID 3 100.00%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
I-129	1.57E+07Y	1.00	1.213E+01	1.213E+01	0.253E+01	20.84	
Total Activity :			1.213E+01	1.213E+01			

Grand Total Activity : 1.213E+01 1.213E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I1203627533

Page : 3
Acquisition date : 29-SEP-2016 08:04:21

None

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627533.CNF;1
* Acquisition date   : 29-SEP-2016 08:04:21 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.03 Half life ratio  : *****
* Sample date        : 14-DEC-2015 13:47:00 Nuclide Library : IODINE
* Sample ID          : I1203627533 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 2.9800E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
I-129	5.321E-01

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
I-125	5.051E+00 NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627533.CNF;1
* Acquisition date   : 29-SEP-2016 08:04:21 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.03 Half life ratio  : *****
* Sample date        : 14-DEC-2015 13:47:00 Nuclide Library : IODINE
* Sample ID          : I1203627533 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity  : 2.9800E+00 GRAM
*                   : Quantity Err(%) : 3.3557E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
I-129	1.213E+01	2.760E+00	2.760E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)
I-125	-7.798E+00	1.046E+01	1.103E+01 NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	7.0786				
29.62	5.8572				
27.34	2.9842				
29.62	2.0593				
35.49	3.1623				
39.58	1.6568				

VAX/VMS Nuclide Identification Report Generated 29-SEP-2016 09:03:59.48

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627534.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY1.CNF;415
Background date    : 25-SEP-2016 12:22:54
Sample date        : 27-SEP-2016 00:00:00 Acquisition date : 29-SEP-2016 08:33:28
Sample ID          : I1203627534 Sample quantity      : 4.23000E+00 GRAM
Detector name      : XRAY1 Detector geometry         : I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time : 0 00:30:00.16 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials     : MJH1
Abundance limit   : 75.00000 Sensitivity        : 3.00000
Batch ID          : 1598663 Detector SN#       :
Matrix Spike ID   : 1470-K LCS ID                    : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	24.69	5	15	0.26	123.73	120	7	2.94E-03	125.9	
2	0	29.77	352	56	1.06	149.35	142	16	1.95E-01	7.3	
3	0	33.93	91	9	1.58	170.28	161	18	5.06E-02	13.0	
4	0	39.61	54	0	0.83	198.93	194	10	3.00E-02	13.6	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627534.CNF;1
* Acquisition date   : 29-SEP-2016 08:33:28 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.16 Half life ratio : *****
* Sample date        : 27-SEP-2016 00:00:00 Analyst initials: MJH1
* Sample ID          : I1203627534 Sample Quantity : 4.2300E+00 GRAM
* Batch Number       : 1598663 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
I-129	1.002E+01	1.438E+00	6.886E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-6.783E-02		2.419E-01	3.747E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	24.69	5	15	0.26	123.73	120	7	2.94E-03	125.9	
2	0	29.77	352	56	1.06	149.35	142	16	1.95E-01	7.3	
3	0	33.93	91	9	1.58	170.28	161	18	5.06E-02	13.0	
4	0	39.61	54	0	0.83	198.93	194	10	3.00E-02	13.6	

Nuclide Line Activity Report

Nuclide Type: FISSION

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
I-129	29.62	352	56.60*	2.203E+01	1.002E+01	1.002E+01	14.65
	33.59	91	10.04	2.307E+01	1.397E+01	1.397E+01	26.01
	39.58	54	7.51	2.288E+01	1.115E+01	1.115E+01	27.22

Flag: "*" = Keyline

Total number of lines in spectrum 4
Number of unidentified lines 1
Number of lines tentatively identified by NID 3 75.00%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
I-129	1.57E+07Y	1.00	1.002E+01	1.002E+01	0.147E+01	14.65	
Total Activity :			1.002E+01	1.002E+01			

Grand Total Activity : 1.002E+01 1.002E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I1203627534

Page : 3
Acquisition date : 29-SEP-2016 08:33:28

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	24.69	5	15	0.26	123.73	120	7	2.94E-03	****	1.89E+01	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627534.CNF;1 *
* Acquisition date : 29-SEP-2016 08:33:28 Sensitivity : 3.000 *
* Detector ID : XRAY1 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.16 Half life ratio : ***** *
* Sample date : 27-SEP-2016 00:00:00 Nuclide Library : IODINE *
* Sample ID : I1203627534 Analyst initials: MJH1 *
* Batch Number : 1598663 Sample Quantity : 4.2300E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide Lc
(pCi/GRAM)
I-129 3.058E-01

---- Non-Identified Nuclides ----

Nuclide Lc
(pCi/GRAM)
I-125 1.667E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627534.CNF;1
* Acquisition date   : 29-SEP-2016 08:33:28 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.16 Half life ratio  : *****
* Sample date        : 27-SEP-2016 00:00:00 Nuclide Library : IODINE
* Sample ID          : I1203627534 Analyst initials: MJH1
* Batch Number       : 1598663 Sample Quantity : 4.2300E+00 GRAM
*                    : Quantity Err(%) : 2.3641E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                    : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
I-129        1.002E+01          1.740E+00      1.740E+00

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line Activity      K.L Act error      TPU
              (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        -6.783E-02          2.422E-01          2.441E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	26.1663				
29.62	21.2045				
27.34	8.6562				
29.62	4.4924				
35.49	1.3822				
39.58	0.0000				

09/28/16

Batch# 1598618

Product: I-129 / MJWC

Date: 09/28/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			n/a
Samples have been blank corrected (if required). Blank correction reported included (if required).			n/a
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			n/a
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	9/28/16 ✓	✓	Der # 1562421
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			n/a
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.	✓		
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)	✓		
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		n/a Der # 1562421
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		n/a 9/29/16
Aliquot Correction completed if required.	✓		n/a
Review sample historical results if available (If REM, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: 9/28/16

Secondary Review Performed By: 9/29/16

DATA EXCEPTION REPORT

Mo.Day Yr. 28-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GAMMA SPECTROMETER	Test / Method: DOE EML HASL-300,I-01 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1598618	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>Samples received out of holding:</p> <p>405235 001,002,003,004,005,006,007,008,009, 010,011,012,013,014,015,016,017,018, 019,020</p> <p>QC 1203627431DUP,1203627432MS</p>		<p>Samples were counting in a timely manner upon receipt. Reporting results.</p>	

Originator's Name:

Spencer Collins 28-SEP-16

Data Validator/Group Leader:

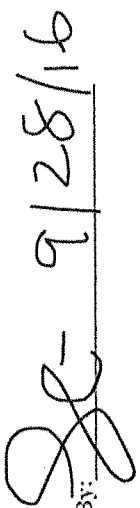
Bryan Williams 29-SEP-16

I-129 Queue Sheet

09/14/2016

Batch #: 1598618 Analyst: MJH1 First Client Due Date: 10/04/2016 Internal Due Date: 09/30/2016
 Spike Isotope: I-129 Spike Code: H70-K Expiration Date: 3-30-17
 LCS Isotope: I-129 LCS Code: H70-K Expiration Date: 3-30-17 Vol: 0.1uL Nominal Concentration: NA
 Prep Date: 9-26-16 Initials: MJH Pipette ID: H21303 Witness: NA BALANCE: 17955156
 184359Z

Sample ID	Client Description	Type	Hazard Code	RDL	Client	Matrix	Collect Date	Aliquot (mL or g)	Detector
405235001-1	4.1.B.R.1.2	SAMPLE	1 pCi/g	3.29	MJWC001	SOIL	10-DEC-15 14:20 A1	2.55	X4 MS
405235002-1	4.1.B.R.1.3	SAMPLE	1 pCi/g	3.04	MJWC001	SOIL	10-DEC-15 14:30 A2	2.56	X2 MS
405235003-1	4.1.B.R.1.4	SAMPLE	1 pCi/g	3.56	MJWC001	SOIL	10-DEC-15 14:35 A3	2.53	X5 MS
405235004-1	4.1.B.R.7.2	SAMPLE	1 pCi/g	3.12	MJWC001	SOIL	09-DEC-15 14:00 A4	2.52	X6 MS
405235005-1	4.1.C.R.1.3	SAMPLE	1 pCi/g	3.43	MJWC001	SOIL	10-DEC-15 13:15 A5	2.73	X4 MS
405235006-1	4.1.C.R.1.4	SAMPLE	1 pCi/g	3.45	MJWC001	SOIL	10-DEC-15 13:25 A6	2.78	X5 MS
405235007-1	4.1.C.R.2.3	SAMPLE	1 pCi/g	3.50	MJWC001	SOIL	10-DEC-15 13:55 A7	2.60	X6 MS
405235008-1	4.1.C.R.2.4	SAMPLE	1 pCi/g	3.15	MJWC001	SOIL	10-DEC-15 14:05 A8	2.58	X1 MS
405235009-1	4.1.D.R.1.3	SAMPLE	1 pCi/g	3.44	MJWC001	SOIL	10-DEC-15 10:30 A9	2.83	X2 MS
405235010-1	4.1.D.R.1.4	SAMPLE	1 pCi/g	4.18	MJWC001	SOIL	10-DEC-15 10:35 A10	3.34	X4 MS
405235011-1	4.1.D.R.3.2	SAMPLE	1 pCi/g	3.12	MJWC001	SOIL	09-DEC-15 10:13 A11	2.61	X5 MS
405235012-1	4.1.D.R.2.4	SAMPLE	1 pCi/g	3.30	MJWC001	SOIL	10-DEC-15 11:25 A12	2.74	X6 MS
405235013-1	4.2.A.R.2.3	SAMPLE	1 pCi/g	3.53	MJWC001	SOIL	08-DEC-15 11:23 A13	2.77	X2 RP
405235014-1	4.2.A.R.1.3	SAMPLE	1 pCi/g	3.44	MJWC001	SOIL	08-DEC-15 10:49 A14	2.92	X4 RP
405235015-1	4.2.A.R.1.4	SAMPLE	1 pCi/g	3.37	MJWC001	SOIL	08-DEC-15 10:56 A15	3.15	X6 RP
405235016-1	4.2.A.R.2.4	SAMPLE	1 pCi/g	3.58	MJWC001	SOIL	08-DEC-15 11:29 A16	2.85	X5 RP
405235017-1	4.2.A.R.3.2	SAMPLE	1 pCi/g	3.01	MJWC001	SOIL	02-DEC-15 10:02 A17	2.33	X2 RP
405235018-1	4.2.A.R.4.2	SAMPLE	1 pCi/g	3.53	MJWC001	SOIL	02-DEC-15 10:19 A18	2.76	X4 RP
405235019-1	4.2.B.R.2.4	SAMPLE	1 pCi/g	3.11	MJWC001	SOIL	08-DEC-15 14:30 A19	2.56	X8 RP
405235020-1	4.2.B.R.1.4	SAMPLE	1 pCi/g	3.47	MJWC001	SOIL	08-DEC-15 13:50 A20	2.47	X5 RP
1203627430-1	MB for batch 1598618	MB	1 pCi/g		QC.ACCOUNT	SOIL	9-26-16 A21	3.34	X1 RP
1203627431-1	4.1.B.R.1.2(405235001DUP)	DUP	1 pCi/g	3.10	QC.ACCOUNT	SOIL	10-DEC-15 14:20 A22	2.50	X2 RP
1203627432-1	4.1.B.R.1.2(405235001MS)	MS	1 pCi/g	3.18	QC.ACCOUNT	SOIL	10-DEC-15 14:20 A23	2.56	X4 RP
1203627433-1	LCS for batch 1598618	LCS	1 pCi/g		QC.ACCOUNT	SOIL	9-26-16 A24	3.34	X1 RP

Data Reviewed By:  9/28/16



Weight/Loss Aliquot Correction Report



Select What to Correct Aliquot to

Ash Dry Weight Dry Weight Wet Weight

Submit

Batch ID: 1598618

Calculate Corrected Aliquot

Aliquot Correction to Dry Weight for Batch 1598618

Sample Id	Aliquot (G)	Sample Type	Parent Sample Id	Loss (Dec)	Corrected Aliquot (G)
405235001	3.29	SAMPLE	NA	.1942	2.6510660266506667
405235002	3.04	SAMPLE	NA	.2235	2.360379856739744
405235003	3.06	SAMPLE	NA	.1736	2.5287285847194174
405235004	3.12	SAMPLE	NA	.1938	2.515327014462366
405235005	3.43	SAMPLE	NA	.2039	2.7305743181168594
405235006	3.45	SAMPLE	NA	.1950	2.7770259631162237
405235007	3.30	SAMPLE	NA	.2124	2.5988886984028667
405235008	3.25	SAMPLE	NA	.2073	2.5759850115735894
405235009	3.44	SAMPLE	NA	.2364	2.6267803919742008
405235010	4.18	SAMPLE	NA	.2011	3.3392224491222073
405235011	3.12	SAMPLE	NA	.1630	2.611405160188863
405235012	3.30	SAMPLE	NA	.1695	2.74048203831504
405235013	3.53	SAMPLE	NA	.2159	2.767562944111547
405235014	3.44	SAMPLE	NA	.1517	2.9178630278492828
405235015	3.37	SAMPLE	NA	.0714	3.1292114118581718
405235016	3.58	SAMPLE	NA	.2043	2.848281121210127
405235017	3.01	SAMPLE	NA	.2250	2.3326564650189908
405235018	3.53	SAMPLE	NA	.2167	2.764782914942685
405235019	3.11	SAMPLE	NA	.1752	2.564851595712084
405235020	3.47	SAMPLE	NA	.1427	2.974519250918073
1203627430		MB	NA	NA	
1203627431	3.10	DUP	405235001	.1942	2.4979649491237286
1203627432	3.18	MS	405235001	.1942	2.562428560714018
1203627433		LCS	NA	NA	

GEL Laboratories LLC

VAX/VMS Nuclide Identification Report Generated 27-SEP-2016 13:28:08.82

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235001.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY4.CNF;433
Background date : 25-SEP-2016 12:23:10
Sample date     : 10-DEC-2015 14:20:00 Acquisition date : 27-SEP-2016 12:26:55
Sample ID      : I405235001 Sample quantity : 2.65000E+00 GRAM
Detector name  : XRAY4 Detector geometry: I129
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.20 0.0%
Energy tolerance : 1.00000 keV Analyst Initials : MJH1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1598618 Detector SN# :
Matrix Spike ID : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	16.23*	0	10	0.27	80.58	78	5	8.63E-05	*****	
2	0	25.34	6	3	0.25	126.21	123	6	1.64E-03	62.4	
3	0	27.18	7	7	0.74	135.45	131	9	1.93E-03	77.6	
4	0	42.46	6	4	0.43	212.03	208	8	1.61E-03	73.1	
5	0	71.46	11	2	0.92	357.31	354	7	3.09E-03	36.1	
6	0	113.16	10	0	1.37	566.30	561	10	2.78E-03	31.6	
7	0	185.92*	8	2	0.88	930.99	927	8	2.28E-03	56.7	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*                               *                                               *
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235001.CNF;1   *
* Acquisition date   : 27-SEP-2016 12:26:55 Sensitivity      : 3.000           *
* Detector ID       : XRAY4 Energy tolerance: 1.000         *
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000   *
* Elapsed real time : 0 01:00:00.20 Half life ratio : ***** *
* Sample date       : 10-DEC-2015 14:20:00 Analyst initials: MJH1      *
* Sample ID        : I405235001 Sample Quantity : 2.6500E+00 GRAM *
* Batch Number     : 1598618 Carrier Weight : 0.00000       *
* Recovery         : 1.00000 Standard Weight : 0.00000       *
* Nuclide Library  : IODINE.NLB;1                                           *
*****
*                               CALIBRATION INFORMATION                         *
*                               *                                               *
* Eff. Cal. date    : 17-JUN-2016 08:18:14 Eff. Geometry   : I129       *
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14 *
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
I-125	4.290E+00	6.523E+00	8.870E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-129	-1.600E-02		1.763E-01	3.719E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	16.23	8	10	0.27	80.58	78	5	2.08E-03	72.4	
2	0	25.34	6	3	0.25	126.21	123	6	1.64E-03	62.4	
3	0	27.18	7	7	0.74	135.45	131	9	1.93E-03	77.6	
4	0	42.46	6	4	0.43	212.03	208	8	1.61E-03	73.1	
5	0	71.46	11	2	0.92	357.31	354	7	3.09E-03	36.1	
6	0	113.16	10	0	1.37	566.30	561	10	2.78E-03	31.6	
7	0	185.92	13	2	0.88	930.99	927	8	3.66E-03	33.1	

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
I-125	27.34	7	114.10*	1.216E+01	1.422E-01	4.290E+00	155.15
	30.97	-----	20.30	1.514E+01	-----	Line Not Found	-----
	35.49	-----	6.68	1.660E+01	-----	Line Not Found	-----

Flag: "*" = Keyline

Total number of lines in spectrum 7
 Number of unidentified lines 6
 Number of lines tentatively identified by NID 1 14.29%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
I-125	59.40D	30.2	1.422E-01	4.290E+00	6.656E+00	155.15	
Total Activity :			1.422E-01	4.290E+00			

Grand Total Activity : 1.422E-01 4.290E+00

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	25.34	6	3	0.25	126.21	123	6	1.64E-03	****	1.02E+01	
0	42.46	6	4	0.43	212.03	208	8	1.61E-03	****	1.52E+01	
0	71.46	11	2	0.92	357.31	354	7	3.09E-03	72.1	2.88E+00	
0	113.16	10	0	1.37	566.30	561	10	2.78E-03	63.2	8.28E-02	
0	185.92	8	2	0.88	930.99	927	8	2.28E-03	****	8.06E-05	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235001.CNF;1
* Acquisition date   : 27-SEP-2016 12:26:55 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.20 Half life ratio  : *****
* Sample date        : 10-DEC-2015 14:20:00 Nuclide Library : IODINE
* Sample ID          : I405235001 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity : 2.6500E+00 GRAM
* Recovery           : 1.00000 Carrier Weight  : 0.00000
*                   Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
I-125	3.613E+00

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
I-129	1.384E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235001.CNF;1
* Acquisition date   : 27-SEP-2016 12:26:55 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.20 Half life ratio  : *****
* Sample date        : 10-DEC-2015 14:20:00 Nuclide Library : IODINE
* Sample ID          : I405235001 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.6500E+00 GRAM
*                   : Quantity Err(%) : 3.7736E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
I-125	4.290E+00	6.571E+00	6.571E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
I-129	-1.600E-02	1.763E-01	1.765E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	6.5146				
29.62	3.3266				
30.97	6.7326				
33.59	0.0000				
35.49	2.3289				
39.58	3.6015				

VAX/VMS Nuclide Identification Report Generated 27-SEP-2016 13:28:33.97

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235002.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY2.CNF;379
Background date : 25-SEP-2016 12:22:59
Sample date     : 10-DEC-2015 14:30:00 Acquisition date : 27-SEP-2016 12:27:18
Sample ID      : I405235002 Sample quantity : 2.36000E+00 GRAM
Detector name  : XRAY2 Detector geometry: I129
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.19 0.0%
Energy tolerance : 1.00000 keV Analyst Initials : MJH1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1598618 Detector SN# :
Matrix Spike ID : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4.99*	22	119	0.42	23.87	22	6	6.08E-03	101.3	
2	0	21.91	17	3	1.63	108.60	103	12	4.67E-03	32.1	
3	0	63.35*	16	0	0.64	316.05	310	12	4.38E-03	31.5	
4	0	74.97*	8	3	0.29	374.22	369	11	2.13E-03	66.0	
5	0	95.89	5	4	0.26	478.98	474	8	1.30E-03	88.4	
6	0	113.15	7	6	1.54	565.43	557	12	1.94E-03	79.5	
7	0	164.06	8	7	1.84	820.40	809	13	2.08E-03	79.0	
8	0	238.95	9	9	0.36	1195.49	1186	14	2.55E-03	80.7	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235002.CNF;1
* Acquisition date   : 27-SEP-2016 12:27:18 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.19 Half life ratio  : *****
* Sample date        : 10-DEC-2015 14:30:00 Analyst initials: MJH1
* Sample ID          : I405235002 Sample Quantity : 2.3600E+00 GRAM
* Batch Number       : 1598618 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	1.963E+00		6.722E+00	1.462E+01	NOT IDENT.
I-129	1.088E-01		2.783E-01	5.982E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4.99	194	119	0.42	23.87	22	6	5.40E-02	11.1	
2	0	21.91	17	3	1.63	108.60	103	12	4.67E-03	32.1	
3	0	63.35	21	0	0.64	316.05	310	12	5.83E-03	21.8	
4	0	74.97	13	3	0.29	374.22	369	11	3.63E-03	37.2	
5	0	92.52	13	6	0.60	462.12	455	11	3.47E-03	46.0	
6	0	95.89	5	4	0.26	478.98	474	8	1.30E-03	88.4	
7	0	113.15	7	6	1.54	565.43	557	12	1.94E-03	79.5	
8	0	164.06	8	7	1.84	820.40	809	13	2.08E-03	79.0	
9	0	186.52	9	14	0.37	932.89	920	14	2.50E-03	94.3	
10	0	238.95	9	9	0.36	1195.49	1186	14	2.55E-03	80.7	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235002

Page : 2
Acquisition date : 27-SEP-2016 12:27:18

Total number of lines in spectrum	8	
Number of unidentified lines	8	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	4.99	22	119	0.42	23.87	22	6	6.08E-03	****	0.00E+00	
0	21.91	17	3	1.63	108.60	103	12	4.67E-03	64.1	4.42E-01	
0	63.35	16	0	0.64	316.05	310	12	4.38E-03	63.1	1.73E-02	
0	74.97	8	3	0.29	374.22	369	11	2.13E-03	****	1.37E-04	
0	95.89	5	4	0.26	478.98	474	8	1.30E-03	****	8.41E-09	
0	113.15	7	6	1.54	565.43	557	12	1.94E-03	****	1.64E-12	
0	164.06	8	7	1.84	820.40	809	13	2.08E-03	****	5.13E-24	
0	238.95	9	9	0.36	1195.49	1186	14	2.55E-03	****	0.00E+00	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235002.CNF;1 *
* Acquisition date : 27-SEP-2016 12:27:18 Sensitivity : 3.000 *
* Detector ID : XRAY2 Energy tolerance: 1.000 *
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 01:00:00.19 Half life ratio : ***** *
* Sample date : 10-DEC-2015 14:30:00 Nuclide Library : IODINE *
* Sample ID : I405235002 Analyst initials: MJH1 *
* Batch Number : 1598618 Sample Quantity : 2.3600E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 27-JUL-2016 12:15:07 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 6.019E+00 NOT IDENT.
I-129 2.517E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235002.CNF;1
* Acquisition date   : 27-SEP-2016 12:27:18 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.19 Half life ratio  : *****
* Sample date        : 10-DEC-2015 14:30:00 Nuclide Library : IODINE
* Sample ID          : I405235002 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.3600E+00 GRAM
*                   : Quantity Err(%) : 4.2373E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity          Act Error          TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
              Activity          K.L Act error          TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)
I-125        1.963E+00          6.730E+00          6.788E+00 NOT IDENT.
I-129        1.088E-01          2.785E-01          2.828E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	5.2595				
29.62	6.4220				
27.34	8.6471				
29.62	4.4030				
35.49	8.9174				
39.58	9.1471				

VAX/VMS Nuclide Identification Report Generated 27-SEP-2016 13:28:58.44

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235003.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY5.CNF;58
Background date    : 25-SEP-2016 12:23:15
Sample date        : 10-DEC-2015 14:35:00 Acquisition date : 27-SEP-2016 12:27:38
Sample ID          : I405235003 Sample quantity      : 2.53000E+00 GRAM
Detector name      : XRAY5 Detector geometry       : I129
Elapsed live time  : 0 01:00:00.00 Elapsed real time: 0 01:00:00.06 0.0%
Energy tolerance   : 1.00000 keV Analyst Initials    : MJH1
Abundance limit    : 75.00000 Sensitivity        : 3.00000
Batch ID           : 1598618 Detector SN#         :
Matrix Spike ID    : 1470-K LCS ID                   : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.67*	3	5	0.73	316.68	312	9	7.98E-04	179.4	

Flag: "*" = Peak area was modified by background subtraction


```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235003.CNF;1
* Acquisition date   : 27-SEP-2016 12:27:38 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.06 Half life ratio  : *****
* Sample date        : 10-DEC-2015 14:35:00 Analyst initials: MJH1
* Sample ID          : I405235003 Sample Quantity : 2.5300E+00 GRAM
* Batch Number       : 1598618 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	---------------------	--------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)	
I-125	1.199E+00		3.231E+00		9.382E+00	NOT IDENT.
I-129	2.377E-01		2.329E-01		7.137E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.67	10	5	0.73	316.68	312	9	2.64E-03	51.7	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235003

Page : 2
Acquisition date : 27-SEP-2016 12:27:38

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235003

Page : 3
Acquisition date : 27-SEP-2016 12:27:38

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	63.67	3	5	0.73	316.68	312	9	7.98E-04	****	3.12E+00	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235003.CNF;1 *
* Acquisition date : 27-SEP-2016 12:27:38 Sensitivity : 3.000 *
* Detector ID : XRAY5 Energy tolerance: 1.000 *
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 01:00:00.06 Half life ratio : ***** *
* Sample date : 10-DEC-2015 14:35:00 Nuclide Library : IODINE *
* Sample ID : I405235003 Analyst initials: MJH1 *
* Batch Number : 1598618 Sample Quantity : 2.5300E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 30-AUG-2016 11:41:11 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 3.324E+00 NOT IDENT.
I-129 2.765E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235003.CNF;1
* Acquisition date   : 27-SEP-2016 12:27:38 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.06 Half life ratio  : *****
* Sample date        : 10-DEC-2015 14:35:00 Nuclide Library : IODINE
* Sample ID          : I405235003 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.5300E+00 GRAM
*                   : Quantity Err(%) : 3.9526E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        1.199E+00      3.237E+00      3.282E+00  NOT IDENT.
I-129        2.377E-01      2.342E-01      2.575E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.8133				
29.62	0.0000				
27.34	0.0000				
29.62	2.7692				
35.49	1.9087				
39.58	3.0566				

VAX/VMS Nuclide Identification Report Generated 27-SEP-2016 13:29:21.90

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235004.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY6.CNF;215
Background date    : 25-SEP-2016 12:23:20
Sample date        : 9-DEC-2015 14:00:00. Acquisition date : 27-SEP-2016 12:27:59
Sample ID          : I405235004. Sample quantity : 2.52000E+00 GRAM
Detector name      : XRAY6. Detector geometry: I129
Elapsed live time  : 0 01:00:00.00. Elapsed real time: 0 01:00:00.07 0.0%
Energy tolerance  : 1.00000 keV. Analyst Initials : MJH1
Abundance limit   : 75.00000. Sensitivity : 3.00000
Batch ID          : 1598618. Detector SN# :
Matrix Spike ID   : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.36*	4	0	0.47	316.22	313	7	1.00E-03	89.9	
2	0	81.17*	5	2	0.38	405.30	402	7	1.32E-03	74.3	

Flag: "*" = Peak area was modified by background subtraction

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235004.CNF;1
* Acquisition date   : 27-SEP-2016 12:27:59 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.07 Half life ratio  : *****
* Sample date        : 9-DEC-2015 14:00:00 Analyst initials: MJH1
* Sample ID          : I405235004 Sample Quantity : 2.5200E+00 GRAM
* Batch Number       : 1598618 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
```

CALIBRATION INFORMATION

```
*
* Eff. Cal. date    : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-1.726E+00		4.133E+00	6.935E+00	NOT IDENT.
I-129	2.594E-02		2.210E-01	5.123E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.36	9	0	0.47	316.22	313	7	2.50E-03	33.3	
2	0	81.17	7	2	0.38	405.30	402	7	1.98E-03	48.8	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235004

Page : 2
Acquisition date : 27-SEP-2016 12:27:59

Total number of lines in spectrum	2	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235004

Page : 3
Acquisition date : 27-SEP-2016 12:27:59

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	63.36	4	0	0.47	316.22	313	7	1.00E-03	****	3.07E+00	
0	81.17	5	2	0.38	405.30	402	7	1.32E-03	****	9.25E-01	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235004.CNF;1
* Acquisition date   : 27-SEP-2016 12:27:59 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.07 Half life ratio  : *****
* Sample date        : 9-DEC-2015 14:00:00 Nuclide Library : IODINE
* Sample ID          : I405235004 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.5200E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	2.192E+00	NOT IDENT.
I-129	1.805E-01	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235004.CNF;1
* Acquisition date   : 27-SEP-2016 12:27:59 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.07 Half life ratio  : *****
* Sample date        : 9-DEC-2015 14:00:00 Nuclide Library : IODINE
* Sample ID          : I405235004 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.5200E+00 GRAM
*                   : Quantity Err(%) : 3.9683E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity          Act Error          TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
              Activity          K.L Act error          TPU
              (pCi/GRAM )          (1.96-sigma)          (1.96-sigma)
I-125        -1.726E+00          4.136E+00          4.208E+00  NOT IDENT.
I-129        2.594E-02          2.210E-01          2.213E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	2.8315				
29.62	1.4643				
27.34	1.4921				
29.62	0.0000				
35.49	1.5811				
39.58	0.0000				

VAX/VMS Nuclide Identification Report Generated 27-SEP-2016 15:42:01.35

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                 *
*                               Charleston, SC 29407                             *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235005.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY4.CNF;433
Background date    : 25-SEP-2016 12:23:10
Sample date        : 10-DEC-2015 13:15:00 Acquisition date : 27-SEP-2016 15:11:29
Sample ID          : I405235005 Sample quantity : 2.73000E+00 GRAM
Detector name      : XRAY4 Detector geometry: I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.10 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials : MJH1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1598618 Detector SN# :
Matrix Spike ID   : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	44.78	6	0	0.29	223.67	220	6	3.33E-03	40.8	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*                               *                                               *
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235005.CNF;1   *
* Acquisition date   : 27-SEP-2016 15:11:29 Sensitivity      : 3.000           *
* Detector ID       : XRAY4 Energy tolerance: 1.000         *
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000   *
* Elapsed real time : 0 00:30:00.10 Half life ratio : ***** *
* Sample date       : 10-DEC-2015 13:15:00 Analyst initials: MJH1         *
* Sample ID        : I405235005 Sample Quantity : 2.7300E+00 GRAM *
* Batch Number     : 1598618 Carrier Weight : 0.00000       *
* Recovery         : 1.00000 Standard Weight : 0.00000       *
* Nuclide Library  : IODINE.NLB;1                                           *
*****
*                               CALIBRATION INFORMATION                          *
*                               *                                               *
* Eff. Cal. date    : 17-JUN-2016 08:18:14 Eff. Geometry   : I129           *
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14         *
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt Uncert	MDA (pCi/GRAM)	
I-125	-1.488E+00		5.457E+00	1.099E+01	NOT IDENT.
I-129	1.289E-01		2.748E-01	7.339E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	44.78	6	0	0.29	223.67	220	6	3.33E-03	40.8	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235005

Page : 2
Acquisition date : 27-SEP-2016 15:11:29

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235005

Page : 3
Acquisition date : 27-SEP-2016 15:11:29

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	44.78	6	0	0.29	223.67	220	6	3.33E-03	81.6	1.41E+01	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235005.CNF;1
* Acquisition date   : 27-SEP-2016 15:11:29 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.10 Half life ratio  : *****
* Sample date        : 10-DEC-2015 13:15:00 Nuclide Library : IODINE
* Sample ID          : I405235005 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.7300E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	3.893E+00	NOT IDENT.
I-129	2.747E-01	NOT IDENT.


```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235005.CNF;1
* Acquisition date   : 27-SEP-2016 15:11:29 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.10 Half life ratio  : *****
* Sample date        : 10-DEC-2015 13:15:00 Nuclide Library : IODINE
* Sample ID          : I405235005 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity : 2.7300E+00 GRAM
*                   : Quantity Err(%) : 3.6630E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
              Activity      K.L Act error      TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
I-125        -1.488E+00      5.463E+00      5.504E+00 NOT IDENT.
I-129        1.289E-01      2.751E-01      2.812E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	3.2573				
29.62	1.1089				
27.34	2.2442				
29.62	1.1470				
35.49	0.0000				
39.58	0.0000				

VAX/VMS Nuclide Identification Report Generated 27-SEP-2016 15:43:13.53

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235006.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY5.CNF;58
Background date    : 25-SEP-2016 12:23:15
Sample date       : 10-DEC-2015 13:25:00 Acquisition date : 27-SEP-2016 15:11:52
Sample ID        : I405235006 Sample quantity   : 2.78000E+00 GRAM
Detector name    : XRAY5 Detector geometry: I129
Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:00.02 0.0%
Energy tolerance : 1.00000 keV Analyst Initials : MJH1
Abundance limit  : 75.00000 Sensitivity   : 3.00000
Batch ID        : 1598618 Detector SN#    :
Matrix Spike ID : 1470-K LCS ID           : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	131.03	7	0	0.55	652.14	645	12	3.89E-03	37.8	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235006.CNF;1
* Acquisition date   : 27-SEP-2016 15:11:52 Sensitivity      : 3.000
* Detector ID       : XRAY5 Energy tolerance: 1.000
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:30:00.02 Half life ratio : *****
* Sample date       : 10-DEC-2015 13:25:00 Analyst initials: MJH1
* Sample ID         : I405235006 Sample Quantity : 2.7800E+00 GRAM
* Batch Number      : 1598618 Carrier Weight : 0.00000
* Recovery          : 1.00000 Standard Weight : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	1.842E+00		3.611E+00	1.356E+01	NOT IDENT.
I-129	4.326E-01		4.240E-01	1.299E+00	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	131.03	7	0	0.55	652.14	645	12	3.89E-03	37.8	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235006

Page : 2
Acquisition date : 27-SEP-2016 15:11:52

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235006

Page : 3
Acquisition date : 27-SEP-2016 15:11:52

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	131.03	7	0	0.55	652.14	645	12	3.89E-03	75.6	1.35E-02	

Flags: "T" = Tentatively associated


```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235006.CNF;1
* Acquisition date   : 27-SEP-2016 15:11:52 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.02 Half life ratio  : *****
* Sample date        : 10-DEC-2015 13:25:00 Nuclide Library : IODINE
* Sample ID          : I405235006 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.7800E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	4.286E+00	NOT IDENT.
I-129	5.032E-01	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235006.CNF;1
* Acquisition date   : 27-SEP-2016 15:11:52 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.02 Half life ratio  : *****
* Sample date        : 10-DEC-2015 13:25:00 Nuclide Library : IODINE
* Sample ID          : I405235006 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity : 2.7800E+00 GRAM
*                   : Quantity Err(%) : 3.5971E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        1.842E+00      3.625E+00      3.719E+00 NOT IDENT.
I-129        4.326E-01      4.262E-01      4.687E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.0000				
29.62	0.0000				
27.34	0.0000				
29.62	0.9231				
35.49	0.9543				
39.58	0.0000				

VAX/VMS Nuclide Identification Report Generated 27-SEP-2016 15:43:38.92

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235007.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY6.CNF;215
Background date    : 25-SEP-2016 12:23:20
Sample date        : 10-DEC-2015 13:55:00 Acquisition date : 27-SEP-2016 15:12:14
Sample ID          : I405235007 Sample quantity : 2.60000E+00 GRAM
Detector name      : XRAY6 Detector geometry: I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.04 0.0%
Energy tolerance   : 1.00000 keV Analyst Initials : MJH1
Abundance limit    : 75.00000 Sensitivity : 3.00000
Batch ID           : 1598618 Detector SN# :
Matrix Spike ID    : 1470-K LCS ID : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235007.CNF;1
* Acquisition date   : 27-SEP-2016 15:12:14 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.04 Half life ratio : *****
* Sample date        : 10-DEC-2015 13:55:00 Analyst initials: MJH1
* Sample ID          : I405235007 Sample Quantity : 2.6000E+00 GRAM
* Batch Number       : 1598618 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	---------------------	--------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)	
I-125	-2.559E+00		5.015E+00		4.898E+00	NOT IDENT.
I-129	-2.761E-01		4.587E-01		6.039E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235007

Page : 2
Acquisition date : 27-SEP-2016 15:12:14

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235007

Page : 3
Acquisition date : 27-SEP-2016 15:12:14

None

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235007.CNF;1 *
* Acquisition date : 27-SEP-2016 15:12:14 Sensitivity : 3.000 *
* Detector ID : XRAY6 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.04 Half life ratio : ***** *
* Sample date : 10-DEC-2015 13:55:00 Nuclide Library : IODINE *
* Sample ID : I405235007 Analyst initials: MJH1 *
* Batch Number : 1598618 Sample Quantity : 2.6000E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 26-JAN-2016 10:07:09 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 0.000E+00 NOT IDENT.
I-129 1.553E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235007.CNF;1
* Acquisition date   : 27-SEP-2016 15:12:14 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.04 Half life ratio  : *****
* Sample date        : 10-DEC-2015 13:55:00 Nuclide Library : IODINE
* Sample ID          : I405235007 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.6000E+00 GRAM
*                   : Quantity Err(%) : 3.8462E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        -2.559E+00      5.020E+00      5.151E+00 NOT IDENT.
I-129        -2.761E-01      4.595E-01      4.761E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	1.4157				
29.62	2.9286				
27.34	0.0000				
29.62	0.0000				
35.49	1.5811				
39.58	0.0000				

VAX/VMS Nuclide Identification Report Generated 27-SEP-2016 17:19:39.41

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235008.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY1.CNF;415
Background date    : 25-SEP-2016 12:22:54
Sample date        : 10-DEC-2015 14:05:00 Acquisition date : 27-SEP-2016 16:19:05
Sample ID          : I405235008 Sample quantity : 2.58000E+00 GRAM
Detector name      : XRAY1 Detector geometry: I129
Elapsed live time  : 0 01:00:00.00 Elapsed real time: 0 01:00:00.23 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials : MJH1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1598618 Detector SN# :
Matrix Spike ID   : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	72.29	11	0	0.63	363.64	360	8	3.06E-03	30.2	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235008.CNF;1
* Acquisition date   : 27-SEP-2016 16:19:05 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.23 Half life ratio  : *****
* Sample date        : 10-DEC-2015 14:05:00 Analyst initials: MJH1
* Sample ID          : I405235008 Sample Quantity : 2.5800E+00 GRAM
* Batch Number       : 1598618 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	2.033E+00		3.175E+00	6.873E+00	NOT IDENT.
I-129	-1.212E-01		1.964E-01	3.623E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	72.29	11	0	0.63	363.64	360	8	3.06E-03	30.2	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235008

Page : 2
Acquisition date : 27-SEP-2016 16:19:05

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235008

Page : 3
Acquisition date : 27-SEP-2016 16:19:05

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	72.29	11	0	0.63	363.64	360	8	3.06E-03	60.3	1.13E+01	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235008.CNF;1 *
* Acquisition date : 27-SEP-2016 16:19:05 Sensitivity : 3.000 *
* Detector ID : XRAY1 Energy tolerance: 1.000 *
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 01:00:00.23 Half life ratio : ***** *
* Sample date : 10-DEC-2015 14:05:00 Nuclide Library : IODINE *
* Sample ID : I405235008 Analyst initials: MJH1 *
* Batch Number : 1598618 Sample Quantity : 2.5800E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 2.937E+00 NOT IDENT.
I-129 1.495E-01 NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235008.CNF;1
* Acquisition date   : 27-SEP-2016 16:19:05 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.23 Half life ratio  : *****
* Sample date        : 10-DEC-2015 14:05:00 Nuclide Library : IODINE
* Sample ID          : I405235008 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.5800E+00 GRAM
*                   : Quantity Err(%) : 3.8760E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
```

CALIBRATION INFORMATION

```
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```
---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
```

```
---- Non-Identified Nuclides ----
Nuclide      Key-Line
              Activity      K.L Act error      TPU
              (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        2.033E+00      3.195E+00      3.324E+00 NOT IDENT.
I-129        -1.212E-01      1.968E-01      2.042E-01 NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	6.1327				
29.62	12.7227				
27.34	5.1937				
29.62	8.9849				
35.49	6.4505				
39.58	6.7829				

VAX/VMS Nuclide Identification Report Generated 27-SEP-2016 17:19:13.31

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235009.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY2.CNF;379
Background date : 25-SEP-2016 12:22:59
Sample date     : 10-DEC-2015 10:30:00 Acquisition date : 27-SEP-2016 16:18:41
Sample ID      : I405235009 Sample quantity   : 2.63000E+00 GRAM
Detector name  : XRAY2 Detector geometry   : I129
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.20 0.0%
Energy tolerance : 1.00000 keV Analyst Initials : MJH1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1598618 Detector SN#   :
Matrix Spike ID : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	16.81*	7	14	0.43	83.03	77	11	2.01E-03	124.4	
2	0	36.66	7	0	0.55	182.43	177	9	1.94E-03	37.8	
3	0	41.39	9	3	1.36	206.11	200	10	2.62E-03	45.4	
4	0	57.90	12	0	0.25	288.75	283	11	3.33E-03	28.9	
5	0	63.05*	6	2	0.61	314.55	310	9	1.58E-03	82.0	
6	0	64.67	6	2	0.45	322.66	319	7	1.74E-03	53.2	
7	2	70.09	12	1	0.96	349.79	346	13	3.39E-03	34.7	4.21E-01
8	2	71.29	12	2	0.65	355.82	346	13	3.26E-03	32.1	
9	0	93.00*	6	7	1.31	464.51	456	14	1.71E-03	126.9	
10	0	134.56	9	2	0.28	672.65	668	9	2.44E-03	45.7	
11	0	182.13	11	6	0.42	910.91	904	12	3.06E-03	53.8	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235009.CNF;1
* Acquisition date   : 27-SEP-2016 16:18:41 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.20 Half life ratio  : *****
* Sample date        : 10-DEC-2015 10:30:00 Analyst initials: MJH1
* Sample ID          : I405235009 Sample Quantity : 2.6300E+00 GRAM
* Batch Number       : 1598618 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	---------------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	2.282E+00	6.193E+00	1.361E+01	NOT IDENT.
I-129	4.861E-02	2.191E-01	4.694E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	5.01	166	89	0.41	23.95	22	6	4.60E-02	11.6	
2	0	16.81	21	14	0.43	83.03	77	11	5.96E-03	39.8	
3	0	36.66	7	0	0.55	182.43	177	9	1.94E-03	37.8	
4	0	41.39	9	3	1.36	206.11	200	10	2.62E-03	45.4	
5	0	57.90	12	0	0.25	288.75	283	11	3.33E-03	28.9	
6	0	63.05	11	2	0.61	314.55	310	9	3.03E-03	38.9	
7	0	64.67	6	2	0.45	322.66	319	7	1.74E-03	53.2	
8	2	70.09	12	1	0.96	349.79	346	13	3.39E-03	34.7	4.21E-01
9	2	71.29	12	2	0.65	355.82	346	13	3.26E-03	32.1	
10	0	93.00	23	7	1.31	464.51	456	14	6.32E-03	32.4	
11	0	134.56	9	2	0.28	672.65	668	9	2.44E-03	45.7	
12	0	182.13	11	6	0.42	910.91	904	12	3.06E-03	53.8	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235009

Page : 2
Acquisition date : 27-SEP-2016 16:18:41

Total number of lines in spectrum 11
Number of unidentified lines 11
Number of lines tentatively identified by NID 0 0.00%
**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	16.81	7	14	0.43	83.03	77	11	2.01E-03	****	7.68E-04	
0	36.66	7	0	0.55	182.43	177	9	1.94E-03	75.6	2.36E+01	
0	41.39	9	3	1.36	206.11	200	10	2.62E-03	90.7	1.34E+01	
0	57.90	12	0	0.25	288.75	283	11	3.33E-03	57.7	1.34E-01	
0	63.05	6	2	0.61	314.55	310	9	1.58E-03	****	1.95E-02	
0	64.67	6	2	0.45	322.66	319	7	1.74E-03	****	1.03E-02	
2	70.09	12	1	0.96	349.79	346	13	3.39E-03	69.5	1.12E-03	
2	71.29	12	2	0.65	355.82	346	13	3.26E-03	64.3	6.72E-04	
0	93.00	6	7	1.31	464.51	456	14	1.71E-03	****	3.38E-08	
0	134.56	9	2	0.28	672.65	668	9	2.44E-03	91.4	2.81E-17	
0	182.13	11	6	0.42	910.91	904	12	3.06E-03	****	3.32E-28	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235009.CNF;1
* Acquisition date   : 27-SEP-2016 16:18:41 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.20 Half life ratio  : *****
* Sample date        : 10-DEC-2015 10:30:00 Nuclide Library : IODINE
* Sample ID          : I405235009 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.6300E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	5.639E+00	NOT IDENT.
I-129	1.922E-01	NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235009.CNF;1
* Acquisition date   : 27-SEP-2016 16:18:41 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.20 Half life ratio  : *****
* Sample date        : 10-DEC-2015 10:30:00 Nuclide Library : IODINE
* Sample ID          : I405235009 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.6300E+00 GRAM
*                   : Quantity Err(%) : 3.8023E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )    (1.96-sigma)  (1.96-sigma)
```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )    (1.96-sigma)      (1.96-sigma)
I-125        2.282E+00      6.206E+00      6.291E+00 NOT IDENT.
I-129        4.861E-02      2.191E-01      2.202E-01 NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	5.2595				
29.62	5.3517				
27.34	4.3235				
29.62	5.5038				
35.49	6.6880				
39.58	8.5754				

VAX/VMS Nuclide Identification Report Generated 27-SEP-2016 17:20:03.84

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235010.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY4.CNF;433
Background date    : 25-SEP-2016 12:23:10
Sample date        : 10-DEC-2015 10:35:00 Acquisition date : 27-SEP-2016 16:19:26
Sample ID          : I405235010 Sample quantity      : 3.34000E+00 GRAM
Detector name      : XRAY4 Detector geometry       : I129
Elapsed live time  : 0 01:00:00.00 Elapsed real time : 0 01:00:00.21 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials    : MJH1
Abundance limit   : 75.00000 Sensitivity      : 3.00000
Batch ID          : 1598618 Detector SN#      :
Matrix Spike ID   : 1470-K LCS ID                  : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	24.66	3	6	0.32	122.81	119	7	9.57E-04	123.8	
2	0	27.52	6	6	0.40	137.17	132	8	1.62E-03	90.7	
3	0	92.71*	9	3	0.61	463.84	459	11	2.52E-03	62.2	
4	0	139.94	12	3	0.75	700.53	693	12	3.28E-03	41.5	
5	0	158.54	7	5	1.36	793.77	788	9	1.81E-03	70.7	
6	0	185.65*	9	0	0.33	929.64	925	9	2.51E-03	45.1	
7	0	202.95	9	0	0.65	1016.33	1012	9	2.50E-03	33.3	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*                               *                                               *
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235010.CNF;1  *
* Acquisition date   : 27-SEP-2016 16:19:26 Sensitivity      : 3.000          *
* Detector ID       : XRAY4 Energy tolerance: 1.000         *
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000    *
* Elapsed real time: 0 01:00:00.21 Half life ratio : *****   *
* Sample date       : 10-DEC-2015 10:35:00 Analyst initials: MJH1     *
* Sample ID        : I405235010 Sample Quantity : 3.3400E+00 GRAM *
* Batch Number     : 1598618 Carrier Weight  : 0.00000        *
* Recovery         : 1.00000 Standard Weight  : 0.00000        *
* Nuclide Library  : IODINE.NLB;1                                           *
*****
*                               CALIBRATION INFORMATION                         *
*                               *                                               *
* Eff. Cal. date    : 17-JUN-2016 08:18:14 Eff. Geometry   : I129      *
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14      *
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
I-125	2.786E+00	4.954E+00	6.562E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-129	2.999E-02		1.554E-01	3.474E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	17.21	6	12	0.20	85.51	80	8	1.76E-03	102.3	
2	0	24.66	3	6	0.32	122.81	119	7	9.57E-04	123.8	
3	0	27.52	6	6	0.40	137.17	132	8	1.62E-03	90.7	
4	0	92.71	17	3	0.61	463.84	459	11	4.72E-03	30.9	
5	0	139.94	12	3	0.75	700.53	693	12	3.28E-03	41.5	
6	0	158.54	7	5	1.36	793.77	788	9	1.81E-03	70.7	
7	0	185.65	14	0	0.33	929.64	925	9	3.89E-03	26.7	
8	0	202.95	9	0	0.65	1016.33	1012	9	2.50E-03	33.3	

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
I-125	27.34	6	114.10*	1.249E+01	9.202E-02	2.786E+00	181.42
	30.97	-----	20.30	1.514E+01	-----	Line Not Found	-----
	35.49	-----	6.68	1.660E+01	-----	Line Not Found	-----

Flag: "*" = Keyline

Total number of lines in spectrum 7
Number of unidentified lines 6
Number of lines tentatively identified by NID 1 14.29%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
I-125	59.40D	30.3	9.202E-02	2.786E+00	5.055E+00	181.42	
Total Activity :			9.202E-02	2.786E+00			

Grand Total Activity : 9.202E-02 2.786E+00

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	24.66	3	6	0.32	122.81	119	7	9.57E-04	****	9.48E+00	
0	92.71	9	3	0.61	463.84	459	11	2.52E-03	****	5.10E-01	
0	139.94	12	3	0.75	700.53	693	12	3.28E-03	83.0	6.82E-03	
0	158.54	7	5	1.36	793.77	788	9	1.81E-03	****	1.15E-03	
0	185.65	9	0	0.33	929.64	925	9	2.51E-03	90.2	8.28E-05	
0	202.95	9	0	0.65	1016.33	1012	9	2.50E-03	66.7	1.52E-05	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235010.CNF;1
* Acquisition date   : 27-SEP-2016 16:19:26 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.21 Half life ratio  : *****
* Sample date        : 10-DEC-2015 10:35:00 Nuclide Library : IODINE
* Sample ID          : I405235010 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 3.3400E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
I-125	2.626E+00

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
I-129	1.360E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235010.CNF;1
* Acquisition date   : 27-SEP-2016 16:19:26 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.21 Half life ratio  : *****
* Sample date        : 10-DEC-2015 10:35:00 Nuclide Library : IODINE
* Sample ID          : I405235010 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 3.3400E+00 GRAM
*                   : Quantity Err(%) : 2.9940E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
I-125	2.786E+00	4.975E+00	4.975E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)
I-129	2.999E-02	1.554E-01	1.560E-01 NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	5.4288				
29.62	3.3266				
30.97	4.4884				
33.59	2.2941				
35.49	8.1513				
39.58	3.6015				

VAX/VMS Nuclide Identification Report Generated 27-SEP-2016 17:20:28.54

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235011.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY5.CNF;58
Background date    : 25-SEP-2016 12:23:15
Sample date       : 9-DEC-2015 10:13:00. Acquisition date : 27-SEP-2016 16:19:47
Sample ID        : I405235011. Sample quantity : 2.61000E+00 GRAM
Detector name    : XRAY5. Detector geometry: I129
Elapsed live time: 0 01:00:00.00. Elapsed real time: 0 01:00:00.06 0.0%
Energy tolerance : 1.00000 keV. Analyst Initials : MJH1
Abundance limit  : 75.00000. Sensitivity : 3.00000
Batch ID        : 1598618. Detector SN# :
Matrix Spike ID  : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.53*	2	0	0.20	231.33	229	5	5.61E-04	135.4	
2	0	63.38*	6	4	0.32	315.27	311	8	1.77E-03	82.2	
3	0	74.74*	6	0	0.53	371.80	369	6	1.75E-03	53.3	
4	0	78.54	9	3	0.20	390.74	383	11	2.47E-03	49.8	
5	0	92.69*	3	0	0.70	461.22	457	8	9.51E-04	139.4	
6	0	162.02	8	3	0.39	806.47	800	11	2.35E-03	51.0	

Flag: "*" = Peak area was modified by background subtraction


```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235011.CNF;1
* Acquisition date   : 27-SEP-2016 16:19:47 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.06 Half life ratio  : *****
* Sample date        : 9-DEC-2015 10:13:00 Analyst initials: MJH1
* Sample ID          : I405235011 Sample Quantity : 2.6100E+00 GRAM
* Batch Number       : 1598618 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-4.152E-01		2.005E+00	5.607E+00	NOT IDENT.
I-129	9.429E-02		1.444E-01	4.988E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.53	6	0	0.20	231.33	229	5	1.67E-03	40.8	
2	0	63.38	13	4	0.32	315.27	311	8	3.61E-03	38.5	
3	0	74.74	10	0	0.53	371.80	369	6	2.78E-03	31.6	
4	0	78.54	9	3	0.20	390.74	383	11	2.47E-03	49.8	
5	0	92.69	18	0	0.70	461.22	457	8	5.00E-03	23.6	
6	0	162.02	8	3	0.39	806.47	800	11	2.35E-03	51.0	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235011

Page : 2
Acquisition date : 27-SEP-2016 16:19:47

Total number of lines in spectrum	6	
Number of unidentified lines	6	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	46.53	2	0	0.20	231.33	229	5	5.61E-04	****	7.90E+00	
0	63.38	6	4	0.32	315.27	311	8	1.77E-03	****	3.18E+00	
0	74.74	6	0	0.53	371.80	369	6	1.75E-03	****	1.44E+00	
0	78.54	9	3	0.20	390.74	383	11	2.47E-03	99.7	1.09E+00	
0	92.69	3	0	0.70	461.22	457	8	9.51E-04	****	3.57E-01	
0	162.02	8	3	0.39	806.47	800	11	2.35E-03	****	8.37E-04	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235011.CNF;1 *
* Acquisition date : 27-SEP-2016 16:19:47 Sensitivity : 3.000 *
* Detector ID : XRAY5 Energy tolerance: 1.000 *
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 01:00:00.06 Half life ratio : ***** *
* Sample date : 9-DEC-2015 10:13:00 Nuclide Library : IODINE *
* Sample ID : I405235011 Analyst initials: MJH1 *
* Batch Number : 1598618 Sample Quantity : 2.6100E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 30-AUG-2016 11:41:11 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 1.456E+00 NOT IDENT.
I-129 1.714E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235011.CNF;1
* Acquisition date   : 27-SEP-2016 16:19:47 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.06 Half life ratio  : *****
* Sample date        : 9-DEC-2015 10:13:00 Nuclide Library : IODINE
* Sample ID          : I405235011 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity : 2.6100E+00 GRAM
*                   : Quantity Err(%) : 3.8314E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
I-125        -4.152E-01      2.006E+00      2.015E+00 NOT IDENT.
I-129        9.429E-02      1.448E-01      1.509E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.8133				
29.62	0.0000				
27.34	0.8784				
29.62	3.6923				
35.49	1.9087				
39.58	3.0566				

VAX/VMS Nuclide Identification Report Generated 27-SEP-2016 17:20:52.82

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235012.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY6.CNF;215
Background date    : 25-SEP-2016 12:23:20
Sample date        : 10-DEC-2015 11:25:00 Acquisition date : 27-SEP-2016 16:20:09
Sample ID          : I405235012 Sample quantity      : 2.74000E+00 GRAM
Detector name      : XRAY6 Detector geometry      : I129
Elapsed live time  : 0 01:00:00.00 Elapsed real time: 0 01:00:00.07 0.0%
Energy tolerance   : 1.00000 keV Analyst Initials    : MJH1
Abundance limit    : 75.00000 Sensitivity       : 3.00000
Batch ID           : 1598618 Detector SN#       :
Matrix Spike ID    : 1470-K LCS ID                  : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235012.CNF;1
* Acquisition date   : 27-SEP-2016 16:20:09 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.07 Half life ratio  : *****
* Sample date        : 10-DEC-2015 11:25:00 Analyst initials: MJH1
* Sample ID          : I405235012 Sample Quantity : 2.7400E+00 GRAM
* Batch Number       : 1598618 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	3.958E+00		3.614E+00	1.090E+01	NOT IDENT.
I-129	1.310E-01		1.608E-01	5.208E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235012

Page : 2
Acquisition date : 27-SEP-2016 16:20:09

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235012

Page : 3
Acquisition date : 27-SEP-2016 16:20:09

None

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235012.CNF;1 *
* Acquisition date : 27-SEP-2016 16:20:09 Sensitivity : 3.000 *
* Detector ID : XRAY6 Energy tolerance: 1.000 *
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 01:00:00.07 Half life ratio : ***** *
* Sample date : 10-DEC-2015 11:25:00 Nuclide Library : IODINE *
* Sample ID : I405235012 Analyst initials: MJH1 *
* Batch Number : 1598618 Sample Quantity : 2.7400E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 26-JAN-2016 10:07:09 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 4.290E+00 NOT IDENT.
I-129 1.909E-01 NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235012.CNF;1
* Acquisition date   : 27-SEP-2016 16:20:09 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.07 Half life ratio  : *****
* Sample date        : 10-DEC-2015 11:25:00 Nuclide Library : IODINE
* Sample ID          : I405235012 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity : 2.7400E+00 GRAM
*                   : Quantity Err(%) : 3.6496E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
---------	-------------------------	---------------------------	---------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
I-125	3.958E+00	3.631E+00	4.046E+00	NOT IDENT.
I-129	1.310E-01	1.613E-01	1.718E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.0000				
29.62	0.0000				
27.34	0.0000				
29.62	0.7722				
35.49	2.3717				
39.58	0.8284				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 07:07:14.72

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235013.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY2.CNF;379
Background date    : 25-SEP-2016 12:22:59
Sample date        : 8-DEC-2015 11:23:00. Acquisition date : 28-SEP-2016 06:36:49
Sample ID          : I405235013. Sample quantity : 2.77000E+00 GRAM
Detector name      : XRAY2. Detector geometry: I129
Elapsed live time  : 0 00:30:00.00. Elapsed real time: 0 00:30:00.10 0.0%
Energy tolerance  : 1.00000 keV. Analyst Initials : MJH1
Abundance limit   : 75.00000. Sensitivity : 3.00000
Batch ID          : 1598618. Detector SN# :
Matrix Spike ID   : 1470-K. LCS ID : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235013.CNF;1
* Acquisition date   : 28-SEP-2016 06:36:49 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.10 Half life ratio  : *****
* Sample date        : 8-DEC-2015 11:23:00 Analyst initials: MJH1
* Sample ID          : I405235013 Sample Quantity : 2.7700E+00 GRAM
* Batch Number       : 1598618 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
```

CALIBRATION INFORMATION

```
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	1.949E+00		9.129E+00	2.085E+01	NOT IDENT.
I-129	4.713E-02		3.193E-01	7.175E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235013

Page : 2
Acquisition date : 28-SEP-2016 06:36:49

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235013

Page : 3
Acquisition date : 28-SEP-2016 06:36:49

None

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235013.CNF;1
* Acquisition date   : 28-SEP-2016 06:36:49 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.10 Half life ratio  : *****
* Sample date        : 8-DEC-2015 11:23:00 Nuclide Library : IODINE
* Sample ID          : I405235013 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.7700E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File           : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	8.145E+00	NOT IDENT.
I-129	2.780E-01	NOT IDENT.


```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235013.CNF;1
* Acquisition date   : 28-SEP-2016 06:36:49 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.10 Half life ratio  : *****
* Sample date        : 8-DEC-2015 11:23:00 Nuclide Library : IODINE
* Sample ID          : I405235013 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.7700E+00 GRAM
*                   : Quantity Err(%) : 3.6101E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        1.949E+00      9.136E+00      9.178E+00 NOT IDENT.
I-129        4.713E-02      3.193E-01      3.201E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	3.1557				
29.62	3.2110				
27.34	2.1618				
29.62	4.4030				
35.49	4.4587				
39.58	2.2868				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 07:15:47.60

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235014.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY4.CNF;433
Background date    : 25-SEP-2016 12:23:10
Sample date        : 8-DEC-2015 10:49:00. Acquisition date : 28-SEP-2016 06:45:16
Sample ID          : I405235014. Sample quantity : 2.92000E+00 GRAM
Detector name      : XRAY4. Detector geometry: I129
Elapsed live time  : 0 00:30:00.00. Elapsed real time: 0 00:30:00.10 0.0%
Energy tolerance  : 1.00000 keV. Analyst Initials : MJH1
Abundance limit   : 75.00000. Sensitivity : 3.00000
Batch ID          : 1598618. Detector SN# :
Matrix Spike ID   : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	14.62	13	2	0.34	72.50	69	7	7.43E-03	31.8	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235014.CNF;1
* Acquisition date   : 28-SEP-2016 06:45:16 Sensitivity      : 3.000
* Detector ID       : XRAY4 Energy tolerance: 1.000
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:30:00.10 Half life ratio : *****
* Sample date      : 8-DEC-2015 10:49:00 Analyst initials: MJH1
* Sample ID       : I405235014 Sample Quantity : 2.9200E+00 GRAM
* Batch Number    : 1598618 Carrier Weight : 0.00000
* Recovery        : 1.00000 Standard Weight : 0.00000
* Nuclide Library : IODINE.NLB;1
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	---------------------	--------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)	
I-125	3.275E+00		3.791E+00		1.209E+01	NOT IDENT.
I-129	-8.457E-02		2.980E-01		5.919E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	14.62	13	2	0.34	72.50	69	7	7.43E-03	31.8	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235014

Page : 2
Acquisition date : 28-SEP-2016 06:45:16

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235014

Page : 3
Acquisition date : 28-SEP-2016 06:45:16

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	14.62	13	2	0.34	72.50	69	7	7.43E-03	63.6	6.25E-01	

Flags: "T" = Tentatively associated


```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235014.CNF;1
* Acquisition date   : 28-SEP-2016 06:45:16 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.10 Half life ratio  : *****
* Sample date        : 8-DEC-2015 10:49:00 Nuclide Library : IODINE
* Sample ID          : I405235014 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.9200E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	4.499E+00	NOT IDENT.
I-129	2.097E-01	NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235014.CNF;1
* Acquisition date   : 28-SEP-2016 06:45:16 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.10 Half life ratio  : *****
* Sample date        : 8-DEC-2015 10:49:00 Nuclide Library : IODINE
* Sample ID          : I405235014 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.9200E+00 GRAM
*                    : Quantity Err(%) : 3.4247E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                    : Standard Weight  : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        3.275E+00      3.834E+00      4.108E+00 NOT IDENT.
I-129        -8.457E-02      2.981E-01      3.005E-01 NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.0000				
29.62	3.3266				
27.34	1.1221				
29.62	2.2941				
35.49	6.9868				
39.58	0.0000				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 07:18:50.73

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235015.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY6.CNF;215
Background date  : 25-SEP-2016 12:23:20
Sample date     : 8-DEC-2015 10:56:00. Acquisition date : 28-SEP-2016 06:48:23
Sample ID      : I405235015. Sample quantity : 3.13000E+00 GRAM
Detector name   : XRAY6. Detector geometry: I129
Elapsed live time: 0 00:30:00.00. Elapsed real time: 0 00:30:00.04 0.0%
Energy tolerance: 1.00000 keV. Analyst Initials : MJH1
Abundance limit : 75.00000. Sensitivity : 3.00000
Batch ID       : 1598618. Detector SN# :
Matrix Spike ID : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	87.30	6	0	0.57	436.00	433	6	3.33E-03	40.8	
2	0	295.19	6	0	0.40	1476.17	1472	8	3.33E-03	40.8	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235015.CNF;1
* Acquisition date   : 28-SEP-2016 06:48:23 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.04 Half life ratio  : *****
* Sample date        : 8-DEC-2015 10:56:00 Analyst initials: MJH1
* Sample ID          : I405235015 Sample Quantity : 3.1300E+00 GRAM
* Batch Number       : 1598618 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	---------------------	--------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)	
I-125	1.442E+00		2.931E+00		1.116E+01	NOT IDENT.
I-129	0.000E+00		1.764E-01		2.438E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	87.30	6	0	0.57	436.00	433	6	3.33E-03	40.8	
2	0	295.19	6	0	0.40	1476.17	1472	8	3.33E-03	40.8	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235015

Page : 2
Acquisition date : 28-SEP-2016 06:48:23

Total number of lines in spectrum 2
Number of unidentified lines 2
Number of lines tentatively identified by NID 0 0.00%
**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235015

Page : 3
Acquisition date : 28-SEP-2016 06:48:23

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	87.30	6	0	0.57	436.00	433	6	3.33E-03	81.6	6.01E-01	
0	295.19	6	0	0.40	1476.17	1472	8	3.33E-03	81.6	2.29E-06	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235015.CNF;1
* Acquisition date   : 28-SEP-2016 06:48:23 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.04 Half life ratio  : *****
* Sample date        : 8-DEC-2015 10:56:00 Nuclide Library : IODINE
* Sample ID          : I405235015 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 3.1300E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	3.479E+00	NOT IDENT.
I-129	0.000E+00	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235015.CNF;1
* Acquisition date   : 28-SEP-2016 06:48:23 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.04 Half life ratio  : *****
* Sample date        : 8-DEC-2015 10:56:00 Nuclide Library : IODINE
* Sample ID          : I405235015 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 3.1300E+00 GRAM
*                   : Quantity Err(%) : 3.1949E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        1.442E+00      2.934E+00      3.005E+00  NOT IDENT.
I-129        0.000E+00      0.000E+00      0.000E+00  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.0000				
29.62	0.0000				
27.34	1.4921				
29.62	0.0000				
35.49	0.0000				
39.58	0.0000				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 07:26:02.09

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235016.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY5.CNF;58
Background date    : 25-SEP-2016 12:23:15
Sample date       : 8-DEC-2015 11:29:00. Acquisition date : 28-SEP-2016 06:55:30
Sample ID        : I405235016. Sample quantity : 2.85000E+00 GRAM
Detector name    : XRAY5. Detector geometry: I129
Elapsed live time: 0 00:30:00.00. Elapsed real time: 0 00:30:00.03 0.0%
Energy tolerance : 1.00000 keV. Analyst Initials : MJH1
Abundance limit  : 75.00000. Sensitivity : 3.00000
Batch ID        : 1598618. Detector SN# :
Matrix Spike ID : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	92.55*	7	0	0.55	460.50	456	9	3.73E-03	58.1	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235016.CNF;1
* Acquisition date   : 28-SEP-2016 06:55:30 Sensitivity      : 3.000
* Detector ID       : XRAY5 Energy tolerance: 1.000
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:30:00.03 Half life ratio : *****
* Sample date       : 8-DEC-2015 11:29:00 Analyst initials: MJH1
* Sample ID         : I405235016 Sample Quantity : 2.8500E+00 GRAM
* Batch Number      : 1598618 Carrier Weight : 0.00000
* Recovery          : 1.00000 Standard Weight : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	---------------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	4.138E+00	8.276E+00	2.197E+01	NOT IDENT.
I-129	3.359E-02	1.167E-01	5.628E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	92.55	14	0	0.55	460.50	456	9	7.78E-03	26.7	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235016

Page : 2
Acquisition date : 28-SEP-2016 06:55:30

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235016

Page : 3
Acquisition date : 28-SEP-2016 06:55:30

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	92.55	7	0	0.55	460.50	456	9	3.73E-03	****	3.61E-01	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235016.CNF;1 *
* Acquisition date : 28-SEP-2016 06:55:30 Sensitivity : 3.000 *
* Detector ID : XRAY5 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.03 Half life ratio : ***** *
* Sample date : 8-DEC-2015 11:29:00 Nuclide Library : IODINE *
* Sample ID : I405235016 Analyst initials: MJH1 *
* Batch Number : 1598618 Sample Quantity : 2.8500E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 30-AUG-2016 11:41:11 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 8.477E+00 NOT IDENT.
I-129 1.385E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235016.CNF;1
* Acquisition date   : 28-SEP-2016 06:55:30 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.03 Half life ratio  : *****
* Sample date        : 8-DEC-2015 11:29:00 Nuclide Library : IODINE
* Sample ID          : I405235016 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.8500E+00 GRAM
*                   : Quantity Err(%) : 3.5088E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        4.138E+00      8.308E+00      8.515E+00 NOT IDENT.
I-129        3.359E-02      1.167E-01      1.177E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	1.6265				
29.62	0.0000				
27.34	0.0000				
29.62	0.9231				
35.49	0.9543				
39.58	1.0189				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 07:53:55.37

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235017.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY2.CNF;379
Background date : 25-SEP-2016 12:22:59
Sample date     : 2-DEC-2015 10:02:00. Acquisition date : 28-SEP-2016 07:22:16
Sample ID      : I405235017. Sample quantity : 2.33000E+00 GRAM
Detector name  : XRAY2. Detector geometry: I129
Elapsed live time: 0 00:30:00.00. Elapsed real time: 0 00:30:00.11 0.0%
Energy tolerance : 1.00000 keV. Analyst Initials : MJH1
Abundance limit : 75.00000. Sensitivity : 3.00000
Batch ID       : 1598618. Detector SN# :
Matrix Spike ID : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	20.58	14	5	1.35	101.91	95	11	7.51E-03	43.2	
2	0	29.78	6	0	0.57	148.00	145	6	3.33E-03	40.8	
3	0	34.84	6	0	0.38	173.33	170	6	3.33E-03	40.8	
4	0	115.20	9	0	1.79	575.67	569	13	5.00E-03	33.3	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*                               *                                               *
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235017.CNF;1  *
* Acquisition date   : 28-SEP-2016 07:22:16 Sensitivity      : 3.000          *
* Detector ID       : XRAY2 Energy tolerance: 1.000         *
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000   *
* Elapsed real time : 0 00:30:00.11 Half life ratio : ***** *
* Sample date       : 2-DEC-2015 10:02:00 Analyst initials: MJH1   *
* Sample ID         : I405235017 Sample Quantity : 2.3300E+00 GRAM *
* Batch Number      : 1598618 Carrier Weight : 0.00000        *
* Recovery          : 1.00000 Standard Weight : 0.00000        *
* Nuclide Library   : IODINE.NLB;1                                           *
*****
*                               CALIBRATION INFORMATION                          *
*                               *                                               *
* Eff. Cal. date    : 27-JUL-2016 12:15:07 Eff. Geometry   : I129      *
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15      *
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
I-129	4.128E-01	3.303E-01	6.757E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-3.109E+00	1.290E+01	2.538E+01	FAIL ABUN

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	20.58	14	5	1.35	101.91	95	11	7.51E-03	43.2	
2	0	29.78	6	0	0.57	148.00	145	6	3.33E-03	40.8	
3	0	34.84	6	0	0.38	173.33	170	6	3.33E-03	40.8	
4	0	92.88	7	5	0.65	463.93	457	9	3.98E-03	65.6	
5	0	115.20	9	0	1.79	575.67	569	13	5.00E-03	33.3	

Nuclide Line Activity Report

Nuclide Type: FISSION

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
I-129	29.62	6	56.60*	1.655E+01	4.128E-01	4.128E-01	81.65
	33.59	-----	10.04	2.487E+01	-----	Line Not Found	-----
	39.58	-----	7.51	1.767E+01	-----	Line Not Found	-----

Flag: "*" = Keyline

Total number of lines in spectrum 4
Number of unidentified lines 2
Number of lines tentatively identified by NID 2 50.00%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
I-129	1.57E+07Y	1.00	4.128E-01	4.128E-01	3.370E-01	81.65	
Total Activity :			4.128E-01	4.128E-01			

Grand Total Activity : 4.128E-01 4.128E-01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	20.58	14	5	1.35	101.91	95	11	7.51E-03	86.4	1.30E-01	
0	34.84	6	0	0.38	173.33	170	6	3.33E-03	81.6	2.52E+01	T
0	115.20	9	0	1.79	575.67	569	13	5.00E-03	66.7	5.83E-13	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235017.CNF;1
* Acquisition date   : 28-SEP-2016 07:22:16 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.11 Half life ratio  : *****
* Sample date        : 2-DEC-2015 10:02:00 Nuclide Library : IODINE
* Sample ID          : I405235017 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.3300E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
I-129	2.417E-01

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
I-125	9.779E+00 FAIL ABUN

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235017.CNF;1
* Acquisition date   : 28-SEP-2016 07:22:16 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.11 Half life ratio  : *****
* Sample date        : 2-DEC-2015 10:02:00 Nuclide Library : IODINE
* Sample ID          : I405235017 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.3300E+00 GRAM
*                    : Quantity Err(%) : 4.2918E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                    : Standard Weight  : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
I-129	4.128E-01	3.327E-01	3.327E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
I-125	-3.109E+00	1.291E+01	1.298E+01	FAIL ABUN

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	5.2595				
29.62	2.1407				
27.34	1.6213				
29.62	0.0000				
35.49	1.6720				
39.58	2.2868				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 07:55:07.51

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235018.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY4.CNF;433
Background date    : 25-SEP-2016 12:23:10
Sample date       : 2-DEC-2015 10:19:00. Acquisition date : 28-SEP-2016 07:22:56
Sample ID        : I405235018. Sample quantity : 2.76000E+00 GRAM
Detector name    : XRAY4. Detector geometry: I129
Elapsed live time: 0 00:30:00.00. Elapsed real time: 0 00:30:00.08 0.0%
Energy tolerance : 1.00000 keV. Analyst Initials : MJH1
Abundance limit  : 75.00000. Sensitivity : 3.00000
Batch ID         : 1598618. Detector SN# :
Matrix Spike ID  : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	10.11*	6	1	0.58	49.91	48	5	3.22E-03	60.7	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235018.CNF;1
* Acquisition date   : 28-SEP-2016 07:22:56 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.08 Half life ratio  : *****
* Sample date        : 2-DEC-2015 10:19:00 Analyst initials: MJH1
* Sample ID          : I405235018 Sample Quantity : 2.7600E+00 GRAM
* Batch Number       : 1598618 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	3.773E+00		4.336E+00	1.380E+01	NOT IDENT.
I-129	-2.368E-01		3.781E-01	6.299E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	10.11	9	1	0.58	49.91	48	5	5.06E-03	37.4	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235018

Page : 2
Acquisition date : 28-SEP-2016 07:22:56

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235018

Page : 3
Acquisition date : 28-SEP-2016 07:22:56

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	10.11	6	1	0.58	49.91	48	5	3.22E-03	****	1.65E-02	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235018.CNF;1 *
* Acquisition date : 28-SEP-2016 07:22:56 Sensitivity : 3.000 *
* Detector ID : XRAY4 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.08 Half life ratio : ***** *
* Sample date : 2-DEC-2015 10:19:00 Nuclide Library : IODINE *
* Sample ID : I405235018 Analyst initials: MJH1 *
* Batch Number : 1598618 Sample Quantity : 2.7600E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 17-JUN-2016 08:18:14 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 5.146E+00 NOT IDENT.
I-129 2.237E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235018.CNF;1
* Acquisition date   : 28-SEP-2016 07:22:56 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.08 Half life ratio  : *****
* Sample date        : 2-DEC-2015 10:19:00 Nuclide Library : IODINE
* Sample ID          : I405235018 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity : 2.7600E+00 GRAM
*                   : Quantity Err(%) : 3.6232E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        3.773E+00      4.386E+00      4.704E+00  NOT IDENT.
I-129        -2.368E-01      3.788E-01      3.936E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.0000				
29.62	5.5444				
27.34	1.1221				
29.62	2.2941				
35.49	0.0000				
39.58	1.2005				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 07:55:32.95

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235019.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY6.CNF;215
Background date    : 25-SEP-2016 12:23:20
Sample date        : 8-DEC-2015 14:30:00. Acquisition date : 28-SEP-2016 07:23:18
Sample ID          : I405235019. Sample quantity : 2.56000E+00 GRAM
Detector name      : XRAY6. Detector geometry: I129
Elapsed live time  : 0 00:30:00.00. Elapsed real time: 0 00:30:00.03 0.0%
Energy tolerance  : 1.00000 keV. Analyst Initials : MJH1
Abundance limit   : 75.00000. Sensitivity : 3.00000
Batch ID          : 1598618. Detector SN# :
Matrix Spike ID   : 1470-K. LCS ID : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found


```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235019.CNF;1
* Acquisition date   : 28-SEP-2016 07:23:18 Sensitivity      : 3.000
* Detector ID       : XRAY6 Energy tolerance: 1.000
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:30:00.03 Half life ratio  : *****
* Sample date      : 8-DEC-2015 14:30:00 Analyst initials: MJH1
* Sample ID       : I405235019 Sample Quantity : 2.5600E+00 GRAM
* Batch Number    : 1598618 Carrier Weight  : 0.00000
* Recovery       : 1.00000 Standard Weight : 0.00000
* Nuclide Library : IODINE.NLB;1
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	---------------------	--------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)	
I-125	0.000E+00		3.711E+00		5.131E+00	NOT IDENT.
I-129	1.518E-01		2.533E-01		8.990E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235019

Page : 2
Acquisition date : 28-SEP-2016 07:23:18

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235019

Page : 3
Acquisition date : 28-SEP-2016 07:23:18

None

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235019.CNF;1 *
* Acquisition date : 28-SEP-2016 07:23:18 Sensitivity : 3.000 *
* Detector ID : XRAY6 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.03 Half life ratio : ***** *
* Sample date : 8-DEC-2015 14:30:00 Nuclide Library : IODINE *
* Sample ID : I405235019 Analyst initials: MJH1 *
* Batch Number : 1598618 Sample Quantity : 2.5600E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 26-JAN-2016 10:07:09 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 0.000E+00 NOT IDENT.
I-129 3.006E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235019.CNF;1
* Acquisition date   : 28-SEP-2016 07:23:18 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.03 Half life ratio  : *****
* Sample date        : 8-DEC-2015 14:30:00 Nuclide Library : IODINE
* Sample ID          : I405235019 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.5600E+00 GRAM
*                   : Quantity Err(%) : 3.9063E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity          Act Error          TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
              Activity          K.L Act error      TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)
I-125        0.000E+00          0.000E+00          0.000E+00  NOT IDENT.
I-129        1.518E-01          2.537E-01          2.628E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.0000				
29.62	0.0000				
27.34	0.0000				
29.62	1.5445				
35.49	0.7906				
39.58	2.4852				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 07:57:57.75

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235020.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY5.CNF;58
Background date    : 25-SEP-2016 12:23:15
Sample date        : 8-DEC-2015 13:50:00. Acquisition date : 28-SEP-2016 07:27:31
Sample ID          : I405235020. Sample quantity : 2.97000E+00 GRAM
Detector name      : XRAY5. Detector geometry: I129
Elapsed live time  : 0 00:30:00.00. Elapsed real time: 0 00:30:00.03 0.0%
Energy tolerance  : 1.00000 keV. Analyst Initials : MJH1
Abundance limit   : 75.00000. Sensitivity : 3.00000
Batch ID          : 1598618. Detector SN# :
Matrix Spike ID   : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.22*	10	0	0.63	314.46	310	10	5.38E-03	38.1	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235020.CNF;1
* Acquisition date   : 28-SEP-2016 07:27:31 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.03 Half life ratio  : *****
* Sample date        : 8-DEC-2015 13:50:00 Analyst initials: MJH1
* Sample ID          : I405235020 Sample Quantity : 2.9700E+00 GRAM
* Batch Number       : 1598618 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	---------------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	3.322E-01	4.494E+00	1.309E+01	NOT IDENT.
I-129	5.711E-02	2.909E-01	8.351E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.22	13	0	0.63	314.46	310	10	7.22E-03	27.7	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235020

Page : 2
Acquisition date : 28-SEP-2016 07:27:31

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235020

Page : 3
Acquisition date : 28-SEP-2016 07:27:31

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	63.22	10	0	0.63	314.46	310	10	5.38E-03	76.2	3.22E+00	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235020.CNF;1 *
* Acquisition date : 28-SEP-2016 07:27:31 Sensitivity : 3.000 *
* Detector ID : XRAY5 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.03 Half life ratio : ***** *
* Sample date : 8-DEC-2015 13:50:00 Nuclide Library : IODINE *
* Sample ID : I405235020 Analyst initials: MJH1 *
* Batch Number : 1598618 Sample Quantity : 2.9700E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 30-AUG-2016 11:41:11 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 4.138E+00 NOT IDENT.
I-129 2.805E-01 NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235020.CNF;1
* Acquisition date   : 28-SEP-2016 07:27:31 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.03 Half life ratio  : *****
* Sample date        : 8-DEC-2015 13:50:00 Nuclide Library : IODINE
* Sample ID          : I405235020 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity : 2.9700E+00 GRAM
*                   : Quantity Err(%) : 3.3670E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
```

CALIBRATION INFORMATION

```
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```
---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
```

```
---- Non-Identified Nuclides ----
Nuclide      Key-Line
              Activity      K.L Act error      TPU
              (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        3.322E-01      4.494E+00      4.497E+00 NOT IDENT.
I-129        5.711E-02      2.910E-01      2.921E-01 NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.8133				
29.62	0.8547				
27.34	0.0000				
29.62	0.0000				
35.49	1.9087				
39.58	2.0378				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 08:09:57.73

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627430.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY1.CNF;415
Background date    : 25-SEP-2016 12:22:54
Sample date        : 26-SEP-2016 00:00:00 Acquisition date : 28-SEP-2016 07:39:35
Sample ID          : I1203627430 Sample quantity      : 3.34000E+00 GRAM
Detector name      : XRAY1 Detector geometry       : I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.14 0.0%
Energy tolerance   : 1.00000 keV Analyst Initials    : MJH1
Abundance limit    : 75.00000 Sensitivity        : 3.00000
Batch ID           : 1598618 Detector SN#       :
Matrix Spike ID    : 1470-K LCS ID                  : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627430.CNF;1
* Acquisition date   : 28-SEP-2016 07:39:35 Sensitivity      : 3.000
* Detector ID       : XRAY1 Energy tolerance: 1.000
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:30:00.14 Half life ratio : *****
* Sample date       : 26-SEP-2016 00:00:00 Analyst initials: MJH1
* Sample ID         : I1203627430 Sample Quantity : 3.3400E+00 GRAM
* Batch Number      : 1598618 Carrier Weight : 0.00000
* Recovery          : 1.00000 Standard Weight : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 9-JUN-2016 11:39:23 Eff. Geometry     : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-7.411E-02		1.016E-01	1.473E-01	NOT IDENT.
I-129	-1.098E-02		1.731E-01	3.935E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I1203627430

Page : 2
Acquisition date : 28-SEP-2016 07:39:35

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I1203627430

Page : 3
Acquisition date : 28-SEP-2016 07:39:35

None

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627430.CNF;1 *
* Acquisition date : 28-SEP-2016 07:39:35 Sensitivity : 3.000 *
* Detector ID : XRAY1 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.14 Half life ratio : ***** *
* Sample date : 26-SEP-2016 00:00:00 Nuclide Library : IODINE *
* Sample ID : I1203627430 Analyst initials: MJH1 *
* Batch Number : 1598618 Sample Quantity : 3.3400E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 4.734E-02 NOT IDENT.
I-129 1.478E-01 NOT IDENT.


```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627430.CNF;1
* Acquisition date   : 28-SEP-2016 07:39:35 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.14 Half life ratio  : *****
* Sample date        : 26-SEP-2016 00:00:00 Nuclide Library : IODINE
* Sample ID          : I1203627430 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity : 3.3400E+00 GRAM
*                   : Quantity Err(%) : 2.9940E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
I-125        -7.411E-02      1.025E-01      1.078E-01  NOT IDENT.
I-129        -1.098E-02      1.731E-01      1.732E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	4.9062				
29.62	3.3927				
27.34	1.7312				
29.62	0.8985				
35.49	0.9215				
39.58	3.8759				

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627431.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY2.CNF;379
Background date    : 25-SEP-2016 12:22:59
Sample date       : 10-DEC-2015 14:20:00 Acquisition date : 28-SEP-2016 08:03:53
Sample ID        : I1203627431 Sample quantity : 2.50000E+00 GRAM
Detector name    : XRAY2 Detector geometry: I129
Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:00.08 0.0%
Energy tolerance : 1.00000 keV Analyst Initials : MJH1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1598618 Detector SN# :
Matrix Spike ID : 1470-K LCS ID : 1470-K
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	16.37*	10	6	0.58	80.86	76	11	5.78E-03	61.0	
2	0	61.41	5	4	0.29	306.33	300	8	2.78E-03	82.5	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627431.CNF;1
* Acquisition date   : 28-SEP-2016 08:03:53 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.08 Half life ratio  : *****
* Sample date        : 10-DEC-2015 14:20:00 Analyst initials: MJH1
* Sample ID          : I1203627431 Sample Quantity : 2.5000E+00 GRAM
* Batch Number       : 1598618 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	1.190E+00		9.544E+00	2.149E+01	NOT IDENT.
I-129	8.699E-02		3.661E-01	8.341E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	16.37	18	6	0.58	80.86	76	11	9.72E-03	35.3	
2	0	61.41	5	4	0.29	306.33	300	8	2.78E-03	82.5	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I1203627431

Page : 2
Acquisition date : 28-SEP-2016 08:03:53

Total number of lines in spectrum	2	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I1203627431

Page : 3
Acquisition date : 28-SEP-2016 08:03:53

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	16.37	10	6	0.58	80.86	76	11	5.78E-03	****	3.43E-04	
0	61.41	5	4	0.29	306.33	300	8	2.78E-03	****	3.66E-02	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627431.CNF;1 *
* Acquisition date : 28-SEP-2016 08:03:53 Sensitivity : 3.000 *
* Detector ID : XRAY2 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.08 Half life ratio : ***** *
* Sample date : 10-DEC-2015 14:20:00 Nuclide Library : IODINE *
* Sample ID : I1203627431 Analyst initials: MJH1 *
* Batch Number : 1598618 Sample Quantity : 2.5000E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 27-JUL-2016 12:15:07 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 8.280E+00 NOT IDENT.
I-129 3.276E-01 NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627431.CNF;1 *
 * Acquisition date : 28-SEP-2016 08:03:53 Sensitivity : 3.000 *
 * Detector ID : XRAY2 Energy tolerance: 1.000 *
 * Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 00:30:00.08 Half life ratio : ***** *
 * Sample date : 10-DEC-2015 14:20:00 Nuclide Library : IODINE *
 * Sample ID : I1203627431 Analyst initials: MJH1 *
 * Batch Number : 1598618 Sample Quantity : 2.5000E+00 GRAM *
 * Quantity Err(%) : 4.0000E-03 % *
 * Recovery : 1.00000 Carrier Weight : 0.00000 *
 * Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 27-JUL-2016 12:15:07 Eff. Geometry : I129 *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
---------	-------------------------	---------------------------	---------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
I-125	1.190E+00	9.546E+00	9.561E+00	NOT IDENT.
I-129	8.699E-02	3.662E-01	3.683E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	3.1557				
29.62	3.2110				
27.34	3.2426				
29.62	4.4030				
35.49	7.8027				
39.58	5.7170				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 08:34:51.76

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627432.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY4.CNF;433
Background date  : 25-SEP-2016 12:23:10
Sample date      : 10-DEC-2015 14:20:00 Acquisition date : 28-SEP-2016 08:04:20
Sample ID        : I1203627432 Sample quantity : 2.56000E+00 GRAM
Detector name    : XRAY4 Detector geometry: I129
Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:00.10 0.0%
Energy tolerance : 1.00000 keV Analyst Initials : MJH1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID         : 1598618 Detector SN# :
Matrix Spike ID  : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	16.82*	9	7	0.57	83.56	78	10	4.98E-03	70.8	
2	4	28.53	12	7	0.48	142.22	131	24	6.47E-03	52.3	1.13E+00
3	4	29.68	179	7	0.65	147.98	131	24	9.95E-02	8.5	
4	6	33.43	38	0	0.81	166.76	164	12	2.11E-02	17.3	3.06E+00
5	6	34.39	25	0	0.69	171.59	164	12	1.42E-02	30.7	
6	0	39.62	24	2	0.29	197.79	194	8	1.33E-02	22.9	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627432.CNF;1
* Acquisition date   : 28-SEP-2016 08:04:20 Sensitivity      : 3.000
* Detector ID       : XRAY4 Energy tolerance: 1.000
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:30:00.10 Half life ratio : 8.000
* Sample date       : 10-DEC-2015 14:20:00 Analyst initials: MJH1
* Sample ID         : I1203627432 Sample Quantity : 2.5600E+00 GRAM
* Batch Number      : 1598618 Carrier Weight : 0.00000
* Recovery          : 1.00000 Standard Weight : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
I-129	1.298E+01	2.163E+00	9.931E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	1.537E+01		1.206E+01	2.819E+01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	16.82	13	7	0.57	83.56	78	10	6.97E-03	49.6	
2	4	28.53	12	7	0.48	142.22	131	24	6.47E-03	52.3	1.13E+00
3	4	29.68	179	7	0.65	147.98	131	24	9.95E-02	8.5	
4	6	33.43	38	0	0.81	166.76	164	12	2.11E-02	17.3	3.06E+00
5	6	34.39	25	0	0.69	171.59	164	12	1.42E-02	30.7	
6	0	39.62	24	2	0.29	197.79	194	8	1.33E-02	22.9	

Nuclide Line Activity Report

Nuclide Type: FISSION

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	1-Sigma %Error
I-129	29.62	179	56.60*	1.430E+01	1.298E+01	1.298E+01	8.50
	33.59	38	10.04	1.621E+01	1.369E+01	1.369E+01	17.26
	39.58	24	7.51	1.618E+01	1.153E+01	1.153E+01	22.93

Flag: "*" = Keyline

Total number of lines in spectrum 6
Number of unidentified lines 3
Number of lines tentatively identified by NID 3 50.00%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 1-Sigma Error	1-Sigma %Error	Flags
I-129	1.57E+07Y	1.00	1.298E+01	1.298E+01	0.110E+01	8.50	
Total Activity :			1.298E+01	1.298E+01			

Grand Total Activity : 1.298E+01 1.298E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I1203627432

Page : 3
Acquisition date : 28-SEP-2016 08:04:20

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	16.82	9	7	0.57	83.56	78	10	4.98E-03	70.8	1.67E+00	
4	28.53	12	7	0.48	142.22	131	24	6.47E-03	52.3	1.34E+01	
6	34.39	25	0	0.69	171.59	164	12	1.42E-02	30.7	1.65E+01	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627432.CNF;1
* Acquisition date   : 28-SEP-2016 08:04:20 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.10 Half life ratio  : 8.000
* Sample date        : 10-DEC-2015 14:20:00 Nuclide Library : IODINE
* Sample ID          : I1203627432 Analyst initials: MJH1
* Batch Number       : 1598618 Sample Quantity  : 2.5600E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
I-129	3.983E-01

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
I-125	1.238E+01 NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627432.CNF;1 *
 * Acquisition date : 28-SEP-2016 08:04:20 Sensitivity : 3.000 *
 * Detector ID : XRAY4 Energy tolerance: 1.000 *
 * Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 00:30:00.10 Half life ratio : 8.000 *
 * Sample date : 10-DEC-2015 14:20:00 Nuclide Library : IODINE *
 * Sample ID : I1203627432 Analyst initials: MJH1 *
 * Batch Number : 1598618 Sample Quantity : 2.5600E+00 GRAM *
 * Quantity Err(%) : 3.9063E-03 % *
 * Recovery : 1.00000 Carrier Weight : 0.00000 *
 * Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 17-JUN-2016 08:18:14 Eff. Geometry : I129 *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
I-129	1.298E+01	2.517E+00	2.517E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)
I-125	1.537E+01	1.235E+01	1.416E+01 NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	5.4288				
29.62	5.5444				
27.34	5.0495				
29.62	3.4411				
35.49	6.9868				
39.58	3.6015				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 08:42:37.28

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627433.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY1.CNF;415
Background date    : 25-SEP-2016 12:22:54
Sample date       : 26-SEP-2016 00:00:00 Acquisition date : 28-SEP-2016 08:11:05
Sample ID        : I1203627433 Sample quantity   : 3.34000E+00 GRAM
Detector name    : XRAY1 Detector geometry: I129
Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:00.14 0.0%
Energy tolerance : 1.00000 keV Analyst Initials  : MJH1
Abundance limit  : 75.00000 Sensitivity   : 3.00000
Batch ID         : 1598618 Detector SN#   :
Matrix Spike ID  : 1470-K LCS ID       : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	29.75	291	33	0.60	149.23	145	12	1.62E-01	7.3	
2	0	33.71	90	3	0.48	169.18	164	12	4.98E-02	11.3	
3	0	39.54	49	0	0.80	198.55	193	13	2.72E-02	14.3	

Flag: "*" = Peak area was modified by background subtraction

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
```

DETECTOR AND SAMPLE DATA

```
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627433.CNF;1
* Acquisition date   : 28-SEP-2016 08:11:05 Sensitivity      : 3.000
* Detector ID       : XRAY1 Energy tolerance: 1.000
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:30:00.14 Half life ratio : *****
* Sample date       : 26-SEP-2016 00:00:00 Analyst initials: MJH1
* Sample ID         : I1203627433 Sample Quantity : 3.3400E+00 GRAM
* Batch Number      : 1598618 Carrier Weight : 0.00000
* Recovery          : 1.00000 Standard Weight : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
```

CALIBRATION INFORMATION

```
* Eff. Cal. date    : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
I-129	1.051E+01	1.500E+00	9.173E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-5.238E-02		3.087E-01	5.310E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	29.75	291	33	0.60	149.23	145	12	1.62E-01	7.3	
2	0	33.71	90	3	0.48	169.18	164	12	4.98E-02	11.3	
3	0	39.54	49	0	0.80	198.55	193	13	2.72E-02	14.3	

Nuclide Line Activity Report

Nuclide Type: FISSION

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
I-129	29.62	291	56.60*	2.202E+01	1.051E+01	1.051E+01	14.56
	33.59	90	10.04	2.304E+01	1.741E+01	1.741E+01	22.54
	39.58	49	7.51	2.289E+01	1.281E+01	1.281E+01	28.57

Flag: "*" = Keyline

Total number of lines in spectrum 3
 Number of unidentified lines 0
 Number of lines tentatively identified by NID 3 100.00%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
I-129	1.57E+07Y	1.00	1.051E+01	1.051E+01	0.153E+01	14.56	
Total Activity :			1.051E+01	1.051E+01			

Grand Total Activity : 1.051E+01 1.051E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I1203627433

Page : 3
Acquisition date : 28-SEP-2016 08:11:05

None

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627433.CNF;1 *
* Acquisition date : 28-SEP-2016 08:11:05 Sensitivity : 3.000 *
* Detector ID : XRAY1 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.14 Half life ratio : ***** *
* Sample date : 26-SEP-2016 00:00:00 Nuclide Library : IODINE *
* Sample ID : I1203627433 Analyst initials: MJH1 *
* Batch Number : 1598618 Sample Quantity : 3.3400E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide Lc
(pCi/GRAM)
I-129 4.099E-01

---- Non-Identified Nuclides ----

Nuclide Lc
(pCi/GRAM)
I-125 2.393E-01 NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627433.CNF;1 *
 * Acquisition date : 28-SEP-2016 08:11:05 Sensitivity : 3.000 *
 * Detector ID : XRAY1 Energy tolerance: 1.000 *
 * Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 00:30:00.14 Half life ratio : ***** *
 * Sample date : 26-SEP-2016 00:00:00 Nuclide Library : IODINE *
 * Sample ID : I1203627433 Analyst initials: MJH1 *
 * Batch Number : 1598618 Sample Quantity : 3.3400E+00 GRAM *
 * Quantity Err(%) : 2.9940E-03 % *
 * Recovery : 1.00000 Carrier Weight : 0.00000 *
 * Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
I-129	1.051E+01	1.820E+00	1.820E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)
I-125	-5.238E-02	3.089E-01	3.098E-01 NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	30.6637				
29.62	23.7490				
27.34	10.3875				
29.62	8.0864				
35.49	9.6757				
39.58	3.8759				

09/29/16

Batch# 1598620 Product: I-129 / MJWC Date: 09/29/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			n/a
Samples have been blank corrected (if required). Blank correction reported included (if required).			n/a
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			n/a
Method blank is less than the RDL/ LLD. (If rad samples. < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	DER 1562566
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			n/a
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.	✓		
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)	✓		
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER 1562566
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		
Aliquot Correction completed if required.	✓		n/a BW 9/29/16
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: JJ 9/29/16

Secondary Review Performed By: B. Wells 9/29/16

DATA EXCEPTION REPORT

Mo.Day Yr. 29-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GAMMA SPECTROMETER	Test / Method: DOE EML HASL-300,I-01 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1598620	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>Sample received out of holding:</p> <p>405235 021,022,023,024,025,026,027,028,029, 030,031,032,033,034,035,036,037,038, 039,040</p> <p>QC 1203627438DUP,1203627439MS</p>		<p>Samples were analyzed in a timely manner upon receipt. Reporting results.</p>	

Originator's Name:
Spencer Collins 29-SEP-16

Data Validator/Group Leader:
Bryan Williams 29-SEP-16


I-129 Queue Sheet

09/14/2016

Batch #: 1598620 Analyst: MJH1 First Client Due Date: 10/04/2016 Internal Due Date: 09/30/2016
 Spike Isotope: I-129 Spike Code: 1470-K Expiration Date: 3-30-17 Vol: 0.1 mL Nominal Concentration: NA
 LCS Isotope: I-129 LCS Code: 1470-K Expiration Date: 3-30-17 Vol: 0.1 mL Nominal Concentration: NA
 Prep Date: 9-26-16 Initials: MSH Pipette ID: 1429303 Witness: NA Balance: 17955156
1843592

Sample ID	Client Description	Type	Hazard Code	RDL	Client	Matrix	Weight (g)	Collect Date	Aliquot (mL or g)	Detector
405235021-1	4.2B.R.2.3	SAMPLE		1 pCi/g	MJWC001	SOIL	3.94	08-DEC-15 14:17 B1	3.24	X1 NF
405235022-1	4.2B.R.1.3	SAMPLE		1 pCi/g	MJWC001	SOIL	3.13	08-DEC-15 13:43 B2	2.60	X2 NF
405235023-1	4.2B.R.11.2	SAMPLE		1 pCi/g	MJWC001	SOIL	4.18	02-DEC-15 10:40 B3	3.24	X4 NF
405235024-1	4.2B.R.2.2	SAMPLE		1 pCi/g	MJWC001	SOIL	3.12	08-DEC-15 14:13 B4	2.60	X5 NF
405235025-1	4.2B.R.1.2	SAMPLE		1 pCi/g	MJWC001	SOIL	3.00	08-DEC-15 13:38 B5	2.36	X6 NF
405235026-1	4.2C.R.1.3	SAMPLE		1 pCi/g	MJWC001	SOIL	3.05	08-DEC-15 10:15 B6	2.54	X1 NF
405235027-1	4.2C.R.1.4	SAMPLE		1 pCi/g	MJWC001	SOIL	3.63	08-DEC-15 10:19 B7	2.97	X2 NF
405235028-1	4.3.A.R.1.3	SAMPLE		1 pCi/g	MJWC001	SOIL	3.38	23-NOV-15 14:50 B8	2.61	X4 NF
405235029-1	4.3.B.R.1.3	SAMPLE		1 pCi/g	MJWC001	SOIL	3.47	23-NOV-15 11:10 B9	2.80	X5 NF
405235030-1	4.5.A.R.2.3	SAMPLE		1 pCi/g	MJWC001	SOIL	3.42	23-NOV-15 14:44 B10	2.60	X6 NF
405235031-1	4.3.B.R.19.2	SAMPLE		1 pCi/g	MJWC001	SOIL	3.57	26-NOV-15 14:25 B11	2.76	X1 NF
405235032-1	4.3B.R.3.3	SAMPLE		1 pCi/g	MJWC001	SOIL	3.59	23-NOV-15 11:48 B12	2.86	X2 NF
405235033-1	4.3B.R.3.4	SAMPLE		1 pCi/g	MJWC001	SOIL	4.05	23-NOV-15 11:53 B13	3.29	X4 NF
405235034-1	4.3.B.R.1.4	SAMPLE		1 pCi/g	MJWC001	SOIL	3.10	23-NOV-15 11:20 B14	2.98	X5 NF
405235035-1	4.3B.R.2.3	SAMPLE		1 pCi/g	MJWC001	SOIL	3.42	23-NOV-15 11:06 B15	2.80	X6 NF
405235036-1	4.3B.R.2.4	SAMPLE		1 pCi/g	MJWC001	SOIL	3.24	23-NOV-15 11:12 B16	2.67	X1 NF
405235037-1	4.4C.R.2.4	SAMPLE		1 pCi/g	MJWC001	SOIL	3.03	30-NOV-15 11:19 B17	2.64	X2 NF
405235038-1	4.4C.R.1.3	SAMPLE		1 pCi/g	MJWC001	SOIL	3.37	30-NOV-15 10:40 B18	2.82	X4 NF
405235039-1	4.4C.R.1.4	SAMPLE		1 pCi/g	MJWC001	SOIL	3.47	30-NOV-15 10:43 B19	3.17	X5 NF
405235040-1	4.4D.R.1.3	SAMPLE		1 pCi/g	MJWC001	SOIL	4.15	30-NOV-15 13:23 B20	3.54	X6 NF
1203627437-1	MB for batch 1598620	MB		1 pCi/g	QC.ACCOUNT	SOIL		9-26-16 B21	3.54	X1 MS
1203627438-1	4.2B.R.2.3(405235021DUP)	DUP		1 pCi/g	QC.ACCOUNT	SOIL	4.01	08-DEC-15 14:17 B22	3.55	X2 MS
1203627439-1	4.2B.R.2.3(405235021MS)	MS		1 pCi/g	QC.ACCOUNT	SOIL	3.52	08-DEC-15 14:17 B23	2.94	X4 MS
1203627440-1	LCS for batch 1598620	LCS		1 pCi/g	QC.ACCOUNT	SOIL		9-26-16 B24	3.54	X5 MS

Data Reviewed By:  9/29/16



Weight/Loss Aliquot Correction Report



Select What to Correct Aliquot to

Ash Dry Weight Dry Weight Wet Weight

Submit

Batch ID: 1598620

Calculate Corrected Aliquot

Aliquot Correction to Dry Weight for Batch 1598620

Sample Id	Aliquot (G)	Sample Type	Parent Sample Id	Loss (Dec)	Corrected Aliquot (G)
405235021	3.94	SAMPLE	NA	.1654	3.288179268289706
405235022	3.23	SAMPLE	NA	.1937	2.6041876287213626
405235023	4.18	SAMPLE	NA	.2255	3.2373361221501779
405235024	3.22	SAMPLE	NA	.1939	2.5953211168275629
405235025	3.00	SAMPLE	NA	.2138	2.3583584707324863
405235026	3.05	SAMPLE	NA	.1664	2.542323751273092
405235027	3.63	SAMPLE	NA	.1816	2.9707806555972556
405235028	3.38	SAMPLE	NA	.2267	2.613558900318237
405235029	3.47	SAMPLE	NA	.1932	2.79956391512922
405235030	3.42	SAMPLE	NA	.2389	2.602888768270461
405235031	3.57	SAMPLE	NA	.2258	2.7638436867904583
405235032	3.59	SAMPLE	NA	.2036	2.8587411379283867
405235033	4.00	SAMPLE	NA	.1762	3.294888818763806
405235034	3.70	SAMPLE	NA	.1956	2.9761179290658006
405235035	3.42	SAMPLE	NA	.1626	2.8636093783609379
405235036	3.24	SAMPLE	NA	.1769	2.6665871086005017
405235037	3.03	SAMPLE	NA	.0623	2.841216180207582
405235038	3.37	SAMPLE	NA	.1634	2.819070473085432
405235039	3.47	SAMPLE	NA	.0869	3.1682391257910689
405235040	4.15	SAMPLE	NA	.1478	3.536328075496036
1203627437		MB	NA	NA	
1203627438	4.01	DUP	405235021	.1654	3.346598696914142
1203627439	3.52	MS	405235021	.1654	2.9376626965430876
1203627440		LCS	NA	NA	

GEL Laboratories LLC

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 09:23:56.34

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235021.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY1.CNF;415
Background date    : 25-SEP-2016 12:22:54
Sample date        : 8-DEC-2015 14:17:00. Acquisition date : 28-SEP-2016 08:45:02
Sample ID          : I405235021. Sample quantity : 3.29000E+00 GRAM
Detector name      : XRAY1. Detector geometry: I129
Elapsed live time  : 0 00:38:04.89. Elapsed real time: 0 00:38:05.06 0.0%
Energy tolerance  : 1.00000 keV. Analyst Initials : MJH1
Abundance limit   : 75.00000. Sensitivity : 3.00000
Batch ID          : 1598620. Detector SN# :
Matrix Spike ID   : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	59.10	7	0	0.54	297.14	294	6	3.06E-03	37.8	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235021.CNF;1
* Acquisition date   : 28-SEP-2016 08:45:02 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:38:04.89 Abundance limit : 75.000
* Elapsed real time  : 0 00:38:05.06 Half life ratio  : *****
* Sample date        : 8-DEC-2015 14:17:00 Analyst initials: MJH1
* Sample ID          : I405235021 Sample Quantity : 3.2900E+00 GRAM
* Batch Number       : 1598620 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	---------------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	1.235E+00	4.824E+00	9.388E+00	NOT IDENT.
I-129	5.697E-02	2.039E-01	4.564E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	59.10	7	0	0.54	297.14	294	6	3.06E-03	37.8	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235021

Page : 2
Acquisition date : 28-SEP-2016 08:45:02

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235021

Page : 3
Acquisition date : 28-SEP-2016 08:45:02

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	59.10	7	0	0.54	297.14	294	6	3.06E-03	75.6	1.63E+01	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235021.CNF;1 *
* Acquisition date : 28-SEP-2016 08:45:02 Sensitivity : 3.000 *
* Detector ID : XRAY1 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:38:04.89 Abundance limit : 75.000 *
* Elapsed real time: 0 00:38:05.06 Half life ratio : ***** *
* Sample date : 8-DEC-2015 14:17:00 Nuclide Library : IODINE *
* Sample ID : I405235021 Analyst initials: MJH1 *
* Batch Number : 1598620 Sample Quantity : 3.2900E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 4.057E+00 NOT IDENT.
I-129 1.892E-01 NOT IDENT.


```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235021.CNF;1
* Acquisition date   : 28-SEP-2016 08:45:02 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:38:04.89 Abundance limit : 75.000
* Elapsed real time  : 0 00:38:05.06 Half life ratio  : *****
* Sample date        : 8-DEC-2015 14:17:00 Nuclide Library : IODINE
* Sample ID          : I405235021 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity  : 3.2900E+00 GRAM
*                   : Quantity Err(%) : 3.0395E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
```

CALIBRATION INFORMATION

```
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```
---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
```

```
---- Non-Identified Nuclides ----
Nuclide      Key-Line
              Activity      K.L Act error      TPU
              (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        1.235E+00      4.828E+00      4.860E+00 NOT IDENT.
I-129        5.697E-02      2.040E-01      2.056E-01 NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	11.0389				
29.62	5.9373				
27.34	6.0593				
29.62	6.2894				
35.49	5.5290				
39.58	0.9690				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 09:24:19.03

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235022.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY2.CNF;379
Background date : 25-SEP-2016 12:22:59
Sample date     : 8-DEC-2015 13:43:00. Acquisition date : 28-SEP-2016 08:45:25
Sample ID      : I405235022. Sample quantity : 2.60000E+00 GRAM
Detector name  : XRAY2. Detector geometry: I129
Elapsed live time: 0 00:37:43.11. Elapsed real time: 0 00:37:43.26 0.0%
Energy tolerance : 1.00000 keV. Analyst Initials : MJH1
Abundance limit : 75.00000. Sensitivity : 3.00000
Batch ID       : 1598620. Detector SN# :
Matrix Spike ID : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	6.24	27	50	0.49	30.14	28	6	1.20E-02	47.6	
2	0	72.18	6	2	0.48	360.25	356	7	2.76E-03	53.2	
3	0	82.04	8	2	0.53	409.63	406	8	3.71E-03	44.5	
4	0	92.46*	9	4	0.71	461.84	455	14	3.99E-03	68.1	
5	0	132.97	9	0	0.33	664.67	658	12	3.98E-03	33.3	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235022.CNF;1
* Acquisition date   : 28-SEP-2016 08:45:25 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:37:43.11 Abundance limit : 75.000
* Elapsed real time  : 0 00:37:43.26 Half life ratio : *****
* Sample date        : 8-DEC-2015 13:43:00 Analyst initials: MJH1
* Sample ID          : I405235022 Sample Quantity : 2.6000E+00 GRAM
* Batch Number       : 1598620 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	8.869E+00		9.085E+00	2.302E+01	NOT IDENT.
I-129	1.625E-01		3.115E-01	7.337E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	6.24	27	50	0.49	30.14	28	6	1.20E-02	47.6	
2	0	72.18	6	2	0.48	360.25	356	7	2.76E-03	53.2	
3	0	82.04	8	2	0.53	409.63	406	8	3.71E-03	44.5	
4	0	92.46	19	4	0.71	461.84	455	14	8.61E-03	30.5	
5	0	132.97	9	0	0.33	664.67	658	12	3.98E-03	33.3	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235022

Page : 2
Acquisition date : 28-SEP-2016 08:45:25

Total number of lines in spectrum	5	
Number of unidentified lines	5	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	6.24	27	50	0.49	30.14	28	6	1.20E-02	95.3	2.66E-30	
0	72.18	6	2	0.48	360.25	356	7	2.76E-03	****	4.60E-04	
0	82.04	8	2	0.53	409.63	406	8	3.71E-03	89.1	5.78E-06	
0	92.46	9	4	0.71	461.84	455	14	3.99E-03	****	4.36E-08	
0	132.97	9	0	0.33	664.67	658	12	3.98E-03	66.7	6.43E-17	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235022.CNF;1 *
* Acquisition date : 28-SEP-2016 08:45:25 Sensitivity : 3.000 *
* Detector ID : XRAY2 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:37:43.11 Abundance limit : 75.000 *
* Elapsed real time: 0 00:37:43.26 Half life ratio : ***** *
* Sample date : 8-DEC-2015 13:43:00 Nuclide Library : IODINE *
* Sample ID : I405235022 Analyst initials: MJH1 *
* Batch Number : 1598620 Sample Quantity : 2.6000E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 27-JUL-2016 12:15:07 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide Lc
(pCi/GRAM)

---- Non-Identified Nuclides ----

Nuclide Lc
(pCi/GRAM)

I-125 9.582E+00 NOT IDENT.
I-129 2.984E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235022.CNF;1
* Acquisition date   : 28-SEP-2016 08:45:25 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:37:43.11 Abundance limit : 75.000
* Elapsed real time  : 0 00:37:43.26 Half life ratio  : *****
* Sample date        : 8-DEC-2015 13:43:00 Nuclide Library : IODINE
* Sample ID          : I405235022 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity  : 2.6000E+00 GRAM
*                   : Quantity Err(%) : 3.8462E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        8.869E+00      9.217E+00      1.005E+01  NOT IDENT.
I-129        1.625E-01      3.120E-01      3.205E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	2.1038				
29.62	3.2110				
27.34	3.2426				
29.62	2.2015				
35.49	2.2293				
39.58	2.2868				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 09:24:42.35

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235023.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY4.CNF;433
Background date    : 25-SEP-2016 12:23:10
Sample date       : 2-DEC-2015 10:40:00. Acquisition date : 28-SEP-2016 08:45:52
Sample ID        : I405235023      Sample quantity  : 3.24000E+00 GRAM
Detector name    : XRAY4           Detector geometry: I129
Elapsed live time: 0 00:37:20.59   Elapsed real time: 0 00:37:20.71  0.0%
Energy tolerance : 1.00000 keV     Analyst Initials  : MJH1
Abundance limit  : 75.00000        Sensitivity       : 3.00000
Batch ID         : 1598620         Detector SN#      :
Matrix Spike ID  : 1470-K         LCS ID           : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235023.CNF;1
* Acquisition date   : 28-SEP-2016 08:45:52 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:37:20.59 Abundance limit : 75.000
* Elapsed real time  : 0 00:37:20.71 Half life ratio  : *****
* Sample date        : 2-DEC-2015 10:40:00 Analyst initials: MJH1
* Sample ID          : I405235023 Sample Quantity : 3.2400E+00 GRAM
* Batch Number       : 1598620 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-6.749E+00		5.000E+00	2.406E+00	NOT IDENT.
I-129	5.620E-02		2.196E-01	5.229E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235023

Page : 2
Acquisition date : 28-SEP-2016 08:45:52

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235023

Page : 3
Acquisition date : 28-SEP-2016 08:45:52

None

Flags: "T" = Tentatively associated

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 09:25:06.50

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235024.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY5.CNF;58
Background date   : 25-SEP-2016 12:23:15
Sample date       : 8-DEC-2015 14:13:00. Acquisition date : 28-SEP-2016 08:46:16
Sample ID         : I405235024. Sample quantity : 2.60000E+00 GRAM
Detector name     : XRAY5. Detector geometry: I129
Elapsed live time: 0 00:36:58.84. Elapsed real time: 0 00:36:58.88 0.0%
Energy tolerance : 1.00000 keV. Analyst Initials : MJH1
Abundance limit  : 75.00000. Sensitivity : 3.00000
Batch ID         : 1598620. Detector SN# :
Matrix Spike ID  : 1470-K. LCS ID : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235024.CNF;1
* Acquisition date   : 28-SEP-2016 08:46:16 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:36:58.84 Abundance limit : 75.000
* Elapsed real time  : 0 00:36:58.88 Half life ratio  : *****
* Sample date        : 8-DEC-2015 14:13:00 Analyst initials: MJH1
* Sample ID          : I405235024 Sample Quantity : 2.6000E+00 GRAM
* Batch Number       : 1598620 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	3.080E-01		4.166E+00	1.214E+01	NOT IDENT.
I-129	-2.406E-01		2.722E-01	2.542E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235024

Page : 2
Acquisition date : 28-SEP-2016 08:46:16

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235024

Page : 3
Acquisition date : 28-SEP-2016 08:46:16

None

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235024.CNF;1 *
* Acquisition date : 28-SEP-2016 08:46:16 Sensitivity : 3.000 *
* Detector ID : XRAY5 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:36:58.84 Abundance limit : 75.000 *
* Elapsed real time: 0 00:36:58.88 Half life ratio : ***** *
* Sample date : 8-DEC-2015 14:13:00 Nuclide Library : IODINE *
* Sample ID : I405235024 Analyst initials: MJH1 *
* Batch Number : 1598620 Sample Quantity : 2.6000E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 30-AUG-2016 11:41:11 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 3.836E+00 NOT IDENT.
I-129 0.000E+00 NOT IDENT.


```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235024.CNF;1
* Acquisition date   : 28-SEP-2016 08:46:16 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:36:58.84 Abundance limit : 75.000
* Elapsed real time  : 0 00:36:58.88 Half life ratio  : *****
* Sample date        : 8-DEC-2015 14:13:00 Nuclide Library : IODINE
* Sample ID          : I405235024 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity  : 2.6000E+00 GRAM
*                    : Quantity Err(%) : 3.8462E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                    : Standard Weight  : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
              Activity      K.L Act error      TPU
              (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        3.080E-01      4.167E+00      4.169E+00 NOT IDENT.
I-129        -2.406E-01      2.733E-01      2.940E-01 NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.8133				
29.62	2.5641				
27.34	1.7568				
29.62	0.9231				
35.49	0.0000				
39.58	2.0378				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 09:25:34.51

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235025.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY6.CNF;215
Background date    : 25-SEP-2016 12:23:20
Sample date        : 8-DEC-2015 13:38:00. Acquisition date : 28-SEP-2016 08:46:38
Sample ID          : I405235025      Sample quantity   : 2.36000E+00 GRAM
Detector name      : XRAY6           Detector geometry  : I129
Elapsed live time  : 0 00:36:39.40   Elapsed real time  : 0 00:36:39.44  0.0%
Energy tolerance   : 1.00000 keV     Analyst Initials   : MJH1
Abundance limit    : 75.00000        Sensitivity        : 3.00000
Batch ID           : 1598620         Detector SN#       :
Matrix Spike ID    : 1470-K          LCS ID            : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235025.CNF;1
* Acquisition date   : 28-SEP-2016 08:46:38 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:36:39.40 Abundance limit : 75.000
* Elapsed real time  : 0 00:36:39.44 Half life ratio  : *****
* Sample date        : 8-DEC-2015 13:38:00 Analyst initials: MJH1
* Sample ID          : I405235025 Sample Quantity : 2.3600E+00 GRAM
* Batch Number       : 1598620 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	---------------------	--------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)	
I-125	3.082E+00		4.463E+00		1.515E+01	NOT IDENT.
I-129	2.049E-01		2.772E-01		9.224E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235025

Page : 2
Acquisition date : 28-SEP-2016 08:46:38

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235025

Page : 3
Acquisition date : 28-SEP-2016 08:46:38

None

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235025.CNF;1 *
* Acquisition date : 28-SEP-2016 08:46:38 Sensitivity : 3.000 *
* Detector ID : XRAY6 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:36:39.40 Abundance limit : 75.000 *
* Elapsed real time: 0 00:36:39.44 Half life ratio : ***** *
* Sample date : 8-DEC-2015 13:38:00 Nuclide Library : IODINE *
* Sample ID : I405235025 Analyst initials: MJH1 *
* Batch Number : 1598620 Sample Quantity : 2.3600E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 26-JAN-2016 10:07:09 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 5.298E+00 NOT IDENT.
I-129 3.291E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235025.CNF;1
* Acquisition date   : 28-SEP-2016 08:46:38 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:36:39.40 Abundance limit : 75.000
* Elapsed real time  : 0 00:36:39.44 Half life ratio  : *****
* Sample date        : 8-DEC-2015 13:38:00 Nuclide Library : IODINE
* Sample ID          : I405235025 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity : 2.3600E+00 GRAM
*                   : Quantity Err(%) : 4.2373E-03 %
* Recovery           : 1.00000 Carrier Weight  : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
              Activity      K.L Act error      TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
I-125        3.082E+00      4.472E+00      4.683E+00 NOT IDENT.
I-129        2.049E-01      2.780E-01      2.929E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.0000				
29.62	0.0000				
27.34	0.0000				
29.62	2.3167				
35.49	0.0000				
39.58	0.8284				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 10:15:42.48

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235026.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY1.CNF;415
Background date    : 25-SEP-2016 12:22:54
Sample date        : 8-DEC-2015 10:15:00. Acquisition date : 28-SEP-2016 09:28:33
Sample ID          : I405235026. Sample quantity : 2.54000E+00 GRAM
Detector name      : XRAY1. Detector geometry: I129
Elapsed live time  : 0 00:46:46.72. Elapsed real time: 0 00:46:46.92 0.0%
Energy tolerance  : 1.00000 keV. Analyst Initials : MJH1
Abundance limit   : 75.00000. Sensitivity : 3.00000
Batch ID          : 1598620. Detector SN# :
Matrix Spike ID   : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	95.02	6	0	0.39	478.17	474	8	2.14E-03	40.8	
2	0	120.45	3	10	0.30	606.33	598	10	1.07E-03	205.5	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235026.CNF;1
* Acquisition date   : 28-SEP-2016 09:28:33 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:46:46.72 Abundance limit : 75.000
* Elapsed real time  : 0 00:46:46.92 Half life ratio  : *****
* Sample date        : 8-DEC-2015 10:15:00 Analyst initials: MJH1
* Sample ID          : I405235026 Sample Quantity : 2.5400E+00 GRAM
* Batch Number       : 1598620 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	---------------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	7.436E-01	3.805E+00	7.756E+00	NOT IDENT.
I-129	2.314E-02	1.752E-01	3.996E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	95.02	6	0	0.39	478.17	474	8	2.14E-03	40.8	
2	0	120.45	3	10	0.30	606.33	598	10	1.07E-03	205.5	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235026

Page : 2
Acquisition date : 28-SEP-2016 09:28:33

Total number of lines in spectrum	2	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235026

Page : 3
Acquisition date : 28-SEP-2016 09:28:33

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	95.02	6	0	0.39	478.17	474	8	2.14E-03	81.6	5.50E+00	
0	120.45	3	10	0.30	606.33	598	10	1.07E-03	****	2.27E+00	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235026.CNF;1 *
* Acquisition date : 28-SEP-2016 09:28:33 Sensitivity : 3.000 *
* Detector ID : XRAY1 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:46:46.72 Abundance limit : 75.000 *
* Elapsed real time: 0 00:46:46.92 Half life ratio : ***** *
* Sample date : 8-DEC-2015 10:15:00 Nuclide Library : IODINE *
* Sample ID : I405235026 Analyst initials: MJH1 *
* Batch Number : 1598620 Sample Quantity : 2.5400E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide Lc
(pCi/GRAM)

---- Non-Identified Nuclides ----

Nuclide Lc
(pCi/GRAM)

I-125 3.204E+00 NOT IDENT.
I-129 1.586E-01 NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235026.CNF;1
* Acquisition date   : 28-SEP-2016 09:28:33 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:46:46.72 Abundance limit : 75.000
* Elapsed real time  : 0 00:46:46.92 Half life ratio  : *****
* Sample date        : 8-DEC-2015 10:15:00 Nuclide Library : IODINE
* Sample ID          : I405235026 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity : 2.5400E+00 GRAM
*                    : Quantity Err(%) : 3.9370E-03 %
* Recovery           : 1.00000 Carrier Weight  : 0.00000
*                    : Standard Weight : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 9-JUN-2016 11:39:23 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        7.436E-01      3.807E+00      3.822E+00 NOT IDENT.
I-129        2.314E-02      1.752E-01      1.755E-01 NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	6.1327				
29.62	4.2409				
27.34	6.0593				
29.62	4.4924				
35.49	4.6075				
39.58	4.8449				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 10:16:06.11

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235027.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY2.CNF;379
Background date : 25-SEP-2016 12:22:59
Sample date     : 8-DEC-2015 10:19:00. Acquisition date : 28-SEP-2016 09:28:55
Sample ID      : I405235027. Sample quantity : 2.97000E+00 GRAM
Detector name  : XRAY2. Detector geometry: I129
Elapsed live time: 0 00:46:24.90. Elapsed real time: 0 00:46:25.06 0.0%
Energy tolerance : 1.00000 keV. Analyst Initials : MJH1
Abundance limit : 75.00000. Sensitivity : 3.00000
Batch ID       : 1598620. Detector SN# :
Matrix Spike ID : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	54.20	6	7	0.71	270.24	263	9	2.31E-03	82.7	
2	0	87.03	9	3	0.99	434.61	430	10	3.28E-03	46.8	
3	0	92.83*	9	3	0.82	463.68	458	11	3.41E-03	63.7	
4	0	126.22	9	0	0.40	630.89	625	12	3.23E-03	33.3	
5	0	129.38	9	3	0.35	646.72	639	13	3.19E-03	53.5	
6	0	144.07	11	0	0.56	720.27	716	10	3.95E-03	30.2	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235027.CNF;1
* Acquisition date   : 28-SEP-2016 09:28:55 Sensitivity      : 3.000
* Detector ID       : XRAY2 Energy tolerance: 1.000
* Elapsed live time : 0 00:46:24.90 Abundance limit : 75.000
* Elapsed real time : 0 00:46:25.06 Half life ratio : *****
* Sample date       : 8-DEC-2015 10:19:00 Analyst initials: MJH1
* Sample ID         : I405235027 Sample Quantity : 2.9700E+00 GRAM
* Batch Number      : 1598620 Carrier Weight : 0.00000
* Recovery          : 1.00000 Standard Weight : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-5.286E-02		7.746E+00	1.557E+01	NOT IDENT.
I-129	4.226E-02		2.471E-01	5.254E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	13.90	5	27	0.31	68.47	61	10	1.78E-03	202.6	
2	0	54.20	6	7	0.71	270.24	263	9	2.31E-03	82.7	
3	0	87.03	9	3	0.99	434.61	430	10	3.28E-03	46.8	
4	0	92.83	22	3	0.82	463.68	458	11	8.02E-03	25.5	
5	0	126.22	9	0	0.40	630.89	625	12	3.23E-03	33.3	
6	0	129.38	9	3	0.35	646.72	639	13	3.19E-03	53.5	
7	0	144.07	11	0	0.56	720.27	716	10	3.95E-03	30.2	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235027

Page : 2
Acquisition date : 28-SEP-2016 09:28:55

Total number of lines in spectrum	6	
Number of unidentified lines	6	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	54.20	6	7	0.71	270.24	263	9	2.31E-03	****	4.79E-01	
0	87.03	9	3	0.99	434.61	430	10	3.28E-03	93.6	5.73E-07	
0	92.83	9	3	0.82	463.68	458	11	3.41E-03	****	3.66E-08	
0	126.22	9	0	0.40	630.89	625	12	3.23E-03	66.7	2.10E-15	
0	129.38	9	3	0.35	646.72	639	13	3.19E-03	****	4.11E-16	
0	144.07	11	0	0.56	720.27	716	10	3.95E-03	60.3	1.97E-19	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235027.CNF;1
* Acquisition date   : 28-SEP-2016 09:28:55 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:46:24.90 Abundance limit : 75.000
* Elapsed real time  : 0 00:46:25.06 Half life ratio  : *****
* Sample date        : 8-DEC-2015 10:19:00 Nuclide Library : IODINE
* Sample ID          : I405235027 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity : 2.9700E+00 GRAM
* Recovery           : 1.00000 Carrier Weight  : 0.00000
*                   Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	6.407E+00	NOT IDENT.
I-129	2.140E-01	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235027.CNF;1
* Acquisition date   : 28-SEP-2016 09:28:55 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:46:24.90 Abundance limit : 75.000
* Elapsed real time  : 0 00:46:25.06 Half life ratio  : *****
* Sample date        : 8-DEC-2015 10:19:00 Nuclide Library : IODINE
* Sample ID          : I405235027 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity : 2.9700E+00 GRAM
*                   : Quantity Err(%) : 3.3670E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
              Activity      K.L Act error      TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
I-125        -5.286E-02      7.746E+00      7.746E+00 NOT IDENT.
I-129        4.226E-02      2.471E-01      2.478E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	7.3633				
29.62	5.3517				
27.34	2.1618				
29.62	3.3023				
35.49	2.2293				
39.58	3.4302				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 10:16:29.09

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235028.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY4.CNF;433
Background date    : 25-SEP-2016 12:23:10
Sample date       : 23-NOV-2015 14:50:00 Acquisition date : 28-SEP-2016 09:29:20
Sample ID        : I405235028 Sample quantity : 2.61000E+00 GRAM
Detector name    : XRAY4 Detector geometry: I129
Elapsed live time: 0 00:46:04.82 Elapsed real time: 0 00:46:04.97 0.0%
Energy tolerance : 1.00000 keV Analyst Initials : MJH1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1598620 Detector SN# :
Matrix Spike ID : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	35.56	7	4	0.60	177.46	173	7	2.35E-03	61.8	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235028.CNF;1
* Acquisition date   : 28-SEP-2016 09:29:20 Sensitivity      : 3.000
* Detector ID       : XRAY4 Energy tolerance: 1.000
* Elapsed live time : 0 00:46:04.82 Abundance limit : 75.000
* Elapsed real time : 0 00:46:04.97 Half life ratio : *****
* Sample date       : 23-NOV-2015 14:50:00 Analyst initials: MJH1
* Sample ID         : I405235028 Sample Quantity : 2.6100E+00 GRAM
* Batch Number      : 1598620 Carrier Weight : 0.00000
* Recovery          : 1.00000 Standard Weight : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	---------------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	2.708E+00	4.341E+00	1.169E+01	FAIL ABUN
I-129	-2.110E-01	2.433E-01	3.417E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	35.56	7	4	0.60	177.46	173	7	2.35E-03	61.8	
2	0	92.73	5	7	0.22	463.91	460	6	1.73E-03	100.6	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235028

Page : 2
Acquisition date : 28-SEP-2016 09:29:20

Total number of lines in spectrum	1	
Number of unidentified lines	0	
Number of lines tentatively identified by NID	1	100.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235028

Page : 3
Acquisition date : 28-SEP-2016 09:29:20

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	35.56	7	4	0.60	177.46	173	7	2.35E-03	****	1.66E+01	T

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235028.CNF;1
* Acquisition date   : 28-SEP-2016 09:29:20 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:46:04.82 Abundance limit : 75.000
* Elapsed real time  : 0 00:46:04.97 Half life ratio  : *****
* Sample date        : 23-NOV-2015 14:50:00 Nuclide Library : IODINE
* Sample ID          : I405235028 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity : 2.6100E+00 GRAM
* Recovery           : 1.00000 Carrier Weight  : 0.00000
*                               Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	4.504E+00	FAIL ABUN
I-129	1.080E-01	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235028.CNF;1
* Acquisition date   : 28-SEP-2016 09:29:20 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:46:04.82 Abundance limit : 75.000
* Elapsed real time  : 0 00:46:04.97 Half life ratio  : *****
* Sample date        : 23-NOV-2015 14:50:00 Nuclide Library : IODINE
* Sample ID          : I405235028 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity : 2.6100E+00 GRAM
*                   : Quantity Err(%) : 3.8314E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        2.708E+00      4.366E+00      4.534E+00  FAIL ABUN
I-129        -2.110E-01      2.442E-01      2.621E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	1.0858				
29.62	5.5444				
27.34	4.4884				
29.62	1.1470				
35.49	1.1645				
39.58	3.6015				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 10:16:52.26

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235029.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY5.CNF;58
Background date    : 25-SEP-2016 12:23:15
Sample date        : 23-NOV-2015 11:10:00 Acquisition date : 28-SEP-2016 09:29:56
Sample ID          : I405235029 Sample quantity : 2.80000E+00 GRAM
Detector name      : XRAY5 Detector geometry: I129
Elapsed live time  : 0 00:45:30.43 Elapsed real time: 0 00:45:30.47 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials : MJH1
Abundance limit    : 75.00000 Sensitivity : 3.00000
Batch ID           : 1598620 Detector SN# :
Matrix Spike ID    : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.59*	1	4	0.56	316.31	310	8	2.83E-04	569.7	

Flag: "*" = Peak area was modified by background subtraction

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235029.CNF;1
* Acquisition date   : 28-SEP-2016 09:29:56 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:45:30.43 Abundance limit : 75.000
* Elapsed real time  : 0 00:45:30.47 Half life ratio  : *****
* Sample date        : 23-NOV-2015 11:10:00 Analyst initials: MJH1
* Sample ID          : I405235029 Sample Quantity : 2.8000E+00 GRAM
* Batch Number       : 1598620 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
```

CALIBRATION INFORMATION

```
*
* Eff. Cal. date    : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-4.832E+00		4.735E+00	4.025E+00	NOT IDENT.
I-129	-5.022E-02		2.177E-01	5.210E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.59	6	4	0.56	316.31	310	8	2.12E-03	73.1	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235029

Page : 2
Acquisition date : 28-SEP-2016 09:29:56

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235029

Page : 3
Acquisition date : 28-SEP-2016 09:29:56

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	63.59	1	4	0.56	316.31	310	8	2.83E-04	****	3.14E+00	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235029.CNF;1 *
* Acquisition date : 28-SEP-2016 09:29:56 Sensitivity : 3.000 *
* Detector ID : XRAY5 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:45:30.43 Abundance limit : 75.000 *
* Elapsed real time: 0 00:45:30.47 Half life ratio : ***** *
* Sample date : 23-NOV-2015 11:10:00 Nuclide Library : IODINE *
* Sample ID : I405235029 Analyst initials: MJH1 *
* Batch Number : 1598620 Sample Quantity : 2.8000E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 30-AUG-2016 11:41:11 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 0.000E+00 NOT IDENT.
I-129 1.647E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235029.CNF;1
* Acquisition date   : 28-SEP-2016 09:29:56 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:45:30.43 Abundance limit : 75.000
* Elapsed real time  : 0 00:45:30.47 Half life ratio  : *****
* Sample date        : 23-NOV-2015 11:10:00 Nuclide Library : IODINE
* Sample ID          : I405235029 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity : 2.8000E+00 GRAM
*                   : Quantity Err(%) : 3.5714E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
I-125        -4.832E+00      4.810E+00      5.280E+00 NOT IDENT.
I-129        -5.022E-02      2.177E-01      2.189E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	3.2531				
29.62	1.7094				
27.34	0.8784				
29.62	4.6154				
35.49	0.9543				
39.58	0.0000				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 10:17:15.32

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235030.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY6.CNF;215
Background date    : 25-SEP-2016 12:23:20
Sample date       : 23-NOV-2015 14:44:00 Acquisition date : 28-SEP-2016 09:30:21
Sample ID        : I405235030 Sample quantity : 2.60000E+00 GRAM
Detector name    : XRAY6 Detector geometry: I129
Elapsed live time: 0 00:45:07.66 Elapsed real time: 0 00:45:07.72 0.0%
Energy tolerance : 1.00000 keV Analyst Initials : MJH1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1598620 Detector SN# :
Matrix Spike ID  : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	7.43*	4	2	0.56	36.37	34	5	1.66E-03	81.4	
2	0	10.27	7	1	0.36	50.62	49	4	2.68E-03	41.4	

Flag: "*" = Peak area was modified by background subtraction


```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235030.CNF;1
* Acquisition date   : 28-SEP-2016 09:30:21 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:45:07.66 Abundance limit : 75.000
* Elapsed real time  : 0 00:45:07.72 Half life ratio  : *****
* Sample date        : 23-NOV-2015 14:44:00 Analyst initials: MJH1
* Sample ID          : I405235030 Sample Quantity : 2.6000E+00 GRAM
* Batch Number       : 1598620 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
```

CALIBRATION INFORMATION

```
*
* Eff. Cal. date    : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-2.092E+00		4.101E+00	4.005E+00	NOT IDENT.
I-129	-6.592E-02		2.316E-01	4.432E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	7.43	7	2	0.56	36.37	34	5	2.59E-03	49.7	
2	0	10.27	7	1	0.36	50.62	49	4	2.68E-03	41.4	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235030

Page : 2
Acquisition date : 28-SEP-2016 09:30:21

Total number of lines in spectrum	2	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235030

Page : 3
Acquisition date : 28-SEP-2016 09:30:21

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	7.43	4	2	0.56	36.37	34	5	1.66E-03	****	3.52E-03	
0	10.27	7	1	0.36	50.62	49	4	2.68E-03	82.8	7.10E-02	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235030.CNF;1 *
* Acquisition date : 28-SEP-2016 09:30:21 Sensitivity : 3.000 *
* Detector ID : XRAY6 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:45:07.66 Abundance limit : 75.000 *
* Elapsed real time: 0 00:45:07.72 Half life ratio : ***** *
* Sample date : 23-NOV-2015 14:44:00 Nuclide Library : IODINE *
* Sample ID : I405235030 Analyst initials: MJH1 *
* Batch Number : 1598620 Sample Quantity : 2.6000E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 26-JAN-2016 10:07:09 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

I-125 0.000E+00 NOT IDENT.
I-129 1.241E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235030.CNF;1
* Acquisition date   : 28-SEP-2016 09:30:21 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:45:07.66 Abundance limit : 75.000
* Elapsed real time  : 0 00:45:07.72 Half life ratio  : *****
* Sample date        : 23-NOV-2015 14:44:00 Nuclide Library : IODINE
* Sample ID          : I405235030 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity : 2.6000E+00 GRAM
*                   : Quantity Err(%) : 3.8462E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line      K.L Act error      TPU
             Activity      (1.96-sigma)      (1.96-sigma)
I-125        -2.092E+00      4.105E+00          4.212E+00  NOT IDENT.
I-129        -6.592E-02      2.317E-01          2.336E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	1.4157				
29.62	1.4643				
27.34	0.0000				
29.62	0.7722				
35.49	0.7906				
39.58	1.6568				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 10:48:30.25

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235031.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY1.CNF;415
Background date    : 25-SEP-2016 12:22:54
Sample date        : 26-NOV-2015 14:25:00 Acquisition date : 28-SEP-2016 10:17:59
Sample ID          : I405235031 Sample quantity      : 2.76000E+00 GRAM
Detector name      : XRAY1 Detector geometry       : I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.14 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials    : MJH1
Abundance limit   : 75.00000 Sensitivity       : 3.00000
Batch ID          : 1598620 Detector SN#      :
Matrix Spike ID   : 1470-K LCS ID                  : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	23.69	20	20	0.56	118.72	113	11	1.09E-02	53.0	

Flag: "*" = Peak area was modified by background subtraction

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235031.CNF;1
* Acquisition date   : 28-SEP-2016 10:17:59 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.14 Half life ratio  : *****
* Sample date        : 26-NOV-2015 14:25:00 Analyst initials: MJH1
* Sample ID          : I405235031 Sample Quantity : 2.7600E+00 GRAM
* Batch Number       : 1598620 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
```

CALIBRATION INFORMATION

```
*
* Eff. Cal. date    : 9-JUN-2016 11:39:23 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-9.311E-01		5.701E+00	1.077E+01	NOT IDENT.
I-129	0.000E+00		2.630E-01	5.775E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	23.69	20	20	0.56	118.72	113	11	1.09E-02	53.0	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235031

Page : 2
Acquisition date : 28-SEP-2016 10:17:59

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235031

Page : 3
Acquisition date : 28-SEP-2016 10:17:59

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	23.69	20	20	0.56	118.72	113	11	1.09E-02	****	1.80E+01	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235031.CNF;1 *
* Acquisition date : 28-SEP-2016 10:17:59 Sensitivity : 3.000 *
* Detector ID : XRAY1 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.14 Half life ratio : ***** *
* Sample date : 26-NOV-2015 14:25:00 Nuclide Library : IODINE *
* Sample ID : I405235031 Analyst initials: MJH1 *
* Batch Number : 1598620 Sample Quantity : 2.7600E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 9-JUN-2016 11:39:23 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 4.276E+00 NOT IDENT.
I-129 2.296E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235031.CNF;1
* Acquisition date   : 28-SEP-2016 10:17:59 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.14 Half life ratio  : *****
* Sample date        : 26-NOV-2015 14:25:00 Nuclide Library : IODINE
* Sample ID          : I405235031 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity  : 2.7600E+00 GRAM
*                   : Quantity Err(%) : 3.6232E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
              Activity      K.L Act error      TPU
              (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
I-125        -9.311E-01      5.703E+00      5.719E+00 NOT IDENT.
I-129        0.000E+00      2.630E-01      0.000E+00 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	6.1327				
29.62	5.0891				
27.34	4.3281				
29.62	6.2894				
35.49	8.2934				
39.58	6.7829				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 10:49:03.08

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235032.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY2.CNF;379
Background date    : 25-SEP-2016 12:22:59
Sample date        : 23-NOV-2015 11:48:00 Acquisition date : 28-SEP-2016 10:18:25
Sample ID          : I405235032 Sample quantity      : 2.86000E+00 GRAM
Detector name      : XRAY2 Detector geometry       : I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.13 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials    : MJH1
Abundance limit    : 75.00000 Sensitivity       : 3.00000
Batch ID           : 1598620 Detector SN#       :
Matrix Spike ID    : 1470-K LCS ID                 : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	185.52*	13	0	1.80	927.89	920	15	7.44E-03	32.7	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235032.CNF;1  *
* Acquisition date   : 28-SEP-2016 10:18:25 Sensitivity      : 3.000          *
* Detector ID       : XRAY2 Energy tolerance: 1.000         *
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000   *
* Elapsed real time : 0 00:30:00.13 Half life ratio : ***** *
* Sample date       : 23-NOV-2015 11:48:00 Analyst initials: MJH1      *
* Sample ID         : I405235032 Sample Quantity : 2.8600E+00 GRAM *
* Batch Number      : 1598620 Carrier Weight : 0.00000      *
* Recovery          : 1.00000 Standard Weight : 0.00000      *
* Nuclide Library   : IODINE.NLB;1
*****
*
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 27-JUL-2016 12:15:07 Eff. Geometry   : I129        *
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt Uncert	MDA (pCi/GRAM)	
I-125	-7.655E-01		1.096E+01	2.298E+01	NOT IDENT.
I-129	9.754E-02		3.274E-01	7.522E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	185.52	18	0	1.80	927.89	920	15	1.00E-02	23.6	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235032

Page : 2
Acquisition date : 28-SEP-2016 10:18:25

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235032

Page : 3
Acquisition date : 28-SEP-2016 10:18:25

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	185.52	13	0	1.80	927.89	920	15	7.44E-03	65.3	5.39E-29	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235032.CNF;1
* Acquisition date   : 28-SEP-2016 10:18:25 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.13 Half life ratio  : *****
* Sample date        : 23-NOV-2015 11:48:00 Nuclide Library : IODINE
* Sample ID          : I405235032 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity  : 2.8600E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	8.854E+00	NOT IDENT.
I-129	2.979E-01	NOT IDENT.


```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235032.CNF;1
* Acquisition date   : 28-SEP-2016 10:18:25 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.13 Half life ratio  : *****
* Sample date        : 23-NOV-2015 11:48:00 Nuclide Library : IODINE
* Sample ID          : I405235032 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity : 2.8600E+00 GRAM
*                   : Quantity Err(%) : 3.4965E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
I-125        -7.655E-01      1.096E+01      1.097E+01  NOT IDENT.
I-129        9.754E-02      3.275E-01      3.305E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	4.2076				
29.62	3.2110				
27.34	5.4044				
29.62	5.5038				
35.49	2.2293				
39.58	2.2868				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 10:49:26.12

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235033.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY4.CNF;433
Background date    : 25-SEP-2016 12:23:10
Sample date        : 23-NOV-2015 11:53:00 Acquisition date : 28-SEP-2016 10:18:47
Sample ID          : I405235033 Sample quantity      : 3.29000E+00 GRAM
Detector name      : XRAY4 Detector geometry       : I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.09 0.0%
Energy tolerance   : 1.00000 keV Analyst Initials    : MJH1
Abundance limit    : 75.00000 Sensitivity       : 3.00000
Batch ID           : 1598620 Detector SN#        :
Matrix Spike ID    : 1470-K LCS ID                   : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235033.CNF;1
* Acquisition date   : 28-SEP-2016 10:18:47 Sensitivity      : 3.000
* Detector ID       : XRAY4 Energy tolerance: 1.000
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:30:00.09 Half life ratio : *****
* Sample date       : 23-NOV-2015 11:53:00 Analyst initials: MJH1
* Sample ID         : I405235033 Sample Quantity : 3.2900E+00 GRAM
* Batch Number      : 1598620 Carrier Weight : 0.00000
* Recovery          : 1.00000 Standard Weight : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	---------------------	--------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)	
I-125	5.241E-01		1.560E+00		6.979E+00	NOT IDENT.
I-129	7.937E-02		1.313E-01		4.649E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235033

Page : 2
Acquisition date : 28-SEP-2016 10:18:47

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235033

Page : 3
Acquisition date : 28-SEP-2016 10:18:47

None

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235033.CNF;1 *
* Acquisition date : 28-SEP-2016 10:18:47 Sensitivity : 3.000 *
* Detector ID : XRAY4 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.09 Half life ratio : ***** *
* Sample date : 23-NOV-2015 11:53:00 Nuclide Library : IODINE *
* Sample ID : I405235033 Analyst initials: MJH1 *
* Batch Number : 1598620 Sample Quantity : 3.2900E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 17-JUN-2016 08:18:14 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 1.852E+00 NOT IDENT.
I-129 1.559E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235033.CNF;1
* Acquisition date   : 28-SEP-2016 10:18:47 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.09 Half life ratio  : *****
* Sample date        : 23-NOV-2015 11:53:00 Nuclide Library : IODINE
* Sample ID          : I405235033 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity : 3.2900E+00 GRAM
*                   : Quantity Err(%) : 3.0395E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        5.241E-01      1.563E+00      1.581E+00 NOT IDENT.
I-129        7.937E-02      1.316E-01      1.364E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.0000				
29.62	0.0000				
27.34	1.1221				
29.62	4.5881				
35.49	2.3289				
39.58	1.2005				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 10:49:51.59

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235034.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY5.CNF;58
Background date    : 25-SEP-2016 12:23:15
Sample date        : 23-NOV-2015 11:20:00 Acquisition date : 28-SEP-2016 10:19:14
Sample ID          : I405235034 Sample quantity : 2.98000E+00 GRAM
Detector name      : XRAY5 Detector geometry: I129
Elapsed live time  : 0 00:30:00.00 Elapsed real time: 0 00:30:00.02 0.0%
Energy tolerance   : 1.00000 keV Analyst Initials : MJH1
Abundance limit    : 75.00000 Sensitivity : 3.00000
Batch ID           : 1598620 Detector SN# :
Matrix Spike ID    : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.33*	6	0	0.33	315.00	311	7	3.16E-03	54.5	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235034.CNF;1
* Acquisition date   : 28-SEP-2016 10:19:14 Sensitivity      : 3.000
* Detector ID       : XRAY5 Energy tolerance: 1.000
* Elapsed live time : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:30:00.02 Half life ratio : *****
* Sample date       : 23-NOV-2015 11:20:00 Analyst initials: MJH1
* Sample ID         : I405235034 Sample Quantity : 2.9800E+00 GRAM
* Batch Number      : 1598620 Carrier Weight : 0.00000
* Recovery          : 1.00000 Standard Weight : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-5.212E+00		7.694E+00	1.450E+01	NOT IDENT.
I-129	0.000E+00		1.978E-01	2.734E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.33	9	0	0.33	315.00	311	7	5.00E-03	33.3	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235034

Page : 2
Acquisition date : 28-SEP-2016 10:19:14

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235034

Page : 3
Acquisition date : 28-SEP-2016 10:19:14

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	63.33	6	0	0.33	315.00	311	7	3.16E-03	****	3.19E+00	

Flags: "T" = Tentatively associated

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235034.CNF;1
* Acquisition date   : 28-SEP-2016 10:19:14 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.02 Half life ratio  : *****
* Sample date        : 23-NOV-2015 11:20:00 Nuclide Library : IODINE
* Sample ID          : I405235034 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity  : 2.9800E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   Standard Weight  : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	4.383E+00	NOT IDENT.
I-129	0.000E+00	NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235034.CNF;1
* Acquisition date   : 28-SEP-2016 10:19:14 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.02 Half life ratio  : *****
* Sample date        : 23-NOV-2015 11:20:00 Nuclide Library : IODINE
* Sample ID          : I405235034 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity : 2.9800E+00 GRAM
*                    : Quantity Err(%) : 3.3557E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                    : Standard Weight : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        -5.212E+00      7.748E+00      8.097E+00 NOT IDENT.
I-129        0.000E+00      0.000E+00      0.000E+00 NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	3.2531				
29.62	0.0000				
27.34	0.0000				
29.62	0.9231				
35.49	0.9543				
39.58	0.0000				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 10:50:15.90

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235035.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY6.CNF;215
Background date    : 25-SEP-2016 12:23:20
Sample date       : 23-NOV-2015 11:06:00 Acquisition date : 28-SEP-2016 10:19:45
Sample ID        : I405235035 Sample quantity : 2.86000E+00 GRAM
Detector name    : XRAY6 Detector geometry: I129
Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:00.04 0.0%
Energy tolerance : 1.00000 keV Analyst Initials : MJH1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1598620 Detector SN# :
Matrix Spike ID  : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.28*	9	0	0.35	315.83	312	7	5.17E-03	37.8	

Flag: "*" = Peak area was modified by background subtraction

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235035.CNF;1
* Acquisition date   : 28-SEP-2016 10:19:45 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.04 Half life ratio  : *****
* Sample date        : 23-NOV-2015 11:06:00 Analyst initials: MJH1
* Sample ID          : I405235035 Sample Quantity : 2.8600E+00 GRAM
* Batch Number       : 1598620 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
```

CALIBRATION INFORMATION

```
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt Uncert	MDA (pCi/GRAM)	
I-125	0.000E+00		3.969E+00	5.488E+00	NOT IDENT.
I-129	5.275E-02		3.929E-01	9.144E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.28	12	0	0.35	315.83	312	7	6.67E-03	28.9	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235035

Page : 2
Acquisition date : 28-SEP-2016 10:19:45

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235035

Page : 3
Acquisition date : 28-SEP-2016 10:19:45

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	63.28	9	0	0.35	315.83	312	7	5.17E-03	75.6	3.09E+00	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235035.CNF;1 *
* Acquisition date : 28-SEP-2016 10:19:45 Sensitivity : 3.000 *
* Detector ID : XRAY6 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:30:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 00:30:00.04 Half life ratio : ***** *
* Sample date : 23-NOV-2015 11:06:00 Nuclide Library : IODINE *
* Sample ID : I405235035 Analyst initials: MJH1 *
* Batch Number : 1598620 Sample Quantity : 2.8600E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 26-JAN-2016 10:07:09 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 0.000E+00 NOT IDENT.
I-129 3.240E-01 NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235035.CNF;1
* Acquisition date   : 28-SEP-2016 10:19:45 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 00:30:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:30:00.04 Half life ratio  : *****
* Sample date        : 23-NOV-2015 11:06:00 Nuclide Library : IODINE
* Sample ID          : I405235035 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity  : 2.8600E+00 GRAM
*                   : Quantity Err(%) : 3.4965E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity          Act Error          TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
              Activity          K.L Act error      TPU
              (pCi/GRAM )          (1.96-sigma)      (1.96-sigma)
I-125        0.000E+00          0.000E+00          0.000E+00  NOT IDENT.
I-129        5.275E-02          3.929E-01          3.936E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.0000				
29.62	1.4643				
27.34	0.0000				
29.62	0.0000				
35.49	0.7906				
39.58	0.8284				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 12:18:06.75

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235036.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY1.CNF;415
Background date    : 25-SEP-2016 12:22:54
Sample date        : 23-NOV-2015 11:12:00 Acquisition date : 28-SEP-2016 11:17:38
Sample ID          : I405235036 Sample quantity : 2.67000E+00 GRAM
Detector name      : XRAY1 Detector geometry: I129
Elapsed live time  : 0 01:00:00.00 Elapsed real time: 0 01:00:00.22 0.0%
Energy tolerance  : 1.00000 keV Analyst Initials : MJH1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1598620 Detector SN# :
Matrix Spike ID   : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	32.52	15	6	0.53	163.19	157	12	4.22E-03	41.1	
2	0	108.45	8	9	0.21	545.85	533	16	2.35E-03	82.6	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235036.CNF;1
* Acquisition date   : 28-SEP-2016 11:17:38 Sensitivity      : 3.000
* Detector ID       : XRAY1 Energy tolerance: 1.000
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.22 Half life ratio : *****
* Sample date       : 23-NOV-2015 11:12:00 Analyst initials: MJH1
* Sample ID         : I405235036 Sample Quantity : 2.6700E+00 GRAM
* Batch Number      : 1598620 Carrier Weight : 0.00000
* Recovery          : 1.00000 Standard Weight : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-2.077E+00		4.349E+00	7.270E+00	NOT IDENT.
I-129	3.934E-05		1.665E-01	3.518E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	32.52	15	6	0.53	163.19	157	12	4.22E-03	41.1	
2	0	108.45	8	9	0.21	545.85	533	16	2.35E-03	82.6	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235036

Page : 2
Acquisition date : 28-SEP-2016 11:17:38

Total number of lines in spectrum	2	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235036

Page : 3
Acquisition date : 28-SEP-2016 11:17:38

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	32.52	15	6	0.53	163.19	157	12	4.22E-03	82.2	2.28E+01	
0	108.45	8	9	0.21	545.85	533	16	2.35E-03	****	3.47E+00	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235036.CNF;1
* Acquisition date   : 28-SEP-2016 11:17:38 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.22 Half life ratio  : *****
* Sample date        : 23-NOV-2015 11:12:00 Nuclide Library : IODINE
* Sample ID          : I405235036 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity  : 2.6700E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                               Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	3.040E+00	NOT IDENT.
I-129	1.454E-01	NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235036.CNF;1
* Acquisition date   : 28-SEP-2016 11:17:38 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.22 Half life ratio  : *****
* Sample date        : 23-NOV-2015 11:12:00 Nuclide Library : IODINE
* Sample ID          : I405235036 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity  : 2.6700E+00 GRAM
*                   : Quantity Err(%) : 3.7453E-03 %
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   : Standard Weight  : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 9-JUN-2016 11:39:23 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        -2.077E+00      4.365E+00      4.464E+00 NOT IDENT.
I-129        3.934E-05      1.665E-01      1.665E-01 NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	13.4920				
29.62	7.6336				
27.34	7.7906				
29.62	6.7387				
35.49	3.6860				
39.58	4.8449				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 12:18:32.74

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235037.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY2.CNF;379
Background date  : 25-SEP-2016 12:22:59
Sample date      : 30-NOV-2015 11:19:00 Acquisition date : 28-SEP-2016 11:18:01
Sample ID        : I405235037 Sample quantity   : 2.84000E+00 GRAM
Detector name    : XRAY2 Detector geometry: I129
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.20 0.0%
Energy tolerance : 1.00000 keV Analyst Initials  : MJH1
Abundance limit  : 75.00000 Sensitivity    : 3.00000
Batch ID         : 1598620 Detector SN#    :
Matrix Spike ID  : 1470-K LCS ID              : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	24.46	10	5	0.50	121.32	114	10	2.65E-03	55.0	
2	4	91.42	12	3	0.79	456.60	454	14	3.41E-03	27.3	3.05E+00
3	4	92.50*	19	2	0.86	462.00	454	14	5.23E-03	33.7	
4	0	147.24	9	11	1.41	736.13	723	15	2.45E-03	89.4	
5	0	153.65	13	0	0.33	768.23	763	10	3.61E-03	27.7	
6	0	185.93*	20	0	1.14	929.93	920	18	5.49E-03	29.2	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235037.CNF;1
* Acquisition date   : 28-SEP-2016 11:18:01 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.20 Half life ratio  : *****
* Sample date        : 30-NOV-2015 11:19:00 Analyst initials: MJH1
* Sample ID          : I405235037 Sample Quantity : 2.8400E+00 GRAM
* Batch Number       : 1598620 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight  : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	-4.085E-01		5.704E+00	1.168E+01	NOT IDENT.
I-129	-1.442E-02		2.213E-01	4.373E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	24.46	10	5	0.50	121.32	114	10	2.65E-03	55.0	
2	4	91.42	12	3	0.79	456.60	454	14	3.41E-03	27.3	3.05E+00
3	4	92.50	35	2	0.86	462.00	454	14	9.84E-03	16.4	
4	0	147.24	9	11	1.41	736.13	723	15	2.45E-03	89.4	
5	0	153.65	13	0	0.33	768.23	763	10	3.61E-03	27.7	
6	0	185.93	29	0	1.14	929.93	920	18	8.06E-03	18.6	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235037

Page : 2
Acquisition date : 28-SEP-2016 11:18:01

Total number of lines in spectrum	6	
Number of unidentified lines	6	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	24.46	10	5	0.50	121.32	114	10	2.65E-03	****	2.50E+00	
4	91.42	12	3	0.79	456.60	454	14	3.41E-03	54.7	7.19E-08	
4	92.50	19	2	0.86	462.00	454	14	5.23E-03	67.5	4.30E-08	
0	147.24	9	11	1.41	736.13	723	15	2.45E-03	****	3.74E-20	
0	153.65	13	0	0.33	768.23	763	10	3.61E-03	55.5	1.28E-21	
0	185.93	20	0	1.14	929.93	920	18	5.49E-03	58.5	4.33E-29	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235037.CNF;1
* Acquisition date   : 28-SEP-2016 11:18:01 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.20 Half life ratio  : *****
* Sample date        : 30-NOV-2015 11:19:00 Nuclide Library : IODINE
* Sample ID          : I405235037 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity : 2.8400E+00 GRAM
* Recovery           : 1.00000 Carrier Weight  : 0.00000
*                   Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File           : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	4.616E+00	NOT IDENT.
I-129	1.793E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235037.CNF;1 *
 * Acquisition date : 28-SEP-2016 11:18:01 Sensitivity : 3.000 *
 * Detector ID : XRAY2 Energy tolerance: 1.000 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.20 Half life ratio : ***** *
 * Sample date : 30-NOV-2015 11:19:00 Nuclide Library : IODINE *
 * Sample ID : I405235037 Analyst initials: MJH1 *
 * Batch Number : 1598620 Sample Quantity : 2.8400E+00 GRAM *
 * Quantity Err(%) : 3.5211E-03 % *
 * Recovery : 1.00000 Carrier Weight : 0.00000 *
 * Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 27-JUL-2016 12:15:07 Eff. Geometry : I129 *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
---------	-------------------------	---------------------------	---------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
I-125	-4.085E-01	5.704E+00	5.707E+00	NOT IDENT.
I-129	-1.442E-02	2.213E-01	2.214E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	5.2595				
29.62	7.4924				
27.34	5.4044				
29.62	5.5038				
35.49	5.5733				
39.58	4.5736				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 12:19:14.89

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235038.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY4.CNF;433
Background date    : 25-SEP-2016 12:23:10
Sample date        : 30-NOV-2015 10:40:00 Acquisition date : 28-SEP-2016 11:18:47
Sample ID          : I405235038 Sample quantity : 2.82000E+00 GRAM
Detector name      : XRAY4 Detector geometry: I129
Elapsed live time  : 0 01:00:00.00 Elapsed real time: 0 01:00:00.18 0.0%
Energy tolerance   : 1.00000 keV Analyst Initials : MJH1
Abundance limit    : 75.00000 Sensitivity : 3.00000
Batch ID           : 1598620 Detector SN# :
Matrix Spike ID    : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	4	15.84*	8	8	0.55	78.64	75	17	2.11E-03	83.5	2.83E+00
2	4	16.51*	1	7	0.38	82.00	75	17	1.55E-04	*****	
3	4	17.89	8	5	0.57	88.91	75	17	2.20E-03	51.7	
4	0	31.71	7	2	0.36	158.14	155	6	1.82E-03	56.0	
5	0	92.53*	8	0	0.78	462.94	458	9	2.25E-03	55.6	
6	0	132.35	8	3	1.50	662.49	656	10	2.31E-03	49.9	

Flag: "*" = Peak area was modified by background subtraction


```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****

```

DETECTOR AND SAMPLE DATA

```

*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235038.CNF;1
* Acquisition date   : 28-SEP-2016 11:18:47 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.18 Half life ratio  : *****
* Sample date        : 30-NOV-2015 10:40:00 Analyst initials: MJH1
* Sample ID          : I405235038 Sample Quantity : 2.8200E+00 GRAM
* Batch Number       : 1598620 Carrier Weight  : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****

```

CALIBRATION INFORMATION

```

*
* Eff. Cal. date    : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt Uncert	MDA (pCi/GRAM)	
I-125	7.595E-01		2.363E+00	6.306E+00	FAIL ABUN
I-129	5.630E-02		1.910E-01	4.337E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	4	15.84	15	8	0.55	78.64	75	17	4.10E-03	39.6	2.83E+00
2	4	16.51	8	7	0.38	82.00	75	17	2.15E-03	75.6	
3	4	17.89	8	5	0.57	88.91	75	17	2.20E-03	51.7	
4	0	31.71	7	2	0.36	158.14	155	6	1.82E-03	56.0	
5	0	92.53	16	0	0.78	462.94	458	9	4.44E-03	25.0	
6	0	132.35	8	3	1.50	662.49	656	10	2.31E-03	49.9	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235038

Page : 2
Acquisition date : 28-SEP-2016 11:18:47

Total number of lines in spectrum	6	
Number of unidentified lines	5	
Number of lines tentatively identified by NID	1	16.67%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
4	15.84	8	8	0.55	78.64	75	17	2.11E-03	****	1.12E+00	
4	16.51	1	7	0.38	82.00	75	17	1.55E-04	****	1.48E+00	
4	17.89	8	5	0.57	88.91	75	17	2.20E-03	****	2.41E+00	
0	31.71	7	2	0.36	158.14	155	6	1.82E-03	****	1.55E+01	T
0	92.53	8	0	0.78	462.94	458	9	2.25E-03	****	5.17E-01	
0	132.35	8	3	1.50	662.49	656	10	2.31E-03	99.9	1.40E-02	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235038.CNF;1
* Acquisition date   : 28-SEP-2016 11:18:47 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.18 Half life ratio  : *****
* Sample date        : 30-NOV-2015 10:40:00 Nuclide Library : IODINE
* Sample ID          : I405235038 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity : 2.8200E+00 GRAM
* Recovery           : 1.00000 Carrier Weight  : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	2.273E+00	FAIL ABUN
I-129	1.722E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235038.CNF;1 *
 * Acquisition date : 28-SEP-2016 11:18:47 Sensitivity : 3.000 *
 * Detector ID : XRAY4 Energy tolerance: 1.000 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.18 Half life ratio : ***** *
 * Sample date : 30-NOV-2015 10:40:00 Nuclide Library : IODINE *
 * Sample ID : I405235038 Analyst initials: MJH1 *
 * Batch Number : 1598620 Sample Quantity : 2.8200E+00 GRAM *
 * Quantity Err(%) : 3.5461E-03 % *
 * Recovery : 1.00000 Carrier Weight : 0.00000 *
 * Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 17-JUN-2016 08:18:14 Eff. Geometry : I129 *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
---------	-------------------------	---------------------------	---------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
I-125	7.595E-01	2.367E+00	2.391E+00	FAIL ABUN
I-129	5.630E-02	1.911E-01	1.928E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	1.0858				
29.62	3.3266				
27.34	1.4961				
29.62	2.2941				
35.49	4.6579				
39.58	4.8019				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 12:19:44.16

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235039.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY5.CNF;58
Background date    : 25-SEP-2016 12:23:15
Sample date       : 30-NOV-2015 10:43:00 Acquisition date : 28-SEP-2016 11:19:10
Sample ID        : I405235039 Sample quantity   : 3.17000E+00 GRAM
Detector name    : XRAY5 Detector geometry: I129
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.05 0.0%
Energy tolerance : 1.00000 keV Analyst Initials : MJH1
Abundance limit  : 75.00000 Sensitivity    : 3.00000
Batch ID        : 1598620 Detector SN#    :
Matrix Spike ID : 1470-K LCS ID           : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.90*	2	4	0.26	233.18	228	7	4.22E-04	268.3	
2	0	63.52*	9	3	0.60	315.92	312	9	2.46E-03	57.1	
3	0	92.75*	3	2	1.01	461.54	456	10	8.74E-04	176.9	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****

```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235039.CNF;1
* Acquisition date   : 28-SEP-2016 11:19:10 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.05 Half life ratio : *****
* Sample date        : 30-NOV-2015 10:43:00 Analyst initials: MJH1
* Sample ID          : I405235039 Sample Quantity : 3.1700E+00 GRAM
* Batch Number       : 1598620 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****

```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	3.840E-01		3.302E+00	8.592E+00	NOT IDENT.
I-129	1.378E-02		1.729E-01	4.404E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.90	6	4	0.26	233.18	228	7	1.53E-03	70.7	
2	0	63.52	15	3	0.60	315.92	312	9	4.30E-03	31.0	
3	0	92.75	18	2	1.01	461.54	456	10	4.92E-03	28.9	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235039

Page : 2
Acquisition date : 28-SEP-2016 11:19:10

Total number of lines in spectrum	3	
Number of unidentified lines	3	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235039

Page : 3
Acquisition date : 28-SEP-2016 11:19:10

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	46.90	2	4	0.26	233.18	228	7	4.22E-04	****	7.78E+00	
0	63.52	9	3	0.60	315.92	312	9	2.46E-03	****	3.16E+00	
0	92.75	3	2	1.01	461.54	456	10	8.74E-04	****	3.55E-01	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235039.CNF;1 *
* Acquisition date : 28-SEP-2016 11:19:10 Sensitivity : 3.000 *
* Detector ID : XRAY5 Energy tolerance: 1.000 *
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 01:00:00.05 Half life ratio : ***** *
* Sample date : 30-NOV-2015 10:43:00 Nuclide Library : IODINE *
* Sample ID : I405235039 Analyst initials: MJH1 *
* Batch Number : 1598620 Sample Quantity : 3.1700E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 30-AUG-2016 11:41:11 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide Lc
(pCi/GRAM)

---- Non-Identified Nuclides ----

Nuclide Lc
(pCi/GRAM)

I-125 3.054E+00 NOT IDENT.
I-129 1.560E-01 NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235039.CNF;1 *
 * Acquisition date : 28-SEP-2016 11:19:10 Sensitivity : 3.000 *
 * Detector ID : XRAY5 Energy tolerance: 1.000 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.05 Half life ratio : ***** *
 * Sample date : 30-NOV-2015 10:43:00 Nuclide Library : IODINE *
 * Sample ID : I405235039 Analyst initials: MJH1 *
 * Batch Number : 1598620 Sample Quantity : 3.1700E+00 GRAM *
 * Quantity Err(%) : 3.1546E-03 % *
 * Recovery : 1.00000 Carrier Weight : 0.00000 *
 * Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 30-AUG-2016 11:41:11 Eff. Geometry : I129 *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
---------	-------------------------	---------------------------	---------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
I-125	3.840E-01	3.303E+00	3.307E+00	NOT IDENT.
I-129	1.378E-02	1.729E-01	1.731E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	1.6265				
29.62	1.7094				
27.34	0.0000				
29.62	1.8461				
35.49	3.8174				
39.58	1.0189				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 12:20:21.94

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235040.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY6.CNF;215
Background date    : 25-SEP-2016 12:23:20
Sample date        : 30-NOV-2015 13:23:00 Acquisition date : 28-SEP-2016 11:19:53
Sample ID          : I405235040 Sample quantity : 3.54000E+00 GRAM
Detector name      : XRAY6 Detector geometry: I129
Elapsed live time  : 0 01:00:00.00 Elapsed real time: 0 01:00:00.07 0.0%
Energy tolerance   : 1.00000 keV Analyst Initials : MJH1
Abundance limit    : 75.00000 Sensitivity : 3.00000
Batch ID           : 1598620 Detector SN# :
Matrix Spike ID    : 1470-K LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.27*	3	2	0.54	315.77	312	7	8.07E-04	131.4	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235040.CNF;1
* Acquisition date   : 28-SEP-2016 11:19:53 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.07 Half life ratio : *****
* Sample date        : 30-NOV-2015 13:23:00 Analyst initials: MJH1
* Sample ID          : I405235040 Sample Quantity : 3.5400E+00 GRAM
* Batch Number       : 1598620 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	---------------------------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
I-125	7.535E-01	1.477E+00	5.546E+00	NOT IDENT.
I-129	-7.671E-02	1.793E-01	2.928E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.27	8	2	0.54	315.77	312	7	2.31E-03	43.5	
2	0	92.65	6	3	0.19	462.75	458	7	1.70E-03	63.6	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I405235040

Page : 2
Acquisition date : 28-SEP-2016 11:19:53

Total number of lines in spectrum	1	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I405235040

Page : 3
Acquisition date : 28-SEP-2016 11:19:53

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	63.27	3	2	0.54	315.77	312	7	8.07E-04	****	3.09E+00	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235040.CNF;1 *
* Acquisition date : 28-SEP-2016 11:19:53 Sensitivity : 3.000 *
* Detector ID : XRAY6 Energy tolerance: 1.000 *
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
* Elapsed real time: 0 01:00:00.07 Half life ratio : ***** *
* Sample date : 30-NOV-2015 13:23:00 Nuclide Library : IODINE *
* Sample ID : I405235040 Analyst initials: MJH1 *
* Batch Number : 1598620 Sample Quantity : 3.5400E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 26-JAN-2016 10:07:09 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc

---- Non-Identified Nuclides ----

Nuclide (pCi/GRAM)
Lc
I-125 1.753E+00 NOT IDENT.
I-129 9.254E-02 NOT IDENT.


```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I405235040.CNF;1
* Acquisition date   : 28-SEP-2016 11:19:53 Sensitivity      : 3.000
* Detector ID        : XRAY6 Energy tolerance: 1.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.07 Half life ratio  : *****
* Sample date        : 30-NOV-2015 13:23:00 Nuclide Library : IODINE
* Sample ID          : I405235040 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity : 3.5400E+00 GRAM
*                   : Quantity Err(%) : 2.8249E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 10:07:09 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY6_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

```

---- Non-Identified Nuclides ----
Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        7.535E-01      1.478E+00      1.517E+00  NOT IDENT.
I-129        -7.671E-02      1.795E-01      1.828E-01  NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.0000				
29.62	2.9286				
27.34	1.4921				
29.62	0.0000				
35.49	1.5811				
39.58	3.3136				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 13:32:24.89

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627437.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY1.CNF;415
Background date    : 25-SEP-2016 12:22:54
Sample date       : 26-SEP-2016 00:00:00 Acquisition date : 28-SEP-2016 12:50:58
Sample ID        : I1203627437 Sample quantity   : 3.54000E+00 GRAM
Detector name    : XRAY1 Detector geometry: I129
Elapsed live time: 0 00:40:07.21 Elapsed real time: 0 00:40:07.36 0.0%
Energy tolerance : 1.00000 keV Analyst Initials  : MJH1
Abundance limit  : 75.00000 Sensitivity    : 3.00000
Batch ID         : 1598620 Detector SN#    :
Matrix Spike ID  : 1470-K LCS ID              : 1470-K
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

No peaks were found

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627437.CNF;1
* Acquisition date   : 28-SEP-2016 12:50:58 Sensitivity      : 3.000
* Detector ID       : XRAY1 Energy tolerance: 1.000
* Elapsed live time : 0 00:40:07.21 Abundance limit : 75.000
* Elapsed real time : 0 00:40:07.36 Half life ratio : *****
* Sample date       : 26-SEP-2016 00:00:00 Analyst initials: MJH1
* Sample ID         : I1203627437 Sample Quantity : 3.5400E+00 GRAM
* Batch Number      : 1598620 Carrier Weight : 0.00000
* Recovery          : 1.00000 Standard Weight : 0.00000
* Nuclide Library   : IODINE.NLB;1
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	------------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt Uncert	MDA (pCi/GRAM)	
I-125	2.094E-02		1.050E-01	2.142E-01	NOT IDENT.
I-129	4.719E-02		1.896E-01	4.177E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

No peaks were found

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I1203627437

Page : 2
Acquisition date : 28-SEP-2016 12:50:58

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I1203627437

Page : 3
Acquisition date : 28-SEP-2016 12:50:58

None

Flags: "T" = Tentatively associated


```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627437.CNF;1
* Acquisition date   : 28-SEP-2016 12:50:58 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:40:07.21 Abundance limit : 75.000
* Elapsed real time  : 0 00:40:07.36 Half life ratio  : *****
* Sample date        : 26-SEP-2016 00:00:00 Nuclide Library : IODINE
* Sample ID          : I1203627437 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity  : 3.5400E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
*                   Standard Weight  : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 9-JUN-2016 11:39:23 Eff. Geometry    : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
I-125	8.853E-02	NOT IDENT.
I-129	1.744E-01	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627437.CNF;1
* Acquisition date   : 28-SEP-2016 12:50:58 Sensitivity      : 3.000
* Detector ID        : XRAY1 Energy tolerance: 1.000
* Elapsed live time  : 0 00:40:07.21 Abundance limit : 75.000
* Elapsed real time  : 0 00:40:07.36 Half life ratio  : *****
* Sample date        : 26-SEP-2016 00:00:00 Nuclide Library : IODINE
* Sample ID          : I1203627437 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity : 3.5400E+00 GRAM
*                   : Quantity Err(%) : 2.8249E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 9-JUN-2016 11:39:23 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY1_I129.CNF;6
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)

```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        2.094E-02      1.051E-01      1.055E-01 NOT IDENT.
I-129        4.719E-02      1.897E-01      1.909E-01 NOT IDENT.

```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	6.1327				
29.62	6.7854				
27.34	4.3281				
29.62	1.7970				
35.49	1.8430				
39.58	10.6588				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 13:32:00.80

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627438.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY2.CNF;379
Background date    : 25-SEP-2016 12:22:59
Sample date        : 8-DEC-2015 14:17:00. Acquisition date : 28-SEP-2016 12:51:32
Sample ID          : I1203627438. Sample quantity : 3.35000E+00 GRAM
Detector name      : XRAY2. Detector geometry: I129
Elapsed live time  : 0 00:39:28.38. Elapsed real time: 0 00:39:28.53 0.0%
Energy tolerance   : 1.00000 keV. Analyst Initials : MJH1
Abundance limit    : 75.00000. Sensitivity : 3.00000
Batch ID           : 1598620. Detector SN# :
Matrix Spike ID    : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	92.71*	10	0	0.94	463.05	457	11	4.25E-03	48.5	
2	0	96.42	8	3	0.37	481.65	474	12	3.40E-03	55.6	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627438.CNF;1
* Acquisition date   : 28-SEP-2016 12:51:32 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:39:28.38 Abundance limit : 75.000
* Elapsed real time  : 0 00:39:28.53 Half life ratio  : *****
* Sample date        : 8-DEC-2015 14:17:00 Analyst initials: MJH1
* Sample ID          : I1203627438 Sample Quantity : 3.3500E+00 GRAM
* Batch Number       : 1598620 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)
---------	-------------------------------------	----------------------	---------------------	--------	--------------------

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. (1.96-sigma)	Cnt (1.96-sigma)	Uncert	MDA (pCi/GRAM)	
I-125	3.393E+00		7.155E+00		1.631E+01	NOT IDENT.
I-129	2.433E-01		2.666E-01		6.452E-01	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	92.71	21	0	0.94	463.05	457	11	8.87E-03	21.8	
2	0	96.42	8	3	0.37	481.65	474	12	3.40E-03	55.6	

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : I1203627438

Page : 2
Acquisition date : 28-SEP-2016 12:51:32

Total number of lines in spectrum	2	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I1203627438

Page : 3
Acquisition date : 28-SEP-2016 12:51:32

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	92.71	10	0	0.94	463.05	457	11	4.25E-03	97.0	3.89E-08	
0	96.42	8	3	0.37	481.65	474	12	3.40E-03	****	6.49E-09	

Flags: "T" = Tentatively associated

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627438.CNF;1 *
* Acquisition date : 28-SEP-2016 12:51:32 Sensitivity : 3.000 *
* Detector ID : XRAY2 Energy tolerance: 1.000 *
* Elapsed live time: 0 00:39:28.38 Abundance limit : 75.000 *
* Elapsed real time: 0 00:39:28.53 Half life ratio : ***** *
* Sample date : 8-DEC-2015 14:17:00 Nuclide Library : IODINE *
* Sample ID : I1203627438 Analyst initials: MJH1 *
* Batch Number : 1598620 Sample Quantity : 3.3500E+00 GRAM *
* Recovery : 1.00000 Carrier Weight : 0.00000 *
* Standard Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 27-JUL-2016 12:15:07 Eff. Geometry : I129 *
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide Lc
(pCi/GRAM)

---- Non-Identified Nuclides ----

Nuclide Lc
(pCi/GRAM)

I-125 6.719E+00 NOT IDENT.
I-129 2.719E-01 NOT IDENT.

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```

* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627438.CNF;1
* Acquisition date   : 28-SEP-2016 12:51:32 Sensitivity      : 3.000
* Detector ID        : XRAY2 Energy tolerance: 1.000
* Elapsed live time  : 0 00:39:28.38 Abundance limit : 75.000
* Elapsed real time  : 0 00:39:28.53 Half life ratio  : *****
* Sample date        : 8-DEC-2015 14:17:00 Nuclide Library : IODINE
* Sample ID          : I1203627438 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity : 3.3500E+00 GRAM
* Recovery            : 1.00000 Quantity Err(%) : 2.9851E-03 %
* Carrier Weight     : 0.00000
* Standard Weight    : 0.00000
*****
```

CALIBRATION INFORMATION

```

* Eff. Cal. date    : 27-JUL-2016 12:15:07 Eff. Geometry   : I129
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_XRAY2_I129.CNF;15
*****
```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

```

---- Identified Nuclides ----
Nuclide      Activity      Act Error      TPU
             (pCi/GRAM )      (1.96-sigma)  (1.96-sigma)
```

---- Non-Identified Nuclides ----

```

Nuclide      Key-Line
             Activity      K.L Act error      TPU
             (pCi/GRAM )      (1.96-sigma)      (1.96-sigma)
I-125        3.393E+00      7.180E+00      7.341E+00 NOT IDENT.
I-129        2.433E-01      2.677E-01      2.893E-01 NOT IDENT.
```

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	4.2076				
29.62	3.2110				
27.34	5.4044				
29.62	7.7053				
35.49	7.8027				
39.58	4.5736				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 13:31:36.22

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627439.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY4.CNF;433
Background date  : 25-SEP-2016 12:23:10
Sample date     : 8-DEC-2015 14:17:00. Acquisition date : 28-SEP-2016 12:52:05
Sample ID      : I1203627439. Sample quantity : 2.94000E+00 GRAM
Detector name   : XRAY4. Detector geometry: I129
Elapsed live time: 0 00:38:50.89. Elapsed real time: 0 00:38:51.04 0.0%
Energy tolerance : 1.00000 keV. Analyst Initials : MJH1
Abundance limit : 75.00000. Sensitivity : 3.00000
Batch ID       : 1598620. Detector SN# :
Matrix Spike ID : 1470-K. LCS ID : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	4	27.00	10	22	0.63	134.54	127	32	4.35E-03	77.9	1.74E+00
2	4	27.78	19	18	0.53	138.46	127	32	7.98E-03	45.3	
3	4	28.69	11	14	0.44	143.00	127	32	4.92E-03	81.1	
4	4	29.70	247	13	0.65	148.09	127	32	1.06E-01	7.1	
5	0	33.60	23	27	0.36	167.62	164	8	1.00E-02	43.2	
6	0	39.65	29	9	0.75	197.94	193	9	1.25E-02	26.2	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627439.CNF;1
* Acquisition date   : 28-SEP-2016 12:52:05 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:38:50.89 Abundance limit : 75.000
* Elapsed real time  : 0 00:38:51.04 Half life ratio  : *****
* Sample date        : 8-DEC-2015 14:17:00 Analyst initials: MJH1
* Sample ID          : I1203627439 Sample Quantity : 2.9400E+00 GRAM
* Batch Number       : 1598620 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
I-125	9.138E+00	1.395E+01	1.362E+01
I-129	1.203E+01	1.679E+00	7.659E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	4	27.00	10	22	0.63	134.54	127	32	4.35E-03	77.9	1.74E+00
2	4	27.78	19	18	0.53	138.46	127	32	7.98E-03	45.3	
3	4	28.69	11	14	0.44	143.00	127	32	4.92E-03	81.1	
4	4	29.70	247	13	0.65	148.09	127	32	1.06E-01	7.1	
5	0	33.60	23	27	0.36	167.62	164	8	1.00E-02	43.2	
6	0	39.65	29	9	0.75	197.94	193	9	1.25E-02	26.2	

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
I-125	27.34	10	114.10*	1.198E+01	2.925E-01	9.138E+00	155.83
	30.97	-----	20.30	1.514E+01	-----	Line Not Found	-----
	35.49	-----	6.68	1.660E+01	-----	Line Not Found	-----

Nuclide Type: FISSION

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
I-129	29.62	247	56.60*	1.431E+01	1.203E+01	1.203E+01	14.24
	33.59	23	10.04	1.626E+01	5.644E+00	5.644E+00	86.43
	39.58	29	7.51	1.617E+01	9.467E+00	9.467E+00	52.35

Flag: "*" = Keyline

Total number of lines in spectrum 6
 Number of unidentified lines 2
 Number of lines tentatively identified by NID 4 66.67%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
I-125	59.40D	31.2	2.925E-01	9.138E+00	14.24E+00	155.83	
Total Activity :			2.925E-01	9.138E+00			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
I-129	1.57E+07Y	1.00	1.203E+01	1.203E+01	0.171E+01	14.24	
Total Activity :			1.203E+01	1.203E+01			

Grand Total Activity : 1.232E+01 2.117E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I1203627439

Page : 3
Acquisition date : 28-SEP-2016 12:52:05

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
4	27.78	19	18	0.53	138.46	127	32	7.98E-03	90.6	1.27E+01	
4	28.69	11	14	0.44	143.00	127	32	4.92E-03	****	1.35E+01	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627439.CNF;1
* Acquisition date   : 28-SEP-2016 12:52:05 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:38:50.89 Abundance limit : 75.000
* Elapsed real time  : 0 00:38:51.04 Half life ratio  : *****
* Sample date        : 8-DEC-2015 14:17:00 Nuclide Library : IODINE
* Sample ID          : I1203627439 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity  : 2.9400E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
I-125	5.626E+00
I-129	3.169E-01

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627439.CNF;1
* Acquisition date   : 28-SEP-2016 12:52:05 Sensitivity      : 3.000
* Detector ID        : XRAY4 Energy tolerance: 1.000
* Elapsed live time  : 0 00:38:50.89 Abundance limit : 75.000
* Elapsed real time  : 0 00:38:51.04 Half life ratio  : *****
* Sample date        : 8-DEC-2015 14:17:00 Nuclide Library : IODINE
* Sample ID          : I1203627439 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity : 2.9400E+00 GRAM
*                   : Quantity Err(%) : 3.4014E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 08:18:14 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY4_I129.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
I-125	9.138E+00	1.407E+01	1.407E+01
I-129	1.203E+01	2.057E+00	2.057E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)
---------	-------------------------------------	-------------------------------	---------------------

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	7.6004				
29.62	7.7622				
30.97	7.8547				
33.59	17.2054				
35.49	12.8092				
39.58	7.2029				

VAX/VMS Nuclide Identification Report Generated 28-SEP-2016 13:31:10.80

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627440.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_XRAY5.CNF;58
Background date : 25-SEP-2016 12:23:15
Sample date     : 26-SEP-2016 00:00:00 Acquisition date : 28-SEP-2016 12:52:43
Sample ID      : I1203627440 Sample quantity   : 3.54000E+00 GRAM
Detector name  : XRAY5 Detector geometry   : I129
Elapsed live time: 0 00:38:05.93 Elapsed real time: 0 00:38:05.98 0.0%
Energy tolerance : 1.00000 keV Analyst Initials : MJH1
Abundance limit : 75.00000 Sensitivity   : 3.00000
Batch ID       : 1598620 Detector SN#    :
Matrix Spike ID : 1470-K LCS ID           : 1470-K
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	6	27.21	14	0	0.57	135.07	129	25	6.34E-03	35.9	2.22E+00
2	6	29.70	198	0	0.61	147.48	129	25	8.66E-02	7.4	
3	0	32.46	8	3	0.55	161.23	157	7	3.34E-03	54.2	
4	0	33.67	27	16	0.53	167.29	164	8	1.18E-02	31.3	
5	0	39.64	38	5	0.58	196.99	192	10	1.68E-02	19.4	
6	0	76.98*	4	0	0.58	383.00	380	6	1.87E-03	59.8	

Flag: "*" = Peak area was modified by background subtraction

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627440.CNF;1
* Acquisition date   : 28-SEP-2016 12:52:43 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:38:05.93 Abundance limit : 75.000
* Elapsed real time  : 0 00:38:05.98 Half life ratio  : *****
* Sample date        : 26-SEP-2016 00:00:00 Analyst initials: MJH1
* Sample ID          : I1203627440 Sample Quantity : 3.5400E+00 GRAM
* Batch Number       : 1598620 Carrier Weight : 0.00000
* Recovery           : 1.00000 Standard Weight : 0.00000
* Nuclide Library    : IODINE.NLB;1
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
I-125	5.681E-01	3.992E-01	2.681E-01
I-129	1.320E+01	1.907E+00	4.688E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)
---------	-------------------------------------	------	----------------------------	--------------------

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	6	27.21	14	0	0.57	135.07	129	25	6.34E-03	35.9	2.22E+00
2	6	29.70	198	0	0.61	147.48	129	25	8.66E-02	7.4	
3	0	32.46	8	3	0.55	161.23	157	7	3.34E-03	54.2	
4	0	33.67	27	16	0.53	167.29	164	8	1.18E-02	31.3	
5	0	39.64	38	5	0.58	196.99	192	10	1.68E-02	19.4	
6	0	76.98	6	0	0.58	383.00	380	6	2.62E-03	40.8	

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
I-125	27.34	14	114.10*	7.693E+00	5.514E-01	5.681E-01	71.71
	30.97	-----	20.30	9.289E+00	-----	Line Not Found	-----
	35.49	-----	6.68	9.988E+00	-----	Line Not Found	-----

Nuclide Type: FISSION

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
I-129	29.62	198	56.60*	8.851E+00	1.320E+01	1.320E+01	14.75
	33.59	27	10.04	9.860E+00	9.070E+00	9.070E+00	62.69
	39.58	38	7.51	9.649E+00	1.769E+01	1.769E+01	38.83

Flag: "*" = Keyline

Total number of lines in spectrum 6
 Number of unidentified lines 2
 Number of lines tentatively identified by NID 4 66.67%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
I-125	59.40D	1.03	5.514E-01	5.681E-01	4.073E-01	71.71	
Total Activity :			5.514E-01	5.681E-01			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
I-129	1.57E+07Y	1.00	1.320E+01	1.320E+01	0.195E+01	14.75	
Total Activity :			1.320E+01	1.320E+01			

Grand Total Activity : 1.375E+01 1.376E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : I1203627440

Page : 3
Acquisition date : 28-SEP-2016 12:52:43

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	32.46	8	3	0.55	161.23	157	7	3.34E-03	****	9.66E+00	
0	76.98	4	0	0.58	383.00	380	6	1.87E-03	****	1.22E+00	

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627440.CNF;1
* Acquisition date   : 28-SEP-2016 12:52:43 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:38:05.93 Abundance limit : 75.000
* Elapsed real time  : 0 00:38:05.98 Half life ratio  : *****
* Sample date        : 26-SEP-2016 00:00:00 Nuclide Library : IODINE
* Sample ID          : I1203627440 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity  : 3.5400E+00 GRAM
* Recovery           : 1.00000 Carrier Weight   : 0.00000
* Standard Weight    : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
I-125	8.148E-02
I-129	1.438E-01

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
---------	-------------------

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]I1203627440.CNF;1
* Acquisition date   : 28-SEP-2016 12:52:43 Sensitivity      : 3.000
* Detector ID        : XRAY5 Energy tolerance: 1.000
* Elapsed live time  : 0 00:38:05.93 Abundance limit : 75.000
* Elapsed real time  : 0 00:38:05.98 Half life ratio  : *****
* Sample date        : 26-SEP-2016 00:00:00 Nuclide Library : IODINE
* Sample ID          : I1203627440 Analyst initials: MJH1
* Batch Number       : 1598620 Sample Quantity : 3.5400E+00 GRAM
*                   : Quantity Err(%) : 2.8249E-03 %
* Recovery           : 1.00000 Carrier Weight : 0.00000
*                   : Standard Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-AUG-2016 11:41:11 Eff. Geometry   : I129
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_XRAY5_I129.CNF;5
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
I-125	5.681E-01	4.125E-01	4.125E-01
I-129	1.320E+01	2.311E+00	2.311E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)
---------	-------------------------------------	-------------------------------	---------------------

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>	<u>ENERGY</u>	<u>MDA COUNTS</u>
27.34	0.8133				
29.62	0.8547				
30.97	0.0000				
33.59	7.3846				
35.49	6.6804				
39.58	1.0189				

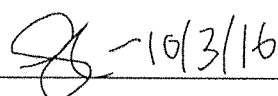
Gamma Solid

Batch# 1596247

Product: MJWC

Date: 10/03/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			n/a
Samples have been blank corrected (if required). Blank correction reported included (if required).			n/a
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits. Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		see narrative
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			n/a
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	DER 1563869
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			n/a
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.	✓		
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)	✓		
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER 1563869
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		
Aliquot Correction completed if required.			n/a
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By:  - 10/3/16

Secondary Review Performed By:  10-3-16

DATA EXCEPTION REPORT

Mo.Day Yr. 03-OCT-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GAMMA SPECTROMETER	Test / Method: DOE HASL 300, 4.5.2.3/Ga-01-R	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596247	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
Samples 405235 001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 013, 014, 015, 016, 017, 018, 019, 020, and 1203621351 (duplicate) were received outside of the holding period.		Samples were analyzed in a timely manner upon receipt. Reporting results.	

Originator's Name:
Spencer Collins 03-OCT-16

Data Validator/Group Leader:
Michael Hilton 03-OCT-16

Gamma Spec Queue Sheet

J.G. - 10/3/16

09/16/2016

Batch #: 1596247 Analyst: MXRI First Client Due Date: 09/30/2016 Internal Due Date: 09/30/2016

Gamma LCS Isotope: Mixed Gamma LCS Code: 1556 Expiration Date: 4/1/37 Vol: 10 ml

Initials: MS Prep Date: 9/12/16 Library: 80C1D Balance ID: N/A

Sample ID	Client Description / Container ID	Type	Hazard Code	Client	Matrix	Collect Date	Geometry	Wet/Dry Aliquot (1/g/F)	Detector	Sealing Date/Time (if Applicable)
405235001-1	4.1.B.R.1.2	SAMPLE		MJWC001	SOIL	10-DEC-15 14:20:00 <u>RF</u>	CAN	141.921 g	2	9/12/16
405235002-1	4.1.B.R.1.3	SAMPLE		MJWC001	SOIL	10-DEC-15 14:30:00 <u>RF</u>		123.837 g	30	
405235003-1	4.1.B.R.1.4	SAMPLE		MJWC001	SOIL	10-DEC-15 14:35:00 <u>RF</u>		140.486 g	8	
405235004-1	4.1.B.R.7.2	SAMPLE		MJWC001	SOIL	09-DEC-15 14:00:00 <u>RF</u>		148.94 g	9	
405235005-1	4.1.C.R.1.3	SAMPLE		MJWC001	SOIL	10-DEC-15 13:15:00 <u>RF</u>		157.331 g	19	
405235006-1	4.1.C.R.1.4	SAMPLE		MJWC001	SOIL	10-DEC-15 13:25:00 <u>RF</u>		156.342 g	20	
405235007-1	4.1.C.R.2.3	SAMPLE		MJWC001	SOIL	10-DEC-15 13:55:00 <u>RF</u>		152.523 g	32	
405235008-1	4.1.C.R.2.4	SAMPLE		MJWC001	SOIL	10-DEC-15 14:05:00 <u>RF</u>		147.889 g	39	
405235009-1	4.1.D.R.1.3	SAMPLE		MJWC001	SOIL	10-DEC-15 10:30:00 <u>RF</u>		134.381 g	25	
405235010-1	4.1.D.R.1.4	SAMPLE		MJWC001	SOIL	10-DEC-15 10:35:00 <u>RF</u>		141.695 g	28	
405235011-1	4.1.D.R.3.2	SAMPLE		MJWC001	SOIL	09-DEC-15 10:13:00 <u>RF</u>		146.502 g	37	
405235012-1	4.1.D.R.2.4	SAMPLE		MJWC001	SOIL	10-DEC-15 11:25:00 <u>RF</u>		154.64 g	38	
405235013-1	4.2.A.R.2.3	SAMPLE		MJWC001	SOIL	10-DEC-15 11:23:00 <u>RF</u>		144.574 g	41	
405235014-1	4.2.A.R.1.3	SAMPLE		MJWC001	SOIL	08-DEC-15 10:49:00 <u>RF</u>		153.732 g	43	
405235015-1	4.2.A.R.1.4	SAMPLE		MJWC001	SOIL	08-DEC-15 10:56:00 <u>RF</u>		145.075 g	44	
405235016-1	4.2.A.R.2.4	SAMPLE		MJWC001	SOIL	08-DEC-15 11:29:00 <u>RF</u>		163.118 g	12	
405235017-1	4.2.A.R.3.2	SAMPLE		MJWC001	SOIL	02-DEC-15 10:02:00 <u>RF</u>		148.561 g	16	
405235018-1	4.2.A.R.4.2	SAMPLE		MJWC001	SOIL	02-DEC-15 10:19:00 <u>RF</u>		155.815 g	27	
405235019-1	4.2.B.R.2.4	SAMPLE		MJWC001	SOIL	08-DEC-15 14:30:00 <u>RF</u>		175.975 g	11	
405235020-1	4.2.B.R.1.4	SAMPLE		MJWC001	SOIL	08-DEC-15 13:50:00 <u>RF</u>		170.763 g	1	
1203621350-1	MB	MB		QC ACCOUNT	SOIL	9/12/16 <u>RF</u>		175.975	31	
1203621351-1	DUP 4.1.B.R.1.2(405235001)	DUP		QC ACCOUNT	SOIL	10-DEC-15 14:20:00 <u>RF</u>		141.585	5	
1203621352-1	LCS	LCS		QC ACCOUNT	SOIL	9/12/16 <u>RF</u>		115	6	

Data Reviewed By: Wendy Peterson 10-3-16

GEL Laboratories LLC, Radiochemistry Division

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235001.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM02.CNF;493
Background date : 2-OCT-2016 11:00:01.
Sample date      : 10-DEC-2015 14:20:00 Acquisition date : 3-OCT-2016 07:56:53.
Sample ID       : G405235001 Sample quantity : 1.41921E+02 GRAM
Detector name   : GAM02 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.40 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596247 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	62.77*	30	156	0.99	125.05	122	8	8.25E-03	79.1	
2	3	74.90*	134	219	1.19	149.28	146	16	3.72E-02	19.9	2.23E+00
3	3	77.10	214	173	1.25	153.69	146	16	5.95E-02	13.0	
4	0	92.82*	107	266	1.47	185.10	180	12	2.97E-02	34.1	
5	0	112.23*	12	140	1.42	223.88	223	8	3.36E-03	174.4	
6	0	143.48*	10	140	1.27	286.32	283	8	2.92E-03	203.7	
7	0	186.02*	77	141	1.10	371.32	366	11	2.13E-02	34.6	
8	0	208.83	67	162	2.65	416.92	411	13	1.86E-02	41.0	
9	6	238.54*	414	71	1.26	476.29	471	18	1.15E-01	6.1	1.54E+00
10	6	241.94	115	81	2.10	483.07	471	18	3.20E-02	19.7	
11	0	270.65	84	95	3.65	540.43	533	14	2.34E-02	26.8	
12	0	295.25	153	83	1.10	589.60	585	10	4.26E-02	13.7	
13	0	338.34*	102	48	1.41	675.71	671	10	2.83E-02	16.4	
14	0	351.68*	258	72	1.53	702.37	696	12	7.17E-02	9.2	
15	0	382.01	14	39	2.94	762.98	756	9	3.79E-03	79.9	
16	0	464.18	18	44	0.60	927.18	918	13	5.13E-03	78.4	
17	0	510.86*	54	54	2.48	1020.46	1015	15	1.51E-02	37.4	
18	1	546.32	22	18	1.84	1091.33	1088	18	6.19E-03	35.8	2.69E+00
19	1	548.66	18	28	1.67	1096.00	1088	18	5.09E-03	58.2	
20	0	583.19*	145	28	1.34	1165.01	1159	13	4.04E-02	11.5	
21	0	609.14*	183	49	1.35	1216.87	1210	15	5.08E-02	11.4	
22	4	658.58	16	20	1.94	1315.69	1312	17	4.55E-03	56.0	6.25E+00
23	4	661.37	174	30	1.79	1321.26	1312	17	4.82E-02	9.5	
24	0	717.42	13	19	3.43	1433.28	1429	12	3.65E-03	70.7	
25	0	726.67	33	15	1.28	1451.75	1448	8	9.04E-03	27.5	
26	0	755.24	14	25	1.36	1508.86	1502	10	3.91E-03	71.6	
27	0	769.00	24	40	0.88	1536.36	1527	12	6.74E-03	55.5	
28	0	795.57	28	17	1.37	1589.45	1582	15	7.65E-03	41.3	
29	0	808.56	14	20	1.21	1615.42	1608	11	3.75E-03	71.6	
30	0	812.22	6	12	1.07	1622.73	1618	9	1.80E-03	101.7	
31	0	911.29*	79	11	1.64	1820.74	1815	11	2.20E-02	14.4	
32	1	964.76*	26	1	2.17	1927.61	1922	21	7.22E-03	27.6	6.57E-01
33	1	969.00*	49	5	2.17	1936.08	1922	21	1.36E-02	18.2	
34	0	1023.46	12	15	4.60	2044.92	2036	15	3.33E-03	76.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1099.87	16	18	0.80	2197.65	2188	14	4.35E-03	66.3	
36	0	1120.14*	42	12	1.94	2238.17	2233	15	1.17E-02	24.3	
37	0	1130.15	18	6	3.23	2258.17	2252	12	5.00E-03	36.0	
38	0	1154.59	26	10	2.10	2307.01	2300	14	7.16E-03	33.1	
39	2	1186.65	15	8	2.55	2371.09	2361	26	4.09E-03	62.7	1.04E+00
40	2	1191.84	14	17	2.55	2381.47	2361	26	4.01E-03	52.9	
41	0	1195.72	9	7	1.37	2389.22	2386	7	2.50E-03	59.1	
42	0	1222.52	15	8	1.55	2442.79	2438	10	4.24E-03	42.3	
43	0	1228.78	14	5	2.06	2455.30	2451	9	3.96E-03	37.8	
44	0	1252.82	23	3	3.01	2503.34	2498	12	6.31E-03	26.0	
45	0	1282.31	24	4	5.42	2562.30	2555	16	6.59E-03	28.0	
46	0	1325.72	13	0	2.73	2649.08	2644	12	3.61E-03	27.7	
47	0	1378.42*	14	7	1.11	2754.41	2750	10	3.91E-03	47.3	
48	0	1460.66*	375	8	1.79	2918.80	2910	15	1.04E-01	5.5	
49	0	1729.65*	7	2	0.69	3456.50	3450	11	1.90E-03	63.9	
50	0	1764.48*	33	0	2.63	3526.12	3520	13	9.15E-03	19.8	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235001.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 10-DEC-2015 14:20:00 Acquisition date : 3-OCT-2016 07:56:53
Sample ID         : G405235001 Sample quantity   : 141.92 GRAM
Sample type       : SOLID Sample geometry    :
Detector name     : GAMMA2 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.40 0.0%
Energy tolerance  : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type   : Linear Efficiencies at   : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.059E+00	1.685E+01	1.685E+01	10.98	OK
CO-58	810.76	99.45*	1.711E+00	2.038E-02	3.751E-01	203.37	OK
BA-137M	661.66	89.90*	2.016E+00	5.224E-01	5.323E-01	18.94	OK
CS-137	661.66	85.10*	2.016E+00	5.519E-01	5.624E-01	18.94	OK
TL-208	277.37	6.60	4.173E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.233E+00	4.222E-01	4.222E-01	23.00	OK
	860.56	12.50	1.634E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	3.783E+00	1.545E+00	1.545E+00	59.01	OK
	77.11	17.10	4.000E+00	2.030E+00	2.030E+00	25.96	OK
	238.63	43.60*	4.702E+00	1.200E+00	1.200E+00	12.25	OK
	300.09	3.30	3.910E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.155E+00	1.025E+00	1.026E+00	22.80	OK
	1120.29	14.92	1.323E+00	1.112E+00	1.112E+00	48.51	OK
	1764.49	15.30	8.931E-01	1.201E+00	1.202E+00	39.68	OK
PB-214	74.82	5.80	3.775E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	4.000E+00	3.579E+00	3.580E+00	25.96	OK
	87.09	3.41	4.837E+00	----- Line	Not Found	-----	Absent
	242.00	7.25	4.651E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.963E+00	1.226E+00	1.226E+00	27.45	OK
	351.93	35.60*	3.418E+00	1.221E+00	1.221E+00	18.38	OK
RN-222	609.32	45.49*	2.155E+00	1.025E+00	1.026E+00	22.80	OK
	1120.29	14.92	1.323E+00	1.112E+00	1.112E+00	48.51	OK
	1764.49	15.30	8.931E-01	1.201E+00	1.202E+00	39.68	OK
RA-224	240.99	4.10*	4.652E+00	1.414E+00	1.414E+00	108.39	OK
RA-226	609.32	45.49*	2.155E+00	1.025E+00	1.026E+00	22.80	OK
	1120.29	14.92	1.323E+00	1.112E+00	1.112E+00	48.51	OK
	1764.49	15.30	8.931E-01	1.201E+00	1.202E+00	39.68	OK
AC-228	105.21	1.10	5.776E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.533E+00	1.479E+00	1.479E+00	32.75	OK
	794.95	4.25	1.739E+00	1.999E+00	1.999E+00	82.62	OK
	835.71	1.61	1.672E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.561E+00	1.041E+00	1.041E+00	28.80	OK
	968.97	15.80	1.487E+00	1.100E+00	1.100E+00	36.32	OK
RA-228	105.21	1.10	5.776E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.533E+00	1.479E+00	1.479E+00	32.75	OK
	794.95	4.25	1.739E+00	1.999E+00	1.999E+00	82.62	OK
	835.71	1.61	1.672E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.561E+00	1.041E+00	1.041E+00	28.80	OK
	968.97	15.80	1.487E+00	1.100E+00	1.100E+00	36.32	OK
TH-228	74.82	10.28	3.783E+00	1.545E+00	1.545E+00	59.01	OK
	77.11	17.10	4.000E+00	2.030E+00	2.030E+00	25.96	OK
	238.63	43.60*	4.702E+00	1.200E+00	1.200E+00	12.25	OK
	300.09	3.30	3.910E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.155E+00	1.025E+00	1.025E+00	22.80	OK
	1120.29	14.92	1.323E+00	1.112E+00	1.112E+00	48.51	OK
	1764.49	15.30	8.931E-01	1.201E+00	1.201E+00	39.68	OK
TH-232	105.21	1.10	5.776E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.533E+00	1.479E+00	1.479E+00	32.75	OK
	835.71	1.61	1.672E+00	----- Line	Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	911.20	25.80*	1.561E+00	1.041E+00	1.041E+00	28.80	OK
	968.97	15.80	1.487E+00	1.100E+00	1.100E+00	36.32	OK
TH-234	63.29	3.70*	2.417E+00	2.186E+00	2.186E+00	158.12	OK
	92.59	4.23	5.211E+00	3.099E+00	3.099E+00	68.16	OK
U-234	609.32	45.49*	2.155E+00	1.025E+00	1.025E+00	22.80	OK
	1120.29	14.92	1.323E+00	1.112E+00	1.112E+00	48.51	OK
	1764.49	15.30	8.931E-01	1.201E+00	1.201E+00	39.68	OK
U-235	89.96	3.47	5.033E+00	----- Line	Not Found	-----	Absent
	93.35	5.60	5.211E+00	2.341E+00	2.341E+00	68.16	OK
	143.76	10.96*	6.129E+00	9.669E-02	9.669E-02	407.43	OK
	163.33	5.08	5.908E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.553E+00	1.464E-01	1.464E-01	69.13	OK
	205.31	5.01	5.230E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	2.417E+00	2.186E+00	2.186E+00	158.12	OK
	92.59	4.23	5.211E+00	3.099E+00	3.099E+00	68.16	OK
AM-243	43.53	5.90	2.878E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.783E+00	2.363E-01	2.364E-01	59.01	OK
ANH-511	511.00	100.00*	2.491E+00	1.218E-01	1.218E-01	74.84	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235001.CNF;1
* Acquisition date   : 3-OCT-2016 07:56:53 Sensitivity      : 3.000
* Detector ID       : GAM02 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.40 Half life ratio : *****
* Sample date       : 10-DEC-2015 14:20:00 Analyst initials: MXR1
* Sample ID         : G405235001 Sample Quantity : 1.4192E+02 GRAM
* Batch Number      : 1596247 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 22-AUG-2016 09:02:05 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.685E+01	1.814E+00	5.916E-01
CO-58	3.751E-01	7.476E-01	1.576E-01
BA-137M	5.323E-01	9.881E-02	8.448E-02
CS-137	5.624E-01	1.044E-01	8.924E-02
TL-208	4.222E-01	9.518E-02	7.254E-02
PB-212	1.200E+00	1.441E-01	1.072E-01
BI-214	1.026E+00	2.292E-01	1.350E-01
PB-214	1.221E+00	2.199E-01	1.460E-01
RN-222	1.026E+00	2.292E-01	1.350E-01
RA-224	1.414E+00	1.502E+00	1.149E+00
RA-226	1.026E+00	2.292E-01	1.350E-01
AC-228	1.041E+00	2.939E-01	2.560E-01
RA-228	1.041E+00	2.939E-01	2.560E-01
TH-228	1.200E+00	1.441E-01	1.072E-01
TH-230	1.025E+00	2.291E-01	1.350E-01
TH-232	1.041E+00	2.939E-01	2.560E-01
TH-234	2.186E+00	3.388E+00	2.955E+00
U-234	1.025E+00	2.291E-01	1.350E-01
U-235	9.669E-02	3.860E-01	3.806E-01
U-238	2.186E+00	3.388E+00	2.955E+00
AM-243	2.364E-01	1.367E-01	1.249E-01
ANH-511	1.218E-01	8.937E-02	6.502E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.033E+01	1.586E+01	2.726E+01	NOT IDENT.
NA-22	1.975E-02	5.169E-02	1.055E-01	NOT IDENT.
NA-24	0.000E+00	1.349E+41	0.000E+00	SHORT HLIF
AL-26	-1.136E-02	2.855E-02	5.642E-02	FAIL ABUN
SC-46	-2.504E-01	4.309E-01	7.340E-01	FAIL ABUN
V-48	0.000E+00	1.594E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	4.612E+02	0.000E+00	SHORT HLIF
MN-54	1.886E-02	7.391E-02	1.496E-01	NOT IDENT.

CO-56	-3.947E-01	5.563E-01	9.794E-01	NOT IDENT.
MN-56	0.000E+00	1.410E+41	0.000E+00	SHORT HLIF
CO-57	4.240E-02	5.649E-02	1.081E-01	NOT IDENT.
FE-59	1.111E+01	1.443E+01	1.734E+01	FAIL ABUN
CO-60	-3.648E-02	5.042E-02	7.292E-02	NOT IDENT.
ZN-65	-4.372E-03	2.487E-01	4.150E-01	NOT IDENT.
GE-68	-5.512E-01	2.709E+00	5.102E+00	NOT IDENT.
AS-73	8.307E+00	1.268E+01	2.537E+01	NOT IDENT.
AS-74	0.000E+00	7.478E+03	0.000E+00	SHORT HLIF
SE-75	-1.764E-01	2.576E-01	4.087E-01	NOT IDENT.
BR-77	0.000E+00	1.407E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	7.141E+02	0.000E+00	SHORT HLIF
RB-83	2.717E-01	7.858E-01	1.531E+00	NOT IDENT.
KR-85	1.558E+00	9.643E+00	1.629E+01	NOT IDENT.
SR-85	1.601E-01	9.966E-01	1.683E+00	NOT IDENT.
RB-86	0.000E+00	3.140E+04	0.000E+00	SHORT HLIF
Y-88	4.653E-02	2.202E-01	5.156E-01	NOT IDENT.
Y-91	-1.329E+02	6.400E+02	1.180E+03	NOT IDENT.
NB-94	-1.070E-02	3.508E-02	6.669E-02	NOT IDENT.
NB-95	-2.388E-01	1.250E+00	2.107E+00	NOT IDENT.
NB-95M	-4.962E-01	2.845E+00	4.826E+00	NOT IDENT.
ZR-95	1.934E+00	2.712E+00	3.715E+00	FAIL ABUN
NB-97	0.000E+00	1.097E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.179E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.572E+41	0.000E+00	SHORT HLIF
RH-101	-1.953E-02	4.321E-02	7.469E-02	NOT IDENT.
RH-102	1.531E-02	7.310E-02	1.392E-01	NOT IDENT.
RU-103	5.366E+00	5.231E+00	1.151E+01	FAIL ABUN
RH-106	-2.953E-01	6.393E-01	1.102E+00	NOT IDENT.
RU-106	-2.953E-01	6.393E-01	1.102E+00	NOT IDENT.
AG-108M	3.360E-02	3.703E-02	7.512E-02	NOT IDENT.
CD-109	2.982E+00	1.609E+00	3.067E+00	NOT IDENT.
AG-110M	5.130E-02	1.239E-01	2.550E-01	FAIL ABUN
SN-113	1.139E-01	2.743E-01	5.386E-01	NOT IDENT.
CD-115	0.000E+00	2.020E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.017E+05	0.000E+00	SHORT HLIF
TE-123M	5.067E-02	1.533E-01	3.055E-01	NOT IDENT.
SB-124	-6.571E-01	1.707E+00	3.429E+00	NOT IDENT.
SB-125	-4.868E-02	1.220E-01	2.192E-01	FAIL ABUN
TE-125M	8.935E+01	3.109E+02	5.793E+02	NOT IDENT.
I-126	0.000E+00	9.782E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.382E+06	0.000E+00	SHORT HLIF
SN-126	1.453E-01	1.028E-01	2.016E-01	NOT IDENT.
SB-127	0.000E+00	1.820E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	4.953E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.181E+26	0.000E+00	SHORT HLIF
BA-133	2.367E-02	4.869E-02	8.874E-02	NOT IDENT.
I-133	0.000E+00	7.179E+40	0.000E+00	SHORT HLIF
CS-134	1.306E-01	1.058E-01	1.338E-01	FAIL ABUN
CS-135	2.299E-02	1.592E-01	3.083E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.992E+05	0.000E+00	SHORT HLIF
CE-139	-2.036E-03	1.259E-01	2.457E-01	NOT IDENT.
BA-140	0.000E+00	1.537E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	5.300E+05	0.000E+00	SHORT HLIF
CE-141	-5.740E+00	3.088E+01	4.955E+01	NOT IDENT.
CE-143	0.000E+00	1.042E+41	0.000E+00	SHORT HLIF
CE-144	-4.306E-02	3.893E-01	6.950E-01	NOT IDENT.
PM-144	3.248E-02	6.778E-02	1.395E-01	NOT IDENT.
PR-144	2.802E+00	5.879E+00	1.210E+01	NOT IDENT.
PM-146	1.939E-02	5.429E-02	1.056E-01	NOT IDENT.
ND-147	0.000E+00	3.661E+07	0.000E+00	SHORT HLIF
PM-147	1.318E+02	9.980E+02	1.821E+03	NOT IDENT.
PM-149	0.000E+00	2.721E+40	0.000E+00	SHORT HLIF
EU-150	-4.283E-03	3.377E-02	5.634E-02	FAIL ABUN
EU-152	5.747E-03	1.128E-01	2.144E-01	FAIL ABUN
GD-153	-9.845E-02	2.504E-01	4.109E-01	NOT IDENT.
EU-154	4.574E-02	1.263E-01	2.570E-01	NOT IDENT.
EU-155	7.265E-02	1.258E-01	2.402E-01	NOT IDENT.
TB-160	-1.448E+00	1.972E+00	3.443E+00	FAIL ABUN
HO-166M	2.139E-02	6.676E-02	1.331E-01	NOT IDENT.
TM-171	-2.711E+00	3.236E+01	6.126E+01	NOT IDENT.
HF-172	-1.167E-02	2.786E-01	4.995E-01	FAIL ABUN
LU-172	-3.326E-02	1.334E-01	2.099E-01	FAIL ABUN
LU-176	-9.986E-03	2.611E-02	4.822E-02	NOT IDENT.
HF-181	2.255E-01	5.453E+00	1.019E+01	NOT IDENT.

TA-182	1.438E+00	1.193E+00	2.312E+00	FAIL ABUN
RE-183	-2.638E+00	4.377E+00	7.887E+00	NOT IDENT.
RE-184	2.943E+01	3.645E+01	7.818E+01	NOT IDENT.
W-188	-3.587E+01	1.423E+02	2.362E+02	FAIL ABUN
IR-192	-4.362E-01	5.188E-01	9.087E-01	FAIL ABUN
HG-203	4.209E-01	2.751E+00	5.309E+00	NOT IDENT.
BI-207	-2.553E-02	5.978E-02	1.077E-01	FAIL ABUN
PB-210	-1.184E+00	5.916E+00	1.104E+01	NOT IDENT.
BI-211	0.000E+00	6.058E-01	9.921E-01	FAIL ABUN
PB-211	-3.378E-02	8.026E-01	1.503E+00	NOT IDENT.
BI-212	1.412E+00	7.607E-01	1.461E+00	FAIL ABUN
RN-219	-1.153E-01	4.514E-01	8.272E-01	FAIL ABUN
RA-223	-2.656E-01	6.892E-01	1.262E+00	FAIL ABUN
AC-227	1.042E-02	2.582E-01	4.975E-01	NOT IDENT.
TH-227	1.042E-02	2.582E-01	4.975E-01	NOT IDENT.
TH-229	1.264E-01	5.363E-01	1.054E+00	NOT IDENT.
PA-231	5.744E-02	5.328E-01	1.019E+00	NOT IDENT.
TH-231	-2.656E-01	6.892E-01	1.262E+00	FAIL ABUN
PA-233	-8.485E-03	6.648E-02	1.255E-01	NOT IDENT.
PA-234	-1.485E-01	3.838E-01	6.989E-01	FAIL ABUN
PA-234M	-1.313E+00	5.149E+00	1.012E+01	NOT IDENT.
NP-237	-8.485E-03	6.648E-02	1.255E-01	NOT IDENT.
NP-238	0.000E+00	1.204E+41	0.000E+00	SHORT HLIF
NP-239	3.933E-01	3.001E-01	5.656E-01	NOT IDENT.
PU-239	2.344E+01	3.894E+02	7.001E+02	NOT IDENT.
AM-241	2.139E-01	2.158E-01	4.059E-01	NOT IDENT.
CM-243	-1.051E-02	1.259E-01	2.275E-01	NOT IDENT.
BK-247	-6.994E-02	8.734E-02	1.363E-01	NOT IDENT.
CM-247	-3.403E-02	4.050E-02	6.917E-02	NOT IDENT.
CF-249	3.059E-03	4.283E-02	8.169E-02	NOT IDENT.
CF-251	-1.555E-02	1.229E-01	2.383E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	360	10.66*	1.059E+00	1.685E+01	1.685E+01	10.98
CO-58	810.76	7	99.45*	1.711E+00	2.038E-02	3.751E-01	203.37
BA-137M	661.66	179	89.90*	2.016E+00	5.224E-01	5.323E-01	18.94
CS-137	661.66	179	85.10*	2.016E+00	5.519E-01	5.624E-01	18.94
TL-208	277.37	-----	6.60	4.173E+00	-----	Line Not Found	-----
	583.19	151	85.00*	2.233E+00	4.222E-01	4.222E-01	23.00
	860.56	-----	12.50	1.634E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	3.574E+00	-----	Line Not Found	-----
	351.06	281	12.92*	3.418E+00	3.364E+00	3.364E+00	18.38
PB-212	74.82	164	10.28	3.783E+00	2.237E+00	2.237E+00	39.87
	77.11	262	17.10	4.000E+00	2.030E+00	2.030E+00	25.96
	238.63	465	43.60*	4.702E+00	1.200E+00	1.200E+00	12.25
	300.09	-----	3.30	3.910E+00	-----	Line Not Found	-----
BI-214	609.32	190	45.49*	2.155E+00	1.025E+00	1.026E+00	22.80
	1120.29	41	14.92	1.323E+00	1.112E+00	1.112E+00	48.51
	1764.49	31	15.30	8.931E-01	1.201E+00	1.202E+00	39.68
PB-214	74.82	164	5.80	3.783E+00	3.964E+00	3.966E+00	39.87
	77.11	262	9.70	4.000E+00	3.579E+00	3.580E+00	25.96
	87.09	-----	3.41	4.837E+00	-----	Line Not Found	-----
	242.00	129	7.25	4.652E+00	2.026E+00	2.027E+00	39.44
	295.22	169	18.42	3.963E+00	1.226E+00	1.226E+00	27.45
	351.93	281	35.60*	3.418E+00	1.221E+00	1.221E+00	18.38
RN-222	609.32	190	45.49*	2.155E+00	1.025E+00	1.026E+00	22.80
	1120.29	41	14.92	1.323E+00	1.112E+00	1.112E+00	48.51
	1764.49	31	15.30	8.931E-01	1.201E+00	1.202E+00	39.68
RA-224	240.99	129	4.10*	4.652E+00	3.582E+00	3.582E+00	39.44
RA-226	609.32	190	45.49*	2.155E+00	1.025E+00	1.026E+00	22.80
	1120.29	41	14.92	1.323E+00	1.112E+00	1.112E+00	48.51
	1764.49	31	15.30	8.931E-01	1.201E+00	1.202E+00	39.68
AC-228	105.21	-----	1.10	5.776E+00	-----	Line Not Found	-----
	338.32	111	11.27	3.533E+00	1.479E+00	1.479E+00	32.75
	794.95	28	4.25	1.739E+00	1.999E+00	1.999E+00	82.62
	835.71	-----	1.61	1.672E+00	-----	Line Not Found	-----
	911.20	79	25.80*	1.561E+00	1.041E+00	1.041E+00	28.80
	968.97	49	15.80	1.487E+00	1.100E+00	1.100E+00	36.32
RA-228	105.21	-----	1.10	5.776E+00	-----	Line Not Found	-----
	338.32	111	11.27	3.533E+00	1.479E+00	1.479E+00	32.75
	794.95	28	4.25	1.739E+00	1.999E+00	1.999E+00	82.62
	835.71	-----	1.61	1.672E+00	-----	Line Not Found	-----
	911.20	79	25.80*	1.561E+00	1.041E+00	1.041E+00	28.80
	968.97	49	15.80	1.487E+00	1.100E+00	1.100E+00	36.32
TH-228	74.82	164	10.28	3.783E+00	2.237E+00	2.237E+00	39.87
	77.11	262	17.10	4.000E+00	2.030E+00	2.030E+00	25.96
	238.63	465	43.60*	4.702E+00	1.200E+00	1.200E+00	12.25
	300.09	-----	3.30	3.910E+00	-----	Line Not Found	-----
TH-230	609.32	190	45.49*	2.155E+00	1.025E+00	1.025E+00	22.80
	1120.29	41	14.92	1.323E+00	1.112E+00	1.112E+00	48.51

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	1764.49	31	15.30	8.931E-01	1.201E+00	1.201E+00	39.68
TH-232	105.21	-----	1.10	5.776E+00	-----	Line Not Found	-----
	338.32	111	11.27	3.533E+00	1.479E+00	1.479E+00	32.75
	835.71	-----	1.61	1.672E+00	-----	Line Not Found	-----
	911.20	79	25.80*	1.561E+00	1.041E+00	1.041E+00	28.80
	968.97	49	15.80	1.487E+00	1.100E+00	1.100E+00	36.32
TH-234	63.29	37	3.70*	2.417E+00	2.186E+00	2.186E+00	158.12
	92.59	129	4.23	5.211E+00	3.099E+00	3.099E+00	68.16
U-234	609.32	190	45.49*	2.155E+00	1.025E+00	1.025E+00	22.80
	1120.29	41	14.92	1.323E+00	1.112E+00	1.112E+00	48.51
	1764.49	31	15.30	8.931E-01	1.201E+00	1.201E+00	39.68
U-235	89.96	-----	3.47	5.033E+00	-----	Line Not Found	-----
	93.35	129	5.60	5.211E+00	2.341E+00	2.341E+00	68.16
	143.76	12	10.96*	6.129E+00	9.669E-02	9.669E-02	407.43
	163.33	-----	5.08	5.908E+00	-----	Line Not Found	-----
	185.72	88	57.20	5.553E+00	1.464E-01	1.464E-01	69.13
	205.31	-----	5.01	5.230E+00	-----	Line Not Found	-----
U-238	63.29	37	3.70*	2.417E+00	2.186E+00	2.186E+00	158.12
	92.59	129	4.23	5.211E+00	3.099E+00	3.099E+00	68.16
AM-243	43.53	-----	5.90	2.878E-01	-----	Line Not Found	-----
	74.66	164	67.20*	3.783E+00	3.421E-01	3.422E-01	39.87
ANH-511	511.00	57	100.00*	2.491E+00	1.218E-01	1.218E-01	74.84

Flag: "*" = Keyline

Total number of lines in spectrum 50
 Number of unidentified lines 16
 Number of lines tentatively identified by NID 34 68.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.685E+01	1.685E+01	0.185E+01	10.98	
CO-58	70.86D	18.4	2.038E-02	3.751E-01	7.629E-01	203.37	
BA-137M	30.08Y	1.02	5.224E-01	5.323E-01	1.008E-01	18.94	
CS-137	30.08Y	1.02	5.519E-01	5.624E-01	1.065E-01	18.94	
TL-208	1.41E+10Y	1.00	4.222E-01	4.222E-01	0.971E-01	23.00	
BI-211	7.04E+08Y	1.00	3.364E+00	3.364E+00	0.618E+00	18.38	
PB-212	1.41E+10Y	1.00	1.200E+00	1.200E+00	0.147E+00	12.25	
BI-214	1600.00Y	1.00	1.025E+00	1.026E+00	0.234E+00	22.80	
PB-214	1600.00Y	1.00	1.221E+00	1.221E+00	0.224E+00	18.38	
RN-222	1600.00Y	1.00	1.025E+00	1.026E+00	0.234E+00	22.80	
RA-224	1.41E+10Y	1.00	3.582E+00	3.582E+00	1.413E+00	39.44	
RA-226	1600.00Y	1.00	1.025E+00	1.026E+00	0.234E+00	22.80	
AC-228	1.41E+10Y	1.00	1.041E+00	1.041E+00	0.300E+00	28.80	
RA-228	1.41E+10Y	1.00	1.041E+00	1.041E+00	0.300E+00	28.80	
TH-228	1.41E+10Y	1.00	1.200E+00	1.200E+00	0.147E+00	12.25	
TH-230	7.54E+04Y	1.00	1.025E+00	1.025E+00	0.234E+00	22.80	
TH-232	1.41E+10Y	1.00	1.041E+00	1.041E+00	0.300E+00	28.80	
TH-234	4.47E+09Y	1.00	2.186E+00	2.186E+00	3.457E+00	158.12	
U-234	2.45E+05Y	1.00	1.025E+00	1.025E+00	0.234E+00	22.80	
U-235	7.04E+08Y	1.00	9.669E-02	9.669E-02	39.39E-02	407.43	
U-238	4.47E+09Y	1.00	2.186E+00	2.186E+00	3.457E+00	158.12	
AM-243	7370.00Y	1.00	3.421E-01	3.422E-01	1.364E-01	39.87	
ANH-511	1.00E+09Y	1.00	1.218E-01	1.218E-01	0.912E-01	74.84	
Total Activity :			4.212E+01	4.250E+01			

Grand Total Activity : 4.212E+01 4.250E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	112.23	14	167	1.42	223.88	223	8	3.36E-03	****	5.97E+00	T
0	208.83	76	184	2.65	416.92	411	13	1.86E-02	82.0	5.17E+00	
0	270.65	94	105	3.65	540.43	533	14	2.34E-02	53.6	4.26E+00	T
0	382.01	15	43	2.94	762.98	756	9	3.79E-03	****	3.19E+00	
0	464.18	20	46	0.60	927.18	918	13	5.13E-03	****	2.70E+00	T
1	546.32	23	19	1.84	1091.33	1088	18	6.19E-03	71.6	2.36E+00	T
1	548.66	19	29	1.67	1096.00	1088	18	5.09E-03	****	2.35E+00	
4	658.58	17	21	1.94	1315.69	1312	17	4.55E-03	****	2.02E+00	T
0	717.42	13	19	3.43	1433.28	1429	12	3.65E-03	****	1.89E+00	
0	726.67	33	16	1.28	1451.75	1448	8	9.04E-03	55.0	1.87E+00	T
0	755.24	14	25	1.36	1508.86	1502	10	3.91E-03	****	1.81E+00	T
0	769.00	25	40	0.88	1536.36	1527	12	6.74E-03	****	1.79E+00	
0	808.56	14	20	1.21	1615.42	1608	11	3.75E-03	****	1.72E+00	T
1	964.76	26	1	2.17	1927.61	1922	21	7.22E-03	55.2	1.49E+00	T
0	1023.46	12	15	4.60	2044.92	2036	15	3.33E-03	****	1.42E+00	
0	1099.87	15	18	0.80	2197.65	2188	14	4.35E-03	****	1.34E+00	T
0	1130.15	18	6	3.23	2258.17	2252	12	5.00E-03	72.0	1.31E+00	T
0	1154.59	25	10	2.10	2307.01	2300	14	7.16E-03	66.1	1.29E+00	
2	1186.65	14	8	2.55	2371.09	2361	26	4.09E-03	****	1.26E+00	
2	1191.84	14	17	2.55	2381.47	2361	26	4.01E-03	****	1.26E+00	
0	1195.72	9	7	1.37	2389.22	2386	7	2.50E-03	****	1.25E+00	
0	1222.52	15	8	1.55	2442.79	2438	10	4.24E-03	84.7	1.23E+00	T
0	1228.78	14	5	2.06	2455.30	2451	9	3.96E-03	75.7	1.23E+00	
0	1252.82	22	3	3.01	2503.34	2498	12	6.31E-03	52.1	1.21E+00	
0	1282.31	23	4	5.42	2562.30	2555	16	6.59E-03	55.9	1.18E+00	
0	1325.72	13	0	2.73	2649.08	2644	12	3.61E-03	55.5	1.15E+00	
0	1378.42	14	7	1.11	2754.41	2750	10	3.91E-03	94.7	1.11E+00	
0	1729.65	6	2	0.69	3456.50	3450	11	1.90E-03	****	9.10E-01	

Flags: "T" = Tentatively associated

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
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DETECTOR AND SAMPLE DATA

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*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235001.CNF;1
* Acquisition date   : 3-OCT-2016 07:56:53 Sensitivity      : 3.000
* Detector ID        : GAM02 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.40 Half life ratio  : *****
* Sample date        : 10-DEC-2015 14:20:00 Nuclide Library : SOLID
* Sample ID          : G405235001 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.4192E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
* Dry Weight         : 0.00000
*****
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CALIBRATION INFORMATION

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*
* Eff. Cal. date     : 22-AUG-2016 09:02:05 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;15
*****
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.322E-01
CO-58	0.000E+00
BA-137M	3.814E-02
CS-137	4.029E-02
TL-208	3.242E-02
PB-212	4.997E-02
BI-214	6.005E-02
PB-214	6.692E-02
RN-222	6.005E-02
RA-224	5.359E-01
RA-226	6.005E-02
AC-228	1.100E-01
RA-228	1.100E-01
TH-228	4.997E-02
TH-230	6.003E-02
TH-232	1.100E-01
TH-234	1.395E+00
U-234	6.003E-02
U-235	1.791E-01
U-238	1.395E+00
AM-243	5.947E-02
ANH-511	2.957E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.234E+01	NOT IDENT.
NA-22	4.521E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.999E-02	FAIL ABUN
SC-46	3.135E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	6.639E-02	NOT IDENT.
CO-56	4.262E-01	NOT IDENT.

MN-56	0.000E+00	SHORT HLIF
CO-57	5.099E-02	NOT IDENT.
FE-59	7.686E+00	FAIL ABUN
CO-60	2.947E-02	NOT IDENT.
ZN-65	1.825E-01	NOT IDENT.
GE-68	2.199E+00	NOT IDENT.
AS-73	1.192E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.881E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	6.927E-01	NOT IDENT.
KR-85	7.428E+00	NOT IDENT.
SR-85	7.675E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.997E-01	NOT IDENT.
Y-91	5.143E+02	NOT IDENT.
NB-94	2.955E-02	NOT IDENT.
NB-95	9.515E-01	NOT IDENT.
NB-95M	2.254E+00	NOT IDENT.
ZR-95	1.672E+00	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.522E-02	NOT IDENT.
RH-102	6.238E-02	NOT IDENT.
RU-103	5.151E+00	FAIL ABUN
RH-106	4.904E-01	NOT IDENT.
RU-106	4.904E-01	NOT IDENT.
AG-108M	3.472E-02	NOT IDENT.
CD-109	1.469E+00	NOT IDENT.
AG-110M	1.133E-01	FAIL ABUN
SN-113	2.474E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.443E-01	NOT IDENT.
SB-124	1.215E+00	NOT IDENT.
SB-125	9.914E-02	FAIL ABUN
TE-125M	2.724E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SN-126	9.664E-02	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.066E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	6.047E-02	FAIL ABUN
CS-135	1.433E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	1.157E-01	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.333E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.248E-01	NOT IDENT.
PM-144	6.308E-02	NOT IDENT.
PR-144	5.470E+00	NOT IDENT.
PM-146	4.823E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	8.571E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.599E-02	FAIL ABUN
EU-152	9.888E-02	FAIL ABUN
GD-153	1.942E-01	NOT IDENT.
EU-154	1.100E-01	NOT IDENT.
EU-155	1.131E-01	NOT IDENT.
TB-160	1.461E+00	FAIL ABUN
HO-166M	5.947E-02	NOT IDENT.
TM-171	2.873E+01	NOT IDENT.
HF-172	2.351E-01	FAIL ABUN
LU-172	9.346E-02	FAIL ABUN
LU-176	2.205E-02	NOT IDENT.
HF-181	4.643E+00	NOT IDENT.
TA-182	1.025E+00	FAIL ABUN

RE-183	3.711E+00	NOT IDENT.
RE-184	3.498E+01	NOT IDENT.
W-188	1.093E+02	FAIL ABUN
IR-192	4.152E-01	FAIL ABUN
HG-203	2.471E+00	NOT IDENT.
BI-207	4.672E-02	FAIL ABUN
PB-210	5.173E+00	NOT IDENT.
BI-211	4.796E-01	FAIL ABUN
PB-211	6.871E-01	NOT IDENT.
BI-212	6.722E-01	FAIL ABUN
RN-219	3.771E-01	FAIL ABUN
RA-223	5.807E-01	FAIL ABUN
AC-227	2.312E-01	NOT IDENT.
TH-227	2.312E-01	NOT IDENT.
TH-229	4.961E-01	NOT IDENT.
PA-231	4.740E-01	NOT IDENT.
TH-231	5.807E-01	FAIL ABUN
PA-233	5.767E-02	NOT IDENT.
PA-234	3.097E-01	FAIL ABUN
PA-234M	4.465E+00	NOT IDENT.
NP-237	5.767E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	2.671E-01	NOT IDENT.
PU-239	3.308E+02	NOT IDENT.
AM-241	1.924E-01	NOT IDENT.
CM-243	1.073E-01	NOT IDENT.
BK-247	6.243E-02	NOT IDENT.
CM-247	3.123E-02	NOT IDENT.
CF-249	3.729E-02	NOT IDENT.
CF-251	1.115E-01	NOT IDENT.


```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235001.CNF;1
* Acquisition date   : 3-OCT-2016 07:56:53 Sensitivity      : 3.000
* Detector ID       : GAM02 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.40 Half life ratio : *****
* Sample date       : 10-DEC-2015 14:20:00 Nuclide Library : SOLID
* Sample ID         : G405235001 Analyst initials: MXR1
* Batch Number      : 1596247 Sample Quantity : 1.4192E+02 GRAM
*                               Quantity Err(%) : 1.4092E-03 %
* Wet wt corr       : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight      : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date    : 22-AUG-2016 09:02:05 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.685E+01	2.017E+00	2.017E+00
CO-58	3.751E-01	7.478E-01	7.478E-01
BA-137M	5.323E-01	1.014E-01	1.014E-01
CS-137	5.624E-01	1.071E-01	1.071E-01
TL-208	4.222E-01	9.686E-02	9.686E-02
PB-212	1.200E+00	1.576E-01	1.576E-01
BI-214	1.026E+00	2.334E-01	2.334E-01
PB-214	1.221E+00	2.258E-01	2.258E-01
RN-222	1.026E+00	2.334E-01	2.334E-01
RA-224	1.414E+00	1.511E+00	1.511E+00
RA-226	1.026E+00	2.334E-01	2.334E-01
AC-228	1.041E+00	2.987E-01	2.987E-01
RA-228	1.041E+00	2.987E-01	2.987E-01
TH-228	1.200E+00	1.576E-01	1.576E-01
TH-230	1.025E+00	2.333E-01	2.333E-01
TH-232	1.041E+00	2.987E-01	2.987E-01
TH-234	2.186E+00	3.422E+00	3.422E+00
U-234	1.025E+00	2.333E-01	2.333E-01
U-235	9.669E-02	3.861E-01	3.861E-01
U-238	2.186E+00	3.422E+00	3.422E+00
AM-243	2.364E-01	1.381E-01	1.381E-01
ANH-511	1.218E-01	8.951E-02	8.951E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.033E+01	1.586E+01	1.653E+01	NOT IDENT.
NA-22	1.975E-02	5.170E-02	5.246E-02	NOT IDENT.
NA-24	-1.000E+41	1.417E+41	0.000E+00	SHORT HLIF
AL-26	-1.136E-02	2.856E-02	2.901E-02	FAIL ABUN
SC-46	-2.504E-01	4.310E-01	4.456E-01	FAIL ABUN
V-48	1.277E+04	1.595E+04	1.696E+04	SHORT HLIF
CR-51	2.842E+02	4.614E+02	4.789E+02	SHORT HLIF
MN-54	1.886E-02	7.391E-02	7.440E-02	NOT IDENT.

CO-56	-3.947E-01	5.565E-01	5.843E-01	NOT IDENT.
MN-56	-1.000E+41	1.410E+41	0.000E+00	SHORT HLIF
CO-57	4.240E-02	5.653E-02	5.967E-02	NOT IDENT.
FE-59	1.111E+01	1.445E+01	1.529E+01	FAIL ABUN
CO-60	-3.648E-02	5.044E-02	5.306E-02	NOT IDENT.
ZN-65	-4.372E-03	2.487E-01	2.487E-01	NOT IDENT.
GE-68	-5.512E-01	2.709E+00	2.720E+00	NOT IDENT.
AS-73	8.307E+00	1.279E+01	1.333E+01	NOT IDENT.
AS-74	5.670E+03	7.493E+03	7.917E+03	SHORT HLIF
SE-75	-1.764E-01	2.577E-01	2.697E-01	NOT IDENT.
BR-77	1.172E+38	1.007E+39	0.000E+00	SHORT HLIF
SR-82	1.438E+02	7.141E+02	7.170E+02	SHORT HLIF
RB-83	2.717E-01	7.867E-01	7.962E-01	NOT IDENT.
KR-85	1.558E+00	9.643E+00	9.668E+00	NOT IDENT.
SR-85	1.601E-01	9.966E-01	9.992E-01	NOT IDENT.
RB-86	-1.205E+04	3.141E+04	3.187E+04	SHORT HLIF
Y-88	4.653E-02	2.202E-01	2.212E-01	NOT IDENT.
Y-91	-1.329E+02	6.400E+02	6.428E+02	NOT IDENT.
NB-94	-1.070E-02	3.508E-02	3.541E-02	NOT IDENT.
NB-95	-2.388E-01	1.250E+00	1.255E+00	NOT IDENT.
NB-95M	-4.962E-01	2.845E+00	2.854E+00	NOT IDENT.
ZR-95	1.934E+00	2.714E+00	2.850E+00	FAIL ABUN
NB-97	1.000E+41	1.098E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	4.411E+41	0.000E+00	SHORT HLIF
MO-99	1.831E+31	1.179E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.576E+41	0.000E+00	SHORT HLIF
RH-101	-1.953E-02	4.335E-02	4.424E-02	NOT IDENT.
RH-102	1.531E-02	7.311E-02	7.344E-02	NOT IDENT.
RU-103	5.366E+00	5.237E+00	5.769E+00	FAIL ABUN
RH-106	-2.953E-01	6.396E-01	6.533E-01	NOT IDENT.
RU-106	-2.953E-01	6.396E-01	6.533E-01	NOT IDENT.
AG-108M	3.360E-02	3.705E-02	4.003E-02	NOT IDENT.
CD-109	2.982E+00	1.628E+00	2.111E+00	NOT IDENT.
AG-110M	5.130E-02	1.239E-01	1.260E-01	FAIL ABUN
SN-113	1.139E-01	2.743E-01	2.791E-01	NOT IDENT.
CD-115	6.777E+38	2.023E+39	0.000E+00	SHORT HLIF
SN-117M	2.239E+03	1.017E+05	1.017E+05	SHORT HLIF
TE-123M	5.067E-02	1.533E-01	1.550E-01	NOT IDENT.
SB-124	-6.571E-01	1.707E+00	1.733E+00	NOT IDENT.
SB-125	-4.868E-02	1.220E-01	1.239E-01	FAIL ABUN
TE-125M	8.935E+01	3.109E+02	3.135E+02	NOT IDENT.
I-126	1.189E+05	9.783E+05	9.798E+05	SHORT HLIF
SB-126	-4.278E+05	1.384E+06	1.398E+06	SHORT HLIF
SN-126	1.453E-01	1.032E-01	1.222E-01	NOT IDENT.
SB-127	-1.412E+22	2.651E+22	0.000E+00	SHORT HLIF
I-131	1.886E+09	4.954E+09	5.026E+09	SHORT HLIF
I-132	-1.000E+41	1.847E+42	0.000E+00	SHORT HLIF
TE-132	-1.375E+26	3.229E+26	0.000E+00	SHORT HLIF
BA-133	2.367E-02	4.870E-02	4.985E-02	NOT IDENT.
I-133	-1.000E+41	1.935E+41	0.000E+00	SHORT HLIF
CS-134	1.306E-01	1.059E-01	1.212E-01	FAIL ABUN
CS-135	2.299E-02	1.592E-01	1.596E-01	NOT IDENT.
I-135	1.000E+41	7.696E+41	0.000E+00	SHORT HLIF
CS-136	2.616E+05	3.005E+05	3.229E+05	SHORT HLIF
CE-139	-2.036E-03	1.259E-01	1.259E-01	NOT IDENT.
BA-140	1.090E+06	1.538E+06	1.615E+06	SHORT HLIF
LA-140	1.213E+05	5.300E+05	5.328E+05	SHORT HLIF
CE-141	-5.740E+00	3.089E+01	3.099E+01	NOT IDENT.
CE-143	1.000E+41	1.047E+41	0.000E+00	SHORT HLIF
CE-144	-4.306E-02	3.893E-01	3.898E-01	NOT IDENT.
PM-144	3.248E-02	6.781E-02	6.937E-02	NOT IDENT.
PR-144	2.802E+00	5.880E+00	6.014E+00	NOT IDENT.
PM-146	1.939E-02	5.431E-02	5.500E-02	NOT IDENT.
ND-147	-2.717E+07	3.664E+07	3.863E+07	SHORT HLIF
PM-147	1.318E+02	9.980E+02	9.998E+02	NOT IDENT.
PM-149	-9.014E+39	2.728E+40	0.000E+00	SHORT HLIF
EU-150	-4.283E-03	3.377E-02	3.382E-02	FAIL ABUN
EU-152	5.747E-03	1.128E-01	1.128E-01	FAIL ABUN
GD-153	-9.845E-02	2.505E-01	2.544E-01	NOT IDENT.
EU-154	4.574E-02	1.263E-01	1.280E-01	NOT IDENT.
EU-155	7.265E-02	1.259E-01	1.301E-01	NOT IDENT.
TB-160	-1.448E+00	1.974E+00	2.079E+00	FAIL ABUN
HO-166M	2.139E-02	6.677E-02	6.746E-02	NOT IDENT.
TM-171	-2.711E+00	3.236E+01	3.239E+01	NOT IDENT.
HF-172	-1.167E-02	2.786E-01	2.787E-01	FAIL ABUN
LU-172	-3.326E-02	1.334E-01	1.342E-01	FAIL ABUN
LU-176	-9.986E-03	2.612E-02	2.650E-02	NOT IDENT.
HF-181	2.255E-01	5.453E+00	5.454E+00	NOT IDENT.

TA-182	1.438E+00	1.195E+00	1.359E+00	FAIL ABUN
RE-183	-2.638E+00	4.396E+00	4.554E+00	NOT IDENT.
RE-184	2.943E+01	3.712E+01	3.942E+01	NOT IDENT.
W-188	-3.587E+01	1.424E+02	1.433E+02	FAIL ABUN
IR-192	-4.362E-01	5.191E-01	5.551E-01	FAIL ABUN
HG-203	4.209E-01	2.751E+00	2.757E+00	NOT IDENT.
BI-207	-2.553E-02	5.979E-02	6.088E-02	FAIL ABUN
PB-210	-1.184E+00	5.917E+00	5.941E+00	NOT IDENT.
BI-211	3.364E+00	6.243E-01	1.640E+00	FAIL ABUN
PB-211	-3.378E-02	8.026E-01	8.027E-01	NOT IDENT.
BI-212	1.412E+00	7.641E-01	9.945E-01	FAIL ABUN
RN-219	-1.153E-01	4.517E-01	4.547E-01	FAIL ABUN
RA-223	-2.656E-01	6.894E-01	6.997E-01	FAIL ABUN
AC-227	1.042E-02	2.582E-01	2.583E-01	NOT IDENT.
TH-227	1.042E-02	2.582E-01	2.583E-01	NOT IDENT.
TH-229	1.264E-01	5.363E-01	5.393E-01	NOT IDENT.
PA-231	5.744E-02	5.329E-01	5.336E-01	NOT IDENT.
TH-231	-2.656E-01	6.894E-01	6.997E-01	FAIL ABUN
PA-233	-8.485E-03	6.648E-02	6.659E-02	NOT IDENT.
PA-234	-1.485E-01	4.197E-01	4.250E-01	FAIL ABUN
PA-234M	-1.313E+00	5.149E+00	5.183E+00	NOT IDENT.
NP-237	-8.485E-03	6.648E-02	6.659E-02	NOT IDENT.
NP-238	1.000E+41	1.205E+41	0.000E+00	SHORT HLIF
NP-239	3.933E-01	3.019E-01	3.501E-01	NOT IDENT.
PU-239	2.344E+01	3.894E+02	3.896E+02	NOT IDENT.
AM-241	2.139E-01	2.164E-01	2.369E-01	NOT IDENT.
CM-243	-1.051E-02	1.259E-01	1.260E-01	NOT IDENT.
BK-247	-6.994E-02	8.847E-02	9.392E-02	NOT IDENT.
CM-247	-3.403E-02	4.090E-02	4.368E-02	NOT IDENT.
CF-249	3.059E-03	4.283E-02	4.286E-02	NOT IDENT.
CF-251	-1.555E-02	1.229E-01	1.231E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	78.2704	87.09	134.7812	136.47	85.0401
45.60	71.5784	87.57	127.0328	140.51	0.0000
46.54	72.7927	88.03	103.5126	143.76	85.8807
49.72	0.0000	88.34	141.0985	144.24	85.9352
51.35	77.8999	88.47	136.6277	145.44	91.8101
51.87	86.3264	89.96	143.0228	152.43	89.3353
52.39	78.1111	1093.63	137.1702	153.25	0.0000
52.97	63.6255	91.11	0.0000	323.87	90.7811
53.44	65.7908	92.59	114.5844	156.02	0.0000
54.07	78.4481	93.35	114.7400	158.56	0.0000
57.36	0.0000	94.56	114.9858	159.00	89.2407
57.53	88.6213	94.65	115.0043	162.33	96.3059
57.98	101.3919	94.67	115.0082	162.66	0.0000
59.27	69.2175	94.87	115.0482	163.33	90.5537
59.32	69.2258	97.43	100.6885	165.86	88.3075
59.54	81.9838	98.43	85.9617	176.31	78.3306
60.96	93.6061	98.44	85.9634	176.60	0.0000
61.17	86.5572	99.53	97.6068	177.52	75.0288
62.93	94.0358	100.11	100.0017	181.07	0.0000
63.29	94.1133	102.03	93.4072	181.52	80.9379
63.58	94.1761	103.18	94.7418	184.41	77.3337
64.28	102.9014	103.37	94.7718	143.76	77.4463
66.73	100.5944	105.21	73.0336	193.51	78.9761
67.24	103.5850	105.31	73.0456	197.03	85.3722
125.81	111.2457	106.12	85.9137	198.01	77.6124
67.75	111.2622	106.47	98.7410	201.83	78.8013
69.67	100.8815	109.28	75.8505	203.43	72.3545
70.83	144.6296	111.00	84.2492	205.31	56.6783
72.81	141.2314	111.76	0.0000	210.85	70.2564
72.87	141.2491	114.06	99.9395	215.65	63.0488
74.66	130.4477	116.30	0.0000	222.11	78.6445
74.82	130.4904	116.74	61.3925	227.09	80.8209
74.97	130.5312	119.76	83.0230	227.38	80.8429
77.11	131.1005	121.12	82.0038	228.16	0.0000
78.74	131.5290	121.22	82.0159	228.18	86.2988
79.69	131.7769	121.78	83.2740	116.74	86.2988
80.12	104.9197	122.06	72.5976	235.69	71.9757
80.19	0.0000	122.92	95.3308	235.96	71.9943
80.57	121.2817	123.07	95.3522	238.63	63.5486
81.00	113.9828	265.00	90.6657	238.98	0.0000
81.07	113.9984	125.81	87.3586	240.99	63.6874
81.75	121.5611	127.23	104.3257	242.00	63.7465
83.79	109.3894	127.91	80.4223	244.70	64.3611
84.00	101.6162	129.30	96.2170	252.40	0.0000
85.43	164.5944	131.20	86.8293	252.80	53.3366
86.55	138.0118	133.02	91.8886	254.15	0.0000
86.79	131.3385	133.52	71.3841	256.23	57.1884
86.94	134.7437	136.00	69.2017	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	59.9320	355.39	0.0000	584.27	23.8292
264.80	57.1520	356.01	31.3994	595.83	0.0000
265.00	57.1620	364.49	0.0000	427.87	29.7303
268.22	55.9216	366.42	0.0000	602.52	0.0000
269.46	55.9802	372.51	40.3223	604.72	32.6505
270.03	56.0071	375.05	35.3418	607.14	25.8060
271.23	56.0645	377.52	40.9622	609.32	21.8134
273.65	0.0000	356.01	36.5625	610.33	21.8234
276.40	65.3180	388.16	35.6473	614.28	24.1642
277.37	56.3538	388.63	0.0000	618.01	28.8157
277.60	56.3647	391.69	35.7285	620.36	19.6154
278.00	48.8653	264.66	36.9602	621.93	28.8676
279.20	57.3799	401.81	40.0696	630.19	0.0000
279.54	60.2188	402.40	43.1672	631.29	22.0314
279.70	61.1676	404.85	39.1164	633.25	27.8535
280.46	61.2060	410.95	37.1990	634.78	0.0000
283.69	45.3184	413.71	35.1925	635.95	25.5628
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	48.2182	423.72	0.0000	645.85	20.1313
285.90	0.0000	427.09	39.6552	657.76	29.5620
287.50	55.8767	427.87	36.5424	657.90	0.0000
290.67	56.9690	433.94	33.5313	661.66	29.0835
293.27	0.0000	439.40	35.7425	664.57	0.0000
351.93	48.6000	453.88	31.8048	666.33	0.0000
295.96	48.6291	463.37	27.7144	666.50	0.0000
879.38	51.5962	468.07	38.4756	667.71	0.0000
299.98	61.6970	473.00	0.0000	677.62	24.8452
300.09	61.7023	475.06	37.5535	685.70	0.0000
300.13	61.7036	476.78	35.4412	695.00	0.0000
301.36	57.4548	477.60	41.9041	696.49	23.2531
302.85	54.6447	482.18	34.4701	696.51	23.2531
256.23	47.0361	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	19.6824
306.78	45.1956	497.08	11.9453	697.49	23.2626
308.46	31.7740	505.52	27.8164	702.65	24.2084
311.90	41.5119	507.63	0.0000	706.68	22.4525
316.51	53.2835	511.00	33.9141	711.68	19.5414
319.41	0.0000	514.00	32.8720	720.70	0.0000
320.08	0.0000	514.00	32.8720	721.93	0.0000
321.04	47.6322	520.40	25.2854	722.78	14.4634
323.87	51.6284	520.69	0.0000	722.91	14.4644
325.23	59.4822	522.65	0.0000	723.31	14.4668
328.76	0.0000	527.90	0.0000	724.19	16.8836
333.37	58.8562	528.26	19.8691	727.33	11.5918
333.97	50.0496	529.59	34.2430	733.00	18.1537
334.37	50.0641	529.87	0.0000	735.93	18.1744
338.28	40.3619	531.02	0.0000	333.97	16.3669
338.32	40.3627	537.26	0.0000	739.50	0.0000
311.90	50.2851	546.56	0.0000	747.24	19.1684
340.48	50.2851	552.55	26.8184	748.06	21.9133
340.55	0.0000	563.25	34.8233	752.31	24.8766
344.28	46.4664	569.33	38.3067	753.82	0.0000
345.93	50.4802	946.00	38.3095	756.73	16.1240
351.06	40.7289	569.70	39.4405	756.80	14.6587
351.93	40.7531	583.19	23.8173	884.68	23.5188

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	27.9489	1274.44	20.9000	1620.50	1.8637
766.42	24.8288	1001.03	14.9506	1621.92	3.7285
766.84	24.8321	1002.74	17.9506	1678.03	0.0000
772.60	0.0000	1004.73	21.9530	1690.97	3.7814
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	4.7957
778.90	17.5551	1028.54	0.0000	1063.66	13.4429
783.70	0.0000	1037.84	13.1031	1771.35	7.6832
785.37	19.4504	1038.76	0.0000	1791.20	0.0000
792.07	19.3134	631.29	14.1487	1808.65	3.8691
794.95	9.2953	1048.07	0.0000	1810.72	0.0000
795.86	9.2984	1049.04	7.0795	1836.06	2.9169
810.06	0.0000	1050.41	14.1649		
810.29	0.0000	1063.66	19.2992		
344.28	0.0000	1077.00	0.0000		
810.76	0.0000	1077.34	15.2975		
815.77	0.0000	1085.87	12.2681		
1048.07	0.0000	1093.63	26.2313		
832.01	20.7284	1099.45	16.4219		
834.85	17.9203	1112.07	15.4504		
835.71	12.2649	1112.84	8.2422		
836.80	0.0000	1115.54	18.1468		
846.75	0.0000	1120.29	11.3572		
846.77	23.6794	1120.55	11.3578		
856.80	0.0000	1221.41	11.3599		
860.56	16.1803	1129.67	11.3867		
871.09	15.2842	1131.51	0.0000		
873.19	17.2073	1147.95	0.0000		
875.33	0.0000	1173.23	12.5720		
879.38	18.2021	1177.95	9.7908		
880.51	12.4589	1189.05	10.1010		
883.24	19.1852	1204.77	17.9629		
884.68	16.3157	1221.41	8.4902		
889.28	16.3411	1231.02	11.9164		
894.76	15.4087	1235.36	0.0000		
898.04	23.1387	1238.28	11.7258		
900.72	18.3344	1260.41	0.0000		
903.28	14.4873	1271.87	10.7520		
911.20	12.5890	1274.44	8.6074		
912.08	9.2991	1274.54	8.6074		
923.98	0.0000	1291.59	4.3223		
926.50	15.5728	1298.22	0.0000		
929.11	23.3789	1312.11	0.0000		
937.49	25.3970	1332.49	13.0994		
944.13	0.0000	1362.66	0.0000		
946.00	25.4676	1365.19	8.8022		
949.00	19.6094	1368.63	0.0000		
667.71	0.0000	1384.29	7.3686		
962.31	17.3298	1408.01	6.6691		
964.08	11.8228	1457.56	0.0000		
966.17	11.8304	1460.82	4.5005		
911.20	11.8411	1489.16	2.7176		
968.97	11.8411	1505.03	12.7265		
983.53	0.0000	1584.12	13.8713		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235002.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM30.CNF;300
Background date : 2-OCT-2016 11:01:47.
Sample date     : 10-DEC-2015 14:30:00 Acquisition date : 3-OCT-2016 07:57:26.
Sample ID      : G405235002 Sample quantity   : 1.23837E+02 GRAM
Detector name  : GAM30 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:01.45 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID      : 1596247 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.20*	16	128	1.12	126.12	123	7	4.52E-03	122.3	
2	3	72.96	37	158	1.31	145.65	142	17	1.03E-02	65.1	1.24E+00
3	3	74.81	170	155	1.31	149.35	142	17	4.72E-02	15.1	
4	3	77.12*	277	129	1.10	153.97	142	17	7.68E-02	9.3	
5	2	87.18	96	181	1.19	174.09	169	25	2.66E-02	23.7	2.94E+00
6	2	89.84	66	141	0.97	179.40	169	25	1.82E-02	30.4	
7	2	92.75*	93	140	1.23	185.22	169	25	2.59E-02	25.9	
8	0	105.57	39	134	1.15	210.87	207	10	1.09E-02	57.3	
9	0	186.31*	88	173	1.18	372.35	365	14	2.43E-02	34.5	
10	0	209.30	49	89	1.00	418.34	415	8	1.37E-02	35.8	
11	2	238.71*	530	59	1.20	477.15	471	18	1.47E-01	5.0	2.23E+00
12	2	241.88	122	62	1.44	483.50	471	18	3.40E-02	16.6	
13	0	270.44	43	116	1.50	540.64	536	13	1.20E-02	53.1	
14	3	295.25*	185	38	1.25	590.25	585	27	5.13E-02	9.6	1.17E+00
15	3	300.21	28	59	1.65	600.18	585	27	7.74E-03	54.9	
16	0	331.76*	83	97	7.88	663.28	652	20	2.32E-02	31.4	
17	2	338.35*	112	38	1.45	676.47	672	21	3.12E-02	14.4	3.34E+00
18	2	341.35	22	51	1.54	682.46	672	21	6.02E-03	60.7	
19	0	352.21*	259	74	1.34	704.19	699	13	7.19E-02	9.4	
20	0	387.36	19	50	1.86	774.49	767	10	5.29E-03	73.1	
21	5	430.57	15	7	1.54	860.93	859	11	4.04E-03	32.2	7.52E-01
22	5	433.18	24	9	1.64	866.14	859	11	6.72E-03	32.8	
23	2	463.17	38	20	1.65	926.14	919	31	1.05E-02	29.8	1.95E+00
24	2	466.96	14	18	1.50	933.73	919	31	3.98E-03	62.2	
25	0	511.12*	35	58	1.97	1022.06	1015	17	9.64E-03	60.7	
26	0	524.39	15	26	1.69	1048.59	1041	10	4.07E-03	73.5	
27	3	583.26*	97	18	1.39	1166.36	1162	15	2.70E-02	13.8	2.37E+00
28	3	587.03	15	12	1.92	1173.92	1162	15	4.11E-03	42.9	
29	0	609.64*	186	31	1.39	1219.15	1213	14	5.17E-02	9.9	
30	0	639.66	25	28	3.74	1279.20	1271	14	7.02E-03	48.6	
31	0	660.26	44	33	7.52	1320.41	1309	20	1.22E-02	36.2	
32	0	666.48	31	12	0.67	1332.84	1328	12	8.61E-03	28.7	
33	0	727.68	58	12	2.21	1455.27	1448	16	1.60E-02	18.8	
34	0	737.36	15	16	0.78	1474.65	1471	7	4.27E-03	49.7	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	794.89	31	10	1.34	1589.74	1585	10	8.61E-03	26.2	
36	0	851.32	14	2	0.66	1702.64	1699	8	3.98E-03	31.2	
37	0	860.49	37	14	1.26	1720.98	1715	12	1.03E-02	26.4	
38	0	911.52	111	27	1.55	1823.07	1817	14	3.09E-02	13.5	
39	0	935.80	26	3	2.68	1871.64	1867	10	7.31E-03	22.6	
40	5	964.58*	22	32	2.64	1929.22	1921	27	6.24E-03	63.9	8.74E-01
41	5	969.20*	50	22	1.87	1938.48	1921	27	1.39E-02	23.9	
42	0	1065.20	8	13	0.77	2130.55	2124	11	2.10E-03	101.3	
43	0	1115.32	11	14	1.38	2230.82	2223	14	3.06E-03	78.2	
44	0	1121.17*	57	7	2.07	2242.53	2236	14	1.59E-02	16.8	
45	0	1167.01	19	20	5.96	2334.25	2325	16	5.34E-03	56.7	
46	0	1212.44	9	14	0.66	2425.14	2420	7	2.59E-03	73.9	
47	0	1238.24	21	12	1.35	2476.76	2469	12	5.83E-03	39.6	
48	0	1328.10	6	5	1.03	2656.58	2652	7	1.64E-03	76.0	
49	0	1378.05	16	2	1.36	2756.53	2751	10	4.37E-03	31.3	
50	0	1393.55*	4	4	1.41	2787.55	2781	8	1.16E-03	101.2	
51	0	1430.88	6	5	1.40	2862.25	2855	10	1.67E-03	80.8	
52	0	1461.22*	432	10	1.91	2922.95	2916	14	1.20E-01	5.1	
53	0	1547.80	9	0	0.88	3096.22	3091	10	2.50E-03	33.3	
54	0	1731.15	7	5	0.77	3463.13	3455	10	1.92E-03	71.6	
55	0	1765.18*	23	6	3.09	3531.24	3526	11	6.51E-03	30.0	

Flag: "*" = Peak area was modified by background subtraction


```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235002.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 10-DEC-2015 14:30:00 Acquisition date : 3-OCT-2016 07:57:26
Sample ID        : G405235002 Sample quantity   : 123.84 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA30 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:01.45 0.0%
Energy tolerance : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.307E+00	1.784E+01	1.784E+01	10.20	OK
ZN-65	1115.54	50.60*	1.652E+00	7.695E-02	1.792E-01	156.41	OK
CD-109	88.03	3.70*	6.548E+00	1.395E+00	2.183E+00	92.25	OK
SN-126	64.28	9.60	3.867E+00	3.007E-01	3.007E-01	244.55	OK
	86.94	8.90	6.548E+00	5.801E-01	5.801E-01	92.25	OK
	87.57	37.00*	6.548E+00	1.395E-01	1.395E-01	92.25	OK
BA-137M	661.66	89.90*	2.546E+00	1.156E-01	1.178E-01	72.35	OK
CS-137	661.66	85.10*	2.546E+00	1.222E-01	1.245E-01	72.35	OK
EU-155	86.55	30.70	6.548E+00	1.682E-01	1.894E-01	92.25	OK
	105.31	21.10*	7.284E+00	1.703E-01	1.918E-01	114.53	OK
TL-208	277.37	6.60	4.820E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.799E+00	2.485E-01	2.485E-01	27.65	OK
	860.56	12.50	2.059E+00	8.550E-01	8.550E-01	52.88	OK
PB-212	74.82	10.28	5.441E+00	1.291E+00	1.291E+00	49.80	OK
	77.11	17.10	5.693E+00	1.928E+00	1.928E+00	18.63	OK
	238.63	43.60*	5.356E+00	1.449E+00	1.449E+00	10.08	OK
	300.09	3.30	4.554E+00	1.169E+00	1.169E+00	109.89	OK
BI-214	609.32	45.49*	2.707E+00	9.149E-01	9.152E-01	19.80	OK
	1120.29	14.92	1.644E+00	1.366E+00	1.366E+00	33.69	OK
	1764.49	15.30	1.121E+00	7.769E-01	7.771E-01	59.97	OK
PB-214	74.82	5.80	5.442E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	5.693E+00	3.400E+00	3.401E+00	18.63	OK
	87.09	3.41	6.542E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	5.305E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.609E+00	1.374E+00	1.375E+00	19.23	OK
	351.93	35.60*	4.058E+00	1.119E+00	1.120E+00	18.84	OK
RN-222	609.32	45.49*	2.707E+00	9.149E-01	9.152E-01	19.80	OK
	1120.29	14.92	1.644E+00	1.366E+00	1.366E+00	33.69	OK
	1764.49	15.30	1.121E+00	7.769E-01	7.771E-01	59.97	OK
RA-224	240.99	4.10*	5.307E+00	1.160E+00	1.160E+00	110.62	OK
RA-226	609.32	45.49*	2.707E+00	9.149E-01	9.152E-01	19.80	OK
	1120.29	14.92	1.644E+00	1.366E+00	1.366E+00	33.69	OK
	1764.49	15.30	1.121E+00	7.769E-01	7.771E-01	59.97	OK
AC-228	105.21	1.10	7.284E+00	3.267E+00	3.267E+00	114.53	OK
	338.32	11.27	4.178E+00	1.494E+00	1.494E+00	28.78	OK
	794.95	4.25	2.197E+00	1.980E+00	1.980E+00	52.41	OK
	835.71	1.61	2.109E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.962E+00	1.298E+00	1.298E+00	26.93	OK
	968.97	15.80	1.863E+00	9.990E-01	9.990E-01	47.84	OK
RA-228	105.21	1.10	7.284E+00	3.267E+00	3.267E+00	114.53	OK
	338.32	11.27	4.178E+00	1.494E+00	1.494E+00	28.78	OK
	794.95	4.25	2.197E+00	1.980E+00	1.980E+00	52.41	OK
	835.71	1.61	2.109E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.962E+00	1.298E+00	1.298E+00	26.93	OK
	968.97	15.80	1.863E+00	9.990E-01	9.990E-01	47.84	OK
TH-228	74.82	10.28	5.441E+00	1.291E+00	1.291E+00	49.80	OK
	77.11	17.10	5.693E+00	1.928E+00	1.928E+00	18.63	OK
	238.63	43.60*	5.356E+00	1.449E+00	1.449E+00	10.08	OK
	300.09	3.30	4.554E+00	1.169E+00	1.169E+00	109.89	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	609.32	45.49*	2.707E+00	9.149E-01	9.149E-01	19.80	OK
	1120.29	14.92	1.644E+00	1.366E+00	1.366E+00	33.69	OK
	1764.49	15.30	1.121E+00	7.769E-01	7.769E-01	59.97	OK
PA-231	283.69	1.70	4.743E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	4.554E+00	7.211E-01	7.211E-01	109.89	OK
TH-232	105.21	1.10	7.284E+00	3.267E+00	3.267E+00	114.53	OK
	338.32	11.27	4.178E+00	1.494E+00	1.494E+00	28.78	OK
	835.71	1.61	2.109E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.962E+00	1.298E+00	1.298E+00	26.93	OK
TH-234	968.97	15.80	1.863E+00	9.990E-01	9.990E-01	47.84	OK
	63.29	3.70*	3.867E+00	7.801E-01	7.801E-01	244.55	OK
	92.59	4.23	6.868E+00	2.155E+00	2.155E+00	51.86	OK
U-234	609.32	45.49*	2.707E+00	9.149E-01	9.149E-01	19.80	OK
	1120.29	14.92	1.644E+00	1.366E+00	1.366E+00	33.69	OK
	1764.49	15.30	1.121E+00	7.769E-01	7.769E-01	59.97	OK
U-235	89.96	3.47	6.713E+00	1.893E+00	1.893E+00	60.80	OK
	93.35	5.60	6.868E+00	1.628E+00	1.628E+00	51.86	OK
	143.76	10.96*	7.121E+00	-----	Line Not Found	-----	Absent
	163.33	5.08	6.750E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	6.287E+00	1.577E-01	1.577E-01	69.06	OK
U-238	205.31	5.01	5.922E+00	-----	Line Not Found	-----	Absent
	63.29	3.70*	3.867E+00	7.801E-01	7.801E-01	244.55	OK
	92.59	4.23	6.868E+00	2.155E+00	2.155E+00	51.86	OK
AM-243	43.53	5.90	8.765E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	5.441E+00	1.975E-01	1.975E-01	49.80	OK
CF-249	252.80	2.50	5.147E+00	-----	Line Not Found	-----	Absent
	333.37	14.60	4.223E+00	-----	Line Not Found	-----	Absent
	388.16	66.00*	3.787E+00	4.741E-02	4.748E-02	146.17	OK
ANH-511	511.00	100.00*	3.091E+00	6.875E-02	6.875E-02	121.32	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235002.CNF;1
* Acquisition date   : 3-OCT-2016 07:57:26 Sensitivity      : 3.000
* Detector ID       : GAM30 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:01.45 Half life ratio : *****
* Sample date       : 10-DEC-2015 14:30:00 Analyst initials: MXR1
* Sample ID         : G405235002 Sample Quantity : 1.2384E+02 GRAM
* Batch Number      : 1596247 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 11-MAR-2016 05:58:49 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.784E+01	1.782E+00	6.674E-01
ZN-65	1.792E-01	2.747E-01	2.520E-01
CD-109	2.183E+00	1.973E+00	1.831E+00
SN-126	1.395E-01	1.262E-01	1.176E-01
BA-137M	1.178E-01	8.354E-02	5.633E-02
CS-137	1.245E-01	8.825E-02	5.951E-02
EU-155	1.918E-01	2.153E-01	1.766E-01
TL-208	2.485E-01	6.732E-02	6.449E-02
PB-212	1.449E+00	1.431E-01	9.642E-02
BI-214	9.152E-01	1.775E-01	8.187E-02
PB-214	1.120E+00	2.068E-01	1.155E-01
RN-222	9.152E-01	1.775E-01	8.187E-02
RA-224	1.160E+00	1.258E+00	1.033E+00
RA-226	9.152E-01	1.775E-01	8.187E-02
AC-228	1.298E+00	3.426E-01	2.069E-01
RA-228	1.298E+00	3.426E-01	2.069E-01
TH-228	1.449E+00	1.431E-01	9.642E-02
TH-230	9.149E-01	1.775E-01	8.184E-02
PA-231	7.211E-01	7.766E-01	8.034E-01
TH-232	1.298E+00	3.426E-01	2.069E-01
TH-234	7.801E-01	1.870E+00	1.939E+00
U-234	9.149E-01	1.775E-01	8.184E-02
U-235	5.447E-02	1.765E-01	3.287E-01
U-238	7.801E-01	1.870E+00	1.939E+00
AM-243	1.975E-01	9.638E-02	7.383E-02
CF-249	4.748E-02	6.802E-02	6.705E-02
ANH-511	6.875E-02	8.174E-02	4.622E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-5.252E+00		1.101E+01	1.916E+01	NOT IDENT.
NA-22	2.002E-02		4.927E-02	1.049E-01	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF

AL-26	1.369E-03	2.682E-02	6.071E-02	NOT IDENT.
SC-46	1.978E-01	3.668E-01	7.672E-01	FAIL ABUN
V-48	0.000E+00	1.554E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	3.903E+02	0.000E+00	SHORT HLIF
MN-54	5.343E-02	6.886E-02	1.437E-01	NOT IDENT.
CO-56	2.914E-01	4.921E-01	9.506E-01	FAIL ABUN
MN-56	0.000E+00	1.689E+41	0.000E+00	SHORT HLIF
CO-57	-5.272E-02	4.967E-02	8.267E-02	NOT IDENT.
CO-58	-2.314E-01	4.909E-01	8.752E-01	NOT IDENT.
FE-59	4.032E+00	6.865E+00	1.428E+01	NOT IDENT.
CO-60	-1.437E-02	4.976E-02	9.113E-02	NOT IDENT.
GE-68	-2.439E+00	2.787E+00	4.454E+00	NOT IDENT.
AS-73	3.034E+00	7.472E+00	1.464E+01	NOT IDENT.
AS-74	0.000E+00	5.971E+03	0.000E+00	SHORT HLIF
SE-75	5.062E-02	2.085E-01	3.827E-01	NOT IDENT.
BR-77	0.000E+00	1.395E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.441E+02	0.000E+00	SHORT HLIF
RB-83	-1.010E-01	7.256E-01	1.230E+00	NOT IDENT.
KR-85	1.877E+00	6.059E+00	1.224E+01	NOT IDENT.
SR-85	1.922E-01	6.260E-01	1.265E+00	NOT IDENT.
RB-86	0.000E+00	3.177E+04	0.000E+00	SHORT HLIF
Y-88	-7.362E-02	1.373E-01	2.849E-01	NOT IDENT.
Y-91	2.211E+01	5.808E+02	1.084E+03	NOT IDENT.
NB-94	-3.826E-03	3.251E-02	6.065E-02	NOT IDENT.
NB-95	-1.197E+00	9.999E-01	1.569E+00	NOT IDENT.
NB-95M	1.723E+00	2.489E+00	4.477E+00	NOT IDENT.
ZR-95	9.690E-01	1.418E+00	2.980E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.281E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-1.948E-02	3.571E-02	6.210E-02	NOT IDENT.
RH-102	4.200E-02	5.459E-02	1.172E-01	NOT IDENT.
RU-103	3.008E+00	5.206E+00	1.083E+01	FAIL ABUN
RH-106	3.384E-01	4.781E-01	1.011E+00	NOT IDENT.
RU-106	3.384E-01	4.781E-01	1.011E+00	NOT IDENT.
AG-108M	4.739E-02	3.046E-02	4.786E-02	FAIL ABUN
AG-110M	-8.785E-02	9.486E-02	1.497E-01	NOT IDENT.
SN-113	4.570E-02	2.014E-01	4.059E-01	NOT IDENT.
CD-115	0.000E+00	1.549E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	8.813E+04	0.000E+00	SHORT HLIF
TE-123M	8.256E-02	1.258E-01	2.419E-01	NOT IDENT.
SB-124	-7.328E-01	2.022E+00	3.914E+00	NOT IDENT.
SB-125	4.379E-02	1.152E-01	2.117E-01	FAIL ABUN
TE-125M	8.068E-01	2.778E+02	4.673E+02	NOT IDENT.
I-126	0.000E+00	1.080E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.004E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.524E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	4.394E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	5.620E+40	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.627E+26	0.000E+00	SHORT HLIF
BA-133	-3.670E-03	4.171E-02	7.281E-02	NOT IDENT.
I-133	0.000E+00	1.130E+41	0.000E+00	SHORT HLIF
CS-134	0.000E+00	6.647E-02	1.205E-01	FAIL ABUN
CS-135	4.649E-02	1.530E-01	2.611E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.317E+05	0.000E+00	SHORT HLIF
CE-139	1.710E-03	1.169E-01	2.107E-01	NOT IDENT.
BA-140	0.000E+00	1.067E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.015E+05	0.000E+00	SHORT HLIF
CE-141	-5.014E+00	2.309E+01	4.111E+01	NOT IDENT.
CE-143	0.000E+00	1.665E+41	0.000E+00	SHORT HLIF
CE-144	9.386E-03	3.450E-01	6.333E-01	NOT IDENT.
PM-144	2.222E-03	5.523E-02	1.084E-01	NOT IDENT.
PR-144	1.775E-01	4.789E+00	9.394E+00	NOT IDENT.
PM-146	4.628E-02	4.510E-02	9.611E-02	FAIL ABUN
ND-147	0.000E+00	2.628E+07	0.000E+00	SHORT HLIF
PM-147	1.446E+03	7.769E+02	1.641E+03	NOT IDENT.
PM-149	0.000E+00	2.674E+40	0.000E+00	SHORT HLIF
EU-150	1.870E-02	3.044E-02	5.659E-02	FAIL ABUN
EU-152	-1.798E-03	9.207E-02	1.629E-01	FAIL ABUN
GD-153	-6.544E-02	1.732E-01	2.840E-01	NOT IDENT.
EU-154	4.660E-02	1.204E-01	2.560E-01	NOT IDENT.
TB-160	-3.604E-02	2.009E+00	3.794E+00	FAIL ABUN
HO-166M	8.084E-03	5.809E-02	1.129E-01	NOT IDENT.
TM-171	-2.052E-01	1.746E+01	3.327E+01	NOT IDENT.
HF-172	1.331E-01	2.256E-01	4.322E-01	FAIL ABUN
LU-172	3.109E-02	7.343E-02	1.518E-01	FAIL ABUN

LU-176	-3.930E-03	2.940E-02	4.668E-02	FAIL ABUN
HF-181	1.039E+00	3.943E+00	7.927E+00	NOT IDENT.
TA-182	2.800E-02	9.320E-01	1.866E+00	FAIL ABUN
RE-183	-9.476E-02	2.642E+00	4.972E+00	NOT IDENT.
RE-184	-2.167E+00	2.852E+01	5.396E+01	NOT IDENT.
W-188	5.014E+01	1.268E+02	2.174E+02	FAIL ABUN
IR-192	-1.458E-02	4.490E-01	8.747E-01	FAIL ABUN
HG-203	-1.183E+00	2.437E+00	4.072E+00	FAIL ABUN
BI-207	1.742E-02	4.722E-02	9.617E-02	FAIL ABUN
PB-210	3.524E-01	2.359E+00	4.605E+00	NOT IDENT.
BI-211	0.000E+00	5.695E-01	8.315E-01	FAIL ABUN
PB-211	4.493E-01	6.822E-01	1.403E+00	NOT IDENT.
BI-212	0.000E+00	8.115E-01	1.330E+00	FAIL ABUN
RN-219	-6.924E-02	3.679E-01	7.015E-01	FAIL ABUN
RA-223	4.601E-02	6.537E-01	1.159E+00	FAIL ABUN
AC-227	1.881E-02	2.380E-01	4.276E-01	FAIL ABUN
TH-227	1.881E-02	2.380E-01	4.276E-01	FAIL ABUN
TH-229	2.042E-01	4.583E-01	8.605E-01	FAIL ABUN
TH-231	4.601E-02	6.537E-01	1.159E+00	FAIL ABUN
PA-233	-1.265E-02	5.819E-02	1.116E-01	FAIL ABUN
PA-234	9.521E-03	2.502E-01	4.885E-01	NOT IDENT.
PA-234M	-2.099E+00	4.725E+00	8.194E+00	NOT IDENT.
NP-237	-1.265E-02	5.819E-02	1.116E-01	FAIL ABUN
NP-238	0.000E+00	1.097E+41	0.000E+00	SHORT HLIF
NP-239	5.193E-03	2.345E-01	4.312E-01	FAIL ABUN
PU-239	3.268E+02	3.267E+02	6.386E+02	NOT IDENT.
AM-241	5.439E-02	1.330E-01	2.406E-01	NOT IDENT.
CM-243	-1.163E-02	9.611E-02	1.625E-01	NOT IDENT.
BK-247	-1.203E-02	7.576E-02	1.324E-01	FAIL ABUN
CM-247	-5.026E-03	3.442E-02	6.584E-02	NOT IDENT.
CF-251	-1.778E-01	1.232E-01	1.907E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	410	10.66*	1.307E+00	1.784E+01	1.784E+01	10.20
ZN-65	1115.54	11	50.60*	1.652E+00	7.695E-02	1.792E-01	156.41
CD-109	88.03	106	3.70*	6.548E+00	2.662E+00	4.163E+00	47.48
SN-126	64.28	18	9.60	3.867E+00	3.007E-01	3.007E-01	244.55
	86.94	106	8.90	6.548E+00	1.107E+00	1.107E+00	47.48
	87.57	106	37.00*	6.548E+00	2.662E-01	2.662E-01	47.48
BA-137M	661.66	44	89.90*	2.546E+00	1.156E-01	1.178E-01	72.35
CS-137	661.66	44	85.10*	2.546E+00	1.222E-01	1.245E-01	72.35
EU-155	86.55	106	30.70	6.548E+00	3.208E-01	3.613E-01	47.48
	105.31	43	21.10*	7.284E+00	1.703E-01	1.918E-01	114.53
TL-208	277.37	-----	6.60	4.820E+00	-----	Line Not Found	-----
	583.19	98	85.00*	2.799E+00	2.485E-01	2.485E-01	27.65
	860.56	36	12.50	2.059E+00	8.550E-01	8.550E-01	52.88
BI-211	72.87	41	1.23	5.224E+00	3.913E+00	3.913E+00	130.26
	351.06	267	12.92*	4.058E+00	3.084E+00	3.084E+00	18.84
PB-212	74.82	191	10.28	5.441E+00	2.066E+00	2.066E+00	30.27
	77.11	310	17.10	5.693E+00	1.928E+00	1.928E+00	18.63
	238.63	558	43.60*	5.356E+00	1.449E+00	1.449E+00	10.08
	300.09	29	3.30	4.554E+00	1.169E+00	1.169E+00	109.89
BI-214	609.32	186	45.49*	2.707E+00	9.149E-01	9.152E-01	19.80
	1120.29	55	14.92	1.644E+00	1.366E+00	1.366E+00	33.69
	1764.49	22	15.30	1.121E+00	7.769E-01	7.771E-01	59.97
PB-214	74.82	191	5.80	5.441E+00	3.662E+00	3.663E+00	30.27
	77.11	310	9.70	5.693E+00	3.400E+00	3.401E+00	18.63
	87.09	106	3.41	6.548E+00	2.888E+00	2.889E+00	47.48
	242.00	129	7.25	5.307E+00	2.030E+00	2.031E+00	33.30
	295.22	192	18.42	4.609E+00	1.374E+00	1.375E+00	19.23
	351.93	267	35.60*	4.058E+00	1.119E+00	1.120E+00	18.84
RN-222	609.32	186	45.49*	2.707E+00	9.149E-01	9.152E-01	19.80
	1120.29	55	14.92	1.644E+00	1.366E+00	1.366E+00	33.69
	1764.49	22	15.30	1.121E+00	7.769E-01	7.771E-01	59.97
RA-224	240.99	129	4.10*	5.307E+00	3.590E+00	3.590E+00	33.30
RA-226	609.32	186	45.49*	2.707E+00	9.149E-01	9.152E-01	19.80
	1120.29	55	14.92	1.644E+00	1.366E+00	1.366E+00	33.69
	1764.49	22	15.30	1.121E+00	7.769E-01	7.771E-01	59.97
AC-228	105.21	43	1.10	7.284E+00	3.267E+00	3.267E+00	114.53
	338.32	116	11.27	4.178E+00	1.494E+00	1.494E+00	28.78
	794.95	31	4.25	2.197E+00	1.980E+00	1.980E+00	52.41
	835.71	-----	1.61	2.109E+00	-----	Line Not Found	-----
	911.20	108	25.80*	1.962E+00	1.298E+00	1.298E+00	26.93
	968.97	49	15.80	1.863E+00	9.990E-01	9.990E-01	47.84
RA-228	105.21	43	1.10	7.284E+00	3.267E+00	3.267E+00	114.53
	338.32	116	11.27	4.178E+00	1.494E+00	1.494E+00	28.78
	794.95	31	4.25	2.197E+00	1.980E+00	1.980E+00	52.41
	835.71	-----	1.61	2.109E+00	-----	Line Not Found	-----
	911.20	108	25.80*	1.962E+00	1.298E+00	1.298E+00	26.93
	968.97	49	15.80	1.863E+00	9.990E-01	9.990E-01	47.84

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	74.82	191	10.28	5.441E+00	2.066E+00	2.066E+00	30.27
	77.11	310	17.10	5.693E+00	1.928E+00	1.928E+00	18.63
	238.63	558	43.60*	5.356E+00	1.449E+00	1.449E+00	10.08
	300.09	29	3.30	4.554E+00	1.169E+00	1.169E+00	109.89
TH-230	609.32	186	45.49*	2.707E+00	9.149E-01	9.149E-01	19.80
	1120.29	55	14.92	1.644E+00	1.366E+00	1.366E+00	33.69
	1764.49	22	15.30	1.121E+00	7.769E-01	7.769E-01	59.97
PA-231	283.69	-----	1.70	4.743E+00	-----	Line Not Found	-----
	301.36	29	5.35*	4.554E+00	7.211E-01	7.211E-01	109.89
TH-232	105.21	43	1.10	7.284E+00	3.267E+00	3.267E+00	114.53
	338.32	116	11.27	4.178E+00	1.494E+00	1.494E+00	28.78
	835.71	-----	1.61	2.109E+00	-----	Line Not Found	-----
	911.20	108	25.80*	1.962E+00	1.298E+00	1.298E+00	26.93
TH-234	968.97	49	15.80	1.863E+00	9.990E-01	9.990E-01	47.84
	63.29	18	3.70*	3.867E+00	7.801E-01	7.801E-01	244.55
	92.59	103	4.23	6.868E+00	2.155E+00	2.155E+00	51.86
U-234	609.32	186	45.49*	2.707E+00	9.149E-01	9.149E-01	19.80
	1120.29	55	14.92	1.644E+00	1.366E+00	1.366E+00	33.69
	1764.49	22	15.30	1.121E+00	7.769E-01	7.769E-01	59.97
U-235	89.96	73	3.47	6.713E+00	1.893E+00	1.893E+00	60.80
	93.35	103	5.60	6.868E+00	1.628E+00	1.628E+00	51.86
	143.76	-----	10.96*	7.121E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.750E+00	-----	Line Not Found	-----
	185.72	94	57.20	6.287E+00	1.577E-01	1.577E-01	69.06
U-238	205.31	-----	5.01	5.922E+00	-----	Line Not Found	-----
	63.29	18	3.70*	3.867E+00	7.801E-01	7.801E-01	244.55
	92.59	103	4.23	6.868E+00	2.155E+00	2.155E+00	51.86
AM-243	43.53	-----	5.90	8.765E-01	-----	Line Not Found	-----
CF-249	74.66	191	67.20*	5.441E+00	3.161E-01	3.161E-01	30.27
	252.80	-----	2.50	5.147E+00	-----	Line Not Found	-----
	333.37	-----	14.60	4.223E+00	-----	Line Not Found	-----
ANH-511	388.16	20	66.00*	3.787E+00	4.741E-02	4.748E-02	146.17
	511.00	35	100.00*	3.091E+00	6.875E-02	6.875E-02	121.32

Flag: "*" = Keyline

Total number of lines in spectrum 55
 Number of unidentified lines 17
 Number of lines tentatively identified by NID 38 69.09%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.784E+01	1.784E+01	0.182E+01	10.20	
ZN-65	244.06D	2.33	7.695E-02	1.792E-01	2.803E-01	156.41	
CD-109	461.40D	1.56	2.662E+00	4.163E+00	1.977E+00	47.48	
SN-126	2.30E+05Y	1.00	2.662E-01	2.662E-01	1.264E-01	47.48	
BA-137M	30.08Y	1.02	1.156E-01	1.178E-01	0.852E-01	72.35	
CS-137	30.08Y	1.02	1.222E-01	1.245E-01	0.901E-01	72.35	
EU-155	4.75Y	1.13	1.703E-01	1.918E-01	2.197E-01	114.53	
TL-208	1.41E+10Y	1.00	2.485E-01	2.485E-01	0.687E-01	27.65	
BI-211	7.04E+08Y	1.00	3.084E+00	3.084E+00	0.581E+00	18.84	
PB-212	1.41E+10Y	1.00	1.449E+00	1.449E+00	0.146E+00	10.08	
BI-214	1600.00Y	1.00	9.149E-01	9.152E-01	1.812E-01	19.80	
PB-214	1600.00Y	1.00	1.119E+00	1.120E+00	0.211E+00	18.84	
RN-222	1600.00Y	1.00	9.149E-01	9.152E-01	1.812E-01	19.80	
RA-224	1.41E+10Y	1.00	3.590E+00	3.590E+00	1.195E+00	33.30	
RA-226	1600.00Y	1.00	9.149E-01	9.152E-01	1.812E-01	19.80	
AC-228	1.41E+10Y	1.00	1.298E+00	1.298E+00	0.350E+00	26.93	
RA-228	1.41E+10Y	1.00	1.298E+00	1.298E+00	0.350E+00	26.93	
TH-228	1.41E+10Y	1.00	1.449E+00	1.449E+00	0.146E+00	10.08	
TH-230	7.54E+04Y	1.00	9.149E-01	9.149E-01	1.811E-01	19.80	
PA-231	7.04E+08Y	1.00	7.211E-01	7.211E-01	7.924E-01	109.89	
TH-232	1.41E+10Y	1.00	1.298E+00	1.298E+00	0.350E+00	26.93	
TH-234	4.47E+09Y	1.00	7.801E-01	7.801E-01	19.08E-01	244.55	
U-234	2.45E+05Y	1.00	9.149E-01	9.149E-01	1.811E-01	19.80	
U-235	7.04E+08Y	1.00	1.577E-01	1.577E-01	1.089E-01	69.06	K
U-238	4.47E+09Y	1.00	7.801E-01	7.801E-01	19.08E-01	244.55	
AM-243	7370.00Y	1.00	3.161E-01	3.161E-01	0.957E-01	30.27	
CF-249	351.00Y	1.00	4.741E-02	4.748E-02	6.941E-02	146.17	
ANH-511	1.00E+09Y	1.00	6.875E-02	6.875E-02	8.341E-02	121.32	
Total Activity :			4.353E+01	4.516E+01			

Grand Total Activity : 4.353E+01 4.516E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	209.30	53	94	1.00	418.34	415	8	1.37E-02	71.6	5.85E+00	
0	270.44	45	121	1.50	540.64	536	13	1.20E-02	****	4.91E+00	T
0	331.76	86	100	7.88	663.28	652	20	2.32E-02	62.8	4.24E+00	
2	341.35	22	53	1.54	682.46	672	21	6.02E-03	****	4.15E+00	T
5	430.57	15	8	1.54	860.93	859	11	4.04E-03	64.4	3.51E+00	
5	433.18	25	9	1.64	866.14	859	11	6.72E-03	65.6	3.49E+00	T
2	463.17	38	20	1.65	926.14	919	31	1.05E-02	59.6	3.32E+00	T
2	466.96	15	18	1.50	933.73	919	31	3.98E-03	****	3.30E+00	T
0	524.39	15	27	1.69	1048.59	1041	10	4.07E-03	****	3.03E+00	
3	587.03	15	12	1.92	1173.92	1162	15	4.11E-03	85.8	2.79E+00	
0	639.66	25	28	3.74	1279.20	1271	14	7.02E-03	97.2	2.61E+00	
0	666.48	31	12	0.67	1332.84	1328	12	8.61E-03	57.3	2.53E+00	T
0	727.68	57	12	2.21	1455.27	1448	16	1.60E-02	37.7	2.36E+00	T
0	737.36	15	15	0.78	1474.65	1471	7	4.27E-03	99.5	2.33E+00	T
0	851.32	14	2	0.66	1702.64	1699	8	3.98E-03	62.5	2.08E+00	
0	935.80	26	3	2.68	1871.64	1867	10	7.31E-03	45.1	1.92E+00	
5	964.58	22	31	2.64	1929.22	1921	27	6.24E-03	****	1.87E+00	T
0	1065.20	7	13	0.77	2130.55	2124	11	2.10E-03	****	1.72E+00	
0	1167.01	18	19	5.96	2334.25	2325	16	5.34E-03	****	1.59E+00	
0	1212.44	9	13	0.66	2425.14	2420	7	2.59E-03	****	1.54E+00	
0	1238.24	20	11	1.35	2476.76	2469	12	5.83E-03	79.1	1.51E+00	T
0	1328.10	6	5	1.03	2656.58	2652	7	1.64E-03	****	1.42E+00	
0	1378.05	15	2	1.36	2756.53	2751	10	4.37E-03	62.6	1.37E+00	
0	1393.55	4	4	1.41	2787.55	2781	8	1.16E-03	****	1.36E+00	
0	1430.88	6	5	1.40	2862.25	2855	10	1.67E-03	****	1.33E+00	
0	1547.80	9	0	0.88	3096.22	3091	10	2.50E-03	66.7	1.25E+00	
0	1731.15	6	5	0.77	3463.13	3455	10	1.92E-03	****	1.14E+00	

Flags: "T" = Tentatively associated

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
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DETECTOR AND SAMPLE DATA

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* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235002.CNF;1
* Acquisition date   : 3-OCT-2016 07:57:26 Sensitivity      : 3.000
* Detector ID        : GAM30 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:01.45 Half life ratio  : *****
* Sample date        : 10-DEC-2015 14:30:00 Nuclide Library : SOLID
* Sample ID          : G405235002 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity  : 1.2384E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight       : 0.00000
* Dry Weight         : 0.00000
*****
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CALIBRATION INFORMATION

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* Eff. Cal. date     : 11-MAR-2016 05:58:49 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.750E-01
ZN-65	1.031E-01
CD-109	8.616E-01
SN-126	5.532E-02
BA-137M	2.448E-02
CS-137	2.586E-02
EU-155	8.214E-02
TL-208	2.877E-02
PB-212	4.464E-02
BI-214	3.421E-02
PB-214	5.198E-02
RN-222	3.421E-02
RA-224	4.783E-01
RA-226	3.421E-02
AC-228	8.719E-02
RA-228	8.719E-02
TH-228	4.464E-02
TH-230	3.420E-02
PA-231	3.674E-01
TH-232	8.719E-02
TH-234	9.105E-01
U-234	3.420E-02
U-235	1.536E-01
U-238	9.105E-01
AM-243	3.459E-02
CF-249	3.019E-02
ANH-511	2.043E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.396E+00	NOT IDENT.
NA-22	4.554E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.292E-02	NOT IDENT.

SC-46	3.354E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	6.429E-02	NOT IDENT.
CO-56	4.182E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	3.849E-02	NOT IDENT.
CO-58	3.670E-01	NOT IDENT.
FE-59	6.244E+00	NOT IDENT.
CO-60	3.912E-02	NOT IDENT.
GE-68	1.906E+00	NOT IDENT.
AS-73	6.849E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.754E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.487E-01	NOT IDENT.
KR-85	5.468E+00	NOT IDENT.
SR-85	5.647E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	9.004E-02	NOT IDENT.
Y-91	4.726E+02	NOT IDENT.
NB-94	2.692E-02	NOT IDENT.
NB-95	6.931E-01	NOT IDENT.
NB-95M	2.082E+00	NOT IDENT.
ZR-95	1.323E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.905E-02	NOT IDENT.
RH-102	5.209E-02	NOT IDENT.
RU-103	4.862E+00	FAIL ABUN
RH-106	4.509E-01	NOT IDENT.
RU-106	4.509E-01	NOT IDENT.
AG-108M	2.129E-02	FAIL ABUN
AG-110M	6.200E-02	NOT IDENT.
SN-113	1.825E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.127E-01	NOT IDENT.
SB-124	1.500E+00	NOT IDENT.
SB-125	9.613E-02	FAIL ABUN
TE-125M	2.182E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.289E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.451E-02	FAIL ABUN
CS-135	1.200E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	9.837E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.916E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.951E-01	NOT IDENT.
PM-144	4.818E-02	NOT IDENT.
PR-144	4.177E+00	NOT IDENT.
PM-146	4.387E-02	FAIL ABUN
ND-147	0.000E+00	SHORT HLIF
PM-147	7.709E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.621E-02	FAIL ABUN
EU-152	7.356E-02	FAIL ABUN
GD-153	1.323E-01	NOT IDENT.
EU-154	1.110E-01	NOT IDENT.
TB-160	1.662E+00	FAIL ABUN
HO-166M	5.011E-02	NOT IDENT.
TM-171	1.549E+01	NOT IDENT.
HF-172	2.024E-01	FAIL ABUN
LU-172	6.539E-02	FAIL ABUN
LU-176	2.136E-02	FAIL ABUN

HF-181	3.548E+00	NOT IDENT.
TA-182	8.122E-01	FAIL ABUN
RE-183	2.331E+00	NOT IDENT.
RE-184	2.326E+01	NOT IDENT.
W-188	1.002E+02	FAIL ABUN
IR-192	3.998E-01	FAIL ABUN
HG-203	1.857E+00	FAIL ABUN
BI-207	4.158E-02	FAIL ABUN
PB-210	2.139E+00	NOT IDENT.
BI-211	4.001E-01	FAIL ABUN
PB-211	6.414E-01	NOT IDENT.
BI-212	6.129E-01	FAIL ABUN
RN-219	3.167E-01	FAIL ABUN
RA-223	5.309E-01	FAIL ABUN
AC-227	1.966E-01	FAIL ABUN
TH-227	1.966E-01	FAIL ABUN
TH-229	3.994E-01	FAIL ABUN
TH-231	5.309E-01	FAIL ABUN
PA-233	5.091E-02	FAIL ABUN
PA-234	2.082E-01	NOT IDENT.
PA-234M	3.558E+00	NOT IDENT.
NP-237	5.091E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.012E-01	FAIL ABUN
PU-239	3.012E+02	NOT IDENT.
AM-241	1.131E-01	NOT IDENT.
CM-243	7.556E-02	NOT IDENT.
BK-247	6.059E-02	FAIL ABUN
CM-247	2.979E-02	NOT IDENT.
CF-251	8.784E-02	NOT IDENT.

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235002.CNF;1
* Acquisition date   : 3-OCT-2016 07:57:26 Sensitivity      : 3.000
* Detector ID        : GAM30 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:01.45 Half life ratio : *****
* Sample date        : 10-DEC-2015 14:30:00 Nuclide Library : SOLID
* Sample ID          : G405235002 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.2384E+02 GRAM
*                               Quantity Err(%) : 1.6150E-03 %
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight  : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date     : 11-MAR-2016 05:58:49 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.784E+01	2.389E+00	2.389E+00
ZN-65	1.792E-01	2.770E-01	2.770E-01
CD-109	2.183E+00	2.007E+00	2.007E+00
SN-126	1.395E-01	1.281E-01	1.281E-01
BA-137M	1.178E-01	8.405E-02	8.405E-02
CS-137	1.245E-01	8.879E-02	8.879E-02
EU-155	1.918E-01	2.159E-01	2.159E-01
TL-208	2.485E-01	7.033E-02	7.033E-02
PB-212	1.449E+00	1.858E-01	1.858E-01
BI-214	9.152E-01	1.924E-01	1.924E-01
PB-214	1.120E+00	2.265E-01	2.265E-01
RN-222	9.152E-01	1.924E-01	1.924E-01
RA-224	1.160E+00	1.292E+00	1.292E+00
RA-226	9.152E-01	1.924E-01	1.924E-01
AC-228	1.298E+00	3.876E-01	3.876E-01
RA-228	1.298E+00	3.876E-01	3.876E-01
TH-228	1.449E+00	1.858E-01	1.858E-01
TH-230	9.149E-01	1.923E-01	1.923E-01
PA-231	7.211E-01	7.933E-01	7.933E-01
TH-232	1.298E+00	3.876E-01	3.876E-01
TH-234	7.801E-01	1.878E+00	1.878E+00
U-234	9.149E-01	1.923E-01	1.923E-01
U-235	5.447E-02	1.765E-01	1.765E-01
U-238	7.801E-01	1.878E+00	1.878E+00
AM-243	1.975E-01	9.910E-02	9.910E-02
CF-249	4.748E-02	6.821E-02	6.821E-02
ANH-511	6.875E-02	8.194E-02	8.194E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-5.252E+00	1.102E+01	1.127E+01	NOT IDENT.
NA-22	2.002E-02	4.930E-02	5.012E-02	NOT IDENT.
NA-24	1.000E+41	1.285E+42	0.000E+00	SHORT HLIF

AL-26	1.369E-03	2.682E-02	2.683E-02	NOT IDENT.
SC-46	1.978E-01	3.677E-01	3.784E-01	FAIL ABUN
V-48	1.221E+04	1.565E+04	1.659E+04	SHORT HLIF
CR-51	-2.639E+02	3.909E+02	4.086E+02	SHORT HLIF
MN-54	5.343E-02	6.914E-02	7.322E-02	NOT IDENT.
CO-56	2.914E-01	4.934E-01	5.106E-01	FAIL ABUN
MN-56	1.000E+41	1.693E+41	0.000E+00	SHORT HLIF
CO-57	-5.272E-02	4.981E-02	5.519E-02	NOT IDENT.
CO-58	-2.314E-01	4.916E-01	5.025E-01	NOT IDENT.
FE-59	4.032E+00	6.914E+00	7.148E+00	NOT IDENT.
CO-60	-1.437E-02	4.977E-02	5.019E-02	NOT IDENT.
GE-68	-2.439E+00	2.823E+00	3.030E+00	NOT IDENT.
AS-73	3.034E+00	7.498E+00	7.622E+00	NOT IDENT.
AS-74	-2.159E+02	5.971E+03	5.972E+03	SHORT HLIF
SE-75	5.062E-02	2.085E-01	2.098E-01	NOT IDENT.
BR-77	1.412E+38	1.214E+39	0.000E+00	SHORT HLIF
SR-82	1.989E+02	6.444E+02	6.506E+02	SHORT HLIF
RB-83	-1.010E-01	7.257E-01	7.272E-01	NOT IDENT.
KR-85	1.877E+00	6.061E+00	6.120E+00	NOT IDENT.
SR-85	1.922E-01	6.262E-01	6.321E-01	NOT IDENT.
RB-86	-2.369E+04	3.208E+04	3.381E+04	SHORT HLIF
Y-88	-7.362E-02	1.374E-01	1.414E-01	NOT IDENT.
Y-91	2.211E+01	5.808E+02	5.809E+02	NOT IDENT.
NB-94	-3.826E-03	3.251E-02	3.256E-02	NOT IDENT.
NB-95	-1.197E+00	1.007E+00	1.143E+00	NOT IDENT.
NB-95M	1.723E+00	2.495E+00	2.613E+00	NOT IDENT.
ZR-95	9.690E-01	1.421E+00	1.487E+00	NOT IDENT.
NB-97	1.000E+41	6.207E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.229E+42	0.000E+00	SHORT HLIF
MO-99	-4.789E+31	1.282E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.414E+42	0.000E+00	SHORT HLIF
RH-101	-1.948E-02	3.590E-02	3.696E-02	NOT IDENT.
RH-102	4.200E-02	5.477E-02	5.795E-02	NOT IDENT.
RU-103	3.008E+00	5.212E+00	5.386E+00	FAIL ABUN
RH-106	3.384E-01	4.791E-01	5.028E-01	NOT IDENT.
RU-106	3.384E-01	4.791E-01	5.028E-01	NOT IDENT.
AG-108M	4.739E-02	3.071E-02	3.741E-02	FAIL ABUN
AG-110M	-8.785E-02	9.557E-02	1.035E-01	NOT IDENT.
SN-113	4.570E-02	2.014E-01	2.025E-01	NOT IDENT.
CD-115	1.004E+39	1.561E+39	0.000E+00	SHORT HLIF
SN-117M	6.973E+03	8.814E+04	8.819E+04	SHORT HLIF
TE-123M	8.256E-02	1.259E-01	1.313E-01	NOT IDENT.
SB-124	-7.328E-01	2.023E+00	2.049E+00	NOT IDENT.
SB-125	4.379E-02	1.153E-01	1.170E-01	FAIL ABUN
TE-125M	8.068E-01	2.778E+02	2.778E+02	NOT IDENT.
I-126	1.922E+06	1.118E+06	1.414E+06	SHORT HLIF
SB-126	8.688E+04	1.004E+06	1.005E+06	SHORT HLIF
SB-127	-3.331E+21	1.591E+22	0.000E+00	SHORT HLIF
I-131	3.100E+09	4.402E+09	4.618E+09	SHORT HLIF
I-132	1.000E+41	1.836E+42	0.000E+00	SHORT HLIF
TE-132	1.363E+26	2.685E+26	0.000E+00	SHORT HLIF
BA-133	-3.670E-03	4.171E-02	4.174E-02	NOT IDENT.
I-133	-1.000E+41	2.124E+41	0.000E+00	SHORT HLIF
CS-134	1.294E-01	6.790E-02	8.951E-02	FAIL ABUN
CS-135	4.649E-02	1.530E-01	1.545E-01	NOT IDENT.
I-135	-1.000E+41	2.665E+42	0.000E+00	SHORT HLIF
CS-136	1.536E+04	3.317E+05	3.317E+05	SHORT HLIF
CE-139	1.710E-03	1.169E-01	1.169E-01	NOT IDENT.
BA-140	-7.668E+05	1.069E+06	1.124E+06	SHORT HLIF
LA-140	-1.875E+05	4.018E+05	4.106E+05	SHORT HLIF
CE-141	-5.014E+00	2.309E+01	2.320E+01	NOT IDENT.
CE-143	1.000E+41	1.669E+41	0.000E+00	SHORT HLIF
CE-144	9.386E-03	3.450E-01	3.450E-01	NOT IDENT.
PM-144	2.222E-03	5.523E-02	5.524E-02	NOT IDENT.
PR-144	1.775E-01	4.790E+00	4.790E+00	NOT IDENT.
PM-146	4.628E-02	4.534E-02	4.991E-02	FAIL ABUN
ND-147	-9.633E+06	2.629E+07	2.665E+07	SHORT HLIF
PM-147	1.446E+03	7.833E+02	1.019E+03	NOT IDENT.
PM-149	-3.778E+39	2.675E+40	0.000E+00	SHORT HLIF
EU-150	1.870E-02	3.048E-02	3.163E-02	FAIL ABUN
EU-152	-1.798E-03	9.207E-02	9.208E-02	FAIL ABUN
GD-153	-6.544E-02	1.733E-01	1.758E-01	NOT IDENT.
EU-154	4.660E-02	1.205E-01	1.223E-01	NOT IDENT.
TB-160	-3.604E-02	2.009E+00	2.009E+00	FAIL ABUN
HO-166M	8.084E-03	5.809E-02	5.821E-02	NOT IDENT.
TM-171	-2.052E-01	1.746E+01	1.746E+01	NOT IDENT.
HF-172	1.331E-01	2.268E-01	2.346E-01	FAIL ABUN
LU-172	3.109E-02	7.372E-02	7.504E-02	FAIL ABUN

LU-176	-3.930E-03	2.940E-02	2.945E-02	FAIL ABUN
HF-181	1.039E+00	3.944E+00	3.972E+00	NOT IDENT.
TA-182	2.800E-02	9.320E-01	9.321E-01	FAIL ABUN
RE-183	-9.476E-02	2.642E+00	2.642E+00	NOT IDENT.
RE-184	-2.167E+00	2.852E+01	2.854E+01	NOT IDENT.
W-188	5.014E+01	1.270E+02	1.290E+02	FAIL ABUN
IR-192	-1.458E-02	4.490E-01	4.491E-01	FAIL ABUN
HG-203	-1.183E+00	2.439E+00	2.496E+00	FAIL ABUN
BI-207	1.742E-02	4.733E-02	4.797E-02	FAIL ABUN
PB-210	3.524E-01	2.359E+00	2.364E+00	NOT IDENT.
BI-211	3.084E+00	6.258E-01	1.525E+00	FAIL ABUN
PB-211	4.493E-01	6.833E-01	7.127E-01	NOT IDENT.
BI-212	2.197E+00	8.384E-01	1.298E+00	FAIL ABUN
RN-219	-6.924E-02	3.680E-01	3.693E-01	FAIL ABUN
RA-223	4.601E-02	6.537E-01	6.540E-01	FAIL ABUN
AC-227	1.881E-02	2.380E-01	2.382E-01	FAIL ABUN
TH-227	1.881E-02	2.380E-01	2.382E-01	FAIL ABUN
TH-229	2.042E-01	4.585E-01	4.677E-01	FAIL ABUN
TH-231	4.601E-02	6.537E-01	6.540E-01	FAIL ABUN
PA-233	-1.265E-02	5.820E-02	5.848E-02	FAIL ABUN
PA-234	9.521E-03	2.505E-01	2.505E-01	NOT IDENT.
PA-234M	-2.099E+00	4.737E+00	4.831E+00	NOT IDENT.
NP-237	-1.265E-02	5.820E-02	5.848E-02	FAIL ABUN
NP-238	1.000E+41	1.108E+41	0.000E+00	SHORT HLIF
NP-239	5.193E-03	2.345E-01	2.345E-01	FAIL ABUN
PU-239	3.268E+02	3.275E+02	3.591E+02	NOT IDENT.
AM-241	5.439E-02	1.330E-01	1.353E-01	NOT IDENT.
CM-243	-1.163E-02	9.612E-02	9.626E-02	NOT IDENT.
BK-247	-1.203E-02	7.580E-02	7.600E-02	FAIL ABUN
CM-247	-5.026E-03	3.444E-02	3.451E-02	NOT IDENT.
CF-251	-1.778E-01	1.252E-01	1.486E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	37.0694	87.09	84.5633	136.47	56.9975
45.60	58.6698	87.57	84.6261	140.51	0.0000
46.54	47.5979	88.03	84.6864	143.76	55.3058
49.72	0.0000	88.34	84.7267	144.24	47.7410
51.35	64.1478	88.47	84.7440	145.44	67.3612
51.87	66.1086	89.96	84.9376	152.43	78.8291
52.39	61.4550	1093.63	85.0254	153.25	0.0000
52.97	57.7443	91.11	0.0000	323.87	63.6234
53.44	61.5921	92.59	85.2760	156.02	0.0000
54.07	59.7763	93.35	85.3727	158.56	0.0000
57.36	0.0000	94.56	85.5259	159.00	48.5124
57.53	71.6703	94.65	85.5374	162.33	73.0214
57.98	75.5609	94.67	85.5400	162.66	0.0000
59.27	77.6734	94.87	85.5650	163.33	62.0216
59.32	77.6811	97.43	66.8003	165.86	65.5143
59.54	71.6383	98.43	70.9922	176.31	54.9829
60.96	82.1009	98.44	70.9932	176.60	0.0000
61.17	82.1344	99.53	59.4815	177.52	78.6400
62.93	79.1938	100.11	66.7154	181.07	0.0000
63.29	79.2483	102.03	63.1232	181.52	85.7122
63.58	79.2917	103.18	61.8507	184.41	55.4151
64.28	76.1693	103.37	61.8672	143.76	55.4839
66.73	86.8927	105.21	58.9239	193.51	46.7650
67.24	69.1252	105.31	58.9322	197.03	49.2043
125.81	71.1292	106.12	58.9978	198.01	60.7014
67.75	71.1381	106.47	59.0261	201.83	47.1197
69.67	88.6620	109.28	63.7561	203.43	71.3554
70.83	69.2471	111.00	76.0587	205.31	43.0385
72.81	73.7497	111.76	0.0000	210.85	50.9710
72.87	73.7572	114.06	67.9973	215.65	46.5295
74.66	73.9861	116.30	0.0000	222.11	65.4994
74.82	74.0061	116.74	65.0855	227.09	51.6773
74.97	74.0250	119.76	62.1757	227.38	49.3405
77.11	74.2945	121.12	40.1141	228.16	0.0000
78.74	76.8147	121.22	40.1193	228.18	45.8465
79.69	83.5674	121.78	59.1646	116.74	45.8465
80.12	87.6086	122.06	86.6646	235.69	39.4251
80.19	0.0000	122.92	66.6554	235.96	39.4338
80.57	77.0466	123.07	60.3185	238.63	52.1641
81.00	82.4175	265.00	70.9544	238.98	0.0000
81.07	82.4270	125.81	59.4611	240.99	52.2621
81.75	80.8548	127.23	84.0285	242.00	52.3037
83.79	98.8127	127.91	72.3885	244.70	31.7668
84.00	96.1743	129.30	62.9135	252.40	0.0000
85.43	84.3435	131.20	73.7442	252.80	37.1616
86.55	84.4922	133.02	69.6199	254.15	0.0000
86.79	84.5236	133.52	58.9444	256.23	42.0667
86.94	84.5435	136.00	69.8639	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	36.2869	355.39	0.0000	584.27	23.0508
264.80	42.3390	356.01	30.8540	595.83	0.0000
265.00	42.3454	364.49	0.0000	427.87	23.2080
268.22	37.1906	366.42	0.0000	602.52	0.0000
269.46	48.5535	372.51	30.2917	604.72	23.2471
270.03	48.5742	375.05	23.4025	607.14	21.8161
271.23	48.6169	377.52	30.3800	609.32	8.7341
273.65	0.0000	356.01	24.8285	610.33	8.7378
276.40	40.6667	388.16	27.5093	614.28	14.5862
277.37	37.8456	388.63	0.0000	618.01	21.4253
277.60	34.1891	391.69	23.6261	620.36	19.4954
278.00	34.1993	264.66	29.9008	621.93	14.6313
279.20	45.2304	401.81	31.6802	630.19	0.0000
279.54	45.2417	402.40	32.5707	631.29	12.7276
279.70	41.5776	404.85	28.2070	633.25	13.2275
280.46	31.8121	410.95	31.8391	634.78	0.0000
283.69	42.9222	413.71	30.1152	635.95	8.8275
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	33.1518	423.72	0.0000	645.85	16.7392
285.90	0.0000	427.09	21.4106	657.76	14.8383
287.50	38.1190	427.87	26.7743	657.90	0.0000
290.67	37.7933	433.94	20.1448	661.66	14.8602
293.27	0.0000	439.40	22.4467	664.57	0.0000
351.93	38.3243	453.88	21.7095	666.33	0.0000
295.96	38.3441	463.37	17.2686	666.50	0.0000
879.38	38.4123	468.07	17.3088	667.71	0.0000
299.98	38.4492	473.00	0.0000	677.62	16.9440
300.09	38.4520	475.06	16.4542	685.70	0.0000
300.13	38.4529	476.78	16.4681	695.00	0.0000
301.36	38.4851	477.60	23.0646	696.49	17.0636
302.85	38.5239	482.18	21.0978	696.51	17.0636
256.23	38.5674	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	18.0725
306.78	41.5334	497.08	18.4774	697.49	18.0740
308.46	43.6592	505.52	20.8699	702.65	21.1256
311.90	40.0088	507.63	0.0000	706.68	22.1647
316.51	38.4578	511.00	19.5284	711.68	19.1770
319.41	0.0000	514.00	19.5551	720.70	0.0000
320.08	0.0000	514.00	19.5551	721.93	0.0000
321.04	35.2179	520.40	25.2169	722.78	16.7202
323.87	39.0622	520.69	0.0000	722.91	18.2410
325.23	37.8360	522.65	0.0000	723.31	18.2439
328.76	0.0000	527.90	0.0000	724.19	13.6873
333.37	40.5684	528.26	15.9340	727.33	14.2096
333.97	40.5830	529.59	25.3224	733.00	12.2046
334.37	40.5938	529.87	0.0000	735.93	15.2716
338.28	29.2484	531.02	0.0000	333.97	16.8075
338.32	29.2491	537.26	0.0000	739.50	0.0000
311.90	29.2884	546.56	0.0000	747.24	12.2656
340.48	29.2884	552.55	14.2120	748.06	15.3363
340.55	0.0000	563.25	25.7014	752.31	13.3110
344.28	29.3578	569.33	14.3158	753.82	0.0000
345.93	37.0536	946.00	16.2260	756.73	13.3317
351.06	27.3438	569.70	16.2273	756.80	12.3066
351.93	27.3581	583.19	23.0400	884.68	15.4211

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	37.0342	1274.44	16.5686	1620.50	1.9110
766.42	33.9547	1001.03	19.9087	1621.92	3.8232
766.84	23.6691	1002.74	9.9591	1678.03	0.0000
772.60	0.0000	1004.73	13.2861	1690.97	5.8092
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	4.9057
778.90	18.5999	1028.54	0.0000	1063.66	8.8391
783.70	0.0000	1037.84	13.4072	1771.35	4.4905
785.37	5.1778	1038.76	0.0000	1791.20	0.0000
792.07	20.2387	631.29	16.7993	1808.65	2.9663
794.95	11.4279	1048.07	0.0000	1810.72	0.0000
795.86	15.5884	1049.04	16.8103	1836.06	1.9869
810.06	17.7498	1050.41	8.9688		
810.29	16.7070	1063.66	10.1257		
344.28	12.5308	1077.00	0.0000		
810.76	13.5761	1077.34	20.3247		
815.77	0.0000	1085.87	11.3167		
1048.07	0.0000	1093.63	9.0716		
832.01	18.9280	1099.45	10.2209		
834.85	14.7354	1112.07	1.7090		
835.71	12.6338	1112.84	3.4187		
836.80	0.0000	1115.54	6.8423		
846.75	0.0000	1120.29	15.4138		
846.77	11.0934	1120.55	15.4149		
856.80	0.0000	1221.41	15.4171		
860.56	13.7945	1129.67	6.8667		
871.09	12.7754	1131.51	0.0000		
873.19	17.0449	1147.95	0.0000		
875.33	0.0000	1173.23	15.2722		
879.38	17.0775	1177.95	13.9004		
880.51	18.1510	1189.05	13.9375		
883.24	9.6174	1204.77	15.1571		
884.68	17.1055	1221.41	14.9248		
889.28	10.7060	1231.02	14.0791		
894.76	10.7239	1235.36	0.0000		
898.04	20.3955	1238.28	10.5776		
900.72	11.8173	1260.41	0.0000		
903.28	13.9770	1271.87	14.2139		
911.20	9.6995	1274.44	10.6670		
912.08	9.7020	1274.54	10.6670		
923.98	0.0000	1291.59	8.0316		
926.50	15.1570	1298.22	0.0000		
929.11	6.5007	1312.11	0.0000		
937.49	9.7753	1332.49	15.4395		
944.13	0.0000	1362.66	0.0000		
946.00	10.8883	1365.19	6.3502		
949.00	15.2572	1368.63	0.0000		
667.71	0.0000	1384.29	7.2876		
962.31	15.3159	1408.01	10.9871		
964.08	15.3239	1457.56	0.0000		
966.17	15.3330	1460.82	7.4063		
911.20	15.3450	1489.16	7.4492		
968.97	15.3450	1505.03	0.9341		
983.53	0.0000	1584.12	7.5908		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235003.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM08.CNF;320
Background date : 2-OCT-2016 11:00:23.
Sample date     : 10-DEC-2015 14:35:00 Acquisition date : 3-OCT-2016 08:01:06.
Sample ID      : G405235003 Sample quantity   : 1.40486E+02 GRAM
Detector name  : GAM08 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.68 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity    : 3.00000
Batch ID       : 1596247 Detector SN#    :
Matrix Spike ID : LCS ID           : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	41.47	14	99	1.38	83.16	80	7	3.94E-03	118.8	
2	0	63.66*	67	146	1.58	127.57	122	11	1.87E-02	37.6	
3	2	74.52*	116	145	1.30	149.30	143	16	3.22E-02	20.8	3.53E+00
4	2	77.01*	157	119	1.10	154.28	143	16	4.35E-02	14.7	
5	0	86.98*	51	178	1.03	174.23	171	8	1.41E-02	47.8	
6	0	92.58*	14	204	1.43	185.43	182	9	3.85E-03	198.0	
7	0	104.66	31	88	1.66	209.61	207	7	8.75E-03	52.7	
8	0	129.00	18	116	0.83	258.30	253	9	4.96E-03	111.6	
9	0	185.88*	56	108	1.54	372.11	367	9	1.55E-02	38.5	
10	0	209.35	64	112	3.58	419.08	413	14	1.78E-02	37.2	
11	3	238.59*	371	56	1.15	477.57	473	18	1.03E-01	6.3	1.01E+00
12	3	241.51	90	76	1.79	483.42	473	18	2.51E-02	27.7	
13	0	270.63	29	77	1.12	541.69	535	10	8.01E-03	60.0	
14	0	278.02*	15	60	1.02	556.48	550	9	4.25E-03	100.0	
15	0	294.96*	116	48	1.30	590.38	585	10	3.21E-02	14.8	
16	7	338.25*	70	52	1.72	676.98	672	20	1.93E-02	23.1	2.33E+00
17	7	342.50	33	61	2.84	685.48	672	20	9.06E-03	53.0	
18	0	352.04*	189	76	1.25	704.59	698	14	5.24E-02	12.4	
19	0	367.54	22	30	2.73	735.59	731	9	6.12E-03	49.3	
20	0	401.74	16	51	4.42	804.01	795	15	4.37E-03	103.2	
21	0	416.72	12	27	1.30	834.00	830	8	3.34E-03	81.1	
22	0	463.41	12	30	1.33	927.40	923	8	3.45E-03	81.3	
23	0	511.20*	42	31	1.97	1023.03	1015	16	1.17E-02	40.9	
24	0	517.47	18	17	3.86	1035.57	1030	11	4.86E-03	50.9	
25	0	583.39*	121	33	1.36	1167.46	1161	12	3.36E-02	13.3	
26	0	596.95	14	7	1.66	1194.59	1191	7	3.75E-03	42.1	
27	0	609.38*	116	42	1.56	1219.46	1213	12	3.23E-02	14.8	
28	0	679.31	25	17	3.78	1359.36	1350	17	7.05E-03	42.1	
29	0	706.97	9	19	0.98	1414.71	1411	7	2.61E-03	91.4	
30	0	727.97*	24	29	1.06	1456.73	1448	13	6.75E-03	51.9	
31	0	781.12	21	2	0.90	1563.07	1558	10	5.72E-03	26.2	
32	0	785.41	25	0	0.87	1571.64	1568	8	6.94E-03	20.0	
33	0	860.11*	25	10	0.82	1721.09	1714	13	6.86E-03	34.3	
34	0	876.69	8	7	3.30	1754.26	1748	10	2.16E-03	74.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	911.50*	67	13	1.62	1823.91	1818	14	1.87E-02	17.3	
36	0	934.52	9	9	0.92	1869.96	1863	9	2.45E-03	70.0	
37	0	963.07*	27	6	0.63	1927.07	1920	13	7.49E-03	28.3	
38	0	968.96*	44	11	2.45	1938.86	1934	10	1.22E-02	21.7	
39	0	1042.94	18	4	1.35	2086.86	2082	11	4.90E-03	34.5	
40	0	1097.55	11	6	1.29	2196.11	2192	8	3.14E-03	47.7	
41	0	1121.15*	34	10	3.88	2243.33	2236	18	9.40E-03	30.9	
42	0	1145.18	9	7	1.18	2291.40	2287	8	2.40E-03	69.3	
43	0	1155.67	21	7	2.04	2312.38	2304	14	5.79E-03	34.7	
44	0	1239.66	11	12	3.50	2480.41	2473	13	3.12E-03	71.9	
45	0	1243.50	10	0	1.53	2488.10	2485	7	2.78E-03	31.6	
46	0	1310.84	12	5	1.11	2622.80	2617	12	3.38E-03	48.6	
47	0	1408.11	9	2	1.57	2817.40	2813	9	2.41E-03	46.2	
48	0	1430.72	8	6	0.66	2862.62	2853	13	2.14E-03	76.8	
49	0	1460.85	291	3	1.90	2922.90	2916	13	8.08E-02	6.0	
50	0	1764.80*	17	3	1.03	3530.91	3525	11	4.68E-03	34.6	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235003.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 10-DEC-2015 14:35:00 Acquisition date : 3-OCT-2016 08:01:06
Sample ID        : G405235003 Sample quantity   : 140.49 GRAM
Sample type      : SOLID Sample geometry    :
Detector name    : GAMMA8 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.68 0.0%
Energy tolerance : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type  : Linear Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	242.00	RA-224	240.99
TL-208	277.37	CM-247	278.00
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	9.671E-01	1.446E+01	1.446E+01	12.00	OK
CD-109	88.03	3.70*	4.281E+00	1.101E+00	1.722E+00	181.21	OK
SN-126	64.28	9.60	2.181E+00	2.125E+00	2.125E+00	75.23	OK
	86.94	8.90	4.281E+00	4.577E-01	4.577E-01	181.21	OK
	87.57	37.00*	4.281E+00	1.101E-01	1.101E-01	181.21	OK
EU-155	86.55	30.70	4.281E+00	1.327E-01	1.495E-01	181.21	OK
	105.31	21.10*	5.121E+00	1.853E-01	2.088E-01	105.38	OK
TL-208	277.37	6.60	3.703E+00	3.695E-01	3.695E-01	199.99	OK
	583.19	85.00*	2.006E+00	3.940E-01	3.940E-01	26.63	OK
	860.56	12.50	1.479E+00	7.179E-01	7.179E-01	68.57	OK
BI-212	727.33	6.67*	1.684E+00	1.178E+00	1.178E+00	103.81	OK
	785.37	1.10	1.587E+00	7.754E+00	7.754E+00	40.00	OK
	1620.50	1.47	8.836E-01	-----	Line Not Found	-----	Absent
PB-212	74.82	10.28	3.291E+00	1.644E+00	1.644E+00	57.64	OK
	77.11	17.10	3.516E+00	1.694E+00	1.694E+00	29.38	OK
	238.63	43.60*	4.175E+00	1.218E+00	1.218E+00	12.63	OK
	300.09	3.30	3.479E+00	-----	Line Not Found	-----	Absent
BI-214	609.32	45.49*	1.938E+00	7.300E-01	7.303E-01	29.55	OK
	1120.29	14.92	1.202E+00	9.905E-01	9.908E-01	61.72	OK
	1764.49	15.30	8.179E-01	6.774E-01	6.777E-01	69.13	OK
PB-214	74.82	5.80	3.318E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	3.516E+00	2.986E+00	2.987E+00	29.38	OK
	87.09	3.41	4.288E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	4.130E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	3.529E+00	1.045E+00	1.045E+00	29.69	OK
	351.93	35.60*	3.045E+00	1.007E+00	1.008E+00	24.88	OK
RN-219	271.23	10.80	3.784E+00	4.176E-01	4.176E-01	120.01	OK
	401.81	6.60*	2.725E+00	5.016E-01	5.016E-01	206.32	OK
RN-222	609.32	45.49*	1.938E+00	7.300E-01	7.303E-01	29.55	OK
	1120.29	14.92	1.202E+00	9.905E-01	9.908E-01	61.72	OK
	1764.49	15.30	8.179E-01	6.774E-01	6.777E-01	69.13	OK
RA-224	240.99	4.10*	4.136E+00	1.333E+00	1.333E+00	138.31	OK
RA-226	609.32	45.49*	1.938E+00	7.300E-01	7.303E-01	29.55	OK
	1120.29	14.92	1.202E+00	9.905E-01	9.908E-01	61.72	OK
	1764.49	15.30	8.179E-01	6.774E-01	6.777E-01	69.13	OK
AC-228	105.21	1.10	5.121E+00	3.555E+00	3.555E+00	105.38	OK
	338.32	11.27	3.149E+00	1.138E+00	1.138E+00	46.11	OK
	794.95	4.25	1.572E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.512E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.413E+00	9.868E-01	9.868E-01	34.65	OK
	968.97	15.80	1.348E+00	1.097E+00	1.097E+00	43.42	OK
RA-228	105.21	1.10	5.121E+00	3.555E+00	3.555E+00	105.38	OK
	338.32	11.27	3.149E+00	1.138E+00	1.138E+00	46.11	OK
	794.95	4.25	1.572E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.512E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.413E+00	9.868E-01	9.868E-01	34.65	OK
	968.97	15.80	1.348E+00	1.097E+00	1.097E+00	43.42	OK
TH-228	74.82	10.28	3.291E+00	1.644E+00	1.644E+00	57.64	OK
	77.11	17.10	3.516E+00	1.694E+00	1.694E+00	29.38	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	238.63	43.60*	4.175E+00	1.218E+00	1.218E+00	12.63	OK
	300.09	3.30	3.479E+00	-----	Line Not Found	-----	Absent
TH-230	609.32	45.49*	1.938E+00	7.301E-01	7.301E-01	29.55	OK
	1120.29	14.92	1.202E+00	9.905E-01	9.905E-01	61.72	OK
	1764.49	15.30	8.179E-01	6.774E-01	6.774E-01	69.13	OK
TH-232	105.21	1.10	5.121E+00	3.555E+00	3.555E+00	105.38	OK
	338.32	11.27	3.149E+00	1.138E+00	1.138E+00	46.11	OK
	835.71	1.61	1.512E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.413E+00	9.868E-01	9.868E-01	34.65	OK
	968.97	15.80	1.348E+00	1.097E+00	1.097E+00	43.42	OK
TH-234	63.29	3.70*	2.181E+00	5.514E+00	5.514E+00	75.23	OK
	92.59	4.23	4.614E+00	4.562E-01	4.562E-01	395.92	OK
U-234	609.32	45.49*	1.938E+00	7.300E-01	7.301E-01	29.55	OK
	1120.29	14.92	1.202E+00	9.905E-01	9.905E-01	61.72	OK
	1764.49	15.30	8.179E-01	6.774E-01	6.774E-01	69.13	OK
U-238	63.29	3.70*	2.181E+00	5.514E+00	5.514E+00	75.23	OK
	92.59	4.23	4.614E+00	4.562E-01	4.562E-01	395.92	OK
AM-243	43.53	5.90	2.327E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	3.291E+00	2.515E-01	2.515E-01	57.64	OK
CM-247	278.00	3.40	3.703E+00	-----	Line Not Found	-----	<<INT Reject
	287.50	2.00	3.604E+00	-----	Line Not Found	-----	Absent
	402.40	72.00*	2.725E+00	4.598E-02	4.598E-02	206.32	OK
ANH-511	511.00	100.00*	2.232E+00	1.061E-01	1.061E-01	81.81	OK

Flag: "*" = Keyline


```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235003.CNF;1
* Acquisition date   : 3-OCT-2016 08:01:06 Sensitivity      : 3.000
* Detector ID       : GAM08 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.68 Half life ratio : *****
* Sample date      : 10-DEC-2015 14:35:00 Analyst initials: MXR1
* Sample ID       : G405235003 Sample Quantity : 1.4049E+02 GRAM
* Batch Number    : 1596247 Wet Weight : 0.00000
* Wet wt corr    : 1.00000 Dry Weight : 0.00000
* Nuclide Library : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 21-JUL-2016 06:09:19 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.446E+01	1.700E+00	8.167E-01
CD-109	1.722E+00	3.058E+00	3.055E+00
SN-126	1.101E-01	1.955E-01	1.900E-01
EU-155	2.088E-01	2.156E-01	2.455E-01
TL-208	3.940E-01	1.028E-01	6.557E-02
BI-212	1.178E+00	1.199E+00	1.010E+00
PB-212	1.218E+00	1.508E-01	1.099E-01
BI-214	7.303E-01	2.115E-01	1.733E-01
PB-214	1.008E+00	2.457E-01	1.604E-01
RN-219	5.016E-01	1.014E+00	8.686E-01
RN-222	7.303E-01	2.115E-01	1.733E-01
RA-224	1.333E+00	1.807E+00	1.178E+00
RA-226	7.303E-01	2.115E-01	1.733E-01
AC-228	9.868E-01	3.351E-01	3.106E-01
RA-228	9.868E-01	3.351E-01	3.106E-01
TH-228	1.218E+00	1.508E-01	1.099E-01
TH-230	7.301E-01	2.114E-01	1.733E-01
TH-232	9.868E-01	3.351E-01	3.106E-01
TH-234	5.514E+00	4.065E+00	2.879E+00
U-234	7.301E-01	2.114E-01	1.733E-01
U-238	5.514E+00	4.065E+00	2.879E+00
AM-243	2.515E-01	1.421E-01	1.162E-01
CM-247	4.598E-02	9.297E-02	7.973E-02
ANH-511	1.061E-01	8.509E-02	5.025E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	3.769E-01	1.220E+01	2.376E+01	NOT IDENT.
NA-22	-3.017E-02	6.110E-02	1.074E-01	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	2.807E-04	1.819E-02	4.928E-02	NOT IDENT.
SC-46	-4.138E-02	3.385E-01	6.862E-01	FAIL ABUN
V-48	0.000E+00	1.452E+04	0.000E+00	SHORT HLIF

CR-51	0.000E+00	4.984E+02	0.000E+00	SHORT HLIF
MN-54	1.168E-02	6.721E-02	1.390E-01	NOT IDENT.
CO-56	-3.603E-01	5.812E-01	1.044E+00	FAIL ABUN
MN-56	0.000E+00	1.603E+41	0.000E+00	SHORT HLIF
CO-57	3.215E-02	5.676E-02	1.088E-01	NOT IDENT.
CO-58	-7.275E-01	6.999E-01	1.167E+00	NOT IDENT.
FE-59	2.551E+00	9.019E+00	1.654E+01	NOT IDENT.
CO-60	4.861E-03	5.650E-02	1.113E-01	NOT IDENT.
ZN-65	9.557E-02	2.044E-01	3.990E-01	NOT IDENT.
GE-68	9.350E-01	2.840E+00	5.888E+00	NOT IDENT.
AS-73	4.679E+00	1.492E+01	2.911E+01	NOT IDENT.
AS-74	0.000E+00	5.875E+03	0.000E+00	SHORT HLIF
SE-75	2.433E-01	2.254E-01	4.693E-01	FAIL ABUN
BR-77	0.000E+00	1.469E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	7.886E+02	0.000E+00	SHORT HLIF
RB-83	-4.842E-01	8.995E-01	1.357E+00	NOT IDENT.
KR-85	9.885E+00	9.717E+00	1.687E+01	NOT IDENT.
SR-85	1.019E+00	1.004E+00	1.743E+00	NOT IDENT.
RB-86	0.000E+00	3.377E+04	0.000E+00	SHORT HLIF
Y-88	-8.771E-02	2.218E-01	4.392E-01	NOT IDENT.
Y-91	-2.454E+02	4.722E+02	8.419E+02	NOT IDENT.
NB-94	9.471E-03	4.610E-02	8.292E-02	NOT IDENT.
NB-95	-6.313E-01	1.019E+00	1.846E+00	NOT IDENT.
NB-95M	-2.326E-01	2.792E+00	4.837E+00	NOT IDENT.
ZR-95	-9.418E-02	1.968E+00	3.838E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.517E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.217E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	1.169E-02	4.169E-02	7.220E-02	NOT IDENT.
RH-102	3.701E-03	6.831E-02	1.306E-01	NOT IDENT.
RU-103	1.458E+00	6.553E+00	1.286E+01	FAIL ABUN
RH-106	-2.142E-01	6.246E-01	1.109E+00	NOT IDENT.
RU-106	-2.142E-01	6.246E-01	1.109E+00	NOT IDENT.
AG-108M	-9.918E-03	3.475E-02	6.372E-02	NOT IDENT.
AG-110M	-2.885E-02	9.101E-02	1.769E-01	FAIL ABUN
SN-113	7.813E-02	2.482E-01	4.970E-01	NOT IDENT.
CD-115	0.000E+00	2.060E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.123E+05	0.000E+00	SHORT HLIF
TE-123M	1.883E-01	1.573E-01	3.123E-01	NOT IDENT.
SB-124	-7.623E-01	1.056E+00	1.104E+00	NOT IDENT.
SB-125	-5.468E-02	1.179E-01	2.122E-01	FAIL ABUN
TE-125M	1.069E+02	3.419E+02	6.351E+02	NOT IDENT.
I-126	0.000E+00	1.117E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.198E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.667E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	5.195E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.039E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.815E+26	0.000E+00	SHORT HLIF
BA-133	1.325E-02	5.067E-02	9.088E-02	NOT IDENT.
I-133	0.000E+00	1.167E+41	0.000E+00	SHORT HLIF
CS-134	8.258E-02	5.926E-02	1.380E-01	NOT IDENT.
CS-135	9.185E-02	1.707E-01	3.171E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.500E+05	0.000E+00	SHORT HLIF
BA-137M	6.763E-03	4.608E-02	8.695E-02	NOT IDENT.
CS-137	7.144E-03	4.868E-02	9.186E-02	NOT IDENT.
CE-139	-4.362E-02	1.406E-01	2.432E-01	NOT IDENT.
BA-140	0.000E+00	1.724E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	3.627E+05	0.000E+00	SHORT HLIF
CE-141	3.308E+00	3.052E+01	5.510E+01	NOT IDENT.
CE-143	0.000E+00	8.286E+40	0.000E+00	SHORT HLIF
CE-144	9.356E-02	4.746E-01	8.603E-01	NOT IDENT.
PM-144	-1.355E-02	6.227E-02	1.212E-01	NOT IDENT.
PR-144	-1.232E+00	5.393E+00	1.048E+01	NOT IDENT.
PM-146	4.955E-03	5.043E-02	9.762E-02	NOT IDENT.
ND-147	0.000E+00	4.064E+07	0.000E+00	SHORT HLIF
PM-147	-9.139E+02	1.045E+03	1.753E+03	NOT IDENT.
PM-149	0.000E+00	2.372E+40	0.000E+00	SHORT HLIF
EU-150	-6.881E-03	3.208E-02	5.364E-02	FAIL ABUN
EU-152	7.929E-04	1.151E-01	1.992E-01	FAIL ABUN
GD-153	-8.738E-02	2.201E-01	3.926E-01	FAIL ABUN
EU-154	-7.705E-02	1.494E-01	2.614E-01	NOT IDENT.
TB-160	-7.311E-01	1.832E+00	2.961E+00	FAIL ABUN
HO-166M	6.388E-02	7.824E-02	1.640E-01	FAIL ABUN
TM-171	-1.557E+01	3.878E+01	7.150E+01	NOT IDENT.
HF-172	-9.778E-02	2.939E-01	4.742E-01	FAIL ABUN
LU-172	4.333E-02	1.119E-01	2.119E-01	FAIL ABUN

LU-176	2.191E-02	2.782E-02	5.780E-02	FAIL ABUN
HF-181	2.207E+00	4.754E+00	9.671E+00	NOT IDENT.
TA-182	-8.885E-01	1.158E+00	1.927E+00	FAIL ABUN
RE-183	1.486E-01	4.431E+00	8.474E+00	NOT IDENT.
RE-184	9.336E+00	3.418E+01	7.087E+01	NOT IDENT.
W-188	9.807E+00	1.247E+02	2.208E+02	FAIL ABUN
IR-192	-1.562E-01	5.335E-01	9.972E-01	FAIL ABUN
HG-203	2.509E+00	4.918E+00	4.798E+00	FAIL ABUN
BI-207	-2.470E-02	6.450E-02	1.176E-01	FAIL ABUN
PB-210	4.378E+00	6.861E+00	1.389E+01	NOT IDENT.
BI-211	0.000E+00	6.767E-01	9.852E-01	FAIL ABUN
PB-211	-6.341E-02	7.940E-01	1.350E+00	NOT IDENT.
RA-223	-3.459E-01	6.499E-01	1.147E+00	FAIL ABUN
AC-227	6.193E-02	2.609E-01	5.171E-01	NOT IDENT.
TH-227	6.193E-02	2.609E-01	5.171E-01	NOT IDENT.
TH-229	3.118E-01	5.182E-01	1.061E+00	FAIL ABUN
PA-231	8.794E-01	5.953E-01	1.261E+00	NOT IDENT.
TH-231	-3.459E-01	6.499E-01	1.147E+00	FAIL ABUN
PA-233	-1.557E-02	6.863E-02	1.294E-01	NOT IDENT.
PA-234	6.011E-02	3.615E-01	7.255E-01	NOT IDENT.
PA-234M	1.138E+00	6.167E+00	1.246E+01	NOT IDENT.
U-235	1.168E-01	2.250E-01	4.286E-01	FAIL ABUN
NP-237	-1.557E-02	6.863E-02	1.294E-01	NOT IDENT.
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	4.035E-02	3.200E-01	5.880E-01	FAIL ABUN
PU-239	3.234E+02	7.071E+02	7.300E+02	FAIL ABUN
AM-241	1.208E-02	2.140E-01	3.793E-01	NOT IDENT.
CM-243	1.908E-01	1.970E-01	2.313E-01	FAIL ABUN
BK-247	3.487E-02	8.713E-02	1.603E-01	NOT IDENT.
CF-249	-2.600E-02	4.139E-02	7.336E-02	NOT IDENT.
CF-251	5.720E-02	1.289E-01	2.619E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	279	10.66*	9.671E-01	1.446E+01	1.446E+01	12.00
CD-109	88.03	61	3.70*	4.281E+00	2.064E+00	3.228E+00	95.67
SN-126	64.28	83	9.60	2.181E+00	2.125E+00	2.125E+00	75.23
	86.94	61	8.90	4.281E+00	8.580E-01	8.580E-01	95.67
	87.57	61	37.00*	4.281E+00	2.064E-01	2.064E-01	95.67
EU-155	86.55	61	30.70	4.281E+00	2.487E-01	2.802E-01	95.67
	105.31	37	21.10*	5.121E+00	1.853E-01	2.088E-01	105.38
HG-203	70.83	-----	3.69	2.935E+00	-----	Line Not Found	-----
	72.87	-----	6.19	3.135E+00	-----	Line Not Found	-----
	279.20	17	81.56*	3.703E+00	2.990E-02	2.509E+00	199.99
TL-208	277.37	17	6.60	3.703E+00	3.695E-01	3.695E-01	199.99
	583.19	126	85.00*	2.006E+00	3.940E-01	3.940E-01	26.63
	860.56	25	12.50	1.479E+00	7.179E-01	7.179E-01	68.57
BI-211	72.87	-----	1.23	3.135E+00	-----	Line Not Found	-----
	351.06	204	12.92*	3.045E+00	2.776E+00	2.776E+00	24.88
BI-212	727.33	25	6.67*	1.684E+00	1.178E+00	1.178E+00	103.81
	785.37	25	1.10	1.587E+00	7.754E+00	7.754E+00	40.00
	1620.50	-----	1.47	8.836E-01	-----	Line Not Found	-----
PB-212	74.82	141	10.28	3.291E+00	2.233E+00	2.233E+00	41.69
	77.11	191	17.10	3.516E+00	1.694E+00	1.694E+00	29.38
	238.63	415	43.60*	4.175E+00	1.218E+00	1.218E+00	12.63
	300.09	-----	3.30	3.479E+00	-----	Line Not Found	-----
BI-214	609.32	120	45.49*	1.938E+00	7.300E-01	7.303E-01	29.55
	1120.29	33	14.92	1.202E+00	9.905E-01	9.908E-01	61.72
	1764.49	16	15.30	8.179E-01	6.774E-01	6.777E-01	69.13
PB-214	74.82	141	5.80	3.291E+00	3.959E+00	3.960E+00	41.69
	77.11	191	9.70	3.516E+00	2.986E+00	2.987E+00	29.38
	87.09	61	3.41	4.281E+00	2.239E+00	2.240E+00	95.67
	242.00	101	7.25	4.136E+00	1.799E+00	1.799E+00	55.34
	295.22	127	18.42	3.529E+00	1.045E+00	1.045E+00	29.69
	351.93	204	35.60*	3.045E+00	1.007E+00	1.008E+00	24.88
RN-219	271.23	32	10.80	3.784E+00	4.176E-01	4.176E-01	120.01
	401.81	17	6.60*	2.725E+00	5.016E-01	5.016E-01	206.32
RN-222	609.32	120	45.49*	1.938E+00	7.300E-01	7.303E-01	29.55
	1120.29	33	14.92	1.202E+00	9.905E-01	9.908E-01	61.72
	1764.49	16	15.30	8.179E-01	6.774E-01	6.777E-01	69.13
RA-224	240.99	101	4.10*	4.136E+00	3.181E+00	3.181E+00	55.34
RA-226	609.32	120	45.49*	1.938E+00	7.300E-01	7.303E-01	29.55
	1120.29	33	14.92	1.202E+00	9.905E-01	9.908E-01	61.72
	1764.49	16	15.30	8.179E-01	6.774E-01	6.777E-01	69.13
AC-228	105.21	37	1.10	5.121E+00	3.555E+00	3.555E+00	105.38
	338.32	76	11.27	3.149E+00	1.138E+00	1.138E+00	46.11
	794.95	-----	4.25	1.572E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.512E+00	-----	Line Not Found	-----
	911.20	67	25.80*	1.413E+00	9.868E-01	9.868E-01	34.65
	968.97	44	15.80	1.348E+00	1.097E+00	1.097E+00	43.42
RA-228	105.21	37	1.10	5.121E+00	3.555E+00	3.555E+00	105.38

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	338.32	76	11.27	3.149E+00	1.138E+00	1.138E+00	46.11
	794.95	-----	4.25	1.572E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.512E+00	-----	Line Not Found	-----
	911.20	67	25.80*	1.413E+00	9.868E-01	9.868E-01	34.65
	968.97	44	15.80	1.348E+00	1.097E+00	1.097E+00	43.42
TH-228	74.82	141	10.28	3.291E+00	2.233E+00	2.233E+00	41.69
	77.11	191	17.10	3.516E+00	1.694E+00	1.694E+00	29.38
	238.63	415	43.60*	4.175E+00	1.218E+00	1.218E+00	12.63
	300.09	-----	3.30	3.479E+00	-----	Line Not Found	-----
TH-230	609.32	120	45.49*	1.938E+00	7.301E-01	7.301E-01	29.55
	1120.29	33	14.92	1.202E+00	9.905E-01	9.905E-01	61.72
	1764.49	16	15.30	8.179E-01	6.774E-01	6.774E-01	69.13
TH-232	105.21	37	1.10	5.121E+00	3.555E+00	3.555E+00	105.38
	338.32	76	11.27	3.149E+00	1.138E+00	1.138E+00	46.11
	835.71	-----	1.61	1.512E+00	-----	Line Not Found	-----
	911.20	67	25.80*	1.413E+00	9.868E-01	9.868E-01	34.65
	968.97	44	15.80	1.348E+00	1.097E+00	1.097E+00	43.42
TH-234	63.29	83	3.70*	2.181E+00	5.514E+00	5.514E+00	75.23
	92.59	17	4.23	4.614E+00	4.562E-01	4.562E-01	395.92
U-234	609.32	120	45.49*	1.938E+00	7.300E-01	7.301E-01	29.55
	1120.29	33	14.92	1.202E+00	9.905E-01	9.905E-01	61.72
	1764.49	16	15.30	8.179E-01	6.774E-01	6.774E-01	69.13
U-238	63.29	83	3.70*	2.181E+00	5.514E+00	5.514E+00	75.23
	92.59	17	4.23	4.614E+00	4.562E-01	4.562E-01	395.92
AM-243	43.53	-----	5.90	2.327E-01	-----	Line Not Found	-----
	74.66	141	67.20*	3.291E+00	3.417E-01	3.417E-01	41.69
CM-247	278.00	17	3.40	3.703E+00	7.173E-01	7.173E-01	199.99
	287.50	-----	2.00	3.604E+00	-----	Line Not Found	-----
	402.40	17	72.00*	2.725E+00	4.598E-02	4.598E-02	206.32
ANH-511	511.00	44	100.00*	2.232E+00	1.061E-01	1.061E-01	81.81

Flag: "*" = Keyline

Total number of lines in spectrum 50
 Number of unidentified lines 13
 Number of lines tentatively identified by NID 37 74.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.446E+01	1.446E+01	0.173E+01	12.00	
CD-109	461.40D	1.56	2.064E+00	3.228E+00	3.088E+00	95.67	
SN-126	2.30E+05Y	1.00	2.064E-01	2.064E-01	1.974E-01	95.67	
EU-155	4.75Y	1.13	1.853E-01	2.088E-01	2.200E-01	105.38	
HG-203	46.59D	83.9	2.990E-02	2.509E+00	5.018E+00	199.99	
TL-208	1.41E+10Y	1.00	3.940E-01	3.940E-01	1.049E-01	26.63	
BI-211	7.04E+08Y	1.00	2.776E+00	2.776E+00	0.690E+00	24.88	
BI-212	1.41E+10Y	1.00	1.178E+00	1.178E+00	1.223E+00	103.81	
PB-212	1.41E+10Y	1.00	1.218E+00	1.218E+00	0.154E+00	12.63	
BI-214	1600.00Y	1.00	7.300E-01	7.303E-01	2.158E-01	29.55	
PB-214	1600.00Y	1.00	1.007E+00	1.008E+00	0.251E+00	24.88	
RN-219	7.04E+08Y	1.00	5.016E-01	5.016E-01	10.35E-01	206.32	
RN-222	1600.00Y	1.00	7.300E-01	7.303E-01	2.158E-01	29.55	
RA-224	1.41E+10Y	1.00	3.181E+00	3.181E+00	1.760E+00	55.34	
RA-226	1600.00Y	1.00	7.300E-01	7.303E-01	2.158E-01	29.55	
AC-228	1.41E+10Y	1.00	9.868E-01	9.868E-01	3.419E-01	34.65	
RA-228	1.41E+10Y	1.00	9.868E-01	9.868E-01	3.419E-01	34.65	
TH-228	1.41E+10Y	1.00	1.218E+00	1.218E+00	0.154E+00	12.63	
TH-230	7.54E+04Y	1.00	7.301E-01	7.301E-01	2.157E-01	29.55	
TH-232	1.41E+10Y	1.00	9.868E-01	9.868E-01	3.419E-01	34.65	
TH-234	4.47E+09Y	1.00	5.514E+00	5.514E+00	4.148E+00	75.23	
U-234	2.45E+05Y	1.00	7.300E-01	7.301E-01	2.157E-01	29.55	
U-238	4.47E+09Y	1.00	5.514E+00	5.514E+00	4.148E+00	75.23	
AM-243	7370.00Y	1.00	3.417E-01	3.417E-01	1.425E-01	41.69	
CM-247	1.56E+07Y	1.00	4.598E-02	4.598E-02	9.486E-02	206.32	
ANH-511	1.00E+09Y	1.00	1.061E-01	1.061E-01	0.868E-01	81.81	
Total Activity :			4.655E+01	5.022E+01			

Grand Total Activity : 4.655E+01 5.022E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	41.47	18	126	1.38	83.16	80	7	3.94E-03	****	1.33E-01	
0	129.00	21	136	0.83	258.30	253	9	4.96E-03	****	5.48E+00	T
0	185.88	64	123	1.54	372.11	367	9	1.55E-02	76.9	4.93E+00	T
0	209.35	72	126	3.58	419.08	413	14	1.78E-02	74.5	4.58E+00	T
7	342.50	35	66	2.84	685.48	672	20	9.06E-03	****	3.12E+00	
0	367.54	24	32	2.73	735.59	731	9	6.12E-03	98.5	2.94E+00	T
0	416.72	13	29	1.30	834.00	830	8	3.34E-03	****	2.64E+00	
0	463.41	13	31	1.33	927.40	923	8	3.45E-03	****	2.42E+00	T
0	517.47	18	17	3.86	1035.57	1030	11	4.86E-03	****	2.21E+00	
0	596.95	14	7	1.66	1194.59	1191	7	3.75E-03	84.1	1.97E+00	T
0	679.31	26	17	3.78	1359.36	1350	17	7.05E-03	84.2	1.78E+00	
0	706.97	10	19	0.98	1414.71	1411	7	2.61E-03	****	1.72E+00	T
0	781.12	21	2	0.90	1563.07	1558	10	5.72E-03	52.5	1.59E+00	
0	876.69	8	7	3.30	1754.26	1748	10	2.16E-03	****	1.46E+00	T
0	934.52	9	9	0.92	1869.96	1863	9	2.45E-03	****	1.39E+00	
0	963.07	27	6	0.63	1927.07	1920	13	7.49E-03	56.7	1.35E+00	T
0	1042.94	17	4	1.35	2086.86	2082	11	4.90E-03	69.1	1.27E+00	
0	1097.55	11	6	1.29	2196.11	2192	8	3.14E-03	95.4	1.22E+00	
0	1145.18	8	7	1.18	2291.40	2287	8	2.40E-03	****	1.18E+00	
0	1155.67	20	7	2.04	2312.38	2304	14	5.79E-03	69.5	1.17E+00	
0	1239.66	11	11	3.50	2480.41	2473	13	3.12E-03	****	1.11E+00	T
0	1243.50	10	0	1.53	2488.10	2485	7	2.78E-03	63.2	1.11E+00	
0	1310.84	12	5	1.11	2622.80	2617	12	3.38E-03	97.2	1.06E+00	T
0	1408.11	8	2	1.57	2817.40	2813	9	2.41E-03	92.3	9.98E-01	T
0	1430.72	7	6	0.66	2862.62	2853	13	2.14E-03	****	9.84E-01	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235003.CNF;1
* Acquisition date   : 3-OCT-2016 08:01:06 Sensitivity      : 3.000
* Detector ID       : GAM08 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.68 Half life ratio : *****
* Sample date       : 10-DEC-2015 14:35:00 Nuclide Library : SOLID
* Sample ID        : G405235003 Analyst initials: MXR1
* Batch Number     : 1596247 Sample Quantity : 1.4049E+02 GRAM
* Wet wt corr      : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date    : 21-JUL-2016 06:09:19 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;14
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	3.380E-01
CD-109	1.453E+00
SN-126	9.024E-02
EU-155	1.148E-01
TL-208	2.846E-02
BI-212	4.395E-01
PB-212	5.081E-02
BI-214	7.832E-02
PB-214	7.331E-02
RN-219	3.930E-01
RN-222	7.832E-02
RA-224	5.448E-01
RA-226	7.832E-02
AC-228	1.353E-01
RA-228	1.353E-01
TH-228	5.081E-02
TH-230	7.829E-02
TH-232	1.353E-01
TH-234	1.343E+00
U-234	7.829E-02
U-238	1.343E+00
AM-243	5.467E-02
CM-247	3.607E-02
ANH-511	2.181E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.043E+01	NOT IDENT.
NA-22	4.538E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.558E-02	NOT IDENT.
SC-46	2.834E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF

MN-54	6.013E-02	NOT IDENT.
CO-56	4.509E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	5.090E-02	NOT IDENT.
CO-58	4.960E-01	NOT IDENT.
FE-59	7.178E+00	NOT IDENT.
CO-60	4.792E-02	NOT IDENT.
ZN-65	1.717E-01	NOT IDENT.
GE-68	2.553E+00	NOT IDENT.
AS-73	1.364E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	2.162E-01	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.964E-01	NOT IDENT.
KR-85	7.628E+00	NOT IDENT.
SR-85	7.877E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.556E-01	NOT IDENT.
Y-91	3.369E+02	NOT IDENT.
NB-94	3.721E-02	NOT IDENT.
NB-95	8.089E-01	NOT IDENT.
NB-95M	2.238E+00	NOT IDENT.
ZR-95	1.712E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.369E-02	NOT IDENT.
RH-102	5.716E-02	NOT IDENT.
RU-103	5.748E+00	FAIL ABUN
RH-106	4.864E-01	NOT IDENT.
RU-106	4.864E-01	NOT IDENT.
AG-108M	2.865E-02	NOT IDENT.
AG-110M	7.251E-02	FAIL ABUN
SN-113	2.238E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.466E-01	NOT IDENT.
SB-124	0.000E+00	NOT IDENT.
SB-125	9.428E-02	FAIL ABUN
TE-125M	2.980E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.124E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	6.184E-02	NOT IDENT.
CS-135	1.463E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	3.888E-02	NOT IDENT.
CS-137	4.108E-02	NOT IDENT.
CE-139	1.135E-01	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.591E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	4.045E-01	NOT IDENT.
PM-144	5.312E-02	NOT IDENT.
PR-144	4.593E+00	NOT IDENT.
PM-146	4.368E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	8.158E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.434E-02	FAIL ABUN
EU-152	9.019E-02	FAIL ABUN
GD-153	1.835E-01	FAIL ABUN
EU-154	1.102E-01	NOT IDENT.
TB-160	1.190E+00	FAIL ABUN
HO-166M	7.409E-02	FAIL ABUN
TM-171	3.345E+01	NOT IDENT.
HF-172	2.205E-01	FAIL ABUN
LU-172	9.319E-02	FAIL ABUN
LU-176	2.657E-02	FAIL ABUN

HF-181	4.324E+00	NOT IDENT.
TA-182	8.178E-01	FAIL ABUN
RE-183	3.962E+00	NOT IDENT.
RE-184	3.085E+01	NOT IDENT.
W-188	1.004E+02	FAIL ABUN
IR-192	4.542E-01	FAIL ABUN
HG-203	2.190E+00	FAIL ABUN
BI-207	5.088E-02	FAIL ABUN
PB-210	6.513E+00	NOT IDENT.
BI-211	4.739E-01	FAIL ABUN
PB-211	6.025E-01	NOT IDENT.
RA-223	5.165E-01	FAIL ABUN
AC-227	2.386E-01	NOT IDENT.
TH-227	2.386E-01	NOT IDENT.
TH-229	4.951E-01	FAIL ABUN
PA-231	5.901E-01	NOT IDENT.
TH-231	5.165E-01	FAIL ABUN
PA-233	5.895E-02	NOT IDENT.
PA-234	3.184E-01	NOT IDENT.
PA-234M	5.567E+00	NOT IDENT.
U-235	2.016E-01	FAIL ABUN
NP-237	5.895E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	2.763E-01	FAIL ABUN
PU-239	3.431E+02	FAIL ABUN
AM-241	1.772E-01	NOT IDENT.
CM-243	1.084E-01	FAIL ABUN
BK-247	7.365E-02	NOT IDENT.
CF-249	3.265E-02	NOT IDENT.
CF-251	1.223E-01	NOT IDENT.

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*****
*                                     GEL Laboratories LLC                       *
*                                     2040 Savage Road                          *
*                                     Charleston, SC 29407                       *
*****
*                                     DETECTOR AND SAMPLE DATA                  *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235003.CNF;1  *
* Acquisition date   : 3-OCT-2016 08:01:06 Sensitivity      : 3.000          *
* Detector ID       : GAM08 Energy tolerance: 1.500         *
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000     *
* Elapsed real time: 0 01:00:00.68 Half life ratio  : *****      *
* Sample date       : 10-DEC-2015 14:35:00 Nuclide Library : SOLID        *
* Sample ID         : G405235003 Analyst initials: MXR1         *
* Batch Number      : 1596247 Sample Quantity : 1.4049E+02 GRAM      *
* Wet wt corr       : 1.00000 Quantity Err(%) : 1.4236E-03 %      *
* Wet Weight        : 0.00000 Wet Weight       : 0.00000         *
* Dry Weight        : 0.00000 Dry Weight       : 0.00000         *
*****
*                                     CALIBRATION INFORMATION                    *
*
* Eff. Cal. date    : 21-JUL-2016 06:09:19 Eff. Geometry   : CAN          *
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;14          *
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.446E+01	1.860E+00	1.860E+00
CD-109	1.722E+00	3.067E+00	3.067E+00
SN-126	1.101E-01	1.960E-01	1.960E-01
EU-155	2.088E-01	2.161E-01	2.161E-01
TL-208	3.940E-01	1.042E-01	1.042E-01
BI-212	1.178E+00	1.200E+00	1.200E+00
PB-212	1.218E+00	1.640E-01	1.640E-01
BI-214	7.303E-01	2.138E-01	2.138E-01
PB-214	1.008E+00	2.492E-01	2.492E-01
RN-219	5.016E-01	1.016E+00	1.016E+00
RN-222	7.303E-01	2.138E-01	2.138E-01
RA-224	1.333E+00	1.812E+00	1.812E+00
RA-226	7.303E-01	2.138E-01	2.138E-01
AC-228	9.868E-01	3.389E-01	3.389E-01
RA-228	9.868E-01	3.389E-01	3.389E-01
TH-228	1.218E+00	1.640E-01	1.640E-01
TH-230	7.301E-01	2.137E-01	2.137E-01
TH-232	9.868E-01	3.389E-01	3.389E-01
TH-234	5.514E+00	4.245E+00	4.245E+00
U-234	7.301E-01	2.137E-01	2.137E-01
U-238	5.514E+00	4.245E+00	4.245E+00
AM-243	2.515E-01	1.434E-01	1.434E-01
CM-247	4.598E-02	9.329E-02	9.329E-02
ANH-511	1.061E-01	8.520E-02	8.520E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	3.769E-01	1.220E+01	1.220E+01	NOT IDENT.
NA-22	-3.017E-02	6.111E-02	6.261E-02	NOT IDENT.
NA-24	-1.000E+41	8.361E+41	0.000E+00	SHORT HLIF
AL-26	2.807E-04	1.819E-02	1.819E-02	NOT IDENT.
SC-46	-4.138E-02	3.385E-01	3.390E-01	FAIL ABUN
V-48	-8.087E+03	1.452E+04	1.497E+04	SHORT HLIF

CR-51	2.431E+02	4.985E+02	5.104E+02	SHORT HLIF
MN-54	1.168E-02	6.721E-02	6.742E-02	NOT IDENT.
CO-56	-3.603E-01	5.814E-01	6.037E-01	FAIL ABUN
MN-56	-1.000E+41	1.604E+41	0.000E+00	SHORT HLIF
CO-57	3.215E-02	5.678E-02	5.860E-02	NOT IDENT.
CO-58	-7.275E-01	7.006E-01	7.736E-01	NOT IDENT.
FE-59	2.551E+00	9.021E+00	9.094E+00	NOT IDENT.
CO-60	4.861E-03	5.650E-02	5.654E-02	NOT IDENT.
ZN-65	9.557E-02	2.045E-01	2.090E-01	NOT IDENT.
GE-68	9.350E-01	2.840E+00	2.871E+00	NOT IDENT.
AS-73	4.679E+00	1.495E+01	1.510E+01	NOT IDENT.
AS-74	7.125E+03	5.904E+03	6.722E+03	SHORT HLIF
SE-75	2.433E-01	2.257E-01	2.509E-01	FAIL ABUN
BR-77	1.187E+38	1.020E+39	0.000E+00	SHORT HLIF
SR-82	-5.075E+01	7.886E+02	7.890E+02	SHORT HLIF
RB-83	-4.842E-01	9.019E-01	9.280E-01	NOT IDENT.
KR-85	9.885E+00	9.725E+00	1.070E+01	NOT IDENT.
SR-85	1.019E+00	1.005E+00	1.105E+00	NOT IDENT.
RB-86	1.534E+03	3.377E+04	3.378E+04	SHORT HLIF
Y-88	-8.771E-02	2.218E-01	2.253E-01	NOT IDENT.
Y-91	-2.454E+02	4.723E+02	4.851E+02	NOT IDENT.
NB-94	9.471E-03	4.610E-02	4.630E-02	NOT IDENT.
NB-95	-6.313E-01	1.019E+00	1.058E+00	NOT IDENT.
NB-95M	-2.326E-01	2.792E+00	2.794E+00	NOT IDENT.
ZR-95	-9.418E-02	1.968E+00	1.968E+00	NOT IDENT.
NB-97	-1.000E+41	3.976E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.517E+41	0.000E+00	SHORT HLIF
MO-99	5.623E+30	1.217E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	3.882E+41	0.000E+00	SHORT HLIF
RH-101	1.169E-02	4.175E-02	4.208E-02	NOT IDENT.
RH-102	3.701E-03	6.831E-02	6.833E-02	NOT IDENT.
RU-103	1.458E+00	6.554E+00	6.586E+00	FAIL ABUN
RH-106	-2.142E-01	6.247E-01	6.321E-01	NOT IDENT.
RU-106	-2.142E-01	6.247E-01	6.321E-01	NOT IDENT.
AG-108M	-9.918E-03	3.475E-02	3.504E-02	NOT IDENT.
AG-110M	-2.885E-02	9.102E-02	9.195E-02	FAIL ABUN
SN-113	7.813E-02	2.482E-01	2.507E-01	NOT IDENT.
CD-115	-1.298E+39	2.074E+39	0.000E+00	SHORT HLIF
SN-117M	1.370E+04	1.123E+05	1.125E+05	SHORT HLIF
TE-123M	1.883E-01	1.576E-01	1.790E-01	NOT IDENT.
SB-124	-7.623E-01	1.057E+00	1.112E+00	NOT IDENT.
SB-125	-5.468E-02	1.179E-01	1.205E-01	FAIL ABUN
TE-125M	1.069E+02	3.420E+02	3.453E+02	NOT IDENT.
I-126	-3.319E+04	1.117E+06	1.117E+06	SHORT HLIF
SB-126	5.939E+05	1.203E+06	1.233E+06	SHORT HLIF
SB-127	2.057E+21	1.690E+22	0.000E+00	SHORT HLIF
I-131	-3.372E+09	5.197E+09	5.415E+09	SHORT HLIF
I-132	1.000E+41	1.838E+42	0.000E+00	SHORT HLIF
TE-132	-1.489E+26	2.879E+26	0.000E+00	SHORT HLIF
BA-133	1.325E-02	5.067E-02	5.102E-02	NOT IDENT.
I-133	1.000E+41	2.142E+41	0.000E+00	SHORT HLIF
CS-134	8.258E-02	5.936E-02	7.007E-02	NOT IDENT.
CS-135	9.185E-02	1.708E-01	1.757E-01	NOT IDENT.
I-135	1.000E+41	2.658E+42	0.000E+00	SHORT HLIF
CS-136	2.261E+05	3.508E+05	3.653E+05	SHORT HLIF
BA-137M	6.763E-03	4.608E-02	4.619E-02	NOT IDENT.
CS-137	7.144E-03	4.868E-02	4.879E-02	NOT IDENT.
CE-139	-4.362E-02	1.409E-01	1.422E-01	NOT IDENT.
BA-140	-4.541E+05	1.724E+06	1.737E+06	SHORT HLIF
LA-140	-7.891E+04	3.627E+05	3.644E+05	SHORT HLIF
CE-141	3.308E+00	3.052E+01	3.055E+01	NOT IDENT.
CE-143	1.000E+41	8.347E+40	0.000E+00	SHORT HLIF
CE-144	9.356E-02	4.746E-01	4.765E-01	NOT IDENT.
PM-144	-1.355E-02	6.227E-02	6.257E-02	NOT IDENT.
PR-144	-1.232E+00	5.394E+00	5.422E+00	NOT IDENT.
PM-146	4.955E-03	5.043E-02	5.048E-02	NOT IDENT.
ND-147	-5.972E+06	4.064E+07	4.073E+07	SHORT HLIF
PM-147	-9.139E+02	1.046E+03	1.124E+03	NOT IDENT.
PM-149	-6.305E+39	2.376E+40	0.000E+00	SHORT HLIF
EU-150	-6.881E-03	3.208E-02	3.223E-02	FAIL ABUN
EU-152	7.929E-04	1.151E-01	1.151E-01	FAIL ABUN
GD-153	-8.738E-02	2.202E-01	2.237E-01	FAIL ABUN
EU-154	-7.705E-02	1.494E-01	1.534E-01	NOT IDENT.
TB-160	-7.311E-01	1.832E+00	1.862E+00	FAIL ABUN
HO-166M	6.388E-02	7.831E-02	8.344E-02	FAIL ABUN
TM-171	-1.557E+01	3.880E+01	3.943E+01	NOT IDENT.
HF-172	-9.778E-02	2.943E-01	2.976E-01	FAIL ABUN
LU-172	4.333E-02	1.119E-01	1.136E-01	FAIL ABUN

LU-176	2.191E-02	2.783E-02	2.953E-02	FAIL ABUN
HF-181	2.207E+00	4.755E+00	4.858E+00	NOT IDENT.
TA-182	-8.885E-01	1.159E+00	1.226E+00	FAIL ABUN
RE-183	1.486E-01	4.431E+00	4.431E+00	NOT IDENT.
RE-184	9.336E+00	3.425E+01	3.451E+01	NOT IDENT.
W-188	9.807E+00	1.247E+02	1.248E+02	FAIL ABUN
IR-192	-1.562E-01	5.335E-01	5.382E-01	FAIL ABUN
HG-203	2.509E+00	4.919E+00	5.048E+00	FAIL ABUN
BI-207	-2.470E-02	6.451E-02	6.546E-02	FAIL ABUN
PB-210	4.378E+00	6.874E+00	7.151E+00	NOT IDENT.
BI-211	2.776E+00	6.879E-01	1.428E+00	FAIL ABUN
PB-211	-6.341E-02	7.940E-01	7.945E-01	NOT IDENT.
RA-223	-3.459E-01	6.502E-01	6.687E-01	FAIL ABUN
AC-227	6.193E-02	2.610E-01	2.625E-01	NOT IDENT.
TH-227	6.193E-02	2.610E-01	2.625E-01	NOT IDENT.
TH-229	3.118E-01	5.184E-01	5.372E-01	FAIL ABUN
PA-231	8.794E-01	6.242E-01	7.395E-01	NOT IDENT.
TH-231	-3.459E-01	6.502E-01	6.687E-01	FAIL ABUN
PA-233	-1.557E-02	6.864E-02	6.900E-02	NOT IDENT.
PA-234	6.011E-02	3.680E-01	3.690E-01	NOT IDENT.
PA-234M	1.138E+00	6.167E+00	6.189E+00	NOT IDENT.
U-235	1.168E-01	2.251E-01	2.311E-01	FAIL ABUN
NP-237	-1.557E-02	6.864E-02	6.900E-02	NOT IDENT.
NP-238	-9.871E+40	2.386E+41	0.000E+00	SHORT HLIF
NP-239	4.035E-02	3.200E-01	3.206E-01	FAIL ABUN
PU-239	3.234E+02	7.073E+02	7.222E+02	FAIL ABUN
AM-241	1.208E-02	2.140E-01	2.141E-01	NOT IDENT.
CM-243	1.908E-01	1.978E-01	2.157E-01	FAIL ABUN
BK-247	3.487E-02	8.741E-02	8.881E-02	NOT IDENT.
CF-249	-2.600E-02	4.145E-02	4.307E-02	NOT IDENT.
CF-251	5.720E-02	1.291E-01	1.317E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	59.6892	87.09	118.9514	136.47	81.1235
45.60	68.0586	87.57	119.0594	140.51	0.0000
46.54	61.2173	88.03	127.9901	143.76	60.2501
49.72	0.0000	88.34	128.0645	144.24	72.3468
51.35	64.0687	88.47	128.0954	145.44	79.7094
51.87	70.2679	89.96	126.2374	152.43	62.1633
52.39	75.4637	1093.63	104.2217	153.25	0.0000
52.97	68.4295	91.11	0.0000	323.87	76.9658
53.44	61.3554	92.59	107.9328	156.02	0.0000
54.07	67.6015	93.35	108.0823	158.56	0.0000
57.36	0.0000	94.56	84.8680	159.00	50.3948
57.53	66.1311	94.65	84.8813	162.33	59.2449
57.98	68.2737	94.67	84.8848	162.66	0.0000
59.27	66.4148	94.87	84.9149	163.33	58.0823
59.32	66.4231	97.43	78.5674	165.86	73.1387
59.54	66.4585	98.43	68.5859	176.31	68.6178
60.96	63.9081	98.44	68.5873	176.60	0.0000
61.17	63.9402	99.53	63.0850	177.52	57.8208
62.93	63.8584	100.11	75.5524	181.07	0.0000
63.29	63.9123	102.03	63.3568	181.52	64.4029
63.58	63.9555	103.18	64.9917	184.41	64.1930
64.28	64.0596	103.37	66.5246	143.76	64.2881
66.73	70.4041	105.21	70.5224	193.51	52.9009
67.24	76.1237	105.31	70.5343	197.03	70.2344
125.81	87.4877	106.12	71.3888	198.01	53.1602
67.75	86.0897	106.47	68.3908	201.83	68.0136
69.67	72.2842	109.28	62.9815	203.43	53.8135
70.83	89.5185	111.00	75.7883	205.31	55.7348
72.81	83.4790	111.76	0.0000	210.85	47.7999
72.87	83.4897	114.06	70.3898	215.65	69.1703
74.66	83.8069	116.30	0.0000	222.11	52.7423
74.82	83.8349	116.74	77.6390	227.09	48.5843
74.97	83.8611	119.76	68.6882	227.38	50.3655
77.11	84.2342	121.12	81.6633	228.16	0.0000
78.74	88.1268	121.22	81.6761	228.18	58.3630
79.69	94.0862	121.78	65.3960	116.74	58.3630
80.12	76.7822	122.06	58.4141	235.69	53.4418
80.19	0.0000	122.92	58.4900	235.96	52.1194
80.57	58.0013	123.07	59.6730	238.63	50.9112
81.00	74.0150	265.00	62.0702	238.98	0.0000
81.07	95.7975	125.81	67.3581	240.99	51.0242
81.75	101.3768	127.23	58.0801	242.00	51.0724
83.79	74.4222	127.91	60.1026	244.70	41.7688
84.00	74.4528	129.30	60.2240	252.40	0.0000
85.43	112.7193	131.20	77.3620	252.80	40.7217
86.55	118.8295	133.02	68.8573	254.15	0.0000
86.79	118.8831	133.52	74.8471	256.23	43.5703
86.94	118.9177	136.00	77.4940	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	27.4353	355.39	0.0000	584.27	10.0789
264.80	26.0664	356.01	27.9886	595.83	0.0000
265.00	35.6762	364.49	0.0000	427.87	8.4644
268.22	37.1522	366.42	0.0000	602.52	0.0000
269.46	42.2425	372.51	20.8590	604.72	27.1387
270.03	42.2640	375.05	27.8604	607.14	35.6592
271.23	46.9056	377.52	20.9299	609.32	29.4626
273.65	0.0000	356.01	29.0254	610.33	25.5093
276.40	40.6466	388.16	31.1154	614.28	28.9625
277.37	40.6798	388.63	0.0000	618.01	14.7906
277.60	40.6878	391.69	23.1390	620.36	28.4749
278.00	40.2387	264.66	30.3571	621.93	21.6564
279.20	30.5568	401.81	30.3796	630.19	0.0000
279.54	30.5656	402.40	30.3906	631.29	16.0251
279.70	30.5696	404.85	24.3506	633.25	10.3110
280.46	27.8082	410.95	26.4819	634.78	0.0000
283.69	38.1072	413.71	33.6700	635.95	13.7646
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	35.3691	423.72	0.0000	645.85	10.3693
285.90	0.0000	427.09	29.8349	657.76	23.1641
287.50	27.0388	427.87	27.7905	657.90	0.0000
290.67	32.2504	433.94	30.9924	661.66	22.0437
293.27	0.0000	439.40	37.3125	664.57	0.0000
351.93	36.5919	453.88	22.9981	666.33	0.0000
295.96	40.8379	463.37	25.2271	666.50	0.0000
879.38	57.8577	468.07	30.5647	667.71	0.0000
299.98	52.7427	473.00	0.0000	677.62	11.3897
300.09	52.7472	475.06	27.5118	685.70	0.0000
300.13	38.6193	476.78	19.0649	695.00	0.0000
301.36	41.4863	477.60	16.9544	696.49	19.4293
302.85	55.6942	482.18	18.0601	696.51	19.4299
256.23	56.7126	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	22.0863
306.78	30.3008	497.08	19.2799	697.49	22.0879
308.46	36.9775	505.52	11.2981	702.65	22.6672
311.90	38.9780	507.63	0.0000	706.68	31.0416
316.51	40.0706	511.00	14.5688	711.68	18.2825
319.41	0.0000	514.00	12.9707	720.70	0.0000
320.08	0.0000	514.00	12.9707	721.93	0.0000
321.04	31.5928	520.40	26.0293	722.78	19.9979
323.87	33.5794	520.69	0.0000	722.91	19.9992
325.23	43.2175	522.65	0.0000	723.31	22.8602
328.76	0.0000	527.90	0.0000	724.19	17.1510
333.37	33.3345	528.26	25.0468	727.33	15.2050
333.97	36.2488	529.59	17.4362	733.00	14.3433
334.37	43.5114	529.87	0.0000	735.93	17.0529
338.28	29.0912	531.02	0.0000	333.97	12.5730
338.32	29.0918	537.26	0.0000	739.50	0.0000
311.90	29.1376	546.56	0.0000	747.24	16.2285
340.48	29.1376	552.55	23.1542	748.06	14.4297
340.55	0.0000	563.25	17.7357	752.31	20.7778
344.28	30.6784	569.33	22.2355	753.82	0.0000
345.93	46.8037	946.00	22.2380	756.73	23.5284
351.06	38.1669	569.70	21.1276	756.80	23.5292
351.93	38.1907	583.19	14.5509	884.68	19.9650

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	24.5198	1274.44	22.6315	1620.50	2.7681
766.42	21.8005	1001.03	16.7525	1621.92	5.5377
766.84	19.0787	1002.74	19.7192	1678.03	0.0000
772.60	0.0000	1004.73	17.7583	1690.97	1.8724
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.8000
778.90	10.2228	1028.54	0.0000	1063.66	4.7551
783.70	0.0000	1037.84	6.3785	1771.35	2.8538
785.37	8.7838	1038.76	0.0000	1791.20	0.0000
792.07	22.9332	631.29	4.7968	1808.65	0.9581
794.95	12.8563	1048.07	0.0000	1810.72	0.0000
795.86	9.1864	1049.04	14.6676	1836.06	3.8525
810.06	20.3175	1050.41	13.0063		
810.29	23.0896	1063.66	18.0802		
344.28	23.0911	1077.00	0.0000		
810.76	22.1697	1077.34	11.0933		
815.77	0.0000	1085.87	8.0884		
1048.07	0.0000	1093.63	11.3490		
832.01	7.4478	1099.45	11.3682		
834.85	12.1153	1112.07	13.2436		
835.71	17.7122	1112.84	15.2847		
836.80	0.0000	1115.54	8.1582		
846.75	0.0000	1120.29	12.2534		
846.77	20.5908	1120.55	12.2542		
856.80	0.0000	1221.41	12.2571		
860.56	15.9894	1129.67	10.9212		
871.09	10.5731	1131.51	0.0000		
873.19	9.0694	1147.95	0.0000		
875.33	0.0000	1173.23	10.3638		
879.38	9.0888	1177.95	19.7167		
880.51	4.5461	1189.05	15.6125		
883.24	6.6362	1204.77	9.4076		
884.68	9.4849	1221.41	18.8987		
889.28	8.5501	1231.02	16.8418		
894.76	10.4696	1235.36	0.0000		
898.04	10.4814	1238.28	13.4992		
900.72	15.2598	1260.41	0.0000		
903.28	12.4093	1271.87	9.5746		
911.20	15.3140	1274.44	14.9041		
912.08	15.3184	1274.54	14.9041		
923.98	0.0000	1291.59	13.8998		
926.50	9.6204	1298.22	0.0000		
929.11	7.7029	1312.11	0.0000		
937.49	10.8141	1332.49	10.8026		
944.13	0.0000	1362.66	0.0000		
946.00	15.4922	1365.19	7.6225		
949.00	11.6305	1368.63	0.0000		
667.71	0.0000	1384.29	10.9393		
962.31	15.5742	1408.01	4.4004		
964.08	19.4788	1457.56	0.0000		
966.17	15.5938	1460.82	7.7960		
911.20	12.4863	1489.16	6.7255		
968.97	12.4863	1505.03	11.2488		
983.53	0.0000	1584.12	10.0719		
984.45	0.0000	1596.21	0.0000		

VAX/VMS Nuclide Identification Report Generated 3-OCT-2016 09:02:43.73

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235004.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM09.CNF;335
Background date : 2-OCT-2016 11:00:29.
Sample date      : 9-DEC-2015 14:00:00. Acquisition date : 3-OCT-2016 08:01:44.
Sample ID       : G405235004           Sample quantity  : 1.48940E+02 GRAM
Detector name   : GAM09                 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00        Elapsed real time: 0 01:00:00.56  0.0%
Energy tolerance: 1.50000 keV          Analyst Initials  : MXR1
Abundance limit : 75.00000             Sensitivity       : 3.00000
Batch ID        : 1596247              Detector SN#      :
Matrix Spike ID :                       LCS ID           : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	58.87	42	77	1.95	117.40	114	7	1.17E-02	37.9	
2	0	63.49*	24	163	0.93	126.66	124	9	6.78E-03	97.6	
3	4	74.93	86	189	1.03	149.54	146	16	2.39E-02	25.8	4.15E+00
4	4	77.15	149	129	0.78	153.99	146	16	4.15E-02	14.1	
5	0	83.38*	16	126	0.99	166.45	165	6	4.36E-03	117.2	
6	0	87.17	116	153	1.14	174.03	170	8	3.23E-02	20.7	
7	0	185.97*	74	148	0.94	371.72	367	11	2.06E-02	35.4	
8	0	190.86	16	79	1.00	381.50	378	7	4.57E-03	92.7	
9	0	209.28	36	89	0.82	418.36	415	7	9.88E-03	47.2	
10	4	238.68*	428	69	0.93	477.18	473	15	1.19E-01	5.8	1.17E+00
11	4	241.57	116	96	1.61	482.96	473	15	3.21E-02	21.7	
12	0	295.43*	146	58	1.10	590.73	585	10	4.07E-02	12.9	
13	1	299.56	33	44	1.16	599.00	596	12	9.24E-03	38.1	2.17E+00
14	1	301.06	25	34	1.16	602.00	596	12	7.00E-03	50.4	
15	0	327.62	32	54	2.41	655.13	651	10	8.75E-03	46.8	
16	0	338.35*	89	77	1.52	676.60	671	11	2.48E-02	22.0	
17	0	352.00*	264	91	1.29	703.92	699	12	7.34E-02	9.5	
18	0	438.80	16	24	0.52	877.59	874	9	4.36E-03	62.4	
19	0	462.68	40	30	1.07	925.37	919	12	1.12E-02	31.3	
20	0	510.90*	32	64	2.16	1021.86	1013	17	8.82E-03	67.1	
21	0	582.98*	147	24	1.38	1166.08	1159	14	4.09E-02	11.1	
22	0	592.66	35	16	3.82	1185.46	1179	13	9.70E-03	29.2	
23	0	609.23*	173	52	1.10	1218.60	1212	14	4.82E-02	11.9	
24	0	661.71	72	17	1.64	1323.62	1319	11	1.99E-02	16.2	
25	0	701.42	18	24	1.39	1403.06	1396	14	4.99E-03	62.9	
26	0	727.52	53	28	1.63	1455.29	1447	16	1.47E-02	26.3	
27	0	752.96	20	33	3.45	1506.21	1497	17	5.66E-03	69.0	
28	0	768.41	24	13	0.82	1537.12	1532	10	6.56E-03	36.5	
29	0	795.16	28	7	1.15	1590.64	1586	10	7.71E-03	26.4	
30	0	808.19	17	3	0.73	1616.71	1613	8	4.63E-03	31.8	
31	0	820.39	7	10	0.62	1641.13	1636	8	1.95E-03	86.5	
32	0	861.30	11	14	2.20	1722.98	1717	11	3.02E-03	73.0	
33	0	872.46	17	19	0.94	1745.32	1736	16	4.75E-03	67.3	
34	0	910.79*	90	6	1.73	1822.02	1816	12	2.51E-02	12.2	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	964.44	21	10	1.25	1929.37	1926	7	5.86E-03	33.3	
36	0	968.67	40	21	1.22	1937.82	1933	10	1.11E-02	26.3	
37	0	1120.29	50	11	1.03	2241.21	2233	15	1.39E-02	20.3	
38	0	1183.15	12	5	1.27	2367.01	2363	9	3.35E-03	43.2	
39	0	1216.65	23	9	2.98	2434.04	2428	12	6.46E-03	33.0	
40	0	1220.72	12	4	1.10	2442.17	2439	7	3.19E-03	40.0	
41	1	1224.31	17	3	1.98	2449.36	2446	19	4.80E-03	24.7	1.13E+00
42	1	1226.95	18	3	1.98	2454.64	2446	19	4.99E-03	39.4	
43	1	1230.12	23	0	1.80	2461.00	2446	19	6.30E-03	21.6	
44	0	1239.21	10	20	0.56	2479.18	2473	9	2.78E-03	89.8	
45	0	1460.26*	352	14	1.63	2921.51	2914	14	9.77E-02	5.9	
46	0	1542.51	6	2	1.20	3086.11	3082	7	1.79E-03	51.7	
47	0	1763.43*	29	0	1.85	3528.19	3522	11	7.94E-03	20.2	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235004.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 9-DEC-2015 14:00:00   Acquisition date  : 3-OCT-2016 08:01:44
Sample ID        : G405235004             Sample quantity   : 148.94 GRAM
Sample type      : SOLID                   Sample geometry   :
Detector name    : GAMMA9                 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00          Elapsed real time: 0 01:00:00.56   0.0%
Energy tolerance : 1.50 keV               Half life ratio   : 10.00
Errors propagated: No                     Systematic Error  : 0.00 %
Efficiency type  : Linear                  Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.146E+00	1.398E+01	1.398E+01	11.70	OK
NB-94	702.65	99.81*	2.061E+00	4.576E-02	4.576E-02	125.83	OK
	871.09	99.89	1.740E+00	5.040E-02	5.040E-02	134.51	OK
CD-109	88.03	3.70*	4.855E+00	3.083E+00	4.830E+00	55.48	OK
SN-126	64.28	9.60	2.292E+00	7.198E-01	7.198E-01	195.25	OK
	86.94	8.90	4.855E+00	1.282E+00	1.282E+00	55.48	OK
	87.57	37.00*	4.855E+00	3.083E-01	3.083E-01	55.48	OK
BA-137M	661.66	89.90*	2.157E+00	1.943E-01	1.980E-01	32.30	OK
CS-137	661.66	85.10*	2.157E+00	2.053E-01	2.092E-01	32.30	OK
TL-208	277.37	6.60	4.352E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.382E+00	3.877E-01	3.877E-01	22.10	OK
	860.56	12.50	1.757E+00	2.538E-01	2.538E-01	145.96	OK
BI-211	72.87	1.23	3.448E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.588E+00	1.803E-01	1.803E-01	546.38	OK
PB-212	74.82	10.28	3.682E+00	8.364E-01	8.364E-01	91.68	OK
	77.11	17.10	3.923E+00	1.421E+00	1.421E+00	28.16	OK
	238.63	43.60*	4.882E+00	1.167E+00	1.167E+00	11.52	OK
	300.09	3.30	4.092E+00	1.399E+00	1.399E+00	76.19	OK
BI-214	609.32	45.49*	2.301E+00	8.801E-01	8.804E-01	23.73	OK
	1120.29	14.92	1.429E+00	1.171E+00	1.171E+00	40.66	OK
	1764.49	15.30	9.661E-01	9.205E-01	9.208E-01	40.37	OK
PB-214	74.82	5.80	3.669E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.923E+00	2.506E+00	2.507E+00	28.16	OK
	87.09	3.41	4.849E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.832E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.139E+00	1.093E+00	1.093E+00	25.74	OK
	351.93	35.60*	3.588E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.301E+00	8.801E-01	8.804E-01	23.73	OK
	1120.29	14.92	1.429E+00	1.171E+00	1.171E+00	40.66	OK
	1764.49	15.30	9.661E-01	9.205E-01	9.208E-01	40.37	OK
RA-224	240.99	4.10*	4.839E+00	1.444E+00	1.444E+00	106.96	OK
RA-226	609.32	45.49*	2.301E+00	8.801E-01	8.804E-01	23.73	OK
	1120.29	14.92	1.429E+00	1.171E+00	1.171E+00	40.66	OK
	1764.49	15.30	9.661E-01	9.205E-01	9.208E-01	40.37	OK
AC-228	105.21	1.10	5.896E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.706E+00	1.201E+00	1.201E+00	44.00	OK
	794.95	4.25	1.869E+00	1.809E+00	1.809E+00	52.80	OK
	835.71	1.61	1.799E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.682E+00	1.062E+00	1.062E+00	24.49	OK
	968.97	15.80	1.603E+00	8.012E-01	8.012E-01	52.66	OK
RA-228	105.21	1.10	5.896E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.706E+00	1.201E+00	1.201E+00	44.00	OK
	794.95	4.25	1.869E+00	1.809E+00	1.809E+00	52.80	OK
	835.71	1.61	1.799E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.682E+00	1.062E+00	1.062E+00	24.49	OK
	968.97	15.80	1.603E+00	8.012E-01	8.012E-01	52.66	OK
TH-228	74.82	10.28	3.682E+00	8.364E-01	8.364E-01	91.68	OK
	77.11	17.10	3.923E+00	1.421E+00	1.421E+00	28.16	OK
	238.63	43.60*	4.882E+00	1.167E+00	1.167E+00	11.52	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	300.09	3.30	4.092E+00	1.399E+00	1.399E+00	76.19	OK
TH-230	609.32	45.49*	2.301E+00	8.801E-01	8.801E-01	23.73	OK
	1120.29	14.92	1.429E+00	1.171E+00	1.171E+00	40.66	OK
	1764.49	15.30	9.661E-01	9.205E-01	9.205E-01	40.37	OK
PA-231	283.69	1.70	4.275E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.076E+00	6.560E-01	6.560E-01	100.87	OK
TH-232	105.21	1.10	5.896E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.706E+00	1.201E+00	1.201E+00	44.00	OK
	835.71	1.61	1.799E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.682E+00	1.062E+00	1.062E+00	24.49	OK
	968.97	15.80	1.603E+00	8.012E-01	8.012E-01	52.66	OK
U-234	609.32	45.49*	2.301E+00	8.801E-01	8.801E-01	23.73	OK
	1120.29	14.92	1.429E+00	1.171E+00	1.171E+00	40.66	OK
	1764.49	15.30	9.661E-01	9.205E-01	9.205E-01	40.37	OK
AM-241	59.54	35.90*	1.701E+00	4.489E-01	4.495E-01	75.85	OK
AM-243	43.53	5.90	1.969E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.682E+00	1.279E-01	1.280E-01	91.68	OK
ANH-511	511.00	100.00*	2.647E+00	6.485E-02	6.485E-02	134.22	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235004.CNF;1
* Acquisition date   : 3-OCT-2016 08:01:44 Sensitivity      : 3.000
* Detector ID        : GAM09 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.56 Half life ratio : *****
* Sample date        : 9-DEC-2015 14:00:00 Analyst initials: MXR1
* Sample ID          : G405235004 Sample Quantity : 1.4894E+02 GRAM
* Batch Number       : 1596247 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 3-JUN-2016 07:32:22 Eff. Geometry   : CAN
* Eff. File           : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.398E+01	1.603E+00	5.756E-01
NB-94	4.576E-02	5.643E-02	5.494E-02
CD-109	4.830E+00	2.626E+00	2.236E+00
SN-126	3.083E-01	1.676E-01	1.268E-01
BA-137M	1.980E-01	6.270E-02	6.185E-02
CS-137	2.092E-01	6.623E-02	6.534E-02
TL-208	3.877E-01	8.398E-02	5.989E-02
BI-211	1.803E-01	9.657E-01	3.372E-01
PB-212	1.167E+00	1.317E-01	9.158E-02
BI-214	8.804E-01	2.048E-01	1.088E-01
PB-214	1.159E+00	2.166E-01	3.510E-01
RN-222	8.804E-01	2.048E-01	1.088E-01
RA-224	1.444E+00	1.514E+00	9.818E-01
RA-226	8.804E-01	2.048E-01	1.088E-01
AC-228	1.062E+00	2.549E-01	2.386E-01
RA-228	1.062E+00	2.549E-01	2.386E-01
TH-228	1.167E+00	1.317E-01	9.158E-02
TH-230	8.801E-01	2.047E-01	1.088E-01
PA-231	6.560E-01	6.485E-01	7.231E-01
TH-232	1.062E+00	2.549E-01	2.386E-01
U-234	8.801E-01	2.047E-01	1.088E-01
AM-241	4.495E-01	3.342E-01	3.277E-01
AM-243	1.280E-01	1.150E-01	1.048E-01
ANH-511	6.485E-02	8.530E-02	4.609E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.312E+00	1.196E+01	2.345E+01	NOT IDENT.
NA-22	2.943E-02	3.671E-02	8.789E-02	NOT IDENT.
NA-24	0.000E+00	1.883E+41	0.000E+00	SHORT HLIF
AL-26	-5.207E-03	2.342E-02	4.981E-02	NOT IDENT.
SC-46	-7.557E-02	3.229E-01	6.092E-01	FAIL ABUN
V-48	0.000E+00	1.251E+04	0.000E+00	SHORT HLIF

CR-51	0.000E+00	4.078E+02	0.000E+00	SHORT HLIF
MN-54	7.091E-03	6.386E-02	1.250E-01	NOT IDENT.
CO-56	-4.387E-02	4.399E-01	8.425E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.608E-02	3.948E-02	7.496E-02	NOT IDENT.
CO-58	1.278E-01	4.763E-01	9.224E-01	NOT IDENT.
FE-59	-7.773E+00	8.275E+00	1.291E+01	NOT IDENT.
CO-60	-2.285E-02	2.699E-02	4.509E-02	NOT IDENT.
ZN-65	-8.201E-03	1.538E-01	2.637E-01	NOT IDENT.
GE-68	-3.959E-01	2.345E+00	4.453E+00	NOT IDENT.
AS-73	7.034E+00	1.179E+01	2.556E+01	NOT IDENT.
AS-74	0.000E+00	5.264E+03	0.000E+00	SHORT HLIF
SE-75	1.159E-01	1.817E-01	3.649E-01	NOT IDENT.
BR-77	0.000E+00	1.731E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.308E+02	0.000E+00	SHORT HLIF
RB-83	5.138E-01	6.149E-01	1.340E+00	NOT IDENT.
KR-85	4.621E+00	6.934E+00	1.360E+01	NOT IDENT.
SR-85	4.825E-01	7.244E-01	1.420E+00	NOT IDENT.
RB-86	0.000E+00	2.671E+04	0.000E+00	SHORT HLIF
Y-88	8.201E-02	1.545E-01	4.203E-01	NOT IDENT.
Y-91	3.388E+02	5.518E+02	1.185E+03	NOT IDENT.
NB-95	-2.377E-01	8.955E-01	1.468E+00	NOT IDENT.
NB-95M	3.039E-01	2.355E+00	4.109E+00	NOT IDENT.
ZR-95	2.840E-01	1.845E+00	3.234E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.326E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-2.655E-02	2.779E-02	4.988E-02	NOT IDENT.
RH-102	7.622E-03	5.477E-02	1.104E-01	NOT IDENT.
RU-103	4.191E+00	5.418E+00	1.168E+01	FAIL ABUN
RH-106	4.606E-02	3.733E-01	7.751E-01	NOT IDENT.
RU-106	4.606E-02	3.733E-01	7.751E-01	NOT IDENT.
AG-108M	2.466E-02	2.478E-02	5.507E-02	NOT IDENT.
AG-110M	-6.962E-02	8.794E-02	1.452E-01	NOT IDENT.
SN-113	-2.848E-02	2.040E-01	4.059E-01	NOT IDENT.
CD-115	0.000E+00	2.022E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	7.413E+04	0.000E+00	SHORT HLIF
TE-123M	3.041E-02	1.078E-01	2.135E-01	NOT IDENT.
SB-124	7.987E-01	1.642E+00	4.128E+00	NOT IDENT.
SB-125	-2.940E-02	9.972E-02	1.932E-01	FAIL ABUN
TE-125M	2.234E+02	2.220E+02	4.761E+02	NOT IDENT.
I-126	0.000E+00	7.250E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	9.274E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.679E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	4.399E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.933E+26	0.000E+00	SHORT HLIF
BA-133	1.473E-03	3.922E-02	6.709E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	0.000E+00	6.121E-02	1.158E-01	FAIL ABUN
CS-135	-1.026E-01	1.337E-01	2.271E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.525E+05	0.000E+00	SHORT HLIF
CE-139	-3.435E-04	1.007E-01	1.924E-01	NOT IDENT.
BA-140	0.000E+00	1.062E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	2.202E+05	0.000E+00	SHORT HLIF
CE-141	6.175E-01	2.076E+01	4.018E+01	NOT IDENT.
CE-143	0.000E+00	1.514E+41	0.000E+00	SHORT HLIF
CE-144	-1.473E-01	3.011E-01	5.628E-01	NOT IDENT.
PM-144	5.270E-03	4.419E-02	8.239E-02	NOT IDENT.
PR-144	4.725E-01	3.840E+00	7.163E+00	NOT IDENT.
PM-146	1.615E-02	3.930E-02	8.246E-02	NOT IDENT.
ND-147	0.000E+00	2.882E+07	0.000E+00	SHORT HLIF
PM-147	-2.104E+02	6.816E+02	1.307E+03	NOT IDENT.
PM-149	0.000E+00	3.252E+40	0.000E+00	SHORT HLIF
EU-150	-1.637E-02	2.736E-02	4.185E-02	FAIL ABUN
EU-152	-7.932E-03	8.013E-02	1.466E-01	FAIL ABUN
GD-153	5.437E-03	1.603E-01	3.174E-01	NOT IDENT.
EU-154	6.543E-02	9.358E-02	2.185E-01	FAIL ABUN
EU-155	1.214E-01	9.804E-02	2.110E-01	FAIL ABUN
TB-160	1.399E-01	1.814E+00	3.562E+00	FAIL ABUN
HO-166M	1.280E-02	5.584E-02	1.121E-01	FAIL ABUN
TM-171	6.161E+00	3.042E+01	6.404E+01	NOT IDENT.
HF-172	-6.209E-02	1.763E-01	3.368E-01	FAIL ABUN
LU-172	2.174E-03	8.933E-02	1.675E-01	FAIL ABUN
LU-176	2.479E-03	2.245E-02	4.216E-02	FAIL ABUN
HF-181	-5.894E-01	3.197E+00	6.381E+00	FAIL ABUN

TA-182	9.666E-01	7.572E-01	1.821E+00	FAIL ABUN
RE-183	0.000E+00	6.730E+00	7.122E+00	FAIL ABUN
RE-184	-8.777E-02	3.088E+01	5.919E+01	NOT IDENT.
W-188	8.756E+01	8.965E+01	1.804E+02	FAIL ABUN
IR-192	-5.684E-02	4.725E-01	8.544E-01	FAIL ABUN
HG-203	-1.680E+00	2.336E+00	3.975E+00	NOT IDENT.
BI-207	-8.270E-04	3.599E-02	7.363E-02	FAIL ABUN
PB-210	6.344E-01	6.095E+00	1.271E+01	NOT IDENT.
PB-211	-1.763E-01	5.784E-01	1.130E+00	NOT IDENT.
BI-212	0.000E+00	1.064E+00	1.386E+00	FAIL ABUN
RN-219	6.745E-02	3.160E-01	6.557E-01	NOT IDENT.
RA-223	-4.703E-02	5.776E-01	9.710E-01	FAIL ABUN
AC-227	-8.334E-02	2.338E-01	4.178E-01	FAIL ABUN
TH-227	-8.334E-02	2.338E-01	4.178E-01	FAIL ABUN
TH-229	2.894E-01	4.550E-01	8.509E-01	FAIL ABUN
TH-231	-4.703E-02	5.776E-01	9.710E-01	FAIL ABUN
PA-233	-1.322E-02	5.324E-02	9.572E-02	FAIL ABUN
PA-234	3.338E-02	2.817E-01	5.511E-01	NOT IDENT.
PA-234M	-3.346E-01	4.292E+00	8.503E+00	NOT IDENT.
TH-234	1.868E+00	3.573E+00	3.066E+00	FAIL ABUN
U-235	-2.460E-02	1.600E-01	3.047E-01	FAIL ABUN
NP-237	-1.322E-02	5.324E-02	9.572E-02	FAIL ABUN
NP-238	0.000E+00	1.898E+41	0.000E+00	SHORT HLIF
U-238	1.868E+00	3.573E+00	3.066E+00	FAIL ABUN
NP-239	-4.922E-02	2.028E-01	3.920E-01	NOT IDENT.
PU-239	2.068E+02	2.724E+02	5.608E+02	NOT IDENT.
CM-243	-5.301E-02	8.741E-02	1.649E-01	NOT IDENT.
BK-247	2.268E-03	6.609E-02	1.239E-01	FAIL ABUN
CM-247	1.361E-02	2.862E-02	6.109E-02	NOT IDENT.
CF-249	-1.180E-02	3.731E-02	6.494E-02	NOT IDENT.
CF-251	5.653E-02	1.029E-01	2.054E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	339	10.66*	1.146E+00	1.398E+01	1.398E+01	11.70
NB-94	702.65	19	99.81*	2.061E+00	4.576E-02	4.576E-02	125.83
	871.09	17	99.89	1.740E+00	5.040E-02	5.040E-02	134.51
CD-109	88.03	146	3.70*	4.855E+00	4.090E+00	6.408E+00	41.34
SN-126	64.28	31	9.60	2.292E+00	7.198E-01	7.198E-01	195.25
	86.94	146	8.90	4.855E+00	1.701E+00	1.701E+00	41.34
	87.57	146	37.00*	4.855E+00	4.090E-01	4.090E-01	41.34
BA-137M	661.66	75	89.90*	2.157E+00	1.943E-01	1.980E-01	32.30
CS-137	661.66	75	85.10*	2.157E+00	2.053E-01	2.092E-01	32.30
TL-208	277.37	-----	6.60	4.352E+00	-----	Line Not Found	-----
	583.19	156	85.00*	2.382E+00	3.877E-01	3.877E-01	22.10
	860.56	11	12.50	1.757E+00	2.538E-01	2.538E-01	145.96
BI-211	72.87	-----	1.23	3.448E+00	-----	Line Not Found	-----
	351.06	293	12.92*	3.588E+00	3.191E+00	3.191E+00	19.07
PB-212	74.82	109	10.28	3.682E+00	1.453E+00	1.453E+00	51.64
	77.11	189	17.10	3.923E+00	1.421E+00	1.421E+00	28.16
	238.63	493	43.60*	4.882E+00	1.167E+00	1.167E+00	11.52
	300.09	37	3.30	4.092E+00	1.399E+00	1.399E+00	76.19
BI-214	609.32	183	45.49*	2.301E+00	8.801E-01	8.804E-01	23.73
	1120.29	50	14.92	1.429E+00	1.171E+00	1.171E+00	40.66
	1764.49	27	15.30	9.661E-01	9.205E-01	9.208E-01	40.37
PB-214	74.82	109	5.80	3.682E+00	2.575E+00	2.576E+00	51.64
	77.11	189	9.70	3.923E+00	2.506E+00	2.507E+00	28.16
	87.09	146	3.41	4.855E+00	4.438E+00	4.440E+00	41.34
	242.00	133	7.25	4.839E+00	1.909E+00	1.910E+00	43.31
	295.22	165	18.42	4.139E+00	1.093E+00	1.093E+00	25.74
	351.93	293	35.60*	3.588E+00	1.158E+00	1.159E+00	19.07
RN-222	609.32	183	45.49*	2.301E+00	8.801E-01	8.804E-01	23.73
	1120.29	50	14.92	1.429E+00	1.171E+00	1.171E+00	40.66
	1764.49	27	15.30	9.661E-01	9.205E-01	9.208E-01	40.37
RA-224	240.99	133	4.10*	4.839E+00	3.376E+00	3.376E+00	43.31
RA-226	609.32	183	45.49*	2.301E+00	8.801E-01	8.804E-01	23.73
	1120.29	50	14.92	1.429E+00	1.171E+00	1.171E+00	40.66
	1764.49	27	15.30	9.661E-01	9.205E-01	9.208E-01	40.37
AC-228	105.21	-----	1.10	5.896E+00	-----	Line Not Found	-----
	338.32	100	11.27	3.706E+00	1.201E+00	1.201E+00	44.00
	794.95	29	4.25	1.869E+00	1.809E+00	1.809E+00	52.80
	835.71	-----	1.61	1.799E+00	-----	Line Not Found	-----
	911.20	91	25.80*	1.682E+00	1.062E+00	1.062E+00	24.49
	968.97	40	15.80	1.603E+00	8.012E-01	8.012E-01	52.66
RA-228	105.21	-----	1.10	5.896E+00	-----	Line Not Found	-----
	338.32	100	11.27	3.706E+00	1.201E+00	1.201E+00	44.00
	794.95	29	4.25	1.869E+00	1.809E+00	1.809E+00	52.80
	835.71	-----	1.61	1.799E+00	-----	Line Not Found	-----
	911.20	91	25.80*	1.682E+00	1.062E+00	1.062E+00	24.49
	968.97	40	15.80	1.603E+00	8.012E-01	8.012E-01	52.66
TH-228	74.82	109	10.28	3.682E+00	1.453E+00	1.453E+00	51.64

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	77.11	189	17.10	3.923E+00	1.421E+00	1.421E+00	28.16
	238.63	493	43.60*	4.882E+00	1.167E+00	1.167E+00	11.52
	300.09	37	3.30	4.092E+00	1.399E+00	1.399E+00	76.19
TH-230	609.32	183	45.49*	2.301E+00	8.801E-01	8.801E-01	23.73
	1120.29	50	14.92	1.429E+00	1.171E+00	1.171E+00	40.66
	1764.49	27	15.30	9.661E-01	9.205E-01	9.205E-01	40.37
PA-231	283.69	-----	1.70	4.275E+00	-----	Line Not Found	-----
	301.36	28	5.35*	4.076E+00	6.560E-01	6.560E-01	100.87
TH-232	105.21	-----	1.10	5.896E+00	-----	Line Not Found	-----
	338.32	100	11.27	3.706E+00	1.201E+00	1.201E+00	44.00
	835.71	-----	1.61	1.799E+00	-----	Line Not Found	-----
	911.20	91	25.80*	1.682E+00	1.062E+00	1.062E+00	24.49
	968.97	40	15.80	1.603E+00	8.012E-01	8.012E-01	52.66
U-234	609.32	183	45.49*	2.301E+00	8.801E-01	8.801E-01	23.73
	1120.29	50	14.92	1.429E+00	1.171E+00	1.171E+00	40.66
	1764.49	27	15.30	9.661E-01	9.205E-01	9.205E-01	40.37
AM-241	59.54	54	35.90*	1.701E+00	4.489E-01	4.495E-01	75.85
AM-243	43.53	-----	5.90	1.969E-01	-----	Line Not Found	-----
	74.66	109	67.20*	3.682E+00	2.223E-01	2.223E-01	51.64
ANH-511	511.00	34	100.00*	2.647E+00	6.485E-02	6.485E-02	134.22

Flag: "*" = Keyline

Total number of lines in spectrum 47
 Number of unidentified lines 11
 Number of lines tentatively identified by NID 36 76.60%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.398E+01	1.398E+01	0.164E+01	11.70	
NB-94	20300.00Y	1.00	4.576E-02	4.576E-02	5.759E-02	125.83	
CD-109	461.40D	1.57	4.090E+00	6.408E+00	2.649E+00	41.34	
SN-126	2.30E+05Y	1.00	4.090E-01	4.090E-01	1.691E-01	41.34	
BA-137M	30.08Y	1.02	1.943E-01	1.980E-01	0.640E-01	32.30	
CS-137	30.08Y	1.02	2.053E-01	2.092E-01	0.676E-01	32.30	
TL-208	1.41E+10Y	1.00	3.877E-01	3.877E-01	0.857E-01	22.10	
BI-211	7.04E+08Y	1.00	3.191E+00	3.191E+00	0.609E+00	19.07	
PB-212	1.41E+10Y	1.00	1.167E+00	1.167E+00	0.134E+00	11.52	
BI-214	1600.00Y	1.00	8.801E-01	8.804E-01	2.089E-01	23.73	
PB-214	1600.00Y	1.00	1.158E+00	1.159E+00	0.221E+00	19.07	
RN-222	1600.00Y	1.00	8.801E-01	8.804E-01	2.089E-01	23.73	
RA-224	1.41E+10Y	1.00	3.376E+00	3.376E+00	1.462E+00	43.31	
RA-226	1600.00Y	1.00	8.801E-01	8.804E-01	2.089E-01	23.73	
AC-228	1.41E+10Y	1.00	1.062E+00	1.062E+00	0.260E+00	24.49	
RA-228	1.41E+10Y	1.00	1.062E+00	1.062E+00	0.260E+00	24.49	
TH-228	1.41E+10Y	1.00	1.167E+00	1.167E+00	0.134E+00	11.52	
TH-230	7.54E+04Y	1.00	8.801E-01	8.801E-01	2.089E-01	23.73	
PA-231	7.04E+08Y	1.00	6.560E-01	6.560E-01	6.617E-01	100.87	
TH-232	1.41E+10Y	1.00	1.062E+00	1.062E+00	0.260E+00	24.49	
U-234	2.45E+05Y	1.00	8.801E-01	8.801E-01	2.089E-01	23.73	
AM-241	432.60Y	1.00	4.489E-01	4.495E-01	3.410E-01	75.85	
AM-243	7370.00Y	1.00	2.223E-01	2.223E-01	1.148E-01	51.64	
ANH-511	1.00E+09Y	1.00	6.485E-02	6.485E-02	8.704E-02	134.22	
Total Activity :			3.835E+01	4.068E+01			

Grand Total Activity : 3.835E+01 4.068E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	83.38	20	158	0.99	166.45	165	6	4.36E-03	****	4.53E+00	T
0	185.97	87	174	0.94	371.72	367	11	2.06E-02	70.8	5.74E+00	T
0	190.86	19	92	1.00	381.50	378	7	4.57E-03	****	5.66E+00	
0	209.28	41	104	0.82	418.36	415	7	9.88E-03	94.3	5.35E+00	
0	327.62	35	61	2.41	655.13	651	10	8.75E-03	93.5	3.81E+00	T
0	438.80	17	26	0.52	877.59	874	9	4.36E-03	****	2.99E+00	T
0	462.68	44	32	1.07	925.37	919	12	1.12E-02	62.7	2.87E+00	T
0	592.66	37	17	3.82	1185.46	1179	13	9.70E-03	58.4	2.35E+00	
0	727.52	55	29	1.63	1455.29	1447	16	1.47E-02	52.6	2.00E+00	T
0	752.96	21	34	3.45	1506.21	1497	17	5.66E-03	****	1.95E+00	T
0	768.41	24	14	0.82	1537.12	1532	10	6.56E-03	73.1	1.92E+00	
0	808.19	17	3	0.73	1616.71	1613	8	4.63E-03	63.6	1.85E+00	
0	820.39	7	10	0.62	1641.13	1636	8	1.95E-03	****	1.82E+00	
0	964.44	21	10	1.25	1929.37	1926	7	5.86E-03	66.6	1.61E+00	T
0	1183.15	12	5	1.27	2367.01	2363	9	3.35E-03	86.4	1.37E+00	
0	1216.65	23	9	2.98	2434.04	2428	12	6.46E-03	66.1	1.34E+00	
0	1220.72	11	3	1.10	2442.17	2439	7	3.19E-03	79.9	1.33E+00	T
1	1224.31	17	3	1.98	2449.36	2446	19	4.80E-03	49.5	1.33E+00	
1	1226.95	18	3	1.98	2454.64	2446	19	4.99E-03	78.7	1.33E+00	
1	1230.12	22	0	1.80	2461.00	2446	19	6.30E-03	43.2	1.32E+00	T
0	1239.21	10	20	0.56	2479.18	2473	9	2.78E-03	****	1.32E+00	T
0	1542.51	6	1	1.20	3086.11	3082	7	1.79E-03	****	1.09E+00	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235004.CNF;1
* Acquisition date   : 3-OCT-2016 08:01:44 Sensitivity      : 3.000
* Detector ID       : GAM09 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.56 Half life ratio : *****
* Sample date       : 9-DEC-2015 14:00:00 Nuclide Library : SOLID
* Sample ID         : G405235004 Analyst initials: MXR1
* Batch Number      : 1596247 Sample Quantity : 1.4894E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 3-JUN-2016 07:32:22 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.316E-01
NB-94	2.408E-02
CD-109	1.056E+00
SN-126	5.937E-02
BA-137M	2.726E-02
CS-137	2.879E-02
TL-208	2.649E-02
BI-211	1.534E-01
PB-212	4.244E-02
BI-214	4.772E-02
PB-214	1.700E-01
RN-222	4.772E-02
RA-224	4.550E-01
RA-226	4.772E-02
AC-228	1.033E-01
RA-228	1.033E-01
TH-228	4.244E-02
TH-230	4.770E-02
PA-231	3.289E-01
TH-232	1.033E-01
U-234	4.770E-02
AM-241	1.524E-01
AM-243	4.944E-02
ANH-511	2.039E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.054E+01	NOT IDENT.
NA-22	3.729E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.765E-02	NOT IDENT.
SC-46	2.566E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF

MN-54	5.502E-02	NOT IDENT.
CO-56	3.642E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	3.460E-02	NOT IDENT.
CO-58	3.906E-01	NOT IDENT.
FE-59	5.570E+00	NOT IDENT.
CO-60	1.637E-02	NOT IDENT.
ZN-65	1.096E-01	NOT IDENT.
GE-68	1.914E+00	NOT IDENT.
AS-73	1.188E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.674E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	6.039E-01	NOT IDENT.
KR-85	6.150E+00	NOT IDENT.
SR-85	6.424E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.586E-01	NOT IDENT.
Y-91	5.249E+02	NOT IDENT.
NB-95	6.418E-01	NOT IDENT.
NB-95M	1.906E+00	NOT IDENT.
ZR-95	1.450E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.294E-02	NOT IDENT.
RH-102	4.873E-02	NOT IDENT.
RU-103	5.282E+00	FAIL ABUN
RH-106	3.332E-01	NOT IDENT.
RU-106	3.332E-01	NOT IDENT.
AG-108M	2.496E-02	NOT IDENT.
AG-110M	5.990E-02	NOT IDENT.
SN-113	1.829E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	9.882E-02	NOT IDENT.
SB-124	1.618E+00	NOT IDENT.
SB-125	8.710E-02	FAIL ABUN
TE-125M	2.216E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.016E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.216E-02	FAIL ABUN
CS-135	1.036E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	8.953E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.871E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.602E-01	NOT IDENT.
PM-144	3.521E-02	NOT IDENT.
PR-144	3.062E+00	NOT IDENT.
PM-146	3.711E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	6.033E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.892E-02	FAIL ABUN
EU-152	6.572E-02	FAIL ABUN
GD-153	1.480E-01	NOT IDENT.
EU-154	9.296E-02	FAIL ABUN
EU-155	9.894E-02	FAIL ABUN
TB-160	1.547E+00	FAIL ABUN
HO-166M	4.973E-02	FAIL ABUN
TM-171	2.975E+01	NOT IDENT.
HF-172	1.547E-01	FAIL ABUN
LU-172	7.359E-02	FAIL ABUN
LU-176	1.919E-02	FAIL ABUN
HF-181	2.773E+00	FAIL ABUN
TA-182	7.936E-01	FAIL ABUN

RE-183	3.301E+00	FAIL ABUN
RE-184	2.587E+01	NOT IDENT.
W-188	8.199E+01	FAIL ABUN
IR-192	3.910E-01	FAIL ABUN
HG-203	1.816E+00	NOT IDENT.
BI-207	3.049E-02	FAIL ABUN
PB-210	5.892E+00	NOT IDENT.
PB-211	5.064E-01	NOT IDENT.
BI-212	6.410E-01	FAIL ABUN
RN-219	2.946E-01	NOT IDENT.
RA-223	4.392E-01	FAIL ABUN
AC-227	1.927E-01	FAIL ABUN
TH-227	1.927E-01	FAIL ABUN
TH-229	3.965E-01	FAIL ABUN
TH-231	4.392E-01	FAIL ABUN
PA-233	4.320E-02	FAIL ABUN
PA-234	2.402E-01	NOT IDENT.
PA-234M	3.725E+00	NOT IDENT.
TH-234	1.446E+00	FAIL ABUN
U-235	1.419E-01	FAIL ABUN
NP-237	4.320E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.446E+00	FAIL ABUN
NP-239	1.813E-01	NOT IDENT.
PU-239	2.624E+02	NOT IDENT.
CM-243	7.638E-02	NOT IDENT.
BK-247	5.670E-02	FAIL ABUN
CM-247	2.749E-02	NOT IDENT.
CF-249	2.923E-02	NOT IDENT.
CF-251	9.565E-02	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235004.CNF;1
* Acquisition date   : 3-OCT-2016 08:01:44 Sensitivity       : 3.000
* Detector ID        : GAM09 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.56 Half life ratio  : *****
* Sample date        : 9-DEC-2015 14:00:00 Nuclide Library : SOLID
* Sample ID          : G405235004 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.4894E+02 GRAM
*                   : Quantity Err(%) : 1.3428E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 3-JUN-2016 07:32:22 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.398E+01	1.761E+00	1.761E+00
NB-94	4.576E-02	5.647E-02	5.647E-02
CD-109	4.830E+00	2.663E+00	2.663E+00
SN-126	3.083E-01	1.692E-01	1.692E-01
BA-137M	1.980E-01	6.327E-02	6.327E-02
CS-137	2.092E-01	6.684E-02	6.684E-02
TL-208	3.877E-01	8.558E-02	8.558E-02
BI-211	1.803E-01	9.829E-01	9.829E-01
PB-212	1.167E+00	1.454E-01	1.454E-01
BI-214	8.804E-01	2.082E-01	2.082E-01
PB-214	1.159E+00	2.218E-01	2.218E-01
RN-222	8.804E-01	2.082E-01	2.082E-01
RA-224	1.444E+00	1.521E+00	1.521E+00
RA-226	8.804E-01	2.082E-01	2.082E-01
AC-228	1.062E+00	2.606E-01	2.606E-01
RA-228	1.062E+00	2.606E-01	2.606E-01
TH-228	1.167E+00	1.454E-01	1.454E-01
TH-230	8.801E-01	2.081E-01	2.081E-01
PA-231	6.560E-01	6.634E-01	6.634E-01
TH-232	1.062E+00	2.606E-01	2.606E-01
U-234	8.801E-01	2.081E-01	2.081E-01
AM-241	4.495E-01	3.359E-01	3.359E-01
AM-243	1.280E-01	1.159E-01	1.159E-01
ANH-511	6.485E-02	8.534E-02	8.534E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.312E+00	1.196E+01	1.198E+01	NOT IDENT.
NA-22	2.943E-02	3.673E-02	3.905E-02	NOT IDENT.
NA-24	1.000E+41	1.933E+41	0.000E+00	SHORT HLIF
AL-26	-5.207E-03	2.343E-02	2.354E-02	NOT IDENT.
SC-46	-7.557E-02	3.229E-01	3.247E-01	FAIL ABUN
V-48	1.075E+03	1.251E+04	1.252E+04	SHORT HLIF

CR-51	-2.238E+02	4.079E+02	4.202E+02	SHORT HLIF
MN-54	7.091E-03	6.386E-02	6.394E-02	NOT IDENT.
CO-56	-4.387E-02	4.399E-01	4.404E-01	FAIL ABUN
MN-56	-1.000E+41	8.989E+41	0.000E+00	SHORT HLIF
CO-57	-1.608E-02	3.948E-02	4.014E-02	NOT IDENT.
CO-58	1.278E-01	4.763E-01	4.798E-01	NOT IDENT.
FE-59	-7.773E+00	8.294E+00	9.004E+00	NOT IDENT.
CO-60	-2.285E-02	2.700E-02	2.890E-02	NOT IDENT.
ZN-65	-8.201E-03	1.538E-01	1.539E-01	NOT IDENT.
GE-68	-3.959E-01	2.345E+00	2.352E+00	NOT IDENT.
AS-73	7.034E+00	1.188E+01	1.230E+01	NOT IDENT.
AS-74	1.324E+03	5.265E+03	5.299E+03	SHORT HLIF
SE-75	1.159E-01	1.818E-01	1.891E-01	NOT IDENT.
BR-77	1.533E+38	1.322E+39	0.000E+00	SHORT HLIF
SR-82	1.195E+02	6.308E+02	6.331E+02	SHORT HLIF
RB-83	5.138E-01	6.189E-01	6.608E-01	NOT IDENT.
KR-85	4.621E+00	6.937E+00	7.243E+00	NOT IDENT.
SR-85	4.825E-01	7.246E-01	7.566E-01	NOT IDENT.
RB-86	-6.350E+02	2.671E+04	2.671E+04	SHORT HLIF
Y-88	8.201E-02	1.546E-01	1.590E-01	NOT IDENT.
Y-91	3.388E+02	5.519E+02	5.726E+02	NOT IDENT.
NB-95	-2.377E-01	8.956E-01	9.020E-01	NOT IDENT.
NB-95M	3.039E-01	2.355E+00	2.359E+00	NOT IDENT.
ZR-95	2.840E-01	1.845E+00	1.849E+00	NOT IDENT.
NB-97	-1.000E+41	2.193E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	3.295E+41	0.000E+00	SHORT HLIF
MO-99	-4.049E+31	1.327E+32	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	5.879E+41	0.000E+00	SHORT HLIF
RH-101	-2.655E-02	2.820E-02	3.063E-02	NOT IDENT.
RH-102	7.622E-03	5.477E-02	5.488E-02	NOT IDENT.
RU-103	4.191E+00	5.421E+00	5.741E+00	FAIL ABUN
RH-106	4.606E-02	3.733E-01	3.739E-01	NOT IDENT.
RU-106	4.606E-02	3.733E-01	3.739E-01	NOT IDENT.
AG-108M	2.466E-02	2.480E-02	2.718E-02	NOT IDENT.
AG-110M	-6.962E-02	8.801E-02	9.344E-02	NOT IDENT.
SN-113	-2.848E-02	2.040E-01	2.044E-01	NOT IDENT.
CD-115	1.572E+39	2.042E+39	0.000E+00	SHORT HLIF
SN-117M	1.471E+04	7.415E+04	7.445E+04	SHORT HLIF
TE-123M	3.041E-02	1.078E-01	1.086E-01	NOT IDENT.
SB-124	7.987E-01	1.643E+00	1.682E+00	NOT IDENT.
SB-125	-2.940E-02	9.972E-02	1.006E-01	FAIL ABUN
TE-125M	2.234E+02	2.224E+02	2.441E+02	NOT IDENT.
I-126	7.169E+05	7.315E+05	7.997E+05	SHORT HLIF
SB-126	8.367E+05	9.405E+05	1.013E+06	SHORT HLIF
SB-127	-3.384E+21	1.742E+22	0.000E+00	SHORT HLIF
I-131	2.533E+09	4.401E+09	4.547E+09	SHORT HLIF
I-132	-1.000E+41	1.857E+42	0.000E+00	SHORT HLIF
TE-132	-1.554E+26	3.000E+26	0.000E+00	SHORT HLIF
BA-133	1.473E-03	3.922E-02	3.922E-02	NOT IDENT.
I-133	-1.000E+41	2.884E+41	0.000E+00	SHORT HLIF
CS-134	1.183E-01	6.141E-02	8.133E-02	FAIL ABUN
CS-135	-1.026E-01	1.338E-01	1.416E-01	NOT IDENT.
I-135	1.000E+41	1.184E+42	0.000E+00	SHORT HLIF
CS-136	-1.122E+05	2.528E+05	2.578E+05	SHORT HLIF
CE-139	-3.435E-04	1.007E-01	1.007E-01	NOT IDENT.
BA-140	-5.276E+05	1.062E+06	1.088E+06	SHORT HLIF
LA-140	1.248E+03	2.202E+05	2.202E+05	SHORT HLIF
CE-141	6.175E-01	2.076E+01	2.076E+01	NOT IDENT.
CE-143	-1.000E+41	1.517E+41	0.000E+00	SHORT HLIF
CE-144	-1.473E-01	3.012E-01	3.085E-01	NOT IDENT.
PM-144	5.270E-03	4.420E-02	4.426E-02	NOT IDENT.
PR-144	4.725E-01	3.840E+00	3.846E+00	NOT IDENT.
PM-146	1.615E-02	3.932E-02	3.999E-02	NOT IDENT.
ND-147	-2.097E+07	2.884E+07	3.035E+07	SHORT HLIF
PM-147	-2.104E+02	6.816E+02	6.882E+02	NOT IDENT.
PM-149	-1.076E+40	3.261E+40	0.000E+00	SHORT HLIF
EU-150	-1.637E-02	2.737E-02	2.835E-02	FAIL ABUN
EU-152	-7.932E-03	8.013E-02	8.021E-02	FAIL ABUN
GD-153	5.437E-03	1.603E-01	1.603E-01	NOT IDENT.
EU-154	6.543E-02	9.362E-02	9.815E-02	FAIL ABUN
EU-155	1.214E-01	9.842E-02	1.126E-01	FAIL ABUN
TB-160	1.399E-01	1.814E+00	1.815E+00	FAIL ABUN
HO-166M	1.280E-02	5.585E-02	5.615E-02	FAIL ABUN
TM-171	6.161E+00	3.042E+01	3.055E+01	NOT IDENT.
HF-172	-6.209E-02	1.766E-01	1.788E-01	FAIL ABUN
LU-172	2.174E-03	8.933E-02	8.933E-02	FAIL ABUN
LU-176	2.479E-03	2.245E-02	2.248E-02	FAIL ABUN
HF-181	-5.894E-01	3.197E+00	3.208E+00	FAIL ABUN

TA-182	9.666E-01	7.581E-01	8.744E-01	FAIL ABUN
RE-183	9.053E+00	6.876E+00	7.996E+00	FAIL ABUN
RE-184	-8.777E-02	3.088E+01	3.088E+01	NOT IDENT.
W-188	8.756E+01	9.018E+01	9.844E+01	FAIL ABUN
IR-192	-5.684E-02	4.725E-01	4.732E-01	FAIL ABUN
HG-203	-1.680E+00	2.337E+00	2.457E+00	NOT IDENT.
BI-207	-8.270E-04	3.599E-02	3.599E-02	FAIL ABUN
PB-210	6.344E-01	6.095E+00	6.102E+00	NOT IDENT.
PB-211	-1.763E-01	5.785E-01	5.839E-01	NOT IDENT.
BI-212	2.064E+00	1.069E+00	1.417E+00	FAIL ABUN
RN-219	6.745E-02	3.162E-01	3.176E-01	NOT IDENT.
RA-223	-4.703E-02	5.776E-01	5.780E-01	FAIL ABUN
AC-227	-8.334E-02	2.341E-01	2.371E-01	FAIL ABUN
TH-227	-8.334E-02	2.341E-01	2.371E-01	FAIL ABUN
TH-229	2.894E-01	4.552E-01	4.736E-01	FAIL ABUN
TH-231	-4.703E-02	5.776E-01	5.780E-01	FAIL ABUN
PA-233	-1.322E-02	5.324E-02	5.358E-02	FAIL ABUN
PA-234	3.338E-02	2.843E-01	2.847E-01	NOT IDENT.
PA-234M	-3.346E-01	4.292E+00	4.295E+00	NOT IDENT.
TH-234	1.868E+00	3.597E+00	3.695E+00	FAIL ABUN
U-235	-2.460E-02	1.600E-01	1.604E-01	FAIL ABUN
NP-237	-1.322E-02	5.324E-02	5.358E-02	FAIL ABUN
NP-238	1.000E+41	1.898E+41	0.000E+00	SHORT HLIF
U-238	1.868E+00	3.597E+00	3.695E+00	FAIL ABUN
NP-239	-4.922E-02	2.029E-01	2.041E-01	NOT IDENT.
PU-239	2.068E+02	2.725E+02	2.880E+02	NOT IDENT.
CM-243	-5.301E-02	8.755E-02	9.075E-02	NOT IDENT.
BK-247	2.268E-03	6.610E-02	6.610E-02	FAIL ABUN
CM-247	1.361E-02	2.871E-02	2.936E-02	NOT IDENT.
CF-249	-1.180E-02	3.732E-02	3.770E-02	NOT IDENT.
CF-251	5.653E-02	1.031E-01	1.062E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	44.2373	87.09	72.3018	136.47	63.3131
45.60	48.4640	87.57	72.3787	140.51	0.0000
46.54	43.1295	88.03	94.6541	143.76	59.1933
49.72	0.0000	88.34	94.7184	144.24	57.2949
51.35	50.9800	88.47	94.7455	145.44	60.3198
51.87	47.8720	89.96	77.4505	152.43	73.7423
52.39	53.5440	1093.63	135.1493	153.25	0.0000
52.97	51.2388	91.11	0.0000	323.87	58.1628
53.44	46.5024	92.59	75.2317	156.02	0.0000
54.07	57.8386	93.35	107.2662	158.56	0.0000
57.36	0.0000	94.56	120.8698	159.00	46.6572
57.53	51.9465	94.65	120.8915	162.33	52.8641
57.98	58.5162	94.67	120.8967	162.66	0.0000
59.27	58.7348	94.87	104.0505	163.33	55.9359
59.32	58.7433	97.43	58.1113	165.86	60.1447
59.54	58.7802	98.43	68.9799	176.31	56.9408
60.96	44.2631	98.44	68.9811	176.60	0.0000
61.17	44.2893	99.53	61.0528	177.52	49.9039
62.93	69.2328	100.11	67.4160	181.07	0.0000
63.29	69.3013	102.03	59.5532	181.52	54.6037
63.58	69.3563	103.18	65.1143	184.41	57.5492
64.28	69.4888	103.37	65.1385	143.76	57.6466
66.73	75.4984	105.21	56.2930	193.51	48.5145
67.24	82.2706	105.31	49.0388	197.03	54.2947
125.81	74.5749	106.12	47.2964	198.01	48.0882
67.75	75.7010	106.47	53.6992	201.83	52.5131
69.67	74.6816	109.28	41.1764	203.43	69.4513
70.83	90.8935	111.00	74.3567	205.31	52.0297
72.81	94.7316	111.76	0.0000	210.85	49.5399
72.87	94.7461	114.06	60.9299	215.65	45.9021
74.66	91.7677	116.30	0.0000	222.11	48.3913
74.82	91.8040	116.74	55.6604	227.09	42.1724
74.97	91.8377	119.76	45.7012	227.38	47.5946
77.11	92.3148	121.12	54.2250	228.16	0.0000
78.74	92.6741	121.22	54.2343	228.18	56.2982
79.69	92.8817	121.78	56.1594	116.74	56.2982
80.12	68.8708	122.06	56.1868	235.69	52.3938
80.19	0.0000	122.92	41.2653	235.96	50.9534
80.57	67.2193	123.07	45.0282	238.63	53.6536
81.00	67.2865	265.00	47.8930	238.98	0.0000
81.07	75.9258	125.81	49.0107	240.99	53.7881
81.75	67.4038	127.23	63.3007	242.00	53.8457
83.79	72.9277	127.91	54.8609	244.70	41.1415
84.00	72.9623	129.30	54.0402	252.40	0.0000
85.43	73.1975	131.20	64.6735	252.80	41.1169
86.55	72.2154	133.02	59.1439	254.15	0.0000
86.79	72.2539	133.52	60.1469	256.23	54.6420
86.94	72.2778	136.00	57.5139	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	30.3626	355.39	0.0000	584.27	19.7302
264.80	35.9902	356.01	25.9889	595.83	0.0000
265.00	38.2469	364.49	0.0000	427.87	19.8994
268.22	50.7816	366.42	0.0000	602.52	0.0000
269.46	36.1553	372.51	28.3773	604.72	14.2444
270.03	47.4794	375.05	27.1959	607.14	17.1145
271.23	48.6663	377.52	23.5308	609.32	17.1335
273.65	0.0000	356.01	31.1073	610.33	17.1423
276.40	35.2600	388.16	32.4548	614.28	20.0396
277.37	42.1230	388.63	0.0000	618.01	9.5610
277.60	40.9933	391.69	30.0359	620.36	18.1867
278.00	34.1739	264.66	28.5512	621.93	11.4956
279.20	51.3199	401.81	23.5316	630.19	0.0000
279.54	36.5059	402.40	21.0195	631.29	17.3240
279.70	39.9336	404.85	29.4786	633.25	15.4141
280.46	38.8207	410.95	43.1392	634.78	0.0000
283.69	30.9221	413.71	23.7298	635.95	14.4702
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	37.8541	423.72	0.0000	645.85	18.4178
285.90	0.0000	427.09	33.3585	657.76	19.0120
287.50	26.4344	427.87	32.5202	657.90	0.0000
290.67	18.4429	433.94	18.0456	661.66	18.5593
293.27	0.0000	439.40	26.7359	664.57	0.0000
351.93	38.5824	453.88	21.7667	666.33	0.0000
295.96	38.6078	463.37	14.0160	666.50	0.0000
879.38	25.5416	468.07	14.0576	667.71	0.0000
299.98	34.0984	473.00	0.0000	677.62	13.7790
300.09	34.1011	475.06	25.5921	685.70	0.0000
300.13	34.1029	476.78	33.5701	695.00	0.0000
301.36	34.1405	477.60	26.5161	696.49	10.4252
302.85	29.5236	482.18	16.8415	696.51	10.4252
256.23	32.6792	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	11.9189
306.78	32.7450	497.08	19.6783	697.49	11.9199
308.46	43.3345	505.52	22.9247	702.65	16.9260
311.90	32.8920	507.63	0.0000	706.68	16.4584
316.51	41.2794	511.00	19.8422	711.68	17.9956
319.41	0.0000	514.00	20.3293	720.70	0.0000
320.08	0.0000	514.00	20.3293	721.93	0.0000
321.04	27.2311	520.40	17.2311	722.78	12.0566
323.87	31.6479	520.69	0.0000	722.91	12.0571
325.23	23.7634	522.65	0.0000	723.31	13.5670
328.76	0.0000	527.90	0.0000	724.19	15.0800
333.37	22.3302	528.26	13.6652	727.33	16.1081
333.97	41.4904	529.59	22.7926	733.00	0.0000
334.37	39.9078	529.87	0.0000	735.93	15.1587
338.28	33.6302	531.02	0.0000	333.97	9.1011
338.32	33.6311	537.26	0.0000	739.50	0.0000
311.90	32.0858	546.56	0.0000	747.24	13.7098
340.48	32.0858	552.55	24.9368	748.06	13.7148
340.55	0.0000	563.25	17.6509	752.31	20.3556
344.28	26.5527	569.33	24.2343	753.82	0.0000
345.93	22.9620	946.00	24.2364	756.73	22.9431
351.06	33.9772	569.70	19.5773	756.80	22.9440
351.93	34.0011	583.19	19.7191	884.68	15.3430

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	19.9610	1274.44	14.5224	1620.50	4.9722
766.42	19.9666	1001.03	12.3083	1621.92	4.9738
766.84	16.8975	1002.74	14.5546	1678.03	0.0000
772.60	0.0000	1004.73	13.4438	1690.97	2.0200
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	1.6415
778.90	11.3227	1028.54	0.0000	1063.66	5.1361
783.70	0.0000	1037.84	9.0625	1771.35	3.0822
785.37	10.3210	1038.76	0.0000	1791.20	0.0000
792.07	13.9719	631.29	7.9525	1808.65	1.0354
794.95	10.3617	1048.07	0.0000	1810.72	0.0000
795.86	10.3658	1049.04	9.0957	1836.06	1.0411
810.06	4.6917	1050.41	20.4741		
810.29	4.6921	1063.66	5.7117		
344.28	4.6924	1077.00	0.0000		
810.76	7.8217	1077.34	12.6212		
815.77	0.0000	1085.87	14.9561		
1048.07	0.0000	1093.63	17.2998		
832.01	18.9324	1099.45	25.4196		
834.85	16.8477	1112.07	8.1200		
835.71	13.6935	1112.84	6.9614		
836.80	0.0000	1115.54	8.7091		
846.75	0.0000	1120.29	13.9551		
846.77	14.8106	1120.55	13.9561		
856.80	0.0000	1221.41	13.9590		
860.56	12.7632	1129.67	12.8289		
871.09	13.8823	1131.51	0.0000		
873.19	13.8934	1147.95	0.0000		
875.33	0.0000	1173.23	15.0670		
879.38	13.9262	1177.95	5.9167		
880.51	7.5019	1189.05	11.1941		
883.24	9.6552	1204.77	13.4180		
884.68	15.0277	1221.41	3.5952		
889.28	11.8276	1231.02	12.9788		
894.76	10.7743	1235.36	0.0000		
898.04	14.0241	1238.28	19.8690		
900.72	12.9580	1260.41	0.0000		
903.28	16.2128	1271.87	10.0285		
911.20	14.0923	1274.44	5.4741		
912.08	14.6393	1274.54	4.5618		
923.98	0.0000	1291.59	8.2502		
926.50	9.8108	1298.22	0.0000		
929.11	10.9111	1312.11	0.0000		
937.49	15.3216	1332.49	7.4146		
944.13	0.0000	1362.66	0.0000		
946.00	14.2706	1365.19	12.1534		
949.00	17.5827	1368.63	0.0000		
667.71	0.0000	1384.29	6.5766		
962.31	19.8735	1408.01	4.7260		
964.08	11.6002	1457.56	0.0000		
966.17	6.6335	1460.82	5.7466		
911.20	13.2798	1489.16	1.9288		
968.97	13.2798	1505.03	5.8088		
983.53	0.0000	1584.12	5.9176		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235005.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM19.CNF;561
Background date : 2-OCT-2016 11:01:07.
Sample date     : 10-DEC-2015 13:15:00 Acquisition date : 3-OCT-2016 08:02:09.
Sample ID      : G405235005 Sample quantity   : 1.57331E+02 GRAM
Detector name  : GAM19 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.81 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity    : 3.00000
Batch ID       : 1596247 Detector SN#    :
Matrix Spike ID : LCS ID              : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	53.91	3	179	1.51	108.59	102	10	7.37E-04	956.6	
2	0	63.56*	51	190	0.74	127.90	123	10	1.43E-02	53.2	
3	6	74.83*	157	150	1.16	150.45	145	17	4.35E-02	15.5	1.19E+00
4	6	77.19*	221	118	1.06	155.17	145	17	6.15E-02	10.6	
5	5	87.35	75	256	1.56	175.52	170	23	2.08E-02	37.1	3.61E+00
6	5	90.10	32	170	1.21	181.00	170	23	9.01E-03	68.7	
7	5	92.75*	100	195	1.73	186.31	170	23	2.77E-02	31.3	
8	0	185.62*	135	164	1.38	372.14	365	14	3.74E-02	22.4	
9	0	208.99	26	120	1.26	418.88	416	8	7.22E-03	75.6	
10	4	238.58*	364	91	1.14	478.09	472	18	1.01E-01	6.9	1.84E+00
11	4	241.88	93	111	1.70	484.71	472	18	2.58E-02	25.2	
12	0	270.49	60	73	1.20	541.94	538	9	1.68E-02	28.7	
13	0	295.09*	166	85	1.18	591.15	584	13	4.60E-02	14.1	
14	0	300.17	36	70	1.09	601.33	598	9	9.93E-03	44.9	
15	0	326.32	74	98	5.86	653.64	643	18	2.07E-02	33.4	
16	0	338.70	125	56	1.70	678.41	672	15	3.48E-02	15.8	
17	0	351.79*	246	84	1.35	704.61	698	12	6.83E-02	9.9	
18	0	463.18	66	55	2.43	927.47	918	18	1.83E-02	29.7	
19	0	471.99	13	45	0.86	945.12	940	10	3.61E-03	100.4	
20	0	489.26*	23	17	4.22	979.67	974	11	6.41E-03	42.2	
21	0	510.87*	45	72	2.01	1022.91	1014	18	1.26E-02	51.6	
22	0	561.21	18	34	1.39	1123.63	1118	11	5.12E-03	64.8	
23	0	569.64*	16	24	1.19	1140.49	1136	11	4.35E-03	98.9	
24	0	583.12*	127	33	1.57	1167.46	1161	12	3.52E-02	12.9	
25	0	609.18*	186	32	1.59	1219.62	1213	13	5.17E-02	9.9	
26	0	614.42*	14	30	0.83	1230.09	1226	9	3.94E-03	76.8	
27	0	661.60	55	18	1.50	1324.50	1320	9	1.54E-02	19.2	
28	0	665.45	25	19	2.40	1332.20	1329	9	6.99E-03	36.5	
29	0	727.26	38	35	1.59	1455.87	1448	13	1.06E-02	37.0	
30	0	757.10	22	22	2.86	1515.57	1509	14	6.24E-03	48.3	
31	0	763.15*	17	8	1.09	1527.69	1523	8	4.78E-03	38.6	
32	0	829.83	21	7	1.22	1661.10	1656	10	5.75E-03	33.0	
33	0	911.02*	97	23	2.05	1823.55	1817	15	2.68E-02	15.1	
34	8	948.19	16	4	3.21	1897.92	1894	15	4.33E-03	32.2	1.63E+00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	8	951.23	17	9	1.93	1904.00	1894	15	4.66E-03	38.1	
36	2	962.21	16	2	1.73	1925.97	1923	12	4.46E-03	33.6	7.21E-01
37	2	964.22	26	12	1.94	1930.00	1923	12	7.24E-03	32.8	
38	0	969.02	58	20	2.28	1939.60	1934	13	1.60E-02	20.6	
39	0	1024.33	4	10	0.47	2050.27	2044	8	1.01E-03	160.1	
40	0	1120.64	48	12	1.23	2242.97	2236	12	1.33E-02	20.5	
41	0	1130.03	22	10	4.80	2261.75	2253	16	6.00E-03	41.4	
42	0	1197.83	28	41	8.79	2397.43	2382	28	7.64E-03	69.3	
43	5	1212.75	10	3	1.49	2427.27	2426	11	2.65E-03	32.6	2.29E+00
44	5	1215.68	17	5	1.82	2433.14	2426	11	4.61E-03	30.9	
45	0	1376.89	17	6	4.26	2755.69	2749	13	4.79E-03	38.5	
46	0	1460.49	391	4	1.98	2922.98	2916	15	1.09E-01	5.2	
47	0	1694.43	7	3	1.47	3391.07	3384	10	2.00E-03	56.0	
48	0	1764.28*	43	0	2.21	3530.83	3523	15	1.19E-02	16.1	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235005.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 10-DEC-2015 13:15:00 Acquisition date : 3-OCT-2016 08:02:09
Sample ID        : G405235005 Sample quantity   : 157.33 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA19 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.81 0.0%
Energy tolerance : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error  : 0.00 %
Efficiency type  : Linear Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.161E+00	1.461E+01	1.461E+01	10.35	OK
AS-73	53.44	10.30*	2.017E+00	8.281E-02	1.083E+00	1913.23	OK
CD-109	88.03	3.70*	5.494E+00	1.200E+00	1.876E+00	143.99	OK
SN-126	64.28	9.60	3.338E+00	1.024E+00	1.024E+00	106.41	OK
	86.94	8.90	5.494E+00	4.987E-01	4.987E-01	143.99	OK
	87.57	37.00*	5.494E+00	1.200E-01	1.200E-01	143.99	OK
BA-137M	661.66	89.90*	2.164E+00	1.444E-01	1.471E-01	38.46	OK
CS-137	661.66	85.10*	2.164E+00	1.526E-01	1.554E-01	38.46	OK
TL-208	277.37	6.60	4.415E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.392E+00	3.206E-01	3.206E-01	25.76	OK
	860.56	12.50	1.763E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	4.545E+00	1.445E+00	1.445E+00	47.20	OK
	77.11	17.10	4.754E+00	1.710E+00	1.710E+00	21.10	OK
	238.63	43.60*	4.960E+00	9.499E-01	9.499E-01	13.81	OK
	300.09	3.30	4.141E+00	1.443E+00	1.443E+00	89.83	OK
BI-214	609.32	45.49*	2.310E+00	9.063E-01	9.066E-01	19.71	OK
	1120.29	14.92	1.437E+00	1.064E+00	1.065E+00	41.00	OK
	1764.49	15.30	9.862E-01	1.282E+00	1.282E+00	32.20	OK
PB-214	74.82	5.80	4.544E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	4.754E+00	3.015E+00	3.016E+00	21.10	OK
	87.09	3.41	5.478E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.908E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.199E+00	1.183E+00	1.183E+00	28.12	OK
	351.93	35.60*	3.630E+00	1.032E+00	1.033E+00	19.83	OK
RN-222	609.32	45.49*	2.310E+00	9.063E-01	9.066E-01	19.71	OK
	1120.29	14.92	1.437E+00	1.064E+00	1.065E+00	41.00	OK
	1764.49	15.30	9.862E-01	1.282E+00	1.282E+00	32.20	OK
RA-224	240.99	4.10*	4.910E+00	5.045E-01	5.045E-01	284.33	OK
RA-226	609.32	45.49*	2.310E+00	9.063E-01	9.066E-01	19.71	OK
	1120.29	14.92	1.437E+00	1.064E+00	1.065E+00	41.00	OK
	1764.49	15.30	9.862E-01	1.282E+00	1.282E+00	32.20	OK
AC-228	105.21	1.10	6.259E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.747E+00	1.616E+00	1.616E+00	31.60	OK
	794.95	4.25	1.875E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.803E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.687E+00	1.084E+00	1.084E+00	30.29	OK
	968.97	15.80	1.609E+00	1.098E+00	1.098E+00	41.21	OK
RA-228	105.21	1.10	6.259E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.747E+00	1.616E+00	1.616E+00	31.60	OK
	794.95	4.25	1.875E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.803E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.687E+00	1.084E+00	1.084E+00	30.29	OK
	968.97	15.80	1.609E+00	1.098E+00	1.098E+00	41.21	OK
TH-228	74.82	10.28	4.545E+00	1.445E+00	1.445E+00	47.20	OK
	77.11	17.10	4.754E+00	1.710E+00	1.710E+00	21.10	OK
	238.63	43.60*	4.960E+00	9.499E-01	9.499E-01	13.81	OK
	300.09	3.30	4.141E+00	1.443E+00	1.443E+00	89.83	OK
TH-230	609.32	45.49*	2.310E+00	9.063E-01	9.063E-01	19.71	OK
	1120.29	14.92	1.437E+00	1.064E+00	1.064E+00	41.00	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	1764.49	15.30	9.862E-01	1.282E+00	1.282E+00	32.20	OK
PA-231	283.69	1.70	4.336E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.141E+00	8.901E-01	8.901E-01	89.83	OK
TH-232	105.21	1.10	6.259E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.747E+00	1.616E+00	1.616E+00	31.60	OK
	835.71	1.61	1.803E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.687E+00	1.084E+00	1.084E+00	30.29	OK
	968.97	15.80	1.609E+00	1.098E+00	1.098E+00	41.21	OK
TH-234	63.29	3.70*	3.338E+00	2.657E+00	2.657E+00	106.41	OK
	92.59	4.23	5.791E+00	2.516E+00	2.516E+00	62.65	OK
U-234	609.32	45.49*	2.310E+00	9.063E-01	9.063E-01	19.71	OK
	1120.29	14.92	1.437E+00	1.064E+00	1.064E+00	41.00	OK
	1764.49	15.30	9.862E-01	1.282E+00	1.282E+00	32.20	OK
U-235	89.96	3.47	5.653E+00	1.024E+00	1.024E+00	137.50	OK
	93.35	5.60	5.791E+00	1.900E+00	1.900E+00	62.65	OK
	143.76	10.96*	6.462E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	6.216E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.848E+00	2.332E-01	2.332E-01	44.76	OK
	205.31	5.01	5.506E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	3.338E+00	2.657E+00	2.657E+00	106.41	OK
	92.59	4.23	5.791E+00	2.516E+00	2.516E+00	62.65	OK
AM-243	43.53	5.90	5.190E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	4.545E+00	2.211E-01	2.211E-01	47.20	OK
ANH-511	511.00	100.00*	2.662E+00	8.853E-02	8.853E-02	103.14	OK

Flag: "*" = Keyline

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235005.CNF;1
* Acquisition date   : 3-OCT-2016 08:02:09 Sensitivity      : 3.000
* Detector ID        : GAM19 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.81 Half life ratio  : *****
* Sample date        : 10-DEC-2015 13:15:00 Analyst initials: MXR1
* Sample ID          : G405235005 Sample Quantity : 1.5733E+02 GRAM
* Batch Number       : 1596247 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 15-JUN-2016 10:35:16 Eff. Geometry : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM19_CAN.CNF;17
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.461E+01	1.481E+00	6.721E-01
AS-73	1.083E+00	2.030E+01	1.538E+01
CD-109	1.876E+00	2.648E+00	2.107E+00
SN-126	1.200E-01	1.693E-01	1.354E-01
BA-137M	1.471E-01	5.546E-02	5.420E-02
CS-137	1.554E-01	5.858E-02	5.726E-02
TL-208	3.206E-01	8.095E-02	5.774E-02
PB-212	9.499E-01	1.285E-01	9.481E-02
BI-214	9.066E-01	1.751E-01	1.201E-01
PB-214	1.033E+00	2.006E-01	1.353E-01
RN-222	9.066E-01	1.751E-01	1.201E-01
RA-224	5.045E-01	1.406E+00	1.016E+00
RA-226	9.066E-01	1.751E-01	1.201E-01
AC-228	1.084E+00	3.219E-01	2.582E-01
RA-228	1.084E+00	3.219E-01	2.582E-01
TH-228	9.499E-01	1.285E-01	9.481E-02
TH-230	9.063E-01	1.751E-01	1.201E-01
PA-231	8.901E-01	7.835E-01	8.240E-01
TH-232	1.084E+00	3.219E-01	2.582E-01
TH-234	2.657E+00	2.771E+00	2.013E+00
U-234	9.063E-01	1.751E-01	1.201E-01
U-235	-4.374E-02	1.754E-01	3.346E-01
U-238	2.657E+00	2.771E+00	2.013E+00
AM-243	2.211E-01	1.023E-01	9.013E-02
ANH-511	8.853E-02	8.948E-02	5.654E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.076E+01	1.249E+01	2.588E+01	NOT IDENT.
NA-22	4.948E-03	4.450E-02	8.902E-02	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	-3.904E-03	2.083E-02	4.619E-02	FAIL ABUN
SC-46	1.237E-01	3.257E-01	6.951E-01	FAIL ABUN

V-48	0.000E+00	1.287E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	4.153E+02	0.000E+00	SHORT HLIF
MN-54	-8.393E-03	7.391E-02	1.255E-01	NOT IDENT.
CO-56	-1.813E-01	4.386E-01	8.220E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	2.889E-02	4.520E-02	9.408E-02	NOT IDENT.
CO-58	-3.563E-01	5.850E-01	1.064E+00	NOT IDENT.
FE-59	-4.730E-02	5.995E+00	1.186E+01	NOT IDENT.
CO-60	1.429E-03	3.289E-02	6.726E-02	NOT IDENT.
ZN-65	2.099E-02	1.873E-01	3.293E-01	NOT IDENT.
GE-68	-7.859E-01	1.695E+00	3.141E+00	NOT IDENT.
AS-74	0.000E+00	5.432E+03	0.000E+00	SHORT HLIF
SE-75	-2.272E-02	2.061E-01	3.943E-01	NOT IDENT.
BR-77	0.000E+00	1.273E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.671E+02	0.000E+00	SHORT HLIF
RB-83	-3.352E-01	7.244E-01	1.278E+00	NOT IDENT.
KR-85	-2.354E+00	8.780E+00	1.394E+01	NOT IDENT.
SR-85	-2.437E-01	9.080E-01	1.441E+00	NOT IDENT.
RB-86	0.000E+00	1.979E+04	0.000E+00	SHORT HLIF
Y-88	1.075E-01	1.516E-01	4.219E-01	NOT IDENT.
Y-91	1.331E+02	5.863E+02	1.042E+03	NOT IDENT.
NB-94	4.733E-03	3.297E-02	6.606E-02	NOT IDENT.
NB-95	1.607E-01	9.452E-01	1.689E+00	NOT IDENT.
NB-95M	-9.658E-01	2.638E+00	4.397E+00	NOT IDENT.
ZR-95	2.661E+00	2.518E+00	3.235E+00	FAIL ABUN
NB-97	0.000E+00	8.289E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	7.667E+40	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.064E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.643E+41	0.000E+00	SHORT HLIF
RH-101	2.392E-02	3.357E-02	6.960E-02	FAIL ABUN
RH-102	-1.925E-02	6.311E-02	1.125E-01	NOT IDENT.
RU-103	-2.171E+00	5.207E+00	9.347E+00	FAIL ABUN
RH-106	-7.927E-02	5.362E-01	9.786E-01	NOT IDENT.
RU-106	-7.927E-02	5.362E-01	9.786E-01	NOT IDENT.
AG-108M	-7.699E-04	3.053E-02	5.740E-02	FAIL ABUN
AG-110M	2.930E-02	9.489E-02	1.976E-01	FAIL ABUN
SN-113	-9.900E-02	2.233E-01	4.050E-01	NOT IDENT.
CD-115	0.000E+00	1.782E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	8.822E+04	0.000E+00	SHORT HLIF
TE-123M	-4.327E-02	1.294E-01	2.495E-01	NOT IDENT.
SB-124	1.082E-01	1.674E+00	3.422E+00	NOT IDENT.
SB-125	-1.718E-02	1.041E-01	1.941E-01	FAIL ABUN
TE-125M	-2.351E+02	2.895E+02	4.908E+02	NOT IDENT.
I-126	0.000E+00	1.105E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.263E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.380E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	4.066E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.699E+26	0.000E+00	SHORT HLIF
BA-133	3.556E-02	4.089E-02	7.893E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	4.287E-02	5.612E-02	1.184E-01	FAIL ABUN
CS-135	7.152E-02	1.535E-01	2.784E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.387E+05	0.000E+00	SHORT HLIF
CE-139	-7.430E-02	1.067E-01	2.002E-01	NOT IDENT.
BA-140	0.000E+00	1.271E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.458E+05	0.000E+00	SHORT HLIF
CE-141	4.671E+00	2.202E+01	4.422E+01	NOT IDENT.
CE-143	0.000E+00	6.428E+40	0.000E+00	SHORT HLIF
CE-144	-2.000E-01	3.390E-01	6.502E-01	NOT IDENT.
PM-144	-5.629E-02	5.442E-02	9.538E-02	NOT IDENT.
PR-144	-4.870E+00	4.724E+00	8.285E+00	NOT IDENT.
PM-146	-4.808E-02	4.381E-02	7.142E-02	NOT IDENT.
ND-147	0.000E+00	3.376E+07	0.000E+00	SHORT HLIF
PM-147	-1.015E+02	7.754E+02	1.543E+03	NOT IDENT.
PM-149	0.000E+00	2.610E+40	0.000E+00	SHORT HLIF
EU-150	-8.023E-03	2.560E-02	4.216E-02	FAIL ABUN
EU-152	2.626E-03	8.486E-02	1.484E-01	FAIL ABUN
GD-153	-4.101E-02	1.947E-01	3.238E-01	NOT IDENT.
EU-154	9.896E-03	1.088E-01	2.170E-01	FAIL ABUN
EU-155	-1.051E-02	1.152E-01	2.083E-01	FAIL ABUN
TB-160	5.362E-01	1.681E+00	3.524E+00	FAIL ABUN
HO-166M	-5.176E-02	5.397E-02	9.423E-02	FAIL ABUN
TM-171	1.322E+01	2.074E+01	4.122E+01	NOT IDENT.
HF-172	-1.790E-01	2.219E-01	4.211E-01	FAIL ABUN
LU-172	-1.386E-02	7.778E-02	1.478E-01	FAIL ABUN
LU-176	1.804E-02	2.493E-02	5.073E-02	FAIL ABUN

HF-181	-1.929E+00	4.398E+00	7.850E+00	NOT IDENT.
TA-182	-5.309E-01	1.051E+00	1.775E+00	FAIL ABUN
RE-183	9.693E-01	2.792E+00	5.408E+00	NOT IDENT.
RE-184	-9.237E+00	2.423E+01	4.590E+01	NOT IDENT.
W-188	-7.491E+01	1.312E+02	2.094E+02	FAIL ABUN
IR-192	2.868E-01	4.517E-01	9.166E-01	FAIL ABUN
HG-203	-5.437E-01	2.322E+00	4.376E+00	NOT IDENT.
BI-207	-7.770E-02	9.420E-02	2.223E-01	FAIL ABUN
PB-210	-9.949E-02	3.206E+00	6.122E+00	NOT IDENT.
BI-211	0.000E+00	5.526E-01	8.424E-01	FAIL ABUN
PB-211	5.173E-01	6.659E-01	1.367E+00	NOT IDENT.
BI-212	0.000E+00	1.037E+00	1.307E+00	FAIL ABUN
RN-219	2.706E-02	3.912E-01	7.474E-01	FAIL ABUN
RA-223	2.309E-01	6.365E-01	1.249E+00	FAIL ABUN
AC-227	-5.213E-04	2.273E-01	4.389E-01	FAIL ABUN
TH-227	-5.213E-04	2.273E-01	4.389E-01	FAIL ABUN
TH-229	4.061E-02	4.873E-01	9.525E-01	FAIL ABUN
TH-231	2.309E-01	6.365E-01	1.249E+00	FAIL ABUN
PA-233	4.542E-02	6.106E-02	1.244E-01	FAIL ABUN
PA-234	-2.884E-02	2.437E-01	4.246E-01	FAIL ABUN
PA-234M	6.096E-01	4.818E+00	9.595E+00	NOT IDENT.
NP-237	4.542E-02	6.106E-02	1.244E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	-2.650E-02	2.318E-01	4.623E-01	NOT IDENT.
PU-239	2.374E+02	3.222E+02	6.651E+02	NOT IDENT.
AM-241	9.053E-02	1.381E-01	2.545E-01	NOT IDENT.
CM-243	-8.033E-02	1.089E-01	1.866E-01	NOT IDENT.
BK-247	-3.373E-02	7.300E-02	1.354E-01	NOT IDENT.
CM-247	2.414E-04	3.662E-02	6.939E-02	NOT IDENT.
CF-249	-1.809E-02	3.760E-02	6.786E-02	NOT IDENT.
CF-251	-4.791E-03	1.119E-01	2.190E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	379	10.66*	1.161E+00	1.461E+01	1.461E+01	10.35
AS-73	53.44	4	10.30*	2.017E+00	8.281E-02	1.083E+00	1913.23
CD-109	88.03	98	3.70*	5.494E+00	2.290E+00	3.582E+00	74.24
SN-126	64.28	69	9.60	3.338E+00	1.024E+00	1.024E+00	106.41
	86.94	98	8.90	5.494E+00	9.519E-01	9.519E-01	74.24
	87.57	98	37.00*	5.494E+00	2.290E-01	2.290E-01	74.24
BA-137M	661.66	59	89.90*	2.164E+00	1.444E-01	1.471E-01	38.46
CS-137	661.66	59	85.10*	2.164E+00	1.526E-01	1.554E-01	38.46
TL-208	277.37	-----	6.60	4.415E+00	-----	Line Not Found	-----
	583.19	137	85.00*	2.392E+00	3.206E-01	3.206E-01	25.76
	860.56	-----	12.50	1.763E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	4.361E+00	-----	Line Not Found	-----
	351.06	280	12.92*	3.630E+00	2.844E+00	2.844E+00	19.83
PB-212	74.82	207	10.28	4.545E+00	2.113E+00	2.113E+00	31.05
	77.11	291	17.10	4.754E+00	1.710E+00	1.710E+00	21.10
	238.63	431	43.60*	4.960E+00	9.499E-01	9.499E-01	13.81
	300.09	41	3.30	4.141E+00	1.443E+00	1.443E+00	89.83
BI-214	609.32	200	45.49*	2.310E+00	9.063E-01	9.066E-01	19.71
	1120.29	48	14.92	1.437E+00	1.064E+00	1.065E+00	41.00
	1764.49	41	15.30	9.862E-01	1.282E+00	1.282E+00	32.20
PB-214	74.82	207	5.80	4.545E+00	3.745E+00	3.746E+00	31.05
	77.11	291	9.70	4.754E+00	3.015E+00	3.016E+00	21.10
	87.09	98	3.41	5.494E+00	2.485E+00	2.485E+00	74.24
	242.00	110	7.25	4.910E+00	1.468E+00	1.469E+00	50.39
	295.22	192	18.42	4.199E+00	1.183E+00	1.183E+00	28.12
	351.93	280	35.60*	3.630E+00	1.032E+00	1.033E+00	19.83
RN-222	609.32	200	45.49*	2.310E+00	9.063E-01	9.066E-01	19.71
	1120.29	48	14.92	1.437E+00	1.064E+00	1.065E+00	41.00
	1764.49	41	15.30	9.862E-01	1.282E+00	1.282E+00	32.20
RA-224	240.99	110	4.10*	4.910E+00	2.596E+00	2.596E+00	50.39
RA-226	609.32	200	45.49*	2.310E+00	9.063E-01	9.066E-01	19.71
	1120.29	48	14.92	1.437E+00	1.064E+00	1.065E+00	41.00
	1764.49	41	15.30	9.862E-01	1.282E+00	1.282E+00	32.20
AC-228	105.21	-----	1.10	6.259E+00	-----	Line Not Found	-----
	338.32	143	11.27	3.747E+00	1.616E+00	1.616E+00	31.60
	794.95	-----	4.25	1.875E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.803E+00	-----	Line Not Found	-----
	911.20	99	25.80*	1.687E+00	1.084E+00	1.084E+00	30.29
	968.97	59	15.80	1.609E+00	1.098E+00	1.098E+00	41.21
RA-228	105.21	-----	1.10	6.259E+00	-----	Line Not Found	-----
	338.32	143	11.27	3.747E+00	1.616E+00	1.616E+00	31.60
	794.95	-----	4.25	1.875E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.803E+00	-----	Line Not Found	-----
	911.20	99	25.80*	1.687E+00	1.084E+00	1.084E+00	30.29
	968.97	59	15.80	1.609E+00	1.098E+00	1.098E+00	41.21
TH-228	74.82	207	10.28	4.545E+00	2.113E+00	2.113E+00	31.05
	77.11	291	17.10	4.754E+00	1.710E+00	1.710E+00	21.10

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	238.63	431	43.60*	4.960E+00	9.499E-01	9.499E-01	13.81
	300.09	41	3.30	4.141E+00	1.443E+00	1.443E+00	89.83
TH-230	609.32	200	45.49*	2.310E+00	9.063E-01	9.063E-01	19.71
	1120.29	48	14.92	1.437E+00	1.064E+00	1.064E+00	41.00
	1764.49	41	15.30	9.862E-01	1.282E+00	1.282E+00	32.20
PA-231	283.69	-----	1.70	4.336E+00	-----	Line Not Found	-----
	301.36	41	5.35*	4.141E+00	8.901E-01	8.901E-01	89.83
TH-232	105.21	-----	1.10	6.259E+00	-----	Line Not Found	-----
	338.32	143	11.27	3.747E+00	1.616E+00	1.616E+00	31.60
	835.71	-----	1.61	1.803E+00	-----	Line Not Found	-----
	911.20	99	25.80*	1.687E+00	1.084E+00	1.084E+00	30.29
	968.97	59	15.80	1.609E+00	1.098E+00	1.098E+00	41.21
TH-234	63.29	69	3.70*	3.338E+00	2.657E+00	2.657E+00	106.41
	92.59	129	4.23	5.791E+00	2.516E+00	2.516E+00	62.65
U-234	609.32	200	45.49*	2.310E+00	9.063E-01	9.063E-01	19.71
	1120.29	48	14.92	1.437E+00	1.064E+00	1.064E+00	41.00
	1764.49	41	15.30	9.862E-01	1.282E+00	1.282E+00	32.20
U-235	89.96	42	3.47	5.653E+00	1.024E+00	1.024E+00	137.50
	93.35	129	5.60	5.791E+00	1.900E+00	1.900E+00	62.65
	143.76	-----	10.96*	6.462E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.216E+00	-----	Line Not Found	-----
	185.72	163	57.20	5.848E+00	2.332E-01	2.332E-01	44.76
	205.31	-----	5.01	5.506E+00	-----	Line Not Found	-----
U-238	63.29	69	3.70*	3.338E+00	2.657E+00	2.657E+00	106.41
	92.59	129	4.23	5.791E+00	2.516E+00	2.516E+00	62.65
AM-243	43.53	-----	5.90	5.190E-01	-----	Line Not Found	-----
	74.66	207	67.20*	4.545E+00	3.232E-01	3.232E-01	31.05
ANH-511	511.00	49	100.00*	2.662E+00	8.853E-02	8.853E-02	103.14

Flag: "*" = Keyline

Total number of lines in spectrum 48
 Number of unidentified lines 11
 Number of lines tentatively identified by NID 37 77.08%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.461E+01	1.461E+01	0.151E+01	10.35	
AS-73	80.30D	13.1	8.281E-02	1.083E+00	20.71E+00	1913.23	
CD-109	461.40D	1.56	2.290E+00	3.582E+00	2.659E+00	74.24	
SN-126	2.30E+05Y	1.00	2.290E-01	2.290E-01	1.700E-01	74.24	
BA-137M	30.08Y	1.02	1.444E-01	1.471E-01	0.566E-01	38.46	
CS-137	30.08Y	1.02	1.526E-01	1.554E-01	0.598E-01	38.46	
TL-208	1.41E+10Y	1.00	3.206E-01	3.206E-01	0.826E-01	25.76	
BI-211	7.04E+08Y	1.00	2.844E+00	2.844E+00	0.564E+00	19.83	
PB-212	1.41E+10Y	1.00	9.499E-01	9.499E-01	1.311E-01	13.81	
BI-214	1600.00Y	1.00	9.063E-01	9.066E-01	1.787E-01	19.71	
PB-214	1600.00Y	1.00	1.032E+00	1.033E+00	0.205E+00	19.83	
RN-222	1600.00Y	1.00	9.063E-01	9.066E-01	1.787E-01	19.71	
RA-224	1.41E+10Y	1.00	2.596E+00	2.596E+00	1.308E+00	50.39	
RA-226	1600.00Y	1.00	9.063E-01	9.066E-01	1.787E-01	19.71	
AC-228	1.41E+10Y	1.00	1.084E+00	1.084E+00	0.328E+00	30.29	
RA-228	1.41E+10Y	1.00	1.084E+00	1.084E+00	0.328E+00	30.29	
TH-228	1.41E+10Y	1.00	9.499E-01	9.499E-01	1.311E-01	13.81	
TH-230	7.54E+04Y	1.00	9.063E-01	9.063E-01	1.787E-01	19.71	
PA-231	7.04E+08Y	1.00	8.901E-01	8.901E-01	7.995E-01	89.83	
TH-232	1.41E+10Y	1.00	1.084E+00	1.084E+00	0.328E+00	30.29	
TH-234	4.47E+09Y	1.00	2.657E+00	2.657E+00	2.827E+00	106.41	
U-234	2.45E+05Y	1.00	9.063E-01	9.063E-01	1.787E-01	19.71	
U-235	7.04E+08Y	1.00	2.332E-01	2.332E-01	1.044E-01	44.76	K
U-238	4.47E+09Y	1.00	2.657E+00	2.657E+00	2.827E+00	106.41	
AM-243	7370.00Y	1.00	3.232E-01	3.232E-01	1.004E-01	31.05	
ANH-511	1.00E+09Y	1.00	8.853E-02	8.853E-02	9.131E-02	103.14	

Total Activity : 4.083E+01 4.313E+01

Grand Total Activity : 4.083E+01 4.313E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	208.99	31	144	1.26	418.88	416	8	7.22E-03	****	5.44E+00	
0	270.49	71	85	1.20	541.94	538	9	1.68E-02	57.3	4.50E+00	T
0	326.32	85	112	5.86	653.64	643	18	2.07E-02	66.8	3.87E+00	T
0	463.18	73	61	2.43	927.47	918	18	1.83E-02	59.4	2.89E+00	T
0	471.99	14	50	0.86	945.12	940	10	3.61E-03	****	2.84E+00	T
0	489.26	25	18	4.22	979.67	974	11	6.41E-03	84.3	2.76E+00	
0	561.21	20	36	1.39	1123.63	1118	11	5.12E-03	****	2.47E+00	
0	569.64	17	26	1.19	1140.49	1136	11	4.35E-03	****	2.44E+00	T
0	614.42	15	32	0.83	1230.09	1226	9	3.94E-03	****	2.29E+00	T
0	665.45	27	20	2.40	1332.20	1329	9	6.99E-03	73.1	2.15E+00	T
0	727.26	40	37	1.59	1455.87	1448	13	1.06E-02	74.0	2.01E+00	T
0	757.10	23	23	2.86	1515.57	1509	14	6.24E-03	96.5	1.95E+00	T
0	763.15	18	8	1.09	1527.69	1523	8	4.78E-03	77.2	1.93E+00	T
0	829.83	21	8	1.22	1661.10	1656	10	5.75E-03	66.1	1.81E+00	
8	948.19	16	4	3.21	1897.92	1894	15	4.33E-03	64.4	1.64E+00	T
8	951.23	17	9	1.93	1904.00	1894	15	4.66E-03	76.1	1.63E+00	
2	962.21	16	2	1.73	1925.97	1923	12	4.46E-03	67.1	1.62E+00	T
2	964.22	27	12	1.94	1930.00	1923	12	7.24E-03	65.6	1.61E+00	T
0	1024.33	4	10	0.47	2050.27	2044	8	1.01E-03	****	1.54E+00	
0	1130.03	22	10	4.80	2261.75	2253	16	6.00E-03	82.8	1.43E+00	T
0	1197.83	27	41	8.79	2397.43	2382	28	7.64E-03	****	1.36E+00	
5	1212.75	9	3	1.49	2427.27	2426	11	2.65E-03	65.1	1.35E+00	
5	1215.68	16	4	1.82	2433.14	2426	11	4.61E-03	61.7	1.35E+00	
0	1376.89	17	6	4.26	2755.69	2749	13	4.79E-03	77.0	1.22E+00	
0	1694.43	7	3	1.47	3391.07	3384	10	2.00E-03	****	1.02E+00	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235005.CNF;1
* Acquisition date   : 3-OCT-2016 08:02:09 Sensitivity      : 3.000
* Detector ID        : GAM19 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.81 Half life ratio : *****
* Sample date        : 10-DEC-2015 13:15:00 Nuclide Library : SOLID
* Sample ID          : G405235005 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.5733E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 15-JUN-2016 10:35:16 Eff. Geometry : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM19_CAN.CNF;17
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.835E-01
AS-73	7.232E+00
CD-109	1.001E+00
SN-126	6.427E-02
BA-137M	2.362E-02
CS-137	2.495E-02
TL-208	2.559E-02
PB-212	4.426E-02
BI-214	5.372E-02
PB-214	6.241E-02
RN-222	5.372E-02
RA-224	4.744E-01
RA-226	5.372E-02
AC-228	1.140E-01
RA-228	1.140E-01
TH-228	4.426E-02
TH-230	5.371E-02
PA-231	3.814E-01
TH-232	1.140E-01
TH-234	9.491E-01
U-234	5.371E-02
U-235	1.576E-01
U-238	9.491E-01
AM-243	4.277E-02
ANH-511	2.576E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.184E+01	NOT IDENT.
NA-22	3.825E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.636E-02	FAIL ABUN
SC-46	3.025E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF

CR-51	0.000E+00	SHORT HLIF
MN-54	5.568E-02	NOT IDENT.
CO-56	3.574E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.439E-02	NOT IDENT.
CO-58	4.658E-01	NOT IDENT.
FE-59	5.106E+00	NOT IDENT.
CO-60	2.783E-02	NOT IDENT.
ZN-65	1.437E-01	NOT IDENT.
GE-68	1.276E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.831E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.770E-01	NOT IDENT.
KR-85	6.356E+00	NOT IDENT.
SR-85	6.573E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.634E-01	NOT IDENT.
Y-91	4.578E+02	NOT IDENT.
NB-94	2.982E-02	NOT IDENT.
NB-95	7.580E-01	NOT IDENT.
NB-95M	2.061E+00	NOT IDENT.
ZR-95	1.461E+00	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.296E-02	FAIL ABUN
RH-102	5.012E-02	NOT IDENT.
RU-103	4.155E+00	FAIL ABUN
RH-106	4.380E-01	NOT IDENT.
RU-106	4.380E-01	NOT IDENT.
AG-108M	2.626E-02	FAIL ABUN
AG-110M	8.678E-02	FAIL ABUN
SN-113	1.837E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.174E-01	NOT IDENT.
SB-124	1.301E+00	NOT IDENT.
SB-125	8.806E-02	FAIL ABUN
TE-125M	2.306E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.628E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.380E-02	FAIL ABUN
CS-135	1.299E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	9.388E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.085E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.055E-01	NOT IDENT.
PM-144	4.203E-02	NOT IDENT.
PR-144	3.651E+00	NOT IDENT.
PM-146	3.181E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.255E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.919E-02	FAIL ABUN
EU-152	6.704E-02	FAIL ABUN
GD-153	1.525E-01	NOT IDENT.
EU-154	9.313E-02	FAIL ABUN
EU-155	9.822E-02	FAIL ABUN
TB-160	1.542E+00	FAIL ABUN
HO-166M	4.111E-02	FAIL ABUN
TM-171	1.948E+01	NOT IDENT.
HF-172	1.979E-01	FAIL ABUN
LU-172	6.430E-02	FAIL ABUN
LU-176	2.359E-02	FAIL ABUN
HF-181	3.537E+00	NOT IDENT.

TA-182	7.780E-01	FAIL ABUN
RE-183	2.554E+00	NOT IDENT.
RE-184	1.948E+01	NOT IDENT.
W-188	9.706E+01	FAIL ABUN
IR-192	4.245E-01	FAIL ABUN
HG-203	2.029E+00	NOT IDENT.
BI-207	1.052E-01	FAIL ABUN
PB-210	2.874E+00	NOT IDENT.
BI-211	4.070E-01	FAIL ABUN
PB-211	6.286E-01	NOT IDENT.
BI-212	6.042E-01	FAIL ABUN
RN-219	3.424E-01	FAIL ABUN
RA-223	5.808E-01	FAIL ABUN
AC-227	2.043E-01	FAIL ABUN
TH-227	2.043E-01	FAIL ABUN
TH-229	4.491E-01	FAIL ABUN
TH-231	5.808E-01	FAIL ABUN
PA-233	5.784E-02	FAIL ABUN
PA-234	1.788E-01	FAIL ABUN
PA-234M	4.299E+00	NOT IDENT.
NP-237	5.784E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.177E-01	NOT IDENT.
PU-239	3.158E+02	NOT IDENT.
AM-241	1.203E-01	NOT IDENT.
CM-243	8.786E-02	NOT IDENT.
BK-247	6.275E-02	NOT IDENT.
CM-247	3.181E-02	NOT IDENT.
CF-249	3.087E-02	NOT IDENT.
CF-251	1.029E-01	NOT IDENT.

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235005.CNF;1
* Acquisition date   : 3-OCT-2016 08:02:09 Sensitivity      : 3.000
* Detector ID        : GAM19 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.81 Half life ratio  : *****
* Sample date        : 10-DEC-2015 13:15:00 Nuclide Library : SOLID
* Sample ID          : G405235005 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.5733E+02 GRAM
*                   : Quantity Err(%) : 1.2712E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight       : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 15-JUN-2016 10:35:16 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM19_CAN.CNF;17
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.461E+01	1.667E+00	1.667E+00
AS-73	1.083E+00	2.030E+01	2.030E+01
CD-109	1.876E+00	2.661E+00	2.661E+00
SN-126	1.200E-01	1.700E-01	1.700E-01
BA-137M	1.471E-01	5.582E-02	5.582E-02
CS-137	1.554E-01	5.897E-02	5.897E-02
TL-208	3.206E-01	8.211E-02	8.211E-02
PB-212	9.499E-01	1.381E-01	1.381E-01
BI-214	9.066E-01	1.795E-01	1.795E-01
PB-214	1.033E+00	2.052E-01	2.052E-01
RN-222	9.066E-01	1.795E-01	1.795E-01
RA-224	5.045E-01	1.413E+00	1.413E+00
RA-226	9.066E-01	1.795E-01	1.795E-01
AC-228	1.084E+00	3.267E-01	3.267E-01
RA-228	1.084E+00	3.267E-01	3.267E-01
TH-228	9.499E-01	1.381E-01	1.381E-01
TH-230	9.063E-01	1.794E-01	1.794E-01
PA-231	8.901E-01	8.062E-01	8.062E-01
TH-232	1.084E+00	3.267E-01	3.267E-01
TH-234	2.657E+00	2.833E+00	2.833E+00
U-234	9.063E-01	1.794E-01	1.794E-01
U-235	-4.374E-02	1.754E-01	1.754E-01
U-238	2.657E+00	2.833E+00	2.833E+00
AM-243	2.211E-01	1.040E-01	1.040E-01
ANH-511	8.853E-02	8.955E-02	8.955E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.076E+01	1.250E+01	1.341E+01	NOT IDENT.
NA-22	4.948E-03	4.450E-02	4.456E-02	NOT IDENT.
NA-24	-1.000E+41	3.245E+41	0.000E+00	SHORT HLIF
AL-26	-3.904E-03	2.083E-02	2.090E-02	FAIL ABUN
SC-46	1.237E-01	3.258E-01	3.305E-01	FAIL ABUN

V-48	6.546E+03	1.287E+04	1.321E+04	SHORT HLIF
CR-51	-1.643E+02	4.154E+02	4.219E+02	SHORT HLIF
MN-54	-8.393E-03	7.391E-02	7.401E-02	NOT IDENT.
CO-56	-1.813E-01	4.387E-01	4.462E-01	NOT IDENT.
MN-56	-1.000E+41	2.420E+41	0.000E+00	SHORT HLIF
CO-57	2.889E-02	4.522E-02	4.705E-02	NOT IDENT.
CO-58	-3.563E-01	5.852E-01	6.069E-01	NOT IDENT.
FE-59	-4.730E-02	5.995E+00	5.995E+00	NOT IDENT.
CO-60	1.429E-03	3.289E-02	3.289E-02	NOT IDENT.
ZN-65	2.099E-02	1.873E-01	1.875E-01	NOT IDENT.
GE-68	-7.859E-01	1.695E+00	1.732E+00	NOT IDENT.
AS-74	-4.299E+02	5.432E+03	5.436E+03	SHORT HLIF
SE-75	-2.272E-02	2.062E-01	2.064E-01	NOT IDENT.
BR-77	9.409E+37	8.088E+38	0.000E+00	SHORT HLIF
SR-82	-7.664E+02	6.681E+02	7.521E+02	SHORT HLIF
RB-83	-3.352E-01	7.258E-01	7.414E-01	NOT IDENT.
KR-85	-2.354E+00	8.781E+00	8.845E+00	NOT IDENT.
SR-85	-2.437E-01	9.080E-01	9.147E-01	NOT IDENT.
RB-86	-5.544E+03	1.979E+04	1.995E+04	SHORT HLIF
Y-88	1.075E-01	1.518E-01	1.593E-01	NOT IDENT.
Y-91	1.331E+02	5.863E+02	5.894E+02	NOT IDENT.
NB-94	4.733E-03	3.297E-02	3.304E-02	NOT IDENT.
NB-95	1.607E-01	9.452E-01	9.480E-01	NOT IDENT.
NB-95M	-9.658E-01	2.639E+00	2.675E+00	NOT IDENT.
ZR-95	2.661E+00	2.520E+00	2.791E+00	FAIL ABUN
NB-97	-1.000E+41	8.300E+40	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	7.678E+40	0.000E+00	SHORT HLIF
MO-99	-1.402E+31	1.064E+32	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	1.646E+41	0.000E+00	SHORT HLIF
RH-101	2.392E-02	3.385E-02	3.552E-02	FAIL ABUN
RH-102	-1.925E-02	6.313E-02	6.373E-02	NOT IDENT.
RU-103	-2.171E+00	5.208E+00	5.299E+00	FAIL ABUN
RH-106	-7.927E-02	5.362E-01	5.374E-01	NOT IDENT.
RU-106	-7.927E-02	5.362E-01	5.374E-01	NOT IDENT.
AG-108M	-7.699E-04	3.053E-02	3.053E-02	FAIL ABUN
AG-110M	2.930E-02	9.490E-02	9.581E-02	FAIL ABUN
SN-113	-9.900E-02	2.233E-01	2.277E-01	NOT IDENT.
CD-115	6.419E+38	1.785E+39	0.000E+00	SHORT HLIF
SN-117M	-1.092E+04	8.823E+04	8.836E+04	SHORT HLIF
TE-123M	-4.327E-02	1.294E-01	1.309E-01	NOT IDENT.
SB-124	1.082E-01	1.674E+00	1.675E+00	NOT IDENT.
SB-125	-1.718E-02	1.041E-01	1.044E-01	FAIL ABUN
TE-125M	-2.351E+02	2.898E+02	3.086E+02	NOT IDENT.
I-126	1.543E+06	1.124E+06	1.322E+06	SHORT HLIF
SB-126	-7.978E+04	1.263E+06	1.264E+06	SHORT HLIF
SB-127	-4.045E+21	1.487E+22	0.000E+00	SHORT HLIF
I-131	1.159E+09	4.067E+09	4.100E+09	SHORT HLIF
I-132	-1.000E+41	1.901E+42	0.000E+00	SHORT HLIF
TE-132	-3.288E+25	2.703E+26	0.000E+00	SHORT HLIF
BA-133	3.556E-02	4.092E-02	4.394E-02	NOT IDENT.
I-133	-1.000E+41	4.526E+41	0.000E+00	SHORT HLIF
CS-134	4.287E-02	5.615E-02	5.938E-02	FAIL ABUN
CS-135	7.152E-02	1.535E-01	1.569E-01	NOT IDENT.
I-135	-1.000E+41	1.298E+42	0.000E+00	SHORT HLIF
CS-136	-7.556E+04	2.389E+05	2.413E+05	SHORT HLIF
CE-139	-7.430E-02	1.077E-01	1.128E-01	NOT IDENT.
BA-140	-3.243E+05	1.271E+06	1.280E+06	SHORT HLIF
LA-140	-2.754E+04	4.458E+05	4.459E+05	SHORT HLIF
CE-141	4.671E+00	2.202E+01	2.212E+01	NOT IDENT.
CE-143	1.000E+41	6.508E+40	0.000E+00	SHORT HLIF
CE-144	-2.000E-01	3.391E-01	3.509E-01	NOT IDENT.
PM-144	-5.629E-02	5.453E-02	6.014E-02	NOT IDENT.
PR-144	-4.870E+00	4.729E+00	5.214E+00	NOT IDENT.
PM-146	-4.808E-02	4.395E-02	4.900E-02	NOT IDENT.
ND-147	7.985E+06	3.376E+07	3.395E+07	SHORT HLIF
PM-147	-1.015E+02	7.754E+02	7.768E+02	NOT IDENT.
PM-149	-3.334E+39	2.611E+40	0.000E+00	SHORT HLIF
EU-150	-8.023E-03	2.560E-02	2.586E-02	FAIL ABUN
EU-152	2.626E-03	8.486E-02	8.487E-02	FAIL ABUN
GD-153	-4.101E-02	1.948E-01	1.956E-01	NOT IDENT.
EU-154	9.896E-03	1.088E-01	1.089E-01	FAIL ABUN
EU-155	-1.051E-02	1.152E-01	1.153E-01	FAIL ABUN
TB-160	5.362E-01	1.681E+00	1.698E+00	FAIL ABUN
HO-166M	-5.176E-02	5.404E-02	5.886E-02	FAIL ABUN
TM-171	1.322E+01	2.077E+01	2.161E+01	NOT IDENT.
HF-172	-1.790E-01	2.238E-01	2.379E-01	FAIL ABUN
LU-172	-1.386E-02	7.779E-02	7.804E-02	FAIL ABUN
LU-176	1.804E-02	2.494E-02	2.623E-02	FAIL ABUN

HF-181	-1.929E+00	4.398E+00	4.484E+00	NOT IDENT.
TA-182	-5.309E-01	1.051E+00	1.078E+00	FAIL ABUN
RE-183	9.693E-01	2.796E+00	2.830E+00	NOT IDENT.
RE-184	-9.237E+00	2.433E+01	2.469E+01	NOT IDENT.
W-188	-7.491E+01	1.314E+02	1.357E+02	FAIL ABUN
IR-192	2.868E-01	4.519E-01	4.700E-01	FAIL ABUN
HG-203	-5.437E-01	2.322E+00	2.335E+00	NOT IDENT.
BI-207	-7.770E-02	9.425E-02	1.005E-01	FAIL ABUN
PB-210	-9.949E-02	3.206E+00	3.206E+00	NOT IDENT.
BI-211	2.844E+00	5.671E-01	1.402E+00	FAIL ABUN
PB-211	5.173E-01	6.664E-01	7.060E-01	NOT IDENT.
BI-212	1.431E+00	1.040E+00	1.223E+00	FAIL ABUN
RN-219	2.706E-02	3.912E-01	3.914E-01	FAIL ABUN
RA-223	2.309E-01	6.366E-01	6.451E-01	FAIL ABUN
AC-227	-5.213E-04	2.273E-01	2.273E-01	FAIL ABUN
TH-227	-5.213E-04	2.273E-01	2.273E-01	FAIL ABUN
TH-229	4.061E-02	4.873E-01	4.876E-01	FAIL ABUN
TH-231	2.309E-01	6.366E-01	6.451E-01	FAIL ABUN
PA-233	4.542E-02	6.110E-02	6.444E-02	FAIL ABUN
PA-234	-2.884E-02	2.459E-01	2.463E-01	FAIL ABUN
PA-234M	6.096E-01	4.818E+00	4.826E+00	NOT IDENT.
NP-237	4.542E-02	6.110E-02	6.444E-02	FAIL ABUN
NP-238	8.874E+40	2.429E+41	0.000E+00	SHORT HLIF
NP-239	-2.650E-02	2.318E-01	2.321E-01	NOT IDENT.
PU-239	2.374E+02	3.224E+02	3.397E+02	NOT IDENT.
AM-241	9.053E-02	1.382E-01	1.441E-01	NOT IDENT.
CM-243	-8.033E-02	1.092E-01	1.150E-01	NOT IDENT.
BK-247	-3.373E-02	7.332E-02	7.488E-02	NOT IDENT.
CM-247	2.414E-04	3.662E-02	3.662E-02	NOT IDENT.
CF-249	-1.809E-02	3.763E-02	3.850E-02	NOT IDENT.
CF-251	-4.791E-03	1.119E-01	1.120E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	83.8463	87.09	117.3344	136.47	87.6127
45.60	77.4971	87.57	117.4180	140.51	0.0000
46.54	73.1555	88.03	117.4979	143.76	90.0468
49.72	0.0000	88.34	117.5512	144.24	80.5642
51.35	69.7358	88.47	117.5742	145.44	85.0043
51.87	81.9514	89.96	117.8302	152.43	92.6217
52.39	82.0382	1093.63	117.9472	153.25	0.0000
52.97	82.1346	91.11	0.0000	323.87	90.1659
53.44	82.2123	92.59	118.2780	156.02	0.0000
54.07	82.3162	93.35	118.4060	158.56	0.0000
57.36	0.0000	94.56	118.6095	159.00	93.2460
57.53	90.9330	94.65	89.6816	162.33	75.0226
57.98	86.4029	94.67	89.6844	162.66	0.0000
59.27	87.7696	94.87	89.7096	163.33	82.1649
59.32	87.7779	97.43	86.7563	165.86	92.9976
59.54	80.1111	98.43	82.3683	176.31	87.6730
60.96	105.0388	98.44	82.3698	176.60	0.0000
61.17	95.8082	99.53	94.8048	177.52	81.5033
62.93	90.6917	100.11	104.7377	181.07	0.0000
63.29	90.7511	102.03	87.7143	181.52	74.1656
63.58	90.7987	103.18	107.6462	184.41	82.9258
64.28	90.9129	103.37	107.6734	143.76	83.0250
66.73	120.1840	105.21	94.2891	193.51	89.0587
67.24	131.2269	105.31	94.3013	197.03	76.5728
125.81	125.0741	106.12	90.6758	198.01	73.9015
67.75	98.5074	106.47	90.7170	201.83	83.2991
69.67	118.8364	109.28	104.7680	203.43	84.3305
70.83	139.8981	111.00	99.9988	205.31	89.5148
72.81	127.7457	111.76	0.0000	210.85	78.8647
72.87	127.7589	114.06	99.5492	215.65	63.8993
74.66	115.0854	116.30	0.0000	222.11	75.4069
74.82	115.1150	116.74	89.8089	227.09	75.7076
74.97	115.1431	119.76	79.1891	227.38	85.0746
77.11	115.5427	121.12	85.2259	228.16	0.0000
78.74	115.8424	121.22	85.2362	228.18	83.2573
79.69	119.6045	121.78	77.6933	116.74	83.2573
80.12	119.6854	122.06	77.7195	235.69	84.6890
80.19	0.0000	122.92	65.1148	235.96	80.4711
80.57	99.0093	123.07	76.9673	238.63	66.0181
81.00	81.4976	265.00	94.7979	238.98	0.0000
81.07	81.5064	125.81	101.8250	240.99	66.1377
81.75	135.9875	127.23	87.5446	242.00	66.1883
83.79	154.0664	127.91	91.8677	244.70	52.5851
84.00	154.1162	129.30	97.9788	252.40	0.0000
85.43	133.5342	131.20	100.7545	252.80	66.7259
86.55	117.2404	133.02	105.2414	254.15	0.0000
86.79	117.2818	133.52	95.0282	256.23	60.2045
86.94	117.3085	136.00	72.9725	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	58.6495	355.39	0.0000	584.27	22.1938
264.80	59.6172	356.01	27.5284	595.83	0.0000
265.00	63.4716	364.49	0.0000	427.87	27.4951
268.22	53.4969	366.42	0.0000	602.52	0.0000
269.46	53.5432	372.51	36.0233	604.72	24.0975
270.03	63.6985	375.05	42.2587	607.14	20.6748
271.23	63.7522	377.52	37.1565	609.32	24.1411
273.65	0.0000	356.01	30.0372	610.33	24.1505
276.40	68.8304	388.16	42.5665	614.28	24.1881
277.37	57.2355	388.63	0.0000	618.01	20.7634
277.60	57.2451	391.69	39.5277	620.36	28.8635
278.00	46.5850	264.66	43.9004	621.93	26.5713
279.20	54.3936	401.81	38.6975	630.19	0.0000
279.54	70.9222	402.40	40.8027	631.29	26.6667
279.70	70.9311	404.85	30.3800	633.25	17.4048
280.46	68.0518	410.95	38.8849	634.78	0.0000
283.69	51.6381	413.71	35.7840	635.95	19.7455
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	65.3547	423.72	0.0000	645.85	31.4791
285.90	0.0000	427.09	37.0921	657.76	21.0798
287.50	61.5401	427.87	34.9860	657.90	0.0000
290.67	61.6721	433.94	39.3479	661.66	15.4811
293.27	0.0000	439.40	34.1237	664.57	0.0000
351.93	48.6037	453.88	39.7393	666.33	0.0000
295.96	48.6269	463.37	35.6063	666.50	0.0000
879.38	17.7133	468.07	19.4656	667.71	0.0000
299.98	47.2783	473.00	0.0000	677.62	17.6953
300.09	47.2822	475.06	35.8057	685.70	0.0000
300.13	47.2832	476.78	35.8346	695.00	0.0000
301.36	51.7577	477.60	24.9855	696.49	29.3967
302.85	66.6101	482.18	34.8372	696.51	29.3967
256.23	53.3452	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	24.0584
306.78	44.5203	497.08	27.4043	697.49	21.3867
308.46	63.3854	505.52	29.7109	702.65	26.7828
311.90	43.6742	507.63	0.0000	706.68	27.7144
316.51	40.8148	511.00	35.2995	711.68	27.7636
319.41	0.0000	514.00	41.4215	720.70	0.0000
320.08	0.0000	514.00	41.4215	721.93	0.0000
321.04	38.9349	520.40	36.5557	722.78	33.0861
323.87	52.0042	520.69	0.0000	722.91	27.3329
325.23	52.0487	522.65	0.0000	723.31	27.3366
328.76	0.0000	527.90	0.0000	724.19	37.4194
333.37	40.7406	528.26	22.2314	727.33	29.7159
333.97	40.7554	529.59	31.1423	733.00	19.5918
334.37	49.8243	529.87	0.0000	735.93	18.9665
338.28	40.3573	531.02	0.0000	333.97	23.4943
338.32	40.3589	537.26	0.0000	739.50	0.0000
311.90	40.4110	546.56	0.0000	747.24	20.8529
340.48	40.4110	552.55	30.3278	748.06	19.9516
340.55	0.0000	563.25	30.4640	752.31	26.1554
344.28	28.8583	569.33	16.9678	753.82	0.0000
345.93	42.5699	946.00	16.9690	756.73	14.5527
351.06	47.7822	569.70	16.9702	756.80	14.5527
351.93	47.8061	583.19	20.4771	884.68	37.9285

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	23.3547	1274.44	16.6176	1620.50	6.7394
766.42	16.0596	1001.03	18.5970	1621.92	5.6177
766.84	14.6016	1002.74	23.5012	1678.03	0.0000
772.60	0.0000	1004.73	15.6763	1690.97	3.0340
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	2.7662
778.90	21.0733	1028.54	0.0000	1063.66	11.9990
783.70	0.0000	1037.84	20.7578	1771.35	3.6926
785.37	24.7909	1038.76	0.0000	1791.20	0.0000
792.07	36.8079	631.29	14.8608	1808.65	2.7872
794.95	21.1842	1048.07	0.0000	1810.72	0.0000
795.86	22.1111	1049.04	13.8787	1836.06	0.9333
810.06	28.6907	1050.41	13.8838		
810.29	26.8415	1063.66	9.9512		
344.28	26.8432	1077.00	0.0000		
810.76	24.0687	1077.34	9.9860		
815.77	0.0000	1085.87	14.0111		
1048.07	0.0000	1093.63	17.0467		
832.01	19.3845	1099.45	13.0555		
834.85	22.3865	1112.07	16.1191		
835.71	25.5912	1112.84	13.0992		
836.80	0.0000	1115.54	14.5195		
846.75	0.0000	1120.29	13.1230		
846.77	19.6599	1120.55	13.1238		
856.80	0.0000	1221.41	14.5406		
860.56	23.5039	1129.67	17.2013		
871.09	15.0903	1131.51	0.0000		
873.19	15.1001	1147.95	0.0000		
875.33	0.0000	1173.23	22.4968		
879.38	13.2369	1177.95	17.4036		
880.51	15.1333	1189.05	13.1383		
883.24	17.0387	1204.77	14.8359		
884.68	14.2049	1221.41	23.6398		
889.28	11.3796	1231.02	13.4753		
894.76	18.0468	1235.36	0.0000		
898.04	10.4582	1238.28	20.7654		
900.72	17.1271	1260.41	0.0000		
903.28	14.2831	1271.87	8.3701		
911.20	19.0881	1274.44	11.5156		
912.08	19.0930	1274.54	11.5156		
923.98	0.0000	1291.59	15.7626		
926.50	14.3797	1298.22	0.0000		
929.11	24.9439	1312.11	0.0000		
937.49	17.3101	1332.49	7.4221		
944.13	0.0000	1362.66	0.0000		
946.00	10.7967	1365.19	4.2712		
949.00	10.6129	1368.63	0.0000		
667.71	0.0000	1384.29	9.6487		
962.31	3.0989	1408.01	3.2324		
964.08	7.7512	1457.56	0.0000		
966.17	7.7556	1460.82	9.8020		
911.20	13.9711	1489.16	6.5717		
968.97	13.9711	1505.03	7.6913		
983.53	0.0000	1584.12	14.5028		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                 *
*                               Charleston, SC 29407                            *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235006.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM20.CNF;515
Background date  : 2-OCT-2016 11:01:13.
Sample date      : 10-DEC-2015 13:25:00 Acquisition date : 3-OCT-2016 08:02:32.
Sample ID        : G405235006 Sample quantity   : 1.56342E+02 GRAM
Detector name    : GAM20 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:14.99 0.4%
Energy tolerance : 1.50000 keV Analyst Initials  : MXR1
Abundance limit  : 75.00000 Sensitivity    : 3.00000
Batch ID         : 1596247 Detector SN#    :
Matrix Spike ID  : LCS ID          : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	7	26.75*	15	7	1.19	53.71	51	16	4.30E-03	69.1	2.88E+00
2	7	28.24*	38	68	2.00	56.68	51	16	1.05E-02	59.6	
3	0	63.57*	0	243	0.50	127.29	123	9	1.01E-04	*****	
4	1	73.54	51	190	1.23	147.22	144	16	1.42E-02	50.3	2.27E+01
5	1	76.84	316	172	1.24	153.82	144	16	8.78E-02	9.5	
6	0	84.32*	33	119	0.77	168.76	166	6	9.21E-03	56.2	
7	0	87.19	83	181	1.03	174.51	172	7	2.29E-02	29.0	
8	3	89.95*	36	107	0.96	180.02	178	13	1.00E-02	42.8	3.01E+00
9	3	92.82*	94	201	1.51	185.76	178	13	2.60E-02	30.6	
10	0	105.40	42	147	1.17	210.90	207	10	1.17E-02	55.6	
11	0	121.39	32	99	1.33	242.85	239	7	8.84E-03	55.2	
12	0	128.75	38	82	1.75	257.57	255	6	1.05E-02	41.4	
13	0	186.06*	63	164	0.93	372.12	367	11	1.76E-02	42.8	
14	0	210.28	35	146	2.42	420.54	411	12	9.85E-03	70.3	
15	0	238.45*	473	122	1.22	476.85	471	10	1.31E-01	6.5	
16	0	241.57	80	84	1.22	483.08	481	7	2.21E-02	22.5	
17	0	270.34	66	106	1.48	540.60	535	13	1.84E-02	34.5	
18	0	295.06*	201	72	0.98	590.03	584	11	5.59E-02	10.8	
19	0	300.35	53	61	1.02	600.60	596	11	1.46E-02	31.8	
20	0	338.55*	96	78	1.14	676.98	671	13	2.68E-02	21.6	
21	0	351.77*	288	60	1.24	703.41	698	12	8.01E-02	8.0	
22	0	446.92	39	30	2.59	893.68	885	15	1.09E-02	34.4	
23	0	462.90	46	50	1.74	925.64	919	15	1.29E-02	36.1	
24	0	511.01*	15	79	1.85	1021.84	1016	15	4.17E-03	143.3	
25	0	543.83	64	30	5.63	1087.48	1074	30	1.76E-02	28.1	
26	0	583.49*	164	42	1.32	1166.82	1159	16	4.55E-02	12.0	
27	0	609.34*	179	49	1.52	1218.53	1211	13	4.97E-02	11.1	
28	0	654.51	26	14	1.06	1308.89	1304	10	7.08E-03	34.5	
29	0	727.18	32	14	2.01	1454.27	1448	11	8.96E-03	28.4	
30	0	786.46	17	29	0.64	1572.89	1568	14	4.75E-03	70.2	
31	0	794.94	29	7	2.70	1589.85	1585	9	8.14E-03	24.4	
32	0	835.82	18	15	4.43	1671.64	1664	12	4.99E-03	49.2	
33	0	911.38*	142	19	1.54	1822.85	1817	15	3.95E-02	10.8	
34	0	957.75	14	11	3.21	1915.67	1910	9	3.83E-03	51.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	1	964.57	41	10	1.94	1929.32	1922	22	1.15E-02	22.3	2.97E+00
36	1	969.00	73	17	1.87	1938.18	1922	22	2.03E-02	14.7	
37	0	1088.96	11	12	1.19	2178.31	2174	9	2.92E-03	65.5	
38	0	1095.52	29	11	4.82	2191.43	2183	17	8.07E-03	33.4	
39	0	1104.64	12	6	3.10	2209.70	2204	11	3.19E-03	49.3	
40	0	1108.77	11	4	1.17	2217.95	2214	7	2.92E-03	42.7	
41	0	1120.71	33	22	1.18	2241.86	2239	8	9.18E-03	30.1	
42	1	1203.69	17	9	1.87	2408.00	2400	20	4.59E-03	40.0	6.67E-01
43	1	1206.69	14	7	1.87	2414.00	2400	20	3.77E-03	54.5	
44	0	1238.48	27	7	2.23	2477.66	2472	10	7.42E-03	27.2	
45	0	1258.60	11	11	1.01	2517.96	2512	9	3.12E-03	61.3	
46	0	1288.43	15	7	2.88	2577.68	2572	13	4.17E-03	43.8	
47	0	1334.20	17	6	1.19	2669.34	2664	12	4.73E-03	37.6	
48	0	1360.53	6	5	0.55	2722.08	2718	6	1.53E-03	74.4	
49	0	1377.89	22	5	1.34	2756.85	2751	11	6.08E-03	29.7	
50	0	1416.25	6	9	0.55	2833.68	2823	12	1.74E-03	103.4	
51	0	1460.92*	480	0	2.16	2923.15	2916	14	1.33E-01	4.6	
52	0	1588.20	11	6	4.32	3178.14	3171	12	3.06E-03	53.8	
53	0	1630.78	11	0	0.83	3263.45	3257	11	3.06E-03	30.2	
54	0	1729.10	13	3	0.72	3460.47	3453	13	3.67E-03	39.0	
55	0	1764.39	43	0	2.54	3531.19	3525	12	1.19E-02	15.2	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235006.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 10-DEC-2015 13:25:00 Acquisition date : 3-OCT-2016 08:02:32
Sample ID        : G405235006 Sample quantity   : 156.34 GRAM
Sample type      : SOLID Sample geometry    :
Detector name    : GAMMA20 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:14.99 0.4%
Energy tolerance : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type  : Linear Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
PB-214	74.82	BI-211	72.87
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.312E+00	1.597E+01	1.597E+01	9.18	OK
MN-54	834.85	99.98*	2.057E+00	4.332E-02	8.395E-02	98.38	OK
CO-57	122.06	85.60*	7.574E+00	2.963E-02	6.333E-02	110.46	OK
	136.47	10.68	7.468E+00	-----	Line Not Found	-----	Absent
Y-91	1204.77	0.26*	1.543E+00	1.960E+01	6.675E+02	79.96	OK
CD-109	88.03	3.70*	6.842E+00	8.453E-01	1.322E+00	142.57	OK
SN-126	64.28	9.60	4.822E+00	5.031E-03	5.031E-03*****		OK
	86.94	8.90	6.842E+00	3.514E-01	3.514E-01	142.57	OK
	87.57	37.00*	6.842E+00	8.453E-02	8.453E-02	142.57	OK
PM-147	121.22	0.00*	7.574E+00	8.899E+02	1.104E+03	110.46	OK
EU-155	86.55	30.70	6.842E+00	1.019E-01	1.147E-01	142.57	OK
	105.31	21.10*	7.457E+00	1.643E-01	1.850E-01	111.18	OK
TL-208	277.37	6.60	4.947E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.718E+00	3.661E-01	3.661E-01	24.08	OK
	860.56	12.50	2.011E+00	-----	Line Not Found	-----	Absent
BI-212	727.33	6.67*	2.290E+00	1.064E+00	1.064E+00	56.79	OK
	785.37	1.10	2.156E+00	3.600E+00	3.600E+00	140.46	OK
	1620.50	1.47	1.197E+00	-----	Line Not Found	-----	Absent
PB-212	74.82	10.28	5.996E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	17.10	6.163E+00	1.887E+00	1.887E+00	19.08	OK
	238.63	43.60*	5.555E+00	1.105E+00	1.105E+00	12.91	OK
	300.09	3.30	4.643E+00	1.896E+00	1.896E+00	63.67	OK
BI-214	609.32	45.49*	2.627E+00	7.694E-01	7.696E-01	22.24	OK
	1120.29	14.92	1.635E+00	6.500E-01	6.502E-01	60.22	OK
	1764.49	15.30	1.106E+00	1.155E+00	1.155E+00	30.50	OK
PB-214	74.82	5.80	5.884E+00	9.459E-01	9.463E-01	100.67	OK
	77.11	9.70	6.163E+00	3.326E+00	3.328E+00	19.08	OK
	787.09	3.41	6.836E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	5.502E+00	1.127E+00	1.128E+00	45.00	OK
	295.22	18.42	4.710E+00	1.287E+00	1.287E+00	21.68	OK
	351.93	35.60*	4.085E+00	1.079E+00	1.080E+00	16.10	OK
RN-222	609.32	45.49*	2.627E+00	7.694E-01	7.696E-01	22.24	OK
	1120.29	14.92	1.635E+00	6.500E-01	6.502E-01	60.22	OK
	1764.49	15.30	1.106E+00	1.155E+00	1.155E+00	30.50	OK
RA-226	609.32	45.49*	2.627E+00	7.694E-01	7.696E-01	22.24	OK
	1120.29	14.92	1.635E+00	6.500E-01	6.502E-01	60.22	OK
	1764.49	15.30	1.106E+00	1.155E+00	1.155E+00	30.50	OK
AC-228	105.21	1.10	7.457E+00	3.151E+00	3.151E+00	111.18	OK
	338.32	11.27	4.214E+00	1.110E+00	1.110E+00	43.25	OK
	794.95	4.25	2.138E+00	1.609E+00	1.609E+00	48.85	OK
	835.71	1.61	2.057E+00	2.690E+00	2.690E+00	98.38	OK
	911.20	25.80*	1.923E+00	1.408E+00	1.408E+00	21.64	OK
	968.97	15.80	1.834E+00	1.229E+00	1.229E+00	29.49	OK
RA-228	105.21	1.10	7.457E+00	3.151E+00	3.151E+00	111.18	OK
	338.32	11.27	4.214E+00	1.110E+00	1.110E+00	43.25	OK
	794.95	4.25	2.138E+00	1.609E+00	1.609E+00	48.85	OK
	835.71	1.61	2.057E+00	2.690E+00	2.690E+00	98.38	OK
	911.20	25.80*	1.923E+00	1.408E+00	1.408E+00	21.64	OK
	968.97	15.80	1.834E+00	1.229E+00	1.229E+00	29.49	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	74.82	10.28	5.996E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	17.10	6.163E+00	1.887E+00	1.887E+00	19.08	OK
	238.63	43.60*	5.555E+00	1.105E+00	1.105E+00	12.91	OK
TH-229	300.09	3.30	4.643E+00	1.896E+00	1.896E+00	63.67	OK
	85.43	14.70	6.681E+00	2.108E-01	2.108E-01	112.36	OK
	88.47	24.00	6.842E+00	1.303E-01	1.303E-01	142.57	OK
TH-230	193.51	4.41*	6.409E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	6.074E+00	1.196E+00	1.196E+00	140.62	OK
	609.32	45.49*	2.627E+00	7.694E-01	7.694E-01	22.24	OK
PA-231	1120.29	14.92	1.635E+00	6.500E-01	6.500E-01	60.22	OK
	1764.49	15.30	1.106E+00	1.155E+00	1.155E+00	30.50	OK
	283.69	1.70	4.860E+00	----- Line	Not Found	-----	Absent
TH-232	301.36	5.35*	4.643E+00	1.169E+00	1.169E+00	63.67	OK
	105.21	1.10	7.457E+00	3.151E+00	3.151E+00	111.18	OK
	338.32	11.27	4.214E+00	1.110E+00	1.110E+00	43.25	OK
TH-234	835.71	1.61	2.057E+00	2.690E+00	2.690E+00	98.38	OK
	911.20	25.80*	1.923E+00	1.408E+00	1.408E+00	21.64	OK
	968.97	15.80	1.834E+00	1.229E+00	1.229E+00	29.49	OK
U-234	63.29	3.70*	4.822E+00	1.305E-02	1.305E-02*****		OK
	92.59	4.23	7.101E+00	1.932E+00	1.932E+00	61.25	OK
	609.32	45.49*	2.627E+00	7.694E-01	7.694E-01	22.24	OK
U-235	1120.29	14.92	1.635E+00	6.500E-01	6.500E-01	60.22	OK
	1764.49	15.30	1.106E+00	1.155E+00	1.155E+00	30.50	OK
	89.96	3.47	6.978E+00	9.241E-01	9.241E-01	85.65	OK
U-238	93.35	5.60	7.101E+00	1.459E+00	1.459E+00	61.25	OK
	143.76	10.96*	7.370E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	7.024E+00	----- Line	Not Found	-----	Absent
ANH-511	185.72	57.20	6.562E+00	9.797E-02	9.797E-02	85.62	OK
	205.31	5.01	6.171E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	4.822E+00	1.305E-02	1.305E-02*****		OK
	92.59	4.23	7.101E+00	1.932E+00	1.932E+00	61.25	OK
	511.00	100.00*	3.019E+00	2.603E-02	2.603E-02	286.68	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235006.CNF;1 *
 * Acquisition date : 3-OCT-2016 08:02:32 Sensitivity : 3.000 *
 * Detector ID : GAM20 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:14.99 Half life ratio : ***** *
 * Sample date : 10-DEC-2015 13:25:00 Analyst initials: MXR1 *
 * Sample ID : G405235006 Sample Quantity : 1.5634E+02 GRAM *
 * Batch Number : 1596247 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 30-JUN-2016 06:52:39 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM20_CAN.CNF;15 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.597E+01	1.437E+00	3.706E-01
MN-54	8.395E-02	8.094E-02	1.126E-01
CO-57	6.333E-02	6.855E-02	7.947E-02
Y-91	6.675E+02	5.231E+02	6.999E+02
CD-109	1.322E+00	1.847E+00	1.773E+00
SN-126	8.453E-02	1.181E-01	1.137E-01
PM-147	1.104E+03	1.195E+03	1.179E+03
EU-155	1.850E-01	2.016E-01	1.643E-01
TL-208	3.661E-01	8.638E-02	5.374E-02
BI-212	1.064E+00	5.920E-01	6.980E-01
PB-212	1.105E+00	1.398E-01	8.502E-02
BI-214	7.696E-01	1.678E-01	1.143E-01
PB-214	1.080E+00	1.703E-01	1.083E-01
RN-222	7.696E-01	1.678E-01	1.143E-01
RA-226	7.696E-01	1.678E-01	1.143E-01
AC-228	1.408E+00	2.987E-01	1.578E-01
RA-228	1.408E+00	2.987E-01	1.578E-01
TH-228	1.105E+00	1.398E-01	8.502E-02
TH-229	7.367E-02	4.123E-01	8.250E-01
TH-230	7.694E-01	1.677E-01	1.143E-01
PA-231	1.169E+00	7.297E-01	6.113E-01
TH-232	1.408E+00	2.987E-01	1.578E-01
TH-234	1.305E-02	2.015E+00	1.560E+00
U-234	7.694E-01	1.677E-01	1.143E-01
U-235	-2.283E-02	1.683E-01	3.042E-01
U-238	1.305E-02	2.015E+00	1.560E+00
ANH-511	2.603E-02	7.312E-02	4.614E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.023E+00		8.808E+00	1.761E+01	NOT IDENT.
NA-22	-2.495E-02		3.358E-02	5.855E-02	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF

AL-26	0.000E+00	8.732E-03	1.210E-02	NOT IDENT.
SC-46	1.332E-01	2.927E-01	6.099E-01	FAIL ABUN
V-48	0.000E+00	1.052E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	3.021E+02	0.000E+00	SHORT HLIF
CO-56	1.650E-01	2.952E-01	6.507E-01	FAIL ABUN
MN-56	0.000E+00	1.789E+41	0.000E+00	SHORT HLIF
CO-58	-3.271E-01	4.576E-01	7.628E-01	NOT IDENT.
FE-59	4.920E+00	3.163E+00	9.091E+00	NOT IDENT.
CO-60	4.019E-02	2.818E-02	7.222E-02	NOT IDENT.
ZN-65	-3.067E-02	1.335E-01	2.514E-01	NOT IDENT.
GE-68	-2.497E-01	1.905E+00	3.777E+00	NOT IDENT.
AS-73	4.709E-02	5.122E+00	9.820E+00	NOT IDENT.
AS-74	0.000E+00	4.730E+03	0.000E+00	SHORT HLIF
SE-75	-6.351E-02	1.680E-01	3.059E-01	FAIL ABUN
BR-77	0.000E+00	1.382E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.250E+02	0.000E+00	SHORT HLIF
RB-83	3.126E-02	5.566E-01	1.083E+00	NOT IDENT.
KR-85	1.789E+00	6.540E+00	1.171E+01	NOT IDENT.
SR-85	1.852E-01	6.763E-01	1.211E+00	NOT IDENT.
RB-86	0.000E+00	2.298E+04	0.000E+00	SHORT HLIF
Y-88	4.852E-02	7.663E-02	2.677E-01	NOT IDENT.
NB-94	2.643E-02	2.816E-02	5.967E-02	NOT IDENT.
NB-95	-4.482E-01	7.824E-01	1.348E+00	NOT IDENT.
NB-95M	-7.774E-02	2.027E+00	3.588E+00	NOT IDENT.
ZR-95	-1.106E-01	1.356E+00	2.525E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	9.017E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	1.017E-02	3.106E-02	5.424E-02	NOT IDENT.
RH-102	-1.268E-02	4.314E-02	8.041E-02	NOT IDENT.
RU-103	-8.177E-01	4.273E+00	8.146E+00	FAIL ABUN
RH-106	2.870E-01	4.005E-01	8.522E-01	NOT IDENT.
RU-106	2.870E-01	4.005E-01	8.522E-01	NOT IDENT.
AG-108M	-2.404E-02	2.189E-02	3.677E-02	NOT IDENT.
AG-110M	-2.067E-02	7.810E-02	1.429E-01	NOT IDENT.
SN-113	-1.728E-01	2.027E-01	3.583E-01	NOT IDENT.
CD-115	0.000E+00	1.463E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	8.675E+04	0.000E+00	SHORT HLIF
TE-123M	7.504E-02	1.194E-01	2.273E-01	NOT IDENT.
SB-124	1.068E+00	1.509E+00	3.831E+00	NOT IDENT.
SB-125	5.590E-02	8.202E-02	1.728E-01	FAIL ABUN
TE-125M	3.300E+01	2.511E+02	4.330E+02	NOT IDENT.
I-126	0.000E+00	6.554E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	9.492E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.293E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	3.417E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.209E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.209E+26	0.000E+00	SHORT HLIF
BA-133	-1.606E-03	3.919E-02	7.061E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	0.000E+00	5.032E-02	1.001E-01	FAIL ABUN
CS-135	6.807E-02	1.326E-01	2.466E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.078E+05	0.000E+00	SHORT HLIF
BA-137M	3.260E-02	3.657E-02	7.489E-02	NOT IDENT.
CS-137	3.443E-02	3.863E-02	7.911E-02	NOT IDENT.
CE-139	3.492E-02	9.631E-02	1.800E-01	NOT IDENT.
BA-140	0.000E+00	8.021E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	2.277E+05	0.000E+00	SHORT HLIF
CE-141	-2.549E+00	2.069E+01	3.738E+01	NOT IDENT.
CE-143	0.000E+00	4.447E+40	0.000E+00	SHORT HLIF
CE-144	8.658E-02	3.246E-01	6.052E-01	NOT IDENT.
PM-144	9.297E-03	3.994E-02	8.052E-02	NOT IDENT.
PR-144	7.690E-01	3.459E+00	6.964E+00	NOT IDENT.
PM-146	-4.613E-03	3.653E-02	6.994E-02	NOT IDENT.
ND-147	0.000E+00	2.538E+07	0.000E+00	SHORT HLIF
PM-149	0.000E+00	1.938E+40	0.000E+00	SHORT HLIF
EU-150	-1.374E-02	2.402E-02	3.900E-02	FAIL ABUN
EU-152	2.263E-02	8.124E-02	1.563E-01	FAIL ABUN
GD-153	3.451E-02	1.485E-01	2.811E-01	NOT IDENT.
EU-154	-5.181E-02	8.030E-02	1.437E-01	NOT IDENT.
TB-160	-1.190E+00	1.530E+00	2.487E+00	FAIL ABUN
HO-166M	2.688E-02	4.531E-02	9.477E-02	NOT IDENT.
TM-171	-1.661E+00	1.166E+01	2.218E+01	NOT IDENT.
HF-172	2.763E-02	2.097E-01	3.599E-01	FAIL ABUN
LU-172	8.659E-02	6.847E-02	1.520E-01	FAIL ABUN
LU-176	3.988E-03	2.147E-02	4.260E-02	FAIL ABUN

HF-181	1.079E+00	3.284E+00	6.687E+00	NOT IDENT.
TA-182	7.436E-01	8.528E-01	1.849E+00	FAIL ABUN
RE-183	-2.026E-01	1.829E+00	3.463E+00	NOT IDENT.
RE-184	-2.740E+00	2.614E+01	4.846E+01	NOT IDENT.
W-188	-4.717E+01	1.004E+02	1.672E+02	FAIL ABUN
IR-192	-1.267E-01	3.466E-01	6.595E-01	FAIL ABUN
HG-203	-7.852E-02	2.006E+00	3.918E+00	FAIL ABUN
BI-207	-1.900E-02	3.968E-02	7.421E-02	FAIL ABUN
PB-210	-1.283E+00	1.617E+00	2.972E+00	NOT IDENT.
BI-211	0.000E+00	4.691E-01	7.832E-01	FAIL ABUN
PB-211	3.265E-02	5.032E-01	9.959E-01	NOT IDENT.
RN-219	8.218E-02	3.087E-01	6.196E-01	FAIL ABUN
RA-223	2.836E-01	4.879E-01	1.005E+00	FAIL ABUN
RA-224	0.000E+00	8.792E-01	1.309E+00	FAIL ABUN
AC-227	1.949E-02	1.984E-01	3.929E-01	FAIL ABUN
TH-227	1.949E-02	1.984E-01	3.929E-01	FAIL ABUN
TH-231	2.836E-01	4.879E-01	1.005E+00	FAIL ABUN
PA-233	-2.120E-02	5.083E-02	9.575E-02	FAIL ABUN
PA-234	1.098E-01	2.475E-01	5.245E-01	NOT IDENT.
PA-234M	2.820E+00	3.809E+00	8.419E+00	NOT IDENT.
NP-237	-2.120E-02	5.083E-02	9.575E-02	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	-1.976E-01	2.067E-01	3.502E-01	FAIL ABUN
PU-239	4.764E+02	3.862E+02	5.310E+02	FAIL ABUN
AM-241	2.954E-02	9.556E-02	1.724E-01	NOT IDENT.
AM-243	8.165E-02	8.055E-02	1.100E-01	FAIL ABUN
CM-243	1.654E-02	7.731E-02	1.368E-01	NOT IDENT.
BK-247	-1.296E-02	6.102E-02	1.061E-01	FAIL ABUN
CM-247	-1.052E-02	2.867E-02	5.364E-02	NOT IDENT.
CF-249	1.569E-02	3.256E-02	6.621E-02	NOT IDENT.
CF-251	6.862E-02	1.006E-01	2.083E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	465	10.66*	1.312E+00	1.597E+01	1.597E+01	9.18
MN-54	834.85	19	99.98*	2.057E+00	4.332E-02	8.395E-02	98.38
CO-57	122.06	40	85.60*	7.574E+00	2.963E-02	6.333E-02	110.46
	136.47	-----	10.68	7.468E+00	-----	Line Not Found	-----
Y-91	1204.77	16	0.26*	1.543E+00	1.960E+01	6.675E+02	79.96
CD-109	88.03	107	3.70*	6.842E+00	2.031E+00	3.177E+00	57.97
SN-126	64.28	0	9.60	4.822E+00	5.031E-03	5.031E-03	15752.45
	86.94	107	8.90	6.842E+00	8.444E-01	8.444E-01	57.97
	87.57	107	37.00*	6.842E+00	2.031E-01	2.031E-01	57.97
PM-147	121.22	40	0.00*	7.574E+00	8.899E+02	1.104E+03	110.46
EU-155	86.55	107	30.70	6.842E+00	2.448E-01	2.757E-01	57.97
	105.31	54	21.10*	7.457E+00	1.643E-01	1.850E-01	111.18
TL-208	277.37	-----	6.60	4.947E+00	-----	Line Not Found	-----
	583.19	176	85.00*	2.718E+00	3.661E-01	3.661E-01	24.08
	860.56	-----	12.50	2.011E+00	-----	Line Not Found	-----
BI-211	72.87	67	1.23	5.884E+00	4.460E+00	4.460E+00	100.67
	351.06	327	12.92*	4.085E+00	2.974E+00	2.974E+00	16.10
BI-212	727.33	34	6.67*	2.290E+00	1.064E+00	1.064E+00	56.79
	785.37	18	1.10	2.156E+00	3.600E+00	3.600E+00	140.46
	1620.50	-----	1.47	1.197E+00	-----	Line Not Found	-----
PB-212	74.82	67	10.28	5.884E+00	5.337E-01	5.337E-01	100.67
	77.11	414	17.10	6.163E+00	1.887E+00	1.887E+00	19.08
	238.63	557	43.60*	5.555E+00	1.105E+00	1.105E+00	12.91
	300.09	60	3.30	4.643E+00	1.896E+00	1.896E+00	63.67
BI-214	609.32	191	45.49*	2.627E+00	7.694E-01	7.696E-01	22.24
	1120.29	33	14.92	1.635E+00	6.500E-01	6.502E-01	60.22
	1764.49	41	15.30	1.106E+00	1.155E+00	1.155E+00	30.50
PB-214	74.82	67	5.80	5.884E+00	9.459E-01	9.463E-01	100.67
	77.11	414	9.70	6.163E+00	3.326E+00	3.328E+00	19.08
	87.09	107	3.41	6.842E+00	2.204E+00	2.205E+00	57.97
	242.00	94	7.25	5.502E+00	1.127E+00	1.128E+00	45.00
	295.22	232	18.42	4.710E+00	1.287E+00	1.287E+00	21.68
	351.93	327	35.60*	4.085E+00	1.079E+00	1.080E+00	16.10
RN-222	609.32	191	45.49*	2.627E+00	7.694E-01	7.696E-01	22.24
	1120.29	33	14.92	1.635E+00	6.500E-01	6.502E-01	60.22
	1764.49	41	15.30	1.106E+00	1.155E+00	1.155E+00	30.50
RA-224	240.99	94	4.10*	5.502E+00	1.994E+00	1.994E+00	45.00
RA-226	609.32	191	45.49*	2.627E+00	7.694E-01	7.696E-01	22.24
	1120.29	33	14.92	1.635E+00	6.500E-01	6.502E-01	60.22
	1764.49	41	15.30	1.106E+00	1.155E+00	1.155E+00	30.50
AC-228	105.21	54	1.10	7.457E+00	3.151E+00	3.151E+00	111.18
	338.32	110	11.27	4.214E+00	1.110E+00	1.110E+00	43.25
	794.95	30	4.25	2.138E+00	1.609E+00	1.609E+00	48.85
	835.71	19	1.61	2.057E+00	2.690E+00	2.690E+00	98.38
	911.20	146	25.80*	1.923E+00	1.408E+00	1.408E+00	21.64
	968.97	74	15.80	1.834E+00	1.229E+00	1.229E+00	29.49
RA-228	105.21	54	1.10	7.457E+00	3.151E+00	3.151E+00	111.18

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	338.32	110	11.27	4.214E+00	1.110E+00	1.110E+00	43.25
	794.95	30	4.25	2.138E+00	1.609E+00	1.609E+00	48.85
	835.71	19	1.61	2.057E+00	2.690E+00	2.690E+00	98.38
	911.20	146	25.80*	1.923E+00	1.408E+00	1.408E+00	21.64
	968.97	74	15.80	1.834E+00	1.229E+00	1.229E+00	29.49
TH-228	74.82	67	10.28	5.884E+00	5.337E-01	5.337E-01	100.67
	77.11	414	17.10	6.163E+00	1.887E+00	1.887E+00	19.08
	238.63	557	43.60*	5.555E+00	1.105E+00	1.105E+00	12.91
	300.09	60	3.30	4.643E+00	1.896E+00	1.896E+00	63.67
TH-229	85.43	43	14.70	6.681E+00	2.108E-01	2.108E-01	112.36
	88.47	107	24.00	6.842E+00	3.131E-01	3.131E-01	57.97
	193.51	-----	4.41*	6.409E+00	-----	Line Not Found	-----
	210.85	42	2.80	6.074E+00	1.196E+00	1.196E+00	140.62
TH-230	609.32	191	45.49*	2.627E+00	7.694E-01	7.694E-01	22.24
	1120.29	33	14.92	1.635E+00	6.500E-01	6.500E-01	60.22
	1764.49	41	15.30	1.106E+00	1.155E+00	1.155E+00	30.50
PA-231	283.69	-----	1.70	4.860E+00	-----	Line Not Found	-----
	301.36	60	5.35*	4.643E+00	1.169E+00	1.169E+00	63.67
TH-232	105.21	54	1.10	7.457E+00	3.151E+00	3.151E+00	111.18
	338.32	110	11.27	4.214E+00	1.110E+00	1.110E+00	43.25
	835.71	19	1.61	2.057E+00	2.690E+00	2.690E+00	98.38
	911.20	146	25.80*	1.923E+00	1.408E+00	1.408E+00	21.64
	968.97	74	15.80	1.834E+00	1.229E+00	1.229E+00	29.49
TH-234	63.29	0	3.70*	4.822E+00	1.305E-02	1.305E-02	15752.45
	92.59	121	4.23	7.101E+00	1.932E+00	1.932E+00	61.25
U-234	609.32	191	45.49*	2.627E+00	7.694E-01	7.694E-01	22.24
	1120.29	33	14.92	1.635E+00	6.500E-01	6.500E-01	60.22
	1764.49	41	15.30	1.106E+00	1.155E+00	1.155E+00	30.50
U-235	89.96	47	3.47	6.978E+00	9.241E-01	9.241E-01	85.65
	93.35	121	5.60	7.101E+00	1.459E+00	1.459E+00	61.25
	143.76	-----	10.96*	7.370E+00	-----	Line Not Found	-----
	163.33	-----	5.08	7.024E+00	-----	Line Not Found	-----
	185.72	77	57.20	6.562E+00	9.797E-02	9.797E-02	85.62
	205.31	-----	5.01	6.171E+00	-----	Line Not Found	-----
U-238	63.29	0	3.70*	4.822E+00	1.305E-02	1.305E-02	15752.45
	92.59	121	4.23	7.101E+00	1.932E+00	1.932E+00	61.25
AM-243	43.53	-----	5.90	1.315E+00	-----	Line Not Found	-----
	74.66	67	67.20*	5.884E+00	8.164E-02	8.165E-02	100.67
ANH-511	511.00	16	100.00*	3.019E+00	2.603E-02	2.603E-02	286.68

Flag: "*" = Keyline

Total number of lines in spectrum 55
 Number of unidentified lines 20
 Number of lines tentatively identified by NID 35 63.64%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.597E+01	1.597E+01	0.147E+01	9.18	
MN-54	312.05D	1.94	4.332E-02	8.395E-02	8.259E-02	98.38	
CO-57	271.74D	2.14	2.963E-02	6.333E-02	6.995E-02	110.46	
Y-91	58.51D	34.1	1.960E+01	6.675E+02	5.337E+02	79.96	
CD-109	461.40D	1.56	2.031E+00	3.177E+00	1.842E+00	57.97	
SN-126	2.30E+05Y	1.00	2.031E-01	2.031E-01	1.177E-01	57.97	
PM-147	2.62Y	1.24	8.899E+02	1.104E+03	1.219E+03	110.46	
EU-155	4.75Y	1.13	1.643E-01	1.850E-01	2.057E-01	111.18	
TL-208	1.41E+10Y	1.00	3.661E-01	3.661E-01	0.881E-01	24.08	
BI-211	7.04E+08Y	1.00	2.974E+00	2.974E+00	0.479E+00	16.10	
BI-212	1.41E+10Y	1.00	1.064E+00	1.064E+00	0.604E+00	56.79	
PB-212	1.41E+10Y	1.00	1.105E+00	1.105E+00	0.143E+00	12.91	
BI-214	1600.00Y	1.00	7.694E-01	7.696E-01	1.712E-01	22.24	
PB-214	1600.00Y	1.00	1.079E+00	1.080E+00	0.174E+00	16.10	
RN-222	1600.00Y	1.00	7.694E-01	7.696E-01	1.712E-01	22.24	
RA-224	1.41E+10Y	1.00	1.994E+00	1.994E+00	0.897E+00	45.00	
RA-226	1600.00Y	1.00	7.694E-01	7.696E-01	1.712E-01	22.24	
AC-228	1.41E+10Y	1.00	1.408E+00	1.408E+00	0.305E+00	21.64	
RA-228	1.41E+10Y	1.00	1.408E+00	1.408E+00	0.305E+00	21.64	
TH-228	1.41E+10Y	1.00	1.105E+00	1.105E+00	0.143E+00	12.91	
TH-229	7340.00Y	1.00	3.131E-01	3.131E-01	1.815E-01	57.97	K
TH-230	7.54E+04Y	1.00	7.694E-01	7.694E-01	1.711E-01	22.24	
PA-231	7.04E+08Y	1.00	1.169E+00	1.169E+00	0.745E+00	63.67	
TH-232	1.41E+10Y	1.00	1.408E+00	1.408E+00	0.305E+00	21.64	
TH-234	4.47E+09Y	1.00	1.305E-02	1.305E-02	205.6E-02	15752.45	
U-234	2.45E+05Y	1.00	7.694E-01	7.694E-01	1.711E-01	22.24	
U-235	7.04E+08Y	1.00	9.797E-02	9.797E-02	8.388E-02	85.62	K
U-238	4.47E+09Y	1.00	1.305E-02	1.305E-02	205.6E-02	15752.45	
AM-243	7370.00Y	1.00	8.164E-02	8.165E-02	8.220E-02	100.67	
ANH-511	1.00E+09Y	1.00	2.603E-02	2.603E-02	7.461E-02	286.68	
Total Activity :			9.474E+02	1.811E+03			

Grand Total Activity : 9.474E+02 1.811E+03

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
7	26.75	22	11	1.19	53.71	51	16	4.30E-03	****	1.71E-07	
7	28.24	54	98	2.00	56.68	51	16	1.05E-02	****	1.29E-05	
0	128.75	47	103	1.75	257.57	255	6	1.05E-02	82.7	7.54E+00	T
0	270.34	77	123	1.48	540.60	535	13	1.84E-02	69.1	5.05E+00	T
0	446.92	43	33	2.59	893.68	885	15	1.09E-02	68.8	3.36E+00	
0	462.90	51	55	1.74	925.64	919	15	1.29E-02	72.2	3.27E+00	T
0	543.83	69	33	5.63	1087.48	1074	30	1.76E-02	56.2	2.87E+00	
0	654.51	27	15	1.06	1308.89	1304	10	7.08E-03	69.0	2.48E+00	
0	957.75	14	11	3.21	1915.67	1910	9	3.83E-03	****	1.85E+00	
1	964.57	42	10	1.94	1929.32	1922	22	1.15E-02	44.6	1.84E+00	T
0	1088.96	11	12	1.19	2178.31	2174	9	2.92E-03	****	1.67E+00	
0	1095.52	29	11	4.82	2191.43	2183	17	8.07E-03	66.8	1.66E+00	
0	1104.64	12	6	3.10	2209.70	2204	11	3.19E-03	98.6	1.65E+00	
0	1108.77	11	4	1.17	2217.95	2214	7	2.92E-03	85.4	1.65E+00	
1	1206.69	13	7	1.87	2414.00	2400	20	3.77E-03	****	1.54E+00	
0	1238.48	26	7	2.23	2477.66	2472	10	7.42E-03	54.4	1.51E+00	T
0	1258.60	11	11	1.01	2517.96	2512	9	3.12E-03	****	1.49E+00	
0	1288.43	15	7	2.88	2577.68	2572	13	4.17E-03	87.6	1.46E+00	
0	1334.20	17	6	1.19	2669.34	2664	12	4.73E-03	75.1	1.42E+00	
0	1360.53	5	4	0.55	2722.08	2718	6	1.53E-03	****	1.39E+00	
0	1377.89	21	5	1.34	2756.85	2751	11	6.08E-03	59.3	1.38E+00	
0	1416.25	6	8	0.55	2833.68	2823	12	1.74E-03	****	1.35E+00	
0	1588.20	11	6	4.32	3178.14	3171	12	3.06E-03	****	1.22E+00	
0	1630.78	11	0	0.83	3263.45	3257	11	3.06E-03	60.3	1.19E+00	
0	1729.10	13	3	0.72	3460.47	3453	13	3.67E-03	78.0	1.13E+00	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
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DETECTOR AND SAMPLE DATA

```
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235006.CNF;1
* Acquisition date   : 3-OCT-2016 08:02:32 Sensitivity      : 3.000
* Detector ID       : GAM20 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:14.99 Half life ratio : *****
* Sample date       : 10-DEC-2015 13:25:00 Nuclide Library : SOLID
* Sample ID         : G405235006 Analyst initials: MXR1
* Batch Number      : 1596247 Sample Quantity : 1.5634E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
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CALIBRATION INFORMATION

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* Eff. Cal. date    : 30-JUN-2016 06:52:39 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM20_CAN.CNF;15
*****
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.384E-01
MN-54	5.004E-02
CO-57	3.745E-02
Y-91	2.941E+02
CD-109	8.436E-01
SN-126	5.411E-02
PM-147	5.496E+02
EU-155	7.715E-02
TL-208	2.397E-02
BI-212	3.053E-01
PB-212	3.968E-02
BI-214	5.156E-02
PB-214	4.948E-02
RN-222	5.156E-02
RA-226	5.156E-02
AC-228	6.554E-02
RA-228	6.554E-02
TH-228	3.968E-02
TH-229	3.882E-01
TH-230	5.154E-02
PA-231	2.781E-01
TH-232	6.554E-02
TH-234	7.400E-01
U-234	5.154E-02
U-235	1.435E-01
U-238	7.400E-01
ANH-511	2.085E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	7.828E+00	NOT IDENT.
NA-22	2.373E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	0.000E+00	NOT IDENT.

SC-46	2.652E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
CO-56	2.781E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-58	3.229E-01	NOT IDENT.
FE-59	3.818E+00	NOT IDENT.
CO-60	3.097E-02	NOT IDENT.
ZN-65	1.072E-01	NOT IDENT.
GE-68	1.628E+00	NOT IDENT.
AS-73	4.638E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.403E-01	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.866E-01	NOT IDENT.
KR-85	5.311E+00	NOT IDENT.
SR-85	5.493E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	9.115E-02	NOT IDENT.
NB-94	2.700E-02	NOT IDENT.
NB-95	5.977E-01	NOT IDENT.
NB-95M	1.670E+00	NOT IDENT.
ZR-95	1.124E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.551E-02	NOT IDENT.
RH-102	3.477E-02	NOT IDENT.
RU-103	3.613E+00	FAIL ABUN
RH-106	3.807E-01	NOT IDENT.
RU-106	3.807E-01	NOT IDENT.
AG-108M	1.621E-02	NOT IDENT.
AG-110M	6.085E-02	NOT IDENT.
SN-113	1.624E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.071E-01	NOT IDENT.
SB-124	1.548E+00	NOT IDENT.
SB-125	7.840E-02	FAIL ABUN
TE-125M	2.040E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.246E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	4.526E-02	FAIL ABUN
CS-135	1.149E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	3.438E-02	NOT IDENT.
CS-137	3.632E-02	NOT IDENT.
CE-139	8.445E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.757E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.854E-01	NOT IDENT.
PM-144	3.526E-02	NOT IDENT.
PR-144	3.048E+00	NOT IDENT.
PM-146	3.151E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-149	0.000E+00	SHORT HLIF
EU-150	1.781E-02	FAIL ABUN
EU-152	7.175E-02	FAIL ABUN
GD-153	1.327E-01	NOT IDENT.
EU-154	5.823E-02	NOT IDENT.
TB-160	1.050E+00	FAIL ABUN
HO-166M	4.209E-02	NOT IDENT.
TM-171	1.044E+01	NOT IDENT.
HF-172	1.689E-01	FAIL ABUN
LU-172	6.752E-02	FAIL ABUN
LU-176	1.971E-02	FAIL ABUN
HF-181	2.999E+00	NOT IDENT.

TA-182	8.279E-01	FAIL ABUN
RE-183	1.634E+00	NOT IDENT.
RE-184	2.117E+01	NOT IDENT.
W-188	7.674E+01	FAIL ABUN
IR-192	2.995E-01	FAIL ABUN
HG-203	1.817E+00	FAIL ABUN
BI-207	3.182E-02	FAIL ABUN
PB-210	1.398E+00	NOT IDENT.
BI-211	3.789E-01	FAIL ABUN
PB-211	4.488E-01	NOT IDENT.
RN-219	2.818E-01	FAIL ABUN
RA-223	4.637E-01	FAIL ABUN
RA-224	6.245E-01	FAIL ABUN
AC-227	1.828E-01	FAIL ABUN
TH-227	1.828E-01	FAIL ABUN
TH-231	4.637E-01	FAIL ABUN
PA-233	4.395E-02	FAIL ABUN
PA-234	2.327E-01	NOT IDENT.
PA-234M	3.770E+00	NOT IDENT.
NP-237	4.395E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.635E-01	FAIL ABUN
PU-239	2.509E+02	FAIL ABUN
AM-241	8.159E-02	NOT IDENT.
AM-243	5.328E-02	FAIL ABUN
CM-243	6.378E-02	NOT IDENT.
BK-247	4.862E-02	FAIL ABUN
CM-247	2.425E-02	NOT IDENT.
CF-249	3.038E-02	NOT IDENT.
CF-251	9.823E-02	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235006.CNF;1
* Acquisition date   : 3-OCT-2016 08:02:32 Sensitivity      : 3.000
* Detector ID        : GAM20 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:14.99 Half life ratio  : *****
* Sample date        : 10-DEC-2015 13:25:00 Nuclide Library : SOLID
* Sample ID          : G405235006 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.5634E+02 GRAM
*                   : Quantity Err(%) : 1.2792E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-JUN-2016 06:52:39 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM20_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.597E+01	1.661E+00	1.661E+00
MN-54	8.395E-02	8.101E-02	8.101E-02
CO-57	6.333E-02	6.862E-02	6.862E-02
Y-91	6.675E+02	5.236E+02	5.236E+02
CD-109	1.322E+00	1.865E+00	1.865E+00
SN-126	8.453E-02	1.191E-01	1.191E-01
PM-147	1.104E+03	1.196E+03	1.196E+03
EU-155	1.850E-01	2.020E-01	2.020E-01
TL-208	3.661E-01	8.776E-02	8.776E-02
BI-212	1.064E+00	5.944E-01	5.944E-01
PB-212	1.105E+00	1.515E-01	1.515E-01
BI-214	7.696E-01	1.710E-01	1.710E-01
PB-214	1.080E+00	1.761E-01	1.761E-01
RN-222	7.696E-01	1.710E-01	1.710E-01
RA-226	7.696E-01	1.710E-01	1.710E-01
AC-228	1.408E+00	3.072E-01	3.072E-01
RA-228	1.408E+00	3.072E-01	3.072E-01
TH-228	1.105E+00	1.515E-01	1.515E-01
TH-229	7.367E-02	4.123E-01	4.123E-01
TH-230	7.694E-01	1.709E-01	1.709E-01
PA-231	1.169E+00	7.712E-01	7.712E-01
TH-232	1.408E+00	3.072E-01	3.072E-01
TH-234	1.305E-02	2.015E+00	2.015E+00
U-234	7.694E-01	1.709E-01	1.709E-01
U-235	-2.283E-02	1.684E-01	1.684E-01
U-238	1.305E-02	2.015E+00	2.015E+00
ANH-511	2.603E-02	7.313E-02	7.313E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.023E+00	8.808E+00	8.820E+00	NOT IDENT.
NA-22	-2.495E-02	3.359E-02	3.542E-02	NOT IDENT.
NA-24	1.000E+41	3.151E+41	0.000E+00	SHORT HLIF

AL-26	0.000E+00	0.000E+00	0.000E+00	NOT IDENT.
SC-46	1.332E-01	2.928E-01	2.989E-01	FAIL ABUN
V-48	-7.895E+02	1.052E+04	1.053E+04	SHORT HLIF
CR-51	-1.589E+02	3.022E+02	3.105E+02	SHORT HLIF
CO-56	1.650E-01	2.953E-01	3.045E-01	FAIL ABUN
MN-56	1.000E+41	1.790E+41	0.000E+00	SHORT HLIF
CO-58	-3.271E-01	4.578E-01	4.809E-01	NOT IDENT.
FE-59	4.920E+00	3.183E+00	3.880E+00	NOT IDENT.
CO-60	4.019E-02	2.821E-02	3.353E-02	NOT IDENT.
ZN-65	-3.067E-02	1.335E-01	1.342E-01	NOT IDENT.
GE-68	-2.497E-01	1.905E+00	1.909E+00	NOT IDENT.
AS-73	4.709E-02	5.122E+00	5.122E+00	NOT IDENT.
AS-74	5.866E+02	4.730E+03	4.738E+03	SHORT HLIF
SE-75	-6.351E-02	1.681E-01	1.705E-01	FAIL ABUN
BR-77	1.092E+38	9.390E+38	0.000E+00	SHORT HLIF
SR-82	-3.489E+02	6.252E+02	6.447E+02	SHORT HLIF
RB-83	3.126E-02	5.566E-01	5.568E-01	NOT IDENT.
KR-85	1.789E+00	6.540E+00	6.590E+00	NOT IDENT.
SR-85	1.852E-01	6.763E-01	6.815E-01	NOT IDENT.
RB-86	-8.693E+03	2.298E+04	2.331E+04	SHORT HLIF
Y-88	4.852E-02	7.669E-02	7.975E-02	NOT IDENT.
NB-94	2.643E-02	2.818E-02	3.059E-02	NOT IDENT.
NB-95	-4.482E-01	7.827E-01	8.083E-01	NOT IDENT.
NB-95M	-7.774E-02	2.027E+00	2.028E+00	NOT IDENT.
ZR-95	-1.106E-01	1.356E+00	1.356E+00	NOT IDENT.
NB-97	-1.000E+41	1.063E+42	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.758E+42	0.000E+00	SHORT HLIF
MO-99	-2.556E+31	9.018E+31	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	4.493E+41	0.000E+00	SHORT HLIF
RH-101	1.017E-02	3.111E-02	3.145E-02	NOT IDENT.
RH-102	-1.268E-02	4.315E-02	4.353E-02	NOT IDENT.
RU-103	-8.177E-01	4.273E+00	4.289E+00	FAIL ABUN
RH-106	2.870E-01	4.009E-01	4.212E-01	NOT IDENT.
RU-106	2.870E-01	4.009E-01	4.212E-01	NOT IDENT.
AG-108M	-2.404E-02	2.191E-02	2.444E-02	NOT IDENT.
AG-110M	-2.067E-02	7.810E-02	7.866E-02	NOT IDENT.
SN-113	-1.728E-01	2.029E-01	2.173E-01	NOT IDENT.
CD-115	-2.604E+38	1.464E+39	0.000E+00	SHORT HLIF
SN-117M	-6.846E+03	8.675E+04	8.681E+04	SHORT HLIF
TE-123M	7.504E-02	1.195E-01	1.242E-01	NOT IDENT.
SB-124	1.068E+00	1.510E+00	1.585E+00	NOT IDENT.
SB-125	5.590E-02	8.205E-02	8.583E-02	FAIL ABUN
TE-125M	3.300E+01	2.511E+02	2.516E+02	NOT IDENT.
I-126	2.407E+04	6.554E+05	6.555E+05	SHORT HLIF
SB-126	-2.921E+05	9.508E+05	9.598E+05	SHORT HLIF
SB-127	-1.057E+21	1.301E+22	0.000E+00	SHORT HLIF
I-131	2.058E+09	3.419E+09	3.542E+09	SHORT HLIF
I-132	-1.000E+41	1.839E+42	0.000E+00	SHORT HLIF
TE-132	1.221E+26	2.263E+26	0.000E+00	SHORT HLIF
BA-133	-1.606E-03	3.919E-02	3.919E-02	NOT IDENT.
I-133	-1.000E+41	1.045E+43	0.000E+00	SHORT HLIF
CS-134	1.051E-01	5.052E-02	6.926E-02	FAIL ABUN
CS-135	6.807E-02	1.327E-01	1.362E-01	NOT IDENT.
I-135	-1.000E+41	2.090E+42	0.000E+00	SHORT HLIF
CS-136	-4.409E+03	2.078E+05	2.078E+05	SHORT HLIF
BA-137M	3.260E-02	3.659E-02	3.943E-02	NOT IDENT.
CS-137	3.443E-02	3.866E-02	4.166E-02	NOT IDENT.
CE-139	3.492E-02	9.656E-02	9.784E-02	NOT IDENT.
BA-140	2.207E+04	8.021E+05	8.022E+05	SHORT HLIF
LA-140	-5.841E+04	2.277E+05	2.292E+05	SHORT HLIF
CE-141	-2.549E+00	2.069E+01	2.072E+01	NOT IDENT.
CE-143	1.000E+41	4.561E+40	0.000E+00	SHORT HLIF
CE-144	8.658E-02	3.247E-01	3.270E-01	NOT IDENT.
PM-144	9.297E-03	3.995E-02	4.017E-02	NOT IDENT.
PR-144	7.690E-01	3.460E+00	3.477E+00	NOT IDENT.
PM-146	-4.613E-03	3.653E-02	3.659E-02	NOT IDENT.
ND-147	-1.414E+07	2.539E+07	2.618E+07	SHORT HLIF
PM-149	-1.459E+40	1.964E+40	0.000E+00	SHORT HLIF
EU-150	-1.374E-02	2.403E-02	2.481E-02	FAIL ABUN
EU-152	2.263E-02	8.125E-02	8.189E-02	FAIL ABUN
GD-153	3.451E-02	1.485E-01	1.493E-01	NOT IDENT.
EU-154	-5.181E-02	8.033E-02	8.365E-02	NOT IDENT.
TB-160	-1.190E+00	1.532E+00	1.623E+00	FAIL ABUN
HO-166M	2.688E-02	4.533E-02	4.692E-02	NOT IDENT.
TM-171	-1.661E+00	1.166E+01	1.168E+01	NOT IDENT.
HF-172	2.763E-02	2.097E-01	2.101E-01	FAIL ABUN
LU-172	8.659E-02	6.902E-02	7.930E-02	FAIL ABUN
LU-176	3.988E-03	2.147E-02	2.154E-02	FAIL ABUN

HF-181	1.079E+00	3.284E+00	3.320E+00	NOT IDENT.
TA-182	7.436E-01	8.532E-01	9.167E-01	FAIL ABUN
RE-183	-2.026E-01	1.829E+00	1.832E+00	NOT IDENT.
RE-184	-2.740E+00	2.614E+01	2.617E+01	NOT IDENT.
W-188	-4.717E+01	1.005E+02	1.027E+02	FAIL ABUN
IR-192	-1.267E-01	3.466E-01	3.513E-01	FAIL ABUN
HG-203	-7.852E-02	2.006E+00	2.007E+00	FAIL ABUN
BI-207	-1.900E-02	3.968E-02	4.060E-02	FAIL ABUN
PB-210	-1.283E+00	1.621E+00	1.721E+00	NOT IDENT.
BI-211	2.974E+00	4.874E-01	1.426E+00	FAIL ABUN
PB-211	3.265E-02	5.032E-01	5.034E-01	NOT IDENT.
RN-219	8.218E-02	3.089E-01	3.111E-01	FAIL ABUN
RA-223	2.836E-01	4.882E-01	5.047E-01	FAIL ABUN
RA-224	1.994E+00	8.856E-01	1.262E+00	FAIL ABUN
AC-227	1.949E-02	1.984E-01	1.986E-01	FAIL ABUN
TH-227	1.949E-02	1.984E-01	1.986E-01	FAIL ABUN
TH-231	2.836E-01	4.882E-01	5.047E-01	FAIL ABUN
PA-233	-2.120E-02	5.084E-02	5.173E-02	FAIL ABUN
PA-234	1.098E-01	2.776E-01	2.820E-01	NOT IDENT.
PA-234M	2.820E+00	3.811E+00	4.018E+00	NOT IDENT.
NP-237	-2.120E-02	5.084E-02	5.173E-02	FAIL ABUN
NP-238	-2.635E+40	2.010E+41	0.000E+00	SHORT HLIF
NP-239	-1.976E-01	2.073E-01	2.257E-01	FAIL ABUN
PU-239	4.764E+02	3.868E+02	4.424E+02	FAIL ABUN
AM-241	2.954E-02	9.558E-02	9.651E-02	NOT IDENT.
AM-243	8.165E-02	8.071E-02	8.870E-02	FAIL ABUN
CM-243	1.654E-02	7.733E-02	7.769E-02	NOT IDENT.
BK-247	-1.296E-02	6.107E-02	6.135E-02	FAIL ABUN
CM-247	-1.052E-02	2.873E-02	2.911E-02	NOT IDENT.
CF-249	1.569E-02	3.259E-02	3.335E-02	NOT IDENT.
CF-251	6.862E-02	1.009E-01	1.055E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	95.6707	87.09	127.8269	136.47	90.6452
45.60	88.5982	87.57	127.9089	140.51	0.0000
46.54	95.1794	88.03	127.9884	143.76	91.3067
49.72	0.0000	88.34	114.3227	144.24	88.9131
51.35	100.3728	88.47	114.3421	145.44	81.7012
51.87	99.3889	89.96	97.7650	152.43	84.7055
52.39	89.7516	1093.63	97.8522	153.25	0.0000
52.97	87.6816	91.11	0.0000	323.87	92.2256
53.44	96.4237	92.59	98.1009	156.02	0.0000
54.07	90.0252	93.35	98.1973	158.56	0.0000
57.36	0.0000	94.56	87.5926	159.00	69.1694
57.53	90.5761	94.65	87.6031	162.33	68.1407
57.98	97.1988	94.67	87.6054	162.66	0.0000
59.27	94.8598	94.87	87.6274	163.33	70.6829
59.32	94.8677	97.43	84.4413	165.86	68.3581
59.54	94.9031	98.43	85.7053	176.31	75.2582
60.96	98.0573	98.44	85.7065	176.60	0.0000
61.17	98.0917	99.53	86.9820	177.52	75.3369
62.93	114.5288	100.11	70.7961	181.07	0.0000
63.29	114.5964	102.03	69.7998	181.52	69.2938
63.58	114.6506	103.18	68.3440	184.41	75.7764
64.28	114.7809	103.37	59.0379	143.76	74.1739
66.73	115.2322	105.21	79.4105	193.51	80.5873
67.24	143.4160	105.31	79.4198	197.03	73.1591
125.81	134.6384	106.12	79.4966	198.01	61.2971
67.75	134.6532	106.47	79.5298	201.83	64.0450
69.67	129.1194	109.28	84.4868	203.43	67.9726
70.83	141.2427	111.00	94.0619	205.31	71.9260
72.81	118.5529	111.76	0.0000	210.85	77.3932
72.87	118.5634	114.06	96.7519	215.65	69.0454
74.66	118.8796	116.30	0.0000	222.11	74.5816
74.82	118.9079	116.74	91.1279	227.09	76.5954
74.97	118.9338	119.76	71.2473	227.38	76.6115
77.11	119.3066	121.12	63.0289	228.16	0.0000
78.74	102.2885	121.22	63.0358	228.18	63.5898
79.69	100.9205	121.78	77.7523	116.74	63.5898
80.12	85.9099	122.06	88.8866	235.69	61.7442
80.19	0.0000	122.92	73.0823	235.96	61.7556
80.57	83.7022	123.07	77.8615	238.63	65.8218
81.00	90.5438	265.00	79.5029	238.98	0.0000
81.07	104.1359	125.81	74.9039	240.99	79.1171
81.75	83.8411	127.23	75.0167	242.00	62.0188
83.79	93.9259	127.91	76.6682	244.70	37.0166
84.00	84.8608	129.30	78.3799	252.40	0.0000
85.43	93.3780	131.20	88.1520	252.80	46.0850
86.55	93.5194	133.02	83.0999	254.15	0.0000
86.79	93.5494	133.52	84.3480	256.23	57.7399
86.94	127.8013	136.00	88.1857	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	48.2377	355.39	0.0000	584.27	22.9722
264.80	48.2421	356.01	35.3600	595.83	0.0000
265.00	44.2279	364.49	0.0000	427.87	23.1127
268.22	51.0358	366.42	0.0000	602.52	0.0000
269.46	49.2854	372.51	35.1934	604.72	23.6737
270.03	49.3033	375.05	36.1925	607.14	28.4337
271.23	49.3413	377.52	26.7023	609.32	28.4568
273.65	0.0000	356.01	26.7889	610.33	22.1416
276.40	47.5256	388.16	33.5595	614.28	31.6760
277.37	51.3373	388.63	0.0000	618.01	16.9167
277.60	49.5439	391.69	46.1064	620.36	29.6304
278.00	45.0511	264.66	34.7344	621.93	14.8232
279.20	55.0045	401.81	29.9272	630.19	0.0000
279.54	52.3100	402.40	35.7301	631.29	16.9980
279.70	55.9239	404.85	27.0715	633.25	12.7573
280.46	60.4625	410.95	35.8799	634.78	0.0000
283.69	43.4043	413.71	33.0150	635.95	22.3467
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	53.4087	423.72	0.0000	645.85	20.2896
285.90	0.0000	427.09	26.3859	657.76	22.5193
287.50	41.6950	427.87	22.4848	657.90	0.0000
290.67	51.7676	433.94	34.3143	661.66	24.6967
293.27	0.0000	439.40	24.7688	664.57	0.0000
351.93	28.6879	453.88	29.6832	666.33	0.0000
295.96	30.0681	463.37	24.8418	666.50	0.0000
879.38	27.3779	468.07	23.8979	667.71	0.0000
299.98	34.2514	473.00	0.0000	677.62	16.1951
300.09	34.2537	475.06	16.9799	685.70	0.0000
300.13	34.2545	476.78	20.9910	695.00	0.0000
301.36	34.2796	477.60	19.9984	696.49	14.1251
302.85	39.7998	482.18	21.0402	696.51	14.1251
256.23	42.5872	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	19.5630
306.78	47.6889	497.08	23.1919	697.49	20.6514
308.46	54.1626	505.52	21.2508	702.65	17.4199
311.90	49.6736	507.63	0.0000	706.68	19.6238
316.51	38.7393	511.00	29.4136	711.68	14.1960
319.41	0.0000	514.00	27.4197	720.70	0.0000
320.08	0.0000	514.00	27.4197	721.93	0.0000
321.04	44.3896	520.40	25.4557	722.78	27.9467
323.87	37.0516	520.69	0.0000	722.91	27.9477
325.23	56.5471	522.65	0.0000	723.31	23.0192
328.76	0.0000	527.90	0.0000	724.19	11.5130
333.37	51.6857	528.26	26.5586	727.33	16.4636
333.97	48.9090	529.59	20.4411	733.00	19.7922
334.37	53.1128	529.87	0.0000	735.93	13.2075
338.28	40.1550	531.02	0.0000	333.97	17.6185
338.32	40.1559	537.26	0.0000	739.50	0.0000
311.90	51.8912	546.56	0.0000	747.24	19.8823
340.48	51.8912	552.55	10.8303	748.06	15.4680
340.55	0.0000	563.25	18.6445	752.31	25.4454
344.28	37.1024	569.33	24.9180	753.82	0.0000
345.93	43.8883	946.00	30.1104	756.73	23.2653
351.06	37.6164	569.70	30.1128	756.80	23.2661
351.93	37.6343	583.19	22.9623	884.68	16.6559

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	28.8861	1274.44	12.4457	1620.50	6.0806
766.42	27.7812	1001.03	12.4606	1621.92	4.0547
766.84	18.8933	1002.74	13.3566	1678.03	0.0000
772.60	0.0000	1004.73	24.0535	1690.97	2.0516
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	0.0000
778.90	11.1552	1028.54	0.0000	1063.66	3.1183
783.70	0.0000	1037.84	10.7798	1771.35	3.1190
785.37	15.0892	1038.76	0.0000	1791.20	0.0000
792.07	10.0800	631.29	14.4043	1808.65	0.0000
794.95	13.4517	1048.07	0.0000	1810.72	0.0000
795.86	18.5014	1049.04	11.7098	1836.06	0.0000
810.06	19.1430	1050.41	12.6149		
810.29	22.5228	1063.66	17.1758		
344.28	20.2712	1077.00	0.0000		
810.76	18.0208	1077.34	14.5117		
815.77	0.0000	1085.87	8.7252		
1048.07	0.0000	1093.63	7.2842		
832.01	13.6006	1099.45	0.0000		
834.85	21.5520	1112.07	8.7791		
835.71	21.5575	1112.84	14.6348		
836.80	0.0000	1115.54	13.5985		
846.75	0.0000	1120.29	11.7281		
846.77	6.8293	1120.55	16.1272		
856.80	0.0000	1221.41	19.2466		
860.56	7.9992	1129.67	13.7741		
871.09	12.6077	1131.51	0.0000		
873.19	11.4685	1147.95	0.0000		
875.33	0.0000	1173.23	20.4048		
879.38	18.3815	1177.95	18.5693		
880.51	14.9397	1189.05	17.6849		
883.24	6.9004	1204.77	9.3402		
884.68	13.8066	1221.41	14.0616		
889.28	10.3682	1231.02	15.9697		
894.76	17.3065	1235.36	0.0000		
898.04	16.1676	1238.28	15.0537		
900.72	13.8682	1260.41	0.0000		
903.28	17.3474	1271.87	7.5815		
911.20	8.1128	1274.44	11.3782		
912.08	8.1148	1274.54	12.3264		
923.98	0.0000	1291.59	7.6128		
926.50	12.8020	1298.22	0.0000		
929.11	12.8110	1312.11	0.0000		
937.49	20.1348	1332.49	1.5355		
944.13	0.0000	1362.66	0.0000		
946.00	15.7934	1365.19	11.5928		
949.00	17.5623	1368.63	0.0000		
667.71	0.0000	1384.29	8.7275		
962.31	7.0496	1408.01	6.2355		
964.08	15.1130	1457.56	0.0000		
966.17	15.1214	1460.82	2.9528		
911.20	15.1324	1489.16	3.9583		
968.97	15.1324	1505.03	12.9024		
983.53	0.0000	1584.12	6.4441		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                   *
*                               Charleston, SC 29407                             *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235007.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM32.CNF;277
Background date : 2-OCT-2016 11:01:57.
Sample date      : 10-DEC-2015 13:55:00 Acquisition date : 3-OCT-2016 08:02:54.
Sample ID       : G405235007 Sample quantity : 1.52523E+02 GRAM
Detector name   : GAM32 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.63 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596247 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	62.99*	45	145	1.34	127.20	123	9	1.25E-02	51.6	
2	2	75.19	109	157	1.29	151.59	147	13	3.02E-02	23.0	9.54E-01
3	2	77.47	181	135	1.14	156.14	147	13	5.02E-02	13.1	
4	0	87.49	38	136	1.68	176.20	174	6	1.05E-02	51.5	
5	5	93.12*	46	153	1.93	187.46	184	10	1.28E-02	51.7	4.56E+00
6	5	94.77	32	84	1.26	190.76	184	10	8.77E-03	57.2	
7	0	129.53	31	117	1.78	260.27	256	8	8.50E-03	64.0	
8	0	186.37*	139	169	1.23	373.96	368	13	3.85E-02	21.6	
9	0	209.43	71	76	1.25	420.08	416	8	1.97E-02	24.4	
10	2	239.11*	381	91	1.23	479.43	474	17	1.06E-01	6.6	1.54E+00
11	2	242.11	93	90	1.62	485.43	474	17	2.57E-02	25.5	
12	0	270.47	46	61	1.08	542.17	537	10	1.27E-02	35.6	
13	0	295.71*	168	74	1.34	592.64	588	11	4.66E-02	12.7	
14	0	300.59	24	52	1.45	602.40	599	8	6.67E-03	55.9	
15	0	338.59	114	63	1.03	678.40	673	11	3.15E-02	16.5	
16	0	352.25*	255	67	1.13	705.72	699	12	7.08E-02	9.0	
17	0	464.99	14	51	0.67	931.20	925	11	3.97E-03	101.1	
18	0	511.31*	46	53	1.96	1023.86	1017	14	1.28E-02	41.6	
19	0	534.57	24	36	3.98	1070.37	1064	13	6.57E-03	56.1	
20	0	583.92*	139	38	1.19	1169.08	1162	14	3.85E-02	12.8	
21	0	609.94*	165	38	1.42	1221.11	1215	14	4.59E-02	11.3	
22	0	662.17	91	55	1.77	1325.59	1319	13	2.52E-02	19.9	
23	7	707.28	11	9	1.96	1415.81	1413	25	3.12E-03	48.2	1.37E+00
24	7	710.32	27	15	2.00	1421.88	1413	25	7.41E-03	35.6	
25	0	720.76	14	7	3.40	1442.77	1438	10	3.86E-03	45.4	
26	0	728.15*	35	27	0.95	1457.55	1450	12	9.78E-03	34.8	
27	0	797.49	23	26	1.86	1596.23	1586	14	6.26E-03	53.8	
28	0	803.54*	19	11	0.66	1608.33	1604	11	5.25E-03	44.7	
29	0	812.25	13	11	3.67	1625.76	1617	13	3.52E-03	64.3	
30	0	816.56	9	15	1.70	1634.38	1630	8	2.62E-03	76.6	
31	0	861.47*	20	18	1.45	1724.20	1719	10	5.62E-03	45.5	
32	0	911.71*	103	8	1.62	1824.69	1819	11	2.87E-02	11.5	
33	0	969.39	56	44	1.73	1940.04	1933	17	1.56E-02	30.9	
34	0	996.21	12	13	1.17	1993.69	1989	12	3.43E-03	63.2	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1049.83	19	6	3.87	2100.93	2093	14	5.20E-03	37.6	
36	0	1121.18*	38	14	1.72	2243.64	2238	10	1.05E-02	25.4	
37	0	1190.02	9	7	0.61	2381.31	2378	6	2.57E-03	56.4	
38	0	1227.61	16	12	3.52	2456.49	2449	15	4.58E-03	50.8	
39	0	1234.03	27	5	2.60	2469.34	2464	10	7.53E-03	24.6	
40	0	1239.00	23	6	1.24	2479.29	2475	11	6.25E-03	29.2	
41	0	1245.45	17	3	3.62	2492.19	2486	11	4.79E-03	30.4	
42	0	1250.95	17	15	3.83	2503.18	2497	14	4.77E-03	52.4	
43	0	1333.81	15	3	4.00	2668.91	2663	11	4.25E-03	33.0	
44	0	1337.86	6	0	1.50	2677.00	2674	6	1.67E-03	40.8	
45	0	1461.22*	389	3	1.96	2923.73	2917	14	1.08E-01	5.2	
46	0	1544.74	9	2	0.52	3090.77	3086	8	2.58E-03	41.8	
47	0	1765.38*	23	0	1.50	3532.08	3527	10	6.40E-03	22.4	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235007.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 10-DEC-2015 13:55:00 Acquisition date : 3-OCT-2016 08:02:54
Sample ID        : G405235007 Sample quantity   : 152.52 GRAM
Sample type      : SOLID Sample geometry    :
Detector name    : GAMMA32 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.63 0.0%
Energy tolerance : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type  : Linear Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.119E+00	1.552E+01	1.552E+01	10.42	OK
CO-58	810.76	99.45*	1.793E+00	3.603E-02	6.633E-01	128.52	OK
CD-109	88.03	3.70*	4.577E+00	2.402E-01	3.758E-01	612.50	OK
SN-126	64.28	9.60	2.075E+00	1.451E+00	1.451E+00	103.12	OK
	86.94	8.90	4.577E+00	9.988E-02	9.988E-02	612.50	OK
	87.57	37.00*	4.577E+00	2.402E-02	2.402E-02	612.50	OK
BA-137M	661.66	89.90*	2.104E+00	2.484E-01	2.531E-01	39.80	OK
CS-137	661.66	85.10*	2.104E+00	2.624E-01	2.674E-01	39.80	OK
TL-208	277.37	6.60	4.277E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.325E+00	3.684E-01	3.684E-01	25.69	OK
	860.56	12.50	1.712E+00	4.765E-01	4.765E-01	90.96	OK
PB-212	74.82	10.28	3.461E+00	1.229E+00	1.229E+00	73.91	OK
	77.11	17.10	3.693E+00	1.813E+00	1.813E+00	26.24	OK
	238.63	43.60*	4.786E+00	1.046E+00	1.046E+00	13.16	OK
	300.09	3.30	4.011E+00	1.017E+00	1.017E+00	111.80	OK
BI-214	609.32	45.49*	2.246E+00	8.454E-01	8.457E-01	22.62	OK
	1120.29	14.92	1.392E+00	8.904E-01	8.907E-01	50.87	OK
	1764.49	15.30	9.459E-01	7.405E-01	7.408E-01	44.75	OK
PB-214	74.82	5.80	3.423E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	3.693E+00	3.196E+00	3.197E+00	26.24	OK
	87.09	3.41	4.545E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	4.745E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.064E+00	1.258E+00	1.258E+00	25.48	OK
	351.93	35.60*	3.521E+00	1.122E+00	1.122E+00	18.06	OK
RN-222	609.32	45.49*	2.246E+00	8.454E-01	8.457E-01	22.62	OK
	1120.29	14.92	1.392E+00	8.904E-01	8.907E-01	50.87	OK
	1764.49	15.30	9.459E-01	7.405E-01	7.408E-01	44.75	OK
RA-224	240.99	4.10*	4.743E+00	4.991E-01	4.991E-01	300.41	OK
RA-226	609.32	45.49*	2.246E+00	8.454E-01	8.457E-01	22.62	OK
	1120.29	14.92	1.392E+00	8.904E-01	8.907E-01	50.87	OK
	1764.49	15.30	9.459E-01	7.405E-01	7.408E-01	44.75	OK
AC-228	105.21	1.10	5.586E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.639E+00	1.535E+00	1.535E+00	32.99	OK
	794.95	4.25	1.823E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.753E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.638E+00	1.226E+00	1.226E+00	22.98	OK
	968.97	15.80	1.561E+00	1.130E+00	1.130E+00	61.71	OK
RA-228	105.21	1.10	5.586E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.639E+00	1.535E+00	1.535E+00	32.99	OK
	794.95	4.25	1.823E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.753E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.638E+00	1.226E+00	1.226E+00	22.98	OK
	968.97	15.80	1.561E+00	1.130E+00	1.130E+00	61.71	OK
TH-228	74.82	10.28	3.461E+00	1.229E+00	1.229E+00	73.91	OK
	77.11	17.10	3.693E+00	1.813E+00	1.813E+00	26.24	OK
	238.63	43.60*	4.786E+00	1.046E+00	1.046E+00	13.16	OK
	300.09	3.30	4.011E+00	1.017E+00	1.017E+00	111.80	OK
TH-230	609.32	45.49*	2.246E+00	8.454E-01	8.455E-01	22.62	OK
	1120.29	14.92	1.392E+00	8.904E-01	8.904E-01	50.87	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	1764.49	15.30	9.459E-01	7.405E-01	7.405E-01	44.75	OK
PA-231	283.69	1.70	4.201E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.011E+00	6.271E-01	6.271E-01	111.80	OK
TH-232	105.21	1.10	5.586E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.639E+00	1.535E+00	1.535E+00	32.99	OK
	835.71	1.61	1.753E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.638E+00	1.226E+00	1.226E+00	22.98	OK
	968.97	15.80	1.561E+00	1.130E+00	1.130E+00	61.71	OK
TH-234	63.29	3.70*	2.075E+00	3.764E+00	3.764E+00	103.12	OK
	92.59	4.23	4.971E+00	1.370E+00	1.370E+00	103.36	OK
U-234	609.32	45.49*	2.246E+00	8.454E-01	8.454E-01	22.62	OK
	1120.29	14.92	1.392E+00	8.904E-01	8.904E-01	50.87	OK
	1764.49	15.30	9.459E-01	7.405E-01	7.405E-01	44.75	OK
U-238	63.29	3.70*	2.075E+00	3.764E+00	3.764E+00	103.12	OK
	92.59	4.23	4.971E+00	1.370E+00	1.370E+00	103.36	OK
AM-243	43.53	5.90	1.701E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.461E+00	1.880E-01	1.880E-01	73.91	OK
ANH-511	511.00	100.00*	2.588E+00	9.466E-02	9.466E-02	83.19	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235007.CNF;1
* Acquisition date   : 3-OCT-2016 08:02:54 Sensitivity      : 3.000
* Detector ID       : GAM32 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.63 Half life ratio : *****
* Sample date       : 10-DEC-2015 13:55:00 Analyst initials: MXR1
* Sample ID         : G405235007 Sample Quantity : 1.5252E+02 GRAM
* Batch Number      : 1596247 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date    : 23-AUG-2016 07:56:33 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;11
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.552E+01	1.585E+00	5.415E-01
CO-58	6.633E-01	8.354E-01	8.694E-01
CD-109	3.758E-01	2.256E+00	2.825E+00
SN-126	2.402E-02	1.442E-01	1.669E-01
BA-137M	2.531E-01	9.871E-02	7.217E-02
CS-137	2.674E-01	1.043E-01	7.624E-02
TL-208	3.684E-01	9.275E-02	5.456E-02
PB-212	1.046E+00	1.349E-01	1.025E-01
BI-214	8.457E-01	1.875E-01	1.254E-01
PB-214	1.122E+00	1.986E-01	1.280E-01
RN-222	8.457E-01	1.875E-01	1.254E-01
RA-224	4.991E-01	1.470E+00	1.098E+00
RA-226	8.457E-01	1.875E-01	1.254E-01
AC-228	1.226E+00	2.762E-01	2.634E-01
RA-228	1.226E+00	2.762E-01	2.634E-01
TH-228	1.046E+00	1.349E-01	1.025E-01
TH-230	8.455E-01	1.874E-01	1.254E-01
PA-231	6.271E-01	6.871E-01	8.744E-01
TH-232	1.226E+00	2.762E-01	2.634E-01
TH-234	3.764E+00	3.804E+00	3.193E+00
U-234	8.454E-01	1.874E-01	1.254E-01
U-238	3.764E+00	3.804E+00	3.193E+00
AM-243	1.880E-01	1.362E-01	1.165E-01
ANH-511	9.466E-02	7.717E-02	4.992E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	2.468E+00	1.180E+01	2.337E+01	NOT IDENT.
NA-22	-1.801E-02	4.318E-02	8.088E-02	NOT IDENT.
NA-24	0.000E+00	1.523E+41	0.000E+00	SHORT HLIF
AL-26	2.599E-02	3.510E-02	8.479E-02	NOT IDENT.
SC-46	-7.774E-02	4.446E-01	8.057E-01	FAIL ABUN
V-48	0.000E+00	1.266E+04	0.000E+00	SHORT HLIF

CR-51	0.000E+00	4.162E+02	0.000E+00	SHORT HLIF
MN-54	8.976E-03	6.462E-02	1.236E-01	NOT IDENT.
CO-56	-1.060E-02	4.543E-01	8.620E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	3.147E-02	5.427E-02	1.030E-01	NOT IDENT.
FE-59	-3.185E+00	5.999E+00	1.110E+01	NOT IDENT.
CO-60	6.774E-02	4.386E-02	8.395E-02	FAIL ABUN
ZN-65	-3.150E-02	2.052E-01	3.480E-01	NOT IDENT.
GE-68	1.743E+00	2.387E+00	5.269E+00	NOT IDENT.
AS-73	-3.993E-01	1.505E+01	2.858E+01	NOT IDENT.
AS-74	0.000E+00	5.810E+03	0.000E+00	SHORT HLIF
SE-75	-3.559E-02	2.054E-01	3.949E-01	NOT IDENT.
BR-77	0.000E+00	1.326E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.736E+02	0.000E+00	SHORT HLIF
RB-83	-5.887E-01	6.134E-01	1.020E+00	NOT IDENT.
KR-85	5.211E+00	8.053E+00	1.500E+01	NOT IDENT.
SR-85	5.350E-01	8.321E-01	1.550E+00	NOT IDENT.
RB-86	0.000E+00	2.647E+04	0.000E+00	SHORT HLIF
Y-88	1.131E-01	1.280E-01	4.065E-01	NOT IDENT.
Y-91	-1.149E+01	5.321E+02	1.050E+03	NOT IDENT.
NB-94	8.328E-03	3.326E-02	6.198E-02	NOT IDENT.
NB-95	4.546E-01	9.760E-01	1.920E+00	NOT IDENT.
NB-95M	8.656E-01	2.662E+00	4.785E+00	NOT IDENT.
ZR-95	8.962E-02	1.322E+00	2.572E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.305E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.158E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	5.080E-03	3.847E-02	6.507E-02	NOT IDENT.
RH-102	3.756E-02	5.752E-02	1.208E-01	NOT IDENT.
RU-103	-3.909E+00	5.100E+00	8.823E+00	FAIL ABUN
RH-106	-7.579E-02	4.995E-01	9.362E-01	FAIL ABUN
RU-106	-7.579E-02	4.995E-01	9.362E-01	FAIL ABUN
AG-108M	1.727E-02	2.729E-02	5.656E-02	NOT IDENT.
AG-110M	-8.523E-02	1.004E-01	1.593E-01	FAIL ABUN
SN-113	-2.925E-02	2.040E-01	3.917E-01	NOT IDENT.
CD-115	0.000E+00	1.825E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	9.374E+04	0.000E+00	SHORT HLIF
TE-123M	4.718E-03	1.414E-01	2.795E-01	NOT IDENT.
SB-124	-1.878E+00	1.637E+00	1.776E+00	NOT IDENT.
SB-125	-1.082E-02	9.934E-02	1.901E-01	NOT IDENT.
TE-125M	6.273E+01	3.059E+02	5.674E+02	NOT IDENT.
I-126	0.000E+00	9.549E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.086E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.598E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	4.096E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.430E+26	0.000E+00	SHORT HLIF
BA-133	2.323E-02	4.307E-02	8.057E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	5.025E-02	6.329E-02	1.281E-01	NOT IDENT.
CS-135	-6.215E-02	1.478E-01	2.463E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.422E+05	0.000E+00	SHORT HLIF
CE-139	2.333E-02	1.015E-01	2.050E-01	NOT IDENT.
BA-140	0.000E+00	1.297E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	3.761E+05	0.000E+00	SHORT HLIF
CE-141	1.001E+01	2.238E+01	4.585E+01	NOT IDENT.
CE-143	0.000E+00	1.576E+41	0.000E+00	SHORT HLIF
CE-144	6.062E-02	4.104E-01	7.478E-01	NOT IDENT.
PM-144	-2.192E-02	5.275E-02	9.415E-02	NOT IDENT.
PR-144	-1.887E+00	4.579E+00	8.179E+00	NOT IDENT.
PM-146	1.579E-03	4.119E-02	8.030E-02	NOT IDENT.
ND-147	0.000E+00	3.634E+07	0.000E+00	SHORT HLIF
PM-147	2.177E+02	9.659E+02	1.781E+03	NOT IDENT.
PM-149	0.000E+00	2.348E+40	0.000E+00	SHORT HLIF
EU-150	2.461E-02	2.784E-02	5.355E-02	FAIL ABUN
EU-152	-1.533E-02	9.628E-02	1.832E-01	NOT IDENT.
GD-153	5.333E-02	2.075E-01	3.610E-01	NOT IDENT.
EU-154	-7.429E-03	9.930E-02	2.006E-01	FAIL ABUN
EU-155	9.166E-02	1.201E-01	2.338E-01	FAIL ABUN
TB-160	-9.629E-01	2.004E+00	3.461E+00	FAIL ABUN
HO-166M	0.000E+00	8.884E-02	1.223E-01	FAIL ABUN
TM-171	-1.473E+01	4.019E+01	7.396E+01	NOT IDENT.
HF-172	3.379E-03	2.709E-01	4.519E-01	FAIL ABUN
LU-172	7.175E-02	7.846E-02	1.765E-01	FAIL ABUN
LU-176	-1.076E-02	2.381E-02	4.436E-02	FAIL ABUN
HF-181	1.271E+00	3.789E+00	7.711E+00	NOT IDENT.

TA-182	3.677E-01	9.252E-01	1.780E+00	FAIL ABUN
RE-183	-1.069E-02	4.879E+00	9.182E+00	NOT IDENT.
RE-184	1.417E+01	2.767E+01	5.768E+01	NOT IDENT.
W-188	-4.823E+01	1.084E+02	1.923E+02	FAIL ABUN
IR-192	3.096E-01	4.344E-01	9.031E-01	FAIL ABUN
HG-203	2.435E+00	2.341E+00	4.928E+00	NOT IDENT.
BI-207	-4.060E-02	4.397E-02	7.559E-02	FAIL ABUN
PB-210	-6.291E-01	8.393E+00	1.595E+01	NOT IDENT.
BI-211	0.000E+00	5.470E-01	7.906E-01	FAIL ABUN
PB-211	-2.468E-02	6.710E-01	1.289E+00	NOT IDENT.
BI-212	0.000E+00	9.448E-01	1.374E+00	FAIL ABUN
RN-219	-3.656E-02	3.732E-01	7.139E-01	FAIL ABUN
RA-223	-3.302E-01	5.544E-01	1.015E+00	FAIL ABUN
AC-227	-7.881E-02	2.487E-01	4.705E-01	FAIL ABUN
TH-227	-7.881E-02	2.487E-01	4.705E-01	FAIL ABUN
TH-229	4.338E-02	4.603E-01	9.108E-01	FAIL ABUN
TH-231	-3.302E-01	5.544E-01	1.015E+00	FAIL ABUN
PA-233	-6.032E-03	5.711E-02	1.102E-01	FAIL ABUN
PA-234	-9.698E-02	2.745E-01	5.269E-01	FAIL ABUN
PA-234M	1.616E+00	3.597E+00	7.521E+00	NOT IDENT.
U-235	-2.144E-02	1.797E-01	3.545E-01	FAIL ABUN
NP-237	-6.032E-03	5.711E-02	1.102E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	1.792E-02	2.553E-01	4.693E-01	NOT IDENT.
PU-239	4.826E+02	6.058E+02	6.983E+02	FAIL ABUN
AM-241	-1.091E-01	2.368E-01	3.916E-01	NOT IDENT.
CM-243	-1.018E-01	1.076E-01	1.803E-01	NOT IDENT.
BK-247	1.296E-02	7.448E-02	1.413E-01	NOT IDENT.
CM-247	-2.391E-03	3.386E-02	6.502E-02	NOT IDENT.
CF-249	1.156E-02	3.690E-02	7.375E-02	NOT IDENT.
CF-251	-3.520E-02	1.088E-01	2.104E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	376	10.66*	1.119E+00	1.552E+01	1.552E+01	10.42
CO-58	810.76	13	99.45*	1.793E+00	3.603E-02	6.633E-01	128.52
CD-109	88.03	48	3.70*	4.577E+00	1.399E+00	2.189E+00	103.01
SN-126	64.28	59	9.60	2.075E+00	1.451E+00	1.451E+00	103.12
	86.94	48	8.90	4.577E+00	5.818E-01	5.818E-01	103.01
	87.57	48	37.00*	4.577E+00	1.399E-01	1.400E-01	103.01
BA-137M	661.66	95	89.90*	2.104E+00	2.484E-01	2.531E-01	39.80
CS-137	661.66	95	85.10*	2.104E+00	2.624E-01	2.674E-01	39.80
TL-208	277.37	-----	6.60	4.277E+00	-----	Line Not Found	-----
	583.19	148	85.00*	2.325E+00	3.684E-01	3.684E-01	25.69
	860.56	21	12.50	1.712E+00	4.765E-01	4.765E-01	90.96
BI-211	72.87	-----	1.23	3.214E+00	-----	Line Not Found	-----
	351.06	286	12.92*	3.521E+00	3.091E+00	3.091E+00	18.06
PB-212	74.82	140	10.28	3.461E+00	1.938E+00	1.938E+00	45.91
	77.11	233	17.10	3.693E+00	1.813E+00	1.813E+00	26.24
	238.63	443	43.60*	4.786E+00	1.046E+00	1.046E+00	13.16
	300.09	27	3.30	4.011E+00	1.017E+00	1.017E+00	111.80
BI-214	609.32	175	45.49*	2.246E+00	8.454E-01	8.457E-01	22.62
	1120.29	38	14.92	1.392E+00	8.904E-01	8.907E-01	50.87
	1764.49	22	15.30	9.459E-01	7.405E-01	7.408E-01	44.75
PB-214	74.82	140	5.80	3.461E+00	3.436E+00	3.437E+00	45.91
	77.11	233	9.70	3.693E+00	3.196E+00	3.197E+00	26.24
	87.09	48	3.41	4.577E+00	1.519E+00	1.519E+00	103.01
	242.00	108	7.25	4.743E+00	1.540E+00	1.541E+00	50.98
	295.22	191	18.42	4.064E+00	1.258E+00	1.258E+00	25.48
	351.93	286	35.60*	3.521E+00	1.122E+00	1.122E+00	18.06
RN-222	609.32	175	45.49*	2.246E+00	8.454E-01	8.457E-01	22.62
	1120.29	38	14.92	1.392E+00	8.904E-01	8.907E-01	50.87
	1764.49	22	15.30	9.459E-01	7.405E-01	7.408E-01	44.75
RA-224	240.99	108	4.10*	4.743E+00	2.723E+00	2.723E+00	50.98
RA-226	609.32	175	45.49*	2.246E+00	8.454E-01	8.457E-01	22.62
	1120.29	38	14.92	1.392E+00	8.904E-01	8.907E-01	50.87
	1764.49	22	15.30	9.459E-01	7.405E-01	7.408E-01	44.75
AC-228	105.21	-----	1.10	5.586E+00	-----	Line Not Found	-----
	338.32	128	11.27	3.639E+00	1.535E+00	1.535E+00	32.99
	794.95	-----	4.25	1.823E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.753E+00	-----	Line Not Found	-----
	911.20	105	25.80*	1.638E+00	1.226E+00	1.226E+00	22.98
	968.97	57	15.80	1.561E+00	1.130E+00	1.130E+00	61.71
RA-228	105.21	-----	1.10	5.586E+00	-----	Line Not Found	-----
	338.32	128	11.27	3.639E+00	1.535E+00	1.535E+00	32.99
	794.95	-----	4.25	1.823E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.753E+00	-----	Line Not Found	-----
	911.20	105	25.80*	1.638E+00	1.226E+00	1.226E+00	22.98
	968.97	57	15.80	1.561E+00	1.130E+00	1.130E+00	61.71
TH-228	74.82	140	10.28	3.461E+00	1.938E+00	1.938E+00	45.91
	77.11	233	17.10	3.693E+00	1.813E+00	1.813E+00	26.24

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	238.63	443	43.60*	4.786E+00	1.046E+00	1.046E+00	13.16
	300.09	27	3.30	4.011E+00	1.017E+00	1.017E+00	111.80
TH-230	609.32	175	45.49*	2.246E+00	8.454E-01	8.455E-01	22.62
	1120.29	38	14.92	1.392E+00	8.904E-01	8.904E-01	50.87
	1764.49	22	15.30	9.459E-01	7.405E-01	7.405E-01	44.75
PA-231	283.69	-----	1.70	4.201E+00	-----	Line Not Found	-----
	301.36	27	5.35*	4.011E+00	6.271E-01	6.271E-01	111.80
TH-232	105.21	-----	1.10	5.586E+00	-----	Line Not Found	-----
	338.32	128	11.27	3.639E+00	1.535E+00	1.535E+00	32.99
	835.71	-----	1.61	1.753E+00	-----	Line Not Found	-----
	911.20	105	25.80*	1.638E+00	1.226E+00	1.226E+00	22.98
	968.97	57	15.80	1.561E+00	1.130E+00	1.130E+00	61.71
TH-234	63.29	59	3.70*	2.075E+00	3.764E+00	3.764E+00	103.12
	92.59	59	4.23	4.971E+00	1.370E+00	1.370E+00	103.36
U-234	609.32	175	45.49*	2.246E+00	8.454E-01	8.454E-01	22.62
	1120.29	38	14.92	1.392E+00	8.904E-01	8.904E-01	50.87
	1764.49	22	15.30	9.459E-01	7.405E-01	7.405E-01	44.75
U-238	63.29	59	3.70*	2.075E+00	3.764E+00	3.764E+00	103.12
	92.59	59	4.23	4.971E+00	1.370E+00	1.370E+00	103.36
AM-243	43.53	-----	5.90	1.701E-01	-----	Line Not Found	-----
	74.66	140	67.20*	3.461E+00	2.965E-01	2.965E-01	45.91
ANH-511	511.00	50	100.00*	2.588E+00	9.466E-02	9.466E-02	83.19

Flag: "*" = Keyline

Total number of lines in spectrum 47
 Number of unidentified lines 9
 Number of lines tentatively identified by NID 38 80.85%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.552E+01	1.552E+01	0.162E+01	10.42	
CO-58	70.86D	18.4	3.603E-02	6.633E-01	8.525E-01	128.52	
CD-109	461.40D	1.56	1.399E+00	2.189E+00	2.255E+00	103.01	
SN-126	2.30E+05Y	1.00	1.399E-01	1.400E-01	1.442E-01	103.01	
BA-137M	30.08Y	1.02	2.484E-01	2.531E-01	1.007E-01	39.80	
CS-137	30.08Y	1.02	2.624E-01	2.674E-01	1.064E-01	39.80	
TL-208	1.41E+10Y	1.00	3.684E-01	3.684E-01	0.946E-01	25.69	
BI-211	7.04E+08Y	1.00	3.091E+00	3.091E+00	0.558E+00	18.06	
PB-212	1.41E+10Y	1.00	1.046E+00	1.046E+00	0.138E+00	13.16	
BI-214	1600.00Y	1.00	8.454E-01	8.457E-01	1.913E-01	22.62	
PB-214	1600.00Y	1.00	1.122E+00	1.122E+00	0.203E+00	18.06	
RN-222	1600.00Y	1.00	8.454E-01	8.457E-01	1.913E-01	22.62	
RA-224	1.41E+10Y	1.00	2.723E+00	2.723E+00	1.388E+00	50.98	
RA-226	1600.00Y	1.00	8.454E-01	8.457E-01	1.913E-01	22.62	
AC-228	1.41E+10Y	1.00	1.226E+00	1.226E+00	0.282E+00	22.98	
RA-228	1.41E+10Y	1.00	1.226E+00	1.226E+00	0.282E+00	22.98	
TH-228	1.41E+10Y	1.00	1.046E+00	1.046E+00	0.138E+00	13.16	
TH-230	7.54E+04Y	1.00	8.454E-01	8.455E-01	1.912E-01	22.62	
PA-231	7.04E+08Y	1.00	6.271E-01	6.271E-01	7.011E-01	111.80	
TH-232	1.41E+10Y	1.00	1.226E+00	1.226E+00	0.282E+00	22.98	
TH-234	4.47E+09Y	1.00	3.764E+00	3.764E+00	3.882E+00	103.12	
U-234	2.45E+05Y	1.00	8.454E-01	8.454E-01	1.912E-01	22.62	
U-238	4.47E+09Y	1.00	3.764E+00	3.764E+00	3.882E+00	103.12	
AM-243	7370.00Y	1.00	2.965E-01	2.965E-01	1.362E-01	45.91	
ANH-511	1.00E+09Y	1.00	9.466E-02	9.466E-02	7.874E-02	83.19	
Total Activity :			4.345E+01	4.488E+01			

Grand Total Activity : 4.345E+01 4.488E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
5	94.77	40	106	1.26	190.76	184	10	8.77E-03	****	5.07E+00	T
0	129.53	38	145	1.78	260.27	256	8	8.50E-03	****	6.09E+00	T
0	186.37	165	201	1.23	373.96	368	13	3.85E-02	43.1	5.60E+00	T
0	209.43	84	90	1.25	420.08	416	8	1.97E-02	48.7	5.24E+00	T
0	270.47	52	71	1.08	542.17	537	10	1.27E-02	71.2	4.36E+00	T
0	464.99	16	55	0.67	931.20	925	11	3.97E-03	****	2.80E+00	
0	534.57	25	39	3.98	1070.37	1064	13	6.57E-03	****	2.50E+00	
7	707.28	12	9	1.96	1415.81	1413	25	3.12E-03	96.3	2.00E+00	T
7	710.32	28	16	2.00	1421.88	1413	25	7.41E-03	71.1	1.99E+00	T
0	720.76	14	7	3.40	1442.77	1438	10	3.86E-03	90.8	1.97E+00	T
0	728.15	37	29	0.95	1457.55	1450	12	9.78E-03	69.5	1.95E+00	T
0	797.49	23	27	1.86	1596.23	1586	14	6.26E-03	****	1.82E+00	
0	803.54	19	12	0.66	1608.33	1604	11	5.25E-03	89.5	1.81E+00	
0	816.56	10	15	1.70	1634.38	1630	8	2.62E-03	****	1.79E+00	T
0	996.21	12	13	1.17	1993.69	1989	12	3.43E-03	****	1.53E+00	T
0	1049.83	19	6	3.87	2100.93	2093	14	5.20E-03	75.2	1.47E+00	T
0	1190.02	9	7	0.61	2381.31	2378	6	2.57E-03	****	1.33E+00	T
0	1227.61	16	11	3.52	2456.49	2449	15	4.58E-03	****	1.29E+00	
0	1234.03	27	5	2.60	2469.34	2464	10	7.53E-03	49.2	1.29E+00	T
0	1239.00	22	5	1.24	2479.29	2475	11	6.25E-03	58.4	1.28E+00	T
0	1245.45	17	3	3.62	2492.19	2486	11	4.79E-03	60.9	1.28E+00	
0	1250.95	17	15	3.83	2503.18	2497	14	4.77E-03	****	1.27E+00	
0	1333.81	15	3	4.00	2668.91	2663	11	4.25E-03	66.1	1.21E+00	T
0	1337.86	6	0	1.50	2677.00	2674	6	1.67E-03	81.6	1.21E+00	
0	1544.74	9	2	0.52	3090.77	3086	8	2.58E-03	83.5	1.07E+00	

Flags: "T" = Tentatively associated

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235007.CNF;1
* Acquisition date   : 3-OCT-2016 08:02:54 Sensitivity      : 3.000
* Detector ID        : GAM32 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.63 Half life ratio  : *****
* Sample date        : 10-DEC-2015 13:55:00 Nuclide Library : SOLID
* Sample ID          : G405235007 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity  : 1.5252E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
* Dry Weight         : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 23-AUG-2016 07:56:33 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;11
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.145E-01
CO-58	3.645E-01
CD-109	1.347E+00
SN-126	7.925E-02
BA-137M	3.241E-02
CS-137	3.424E-02
TL-208	2.382E-02
PB-212	4.791E-02
BI-214	5.602E-02
PB-214	5.848E-02
RN-222	5.602E-02
RA-224	5.134E-01
RA-226	5.602E-02
AC-228	1.157E-01
RA-228	1.157E-01
TH-228	4.791E-02
TH-230	5.600E-02
PA-231	4.048E-01
TH-232	1.157E-01
TH-234	1.504E+00
U-234	5.600E-02
U-238	1.504E+00
AM-243	5.511E-02
ANH-511	2.231E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.052E+01	NOT IDENT.
NA-22	3.377E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	3.517E-02	NOT IDENT.
SC-46	3.552E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF

MN-54	5.427E-02	NOT IDENT.
CO-56	3.743E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	4.857E-02	NOT IDENT.
FE-59	4.676E+00	NOT IDENT.
CO-60	3.579E-02	FAIL ABUN
ZN-65	1.518E-01	NOT IDENT.
GE-68	2.322E+00	NOT IDENT.
AS-73	1.334E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.825E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.445E-01	NOT IDENT.
KR-85	6.854E+00	NOT IDENT.
SR-85	7.079E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.522E-01	NOT IDENT.
Y-91	4.580E+02	NOT IDENT.
NB-94	2.759E-02	NOT IDENT.
NB-95	8.686E-01	NOT IDENT.
NB-95M	2.246E+00	NOT IDENT.
ZR-95	1.120E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.050E-02	NOT IDENT.
RH-102	5.390E-02	NOT IDENT.
RU-103	3.863E+00	FAIL ABUN
RH-106	4.138E-01	FAIL ABUN
RU-106	4.138E-01	FAIL ABUN
AG-108M	2.571E-02	NOT IDENT.
AG-110M	6.691E-02	FAIL ABUN
SN-113	1.760E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.318E-01	NOT IDENT.
SB-124	4.471E-01	NOT IDENT.
SB-125	8.557E-02	NOT IDENT.
TE-125M	2.670E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.691E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.834E-02	NOT IDENT.
CS-135	1.132E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	9.582E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.155E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.523E-01	NOT IDENT.
PM-144	4.108E-02	NOT IDENT.
PR-144	3.569E+00	NOT IDENT.
PM-146	3.604E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	8.393E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.478E-02	FAIL ABUN
EU-152	8.402E-02	NOT IDENT.
GD-153	1.694E-01	NOT IDENT.
EU-154	8.393E-02	FAIL ABUN
EU-155	1.101E-01	FAIL ABUN
TB-160	1.498E+00	FAIL ABUN
HO-166M	5.479E-02	FAIL ABUN
TM-171	3.458E+01	NOT IDENT.
HF-172	2.120E-01	FAIL ABUN
LU-172	7.807E-02	FAIL ABUN
LU-176	2.030E-02	FAIL ABUN
HF-181	3.445E+00	NOT IDENT.
TA-182	7.733E-01	FAIL ABUN

RE-183	4.320E+00	NOT IDENT.
RE-184	2.517E+01	NOT IDENT.
W-188	8.804E+01	FAIL ABUN
IR-192	4.158E-01	FAIL ABUN
HG-203	2.296E+00	NOT IDENT.
BI-207	3.144E-02	FAIL ABUN
PB-210	7.468E+00	NOT IDENT.
BI-211	3.802E-01	FAIL ABUN
PB-211	5.862E-01	NOT IDENT.
BI-212	6.347E-01	FAIL ABUN
RN-219	3.238E-01	FAIL ABUN
RA-223	4.613E-01	FAIL ABUN
AC-227	2.191E-01	FAIL ABUN
TH-227	2.191E-01	FAIL ABUN
TH-229	4.264E-01	FAIL ABUN
TH-231	4.613E-01	FAIL ABUN
PA-233	5.045E-02	FAIL ABUN
PA-234	2.280E-01	FAIL ABUN
PA-234M	3.232E+00	NOT IDENT.
U-235	1.667E-01	FAIL ABUN
NP-237	5.045E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.195E-01	NOT IDENT.
PU-239	3.307E+02	FAIL ABUN
AM-241	1.837E-01	NOT IDENT.
CM-243	8.386E-02	NOT IDENT.
BK-247	6.539E-02	NOT IDENT.
CM-247	2.947E-02	NOT IDENT.
CF-249	3.364E-02	NOT IDENT.
CF-251	9.812E-02	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235007.CNF;1
* Acquisition date   : 3-OCT-2016 08:02:54 Sensitivity      : 3.000
* Detector ID        : GAM32 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.63 Half life ratio  : *****
* Sample date        : 10-DEC-2015 13:55:00 Nuclide Library : SOLID
* Sample ID          : G405235007 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.5252E+02 GRAM
*                   : Quantity Err(%) : 1.3113E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight       : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 23-AUG-2016 07:56:33 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;11
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.552E+01	1.780E+00	1.780E+00
CO-58	6.633E-01	8.359E-01	8.359E-01
CD-109	3.758E-01	2.267E+00	2.267E+00
SN-126	2.402E-02	1.449E-01	1.449E-01
BA-137M	2.531E-01	9.931E-02	9.931E-02
CS-137	2.674E-01	1.049E-01	1.049E-01
TL-208	3.684E-01	9.407E-02	9.407E-02
PB-212	1.046E+00	1.459E-01	1.459E-01
BI-214	8.457E-01	1.909E-01	1.909E-01
PB-214	1.122E+00	2.041E-01	2.041E-01
RN-222	8.457E-01	1.909E-01	1.909E-01
RA-224	4.991E-01	1.477E+00	1.477E+00
RA-226	8.457E-01	1.909E-01	1.909E-01
AC-228	1.226E+00	2.832E-01	2.832E-01
RA-228	1.226E+00	2.832E-01	2.832E-01
TH-228	1.046E+00	1.459E-01	1.459E-01
TH-230	8.455E-01	1.909E-01	1.909E-01
PA-231	6.271E-01	7.000E-01	7.000E-01
TH-232	1.226E+00	2.832E-01	2.832E-01
TH-234	3.764E+00	3.895E+00	3.895E+00
U-234	8.454E-01	1.909E-01	1.909E-01
U-238	3.764E+00	3.895E+00	3.895E+00
AM-243	1.880E-01	1.373E-01	1.373E-01
ANH-511	9.466E-02	7.726E-02	7.726E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	2.468E+00	1.180E+01	1.185E+01	NOT IDENT.
NA-22	-1.801E-02	4.319E-02	4.395E-02	NOT IDENT.
NA-24	1.000E+41	1.583E+41	0.000E+00	SHORT HLIF
AL-26	2.599E-02	3.513E-02	3.704E-02	NOT IDENT.
SC-46	-7.774E-02	4.446E-01	4.460E-01	FAIL ABUN
V-48	7.600E+03	1.266E+04	1.312E+04	SHORT HLIF

CR-51	6.530E+01	4.162E+02	4.173E+02	SHORT HLIF
MN-54	8.976E-03	6.462E-02	6.475E-02	NOT IDENT.
CO-56	-1.060E-02	4.543E-01	4.543E-01	FAIL ABUN
MN-56	-1.000E+41	4.285E+42	0.000E+00	SHORT HLIF
CO-57	3.147E-02	5.429E-02	5.612E-02	NOT IDENT.
FE-59	-3.185E+00	6.003E+00	6.173E+00	NOT IDENT.
CO-60	6.774E-02	4.393E-02	5.350E-02	FAIL ABUN
ZN-65	-3.150E-02	2.052E-01	2.057E-01	NOT IDENT.
GE-68	1.743E+00	2.388E+00	2.514E+00	NOT IDENT.
AS-73	-3.993E-01	1.505E+01	1.505E+01	NOT IDENT.
AS-74	2.245E+03	5.813E+03	5.901E+03	SHORT HLIF
SE-75	-3.559E-02	2.054E-01	2.060E-01	NOT IDENT.
BR-77	1.028E+38	8.832E+38	0.000E+00	SHORT HLIF
SR-82	-2.144E+02	6.737E+02	6.806E+02	SHORT HLIF
RB-83	-5.887E-01	6.187E-01	6.732E-01	NOT IDENT.
KR-85	5.211E+00	8.056E+00	8.391E+00	NOT IDENT.
SR-85	5.350E-01	8.324E-01	8.667E-01	NOT IDENT.
RB-86	1.804E+04	2.648E+04	2.770E+04	SHORT HLIF
Y-88	1.131E-01	1.282E-01	1.380E-01	NOT IDENT.
Y-91	-1.149E+01	5.321E+02	5.322E+02	NOT IDENT.
NB-94	8.328E-03	3.326E-02	3.347E-02	NOT IDENT.
NB-95	4.546E-01	9.762E-01	9.975E-01	NOT IDENT.
NB-95M	8.656E-01	2.663E+00	2.691E+00	NOT IDENT.
ZR-95	8.962E-02	1.322E+00	1.323E+00	NOT IDENT.
NB-97	-1.000E+41	2.015E+41	0.000E+00	SHORT HLIF
ZR-97	-1.000E+41	1.306E+41	0.000E+00	SHORT HLIF
MO-99	-6.792E+31	1.159E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.054E+42	0.000E+00	SHORT HLIF
RH-101	5.080E-03	3.848E-02	3.854E-02	NOT IDENT.
RH-102	3.756E-02	5.760E-02	6.004E-02	NOT IDENT.
RU-103	-3.909E+00	5.104E+00	5.399E+00	FAIL ABUN
RH-106	-7.579E-02	4.995E-01	5.007E-01	FAIL ABUN
RU-106	-7.579E-02	4.995E-01	5.007E-01	FAIL ABUN
AG-108M	1.727E-02	2.730E-02	2.839E-02	NOT IDENT.
AG-110M	-8.523E-02	1.005E-01	1.076E-01	FAIL ABUN
SN-113	-2.925E-02	2.040E-01	2.044E-01	NOT IDENT.
CD-115	7.006E+38	1.830E+39	0.000E+00	SHORT HLIF
SN-117M	4.147E+04	9.386E+04	9.571E+04	SHORT HLIF
TE-123M	4.718E-03	1.414E-01	1.414E-01	NOT IDENT.
SB-124	-1.878E+00	1.640E+00	1.846E+00	NOT IDENT.
SB-125	-1.082E-02	9.934E-02	9.946E-02	NOT IDENT.
TE-125M	6.273E+01	3.059E+02	3.072E+02	NOT IDENT.
I-126	4.551E+05	9.569E+05	9.787E+05	SHORT HLIF
SB-126	1.220E+06	1.110E+06	1.239E+06	SHORT HLIF
SB-127	4.058E+21	1.691E+22	0.000E+00	SHORT HLIF
I-131	-3.554E+09	4.099E+09	4.401E+09	SHORT HLIF
I-132	-1.000E+41	1.865E+42	0.000E+00	SHORT HLIF
TE-132	-3.447E+24	2.430E+26	0.000E+00	SHORT HLIF
BA-133	2.323E-02	2.308E-02	4.434E-02	NOT IDENT.
I-133	1.000E+41	7.821E+41	0.000E+00	SHORT HLIF
CS-134	5.025E-02	6.332E-02	6.725E-02	NOT IDENT.
CS-135	-6.215E-02	1.478E-01	1.505E-01	NOT IDENT.
I-135	1.000E+41	8.076E+41	0.000E+00	SHORT HLIF
CS-136	-9.321E+04	2.425E+05	2.461E+05	SHORT HLIF
CE-139	2.333E-02	1.016E-01	1.022E-01	NOT IDENT.
BA-140	1.476E+05	1.297E+06	1.299E+06	SHORT HLIF
LA-140	4.078E+04	3.761E+05	3.766E+05	SHORT HLIF
CE-141	1.001E+01	2.238E+01	2.283E+01	NOT IDENT.
CE-143	1.000E+41	1.579E+41	0.000E+00	SHORT HLIF
CE-144	6.062E-02	4.105E-01	4.114E-01	NOT IDENT.
PM-144	-2.192E-02	5.277E-02	5.368E-02	NOT IDENT.
PR-144	-1.887E+00	4.580E+00	4.658E+00	NOT IDENT.
PM-146	1.579E-03	4.119E-02	4.120E-02	NOT IDENT.
ND-147	-7.968E+06	3.635E+07	3.652E+07	SHORT HLIF
PM-147	2.177E+02	9.659E+02	9.709E+02	NOT IDENT.
PM-149	1.655E+40	2.375E+40	0.000E+00	SHORT HLIF
EU-150	2.461E-02	2.786E-02	2.999E-02	FAIL ABUN
EU-152	-1.533E-02	9.629E-02	9.653E-02	NOT IDENT.
GD-153	5.333E-02	2.075E-01	2.089E-01	NOT IDENT.
EU-154	-7.429E-03	9.930E-02	9.936E-02	FAIL ABUN
EU-155	9.166E-02	1.203E-01	1.272E-01	FAIL ABUN
TB-160	-9.629E-01	2.005E+00	2.052E+00	FAIL ABUN
HO-166M	1.275E-01	8.911E-02	1.060E-01	FAIL ABUN
TM-171	-1.473E+01	4.021E+01	4.076E+01	NOT IDENT.
HF-172	3.379E-03	2.709E-01	2.709E-01	FAIL ABUN
LU-172	7.175E-02	7.880E-02	8.518E-02	FAIL ABUN
LU-176	-1.076E-02	2.382E-02	2.431E-02	FAIL ABUN
HF-181	1.271E+00	3.789E+00	3.832E+00	NOT IDENT.

TA-182	3.677E-01	9.253E-01	9.400E-01	FAIL ABUN
RE-183	-1.069E-02	4.879E+00	4.879E+00	NOT IDENT.
RE-184	1.417E+01	2.788E+01	2.860E+01	NOT IDENT.
W-188	-4.823E+01	1.085E+02	1.106E+02	FAIL ABUN
IR-192	3.096E-01	4.346E-01	4.564E-01	FAIL ABUN
HG-203	2.435E+00	2.344E+00	2.588E+00	NOT IDENT.
BI-207	-4.060E-02	4.399E-02	4.765E-02	FAIL ABUN
PB-210	-6.291E-01	8.393E+00	8.398E+00	NOT IDENT.
BI-211	3.091E+00	5.643E-01	1.503E+00	FAIL ABUN
PB-211	-2.468E-02	6.710E-01	6.711E-01	NOT IDENT.
BI-212	1.387E+00	9.474E-01	1.135E+00	FAIL ABUN
RN-219	-3.656E-02	3.732E-01	3.736E-01	FAIL ABUN
RA-223	-3.302E-01	5.548E-01	5.744E-01	FAIL ABUN
AC-227	-7.881E-02	2.489E-01	2.514E-01	FAIL ABUN
TH-227	-7.881E-02	2.489E-01	2.514E-01	FAIL ABUN
TH-229	4.338E-02	4.603E-01	4.607E-01	FAIL ABUN
TH-231	-3.302E-01	5.548E-01	5.744E-01	FAIL ABUN
PA-233	-6.032E-03	5.711E-02	5.718E-02	FAIL ABUN
PA-234	-9.698E-02	2.961E-01	2.993E-01	FAIL ABUN
PA-234M	1.616E+00	3.598E+00	3.671E+00	NOT IDENT.
U-235	-2.144E-02	1.797E-01	1.799E-01	FAIL ABUN
NP-237	-6.032E-03	5.711E-02	5.718E-02	FAIL ABUN
NP-238	-1.000E+41	1.995E+41	0.000E+00	SHORT HLIF
NP-239	1.792E-02	2.553E-01	2.554E-01	NOT IDENT.
PU-239	4.826E+02	6.061E+02	6.440E+02	FAIL ABUN
AM-241	-1.091E-01	2.370E-01	2.420E-01	NOT IDENT.
CM-243	-1.018E-01	1.080E-01	1.173E-01	NOT IDENT.
BK-247	1.296E-02	7.453E-02	7.476E-02	NOT IDENT.
CM-247	-2.391E-03	3.386E-02	3.388E-02	NOT IDENT.
CF-249	1.156E-02	3.691E-02	3.728E-02	NOT IDENT.
CF-251	-3.520E-02	1.089E-01	1.101E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	60.1854	87.09	115.6747	136.47	95.9819
45.60	71.5991	87.57	117.7241	140.51	0.0000
46.54	68.3569	88.03	141.1892	143.76	85.6973
49.72	0.0000	88.34	141.2417	144.24	82.3725
51.35	66.6640	88.47	146.0260	145.44	71.5216
51.87	72.3762	89.96	135.9516	152.43	83.8122
52.39	78.0977	1093.63	109.8045	153.25	0.0000
52.97	71.3746	91.11	0.0000	323.87	84.7890
53.44	66.8942	92.59	105.2728	156.02	0.0000
54.07	82.8521	93.35	105.3661	158.56	0.0000
57.36	0.0000	94.56	105.5151	159.00	91.0932
57.53	73.0383	94.65	105.5259	162.33	83.6625
57.98	84.5096	94.67	105.5286	162.66	0.0000
59.27	76.2866	94.87	105.5527	163.33	79.4602
59.32	99.1800	97.43	70.5753	165.86	63.3574
59.54	90.0554	98.43	75.8743	176.31	60.4368
60.96	68.8346	98.44	75.8752	176.60	0.0000
61.17	68.8564	99.53	73.5568	177.52	70.8641
62.93	88.5981	100.11	74.8113	181.07	0.0000
63.29	88.6451	102.03	83.4357	181.52	66.3173
63.58	88.6830	103.18	85.9630	184.41	82.1030
64.28	102.9933	103.37	82.3479	143.76	69.5744
66.73	87.9318	105.21	67.9522	193.51	69.9821
67.24	83.3648	105.31	67.9599	197.03	72.7947
125.81	99.6370	106.12	72.8778	198.01	55.2935
67.75	99.6468	106.47	88.7014	201.83	75.6892
69.67	97.5925	109.28	79.2183	203.43	49.3429
70.83	85.3366	111.00	90.3512	205.31	55.5851
72.81	99.5703	111.76	0.0000	210.85	65.1035
72.87	101.1340	114.06	77.1663	215.65	79.9850
74.66	102.9377	116.30	0.0000	222.11	62.4862
74.82	102.9598	116.74	68.7806	227.09	55.5303
74.97	102.9807	119.76	85.0066	227.38	52.8536
77.11	103.2727	121.12	82.6551	228.16	0.0000
78.74	106.6284	121.22	82.6633	228.18	60.0522
79.69	108.3291	121.78	69.1301	116.74	60.0522
80.12	111.5305	122.06	75.3234	235.69	70.2582
80.19	0.0000	122.92	74.1513	235.96	70.2701
80.57	73.8726	123.07	74.1623	238.63	68.5874
81.00	86.4936	265.00	89.0480	238.98	0.0000
81.07	86.5015	125.81	76.0139	240.99	68.6918
81.75	97.9888	127.23	71.1540	242.00	68.7358
83.79	106.5255	127.91	81.1361	244.70	62.5130
84.00	113.6565	129.30	83.3165	252.40	0.0000
85.43	104.3704	131.20	94.6799	252.80	58.2786
86.55	131.4335	133.02	93.1784	254.15	0.0000
86.79	131.4724	133.52	84.8983	256.23	68.4406
86.94	115.6539	136.00	90.9342	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	53.2009	355.39	0.0000	584.27	15.8948
264.80	48.4355	356.01	30.3689	595.83	0.0000
265.00	48.4408	364.49	0.0000	427.87	24.5105
268.22	52.3950	366.42	0.0000	602.52	0.0000
269.46	43.2354	372.51	28.1846	604.72	24.0115
270.03	43.2497	375.05	32.1111	607.14	30.4401
271.23	43.2803	377.52	37.9939	609.32	23.5155
273.65	0.0000	356.01	32.2454	610.33	23.5236
276.40	46.1843	388.16	31.3314	614.28	22.4843
277.37	55.4529	388.63	0.0000	618.01	13.9363
277.60	54.5359	391.69	28.4407	620.36	26.8219
278.00	49.0006	264.66	24.6195	621.93	21.4689
279.20	41.6336	401.81	33.4999	630.19	0.0000
279.54	58.2986	402.40	32.5233	631.29	15.0755
279.70	58.3037	404.85	34.5329	633.25	16.1627
280.46	50.9224	410.95	31.6602	634.78	0.0000
283.69	38.0321	413.71	31.6992	635.95	20.4913
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	42.7123	423.72	0.0000	645.85	16.2299
285.90	0.0000	427.09	30.8909	657.76	19.5520
287.50	53.9183	427.87	28.9080	657.90	0.0000
290.67	48.0559	433.94	23.9868	661.66	26.1016
293.27	0.0000	439.40	31.0561	664.57	0.0000
351.93	44.8184	453.88	25.1994	666.33	0.0000
295.96	44.8369	463.37	26.3110	666.50	0.0000
879.38	36.4832	468.07	34.9808	667.71	0.0000
299.98	36.5117	473.00	0.0000	677.62	18.5834
300.09	44.9404	475.06	23.3870	685.70	0.0000
300.13	44.9414	476.78	27.4735	695.00	0.0000
301.36	51.9985	477.60	24.4292	696.49	20.8926
302.85	36.5696	482.18	19.3753	696.51	20.8926
256.23	36.6030	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	18.6982
306.78	46.9859	497.08	26.6713	697.49	20.8995
308.46	31.9795	505.52	32.4203	702.65	17.1869
311.90	41.4631	507.63	0.0000	706.68	21.5098
316.51	33.0639	511.00	23.7225	711.68	9.9430
319.41	0.0000	514.00	26.3311	720.70	0.0000
320.08	0.0000	514.00	26.3311	721.93	0.0000
321.04	36.9315	520.40	27.9492	722.78	13.3022
323.87	43.6257	520.69	0.0000	722.91	13.3027
325.23	48.4019	522.65	0.0000	723.31	13.3042
328.76	0.0000	527.90	0.0000	724.19	13.3076
333.37	35.7414	528.26	19.9344	727.33	10.6563
333.97	34.3220	529.59	21.8135	733.00	12.0085
334.37	35.7597	529.87	0.0000	735.93	13.3545
338.28	39.1757	531.02	0.0000	333.97	15.5876
338.32	39.1766	537.26	0.0000	739.50	0.0000
311.90	31.5673	546.56	0.0000	747.24	18.9825
340.48	31.5673	552.55	31.4294	748.06	13.4028
340.55	0.0000	563.25	18.9309	752.31	22.3657
344.28	44.0880	569.33	20.0267	753.82	0.0000
345.93	39.1374	946.00	20.0275	756.73	14.5568
351.06	37.5067	569.70	20.0290	756.80	14.5573
351.93	37.5234	583.19	15.8887	884.68	28.0528

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	23.5771	1274.44	8.9459	1620.50	1.0120
766.42	31.4419	1001.03	5.7320	1621.92	1.0123
766.84	35.9375	1002.74	16.7253	1678.03	0.0000
772.60	0.0000	1004.73	12.5499	1690.97	6.1425
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	4.9714
778.90	9.0156	1028.54	0.0000	1063.66	7.2563
783.70	0.0000	1037.84	7.2271	1771.35	5.1840
785.37	11.2903	1038.76	0.0000	1791.20	0.0000
792.07	11.8774	631.29	10.1384	1808.65	3.1282
794.95	22.6424	1048.07	0.0000	1810.72	0.0000
795.86	22.6481	1049.04	12.6807	1836.06	0.0000
810.06	9.0954	1050.41	12.6849		
810.29	9.0960	1063.66	13.6322		
344.28	9.0964	1077.00	0.0000		
810.76	9.0970	1077.34	10.9395		
815.77	0.0000	1085.87	6.3937		
1048.07	0.0000	1093.63	10.0648		
832.01	16.0132	1099.45	14.6582		
834.85	14.8810	1112.07	13.7805		
835.71	18.3197	1112.84	11.9455		
836.80	0.0000	1115.54	17.6531		
846.75	0.0000	1120.29	14.7256		
846.77	14.9292	1120.55	14.7266		
856.80	0.0000	1221.41	13.2565		
860.56	10.3740	1129.67	15.6781		
871.09	11.5588	1131.51	0.0000		
873.19	10.4088	1147.95	0.0000		
875.33	0.0000	1173.23	15.8254		
879.38	19.6929	1177.95	12.1145		
880.51	15.0635	1189.05	12.1423		
883.24	13.9150	1204.77	15.9313		
884.68	18.5599	1221.41	10.5314		
889.28	20.9055	1231.02	7.5376		
894.76	15.1196	1235.36	0.0000		
898.04	17.4609	1238.28	0.0000		
900.72	17.4725	1260.41	0.0000		
903.28	10.4905	1271.87	12.3502		
911.20	17.5195	1274.44	9.5050		
912.08	17.5238	1274.54	12.3565		
923.98	0.0000	1291.59	9.5374		
926.50	7.9146	1298.22	0.0000		
929.11	15.8395	1312.11	0.0000		
937.49	25.5732	1332.49	12.3055		
944.13	0.0000	1362.66	0.0000		
946.00	17.6740	1365.19	5.8041		
949.00	9.7281	1368.63	0.0000		
667.71	0.0000	1384.29	6.7958		
962.31	21.2944	1408.01	7.8008		
964.08	14.2026	1457.56	0.0000		
966.17	17.0520	1460.82	4.9228		
911.20	15.1085	1489.16	3.9583		
968.97	15.1085	1505.03	3.9692		
983.53	0.0000	1584.12	4.0237		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235008.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM39.CNF;134
Background date : 2-OCT-2016 11:02:13.
Sample date     : 10-DEC-2015 14:05:00 Acquisition date : 3-OCT-2016 08:03:23.
Sample ID      : G405235008 Sample quantity   : 1.47889E+02 GRAM
Detector name  : GAM39 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:07.23 0.2%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity    : 3.00000
Batch ID       : 1596247 Detector SN#    :
Matrix Spike ID : LCS ID           : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.75*	50	157	1.60	93.34	89	8	1.39E-02	47.5	
2	0	63.19*	1	252	1.10	126.23	123	8	3.42E-04	*****	
3	2	72.81	32	141	1.27	145.47	143	16	8.84E-03	64.2	8.87E-01
4	2	74.90*	222	172	1.17	149.65	143	16	6.17E-02	12.1	
5	2	77.17*	272	159	1.08	154.17	143	16	7.56E-02	9.8	
6	0	87.21	56	169	1.17	174.26	171	7	1.55E-02	40.8	
7	0	92.82*	74	176	1.48	185.47	183	8	2.05E-02	35.8	
8	0	129.55	49	107	0.95	258.94	256	8	1.36E-02	39.1	
9	0	153.90*	21	107	0.61	307.64	305	8	5.81E-03	89.8	
10	0	185.18*	91	175	1.55	370.20	364	15	2.53E-02	34.0	
11	0	209.61	31	101	0.98	419.06	413	10	8.56E-03	64.0	
12	0	217.41	35	79	0.74	434.67	430	9	9.66E-03	49.5	
13	3	238.66*	392	74	1.20	477.17	472	17	1.09E-01	6.4	1.84E+00
14	3	241.62	77	95	1.83	483.09	472	17	2.15E-02	33.2	
15	0	270.81*	25	64	1.90	541.47	536	9	6.87E-03	62.7	
16	1	295.22*	111	60	1.56	590.28	586	21	3.09E-02	16.1	7.31E-01
17	1	299.64*	24	62	1.57	599.12	586	21	6.57E-03	65.0	
18	0	338.10*	78	89	1.12	676.04	669	14	2.15E-02	28.4	
19	0	352.09*	210	62	1.44	704.03	698	12	5.84E-02	10.5	
20	0	375.96	9	32	1.27	751.77	748	8	2.42E-03	115.6	
21	0	411.76	61	34	6.89	823.38	816	17	1.69E-02	25.4	
22	0	454.53	39	16	6.16	908.93	902	15	1.09E-02	26.8	
23	0	464.96	74	57	9.36	929.79	917	28	2.06E-02	30.9	
24	0	511.52*	12	82	1.73	1022.92	1016	17	3.24E-03	201.7	
25	0	534.00	14	13	1.46	1067.88	1065	6	3.80E-03	50.2	
26	0	552.45	21	21	1.27	1104.78	1099	11	5.72E-03	49.2	
27	0	562.62	13	34	1.79	1125.13	1118	10	3.61E-03	89.4	
28	0	583.26*	72	51	1.59	1166.40	1160	12	2.00E-02	23.8	
29	0	595.97	9	28	1.27	1191.82	1185	10	2.54E-03	112.4	
30	0	609.56*	130	49	1.22	1219.01	1214	10	3.61E-02	13.3	
31	0	663.04	52	24	2.17	1325.97	1319	17	1.45E-02	25.9	
32	0	669.35	14	6	1.24	1338.59	1335	8	3.97E-03	39.6	
33	0	693.49	33	24	6.10	1386.88	1378	20	9.10E-03	41.2	
34	0	808.79	37	4	4.03	1617.50	1610	16	1.03E-02	20.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	860.71	30	14	2.16	1721.35	1715	11	8.40E-03	29.9	
36	0	870.96	14	12	1.14	1741.86	1736	10	3.96E-03	53.1	
37	0	881.92	27	23	8.82	1763.78	1749	23	7.50E-03	50.0	
38	0	911.61*	55	26	1.16	1823.17	1816	13	1.52E-02	24.4	
39	1	964.70	22	17	2.03	1929.37	1919	26	6.05E-03	42.6	9.26E-01
40	1	969.17*	51	14	2.03	1938.30	1919	26	1.42E-02	22.5	
41	0	1033.58	14	2	1.12	2067.13	2063	8	3.91E-03	31.7	
42	0	1120.49	23	25	1.73	2241.00	2236	8	6.31E-03	39.4	
43	0	1160.33	18	3	1.58	2320.67	2315	10	5.10E-03	28.4	
44	0	1175.83	28	9	0.75	2351.69	2343	17	7.64E-03	30.9	
45	0	1228.04	9	7	0.90	2456.12	2453	8	2.39E-03	61.6	
46	0	1384.20	7	5	1.35	2768.50	2763	10	1.94E-03	70.7	
47	0	1460.83*	284	4	1.75	2921.78	2914	16	7.89E-02	6.3	
48	0	1509.87	9	2	0.93	3019.90	3014	10	2.39E-03	48.3	
49	0	1587.75	13	0	1.53	3175.69	3170	11	3.61E-03	27.7	
50	0	1764.45	18	0	2.02	3529.17	3524	10	5.00E-03	23.6	
51	0	1887.13	4	3	1.36	3774.60	3767	10	1.23E-03	82.2	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235008.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 10-DEC-2015 14:05:00 Acquisition date : 3-OCT-2016 08:03:23
Sample ID        : G405235008 Sample quantity  : 147.89 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA39 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:07.23 0.2%
Energy tolerance : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error  : 0.00 %
Efficiency type  : Linear Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	8.984E-01	1.449E+01	1.449E+01	12.51	OK
CD-109	88.03	3.70*	6.754E+00	5.138E-01	8.037E-01	232.54	OK
SN-126	64.28	9.60	6.932E+00	1.205E-02	1.205E-02	4690.27	OK
	86.94	8.90	6.754E+00	2.136E-01	2.136E-01	232.54	OK
	87.57	37.00*	6.754E+00	5.138E-02	5.138E-02	232.54	OK
BA-137M	661.66	89.90*	1.755E+00	1.757E-01	1.790E-01	51.88	OK
CS-137	661.66	85.10*	1.755E+00	1.856E-01	1.891E-01	51.88	OK
TL-208	277.37	6.60	3.709E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	1.953E+00	2.325E-01	2.325E-01	47.52	OK
	860.56	12.50	1.416E+00	8.818E-01	8.818E-01	59.82	OK
PB-210	46.54	4.25*	6.842E+00	1.145E+00	1.174E+00	94.92	OK
BI-211	72.87	1.23	6.824E+00	2.436E+00	2.436E+00	128.32	OK
	351.06	12.92*	3.013E+00	3.292E-01	3.292E-01	327.48	OK
PB-212	74.82	10.28	6.811E+00	1.481E+00	1.481E+00	35.42	OK
	77.11	17.10	6.799E+00	1.497E+00	1.497E+00	19.65	OK
	238.63	43.60*	4.211E+00	1.242E+00	1.242E+00	12.83	OK
	300.09	3.30	3.469E+00	1.178E+00	1.178E+00	130.01	OK
BI-214	609.32	45.49*	1.882E+00	8.100E-01	8.103E-01	26.57	OK
	1120.29	14.92	1.136E+00	6.735E-01	6.737E-01	78.75	OK
	1764.49	15.30	7.485E-01	7.533E-01	7.536E-01	47.14	OK
PB-214	74.82	5.80	6.812E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	6.799E+00	2.640E+00	2.641E+00	19.65	OK
	87.09	3.41	6.755E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	4.163E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	3.514E+00	9.817E-01	9.821E-01	32.23	OK
	351.93	35.60*	3.014E+00	-----	Line Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	1.882E+00	8.100E-01	8.103E-01	26.57	OK
	1120.29	14.92	1.136E+00	6.735E-01	6.737E-01	78.75	OK
	1764.49	15.30	7.485E-01	7.533E-01	7.536E-01	47.14	OK
RA-224	240.99	4.10*	4.168E+00	8.981E-01	8.981E-01	204.49	OK
RA-226	609.32	45.49*	1.882E+00	8.100E-01	8.103E-01	26.57	OK
	1120.29	14.92	1.136E+00	6.735E-01	6.737E-01	78.75	OK
	1764.49	15.30	7.485E-01	7.533E-01	7.536E-01	47.14	OK
AC-228	105.21	1.10	6.612E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.122E+00	1.243E+00	1.243E+00	56.75	OK
	794.95	4.25	1.512E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.451E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.350E+00	8.054E-01	8.054E-01	48.84	OK
	968.97	15.80	1.284E+00	1.288E+00	1.288E+00	44.91	OK
RA-228	105.21	1.10	6.612E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.122E+00	1.243E+00	1.243E+00	56.75	OK
	794.95	4.25	1.512E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.451E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.350E+00	8.054E-01	8.054E-01	48.84	OK
	968.97	15.80	1.284E+00	1.288E+00	1.288E+00	44.91	OK
TH-228	74.82	10.28	6.811E+00	1.481E+00	1.481E+00	35.42	OK
	77.11	17.10	6.799E+00	1.497E+00	1.497E+00	19.65	OK
	238.63	43.60*	4.211E+00	1.242E+00	1.242E+00	12.83	OK
	300.09	3.30	3.469E+00	1.178E+00	1.178E+00	130.01	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	609.32	45.49*	1.882E+00	8.100E-01	8.100E-01	26.57	OK
	1120.29	14.92	1.136E+00	6.735E-01	6.735E-01	78.75	OK
	1764.49	15.30	7.485E-01	7.533E-01	7.533E-01	47.14	OK
TH-232	105.21	1.10	6.612E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.122E+00	1.243E+00	1.243E+00	56.75	OK
	835.71	1.61	1.451E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.350E+00	8.054E-01	8.054E-01	48.84	OK
TH-234	968.97	15.80	1.284E+00	1.288E+00	1.288E+00	44.91	OK
	63.29	3.70*	6.932E+00	3.126E-02	3.126E-02	4690.27	OK
	92.59	4.23	6.722E+00	1.635E+00	1.635E+00	71.63	OK
U-234	609.32	45.49*	1.882E+00	8.100E-01	8.100E-01	26.57	OK
	1120.29	14.92	1.136E+00	6.735E-01	6.735E-01	78.75	OK
	1764.49	15.30	7.485E-01	7.533E-01	7.533E-01	47.14	OK
U-238	63.29	3.70*	6.932E+00	3.126E-02	3.126E-02	4690.27	OK
	92.59	4.23	6.722E+00	1.635E+00	1.635E+00	71.63	OK
	129.30	0.01*	6.237E+00	7.647E+02	7.647E+02	78.19	OK
PU-239	375.05	0.00	2.845E+00	1.099E+03	1.099E+03	231.16	OK
	413.71	0.00	2.617E+00	----- Line	Not Found	-----	Absent
	43.53	5.90	6.236E+00	----- Line	Not Found	-----	Absent
AM-243	74.66	67.20*	6.811E+00	2.266E-01	2.266E-01	35.42	OK
	511.00	100.00*	2.181E+00	2.903E-02	2.903E-02	403.36	OK

Flag: "*" = Keyline

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235008.CNF;1
* Acquisition date   : 3-OCT-2016 08:03:23 Sensitivity      : 3.000
* Detector ID        : GAM39 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:07.23 Half life ratio  : *****
* Sample date        : 10-DEC-2015 14:05:00 Analyst initials: MXR1
* Sample ID          : G405235008 Sample Quantity : 1.4789E+02 GRAM
* Batch Number       : 1596247 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 13:04:01 Eff. Geometry : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM39_CAN.CNF;4
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.449E+01	1.777E+00	8.112E-01
CD-109	8.037E-01	1.832E+00	2.195E+00
SN-126	5.138E-02	1.171E-01	1.308E-01
BA-137M	1.790E-01	9.101E-02	7.925E-02
CS-137	1.891E-01	9.614E-02	8.372E-02
TL-208	2.325E-01	1.083E-01	8.491E-02
PB-210	1.174E+00	1.092E+00	9.860E-01
BI-211	3.292E-01	1.057E+00	4.359E-01
PB-212	1.242E+00	1.561E-01	1.111E-01
BI-214	8.103E-01	2.110E-01	1.622E-01
PB-214	1.102E+00	2.257E-01	3.711E-01
RN-222	8.103E-01	2.110E-01	1.622E-01
RA-224	8.981E-01	1.800E+00	1.192E+00
RA-226	8.103E-01	2.110E-01	1.622E-01
AC-228	8.054E-01	3.855E-01	3.191E-01
RA-228	8.054E-01	3.855E-01	3.191E-01
TH-228	1.242E+00	1.561E-01	1.111E-01
TH-230	8.100E-01	2.109E-01	1.621E-01
TH-232	8.054E-01	3.855E-01	3.191E-01
TH-234	3.126E-02	1.437E+00	1.238E+00
U-234	8.100E-01	2.109E-01	1.621E-01
U-238	3.126E-02	1.437E+00	1.238E+00
PU-239	7.647E+02	5.860E+02	6.159E+02
AM-243	2.266E-01	7.864E-02	6.463E-02
ANH-511	2.903E-02	1.147E-01	6.277E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	3.700E+00	1.362E+01	2.698E+01	NOT IDENT.
NA-22	1.582E-03	5.716E-02	1.145E-01	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	8.283E-03	3.889E-02	8.760E-02	NOT IDENT.
SC-46	1.544E-01	4.379E-01	9.111E-01	FAIL ABUN

V-48	0.000E+00	1.467E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	5.071E+02	0.000E+00	SHORT HLIF
MN-54	-2.318E-02	7.886E-02	1.514E-01	NOT IDENT.
CO-56	-2.644E-01	5.683E-01	1.066E+00	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.366E-02	4.783E-02	8.895E-02	NOT IDENT.
CO-58	6.019E-01	6.532E-01	1.490E+00	NOT IDENT.
FE-59	2.132E-01	6.512E+00	1.349E+01	NOT IDENT.
CO-60	-3.340E-03	4.175E-02	8.481E-02	NOT IDENT.
ZN-65	-7.592E-02	2.510E-01	4.065E-01	NOT IDENT.
GE-68	1.875E-01	3.101E+00	6.185E+00	NOT IDENT.
AS-73	1.305E-01	2.674E+00	5.001E+00	NOT IDENT.
AS-74	0.000E+00	1.055E+04	0.000E+00	SHORT HLIF
SE-75	2.219E-01	2.432E-01	5.059E-01	NOT IDENT.
BR-77	0.000E+00	1.531E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	8.059E+02	0.000E+00	SHORT HLIF
RB-83	4.312E-02	7.892E-01	1.517E+00	FAIL ABUN
KR-85	4.428E+00	8.639E+00	1.731E+01	NOT IDENT.
SR-85	4.578E-01	8.931E-01	1.789E+00	NOT IDENT.
RB-86	0.000E+00	3.395E+04	0.000E+00	SHORT HLIF
Y-88	-1.521E-02	2.493E-01	5.313E-01	NOT IDENT.
Y-91	6.165E+01	6.898E+02	1.360E+03	NOT IDENT.
NB-94	7.994E-03	4.165E-02	7.975E-02	FAIL ABUN
NB-95	-6.481E-01	1.134E+00	1.916E+00	NOT IDENT.
NB-95M	2.790E+00	2.797E+00	5.364E+00	NOT IDENT.
ZR-95	1.184E+00	1.798E+00	3.723E+00	NOT IDENT.
NB-97	0.000E+00	1.657E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.439E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.315E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-2.661E-03	4.124E-02	6.760E-02	NOT IDENT.
RH-102	3.605E-02	6.848E-02	1.413E-01	NOT IDENT.
RU-103	2.292E+00	6.649E+00	1.327E+01	FAIL ABUN
RH-106	-7.648E-02	6.488E-01	1.203E+00	NOT IDENT.
RU-106	-7.648E-02	6.488E-01	1.203E+00	NOT IDENT.
AG-108M	-1.319E-02	2.899E-02	5.281E-02	NOT IDENT.
AG-110M	3.183E-02	1.457E-01	2.676E-01	FAIL ABUN
SN-113	-2.081E-02	2.744E-01	5.218E-01	NOT IDENT.
CD-115	0.000E+00	2.009E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	9.913E+04	0.000E+00	SHORT HLIF
TE-123M	5.890E-03	1.393E-01	2.645E-01	NOT IDENT.
SB-124	1.653E+00	2.049E+00	5.536E+00	NOT IDENT.
SB-125	-5.299E-02	1.243E-01	2.259E-01	NOT IDENT.
TE-125M	-7.003E+01	2.762E+02	4.901E+02	NOT IDENT.
I-126	0.000E+00	6.358E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.277E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	2.434E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	4.927E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	4.267E+40	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.028E+26	0.000E+00	SHORT HLIF
BA-133	-9.803E-03	5.528E-02	9.266E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	3.874E-02	7.077E-02	1.476E-01	FAIL ABUN
CS-135	-8.423E-02	1.764E-01	2.891E-01	NOT IDENT.
I-135	0.000E+00	1.552E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.474E+05	0.000E+00	SHORT HLIF
CE-139	-8.275E-02	1.131E-01	2.114E-01	NOT IDENT.
BA-140	0.000E+00	1.509E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.638E+05	0.000E+00	SHORT HLIF
CE-141	-1.571E+01	2.454E+01	4.663E+01	NOT IDENT.
CE-143	0.000E+00	9.757E+40	0.000E+00	SHORT HLIF
CE-144	2.523E-01	4.242E-01	7.943E-01	NOT IDENT.
PM-144	3.898E-03	6.171E-02	1.187E-01	NOT IDENT.
PR-144	3.382E-01	5.354E+00	1.030E+01	NOT IDENT.
PM-146	0.000E+00	8.015E-02	1.067E-01	FAIL ABUN
ND-147	0.000E+00	3.842E+07	0.000E+00	SHORT HLIF
PM-147	-4.548E+02	8.518E+02	1.466E+03	NOT IDENT.
PM-149	0.000E+00	2.847E+40	0.000E+00	SHORT HLIF
EU-150	-4.633E-03	2.973E-02	5.055E-02	FAIL ABUN
EU-152	4.066E-03	1.131E-01	2.089E-01	FAIL ABUN
GD-153	-2.382E-01	2.075E-01	3.089E-01	NOT IDENT.
EU-154	6.934E-03	1.409E-01	2.832E-01	NOT IDENT.
EU-155	3.278E-02	1.168E-01	2.159E-01	FAIL ABUN
TB-160	4.738E-01	2.158E+00	4.395E+00	FAIL ABUN
HO-166M	4.661E-03	6.804E-02	1.301E-01	FAIL ABUN
TM-171	-2.266E-01	5.845E+00	1.089E+01	NOT IDENT.
HF-172	1.805E-01	2.778E-01	4.889E-01	FAIL ABUN
LU-172	-5.872E-02	8.580E-02	1.515E-01	FAIL ABUN

LU-176	-2.576E-02	2.683E-02	4.501E-02	FAIL ABUN
HF-181	1.594E+00	4.821E+00	9.668E+00	NOT IDENT.
TA-182	1.301E+00	1.153E+00	2.620E+00	FAIL ABUN
RE-183	-5.289E-01	1.231E+00	2.220E+00	NOT IDENT.
RE-184	8.884E+00	3.801E+01	7.801E+01	NOT IDENT.
W-188	-1.235E+02	1.460E+02	2.257E+02	FAIL ABUN
IR-192	-1.293E-01	5.466E-01	1.029E+00	FAIL ABUN
HG-203	7.372E-01	2.945E+00	5.769E+00	FAIL ABUN
BI-207	4.104E-02	6.548E-02	1.399E-01	FAIL ABUN
PB-211	4.073E-01	7.909E-01	1.548E+00	NOT IDENT.
BI-212	-4.087E-02	6.376E-01	1.190E+00	NOT IDENT.
RN-219	1.161E-01	4.444E-01	8.780E-01	FAIL ABUN
RA-223	-1.003E-01	7.311E-01	1.384E+00	FAIL ABUN
AC-227	-1.829E-02	2.469E-01	4.781E-01	FAIL ABUN
TH-227	-1.829E-02	2.469E-01	4.781E-01	FAIL ABUN
TH-229	2.750E-02	4.927E-01	9.700E-01	FAIL ABUN
PA-231	2.686E-01	5.359E-01	1.072E+00	NOT IDENT.
TH-231	-1.003E-01	7.311E-01	1.384E+00	FAIL ABUN
PA-233	5.629E-04	6.771E-02	1.311E-01	FAIL ABUN
PA-234	-7.937E-02	3.624E-01	6.983E-01	FAIL ABUN
PA-234M	-1.304E+00	5.456E+00	1.058E+01	NOT IDENT.
U-235	1.313E-02	1.897E-01	3.775E-01	FAIL ABUN
NP-237	5.629E-04	6.771E-02	1.311E-01	FAIL ABUN
NP-238	0.000E+00	1.900E+41	0.000E+00	SHORT HLIF
NP-239	-8.397E-02	2.566E-01	4.509E-01	NOT IDENT.
AM-241	4.371E-02	7.067E-02	1.263E-01	NOT IDENT.
CM-243	-4.231E-02	1.013E-01	1.776E-01	NOT IDENT.
BK-247	9.072E-02	8.940E-02	1.808E-01	NOT IDENT.
CM-247	-3.040E-02	4.226E-02	7.421E-02	NOT IDENT.
CF-249	7.471E-03	4.250E-02	8.354E-02	NOT IDENT.
CF-251	1.046E-02	1.315E-01	2.587E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	273	10.66*	8.984E-01	1.449E+01	1.449E+01	12.51
CD-109	88.03	70	3.70*	6.754E+00	1.419E+00	2.219E+00	81.68
SN-126	64.28	2	9.60	6.932E+00	1.205E-02	1.205E-02	4690.27
	86.94	70	8.90	6.754E+00	5.898E-01	5.898E-01	81.68
	87.57	70	37.00*	6.754E+00	1.419E-01	1.419E-01	81.68
BA-137M	661.66	55	89.90*	1.755E+00	1.757E-01	1.790E-01	51.88
CS-137	661.66	55	85.10*	1.755E+00	1.856E-01	1.891E-01	51.88
TL-208	277.37	-----	6.60	3.709E+00	-----	Line Not Found	-----
	583.19	76	85.00*	1.953E+00	2.325E-01	2.325E-01	47.52
	860.56	31	12.50	1.416E+00	8.818E-01	8.818E-01	59.82
PB-210	46.54	66	4.25*	6.842E+00	1.145E+00	1.174E+00	94.92
BI-211	72.87	40	1.23	6.824E+00	2.436E+00	2.436E+00	128.32
	351.06	233	12.92*	3.013E+00	3.034E+00	3.034E+00	20.91
PB-212	74.82	281	10.28	6.811E+00	2.035E+00	2.035E+00	24.24
	77.11	343	17.10	6.799E+00	1.497E+00	1.497E+00	19.65
	238.63	449	43.60*	4.211E+00	1.242E+00	1.242E+00	12.83
	300.09	27	3.30	3.469E+00	1.178E+00	1.178E+00	130.01
BI-214	609.32	137	45.49*	1.882E+00	8.100E-01	8.103E-01	26.57
	1120.29	22	14.92	1.136E+00	6.735E-01	6.737E-01	78.75
	1764.49	17	15.30	7.485E-01	7.533E-01	7.536E-01	47.14
PB-214	74.82	281	5.80	6.811E+00	3.607E+00	3.608E+00	24.24
	77.11	343	9.70	6.799E+00	2.640E+00	2.641E+00	19.65
	87.09	70	3.41	6.754E+00	1.539E+00	1.540E+00	81.68
	242.00	89	7.25	4.168E+00	1.490E+00	1.490E+00	66.41
	295.22	125	18.42	3.514E+00	9.817E-01	9.821E-01	32.23
	351.93	233	35.60*	3.013E+00	1.101E+00	1.102E+00	20.91
RN-222	609.32	137	45.49*	1.882E+00	8.100E-01	8.103E-01	26.57
	1120.29	22	14.92	1.136E+00	6.735E-01	6.737E-01	78.75
	1764.49	17	15.30	7.485E-01	7.533E-01	7.536E-01	47.14
RA-224	240.99	89	4.10*	4.168E+00	2.634E+00	2.634E+00	66.41
RA-226	609.32	137	45.49*	1.882E+00	8.100E-01	8.103E-01	26.57
	1120.29	22	14.92	1.136E+00	6.735E-01	6.737E-01	78.75
	1764.49	17	15.30	7.485E-01	7.533E-01	7.536E-01	47.14
AC-228	105.21	-----	1.10	6.612E+00	-----	Line Not Found	-----
	338.32	86	11.27	3.122E+00	1.243E+00	1.243E+00	56.75
	794.95	-----	4.25	1.512E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.451E+00	-----	Line Not Found	-----
	911.20	55	25.80*	1.350E+00	8.054E-01	8.054E-01	48.84
	968.97	51	15.80	1.284E+00	1.288E+00	1.288E+00	44.91
RA-228	105.21	-----	1.10	6.612E+00	-----	Line Not Found	-----
	338.32	86	11.27	3.122E+00	1.243E+00	1.243E+00	56.75
	794.95	-----	4.25	1.512E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.451E+00	-----	Line Not Found	-----
	911.20	55	25.80*	1.350E+00	8.054E-01	8.054E-01	48.84
	968.97	51	15.80	1.284E+00	1.288E+00	1.288E+00	44.91
TH-228	74.82	281	10.28	6.811E+00	2.035E+00	2.035E+00	24.24
	77.11	343	17.10	6.799E+00	1.497E+00	1.497E+00	19.65

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	238.63	449	43.60*	4.211E+00	1.242E+00	1.242E+00	12.83
	300.09	27	3.30	3.469E+00	1.178E+00	1.178E+00	130.01
TH-230	609.32	137	45.49*	1.882E+00	8.100E-01	8.100E-01	26.57
	1120.29	22	14.92	1.136E+00	6.735E-01	6.735E-01	78.75
	1764.49	17	15.30	7.485E-01	7.533E-01	7.533E-01	47.14
TH-232	105.21	-----	1.10	6.612E+00	-----	Line Not Found	-----
	338.32	86	11.27	3.122E+00	1.243E+00	1.243E+00	56.75
	835.71	-----	1.61	1.451E+00	-----	Line Not Found	-----
	911.20	55	25.80*	1.350E+00	8.054E-01	8.054E-01	48.84
	968.97	51	15.80	1.284E+00	1.288E+00	1.288E+00	44.91
TH-234	63.29	2	3.70*	6.932E+00	3.126E-02	3.126E-02	4690.27
	92.59	92	4.23	6.722E+00	1.635E+00	1.635E+00	71.63
U-234	609.32	137	45.49*	1.882E+00	8.100E-01	8.100E-01	26.57
	1120.29	22	14.92	1.136E+00	6.735E-01	6.735E-01	78.75
	1764.49	17	15.30	7.485E-01	7.533E-01	7.533E-01	47.14
U-238	63.29	2	3.70*	6.932E+00	3.126E-02	3.126E-02	4690.27
	92.59	92	4.23	6.722E+00	1.635E+00	1.635E+00	71.63
PU-239	129.30	59	0.01*	6.237E+00	7.647E+02	7.647E+02	78.19
	375.05	10	0.00	2.845E+00	1.099E+03	1.099E+03	231.16
	413.71	-----	0.00	2.617E+00	-----	Line Not Found	-----
AM-243	43.53	-----	5.90	6.236E+00	-----	Line Not Found	-----
	74.66	281	67.20*	6.811E+00	3.113E-01	3.113E-01	24.24
ANH-511	511.00	12	100.00*	2.181E+00	2.903E-02	2.903E-02	403.36

Flag: "*" = Keyline

Total number of lines in spectrum 51
 Number of unidentified lines 12
 Number of lines tentatively identified by NID 39 76.47%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.449E+01	1.449E+01	0.181E+01	12.51	
CD-109	461.40D	1.56	1.419E+00	2.219E+00	1.812E+00	81.68	
SN-126	2.30E+05Y	1.00	1.419E-01	1.419E-01	1.159E-01	81.68	
BA-137M	30.08Y	1.02	1.757E-01	1.790E-01	0.929E-01	51.88	
CS-137	30.08Y	1.02	1.856E-01	1.891E-01	0.981E-01	51.88	
TL-208	1.41E+10Y	1.00	2.325E-01	2.325E-01	1.105E-01	47.52	
PB-210	22.20Y	1.03	1.145E+00	1.174E+00	1.114E+00	94.92	
BI-211	7.04E+08Y	1.00	3.034E+00	3.034E+00	0.634E+00	20.91	
PB-212	1.41E+10Y	1.00	1.242E+00	1.242E+00	0.159E+00	12.83	
BI-214	1600.00Y	1.00	8.100E-01	8.103E-01	2.153E-01	26.57	
PB-214	1600.00Y	1.00	1.101E+00	1.102E+00	0.230E+00	20.91	
RN-222	1600.00Y	1.00	8.100E-01	8.103E-01	2.153E-01	26.57	
RA-224	1.41E+10Y	1.00	2.634E+00	2.634E+00	1.749E+00	66.41	
RA-226	1600.00Y	1.00	8.100E-01	8.103E-01	2.153E-01	26.57	
AC-228	1.41E+10Y	1.00	8.054E-01	8.054E-01	3.933E-01	48.84	
RA-228	1.41E+10Y	1.00	8.054E-01	8.054E-01	3.933E-01	48.84	
TH-228	1.41E+10Y	1.00	1.242E+00	1.242E+00	0.159E+00	12.83	
TH-230	7.54E+04Y	1.00	8.100E-01	8.100E-01	2.153E-01	26.57	
TH-232	1.41E+10Y	1.00	8.054E-01	8.054E-01	3.933E-01	48.84	
TH-234	4.47E+09Y	1.00	3.126E-02	3.126E-02	146.6E-02	4690.27	
U-234	2.45E+05Y	1.00	8.100E-01	8.100E-01	2.152E-01	26.57	
U-238	4.47E+09Y	1.00	3.126E-02	3.126E-02	146.6E-02	4690.27	
PU-239	24110.00Y	1.00	7.647E+02	7.647E+02	5.980E+02	78.19	
AM-243	7370.00Y	1.00	3.113E-01	3.113E-01	0.755E-01	24.24	
ANH-511	1.00E+09Y	1.00	2.903E-02	2.903E-02	11.71E-02	403.36	
Total Activity :			7.986E+02	7.995E+02			

Grand Total Activity : 7.986E+02 7.995E+02

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	153.90	25	128	0.61	307.64	305	8	5.81E-03	****	5.75E+00	T
0	185.18	107	205	1.55	370.20	364	15	2.53E-02	67.9	5.12E+00	T
0	209.61	36	117	0.98	419.06	413	10	8.56E-03	****	4.67E+00	T
0	217.41	40	92	0.74	434.67	430	9	9.66E-03	98.9	4.54E+00	
0	270.81	28	73	1.90	541.47	536	9	6.87E-03	****	3.79E+00	T
0	411.76	67	37	6.89	823.38	816	17	1.69E-02	50.7	2.63E+00	T
0	454.53	43	17	6.16	908.93	902	15	1.09E-02	53.6	2.41E+00	T
0	464.96	80	61	9.36	929.79	917	28	2.06E-02	61.8	2.37E+00	
0	534.00	15	14	1.46	1067.88	1065	6	3.80E-03	****	2.10E+00	
0	552.45	22	23	1.27	1104.78	1099	11	5.72E-03	98.3	2.04E+00	T
0	562.62	14	36	1.79	1125.13	1118	10	3.61E-03	****	2.01E+00	T
0	595.97	10	29	1.27	1191.82	1185	10	2.54E-03	****	1.92E+00	T
0	669.35	15	6	1.24	1338.59	1335	8	3.97E-03	79.1	1.74E+00	
0	693.49	34	25	6.10	1386.88	1378	20	9.10E-03	82.3	1.69E+00	
0	808.79	38	4	4.03	1617.50	1610	16	1.03E-02	40.9	1.49E+00	T
0	870.96	14	12	1.14	1741.86	1736	10	3.96E-03	****	1.40E+00	T
0	881.92	27	23	8.82	1763.78	1749	23	7.50E-03	****	1.39E+00	T
1	964.70	22	17	2.03	1929.37	1919	26	6.05E-03	85.2	1.29E+00	T
0	1033.58	14	2	1.12	2067.13	2063	8	3.91E-03	63.5	1.22E+00	
0	1160.33	18	3	1.58	2320.67	2315	10	5.10E-03	56.9	1.10E+00	
0	1175.83	27	8	0.75	2351.69	2343	17	7.64E-03	61.8	1.09E+00	
0	1228.04	8	7	0.90	2456.12	2453	8	2.39E-03	****	1.05E+00	
0	1384.20	7	5	1.35	2768.50	2763	10	1.94E-03	****	9.44E-01	T
0	1509.87	8	2	0.93	3019.90	3014	10	2.39E-03	96.7	8.71E-01	
0	1587.75	12	0	1.53	3175.69	3170	11	3.61E-03	55.5	8.31E-01	
0	1887.13	4	2	1.36	3774.60	3767	10	1.23E-03	****	6.98E-01	

Flags: "T" = Tentatively associated


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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235008.CNF;1
* Acquisition date   : 3-OCT-2016 08:03:23 Sensitivity      : 3.000
* Detector ID       : GAM39 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:07.23 Half life ratio  : *****
* Sample date       : 10-DEC-2015 14:05:00 Nuclide Library : SOLID
* Sample ID         : G405235008 Analyst initials: MXR1
* Batch Number      : 1596247 Sample Quantity  : 1.4789E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight      : 0.00000
*                   Dry Weight      : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 27-JUL-2016 13:04:01 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM39_CAN.CNF;4
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	3.335E-01
CD-109	1.052E+00
SN-126	6.250E-02
BA-137M	3.510E-02
CS-137	3.708E-02
TL-208	3.822E-02
PB-210	4.668E-01
BI-211	1.997E-01
PB-212	5.165E-02
BI-214	7.288E-02
PB-214	1.790E-01
RN-222	7.288E-02
RA-224	5.541E-01
RA-226	7.288E-02
AC-228	1.396E-01
RA-228	1.396E-01
TH-228	5.165E-02
TH-230	7.286E-02
TH-232	1.396E-01
TH-234	5.902E-01
U-234	7.286E-02
U-238	5.902E-01
PU-239	2.895E+02
AM-243	3.072E-02
ANH-511	2.815E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.207E+01	NOT IDENT.
NA-22	4.879E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	3.437E-02	NOT IDENT.
SC-46	3.961E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF

CR-51	0.000E+00	SHORT HLIF
MN-54	6.639E-02	NOT IDENT.
CO-56	4.626E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.162E-02	NOT IDENT.
CO-58	6.582E-01	NOT IDENT.
FE-59	5.643E+00	NOT IDENT.
CO-60	3.452E-02	NOT IDENT.
ZN-65	1.752E-01	NOT IDENT.
GE-68	2.699E+00	NOT IDENT.
AS-73	2.368E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	2.353E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	6.784E-01	FAIL ABUN
KR-85	7.863E+00	NOT IDENT.
SR-85	8.129E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.989E-01	NOT IDENT.
Y-91	5.950E+02	NOT IDENT.
NB-94	3.568E-02	FAIL ABUN
NB-95	8.452E-01	NOT IDENT.
NB-95M	2.511E+00	NOT IDENT.
ZR-95	1.656E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.178E-02	NOT IDENT.
RH-102	6.266E-02	NOT IDENT.
RU-103	5.969E+00	FAIL ABUN
RH-106	5.350E-01	NOT IDENT.
RU-106	5.350E-01	NOT IDENT.
AG-108M	2.328E-02	NOT IDENT.
AG-110M	1.180E-01	FAIL ABUN
SN-113	2.370E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.236E-01	NOT IDENT.
SB-124	2.197E+00	NOT IDENT.
SB-125	1.015E-01	NOT IDENT.
TE-125M	2.301E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.227E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	6.667E-02	FAIL ABUN
CS-135	1.328E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	9.834E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.187E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.753E-01	NOT IDENT.
PM-144	5.196E-02	NOT IDENT.
PR-144	4.509E+00	NOT IDENT.
PM-146	4.837E-02	FAIL ABUN
ND-147	0.000E+00	SHORT HLIF
PM-147	6.835E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.289E-02	FAIL ABUN
EU-152	9.539E-02	FAIL ABUN
GD-153	1.456E-01	NOT IDENT.
EU-154	1.208E-01	NOT IDENT.
EU-155	1.021E-01	FAIL ABUN
TB-160	1.908E+00	FAIL ABUN
HO-166M	5.722E-02	FAIL ABUN
TM-171	5.146E+00	NOT IDENT.
HF-172	2.307E-01	FAIL ABUN
LU-172	6.289E-02	FAIL ABUN
LU-176	2.026E-02	FAIL ABUN

HF-181	4.335E+00	NOT IDENT.
TA-182	1.162E+00	FAIL ABUN
RE-183	1.052E+00	NOT IDENT.
RE-184	3.443E+01	NOT IDENT.
W-188	1.032E+02	FAIL ABUN
IR-192	4.718E-01	FAIL ABUN
HG-203	2.685E+00	FAIL ABUN
BI-207	6.196E-02	FAIL ABUN
PB-211	7.036E-01	NOT IDENT.
BI-212	5.302E-01	NOT IDENT.
RN-219	3.989E-01	FAIL ABUN
RA-223	6.370E-01	FAIL ABUN
AC-227	2.200E-01	FAIL ABUN
TH-227	2.200E-01	FAIL ABUN
TH-229	4.520E-01	FAIL ABUN
PA-231	4.976E-01	NOT IDENT.
TH-231	6.370E-01	FAIL ABUN
PA-233	6.002E-02	FAIL ABUN
PA-234	3.048E-01	FAIL ABUN
PA-234M	4.627E+00	NOT IDENT.
U-235	1.777E-01	FAIL ABUN
NP-237	6.002E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.113E-01	NOT IDENT.
AM-241	6.022E-02	NOT IDENT.
CM-243	8.343E-02	NOT IDENT.
BK-247	8.423E-02	NOT IDENT.
CM-247	3.343E-02	NOT IDENT.
CF-249	3.787E-02	NOT IDENT.
CF-251	1.214E-01	NOT IDENT.

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235008.CNF;1
* Acquisition date   : 3-OCT-2016 08:03:23 Sensitivity      : 3.000
* Detector ID        : GAM39 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:07.23 Half life ratio  : *****
* Sample date        : 10-DEC-2015 14:05:00 Nuclide Library : SOLID
* Sample ID          : G405235008 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.4789E+02 GRAM
*                   : Quantity Err(%) : 1.3524E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight       : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 13:04:01 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM39_CAN.CNF;4
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.449E+01	1.931E+00	1.931E+00
CD-109	8.037E-01	1.841E+00	1.841E+00
SN-126	5.138E-02	1.177E-01	1.177E-01
BA-137M	1.790E-01	9.134E-02	9.134E-02
CS-137	1.891E-01	9.649E-02	9.649E-02
TL-208	2.325E-01	1.087E-01	1.087E-01
PB-210	1.174E+00	1.096E+00	1.096E+00
BI-211	3.292E-01	1.070E+00	1.070E+00
PB-212	1.242E+00	1.694E-01	1.694E-01
BI-214	8.103E-01	2.139E-01	2.139E-01
PB-214	1.102E+00	2.303E-01	2.303E-01
RN-222	8.103E-01	2.139E-01	2.139E-01
RA-224	8.981E-01	1.804E+00	1.804E+00
RA-226	8.103E-01	2.139E-01	2.139E-01
AC-228	8.054E-01	3.877E-01	3.877E-01
RA-228	8.054E-01	3.877E-01	3.877E-01
TH-228	1.242E+00	1.694E-01	1.694E-01
TH-230	8.100E-01	2.138E-01	2.138E-01
TH-232	8.054E-01	3.877E-01	3.877E-01
TH-234	3.126E-02	1.437E+00	1.437E+00
U-234	8.100E-01	2.138E-01	2.138E-01
U-238	3.126E-02	1.437E+00	1.437E+00
PU-239	7.647E+02	5.870E+02	5.870E+02
AM-243	2.266E-01	8.058E-02	8.058E-02
ANH-511	2.903E-02	1.148E-01	1.148E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	3.700E+00	1.362E+01	1.372E+01	NOT IDENT.
NA-22	1.582E-03	5.716E-02	5.717E-02	NOT IDENT.
NA-24	1.000E+41	2.556E+43	0.000E+00	SHORT HLIF
AL-26	8.283E-03	3.889E-02	3.907E-02	NOT IDENT.
SC-46	1.544E-01	4.379E-01	4.434E-01	FAIL ABUN

V-48	1.063E+04	1.468E+04	1.544E+04	SHORT HLIF
CR-51	-5.832E+01	5.071E+02	5.078E+02	SHORT HLIF
MN-54	-2.318E-02	7.886E-02	7.955E-02	NOT IDENT.
CO-56	-2.644E-01	5.684E-01	5.808E-01	NOT IDENT.
MN-56	-1.000E+41	2.187E+41	0.000E+00	SHORT HLIF
CO-57	1.366E-02	4.783E-02	4.822E-02	NOT IDENT.
CO-58	6.019E-01	6.537E-01	7.078E-01	NOT IDENT.
FE-59	2.132E-01	6.512E+00	6.513E+00	NOT IDENT.
CO-60	-3.340E-03	4.175E-02	4.177E-02	NOT IDENT.
ZN-65	-7.592E-02	2.510E-01	2.533E-01	NOT IDENT.
GE-68	1.875E-01	3.101E+00	3.102E+00	NOT IDENT.
AS-73	1.305E-01	2.674E+00	2.675E+00	NOT IDENT.
AS-74	4.791E+03	1.056E+04	1.078E+04	SHORT HLIF
SE-75	2.219E-01	2.434E-01	2.631E-01	NOT IDENT.
BR-77	1.218E+38	1.047E+39	0.000E+00	SHORT HLIF
SR-82	1.689E+02	8.059E+02	8.095E+02	SHORT HLIF
RB-83	4.312E-02	7.892E-01	7.894E-01	FAIL ABUN
KR-85	4.428E+00	8.641E+00	8.869E+00	NOT IDENT.
SR-85	4.578E-01	8.933E-01	9.168E-01	NOT IDENT.
RB-86	1.566E+04	3.396E+04	3.468E+04	SHORT HLIF
Y-88	-1.521E-02	2.493E-01	2.494E-01	NOT IDENT.
Y-91	6.165E+01	6.898E+02	6.903E+02	NOT IDENT.
NB-94	7.994E-03	4.165E-02	4.180E-02	FAIL ABUN
NB-95	-6.481E-01	1.134E+00	1.171E+00	NOT IDENT.
NB-95M	2.790E+00	2.806E+00	3.075E+00	NOT IDENT.
ZR-95	1.184E+00	1.799E+00	1.877E+00	NOT IDENT.
NB-97	1.000E+41	1.658E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.439E+41	0.000E+00	SHORT HLIF
MO-99	-5.484E+31	1.315E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	4.182E+41	0.000E+00	SHORT HLIF
RH-101	-2.661E-03	4.125E-02	4.126E-02	NOT IDENT.
RH-102	3.605E-02	6.854E-02	7.044E-02	NOT IDENT.
RU-103	2.292E+00	6.650E+00	6.730E+00	FAIL ABUN
RH-106	-7.648E-02	6.489E-01	6.498E-01	NOT IDENT.
RU-106	-7.648E-02	6.489E-01	6.498E-01	NOT IDENT.
AG-108M	-1.319E-02	2.900E-02	2.960E-02	NOT IDENT.
AG-110M	3.183E-02	1.457E-01	1.464E-01	FAIL ABUN
SN-113	-2.081E-02	2.744E-01	2.746E-01	NOT IDENT.
CD-115	2.413E+38	2.010E+39	0.000E+00	SHORT HLIF
SN-117M	2.909E+03	9.913E+04	9.913E+04	SHORT HLIF
TE-123M	5.890E-03	1.393E-01	1.394E-01	NOT IDENT.
SB-124	1.653E+00	2.051E+00	2.182E+00	NOT IDENT.
SB-125	-5.299E-02	1.243E-01	1.266E-01	NOT IDENT.
TE-125M	-7.003E+01	2.762E+02	2.780E+02	NOT IDENT.
I-126	1.392E+06	6.630E+05	9.130E+05	SHORT HLIF
SB-126	-7.973E+05	1.286E+06	1.335E+06	SHORT HLIF
SB-127	-3.168E+20	2.434E+22	0.000E+00	SHORT HLIF
I-131	-2.939E+08	4.927E+09	4.929E+09	SHORT HLIF
I-132	1.000E+41	1.836E+42	0.000E+00	SHORT HLIF
TE-132	2.547E+25	3.029E+26	0.000E+00	SHORT HLIF
BA-133	-9.803E-03	5.528E-02	5.546E-02	NOT IDENT.
I-133	-1.000E+41	2.749E+41	0.000E+00	SHORT HLIF
CS-134	3.874E-02	7.079E-02	7.292E-02	FAIL ABUN
CS-135	-8.423E-02	1.764E-01	1.805E-01	NOT IDENT.
I-135	-1.000E+41	6.905E+41	0.000E+00	SHORT HLIF
CS-136	-1.289E+05	3.477E+05	3.525E+05	SHORT HLIF
CE-139	-8.275E-02	1.143E-01	1.203E-01	NOT IDENT.
BA-140	2.024E+05	1.509E+06	1.512E+06	SHORT HLIF
LA-140	2.085E+05	4.639E+05	4.733E+05	SHORT HLIF
CE-141	-1.571E+01	2.455E+01	2.555E+01	NOT IDENT.
CE-143	1.000E+41	9.810E+40	0.000E+00	SHORT HLIF
CE-144	2.523E-01	4.245E-01	4.394E-01	NOT IDENT.
PM-144	3.898E-03	6.171E-02	6.173E-02	NOT IDENT.
PR-144	3.382E-01	5.354E+00	5.356E+00	NOT IDENT.
PM-146	1.527E-01	8.091E-02	1.062E-01	FAIL ABUN
ND-147	-1.039E+06	3.842E+07	3.843E+07	SHORT HLIF
PM-147	-4.548E+02	8.521E+02	8.764E+02	NOT IDENT.
PM-149	-8.392E+39	2.853E+40	0.000E+00	SHORT HLIF
EU-150	-4.633E-03	2.973E-02	2.981E-02	FAIL ABUN
EU-152	4.066E-03	1.131E-01	1.132E-01	FAIL ABUN
GD-153	-2.382E-01	2.080E-01	2.340E-01	NOT IDENT.
EU-154	6.934E-03	1.409E-01	1.410E-01	NOT IDENT.
EU-155	3.278E-02	1.169E-01	1.178E-01	FAIL ABUN
TB-160	4.738E-01	2.159E+00	2.169E+00	FAIL ABUN
HO-166M	4.661E-03	6.804E-02	6.808E-02	FAIL ABUN
TM-171	-2.266E-01	5.845E+00	5.846E+00	NOT IDENT.
HF-172	1.805E-01	2.793E-01	2.909E-01	FAIL ABUN
LU-172	-5.872E-02	8.601E-02	8.999E-02	FAIL ABUN

LU-176	-2.576E-02	2.686E-02	2.926E-02	FAIL ABUN
HF-181	1.594E+00	4.822E+00	4.875E+00	NOT IDENT.
TA-182	1.301E+00	1.154E+00	1.294E+00	FAIL ABUN
RE-183	-5.289E-01	1.234E+00	1.257E+00	NOT IDENT.
RE-184	8.884E+00	3.807E+01	3.828E+01	NOT IDENT.
W-188	-1.235E+02	1.467E+02	1.569E+02	FAIL ABUN
IR-192	-1.293E-01	5.466E-01	5.497E-01	FAIL ABUN
HG-203	7.372E-01	2.946E+00	2.964E+00	FAIL ABUN
BI-207	4.104E-02	6.550E-02	6.806E-02	FAIL ABUN
PB-211	4.073E-01	7.912E-01	8.122E-01	NOT IDENT.
BI-212	-4.087E-02	6.376E-01	6.379E-01	NOT IDENT.
RN-219	1.161E-01	4.446E-01	4.477E-01	FAIL ABUN
RA-223	-1.003E-01	7.311E-01	7.325E-01	FAIL ABUN
AC-227	-1.829E-02	2.470E-01	2.471E-01	FAIL ABUN
TH-227	-1.829E-02	2.470E-01	2.471E-01	FAIL ABUN
TH-229	2.750E-02	4.927E-01	4.929E-01	FAIL ABUN
PA-231	2.686E-01	5.389E-01	5.524E-01	NOT IDENT.
TH-231	-1.003E-01	7.311E-01	7.325E-01	FAIL ABUN
PA-233	5.629E-04	6.771E-02	6.771E-02	FAIL ABUN
PA-234	-7.937E-02	3.736E-01	3.753E-01	FAIL ABUN
PA-234M	-1.304E+00	5.456E+00	5.487E+00	NOT IDENT.
U-235	1.313E-02	1.897E-01	1.898E-01	FAIL ABUN
NP-237	5.629E-04	6.771E-02	6.771E-02	FAIL ABUN
NP-238	1.000E+41	1.900E+41	0.000E+00	SHORT HLIF
NP-239	-8.397E-02	2.567E-01	2.594E-01	NOT IDENT.
AM-241	4.371E-02	7.074E-02	7.343E-02	NOT IDENT.
CM-243	-4.231E-02	1.013E-01	1.031E-01	NOT IDENT.
BK-247	9.072E-02	9.125E-02	1.000E-01	NOT IDENT.
CM-247	-3.040E-02	4.257E-02	4.472E-02	NOT IDENT.
CF-249	7.471E-03	4.250E-02	4.264E-02	NOT IDENT.
CF-251	1.046E-02	1.315E-01	1.316E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	84.9955	87.09	151.3662	136.47	76.0925
45.60	104.8623	87.57	151.4658	140.51	0.0000
46.54	105.0630	88.03	175.2441	143.76	71.6081
49.72	0.0000	88.34	153.2064	144.24	66.5855
51.35	101.5943	88.47	153.2330	145.44	79.3240
51.87	94.9898	89.96	87.8530	152.43	86.6695
52.39	89.4901	1093.63	123.5825	153.25	0.0000
52.97	89.5877	91.11	0.0000	323.87	69.7948
53.44	94.1498	92.59	123.9063	156.02	0.0000
54.07	99.8704	93.35	124.0308	158.56	0.0000
57.36	0.0000	94.56	101.9316	159.00	67.7201
57.53	123.0845	94.65	100.3505	162.33	73.7645
57.98	120.9224	94.67	100.3537	162.66	0.0000
59.27	110.2482	94.87	100.3800	163.33	55.8038
59.32	110.2578	97.43	127.8914	165.86	75.7271
59.54	117.8549	98.43	82.8361	176.31	70.3617
60.96	151.4684	98.44	82.8372	176.60	0.0000
61.17	145.4619	99.53	81.7502	177.52	76.5238
62.93	140.1993	100.11	78.2011	181.07	0.0000
63.29	140.2847	102.03	104.9228	181.52	70.6822
63.58	140.3530	103.18	91.7883	184.41	62.9854
64.28	138.6134	103.37	91.8103	143.76	63.0557
66.73	131.5265	105.21	92.0191	193.51	61.7072
67.24	134.6972	105.31	92.0307	197.03	62.7707
125.81	130.9636	106.12	88.4853	198.01	53.0884
67.75	134.4252	106.47	88.5232	201.83	57.6909
69.67	110.6375	109.28	85.1747	203.43	63.9866
70.83	121.6157	111.00	87.7879	205.31	57.4073
72.81	121.6057	111.76	0.0000	210.85	64.3638
72.87	121.6169	114.06	67.3025	215.65	69.9885
74.66	121.9510	116.30	0.0000	222.11	61.6786
74.82	121.9806	116.74	82.2421	227.09	69.6935
74.97	122.0079	119.76	77.5988	227.38	69.7084
77.11	122.4012	121.12	76.4844	228.16	0.0000
78.74	143.3419	121.22	76.4929	228.18	67.0328
79.69	127.9390	121.78	64.1958	116.74	67.0328
80.12	128.0191	122.06	64.2161	235.69	49.1869
80.19	0.0000	122.92	72.9303	235.96	43.7300
80.57	106.2320	123.07	76.6514	238.63	58.4199
81.00	120.3673	265.00	82.8892	238.98	0.0000
81.07	132.8860	125.81	74.4035	240.99	58.5189
81.75	129.1043	127.23	84.4547	242.00	58.5612
83.79	116.1403	127.91	82.8603	244.70	38.5047
84.00	116.1745	129.30	82.1548	252.40	0.0000
85.43	125.8472	131.20	86.4805	252.80	54.3984
86.55	151.2529	133.02	76.6508	254.15	0.0000
86.79	151.3027	133.52	81.2758	256.23	46.2097
86.94	151.3350	136.00	80.2344	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	41.8277	355.39	0.0000	584.27	27.8035
264.80	41.8323	356.01	39.7881	595.83	0.0000
265.00	41.2799	364.49	0.0000	427.87	18.6519
268.22	53.1082	366.42	0.0000	602.52	0.0000
269.46	43.8273	372.51	20.8154	604.72	26.3730
270.03	43.8435	375.05	17.8660	607.14	26.3965
271.23	46.2129	377.52	32.7966	609.32	26.4180
273.65	0.0000	356.01	28.9174	610.33	31.3841
276.40	52.4590	388.16	28.9817	614.28	24.8135
277.37	52.4920	388.63	0.0000	618.01	19.8779
277.60	53.4375	391.69	34.0408	620.36	19.8955
278.00	53.4514	264.66	19.1098	621.93	23.2251
279.20	55.3701	401.81	29.1847	630.19	0.0000
279.54	55.3821	402.40	39.2603	631.29	14.4266
279.70	55.3881	404.85	25.3994	633.25	15.5478
280.46	53.5372	410.95	31.3406	634.78	0.0000
283.69	57.4134	413.71	31.3835	635.95	22.2323
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	42.4008	423.72	0.0000	645.85	23.4276
285.90	0.0000	427.09	36.6841	657.76	15.1249
287.50	30.1921	427.87	32.6204	657.90	0.0000
290.67	56.7236	433.94	24.5366	661.66	20.1943
293.27	0.0000	439.40	28.7007	664.57	0.0000
351.93	45.5088	453.88	15.4797	666.33	0.0000
295.96	45.5303	463.37	17.1022	666.50	0.0000
879.38	45.6045	468.07	17.1388	667.71	0.0000
299.98	45.6436	473.00	0.0000	677.62	21.4353
300.09	45.6465	475.06	28.7590	685.70	0.0000
300.13	45.6475	476.78	18.7701	695.00	0.0000
301.36	45.6826	477.60	18.7771	696.49	15.8970
302.85	41.4379	482.18	20.9062	696.51	15.8970
256.23	24.3156	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	13.6299
306.78	42.0145	497.08	22.0950	697.49	13.6304
308.46	27.7197	505.52	30.0957	702.65	21.6193
311.90	39.2716	507.63	0.0000	706.68	13.6729
316.51	45.1430	511.00	25.4028	711.68	17.1198
319.41	0.0000	514.00	25.4355	720.70	0.0000
320.08	0.0000	514.00	25.4355	721.93	0.0000
321.04	49.1168	520.40	23.3786	722.78	18.3288
323.87	47.2694	520.69	0.0000	722.91	18.3294
325.23	52.1334	522.65	0.0000	723.31	16.0405
328.76	0.0000	527.90	0.0000	724.19	19.4833
333.37	30.5554	528.26	25.5879	727.33	18.3561
333.97	33.4766	529.59	25.6025	733.00	14.9419
334.37	34.9402	529.87	0.0000	735.93	23.0103
338.28	27.2367	531.02	0.0000	333.97	17.2662
338.32	27.2372	537.26	0.0000	739.50	0.0000
311.90	37.9836	546.56	0.0000	747.24	18.4753
340.48	37.9836	552.55	16.1517	748.06	10.3953
340.55	0.0000	563.25	27.5762	752.31	17.3492
344.28	36.3084	569.33	28.1847	753.82	0.0000
345.93	37.5148	946.00	28.1857	756.73	13.8989
351.06	40.1692	569.70	28.1878	756.80	13.8994
351.93	40.1884	583.19	27.2471	884.68	13.9307

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	26.7163	1274.44	8.3752	1620.50	4.2529
766.42	27.8838	1001.03	14.9072	1621.92	2.1270
766.84	20.9158	1002.74	15.8462	1678.03	0.0000
772.60	0.0000	1004.73	14.9219	1690.97	1.0764
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	1.7438
778.90	22.1613	1028.54	0.0000	1063.66	0.0000
783.70	0.0000	1037.84	12.0383	1771.35	2.1824
785.37	24.5436	1038.76	0.0000	1791.20	0.0000
792.07	30.7425	631.29	12.2534	1808.65	3.2937
794.95	28.1328	1048.07	0.0000	1810.72	0.0000
795.86	21.9849	1049.04	17.9203	1836.06	3.3083
810.06	9.7153	1050.41	15.0957		
810.29	9.7160	1063.66	13.2523		
344.28	9.7166	1077.00	0.0000		
810.76	9.7177	1077.34	15.1963		
815.77	0.0000	1085.87	14.2767		
1048.07	0.0000	1093.63	14.3033		
832.01	15.1142	1099.45	8.5941		
834.85	20.4661	1112.07	14.3665		
835.71	17.8009	1112.84	17.2430		
836.80	0.0000	1115.54	16.8706		
846.75	0.0000	1120.29	29.1735		
846.77	19.6448	1120.55	19.9621		
856.80	0.0000	1221.41	15.3584		
860.56	16.1378	1129.67	15.3887		
871.09	9.5924	1131.51	0.0000		
873.19	7.1987	1147.95	0.0000		
875.33	0.0000	1173.23	14.5743		
879.38	12.3624	1177.95	12.4500		
880.51	12.3662	1189.05	11.7012		
883.24	12.3758	1204.77	14.6786		
884.68	15.8893	1221.41	8.8401		
889.28	11.3641	1231.02	17.3239		
894.76	14.4858	1235.36	0.0000		
898.04	19.0300	1238.28	16.7603		
900.72	13.6034	1260.41	0.0000		
903.28	16.3356	1271.87	5.9590		
911.20	16.3718	1274.44	10.9308		
912.08	16.3757	1274.54	10.9308		
923.98	0.0000	1291.59	9.9731		
926.50	12.7875	1298.22	0.0000		
929.11	8.2263	1312.11	0.0000		
937.49	14.6582	1332.49	7.0419		
944.13	0.0000	1362.66	0.0000		
946.00	18.3649	1365.19	8.1021		
949.00	12.8661	1368.63	0.0000		
667.71	0.0000	1384.29	8.1333		
962.31	14.7563	1408.01	5.1077		
964.08	14.7637	1457.56	0.0000		
966.17	14.7720	1460.82	7.2252		
911.20	14.7827	1489.16	2.0756		
968.97	14.7827	1505.03	4.9966		
983.53	0.0000	1584.12	3.3801		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                   *
*                               Charleston, SC 29407                             *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235009.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM25.CNF;357
Background date : 2-OCT-2016 11:01:25.
Sample date      : 10-DEC-2015 10:30:00 Acquisition date : 3-OCT-2016 08:06:24.
Sample ID       : G405235009 Sample quantity : 1.34381E+02 GRAM
Detector name   : GAM25 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.62 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596247 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.38*	76	207	1.01	92.26	88	9	2.12E-02	36.9	
2	0	63.59*	35	307	1.04	126.67	121	10	9.62E-03	99.1	
3	2	74.85*	252	186	0.99	149.20	145	14	6.99E-02	10.8	9.42E-01
4	2	77.11*	432	147	0.85	153.72	145	14	1.20E-01	6.6	
5	0	84.01*	51	199	1.42	167.51	164	7	1.41E-02	48.8	
6	0	87.39	137	180	1.52	174.27	171	7	3.80E-02	18.5	
7	3	90.02	55	171	1.01	179.53	177	12	1.52E-02	37.8	2.80E+00
8	3	92.97*	144	168	1.15	185.42	177	12	4.01E-02	18.6	
9	6	186.07*	118	138	1.32	371.60	367	11	3.27E-02	20.3	2.78E+00
10	6	188.01	27	51	0.74	375.48	367	11	7.42E-03	49.9	
11	0	209.48	41	94	0.60	418.42	415	7	1.15E-02	41.9	
12	6	238.76*	481	61	1.00	476.98	471	18	1.34E-01	5.3	2.10E+00
13	6	241.66	147	116	2.04	482.78	471	18	4.09E-02	21.4	
14	0	269.95	31	95	0.60	539.36	535	9	8.59E-03	59.5	
15	1	295.28*	218	43	1.36	590.02	583	34	6.07E-02	8.5	3.16E+00
16	1	297.40	28	31	1.18	594.25	583	34	7.78E-03	48.8	
17	1	300.15	57	32	1.36	599.75	583	34	1.60E-02	22.6	
18	1	304.40	28	28	1.37	608.25	583	34	7.66E-03	45.6	
19	0	328.57	42	46	1.66	656.61	653	9	1.18E-02	32.5	
20	0	338.73*	69	94	1.29	676.91	672	11	1.91E-02	30.5	
21	0	352.20*	269	76	1.26	703.86	698	12	7.48E-02	9.0	
22	0	359.52	12	45	0.89	718.50	714	6	3.43E-03	90.3	
23	0	365.92	22	53	3.16	731.31	725	10	6.01E-03	69.4	
24	0	463.66	56	80	2.90	926.81	917	18	1.55E-02	40.0	
25	0	481.50	13	28	0.66	962.48	958	7	3.67E-03	71.8	
26	0	511.58*	53	51	1.89	1022.65	1016	16	1.48E-02	38.1	
27	0	583.51*	138	59	1.65	1166.55	1162	14	3.82E-02	15.2	
28	0	609.59*	214	41	1.36	1218.72	1213	14	5.95E-02	9.5	
29	0	628.56	16	20	1.65	1256.67	1250	10	4.44E-03	58.1	
30	0	661.82	477	23	1.45	1323.20	1317	12	1.32E-01	5.0	
31	0	728.64	54	23	2.05	1456.89	1449	17	1.49E-02	26.6	
32	0	794.87	14	21	1.64	1589.39	1584	9	3.78E-03	68.0	
33	0	861.31	30	19	1.07	1722.34	1715	15	8.32E-03	36.5	
34	0	911.58*	98	18	1.50	1822.92	1816	15	2.73E-02	14.1	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	5	931.00	10	3	2.15	1861.77	1859	12	2.79E-03	34.6	3.10E-01
36	5	934.05	14	3	1.37	1867.88	1859	12	3.87E-03	33.3	
37	0	968.97*	46	18	2.45	1937.76	1934	11	1.27E-02	23.8	
38	0	1087.13	12	2	1.60	2174.21	2168	10	3.33E-03	37.5	
39	0	1120.99*	25	24	1.41	2241.97	2235	12	6.92E-03	46.1	
40	0	1198.08	10	20	3.41	2396.26	2385	14	2.87E-03	98.5	
41	0	1277.97	15	34	7.78	2556.16	2542	23	4.07E-03	107.3	
42	0	1294.72	10	2	0.68	2589.68	2585	9	2.72E-03	42.2	
43	0	1377.63	11	7	5.07	2755.63	2745	14	2.95E-03	61.4	
44	0	1444.68	7	0	0.99	2889.86	2883	12	1.94E-03	37.8	
45	0	1460.82*	355	7	1.99	2922.17	2915	15	9.86E-02	5.6	
46	0	1848.28	9	3	1.79	3697.89	3692	10	2.63E-03	45.2	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235009.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 10-DEC-2015 10:30:00 Acquisition date : 3-OCT-2016 08:06:24
Sample ID         : G405235009 Sample quantity   : 134.38 GRAM
Sample type       : SOLID Sample geometry    :
Detector name     : GAMMA25 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.62 0.0%
Energy tolerance  : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error    : 0.00 %
Efficiency type   : Linear Efficiencies at    : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.131E+00	1.571E+01	1.571E+01	11.22	OK
CD-109	88.03	3.70*	9.275E+00	1.166E+00	1.824E+00	85.38	OK
SN-126	64.28	9.60	9.538E+00	2.527E-01	2.527E-01	198.23	OK
	86.94	8.90	9.275E+00	4.846E-01	4.846E-01	85.38	OK
	87.57	37.00*	9.275E+00	1.166E-01	1.166E-01	85.38	OK
BA-137M	661.66	89.90*	2.257E+00	1.333E+00	1.359E+00	10.04	OK
CS-137	661.66	85.10*	2.257E+00	1.409E+00	1.435E+00	10.04	OK
TL-208	277.37	6.60	4.809E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.509E+00	3.698E-01	3.698E-01	30.35	OK
	860.56	12.50	1.809E+00	7.369E-01	7.369E-01	72.92	OK
PB-210	46.54	4.25*	9.109E+00	1.347E+00	1.381E+00	73.81	OK
PB-212	74.82	10.28	9.404E+00	8.358E-01	8.358E-01	47.84	OK
	77.11	17.10	9.383E+00	1.775E+00	1.775E+00	13.12	OK
	238.63	43.60*	5.476E+00	1.232E+00	1.232E+00	10.64	OK
	300.09	3.30	4.485E+00	2.336E+00	2.336E+00	45.10	OK
BI-214	609.32	45.49*	2.418E+00	1.112E+00	1.112E+00	18.92	OK
	1120.29	14.92	1.443E+00	6.310E-01	6.312E-01	92.16	OK
	1764.49	15.30	9.336E-01	-----	Line Not Found	-----	Absent
PB-214	74.82	5.80	9.405E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	9.383E+00	3.130E+00	3.131E+00	13.12	OK
	87.09	3.41	9.279E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	5.413E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.551E+00	1.570E+00	1.570E+00	17.08	OK
	351.93	35.60*	3.891E+00	1.155E+00	1.156E+00	18.02	OK
RN-222	609.32	45.49*	2.418E+00	1.112E+00	1.112E+00	18.92	OK
	1120.29	14.92	1.443E+00	6.310E-01	6.312E-01	92.16	OK
	1764.49	15.30	9.336E-01	-----	Line Not Found	-----	Absent
RA-224	240.99	4.10*	5.420E+00	1.275E+00	1.275E+00	141.00	OK
RA-226	609.32	45.49*	2.418E+00	1.112E+00	1.112E+00	18.92	OK
	1120.29	14.92	1.443E+00	6.310E-01	6.312E-01	92.16	OK
	1764.49	15.30	9.336E-01	-----	Line Not Found	-----	Absent
AC-228	105.21	1.10	8.977E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.029E+00	9.021E-01	9.021E-01	61.06	OK
	794.95	4.25	1.935E+00	9.264E-01	9.264E-01	135.94	OK
	835.71	1.61	1.856E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.724E+00	1.225E+00	1.225E+00	28.29	OK
	968.97	15.80	1.637E+00	9.749E-01	9.749E-01	47.53	OK
RA-228	105.21	1.10	8.977E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.029E+00	9.021E-01	9.021E-01	61.06	OK
	794.95	4.25	1.935E+00	9.264E-01	9.264E-01	135.94	OK
	835.71	1.61	1.856E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.724E+00	1.225E+00	1.225E+00	28.29	OK
	968.97	15.80	1.637E+00	9.749E-01	9.749E-01	47.53	OK
TH-228	74.82	10.28	9.404E+00	8.358E-01	8.358E-01	47.84	OK
	77.11	17.10	9.383E+00	1.775E+00	1.775E+00	13.12	OK
	238.63	43.60*	5.476E+00	1.232E+00	1.232E+00	10.64	OK
	300.09	3.30	4.485E+00	2.336E+00	2.336E+00	45.10	OK
TH-229	85.43	14.70	9.314E+00	2.437E-01	2.437E-01	97.55	OK
	88.47	24.00	9.275E+00	1.797E-01	1.797E-01	85.38	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	193.51	4.41*	6.496E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	6.103E+00	1.494E+00	1.494E+00	83.76	OK
TH-230	609.32	45.49*	2.418E+00	1.112E+00	1.112E+00	18.92	OK
	1120.29	14.92	1.443E+00	6.310E-01	6.310E-01	92.16	OK
	1764.49	15.30	9.336E-01	----- Line	Not Found	-----	Absent
PA-231	283.69	1.70	4.715E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.485E+00	1.441E+00	1.441E+00	45.10	OK
TH-232	105.21	1.10	8.977E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.029E+00	9.021E-01	9.021E-01	61.06	OK
	835.71	1.61	1.856E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.724E+00	1.225E+00	1.225E+00	28.29	OK
	968.97	15.80	1.637E+00	9.749E-01	9.749E-01	47.53	OK
TH-234	63.29	3.70*	9.538E+00	6.556E-01	6.556E-01	198.23	OK
	92.59	4.23	9.199E+00	2.418E+00	2.418E+00	37.13	OK
U-234	609.32	45.49*	2.418E+00	1.112E+00	1.112E+00	18.92	OK
	1120.29	14.92	1.443E+00	6.310E-01	6.310E-01	92.16	OK
	1764.49	15.30	9.336E-01	----- Line	Not Found	-----	Absent
U-235	89.96	3.47	9.241E+00	1.118E+00	1.118E+00	75.64	OK
	93.35	5.60	9.199E+00	1.827E+00	1.827E+00	37.13	OK
	143.76	10.96*	7.922E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	7.333E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.691E+00	1.913E-01	1.913E-01	40.58	OK
	205.31	5.01	6.202E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	9.538E+00	6.556E-01	6.556E-01	198.23	OK
	92.59	4.23	9.199E+00	2.418E+00	2.418E+00	37.13	OK
AM-243	43.53	5.90	8.344E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	9.404E+00	1.279E-01	1.279E-01	47.84	OK
ANH-511	511.00	100.00*	2.807E+00	1.099E-01	1.099E-01	76.13	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235009.CNF;1 *
 * Acquisition date : 3-OCT-2016 08:06:24 Sensitivity : 3.000 *
 * Detector ID : GAM25 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.62 Half life ratio : ***** *
 * Sample date : 10-DEC-2015 10:30:00 Analyst initials: MXR1 *
 * Sample ID : G405235009 Sample Quantity : 1.3438E+02 GRAM *
 * Batch Number : 1596247 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 1-AUG-2016 08:41:33 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM25_CAN.CNF;15 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.571E+01	1.727E+00	5.843E-01
CD-109	1.824E+00	1.526E+00	1.295E+00
SN-126	1.166E-01	9.753E-02	8.267E-02
BA-137M	1.359E+00	1.336E-01	7.723E-02
CS-137	1.435E+00	1.412E-01	8.159E-02
TL-208	3.698E-01	1.100E-01	7.677E-02
PB-210	1.381E+00	9.991E-01	6.610E-01
PB-212	1.232E+00	1.284E-01	8.755E-02
BI-214	1.112E+00	2.062E-01	1.304E-01
PB-214	1.156E+00	2.041E-01	1.252E-01
RN-222	1.112E+00	2.062E-01	1.304E-01
RA-224	1.275E+00	1.761E+00	9.401E-01
RA-226	1.112E+00	2.062E-01	1.304E-01
AC-228	1.225E+00	3.396E-01	2.891E-01
RA-228	1.225E+00	3.396E-01	2.891E-01
TH-228	1.232E+00	1.284E-01	8.755E-02
TH-229	-3.296E-01	4.288E-01	7.339E-01
TH-230	1.112E+00	2.061E-01	1.303E-01
PA-231	1.441E+00	6.369E-01	6.375E-01
TH-232	1.225E+00	3.396E-01	2.891E-01
TH-234	6.556E-01	1.274E+00	8.056E-01
U-234	1.112E+00	2.061E-01	1.303E-01
U-235	4.637E-02	1.639E-01	3.117E-01
U-238	6.556E-01	1.274E+00	8.056E-01
AM-243	1.279E-01	5.995E-02	4.413E-02
ANH-511	1.099E-01	8.199E-02	5.541E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	2.661E+00		1.476E+01	2.592E+01	NOT IDENT.
NA-22	3.162E-02		5.806E-02	1.205E-01	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF
AL-26	6.255E-03		2.080E-02	5.709E-02	NOT IDENT.

SC-46	1.855E-01	4.335E-01	8.997E-01	FAIL ABUN
V-48	0.000E+00	1.611E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	4.361E+02	0.000E+00	SHORT HLIF
MN-54	1.633E-02	7.268E-02	1.465E-01	NOT IDENT.
CO-56	-5.956E-02	4.434E-01	8.743E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-2.905E-02	3.876E-02	6.981E-02	NOT IDENT.
CO-58	3.051E-02	4.858E-01	1.009E+00	NOT IDENT.
FE-59	1.751E+00	6.862E+00	1.432E+01	NOT IDENT.
CO-60	1.350E-02	4.504E-02	9.302E-02	NOT IDENT.
ZN-65	-1.109E-01	2.428E-01	3.679E-01	NOT IDENT.
GE-68	8.788E-01	2.899E+00	5.824E+00	NOT IDENT.
AS-73	1.073E+00	1.691E+00	3.508E+00	NOT IDENT.
AS-74	0.000E+00	6.245E+03	0.000E+00	SHORT HLIF
SE-75	-3.233E-02	1.893E-01	3.366E-01	NOT IDENT.
BR-77	0.000E+00	1.317E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	8.213E+02	0.000E+00	SHORT HLIF
RB-83	3.231E-01	6.745E-01	1.366E+00	NOT IDENT.
KR-85	4.405E+00	7.677E+00	1.539E+01	NOT IDENT.
SR-85	4.537E-01	7.946E-01	1.592E+00	NOT IDENT.
RB-86	0.000E+00	2.881E+04	0.000E+00	SHORT HLIF
Y-88	-1.335E-01	2.806E-01	5.170E-01	NOT IDENT.
Y-91	1.692E+02	5.887E+02	1.181E+03	NOT IDENT.
NB-94	7.792E-03	3.280E-02	6.358E-02	NOT IDENT.
NB-95	1.508E-01	1.069E+00	1.980E+00	NOT IDENT.
NB-95M	7.155E-01	2.422E+00	4.167E+00	NOT IDENT.
ZR-95	-6.851E-03	1.372E+00	2.599E+00	NOT IDENT.
NB-97	0.000E+00	1.852E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.355E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-2.969E-02	2.744E-02	4.788E-02	NOT IDENT.
RH-102	1.982E-02	5.620E-02	1.052E-01	NOT IDENT.
RU-103	-7.399E-01	6.537E+00	1.202E+01	FAIL ABUN
RH-106	4.417E-01	5.306E-01	1.087E+00	NOT IDENT.
RU-106	4.417E-01	5.306E-01	1.087E+00	NOT IDENT.
AG-108M	-1.515E-02	2.932E-02	5.325E-02	NOT IDENT.
AG-110M	-4.508E-02	1.170E-01	2.178E-01	NOT IDENT.
SN-113	1.091E-01	2.420E-01	4.872E-01	NOT IDENT.
CD-115	0.000E+00	1.862E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	7.590E+04	0.000E+00	SHORT HLIF
TE-123M	2.173E-02	1.111E-01	2.113E-01	NOT IDENT.
SB-124	5.418E-01	1.661E+00	4.176E+00	NOT IDENT.
SB-125	3.870E-02	1.256E-01	2.457E-01	FAIL ABUN
TE-125M	2.269E+02	2.014E+02	4.163E+02	NOT IDENT.
I-126	0.000E+00	9.701E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.109E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.618E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	8.383E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.480E+26	0.000E+00	SHORT HLIF
BA-133	-1.782E-02	5.633E-02	7.376E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	6.054E-02	8.065E-02	1.199E-01	FAIL ABUN
CS-135	3.691E-02	1.595E-01	2.701E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.272E+05	0.000E+00	SHORT HLIF
CE-139	-4.642E-02	9.727E-02	1.740E-01	NOT IDENT.
BA-140	0.000E+00	1.451E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.369E+05	0.000E+00	SHORT HLIF
CE-141	-5.909E+00	2.174E+01	3.970E+01	NOT IDENT.
CE-143	0.000E+00	5.509E+40	0.000E+00	SHORT HLIF
CE-144	-4.959E-02	2.739E-01	5.136E-01	NOT IDENT.
PM-144	-4.640E-03	5.639E-02	1.046E-01	NOT IDENT.
PR-144	-4.345E-01	4.889E+00	9.061E+00	NOT IDENT.
PM-146	-6.640E-02	4.803E-02	7.713E-02	NOT IDENT.
ND-147	0.000E+00	3.458E+07	0.000E+00	SHORT HLIF
PM-147	2.122E+02	6.514E+02	1.274E+03	NOT IDENT.
PM-149	0.000E+00	2.676E+40	0.000E+00	SHORT HLIF
EU-150	2.936E-03	2.949E-02	5.224E-02	FAIL ABUN
EU-152	-1.635E-02	1.027E-01	1.880E-01	FAIL ABUN
GD-153	-1.370E-02	1.225E-01	2.330E-01	NOT IDENT.
EU-154	7.697E-02	1.424E-01	2.954E-01	NOT IDENT.
EU-155	6.138E-02	7.207E-02	1.484E-01	FAIL ABUN
TB-160	-9.744E-01	1.701E+00	3.108E+00	FAIL ABUN
HO-166M	-2.264E-02	6.623E-02	1.166E-01	NOT IDENT.
TM-171	1.070E+00	3.740E+00	7.617E+00	NOT IDENT.
HF-172	-6.646E-02	1.776E-01	3.291E-01	FAIL ABUN

LU-172	1.140E-01	9.308E-02	2.091E-01	FAIL ABUN
LU-176	1.849E-02	2.267E-02	4.486E-02	FAIL ABUN
HF-181	4.208E+00	5.925E+00	9.140E+00	FAIL ABUN
TA-182	7.320E-02	9.871E-01	1.925E+00	FAIL ABUN
RE-183	8.592E-02	7.612E-01	1.540E+00	NOT IDENT.
RE-184	-2.544E+00	3.071E+01	6.019E+01	NOT IDENT.
W-188	-8.215E+00	1.243E+02	2.019E+02	FAIL ABUN
IR-192	-4.103E-01	4.411E-01	7.933E-01	FAIL ABUN
HG-203	-1.422E+00	2.615E+00	4.400E+00	NOT IDENT.
BI-207	-6.303E-03	4.881E-02	9.438E-02	FAIL ABUN
BI-211	0.000E+00	5.623E-01	8.326E-01	FAIL ABUN
PB-211	1.501E-01	7.320E-01	1.433E+00	NOT IDENT.
BI-212	0.000E+00	1.134E+00	1.475E+00	FAIL ABUN
RN-219	-3.899E-01	4.248E-01	7.423E-01	FAIL ABUN
RA-223	-5.684E-01	6.527E-01	1.117E+00	FAIL ABUN
AC-227	-1.566E-01	2.106E-01	3.488E-01	FAIL ABUN
TH-227	-1.566E-01	2.106E-01	3.488E-01	FAIL ABUN
TH-231	-5.684E-01	6.527E-01	1.117E+00	FAIL ABUN
PA-233	1.157E-02	6.159E-02	1.222E-01	FAIL ABUN
PA-234	5.117E-02	2.771E-01	5.682E-01	NOT IDENT.
PA-234M	-1.149E+00	4.204E+00	8.188E+00	NOT IDENT.
NP-237	1.157E-02	6.159E-02	1.222E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	-3.652E-02	1.884E-01	3.558E-01	NOT IDENT.
PU-239	2.896E+01	2.737E+02	5.202E+02	NOT IDENT.
AM-241	1.940E-02	4.328E-02	8.364E-02	NOT IDENT.
CM-243	-1.326E-02	6.780E-02	1.296E-01	NOT IDENT.
BK-247	-1.995E-02	6.859E-02	1.199E-01	FAIL ABUN
CM-247	-2.568E-02	3.748E-02	6.723E-02	NOT IDENT.
CF-249	-3.489E-04	4.091E-02	7.876E-02	NOT IDENT.
CF-251	-8.440E-03	1.038E-01	1.910E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	339	10.66*	1.131E+00	1.571E+01	1.571E+01	11.22
CD-109	88.03	160	3.70*	9.275E+00	2.612E+00	4.087E+00	36.90
SN-126	64.28	41	9.60	9.538E+00	2.527E-01	2.527E-01	198.23
	86.94	160	8.90	9.275E+00	1.086E+00	1.086E+00	36.90
	87.57	160	37.00*	9.275E+00	2.612E-01	2.612E-01	36.90
BA-137M	661.66	484	89.90*	2.257E+00	1.333E+00	1.359E+00	10.04
CS-137	661.66	484	85.10*	2.257E+00	1.409E+00	1.435E+00	10.04
TL-208	277.37	-----	6.60	4.809E+00	-----	Line Not Found	-----
	583.19	141	85.00*	2.509E+00	3.698E-01	3.698E-01	30.35
	860.56	30	12.50	1.809E+00	7.369E-01	7.369E-01	72.92
PB-210	46.54	93	4.25*	9.109E+00	1.347E+00	1.381E+00	73.81
BI-211	72.87	-----	1.23	9.424E+00	-----	Line Not Found	-----
	351.06	286	12.92*	3.891E+00	3.183E+00	3.183E+00	18.02
PB-212	74.82	298	10.28	9.404E+00	1.722E+00	1.722E+00	21.50
	77.11	510	17.10	9.383E+00	1.775E+00	1.775E+00	13.12
	238.63	527	43.60*	5.476E+00	1.232E+00	1.232E+00	10.64
	300.09	62	3.30	4.485E+00	2.336E+00	2.336E+00	45.10
BI-214	609.32	219	45.49*	2.418E+00	1.112E+00	1.112E+00	18.92
	1120.29	24	14.92	1.443E+00	6.310E-01	6.312E-01	92.16
	1764.49	-----	15.30	9.336E-01	-----	Line Not Found	-----
PB-214	74.82	298	5.80	9.404E+00	3.051E+00	3.052E+00	21.50
	77.11	510	9.70	9.383E+00	3.130E+00	3.131E+00	13.12
	87.09	160	3.41	9.275E+00	2.835E+00	2.836E+00	36.90
	242.00	161	7.25	5.420E+00	2.291E+00	2.291E+00	42.80
	295.22	236	18.42	4.551E+00	1.570E+00	1.570E+00	17.08
	351.93	286	35.60*	3.891E+00	1.155E+00	1.156E+00	18.02
RN-222	609.32	219	45.49*	2.418E+00	1.112E+00	1.112E+00	18.92
	1120.29	24	14.92	1.443E+00	6.310E-01	6.312E-01	92.16
	1764.49	-----	15.30	9.336E-01	-----	Line Not Found	-----
RA-224	240.99	161	4.10*	5.420E+00	4.050E+00	4.050E+00	42.80
RA-226	609.32	219	45.49*	2.418E+00	1.112E+00	1.112E+00	18.92
	1120.29	24	14.92	1.443E+00	6.310E-01	6.312E-01	92.16
	1764.49	-----	15.30	9.336E-01	-----	Line Not Found	-----
AC-228	105.21	-----	1.10	8.977E+00	-----	Line Not Found	-----
	338.32	73	11.27	4.029E+00	9.021E-01	9.021E-01	61.06
	794.95	14	4.25	1.935E+00	9.264E-01	9.264E-01	135.94
	835.71	-----	1.61	1.856E+00	-----	Line Not Found	-----
	911.20	98	25.80*	1.724E+00	1.225E+00	1.225E+00	28.29
	968.97	45	15.80	1.637E+00	9.749E-01	9.749E-01	47.53
RA-228	105.21	-----	1.10	8.977E+00	-----	Line Not Found	-----
	338.32	73	11.27	4.029E+00	9.021E-01	9.021E-01	61.06
	794.95	14	4.25	1.935E+00	9.264E-01	9.264E-01	135.94
	835.71	-----	1.61	1.856E+00	-----	Line Not Found	-----
	911.20	98	25.80*	1.724E+00	1.225E+00	1.225E+00	28.29
	968.97	45	15.80	1.637E+00	9.749E-01	9.749E-01	47.53
TH-228	74.82	298	10.28	9.404E+00	1.722E+00	1.722E+00	21.50
	77.11	510	17.10	9.383E+00	1.775E+00	1.775E+00	13.12

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	238.63	527	43.60*	5.476E+00	1.232E+00	1.232E+00	10.64
	300.09	62	3.30	4.485E+00	2.336E+00	2.336E+00	45.10
TH-229	85.43	60	14.70	9.314E+00	2.437E-01	2.437E-01	97.55
	88.47	160	24.00	9.275E+00	4.027E-01	4.028E-01	36.90
	193.51	-----	4.41*	6.496E+00	-----	Line Not Found	-----
	210.85	46	2.80	6.103E+00	1.494E+00	1.494E+00	83.76
TH-230	609.32	219	45.49*	2.418E+00	1.112E+00	1.112E+00	18.92
	1120.29	24	14.92	1.443E+00	6.310E-01	6.310E-01	92.16
	1764.49	-----	15.30	9.336E-01	-----	Line Not Found	-----
PA-231	283.69	-----	1.70	4.715E+00	-----	Line Not Found	-----
	301.36	62	5.35*	4.485E+00	1.441E+00	1.441E+00	45.10
TH-232	105.21	-----	1.10	8.977E+00	-----	Line Not Found	-----
	338.32	73	11.27	4.029E+00	9.021E-01	9.021E-01	61.06
	835.71	-----	1.61	1.856E+00	-----	Line Not Found	-----
	911.20	98	25.80*	1.724E+00	1.225E+00	1.225E+00	28.29
	968.97	45	15.80	1.637E+00	9.749E-01	9.749E-01	47.53
TH-234	63.29	41	3.70*	9.538E+00	6.556E-01	6.556E-01	198.23
	92.59	168	4.23	9.199E+00	2.418E+00	2.418E+00	37.13
U-234	609.32	219	45.49*	2.418E+00	1.112E+00	1.112E+00	18.92
	1120.29	24	14.92	1.443E+00	6.310E-01	6.310E-01	92.16
	1764.49	-----	15.30	9.336E-01	-----	Line Not Found	-----
U-235	89.96	64	3.47	9.241E+00	1.118E+00	1.118E+00	75.64
	93.35	168	5.60	9.199E+00	1.827E+00	1.827E+00	37.13
	143.76	-----	10.96*	7.922E+00	-----	Line Not Found	-----
	163.33	-----	5.08	7.333E+00	-----	Line Not Found	-----
	185.72	131	57.20	6.691E+00	1.913E-01	1.913E-01	40.58
	205.31	-----	5.01	6.202E+00	-----	Line Not Found	-----
U-238	63.29	41	3.70*	9.538E+00	6.556E-01	6.556E-01	198.23
	92.59	168	4.23	9.199E+00	2.418E+00	2.418E+00	37.13
AM-243	43.53	-----	5.90	8.344E+00	-----	Line Not Found	-----
	74.66	298	67.20*	9.404E+00	2.634E-01	2.634E-01	21.50
ANH-511	511.00	55	100.00*	2.807E+00	1.099E-01	1.099E-01	76.13

Flag: "*" = Keyline

Total number of lines in spectrum 46
 Number of unidentified lines 11
 Number of lines tentatively identified by NID 35 76.09%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.571E+01	1.571E+01	0.176E+01	11.22	
CD-109	461.40D	1.56	2.612E+00	4.087E+00	1.508E+00	36.90	
SN-126	2.30E+05Y	1.00	2.612E-01	2.612E-01	0.964E-01	36.90	
BA-137M	30.08Y	1.02	1.333E+00	1.359E+00	0.136E+00	10.04	
CS-137	30.08Y	1.02	1.409E+00	1.435E+00	0.144E+00	10.04	
TL-208	1.41E+10Y	1.00	3.698E-01	3.698E-01	1.122E-01	30.35	
PB-210	22.20Y	1.03	1.347E+00	1.381E+00	1.019E+00	73.81	
BI-211	7.04E+08Y	1.00	3.183E+00	3.183E+00	0.574E+00	18.02	
PB-212	1.41E+10Y	1.00	1.232E+00	1.232E+00	0.131E+00	10.64	
BI-214	1600.00Y	1.00	1.112E+00	1.112E+00	0.210E+00	18.92	
PB-214	1600.00Y	1.00	1.155E+00	1.156E+00	0.208E+00	18.02	
RN-222	1600.00Y	1.00	1.112E+00	1.112E+00	0.210E+00	18.92	
RA-224	1.41E+10Y	1.00	4.050E+00	4.050E+00	1.733E+00	42.80	
RA-226	1600.00Y	1.00	1.112E+00	1.112E+00	0.210E+00	18.92	
AC-228	1.41E+10Y	1.00	1.225E+00	1.225E+00	0.347E+00	28.29	
RA-228	1.41E+10Y	1.00	1.225E+00	1.225E+00	0.347E+00	28.29	
TH-228	1.41E+10Y	1.00	1.232E+00	1.232E+00	0.131E+00	10.64	
TH-229	7340.00Y	1.00	4.027E-01	4.028E-01	1.486E-01	36.90	K
TH-230	7.54E+04Y	1.00	1.112E+00	1.112E+00	0.210E+00	18.92	
PA-231	7.04E+08Y	1.00	1.441E+00	1.441E+00	0.650E+00	45.10	
TH-232	1.41E+10Y	1.00	1.225E+00	1.225E+00	0.347E+00	28.29	
TH-234	4.47E+09Y	1.00	6.556E-01	6.556E-01	13.00E-01	198.23	
U-234	2.45E+05Y	1.00	1.112E+00	1.112E+00	0.210E+00	18.92	
U-235	7.04E+08Y	1.00	1.913E-01	1.913E-01	0.776E-01	40.58	K
U-238	4.47E+09Y	1.00	6.556E-01	6.556E-01	13.00E-01	198.23	
AM-243	7370.00Y	1.00	2.634E-01	2.634E-01	0.566E-01	21.50	
ANH-511	1.00E+09Y	1.00	1.099E-01	1.099E-01	0.837E-01	76.13	
Total Activity :			4.685E+01	4.841E+01			

Grand Total Activity : 4.685E+01 4.841E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
6	188.01	30	56	0.74	375.48	367	11	7.42E-03	99.8	6.64E+00	
0	269.95	34	103	0.60	539.36	535	9	8.59E-03	****	4.92E+00	T
1	297.40	30	34	1.18	594.25	583	34	7.78E-03	97.6	4.52E+00	T
1	304.40	30	30	1.37	608.25	583	34	7.66E-03	91.2	4.43E+00	T
0	328.57	45	49	1.66	656.61	653	9	1.18E-02	65.0	4.14E+00	T
0	359.52	13	47	0.89	718.50	714	6	3.43E-03	****	3.82E+00	
0	365.92	23	57	3.16	731.31	725	10	6.01E-03	****	3.76E+00	T
0	463.66	58	84	2.90	926.81	917	18	1.55E-02	80.1	3.06E+00	T
0	481.50	14	29	0.66	962.48	958	7	3.67E-03	****	2.96E+00	T
0	628.56	16	20	1.65	1256.67	1250	10	4.44E-03	****	2.36E+00	
0	728.64	54	24	2.05	1456.89	1449	17	1.49E-02	53.2	2.08E+00	T
5	931.00	10	2	2.15	1861.77	1859	12	2.79E-03	69.3	1.69E+00	
5	934.05	14	3	1.37	1867.88	1859	12	3.87E-03	66.6	1.69E+00	
0	1087.13	12	2	1.60	2174.21	2168	10	3.33E-03	75.0	1.48E+00	T
0	1198.08	10	19	3.41	2396.26	2385	14	2.87E-03	****	1.36E+00	
0	1277.97	14	33	7.78	2556.16	2542	23	4.07E-03	****	1.28E+00	
0	1294.72	9	2	0.68	2589.68	2585	9	2.72E-03	84.4	1.27E+00	
0	1377.63	10	7	5.07	2755.63	2745	14	2.95E-03	****	1.20E+00	
0	1444.68	7	0	0.99	2889.86	2883	12	1.94E-03	75.6	1.14E+00	
0	1848.28	9	2	1.79	3697.89	3692	10	2.63E-03	90.3	8.88E-01	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235009.CNF;1
* Acquisition date   : 3-OCT-2016 08:06:24 Sensitivity      : 3.000
* Detector ID       : GAM25 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.62 Half life ratio : *****
* Sample date       : 10-DEC-2015 10:30:00 Nuclide Library : SOLID
* Sample ID         : G405235009 Analyst initials: MXR1
* Batch Number      : 1596247 Sample Quantity : 1.3438E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 1-AUG-2016 08:41:33 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM25_CAN.CNF;15
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.294E-01
CD-109	6.115E-01
SN-126	3.904E-02
BA-137M	3.477E-02
CS-137	3.673E-02
TL-208	3.479E-02
PB-210	3.094E-01
PB-212	4.052E-02
BI-214	5.822E-02
PB-214	5.700E-02
RN-222	5.822E-02
RA-224	4.351E-01
RA-226	5.822E-02
AC-228	1.274E-01
RA-228	1.274E-01
TH-228	4.052E-02
TH-229	3.397E-01
TH-230	5.820E-02
PA-231	2.863E-01
TH-232	1.274E-01
TH-234	3.803E-01
U-234	5.820E-02
U-235	1.468E-01
U-238	3.803E-01
AM-243	2.081E-02
ANH-511	2.497E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.176E+01	NOT IDENT.
NA-22	5.294E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.023E-02	NOT IDENT.
SC-46	3.990E-01	FAIL ABUN

V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	6.531E-02	NOT IDENT.
CO-56	3.768E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.261E-02	NOT IDENT.
CO-58	4.299E-01	NOT IDENT.
FE-59	6.209E+00	NOT IDENT.
CO-60	3.967E-02	NOT IDENT.
ZN-65	1.598E-01	NOT IDENT.
GE-68	2.574E+00	NOT IDENT.
AS-73	1.649E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.535E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	6.153E-01	NOT IDENT.
KR-85	7.026E+00	NOT IDENT.
SR-85	7.271E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.996E-01	NOT IDENT.
Y-91	5.172E+02	NOT IDENT.
NB-94	2.822E-02	NOT IDENT.
NB-95	8.934E-01	NOT IDENT.
NB-95M	1.941E+00	NOT IDENT.
ZR-95	1.124E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.231E-02	NOT IDENT.
RH-102	4.582E-02	NOT IDENT.
RU-103	5.446E+00	FAIL ABUN
RH-106	4.870E-01	NOT IDENT.
RU-106	4.870E-01	NOT IDENT.
AG-108M	2.399E-02	NOT IDENT.
AG-110M	9.534E-02	NOT IDENT.
SN-113	2.234E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	9.859E-02	NOT IDENT.
SB-124	1.586E+00	NOT IDENT.
SB-125	1.132E-01	FAIL ABUN
TE-125M	1.962E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.347E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.386E-02	FAIL ABUN
CS-135	1.252E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	8.096E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.867E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.390E-01	NOT IDENT.
PM-144	4.603E-02	NOT IDENT.
PR-144	3.985E+00	NOT IDENT.
PM-146	3.434E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	5.971E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.412E-02	FAIL ABUN
EU-152	8.634E-02	FAIL ABUN
GD-153	1.095E-01	NOT IDENT.
EU-154	1.297E-01	NOT IDENT.
EU-155	6.949E-02	FAIL ABUN
TB-160	1.306E+00	FAIL ABUN
HO-166M	5.164E-02	NOT IDENT.
TM-171	3.572E+00	NOT IDENT.
HF-172	1.534E-01	FAIL ABUN
LU-172	9.348E-02	FAIL ABUN

LU-176	2.055E-02	FAIL ABUN
HF-181	4.148E+00	FAIL ABUN
TA-182	8.349E-01	FAIL ABUN
RE-183	7.237E-01	NOT IDENT.
RE-184	2.616E+01	NOT IDENT.
W-188	9.289E+01	FAIL ABUN
IR-192	3.607E-01	FAIL ABUN
HG-203	2.033E+00	NOT IDENT.
BI-207	4.033E-02	FAIL ABUN
BI-211	4.011E-01	FAIL ABUN
PB-211	6.572E-01	NOT IDENT.
BI-212	6.826E-01	FAIL ABUN
RN-219	3.373E-01	FAIL ABUN
RA-223	5.120E-01	FAIL ABUN
AC-227	1.585E-01	FAIL ABUN
TH-227	1.585E-01	FAIL ABUN
TH-231	5.120E-01	FAIL ABUN
PA-233	5.648E-02	FAIL ABUN
PA-234	2.461E-01	NOT IDENT.
PA-234M	3.525E+00	NOT IDENT.
NP-237	5.648E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.665E-01	NOT IDENT.
PU-239	2.452E+02	NOT IDENT.
AM-241	3.951E-02	NOT IDENT.
CM-243	6.052E-02	NOT IDENT.
BK-247	5.478E-02	FAIL ABUN
CM-247	3.051E-02	NOT IDENT.
CF-249	3.610E-02	NOT IDENT.
CF-251	8.898E-02	NOT IDENT.


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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235009.CNF;1
* Acquisition date   : 3-OCT-2016 08:06:24 Sensitivity      : 3.000
* Detector ID        : GAM25 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.62 Half life ratio  : *****
* Sample date        : 10-DEC-2015 10:30:00 Nuclide Library : SOLID
* Sample ID          : G405235009 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.3438E+02 GRAM
*                    : Quantity Err(%) : 1.4883E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                    : Dry Weight       : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 1-AUG-2016 08:41:33 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM25_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.571E+01	1.912E+00	1.912E+00
CD-109	1.824E+00	1.559E+00	1.559E+00
SN-126	1.166E-01	9.943E-02	9.943E-02
BA-137M	1.359E+00	1.458E-01	1.458E-01
CS-137	1.435E+00	1.540E-01	1.540E-01
TL-208	3.698E-01	1.111E-01	1.111E-01
PB-210	1.381E+00	1.006E+00	1.006E+00
PB-212	1.232E+00	1.440E-01	1.440E-01
BI-214	1.112E+00	2.117E-01	2.117E-01
PB-214	1.156E+00	2.097E-01	2.097E-01
RN-222	1.112E+00	2.117E-01	2.117E-01
RA-224	1.275E+00	1.772E+00	1.772E+00
RA-226	1.112E+00	2.117E-01	2.117E-01
AC-228	1.225E+00	3.453E-01	3.453E-01
RA-228	1.225E+00	3.453E-01	3.453E-01
TH-228	1.232E+00	1.440E-01	1.440E-01
TH-229	-3.296E-01	4.291E-01	4.291E-01
TH-230	1.112E+00	2.116E-01	2.116E-01
PA-231	1.441E+00	7.072E-01	7.072E-01
TH-232	1.225E+00	3.453E-01	3.453E-01
TH-234	6.556E-01	1.282E+00	1.282E+00
U-234	1.112E+00	2.116E-01	2.116E-01
U-235	4.637E-02	1.639E-01	1.639E-01
U-238	6.556E-01	1.282E+00	1.282E+00
AM-243	1.279E-01	6.285E-02	6.285E-02
ANH-511	1.099E-01	8.211E-02	8.211E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	2.661E+00	1.476E+01	1.481E+01	NOT IDENT.
NA-22	3.162E-02	5.807E-02	5.980E-02	NOT IDENT.
NA-24	-1.000E+41	5.479E+41	0.000E+00	SHORT HLIF
AL-26	6.255E-03	2.081E-02	2.100E-02	NOT IDENT.

SC-46	1.855E-01	4.335E-01	4.415E-01	FAIL ABUN
V-48	-9.990E+02	1.611E+04	1.612E+04	SHORT HLIF
CR-51	3.589E+02	4.363E+02	4.654E+02	SHORT HLIF
MN-54	1.633E-02	7.269E-02	7.306E-02	NOT IDENT.
CO-56	-5.956E-02	4.434E-01	4.442E-01	NOT IDENT.
MN-56	-1.000E+41	8.191E+41	0.000E+00	SHORT HLIF
CO-57	-2.905E-02	3.878E-02	4.093E-02	NOT IDENT.
CO-58	3.051E-02	4.858E-01	4.860E-01	NOT IDENT.
FE-59	1.751E+00	6.864E+00	6.909E+00	NOT IDENT.
CO-60	1.350E-02	4.504E-02	4.545E-02	NOT IDENT.
ZN-65	-1.109E-01	2.429E-01	2.480E-01	NOT IDENT.
GE-68	8.788E-01	2.899E+00	2.926E+00	NOT IDENT.
AS-73	1.073E+00	1.706E+00	1.773E+00	NOT IDENT.
AS-74	4.227E+03	6.254E+03	6.538E+03	SHORT HLIF
SE-75	-3.233E-02	1.893E-01	1.899E-01	NOT IDENT.
BR-77	1.263E+38	1.086E+39	0.000E+00	SHORT HLIF
SR-82	-3.719E+02	8.215E+02	8.384E+02	SHORT HLIF
RB-83	3.231E-01	6.759E-01	6.915E-01	NOT IDENT.
KR-85	4.405E+00	7.679E+00	7.932E+00	NOT IDENT.
SR-85	4.537E-01	7.948E-01	8.207E-01	NOT IDENT.
RB-86	2.143E+04	2.883E+04	3.040E+04	SHORT HLIF
Y-88	-1.335E-01	2.808E-01	2.871E-01	NOT IDENT.
Y-91	1.692E+02	5.887E+02	5.936E+02	NOT IDENT.
NB-94	7.792E-03	3.280E-02	3.298E-02	NOT IDENT.
NB-95	1.508E-01	1.069E+00	1.071E+00	NOT IDENT.
NB-95M	7.155E-01	2.423E+00	2.444E+00	NOT IDENT.
ZR-95	-6.851E-03	1.372E+00	1.372E+00	NOT IDENT.
NB-97	-1.000E+41	1.852E+41	0.000E+00	SHORT HLIF
ZR-97	-1.000E+41	1.019E+43	0.000E+00	SHORT HLIF
MO-99	-4.374E+31	1.356E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.210E+42	0.000E+00	SHORT HLIF
RH-101	-2.969E-02	2.796E-02	3.100E-02	NOT IDENT.
RH-102	1.982E-02	5.623E-02	5.693E-02	NOT IDENT.
RU-103	-7.399E-01	6.537E+00	6.546E+00	FAIL ABUN
RH-106	4.417E-01	5.313E-01	5.674E-01	NOT IDENT.
RU-106	4.417E-01	5.313E-01	5.674E-01	NOT IDENT.
AG-108M	-1.515E-02	2.932E-02	3.011E-02	NOT IDENT.
AG-110M	-4.508E-02	1.171E-01	1.188E-01	NOT IDENT.
SN-113	1.091E-01	2.420E-01	2.470E-01	NOT IDENT.
CD-115	3.038E+38	1.862E+39	0.000E+00	SHORT HLIF
SN-117M	2.652E+04	7.597E+04	7.690E+04	SHORT HLIF
TE-123M	2.173E-02	1.111E-01	1.115E-01	NOT IDENT.
SB-124	5.418E-01	1.662E+00	1.679E+00	NOT IDENT.
SB-125	3.870E-02	1.256E-01	1.268E-01	FAIL ABUN
TE-125M	2.269E+02	2.018E+02	2.263E+02	NOT IDENT.
I-126	8.903E+05	9.775E+05	1.057E+06	SHORT HLIF
SB-126	4.828E+05	1.112E+06	1.134E+06	SHORT HLIF
SB-127	8.216E+21	1.969E+22	0.000E+00	SHORT HLIF
I-131	6.167E+09	8.388E+09	8.837E+09	SHORT HLIF
I-132	-1.000E+41	1.858E+42	0.000E+00	SHORT HLIF
TE-132	2.070E+26	2.617E+26	0.000E+00	SHORT HLIF
BA-133	-1.782E-02	5.634E-02	5.691E-02	NOT IDENT.
I-133	-1.000E+41	9.416E+41	0.000E+00	SHORT HLIF
CS-134	6.054E-02	8.069E-02	8.518E-02	FAIL ABUN
CS-135	3.691E-02	1.595E-01	1.604E-01	NOT IDENT.
I-135	-1.000E+41	1.271E+43	0.000E+00	SHORT HLIF
CS-136	3.652E+03	3.272E+05	3.272E+05	SHORT HLIF
CE-139	-4.642E-02	9.772E-02	9.994E-02	NOT IDENT.
BA-140	8.721E+05	1.452E+06	1.504E+06	SHORT HLIF
LA-140	-1.823E+05	4.370E+05	4.446E+05	SHORT HLIF
CE-141	-5.909E+00	2.174E+01	2.190E+01	NOT IDENT.
CE-143	1.000E+41	5.601E+40	0.000E+00	SHORT HLIF
CE-144	-4.959E-02	2.739E-01	2.748E-01	NOT IDENT.
PM-144	-4.640E-03	5.639E-02	5.643E-02	NOT IDENT.
PR-144	-4.345E-01	4.889E+00	4.893E+00	NOT IDENT.
PM-146	-6.640E-02	4.827E-02	5.680E-02	NOT IDENT.
ND-147	-1.046E+07	3.458E+07	3.490E+07	SHORT HLIF
PM-147	2.122E+02	6.515E+02	6.585E+02	NOT IDENT.
PM-149	1.439E+40	2.694E+40	0.000E+00	SHORT HLIF
EU-150	2.936E-03	2.949E-02	2.952E-02	FAIL ABUN
EU-152	-1.635E-02	1.028E-01	1.030E-01	FAIL ABUN
GD-153	-1.370E-02	1.225E-01	1.227E-01	NOT IDENT.
EU-154	7.697E-02	1.424E-01	1.466E-01	NOT IDENT.
EU-155	6.138E-02	7.220E-02	7.732E-02	FAIL ABUN
TB-160	-9.744E-01	1.702E+00	1.758E+00	FAIL ABUN
HO-166M	-2.264E-02	6.624E-02	6.702E-02	NOT IDENT.
TM-171	1.070E+00	3.741E+00	3.772E+00	NOT IDENT.
HF-172	-6.646E-02	1.779E-01	1.804E-01	FAIL ABUN

LU-172	1.140E-01	9.379E-02	1.069E-01	FAIL ABUN
LU-176	1.849E-02	2.268E-02	2.416E-02	FAIL ABUN
HF-181	4.208E+00	5.928E+00	6.224E+00	FAIL ABUN
TA-182	7.320E-02	9.871E-01	9.877E-01	FAIL ABUN
RE-183	8.592E-02	7.614E-01	7.623E-01	NOT IDENT.
RE-184	-2.544E+00	3.071E+01	3.073E+01	NOT IDENT.
W-188	-8.215E+00	1.243E+02	1.244E+02	FAIL ABUN
IR-192	-4.103E-01	4.415E-01	4.787E-01	FAIL ABUN
HG-203	-1.422E+00	2.616E+00	2.693E+00	NOT IDENT.
BI-207	-6.303E-03	4.881E-02	4.889E-02	FAIL ABUN
BI-211	3.183E+00	5.799E-01	1.548E+00	FAIL ABUN
PB-211	1.501E-01	7.320E-01	7.352E-01	NOT IDENT.
BI-212	2.176E+00	1.140E+00	1.504E+00	FAIL ABUN
RN-219	-3.899E-01	4.276E-01	4.623E-01	FAIL ABUN
RA-223	-5.684E-01	6.536E-01	7.021E-01	FAIL ABUN
AC-227	-1.566E-01	2.116E-01	2.231E-01	FAIL ABUN
TH-227	-1.566E-01	2.116E-01	2.231E-01	FAIL ABUN
TH-231	-5.684E-01	6.536E-01	7.021E-01	FAIL ABUN
PA-233	1.157E-02	6.159E-02	6.181E-02	FAIL ABUN
PA-234	5.117E-02	2.832E-01	2.842E-01	NOT IDENT.
PA-234M	-1.149E+00	4.204E+00	4.236E+00	NOT IDENT.
NP-237	1.157E-02	6.159E-02	6.181E-02	FAIL ABUN
NP-238	-1.000E+41	2.176E+41	0.000E+00	SHORT HLIF
NP-239	-3.652E-02	1.884E-01	1.892E-01	NOT IDENT.
PU-239	2.896E+01	2.737E+02	2.740E+02	NOT IDENT.
AM-241	1.940E-02	4.331E-02	4.418E-02	NOT IDENT.
CM-243	-1.326E-02	6.781E-02	6.808E-02	NOT IDENT.
BK-247	-1.995E-02	6.871E-02	6.930E-02	FAIL ABUN
CM-247	-2.568E-02	3.773E-02	3.947E-02	NOT IDENT.
CF-249	-3.489E-04	4.091E-02	4.091E-02	NOT IDENT.
CF-251	-8.440E-03	1.038E-01	1.039E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	73.4783	87.09	95.5220	136.47	69.6050
45.60	71.3332	87.57	95.6613	140.51	0.0000
46.54	71.6618	88.03	95.7946	143.76	70.6794
49.72	0.0000	88.34	68.4888	144.24	72.7150
51.35	79.2780	88.47	68.5156	145.44	79.7888
51.87	76.4654	89.96	100.9381	152.43	78.9144
52.39	66.8749	1093.63	101.1413	153.25	0.0000
52.97	68.5541	91.11	0.0000	323.87	69.1664
53.44	64.9216	92.59	101.7205	156.02	0.0000
54.07	71.1566	93.35	101.9443	158.56	0.0000
57.36	0.0000	94.56	66.2623	159.00	60.7004
57.53	80.6626	94.65	69.7675	162.33	64.1372
57.98	74.6553	94.67	69.7717	162.66	0.0000
59.27	99.0366	94.87	69.8114	163.33	56.0969
59.32	80.4835	97.43	79.1071	165.86	70.7056
59.54	80.5557	98.43	79.3275	176.31	61.6009
60.96	99.7124	98.44	79.3295	176.60	0.0000
61.17	99.7959	99.53	71.6116	177.52	63.8231
62.93	94.9933	100.11	80.5803	181.07	0.0000
63.29	95.1262	102.03	63.1992	181.52	71.6389
63.58	95.2328	103.18	71.4301	184.41	88.9302
64.28	95.4895	103.37	71.4667	143.76	74.2714
66.73	88.1461	105.21	54.7595	193.51	68.7832
67.24	91.5053	105.31	54.7740	197.03	60.5271
125.81	89.5226	106.12	72.8871	198.01	62.7861
67.75	87.9466	106.47	74.7552	201.83	72.9674
69.67	115.9398	109.28	62.5981	203.43	76.4258
70.83	87.3166	111.00	91.1186	205.31	81.0290
72.81	115.0662	111.76	0.0000	210.85	63.3120
72.87	114.0042	114.06	91.8175	215.65	55.6122
74.66	91.7690	116.30	0.0000	222.11	48.2818
74.82	91.8186	116.74	75.7864	227.09	66.7216
74.97	91.8656	119.76	64.2358	227.38	64.4868
77.11	92.5321	121.12	67.2446	228.16	0.0000
78.74	76.4198	121.22	67.2605	228.18	45.3052
79.69	102.2104	121.78	83.2508	116.74	45.3052
80.12	102.3536	122.06	85.1778	235.69	54.9397
80.19	0.0000	122.92	64.7154	235.96	54.9602
80.57	90.2466	123.07	62.8616	238.63	51.7140
81.00	92.0454	265.00	65.7692	238.98	0.0000
81.07	92.0664	125.81	71.7579	240.99	51.8802
81.75	86.1159	127.23	88.0922	242.00	51.9509
83.79	102.4324	127.91	87.2800	244.70	49.4362
84.00	102.5000	129.30	87.5527	252.40	0.0000
85.43	101.8259	131.20	80.2791	252.80	38.6467
86.55	95.3647	133.02	89.2366	254.15	0.0000
86.79	95.4340	133.52	64.3593	256.23	47.0526
86.94	95.4784	136.00	62.7744	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	39.2358	355.39	0.0000	584.27	31.4380
264.80	35.6754	356.01	39.4482	595.83	0.0000
265.00	42.8214	364.49	0.0000	427.87	24.3523
268.22	49.3621	366.42	0.0000	602.52	0.0000
269.46	52.6273	372.51	29.3900	604.72	19.1067
270.03	52.6649	375.05	38.3870	607.14	35.0813
271.23	62.3324	377.52	38.4753	609.32	23.4198
273.65	0.0000	356.01	38.7010	610.33	23.4341
276.40	50.6633	388.16	40.6604	614.28	14.4146
277.37	42.2685	388.63	0.0000	618.01	23.5442
277.60	42.2803	391.69	33.5388	620.36	24.6490
278.00	45.9263	264.66	43.8584	621.93	14.1598
279.20	58.0957	401.81	49.3912	630.19	0.0000
279.54	61.7516	402.40	43.9258	631.29	11.3271
279.70	61.7640	404.85	37.6009	633.25	18.3606
280.46	55.7593	410.95	40.5670	634.78	0.0000
283.69	55.9741	413.71	35.1186	635.95	12.9810
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	47.5527	423.72	0.0000	645.85	19.5850
285.90	0.0000	427.09	48.6051	657.76	23.0081
287.50	63.5591	427.87	40.2189	657.90	0.0000
290.67	45.8008	433.94	35.7216	661.66	27.4516
293.27	0.0000	439.40	31.1604	664.57	0.0000
351.93	25.8982	453.88	43.9448	666.33	0.0000
295.96	25.9200	463.37	35.6119	666.50	0.0000
879.38	25.9975	468.07	30.4291	667.71	0.0000
299.98	26.0385	473.00	0.0000	677.62	19.9446
300.09	26.0417	475.06	27.1939	685.70	0.0000
300.13	26.0430	476.78	32.0916	695.00	0.0000
301.36	26.0789	477.60	29.1925	696.49	19.0337
302.85	26.1225	482.18	33.6879	696.51	19.0344
256.23	26.1705	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	15.6822
306.78	26.2372	497.08	31.5951	697.49	15.6833
308.46	37.5513	505.52	28.3127	702.65	17.9746
311.90	46.0694	507.63	0.0000	706.68	21.3912
316.51	49.6672	511.00	27.9259	711.68	24.8359
319.41	0.0000	514.00	27.9852	720.70	0.0000
320.08	0.0000	514.00	27.9863	721.93	0.0000
321.04	42.2963	520.40	21.0846	722.78	23.8472
323.87	54.9809	520.69	0.0000	722.91	23.8489
325.23	42.0597	522.65	0.0000	723.31	18.7424
328.76	0.0000	527.90	0.0000	724.19	25.5698
333.37	50.1306	528.26	28.2689	727.33	13.6597
333.97	46.3030	529.59	27.2834	733.00	13.7007
334.37	43.7482	529.87	0.0000	735.93	13.7212
338.28	44.7859	531.02	0.0000	333.97	19.4543
338.32	44.7869	537.26	0.0000	739.50	0.0000
311.90	42.7274	546.56	0.0000	747.24	23.0029
340.48	42.7274	552.55	22.5819	748.06	20.7114
340.55	0.0000	563.25	22.7430	752.31	19.6037
344.28	45.7521	569.33	29.0618	753.82	0.0000
345.93	45.1329	946.00	21.7981	756.73	13.8691
351.06	34.8950	569.70	23.8778	756.80	13.8696
351.93	34.9251	583.19	31.4172	884.68	24.3599

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	26.7042	1274.44	10.6156	1620.50	2.8216
766.42	25.5512	1001.03	12.5695	1621.92	3.7635
766.84	29.0415	1002.74	9.6753	1678.03	0.0000
772.60	0.0000	1004.73	14.5244	1690.97	1.9146
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	1.9488
778.90	22.7889	1028.54	0.0000	1063.66	16.5883
783.70	0.0000	1037.84	11.7700	1771.35	6.8322
785.37	14.0688	1038.76	0.0000	1791.20	0.0000
792.07	12.7037	631.29	14.7620	1808.65	0.9846
794.95	16.9617	1048.07	0.0000	1810.72	0.0000
795.86	14.1411	1049.04	13.7906	1836.06	6.9354
810.06	14.2383	1050.41	14.7830		
810.29	12.4598	1063.66	12.8762		
344.28	12.4611	1077.00	0.0000		
810.76	10.6824	1077.34	15.9287		
815.77	0.0000	1085.87	4.9936		
1048.07	0.0000	1093.63	10.0153		
832.01	18.8826	1099.45	9.0330		
834.85	19.8079	1112.07	10.0830		
835.71	19.8160	1112.84	16.1367		
836.80	0.0000	1115.54	20.9980		
846.75	0.0000	1120.29	17.1909		
846.77	14.4854	1120.55	17.1930		
856.80	0.0000	1221.41	17.8041		
860.56	15.4882	1129.67	16.2344		
871.09	13.7311	1131.51	0.0000		
873.19	11.9114	1147.95	0.0000		
875.33	0.0000	1173.23	11.3323		
879.38	14.7007	1177.95	16.5098		
880.51	10.1118	1189.05	17.9533		
883.24	15.6465	1204.77	13.5364		
884.68	21.1821	1221.41	13.6118		
889.28	15.6880	1231.02	24.1595		
894.76	13.8757	1235.36	0.0000		
898.04	10.1903	1238.28	20.0054		
900.72	15.7668	1260.41	0.0000		
903.28	15.7845	1271.87	8.5151		
911.20	18.6334	1274.44	11.7177		
912.08	18.6407	1274.54	11.7184		
923.98	0.0000	1291.59	10.2820		
926.50	15.0049	1298.22	0.0000		
929.11	10.5150	1312.11	0.0000		
937.49	9.0448	1332.49	8.6777		
944.13	0.0000	1362.66	0.0000		
946.00	12.2918	1365.19	6.5731		
949.00	16.0937	1368.63	0.0000		
667.71	0.0000	1384.29	8.8140		
962.31	23.7976	1408.01	4.4377		
964.08	15.2417	1457.56	0.0000		
966.17	9.1529	1460.82	4.5054		
911.20	18.1355	1489.16	1.8164		
968.97	18.1355	1505.03	7.2977		
983.53	0.0000	1584.12	15.8387		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235010.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM28.CNF;265
Background date   : 2-OCT-2016 11:01:35.
Sample date       : 10-DEC-2015 10:35:00 Acquisition date : 3-OCT-2016 08:06:48.
Sample ID         : G405235010 Sample quantity      : 1.41695E+02 GRAM
Detector name     : GAM28 Detector geometry       : CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.44 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials   : MXR1
Abundance limit   : 75.00000 Sensitivity      : 3.00000
Batch ID          : 1596247 Detector SN#     :
Matrix Spike ID   : LCS ID                          : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	74.87*	115	142	1.22	149.82	145	15	3.21E-02	20.5	2.90E+00
2	1	77.34	233	145	1.23	154.78	145	15	6.47E-02	11.1	
3	0	88.10	29	281	1.27	176.31	169	10	7.99E-03	111.2	
4	7	90.12	71	89	1.17	180.35	178	12	1.98E-02	22.9	1.05E+00
5	7	92.81*	86	163	1.45	185.73	178	12	2.39E-02	31.4	
6	0	186.51*	91	164	1.65	373.28	368	12	2.51E-02	31.2	
7	0	209.46	55	98	2.05	419.22	415	9	1.53E-02	35.2	
8	3	238.84*	415	101	1.41	478.01	473	16	1.15E-01	6.5	2.08E+00
9	3	241.88	91	87	1.80	484.11	473	16	2.52E-02	23.8	
10	0	270.52	68	98	1.57	541.41	534	14	1.88E-02	33.4	
11	0	281.98	26	149	3.65	564.35	552	17	7.25E-03	110.1	
12	0	295.46	172	108	1.52	591.33	584	14	4.77E-02	15.0	
13	0	328.59	25	46	1.14	657.65	654	7	6.97E-03	48.9	
14	0	338.71	102	61	1.70	677.90	672	11	2.82E-02	17.9	
15	0	352.30*	263	80	1.49	705.10	698	14	7.32E-02	9.6	
16	0	381.75	10	34	0.78	764.04	759	7	2.68E-03	106.2	
17	1	415.85	24	11	1.67	832.30	829	13	6.54E-03	31.0	1.76E+00
18	1	418.05	23	25	1.67	836.70	829	13	6.48E-03	46.0	
19	0	498.95	10	12	1.39	998.62	994	7	2.86E-03	64.0	
20	0	511.08*	39	53	1.24	1022.90	1016	14	1.08E-02	50.2	
21	0	537.63*	33	67	7.89	1076.05	1063	23	9.11E-03	68.2	
22	0	583.55*	167	20	1.75	1167.95	1160	16	4.65E-02	9.9	
23	0	609.92*	157	47	1.67	1220.72	1215	12	4.36E-02	12.0	
24	0	662.07*	109	35	1.71	1325.10	1318	13	3.04E-02	15.1	
25	0	690.92	10	32	0.91	1382.84	1371	13	2.82E-03	119.5	
26	0	728.43	39	58	1.37	1457.91	1450	16	1.09E-02	45.6	
27	0	777.17	22	18	1.40	1555.47	1549	14	6.12E-03	45.6	
28	0	862.69	35	26	1.64	1726.64	1718	18	9.81E-03	38.3	
29	0	880.77	17	9	0.82	1762.82	1756	12	4.72E-03	42.8	
30	0	889.35	7	15	0.72	1780.00	1771	10	1.94E-03	110.2	
31	0	911.66*	98	12	2.04	1824.66	1819	12	2.73E-02	12.5	
32	0	925.88	12	15	5.21	1853.11	1843	16	3.23E-03	82.0	
33	0	957.60	8	29	4.25	1916.61	1903	15	2.29E-03	148.6	
34	7	965.52	23	16	2.53	1932.45	1928	18	6.35E-03	39.3	2.09E+00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	7	969.75	30	25	2.06	1940.92	1928	18	8.40E-03	36.3	
36	0	1120.99*	47	6	2.03	2243.64	2237	11	1.30E-02	18.1	
37	0	1227.79	6	16	3.42	2457.39	2446	13	1.67E-03	143.6	
38	0	1331.39	15	0	1.06	2664.73	2659	12	4.17E-03	25.8	
39	0	1362.03	9	7	2.99	2726.06	2721	11	2.57E-03	60.3	
40	0	1461.82*	402	15	2.22	2925.80	2918	15	1.12E-01	5.4	

Flag: "*" = Peak area was modified by background subtraction


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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235010.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 10-DEC-2015 10:35:00 Acquisition date : 3-OCT-2016 08:06:48
Sample ID         : G405235010 Sample quantity   : 141.70 GRAM
Sample type       : SOLID Sample geometry    :
Detector name     : GAMMA28 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.44 0.0%
Energy tolerance  : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error    : 0.00 %
Efficiency type   : Linear Efficiencies at   : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.237E+00	1.548E+01	1.548E+01	10.88	OK
SC-46	889.28	99.98*	1.841E+00	2.023E-02	2.379E-01	220.39	OK
	1120.55	99.99	1.539E+00	1.584E-01	1.862E+00	36.29	OK
BA-137M	661.66	89.90*	2.305E+00	2.882E-01	2.937E-01	30.20	OK
CS-137	661.66	85.10*	2.305E+00	3.045E-01	3.103E-01	30.20	OK
TL-208	277.37	6.60	4.566E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.540E+00	4.280E-01	4.280E-01	19.83	OK
	860.56	12.50	1.888E+00	-----	Line Not Found	-----	Absent
PB-212	74.82	10.28	4.348E+00	9.762E-01	9.762E-01	73.52	OK
	77.11	17.10	4.595E+00	1.922E+00	1.922E+00	22.12	OK
	238.63	43.60*	5.102E+00	1.110E+00	1.110E+00	13.00	OK
	300.09	3.30	4.295E+00	-----	Line Not Found	-----	Absent
BI-214	609.32	45.49*	2.455E+00	7.735E-01	7.738E-01	24.04	OK
	1120.29	14.92	1.539E+00	1.061E+00	1.062E+00	36.29	OK
	1764.49	15.30	1.045E+00	-----	Line Not Found	-----	Absent
PB-214	74.82	5.80	4.343E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	4.595E+00	3.388E+00	3.389E+00	22.12	OK
	87.09	3.41	5.480E+00	9.889E-01	9.893E-01	222.31	OK
	242.00	7.25	5.054E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.348E+00	1.253E+00	1.253E+00	29.93	OK
	351.93	35.60*	3.782E+00	1.127E+00	1.128E+00	19.25	OK
RN-222	609.32	45.49*	2.455E+00	7.735E-01	7.738E-01	24.04	OK
	1120.29	14.92	1.539E+00	1.061E+00	1.062E+00	36.29	OK
	1764.49	15.30	1.045E+00	-----	Line Not Found	-----	Absent
RA-224	240.99	4.10*	5.056E+00	3.884E-01	3.884E-01	361.47	OK
RA-226	609.32	45.49*	2.455E+00	7.735E-01	7.738E-01	24.04	OK
	1120.29	14.92	1.539E+00	1.061E+00	1.062E+00	36.29	OK
	1764.49	15.30	1.045E+00	-----	Line Not Found	-----	Absent
AC-228	105.21	1.10	6.315E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.903E+00	1.334E+00	1.334E+00	35.71	OK
	794.95	4.25	2.005E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.930E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.806E+00	1.118E+00	1.118E+00	25.05	OK
	968.97	15.80	1.723E+00	5.862E-01	5.862E-01	72.56	OK
RA-228	105.21	1.10	6.315E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.903E+00	1.334E+00	1.334E+00	35.71	OK
	794.95	4.25	2.005E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.930E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.806E+00	1.118E+00	1.118E+00	25.05	OK
	968.97	15.80	1.723E+00	5.862E-01	5.862E-01	72.56	OK
TH-228	74.82	10.28	4.348E+00	9.762E-01	9.762E-01	73.52	OK
	77.11	17.10	4.595E+00	1.922E+00	1.922E+00	22.12	OK
	238.63	43.60*	5.102E+00	1.110E+00	1.110E+00	13.00	OK
	300.09	3.30	4.295E+00	-----	Line Not Found	-----	Absent
TH-230	609.32	45.49*	2.455E+00	7.735E-01	7.735E-01	24.04	OK
	1120.29	14.92	1.539E+00	1.061E+00	1.061E+00	36.29	OK
	1764.49	15.30	1.045E+00	-----	Line Not Found	-----	Absent
TH-232	105.21	1.10	6.315E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.903E+00	1.334E+00	1.334E+00	35.71	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	835.71	1.61	1.930E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.806E+00	1.118E+00	1.118E+00	25.05	OK
	968.97	15.80	1.723E+00	5.862E-01	5.862E-01	72.56	OK
U-234	609.32	45.49*	2.455E+00	7.735E-01	7.735E-01	24.04	OK
	1120.29	14.92	1.539E+00	1.061E+00	1.061E+00	36.29	OK
	1764.49	15.30	1.045E+00	-----	Line Not Found	-----	Absent
U-235	89.96	3.47	5.613E+00	2.346E+00	2.346E+00	45.73	OK
	93.35	5.60	5.774E+00	1.699E+00	1.699E+00	62.79	OK
	143.76	10.96*	6.593E+00	-----	Line Not Found	-----	Absent
	163.33	5.08	6.352E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	5.972E+00	1.607E-01	1.607E-01	62.42	OK
	205.31	5.01	5.647E+00	-----	Line Not Found	-----	Absent
AM-243	43.53	5.90	4.883E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	4.348E+00	1.493E-01	1.493E-01	73.52	OK
ANH-511	511.00	100.00*	2.815E+00	7.735E-02	7.735E-02	100.37	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235010.CNF;1 *
 * Acquisition date : 3-OCT-2016 08:06:48 Sensitivity : 3.000 *
 * Detector ID : GAM28 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.44 Half life ratio : ***** *
 * Sample date : 10-DEC-2015 10:35:00 Analyst initials: MXR1 *
 * Sample ID : G405235010 Sample Quantity : 1.4170E+02 GRAM *
 * Batch Number : 1596247 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 1-AUG-2016 10:02:35 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;10 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.548E+01	1.651E+00	7.790E-01
SC-46	2.379E-01	5.138E-01	5.677E-01
BA-137M	2.937E-01	8.693E-02	6.608E-02
CS-137	3.103E-01	9.183E-02	6.981E-02
TL-208	4.280E-01	8.316E-02	5.872E-02
PB-212	1.110E+00	1.414E-01	9.957E-02
BI-214	7.738E-01	1.823E-01	1.343E-01
PB-214	1.128E+00	2.127E-01	1.199E-01
RN-222	7.738E-01	1.823E-01	1.343E-01
RA-224	3.884E-01	1.376E+00	1.067E+00
RA-226	7.738E-01	1.823E-01	1.343E-01
AC-228	1.118E+00	2.745E-01	1.944E-01
RA-228	1.118E+00	2.745E-01	1.944E-01
TH-228	1.110E+00	1.414E-01	9.957E-02
TH-230	7.735E-01	1.822E-01	1.343E-01
TH-232	1.118E+00	2.745E-01	1.944E-01
U-234	7.735E-01	1.822E-01	1.343E-01
U-235	5.665E-02	2.136E-01	3.889E-01
AM-243	1.493E-01	1.076E-01	1.007E-01
ANH-511	7.735E-02	7.608E-02	5.153E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.688E+00		1.184E+01	2.292E+01	NOT IDENT.
NA-22	2.246E-02		4.683E-02	9.887E-02	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF
AL-26	-2.222E-02		2.865E-02	4.911E-02	NOT IDENT.
V-48	0.000E+00		1.431E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00		4.367E+02	0.000E+00	SHORT HLIF
MN-54	5.688E-03		6.780E-02	1.345E-01	NOT IDENT.
CO-56	8.791E-02		4.665E-01	9.481E-01	NOT IDENT.
MN-56	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.294E-02		5.206E-02	9.583E-02	NOT IDENT.

CO-58	-2.229E-01	6.006E-01	1.133E+00	NOT IDENT.
FE-59	-4.196E+00	7.282E+00	1.292E+01	NOT IDENT.
CO-60	6.396E-02	3.237E-02	8.164E-02	FAIL ABUN
ZN-65	5.230E-02	2.045E-01	3.667E-01	NOT IDENT.
GE-68	-4.752E-01	2.518E+00	4.891E+00	NOT IDENT.
AS-73	2.390E+00	9.590E+00	1.832E+01	NOT IDENT.
AS-74	0.000E+00	6.002E+03	0.000E+00	SHORT HLIF
SE-75	-8.366E-02	2.154E-01	3.575E-01	NOT IDENT.
BR-77	0.000E+00	1.448E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	1.191E+03	0.000E+00	SHORT HLIF
RB-83	-3.177E-02	6.447E-01	1.215E+00	NOT IDENT.
KR-85	8.201E+00	8.453E+00	1.599E+01	NOT IDENT.
SR-85	8.474E-01	8.751E-01	1.655E+00	NOT IDENT.
RB-86	0.000E+00	2.899E+04	0.000E+00	SHORT HLIF
Y-88	4.586E-02	2.072E-01	4.784E-01	NOT IDENT.
Y-91	-3.295E+01	5.892E+02	1.118E+03	NOT IDENT.
NB-94	2.235E-02	3.464E-02	6.927E-02	NOT IDENT.
NB-95	-2.932E-01	8.910E-01	1.686E+00	NOT IDENT.
NB-95M	2.382E+00	2.519E+00	4.765E+00	NOT IDENT.
ZR-95	1.093E+00	1.411E+00	3.071E+00	NOT IDENT.
NB-97	0.000E+00	1.511E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	8.353E+40	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.083E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-2.385E-02	3.724E-02	6.332E-02	NOT IDENT.
RH-102	-4.469E-02	6.196E-02	1.034E-01	NOT IDENT.
RU-103	3.193E+00	4.627E+00	9.254E+00	FAIL ABUN
RH-106	-4.160E-01	5.095E-01	8.365E-01	NOT IDENT.
RU-106	-4.160E-01	5.095E-01	8.365E-01	NOT IDENT.
AG-108M	6.887E-03	2.765E-02	5.420E-02	NOT IDENT.
CD-109	1.426E+00	3.106E+00	2.659E+00	FAIL ABUN
AG-110M	7.324E-03	1.277E-01	1.711E-01	NOT IDENT.
SN-113	-1.797E-01	2.263E-01	3.929E-01	NOT IDENT.
CD-115	0.000E+00	1.853E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.019E+05	0.000E+00	SHORT HLIF
TE-123M	3.932E-02	1.466E-01	2.659E-01	NOT IDENT.
SB-124	2.091E-01	1.723E+00	3.804E+00	NOT IDENT.
SB-125	7.877E-02	1.031E-01	2.129E-01	NOT IDENT.
TE-125M	4.114E+01	2.824E+02	5.199E+02	NOT IDENT.
I-126	0.000E+00	8.109E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	8.774E+05	0.000E+00	SHORT HLIF
SN-126	9.114E-02	1.986E-01	1.810E-01	FAIL ABUN
SB-127	0.000E+00	1.793E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	4.261E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.678E+26	0.000E+00	SHORT HLIF
BA-133	-2.253E-02	4.414E-02	7.019E-02	NOT IDENT.
I-133	0.000E+00	1.188E+41	0.000E+00	SHORT HLIF
CS-134	3.080E-02	5.427E-02	1.132E-01	NOT IDENT.
CS-135	6.612E-02	1.343E-01	2.702E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.768E+05	0.000E+00	SHORT HLIF
CE-139	-1.225E-01	1.030E-01	1.856E-01	NOT IDENT.
BA-140	0.000E+00	3.992E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.611E+05	0.000E+00	SHORT HLIF
CE-141	-2.890E+01	2.759E+01	4.480E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	-2.293E-01	4.016E-01	6.848E-01	NOT IDENT.
PM-144	1.911E-02	5.353E-02	1.055E-01	NOT IDENT.
PR-144	1.643E+00	4.643E+00	9.151E+00	NOT IDENT.
PM-146	7.738E-04	4.315E-02	8.231E-02	NOT IDENT.
ND-147	0.000E+00	3.238E+07	0.000E+00	SHORT HLIF
PM-147	1.114E+02	8.989E+02	1.640E+03	NOT IDENT.
PM-149	0.000E+00	2.644E+40	0.000E+00	SHORT HLIF
EU-150	1.735E-02	2.584E-02	4.861E-02	FAIL ABUN
EU-152	-1.553E-02	8.440E-02	1.597E-01	FAIL ABUN
GD-153	-1.236E-01	1.838E-01	3.185E-01	NOT IDENT.
EU-154	4.809E-02	1.135E-01	2.383E-01	NOT IDENT.
EU-155	9.599E-02	1.155E-01	2.241E-01	NOT IDENT.
TB-160	2.821E+00	2.367E+00	3.319E+00	FAIL ABUN
HO-166M	-1.197E-02	6.195E-02	1.114E-01	NOT IDENT.
TM-171	-1.198E+00	2.291E+01	4.280E+01	NOT IDENT.
HF-172	-1.589E-01	2.482E-01	4.226E-01	NOT IDENT.
LU-172	-4.140E-02	7.390E-02	1.322E-01	FAIL ABUN
LU-176	-2.567E-03	2.640E-02	4.999E-02	FAIL ABUN
HF-181	6.322E-01	4.423E+00	8.501E+00	NOT IDENT.
TA-182	-3.562E-01	1.000E+00	1.565E+00	FAIL ABUN
RE-183	-6.587E-01	3.101E+00	5.754E+00	NOT IDENT.

RE-184	1.787E+01	3.187E+01	6.685E+01	NOT IDENT.
W-188	4.322E+01	1.161E+02	2.112E+02	NOT IDENT.
IR-192	-2.023E-01	4.750E-01	8.734E-01	FAIL ABUN
HG-203	2.180E+00	2.401E+00	4.943E+00	NOT IDENT.
BI-207	3.199E-02	4.675E-02	1.016E-01	FAIL ABUN
PB-210	3.202E-01	3.896E+00	7.399E+00	NOT IDENT.
BI-211	0.000E+00	5.860E-01	8.039E-01	FAIL ABUN
PB-211	3.286E-01	6.805E-01	1.358E+00	NOT IDENT.
BI-212	1.489E+00	1.330E+00	1.516E+00	FAIL ABUN
RN-219	5.262E-02	3.531E-01	6.889E-01	FAIL ABUN
RA-223	5.300E-01	6.662E-01	1.304E+00	FAIL ABUN
AC-227	-8.847E-02	2.256E-01	4.217E-01	NOT IDENT.
TH-227	-8.847E-02	2.256E-01	4.217E-01	NOT IDENT.
TH-229	-2.527E-01	4.570E-01	8.562E-01	FAIL ABUN
PA-231	1.510E-02	5.457E-01	9.892E-01	NOT IDENT.
TH-231	5.300E-01	6.662E-01	1.304E+00	FAIL ABUN
PA-233	-2.707E-02	5.936E-02	1.091E-01	NOT IDENT.
PA-234	2.153E-02	3.000E-01	5.934E-01	FAIL ABUN
PA-234M	-1.253E+00	4.256E+00	8.510E+00	NOT IDENT.
TH-234	-2.636E-01	1.457E+00	2.692E+00	FAIL ABUN
NP-237	-2.707E-02	5.936E-02	1.091E-01	NOT IDENT.
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
U-238	-2.636E-01	1.457E+00	2.692E+00	FAIL ABUN
NP-239	-1.749E-01	2.651E-01	4.527E-01	NOT IDENT.
PU-239	2.404E+02	3.353E+02	6.365E+02	NOT IDENT.
AM-241	-9.236E-02	1.471E-01	2.629E-01	NOT IDENT.
CM-243	-1.132E-01	1.092E-01	1.817E-01	NOT IDENT.
BK-247	8.431E-03	7.088E-02	1.261E-01	NOT IDENT.
CM-247	-2.331E-02	3.432E-02	6.035E-02	NOT IDENT.
CF-249	1.601E-02	3.725E-02	7.428E-02	NOT IDENT.
CF-251	5.780E-02	1.161E-01	2.343E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	385	10.66*	1.237E+00	1.548E+01	1.548E+01	10.88
SC-46	889.28	7	99.98*	1.841E+00	2.023E-02	2.379E-01	220.39
	1120.55	46	99.99	1.539E+00	1.584E-01	1.862E+00	36.29
CD-109	88.03	35	3.70*	5.480E+00	9.114E-01	1.426E+00	222.31
SN-126	64.28	-----	9.60	3.124E+00	-----	Line Not Found	-----
	86.94	35	8.90	5.480E+00	3.789E-01	3.789E-01	222.31
	87.57	35	37.00*	5.480E+00	9.114E-02	9.114E-02	222.31
BA-137M	661.66	113	89.90*	2.305E+00	2.882E-01	2.937E-01	30.20
CS-137	661.66	113	85.10*	2.305E+00	3.045E-01	3.103E-01	30.20
TL-208	277.37	-----	6.60	4.566E+00	-----	Line Not Found	-----
	583.19	174	85.00*	2.540E+00	4.280E-01	4.280E-01	19.83
	860.56	-----	12.50	1.888E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	4.138E+00	-----	Line Not Found	-----
	351.06	287	12.92*	3.782E+00	3.107E+00	3.107E+00	19.25
PB-212	74.82	142	10.28	4.348E+00	1.679E+00	1.679E+00	40.90
	77.11	285	17.10	4.595E+00	1.922E+00	1.922E+00	22.12
	238.63	466	43.60*	5.102E+00	1.110E+00	1.110E+00	13.00
	300.09	-----	3.30	4.295E+00	-----	Line Not Found	-----
BI-214	609.32	163	45.49*	2.455E+00	7.735E-01	7.738E-01	24.04
	1120.29	46	14.92	1.539E+00	1.061E+00	1.062E+00	36.29
	1764.49	-----	15.30	1.045E+00	-----	Line Not Found	-----
PB-214	74.82	142	5.80	4.348E+00	2.976E+00	2.977E+00	40.90
	77.11	285	9.70	4.595E+00	3.388E+00	3.389E+00	22.12
	87.09	35	3.41	5.480E+00	9.889E-01	9.893E-01	222.31
	242.00	102	7.25	5.056E+00	1.472E+00	1.473E+00	47.53
	295.22	189	18.42	4.348E+00	1.253E+00	1.253E+00	29.93
	351.93	287	35.60*	3.782E+00	1.127E+00	1.128E+00	19.25
RN-222	609.32	163	45.49*	2.455E+00	7.735E-01	7.738E-01	24.04
	1120.29	46	14.92	1.539E+00	1.061E+00	1.062E+00	36.29
	1764.49	-----	15.30	1.045E+00	-----	Line Not Found	-----
RA-224	240.99	102	4.10*	5.056E+00	2.604E+00	2.604E+00	47.53
RA-226	609.32	163	45.49*	2.455E+00	7.735E-01	7.738E-01	24.04
	1120.29	46	14.92	1.539E+00	1.061E+00	1.062E+00	36.29
	1764.49	-----	15.30	1.045E+00	-----	Line Not Found	-----
AC-228	105.21	-----	1.10	6.315E+00	-----	Line Not Found	-----
	338.32	111	11.27	3.903E+00	1.334E+00	1.334E+00	35.71
	794.95	-----	4.25	2.005E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.930E+00	-----	Line Not Found	-----
	911.20	98	25.80*	1.806E+00	1.118E+00	1.118E+00	25.05
	968.97	30	15.80	1.723E+00	5.862E-01	5.862E-01	72.56
RA-228	105.21	-----	1.10	6.315E+00	-----	Line Not Found	-----
	338.32	111	11.27	3.903E+00	1.334E+00	1.334E+00	35.71
	794.95	-----	4.25	2.005E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.930E+00	-----	Line Not Found	-----
	911.20	98	25.80*	1.806E+00	1.118E+00	1.118E+00	25.05
	968.97	30	15.80	1.723E+00	5.862E-01	5.862E-01	72.56
TH-228	74.82	142	10.28	4.348E+00	1.679E+00	1.679E+00	40.90

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected Decay Corr		2-Sigma %Error
					pCi/GRAM	pCi/GRAM	
	77.11	285	17.10	4.595E+00	1.922E+00	1.922E+00	22.12
	238.63	466	43.60*	5.102E+00	1.110E+00	1.110E+00	13.00
	300.09	-----	3.30	4.295E+00	-----	Line Not Found	-----
TH-230	609.32	163	45.49*	2.455E+00	7.735E-01	7.735E-01	24.04
	1120.29	46	14.92	1.539E+00	1.061E+00	1.061E+00	36.29
	1764.49	-----	15.30	1.045E+00	-----	Line Not Found	-----
TH-232	105.21	-----	1.10	6.315E+00	-----	Line Not Found	-----
	338.32	111	11.27	3.903E+00	1.334E+00	1.334E+00	35.71
	835.71	-----	1.61	1.930E+00	-----	Line Not Found	-----
	911.20	98	25.80*	1.806E+00	1.118E+00	1.118E+00	25.05
	968.97	30	15.80	1.723E+00	5.862E-01	5.862E-01	72.56
U-234	609.32	163	45.49*	2.455E+00	7.735E-01	7.735E-01	24.04
	1120.29	46	14.92	1.539E+00	1.061E+00	1.061E+00	36.29
	1764.49	-----	15.30	1.045E+00	-----	Line Not Found	-----
U-235	89.96	86	3.47	5.613E+00	2.346E+00	2.346E+00	45.73
	93.35	104	5.60	5.774E+00	1.699E+00	1.699E+00	62.79
	143.76	-----	10.96*	6.593E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.352E+00	-----	Line Not Found	-----
	185.72	104	57.20	5.972E+00	1.607E-01	1.607E-01	62.42
	205.31	-----	5.01	5.647E+00	-----	Line Not Found	-----
AM-243	43.53	-----	5.90	4.883E-01	-----	Line Not Found	-----
	74.66	142	67.20*	4.348E+00	2.568E-01	2.568E-01	40.90
ANH-511	511.00	41	100.00*	2.815E+00	7.735E-02	7.735E-02	100.37

Flag: "*" = Keyline

Total number of lines in spectrum 40
 Number of unidentified lines 8
 Number of lines tentatively identified by NID 32 80.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.548E+01	1.548E+01	0.169E+01	10.88	
SC-46	83.79D	11.8	2.023E-02	2.379E-01	5.243E-01	220.39	
CD-109	461.40D	1.56	9.114E-01	1.426E+00	3.170E+00	222.31	
SN-126	2.30E+05Y	1.00	9.114E-02	9.114E-02	20.26E-02	222.31	
BA-137M	30.08Y	1.02	2.882E-01	2.937E-01	0.887E-01	30.20	
CS-137	30.08Y	1.02	3.045E-01	3.103E-01	0.937E-01	30.20	
TL-208	1.41E+10Y	1.00	4.280E-01	4.280E-01	0.849E-01	19.83	
BI-211	7.04E+08Y	1.00	3.107E+00	3.107E+00	0.598E+00	19.25	
PB-212	1.41E+10Y	1.00	1.110E+00	1.110E+00	0.144E+00	13.00	
BI-214	1600.00Y	1.00	7.735E-01	7.738E-01	1.860E-01	24.04	
PB-214	1600.00Y	1.00	1.127E+00	1.128E+00	0.217E+00	19.25	
RN-222	1600.00Y	1.00	7.735E-01	7.738E-01	1.860E-01	24.04	
RA-224	1.41E+10Y	1.00	2.604E+00	2.604E+00	1.237E+00	47.53	
RA-226	1600.00Y	1.00	7.735E-01	7.738E-01	1.860E-01	24.04	
AC-228	1.41E+10Y	1.00	1.118E+00	1.118E+00	0.280E+00	25.05	
RA-228	1.41E+10Y	1.00	1.118E+00	1.118E+00	0.280E+00	25.05	
TH-228	1.41E+10Y	1.00	1.110E+00	1.110E+00	0.144E+00	13.00	
TH-230	7.54E+04Y	1.00	7.735E-01	7.735E-01	1.860E-01	24.04	
TH-232	1.41E+10Y	1.00	1.118E+00	1.118E+00	0.280E+00	25.05	
U-234	2.45E+05Y	1.00	7.735E-01	7.735E-01	1.860E-01	24.04	
U-235	7.04E+08Y	1.00	1.607E-01	1.607E-01	1.003E-01	62.42	K
AM-243	7370.00Y	1.00	2.568E-01	2.568E-01	1.051E-01	40.90	
ANH-511	1.00E+09Y	1.00	7.735E-02	7.735E-02	7.764E-02	100.37	
Total Activity :			3.430E+01	3.504E+01			

Grand Total Activity : 3.430E+01 3.504E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	209.46	62	111	2.05	419.22	415	9	1.53E-02	70.4	5.58E+00	T
0	270.52	75	109	1.57	541.41	534	14	1.88E-02	66.7	4.65E+00	T
0	281.98	29	165	3.65	564.35	552	17	7.25E-03	****	4.51E+00	
0	328.59	27	50	1.14	657.65	654	7	6.97E-03	97.8	4.00E+00	T
0	381.75	10	37	0.78	764.04	759	7	2.68E-03	****	3.55E+00	
1	415.85	25	12	1.67	832.30	829	13	6.54E-03	62.0	3.31E+00	T
1	418.05	25	27	1.67	836.70	829	13	6.48E-03	92.0	3.30E+00	
0	498.95	11	12	1.39	998.62	994	7	2.86E-03	****	2.87E+00	
0	537.63	34	70	7.89	1076.05	1063	23	9.11E-03	****	2.71E+00	T
0	690.92	10	33	0.91	1382.84	1371	13	2.82E-03	****	2.23E+00	
0	728.43	40	59	1.37	1457.91	1450	16	1.09E-02	91.2	2.14E+00	T
0	777.17	22	18	1.40	1555.47	1549	14	6.12E-03	91.3	2.04E+00	T
0	862.69	36	26	1.64	1726.64	1718	18	9.81E-03	76.5	1.88E+00	
0	880.77	17	9	0.82	1762.82	1756	12	4.72E-03	85.6	1.85E+00	T
0	925.88	12	15	5.21	1853.11	1843	16	3.23E-03	****	1.79E+00	T
0	957.60	8	29	4.25	1916.61	1903	15	2.29E-03	****	1.74E+00	
7	965.52	23	16	2.53	1932.45	1928	18	6.35E-03	78.6	1.73E+00	T
0	1227.79	6	16	3.42	2457.39	2446	13	1.67E-03	****	1.43E+00	
0	1331.39	15	0	1.06	2664.73	2659	12	4.17E-03	51.6	1.34E+00	T
0	1362.03	9	7	2.99	2726.06	2721	11	2.57E-03	****	1.31E+00	T

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235010.CNF;1
* Acquisition date   : 3-OCT-2016 08:06:48 Sensitivity      : 3.000
* Detector ID        : GAM28 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.44 Half life ratio : *****
* Sample date        : 10-DEC-2015 10:35:00 Nuclide Library : SOLID
* Sample ID          : G405235010 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.4170E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 1-AUG-2016 10:02:35 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;10
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	3.350E-01
SC-46	2.374E-01
BA-137M	2.945E-02
CS-137	3.111E-02
TL-208	2.597E-02
PB-212	4.645E-02
BI-214	6.062E-02
PB-214	5.448E-02
RN-222	6.062E-02
RA-224	4.978E-01
RA-226	6.062E-02
AC-228	8.161E-02
RA-228	8.161E-02
TH-228	4.645E-02
TH-230	6.060E-02
TH-232	8.161E-02
U-234	6.060E-02
U-235	1.841E-01
AM-243	4.776E-02
ANH-511	2.316E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.031E+01	NOT IDENT.
NA-22	4.298E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.752E-02	NOT IDENT.
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.997E-02	NOT IDENT.
CO-56	4.189E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.508E-02	NOT IDENT.
CO-58	4.980E-01	NOT IDENT.

FE-59	5.610E+00	NOT IDENT.
CO-60	3.483E-02	FAIL ABUN
ZN-65	1.618E-01	NOT IDENT.
GE-68	2.142E+00	NOT IDENT.
AS-73	8.583E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.638E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.428E-01	NOT IDENT.
KR-85	7.361E+00	NOT IDENT.
SR-85	7.618E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.895E-01	NOT IDENT.
Y-91	4.940E+02	NOT IDENT.
NB-94	3.132E-02	NOT IDENT.
NB-95	7.544E-01	NOT IDENT.
NB-95M	2.236E+00	NOT IDENT.
ZR-95	1.374E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.969E-02	NOT IDENT.
RH-102	4.534E-02	NOT IDENT.
RU-103	4.087E+00	FAIL ABUN
RH-106	3.651E-01	NOT IDENT.
RU-106	3.651E-01	NOT IDENT.
AG-108M	2.456E-02	NOT IDENT.
CD-109	1.271E+00	FAIL ABUN
AG-110M	7.322E-02	NOT IDENT.
SN-113	1.768E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.251E-01	NOT IDENT.
SB-124	1.474E+00	NOT IDENT.
SB-125	9.710E-02	NOT IDENT.
TE-125M	2.441E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SN-126	8.675E-02	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.175E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.102E-02	NOT IDENT.
CS-135	1.252E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	8.616E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.105E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.214E-01	NOT IDENT.
PM-144	4.693E-02	NOT IDENT.
PR-144	4.069E+00	NOT IDENT.
PM-146	3.710E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.706E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.232E-02	FAIL ABUN
EU-152	7.233E-02	FAIL ABUN
GD-153	1.490E-01	NOT IDENT.
EU-154	1.033E-01	NOT IDENT.
EU-155	1.057E-01	NOT IDENT.
TB-160	1.434E+00	FAIL ABUN
HO-166M	4.950E-02	NOT IDENT.
TM-171	1.998E+01	NOT IDENT.
HF-172	1.977E-01	NOT IDENT.
LU-172	5.621E-02	FAIL ABUN
LU-176	2.312E-02	FAIL ABUN
HF-181	3.846E+00	NOT IDENT.
TA-182	6.694E-01	FAIL ABUN
RE-183	2.692E+00	NOT IDENT.
RE-184	2.985E+01	NOT IDENT.

W-188	9.753E+01	NOT IDENT.
IR-192	4.011E-01	FAIL ABUN
HG-203	2.303E+00	NOT IDENT.
BI-207	4.464E-02	FAIL ABUN
PB-210	3.470E+00	NOT IDENT.
BI-211	3.870E-01	FAIL ABUN
PB-211	6.215E-01	NOT IDENT.
BI-212	7.072E-01	FAIL ABUN
RN-219	3.117E-01	FAIL ABUN
RA-223	6.062E-01	FAIL ABUN
AC-227	1.947E-01	NOT IDENT.
TH-227	1.947E-01	NOT IDENT.
TH-229	3.992E-01	FAIL ABUN
PA-231	4.623E-01	NOT IDENT.
TH-231	6.062E-01	FAIL ABUN
PA-233	4.992E-02	NOT IDENT.
PA-234	2.623E-01	FAIL ABUN
PA-234M	3.742E+00	NOT IDENT.
TH-234	1.277E+00	FAIL ABUN
NP-237	4.992E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	1.277E+00	FAIL ABUN
NP-239	2.119E-01	NOT IDENT.
PU-239	3.004E+02	NOT IDENT.
AM-241	1.229E-01	NOT IDENT.
CM-243	8.493E-02	NOT IDENT.
BK-247	5.780E-02	NOT IDENT.
CM-247	2.716E-02	NOT IDENT.
CF-249	3.394E-02	NOT IDENT.
CF-251	1.101E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235010.CNF;1 *
 * Acquisition date : 3-OCT-2016 08:06:48 Sensitivity : 3.000 *
 * Detector ID : GAM28 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.44 Half life ratio : ***** *
 * Sample date : 10-DEC-2015 10:35:00 Nuclide Library : SOLID *
 * Sample ID : G405235010 Analyst initials: MXR1 *
 * Batch Number : 1596247 Sample Quantity : 1.4170E+02 GRAM *
 * Quantity Err(%) : 1.4115E-03 % *
 * Wet wt corr : 1.00000 Wet Weight : 0.00000 *
 * Dry Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 1-AUG-2016 10:02:35 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;10 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.548E+01	1.840E+00	1.840E+00
SC-46	2.379E-01	5.139E-01	5.139E-01
BA-137M	2.937E-01	8.786E-02	8.786E-02
CS-137	3.103E-01	9.281E-02	9.281E-02
TL-208	4.280E-01	8.516E-02	8.516E-02
PB-212	1.110E+00	1.533E-01	1.533E-01
BI-214	7.738E-01	1.854E-01	1.854E-01
PB-214	1.128E+00	2.179E-01	2.179E-01
RN-222	7.738E-01	1.854E-01	1.854E-01
RA-224	3.884E-01	1.384E+00	1.384E+00
RA-226	7.738E-01	1.854E-01	1.854E-01
AC-228	1.118E+00	2.804E-01	2.804E-01
RA-228	1.118E+00	2.804E-01	2.804E-01
TH-228	1.110E+00	1.533E-01	1.533E-01
TH-230	7.735E-01	1.853E-01	1.853E-01
TH-232	1.118E+00	2.804E-01	2.804E-01
U-234	7.735E-01	1.853E-01	1.853E-01
U-235	5.665E-02	2.136E-01	2.136E-01
AM-243	1.494E-01	1.088E-01	1.088E-01
ANH-511	7.735E-02	7.615E-02	7.615E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.688E+00	1.184E+01	1.186E+01	NOT IDENT.
NA-22	2.246E-02	4.684E-02	4.792E-02	NOT IDENT.
NA-24	-1.000E+41	3.866E+41	0.000E+00	SHORT HLIF
AL-26	-2.222E-02	2.868E-02	3.038E-02	NOT IDENT.
V-48	1.361E+03	1.431E+04	1.432E+04	SHORT HLIF
CR-51	2.139E+02	4.368E+02	4.473E+02	SHORT HLIF
MN-54	5.688E-03	6.780E-02	6.785E-02	NOT IDENT.
CO-56	8.791E-02	4.665E-01	4.682E-01	NOT IDENT.
MN-56	1.000E+41	5.403E+41	0.000E+00	SHORT HLIF
CO-57	1.294E-02	5.206E-02	5.239E-02	NOT IDENT.

CO-58	-2.229E-01	6.007E-01	6.091E-01	NOT IDENT.
FE-59	-4.196E+00	7.288E+00	7.530E+00	NOT IDENT.
CO-60	6.396E-02	3.246E-02	4.342E-02	FAIL ABUN
ZN-65	5.230E-02	2.045E-01	2.059E-01	NOT IDENT.
GE-68	-4.752E-01	2.518E+00	2.527E+00	NOT IDENT.
AS-73	2.390E+00	9.602E+00	9.662E+00	NOT IDENT.
AS-74	2.106E+03	6.005E+03	6.079E+03	SHORT HLIF
SE-75	-8.366E-02	2.154E-01	2.187E-01	NOT IDENT.
BR-77	1.137E+38	9.776E+38	0.000E+00	SHORT HLIF
SR-82	1.331E+03	1.192E+03	1.335E+03	SHORT HLIF
RB-83	-3.177E-02	6.447E-01	6.449E-01	NOT IDENT.
KR-85	8.201E+00	8.460E+00	9.233E+00	NOT IDENT.
SR-85	8.474E-01	8.758E-01	9.555E-01	NOT IDENT.
RB-86	-1.586E+04	2.900E+04	2.987E+04	SHORT HLIF
Y-88	4.586E-02	2.072E-01	2.082E-01	NOT IDENT.
Y-91	-3.295E+01	5.892E+02	5.894E+02	NOT IDENT.
NB-94	2.235E-02	3.465E-02	3.609E-02	NOT IDENT.
NB-95	-2.932E-01	8.910E-01	9.008E-01	NOT IDENT.
NB-95M	2.382E+00	2.526E+00	2.745E+00	NOT IDENT.
ZR-95	1.093E+00	1.412E+00	1.495E+00	NOT IDENT.
NB-97	1.000E+41	1.512E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	8.363E+40	0.000E+00	SHORT HLIF
MO-99	-3.736E+30	1.083E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.363E+42	0.000E+00	SHORT HLIF
RH-101	-2.385E-02	3.749E-02	3.900E-02	NOT IDENT.
RH-102	-4.469E-02	6.207E-02	6.525E-02	NOT IDENT.
RU-103	3.193E+00	4.630E+00	4.848E+00	FAIL ABUN
RH-106	-4.160E-01	5.102E-01	5.436E-01	NOT IDENT.
RU-106	-4.160E-01	5.102E-01	5.436E-01	NOT IDENT.
AG-108M	6.887E-03	2.765E-02	2.782E-02	NOT IDENT.
CD-109	1.426E+00	3.109E+00	3.174E+00	FAIL ABUN
AG-110M	7.324E-03	1.277E-01	1.278E-01	NOT IDENT.
SN-113	-1.797E-01	2.264E-01	2.404E-01	NOT IDENT.
CD-115	2.208E+38	1.854E+39	0.000E+00	SHORT HLIF
SN-117M	-6.889E+04	1.022E+05	1.068E+05	SHORT HLIF
TE-123M	3.932E-02	1.466E-01	1.477E-01	NOT IDENT.
SB-124	2.091E-01	1.723E+00	1.725E+00	NOT IDENT.
SB-125	7.877E-02	1.031E-01	1.090E-01	NOT IDENT.
TE-125M	4.114E+01	2.824E+02	2.830E+02	NOT IDENT.
I-126	9.719E+05	8.215E+05	9.310E+05	SHORT HLIF
SB-126	5.345E+05	8.831E+05	9.154E+05	SHORT HLIF
SN-126	9.114E-02	1.986E-01	2.028E-01	FAIL ABUN
SB-127	-4.249E+21	1.884E+22	0.000E+00	SHORT HLIF
I-131	-1.546E+09	4.262E+09	4.318E+09	SHORT HLIF
I-132	1.000E+41	1.921E+42	0.000E+00	SHORT HLIF
TE-132	1.165E+25	2.678E+26	0.000E+00	SHORT HLIF
BA-133	-2.253E-02	4.415E-02	4.530E-02	NOT IDENT.
I-133	-1.000E+41	2.154E+41	0.000E+00	SHORT HLIF
CS-134	3.080E-02	5.429E-02	5.603E-02	NOT IDENT.
CS-135	6.612E-02	1.344E-01	1.376E-01	NOT IDENT.
I-135	1.000E+41	7.113E+41	0.000E+00	SHORT HLIF
CS-136	4.311E+04	2.769E+05	2.775E+05	SHORT HLIF
CE-139	-1.225E-01	1.059E-01	1.195E-01	NOT IDENT.
BA-140	2.989E+06	3.994E+06	4.215E+06	SHORT HLIF
LA-140	-1.434E+05	4.611E+05	4.656E+05	SHORT HLIF
CE-141	-2.890E+01	2.762E+01	3.054E+01	NOT IDENT.
CE-143	1.000E+41	4.669E+41	0.000E+00	SHORT HLIF
CE-144	-2.293E-01	4.018E-01	4.149E-01	NOT IDENT.
PM-144	1.911E-02	5.354E-02	5.423E-02	NOT IDENT.
PR-144	1.643E+00	4.643E+00	4.702E+00	NOT IDENT.
PM-146	7.738E-04	4.315E-02	4.315E-02	NOT IDENT.
ND-147	-2.366E+06	3.238E+07	3.239E+07	SHORT HLIF
PM-147	1.114E+02	8.989E+02	9.003E+02	NOT IDENT.
PM-149	6.778E+39	2.648E+40	0.000E+00	SHORT HLIF
EU-150	1.735E-02	2.585E-02	2.701E-02	FAIL ABUN
EU-152	-1.553E-02	8.440E-02	8.469E-02	FAIL ABUN
GD-153	-1.236E-01	1.840E-01	1.922E-01	NOT IDENT.
EU-154	4.809E-02	1.136E-01	1.156E-01	NOT IDENT.
EU-155	9.599E-02	1.157E-01	1.235E-01	NOT IDENT.
TB-160	2.821E+00	2.373E+00	2.693E+00	FAIL ABUN
HO-166M	-1.197E-02	6.196E-02	6.219E-02	NOT IDENT.
TM-171	-1.198E+00	2.291E+01	2.292E+01	NOT IDENT.
HF-172	-1.589E-01	2.496E-01	2.597E-01	NOT IDENT.
LU-172	-4.140E-02	7.402E-02	7.633E-02	FAIL ABUN
LU-176	-2.567E-03	2.640E-02	2.643E-02	FAIL ABUN
HF-181	6.322E-01	4.424E+00	4.433E+00	NOT IDENT.
TA-182	-3.562E-01	1.000E+00	1.013E+00	FAIL ABUN
RE-183	-6.587E-01	3.103E+00	3.117E+00	NOT IDENT.

RE-184	1.787E+01	3.215E+01	3.315E+01	NOT IDENT.
W-188	4.322E+01	1.162E+02	1.178E+02	NOT IDENT.
IR-192	-2.023E-01	4.751E-01	4.838E-01	FAIL ABUN
HG-203	2.180E+00	2.403E+00	2.597E+00	NOT IDENT.
BI-207	3.199E-02	4.677E-02	4.894E-02	FAIL ABUN
PB-210	3.202E-01	3.896E+00	3.898E+00	NOT IDENT.
BI-211	3.107E+00	6.024E-01	1.525E+00	FAIL ABUN
PB-211	3.286E-01	6.807E-01	6.966E-01	NOT IDENT.
BI-212	1.489E+00	1.333E+00	1.492E+00	FAIL ABUN
RN-219	5.262E-02	3.532E-01	3.540E-01	FAIL ABUN
RA-223	5.300E-01	6.670E-01	7.085E-01	FAIL ABUN
AC-227	-8.847E-02	2.259E-01	2.294E-01	NOT IDENT.
TH-227	-8.847E-02	2.259E-01	2.294E-01	NOT IDENT.
TH-229	-2.527E-01	4.572E-01	4.712E-01	FAIL ABUN
PA-231	1.510E-02	5.457E-01	5.458E-01	NOT IDENT.
TH-231	5.300E-01	6.670E-01	7.085E-01	FAIL ABUN
PA-233	-2.707E-02	5.937E-02	6.062E-02	NOT IDENT.
PA-234	2.153E-02	3.010E-01	3.012E-01	FAIL ABUN
PA-234M	-1.253E+00	4.257E+00	4.294E+00	NOT IDENT.
TH-234	-2.636E-01	1.458E+00	1.463E+00	FAIL ABUN
NP-237	-2.707E-02	5.937E-02	6.062E-02	NOT IDENT.
NP-238	3.888E+40	2.708E+41	0.000E+00	SHORT HLIF
U-238	-2.636E-01	1.458E+00	1.463E+00	FAIL ABUN
NP-239	-1.749E-01	2.655E-01	2.769E-01	NOT IDENT.
PU-239	2.404E+02	3.355E+02	3.526E+02	NOT IDENT.
AM-241	-9.236E-02	1.473E-01	1.531E-01	NOT IDENT.
CM-243	-1.132E-01	1.097E-01	1.210E-01	NOT IDENT.
BK-247	8.431E-03	7.090E-02	7.100E-02	NOT IDENT.
CM-247	-2.331E-02	3.455E-02	3.611E-02	NOT IDENT.
CF-249	1.601E-02	3.727E-02	3.796E-02	NOT IDENT.
CF-251	5.780E-02	1.163E-01	1.192E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	54.1856	87.09	145.3838	136.47	79.0660
45.60	74.3617	87.57	145.4961	140.51	0.0000
46.54	69.2816	88.03	145.6035	143.76	89.5680
49.72	0.0000	88.34	68.2860	144.24	85.9352
51.35	67.9370	88.47	68.3002	145.44	110.6419
51.87	64.8281	89.96	112.5823	152.43	80.5468
52.39	63.8395	1093.63	91.3812	153.25	0.0000
52.97	73.5099	91.11	0.0000	323.87	74.4983
53.44	63.9880	92.59	91.6608	156.02	0.0000
54.07	61.9405	93.35	91.7688	158.56	0.0000
57.36	0.0000	94.56	81.2139	159.00	77.3884
57.53	62.4014	94.65	81.2247	162.33	82.6783
57.98	75.3828	94.67	81.2274	162.66	0.0000
59.27	77.7448	94.87	81.2522	163.33	71.8994
59.32	85.3120	97.43	83.1077	165.86	82.1522
59.54	85.3506	98.43	84.3884	176.31	71.1835
60.96	81.2642	98.44	84.3895	176.60	0.0000
61.17	96.4746	99.53	83.3692	177.52	69.5737
62.93	96.8158	100.11	81.1228	181.07	0.0000
63.29	106.6823	102.03	79.0276	181.52	74.1134
63.58	103.4757	103.18	97.7857	184.41	85.8591
64.28	93.8020	103.37	96.6488	143.76	72.7105
66.73	105.2073	105.21	70.0518	193.51	75.8461
67.24	116.2796	105.31	70.0616	197.03	74.3699
125.81	107.5942	106.12	79.4950	198.01	65.7826
67.75	107.6077	106.47	87.7224	201.83	89.4712
69.67	113.5081	109.28	75.1533	203.43	86.9934
70.83	92.7684	111.00	80.0413	205.31	67.9723
72.81	115.2734	111.76	0.0000	210.85	61.7463
72.87	124.1534	114.06	68.5577	215.65	65.9691
74.66	111.2091	116.30	0.0000	222.11	53.0750
74.82	111.2404	116.74	88.9727	227.09	55.0794
74.97	111.2701	119.76	89.3297	227.38	58.6476
77.11	111.6913	121.12	77.5574	228.16	0.0000
78.74	112.0079	121.22	77.5674	228.18	66.6901
79.69	92.7446	121.78	78.8186	116.74	66.6901
80.12	92.8127	122.06	77.6527	235.69	55.0331
80.19	0.0000	122.92	84.9149	235.96	64.4429
80.57	92.8839	123.07	78.9505	238.63	64.5857
81.00	92.9514	265.00	79.0125	238.98	0.0000
81.07	92.9628	125.81	87.6315	240.99	64.7109
81.75	123.0918	127.23	92.5992	242.00	64.7644
83.79	115.9809	127.91	91.4755	244.70	59.4983
84.00	116.0217	129.30	74.7546	252.40	0.0000
85.43	144.9912	131.20	100.3128	252.80	46.2753
86.55	145.2559	133.02	86.0026	254.15	0.0000
86.79	145.3125	133.52	93.3268	256.23	56.4086
86.94	145.3477	136.00	81.4518	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	48.0791	355.39	0.0000	584.27	19.7366
264.80	49.4583	356.01	39.4964	595.83	0.0000
265.00	38.4735	364.49	0.0000	427.87	28.7083
268.22	44.0771	366.42	0.0000	602.52	0.0000
269.46	44.1191	372.51	38.4192	604.72	23.2277
270.03	44.1377	375.05	41.4377	607.14	23.2507
271.23	44.1777	377.52	31.1245	609.32	28.8131
273.65	0.0000	356.01	44.6301	610.33	28.8258
276.40	59.1328	388.16	30.8228	614.28	18.3235
277.37	44.3818	388.63	0.0000	618.01	30.0300
277.60	44.3887	391.69	39.8535	620.36	14.4727
278.00	44.4023	264.66	29.0431	621.93	26.7363
279.20	44.4414	401.81	28.0598	630.19	0.0000
279.54	44.4531	402.40	38.0943	631.29	26.8389
279.70	44.4580	404.85	31.1198	633.25	16.7877
280.46	44.4834	410.95	27.8021	634.78	0.0000
283.69	43.1955	413.71	33.2927	635.95	29.1305
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	40.4591	423.72	0.0000	645.85	21.3727
285.90	0.0000	427.09	31.5064	657.76	11.8672
287.50	45.6434	427.87	24.4023	657.90	0.0000
290.67	36.4117	433.94	27.5427	661.66	22.6392
293.27	0.0000	439.40	27.6235	664.57	0.0000
351.93	59.0112	453.88	27.8350	666.33	0.0000
295.96	59.0420	463.37	31.0797	666.50	0.0000
879.38	77.4596	468.07	30.1163	667.71	0.0000
299.98	46.5221	473.00	0.0000	677.62	14.8070
300.09	46.5251	475.06	32.3074	685.70	0.0000
300.13	49.3459	476.78	23.9906	695.00	0.0000
301.36	67.7329	477.60	25.0439	696.49	17.2083
302.85	69.6866	482.18	28.2387	696.51	17.2083
256.23	49.9689	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	17.2137
306.78	52.8805	497.08	11.0627	697.49	18.3626
308.46	47.2697	505.52	14.2817	702.65	20.6982
311.90	47.3806	507.63	0.0000	706.68	26.4871
316.51	50.3819	511.00	26.5170	711.68	24.2291
319.41	0.0000	514.00	27.0854	720.70	0.0000
320.08	0.0000	514.00	27.0854	721.93	0.0000
321.04	48.6281	520.40	24.5039	722.78	10.4268
323.87	42.4154	520.69	0.0000	722.91	10.4271
325.23	48.7640	522.65	0.0000	723.31	10.4286
328.76	0.0000	527.90	0.0000	724.19	13.9092
333.37	49.0255	528.26	32.0801	727.33	10.4440
333.97	30.2926	529.59	30.4946	733.00	13.9541
334.37	34.6289	529.87	0.0000	735.93	20.9531
338.28	41.4673	531.02	0.0000	333.97	17.4707
338.32	41.4682	537.26	0.0000	739.50	0.0000
311.90	39.1116	546.56	0.0000	747.24	20.1622
340.48	39.1116	552.55	20.5439	748.06	21.0447
340.55	0.0000	563.25	19.5564	752.31	19.3205
344.28	33.8820	569.33	23.9658	753.82	0.0000
345.93	46.5156	946.00	25.0570	756.73	14.9528
351.06	33.0558	569.70	25.0599	756.80	14.9533
351.93	33.0738	583.19	19.7278	884.68	24.6914

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	26.4725	1274.44	12.3387	1620.50	4.3926
766.42	29.1258	1001.03	15.2065	1621.92	2.1969
766.84	28.2471	1002.74	10.4595	1678.03	0.0000
772.60	0.0000	1004.73	13.3198	1690.97	3.3391
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	5.4152
778.90	17.7289	1028.54	0.0000	1063.66	12.6485
783.70	0.0000	1037.84	15.3643	1771.35	7.2293
785.37	15.1033	1038.76	0.0000	1791.20	0.0000
792.07	25.8237	631.29	18.2903	1808.65	6.3680
794.95	22.2839	1048.07	0.0000	1810.72	0.0000
795.86	20.5075	1049.04	15.4121	1836.06	3.6564
810.06	25.0862	1050.41	10.5999		
810.29	25.0879	1063.66	10.6381		
344.28	22.4007	1077.00	0.0000		
810.76	22.4037	1077.34	15.5313		
815.77	0.0000	1085.87	12.6485		
1048.07	0.0000	1093.63	16.5746		
832.01	17.1474	1099.45	21.4817		
834.85	21.6797	1112.07	13.7163		
835.71	17.1683	1112.84	16.6586		
836.80	0.0000	1115.54	15.6895		
846.75	0.0000	1120.29	15.7090		
846.77	17.2303	1120.55	15.7100		
856.80	0.0000	1221.41	17.2842		
860.56	12.7529	1129.67	14.7629		
871.09	9.1397	1131.51	0.0000		
873.19	16.4625	1147.95	0.0000		
875.33	0.0000	1173.23	17.9143		
879.38	14.6621	1177.95	18.9316		
880.51	14.6675	1189.05	15.9863		
883.24	11.0098	1204.77	20.0610		
884.68	11.0149	1221.41	16.1143		
889.28	8.8245	1231.02	19.3828		
894.76	13.8121	1235.36	0.0000		
898.04	15.6698	1238.28	23.2597		
900.72	21.2179	1260.41	0.0000		
903.28	16.6185	1271.87	12.2329		
911.20	9.2551	1274.44	10.2002		
912.08	9.2575	1274.54	10.2008		
923.98	0.0000	1291.59	14.3375		
926.50	12.0875	1298.22	0.0000		
929.11	11.9109	1312.11	0.0000		
937.49	21.4572	1332.49	8.2705		
944.13	0.0000	1362.66	0.0000		
946.00	18.7054	1365.19	6.6652		
949.00	25.4626	1368.63	0.0000		
667.71	0.0000	1384.29	7.3213		
962.31	16.5408	1408.01	6.3080		
964.08	16.5494	1457.56	0.0000		
966.17	18.8177	1460.82	12.7595		
911.20	18.8330	1489.16	3.2087		
968.97	18.8330	1505.03	5.3656		
983.53	0.0000	1584.12	9.8135		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235011.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM33.CNF;235
Background date : 2-OCT-2016 11:02:02.
Sample date      : 9-DEC-2015 10:13:00. Acquisition date : 3-OCT-2016 08:07:11.
Sample ID       : G405235011 Sample quantity : 1.46502E+02 GRAM
Detector name   : GAM33 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.76 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596247 Detector SN# :
Matrix Spike ID : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.53*	7	123	0.83	127.17	124	6	1.85E-03	281.1	
2	0	76.04*	274	283	3.34	152.16	146	14	7.61E-02	14.4	
3	3	87.05	70	193	1.31	174.15	168	24	1.94E-02	34.5	1.69E+00
4	3	89.79	43	127	1.01	179.62	168	24	1.18E-02	44.1	
5	3	92.69*	61	148	1.37	185.41	168	24	1.70E-02	41.6	
6	0	163.14*	15	63	1.35	326.13	324	5	4.03E-03	90.4	
7	0	185.81*	95	125	1.27	371.42	367	11	2.63E-02	26.4	
8	0	209.23	33	73	1.11	418.20	415	7	9.11E-03	47.0	
9	2	238.67*	343	74	1.18	477.02	472	17	9.52E-02	6.9	1.29E+00
10	2	241.72	100	88	1.48	483.11	472	17	2.78E-02	20.4	
11	0	253.11	24	48	0.65	505.86	502	8	6.54E-03	55.0	
12	1	269.69	31	58	1.25	539.00	534	12	8.59E-03	44.7	2.12E+00
13	1	271.20	28	54	1.25	542.00	534	12	7.68E-03	51.3	
14	0	279.74	20	108	2.28	559.08	551	14	5.47E-03	115.7	
15	0	295.23	176	69	0.97	590.01	584	12	4.89E-02	12.1	
16	0	300.38	15	57	0.97	600.32	596	8	4.27E-03	88.1	
17	0	328.33*	48	48	1.22	656.16	653	9	1.34E-02	30.9	
18	0	338.46*	60	70	0.81	676.40	671	10	1.65E-02	29.7	
19	0	351.84*	263	51	1.05	703.14	697	12	7.30E-02	8.3	
20	0	405.09	27	28	1.67	809.54	805	9	7.43E-03	41.1	
21	0	410.63	18	44	1.27	820.61	815	11	5.00E-03	75.2	
22	0	462.59	48	33	4.52	924.45	917	15	1.32E-02	30.3	
23	0	510.76*	20	52	1.21	1020.71	1015	13	5.55E-03	92.7	
24	0	583.10*	114	41	1.20	1165.31	1158	14	3.16E-02	15.6	
25	0	609.29*	215	24	1.31	1217.67	1210	14	5.99E-02	8.5	
26	0	653.95	5	29	0.84	1306.93	1298	13	1.44E-03	219.5	
27	0	661.69	85	30	1.51	1322.41	1317	11	2.35E-02	16.7	
28	0	726.96	23	20	2.41	1452.90	1447	10	6.43E-03	41.7	
29	0	769.04	14	19	1.49	1537.04	1533	8	3.83E-03	63.6	
30	0	805.86	12	17	1.03	1610.67	1605	9	3.19E-03	72.0	
31	0	825.89	12	8	1.28	1650.71	1646	9	3.25E-03	54.2	
32	0	860.69	19	18	1.98	1720.32	1713	11	5.18E-03	50.8	
33	0	880.86	15	14	4.75	1760.64	1753	14	4.05E-03	60.5	
34	0	894.48	24	14	0.62	1787.88	1779	18	6.75E-03	40.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	911.34*	93	18	1.23	1821.60	1815	12	2.60E-02	14.0	
36	0	934.66	28	8	1.44	1868.25	1861	15	7.64E-03	28.9	
37	0	967.81	62	23	6.61	1934.54	1924	18	1.73E-02	21.9	
38	0	979.57	12	14	0.94	1958.08	1948	14	3.33E-03	72.2	
39	0	1120.52*	53	16	1.17	2240.03	2234	13	1.48E-02	21.0	
40	0	1166.35	10	4	0.71	2331.73	2328	8	2.67E-03	53.1	
41	0	1195.46	11	9	1.38	2389.97	2386	9	2.99E-03	62.5	
42	0	1238.94	17	12	2.42	2476.97	2472	10	4.69E-03	46.0	
43	0	1461.02*	355	9	1.87	2921.43	2913	17	9.85E-02	5.7	
44	0	1592.82*	10	2	1.63	3185.30	3182	7	2.80E-03	41.0	
45	0	1765.02*	30	0	1.72	3530.12	3524	12	8.28E-03	19.5	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235011.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 9-DEC-2015 10:13:00   Acquisition date  : 3-OCT-2016 08:07:11
Sample ID         : G405235011           Sample quantity  : 146.50 GRAM
Sample type       : SOLID                 Sample geometry  :
Detector name     : GAMMA33              Detector geometry: CAN
Elapsed live time : 0 01:00:00.00         Elapsed real time: 0 01:00:00.76   0.0%
Energy tolerance  : 1.50 keV             Half life ratio  : 10.00
Errors propagated: No                    Systematic Error : 0.00 %
Efficiency type   : Linear                Efficiencies at  : Peak Energy
Abundance limit   : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	74.82	TH-228	77.11
PB-214	74.82	PB-212	77.11
PB-214	74.82	PB-214	77.11
PB-214	77.11	AM-243	74.66
PB-214	77.11	TH-228	74.82
PB-214	77.11	PB-212	74.82
PB-214	77.11	TH-228	77.11
PB-214	77.11	PB-212	77.11
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.133E+00	1.447E+01	1.447E+01	11.37	OK
CD-109	88.03	3.70*	4.889E+00	1.205E+00	1.888E+00	142.57	OK
SN-126	64.28	9.60	2.483E+00	1.819E-01	1.819E-01	562.28	OK
	86.94	8.90	4.889E+00	5.010E-01	5.010E-01	142.57	OK
	87.57	37.00*	4.889E+00	1.205E-01	1.205E-01	142.57	OK
CS-135	268.22	16.00*	4.353E+00	2.570E-01	2.570E-01	89.36	OK
BA-137M	661.66	89.90*	2.115E+00	2.371E-01	2.416E-01	33.30	OK
CS-137	661.66	85.10*	2.115E+00	2.505E-01	2.553E-01	33.30	OK
HG-203	70.83	3.69	3.364E+00	-----	Line Not Found	-----	Absent
	72.87	6.19	3.591E+00	-----	Line Not Found	-----	Absent
	279.20	81.56*	4.230E+00	3.294E-02	2.813E+00	231.47	OK
TL-208	277.37	6.60	4.258E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.334E+00	3.090E-01	3.090E-01	31.11	OK
	860.56	12.50	1.727E+00	4.495E-01	4.495E-01	101.63	OK
PB-212	74.82	10.28	3.925E+00	2.323E+00	2.323E+00	56.07	OK
	77.11	17.10	3.925E+00	1.397E+00	1.397E+00	56.07	OK
	238.63	43.60*	4.775E+00	9.622E-01	9.622E-01	13.75	OK
	300.09	3.30	3.996E+00	6.688E-01	6.688E-01	176.29	OK
BI-214	609.32	45.49*	2.255E+00	1.129E+00	1.129E+00	17.00	OK
	1120.29	14.92	1.407E+00	1.289E+00	1.290E+00	41.98	OK
	1764.49	15.30	9.589E-01	9.830E-01	9.833E-01	38.98	OK
PB-214	74.82	5.80	3.800E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	4.033E+00	-----	Line Not Found	-----	<<INT Reject
	87.09	3.41	4.892E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	4.727E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.052E+00	1.353E+00	1.353E+00	24.17	OK
	351.93	35.60*	3.513E+00	1.187E+00	1.187E+00	16.59	OK
RN-222	609.32	45.49*	2.255E+00	1.129E+00	1.129E+00	17.00	OK
	1120.29	14.92	1.407E+00	1.289E+00	1.290E+00	41.98	OK
	1764.49	15.30	9.589E-01	9.830E-01	9.833E-01	38.98	OK
RA-224	240.99	4.10*	4.731E+00	6.267E-01	6.267E-01	216.97	OK
RA-226	609.32	45.49*	2.255E+00	1.129E+00	1.129E+00	17.00	OK
	1120.29	14.92	1.407E+00	1.289E+00	1.290E+00	41.98	OK
	1764.49	15.30	9.589E-01	9.830E-01	9.833E-01	38.98	OK
AC-228	105.21	1.10	5.839E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.627E+00	8.265E-01	8.265E-01	59.37	OK
	794.95	4.25	1.835E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.766E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.653E+00	1.133E+00	1.133E+00	28.05	OK
	968.97	15.80	1.578E+00	1.282E+00	1.282E+00	43.90	OK
RA-228	105.21	1.10	5.839E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.627E+00	8.265E-01	8.265E-01	59.37	OK
	794.95	4.25	1.835E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.766E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.653E+00	1.133E+00	1.133E+00	28.05	OK
	968.97	15.80	1.578E+00	1.282E+00	1.282E+00	43.90	OK
TH-228	74.82	10.28	3.925E+00	2.323E+00	2.323E+00	56.07	OK
	77.11	17.10	3.925E+00	1.397E+00	1.397E+00	56.07	OK
	238.63	43.60*	4.775E+00	9.622E-01	9.622E-01	13.75	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	300.09	3.30	3.996E+00	6.688E-01	6.688E-01	176.29	OK
TH-230	609.32	45.49*	2.255E+00	1.129E+00	1.129E+00	17.00	OK
	1120.29	14.92	1.407E+00	1.289E+00	1.289E+00	41.98	OK
	1764.49	15.30	9.589E-01	9.830E-01	9.830E-01	38.98	OK
PA-231	283.69	1.70	4.183E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.996E+00	4.125E-01	4.125E-01	176.29	OK
TH-232	105.21	1.10	5.839E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.627E+00	8.265E-01	8.265E-01	59.37	OK
	835.71	1.61	1.766E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.653E+00	1.133E+00	1.133E+00	28.05	OK
	968.97	15.80	1.578E+00	1.282E+00	1.282E+00	43.90	OK
TH-234	63.29	3.70*	2.483E+00	4.719E-01	4.719E-01	562.28	OK
	92.59	4.23	5.263E+00	1.738E+00	1.738E+00	83.28	OK
U-234	609.32	45.49*	2.255E+00	1.129E+00	1.129E+00	17.00	OK
	1120.29	14.92	1.407E+00	1.289E+00	1.289E+00	41.98	OK
	1764.49	15.30	9.589E-01	9.830E-01	9.830E-01	38.98	OK
U-235	89.96	3.47	5.080E+00	1.535E+00	1.535E+00	88.12	OK
	93.35	5.60	5.263E+00	1.312E+00	1.312E+00	83.28	OK
	143.76	10.96*	6.181E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	5.966E+00	2.895E-01	2.895E-01	180.74	OK
	185.72	57.20	5.616E+00	1.761E-01	1.761E-01	52.74	OK
	205.31	5.01	5.295E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	2.483E+00	4.719E-01	4.719E-01	562.28	OK
	92.59	4.23	5.263E+00	1.738E+00	1.738E+00	83.28	OK
AM-243	43.53	5.90	2.461E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.925E+00	3.554E-01	3.555E-01	56.07	OK
ANH-511	511.00	100.00*	2.593E+00	4.207E-02	4.207E-02	185.33	OK

Flag: "*" = Keyline


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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235011.CNF;1
* Acquisition date   : 3-OCT-2016 08:07:11 Sensitivity      : 3.000
* Detector ID       : GAM33 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.76 Half life ratio : *****
* Sample date       : 9-DEC-2015 10:13:00 Analyst initials: MXR1
* Sample ID         : G405235011 Sample Quantity : 1.4650E+02 GRAM
* Batch Number      : 1596247 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 10-JUN-2016 07:00:49 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.447E+01	1.613E+00	6.678E-01
CD-109	1.888E+00	2.638E+00	2.312E+00
SN-126	1.205E-01	1.684E-01	1.485E-01
CS-135	2.570E-01	2.250E-01	2.458E-01
BA-137M	2.416E-01	7.886E-02	7.398E-02
CS-137	2.553E-01	8.331E-02	7.816E-02
HG-203	2.813E+00	6.381E+00	4.499E+00
TL-208	3.090E-01	9.423E-02	6.624E-02
PB-212	9.622E-01	1.297E-01	8.860E-02
BI-214	1.129E+00	1.881E-01	1.126E-01
PB-214	1.187E+00	1.931E-01	9.264E-02
RN-222	1.129E+00	1.881E-01	1.126E-01
RA-224	6.267E-01	1.333E+00	9.496E-01
RA-226	1.129E+00	1.881E-01	1.126E-01
AC-228	1.133E+00	3.115E-01	1.924E-01
RA-228	1.133E+00	3.115E-01	1.924E-01
TH-228	9.622E-01	1.297E-01	8.860E-02
TH-230	1.129E+00	1.880E-01	1.125E-01
PA-231	4.125E-01	7.127E-01	6.999E-01
TH-232	1.133E+00	3.115E-01	1.924E-01
TH-234	4.719E-01	2.600E+00	2.657E+00
U-234	1.129E+00	1.880E-01	1.125E-01
U-235	6.013E-02	2.029E-01	3.875E-01
U-238	4.719E-01	2.600E+00	2.657E+00
AM-243	3.555E-01	1.953E-01	9.832E-02
ANH-511	4.207E-02	7.641E-02	5.558E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-5.945E-01		1.274E+01	2.471E+01	NOT IDENT.
NA-22	-4.517E-02		3.949E-02	6.094E-02	NOT IDENT.
NA-24	0.000E+00		1.335E+41	0.000E+00	SHORT HLIF
AL-26	-5.270E-03		2.490E-02	5.224E-02	NOT IDENT.

SC-46	-6.396E-02	3.082E-01	5.412E-01	FAIL ABUN
V-48	0.000E+00	1.507E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	4.031E+02	0.000E+00	SHORT HLIF
MN-54	3.719E-03	6.319E-02	1.223E-01	NOT IDENT.
CO-56	1.604E-02	4.266E-01	8.360E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.222E-02	4.696E-02	9.024E-02	NOT IDENT.
CO-58	-2.268E-01	4.725E-01	8.438E-01	NOT IDENT.
FE-59	-1.039E+00	5.646E+00	1.133E+01	NOT IDENT.
CO-60	-6.480E-03	3.547E-02	7.091E-02	NOT IDENT.
ZN-65	7.180E-02	1.755E-01	3.441E-01	NOT IDENT.
GE-68	1.522E+00	2.297E+00	5.111E+00	NOT IDENT.
AS-73	4.634E+00	1.069E+01	2.202E+01	NOT IDENT.
AS-74	0.000E+00	6.303E+03	0.000E+00	SHORT HLIF
SE-75	6.535E-02	1.891E-01	3.600E-01	FAIL ABUN
BR-77	0.000E+00	1.785E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	8.736E+02	0.000E+00	SHORT HLIF
RB-83	2.006E-01	5.353E-01	1.129E+00	NOT IDENT.
KR-85	1.450E+00	7.081E+00	1.285E+01	NOT IDENT.
SR-85	1.517E-01	7.411E-01	1.344E+00	NOT IDENT.
RB-86	0.000E+00	2.606E+04	0.000E+00	SHORT HLIF
Y-88	-8.954E-02	2.715E-01	5.115E-01	NOT IDENT.
Y-91	-7.957E+01	5.157E+02	1.010E+03	NOT IDENT.
NB-94	-3.468E-03	2.946E-02	5.606E-02	NOT IDENT.
NB-95	-2.194E-01	1.070E+00	1.748E+00	NOT IDENT.
NB-95M	-7.068E-01	2.544E+00	4.077E+00	NOT IDENT.
ZR-95	7.376E-01	1.301E+00	2.776E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.345E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.292E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.793E+41	0.000E+00	SHORT HLIF
RH-101	-3.358E-02	3.564E-02	6.130E-02	NOT IDENT.
RH-102	-1.877E-04	6.083E-02	1.178E-01	NOT IDENT.
RU-103	-2.149E+00	5.258E+00	9.805E+00	FAIL ABUN
RH-106	-1.854E-01	4.052E-01	7.438E-01	NOT IDENT.
RU-106	-1.854E-01	4.052E-01	7.438E-01	NOT IDENT.
AG-108M	6.948E-03	2.791E-02	5.626E-02	NOT IDENT.
AG-110M	4.396E-03	8.931E-02	1.606E-01	NOT IDENT.
SN-113	-1.097E-01	2.371E-01	4.431E-01	NOT IDENT.
CD-115	0.000E+00	2.202E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	9.117E+04	0.000E+00	SHORT HLIF
TE-123M	-1.092E-01	1.297E-01	2.210E-01	NOT IDENT.
SB-124	-9.972E-03	1.333E+00	3.141E+00	NOT IDENT.
SB-125	-8.818E-03	1.124E-01	2.172E-01	FAIL ABUN
TE-125M	2.608E+02	2.761E+02	5.574E+02	NOT IDENT.
I-126	0.000E+00	1.036E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.108E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.788E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	4.369E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.099E+26	0.000E+00	SHORT HLIF
BA-133	-1.680E-02	4.204E-02	7.083E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	5.235E-03	4.819E-02	9.439E-02	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.923E+05	0.000E+00	SHORT HLIF
CE-139	2.759E-02	1.227E-01	2.131E-01	NOT IDENT.
BA-140	0.000E+00	1.265E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	2.156E+05	0.000E+00	SHORT HLIF
CE-141	-2.715E+00	2.561E+01	4.689E+01	NOT IDENT.
CE-143	0.000E+00	1.121E+41	0.000E+00	SHORT HLIF
CE-144	-1.632E-01	3.535E-01	6.338E-01	NOT IDENT.
PM-144	9.472E-04	5.455E-02	1.054E-01	NOT IDENT.
PR-144	1.446E-01	4.746E+00	9.187E+00	NOT IDENT.
PM-146	-3.349E-02	4.771E-02	8.562E-02	NOT IDENT.
ND-147	0.000E+00	2.826E+07	0.000E+00	SHORT HLIF
PM-147	3.068E+02	8.045E+02	1.564E+03	NOT IDENT.
PM-149	0.000E+00	3.366E+40	0.000E+00	SHORT HLIF
EU-150	1.228E-02	2.552E-02	4.849E-02	FAIL ABUN
EU-152	2.065E-02	9.906E-02	1.979E-01	NOT IDENT.
GD-153	-3.455E-02	2.178E-01	3.728E-01	NOT IDENT.
EU-154	-1.059E-01	9.805E-02	1.551E-01	NOT IDENT.
EU-155	-3.636E-02	1.082E-01	1.993E-01	FAIL ABUN
TB-160	2.603E+00	3.089E+00	3.609E+00	FAIL ABUN
HO-166M	2.822E-02	5.407E-02	1.130E-01	FAIL ABUN
TM-171	-7.373E+00	2.694E+01	5.225E+01	NOT IDENT.
HF-172	7.132E-03	2.314E-01	4.345E-01	FAIL ABUN
LU-172	8.715E-03	6.365E-02	1.355E-01	FAIL ABUN

LU-176	4.116E-03	2.251E-02	4.560E-02	FAIL ABUN
HF-181	1.807E+00	3.986E+00	8.302E+00	NOT IDENT.
TA-182	-3.295E-01	9.705E-01	1.828E+00	FAIL ABUN
RE-183	1.712E+00	3.502E+00	7.147E+00	FAIL ABUN
RE-184	1.509E+01	2.852E+01	6.010E+01	FAIL ABUN
W-188	-8.038E-01	1.136E+02	2.040E+02	FAIL ABUN
IR-192	-1.862E-01	3.850E-01	7.339E-01	FAIL ABUN
BI-207	4.969E-02	5.131E-02	1.159E-01	FAIL ABUN
PB-210	3.479E+00	5.166E+00	1.090E+01	NOT IDENT.
BI-211	0.000E+00	5.318E-01	8.701E-01	FAIL ABUN
PB-211	1.262E+00	1.016E+00	1.464E+00	FAIL ABUN
BI-212	9.324E-01	7.616E-01	1.165E+00	FAIL ABUN
RN-219	1.905E-02	3.799E-01	6.826E-01	FAIL ABUN
RA-223	-2.012E-01	6.095E-01	1.112E+00	FAIL ABUN
AC-227	-1.880E-02	2.417E-01	3.986E-01	FAIL ABUN
TH-227	-1.880E-02	2.417E-01	3.986E-01	FAIL ABUN
TH-229	1.531E-01	4.706E-01	8.856E-01	FAIL ABUN
TH-231	-2.012E-01	6.095E-01	1.112E+00	FAIL ABUN
PA-233	1.608E-02	5.091E-02	1.053E-01	FAIL ABUN
PA-234	-1.947E-02	2.525E-01	4.826E-01	FAIL ABUN
PA-234M	-2.344E+00	4.564E+00	8.080E+00	NOT IDENT.
NP-237	1.608E-02	5.091E-02	1.053E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	1.453E-01	2.540E-01	4.982E-01	NOT IDENT.
PU-239	5.633E+01	3.310E+02	6.237E+02	NOT IDENT.
AM-241	-1.001E-01	1.674E-01	3.119E-01	NOT IDENT.
CM-243	6.895E-02	9.505E-02	1.917E-01	NOT IDENT.
BK-247	-2.901E-02	7.847E-02	1.234E-01	NOT IDENT.
CM-247	5.343E-03	3.533E-02	6.431E-02	NOT IDENT.
CF-249	2.814E-02	3.785E-02	7.964E-02	FAIL ABUN
CF-251	1.066E-01	1.181E-01	2.335E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	341	10.66*	1.133E+00	1.447E+01	1.447E+01	11.37
CD-109	88.03	87	3.70*	4.889E+00	2.452E+00	3.842E+00	68.99
SN-126	64.28	8	9.60	2.483E+00	1.819E-01	1.819E-01	562.28
	86.94	87	8.90	4.889E+00	1.019E+00	1.019E+00	68.99
	87.57	87	37.00*	4.889E+00	2.452E-01	2.452E-01	68.99
CS-135	268.22	35	16.00*	4.353E+00	2.570E-01	2.570E-01	89.36
BA-137M	661.66	88	89.90*	2.115E+00	2.371E-01	2.416E-01	33.30
CS-137	661.66	88	85.10*	2.115E+00	2.505E-01	2.553E-01	33.30
HG-203	70.83	-----	3.69	3.364E+00	-----	Line Not Found	-----
	72.87	-----	6.19	3.591E+00	-----	Line Not Found	-----
	279.20	22	81.56*	4.230E+00	3.294E-02	2.813E+00	231.47
TL-208	277.37	-----	6.60	4.258E+00	-----	Line Not Found	-----
	583.19	120	85.00*	2.334E+00	3.090E-01	3.090E-01	31.11
	860.56	19	12.50	1.727E+00	4.495E-01	4.495E-01	101.63
BI-211	72.87	-----	1.23	3.591E+00	-----	Line Not Found	-----
	351.06	290	12.92*	3.513E+00	3.270E+00	3.270E+00	16.59
PB-212	74.82	344	10.28	3.925E+00	4.363E+00	4.363E+00	28.70
	77.11	344	17.10	3.925E+00	2.623E+00	2.623E+00	28.70
	238.63	391	43.60*	4.775E+00	9.622E-01	9.622E-01	13.75
	300.09	17	3.30	3.996E+00	6.688E-01	6.688E-01	176.29
BI-214	609.32	226	45.49*	2.255E+00	1.129E+00	1.129E+00	17.00
	1120.29	53	14.92	1.407E+00	1.289E+00	1.290E+00	41.98
	1764.49	28	15.30	9.589E-01	9.830E-01	9.833E-01	38.98
PB-214	74.82	344	5.80	3.925E+00	7.733E+00	7.736E+00	28.70
	77.11	344	9.70	3.925E+00	4.624E+00	4.626E+00	28.70
	87.09	87	3.41	4.889E+00	2.660E+00	2.661E+00	68.99
	242.00	114	7.25	4.731E+00	1.707E+00	1.708E+00	40.77
	295.22	197	18.42	4.052E+00	1.353E+00	1.353E+00	24.17
	351.93	290	35.60*	3.513E+00	1.187E+00	1.187E+00	16.59
RN-222	609.32	226	45.49*	2.255E+00	1.129E+00	1.129E+00	17.00
	1120.29	53	14.92	1.407E+00	1.289E+00	1.290E+00	41.98
	1764.49	28	15.30	9.589E-01	9.830E-01	9.833E-01	38.98
RA-224	240.99	114	4.10*	4.731E+00	3.019E+00	3.019E+00	40.77
RA-226	609.32	226	45.49*	2.255E+00	1.129E+00	1.129E+00	17.00
	1120.29	53	14.92	1.407E+00	1.289E+00	1.290E+00	41.98
	1764.49	28	15.30	9.589E-01	9.830E-01	9.833E-01	38.98
AC-228	105.21	-----	1.10	5.839E+00	-----	Line Not Found	-----
	338.32	66	11.27	3.627E+00	8.265E-01	8.265E-01	59.37
	794.95	-----	4.25	1.835E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.766E+00	-----	Line Not Found	-----
	911.20	94	25.80*	1.653E+00	1.133E+00	1.133E+00	28.05
	968.97	62	15.80	1.578E+00	1.282E+00	1.282E+00	43.90
RA-228	105.21	-----	1.10	5.839E+00	-----	Line Not Found	-----
	338.32	66	11.27	3.627E+00	8.265E-01	8.265E-01	59.37
	794.95	-----	4.25	1.835E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.766E+00	-----	Line Not Found	-----
	911.20	94	25.80*	1.653E+00	1.133E+00	1.133E+00	28.05

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	968.97	62	15.80	1.578E+00	1.282E+00	1.282E+00	43.90
	74.82	344	10.28	3.925E+00	4.363E+00	4.363E+00	28.70
	77.11	344	17.10	3.925E+00	2.623E+00	2.623E+00	28.70
TH-230	238.63	391	43.60*	4.775E+00	9.622E-01	9.622E-01	13.75
	300.09	17	3.30	3.996E+00	6.688E-01	6.688E-01	176.29
	609.32	226	45.49*	2.255E+00	1.129E+00	1.129E+00	17.00
	1120.29	53	14.92	1.407E+00	1.289E+00	1.289E+00	41.98
PA-231	1764.49	28	15.30	9.589E-01	9.830E-01	9.830E-01	38.98
	283.69	-----	1.70	4.183E+00	-----	Line Not Found	-----
TH-232	301.36	17	5.35*	3.996E+00	4.125E-01	4.125E-01	176.29
	105.21	-----	1.10	5.839E+00	-----	Line Not Found	-----
	338.32	66	11.27	3.627E+00	8.265E-01	8.265E-01	59.37
	835.71	-----	1.61	1.766E+00	-----	Line Not Found	-----
TH-234	911.20	94	25.80*	1.653E+00	1.133E+00	1.133E+00	28.05
	968.97	62	15.80	1.578E+00	1.282E+00	1.282E+00	43.90
	63.29	8	3.70*	2.483E+00	4.719E-01	4.719E-01	562.28
U-234	92.59	75	4.23	5.263E+00	1.738E+00	1.738E+00	83.28
	609.32	226	45.49*	2.255E+00	1.129E+00	1.129E+00	17.00
U-235	1120.29	53	14.92	1.407E+00	1.289E+00	1.289E+00	41.98
	1764.49	28	15.30	9.589E-01	9.830E-01	9.830E-01	38.98
	89.96	53	3.47	5.080E+00	1.535E+00	1.535E+00	88.12
	93.35	75	5.60	5.263E+00	1.312E+00	1.312E+00	83.28
U-238	143.76	-----	10.96*	6.181E+00	-----	Line Not Found	-----
	163.33	17	5.08	5.966E+00	2.895E-01	2.895E-01	180.74
	185.72	110	57.20	5.616E+00	1.761E-01	1.761E-01	52.74
	205.31	-----	5.01	5.295E+00	-----	Line Not Found	-----
AM-243	63.29	8	3.70*	2.483E+00	4.719E-01	4.719E-01	562.28
	92.59	75	4.23	5.263E+00	1.738E+00	1.738E+00	83.28
ANH-511	43.53	-----	5.90	2.461E-01	-----	Line Not Found	-----
	74.66	344	67.20*	3.925E+00	6.675E-01	6.675E-01	28.70
	511.00	21	100.00*	2.593E+00	4.207E-02	4.207E-02	185.33

Flag: "*" = Keyline

Total number of lines in spectrum 45
 Number of unidentified lines 10
 Number of lines tentatively identified by NID 35 77.78%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.447E+01	1.447E+01	0.165E+01	11.37	
CD-109	461.40D	1.57	2.452E+00	3.842E+00	2.650E+00	68.99	
SN-126	2.30E+05Y	1.00	2.452E-01	2.452E-01	1.691E-01	68.99	
CS-135	2.30E+06Y	1.00	2.570E-01	2.570E-01	2.296E-01	89.36	
BA-137M	30.08Y	1.02	2.371E-01	2.416E-01	0.805E-01	33.30	
CS-137	30.08Y	1.02	2.505E-01	2.553E-01	0.850E-01	33.30	
HG-203	46.59D	85.4	3.294E-02	2.813E+00	6.512E+00	231.47	
TL-208	1.41E+10Y	1.00	3.090E-01	3.090E-01	0.961E-01	31.11	
BI-211	7.04E+08Y	1.00	3.270E+00	3.270E+00	0.543E+00	16.59	
PB-212	1.41E+10Y	1.00	9.622E-01	9.622E-01	1.323E-01	13.75	
BI-214	1600.00Y	1.00	1.129E+00	1.129E+00	0.192E+00	17.00	
PB-214	1600.00Y	1.00	1.187E+00	1.187E+00	0.197E+00	16.59	
RN-222	1600.00Y	1.00	1.129E+00	1.129E+00	0.192E+00	17.00	
RA-224	1.41E+10Y	1.00	3.019E+00	3.019E+00	1.231E+00	40.77	
RA-226	1600.00Y	1.00	1.129E+00	1.129E+00	0.192E+00	17.00	
AC-228	1.41E+10Y	1.00	1.133E+00	1.133E+00	0.318E+00	28.05	
RA-228	1.41E+10Y	1.00	1.133E+00	1.133E+00	0.318E+00	28.05	
TH-228	1.41E+10Y	1.00	9.622E-01	9.622E-01	1.323E-01	13.75	
TH-230	7.54E+04Y	1.00	1.129E+00	1.129E+00	0.192E+00	17.00	
PA-231	7.04E+08Y	1.00	4.125E-01	4.125E-01	7.273E-01	176.29	
TH-232	1.41E+10Y	1.00	1.133E+00	1.133E+00	0.318E+00	28.05	
TH-234	4.47E+09Y	1.00	4.719E-01	4.719E-01	26.53E-01	562.28	
U-234	2.45E+05Y	1.00	1.129E+00	1.129E+00	0.192E+00	17.00	
U-235	7.04E+08Y	1.00	1.761E-01	1.761E-01	0.929E-01	52.74	K
U-238	4.47E+09Y	1.00	4.719E-01	4.719E-01	26.53E-01	562.28	
AM-243	7370.00Y	1.00	6.675E-01	6.675E-01	1.916E-01	28.70	
ANH-511	1.00E+09Y	1.00	4.207E-02	4.207E-02	7.797E-02	185.33	
Total Activity :			3.894E+01	4.312E+01			

Grand Total Activity : 3.894E+01 4.312E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	209.23	38	84	1.11	418.20	415	7	9.11E-03	94.0	5.23E+00	
0	253.11	27	55	0.65	505.86	502	8	6.54E-03	****	4.57E+00	T
1	271.20	31	60	1.25	542.00	534	12	7.68E-03	****	4.33E+00	T
0	328.33	53	53	1.22	656.16	653	9	1.34E-02	61.8	3.72E+00	T
0	405.09	29	31	1.67	809.54	805	9	7.43E-03	82.2	3.13E+00	T
0	410.63	20	48	1.27	820.61	815	11	5.00E-03	****	3.09E+00	T
0	462.59	51	36	4.52	924.45	917	15	1.32E-02	60.6	2.81E+00	T
0	653.95	5	30	0.84	1306.93	1298	13	1.44E-03	****	2.13E+00	
0	726.96	24	20	2.41	1452.90	1447	10	6.43E-03	83.4	1.97E+00	T
0	769.04	14	20	1.49	1537.04	1533	8	3.83E-03	****	1.88E+00	
0	805.86	12	17	1.03	1610.67	1605	9	3.19E-03	****	1.82E+00	
0	825.89	12	8	1.28	1650.71	1646	9	3.25E-03	****	1.78E+00	
0	880.86	15	15	4.75	1760.64	1753	14	4.05E-03	****	1.70E+00	T
0	894.48	25	14	0.62	1787.88	1779	18	6.75E-03	81.8	1.68E+00	T
0	934.66	28	8	1.44	1868.25	1861	15	7.64E-03	57.8	1.62E+00	
0	979.57	12	14	0.94	1958.08	1948	14	3.33E-03	****	1.56E+00	
0	1166.35	9	4	0.71	2331.73	2328	8	2.67E-03	****	1.36E+00	
0	1195.46	11	9	1.38	2389.97	2386	9	2.99E-03	****	1.34E+00	
0	1238.94	17	12	2.42	2476.97	2472	10	4.69E-03	92.0	1.30E+00	T
0	1592.82	10	1	1.63	3185.30	3182	7	2.80E-03	82.0	1.05E+00	

Flags: "T" = Tentatively associated

```
*****
*                               GEL Laboratories LLC                       *
*                               2040 Savage Road                          *
*                               Charleston, SC 29407                      *
*****
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DETECTOR AND SAMPLE DATA

```
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235011.CNF;1
* Acquisition date   : 3-OCT-2016 08:07:11 Sensitivity      : 3.000
* Detector ID       : GAM33 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.76 Half life ratio : *****
* Sample date       : 9-DEC-2015 10:13:00 Nuclide Library : SOLID
* Sample ID         : G405235011 Analyst initials: MXR1
* Batch Number      : 1596247 Sample Quantity : 1.4650E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
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CALIBRATION INFORMATION

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* Eff. Cal. date    : 10-JUN-2016 07:00:49 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8
*****
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.762E-01
CD-109	1.093E+00
SN-126	7.021E-02
CS-135	1.126E-01
BA-137M	3.320E-02
CS-137	3.507E-02
HG-203	2.071E+00
TL-208	2.954E-02
PB-212	4.083E-02
BI-214	4.936E-02
PB-214	4.057E-02
RN-222	4.936E-02
RA-224	4.376E-01
RA-226	4.936E-02
AC-228	7.970E-02
RA-228	7.970E-02
TH-228	4.083E-02
TH-230	4.934E-02
PA-231	3.161E-01
TH-232	7.970E-02
TH-234	1.247E+00
U-234	4.934E-02
U-235	1.830E-01
U-238	1.247E+00
AM-243	4.625E-02
ANH-511	2.504E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.113E+01	NOT IDENT.
NA-22	2.361E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.870E-02	NOT IDENT.
SC-46	2.209E-01	FAIL ABUN

V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.340E-02	NOT IDENT.
CO-56	3.590E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	4.215E-02	NOT IDENT.
CO-58	3.487E-01	NOT IDENT.
FE-59	4.751E+00	NOT IDENT.
CO-60	2.910E-02	NOT IDENT.
ZN-65	1.492E-01	NOT IDENT.
GE-68	2.233E+00	NOT IDENT.
AS-73	1.022E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.643E-01	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.960E-01	NOT IDENT.
KR-85	5.753E+00	NOT IDENT.
SR-85	6.020E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	2.030E-01	NOT IDENT.
Y-91	4.349E+02	NOT IDENT.
NB-94	2.452E-02	NOT IDENT.
NB-95	7.787E-01	NOT IDENT.
NB-95M	1.885E+00	NOT IDENT.
ZR-95	1.215E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.859E-02	NOT IDENT.
RH-102	5.217E-02	NOT IDENT.
RU-103	4.323E+00	FAIL ABUN
RH-106	3.156E-01	NOT IDENT.
RU-106	3.156E-01	NOT IDENT.
AG-108M	2.546E-02	NOT IDENT.
AG-110M	6.716E-02	NOT IDENT.
SN-113	2.008E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.023E-01	NOT IDENT.
SB-124	1.113E+00	NOT IDENT.
SB-125	9.876E-02	FAIL ABUN
TE-125M	2.618E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.190E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	4.127E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	9.965E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.201E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.950E-01	NOT IDENT.
PM-144	4.651E-02	NOT IDENT.
PR-144	4.056E+00	NOT IDENT.
PM-146	3.854E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.304E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.217E-02	FAIL ABUN
EU-152	9.107E-02	NOT IDENT.
GD-153	1.755E-01	NOT IDENT.
EU-154	6.074E-02	NOT IDENT.
EU-155	9.292E-02	FAIL ABUN
TB-160	1.563E+00	FAIL ABUN
HO-166M	4.993E-02	FAIL ABUN
TM-171	2.415E+01	NOT IDENT.
HF-172	2.031E-01	FAIL ABUN
LU-172	5.724E-02	FAIL ABUN
LU-176	2.084E-02	FAIL ABUN

HF-181	3.718E+00	NOT IDENT.
TA-182	7.934E-01	FAIL ABUN
RE-183	3.338E+00	FAIL ABUN
RE-184	2.618E+01	FAIL ABUN
W-188	9.347E+01	FAIL ABUN
IR-192	3.293E-01	FAIL ABUN
BI-207	5.145E-02	FAIL ABUN
PB-210	5.068E+00	NOT IDENT.
BI-211	4.194E-01	FAIL ABUN
PB-211	6.713E-01	FAIL ABUN
BI-212	5.287E-01	FAIL ABUN
RN-219	3.068E-01	FAIL ABUN
RA-223	5.083E-01	FAIL ABUN
AC-227	1.825E-01	FAIL ABUN
TH-227	1.825E-01	FAIL ABUN
TH-229	4.128E-01	FAIL ABUN
TH-231	5.083E-01	FAIL ABUN
PA-233	4.783E-02	FAIL ABUN
PA-234	2.048E-01	FAIL ABUN
PA-234M	3.496E+00	NOT IDENT.
NP-237	4.783E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.340E-01	NOT IDENT.
PU-239	2.932E+02	NOT IDENT.
AM-241	1.454E-01	NOT IDENT.
CM-243	8.965E-02	NOT IDENT.
BK-247	5.623E-02	NOT IDENT.
CM-247	2.899E-02	NOT IDENT.
CF-249	3.647E-02	FAIL ABUN
CF-251	1.094E-01	NOT IDENT.

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*****
*                                     GEL Laboratories LLC                       *
*                                     2040 Savage Road                          *
*                                     Charleston, SC 29407                       *
*****
*                                     DETECTOR AND SAMPLE DATA                  *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235011.CNF;1   *
* Acquisition date   : 3-OCT-2016 08:07:11 Sensitivity      : 3.000             *
* Detector ID       : GAM33 Energy tolerance: 1.500         *
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000    *
* Elapsed real time : 0 01:00:00.76 Half life ratio : ***** *
* Sample date       : 9-DEC-2015 10:13:00 Nuclide Library : SOLID          *
* Sample ID         : G405235011 Analyst initials: MXR1         *
* Batch Number      : 1596247 Sample Quantity : 1.4650E+02 GRAM *
* Wet wt corr       : 1.00000 Quantity Err(%) : 1.3652E-03 % *
* Wet Weight        : 0.00000 Dry Weight       : 0.00000 *
* Dry Weight        : 0.00000
*****
*                                     CALIBRATION INFORMATION                    *
*
* Eff. Cal. date    : 10-JUN-2016 07:00:49 Eff. Geometry   : CAN             *
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8 *
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.447E+01	1.781E+00	1.781E+00
CD-109	1.888E+00	2.654E+00	2.654E+00
SN-126	1.205E-01	1.693E-01	1.693E-01
CS-135	2.570E-01	2.257E-01	2.257E-01
BA-137M	2.416E-01	7.954E-02	7.954E-02
CS-137	2.553E-01	8.403E-02	8.403E-02
HG-203	2.813E+00	6.383E+00	6.383E+00
TL-208	3.090E-01	9.513E-02	9.513E-02
PB-212	9.622E-01	1.392E-01	1.392E-01
BI-214	1.129E+00	1.942E-01	1.942E-01
PB-214	1.187E+00	1.992E-01	1.992E-01
RN-222	1.129E+00	1.942E-01	1.942E-01
RA-224	6.267E-01	1.342E+00	1.342E+00
RA-226	1.129E+00	1.942E-01	1.942E-01
AC-228	1.133E+00	3.168E-01	3.168E-01
RA-228	1.133E+00	3.168E-01	3.168E-01
TH-228	9.622E-01	1.392E-01	1.392E-01
TH-230	1.129E+00	1.941E-01	1.941E-01
PA-231	4.125E-01	7.181E-01	7.181E-01
TH-232	1.133E+00	3.168E-01	3.168E-01
TH-234	4.719E-01	2.602E+00	2.602E+00
U-234	1.129E+00	1.941E-01	1.941E-01
U-235	6.013E-02	2.029E-01	2.029E-01
U-238	4.719E-01	2.602E+00	2.602E+00
AM-243	3.555E-01	1.987E-01	1.987E-01
ANH-511	4.207E-02	7.643E-02	7.643E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-5.945E-01	1.274E+01	1.274E+01	NOT IDENT.
NA-22	-4.517E-02	3.952E-02	4.446E-02	NOT IDENT.
NA-24	-1.000E+41	1.404E+41	0.000E+00	SHORT HLIF
AL-26	-5.270E-03	2.491E-02	2.502E-02	NOT IDENT.

SC-46	-6.396E-02	3.083E-01	3.096E-01	FAIL ABUN
V-48	8.494E+03	1.508E+04	1.556E+04	SHORT HLIF
CR-51	-7.144E+01	4.031E+02	4.044E+02	SHORT HLIF
MN-54	3.719E-03	6.319E-02	6.321E-02	NOT IDENT.
CO-56	1.604E-02	4.266E-01	4.267E-01	FAIL ABUN
MN-56	1.000E+41	2.977E+42	0.000E+00	SHORT HLIF
CO-57	1.222E-02	4.696E-02	4.729E-02	NOT IDENT.
CO-58	-2.268E-01	4.726E-01	4.835E-01	NOT IDENT.
FE-59	-1.039E+00	5.647E+00	5.666E+00	NOT IDENT.
CO-60	-6.480E-03	3.547E-02	3.559E-02	NOT IDENT.
ZN-65	7.180E-02	1.756E-01	1.785E-01	NOT IDENT.
GE-68	1.522E+00	2.298E+00	2.398E+00	NOT IDENT.
AS-73	4.634E+00	1.073E+01	1.093E+01	NOT IDENT.
AS-74	7.799E+02	6.303E+03	6.313E+03	SHORT HLIF
SE-75	6.535E-02	1.892E-01	1.914E-01	FAIL ABUN
BR-77	1.325E+38	1.143E+39	0.000E+00	SHORT HLIF
SR-82	6.801E+01	8.736E+02	8.741E+02	SHORT HLIF
RB-83	2.006E-01	5.360E-01	5.435E-01	NOT IDENT.
KR-85	1.450E+00	7.082E+00	7.112E+00	NOT IDENT.
SR-85	1.517E-01	7.411E-01	7.442E-01	NOT IDENT.
RB-86	9.534E+03	2.607E+04	2.642E+04	SHORT HLIF
Y-88	-8.954E-02	2.716E-01	2.745E-01	NOT IDENT.
Y-91	-7.957E+01	5.157E+02	5.169E+02	NOT IDENT.
NB-94	-3.468E-03	2.946E-02	2.951E-02	NOT IDENT.
NB-95	-2.194E-01	1.070E+00	1.074E+00	NOT IDENT.
NB-95M	-7.068E-01	2.544E+00	2.564E+00	NOT IDENT.
ZR-95	7.376E-01	1.301E+00	1.343E+00	NOT IDENT.
NB-97	1.000E+41	2.701E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.345E+41	0.000E+00	SHORT HLIF
MO-99	3.932E+30	1.292E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.796E+41	0.000E+00	SHORT HLIF
RH-101	-3.358E-02	3.615E-02	3.919E-02	NOT IDENT.
RH-102	-1.877E-04	6.083E-02	6.083E-02	NOT IDENT.
RU-103	-2.149E+00	5.259E+00	5.348E+00	FAIL ABUN
RH-106	-1.854E-01	4.054E-01	4.139E-01	NOT IDENT.
RU-106	-1.854E-01	4.054E-01	4.139E-01	NOT IDENT.
AG-108M	6.948E-03	2.791E-02	2.809E-02	NOT IDENT.
AG-110M	4.396E-03	8.931E-02	8.933E-02	NOT IDENT.
SN-113	-1.097E-01	2.372E-01	2.423E-01	NOT IDENT.
CD-115	1.272E+38	2.202E+39	0.000E+00	SHORT HLIF
SN-117M	-3.348E+04	9.125E+04	9.249E+04	SHORT HLIF
TE-123M	-1.092E-01	1.298E-01	1.388E-01	NOT IDENT.
SB-124	-9.972E-03	1.333E+00	1.333E+00	NOT IDENT.
SB-125	-8.818E-03	1.124E-01	1.125E-01	FAIL ABUN
TE-125M	2.608E+02	2.765E+02	3.005E+02	NOT IDENT.
I-126	9.615E+05	1.045E+06	1.131E+06	SHORT HLIF
SB-126	5.093E+05	1.112E+06	1.135E+06	SHORT HLIF
SB-127	-1.559E+22	2.787E+22	0.000E+00	SHORT HLIF
I-131	-3.096E+09	4.371E+09	4.589E+09	SHORT HLIF
I-132	1.000E+41	2.179E+43	0.000E+00	SHORT HLIF
TE-132	6.791E+25	3.112E+26	0.000E+00	SHORT HLIF
BA-133	-1.680E-02	4.205E-02	4.273E-02	NOT IDENT.
I-133	-1.000E+41	4.789E+41	0.000E+00	SHORT HLIF
CS-134	5.235E-03	4.819E-02	4.825E-02	NOT IDENT.
I-135	-1.000E+41	7.403E+41	0.000E+00	SHORT HLIF
CS-136	1.611E+05	2.928E+05	3.017E+05	SHORT HLIF
CE-139	2.759E-02	1.228E-01	1.235E-01	NOT IDENT.
BA-140	8.039E+05	1.266E+06	1.317E+06	SHORT HLIF
LA-140	-3.472E+04	2.156E+05	2.162E+05	SHORT HLIF
CE-141	-2.715E+00	2.561E+01	2.564E+01	NOT IDENT.
CE-143	1.000E+41	1.126E+41	0.000E+00	SHORT HLIF
CE-144	-1.632E-01	3.536E-01	3.612E-01	NOT IDENT.
PM-144	9.472E-04	5.455E-02	5.455E-02	NOT IDENT.
PR-144	1.446E-01	4.746E+00	4.746E+00	NOT IDENT.
PM-146	-3.349E-02	4.777E-02	5.010E-02	NOT IDENT.
ND-147	-1.297E+07	2.827E+07	2.887E+07	SHORT HLIF
PM-147	3.068E+02	8.047E+02	8.165E+02	NOT IDENT.
PM-149	-9.900E+39	3.373E+40	0.000E+00	SHORT HLIF
EU-150	1.228E-02	2.552E-02	2.611E-02	FAIL ABUN
EU-152	2.065E-02	9.906E-02	9.950E-02	NOT IDENT.
GD-153	-3.455E-02	2.178E-01	2.184E-01	NOT IDENT.
EU-154	-1.059E-01	9.814E-02	1.091E-01	NOT IDENT.
EU-155	-3.636E-02	1.082E-01	1.095E-01	FAIL ABUN
TB-160	2.603E+00	3.093E+00	3.308E+00	FAIL ABUN
HO-166M	2.822E-02	5.409E-02	5.556E-02	FAIL ABUN
TM-171	-7.373E+00	2.695E+01	2.715E+01	NOT IDENT.
HF-172	7.132E-03	2.314E-01	2.315E-01	FAIL ABUN
LU-172	8.715E-03	6.365E-02	6.378E-02	FAIL ABUN

LU-176	4.116E-03	2.251E-02	2.258E-02	FAIL ABUN
HF-181	1.807E+00	3.986E+00	4.069E+00	NOT IDENT.
TA-182	-3.295E-01	9.706E-01	9.819E-01	FAIL ABUN
RE-183	1.712E+00	3.512E+00	3.596E+00	FAIL ABUN
RE-184	1.509E+01	2.875E+01	2.954E+01	FAIL ABUN
W-188	-8.038E-01	1.136E+02	1.136E+02	FAIL ABUN
IR-192	-1.862E-01	3.851E-01	3.941E-01	FAIL ABUN
BI-207	4.969E-02	5.135E-02	5.602E-02	FAIL ABUN
PB-210	3.479E+00	5.176E+00	5.408E+00	NOT IDENT.
BI-211	3.270E+00	5.514E-01	1.574E+00	FAIL ABUN
PB-211	1.262E+00	1.018E+00	1.166E+00	FAIL ABUN
BI-212	9.324E-01	7.631E-01	8.712E-01	FAIL ABUN
RN-219	1.905E-02	3.800E-01	3.801E-01	FAIL ABUN
RA-223	-2.012E-01	6.097E-01	6.164E-01	FAIL ABUN
AC-227	-1.880E-02	2.417E-01	2.419E-01	FAIL ABUN
TH-227	-1.880E-02	2.417E-01	2.419E-01	FAIL ABUN
TH-229	1.531E-01	4.707E-01	4.757E-01	FAIL ABUN
TH-231	-2.012E-01	6.097E-01	6.164E-01	FAIL ABUN
PA-233	1.608E-02	5.092E-02	5.143E-02	FAIL ABUN
PA-234	-1.947E-02	2.535E-01	2.537E-01	FAIL ABUN
PA-234M	-2.344E+00	4.566E+00	4.686E+00	NOT IDENT.
NP-237	1.608E-02	5.092E-02	5.143E-02	FAIL ABUN
NP-238	-1.000E+41	2.592E+41	0.000E+00	SHORT HLIF
NP-239	1.453E-01	2.543E-01	2.626E-01	NOT IDENT.
PU-239	5.633E+01	3.310E+02	3.320E+02	NOT IDENT.
AM-241	-1.001E-01	1.675E-01	1.735E-01	NOT IDENT.
CM-243	6.895E-02	9.527E-02	1.002E-01	NOT IDENT.
BK-247	-2.901E-02	7.869E-02	7.977E-02	NOT IDENT.
CM-247	5.343E-03	3.534E-02	3.542E-02	NOT IDENT.
CF-249	2.814E-02	3.792E-02	3.999E-02	FAIL ABUN
CF-251	1.066E-01	1.187E-01	1.281E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	55.1871	87.09	100.1593	136.47	54.8256
45.60	63.9396	87.57	100.2393	140.51	0.0000
46.54	45.2391	88.03	100.3156	143.76	73.0133
49.72	0.0000	88.34	100.3668	144.24	78.5901
51.35	54.3427	88.47	100.3881	145.44	80.9187
51.87	59.1808	89.96	100.6333	152.43	63.7006
52.39	55.4288	1093.63	100.7440	153.25	0.0000
52.97	47.8468	91.11	0.0000	323.87	82.8672
53.44	46.9400	92.59	101.0610	156.02	0.0000
54.07	47.9658	93.35	101.1829	158.56	0.0000
57.36	0.0000	94.56	101.3773	159.00	70.9317
57.53	58.9665	94.65	101.3915	162.33	61.7769
57.98	56.1207	94.67	101.3945	162.66	0.0000
59.27	77.6215	94.87	89.6970	163.33	78.0598
59.32	77.6297	97.43	88.6699	165.86	63.5281
59.54	77.6657	98.43	79.0934	176.31	68.8257
60.96	70.1079	98.44	79.0946	176.60	0.0000
61.17	70.1386	99.53	77.1419	177.52	53.9809
62.93	77.2373	100.11	64.6891	181.07	0.0000
63.29	77.2941	102.03	73.2481	181.52	49.2057
63.58	77.3397	103.18	64.9881	184.41	75.5676
64.28	94.1155	103.37	53.4731	143.76	56.7505
66.73	78.8135	105.21	68.3380	193.51	56.0229
67.24	89.7399	105.31	71.5024	197.03	64.4120
125.81	89.8170	106.12	65.2707	198.01	48.0619
67.75	93.7780	106.47	62.1442	201.83	57.6492
69.67	80.2560	109.28	53.9365	203.43	65.9847
70.83	84.7363	111.00	86.9342	205.31	51.9371
72.81	93.0257	111.76	0.0000	210.85	64.8599
72.87	93.0364	114.06	77.7262	215.65	57.2007
74.66	84.0096	116.30	0.0000	222.11	59.9297
74.82	84.0346	116.74	66.2596	227.09	49.3582
74.97	84.0577	119.76	70.8244	227.38	55.3915
77.11	84.3845	121.12	60.2037	228.16	0.0000
78.74	84.6300	121.22	58.0614	228.18	44.5851
79.69	88.8090	121.78	63.4847	116.74	44.5851
80.12	71.3702	122.06	61.3557	235.69	56.5984
80.19	0.0000	122.92	64.6587	235.96	56.6115
80.57	70.0787	123.07	64.6715	238.63	46.2023
81.00	86.3151	265.00	72.2748	238.98	0.0000
81.07	86.3255	125.81	68.1507	240.99	46.2939
81.75	95.8808	127.23	87.7839	242.00	46.3334
83.79	77.2449	127.91	71.5906	244.70	47.2519
84.00	77.2722	129.30	78.2380	252.40	0.0000
85.43	99.8819	131.20	87.1436	252.80	38.1355
86.55	100.0696	133.02	73.1504	254.15	0.0000
86.79	100.1092	133.52	71.0114	256.23	41.1194
86.94	100.1346	136.00	48.2183	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	31.0463	355.39	0.0000	584.27	22.8821
264.80	43.0562	356.01	34.4305	595.83	0.0000
265.00	43.0625	364.49	0.0000	427.87	26.0518
268.22	39.8496	366.42	0.0000	602.52	0.0000
269.46	39.8887	372.51	38.3546	604.72	19.5730
270.03	39.9063	375.05	30.3739	607.14	17.0816
271.23	39.9434	377.52	33.1037	609.32	17.0975
273.65	0.0000	356.01	24.2496	610.33	17.1045
276.40	38.8484	388.16	27.9140	614.28	24.1885
277.37	45.1472	388.63	0.0000	618.01	20.1888
277.60	45.1549	391.69	38.8008	620.36	7.0729
278.00	45.1692	264.66	19.0492	621.93	15.1666
279.20	45.2098	401.81	25.8693	630.19	0.0000
279.54	45.2219	402.40	25.8786	631.29	20.3011
279.70	45.2274	404.85	25.9151	633.25	24.3809
280.46	45.2527	410.95	24.6374	634.78	0.0000
283.69	45.3625	413.71	24.6758	635.95	21.3572
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	45.4208	423.72	0.0000	645.85	15.3168
285.90	0.0000	427.09	31.3078	657.76	12.3125
287.50	49.7032	427.87	35.0065	657.90	0.0000
290.67	40.5313	433.94	26.8052	661.66	25.6917
293.27	0.0000	439.40	20.3954	664.57	0.0000
351.93	33.0411	453.88	38.3065	666.33	0.0000
295.96	33.0586	463.37	21.5967	666.50	0.0000
879.38	30.5735	468.07	33.8862	667.71	0.0000
299.98	34.4298	473.00	0.0000	677.62	14.4785
300.09	34.4331	475.06	32.1192	685.70	0.0000
300.13	34.4339	476.78	21.7469	695.00	0.0000
301.36	29.3586	477.60	28.3777	696.49	18.7522
302.85	38.3340	482.18	18.9624	696.51	18.7522
256.23	40.9375	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	18.7581
306.78	35.0242	497.08	23.8810	697.49	19.8017
308.46	31.6448	505.52	17.2661	702.65	17.7519
311.90	28.2916	507.63	0.0000	706.68	20.9172
316.51	32.6825	511.00	27.8920	711.68	13.6215
319.41	0.0000	514.00	21.6714	720.70	0.0000
320.08	0.0000	514.00	21.6714	721.93	0.0000
321.04	37.0983	520.40	13.5260	722.78	17.3614
323.87	43.5668	520.69	0.0000	722.91	23.6755
325.23	41.5303	522.65	0.0000	723.31	23.6792
328.76	0.0000	527.90	0.0000	724.19	17.3708
333.37	33.0583	528.26	16.4867	727.33	15.8099
333.97	30.0254	529.59	19.4084	733.00	12.6743
334.37	36.5620	529.87	0.0000	735.93	15.8600
338.28	39.2752	531.02	0.0000	333.97	16.9271
338.32	39.2761	537.26	0.0000	739.50	0.0000
311.90	51.1316	546.56	0.0000	747.24	11.6790
340.48	51.1316	552.55	12.7509	748.06	13.8067
340.55	0.0000	563.25	17.7407	752.31	11.7005
344.28	41.1824	569.33	22.7314	753.82	0.0000
345.93	29.4725	946.00	22.7333	756.73	10.6539
351.06	16.7209	569.70	20.7582	756.80	10.6543
351.93	16.7301	583.19	22.8718	884.68	30.7629

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	24.0500	1274.44	10.3597	1620.50	2.0021
766.42	14.4327	1001.03	16.1374	1621.92	6.0077
766.84	14.4349	1002.74	14.9921	1678.03	0.0000
772.60	0.0000	1004.73	13.8467	1690.97	2.0295
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	1.0287
778.90	21.4771	1028.54	0.0000	1063.66	9.2686
783.70	0.0000	1037.84	11.6488	1771.35	2.0601
785.37	9.6866	1038.76	0.0000	1791.20	0.0000
792.07	17.2611	631.29	9.6337	1808.65	3.1111
794.95	18.3579	1048.07	0.0000	1810.72	0.0000
795.86	15.1234	1049.04	14.8989	1836.06	7.2948
810.06	9.1185	1050.41	14.9041		
810.29	9.1191	1063.66	9.6794		
344.28	11.9422	1077.00	0.0000		
810.76	11.9435	1077.34	9.7156		
815.77	0.0000	1085.87	8.8531		
1048.07	0.0000	1093.63	8.8715		
832.01	12.0299	1099.45	10.6626		
834.85	15.3250	1112.07	14.2646		
835.71	16.4246	1112.84	12.4841		
836.80	0.0000	1115.54	9.9948		
846.75	0.0000	1120.29	12.5089		
846.77	12.0890	1120.55	12.5098		
856.80	0.0000	1221.41	12.5123		
860.56	12.1438	1129.67	10.7490		
871.09	11.0775	1131.51	0.0000		
873.19	11.0852	1147.95	0.0000		
875.33	0.0000	1173.23	11.7765		
879.38	11.1072	1177.95	10.8838		
880.51	11.1112	1189.05	12.7336		
883.24	6.6726	1204.77	14.6104		
884.68	8.3444	1221.41	18.3386		
889.28	6.6855	1231.02	12.8678		
894.76	5.5809	1235.36	0.0000		
898.04	6.7041	1238.28	14.7324		
900.72	15.0969	1260.41	0.0000		
903.28	10.0726	1271.87	12.0677		
911.20	7.8536	1274.44	13.0037		
912.08	7.8559	1274.54	13.0037		
923.98	0.0000	1291.59	6.5283		
926.50	11.2728	1298.22	0.0000		
929.11	6.7693	1312.11	0.0000		
937.49	13.5732	1332.49	8.4743		
944.13	0.0000	1362.66	0.0000		
946.00	11.3403	1365.19	6.6403		
949.00	10.2155	1368.63	0.0000		
667.71	0.0000	1384.29	5.7162		
962.31	15.3847	1408.01	1.9155		
964.08	10.2620	1457.56	0.0000		
966.17	10.2682	1460.82	7.7505		
911.20	10.2766	1489.16	5.8477		
968.97	10.2766	1505.03	7.8232		
983.53	0.0000	1584.12	5.9630		
984.45	0.0000	1596.21	0.0000		


```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235012.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM36.CNF;52
Background date  : 2-OCT-2016 11:02:08.
Sample date     : 10-DEC-2015 11:25:00 Acquisition date : 3-OCT-2016 08:07:40.
Sample ID      : G405235012 Sample quantity   : 1.54640E+02 GRAM
Detector name   : GAM36 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.35 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity    : 3.00000
Batch ID       : 1596247 Detector SN#    :
Matrix Spike ID : LCS ID           : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.37*	17	99	0.73	126.71	124	6	4.70E-03	98.4	
2	3	74.74*	107	127	0.99	149.46	146	19	2.98E-02	19.0	7.00E-01
3	3	77.05*	181	142	1.15	154.07	146	19	5.02E-02	13.5	
4	0	87.48	62	167	1.42	174.93	170	8	1.72E-02	38.4	
5	0	93.40*	67	162	1.53	186.78	182	10	1.85E-02	39.4	
6	0	129.39	47	86	1.16	258.76	255	8	1.31E-02	37.3	
7	0	186.31*	86	125	1.19	372.60	367	13	2.39E-02	29.8	
8	8	238.68*	371	31	1.20	477.34	474	15	1.03E-01	5.8	1.99E+00
9	8	241.61	107	37	2.19	483.20	474	15	2.98E-02	19.2	
10	0	258.46	52	41	2.58	516.90	511	11	1.44E-02	27.8	
11	0	277.51	34	38	0.73	555.00	552	8	9.35E-03	36.2	
12	0	291.35	11	42	2.01	582.69	577	8	3.10E-03	105.0	
13	0	295.32*	101	52	0.82	590.62	588	8	2.81E-02	16.1	
14	0	328.80*	7	37	0.65	657.57	653	6	1.82E-03	155.6	
15	0	338.53	51	35	1.22	677.04	673	9	1.41E-02	25.5	
16	0	352.01*	158	34	1.12	704.00	699	9	4.40E-02	10.5	
17	0	450.55	9	22	0.49	901.07	897	8	2.40E-03	100.2	
18	0	463.41	35	17	1.48	926.78	921	11	9.58E-03	28.5	
19	0	511.75*	54	46	2.88	1023.44	1014	24	1.51E-02	40.6	
20	0	533.47	17	9	2.38	1066.89	1062	10	4.67E-03	42.5	
21	0	537.32	11	11	1.20	1074.59	1072	8	2.94E-03	61.3	
22	0	545.07	18	23	3.44	1090.08	1081	16	5.00E-03	65.0	
23	0	554.96	7	11	0.72	1109.86	1108	6	1.96E-03	85.0	
24	0	563.51	10	16	0.57	1126.95	1119	10	2.69E-03	89.9	
25	0	583.39*	81	25	1.60	1166.71	1162	10	2.25E-02	16.4	
26	0	609.42*	107	17	1.02	1218.76	1214	11	2.97E-02	12.6	
27	0	623.55*	11	9	3.28	1247.01	1242	9	3.05E-03	59.1	
28	0	633.11	10	39	5.34	1266.13	1256	14	2.90E-03	130.0	
29	0	643.35	6	11	0.91	1286.60	1282	6	1.54E-03	107.0	
30	0	661.56	79	12	1.29	1323.02	1317	12	2.20E-02	14.3	
31	0	679.66	11	7	1.08	1359.22	1354	10	3.00E-03	56.1	
32	0	726.74	23	13	4.32	1453.35	1446	13	6.47E-03	38.0	
33	0	772.05	21	19	4.63	1543.94	1533	20	5.83E-03	56.3	
34	0	816.20	11	4	2.17	1632.23	1628	8	3.17E-03	42.1	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	905.10*	5	7	1.39	1809.98	1804	9	1.28E-03	116.1	
36	0	911.73*	53	3	1.67	1823.23	1817	14	1.46E-02	16.3	
37	0	934.67	14	10	0.67	1869.10	1861	14	3.78E-03	57.2	
38	0	951.55	10	1	0.91	1902.84	1900	6	2.69E-03	37.6	
39	0	970.47	9	24	0.68	1940.67	1933	12	2.50E-03	113.9	
40	0	1000.30*	16	4	3.42	2000.31	1993	15	4.55E-03	37.1	
41	0	1120.98*	22	6	2.21	2241.57	2235	11	5.99E-03	31.0	
42	0	1202.26	7	12	1.35	2404.06	2397	10	1.89E-03	104.0	
43	0	1208.67	13	9	1.04	2416.88	2409	12	3.59E-03	54.1	
44	0	1377.98	10	2	0.64	2755.32	2752	7	2.81E-03	38.3	
45	0	1461.19*	205	3	1.98	2921.64	2916	12	5.68E-02	7.3	
46	0	1588.72	11	0	1.50	3176.55	3171	10	3.06E-03	30.2	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235012.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 10-DEC-2015 11:25:00 Acquisition date : 3-OCT-2016 08:07:40
Sample ID        : G405235012 Sample quantity   : 154.64 GRAM
Sample type      : SOLID Sample geometry    :
Detector name    : GAMMA36 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.35 0.0%
Energy tolerance : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error    : 0.00 %
Efficiency type  : Linear Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	6.545E-01	1.377E+01	1.377E+01	14.53	OK
CD-109	88.03	3.70*	4.307E+00	1.439E+00	2.252E+00	131.26	OK
SN-126	64.28	9.60	2.480E+00	4.564E-01	4.564E-01	196.78	OK
	86.94	8.90	4.307E+00	5.984E-01	5.984E-01	131.26	OK
	87.57	37.00*	4.307E+00	1.439E-01	1.439E-01	131.26	OK
BA-137M	661.66	89.90*	1.335E+00	3.381E-01	3.445E-01	28.51	OK
CS-137	661.66	85.10*	1.335E+00	3.572E-01	3.639E-01	28.51	OK
TL-208	277.37	6.60	3.040E+00	9.409E-01	9.409E-01	72.30	OK
	583.19	85.00*	1.496E+00	3.313E-01	3.313E-01	32.72	OK
	860.56	12.50	1.058E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	3.476E+00	1.297E+00	1.297E+00	57.70	OK
	77.11	17.10	3.651E+00	1.828E+00	1.828E+00	27.04	OK
	238.63	43.60*	3.499E+00	1.385E+00	1.385E+00	11.62	OK
	300.09	3.30	2.819E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	1.437E+00	8.468E-01	8.471E-01	25.22	OK
	1120.29	14.92	8.367E-01	8.359E-01	8.362E-01	62.02	OK
	1764.49	15.30	5.419E-01	----- Line	Not Found	-----	Absent
PB-214	74.82	5.80	3.482E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.651E+00	3.222E+00	3.224E+00	27.04	OK
	87.09	3.41	4.287E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	3.455E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	2.863E+00	1.068E+00	1.069E+00	32.17	OK
	351.93	35.60*	2.414E+00	1.010E+00	1.010E+00	21.06	OK
RN-222	609.32	45.49*	1.437E+00	8.468E-01	8.471E-01	25.22	OK
	1120.29	14.92	8.367E-01	8.359E-01	8.362E-01	62.02	OK
	1764.49	15.30	5.419E-01	----- Line	Not Found	-----	Absent
RA-224	240.99	4.10*	3.460E+00	2.410E+00	2.410E+00	73.01	OK
RA-226	609.32	45.49*	1.437E+00	8.468E-01	8.471E-01	25.22	OK
	1120.29	14.92	8.367E-01	8.359E-01	8.362E-01	62.02	OK
	1764.49	15.30	5.419E-01	----- Line	Not Found	-----	Absent
AC-228	105.21	1.10	4.933E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.507E+00	9.861E-01	9.861E-01	51.02	OK
	794.95	4.25	1.134E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.085E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.005E+00	1.007E+00	1.007E+00	32.55	OK
	968.97	15.80	9.513E-01	2.947E-01	2.947E-01	227.71	OK
RA-228	105.21	1.10	4.933E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.507E+00	9.861E-01	9.861E-01	51.02	OK
	794.95	4.25	1.134E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.085E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.005E+00	1.007E+00	1.007E+00	32.55	OK
	968.97	15.80	9.513E-01	2.947E-01	2.947E-01	227.71	OK
TH-228	74.82	10.28	3.476E+00	1.297E+00	1.297E+00	57.70	OK
	77.11	17.10	3.651E+00	1.828E+00	1.828E+00	27.04	OK
	238.63	43.60*	3.499E+00	1.385E+00	1.385E+00	11.62	OK
	300.09	3.30	2.819E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	1.437E+00	8.468E-01	8.469E-01	25.22	OK
	1120.29	14.92	8.367E-01	8.359E-01	8.359E-01	62.02	OK
	1764.49	15.30	5.419E-01	----- Line	Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-232	105.21	1.10	4.933E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	2.507E+00	9.861E-01	9.861E-01	51.02	OK
	835.71	1.61	1.085E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.005E+00	1.007E+00	1.007E+00	32.55	OK
TH-234	968.97	15.80	9.513E-01	2.947E-01	2.947E-01	227.71	OK
	63.29	3.70*	2.480E+00	1.184E+00	1.184E+00	196.78	OK
	92.59	4.23	4.581E+00	2.132E+00	2.132E+00	78.87	OK
U-234	609.32	45.49*	1.437E+00	8.468E-01	8.469E-01	25.22	OK
	1120.29	14.92	8.367E-01	8.359E-01	8.359E-01	62.02	OK
	1764.49	15.30	5.419E-01	-----	Line Not Found	-----	Absent
U-238	63.29	3.70*	2.480E+00	1.184E+00	1.184E+00	196.78	OK
	92.59	4.23	4.581E+00	2.132E+00	2.132E+00	78.87	OK
AM-243	43.53	5.90	5.957E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	3.476E+00	1.984E-01	1.984E-01	57.70	OK
ANH-511	511.00	100.00*	1.688E+00	1.698E-01	1.698E-01	81.23	OK

Flag: "*" = Keyline

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235012.CNF;1
* Acquisition date   : 3-OCT-2016 08:07:40 Sensitivity      : 3.000
* Detector ID        : GAM36 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.35 Half life ratio : *****
* Sample date        : 10-DEC-2015 11:25:00 Analyst initials: MXR1
* Sample ID          : G405235012 Sample Quantity : 1.5464E+02 GRAM
* Batch Number       : 1596247 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 1-JUN-2016 09:39:12 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM36_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.377E+01	1.961E+00	9.078E-01
CD-109	2.252E+00	2.897E+00	2.471E+00
SN-126	1.439E-01	1.852E-01	1.636E-01
BA-137M	3.445E-01	9.625E-02	9.705E-02
CS-137	3.639E-01	1.017E-01	1.025E-01
TL-208	3.313E-01	1.063E-01	8.861E-02
PB-212	1.385E+00	1.577E-01	8.974E-02
BI-214	8.471E-01	2.094E-01	1.368E-01
PB-214	1.010E+00	2.084E-01	1.489E-01
RN-222	8.471E-01	2.094E-01	1.368E-01
RA-224	2.410E+00	1.725E+00	9.638E-01
RA-226	8.471E-01	2.094E-01	1.368E-01
AC-228	1.007E+00	3.212E-01	2.979E-01
RA-228	1.007E+00	3.212E-01	2.979E-01
TH-228	1.385E+00	1.577E-01	8.974E-02
TH-230	8.469E-01	2.093E-01	1.367E-01
TH-232	1.007E+00	3.212E-01	2.979E-01
TH-234	1.184E+00	2.284E+00	2.343E+00
U-234	8.469E-01	2.093E-01	1.367E-01
U-238	1.184E+00	2.284E+00	2.343E+00
AM-243	1.984E-01	1.122E-01	9.921E-02
ANH-511	1.698E-01	1.351E-01	5.931E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.388E+01	1.167E+01	1.922E+01	NOT IDENT.
NA-22	-4.322E-02	6.347E-02	1.137E-01	NOT IDENT.
NA-24	0.000E+00	1.309E+41	0.000E+00	SHORT HLIF
AL-26	-1.009E-02	3.228E-02	6.799E-02	NOT IDENT.
SC-46	-2.551E-01	4.008E-01	6.887E-01	FAIL ABUN
V-48	0.000E+00	1.782E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	4.461E+02	0.000E+00	SHORT HLIF
MN-54	5.323E-02	7.878E-02	1.761E-01	NOT IDENT.

CO-56	-1.022E-01	5.833E-01	1.126E+00	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.567E-02	4.796E-02	9.727E-02	NOT IDENT.
CO-58	-5.616E-03	5.973E-01	1.186E+00	NOT IDENT.
FE-59	-2.197E+00	8.186E+00	1.643E+01	NOT IDENT.
CO-60	-7.445E-03	4.669E-02	9.734E-02	NOT IDENT.
ZN-65	6.894E-02	2.498E-01	4.909E-01	NOT IDENT.
GE-68	-2.026E+00	3.020E+00	4.966E+00	NOT IDENT.
AS-73	8.629E+00	7.399E+00	1.691E+01	NOT IDENT.
AS-74	0.000E+00	5.435E+03	0.000E+00	SHORT HLIF
SE-75	1.056E-01	2.387E-01	4.740E-01	NOT IDENT.
BR-77	0.000E+00	1.599E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	7.092E+02	0.000E+00	SHORT HLIF
RB-83	8.669E-02	8.817E-01	1.657E+00	NOT IDENT.
KR-85	8.653E+00	8.540E+00	1.925E+01	NOT IDENT.
SR-85	8.904E-01	8.831E-01	1.990E+00	NOT IDENT.
RB-86	0.000E+00	3.260E+04	0.000E+00	SHORT HLIF
Y-88	-7.223E-02	2.296E-01	4.815E-01	NOT IDENT.
Y-91	-3.935E+02	1.253E+03	1.410E+03	NOT IDENT.
NB-94	1.658E-02	3.730E-02	8.045E-02	NOT IDENT.
NB-95	8.572E-02	1.014E+00	1.876E+00	NOT IDENT.
NB-95M	-1.658E-01	2.526E+00	4.394E+00	NOT IDENT.
ZR-95	3.502E-01	1.303E+00	2.921E+00	NOT IDENT.
NB-97	0.000E+00	1.282E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.705E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.134E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	2.476E-02	3.333E-02	6.615E-02	NOT IDENT.
RH-102	-1.754E-03	8.764E-02	1.725E-01	NOT IDENT.
RU-103	3.893E+00	6.051E+00	1.359E+01	FAIL ABUN
RH-106	-2.134E-01	6.580E-01	1.129E+00	NOT IDENT.
RU-106	-2.134E-01	6.580E-01	1.129E+00	NOT IDENT.
AG-108M	-1.346E-02	3.256E-02	6.309E-02	NOT IDENT.
AG-110M	-1.380E-02	1.418E-01	2.742E-01	NOT IDENT.
SN-113	-5.246E-02	2.639E-01	5.281E-01	NOT IDENT.
CD-115	0.000E+00	2.097E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	9.397E+04	0.000E+00	SHORT HLIF
TE-123M	-2.052E-02	1.345E-01	2.575E-01	NOT IDENT.
SB-124	1.113E+00	1.542E+00	5.188E+00	NOT IDENT.
SB-125	1.032E-02	1.210E-01	2.500E-01	FAIL ABUN
TE-125M	1.784E+02	2.554E+02	5.388E+02	NOT IDENT.
I-126	0.000E+00	9.810E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.519E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.962E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	4.892E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.348E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.982E+26	0.000E+00	SHORT HLIF
BA-133	1.368E-02	4.688E-02	9.169E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	1.758E-02	7.139E-02	1.451E-01	FAIL ABUN
CS-135	-1.049E-01	1.661E-01	2.880E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	4.804E+05	0.000E+00	SHORT HLIF
CE-139	-3.431E-02	1.090E-01	2.052E-01	NOT IDENT.
BA-140	0.000E+00	1.828E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	3.106E+05	0.000E+00	SHORT HLIF
CE-141	-1.837E+01	2.366E+01	4.177E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	2.411E-01	3.828E-01	7.848E-01	NOT IDENT.
PM-144	-1.160E-02	6.810E-02	1.324E-01	NOT IDENT.
PR-144	-1.054E+00	5.901E+00	1.146E+01	NOT IDENT.
PM-146	3.331E-02	5.304E-02	1.090E-01	FAIL ABUN
ND-147	0.000E+00	3.694E+07	0.000E+00	SHORT HLIF
PM-147	-1.006E+00	8.159E+02	1.615E+03	NOT IDENT.
PM-149	0.000E+00	2.955E+40	0.000E+00	SHORT HLIF
EU-150	2.220E-02	3.178E-02	6.420E-02	FAIL ABUN
EU-152	-5.809E-02	1.118E-01	1.922E-01	NOT IDENT.
GD-153	3.292E-02	1.939E-01	3.679E-01	NOT IDENT.
EU-154	-1.100E-01	1.548E-01	2.750E-01	NOT IDENT.
EU-155	-7.153E-03	1.101E-01	2.180E-01	FAIL ABUN
TB-160	4.382E-01	2.210E+00	4.647E+00	FAIL ABUN
HO-166M	-8.789E-03	6.146E-02	1.223E-01	NOT IDENT.
TM-171	-3.869E+00	1.748E+01	3.616E+01	NOT IDENT.
HF-172	2.282E-02	2.297E-01	4.271E-01	FAIL ABUN
LU-172	3.835E-03	9.394E-02	1.893E-01	FAIL ABUN
LU-176	-1.853E-03	2.811E-02	5.236E-02	FAIL ABUN
HF-181	1.758E-03	5.398E+00	1.091E+01	NOT IDENT.
TA-182	-7.022E-01	1.215E+00	2.238E+00	FAIL ABUN

RE-183	9.966E-01	2.722E+00	5.807E+00	NOT IDENT.
RE-184	-2.399E-01	4.279E+01	7.563E+01	NOT IDENT.
W-188	1.029E+02	2.117E+02	2.611E+02	FAIL ABUN
IR-192	1.705E-01	5.551E-01	1.079E+00	FAIL ABUN
HG-203	2.766E-01	2.749E+00	4.866E+00	NOT IDENT.
BI-207	5.891E-02	7.431E-02	1.631E-01	FAIL ABUN
PB-210	-1.426E+00	2.486E+00	5.002E+00	NOT IDENT.
BI-211	0.000E+00	5.741E-01	9.598E-01	FAIL ABUN
PB-211	-3.359E-01	8.036E-01	1.563E+00	NOT IDENT.
BI-212	1.444E+00	1.076E+00	1.556E+00	FAIL ABUN
RN-219	-9.572E-03	4.406E-01	8.983E-01	NOT IDENT.
RA-223	-1.789E-01	7.173E-01	1.292E+00	FAIL ABUN
AC-227	-6.853E-03	2.432E-01	4.280E-01	NOT IDENT.
TH-227	-6.853E-03	2.432E-01	4.280E-01	NOT IDENT.
TH-229	-1.759E-01	5.134E-01	9.485E-01	FAIL ABUN
PA-231	3.236E-01	5.254E-01	1.054E+00	NOT IDENT.
TH-231	-1.789E-01	7.173E-01	1.292E+00	FAIL ABUN
PA-233	4.224E-02	6.304E-02	1.309E-01	NOT IDENT.
PA-234	7.189E-02	4.086E-01	8.216E-01	FAIL ABUN
PA-234M	1.032E+01	7.498E+00	1.271E+01	FAIL ABUN
U-235	3.330E-02	1.935E-01	3.735E-01	FAIL ABUN
NP-237	4.224E-02	6.304E-02	1.309E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	-5.313E-02	2.280E-01	4.446E-01	FAIL ABUN
PU-239	0.000E+00	6.481E+02	7.164E+02	FAIL ABUN
AM-241	1.825E-02	1.297E-01	2.712E-01	NOT IDENT.
CM-243	5.526E-02	9.585E-02	2.007E-01	FAIL ABUN
BK-247	7.357E-03	8.605E-02	1.636E-01	NOT IDENT.
CM-247	1.727E-02	3.941E-02	8.481E-02	FAIL ABUN
CF-249	2.069E-02	4.089E-02	8.909E-02	NOT IDENT.
CF-251	4.467E-02	1.232E-01	2.449E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	198	10.66*	6.545E-01	1.377E+01	1.377E+01	14.53
CD-109	88.03	80	3.70*	4.307E+00	2.424E+00	3.792E+00	76.83
SN-126	64.28	22	9.60	2.480E+00	4.564E-01	4.564E-01	196.78
	86.94	80	8.90	4.307E+00	1.008E+00	1.008E+00	76.83
	87.57	80	37.00*	4.307E+00	2.424E-01	2.424E-01	76.83
BA-137M	661.66	84	89.90*	1.335E+00	3.381E-01	3.445E-01	28.51
CS-137	661.66	84	85.10*	1.335E+00	3.572E-01	3.639E-01	28.51
TL-208	277.37	39	6.60	3.040E+00	9.409E-01	9.409E-01	72.30
	583.19	87	85.00*	1.496E+00	3.313E-01	3.313E-01	32.72
	860.56	-----	12.50	1.058E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	3.327E+00	-----	Line Not Found	-----
	351.06	179	12.92*	2.414E+00	2.782E+00	2.782E+00	21.06
PB-212	74.82	140	10.28	3.476E+00	1.899E+00	1.899E+00	38.04
	77.11	235	17.10	3.651E+00	1.828E+00	1.828E+00	27.04
	238.63	435	43.60*	3.499E+00	1.385E+00	1.385E+00	11.62
	300.09	-----	3.30	2.819E+00	-----	Line Not Found	-----
BI-214	609.32	114	45.49*	1.437E+00	8.468E-01	8.471E-01	25.22
	1120.29	21	14.92	8.367E-01	8.359E-01	8.362E-01	62.02
	1764.49	-----	15.30	5.419E-01	-----	Line Not Found	-----
PB-214	74.82	140	5.80	3.476E+00	3.367E+00	3.368E+00	38.04
	77.11	235	9.70	3.651E+00	3.222E+00	3.224E+00	27.04
	87.09	80	3.41	4.307E+00	2.630E+00	2.631E+00	76.83
	242.00	126	7.25	3.460E+00	2.432E+00	2.432E+00	38.41
	295.22	116	18.42	2.863E+00	1.068E+00	1.069E+00	32.17
	351.93	179	35.60*	2.414E+00	1.010E+00	1.010E+00	21.06
RN-222	609.32	114	45.49*	1.437E+00	8.468E-01	8.471E-01	25.22
	1120.29	21	14.92	8.367E-01	8.359E-01	8.362E-01	62.02
	1764.49	-----	15.30	5.419E-01	-----	Line Not Found	-----
RA-224	240.99	126	4.10*	3.460E+00	4.300E+00	4.300E+00	38.41
RA-226	609.32	114	45.49*	1.437E+00	8.468E-01	8.471E-01	25.22
	1120.29	21	14.92	8.367E-01	8.359E-01	8.362E-01	62.02
	1764.49	-----	15.30	5.419E-01	-----	Line Not Found	-----
AC-228	105.21	-----	1.10	4.933E+00	-----	Line Not Found	-----
	338.32	57	11.27	2.507E+00	9.861E-01	9.861E-01	51.02
	794.95	-----	4.25	1.134E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.085E+00	-----	Line Not Found	-----
	911.20	54	25.80*	1.005E+00	1.007E+00	1.007E+00	32.55
	968.97	9	15.80	9.513E-01	2.947E-01	2.947E-01	227.71
RA-228	105.21	-----	1.10	4.933E+00	-----	Line Not Found	-----
	338.32	57	11.27	2.507E+00	9.861E-01	9.861E-01	51.02
	794.95	-----	4.25	1.134E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.085E+00	-----	Line Not Found	-----
	911.20	54	25.80*	1.005E+00	1.007E+00	1.007E+00	32.55
	968.97	9	15.80	9.513E-01	2.947E-01	2.947E-01	227.71
TH-228	74.82	140	10.28	3.476E+00	1.899E+00	1.899E+00	38.04
	77.11	235	17.10	3.651E+00	1.828E+00	1.828E+00	27.04
	238.63	435	43.60*	3.499E+00	1.385E+00	1.385E+00	11.62

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	300.09	-----	3.30	2.819E+00	-----	Line Not Found	-----
TH-230	609.32	114	45.49*	1.437E+00	8.468E-01	8.469E-01	25.22
	1120.29	21	14.92	8.367E-01	8.359E-01	8.359E-01	62.02
	1764.49	-----	15.30	5.419E-01	-----	Line Not Found	-----
TH-232	105.21	-----	1.10	4.933E+00	-----	Line Not Found	-----
	338.32	57	11.27	2.507E+00	9.861E-01	9.861E-01	51.02
	835.71	-----	1.61	1.085E+00	-----	Line Not Found	-----
	911.20	54	25.80*	1.005E+00	1.007E+00	1.007E+00	32.55
	968.97	9	15.80	9.513E-01	2.947E-01	2.947E-01	227.71
TH-234	63.29	22	3.70*	2.480E+00	1.184E+00	1.184E+00	196.78
	92.59	85	4.23	4.581E+00	2.132E+00	2.132E+00	78.87
U-234	609.32	114	45.49*	1.437E+00	8.468E-01	8.469E-01	25.22
	1120.29	21	14.92	8.367E-01	8.359E-01	8.359E-01	62.02
	1764.49	-----	15.30	5.419E-01	-----	Line Not Found	-----
U-238	63.29	22	3.70*	2.480E+00	1.184E+00	1.184E+00	196.78
	92.59	85	4.23	4.581E+00	2.132E+00	2.132E+00	78.87
AM-243	43.53	-----	5.90	5.957E-01	-----	Line Not Found	-----
	74.66	140	67.20*	3.476E+00	2.906E-01	2.906E-01	38.04
ANH-511	511.00	59	100.00*	1.688E+00	1.698E-01	1.698E-01	81.23

Flag: "*" = Keyline

Total number of lines in spectrum 46
 Number of unidentified lines 14
 Number of lines tentatively identified by NID 32 69.57%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.377E+01	1.377E+01	0.200E+01	14.53	
CD-109	461.40D	1.56	2.424E+00	3.792E+00	2.914E+00	76.83	
SN-126	2.30E+05Y	1.00	2.424E-01	2.424E-01	1.863E-01	76.83	
BA-137M	30.08Y	1.02	3.381E-01	3.445E-01	0.982E-01	28.51	
CS-137	30.08Y	1.02	3.572E-01	3.639E-01	1.037E-01	28.51	
TL-208	1.41E+10Y	1.00	3.313E-01	3.313E-01	1.084E-01	32.72	
BI-211	7.04E+08Y	1.00	2.782E+00	2.782E+00	0.586E+00	21.06	
PB-212	1.41E+10Y	1.00	1.385E+00	1.385E+00	0.161E+00	11.62	
BI-214	1600.00Y	1.00	8.468E-01	8.471E-01	2.136E-01	25.22	
PB-214	1600.00Y	1.00	1.010E+00	1.010E+00	0.213E+00	21.06	
RN-222	1600.00Y	1.00	8.468E-01	8.471E-01	2.136E-01	25.22	
RA-224	1.41E+10Y	1.00	4.300E+00	4.300E+00	1.651E+00	38.41	
RA-226	1600.00Y	1.00	8.468E-01	8.471E-01	2.136E-01	25.22	
AC-228	1.41E+10Y	1.00	1.007E+00	1.007E+00	0.328E+00	32.55	
RA-228	1.41E+10Y	1.00	1.007E+00	1.007E+00	0.328E+00	32.55	
TH-228	1.41E+10Y	1.00	1.385E+00	1.385E+00	0.161E+00	11.62	
TH-230	7.54E+04Y	1.00	8.468E-01	8.469E-01	2.136E-01	25.22	
TH-232	1.41E+10Y	1.00	1.007E+00	1.007E+00	0.328E+00	32.55	
TH-234	4.47E+09Y	1.00	1.184E+00	1.184E+00	2.330E+00	196.78	
U-234	2.45E+05Y	1.00	8.468E-01	8.469E-01	2.136E-01	25.22	
U-238	4.47E+09Y	1.00	1.184E+00	1.184E+00	2.330E+00	196.78	
AM-243	7370.00Y	1.00	2.906E-01	2.906E-01	1.105E-01	38.04	
ANH-511	1.00E+09Y	1.00	1.698E-01	1.698E-01	1.379E-01	81.23	
Total Activity :			3.841E+01	3.979E+01			

Grand Total Activity : 3.841E+01 3.979E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	129.39	59	107	1.16	258.76	255	8	1.31E-02	74.5	5.08E+00	T
0	186.31	103	150	1.19	372.60	367	13	2.39E-02	59.5	4.29E+00	T
0	258.46	60	48	2.58	516.90	511	11	1.44E-02	55.6	3.25E+00	
0	291.35	13	48	2.01	582.69	577	8	3.10E-03	****	2.90E+00	T
0	328.80	7	42	0.65	657.57	653	6	1.82E-03	****	2.58E+00	T
0	450.55	10	25	0.49	901.07	897	8	2.40E-03	****	1.90E+00	
0	463.41	38	18	1.48	926.78	921	11	9.58E-03	56.9	1.85E+00	T
0	533.47	18	10	2.38	1066.89	1062	10	4.67E-03	85.0	1.62E+00	
0	537.32	11	12	1.20	1074.59	1072	8	2.94E-03	****	1.61E+00	T
0	545.07	19	25	3.44	1090.08	1081	16	5.00E-03	****	1.59E+00	T
0	554.96	8	12	0.72	1109.86	1108	6	1.96E-03	****	1.57E+00	
0	563.51	10	18	0.57	1126.95	1119	10	2.69E-03	****	1.54E+00	T
0	623.55	12	9	3.28	1247.01	1242	9	3.05E-03	****	1.41E+00	
0	633.11	11	41	5.34	1266.13	1256	14	2.90E-03	****	1.39E+00	T
0	643.35	6	12	0.91	1286.60	1282	6	1.54E-03	****	1.37E+00	
0	679.66	11	8	1.08	1359.22	1354	10	3.00E-03	****	1.30E+00	
0	726.74	24	13	4.32	1453.35	1446	13	6.47E-03	76.0	1.23E+00	T
0	772.05	22	20	4.63	1543.94	1533	20	5.83E-03	****	1.16E+00	T
0	816.20	12	4	2.17	1632.23	1628	8	3.17E-03	84.1	1.11E+00	T
0	905.10	5	7	1.39	1809.98	1804	9	1.28E-03	****	1.01E+00	
0	934.67	14	11	0.67	1869.10	1861	14	3.78E-03	****	9.83E-01	
0	951.55	10	1	0.91	1902.84	1900	6	2.69E-03	75.2	9.68E-01	
0	1000.30	17	4	3.42	2000.31	1993	15	4.55E-03	74.2	9.26E-01	T
0	1202.26	7	12	1.35	2404.06	2397	10	1.89E-03	****	7.85E-01	
0	1208.67	13	9	1.04	2416.88	2409	12	3.59E-03	****	7.82E-01	
0	1377.98	10	2	0.64	2755.32	2752	7	2.81E-03	76.7	6.92E-01	
0	1588.72	11	0	1.50	3176.55	3171	10	3.06E-03	60.3	6.03E-01	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235012.CNF;1
* Acquisition date   : 3-OCT-2016 08:07:40 Sensitivity      : 3.000
* Detector ID       : GAM36 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.35 Half life ratio : *****
* Sample date       : 10-DEC-2015 11:25:00 Nuclide Library : SOLID
* Sample ID         : G405235012 Analyst initials: MXR1
* Batch Number      : 1596247 Sample Quantity : 1.5464E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date    : 1-JUN-2016 09:39:12 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM36_CAN.CNF;7
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	3.591E-01
CD-109	1.167E+00
SN-126	7.735E-02
BA-137M	4.279E-02
CS-137	4.521E-02
TL-208	3.898E-02
PB-212	4.033E-02
BI-214	5.802E-02
PB-214	6.647E-02
RN-222	5.802E-02
RA-224	4.332E-01
RA-226	5.802E-02
AC-228	1.231E-01
RA-228	1.231E-01
TH-228	4.033E-02
TH-230	5.800E-02
TH-232	1.231E-01
TH-234	1.093E+00
U-234	5.800E-02
U-238	1.093E+00
AM-243	4.656E-02
ANH-511	2.563E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	7.856E+00	NOT IDENT.
NA-22	4.574E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.149E-02	NOT IDENT.
SC-46	2.676E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	7.609E-02	NOT IDENT.
CO-56	4.723E-01	NOT IDENT.

MN-56	0.000E+00	SHORT HLIF
CO-57	4.519E-02	NOT IDENT.
CO-58	4.812E-01	NOT IDENT.
FE-59	6.780E+00	NOT IDENT.
CO-60	3.833E-02	NOT IDENT.
ZN-65	2.089E-01	NOT IDENT.
GE-68	1.971E+00	NOT IDENT.
AS-73	7.853E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	2.163E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	7.287E-01	NOT IDENT.
KR-85	8.642E+00	NOT IDENT.
SR-85	8.932E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.522E-01	NOT IDENT.
Y-91	5.940E+02	NOT IDENT.
NB-94	3.489E-02	NOT IDENT.
NB-95	7.931E-01	NOT IDENT.
NB-95M	1.999E+00	NOT IDENT.
ZR-95	1.198E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.067E-02	NOT IDENT.
RH-102	7.618E-02	NOT IDENT.
RU-103	5.965E+00	FAIL ABUN
RH-106	4.804E-01	NOT IDENT.
RU-106	4.804E-01	NOT IDENT.
AG-108M	2.772E-02	NOT IDENT.
AG-110M	1.167E-01	NOT IDENT.
SN-113	2.350E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.188E-01	NOT IDENT.
SB-124	1.838E+00	NOT IDENT.
SB-125	1.109E-01	FAIL ABUN
TE-125M	2.504E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.096E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	6.342E-02	FAIL ABUN
CS-135	1.302E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	9.416E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.920E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.666E-01	NOT IDENT.
PM-144	5.682E-02	NOT IDENT.
PR-144	4.914E+00	NOT IDENT.
PM-146	4.835E-02	FAIL ABUN
ND-147	0.000E+00	SHORT HLIF
PM-147	7.476E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.924E-02	FAIL ABUN
EU-152	8.517E-02	NOT IDENT.
GD-153	1.718E-01	NOT IDENT.
EU-154	1.103E-01	NOT IDENT.
EU-155	1.014E-01	FAIL ABUN
TB-160	1.950E+00	FAIL ABUN
HO-166M	5.117E-02	NOT IDENT.
TM-171	1.662E+01	NOT IDENT.
HF-172	1.970E-01	FAIL ABUN
LU-172	7.791E-02	FAIL ABUN
LU-176	2.352E-02	FAIL ABUN
HF-181	4.836E+00	NOT IDENT.
TA-182	9.259E-01	FAIL ABUN
RE-183	2.700E+00	NOT IDENT.

RE-184	3.189E+01	NOT IDENT.
W-188	1.192E+02	FAIL ABUN
IR-192	4.885E-01	FAIL ABUN
HG-203	2.198E+00	NOT IDENT.
BI-207	7.120E-02	FAIL ABUN
PB-210	2.298E+00	NOT IDENT.
BI-211	4.581E-01	FAIL ABUN
PB-211	6.957E-01	NOT IDENT.
BI-212	6.956E-01	FAIL ABUN
RN-219	4.004E-01	NOT IDENT.
RA-223	5.800E-01	FAIL ABUN
AC-227	1.918E-01	NOT IDENT.
TH-227	1.918E-01	NOT IDENT.
TH-229	4.365E-01	FAIL ABUN
PA-231	4.813E-01	NOT IDENT.
TH-231	5.800E-01	FAIL ABUN
PA-233	5.886E-02	NOT IDENT.
PA-234	3.535E-01	FAIL ABUN
PA-234M	5.496E+00	FAIL ABUN
U-235	1.739E-01	FAIL ABUN
NP-237	5.886E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.048E-01	FAIL ABUN
PU-239	3.363E+02	FAIL ABUN
AM-241	1.262E-01	NOT IDENT.
CM-243	9.330E-02	FAIL ABUN
BK-247	7.457E-02	NOT IDENT.
CM-247	3.793E-02	FAIL ABUN
CF-249	3.981E-02	NOT IDENT.
CF-251	1.134E-01	NOT IDENT.

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235012.CNF;1
* Acquisition date   : 3-OCT-2016 08:07:40 Sensitivity      : 3.000
* Detector ID        : GAM36 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.35 Half life ratio  : *****
* Sample date        : 10-DEC-2015 11:25:00 Nuclide Library : SOLID
* Sample ID          : G405235012 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.5464E+02 GRAM
*                    : Quantity Err(%) : 1.2933E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                    : Dry Weight       : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 1-JUN-2016 09:39:12 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM36_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.377E+01	2.089E+00	2.089E+00
CD-109	2.252E+00	2.909E+00	2.909E+00
SN-126	1.439E-01	1.858E-01	1.858E-01
BA-137M	3.445E-01	9.738E-02	9.738E-02
CS-137	3.639E-01	1.029E-01	1.029E-01
TL-208	3.313E-01	1.072E-01	1.072E-01
PB-212	1.385E+00	1.738E-01	1.738E-01
BI-214	8.471E-01	2.125E-01	2.125E-01
PB-214	1.010E+00	2.126E-01	2.126E-01
RN-222	8.471E-01	2.125E-01	2.125E-01
RA-224	2.410E+00	1.734E+00	1.734E+00
RA-226	8.471E-01	2.125E-01	2.125E-01
AC-228	1.007E+00	3.253E-01	3.253E-01
RA-228	1.007E+00	3.253E-01	3.253E-01
TH-228	1.385E+00	1.738E-01	1.738E-01
TH-230	8.469E-01	2.124E-01	2.124E-01
TH-232	1.007E+00	3.253E-01	3.253E-01
TH-234	1.184E+00	2.299E+00	2.299E+00
U-234	8.469E-01	2.124E-01	2.124E-01
U-238	1.184E+00	2.299E+00	2.299E+00
AM-243	1.984E-01	1.134E-01	1.134E-01
ANH-511	1.698E-01	1.353E-01	1.353E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.388E+01	1.169E+01	1.326E+01	NOT IDENT.
NA-22	-4.322E-02	6.349E-02	6.641E-02	NOT IDENT.
NA-24	1.000E+41	1.379E+41	0.000E+00	SHORT HLIF
AL-26	-1.009E-02	3.229E-02	3.261E-02	NOT IDENT.
SC-46	-2.551E-01	4.010E-01	4.171E-01	FAIL ABUN
V-48	8.315E+03	1.782E+04	1.821E+04	SHORT HLIF
CR-51	-4.712E+02	4.466E+02	4.945E+02	SHORT HLIF
MN-54	5.323E-02	7.881E-02	8.238E-02	NOT IDENT.

CO-56	-1.022E-01	5.833E-01	5.852E-01	NOT IDENT.
MN-56	-1.000E+41	6.027E+41	0.000E+00	SHORT HLIF
CO-57	1.567E-02	4.796E-02	4.848E-02	NOT IDENT.
CO-58	-5.616E-03	5.973E-01	5.973E-01	NOT IDENT.
FE-59	-2.197E+00	8.187E+00	8.247E+00	NOT IDENT.
CO-60	-7.445E-03	4.669E-02	4.681E-02	NOT IDENT.
ZN-65	6.894E-02	2.498E-01	2.517E-01	NOT IDENT.
GE-68	-2.026E+00	3.021E+00	3.157E+00	NOT IDENT.
AS-73	8.629E+00	7.609E+00	8.546E+00	NOT IDENT.
AS-74	3.007E+03	5.441E+03	5.607E+03	SHORT HLIF
SE-75	1.056E-01	2.388E-01	2.435E-01	NOT IDENT.
BR-77	1.404E+38	1.207E+39	0.000E+00	SHORT HLIF
SR-82	2.194E+02	7.092E+02	7.161E+02	SHORT HLIF
RB-83	8.669E-02	8.818E-01	8.827E-01	NOT IDENT.
KR-85	8.653E+00	8.547E+00	9.395E+00	NOT IDENT.
SR-85	8.904E-01	8.838E-01	9.707E-01	NOT IDENT.
RB-86	-1.793E+04	3.261E+04	3.360E+04	SHORT HLIF
Y-88	-7.223E-02	2.297E-01	2.320E-01	NOT IDENT.
Y-91	-3.935E+02	1.253E+03	1.265E+03	NOT IDENT.
NB-94	1.658E-02	3.731E-02	3.805E-02	NOT IDENT.
NB-95	8.572E-02	1.014E+00	1.015E+00	NOT IDENT.
NB-95M	-1.658E-01	2.526E+00	2.527E+00	NOT IDENT.
ZR-95	3.502E-01	1.303E+00	1.313E+00	NOT IDENT.
NB-97	1.000E+41	1.283E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.705E+41	0.000E+00	SHORT HLIF
MO-99	-4.920E+30	1.134E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	2.885E+41	0.000E+00	SHORT HLIF
RH-101	2.476E-02	3.363E-02	3.543E-02	NOT IDENT.
RH-102	-1.754E-03	8.764E-02	8.765E-02	NOT IDENT.
RU-103	3.893E+00	6.053E+00	6.303E+00	FAIL ABUN
RH-106	-2.134E-01	6.581E-01	6.651E-01	NOT IDENT.
RU-106	-2.134E-01	6.581E-01	6.651E-01	NOT IDENT.
AG-108M	-1.346E-02	3.257E-02	3.313E-02	NOT IDENT.
AG-110M	-1.380E-02	1.418E-01	1.420E-01	NOT IDENT.
SN-113	-5.246E-02	2.639E-01	2.650E-01	NOT IDENT.
CD-115	1.366E+39	2.111E+39	0.000E+00	SHORT HLIF
SN-117M	-4.365E+04	9.411E+04	9.615E+04	SHORT HLIF
TE-123M	-2.052E-02	1.345E-01	1.348E-01	NOT IDENT.
SB-124	1.113E+00	1.543E+00	1.623E+00	NOT IDENT.
SB-125	1.032E-02	1.210E-01	1.211E-01	FAIL ABUN
TE-125M	1.784E+02	2.556E+02	2.680E+02	NOT IDENT.
I-126	1.202E+06	9.944E+05	1.132E+06	SHORT HLIF
SB-126	9.405E+05	1.529E+06	1.587E+06	SHORT HLIF
SB-127	-5.551E+21	2.103E+22	0.000E+00	SHORT HLIF
I-131	4.133E+09	4.896E+09	5.238E+09	SHORT HLIF
I-132	-1.000E+41	1.841E+42	0.000E+00	SHORT HLIF
TE-132	-1.162E+26	3.019E+26	0.000E+00	SHORT HLIF
BA-133	1.368E-02	4.689E-02	4.729E-02	FAIL ABUN
I-133	-1.000E+41	4.249E+41	0.000E+00	SHORT HLIF
CS-134	1.758E-02	7.139E-02	7.183E-02	FAIL ABUN
CS-135	-1.049E-01	1.662E-01	1.728E-01	NOT IDENT.
I-135	-1.000E+41	7.196E+41	0.000E+00	SHORT HLIF
CS-136	2.513E+05	4.812E+05	4.943E+05	SHORT HLIF
CE-139	-3.431E-02	1.092E-01	1.103E-01	NOT IDENT.
BA-140	1.521E+06	1.829E+06	1.953E+06	SHORT HLIF
LA-140	9.148E+04	3.107E+05	3.134E+05	SHORT HLIF
CE-141	-1.837E+01	2.367E+01	2.508E+01	NOT IDENT.
CE-143	1.000E+41	2.575E+41	0.000E+00	SHORT HLIF
CE-144	2.411E-01	3.830E-01	3.981E-01	NOT IDENT.
PM-144	-1.160E-02	6.811E-02	6.831E-02	NOT IDENT.
PR-144	-1.054E+00	5.901E+00	5.920E+00	NOT IDENT.
PM-146	3.331E-02	5.310E-02	5.518E-02	FAIL ABUN
ND-147	-3.489E+06	3.694E+07	3.697E+07	SHORT HLIF
PM-147	-1.006E+00	8.159E+02	8.159E+02	NOT IDENT.
PM-149	-2.189E+40	2.993E+40	0.000E+00	SHORT HLIF
EU-150	2.220E-02	3.179E-02	3.333E-02	FAIL ABUN
EU-152	-5.809E-02	1.118E-01	1.149E-01	NOT IDENT.
GD-153	3.292E-02	1.939E-01	1.945E-01	NOT IDENT.
EU-154	-1.100E-01	1.548E-01	1.626E-01	NOT IDENT.
EU-155	-7.153E-03	1.101E-01	1.101E-01	FAIL ABUN
TB-160	4.382E-01	2.211E+00	2.219E+00	FAIL ABUN
HO-166M	-8.789E-03	6.146E-02	6.159E-02	NOT IDENT.
TM-171	-3.869E+00	1.748E+01	1.757E+01	NOT IDENT.
HF-172	2.282E-02	2.298E-01	2.300E-01	FAIL ABUN
LU-172	3.835E-03	9.394E-02	9.396E-02	FAIL ABUN
LU-176	-1.853E-03	2.811E-02	2.812E-02	FAIL ABUN
HF-181	1.758E-03	5.398E+00	5.398E+00	NOT IDENT.
TA-182	-7.022E-01	1.216E+00	1.256E+00	FAIL ABUN

RE-183	9.966E-01	2.726E+00	2.763E+00	NOT IDENT.
RE-184	-2.399E-01	4.279E+01	4.279E+01	NOT IDENT.
W-188	1.029E+02	2.120E+02	2.171E+02	FAIL ABUN
IR-192	1.705E-01	5.552E-01	5.605E-01	FAIL ABUN
HG-203	2.766E-01	2.749E+00	2.751E+00	NOT IDENT.
BI-207	5.891E-02	7.435E-02	7.895E-02	FAIL ABUN
PB-210	-1.426E+00	2.489E+00	2.571E+00	NOT IDENT.
BI-211	2.782E+00	5.873E-01	1.385E+00	FAIL ABUN
PB-211	-3.359E-01	8.038E-01	8.179E-01	NOT IDENT.
BI-212	1.444E+00	1.078E+00	1.259E+00	FAIL ABUN
RN-219	-9.572E-03	4.406E-01	4.406E-01	NOT IDENT.
RA-223	-1.789E-01	7.173E-01	7.219E-01	FAIL ABUN
AC-227	-6.853E-03	2.432E-01	2.432E-01	NOT IDENT.
TH-227	-6.853E-03	2.432E-01	2.432E-01	NOT IDENT.
TH-229	-1.759E-01	5.135E-01	5.195E-01	FAIL ABUN
PA-231	3.236E-01	5.299E-01	5.496E-01	NOT IDENT.
TH-231	-1.789E-01	7.173E-01	7.219E-01	FAIL ABUN
PA-233	4.224E-02	6.307E-02	6.589E-02	NOT IDENT.
PA-234	7.189E-02	4.168E-01	4.181E-01	FAIL ABUN
PA-234M	1.032E+01	7.512E+00	8.835E+00	FAIL ABUN
U-235	3.330E-02	1.935E-01	1.941E-01	FAIL ABUN
NP-237	4.224E-02	6.307E-02	6.589E-02	FAIL ABUN
NP-238	1.000E+41	2.226E+41	0.000E+00	SHORT HLIF
NP-239	-5.313E-02	2.280E-01	2.293E-01	FAIL ABUN
PU-239	8.872E+02	6.493E+02	7.626E+02	FAIL ABUN
AM-241	1.825E-02	1.297E-01	1.299E-01	NOT IDENT.
CM-243	5.526E-02	9.599E-02	9.917E-02	FAIL ABUN
BK-247	7.357E-03	8.607E-02	8.613E-02	NOT IDENT.
CM-247	1.727E-02	3.952E-02	4.028E-02	FAIL ABUN
CF-249	2.069E-02	4.093E-02	4.198E-02	NOT IDENT.
CF-251	4.467E-02	1.233E-01	1.249E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	22.6668	87.09	101.3752	136.47	51.2710
45.60	47.2366	87.57	101.4831	140.51	0.0000
46.54	46.5986	88.03	95.4023	143.76	55.7815
49.72	0.0000	88.34	95.4673	144.24	49.9471
51.35	48.1423	88.47	96.6735	145.44	57.8900
51.87	47.4180	89.96	81.6125	152.43	64.4565
52.39	47.4955	1093.63	95.9473	153.25	0.0000
52.97	37.9040	91.11	0.0000	323.87	52.6959
53.44	35.5365	92.59	76.7224	156.02	0.0000
54.07	54.2174	93.35	76.8464	158.56	0.0000
57.36	0.0000	94.56	77.0425	159.00	51.0646
57.53	67.8678	94.65	77.0570	162.33	47.2847
57.98	51.5819	94.67	77.0603	162.66	0.0000
59.27	54.2413	94.87	50.1997	163.33	53.3971
59.32	54.2491	97.43	54.0715	165.86	47.5214
59.54	56.7511	98.43	51.4732	176.31	54.3619
60.96	67.1668	98.44	51.4745	176.60	0.0000
61.17	53.9858	99.53	56.1137	177.52	45.2038
62.93	65.6012	100.11	52.5550	181.07	0.0000
63.29	65.6664	102.03	57.3052	181.52	46.8206
63.58	65.7190	103.18	48.3192	184.41	37.3217
64.28	68.9016	103.37	47.4253	143.76	37.3848
66.73	62.9265	105.21	60.4107	193.51	51.3918
67.24	66.3724	105.31	60.4228	197.03	46.3499
125.81	63.0850	106.12	60.5175	198.01	36.9141
67.75	63.0964	106.47	61.4763	201.83	33.9077
69.67	50.7317	109.28	44.2800	203.43	53.0838
70.83	71.2358	111.00	48.1255	205.31	46.8192
72.81	60.2305	111.76	0.0000	210.85	51.4124
72.87	60.2396	114.06	49.3305	215.65	39.8522
74.66	77.9192	116.30	0.0000	222.11	41.2326
74.82	77.9497	116.74	50.5072	227.09	40.3722
74.97	77.9789	119.76	48.9004	227.38	46.9341
77.11	78.3864	121.12	45.2476	228.16	0.0000
78.74	78.6933	121.22	51.8554	228.18	41.5138
79.69	78.8710	121.78	48.1312	116.74	41.5138
80.12	78.9509	122.06	50.9875	235.69	35.2471
80.19	0.0000	122.92	50.1185	235.96	41.1335
80.57	79.0342	123.07	50.1315	238.63	26.5192
81.00	79.1140	265.00	51.1317	238.98	0.0000
81.07	79.1265	125.81	45.6176	240.99	26.5858
81.75	71.9946	127.23	39.3768	242.00	26.6144
83.79	70.0000	127.91	48.3243	244.70	31.1385
84.00	91.0436	129.30	58.3165	252.40	0.0000
85.43	93.6808	131.20	56.2649	252.80	25.7939
86.55	101.2532	133.02	50.0211	254.15	0.0000
86.79	101.3067	133.52	53.9133	256.23	25.5090
86.94	101.3409	136.00	54.1321	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	29.5087	355.39	0.0000	584.27	18.0336
264.80	29.5126	356.01	19.6787	595.83	0.0000
265.00	34.0594	364.49	0.0000	427.87	8.6158
268.22	41.0010	366.42	0.0000	602.52	0.0000
269.46	34.2096	372.51	22.4231	604.72	17.2683
270.03	33.0870	375.05	12.4814	607.14	8.6448
271.23	21.7032	377.52	24.1755	609.32	10.5779
273.65	0.0000	356.01	15.9141	610.33	10.5833
276.40	18.3677	388.16	17.6453	614.28	17.3533
277.37	26.4281	388.63	0.0000	618.01	15.0681
277.60	26.4337	391.69	24.4304	620.36	8.7034
278.00	26.4442	264.66	21.1980	621.93	13.0655
279.20	27.6255	401.81	22.9131	630.19	0.0000
279.54	27.6343	402.40	18.6775	631.29	19.4474
279.70	23.0322	404.85	25.5139	633.25	19.4661
280.46	24.5853	410.95	17.9371	634.78	0.0000
283.69	21.9630	413.71	23.9622	635.95	11.6953
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	32.4186	423.72	0.0000	645.85	8.8143
285.90	0.0000	427.09	15.5475	657.76	7.3880
287.50	20.1078	427.87	19.8770	657.90	0.0000
290.67	26.7601	433.94	22.5622	661.66	18.7511
293.27	0.0000	439.40	19.1609	664.57	0.0000
351.93	30.3767	453.88	13.1894	666.33	0.0000
295.96	30.3965	463.37	15.9243	666.50	0.0000
879.38	43.7500	468.07	22.6274	667.71	0.0000
299.98	37.5479	473.00	0.0000	677.62	13.4247
300.09	38.7253	475.06	12.4779	685.70	0.0000
300.13	38.7263	476.78	16.0602	695.00	0.0000
301.36	27.0205	477.60	17.8536	696.49	14.0450
302.85	30.5862	482.18	20.5901	696.51	14.0450
256.23	20.0277	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	14.0501
306.78	27.1518	497.08	10.8411	697.49	11.0403
308.46	20.0983	505.52	12.2583	702.65	10.0602
311.90	17.7873	507.63	0.0000	706.68	10.0789
316.51	26.1921	511.00	13.6647	711.68	10.1017
319.41	0.0000	514.00	13.6890	720.70	0.0000
320.08	0.0000	514.00	13.6890	721.93	0.0000
321.04	26.2942	520.40	15.1143	722.78	15.2283
323.87	29.9522	520.69	0.0000	722.91	18.2747
325.23	33.5850	522.65	0.0000	723.31	18.2783
328.76	0.0000	527.90	0.0000	724.19	18.2856
333.37	26.5681	528.26	12.1467	727.33	11.1902
333.97	24.1650	529.59	19.3389	733.00	10.1982
334.37	29.0076	529.87	0.0000	735.93	14.2962
338.28	21.8260	531.02	0.0000	333.97	6.1311
338.32	21.8265	537.26	0.0000	739.50	0.0000
311.90	29.1533	546.56	0.0000	747.24	14.3669
340.48	29.1533	552.55	8.3965	748.06	5.1329
340.55	0.0000	563.25	8.4459	752.31	9.2560
344.28	28.0249	569.33	12.2404	753.82	0.0000
345.93	17.0813	946.00	12.2415	756.73	5.1522
351.06	23.2774	569.70	16.0094	756.80	5.1522
351.93	23.2937	583.19	18.0236	884.68	10.8529

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	9.3098	1274.44	8.4689	1620.50	2.0114
766.42	12.4165	1001.03	6.7861	1621.92	2.0120
766.84	12.4185	1002.74	10.1851	1678.03	0.0000
772.60	0.0000	1004.73	5.0960	1690.97	0.0000
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.1130
778.90	8.7374	1028.54	0.0000	1063.66	3.1166
783.70	0.0000	1037.84	5.7255	1771.35	1.0391
785.37	7.3008	1038.76	0.0000	1791.20	0.0000
792.07	15.6885	631.29	8.0385	1808.65	2.0944
794.95	12.5654	1048.07	0.0000	1810.72	0.0000
795.86	13.6178	1049.04	9.1940	1836.06	2.1061
810.06	2.1073	1050.41	11.4982		
810.29	4.2148	1063.66	8.0835		
344.28	5.2690	1077.00	0.0000		
810.76	6.3235	1077.34	10.4385		
815.77	0.0000	1085.87	5.8150		
1048.07	0.0000	1093.63	6.9951		
832.01	9.5665	1099.45	9.6364		
834.85	7.4492	1112.07	8.7946		
835.71	7.4517	1112.84	4.3985		
836.80	0.0000	1115.54	8.4521		
846.75	0.0000	1120.29	9.6989		
846.77	10.6917	1120.55	9.6995		
856.80	0.0000	1221.41	9.8786		
860.56	8.5993	1129.67	7.9585		
871.09	10.7926	1131.51	0.0000		
873.19	7.5608	1147.95	0.0000		
875.33	0.0000	1173.23	8.9600		
879.38	7.5788	1177.95	6.2809		
880.51	9.7482	1189.05	10.8025		
883.24	10.8427	1204.77	14.4697		
884.68	11.9332	1221.41	12.7225		
889.28	8.6940	1231.02	13.6688		
894.76	8.7119	1235.36	0.0000		
898.04	7.6320	1238.28	10.9578		
900.72	4.9113	1260.41	0.0000		
903.28	9.8320	1271.87	6.4523		
911.20	7.6694	1274.44	11.0691		
912.08	7.6719	1274.54	11.0698		
923.98	0.0000	1291.59	5.5609		
926.50	8.8141	1298.22	0.0000		
929.11	8.2712	1312.11	0.0000		
937.49	9.9554	1332.49	5.6228		
944.13	0.0000	1362.66	0.0000		
946.00	11.0954	1365.19	8.5073		
949.00	11.6625	1368.63	0.0000		
667.71	0.0000	1384.29	2.8499		
962.31	11.1597	1408.01	5.7345		
964.08	5.0250	1457.56	0.0000		
966.17	6.7048	1460.82	4.8425		
911.20	11.1857	1489.16	1.9504		
968.97	11.1857	1505.03	2.9370		
983.53	0.0000	1584.12	4.7874		
984.45	0.0000	1596.21	0.0000		

VAX/VMS Nuclide Identification Report Generated 3-OCT-2016 09:13:37.83

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235013.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM41.CNF;119
Background date : 2-OCT-2016 11:02:18.
Sample date     : 8-DEC-2015 11:23:00. Acquisition date : 3-OCT-2016 08:10:29.
Sample ID      : G405235013 Sample quantity   : 1.44574E+02 GRAM
Detector name  : GAM41 Detector geometry   : CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:06.06 0.2%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity   : 3.00000
Batch ID       : 1596247 Detector SN#   :
Matrix Spike ID : LCS ID           : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.50*	66	113	0.88	93.30	90	8	1.84E-02	32.5	
2	0	63.49*	96	276	0.96	127.26	122	11	2.66E-02	36.5	
3	3	74.86*	289	219	1.55	149.99	143	15	8.03E-02	10.8	8.32E+00
4	3	77.27*	372	110	0.90	154.81	143	15	1.03E-01	6.8	
5	3	84.07*	49	212	1.58	168.41	161	32	1.37E-02	53.8	1.02E+00
6	3	87.32	113	156	1.23	174.91	161	32	3.15E-02	20.1	
7	3	89.88	51	126	0.93	180.04	161	32	1.41E-02	37.5	
8	3	92.86*	101	135	1.13	185.98	161	32	2.80E-02	25.1	
9	0	129.25	46	122	0.60	258.74	255	9	1.26E-02	46.1	
10	0	135.60	38	121	2.98	271.43	267	10	1.06E-02	56.6	
11	0	185.77*	116	126	0.94	371.76	367	11	3.22E-02	21.7	
12	0	209.76	95	73	2.39	419.73	414	12	2.65E-02	20.8	
13	4	238.91*	384	42	1.03	478.00	470	18	1.07E-01	5.8	1.45E+00
14	4	241.66	97	55	1.67	483.51	470	18	2.70E-02	25.8	
15	5	270.18	49	61	2.10	540.52	535	16	1.35E-02	34.1	1.73E+00
16	5	273.53	19	44	1.62	547.23	535	16	5.36E-03	64.1	
17	0	295.59	134	66	0.99	591.35	585	11	3.72E-02	14.6	
18	0	300.37	43	79	1.34	600.90	596	12	1.21E-02	43.5	
19	0	338.80	67	95	0.96	677.74	672	12	1.87E-02	31.1	
20	0	352.16*	206	53	1.13	704.46	697	12	5.72E-02	10.1	
21	0	411.07	20	36	2.23	822.26	816	9	5.52E-03	60.0	
22	0	464.00	17	39	1.57	928.10	924	7	4.68E-03	67.5	
23	0	498.44	14	22	0.95	996.98	992	8	3.99E-03	62.2	
24	10	511.26*	84	24	4.01	1022.62	1014	27	2.34E-02	20.4	2.44E+00
25	10	516.70	16	6	1.53	1033.49	1014	27	4.40E-03	46.5	
26	10	519.03	10	3	1.21	1038.16	1014	27	2.88E-03	42.9	
27	1	521.78	16	3	1.51	1043.66	1041	12	4.40E-03	29.0	8.51E-01
28	1	524.48	16	4	1.81	1049.06	1041	12	4.36E-03	32.6	
29	0	583.87*	105	33	1.81	1167.83	1161	12	2.92E-02	14.9	
30	0	609.73*	142	23	1.24	1219.55	1213	13	3.94E-02	11.1	
31	0	636.18	7	16	0.49	1272.45	1267	7	1.93E-03	105.6	
32	0	662.05*	345	38	1.34	1324.18	1316	14	9.59E-02	6.6	
33	0	728.48*	32	20	1.91	1457.05	1452	12	8.77E-03	34.5	
34	0	782.60	12	2	1.12	1565.29	1560	9	3.34E-03	36.3	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	861.22	37	0	1.48	1722.54	1716	14	1.03E-02	16.4	
36	0	912.01*	61	17	1.76	1824.14	1815	14	1.69E-02	19.7	
37	0	935.83	34	7	4.86	1871.77	1864	16	9.41E-03	25.2	
38	0	952.71	11	10	0.69	1905.55	1899	10	3.06E-03	61.7	
39	0	969.98*	33	13	1.34	1940.09	1935	10	9.22E-03	28.1	
40	0	1104.14	13	21	4.41	2208.47	2198	17	3.55E-03	87.1	
41	0	1121.49	23	17	0.75	2243.17	2239	10	6.41E-03	39.6	
42	0	1208.19	13	10	1.54	2416.62	2411	10	3.61E-03	53.3	
43	0	1211.03	10	0	1.24	2422.30	2420	6	2.78E-03	31.6	
44	0	1238.66	30	13	1.50	2477.57	2470	13	8.33E-03	30.8	
45	0	1378.39	8	4	0.61	2757.12	2752	9	2.18E-03	60.0	
46	0	1461.77*	256	8	1.76	2923.94	2915	16	7.10E-02	6.8	
47	0	1765.03	28	0	1.05	3530.75	3524	12	7.78E-03	18.9	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235013.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 8-DEC-2015 11:23:00   Acquisition date  : 3-OCT-2016 08:10:29
Sample ID        : G405235013             Sample quantity  : 144.57 GRAM
Sample type      : SOLID                   Sample geometry  :
Detector name    : GAMMA41                Detector geometry: CAN
Elapsed live time: 0 01:00:00.00          Elapsed real time: 0 01:00:06.06   0.2%
Energy tolerance : 1.50 keV               Half life ratio  : 10.00
Errors propagated: No                     Systematic Error : 0.00 %
Efficiency type  : Empirical              Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	8.926E-01	1.342E+01	1.342E+01	13.57	OK
RU-103	497.08	91.00*	2.367E+00	3.686E-02	7.344E+00	124.44	OK
	610.33	5.76	1.970E+00	6.774E+00	1.350E+03	22.14	OK
CD-109	88.03	3.70*	7.449E+00	1.582E+00	2.483E+00	69.50	OK
SN-126	64.28	9.60	7.794E+00	8.387E-01	8.387E-01	72.92	OK
	86.94	8.90	7.449E+00	6.579E-01	6.579E-01	69.50	OK
	87.57	37.00*	7.449E+00	1.582E-01	1.582E-01	69.50	OK
BA-137M	661.66	89.90*	1.826E+00	1.132E+00	1.154E+00	13.23	OK
CS-137	661.66	85.10*	1.826E+00	1.196E+00	1.219E+00	13.23	OK
TL-208	277.37	6.60	3.907E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.050E+00	3.288E-01	3.288E-01	29.74	OK
PB-210	860.56	12.50	1.433E+00	1.085E+00	1.085E+00	32.88	OK
	46.54	4.25*	7.552E+00	1.385E+00	1.421E+00	64.95	OK
PB-212	74.82	10.28	7.683E+00	1.726E+00	1.726E+00	31.59	OK
	77.11	17.10	7.644E+00	1.836E+00	1.836E+00	13.51	OK
BI-214	238.63	43.60*	4.382E+00	1.184E+00	1.184E+00	11.68	OK
	300.09	3.30	3.666E+00	2.071E+00	2.071E+00	86.98	OK
	609.32	45.49*	1.970E+00	8.578E-01	8.581E-01	22.14	OK
PB-214	1120.29	14.92	1.127E+00	7.033E-01	7.035E-01	79.28	OK
	1764.49	15.30	7.618E-01	1.177E+00	1.177E+00	37.80	OK
PB-214	74.82	5.80	7.683E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	7.644E+00	3.237E+00	3.238E+00	13.51	OK
	87.09	3.41	7.454E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	4.340E+00	-----	Line Not Found	-----	<<INT Reject
RN-222	295.22	18.42	3.714E+00	1.133E+00	1.133E+00	29.15	OK
	351.93	35.60*	3.212E+00	1.026E+00	1.026E+00	20.15	OK
	609.32	45.49*	1.970E+00	8.578E-01	8.581E-01	22.14	OK
RA-224	1120.29	14.92	1.127E+00	7.033E-01	7.035E-01	79.28	OK
	1764.49	15.30	7.618E-01	1.177E+00	1.177E+00	37.80	OK
RA-226	240.99	4.10*	4.345E+00	1.202E+00	1.202E+00	146.05	OK
AC-228	609.32	45.49*	1.970E+00	8.578E-01	8.581E-01	22.14	OK
	1120.29	14.92	1.127E+00	7.033E-01	7.035E-01	79.28	OK
	1764.49	15.30	7.618E-01	1.177E+00	1.177E+00	37.80	OK
RA-228	105.21	1.10	7.028E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.319E+00	1.031E+00	1.031E+00	62.23	OK
	794.95	4.25	1.543E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.473E+00	-----	Line Not Found	-----	Absent
TH-228	911.20	25.80*	1.360E+00	9.074E-01	9.074E-01	39.40	OK
	968.97	15.80	1.285E+00	8.493E-01	8.493E-01	56.29	OK
	105.21	1.10	7.028E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.319E+00	1.031E+00	1.031E+00	62.23	OK
TH-228	794.95	4.25	1.543E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.473E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.360E+00	9.074E-01	9.074E-01	39.40	OK
	968.97	15.80	1.285E+00	8.493E-01	8.493E-01	56.29	OK
TH-228	74.82	10.28	7.683E+00	1.726E+00	1.726E+00	31.59	OK
	77.11	17.10	7.644E+00	1.836E+00	1.836E+00	13.51	OK
	238.63	43.60*	4.382E+00	1.184E+00	1.184E+00	11.68	OK
	300.09	3.30	3.666E+00	2.071E+00	2.071E+00	86.98	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-229	85.43	14.70	7.517E+00	2.864E-01	2.864E-01	107.55	OK
	88.47	24.00	7.449E+00	2.440E-01	2.440E-01	69.50	OK
	193.51	4.41*	5.088E+00	-----	Line Not Found	-----	Absent
TH-230	210.85	2.80	4.815E+00	4.207E+00	4.208E+00	41.60	OK
	609.32	45.49*	1.970E+00	8.578E-01	8.578E-01	22.14	OK
	1120.29	14.92	1.127E+00	7.033E-01	7.033E-01	79.28	OK
PA-231	1764.49	15.30	7.618E-01	1.177E+00	1.177E+00	37.80	OK
	283.69	1.70	3.838E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	3.666E+00	1.277E+00	1.277E+00	86.98	OK
TH-232	105.21	1.10	7.028E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.319E+00	1.031E+00	1.031E+00	62.23	OK
	835.71	1.61	1.473E+00	-----	Line Not Found	-----	Absent
TH-234	911.20	25.80*	1.360E+00	9.074E-01	9.074E-01	39.40	OK
	968.97	15.80	1.285E+00	8.493E-01	8.493E-01	56.29	OK
	63.29	3.70*	7.794E+00	2.176E+00	2.176E+00	72.92	OK
U-234	92.59	4.23	7.325E+00	2.067E+00	2.067E+00	50.15	OK
	609.32	45.49*	1.970E+00	8.578E-01	8.578E-01	22.14	OK
	1120.29	14.92	1.127E+00	7.033E-01	7.033E-01	79.28	OK
U-235	1764.49	15.30	7.618E-01	1.177E+00	1.177E+00	37.80	OK
	89.96	3.47	7.393E+00	1.264E+00	1.264E+00	75.02	OK
	93.35	5.60	7.325E+00	1.562E+00	1.562E+00	50.15	OK
U-238	143.76	10.96*	6.093E+00	-----	Line Not Found	-----	Absent
	163.33	5.08	5.667E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	5.227E+00	2.333E-01	2.333E-01	43.44	OK
AM-243	205.31	5.01	4.887E+00	-----	Line Not Found	-----	Absent
	63.29	3.70*	7.794E+00	2.176E+00	2.176E+00	72.92	OK
	92.59	4.23	7.325E+00	2.067E+00	2.067E+00	50.15	OK
ANH-511	43.53	5.90	7.421E+00	-----	Line Not Found	-----	Absent
	74.66	67.20*	7.683E+00	2.640E-01	2.641E-01	31.59	OK
	511.00	100.00*	2.313E+00	2.004E-01	2.004E-01	40.73	OK

Flag: "*" = Keyline

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235013.CNF;1
* Acquisition date   : 3-OCT-2016 08:10:29 Sensitivity      : 3.000
* Detector ID       : GAM41 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:06.06 Half life ratio : *****
* Sample date      : 8-DEC-2015 11:23:00 Analyst initials: MXR1
* Sample ID       : G405235013 Sample Quantity : 1.4457E+02 GRAM
* Batch Number    : 1596247 Wet Weight : 0.00000
* Wet wt corr    : 1.00000 Dry Weight : 0.00000
* Nuclide Library : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 26-JAN-2016 06:01:47 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.342E+01	1.784E+00	7.420E-01
RU-103	7.344E+00	8.956E+00	1.390E+01
CD-109	2.483E+00	1.691E+00	1.662E+00
SN-126	1.582E-01	1.078E-01	1.058E-01
BA-137M	1.154E+00	1.497E-01	8.929E-02
CS-137	1.219E+00	1.581E-01	9.433E-02
TL-208	3.288E-01	9.584E-02	7.288E-02
PB-210	1.421E+00	9.045E-01	7.952E-01
PB-212	1.184E+00	1.355E-01	1.022E-01
BI-214	8.581E-01	1.862E-01	1.233E-01
PB-214	1.026E+00	2.026E-01	1.483E-01
RN-222	8.581E-01	1.862E-01	1.233E-01
RA-224	1.202E+00	1.720E+00	1.095E+00
RA-226	8.581E-01	1.862E-01	1.233E-01
AC-228	9.074E-01	3.503E-01	2.775E-01
RA-228	9.074E-01	3.503E-01	2.775E-01
TH-228	1.184E+00	1.355E-01	1.022E-01
TH-229	2.255E-01	5.388E-01	1.064E+00
TH-230	8.578E-01	1.861E-01	1.233E-01
PA-231	1.277E+00	1.089E+00	8.319E-01
TH-232	9.074E-01	3.503E-01	2.775E-01
TH-234	2.176E+00	1.555E+00	1.053E+00
U-234	8.578E-01	1.861E-01	1.233E-01
U-235	-2.341E-02	2.042E-01	3.984E-01
U-238	2.176E+00	1.555E+00	1.053E+00
AM-243	2.641E-01	8.175E-02	6.463E-02
ANH-511	2.004E-01	7.998E-02	5.635E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	5.147E+00		1.532E+01	2.985E+01	NOT IDENT.
NA-22	6.027E-03		5.947E-02	1.193E-01	NOT IDENT.
NA-24	0.000E+00		9.294E+40	0.000E+00	SHORT HLIF

AL-26	-3.212E-02	2.816E-02	1.889E-02	NOT IDENT.
SC-46	-3.272E-01	4.132E-01	7.148E-01	FAIL ABUN
V-48	0.000E+00	1.692E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	4.497E+02	0.000E+00	SHORT HLIF
MN-54	-5.825E-04	6.511E-02	1.318E-01	NOT IDENT.
CO-56	-1.375E-02	4.374E-01	8.986E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.237E-02	4.737E-02	9.132E-02	FAIL ABUN
CO-58	-7.185E-02	6.447E-01	1.278E+00	NOT IDENT.
FE-59	-6.747E-01	9.589E+00	1.633E+01	NOT IDENT.
CO-60	-3.631E-02	4.306E-02	6.830E-02	NOT IDENT.
ZN-65	-2.634E-01	2.362E-01	3.465E-01	NOT IDENT.
GE-68	-1.572E+00	3.117E+00	5.598E+00	NOT IDENT.
AS-73	1.478E+00	2.671E+00	5.057E+00	NOT IDENT.
AS-74	0.000E+00	7.205E+03	0.000E+00	SHORT HLIF
SE-75	1.799E-02	2.404E-01	4.421E-01	FAIL ABUN
BR-77	0.000E+00	2.465E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	7.950E+02	0.000E+00	SHORT HLIF
RB-83	6.204E-01	5.213E-01	1.469E+00	FAIL ABUN
KR-85	1.119E+01	9.534E+00	1.858E+01	NOT IDENT.
SR-85	1.178E+00	1.007E+00	1.963E+00	NOT IDENT.
RB-86	0.000E+00	3.688E+04	0.000E+00	SHORT HLIF
Y-88	-1.347E-01	2.056E-01	3.668E-01	NOT IDENT.
Y-91	-3.063E+02	8.498E+02	1.316E+03	NOT IDENT.
NB-94	8.340E-03	3.899E-02	7.890E-02	NOT IDENT.
NB-95	1.013E-01	9.653E-01	1.946E+00	NOT IDENT.
NB-95M	-7.221E-01	2.944E+00	4.891E+00	NOT IDENT.
ZR-95	-9.977E-02	1.746E+00	3.449E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.945E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-1.200E-02	3.861E-02	6.608E-02	NOT IDENT.
RH-102	-1.545E-02	7.933E-02	1.354E-01	NOT IDENT.
RH-106	1.730E-01	5.784E-01	1.138E+00	NOT IDENT.
RU-106	1.730E-01	5.784E-01	1.138E+00	NOT IDENT.
AG-108M	2.763E-03	3.302E-02	6.280E-02	NOT IDENT.
AG-110M	-7.668E-04	1.217E-01	2.488E-01	NOT IDENT.
SN-113	-3.029E-02	2.802E-01	5.205E-01	NOT IDENT.
CD-115	0.000E+00	4.226E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	9.991E+04	0.000E+00	SHORT HLIF
TE-123M	8.356E-02	1.358E-01	2.757E-01	NOT IDENT.
SB-124	2.379E+00	2.789E+00	6.999E+00	NOT IDENT.
SB-125	4.677E-02	1.340E-01	2.598E-01	FAIL ABUN
TE-125M	1.899E+02	2.766E+02	5.623E+02	NOT IDENT.
I-126	0.000E+00	1.277E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.384E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	2.687E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	5.620E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	4.346E+26	0.000E+00	SHORT HLIF
BA-133	4.340E-02	5.521E-02	1.024E-01	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	5.339E-02	6.894E-02	1.464E-01	NOT IDENT.
CS-135	-2.247E-02	1.666E-01	2.804E-01	NOT IDENT.
I-135	0.000E+00	1.753E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	4.130E+05	0.000E+00	SHORT HLIF
CE-139	-5.176E-02	1.197E-01	2.244E-01	NOT IDENT.
BA-140	0.000E+00	1.443E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	5.563E+05	0.000E+00	SHORT HLIF
CE-141	5.832E-01	2.697E+01	5.232E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	1.757E-01	5.043E-01	7.432E-01	NOT IDENT.
PM-144	2.327E-02	5.848E-02	1.240E-01	NOT IDENT.
PR-144	3.672E-01	5.332E+00	1.077E+01	NOT IDENT.
PM-146	-2.107E-02	6.287E-02	1.120E-01	NOT IDENT.
ND-147	0.000E+00	4.209E+07	0.000E+00	SHORT HLIF
PM-147	2.230E+02	8.008E+02	1.603E+03	NOT IDENT.
PM-149	0.000E+00	5.423E+40	0.000E+00	SHORT HLIF
EU-150	-8.134E-03	3.563E-02	5.804E-02	FAIL ABUN
EU-152	3.350E-03	1.131E-01	2.047E-01	NOT IDENT.
GD-153	-4.475E-03	1.671E-01	2.972E-01	NOT IDENT.
EU-154	1.715E-02	1.463E-01	2.940E-01	NOT IDENT.
EU-155	7.484E-02	1.040E-01	2.129E-01	FAIL ABUN
TB-160	2.176E+00	2.275E+00	5.141E+00	FAIL ABUN
HO-166M	6.081E-04	5.596E-02	1.142E-01	FAIL ABUN
TM-171	3.640E+00	5.817E+00	1.110E+01	NOT IDENT.
HF-172	1.196E-01	2.625E-01	4.800E-01	FAIL ABUN

LU-172	8.250E-03	1.091E-01	2.140E-01	FAIL ABUN
LU-176	1.038E-02	2.953E-02	5.763E-02	FAIL ABUN
HF-181	-1.063E+00	5.596E+00	1.019E+01	NOT IDENT.
TA-182	9.516E-02	1.177E+00	2.317E+00	FAIL ABUN
RE-183	7.378E-01	1.201E+00	2.274E+00	NOT IDENT.
RE-184	3.078E+01	3.738E+01	8.280E+01	NOT IDENT.
W-188	-7.409E+01	1.425E+02	2.257E+02	FAIL ABUN
IR-192	-4.557E-02	5.237E-01	9.865E-01	FAIL ABUN
HG-203	2.099E+00	2.455E+00	5.095E+00	NOT IDENT.
BI-207	4.081E-04	6.198E-02	1.220E-01	FAIL ABUN
BI-211	0.000E+00	5.582E-01	8.632E-01	FAIL ABUN
PB-211	7.339E-01	7.929E-01	1.593E+00	NOT IDENT.
BI-212	1.510E+00	1.021E+00	1.580E+00	FAIL ABUN
RN-219	-2.732E-01	4.461E-01	7.790E-01	FAIL ABUN
RA-223	1.967E-01	6.671E-01	1.302E+00	FAIL ABUN
AC-227	-2.352E-02	2.456E-01	4.663E-01	FAIL ABUN
TH-227	-2.352E-02	2.456E-01	4.663E-01	FAIL ABUN
TH-231	1.967E-01	6.671E-01	1.302E+00	FAIL ABUN
PA-233	2.532E-02	7.518E-02	1.459E-01	FAIL ABUN
PA-234	-2.915E-02	3.071E-01	5.673E-01	NOT IDENT.
PA-234M	-2.595E+00	4.341E+00	7.673E+00	NOT IDENT.
NP-237	2.532E-02	7.518E-02	1.459E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	3.233E-02	2.332E-01	4.625E-01	NOT IDENT.
PU-239	0.000E+00	6.271E+02	6.927E+02	FAIL ABUN
AM-241	-4.753E-02	6.929E-02	1.089E-01	NOT IDENT.
CM-243	-4.333E-02	9.516E-02	1.821E-01	NOT IDENT.
BK-247	5.619E-03	8.955E-02	1.544E-01	FAIL ABUN
CM-247	-1.790E-02	4.179E-02	7.468E-02	NOT IDENT.
CF-249	4.208E-04	4.683E-02	8.788E-02	NOT IDENT.
CF-251	6.306E-02	1.157E-01	2.341E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	246	10.66*	8.926E-01	1.342E+01	1.342E+01	13.57
RU-103	497.08	15	91.00*	2.367E+00	3.686E-02	7.344E+00	124.44
	610.33	148	5.76	1.970E+00	6.774E+00	1.350E+03	22.14
CD-109	88.03	139	3.70*	7.449E+00	2.626E+00	4.121E+00	40.24
SN-126	64.28	121	9.60	7.794E+00	8.387E-01	8.387E-01	72.92
	86.94	139	8.90	7.449E+00	1.092E+00	1.092E+00	40.24
	87.57	139	37.00*	7.449E+00	2.626E-01	2.626E-01	40.24
BA-137M	661.66	358	89.90*	1.826E+00	1.132E+00	1.154E+00	13.23
CS-137	661.66	358	85.10*	1.826E+00	1.196E+00	1.219E+00	13.23
TL-208	277.37	-----	6.60	3.907E+00	-----	Line Not Found	-----
	583.19	110	85.00*	2.050E+00	3.288E-01	3.288E-01	29.74
	860.56	37	12.50	1.433E+00	1.085E+00	1.085E+00	32.88
PB-210	46.54	86	4.25*	7.552E+00	1.385E+00	1.421E+00	64.95
BI-211	72.87	-----	1.23	7.711E+00	-----	Line Not Found	-----
	351.06	226	12.92*	3.212E+00	2.826E+00	2.826E+00	20.15
PB-212	74.82	360	10.28	7.683E+00	2.365E+00	2.365E+00	21.67
	77.11	462	17.10	7.644E+00	1.836E+00	1.836E+00	13.51
	238.63	435	43.60*	4.382E+00	1.184E+00	1.184E+00	11.68
	300.09	48	3.30	3.666E+00	2.071E+00	2.071E+00	86.98
BI-214	609.32	148	45.49*	1.970E+00	8.578E-01	8.581E-01	22.14
	1120.29	23	14.92	1.127E+00	7.033E-01	7.035E-01	79.28
	1764.49	26	15.30	7.618E-01	1.177E+00	1.177E+00	37.80
PB-214	74.82	360	5.80	7.683E+00	4.192E+00	4.193E+00	21.67
	77.11	462	9.70	7.644E+00	3.237E+00	3.238E+00	13.51
	87.09	139	3.41	7.449E+00	2.849E+00	2.851E+00	40.24
	242.00	110	7.25	4.345E+00	1.812E+00	1.813E+00	51.66
	295.22	149	18.42	3.714E+00	1.133E+00	1.133E+00	29.15
	351.93	226	35.60*	3.212E+00	1.026E+00	1.026E+00	20.15
RN-222	609.32	148	45.49*	1.970E+00	8.578E-01	8.581E-01	22.14
	1120.29	23	14.92	1.127E+00	7.033E-01	7.035E-01	79.28
	1764.49	26	15.30	7.618E-01	1.177E+00	1.177E+00	37.80
RA-224	240.99	110	4.10*	4.345E+00	3.205E+00	3.205E+00	51.66
RA-226	609.32	148	45.49*	1.970E+00	8.578E-01	8.581E-01	22.14
	1120.29	23	14.92	1.127E+00	7.033E-01	7.035E-01	79.28
	1764.49	26	15.30	7.618E-01	1.177E+00	1.177E+00	37.80
AC-228	105.21	-----	1.10	7.028E+00	-----	Line Not Found	-----
	338.32	74	11.27	3.319E+00	1.031E+00	1.031E+00	62.23
	794.95	-----	4.25	1.543E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.473E+00	-----	Line Not Found	-----
	911.20	61	25.80*	1.360E+00	9.074E-01	9.074E-01	39.40
	968.97	33	15.80	1.285E+00	8.493E-01	8.493E-01	56.29
RA-228	105.21	-----	1.10	7.028E+00	-----	Line Not Found	-----
	338.32	74	11.27	3.319E+00	1.031E+00	1.031E+00	62.23
	794.95	-----	4.25	1.543E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.473E+00	-----	Line Not Found	-----
	911.20	61	25.80*	1.360E+00	9.074E-01	9.074E-01	39.40
	968.97	33	15.80	1.285E+00	8.493E-01	8.493E-01	56.29

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	74.82	360	10.28	7.683E+00	2.365E+00	2.365E+00	21.67
	77.11	462	17.10	7.644E+00	1.836E+00	1.836E+00	13.51
	238.63	435	43.60*	4.382E+00	1.184E+00	1.184E+00	11.68
	300.09	48	3.30	3.666E+00	2.071E+00	2.071E+00	86.98
TH-229	85.43	61	14.70	7.517E+00	2.864E-01	2.864E-01	107.55
	88.47	139	24.00	7.449E+00	4.049E-01	4.049E-01	40.24
	193.51	-----	4.41*	5.088E+00	-----	Line Not Found	-----
	210.85	109	2.80	4.815E+00	4.207E+00	4.208E+00	41.60
TH-230	609.32	148	45.49*	1.970E+00	8.578E-01	8.578E-01	22.14
	1120.29	23	14.92	1.127E+00	7.033E-01	7.033E-01	79.28
	1764.49	26	15.30	7.618E-01	1.177E+00	1.177E+00	37.80
PA-231	283.69	-----	1.70	3.838E+00	-----	Line Not Found	-----
	301.36	48	5.35*	3.666E+00	1.277E+00	1.277E+00	86.98
TH-232	105.21	-----	1.10	7.028E+00	-----	Line Not Found	-----
	338.32	74	11.27	3.319E+00	1.031E+00	1.031E+00	62.23
	835.71	-----	1.61	1.473E+00	-----	Line Not Found	-----
	911.20	61	25.80*	1.360E+00	9.074E-01	9.074E-01	39.40
TH-234	968.97	33	15.80	1.285E+00	8.493E-01	8.493E-01	56.29
	63.29	121	3.70*	7.794E+00	2.176E+00	2.176E+00	72.92
	92.59	123	4.23	7.325E+00	2.067E+00	2.067E+00	50.15
U-234	609.32	148	45.49*	1.970E+00	8.578E-01	8.578E-01	22.14
	1120.29	23	14.92	1.127E+00	7.033E-01	7.033E-01	79.28
	1764.49	26	15.30	7.618E-01	1.177E+00	1.177E+00	37.80
U-235	89.96	62	3.47	7.393E+00	1.264E+00	1.264E+00	75.02
	93.35	123	5.60	7.325E+00	1.562E+00	1.562E+00	50.15
	143.76	-----	10.96*	6.093E+00	-----	Line Not Found	-----
	163.33	-----	5.08	5.667E+00	-----	Line Not Found	-----
	185.72	134	57.20	5.227E+00	2.333E-01	2.333E-01	43.44
U-238	205.31	-----	5.01	4.887E+00	-----	Line Not Found	-----
	63.29	121	3.70*	7.794E+00	2.176E+00	2.176E+00	72.92
	92.59	123	4.23	7.325E+00	2.067E+00	2.067E+00	50.15
AM-243	43.53	-----	5.90	7.421E+00	-----	Line Not Found	-----
	74.66	360	67.20*	7.683E+00	3.618E-01	3.618E-01	21.67
ANH-511	511.00	89	100.00*	2.313E+00	2.004E-01	2.004E-01	40.73

Flag: "*" = Keyline

Total number of lines in spectrum 47
 Number of unidentified lines 8
 Number of lines tentatively identified by NID 39 82.98%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.342E+01	1.342E+01	0.182E+01	13.57	
RU-103	39.26D	199.	3.686E-02	7.344E+00	9.139E+00	124.44	
CD-109	461.40D	1.57	2.626E+00	4.121E+00	1.658E+00	40.24	
SN-126	2.30E+05Y	1.00	2.626E-01	2.626E-01	1.057E-01	40.24	
BA-137M	30.08Y	1.02	1.132E+00	1.154E+00	0.153E+00	13.23	
CS-137	30.08Y	1.02	1.196E+00	1.219E+00	0.161E+00	13.23	
TL-208	1.41E+10Y	1.00	3.288E-01	3.288E-01	0.978E-01	29.74	
PB-210	22.20Y	1.03	1.385E+00	1.421E+00	0.923E+00	64.95	
BI-211	7.04E+08Y	1.00	2.826E+00	2.826E+00	0.570E+00	20.15	
PB-212	1.41E+10Y	1.00	1.184E+00	1.184E+00	0.138E+00	11.68	
BI-214	1600.00Y	1.00	8.578E-01	8.581E-01	1.899E-01	22.14	
PB-214	1600.00Y	1.00	1.026E+00	1.026E+00	0.207E+00	20.15	
RN-222	1600.00Y	1.00	8.578E-01	8.581E-01	1.899E-01	22.14	
RA-224	1.41E+10Y	1.00	3.205E+00	3.205E+00	1.656E+00	51.66	
RA-226	1600.00Y	1.00	8.578E-01	8.581E-01	1.899E-01	22.14	
AC-228	1.41E+10Y	1.00	9.074E-01	9.074E-01	3.575E-01	39.40	
RA-228	1.41E+10Y	1.00	9.074E-01	9.074E-01	3.575E-01	39.40	
TH-228	1.41E+10Y	1.00	1.184E+00	1.184E+00	0.138E+00	11.68	
TH-229	7340.00Y	1.00	4.049E-01	4.049E-01	1.629E-01	40.24	K
TH-230	7.54E+04Y	1.00	8.578E-01	8.578E-01	1.899E-01	22.14	
PA-231	7.04E+08Y	1.00	1.277E+00	1.277E+00	1.111E+00	86.98	
TH-232	1.41E+10Y	1.00	9.074E-01	9.074E-01	3.575E-01	39.40	
TH-234	4.47E+09Y	1.00	2.176E+00	2.176E+00	1.587E+00	72.92	
U-234	2.45E+05Y	1.00	8.578E-01	8.578E-01	1.899E-01	22.14	
U-235	7.04E+08Y	1.00	2.333E-01	2.333E-01	1.014E-01	43.44	K
U-238	4.47E+09Y	1.00	2.176E+00	2.176E+00	1.587E+00	72.92	
AM-243	7370.00Y	1.00	3.618E-01	3.618E-01	0.784E-01	21.67	
ANH-511	1.00E+09Y	1.00	2.004E-01	2.004E-01	0.816E-01	40.73	
Total Activity :			4.365E+01	5.253E+01			

Grand Total Activity : 4.365E+01 5.253E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	129.25	54	145	0.60	258.74	255	9	1.26E-02	92.2	6.43E+00	T
0	135.60	45	144	2.98	271.43	267	10	1.06E-02	****	6.28E+00	T
5	270.18	55	68	2.10	540.52	535	16	1.35E-02	68.2	3.99E+00	T
5	273.53	22	49	1.62	547.23	535	16	5.36E-03	****	3.95E+00	T
0	411.07	22	39	2.23	822.26	816	9	5.52E-03	****	2.81E+00	T
0	464.00	18	42	1.57	928.10	924	7	4.68E-03	****	2.52E+00	T
10	516.70	17	6	1.53	1033.49	1014	27	4.40E-03	93.1	2.29E+00	
10	519.03	11	3	1.21	1038.16	1014	27	2.88E-03	85.7	2.28E+00	T
1	521.78	17	3	1.51	1043.66	1041	12	4.40E-03	58.0	2.27E+00	T
1	524.48	17	4	1.81	1049.06	1041	12	4.36E-03	65.1	2.26E+00	
0	636.18	7	17	0.49	1272.45	1267	7	1.93E-03	****	1.89E+00	T
0	728.48	32	21	1.91	1457.05	1452	12	8.77E-03	69.0	1.67E+00	T
0	782.60	12	2	1.12	1565.29	1560	9	3.34E-03	72.6	1.57E+00	T
0	935.83	34	7	4.86	1871.77	1864	16	9.41E-03	50.4	1.33E+00	
0	952.71	11	10	0.69	1905.55	1899	10	3.06E-03	****	1.31E+00	
0	1104.14	13	21	4.41	2208.47	2198	17	3.55E-03	****	1.14E+00	
0	1208.19	13	10	1.54	2416.62	2411	10	3.61E-03	****	1.05E+00	
0	1211.03	10	0	1.24	2422.30	2420	6	2.78E-03	63.2	1.05E+00	
0	1238.66	29	13	1.50	2477.57	2470	13	8.33E-03	61.6	1.03E+00	T
0	1378.39	8	4	0.61	2757.12	2752	9	2.18E-03	****	9.39E-01	

Flags: "T" = Tentatively associated

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235013.CNF;1 *
 * Acquisition date : 3-OCT-2016 08:10:29 Sensitivity : 3.000 *
 * Detector ID : GAM41 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:06.06 Half life ratio : ***** *
 * Sample date : 8-DEC-2015 11:23:00 Nuclide Library : SOLID *
 * Sample ID : G405235013 Analyst initials: MXR1 *
 * Batch Number : 1596247 Sample Quantity : 1.4457E+02 GRAM *
 * Wet wt corr : 1.00000 Wet Weight : 0.00000 *
 * Dry Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 26-JAN-2016 06:01:47 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.969E-01
RU-103	6.283E+00
CD-109	7.885E-01
SN-126	5.018E-02
BA-137M	4.020E-02
CS-137	4.247E-02
TL-208	3.232E-02
PB-210	3.735E-01
PB-212	4.727E-02
BI-214	5.365E-02
PB-214	6.782E-02
RN-222	5.365E-02
RA-224	5.067E-01
RA-226	5.365E-02
AC-228	1.185E-01
RA-228	1.185E-01
TH-228	4.727E-02
TH-229	4.992E-01
TH-230	5.364E-02
PA-231	3.787E-01
TH-232	1.185E-01
TH-234	5.007E-01
U-234	5.364E-02
U-235	1.882E-01
U-238	5.007E-01
AM-243	3.087E-02
ANH-511	2.506E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.353E+01	NOT IDENT.
NA-22	5.087E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	0.000E+00	NOT IDENT.

SC-46	2.961E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.646E-02	NOT IDENT.
CO-56	3.769E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	4.285E-02	FAIL ABUN
CO-58	5.500E-01	NOT IDENT.
FE-59	6.995E+00	NOT IDENT.
CO-60	2.600E-02	NOT IDENT.
ZN-65	1.442E-01	NOT IDENT.
GE-68	2.392E+00	NOT IDENT.
AS-73	2.403E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	2.037E-01	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	6.561E-01	FAIL ABUN
KR-85	8.530E+00	NOT IDENT.
SR-85	9.009E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.159E-01	NOT IDENT.
Y-91	5.682E+02	NOT IDENT.
NB-94	3.530E-02	NOT IDENT.
NB-95	8.577E-01	NOT IDENT.
NB-95M	2.274E+00	NOT IDENT.
ZR-95	1.515E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.105E-02	NOT IDENT.
RH-102	5.988E-02	NOT IDENT.
RH-106	5.038E-01	NOT IDENT.
RU-106	5.038E-01	NOT IDENT.
AG-108M	2.841E-02	NOT IDENT.
AG-110M	1.083E-01	NOT IDENT.
SN-113	2.371E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.291E-01	NOT IDENT.
SB-124	2.908E+00	NOT IDENT.
SB-125	1.189E-01	FAIL ABUN
TE-125M	2.663E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.731E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	6.605E-02	NOT IDENT.
CS-135	1.288E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	1.048E-01	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.465E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.498E-01	NOT IDENT.
PM-144	5.465E-02	NOT IDENT.
PR-144	4.747E+00	NOT IDENT.
PM-146	5.123E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.527E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.673E-02	FAIL ABUN
EU-152	9.364E-02	NOT IDENT.
GD-153	1.402E-01	NOT IDENT.
EU-154	1.255E-01	NOT IDENT.
EU-155	1.008E-01	FAIL ABUN
TB-160	2.272E+00	FAIL ABUN
HO-166M	4.932E-02	FAIL ABUN
TM-171	5.269E+00	NOT IDENT.
HF-172	2.264E-01	FAIL ABUN
LU-172	9.378E-02	FAIL ABUN

LU-176	2.666E-02	FAIL ABUN
HF-181	4.601E+00	NOT IDENT.
TA-182	1.004E+00	FAIL ABUN
RE-183	1.082E+00	NOT IDENT.
RE-184	3.656E+01	NOT IDENT.
W-188	1.034E+02	FAIL ABUN
IR-192	4.514E-01	FAIL ABUN
HG-203	2.348E+00	NOT IDENT.
BI-207	5.281E-02	FAIL ABUN
BI-211	4.143E-01	FAIL ABUN
PB-211	7.293E-01	NOT IDENT.
BI-212	7.262E-01	FAIL ABUN
RN-219	3.512E-01	FAIL ABUN
RA-223	5.983E-01	FAIL ABUN
AC-227	2.147E-01	FAIL ABUN
TH-227	2.147E-01	FAIL ABUN
TH-231	5.983E-01	FAIL ABUN
PA-233	6.763E-02	FAIL ABUN
PA-234	2.385E-01	NOT IDENT.
PA-234M	3.158E+00	NOT IDENT.
NP-237	6.763E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.174E-01	NOT IDENT.
PU-239	3.282E+02	FAIL ABUN
AM-241	5.175E-02	NOT IDENT.
CM-243	8.592E-02	NOT IDENT.
BK-247	7.120E-02	FAIL ABUN
CM-247	3.383E-02	NOT IDENT.
CF-249	4.022E-02	NOT IDENT.
CF-251	1.091E-01	NOT IDENT.

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DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235013.CNF;1 *
 * Acquisition date : 3-OCT-2016 08:10:29 Sensitivity : 3.000 *
 * Detector ID : GAM41 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:06.06 Half life ratio : ***** *
 * Sample date : 8-DEC-2015 11:23:00 Nuclide Library : SOLID *
 * Sample ID : G405235013 Analyst initials: MXR1 *
 * Batch Number : 1596247 Sample Quantity : 1.4457E+02 GRAM *
 * Quantity Err(%) : 1.3834E-03 % *
 * Wet wt corr : 1.00000 Wet Weight : 0.00000 *
 * Dry Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 26-JAN-2016 06:01:47 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.342E+01	2.119E+00	2.119E+00
RU-103	7.344E+00	8.980E+00	8.980E+00
CD-109	2.483E+00	1.729E+00	1.729E+00
SN-126	1.582E-01	1.099E-01	1.099E-01
BA-137M	1.154E+00	1.769E-01	1.769E-01
CS-137	1.219E+00	1.868E-01	1.868E-01
TL-208	3.288E-01	9.987E-02	9.987E-02
PB-210	1.421E+00	9.219E-01	9.219E-01
PB-212	1.184E+00	1.759E-01	1.759E-01
BI-214	8.581E-01	1.998E-01	1.998E-01
PB-214	1.026E+00	2.207E-01	2.207E-01
RN-222	8.581E-01	1.998E-01	1.998E-01
RA-224	1.202E+00	1.743E+00	1.743E+00
RA-226	8.581E-01	1.998E-01	1.998E-01
AC-228	9.074E-01	3.666E-01	3.666E-01
RA-228	9.074E-01	3.666E-01	3.666E-01
TH-228	1.184E+00	1.759E-01	1.759E-01
TH-229	2.255E-01	5.392E-01	5.392E-01
TH-230	8.578E-01	1.997E-01	1.997E-01
PA-231	1.277E+00	1.126E+00	1.126E+00
TH-232	9.074E-01	3.666E-01	3.666E-01
TH-234	2.176E+00	1.645E+00	1.645E+00
U-234	8.578E-01	1.997E-01	1.997E-01
U-235	-2.341E-02	2.042E-01	2.042E-01
U-238	2.176E+00	1.645E+00	1.645E+00
AM-243	2.641E-01	8.817E-02	8.817E-02
ANH-511	2.004E-01	8.181E-02	8.181E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	5.147E+00	1.533E+01	1.550E+01	NOT IDENT.
NA-22	6.027E-03	5.948E-02	5.954E-02	NOT IDENT.
NA-24	-1.000E+41	1.029E+41	0.000E+00	SHORT HLIF

AL-26	-3.212E-02	2.826E-02	3.175E-02	NOT IDENT.
SC-46	-3.272E-01	4.148E-01	4.402E-01	FAIL ABUN
V-48	1.217E+04	1.700E+04	1.787E+04	SHORT HLIF
CR-51	2.275E+01	4.497E+02	4.499E+02	SHORT HLIF
MN-54	-5.825E-04	6.511E-02	6.511E-02	NOT IDENT.
CO-56	-1.375E-02	4.374E-01	4.375E-01	FAIL ABUN
MN-56	-1.000E+41	3.761E+42	0.000E+00	SHORT HLIF
CO-57	-1.237E-02	4.739E-02	4.772E-02	FAIL ABUN
CO-58	-7.185E-02	6.448E-01	6.456E-01	NOT IDENT.
FE-59	-6.747E-01	9.590E+00	9.595E+00	NOT IDENT.
CO-60	-3.631E-02	4.315E-02	4.615E-02	NOT IDENT.
ZN-65	-2.634E-01	2.409E-01	2.686E-01	NOT IDENT.
GE-68	-1.572E+00	3.128E+00	3.207E+00	NOT IDENT.
AS-73	1.478E+00	2.692E+00	2.773E+00	NOT IDENT.
AS-74	-3.064E+03	7.213E+03	7.344E+03	SHORT HLIF
SE-75	1.799E-02	2.404E-01	2.405E-01	FAIL ABUN
BR-77	2.152E+38	1.863E+39	0.000E+00	SHORT HLIF
SR-82	-1.024E+02	7.950E+02	7.964E+02	SHORT HLIF
RB-83	6.204E-01	5.302E-01	5.995E-01	FAIL ABUN
KR-85	1.119E+01	9.582E+00	1.083E+01	NOT IDENT.
SR-85	1.178E+00	1.012E+00	1.143E+00	NOT IDENT.
RB-86	-2.266E+04	3.708E+04	3.846E+04	SHORT HLIF
Y-88	-1.347E-01	2.058E-01	2.146E-01	NOT IDENT.
Y-91	-3.063E+02	8.502E+02	8.613E+02	NOT IDENT.
NB-94	8.340E-03	3.900E-02	3.918E-02	NOT IDENT.
NB-95	1.013E-01	9.653E-01	9.664E-01	NOT IDENT.
NB-95M	-7.221E-01	2.945E+00	2.963E+00	NOT IDENT.
ZR-95	-9.977E-02	1.746E+00	1.746E+00	NOT IDENT.
NB-97	1.000E+41	2.778E+41	0.000E+00	SHORT HLIF
ZR-97	-1.000E+41	2.499E+41	0.000E+00	SHORT HLIF
MO-99	4.076E+31	1.946E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	4.249E+41	0.000E+00	SHORT HLIF
RH-101	-1.200E-02	3.870E-02	3.907E-02	NOT IDENT.
RH-102	-1.545E-02	7.935E-02	7.966E-02	NOT IDENT.
RH-106	1.730E-01	5.786E-01	5.838E-01	NOT IDENT.
RU-106	1.730E-01	5.786E-01	5.838E-01	NOT IDENT.
AG-108M	2.763E-03	3.303E-02	3.305E-02	NOT IDENT.
AG-110M	-7.668E-04	1.217E-01	1.217E-01	NOT IDENT.
SN-113	-3.029E-02	2.802E-01	2.805E-01	NOT IDENT.
CD-115	-1.504E+39	4.236E+39	0.000E+00	SHORT HLIF
SN-117M	1.323E+04	9.993E+04	1.001E+05	SHORT HLIF
TE-123M	8.356E-02	1.360E-01	1.411E-01	NOT IDENT.
SB-124	2.379E+00	2.795E+00	2.994E+00	NOT IDENT.
SB-125	4.677E-02	1.341E-01	1.357E-01	FAIL ABUN
TE-125M	1.899E+02	2.774E+02	2.903E+02	NOT IDENT.
I-126	1.085E+06	1.288E+06	1.378E+06	SHORT HLIF
SB-126	-3.412E+05	1.385E+06	1.394E+06	SHORT HLIF
SB-127	4.426E+21	2.755E+22	0.000E+00	SHORT HLIF
I-131	4.091E+09	5.631E+09	5.925E+09	SHORT HLIF
I-132	1.000E+41	1.893E+42	0.000E+00	SHORT HLIF
TE-132	-1.311E+26	4.380E+26	0.000E+00	SHORT HLIF
BA-133	4.340E-02	5.534E-02	5.869E-02	NOT IDENT.
I-133	1.000E+41	4.882E+42	0.000E+00	SHORT HLIF
CS-134	5.339E-02	6.913E-02	7.321E-02	NOT IDENT.
CS-135	-2.247E-02	1.667E-01	1.670E-01	NOT IDENT.
I-135	1.000E+41	6.999E+41	0.000E+00	SHORT HLIF
CS-136	-3.018E+04	4.130E+05	4.132E+05	SHORT HLIF
CE-139	-5.176E-02	1.202E-01	1.224E-01	NOT IDENT.
BA-140	-5.974E+05	1.444E+06	1.469E+06	SHORT HLIF
LA-140	-4.657E+05	5.575E+05	5.957E+05	SHORT HLIF
CE-141	5.832E-01	2.697E+01	2.697E+01	NOT IDENT.
CE-143	1.000E+41	3.931E+41	0.000E+00	SHORT HLIF
CE-144	1.757E-01	5.048E-01	5.109E-01	NOT IDENT.
PM-144	2.327E-02	5.853E-02	5.946E-02	NOT IDENT.
PR-144	3.672E-01	5.333E+00	5.335E+00	NOT IDENT.
PM-146	-2.107E-02	6.291E-02	6.362E-02	NOT IDENT.
ND-147	7.793E+06	4.210E+07	4.224E+07	SHORT HLIF
PM-147	2.230E+02	8.012E+02	8.075E+02	NOT IDENT.
PM-149	1.902E+40	5.441E+40	0.000E+00	SHORT HLIF
EU-150	-8.134E-03	3.563E-02	3.582E-02	FAIL ABUN
EU-152	3.350E-03	1.131E-01	1.132E-01	NOT IDENT.
GD-153	-4.475E-03	1.671E-01	1.671E-01	NOT IDENT.
EU-154	1.715E-02	1.463E-01	1.465E-01	NOT IDENT.
EU-155	7.484E-02	1.043E-01	1.097E-01	FAIL ABUN
TB-160	2.176E+00	2.289E+00	2.491E+00	FAIL ABUN
HO-166M	6.081E-04	5.596E-02	5.596E-02	FAIL ABUN
TM-171	3.640E+00	5.838E+00	6.064E+00	NOT IDENT.
HF-172	1.196E-01	2.635E-01	2.690E-01	FAIL ABUN

LU-172	8.250E-03	1.091E-01	1.091E-01	FAIL ABUN
LU-176	1.038E-02	2.955E-02	2.991E-02	FAIL ABUN
HF-181	-1.063E+00	5.597E+00	5.618E+00	NOT IDENT.
TA-182	9.516E-02	1.177E+00	1.178E+00	FAIL ABUN
RE-183	7.378E-01	1.209E+00	1.254E+00	NOT IDENT.
RE-184	3.078E+01	3.824E+01	4.067E+01	NOT IDENT.
W-188	-7.409E+01	1.429E+02	1.467E+02	FAIL ABUN
IR-192	-4.557E-02	5.237E-01	5.241E-01	FAIL ABUN
HG-203	2.099E+00	2.461E+00	2.637E+00	NOT IDENT.
BI-207	4.081E-04	6.198E-02	6.198E-02	FAIL ABUN
BI-211	2.826E+00	6.098E-01	1.413E+00	FAIL ABUN
PB-211	7.339E-01	7.955E-01	8.616E-01	NOT IDENT.
BI-212	1.510E+00	1.031E+00	1.235E+00	FAIL ABUN
RN-219	-2.732E-01	4.478E-01	4.644E-01	FAIL ABUN
RA-223	1.967E-01	6.673E-01	6.732E-01	FAIL ABUN
AC-227	-2.352E-02	2.456E-01	2.458E-01	FAIL ABUN
TH-227	-2.352E-02	2.456E-01	2.458E-01	FAIL ABUN
TH-231	1.967E-01	6.673E-01	6.732E-01	FAIL ABUN
PA-233	2.532E-02	7.522E-02	7.608E-02	FAIL ABUN
PA-234	-2.915E-02	3.090E-01	3.092E-01	NOT IDENT.
PA-234M	-2.595E+00	4.356E+00	4.511E+00	NOT IDENT.
NP-237	2.532E-02	7.522E-02	7.608E-02	FAIL ABUN
NP-238	1.000E+41	2.895E+41	0.000E+00	SHORT HLIF
NP-239	3.233E-02	2.332E-01	2.337E-01	NOT IDENT.
PU-239	6.937E+02	6.321E+02	7.053E+02	FAIL ABUN
AM-241	-4.753E-02	6.959E-02	7.281E-02	NOT IDENT.
CM-243	-4.333E-02	9.531E-02	9.729E-02	NOT IDENT.
BK-247	5.619E-03	8.955E-02	8.959E-02	FAIL ABUN
CM-247	-1.790E-02	4.192E-02	4.269E-02	NOT IDENT.
CF-249	4.208E-04	4.683E-02	4.683E-02	NOT IDENT.
CF-251	6.306E-02	1.160E-01	1.194E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	60.6064	87.09	114.3639	136.47	83.1355
45.60	74.9070	87.57	114.4384	140.51	0.0000
46.54	79.7381	88.03	114.5095	143.76	83.7465
49.72	0.0000	88.34	114.5576	144.24	82.8953
51.35	130.1865	88.47	114.5771	145.44	88.3471
51.87	117.2815	89.96	114.8056	152.43	88.9463
52.39	93.6784	1093.63	114.9095	153.25	0.0000
52.97	94.9655	91.11	0.0000	323.87	65.6973
53.44	98.6113	92.59	115.2042	156.02	0.0000
54.07	101.1032	93.35	115.3178	158.56	0.0000
57.36	0.0000	94.56	115.4990	159.00	59.6648
57.53	112.4989	94.65	115.5122	162.33	68.0092
57.98	110.1909	94.67	115.5150	162.66	0.0000
59.27	105.6350	94.87	84.7611	163.33	73.5167
59.32	129.6541	97.43	92.6535	165.86	76.4147
59.54	148.9184	98.43	88.4496	176.31	70.6969
60.96	136.4368	98.44	88.4507	176.60	0.0000
61.17	136.4847	99.53	78.8997	177.52	52.3886
62.93	123.1975	100.11	90.8429	181.07	0.0000
63.29	123.2705	102.03	92.7610	181.52	52.5683
63.58	123.3296	103.18	98.8568	184.41	74.8853
64.28	123.4711	103.37	105.6991	143.76	65.7124
66.73	155.5576	105.21	87.1400	193.51	67.9994
67.24	136.2240	105.31	87.1509	197.03	73.7989
125.81	116.8447	106.12	96.6433	198.01	77.5964
67.75	116.8572	106.47	100.9621	201.83	71.2693
69.67	120.4660	109.28	84.1300	203.43	69.4819
70.83	159.8222	111.00	100.6433	205.31	81.8085
72.81	150.9000	111.76	0.0000	210.85	57.6076
72.87	150.9141	114.06	80.2818	215.65	48.3406
74.66	151.3204	116.30	0.0000	222.11	57.1484
74.82	151.3561	116.74	78.7951	227.09	60.2270
74.97	151.3899	119.76	79.0622	227.38	62.1521
77.11	151.8685	121.12	73.0903	228.16	0.0000
78.74	118.8120	121.22	73.0984	228.18	59.3183
79.69	133.8464	121.78	74.8852	116.74	59.3183
80.12	106.6470	122.06	83.6182	235.69	64.9319
80.19	0.0000	122.92	91.5439	235.96	64.9443
80.57	134.0145	123.07	101.1507	238.63	51.0904
81.00	142.3745	265.00	85.5117	238.98	0.0000
81.07	142.3885	125.81	76.0887	240.99	51.1755
81.75	115.5944	127.23	89.3429	242.00	51.2122
83.79	115.9250	127.91	95.9827	244.70	53.7295
84.00	115.9591	129.30	81.6389	252.40	0.0000
85.43	116.1876	131.20	73.8871	252.80	44.7820
86.55	114.2803	133.02	71.3834	254.15	0.0000
86.79	114.3172	133.52	74.0657	256.23	46.8379
86.94	114.3409	136.00	83.0953	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	44.7474	355.39	0.0000	584.27	20.6689
264.80	45.6353	356.01	34.1957	595.83	0.0000
265.00	45.6410	364.49	0.0000	427.87	28.8839
268.22	45.7375	366.42	0.0000	602.52	0.0000
269.46	37.4078	372.51	29.2703	604.72	17.3572
270.03	37.4217	375.05	34.5428	607.14	27.7959
271.23	37.4511	377.52	34.5872	609.32	15.0683
273.65	0.0000	356.01	36.8037	610.33	15.0741
276.40	41.5317	388.16	38.9918	614.28	29.6110
277.37	48.9783	388.63	0.0000	618.01	30.2328
277.60	48.9854	391.69	36.9504	620.36	23.2764
278.00	45.1380	264.66	29.6936	621.93	16.3026
279.20	31.6999	401.81	38.1995	630.19	0.0000
279.54	31.7070	402.40	38.2104	631.29	22.4336
279.70	34.6831	404.85	24.2296	633.25	25.2554
280.46	32.7167	410.95	27.1799	634.78	0.0000
283.69	45.6986	413.71	27.2167	635.95	21.0667
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	39.7811	423.72	0.0000	645.85	16.7369
285.90	0.0000	427.09	32.2266	657.76	15.5687
287.50	41.8248	427.87	33.3128	657.90	0.0000
290.67	50.8879	433.94	29.0978	661.66	27.4590
293.27	0.0000	439.40	22.6898	664.57	0.0000
351.93	46.5284	453.88	44.5960	666.33	0.0000
295.96	46.5492	463.37	46.9726	666.50	0.0000
879.38	36.0959	468.07	39.4087	667.71	0.0000
299.98	34.6214	473.00	0.0000	677.62	13.3598
300.09	34.6235	475.06	47.2176	685.70	0.0000
300.13	34.6249	476.78	26.3740	695.00	0.0000
301.36	34.6502	477.60	26.3833	696.49	14.3418
302.85	46.7450	482.18	31.9441	696.51	17.9272
256.23	52.8290	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	20.6219
306.78	44.3366	497.08	29.9331	697.49	22.4167
308.46	56.4853	505.52	21.6959	702.65	21.5574
311.90	47.5039	507.63	0.0000	706.68	17.9883
316.51	40.5387	511.00	21.7459	711.68	13.5136
319.41	0.0000	514.00	21.7733	720.70	0.0000
320.08	0.0000	514.00	21.7733	721.93	0.0000
321.04	39.6300	520.40	3.3586	722.78	16.8779
323.87	37.6594	520.69	0.0000	722.91	17.3613
325.23	45.8377	522.65	0.0000	723.31	18.8106
328.76	0.0000	527.90	0.0000	724.19	18.8157
333.37	35.3058	528.26	18.5323	727.33	21.7324
333.97	50.6732	529.59	21.3518	733.00	13.0636
334.37	43.0049	529.87	0.0000	735.93	17.2530
338.28	40.0212	531.02	0.0000	333.97	11.8106
338.32	40.0220	537.26	0.0000	739.50	0.0000
311.90	44.6939	546.56	0.0000	747.24	15.4929
340.48	44.6939	552.55	13.6108	748.06	14.5850
340.55	0.0000	563.25	22.7799	752.31	22.8203
344.28	38.3012	569.33	22.8337	753.82	0.0000
345.93	41.7376	946.00	15.9847	756.73	18.2819
351.06	38.2375	569.70	15.9858	756.80	18.2819
351.93	38.2556	583.19	20.6602	884.68	12.8259

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	17.4171	1274.44	14.6750	1620.50	4.4641
766.42	15.5868	1001.03	10.7747	1621.92	4.4653
766.84	14.6719	1002.74	11.7594	1678.03	0.0000
772.60	0.0000	1004.73	9.8044	1690.97	2.7114
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	0.9150
778.90	10.3086	1028.54	0.0000	1063.66	11.9063
783.70	0.0000	1037.84	12.8524	1771.35	3.6643
785.37	10.3291	1038.76	0.0000	1791.20	0.0000
792.07	26.7999	631.29	7.9263	1808.65	4.6082
794.95	10.1745	1048.07	0.0000	1810.72	0.0000
795.86	18.5040	1049.04	11.8967	1836.06	3.7029
810.06	14.8667	1050.41	15.8682		
810.29	13.9384	1063.66	13.9299		
344.28	14.8687	1077.00	0.0000		
810.76	13.9407	1077.34	16.9709		
815.77	0.0000	1085.87	12.0037		
1048.07	0.0000	1093.63	16.0352		
832.01	8.4172	1099.45	12.8461		
834.85	12.1685	1112.07	11.0725		
835.71	13.1075	1112.84	8.0542		
836.80	0.0000	1115.54	20.7246		
846.75	0.0000	1120.29	8.0684		
846.77	9.3927	1120.55	8.0688		
856.80	0.0000	1221.41	19.1670		
860.56	11.3163	1129.67	15.1611		
871.09	11.3503	1131.51	0.0000		
873.19	8.5177	1147.95	0.0000		
875.33	0.0000	1173.23	7.1465		
879.38	9.4809	1177.95	11.2424		
880.51	11.3804	1189.05	17.4182		
883.24	18.0328	1204.77	18.0963		
884.68	12.3434	1221.41	13.4158		
889.28	15.2114	1231.02	13.0003		
894.76	8.5696	1235.36	0.0000		
898.04	10.4834	1238.28	16.5723		
900.72	11.4448	1260.41	0.0000		
903.28	10.4985	1271.87	8.3462		
911.20	11.4781	1274.44	10.4382		
912.08	11.4807	1274.54	10.4388		
923.98	0.0000	1291.59	6.2860		
926.50	8.6446	1298.22	0.0000		
929.11	15.3789	1312.11	0.0000		
937.49	6.7434	1332.49	9.5092		
944.13	0.0000	1362.66	0.0000		
946.00	10.2992	1365.19	5.3183		
949.00	9.2766	1368.63	0.0000		
667.71	0.0000	1384.29	7.4742		
962.31	25.2129	1408.01	2.1455		
964.08	18.1101	1457.56	0.0000		
966.17	13.9781	1460.82	5.4190		
911.20	34.1945	1489.16	6.5380		
968.97	34.1945	1505.03	1.0929		
983.53	0.0000	1584.12	5.5441		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235014.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM43.CNF;151
Background date  : 2-OCT-2016 11:02:23.
Sample date      : 8-DEC-2015 10:49:00. Acquisition date : 3-OCT-2016 08:11:15.
Sample ID        : G405235014          Sample quantity  : 1.53732E+02 GRAM
Detector name    : GAM43                Detector geometry: CAN
Elapsed live time: 0 01:00:00.00        Elapsed real time: 0 01:00:00.71  0.0%
Energy tolerance : 1.50000 keV          Analyst Initials  : MXR1
Abundance limit  : 75.00000             Sensitivity       : 3.00000
Batch ID         : 1596247              Detector SN#      :
Matrix Spike ID  :                      LCS ID           : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	47.48	53	153	1.50	94.74	90	13	1.47E-02	50.3	
2	0	62.99*	25	69	0.84	125.76	124	5	6.82E-03	56.7	
3	2	74.87	99	168	1.36	149.53	145	13	2.74E-02	25.5	2.30E+00
4	2	76.92	173	176	1.29	153.64	145	13	4.81E-02	15.3	
5	4	90.01	50	61	0.94	179.82	178	16	1.39E-02	25.8	1.43E+00
6	4	92.96*	81	149	1.70	185.73	178	16	2.24E-02	31.9	
7	0	109.22	21	125	1.34	218.25	214	9	5.70E-03	101.0	
8	0	186.07*	84	169	1.09	372.01	366	12	2.34E-02	33.7	
9	0	210.28	35	153	0.58	420.44	412	12	9.81E-03	72.0	
10	3	238.55*	415	56	1.08	476.99	472	18	1.15E-01	5.7	1.71E+00
11	3	241.44	88	77	1.90	482.76	472	18	2.43E-02	31.5	
12	6	266.97	13	30	1.36	533.85	532	12	3.68E-03	62.7	2.44E+00
13	6	270.06	26	68	1.58	540.02	532	12	7.35E-03	58.9	
14	0	277.80	33	90	1.33	555.51	549	10	9.20E-03	56.8	
15	0	295.37*	158	77	1.26	590.66	584	13	4.40E-02	14.1	
16	0	301.50	36	76	4.72	602.93	596	13	9.97E-03	53.3	
17	0	337.91	105	47	1.16	675.76	670	10	2.91E-02	15.7	
18	0	352.00*	209	50	1.20	703.94	700	11	5.80E-02	9.6	
19	0	434.31	20	58	4.44	868.61	861	16	5.63E-03	88.1	
20	2	440.31	24	18	2.02	880.60	876	17	6.72E-03	42.2	1.57E+00
21	2	444.15	29	22	2.03	888.30	876	17	8.07E-03	36.7	
22	0	463.30	31	37	0.88	926.60	924	8	8.55E-03	39.5	
23	0	510.77*	62	41	2.24	1021.56	1014	15	1.72E-02	29.6	
24	0	583.13*	106	63	1.45	1166.31	1160	12	2.94E-02	18.1	
25	0	609.17*	136	46	1.43	1218.40	1212	13	3.78E-02	13.5	
26	0	661.58	208	36	1.65	1323.25	1318	12	5.79E-02	9.0	
27	0	665.90	19	5	0.61	1331.88	1329	7	5.28E-03	31.7	
28	0	695.65	17	23	0.86	1391.39	1386	12	4.72E-03	62.3	
29	0	704.04	21	27	0.89	1408.18	1397	18	5.95E-03	60.8	
30	0	727.74	19	27	1.03	1455.59	1448	12	5.27E-03	59.4	
31	0	754.99	54	20	8.83	1510.09	1497	27	1.51E-02	26.7	
32	0	768.76	18	18	1.41	1537.65	1532	11	4.98E-03	54.8	
33	0	773.28	8	11	1.41	1546.69	1543	8	2.35E-03	73.9	
34	0	794.87	28	6	1.00	1589.88	1585	10	7.64E-03	26.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	799.01	9	5	0.56	1598.16	1595	8	2.62E-03	49.7	
36	0	821.19	9	12	4.21	1642.52	1635	10	2.46E-03	86.4	
37	0	910.92	96	6	1.79	1822.01	1816	11	2.65E-02	11.3	
38	0	935.10	12	21	0.80	1870.38	1859	14	3.33E-03	86.0	
39	0	969.52	25	44	1.27	1939.21	1933	14	6.81E-03	61.6	
40	0	1031.64	13	11	0.88	2063.48	2052	15	3.52E-03	64.1	
41	0	1050.16	13	9	3.86	2100.52	2094	12	3.59E-03	54.1	
42	0	1093.61	31	5	4.87	2187.43	2177	20	8.69E-03	25.0	
43	0	1120.46	40	3	2.67	2241.12	2235	13	1.10E-02	18.5	
44	0	1155.98	16	16	0.84	2312.18	2305	13	4.49E-03	56.9	
45	0	1197.74	8	13	0.71	2395.70	2387	13	2.32E-03	95.2	
46	0	1376.00	20	0	3.21	2752.25	2744	16	5.56E-03	22.4	
47	0	1460.53*	335	4	2.38	2921.30	2913	15	9.30E-02	5.7	
48	0	1764.33*	28	0	3.32	3528.90	3522	14	7.82E-03	20.0	
49	0	1847.78	9	0	1.07	3695.78	3692	9	2.50E-03	33.3	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235014.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 8-DEC-2015 10:49:00   Acquisition date  : 3-OCT-2016 08:11:15
Sample ID         : G405235014           Sample quantity  : 153.73 GRAM
Sample type       : SOLID                 Sample geometry  :
Detector name     : GAMMA43              Detector geometry: CAN
Elapsed live time : 0 01:00:00.00        Elapsed real time: 0 01:00:00.71   0.0%
Energy tolerance  : 1.50 keV             Half life ratio  : 10.00
Errors propagated: No                    Systematic Error : 0.00 %
Efficiency type   : Linear                Efficiencies at  : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.002E+00	1.481E+01	1.481E+01	11.33	OK
TE-125M	109.28	0.27*	5.555E+00	8.391E+00	3.138E+02	202.05	OK
CS-135	268.22	16.00*	4.339E+00	1.078E-01	1.078E-01	125.35	OK
BA-137M	661.66	89.90*	1.974E+00	6.050E-01	6.165E-01	18.01	OK
CS-137	661.66	85.10*	1.974E+00	6.391E-01	6.513E-01	18.01	OK
PR-144	696.51	1.34*	1.892E+00	3.437E+00	7.130E+00	124.51	OK
	1489.16	0.28	9.838E-01	-----	Line Not Found	-----	Absent
HG-203	70.83	3.69	2.720E+00	-----	Line Not Found	-----	Absent
	72.87	6.19	2.941E+00	-----	Line Not Found	-----	Absent
	279.20	81.56*	4.200E+00	3.048E-02	2.642E+00	204.81	OK
TL-208	277.37	6.60	4.205E+00	-----	Line Not Found	-----	<<INT Reject
	583.19	85.00*	2.199E+00	2.958E-01	2.958E-01	36.14	OK
	860.56	12.50	1.582E+00	-----	Line Not Found	-----	Absent
PB-210	46.54	4.25*	3.240E-01	2.540E+01	2.606E+01	100.60	OK
PB-212	74.82	10.28	3.152E+00	1.248E+00	1.248E+00	80.16	OK
	77.11	17.10	3.363E+00	1.907E+00	1.907E+00	30.68	OK
	238.63	43.60*	4.740E+00	1.147E+00	1.147E+00	11.44	OK
	300.09	3.30	3.919E+00	1.548E+00	1.548E+00	106.58	OK
BI-214	609.32	45.49*	2.118E+00	7.335E-01	7.337E-01	27.01	OK
	1120.29	14.92	1.266E+00	1.020E+00	1.020E+00	36.97	OK
	1764.49	15.30	8.364E-01	1.016E+00	1.017E+00	39.95	OK
PB-214	74.82	5.80	3.147E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	3.363E+00	3.361E+00	3.362E+00	30.68	OK
	87.09	3.41	4.287E+00	-----	Line Not Found	-----	Absent
	242.00	7.25	4.688E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	3.989E+00	1.205E+00	1.205E+00	28.11	OK
	351.93	35.60*	3.425E+00	9.411E-01	9.414E-01	19.18	OK
RN-222	609.32	45.49*	2.118E+00	7.335E-01	7.337E-01	27.01	OK
	1120.29	14.92	1.266E+00	1.020E+00	1.020E+00	36.97	OK
	1764.49	15.30	8.364E-01	1.016E+00	1.017E+00	39.95	OK
RA-224	240.99	4.10*	4.697E+00	4.607E-01	4.607E-01	377.38	OK
RA-226	609.32	45.49*	2.118E+00	7.335E-01	7.337E-01	27.01	OK
	1120.29	14.92	1.266E+00	1.020E+00	1.020E+00	36.97	OK
	1764.49	15.30	8.364E-01	1.016E+00	1.017E+00	39.95	OK
AC-228	105.21	1.10	5.396E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.550E+00	1.444E+00	1.444E+00	31.44	OK
	794.95	4.25	1.691E+00	1.935E+00	1.935E+00	52.79	OK
	835.71	1.61	1.621E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.508E+00	1.222E+00	1.222E+00	22.57	OK
	968.97	15.80	1.431E+00	5.358E-01	5.358E-01	123.29	OK
RA-228	105.21	1.10	5.396E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.550E+00	1.444E+00	1.444E+00	31.44	OK
	794.95	4.25	1.691E+00	1.935E+00	1.935E+00	52.79	OK
	835.71	1.61	1.621E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.508E+00	1.222E+00	1.222E+00	22.57	OK
	968.97	15.80	1.431E+00	5.358E-01	5.358E-01	123.29	OK
TH-228	74.82	10.28	3.152E+00	1.248E+00	1.248E+00	80.16	OK
	77.11	17.10	3.363E+00	1.907E+00	1.907E+00	30.68	OK
	238.63	43.60*	4.740E+00	1.147E+00	1.147E+00	11.44	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	300.09	3.30	3.919E+00	1.548E+00	1.548E+00	106.58	OK
TH-230	609.32	45.49*	2.118E+00	7.335E-01	7.335E-01	27.01	OK
	1120.29	14.92	1.266E+00	1.020E+00	1.020E+00	36.97	OK
	1764.49	15.30	8.364E-01	1.016E+00	1.016E+00	39.95	OK
PA-231	283.69	1.70	4.127E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.919E+00	9.549E-01	9.549E-01	106.58	OK
TH-232	105.21	1.10	5.396E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.550E+00	1.444E+00	1.444E+00	31.44	OK
	835.71	1.61	1.621E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.508E+00	1.222E+00	1.222E+00	22.57	OK
	968.97	15.80	1.431E+00	5.358E-01	5.358E-01	123.29	OK
TH-234	63.29	3.70*	1.836E+00	2.324E+00	2.324E+00	113.44	OK
	92.59	4.23	4.722E+00	2.512E+00	2.512E+00	63.86	OK
U-234	609.32	45.49*	2.118E+00	7.335E-01	7.335E-01	27.01	OK
	1120.29	14.92	1.266E+00	1.020E+00	1.020E+00	36.97	OK
	1764.49	15.30	8.364E-01	1.016E+00	1.016E+00	39.95	OK
U-235	89.96	3.47	4.512E+00	1.994E+00	1.994E+00	51.66	OK
	93.35	5.60	4.722E+00	1.897E+00	1.897E+00	63.86	OK
	143.76	10.96*	6.023E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	5.876E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.564E+00	1.546E-01	1.546E-01	67.36	OK
	205.31	5.01	5.260E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	1.836E+00	2.324E+00	2.324E+00	113.44	OK
	92.59	4.23	4.722E+00	2.512E+00	2.512E+00	63.86	OK
AM-243	43.53	5.90	1.216E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.152E+00	1.910E-01	1.910E-01	80.16	OK
ANH-511	511.00	100.00*	2.466E+00	1.326E-01	1.326E-01	59.16	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235014.CNF;1 *
 * Acquisition date : 3-OCT-2016 08:11:15 Sensitivity : 3.000 *
 * Detector ID : GAM43 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.71 Half life ratio : ***** *
 * Sample date : 8-DEC-2015 10:49:00 Analyst initials: MXR1 *
 * Sample ID : G405235014 Sample Quantity : 1.5373E+02 GRAM *
 * Batch Number : 1596247 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 6-SEP-2016 07:25:20 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;7 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.481E+01	1.644E+00	6.863E-01
TE-125M	3.138E+02	6.214E+02	5.267E+02
CS-135	1.078E-01	1.324E-01	2.716E-01
BA-137M	6.165E-01	1.088E-01	7.973E-02
CS-137	6.513E-01	1.150E-01	8.423E-02
PR-144	7.130E+00	8.700E+00	9.976E+00
HG-203	2.642E+00	5.302E+00	4.912E+00
TL-208	2.958E-01	1.048E-01	7.283E-02
PB-210	2.606E+01	2.569E+01	1.890E+01
PB-212	1.147E+00	1.286E-01	9.376E-02
BI-214	7.337E-01	1.942E-01	1.399E-01
PB-214	9.414E-01	1.770E-01	1.295E-01
RN-222	7.337E-01	1.942E-01	1.399E-01
RA-224	4.607E-01	1.704E+00	1.005E+00
RA-226	7.337E-01	1.942E-01	1.399E-01
AC-228	1.222E+00	2.702E-01	2.657E-01
RA-228	1.222E+00	2.702E-01	2.657E-01
TH-228	1.147E+00	1.286E-01	9.376E-02
TH-230	7.335E-01	1.942E-01	1.398E-01
PA-231	9.549E-01	9.974E-01	8.322E-01
TH-232	1.222E+00	2.702E-01	2.657E-01
TH-234	2.324E+00	2.583E+00	3.466E+00
U-234	7.335E-01	1.942E-01	1.398E-01
U-235	-2.352E-02	1.788E-01	3.515E-01
U-238	2.324E+00	2.583E+00	3.466E+00
AM-243	1.910E-01	1.500E-01	1.329E-01
ANH-511	1.326E-01	7.689E-02	5.390E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.129E+01		1.462E+01	2.444E+01	NOT IDENT.
NA-22	-8.378E-03		4.504E-02	8.932E-02	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF

AL-26	-3.236E-02	3.683E-02	5.583E-02	NOT IDENT.
SC-46	7.289E-02	3.221E-01	6.806E-01	FAIL ABUN
V-48	0.000E+00	1.413E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	4.006E+02	0.000E+00	SHORT HLIF
MN-54	-1.942E-02	6.643E-02	1.240E-01	NOT IDENT.
CO-56	-9.078E-02	5.059E-01	9.614E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	3.139E-03	5.206E-02	9.550E-02	NOT IDENT.
CO-58	-1.237E-01	5.755E-01	1.101E+00	NOT IDENT.
FE-59	4.269E+00	8.949E+00	1.651E+01	NOT IDENT.
CO-60	2.219E-02	4.296E-02	9.516E-02	NOT IDENT.
ZN-65	-1.444E-01	2.380E-01	3.342E-01	NOT IDENT.
GE-68	5.698E-01	2.104E+00	4.417E+00	NOT IDENT.
AS-73	1.078E+00	1.785E+01	3.442E+01	NOT IDENT.
AS-74	0.000E+00	6.601E+03	0.000E+00	SHORT HLIF
SE-75	-1.310E-01	2.388E-01	3.840E-01	NOT IDENT.
BR-77	0.000E+00	2.356E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	7.819E+02	0.000E+00	SHORT HLIF
RB-83	-1.294E-01	7.147E-01	1.395E+00	NOT IDENT.
KR-85	-3.310E+00	9.208E+00	1.412E+01	NOT IDENT.
SR-85	-3.512E-01	9.735E-01	1.492E+00	NOT IDENT.
RB-86	0.000E+00	2.538E+04	0.000E+00	SHORT HLIF
Y-88	-1.760E-01	1.823E-01	1.968E-01	NOT IDENT.
Y-91	-2.612E+02	6.761E+02	1.259E+03	NOT IDENT.
NB-94	5.865E-02	6.989E-02	6.659E-02	FAIL ABUN
NB-95	7.046E-01	1.044E+00	1.992E+00	NOT IDENT.
NB-95M	-1.012E+00	2.615E+00	4.336E+00	NOT IDENT.
ZR-95	1.957E+00	1.629E+00	3.655E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.583E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.482E+41	0.000E+00	SHORT HLIF
RH-101	-3.795E-02	4.001E-02	6.654E-02	NOT IDENT.
RH-102	5.154E-02	5.776E-02	1.285E-01	NOT IDENT.
RU-103	1.514E+00	5.774E+00	1.128E+01	FAIL ABUN
RH-106	2.972E-01	4.719E-01	1.026E+00	FAIL ABUN
RU-106	2.972E-01	4.719E-01	1.026E+00	FAIL ABUN
AG-108M	4.241E-02	7.319E-02	6.090E-02	FAIL ABUN
CD-109	1.734E+00	1.563E+00	2.901E+00	NOT IDENT.
AG-110M	-1.342E-01	1.085E-01	1.641E-01	NOT IDENT.
SN-113	-2.478E-01	2.780E-01	4.697E-01	NOT IDENT.
CD-115	0.000E+00	3.293E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	9.876E+04	0.000E+00	SHORT HLIF
TE-123M	1.303E-01	1.351E-01	2.830E-01	NOT IDENT.
SB-124	-3.031E-01	2.005E+00	4.171E+00	NOT IDENT.
SB-125	2.322E-02	1.247E-01	2.148E-01	FAIL ABUN
I-126	0.000E+00	9.035E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.424E+06	0.000E+00	SHORT HLIF
SN-126	0.000E+00	9.931E-02	1.962E-01	FAIL ABUN
SB-127	0.000E+00	2.142E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	4.700E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.120E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.875E+26	0.000E+00	SHORT HLIF
BA-133	1.923E-03	4.564E-02	7.799E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	0.000E+00	6.553E-02	1.245E-01	FAIL ABUN
I-135	0.000E+00	1.833E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	4.236E+05	0.000E+00	SHORT HLIF
CE-139	-1.909E-02	1.037E-01	2.027E-01	NOT IDENT.
BA-140	0.000E+00	1.438E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	5.120E+05	0.000E+00	SHORT HLIF
CE-141	-2.980E+00	2.395E+01	4.726E+01	NOT IDENT.
CE-143	0.000E+00	8.116E+40	0.000E+00	SHORT HLIF
CE-144	-8.042E-02	3.852E-01	7.583E-01	NOT IDENT.
PM-144	8.208E-02	1.002E-01	1.253E-01	FAIL ABUN
PM-146	1.728E-02	4.907E-02	9.645E-02	NOT IDENT.
ND-147	0.000E+00	3.358E+07	0.000E+00	SHORT HLIF
PM-147	1.955E+02	9.309E+02	1.727E+03	NOT IDENT.
PM-149	0.000E+00	5.276E+40	0.000E+00	SHORT HLIF
EU-150	2.285E-03	3.046E-02	5.200E-02	FAIL ABUN
EU-152	-6.069E-02	1.084E-01	1.931E-01	NOT IDENT.
GD-153	-8.930E-02	2.365E-01	3.882E-01	NOT IDENT.
EU-154	-2.756E-02	1.142E-01	2.231E-01	NOT IDENT.
EU-155	2.749E-02	1.236E-01	2.158E-01	NOT IDENT.
TB-160	1.175E-01	1.916E+00	3.810E+00	NOT IDENT.
HO-166M	-1.547E-02	6.203E-02	1.175E-01	NOT IDENT.
TM-171	-1.986E+01	4.678E+01	7.968E+01	NOT IDENT.
HF-172	2.189E-01	2.466E-01	4.829E-01	FAIL ABUN

LU-172	0.000E+00	1.244E-01	2.001E-01	FAIL ABUN
LU-176	-4.830E-03	2.643E-02	4.421E-02	NOT IDENT.
HF-181	-1.802E+00	4.908E+00	8.702E+00	NOT IDENT.
TA-182	9.192E-03	1.077E+00	2.130E+00	FAIL ABUN
RE-183	3.007E-01	5.700E+00	1.096E+01	NOT IDENT.
RE-184	-6.113E+00	3.426E+01	6.457E+01	NOT IDENT.
W-188	-3.102E+01	1.259E+02	2.089E+02	FAIL ABUN
IR-192	-2.127E-01	4.731E-01	8.620E-01	FAIL ABUN
BI-207	1.715E-02	5.288E-02	1.075E-01	FAIL ABUN
BI-211	0.000E+00	4.875E-01	8.259E-01	FAIL ABUN
PB-211	-4.174E-01	6.882E-01	1.202E+00	NOT IDENT.
BI-212	7.965E-01	9.276E-01	1.307E+00	FAIL ABUN
RN-219	1.993E-01	4.340E-01	8.510E-01	FAIL ABUN
RA-223	-2.664E-01	6.167E-01	1.122E+00	FAIL ABUN
AC-227	4.542E-02	2.299E-01	4.506E-01	NOT IDENT.
TH-227	4.542E-02	2.299E-01	4.506E-01	NOT IDENT.
TH-229	6.960E-02	4.526E-01	8.954E-01	FAIL ABUN
TH-231	-2.664E-01	6.167E-01	1.122E+00	FAIL ABUN
PA-233	2.563E-03	6.297E-02	1.204E-01	FAIL ABUN
PA-234	1.054E-01	2.756E-01	5.773E-01	NOT IDENT.
PA-234M	1.875E+00	5.187E+00	1.036E+01	NOT IDENT.
NP-237	2.563E-03	6.297E-02	1.204E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	-1.186E-01	2.716E-01	4.776E-01	FAIL ABUN
PU-239	1.003E+02	3.584E+02	6.616E+02	NOT IDENT.
AM-241	8.840E-02	2.500E-01	4.899E-01	NOT IDENT.
CM-243	3.917E-02	1.137E-01	2.158E-01	FAIL ABUN
BK-247	-4.830E-02	8.371E-02	1.341E-01	NOT IDENT.
CM-247	1.053E-03	3.963E-02	7.438E-02	FAIL ABUN
CF-249	4.493E-02	4.237E-02	8.790E-02	NOT IDENT.
CF-251	5.042E-02	1.112E-01	2.257E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	324	10.66*	1.002E+00	1.481E+01	1.481E+01	11.33
TE-125M	109.28	26	0.27*	5.555E+00	8.391E+00	3.138E+02	202.05
CS-135	268.22	15	16.00*	4.339E+00	1.078E-01	1.078E-01	125.35
BA-137M	661.66	220	89.90*	1.974E+00	6.050E-01	6.165E-01	18.01
CS-137	661.66	220	85.10*	1.974E+00	6.391E-01	6.513E-01	18.01
PR-144	696.51	18	1.34*	1.892E+00	3.437E+00	7.130E+00	124.51
	1489.16	-----	0.28	9.838E-01	-----	Line Not Found	-----
HG-203	70.83	-----	3.69	2.720E+00	-----	Line Not Found	-----
	72.87	-----	6.19	2.941E+00	-----	Line Not Found	-----
	279.20	38	81.56*	4.200E+00	5.442E-02	4.716E+00	113.61
TL-208	277.37	38	6.60	4.200E+00	6.725E-01	6.725E-01	113.61
	583.19	113	85.00*	2.199E+00	2.958E-01	2.958E-01	36.14
	860.56	-----	12.50	1.582E+00	-----	Line Not Found	-----
PB-210	46.54	72	4.25*	3.240E-01	2.540E+01	2.606E+01	100.60
BI-211	72.87	-----	1.23	2.941E+00	-----	Line Not Found	-----
	351.06	235	12.92*	3.425E+00	2.593E+00	2.593E+00	19.18
PB-212	74.82	128	10.28	3.152E+00	1.928E+00	1.928E+00	50.94
	77.11	225	17.10	3.363E+00	1.907E+00	1.907E+00	30.68
	238.63	486	43.60*	4.740E+00	1.147E+00	1.147E+00	11.44
	300.09	41	3.30	3.919E+00	1.548E+00	1.548E+00	106.58
BI-214	609.32	145	45.49*	2.118E+00	7.335E-01	7.337E-01	27.01
	1120.29	39	14.92	1.266E+00	1.020E+00	1.020E+00	36.97
	1764.49	27	15.30	8.364E-01	1.016E+00	1.017E+00	39.95
PB-214	74.82	128	5.80	3.152E+00	3.418E+00	3.419E+00	50.94
	77.11	225	9.70	3.363E+00	3.361E+00	3.362E+00	30.68
	87.09	-----	3.41	4.287E+00	-----	Line Not Found	-----
	242.00	102	7.25	4.697E+00	1.465E+00	1.466E+00	62.99
	295.22	181	18.42	3.989E+00	1.205E+00	1.205E+00	28.11
	351.93	235	35.60*	3.425E+00	9.411E-01	9.414E-01	19.18
RN-222	609.32	145	45.49*	2.118E+00	7.335E-01	7.337E-01	27.01
	1120.29	39	14.92	1.266E+00	1.020E+00	1.020E+00	36.97
	1764.49	27	15.30	8.364E-01	1.016E+00	1.017E+00	39.95
RA-224	240.99	102	4.10*	4.697E+00	2.591E+00	2.591E+00	62.99
RA-226	609.32	145	45.49*	2.118E+00	7.335E-01	7.337E-01	27.01
	1120.29	39	14.92	1.266E+00	1.020E+00	1.020E+00	36.97
	1764.49	27	15.30	8.364E-01	1.016E+00	1.017E+00	39.95
AC-228	105.21	-----	1.10	5.396E+00	-----	Line Not Found	-----
	338.32	118	11.27	3.550E+00	1.444E+00	1.444E+00	31.44
	794.95	28	4.25	1.691E+00	1.935E+00	1.935E+00	52.79
	835.71	-----	1.61	1.621E+00	-----	Line Not Found	-----
	911.20	97	25.80*	1.508E+00	1.222E+00	1.222E+00	22.57
	968.97	25	15.80	1.431E+00	5.358E-01	5.358E-01	123.29
RA-228	105.21	-----	1.10	5.396E+00	-----	Line Not Found	-----
	338.32	118	11.27	3.550E+00	1.444E+00	1.444E+00	31.44
	794.95	28	4.25	1.691E+00	1.935E+00	1.935E+00	52.79
	835.71	-----	1.61	1.621E+00	-----	Line Not Found	-----
	911.20	97	25.80*	1.508E+00	1.222E+00	1.222E+00	22.57

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	968.97	25	15.80	1.431E+00	5.358E-01	5.358E-01	123.29
	74.82	128	10.28	3.152E+00	1.928E+00	1.928E+00	50.94
	77.11	225	17.10	3.363E+00	1.907E+00	1.907E+00	30.68
TH-230	238.63	486	43.60*	4.740E+00	1.147E+00	1.147E+00	11.44
	300.09	41	3.30	3.919E+00	1.548E+00	1.548E+00	106.58
	609.32	145	45.49*	2.118E+00	7.335E-01	7.335E-01	27.01
	1120.29	39	14.92	1.266E+00	1.020E+00	1.020E+00	36.97
PA-231	1764.49	27	15.30	8.364E-01	1.016E+00	1.016E+00	39.95
	283.69	-----	1.70	4.127E+00	-----	Line Not Found	-----
TH-232	301.36	41	5.35*	3.919E+00	9.549E-01	9.549E-01	106.58
	105.21	-----	1.10	5.396E+00	-----	Line Not Found	-----
	338.32	118	11.27	3.550E+00	1.444E+00	1.444E+00	31.44
	835.71	-----	1.61	1.621E+00	-----	Line Not Found	-----
TH-234	911.20	97	25.80*	1.508E+00	1.222E+00	1.222E+00	22.57
	968.97	25	15.80	1.431E+00	5.358E-01	5.358E-01	123.29
	63.29	32	3.70*	1.836E+00	2.324E+00	2.324E+00	113.44
U-234	92.59	103	4.23	4.722E+00	2.512E+00	2.512E+00	63.86
	609.32	145	45.49*	2.118E+00	7.335E-01	7.335E-01	27.01
	1120.29	39	14.92	1.266E+00	1.020E+00	1.020E+00	36.97
U-235	1764.49	27	15.30	8.364E-01	1.016E+00	1.016E+00	39.95
	89.96	64	3.47	4.512E+00	1.994E+00	1.994E+00	51.66
	93.35	103	5.60	4.722E+00	1.897E+00	1.897E+00	63.86
	143.76	-----	10.96*	6.023E+00	-----	Line Not Found	-----
	163.33	-----	5.08	5.876E+00	-----	Line Not Found	-----
U-238	185.72	101	57.20	5.564E+00	1.546E-01	1.546E-01	67.36
	205.31	-----	5.01	5.260E+00	-----	Line Not Found	-----
	63.29	32	3.70*	1.836E+00	2.324E+00	2.324E+00	113.44
	92.59	103	4.23	4.722E+00	2.512E+00	2.512E+00	63.86
AM-243	43.53	-----	5.90	1.216E-01	-----	Line Not Found	-----
	74.66	128	67.20*	3.152E+00	2.950E-01	2.950E-01	50.94
ANH-511	511.00	67	100.00*	2.466E+00	1.326E-01	1.326E-01	59.16

Flag: "*" = Keyline

Total number of lines in spectrum 49
 Number of unidentified lines 10
 Number of lines tentatively identified by NID 39 79.59%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.481E+01	1.481E+01	0.168E+01	11.33	
TE-125M	57.40D	37.4	8.391E+00	3.138E+02	6.341E+02	202.05	
CS-135	2.30E+06Y	1.00	1.078E-01	1.078E-01	1.351E-01	125.35	
BA-137M	30.08Y	1.02	6.050E-01	6.165E-01	1.110E-01	18.01	
CS-137	30.08Y	1.02	6.391E-01	6.513E-01	1.173E-01	18.01	
PR-144	284.91D	2.07	3.437E+00	7.130E+00	8.877E+00	124.51	
HG-203	46.59D	86.7	5.442E-02	4.716E+00	5.358E+00	113.61	
TL-208	1.41E+10Y	1.00	2.958E-01	2.958E-01	1.069E-01	36.14	
PB-210	22.20Y	1.03	2.540E+01	2.606E+01	2.621E+01	100.60	
BI-211	7.04E+08Y	1.00	2.593E+00	2.593E+00	0.497E+00	19.18	
PB-212	1.41E+10Y	1.00	1.147E+00	1.147E+00	0.131E+00	11.44	
BI-214	1600.00Y	1.00	7.335E-01	7.337E-01	1.982E-01	27.01	
PB-214	1600.00Y	1.00	9.411E-01	9.414E-01	1.806E-01	19.18	
RN-222	1600.00Y	1.00	7.335E-01	7.337E-01	1.982E-01	27.01	
RA-224	1.41E+10Y	1.00	2.591E+00	2.591E+00	1.632E+00	62.99	
RA-226	1600.00Y	1.00	7.335E-01	7.337E-01	1.982E-01	27.01	
AC-228	1.41E+10Y	1.00	1.222E+00	1.222E+00	0.276E+00	22.57	
RA-228	1.41E+10Y	1.00	1.222E+00	1.222E+00	0.276E+00	22.57	
TH-228	1.41E+10Y	1.00	1.147E+00	1.147E+00	0.131E+00	11.44	
TH-230	7.54E+04Y	1.00	7.335E-01	7.335E-01	1.981E-01	27.01	
PA-231	7.04E+08Y	1.00	9.549E-01	9.549E-01	10.18E-01	106.58	
TH-232	1.41E+10Y	1.00	1.222E+00	1.222E+00	0.276E+00	22.57	
TH-234	4.47E+09Y	1.00	2.324E+00	2.324E+00	2.636E+00	113.44	
U-234	2.45E+05Y	1.00	7.335E-01	7.335E-01	1.981E-01	27.01	
U-235	7.04E+08Y	1.00	1.546E-01	1.546E-01	1.041E-01	67.36	K
U-238	4.47E+09Y	1.00	2.324E+00	2.324E+00	2.636E+00	113.44	
AM-243	7370.00Y	1.00	2.950E-01	2.950E-01	1.503E-01	50.94	
ANH-511	1.00E+09Y	1.00	1.326E-01	1.326E-01	0.785E-01	59.16	
Total Activity :			7.567E+01	3.901E+02			

Grand Total Activity : 7.567E+01 3.901E+02

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	210.28	42	181	0.58	420.44	412	12	9.81E-03	****	5.18E+00	T
6	270.06	31	78	1.58	540.02	532	12	7.35E-03	****	4.30E+00	T
0	434.31	22	64	4.44	868.61	861	16	5.63E-03	****	2.84E+00	T
2	440.31	27	20	2.02	880.60	876	17	6.72E-03	84.4	2.81E+00	T
2	444.15	32	24	2.03	888.30	876	17	8.07E-03	73.5	2.79E+00	
0	463.30	34	41	0.88	926.60	924	8	8.55E-03	79.1	2.69E+00	T
0	665.90	20	5	0.61	1331.88	1329	7	5.28E-03	63.4	1.96E+00	T
0	704.04	22	28	0.89	1408.18	1397	18	5.95E-03	****	1.87E+00	T
0	727.74	20	28	1.03	1455.59	1448	12	5.27E-03	****	1.82E+00	T
0	754.99	56	21	8.83	1510.09	1497	27	1.51E-02	53.5	1.77E+00	T
0	768.76	19	19	1.41	1537.65	1532	11	4.98E-03	****	1.74E+00	
0	773.28	9	11	1.41	1546.69	1543	8	2.35E-03	****	1.73E+00	T
0	799.01	10	5	0.56	1598.16	1595	8	2.62E-03	99.5	1.68E+00	
0	821.19	9	13	4.21	1642.52	1635	10	2.46E-03	****	1.65E+00	
0	935.10	12	21	0.80	1870.38	1859	14	3.33E-03	****	1.48E+00	
0	1031.64	13	11	0.88	2063.48	2052	15	3.52E-03	****	1.36E+00	
0	1050.16	13	9	3.86	2100.52	2094	12	3.59E-03	****	1.34E+00	T
0	1093.61	31	5	4.87	2187.43	2177	20	8.69E-03	49.9	1.29E+00	T
0	1155.98	16	16	0.84	2312.18	2305	13	4.49E-03	****	1.23E+00	
0	1197.74	8	13	0.71	2395.70	2387	13	2.32E-03	****	1.20E+00	
0	1376.00	19	0	3.21	2752.25	2744	16	5.56E-03	44.7	1.06E+00	
0	1847.78	8	0	1.07	3695.78	3692	9	2.50E-03	66.7	7.98E-01	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235014.CNF;1
* Acquisition date   : 3-OCT-2016 08:11:15 Sensitivity      : 3.000
* Detector ID       : GAM43 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.71 Half life ratio : *****
* Sample date       : 8-DEC-2015 10:49:00 Nuclide Library : SOLID
* Sample ID         : G405235014 Analyst initials: MXR1
* Batch Number      : 1596247 Sample Quantity : 1.5373E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 6-SEP-2016 07:25:20 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;7
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.808E-01
TE-125M	2.457E+02
CS-135	1.258E-01
BA-137M	3.598E-02
CS-137	3.800E-02
PR-144	4.433E+00
HG-203	2.280E+00
TL-208	3.278E-02
PB-210	8.795E+00
PB-212	4.352E-02
BI-214	6.289E-02
PB-214	5.911E-02
RN-222	6.289E-02
RA-224	4.667E-01
RA-226	6.289E-02
AC-228	1.156E-01
RA-228	1.156E-01
TH-228	4.352E-02
TH-230	6.286E-02
PA-231	3.832E-01
TH-232	1.156E-01
TH-234	1.630E+00
U-234	6.286E-02
U-235	1.651E-01
U-238	1.630E+00
AM-243	6.306E-02
ANH-511	2.418E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.098E+01	NOT IDENT.
NA-22	3.732E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.978E-02	NOT IDENT.

SC-46	2.880E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.393E-02	NOT IDENT.
CO-56	4.186E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.475E-02	NOT IDENT.
CO-58	4.739E-01	NOT IDENT.
FE-59	7.273E+00	NOT IDENT.
CO-60	4.076E-02	NOT IDENT.
ZN-65	1.427E-01	NOT IDENT.
GE-68	1.866E+00	NOT IDENT.
AS-73	1.607E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.767E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	6.277E-01	NOT IDENT.
KR-85	6.384E+00	NOT IDENT.
SR-85	6.747E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	3.998E-02	NOT IDENT.
Y-91	5.540E+02	NOT IDENT.
NB-94	2.968E-02	FAIL ABUN
NB-95	8.962E-01	NOT IDENT.
NB-95M	2.017E+00	NOT IDENT.
ZR-95	1.646E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.121E-02	NOT IDENT.
RH-102	5.740E-02	NOT IDENT.
RU-103	5.046E+00	FAIL ABUN
RH-106	4.554E-01	FAIL ABUN
RU-106	4.554E-01	FAIL ABUN
AG-108M	2.779E-02	FAIL ABUN
CD-109	1.382E+00	NOT IDENT.
AG-110M	6.827E-02	NOT IDENT.
SN-113	2.142E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.335E-01	NOT IDENT.
SB-124	1.580E+00	NOT IDENT.
SB-125	9.758E-02	FAIL ABUN
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SN-126	9.368E-02	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.554E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	5.611E-02	FAIL ABUN
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	9.455E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.218E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.573E-01	NOT IDENT.
PM-144	5.627E-02	FAIL ABUN
PM-146	4.396E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	8.112E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.397E-02	FAIL ABUN
EU-152	8.881E-02	NOT IDENT.
GD-153	1.825E-01	NOT IDENT.
EU-154	9.356E-02	NOT IDENT.
EU-155	1.009E-01	NOT IDENT.
TB-160	1.650E+00	NOT IDENT.
HO-166M	5.200E-02	NOT IDENT.
TM-171	3.695E+01	NOT IDENT.
HF-172	2.273E-01	FAIL ABUN
LU-172	8.890E-02	FAIL ABUN

LU-176	2.019E-02	NOT IDENT.
HF-181	3.910E+00	NOT IDENT.
TA-182	9.356E-01	FAIL ABUN
RE-183	5.161E+00	NOT IDENT.
RE-184	2.816E+01	NOT IDENT.
W-188	9.609E+01	FAIL ABUN
IR-192	3.939E-01	FAIL ABUN
BI-207	4.684E-02	FAIL ABUN
BI-211	3.976E-01	FAIL ABUN
PB-211	5.410E-01	NOT IDENT.
BI-212	5.979E-01	FAIL ABUN
RN-219	3.914E-01	FAIL ABUN
RA-223	5.141E-01	FAIL ABUN
AC-227	2.091E-01	NOT IDENT.
TH-227	2.091E-01	NOT IDENT.
TH-229	4.187E-01	FAIL ABUN
TH-231	5.141E-01	FAIL ABUN
PA-233	5.550E-02	FAIL ABUN
PA-234	2.503E-01	NOT IDENT.
PA-234M	4.606E+00	NOT IDENT.
NP-237	5.550E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.234E-01	FAIL ABUN
PU-239	3.122E+02	NOT IDENT.
AM-241	2.312E-01	NOT IDENT.
CM-243	1.014E-01	FAIL ABUN
BK-247	6.175E-02	NOT IDENT.
CM-247	3.406E-02	FAIL ABUN
CF-249	4.064E-02	NOT IDENT.
CF-251	1.058E-01	NOT IDENT.

```

*****
*                                     GEL Laboratories LLC                       *
*                                     2040 Savage Road                          *
*                                     Charleston, SC 29407                       *
*****
*                                     DETECTOR AND SAMPLE DATA                  *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235014.CNF;1
* Acquisition date   : 3-OCT-2016 08:11:15 Sensitivity      : 3.000
* Detector ID        : GAM43 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.71 Half life ratio : *****
* Sample date        : 8-DEC-2015 10:49:00 Nuclide Library : SOLID
* Sample ID          : G405235014 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity: 1.5373E+02 GRAM
* Wet wt corr        : 1.00000 Quantity Err(%): 1.3010E-03 %
* Dry Weight         : 0.00000
* Wet Weight         : 0.00000
* Dry Weight         : 0.00000
*****
*                                     CALIBRATION INFORMATION                    *
*
* Eff. Cal. date     : 6-SEP-2016 07:25:20 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.481E+01	1.817E+00	1.817E+00
TE-125M	3.138E+02	6.217E+02	6.217E+02
CS-135	1.078E-01	1.326E-01	1.326E-01
BA-137M	6.165E-01	1.120E-01	1.120E-01
CS-137	6.513E-01	1.183E-01	1.183E-01
PR-144	7.130E+00	8.705E+00	8.705E+00
HG-203	2.642E+00	5.308E+00	5.308E+00
TL-208	2.958E-01	1.055E-01	1.055E-01
PB-210	2.606E+01	2.580E+01	2.580E+01
PB-212	1.147E+00	1.425E-01	1.425E-01
BI-214	7.337E-01	1.968E-01	1.968E-01
PB-214	9.414E-01	1.814E-01	1.814E-01
RN-222	7.337E-01	1.968E-01	1.968E-01
RA-224	4.607E-01	1.710E+00	1.710E+00
RA-226	7.337E-01	1.968E-01	1.968E-01
AC-228	1.222E+00	2.774E-01	2.774E-01
RA-228	1.222E+00	2.774E-01	2.774E-01
TH-228	1.147E+00	1.425E-01	1.425E-01
TH-230	7.335E-01	1.967E-01	1.967E-01
PA-231	9.549E-01	1.018E+00	1.018E+00
TH-232	1.222E+00	2.774E-01	2.774E-01
TH-234	2.324E+00	2.635E+00	2.635E+00
U-234	7.335E-01	1.967E-01	1.967E-01
U-235	-2.352E-02	1.788E-01	1.788E-01
U-238	2.324E+00	2.635E+00	2.635E+00
AM-243	1.910E-01	1.511E-01	1.511E-01
ANH-511	1.326E-01	7.708E-02	7.708E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.129E+01	1.463E+01	1.549E+01	NOT IDENT.
NA-22	-8.378E-03	4.504E-02	4.520E-02	NOT IDENT.
NA-24	1.000E+41	7.300E+41	0.000E+00	SHORT HLIF

AL-26	-3.236E-02	3.689E-02	3.967E-02	NOT IDENT.
SC-46	7.289E-02	3.221E-01	3.238E-01	FAIL ABUN
V-48	-9.700E+02	1.413E+04	1.414E+04	SHORT HLIF
CR-51	3.430E+02	4.009E+02	4.296E+02	SHORT HLIF
MN-54	-1.942E-02	6.643E-02	6.701E-02	NOT IDENT.
CO-56	-9.078E-02	5.059E-01	5.076E-01	NOT IDENT.
MN-56	-1.000E+41	5.573E+41	0.000E+00	SHORT HLIF
CO-57	3.139E-03	5.206E-02	5.208E-02	NOT IDENT.
CO-58	-1.237E-01	5.755E-01	5.782E-01	NOT IDENT.
FE-59	4.269E+00	8.955E+00	9.159E+00	NOT IDENT.
CO-60	2.219E-02	4.296E-02	4.411E-02	NOT IDENT.
ZN-65	-1.444E-01	2.381E-01	2.468E-01	NOT IDENT.
GE-68	5.698E-01	2.104E+00	2.120E+00	NOT IDENT.
AS-73	1.078E+00	1.786E+01	1.786E+01	NOT IDENT.
AS-74	4.392E+03	6.611E+03	6.902E+03	SHORT HLIF
SE-75	-1.310E-01	2.389E-01	2.460E-01	NOT IDENT.
BR-77	2.101E+38	1.819E+39	0.000E+00	SHORT HLIF
SR-82	4.516E+02	7.822E+02	8.082E+02	SHORT HLIF
RB-83	-1.294E-01	7.149E-01	7.173E-01	NOT IDENT.
KR-85	-3.310E+00	9.209E+00	9.329E+00	NOT IDENT.
SR-85	-3.512E-01	9.736E-01	9.864E-01	NOT IDENT.
RB-86	6.876E+03	2.538E+04	2.557E+04	SHORT HLIF
Y-88	-1.760E-01	1.827E-01	1.992E-01	NOT IDENT.
Y-91	-2.612E+02	6.762E+02	6.864E+02	NOT IDENT.
NB-94	5.865E-02	6.993E-02	7.476E-02	FAIL ABUN
NB-95	7.046E-01	1.044E+00	1.091E+00	NOT IDENT.
NB-95M	-1.012E+00	2.616E+00	2.656E+00	NOT IDENT.
ZR-95	1.957E+00	1.632E+00	1.855E+00	NOT IDENT.
NB-97	1.000E+41	5.763E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	3.376E+41	0.000E+00	SHORT HLIF
MO-99	-4.810E+30	1.583E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.485E+41	0.000E+00	SHORT HLIF
RH-101	-3.795E-02	4.059E-02	4.405E-02	NOT IDENT.
RH-102	5.154E-02	5.791E-02	6.240E-02	NOT IDENT.
RU-103	1.514E+00	5.775E+00	5.815E+00	FAIL ABUN
RH-106	2.972E-01	4.723E-01	4.909E-01	FAIL ABUN
RU-106	2.972E-01	4.723E-01	4.909E-01	FAIL ABUN
AG-108M	4.241E-02	7.321E-02	7.567E-02	FAIL ABUN
CD-109	1.734E+00	1.570E+00	1.754E+00	NOT IDENT.
AG-110M	-1.342E-01	1.087E-01	1.244E-01	NOT IDENT.
SN-113	-2.478E-01	2.782E-01	2.997E-01	NOT IDENT.
CD-115	3.730E+38	3.293E+39	0.000E+00	SHORT HLIF
SN-117M	9.717E+04	9.943E+04	1.087E+05	SHORT HLIF
TE-123M	1.303E-01	1.352E-01	1.474E-01	NOT IDENT.
SB-124	-3.031E-01	2.005E+00	2.009E+00	NOT IDENT.
SB-125	2.322E-02	1.247E-01	1.251E-01	FAIL ABUN
I-126	1.455E+06	9.248E+05	1.134E+06	SHORT HLIF
SB-126	-7.524E+05	1.431E+06	1.470E+06	SHORT HLIF
SN-126	1.998E-01	1.001E-01	1.347E-01	FAIL ABUN
SB-127	6.591E+21	2.326E+22	0.000E+00	SHORT HLIF
I-131	-3.823E+08	4.700E+09	4.703E+09	SHORT HLIF
I-132	1.000E+41	1.852E+42	0.000E+00	SHORT HLIF
TE-132	-1.155E+26	3.904E+26	0.000E+00	SHORT HLIF
BA-133	1.923E-03	4.564E-02	4.565E-02	FAIL ABUN
I-133	-1.000E+41	7.635E+41	0.000E+00	SHORT HLIF
CS-134	1.267E-01	6.575E-02	8.708E-02	FAIL ABUN
I-135	-1.000E+41	7.020E+41	0.000E+00	SHORT HLIF
CS-136	-1.299E+04	4.236E+05	4.236E+05	SHORT HLIF
CE-139	-1.909E-02	1.037E-01	1.041E-01	NOT IDENT.
BA-140	3.127E+05	1.438E+06	1.445E+06	SHORT HLIF
LA-140	-6.102E+05	5.128E+05	5.819E+05	SHORT HLIF
CE-141	-2.980E+00	2.395E+01	2.399E+01	NOT IDENT.
CE-143	1.000E+41	8.180E+40	0.000E+00	SHORT HLIF
CE-144	-8.042E-02	3.852E-01	3.870E-01	NOT IDENT.
PM-144	8.208E-02	1.003E-01	1.069E-01	FAIL ABUN
PM-146	1.728E-02	4.909E-02	4.970E-02	NOT IDENT.
ND-147	-4.681E+06	3.358E+07	3.364E+07	SHORT HLIF
PM-147	1.955E+02	9.309E+02	9.351E+02	NOT IDENT.
PM-149	-1.248E+40	5.284E+40	0.000E+00	SHORT HLIF
EU-150	2.285E-03	3.046E-02	3.048E-02	FAIL ABUN
EU-152	-6.069E-02	1.085E-01	1.119E-01	NOT IDENT.
GD-153	-8.930E-02	2.365E-01	2.399E-01	NOT IDENT.
EU-154	-2.756E-02	1.142E-01	1.149E-01	NOT IDENT.
EU-155	2.749E-02	1.236E-01	1.242E-01	NOT IDENT.
TB-160	1.175E-01	1.916E+00	1.916E+00	NOT IDENT.
HO-166M	-1.547E-02	6.204E-02	6.243E-02	NOT IDENT.
TM-171	-1.986E+01	4.682E+01	4.767E+01	NOT IDENT.
HF-172	2.189E-01	2.492E-01	2.680E-01	FAIL ABUN

LU-172	2.541E-01	1.270E-01	1.710E-01	FAIL ABUN
LU-176	-4.830E-03	2.643E-02	2.652E-02	NOT IDENT.
HF-181	-1.802E+00	4.908E+00	4.975E+00	NOT IDENT.
TA-182	9.192E-03	1.077E+00	1.077E+00	FAIL ABUN
RE-183	3.007E-01	5.700E+00	5.702E+00	NOT IDENT.
RE-184	-6.113E+00	3.429E+01	3.440E+01	NOT IDENT.
W-188	-3.102E+01	1.259E+02	1.267E+02	FAIL ABUN
IR-192	-2.127E-01	4.732E-01	4.828E-01	FAIL ABUN
BI-207	1.715E-02	5.288E-02	5.344E-02	FAIL ABUN
BI-211	2.593E+00	5.013E-01	1.272E+00	FAIL ABUN
PB-211	-4.174E-01	6.886E-01	7.138E-01	NOT IDENT.
BI-212	7.965E-01	9.284E-01	9.955E-01	FAIL ABUN
RN-219	1.993E-01	4.347E-01	4.439E-01	FAIL ABUN
RA-223	-2.664E-01	6.169E-01	6.285E-01	FAIL ABUN
AC-227	4.542E-02	2.300E-01	2.309E-01	NOT IDENT.
TH-227	4.542E-02	2.300E-01	2.309E-01	NOT IDENT.
TH-229	6.960E-02	4.527E-01	4.537E-01	FAIL ABUN
TH-231	-2.664E-01	6.169E-01	6.285E-01	FAIL ABUN
PA-233	2.563E-03	6.297E-02	6.298E-02	FAIL ABUN
PA-234	1.054E-01	3.009E-01	3.046E-01	NOT IDENT.
PA-234M	1.875E+00	5.188E+00	5.256E+00	NOT IDENT.
NP-237	2.563E-03	6.297E-02	6.298E-02	FAIL ABUN
NP-238	-1.000E+41	2.329E+41	0.000E+00	SHORT HLIF
NP-239	-1.186E-01	2.717E-01	2.770E-01	FAIL ABUN
PU-239	1.003E+02	3.585E+02	3.613E+02	NOT IDENT.
AM-241	8.840E-02	2.501E-01	2.533E-01	NOT IDENT.
CM-243	3.917E-02	1.137E-01	1.151E-01	FAIL ABUN
BK-247	-4.830E-02	8.428E-02	8.704E-02	NOT IDENT.
CM-247	1.053E-03	3.963E-02	3.963E-02	FAIL ABUN
CF-249	4.493E-02	4.253E-02	4.710E-02	NOT IDENT.
CF-251	5.042E-02	1.113E-01	1.136E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	64.4058	87.09	95.1059	136.47	89.5901
45.60	81.3972	87.57	82.9171	140.51	0.0000
46.54	60.1935	88.03	96.8296	143.76	79.5716
49.72	0.0000	88.34	96.8917	144.24	76.2396
51.35	58.9820	88.47	96.9174	145.44	81.4648
51.87	66.1055	89.96	106.4733	152.43	81.4309
52.39	61.9809	1093.63	82.2839	153.25	0.0000
52.97	64.9081	91.11	0.0000	323.87	77.3383
53.44	61.4644	92.59	82.6084	156.02	0.0000
54.07	64.7612	93.35	82.7340	158.56	0.0000
57.36	0.0000	94.56	82.9328	159.00	68.3382
57.53	80.4045	94.65	82.9474	162.33	67.7803
57.98	85.8707	94.67	82.9507	162.66	0.0000
59.27	90.4818	94.87	82.9837	163.33	65.2611
59.32	82.9528	97.43	90.8392	165.86	68.9747
59.54	84.0801	98.43	73.7531	176.31	58.4133
60.96	83.6789	98.44	73.7545	176.60	0.0000
61.17	83.7255	99.53	90.8130	177.52	63.8218
62.93	90.2769	100.11	81.4679	181.07	0.0000
63.29	82.7403	102.03	91.2436	181.52	74.8339
63.58	81.3498	103.18	72.4389	184.41	79.5725
64.28	94.5941	103.37	72.4650	143.76	79.7011
66.73	91.1561	105.21	63.5730	193.51	65.9907
67.24	86.8734	105.31	63.5844	197.03	70.8041
125.81	92.4729	106.12	90.7423	198.01	78.1562
67.75	92.4883	106.47	90.8003	201.83	73.0265
69.67	113.9450	109.28	64.8439	203.43	92.1826
70.83	90.2279	111.00	77.0874	205.31	83.8582
72.81	98.0849	111.76	0.0000	210.85	58.0999
72.87	98.0990	114.06	79.9234	215.65	64.9001
74.66	115.3021	116.30	0.0000	222.11	72.8267
74.82	115.3446	116.74	81.5095	227.09	70.3987
74.97	115.3846	119.76	61.1397	227.38	69.4811
77.11	115.9520	121.12	74.7598	228.16	0.0000
78.74	100.9369	121.22	74.7724	228.18	62.0220
79.69	87.5635	121.78	72.3879	116.74	62.0220
80.12	84.6249	122.06	72.4217	235.69	69.6121
80.19	0.0000	122.92	83.5878	235.96	73.8947
80.57	114.9618	123.07	71.3128	238.63	56.0477
81.00	122.6412	265.00	78.7690	238.98	0.0000
81.07	122.6602	125.81	62.9874	240.99	56.1822
81.75	108.0564	127.23	102.7431	242.00	56.2398
83.79	93.6820	127.91	86.7462	244.70	40.1436
84.00	99.4395	129.30	85.6962	252.40	0.0000
85.43	173.1168	131.20	108.3770	252.80	52.0285
86.55	90.7850	133.02	93.6951	254.15	0.0000
86.79	98.1120	133.52	94.1851	256.23	51.2351
86.94	98.1432	136.00	92.0359	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	57.0087	355.39	0.0000	584.27	26.1571
264.80	58.4790	356.01	34.7261	595.83	0.0000
265.00	58.4900	364.49	0.0000	427.87	30.2205
268.22	52.8003	366.42	0.0000	602.52	0.0000
269.46	52.8607	372.51	38.3489	604.72	33.7700
270.03	52.8893	375.05	42.6880	607.14	32.3404
271.23	61.7734	377.52	37.4189	609.32	26.6724
273.65	0.0000	356.01	35.4405	610.33	26.6857
276.40	60.0965	388.16	31.2403	614.28	29.5039
277.37	60.1499	388.63	0.0000	618.01	25.8629
277.60	60.1623	391.69	52.9159	620.36	24.9681
278.00	62.1579	264.66	40.2068	621.93	13.8817
279.20	56.2996	401.81	35.8883	630.19	0.0000
279.54	54.8349	402.40	39.1663	631.29	13.0152
279.70	54.8428	404.85	37.0526	633.25	26.9848
280.46	68.2293	410.95	32.8290	634.78	0.0000
283.69	56.5280	413.71	51.5277	635.95	13.0443
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	59.5947	423.72	0.0000	645.85	18.7219
285.90	0.0000	427.09	24.3342	657.76	18.0738
287.50	52.7391	427.87	29.8801	657.90	0.0000
290.67	49.3953	433.94	28.3316	661.66	28.6688
293.27	0.0000	439.40	6.6897	664.57	0.0000
351.93	36.0667	453.88	27.0049	666.33	0.0000
295.96	36.0901	463.37	28.8618	666.50	0.0000
879.38	24.1143	468.07	25.5396	667.71	0.0000
299.98	45.2692	473.00	0.0000	677.62	14.2497
300.09	45.2737	475.06	28.4973	685.70	0.0000
300.13	45.2747	476.78	29.6679	695.00	0.0000
301.36	45.3223	477.60	38.8158	696.49	21.4601
302.85	34.7913	482.18	32.0537	696.51	21.4601
256.23	36.3552	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	15.3340
306.78	40.9787	497.08	20.7872	697.49	15.3354
308.46	45.5960	505.52	26.1108	702.65	16.9077
311.90	45.7278	507.63	0.0000	706.68	13.8582
316.51	45.9027	511.00	25.6105	711.68	23.1475
319.41	0.0000	514.00	36.7321	720.70	0.0000
320.08	0.0000	514.00	36.7321	721.93	0.0000
321.04	34.8114	520.40	29.8434	722.78	12.4047
323.87	48.2326	520.69	0.0000	722.91	12.4055
325.23	48.2852	522.65	0.0000	723.31	13.9583
328.76	0.0000	527.90	0.0000	724.19	15.5151
333.37	40.3282	528.26	24.6846	727.33	24.2752
333.97	45.0027	529.59	23.8203	733.00	18.1694
334.37	40.3600	529.87	0.0000	735.93	17.5424
338.28	52.9413	531.02	0.0000	333.97	17.5540
338.32	52.9434	537.26	0.0000	739.50	0.0000
311.90	43.6740	546.56	0.0000	747.24	15.6680
340.48	43.6740	552.55	23.2261	748.06	25.0773
340.55	0.0000	563.25	26.9522	752.31	12.7572
344.28	55.2752	569.33	28.8403	753.82	0.0000
345.93	45.9470	946.00	28.8428	756.73	12.7806
351.06	44.0311	569.70	27.0428	756.80	12.7810
351.93	36.7168	583.19	27.2324	884.68	15.7769

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	17.3680	1274.44	17.1860	1620.50	5.0767
766.42	22.1102	1001.03	17.2129	1621.92	4.0625
766.84	20.5347	1002.74	17.2227	1678.03	0.0000
772.60	0.0000	1004.73	20.4652	1690.97	4.1234
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.1403
778.90	14.7397	1028.54	0.0000	1063.66	3.4933
783.70	0.0000	1037.84	11.9762	1771.35	1.4975
785.37	14.9203	1038.76	0.0000	1791.20	0.0000
792.07	15.9580	631.29	17.4688	1808.65	7.3931
794.95	11.1836	1048.07	0.0000	1810.72	0.0000
795.86	0.0000	1049.04	17.4824	1836.06	4.2477
810.06	18.0813	1050.41	17.4902		
810.29	18.0829	1063.66	12.0742		
344.28	18.0840	1077.00	0.0000		
810.76	15.0719	1077.34	7.7165		
815.77	0.0000	1085.87	21.2215		
1048.07	0.0000	1093.63	15.5107		
832.01	13.1702	1099.45	12.4312		
834.85	18.2554	1112.07	13.3696		
835.71	18.2615	1112.84	11.1444		
836.80	0.0000	1115.54	19.6292		
846.75	0.0000	1120.29	14.5203		
846.77	17.3201	1120.55	14.5211		
856.80	0.0000	1221.41	14.5242		
860.56	19.4581	1129.67	16.8008		
871.09	18.5065	1131.51	0.0000		
873.19	15.4340	1147.95	0.0000		
875.33	0.0000	1173.23	9.9833		
879.38	13.4066	1177.95	19.0846		
880.51	13.4122	1189.05	12.5361		
883.24	14.4584	1204.77	22.8943		
884.68	21.6985	1221.41	17.4813		
889.28	8.2800	1231.02	17.5277		
894.76	13.4820	1235.36	0.0000		
898.04	16.6128	1238.28	11.0924		
900.72	18.7075	1260.41	0.0000		
903.28	17.6843	1271.87	6.5304		
911.20	15.0223	1274.44	11.2025		
912.08	16.6963	1274.54	10.2690		
923.98	0.0000	1291.59	11.2541		
926.50	10.0690	1298.22	0.0000		
929.11	10.0784	1312.11	0.0000		
937.49	18.5313	1332.49	7.5836		
944.13	0.0000	1362.66	0.0000		
946.00	10.5603	1365.19	8.6036		
949.00	19.0278	1368.63	0.0000		
667.71	0.0000	1384.29	5.3366		
962.31	24.2732	1408.01	9.6631		
964.08	20.4018	1457.56	0.0000		
966.17	11.9092	1460.82	6.8517		
911.20	22.3516	1489.16	4.9272		
968.97	22.3516	1505.03	10.8802		
983.53	0.0000	1584.12	4.0287		
984.45	0.0000	1596.21	0.0000		

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*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                 *
*                               Charleston, SC 29407                            *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235015.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM44.CNF;111
Background date : 2-OCT-2016 11:02:28.
Sample date     : 8-DEC-2015 10:56:00. Acquisition date : 3-OCT-2016 08:11:39.
Sample ID      : G405235015 Sample quantity : 1.45075E+02 GRAM
Detector name  : GAM44 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.75 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID      : 1596247 Detector SN# :
Matrix Spike ID : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	62.79*	60	131	1.00	126.04	122	9	1.68E-02	37.0	
2	3	74.99	79	138	1.07	150.43	147	13	2.18E-02	25.3	1.29E+00
3	3	77.15*	140	118	1.07	154.76	147	13	3.89E-02	15.4	
4	0	87.17	38	144	1.06	174.81	172	7	1.06E-02	54.1	
5	0	93.06*	58	181	1.03	186.60	183	10	1.60E-02	46.7	
6	0	99.51*	31	187	3.33	199.50	193	12	8.49E-03	92.2	
7	0	185.90*	102	114	0.96	372.34	366	12	2.83E-02	23.7	
8	0	209.20	26	70	0.93	418.96	416	7	7.09E-03	57.9	
9	4	238.73*	365	63	1.15	478.06	472	19	1.01E-01	6.5	1.12E+00
10	4	241.60	113	88	1.78	483.80	472	19	3.14E-02	24.2	
11	0	271.00	23	74	1.46	542.61	536	9	6.29E-03	71.7	
12	0	284.47	43	79	3.86	569.57	562	15	1.20E-02	47.4	
13	2	295.41	91	56	1.42	591.47	587	18	2.53E-02	17.9	1.56E+00
14	2	299.91	21	56	1.56	600.46	587	18	5.84E-03	69.0	
15	0	321.84	37	40	0.98	644.35	640	10	1.03E-02	36.0	
16	0	338.37	70	82	1.05	677.42	673	11	1.95E-02	27.4	
17	0	351.83*	241	48	1.19	704.35	698	11	6.71E-02	8.6	
18	0	414.86	15	37	2.38	830.48	823	10	4.05E-03	82.7	
19	0	482.23	12	21	1.49	965.28	959	10	3.27E-03	80.2	
20	0	511.09*	64	23	2.12	1023.03	1015	16	1.76E-02	25.5	
21	2	516.88	21	4	1.80	1034.63	1031	25	5.80E-03	29.6	1.60E+00
22	2	525.75	19	7	1.81	1052.37	1031	25	5.21E-03	30.7	
23	0	583.28*	120	33	1.30	1167.51	1162	10	3.33E-02	13.0	
24	0	609.36*	155	35	1.35	1219.70	1213	15	4.31E-02	11.6	
25	0	661.95	78	40	1.17	1324.93	1319	12	2.18E-02	19.2	
26	0	669.81	10	26	4.82	1340.67	1330	12	2.80E-03	107.3	
27	0	727.83	17	25	1.36	1456.78	1451	10	4.66E-03	60.9	
28	0	738.40	5	10	0.89	1477.92	1474	6	1.25E-03	116.5	
29	0	768.61	27	23	1.71	1538.38	1529	13	7.49E-03	41.3	
30	0	772.60	8	13	1.38	1546.37	1543	7	2.35E-03	76.9	
31	0	794.46	35	7	1.26	1590.12	1584	13	9.79E-03	22.5	
32	0	861.16	37	15	0.64	1723.62	1714	20	1.03E-02	30.5	
33	0	871.28	26	13	6.59	1743.86	1734	18	7.15E-03	38.8	
34	0	911.36*	73	24	1.06	1824.08	1819	11	2.02E-02	18.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	923.46	11	5	0.59	1848.31	1845	7	3.07E-03	45.4	
36	5	964.70	22	5	2.91	1930.84	1926	18	6.07E-03	27.5	1.67E+00
37	5	968.96*	44	5	1.74	1939.36	1926	18	1.23E-02	20.0	
38	0	1005.15	8	12	0.92	2011.81	2008	8	2.22E-03	82.9	
39	0	1039.30	7	14	0.97	2080.16	2071	11	2.02E-03	105.3	
40	0	1041.21	13	1	1.51	2083.97	2081	6	3.50E-03	32.0	
41	0	1084.19	13	14	0.73	2170.00	2162	14	3.61E-03	67.1	
42	0	1095.28	7	7	0.98	2192.21	2188	6	1.84E-03	76.1	
43	0	1098.49	16	4	3.22	2198.64	2194	10	4.44E-03	35.6	
44	0	1120.70	34	30	1.56	2243.09	2237	15	9.44E-03	39.1	
45	0	1154.44	16	8	2.34	2310.63	2305	11	4.45E-03	42.6	
46	0	1223.88	9	11	0.65	2449.62	2444	9	2.51E-03	74.6	
47	0	1333.06	9	6	2.33	2668.18	2661	11	2.36E-03	63.5	
48	0	1460.73*	384	4	2.05	2923.76	2915	16	1.07E-01	5.3	
49	0	1764.90	24	2	2.03	3532.71	3528	11	6.61E-03	24.4	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235015.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 8-DEC-2015 10:56:00   Acquisition date  : 3-OCT-2016 08:11:39
Sample ID        : G405235015             Sample quantity   : 145.07 GRAM
Sample type      : SOLID                   Sample geometry   :
Detector name    : GAMMA44                Detector geometry : CAN
Elapsed live time: 0 01:00:00.00          Elapsed real time: 0 01:00:00.75   0.0%
Energy tolerance : 1.50 keV               Half life ratio   : 10.00
Errors propagated: No                      Systematic Error  : 0.00 %
Efficiency type  : Linear                  Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.030E+00	1.738E+01	1.738E+01	10.57	OK
CD-109	88.03	3.70*	4.453E+00	8.036E-01	1.261E+00	202.07	OK
SN-126	64.28	9.60	1.986E+00	2.070E+00	2.070E+00	73.96	OK
	86.94	8.90	4.453E+00	3.341E-01	3.341E-01	202.07	OK
	87.57	37.00*	4.453E+00	8.036E-02	8.036E-02	202.07	OK
BA-137M	661.66	89.90*	1.965E+00	2.384E-01	2.430E-01	38.33	OK
CS-137	661.66	85.10*	1.965E+00	2.519E-01	2.567E-01	38.33	OK
TL-208	277.37	6.60	4.074E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.178E+00	3.520E-01	3.520E-01	26.04	OK
	860.56	12.50	1.591E+00	9.740E-01	9.740E-01	60.95	OK
BI-211	72.87	1.23	3.135E+00	-----	Line Not Found	-----	Absent
	351.06	12.92*	3.337E+00	1.150E+00	1.150E+00	79.27	OK
PB-212	74.82	10.28	3.357E+00	1.054E+00	1.054E+00	71.86	OK
	77.11	17.10	3.576E+00	1.473E+00	1.473E+00	30.75	OK
	238.63	43.60*	4.584E+00	1.073E+00	1.073E+00	12.92	OK
	300.09	3.30	3.820E+00	9.620E-01	9.620E-01	137.97	OK
BI-214	609.32	45.49*	2.102E+00	8.785E-01	8.789E-01	23.19	OK
	1120.29	14.92	1.287E+00	9.041E-01	9.044E-01	78.15	OK
	1764.49	15.30	8.672E-01	8.753E-01	8.756E-01	48.71	OK
PB-214	74.82	5.80	3.340E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	3.576E+00	2.597E+00	2.598E+00	30.75	OK
	87.09	3.41	4.447E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	4.538E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	3.868E+00	7.375E-01	7.378E-01	35.88	OK
	351.93	35.60*	3.336E+00	-----	Line Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.102E+00	8.785E-01	8.789E-01	23.19	OK
	1120.29	14.92	1.287E+00	9.041E-01	9.044E-01	78.15	OK
	1764.49	15.30	8.672E-01	8.753E-01	8.756E-01	48.71	OK
RA-224	240.99	4.10*	4.543E+00	2.256E+00	2.256E+00	79.02	OK
RA-226	609.32	45.49*	2.102E+00	8.785E-01	8.789E-01	23.19	OK
	1120.29	14.92	1.287E+00	9.041E-01	9.044E-01	78.15	OK
	1764.49	15.30	8.672E-01	8.753E-01	8.756E-01	48.71	OK
AC-228	105.21	1.10	5.460E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.450E+00	1.031E+00	1.031E+00	54.85	OK
	794.95	4.25	1.697E+00	2.579E+00	2.579E+00	45.09	OK
	835.71	1.61	1.630E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.521E+00	9.637E-01	9.637E-01	35.95	OK
	968.97	15.80	1.448E+00	9.995E-01	9.995E-01	39.93	OK
RA-228	105.21	1.10	5.460E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.450E+00	1.031E+00	1.031E+00	54.85	OK
	794.95	4.25	1.697E+00	2.579E+00	2.579E+00	45.09	OK
	835.71	1.61	1.630E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.521E+00	9.637E-01	9.637E-01	35.95	OK
	968.97	15.80	1.448E+00	9.995E-01	9.995E-01	39.93	OK
TH-228	74.82	10.28	3.357E+00	1.054E+00	1.054E+00	71.86	OK
	77.11	17.10	3.576E+00	1.473E+00	1.473E+00	30.75	OK
	238.63	43.60*	4.584E+00	1.073E+00	1.073E+00	12.92	OK
	300.09	3.30	3.820E+00	9.620E-01	9.620E-01	137.97	OK
TH-230	609.32	45.49*	2.102E+00	8.785E-01	8.785E-01	23.19	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	1120.29	14.92	1.287E+00	9.041E-01	9.041E-01	78.15	OK
	1764.49	15.30	8.672E-01	8.753E-01	8.753E-01	48.71	OK
PA-231	283.69	1.70	3.991E+00	3.676E+00	3.676E+00	94.84	OK
	301.36	5.35*	3.820E+00	5.934E-01	5.934E-01	137.97	OK
TH-232	105.21	1.10	5.460E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.450E+00	1.031E+00	1.031E+00	54.85	OK
	835.71	1.61	1.630E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.521E+00	9.637E-01	9.637E-01	35.95	OK
	968.97	15.80	1.448E+00	9.995E-01	9.995E-01	39.93	OK
TH-234	63.29	3.70*	1.986E+00	5.371E+00	5.371E+00	73.96	OK
	92.59	4.23	4.860E+00	1.783E+00	1.783E+00	93.49	OK
U-234	609.32	45.49*	2.102E+00	8.785E-01	8.785E-01	23.19	OK
	1120.29	14.92	1.287E+00	9.041E-01	9.041E-01	78.15	OK
	1764.49	15.30	8.672E-01	8.753E-01	8.753E-01	48.71	OK
U-238	63.29	3.70*	1.986E+00	5.371E+00	5.371E+00	73.96	OK
	92.59	4.23	4.860E+00	1.783E+00	1.783E+00	93.49	OK
AM-243	43.53	5.90	1.573E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.357E+00	1.612E-01	1.612E-01	71.86	OK
ANH-511	511.00	100.00*	2.430E+00	1.437E-01	1.437E-01	51.05	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235015.CNF;1
* Acquisition date   : 3-OCT-2016 08:11:39 Sensitivity      : 3.000
* Detector ID       : GAM44 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.75 Half life ratio : *****
* Sample date      : 8-DEC-2015 10:56:00 Analyst initials: MXR1
* Sample ID       : G405235015 Sample Quantity : 1.4507E+02 GRAM
* Batch Number    : 1596247 Wet Weight : 0.00000
* Wet wt corr    : 1.00000 Dry Weight : 0.00000
* Nuclide Library : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date   : 6-SEP-2016 04:59:25 Eff. Geometry   : CAN
* Eff. File       : DKA100:[CANBERRA.GAMMA]EFF_GAM44_CAN.CNF;3
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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.738E+01	1.800E+00	6.783E-01
CD-109	1.261E+00	2.497E+00	2.713E+00
SN-126	8.036E-02	1.591E-01	1.577E-01
BA-137M	2.430E-01	9.127E-02	7.562E-02
CS-137	2.567E-01	9.642E-02	7.989E-02
TL-208	3.520E-01	8.982E-02	6.522E-02
BI-211	1.150E+00	8.936E-01	3.333E-01
PB-212	1.073E+00	1.359E-01	9.191E-02
BI-214	8.789E-01	1.997E-01	1.300E-01
PB-214	1.155E+00	1.947E-01	3.487E-01
RN-222	8.789E-01	1.997E-01	1.300E-01
RA-224	2.256E+00	1.747E+00	9.855E-01
RA-226	8.789E-01	1.997E-01	1.300E-01
AC-228	9.637E-01	3.395E-01	2.921E-01
RA-228	9.637E-01	3.395E-01	2.921E-01
TH-228	1.073E+00	1.359E-01	9.191E-02
TH-230	8.785E-01	1.997E-01	1.300E-01
PA-231	5.934E-01	8.023E-01	8.249E-01
TH-232	9.637E-01	3.395E-01	2.921E-01
TH-234	5.371E+00	3.893E+00	2.910E+00
U-234	8.785E-01	1.996E-01	1.300E-01
U-238	5.371E+00	3.893E+00	2.910E+00
AM-243	1.612E-01	1.135E-01	1.148E-01
ANH-511	1.437E-01	7.188E-02	4.525E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.215E+00	1.313E+01	2.278E+01	NOT IDENT.
NA-22	-2.426E-02	5.689E-02	1.037E-01	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	1.487E-02	3.214E-02	7.812E-02	NOT IDENT.
SC-46	-2.499E-01	3.789E-01	6.934E-01	FAIL ABUN
V-48	0.000E+00	1.677E+04	0.000E+00	SHORT HLIF

CR-51	0.000E+00	4.430E+02	0.000E+00	SHORT HLIF
MN-54	-1.210E-02	8.120E-02	1.475E-01	NOT IDENT.
CO-56	-1.101E-01	4.646E-01	8.533E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	5.235E-02	4.850E-02	9.989E-02	NOT IDENT.
CO-58	1.616E-01	5.703E-01	1.163E+00	NOT IDENT.
FE-59	1.183E+01	8.264E+00	1.373E+01	FAIL ABUN
CO-60	4.267E-02	5.311E-02	9.449E-02	FAIL ABUN
ZN-65	1.012E-01	2.061E-01	4.006E-01	NOT IDENT.
GE-68	2.101E+00	2.449E+00	5.311E+00	NOT IDENT.
AS-73	2.130E+00	1.516E+01	3.040E+01	NOT IDENT.
AS-74	0.000E+00	6.059E+03	0.000E+00	SHORT HLIF
SE-75	-3.892E-03	2.215E-01	3.990E-01	NOT IDENT.
BR-77	0.000E+00	2.486E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	9.496E+02	0.000E+00	SHORT HLIF
RB-83	3.473E-01	6.642E-01	1.294E+00	NOT IDENT.
KR-85	6.488E+00	5.028E+00	1.124E+01	NOT IDENT.
SR-85	6.846E-01	5.313E-01	1.188E+00	NOT IDENT.
RB-86	0.000E+00	3.075E+04	0.000E+00	SHORT HLIF
Y-88	-2.598E-02	2.676E-01	5.665E-01	NOT IDENT.
Y-91	2.110E+02	6.393E+02	1.306E+03	NOT IDENT.
NB-94	2.033E-02	3.945E-02	7.873E-02	FAIL ABUN
NB-95	1.164E-01	1.067E+00	1.829E+00	NOT IDENT.
NB-95M	-1.639E+00	2.828E+00	4.342E+00	NOT IDENT.
ZR-95	-9.700E-01	1.819E+00	3.138E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.810E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	1.974E-02	3.565E-02	6.993E-02	NOT IDENT.
RH-102	7.340E-03	5.816E-02	1.156E-01	NOT IDENT.
RU-103	-2.265E+00	6.652E+00	1.230E+01	FAIL ABUN
RH-106	2.279E-02	5.336E-01	1.037E+00	NOT IDENT.
RU-106	2.279E-02	5.336E-01	1.037E+00	NOT IDENT.
AG-108M	1.552E-02	3.093E-02	6.332E-02	NOT IDENT.
AG-110M	-1.230E-01	1.150E-01	1.947E-01	NOT IDENT.
SN-113	-1.381E-01	2.528E-01	4.650E-01	NOT IDENT.
CD-115	0.000E+00	2.914E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	9.547E+04	0.000E+00	SHORT HLIF
TE-123M	2.414E-02	1.261E-01	2.394E-01	NOT IDENT.
SB-124	-9.028E-01	1.943E+00	3.543E+00	NOT IDENT.
SB-125	2.405E-02	1.017E-01	2.058E-01	FAIL ABUN
TE-125M	-4.543E+01	2.972E+02	5.574E+02	NOT IDENT.
I-126	0.000E+00	1.066E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	9.128E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	2.299E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	4.605E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	4.228E+26	0.000E+00	SHORT HLIF
BA-133	5.431E-02	3.986E-02	8.526E-02	NOT IDENT.
I-133	0.000E+00	1.388E+41	0.000E+00	SHORT HLIF
CS-134	0.000E+00	7.462E-02	1.326E-01	FAIL ABUN
CS-135	-2.155E-02	1.460E-01	2.585E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.293E+05	0.000E+00	SHORT HLIF
CE-139	7.823E-02	1.206E-01	2.342E-01	NOT IDENT.
BA-140	0.000E+00	1.205E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.009E+05	0.000E+00	SHORT HLIF
CE-141	1.041E+00	2.691E+01	5.004E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	-2.331E-01	3.726E-01	6.609E-01	NOT IDENT.
PM-144	-7.840E-03	6.171E-02	1.150E-01	NOT IDENT.
PR-144	-6.812E-01	5.361E+00	9.992E+00	NOT IDENT.
PM-146	2.362E-02	4.484E-02	9.309E-02	NOT IDENT.
ND-147	0.000E+00	3.052E+07	0.000E+00	SHORT HLIF
PM-147	-5.403E+01	8.382E+02	1.579E+03	NOT IDENT.
PM-149	0.000E+00	9.295E+40	0.000E+00	SHORT HLIF
EU-150	5.076E-06	2.641E-02	4.717E-02	FAIL ABUN
EU-152	2.974E-02	8.964E-02	1.835E-01	FAIL ABUN
GD-153	1.756E-01	1.968E-01	3.800E-01	NOT IDENT.
EU-154	-6.221E-02	1.389E-01	2.524E-01	FAIL ABUN
EU-155	-1.454E-02	1.127E-01	2.128E-01	FAIL ABUN
TB-160	7.227E-01	1.782E+00	3.904E+00	FAIL ABUN
HO-166M	-4.340E-03	5.857E-02	1.111E-01	FAIL ABUN
TM-171	1.593E+00	3.750E+01	7.477E+01	NOT IDENT.
HF-172	-6.872E-02	2.293E-01	4.218E-01	FAIL ABUN
LU-172	2.874E-02	1.066E-01	1.947E-01	FAIL ABUN
LU-176	7.255E-03	2.377E-02	4.854E-02	FAIL ABUN

HF-181	4.271E+00	6.717E+00	8.497E+00	FAIL ABUN
TA-182	-1.841E-01	1.190E+00	1.980E+00	FAIL ABUN
RE-183	-2.181E-01	4.547E+00	8.974E+00	NOT IDENT.
RE-184	-8.667E+00	2.909E+01	5.692E+01	NOT IDENT.
W-188	9.675E+00	1.339E+02	2.221E+02	FAIL ABUN
IR-192	1.295E-01	4.625E-01	9.399E-01	FAIL ABUN
HG-203	-1.257E+00	2.412E+00	4.061E+00	NOT IDENT.
BI-207	6.760E-02	5.011E-02	1.207E-01	FAIL ABUN
PB-210	-1.268E-01	7.562E+00	1.525E+01	NOT IDENT.
PB-211	1.792E-01	7.193E-01	1.438E+00	NOT IDENT.
BI-212	7.358E-01	8.783E-01	1.335E+00	FAIL ABUN
RN-219	-2.098E-01	3.617E-01	6.640E-01	FAIL ABUN
RA-223	-4.391E-01	6.307E-01	1.017E+00	FAIL ABUN
AC-227	-3.762E-01	2.657E-01	3.996E-01	FAIL ABUN
TH-227	-3.762E-01	2.657E-01	3.996E-01	FAIL ABUN
TH-229	-7.744E-02	4.848E-01	8.736E-01	FAIL ABUN
TH-231	-4.391E-01	6.307E-01	1.017E+00	FAIL ABUN
PA-233	5.431E-02	6.613E-02	1.385E-01	FAIL ABUN
PA-234	1.529E-02	2.725E-01	5.620E-01	FAIL ABUN
PA-234M	3.369E+00	4.340E+00	9.184E+00	NOT IDENT.
U-235	1.771E-02	1.940E-01	3.630E-01	FAIL ABUN
NP-237	5.431E-02	6.613E-02	1.385E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	-1.136E-01	2.437E-01	4.440E-01	FAIL ABUN
PU-239	-4.243E+01	3.300E+02	6.121E+02	FAIL ABUN
AM-241	6.568E-02	2.020E-01	3.839E-01	NOT IDENT.
CM-243	2.062E-02	1.056E-01	1.915E-01	FAIL ABUN
BK-247	1.557E-03	7.712E-02	1.394E-01	NOT IDENT.
CM-247	1.930E-02	3.194E-02	6.773E-02	NOT IDENT.
CF-249	1.140E-02	3.678E-02	7.492E-02	NOT IDENT.
CF-251	-6.705E-02	1.119E-01	1.944E-01	FAIL ABUN

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	369	10.66*	1.030E+00	1.738E+01	1.738E+01	10.57
CD-109	88.03	47	3.70*	4.453E+00	1.483E+00	2.328E+00	108.23
SN-126	64.28	76	9.60	1.986E+00	2.070E+00	2.070E+00	73.96
	86.94	47	8.90	4.453E+00	6.167E-01	6.167E-01	108.23
	87.57	47	37.00*	4.453E+00	1.483E-01	1.483E-01	108.23
BA-137M	661.66	81	89.90*	1.965E+00	2.384E-01	2.430E-01	38.33
CS-137	661.66	81	85.10*	1.965E+00	2.519E-01	2.567E-01	38.33
TL-208	277.37	-----	6.60	4.074E+00	-----	Line Not Found	-----
	583.19	126	85.00*	2.178E+00	3.520E-01	3.520E-01	26.04
	860.56	37	12.50	1.591E+00	9.740E-01	9.740E-01	60.95
BI-211	72.87	-----	1.23	3.135E+00	-----	Line Not Found	-----
	351.06	265	12.92*	3.337E+00	3.182E+00	3.182E+00	17.20
PB-212	74.82	98	10.28	3.357E+00	1.470E+00	1.470E+00	50.50
	77.11	174	17.10	3.576E+00	1.473E+00	1.473E+00	30.75
	238.63	415	43.60*	4.584E+00	1.073E+00	1.073E+00	12.92
	300.09	23	3.30	3.820E+00	9.620E-01	9.620E-01	137.97
BI-214	609.32	162	45.49*	2.102E+00	8.785E-01	8.789E-01	23.19
	1120.29	34	14.92	1.287E+00	9.041E-01	9.044E-01	78.15
	1764.49	22	15.30	8.672E-01	8.753E-01	8.756E-01	48.71
PB-214	74.82	98	5.80	3.357E+00	2.605E+00	2.606E+00	50.50
	77.11	174	9.70	3.576E+00	2.597E+00	2.598E+00	30.75
	87.09	47	3.41	4.453E+00	1.609E+00	1.610E+00	108.23
	242.00	128	7.25	4.543E+00	2.013E+00	2.014E+00	48.32
	295.22	102	18.42	3.868E+00	7.375E-01	7.378E-01	35.88
	351.93	265	35.60*	3.337E+00	1.155E+00	1.155E+00	17.20
RN-222	609.32	162	45.49*	2.102E+00	8.785E-01	8.789E-01	23.19
	1120.29	34	14.92	1.287E+00	9.041E-01	9.044E-01	78.15
	1764.49	22	15.30	8.672E-01	8.753E-01	8.756E-01	48.71
RA-224	240.99	128	4.10*	4.543E+00	3.560E+00	3.560E+00	48.32
RA-226	609.32	162	45.49*	2.102E+00	8.785E-01	8.789E-01	23.19
	1120.29	34	14.92	1.287E+00	9.041E-01	9.044E-01	78.15
	1764.49	22	15.30	8.672E-01	8.753E-01	8.756E-01	48.71
AC-228	105.21	-----	1.10	5.460E+00	-----	Line Not Found	-----
	338.32	77	11.27	3.450E+00	1.031E+00	1.031E+00	54.85
	794.95	36	4.25	1.697E+00	2.579E+00	2.579E+00	45.09
	835.71	-----	1.61	1.630E+00	-----	Line Not Found	-----
	911.20	73	25.80*	1.521E+00	9.637E-01	9.637E-01	35.95
	968.97	44	15.80	1.448E+00	9.995E-01	9.995E-01	39.93
RA-228	105.21	-----	1.10	5.460E+00	-----	Line Not Found	-----
	338.32	77	11.27	3.450E+00	1.031E+00	1.031E+00	54.85
	794.95	36	4.25	1.697E+00	2.579E+00	2.579E+00	45.09
	835.71	-----	1.61	1.630E+00	-----	Line Not Found	-----
	911.20	73	25.80*	1.521E+00	9.637E-01	9.637E-01	35.95
	968.97	44	15.80	1.448E+00	9.995E-01	9.995E-01	39.93
TH-228	74.82	98	10.28	3.357E+00	1.470E+00	1.470E+00	50.50
	77.11	174	17.10	3.576E+00	1.473E+00	1.473E+00	30.75
	238.63	415	43.60*	4.584E+00	1.073E+00	1.073E+00	12.92

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-230	300.09	23	3.30	3.820E+00	9.620E-01	9.620E-01	137.97
	609.32	162	45.49*	2.102E+00	8.785E-01	8.785E-01	23.19
	1120.29	34	14.92	1.287E+00	9.041E-01	9.041E-01	78.15
PA-231	1764.49	22	15.30	8.672E-01	8.753E-01	8.753E-01	48.71
	283.69	48	1.70	3.991E+00	3.676E+00	3.676E+00	94.84
TH-232	301.36	23	5.35*	3.820E+00	5.934E-01	5.934E-01	137.97
	105.21	-----	1.10	5.460E+00	-----	Line Not Found	-----
	338.32	77	11.27	3.450E+00	1.031E+00	1.031E+00	54.85
TH-234	835.71	-----	1.61	1.630E+00	-----	Line Not Found	-----
	911.20	73	25.80*	1.521E+00	9.637E-01	9.637E-01	35.95
	968.97	44	15.80	1.448E+00	9.995E-01	9.995E-01	39.93
U-234	63.29	76	3.70*	1.986E+00	5.371E+00	5.371E+00	73.96
	92.59	71	4.23	4.860E+00	1.783E+00	1.783E+00	93.49
U-238	609.32	162	45.49*	2.102E+00	8.785E-01	8.785E-01	23.19
	1120.29	34	14.92	1.287E+00	9.041E-01	9.041E-01	78.15
	1764.49	22	15.30	8.672E-01	8.753E-01	8.753E-01	48.71
AM-243	63.29	76	3.70*	1.986E+00	5.371E+00	5.371E+00	73.96
	92.59	71	4.23	4.860E+00	1.783E+00	1.783E+00	93.49
ANH-511	43.53	-----	5.90	1.573E-01	-----	Line Not Found	-----
	74.66	98	67.20*	3.357E+00	2.248E-01	2.248E-01	50.50
	511.00	67	100.00*	2.430E+00	1.437E-01	1.437E-01	51.05

Flag: "*" = Keyline

Total number of lines in spectrum 49
 Number of unidentified lines 10
 Number of lines tentatively identified by NID 39 79.59%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.738E+01	1.738E+01	0.184E+01	10.57	
CD-109	461.40D	1.57	1.483E+00	2.328E+00	2.519E+00	108.23	
SN-126	2.30E+05Y	1.00	1.483E-01	1.483E-01	1.605E-01	108.23	
BA-137M	30.08Y	1.02	2.384E-01	2.430E-01	0.931E-01	38.33	
CS-137	30.08Y	1.02	2.519E-01	2.567E-01	0.984E-01	38.33	
TL-208	1.41E+10Y	1.00	3.520E-01	3.520E-01	0.917E-01	26.04	
BI-211	7.04E+08Y	1.00	3.182E+00	3.182E+00	0.547E+00	17.20	
PB-212	1.41E+10Y	1.00	1.073E+00	1.073E+00	0.139E+00	12.92	
BI-214	1600.00Y	1.00	8.785E-01	8.789E-01	2.038E-01	23.19	
PB-214	1600.00Y	1.00	1.155E+00	1.155E+00	0.199E+00	17.20	
RN-222	1600.00Y	1.00	8.785E-01	8.789E-01	2.038E-01	23.19	
RA-224	1.41E+10Y	1.00	3.560E+00	3.560E+00	1.720E+00	48.32	
RA-226	1600.00Y	1.00	8.785E-01	8.789E-01	2.038E-01	23.19	
AC-228	1.41E+10Y	1.00	9.637E-01	9.637E-01	3.464E-01	35.95	
RA-228	1.41E+10Y	1.00	9.637E-01	9.637E-01	3.464E-01	35.95	
TH-228	1.41E+10Y	1.00	1.073E+00	1.073E+00	0.139E+00	12.92	
TH-230	7.54E+04Y	1.00	8.785E-01	8.785E-01	2.037E-01	23.19	
PA-231	7.04E+08Y	1.00	5.934E-01	5.934E-01	8.186E-01	137.97	
TH-232	1.41E+10Y	1.00	9.637E-01	9.637E-01	3.464E-01	35.95	
TH-234	4.47E+09Y	1.00	5.371E+00	5.371E+00	3.973E+00	73.96	
U-234	2.45E+05Y	1.00	8.785E-01	8.785E-01	2.037E-01	23.19	
U-238	4.47E+09Y	1.00	5.371E+00	5.371E+00	3.973E+00	73.96	
AM-243	7370.00Y	1.00	2.248E-01	2.248E-01	1.135E-01	50.50	
ANH-511	1.00E+09Y	1.00	1.437E-01	1.437E-01	0.733E-01	51.05	
Total Activity :			4.889E+01	4.975E+01			

Grand Total Activity : 4.889E+01 4.975E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	99.51	37	228	3.33	199.50	193	12	8.49E-03	****	5.22E+00	T
0	185.90	118	132	0.96	372.34	366	12	2.83E-02	47.5	5.40E+00	T
0	209.20	29	81	0.93	418.96	416	7	7.09E-03	****	5.03E+00	
0	271.00	25	84	1.46	542.61	536	9	6.29E-03	****	4.15E+00	T
0	321.84	41	44	0.98	644.35	640	10	1.03E-02	71.9	3.60E+00	T
0	414.86	16	40	2.38	830.48	823	10	4.05E-03	****	2.90E+00	T
0	482.23	13	23	1.49	965.28	959	10	3.27E-03	****	2.55E+00	T
2	516.88	22	4	1.80	1034.63	1031	25	5.80E-03	59.2	2.41E+00	
2	525.75	20	7	1.81	1052.37	1031	25	5.21E-03	61.4	2.37E+00	
0	669.81	10	27	4.82	1340.67	1330	12	2.80E-03	****	1.95E+00	
0	727.83	17	26	1.36	1456.78	1451	10	4.66E-03	****	1.82E+00	T
0	738.40	5	10	0.89	1477.92	1474	6	1.25E-03	****	1.80E+00	T
0	768.61	28	24	1.71	1538.38	1529	13	7.49E-03	82.6	1.74E+00	
0	772.60	9	13	1.38	1546.37	1543	7	2.35E-03	****	1.74E+00	T
0	871.28	26	13	6.59	1743.86	1734	18	7.15E-03	77.6	1.58E+00	T
0	923.46	11	5	0.59	1848.31	1845	7	3.07E-03	90.7	1.50E+00	T
5	964.70	22	5	2.91	1930.84	1926	18	6.07E-03	55.0	1.45E+00	T
0	1005.15	8	12	0.92	2011.81	2008	8	2.22E-03	****	1.41E+00	T
0	1039.30	7	14	0.97	2080.16	2071	11	2.02E-03	****	1.37E+00	T
0	1041.21	13	1	1.51	2083.97	2081	6	3.50E-03	63.9	1.37E+00	
0	1084.19	13	14	0.73	2170.00	2162	14	3.61E-03	****	1.32E+00	
0	1095.28	7	7	0.98	2192.21	2188	6	1.84E-03	****	1.31E+00	
0	1098.49	16	4	3.22	2198.64	2194	10	4.44E-03	71.3	1.31E+00	T
0	1154.44	16	8	2.34	2310.63	2305	11	4.45E-03	85.3	1.26E+00	
0	1223.88	9	11	0.65	2449.62	2444	9	2.51E-03	****	1.20E+00	
0	1333.06	8	5	2.33	2668.18	2661	11	2.36E-03	****	1.11E+00	T

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235015.CNF;1
* Acquisition date   : 3-OCT-2016 08:11:39 Sensitivity      : 3.000
* Detector ID       : GAM44 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.75 Half life ratio : *****
* Sample date      : 8-DEC-2015 10:56:00 Nuclide Library : SOLID
* Sample ID       : G405235015 Analyst initials: MXR1
* Batch Number    : 1596247 Sample Quantity : 1.4507E+02 GRAM
* Wet wt corr     : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 6-SEP-2016 04:59:25 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM44_CAN.CNF;3
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.751E-01
CD-109	1.287E+00
SN-126	7.438E-02
BA-137M	3.369E-02
CS-137	3.559E-02
TL-208	2.874E-02
BI-211	1.499E-01
PB-212	4.231E-02
BI-214	5.753E-02
PB-214	1.683E-01
RN-222	5.753E-02
RA-224	4.537E-01
RA-226	5.753E-02
AC-228	1.280E-01
RA-228	1.280E-01
TH-228	4.231E-02
TH-230	5.751E-02
PA-231	3.768E-01
TH-232	1.280E-01
TH-234	1.356E+00
U-234	5.751E-02
U-238	1.356E+00
AM-243	5.407E-02
ANH-511	1.967E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.006E+01	NOT IDENT.
NA-22	4.428E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	3.078E-02	NOT IDENT.
SC-46	2.919E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF

MN-54	6.526E-02	NOT IDENT.
CO-56	3.615E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	4.678E-02	NOT IDENT.
CO-58	5.009E-01	NOT IDENT.
FE-59	5.845E+00	FAIL ABUN
CO-60	4.021E-02	FAIL ABUN
ZN-65	1.750E-01	NOT IDENT.
GE-68	2.300E+00	NOT IDENT.
AS-73	1.415E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.829E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.728E-01	NOT IDENT.
KR-85	4.899E+00	NOT IDENT.
SR-85	5.175E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	2.239E-01	NOT IDENT.
Y-91	5.751E+02	NOT IDENT.
NB-94	3.555E-02	FAIL ABUN
NB-95	8.093E-01	NOT IDENT.
NB-95M	2.008E+00	NOT IDENT.
ZR-95	1.378E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.278E-02	NOT IDENT.
RH-102	5.050E-02	NOT IDENT.
RU-103	5.518E+00	FAIL ABUN
RH-106	4.573E-01	NOT IDENT.
RU-106	4.573E-01	NOT IDENT.
AG-108M	2.880E-02	NOT IDENT.
AG-110M	8.291E-02	NOT IDENT.
SN-113	2.103E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.110E-01	NOT IDENT.
SB-124	1.255E+00	NOT IDENT.
SB-125	9.237E-02	FAIL ABUN
TE-125M	2.604E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.890E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.983E-02	FAIL ABUN
CS-135	1.184E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	1.098E-01	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.348E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.072E-01	NOT IDENT.
PM-144	5.076E-02	NOT IDENT.
PR-144	4.410E+00	NOT IDENT.
PM-146	4.197E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.344E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.139E-02	FAIL ABUN
EU-152	8.342E-02	FAIL ABUN
GD-153	1.781E-01	NOT IDENT.
EU-154	1.076E-01	FAIL ABUN
EU-155	9.915E-02	FAIL ABUN
TB-160	1.684E+00	FAIL ABUN
HO-166M	4.844E-02	FAIL ABUN
TM-171	3.475E+01	NOT IDENT.
HF-172	1.959E-01	FAIL ABUN
LU-172	8.575E-02	FAIL ABUN
LU-176	2.220E-02	FAIL ABUN
HF-181	3.776E+00	FAIL ABUN

TA-182	8.560E-01	FAIL ABUN
RE-183	4.187E+00	NOT IDENT.
RE-184	2.414E+01	NOT IDENT.
W-188	1.020E+02	FAIL ABUN
IR-192	4.299E-01	FAIL ABUN
HG-203	1.840E+00	NOT IDENT.
BI-207	5.319E-02	FAIL ABUN
PB-210	7.066E+00	NOT IDENT.
PB-211	6.545E-01	NOT IDENT.
BI-212	6.091E-01	FAIL ABUN
RN-219	2.952E-01	FAIL ABUN
RA-223	4.577E-01	FAIL ABUN
AC-227	1.821E-01	FAIL ABUN
TH-227	1.821E-01	FAIL ABUN
TH-229	4.054E-01	FAIL ABUN
TH-231	4.577E-01	FAIL ABUN
PA-233	6.417E-02	FAIL ABUN
PA-234	2.410E-01	FAIL ABUN
PA-234M	3.994E+00	NOT IDENT.
U-235	1.702E-01	FAIL ABUN
NP-237	6.417E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.059E-01	FAIL ABUN
PU-239	2.863E+02	FAIL ABUN
AM-241	1.789E-01	NOT IDENT.
CM-243	8.901E-02	FAIL ABUN
BK-247	6.398E-02	NOT IDENT.
CM-247	3.049E-02	NOT IDENT.
CF-249	3.389E-02	NOT IDENT.
CF-251	8.954E-02	FAIL ABUN

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235015.CNF;1
* Acquisition date   : 3-OCT-2016 08:11:39 Sensitivity      : 3.000
* Detector ID        : GAM44 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.75 Half life ratio  : *****
* Sample date        : 8-DEC-2015 10:56:00 Nuclide Library : SOLID
* Sample ID          : G405235015 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.4507E+02 GRAM
*                   : Quantity Err(%) : 1.3786E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 6-SEP-2016 04:59:25 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM44_CAN.CNF;3
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.738E+01	2.015E+00	2.015E+00
CD-109	1.261E+00	2.503E+00	2.503E+00
SN-126	8.036E-02	1.594E-01	1.594E-01
BA-137M	2.430E-01	9.187E-02	9.187E-02
CS-137	2.567E-01	9.705E-02	9.705E-02
TL-208	3.520E-01	9.105E-02	9.105E-02
BI-211	1.150E+00	9.036E-01	9.036E-01
PB-212	1.073E+00	1.473E-01	1.473E-01
BI-214	8.789E-01	2.032E-01	2.032E-01
PB-214	1.155E+00	2.006E-01	2.006E-01
RN-222	8.789E-01	2.032E-01	2.032E-01
RA-224	2.256E+00	1.753E+00	1.753E+00
RA-226	8.789E-01	2.032E-01	2.032E-01
AC-228	9.637E-01	3.430E-01	3.430E-01
RA-228	9.637E-01	3.430E-01	3.430E-01
TH-228	1.073E+00	1.473E-01	1.473E-01
TH-230	8.785E-01	2.032E-01	2.032E-01
PA-231	5.934E-01	8.122E-01	8.122E-01
TH-232	9.637E-01	3.430E-01	3.430E-01
TH-234	5.371E+00	4.071E+00	4.071E+00
U-234	8.785E-01	2.032E-01	2.032E-01
U-238	5.371E+00	4.071E+00	4.071E+00
AM-243	1.612E-01	1.142E-01	1.142E-01
ANH-511	1.437E-01	7.212E-02	7.212E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.215E+00	1.313E+01	1.314E+01	NOT IDENT.
NA-22	-2.426E-02	5.690E-02	5.794E-02	NOT IDENT.
NA-24	-1.000E+41	4.956E+41	0.000E+00	SHORT HLIF
AL-26	1.487E-02	3.216E-02	3.285E-02	NOT IDENT.
SC-46	-2.499E-01	3.790E-01	3.954E-01	FAIL ABUN
V-48	1.113E+04	1.678E+04	1.751E+04	SHORT HLIF

CR-51	-1.114E+02	4.431E+02	4.459E+02	SHORT HLIF
MN-54	-1.210E-02	8.120E-02	8.138E-02	NOT IDENT.
CO-56	-1.101E-01	4.647E-01	4.673E-01	FAIL ABUN
MN-56	-1.000E+41	4.458E+41	0.000E+00	SHORT HLIF
CO-57	5.235E-02	4.856E-02	5.399E-02	NOT IDENT.
CO-58	1.616E-01	5.704E-01	5.750E-01	NOT IDENT.
FE-59	1.183E+01	8.309E+00	9.874E+00	FAIL ABUN
CO-60	4.267E-02	5.313E-02	5.650E-02	FAIL ABUN
ZN-65	1.012E-01	2.061E-01	2.111E-01	NOT IDENT.
GE-68	2.101E+00	2.450E+00	2.627E+00	NOT IDENT.
AS-73	2.130E+00	1.516E+01	1.519E+01	NOT IDENT.
AS-74	-3.971E+02	6.059E+03	6.062E+03	SHORT HLIF
SE-75	-3.892E-03	2.215E-01	2.215E-01	NOT IDENT.
BR-77	1.963E+38	1.700E+39	0.000E+00	SHORT HLIF
SR-82	-2.631E+01	9.496E+02	9.497E+02	SHORT HLIF
RB-83	3.473E-01	6.659E-01	6.841E-01	NOT IDENT.
KR-85	6.488E+00	5.035E+00	5.823E+00	NOT IDENT.
SR-85	6.846E-01	5.321E-01	6.151E-01	NOT IDENT.
RB-86	7.865E+03	3.075E+04	3.095E+04	SHORT HLIF
Y-88	-2.598E-02	2.676E-01	2.678E-01	NOT IDENT.
Y-91	2.110E+02	6.394E+02	6.464E+02	NOT IDENT.
NB-94	2.033E-02	3.946E-02	4.051E-02	FAIL ABUN
NB-95	1.164E-01	1.067E+00	1.068E+00	NOT IDENT.
NB-95M	-1.639E+00	2.831E+00	2.926E+00	NOT IDENT.
ZR-95	-9.700E-01	1.820E+00	1.872E+00	NOT IDENT.
NB-97	-1.000E+41	1.940E+42	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	3.690E+41	0.000E+00	SHORT HLIF
MO-99	7.926E+31	1.811E+32	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	5.547E+41	0.000E+00	SHORT HLIF
RH-101	1.974E-02	3.582E-02	3.691E-02	NOT IDENT.
RH-102	7.340E-03	5.817E-02	5.826E-02	NOT IDENT.
RU-103	-2.265E+00	6.653E+00	6.730E+00	FAIL ABUN
RH-106	2.279E-02	5.336E-01	5.337E-01	NOT IDENT.
RU-106	2.279E-02	5.336E-01	5.337E-01	NOT IDENT.
AG-108M	1.552E-02	3.094E-02	3.172E-02	NOT IDENT.
AG-110M	-1.230E-01	1.151E-01	1.278E-01	NOT IDENT.
SN-113	-1.381E-01	2.529E-01	2.604E-01	NOT IDENT.
CD-115	1.119E+39	2.921E+39	0.000E+00	SHORT HLIF
SN-117M	-8.680E+03	9.548E+04	9.556E+04	SHORT HLIF
TE-123M	2.414E-02	1.261E-01	1.266E-01	NOT IDENT.
SB-124	-9.028E-01	1.944E+00	1.986E+00	NOT IDENT.
SB-125	2.405E-02	1.017E-01	1.023E-01	FAIL ABUN
TE-125M	-4.543E+01	2.972E+02	2.979E+02	NOT IDENT.
I-126	2.633E+05	1.066E+06	1.073E+06	SHORT HLIF
SB-126	-1.938E+05	9.135E+05	9.177E+05	SHORT HLIF
SB-127	1.037E+22	2.705E+22	0.000E+00	SHORT HLIF
I-131	7.678E+08	4.605E+09	4.618E+09	SHORT HLIF
I-132	1.000E+41	1.933E+42	0.000E+00	SHORT HLIF
TE-132	3.654E+26	4.481E+26	0.000E+00	SHORT HLIF
BA-133	5.431E-02	3.992E-02	4.683E-02	NOT IDENT.
I-133	-1.000E+41	2.280E+41	0.000E+00	SHORT HLIF
CS-134	1.689E-01	7.497E-02	1.068E-01	FAIL ABUN
CS-135	-2.155E-02	1.460E-01	1.463E-01	NOT IDENT.
I-135	1.000E+41	1.052E+42	0.000E+00	SHORT HLIF
CS-136	-4.493E+04	3.294E+05	3.300E+05	SHORT HLIF
CE-139	7.823E-02	1.216E-01	1.266E-01	NOT IDENT.
BA-140	-3.078E+05	1.205E+06	1.213E+06	SHORT HLIF
LA-140	-3.037E+05	4.012E+05	4.239E+05	SHORT HLIF
CE-141	1.041E+00	2.691E+01	2.692E+01	NOT IDENT.
CE-143	-1.000E+41	6.679E+41	0.000E+00	SHORT HLIF
CE-144	-2.331E-01	3.728E-01	3.873E-01	NOT IDENT.
PM-144	-7.840E-03	6.171E-02	6.181E-02	NOT IDENT.
PR-144	-6.812E-01	5.361E+00	5.369E+00	NOT IDENT.
PM-146	2.362E-02	4.487E-02	4.612E-02	NOT IDENT.
ND-147	-8.845E+06	3.053E+07	3.079E+07	SHORT HLIF
PM-147	-5.403E+01	8.382E+02	8.386E+02	NOT IDENT.
PM-149	1.000E+41	9.550E+40	0.000E+00	SHORT HLIF
EU-150	5.076E-06	2.641E-02	2.641E-02	FAIL ABUN
EU-152	2.974E-02	8.966E-02	9.065E-02	FAIL ABUN
GD-153	1.756E-01	1.971E-01	2.124E-01	NOT IDENT.
EU-154	-6.221E-02	1.390E-01	1.418E-01	FAIL ABUN
EU-155	-1.454E-02	1.127E-01	1.129E-01	FAIL ABUN
TB-160	7.227E-01	1.783E+00	1.812E+00	FAIL ABUN
HO-166M	-4.340E-03	5.857E-02	5.860E-02	FAIL ABUN
TM-171	1.593E+00	3.750E+01	3.750E+01	NOT IDENT.
HF-172	-6.872E-02	2.296E-01	2.317E-01	FAIL ABUN
LU-172	2.874E-02	1.066E-01	1.074E-01	FAIL ABUN
LU-176	7.255E-03	2.377E-02	2.400E-02	FAIL ABUN

HF-181	4.271E+00	6.720E+00	6.990E+00	FAIL ABUN
TA-182	-1.841E-01	1.190E+00	1.193E+00	FAIL ABUN
RE-183	-2.181E-01	4.547E+00	4.549E+00	NOT IDENT.
RE-184	-8.667E+00	2.917E+01	2.943E+01	NOT IDENT.
W-188	9.675E+00	1.339E+02	1.340E+02	FAIL ABUN
IR-192	1.295E-01	4.625E-01	4.662E-01	FAIL ABUN
HG-203	-1.257E+00	2.413E+00	2.478E+00	NOT IDENT.
BI-207	6.760E-02	5.018E-02	5.870E-02	FAIL ABUN
PB-210	-1.268E-01	7.562E+00	7.562E+00	NOT IDENT.
PB-211	1.792E-01	7.194E-01	7.239E-01	NOT IDENT.
BI-212	7.358E-01	8.791E-01	9.396E-01	FAIL ABUN
RN-219	-2.098E-01	3.626E-01	3.747E-01	FAIL ABUN
RA-223	-4.391E-01	6.312E-01	6.616E-01	FAIL ABUN
AC-227	-3.762E-01	2.703E-01	3.191E-01	FAIL ABUN
TH-227	-3.762E-01	2.703E-01	3.191E-01	FAIL ABUN
TH-229	-7.744E-02	4.848E-01	4.860E-01	FAIL ABUN
TH-231	-4.391E-01	6.312E-01	6.616E-01	FAIL ABUN
PA-233	5.431E-02	6.618E-02	7.056E-02	FAIL ABUN
PA-234	1.529E-02	2.731E-01	2.732E-01	FAIL ABUN
PA-234M	3.369E+00	4.343E+00	4.601E+00	NOT IDENT.
U-235	1.771E-02	1.940E-01	1.942E-01	FAIL ABUN
NP-237	5.431E-02	6.618E-02	7.056E-02	FAIL ABUN
NP-238	4.718E+40	5.971E+41	0.000E+00	SHORT HLIF
NP-239	-1.136E-01	2.439E-01	2.492E-01	FAIL ABUN
PU-239	-4.243E+01	3.300E+02	3.306E+02	FAIL ABUN
AM-241	6.568E-02	2.020E-01	2.042E-01	NOT IDENT.
CM-243	2.062E-02	1.056E-01	1.060E-01	FAIL ABUN
BK-247	1.557E-03	7.712E-02	7.713E-02	NOT IDENT.
CM-247	1.930E-02	3.210E-02	3.326E-02	NOT IDENT.
CF-249	1.140E-02	3.679E-02	3.715E-02	NOT IDENT.
CF-251	-6.705E-02	1.121E-01	1.161E-01	FAIL ABUN

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	53.8048	87.09	91.6306	136.47	51.5515
45.60	55.0496	87.57	91.7214	140.51	0.0000
46.54	53.4309	88.03	113.1961	143.76	72.7363
49.72	0.0000	88.34	113.2678	144.24	64.0964
51.35	61.4377	88.47	113.2975	145.44	76.1780
51.87	57.9111	89.96	85.2290	152.43	79.1334
52.39	54.3732	1093.63	85.3452	153.25	0.0000
52.97	49.0174	91.11	0.0000	323.87	60.5977
53.44	54.5368	92.59	92.9816	156.02	0.0000
54.07	56.4552	93.35	93.1204	158.56	0.0000
57.36	0.0000	94.56	93.3405	159.00	51.0144
57.53	57.9169	94.65	93.3568	162.33	57.9263
57.98	66.2709	94.67	93.3604	162.66	0.0000
59.27	65.2685	94.87	93.3967	163.33	69.1578
59.32	65.2771	97.43	53.6324	165.86	60.4352
59.54	55.4562	98.43	53.7341	176.31	52.1754
60.96	63.0852	98.44	53.7351	176.60	0.0000
61.17	63.1197	99.53	53.8456	177.52	57.9345
62.93	62.4742	100.11	53.9038	181.07	0.0000
63.29	62.5314	102.03	51.3915	181.52	63.9297
63.58	62.5775	103.18	54.2102	184.41	46.9708
64.28	72.3566	103.37	54.2293	143.76	47.0459
66.73	56.4816	105.21	65.2930	193.51	59.0645
67.24	59.3797	105.31	65.3047	197.03	59.3073
125.81	76.4276	106.12	57.2249	198.01	76.8372
67.75	76.4399	106.47	57.2608	201.83	60.8042
69.67	71.1061	109.28	70.9057	203.43	59.7431
70.83	75.1046	111.00	63.9044	205.31	64.1734
72.81	95.5101	111.76	0.0000	210.85	59.8451
72.87	95.5238	114.06	56.9886	215.65	65.3049
74.66	87.2842	116.30	0.0000	222.11	66.9537
74.82	87.3162	116.74	64.5340	227.09	57.6899
74.97	87.3460	119.76	65.9051	227.38	43.2806
77.11	87.7675	121.12	60.8099	228.16	0.0000
78.74	80.0184	121.22	60.8201	228.18	48.1299
79.69	60.7853	121.78	52.4788	116.74	48.1299
80.12	55.6641	122.06	49.3527	235.69	64.6696
80.19	0.0000	122.92	52.5761	235.96	64.6867
80.57	59.6057	123.07	56.7962	238.63	44.9978
81.00	53.1765	265.00	56.8522	238.98	0.0000
81.07	59.6703	125.81	63.3852	240.99	45.1039
81.75	78.9186	127.23	62.4687	242.00	45.1496
83.79	61.3217	127.91	71.0157	244.70	44.0469
84.00	58.7384	129.30	73.2946	252.40	0.0000
85.43	79.8615	131.20	68.1855	252.80	48.0954
86.55	91.5291	133.02	65.1709	254.15	0.0000
86.79	91.5738	133.52	72.7055	256.23	65.5755
86.94	91.6029	136.00	62.2472	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	41.1553	355.39	0.0000	584.27	20.0919
264.80	41.1614	356.01	16.1433	595.83	0.0000
265.00	41.1684	364.49	0.0000	427.87	28.0470
268.22	42.5425	366.42	0.0000	602.52	0.0000
269.46	45.0967	372.51	32.6785	604.72	15.6134
270.03	45.1198	375.05	22.7351	607.14	25.0107
271.23	42.6608	377.52	26.4187	609.32	19.8218
273.65	0.0000	356.01	35.6881	610.33	19.8311
276.40	34.4570	388.16	25.6997	614.28	26.6673
277.37	37.0104	388.63	0.0000	618.01	19.9053
277.60	37.0176	391.69	38.6436	620.36	22.0254
278.00	35.3478	264.66	36.1047	621.93	16.7943
279.20	40.4414	401.81	29.6471	630.19	0.0000
279.54	50.5664	402.40	19.4641	631.29	14.7611
279.70	50.5737	404.85	30.6367	633.25	18.9961
280.46	44.2819	410.95	32.1606	634.78	0.0000
283.69	29.6060	413.71	36.4221	635.95	16.9069
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	29.6509	423.72	0.0000	645.85	14.8625
285.90	0.0000	427.09	30.1478	657.76	17.6132
287.50	30.5544	427.87	22.6221	657.90	0.0000
290.67	40.8516	433.94	26.4955	661.66	22.4569
293.27	0.0000	439.40	28.4863	664.57	0.0000
351.93	38.4485	453.88	21.0798	666.33	0.0000
295.96	38.4732	463.37	26.0211	666.50	0.0000
879.38	38.5593	468.07	23.1958	667.71	0.0000
299.98	38.6050	473.00	0.0000	677.62	14.0029
300.09	38.6087	475.06	21.3519	685.70	0.0000
300.13	38.6096	476.78	26.2315	695.00	0.0000
301.36	37.3616	477.60	20.4121	696.49	20.6375
302.85	39.9884	482.18	15.5944	696.51	20.6382
256.23	38.2357	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	22.8184
306.78	33.6497	497.08	30.4765	697.49	21.7334
308.46	42.3367	505.52	25.1903	702.65	21.7822
311.90	38.1249	507.63	0.0000	706.68	17.4564
316.51	33.9203	511.00	14.8639	711.68	16.4008
319.41	0.0000	514.00	2.9778	720.70	0.0000
320.08	0.0000	514.00	2.9778	721.93	0.0000
321.04	30.5524	520.40	13.4478	722.78	6.5918
323.87	39.3713	520.69	0.0000	722.91	8.2401
325.23	44.6696	522.65	0.0000	723.31	8.2416
328.76	0.0000	527.90	0.0000	724.19	6.5957
333.37	27.5031	528.26	10.5047	727.33	12.1082
333.97	31.7490	529.59	18.0212	733.00	15.4475
334.37	33.0826	529.87	0.0000	735.93	9.9426
338.28	30.0862	531.02	0.0000	333.97	15.4766
338.32	30.0869	537.26	0.0000	739.50	0.0000
311.90	31.9102	546.56	0.0000	747.24	12.2098
340.48	31.9102	552.55	21.2854	748.06	16.6553
340.55	0.0000	563.25	23.4436	752.31	23.3584
344.28	28.4473	569.33	20.4500	753.82	0.0000
345.93	29.9072	946.00	20.4517	756.73	24.5155
351.06	26.8066	569.70	20.4541	756.80	24.5164
351.93	26.8237	583.19	18.5361	884.68	13.4116

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	18.4551	1274.44	13.6844	1620.50	2.1527
766.42	18.4591	1001.03	7.3098	1621.92	7.5370
766.84	18.4625	1002.74	13.1647	1678.03	0.0000
772.60	0.0000	1004.73	17.3817	1690.97	4.3708
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	8.8750
778.90	11.2439	1028.54	0.0000	1063.66	7.7750
783.70	0.0000	1037.84	16.2733	1771.35	2.2219
785.37	16.9098	1038.76	0.0000	1791.20	0.0000
792.07	8.4775	631.29	9.2712	1808.65	2.2385
794.95	7.9211	1048.07	0.0000	1810.72	0.0000
795.86	7.9240	1049.04	15.7736	1836.06	5.4015
810.06	15.9363	1050.41	10.2111		
810.29	15.9380	1063.66	5.5928		
344.28	10.2462	1077.00	0.0000		
810.76	10.2477	1077.34	5.9906		
815.77	0.0000	1085.87	13.5141		
1048.07	0.0000	1093.63	15.0518		
832.01	19.5151	1099.45	7.5391		
834.85	21.8342	1112.07	13.2438		
835.71	18.3932	1112.84	18.9233		
836.80	0.0000	1115.54	10.6060		
846.75	0.0000	1120.29	17.0695		
846.77	12.6982	1120.55	17.0706		
856.80	0.0000	1221.41	17.0739		
860.56	10.4429	1129.67	11.4111		
871.09	10.4832	1131.51	0.0000		
873.19	10.4912	1147.95	0.0000		
875.33	0.0000	1173.23	13.4830		
879.38	9.6388	1177.95	13.5010		
880.51	4.3831	1189.05	11.6089		
883.24	18.4269	1204.77	14.5752		
884.68	22.8262	1221.41	15.6191		
889.28	15.8291	1231.02	18.5964		
894.76	14.0981	1235.36	0.0000		
898.04	11.4678	1238.28	19.6143		
900.72	14.1279	1260.41	0.0000		
903.28	13.2568	1271.87	13.8556		
911.20	16.8395	1274.44	15.8457		
912.08	16.8448	1274.54	15.8457		
923.98	0.0000	1291.59	8.9539		
926.50	12.8312	1298.22	0.0000		
929.11	8.0266	1312.11	0.0000		
937.49	9.8388	1332.49	8.0444		
944.13	0.0000	1362.66	0.0000		
946.00	11.6618	1365.19	5.0696		
949.00	14.3677	1368.63	0.0000		
667.71	0.0000	1384.29	9.1692		
962.31	11.5461	1408.01	6.1487		
964.08	9.0259	1457.56	0.0000		
966.17	9.0323	1460.82	6.2278		
911.20	9.0408	1489.16	5.2246		
968.97	9.0408	1505.03	6.2926		
983.53	0.0000	1584.12	7.4747		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235016.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM12.CNF;467
Background date : 2-OCT-2016 11:00:40.
Sample date      : 8-DEC-2015 11:29:00. Acquisition date : 3-OCT-2016 08:15:34.
Sample ID       : G405235016 Sample quantity : 1.63118E+02 GRAM
Detector name   : GAM12 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.56 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596247 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	9	35.91*	31	8	1.15	71.66	68	25	8.49E-03	43.5	2.41E+00
2	9	37.68*	50	40	1.86	75.20	68	25	1.39E-02	41.4	
3	9	40.14	72	77	1.78	80.11	68	25	2.00E-02	28.2	
4	9	42.83	27	145	2.60	85.49	68	25	7.47E-03	90.1	
5	9	45.08	17	86	1.17	90.00	68	25	4.85E-03	81.1	
6	0	64.52*	14	166	0.62	128.86	124	8	3.90E-03	163.9	
7	3	75.00	120	192	1.69	149.83	143	17	3.33E-02	24.8	1.17E+00
8	3	77.26*	148	135	1.23	154.36	143	17	4.10E-02	16.1	
9	0	87.10	30	170	1.23	174.04	171	8	8.20E-03	78.4	
10	4	90.06	53	68	1.04	179.95	178	16	1.48E-02	24.7	1.47E+00
11	4	93.09*	108	169	1.90	186.01	178	16	3.01E-02	26.9	
12	0	154.32	31	65	1.34	308.48	306	6	8.54E-03	45.7	
13	0	157.46	23	92	1.37	314.75	312	8	6.48E-03	73.6	
14	0	185.62*	61	137	1.24	371.06	367	10	1.70E-02	39.1	
15	0	209.26	29	90	0.89	418.35	415	8	7.98E-03	60.2	
16	3	238.62*	399	86	1.28	477.07	472	19	1.11E-01	6.5	1.02E+00
17	3	241.60	122	90	1.92	483.04	472	19	3.40E-02	23.9	
18	0	258.15	13	62	1.41	516.13	512	9	3.62E-03	112.8	
19	0	271.20	32	112	0.80	542.23	536	14	8.80E-03	73.9	
20	0	295.06	171	58	1.30	589.98	586	10	4.75E-02	11.3	
21	0	338.33*	76	57	1.10	676.52	672	10	2.11E-02	22.3	
22	0	351.65*	232	75	1.38	703.18	697	12	6.46E-02	10.0	
23	0	408.91	26	97	5.41	817.70	805	19	7.34E-03	92.5	
24	0	432.57	10	31	1.27	865.05	861	8	2.74E-03	100.0	
25	2	443.52	20	7	1.28	886.95	885	17	5.51E-03	28.1	3.17E+00
26	2	446.21	24	26	1.74	892.32	885	17	6.65E-03	45.9	
27	0	462.58	29	45	3.05	925.07	918	14	8.03E-03	52.9	
28	0	491.73	14	17	1.73	983.40	979	7	3.94E-03	55.4	
29	0	510.37*	58	36	1.35	1020.67	1013	16	1.61E-02	31.0	
30	0	569.42	39	60	0.81	1138.82	1132	16	1.10E-02	46.6	
31	0	583.20*	122	26	1.31	1166.38	1160	14	3.40E-02	13.0	
32	0	609.25*	146	44	1.55	1218.51	1213	15	4.04E-02	12.9	
33	0	662.19	28	58	1.02	1324.44	1320	11	7.65E-03	56.8	
34	0	727.24	46	35	1.52	1454.59	1448	16	1.27E-02	32.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	795.02	25	11	1.10	1590.21	1584	11	7.01E-03	32.3	
36	0	862.42	39	30	4.43	1725.08	1717	19	1.08E-02	36.7	
37	0	889.39	12	14	3.27	1779.06	1774	11	3.26E-03	68.0	
38	0	911.23*	78	20	1.10	1822.78	1817	13	2.15E-02	16.7	
39	0	969.14	66	24	1.25	1938.66	1932	14	1.83E-02	20.1	
40	0	996.16	11	2	1.63	1992.73	1989	7	3.14E-03	35.4	
41	0	1104.74	15	20	0.53	2210.06	2202	16	4.07E-03	73.2	
42	0	1120.60	50	11	1.39	2241.80	2236	14	1.39E-02	19.8	
43	0	1161.46	12	0	1.60	2323.58	2320	7	3.33E-03	28.9	
44	0	1181.87	11	27	3.93	2364.44	2352	19	2.97E-03	123.2	
45	0	1187.67	16	5	2.39	2376.05	2372	9	4.46E-03	34.8	
46	0	1194.48	20	2	3.89	2389.67	2385	11	5.49E-03	27.5	
47	0	1239.76	31	7	3.90	2480.31	2473	14	8.73E-03	25.2	
48	0	1247.01	21	7	2.11	2494.83	2488	13	5.69E-03	33.8	
49	0	1460.74	336	0	1.85	2922.71	2915	14	9.33E-02	5.5	
50	0	1764.60	35	7	1.38	3531.13	3523	13	9.58E-03	22.8	
51	0	2042.49	5	5	0.51	4087.70	4081	10	1.39E-03	94.9	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235016.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 8-DEC-2015 11:29:00   Acquisition date  : 3-OCT-2016 08:15:34
Sample ID         : G405235016           Sample quantity  : 163.12 GRAM
Sample type       : SOLID                 Sample geometry  :
Detector name     : GAMMA12              Detector geometry: CAN
Elapsed live time : 0 01:00:00.00         Elapsed real time: 0 01:00:00.56   0.0%
Energy tolerance  : 1.50 keV             Half life ratio  : 10.00
Errors propagated: No                    Systematic Error : 0.00 %
Efficiency type   : Linear                Efficiencies at  : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.082E+00	1.303E+01	1.303E+01	10.91	OK
SC-46	889.28	99.98*	1.620E+00	3.460E-02	4.135E-01	135.97	OK
	1120.55	99.99	1.350E+00	1.715E-01	2.049E+00	39.59	OK
BA-137M	661.66	89.90*	2.040E+00	7.427E-02	7.569E-02	113.58	OK
CS-137	661.66	85.10*	2.040E+00	7.846E-02	7.996E-02	113.58	OK
TL-208	277.37	6.60	4.142E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.256E+00	3.205E-01	3.205E-01	26.05	OK
	860.56	12.50	1.662E+00	-----	Line Not Found	-----	Absent
PB-210	46.54	4.25*	3.130E-01	8.579E+00	8.802E+00	162.16	OK
PB-212	74.82	10.28	3.186E+00	1.562E+00	1.562E+00	73.17	OK
	77.11	17.10	3.414E+00	1.571E+00	1.571E+00	32.23	OK
	238.63	43.60*	4.646E+00	1.093E+00	1.093E+00	12.91	OK
	300.09	3.30	3.888E+00	-----	Line Not Found	-----	Absent
BI-214	609.32	45.49*	2.179E+00	7.334E-01	7.336E-01	25.80	OK
	1120.29	14.92	1.350E+00	1.149E+00	1.149E+00	39.59	OK
	1764.49	15.30	9.121E-01	1.079E+00	1.079E+00	45.69	OK
PB-214	74.82	5.80	3.167E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	3.414E+00	2.769E+00	2.770E+00	32.23	OK
	87.09	3.41	4.297E+00	1.237E+00	1.238E+00	156.88	OK
	242.00	7.25	4.599E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	3.942E+00	1.277E+00	1.278E+00	22.57	OK
	351.93	35.60*	3.413E+00	1.017E+00	1.018E+00	20.10	OK
RN-222	609.32	45.49*	2.179E+00	7.334E-01	7.336E-01	25.80	OK
	1120.29	14.92	1.350E+00	1.149E+00	1.149E+00	39.59	OK
	1764.49	15.30	9.121E-01	1.079E+00	1.079E+00	45.69	OK
RA-224	240.99	4.10*	4.604E+00	1.332E+00	1.332E+00	134.55	OK
RA-226	609.32	45.49*	2.179E+00	7.334E-01	7.336E-01	25.80	OK
	1120.29	14.92	1.350E+00	1.149E+00	1.149E+00	39.59	OK
	1764.49	15.30	9.121E-01	1.079E+00	1.079E+00	45.69	OK
AC-228	105.21	1.10	5.379E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.524E+00	1.021E+00	1.021E+00	44.67	OK
	794.95	4.25	1.768E+00	1.623E+00	1.623E+00	64.54	OK
	835.71	1.61	1.701E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.589E+00	8.986E-01	8.986E-01	33.41	OK
	968.97	15.80	1.514E+00	1.298E+00	1.298E+00	40.27	OK
RA-228	105.21	1.10	5.379E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.524E+00	1.021E+00	1.021E+00	44.67	OK
	794.95	4.25	1.768E+00	1.623E+00	1.623E+00	64.54	OK
	835.71	1.61	1.701E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.589E+00	8.986E-01	8.986E-01	33.41	OK
	968.97	15.80	1.514E+00	1.298E+00	1.298E+00	40.27	OK
TH-228	74.82	10.28	3.186E+00	1.562E+00	1.562E+00	73.17	OK
	77.11	17.10	3.414E+00	1.571E+00	1.571E+00	32.23	OK
	238.63	43.60*	4.646E+00	1.093E+00	1.093E+00	12.91	OK
	300.09	3.30	3.888E+00	-----	Line Not Found	-----	Absent
TH-230	609.32	45.49*	2.179E+00	7.334E-01	7.334E-01	25.80	OK
	1120.29	14.92	1.350E+00	1.149E+00	1.149E+00	39.59	OK
	1764.49	15.30	9.121E-01	1.079E+00	1.079E+00	45.69	OK
TH-232	105.21	1.10	5.379E+00	-----	Line Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	338.32	11.27	3.524E+00	1.021E+00	1.021E+00	44.67	OK
	835.71	1.61	1.701E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.589E+00	8.986E-01	8.986E-01	33.41	OK
	968.97	15.80	1.514E+00	1.298E+00	1.298E+00	40.27	OK
TH-234	63.29	3.70*	2.058E+00	1.166E+00	1.166E+00	327.90	OK
	92.59	4.23	4.733E+00	3.299E+00	3.299E+00	53.76	OK
U-234	609.32	45.49*	2.179E+00	7.334E-01	7.334E-01	25.80	OK
	1120.29	14.92	1.350E+00	1.149E+00	1.149E+00	39.59	OK
	1764.49	15.30	9.121E-01	1.079E+00	1.079E+00	45.69	OK
U-235	89.96	3.47	4.522E+00	2.083E+00	2.083E+00	49.42	OK
	93.35	5.60	4.733E+00	2.492E+00	2.492E+00	53.76	OK
	143.76	10.96*	5.929E+00	-----	Line Not Found	-----	Absent
	163.33	5.08	5.762E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	5.452E+00	1.120E-01	1.120E-01	78.16	OK
	205.31	5.01	5.147E+00	-----	Line Not Found	-----	Absent
U-238	63.29	3.70*	2.058E+00	1.166E+00	1.166E+00	327.90	OK
	92.59	4.23	4.733E+00	3.299E+00	3.299E+00	53.76	OK
AM-243	43.53	5.90	2.032E-01	1.471E+01	1.471E+01	180.12	OK
	74.66	67.20*	3.186E+00	2.389E-01	2.390E-01	73.17	OK
ANH-511	511.00	100.00*	2.511E+00	1.177E-01	1.177E-01	62.00	OK

Flag: "*" = Keyline

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235016.CNF;1
* Acquisition date   : 3-OCT-2016 08:15:34 Sensitivity      : 3.000
* Detector ID        : GAM12 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.56 Half life ratio : *****
* Sample date        : 8-DEC-2015 11:29:00 Analyst initials: MXR1
* Sample ID          : G405235016 Sample Quantity : 1.6312E+02 GRAM
* Batch Number       : 1596247 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 22-SEP-2016 11:41:01 Eff. Geometry : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM12_CAN.CNF;13
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.303E+01	1.394E+00	3.757E-01
SC-46	4.135E-01	5.510E-01	7.481E-01
BA-137M	7.569E-02	8.424E-02	8.137E-02
CS-137	7.996E-02	8.900E-02	8.596E-02
TL-208	3.205E-01	8.181E-02	5.564E-02
PB-210	8.802E+00	1.399E+01	1.482E+01
PB-212	1.093E+00	1.382E-01	9.363E-02
BI-214	7.336E-01	1.855E-01	1.137E-01
PB-214	1.018E+00	2.004E-01	1.354E-01
RN-222	7.336E-01	1.855E-01	1.137E-01
RA-224	1.332E+00	1.756E+00	1.003E+00
RA-226	7.336E-01	1.855E-01	1.137E-01
AC-228	8.986E-01	2.943E-01	1.842E-01
RA-228	8.986E-01	2.943E-01	1.842E-01
TH-228	1.093E+00	1.382E-01	9.363E-02
TH-230	7.334E-01	1.855E-01	1.136E-01
TH-232	8.986E-01	2.943E-01	1.842E-01
TH-234	1.166E+00	3.747E+00	3.551E+00
U-234	7.334E-01	1.855E-01	1.136E-01
U-235	4.023E-02	1.760E-01	3.561E-01
U-238	1.166E+00	3.747E+00	3.551E+00
AM-243	2.390E-01	1.713E-01	1.220E-01
ANH-511	1.177E-01	7.154E-02	4.450E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-5.074E-01		1.269E+01	2.412E+01	NOT IDENT.
NA-22	3.326E-02		4.387E-02	9.885E-02	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF
AL-26	-1.662E-02		2.829E-02	4.921E-02	NOT IDENT.
V-48	0.000E+00		1.393E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00		3.755E+02	0.000E+00	SHORT HLIF
MN-54	1.791E-02		5.843E-02	1.232E-01	NOT IDENT.

CO-56	1.676E-01	4.422E-01	9.416E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-2.561E-02	4.717E-02	9.092E-02	NOT IDENT.
CO-58	-1.599E-01	4.577E-01	8.989E-01	NOT IDENT.
FE-59	3.785E+00	5.186E+00	1.151E+01	NOT IDENT.
CO-60	1.572E-02	3.574E-02	7.896E-02	NOT IDENT.
ZN-65	-3.473E-02	1.851E-01	3.122E-01	NOT IDENT.
GE-68	1.709E-01	2.145E+00	4.394E+00	NOT IDENT.
AS-73	-9.140E+00	1.748E+01	3.136E+01	NOT IDENT.
AS-74	0.000E+00	6.114E+03	0.000E+00	SHORT HLIF
SE-75	-1.278E-02	1.970E-01	3.815E-01	NOT IDENT.
BR-77	0.000E+00	2.513E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.420E+02	0.000E+00	SHORT HLIF
RB-83	2.473E-01	7.246E-01	1.428E+00	NOT IDENT.
KR-85	7.898E+00	6.575E+00	1.362E+01	NOT IDENT.
SR-85	8.337E-01	6.948E-01	1.439E+00	NOT IDENT.
RB-86	0.000E+00	2.513E+04	0.000E+00	SHORT HLIF
Y-88	-1.189E-01	1.346E-01	1.009E-01	NOT IDENT.
Y-91	1.635E+02	5.205E+02	1.077E+03	NOT IDENT.
NB-94	1.764E-02	3.342E-02	6.702E-02	NOT IDENT.
NB-95	-2.185E-03	8.650E-01	1.727E+00	NOT IDENT.
NB-95M	-1.185E+00	2.737E+00	4.532E+00	NOT IDENT.
ZR-95	-4.010E-01	1.203E+00	2.179E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	6.034E+40	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.711E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.426E+41	0.000E+00	SHORT HLIF
RH-101	-2.472E-02	3.403E-02	6.454E-02	NOT IDENT.
RH-102	4.147E-03	6.179E-02	1.181E-01	NOT IDENT.
RU-103	7.210E-01	5.736E+00	1.115E+01	FAIL ABUN
RH-106	-4.231E-04	5.113E-01	9.706E-01	NOT IDENT.
RU-106	-4.231E-04	5.113E-01	9.706E-01	NOT IDENT.
AG-108M	1.970E-02	3.860E-02	5.205E-02	FAIL ABUN
CD-109	1.789E+00	2.751E+00	2.923E+00	FAIL ABUN
AG-110M	6.783E-03	1.103E-01	1.991E-01	NOT IDENT.
SN-113	-9.909E-02	2.278E-01	4.167E-01	NOT IDENT.
CD-115	0.000E+00	3.111E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.682E+05	0.000E+00	SHORT HLIF
TE-123M	-3.086E-02	1.478E-01	2.567E-01	NOT IDENT.
SB-124	-8.270E-01	2.224E+00	4.163E+00	NOT IDENT.
SB-125	5.811E-02	1.160E-01	2.134E-01	FAIL ABUN
TE-125M	1.391E+02	2.888E+02	5.969E+02	NOT IDENT.
I-126	0.000E+00	1.205E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.273E+06	0.000E+00	SHORT HLIF
SN-126	1.140E-01	1.753E-01	1.916E-01	FAIL ABUN
SB-127	0.000E+00	2.169E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	4.777E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.871E+26	0.000E+00	SHORT HLIF
BA-133	1.772E-02	4.090E-02	7.551E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	1.063E-01	6.721E-02	1.082E-01	FAIL ABUN
CS-135	8.011E-02	1.432E-01	2.662E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.416E+05	0.000E+00	SHORT HLIF
CE-139	8.136E-03	1.051E-01	2.085E-01	NOT IDENT.
BA-140	0.000E+00	1.186E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.593E+05	0.000E+00	SHORT HLIF
CE-141	-1.706E+01	2.422E+01	4.565E+01	NOT IDENT.
CE-143	0.000E+00	5.559E+40	0.000E+00	SHORT HLIF
CE-144	8.743E-02	3.465E-01	7.021E-01	NOT IDENT.
PM-144	2.444E-03	4.852E-02	9.377E-02	NOT IDENT.
PR-144	-6.480E-01	4.365E+00	8.130E+00	NOT IDENT.
PM-146	-9.711E-03	3.995E-02	7.109E-02	NOT IDENT.
ND-147	0.000E+00	3.585E+07	0.000E+00	SHORT HLIF
PM-147	-2.014E+02	8.307E+02	1.635E+03	NOT IDENT.
PM-149	0.000E+00	4.587E+40	0.000E+00	SHORT HLIF
EU-150	2.263E-02	2.525E-02	4.915E-02	FAIL ABUN
EU-152	-4.763E-03	9.819E-02	1.874E-01	NOT IDENT.
GD-153	3.764E-02	1.940E-01	3.607E-01	NOT IDENT.
EU-154	7.458E-02	1.061E-01	2.380E-01	FAIL ABUN
EU-155	1.808E-02	1.089E-01	2.221E-01	FAIL ABUN
TB-160	-1.413E+00	1.475E+00	2.526E+00	FAIL ABUN
HO-166M	2.079E-02	5.761E-02	1.144E-01	FAIL ABUN
TM-171	-3.003E+01	4.271E+01	7.545E+01	NOT IDENT.
HF-172	-9.750E-02	2.359E-01	4.575E-01	NOT IDENT.
LU-172	7.676E-02	5.341E-02	1.409E-01	FAIL ABUN
LU-176	-6.849E-03	2.260E-02	4.256E-02	FAIL ABUN

HF-181	-2.950E+00	4.400E+00	7.685E+00	NOT IDENT.
TA-182	3.397E-02	8.497E-01	1.701E+00	FAIL ABUN
RE-183	-3.033E+00	5.074E+00	8.999E+00	NOT IDENT.
RE-184	-9.960E+00	2.832E+01	5.441E+01	NOT IDENT.
W-188	1.869E+01	1.254E+02	2.204E+02	FAIL ABUN
IR-192	-2.217E-01	4.445E-01	7.900E-01	FAIL ABUN
HG-203	-5.593E-01	2.547E+00	4.813E+00	NOT IDENT.
BI-207	-1.147E+02	4.946E-02	9.508E-02	FAIL ABUN
BI-211	0.000E+00	5.521E-01	8.615E-01	FAIL ABUN
PB-211	7.166E-01	6.909E-01	1.458E+00	NOT IDENT.
BI-212	0.000E+00	1.137E+00	1.394E+00	FAIL ABUN
RN-219	-2.873E-01	4.540E-01	7.021E-01	FAIL ABUN
RA-223	1.044E-01	5.387E-01	1.066E+00	FAIL ABUN
AC-227	1.571E-01	2.269E-01	4.306E-01	NOT IDENT.
TH-227	1.571E-01	2.269E-01	4.306E-01	NOT IDENT.
TH-229	4.188E-01	4.920E-01	1.011E+00	FAIL ABUN
PA-231	-2.591E-01	4.113E-01	7.474E-01	NOT IDENT.
TH-231	1.044E-01	5.387E-01	1.066E+00	FAIL ABUN
PA-233	-2.076E-02	5.396E-02	1.008E-01	NOT IDENT.
PA-234	-4.241E-03	1.812E-01	3.856E-01	FAIL ABUN
PA-234M	-6.112E-01	3.785E+00	7.418E+00	NOT IDENT.
NP-237	-2.076E-02	5.396E-02	1.008E-01	NOT IDENT.
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	3.730E-02	2.438E-01	4.938E-01	NOT IDENT.
PU-239	1.282E+02	3.112E+02	6.352E+02	NOT IDENT.
AM-241	-8.076E-02	2.236E-01	4.049E-01	NOT IDENT.
CM-243	-6.819E-02	9.733E-02	1.873E-01	NOT IDENT.
BK-247	1.640E-02	6.957E-02	1.328E-01	NOT IDENT.
CM-247	1.891E-02	3.598E-02	6.701E-02	NOT IDENT.
CF-249	4.479E-02	3.711E-02	8.006E-02	NOT IDENT.
CF-251	7.996E-02	1.141E-01	2.346E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	327	10.66*	1.082E+00	1.303E+01	1.303E+01	10.91
SC-46	889.28	12	99.98*	1.620E+00	3.460E-02	4.135E-01	135.97
	1120.55	50	99.99	1.350E+00	1.715E-01	2.049E+00	39.59
CD-109	88.03	39	3.70*	4.297E+00	1.140E+00	1.789E+00	156.88
SN-126	64.28	19	9.60	2.058E+00	4.494E-01	4.494E-01	327.90
	86.94	39	8.90	4.297E+00	4.741E-01	4.741E-01	156.88
	87.57	39	37.00*	4.297E+00	1.140E-01	1.140E-01	156.88
BA-137M	661.66	30	89.90*	2.040E+00	7.427E-02	7.569E-02	113.58
CS-137	661.66	30	85.10*	2.040E+00	7.846E-02	7.996E-02	113.58
TL-208	277.37	-----	6.60	4.142E+00	-----	Line Not Found	-----
	583.19	134	85.00*	2.256E+00	3.205E-01	3.205E-01	26.05
	860.56	-----	12.50	1.662E+00	-----	Line Not Found	-----
PB-210	46.54	25	4.25*	3.130E-01	8.579E+00	8.802E+00	162.16
BI-211	72.87	-----	1.23	2.964E+00	-----	Line Not Found	-----
	351.06	269	12.92*	3.413E+00	2.803E+00	2.803E+00	20.10
PB-212	74.82	162	10.28	3.186E+00	2.282E+00	2.282E+00	49.58
	77.11	199	17.10	3.414E+00	1.571E+00	1.571E+00	32.23
	238.63	481	43.60*	4.646E+00	1.093E+00	1.093E+00	12.91
	300.09	-----	3.30	3.888E+00	-----	Line Not Found	-----
BI-214	609.32	158	45.49*	2.179E+00	7.334E-01	7.336E-01	25.80
	1120.29	50	14.92	1.350E+00	1.149E+00	1.149E+00	39.59
	1764.49	33	15.30	9.121E-01	1.079E+00	1.079E+00	45.69
PB-214	74.82	162	5.80	3.186E+00	4.045E+00	4.046E+00	49.58
	77.11	199	9.70	3.414E+00	2.769E+00	2.770E+00	32.23
	87.09	39	3.41	4.297E+00	1.237E+00	1.238E+00	156.88
	242.00	147	7.25	4.604E+00	2.031E+00	2.031E+00	47.85
	295.22	201	18.42	3.942E+00	1.277E+00	1.278E+00	22.57
	351.93	269	35.60*	3.413E+00	1.017E+00	1.018E+00	20.10
RN-222	609.32	158	45.49*	2.179E+00	7.334E-01	7.336E-01	25.80
	1120.29	50	14.92	1.350E+00	1.149E+00	1.149E+00	39.59
	1764.49	33	15.30	9.121E-01	1.079E+00	1.079E+00	45.69
RA-224	240.99	147	4.10*	4.604E+00	3.591E+00	3.591E+00	47.85
RA-226	609.32	158	45.49*	2.179E+00	7.334E-01	7.336E-01	25.80
	1120.29	50	14.92	1.350E+00	1.149E+00	1.149E+00	39.59
	1764.49	33	15.30	9.121E-01	1.079E+00	1.079E+00	45.69
AC-228	105.21	-----	1.10	5.379E+00	-----	Line Not Found	-----
	338.32	88	11.27	3.524E+00	1.021E+00	1.021E+00	44.67
	794.95	26	4.25	1.768E+00	1.623E+00	1.623E+00	64.54
	835.71	-----	1.61	1.701E+00	-----	Line Not Found	-----
	911.20	80	25.80*	1.589E+00	8.986E-01	8.986E-01	33.41
	968.97	67	15.80	1.514E+00	1.298E+00	1.298E+00	40.27
RA-228	105.21	-----	1.10	5.379E+00	-----	Line Not Found	-----
	338.32	88	11.27	3.524E+00	1.021E+00	1.021E+00	44.67
	794.95	26	4.25	1.768E+00	1.623E+00	1.623E+00	64.54
	835.71	-----	1.61	1.701E+00	-----	Line Not Found	-----
	911.20	80	25.80*	1.589E+00	8.986E-01	8.986E-01	33.41
	968.97	67	15.80	1.514E+00	1.298E+00	1.298E+00	40.27

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	74.82	162	10.28	3.186E+00	2.282E+00	2.282E+00	49.58
	77.11	199	17.10	3.414E+00	1.571E+00	1.571E+00	32.23
	238.63	481	43.60*	4.646E+00	1.093E+00	1.093E+00	12.91
	300.09	-----	3.30	3.888E+00	-----	Line Not Found	-----
TH-230	609.32	158	45.49*	2.179E+00	7.334E-01	7.334E-01	25.80
	1120.29	50	14.92	1.350E+00	1.149E+00	1.149E+00	39.59
	1764.49	33	15.30	9.121E-01	1.079E+00	1.079E+00	45.69
TH-232	105.21	-----	1.10	5.379E+00	-----	Line Not Found	-----
	338.32	88	11.27	3.524E+00	1.021E+00	1.021E+00	44.67
	835.71	-----	1.61	1.701E+00	-----	Line Not Found	-----
	911.20	80	25.80*	1.589E+00	8.986E-01	8.986E-01	33.41
TH-234	968.97	67	15.80	1.514E+00	1.298E+00	1.298E+00	40.27
	63.29	19	3.70*	2.058E+00	1.166E+00	1.166E+00	327.90
U-234	92.59	144	4.23	4.733E+00	3.299E+00	3.299E+00	53.76
	609.32	158	45.49*	2.179E+00	7.334E-01	7.334E-01	25.80
	1120.29	50	14.92	1.350E+00	1.149E+00	1.149E+00	39.59
U-235	1764.49	33	15.30	9.121E-01	1.079E+00	1.079E+00	45.69
	89.96	71	3.47	4.522E+00	2.083E+00	2.083E+00	49.42
	93.35	144	5.60	4.733E+00	2.492E+00	2.492E+00	53.76
	143.76	-----	10.96*	5.929E+00	-----	Line Not Found	-----
	163.33	-----	5.08	5.762E+00	-----	Line Not Found	-----
U-238	185.72	76	57.20	5.452E+00	1.120E-01	1.120E-01	78.16
	205.31	-----	5.01	5.147E+00	-----	Line Not Found	-----
	63.29	19	3.70*	2.058E+00	1.166E+00	1.166E+00	327.90
	92.59	144	4.23	4.733E+00	3.299E+00	3.299E+00	53.76
AM-243	43.53	38	5.90	2.032E-01	1.471E+01	1.471E+01	180.12
	74.66	162	67.20*	3.186E+00	3.491E-01	3.491E-01	49.58
ANH-511	511.00	64	100.00*	2.511E+00	1.177E-01	1.177E-01	62.00

Flag: "*" = Keyline

Total number of lines in spectrum 51
 Number of unidentified lines 15
 Number of lines tentatively identified by NID 36 70.59%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.303E+01	1.303E+01	0.142E+01	10.91	
SC-46	83.79D	12.0	3.460E-02	4.135E-01	5.622E-01	135.97	
CD-109	461.40D	1.57	1.140E+00	1.789E+00	2.807E+00	156.88	
SN-126	2.30E+05Y	1.00	1.140E-01	1.140E-01	1.789E-01	156.88	
BA-137M	30.08Y	1.02	7.427E-02	7.569E-02	8.596E-02	113.58	
CS-137	30.08Y	1.02	7.846E-02	7.996E-02	9.081E-02	113.58	
TL-208	1.41E+10Y	1.00	3.205E-01	3.205E-01	0.835E-01	26.05	
PB-210	22.20Y	1.03	8.579E+00	8.802E+00	14.27E+00	162.16	
BI-211	7.04E+08Y	1.00	2.803E+00	2.803E+00	0.563E+00	20.10	
PB-212	1.41E+10Y	1.00	1.093E+00	1.093E+00	0.141E+00	12.91	
BI-214	1600.00Y	1.00	7.334E-01	7.336E-01	1.893E-01	25.80	
PB-214	1600.00Y	1.00	1.017E+00	1.018E+00	0.205E+00	20.10	
RN-222	1600.00Y	1.00	7.334E-01	7.336E-01	1.893E-01	25.80	
RA-224	1.41E+10Y	1.00	3.591E+00	3.591E+00	1.718E+00	47.85	
RA-226	1600.00Y	1.00	7.334E-01	7.336E-01	1.893E-01	25.80	
AC-228	1.41E+10Y	1.00	8.986E-01	8.986E-01	3.003E-01	33.41	
RA-228	1.41E+10Y	1.00	8.986E-01	8.986E-01	3.003E-01	33.41	
TH-228	1.41E+10Y	1.00	1.093E+00	1.093E+00	0.141E+00	12.91	
TH-230	7.54E+04Y	1.00	7.334E-01	7.334E-01	1.892E-01	25.80	
TH-232	1.41E+10Y	1.00	8.986E-01	8.986E-01	3.003E-01	33.41	
TH-234	4.47E+09Y	1.00	1.166E+00	1.166E+00	3.824E+00	327.90	
U-234	2.45E+05Y	1.00	7.334E-01	7.334E-01	1.892E-01	25.80	
U-235	7.04E+08Y	1.00	1.120E-01	1.120E-01	0.876E-01	78.16	K
U-238	4.47E+09Y	1.00	1.166E+00	1.166E+00	3.824E+00	327.90	
AM-243	7370.00Y	1.00	3.491E-01	3.491E-01	1.731E-01	49.58	
ANH-511	1.00E+09Y	1.00	1.177E-01	1.177E-01	0.730E-01	62.00	
Total Activity :			4.225E+01	4.350E+01			

Grand Total Activity : 4.225E+01 4.350E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
9	35.91	44	11	1.15	71.66	68	25	8.49E-03	87.0	2.40E-02	
9	37.68	72	58	1.86	75.20	68	25	1.39E-02	82.7	4.91E-02	
9	40.14	103	111	1.78	80.11	68	25	2.00E-02	56.4	1.06E-01	
0	154.32	39	82	1.34	308.48	306	6	8.54E-03	91.3	5.86E+00	T
0	157.46	29	115	1.37	314.75	312	8	6.48E-03	****	5.83E+00	T
0	209.26	35	110	0.89	418.35	415	8	7.98E-03	****	5.09E+00	
0	258.15	16	74	1.41	516.13	512	9	3.62E-03	****	4.38E+00	
0	271.20	38	133	0.80	542.23	536	14	8.80E-03	****	4.22E+00	T
0	408.91	30	110	5.41	817.70	805	19	7.34E-03	****	3.01E+00	
0	432.57	11	35	1.27	865.05	861	8	2.74E-03	****	2.87E+00	T
2	443.52	22	8	1.28	886.95	885	17	5.51E-03	56.2	2.82E+00	
2	446.21	27	30	1.74	892.32	885	17	6.65E-03	91.8	2.80E+00	
0	462.58	32	51	3.05	925.07	918	14	8.03E-03	****	2.72E+00	T
0	491.73	16	19	1.73	983.40	979	7	3.94E-03	****	2.59E+00	T
0	569.42	43	65	0.81	1138.82	1132	16	1.10E-02	93.2	2.30E+00	T
0	727.24	49	38	1.52	1454.59	1448	16	1.27E-02	65.7	1.90E+00	T
0	862.42	41	31	4.43	1725.08	1717	19	1.08E-02	73.4	1.66E+00	
0	996.16	12	2	1.63	1992.73	1989	7	3.14E-03	70.9	1.48E+00	T
0	1104.74	15	21	0.53	2210.06	2202	16	4.07E-03	****	1.37E+00	
0	1161.46	12	0	1.60	2323.58	2320	7	3.33E-03	57.7	1.31E+00	
0	1181.87	11	27	3.93	2364.44	2352	19	2.97E-03	****	1.29E+00	
0	1187.67	16	5	2.39	2376.05	2372	9	4.46E-03	69.5	1.29E+00	T
0	1194.48	20	2	3.89	2389.67	2385	11	5.49E-03	55.0	1.28E+00	
0	1239.76	31	7	3.90	2480.31	2473	14	8.73E-03	50.3	1.24E+00	T
0	1247.01	20	6	2.11	2494.83	2488	13	5.69E-03	67.7	1.24E+00	
0	2042.49	5	5	0.51	4087.70	4081	10	1.39E-03	****	7.90E-01	

Flags: "T" = Tentatively associated


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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235016.CNF;1
* Acquisition date   : 3-OCT-2016 08:15:34 Sensitivity      : 3.000
* Detector ID       : GAM12 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.56 Half life ratio : *****
* Sample date       : 8-DEC-2015 11:29:00 Nuclide Library : SOLID
* Sample ID        : G405235016 Analyst initials: MXR1
* Batch Number     : 1596247 Sample Quantity : 1.6312E+02 GRAM
* Wet wt corr      : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date    : 22-SEP-2016 11:41:01 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM12_CAN.CNF;13
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.333E-01
SC-46	3.270E-01
BA-137M	3.712E-02
CS-137	3.921E-02
TL-208	2.445E-02
PB-210	6.990E+00
PB-212	4.355E-02
BI-214	5.033E-02
PB-214	6.229E-02
RN-222	5.033E-02
RA-224	4.667E-01
RA-226	5.033E-02
AC-228	7.656E-02
RA-228	7.656E-02
TH-228	4.355E-02
TH-230	5.032E-02
TH-232	7.656E-02
TH-234	1.679E+00
U-234	5.032E-02
U-235	1.678E-01
U-238	1.679E+00
AM-243	5.778E-02
ANH-511	1.967E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.089E+01	NOT IDENT.
NA-22	4.296E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.757E-02	NOT IDENT.
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.428E-02	NOT IDENT.
CO-56	4.148E-01	FAIL ABUN

MN-56	0.000E+00	SHORT HLIF
CO-57	4.257E-02	NOT IDENT.
CO-58	3.800E-01	NOT IDENT.
FE-59	4.882E+00	NOT IDENT.
CO-60	3.348E-02	NOT IDENT.
ZN-65	1.344E-01	NOT IDENT.
GE-68	1.893E+00	NOT IDENT.
AS-73	1.472E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.760E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	6.490E-01	NOT IDENT.
KR-85	6.181E+00	NOT IDENT.
SR-85	6.531E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	0.000E+00	NOT IDENT.
Y-91	4.719E+02	NOT IDENT.
NB-94	3.021E-02	NOT IDENT.
NB-95	7.729E-01	NOT IDENT.
NB-95M	2.120E+00	NOT IDENT.
ZR-95	9.246E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.028E-02	NOT IDENT.
RH-102	5.275E-02	NOT IDENT.
RU-103	5.023E+00	FAIL ABUN
RH-106	4.324E-01	NOT IDENT.
RU-106	4.324E-01	NOT IDENT.
AG-108M	2.352E-02	FAIL ABUN
CD-109	1.396E+00	FAIL ABUN
AG-110M	8.716E-02	NOT IDENT.
SN-113	1.887E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.205E-01	NOT IDENT.
SB-124	1.644E+00	NOT IDENT.
SB-125	9.747E-02	FAIL ABUN
TE-125M	2.816E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SN-126	9.158E-02	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.446E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	4.854E-02	FAIL ABUN
CS-135	1.234E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	9.768E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.143E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.299E-01	NOT IDENT.
PM-144	4.105E-02	NOT IDENT.
PR-144	3.558E+00	NOT IDENT.
PM-146	3.153E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.674E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.263E-02	FAIL ABUN
EU-152	8.631E-02	NOT IDENT.
GD-153	1.693E-01	NOT IDENT.
EU-154	1.032E-01	FAIL ABUN
EU-155	1.043E-01	FAIL ABUN
TB-160	1.033E+00	FAIL ABUN
HO-166M	5.106E-02	FAIL ABUN
TM-171	3.537E+01	NOT IDENT.
HF-172	2.150E-01	NOT IDENT.
LU-172	6.052E-02	FAIL ABUN
LU-176	1.944E-02	FAIL ABUN
HF-181	3.429E+00	NOT IDENT.

TA-182	7.361E-01	FAIL ABUN
RE-183	4.214E+00	NOT IDENT.
RE-184	2.349E+01	NOT IDENT.
W-188	1.021E+02	FAIL ABUN
IR-192	3.594E-01	FAIL ABUN
HG-203	2.237E+00	NOT IDENT.
BI-207	4.139E-02	FAIL ABUN
BI-211	4.161E-01	FAIL ABUN
PB-211	6.722E-01	NOT IDENT.
BI-212	6.466E-01	FAIL ABUN
RN-219	3.187E-01	FAIL ABUN
RA-223	4.883E-01	FAIL ABUN
AC-227	1.995E-01	NOT IDENT.
TH-227	1.995E-01	NOT IDENT.
TH-229	4.774E-01	FAIL ABUN
PA-231	3.420E-01	NOT IDENT.
TH-231	4.883E-01	FAIL ABUN
PA-233	4.586E-02	NOT IDENT.
PA-234	1.584E-01	FAIL ABUN
PA-234M	3.196E+00	NOT IDENT.
NP-237	4.586E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	2.321E-01	NOT IDENT.
PU-239	2.996E+02	NOT IDENT.
AM-241	1.899E-01	NOT IDENT.
CM-243	8.741E-02	NOT IDENT.
BK-247	6.126E-02	NOT IDENT.
CM-247	3.054E-02	NOT IDENT.
CF-249	3.689E-02	NOT IDENT.
CF-251	1.104E-01	NOT IDENT.

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235016.CNF;1
* Acquisition date   : 3-OCT-2016 08:15:34 Sensitivity      : 3.000
* Detector ID       : GAM12 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.56 Half life ratio  : *****
* Sample date      : 8-DEC-2015 11:29:00 Nuclide Library : SOLID
* Sample ID       : G405235016 Analyst initials: MXR1
* Batch Number    : 1596247 Sample Quantity : 1.6312E+02 GRAM
* Wet wt corr     : 1.00000 Quantity Err(%) : 1.2261E-03 %
* Dry Weight      : 0.00000
* Wet Weight      : 0.00000
* Dry Weight      : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 22-SEP-2016 11:41:01 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM12_CAN.CNF;13
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.303E+01	1.552E+00	1.552E+00
SC-46	4.135E-01	5.513E-01	5.513E-01
BA-137M	7.569E-02	8.431E-02	8.431E-02
CS-137	7.996E-02	8.906E-02	8.906E-02
TL-208	3.205E-01	8.295E-02	8.295E-02
PB-210	8.802E+00	1.404E+01	1.404E+01
PB-212	1.093E+00	1.503E-01	1.503E-01
BI-214	7.336E-01	1.882E-01	1.882E-01
PB-214	1.018E+00	2.050E-01	2.050E-01
RN-222	7.336E-01	1.882E-01	1.882E-01
RA-224	1.332E+00	1.764E+00	1.764E+00
RA-226	7.336E-01	1.882E-01	1.882E-01
AC-228	8.986E-01	2.979E-01	2.979E-01
RA-228	8.986E-01	2.979E-01	2.979E-01
TH-228	1.093E+00	1.503E-01	1.503E-01
TH-230	7.334E-01	1.881E-01	1.881E-01
TH-232	8.986E-01	2.979E-01	2.979E-01
TH-234	1.166E+00	3.756E+00	3.756E+00
U-234	7.334E-01	1.881E-01	1.881E-01
U-235	4.023E-02	1.760E-01	1.760E-01
U-238	1.166E+00	3.756E+00	3.756E+00
AM-243	2.390E-01	1.726E-01	1.726E-01
ANH-511	1.177E-01	7.170E-02	7.170E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-5.074E-01	1.269E+01	1.269E+01	NOT IDENT.
NA-22	3.326E-02	4.388E-02	4.637E-02	NOT IDENT.
NA-24	1.000E+41	4.275E+41	0.000E+00	SHORT HLIF
AL-26	-1.662E-02	2.831E-02	2.929E-02	NOT IDENT.
V-48	-7.597E+03	1.393E+04	1.435E+04	SHORT HLIF
CR-51	4.549E+01	3.755E+02	3.761E+02	SHORT HLIF
MN-54	1.791E-02	5.844E-02	5.899E-02	NOT IDENT.

CO-56	1.676E-01	4.423E-01	4.487E-01	FAIL ABUN
MN-56	1.000E+41	2.640E+41	0.000E+00	SHORT HLIF
CO-57	-2.561E-02	4.718E-02	4.857E-02	NOT IDENT.
CO-58	-1.599E-01	4.578E-01	4.634E-01	NOT IDENT.
FE-59	3.785E+00	5.193E+00	5.466E+00	NOT IDENT.
CO-60	1.572E-02	3.575E-02	3.644E-02	NOT IDENT.
ZN-65	-3.473E-02	1.851E-01	1.857E-01	NOT IDENT.
GE-68	1.709E-01	2.145E+00	2.146E+00	NOT IDENT.
AS-73	-9.140E+00	1.758E+01	1.806E+01	NOT IDENT.
AS-74	-8.607E+02	6.115E+03	6.127E+03	SHORT HLIF
SE-75	-1.278E-02	1.971E-01	1.971E-01	NOT IDENT.
BR-77	1.987E+38	1.720E+39	0.000E+00	SHORT HLIF
SR-82	1.105E+02	6.420E+02	6.439E+02	SHORT HLIF
RB-83	2.473E-01	7.254E-01	7.339E-01	NOT IDENT.
KR-85	7.898E+00	6.583E+00	7.484E+00	NOT IDENT.
SR-85	8.337E-01	6.957E-01	7.907E-01	NOT IDENT.
RB-86	3.294E+03	2.513E+04	2.517E+04	SHORT HLIF
Y-88	-1.189E-01	1.348E-01	1.451E-01	NOT IDENT.
Y-91	1.635E+02	5.205E+02	5.257E+02	NOT IDENT.
NB-94	1.764E-02	3.343E-02	3.436E-02	NOT IDENT.
NB-95	-2.185E-03	8.650E-01	8.650E-01	NOT IDENT.
NB-95M	-1.185E+00	2.739E+00	2.791E+00	NOT IDENT.
ZR-95	-4.010E-01	1.203E+00	1.216E+00	NOT IDENT.
NB-97	1.000E+41	3.541E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	6.048E+40	0.000E+00	SHORT HLIF
MO-99	8.346E+31	1.712E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.430E+41	0.000E+00	SHORT HLIF
RH-101	-2.472E-02	3.432E-02	3.609E-02	NOT IDENT.
RH-102	4.147E-03	6.179E-02	6.182E-02	NOT IDENT.
RU-103	7.210E-01	5.736E+00	5.745E+00	FAIL ABUN
RH-106	-4.231E-04	5.113E-01	5.113E-01	NOT IDENT.
RU-106	-4.231E-04	5.113E-01	5.113E-01	NOT IDENT.
AG-108M	1.970E-02	3.860E-02	3.961E-02	FAIL ABUN
CD-109	1.789E+00	2.755E+00	2.870E+00	FAIL ABUN
AG-110M	6.783E-03	1.103E-01	1.103E-01	NOT IDENT.
SN-113	-9.909E-02	2.279E-01	2.322E-01	NOT IDENT.
CD-115	2.004E+39	3.132E+39	0.000E+00	SHORT HLIF
SN-117M	1.166E+05	1.688E+05	1.768E+05	SHORT HLIF
TE-123M	-3.086E-02	1.478E-01	1.485E-01	NOT IDENT.
SB-124	-8.270E-01	2.224E+00	2.255E+00	NOT IDENT.
SB-125	5.811E-02	1.160E-01	1.190E-01	FAIL ABUN
TE-125M	1.391E+02	2.889E+02	2.956E+02	NOT IDENT.
I-126	2.344E+05	1.205E+06	1.210E+06	SHORT HLIF
SB-126	-2.180E+05	1.273E+06	1.277E+06	SHORT HLIF
SN-126	1.140E-01	1.755E-01	1.828E-01	FAIL ABUN
SB-127	4.336E+21	2.249E+22	0.000E+00	SHORT HLIF
I-131	-3.454E+09	4.780E+09	5.027E+09	SHORT HLIF
I-132	1.000E+41	1.911E+42	0.000E+00	SHORT HLIF
TE-132	-1.587E+25	3.871E+26	0.000E+00	SHORT HLIF
BA-133	1.772E-02	4.091E-02	4.168E-02	NOT IDENT.
I-133	1.000E+41	4.029E+41	0.000E+00	SHORT HLIF
CS-134	1.063E-01	6.737E-02	8.266E-02	FAIL ABUN
CS-135	8.011E-02	1.433E-01	1.478E-01	NOT IDENT.
I-135	1.000E+41	1.016E+42	0.000E+00	SHORT HLIF
CS-136	-1.033E+04	2.416E+05	2.417E+05	SHORT HLIF
CE-139	8.136E-03	1.051E-01	1.051E-01	NOT IDENT.
BA-140	8.733E+05	1.187E+06	1.250E+06	SHORT HLIF
LA-140	-2.688E+05	4.595E+05	4.752E+05	SHORT HLIF
CE-141	-1.706E+01	2.423E+01	2.542E+01	NOT IDENT.
CE-143	1.000E+41	5.652E+40	0.000E+00	SHORT HLIF
CE-144	8.743E-02	3.466E-01	3.488E-01	NOT IDENT.
PM-144	2.444E-03	4.852E-02	4.853E-02	NOT IDENT.
PR-144	-6.480E-01	4.365E+00	4.375E+00	NOT IDENT.
PM-146	-9.711E-03	3.995E-02	4.019E-02	NOT IDENT.
ND-147	7.457E+06	3.585E+07	3.601E+07	SHORT HLIF
PM-147	-2.014E+02	8.307E+02	8.357E+02	NOT IDENT.
PM-149	2.545E+38	4.587E+40	0.000E+00	SHORT HLIF
EU-150	2.263E-02	2.527E-02	2.725E-02	FAIL ABUN
EU-152	-4.763E-03	9.819E-02	9.822E-02	NOT IDENT.
GD-153	3.764E-02	1.941E-01	1.948E-01	NOT IDENT.
EU-154	7.458E-02	1.061E-01	1.113E-01	FAIL ABUN
EU-155	1.808E-02	1.089E-01	1.092E-01	FAIL ABUN
TB-160	-1.413E+00	1.477E+00	1.609E+00	FAIL ABUN
HO-166M	2.079E-02	5.762E-02	5.838E-02	FAIL ABUN
TM-171	-3.003E+01	4.280E+01	4.489E+01	NOT IDENT.
HF-172	-9.750E-02	2.365E-01	2.405E-01	NOT IDENT.
LU-172	7.676E-02	5.397E-02	6.411E-02	FAIL ABUN
LU-176	-6.849E-03	2.260E-02	2.281E-02	FAIL ABUN

HF-181	-2.950E+00	4.402E+00	4.599E+00	NOT IDENT.
TA-182	3.397E-02	8.497E-01	8.498E-01	FAIL ABUN
RE-183	-3.033E+00	5.097E+00	5.277E+00	NOT IDENT.
RE-184	-9.960E+00	2.842E+01	2.877E+01	NOT IDENT.
W-188	1.869E+01	1.254E+02	1.257E+02	FAIL ABUN
IR-192	-2.217E-01	4.446E-01	4.557E-01	FAIL ABUN
HG-203	-5.593E-01	2.547E+00	2.560E+00	NOT IDENT.
BI-207	-1.147E-02	4.946E-02	4.973E-02	FAIL ABUN
BI-211	2.803E+00	5.666E-01	1.385E+00	FAIL ABUN
PB-211	7.166E-01	6.919E-01	7.636E-01	NOT IDENT.
BI-212	1.766E+00	1.140E+00	1.391E+00	FAIL ABUN
RN-219	-2.873E-01	4.555E-01	4.735E-01	FAIL ABUN
RA-223	1.044E-01	5.388E-01	5.408E-01	FAIL ABUN
AC-227	1.571E-01	2.279E-01	2.386E-01	NOT IDENT.
TH-227	1.571E-01	2.279E-01	2.386E-01	NOT IDENT.
TH-229	4.188E-01	4.924E-01	5.274E-01	FAIL ABUN
PA-231	-2.591E-01	4.150E-01	4.312E-01	NOT IDENT.
TH-231	1.044E-01	5.388E-01	5.408E-01	FAIL ABUN
PA-233	-2.076E-02	5.397E-02	5.478E-02	NOT IDENT.
PA-234	-4.241E-03	1.813E-01	1.813E-01	FAIL ABUN
PA-234M	-6.112E-01	3.785E+00	3.795E+00	NOT IDENT.
NP-237	-2.076E-02	5.397E-02	5.478E-02	NOT IDENT.
NP-238	-1.000E+41	2.160E+41	0.000E+00	SHORT HLIF
NP-239	3.730E-02	2.439E-01	2.444E-01	NOT IDENT.
PU-239	1.282E+02	3.113E+02	3.166E+02	NOT IDENT.
AM-241	-8.076E-02	2.237E-01	2.267E-01	NOT IDENT.
CM-243	-6.819E-02	9.754E-02	1.023E-01	NOT IDENT.
BK-247	1.640E-02	6.965E-02	7.004E-02	NOT IDENT.
CM-247	1.891E-02	3.612E-02	3.712E-02	NOT IDENT.
CF-249	4.479E-02	3.730E-02	4.241E-02	NOT IDENT.
CF-251	7.996E-02	1.145E-01	1.200E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	43.8354	87.09	136.4134	136.47	78.0933
45.60	91.2111	87.57	136.4821	140.51	0.0000
46.54	92.9732	88.03	136.5484	143.76	74.0322
49.72	0.0000	88.34	82.4707	144.24	82.1883
51.35	92.4033	88.47	82.4819	145.44	95.8253
51.87	88.7731	89.96	82.6099	152.43	64.0735
52.39	91.3065	1093.63	83.9597	153.25	0.0000
52.97	95.0859	91.11	0.0000	323.87	87.3652
53.44	90.2060	92.59	84.1273	156.02	0.0000
54.07	76.6810	93.35	84.1922	158.56	0.0000
57.36	0.0000	94.56	84.2949	159.00	84.9359
57.53	83.2581	94.65	84.3028	162.33	71.4095
57.98	88.2817	94.67	84.3043	162.66	0.0000
59.27	85.9423	94.87	84.3212	163.33	84.2875
59.32	85.9478	97.43	72.8314	165.86	71.5912
59.54	85.9728	98.43	68.9972	176.31	69.3436
60.96	74.8979	98.44	68.9980	176.60	0.0000
61.17	83.2428	99.53	72.9813	177.52	68.4762
62.93	88.8544	100.11	78.2382	181.07	0.0000
63.29	101.8330	102.03	67.9322	181.52	86.2916
63.58	101.8704	103.18	81.9574	184.41	65.5423
64.28	101.9606	103.37	81.9722	143.76	71.6478
66.73	100.5957	105.21	76.8738	193.51	73.8857
67.24	98.1427	105.31	76.8809	197.03	96.5510
125.81	100.7135	106.12	69.9451	198.01	76.9142
67.75	100.7220	106.47	71.7171	201.83	84.6231
69.67	94.6472	109.28	80.6731	203.43	63.0613
70.83	102.3605	111.00	82.5569	205.31	72.0876
72.81	107.2447	111.76	0.0000	210.85	73.7542
72.87	107.2525	114.06	79.2632	215.65	76.8159
74.66	107.4760	116.30	0.0000	222.11	65.6898
74.82	107.4954	116.74	78.5703	227.09	64.9287
74.97	107.5141	119.76	83.2048	227.38	65.8948
77.11	107.7770	121.12	84.1890	228.16	0.0000
78.74	109.6757	121.22	83.3100	228.18	64.0148
79.69	112.3452	121.78	84.2373	116.74	64.0148
80.12	109.8443	122.06	85.1445	235.69	82.0462
80.19	0.0000	122.92	85.2075	235.96	71.9818
80.57	108.6209	123.07	88.7690	238.63	59.5958
81.00	108.6728	265.00	73.7167	238.98	0.0000
81.07	121.4672	125.81	92.5356	240.99	59.6753
81.75	125.3965	127.23	95.3186	242.00	59.7093
83.79	107.7211	127.91	90.9166	244.70	44.8501
84.00	107.7455	129.30	82.0982	252.40	0.0000
85.43	107.9108	131.20	98.3156	252.80	56.1934
86.55	124.7601	133.02	69.8195	254.15	0.0000
86.79	136.3697	133.52	75.2209	256.23	39.3118
86.94	136.3915	136.00	85.2424	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	48.7539	355.39	0.0000	584.27	17.7370
264.80	47.7828	356.01	29.0410	595.83	0.0000
265.00	43.3016	364.49	0.0000	427.87	22.2843
268.22	42.4964	366.42	0.0000	602.52	0.0000
269.46	49.8555	372.51	25.6571	604.72	31.7958
270.03	49.8701	375.05	33.9037	607.14	26.7949
271.23	49.9022	377.52	28.7970	609.32	20.1094
273.65	0.0000	356.01	36.0923	610.33	20.1160
276.40	54.4510	388.16	25.8265	614.28	30.2102
277.37	49.4720	388.63	0.0000	618.01	19.0427
277.60	49.4782	391.69	38.2789	620.36	20.1775
278.00	51.0595	264.66	46.7267	621.93	22.4300
279.20	62.8815	401.81	45.1904	630.19	0.0000
279.54	69.7707	402.40	26.4971	631.29	22.4927
279.70	69.7765	404.85	29.1239	633.25	20.2559
280.46	62.9219	410.95	34.4086	634.78	0.0000
283.69	46.2848	413.71	31.3153	635.95	28.1555
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	54.2100	423.72	0.0000	645.85	15.8132
285.90	0.0000	427.09	39.8748	657.76	22.1025
287.50	50.3214	427.87	28.3409	657.90	0.0000
290.67	50.4013	433.94	37.8765	661.66	36.3112
293.27	0.0000	439.40	30.3650	664.57	0.0000
351.93	53.4869	453.88	24.1707	666.33	0.0000
295.96	53.5067	463.37	31.9159	666.50	0.0000
879.38	35.7173	468.07	33.5694	667.71	0.0000
299.98	29.7852	473.00	0.0000	677.62	21.6587
300.09	29.7864	475.06	25.6421	685.70	0.0000
300.13	29.7870	476.78	34.2109	695.00	0.0000
301.36	50.6690	477.60	29.9431	696.49	16.0445
302.85	54.6822	482.18	33.2062	696.51	18.3366
256.23	30.8461	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	17.1942
306.78	42.8338	497.08	25.8447	697.49	17.1954
308.46	35.8901	505.52	19.4407	702.65	20.6638
311.90	40.9424	507.63	0.0000	706.68	26.4328
316.51	41.0325	511.00	19.4777	711.68	18.4134
319.41	0.0000	514.00	14.6234	720.70	0.0000
320.08	0.0000	514.00	14.6234	721.93	0.0000
321.04	44.1289	520.40	28.2249	722.78	24.2411
323.87	36.1531	520.69	0.0000	722.91	24.2419
325.23	43.2108	522.65	0.0000	723.31	22.5135
328.76	0.0000	527.90	0.0000	724.19	22.5183
333.37	36.3127	528.26	21.7700	727.33	17.3370
333.97	28.7551	529.59	26.1357	733.00	17.3633
334.37	40.8708	529.87	0.0000	735.93	18.5352
338.28	50.5473	531.02	0.0000	333.97	18.5430
338.32	50.5483	537.26	0.0000	739.50	0.0000
311.90	51.6101	546.56	0.0000	747.24	16.2678
340.48	51.6101	552.55	15.3621	748.06	18.5957
340.55	0.0000	563.25	26.4268	752.31	10.4718
344.28	46.6298	569.33	27.5818	753.82	0.0000
345.93	45.6500	946.00	27.5838	756.73	13.9785
351.06	44.7376	569.70	27.5859	756.80	13.9790
351.93	44.7546	583.19	17.7305	884.68	12.2547

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	24.5214	1274.44	7.4001	1620.50	3.1053
766.42	28.0283	1001.03	11.6411	1621.92	1.0353
766.84	27.1553	1002.74	12.0423	1678.03	0.0000
772.60	0.0000	1004.73	13.9009	1690.97	7.3226
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	2.1146
778.90	19.3326	1028.54	0.0000	1063.66	5.6436
783.70	0.0000	1037.84	9.3329	1771.35	4.2332
785.37	14.9637	1038.76	0.0000	1791.20	0.0000
792.07	11.2859	631.29	13.0900	1808.65	5.3195
794.95	12.3530	1048.07	0.0000	1810.72	0.0000
795.86	8.4727	1049.04	8.4194	1836.06	3.2040
810.06	11.5146	1050.41	11.2288		
810.29	11.5154	1063.66	17.8287		
344.28	13.2875	1077.00	0.0000		
810.76	13.2884	1077.34	12.2327		
815.77	0.0000	1085.87	12.2542		
1048.07	0.0000	1093.63	1.8882		
832.01	11.5777	1099.45	4.5372		
834.85	15.1505	1112.07	15.1621		
835.71	16.9364	1112.84	15.1641		
836.80	0.0000	1115.54	15.1729		
846.75	0.0000	1120.29	17.0848		
846.77	14.3013	1120.55	17.0859		
856.80	0.0000	1221.41	17.0892		
860.56	17.9364	1129.67	17.1167		
871.09	15.4128	1131.51	0.0000		
873.19	12.5935	1147.95	0.0000		
875.33	0.0000	1173.23	7.6729		
879.38	15.3144	1177.95	16.8953		
880.51	11.7142	1189.05	7.6958		
883.24	10.3048	1204.77	13.5087		
884.68	15.8748	1221.41	13.5505		
889.28	16.2532	1231.02	12.6057		
894.76	23.1453	1235.36	0.0000		
898.04	11.7626	1238.28	6.2141		
900.72	19.0127	1260.41	0.0000		
903.28	17.2124	1271.87	15.6309		
911.20	8.1683	1274.44	7.8193		
912.08	8.1700	1274.54	7.8193		
923.98	0.0000	1291.59	8.8242		
926.50	10.9292	1298.22	0.0000		
929.11	12.7584	1312.11	0.0000		
937.49	21.9133	1332.49	6.9133		
944.13	0.0000	1362.66	0.0000		
946.00	7.3186	1365.19	8.9390		
949.00	10.9852	1368.63	0.0000		
667.71	0.0000	1384.29	3.9861		
962.31	22.0356	1408.01	6.0029		
964.08	16.1659	1457.56	0.0000		
966.17	23.5250	1460.82	2.0187		
911.20	22.9881	1489.16	4.0562		
968.97	22.9881	1505.03	11.1826		
983.53	0.0000	1584.12	8.2349		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235017.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM16.CNF;440
Background date : 2-OCT-2016 11:00:50.
Sample date      : 2-DEC-2015 10:02:00. Acquisition date : 3-OCT-2016 08:16:00.
Sample ID       : G405235017 Sample quantity : 1.48561E+02 GRAM
Detector name   : GAM16 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.55 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596247 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	43.60	27	145	0.86	87.27	84	7	7.36E-03	78.4	
2	3	70.29	31	189	1.22	140.62	137	28	8.56E-03	71.5	2.06E+00
3	3	74.95	142	189	1.32	149.93	137	28	3.95E-02	19.5	
4	3	77.16	234	170	1.32	154.35	137	28	6.49E-02	12.7	
5	3	81.32	43	71	1.34	162.66	137	28	1.18E-02	33.8	
6	1	87.09	78	205	1.12	174.19	170	22	2.18E-02	31.6	2.52E+00
7	1	90.10	40	194	1.12	180.20	170	22	1.10E-02	59.7	
8	1	92.57*	75	183	1.13	185.16	170	22	2.09E-02	34.8	
9	0	115.21	31	183	1.66	230.41	225	9	8.50E-03	82.3	
10	0	144.07*	29	133	1.56	288.09	285	7	8.01E-03	70.3	
11	0	154.89	28	180	1.75	309.72	305	9	7.66E-03	90.1	
12	0	186.01*	91	207	1.19	371.93	367	10	2.51E-02	32.3	
13	0	209.13	44	129	1.18	418.16	415	7	1.21E-02	46.1	
14	0	228.05	26	123	1.48	455.98	453	8	7.16E-03	77.0	
15	6	238.69*	468	91	1.11	477.25	472	19	1.30E-01	5.9	1.15E+00
16	6	241.61	154	150	2.23	483.08	472	19	4.27E-02	23.7	
17	0	270.50	32	155	1.06	540.83	536	10	8.89E-03	74.9	
18	0	295.27*	173	117	1.10	590.35	585	12	4.81E-02	14.7	
19	0	300.49	54	113	3.35	600.78	596	11	1.49E-02	40.8	
20	0	328.07	47	89	1.60	655.93	652	9	1.32E-02	38.8	
21	0	338.67	88	118	1.00	677.11	671	10	2.44E-02	25.6	
22	0	351.96*	277	133	1.25	703.68	698	13	7.68E-02	10.6	
23	0	467.98	99	201	9.84	935.63	921	26	2.76E-02	40.4	
24	0	511.26*	14	104	1.12	1022.15	1016	13	3.87E-03	167.9	
25	1	546.79	22	12	1.71	1093.19	1090	16	6.23E-03	33.0	2.19E+00
26	1	551.54	17	21	1.72	1102.69	1090	16	4.85E-03	46.5	
27	0	562.64	30	30	1.29	1124.88	1119	12	8.33E-03	40.8	
28	0	583.38*	139	68	1.74	1166.34	1161	15	3.85E-02	15.6	
29	0	609.48*	238	38	1.32	1218.54	1213	13	6.60E-02	8.5	
30	0	616.03	24	37	3.46	1231.63	1226	12	6.72E-03	53.8	
31	0	646.12	28	13	1.47	1291.80	1286	11	7.79E-03	31.7	
32	0	661.74	1437	68	1.64	1323.02	1316	16	3.99E-01	2.9	
33	0	685.39	17	23	4.96	1370.30	1363	15	4.80E-03	64.6	
34	0	728.12*	45	25	1.21	1455.74	1449	14	1.25E-02	28.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	1	742.92	18	22	1.88	1485.34	1478	19	4.90E-03	60.0	4.56E+00
36	1	745.25	23	24	1.71	1490.00	1478	19	6.48E-03	42.3	
37	0	768.89	15	32	1.42	1537.26	1533	11	4.28E-03	74.1	
38	0	782.30	8	10	1.50	1564.08	1560	7	2.28E-03	73.4	
39	0	785.92	14	14	0.68	1571.31	1567	9	3.93E-03	54.0	
40	0	911.42*	75	33	1.34	1822.26	1816	14	2.08E-02	20.7	
41	0	969.24*	63	13	1.42	1937.87	1932	12	1.75E-02	17.8	
42	0	1002.46	13	20	0.66	2004.30	1996	17	3.49E-03	88.4	
43	0	1008.37	17	6	2.90	2016.12	2012	9	4.62E-03	37.2	
44	0	1072.24	12	8	2.30	2143.83	2139	8	3.39E-03	49.2	
45	0	1110.46	10	17	1.09	2220.28	2209	14	2.67E-03	97.7	
46	0	1120.27	50	5	1.62	2239.89	2235	10	1.40E-02	16.3	
47	0	1221.91	13	9	2.28	2443.16	2438	9	3.47E-03	51.4	
48	0	1411.82	10	7	3.55	2822.96	2816	11	2.69E-03	65.1	
49	0	1460.83*	424	7	2.42	2920.98	2914	14	1.18E-01	5.1	
50	0	1588.32	9	2	1.11	3175.98	3172	8	2.56E-03	42.0	
51	0	1593.67*	3	0	0.73	3186.67	3183	8	7.84E-04	99.9	
52	0	1764.55	26	9	1.64	3528.46	3522	12	7.24E-03	30.2	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235017.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 2-DEC-2015 10:02:00   Acquisition date  : 3-OCT-2016 08:16:00
Sample ID         : G405235017           Sample quantity   : 148.56 GRAM
Sample type       : SOLID                 Sample geometry    :
Detector name     : GAMMA16              Detector geometry  : CAN
Elapsed live time: 0 01:00:00.00         Elapsed real time: 0 01:00:00.55   0.0%
Energy tolerance  : 1.50 keV             Half life ratio   : 10.00
Errors propagated: No                    Systematic Error  : 0.00 %
Efficiency type   : Linear                Efficiencies at   : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.215E+00	1.595E+01	1.595E+01	10.13	OK
CD-109	88.03	3.70*	5.400E+00	1.377E+00	2.181E+00	116.66	OK
SN-126	64.28	9.60	3.017E+00	-----	Line Not Found	-----	Absent
	86.94	8.90	5.400E+00	5.725E-01	5.725E-01	116.66	OK
	87.57	37.00*	5.400E+00	1.377E-01	1.377E-01	116.66	OK
BA-137M	661.66	89.90*	2.305E+00	3.661E+00	3.733E+00	5.89	OK
CS-137	661.66	85.10*	2.305E+00	3.868E+00	3.943E+00	5.89	OK
CE-141	145.44	48.29*	6.768E+00	1.517E-02	1.032E+01	517.35	OK
TL-208	277.37	6.60	4.683E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.549E+00	3.420E-01	3.420E-01	31.12	OK
	860.56	12.50	1.874E+00	-----	Line Not Found	-----	Absent
BI-212	727.33	6.67*	2.137E+00	1.646E+00	1.646E+00	56.05	OK
	785.37	1.10	2.013E+00	3.316E+00	3.316E+00	108.05	OK
	1620.50	1.47	1.107E+00	-----	Line Not Found	-----	Absent
PB-212	74.82	10.28	4.288E+00	1.388E+00	1.388E+00	59.83	OK
	77.11	17.10	4.519E+00	1.931E+00	1.931E+00	25.39	OK
	238.63	43.60*	5.251E+00	1.186E+00	1.186E+00	11.79	OK
	300.09	3.30	4.392E+00	2.101E+00	2.101E+00	81.58	OK
BI-214	609.32	45.49*	2.461E+00	1.129E+00	1.130E+00	17.06	OK
	1120.29	14.92	1.519E+00	1.112E+00	1.113E+00	32.64	OK
	1764.49	15.30	1.023E+00	7.948E-01	7.951E-01	60.44	OK
PB-214	74.82	5.80	4.274E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	4.519E+00	3.404E+00	3.406E+00	25.39	OK
	87.09	3.41	5.400E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	5.198E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.455E+00	1.203E+00	1.203E+00	29.37	OK
	351.93	35.60*	3.858E+00	1.129E+00	1.129E+00	21.10	OK
RN-222	609.32	45.49*	2.461E+00	1.129E+00	1.130E+00	17.06	OK
	1120.29	14.92	1.519E+00	1.112E+00	1.113E+00	32.64	OK
	1764.49	15.30	1.023E+00	7.948E-01	7.951E-01	60.44	OK
RA-224	240.99	4.10*	5.204E+00	2.048E+00	2.048E+00	101.21	OK
RA-226	609.32	45.49*	2.461E+00	1.129E+00	1.130E+00	17.06	OK
	1120.29	14.92	1.519E+00	1.112E+00	1.113E+00	32.64	OK
	1764.49	15.30	1.023E+00	7.948E-01	7.951E-01	60.44	OK
AC-228	105.21	1.10	6.393E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.983E+00	1.100E+00	1.100E+00	51.24	OK
	794.95	4.25	1.995E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.918E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.791E+00	8.287E-01	8.287E-01	41.38	OK
	968.97	15.80	1.706E+00	1.188E+00	1.188E+00	35.66	OK
RA-228	105.21	1.10	6.393E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.983E+00	1.100E+00	1.100E+00	51.24	OK
	794.95	4.25	1.995E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.918E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.791E+00	8.287E-01	8.287E-01	41.38	OK
	968.97	15.80	1.706E+00	1.188E+00	1.188E+00	35.66	OK
TH-228	74.82	10.28	4.288E+00	1.388E+00	1.388E+00	59.83	OK
	77.11	17.10	4.519E+00	1.931E+00	1.931E+00	25.39	OK
	238.63	43.60*	5.251E+00	1.186E+00	1.186E+00	11.79	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	300.09	3.30	4.392E+00	2.101E+00	2.101E+00	81.58	OK
TH-230	609.32	45.49*	2.461E+00	1.129E+00	1.129E+00	17.06	OK
	1120.29	14.92	1.519E+00	1.112E+00	1.112E+00	32.64	OK
	1764.49	15.30	1.023E+00	7.948E-01	7.948E-01	60.44	OK
PA-231	283.69	1.70	4.600E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.392E+00	1.296E+00	1.296E+00	81.58	OK
TH-232	105.21	1.10	6.393E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.983E+00	1.100E+00	1.100E+00	51.24	OK
	835.71	1.61	1.918E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.791E+00	8.287E-01	8.287E-01	41.38	OK
	968.97	15.80	1.706E+00	1.188E+00	1.188E+00	35.66	OK
U-234	609.32	45.49*	2.461E+00	1.129E+00	1.129E+00	17.06	OK
	1120.29	14.92	1.519E+00	1.112E+00	1.112E+00	32.64	OK
	1764.49	15.30	1.023E+00	7.948E-01	7.948E-01	60.44	OK
U-235	89.96	3.47	5.617E+00	1.286E+00	1.286E+00	119.50	OK
	93.35	5.60	5.779E+00	1.461E+00	1.461E+00	69.70	OK
	143.76	10.96*	6.770E+00	----- Line	Not Found	-----	<<INT Reject
	163.33	5.08	6.541E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.164E+00	1.524E-01	1.524E-01	64.51	OK
	205.31	5.01	5.819E+00	----- Line	Not Found	-----	Absent
AM-243	43.53	5.90	4.061E-01	7.398E+00	7.398E+00	156.85	OK
	74.66	67.20*	4.288E+00	2.124E-01	2.124E-01	59.83	OK
ANH-511	511.00	100.00*	2.836E+00	2.662E-02	2.662E-02	335.79	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235017.CNF;1
* Acquisition date   : 3-OCT-2016 08:16:00 Sensitivity      : 3.000
* Detector ID       : GAM16 Energy tolerance: 1.500
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time: 0 01:00:00.55 Half life ratio : *****
* Sample date       : 2-DEC-2015 10:02:00 Analyst initials: MXR1
* Sample ID         : G405235017 Sample Quantity : 1.4856E+02 GRAM
* Batch Number      : 1596247 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 23-SEP-2016 08:25:42 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM16_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.595E+01	1.583E+00	7.018E-01
CD-109	2.181E+00	2.493E+00	2.282E+00
SN-126	1.377E-01	1.575E-01	1.450E-01
BA-137M	3.733E+00	2.155E-01	6.780E-02
CS-137	3.943E+00	2.277E-01	7.163E-02
CE-141	1.032E+01	5.234E+01	5.673E+01
TL-208	3.420E-01	1.043E-01	7.041E-02
BI-212	1.646E+00	9.043E-01	8.373E-01
PB-212	1.186E+00	1.370E-01	9.442E-02
BI-214	1.130E+00	1.889E-01	1.319E-01
PB-214	1.129E+00	2.336E-01	1.450E-01
RN-222	1.130E+00	1.889E-01	1.319E-01
RA-224	2.048E+00	2.032E+00	1.012E+00
RA-226	1.130E+00	1.889E-01	1.319E-01
AC-228	8.287E-01	3.361E-01	2.509E-01
RA-228	8.287E-01	3.361E-01	2.509E-01
TH-228	1.186E+00	1.370E-01	9.442E-02
TH-230	1.129E+00	1.889E-01	1.318E-01
PA-231	1.296E+00	1.036E+00	9.476E-01
TH-232	8.287E-01	3.361E-01	2.509E-01
U-234	1.129E+00	1.888E-01	1.318E-01
U-235	2.358E-01	3.250E-01	3.932E-01
AM-243	2.124E-01	1.245E-01	9.680E-02
ANH-511	2.662E-02	8.759E-02	6.092E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.574E+01	1.907E+01	3.305E+01	NOT IDENT.
NA-22	1.795E-02	4.081E-02	8.794E-02	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	-1.312E-02	2.477E-02	4.715E-02	NOT IDENT.
SC-46	-1.637E-01	3.600E-01	6.771E-01	FAIL ABUN
V-48	0.000E+00	1.669E+04	0.000E+00	SHORT HLIF

CR-51	0.000E+00	5.920E+02	0.000E+00	SHORT HLIF
MN-54	8.642E-03	5.258E-02	1.096E-01	NOT IDENT.
CO-56	-1.079E-01	4.273E-01	8.351E-01	NOT IDENT.
MN-56	0.000E+00	1.747E+41	0.000E+00	SHORT HLIF
CO-57	-3.425E-02	5.374E-02	9.531E-02	NOT IDENT.
CO-58	6.255E-02	5.612E-01	1.152E+00	NOT IDENT.
FE-59	2.294E-01	5.868E+00	1.202E+01	NOT IDENT.
CO-60	-1.098E-02	4.174E-02	7.797E-02	NOT IDENT.
ZN-65	3.965E-02	2.081E-01	3.690E-01	NOT IDENT.
GE-68	-3.464E-01	2.284E+00	4.278E+00	NOT IDENT.
AS-73	-5.475E+00	1.185E+01	2.252E+01	NOT IDENT.
AS-74	0.000E+00	8.525E+03	0.000E+00	SHORT HLIF
SE-75	5.271E-02	2.377E-01	4.707E-01	NOT IDENT.
BR-77	0.000E+00	1.459E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	8.459E+02	0.000E+00	SHORT HLIF
RB-83	8.200E-02	7.940E-01	1.515E+00	FAIL ABUN
KR-85	3.266E+00	9.035E+00	1.583E+01	NOT IDENT.
SR-85	3.647E-01	1.018E+00	1.782E+00	NOT IDENT.
RB-86	0.000E+00	3.267E+04	0.000E+00	SHORT HLIF
Y-88	2.707E-01	2.425E-01	6.305E-01	NOT IDENT.
Y-91	1.368E+02	6.350E+02	1.253E+03	NOT IDENT.
NB-94	1.327E-04	3.108E-02	5.836E-02	NOT IDENT.
NB-95	-7.649E-01	1.133E+00	1.614E+00	NOT IDENT.
NB-95M	-1.446E+00	3.106E+00	4.802E+00	NOT IDENT.
ZR-95	2.686E-01	1.355E+00	2.674E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	8.862E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-1.537E-02	3.813E-02	6.854E-02	NOT IDENT.
RH-102	3.642E-02	6.305E-02	1.274E-01	NOT IDENT.
RU-103	-1.921E+00	7.841E+00	1.440E+01	FAIL ABUN
RH-106	2.697E-01	5.389E-01	1.043E+00	NOT IDENT.
RU-106	2.697E-01	5.389E-01	1.043E+00	NOT IDENT.
AG-108M	-2.261E-02	3.506E-02	6.250E-02	NOT IDENT.
AG-110M	-2.589E-03	9.860E-02	1.967E-01	NOT IDENT.
SN-113	3.590E-02	3.082E-01	5.891E-01	NOT IDENT.
CD-115	0.000E+00	2.519E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.593E+05	0.000E+00	SHORT HLIF
TE-123M	1.244E-01	1.465E-01	2.843E-01	NOT IDENT.
SB-124	-4.188E-01	1.241E+00	2.495E+00	FAIL ABUN
SB-125	1.903E-02	1.310E-01	2.506E-01	NOT IDENT.
TE-125M	1.116E+02	3.124E+02	6.008E+02	NOT IDENT.
I-126	0.000E+00	1.154E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.556E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.164E+23	0.000E+00	SHORT HLIF
I-131	0.000E+00	1.013E+10	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.866E+27	0.000E+00	SHORT HLIF
BA-133	1.839E-02	4.905E-02	8.840E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	3.845E-02	5.577E-02	1.123E-01	FAIL ABUN
CS-135	-3.516E-02	1.742E-01	2.998E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.870E+05	0.000E+00	SHORT HLIF
CE-139	-8.036E-02	1.274E-01	2.203E-01	NOT IDENT.
BA-140	0.000E+00	1.994E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	2.766E+05	0.000E+00	SHORT HLIF
CE-143	0.000E+00	9.806E+40	0.000E+00	SHORT HLIF
CE-144	2.124E-02	4.147E-01	7.664E-01	FAIL ABUN
PM-144	5.082E-02	6.697E-02	1.341E-01	NOT IDENT.
PR-144	4.357E+00	5.828E+00	1.166E+01	NOT IDENT.
PM-146	-1.414E-02	6.025E-02	1.107E-01	NOT IDENT.
ND-147	0.000E+00	5.686E+07	0.000E+00	SHORT HLIF
PM-147	-5.660E+01	9.040E+02	1.675E+03	NOT IDENT.
PM-149	0.000E+00	1.497E+41	0.000E+00	SHORT HLIF
EU-150	-5.178E-03	3.255E-02	5.530E-02	FAIL ABUN
EU-152	4.729E-02	1.016E-01	2.032E-01	NOT IDENT.
GD-153	4.509E-03	2.296E-01	3.994E-01	FAIL ABUN
EU-154	4.386E-02	9.974E-02	2.149E-01	NOT IDENT.
EU-155	8.891E-02	1.167E-01	2.305E-01	FAIL ABUN
TB-160	-3.736E-01	1.738E+00	3.409E+00	FAIL ABUN
HO-166M	-5.948E-02	5.689E-02	8.902E-02	FAIL ABUN
TM-171	1.293E+01	2.676E+01	5.419E+01	NOT IDENT.
HF-172	-5.917E-02	2.532E-01	4.616E-01	FAIL ABUN
LU-172	3.339E-02	7.741E-02	1.616E-01	FAIL ABUN
LU-176	1.956E-03	2.670E-02	5.202E-02	FAIL ABUN
HF-181	7.667E+00	6.760E+00	1.374E+01	NOT IDENT.

TA-182	1.036E+00	1.043E+00	2.021E+00	FAIL ABUN
RE-183	-1.266E+00	3.408E+00	6.517E+00	NOT IDENT.
RE-184	2.583E+01	3.559E+01	7.658E+01	NOT IDENT.
W-188	2.142E+01	1.307E+02	2.337E+02	FAIL ABUN
IR-192	-2.060E-02	5.417E-01	1.045E+00	FAIL ABUN
HG-203	-1.178E-02	2.862E+00	5.563E+00	FAIL ABUN
BI-207	-4.538E-02	4.581E-02	7.574E-02	FAIL ABUN
PB-210	-3.189E+00	4.672E+00	8.184E+00	NOT IDENT.
BI-211	0.000E+00	6.434E-01	8.492E-01	FAIL ABUN
PB-211	1.331E-01	8.190E-01	1.573E+00	NOT IDENT.
RN-219	2.806E-01	4.653E-01	9.251E-01	FAIL ABUN
RA-223	-1.701E-01	7.430E-01	1.258E+00	FAIL ABUN
AC-227	1.004E-01	2.473E-01	4.962E-01	FAIL ABUN
TH-227	1.004E-01	2.473E-01	4.962E-01	FAIL ABUN
TH-229	-3.999E-01	5.417E-01	9.153E-01	FAIL ABUN
TH-231	-1.701E-01	7.430E-01	1.258E+00	FAIL ABUN
PA-233	-3.135E-02	6.316E-02	1.178E-01	FAIL ABUN
PA-234	-5.330E-02	2.582E-01	5.009E-01	NOT IDENT.
PA-234M	4.560E+00	7.901E+00	8.386E+00	FAIL ABUN
TH-234	-2.226E-01	1.357E+00	2.661E+00	FAIL ABUN
NP-237	-3.135E-02	6.316E-02	1.178E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
U-238	-2.226E-01	1.357E+00	2.661E+00	FAIL ABUN
NP-239	-1.084E-02	2.685E-01	4.624E-01	FAIL ABUN
PU-239	1.448E+02	3.547E+02	6.714E+02	NOT IDENT.
AM-241	-9.017E-02	1.586E-01	2.978E-01	NOT IDENT.
CM-243	-9.716E-02	1.023E-01	1.792E-01	FAIL ABUN
BK-247	2.001E-02	7.981E-02	1.583E-01	NOT IDENT.
CM-247	2.693E-04	4.349E-02	8.246E-02	NOT IDENT.
CF-249	-9.102E-03	4.912E-02	9.167E-02	NOT IDENT.
CF-251	4.402E-02	1.299E-01	2.407E-01	FAIL ABUN

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	409	10.66*	1.215E+00	1.595E+01	1.595E+01	10.13
CD-109	88.03	98	3.70*	5.400E+00	2.486E+00	3.936E+00	63.30
SN-126	64.28	-----	9.60	3.017E+00	-----	Line Not Found	-----
	86.94	98	8.90	5.400E+00	1.033E+00	1.033E+00	63.30
	87.57	98	37.00*	5.400E+00	2.486E-01	2.486E-01	63.30
BA-137M	661.66	1501	89.90*	2.305E+00	3.661E+00	3.733E+00	5.89
CS-137	661.66	1501	85.10*	2.305E+00	3.868E+00	3.943E+00	5.89
CE-141	145.44	35	48.29*	6.768E+00	5.351E-02	3.643E+01	140.66
TL-208	277.37	-----	6.60	4.683E+00	-----	Line Not Found	-----
	583.19	147	85.00*	2.549E+00	3.420E-01	3.420E-01	31.12
	860.56	-----	12.50	1.874E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	4.060E+00	-----	Line Not Found	-----
	351.06	307	12.92*	3.858E+00	3.111E+00	3.111E+00	21.10
BI-212	727.33	46	6.67*	2.137E+00	1.646E+00	1.646E+00	56.05
	785.37	15	1.10	2.013E+00	3.316E+00	3.316E+00	108.05
	1620.50	-----	1.47	1.107E+00	-----	Line Not Found	-----
PB-212	74.82	180	10.28	4.288E+00	2.067E+00	2.067E+00	39.02
	77.11	295	17.10	4.519E+00	1.931E+00	1.931E+00	25.39
	238.63	537	43.60*	5.251E+00	1.186E+00	1.186E+00	11.79
	300.09	60	3.30	4.392E+00	2.101E+00	2.101E+00	81.58
BI-214	609.32	250	45.49*	2.461E+00	1.129E+00	1.130E+00	17.06
	1120.29	50	14.92	1.519E+00	1.112E+00	1.113E+00	32.64
	1764.49	25	15.30	1.023E+00	7.948E-01	7.951E-01	60.44
PB-214	74.82	180	5.80	4.288E+00	3.663E+00	3.665E+00	39.02
	77.11	295	9.70	4.519E+00	3.404E+00	3.406E+00	25.39
	87.09	98	3.41	5.400E+00	2.697E+00	2.698E+00	63.30
	242.00	176	7.25	5.204E+00	2.361E+00	2.362E+00	47.35
	295.22	195	18.42	4.455E+00	1.203E+00	1.203E+00	29.37
	351.93	307	35.60*	3.858E+00	1.129E+00	1.129E+00	21.10
RN-222	609.32	250	45.49*	2.461E+00	1.129E+00	1.130E+00	17.06
	1120.29	50	14.92	1.519E+00	1.112E+00	1.113E+00	32.64
	1764.49	25	15.30	1.023E+00	7.948E-01	7.951E-01	60.44
RA-224	240.99	176	4.10*	5.204E+00	4.175E+00	4.175E+00	47.35
RA-226	609.32	250	45.49*	2.461E+00	1.129E+00	1.130E+00	17.06
	1120.29	50	14.92	1.519E+00	1.112E+00	1.113E+00	32.64
	1764.49	25	15.30	1.023E+00	7.948E-01	7.951E-01	60.44
AC-228	105.21	-----	1.10	6.393E+00	-----	Line Not Found	-----
	338.32	98	11.27	3.983E+00	1.100E+00	1.100E+00	51.24
	794.95	-----	4.25	1.995E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.918E+00	-----	Line Not Found	-----
	911.20	76	25.80*	1.791E+00	8.287E-01	8.287E-01	41.38
	968.97	63	15.80	1.706E+00	1.188E+00	1.188E+00	35.66
RA-228	105.21	-----	1.10	6.393E+00	-----	Line Not Found	-----
	338.32	98	11.27	3.983E+00	1.100E+00	1.100E+00	51.24
	794.95	-----	4.25	1.995E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.918E+00	-----	Line Not Found	-----
	911.20	76	25.80*	1.791E+00	8.287E-01	8.287E-01	41.38

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	968.97	63	15.80	1.706E+00	1.188E+00	1.188E+00	35.66
	74.82	180	10.28	4.288E+00	2.067E+00	2.067E+00	39.02
	77.11	295	17.10	4.519E+00	1.931E+00	1.931E+00	25.39
TH-230	238.63	537	43.60*	5.251E+00	1.186E+00	1.186E+00	11.79
	300.09	60	3.30	4.392E+00	2.101E+00	2.101E+00	81.58
	609.32	250	45.49*	2.461E+00	1.129E+00	1.129E+00	17.06
	1120.29	50	14.92	1.519E+00	1.112E+00	1.112E+00	32.64
PA-231	1764.49	25	15.30	1.023E+00	7.948E-01	7.948E-01	60.44
	283.69	-----	1.70	4.600E+00	-----	Line Not Found	-----
TH-232	301.36	60	5.35*	4.392E+00	1.296E+00	1.296E+00	81.58
	105.21	-----	1.10	6.393E+00	-----	Line Not Found	-----
	338.32	98	11.27	3.983E+00	1.100E+00	1.100E+00	51.24
	835.71	-----	1.61	1.918E+00	-----	Line Not Found	-----
U-234	911.20	76	25.80*	1.791E+00	8.287E-01	8.287E-01	41.38
	968.97	63	15.80	1.706E+00	1.188E+00	1.188E+00	35.66
	609.32	250	45.49*	2.461E+00	1.129E+00	1.129E+00	17.06
U-235	1120.29	50	14.92	1.519E+00	1.112E+00	1.112E+00	32.64
	1764.49	25	15.30	1.023E+00	7.948E-01	7.948E-01	60.44
	89.96	50	3.47	5.617E+00	1.286E+00	1.286E+00	119.50
	93.35	94	5.60	5.779E+00	1.461E+00	1.461E+00	69.70
	143.76	35	10.96*	6.768E+00	2.358E-01	2.358E-01	140.66
AM-243	163.33	-----	5.08	6.541E+00	-----	Line Not Found	-----
	185.72	106	57.20	6.164E+00	1.524E-01	1.524E-01	64.51
	205.31	-----	5.01	5.819E+00	-----	Line Not Found	-----
	43.53	35	5.90	4.061E-01	7.398E+00	7.398E+00	156.85
ANH-511	74.66	180	67.20*	4.288E+00	3.162E-01	3.162E-01	39.02
	511.00	15	100.00*	2.836E+00	2.662E-02	2.662E-02	335.79

Flag: "*" = Keyline

Total number of lines in spectrum 52
 Number of unidentified lines 11
 Number of lines tentatively identified by NID 41 78.85%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.595E+01	1.595E+01	0.162E+01	10.13	
CD-109	461.40D	1.58	2.486E+00	3.936E+00	2.491E+00	63.30	
SN-126	2.30E+05Y	1.00	2.486E-01	2.486E-01	1.573E-01	63.30	
BA-137M	30.08Y	1.02	3.661E+00	3.733E+00	0.220E+00	5.89	
CS-137	30.08Y	1.02	3.868E+00	3.943E+00	0.232E+00	5.89	
CE-141	32.51D	681.	5.351E-02	3.643E+01	5.124E+01	140.66	
TL-208	1.41E+10Y	1.00	3.420E-01	3.420E-01	1.064E-01	31.12	
BI-211	7.04E+08Y	1.00	3.111E+00	3.111E+00	0.657E+00	21.10	
BI-212	1.41E+10Y	1.00	1.646E+00	1.646E+00	0.923E+00	56.05	
PB-212	1.41E+10Y	1.00	1.186E+00	1.186E+00	0.140E+00	11.79	
BI-214	1600.00Y	1.00	1.129E+00	1.130E+00	0.193E+00	17.06	
PB-214	1600.00Y	1.00	1.129E+00	1.129E+00	0.238E+00	21.10	
RN-222	1600.00Y	1.00	1.129E+00	1.130E+00	0.193E+00	17.06	
RA-224	1.41E+10Y	1.00	4.175E+00	4.175E+00	1.977E+00	47.35	
RA-226	1600.00Y	1.00	1.129E+00	1.130E+00	0.193E+00	17.06	
AC-228	1.41E+10Y	1.00	8.287E-01	8.287E-01	3.430E-01	41.38	
RA-228	1.41E+10Y	1.00	8.287E-01	8.287E-01	3.430E-01	41.38	
TH-228	1.41E+10Y	1.00	1.186E+00	1.186E+00	0.140E+00	11.79	
TH-230	7.54E+04Y	1.00	1.129E+00	1.129E+00	0.193E+00	17.06	
PA-231	7.04E+08Y	1.00	1.296E+00	1.296E+00	1.057E+00	81.58	
TH-232	1.41E+10Y	1.00	8.287E-01	8.287E-01	3.430E-01	41.38	
U-234	2.45E+05Y	1.00	1.129E+00	1.129E+00	0.193E+00	17.06	
U-235	7.04E+08Y	1.00	2.358E-01	2.358E-01	3.317E-01	140.66	
AM-243	7370.00Y	1.00	3.162E-01	3.162E-01	1.234E-01	39.02	
ANH-511	1.00E+09Y	1.00	2.662E-02	2.662E-02	8.938E-02	335.79	
Total Activity :			4.905E+01	8.702E+01			

Grand Total Activity : 4.905E+01 8.702E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
3	70.29	39	241	1.22	140.62	137	28	8.56E-03	****	3.76E+00	T
3	81.32	54	90	1.34	162.66	137	28	1.18E-02	67.7	4.92E+00	T
0	115.21	37	224	1.66	230.41	225	9	8.50E-03	****	6.66E+00	T
0	154.89	33	215	1.75	309.72	305	9	7.66E-03	****	6.66E+00	T
0	209.13	51	150	1.18	418.16	415	7	1.21E-02	92.3	5.75E+00	
0	228.05	30	142	1.48	455.98	453	8	7.16E-03	****	5.43E+00	T
0	270.50	36	176	1.06	540.83	536	10	8.89E-03	****	4.78E+00	T
0	328.07	53	99	1.60	655.93	652	9	1.32E-02	77.6	4.09E+00	T
0	467.98	107	217	9.84	935.63	921	26	2.76E-02	80.8	3.05E+00	T
1	546.79	24	13	1.71	1093.19	1090	16	6.23E-03	66.0	2.69E+00	T
1	551.54	19	22	1.72	1102.69	1090	16	4.85E-03	92.9	2.67E+00	T
0	562.64	32	32	1.29	1124.88	1119	12	8.33E-03	81.6	2.62E+00	T
0	616.03	25	39	3.46	1231.63	1226	12	6.72E-03	****	2.44E+00	
0	646.12	29	14	1.47	1291.80	1286	11	7.79E-03	63.3	2.35E+00	T
0	685.39	18	24	4.96	1370.30	1363	15	4.80E-03	****	2.24E+00	T
1	742.92	18	23	1.88	1485.34	1478	19	4.90E-03	****	2.10E+00	
1	745.25	24	25	1.71	1490.00	1478	19	6.48E-03	84.5	2.10E+00	
0	768.89	16	33	1.42	1537.26	1533	11	4.28E-03	****	2.05E+00	
0	782.30	8	10	1.50	1564.08	1560	7	2.28E-03	****	2.02E+00	T
0	1002.46	13	20	0.66	2004.30	1996	17	3.49E-03	****	1.66E+00	T
0	1008.37	17	6	2.90	2016.12	2012	9	4.62E-03	74.3	1.65E+00	
0	1072.24	12	8	2.30	2143.83	2139	8	3.39E-03	98.4	1.57E+00	
0	1110.46	10	17	1.09	2220.28	2209	14	2.67E-03	****	1.53E+00	
0	1221.91	12	8	2.28	2443.16	2438	9	3.47E-03	****	1.41E+00	T
0	1411.82	9	7	3.55	2822.96	2816	11	2.69E-03	****	1.25E+00	
0	1588.32	9	2	1.11	3175.98	3172	8	2.56E-03	83.9	1.13E+00	
0	1593.67	3	0	0.73	3186.67	3183	8	7.84E-04	****	1.12E+00	

Flags: "T" = Tentatively associated

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235017.CNF;1
* Acquisition date   : 3-OCT-2016 08:16:00 Sensitivity      : 3.000
* Detector ID       : GAM16 Energy tolerance: 1.500
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time: 0 01:00:00.55 Half life ratio : *****
* Sample date       : 2-DEC-2015 10:02:00 Nuclide Library : SOLID
* Sample ID        : G405235017 Analyst initials: MXR1
* Batch Number     : 1596247 Sample Quantity : 1.4856E+02 GRAM
* Wet wt corr      : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 23-SEP-2016 08:25:42 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM16_CAN.CNF;14
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.979E-01
CD-109	1.084E+00
SN-126	6.885E-02
BA-137M	3.046E-02
CS-137	3.218E-02
CE-141	2.686E+01
TL-208	3.197E-02
BI-212	3.697E-01
PB-212	4.409E-02
BI-214	5.967E-02
PB-214	6.734E-02
RN-222	5.967E-02
RA-224	4.727E-01
RA-226	5.967E-02
AC-228	1.105E-01
RA-228	1.105E-01
TH-228	4.409E-02
TH-230	5.965E-02
PA-231	4.435E-01
TH-232	1.105E-01
U-234	5.965E-02
U-235	1.869E-01
AM-243	4.585E-02
ANH-511	2.798E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.532E+01	NOT IDENT.
NA-22	3.766E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.671E-02	NOT IDENT.
SC-46	2.907E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF

MN-54	4.766E-02	NOT IDENT.
CO-56	3.604E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.492E-02	NOT IDENT.
CO-58	5.051E-01	NOT IDENT.
FE-59	5.077E+00	NOT IDENT.
CO-60	3.314E-02	NOT IDENT.
ZN-65	1.631E-01	NOT IDENT.
GE-68	1.839E+00	NOT IDENT.
AS-73	1.062E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	2.207E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	6.922E-01	FAIL ABUN
KR-85	7.311E+00	NOT IDENT.
SR-85	8.230E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	2.641E-01	NOT IDENT.
Y-91	5.571E+02	NOT IDENT.
NB-94	2.600E-02	NOT IDENT.
NB-95	7.138E-01	NOT IDENT.
NB-95M	2.252E+00	NOT IDENT.
ZR-95	1.167E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.241E-02	NOT IDENT.
RH-102	5.758E-02	NOT IDENT.
RU-103	6.607E+00	FAIL ABUN
RH-106	4.699E-01	NOT IDENT.
RU-106	4.699E-01	NOT IDENT.
AG-108M	2.885E-02	NOT IDENT.
AG-110M	8.616E-02	NOT IDENT.
SN-113	2.751E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.345E-01	NOT IDENT.
SB-124	7.885E-01	FAIL ABUN
SB-125	1.164E-01	NOT IDENT.
TE-125M	2.838E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.104E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	5.074E-02	FAIL ABUN
CS-135	1.406E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	1.037E-01	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-143	0.000E+00	SHORT HLIF
CE-144	3.631E-01	FAIL ABUN
PM-144	6.137E-02	NOT IDENT.
PR-144	5.334E+00	NOT IDENT.
PM-146	5.150E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.905E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.579E-02	FAIL ABUN
EU-152	9.452E-02	NOT IDENT.
GD-153	1.897E-01	FAIL ABUN
EU-154	9.204E-02	NOT IDENT.
EU-155	1.092E-01	FAIL ABUN
TB-160	1.469E+00	FAIL ABUN
HO-166M	3.857E-02	FAIL ABUN
TM-171	2.560E+01	NOT IDENT.
HF-172	2.180E-01	FAIL ABUN
LU-172	7.114E-02	FAIL ABUN
LU-176	2.425E-02	FAIL ABUN
HF-181	6.433E+00	NOT IDENT.
TA-182	8.954E-01	FAIL ABUN

RE-183	3.054E+00	NOT IDENT.
RE-184	3.426E+01	NOT IDENT.
W-188	1.087E+02	FAIL ABUN
IR-192	4.865E-01	FAIL ABUN
HG-203	2.604E+00	FAIL ABUN
BI-207	3.191E-02	FAIL ABUN
PB-210	3.836E+00	NOT IDENT.
BI-211	4.106E-01	FAIL ABUN
PB-211	7.323E-01	NOT IDENT.
RN-219	4.316E-01	FAIL ABUN
RA-223	5.858E-01	FAIL ABUN
AC-227	2.330E-01	FAIL ABUN
TH-227	2.330E-01	FAIL ABUN
TH-229	4.307E-01	FAIL ABUN
TH-231	5.858E-01	FAIL ABUN
PA-233	5.455E-02	FAIL ABUN
PA-234	2.172E-01	NOT IDENT.
PA-234M	3.697E+00	FAIL ABUN
TH-234	1.262E+00	FAIL ABUN
NP-237	5.455E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.262E+00	FAIL ABUN
NP-239	2.176E-01	FAIL ABUN
PU-239	3.189E+02	NOT IDENT.
AM-241	1.403E-01	NOT IDENT.
CM-243	8.400E-02	FAIL ABUN
BK-247	7.423E-02	NOT IDENT.
CM-247	3.839E-02	NOT IDENT.
CF-249	4.283E-02	NOT IDENT.
CF-251	1.138E-01	FAIL ABUN


```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235017.CNF;1
* Acquisition date   : 3-OCT-2016 08:16:00 Sensitivity      : 3.000
* Detector ID        : GAM16 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.55 Half life ratio  : *****
* Sample date        : 2-DEC-2015 10:02:00 Nuclide Library : SOLID
* Sample ID          : G405235017 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.4856E+02 GRAM
*                   : Quantity Err(%) : 1.3462E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 23-SEP-2016 08:25:42 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM16_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.595E+01	1.789E+00	1.789E+00
CD-109	2.181E+00	2.509E+00	2.509E+00
SN-126	1.377E-01	1.583E-01	1.583E-01
BA-137M	3.733E+00	2.689E-01	2.689E-01
CS-137	3.943E+00	2.838E-01	2.838E-01
CE-141	1.033E+01	5.238E+01	5.238E+01
TL-208	3.420E-01	1.053E-01	1.053E-01
BI-212	1.646E+00	9.081E-01	9.081E-01
PB-212	1.186E+00	1.509E-01	1.509E-01
BI-214	1.130E+00	1.951E-01	1.951E-01
PB-214	1.129E+00	2.383E-01	2.383E-01
RN-222	1.130E+00	1.951E-01	1.951E-01
RA-224	2.048E+00	2.040E+00	2.040E+00
RA-226	1.130E+00	1.951E-01	1.951E-01
AC-228	8.287E-01	3.388E-01	3.388E-01
RA-228	8.287E-01	3.388E-01	3.388E-01
TH-228	1.186E+00	1.509E-01	1.509E-01
TH-230	1.129E+00	1.950E-01	1.950E-01
PA-231	1.296E+00	1.073E+00	1.073E+00
TH-232	8.287E-01	3.388E-01	3.388E-01
U-234	1.129E+00	1.950E-01	1.950E-01
U-235	2.358E-01	3.252E-01	3.252E-01
AM-243	2.124E-01	1.259E-01	1.259E-01
ANH-511	2.662E-02	8.760E-02	8.760E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.574E+01	1.908E+01	2.036E+01	NOT IDENT.
NA-22	1.795E-02	4.082E-02	4.161E-02	NOT IDENT.
NA-24	1.000E+41	3.054E+41	0.000E+00	SHORT HLIF
AL-26	-1.312E-02	2.478E-02	2.548E-02	NOT IDENT.
SC-46	-1.637E-01	3.601E-01	3.676E-01	FAIL ABUN
V-48	-5.949E+03	1.669E+04	1.691E+04	SHORT HLIF

CR-51	4.574E+02	5.924E+02	6.272E+02	SHORT HLIF
MN-54	8.642E-03	5.258E-02	5.273E-02	NOT IDENT.
CO-56	-1.079E-01	4.273E-01	4.301E-01	NOT IDENT.
MN-56	-1.000E+41	1.748E+41	0.000E+00	SHORT HLIF
CO-57	-3.425E-02	5.377E-02	5.594E-02	NOT IDENT.
CO-58	6.255E-02	5.612E-01	5.619E-01	NOT IDENT.
FE-59	2.294E-01	5.868E+00	5.869E+00	NOT IDENT.
CO-60	-1.098E-02	4.174E-02	4.203E-02	NOT IDENT.
ZN-65	3.965E-02	2.081E-01	2.089E-01	NOT IDENT.
GE-68	-3.464E-01	2.284E+00	2.289E+00	NOT IDENT.
AS-73	-5.475E+00	1.190E+01	1.215E+01	NOT IDENT.
AS-74	8.846E+02	8.526E+03	8.535E+03	SHORT HLIF
SE-75	5.271E-02	2.378E-01	2.389E-01	NOT IDENT.
BR-77	1.263E+39	1.116E+40	0.000E+00	SHORT HLIF
SR-82	-1.850E+02	8.459E+02	8.500E+02	SHORT HLIF
RB-83	8.200E-02	7.941E-01	7.950E-01	FAIL ABUN
KR-85	3.266E+00	9.036E+00	9.155E+00	NOT IDENT.
SR-85	3.647E-01	1.018E+00	1.031E+00	NOT IDENT.
RB-86	2.978E+03	3.267E+04	3.270E+04	SHORT HLIF
Y-88	2.707E-01	2.432E-01	2.721E-01	NOT IDENT.
Y-91	1.368E+02	6.350E+02	6.380E+02	NOT IDENT.
NB-94	1.327E-04	3.108E-02	3.108E-02	NOT IDENT.
NB-95	-7.649E-01	1.133E+00	1.185E+00	NOT IDENT.
NB-95M	-1.446E+00	3.108E+00	3.175E+00	NOT IDENT.
ZR-95	2.686E-01	1.355E+00	1.360E+00	NOT IDENT.
NB-97	-1.000E+41	6.378E+41	0.000E+00	SHORT HLIF
ZR-97	-1.000E+41	4.159E+41	0.000E+00	SHORT HLIF
MO-99	-4.977E+32	8.870E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	2.536E+41	0.000E+00	SHORT HLIF
RH-101	-1.537E-02	3.823E-02	3.886E-02	NOT IDENT.
RH-102	3.642E-02	6.312E-02	6.522E-02	NOT IDENT.
RU-103	-1.921E+00	7.842E+00	7.889E+00	FAIL ABUN
RH-106	2.697E-01	5.391E-01	5.527E-01	NOT IDENT.
RU-106	2.697E-01	5.391E-01	5.527E-01	NOT IDENT.
AG-108M	-2.261E-02	3.507E-02	3.652E-02	NOT IDENT.
AG-110M	-2.589E-03	9.860E-02	9.861E-02	NOT IDENT.
SN-113	3.590E-02	3.082E-01	3.086E-01	NOT IDENT.
CD-115	-2.042E+40	2.547E+40	0.000E+00	SHORT HLIF
SN-117M	1.632E+04	1.593E+05	1.595E+05	SHORT HLIF
TE-123M	1.244E-01	1.466E-01	1.570E-01	NOT IDENT.
SB-124	-4.188E-01	1.241E+00	1.255E+00	FAIL ABUN
SB-125	1.903E-02	1.310E-01	1.312E-01	NOT IDENT.
TE-125M	1.116E+02	3.124E+02	3.165E+02	NOT IDENT.
I-126	1.178E+06	1.166E+06	1.281E+06	SHORT HLIF
SB-126	-4.101E+05	1.558E+06	1.569E+06	SHORT HLIF
SB-127	9.203E+22	1.739E+23	0.000E+00	SHORT HLIF
I-131	-4.498E+09	1.013E+10	1.033E+10	SHORT HLIF
I-132	-1.000E+41	1.940E+42	0.000E+00	SHORT HLIF
TE-132	1.900E+27	2.972E+27	0.000E+00	SHORT HLIF
BA-133	1.839E-02	4.906E-02	4.975E-02	FAIL ABUN
I-133	1.000E+41	6.660E+41	0.000E+00	SHORT HLIF
CS-134	3.845E-02	5.579E-02	5.842E-02	FAIL ABUN
CS-135	-3.516E-02	1.742E-01	1.749E-01	NOT IDENT.
I-135	1.000E+41	8.045E+41	0.000E+00	SHORT HLIF
CS-136	1.181E+05	3.872E+05	3.908E+05	SHORT HLIF
CE-139	-8.036E-02	1.284E-01	1.334E-01	NOT IDENT.
BA-140	-9.431E+05	1.995E+06	2.040E+06	SHORT HLIF
LA-140	2.523E+05	2.769E+05	2.993E+05	SHORT HLIF
CE-143	1.000E+41	9.861E+40	0.000E+00	SHORT HLIF
CE-144	2.124E-02	4.147E-01	4.148E-01	FAIL ABUN
PM-144	5.082E-02	6.705E-02	7.085E-02	NOT IDENT.
PR-144	4.357E+00	5.831E+00	6.152E+00	NOT IDENT.
PM-146	-1.414E-02	6.026E-02	6.060E-02	NOT IDENT.
ND-147	3.804E+07	5.690E+07	5.943E+07	SHORT HLIF
PM-147	-5.660E+01	9.040E+02	9.044E+02	NOT IDENT.
PM-149	1.000E+41	1.514E+41	0.000E+00	SHORT HLIF
EU-150	-5.178E-03	3.255E-02	3.264E-02	FAIL ABUN
EU-152	4.729E-02	1.017E-01	1.039E-01	NOT IDENT.
GD-153	4.509E-03	2.296E-01	2.296E-01	FAIL ABUN
EU-154	4.386E-02	9.976E-02	1.017E-01	NOT IDENT.
EU-155	8.891E-02	1.168E-01	1.235E-01	FAIL ABUN
TB-160	-3.736E-01	1.738E+00	1.747E+00	FAIL ABUN
HO-166M	-5.948E-02	5.698E-02	6.297E-02	FAIL ABUN
TM-171	1.293E+01	2.678E+01	2.741E+01	NOT IDENT.
HF-172	-5.917E-02	2.534E-01	2.548E-01	FAIL ABUN
LU-172	3.339E-02	7.749E-02	7.894E-02	FAIL ABUN
LU-176	1.956E-03	2.670E-02	2.672E-02	FAIL ABUN
HF-181	7.667E+00	6.769E+00	7.600E+00	NOT IDENT.

TA-182	1.036E+00	1.044E+00	1.144E+00	FAIL ABUN
RE-183	-1.266E+00	3.414E+00	3.461E+00	NOT IDENT.
RE-184	2.583E+01	3.614E+01	3.797E+01	NOT IDENT.
W-188	2.142E+01	1.307E+02	1.310E+02	FAIL ABUN
IR-192	-2.060E-02	5.417E-01	5.418E-01	FAIL ABUN
HG-203	-1.178E-02	2.862E+00	2.862E+00	FAIL ABUN
BI-207	-4.538E-02	4.585E-02	5.020E-02	FAIL ABUN
PB-210	-3.189E+00	4.681E+00	4.896E+00	NOT IDENT.
BI-211	3.111E+00	6.584E-01	1.549E+00	FAIL ABUN
PB-211	1.331E-01	8.190E-01	8.212E-01	NOT IDENT.
RN-219	2.806E-01	4.667E-01	4.835E-01	FAIL ABUN
RA-223	-1.701E-01	7.431E-01	7.470E-01	FAIL ABUN
AC-227	1.004E-01	2.477E-01	2.518E-01	FAIL ABUN
TH-227	1.004E-01	2.477E-01	2.518E-01	FAIL ABUN
TH-229	-3.999E-01	5.421E-01	5.712E-01	FAIL ABUN
TH-231	-1.701E-01	7.431E-01	7.470E-01	FAIL ABUN
PA-233	-3.135E-02	6.318E-02	6.474E-02	FAIL ABUN
PA-234	-5.330E-02	2.653E-01	2.664E-01	NOT IDENT.
PA-234M	4.560E+00	7.904E+00	8.167E+00	FAIL ABUN
TH-234	-2.226E-01	1.358E+00	1.362E+00	FAIL ABUN
NP-237	-3.135E-02	6.318E-02	6.474E-02	FAIL ABUN
NP-238	-1.000E+41	4.680E+41	0.000E+00	SHORT HLIF
U-238	-2.226E-01	1.358E+00	1.362E+00	FAIL ABUN
NP-239	-1.084E-02	2.685E-01	2.685E-01	FAIL ABUN
PU-239	1.448E+02	3.548E+02	3.608E+02	NOT IDENT.
AM-241	-9.017E-02	1.588E-01	1.639E-01	NOT IDENT.
CM-243	-9.716E-02	1.027E-01	1.116E-01	FAIL ABUN
BK-247	2.001E-02	7.991E-02	8.042E-02	NOT IDENT.
CM-247	2.693E-04	4.349E-02	4.349E-02	NOT IDENT.
CF-249	-9.102E-03	4.912E-02	4.929E-02	NOT IDENT.
CF-251	4.402E-02	1.300E-01	1.315E-01	FAIL ABUN

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	79.2320	87.09	119.8780	136.47	102.8881
45.60	66.0009	87.57	119.9950	140.51	0.0000
46.54	83.3537	88.03	120.1066	143.76	95.0439
49.72	0.0000	88.34	120.1814	144.24	95.1101
51.35	76.4709	88.47	120.2129	145.44	106.1085
51.87	79.3869	89.96	120.5703	152.43	99.6056
52.39	80.4400	1093.63	120.7332	153.25	0.0000
52.97	83.3828	91.11	0.0000	323.87	77.1558
53.44	98.5032	92.59	121.1955	156.02	0.0000
54.07	86.4599	93.35	121.3742	158.56	0.0000
57.36	0.0000	94.56	121.6578	159.00	78.7979
57.53	88.2287	94.65	121.6785	162.33	88.3239
57.98	83.5850	94.67	121.6834	162.66	0.0000
59.27	99.1194	94.87	105.9118	163.33	76.9535
59.32	103.8985	97.43	118.8676	165.86	103.7123
59.54	103.9584	98.43	94.5103	176.31	110.9338
60.96	89.0256	98.44	94.5123	176.60	0.0000
61.17	89.0738	99.53	105.1110	177.52	90.0499
62.93	109.6769	100.11	95.8478	181.07	0.0000
63.29	99.1840	102.03	80.5030	181.52	89.3165
63.58	99.2559	103.18	78.5757	184.41	94.3469
64.28	104.2561	103.37	99.5633	143.76	116.9371
66.73	121.7188	105.21	86.2235	193.51	106.0936
67.24	106.3112	105.31	86.2385	197.03	106.5254
125.81	127.1895	106.12	76.8841	198.01	116.2310
67.75	129.8065	106.47	84.3091	201.83	108.3115
69.67	105.6253	109.28	87.9025	203.43	88.0097
70.83	105.9120	111.00	101.9729	205.31	86.9865
72.81	106.3974	111.76	0.0000	210.85	105.3460
72.87	106.4122	114.06	90.7600	215.65	86.7523
74.66	106.8456	116.30	0.0000	222.11	109.4927
74.82	106.8835	116.74	85.8051	227.09	82.4432
74.97	106.9198	119.76	93.7783	227.38	82.4677
77.11	107.4298	121.12	87.5036	228.16	0.0000
78.74	107.8130	121.22	96.1616	228.18	84.1865
79.69	108.0354	121.78	98.4114	116.74	84.1865
80.12	108.1351	122.06	108.1932	235.69	89.8220
80.19	0.0000	122.92	78.0068	235.96	89.8462
80.57	108.2390	123.07	78.0255	238.63	66.7301
81.00	108.3387	265.00	96.5418	238.98	0.0000
81.07	108.3551	125.81	102.3105	240.99	66.8872
81.75	101.8134	127.23	112.3561	242.00	66.9535
83.79	100.9048	127.91	97.1876	244.70	61.6769
84.00	100.9491	129.30	107.2458	252.40	0.0000
85.43	129.5977	131.20	113.0492	252.80	65.1207
86.55	119.7465	133.02	108.9595	254.15	0.0000
86.79	119.8050	133.52	106.8397	256.23	70.4243
86.94	119.8419	136.00	103.9212	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	70.9803	355.39	0.0000	584.27	32.7950
264.80	70.9887	356.01	48.3974	595.83	0.0000
265.00	71.0022	364.49	0.0000	427.87	26.6622
268.22	82.3652	366.42	0.0000	602.52	0.0000
269.46	75.5874	372.51	50.3789	604.72	22.4415
270.03	75.6268	375.05	65.4242	607.14	25.6777
271.23	75.7092	377.52	61.7944	609.32	30.5248
273.65	0.0000	356.01	63.9492	610.33	30.5399
276.40	66.5541	388.16	71.6860	614.28	16.1041
277.37	75.2630	388.63	0.0000	618.01	29.0391
277.60	74.4119	391.69	64.2965	620.36	38.7627
278.00	75.3037	264.66	57.0789	621.93	20.6891
279.20	71.9191	401.81	52.3626	630.19	0.0000
279.54	70.2076	402.40	60.9557	631.29	21.6471
279.70	67.6168	404.85	57.2400	633.25	19.5007
280.46	66.7938	410.95	64.1770	634.78	0.0000
283.69	68.7232	413.71	51.8192	635.95	26.0332
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	51.4029	423.72	0.0000	645.85	15.2567
285.90	0.0000	427.09	61.9505	657.76	37.8032
287.50	63.7161	427.87	54.2340	657.90	0.0000
290.67	55.1378	433.94	61.2491	661.66	26.3438
293.27	0.0000	439.40	53.6561	664.57	0.0000
351.93	61.9428	453.88	64.9674	666.33	0.0000
295.96	61.9815	463.37	60.3919	666.50	0.0000
879.38	31.7205	468.07	60.5619	667.71	0.0000
299.98	71.4551	473.00	0.0000	677.62	30.9565
300.09	71.4617	475.06	53.8352	685.70	0.0000
300.13	71.4633	476.78	56.8840	695.00	0.0000
301.36	71.5375	477.60	71.8887	696.49	26.7559
302.85	78.2585	482.18	48.0537	696.51	26.7559
256.23	65.0826	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	33.4558
306.78	62.1016	497.08	46.4492	697.49	31.2288
308.46	71.9594	505.52	47.1793	702.65	22.3560
311.90	63.2532	507.63	0.0000	706.68	22.3950
316.51	61.7016	511.00	42.7438	711.68	28.0538
319.41	0.0000	514.00	41.2861	720.70	0.0000
320.08	0.0000	514.00	41.2861	721.93	0.0000
321.04	60.1312	520.40	35.8061	722.78	15.2210
323.87	67.4622	520.69	0.0000	722.91	20.2954
325.23	55.3790	522.65	0.0000	723.31	18.6075
328.76	0.0000	527.90	0.0000	724.19	16.9220
333.37	70.6859	528.26	39.0422	727.33	19.2039
333.97	67.9977	529.59	32.9010	733.00	18.6833
334.37	63.9380	529.87	0.0000	735.93	13.6045
338.28	65.4961	531.02	0.0000	333.97	10.2100
338.32	65.4976	537.26	0.0000	739.50	0.0000
311.90	46.4709	546.56	0.0000	747.24	29.0455
340.48	46.4709	552.55	40.5917	748.06	20.5100
340.55	0.0000	563.25	34.5388	752.31	26.2526
344.28	50.2600	569.33	34.6476	753.82	0.0000
345.93	65.8770	946.00	34.6503	756.73	13.7217
351.06	56.9469	569.70	31.5039	756.80	11.4351
351.93	56.9834	583.19	32.7773	884.68	15.4825

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	30.9880	1274.44	13.4728	1620.50	3.3085
766.42	30.9957	1001.03	13.4938	1621.92	6.6189
766.84	24.1121	1002.74	13.5013	1678.03	0.0000
772.60	0.0000	1004.73	0.0000	1690.97	2.2389
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	4.5459
778.90	12.1141	1028.54	0.0000	1063.66	10.9230
783.70	0.0000	1037.84	13.2745	1771.35	3.6418
785.37	8.6752	1038.76	0.0000	1791.20	0.0000
792.07	19.7157	631.29	10.4582	1808.65	4.5862
794.95	15.0942	1048.07	0.0000	1810.72	0.0000
795.86	19.7455	1049.04	13.3207	1836.06	1.8443
810.06	14.8911	1050.41	11.4229		
810.29	15.7681	1063.66	20.0720		
344.28	15.7692	1077.00	0.0000		
810.76	15.7714	1077.34	14.2605		
815.77	0.0000	1085.87	16.3598		
1048.07	0.0000	1093.63	13.5044		
832.01	14.1328	1099.45	9.6631		
834.85	13.2637	1112.07	24.8297		
835.71	14.1528	1112.84	23.2837		
836.80	0.0000	1115.54	17.0887		
846.75	0.0000	1120.29	10.6952		
846.77	15.9879	1120.55	10.6959		
856.80	0.0000	1221.41	3.1123		
860.56	18.7480	1129.67	12.6747		
871.09	13.4427	1131.51	0.0000		
873.19	18.8345	1147.95	0.0000		
875.33	0.0000	1173.23	21.7220		
879.38	15.2812	1177.95	15.8184		
880.51	17.0860	1189.05	18.8434		
883.24	18.9031	1204.77	18.9269		
884.68	17.1115	1221.41	11.0081		
889.28	17.1399	1231.02	21.0705		
894.76	18.9806	1235.36	0.0000		
898.04	20.8129	1238.28	19.1021		
900.72	22.6440	1260.41	0.0000		
903.28	15.4120	1271.87	13.1880		
911.20	18.1824	1274.44	8.1216		
912.08	18.1879	1274.54	8.1216		
923.98	0.0000	1291.59	8.1582		
926.50	19.1934	1298.22	0.0000		
929.11	17.3811	1312.11	0.0000		
937.49	16.5135	1332.49	13.3983		
944.13	0.0000	1362.66	0.0000		
946.00	16.5619	1365.19	11.4310		
949.00	17.5000	1368.63	0.0000		
667.71	0.0000	1384.29	9.3972		
962.31	19.0321	1408.01	3.3607		
964.08	23.6984	1457.56	0.0000		
966.17	16.3040	1460.82	10.6366		
911.20	21.3267	1489.16	7.4952		
968.97	21.3267	1505.03	6.4482		
983.53	0.0000	1584.12	3.5010		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                 *
*                               Charleston, SC 29407                            *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235018.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM27.CNF;330
Background date : 2-OCT-2016 11:01:30.
Sample date      : 2-DEC-2015 10:19:00. Acquisition date : 3-OCT-2016 08:16:22.
Sample ID       : G405235018           Sample quantity  : 1.55815E+02 GRAM
Detector name   : GAM27                Detector geometry: CAN
Elapsed live time: 0 01:00:00.00       Elapsed real time: 0 01:00:00.98  0.0%
Energy tolerance: 1.50000 keV          Analyst Initials  : MXR1
Abundance limit : 75.00000             Sensitivity       : 3.00000
Batch ID        : 1596247              Detector SN#      :
Matrix Spike ID :                       LCS ID           : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.29*	67	266	0.82	125.90	122	9	1.86E-02	46.5	
2	3	74.84*	201	278	1.31	149.00	144	15	5.58E-02	16.0	1.14E+00
3	3	77.20	260	172	0.84	153.73	144	15	7.21E-02	9.8	
4	0	83.74*	26	199	1.52	166.81	165	7	2.29E-03	92.1	
5	0	87.27	108	183	1.53	173.88	171	7	2.99E-02	23.0	
6	3	93.05*	63	168	1.21	185.43	182	13	1.75E-02	39.1	1.75E+00
7	3	95.46	48	152	1.41	190.27	182	13	1.35E-02	52.2	
8	0	105.45	40	97	0.96	210.25	208	6	1.11E-02	42.3	
9	0	136.89	52	137	0.90	273.15	270	8	1.45E-02	40.8	
10	0	186.02*	66	204	1.01	371.45	366	11	1.84E-02	44.9	
11	5	238.71*	469	86	1.11	476.86	469	21	1.30E-01	5.8	1.03E+00
12	5	241.58	129	131	2.06	482.61	469	21	3.58E-02	26.3	
13	0	270.35	46	93	1.76	540.18	536	9	1.29E-02	40.3	
14	0	277.65	39	136	1.46	554.79	548	13	1.10E-02	63.0	
15	2	295.31*	178	71	1.28	590.12	585	19	4.95E-02	11.3	1.22E+00
16	2	300.02	40	68	1.63	599.53	585	19	1.12E-02	39.7	
17	0	328.39	55	75	2.34	656.30	651	10	1.52E-02	32.7	
18	0	338.51*	60	103	1.16	676.54	671	10	1.66E-02	35.0	
19	0	351.96*	297	84	1.34	703.47	697	11	8.26E-02	8.4	
20	0	394.83	21	61	0.72	789.24	786	8	5.71E-03	69.1	
21	0	408.86	47	52	1.14	817.32	813	9	1.30E-02	31.3	
22	0	510.67*	34	100	2.45	1021.02	1012	18	9.38E-03	77.7	
23	0	536.91	43	53	7.37	1073.53	1065	19	1.20E-02	42.8	
24	0	554.81	18	38	3.48	1109.35	1101	13	4.98E-03	75.4	
25	0	583.29*	124	54	1.44	1166.33	1160	12	3.45E-02	15.1	
26	0	609.62*	142	65	1.58	1219.03	1213	13	3.95E-02	14.6	
27	0	645.81	23	26	2.44	1291.43	1286	12	6.33E-03	51.7	
28	0	654.80	19	34	4.26	1309.43	1300	15	5.38E-03	69.2	
29	0	661.76*	951	64	1.43	1323.36	1316	15	2.64E-01	3.7	
30	0	722.27	16	17	3.38	1444.45	1439	10	4.40E-03	55.3	
31	0	726.97	50	23	1.90	1453.85	1449	11	1.37E-02	23.3	
32	0	755.46	20	18	1.54	1510.85	1507	9	5.56E-03	44.3	
33	0	811.35	12	19	1.24	1622.71	1616	9	3.20E-03	78.3	
34	0	816.68	40	15	4.54	1633.37	1625	19	1.12E-02	27.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	862.01	24	43	4.86	1724.08	1713	19	6.75E-03	67.7	
36	0	911.47*	105	28	2.30	1823.05	1815	14	2.92E-02	14.8	
37	0	953.31	11	9	1.71	1906.78	1900	9	3.11E-03	56.6	
38	2	964.74	34	16	2.24	1929.66	1923	22	9.46E-03	28.7	1.54E+00
39	2	968.79*	51	9	1.97	1937.77	1923	22	1.42E-02	20.1	
40	0	1120.06*	49	35	2.52	2240.50	2234	14	1.36E-02	29.8	
41	0	1150.90	14	12	3.15	2302.21	2296	12	3.89E-03	56.2	
42	0	1255.13	9	18	2.84	2510.82	2500	15	2.40E-03	114.3	
43	0	1301.45	7	21	2.68	2603.53	2591	14	2.04E-03	145.3	
44	0	1314.68	9	5	0.90	2629.99	2622	11	2.38E-03	63.0	
45	0	1318.32	12	5	2.18	2637.29	2632	10	3.33E-03	45.3	
46	0	1339.26	5	11	0.51	2679.20	2668	14	1.48E-03	136.7	
47	0	1377.72	17	7	1.08	2756.18	2750	13	4.58E-03	40.3	
48	0	1460.95*	423	11	1.70	2922.75	2915	15	1.17E-01	5.2	
49	0	1480.60	10	3	2.96	2962.08	2956	12	2.74E-03	47.6	
50	3	1588.20	13	1	2.90	3177.46	3174	16	3.53E-03	29.5	6.09E-01
51	3	1592.38	11	3	1.91	3185.83	3174	16	3.02E-03	39.1	
52	0	1764.60*	37	3	2.04	3530.55	3524	13	1.04E-02	20.4	
53	0	1847.52	15	0	1.98	3696.53	3690	11	4.17E-03	25.8	

Flag: "*" = Peak area was modified by background subtraction


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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235018.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 2-DEC-2015 10:19:00   Acquisition date : 3-OCT-2016 08:16:22
Sample ID         : G405235018           Sample quantity  : 155.82 GRAM
Sample type       : SOLID                 Sample geometry  :
Detector name     : GAMMA27              Detector geometry: CAN
Elapsed live time : 0 01:00:00.00         Elapsed real time: 0 01:00:00.98   0.0%
Energy tolerance  : 1.50 keV             Half life ratio  : 10.00
Errors propagated: No                    Systematic Error : 0.00 %
Efficiency type   : Linear                Efficiencies at  : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.403E+00	1.319E+01	1.319E+01	10.43	OK
CO-58	810.76	99.45*	2.251E+00	2.571E-02	5.127E-01	156.68	OK
CD-109	88.03	3.70*	7.568E+00	1.379E+00	2.183E+00	81.38	OK
SN-126	64.28	9.60	5.536E+00	8.091E-01	8.091E-01	93.09	OK
	86.94	8.90	7.568E+00	5.732E-01	5.732E-01	81.38	OK
	87.57	37.00*	7.568E+00	1.379E-01	1.379E-01	81.38	OK
BA-137M	661.66	89.90*	2.624E+00	2.058E+00	2.098E+00	7.49	OK
CS-137	661.66	85.10*	2.624E+00	2.174E+00	2.216E+00	7.49	OK
EU-155	86.55	30.70	7.568E+00	1.662E-01	1.878E-01	81.38	OK
	105.31	21.10*	8.063E+00	1.433E-01	1.619E-01	84.59	OK
TL-208	277.37	6.60	5.128E+00	6.519E-01	6.519E-01	125.97	OK
	583.19	85.00*	2.886E+00	2.619E-01	2.619E-01	30.18	OK
	860.56	12.50	2.150E+00	4.481E-01	4.481E-01	135.31	OK
PB-212	74.82	10.28	6.758E+00	1.207E+00	1.207E+00	49.92	OK
	77.11	17.10	6.949E+00	1.376E+00	1.376E+00	19.56	OK
	238.63	43.60*	5.747E+00	1.060E+00	1.060E+00	11.65	OK
	300.09	3.30	4.829E+00	1.402E+00	1.402E+00	79.42	OK
BI-214	609.32	45.49*	2.791E+00	5.775E-01	5.777E-01	29.30	OK
	1120.29	14.92	1.754E+00	9.007E-01	9.010E-01	59.54	OK
	1764.49	15.30	1.177E+00	9.458E-01	9.461E-01	40.84	OK
PB-214	74.82	5.80	6.757E+00	----- Line Not Found	-----	-----	<<INT Reject
	77.11	9.70	6.949E+00	2.425E+00	2.426E+00	19.56	OK
	87.09	3.41	7.559E+00	----- Line Not Found	-----	-----	<<INT Reject
	242.00	7.25	5.689E+00	----- Line Not Found	-----	-----	<<INT Reject
	295.22	18.42	4.889E+00	1.099E+00	1.100E+00	22.56	OK
	351.93	35.60*	4.262E+00	1.069E+00	1.070E+00	16.86	OK
RN-222	609.32	45.49*	2.791E+00	5.775E-01	5.777E-01	29.30	OK
	1120.29	14.92	1.754E+00	9.007E-01	9.010E-01	59.54	OK
	1764.49	15.30	1.177E+00	9.458E-01	9.461E-01	40.84	OK
RA-224	240.99	4.10*	5.697E+00	1.181E+00	1.181E+00	144.23	OK
RA-226	609.32	45.49*	2.791E+00	5.775E-01	5.777E-01	29.30	OK
	1120.29	14.92	1.754E+00	9.007E-01	9.010E-01	59.54	OK
	1764.49	15.30	1.177E+00	9.458E-01	9.461E-01	40.84	OK
AC-228	105.21	1.10	8.063E+00	2.748E+00	2.748E+00	84.59	OK
	338.32	11.27	4.394E+00	6.612E-01	6.612E-01	69.99	OK
	794.95	4.25	2.286E+00	----- Line Not Found	-----	-----	Absent
	835.71	1.61	2.201E+00	----- Line Not Found	-----	-----	Absent
	911.20	25.80*	2.060E+00	9.737E-01	9.737E-01	29.57	OK
	968.97	15.80	1.966E+00	8.046E-01	8.046E-01	40.21	OK
RA-228	105.21	1.10	8.063E+00	2.748E+00	2.748E+00	84.59	OK
	338.32	11.27	4.394E+00	6.612E-01	6.612E-01	69.99	OK
	794.95	4.25	2.286E+00	----- Line Not Found	-----	-----	Absent
	835.71	1.61	2.201E+00	----- Line Not Found	-----	-----	Absent
	911.20	25.80*	2.060E+00	9.737E-01	9.737E-01	29.57	OK
	968.97	15.80	1.966E+00	8.046E-01	8.046E-01	40.21	OK
TH-228	74.82	10.28	6.758E+00	1.207E+00	1.207E+00	49.92	OK
	77.11	17.10	6.949E+00	1.376E+00	1.376E+00	19.56	OK
	238.63	43.60*	5.747E+00	1.060E+00	1.060E+00	11.65	OK
	300.09	3.30	4.829E+00	1.402E+00	1.402E+00	79.42	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	609.32	45.49*	2.791E+00	5.775E-01	5.775E-01	29.30	OK
	1120.29	14.92	1.754E+00	9.007E-01	9.007E-01	59.54	OK
	1764.49	15.30	1.177E+00	9.458E-01	9.458E-01	40.84	OK
PA-231	283.69	1.70	5.044E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.829E+00	8.646E-01	8.646E-01	79.42	OK
TH-232	105.21	1.10	8.063E+00	2.748E+00	2.748E+00	84.59	OK
	338.32	11.27	4.394E+00	6.612E-01	6.612E-01	69.99	OK
	835.71	1.61	2.201E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	2.060E+00	9.737E-01	9.737E-01	29.57	OK
TH-234	968.97	15.80	1.966E+00	8.046E-01	8.046E-01	40.21	OK
	63.29	3.70*	5.536E+00	2.099E+00	2.099E+00	93.09	OK
	92.59	4.23	7.800E+00	1.184E+00	1.184E+00	78.13	OK
U-234	609.32	45.49*	2.791E+00	5.775E-01	5.775E-01	29.30	OK
	1120.29	14.92	1.754E+00	9.007E-01	9.007E-01	59.54	OK
	1764.49	15.30	1.177E+00	9.458E-01	9.458E-01	40.84	OK
U-238	63.29	3.70*	5.536E+00	2.099E+00	2.099E+00	93.09	OK
	92.59	4.23	7.800E+00	1.184E+00	1.184E+00	78.13	OK
AM-243	43.53	5.90	2.021E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	6.758E+00	1.846E-01	1.846E-01	49.92	OK
ANH-511	511.00	100.00*	3.192E+00	5.553E-02	5.553E-02	155.34	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235018.CNF;1 *
 * Acquisition date : 3-OCT-2016 08:16:22 Sensitivity : 3.000 *
 * Detector ID : GAM27 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.98 Half life ratio : ***** *
 * Sample date : 2-DEC-2015 10:19:00 Analyst initials: MXR1 *
 * Sample ID : G405235018 Sample Quantity : 1.5582E+02 GRAM *
 * Batch Number : 1596247 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 3-OCT-2016 06:09:32 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM27_CAN.CNF;13 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.319E+01	1.348E+00	4.997E-01
CO-58	5.127E-01	7.873E-01	9.769E-01
CD-109	2.183E+00	1.741E+00	1.691E+00
SN-126	1.379E-01	1.100E-01	1.071E-01
BA-137M	2.098E+00	1.540E-01	5.879E-02
CS-137	2.216E+00	1.627E-01	6.211E-02
EU-155	1.619E-01	1.342E-01	1.553E-01
TL-208	2.619E-01	7.747E-02	5.981E-02
PB-212	1.060E+00	1.211E-01	8.503E-02
BI-214	5.777E-01	1.659E-01	1.211E-01
PB-214	1.070E+00	1.767E-01	1.179E-01
RN-222	5.777E-01	1.659E-01	1.211E-01
RA-224	1.181E+00	1.670E+00	9.115E-01
RA-226	5.777E-01	1.659E-01	1.211E-01
AC-228	9.737E-01	2.821E-01	2.043E-01
RA-228	9.737E-01	2.821E-01	2.043E-01
TH-228	1.060E+00	1.211E-01	8.503E-02
TH-230	5.775E-01	1.658E-01	1.210E-01
PA-231	8.646E-01	6.729E-01	7.896E-01
TH-232	9.737E-01	2.821E-01	2.043E-01
TH-234	2.099E+00	1.915E+00	1.443E+00
U-234	5.775E-01	1.658E-01	1.210E-01
U-238	2.099E+00	1.915E+00	1.443E+00
AM-243	1.846E-01	9.030E-02	6.479E-02
ANH-511	5.553E-02	8.454E-02	5.039E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.854E+00	1.400E+01	2.679E+01	NOT IDENT.
NA-22	-1.638E-02	3.530E-02	6.409E-02	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	3.874E-02	2.728E-02	7.380E-02	NOT IDENT.
SC-46	9.603E-02	3.228E-01	6.731E-01	FAIL ABUN

V-48	0.000E+00	1.790E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	4.233E+02	0.000E+00	SHORT HLIF
MN-54	5.415E-02	5.306E-02	1.183E-01	NOT IDENT.
CO-56	-2.903E-01	4.017E-01	7.258E-01	NOT IDENT.
MN-56	0.000E+00	1.391E+41	0.000E+00	SHORT HLIF
CO-57	-3.318E-03	4.215E-02	7.817E-02	FAIL ABUN
FE-59	-3.865E+00	6.688E+00	1.197E+01	NOT IDENT.
CO-60	1.028E-02	2.364E-02	5.114E-02	NOT IDENT.
ZN-65	6.215E-02	1.965E-01	3.498E-01	NOT IDENT.
GE-68	-2.862E-01	2.015E+00	3.890E+00	NOT IDENT.
AS-73	-3.048E+00	4.557E+00	8.566E+00	NOT IDENT.
AS-74	0.000E+00	6.804E+03	0.000E+00	SHORT HLIF
SE-75	-2.039E-01	1.943E-01	3.517E-01	FAIL ABUN
BR-77	0.000E+00	1.285E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	7.184E+02	0.000E+00	SHORT HLIF
RB-83	-4.170E-01	6.969E-01	1.231E+00	NOT IDENT.
KR-85	-4.591E+00	8.086E+00	1.253E+01	NOT IDENT.
SR-85	-5.166E-01	9.109E-01	1.412E+00	NOT IDENT.
RB-86	0.000E+00	2.973E+04	0.000E+00	SHORT HLIF
Y-88	1.816E-02	2.207E-01	4.719E-01	NOT IDENT.
Y-91	3.156E+02	5.163E+02	1.075E+03	NOT IDENT.
NB-94	1.547E-02	2.817E-02	5.626E-02	NOT IDENT.
NB-95	-5.483E-01	8.881E-01	1.498E+00	NOT IDENT.
NB-95M	-4.289E-01	2.602E+00	4.544E+00	NOT IDENT.
ZR-95	2.137E+00	1.856E+00	2.864E+00	FAIL ABUN
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	6.460E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	8.920E+40	0.000E+00	SHORT HLIF
RH-101	-1.392E-02	3.173E-02	5.698E-02	NOT IDENT.
RH-102	3.331E-03	4.936E-02	9.487E-02	NOT IDENT.
RU-103	5.173E+00	6.562E+00	1.333E+01	FAIL ABUN
RH-106	-2.414E-01	4.562E-01	8.008E-01	NOT IDENT.
RU-106	-2.414E-01	4.562E-01	8.008E-01	NOT IDENT.
AG-108M	-2.565E-02	3.068E-02	5.325E-02	FAIL ABUN
AG-110M	-2.689E-02	8.626E-02	1.650E-01	NOT IDENT.
SN-113	-8.626E-02	2.513E-01	4.150E-01	NOT IDENT.
CD-115	0.000E+00	1.908E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.178E+05	0.000E+00	SHORT HLIF
TE-123M	-2.056E-02	1.222E-01	2.211E-01	NOT IDENT.
SB-124	-6.167E-02	1.663E+00	3.451E+00	FAIL ABUN
SB-125	4.597E-02	1.077E-01	2.124E-01	NOT IDENT.
TE-125M	1.914E+02	2.394E+02	4.763E+02	NOT IDENT.
I-126	0.000E+00	1.295E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.594E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	5.653E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	8.587E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.314E+27	0.000E+00	SHORT HLIF
BA-133	-4.407E-02	4.771E-02	7.565E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	3.050E-02	5.159E-02	1.013E-01	NOT IDENT.
CS-135	1.794E-02	1.364E-01	2.444E-01	NOT IDENT.
I-135	0.000E+00	1.632E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	4.064E+05	0.000E+00	SHORT HLIF
CE-139	9.394E-03	9.938E-02	1.834E-01	NOT IDENT.
BA-140	0.000E+00	4.235E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.524E+05	0.000E+00	SHORT HLIF
CE-141	-1.689E+01	2.669E+01	4.643E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	2.211E-01	3.517E-01	6.332E-01	NOT IDENT.
PM-144	-1.013E-02	4.502E-02	8.228E-02	NOT IDENT.
PR-144	-1.243E+00	3.975E+00	7.157E+00	NOT IDENT.
PM-146	8.201E-03	4.350E-02	8.424E-02	NOT IDENT.
ND-147	0.000E+00	4.887E+07	0.000E+00	SHORT HLIF
PM-147	-3.412E+01	7.324E+02	1.361E+03	NOT IDENT.
PM-149	0.000E+00	1.237E+41	0.000E+00	SHORT HLIF
EU-150	-1.696E-03	2.627E-02	4.539E-02	FAIL ABUN
EU-152	1.567E-02	9.275E-02	1.811E-01	FAIL ABUN
GD-153	-5.762E-02	1.549E-01	2.621E-01	NOT IDENT.
EU-154	-3.713E-02	8.688E-02	1.589E-01	FAIL ABUN
TB-160	1.226E+00	1.504E+00	3.373E+00	FAIL ABUN
HO-166M	1.593E-03	4.615E-02	8.804E-02	FAIL ABUN
TM-171	5.599E+00	9.701E+00	1.982E+01	NOT IDENT.
HF-172	8.408E-03	2.042E-01	3.808E-01	FAIL ABUN
LU-172	-4.981E-03	6.783E-02	1.315E-01	FAIL ABUN
LU-176	3.662E-03	2.207E-02	4.363E-02	FAIL ABUN
HF-181	-8.016E-01	4.807E+00	8.964E+00	NOT IDENT.

TA-182	8.139E-02	8.541E-01	1.666E+00	FAIL ABUN
RE-183	1.166E+00	1.691E+00	3.450E+00	NOT IDENT.
RE-184	9.775E+00	2.902E+01	6.016E+01	NOT IDENT.
W-188	8.433E+00	1.113E+02	1.983E+02	FAIL ABUN
IR-192	3.218E-01	4.774E-01	9.718E-01	FAIL ABUN
HG-203	1.448E+00	2.448E+00	4.597E+00	NOT IDENT.
BI-207	-1.332E-02	3.611E-02	6.789E-02	FAIL ABUN
PB-210	-4.432E-01	1.285E+00	2.558E+00	NOT IDENT.
BI-211	0.000E+00	4.868E-01	7.353E-01	FAIL ABUN
PB-211	3.733E-01	6.982E-01	1.277E+00	NOT IDENT.
BI-212	0.000E+00	6.990E-01	1.187E+00	FAIL ABUN
RN-219	5.585E-03	3.627E-01	6.966E-01	FAIL ABUN
RA-223	5.092E-01	5.614E-01	1.083E+00	FAIL ABUN
AC-227	1.163E-01	2.215E-01	4.484E-01	FAIL ABUN
TH-227	1.163E-01	2.215E-01	4.484E-01	FAIL ABUN
TH-229	-4.498E-02	4.879E-01	8.695E-01	FAIL ABUN
TH-231	5.092E-01	5.614E-01	1.083E+00	FAIL ABUN
PA-233	-5.449E-03	5.268E-02	1.020E-01	FAIL ABUN
PA-234	1.837E-01	2.256E-01	4.892E-01	FAIL ABUN
PA-234M	-2.650E+00	3.674E+00	6.504E+00	NOT IDENT.
U-235	1.255E-01	1.698E-01	3.256E-01	FAIL ABUN
NP-237	-5.449E-03	5.268E-02	1.020E-01	FAIL ABUN
NP-238	0.000E+00	1.637E+41	0.000E+00	SHORT HLIF
NP-239	2.723E-02	2.115E-01	3.989E-01	FAIL ABUN
PU-239	2.824E+02	2.898E+02	5.698E+02	NOT IDENT.
AM-241	4.583E-03	8.366E-02	1.516E-01	NOT IDENT.
CM-243	2.000E-02	7.881E-02	1.415E-01	FAIL ABUN
BK-247	-7.230E-02	6.601E-02	1.191E-01	FAIL ABUN
CM-247	1.871E-02	3.313E-02	6.670E-02	FAIL ABUN
CF-249	1.475E-02	3.654E-02	7.250E-02	NOT IDENT.
CF-251	1.980E-02	1.136E-01	2.084E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	409	10.66*	1.403E+00	1.319E+01	1.319E+01	10.43
CO-58	810.76	12	99.45*	2.251E+00	2.571E-02	5.127E-01	156.68
CD-109	88.03	139	3.70*	7.568E+00	2.392E+00	3.788E+00	45.93
SN-126	64.28	89	9.60	5.536E+00	8.091E-01	8.091E-01	93.09
	86.94	139	8.90	7.568E+00	9.944E-01	9.944E-01	45.93
	87.57	139	37.00*	7.568E+00	2.392E-01	2.392E-01	45.93
BA-137M	661.66	1007	89.90*	2.624E+00	2.058E+00	2.098E+00	7.49
CS-137	661.66	1007	85.10*	2.624E+00	2.174E+00	2.216E+00	7.49
EU-155	86.55	139	30.70	7.568E+00	2.883E-01	3.258E-01	45.93
	105.31	51	21.10*	8.063E+00	1.433E-01	1.619E-01	84.59
TL-208	277.37	46	6.60	5.128E+00	6.519E-01	6.519E-01	125.97
	583.19	133	85.00*	2.886E+00	2.619E-01	2.619E-01	30.18
	860.56	25	12.50	2.150E+00	4.481E-01	4.481E-01	135.31
BI-211	72.87	-----	1.23	6.585E+00	-----	Line Not Found	-----
	351.06	337	12.92*	4.262E+00	2.946E+00	2.946E+00	16.86
PB-212	74.82	263	10.28	6.758E+00	1.827E+00	1.827E+00	32.07
	77.11	339	17.10	6.949E+00	1.376E+00	1.376E+00	19.56
	238.63	551	43.60*	5.747E+00	1.060E+00	1.060E+00	11.65
	300.09	46	3.30	4.829E+00	1.402E+00	1.402E+00	79.42
BI-214	609.32	152	45.49*	2.791E+00	5.775E-01	5.777E-01	29.30
	1120.29	49	14.92	1.754E+00	9.007E-01	9.010E-01	59.54
	1764.49	35	15.30	1.177E+00	9.458E-01	9.461E-01	40.84
PB-214	74.82	263	5.80	6.758E+00	3.238E+00	3.239E+00	32.07
	77.11	339	9.70	6.949E+00	2.425E+00	2.426E+00	19.56
	87.09	139	3.41	7.568E+00	2.595E+00	2.596E+00	45.93
	242.00	152	7.25	5.697E+00	1.767E+00	1.768E+00	52.67
	295.22	205	18.42	4.889E+00	1.099E+00	1.100E+00	22.56
	351.93	337	35.60*	4.262E+00	1.069E+00	1.070E+00	16.86
RN-222	609.32	152	45.49*	2.791E+00	5.775E-01	5.777E-01	29.30
	1120.29	49	14.92	1.754E+00	9.007E-01	9.010E-01	59.54
	1764.49	35	15.30	1.177E+00	9.458E-01	9.461E-01	40.84
RA-224	240.99	152	4.10*	5.697E+00	3.125E+00	3.125E+00	52.67
RA-226	609.32	152	45.49*	2.791E+00	5.775E-01	5.777E-01	29.30
	1120.29	49	14.92	1.754E+00	9.007E-01	9.010E-01	59.54
	1764.49	35	15.30	1.177E+00	9.458E-01	9.461E-01	40.84
AC-228	105.21	51	1.10	8.063E+00	2.748E+00	2.748E+00	84.59
	338.32	68	11.27	4.394E+00	6.612E-01	6.612E-01	69.99
	794.95	-----	4.25	2.286E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.201E+00	-----	Line Not Found	-----
	911.20	107	25.80*	2.060E+00	9.737E-01	9.737E-01	29.57
	968.97	52	15.80	1.966E+00	8.046E-01	8.046E-01	40.21
RA-228	105.21	51	1.10	8.063E+00	2.748E+00	2.748E+00	84.59
	338.32	68	11.27	4.394E+00	6.612E-01	6.612E-01	69.99
	794.95	-----	4.25	2.286E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.201E+00	-----	Line Not Found	-----
	911.20	107	25.80*	2.060E+00	9.737E-01	9.737E-01	29.57
	968.97	52	15.80	1.966E+00	8.046E-01	8.046E-01	40.21

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	74.82	263	10.28	6.758E+00	1.827E+00	1.827E+00	32.07
	77.11	339	17.10	6.949E+00	1.376E+00	1.376E+00	19.56
	238.63	551	43.60*	5.747E+00	1.060E+00	1.060E+00	11.65
TH-230	300.09	46	3.30	4.829E+00	1.402E+00	1.402E+00	79.42
	609.32	152	45.49*	2.791E+00	5.775E-01	5.775E-01	29.30
	1120.29	49	14.92	1.754E+00	9.007E-01	9.007E-01	59.54
PA-231	1764.49	35	15.30	1.177E+00	9.458E-01	9.458E-01	40.84
	283.69	-----	1.70	5.044E+00	-----	Line Not Found	-----
TH-232	301.36	46	5.35*	4.829E+00	8.646E-01	8.646E-01	79.42
	105.21	51	1.10	8.063E+00	2.748E+00	2.748E+00	84.59
	338.32	68	11.27	4.394E+00	6.612E-01	6.612E-01	69.99
TH-234	835.71	-----	1.61	2.201E+00	-----	Line Not Found	-----
	911.20	107	25.80*	2.060E+00	9.737E-01	9.737E-01	29.57
	968.97	52	15.80	1.966E+00	8.046E-01	8.046E-01	40.21
U-234	63.29	89	3.70*	5.536E+00	2.099E+00	2.099E+00	93.09
	92.59	81	4.23	7.800E+00	1.184E+00	1.184E+00	78.13
U-238	609.32	152	45.49*	2.791E+00	5.775E-01	5.775E-01	29.30
	1120.29	49	14.92	1.754E+00	9.007E-01	9.007E-01	59.54
AM-243	1764.49	35	15.30	1.177E+00	9.458E-01	9.458E-01	40.84
	63.29	89	3.70*	5.536E+00	2.099E+00	2.099E+00	93.09
ANH-511	92.59	81	4.23	7.800E+00	1.184E+00	1.184E+00	78.13
	43.53	-----	5.90	2.021E+00	-----	Line Not Found	-----
	74.66	263	67.20*	6.758E+00	2.795E-01	2.795E-01	32.07
	511.00	37	100.00*	3.192E+00	5.553E-02	5.553E-02	155.34

Flag: "*" = Keyline

Total number of lines in spectrum 53
 Number of unidentified lines 15
 Number of lines tentatively identified by NID 38 71.70%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.319E+01	1.319E+01	0.138E+01	10.43	
CO-58	70.86D	19.9	2.571E-02	5.127E-01	8.033E-01	156.68	
CD-109	461.40D	1.58	2.392E+00	3.788E+00	1.740E+00	45.93	
SN-126	2.30E+05Y	1.00	2.392E-01	2.392E-01	1.099E-01	45.93	
BA-137M	30.08Y	1.02	2.058E+00	2.098E+00	0.157E+00	7.49	
CS-137	30.08Y	1.02	2.174E+00	2.216E+00	0.166E+00	7.49	
EU-155	4.75Y	1.13	1.433E-01	1.619E-01	1.369E-01	84.59	
TL-208	1.41E+10Y	1.00	2.619E-01	2.619E-01	0.791E-01	30.18	
BI-211	7.04E+08Y	1.00	2.946E+00	2.946E+00	0.497E+00	16.86	
PB-212	1.41E+10Y	1.00	1.060E+00	1.060E+00	0.124E+00	11.65	
BI-214	1600.00Y	1.00	5.775E-01	5.777E-01	1.693E-01	29.30	
PB-214	1600.00Y	1.00	1.069E+00	1.070E+00	0.180E+00	16.86	
RN-222	1600.00Y	1.00	5.775E-01	5.777E-01	1.693E-01	29.30	
RA-224	1.41E+10Y	1.00	3.125E+00	3.125E+00	1.646E+00	52.67	
RA-226	1600.00Y	1.00	5.775E-01	5.777E-01	1.693E-01	29.30	
AC-228	1.41E+10Y	1.00	9.737E-01	9.737E-01	2.879E-01	29.57	
RA-228	1.41E+10Y	1.00	9.737E-01	9.737E-01	2.879E-01	29.57	
TH-228	1.41E+10Y	1.00	1.060E+00	1.060E+00	0.124E+00	11.65	
TH-230	7.54E+04Y	1.00	5.775E-01	5.775E-01	1.692E-01	29.30	
PA-231	7.04E+08Y	1.00	8.646E-01	8.646E-01	6.866E-01	79.42	
TH-232	1.41E+10Y	1.00	9.737E-01	9.737E-01	2.879E-01	29.57	
TH-234	4.47E+09Y	1.00	2.099E+00	2.099E+00	1.954E+00	93.09	
U-234	2.45E+05Y	1.00	5.775E-01	5.775E-01	1.692E-01	29.30	
U-238	4.47E+09Y	1.00	2.099E+00	2.099E+00	1.954E+00	93.09	
AM-243	7370.00Y	1.00	2.795E-01	2.795E-01	0.896E-01	32.07	
ANH-511	1.00E+09Y	1.00	5.553E-02	5.553E-02	8.627E-02	155.34	
Total Activity :			4.095E+01	4.294E+01			

Grand Total Activity : 4.095E+01 4.294E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	83.74	34	258	1.52	166.81	165	7	7.29E-03	****	7.38E+00	T
3	95.46	62	195	1.41	190.27	182	13	1.35E-02	****	7.87E+00	T
0	136.89	65	170	0.90	273.15	270	8	1.45E-02	81.7	7.87E+00	T
0	186.02	80	246	1.01	371.45	366	11	1.84E-02	89.9	6.81E+00	T
0	270.35	54	108	1.76	540.18	536	9	1.29E-02	80.7	5.23E+00	T
0	328.39	62	86	2.34	656.30	651	10	1.52E-02	65.3	4.50E+00	T
0	394.83	23	69	0.72	789.24	786	8	5.71E-03	****	3.89E+00	
0	408.86	52	58	1.14	817.32	813	9	1.30E-02	62.6	3.79E+00	
0	536.91	47	57	7.37	1073.53	1065	19	1.20E-02	85.6	3.07E+00	T
0	554.81	19	41	3.48	1109.35	1101	13	4.98E-03	****	3.00E+00	
0	645.81	24	28	2.44	1291.43	1286	12	6.33E-03	****	2.67E+00	T
0	654.80	21	36	4.26	1309.43	1300	15	5.38E-03	****	2.64E+00	
0	722.27	17	18	3.38	1444.45	1439	10	4.40E-03	****	2.46E+00	T
0	726.97	52	24	1.90	1453.85	1449	11	1.37E-02	46.5	2.44E+00	T
0	755.46	21	19	1.54	1510.85	1507	9	5.56E-03	88.6	2.38E+00	T
0	816.68	42	15	4.54	1633.37	1625	19	1.12E-02	54.9	2.24E+00	T
0	953.31	11	9	1.71	1906.78	1900	9	3.11E-03	****	1.99E+00	T
2	964.74	35	16	2.24	1929.66	1923	22	9.46E-03	57.3	1.97E+00	T
0	1150.90	14	12	3.15	2302.21	2296	12	3.89E-03	****	1.72E+00	
0	1255.13	9	18	2.84	2510.82	2500	15	2.40E-03	****	1.60E+00	
0	1301.45	7	20	2.68	2603.53	2591	14	2.04E-03	****	1.55E+00	
0	1314.68	8	5	0.90	2629.99	2622	11	2.38E-03	****	1.54E+00	
0	1318.32	12	5	2.18	2637.29	2632	10	3.33E-03	90.5	1.53E+00	
0	1339.26	5	10	0.51	2679.20	2668	14	1.48E-03	****	1.51E+00	
0	1377.72	16	6	1.08	2756.18	2750	13	4.58E-03	80.5	1.48E+00	
0	1480.60	10	3	2.96	2962.08	2956	12	2.74E-03	95.3	1.39E+00	
3	1588.20	12	1	2.90	3177.46	3174	16	3.53E-03	59.0	1.30E+00	
3	1592.38	10	3	1.91	3185.83	3174	16	3.02E-03	78.1	1.30E+00	
0	1847.52	14	0	1.98	3696.53	3690	11	4.17E-03	51.6	1.12E+00	

Flags: "T" = Tentatively associated

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235018.CNF;1
* Acquisition date   : 3-OCT-2016 08:16:22 Sensitivity      : 3.000
* Detector ID        : GAM27 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.98 Half life ratio  : *****
* Sample date        : 2-DEC-2015 10:19:00 Nuclide Library : SOLID
* Sample ID          : G405235018 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity  : 1.5582E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight       : 0.00000
* Dry Weight         : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 3-OCT-2016 06:09:32 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM27_CAN.CNF;13
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.059E-01
CO-58	4.291E-01
CD-109	8.062E-01
SN-126	5.104E-02
BA-137M	2.650E-02
CS-137	2.800E-02
EU-155	7.300E-02
TL-208	2.717E-02
PB-212	3.978E-02
BI-214	5.525E-02
PB-214	5.445E-02
RN-222	5.525E-02
RA-224	4.264E-01
RA-226	5.525E-02
AC-228	8.966E-02
RA-228	8.966E-02
TH-228	3.978E-02
TH-230	5.523E-02
PA-231	3.683E-01
TH-232	8.966E-02
TH-234	6.868E-01
U-234	5.523E-02
U-238	6.868E-01
AM-243	3.084E-02
ANH-511	2.308E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.236E+01	NOT IDENT.
NA-22	2.682E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	3.121E-02	NOT IDENT.
SC-46	2.968E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF

CR-51	0.000E+00	SHORT HLIF
MN-54	5.320E-02	NOT IDENT.
CO-56	3.152E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.688E-02	FAIL ABUN
FE-59	5.212E+00	NOT IDENT.
CO-60	2.073E-02	NOT IDENT.
ZN-65	1.572E-01	NOT IDENT.
GE-68	1.697E+00	NOT IDENT.
AS-73	4.043E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.630E-01	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.599E-01	NOT IDENT.
KR-85	5.749E+00	NOT IDENT.
SR-85	6.477E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.935E-01	NOT IDENT.
Y-91	4.801E+02	NOT IDENT.
NB-94	2.546E-02	NOT IDENT.
NB-95	6.709E-01	NOT IDENT.
NB-95M	2.141E+00	NOT IDENT.
ZR-95	1.290E+00	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.697E-02	NOT IDENT.
RH-102	4.229E-02	NOT IDENT.
RU-103	6.159E+00	FAIL ABUN
RH-106	3.569E-01	NOT IDENT.
RU-106	3.569E-01	NOT IDENT.
AG-108M	2.456E-02	FAIL ABUN
AG-110M	7.234E-02	NOT IDENT.
SN-113	1.907E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.040E-01	NOT IDENT.
SB-124	1.346E+00	FAIL ABUN
SB-125	9.855E-02	NOT IDENT.
TE-125M	2.253E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.509E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	4.613E-02	NOT IDENT.
CS-135	1.141E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	8.617E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.195E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.000E-01	NOT IDENT.
PM-144	3.636E-02	NOT IDENT.
PR-144	3.162E+00	NOT IDENT.
PM-146	3.882E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	6.429E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.107E-02	FAIL ABUN
EU-152	8.440E-02	FAIL ABUN
GD-153	1.237E-01	NOT IDENT.
EU-154	6.668E-02	FAIL ABUN
TB-160	1.491E+00	FAIL ABUN
HO-166M	3.904E-02	FAIL ABUN
TM-171	9.380E+00	NOT IDENT.
HF-172	1.799E-01	FAIL ABUN
LU-172	5.772E-02	FAIL ABUN
LU-176	2.028E-02	FAIL ABUN
HF-181	4.108E+00	NOT IDENT.
TA-182	7.375E-01	FAIL ABUN

RE-183	1.636E+00	NOT IDENT.
RE-184	2.672E+01	NOT IDENT.
W-188	9.196E+01	FAIL ABUN
IR-192	4.545E-01	FAIL ABUN
HG-203	2.143E+00	NOT IDENT.
BI-207	2.900E-02	FAIL ABUN
PB-210	1.215E+00	NOT IDENT.
BI-211	3.554E-01	FAIL ABUN
PB-211	5.915E-01	NOT IDENT.
BI-212	5.528E-01	FAIL ABUN
RN-219	3.216E-01	FAIL ABUN
RA-223	5.038E-01	FAIL ABUN
AC-227	2.110E-01	FAIL ABUN
TH-227	2.110E-01	FAIL ABUN
TH-229	4.113E-01	FAIL ABUN
TH-231	5.038E-01	FAIL ABUN
PA-233	4.724E-02	FAIL ABUN
PA-234	2.170E-01	FAIL ABUN
PA-234M	2.840E+00	NOT IDENT.
U-235	1.546E-01	FAIL ABUN
NP-237	4.724E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.886E-01	FAIL ABUN
PU-239	2.711E+02	NOT IDENT.
AM-241	7.188E-02	NOT IDENT.
CM-243	6.651E-02	FAIL ABUN
BK-247	5.523E-02	FAIL ABUN
CM-247	3.090E-02	FAIL ABUN
CF-249	3.364E-02	NOT IDENT.
CF-251	9.851E-02	NOT IDENT.

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235018.CNF;1
* Acquisition date   : 3-OCT-2016 08:16:22 Sensitivity      : 3.000
* Detector ID       : GAM27 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.98 Half life ratio : *****
* Sample date      : 2-DEC-2015 10:19:00 Nuclide Library : SOLID
* Sample ID       : G405235018 Analyst initials: MXR1
* Batch Number    : 1596247 Sample Quantity : 1.5582E+02 GRAM
*                               Quantity Err(%) : 1.2836E-03 %
* Wet wt corr     : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight     : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 3-OCT-2016 06:09:32 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM27_CAN.CNF;13
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.319E+01	1.514E+00	1.514E+00
CO-58	5.127E-01	7.876E-01	7.876E-01
CD-109	2.183E+00	1.762E+00	1.762E+00
SN-126	1.379E-01	1.110E-01	1.110E-01
BA-137M	2.098E+00	1.785E-01	1.785E-01
CS-137	2.216E+00	1.885E-01	1.885E-01
EU-155	1.619E-01	1.347E-01	1.347E-01
TL-208	2.619E-01	7.827E-02	7.827E-02
PB-212	1.060E+00	1.338E-01	1.338E-01
BI-214	5.777E-01	1.677E-01	1.677E-01
PB-214	1.070E+00	1.824E-01	1.824E-01
RN-222	5.777E-01	1.677E-01	1.677E-01
RA-224	1.181E+00	1.676E+00	1.676E+00
RA-226	5.777E-01	1.677E-01	1.677E-01
AC-228	9.737E-01	2.865E-01	2.865E-01
RA-228	9.737E-01	2.865E-01	2.865E-01
TH-228	1.060E+00	1.338E-01	1.338E-01
TH-230	5.775E-01	1.677E-01	1.677E-01
PA-231	8.646E-01	6.978E-01	6.978E-01
TH-232	9.737E-01	2.865E-01	2.865E-01
TH-234	2.099E+00	1.971E+00	1.971E+00
U-234	5.775E-01	1.677E-01	1.677E-01
U-238	2.099E+00	1.971E+00	1.971E+00
AM-243	1.846E-01	9.180E-02	9.180E-02
ANH-511	5.553E-02	8.457E-02	8.457E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.854E+00	1.400E+01	1.403E+01	NOT IDENT.
NA-22	-1.638E-02	3.531E-02	3.607E-02	NOT IDENT.
NA-24	-1.000E+41	5.275E+41	0.000E+00	SHORT HLIF
AL-26	3.874E-02	2.739E-02	3.249E-02	NOT IDENT.
SC-46	9.603E-02	3.228E-01	3.257E-01	FAIL ABUN

V-48	2.628E+03	1.790E+04	1.794E+04	SHORT HLIF
CR-51	-1.305E+02	4.233E+02	4.274E+02	SHORT HLIF
MN-54	5.415E-02	5.311E-02	5.845E-02	NOT IDENT.
CO-56	-2.903E-01	4.019E-01	4.227E-01	NOT IDENT.
MN-56	-1.000E+41	1.392E+41	0.000E+00	SHORT HLIF
CO-57	-3.318E-03	4.215E-02	4.217E-02	FAIL ABUN
FE-59	-3.865E+00	6.694E+00	6.917E+00	NOT IDENT.
CO-60	1.028E-02	2.365E-02	2.410E-02	NOT IDENT.
ZN-65	6.215E-02	1.965E-01	1.985E-01	NOT IDENT.
GE-68	-2.862E-01	2.015E+00	2.019E+00	NOT IDENT.
AS-73	-3.048E+00	4.600E+00	4.801E+00	NOT IDENT.
AS-74	7.101E+03	6.829E+03	7.543E+03	SHORT HLIF
SE-75	-2.039E-01	1.945E-01	2.152E-01	FAIL ABUN
BR-77	1.125E+39	9.939E+39	0.000E+00	SHORT HLIF
SR-82	2.157E+02	7.184E+02	7.250E+02	SHORT HLIF
RB-83	-4.170E-01	6.992E-01	7.241E-01	NOT IDENT.
KR-85	-4.591E+00	8.088E+00	8.349E+00	NOT IDENT.
SR-85	-5.166E-01	9.111E-01	9.404E-01	NOT IDENT.
RB-86	-1.055E+04	2.974E+04	3.012E+04	SHORT HLIF
Y-88	1.816E-02	2.207E-01	2.209E-01	NOT IDENT.
Y-91	3.156E+02	5.165E+02	5.357E+02	NOT IDENT.
NB-94	1.547E-02	2.818E-02	2.903E-02	NOT IDENT.
NB-95	-5.483E-01	8.884E-01	9.221E-01	NOT IDENT.
NB-95M	-4.289E-01	2.602E+00	2.609E+00	NOT IDENT.
ZR-95	2.137E+00	1.858E+00	2.093E+00	FAIL ABUN
NB-97	1.000E+41	2.235E+41	0.000E+00	SHORT HLIF
ZR-97	-1.000E+41	2.432E+42	0.000E+00	SHORT HLIF
MO-99	2.651E+32	6.463E+32	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	8.974E+40	0.000E+00	SHORT HLIF
RH-101	-1.392E-02	3.183E-02	3.245E-02	NOT IDENT.
RH-102	3.331E-03	4.936E-02	4.938E-02	NOT IDENT.
RU-103	5.173E+00	6.566E+00	6.968E+00	FAIL ABUN
RH-106	-2.414E-01	4.564E-01	4.692E-01	NOT IDENT.
RU-106	-2.414E-01	4.564E-01	4.692E-01	NOT IDENT.
AG-108M	-2.565E-02	3.070E-02	3.280E-02	FAIL ABUN
AG-110M	-2.689E-02	8.627E-02	8.712E-02	NOT IDENT.
SN-113	-8.626E-02	2.514E-01	2.543E-01	NOT IDENT.
CD-115	-8.038E+37	1.908E+40	0.000E+00	SHORT HLIF
SN-117M	5.614E+03	1.178E+05	1.178E+05	SHORT HLIF
TE-123M	-2.056E-02	1.222E-01	1.226E-01	NOT IDENT.
SB-124	-6.167E-02	1.663E+00	1.664E+00	FAIL ABUN
SB-125	4.597E-02	1.077E-01	1.097E-01	NOT IDENT.
TE-125M	1.914E+02	2.397E+02	2.548E+02	NOT IDENT.
I-126	2.786E+05	1.295E+06	1.301E+06	SHORT HLIF
SB-126	1.358E+05	1.595E+06	1.596E+06	SHORT HLIF
SB-127	-2.715E+22	6.816E+22	0.000E+00	SHORT HLIF
I-131	-9.392E+08	8.587E+09	8.598E+09	SHORT HLIF
I-132	-1.000E+41	1.962E+42	0.000E+00	SHORT HLIF
TE-132	-2.444E+26	1.318E+27	0.000E+00	SHORT HLIF
BA-133	-4.407E-02	4.774E-02	5.171E-02	FAIL ABUN
I-133	1.000E+41	2.749E+41	0.000E+00	SHORT HLIF
CS-134	3.050E-02	5.161E-02	5.341E-02	NOT IDENT.
CS-135	1.794E-02	1.364E-01	1.367E-01	NOT IDENT.
I-135	1.000E+41	7.102E+41	0.000E+00	SHORT HLIF
CS-136	-6.038E+04	4.065E+05	4.074E+05	SHORT HLIF
CE-139	9.394E-03	9.940E-02	9.949E-02	NOT IDENT.
BA-140	5.050E+06	4.240E+06	4.812E+06	SHORT HLIF
LA-140	-1.231E+05	4.524E+05	4.558E+05	SHORT HLIF
CE-141	-1.689E+01	2.670E+01	2.776E+01	NOT IDENT.
CE-143	1.000E+41	2.263E+41	0.000E+00	SHORT HLIF
CE-144	2.211E-01	3.519E-01	3.657E-01	NOT IDENT.
PM-144	-1.013E-02	4.503E-02	4.526E-02	NOT IDENT.
PR-144	-1.243E+00	3.975E+00	4.014E+00	NOT IDENT.
PM-146	8.201E-03	4.350E-02	4.366E-02	NOT IDENT.
ND-147	7.012E+06	4.887E+07	4.897E+07	SHORT HLIF
PM-147	-3.412E+01	7.324E+02	7.326E+02	NOT IDENT.
PM-149	1.000E+41	1.256E+41	0.000E+00	SHORT HLIF
EU-150	-1.696E-03	2.627E-02	2.628E-02	FAIL ABUN
EU-152	1.567E-02	9.276E-02	9.303E-02	FAIL ABUN
GD-153	-5.762E-02	1.549E-01	1.571E-01	NOT IDENT.
EU-154	-3.713E-02	8.689E-02	8.849E-02	FAIL ABUN
TB-160	1.226E+00	1.506E+00	1.604E+00	FAIL ABUN
HO-166M	1.593E-03	4.615E-02	4.615E-02	FAIL ABUN
TM-171	5.599E+00	9.713E+00	1.004E+01	NOT IDENT.
HF-172	8.408E-03	2.042E-01	2.042E-01	FAIL ABUN
LU-172	-4.981E-03	6.783E-02	6.787E-02	FAIL ABUN
LU-176	3.662E-03	2.207E-02	2.213E-02	FAIL ABUN
HF-181	-8.016E-01	4.807E+00	4.820E+00	NOT IDENT.

TA-182	8.139E-02	8.541E-01	8.549E-01	FAIL ABUN
RE-183	1.166E+00	1.701E+00	1.781E+00	NOT IDENT.
RE-184	9.775E+00	2.912E+01	2.945E+01	NOT IDENT.
W-188	8.433E+00	1.113E+02	1.114E+02	FAIL ABUN
IR-192	3.218E-01	4.776E-01	4.992E-01	FAIL ABUN
HG-203	1.448E+00	2.449E+00	2.534E+00	NOT IDENT.
BI-207	-1.332E-02	3.611E-02	3.661E-02	FAIL ABUN
PB-210	-4.432E-01	1.285E+00	1.301E+00	NOT IDENT.
BI-211	2.946E+00	5.046E-01	1.421E+00	FAIL ABUN
PB-211	3.733E-01	6.985E-01	7.185E-01	NOT IDENT.
BI-212	1.534E+00	7.033E-01	9.862E-01	FAIL ABUN
RN-219	5.585E-03	3.627E-01	3.627E-01	FAIL ABUN
RA-223	5.092E-01	5.623E-01	6.074E-01	FAIL ABUN
AC-227	1.163E-01	2.221E-01	2.282E-01	FAIL ABUN
TH-227	1.163E-01	2.221E-01	2.282E-01	FAIL ABUN
TH-229	-4.498E-02	4.879E-01	4.883E-01	FAIL ABUN
TH-231	5.092E-01	5.623E-01	6.074E-01	FAIL ABUN
PA-233	-5.449E-03	5.268E-02	5.274E-02	FAIL ABUN
PA-234	1.837E-01	3.083E-01	3.193E-01	FAIL ABUN
PA-234M	-2.650E+00	3.675E+00	3.865E+00	NOT IDENT.
U-235	1.255E-01	1.699E-01	1.791E-01	FAIL ABUN
NP-237	-5.449E-03	5.268E-02	5.274E-02	FAIL ABUN
NP-238	-1.000E+41	1.638E+41	0.000E+00	SHORT HLIF
NP-239	2.723E-02	2.115E-01	2.119E-01	FAIL ABUN
PU-239	2.824E+02	2.901E+02	3.168E+02	NOT IDENT.
AM-241	4.583E-03	8.366E-02	8.368E-02	NOT IDENT.
CM-243	2.000E-02	7.883E-02	7.935E-02	FAIL ABUN
BK-247	-7.230E-02	6.760E-02	7.505E-02	FAIL ABUN
CM-247	1.871E-02	3.328E-02	3.434E-02	FAIL ABUN
CF-249	1.475E-02	3.656E-02	3.716E-02	NOT IDENT.
CF-251	1.980E-02	1.136E-01	1.140E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	87.8545	87.09	159.0519	136.47	79.3663
45.60	104.5483	87.57	138.2499	140.51	0.0000
46.54	100.0665	88.03	138.3703	143.76	89.3306
49.72	0.0000	88.34	165.0228	144.24	77.9277
51.35	106.2390	88.47	165.0636	145.44	111.3422
51.87	93.8141	89.96	111.5187	152.43	84.5711
52.39	88.1330	1093.63	134.8350	153.25	0.0000
52.97	102.8177	91.11	0.0000	323.87	92.8943
53.44	113.6281	92.59	133.2050	156.02	0.0000
54.07	94.3593	93.35	133.3905	158.56	0.0000
57.36	0.0000	94.56	133.6827	159.00	87.6228
57.53	96.1768	94.65	133.7039	162.33	90.3354
57.98	92.3545	94.67	133.7087	162.66	0.0000
59.27	109.0760	94.87	133.7572	163.33	97.4961
59.32	109.0895	97.43	105.2203	165.86	77.7687
59.54	109.1482	98.43	86.8883	176.31	89.4882
60.96	102.9268	98.44	86.8901	176.60	0.0000
61.17	100.3383	99.53	78.4929	177.52	94.3947
62.93	131.2527	100.11	92.1433	181.07	0.0000
63.29	131.3635	102.03	83.1325	181.52	94.4334
63.58	131.4532	103.18	74.6791	184.41	98.7601
64.28	131.6682	103.37	74.7029	143.76	98.9077
66.73	101.6488	105.21	82.1410	193.51	104.6367
67.24	125.8688	105.31	82.1544	197.03	106.2609
125.81	143.7539	106.12	96.6983	198.01	91.7015
67.75	143.7757	106.47	96.7548	201.83	87.1683
69.67	123.1886	109.28	80.5203	203.43	94.6956
70.83	125.5269	111.00	97.1129	205.31	77.6320
72.81	143.6872	111.76	0.0000	210.85	87.9971
72.87	143.7056	114.06	89.9149	215.65	77.2219
74.66	130.6455	116.30	0.0000	222.11	90.2615
74.82	130.6895	116.74	96.9026	227.09	84.8273
74.97	130.7305	119.76	92.9318	227.38	78.1301
77.11	131.3145	121.12	90.9081	228.16	0.0000
78.74	135.8712	121.22	97.5746	228.18	81.5546
79.69	123.7582	121.78	97.6579	116.74	81.5546
80.12	125.2416	122.06	95.4791	235.69	94.0040
80.19	0.0000	122.92	101.1614	235.96	70.3099
80.57	119.8445	123.07	104.5201	238.63	70.4880
81.00	128.2203	265.00	94.5997	238.98	0.0000
81.07	117.8965	125.81	97.1342	240.99	70.6451
81.75	120.1277	127.23	117.4769	242.00	70.7118
83.79	137.2469	127.91	113.1153	244.70	55.0892
84.00	137.3033	129.30	98.7556	252.40	0.0000
85.43	100.1345	131.20	133.9149	252.80	83.4650
86.55	100.3499	133.02	87.2537	254.15	0.0000
86.79	158.9603	133.52	88.8205	256.23	72.5024
86.94	159.0056	136.00	90.6445	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	76.5256	355.39	0.0000	584.27	33.0334
264.80	73.0557	356.01	67.2539	595.83	0.0000
265.00	79.1584	364.49	0.0000	427.87	25.7744
268.22	62.8066	366.42	0.0000	602.52	0.0000
269.46	68.1135	372.51	44.4058	604.72	27.4382
270.03	68.1469	375.05	59.6252	607.14	37.1644
271.23	66.4675	377.52	65.4119	609.32	36.6632
273.65	0.0000	356.01	40.9371	610.33	36.6798
276.40	59.7352	388.16	47.7376	614.28	38.9092
277.37	59.7836	388.63	0.0000	618.01	25.9844
277.60	59.7961	391.69	50.2409	620.36	28.1794
278.00	59.8154	264.66	56.7901	621.93	30.3698
279.20	50.1904	401.81	48.1628	630.19	0.0000
279.54	50.2055	402.40	42.3994	631.29	21.7847
279.70	54.1754	404.85	41.9840	633.25	23.9846
280.46	51.5660	410.95	50.8669	634.78	0.0000
283.69	60.9857	413.71	40.7644	635.95	17.4648
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	53.1079	423.72	0.0000	645.85	26.3135
285.90	0.0000	427.09	52.8475	657.76	13.2261
287.50	51.4261	427.87	46.9980	657.90	0.0000
290.67	53.3374	433.94	62.8971	661.66	28.1531
293.27	0.0000	439.40	65.0762	664.57	0.0000
351.93	62.4577	453.88	42.7629	666.33	0.0000
295.96	62.4961	463.37	61.9987	666.50	0.0000
879.38	62.6272	468.07	61.1638	667.71	0.0000
299.98	62.6984	473.00	0.0000	677.62	24.4573
300.09	62.7026	475.06	46.3070	685.70	0.0000
300.13	62.7055	476.78	51.3901	695.00	0.0000
301.36	64.5601	477.60	45.3653	696.49	22.4129
302.85	61.9431	482.18	43.4610	696.51	23.5336
256.23	55.0130	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	24.6623
306.78	54.9325	497.08	35.6672	697.49	24.6641
308.46	57.7096	505.52	19.9630	702.65	22.4707
311.90	54.2480	507.63	0.0000	706.68	24.7590
316.51	55.3483	511.00	40.0438	711.68	18.0436
319.41	0.0000	514.00	53.9911	720.70	0.0000
320.08	0.0000	514.00	53.9911	721.93	0.0000
321.04	61.0036	520.40	44.3717	722.78	10.1960
323.87	41.0605	520.69	0.0000	722.91	10.1964
325.23	47.9530	522.65	0.0000	723.31	10.1982
328.76	0.0000	527.90	0.0000	724.19	10.2019
333.37	67.5440	528.26	29.0117	727.33	15.3221
333.97	57.9205	529.59	28.6175	733.00	17.7461
334.37	52.4193	529.87	0.0000	735.93	22.7783
338.28	71.0157	531.02	0.0000	333.97	20.5129
338.32	71.0173	537.26	0.0000	739.50	0.0000
311.90	63.7399	546.56	0.0000	747.24	19.4494
340.48	63.7399	552.55	25.1787	748.06	13.7334
340.55	0.0000	563.25	44.2986	752.31	24.0736
344.28	59.2839	569.33	39.1424	753.82	0.0000
345.93	58.9832	946.00	39.1454	756.73	20.6704
351.06	49.3327	569.70	39.1484	756.80	20.6711
351.93	49.3640	583.19	33.0170	884.68	18.4258

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	34.5728	1274.44	11.2401	1620.50	9.8849
766.42	31.1232	1001.03	20.6378	1621.92	14.2830
766.84	31.1287	1002.74	21.5878	1678.03	0.0000
772.60	0.0000	1004.73	19.7227	1690.97	4.4578
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.6189
778.90	15.0577	1028.54	0.0000	1063.66	4.5288
783.70	0.0000	1037.84	16.1295	1771.35	5.6622
785.37	17.4170	1038.76	0.0000	1791.20	0.0000
792.07	31.4308	631.29	17.1244	1808.65	0.9125
794.95	25.6380	1048.07	0.0000	1810.72	0.0000
795.86	25.6470	1049.04	22.8486	1836.06	6.4210
810.06	19.6896	1050.41	18.0966		
810.29	19.6909	1063.66	15.2998		
344.28	19.6923	1077.00	0.0000		
810.76	17.5842	1077.34	17.2815		
815.77	0.0000	1085.87	17.3254		
1048.07	0.0000	1093.63	18.3297		
832.01	22.1527	1099.45	22.2251		
834.85	14.1924	1112.07	17.4573		
835.71	16.8587	1112.84	24.3909		
836.80	0.0000	1115.54	21.7465		
846.75	0.0000	1120.29	23.3320		
846.77	23.1618	1120.55	23.3335		
856.80	0.0000	1221.41	23.3379		
860.56	16.1142	1129.67	14.6210		
871.09	17.9712	1131.51	0.0000		
873.19	12.5892	1147.95	0.0000		
875.33	0.0000	1173.23	17.7605		
879.38	10.8142	1177.95	14.8196		
880.51	17.1289	1189.05	20.8103		
883.24	15.3404	1204.77	15.9229		
884.68	20.7651	1221.41	18.9930		
889.28	15.3725	1231.02	23.0505		
894.76	15.4016	1235.36	0.0000		
898.04	14.5117	1238.28	27.1104		
900.72	17.2489	1260.41	0.0000		
903.28	17.2640	1271.87	9.1165		
911.20	17.3104	1274.44	13.1769		
912.08	17.3156	1274.54	13.1769		
923.98	0.0000	1291.59	16.2891		
926.50	20.1470	1298.22	0.0000		
929.11	19.2479	1312.11	0.0000		
937.49	18.3820	1332.49	3.2914		
944.13	0.0000	1362.66	0.0000		
946.00	11.5870	1365.19	14.5161		
949.00	16.2374	1368.63	0.0000		
667.71	0.0000	1384.29	2.7777		
962.31	16.3083	1408.01	8.3804		
964.08	13.9069	1457.56	0.0000		
966.17	13.9165	1460.82	7.4234		
911.20	13.9288	1489.16	7.4717		
968.97	13.9288	1505.03	10.7117		
983.53	0.0000	1584.12	6.9754		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235019.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM11.CNF;517
Background date : 2-OCT-2016 11:00:34.
Sample date     : 8-DEC-2015 14:30:00. Acquisition date : 3-OCT-2016 08:21:03.
Sample ID      : G405235019           Sample quantity  : 1.75975E+02 GRAM
Detector name  : GAM11                Detector geometry: CAN
Elapsed live time: 0 01:00:00.00      Elapsed real time: 0 01:00:00.63  0.0%
Energy tolerance: 1.50000 keV         Analyst Initials  : MXR1
Abundance limit: 75.00000             Sensitivity       : 3.00000
Batch ID      : 1596247               Detector SN#      :
Matrix Spike ID :                      LCS ID           : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.02*	26	272	1.13	125.95	122	11	7.13E-03	127.1	
2	2	74.87*	137	156	0.88	149.66	146	14	3.80E-02	15.9	3.97E-01
3	2	77.15*	212	134	0.91	154.22	146	14	5.89E-02	11.0	
4	0	83.89*	45	165	1.04	167.71	165	7	1.26E-02	49.5	
5	0	86.82	58	157	0.74	173.58	172	6	1.62E-02	36.4	
6	0	89.82	64	123	1.37	179.58	177	6	1.78E-02	30.4	
7	0	92.82*	59	156	1.46	185.58	182	7	1.65E-02	39.8	
8	0	185.56*	175	124	1.20	371.18	365	13	4.85E-02	15.6	
9	0	209.55	50	127	1.42	419.20	414	11	1.37E-02	46.2	
10	2	238.65*	400	90	1.03	477.44	473	15	1.11E-01	6.2	2.44E+00
11	2	241.64	100	95	1.41	483.41	473	15	2.77E-02	21.6	
12	4	270.47	56	52	1.75	541.11	537	27	1.57E-02	28.2	4.29E+00
13	4	274.41	40	44	1.20	549.00	537	27	1.11E-02	31.1	
14	4	276.97	20	72	1.76	554.12	537	27	5.44E-03	92.0	
15	4	295.35*	182	55	1.36	590.91	586	23	5.06E-02	9.9	3.06E+00
16	4	300.14	38	53	1.80	600.49	586	23	1.06E-02	45.7	
17	0	338.45*	83	87	0.92	677.16	672	11	2.30E-02	24.7	
18	0	351.87*	248	51	1.32	704.01	698	12	6.89E-02	8.7	
19	0	415.66	34	112	7.63	831.66	813	24	9.52E-03	84.0	
20	0	428.86	10	41	1.41	858.08	851	9	2.79E-03	120.8	
21	0	469.33	25	25	1.81	939.06	935	9	6.91E-03	41.4	
22	1	491.68	15	25	1.55	983.78	977	17	4.30E-03	63.8	1.99E+00
23	1	494.93	16	18	1.55	990.28	977	17	4.46E-03	48.9	
24	0	498.75	32	23	3.26	997.93	993	10	8.92E-03	32.8	
25	0	510.95*	18	45	1.03	1022.34	1019	9	4.92E-03	92.2	
26	0	544.28	12	22	3.54	1089.02	1081	10	3.20E-03	82.5	
27	0	583.46*	160	29	1.56	1167.43	1162	14	4.45E-02	11.0	
28	0	609.42*	167	44	1.23	1219.36	1214	11	4.63E-02	11.2	
29	0	660.96*	23	18	0.84	1322.50	1316	11	6.49E-03	43.8	
30	6	668.21	28	19	1.54	1337.00	1333	12	7.79E-03	27.8	9.15E+00
31	6	670.75	9	11	1.65	1342.09	1333	12	2.38E-03	71.4	
32	0	701.59	16	38	5.90	1403.77	1395	15	4.31E-03	89.8	
33	0	727.59*	40	18	1.92	1455.79	1451	11	1.12E-02	26.8	
34	0	747.05	20	17	1.62	1494.74	1490	10	5.55E-03	45.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	768.97	24	27	2.85	1538.59	1533	11	6.59E-03	51.5	
36	0	817.97	15	14	3.22	1636.63	1631	11	4.13E-03	55.0	
37	0	860.97	28	12	1.35	1722.66	1717	11	7.88E-03	31.1	
38	0	911.28*	87	19	2.09	1823.31	1817	15	2.41E-02	15.7	
39	0	935.17	11	9	1.29	1871.08	1867	8	3.18E-03	57.9	
40	1	964.79	26	20	1.90	1930.35	1920	25	7.29E-03	33.5	1.53E+00
41	1	968.79	50	15	1.84	1938.35	1920	25	1.38E-02	21.9	
42	0	1003.33*	30	4	5.74	2007.44	2000	15	8.36E-03	25.3	
43	0	1116.48	11	11	1.51	2233.79	2225	12	3.03E-03	69.8	
44	0	1120.37*	42	8	1.39	2241.57	2237	10	1.17E-02	20.5	
45	0	1153.38	14	22	2.48	2307.60	2301	11	3.89E-03	70.2	
46	0	1166.18	10	7	2.27	2333.20	2329	7	2.78E-03	54.1	
47	0	1336.20	9	4	0.68	2673.26	2669	8	2.36E-03	52.6	
48	0	1377.44	18	5	2.28	2755.75	2750	10	5.00E-03	33.1	
49	0	1415.36	12	0	0.83	2831.58	2827	9	3.33E-03	28.9	
50	0	1460.91*	413	8	1.73	2922.68	2915	14	1.15E-01	5.1	
51	0	1509.86	7	5	1.79	3020.57	3014	10	1.94E-03	70.7	
52	0	1764.78*	32	3	2.13	3530.35	3524	12	8.81E-03	22.1	
53	0	1847.73	7	2	1.26	3696.23	3691	9	1.90E-03	54.9	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235019.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 8-DEC-2015 14:30:00   Acquisition date  : 3-OCT-2016 08:21:03
Sample ID         : G405235019           Sample quantity  : 175.98 GRAM
Sample type       : SOLID                 Sample geometry  :
Detector name     : GAMMA11              Detector geometry: CAN
Elapsed live time: 0 01:00:00.00         Elapsed real time: 0 01:00:00.63   0.0%
Energy tolerance  : 1.50 keV             Half life ratio  : 10.00
Errors propagated: No                    Systematic Error : 0.00 %
Efficiency type   : Linear                Efficiencies at  : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	TH-229	85.43
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.238E+00	1.308E+01	1.308E+01	10.29	OK
ZN-65	1115.54	50.60*	1.552E+00	6.051E-02	1.418E-01	139.62	OK
CD-109	88.03	3.70*	6.225E+00	4.599E-01	7.215E-01	244.59	OK
SN-126	64.28	9.60	3.845E+00	4.320E-01	4.320E-01	254.25	OK
	86.94	8.90	6.225E+00	1.912E-01	1.912E-01	244.59	OK
	87.57	37.00*	6.225E+00	4.599E-02	4.599E-02	244.59	OK
BA-137M	661.66	89.90*	2.341E+00	5.215E-02	5.314E-02	87.64	OK
CS-137	661.66	85.10*	2.341E+00	5.509E-02	5.614E-02	87.64	OK
TL-208	277.37	6.60	4.720E+00	3.303E-01	3.303E-01	183.91	OK
	583.19	85.00*	2.581E+00	3.483E-01	3.483E-01	21.98	OK
	860.56	12.50	1.906E+00	5.387E-01	5.387E-01	62.18	OK
PB-212	74.82	10.28	5.239E+00	9.007E-01	9.007E-01	56.51	OK
	77.11	17.10	5.459E+00	1.382E+00	1.382E+00	21.98	OK
	238.63	43.60*	5.299E+00	9.269E-01	9.269E-01	12.41	OK
	300.09	3.30	4.424E+00	1.357E+00	1.357E+00	91.45	OK
BI-214	609.32	45.49*	2.494E+00	6.972E-01	6.975E-01	22.43	OK
	1120.29	14.92	1.548E+00	7.912E-01	7.915E-01	41.03	OK
	1764.49	15.30	1.040E+00	8.093E-01	8.096E-01	44.16	OK
PB-214	74.82	5.80	5.234E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.459E+00	2.436E+00	2.437E+00	21.98	OK
	87.09	3.41	6.242E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.244E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.482E+00	1.150E+00	1.150E+00	19.77	OK
	351.93	35.60*	3.884E+00	9.156E-01	9.159E-01	17.41	OK
RN-222	609.32	45.49*	2.494E+00	6.972E-01	6.975E-01	22.43	OK
	1120.29	14.92	1.548E+00	7.912E-01	7.915E-01	41.03	OK
	1764.49	15.30	1.040E+00	8.093E-01	8.096E-01	44.16	OK
RA-224	240.99	4.10*	5.250E+00	4.419E-01	4.419E-01	258.61	OK
RA-226	609.32	45.49*	2.494E+00	6.972E-01	6.975E-01	22.43	OK
	1120.29	14.92	1.548E+00	7.912E-01	7.915E-01	41.03	OK
	1764.49	15.30	1.040E+00	8.093E-01	8.096E-01	44.16	OK
AC-228	105.21	1.10	7.023E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.010E+00	9.376E-01	9.376E-01	49.50	OK
	794.95	4.25	2.028E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.951E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.823E+00	8.277E-01	8.277E-01	31.41	OK
	968.97	15.80	1.738E+00	8.072E-01	8.072E-01	43.85	OK
RA-228	105.21	1.10	7.023E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.010E+00	9.376E-01	9.376E-01	49.50	OK
	794.95	4.25	2.028E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.951E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.823E+00	8.277E-01	8.277E-01	31.41	OK
	968.97	15.80	1.738E+00	8.072E-01	8.072E-01	43.85	OK
TH-228	74.82	10.28	5.239E+00	9.007E-01	9.007E-01	56.51	OK
	77.11	17.10	5.459E+00	1.382E+00	1.382E+00	21.98	OK
	238.63	43.60*	5.299E+00	9.269E-01	9.269E-01	12.41	OK
	300.09	3.30	4.424E+00	1.357E+00	1.357E+00	91.45	OK
TH-229	85.43	14.70	6.225E+00	1.158E-01	1.158E-01	244.59	OK
	88.47	24.00	6.409E+00	2.491E-01	2.491E-01	60.75	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	193.51	4.41*	6.133E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	5.821E+00	1.651E+00	1.651E+00	92.48	OK
TH-230	609.32	45.49*	2.494E+00	6.972E-01	6.972E-01	22.43	OK
	1120.29	14.92	1.548E+00	7.912E-01	7.912E-01	41.03	OK
	1764.49	15.30	1.040E+00	8.093E-01	8.093E-01	44.16	OK
PA-231	283.69	1.70	4.630E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.424E+00	8.372E-01	8.372E-01	91.45	OK
TH-232	105.21	1.10	7.023E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.010E+00	9.376E-01	9.376E-01	49.50	OK
	835.71	1.61	1.951E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.823E+00	8.277E-01	8.277E-01	31.41	OK
	968.97	15.80	1.738E+00	8.072E-01	8.072E-01	43.85	OK
TH-234	63.29	3.70*	3.845E+00	1.121E+00	1.121E+00	254.25	OK
	92.59	4.23	6.570E+00	1.273E+00	1.273E+00	79.53	OK
U-234	609.32	45.49*	2.494E+00	6.972E-01	6.972E-01	22.43	OK
	1120.29	14.92	1.548E+00	7.912E-01	7.912E-01	41.03	OK
	1764.49	15.30	1.040E+00	8.093E-01	8.093E-01	44.16	OK
U-235	89.96	3.47	6.409E+00	1.723E+00	1.723E+00	60.75	OK
	93.35	5.60	6.570E+00	9.616E-01	9.616E-01	79.53	OK
	143.76	10.96*	7.059E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	6.731E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.293E+00	2.677E-01	2.677E-01	31.14	OK
	205.31	5.01	5.902E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	3.845E+00	1.121E+00	1.121E+00	254.25	OK
	92.59	4.23	6.570E+00	1.273E+00	1.273E+00	79.53	OK
AM-243	43.53	5.90	9.310E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	5.239E+00	1.378E-01	1.378E-01	56.51	OK
ANH-511	511.00	100.00*	2.868E+00	3.004E-02	3.004E-02	184.44	OK

Flag: "*" = Keyline


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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235019.CNF;1
* Acquisition date   : 3-OCT-2016 08:21:03 Sensitivity      : 3.000
* Detector ID       : GAM11 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.63 Half life ratio : *****
* Sample date       : 8-DEC-2015 14:30:00 Analyst initials: MXR1
* Sample ID         : G405235019 Sample Quantity : 1.7598E+02 GRAM
* Batch Number      : 1596247 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 2-AUG-2016 10:31:39 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.308E+01	1.319E+00	3.933E-01
ZN-65	1.418E-01	1.940E-01	2.419E-01
CD-109	7.215E-01	1.729E+00	1.412E+00
SN-126	4.599E-02	1.102E-01	9.996E-02
BA-137M	5.314E-02	4.564E-02	4.713E-02
CS-137	5.614E-02	4.822E-02	4.978E-02
TL-208	3.483E-01	7.503E-02	5.067E-02
PB-212	9.269E-01	1.127E-01	8.229E-02
BI-214	6.975E-01	1.533E-01	1.022E-01
PB-214	9.159E-01	1.562E-01	9.511E-02
RN-222	6.975E-01	1.533E-01	1.022E-01
RA-224	4.419E-01	1.120E+00	8.823E-01
RA-226	6.975E-01	1.533E-01	1.022E-01
AC-228	8.277E-01	2.547E-01	1.987E-01
RA-228	8.277E-01	2.547E-01	1.987E-01
TH-228	9.269E-01	1.127E-01	8.229E-02
TH-229	-8.168E-02	3.649E-01	6.825E-01
TH-230	6.972E-01	1.532E-01	1.022E-01
PA-231	8.372E-01	7.503E-01	6.279E-01
TH-232	8.277E-01	2.547E-01	1.987E-01
TH-234	1.121E+00	2.793E+00	1.538E+00
U-234	6.972E-01	1.532E-01	1.022E-01
U-235	-2.306E-02	1.394E-01	2.680E-01
U-238	1.121E+00	2.793E+00	1.538E+00
AM-243	1.378E-01	7.631E-02	7.049E-02
ANH-511	3.004E-02	5.430E-02	4.182E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-2.030E+00		9.521E+00	1.863E+01	NOT IDENT.
NA-22	-4.410E-03		3.432E-02	6.846E-02	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF
AL-26	1.871E-02		2.462E-02	6.211E-02	NOT IDENT.

SC-46	3.402E-01	2.517E-01	6.183E-01	FAIL ABUN
V-48	0.000E+00	9.984E+03	0.000E+00	SHORT HLIF
CR-51	0.000E+00	3.117E+02	0.000E+00	SHORT HLIF
MN-54	-5.091E-03	5.301E-02	1.003E-01	NOT IDENT.
CO-56	-1.179E-01	3.829E-01	7.025E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	4.973E-03	3.363E-02	6.752E-02	NOT IDENT.
CO-58	-2.941E-01	3.921E-01	6.621E-01	NOT IDENT.
FE-59	-1.537E+00	4.969E+00	9.690E+00	NOT IDENT.
CO-60	-1.192E-02	4.096E-02	6.849E-02	NOT IDENT.
GE-68	1.051E+00	1.852E+00	4.066E+00	NOT IDENT.
AS-73	-6.730E-01	5.407E+00	1.124E+01	NOT IDENT.
AS-74	0.000E+00	4.441E+03	0.000E+00	SHORT HLIF
SE-75	-2.080E-02	1.573E-01	2.918E-01	NOT IDENT.
BR-77	0.000E+00	1.978E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	5.237E+02	0.000E+00	SHORT HLIF
RB-83	8.125E-03	5.009E-01	1.004E+00	NOT IDENT.
KR-85	-1.717E+00	5.560E+00	9.456E+00	NOT IDENT.
SR-85	-1.822E-01	5.869E-01	9.978E-01	NOT IDENT.
RB-86	0.000E+00	2.390E+04	0.000E+00	SHORT HLIF
Y-88	1.539E-01	1.336E-01	4.012E-01	NOT IDENT.
Y-91	1.451E+02	4.130E+02	8.711E+02	NOT IDENT.
NB-94	3.236E-02	5.694E-02	4.936E-02	FAIL ABUN
NB-95	4.936E-01	8.228E-01	1.545E+00	NOT IDENT.
NB-95M	2.028E+00	2.085E+00	3.960E+00	NOT IDENT.
ZR-95	2.861E-01	1.125E+00	2.282E+00	NOT IDENT.
NB-97	0.000E+00	1.585E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.205E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-6.699E-03	2.612E-02	5.036E-02	NOT IDENT.
RH-102	-1.461E-02	4.451E-02	8.412E-02	NOT IDENT.
RU-103	8.096E+00	4.274E+00	9.608E+00	FAIL ABUN
RH-106	-2.769E-01	4.128E-01	7.376E-01	NOT IDENT.
RU-106	-2.769E-01	4.128E-01	7.376E-01	NOT IDENT.
AG-108M	6.667E-03	1.918E-02	4.064E-02	NOT IDENT.
AG-110M	-4.382E-03	7.159E-02	1.392E-01	NOT IDENT.
SN-113	-5.393E-02	1.605E-01	3.157E-01	NOT IDENT.
CD-115	0.000E+00	2.409E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	6.910E+04	0.000E+00	SHORT HLIF
TE-123M	-1.664E-02	9.651E-02	1.848E-01	NOT IDENT.
SB-124	1.150E+00	1.310E+00	3.577E+00	NOT IDENT.
SB-125	6.234E-02	1.477E-01	1.689E-01	FAIL ABUN
TE-125M	8.779E+01	1.970E+02	4.059E+02	NOT IDENT.
I-126	0.000E+00	7.461E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	8.010E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.446E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	3.541E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	5.442E+40	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.044E+26	0.000E+00	SHORT HLIF
BA-133	2.751E-03	3.202E-02	5.973E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	-1.254E-02	4.511E-02	8.276E-02	NOT IDENT.
CS-135	-1.282E-02	1.107E-01	1.886E-01	NOT IDENT.
I-135	0.000E+00	1.843E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.139E+05	0.000E+00	SHORT HLIF
CE-139	9.921E-02	8.832E-02	1.845E-01	NOT IDENT.
BA-140	0.000E+00	1.032E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	2.577E+05	0.000E+00	SHORT HLIF
CE-141	-1.223E+00	1.804E+01	3.498E+01	NOT IDENT.
CE-143	0.000E+00	9.385E+40	0.000E+00	SHORT HLIF
CE-144	5.676E-02	2.533E-01	5.079E-01	NOT IDENT.
PM-144	1.962E-02	4.483E-02	8.540E-02	NOT IDENT.
PR-144	1.786E+00	3.906E+00	7.461E+00	NOT IDENT.
PM-146	4.898E-04	2.943E-02	6.010E-02	FAIL ABUN
ND-147	0.000E+00	2.339E+07	0.000E+00	SHORT HLIF
PM-147	2.411E+02	6.008E+02	1.227E+03	NOT IDENT.
PM-149	0.000E+00	3.548E+40	0.000E+00	SHORT HLIF
EU-150	-5.887E-03	2.094E-02	3.722E-02	FAIL ABUN
EU-152	6.035E-03	7.271E-02	1.488E-01	FAIL ABUN
GD-153	8.733E-03	1.268E-01	2.560E-01	NOT IDENT.
EU-154	-1.268E-02	8.373E-02	1.664E-01	FAIL ABUN
EU-155	2.673E-02	7.650E-02	1.571E-01	FAIL ABUN
TB-160	-1.163E+00	1.475E+00	2.444E+00	FAIL ABUN
HO-166M	-1.428E-02	4.819E-02	8.957E-02	FAIL ABUN
TM-171	-1.285E+00	1.269E+01	2.648E+01	NOT IDENT.
HF-172	-8.547E-02	1.759E-01	3.337E-01	FAIL ABUN
LU-172	2.802E-02	6.473E-02	1.379E-01	FAIL ABUN

LU-176	-1.290E-02	1.860E-02	3.159E-02	FAIL ABUN
HF-181	-1.802E+00	3.171E+00	5.940E+00	NOT IDENT.
TA-182	4.024E-01	6.947E-01	1.513E+00	FAIL ABUN
RE-183	6.868E-01	1.784E+00	3.825E+00	NOT IDENT.
RE-184	7.369E+00	2.491E+01	5.015E+01	NOT IDENT.
W-188	-8.317E-01	9.107E+01	1.564E+02	FAIL ABUN
IR-192	1.873E-01	3.482E-01	6.921E-01	FAIL ABUN
HG-203	7.031E-01	1.858E+00	3.612E+00	NOT IDENT.
BI-207	1.043E-02	3.756E-02	7.951E-02	FAIL ABUN
PB-210	1.166E+00	1.708E+00	3.780E+00	NOT IDENT.
BI-211	0.000E+00	4.304E-01	6.421E-01	FAIL ABUN
PB-211	-1.196E-01	5.261E-01	9.302E-01	NOT IDENT.
BI-212	0.000E+00	6.742E-01	1.117E+00	FAIL ABUN
RN-219	5.979E-02	2.698E-01	5.614E-01	FAIL ABUN
RA-223	-3.781E-02	4.420E-01	8.962E-01	FAIL ABUN
AC-227	-6.068E-02	1.723E-01	3.119E-01	FAIL ABUN
TH-227	-6.068E-02	1.723E-01	3.119E-01	FAIL ABUN
TH-231	-3.781E-02	4.420E-01	8.962E-01	FAIL ABUN
PA-233	-5.017E-02	4.711E-02	7.543E-02	FAIL ABUN
PA-234	2.962E-02	2.102E-01	4.173E-01	NOT IDENT.
PA-234M	3.362E+00	3.111E+00	6.960E+00	NOT IDENT.
NP-237	-5.017E-02	4.711E-02	7.543E-02	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	2.354E-02	1.642E-01	3.315E-01	FAIL ABUN
PU-239	-2.539E+01	2.347E+02	4.572E+02	NOT IDENT.
AM-241	9.666E-03	8.947E-02	1.750E-01	NOT IDENT.
CM-243	-3.383E-03	6.738E-02	1.350E-01	FAIL ABUN
BK-247	-1.496E-02	5.689E-02	1.036E-01	FAIL ABUN
CM-247	-4.980E-03	2.489E-02	4.952E-02	FAIL ABUN
CF-249	-6.187E-03	2.648E-02	5.266E-02	NOT IDENT.
CF-251	4.211E-02	8.575E-02	1.720E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	405	10.66*	1.238E+00	1.308E+01	1.308E+01	10.29
ZN-65	1115.54	11	50.60*	1.552E+00	6.051E-02	1.418E-01	139.62
CD-109	88.03	82	3.70*	6.225E+00	1.519E+00	2.384E+00	72.74
SN-126	64.28	37	9.60	3.845E+00	4.320E-01	4.320E-01	254.25
	86.94	82	8.90	6.225E+00	6.317E-01	6.317E-01	72.74
	87.57	82	37.00*	6.225E+00	1.519E-01	1.519E-01	72.74
BA-137M	661.66	26	89.90*	2.341E+00	5.215E-02	5.314E-02	87.64
CS-137	661.66	26	85.10*	2.341E+00	5.509E-02	5.614E-02	87.64
TL-208	277.37	24	6.60	4.720E+00	3.303E-01	3.303E-01	183.91
	583.19	179	85.00*	2.581E+00	3.483E-01	3.483E-01	21.98
	860.56	30	12.50	1.906E+00	5.387E-01	5.387E-01	62.18
BI-211	72.87	-----	1.23	5.033E+00	-----	Line Not Found	-----
	351.06	297	12.92*	3.884E+00	2.523E+00	2.523E+00	17.41
PB-212	74.82	196	10.28	5.239E+00	1.549E+00	1.549E+00	31.79
	77.11	302	17.10	5.459E+00	1.382E+00	1.382E+00	21.98
	238.63	502	43.60*	5.299E+00	9.269E-01	9.269E-01	12.41
	300.09	46	3.30	4.424E+00	1.357E+00	1.357E+00	91.45
BI-214	609.32	185	45.49*	2.494E+00	6.972E-01	6.975E-01	22.43
	1120.29	43	14.92	1.548E+00	7.912E-01	7.915E-01	41.03
	1764.49	30	15.30	1.040E+00	8.093E-01	8.096E-01	44.16
PB-214	74.82	196	5.80	5.239E+00	2.746E+00	2.747E+00	31.79
	77.11	302	9.70	5.459E+00	2.436E+00	2.437E+00	21.98
	87.09	82	3.41	6.225E+00	1.649E+00	1.649E+00	72.74
	242.00	125	7.25	5.250E+00	1.400E+00	1.400E+00	43.23
	295.22	222	18.42	4.482E+00	1.150E+00	1.150E+00	19.77
	351.93	297	35.60*	3.884E+00	9.156E-01	9.159E-01	17.41
RN-222	609.32	185	45.49*	2.494E+00	6.972E-01	6.975E-01	22.43
	1120.29	43	14.92	1.548E+00	7.912E-01	7.915E-01	41.03
	1764.49	30	15.30	1.040E+00	8.093E-01	8.096E-01	44.16
RA-224	240.99	125	4.10*	5.250E+00	2.475E+00	2.475E+00	43.23
RA-226	609.32	185	45.49*	2.494E+00	6.972E-01	6.975E-01	22.43
	1120.29	43	14.92	1.548E+00	7.912E-01	7.915E-01	41.03
	1764.49	30	15.30	1.040E+00	8.093E-01	8.096E-01	44.16
AC-228	105.21	-----	1.10	7.023E+00	-----	Line Not Found	-----
	338.32	99	11.27	4.010E+00	9.376E-01	9.376E-01	49.50
	794.95	-----	4.25	2.028E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.951E+00	-----	Line Not Found	-----
	911.20	91	25.80*	1.823E+00	8.277E-01	8.277E-01	31.41
	968.97	52	15.80	1.738E+00	8.072E-01	8.072E-01	43.85
RA-228	105.21	-----	1.10	7.023E+00	-----	Line Not Found	-----
	338.32	99	11.27	4.010E+00	9.376E-01	9.376E-01	49.50
	794.95	-----	4.25	2.028E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.951E+00	-----	Line Not Found	-----
	911.20	91	25.80*	1.823E+00	8.277E-01	8.277E-01	31.41
	968.97	52	15.80	1.738E+00	8.072E-01	8.072E-01	43.85
TH-228	74.82	196	10.28	5.239E+00	1.549E+00	1.549E+00	31.79
	77.11	302	17.10	5.459E+00	1.382E+00	1.382E+00	21.98

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	238.63	502	43.60*	5.299E+00	9.269E-01	9.269E-01	12.41
	300.09	46	3.30	4.424E+00	1.357E+00	1.357E+00	91.45
TH-229	85.43	82	14.70	6.225E+00	3.824E-01	3.825E-01	72.74
	88.47	90	24.00	6.409E+00	2.491E-01	2.491E-01	60.75
	193.51	-----	4.41*	6.133E+00	-----	Line Not Found	-----
	210.85	63	2.80	5.821E+00	1.651E+00	1.651E+00	92.48
TH-230	609.32	185	45.49*	2.494E+00	6.972E-01	6.972E-01	22.43
	1120.29	43	14.92	1.548E+00	7.912E-01	7.912E-01	41.03
	1764.49	30	15.30	1.040E+00	8.093E-01	8.093E-01	44.16
PA-231	283.69	-----	1.70	4.630E+00	-----	Line Not Found	-----
	301.36	46	5.35*	4.424E+00	8.372E-01	8.372E-01	91.45
TH-232	105.21	-----	1.10	7.023E+00	-----	Line Not Found	-----
	338.32	99	11.27	4.010E+00	9.376E-01	9.376E-01	49.50
	835.71	-----	1.61	1.951E+00	-----	Line Not Found	-----
	911.20	91	25.80*	1.823E+00	8.277E-01	8.277E-01	31.41
	968.97	52	15.80	1.738E+00	8.072E-01	8.072E-01	43.85
TH-234	63.29	37	3.70*	3.845E+00	1.121E+00	1.121E+00	254.25
	92.59	83	4.23	6.570E+00	1.273E+00	1.273E+00	79.53
U-234	609.32	185	45.49*	2.494E+00	6.972E-01	6.972E-01	22.43
	1120.29	43	14.92	1.548E+00	7.912E-01	7.912E-01	41.03
	1764.49	30	15.30	1.040E+00	8.093E-01	8.093E-01	44.16
U-235	89.96	90	3.47	6.409E+00	1.723E+00	1.723E+00	60.75
	93.35	83	5.60	6.570E+00	9.616E-01	9.616E-01	79.53
	143.76	-----	10.96*	7.059E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.731E+00	-----	Line Not Found	-----
	185.72	226	57.20	6.293E+00	2.677E-01	2.677E-01	31.14
	205.31	-----	5.01	5.902E+00	-----	Line Not Found	-----
U-238	63.29	37	3.70*	3.845E+00	1.121E+00	1.121E+00	254.25
	92.59	83	4.23	6.570E+00	1.273E+00	1.273E+00	79.53
AM-243	43.53	-----	5.90	9.310E-01	-----	Line Not Found	-----
	74.66	196	67.20*	5.239E+00	2.370E-01	2.370E-01	31.79
ANH-511	511.00	20	100.00*	2.868E+00	3.004E-02	3.004E-02	184.44

Flag: "*" = Keyline

Total number of lines in spectrum 53
 Number of unidentified lines 13
 Number of lines tentatively identified by NID 40 75.47%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.308E+01	1.308E+01	0.135E+01	10.29	
ZN-65	244.06D	2.34	6.051E-02	1.418E-01	1.979E-01	139.62	
CD-109	461.40D	1.57	1.519E+00	2.384E+00	1.734E+00	72.74	
SN-126	2.30E+05Y	1.00	1.519E-01	1.519E-01	1.105E-01	72.74	
BA-137M	30.08Y	1.02	5.215E-02	5.314E-02	4.658E-02	87.64	
CS-137	30.08Y	1.02	5.509E-02	5.614E-02	4.920E-02	87.64	
TL-208	1.41E+10Y	1.00	3.483E-01	3.483E-01	0.766E-01	21.98	
BI-211	7.04E+08Y	1.00	2.523E+00	2.523E+00	0.439E+00	17.41	
PB-212	1.41E+10Y	1.00	9.269E-01	9.269E-01	1.150E-01	12.41	
BI-214	1600.00Y	1.00	6.972E-01	6.975E-01	1.564E-01	22.43	
PB-214	1600.00Y	1.00	9.156E-01	9.159E-01	1.594E-01	17.41	
RN-222	1600.00Y	1.00	6.972E-01	6.975E-01	1.564E-01	22.43	
RA-224	1.41E+10Y	1.00	2.475E+00	2.475E+00	1.070E+00	43.23	
RA-226	1600.00Y	1.00	6.972E-01	6.975E-01	1.564E-01	22.43	
AC-228	1.41E+10Y	1.00	8.277E-01	8.277E-01	2.599E-01	31.41	
RA-228	1.41E+10Y	1.00	8.277E-01	8.277E-01	2.599E-01	31.41	
TH-228	1.41E+10Y	1.00	9.269E-01	9.269E-01	1.150E-01	12.41	
TH-229	7340.00Y	1.00	2.491E-01	2.491E-01	1.513E-01	60.75	K
TH-230	7.54E+04Y	1.00	6.972E-01	6.972E-01	1.564E-01	22.43	
PA-231	7.04E+08Y	1.00	8.372E-01	8.372E-01	7.656E-01	91.45	
TH-232	1.41E+10Y	1.00	8.277E-01	8.277E-01	2.599E-01	31.41	
TH-234	4.47E+09Y	1.00	1.121E+00	1.121E+00	2.850E+00	254.25	
U-234	2.45E+05Y	1.00	6.972E-01	6.972E-01	1.564E-01	22.43	
U-235	7.04E+08Y	1.00	2.677E-01	2.677E-01	0.834E-01	31.14	K
U-238	4.47E+09Y	1.00	1.121E+00	1.121E+00	2.850E+00	254.25	
AM-243	7370.00Y	1.00	2.370E-01	2.370E-01	0.754E-01	31.79	
ANH-511	1.00E+09Y	1.00	3.004E-02	3.004E-02	5.541E-02	184.44	
Total Activity :			3.287E+01	3.382E+01			
Grand Total Activity :			3.287E+01	3.382E+01			

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	83.89	64	233	1.04	167.71	165	7	1.26E-02	98.9	6.02E+00	T
4	270.47	70	65	1.75	541.11	537	27	1.57E-02	56.3	4.81E+00	T
4	274.41	49	54	1.20	549.00	537	27	1.11E-02	62.2	4.75E+00	T
0	415.66	40	131	7.63	831.66	813	24	9.52E-03	****	3.39E+00	T
0	428.86	12	48	1.41	858.08	851	9	2.79E-03	****	3.30E+00	T
0	469.33	29	29	1.81	939.06	935	9	6.91E-03	82.7	3.07E+00	T
1	491.68	18	29	1.55	983.78	977	17	4.30E-03	****	2.96E+00	T
1	494.93	18	21	1.55	990.28	977	17	4.46E-03	97.7	2.94E+00	
0	498.75	37	26	3.26	997.93	993	10	8.92E-03	65.7	2.92E+00	
0	544.28	13	25	3.54	1089.02	1081	10	3.20E-03	****	2.73E+00	
6	668.21	31	21	1.54	1337.00	1333	12	7.79E-03	55.5	2.32E+00	T
6	670.75	9	12	1.65	1342.09	1333	12	2.38E-03	****	2.31E+00	
0	701.59	17	41	5.90	1403.77	1395	15	4.31E-03	****	2.23E+00	T
0	727.59	44	19	1.92	1455.79	1451	11	1.12E-02	53.5	2.17E+00	T
0	747.05	22	18	1.62	1494.74	1490	10	5.55E-03	89.9	2.13E+00	T
0	768.97	26	29	2.85	1538.59	1533	11	6.59E-03	****	2.08E+00	
0	817.97	16	15	3.22	1636.63	1631	11	4.13E-03	****	1.98E+00	T
0	935.17	12	9	1.29	1871.08	1867	8	3.18E-03	****	1.79E+00	
1	964.79	27	21	1.90	1930.35	1920	25	7.29E-03	67.1	1.74E+00	T
0	1003.33	31	4	5.74	2007.44	2000	15	8.36E-03	50.5	1.69E+00	T
0	1153.38	14	22	2.48	2307.60	2301	11	3.89E-03	****	1.51E+00	
0	1166.18	10	7	2.27	2333.20	2329	7	2.78E-03	****	1.50E+00	
0	1336.20	8	3	0.68	2673.26	2669	8	2.36E-03	****	1.34E+00	
0	1377.44	18	5	2.28	2755.75	2750	10	5.00E-03	66.2	1.30E+00	
0	1415.36	12	0	0.83	2831.58	2827	9	3.33E-03	57.7	1.27E+00	
0	1509.86	7	5	1.79	3020.57	3014	10	1.94E-03	****	1.20E+00	
0	1847.73	6	2	1.26	3696.23	3691	9	1.90E-03	****	9.94E-01	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235019.CNF;1
* Acquisition date   : 3-OCT-2016 08:21:03 Sensitivity      : 3.000
* Detector ID        : GAM11 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.63 Half life ratio  : *****
* Sample date        : 8-DEC-2015 14:30:00 Nuclide Library : SOLID
* Sample ID          : G405235019 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.7598E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                           *
*
* Eff. Cal. date     : 2-AUG-2016 10:31:39 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;14
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.523E-01
ZN-65	1.034E-01
CD-109	6.630E-01
SN-126	4.723E-02
BA-137M	2.065E-02
CS-137	2.181E-02
TL-208	2.259E-02
PB-212	3.846E-02
BI-214	4.579E-02
PB-214	4.312E-02
RN-222	4.579E-02
RA-224	4.124E-01
RA-226	4.579E-02
AC-228	8.671E-02
RA-228	8.671E-02
TH-228	3.846E-02
TH-229	3.182E-01
TH-230	4.577E-02
PA-231	2.878E-01
TH-232	8.671E-02
TH-234	7.241E-01
U-234	4.577E-02
U-235	1.259E-01
U-238	7.241E-01
AM-243	3.341E-02
ANH-511	1.880E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.359E+00	NOT IDENT.
NA-22	2.897E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.532E-02	NOT IDENT.
SC-46	2.709E-01	FAIL ABUN

V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	4.422E-02	NOT IDENT.
CO-56	3.057E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.156E-02	NOT IDENT.
CO-58	2.746E-01	NOT IDENT.
FE-59	4.135E+00	NOT IDENT.
CO-60	2.937E-02	NOT IDENT.
GE-68	1.786E+00	NOT IDENT.
AS-73	5.277E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.337E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.490E-01	NOT IDENT.
KR-85	4.212E+00	NOT IDENT.
SR-85	4.444E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.595E-01	NOT IDENT.
Y-91	3.815E+02	NOT IDENT.
NB-94	2.199E-02	FAIL ABUN
NB-95	6.989E-01	NOT IDENT.
NB-95M	1.860E+00	NOT IDENT.
ZR-95	1.007E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.365E-02	NOT IDENT.
RH-102	3.690E-02	NOT IDENT.
RU-103	4.352E+00	FAIL ABUN
RH-106	3.256E-01	NOT IDENT.
RU-106	3.256E-01	NOT IDENT.
AG-108M	1.826E-02	NOT IDENT.
AG-110M	5.950E-02	NOT IDENT.
SN-113	1.417E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	8.610E-02	NOT IDENT.
SB-124	1.432E+00	NOT IDENT.
SB-125	7.687E-02	FAIL ABUN
TE-125M	1.906E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.715E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	3.684E-02	NOT IDENT.
CS-135	8.634E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	8.694E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.639E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.375E-01	NOT IDENT.
PM-144	3.795E-02	NOT IDENT.
PR-144	3.318E+00	NOT IDENT.
PM-146	2.676E-02	FAIL ABUN
ND-147	0.000E+00	SHORT HLIF
PM-147	5.753E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.701E-02	FAIL ABUN
EU-152	6.831E-02	FAIL ABUN
GD-153	1.203E-01	NOT IDENT.
EU-154	7.033E-02	FAIL ABUN
EU-155	7.370E-02	FAIL ABUN
TB-160	1.035E+00	FAIL ABUN
HO-166M	3.977E-02	FAIL ABUN
TM-171	1.243E+01	NOT IDENT.
HF-172	1.563E-01	FAIL ABUN
LU-172	6.088E-02	FAIL ABUN
LU-176	1.428E-02	FAIL ABUN

HF-181	2.632E+00	NOT IDENT.
TA-182	6.638E-01	FAIL ABUN
RE-183	1.796E+00	NOT IDENT.
RE-184	2.207E+01	NOT IDENT.
W-188	7.154E+01	FAIL ABUN
IR-192	3.167E-01	FAIL ABUN
HG-203	1.666E+00	NOT IDENT.
BI-207	3.476E-02	FAIL ABUN
PB-210	1.776E+00	NOT IDENT.
BI-211	3.090E-01	FAIL ABUN
PB-211	4.184E-01	NOT IDENT.
BI-212	5.172E-01	FAIL ABUN
RN-219	2.542E-01	FAIL ABUN
RA-223	4.110E-01	FAIL ABUN
AC-227	1.430E-01	FAIL ABUN
TH-227	1.430E-01	FAIL ABUN
TH-231	4.110E-01	FAIL ABUN
PA-233	3.398E-02	FAIL ABUN
PA-234	1.807E-01	NOT IDENT.
PA-234M	3.064E+00	NOT IDENT.
NP-237	3.398E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.547E-01	FAIL ABUN
PU-239	2.147E+02	NOT IDENT.
AM-241	8.212E-02	NOT IDENT.
CM-243	6.302E-02	FAIL ABUN
BK-247	4.760E-02	FAIL ABUN
CM-247	2.232E-02	FAIL ABUN
CF-249	2.374E-02	NOT IDENT.
CF-251	8.039E-02	NOT IDENT.

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235019.CNF;1
* Acquisition date   : 3-OCT-2016 08:21:03 Sensitivity      : 3.000
* Detector ID        : GAM11 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.63 Half life ratio  : *****
* Sample date        : 8-DEC-2015 14:30:00 Nuclide Library : SOLID
* Sample ID          : G405235019 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.7598E+02 GRAM
*                   : Quantity Err(%) : 1.1365E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight       : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 2-AUG-2016 10:31:39 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.308E+01	1.485E+00	1.485E+00
ZN-65	1.418E-01	1.940E-01	1.940E-01
CD-109	7.215E-01	1.743E+00	1.743E+00
SN-126	4.599E-02	1.111E-01	1.111E-01
BA-137M	5.314E-02	4.570E-02	4.570E-02
CS-137	5.614E-02	4.828E-02	4.828E-02
TL-208	3.483E-01	7.648E-02	7.648E-02
PB-212	9.269E-01	1.230E-01	1.230E-01
BI-214	6.975E-01	1.562E-01	1.562E-01
PB-214	9.159E-01	1.608E-01	1.608E-01
RN-222	6.975E-01	1.562E-01	1.562E-01
RA-224	4.419E-01	1.128E+00	1.128E+00
RA-226	6.975E-01	1.562E-01	1.562E-01
AC-228	8.277E-01	2.582E-01	2.582E-01
RA-228	8.277E-01	2.582E-01	2.582E-01
TH-228	9.269E-01	1.230E-01	1.230E-01
TH-229	-8.168E-02	3.649E-01	3.649E-01
TH-230	6.972E-01	1.561E-01	1.561E-01
PA-231	8.372E-01	7.713E-01	7.713E-01
TH-232	8.277E-01	2.582E-01	2.582E-01
TH-234	1.121E+00	2.804E+00	2.804E+00
U-234	6.972E-01	1.561E-01	1.561E-01
U-235	-2.306E-02	1.394E-01	1.394E-01
U-238	1.121E+00	2.804E+00	2.804E+00
AM-243	1.378E-01	7.780E-02	7.780E-02
ANH-511	3.004E-02	5.432E-02	5.432E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-2.030E+00	9.521E+00	9.565E+00	NOT IDENT.
NA-22	-4.410E-03	3.432E-02	3.437E-02	NOT IDENT.
NA-24	1.000E+41	6.019E+41	0.000E+00	SHORT HLIF
AL-26	1.871E-02	2.465E-02	2.605E-02	NOT IDENT.

SC-46	3.402E-01	2.521E-01	2.951E-01	FAIL ABUN
V-48	3.854E+03	9.985E+03	1.014E+04	SHORT HLIF
CR-51	1.703E+02	3.118E+02	3.211E+02	SHORT HLIF
MN-54	-5.091E-03	5.301E-02	5.306E-02	NOT IDENT.
CO-56	-1.179E-01	3.830E-01	3.866E-01	NOT IDENT.
MN-56	-1.000E+41	3.138E+41	0.000E+00	SHORT HLIF
CO-57	4.973E-03	3.363E-02	3.370E-02	NOT IDENT.
CO-58	-2.941E-01	3.923E-01	4.141E-01	NOT IDENT.
FE-59	-1.537E+00	4.971E+00	5.019E+00	NOT IDENT.
CO-60	-1.192E-02	4.097E-02	4.132E-02	NOT IDENT.
GE-68	1.051E+00	1.853E+00	1.912E+00	NOT IDENT.
AS-73	-6.730E-01	5.408E+00	5.417E+00	NOT IDENT.
AS-74	-1.108E+03	4.442E+03	4.470E+03	SHORT HLIF
SE-75	-2.080E-02	1.573E-01	1.576E-01	NOT IDENT.
BR-77	1.627E+38	1.407E+39	0.000E+00	SHORT HLIF
SR-82	-6.725E+02	5.246E+02	6.059E+02	SHORT HLIF
RB-83	8.125E-03	5.009E-01	5.009E-01	NOT IDENT.
KR-85	-1.717E+00	5.561E+00	5.614E+00	NOT IDENT.
SR-85	-1.822E-01	5.869E-01	5.926E-01	NOT IDENT.
RB-86	3.761E+03	2.391E+04	2.397E+04	SHORT HLIF
Y-88	1.539E-01	1.340E-01	1.509E-01	NOT IDENT.
Y-91	1.451E+02	4.130E+02	4.182E+02	NOT IDENT.
NB-94	3.236E-02	5.695E-02	5.879E-02	FAIL ABUN
NB-95	4.936E-01	8.231E-01	8.526E-01	NOT IDENT.
NB-95M	2.028E+00	2.091E+00	2.282E+00	NOT IDENT.
ZR-95	2.861E-01	1.125E+00	1.132E+00	NOT IDENT.
NB-97	-1.000E+41	1.586E+41	0.000E+00	SHORT HLIF
ZR-97	-1.000E+41	3.098E+42	0.000E+00	SHORT HLIF
MO-99	-1.909E+31	1.205E+32	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	2.402E+41	0.000E+00	SHORT HLIF
RH-101	-6.699E-03	2.615E-02	2.633E-02	NOT IDENT.
RH-102	-1.461E-02	4.453E-02	4.501E-02	NOT IDENT.
RU-103	8.096E+00	4.292E+00	5.634E+00	FAIL ABUN
RH-106	-2.769E-01	4.131E-01	4.316E-01	NOT IDENT.
RU-106	-2.769E-01	4.131E-01	4.316E-01	NOT IDENT.
AG-108M	6.667E-03	1.918E-02	1.942E-02	NOT IDENT.
AG-110M	-4.382E-03	7.159E-02	7.162E-02	NOT IDENT.
SN-113	-5.393E-02	1.605E-01	1.623E-01	NOT IDENT.
CD-115	-1.407E+39	2.423E+39	0.000E+00	SHORT HLIF
SN-117M	-4.171E+03	6.911E+04	6.913E+04	SHORT HLIF
TE-123M	-1.664E-02	9.651E-02	9.680E-02	NOT IDENT.
SB-124	1.150E+00	1.312E+00	1.411E+00	NOT IDENT.
SB-125	6.234E-02	1.477E-01	1.503E-01	FAIL ABUN
TE-125M	8.779E+01	1.970E+02	2.010E+02	NOT IDENT.
I-126	4.452E+05	7.485E+05	7.750E+05	SHORT HLIF
SB-126	2.165E+05	8.020E+05	8.079E+05	SHORT HLIF
SB-127	-2.355E+21	1.481E+22	0.000E+00	SHORT HLIF
I-131	1.211E+08	3.541E+09	3.542E+09	SHORT HLIF
I-132	1.000E+41	1.848E+42	0.000E+00	SHORT HLIF
TE-132	-2.159E+26	3.168E+26	0.000E+00	SHORT HLIF
BA-133	2.751E-03	3.202E-02	3.205E-02	FAIL ABUN
I-133	-1.000E+41	7.873E+41	0.000E+00	SHORT HLIF
CS-134	-1.254E-02	4.511E-02	4.546E-02	NOT IDENT.
CS-135	-1.282E-02	1.107E-01	1.109E-01	NOT IDENT.
I-135	-1.000E+41	7.019E+41	0.000E+00	SHORT HLIF
CS-136	3.372E+04	2.140E+05	2.145E+05	SHORT HLIF
CE-139	9.921E-02	9.055E-02	1.010E-01	NOT IDENT.
BA-140	-3.105E+05	1.032E+06	1.042E+06	SHORT HLIF
LA-140	7.780E+04	2.578E+05	2.601E+05	SHORT HLIF
CE-141	-1.223E+00	1.804E+01	1.805E+01	NOT IDENT.
CE-143	1.000E+41	9.440E+40	0.000E+00	SHORT HLIF
CE-144	5.676E-02	2.533E-01	2.546E-01	NOT IDENT.
PM-144	1.962E-02	4.485E-02	4.571E-02	NOT IDENT.
PR-144	1.786E+00	3.907E+00	3.989E+00	NOT IDENT.
PM-146	4.898E-04	2.943E-02	2.943E-02	FAIL ABUN
ND-147	4.458E+06	2.339E+07	2.348E+07	SHORT HLIF
PM-147	2.411E+02	6.009E+02	6.107E+02	NOT IDENT.
PM-149	-4.995E+39	3.550E+40	0.000E+00	SHORT HLIF
EU-150	-5.887E-03	2.094E-02	2.111E-02	FAIL ABUN
EU-152	6.035E-03	7.271E-02	7.276E-02	FAIL ABUN
GD-153	8.733E-03	1.268E-01	1.269E-01	NOT IDENT.
EU-154	-1.268E-02	8.373E-02	8.393E-02	FAIL ABUN
EU-155	2.673E-02	7.652E-02	7.746E-02	FAIL ABUN
TB-160	-1.163E+00	1.477E+00	1.567E+00	FAIL ABUN
HO-166M	-1.428E-02	4.820E-02	4.863E-02	FAIL ABUN
TM-171	-1.285E+00	1.269E+01	1.271E+01	NOT IDENT.
HF-172	-8.547E-02	1.765E-01	1.806E-01	FAIL ABUN
LU-172	2.802E-02	6.480E-02	6.602E-02	FAIL ABUN

LU-176	-1.290E-02	1.860E-02	1.949E-02	FAIL ABUN
HF-181	-1.802E+00	3.172E+00	3.274E+00	NOT IDENT.
TA-182	4.024E-01	6.949E-01	7.181E-01	FAIL ABUN
RE-183	6.868E-01	1.787E+00	1.814E+00	NOT IDENT.
RE-184	7.369E+00	2.498E+01	2.520E+01	NOT IDENT.
W-188	-8.317E-01	9.107E+01	9.107E+01	FAIL ABUN
IR-192	1.873E-01	3.483E-01	3.584E-01	FAIL ABUN
HG-203	7.031E-01	1.858E+00	1.885E+00	NOT IDENT.
BI-207	1.043E-02	3.757E-02	3.786E-02	FAIL ABUN
PB-210	1.166E+00	1.711E+00	1.790E+00	NOT IDENT.
BI-211	2.523E+00	4.449E-01	1.221E+00	FAIL ABUN
PB-211	-1.196E-01	5.261E-01	5.289E-01	NOT IDENT.
BI-212	1.286E+00	6.773E-01	8.915E-01	FAIL ABUN
RN-219	5.979E-02	2.699E-01	2.713E-01	FAIL ABUN
RA-223	-3.781E-02	4.420E-01	4.423E-01	FAIL ABUN
AC-227	-6.068E-02	1.724E-01	1.746E-01	FAIL ABUN
TH-227	-6.068E-02	1.724E-01	1.746E-01	FAIL ABUN
TH-231	-3.781E-02	4.420E-01	4.423E-01	FAIL ABUN
PA-233	-5.017E-02	4.717E-02	5.231E-02	FAIL ABUN
PA-234	2.962E-02	2.129E-01	2.133E-01	NOT IDENT.
PA-234M	3.362E+00	3.115E+00	3.464E+00	NOT IDENT.
NP-237	-5.017E-02	4.717E-02	5.231E-02	FAIL ABUN
NP-238	6.669E+40	3.130E+41	0.000E+00	SHORT HLIF
NP-239	2.354E-02	1.642E-01	1.646E-01	FAIL ABUN
PU-239	-2.539E+01	2.347E+02	2.350E+02	NOT IDENT.
AM-241	9.666E-03	8.947E-02	8.958E-02	NOT IDENT.
CM-243	-3.383E-03	6.738E-02	6.740E-02	FAIL ABUN
BK-247	-1.496E-02	5.697E-02	5.736E-02	FAIL ABUN
CM-247	-4.980E-03	2.491E-02	2.501E-02	FAIL ABUN
CF-249	-6.187E-03	2.649E-02	2.663E-02	NOT IDENT.
CF-251	4.211E-02	8.588E-02	8.795E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	54.6419	87.09	97.7634	136.47	66.6544
45.60	66.8561	87.57	97.8610	140.51	0.0000
46.54	53.4742	88.03	79.1166	143.76	74.6378
49.72	0.0000	88.34	79.1666	144.24	67.4290
51.35	77.5164	88.47	79.1877	145.44	74.8213
51.87	91.4366	89.96	96.4491	152.43	77.6697
52.39	80.3444	1093.63	49.2376	153.25	0.0000
52.97	76.1527	91.11	0.0000	323.87	66.2886
53.44	82.3216	92.59	92.5236	156.02	0.0000
54.07	72.9207	93.35	87.5850	158.56	0.0000
57.36	0.0000	94.56	68.7085	159.00	66.7270
57.53	78.0111	94.65	68.7206	162.33	64.9000
57.98	69.3302	94.67	68.7233	162.66	0.0000
59.27	77.4982	94.87	70.0234	163.33	91.6204
59.32	77.5086	97.43	79.6476	165.86	61.9985
59.54	75.2041	98.43	59.6093	176.31	62.8410
60.96	83.7444	98.44	59.6108	176.60	0.0000
61.17	83.7907	99.53	84.7841	177.52	57.5110
62.93	86.2496	100.11	89.6992	181.07	0.0000
63.29	86.3296	102.03	60.9827	181.52	45.0759
63.58	86.3936	103.18	74.6930	184.41	49.2490
64.28	86.5481	103.37	67.9268	143.76	49.3279
66.73	95.7601	105.21	66.2086	193.51	68.6006
67.24	70.7119	105.31	69.1420	197.03	67.7733
125.81	80.3872	106.12	70.2191	198.01	78.9736
67.75	97.2010	106.47	74.1671	201.83	67.0322
69.67	94.9440	109.28	68.6558	203.43	90.6590
70.83	103.3682	111.00	76.7348	205.31	56.8299
72.81	114.1762	111.76	0.0000	210.85	48.5305
72.87	114.1924	114.06	70.2205	215.65	61.2683
74.66	110.7022	116.30	0.0000	222.11	57.1266
74.82	110.7428	116.74	61.6003	227.09	57.4287
74.97	110.7816	119.76	77.8911	227.38	58.5952
77.11	111.3207	121.12	66.0564	228.16	0.0000
78.74	111.7269	121.22	66.0670	228.18	64.3937
79.69	85.1277	121.78	65.1260	116.74	64.3937
80.12	75.3291	122.06	65.1562	235.69	55.6245
80.19	0.0000	122.92	91.3471	235.96	63.3677
80.57	85.2926	123.07	91.3694	238.63	68.5771
81.00	74.2371	265.00	69.3490	238.98	0.0000
81.07	74.2480	125.81	85.7244	240.99	68.7400
81.75	91.7081	127.23	85.9189	242.00	68.8093
83.79	82.1522	127.91	67.7979	244.70	45.2175
84.00	82.1885	129.30	82.1445	252.40	0.0000
85.43	95.5518	131.20	87.4763	252.80	54.2221
86.55	95.7760	133.02	65.2832	254.15	0.0000
86.79	97.7023	133.52	64.3122	256.23	47.3059
86.94	97.7333	136.00	84.0270	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	42.9170	355.39	0.0000	584.27	22.6846
264.80	42.9225	356.01	32.1663	595.83	0.0000
265.00	47.7014	364.49	0.0000	427.87	24.8596
268.22	41.4650	366.42	0.0000	602.52	0.0000
269.46	37.1219	372.51	28.6521	604.72	26.9033
270.03	37.1417	375.05	26.9648	607.14	20.9504
271.23	37.1824	377.52	27.0127	609.32	24.9674
273.65	0.0000	356.01	32.3863	610.33	24.9797
276.40	37.3584	388.16	31.6069	614.28	27.0308
277.37	37.3915	388.63	0.0000	618.01	21.0615
277.60	37.3990	391.69	30.8044	620.36	22.0904
278.00	37.4132	264.66	25.6818	621.93	28.1356
279.20	37.4530	401.81	27.4750	630.19	0.0000
279.54	37.4653	402.40	31.0323	631.29	21.1974
279.70	37.4700	404.85	30.6402	633.25	15.1550
280.46	40.3178	410.95	26.7535	634.78	0.0000
283.69	37.2000	413.71	26.8030	635.95	13.1513
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	36.4471	423.72	0.0000	645.85	18.2944
285.90	0.0000	427.09	26.1385	657.76	19.9293
287.50	38.9482	427.87	26.1520	657.90	0.0000
290.67	39.0566	433.94	21.7280	661.66	16.8934
293.27	0.0000	439.40	21.8037	664.57	0.0000
351.93	40.4363	453.88	22.0029	666.33	0.0000
295.96	40.4625	463.37	28.5870	666.50	0.0000
879.38	40.5541	468.07	24.9697	667.71	0.0000
299.98	40.6024	473.00	0.0000	677.62	15.4700
300.09	40.6055	475.06	25.0752	685.70	0.0000
300.13	40.6075	476.78	28.8197	695.00	0.0000
301.36	40.6498	477.60	28.8336	696.49	15.6006
302.85	40.7011	482.18	27.9797	696.51	15.6012
256.23	26.3490	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	14.0460
306.78	42.0735	497.08	5.6449	697.49	14.0471
308.46	33.4583	505.52	23.6343	702.65	22.9435
311.90	47.2252	507.63	0.0000	706.68	29.7745
316.51	29.9392	511.00	26.5528	711.68	25.1279
319.41	0.0000	514.00	27.0724	720.70	0.0000
320.08	0.0000	514.00	27.0724	721.93	0.0000
321.04	35.8937	520.40	23.8332	722.78	22.0920
323.87	42.6681	520.69	0.0000	722.91	20.5156
325.23	55.2780	522.65	0.0000	723.31	14.2053
328.76	0.0000	527.90	0.0000	724.19	12.6318
333.37	45.5208	528.26	19.1496	727.33	12.6489
333.97	43.0126	529.59	19.1642	733.00	17.4339
334.37	50.6189	529.87	0.0000	735.93	7.4053
338.28	37.2342	531.02	0.0000	333.97	13.7617
338.32	37.2351	537.26	0.0000	739.50	0.0000
311.90	47.0461	546.56	0.0000	747.24	20.1960
340.48	47.0461	552.55	31.0443	748.06	19.1396
340.55	0.0000	563.25	22.4394	752.31	14.0604
344.28	40.8076	569.33	20.5531	753.82	0.0000
345.93	39.8379	946.00	21.5345	756.73	16.0071
351.06	31.6192	569.70	20.5574	756.80	16.0077
351.93	31.6403	583.19	22.6715	884.68	27.2930

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	20.8870	1274.44	2.7970	1620.50	6.1919
766.42	20.8925	1001.03	7.0034	1621.92	5.1617
766.84	20.8957	1002.74	13.1387	1678.03	0.0000
772.60	0.0000	1004.73	13.1470	1690.97	1.0477
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	1.0638
778.90	10.7682	1028.54	0.0000	1063.66	3.4082
783.70	0.0000	1037.84	7.0869	1771.35	3.6525
785.37	22.6722	1038.76	0.0000	1791.20	0.0000
792.07	23.8154	631.29	17.7673	1808.65	2.1466
794.95	19.5081	1048.07	0.0000	1810.72	0.0000
795.86	26.0195	1049.04	13.3356	1836.06	0.0000
810.06	13.0825	1050.41	11.5623		
810.29	14.1743	1063.66	13.3969		
344.28	14.1748	1077.00	0.0000		
810.76	15.2675	1077.34	11.6599		
815.77	0.0000	1085.87	11.6908		
1048.07	0.0000	1093.63	14.4229		
832.01	10.9949	1099.45	14.4482		
834.85	19.8127	1112.07	11.6031		
835.71	14.3140	1112.84	14.5068		
836.80	0.0000	1115.54	11.6148		
846.75	0.0000	1120.29	11.6313		
846.77	18.7964	1120.55	11.6320		
856.80	0.0000	1221.41	14.5439		
860.56	16.6711	1129.67	20.9589		
871.09	20.0830	1131.51	0.0000		
873.19	15.6321	1147.95	0.0000		
875.33	0.0000	1173.23	10.1520		
879.38	19.0254	1177.95	11.0896		
880.51	12.3155	1189.05	16.6882		
883.24	11.2069	1204.77	13.0370		
884.68	12.3343	1221.41	11.2266		
889.28	4.4927	1231.02	16.8849		
894.76	9.0029	1235.36	0.0000		
898.04	13.5205	1238.28	11.2793		
900.72	12.4059	1260.41	0.0000		
903.28	14.6747	1271.87	16.1253		
911.20	15.8480	1274.44	11.3906		
912.08	15.8531	1274.54	11.3906		
923.98	0.0000	1291.59	8.5820		
926.50	14.7959	1298.22	0.0000		
929.11	14.8091	1312.11	0.0000		
937.49	10.2825	1332.49	13.8788		
944.13	0.0000	1362.66	0.0000		
946.00	12.6042	1365.19	6.8035		
949.00	14.9112	1368.63	0.0000		
667.71	0.0000	1384.29	4.8828		
962.31	12.6749	1408.01	9.8236		
964.08	12.6825	1457.56	0.0000		
966.17	12.6914	1460.82	3.9802		
911.20	12.7031	1489.16	6.0103		
968.97	12.7031	1505.03	8.0435		
983.53	0.0000	1584.12	9.2137		
984.45	0.0000	1596.21	0.0000		


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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                 *
*                               Charleston, SC 29407                            *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235020.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM01.CNF;402
Background date : 2-OCT-2016 10:59:55.
Sample date      : 8-DEC-2015 13:50:00. Acquisition date : 3-OCT-2016 08:53:24.
Sample ID       : G405235020 Sample quantity : 1.70763E+02 GRAM
Detector name   : GAM01 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.37 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596247 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	5	35.35*	36	10	1.84	71.39	67	32	1.01E-02	40.9	3.54E+00
2	5	40.33*	29	55	1.85	81.37	67	32	8.00E-03	63.5	
3	5	45.15*	19	62	1.16	91.00	67	32	5.17E-03	72.2	
4	2	74.90	101	157	1.45	150.50	143	17	2.81E-02	26.0	1.02E+00
5	2	77.16*	150	151	1.28	155.01	143	17	4.16E-02	17.0	
6	0	87.73	46	213	0.97	176.15	170	9	1.27E-02	59.7	
7	0	92.89*	42	141	1.12	186.47	183	8	1.16E-02	56.2	
8	0	185.65*	85	176	1.41	371.96	366	14	2.37E-02	35.8	
9	0	209.98	95	138	5.43	420.62	413	18	2.65E-02	30.8	
10	0	216.83	24	42	1.25	434.33	431	6	6.67E-03	47.3	
11	3	238.63*	344	59	1.15	477.92	471	21	9.55E-02	6.7	1.09E+00
12	3	241.71*	94	77	1.80	484.09	471	21	2.61E-02	24.6	
13	0	295.30*	85	61	0.84	591.25	587	9	2.37E-02	20.1	
14	0	338.55*	53	55	0.86	677.74	673	10	1.48E-02	30.5	
15	0	351.87*	224	45	1.27	704.36	699	12	6.22E-02	9.1	
16	0	388.82	14	82	2.33	778.26	766	17	3.93E-03	148.2	
17	0	463.85	40	66	4.43	928.29	920	20	1.11E-02	52.1	
18	0	511.04*	46	55	1.72	1022.65	1013	20	1.27E-02	46.8	
19	0	566.51*	31	53	0.87	1133.56	1127	16	8.51E-03	56.9	
20	0	583.08*	110	35	1.53	1166.70	1159	17	3.06E-02	15.7	
21	0	609.50*	118	33	1.75	1219.53	1215	11	3.29E-02	13.2	
22	0	636.61	7	20	1.40	1273.74	1266	11	2.07E-03	120.1	
23	0	727.70	51	20	3.47	1455.87	1446	16	1.41E-02	24.3	
24	0	737.71	25	10	3.50	1475.89	1468	14	6.82E-03	34.5	
25	0	768.80	18	25	0.62	1538.04	1531	12	4.86E-03	63.4	
26	0	785.79	11	13	1.51	1572.02	1568	8	3.16E-03	63.4	
27	0	860.90	31	15	1.86	1722.19	1715	15	8.61E-03	32.6	
28	0	904.69*	11	13	4.40	1809.75	1802	13	3.18E-03	72.3	
29	0	911.34*	57	22	1.13	1823.05	1817	11	1.59E-02	21.2	
30	0	964.44	28	16	1.32	1929.20	1922	13	7.83E-03	34.9	
31	0	969.20	41	12	1.61	1938.71	1934	10	1.13E-02	22.5	
32	0	1063.09	6	5	1.46	2126.44	2123	6	1.77E-03	66.2	
33	0	1119.89*	39	8	1.43	2239.99	2234	11	1.08E-02	21.7	
34	0	1143.54	8	11	0.53	2287.27	2282	7	2.08E-03	80.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1155.31	10	10	1.46	2310.80	2305	10	2.78E-03	67.1	
36	0	1173.52	5	4	0.52	2347.20	2346	4	1.45E-03	74.2	
37	0	1234.37	8	20	3.32	2468.87	2459	13	2.08E-03	126.8	
38	0	1254.20	10	0	1.66	2508.50	2505	7	2.78E-03	31.6	
39	0	1285.78	11	0	1.28	2571.64	2568	7	3.06E-03	30.2	
40	0	1460.69*	257	9	2.06	2921.30	2915	12	7.15E-02	6.7	
41	0	1493.39	12	0	1.65	2986.67	2982	9	3.33E-03	28.9	
42	0	1591.81	10	0	1.41	3183.40	3179	8	2.78E-03	31.6	
43	0	1729.55	11	0	1.72	3458.73	3455	7	3.06E-03	30.2	
44	0	1764.44*	21	3	1.00	3528.46	3522	13	5.94E-03	29.1	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235020.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 8-DEC-2015 13:50:00   Acquisition date  : 3-OCT-2016 08:53:24
Sample ID        : G405235020             Sample quantity  : 170.76 GRAM
Sample type      : SOLID                   Sample geometry  :
Detector name    : GAMMA1                 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00          Elapsed real time: 0 01:00:00.37   0.0%
Energy tolerance : 1.50 keV               Half life ratio  : 10.00
Errors propagated: No                      Systematic Error : 0.00 %
Efficiency type  : Linear                  Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	9.709E-01	1.069E+01	1.069E+01	13.46	OK
CD-109	88.03	3.70*	4.617E+00	1.021E+00	1.602E+00	191.53	OK
SN-126	64.28	9.60	2.409E+00	-----	Line Not Found	-----	Absent
	86.94	8.90	4.617E+00	4.245E-01	4.245E-01	191.53	OK
	87.57	37.00*	4.617E+00	1.021E-01	1.021E-01	191.53	OK
TL-208	277.37	6.60	3.944E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.090E+00	3.015E-01	3.015E-01	31.39	OK
	860.56	12.50	1.519E+00	7.551E-01	7.551E-01	65.24	OK
PB-210	46.54	4.25*	4.948E-01	5.729E+00	5.877E+00	144.32	OK
BI-211	72.87	1.23	3.328E+00	-----	Line Not Found	-----	Absent
	351.06	12.92*	3.217E+00	9.887E-01	9.887E-01	89.78	OK
BI-212	727.33	6.67*	1.742E+00	2.061E+00	2.061E+00	48.56	OK
	785.37	1.10	1.636E+00	2.959E+00	2.959E+00	126.79	OK
	1620.50	1.47	8.816E-01	-----	Line Not Found	-----	Absent
PB-212	74.82	10.28	3.530E+00	1.345E+00	1.345E+00	67.22	OK
	77.11	17.10	3.747E+00	1.433E+00	1.433E+00	34.06	OK
	238.63	43.60*	4.455E+00	9.612E-01	9.612E-01	13.33	OK
	300.09	3.30	3.690E+00	-----	Line Not Found	-----	Absent
BI-214	609.32	45.49*	2.015E+00	6.255E-01	6.257E-01	26.31	OK
	1120.29	14.92	1.223E+00	9.517E-01	9.521E-01	43.42	OK
	1764.49	15.30	8.116E-01	7.200E-01	7.202E-01	58.11	OK
PB-214	74.82	5.80	3.522E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	3.747E+00	2.527E+00	2.528E+00	34.06	OK
	87.09	3.41	4.572E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	4.406E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	3.741E+00	6.557E-01	6.560E-01	40.21	OK
	351.93	35.60*	3.216E+00	-----	Line Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.015E+00	6.255E-01	6.257E-01	26.31	OK
	1120.29	14.92	1.223E+00	9.517E-01	9.521E-01	43.42	OK
	1764.49	15.30	8.116E-01	7.200E-01	7.202E-01	58.11	OK
RA-224	240.99	4.10*	4.410E+00	1.655E+00	1.655E+00	88.30	OK
RA-226	609.32	45.49*	2.015E+00	6.255E-01	6.257E-01	26.31	OK
	1120.29	14.92	1.223E+00	9.517E-01	9.521E-01	43.42	OK
	1764.49	15.30	8.116E-01	7.200E-01	7.202E-01	58.11	OK
AC-228	105.21	1.10	5.519E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.326E+00	7.402E-01	7.402E-01	61.04	OK
	794.95	4.25	1.621E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.557E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.450E+00	7.028E-01	7.028E-01	42.33	OK
	968.97	15.80	1.379E+00	8.506E-01	8.506E-01	45.09	OK
RA-228	105.21	1.10	5.519E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.326E+00	7.402E-01	7.402E-01	61.04	OK
	794.95	4.25	1.621E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.557E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.450E+00	7.028E-01	7.028E-01	42.33	OK
	968.97	15.80	1.379E+00	8.506E-01	8.506E-01	45.09	OK
TH-228	74.82	10.28	3.530E+00	1.345E+00	1.345E+00	67.22	OK
	77.11	17.10	3.747E+00	1.433E+00	1.433E+00	34.06	OK
	238.63	43.60*	4.455E+00	9.612E-01	9.612E-01	13.33	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	300.09	3.30	3.690E+00	-----	Line Not Found	-----	Absent
TH-230	609.32	45.49*	2.015E+00	6.255E-01	6.255E-01	26.31	OK
	1120.29	14.92	1.223E+00	9.517E-01	9.517E-01	43.42	OK
	1764.49	15.30	8.116E-01	7.200E-01	7.200E-01	58.11	OK
TH-232	105.21	1.10	5.519E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.326E+00	7.402E-01	7.402E-01	61.04	OK
	835.71	1.61	1.557E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.450E+00	7.028E-01	7.028E-01	42.33	OK
	968.97	15.80	1.379E+00	8.506E-01	8.506E-01	45.09	OK
U-234	609.32	45.49*	2.015E+00	6.255E-01	6.255E-01	26.31	OK
	1120.29	14.92	1.223E+00	9.517E-01	9.517E-01	43.42	OK
	1764.49	15.30	8.116E-01	7.200E-01	7.200E-01	58.11	OK
AM-243	43.53	5.90	3.822E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	3.530E+00	2.057E-01	2.057E-01	67.22	OK
CF-249	252.80	2.50	4.256E+00	-----	Line Not Found	-----	Absent
	333.37	14.60	3.371E+00	-----	Line Not Found	-----	Absent
	388.16	66.00*	2.950E+00	3.721E-02	3.727E-02	296.41	OK
ANH-511	511.00	100.00*	2.334E+00	9.690E-02	9.690E-02	93.64	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235020.CNF;1
* Acquisition date   : 3-OCT-2016 08:53:24 Sensitivity      : 3.000
* Detector ID       : GAM01 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.37 Half life ratio : *****
* Sample date       : 8-DEC-2015 13:50:00 Analyst initials: MXR1
* Sample ID         : G405235020 Sample Quantity : 1.7076E+02 GRAM
* Batch Number      : 1596247 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 20-JUL-2016 07:03:55 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM01_CAN.CNF;9
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.069E+01	1.409E+00	5.458E-01
CD-109	1.602E+00	3.007E+00	2.651E+00
SN-126	1.021E-01	1.917E-01	1.565E-01
TL-208	3.015E-01	9.276E-02	5.255E-02
PB-210	5.877E+00	8.313E+00	5.825E+00
BI-211	9.887E-01	8.698E-01	3.512E-01
BI-212	2.061E+00	9.807E-01	7.016E-01
PB-212	9.612E-01	1.255E-01	8.471E-02
BI-214	6.257E-01	1.613E-01	1.341E-01
PB-214	1.015E+00	1.814E-01	3.053E-01
RN-222	6.257E-01	1.613E-01	1.341E-01
RA-224	1.655E+00	1.432E+00	9.080E-01
RA-226	6.257E-01	1.613E-01	1.341E-01
AC-228	7.028E-01	2.916E-01	2.577E-01
RA-228	7.028E-01	2.916E-01	2.577E-01
TH-228	9.612E-01	1.255E-01	8.471E-02
TH-230	6.255E-01	1.613E-01	1.341E-01
TH-232	7.028E-01	2.916E-01	2.577E-01
U-234	6.255E-01	1.613E-01	1.341E-01
AM-243	2.057E-01	1.355E-01	9.483E-02
CF-249	3.727E-02	1.083E-01	6.516E-02
ANH-511	9.690E-02	8.892E-02	4.329E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-4.924E+00	1.067E+01	1.994E+01	NOT IDENT.
NA-22	2.738E-02	4.452E-02	1.007E-01	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	1.405E-02	1.733E-02	5.652E-02	NOT IDENT.
SC-46	4.814E-02	3.610E-01	7.244E-01	FAIL ABUN
V-48	0.000E+00	1.335E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	3.813E+02	0.000E+00	SHORT HLIF
MN-54	2.968E-02	5.948E-02	1.255E-01	NOT IDENT.

CO-56	1.764E-01	4.299E-01	9.045E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-3.997E-02	4.279E-02	8.228E-02	NOT IDENT.
CO-58	-2.614E-01	5.486E-01	9.853E-01	NOT IDENT.
FE-59	-2.573E+00	6.343E+00	1.130E+01	NOT IDENT.
CO-60	-2.207E-02	2.975E-02	5.307E-02	FAIL ABUN
ZN-65	-2.641E-02	1.685E-01	2.802E-01	NOT IDENT.
GE-68	-6.242E-01	2.138E+00	3.931E+00	NOT IDENT.
AS-73	2.796E+00	1.080E+01	2.143E+01	NOT IDENT.
AS-74	0.000E+00	5.875E+03	0.000E+00	SHORT HLIF
SE-75	5.865E-02	1.871E-01	3.847E-01	NOT IDENT.
BR-77	0.000E+00	2.235E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.128E+02	0.000E+00	SHORT HLIF
RB-83	-5.550E-04	5.099E-01	1.031E+00	NOT IDENT.
KR-85	2.082E+00	5.606E+00	1.174E+01	NOT IDENT.
SR-85	2.176E-01	5.918E-01	1.239E+00	NOT IDENT.
RB-86	0.000E+00	2.610E+04	0.000E+00	SHORT HLIF
Y-88	-4.372E-02	2.273E-01	4.699E-01	NOT IDENT.
Y-91	1.208E+02	4.561E+02	9.861E+02	NOT IDENT.
NB-94	1.537E-02	3.167E-02	6.535E-02	NOT IDENT.
NB-95	4.826E-01	9.693E-01	1.815E+00	NOT IDENT.
NB-95M	-1.840E-01	2.374E+00	4.219E+00	NOT IDENT.
ZR-95	-2.812E-01	1.414E+00	2.659E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.531E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.851E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	7.438E-04	3.293E-02	6.716E-02	NOT IDENT.
RH-102	-1.297E-02	4.933E-02	8.361E-02	NOT IDENT.
RU-103	-4.617E+00	5.126E+00	8.870E+00	FAIL ABUN
RH-106	-4.426E-01	4.392E-01	7.218E-01	NOT IDENT.
RU-106	-4.426E-01	4.392E-01	7.218E-01	NOT IDENT.
AG-108M	7.609E-05	2.467E-02	4.916E-02	NOT IDENT.
AG-110M	4.315E-02	8.373E-02	1.836E-01	NOT IDENT.
SN-113	4.383E-02	2.244E-01	4.133E-01	NOT IDENT.
CD-115	0.000E+00	2.477E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	8.817E+04	0.000E+00	SHORT HLIF
TE-123M	7.173E-02	1.193E-01	2.513E-01	NOT IDENT.
SB-124	1.758E+00	2.005E+00	5.217E+00	NOT IDENT.
SB-125	1.072E-02	8.474E-02	1.730E-01	FAIL ABUN
TE-125M	9.450E+01	2.968E+02	5.647E+02	NOT IDENT.
I-126	0.000E+00	7.657E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.341E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	2.012E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	4.540E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.687E+26	0.000E+00	SHORT HLIF
BA-133	-4.435E-03	4.221E-02	7.404E-02	NOT IDENT.
I-133	0.000E+00	1.823E+41	0.000E+00	SHORT HLIF
CS-134	3.244E-02	4.509E-02	9.842E-02	NOT IDENT.
CS-135	-7.638E-02	1.329E-01	2.513E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.541E+05	0.000E+00	SHORT HLIF
BA-137M	3.751E-02	3.609E-02	7.869E-02	NOT IDENT.
CS-137	3.962E-02	3.813E-02	8.313E-02	NOT IDENT.
CE-139	-3.178E-02	9.683E-02	1.917E-01	NOT IDENT.
BA-140	0.000E+00	1.208E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	3.755E+05	0.000E+00	SHORT HLIF
CE-141	3.115E-01	2.283E+01	4.630E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	1.498E-01	3.408E-01	7.123E-01	NOT IDENT.
PM-144	4.402E-02	5.266E-02	1.146E-01	NOT IDENT.
PR-144	3.809E+00	4.572E+00	9.951E+00	NOT IDENT.
PM-146	-1.214E-02	3.260E-02	6.245E-02	NOT IDENT.
ND-147	0.000E+00	3.024E+07	0.000E+00	SHORT HLIF
PM-147	-2.548E+02	7.513E+02	1.508E+03	NOT IDENT.
PM-149	0.000E+00	4.331E+40	0.000E+00	SHORT HLIF
EU-150	-1.270E-02	2.744E-02	4.574E-02	FAIL ABUN
EU-152	-7.684E-02	8.370E-02	1.499E-01	FAIL ABUN
GD-153	-1.793E-01	1.938E-01	3.322E-01	NOT IDENT.
EU-154	6.338E-02	1.083E-01	2.445E-01	NOT IDENT.
EU-155	6.365E-02	1.031E-01	2.037E-01	FAIL ABUN
TB-160	-7.199E-01	1.731E+00	3.134E+00	FAIL ABUN
HO-166M	2.188E-02	4.819E-02	1.026E-01	FAIL ABUN
TM-171	6.729E+00	2.542E+01	5.066E+01	NOT IDENT.
HF-172	-7.921E-02	2.098E-01	4.189E-01	NOT IDENT.
LU-172	3.032E-02	6.454E-02	1.402E-01	FAIL ABUN
LU-176	-1.611E-02	2.231E-02	4.127E-02	FAIL ABUN

HF-181	2.602E+00	3.542E+00	7.821E+00	NOT IDENT.
TA-182	2.248E-01	8.492E-01	1.808E+00	FAIL ABUN
RE-183	-5.144E-01	3.730E+00	7.089E+00	NOT IDENT.
RE-184	3.349E+01	4.743E+01	5.484E+01	FAIL ABUN
W-188	1.903E+01	1.140E+02	2.079E+02	NOT IDENT.
IR-192	6.747E-02	4.262E-01	8.613E-01	FAIL ABUN
HG-203	-9.829E-01	2.254E+00	4.310E+00	NOT IDENT.
BI-207	3.053E-02	3.961E-02	9.927E-02	FAIL ABUN
PB-211	-1.031E-01	5.692E-01	1.111E+00	NOT IDENT.
RN-219	-1.239E-02	3.529E-01	6.960E-01	NOT IDENT.
RA-223	-3.173E-01	4.935E-01	9.193E-01	FAIL ABUN
AC-227	2.433E-02	2.086E-01	4.208E-01	NOT IDENT.
TH-227	2.433E-02	2.086E-01	4.208E-01	NOT IDENT.
TH-229	-3.639E-02	4.542E-01	9.037E-01	FAIL ABUN
PA-231	1.156E-01	4.450E-01	8.958E-01	NOT IDENT.
TH-231	-3.173E-01	4.935E-01	9.193E-01	FAIL ABUN
PA-233	-1.389E-02	5.283E-02	1.027E-01	NOT IDENT.
PA-234	-1.350E-02	2.696E-01	5.200E-01	NOT IDENT.
PA-234M	1.356E+00	4.383E+00	9.216E+00	NOT IDENT.
TH-234	-4.212E-01	1.464E+00	2.801E+00	FAIL ABUN
U-235	-7.525E-02	1.741E-01	3.446E-01	FAIL ABUN
NP-237	-1.389E-02	5.283E-02	1.027E-01	NOT IDENT.
NP-238	0.000E+00	1.611E+41	0.000E+00	SHORT HLIF
U-238	-4.212E-01	1.464E+00	2.801E+00	FAIL ABUN
NP-239	-3.997E-02	2.683E-01	4.895E-01	NOT IDENT.
PU-239	2.487E+02	3.152E+02	6.675E+02	NOT IDENT.
AM-241	-2.316E-02	1.566E-01	2.979E-01	NOT IDENT.
CM-243	-6.645E-02	1.022E-01	1.799E-01	NOT IDENT.
BK-247	2.848E-02	6.512E-02	1.352E-01	NOT IDENT.
CM-247	4.868E-03	3.055E-02	6.195E-02	NOT IDENT.
CF-251	-5.439E-02	1.037E-01	2.013E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	252	10.66*	9.709E-01	1.069E+01	1.069E+01	13.46
CD-109	88.03	63	3.70*	4.617E+00	1.625E+00	2.550E+00	119.39
SN-126	64.28	-----	9.60	2.409E+00	-----	Line Not Found	-----
	86.94	63	8.90	4.617E+00	6.758E-01	6.758E-01	119.39
	87.57	63	37.00*	4.617E+00	1.625E-01	1.625E-01	119.39
TL-208	277.37	-----	6.60	3.944E+00	-----	Line Not Found	-----
	583.19	122	85.00*	2.090E+00	3.015E-01	3.015E-01	31.39
	860.56	33	12.50	1.519E+00	7.551E-01	7.551E-01	65.24
PB-210	46.54	27	4.25*	4.948E-01	5.729E+00	5.877E+00	144.32
BI-211	72.87	-----	1.23	3.328E+00	-----	Line Not Found	-----
	351.06	264	12.92*	3.217E+00	2.795E+00	2.795E+00	18.24
BI-212	727.33	54	6.67*	1.742E+00	2.061E+00	2.061E+00	48.56
	785.37	12	1.10	1.636E+00	2.959E+00	2.959E+00	126.79
	1620.50	-----	1.47	8.816E-01	-----	Line Not Found	-----
PB-212	74.82	142	10.28	3.530E+00	1.714E+00	1.714E+00	52.00
	77.11	209	17.10	3.747E+00	1.433E+00	1.433E+00	34.06
	238.63	425	43.60*	4.455E+00	9.612E-01	9.612E-01	13.33
	300.09	-----	3.30	3.690E+00	-----	Line Not Found	-----
BI-214	609.32	130	45.49*	2.015E+00	6.255E-01	6.257E-01	26.31
	1120.29	40	14.92	1.223E+00	9.517E-01	9.521E-01	43.42
	1764.49	20	15.30	8.116E-01	7.200E-01	7.202E-01	58.11
PB-214	74.82	142	5.80	3.530E+00	3.039E+00	3.040E+00	52.00
	77.11	209	9.70	3.747E+00	2.527E+00	2.528E+00	34.06
	87.09	63	3.41	4.617E+00	1.764E+00	1.764E+00	119.39
	242.00	116	7.25	4.410E+00	1.592E+00	1.592E+00	49.21
	295.22	103	18.42	3.741E+00	6.557E-01	6.560E-01	40.21
	351.93	264	35.60*	3.217E+00	1.015E+00	1.015E+00	18.24
RN-222	609.32	130	45.49*	2.015E+00	6.255E-01	6.257E-01	26.31
	1120.29	40	14.92	1.223E+00	9.517E-01	9.521E-01	43.42
	1764.49	20	15.30	8.116E-01	7.200E-01	7.202E-01	58.11
RA-224	240.99	116	4.10*	4.410E+00	2.815E+00	2.815E+00	49.21
RA-226	609.32	130	45.49*	2.015E+00	6.255E-01	6.257E-01	26.31
	1120.29	40	14.92	1.223E+00	9.517E-01	9.521E-01	43.42
	1764.49	20	15.30	8.116E-01	7.200E-01	7.202E-01	58.11
AC-228	105.21	-----	1.10	5.519E+00	-----	Line Not Found	-----
	338.32	63	11.27	3.326E+00	7.402E-01	7.402E-01	61.04
	794.95	-----	4.25	1.621E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.557E+00	-----	Line Not Found	-----
	911.20	60	25.80*	1.450E+00	7.028E-01	7.028E-01	42.33
	968.97	42	15.80	1.379E+00	8.506E-01	8.506E-01	45.09
RA-228	105.21	-----	1.10	5.519E+00	-----	Line Not Found	-----
	338.32	63	11.27	3.326E+00	7.402E-01	7.402E-01	61.04
	794.95	-----	4.25	1.621E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.557E+00	-----	Line Not Found	-----
	911.20	60	25.80*	1.450E+00	7.028E-01	7.028E-01	42.33
	968.97	42	15.80	1.379E+00	8.506E-01	8.506E-01	45.09
TH-228	74.82	142	10.28	3.530E+00	1.714E+00	1.714E+00	52.00

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	77.11	209	17.10	3.747E+00	1.433E+00	1.433E+00	34.06
	238.63	425	43.60*	4.455E+00	9.612E-01	9.612E-01	13.33
	300.09	-----	3.30	3.690E+00	-----	Line Not Found	-----
TH-230	609.32	130	45.49*	2.015E+00	6.255E-01	6.255E-01	26.31
	1120.29	40	14.92	1.223E+00	9.517E-01	9.517E-01	43.42
	1764.49	20	15.30	8.116E-01	7.200E-01	7.200E-01	58.11
TH-232	105.21	-----	1.10	5.519E+00	-----	Line Not Found	-----
	338.32	63	11.27	3.326E+00	7.402E-01	7.402E-01	61.04
	835.71	-----	1.61	1.557E+00	-----	Line Not Found	-----
	911.20	60	25.80*	1.450E+00	7.028E-01	7.028E-01	42.33
	968.97	42	15.80	1.379E+00	8.506E-01	8.506E-01	45.09
U-234	609.32	130	45.49*	2.015E+00	6.255E-01	6.255E-01	26.31
	1120.29	40	14.92	1.223E+00	9.517E-01	9.517E-01	43.42
	1764.49	20	15.30	8.116E-01	7.200E-01	7.200E-01	58.11
AM-243	43.53	-----	5.90	3.822E-01	-----	Line Not Found	-----
	74.66	142	67.20*	3.530E+00	2.623E-01	2.623E-01	52.00
CF-249	252.80	-----	2.50	4.256E+00	-----	Line Not Found	-----
	333.37	-----	14.60	3.371E+00	-----	Line Not Found	-----
	388.16	16	66.00*	2.950E+00	3.721E-02	3.727E-02	296.41
ANH-511	511.00	51	100.00*	2.334E+00	9.690E-02	9.690E-02	93.64

Flag: "*" = Keyline

Total number of lines in spectrum 44
 Number of unidentified lines 11
 Number of lines tentatively identified by NID 33 75.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.069E+01	1.069E+01	0.144E+01	13.46	
CD-109	461.40D	1.57	1.625E+00	2.550E+00	3.045E+00	119.39	
SN-126	2.30E+05Y	1.00	1.625E-01	1.625E-01	1.941E-01	119.39	
TL-208	1.41E+10Y	1.00	3.015E-01	3.015E-01	0.947E-01	31.39	
PB-210	22.20Y	1.03	5.729E+00	5.877E+00	8.483E+00	144.32	
BI-211	7.04E+08Y	1.00	2.795E+00	2.795E+00	0.510E+00	18.24	
BI-212	1.41E+10Y	1.00	2.061E+00	2.061E+00	1.001E+00	48.56	
PB-212	1.41E+10Y	1.00	9.612E-01	9.612E-01	1.281E-01	13.33	
BI-214	1600.00Y	1.00	6.255E-01	6.257E-01	1.646E-01	26.31	
PB-214	1600.00Y	1.00	1.015E+00	1.015E+00	0.185E+00	18.24	
RN-222	1600.00Y	1.00	6.255E-01	6.257E-01	1.646E-01	26.31	
RA-224	1.41E+10Y	1.00	2.815E+00	2.815E+00	1.385E+00	49.21	
RA-226	1600.00Y	1.00	6.255E-01	6.257E-01	1.646E-01	26.31	
AC-228	1.41E+10Y	1.00	7.028E-01	7.028E-01	2.975E-01	42.33	
RA-228	1.41E+10Y	1.00	7.028E-01	7.028E-01	2.975E-01	42.33	
TH-228	1.41E+10Y	1.00	9.612E-01	9.612E-01	1.281E-01	13.33	
TH-230	7.54E+04Y	1.00	6.255E-01	6.255E-01	1.646E-01	26.31	
TH-232	1.41E+10Y	1.00	7.028E-01	7.028E-01	2.975E-01	42.33	
U-234	2.45E+05Y	1.00	6.255E-01	6.255E-01	1.646E-01	26.31	
AM-243	7370.00Y	1.00	2.623E-01	2.623E-01	1.364E-01	52.00	
CF-249	351.00Y	1.00	3.721E-02	3.727E-02	11.05E-02	296.41	
ANH-511	1.00E+09Y	1.00	9.690E-02	9.690E-02	9.074E-02	93.64	

Total Activity : 3.475E+01 3.582E+01

Grand Total Activity : 3.475E+01 3.582E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
5	35.35	55	15	1.84	71.39	67	32	1.01E-02	81.7	4.02E-02	
5	40.33	43	82	1.85	81.37	67	32	8.00E-03	****	2.01E-01	
0	92.89	57	193	1.12	186.47	183	8	1.16E-02	****	4.95E+00	T
0	185.65	108	223	1.41	371.96	366	14	2.37E-02	71.6	5.30E+00	T
0	209.98	119	172	5.43	420.62	413	18	2.65E-02	61.5	4.90E+00	T
0	216.83	30	52	1.25	434.33	431	6	6.67E-03	94.6	4.79E+00	T
0	463.85	45	75	4.43	928.29	920	20	1.11E-02	****	2.53E+00	T
0	566.51	34	59	0.87	1133.56	1127	16	8.51E-03	****	2.14E+00	
0	636.61	8	21	1.40	1273.74	1266	11	2.07E-03	****	1.94E+00	T
0	737.71	26	11	3.50	1475.89	1468	14	6.82E-03	69.0	1.72E+00	T
0	768.80	19	26	0.62	1538.04	1531	12	4.86E-03	****	1.67E+00	
0	904.69	12	14	4.40	1809.75	1802	13	3.18E-03	****	1.46E+00	T
0	964.44	29	16	1.32	1929.20	1922	13	7.83E-03	69.8	1.38E+00	T
0	1063.09	7	5	1.46	2126.44	2123	6	1.77E-03	****	1.28E+00	T
0	1143.54	8	11	0.53	2287.27	2282	7	2.08E-03	****	1.20E+00	
0	1155.31	10	10	1.46	2310.80	2305	10	2.78E-03	****	1.19E+00	
0	1173.52	5	4	0.52	2347.20	2346	4	1.45E-03	****	1.18E+00	T
0	1234.37	8	20	3.32	2468.87	2459	13	2.08E-03	****	1.13E+00	T
0	1254.20	10	0	1.66	2508.50	2505	7	2.78E-03	63.2	1.11E+00	
0	1285.78	11	0	1.28	2571.64	2568	7	3.06E-03	60.3	1.09E+00	
0	1493.39	12	0	1.65	2986.67	2982	9	3.33E-03	57.7	9.51E-01	
0	1591.81	10	0	1.41	3183.40	3179	8	2.78E-03	63.2	8.97E-01	
0	1729.55	10	0	1.72	3458.73	3455	7	3.06E-03	60.3	8.28E-01	

Flags: "T" = Tentatively associated

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235020.CNF;1
* Acquisition date   : 3-OCT-2016 08:53:24 Sensitivity      : 3.000
* Detector ID        : GAM01 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.37 Half life ratio : *****
* Sample date        : 8-DEC-2015 13:50:00 Nuclide Library : SOLID
* Sample ID          : G405235020 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.7076E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                           *
*
* Eff. Cal. date     : 20-JUL-2016 07:03:55 Eff. Geometry : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM01_CAN.CNF;9
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.147E-01
CD-109	1.266E+00
SN-126	7.444E-02
TL-208	2.278E-02
PB-210	2.644E+00
BI-211	1.605E-01
BI-212	2.978E-01
PB-212	3.908E-02
BI-214	6.032E-02
PB-214	1.472E-01
RN-222	6.032E-02
RA-224	4.189E-01
RA-226	6.032E-02
AC-228	1.125E-01
RA-228	1.125E-01
TH-228	3.908E-02
TH-230	6.030E-02
TH-232	1.125E-01
U-234	6.030E-02
AM-243	4.462E-02
CF-249	2.935E-02
ANH-511	1.898E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.769E+00	NOT IDENT.
NA-22	4.349E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.069E-02	NOT IDENT.
SC-46	3.128E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.509E-02	NOT IDENT.
CO-56	3.935E-01	NOT IDENT.

MN-56	0.000E+00	SHORT HLIF
CO-57	3.837E-02	NOT IDENT.
CO-58	4.200E-01	NOT IDENT.
FE-59	4.727E+00	NOT IDENT.
CO-60	2.014E-02	FAIL ABUN
ZN-65	1.172E-01	NOT IDENT.
GE-68	1.644E+00	NOT IDENT.
AS-73	1.002E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.775E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.485E-01	NOT IDENT.
KR-85	5.218E+00	NOT IDENT.
SR-85	5.506E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.807E-01	NOT IDENT.
Y-91	4.224E+02	NOT IDENT.
NB-94	2.923E-02	NOT IDENT.
NB-95	8.131E-01	NOT IDENT.
NB-95M	1.963E+00	NOT IDENT.
ZR-95	1.158E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.167E-02	NOT IDENT.
RH-102	3.523E-02	NOT IDENT.
RU-103	3.864E+00	FAIL ABUN
RH-106	3.058E-01	NOT IDENT.
RU-106	3.058E-01	NOT IDENT.
AG-108M	2.200E-02	NOT IDENT.
AG-110M	7.879E-02	NOT IDENT.
SN-113	1.866E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.180E-01	NOT IDENT.
SB-124	2.139E+00	NOT IDENT.
SB-125	7.700E-02	FAIL ABUN
TE-125M	2.664E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.366E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	4.337E-02	NOT IDENT.
CS-135	1.159E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	3.563E-02	NOT IDENT.
CS-137	3.764E-02	NOT IDENT.
CE-139	8.935E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.179E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.357E-01	NOT IDENT.
PM-144	5.125E-02	NOT IDENT.
PR-144	4.448E+00	NOT IDENT.
PM-146	2.709E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.058E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.089E-02	FAIL ABUN
EU-152	6.742E-02	FAIL ABUN
GD-153	1.558E-01	NOT IDENT.
EU-154	1.054E-01	NOT IDENT.
EU-155	9.556E-02	FAIL ABUN
TB-160	1.326E+00	FAIL ABUN
HO-166M	4.488E-02	FAIL ABUN
TM-171	2.364E+01	NOT IDENT.
HF-172	1.963E-01	NOT IDENT.
LU-172	5.961E-02	FAIL ABUN
LU-176	1.877E-02	FAIL ABUN
HF-181	3.485E+00	NOT IDENT.

TA-182	7.829E-01	FAIL ABUN
RE-183	3.325E+00	NOT IDENT.
RE-184	2.353E+01	FAIL ABUN
W-188	9.581E+01	NOT IDENT.
IR-192	3.945E-01	FAIL ABUN
HG-203	1.984E+00	NOT IDENT.
BI-207	4.314E-02	FAIL ABUN
PB-211	4.974E-01	NOT IDENT.
RN-219	3.149E-01	NOT IDENT.
RA-223	4.139E-01	FAIL ABUN
AC-227	1.945E-01	NOT IDENT.
TH-227	1.945E-01	NOT IDENT.
TH-229	4.238E-01	FAIL ABUN
PA-231	4.158E-01	NOT IDENT.
TH-231	4.139E-01	FAIL ABUN
PA-233	4.676E-02	NOT IDENT.
PA-234	2.238E-01	NOT IDENT.
PA-234M	4.068E+00	NOT IDENT.
TH-234	1.323E+00	FAIL ABUN
U-235	1.623E-01	FAIL ABUN
NP-237	4.676E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	1.323E+00	FAIL ABUN
NP-239	2.306E-01	NOT IDENT.
PU-239	3.164E+02	NOT IDENT.
AM-241	1.392E-01	NOT IDENT.
CM-243	8.411E-02	NOT IDENT.
BK-247	6.244E-02	NOT IDENT.
CM-247	2.793E-02	NOT IDENT.
CF-251	9.384E-02	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235020.CNF;1
* Acquisition date   : 3-OCT-2016 08:53:24 Sensitivity      : 3.000
* Detector ID        : GAM01 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.37 Half life ratio  : *****
* Sample date        : 8-DEC-2015 13:50:00 Nuclide Library : SOLID
* Sample ID          : G405235020 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.7076E+02 GRAM
*                   : Quantity Err(%) : 1.1712E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 20-JUL-2016 07:03:55 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM01_CAN.CNF;9
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.069E+01	1.516E+00	1.516E+00
CD-109	1.602E+00	3.012E+00	3.012E+00
SN-126	1.021E-01	1.919E-01	1.919E-01
TL-208	3.015E-01	9.364E-02	9.364E-02
PB-210	5.877E+00	8.343E+00	8.343E+00
BI-211	9.887E-01	8.779E-01	8.779E-01
BI-212	2.061E+00	9.862E-01	9.862E-01
PB-212	9.612E-01	1.355E-01	1.355E-01
BI-214	6.257E-01	1.635E-01	1.635E-01
PB-214	1.015E+00	1.862E-01	1.862E-01
RN-222	6.257E-01	1.635E-01	1.635E-01
RA-224	1.655E+00	1.437E+00	1.437E+00
RA-226	6.257E-01	1.635E-01	1.635E-01
AC-228	7.028E-01	2.938E-01	2.938E-01
RA-228	7.028E-01	2.938E-01	2.938E-01
TH-228	9.612E-01	1.355E-01	1.355E-01
TH-230	6.255E-01	1.635E-01	1.635E-01
TH-232	7.028E-01	2.938E-01	2.938E-01
U-234	6.255E-01	1.635E-01	1.635E-01
AM-243	2.057E-01	1.363E-01	1.363E-01
CF-249	3.727E-02	1.083E-01	1.083E-01
ANH-511	9.690E-02	8.901E-02	8.901E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-4.924E+00	1.068E+01	1.090E+01	NOT IDENT.
NA-22	2.738E-02	4.453E-02	4.621E-02	NOT IDENT.
NA-24	1.000E+41	2.203E+42	0.000E+00	SHORT HLIF
AL-26	1.405E-02	1.736E-02	1.848E-02	NOT IDENT.
SC-46	4.814E-02	3.611E-01	3.617E-01	FAIL ABUN
V-48	4.336E+03	1.335E+04	1.349E+04	SHORT HLIF
CR-51	-2.615E+02	3.815E+02	3.993E+02	SHORT HLIF
MN-54	2.968E-02	5.950E-02	6.098E-02	NOT IDENT.

CO-56	1.764E-01	4.299E-01	4.372E-01	NOT IDENT.
MN-56	1.000E+41	2.437E+41	0.000E+00	SHORT HLIF
CO-57	-3.997E-02	4.283E-02	4.646E-02	NOT IDENT.
CO-58	-2.614E-01	5.487E-01	5.612E-01	NOT IDENT.
FE-59	-2.573E+00	6.346E+00	6.451E+00	NOT IDENT.
CO-60	-2.207E-02	2.976E-02	3.138E-02	FAIL ABUN
ZN-65	-2.641E-02	1.685E-01	1.689E-01	NOT IDENT.
GE-68	-6.242E-01	2.138E+00	2.156E+00	NOT IDENT.
AS-73	2.796E+00	1.081E+01	1.088E+01	NOT IDENT.
AS-74	1.607E+03	5.877E+03	5.921E+03	SHORT HLIF
SE-75	5.865E-02	1.871E-01	1.890E-01	NOT IDENT.
BR-77	1.712E+38	1.481E+39	0.000E+00	SHORT HLIF
SR-82	-1.858E+02	6.129E+02	6.186E+02	SHORT HLIF
RB-83	-5.550E-04	5.099E-01	5.099E-01	NOT IDENT.
KR-85	2.082E+00	5.607E+00	5.685E+00	NOT IDENT.
SR-85	2.176E-01	5.918E-01	5.999E-01	NOT IDENT.
RB-86	-5.605E+03	2.610E+04	2.622E+04	SHORT HLIF
Y-88	-4.372E-02	2.273E-01	2.282E-01	NOT IDENT.
Y-91	1.208E+02	4.561E+02	4.594E+02	NOT IDENT.
NB-94	1.537E-02	3.167E-02	3.242E-02	NOT IDENT.
NB-95	4.826E-01	9.696E-01	9.937E-01	NOT IDENT.
NB-95M	-1.840E-01	2.374E+00	2.375E+00	NOT IDENT.
ZR-95	-2.812E-01	1.414E+00	1.419E+00	NOT IDENT.
NB-97	1.000E+41	1.668E+42	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.531E+41	0.000E+00	SHORT HLIF
MO-99	-2.145E+31	1.851E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	2.467E+41	0.000E+00	SHORT HLIF
RH-101	7.438E-04	3.293E-02	3.294E-02	NOT IDENT.
RH-102	-1.297E-02	4.934E-02	4.969E-02	NOT IDENT.
RU-103	-4.617E+00	5.131E+00	5.537E+00	FAIL ABUN
RH-106	-4.426E-01	4.400E-01	4.832E-01	NOT IDENT.
RU-106	-4.426E-01	4.400E-01	4.832E-01	NOT IDENT.
AG-108M	7.609E-05	2.467E-02	2.467E-02	NOT IDENT.
AG-110M	4.315E-02	8.376E-02	8.599E-02	NOT IDENT.
SN-113	4.383E-02	2.245E-01	2.253E-01	NOT IDENT.
CD-115	3.351E+38	2.478E+39	0.000E+00	SHORT HLIF
SN-117M	9.722E+03	8.818E+04	8.829E+04	SHORT HLIF
TE-123M	7.173E-02	1.193E-01	1.236E-01	NOT IDENT.
SB-124	1.758E+00	2.008E+00	2.158E+00	NOT IDENT.
SB-125	1.072E-02	8.474E-02	8.488E-02	FAIL ABUN
TE-125M	9.450E+01	2.969E+02	2.999E+02	NOT IDENT.
I-126	3.377E+05	7.671E+05	7.820E+05	SHORT HLIF
SB-126	-1.330E+05	1.341E+06	1.342E+06	SHORT HLIF
SB-127	-3.836E+20	2.013E+22	0.000E+00	SHORT HLIF
I-131	1.689E+09	4.541E+09	4.604E+09	SHORT HLIF
I-132	-1.000E+41	1.877E+42	0.000E+00	SHORT HLIF
TE-132	1.652E+26	3.747E+26	0.000E+00	SHORT HLIF
BA-133	-4.435E-03	4.221E-02	4.226E-02	NOT IDENT.
I-133	1.000E+41	2.568E+41	0.000E+00	SHORT HLIF
CS-134	3.244E-02	4.511E-02	4.743E-02	NOT IDENT.
CS-135	-7.638E-02	1.330E-01	1.374E-01	NOT IDENT.
I-135	-1.000E+41	9.112E+41	0.000E+00	SHORT HLIF
CS-136	-2.013E+05	2.551E+05	2.707E+05	SHORT HLIF
BA-137M	3.751E-02	3.613E-02	3.989E-02	NOT IDENT.
CS-137	3.962E-02	3.817E-02	4.214E-02	NOT IDENT.
CE-139	-3.178E-02	9.704E-02	9.810E-02	NOT IDENT.
BA-140	4.119E+05	1.208E+06	1.223E+06	SHORT HLIF
LA-140	1.304E+05	3.755E+05	3.801E+05	SHORT HLIF
CE-141	3.115E-01	2.283E+01	2.283E+01	NOT IDENT.
CE-143	-1.000E+41	2.145E+41	0.000E+00	SHORT HLIF
CE-144	1.498E-01	3.409E-01	3.476E-01	NOT IDENT.
PM-144	4.402E-02	5.273E-02	5.634E-02	NOT IDENT.
PR-144	3.809E+00	4.575E+00	4.886E+00	NOT IDENT.
PM-146	-1.214E-02	3.261E-02	3.307E-02	NOT IDENT.
ND-147	6.976E+06	3.024E+07	3.040E+07	SHORT HLIF
PM-147	-2.548E+02	7.514E+02	7.601E+02	NOT IDENT.
PM-149	-2.895E+39	4.331E+40	0.000E+00	SHORT HLIF
EU-150	-1.270E-02	2.745E-02	2.804E-02	FAIL ABUN
EU-152	-7.684E-02	8.381E-02	9.069E-02	FAIL ABUN
GD-153	-1.793E-01	1.941E-01	2.103E-01	NOT IDENT.
EU-154	6.338E-02	1.084E-01	1.121E-01	NOT IDENT.
EU-155	6.365E-02	1.032E-01	1.071E-01	FAIL ABUN
TB-160	-7.199E-01	1.731E+00	1.762E+00	FAIL ABUN
HO-166M	2.188E-02	4.821E-02	4.921E-02	FAIL ABUN
TM-171	6.729E+00	2.543E+01	2.561E+01	NOT IDENT.
HF-172	-7.921E-02	2.102E-01	2.132E-01	NOT IDENT.
LU-172	3.032E-02	6.461E-02	6.604E-02	FAIL ABUN
LU-176	-1.611E-02	2.232E-02	2.347E-02	FAIL ABUN

HF-181	2.602E+00	3.544E+00	3.733E+00	NOT IDENT.
TA-182	2.248E-01	8.493E-01	8.553E-01	FAIL ABUN
RE-183	-5.144E-01	3.731E+00	3.738E+00	NOT IDENT.
RE-184	3.349E+01	4.810E+01	5.042E+01	FAIL ABUN
W-188	1.903E+01	1.141E+02	1.144E+02	NOT IDENT.
IR-192	6.747E-02	4.262E-01	4.273E-01	FAIL ABUN
HG-203	-9.829E-01	2.255E+00	2.298E+00	NOT IDENT.
BI-207	3.053E-02	3.963E-02	4.195E-02	FAIL ABUN
PB-211	-1.031E-01	5.692E-01	5.711E-01	NOT IDENT.
RN-219	-1.239E-02	3.529E-01	3.529E-01	NOT IDENT.
RA-223	-3.173E-01	4.939E-01	5.142E-01	FAIL ABUN
AC-227	2.433E-02	2.086E-01	2.089E-01	NOT IDENT.
TH-227	2.433E-02	2.086E-01	2.089E-01	NOT IDENT.
TH-229	-3.639E-02	4.542E-01	4.545E-01	FAIL ABUN
PA-231	1.156E-01	4.457E-01	4.487E-01	NOT IDENT.
TH-231	-3.173E-01	4.939E-01	5.142E-01	FAIL ABUN
PA-233	-1.389E-02	5.284E-02	5.321E-02	NOT IDENT.
PA-234	-1.350E-02	2.701E-01	2.702E-01	NOT IDENT.
PA-234M	1.356E+00	4.383E+00	4.426E+00	NOT IDENT.
TH-234	-4.212E-01	1.467E+00	1.479E+00	FAIL ABUN
U-235	-7.525E-02	1.742E-01	1.774E-01	FAIL ABUN
NP-237	-1.389E-02	5.284E-02	5.321E-02	NOT IDENT.
NP-238	-1.000E+41	1.612E+41	0.000E+00	SHORT HLIF
U-238	-4.212E-01	1.467E+00	1.479E+00	FAIL ABUN
NP-239	-3.997E-02	2.684E-01	2.690E-01	NOT IDENT.
PU-239	2.487E+02	3.154E+02	3.347E+02	NOT IDENT.
AM-241	-2.316E-02	1.566E-01	1.569E-01	NOT IDENT.
CM-243	-6.645E-02	1.024E-01	1.067E-01	NOT IDENT.
BK-247	2.848E-02	6.537E-02	6.662E-02	NOT IDENT.
CM-247	4.868E-03	3.056E-02	3.064E-02	NOT IDENT.
CF-251	-5.439E-02	1.039E-01	1.067E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	32.3526	87.09	125.0983	136.47	94.4772
45.60	32.4465	87.57	125.1552	140.51	0.0000
46.54	32.4883	88.03	149.1172	143.76	88.1912
49.72	0.0000	88.34	137.8120	144.24	93.3104
51.35	67.7282	88.47	137.8284	145.44	84.8999
51.87	61.9311	89.96	119.3485	152.43	79.3401
52.39	59.6337	1093.63	119.4240	153.25	0.0000
52.97	54.9971	91.11	0.0000	323.87	68.3325
53.44	63.2258	92.59	113.5360	156.02	0.0000
54.07	73.8219	93.35	113.6148	158.56	0.0000
57.36	0.0000	94.56	66.8581	159.00	65.1254
57.53	71.7839	94.65	66.8636	162.33	63.5516
57.98	80.0647	94.67	66.8648	162.66	0.0000
59.27	70.7545	94.87	78.2949	163.33	60.1563
59.32	70.7588	97.43	99.3207	165.86	70.5847
59.54	70.7774	98.43	81.0000	176.31	74.5230
60.96	89.8015	98.44	81.0010	176.60	0.0000
61.17	89.8235	99.53	78.6221	177.52	74.5790
62.93	82.9012	100.11	77.4330	181.07	0.0000
63.29	81.7507	102.03	91.1055	181.52	62.5935
63.58	81.7779	103.18	86.2669	184.41	71.4130
64.28	86.5877	103.37	86.2813	143.76	71.4697
66.73	111.8036	105.21	61.7268	193.51	77.9338
67.24	108.2972	105.31	61.7321	197.03	78.9725
125.81	98.8247	106.12	69.1874	198.01	63.2146
67.75	84.5427	106.47	86.5099	201.83	60.7147
69.67	77.9592	109.28	84.2374	203.43	51.7874
70.83	92.3938	111.00	94.2822	205.31	46.2884
72.81	85.0064	111.76	0.0000	210.85	55.7204
72.87	85.0118	114.06	104.4681	215.65	37.2465
74.66	85.1716	116.30	0.0000	222.11	67.6373
74.82	85.1857	116.74	93.4776	227.09	62.4648
74.97	85.1990	119.76	62.4683	227.38	56.2273
77.11	85.3872	121.12	78.3773	228.16	0.0000
78.74	96.3708	121.22	79.2174	228.18	57.1439
79.69	94.8553	121.78	85.0918	116.74	57.1439
80.12	94.8961	122.06	85.1105	235.69	61.8532
80.19	0.0000	122.92	71.8080	235.96	57.8278
80.57	109.4209	123.07	71.8163	238.63	47.5838
81.00	107.8581	265.00	71.8504	238.98	0.0000
81.07	107.8656	125.81	82.8474	240.99	47.6420
81.75	106.3275	127.23	90.4771	242.00	47.6668
83.79	106.5403	127.91	82.1422	244.70	45.9313
84.00	106.5625	129.30	89.7806	252.40	0.0000
85.43	111.5607	131.20	110.0755	252.80	56.9720
86.55	125.0338	133.02	81.6168	254.15	0.0000
86.79	125.0621	133.52	79.1222	256.23	48.0108
86.94	125.0802	136.00	88.5425	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	41.8429	355.39	0.0000	584.27	14.3287
264.80	40.9360	356.01	35.5156	595.83	0.0000
265.00	40.9396	364.49	0.0000	427.87	22.6230
268.22	58.3164	366.42	0.0000	602.52	0.0000
269.46	43.7637	372.51	26.6926	604.72	32.4305
270.03	45.5994	375.05	28.6279	607.14	21.6349
271.23	52.9259	377.52	20.0588	609.32	26.8030
273.65	0.0000	356.01	24.4167	610.33	26.8104
276.40	49.3978	388.16	27.8135	614.28	20.1300
277.37	48.5046	388.63	0.0000	618.01	20.6681
277.60	45.7642	391.69	25.9305	620.36	14.4774
278.00	44.8578	264.66	28.9087	621.93	21.7255
279.20	53.1265	401.81	30.8496	630.19	0.0000
279.54	54.9670	402.40	26.0349	631.29	12.4468
279.70	57.7205	404.85	27.0236	633.25	3.1134
280.46	43.0766	410.95	31.9211	634.78	0.0000
283.69	37.6342	413.71	28.0802	635.95	17.6558
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	49.6066	423.72	0.0000	645.85	14.5793
285.90	0.0000	427.09	21.4056	657.76	17.7609
287.50	48.7354	427.87	20.4386	657.90	0.0000
290.67	42.8208	433.94	24.3841	661.66	16.7337
293.27	0.0000	439.40	20.5223	664.57	0.0000
351.93	33.2205	453.88	18.6614	666.33	0.0000
295.96	33.2314	463.37	20.6928	666.50	0.0000
879.38	52.6791	468.07	23.6865	667.71	0.0000
299.98	39.9507	473.00	0.0000	677.62	11.5532
300.09	44.3916	475.06	24.7314	685.70	0.0000
300.13	44.3926	476.78	22.7660	695.00	0.0000
301.36	50.8945	477.60	23.7622	696.49	13.7210
302.85	54.6319	482.18	13.8826	696.51	13.7210
256.23	36.1396	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	15.8356
306.78	46.3796	497.08	26.9044	697.49	14.7804
308.46	31.5616	505.52	13.4887	702.65	17.9712
311.90	39.0469	507.63	0.0000	706.68	9.5240
316.51	37.2624	511.00	17.0157	711.68	11.6557
319.41	0.0000	514.00	17.0318	720.70	0.0000
320.08	0.0000	514.00	17.0318	721.93	0.0000
321.04	35.4688	520.40	15.0586	722.78	23.9081
323.87	37.3812	520.69	0.0000	722.91	23.9090
325.23	39.2725	522.65	0.0000	723.31	15.9406
328.76	0.0000	527.90	0.0000	724.19	10.6295
333.37	42.7862	528.26	18.1150	727.33	10.6380
333.97	46.4576	529.59	14.0951	733.00	6.3918
334.37	38.0174	529.87	0.0000	735.93	11.7269
338.28	36.6688	531.02	0.0000	333.97	11.7314
338.32	36.6696	537.26	0.0000	739.50	0.0000
311.90	36.7021	546.56	0.0000	747.24	11.7600
340.48	36.7021	552.55	17.2366	748.06	12.8315
340.55	0.0000	563.25	10.6803	752.31	14.9855
344.28	41.4729	569.33	25.4751	753.82	0.0000
345.93	27.3533	946.00	18.3428	756.73	16.0736
351.06	37.8076	569.70	18.3442	756.80	16.0736
351.93	37.8206	583.19	14.3241	884.68	12.8813

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	17.7199	1274.44	7.9100	1620.50	3.7656
766.42	22.5560	1001.03	10.1796	1621.92	4.7079
766.84	21.4844	1002.74	20.3665	1678.03	0.0000
772.60	0.0000	1004.73	18.1107	1690.97	1.9015
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.8413
778.90	8.6188	1028.54	0.0000	1063.66	5.7664
783.70	0.0000	1037.84	7.9758	1771.35	2.8835
785.37	14.0273	1038.76	0.0000	1791.20	0.0000
792.07	17.2917	631.29	5.7068	1808.65	0.0000
794.95	11.8961	1048.07	0.0000	1810.72	0.0000
795.86	10.8171	1049.04	9.1348	1836.06	4.8471
810.06	16.2793	1050.41	2.2843		
810.29	16.2805	1063.66	22.3295		
344.28	18.4519	1077.00	0.0000		
810.76	16.2823	1077.34	11.4811		
815.77	0.0000	1085.87	9.1999		
1048.07	0.0000	1093.63	6.9102		
832.01	16.3623	1099.45	12.6829		
834.85	12.0066	1112.07	10.4011		
835.71	14.1928	1112.84	12.7143		
836.80	0.0000	1115.54	10.4077		
846.75	0.0000	1120.29	10.4172		
846.77	10.9448	1120.55	8.6816		
856.80	0.0000	1221.41	13.8926		
860.56	9.8811	1129.67	10.4355		
871.09	8.8037	1131.51	0.0000		
873.19	11.0099	1147.95	0.0000		
875.33	0.0000	1173.23	18.4070		
879.38	14.3325	1177.95	16.0424		
880.51	14.3357	1189.05	20.2177		
883.24	15.4481	1204.77	9.6962		
884.68	7.7263	1221.41	11.4932		
889.28	12.1539	1231.02	17.7112		
894.76	12.1682	1235.36	0.0000		
898.04	6.6418	1238.28	21.2798		
900.72	4.9843	1260.41	0.0000		
903.28	14.6287	1271.87	11.5932		
911.20	15.9861	1274.44	8.0294		
912.08	13.3242	1274.54	8.0299		
923.98	0.0000	1291.59	7.1582		
926.50	8.9102	1298.22	0.0000		
929.11	12.2582	1312.11	0.0000		
937.49	15.6292	1332.49	8.1079		
944.13	0.0000	1362.66	0.0000		
946.00	13.4204	1365.19	4.5285		
949.00	8.9525	1368.63	0.0000		
667.71	0.0000	1384.29	4.5422		
962.31	15.1496	1408.01	6.3831		
964.08	15.1551	1457.56	0.0000		
966.17	0.0000	1460.82	4.5972		
911.20	6.7422	1489.16	7.3872		
968.97	6.7422	1505.03	7.4048		
983.53	0.0000	1584.12	7.4922		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621350.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM31.CNF;306
Background date : 2-OCT-2016 11:01:52.
Sample date     : 12-SEP-2016 00:00:00 Acquisition date : 3-OCT-2016 08:50:58.
Sample ID      : G1203621350 Sample quantity   : 1.75975E+02 GRAM
Detector name  : GAM31 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:06.18 0.2%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1596247 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.22*	1	130	0.79	92.08	89	7	3.17E-04	*****	
2	0	54.71	24	187	1.30	109.05	103	8	6.75E-03	100.3	
3	0	62.87*	29	119	1.89	125.37	122	7	8.02E-03	73.9	
4	0	187.22*	18	47	6.25	373.88	366	18	4.98E-03	100.5	
5	0	296.25*	10	24	1.89	591.79	586	9	2.85E-03	97.3	
6	0	338.11*	17	8	0.93	675.45	671	8	4.71E-03	42.2	
7	0	397.11	11	8	3.32	793.37	788	9	2.96E-03	58.8	
8	0	408.80	8	22	1.17	816.72	813	11	2.31E-03	123.8	
9	0	416.83	23	11	5.28	832.78	825	15	6.38E-03	38.0	
10	0	437.75	9	6	1.73	874.59	871	8	2.40E-03	60.2	
11	0	483.85	12	8	1.86	966.73	960	10	3.42E-03	50.5	
12	0	569.56	14	5	3.28	1138.04	1133	9	3.75E-03	39.3	
13	0	609.71*	2	8	1.53	1218.28	1214	8	5.07E-04	344.1	
14	0	702.13*	14	15	1.58	1403.00	1396	15	3.84E-03	68.2	
15	0	873.87	8	1	0.69	1746.26	1743	6	2.10E-03	44.4	
16	0	911.55*	6	2	0.71	1821.58	1817	8	1.59E-03	75.0	
17	0	1121.09	12	2	1.86	2240.41	2236	9	3.33E-03	36.4	

Flag: "*" = Peak area was modified by background subtraction

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621350.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4
Sample title : MXR1
Sample date : 12-SEP-2016 00:00:00 Acquisition date : 3-OCT-2016 08:50:58
Sample ID : G1203621350 Sample quantity : 175.98 GRAM
Sample type : SOLID Sample geometry :
Detector name : GAMMA31 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:06.18 0.2%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type : Linear Efficiencies at : Peak Energy
Abundance limit : 75.00

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
AS-73	53.44	36	10.30*	5.699E+00	2.612E-01	3.141E-01	200.62
PB-210	46.54	2	4.25*	5.454E+00	3.158E-02	3.164E-02	3576.45
BI-214	609.32	2	45.49*	1.433E+00	1.328E-02	1.328E-02	688.26
	1120.29	12	14.92	8.735E-01	4.009E-01	4.009E-01	72.77
	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----
RN-222	609.32	2	45.49*	1.433E+00	1.328E-02	1.328E-02	688.26
	1120.29	12	14.92	8.735E-01	4.009E-01	4.009E-01	72.77
	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----
RA-226	609.32	2	45.49*	1.433E+00	1.328E-02	1.328E-02	688.26
	1120.29	12	14.92	8.735E-01	4.009E-01	4.009E-01	72.77
	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----
TH-230	609.32	2	45.49*	1.433E+00	1.328E-02	1.328E-02	688.26
	1120.29	12	14.92	8.735E-01	4.009E-01	4.009E-01	72.77
	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----
U-234	609.32	2	45.49*	1.433E+00	1.328E-02	1.328E-02	688.26
	1120.29	12	14.92	8.735E-01	4.009E-01	4.009E-01	72.77
	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621350.CNF;1 *
 * Acquisition date : 3-OCT-2016 08:50:58 Sensitivity : 3.000 *
 * Detector ID : GAM31 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:06.18 Half life ratio : ***** *
 * Sample date : 12-SEP-2016 00:00:00 Analyst initials: MXR1 *
 * Sample ID : G1203621350 Sample Quantity : 1.7598E+02 GRAM *
 * Batch Number : 1596247 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 15-JUN-2016 06:54:07 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM31_CAN.CNF;7 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
AS-73	3.141E-01	6.176E-01	4.265E-01
PB-210	3.164E-02	1.109E+00	8.948E-01
BI-214	1.328E-02	8.955E-02	1.264E-01
RN-222	1.328E-02	8.955E-02	1.264E-01
RA-226	1.328E-02	8.955E-02	1.264E-01
TH-230	1.328E-02	8.955E-02	1.264E-01
U-234	1.328E-02	8.955E-02	1.264E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	3.192E-01	3.357E-01	7.599E-01	NOT IDENT.
NA-22	-3.592E-03	3.315E-02	7.002E-02	NOT IDENT.
NA-24	0.000E+00	6.647E+08	0.000E+00	SHORT HLIF
AL-26	1.400E-03	2.822E-02	7.048E-02	NOT IDENT.
K-40	-3.065E-01	4.013E-01	8.243E-01	NOT IDENT.
SC-46	-5.700E-03	3.058E-02	6.534E-02	FAIL ABUN
V-48	3.865E-02	6.426E-02	1.635E-01	NOT IDENT.
CR-51	2.452E-01	3.834E-01	8.556E-01	NOT IDENT.
MN-54	8.034E-03	3.087E-02	6.749E-02	NOT IDENT.
CO-56	2.805E-02	3.965E-02	9.091E-02	NOT IDENT.
MN-56	0.000E+00	1.398E+41	0.000E+00	SHORT HLIF
CO-57	-7.439E-03	1.511E-02	2.905E-02	NOT IDENT.
CO-58	1.836E-02	3.932E-02	8.673E-02	NOT IDENT.
FE-59	1.914E-02	6.225E-02	1.525E-01	NOT IDENT.
CO-60	-1.436E-02	3.492E-02	6.679E-02	NOT IDENT.
ZN-65	-1.288E-02	8.718E-02	1.630E-01	NOT IDENT.
GE-68	4.670E-01	8.860E-01	2.219E+00	NOT IDENT.
AS-74	-2.636E-02	1.119E-01	2.179E-01	NOT IDENT.
SE-75	4.532E-03	3.091E-02	6.271E-02	NOT IDENT.
BR-77	-1.491E+01	4.397E+01	8.724E+01	NOT IDENT.
SR-82	1.672E-01	2.487E-01	6.368E-01	NOT IDENT.
RB-83	4.340E-02	5.757E-02	1.378E-01	NOT IDENT.
KR-85	-1.712E+01	9.643E+00	1.474E+01	NOT IDENT.

SR-85	-9.700E-02	5.458E-02	8.341E-02	NOT IDENT.
RB-86	3.865E-01	7.697E-01	1.862E+00	NOT IDENT.
Y-88	1.552E-03	3.319E-02	8.264E-02	NOT IDENT.
Y-91	-4.665E+00	1.229E+01	2.485E+01	NOT IDENT.
NB-94	5.045E-02	6.744E-02	7.033E-02	FAIL ABUN
NB-95	4.156E-02	3.015E-02	8.291E-02	NOT IDENT.
NB-95M	1.991E-02	9.302E-02	1.864E-01	NOT IDENT.
ZR-95	4.506E-02	6.228E-02	1.485E-01	NOT IDENT.
NB-97	0.000E+00	9.852E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	9.093E+08	0.000E+00	SHORT HLIF
MO-99	-3.081E+01	4.615E+01	7.911E+01	NOT IDENT.
TC-99M	0.000E+00	6.015E+23	0.000E+00	SHORT HLIF
RH-101	3.524E-03	1.662E-02	3.538E-02	NOT IDENT.
RH-102	2.133E-02	3.833E-02	9.209E-02	NOT IDENT.
RU-103	2.408E-02	3.125E-02	7.666E-02	FAIL ABUN
RH-106	5.307E-02	2.699E-01	5.795E-01	NOT IDENT.
RU-106	5.307E-02	2.699E-01	5.795E-01	NOT IDENT.
AG-108M	8.855E-03	2.375E-02	4.941E-02	NOT IDENT.
CD-109	-1.024E-01	3.376E-01	6.878E-01	NOT IDENT.
AG-110M	1.994E-02	3.936E-02	9.531E-02	NOT IDENT.
SN-113	-9.468E-03	3.346E-02	6.481E-02	NOT IDENT.
CD-115	-3.537E+01	4.899E+01	8.714E+01	NOT IDENT.
SN-117M	1.612E-02	4.783E-02	1.003E-01	NOT IDENT.
TE-123M	1.619E-02	1.764E-02	3.994E-02	NOT IDENT.
SB-124	5.479E-02	8.481E-02	2.295E-01	NOT IDENT.
SB-125	-1.106E-02	6.651E-02	1.377E-01	NOT IDENT.
TE-125M	2.479E-02	5.160E+00	1.079E+01	NOT IDENT.
I-126	9.312E-02	2.072E-01	4.891E-01	NOT IDENT.
SB-126	-8.453E-02	1.438E-01	2.550E-01	NOT IDENT.
SN-126	-2.219E-03	3.158E-02	6.630E-02	FAIL ABUN
SB-127	-1.671E+00	3.741E+00	6.894E+00	NOT IDENT.
I-131	2.471E-02	1.526E-01	3.312E-01	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	-2.105E+00	1.983E+00	3.185E+00	NOT IDENT.
BA-133	7.285E-03	2.942E-02	6.533E-02	NOT IDENT.
I-133	0.000E+00	5.019E+05	0.000E+00	SHORT HLIF
CS-134	1.823E-02	3.484E-02	7.903E-02	FAIL ABUN
CS-135	-1.955E-02	1.207E-01	2.270E-01	NOT IDENT.
I-135	0.000E+00	4.139E+22	0.000E+00	SHORT HLIF
CS-136	2.886E-03	1.249E-01	2.698E-01	NOT IDENT.
BA-137M	2.648E-02	2.396E-02	6.339E-02	NOT IDENT.
CS-137	2.797E-02	2.531E-02	6.697E-02	NOT IDENT.
CE-139	-2.293E-02	1.862E-02	3.021E-02	NOT IDENT.
BA-140	3.489E-02	3.009E-01	6.447E-01	NOT IDENT.
LA-140	-3.715E-03	9.130E-02	2.099E-01	NOT IDENT.
CE-141	-2.091E-02	4.305E-02	7.643E-02	NOT IDENT.
CE-143	0.000E+00	1.850E+03	0.000E+00	SHORT HLIF
CE-144	4.573E-02	1.151E-01	2.477E-01	NOT IDENT.
PM-144	6.831E-03	2.977E-02	5.888E-02	NOT IDENT.
PR-144	5.181E-01	2.237E+00	4.425E+00	NOT IDENT.
PM-146	7.788E-03	3.754E-02	8.018E-02	NOT IDENT.
ND-147	1.559E-01	5.305E-01	1.235E+00	NOT IDENT.
PM-147	2.632E+02	3.763E+02	8.582E+02	NOT IDENT.
PM-149	2.685E+02	3.623E+02	8.871E+02	NOT IDENT.
EU-150	-1.003E-03	2.085E-02	3.981E-02	NOT IDENT.
EU-152	7.826E-02	6.709E-02	1.670E-01	NOT IDENT.
GD-153	-5.142E-03	4.189E-02	8.624E-02	NOT IDENT.
EU-154	-7.019E-03	9.461E-02	2.013E-01	FAIL ABUN
EU-155	1.538E-02	4.702E-02	1.039E-01	NOT IDENT.
TB-160	-6.873E-03	1.069E-01	2.338E-01	FAIL ABUN
HO-166M	8.549E-03	5.779E-02	1.114E-01	NOT IDENT.
TM-171	6.925E-01	4.164E+00	8.585E+00	NOT IDENT.
HF-172	-3.697E-02	1.130E-01	2.215E-01	FAIL ABUN
LU-172	-1.494E-02	4.600E-02	9.335E-02	FAIL ABUN
LU-176	9.537E-04	1.815E-02	3.933E-02	NOT IDENT.
HF-181	1.492E-02	3.663E-02	8.333E-02	NOT IDENT.
TA-182	-4.265E-02	1.358E-01	2.710E-01	FAIL ABUN
RE-183	-2.075E-02	7.051E-02	1.432E-01	NOT IDENT.
RE-184	1.816E-02	1.288E-01	2.823E-01	NOT IDENT.
W-188	-1.002E+00	4.692E+00	9.480E+00	FAIL ABUN
IR-192	-2.401E-02	2.859E-02	5.361E-02	FAIL ABUN
HG-203	-1.315E-02	3.176E-02	5.701E-02	NOT IDENT.
BI-207	1.611E-02	2.576E-02	7.357E-02	FAIL ABUN
TL-208	1.739E-02	3.273E-02	7.812E-02	NOT IDENT.
BI-211	-1.654E-01	1.816E-01	3.525E-01	NOT IDENT.
PB-211	-2.101E-01	5.907E-01	1.035E+00	NOT IDENT.
BI-212	-1.201E-02	3.035E-01	6.548E-01	NOT IDENT.
PB-212	-2.936E-02	4.572E-02	8.696E-02	NOT IDENT.

PB-214	5.843E-03	6.678E-02	1.460E-01	FAIL ABUN
RN-219	1.143E-01	2.486E-01	5.883E-01	NOT IDENT.
RA-223	-1.072E-01	4.903E-01	1.008E+00	FAIL ABUN
RA-224	-9.417E-02	4.363E-01	8.415E-01	NOT IDENT.
AC-227	-2.110E-03	1.661E-01	3.281E-01	NOT IDENT.
TH-227	-2.110E-03	1.661E-01	3.281E-01	NOT IDENT.
AC-228	9.592E-02	1.410E-01	3.011E-01	FAIL ABUN
RA-228	9.592E-02	1.410E-01	3.011E-01	FAIL ABUN
TH-228	-2.936E-02	4.572E-02	8.696E-02	NOT IDENT.
TH-229	-1.597E-01	3.437E-01	5.754E-01	NOT IDENT.
PA-231	-9.458E-02	2.899E-01	6.000E-01	NOT IDENT.
TH-231	-1.072E-01	4.903E-01	1.008E+00	FAIL ABUN
TH-232	9.592E-02	1.410E-01	3.011E-01	FAIL ABUN
PA-233	-6.134E-03	4.837E-02	1.012E-01	NOT IDENT.
PA-234	-1.013E-01	1.891E-01	3.699E-01	FAIL ABUN
PA-234M	2.789E+00	4.242E+00	9.882E+00	NOT IDENT.
TH-234	8.671E-01	1.256E+00	1.287E+00	FAIL ABUN
U-235	2.736E-04	1.196E-01	2.296E-01	NOT IDENT.
NP-237	-6.134E-03	4.837E-02	1.012E-01	NOT IDENT.
NP-238	0.000E+00	1.091E+02	0.000E+00	SHORT HLIF
U-238	8.671E-01	1.256E+00	1.287E+00	FAIL ABUN
NP-239	-8.259E-02	1.465E-01	2.802E-01	NOT IDENT.
PU-239	-1.068E+01	1.757E+02	3.606E+02	NOT IDENT.
AM-241	5.273E-02	5.486E-02	1.138E-01	NOT IDENT.
AM-243	5.730E-03	2.103E-02	4.489E-02	NOT IDENT.
CM-243	2.968E-03	5.081E-02	1.075E-01	NOT IDENT.
BK-247	0.000E+00	5.464E-02	1.077E-01	NOT IDENT.
CM-247	1.874E-03	2.444E-02	5.355E-02	NOT IDENT.
CF-249	-2.265E-02	2.734E-02	4.984E-02	NOT IDENT.
CF-251	-8.210E-02	7.861E-02	1.312E-01	NOT IDENT.
ANH-511	-9.288E-02	5.292E-02	1.075E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
AS-73	53.44	36	10.30*	5.699E+00	2.612E-01	3.141E-01	200.62
PB-210	46.54	2	4.25*	5.454E+00	3.158E-02	3.164E-02	3576.45
BI-214	609.32	2	45.49*	1.433E+00	1.328E-02	1.328E-02	688.26
	1120.29	12	14.92	8.735E-01	4.009E-01	4.009E-01	72.77
	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----
RN-222	609.32	2	45.49*	1.433E+00	1.328E-02	1.328E-02	688.26
	1120.29	12	14.92	8.735E-01	4.009E-01	4.009E-01	72.77
	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----
RA-226	609.32	2	45.49*	1.433E+00	1.328E-02	1.328E-02	688.26
	1120.29	12	14.92	8.735E-01	4.009E-01	4.009E-01	72.77
	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----
TH-230	609.32	2	45.49*	1.433E+00	1.328E-02	1.328E-02	688.26
	1120.29	12	14.92	8.735E-01	4.009E-01	4.009E-01	72.77
	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----
U-234	609.32	2	45.49*	1.433E+00	1.328E-02	1.328E-02	688.26
	1120.29	12	14.92	8.735E-01	4.009E-01	4.009E-01	72.77
	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----

Flag: "*" = Keyline

Total number of lines in spectrum 17
 Number of unidentified lines 6
 Number of lines tentatively identified by NID 11 64.71%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AS-73	80.30D	1.20	2.612E-01	3.141E-01	6.302E-01	200.62	
PB-210	22.20Y	1.00	3.158E-02	3.164E-02	113.1E-02	3576.45	
BI-214	1600.00Y	1.00	1.328E-02	1.328E-02	9.138E-02	688.26	
RN-222	1600.00Y	1.00	1.328E-02	1.328E-02	9.138E-02	688.26	
RA-226	1600.00Y	1.00	1.328E-02	1.328E-02	9.138E-02	688.26	
TH-230	7.54E+04Y	1.00	1.328E-02	1.328E-02	9.138E-02	688.26	
U-234	2.45E+05Y	1.00	1.328E-02	1.328E-02	9.138E-02	688.26	
Total Activity :			3.591E-01	4.122E-01			

Grand Total Activity : 3.591E-01 4.122E-01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	62.87	42	174	1.89	125.37	122	7	8.02E-03	****	5.59E+00	T
0	187.22	23	61	6.25	373.88	366	18	4.98E-03	****	3.89E+00	
0	296.25	13	29	1.89	591.79	586	9	2.85E-03	****	2.66E+00	T
0	338.11	20	9	0.93	675.45	671	8	4.71E-03	84.5	2.37E+00	T
0	397.11	13	10	3.32	793.37	788	9	2.96E-03	****	2.06E+00	
0	408.80	10	25	1.17	816.72	813	11	2.31E-03	****	2.01E+00	
0	416.83	27	13	5.28	832.78	825	15	6.38E-03	75.9	1.97E+00	
0	437.75	10	7	1.73	874.59	871	8	2.40E-03	****	1.89E+00	
0	483.85	14	9	1.86	966.73	960	10	3.42E-03	****	1.74E+00	
0	569.56	15	5	3.28	1138.04	1133	9	3.75E-03	78.6	1.52E+00	T
0	702.13	15	16	1.58	1403.00	1396	15	3.84E-03	****	1.28E+00	T
0	873.87	8	2	0.69	1746.26	1743	6	2.10E-03	88.8	1.07E+00	T
0	911.55	6	2	0.71	1821.58	1817	8	1.59E-03	****	1.03E+00	T

Flags: "T" = Tentatively associated

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621350.CNF;1
* Acquisition date   : 3-OCT-2016 08:50:58 Sensitivity      : 3.000
* Detector ID        : GAM31 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:06.18 Half life ratio  : *****
* Sample date        : 12-SEP-2016 00:00:00 Nuclide Library : SOLID
* Sample ID          : G1203621350 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.7598E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                    : Dry Weight       : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 15-JUN-2016 06:54:07 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM31_CAN.CNF;7
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
AS-73	1.999E-01
PB-210	4.194E-01
BI-214	5.396E-02
RN-222	5.396E-02
RA-226	5.396E-02
TH-230	5.396E-02
U-234	5.396E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	3.362E-01	NOT IDENT.
NA-22	2.738E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.497E-02	NOT IDENT.
K-40	3.331E-01	NOT IDENT.
SC-46	2.593E-02	FAIL ABUN
V-48	6.632E-02	NOT IDENT.
CR-51	3.851E-01	NOT IDENT.
MN-54	2.811E-02	NOT IDENT.
CO-56	3.887E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	1.295E-02	NOT IDENT.
CO-58	3.685E-02	NOT IDENT.
FE-59	5.980E-02	NOT IDENT.
CO-60	2.554E-02	NOT IDENT.
ZN-65	6.733E-02	NOT IDENT.
GE-68	8.944E-01	NOT IDENT.
AS-74	9.282E-02	NOT IDENT.
SE-75	2.729E-02	NOT IDENT.
BR-77	3.931E+01	NOT IDENT.
SR-82	2.579E-01	NOT IDENT.
RB-83	5.910E-02	NOT IDENT.
KR-85	6.523E+00	NOT IDENT.
SR-85	3.690E-02	NOT IDENT.

RB-86	7.630E-01	NOT IDENT.
Y-88	2.928E-02	NOT IDENT.
Y-91	8.869E+00	NOT IDENT.
NB-94	3.046E-02	FAIL ABUN
NB-95	3.510E-02	NOT IDENT.
NB-95M	8.343E-02	NOT IDENT.
ZR-95	6.271E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	3.065E+01	NOT IDENT.
TC-99M	0.000E+00	SHORT HLIF
RH-101	1.576E-02	NOT IDENT.
RH-102	3.823E-02	NOT IDENT.
RU-103	3.259E-02	FAIL ABUN
RH-106	2.449E-01	NOT IDENT.
RU-106	2.449E-01	NOT IDENT.
AG-108M	2.117E-02	NOT IDENT.
CD-109	3.106E-01	NOT IDENT.
AG-110M	3.945E-02	NOT IDENT.
SN-113	2.725E-02	NOT IDENT.
CD-115	3.294E+01	NOT IDENT.
SN-117M	4.516E-02	NOT IDENT.
TE-123M	1.802E-02	NOT IDENT.
SB-124	8.890E-02	NOT IDENT.
SB-125	5.807E-02	NOT IDENT.
TE-125M	4.804E+00	NOT IDENT.
I-126	2.014E-01	NOT IDENT.
SB-126	9.785E-02	NOT IDENT.
SN-126	2.993E-02	FAIL ABUN
SB-127	2.857E+00	NOT IDENT.
I-131	1.441E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	1.374E+00	NOT IDENT.
BA-133	2.827E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.333E-02	FAIL ABUN
CS-135	1.001E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	1.102E-01	NOT IDENT.
BA-137M	2.670E-02	NOT IDENT.
CS-137	2.820E-02	NOT IDENT.
CE-139	1.303E-02	NOT IDENT.
BA-140	2.724E-01	NOT IDENT.
LA-140	7.436E-02	NOT IDENT.
CE-141	3.371E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.113E-01	NOT IDENT.
PM-144	2.455E-02	NOT IDENT.
PR-144	1.845E+00	NOT IDENT.
PM-146	3.494E-02	NOT IDENT.
ND-147	5.062E-01	NOT IDENT.
PM-147	3.837E+02	NOT IDENT.
PM-149	3.842E+02	NOT IDENT.
EU-150	1.722E-02	NOT IDENT.
EU-152	7.355E-02	NOT IDENT.
GD-153	3.869E-02	NOT IDENT.
EU-154	7.908E-02	FAIL ABUN
EU-155	4.609E-02	NOT IDENT.
TB-160	9.409E-02	FAIL ABUN
HO-166M	4.690E-02	NOT IDENT.
TM-171	4.045E+00	NOT IDENT.
HF-172	9.909E-02	FAIL ABUN
LU-172	3.591E-02	FAIL ABUN
LU-176	1.711E-02	NOT IDENT.
HF-181	3.551E-02	NOT IDENT.
TA-182	1.049E-01	FAIL ABUN
RE-183	6.749E-02	NOT IDENT.
RE-184	1.184E-01	NOT IDENT.
W-188	4.036E+00	FAIL ABUN
IR-192	2.317E-02	FAIL ABUN
HG-203	2.478E-02	NOT IDENT.
BI-207	2.807E-02	FAIL ABUN
TL-208	3.428E-02	NOT IDENT.
BI-211	1.555E-01	NOT IDENT.
PB-211	4.373E-01	NOT IDENT.
BI-212	2.549E-01	NOT IDENT.
PB-212	3.903E-02	NOT IDENT.
PB-214	6.544E-02	FAIL ABUN

RN-219	2.486E-01	NOT IDENT.
RA-223	4.411E-01	FAIL ABUN
RA-224	3.730E-01	NOT IDENT.
AC-227	1.424E-01	NOT IDENT.
TH-227	1.424E-01	NOT IDENT.
AC-228	1.283E-01	FAIL ABUN
RA-228	1.283E-01	FAIL ABUN
TH-228	3.903E-02	NOT IDENT.
TH-229	2.502E-01	NOT IDENT.
PA-231	2.559E-01	NOT IDENT.
TH-231	4.411E-01	FAIL ABUN
TH-232	1.283E-01	FAIL ABUN
PA-233	4.429E-02	NOT IDENT.
PA-234	1.356E-01	FAIL ABUN
PA-234M	4.205E+00	NOT IDENT.
TH-234	6.122E-01	FAIL ABUN
U-235	1.023E-01	NOT IDENT.
NP-237	4.429E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	6.122E-01	FAIL ABUN
NP-239	1.243E-01	NOT IDENT.
PU-239	1.596E+02	NOT IDENT.
AM-241	5.373E-02	NOT IDENT.
AM-243	2.069E-02	NOT IDENT.
CM-243	4.788E-02	NOT IDENT.
BK-247	4.679E-02	NOT IDENT.
CM-247	2.260E-02	NOT IDENT.
CF-249	2.049E-02	NOT IDENT.
CF-251	5.659E-02	NOT IDENT.
ANH-511	5.009E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621350.CNF;1 *
 * Acquisition date : 3-OCT-2016 08:50:58 Sensitivity : 3.000 *
 * Detector ID : GAM31 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:06.18 Half life ratio : ***** *
 * Sample date : 12-SEP-2016 00:00:00 Nuclide Library : SOLID *
 * Sample ID : G1203621350 Analyst initials: MXR1 *
 * Batch Number : 1596247 Sample Quantity : 1.7598E+02 GRAM *
 * Quantity Err(%) : 1.1365E-03 % *
 * Wet wt corr : 1.00000 Wet Weight : 0.00000 *
 * Dry Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 15-JUN-2016 06:54:07 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM31_CAN.CNF;7 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
AS-73	3.141E-01	6.210E-01	6.210E-01
PB-210	3.164E-02	1.109E+00	1.109E+00
BI-214	1.328E-02	8.955E-02	8.955E-02
RN-222	1.328E-02	8.955E-02	8.955E-02
RA-226	1.328E-02	8.955E-02	8.955E-02
TH-230	1.328E-02	8.955E-02	8.955E-02
U-234	1.328E-02	8.955E-02	8.955E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	3.192E-01	3.360E-01	3.655E-01	NOT IDENT.
NA-22	-3.592E-03	3.315E-02	3.319E-02	NOT IDENT.
NA-24	2.666E+08	6.648E+08	6.756E+08	SHORT HLIF
AL-26	1.400E-03	2.822E-02	2.822E-02	NOT IDENT.
K-40	-3.065E-01	4.017E-01	4.248E-01	NOT IDENT.
SC-46	-5.700E-03	3.058E-02	3.068E-02	FAIL ABUN
V-48	3.865E-02	6.427E-02	6.659E-02	NOT IDENT.
CR-51	2.452E-01	3.835E-01	3.991E-01	NOT IDENT.
MN-54	8.034E-03	3.087E-02	3.108E-02	NOT IDENT.
CO-56	2.805E-02	3.967E-02	4.164E-02	NOT IDENT.
MN-56	1.000E+41	1.399E+41	0.000E+00	SHORT HLIF
CO-57	-7.439E-03	1.512E-02	1.548E-02	NOT IDENT.
CO-58	1.836E-02	3.933E-02	4.019E-02	NOT IDENT.
FE-59	1.914E-02	6.227E-02	6.286E-02	NOT IDENT.
CO-60	-1.436E-02	3.492E-02	3.551E-02	NOT IDENT.
ZN-65	-1.288E-02	8.718E-02	8.737E-02	NOT IDENT.
GE-68	4.670E-01	8.862E-01	9.108E-01	NOT IDENT.
AS-74	-2.636E-02	1.119E-01	1.125E-01	NOT IDENT.
SE-75	4.532E-03	3.091E-02	3.098E-02	NOT IDENT.
BR-77	-1.491E+01	4.493E+01	4.543E+01	NOT IDENT.
SR-82	1.672E-01	2.488E-01	2.600E-01	NOT IDENT.
RB-83	4.340E-02	5.788E-02	6.109E-02	NOT IDENT.
KR-85	-1.712E+01	9.669E+00	1.237E+01	NOT IDENT.

SR-85	-9.700E-02	5.472E-02	7.005E-02	NOT IDENT.
RB-86	3.865E-01	7.699E-01	7.893E-01	NOT IDENT.
Y-88	1.552E-03	3.319E-02	3.320E-02	NOT IDENT.
Y-91	-4.665E+00	1.229E+01	1.247E+01	NOT IDENT.
NB-94	5.045E-02	6.748E-02	7.121E-02	FAIL ABUN
NB-95	4.156E-02	3.020E-02	3.554E-02	NOT IDENT.
NB-95M	1.991E-02	9.304E-02	9.347E-02	NOT IDENT.
ZR-95	4.506E-02	6.231E-02	6.554E-02	NOT IDENT.
NB-97	-1.000E+41	9.861E+40	0.000E+00	SHORT HLIF
ZR-97	-2.172E+08	9.093E+08	9.146E+08	SHORT HLIF
MO-99	-3.081E+01	4.618E+01	4.822E+01	NOT IDENT.
TC-99M	-2.273E+23	6.019E+23	0.000E+00	SHORT HLIF
RH-101	3.524E-03	1.663E-02	1.671E-02	NOT IDENT.
RH-102	2.133E-02	3.837E-02	3.956E-02	NOT IDENT.
RU-103	2.408E-02	3.127E-02	3.310E-02	FAIL ABUN
RH-106	5.307E-02	2.699E-01	2.710E-01	NOT IDENT.
RU-106	5.307E-02	2.699E-01	2.710E-01	NOT IDENT.
AG-108M	8.855E-03	2.375E-02	2.408E-02	NOT IDENT.
CD-109	-1.024E-01	3.377E-01	3.408E-01	NOT IDENT.
AG-110M	1.994E-02	3.937E-02	4.038E-02	NOT IDENT.
SN-113	-9.468E-03	3.347E-02	3.374E-02	NOT IDENT.
CD-115	-3.537E+01	4.904E+01	5.156E+01	NOT IDENT.
SN-117M	1.612E-02	4.784E-02	4.839E-02	NOT IDENT.
TE-123M	1.619E-02	1.765E-02	1.910E-02	NOT IDENT.
SB-124	5.479E-02	8.486E-02	8.838E-02	NOT IDENT.
SB-125	-1.106E-02	6.651E-02	6.670E-02	NOT IDENT.
TE-125M	2.479E-02	5.160E+00	5.160E+00	NOT IDENT.
I-126	9.312E-02	2.073E-01	2.115E-01	NOT IDENT.
SB-126	-8.453E-02	1.440E-01	1.490E-01	NOT IDENT.
SN-126	-2.219E-03	3.158E-02	3.159E-02	FAIL ABUN
SB-127	-1.671E+00	3.745E+00	3.820E+00	NOT IDENT.
I-131	2.471E-02	1.526E-01	1.530E-01	NOT IDENT.
I-132	1.000E+41	3.056E+41	0.000E+00	SHORT HLIF
TE-132	-2.105E+00	1.991E+00	2.206E+00	NOT IDENT.
BA-133	7.285E-03	2.942E-02	2.960E-02	NOT IDENT.
I-133	1.472E+05	5.024E+05	5.068E+05	SHORT HLIF
CS-134	1.823E-02	3.485E-02	3.580E-02	FAIL ABUN
CS-135	-1.955E-02	1.207E-01	1.210E-01	NOT IDENT.
I-135	9.213E+21	4.163E+22	0.000E+00	SHORT HLIF
CS-136	2.886E-03	1.249E-01	1.249E-01	NOT IDENT.
BA-137M	2.648E-02	2.399E-02	2.679E-02	NOT IDENT.
CS-137	2.797E-02	2.534E-02	2.831E-02	NOT IDENT.
CE-139	-2.293E-02	1.918E-02	2.179E-02	NOT IDENT.
BA-140	3.489E-02	3.009E-01	3.013E-01	NOT IDENT.
LA-140	-3.715E-03	9.130E-02	9.132E-02	NOT IDENT.
CE-141	-2.091E-02	4.306E-02	4.408E-02	NOT IDENT.
CE-143	9.909E+02	1.851E+03	1.904E+03	SHORT HLIF
CE-144	4.573E-02	1.151E-01	1.170E-01	NOT IDENT.
PM-144	6.831E-03	2.978E-02	2.993E-02	NOT IDENT.
PR-144	5.181E-01	2.237E+00	2.249E+00	NOT IDENT.
PM-146	7.788E-03	3.754E-02	3.770E-02	NOT IDENT.
ND-147	1.559E-01	5.306E-01	5.352E-01	NOT IDENT.
PM-147	2.632E+02	3.765E+02	3.947E+02	NOT IDENT.
PM-149	2.685E+02	3.641E+02	3.837E+02	NOT IDENT.
EU-150	-1.003E-03	2.085E-02	2.086E-02	NOT IDENT.
EU-152	7.826E-02	6.723E-02	7.593E-02	NOT IDENT.
GD-153	-5.142E-03	4.189E-02	4.196E-02	NOT IDENT.
EU-154	-7.019E-03	9.461E-02	9.466E-02	FAIL ABUN
EU-155	1.538E-02	4.703E-02	4.754E-02	NOT IDENT.
TB-160	-6.873E-03	1.069E-01	1.070E-01	FAIL ABUN
HO-166M	8.549E-03	5.779E-02	5.792E-02	NOT IDENT.
TM-171	6.925E-01	4.165E+00	4.176E+00	NOT IDENT.
HF-172	-3.697E-02	1.132E-01	1.144E-01	FAIL ABUN
LU-172	-1.494E-02	4.602E-02	4.651E-02	FAIL ABUN
LU-176	9.537E-04	1.815E-02	1.815E-02	NOT IDENT.
HF-181	1.492E-02	3.663E-02	3.725E-02	NOT IDENT.
TA-182	-4.265E-02	1.358E-01	1.371E-01	FAIL ABUN
RE-183	-2.075E-02	7.054E-02	7.116E-02	NOT IDENT.
RE-184	1.816E-02	1.288E-01	1.290E-01	NOT IDENT.
W-188	-1.002E+00	4.693E+00	4.715E+00	FAIL ABUN
IR-192	-2.401E-02	2.861E-02	3.059E-02	FAIL ABUN
HG-203	-1.315E-02	3.176E-02	3.231E-02	NOT IDENT.
BI-207	1.611E-02	2.577E-02	2.677E-02	FAIL ABUN
TL-208	1.739E-02	3.274E-02	3.366E-02	NOT IDENT.
BI-211	-1.654E-01	1.817E-01	1.964E-01	NOT IDENT.
PB-211	-2.101E-01	5.908E-01	5.983E-01	NOT IDENT.
BI-212	-1.201E-02	3.035E-01	3.036E-01	NOT IDENT.
PB-212	-2.936E-02	4.574E-02	4.762E-02	NOT IDENT.

PB-214	5.843E-03	6.678E-02	6.683E-02	FAIL ABUN
RN-219	1.143E-01	2.490E-01	2.542E-01	NOT IDENT.
RA-223	-1.072E-01	4.904E-01	4.928E-01	FAIL ABUN
RA-224	-9.417E-02	4.363E-01	4.384E-01	NOT IDENT.
AC-227	-2.110E-03	1.661E-01	1.661E-01	NOT IDENT.
TH-227	-2.110E-03	1.661E-01	1.661E-01	NOT IDENT.
AC-228	9.592E-02	1.410E-01	1.475E-01	FAIL ABUN
RA-228	9.592E-02	1.410E-01	1.475E-01	FAIL ABUN
TH-228	-2.936E-02	4.574E-02	4.762E-02	NOT IDENT.
TH-229	-1.597E-01	3.438E-01	3.512E-01	NOT IDENT.
PA-231	-9.458E-02	2.906E-01	2.937E-01	NOT IDENT.
TH-231	-1.072E-01	4.904E-01	4.928E-01	FAIL ABUN
TH-232	9.592E-02	1.410E-01	1.475E-01	FAIL ABUN
PA-233	-6.134E-03	4.837E-02	4.845E-02	NOT IDENT.
PA-234	-1.013E-01	2.218E-01	2.264E-01	FAIL ABUN
PA-234M	2.789E+00	4.244E+00	4.426E+00	NOT IDENT.
TH-234	8.671E-01	1.270E+00	1.329E+00	FAIL ABUN
U-235	2.736E-04	1.196E-01	1.196E-01	NOT IDENT.
NP-237	-6.134E-03	4.837E-02	4.845E-02	NOT IDENT.
NP-238	1.300E+02	1.092E+02	1.239E+02	SHORT HLIF
U-238	8.671E-01	1.270E+00	1.329E+00	FAIL ABUN
NP-239	-8.259E-02	1.467E-01	1.513E-01	NOT IDENT.
PU-239	-1.068E+01	1.757E+02	1.758E+02	NOT IDENT.
AM-241	5.273E-02	5.500E-02	5.991E-02	NOT IDENT.
AM-243	5.730E-03	2.103E-02	2.119E-02	NOT IDENT.
CM-243	2.968E-03	5.081E-02	5.082E-02	NOT IDENT.
BK-247	0.000E+00	5.464E-02	0.000E+00	NOT IDENT.
CM-247	1.874E-03	2.444E-02	2.445E-02	NOT IDENT.
CF-249	-2.265E-02	2.740E-02	2.924E-02	NOT IDENT.
CF-251	-8.210E-02	7.915E-02	8.737E-02	NOT IDENT.
ANH-511	-9.288E-02	5.305E-02	6.759E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	61.1367	87.09	24.8846	136.47	26.2474
45.60	74.4062	87.57	23.9529	140.51	22.1901
46.54	74.6438	88.03	27.8134	143.76	19.1170
49.72	83.2346	88.34	27.8325	144.24	23.3827
51.35	82.5072	88.47	26.8802	145.44	22.3612
51.87	90.7905	89.96	30.8201	152.43	23.6748
52.39	75.1992	90.64	69.4468	153.25	16.1616
52.97	75.3346	91.11	71.4476	154.21	26.9741
53.44	75.4442	92.59	23.2454	156.02	29.2095
54.07	75.5899	93.35	28.1334	158.56	22.8024
57.36	0.0000	94.56	74.8887	159.00	16.2978
57.53	77.2653	94.65	74.9028	162.33	24.0175
57.98	96.9305	94.67	74.9057	162.66	22.9367
59.27	78.5486	94.87	74.9374	163.33	16.3989
59.32	78.5596	97.43	27.3942	165.86	29.6231
59.54	69.0809	98.43	26.4698	176.31	20.0327
60.96	82.5148	98.44	26.4702	176.60	20.0404
61.17	82.5636	99.53	21.6160	177.52	26.7532
62.93	69.4417	100.11	26.5596	181.07	25.3855
63.29	69.5109	102.03	16.7868	181.52	22.4124
63.58	71.0718	103.18	21.7734	184.41	20.2470
64.28	68.7940	103.37	21.7816	185.72	20.2813
66.73	67.4261	105.21	16.8917	193.51	21.2410
67.24	65.6922	105.31	16.8949	197.03	24.0005
67.68	54.8071	106.12	22.8937	198.01	16.0196
67.75	54.8167	106.47	20.9170	201.83	21.8423
69.67	39.4825	109.28	22.0305	203.43	17.2771
70.83	48.8088	111.00	31.1433	205.31	25.3969
72.81	40.7236	111.76	32.1936	210.85	12.7819
72.87	40.7297	114.06	24.2477	215.65	28.0437
74.66	41.8407	116.30	16.2311	222.11	23.5422
74.82	41.8569	116.74	28.4268	227.09	7.1020
74.97	44.6638	119.76	22.4560	227.38	18.9446
77.11	40.2197	121.12	15.3477	228.16	27.2563
78.74	48.8274	121.22	15.3503	228.18	27.2570
79.69	27.2919	121.78	21.5116	235.69	21.5068
80.12	31.0876	122.06	29.7208	235.96	21.5132
80.19	31.0926	122.92	27.7127	238.63	20.3761
80.57	33.0064	123.07	27.7199	238.98	17.9855
81.00	28.3195	123.68	25.6937	240.99	16.8224
81.07	29.2683	125.81	28.8823	242.00	28.8691
81.75	38.7706	127.23	19.6460	244.70	26.5386
83.79	24.7013	127.91	22.7743	252.40	12.1594
84.00	24.7132	129.30	20.7523	252.80	12.1645
85.43	31.4680	131.20	23.9406	254.15	0.0000
86.55	37.2823	133.02	24.0125	256.23	14.6483
86.79	37.3019	133.52	20.8975	260.90	18.3966
86.94	25.8333	136.00	24.1294	264.66	13.5412

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.80	13.5429	364.49	13.4250	600.60	12.4507
265.00	14.7770	366.42	15.2375	602.52	0.0000
268.22	21.0005	372.51	14.4079	604.72	9.9816
269.46	23.4995	375.05	9.0222	607.14	7.8079
270.03	16.0873	377.52	12.6547	609.32	11.4646
271.23	27.2563	383.85	9.9898	610.33	9.3849
273.65	18.6273	388.16	14.5768	614.28	11.2847
276.40	22.4116	388.63	16.4048	618.01	9.4215
277.37	11.2162	391.69	12.0570	620.36	9.4329
277.60	11.2187	400.66	6.8951	621.93	8.3913
278.00	12.4701	401.81	6.4407	630.19	0.0000
279.20	19.9746	402.40	9.2049	631.29	4.2153
279.54	17.4833	404.85	13.8315	633.25	9.4937
279.70	17.4859	410.95	5.5564	634.78	4.2227
280.46	13.7490	413.71	5.5671	635.95	8.4502
283.69	13.3727	414.70	5.5709	636.99	8.4544
284.31	15.8894	423.72	8.4088	645.85	7.4301
285.41	11.7199	427.09	12.1737	657.76	11.7434
285.90	7.5377	427.87	11.2434	657.90	0.0000
287.50	12.5815	433.94	8.4672	661.66	2.1392
290.67	13.1231	439.40	12.7472	664.57	0.0000
293.27	0.0000	453.88	13.3455	666.33	4.2878
295.22	16.0498	463.37	10.5499	666.50	3.2161
295.96	16.0606	468.07	14.4293	667.71	0.0000
298.58	12.7094	473.00	12.5443	677.62	8.6214
299.98	15.2703	475.06	12.5604	685.70	11.8992
300.09	15.2717	476.78	8.7050	695.00	6.5186
300.13	15.2725	477.60	8.1288	696.49	6.5229
301.36	14.4399	482.18	7.7638	696.51	6.5229
302.85	19.5621	487.02	13.1405	697.00	6.5244
304.50	12.7766	492.35	9.7654	697.30	9.7881
304.85	12.7805	497.08	4.8966	697.49	9.7888
306.78	14.5094	505.52	20.6702	702.65	9.8119
308.46	15.3856	507.63	0.0000	706.68	9.8302
311.90	18.0037	511.00	28.6371	711.68	6.5681
316.51	23.2399	514.00	48.4736	720.70	7.6938
319.41	18.9837	514.00	48.4736	721.93	0.0000
320.08	18.9944	520.40	5.9578	722.78	2.2003
321.04	23.3306	520.69	5.9587	722.91	2.2004
323.87	19.0557	522.65	0.0000	723.31	1.1004
325.23	16.4758	527.90	7.9782	724.19	2.2017
328.76	15.6552	528.26	7.9798	727.33	4.4095
333.37	17.0248	529.59	3.9928	733.00	5.5257
333.97	14.4127	529.87	0.0000	735.93	4.4263
334.37	18.3494	531.02	4.9951	737.46	3.3219
338.28	14.0254	537.26	9.0234	739.50	8.8662
338.32	14.0257	546.56	0.0000	747.24	8.8962
340.48	13.1723	552.55	12.1348	748.06	11.1243
340.55	13.1732	563.25	9.1545	752.31	5.5723
344.28	7.0469	569.33	4.0822	753.82	8.9215
345.93	15.8767	569.50	4.0825	756.73	4.4663
351.06	15.9415	569.70	4.0830	756.80	5.5831
351.93	9.7488	583.19	4.1126	763.94	8.9603
355.39	0.0000	584.27	12.3447	765.81	1.1209
356.01	11.5586	595.83	13.4549	766.42	5.6061

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
766.84	6.7285	1002.74	6.4367	1678.03	0.0000
772.60	0.0000	1004.73	11.0416	1690.97	1.1062
776.52	2.2520	1021.30	0.0000	1750.46	0.0000
777.92	4.5067	1025.87	0.0000	1764.49	3.3710
778.90	4.5085	1028.54	0.0000	1770.23	5.4000
783.70	4.5176	1037.84	7.4429	1771.35	3.6010
785.37	2.2603	1038.76	0.0000	1791.20	0.0000
792.07	9.0664	1046.59	6.5313	1808.65	1.8144
794.95	4.5386	1048.07	6.5343	1810.72	0.0000
795.86	5.6755	1049.04	10.2715	1836.06	1.8245
801.95	7.9653	1050.41	8.4078		
810.06	2.2834	1063.66	0.9382		
810.29	5.7088	1077.00	3.7690		
810.45	5.7092	1077.34	2.8271		
810.76	6.8521	1085.87	4.7247		
815.77	3.4329	1093.63	5.6836		
818.51	5.7277	1099.45	2.8469		
832.01	6.9104	1112.07	6.6689		
834.85	3.4591	1112.84	6.6706		
835.71	3.4603	1115.54	8.9015		
836.80	0.0000	1120.29	9.1693		
846.75	0.0000	1120.55	5.7316		
846.77	5.7922	1121.30	3.0574		
856.80	6.9778	1129.67	6.7056		
860.56	3.4940	1131.51	0.0000		
871.09	8.4196	1147.95	0.0000		
873.19	1.7555	1173.23	4.8529		
875.33	0.0000	1177.95	3.8877		
879.38	6.1585	1189.05	1.9503		
880.51	7.9217	1204.77	3.9185		
883.24	7.0486	1221.41	5.9059		
884.68	4.4078	1231.02	2.9612		
889.28	6.1816	1235.36	5.9297		
894.76	7.0791	1238.28	3.9563		
898.04	5.3159	1260.41	0.0000		
900.72	12.4162	1271.87	4.9924		
903.28	7.9893	1274.44	4.9957		
911.20	8.0126	1274.54	4.9960		
1093.63	4.2749	1291.59	5.0195		
923.98	0.0000	1298.22	0.0000		
926.50	4.4765	1312.11	2.0190		
929.11	4.4806	1332.49	6.0901		
937.49	5.3930	1362.66	0.0000		
944.13	2.7029	1365.19	5.1190		
946.00	5.4095	1368.63	0.0000		
949.00	3.6101	1384.29	3.0868		
954.55	0.0000	1408.01	4.1406		
962.31	3.6272	1457.56	0.0000		
964.08	5.4441	1460.82	5.2448		
966.17	5.4481	1489.16	3.1686		
968.97	5.4534	1505.03	6.3618		
983.53	2.7405	1584.12	5.4007		
984.45	0.0000	1596.21	2.1663		
996.26	9.1751	1620.50	2.1782		
1001.03	4.5949	1621.92	1.0895		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621351.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM05.CNF;477
Background date : 2-OCT-2016 11:00:07.
Sample date      : 10-DEC-2015 14:20:00 Acquisition date : 3-OCT-2016 08:53:50.
Sample ID       : G1203621351 Sample quantity : 1.41585E+02 GRAM
Detector name   : GAM05 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.64 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596247 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	32.25	26	121	0.67	66.34	63	6	7.19E-03	70.8	
2	1	39.16	44	91	0.83	80.15	76	12	1.22E-02	35.0	1.94E+00
3	1	41.51	22	84	0.84	84.85	76	12	6.03E-03	70.2	
4	0	45.75*	88	180	0.73	93.31	88	10	2.44E-02	31.9	
5	0	62.89*	47	239	0.89	127.57	124	8	1.30E-02	60.7	
6	2	74.47*	260	182	0.81	150.71	147	20	7.23E-02	9.7	2.46E+00
7	2	76.75*	485	135	0.81	155.27	147	20	1.35E-01	5.9	
8	2	79.29	33	127	1.04	160.36	147	20	9.28E-03	64.1	
9	0	83.50*	44	112	1.39	168.76	167	5	1.22E-02	40.1	
10	4	86.89*	143	172	1.11	175.55	172	20	3.97E-02	17.2	5.47E-01
11	4	89.44	93	185	1.29	180.65	172	20	2.59E-02	27.7	
12	4	92.28*	134	174	1.30	186.32	172	20	3.73E-02	20.7	
13	0	185.83*	138	134	1.24	373.29	369	11	3.83E-02	19.2	
14	0	208.97	27	90	1.18	419.54	416	7	7.43E-03	62.5	
15	2	238.32*	486	60	0.95	478.20	474	15	1.35E-01	5.3	9.67E-01
16	2	241.49	123	92	1.37	484.53	474	15	3.40E-02	16.6	
17	0	269.53	49	83	0.93	540.57	536	10	1.35E-02	37.8	
18	0	277.75	18	68	1.32	557.00	552	8	5.00E-03	82.8	
19	0	294.91*	186	68	1.12	591.30	587	10	5.18E-02	11.2	
20	0	327.78	32	37	1.08	656.98	654	6	8.82E-03	35.2	
21	1	337.92*	100	54	1.37	677.25	671	15	2.77E-02	16.0	6.51E+00
22	1	339.92*	29	40	1.37	681.25	671	15	7.98E-03	56.5	
23	0	351.75*	267	76	1.09	704.90	700	11	7.42E-02	8.9	
24	0	409.97	30	29	1.86	821.26	818	7	8.43E-03	34.7	
25	2	427.28	18	35	1.62	855.85	848	26	5.02E-03	68.2	2.73E+00
26	2	431.57	32	35	1.62	864.44	848	26	8.90E-03	36.9	
27	0	463.04	28	41	1.17	927.33	922	11	7.82E-03	48.0	
28	0	510.54*	76	68	2.41	1022.27	1014	17	2.12E-02	30.0	
29	0	530.48	14	30	1.47	1062.12	1054	11	4.02E-03	77.8	
30	0	583.24*	118	49	1.12	1167.58	1161	10	3.28E-02	14.5	
31	0	609.16*	184	18	1.20	1219.37	1215	9	5.12E-02	8.6	
32	0	623.99	25	28	1.74	1249.01	1240	14	7.05E-03	48.4	
33	0	661.90	163	81	1.42	1324.79	1319	14	4.52E-02	14.1	
34	0	727.79	49	30	2.05	1456.49	1448	17	1.37E-02	29.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	735.20	4	21	1.06	1471.28	1466	9	1.17E-03	200.0	
36	0	754.89	9	17	0.61	1510.64	1506	8	2.61E-03	83.9	
37	0	786.51	25	26	6.39	1573.84	1565	17	6.97E-03	50.3	
38	0	795.16	12	25	0.73	1591.13	1587	10	3.33E-03	83.1	
39	0	806.54	10	21	0.50	1613.88	1608	9	2.85E-03	87.9	
40	0	815.54	7	18	1.27	1631.86	1626	10	1.88E-03	122.7	
41	0	892.23	15	6	1.85	1785.15	1780	9	4.09E-03	40.9	
42	0	911.09*	112	12	1.47	1822.85	1815	16	3.12E-02	11.8	
43	0	920.75	7	11	1.40	1842.14	1836	9	1.94E-03	94.4	
44	2	934.55	25	4	2.10	1869.73	1863	19	6.81E-03	29.6	9.47E-01
45	2	938.82	14	0	2.11	1878.27	1863	19	4.00E-03	28.7	
46	0	964.48	31	11	0.73	1929.55	1924	11	8.61E-03	27.4	
47	3	969.17	51	4	1.91	1938.93	1935	16	1.42E-02	15.3	1.40E+00
48	3	973.23	14	1	2.35	1947.04	1935	16	4.02E-03	33.2	
49	0	1035.77	4	21	1.05	2072.04	2064	10	1.14E-03	210.2	
50	0	1121.15*	39	23	1.61	2242.70	2237	13	1.07E-02	31.7	
51	0	1156.90	7	8	1.13	2314.17	2311	7	1.95E-03	74.2	
52	0	1230.25	13	18	3.83	2460.78	2449	15	3.48E-03	80.4	
53	0	1238.71	33	17	2.38	2477.68	2471	11	9.29E-03	29.2	
54	0	1280.62	16	3	1.95	2561.44	2558	7	4.42E-03	31.5	
55	0	1377.31	17	0	1.29	2754.71	2748	12	4.72E-03	24.3	
56	0	1460.98*	471	4	1.90	2921.96	2913	15	1.31E-01	4.7	
57	0	1631.06	12	0	1.44	3261.92	3257	10	3.33E-03	28.9	
58	0	1764.57	42	0	2.74	3528.79	3523	12	1.17E-02	15.4	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621351.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 10-DEC-2015 14:20:00 Acquisition date : 3-OCT-2016 08:53:50
Sample ID        : G1203621351 Sample quantity  : 141.59 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA5 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.64 0.0%
Energy tolerance : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error  : 0.00 %
Efficiency type  : Linear Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	TH-229	85.43
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.244E+00	1.807E+01	1.807E+01	9.45	OK
CD-109	88.03	3.70*	8.913E+00	1.624E+00	2.540E+00	61.32	OK
SN-126	64.28	9.60	9.123E+00	3.524E-01	3.524E-01	121.47	OK
	86.94	8.90	8.913E+00	6.751E-01	6.751E-01	61.32	OK
	87.57	37.00*	8.913E+00	1.624E-01	1.624E-01	61.32	OK
CS-135	268.22	16.00*	5.040E+00	3.559E-01	3.559E-01	75.52	OK
BA-137M	661.66	89.90*	2.416E+00	4.095E-01	4.173E-01	28.18	OK
CS-137	661.66	85.10*	2.416E+00	4.326E-01	4.408E-01	28.18	OK
HG-203	70.83	3.69	9.006E+00	-----	Line Not Found	-----	Absent
	72.87	6.19	8.990E+00	-----	Line Not Found	-----	Absent
	279.20	81.56*	4.917E+00	3.160E-03	2.654E-01	1398.35	OK
TL-208	277.37	6.60	4.923E+00	-----	Line Not Found	-----	<<INT Reject
	583.19	85.00*	2.673E+00	2.870E-01	2.870E-01	29.00	OK
	860.56	12.50	1.959E+00	-----	Line Not Found	-----	Absent
PB-210	46.54	4.25*	9.655E+00	1.443E+00	1.480E+00	63.86	OK
BI-212	727.33	6.67*	2.240E+00	1.795E+00	1.795E+00	57.93	OK
	785.37	1.10	2.105E+00	5.833E+00	5.833E+00	100.60	OK
	1620.50	1.47	1.126E+00	-----	Line Not Found	-----	Absent
PB-212	74.82	10.28	8.980E+00	1.122E+00	1.122E+00	34.81	OK
	77.11	17.10	8.967E+00	2.051E+00	2.051E+00	11.84	OK
	238.63	43.60*	5.564E+00	1.192E+00	1.192E+00	10.57	OK
	300.09	3.30	4.613E+00	-----	Line Not Found	-----	Absent
BI-214	609.32	45.49*	2.581E+00	8.641E-01	8.644E-01	17.29	OK
	1120.29	14.92	1.575E+00	8.566E-01	8.569E-01	63.42	OK
	1764.49	15.30	1.032E+00	1.329E+00	1.329E+00	30.86	OK
PB-214	74.82	5.80	8.977E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	8.967E+00	3.616E+00	3.618E+00	11.84	OK
	87.09	3.41	8.912E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	5.497E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.680E+00	1.264E+00	1.265E+00	22.46	OK
	351.93	35.60*	4.043E+00	1.070E+00	1.070E+00	17.74	OK
RN-222	609.32	45.49*	2.581E+00	8.641E-01	8.644E-01	17.29	OK
	1120.29	14.92	1.575E+00	8.566E-01	8.569E-01	63.42	OK
	1764.49	15.30	1.032E+00	1.329E+00	1.329E+00	30.86	OK
RA-224	240.99	4.10*	5.506E+00	9.903E-01	9.903E-01	119.26	OK
RA-226	609.32	45.49*	2.581E+00	8.641E-01	8.644E-01	17.29	OK
	1120.29	14.92	1.575E+00	8.566E-01	8.569E-01	63.42	OK
	1764.49	15.30	1.032E+00	1.329E+00	1.329E+00	30.86	OK
AC-228	105.21	1.10	8.704E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.180E+00	1.223E+00	1.223E+00	31.98	OK
	794.95	4.25	2.087E+00	7.274E-01	7.274E-01	166.25	OK
	835.71	1.61	2.005E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.870E+00	1.236E+00	1.236E+00	23.55	OK
	968.97	15.80	1.778E+00	9.614E-01	9.614E-01	30.58	OK
RA-228	105.21	1.10	8.704E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.180E+00	1.223E+00	1.223E+00	31.98	OK
	794.95	4.25	2.087E+00	7.274E-01	7.274E-01	166.25	OK
	835.71	1.61	2.005E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.870E+00	1.236E+00	1.236E+00	23.55	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	968.97	15.80	1.778E+00	9.614E-01	9.614E-01	30.58	OK
	74.82	10.28	8.980E+00	1.122E+00	1.122E+00	34.81	OK
	77.11	17.10	8.967E+00	2.051E+00	2.051E+00	11.84	OK
	238.63	43.60*	5.564E+00	1.192E+00	1.192E+00	10.57	OK
TH-229	300.09	3.30	4.613E+00	-----	Line Not Found	-----	Absent
	85.43	14.70	8.913E+00	4.088E-01	4.088E-01	61.32	OK
	88.47	24.00	8.895E+00	2.808E-01	2.808E-01	55.31	OK
	193.51	4.41*	6.511E+00	-----	Line Not Found	-----	Absent
TH-230	210.85	2.80	6.116E+00	-----	Line Not Found	-----	Absent
	609.32	45.49*	2.581E+00	8.641E-01	8.641E-01	17.29	OK
	1120.29	14.92	1.575E+00	8.566E-01	8.566E-01	63.42	OK
	1764.49	15.30	1.032E+00	1.329E+00	1.329E+00	30.86	OK
TH-232	105.21	1.10	8.704E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.180E+00	1.223E+00	1.223E+00	31.98	OK
	835.71	1.61	2.005E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.870E+00	1.236E+00	1.236E+00	23.55	OK
TH-234	968.97	15.80	1.778E+00	9.614E-01	9.614E-01	30.58	OK
	63.29	3.70*	9.123E+00	9.143E-01	9.143E-01	121.47	OK
	92.59	4.23	8.870E+00	2.293E+00	2.293E+00	41.31	OK
	609.32	45.49*	2.581E+00	8.641E-01	8.641E-01	17.29	OK
U-234	1120.29	14.92	1.575E+00	8.566E-01	8.566E-01	63.42	OK
	1764.49	15.30	1.032E+00	1.329E+00	1.329E+00	30.86	OK
	89.96	3.47	8.895E+00	1.942E+00	1.942E+00	55.31	OK
	93.35	5.60	8.870E+00	1.732E+00	1.732E+00	41.31	OK
U-235	143.76	10.96*	7.808E+00	-----	Line Not Found	-----	Absent
	163.33	5.08	7.279E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	6.697E+00	2.183E-01	2.183E-01	38.33	OK
	205.31	5.01	6.238E+00	-----	Line Not Found	-----	Absent
U-238	63.29	3.70*	9.123E+00	9.143E-01	9.143E-01	121.47	OK
	92.59	4.23	8.870E+00	2.293E+00	2.293E+00	41.31	OK
AM-243	43.53	5.90	9.491E+00	-----	Line Not Found	-----	Absent
ANH-511	74.66	67.20*	8.980E+00	1.716E-01	1.716E-01	34.81	OK
	511.00	100.00*	2.976E+00	1.434E-01	1.434E-01	59.99	OK

Flag: "*" = Keyline

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621351.CNF;1
* Acquisition date   : 3-OCT-2016 08:53:50 Sensitivity      : 3.000
* Detector ID        : GAM05 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.64 Half life ratio  : *****
* Sample date        : 10-DEC-2015 14:20:00 Analyst initials: MXR1
* Sample ID          : G1203621351 Sample Quantity : 1.4159E+02 GRAM
* Batch Number       : 1596247 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 4-SEP-2016 08:00:28 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;20
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.807E+01	1.673E+00	5.312E-01
CD-109	2.540E+00	1.527E+00	1.161E+00
SN-126	1.624E-01	9.759E-02	7.417E-02
CS-135	3.559E-01	2.634E-01	2.149E-01
BA-137M	4.173E-01	1.152E-01	6.556E-02
CS-137	4.408E-01	1.217E-01	6.925E-02
HG-203	2.654E-01	3.637E+00	3.759E+00
TL-208	2.870E-01	8.156E-02	6.791E-02
PB-210	1.480E+00	9.261E-01	5.346E-01
BI-212	1.795E+00	1.019E+00	7.345E-01
PB-212	1.192E+00	1.234E-01	8.005E-02
BI-214	8.644E-01	1.465E-01	9.851E-02
PB-214	1.070E+00	1.861E-01	1.207E-01
RN-222	8.644E-01	1.465E-01	9.851E-02
RA-224	9.903E-01	1.157E+00	8.588E-01
RA-226	8.644E-01	1.465E-01	9.851E-02
AC-228	1.236E+00	2.852E-01	2.059E-01
RA-228	1.236E+00	2.852E-01	2.059E-01
TH-228	1.192E+00	1.234E-01	8.005E-02
TH-229	-2.553E-01	4.379E-01	7.714E-01
TH-230	8.641E-01	1.464E-01	9.848E-02
TH-232	1.236E+00	2.852E-01	2.059E-01
TH-234	9.143E-01	1.088E+00	8.558E-01
U-234	8.641E-01	1.464E-01	9.848E-02
U-235	7.009E-04	1.524E-01	2.858E-01
U-238	9.143E-01	1.088E+00	8.558E-01
AM-243	1.716E-01	5.854E-02	4.948E-02
ANH-511	1.434E-01	8.432E-02	4.633E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.198E+00	1.188E+01	2.333E+01	NOT IDENT.
NA-22	-8.524E-03	4.026E-02	7.806E-02	NOT IDENT.

NA-24	0.000E+00	1.218E+41	0.000E+00	SHORT HLIF
AL-26	-1.819E-02	2.522E-02	3.887E-02	NOT IDENT.
SC-46	2.973E-02	3.425E-01	6.047E-01	FAIL ABUN
V-48	0.000E+00	1.099E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	3.698E+02	0.000E+00	SHORT HLIF
MN-54	2.230E-02	5.728E-02	1.160E-01	NOT IDENT.
CO-56	-6.903E-02	4.712E-01	8.916E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	7.749E-03	3.492E-02	6.848E-02	NOT IDENT.
CO-58	-1.150E-01	6.885E-01	1.013E+00	NOT IDENT.
FE-59	2.591E+00	6.204E+00	1.314E+01	NOT IDENT.
CO-60	6.116E-03	3.470E-02	7.276E-02	NOT IDENT.
ZN-65	-1.431E-01	2.130E-01	3.177E-01	NOT IDENT.
GE-68	-2.938E-01	2.118E+00	4.172E+00	NOT IDENT.
AS-73	-1.457E-01	1.670E+00	3.358E+00	NOT IDENT.
AS-74	0.000E+00	4.936E+03	0.000E+00	SHORT HLIF
SE-75	1.219E-02	1.742E-01	3.234E-01	NOT IDENT.
BR-77	0.000E+00	1.219E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.493E+02	0.000E+00	SHORT HLIF
RB-83	-2.829E-01	5.702E-01	1.045E+00	FAIL ABUN
KR-85	1.970E+00	5.981E+00	1.118E+01	NOT IDENT.
SR-85	2.010E-01	6.181E-01	1.155E+00	NOT IDENT.
RB-86	0.000E+00	2.381E+04	0.000E+00	SHORT HLIF
Y-88	9.869E-02	1.990E-01	4.849E-01	NOT IDENT.
Y-91	-4.783E+02	5.949E+02	1.021E+03	NOT IDENT.
NB-94	2.110E-02	3.395E-02	6.849E-02	NOT IDENT.
NB-95	-9.650E-01	9.129E-01	1.453E+00	NOT IDENT.
NB-95M	-1.421E+00	2.144E+00	3.333E+00	NOT IDENT.
ZR-95	-4.361E-02	1.500E+00	2.538E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	7.475E+40	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.007E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.684E+41	0.000E+00	SHORT HLIF
RH-101	-2.626E-02	2.720E-02	4.825E-02	NOT IDENT.
RH-102	1.073E-02	4.765E-02	9.727E-02	NOT IDENT.
RU-103	-3.534E+00	4.918E+00	8.768E+00	FAIL ABUN
RH-106	2.090E-01	4.657E-01	9.522E-01	NOT IDENT.
RU-106	2.090E-01	4.657E-01	9.522E-01	NOT IDENT.
AG-108M	-1.608E-02	2.313E-02	4.206E-02	NOT IDENT.
AG-110M	-5.618E-02	8.945E-02	1.502E-01	FAIL ABUN
SN-113	-7.373E-02	1.739E-01	3.317E-01	NOT IDENT.
CD-115	0.000E+00	1.474E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	7.285E+04	0.000E+00	SHORT HLIF
TE-123M	-3.381E-02	1.057E-01	1.945E-01	NOT IDENT.
SB-124	5.851E-01	1.573E+00	3.832E+00	NOT IDENT.
SB-125	1.226E-01	1.638E-01	2.028E-01	FAIL ABUN
TE-125M	3.826E+01	2.051E+02	4.006E+02	NOT IDENT.
I-126	0.000E+00	7.802E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.085E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.410E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	3.679E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.222E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.054E+26	0.000E+00	SHORT HLIF
BA-133	1.321E-02	3.586E-02	6.805E-02	FAIL ABUN
I-133	0.000E+00	1.526E+41	0.000E+00	SHORT HLIF
CS-134	4.753E-02	7.744E-02	1.062E-01	FAIL ABUN
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.302E+05	0.000E+00	SHORT HLIF
CE-139	5.537E-04	9.138E-02	1.721E-01	NOT IDENT.
BA-140	0.000E+00	9.242E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.833E+05	0.000E+00	SHORT HLIF
CE-141	1.082E+01	1.897E+01	3.748E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	4.280E-02	2.800E-01	5.411E-01	FAIL ABUN
PM-144	-1.650E-02	5.341E-02	9.727E-02	NOT IDENT.
PR-144	-1.460E+00	4.631E+00	8.426E+00	NOT IDENT.
PM-146	2.852E-02	4.088E-02	8.571E-02	FAIL ABUN
ND-147	0.000E+00	4.757E+07	0.000E+00	SHORT HLIF
PM-147	-2.543E+02	6.036E+02	1.126E+03	NOT IDENT.
PM-149	0.000E+00	2.111E+40	0.000E+00	SHORT HLIF
EU-150	-1.118E-02	2.838E-02	4.399E-02	FAIL ABUN
EU-152	1.583E-02	8.325E-02	1.542E-01	FAIL ABUN
GD-153	-3.971E-02	1.225E-01	2.322E-01	NOT IDENT.
EU-154	-1.862E-02	9.932E-02	1.934E-01	NOT IDENT.
EU-155	5.563E-02	8.219E-02	1.657E-01	FAIL ABUN
TB-160	3.548E-01	1.808E+00	3.530E+00	FAIL ABUN
HO-166M	-2.302E-02	5.423E-02	9.785E-02	FAIL ABUN
TM-171	1.147E+00	3.793E+00	7.812E+00	NOT IDENT.

HF-172	1.406E-01	1.800E-01	3.641E-01	FAIL ABUN
LU-172	3.597E-02	8.218E-02	1.708E-01	FAIL ABUN
LU-176	-2.303E-02	2.340E-02	3.722E-02	FAIL ABUN
HF-181	-2.095E+00	4.058E+00	7.444E+00	NOT IDENT.
TA-182	1.355E-01	8.576E-01	1.568E+00	FAIL ABUN
RE-183	-2.948E-02	8.280E-01	1.657E+00	NOT IDENT.
RE-184	1.334E+01	2.908E+01	5.875E+01	NOT IDENT.
W-188	9.998E+01	1.138E+02	2.104E+02	FAIL ABUN
IR-192	1.234E-01	4.267E-01	7.979E-01	FAIL ABUN
BI-207	1.032E-03	4.267E-02	8.643E-02	FAIL ABUN
BI-211	0.000E+00	5.125E-01	8.430E-01	FAIL ABUN
PB-211	2.983E-01	6.093E-01	1.254E+00	FAIL ABUN
RN-219	-1.275E-01	3.364E-01	6.381E-01	NOT IDENT.
RA-223	-2.049E-01	6.432E-01	1.013E+00	FAIL ABUN
AC-227	2.618E-02	1.990E-01	3.709E-01	FAIL ABUN
TH-227	2.618E-02	1.990E-01	3.709E-01	FAIL ABUN
PA-231	-1.344E-01	4.492E-01	7.813E-01	NOT IDENT.
TH-231	-2.049E-01	6.432E-01	1.013E+00	FAIL ABUN
PA-233	3.083E-02	5.582E-02	1.074E-01	FAIL ABUN
PA-234	1.892E-01	2.740E-01	5.727E-01	NOT IDENT.
PA-234M	-6.718E-01	4.014E+00	7.941E+00	NOT IDENT.
NP-237	3.083E-02	5.582E-02	1.074E-01	FAIL ABUN
NP-238	0.000E+00	1.938E+41	0.000E+00	SHORT HLIF
NP-239	-1.725E-01	1.917E-01	3.446E-01	FAIL ABUN
PU-239	1.092E+02	2.525E+02	4.958E+02	NOT IDENT.
AM-241	2.777E-02	4.648E-02	9.007E-02	NOT IDENT.
CM-243	-2.004E-02	6.947E-02	1.323E-01	FAIL ABUN
BK-247	1.205E-02	6.575E-02	1.145E-01	FAIL ABUN
CM-247	-4.604E-03	3.008E-02	5.856E-02	FAIL ABUN
CF-249	2.627E-02	3.068E-02	6.637E-02	NOT IDENT.
CF-251	-2.207E-02	9.952E-02	1.827E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	452	10.66*	1.244E+00	1.807E+01	1.807E+01	9.45
CD-109	88.03	173	3.70*	8.913E+00	2.789E+00	4.363E+00	34.45
SN-126	64.28	58	9.60	9.123E+00	3.524E-01	3.524E-01	121.47
	86.94	173	8.90	8.913E+00	1.160E+00	1.160E+00	34.45
	87.57	173	37.00*	8.913E+00	2.789E-01	2.789E-01	34.45
CS-135	268.22	54	16.00*	5.040E+00	3.559E-01	3.559E-01	75.52
BA-137M	661.66	168	89.90*	2.416E+00	4.095E-01	4.173E-01	28.18
CS-137	661.66	168	85.10*	2.416E+00	4.326E-01	4.408E-01	28.18
HG-203	70.83	-----	3.69	9.006E+00	-----	Line Not Found	-----
	72.87	-----	6.19	8.990E+00	-----	Line Not Found	-----
	279.20	20	81.56*	4.917E+00	2.638E-02	2.215E+00	165.55
TL-208	277.37	20	6.60	4.917E+00	3.260E-01	3.260E-01	165.55
	583.19	123	85.00*	2.673E+00	2.870E-01	2.870E-01	29.00
	860.56	-----	12.50	1.959E+00	-----	Line Not Found	-----
PB-210	46.54	112	4.25*	9.655E+00	1.443E+00	1.480E+00	63.86
BI-211	72.87	-----	1.23	8.990E+00	-----	Line Not Found	-----
	351.06	290	12.92*	4.043E+00	2.948E+00	2.948E+00	17.74
BI-212	727.33	51	6.67*	2.240E+00	1.795E+00	1.795E+00	57.93
	785.37	25	1.10	2.105E+00	5.833E+00	5.833E+00	100.60
	1620.50	-----	1.47	1.126E+00	-----	Line Not Found	-----
PB-212	74.82	319	10.28	8.980E+00	1.835E+00	1.835E+00	19.40
	77.11	593	17.10	8.967E+00	2.051E+00	2.051E+00	11.84
	238.63	545	43.60*	5.564E+00	1.192E+00	1.192E+00	10.57
	300.09	-----	3.30	4.613E+00	-----	Line Not Found	-----
BI-214	609.32	191	45.49*	2.581E+00	8.641E-01	8.644E-01	17.29
	1120.29	38	14.92	1.575E+00	8.566E-01	8.569E-01	63.42
	1764.49	40	15.30	1.032E+00	1.329E+00	1.329E+00	30.86
PB-214	74.82	319	5.80	8.980E+00	3.252E+00	3.253E+00	19.40
	77.11	593	9.70	8.967E+00	3.616E+00	3.618E+00	11.84
	87.09	173	3.41	8.913E+00	3.026E+00	3.028E+00	34.45
	242.00	137	7.25	5.506E+00	1.824E+00	1.825E+00	33.13
	295.22	206	18.42	4.680E+00	1.264E+00	1.265E+00	22.46
	351.93	290	35.60*	4.043E+00	1.070E+00	1.070E+00	17.74
RN-222	609.32	191	45.49*	2.581E+00	8.641E-01	8.644E-01	17.29
	1120.29	38	14.92	1.575E+00	8.566E-01	8.569E-01	63.42
	1764.49	40	15.30	1.032E+00	1.329E+00	1.329E+00	30.86
RA-224	240.99	137	4.10*	5.506E+00	3.226E+00	3.226E+00	33.13
RA-226	609.32	191	45.49*	2.581E+00	8.641E-01	8.644E-01	17.29
	1120.29	38	14.92	1.575E+00	8.566E-01	8.569E-01	63.42
	1764.49	40	15.30	1.032E+00	1.329E+00	1.329E+00	30.86
AC-228	105.21	-----	1.10	8.704E+00	-----	Line Not Found	-----
	338.32	109	11.27	4.180E+00	1.223E+00	1.223E+00	31.98
	794.95	12	4.25	2.087E+00	7.274E-01	7.274E-01	166.25
	835.71	-----	1.61	2.005E+00	-----	Line Not Found	-----
	911.20	112	25.80*	1.870E+00	1.236E+00	1.236E+00	23.55
	968.97	51	15.80	1.778E+00	9.614E-01	9.614E-01	30.58
RA-228	105.21	-----	1.10	8.704E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	338.32	109	11.27	4.180E+00	1.223E+00	1.223E+00	31.98
	794.95	12	4.25	2.087E+00	7.274E-01	7.274E-01	166.25
	835.71	-----	1.61	2.005E+00	-----	Line Not Found	-----
	911.20	112	25.80*	1.870E+00	1.236E+00	1.236E+00	23.55
	968.97	51	15.80	1.778E+00	9.614E-01	9.614E-01	30.58
TH-228	74.82	319	10.28	8.980E+00	1.835E+00	1.835E+00	19.40
	77.11	593	17.10	8.967E+00	2.051E+00	2.051E+00	11.84
	238.63	545	43.60*	5.564E+00	1.192E+00	1.192E+00	10.57
	300.09	-----	3.30	4.613E+00	-----	Line Not Found	-----
TH-229	85.43	173	14.70	8.913E+00	7.021E-01	7.021E-01	34.45
	88.47	113	24.00	8.895E+00	2.808E-01	2.808E-01	55.31
	193.51	-----	4.41*	6.511E+00	-----	Line Not Found	-----
	210.85	-----	2.80	6.116E+00	-----	Line Not Found	-----
TH-230	609.32	191	45.49*	2.581E+00	8.641E-01	8.641E-01	17.29
	1120.29	38	14.92	1.575E+00	8.566E-01	8.566E-01	63.42
	1764.49	40	15.30	1.032E+00	1.329E+00	1.329E+00	30.86
TH-232	105.21	-----	1.10	8.704E+00	-----	Line Not Found	-----
	338.32	109	11.27	4.180E+00	1.223E+00	1.223E+00	31.98
	835.71	-----	1.61	2.005E+00	-----	Line Not Found	-----
	911.20	112	25.80*	1.870E+00	1.236E+00	1.236E+00	23.55
	968.97	51	15.80	1.778E+00	9.614E-01	9.614E-01	30.58
TH-234	63.29	58	3.70*	9.123E+00	9.143E-01	9.143E-01	121.47
	92.59	162	4.23	8.870E+00	2.293E+00	2.293E+00	41.31
U-234	609.32	191	45.49*	2.581E+00	8.641E-01	8.641E-01	17.29
	1120.29	38	14.92	1.575E+00	8.566E-01	8.566E-01	63.42
	1764.49	40	15.30	1.032E+00	1.329E+00	1.329E+00	30.86
U-235	89.96	113	3.47	8.895E+00	1.942E+00	1.942E+00	55.31
	93.35	162	5.60	8.870E+00	1.732E+00	1.732E+00	41.31
	143.76	-----	10.96*	7.808E+00	-----	Line Not Found	-----
	163.33	-----	5.08	7.279E+00	-----	Line Not Found	-----
	185.72	158	57.20	6.697E+00	2.183E-01	2.183E-01	38.33
	205.31	-----	5.01	6.238E+00	-----	Line Not Found	-----
U-238	63.29	58	3.70*	9.123E+00	9.143E-01	9.143E-01	121.47
	92.59	162	4.23	8.870E+00	2.293E+00	2.293E+00	41.31
AM-243	43.53	-----	5.90	9.491E+00	-----	Line Not Found	-----
	74.66	319	67.20*	8.980E+00	2.807E-01	2.807E-01	19.40
ANH-511	511.00	80	100.00*	2.976E+00	1.434E-01	1.434E-01	59.99

Flag: "*" = Keyline

Total number of lines in spectrum 58
 Number of unidentified lines 16
 Number of lines tentatively identified by NID 42 72.41%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.807E+01	1.807E+01	0.171E+01	9.45	
CD-109	461.40D	1.56	2.789E+00	4.363E+00	1.503E+00	34.45	
SN-126	2.30E+05Y	1.00	2.789E-01	2.789E-01	0.961E-01	34.45	
CS-135	2.30E+06Y	1.00	3.559E-01	3.559E-01	2.688E-01	75.52	
BA-137M	30.08Y	1.02	4.095E-01	4.173E-01	1.176E-01	28.18	
CS-137	30.08Y	1.02	4.326E-01	4.408E-01	1.242E-01	28.18	
HG-203	46.59D	84.0	2.638E-02	2.215E+00	3.667E+00	165.55	
TL-208	1.41E+10Y	1.00	2.870E-01	2.870E-01	0.832E-01	29.00	
PB-210	22.20Y	1.03	1.443E+00	1.480E+00	0.945E+00	63.86	
BI-211	7.04E+08Y	1.00	2.948E+00	2.948E+00	0.523E+00	17.74	
BI-212	1.41E+10Y	1.00	1.795E+00	1.795E+00	1.040E+00	57.93	
PB-212	1.41E+10Y	1.00	1.192E+00	1.192E+00	0.126E+00	10.57	
BI-214	1600.00Y	1.00	8.641E-01	8.644E-01	1.495E-01	17.29	
PB-214	1600.00Y	1.00	1.070E+00	1.070E+00	0.190E+00	17.74	
RN-222	1600.00Y	1.00	8.641E-01	8.644E-01	1.495E-01	17.29	
RA-224	1.41E+10Y	1.00	3.226E+00	3.226E+00	1.069E+00	33.13	
RA-226	1600.00Y	1.00	8.641E-01	8.644E-01	1.495E-01	17.29	
AC-228	1.41E+10Y	1.00	1.236E+00	1.236E+00	0.291E+00	23.55	
RA-228	1.41E+10Y	1.00	1.236E+00	1.236E+00	0.291E+00	23.55	
TH-228	1.41E+10Y	1.00	1.192E+00	1.192E+00	0.126E+00	10.57	
TH-229	7340.00Y	1.00	2.808E-01	2.808E-01	1.553E-01	55.31	K
TH-230	7.54E+04Y	1.00	8.641E-01	8.641E-01	1.494E-01	17.29	
TH-232	1.41E+10Y	1.00	1.236E+00	1.236E+00	0.291E+00	23.55	
TH-234	4.47E+09Y	1.00	9.143E-01	9.143E-01	11.11E-01	121.47	
U-234	2.45E+05Y	1.00	8.641E-01	8.641E-01	1.494E-01	17.29	
U-235	7.04E+08Y	1.00	2.183E-01	2.183E-01	0.837E-01	38.33	K
U-238	4.47E+09Y	1.00	9.143E-01	9.143E-01	11.11E-01	121.47	
AM-243	7370.00Y	1.00	2.807E-01	2.807E-01	0.545E-01	19.40	
ANH-511	1.00E+09Y	1.00	1.434E-01	1.434E-01	0.860E-01	59.99	
Total Activity :			4.629E+01	5.011E+01			

Grand Total Activity : 4.629E+01 5.011E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	32.25	34	158	0.67	66.34	63	6	7.19E-03	****	2.13E+00	
1	39.16	57	116	0.83	80.15	76	12	1.22E-02	70.0	8.19E+00	
1	41.51	28	107	0.84	84.85	76	12	6.03E-03	****	9.10E+00	
2	79.29	41	155	1.04	160.36	147	20	9.28E-03	****	8.95E+00	T
0	83.50	53	137	1.39	168.76	167	5	1.22E-02	80.3	8.93E+00	T
0	208.97	30	102	1.18	419.54	416	7	7.43E-03	****	6.16E+00	
0	327.78	35	41	1.08	656.98	654	6	8.82E-03	70.5	4.29E+00	T
1	339.92	31	44	1.37	681.25	671	15	7.98E-03	****	4.16E+00	T
0	409.97	33	31	1.86	821.26	818	7	8.43E-03	69.4	3.56E+00	T
2	427.28	19	37	1.62	855.85	848	26	5.02E-03	****	3.44E+00	T
2	431.57	34	37	1.62	864.44	848	26	8.90E-03	73.7	3.41E+00	
0	463.04	30	43	1.17	927.33	922	11	7.82E-03	96.0	3.22E+00	T
0	530.48	15	31	1.47	1062.12	1054	11	4.02E-03	****	2.88E+00	T
0	623.99	26	29	1.74	1249.01	1240	14	7.05E-03	96.8	2.53E+00	
0	735.20	4	21	1.06	1471.28	1466	9	1.17E-03	****	2.22E+00	T
0	754.89	10	17	0.61	1510.64	1506	8	2.61E-03	****	2.18E+00	T
0	806.54	10	21	0.50	1613.88	1608	9	2.85E-03	****	2.06E+00	
0	815.54	7	18	1.27	1631.86	1626	10	1.88E-03	****	2.05E+00	T
0	892.23	15	6	1.85	1785.15	1780	9	4.09E-03	81.8	1.90E+00	
0	920.75	7	11	1.40	1842.14	1836	9	1.94E-03	****	1.85E+00	
2	934.55	24	4	2.10	1869.73	1863	19	6.81E-03	59.2	1.83E+00	
2	938.82	14	0	2.11	1878.27	1863	19	4.00E-03	57.4	1.83E+00	T
0	964.48	31	11	0.73	1929.55	1924	11	8.61E-03	54.8	1.79E+00	T
3	973.23	14	1	2.35	1947.04	1935	16	4.02E-03	66.4	1.77E+00	
0	1035.77	4	21	1.05	2072.04	2064	10	1.14E-03	****	1.68E+00	
0	1156.90	7	8	1.13	2314.17	2311	7	1.95E-03	****	1.53E+00	
0	1230.25	12	18	3.83	2460.78	2449	15	3.48E-03	****	1.45E+00	T
0	1238.71	33	16	2.38	2477.68	2471	11	9.29E-03	58.4	1.44E+00	T
0	1280.62	15	3	1.95	2561.44	2558	7	4.42E-03	63.1	1.40E+00	
0	1377.31	16	0	1.29	2754.71	2748	12	4.72E-03	48.5	1.31E+00	
0	1631.06	11	0	1.44	3261.92	3257	10	3.33E-03	57.7	1.12E+00	

Flags: "T" = Tentatively associated

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621351.CNF;1
* Acquisition date   : 3-OCT-2016 08:53:50 Sensitivity      : 3.000
* Detector ID       : GAM05 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.64 Half life ratio  : *****
* Sample date       : 10-DEC-2015 14:20:00 Nuclide Library : SOLID
* Sample ID         : G1203621351 Analyst initials: MXR1
* Batch Number      : 1596247 Sample Quantity : 1.4159E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight      : 0.00000
*                   Dry Weight      : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 4-SEP-2016 08:00:28 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;20
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.113E-01
CD-109	5.445E-01
SN-126	3.478E-02
CS-135	9.828E-02
BA-137M	2.935E-02
CS-137	3.101E-02
HG-203	1.723E+00
TL-208	3.073E-02
PB-210	2.481E-01
BI-212	3.184E-01
PB-212	3.695E-02
BI-214	4.302E-02
PB-214	5.519E-02
RN-222	4.302E-02
RA-224	3.965E-01
RA-226	4.302E-02
AC-228	8.789E-02
RA-228	8.789E-02
TH-228	3.695E-02
TH-229	3.597E-01
TH-230	4.300E-02
TH-232	8.789E-02
TH-234	4.053E-01
U-234	4.300E-02
U-235	1.341E-01
U-238	4.053E-01
AM-243	2.348E-02
ANH-511	2.070E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.058E+01	NOT IDENT.
NA-22	3.266E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF

AL-26	1.228E-02	NOT IDENT.
SC-46	2.576E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.096E-02	NOT IDENT.
CO-56	3.927E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	3.199E-02	NOT IDENT.
CO-58	4.411E-01	NOT IDENT.
FE-59	5.743E+00	NOT IDENT.
CO-60	3.045E-02	NOT IDENT.
ZN-65	1.378E-01	NOT IDENT.
GE-68	1.791E+00	NOT IDENT.
AS-73	1.576E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.479E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.616E-01	FAIL ABUN
KR-85	4.986E+00	NOT IDENT.
SR-85	5.149E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.919E-01	NOT IDENT.
Y-91	4.467E+02	NOT IDENT.
NB-94	3.107E-02	NOT IDENT.
NB-95	6.411E-01	NOT IDENT.
NB-95M	1.532E+00	NOT IDENT.
ZR-95	1.114E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.253E-02	NOT IDENT.
RH-102	4.258E-02	NOT IDENT.
RU-103	3.874E+00	FAIL ABUN
RH-106	4.256E-01	NOT IDENT.
RU-106	4.256E-01	NOT IDENT.
AG-108M	1.863E-02	NOT IDENT.
AG-110M	6.317E-02	FAIL ABUN
SN-113	1.474E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	9.044E-02	NOT IDENT.
SB-124	1.484E+00	NOT IDENT.
SB-125	9.258E-02	FAIL ABUN
TE-125M	1.885E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.088E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	4.776E-02	FAIL ABUN
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	8.024E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.759E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.532E-01	FAIL ABUN
PM-144	4.305E-02	NOT IDENT.
PR-144	3.728E+00	NOT IDENT.
PM-146	3.903E-02	FAIL ABUN
ND-147	0.000E+00	SHORT HLIF
PM-147	5.240E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.014E-02	FAIL ABUN
EU-152	7.008E-02	FAIL ABUN
GD-153	1.091E-01	NOT IDENT.
EU-154	8.106E-02	NOT IDENT.
EU-155	7.822E-02	FAIL ABUN
TB-160	1.547E+00	FAIL ABUN
HO-166M	4.300E-02	FAIL ABUN
TM-171	3.676E+00	NOT IDENT.
HF-172	1.711E-01	FAIL ABUN

LU-172	7.575E-02	FAIL ABUN
LU-176	1.686E-02	FAIL ABUN
HF-181	3.340E+00	NOT IDENT.
TA-182	6.729E-01	FAIL ABUN
RE-183	7.826E-01	NOT IDENT.
RE-184	2.593E+01	NOT IDENT.
W-188	9.768E+01	FAIL ABUN
IR-192	3.657E-01	FAIL ABUN
BI-207	3.722E-02	FAIL ABUN
BI-211	4.075E-01	FAIL ABUN
PB-211	5.730E-01	FAIL ABUN
RN-219	2.882E-01	NOT IDENT.
RA-223	4.635E-01	FAIL ABUN
AC-227	1.705E-01	FAIL ABUN
TH-227	1.705E-01	FAIL ABUN
PA-231	3.605E-01	NOT IDENT.
TH-231	4.635E-01	FAIL ABUN
PA-233	4.938E-02	FAIL ABUN
PA-234	2.530E-01	NOT IDENT.
PA-234M	3.473E+00	NOT IDENT.
NP-237	4.938E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.611E-01	FAIL ABUN
PU-239	2.334E+02	NOT IDENT.
AM-241	4.273E-02	NOT IDENT.
CM-243	6.190E-02	FAIL ABUN
BK-247	5.237E-02	FAIL ABUN
CM-247	2.645E-02	FAIL ABUN
CF-249	3.018E-02	NOT IDENT.
CF-251	8.510E-02	NOT IDENT.

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621351.CNF;1
* Acquisition date   : 3-OCT-2016 08:53:50 Sensitivity      : 3.000
* Detector ID        : GAM05 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.64 Half life ratio  : *****
* Sample date        : 10-DEC-2015 14:20:00 Nuclide Library : SOLID
* Sample ID          : G1203621351 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.4159E+02 GRAM
*                   : Quantity Err(%) : 1.4126E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight       : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 4-SEP-2016 08:00:28 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;20
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.807E+01	1.921E+00	1.921E+00
CD-109	2.540E+00	1.557E+00	1.557E+00
SN-126	1.624E-01	9.918E-02	9.918E-02
CS-135	3.559E-01	2.645E-01	2.645E-01
BA-137M	4.173E-01	1.166E-01	1.166E-01
CS-137	4.408E-01	1.232E-01	1.232E-01
HG-203	2.654E-01	3.643E+00	3.643E+00
TL-208	2.870E-01	8.247E-02	8.247E-02
PB-210	1.480E+00	9.379E-01	9.379E-01
BI-212	1.795E+00	1.023E+00	1.023E+00
PB-212	1.192E+00	1.387E-01	1.387E-01
BI-214	8.644E-01	1.511E-01	1.511E-01
PB-214	1.070E+00	1.913E-01	1.913E-01
RN-222	8.644E-01	1.511E-01	1.511E-01
RA-224	9.903E-01	1.168E+00	1.168E+00
RA-226	8.644E-01	1.511E-01	1.511E-01
AC-228	1.236E+00	2.921E-01	2.921E-01
RA-228	1.236E+00	2.921E-01	2.921E-01
TH-228	1.192E+00	1.387E-01	1.387E-01
TH-229	-2.553E-01	4.381E-01	4.381E-01
TH-230	8.641E-01	1.511E-01	1.511E-01
TH-232	1.236E+00	2.921E-01	2.921E-01
TH-234	9.143E-01	1.107E+00	1.107E+00
U-234	8.641E-01	1.511E-01	1.511E-01
U-235	7.009E-04	1.524E-01	1.524E-01
U-238	9.143E-01	1.107E+00	1.107E+00
AM-243	1.716E-01	6.106E-02	6.106E-02
ANH-511	1.434E-01	8.452E-02	8.452E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.198E+00	1.188E+01	1.189E+01	NOT IDENT.
NA-22	-8.524E-03	4.027E-02	4.045E-02	NOT IDENT.

NA-24	-1.000E+41	1.293E+41	0.000E+00	SHORT HLIF
AL-26	-1.819E-02	2.525E-02	2.655E-02	NOT IDENT.
SC-46	2.973E-02	3.425E-01	3.428E-01	FAIL ABUN
V-48	-5.603E+03	1.100E+04	1.128E+04	SHORT HLIF
CR-51	-3.415E+01	3.698E+02	3.701E+02	SHORT HLIF
MN-54	2.230E-02	5.729E-02	5.816E-02	NOT IDENT.
CO-56	-6.903E-02	4.712E-01	4.722E-01	FAIL ABUN
MN-56	-1.000E+41	7.515E+41	0.000E+00	SHORT HLIF
CO-57	7.749E-03	3.493E-02	3.510E-02	NOT IDENT.
CO-58	-1.150E-01	6.885E-01	6.904E-01	NOT IDENT.
FE-59	2.591E+00	6.206E+00	6.315E+00	NOT IDENT.
CO-60	6.116E-03	3.470E-02	3.481E-02	NOT IDENT.
ZN-65	-1.431E-01	2.130E-01	2.226E-01	NOT IDENT.
GE-68	-2.938E-01	2.118E+00	2.122E+00	NOT IDENT.
AS-73	-1.457E-01	1.670E+00	1.671E+00	NOT IDENT.
AS-74	-5.065E+02	4.936E+03	4.941E+03	SHORT HLIF
SE-75	1.219E-02	1.742E-01	1.743E-01	NOT IDENT.
BR-77	1.177E+38	1.012E+39	0.000E+00	SHORT HLIF
SR-82	5.163E+02	6.498E+02	6.902E+02	SHORT HLIF
RB-83	-2.829E-01	5.715E-01	5.855E-01	FAIL ABUN
KR-85	1.970E+00	5.981E+00	6.047E+00	NOT IDENT.
SR-85	2.010E-01	6.181E-01	6.247E-01	NOT IDENT.
RB-86	1.284E+03	2.381E+04	2.381E+04	SHORT HLIF
Y-88	9.869E-02	1.991E-01	2.040E-01	NOT IDENT.
Y-91	-4.783E+02	5.952E+02	6.330E+02	NOT IDENT.
NB-94	2.110E-02	3.396E-02	3.527E-02	NOT IDENT.
NB-95	-9.650E-01	9.139E-01	1.012E+00	NOT IDENT.
NB-95M	-1.421E+00	2.147E+00	2.241E+00	NOT IDENT.
ZR-95	-4.361E-02	1.500E+00	1.500E+00	NOT IDENT.
NB-97	1.000E+41	1.485E+42	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	7.486E+40	0.000E+00	SHORT HLIF
MO-99	-3.682E+30	1.007E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.687E+41	0.000E+00	SHORT HLIF
RH-101	-2.626E-02	2.761E-02	3.004E-02	NOT IDENT.
RH-102	1.073E-02	4.766E-02	4.790E-02	NOT IDENT.
RU-103	-3.534E+00	4.920E+00	5.172E+00	FAIL ABUN
RH-106	2.090E-01	4.659E-01	4.753E-01	NOT IDENT.
RU-106	2.090E-01	4.659E-01	4.753E-01	NOT IDENT.
AG-108M	-1.608E-02	2.314E-02	2.425E-02	NOT IDENT.
AG-110M	-5.618E-02	8.950E-02	9.301E-02	FAIL ABUN
SN-113	-7.373E-02	1.739E-01	1.771E-01	NOT IDENT.
CD-115	-3.925E+38	1.476E+39	0.000E+00	SHORT HLIF
SN-117M	-5.892E+04	7.318E+04	7.785E+04	SHORT HLIF
TE-123M	-3.381E-02	1.057E-01	1.068E-01	NOT IDENT.
SB-124	5.851E-01	1.574E+00	1.595E+00	NOT IDENT.
SB-125	1.226E-01	1.639E-01	1.729E-01	FAIL ABUN
TE-125M	3.826E+01	2.051E+02	2.058E+02	NOT IDENT.
I-126	4.960E+05	7.831E+05	8.144E+05	SHORT HLIF
SB-126	2.163E+05	1.086E+06	1.090E+06	SHORT HLIF
SB-127	1.259E+21	1.421E+22	0.000E+00	SHORT HLIF
I-131	-2.082E+08	3.679E+09	3.681E+09	SHORT HLIF
I-132	-1.000E+41	1.840E+42	0.000E+00	SHORT HLIF
TE-132	-2.398E+25	2.057E+26	0.000E+00	SHORT HLIF
BA-133	1.321E-02	3.587E-02	3.636E-02	FAIL ABUN
I-133	1.000E+41	2.357E+41	0.000E+00	SHORT HLIF
CS-134	4.753E-02	7.747E-02	8.038E-02	FAIL ABUN
I-135	1.000E+41	1.080E+42	0.000E+00	SHORT HLIF
CS-136	4.573E+04	2.303E+05	2.312E+05	SHORT HLIF
CE-139	5.537E-04	9.138E-02	9.138E-02	NOT IDENT.
BA-140	7.225E+05	9.247E+05	9.804E+05	SHORT HLIF
LA-140	-5.438E+05	4.840E+05	5.425E+05	SHORT HLIF
CE-141	1.082E+01	1.898E+01	1.960E+01	NOT IDENT.
CE-143	1.000E+41	2.746E+41	0.000E+00	SHORT HLIF
CE-144	4.280E-02	2.800E-01	2.807E-01	FAIL ABUN
PM-144	-1.650E-02	5.342E-02	5.393E-02	NOT IDENT.
PR-144	-1.460E+00	4.631E+00	4.678E+00	NOT IDENT.
PM-146	2.852E-02	4.093E-02	4.290E-02	FAIL ABUN
ND-147	3.118E+07	4.760E+07	4.963E+07	SHORT HLIF
PM-147	-2.543E+02	6.037E+02	6.145E+02	NOT IDENT.
PM-149	7.426E+39	2.117E+40	0.000E+00	SHORT HLIF
EU-150	-1.118E-02	2.839E-02	2.883E-02	FAIL ABUN
EU-152	1.583E-02	8.325E-02	8.356E-02	FAIL ABUN
GD-153	-3.971E-02	1.225E-01	1.238E-01	NOT IDENT.
EU-154	-1.862E-02	9.933E-02	9.968E-02	NOT IDENT.
EU-155	5.563E-02	8.229E-02	8.602E-02	FAIL ABUN
TB-160	3.548E-01	1.809E+00	1.816E+00	FAIL ABUN
HO-166M	-2.302E-02	5.424E-02	5.523E-02	FAIL ABUN
TM-171	1.147E+00	3.795E+00	3.830E+00	NOT IDENT.

HF-172	1.406E-01	1.815E-01	1.922E-01	FAIL ABUN
LU-172	3.597E-02	8.226E-02	8.384E-02	FAIL ABUN
LU-176	-2.303E-02	2.342E-02	2.562E-02	FAIL ABUN
HF-181	-2.095E+00	4.059E+00	4.168E+00	NOT IDENT.
TA-182	1.355E-01	8.576E-01	8.598E-01	FAIL ABUN
RE-183	-2.948E-02	8.280E-01	8.281E-01	NOT IDENT.
RE-184	1.334E+01	2.926E+01	2.987E+01	NOT IDENT.
W-188	9.998E+01	1.144E+02	1.229E+02	FAIL ABUN
IR-192	1.234E-01	4.267E-01	4.303E-01	FAIL ABUN
BI-207	1.032E-03	4.267E-02	4.267E-02	FAIL ABUN
BI-211	2.948E+00	5.292E-01	1.430E+00	FAIL ABUN
PB-211	2.983E-01	6.095E-01	6.242E-01	FAIL ABUN
RN-219	-1.275E-01	3.368E-01	3.417E-01	NOT IDENT.
RA-223	-2.049E-01	6.433E-01	6.499E-01	FAIL ABUN
AC-227	2.618E-02	1.990E-01	1.994E-01	FAIL ABUN
TH-227	2.618E-02	1.990E-01	1.994E-01	FAIL ABUN
PA-231	-1.344E-01	4.501E-01	4.542E-01	NOT IDENT.
TH-231	-2.049E-01	6.433E-01	6.499E-01	FAIL ABUN
PA-233	3.083E-02	5.584E-02	5.754E-02	FAIL ABUN
PA-234	1.892E-01	3.491E-01	3.594E-01	NOT IDENT.
PA-234M	-6.718E-01	4.014E+00	4.025E+00	NOT IDENT.
NP-237	3.083E-02	5.584E-02	5.754E-02	FAIL ABUN
NP-238	-2.003E+39	1.938E+41	0.000E+00	SHORT HLIF
NP-239	-1.725E-01	1.922E-01	2.074E-01	FAIL ABUN
PU-239	1.092E+02	2.525E+02	2.573E+02	NOT IDENT.
AM-241	2.777E-02	4.653E-02	4.818E-02	NOT IDENT.
CM-243	-2.004E-02	6.949E-02	7.008E-02	FAIL ABUN
BK-247	1.205E-02	6.579E-02	6.602E-02	FAIL ABUN
CM-247	-4.604E-03	3.009E-02	3.016E-02	FAIL ABUN
CF-249	2.627E-02	3.075E-02	3.295E-02	NOT IDENT.
CF-251	-2.207E-02	9.955E-02	1.000E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	49.1228	87.09	76.1071	136.47	69.0987
45.60	55.7147	87.57	76.1977	140.51	0.0000
46.54	55.9163	88.03	76.2836	143.76	73.9265
49.72	0.0000	88.34	76.3411	144.24	68.0682
51.35	80.6338	88.47	76.3656	145.44	65.2417
51.87	66.5273	89.96	76.6420	152.43	64.0059
52.39	68.2366	1093.63	76.7676	153.25	0.0000
52.97	71.5557	91.11	0.0000	323.87	70.2094
53.44	70.8767	92.59	77.1247	156.02	0.0000
54.07	76.6183	93.35	77.2629	158.56	0.0000
57.36	0.0000	94.56	73.9057	159.00	65.6982
57.53	91.2452	94.65	73.9214	162.33	67.0594
57.98	97.8495	94.67	73.9246	162.66	0.0000
59.27	93.1185	94.87	73.9586	163.33	64.1113
59.32	93.1339	97.43	84.5951	165.86	63.3415
59.54	96.4511	98.43	75.7671	176.31	61.2300
60.96	102.3334	98.44	75.7687	176.60	0.0000
61.17	99.1332	99.53	73.2425	177.52	66.5361
62.93	106.8018	100.11	66.0944	181.07	0.0000
63.29	106.9211	102.03	72.7411	181.52	55.7690
63.58	107.0168	103.18	86.5982	184.41	75.5991
64.28	106.6966	103.37	78.4263	143.76	62.0645
66.73	103.0565	105.21	80.5711	193.51	77.6271
67.24	109.0391	105.31	77.8412	197.03	72.6567
125.81	109.1810	106.12	84.3984	198.01	58.8437
67.75	111.7038	106.47	94.5602	201.83	78.5004
69.67	114.8485	109.28	80.3472	203.43	70.0454
70.83	114.3900	111.00	77.8553	205.31	99.3868
72.81	121.7988	111.76	0.0000	210.85	66.7343
72.87	121.8197	114.06	58.7587	215.65	56.9250
74.66	115.6247	116.30	0.0000	222.11	46.3483
74.82	115.6755	116.74	90.9597	227.09	44.4104
74.97	115.7233	119.76	78.2976	227.38	47.7576
77.11	116.3987	121.12	69.0474	228.16	0.0000
78.74	116.9072	121.22	69.0607	228.18	45.5807
79.69	117.2008	121.78	71.9765	116.74	45.5807
80.12	117.3326	122.06	62.5402	235.69	58.3278
80.19	0.0000	122.92	69.2880	235.96	58.3469
80.57	117.4706	123.07	71.2069	238.63	48.3986
81.00	117.6024	265.00	72.2404	238.98	0.0000
81.07	117.6241	125.81	63.9442	240.99	48.5312
81.75	62.3809	127.23	89.9520	242.00	48.5882
83.79	80.1266	127.91	76.6528	244.70	45.3381
84.00	88.8835	129.30	74.9293	252.40	0.0000
85.43	89.2041	131.20	73.2643	252.80	41.1784
86.55	76.0059	133.02	84.1472	254.15	0.0000
86.79	76.0509	133.52	67.7655	256.23	41.3350
86.94	76.0793	136.00	70.0137	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	37.0801	355.39	0.0000	584.27	31.0475
264.80	37.0859	356.01	26.5422	595.83	0.0000
265.00	35.5482	364.49	0.0000	427.87	32.8254
268.22	38.3849	366.42	0.0000	602.52	0.0000
269.46	38.4352	372.51	29.8994	604.72	20.9359
270.03	38.4584	375.05	35.9545	607.14	25.4564
271.23	46.6748	377.52	35.1685	609.32	15.9915
273.65	0.0000	356.01	31.8993	610.33	19.5008
276.40	46.9275	388.16	21.6273	614.28	18.0396
277.37	46.9751	388.63	0.0000	618.01	18.0754
277.60	46.9861	391.69	26.8929	620.36	21.1154
278.00	43.8719	264.66	27.0815	621.93	18.1143
279.20	40.7890	401.81	34.9748	630.19	0.0000
279.54	34.5254	402.40	31.4912	631.29	12.1362
279.70	34.5308	404.85	29.7977	633.25	22.2730
280.46	45.5538	410.95	33.0177	634.78	0.0000
283.69	39.0062	413.71	27.7926	635.95	19.2636
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	42.6270	423.72	0.0000	645.85	16.3060
285.90	0.0000	427.09	29.4067	657.76	29.2248
287.50	46.2756	427.87	29.4235	657.90	0.0000
290.67	38.0908	433.94	29.5538	661.66	24.6592
293.27	0.0000	439.40	29.6699	664.57	0.0000
351.93	40.6541	453.88	24.5248	666.33	0.0000
295.96	40.6842	463.37	22.8577	666.50	0.0000
879.38	51.1849	468.07	26.4164	667.71	0.0000
299.98	44.4479	473.00	0.0000	677.62	21.7520
300.09	44.4524	475.06	31.3334	685.70	0.0000
300.13	44.4547	476.78	34.1380	695.00	0.0000
301.36	54.1310	477.60	30.4635	696.49	24.0463
302.85	37.3442	482.18	33.3347	696.51	24.0472
256.23	37.4028	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	24.0566
306.78	49.5771	497.08	28.9862	697.49	23.0125
308.46	35.1225	505.52	35.2547	702.65	23.0706
311.90	34.0225	507.63	0.0000	706.68	23.1154
316.51	35.3898	511.00	23.5850	711.68	21.0645
319.41	0.0000	514.00	18.4312	720.70	0.0000
320.08	0.0000	514.00	18.4312	721.93	0.0000
321.04	34.3130	520.40	25.6223	722.78	23.8229
323.87	45.8703	520.69	0.0000	722.91	27.0014
325.23	36.0857	522.65	0.0000	723.31	27.0066
328.76	0.0000	527.90	0.0000	724.19	20.6608
333.37	33.0469	528.26	22.8867	727.33	14.3245
333.97	47.9439	529.59	22.9053	733.00	12.7671
334.37	56.2295	529.87	0.0000	735.93	17.5789
338.28	41.0748	531.02	0.0000	333.97	15.9918
338.32	41.0758	537.26	0.0000	739.50	0.0000
311.90	41.1543	546.56	0.0000	747.24	13.9225
340.48	41.1543	552.55	20.3215	748.06	18.2133
340.55	0.0000	563.25	22.3973	752.31	16.1023
344.28	30.0300	569.33	19.5451	753.82	0.0000
345.93	31.7440	946.00	19.5475	756.73	17.7481
351.06	38.5972	569.70	17.5942	756.80	17.7488
351.93	38.6263	583.19	30.5371	884.68	22.6628

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	34.5625	1274.44	12.4427	1620.50	6.3875
766.42	25.9287	1001.03	15.1349	1621.92	8.5195
766.84	20.5308	1002.74	17.8168	1678.03	0.0000
772.60	0.0000	1004.73	20.5033	1690.97	2.1642
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	1.1000
778.90	20.8594	1028.54	0.0000	1063.66	12.1145
783.70	0.0000	1037.84	18.7599	1771.35	5.5081
785.37	15.2538	1038.76	0.0000	1791.20	0.0000
792.07	6.5566	631.29	14.4746	1808.65	4.4421
794.95	16.4124	1048.07	0.0000	1810.72	0.0000
795.86	16.4191	1049.04	9.9600	1836.06	2.2340
810.06	13.2163	1050.41	9.0588		
810.29	16.5216	1063.66	12.7396		
344.28	16.5228	1077.00	0.0000		
810.76	17.6270	1077.34	13.7137		
815.77	0.0000	1085.87	20.1711		
1048.07	0.0000	1093.63	15.6273		
832.01	18.8981	1099.45	11.9733		
834.85	13.3560	1112.07	13.8730		
835.71	17.8145	1112.84	16.6509		
836.80	0.0000	1115.54	23.7031		
846.75	0.0000	1120.29	17.6188		
846.77	15.6594	1120.55	17.6212		
856.80	0.0000	1221.41	17.6246		
860.56	19.1236	1129.67	19.5337		
871.09	12.4269	1131.51	0.0000		
873.19	18.0911	1147.95	0.0000		
875.33	0.0000	1173.23	15.0898		
879.38	14.7356	1177.95	18.8904		
880.51	13.6084	1189.05	17.0607		
883.24	13.6230	1204.77	26.6670		
884.68	15.9027	1221.41	10.7208		
889.28	10.2422	1231.02	15.3604		
894.76	5.1321	1235.36	0.0000		
898.04	20.5554	1238.28	12.5073		
900.72	16.0041	1260.41	0.0000		
903.28	13.7314	1271.87	13.6035		
911.20	11.4787	1274.44	10.6965		
912.08	11.4823	1274.54	10.6965		
923.98	0.0000	1291.59	11.7268		
926.50	12.7013	1298.22	0.0000		
929.11	19.0707	1312.11	0.0000		
937.49	9.2760	1332.49	6.9205		
944.13	0.0000	1362.66	0.0000		
946.00	11.6325	1365.19	3.9907		
949.00	15.1392	1368.63	0.0000		
667.71	0.0000	1384.29	3.0086		
962.31	12.6400	1408.01	5.0464		
964.08	8.4322	1457.56	0.0000		
966.17	7.0322	1460.82	5.1169		
911.20	8.4475	1489.16	6.1853		
968.97	8.4475	1505.03	3.1051		
983.53	0.0000	1584.12	2.1107		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621352.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM06.CNF;499
Background date : 2-OCT-2016 11:00:12.
Sample date     : 12-SEP-2016 00:00:00 Acquisition date : 3-OCT-2016 08:54:28.
Sample ID      : G1203621352 Sample quantity   : 1.15000E+02 GRAM
Detector name  : GAM06 Detector geometry: CAN
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:04.93 0.5%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity    : 3.00000
Batch ID       : 1596247 Detector SN#    :
Matrix Spike ID : LCS ID           : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.45*	5184	5306	0.95	92.64	87	11	5.76E+00	3.1	
2	9	57.98	523	1986	1.73	115.68	113	12	5.81E-01	11.5	2.22E+00
3	9	59.52	14681	1748	0.94	118.76	113	12	1.63E+01	1.0	
4	0	79.75	39	920	0.73	159.19	157	6	4.33E-02	123.8	
5	0	88.05	2683	1645	1.02	175.76	170	12	2.98E+00	3.6	
6	0	122.00	183	893	0.97	243.61	240	8	2.03E-01	29.3	
7	0	176.42	33	496	1.25	352.38	351	6	3.71E-02	106.6	
8	0	207.48	45	455	0.62	414.45	413	5	5.02E-02	72.0	
9	0	263.19	46	538	1.46	525.79	524	7	5.13E-02	84.4	
10	0	344.80	51	355	1.25	688.90	686	6	5.69E-02	60.0	
11	0	422.27	87	507	2.45	843.76	841	8	9.63E-02	46.4	
12	0	624.76	4	431	2.97	1248.56	1237	13	3.90E-03	****	
13	0	652.88	40	218	1.35	1304.78	1301	7	4.42E-02	63.7	
14	0	661.31	11922	534	1.47	1321.64	1314	16	1.32E+01	1.0	
15	0	682.16	40	198	1.27	1363.33	1359	8	4.42E-02	63.4	
16	0	868.77	65	373	4.15	1736.45	1730	12	7.18E-02	61.2	
17	0	1004.49	51	391	3.20	2007.88	2001	13	5.64E-02	81.9	
18	0	1061.17	22	263	0.95	2121.24	2118	9	2.46E-02	133.3	
19	0	1070.41	51	227	2.08	2139.72	2134	10	5.66E-02	57.6	
20	0	1116.07	129	276	3.81	2231.04	2225	12	1.43E-01	27.5	
21	0	1172.55	7331	305	1.87	2344.00	2338	16	8.15E+00	1.3	
22	0	1331.71	6678	136	2.00	2662.38	2653	18	7.42E+00	1.3	
23	1	1447.49	17	11	2.03	2894.00	2889	19	1.89E-02	36.1	1.24E+00
24	1	1449.99	19	7	2.03	2899.00	2889	19	2.15E-02	38.0	
25	0	1494.41	11	15	3.00	2987.87	2976	14	1.27E-02	75.6	
26	0	1502.94	19	4	1.01	3004.95	2998	14	2.16E-02	30.5	
27	0	1559.77	10	6	0.63	3118.66	3111	12	1.15E-02	56.5	
28	0	1628.13	9	12	1.10	3255.44	3250	12	1.00E-02	83.9	
29	0	1681.09	9	6	1.40	3361.40	3356	9	1.02E-02	59.7	
30	0	1701.37	7	16	1.44	3401.99	3396	13	8.07E-03	119.9	
31	0	1741.41	12	3	0.78	3482.11	3476	11	1.37E-02	38.4	
32	0	1771.88	11	0	1.00	3543.09	3539	9	1.22E-02	30.2	

Flag: "*" = Peak area was modified by background subtraction

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621352.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4
Sample title : MXR1
Sample date : 12-SEP-2016 00:00:00 Acquisition date : 3-OCT-2016 08:54:28
Sample ID : G1203621352 Sample quantity : 115.00 GRAM
Sample type : SOLID Sample geometry :
Detector name : GAMMA6 Detector geometry: CAN
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:04.93 0.5%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type : Empirical Efficiencies at : Peak Energy
Abundance limit : 75.00

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
CO-57	122.06	192	85.60*	6.177E+00	9.479E-01	1.001E+00	58.57
	136.47	-----	10.68	6.083E+00	-----	Line Not Found	-----
CO-60	1173.23	6983	99.85	1.227E+00	1.488E+02	1.500E+02	2.57
	1332.49	6325	99.98*	1.092E+00	1.513E+02	1.525E+02	2.58
ZN-65	1115.54	123	50.60*	1.284E+00	4.950E+00	5.260E+00	55.01
CD-109	88.03	2848	3.70*	5.256E+00	3.825E+02	3.950E+02	7.21
SN-126	64.28	-----	9.60	2.772E+00	-----	Line Not Found	-----
	86.94	2848	8.90	5.256E+00	1.590E+02	1.590E+02	7.21
	87.57	2848	37.00*	5.256E+00	3.825E+01	3.825E+01	7.21
BA-137M	661.66	11644	89.90*	2.028E+00	1.667E+02	1.670E+02	2.03
CS-137	661.66	11644	85.10*	2.028E+00	1.762E+02	1.764E+02	2.03
PM-147	121.22	192	0.00*	6.177E+00	2.847E+04	2.892E+04	58.57
PB-210	46.54	5644	4.25*	6.123E-01	5.664E+03	5.674E+03	6.13
AM-241	59.54	15831	35.90*	2.129E+00	5.410E+02	5.410E+02	1.91

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621352.CNF;1 *
 * Acquisition date : 3-OCT-2016 08:54:28 Sensitivity : 3.000 *
 * Detector ID : GAM06 Energy tolerance: 1.500 *
 * Elapsed live time: 0 00:15:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 00:15:04.93 Half life ratio : ***** *
 * Sample date : 12-SEP-2016 00:00:00 Analyst initials: MXR1 *
 * Sample ID : G1203621352 Sample Quantity : 1.1500E+02 GRAM *
 * Batch Number : 1596247 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 8-MAR-2016 07:26:53 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM06_CAN.CNF;14 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
CO-57	1.001E+00	5.745E-01	5.328E-01
CO-60	1.525E+02	3.856E+00	8.177E-01
ZN-65	5.260E+00	2.836E+00	3.052E+00
CD-109	3.950E+02	2.790E+01	1.577E+01
SN-126	3.825E+01	2.702E+00	1.536E+00
BA-137M	1.670E+02	3.319E+00	9.844E-01
CS-137	1.764E+02	3.506E+00	1.040E+00
PM-147	2.892E+04	1.660E+04	1.538E+04
PB-210	5.674E+03	3.411E+02	1.962E+02
AM-241	5.410E+02	1.014E+01	5.631E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.880E+00	6.849E+00	1.196E+01	NOT IDENT.
NA-22	-2.590E-01	3.644E-01	6.230E-01	NOT IDENT.
NA-24	0.000E+00	6.071E+09	0.000E+00	SHORT HLIF
AL-26	1.211E-01	3.017E-01	6.159E-01	NOT IDENT.
K-40	-4.385E-01	2.341E+00	4.489E+00	NOT IDENT.
SC-46	-1.583E-01	9.402E-01	1.566E+00	NOT IDENT.
V-48	1.084E+00	1.883E+00	3.451E+00	NOT IDENT.
CR-51	3.819E+00	6.398E+00	1.185E+01	NOT IDENT.
MN-54	-4.769E-01	7.182E-01	1.177E+00	NOT IDENT.
CO-56	2.905E-01	8.260E-01	1.421E+00	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-58	6.436E-01	7.617E-01	1.351E+00	NOT IDENT.
FE-59	1.725E+00	2.102E+00	3.847E+00	NOT IDENT.
GE-68	1.399E+01	2.657E+01	4.826E+01	NOT IDENT.
AS-73	1.201E+00	2.460E+01	4.445E+01	NOT IDENT.
AS-74	-2.402E-02	1.812E+00	3.171E+00	NOT IDENT.
SE-75	5.714E-01	9.449E-01	1.206E+00	FAIL ABUN
BR-77	-3.457E+02	7.879E+02	1.299E+03	NOT IDENT.
SR-82	3.582E+00	6.844E+00	1.202E+01	NOT IDENT.
RB-83	6.686E-01	1.276E+00	2.292E+00	NOT IDENT.

KR-85	4.941E+01	1.076E+02	1.932E+02	NOT IDENT.
SR-85	2.804E-01	6.088E-01	1.093E+00	NOT IDENT.
RB-86	1.695E+01	2.054E+01	3.776E+01	NOT IDENT.
Y-88	-6.479E-02	3.626E-01	6.643E-01	NOT IDENT.
Y-91	-7.015E+01	2.336E+02	4.149E+02	NOT IDENT.
NB-94	-2.860E-01	5.000E-01	8.385E-01	NOT IDENT.
NB-95	-2.712E-01	7.392E-01	1.242E+00	NOT IDENT.
NB-95M	-6.750E-01	1.829E+00	3.021E+00	NOT IDENT.
ZR-95	4.638E-01	1.240E+00	2.173E+00	NOT IDENT.
NB-97	0.000E+00	8.509E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.297E+10	0.000E+00	SHORT HLIF
MO-99	-1.167E+03	1.028E+03	1.661E+03	NOT IDENT.
TC-99M	0.000E+00	1.244E+25	0.000E+00	SHORT HLIF
RH-101	-4.632E-02	3.549E-01	6.178E-01	NOT IDENT.
RH-102	3.279E-01	8.920E-01	1.580E+00	NOT IDENT.
RU-103	9.859E-02	7.754E-01	1.374E+00	NOT IDENT.
RH-106	4.659E-01	5.185E+00	9.070E+00	NOT IDENT.
RU-106	4.659E-01	5.185E+00	9.070E+00	NOT IDENT.
AG-108M	4.513E-02	5.714E-01	1.016E+00	NOT IDENT.
AG-110M	-3.650E-01	1.089E+00	1.803E+00	NOT IDENT.
SN-113	-1.085E-01	7.783E-01	1.387E+00	NOT IDENT.
CD-115	-2.673E+02	1.305E+03	2.279E+03	NOT IDENT.
SN-117M	3.390E-01	8.872E-01	1.550E+00	NOT IDENT.
TE-123M	1.288E-01	3.457E-01	6.040E-01	NOT IDENT.
SB-124	8.470E-03	6.127E-01	1.222E+00	NOT IDENT.
SB-125	-6.472E-01	1.680E+00	2.950E+00	FAIL ABUN
TE-125M	3.835E+01	1.170E+02	2.085E+02	NOT IDENT.
I-126	-1.724E+00	5.101E+00	7.724E+00	NOT IDENT.
SB-126	1.511E+00	3.208E+00	5.669E+00	NOT IDENT.
SB-127	-3.088E+01	7.078E+01	1.060E+02	NOT IDENT.
I-131	8.704E-01	3.204E+00	5.820E+00	FAIL ABUN
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	-1.951E+01	4.099E+01	6.761E+01	NOT IDENT.
BA-133	-9.641E-02	6.541E-01	1.175E+00	FAIL ABUN
I-133	0.000E+00	1.400E+07	0.000E+00	SHORT HLIF
CS-134	-1.044E-01	7.186E-01	1.217E+00	NOT IDENT.
CS-135	-2.920E-01	2.333E+00	3.855E+00	NOT IDENT.
I-135	0.000E+00	3.793E+23	0.000E+00	SHORT HLIF
CS-136	2.977E+00	3.047E+00	5.642E+00	FAIL ABUN
CE-139	1.644E-01	3.677E-01	6.421E-01	NOT IDENT.
BA-140	1.513E+00	5.983E+00	1.065E+01	FAIL ABUN
LA-140	-2.759E-01	8.810E-01	1.605E+00	NOT IDENT.
CE-141	7.074E-02	8.172E-01	1.421E+00	NOT IDENT.
CE-143	0.000E+00	4.321E+04	0.000E+00	SHORT HLIF
CE-144	-1.056E+00	2.320E+00	3.980E+00	FAIL ABUN
PM-144	1.240E-01	5.391E-01	9.429E-01	NOT IDENT.
PR-144	9.313E+00	4.048E+01	7.080E+01	NOT IDENT.
PM-146	6.184E-01	8.485E-01	1.532E+00	NOT IDENT.
ND-147	-9.575E+00	1.364E+01	2.330E+01	NOT IDENT.
PM-149	-4.503E+03	9.654E+03	1.566E+04	NOT IDENT.
EU-150	-1.570E-02	4.035E-01	7.303E-01	NOT IDENT.
EU-152	1.510E+00	1.776E+00	2.717E+00	FAIL ABUN
GD-153	2.130E-01	9.702E-01	1.732E+00	NOT IDENT.
EU-154	-7.977E-01	1.021E+00	1.730E+00	FAIL ABUN
EU-155	-6.607E-01	1.193E+00	2.070E+00	FAIL ABUN
TB-160	6.482E-01	2.996E+00	5.094E+00	FAIL ABUN
HO-166M	-9.997E-03	9.507E-01	1.641E+00	FAIL ABUN
TM-171	-2.081E+00	4.953E+02	8.951E+02	NOT IDENT.
HF-172	-7.571E-01	2.330E+00	3.720E+00	FAIL ABUN
LU-172	-7.722E-01	1.308E+00	2.266E+00	FAIL ABUN
LU-176	-1.151E-01	3.856E-01	6.963E-01	FAIL ABUN
HF-181	-6.184E-01	9.069E-01	1.561E+00	FAIL ABUN
TA-182	-5.438E-02	1.912E+00	3.480E+00	NOT IDENT.
RE-183	0.000E+00	6.232E+00	1.224E+01	FAIL ABUN
RE-184	2.127E+00	3.138E+00	5.420E+00	NOT IDENT.
W-188	1.266E+02	1.178E+02	2.030E+02	NOT IDENT.
IR-192	-2.490E-01	5.280E-01	9.467E-01	NOT IDENT.
HG-203	9.750E-02	6.268E-01	1.045E+00	NOT IDENT.
BI-207	-4.066E-01	1.267E+00	1.816E+00	NOT IDENT.
TL-208	-4.466E-02	5.571E-01	9.726E-01	NOT IDENT.
BI-211	7.282E-01	3.057E+00	5.566E+00	NOT IDENT.
PB-211	-1.244E+01	1.190E+01	2.052E+01	NOT IDENT.
BI-212	9.954E-01	7.923E+00	1.374E+01	NOT IDENT.
PB-212	2.726E-01	8.007E-01	1.360E+00	NOT IDENT.
BI-214	-3.289E-01	1.084E+00	1.867E+00	NOT IDENT.
PB-214	-3.957E-01	1.115E+00	1.990E+00	FAIL ABUN
RN-219	2.822E+00	6.745E+00	1.223E+01	NOT IDENT.
RN-222	-3.289E-01	1.084E+00	1.867E+00	NOT IDENT.

RA-223	3.803E+00	9.421E+00	1.733E+01	FAIL ABUN
RA-224	1.718E+00	8.628E+00	1.455E+01	NOT IDENT.
RA-226	-3.289E-01	1.084E+00	1.867E+00	NOT IDENT.
AC-227	-8.529E-01	3.698E+00	6.110E+00	FAIL ABUN
TH-227	-8.529E-01	3.698E+00	6.110E+00	FAIL ABUN
AC-228	2.703E-01	3.166E+00	5.319E+00	NOT IDENT.
RA-228	2.703E-01	3.166E+00	5.319E+00	NOT IDENT.
TH-228	2.726E-01	8.007E-01	1.360E+00	NOT IDENT.
TH-229	-5.997E+00	6.993E+00	1.152E+01	FAIL ABUN
TH-230	-3.289E-01	1.084E+00	1.867E+00	NOT IDENT.
PA-231	-7.971E+00	6.634E+00	1.165E+01	NOT IDENT.
TH-231	3.803E+00	9.421E+00	1.733E+01	FAIL ABUN
TH-232	2.703E-01	3.166E+00	5.319E+00	NOT IDENT.
PA-233	3.978E-01	9.528E-01	1.757E+00	NOT IDENT.
PA-234	4.267E+00	6.913E+00	1.263E+01	NOT IDENT.
PA-234M	3.551E+01	1.052E+02	1.691E+02	NOT IDENT.
TH-234	-2.388E+00	1.776E+01	2.978E+01	NOT IDENT.
U-234	-3.289E-01	1.084E+00	1.867E+00	NOT IDENT.
U-235	-9.497E-01	2.290E+00	3.917E+00	NOT IDENT.
NP-237	3.978E-01	9.528E-01	1.757E+00	NOT IDENT.
NP-238	0.000E+00	3.268E+03	0.000E+00	SHORT HLIF
U-238	-2.388E+00	1.776E+01	2.978E+01	NOT IDENT.
NP-239	4.059E-01	3.137E+00	5.528E+00	NOT IDENT.
PU-239	-1.314E+03	3.882E+03	6.699E+03	NOT IDENT.
AM-243	1.423E-02	6.129E-01	1.101E+00	NOT IDENT.
CM-243	7.317E-02	1.201E+00	2.129E+00	NOT IDENT.
BK-247	-4.071E-01	1.382E+00	2.082E+00	NOT IDENT.
CM-247	1.264E-01	6.125E-01	1.103E+00	NOT IDENT.
CF-249	3.441E-02	6.706E-01	1.204E+00	NOT IDENT.
CF-251	9.590E-01	2.005E+00	2.687E+00	FAIL ABUN
ANH-511	1.798E-01	4.890E-01	8.844E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
CO-57	122.06	192	85.60*	6.177E+00	9.479E-01	1.001E+00	58.57
	136.47	-----	10.68	6.083E+00	----- Line Not Found		-----
CO-60	1173.23	6983	99.85	1.227E+00	1.488E+02	1.500E+02	2.57
	1332.49	6325	99.98*	1.092E+00	1.513E+02	1.525E+02	2.58
ZN-65	1115.54	123	50.60*	1.284E+00	4.950E+00	5.260E+00	55.01
CD-109	88.03	2848	3.70*	5.256E+00	3.825E+02	3.950E+02	7.21
SN-126	64.28	-----	9.60	2.772E+00	----- Line Not Found		-----
	86.94	2848	8.90	5.256E+00	1.590E+02	1.590E+02	7.21
	87.57	2848	37.00*	5.256E+00	3.825E+01	3.825E+01	7.21
BA-137M	661.66	11644	89.90*	2.028E+00	1.667E+02	1.670E+02	2.03
CS-137	661.66	11644	85.10*	2.028E+00	1.762E+02	1.764E+02	2.03
PM-147	121.22	192	0.00*	6.177E+00	2.847E+04	2.892E+04	58.57
PB-210	46.54	5644	4.25*	6.123E-01	5.664E+03	5.674E+03	6.13
AM-241	59.54	15831	35.90*	2.129E+00	5.410E+02	5.410E+02	1.91

Flag: "*" = Keyline

Total number of lines in spectrum 32
 Number of unidentified lines 16
 Number of lines tentatively identified by NID 16 50.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	271.74D	1.06	9.479E-01	1.001E+00	0.586E+00	58.57	
CO-60	5.27Y	1.01	1.513E+02	1.525E+02	0.039E+02	2.58	
ZN-65	244.06D	1.06	4.950E+00	5.260E+00	2.894E+00	55.01	
CD-109	461.40D	1.03	3.825E+02	3.950E+02	0.285E+02	7.21	
SN-126	2.30E+05Y	1.00	3.825E+01	3.825E+01	0.276E+01	7.21	
BA-137M	30.08Y	1.00	1.667E+02	1.670E+02	0.034E+02	2.03	
CS-137	30.08Y	1.00	1.762E+02	1.764E+02	0.036E+02	2.03	
PM-147	2.62Y	1.02	2.847E+04	2.892E+04	1.693E+04	58.57	
PB-210	22.20Y	1.00	5.664E+03	5.674E+03	0.348E+03	6.13	
AM-241	432.60Y	1.00	5.410E+02	5.410E+02	0.103E+02	1.91	
Total Activity :			3.560E+04	3.607E+04			

Grand Total Activity : 3.560E+04 3.607E+04

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
9	57.98	565	2144	1.73	115.68	113	12	5.81E-01	23.0	1.92E+00	T
0	79.75	42	981	0.73	159.19	157	6	4.33E-02	****	4.59E+00	T
0	176.42	35	512	1.25	352.38	351	6	3.71E-02	****	5.43E+00	T
0	207.48	46	466	0.62	414.45	413	5	5.02E-02	****	4.90E+00	
0	263.19	47	546	1.46	525.79	524	7	5.13E-02	****	4.12E+00	T
0	344.80	51	356	1.25	688.90	686	6	5.69E-02	****	3.36E+00	T
0	422.27	86	505	2.45	843.76	841	8	9.63E-02	92.8	2.88E+00	T
0	624.76	3	422	2.97	1248.56	1237	13	3.90E-03	****	2.12E+00	
0	652.88	39	213	1.35	1304.78	1301	7	4.42E-02	****	2.05E+00	
0	682.16	39	193	1.27	1363.33	1359	8	4.42E-02	****	1.98E+00	
0	868.77	62	360	4.15	1736.45	1730	12	7.18E-02	****	1.61E+00	
0	1004.49	49	375	3.20	2007.88	2001	13	5.64E-02	****	1.41E+00	T
0	1061.17	21	251	0.95	2121.24	2118	9	2.46E-02	****	1.35E+00	
0	1070.41	49	217	2.08	2139.72	2134	10	5.66E-02	****	1.33E+00	
1	1447.49	16	10	2.03	2894.00	2889	19	1.89E-02	72.2	1.01E+00	
1	1449.99	18	6	2.03	2899.00	2889	19	2.15E-02	76.0	1.01E+00	
0	1494.41	11	14	3.00	2987.87	2976	14	1.27E-02	****	9.85E-01	
0	1502.94	18	3	1.01	3004.95	2998	14	2.16E-02	61.0	9.80E-01	
0	1559.77	10	5	0.63	3118.66	3111	12	1.15E-02	****	9.49E-01	
0	1628.13	8	11	1.10	3255.44	3250	12	1.00E-02	****	9.15E-01	
0	1681.09	9	5	1.40	3361.40	3356	9	1.02E-02	****	8.92E-01	
0	1701.37	7	15	1.44	3401.99	3396	13	8.07E-03	****	8.84E-01	
0	1741.41	12	2	0.78	3482.11	3476	11	1.37E-02	76.8	8.68E-01	
0	1771.88	10	0	1.00	3543.09	3539	9	1.22E-02	60.3	8.56E-01	T

Flags: "T" = Tentatively associated

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621352.CNF;1
* Acquisition date   : 3-OCT-2016 08:54:28 Sensitivity      : 3.000
* Detector ID        : GAM06 Energy tolerance: 1.500
* Elapsed live time  : 0 00:15:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:15:04.93 Half life ratio  : *****
* Sample date        : 12-SEP-2016 00:00:00 Nuclide Library : SOLID
* Sample ID          : G1203621352 Analyst initials: MXR1
* Batch Number       : 1596247 Sample Quantity : 1.1500E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                    Dry Weight      : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 8-MAR-2016 07:26:53 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM06_CAN.CNF;14
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
CO-57	2.593E-01
CO-60	3.765E-01
ZN-65	1.469E+00
CD-109	7.698E+00
SN-126	7.496E-01
BA-137M	4.730E-01
CS-137	4.996E-01
PM-147	7.486E+03
PB-210	9.676E+01
AM-241	2.770E+00

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	5.811E+00	NOT IDENT.
NA-22	2.801E-01	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.663E-01	NOT IDENT.
K-40	1.917E+00	NOT IDENT.
SC-46	7.565E-01	NOT IDENT.
V-48	1.664E+00	NOT IDENT.
CR-51	5.753E+00	NOT IDENT.
MN-54	5.664E-01	NOT IDENT.
CO-56	6.848E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-58	6.504E-01	NOT IDENT.
FE-59	1.858E+00	NOT IDENT.
GE-68	2.327E+01	NOT IDENT.
AS-73	2.192E+01	NOT IDENT.
AS-74	1.523E+00	NOT IDENT.
SE-75	5.866E-01	FAIL ABUN
BR-77	6.322E+02	NOT IDENT.
SR-82	5.778E+00	NOT IDENT.
RB-83	1.109E+00	NOT IDENT.
KR-85	9.332E+01	NOT IDENT.

SR-85	5.282E-01	NOT IDENT.
RB-86	1.821E+01	NOT IDENT.
Y-88	2.835E-01	NOT IDENT.
Y-91	1.930E+02	NOT IDENT.
NB-94	4.011E-01	NOT IDENT.
NB-95	5.962E-01	NOT IDENT.
NB-95M	1.471E+00	NOT IDENT.
ZR-95	1.042E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	7.965E+02	NOT IDENT.
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.004E-01	NOT IDENT.
RH-102	7.598E-01	NOT IDENT.
RU-103	6.652E-01	NOT IDENT.
RH-106	4.363E+00	NOT IDENT.
RU-106	4.363E+00	NOT IDENT.
AG-108M	4.942E-01	NOT IDENT.
AG-110M	8.694E-01	NOT IDENT.
SN-113	6.736E-01	NOT IDENT.
CD-115	1.099E+03	NOT IDENT.
SN-117M	7.540E-01	NOT IDENT.
TE-123M	2.937E-01	NOT IDENT.
SB-124	5.045E-01	NOT IDENT.
SB-125	1.433E+00	FAIL ABUN
TE-125M	1.014E+02	NOT IDENT.
I-126	3.696E+00	NOT IDENT.
SB-126	2.720E+00	NOT IDENT.
SB-127	5.076E+01	NOT IDENT.
I-131	2.825E+00	FAIL ABUN
I-132	0.000E+00	SHORT HLIF
TE-132	3.291E+01	NOT IDENT.
BA-133	5.700E-01	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	5.843E-01	NOT IDENT.
CS-135	1.874E+00	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	2.722E+00	FAIL ABUN
CE-139	3.123E-01	NOT IDENT.
BA-140	5.132E+00	FAIL ABUN
LA-140	6.763E-01	NOT IDENT.
CE-141	6.910E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.935E+00	FAIL ABUN
PM-144	4.526E-01	NOT IDENT.
PR-144	3.398E+01	NOT IDENT.
PM-146	7.460E-01	NOT IDENT.
ND-147	1.122E+01	NOT IDENT.
PM-149	7.594E+03	NOT IDENT.
EU-150	3.545E-01	NOT IDENT.
EU-152	1.319E+00	FAIL ABUN
GD-153	8.437E-01	NOT IDENT.
EU-154	7.761E-01	FAIL ABUN
EU-155	1.007E+00	FAIL ABUN
TB-160	2.458E+00	FAIL ABUN
HO-166M	7.866E-01	FAIL ABUN
TM-171	4.413E+02	NOT IDENT.
HF-172	1.808E+00	FAIL ABUN
LU-172	1.090E+00	FAIL ABUN
LU-176	3.379E-01	FAIL ABUN
HF-181	7.570E-01	FAIL ABUN
TA-182	1.615E+00	NOT IDENT.
RE-183	6.057E+00	FAIL ABUN
RE-184	2.621E+00	NOT IDENT.
W-188	9.869E+01	NOT IDENT.
IR-192	4.589E-01	NOT IDENT.
HG-203	5.076E-01	NOT IDENT.
BI-207	8.733E-01	NOT IDENT.
TL-208	4.680E-01	NOT IDENT.
BI-211	2.701E+00	NOT IDENT.
PB-211	9.949E+00	NOT IDENT.
BI-212	6.592E+00	NOT IDENT.
PB-212	6.619E-01	NOT IDENT.
BI-214	8.982E-01	NOT IDENT.
PB-214	9.651E-01	FAIL ABUN
RN-219	5.936E+00	NOT IDENT.
RN-222	8.982E-01	NOT IDENT.
RA-223	8.413E+00	FAIL ABUN

RA-224	7.078E+00	NOT IDENT.
RA-226	8.982E-01	NOT IDENT.
AC-227	2.967E+00	FAIL ABUN
TH-227	2.967E+00	FAIL ABUN
AC-228	2.572E+00	NOT IDENT.
RA-228	2.572E+00	NOT IDENT.
TH-228	6.619E-01	NOT IDENT.
TH-229	5.603E+00	FAIL ABUN
TH-230	8.981E-01	NOT IDENT.
PA-231	5.649E+00	NOT IDENT.
TH-231	8.413E+00	FAIL ABUN
TH-232	2.572E+00	NOT IDENT.
PA-233	8.532E-01	NOT IDENT.
PA-234	6.120E+00	NOT IDENT.
PA-234M	8.161E+01	NOT IDENT.
TH-234	1.453E+01	NOT IDENT.
U-234	8.981E-01	NOT IDENT.
U-235	1.905E+00	NOT IDENT.
NP-237	8.532E-01	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	1.453E+01	NOT IDENT.
NP-239	2.692E+00	NOT IDENT.
PU-239	3.258E+03	NOT IDENT.
AM-243	5.374E-01	NOT IDENT.
CM-243	1.036E+00	NOT IDENT.
BK-247	1.012E+00	NOT IDENT.
CM-247	5.353E-01	NOT IDENT.
CF-249	5.845E-01	NOT IDENT.
CF-251	1.306E+00	FAIL ABUN
ANH-511	4.282E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621352.CNF;1 *
 * Acquisition date : 3-OCT-2016 08:54:28 Sensitivity : 3.000 *
 * Detector ID : GAM06 Energy tolerance: 1.500 *
 * Elapsed live time: 0 00:15:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 00:15:04.93 Half life ratio : ***** *
 * Sample date : 12-SEP-2016 00:00:00 Nuclide Library : SOLID *
 * Sample ID : G1203621352 Analyst initials: MXR1 *
 * Batch Number : 1596247 Sample Quantity : 1.1500E+02 GRAM *
 * Quantity Err(%) : 1.7391E-03 % *
 * Wet wt corr : 1.00000 Wet Weight : 0.00000 *
 * Dry Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 8-MAR-2016 07:26:53 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM06_CAN.CNF;14 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
CO-57	1.001E+00	5.791E-01	5.791E-01
CO-60	1.525E+02	1.247E+01	1.247E+01
ZN-65	5.260E+00	2.986E+00	2.986E+00
CD-109	3.950E+02	4.779E+01	4.779E+01
SN-126	3.825E+01	4.161E+00	4.161E+00
BA-137M	1.670E+02	1.418E+01	1.418E+01
CS-137	1.764E+02	1.497E+01	1.497E+01
PM-147	2.892E+04	1.673E+04	1.673E+04
PB-210	5.674E+03	5.985E+02	5.985E+02
AM-241	5.410E+02	4.310E+01	4.310E+01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.880E+00	6.851E+00	6.903E+00	NOT IDENT.
NA-22	-2.590E-01	3.650E-01	3.833E-01	NOT IDENT.
NA-24	5.870E+08	6.071E+09	6.077E+09	SHORT HLIF
AL-26	1.211E-01	3.018E-01	3.067E-01	NOT IDENT.
K-40	-4.385E-01	2.341E+00	2.350E+00	NOT IDENT.
SC-46	-1.583E-01	9.404E-01	9.432E-01	NOT IDENT.
V-48	1.084E+00	1.889E+00	1.952E+00	NOT IDENT.
CR-51	3.819E+00	6.408E+00	6.635E+00	NOT IDENT.
MN-54	-4.769E-01	7.202E-01	7.516E-01	NOT IDENT.
CO-56	2.905E-01	8.267E-01	8.370E-01	FAIL ABUN
MN-56	1.000E+41	2.766E+41	0.000E+00	SHORT HLIF
CO-58	6.436E-01	7.648E-01	8.180E-01	NOT IDENT.
FE-59	1.725E+00	2.126E+00	2.264E+00	NOT IDENT.
GE-68	1.399E+01	2.667E+01	2.741E+01	NOT IDENT.
AS-73	1.201E+00	2.461E+01	2.461E+01	NOT IDENT.
AS-74	-2.402E-02	1.812E+00	1.812E+00	NOT IDENT.
SE-75	5.714E-01	9.464E-01	9.809E-01	FAIL ABUN
BR-77	-3.457E+02	8.168E+02	8.315E+02	NOT IDENT.
SR-82	3.582E+00	6.854E+00	7.041E+00	NOT IDENT.
RB-83	6.686E-01	1.281E+00	1.316E+00	NOT IDENT.

KR-85	4.941E+01	1.076E+02	1.099E+02	NOT IDENT.
SR-85	2.804E-01	6.092E-01	6.222E-01	NOT IDENT.
RB-86	1.695E+01	2.073E+01	2.210E+01	NOT IDENT.
Y-88	-6.479E-02	3.626E-01	3.638E-01	NOT IDENT.
Y-91	-7.015E+01	2.337E+02	2.358E+02	NOT IDENT.
NB-94	-2.860E-01	5.006E-01	5.170E-01	NOT IDENT.
NB-95	-2.712E-01	7.397E-01	7.497E-01	NOT IDENT.
NB-95M	-6.750E-01	1.831E+00	1.856E+00	NOT IDENT.
ZR-95	4.638E-01	1.241E+00	1.258E+00	NOT IDENT.
NB-97	1.000E+41	8.549E+40	0.000E+00	SHORT HLIF
ZR-97	-5.794E+09	1.298E+10	1.324E+10	SHORT HLIF
MO-99	-1.167E+03	1.034E+03	1.160E+03	NOT IDENT.
TC-99M	-9.070E+24	1.248E+25	0.000E+00	SHORT HLIF
RH-101	-4.632E-02	3.551E-01	3.557E-01	NOT IDENT.
RH-102	3.279E-01	8.927E-01	9.049E-01	NOT IDENT.
RU-103	9.859E-02	7.754E-01	7.767E-01	NOT IDENT.
RH-106	4.659E-01	5.185E+00	5.189E+00	NOT IDENT.
RU-106	4.659E-01	5.185E+00	5.189E+00	NOT IDENT.
AG-108M	4.513E-02	5.714E-01	5.718E-01	NOT IDENT.
AG-110M	-3.650E-01	1.090E+00	1.103E+00	NOT IDENT.
SN-113	-1.085E-01	7.783E-01	7.799E-01	NOT IDENT.
CD-115	-2.673E+02	1.305E+03	1.311E+03	NOT IDENT.
SN-117M	3.390E-01	8.875E-01	9.006E-01	NOT IDENT.
TE-123M	1.288E-01	3.459E-01	3.507E-01	NOT IDENT.
SB-124	8.470E-03	6.127E-01	6.127E-01	NOT IDENT.
SB-125	-6.472E-01	1.681E+00	1.706E+00	FAIL ABUN
TE-125M	3.835E+01	1.170E+02	1.183E+02	NOT IDENT.
I-126	-1.724E+00	5.103E+00	5.162E+00	NOT IDENT.
SB-126	1.511E+00	3.214E+00	3.285E+00	NOT IDENT.
SB-127	-3.088E+01	7.089E+01	7.225E+01	NOT IDENT.
I-131	8.704E-01	3.204E+00	3.228E+00	FAIL ABUN
I-132	1.000E+41	3.538E+41	0.000E+00	SHORT HLIF
TE-132	-1.951E+01	4.105E+01	4.198E+01	NOT IDENT.
BA-133	-9.641E-02	6.542E-01	6.556E-01	FAIL ABUN
I-133	-4.132E+06	1.402E+07	1.414E+07	SHORT HLIF
CS-134	-1.044E-01	7.187E-01	7.202E-01	NOT IDENT.
CS-135	-2.920E-01	2.333E+00	2.337E+00	NOT IDENT.
I-135	-2.706E+23	4.022E+23	0.000E+00	SHORT HLIF
CS-136	2.977E+00	3.092E+00	3.370E+00	FAIL ABUN
CE-139	1.644E-01	3.693E-01	3.767E-01	NOT IDENT.
BA-140	1.513E+00	5.984E+00	6.023E+00	FAIL ABUN
LA-140	-2.759E-01	8.813E-01	8.900E-01	NOT IDENT.
CE-141	7.074E-02	8.172E-01	8.178E-01	NOT IDENT.
CE-143	-5.489E+02	4.321E+04	4.321E+04	SHORT HLIF
CE-144	-1.056E+00	2.322E+00	2.370E+00	FAIL ABUN
PM-144	1.240E-01	5.392E-01	5.421E-01	NOT IDENT.
PR-144	9.313E+00	4.048E+01	4.070E+01	NOT IDENT.
PM-146	6.184E-01	8.509E-01	8.954E-01	NOT IDENT.
ND-147	-9.575E+00	1.367E+01	1.433E+01	NOT IDENT.
PM-149	-4.503E+03	9.680E+03	9.891E+03	NOT IDENT.
EU-150	-1.570E-02	4.035E-01	4.036E-01	NOT IDENT.
EU-152	1.510E+00	1.782E+00	1.908E+00	FAIL ABUN
GD-153	2.130E-01	9.703E-01	9.750E-01	NOT IDENT.
EU-154	-7.977E-01	1.023E+00	1.085E+00	FAIL ABUN
EU-155	-6.607E-01	1.195E+00	1.231E+00	FAIL ABUN
TB-160	6.482E-01	2.998E+00	3.012E+00	FAIL ABUN
HO-166M	-9.997E-03	9.507E-01	9.507E-01	FAIL ABUN
TM-171	-2.081E+00	4.953E+02	4.953E+02	NOT IDENT.
HF-172	-7.571E-01	2.334E+00	2.359E+00	FAIL ABUN
LU-172	-7.722E-01	1.317E+00	1.362E+00	FAIL ABUN
LU-176	-1.151E-01	3.857E-01	3.892E-01	FAIL ABUN
HF-181	-6.184E-01	9.085E-01	9.503E-01	FAIL ABUN
TA-182	-5.438E-02	1.912E+00	1.912E+00	NOT IDENT.
RE-183	2.763E+01	6.890E+00	1.423E+01	FAIL ABUN
RE-184	2.127E+00	3.153E+00	3.295E+00	NOT IDENT.
W-188	1.266E+02	1.191E+02	1.321E+02	NOT IDENT.
IR-192	-2.490E-01	5.285E-01	5.403E-01	NOT IDENT.
HG-203	9.750E-02	6.268E-01	6.284E-01	NOT IDENT.
BI-207	-4.066E-01	1.269E+00	1.282E+00	NOT IDENT.
TL-208	-4.466E-02	5.571E-01	5.575E-01	NOT IDENT.
BI-211	7.282E-01	3.058E+00	3.075E+00	NOT IDENT.
PB-211	-1.244E+01	1.195E+01	1.320E+01	NOT IDENT.
BI-212	9.954E-01	7.924E+00	7.937E+00	NOT IDENT.
PB-212	2.726E-01	8.011E-01	8.105E-01	NOT IDENT.
BI-214	-3.289E-01	1.084E+00	1.094E+00	NOT IDENT.
PB-214	-3.957E-01	1.115E+00	1.129E+00	FAIL ABUN
RN-219	2.822E+00	6.757E+00	6.876E+00	NOT IDENT.
RN-222	-3.289E-01	1.084E+00	1.094E+00	NOT IDENT.

RA-223	3.803E+00	9.430E+00	9.584E+00	FAIL ABUN
RA-224	1.718E+00	8.629E+00	8.664E+00	NOT IDENT.
RA-226	-3.289E-01	1.084E+00	1.094E+00	NOT IDENT.
AC-227	-8.529E-01	3.700E+00	3.720E+00	FAIL ABUN
TH-227	-8.529E-01	3.700E+00	3.720E+00	FAIL ABUN
AC-228	2.703E-01	3.166E+00	3.168E+00	NOT IDENT.
RA-228	2.703E-01	3.166E+00	3.168E+00	NOT IDENT.
TH-228	2.726E-01	8.011E-01	8.105E-01	NOT IDENT.
TH-229	-5.997E+00	7.008E+00	7.511E+00	FAIL ABUN
TH-230	-3.289E-01	1.084E+00	1.094E+00	NOT IDENT.
PA-231	-7.971E+00	6.881E+00	7.763E+00	NOT IDENT.
TH-231	3.803E+00	9.430E+00	9.584E+00	FAIL ABUN
TH-232	2.703E-01	3.166E+00	3.168E+00	NOT IDENT.
PA-233	3.978E-01	9.535E-01	9.702E-01	NOT IDENT.
PA-234	4.267E+00	8.481E+00	8.696E+00	NOT IDENT.
PA-234M	3.551E+01	1.053E+02	1.065E+02	NOT IDENT.
TH-234	-2.388E+00	1.777E+01	1.780E+01	NOT IDENT.
U-234	-3.289E-01	1.084E+00	1.094E+00	NOT IDENT.
U-235	-9.497E-01	2.291E+00	2.331E+00	NOT IDENT.
NP-237	3.978E-01	9.535E-01	9.702E-01	NOT IDENT.
NP-238	1.944E+03	3.280E+03	3.395E+03	SHORT HLIF
U-238	-2.388E+00	1.777E+01	1.780E+01	NOT IDENT.
NP-239	4.059E-01	3.137E+00	3.142E+00	NOT IDENT.
PU-239	-1.314E+03	3.883E+03	3.928E+03	NOT IDENT.
AM-243	1.423E-02	6.129E-01	6.130E-01	NOT IDENT.
CM-243	7.317E-02	1.201E+00	1.202E+00	NOT IDENT.
BK-247	-4.071E-01	1.385E+00	1.397E+00	NOT IDENT.
CM-247	1.264E-01	6.130E-01	6.156E-01	NOT IDENT.
CF-249	3.441E-02	6.706E-01	6.708E-01	NOT IDENT.
CF-251	9.590E-01	2.008E+00	2.054E+00	FAIL ABUN
ANH-511	1.798E-01	4.893E-01	4.959E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	1964.1102	87.09	543.0725	136.47	408.9632
45.60	1653.5233	87.57	543.6205	140.51	429.2876
46.54	1658.5250	88.03	544.1423	143.76	431.3771
49.72	1488.5717	88.34	544.4946	144.24	396.9384
51.35	1543.0040	88.47	544.6424	145.44	411.3519
51.87	1583.8177	89.96	412.7759	152.43	367.5838
52.39	1569.6459	90.64	422.3123	153.25	401.0778
52.97	1610.8647	91.11	440.6485	154.21	408.0317
53.44	1625.3617	92.59	422.7026	156.02	394.0771
54.07	1638.0039	93.35	411.1242	158.56	394.4007
57.36	0.0000	94.56	434.3693	159.00	389.2594
57.53	1148.3273	94.65	434.4481	162.33	379.1556
57.98	1149.7538	94.67	434.4652	162.66	376.0849
59.27	1153.8312	94.87	434.6365	163.33	398.0583
59.32	1153.9841	97.43	442.6662	165.86	391.8196
59.54	1154.6753	98.43	438.6497	176.31	369.7046
60.96	1159.1030	98.44	438.6601	176.60	387.4492
61.17	1159.7546	99.53	452.2791	177.52	417.2925
62.93	516.2480	100.11	468.4312	181.07	426.1812
63.29	523.9438	102.03	415.1772	181.52	429.7448
63.58	517.1239	103.18	427.8779	184.41	455.7509
64.28	549.3857	103.37	428.0305	185.72	477.6435
66.73	546.4628	105.21	448.2537	193.51	474.3121
67.24	558.9999	105.31	448.3368	197.03	443.5702
67.68	586.0448	106.12	402.5224	198.01	431.6502
67.75	586.1478	106.47	423.5623	201.83	418.8242
69.67	572.4478	109.28	412.7963	203.43	442.3439
70.83	547.4277	111.00	415.0669	205.31	387.4597
72.81	551.8744	111.76	438.6048	210.85	501.5160
72.87	567.6429	114.06	428.3455	215.65	462.3163
74.66	553.3564	116.30	421.9538	222.11	459.7844
74.82	553.5613	116.74	444.4453	227.09	448.2363
74.97	575.0912	119.76	433.5675	227.38	444.8740
77.11	525.7336	121.12	438.6215	228.16	469.7811
78.74	586.3143	121.22	438.6940	228.18	469.7933
79.69	557.8715	121.78	439.1027	235.69	464.0754
80.12	558.4072	122.06	439.3070	235.96	448.8912
80.19	558.4934	122.92	439.9365	238.63	407.5923
80.57	584.9567	123.07	427.8218	238.98	446.7409
81.00	599.3088	123.68	429.6140	240.99	416.8667
81.07	599.4012	125.81	416.1079	242.00	406.6216
81.75	605.3193	127.23	410.2280	244.70	387.5279
83.79	584.0486	127.91	400.4141	252.40	364.1497
84.00	608.2906	129.30	436.2925	252.80	373.8801
85.43	643.0718	131.20	408.7134	254.15	0.0000
86.55	542.4550	133.02	425.4116	256.23	383.5511
86.79	542.7246	133.52	430.9233	260.90	365.5590
86.94	542.8986	136.00	400.3504	264.66	452.5277

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.80	452.5847	364.49	350.5050	600.60	203.7072
265.00	428.4145	366.42	365.9636	602.52	0.0000
268.22	398.9092	372.51	352.5831	604.72	217.3263
269.46	392.0739	375.05	325.7884	607.14	209.4534
270.03	387.4072	1093.63	359.1870	609.32	220.8763
271.23	385.4047	383.85	359.9358	610.33	232.1934
273.65	385.0406	388.16	369.9822	614.28	212.2402
276.40	343.1299	388.63	379.0397	618.01	202.4070
277.37	381.4609	391.69	372.6921	620.36	207.7578
277.60	381.5369	400.66	340.7706	621.93	207.9147
278.00	374.3156	401.81	343.7465	630.19	0.0000
279.20	363.6677	402.40	342.0808	631.29	196.5180
279.54	400.6453	404.85	386.0566	633.25	212.1441
279.70	400.7050	410.95	411.2686	634.78	190.6608
280.46	361.6232	413.71	350.1830	635.95	181.4857
283.69	386.1206	414.70	374.9927	636.99	206.3395
284.31	355.4736	423.72	407.9309	645.85	220.6790
285.41	391.6548	427.09	381.0308	657.76	209.4159
285.90	358.4555	427.87	403.9958	657.90	0.0000
287.50	367.6336	433.94	419.4254	661.66	199.3547
290.67	337.6343	439.40	449.5836	664.57	0.0000
293.27	0.0000	453.88	417.3255	666.33	177.3005
295.22	363.9128	463.37	441.3995	666.50	177.3143
295.96	392.8271	468.07	412.5320	667.71	0.0000
298.58	341.2333	473.00	412.8260	677.62	176.6406
299.98	363.7502	475.06	433.2047	685.70	183.6218
300.09	363.7857	476.78	396.7338	695.00	178.0352
300.13	363.7946	477.60	401.6665	696.49	181.3326
301.36	395.0905	482.18	368.5732	696.51	181.3326
302.85	349.5919	487.02	359.1517	697.00	195.1631
304.50	354.2728	492.35	330.6612	697.30	176.0913
304.85	359.4114	497.08	291.3271	697.49	182.4735
306.78	371.7444	505.52	287.9408	702.65	181.8267
308.46	391.6042	507.63	0.0000	706.68	166.1753
311.90	353.9734	511.00	269.5263	711.68	178.2801
316.51	351.1019	514.00	246.7615	720.70	169.3376
319.41	362.1230	514.00	246.7615	721.93	0.0000
320.08	342.7983	520.40	260.2793	722.78	203.8155
321.04	365.9975	520.69	271.0078	722.91	208.1221
323.87	349.8250	522.65	0.0000	723.31	203.8619
325.23	357.0263	527.90	248.7018	724.19	177.1051
328.76	359.7583	528.26	249.7292	727.33	178.4216
333.37	372.2359	529.59	237.2157	733.00	150.8407
333.97	364.6896	529.87	0.0000	735.93	184.4707
334.37	375.1112	531.02	256.9429	737.46	166.2443
338.28	363.3517	537.26	224.4994	739.50	223.6520
338.32	378.8680	546.56	0.0000	747.24	202.7051
340.48	340.5182	552.55	206.6018	748.06	178.9178
340.55	340.5423	563.25	216.7227	752.31	184.6647
344.28	352.9492	569.33	230.3890	753.82	189.1301
345.93	344.3108	569.50	230.4078	756.73	165.4212
351.06	342.6258	569.70	230.4266	756.80	165.4212
351.93	360.2538	583.19	215.9798	763.94	203.0288
355.39	0.0000	584.27	217.0986	765.81	208.6420
356.01	361.3740	595.83	199.1723	766.42	204.3258

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
766.84	199.9924	1002.74	220.8060	1678.03	0.0000
772.60	0.0000	1004.73	220.9492	1690.97	7.4952
776.52	179.9422	1021.30	0.0000	1750.46	0.0000
777.92	205.2921	1025.87	0.0000	1764.49	8.6982
778.90	183.4105	1028.54	0.0000	1770.23	3.4832
783.70	202.4704	1037.84	221.5378	1771.35	1.7421
785.37	198.2080	1038.76	0.0000	1791.20	0.0000
792.07	220.8252	1046.59	228.4980	1808.65	9.8734
794.95	195.6536	1048.07	210.4624	1810.72	0.0000
795.86	201.2546	1049.04	229.5901	1836.06	13.2363
801.95	191.7670	1050.41	243.3003		
810.06	201.2756	1063.66	222.4504		
810.29	202.4098	1077.00	207.8109		
810.45	182.4046	1077.34	218.8256		
810.76	183.5370	1085.87	207.4609		
815.77	215.1067	1093.63	233.7222		
818.51	201.9458	1099.45	225.8444		
832.01	229.9243	1112.07	256.1380		
834.85	248.1394	1112.84	260.6484		
835.71	234.7423	1115.54	219.5403		
836.80	0.0000	1120.29	149.9120		
846.75	0.0000	1120.55	139.5313		
846.77	218.8183	1121.30	142.5375		
856.80	260.4065	1129.67	147.9174		
860.56	259.6470	1131.51	0.0000		
871.09	254.4022	1147.95	0.0000		
873.19	252.8936	1173.23	156.4254		
875.33	0.0000	1177.95	99.6445		
879.38	239.7705	1189.05	85.1935		
880.51	227.3083	1204.77	65.6098		
883.24	257.2632	1221.41	56.3640		
884.68	256.2565	1231.02	39.2733		
889.28	278.4573	1235.36	47.9523		
894.76	312.3086	1238.28	46.0693		
898.04	272.4497	1260.41	0.0000		
900.72	271.5594	1271.87	26.1546		
903.28	251.0779	1274.44	37.8051		
911.20	279.5171	1274.54	37.8051		
912.08	258.8086	1291.59	34.0836		
923.98	0.0000	1298.22	0.0000		
926.50	272.9045	1312.11	33.2903		
929.11	303.3849	1332.49	45.2813		
937.49	291.4531	1362.66	0.0000		
944.13	316.3708	1365.19	14.8901		
946.00	296.4102	1368.63	0.0000		
949.00	326.5671	1384.29	16.9575		
954.55	0.0000	1408.01	17.0591		
962.31	272.4967	1457.56	0.0000		
964.08	302.6686	1460.82	12.1978		
966.17	281.6951	1489.16	21.2862		
968.97	258.0931	1505.03	11.5049		
983.53	220.2847	1584.12	11.5062		
984.45	0.0000	1596.21	12.5867		
996.26	240.8478	1620.50	10.5450		
1001.03	240.1547	1621.92	14.0649		

Gamma Solid
MJWC


Batch# 1596249

Product: MJWC

Date: 10/03/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			n/a
Samples have been blank corrected (if required). Blank correction reported included (if required).			n/a
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			n/a
Method blank is less than the RDL/ LLD. (If rad samples. < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	DER 1563940
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			n/a
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.	✓		
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)	✓		
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER 1563940
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		
Aliquot Correction completed if required.			n/a
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By:  - 10/3/16

Secondary Review Performed By:  10-3-16

DATA EXCEPTION REPORT

Mo.Day Yr. 03-OCT-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GAMMA SPECTROMETER	Test / Method: DOE HASL 300, 4.5.2.3/Ga-01-R	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596249	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
Samples 405235 021, 022, 023, 024, 025, 026, 027, 028, 029, 030, 031, 032, 033, 034, 035, 036, 037, 038, 039, 040, and 1203621355 (duplicate) were received outside of the holding period.		Samples were analyzed in a timely manner upon receipt. Reporting results.	

Originator's Name:
Spencer Collins 03-OCT-16

Data Validator/Group Leader:
Michael Hilton 03-OCT-16

Gamma Spec Queue Sheet

1.g. - 10/3/16

09/13/2016

Batch #: 1596249

Analyst: MXR1

First Client Due Date: 09/30/2016

Internal Due Date: 09/30/2016

Gamma LCS Isotope: Mixed Gamma

LCS Code: 1556

Expiration Date: 4/1/37

Vol: 1.0 ml

Initials: MB

Prep Date: 9/12/16

Library: SOILS

Balance ID: N/A

Sample ID	Client Description / Container ID	Type	Hazard Code	Client	Matrix	Collect Date	Geometry	Wet/Dry Aliquot (g/F)	Detector	Sealing Date/Time (if Applicable)
405235021-1	4.2.B.R.2.3	SAMPLE		MJWC001	SOIL	08-DEC-15 14:17:00 <u>RF</u>	CAN	161.305 g	7	9/12/16
405235022-1	4.2.B.R.1.3	SAMPLE		MJWC001	SOIL	08-DEC-15 13:43:00 <u>RF</u>		161.105 g	18	
405235023-1	4.2.B.R.1.1.2	SAMPLE		MJWC001	SOIL	02-DEC-15 10:40:00 <u>RF</u>		141.404 g	24	
405235024-1	4.2.B.R.2.2	SAMPLE		MJWC001	SOIL	08-DEC-15 14:13:00 <u>RF</u>		138.962 g	29	
405235025-1	4.2.B.R.1.2	SAMPLE		MJWC001	SOIL	08-DEC-15 13:38:00 <u>RF</u>		138.244 g	2	
405235026-1	4.2.C.R.1.3	SAMPLE		MJWC001	SOIL	08-DEC-15 10:15:00 <u>RF</u>		155.202 g	30	
405235027-1	4.2.C.R.1.4	SAMPLE		MJWC001	SOIL	08-DEC-15 10:19:00 <u>RF</u>		158.553 g	8	
405235028-1	4.3.A.R.1.3	SAMPLE		MJWC001	SOIL	23-NOV-15 14:50:00 <u>RF</u>		125.516 g	9	
405235029-1	4.3.B.R.1.3	SAMPLE		MJWC001	SOIL	23-NOV-15 11:10:00 <u>RF</u>		151.202 g	19	
405235030-1	4.3.A.R.2.3	SAMPLE		MJWC001	SOIL	23-NOV-15 14:44:00 <u>RF</u>		131.12 g	20	
405235031-1	4.3.B.R.1.2	SAMPLE		MJWC001	SOIL	26-NOV-15 14:25:00 <u>RF</u>		139.617 g	32	
405235032-1	4.3.B.R.3.3	SAMPLE		MJWC001	SOIL	23-NOV-15 11:48:00 <u>RF</u>		146.947 g	39	
405235033-1	4.3.B.R.3.4	SAMPLE		MJWC001	SOIL	23-NOV-15 11:53:00 <u>RF</u>		166.788 g	25	
405235034-1	4.3.B.R.1.4	SAMPLE		MJWC001	SOIL	23-NOV-15 11:20:00 <u>RF</u>		152.487 g	28	
405235035-1	4.3.B.R.2.3	SAMPLE		MJWC001	SOIL	23-NOV-15 11:06:00 <u>RF</u>		164.073 g	33	9/12/16
405235036-1	4.3.B.R.2.4	SAMPLE		MJWC001	SOIL	23-NOV-15 11:12:00 <u>RF</u>		162.257 g	36	10-3-16
405235037-1	4.4.C.R.2.4	SAMPLE		MJWC001	SOIL	30-NOV-15 11:19:00 <u>RF</u>		178.756 g	41	
405235038-1	4.4.C.R.1.3	SAMPLE		MJWC001	SOIL	30-NOV-15 10:40:00 <u>RF</u>		170.192 g	43	
405235039-1	4.4.C.R.1.4	SAMPLE		MJWC001	SOIL	30-NOV-15 10:43:00 <u>RF</u>		175.326 g	44	
405235040-1	4.4.D.R.1.3	SAMPLE		MJWC001	SOIL	30-NOV-15 13:23:00 <u>RF</u>		172.014 g	12	
1203621354-1	MB	MB		QC ACCOUNT	SOIL	9/12/16 <u>RF</u>		178.756 g	16	
1203621355-1	DUP 4.4.C.R.1.3(405235038)	DUP		QC ACCOUNT	SOIL	30-NOV-15 10:40:00 <u>RF</u>		170.095 g	27	
1203621356-1	LCS	LCS		QC ACCOUNT	SOIL	9/12/16 <u>RF</u>		115 g	6	

GEL Laboratories LLC, Radiochemistry Division

Data Reviewed By: Matthew Notman 10-3-16

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235021.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM07.CNF;484
Background date : 2-OCT-2016 11:00:17.
Sample date     : 8-DEC-2015 14:17:00. Acquisition date : 3-OCT-2016 08:57:41.
Sample ID      : G405235021           Sample quantity  : 1.61305E+02 GRAM
Detector name  : GAM07                 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00      Elapsed real time: 0 01:00:00.50  0.0%
Energy tolerance: 1.50000 keV         Analyst Initials  : MXR1
Abundance limit: 75.00000             Sensitivity       : 3.00000
Batch ID       : 1596249               Detector SN#      :
Matrix Spike ID:                       LCS ID           : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	62.66*	18	180	1.05	125.81	122	9	4.88E-03	143.9	
2	0	70.49	19	125	1.37	141.47	140	6	5.38E-03	94.3	
3	4	74.85*	124	170	1.31	150.19	146	16	3.46E-02	20.9	2.90E+00
4	4	77.17	210	140	1.07	154.82	146	16	5.84E-02	11.1	
5	1	87.24	75	114	1.16	174.95	172	11	2.08E-02	23.9	4.37E+00
6	1	89.87	30	136	1.02	180.21	172	11	8.32E-03	62.4	
7	0	92.89*	74	155	1.47	186.26	183	9	2.07E-02	34.4	
8	0	115.04	15	86	0.60	230.55	228	6	4.24E-03	99.2	
9	0	128.68	48	176	0.63	257.81	253	11	1.33E-02	55.4	
10	0	185.83*	83	133	1.20	372.09	366	11	2.30E-02	30.0	
11	0	209.68	74	97	1.48	419.78	414	11	2.05E-02	28.5	
12	0	238.46*	288	122	1.21	477.32	474	8	8.01E-02	9.0	
13	0	242.08	70	104	1.02	484.57	482	9	1.94E-02	31.3	
14	0	252.03	24	37	0.92	504.47	501	6	6.78E-03	44.4	
15	0	269.99	60	112	4.94	540.38	530	16	1.67E-02	41.4	
16	0	281.65	26	38	1.60	563.70	558	11	7.12E-03	51.9	
17	0	295.17*	128	81	1.17	590.72	584	13	3.54E-02	17.2	
18	0	302.16*	44	84	4.80	604.69	597	16	1.22E-02	49.5	
19	0	338.46*	50	63	0.91	677.29	672	9	1.40E-02	32.4	
20	0	351.81*	192	71	1.32	703.97	698	14	5.34E-02	11.9	
21	0	463.69	16	31	1.37	927.70	922	9	4.47E-03	67.5	
22	0	485.37	40	69	12.38	971.04	957	30	1.10E-02	62.7	
23	3	510.66*	25	27	2.04	1021.61	1014	20	7.03E-03	61.4	2.04E+00
24	3	514.25	19	20	2.04	1028.79	1014	20	5.24E-03	55.9	
25	0	583.25*	103	41	1.27	1166.76	1162	12	2.86E-02	16.2	
26	0	609.13*	146	33	1.48	1218.51	1213	14	4.07E-02	11.8	
27	0	661.74	46	34	1.04	1323.73	1319	10	1.29E-02	27.9	
28	0	665.33	16	13	1.88	1330.89	1328	8	4.31E-03	48.7	
29	0	711.67	8	28	0.78	1423.57	1419	12	2.09E-03	149.1	
30	0	728.14*	13	36	0.92	1456.50	1449	12	3.55E-03	99.6	
31	0	830.98	12	11	1.50	1662.14	1655	11	3.25E-03	66.7	
32	0	852.04	8	14	0.67	1704.25	1694	14	2.22E-03	105.3	
33	0	861.03	27	29	1.54	1722.24	1715	17	7.47E-03	50.3	
34	0	911.88*	91	35	2.35	1823.92	1815	22	2.53E-02	19.6	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	964.23	23	11	1.35	1928.61	1922	11	6.25E-03	35.3	
36	0	968.59*	58	9	1.50	1937.32	1933	10	1.62E-02	16.9	
37	0	991.95	13	1	1.04	1984.05	1981	6	3.49E-03	32.1	
38	0	1055.78	7	16	4.25	2111.68	2103	13	1.93E-03	125.6	
39	0	1102.76	12	15	1.34	2205.63	2200	10	3.33E-03	66.9	
40	0	1119.87	41	12	1.95	2239.84	2231	16	1.14E-02	24.6	
41	0	1128.91	14	2	3.21	2257.93	2253	9	3.86E-03	33.0	
42	0	1238.14	12	9	0.64	2476.37	2473	7	3.43E-03	50.8	
43	0	1376.74	20	3	1.40	2753.54	2746	14	5.43E-03	30.4	
44	0	1460.29*	304	7	1.93	2920.63	2913	14	8.44E-02	6.1	
45	0	1764.35*	29	3	1.45	3528.71	3522	12	8.10E-03	23.5	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235021.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 8-DEC-2015 14:17:00   Acquisition date  : 3-OCT-2016 08:57:41
Sample ID        : G405235021             Sample quantity   : 161.30 GRAM
Sample type      : SOLID                   Sample geometry   :
Detector name    : GAMMA7                 Detector geometry : CAN
Elapsed live time: 0 01:00:00.00          Elapsed real time: 0 01:00:00.50   0.0%
Energy tolerance : 1.50 keV               Half life ratio   : 10.00
Errors propagated: No                     Systematic Error  : 0.00 %
Efficiency type  : Linear                 Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.122E+00	1.148E+01	1.148E+01	12.23	OK
KR-85	514.00	0.43*	2.620E+00	8.514E+00	8.986E+00	111.77	OK
SR-85	514.00	96.00*	2.620E+00	3.849E-02	9.489E-01	111.77	OK
CD-109	88.03	3.70*	5.745E+00	1.334E+00	2.093E+00	80.72	OK
SN-126	64.28	9.60	3.624E+00	----- Line	Not Found	-----	Absent
	86.94	8.90	5.745E+00	5.546E-01	5.546E-01	80.72	OK
	87.57	37.00*	5.745E+00	1.334E-01	1.334E-01	80.72	OK
BA-137M	661.66	89.90*	2.138E+00	1.205E-01	1.228E-01	55.70	OK
CS-137	661.66	85.10*	2.138E+00	1.273E-01	1.297E-01	55.70	OK
TL-208	277.37	6.60	4.377E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.365E+00	2.589E-01	2.589E-01	32.49	OK
	860.56	12.50	1.736E+00	5.982E-01	5.982E-01	100.52	OK
PB-212	74.82	10.28	4.784E+00	1.070E+00	1.070E+00	63.93	OK
	77.11	17.10	4.995E+00	1.533E+00	1.533E+00	22.11	OK
	238.63	43.60*	4.933E+00	7.477E-01	7.477E-01	17.95	OK
	300.09	3.30	4.103E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.284E+00	7.086E-01	7.089E-01	23.69	OK
	1120.29	14.92	1.406E+00	9.123E-01	9.126E-01	49.11	OK
	1764.49	15.30	9.423E-01	8.919E-01	8.922E-01	47.05	OK
PB-214	74.82	5.80	4.781E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	4.995E+00	2.703E+00	2.704E+00	22.11	OK
	87.09	3.41	5.736E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.877E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.160E+00	9.078E-01	9.082E-01	34.41	OK
	351.93	35.60*	3.593E+00	8.043E-01	8.045E-01	23.81	OK
RN-222	609.32	45.49*	2.284E+00	7.086E-01	7.089E-01	23.69	OK
	1120.29	14.92	1.406E+00	9.123E-01	9.126E-01	49.11	OK
	1764.49	15.30	9.423E-01	8.919E-01	8.922E-01	47.05	OK
RA-224	240.99	4.10*	4.876E+00	3.389E-01	3.389E-01	394.49	OK
RA-226	609.32	45.49*	2.284E+00	7.086E-01	7.089E-01	23.69	OK
	1120.29	14.92	1.406E+00	9.123E-01	9.126E-01	49.11	OK
	1764.49	15.30	9.423E-01	8.919E-01	8.922E-01	47.05	OK
AC-228	105.21	1.10	6.488E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.711E+00	6.479E-01	6.479E-01	64.74	OK
	794.95	4.25	1.849E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.777E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.658E+00	1.020E+00	1.020E+00	39.13	OK
	968.97	15.80	1.581E+00	1.112E+00	1.112E+00	33.90	OK
RA-228	105.21	1.10	6.488E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.711E+00	6.479E-01	6.479E-01	64.74	OK
	794.95	4.25	1.849E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.777E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.658E+00	1.020E+00	1.020E+00	39.13	OK
	968.97	15.80	1.581E+00	1.112E+00	1.112E+00	33.90	OK
TH-228	74.82	10.28	4.784E+00	1.070E+00	1.070E+00	63.93	OK
	77.11	17.10	4.995E+00	1.533E+00	1.533E+00	22.11	OK
	238.63	43.60*	4.933E+00	7.477E-01	7.477E-01	17.95	OK
	300.09	3.30	4.103E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.284E+00	7.086E-01	7.086E-01	23.69	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	1120.29	14.92	1.406E+00	9.123E-01	9.123E-01	49.11	OK
	1764.49	15.30	9.423E-01	8.919E-01	8.919E-01	47.05	OK
PA-231	283.69	1.70	4.298E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.080E+00	1.090E+00	1.090E+00	99.01	OK
TH-232	105.21	1.10	6.488E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.711E+00	6.479E-01	6.479E-01	64.74	OK
	835.71	1.61	1.777E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.658E+00	1.020E+00	1.020E+00	39.13	OK
	968.97	15.80	1.581E+00	1.112E+00	1.112E+00	33.90	OK
TH-234	63.29	3.70*	3.418E+00	8.828E-01	8.828E-01	287.78	OK
	92.59	4.23	6.053E+00	1.779E+00	1.779E+00	68.74	OK
U-234	609.32	45.49*	2.284E+00	7.086E-01	7.086E-01	23.69	OK
	1120.29	14.92	1.406E+00	9.123E-01	9.123E-01	49.11	OK
	1764.49	15.30	9.423E-01	8.919E-01	8.919E-01	47.05	OK
U-235	89.96	3.47	5.897E+00	8.997E-01	8.997E-01	124.84	OK
	93.35	5.60	6.053E+00	1.344E+00	1.344E+00	68.74	OK
	143.76	10.96*	6.563E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	6.266E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.856E+00	1.417E-01	1.417E-01	59.94	OK
	205.31	5.01	5.496E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	3.418E+00	8.828E-01	8.828E-01	287.78	OK
	92.59	4.23	6.053E+00	1.779E+00	1.779E+00	68.74	OK
AM-243	43.53	5.90	6.933E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	4.784E+00	1.637E-01	1.637E-01	63.93	OK
ANH-511	511.00	100.00*	2.635E+00	4.932E-02	4.932E-02	122.78	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235021.CNF;1 *
 * Acquisition date : 3-OCT-2016 08:57:41 Sensitivity : 3.000 *
 * Detector ID : GAM07 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.50 Half life ratio : ***** *
 * Sample date : 8-DEC-2015 14:17:00 Analyst initials: MXR1 *
 * Sample ID : G405235021 Sample Quantity : 1.6130E+02 GRAM *
 * Batch Number : 1596249 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 19-AUG-2016 11:09:59 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM07_CAN.CNF;15 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.148E+01	1.376E+00	6.020E-01
KR-85	8.986E+00	9.843E+00	1.069E+01
SR-85	9.489E-01	1.039E+00	1.129E+00
CD-109	2.093E+00	1.656E+00	1.856E+00
SN-126	1.334E-01	1.055E-01	1.188E-01
BA-137M	1.228E-01	6.702E-02	6.972E-02
CS-137	1.297E-01	7.080E-02	7.365E-02
TL-208	2.589E-01	8.244E-02	6.287E-02
PB-212	7.477E-01	1.315E-01	1.031E-01
BI-214	7.089E-01	1.646E-01	1.049E-01
PB-214	8.045E-01	1.877E-01	1.178E-01
RN-222	7.089E-01	1.646E-01	1.049E-01
RA-224	3.389E-01	1.310E+00	1.312E+00
RA-226	7.089E-01	1.646E-01	1.049E-01
AC-228	1.020E+00	3.911E-01	2.008E-01
RA-228	1.020E+00	3.911E-01	2.008E-01
TH-228	7.477E-01	1.315E-01	1.031E-01
TH-230	7.086E-01	1.645E-01	1.048E-01
PA-231	1.090E+00	1.058E+00	6.675E-01
TH-232	1.020E+00	3.911E-01	2.008E-01
TH-234	8.828E-01	2.490E+00	1.888E+00
U-234	7.086E-01	1.645E-01	1.048E-01
U-235	3.069E-02	1.661E-01	3.129E-01
U-238	8.828E-01	2.490E+00	1.888E+00
AM-243	1.637E-01	1.026E-01	7.753E-02
ANH-511	4.932E-02	5.935E-02	4.372E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	2.392E+00		9.940E+00	1.866E+01	NOT IDENT.
NA-22	-4.722E-03		3.491E-02	6.991E-02	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF
AL-26	6.485E-03		3.382E-02	7.502E-02	FAIL ABUN

SC-46	-1.593E-02	2.996E-01	6.153E-01	FAIL ABUN
V-48	0.000E+00	1.277E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	3.367E+02	0.000E+00	SHORT HLIF
MN-54	5.176E-02	6.098E-02	1.269E-01	NOT IDENT.
CO-56	-2.602E-01	4.253E-01	6.647E-01	FAIL ABUN
MN-56	0.000E+00	1.702E+41	0.000E+00	SHORT HLIF
CO-57	-3.235E-02	3.999E-02	7.039E-02	NOT IDENT.
CO-58	-3.988E-01	5.759E-01	9.569E-01	NOT IDENT.
FE-59	2.626E+00	6.765E+00	1.300E+01	NOT IDENT.
CO-60	1.241E-02	3.036E-02	6.856E-02	NOT IDENT.
ZN-65	5.526E-02	1.769E-01	3.311E-01	NOT IDENT.
GE-68	-4.394E-01	2.136E+00	4.149E+00	NOT IDENT.
AS-73	-1.865E+00	6.599E+00	1.291E+01	NOT IDENT.
AS-74	0.000E+00	5.387E+03	0.000E+00	SHORT HLIF
SE-75	-2.194E-01	2.022E-01	3.164E-01	NOT IDENT.
BR-77	0.000E+00	2.331E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.800E+02	0.000E+00	SHORT HLIF
RB-83	1.042E-02	5.040E-01	1.004E+00	NOT IDENT.
RB-86	0.000E+00	2.604E+04	0.000E+00	SHORT HLIF
Y-88	3.393E-03	9.615E-02	2.683E-01	NOT IDENT.
Y-91	1.990E+02	6.222E+02	1.242E+03	NOT IDENT.
NB-94	-5.126E-03	2.760E-02	5.135E-02	NOT IDENT.
NB-95	-5.377E-01	8.952E-01	1.524E+00	NOT IDENT.
NB-95M	1.132E+00	1.907E+00	3.707E+00	NOT IDENT.
ZR-95	-5.668E-02	1.476E+00	2.771E+00	NOT IDENT.
NB-97	0.000E+00	1.082E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.168E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.603E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.738E+41	0.000E+00	SHORT HLIF
RH-101	0.000E+00	8.089E-02	5.978E-02	FAIL ABUN
RH-102	-2.224E-02	5.089E-02	9.190E-02	NOT IDENT.
RU-103	8.950E-02	4.626E+00	9.162E+00	FAIL ABUN
RH-106	1.541E-01	4.129E-01	8.536E-01	NOT IDENT.
RU-106	1.541E-01	4.129E-01	8.536E-01	NOT IDENT.
AG-108M	-6.525E-03	2.718E-02	5.150E-02	NOT IDENT.
AG-110M	-3.167E-02	7.927E-02	1.533E-01	NOT IDENT.
SN-113	-2.884E-02	2.214E-01	4.269E-01	NOT IDENT.
CD-115	0.000E+00	2.764E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	8.764E+04	0.000E+00	SHORT HLIF
TE-123M	-1.079E-01	1.253E-01	2.145E-01	NOT IDENT.
SB-124	1.146E-01	2.131E+00	4.424E+00	NOT IDENT.
SB-125	-5.414E-02	8.818E-02	1.605E-01	FAIL ABUN
TE-125M	6.919E+01	2.305E+02	4.499E+02	NOT IDENT.
I-126	0.000E+00	1.004E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.126E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.888E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	4.311E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.572E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.208E+26	0.000E+00	SHORT HLIF
BA-133	-1.338E-02	4.086E-02	6.908E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	2.153E-02	5.269E-02	1.041E-01	NOT IDENT.
CS-135	7.379E-02	1.144E-01	2.418E-01	NOT IDENT.
I-135	0.000E+00	1.868E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.951E+05	0.000E+00	SHORT HLIF
CE-139	-1.250E-02	1.054E-01	1.927E-01	NOT IDENT.
BA-140	0.000E+00	1.021E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	3.117E+05	0.000E+00	SHORT HLIF
CE-141	1.388E+01	2.089E+01	4.126E+01	NOT IDENT.
CE-143	0.000E+00	1.515E+41	0.000E+00	SHORT HLIF
CE-144	-1.287E-01	3.429E-01	5.708E-01	NOT IDENT.
PM-144	2.690E-02	4.832E-02	1.005E-01	NOT IDENT.
PR-144	2.365E+00	4.201E+00	8.747E+00	NOT IDENT.
PM-146	1.296E-02	3.715E-02	7.623E-02	NOT IDENT.
ND-147	0.000E+00	2.875E+07	0.000E+00	SHORT HLIF
PM-147	1.924E+02	6.547E+02	1.282E+03	NOT IDENT.
PM-149	0.000E+00	3.886E+40	0.000E+00	SHORT HLIF
EU-150	-1.312E-03	2.262E-02	4.017E-02	FAIL ABUN
EU-152	-5.561E-02	7.338E-02	1.339E-01	FAIL ABUN
GD-153	-1.028E-01	1.661E-01	2.784E-01	FAIL ABUN
EU-154	-1.158E-02	8.558E-02	1.714E-01	NOT IDENT.
EU-155	-3.814E-02	9.072E-02	1.676E-01	FAIL ABUN
TB-160	6.524E-01	1.255E+00	2.906E+00	FAIL ABUN
HO-166M	3.408E-02	9.961E-02	1.135E-01	FAIL ABUN
TM-171	-1.794E-01	1.546E+01	3.096E+01	NOT IDENT.
HF-172	-1.101E-01	2.305E-01	3.809E-01	FAIL ABUN
LU-172	-5.708E-02	7.403E-02	1.289E-01	FAIL ABUN
LU-176	-8.387E-03	2.145E-02	3.656E-02	FAIL ABUN

HF-181	4.432E-01	3.660E+00	7.316E+00	NOT IDENT.
TA-182	6.389E-01	9.186E-01	1.966E+00	FAIL ABUN
RE-183	-7.564E-01	2.314E+00	4.481E+00	NOT IDENT.
RE-184	1.372E+01	3.124E+01	6.567E+01	NOT IDENT.
W-188	1.904E+01	1.023E+02	1.882E+02	FAIL ABUN
IR-192	1.089E-01	3.924E-01	7.923E-01	FAIL ABUN
HG-203	-9.161E-01	2.069E+00	3.528E+00	FAIL ABUN
BI-207	2.596E-02	4.647E-02	9.988E-02	FAIL ABUN
PB-210	1.035E+00	2.467E+00	5.096E+00	NOT IDENT.
BI-211	0.000E+00	5.170E-01	7.320E-01	FAIL ABUN
PB-211	2.257E-01	5.095E-01	1.070E+00	FAIL ABUN
BI-212	4.770E-01	9.309E-01	1.119E+00	FAIL ABUN
RN-219	-7.130E-02	3.350E-01	6.430E-01	FAIL ABUN
RA-223	4.393E-02	5.413E-01	1.076E+00	FAIL ABUN
AC-227	-4.093E-02	1.944E-01	3.828E-01	NOT IDENT.
TH-227	-4.093E-02	1.944E-01	3.828E-01	NOT IDENT.
TH-229	6.714E-02	4.220E-01	7.859E-01	FAIL ABUN
TH-231	4.393E-02	5.413E-01	1.076E+00	FAIL ABUN
PA-233	8.350E-03	5.037E-02	1.019E-01	NOT IDENT.
PA-234	8.053E-02	2.328E-01	5.005E-01	NOT IDENT.
PA-234M	-6.592E-01	3.983E+00	7.916E+00	NOT IDENT.
NP-237	8.350E-03	5.037E-02	1.019E-01	NOT IDENT.
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	9.356E-02	2.179E-01	4.002E-01	NOT IDENT.
PU-239	0.000E+00	7.337E+02	6.161E+02	FAIL ABUN
AM-241	-8.491E-03	1.182E-01	2.151E-01	NOT IDENT.
CM-243	2.499E-02	8.365E-02	1.642E-01	NOT IDENT.
BK-247	-4.901E-02	7.077E-02	1.171E-01	NOT IDENT.
CM-247	-2.554E-03	2.981E-02	5.820E-02	NOT IDENT.
CF-249	1.748E-02	3.440E-02	7.092E-02	FAIL ABUN
CF-251	1.018E-01	9.504E-02	1.944E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	295	10.66*	1.122E+00	1.148E+01	1.148E+01	12.23
KR-85	514.00	21	0.43*	2.620E+00	8.514E+00	8.986E+00	111.77
SR-85	514.00	21	96.00*	2.620E+00	3.849E-02	9.489E-01	111.77
CD-109	88.03	99	3.70*	5.745E+00	2.171E+00	3.406E+00	47.80
SN-126	64.28	-----	9.60	3.624E+00	-----	Line Not Found	-----
	86.94	99	8.90	5.745E+00	9.024E-01	9.024E-01	47.80
	87.57	99	37.00*	5.745E+00	2.171E-01	2.171E-01	47.80
BA-137M	661.66	50	89.90*	2.138E+00	1.205E-01	1.228E-01	55.70
CS-137	661.66	50	85.10*	2.138E+00	1.273E-01	1.297E-01	55.70
TL-208	277.37	-----	6.60	4.377E+00	-----	Line Not Found	-----
	583.19	112	85.00*	2.365E+00	2.589E-01	2.589E-01	32.49
	860.56	28	12.50	1.736E+00	5.982E-01	5.982E-01	100.52
BI-211	72.87	-----	1.23	4.591E+00	-----	Line Not Found	-----
	351.06	221	12.92*	3.593E+00	2.216E+00	2.216E+00	23.81
PB-212	74.82	167	10.28	4.784E+00	1.582E+00	1.582E+00	41.77
	77.11	281	17.10	4.995E+00	1.533E+00	1.533E+00	22.11
	238.63	346	43.60*	4.933E+00	7.477E-01	7.477E-01	17.95
	300.09	-----	3.30	4.103E+00	-----	Line Not Found	-----
BI-214	609.32	158	45.49*	2.284E+00	7.086E-01	7.089E-01	23.69
	1120.29	41	14.92	1.406E+00	9.123E-01	9.126E-01	49.11
	1764.49	28	15.30	9.423E-01	8.919E-01	8.922E-01	47.05
PB-214	74.82	167	5.80	4.784E+00	2.805E+00	2.806E+00	41.77
	77.11	281	9.70	4.995E+00	2.703E+00	2.704E+00	22.11
	87.09	99	3.41	5.745E+00	2.355E+00	2.356E+00	47.80
	242.00	84	7.25	4.876E+00	1.099E+00	1.100E+00	62.62
	295.22	149	18.42	4.160E+00	9.078E-01	9.082E-01	34.41
	351.93	221	35.60*	3.593E+00	8.043E-01	8.045E-01	23.81
RN-222	609.32	158	45.49*	2.284E+00	7.086E-01	7.089E-01	23.69
	1120.29	41	14.92	1.406E+00	9.123E-01	9.126E-01	49.11
	1764.49	28	15.30	9.423E-01	8.919E-01	8.922E-01	47.05
RA-224	240.99	84	4.10*	4.876E+00	1.944E+00	1.944E+00	62.62
RA-226	609.32	158	45.49*	2.284E+00	7.086E-01	7.089E-01	23.69
	1120.29	41	14.92	1.406E+00	9.123E-01	9.126E-01	49.11
	1764.49	28	15.30	9.423E-01	8.919E-01	8.922E-01	47.05
AC-228	105.21	-----	1.10	6.488E+00	-----	Line Not Found	-----
	338.32	58	11.27	3.711E+00	6.479E-01	6.479E-01	64.74
	794.95	-----	4.25	1.849E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.777E+00	-----	Line Not Found	-----
	911.20	94	25.80*	1.658E+00	1.020E+00	1.020E+00	39.13
	968.97	60	15.80	1.581E+00	1.112E+00	1.112E+00	33.90
RA-228	105.21	-----	1.10	6.488E+00	-----	Line Not Found	-----
	338.32	58	11.27	3.711E+00	6.479E-01	6.479E-01	64.74
	794.95	-----	4.25	1.849E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.777E+00	-----	Line Not Found	-----
	911.20	94	25.80*	1.658E+00	1.020E+00	1.020E+00	39.13
	968.97	60	15.80	1.581E+00	1.112E+00	1.112E+00	33.90
TH-228	74.82	167	10.28	4.784E+00	1.582E+00	1.582E+00	41.77

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	77.11	281	17.10	4.995E+00	1.533E+00	1.533E+00	22.11
	238.63	346	43.60*	4.933E+00	7.477E-01	7.477E-01	17.95
	300.09	-----	3.30	4.103E+00	-----	Line Not Found	-----
TH-230	609.32	158	45.49*	2.284E+00	7.086E-01	7.086E-01	23.69
	1120.29	41	14.92	1.406E+00	9.123E-01	9.123E-01	49.11
	1764.49	28	15.30	9.423E-01	8.919E-01	8.919E-01	47.05
PA-231	283.69	-----	1.70	4.298E+00	-----	Line Not Found	-----
	301.36	51	5.35*	4.080E+00	1.090E+00	1.090E+00	99.01
TH-232	105.21	-----	1.10	6.488E+00	-----	Line Not Found	-----
	338.32	58	11.27	3.711E+00	6.479E-01	6.479E-01	64.74
	835.71	-----	1.61	1.777E+00	-----	Line Not Found	-----
	911.20	94	25.80*	1.658E+00	1.020E+00	1.020E+00	39.13
	968.97	60	15.80	1.581E+00	1.112E+00	1.112E+00	33.90
TH-234	63.29	24	3.70*	3.418E+00	8.828E-01	8.828E-01	287.78
	92.59	98	4.23	6.053E+00	1.779E+00	1.779E+00	68.74
U-234	609.32	158	45.49*	2.284E+00	7.086E-01	7.086E-01	23.69
	1120.29	41	14.92	1.406E+00	9.123E-01	9.123E-01	49.11
	1764.49	28	15.30	9.423E-01	8.919E-01	8.919E-01	47.05
U-235	89.96	40	3.47	5.897E+00	8.997E-01	8.997E-01	124.84
	93.35	98	5.60	6.053E+00	1.344E+00	1.344E+00	68.74
	143.76	-----	10.96*	6.563E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.266E+00	-----	Line Not Found	-----
	185.72	102	57.20	5.856E+00	1.417E-01	1.417E-01	59.94
	205.31	-----	5.01	5.496E+00	-----	Line Not Found	-----
U-238	63.29	24	3.70*	3.418E+00	8.828E-01	8.828E-01	287.78
	92.59	98	4.23	6.053E+00	1.779E+00	1.779E+00	68.74
AM-243	43.53	-----	5.90	6.933E-01	-----	Line Not Found	-----
	74.66	167	67.20*	4.784E+00	2.421E-01	2.421E-01	41.77
ANH-511	511.00	28	100.00*	2.635E+00	4.932E-02	4.932E-02	122.78

Flag: "*" = Keyline

Total number of lines in spectrum 45
 Number of unidentified lines 6
 Number of lines tentatively identified by NID 39 86.67%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.148E+01	1.148E+01	0.140E+01	12.23	
KR-85	10.56Y	1.06	8.514E+00	8.986E+00	10.04E+00	111.77	
SR-85	64.84D	24.7	3.849E-02	9.489E-01	10.61E-01	111.77	
CD-109	461.40D	1.57	2.171E+00	3.406E+00	1.628E+00	47.80	
SN-126	2.30E+05Y	1.00	2.171E-01	2.171E-01	1.038E-01	47.80	
BA-137M	30.08Y	1.02	1.205E-01	1.228E-01	0.684E-01	55.70	
CS-137	30.08Y	1.02	1.273E-01	1.297E-01	0.722E-01	55.70	
TL-208	1.41E+10Y	1.00	2.589E-01	2.589E-01	0.841E-01	32.49	
BI-211	7.04E+08Y	1.00	2.216E+00	2.216E+00	0.528E+00	23.81	
PB-212	1.41E+10Y	1.00	7.477E-01	7.477E-01	1.342E-01	17.95	
BI-214	1600.00Y	1.00	7.086E-01	7.089E-01	1.679E-01	23.69	
PB-214	1600.00Y	1.00	8.043E-01	8.045E-01	1.915E-01	23.81	
RN-222	1600.00Y	1.00	7.086E-01	7.089E-01	1.679E-01	23.69	
RA-224	1.41E+10Y	1.00	1.944E+00	1.944E+00	1.218E+00	62.62	
RA-226	1600.00Y	1.00	7.086E-01	7.089E-01	1.679E-01	23.69	
AC-228	1.41E+10Y	1.00	1.020E+00	1.020E+00	0.399E+00	39.13	
RA-228	1.41E+10Y	1.00	1.020E+00	1.020E+00	0.399E+00	39.13	
TH-228	1.41E+10Y	1.00	7.477E-01	7.477E-01	1.342E-01	17.95	
TH-230	7.54E+04Y	1.00	7.086E-01	7.086E-01	1.679E-01	23.69	
PA-231	7.04E+08Y	1.00	1.090E+00	1.090E+00	1.079E+00	99.01	
TH-232	1.41E+10Y	1.00	1.020E+00	1.020E+00	0.399E+00	39.13	
TH-234	4.47E+09Y	1.00	8.828E-01	8.828E-01	25.40E-01	287.78	
U-234	2.45E+05Y	1.00	7.086E-01	7.086E-01	1.679E-01	23.69	
U-235	7.04E+08Y	1.00	1.417E-01	1.417E-01	0.850E-01	59.94	K
U-238	4.47E+09Y	1.00	8.828E-01	8.828E-01	25.40E-01	287.78	
AM-243	7370.00Y	1.00	2.421E-01	2.421E-01	1.011E-01	41.77	
ANH-511	1.00E+09Y	1.00	4.932E-02	4.932E-02	6.056E-02	122.78	
Total Activity :			3.928E+01	4.190E+01			

Grand Total Activity : 3.928E+01 4.190E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	70.49	26	168	1.37	141.47	140	6	5.38E-03	****	4.34E+00	T
0	115.04	20	111	0.60	230.55	228	6	4.24E-03	****	6.65E+00	T
0	128.68	61	224	0.63	257.81	253	11	1.33E-02	****	6.69E+00	T
0	209.68	90	118	1.48	419.78	414	11	2.05E-02	56.9	5.42E+00	T
0	252.03	29	44	0.92	504.47	501	6	6.78E-03	88.7	4.73E+00	T
0	269.99	71	132	4.94	540.38	530	16	1.67E-02	82.7	4.47E+00	T
0	281.65	30	45	1.60	563.70	558	11	7.12E-03	****	4.32E+00	T
0	463.69	18	34	1.37	927.70	922	9	4.47E-03	****	2.85E+00	T
0	485.37	44	77	12.38	971.04	957	30	1.10E-02	****	2.75E+00	
0	665.33	17	14	1.88	1330.89	1328	8	4.31E-03	97.3	2.13E+00	T
0	711.67	8	30	0.78	1423.57	1419	12	2.09E-03	****	2.02E+00	T
0	728.14	14	38	0.92	1456.50	1449	12	3.55E-03	****	1.98E+00	T
0	830.98	12	12	1.50	1662.14	1655	11	3.25E-03	****	1.79E+00	T
0	852.04	8	15	0.67	1704.25	1694	14	2.22E-03	****	1.75E+00	
0	964.23	23	11	1.35	1928.61	1922	11	6.25E-03	70.7	1.59E+00	T
0	991.95	13	1	1.04	1984.05	1981	6	3.49E-03	64.1	1.55E+00	
0	1055.78	7	16	4.25	2111.68	2103	13	1.93E-03	****	1.47E+00	
0	1102.76	12	15	1.34	2205.63	2200	10	3.33E-03	****	1.42E+00	
0	1128.91	14	2	3.21	2257.93	2253	9	3.86E-03	66.0	1.40E+00	T
0	1238.14	12	9	0.64	2476.37	2473	7	3.43E-03	****	1.29E+00	T
0	1376.74	19	3	1.40	2753.54	2746	14	5.43E-03	60.8	1.18E+00	

Flags: "T" = Tentatively associated

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235021.CNF;1 *
 * Acquisition date : 3-OCT-2016 08:57:41 Sensitivity : 3.000 *
 * Detector ID : GAM07 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.50 Half life ratio : ***** *
 * Sample date : 8-DEC-2015 14:17:00 Nuclide Library : SOLID *
 * Sample ID : G405235021 Analyst initials: MXR1 *
 * Batch Number : 1596249 Sample Quantity : 1.6130E+02 GRAM *
 * Wet wt corr : 1.00000 Wet Weight : 0.00000 *
 * Dry Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 19-AUG-2016 11:09:59 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM07_CAN.CNF;15 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.479E-01
KR-85	4.737E+00
SR-85	5.003E-01
CD-109	8.780E-01
SN-126	5.622E-02
BA-137M	3.142E-02
CS-137	3.319E-02
TL-208	2.819E-02
PB-212	4.843E-02
BI-214	4.617E-02
PB-214	5.372E-02
RN-222	4.617E-02
RA-224	6.227E-01
RA-226	4.617E-02
AC-228	8.536E-02
RA-228	8.536E-02
TH-228	4.843E-02
TH-230	4.615E-02
PA-231	3.034E-01
TH-232	8.536E-02
TH-234	8.907E-01
U-234	4.615E-02
U-235	1.471E-01
U-238	8.907E-01
AM-243	3.662E-02
ANH-511	1.938E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.209E+00	NOT IDENT.
NA-22	2.866E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	3.063E-02	FAIL ABUN
SC-46	2.621E-01	FAIL ABUN

V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.638E-02	NOT IDENT.
CO-56	2.782E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	3.265E-02	NOT IDENT.
CO-58	4.114E-01	NOT IDENT.
FE-59	5.652E+00	NOT IDENT.
CO-60	2.844E-02	NOT IDENT.
ZN-65	1.445E-01	NOT IDENT.
GE-68	1.779E+00	NOT IDENT.
AS-73	6.035E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.441E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.395E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	8.482E-02	NOT IDENT.
Y-91	5.566E+02	NOT IDENT.
NB-94	2.249E-02	NOT IDENT.
NB-95	6.748E-01	NOT IDENT.
NB-95M	1.715E+00	NOT IDENT.
ZR-95	1.227E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.812E-02	FAIL ABUN
RH-102	3.985E-02	NOT IDENT.
RU-103	4.049E+00	FAIL ABUN
RH-106	3.758E-01	NOT IDENT.
RU-106	3.758E-01	NOT IDENT.
AG-108M	2.334E-02	NOT IDENT.
AG-110M	6.463E-02	NOT IDENT.
SN-113	1.947E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.000E-01	NOT IDENT.
SB-124	1.784E+00	NOT IDENT.
SB-125	7.136E-02	FAIL ABUN
TE-125M	2.106E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.138E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	4.666E-02	NOT IDENT.
CS-135	1.117E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	9.022E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.936E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.664E-01	NOT IDENT.
PM-144	4.464E-02	NOT IDENT.
PR-144	3.884E+00	NOT IDENT.
PM-146	3.426E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	5.970E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.822E-02	FAIL ABUN
EU-152	5.987E-02	FAIL ABUN
GD-153	1.302E-01	FAIL ABUN
EU-154	7.027E-02	NOT IDENT.
EU-155	7.819E-02	FAIL ABUN
TB-160	1.231E+00	FAIL ABUN
HO-166M	5.083E-02	FAIL ABUN
TM-171	1.447E+01	NOT IDENT.
HF-172	1.783E-01	FAIL ABUN
LU-172	5.482E-02	FAIL ABUN
LU-176	1.652E-02	FAIL ABUN
HF-181	3.261E+00	NOT IDENT.

TA-182	8.720E-01	FAIL ABUN
RE-183	2.099E+00	NOT IDENT.
RE-184	2.925E+01	NOT IDENT.
W-188	8.638E+01	FAIL ABUN
IR-192	3.621E-01	FAIL ABUN
HG-203	1.602E+00	FAIL ABUN
BI-207	4.398E-02	FAIL ABUN
PB-210	2.396E+00	NOT IDENT.
BI-211	3.519E-01	FAIL ABUN
PB-211	4.804E-01	FAIL ABUN
BI-212	5.105E-01	FAIL ABUN
RN-219	2.905E-01	FAIL ABUN
RA-223	4.950E-01	FAIL ABUN
AC-227	1.764E-01	NOT IDENT.
TH-227	1.764E-01	NOT IDENT.
TH-229	3.663E-01	FAIL ABUN
TH-231	4.950E-01	FAIL ABUN
PA-233	4.663E-02	NOT IDENT.
PA-234	2.170E-01	NOT IDENT.
PA-234M	3.462E+00	NOT IDENT.
NP-237	4.663E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	1.873E-01	NOT IDENT.
PU-239	2.920E+02	FAIL ABUN
AM-241	1.011E-01	NOT IDENT.
CM-243	7.695E-02	NOT IDENT.
BK-247	5.366E-02	NOT IDENT.
CM-247	2.625E-02	NOT IDENT.
CF-249	3.244E-02	FAIL ABUN
CF-251	9.076E-02	NOT IDENT.


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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235021.CNF;1
* Acquisition date   : 3-OCT-2016 08:57:41 Sensitivity      : 3.000
* Detector ID        : GAM07 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.50 Half life ratio  : *****
* Sample date        : 8-DEC-2015 14:17:00 Nuclide Library : SOLID
* Sample ID          : G405235021 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity : 1.6130E+02 GRAM
*                   : Quantity Err(%) : 1.2399E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight      : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 19-AUG-2016 11:09:59 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM07_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.148E+01	1.501E+00	1.501E+00
KR-85	8.986E+00	9.849E+00	9.849E+00
SR-85	9.489E-01	1.040E+00	1.040E+00
CD-109	2.093E+00	1.672E+00	1.672E+00
SN-126	1.334E-01	1.064E-01	1.064E-01
BA-137M	1.228E-01	6.723E-02	6.723E-02
CS-137	1.297E-01	7.102E-02	7.102E-02
TL-208	2.589E-01	8.317E-02	8.317E-02
PB-212	7.477E-01	1.374E-01	1.374E-01
BI-214	7.089E-01	1.674E-01	1.674E-01
PB-214	8.045E-01	1.907E-01	1.907E-01
RN-222	7.089E-01	1.674E-01	1.674E-01
RA-224	3.389E-01	1.315E+00	1.315E+00
RA-226	7.089E-01	1.674E-01	1.674E-01
AC-228	1.020E+00	3.946E-01	3.946E-01
RA-228	1.020E+00	3.946E-01	3.946E-01
TH-228	7.477E-01	1.374E-01	1.374E-01
TH-230	7.086E-01	1.673E-01	1.673E-01
PA-231	1.090E+00	1.083E+00	1.083E+00
TH-232	1.020E+00	3.946E-01	3.946E-01
TH-234	8.828E-01	2.497E+00	2.497E+00
U-234	7.086E-01	1.673E-01	1.673E-01
U-235	3.069E-02	1.661E-01	1.661E-01
U-238	8.828E-01	2.497E+00	2.497E+00
AM-243	1.637E-01	1.035E-01	1.035E-01
ANH-511	4.932E-02	5.938E-02	5.938E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	2.392E+00	9.940E+00	9.999E+00	NOT IDENT.
NA-22	-4.722E-03	3.491E-02	3.497E-02	NOT IDENT.
NA-24	1.000E+41	2.950E+41	0.000E+00	SHORT HLIF
AL-26	6.485E-03	3.382E-02	3.395E-02	FAIL ABUN

SC-46	-1.593E-02	2.996E-01	2.997E-01	FAIL ABUN
V-48	5.642E+03	1.277E+04	1.302E+04	SHORT HLIF
CR-51	-2.792E+02	3.369E+02	3.597E+02	SHORT HLIF
MN-54	5.176E-02	6.102E-02	6.532E-02	NOT IDENT.
CO-56	-2.602E-01	4.254E-01	4.413E-01	FAIL ABUN
MN-56	-1.000E+41	1.703E+41	0.000E+00	SHORT HLIF
CO-57	-3.235E-02	4.002E-02	4.259E-02	NOT IDENT.
CO-58	-3.988E-01	5.762E-01	6.036E-01	NOT IDENT.
FE-59	2.626E+00	6.767E+00	6.870E+00	NOT IDENT.
CO-60	1.241E-02	3.036E-02	3.087E-02	NOT IDENT.
ZN-65	5.526E-02	1.769E-01	1.786E-01	NOT IDENT.
GE-68	-4.394E-01	2.136E+00	2.145E+00	NOT IDENT.
AS-73	-1.865E+00	6.610E+00	6.664E+00	NOT IDENT.
AS-74	-4.685E+03	5.401E+03	5.799E+03	SHORT HLIF
SE-75	-2.194E-01	2.025E-01	2.253E-01	NOT IDENT.
BR-77	1.325E+38	1.147E+39	0.000E+00	SHORT HLIF
SR-82	-1.811E+02	6.801E+02	6.849E+02	SHORT HLIF
RB-83	1.042E-02	5.040E-01	5.040E-01	NOT IDENT.
RB-86	-3.319E+03	2.604E+04	2.608E+04	SHORT HLIF
Y-88	3.393E-03	9.615E-02	9.617E-02	NOT IDENT.
Y-91	1.990E+02	6.223E+02	6.287E+02	NOT IDENT.
NB-94	-5.126E-03	2.760E-02	2.770E-02	NOT IDENT.
NB-95	-5.377E-01	8.955E-01	9.277E-01	NOT IDENT.
NB-95M	1.132E+00	1.909E+00	1.976E+00	NOT IDENT.
ZR-95	-5.668E-02	1.476E+00	1.477E+00	NOT IDENT.
NB-97	-1.000E+41	1.083E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.168E+41	0.000E+00	SHORT HLIF
MO-99	8.480E+31	1.604E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.741E+41	0.000E+00	SHORT HLIF
RH-101	7.445E-02	8.201E-02	8.861E-02	FAIL ABUN
RH-102	-2.224E-02	5.092E-02	5.190E-02	NOT IDENT.
RU-103	8.950E-02	4.626E+00	4.626E+00	FAIL ABUN
RH-106	1.541E-01	4.130E-01	4.188E-01	NOT IDENT.
RU-106	1.541E-01	4.130E-01	4.188E-01	NOT IDENT.
AG-108M	-6.525E-03	2.718E-02	2.734E-02	NOT IDENT.
AG-110M	-3.167E-02	7.928E-02	8.056E-02	NOT IDENT.
SN-113	-2.884E-02	2.214E-01	2.217E-01	NOT IDENT.
CD-115	1.042E+39	2.770E+39	0.000E+00	SHORT HLIF
SN-117M	-4.146E+04	8.778E+04	8.975E+04	SHORT HLIF
TE-123M	-1.079E-01	1.254E-01	1.345E-01	NOT IDENT.
SB-124	1.146E-01	2.131E+00	2.132E+00	NOT IDENT.
SB-125	-5.414E-02	8.821E-02	9.152E-02	FAIL ABUN
TE-125M	6.919E+01	3.306E+02	2.327E+02	NOT IDENT.
I-126	1.053E+06	1.014E+06	1.120E+06	SHORT HLIF
SB-126	-2.367E+04	1.126E+06	1.126E+06	SHORT HLIF
SB-127	-7.599E+21	2.158E+22	0.000E+00	SHORT HLIF
I-131	5.698E+08	4.311E+09	4.318E+09	SHORT HLIF
I-132	1.000E+41	1.855E+42	0.000E+00	SHORT HLIF
TE-132	-1.446E+26	3.261E+26	0.000E+00	SHORT HLIF
BA-133	-1.338E-02	4.086E-02	4.130E-02	FAIL ABUN
I-133	-1.000E+41	4.115E+41	0.000E+00	SHORT HLIF
CS-134	2.153E-02	5.270E-02	5.359E-02	NOT IDENT.
CS-135	7.379E-02	1.145E-01	1.193E-01	NOT IDENT.
I-135	-1.000E+41	7.026E+41	0.000E+00	SHORT HLIF
CS-136	-6.716E+02	2.951E+05	2.951E+05	SHORT HLIF
CE-139	-1.250E-02	1.054E-01	1.056E-01	NOT IDENT.
BA-140	5.230E+05	1.021E+06	1.048E+06	SHORT HLIF
LA-140	-5.901E+04	3.117E+05	3.129E+05	SHORT HLIF
CE-141	1.388E+01	2.090E+01	2.181E+01	NOT IDENT.
CE-143	1.000E+41	1.519E+41	0.000E+00	SHORT HLIF
CE-144	-1.287E-01	3.430E-01	3.478E-01	NOT IDENT.
PM-144	2.690E-02	4.834E-02	4.984E-02	NOT IDENT.
PR-144	2.365E+00	4.203E+00	4.336E+00	NOT IDENT.
PM-146	1.296E-02	3.716E-02	3.762E-02	NOT IDENT.
ND-147	1.585E+07	2.876E+07	2.964E+07	SHORT HLIF
PM-147	1.924E+02	6.547E+02	6.604E+02	NOT IDENT.
PM-149	1.561E+40	3.901E+40	0.000E+00	SHORT HLIF
EU-150	-1.312E-03	2.262E-02	2.263E-02	FAIL ABUN
EU-152	-5.561E-02	7.345E-02	7.761E-02	FAIL ABUN
GD-153	-1.028E-01	1.662E-01	1.725E-01	FAIL ABUN
EU-154	-1.158E-02	8.558E-02	8.574E-02	NOT IDENT.
EU-155	-3.814E-02	9.076E-02	9.238E-02	FAIL ABUN
TB-160	6.524E-01	1.255E+00	1.289E+00	FAIL ABUN
HO-166M	3.408E-02	9.963E-02	1.008E-01	FAIL ABUN
TM-171	-1.794E-01	1.546E+01	1.546E+01	NOT IDENT.
HF-172	-1.101E-01	2.312E-01	2.364E-01	FAIL ABUN
LU-172	-5.708E-02	7.426E-02	7.859E-02	FAIL ABUN
LU-176	-8.387E-03	2.145E-02	2.178E-02	FAIL ABUN

HF-181	4.432E-01	3.661E+00	3.666E+00	NOT IDENT.
TA-182	6.389E-01	9.189E-01	9.630E-01	FAIL ABUN
RE-183	-7.564E-01	2.317E+00	2.342E+00	NOT IDENT.
RE-184	1.372E+01	3.141E+01	3.201E+01	NOT IDENT.
W-188	1.904E+01	1.023E+02	1.027E+02	FAIL ABUN
IR-192	1.089E-01	3.924E-01	3.955E-01	FAIL ABUN
HG-203	-9.161E-01	2.069E+00	2.110E+00	FAIL ABUN
BI-207	2.596E-02	4.649E-02	4.794E-02	FAIL ABUN
PB-210	1.035E+00	2.468E+00	2.512E+00	NOT IDENT.
BI-211	2.216E+00	5.264E-01	1.129E+00	FAIL ABUN
PB-211	2.257E-01	5.096E-01	5.196E-01	FAIL ABUN
BI-212	4.770E-01	9.312E-01	9.557E-01	FAIL ABUN
RN-219	-7.130E-02	3.351E-01	3.367E-01	FAIL ABUN
RA-223	4.393E-02	5.413E-01	5.417E-01	FAIL ABUN
AC-227	-4.093E-02	1.945E-01	1.953E-01	NOT IDENT.
TH-227	-4.093E-02	1.945E-01	1.953E-01	NOT IDENT.
TH-229	6.714E-02	4.220E-01	4.231E-01	FAIL ABUN
TH-231	4.393E-02	5.413E-01	5.417E-01	FAIL ABUN
PA-233	8.350E-03	5.037E-02	5.051E-02	NOT IDENT.
PA-234	8.053E-02	2.504E-01	2.530E-01	NOT IDENT.
PA-234M	-6.592E-01	3.984E+00	3.995E+00	NOT IDENT.
NP-237	8.350E-03	5.037E-02	5.051E-02	NOT IDENT.
NP-238	8.921E+40	4.010E+41	0.000E+00	SHORT HLIF
NP-239	9.356E-02	2.180E-01	2.221E-01	NOT IDENT.
PU-239	6.753E+02	7.343E+02	7.949E+02	FAIL ABUN
AM-241	-8.491E-03	1.182E-01	1.183E-01	NOT IDENT.
CM-243	2.499E-02	8.368E-02	8.444E-02	NOT IDENT.
BK-247	-4.901E-02	7.146E-02	7.480E-02	NOT IDENT.
CM-247	-2.554E-03	2.982E-02	2.984E-02	NOT IDENT.
CF-249	1.748E-02	3.443E-02	3.532E-02	FAIL ABUN
CF-251	1.018E-01	9.572E-02	1.061E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	61.8428	87.09	102.2612	136.47	64.7451
45.60	62.2083	87.57	102.3518	140.51	0.0000
46.54	63.3312	88.03	102.4387	143.76	72.2641
49.72	0.0000	88.34	102.4966	144.24	70.0137
51.35	74.8469	88.47	102.5211	145.44	60.9278
51.87	68.1345	89.96	95.0544	152.43	64.9585
52.39	69.2008	1093.63	95.1711	153.25	0.0000
52.97	74.1842	91.11	0.0000	323.87	67.4298
53.44	75.2502	92.59	70.7438	156.02	0.0000
54.07	73.4127	93.35	70.8389	158.56	0.0000
57.36	0.0000	94.56	53.9524	159.00	85.3753
57.53	81.9412	94.65	53.9609	162.33	76.3286
57.98	82.0299	94.67	53.9628	162.66	0.0000
59.27	77.9876	94.87	53.9818	163.33	72.8937
59.32	77.9969	97.43	77.0515	165.86	75.4746
59.54	84.6510	98.43	69.6799	176.31	64.4645
60.96	86.2613	98.44	69.6809	176.60	0.0000
61.17	84.9756	99.53	71.9578	177.52	43.0356
62.93	92.9871	100.11	77.4036	181.07	0.0000
63.29	93.0635	102.03	78.7321	181.52	49.6352
63.58	93.1251	103.18	66.9956	184.41	67.4647
64.28	92.2697	103.37	67.0169	143.76	67.5621
66.73	99.4977	105.21	74.8086	193.51	59.6201
67.24	95.9074	105.31	74.8207	197.03	62.2862
125.81	90.2739	106.12	68.4049	198.01	47.6800
67.75	90.2875	106.47	73.8754	201.83	56.4633
69.67	94.7226	109.28	61.1137	203.43	60.2459
70.83	93.6003	111.00	75.5056	205.31	52.5605
72.81	81.7303	111.76	0.0000	210.85	37.9917
72.87	81.7407	114.06	52.7769	215.65	51.0373
74.66	97.0840	116.30	0.0000	222.11	62.6366
74.82	97.1158	116.74	60.3543	227.09	57.9029
74.97	97.1461	119.76	56.5633	227.38	57.9190
77.11	97.5672	121.12	53.3438	228.16	0.0000
78.74	97.8843	121.22	54.4633	228.18	57.9633
79.69	103.5927	121.78	71.1948	116.74	57.9633
80.12	100.9149	122.06	73.4499	235.69	39.3399
80.19	0.0000	122.92	63.5144	235.96	41.8882
80.57	101.0040	123.07	63.5284	238.63	81.4395
81.00	113.5508	265.00	69.1625	238.98	0.0000
81.07	113.5666	125.81	85.0431	240.99	117.3233
81.75	83.2068	127.23	74.0040	242.00	49.7807
83.79	84.9243	127.91	74.0765	244.70	47.3441
84.00	84.9584	129.30	74.2228	252.40	0.0000
85.43	94.9630	131.20	70.6635	252.80	39.9553
86.55	109.1559	133.02	67.8287	254.15	0.0000
86.79	102.2040	133.52	75.4181	256.23	49.9877
86.94	102.2330	136.00	68.1088	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	57.2988	355.39	0.0000	584.27	25.4238
264.80	57.3069	356.01	39.1041	595.83	0.0000
265.00	54.7110	364.49	0.0000	427.87	25.6182
268.22	37.4448	366.42	0.0000	602.52	0.0000
269.46	37.4841	372.51	32.0113	604.72	14.4377
270.03	37.5025	375.05	23.5774	607.14	19.2715
271.23	37.5401	377.52	32.1178	609.32	18.2195
273.65	0.0000	356.01	36.9941	610.33	18.2278
276.40	44.7173	388.16	30.4388	614.28	20.9457
277.37	47.3851	388.63	0.0000	618.01	21.5194
277.60	52.6611	391.69	38.1348	620.36	18.3108
278.00	40.8256	264.66	31.6411	621.93	14.0125
279.20	40.8663	401.81	32.6235	630.19	0.0000
279.54	51.4267	402.40	29.7563	631.29	19.4832
279.70	51.4327	404.85	20.1882	633.25	8.6667
280.46	44.8668	410.95	36.6702	634.78	0.0000
283.69	33.0780	413.71	29.9663	635.95	20.6081
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	34.4487	423.72	0.0000	645.85	17.4297
285.90	0.0000	427.09	21.4396	657.76	21.3527
287.50	42.4707	427.87	30.2249	657.90	0.0000
290.67	38.5864	433.94	35.2273	661.66	27.9695
293.27	0.0000	439.40	31.4141	664.57	0.0000
351.93	38.7263	453.88	21.7793	666.33	0.0000
295.96	38.7493	463.37	21.8971	666.50	0.0000
879.38	29.4564	468.07	19.1609	667.71	0.0000
299.98	33.5098	473.00	0.0000	677.62	11.0429
300.09	33.5129	475.06	17.0315	685.70	0.0000
300.13	33.5144	476.78	18.0505	695.00	0.0000
301.36	33.5464	477.60	15.0488	696.49	14.4690
302.85	33.5854	482.18	21.1218	696.51	14.4690
256.23	33.6281	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	18.9272
306.78	36.3826	497.08	19.2648	697.49	22.2689
308.46	29.1430	505.52	18.3329	702.65	18.9687
311.90	36.0742	507.63	0.0000	706.68	16.7645
316.51	30.7696	511.00	20.4285	711.68	16.7987
319.41	0.0000	514.00	20.4606	720.70	0.0000
320.08	0.0000	514.00	20.4606	721.93	0.0000
321.04	36.3224	520.40	16.4232	722.78	25.3107
323.87	42.7687	520.69	0.0000	722.91	25.3125
325.23	51.0086	522.65	0.0000	723.31	25.3162
328.76	0.0000	527.90	0.0000	724.19	20.2603
333.37	35.7357	528.26	20.6120	727.33	19.1582
333.97	33.0015	529.59	24.7510	733.00	13.5542
334.37	31.6355	529.87	0.0000	735.93	18.0931
338.28	36.7814	531.02	0.0000	333.97	16.9727
338.32	36.7830	537.26	0.0000	739.50	0.0000
311.90	41.4441	546.56	0.0000	747.24	22.7165
340.48	41.4441	552.55	20.8643	748.06	9.0895
340.55	0.0000	563.25	17.8280	752.31	21.6232
344.28	35.0916	569.33	18.9324	753.82	0.0000
345.93	31.0646	946.00	18.9338	756.73	20.5203
351.06	36.1872	569.70	15.7794	756.80	20.5210
351.93	36.2086	583.19	25.4102	884.68	19.4342

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	28.6001	1274.44	14.8569	1620.50	3.2587
766.42	26.3186	1001.03	14.8789	1621.92	5.4327
766.84	21.7445	1002.74	19.5388	1678.03	0.0000
772.60	0.0000	1004.73	18.6200	1690.97	5.5096
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.3539
778.90	18.3952	1028.54	0.0000	1063.66	1.1192
783.70	0.0000	1037.84	11.2844	1771.35	3.3583
785.37	20.7451	1038.76	0.0000	1791.20	0.0000
792.07	26.5741	631.29	12.2573	1808.65	5.4117
794.95	18.5059	1048.07	0.0000	1810.72	0.0000
795.86	19.6694	1049.04	9.0580	1836.06	0.9066
810.06	16.2832	1050.41	13.5923		
810.29	16.2843	1063.66	12.3192		
344.28	20.9385	1077.00	0.0000		
810.76	20.9407	1077.34	14.2712		
815.77	0.0000	1085.87	11.4448		
1048.07	0.0000	1093.63	19.1174		
832.01	15.4747	1099.45	10.7242		
834.85	11.2656	1112.07	19.2188		
835.71	12.9126	1112.84	7.6890		
836.80	0.0000	1115.54	12.3117		
846.75	0.0000	1120.29	11.5576		
846.77	15.5563	1120.55	11.5591		
856.80	0.0000	1221.41	4.6245		
860.56	8.8815	1129.67	12.3609		
871.09	10.6967	1131.51	0.0000		
873.19	8.9203	1147.95	0.0000		
875.33	0.0000	1173.23	23.4565		
879.38	6.2577	1177.95	18.5930		
880.51	12.5200	1189.05	15.7041		
883.24	6.2658	1204.77	20.6988		
884.68	13.4335	1221.41	12.8699		
889.28	11.6602	1231.02	16.8713		
894.76	15.2766	1235.36	0.0000		
898.04	13.4944	1238.28	16.9035		
900.72	20.7097	1260.41	0.0000		
903.28	17.1225	1271.87	7.0205		
911.20	10.8431	1274.44	8.0288		
912.08	10.8461	1274.54	8.0288		
923.98	0.0000	1291.59	9.0714		
926.50	13.6226	1298.22	0.0000		
929.11	14.5430	1312.11	0.0000		
937.49	20.9631	1332.49	5.0909		
944.13	0.0000	1362.66	0.0000		
946.00	10.9673	1365.19	5.1312		
949.00	13.7224	1368.63	0.0000		
667.71	0.0000	1384.29	7.2166		
962.31	8.8198	1408.01	2.0734		
964.08	11.7664	1457.56	0.0000		
966.17	11.0383	1460.82	7.3452		
911.20	10.3117	1489.16	3.1681		
968.97	10.3117	1505.03	3.1793		
983.53	0.0000	1584.12	8.6240		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235022.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM18.CNF;511
Background date : 2-OCT-2016 11:01:02.
Sample date      : 8-DEC-2015 13:43:00. Acquisition date : 3-OCT-2016 08:58:12.
Sample ID       : G405235022 Sample quantity : 1.61105E+02 GRAM
Detector name   : GAM18 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:01.02 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596249 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	49.57	34	109	1.03	99.98	97	6	9.48E-03	51.4	
2	0	62.89*	53	191	2.02	126.58	122	9	1.47E-02	50.0	
3	2	74.91	129	187	1.14	150.61	146	15	3.59E-02	19.7	1.08E+00
4	2	77.20*	212	178	1.15	155.18	146	15	5.90E-02	12.9	
5	0	87.32	74	143	1.17	175.42	173	6	2.04E-02	28.3	
6	0	92.44*	192	306	1.65	185.63	179	15	5.33E-02	21.7	
7	0	129.60	52	285	4.07	259.90	252	15	1.44E-02	72.5	
8	0	143.83*	10	137	0.85	288.33	285	7	2.88E-03	194.1	
9	0	185.90*	71	201	1.52	372.40	366	12	1.97E-02	42.9	
10	0	208.76	49	105	1.53	418.09	415	7	1.35E-02	37.8	
11	3	238.82*	504	106	1.21	478.16	473	16	1.40E-01	5.7	9.60E-01
12	3	241.79	145	111	1.81	484.10	473	16	4.03E-02	16.9	
13	0	270.17	50	111	1.55	540.82	535	12	1.40E-02	44.1	
14	0	295.64*	152	141	1.37	591.71	585	12	4.23E-02	17.8	
15	0	300.66	39	89	1.47	601.75	597	10	1.08E-02	48.8	
16	0	338.90*	96	119	1.22	678.18	671	14	2.68E-02	26.7	
17	0	352.34*	346	102	1.48	705.04	697	16	9.61E-02	8.6	
18	0	453.32*	13	57	1.11	906.86	900	10	3.71E-03	113.0	
19	0	463.59	31	69	1.13	927.38	924	9	8.56E-03	51.5	
20	0	511.57*	103	85	2.85	1023.28	1015	23	2.85E-02	28.2	
21	0	571.35	24	50	2.91	1142.77	1135	14	6.58E-03	67.8	
22	0	583.63*	220	60	1.63	1167.31	1158	16	6.12E-02	10.6	
23	0	609.67*	270	82	1.72	1219.35	1211	18	7.51E-02	10.1	
24	0	641.46	25	19	3.12	1282.88	1275	13	6.86E-03	42.0	
25	0	662.21	364	68	1.55	1324.36	1316	16	1.01E-01	7.3	
26	0	667.87	39	17	0.89	1335.69	1331	13	1.08E-02	26.7	
27	0	683.97	25	12	1.33	1367.87	1363	9	6.87E-03	33.2	
28	0	708.81	24	55	4.85	1417.52	1408	17	6.54E-03	75.2	
29	0	728.24	62	28	1.68	1456.36	1449	16	1.73E-02	22.8	
30	0	769.01	26	32	2.53	1537.84	1532	11	7.19E-03	47.1	
31	0	863.01	25	35	1.35	1725.74	1716	14	7.02E-03	53.5	
32	0	912.06*	86	55	1.44	1823.79	1817	11	2.39E-02	18.1	
33	0	969.92*	85	31	2.05	1939.45	1933	13	2.35E-02	17.9	
34	0	997.10	8	25	0.55	1993.80	1983	12	2.28E-03	130.3	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1054.81	8	47	5.05	2109.15	2091	23	2.30E-03	215.8	
36	0	1062.39	9	15	1.04	2124.31	2116	11	2.48E-03	93.4	
37	0	1065.22	12	8	0.64	2129.97	2126	8	3.22E-03	51.7	
38	0	1121.22*	41	28	1.63	2241.92	2234	16	1.14E-02	33.8	
39	0	1188.16	15	18	0.54	2375.75	2368	14	4.23E-03	63.8	
40	0	1239.27	20	27	3.66	2477.93	2470	12	5.58E-03	56.3	
41	0	1270.17	37	11	8.03	2539.71	2529	21	1.01E-02	27.7	
42	0	1314.97	14	0	1.29	2629.29	2625	9	3.89E-03	26.7	
43	0	1337.14	11	18	0.96	2673.60	2663	16	2.96E-03	98.0	
44	0	1378.49	39	10	2.65	2756.28	2745	17	1.09E-02	23.6	
45	0	1406.28	6	17	1.31	2811.83	2801	17	1.67E-03	162.7	
46	0	1411.65	5	6	0.61	2822.57	2817	9	1.34E-03	106.2	
47	0	1461.65*	587	6	2.57	2922.55	2911	24	1.63E-01	4.3	
48	0	1503.19	7	8	0.70	3005.60	2998	12	1.82E-03	98.7	
49	0	1590.82	15	13	1.13	3180.82	3173	14	4.15E-03	58.8	
50	0	1765.46*	66	0	1.63	3530.04	3520	18	1.83E-02	13.2	

Flag: "*" = Peak area was modified by background subtraction


```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235022.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 8-DEC-2015 13:43:00   Acquisition date  : 3-OCT-2016 08:58:12
Sample ID        : G405235022             Sample quantity   : 161.10 GRAM
Sample type       : SOLID                  Sample geometry    :
Detector name    : GAMMA18                Detector geometry : CAN
Elapsed live time: 0 01:00:00.00          Elapsed real time: 0 01:00:01.02   0.0%
Energy tolerance : 1.50 keV               Half life ratio   : 10.00
Errors propagated: No                      Systematic Error  : 0.00 %
Efficiency type  : Linear                  Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.911E+00	1.305E+01	1.305E+01	8.61	OK
CD-109	88.03	3.70*	6.143E+00	1.288E+00	2.021E+00	89.80	OK
SN-126	64.28	9.60	3.037E+00	1.155E+00	1.155E+00	100.06	OK
	86.94	8.90	6.143E+00	5.354E-01	5.354E-01	89.80	OK
	87.57	37.00*	6.143E+00	1.288E-01	1.288E-01	89.80	OK
BA-137M	661.66	89.90*	3.370E+00	5.994E-01	6.109E-01	14.57	OK
CS-137	661.66	85.10*	3.370E+00	6.332E-01	6.453E-01	14.57	OK
TL-208	277.37	6.60	6.127E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	3.675E+00	3.568E-01	3.568E-01	21.15	OK
	860.56	12.50	2.814E+00	----- Line	Not Found	-----	Absent
BI-211	72.87	1.23	4.495E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	5.217E+00	6.331E-01	6.331E-01	140.40	OK
PB-212	74.82	10.28	4.764E+00	1.217E+00	1.217E+00	54.80	OK
	77.11	17.10	5.051E+00	1.533E+00	1.533E+00	25.72	OK
	238.63	43.60*	6.720E+00	9.605E-01	9.605E-01	11.41	OK
	300.09	3.30	5.811E+00	1.102E+00	1.102E+00	97.69	OK
BI-214	609.32	45.49*	3.566E+00	8.388E-01	8.391E-01	20.12	OK
	1120.29	14.92	2.335E+00	5.509E-01	5.511E-01	67.60	OK
	1764.49	15.30	1.633E+00	1.167E+00	1.168E+00	26.46	OK
PB-214	74.82	5.80	4.752E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.051E+00	2.703E+00	2.704E+00	25.72	OK
	87.09	3.41	6.121E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	6.668E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	5.877E+00	7.669E-01	7.672E-01	35.62	OK
	351.93	35.60*	5.221E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	3.566E+00	8.388E-01	8.391E-01	20.12	OK
	1120.29	14.92	2.335E+00	5.509E-01	5.511E-01	67.60	OK
	1764.49	15.30	1.633E+00	1.167E+00	1.168E+00	26.46	OK
RA-224	240.99	4.10*	6.671E+00	1.597E+00	1.597E+00	69.38	OK
RA-226	609.32	45.49*	3.566E+00	8.388E-01	8.391E-01	20.12	OK
	1120.29	14.92	2.335E+00	5.509E-01	5.511E-01	67.60	OK
	1764.49	15.30	1.633E+00	1.167E+00	1.168E+00	26.46	OK
AC-228	105.21	1.10	7.385E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	5.359E+00	8.573E-01	8.573E-01	53.48	OK
	794.95	4.25	2.973E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.872E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	2.703E+00	5.926E-01	5.926E-01	36.28	OK
	968.97	15.80	2.589E+00	9.865E-01	9.865E-01	35.85	OK
RA-228	105.21	1.10	7.385E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	5.359E+00	8.573E-01	8.573E-01	53.48	OK
	794.95	4.25	2.973E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.872E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	2.703E+00	5.926E-01	5.926E-01	36.28	OK
	968.97	15.80	2.589E+00	9.865E-01	9.865E-01	35.85	OK
TH-228	74.82	10.28	4.764E+00	1.217E+00	1.217E+00	54.80	OK
	77.11	17.10	5.051E+00	1.533E+00	1.533E+00	25.72	OK
	238.63	43.60*	6.720E+00	9.605E-01	9.605E-01	11.41	OK
	300.09	3.30	5.811E+00	1.102E+00	1.102E+00	97.69	OK
TH-230	609.32	45.49*	3.566E+00	8.388E-01	8.388E-01	20.12	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	1120.29	14.92	2.335E+00	5.509E-01	5.509E-01	67.60	OK
	1764.49	15.30	1.633E+00	1.167E+00	1.167E+00	26.46	OK
PA-231	283.69	1.70	6.038E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	5.811E+00	6.797E-01	6.797E-01	97.69	OK
TH-232	105.21	1.10	7.385E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	5.359E+00	8.573E-01	8.573E-01	53.48	OK
	835.71	1.61	2.872E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	2.703E+00	5.926E-01	5.926E-01	36.28	OK
	968.97	15.80	2.589E+00	9.865E-01	9.865E-01	35.85	OK
TH-234	63.29	3.70*	3.037E+00	2.996E+00	2.996E+00	100.06	OK
	92.59	4.23	6.582E+00	4.229E+00	4.229E+00	43.37	OK
U-234	609.32	45.49*	3.566E+00	8.388E-01	8.388E-01	20.12	OK
	1120.29	14.92	2.335E+00	5.509E-01	5.509E-01	67.60	OK
	1764.49	15.30	1.633E+00	1.167E+00	1.167E+00	26.46	OK
U-235	89.96	3.47	6.379E+00	----- Line	Not Found	-----	Absent
	93.35	5.60	6.582E+00	3.195E+00	3.195E+00	43.37	OK
	143.76	10.96*	8.086E+00	6.871E-02	6.871E-02	388.16	OK
	163.33	5.08	7.938E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	7.616E+00	9.318E-02	9.318E-02	85.87	OK
	205.31	5.01	7.289E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	3.037E+00	2.996E+00	2.996E+00	100.06	OK
	92.59	4.23	6.582E+00	4.229E+00	4.229E+00	43.37	OK
AM-243	43.53	5.90	3.443E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	4.764E+00	1.862E-01	1.862E-01	54.80	OK
ANH-511	511.00	100.00*	4.026E+00	1.308E-01	1.308E-01	56.43	OK

Flag: "*" = Keyline

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235022.CNF;1
* Acquisition date   : 3-OCT-2016 08:58:12 Sensitivity      : 3.000
* Detector ID        : GAM18 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:01.02 Half life ratio  : *****
* Sample date        : 8-DEC-2015 13:43:00 Analyst initials: MXR1
* Sample ID          : G405235022 Sample Quantity : 1.6110E+02 GRAM
* Batch Number       : 1596249 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 25-JUN-2016 08:25:19 Eff. Geometry : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM18_CAN.CNF;10
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.305E+01	1.101E+00	3.806E-01
CD-109	2.021E+00	1.778E+00	1.651E+00
SN-126	1.288E-01	1.133E-01	1.097E-01
BA-137M	6.109E-01	8.723E-02	5.719E-02
CS-137	6.453E-01	9.215E-02	6.041E-02
TL-208	3.568E-01	7.397E-02	4.492E-02
BI-211	6.331E-01	8.711E-01	2.554E-01
PB-212	9.605E-01	1.074E-01	7.630E-02
BI-214	8.391E-01	1.655E-01	8.939E-02
PB-214	9.970E-01	1.682E-01	2.454E-01
RN-222	8.391E-01	1.655E-01	8.939E-02
RA-224	1.597E+00	1.086E+00	8.172E-01
RA-226	8.391E-01	1.655E-01	8.939E-02
AC-228	5.926E-01	2.107E-01	2.003E-01
RA-228	5.926E-01	2.107E-01	2.003E-01
TH-228	9.605E-01	1.074E-01	7.630E-02
TH-230	8.388E-01	1.654E-01	8.936E-02
PA-231	6.797E-01	6.507E-01	6.233E-01
TH-232	5.926E-01	2.107E-01	2.003E-01
TH-234	2.996E+00	2.938E+00	2.115E+00
U-234	8.388E-01	1.654E-01	8.936E-02
U-235	6.871E-02	2.614E-01	2.565E-01
U-238	2.996E+00	2.938E+00	2.115E+00
AM-243	1.862E-01	9.999E-02	8.044E-02
ANH-511	1.308E-01	7.232E-02	3.680E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-7.641E+00	1.071E+01	1.808E+01	NOT IDENT.
NA-22	3.943E-02	3.860E-02	7.597E-02	NOT IDENT.
NA-24	0.000E+00	1.779E+41	0.000E+00	SHORT HLIF
AL-26	-1.490E-02	2.491E-02	4.378E-02	NOT IDENT.
SC-46	6.926E-02	3.070E-01	5.862E-01	FAIL ABUN

V-48	0.000E+00	1.065E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	3.331E+02	0.000E+00	SHORT HLIF
MN-54	-3.136E-02	4.802E-02	8.224E-02	NOT IDENT.
CO-56	1.704E-02	3.528E-01	6.658E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.302E-02	3.740E-02	6.907E-02	NOT IDENT.
CO-58	-7.101E-02	3.817E-01	7.107E-01	NOT IDENT.
FE-59	-4.991E-01	4.655E+00	8.911E+00	NOT IDENT.
CO-60	2.140E-02	3.225E-02	6.121E-02	NOT IDENT.
ZN-65	1.107E-01	1.388E-01	2.641E-01	NOT IDENT.
GE-68	-1.237E-01	1.867E+00	3.553E+00	NOT IDENT.
AS-73	-1.057E+00	8.772E+00	1.794E+01	NOT IDENT.
AS-74	0.000E+00	4.756E+03	0.000E+00	SHORT HLIF
SE-75	1.514E-01	1.540E-01	2.998E-01	NOT IDENT.
BR-77	0.000E+00	1.917E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	5.434E+02	0.000E+00	SHORT HLIF
RB-83	-4.114E-02	5.068E-01	8.734E-01	NOT IDENT.
KR-85	1.121E+01	5.744E+00	1.269E+01	NOT IDENT.
SR-85	1.180E+00	6.063E-01	1.340E+00	NOT IDENT.
RB-86	0.000E+00	2.255E+04	0.000E+00	SHORT HLIF
Y-88	2.032E-02	1.233E-01	2.749E-01	NOT IDENT.
Y-91	2.861E+02	4.316E+02	8.710E+02	NOT IDENT.
NB-94	-1.750E-02	2.858E-02	4.325E-02	NOT IDENT.
NB-95	6.325E-01	6.446E-01	1.243E+00	NOT IDENT.
NB-95M	1.835E-01	1.983E+00	3.507E+00	NOT IDENT.
ZR-95	8.519E-02	1.015E+00	1.956E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.081E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.347E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	1.447E-02	2.823E-02	5.500E-02	NOT IDENT.
RH-102	1.531E-02	4.391E-02	8.780E-02	NOT IDENT.
RU-103	-8.813E-01	4.179E+00	7.984E+00	FAIL ABUN
RH-106	-2.326E-01	3.658E-01	6.570E-01	NOT IDENT.
RU-106	-2.326E-01	3.658E-01	6.570E-01	NOT IDENT.
AG-108M	-3.131E-03	2.150E-02	3.932E-02	NOT IDENT.
AG-110M	-2.253E-02	7.881E-02	1.412E-01	NOT IDENT.
SN-113	-5.019E-02	1.896E-01	3.448E-01	NOT IDENT.
CD-115	0.000E+00	2.304E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	8.166E+04	0.000E+00	SHORT HLIF
TE-123M	2.086E-03	1.104E-01	2.029E-01	NOT IDENT.
SB-124	-3.345E-01	1.404E+00	2.741E+00	NOT IDENT.
SB-125	-4.372E-02	8.373E-02	1.468E-01	FAIL ABUN
TE-125M	4.863E+01	2.185E+02	4.261E+02	NOT IDENT.
I-126	0.000E+00	4.917E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	9.456E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.716E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	3.865E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	5.235E+40	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.748E+26	0.000E+00	SHORT HLIF
BA-133	8.277E-03	3.078E-02	5.433E-02	NOT IDENT.
I-133	0.000E+00	1.827E+41	0.000E+00	SHORT HLIF
CS-134	3.357E-02	4.044E-02	8.303E-02	NOT IDENT.
CS-135	8.114E-02	1.129E-01	2.107E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.278E+05	0.000E+00	SHORT HLIF
CE-139	-5.266E-02	9.230E-02	1.610E-01	NOT IDENT.
BA-140	0.000E+00	9.051E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	3.185E+05	0.000E+00	SHORT HLIF
CE-141	-9.646E+00	2.254E+01	3.736E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	-9.676E-02	3.061E-01	5.139E-01	NOT IDENT.
PM-144	-2.033E-02	4.393E-02	7.904E-02	NOT IDENT.
PR-144	-1.740E+00	3.819E+00	6.876E+00	NOT IDENT.
PM-146	2.708E-02	5.998E-02	6.557E-02	FAIL ABUN
ND-147	0.000E+00	2.453E+07	0.000E+00	SHORT HLIF
PM-147	-5.706E+01	6.450E+02	1.218E+03	NOT IDENT.
PM-149	0.000E+00	3.512E+40	0.000E+00	SHORT HLIF
EU-150	1.750E-03	2.173E-02	3.718E-02	FAIL ABUN
EU-152	4.113E-02	8.247E-02	1.470E-01	NOT IDENT.
GD-153	4.647E-02	1.481E-01	2.739E-01	NOT IDENT.
EU-154	9.519E-02	9.444E-02	1.856E-01	FAIL ABUN
EU-155	6.081E-02	8.556E-02	1.733E-01	FAIL ABUN
TB-160	1.774E-01	1.284E+00	2.476E+00	FAIL ABUN
HO-166M	2.500E-02	5.246E-02	9.261E-02	FAIL ABUN
TM-171	-1.511E+00	2.280E+01	4.364E+01	NOT IDENT.
HF-172	-4.209E-02	2.115E-01	3.609E-01	FAIL ABUN
LU-172	3.188E-02	5.934E-02	1.209E-01	FAIL ABUN

LU-176	-2.564E-03	1.836E-02	3.478E-02	FAIL ABUN
HF-181	1.596E+00	3.138E+00	6.153E+00	NOT IDENT.
TA-182	5.369E-01	7.361E-01	1.495E+00	FAIL ABUN
RE-183	-1.204E+00	2.910E+00	5.768E+00	NOT IDENT.
RE-184	-1.555E+01	2.253E+01	3.786E+01	NOT IDENT.
W-188	-5.736E+01	9.789E+01	1.578E+02	FAIL ABUN
IR-192	-1.320E-01	3.467E-01	6.411E-01	FAIL ABUN
HG-203	1.057E+00	1.774E+00	3.582E+00	NOT IDENT.
BI-207	2.360E-02	4.321E-02	7.362E-02	FAIL ABUN
PB-210	-2.609E+00	4.585E+00	8.442E+00	NOT IDENT.
PB-211	-1.065E-01	5.620E-01	1.024E+00	NOT IDENT.
BI-212	0.000E+00	6.523E-01	9.123E-01	FAIL ABUN
RN-219	-1.002E-01	2.939E-01	5.301E-01	FAIL ABUN
RA-223	3.255E-01	4.306E-01	8.751E-01	FAIL ABUN
AC-227	-1.191E-01	1.771E-01	3.270E-01	FAIL ABUN
TH-227	-1.191E-01	1.771E-01	3.270E-01	FAIL ABUN
TH-229	2.710E-02	3.335E-01	6.695E-01	FAIL ABUN
TH-231	3.255E-01	4.306E-01	8.751E-01	FAIL ABUN
PA-233	3.015E-02	4.366E-02	8.856E-02	FAIL ABUN
PA-234	-5.054E-02	2.023E-01	3.845E-01	NOT IDENT.
PA-234M	2.969E+00	3.274E+00	6.539E+00	NOT IDENT.
NP-237	3.015E-02	4.366E-02	8.856E-02	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	-6.413E-02	1.986E-01	3.688E-01	NOT IDENT.
PU-239	0.000E+00	8.641E+02	5.285E+02	FAIL ABUN
AM-241	3.422E-02	1.381E-01	2.661E-01	NOT IDENT.
CM-243	-5.287E-02	7.496E-02	1.370E-01	NOT IDENT.
BK-247	7.490E-02	5.094E-02	1.045E-01	NOT IDENT.
CM-247	1.157E-02	2.629E-02	5.127E-02	NOT IDENT.
CF-249	1.428E-02	2.762E-02	5.454E-02	NOT IDENT.
CF-251	4.262E-02	8.960E-02	1.697E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	570	10.66*	1.911E+00	1.305E+01	1.305E+01	8.61
CD-109	88.03	97	3.70*	6.143E+00	1.995E+00	3.129E+00	56.59
SN-126	64.28	72	9.60	3.037E+00	1.155E+00	1.155E+00	100.06
	86.94	97	8.90	6.143E+00	8.292E-01	8.292E-01	56.59
	87.57	97	37.00*	6.143E+00	1.995E-01	1.995E-01	56.59
BA-137M	661.66	390	89.90*	3.370E+00	5.994E-01	6.109E-01	14.57
CS-137	661.66	390	85.10*	3.370E+00	6.332E-01	6.453E-01	14.57
TL-208	277.37	-----	6.60	6.127E+00	-----	Line Not Found	-----
	583.19	239	85.00*	3.675E+00	3.568E-01	3.568E-01	21.15
	860.56	-----	12.50	2.814E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	4.495E+00	-----	Line Not Found	-----
	351.06	397	12.92*	5.217E+00	2.746E+00	2.746E+00	17.22
PB-212	74.82	173	10.28	4.764E+00	1.650E+00	1.650E+00	39.33
	77.11	284	17.10	5.051E+00	1.533E+00	1.533E+00	25.72
	238.63	604	43.60*	6.720E+00	9.605E-01	9.605E-01	11.41
	300.09	45	3.30	5.811E+00	1.102E+00	1.102E+00	97.69
BI-214	609.32	292	45.49*	3.566E+00	8.388E-01	8.391E-01	20.12
	1120.29	41	14.92	2.335E+00	5.509E-01	5.511E-01	67.60
	1764.49	63	15.30	1.633E+00	1.167E+00	1.168E+00	26.46
PB-214	74.82	173	5.80	4.764E+00	2.924E+00	2.925E+00	39.33
	77.11	284	9.70	5.051E+00	2.703E+00	2.704E+00	25.72
	87.09	97	3.41	6.143E+00	2.164E+00	2.165E+00	56.59
	242.00	173	7.25	6.671E+00	1.670E+00	1.670E+00	33.76
	295.22	178	18.42	5.877E+00	7.669E-01	7.672E-01	35.62
RN-222	351.93	397	35.60*	5.217E+00	9.966E-01	9.970E-01	17.22
	609.32	292	45.49*	3.566E+00	8.388E-01	8.391E-01	20.12
	1120.29	41	14.92	2.335E+00	5.509E-01	5.511E-01	67.60
	1764.49	63	15.30	1.633E+00	1.167E+00	1.168E+00	26.46
RA-224	240.99	173	4.10*	6.671E+00	2.953E+00	2.953E+00	33.76
RA-226	609.32	292	45.49*	3.566E+00	8.388E-01	8.391E-01	20.12
	1120.29	41	14.92	2.335E+00	5.509E-01	5.511E-01	67.60
	1764.49	63	15.30	1.633E+00	1.167E+00	1.168E+00	26.46
AC-228	105.21	-----	1.10	7.385E+00	-----	Line Not Found	-----
	338.32	111	11.27	5.359E+00	8.573E-01	8.573E-01	53.48
	794.95	-----	4.25	2.973E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.872E+00	-----	Line Not Found	-----
	911.20	89	25.80*	2.703E+00	5.926E-01	5.926E-01	36.28
	968.97	87	15.80	2.589E+00	9.865E-01	9.865E-01	35.85
RA-228	105.21	-----	1.10	7.385E+00	-----	Line Not Found	-----
	338.32	111	11.27	5.359E+00	8.573E-01	8.573E-01	53.48
	794.95	-----	4.25	2.973E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.872E+00	-----	Line Not Found	-----
	911.20	89	25.80*	2.703E+00	5.926E-01	5.926E-01	36.28
	968.97	87	15.80	2.589E+00	9.865E-01	9.865E-01	35.85
TH-228	74.82	173	10.28	4.764E+00	1.650E+00	1.650E+00	39.33
	77.11	284	17.10	5.051E+00	1.533E+00	1.533E+00	25.72
	238.63	604	43.60*	6.720E+00	9.605E-01	9.605E-01	11.41

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-230	300.09	45	3.30	5.811E+00	1.102E+00	1.102E+00	97.69
	609.32	292	45.49*	3.566E+00	8.388E-01	8.388E-01	20.12
	1120.29	41	14.92	2.335E+00	5.509E-01	5.509E-01	67.60
PA-231	1764.49	63	15.30	1.633E+00	1.167E+00	1.167E+00	26.46
	283.69	-----	1.70	6.038E+00	-----	Line Not Found	-----
	301.36	45	5.35*	5.811E+00	6.797E-01	6.797E-01	97.69
TH-232	105.21	-----	1.10	7.385E+00	-----	Line Not Found	-----
	338.32	111	11.27	5.359E+00	8.573E-01	8.573E-01	53.48
	835.71	-----	1.61	2.872E+00	-----	Line Not Found	-----
TH-234	911.20	89	25.80*	2.703E+00	5.926E-01	5.926E-01	36.28
	968.97	87	15.80	2.589E+00	9.865E-01	9.865E-01	35.85
	63.29	72	3.70*	3.037E+00	2.996E+00	2.996E+00	100.06
U-234	92.59	253	4.23	6.582E+00	4.229E+00	4.229E+00	43.37
	609.32	292	45.49*	3.566E+00	8.388E-01	8.388E-01	20.12
	1120.29	41	14.92	2.335E+00	5.509E-01	5.509E-01	67.60
U-235	1764.49	63	15.30	1.633E+00	1.167E+00	1.167E+00	26.46
	89.96	-----	3.47	6.379E+00	-----	Line Not Found	-----
	93.35	253	5.60	6.582E+00	3.195E+00	3.195E+00	43.37
U-238	143.76	13	10.96*	8.086E+00	6.871E-02	6.871E-02	388.16
	163.33	-----	5.08	7.938E+00	-----	Line Not Found	-----
	185.72	87	57.20	7.616E+00	9.318E-02	9.318E-02	85.87
AM-243	205.31	-----	5.01	7.289E+00	-----	Line Not Found	-----
	63.29	72	3.70*	3.037E+00	2.996E+00	2.996E+00	100.06
	92.59	253	4.23	6.582E+00	4.229E+00	4.229E+00	43.37
ANH-511	43.53	-----	5.90	3.443E-01	-----	Line Not Found	-----
	74.66	173	67.20*	4.764E+00	2.524E-01	2.524E-01	39.33
	511.00	113	100.00*	4.026E+00	1.308E-01	1.308E-01	56.43

Flag: "*" = Keyline

Total number of lines in spectrum 50
 Number of unidentified lines 17
 Number of lines tentatively identified by NID 33 66.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.305E+01	1.305E+01	0.112E+01	8.61	
CD-109	461.40D	1.57	1.995E+00	3.129E+00	1.771E+00	56.59	
SN-126	2.30E+05Y	1.00	1.995E-01	1.995E-01	1.129E-01	56.59	
BA-137M	30.08Y	1.02	5.994E-01	6.109E-01	0.890E-01	14.57	
CS-137	30.08Y	1.02	6.332E-01	6.453E-01	0.940E-01	14.57	
TL-208	1.41E+10Y	1.00	3.568E-01	3.568E-01	0.755E-01	21.15	
BI-211	7.04E+08Y	1.00	2.746E+00	2.746E+00	0.473E+00	17.22	
PB-212	1.41E+10Y	1.00	9.605E-01	9.605E-01	1.096E-01	11.41	
BI-214	1600.00Y	1.00	8.388E-01	8.391E-01	1.689E-01	20.12	
PB-214	1600.00Y	1.00	9.966E-01	9.970E-01	1.717E-01	17.22	
RN-222	1600.00Y	1.00	8.388E-01	8.391E-01	1.689E-01	20.12	
RA-224	1.41E+10Y	1.00	2.953E+00	2.953E+00	0.997E+00	33.76	
RA-226	1600.00Y	1.00	8.388E-01	8.391E-01	1.689E-01	20.12	
AC-228	1.41E+10Y	1.00	5.926E-01	5.926E-01	2.150E-01	36.28	
RA-228	1.41E+10Y	1.00	5.926E-01	5.926E-01	2.150E-01	36.28	
TH-228	1.41E+10Y	1.00	9.605E-01	9.605E-01	1.096E-01	11.41	
TH-230	7.54E+04Y	1.00	8.388E-01	8.388E-01	1.688E-01	20.12	
PA-231	7.04E+08Y	1.00	6.797E-01	6.797E-01	6.640E-01	97.69	
TH-232	1.41E+10Y	1.00	5.926E-01	5.926E-01	2.150E-01	36.28	
TH-234	4.47E+09Y	1.00	2.996E+00	2.996E+00	2.998E+00	100.06	
U-234	2.45E+05Y	1.00	8.388E-01	8.388E-01	1.688E-01	20.12	
U-235	7.04E+08Y	1.00	6.871E-02	6.871E-02	26.67E-02	388.16	
U-238	4.47E+09Y	1.00	2.996E+00	2.996E+00	2.998E+00	100.06	
AM-243	7370.00Y	1.00	2.524E-01	2.524E-01	0.993E-01	39.33	
ANH-511	1.00E+09Y	1.00	1.308E-01	1.308E-01	0.738E-01	56.43	
Total Activity :			3.854E+01	3.970E+01			

Grand Total Activity : 3.854E+01 3.970E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	49.57	48	152	1.03	99.98	97	6	9.48E-03	****	1.01E+00	T
0	129.60	66	363	4.07	259.90	252	15	1.44E-02	****	8.04E+00	T
0	208.76	59	127	1.53	418.09	415	7	1.35E-02	75.7	7.23E+00	
0	270.17	60	131	1.55	540.82	535	12	1.40E-02	88.3	6.23E+00	T
0	453.32	15	64	1.11	906.86	900	10	3.71E-03	****	4.38E+00	T
0	463.59	34	77	1.13	927.38	924	9	8.56E-03	****	4.31E+00	T
0	571.35	26	55	2.91	1142.77	1135	14	6.58E-03	****	3.73E+00	
0	641.46	27	21	3.12	1282.88	1275	13	6.86E-03	84.0	3.44E+00	
0	667.87	42	18	0.89	1335.69	1331	13	1.08E-02	53.4	3.35E+00	T
0	683.97	26	13	1.33	1367.87	1363	9	6.87E-03	66.4	3.30E+00	
0	708.81	25	59	4.85	1417.52	1408	17	6.54E-03	****	3.22E+00	
0	728.24	66	29	1.68	1456.36	1449	16	1.73E-02	45.5	3.16E+00	T
0	769.01	27	34	2.53	1537.84	1532	11	7.19E-03	94.3	3.04E+00	
0	863.01	26	36	1.35	1725.74	1716	14	7.02E-03	****	2.81E+00	
0	997.10	8	25	0.55	1993.80	1983	12	2.28E-03	****	2.54E+00	T
0	1054.81	8	47	5.05	2109.15	2091	23	2.30E-03	****	2.44E+00	
0	1062.39	9	15	1.04	2124.31	2116	11	2.48E-03	****	2.43E+00	T
0	1065.22	12	8	0.64	2129.97	2126	8	3.22E-03	****	2.42E+00	
0	1188.16	15	18	0.54	2375.75	2368	14	4.23E-03	****	2.24E+00	T
0	1239.27	20	27	3.66	2477.93	2470	12	5.58E-03	****	2.17E+00	T
0	1270.17	36	10	8.03	2539.71	2529	21	1.01E-02	55.4	2.13E+00	
0	1314.97	14	0	1.29	2629.29	2625	9	3.89E-03	53.5	2.07E+00	
0	1337.14	10	18	0.96	2673.60	2663	16	2.96E-03	****	2.05E+00	
0	1378.49	38	10	2.65	2756.28	2745	17	1.09E-02	47.2	2.00E+00	
0	1406.28	6	17	1.31	2811.83	2801	17	1.67E-03	****	1.97E+00	
0	1411.65	5	6	0.61	2822.57	2817	9	1.34E-03	****	1.96E+00	
0	1503.19	6	8	0.70	3005.60	2998	12	1.82E-03	****	1.87E+00	
0	1590.82	14	13	1.13	3180.82	3173	14	4.15E-03	****	1.78E+00	

Flags: "T" = Tentatively associated

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235022.CNF;1
* Acquisition date   : 3-OCT-2016 08:58:12 Sensitivity      : 3.000
* Detector ID        : GAM18 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:01.02 Half life ratio  : *****
* Sample date        : 8-DEC-2015 13:43:00 Nuclide Library : SOLID
* Sample ID          : G405235022 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity  : 1.6110E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight       : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 25-JUN-2016 08:25:19 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM18_CAN.CNF;10
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.591E-01
CD-109	7.788E-01
SN-126	5.186E-02
BA-137M	2.641E-02
CS-137	2.790E-02
TL-208	2.037E-02
BI-211	1.179E-01
PB-212	3.588E-02
BI-214	4.068E-02
PB-214	1.192E-01
RN-222	4.068E-02
RA-224	3.843E-01
RA-226	4.068E-02
AC-228	9.093E-02
RA-228	9.093E-02
TH-228	3.588E-02
TH-230	4.067E-02
PA-231	2.903E-01
TH-232	9.093E-02
TH-234	9.973E-01
U-234	4.067E-02
U-235	1.206E-01
U-238	9.973E-01
AM-243	3.806E-02
ANH-511	1.678E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.300E+00	NOT IDENT.
NA-22	3.425E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.793E-02	NOT IDENT.
SC-46	2.651E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF

CR-51	0.000E+00	SHORT HLIF
MN-54	3.675E-02	NOT IDENT.
CO-56	2.994E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	3.239E-02	NOT IDENT.
CO-58	3.137E-01	NOT IDENT.
FE-59	3.945E+00	NOT IDENT.
CO-60	2.715E-02	NOT IDENT.
ZN-65	1.194E-01	NOT IDENT.
GE-68	1.599E+00	NOT IDENT.
AS-73	8.396E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.397E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	3.960E-01	NOT IDENT.
KR-85	5.952E+00	NOT IDENT.
SR-85	6.281E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.091E-01	NOT IDENT.
Y-91	3.969E+02	NOT IDENT.
NB-94	1.962E-02	NOT IDENT.
NB-95	5.670E-01	NOT IDENT.
NB-95M	1.651E+00	NOT IDENT.
ZR-95	8.787E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.603E-02	NOT IDENT.
RH-102	4.002E-02	NOT IDENT.
RU-103	3.643E+00	FAIL ABUN
RH-106	2.959E-01	NOT IDENT.
RU-106	2.959E-01	NOT IDENT.
AG-108M	1.805E-02	NOT IDENT.
AG-110M	6.324E-02	NOT IDENT.
SN-113	1.597E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	9.573E-02	NOT IDENT.
SB-124	1.123E+00	NOT IDENT.
SB-125	6.747E-02	FAIL ABUN
TE-125M	2.006E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.499E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.817E-02	NOT IDENT.
CS-135	9.872E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	7.568E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.765E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.413E-01	NOT IDENT.
PM-144	3.597E-02	NOT IDENT.
PR-144	3.130E+00	NOT IDENT.
PM-146	3.023E-02	FAIL ABUN
ND-147	0.000E+00	SHORT HLIF
PM-147	5.715E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.730E-02	FAIL ABUN
EU-152	6.862E-02	NOT IDENT.
GD-153	1.289E-01	NOT IDENT.
EU-154	8.364E-02	FAIL ABUN
EU-155	8.171E-02	FAIL ABUN
TB-160	1.101E+00	FAIL ABUN
HO-166M	4.257E-02	FAIL ABUN
TM-171	2.041E+01	NOT IDENT.
HF-172	1.703E-01	FAIL ABUN
LU-172	5.466E-02	FAIL ABUN
LU-176	1.615E-02	FAIL ABUN

HF-181	2.815E+00	NOT IDENT.
TA-182	6.811E-01	FAIL ABUN
RE-183	2.711E+00	NOT IDENT.
RE-184	1.673E+01	NOT IDENT.
W-188	7.344E+01	FAIL ABUN
IR-192	2.967E-01	FAIL ABUN
HG-203	1.676E+00	NOT IDENT.
BI-207	3.321E-02	FAIL ABUN
PB-210	3.958E+00	NOT IDENT.
PB-211	4.751E-01	NOT IDENT.
BI-212	4.255E-01	FAIL ABUN
RN-219	2.441E-01	FAIL ABUN
RA-223	4.076E-01	FAIL ABUN
AC-227	1.526E-01	FAIL ABUN
TH-227	1.526E-01	FAIL ABUN
TH-229	3.144E-01	FAIL ABUN
TH-231	4.076E-01	FAIL ABUN
PA-233	4.124E-02	FAIL ABUN
PA-234	1.719E-01	NOT IDENT.
PA-234M	2.968E+00	NOT IDENT.
NP-237	4.124E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.734E-01	NOT IDENT.
PU-239	2.509E+02	FAIL ABUN
AM-241	1.254E-01	NOT IDENT.
CM-243	6.396E-02	NOT IDENT.
BK-247	4.872E-02	NOT IDENT.
CM-247	2.371E-02	NOT IDENT.
CF-249	2.522E-02	NOT IDENT.
CF-251	7.986E-02	NOT IDENT.

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*****
*                                     GEL Laboratories LLC                       *
*                                     2040 Savage Road                          *
*                                     Charleston, SC 29407                       *
*****
*                                     DETECTOR AND SAMPLE DATA                  *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235022.CNF;1
* Acquisition date   : 3-OCT-2016 08:58:12 Sensitivity      : 3.000
* Detector ID        : GAM18 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:01.02 Half life ratio : *****
* Sample date        : 8-DEC-2015 13:43:00 Nuclide Library : SOLID
* Sample ID          : G405235022 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity : 1.6110E+02 GRAM
* Wet wt corr        : 1.00000 Quantity Err(%) : 1.2414E-03 %
* Dry Weight         : 0.00000
* Wet Weight         : 0.00000
* Dry Weight         : 0.00000
*****
*                                     CALIBRATION INFORMATION                    *
*
* Eff. Cal. date     : 25-JUN-2016 08:25:19 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM18_CAN.CNF;10
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.305E+01	1.295E+00	1.295E+00
CD-109	2.021E+00	1.791E+00	1.791E+00
SN-126	1.288E-01	1.140E-01	1.140E-01
BA-137M	6.109E-01	9.111E-02	9.111E-02
CS-137	6.453E-01	9.623E-02	9.623E-02
TL-208	3.568E-01	7.551E-02	7.551E-02
BI-211	6.331E-01	8.810E-01	8.810E-01
PB-212	9.605E-01	1.188E-01	1.188E-01
BI-214	8.391E-01	1.694E-01	1.694E-01
PB-214	9.970E-01	1.733E-01	1.733E-01
RN-222	8.391E-01	1.694E-01	1.694E-01
RA-224	1.597E+00	1.093E+00	1.093E+00
RA-226	8.391E-01	1.694E-01	1.694E-01
AC-228	5.926E-01	2.129E-01	2.129E-01
RA-228	5.926E-01	2.129E-01	2.129E-01
TH-228	9.605E-01	1.188E-01	1.188E-01
TH-230	8.388E-01	1.693E-01	1.693E-01
PA-231	6.797E-01	6.667E-01	6.667E-01
TH-232	5.926E-01	2.129E-01	2.129E-01
TH-234	2.996E+00	3.012E+00	3.012E+00
U-234	8.388E-01	1.693E-01	1.693E-01
U-235	6.871E-02	2.614E-01	2.614E-01
U-238	2.996E+00	3.012E+00	3.012E+00
AM-243	1.862E-01	1.010E-01	1.010E-01
ANH-511	1.308E-01	7.251E-02	7.251E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-7.641E+00	1.072E+01	1.126E+01	NOT IDENT.
NA-22	3.943E-02	3.863E-02	4.252E-02	NOT IDENT.
NA-24	1.000E+41	1.832E+41	0.000E+00	SHORT HLIF
AL-26	-1.490E-02	2.493E-02	2.582E-02	NOT IDENT.
SC-46	6.926E-02	3.070E-01	3.086E-01	FAIL ABUN

V-48	-1.740E+03	1.065E+04	1.068E+04	SHORT HLIF
CR-51	8.068E+01	3.331E+02	3.351E+02	SHORT HLIF
MN-54	-3.136E-02	4.804E-02	5.008E-02	NOT IDENT.
CO-56	1.704E-02	3.528E-01	3.529E-01	FAIL ABUN
MN-56	1.000E+41	1.861E+42	0.000E+00	SHORT HLIF
CO-57	-1.302E-02	3.741E-02	3.786E-02	NOT IDENT.
CO-58	-7.101E-02	3.817E-01	3.830E-01	NOT IDENT.
FE-59	-4.991E-01	4.655E+00	4.661E+00	NOT IDENT.
CO-60	2.140E-02	3.226E-02	3.367E-02	NOT IDENT.
ZN-65	1.107E-01	1.389E-01	1.476E-01	NOT IDENT.
GE-68	-1.237E-01	1.867E+00	1.868E+00	NOT IDENT.
AS-73	-1.057E+00	8.775E+00	8.788E+00	NOT IDENT.
AS-74	-4.091E+03	4.768E+03	5.113E+03	SHORT HLIF
SE-75	1.514E-01	1.542E-01	1.686E-01	NOT IDENT.
BR-77	1.714E+38	1.484E+39	0.000E+00	SHORT HLIF
SR-82	-2.549E+01	5.434E+02	5.435E+02	SHORT HLIF
RB-83	-4.114E-02	5.068E-01	5.072E-01	NOT IDENT.
KR-85	1.121E+01	5.762E+00	7.665E+00	NOT IDENT.
SR-85	1.180E+00	6.082E-01	8.080E-01	NOT IDENT.
RB-86	2.197E+03	2.255E+04	2.257E+04	SHORT HLIF
Y-88	2.032E-02	1.233E-01	1.237E-01	NOT IDENT.
Y-91	2.861E+02	4.317E+02	4.506E+02	NOT IDENT.
NB-94	-1.750E-02	2.859E-02	2.966E-02	NOT IDENT.
NB-95	6.325E-01	6.451E-01	7.053E-01	NOT IDENT.
NB-95M	1.835E-01	1.983E+00	1.985E+00	NOT IDENT.
ZR-95	8.519E-02	1.015E+00	1.016E+00	NOT IDENT.
NB-97	1.000E+41	3.265E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.082E+41	0.000E+00	SHORT HLIF
MO-99	-4.397E+31	1.347E+32	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	7.343E+42	0.000E+00	SHORT HLIF
RH-101	1.447E-02	2.835E-02	2.910E-02	NOT IDENT.
RH-102	1.531E-02	4.392E-02	4.446E-02	NOT IDENT.
RU-103	-8.813E-01	4.179E+00	4.198E+00	FAIL ABUN
RH-106	-2.326E-01	3.661E-01	3.808E-01	NOT IDENT.
RU-106	-2.326E-01	3.661E-01	3.808E-01	NOT IDENT.
AG-108M	-3.131E-03	2.150E-02	2.155E-02	NOT IDENT.
AG-110M	-2.253E-02	7.881E-02	7.947E-02	NOT IDENT.
SN-113	-5.019E-02	1.896E-01	1.909E-01	NOT IDENT.
CD-115	1.684E+38	2.304E+39	0.000E+00	SHORT HLIF
SN-117M	1.624E+04	8.168E+04	8.201E+04	SHORT HLIF
TE-123M	2.086E-03	1.104E-01	1.104E-01	NOT IDENT.
SB-124	-3.345E-01	1.404E+00	1.412E+00	NOT IDENT.
SB-125	-4.372E-02	8.375E-02	8.604E-02	FAIL ABUN
TE-125M	4.863E+01	2.185E+02	2.196E+02	NOT IDENT.
I-126	1.560E+06	5.354E+05	8.839E+05	SHORT HLIF
SB-126	-1.240E+04	9.456E+05	9.456E+05	SHORT HLIF
SB-127	4.877E+21	1.843E+22	0.000E+00	SHORT HLIF
I-131	6.706E+08	3.865E+09	3.877E+09	SHORT HLIF
I-132	1.000E+41	1.849E+42	0.000E+00	SHORT HLIF
TE-132	-9.294E+25	2.774E+26	0.000E+00	SHORT HLIF
BA-133	8.277E-03	3.078E-02	3.101E-02	NOT IDENT.
I-133	1.000E+41	2.571E+41	0.000E+00	SHORT HLIF
CS-134	3.357E-02	4.047E-02	4.321E-02	NOT IDENT.
CS-135	8.114E-02	1.130E-01	1.188E-01	NOT IDENT.
I-135	-1.000E+41	7.385E+41	0.000E+00	SHORT HLIF
CS-136	1.520E+04	2.278E+05	2.279E+05	SHORT HLIF
CE-139	-5.266E-02	9.291E-02	9.589E-02	NOT IDENT.
BA-140	-2.767E+05	9.052E+05	9.137E+05	SHORT HLIF
LA-140	2.399E+05	3.187E+05	3.365E+05	SHORT HLIF
CE-141	-9.646E+00	2.255E+01	2.296E+01	NOT IDENT.
CE-143	1.000E+41	2.342E+41	0.000E+00	SHORT HLIF
CE-144	-9.676E-02	3.062E-01	3.093E-01	NOT IDENT.
PM-144	-2.033E-02	4.395E-02	4.490E-02	NOT IDENT.
PR-144	-1.740E+00	3.820E+00	3.900E+00	NOT IDENT.
PM-146	2.708E-02	6.001E-02	6.124E-02	FAIL ABUN
ND-147	7.700E+06	2.453E+07	2.478E+07	SHORT HLIF
PM-147	-5.706E+01	6.450E+02	6.455E+02	NOT IDENT.
PM-149	1.865E+39	3.512E+40	0.000E+00	SHORT HLIF
EU-150	1.750E-03	2.173E-02	2.174E-02	FAIL ABUN
EU-152	4.113E-02	8.250E-02	8.456E-02	NOT IDENT.
GD-153	4.647E-02	1.482E-01	1.496E-01	NOT IDENT.
EU-154	9.519E-02	9.451E-02	1.038E-01	FAIL ABUN
EU-155	6.081E-02	8.567E-02	8.995E-02	FAIL ABUN
TB-160	1.774E-01	1.284E+00	1.287E+00	FAIL ABUN
HO-166M	2.500E-02	5.248E-02	5.368E-02	FAIL ABUN
TM-171	-1.511E+00	2.280E+01	2.281E+01	NOT IDENT.
HF-172	-4.209E-02	2.116E-01	2.124E-01	FAIL ABUN
LU-172	3.188E-02	5.942E-02	6.114E-02	FAIL ABUN

LU-176	-2.564E-03	1.836E-02	1.840E-02	FAIL ABUN
HF-181	1.596E+00	3.139E+00	3.220E+00	NOT IDENT.
TA-182	5.369E-01	7.364E-01	7.751E-01	FAIL ABUN
RE-183	-1.204E+00	2.916E+00	2.966E+00	NOT IDENT.
RE-184	-1.555E+01	2.283E+01	2.389E+01	NOT IDENT.
W-188	-5.736E+01	9.810E+01	1.014E+02	FAIL ABUN
IR-192	-1.320E-01	3.467E-01	3.518E-01	FAIL ABUN
HG-203	1.057E+00	1.774E+00	1.837E+00	NOT IDENT.
BI-207	2.360E-02	4.322E-02	4.451E-02	FAIL ABUN
PB-210	-2.609E+00	4.591E+00	4.740E+00	NOT IDENT.
PB-211	-1.065E-01	5.620E-01	5.641E-01	NOT IDENT.
BI-212	1.461E+00	6.565E-01	9.301E-01	FAIL ABUN
RN-219	-1.002E-01	2.942E-01	2.976E-01	FAIL ABUN
RA-223	3.255E-01	4.310E-01	4.553E-01	FAIL ABUN
AC-227	-1.191E-01	1.778E-01	1.858E-01	FAIL ABUN
TH-227	-1.191E-01	1.778E-01	1.858E-01	FAIL ABUN
TH-229	2.710E-02	3.335E-01	3.337E-01	FAIL ABUN
TH-231	3.255E-01	4.310E-01	4.553E-01	FAIL ABUN
PA-233	3.015E-02	4.368E-02	4.575E-02	FAIL ABUN
PA-234	-5.054E-02	2.104E-01	2.116E-01	NOT IDENT.
PA-234M	2.969E+00	3.277E+00	3.540E+00	NOT IDENT.
NP-237	3.015E-02	4.368E-02	4.575E-02	FAIL ABUN
NP-238	-1.000E+41	3.092E+41	0.000E+00	SHORT HLIF
NP-239	-6.413E-02	1.987E-01	2.008E-01	NOT IDENT.
PU-239	6.081E+02	8.645E+02	9.069E+02	FAIL ABUN
AM-241	3.422E-02	1.381E-01	1.389E-01	NOT IDENT.
CM-243	-5.287E-02	7.512E-02	7.881E-02	NOT IDENT.
BK-247	7.490E-02	5.313E-02	6.295E-02	NOT IDENT.
CM-247	1.157E-02	2.636E-02	2.687E-02	NOT IDENT.
CF-249	1.428E-02	2.765E-02	2.839E-02	NOT IDENT.
CF-251	4.262E-02	8.973E-02	9.176E-02	NOT IDENT.

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *
* GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	78.8835	87.09	99.2838	136.47	81.9702
45.60	78.9767	87.57	99.4423	140.51	0.0000
46.54	83.7918	88.03	92.3857	143.76	83.3391
49.72	0.0000	88.34	92.4803	144.24	83.4283
51.35	67.8268	88.47	92.5198	145.44	100.8383
51.87	63.4697	89.96	81.7622	152.43	89.5764
52.39	71.5876	1093.63	81.9426	153.25	0.0000
52.97	68.3734	91.11	0.0000	323.87	95.7522
53.44	74.5267	92.59	82.4554	156.02	0.0000
54.07	82.4875	93.35	82.6534	158.56	0.0000
57.36	0.0000	94.56	82.9681	159.00	91.9906
57.53	96.9429	94.65	82.9915	162.33	77.1796
57.98	91.8914	94.67	82.9965	162.66	0.0000
59.27	79.8124	94.87	83.0482	163.33	77.3343
59.32	79.8303	97.43	76.9550	165.86	98.0519
59.54	82.2595	98.43	88.3607	176.31	79.3060
60.96	92.2402	98.44	88.3634	176.60	0.0000
61.17	92.3251	99.53	77.4449	177.52	72.1493
62.93	91.2437	100.11	77.5789	181.07	0.0000
63.29	91.3844	102.03	76.9947	181.52	70.6317
63.58	91.4974	103.18	83.4336	184.41	76.7848
64.28	95.9678	103.37	82.4493	143.76	76.9664
66.73	93.3158	105.21	73.5633	193.51	78.0345
67.24	101.1002	105.31	73.5844	197.03	76.8220
125.81	110.4059	106.12	77.9102	198.01	82.8699
67.75	110.4372	106.47	85.2663	201.83	85.1095
69.67	99.3351	109.28	80.7016	203.43	92.1643
70.83	115.8046	111.00	89.5103	205.31	75.7603
72.81	115.4553	111.76	0.0000	210.85	90.7033
72.87	115.4818	114.06	100.8759	215.65	80.9578
74.66	103.1418	116.30	0.0000	222.11	67.7126
74.82	103.2039	116.74	91.9727	227.09	63.8013
74.97	103.2618	119.76	79.7649	227.38	50.5314
77.11	104.0834	121.12	80.0443	228.16	0.0000
78.74	104.7019	121.22	80.0647	228.18	72.7827
79.69	85.3210	121.78	85.5968	116.74	72.7827
80.12	84.1765	122.06	84.5734	235.69	84.8235
80.19	0.0000	122.92	86.9312	235.96	87.5510
80.57	90.6986	123.07	90.2253	238.63	82.9361
81.00	88.2778	265.00	87.0978	238.98	0.0000
81.07	88.2996	125.81	99.2372	240.99	83.2206
81.75	93.6419	127.23	88.9673	242.00	83.3422
83.79	86.2323	127.91	89.1169	244.70	66.8419
84.00	91.7885	129.30	89.4181	252.40	0.0000
85.43	116.9193	131.20	89.8297	252.80	59.7890
86.55	109.5365	133.02	84.6511	254.15	0.0000
86.79	109.6237	133.52	87.7258	256.23	81.3296
86.94	99.2336	136.00	86.3677	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	42.0667	355.39	0.0000	584.27	32.0203
264.80	42.0740	356.01	39.0137	595.83	0.0000
265.00	33.6680	364.49	0.0000	427.87	45.6958
268.22	56.3538	366.42	0.0000	602.52	0.0000
269.46	62.0912	372.51	43.3748	604.72	36.6539
270.03	62.1368	375.05	37.1206	607.14	41.3016
271.23	62.2349	377.52	55.2849	609.32	34.4663
273.65	0.0000	356.01	45.9998	610.33	34.4883
276.40	69.2989	388.16	40.8203	614.28	46.1016
277.37	71.2860	388.63	0.0000	618.01	35.2087
277.60	69.4058	391.69	58.2034	620.36	33.7460
278.00	62.7827	264.66	44.5668	621.93	37.6396
279.20	57.1619	401.81	52.2314	630.19	0.0000
279.54	68.6250	402.40	42.4611	631.29	30.0956
279.70	68.6382	404.85	60.0175	633.25	29.1605
280.46	60.1174	410.95	58.1596	634.78	0.0000
283.69	68.9854	413.71	47.3051	635.95	31.1563
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	50.8909	423.72	0.0000	645.85	43.8853
285.90	0.0000	427.09	50.1013	657.76	33.1529
287.50	65.4641	427.87	53.4785	657.90	0.0000
290.67	75.3871	433.94	44.8031	661.66	49.0551
293.27	0.0000	439.40	42.7639	664.57	0.0000
351.93	58.3142	453.88	46.1409	666.33	0.0000
295.96	58.3667	463.37	63.7292	666.50	0.0000
879.38	67.3337	468.07	44.9549	667.71	0.0000
299.98	61.5824	473.00	0.0000	677.62	27.3842
300.09	61.5901	475.06	42.8919	685.70	0.0000
300.13	61.5939	476.78	39.4681	695.00	0.0000
301.36	61.6849	477.60	56.9184	696.49	42.3935
302.85	52.9662	482.18	30.3116	696.51	42.3935
256.23	58.9673	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	38.3734
306.78	60.1114	497.08	33.6159	697.49	40.3979
308.46	54.3051	505.52	35.6146	702.65	38.8957
311.90	47.5840	507.63	0.0000	706.68	34.5178
316.51	59.7974	511.00	35.7629	711.68	34.2070
319.41	0.0000	514.00	35.8435	720.70	0.0000
320.08	0.0000	514.00	35.8435	721.93	0.0000
321.04	56.0991	520.40	33.1344	722.78	19.6682
323.87	46.2284	520.69	0.0000	722.91	26.2258
325.23	82.5322	522.65	0.0000	723.31	26.2320
328.76	0.0000	527.90	0.0000	724.19	37.7265
333.37	68.5533	528.26	36.2244	727.33	30.8084
333.97	57.9277	529.59	32.6338	733.00	26.3719
334.37	62.5285	529.87	0.0000	735.93	25.9424
338.28	58.1991	531.02	0.0000	333.97	30.9796
338.32	58.2026	537.26	0.0000	739.50	0.0000
311.90	58.3383	546.56	0.0000	747.24	30.1054
340.48	58.3383	552.55	31.3313	748.06	27.0029
340.55	0.0000	563.25	39.9214	752.31	30.1877
344.28	53.9505	569.33	37.2925	753.82	0.0000
345.93	60.2222	946.00	37.2961	756.73	25.0415
351.06	48.6457	569.70	37.3010	756.80	25.0422
351.93	48.6906	583.19	31.9974	884.68	21.7852

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	20.1293	1274.44	24.8932	1620.50	10.4983
766.42	25.1697	1001.03	16.0342	1621.92	10.5018
766.84	21.8188	1002.74	27.1436	1678.03	0.0000
772.60	0.0000	1004.73	26.2295	1690.97	8.7477
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	6.9294
778.90	26.3893	1028.54	0.0000	1063.66	5.0981
783.70	0.0000	1037.84	24.6835	1771.35	3.3997
785.37	27.5361	1038.76	0.0000	1791.20	0.0000
792.07	42.5085	631.29	17.4659	1808.65	12.0059
794.95	19.1569	1048.07	0.0000	1810.72	0.0000
795.86	24.4901	1049.04	19.0723	1836.06	4.0282
810.06	19.3035	1050.41	19.0820		
810.29	20.3783	1063.66	0.0000		
344.28	20.3794	1077.00	0.0000		
810.76	21.4557	1077.34	27.9606		
815.77	0.0000	1085.87	24.1833		
1048.07	0.0000	1093.63	22.3149		
832.01	32.5223	1099.45	21.3909		
834.85	33.6527	1112.07	18.4536		
835.71	35.8390	1112.84	19.5449		
836.80	0.0000	1115.54	17.9341		
846.75	0.0000	1120.29	24.4983		
846.77	26.2039	1120.55	24.5007		
856.80	0.0000	1221.41	24.5081		
860.56	20.8810	1129.67	31.6857		
871.09	15.4625	1131.51	0.0000		
873.19	22.1109	1147.95	0.0000		
875.33	0.0000	1173.23	29.9700		
879.38	19.9572	1177.95	22.0150		
880.51	25.5142	1189.05	26.7891		
883.24	29.9894	1204.77	25.2539		
884.68	28.8977	1221.41	24.3832		
889.28	26.7312	1231.02	29.1225		
894.76	27.9144	1235.36	0.0000		
898.04	20.1286	1238.28	31.6766		
900.72	17.9141	1260.41	0.0000		
903.28	29.1437	1271.87	20.6670		
911.20	32.6223	1274.44	13.7897		
912.08	39.0127	1274.54	13.7904		
923.98	0.0000	1291.59	20.8018		
926.50	21.7459	1298.22	0.0000		
929.11	21.7711	1312.11	0.0000		
937.49	25.4933	1332.49	12.2944		
944.13	0.0000	1362.66	0.0000		
946.00	27.4153	1365.19	10.6470		
949.00	21.9609	1368.63	0.0000		
667.71	0.0000	1384.29	19.6340		
962.31	32.2101	1408.01	10.7866		
964.08	30.6991	1457.56	0.0000		
966.17	35.3357	1460.82	8.7652		
911.20	35.0702	1489.16	17.4901		
968.97	35.0702	1505.03	11.0967		
983.53	0.0000	1584.12	16.2026		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235023.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM24.CNF;330
Background date  : 2-OCT-2016 11:01:18.
Sample date     : 2-DEC-2015 10:40:00. Acquisition date : 3-OCT-2016 08:58:40.
Sample ID      : G405235023           Sample quantity  : 1.41404E+02 GRAM
Detector name   : GAM24               Detector geometry: CAN
Elapsed live time: 0 01:00:00.00      Elapsed real time: 0 01:00:02.00  0.1%
Energy tolerance: 1.50000 keV         Analyst Initials  : MXR1
Abundance limit : 75.00000           Sensitivity       : 3.00000
Batch ID       : 1596249             Detector SN#      :
Matrix Spike ID:                      LCS ID           : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.77*	16	158	1.35	93.59	89	9	4.37E-03	149.3	
2	2	63.47*	40	168	1.23	127.00	123	10	1.10E-02	58.5	3.93E+00
3	2	65.12*	12	159	0.94	130.30	123	10	3.29E-03	174.0	
4	2	73.16	37	230	1.25	146.38	143	22	1.02E-02	76.1	2.62E+00
5	2	75.05*	201	215	1.26	150.17	143	22	5.58E-02	14.6	
6	2	77.26*	268	140	1.04	154.58	143	22	7.45E-02	9.9	
7	4	84.43*	48	135	1.54	168.92	165	27	1.33E-02	44.0	8.15E-01
8	4	87.31	106	138	1.16	174.68	165	27	2.95E-02	21.0	
9	4	90.04	61	120	1.07	180.15	165	27	1.69E-02	31.1	
10	4	92.84*	111	144	1.19	185.75	165	27	3.07E-02	21.6	
11	0	110.08*	9	136	1.28	220.24	219	8	2.58E-03	222.1	
12	0	186.31*	92	137	1.07	372.73	368	10	2.56E-02	27.0	
13	0	209.29	27	91	0.83	418.71	416	7	7.47E-03	62.2	
14	5	238.71*	450	59	1.24	477.56	471	23	1.25E-01	5.6	1.69E+00
15	5	242.02	117	94	2.03	484.17	471	23	3.25E-02	24.1	
16	0	295.40	186	50	1.32	590.97	586	9	5.17E-02	10.0	
17	0	300.12	44	38	1.54	600.42	596	8	1.23E-02	28.5	
18	0	311.47	25	100	5.35	623.13	613	17	6.86E-03	95.7	
19	0	338.32	105	80	1.23	676.84	670	14	2.91E-02	20.6	
20	0	352.11*	306	56	1.47	704.43	699	13	8.49E-02	7.8	
21	0	464.13	19	67	1.15	928.53	923	12	5.23E-03	89.5	
22	0	511.80*	1	100	2.36	1023.91	1014	16	1.53E-04	*****	
23	0	583.38*	139	36	1.35	1167.13	1161	11	3.87E-02	12.1	
24	0	609.68*	205	56	1.76	1219.74	1213	17	5.70E-02	11.2	
25	0	662.16	135	53	1.51	1324.74	1316	18	3.74E-02	15.4	
26	0	670.22	26	43	0.73	1340.86	1334	17	7.08E-03	61.8	
27	0	727.02*	33	32	3.34	1454.52	1447	16	9.29E-03	42.4	
28	0	768.38*	14	25	0.78	1537.26	1532	11	4.00E-03	73.0	
29	0	786.48	20	15	1.46	1573.47	1570	11	5.69E-03	41.7	
30	0	794.86*	29	12	1.56	1590.24	1584	10	8.15E-03	30.0	
31	0	809.16	10	11	0.91	1618.85	1614	8	2.84E-03	65.5	
32	0	860.47	17	21	0.90	1721.52	1718	9	4.69E-03	54.1	
33	0	873.29	25	35	10.38	1747.18	1733	28	7.03E-03	69.0	
34	0	911.42*	71	31	1.23	1823.47	1818	13	1.96E-02	20.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	964.51	33	6	2.25	1929.71	1925	9	9.06E-03	22.6	
36	0	968.92*	54	6	2.22	1938.53	1934	11	1.51E-02	17.1	
37	0	1053.71	18	6	1.85	2108.19	2104	10	5.08E-03	33.0	
38	0	1120.43*	41	19	2.21	2241.70	2236	11	1.13E-02	26.6	
39	0	1161.19	10	12	1.28	2323.27	2317	9	2.69E-03	74.7	
40	0	1169.26	15	17	0.96	2339.43	2331	14	4.05E-03	66.2	
41	0	1256.53	11	14	0.65	2514.06	2507	10	3.07E-03	71.6	
42	0	1281.19	14	11	1.80	2563.42	2557	10	3.81E-03	54.7	
43	0	1322.81	5	3	1.24	2646.70	2643	6	1.39E-03	70.7	
44	0	1353.65	7	0	0.73	2708.43	2705	6	1.94E-03	37.8	
45	0	1356.56	8	0	0.73	2714.25	2711	6	2.22E-03	35.4	
46	0	1377.81	22	3	2.85	2756.78	2751	11	6.19E-03	25.6	
47	0	1408.39	15	3	1.93	2817.97	2813	11	4.17E-03	33.6	
48	0	1460.82*	352	4	2.44	2922.89	2915	15	9.79E-02	5.5	
49	0	1588.14	12	2	1.87	3177.70	3173	9	3.30E-03	36.7	
50	0	1620.84	13	0	3.16	3243.15	3238	11	3.61E-03	27.7	
51	0	1764.52*	37	3	0.86	3530.73	3524	12	1.03E-02	20.0	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235023.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 2-DEC-2015 10:40:00   Acquisition date  : 3-OCT-2016 08:58:40
Sample ID        : G405235023             Sample quantity  : 141.40 GRAM
Sample type      : SOLID                  Sample geometry  :
Detector name    : GAMMA24               Detector geometry: CAN
Elapsed live time: 0 01:00:00.00         Elapsed real time: 0 01:00:02.00   0.1%
Energy tolerance : 1.50 keV              Half life ratio  : 10.00
Errors propagated: No                    Systematic Error : 0.00 %
Efficiency type  : Linear                 Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.354E+00	1.243E+01	1.243E+01	11.03	OK
CD-109	88.03	3.70*	7.499E+00	1.317E+00	2.086E+00	80.27	OK
TE-125M	109.28	0.27*	7.981E+00	2.721E+00	1.095E+02	444.12	OK
SN-126	64.28	9.60	5.554E+00	4.883E-01	4.883E-01	116.90	OK
	86.94	8.90	7.499E+00	5.477E-01	5.477E-01	80.27	OK
	87.57	37.00*	7.499E+00	1.317E-01	1.317E-01	80.27	OK
BA-137M	661.66	89.90*	2.532E+00	3.236E-01	3.299E-01	30.82	OK
CS-137	661.66	85.10*	2.532E+00	3.419E-01	3.486E-01	30.82	OK
TL-208	277.37	6.60	5.023E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.790E+00	3.245E-01	3.245E-01	24.30	OK
	860.56	12.50	2.074E+00	3.480E-01	3.480E-01	108.30	OK
PB-210	46.54	4.25*	2.491E+00	9.993E-01	1.026E+00	298.62	OK
BI-212	727.33	6.67*	2.358E+00	1.153E+00	1.153E+00	84.77	OK
	785.37	1.10	2.221E+00	4.513E+00	4.513E+00	83.37	OK
	1620.50	1.47	1.233E+00	3.617E+00	3.617E+00	55.47	OK
PB-212	74.82	10.28	6.749E+00	1.184E+00	1.184E+00	48.04	OK
	77.11	17.10	6.918E+00	1.472E+00	1.472E+00	19.84	OK
	238.63	43.60*	5.637E+00	1.091E+00	1.091E+00	11.14	OK
	300.09	3.30	4.720E+00	1.656E+00	1.656E+00	56.97	OK
BI-214	609.32	45.49*	2.697E+00	9.213E-01	9.216E-01	22.32	OK
	1120.29	14.92	1.689E+00	8.435E-01	8.438E-01	53.28	OK
	1764.49	15.30	1.138E+00	1.066E+00	1.066E+00	39.91	OK
PB-214	74.82	5.80	6.730E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	6.918E+00	2.595E+00	2.596E+00	19.84	OK
	87.09	3.41	7.489E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.579E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.779E+00	1.238E+00	1.239E+00	20.01	OK
	351.93	35.60*	4.154E+00	1.193E+00	1.193E+00	15.55	OK
RN-222	609.32	45.49*	2.697E+00	9.213E-01	9.216E-01	22.32	OK
	1120.29	14.92	1.689E+00	8.435E-01	8.438E-01	53.28	OK
	1764.49	15.30	1.138E+00	1.066E+00	1.066E+00	39.91	OK
RA-224	240.99	4.10*	5.579E+00	8.509E-01	8.509E-01	179.75	OK
RA-226	609.32	45.49*	2.697E+00	9.213E-01	9.216E-01	22.32	OK
	1120.29	14.92	1.689E+00	8.435E-01	8.438E-01	53.28	OK
	1764.49	15.30	1.138E+00	1.066E+00	1.066E+00	39.91	OK
AC-228	105.21	1.10	7.950E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.289E+00	1.254E+00	1.254E+00	41.25	OK
	794.95	4.25	2.204E+00	1.687E+00	1.687E+00	60.00	OK
	835.71	1.61	2.121E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.985E+00	7.334E-01	7.334E-01	41.55	OK
	968.97	15.80	1.893E+00	9.598E-01	9.598E-01	34.24	OK
RA-228	105.21	1.10	7.950E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.289E+00	1.254E+00	1.254E+00	41.25	OK
	794.95	4.25	2.204E+00	1.687E+00	1.687E+00	60.00	OK
	835.71	1.61	2.121E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.985E+00	7.334E-01	7.334E-01	41.55	OK
	968.97	15.80	1.893E+00	9.598E-01	9.598E-01	34.24	OK
TH-228	74.82	10.28	6.749E+00	1.184E+00	1.184E+00	48.04	OK
	77.11	17.10	6.918E+00	1.472E+00	1.472E+00	19.84	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	238.63	43.60*	5.637E+00	1.091E+00	1.091E+00	11.14	OK
	300.09	3.30	4.720E+00	1.656E+00	1.656E+00	56.97	OK
TH-229	85.43	14.70	7.361E+00	2.859E-01	2.859E-01	87.98	OK
	88.47	24.00	7.499E+00	2.031E-01	2.031E-01	80.27	OK
	193.51	4.41*	6.531E+00	-----	Line Not Found	-----	Absent
	210.85	2.80	6.166E+00	-----	Line Not Found	-----	Absent
TH-230	609.32	45.49*	2.697E+00	9.213E-01	9.213E-01	22.32	OK
	1120.29	14.92	1.689E+00	8.435E-01	8.435E-01	53.28	OK
	1764.49	15.30	1.138E+00	1.066E+00	1.066E+00	39.91	OK
PA-231	283.69	1.70	4.935E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	4.720E+00	1.022E+00	1.022E+00	56.97	OK
TH-232	105.21	1.10	7.950E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.289E+00	1.254E+00	1.254E+00	41.25	OK
	835.71	1.61	2.121E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.985E+00	7.334E-01	7.334E-01	41.55	OK
	968.97	15.80	1.893E+00	9.598E-01	9.598E-01	34.24	OK
PA-233	300.13	6.63	4.720E+00	8.243E-01	8.243E-01	56.97	OK
	311.90	38.50*	4.582E+00	8.161E-02	8.161E-02	191.33	OK
	340.48	4.45	4.267E+00	-----	Line Not Found	-----	Absent
TH-234	63.29	3.70*	5.554E+00	1.267E+00	1.267E+00	116.90	OK
	92.59	4.23	7.706E+00	2.171E+00	2.171E+00	43.23	OK
U-234	609.32	45.49*	2.697E+00	9.213E-01	9.213E-01	22.32	OK
	1120.29	14.92	1.689E+00	8.435E-01	8.435E-01	53.28	OK
	1764.49	15.30	1.138E+00	1.066E+00	1.066E+00	39.91	OK
U-235	89.96	3.47	7.610E+00	1.480E+00	1.480E+00	62.13	OK
	93.35	5.60	7.706E+00	1.640E+00	1.640E+00	43.23	OK
	143.76	10.96*	7.620E+00	-----	Line Not Found	-----	Absent
	163.33	5.08	7.206E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	6.689E+00	1.465E-01	1.465E-01	54.04	OK
	205.31	5.01	6.280E+00	-----	Line Not Found	-----	Absent
U-238	63.29	3.70*	5.554E+00	1.267E+00	1.267E+00	116.90	OK
	92.59	4.23	7.706E+00	2.171E+00	2.171E+00	43.23	OK
AM-243	43.53	5.90	1.694E+00	-----	Line Not Found	-----	Absent
	74.66	67.20*	6.749E+00	1.812E-01	1.812E-01	48.04	OK
ANH-511	511.00	100.00*	3.088E+00	9.971E-04	9.971E-04	945.20	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235023.CNF;1 *
 * Acquisition date : 3-OCT-2016 08:58:40 Sensitivity : 3.000 *
 * Detector ID : GAM24 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:02.00 Half life ratio : ***** *
 * Sample date : 2-DEC-2015 10:40:00 Analyst initials: MXR1 *
 * Sample ID : G405235023 Sample Quantity : 1.4140E+02 GRAM *
 * Batch Number : 1596249 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 17-JUN-2016 07:45:20 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM24_CAN.CNF;7 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.243E+01	1.344E+00	4.832E-01
CD-109	2.086E+00	1.641E+00	1.487E+00
TE-125M	1.095E+02	4.764E+02	4.587E+02
SN-126	1.317E-01	1.036E-01	9.410E-02
BA-137M	3.299E-01	9.966E-02	5.785E-02
CS-137	3.486E-01	1.053E-01	6.111E-02
TL-208	3.245E-01	7.726E-02	5.906E-02
PB-210	1.026E+00	3.002E+00	2.460E+00
BI-212	1.153E+00	9.578E-01	7.389E-01
PB-212	1.091E+00	1.192E-01	8.285E-02
BI-214	9.216E-01	2.016E-01	1.125E-01
PB-214	1.193E+00	1.819E-01	1.075E-01
RN-222	9.216E-01	2.016E-01	1.125E-01
RA-224	8.509E-01	1.499E+00	8.882E-01
RA-226	9.216E-01	2.016E-01	1.125E-01
AC-228	7.334E-01	2.986E-01	2.451E-01
RA-228	7.334E-01	2.986E-01	2.451E-01
TH-228	1.091E+00	1.192E-01	8.285E-02
TH-229	4.141E-01	4.432E-01	8.579E-01
TH-230	9.213E-01	2.015E-01	1.124E-01
PA-231	1.022E+00	5.703E-01	7.210E-01
TH-232	7.334E-01	2.986E-01	2.451E-01
PA-233	8.161E-02	1.530E-01	9.713E-02
TH-234	1.267E+00	1.451E+00	1.385E+00
U-234	9.213E-01	2.015E-01	1.124E-01
U-235	-7.143E-02	1.739E-01	3.090E-01
U-238	1.267E+00	1.451E+00	1.385E+00
AM-243	1.812E-01	8.530E-02	6.331E-02
ANH-511	9.971E-04	8.741E-02	5.169E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-4.962E+00	1.228E+01	2.252E+01	NOT IDENT.

NA-22	1.243E-02	5.037E-02	9.585E-02	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	7.081E-03	2.274E-02	5.523E-02	NOT IDENT.
SC-46	-5.738E-01	3.732E-01	4.987E-01	FAIL ABUN
V-48	0.000E+00	1.642E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	4.118E+02	0.000E+00	SHORT HLIF
MN-54	-3.323E-02	6.726E-02	1.157E-01	NOT IDENT.
CO-56	7.905E-02	4.295E-01	8.435E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	7.259E-03	4.035E-02	7.560E-02	NOT IDENT.
CO-58	2.659E-01	3.646E-01	8.222E-01	NOT IDENT.
FE-59	-5.545E+00	6.252E+00	1.070E+01	NOT IDENT.
CO-60	7.350E-03	2.885E-02	6.330E-02	NOT IDENT.
ZN-65	1.056E-01	1.649E-01	3.299E-01	NOT IDENT.
GE-68	-2.103E-01	1.881E+00	3.763E+00	NOT IDENT.
AS-73	3.431E+00	4.973E+00	9.828E+00	NOT IDENT.
AS-74	0.000E+00	7.107E+03	0.000E+00	SHORT HLIF
SE-75	-9.210E-02	1.883E-01	3.549E-01	NOT IDENT.
BR-77	0.000E+00	1.270E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	7.798E+02	0.000E+00	SHORT HLIF
RB-83	5.320E-02	6.081E-01	1.188E+00	NOT IDENT.
KR-85	4.224E+00	7.385E+00	1.359E+01	NOT IDENT.
SR-85	4.720E-01	8.315E-01	1.529E+00	NOT IDENT.
RB-86	0.000E+00	2.780E+04	0.000E+00	SHORT HLIF
Y-88	2.103E-02	2.149E-01	4.626E-01	NOT IDENT.
Y-91	2.930E+01	4.811E+02	9.673E+02	NOT IDENT.
NB-94	5.166E-03	2.952E-02	5.700E-02	NOT IDENT.
NB-95	-3.463E-01	9.430E-01	1.461E+00	NOT IDENT.
NB-95M	-1.482E-01	2.294E+00	4.049E+00	NOT IDENT.
ZR-95	-5.707E-01	1.552E+00	2.757E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	6.430E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-1.290E-02	3.143E-02	5.562E-02	NOT IDENT.
RH-102	2.100E-02	5.312E-02	1.073E-01	NOT IDENT.
RU-103	-1.115E-01	6.133E+00	1.173E+01	FAIL ABUN
RH-106	-2.431E-01	4.526E-01	7.994E-01	NOT IDENT.
RU-106	-2.431E-01	4.526E-01	7.994E-01	NOT IDENT.
AG-108M	6.719E-03	2.650E-02	5.237E-02	NOT IDENT.
AG-110M	-5.599E-02	9.755E-02	1.651E-01	NOT IDENT.
SN-113	2.579E-02	2.076E-01	4.091E-01	NOT IDENT.
CD-115	0.000E+00	1.904E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.176E+05	0.000E+00	SHORT HLIF
TE-123M	5.449E-02	1.229E-01	2.315E-01	NOT IDENT.
SB-124	1.875E+00	2.188E+00	5.319E+00	NOT IDENT.
SB-125	2.521E-02	9.217E-02	1.840E-01	FAIL ABUN
I-126	0.000E+00	1.484E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.467E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	6.558E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	7.131E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.275E+27	0.000E+00	SHORT HLIF
BA-133	6.630E-03	3.279E-02	6.031E-02	NOT IDENT.
I-133	0.000E+00	1.431E+41	0.000E+00	SHORT HLIF
CS-134	1.111E-01	6.531E-02	1.171E-01	FAIL ABUN
CS-135	-1.159E-01	1.189E-01	2.139E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.586E+05	0.000E+00	SHORT HLIF
CE-139	2.532E-02	1.080E-01	1.988E-01	NOT IDENT.
BA-140	0.000E+00	1.622E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.622E+05	0.000E+00	SHORT HLIF
CE-141	7.869E+00	2.563E+01	4.766E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	-6.451E-02	3.266E-01	5.875E-01	NOT IDENT.
PM-144	1.707E-03	4.896E-02	9.367E-02	NOT IDENT.
PR-144	1.488E-01	4.267E+00	8.163E+00	NOT IDENT.
PM-146	2.504E-02	3.878E-02	8.043E-02	NOT IDENT.
ND-147	0.000E+00	4.673E+07	0.000E+00	SHORT HLIF
PM-147	3.721E+02	6.950E+02	1.340E+03	NOT IDENT.
PM-149	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
EU-150	-8.459E-03	2.594E-02	4.347E-02	FAIL ABUN
EU-152	-1.209E-02	8.335E-02	1.531E-01	FAIL ABUN
GD-153	-1.662E-02	1.647E-01	2.796E-01	NOT IDENT.
EU-154	2.611E-02	1.224E-01	2.318E-01	FAIL ABUN
EU-155	7.348E-02	8.533E-02	1.696E-01	FAIL ABUN
TB-160	1.838E-01	2.302E+00	3.875E+00	FAIL ABUN
HO-166M	-9.090E-03	5.178E-02	9.582E-02	FAIL ABUN

TM-171	1.848E+00	1.052E+01	2.043E+01	NOT IDENT.
HF-172	2.587E-02	1.950E-01	3.630E-01	FAIL ABUN
LU-172	3.856E-02	7.593E-02	1.599E-01	FAIL ABUN
LU-176	-7.838E-03	2.299E-02	3.883E-02	FAIL ABUN
HF-181	-8.063E-01	4.423E+00	8.338E+00	NOT IDENT.
TA-182	9.328E-01	8.809E-01	1.972E+00	FAIL ABUN
RE-183	5.395E-01	1.747E+00	3.407E+00	NOT IDENT.
RE-184	3.575E+01	3.237E+01	7.099E+01	NOT IDENT.
W-188	-1.181E+02	1.134E+02	1.740E+02	FAIL ABUN
IR-192	1.622E-01	4.426E-01	8.208E-01	FAIL ABUN
HG-203	-1.083E-01	2.290E+00	4.467E+00	FAIL ABUN
BI-207	-3.287E-03	3.269E-02	6.685E-02	FAIL ABUN
BI-211	0.000E+00	5.009E-01	7.826E-01	FAIL ABUN
PB-211	3.499E-01	5.572E-01	1.158E+00	NOT IDENT.
RN-219	-6.484E-02	3.377E-01	6.414E-01	NOT IDENT.
RA-223	1.260E-01	5.033E-01	1.007E+00	FAIL ABUN
AC-227	2.015E-01	2.012E-01	4.251E-01	FAIL ABUN
TH-227	2.015E-01	2.012E-01	4.251E-01	FAIL ABUN
TH-231	1.260E-01	5.033E-01	1.007E+00	FAIL ABUN
PA-234	-1.091E-01	2.326E-01	4.105E-01	FAIL ABUN
PA-234M	1.210E+00	3.722E+00	7.801E+00	NOT IDENT.
NP-237	8.161E-02	1.530E-01	9.516E-02	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	7.289E-02	2.051E-01	3.896E-01	NOT IDENT.
PU-239	1.216E+02	3.023E+02	5.660E+02	NOT IDENT.
AM-241	-1.082E-02	8.487E-02	1.480E-01	NOT IDENT.
CM-243	-1.628E-03	7.335E-02	1.369E-01	NOT IDENT.
BK-247	-2.981E-02	6.259E-02	1.181E-01	FAIL ABUN
CM-247	1.744E-02	2.802E-02	5.858E-02	NOT IDENT.
CF-249	3.766E-03	3.437E-02	6.724E-02	NOT IDENT.
CF-251	1.701E-02	1.069E-01	1.953E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	338	10.66*	1.354E+00	1.243E+01	1.243E+01	11.03
CD-109	88.03	128	3.70*	7.499E+00	2.459E+00	3.893E+00	42.00
TE-125M	109.28	11	0.27*	7.981E+00	2.721E+00	1.095E+02	444.12
SN-126	64.28	49	9.60	5.554E+00	4.883E-01	4.883E-01	116.90
	86.94	128	8.90	7.499E+00	1.022E+00	1.022E+00	42.00
	87.57	128	37.00*	7.499E+00	2.459E-01	2.459E-01	42.00
BA-137M	661.66	139	89.90*	2.532E+00	3.236E-01	3.299E-01	30.82
CS-137	661.66	139	85.10*	2.532E+00	3.419E-01	3.486E-01	30.82
TL-208	277.37	-----	6.60	5.023E+00	-----	Line Not Found	-----
	583.19	145	85.00*	2.790E+00	3.245E-01	3.245E-01	24.30
	860.56	17	12.50	2.074E+00	3.480E-01	3.480E-01	108.30
PB-210	46.54	20	4.25*	2.491E+00	9.993E-01	1.026E+00	298.62
BI-211	72.87	45	1.23	6.591E+00	2.940E+00	2.940E+00	152.14
	351.06	332	12.92*	4.154E+00	3.287E+00	3.287E+00	15.55
BI-212	727.33	34	6.67*	2.358E+00	1.153E+00	1.153E+00	84.77
	785.37	21	1.10	2.221E+00	4.513E+00	4.513E+00	83.37
	1620.50	12	1.47	1.233E+00	3.617E+00	3.617E+00	55.47
PB-212	74.82	246	10.28	6.749E+00	1.883E+00	1.883E+00	29.29
	77.11	328	17.10	6.918E+00	1.472E+00	1.472E+00	19.84
	238.63	505	43.60*	5.637E+00	1.091E+00	1.091E+00	11.14
	300.09	49	3.30	4.720E+00	1.656E+00	1.656E+00	56.97
BI-214	609.32	213	45.49*	2.697E+00	9.213E-01	9.216E-01	22.32
	1120.29	40	14.92	1.689E+00	8.435E-01	8.438E-01	53.28
	1764.49	35	15.30	1.138E+00	1.066E+00	1.066E+00	39.91
PB-214	74.82	246	5.80	6.749E+00	3.337E+00	3.338E+00	29.29
	77.11	328	9.70	6.918E+00	2.595E+00	2.596E+00	19.84
	87.09	128	3.41	7.499E+00	2.668E+00	2.669E+00	42.00
	242.00	131	7.25	5.579E+00	1.719E+00	1.720E+00	48.20
	295.22	205	18.42	4.779E+00	1.238E+00	1.239E+00	20.01
	351.93	332	35.60*	4.154E+00	1.193E+00	1.193E+00	15.55
RN-222	609.32	213	45.49*	2.697E+00	9.213E-01	9.216E-01	22.32
	1120.29	40	14.92	1.689E+00	8.435E-01	8.438E-01	53.28
	1764.49	35	15.30	1.138E+00	1.066E+00	1.066E+00	39.91
RA-224	240.99	131	4.10*	5.579E+00	3.040E+00	3.040E+00	48.20
RA-226	609.32	213	45.49*	2.697E+00	9.213E-01	9.216E-01	22.32
	1120.29	40	14.92	1.689E+00	8.435E-01	8.438E-01	53.28
	1764.49	35	15.30	1.138E+00	1.066E+00	1.066E+00	39.91
AC-228	105.21	-----	1.10	7.950E+00	-----	Line Not Found	-----
	338.32	114	11.27	4.289E+00	1.254E+00	1.254E+00	41.25
	794.95	30	4.25	2.204E+00	1.687E+00	1.687E+00	60.00
	835.71	-----	1.61	2.121E+00	-----	Line Not Found	-----
	911.20	71	25.80*	1.985E+00	7.334E-01	7.334E-01	41.55
	968.97	54	15.80	1.893E+00	9.598E-01	9.598E-01	34.24
RA-228	105.21	-----	1.10	7.950E+00	-----	Line Not Found	-----
	338.32	114	11.27	4.289E+00	1.254E+00	1.254E+00	41.25
	794.95	30	4.25	2.204E+00	1.687E+00	1.687E+00	60.00
	835.71	-----	1.61	2.121E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	911.20	71	25.80*	1.985E+00	7.334E-01	7.334E-01	41.55
	968.97	54	15.80	1.893E+00	9.598E-01	9.598E-01	34.24
TH-228	74.82	246	10.28	6.749E+00	1.883E+00	1.883E+00	29.29
	77.11	328	17.10	6.918E+00	1.472E+00	1.472E+00	19.84
	238.63	505	43.60*	5.637E+00	1.091E+00	1.091E+00	11.14
	300.09	49	3.30	4.720E+00	1.656E+00	1.656E+00	56.97
TH-229	85.43	58	14.70	7.361E+00	2.859E-01	2.859E-01	87.98
	88.47	128	24.00	7.499E+00	3.790E-01	3.791E-01	42.00
	193.51	-----	4.41*	6.531E+00	-----	Line Not Found	-----
	210.85	-----	2.80	6.166E+00	-----	Line Not Found	-----
TH-230	609.32	213	45.49*	2.697E+00	9.213E-01	9.213E-01	22.32
	1120.29	40	14.92	1.689E+00	8.435E-01	8.435E-01	53.28
	1764.49	35	15.30	1.138E+00	1.066E+00	1.066E+00	39.91
PA-231	283.69	-----	1.70	4.935E+00	-----	Line Not Found	-----
	301.36	49	5.35*	4.720E+00	1.022E+00	1.022E+00	56.97
TH-232	105.21	-----	1.10	7.950E+00	-----	Line Not Found	-----
	338.32	114	11.27	4.289E+00	1.254E+00	1.254E+00	41.25
	835.71	-----	1.61	2.121E+00	-----	Line Not Found	-----
	911.20	71	25.80*	1.985E+00	7.334E-01	7.334E-01	41.55
	968.97	54	15.80	1.893E+00	9.598E-01	9.598E-01	34.24
PA-233	300.13	49	6.63	4.720E+00	8.243E-01	8.243E-01	56.97
	311.90	27	38.50*	4.582E+00	8.161E-02	8.161E-02	191.33
	340.48	-----	4.45	4.267E+00	-----	Line Not Found	-----
TH-234	63.29	49	3.70*	5.554E+00	1.267E+00	1.267E+00	116.90
	92.59	133	4.23	7.706E+00	2.171E+00	2.171E+00	43.23
U-234	609.32	213	45.49*	2.697E+00	9.213E-01	9.213E-01	22.32
	1120.29	40	14.92	1.689E+00	8.435E-01	8.435E-01	53.28
	1764.49	35	15.30	1.138E+00	1.066E+00	1.066E+00	39.91
U-235	89.96	74	3.47	7.610E+00	1.480E+00	1.480E+00	62.13
	93.35	133	5.60	7.706E+00	1.640E+00	1.640E+00	43.23
	143.76	-----	10.96*	7.620E+00	-----	Line Not Found	-----
	163.33	-----	5.08	7.206E+00	-----	Line Not Found	-----
	185.72	106	57.20	6.689E+00	1.465E-01	1.465E-01	54.04
	205.31	-----	5.01	6.280E+00	-----	Line Not Found	-----
U-238	63.29	49	3.70*	5.554E+00	1.267E+00	1.267E+00	116.90
	92.59	133	4.23	7.706E+00	2.171E+00	2.171E+00	43.23
AM-243	43.53	-----	5.90	1.694E+00	-----	Line Not Found	-----
	74.66	246	67.20*	6.749E+00	2.880E-01	2.881E-01	29.29
ANH-511	511.00	1	100.00*	3.088E+00	9.971E-04	9.971E-04	8945.20

Flag: "*" = Keyline

Total number of lines in spectrum 51
 Number of unidentified lines 14
 Number of lines tentatively identified by NID 37 72.55%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.243E+01	1.243E+01	0.137E+01	11.03	
CD-109	461.40D	1.58	2.459E+00	3.893E+00	1.635E+00	42.00	
TE-125M	57.40D	40.2	2.721E+00	1.095E+02	4.862E+02	444.12	
SN-126	2.30E+05Y	1.00	2.459E-01	2.459E-01	1.033E-01	42.00	
BA-137M	30.08Y	1.02	3.236E-01	3.299E-01	1.017E-01	30.82	
CS-137	30.08Y	1.02	3.419E-01	3.486E-01	1.074E-01	30.82	
TL-208	1.41E+10Y	1.00	3.245E-01	3.245E-01	0.788E-01	24.30	
PB-210	22.20Y	1.03	9.993E-01	1.026E+00	3.063E+00	298.62	
BI-211	7.04E+08Y	1.00	3.287E+00	3.287E+00	0.511E+00	15.55	
BI-212	1.41E+10Y	1.00	1.153E+00	1.153E+00	0.977E+00	84.77	
PB-212	1.41E+10Y	1.00	1.091E+00	1.091E+00	0.122E+00	11.14	
BI-214	1600.00Y	1.00	9.213E-01	9.216E-01	2.057E-01	22.32	
PB-214	1600.00Y	1.00	1.193E+00	1.193E+00	0.186E+00	15.55	
RN-222	1600.00Y	1.00	9.213E-01	9.216E-01	2.057E-01	22.32	
RA-224	1.41E+10Y	1.00	3.040E+00	3.040E+00	1.465E+00	48.20	
RA-226	1600.00Y	1.00	9.213E-01	9.216E-01	2.057E-01	22.32	
AC-228	1.41E+10Y	1.00	7.334E-01	7.334E-01	3.047E-01	41.55	
RA-228	1.41E+10Y	1.00	7.334E-01	7.334E-01	3.047E-01	41.55	
TH-228	1.41E+10Y	1.00	1.091E+00	1.091E+00	0.122E+00	11.14	
TH-229	7340.00Y	1.00	3.790E-01	3.791E-01	1.592E-01	42.00	K
TH-230	7.54E+04Y	1.00	9.213E-01	9.213E-01	2.056E-01	22.32	
PA-231	7.04E+08Y	1.00	1.022E+00	1.022E+00	0.582E+00	56.97	
TH-232	1.41E+10Y	1.00	7.334E-01	7.334E-01	3.047E-01	41.55	
PA-233	2.14E+06Y	1.00	8.161E-02	8.161E-02	15.61E-02	191.33	
TH-234	4.47E+09Y	1.00	1.267E+00	1.267E+00	1.481E+00	116.90	
U-234	2.45E+05Y	1.00	9.213E-01	9.213E-01	2.056E-01	22.32	
U-235	7.04E+08Y	1.00	1.465E-01	1.465E-01	0.792E-01	54.04	K
U-238	4.47E+09Y	1.00	1.267E+00	1.267E+00	1.481E+00	116.90	
AM-243	7370.00Y	1.00	2.880E-01	2.881E-01	0.844E-01	29.29	
ANH-511	1.00E+09Y	1.00	9.971E-04	9.971E-04	891.9E-04	8945.20	
Total Activity :			4.196E+01	1.502E+02			

Grand Total Activity : 4.196E+01 1.502E+02

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
2	65.12	15	197	0.94	130.30	123	10	3.29E-03	****	5.76E+00	
0	209.29	30	103	0.83	418.71	416	7	7.47E-03	****	6.20E+00	
0	464.13	20	71	1.15	928.53	923	12	5.23E-03	****	3.33E+00	T
0	670.22	26	44	0.73	1340.86	1334	17	7.08E-03	****	2.51E+00	
0	768.38	15	25	0.78	1537.26	1532	11	4.00E-03	****	2.26E+00	
0	809.16	10	11	0.91	1618.85	1614	8	2.84E-03	****	2.17E+00	T
0	873.29	25	35	10.38	1747.18	1733	28	7.03E-03	****	2.05E+00	T
0	964.51	32	6	2.25	1929.71	1925	9	9.06E-03	45.1	1.90E+00	T
0	1053.71	18	6	1.85	2108.19	2104	10	5.08E-03	66.1	1.77E+00	
0	1161.19	9	12	1.28	2323.27	2317	9	2.69E-03	****	1.64E+00	
0	1169.26	14	17	0.96	2339.43	2331	14	4.05E-03	****	1.63E+00	
0	1256.53	11	14	0.65	2514.06	2507	10	3.07E-03	****	1.54E+00	
0	1281.19	13	11	1.80	2563.42	2557	10	3.81E-03	****	1.51E+00	
0	1322.81	5	3	1.24	2646.70	2643	6	1.39E-03	****	1.47E+00	
0	1353.65	7	0	0.73	2708.43	2705	6	1.94E-03	75.6	1.45E+00	
0	1356.56	8	0	0.73	2714.25	2711	6	2.22E-03	70.7	1.44E+00	
0	1377.81	21	3	2.85	2756.78	2751	11	6.19E-03	51.2	1.42E+00	
0	1408.39	14	3	1.93	2817.97	2813	11	4.17E-03	67.3	1.40E+00	T
0	1588.14	11	2	1.87	3177.70	3173	9	3.30E-03	73.4	1.26E+00	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*                               *                                               *
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235023.CNF;1   *
* Acquisition date   : 3-OCT-2016 08:58:40 Sensitivity      : 3.000           *
* Detector ID       : GAM24 Energy tolerance: 1.500         *
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000   *
* Elapsed real time : 0 01:00:02.00 Half life ratio : ***** *
* Sample date       : 2-DEC-2015 10:40:00 Nuclide Library : SOLID          *
* Sample ID        : G405235023 Analyst initials: MXR1         *
* Batch Number     : 1596249 Sample Quantity : 1.4140E+02 GRAM *
* Wet wt corr      : 1.00000 Wet Weight      : 0.00000         *
*                               Dry Weight     : 0.00000         *
*****
*                               CALIBRATION INFORMATION                         *
*                               *                                               *
* Eff. Cal. date    : 17-JUN-2016 07:45:20 Eff. Geometry   : CAN           *
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM24_CAN.CNF;7 *
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.917E-01
CD-109	7.002E-01
TE-125M	2.152E+02
SN-126	4.432E-02
BA-137M	2.565E-02
CS-137	2.710E-02
TL-208	2.644E-02
PB-210	1.154E+00
BI-212	3.230E-01
PB-212	3.839E-02
BI-214	5.027E-02
PB-214	4.876E-02
RN-222	5.027E-02
RA-224	4.116E-01
RA-226	5.027E-02
AC-228	1.084E-01
RA-228	1.084E-01
TH-228	3.839E-02
TH-229	4.030E-01
TH-230	5.026E-02
PA-231	3.310E-01
TH-232	1.084E-01
PA-233	4.435E-02
TH-234	6.551E-01
U-234	5.026E-02
U-235	1.455E-01
U-238	6.551E-01
AM-243	2.997E-02
ANH-511	2.347E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.010E+01	NOT IDENT.
NA-22	4.199E-02	NOT IDENT.

NA-24	0.000E+00	SHORT HLIF
AL-26	2.114E-02	NOT IDENT.
SC-46	2.041E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.110E-02	NOT IDENT.
CO-56	3.677E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.538E-02	NOT IDENT.
CO-58	3.437E-01	NOT IDENT.
FE-59	4.470E+00	NOT IDENT.
CO-60	2.615E-02	NOT IDENT.
ZN-65	1.448E-01	NOT IDENT.
GE-68	1.599E+00	NOT IDENT.
AS-73	4.651E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.632E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.311E-01	NOT IDENT.
KR-85	6.214E+00	NOT IDENT.
SR-85	6.993E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.830E-01	NOT IDENT.
Y-91	4.182E+02	NOT IDENT.
NB-94	2.547E-02	NOT IDENT.
NB-95	6.421E-01	NOT IDENT.
NB-95M	1.880E+00	NOT IDENT.
ZR-95	1.218E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.614E-02	NOT IDENT.
RH-102	4.784E-02	NOT IDENT.
RU-103	5.298E+00	FAIL ABUN
RH-106	3.506E-01	NOT IDENT.
RU-106	3.506E-01	NOT IDENT.
AG-108M	2.386E-02	NOT IDENT.
AG-110M	7.102E-02	NOT IDENT.
SN-113	1.857E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.085E-01	NOT IDENT.
SB-124	2.228E+00	NOT IDENT.
SB-125	8.342E-02	FAIL ABUN
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.709E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.344E-02	FAIL ABUN
CS-135	9.791E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	9.327E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.243E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.755E-01	NOT IDENT.
PM-144	4.143E-02	NOT IDENT.
PR-144	3.610E+00	NOT IDENT.
PM-146	3.651E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	6.282E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.993E-02	FAIL ABUN
EU-152	6.966E-02	FAIL ABUN
GD-153	1.317E-01	NOT IDENT.
EU-154	1.014E-01	FAIL ABUN
EU-155	7.971E-02	FAIL ABUN
TB-160	1.715E+00	FAIL ABUN
HO-166M	4.228E-02	FAIL ABUN
TM-171	9.628E+00	NOT IDENT.

HF-172	1.700E-01	FAIL ABUN
LU-172	7.084E-02	FAIL ABUN
LU-176	1.771E-02	FAIL ABUN
HF-181	3.748E+00	NOT IDENT.
TA-182	8.778E-01	FAIL ABUN
RE-183	1.607E+00	NOT IDENT.
RE-184	3.168E+01	NOT IDENT.
W-188	7.904E+01	FAIL ABUN
IR-192	3.754E-01	FAIL ABUN
HG-203	2.061E+00	FAIL ABUN
BI-207	2.780E-02	FAIL ABUN
BI-211	3.777E-01	FAIL ABUN
PB-211	5.266E-01	NOT IDENT.
RN-219	2.907E-01	NOT IDENT.
RA-223	4.616E-01	FAIL ABUN
AC-227	1.979E-01	FAIL ABUN
TH-227	1.979E-01	FAIL ABUN
TH-231	4.616E-01	FAIL ABUN
PA-234	1.738E-01	FAIL ABUN
PA-234M	3.433E+00	NOT IDENT.
NP-237	4.337E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.829E-01	NOT IDENT.
PU-239	2.678E+02	NOT IDENT.
AM-241	6.973E-02	NOT IDENT.
CM-243	6.380E-02	NOT IDENT.
BK-247	5.431E-02	FAIL ABUN
CM-247	2.654E-02	NOT IDENT.
CF-249	3.070E-02	NOT IDENT.
CF-251	9.136E-02	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235023.CNF;1
* Acquisition date   : 3-OCT-2016 08:58:40 Sensitivity      : 3.000
* Detector ID       : GAM24 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:02.00 Half life ratio  : *****
* Sample date       : 2-DEC-2015 10:40:00 Nuclide Library : SOLID
* Sample ID         : G405235023 Analyst initials: MXR1
* Batch Number      : 1596249 Sample Quantity : 1.4140E+02 GRAM
*                   :                               Quantity Err(%) : 1.4144E-03 %
* Wet wt corr       : 1.00000 Wet Weight      : 0.00000
*                   :                               Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 17-JUN-2016 07:45:20 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM24_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.243E+01	1.492E+00	1.492E+00
CD-109	2.086E+00	1.665E+00	1.665E+00
TE-125M	1.095E+02	4.765E+02	4.765E+02
SN-126	1.317E-01	1.049E-01	1.049E-01
BA-137M	3.299E-01	1.007E-01	1.007E-01
CS-137	3.486E-01	1.063E-01	1.063E-01
TL-208	3.245E-01	7.848E-02	7.848E-02
PB-210	1.026E+00	3.003E+00	3.003E+00
BI-212	1.153E+00	9.596E-01	9.596E-01
PB-212	1.091E+00	1.323E-01	1.323E-01
BI-214	9.216E-01	2.054E-01	2.054E-01
PB-214	1.193E+00	1.884E-01	1.884E-01
RN-222	9.216E-01	2.054E-01	2.054E-01
RA-224	8.509E-01	1.506E+00	1.506E+00
RA-226	9.216E-01	2.054E-01	2.054E-01
AC-228	7.334E-01	3.009E-01	3.009E-01
RA-228	7.334E-01	3.009E-01	3.009E-01
TH-228	1.091E+00	1.323E-01	1.323E-01
TH-229	4.141E-01	4.436E-01	4.436E-01
TH-230	9.213E-01	2.053E-01	2.053E-01
PA-231	1.022E+00	6.106E-01	6.106E-01
TH-232	7.334E-01	3.009E-01	3.009E-01
PA-233	8.161E-02	1.531E-01	1.531E-01
TH-234	1.267E+00	1.478E+00	1.478E+00
U-234	9.213E-01	2.053E-01	2.053E-01
U-235	-7.143E-02	1.739E-01	1.739E-01
U-238	1.267E+00	1.478E+00	1.478E+00
AM-243	1.812E-01	8.708E-02	8.708E-02
ANH-511	9.971E-04	8.741E-02	8.741E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-4.962E+00	1.228E+01	1.248E+01	NOT IDENT.

NA-22	1.243E-02	5.037E-02	5.069E-02	NOT IDENT.
NA-24	-1.000E+41	2.535E+41	0.000E+00	SHORT HLIF
AL-26	7.081E-03	2.274E-02	2.296E-02	NOT IDENT.
SC-46	-5.738E-01	3.740E-01	4.547E-01	FAIL ABUN
V-48	-1.990E+03	1.642E+04	1.644E+04	SHORT HLIF
CR-51	-3.344E+02	4.120E+02	4.387E+02	SHORT HLIF
MN-54	-3.323E-02	6.727E-02	6.892E-02	NOT IDENT.
CO-56	7.905E-02	4.295E-01	4.310E-01	NOT IDENT.
MN-56	1.000E+41	3.373E+41	0.000E+00	SHORT HLIF
CO-57	7.259E-03	4.035E-02	4.048E-02	NOT IDENT.
CO-58	2.659E-01	3.648E-01	3.840E-01	NOT IDENT.
FE-59	-5.545E+00	6.265E+00	6.745E+00	NOT IDENT.
CO-60	7.350E-03	2.885E-02	2.904E-02	NOT IDENT.
ZN-65	1.056E-01	1.650E-01	1.717E-01	NOT IDENT.
GE-68	-2.103E-01	1.881E+00	1.884E+00	NOT IDENT.
AS-73	3.431E+00	5.023E+00	5.256E+00	NOT IDENT.
AS-74	-2.915E+03	7.111E+03	7.232E+03	SHORT HLIF
SE-75	-9.210E-02	1.883E-01	1.928E-01	NOT IDENT.
BR-77	1.163E+39	1.027E+40	0.000E+00	SHORT HLIF
SR-82	6.237E+02	7.804E+02	8.295E+02	SHORT HLIF
RB-83	5.320E-02	6.082E-01	6.087E-01	NOT IDENT.
KR-85	4.224E+00	7.386E+00	7.628E+00	NOT IDENT.
SR-85	4.720E-01	8.317E-01	8.585E-01	NOT IDENT.
RB-86	-3.932E+03	2.780E+04	2.786E+04	SHORT HLIF
Y-88	2.103E-02	2.149E-01	2.152E-01	NOT IDENT.
Y-91	2.930E+01	4.811E+02	4.813E+02	NOT IDENT.
NB-94	5.166E-03	2.952E-02	2.961E-02	NOT IDENT.
NB-95	-3.463E-01	9.431E-01	9.559E-01	NOT IDENT.
NB-95M	-1.482E-01	2.295E+00	2.295E+00	NOT IDENT.
ZR-95	-5.707E-01	1.552E+00	1.573E+00	NOT IDENT.
NB-97	-1.000E+41	4.064E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	2.321E+41	0.000E+00	SHORT HLIF
MO-99	-6.949E+32	6.450E+32	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	3.406E+41	0.000E+00	SHORT HLIF
RH-101	-1.290E-02	3.152E-02	3.205E-02	NOT IDENT.
RH-102	2.100E-02	5.315E-02	5.399E-02	NOT IDENT.
RU-103	-1.115E-01	6.133E+00	6.133E+00	FAIL ABUN
RH-106	-2.431E-01	4.528E-01	4.659E-01	NOT IDENT.
RU-106	-2.431E-01	4.528E-01	4.659E-01	NOT IDENT.
AG-108M	6.719E-03	2.650E-02	2.667E-02	NOT IDENT.
AG-110M	-5.599E-02	9.759E-02	1.008E-01	NOT IDENT.
SN-113	2.579E-02	2.076E-01	2.079E-01	NOT IDENT.
CD-115	8.801E+38	1.904E+40	0.000E+00	SHORT HLIF
SN-117M	2.188E+04	1.177E+05	1.181E+05	SHORT HLIF
TE-123M	5.449E-02	1.229E-01	1.254E-01	NOT IDENT.
SB-124	1.875E+00	2.190E+00	2.348E+00	NOT IDENT.
SB-125	2.521E-02	9.218E-02	9.288E-02	FAIL ABUN
I-126	1.099E+06	1.492E+06	1.572E+06	SHORT HLIF
SB-126	6.407E+05	1.472E+06	1.500E+06	SHORT HLIF
SB-127	2.035E+21	6.564E+22	0.000E+00	SHORT HLIF
I-131	-5.209E+08	7.131E+09	7.135E+09	SHORT HLIF
I-132	1.000E+41	1.897E+42	0.000E+00	SHORT HLIF
TE-132	9.883E+26	1.339E+27	0.000E+00	SHORT HLIF
BA-133	6.630E-03	3.279E-02	3.293E-02	NOT IDENT.
I-133	-1.000E+41	2.336E+41	0.000E+00	SHORT HLIF
CS-134	1.111E-01	6.548E-02	8.243E-02	FAIL ABUN
CS-135	-1.159E-01	1.191E-01	1.301E-01	NOT IDENT.
I-135	1.000E+41	1.020E+42	0.000E+00	SHORT HLIF
CS-136	4.103E+05	3.614E+05	4.060E+05	SHORT HLIF
CE-139	2.532E-02	1.081E-01	1.087E-01	NOT IDENT.
BA-140	-8.149E+05	1.622E+06	1.663E+06	SHORT HLIF
LA-140	2.849E+05	4.624E+05	4.799E+05	SHORT HLIF
CE-141	7.869E+00	2.563E+01	2.587E+01	NOT IDENT.
CE-143	1.000E+41	2.129E+41	0.000E+00	SHORT HLIF
CE-144	-6.451E-02	3.266E-01	3.279E-01	NOT IDENT.
PM-144	1.707E-03	4.896E-02	4.897E-02	NOT IDENT.
PR-144	1.488E-01	4.267E+00	4.267E+00	NOT IDENT.
PM-146	2.504E-02	3.883E-02	4.043E-02	NOT IDENT.
ND-147	7.057E+06	4.673E+07	4.684E+07	SHORT HLIF
PM-147	3.721E+02	6.952E+02	7.151E+02	NOT IDENT.
PM-149	1.000E+41	2.219E+41	0.000E+00	SHORT HLIF
EU-150	-8.459E-03	2.595E-02	2.622E-02	FAIL ABUN
EU-152	-1.209E-02	8.335E-02	8.353E-02	FAIL ABUN
GD-153	-1.662E-02	1.647E-01	1.649E-01	NOT IDENT.
EU-154	2.611E-02	1.224E-01	1.230E-01	FAIL ABUN
EU-155	7.348E-02	8.549E-02	9.168E-02	FAIL ABUN
TB-160	1.838E-01	2.302E+00	2.304E+00	FAIL ABUN
HO-166M	-9.090E-03	5.179E-02	5.195E-02	FAIL ABUN

TM-171	1.848E+00	1.052E+01	1.055E+01	NOT IDENT.
HF-172	2.587E-02	1.951E-01	1.954E-01	FAIL ABUN
LU-172	3.856E-02	7.603E-02	7.799E-02	FAIL ABUN
LU-176	-7.838E-03	2.299E-02	2.326E-02	FAIL ABUN
HF-181	-8.063E-01	4.424E+00	4.439E+00	NOT IDENT.
TA-182	9.328E-01	8.816E-01	9.768E-01	FAIL ABUN
RE-183	5.395E-01	1.749E+00	1.766E+00	NOT IDENT.
RE-184	3.575E+01	3.352E+01	3.719E+01	NOT IDENT.
W-188	-1.181E+02	1.142E+02	1.260E+02	FAIL ABUN
IR-192	1.622E-01	4.427E-01	4.487E-01	FAIL ABUN
HG-203	-1.083E-01	2.290E+00	2.290E+00	FAIL ABUN
BI-207	-3.287E-03	3.269E-02	3.273E-02	FAIL ABUN
BI-211	3.287E+00	5.218E-01	1.571E+00	FAIL ABUN
PB-211	3.499E-01	5.574E-01	5.793E-01	NOT IDENT.
RN-219	-6.484E-02	3.378E-01	3.391E-01	NOT IDENT.
RA-223	1.260E-01	5.034E-01	5.066E-01	FAIL ABUN
AC-227	2.015E-01	2.030E-01	2.224E-01	FAIL ABUN
TH-227	2.015E-01	2.030E-01	2.224E-01	FAIL ABUN
TH-231	1.260E-01	5.034E-01	5.066E-01	FAIL ABUN
PA-234	-1.091E-01	2.640E-01	2.685E-01	FAIL ABUN
PA-234M	1.210E+00	3.722E+00	3.762E+00	NOT IDENT.
NP-237	8.161E-02	1.531E-01	1.574E-01	FAIL ABUN
NP-238	1.000E+41	5.725E+41	0.000E+00	SHORT HLIF
NP-239	7.289E-02	2.052E-01	2.078E-01	NOT IDENT.
PU-239	1.216E+02	3.023E+02	3.073E+02	NOT IDENT.
AM-241	-1.082E-02	8.488E-02	8.502E-02	NOT IDENT.
CM-243	-1.628E-03	7.335E-02	7.336E-02	NOT IDENT.
BK-247	-2.981E-02	6.287E-02	6.429E-02	FAIL ABUN
CM-247	1.744E-02	2.817E-02	2.925E-02	NOT IDENT.
CF-249	3.766E-03	3.437E-02	3.441E-02	NOT IDENT.
CF-251	1.701E-02	1.069E-01	1.072E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	77.8223	87.09	87.6782	136.47	70.4387
45.60	76.2650	87.57	87.7463	140.51	0.0000
46.54	76.4388	88.03	87.8113	143.76	90.5337
49.72	0.0000	88.34	87.8554	144.24	88.2910
51.35	83.2463	88.47	87.8737	145.44	78.0803
51.87	96.2426	89.96	88.0831	152.43	68.2890
52.39	84.4345	1093.63	88.1783	153.25	0.0000
52.97	78.5760	91.11	0.0000	323.87	69.5856
53.44	82.6403	92.59	88.4489	156.02	0.0000
54.07	87.7402	93.35	88.5530	158.56	0.0000
57.36	0.0000	94.56	88.7188	159.00	64.1250
57.53	86.3865	94.65	91.5938	162.33	73.7176
57.98	83.4515	94.67	91.5964	162.66	0.0000
59.27	92.7493	94.87	91.6244	163.33	76.1401
59.32	92.7591	97.43	91.9824	165.86	71.6473
59.54	92.8012	98.43	83.1249	176.31	68.8679
60.96	86.3271	98.44	83.1261	176.60	0.0000
61.17	86.3639	99.53	73.5299	177.52	66.5752
62.93	102.5824	100.11	76.8399	181.07	0.0000
63.29	102.6558	102.03	64.0339	181.52	77.9841
63.58	102.7151	103.18	68.4900	184.41	84.5928
64.28	102.8571	103.37	63.0715	143.76	75.5133
66.73	124.1539	105.21	64.3300	193.51	57.9697
67.24	140.6631	105.31	61.0676	197.03	59.3756
125.81	129.8470	106.12	61.1385	198.01	65.4953
67.75	125.7635	106.47	66.6303	201.83	69.3809
69.67	112.5006	109.28	77.4965	203.43	60.9512
70.83	141.6166	111.00	84.6447	205.31	61.0565
72.81	104.8742	111.76	0.0000	210.85	67.0921
72.87	104.8858	114.06	89.7849	215.65	59.1636
74.66	105.2252	116.30	0.0000	222.11	60.7401
74.82	105.2553	116.74	69.7993	227.09	62.2467
74.97	105.2832	119.76	76.7543	227.38	62.2620
77.11	105.6829	121.12	63.5192	228.16	0.0000
78.74	105.9836	121.22	63.5275	228.18	41.1211
79.69	106.1568	121.78	63.5740	116.74	41.1211
80.12	106.2356	122.06	66.9447	235.69	57.6846
80.19	0.0000	122.92	71.4873	235.96	57.6972
80.57	106.3168	123.07	71.5015	238.63	53.6354
81.00	106.3949	265.00	71.5576	238.98	0.0000
81.07	106.4073	125.81	69.5116	240.99	53.7396
81.75	79.8976	127.23	92.1005	242.00	53.7845
83.79	87.2039	127.91	94.4285	244.70	53.9030
84.00	87.2342	129.30	92.3413	252.40	0.0000
85.43	87.4404	131.20	99.3330	252.80	60.1886
86.55	87.6012	133.02	82.5873	254.15	0.0000
86.79	87.6353	133.52	80.3744	256.23	41.6518
86.94	87.6567	136.00	77.2118	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	53.0492	355.39	0.0000	584.27	29.2097
264.80	53.0542	356.01	23.2386	595.83	0.0000
265.00	52.2072	364.49	0.0000	427.87	35.0902
268.22	57.4841	366.42	0.0000	602.52	0.0000
269.46	48.0908	372.51	35.9023	604.72	31.0156
270.03	38.6618	375.05	37.8010	607.14	21.7332
271.23	34.3970	377.52	26.7769	609.32	23.8254
273.65	0.0000	356.01	37.9996	610.33	23.8348
276.40	44.8906	388.16	35.3080	614.28	23.3551
277.37	47.5140	388.63	0.0000	618.01	22.8719
277.60	49.2511	391.69	30.7253	620.36	16.6504
278.00	50.1293	264.66	31.8204	621.93	23.9499
279.20	48.4440	401.81	34.6514	630.19	0.0000
279.54	43.2648	402.40	22.4839	631.29	17.7706
279.70	43.2699	404.85	24.3914	633.25	26.1536
280.46	41.5625	410.95	32.0064	634.78	0.0000
283.69	39.9253	413.71	33.9419	635.95	24.0875
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	33.0235	423.72	0.0000	645.85	17.8750
285.90	0.0000	427.09	37.9923	657.76	23.7708
287.50	34.8140	427.87	27.5563	657.90	0.0000
290.67	53.6498	433.94	31.4605	661.66	20.6331
293.27	0.0000	439.40	30.5964	664.57	0.0000
351.93	38.0714	453.88	23.1235	666.33	0.0000
295.96	26.2695	463.37	27.1102	666.50	0.0000
879.38	18.4229	468.07	33.4843	667.71	0.0000
299.98	27.6618	473.00	0.0000	677.62	19.1646
300.09	27.6638	475.06	17.5320	685.70	0.0000
300.13	27.6644	476.78	25.3462	695.00	0.0000
301.36	42.1924	477.60	31.2083	696.49	19.3037
302.85	35.6369	482.18	29.3250	696.51	19.3037
256.23	27.7496	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	27.8916
306.78	42.3516	497.08	29.5410	697.49	22.5295
308.46	37.1012	505.52	29.6625	702.65	21.4982
311.90	37.1884	507.63	0.0000	706.68	21.5308
316.51	31.9761	511.00	32.7140	711.68	18.3350
319.41	0.0000	514.00	28.2936	720.70	0.0000
320.08	0.0000	514.00	28.2936	721.93	0.0000
321.04	35.6380	520.40	22.9027	722.78	14.6206
323.87	36.5982	520.69	0.0000	722.91	14.6212
325.23	50.0334	522.65	0.0000	723.31	14.6234
328.76	0.0000	527.90	0.0000	724.19	14.6277
333.37	48.5057	528.26	20.9889	727.33	16.2720
333.97	47.1765	529.59	27.0022	733.00	17.9361
334.37	51.2330	529.87	0.0000	735.93	9.7939
338.28	39.6494	531.02	0.0000	333.97	6.5330
338.32	39.6503	537.26	0.0000	739.50	0.0000
311.90	35.1938	546.56	0.0000	747.24	13.1118
340.48	35.1938	552.55	23.2443	748.06	16.3947
340.55	0.0000	563.25	23.3566	752.31	19.7036
344.28	36.9078	569.33	30.5469	753.82	0.0000
345.93	28.0717	946.00	30.5493	756.73	24.1198
351.06	31.7971	569.70	24.4414	756.80	24.1207
351.93	31.8142	583.19	24.5859	884.68	16.4874

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	23.0978	1274.44	9.7613	1620.50	3.0811
766.42	24.7522	1001.03	11.5519	1621.92	6.5746
766.84	19.8047	1002.74	11.5575	1678.03	0.0000
772.60	0.0000	1004.73	15.1225	1690.97	3.1227
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	2.1102
778.90	17.6790	1028.54	0.0000	1063.66	6.3373
783.70	0.0000	1037.84	15.2641	1771.35	3.1694
785.37	9.9664	1038.76	0.0000	1791.20	0.0000
792.07	13.3193	631.29	13.5004	1808.65	2.1271
794.95	26.6650	1048.07	0.0000	1810.72	0.0000
795.86	16.6711	1049.04	5.7641	1836.06	4.2747
810.06	5.0255	1050.41	18.7408		
810.29	5.0259	1063.66	9.0424		
344.28	3.3507	1077.00	0.0000		
810.76	3.3511	1077.34	11.7995		
815.77	0.0000	1085.87	11.8265		
1048.07	0.0000	1093.63	14.5859		
832.01	15.7494	1099.45	17.3475		
834.85	25.8984	1112.07	20.1537		
835.71	18.0215	1112.84	21.9902		
836.80	0.0000	1115.54	10.2689		
846.75	0.0000	1120.29	20.1967		
846.77	13.5649	1120.55	20.1980		
856.80	0.0000	1221.41	19.1001		
860.56	19.3028	1129.67	19.3260		
871.09	12.5326	1131.51	0.0000		
873.19	12.5406	1147.95	0.0000		
875.33	0.0000	1173.23	17.8676		
879.38	18.8478	1177.95	14.9072		
880.51	17.1405	1189.05	14.0140		
883.24	16.0120	1204.77	13.1310		
884.68	19.4515	1221.41	10.3595		
889.28	20.6257	1231.02	20.7673		
894.76	19.5131	1235.36	0.0000		
898.04	12.6391	1238.28	19.8580		
900.72	22.9997	1260.41	0.0000		
903.28	10.3579	1271.87	10.4857		
911.20	19.6127	1274.44	13.9890		
912.08	19.6182	1274.54	13.9899		
923.98	0.0000	1291.59	11.4917		
926.50	12.7501	1298.22	0.0000		
929.11	11.6003	1312.11	0.0000		
937.49	22.0963	1332.49	5.8004		
944.13	0.0000	1362.66	0.0000		
946.00	11.6593	1365.19	6.8171		
949.00	13.1282	1368.63	0.0000		
667.71	0.0000	1384.29	1.9561		
962.31	4.2177	1408.01	5.8989		
964.08	8.4398	1457.56	0.0000		
966.17	0.0000	1460.82	4.9716		
911.20	9.8605	1489.16	8.0020		
968.97	9.8605	1505.03	9.0319		
983.53	0.0000	1584.12	8.1577		
984.45	0.0000	1596.21	0.0000		


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*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                   *
*                               Charleston, SC 29407                             *
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Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM29.CNF;354
Background date : 2-OCT-2016 11:01:41.
Sample date      : 8-DEC-2015 14:13:00. Acquisition date : 3-OCT-2016 08:59:12.
Sample ID       : G405235024 Sample quantity : 1.38962E+02 GRAM
Detector name   : GAM29 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:01.43 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596249 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.35*	17	148	0.70	126.67	124	7	4.76E-03	126.2	
2	2	72.24	48	66	1.21	144.42	143	23	1.32E-02	24.4	2.62E+00
3	2	74.74*	139	152	1.22	149.42	143	23	3.86E-02	17.6	
4	2	77.19*	219	150	1.22	154.32	143	23	6.08E-02	11.8	
5	0	87.06	68	170	1.17	174.02	172	7	1.89E-02	34.1	
6	5	90.00	53	73	0.95	179.90	178	13	1.48E-02	26.2	9.81E-01
7	5	92.91*	111	170	1.47	185.71	178	13	3.07E-02	24.5	
8	0	128.68	41	175	0.89	257.14	253	9	1.15E-02	59.6	
9	0	185.79*	90	180	1.44	371.21	366	13	2.51E-02	33.4	
10	1	208.71	53	79	1.16	417.00	413	12	1.48E-02	31.5	3.60E+00
11	1	210.22	26	78	1.16	420.00	413	12	7.31E-03	62.0	
12	3	238.69*	404	91	1.14	476.89	472	26	1.12E-01	6.3	2.81E+00
13	3	241.95	88	107	1.59	483.39	472	26	2.45E-02	26.3	
14	3	243.51	24	93	1.44	486.50	472	26	6.56E-03	88.0	
15	0	270.38	36	83	1.43	540.20	536	9	1.00E-02	48.5	
16	0	295.21*	178	93	1.30	589.79	582	15	4.95E-02	14.1	
17	0	300.42	35	51	2.04	600.19	596	8	9.85E-03	38.4	
18	0	327.86	50	89	2.44	655.01	650	13	1.38E-02	41.6	
19	0	338.30*	92	42	0.88	675.88	673	7	2.56E-02	15.8	
20	0	352.07*	256	98	1.42	703.39	697	11	7.11E-02	9.8	
21	0	438.11	13	38	0.67	875.32	872	8	3.61E-03	89.5	
22	0	462.81	36	62	1.93	924.67	918	12	9.87E-03	47.7	
23	0	471.19	4	32	0.53	941.41	939	6	1.22E-03	210.9	
24	0	480.06	69	128	7.12	959.14	944	34	1.91E-02	52.1	
25	0	511.21*	33	64	1.92	1021.39	1013	14	9.27E-03	62.0	
26	0	533.31	19	27	2.54	1065.57	1059	11	5.24E-03	58.5	
27	0	583.44*	115	56	1.43	1165.76	1160	14	3.20E-02	17.2	
28	0	603.29	8	38	0.64	1205.44	1199	9	2.23E-03	143.5	
29	0	609.37*	209	63	1.50	1217.59	1209	18	5.80E-02	11.4	
30	0	651.41	23	15	2.54	1301.62	1298	8	6.52E-03	35.6	
31	0	661.67	296	49	1.48	1322.13	1315	14	8.22E-02	7.7	
32	0	727.72	35	9	0.97	1454.18	1449	9	9.71E-03	22.9	
33	3	795.15	26	9	2.04	1588.99	1582	19	7.19E-03	34.3	1.08E+00
34	3	799.26	14	4	2.04	1597.21	1582	19	3.90E-03	38.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	835.84	12	17	2.48	1670.35	1664	10	3.41E-03	69.5	
36	0	860.94	14	22	0.90	1720.54	1716	10	3.84E-03	69.5	
37	0	911.32*	86	27	1.45	1821.29	1816	13	2.40E-02	16.6	
38	0	933.01	12	16	1.37	1864.68	1859	9	3.19E-03	68.7	
39	0	954.17	17	30	6.47	1907.01	1892	20	4.67E-03	83.5	
40	0	965.07	26	13	1.94	1928.80	1924	9	7.14E-03	32.4	
41	0	969.22*	51	19	1.50	1937.09	1933	12	1.41E-02	22.7	
42	0	1000.45*	16	15	0.88	1999.57	1993	14	4.48E-03	57.5	
43	0	1052.34	6	23	1.50	2103.36	2097	12	1.63E-03	163.1	
44	0	1093.39	13	11	2.16	2185.47	2179	12	3.66E-03	58.8	
45	0	1120.44*	44	6	1.61	2239.59	2234	11	1.23E-02	19.2	
46	0	1148.58	9	13	0.92	2295.89	2288	10	2.61E-03	77.6	
47	0	1151.13	11	13	1.35	2300.99	2298	8	3.15E-03	61.1	
48	0	1300.05	10	2	3.25	2598.97	2594	9	2.73E-03	42.0	
49	0	1352.11	10	4	1.16	2703.17	2698	9	2.74E-03	49.8	
50	0	1378.52*	9	12	0.88	2756.02	2747	16	2.59E-03	91.3	
51	0	1425.60	16	0	4.00	2850.25	2845	11	4.44E-03	25.0	
52	0	1460.87*	360	13	1.77	2920.86	2912	14	1.00E-01	5.7	
53	0	1508.11	10	3	0.64	3015.41	3009	10	2.84E-03	42.9	
54	0	1729.99	12	2	1.93	3459.68	3454	9	3.40E-03	35.6	
55	0	1764.73*	37	0	1.36	3529.26	3524	10	1.03E-02	18.1	
56	0	1871.53	6	0	0.99	3743.17	3739	7	1.67E-03	40.8	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235024.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 8-DEC-2015 14:13:00   Acquisition date : 3-OCT-2016 08:59:12
Sample ID        : G405235024             Sample quantity  : 138.96 GRAM
Sample type      : SOLID                   Sample geometry  :
Detector name    : GAMMA29                 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00           Elapsed real time: 0 01:00:01.43   0.0%
Energy tolerance : 1.50 keV                Half life ratio  : 10.00
Errors propagated: No                       Systematic Error : 0.00 %
Efficiency type  : Linear                    Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.347E+00	1.298E+01	1.298E+01	11.35	OK
MN-54	834.85	99.98*	2.116E+00	3.152E-02	6.135E-02	138.96	OK
CD-109	88.03	3.70*	6.255E+00	7.744E-01	1.215E+00	172.03	OK
SN-126	64.28	9.60	3.603E+00	3.278E-01	3.278E-01	252.49	OK
	86.94	8.90	6.255E+00	3.219E-01	3.219E-01	172.03	OK
	87.57	37.00*	6.255E+00	7.744E-02	7.744E-02	172.03	OK
CS-134	563.25	8.34	2.846E+00	-----	Line Not Found	-----	Absent
	569.33	15.37	2.823E+00	-----	Line Not Found	-----	Absent
	604.72	97.62	2.703E+00	1.695E-02	2.231E-02	286.91	OK
	795.86	85.46*	2.197E+00	7.517E-02	9.896E-02	68.70	OK
	801.95	8.69	2.183E+00	-----	Line Not Found	-----	Absent
	1365.19	3.02	1.430E+00	-----	Line Not Found	-----	Absent
BA-137M	661.66	89.90*	2.522E+00	7.232E-01	7.370E-01	15.36	OK
CS-137	661.66	85.10*	2.522E+00	7.640E-01	7.785E-01	15.36	OK
TL-208	277.37	6.60	4.914E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.772E+00	2.734E-01	2.734E-01	34.39	OK
	860.56	12.50	2.069E+00	2.895E-01	2.895E-01	139.00	OK
PB-212	74.82	10.28	5.094E+00	1.050E+00	1.050E+00	60.99	OK
	77.11	17.10	5.365E+00	1.557E+00	1.557E+00	23.57	OK
	238.63	43.60*	5.495E+00	1.013E+00	1.013E+00	12.55	OK
	300.09	3.30	4.622E+00	1.373E+00	1.373E+00	76.89	OK
BI-214	609.32	45.49*	2.683E+00	9.538E-01	9.541E-01	22.80	OK
	1120.29	14.92	1.685E+00	9.323E-01	9.326E-01	38.48	OK
	1764.49	15.30	1.129E+00	1.090E+00	1.091E+00	36.10	OK
PB-214	74.82	5.80	5.103E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	5.365E+00	2.745E+00	2.746E+00	23.57	OK
	87.09	3.41	6.257E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	5.441E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.685E+00	1.219E+00	1.220E+00	28.25	OK
	351.93	35.60*	4.086E+00	1.026E+00	1.026E+00	19.69	OK
RN-222	609.32	45.49*	2.683E+00	9.538E-01	9.541E-01	22.80	OK
	1120.29	14.92	1.685E+00	9.323E-01	9.326E-01	38.48	OK
	1764.49	15.30	1.129E+00	1.090E+00	1.091E+00	36.10	OK
RA-224	240.99	4.10*	5.441E+00	2.178E-01	2.178E-01	638.47	OK
RA-226	609.32	45.49*	2.683E+00	9.538E-01	9.541E-01	22.80	OK
	1120.29	14.92	1.685E+00	9.323E-01	9.326E-01	38.48	OK
	1764.49	15.30	1.129E+00	1.090E+00	1.091E+00	36.10	OK
AC-228	105.21	1.10	7.155E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.215E+00	1.134E+00	1.134E+00	31.65	OK
	794.95	4.25	2.197E+00	1.512E+00	1.512E+00	68.70	OK
	835.71	1.61	2.116E+00	1.957E+00	1.957E+00	138.96	OK
	911.20	25.80*	1.981E+00	9.123E-01	9.123E-01	33.21	OK
	968.97	15.80	1.889E+00	9.088E-01	9.088E-01	45.33	OK
RA-228	105.21	1.10	7.155E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.215E+00	1.134E+00	1.134E+00	31.65	OK
	794.95	4.25	2.197E+00	1.512E+00	1.512E+00	68.70	OK
	835.71	1.61	2.116E+00	1.957E+00	1.957E+00	138.96	OK
	911.20	25.80*	1.981E+00	9.123E-01	9.123E-01	33.21	OK
	968.97	15.80	1.889E+00	9.088E-01	9.088E-01	45.33	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	74.82	10.28	5.094E+00	1.050E+00	1.050E+00	60.99	OK
	77.11	17.10	5.365E+00	1.557E+00	1.557E+00	23.57	OK
	238.63	43.60*	5.495E+00	1.013E+00	1.013E+00	12.55	OK
	300.09	3.30	4.622E+00	1.373E+00	1.373E+00	76.89	OK
TH-230	609.32	45.49*	2.683E+00	9.538E-01	9.538E-01	22.80	OK
	1120.29	14.92	1.685E+00	9.323E-01	9.323E-01	38.48	OK
	1764.49	15.30	1.129E+00	1.090E+00	1.090E+00	36.10	OK
PA-231	283.69	1.70	4.831E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.622E+00	8.467E-01	8.467E-01	76.89	OK
TH-232	105.21	1.10	7.155E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.215E+00	1.134E+00	1.134E+00	31.65	OK
	835.71	1.61	2.116E+00	1.957E+00	1.957E+00	138.96	OK
	911.20	25.80*	1.981E+00	9.123E-01	9.123E-01	33.21	OK
TH-234	968.97	15.80	1.889E+00	9.088E-01	9.088E-01	45.33	OK
	63.29	3.70*	3.603E+00	8.506E-01	8.506E-01	252.49	OK
U-234	92.59	4.23	6.639E+00	2.536E+00	2.536E+00	48.92	OK
	609.32	45.49*	2.683E+00	9.538E-01	9.538E-01	22.80	OK
	1120.29	14.92	1.685E+00	9.323E-01	9.323E-01	38.48	OK
U-235	1764.49	15.30	1.129E+00	1.090E+00	1.090E+00	36.10	OK
	89.96	3.47	6.460E+00	1.538E+00	1.538E+00	52.32	OK
	93.35	5.60	6.639E+00	1.916E+00	1.916E+00	48.92	OK
	143.76	10.96*	7.247E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	6.922E+00	----- Line	Not Found	-----	Absent
U-238	185.72	57.20	6.480E+00	1.493E-01	1.493E-01	66.77	OK
	205.31	5.01	6.095E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	3.603E+00	8.506E-01	8.506E-01	252.49	OK
AM-243	92.59	4.23	6.639E+00	2.536E+00	2.536E+00	48.92	OK
	43.53	5.90	7.707E-01	----- Line	Not Found	-----	Absent
ANH-511	74.66	67.20*	5.094E+00	1.607E-01	1.607E-01	60.99	OK
	511.00	100.00*	3.064E+00	6.163E-02	6.163E-02	123.96	OK

Flag: "*" = Keyline

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235024.CNF;1
* Acquisition date   : 3-OCT-2016 08:59:12 Sensitivity      : 3.000
* Detector ID        : GAM29 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:01.43 Half life ratio : *****
* Sample date        : 8-DEC-2015 14:13:00 Analyst initials: MXR1
* Sample ID          : G405235024 Sample Quantity : 1.3896E+02 GRAM
* Batch Number       : 1596249 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 25-JUN-2016 09:55:57 Eff. Geometry   : CAN
* Eff. File           : DKA100:[CANBERRA.GAMMA]EFF_GAM29_CAN.CNF;10
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.298E+01	1.444E+00	6.781E-01
MN-54	6.135E-02	8.355E-02	1.027E-01
CD-109	1.215E+00	2.048E+00	2.117E+00
SN-126	7.744E-02	1.306E-01	1.356E-01
CS-134	9.896E-02	6.662E-02	7.303E-02
BA-137M	7.370E-01	1.109E-01	5.493E-02
CS-137	7.785E-01	1.172E-01	5.803E-02
TL-208	2.734E-01	9.212E-02	6.244E-02
PB-212	1.013E+00	1.246E-01	8.337E-02
BI-214	9.541E-01	2.132E-01	1.065E-01
PB-214	1.026E+00	1.980E-01	1.278E-01
RN-222	9.541E-01	2.132E-01	1.065E-01
RA-224	2.178E-01	1.363E+00	8.935E-01
RA-226	9.541E-01	2.132E-01	1.065E-01
AC-228	9.123E-01	2.969E-01	2.203E-01
RA-228	9.123E-01	2.969E-01	2.203E-01
TH-228	1.013E+00	1.246E-01	8.337E-02
TH-230	9.538E-01	2.132E-01	1.064E-01
PA-231	8.467E-01	6.380E-01	8.399E-01
TH-232	9.123E-01	2.969E-01	2.203E-01
TH-234	8.506E-01	2.105E+00	1.985E+00
U-234	9.538E-01	2.132E-01	1.064E-01
U-235	3.851E-02	1.724E-01	3.178E-01
U-238	8.506E-01	2.105E+00	1.985E+00
AM-243	1.607E-01	9.604E-02	8.528E-02
ANH-511	6.163E-02	7.487E-02	5.255E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	9.431E+00		1.239E+01	2.423E+01	NOT IDENT.
NA-22	7.646E-03		3.797E-02	7.704E-02	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF
AL-26	2.291E-02		2.462E-02	6.743E-02	NOT IDENT.

SC-46	-2.693E-01	3.440E-01	5.743E-01	FAIL ABUN
V-48	0.000E+00	1.129E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	3.959E+02	0.000E+00	SHORT HLIF
CO-56	-2.534E-01	3.559E-01	6.065E-01	NOT IDENT.
MN-56	0.000E+00	1.395E+41	0.000E+00	SHORT HLIF
CO-57	1.558E-02	4.338E-02	8.298E-02	NOT IDENT.
CO-58	2.225E-01	5.020E-01	1.047E+00	NOT IDENT.
FE-59	2.115E+00	4.555E+00	1.006E+01	NOT IDENT.
CO-60	1.120E-02	4.075E-02	8.128E-02	NOT IDENT.
ZN-65	1.345E-01	1.373E-01	3.010E-01	NOT IDENT.
GE-68	-1.424E-02	2.313E+00	4.389E+00	NOT IDENT.
AS-73	8.773E+00	8.373E+00	1.723E+01	NOT IDENT.
AS-74	0.000E+00	5.409E+03	0.000E+00	SHORT HLIF
SE-75	-8.318E-02	2.192E-01	3.769E-01	NOT IDENT.
BR-77	0.000E+00	2.210E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	4.547E+02	0.000E+00	SHORT HLIF
RB-83	6.235E-01	5.286E-01	1.200E+00	NOT IDENT.
KR-85	3.208E+00	6.712E+00	1.261E+01	NOT IDENT.
SR-85	3.371E-01	7.086E-01	1.331E+00	NOT IDENT.
RB-86	0.000E+00	2.726E+04	0.000E+00	SHORT HLIF
Y-88	-4.574E-02	2.182E-01	4.409E-01	NOT IDENT.
Y-91	-3.038E+02	4.663E+02	7.730E+02	NOT IDENT.
NB-94	-1.188E-02	3.102E-02	5.650E-02	NOT IDENT.
NB-95	-7.194E-01	7.903E-01	1.315E+00	NOT IDENT.
NB-95M	1.462E+00	2.276E+00	4.075E+00	NOT IDENT.
ZR-95	1.729E+00	1.232E+00	2.873E+00	NOT IDENT.
NB-97	0.000E+00	1.040E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.444E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	6.146E-02	7.180E-02	6.150E-02	FAIL ABUN
RH-102	-2.658E-03	5.395E-02	1.045E-01	NOT IDENT.
RU-103	-1.204E+00	4.498E+00	8.645E+00	FAIL ABUN
RH-106	2.714E-01	3.874E-01	8.462E-01	NOT IDENT.
RU-106	2.714E-01	3.874E-01	8.462E-01	NOT IDENT.
AG-108M	2.457E-03	2.876E-02	5.137E-02	NOT IDENT.
AG-110M	8.045E-03	8.857E-02	1.747E-01	NOT IDENT.
SN-113	-5.652E-02	2.109E-01	4.040E-01	NOT IDENT.
CD-115	0.000E+00	2.793E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	9.367E+04	0.000E+00	SHORT HLIF
TE-123M	1.418E-02	1.339E-01	2.462E-01	NOT IDENT.
SB-124	4.256E-01	1.338E+00	3.388E+00	NOT IDENT.
SB-125	-4.288E-03	1.060E-01	2.054E-01	FAIL ABUN
TE-125M	-2.771E+02	2.477E+02	4.197E+02	NOT IDENT.
I-126	0.000E+00	8.877E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	8.696E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	2.022E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	5.128E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.771E+26	0.000E+00	SHORT HLIF
BA-133	-6.492E-03	4.293E-02	7.464E-02	NOT IDENT.
I-133	0.000E+00	9.586E+40	0.000E+00	SHORT HLIF
CS-135	-2.064E-02	1.533E-01	2.480E-01	NOT IDENT.
I-135	0.000E+00	1.675E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.467E+05	0.000E+00	SHORT HLIF
CE-139	-8.108E-02	1.058E-01	1.805E-01	NOT IDENT.
BA-140	0.000E+00	1.274E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	3.585E+05	0.000E+00	SHORT HLIF
CE-141	3.964E+00	2.230E+01	4.161E+01	NOT IDENT.
CE-143	0.000E+00	8.562E+40	0.000E+00	SHORT HLIF
CE-144	4.415E-03	3.617E-01	6.655E-01	NOT IDENT.
PM-144	2.748E-02	5.811E-02	1.165E-01	NOT IDENT.
PR-144	2.387E+00	5.048E+00	1.012E+01	NOT IDENT.
PM-146	2.273E-02	4.257E-02	8.737E-02	NOT IDENT.
ND-147	0.000E+00	3.268E+07	0.000E+00	SHORT HLIF
PM-147	-2.367E+02	7.745E+02	1.403E+03	NOT IDENT.
PM-149	0.000E+00	4.543E+40	0.000E+00	SHORT HLIF
EU-150	1.741E-02	2.574E-02	4.919E-02	FAIL ABUN
EU-152	-7.064E-02	8.836E-02	1.612E-01	FAIL ABUN
GD-153	6.911E-03	1.562E-01	2.942E-01	NOT IDENT.
EU-154	1.656E-02	9.259E-02	1.872E-01	NOT IDENT.
EU-155	1.163E-01	1.025E-01	2.067E-01	FAIL ABUN
TB-160	-1.887E-03	1.843E+00	3.530E+00	FAIL ABUN
HO-166M	-1.095E-02	4.703E-02	8.884E-02	FAIL ABUN
TM-171	-6.546E+00	1.997E+01	3.758E+01	NOT IDENT.
HF-172	1.328E-01	2.274E-01	4.114E-01	FAIL ABUN
LU-172	8.750E-02	1.009E-01	1.382E-01	FAIL ABUN
LU-176	1.356E-02	2.450E-02	4.642E-02	FAIL ABUN

HF-181	-1.184E+00	3.796E+00	6.425E+00	NOT IDENT.
TA-182	-1.535E-01	8.010E-01	1.468E+00	FAIL ABUN
RE-183	-1.494E-01	2.816E+00	5.376E+00	NOT IDENT.
RE-184	1.433E+01	2.680E+01	5.620E+01	NOT IDENT.
W-188	-4.208E+01	1.163E+02	1.819E+02	FAIL ABUN
IR-192	1.969E-01	5.028E-01	9.290E-01	FAIL ABUN
HG-203	-1.693E+00	2.470E+00	4.085E+00	FAIL ABUN
BI-207	-1.873E-02	5.148E-02	9.119E-02	FAIL ABUN
PB-210	-3.241E-01	3.128E+00	6.038E+00	NOT IDENT.
BI-211	0.000E+00	5.453E-01	8.020E-01	FAIL ABUN
PB-211	1.292E-01	6.637E-01	1.316E+00	NOT IDENT.
BI-212	0.000E+00	5.512E-01	1.133E+00	FAIL ABUN
RN-219	-1.207E-01	3.592E-01	6.807E-01	FAIL ABUN
RA-223	3.231E-01	5.187E-01	1.008E+00	FAIL ABUN
AC-227	-1.829E-01	2.270E-01	3.725E-01	FAIL ABUN
TH-227	-1.829E-01	2.270E-01	3.725E-01	FAIL ABUN
TH-229	3.173E-03	4.456E-01	8.095E-01	FAIL ABUN
TH-231	3.231E-01	5.187E-01	1.008E+00	FAIL ABUN
PA-233	-2.598E-02	6.275E-02	1.058E-01	FAIL ABUN
PA-234	-1.214E-01	2.758E-01	4.254E-01	NOT IDENT.
PA-234M	5.576E+00	6.280E+00	8.564E+00	FAIL ABUN
NP-237	-2.598E-02	6.275E-02	1.058E-01	FAIL ABUN
NP-238	0.000E+00	1.244E+41	0.000E+00	SHORT HLIF
NP-239	4.189E-02	2.277E-01	4.292E-01	NOT IDENT.
PU-239	5.574E+02	6.512E+02	6.596E+02	FAIL ABUN
AM-241	1.625E-02	1.317E-01	2.537E-01	NOT IDENT.
CM-243	-6.249E-02	9.406E-02	1.667E-01	NOT IDENT.
BK-247	-8.779E-03	7.529E-02	1.332E-01	NOT IDENT.
CM-247	2.728E-02	3.317E-02	6.974E-02	NOT IDENT.
CF-249	-9.112E-03	3.637E-02	6.950E-02	NOT IDENT.
CF-251	8.050E-03	1.058E-01	1.946E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	345	10.66*	1.347E+00	1.298E+01	1.298E+01	11.35
MN-54	834.85	12	99.98*	2.116E+00	3.152E-02	6.135E-02	138.96
CD-109	88.03	81	3.70*	6.255E+00	1.898E+00	2.978E+00	68.17
SN-126	64.28	21	9.60	3.603E+00	3.278E-01	3.278E-01	252.49
	86.94	81	8.90	6.255E+00	7.890E-01	7.890E-01	68.17
	87.57	81	37.00*	6.255E+00	1.898E-01	1.898E-01	68.17
CS-134	563.25	-----	8.34	2.846E+00	-----	Line Not Found	-----
	569.33	-----	15.37	2.823E+00	-----	Line Not Found	-----
	604.72	8	97.62	2.703E+00	1.695E-02	2.231E-02	286.91
	795.86	26	85.46*	2.197E+00	7.517E-02	9.896E-02	68.70
	801.95	-----	8.69	2.183E+00	-----	Line Not Found	-----
	1365.19	-----	3.02	1.430E+00	-----	Line Not Found	-----
BA-137M	661.66	303	89.90*	2.522E+00	7.232E-01	7.370E-01	15.36
CS-137	661.66	303	85.10*	2.522E+00	7.640E-01	7.785E-01	15.36
TL-208	277.37	-----	6.60	4.914E+00	-----	Line Not Found	-----
	583.19	119	85.00*	2.772E+00	2.734E-01	2.734E-01	34.39
	860.56	14	12.50	2.069E+00	2.895E-01	2.895E-01	139.00
BI-211	72.87	58	1.23	4.798E+00	5.284E+00	5.284E+00	48.75
	351.06	276	12.92*	4.086E+00	2.826E+00	2.826E+00	19.69
PB-212	74.82	168	10.28	5.094E+00	1.738E+00	1.738E+00	35.12
	77.11	264	17.10	5.365E+00	1.557E+00	1.557E+00	23.57
	238.63	449	43.60*	5.495E+00	1.013E+00	1.013E+00	12.55
	300.09	39	3.30	4.622E+00	1.373E+00	1.373E+00	76.89
BI-214	609.32	215	45.49*	2.683E+00	9.538E-01	9.541E-01	22.80
	1120.29	43	14.92	1.685E+00	9.323E-01	9.326E-01	38.48
	1764.49	35	15.30	1.129E+00	1.090E+00	1.091E+00	36.10
PB-214	74.82	168	5.80	5.094E+00	3.081E+00	3.082E+00	35.12
	77.11	264	9.70	5.365E+00	2.745E+00	2.746E+00	23.57
	87.09	81	3.41	6.255E+00	2.059E+00	2.060E+00	68.17
	242.00	98	7.25	5.441E+00	1.342E+00	1.343E+00	52.67
	295.22	195	18.42	4.685E+00	1.219E+00	1.220E+00	28.25
	351.93	276	35.60*	4.086E+00	1.026E+00	1.026E+00	19.69
RN-222	609.32	215	45.49*	2.683E+00	9.538E-01	9.541E-01	22.80
	1120.29	43	14.92	1.685E+00	9.323E-01	9.326E-01	38.48
	1764.49	35	15.30	1.129E+00	1.090E+00	1.091E+00	36.10
RA-224	240.99	98	4.10*	5.441E+00	2.374E+00	2.374E+00	52.67
RA-226	609.32	215	45.49*	2.683E+00	9.538E-01	9.541E-01	22.80
	1120.29	43	14.92	1.685E+00	9.323E-01	9.326E-01	38.48
	1764.49	35	15.30	1.129E+00	1.090E+00	1.091E+00	36.10
AC-228	105.21	-----	1.10	7.155E+00	-----	Line Not Found	-----
	338.32	100	11.27	4.215E+00	1.134E+00	1.134E+00	31.65
	794.95	26	4.25	2.197E+00	1.512E+00	1.512E+00	68.70
	835.71	12	1.61	2.116E+00	1.957E+00	1.957E+00	138.96
	911.20	86	25.80*	1.981E+00	9.123E-01	9.123E-01	33.21
	968.97	50	15.80	1.889E+00	9.088E-01	9.088E-01	45.33
RA-228	105.21	-----	1.10	7.155E+00	-----	Line Not Found	-----
	338.32	100	11.27	4.215E+00	1.134E+00	1.134E+00	31.65

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	794.95	26	4.25	2.197E+00	1.512E+00	1.512E+00	68.70
	835.71	12	1.61	2.116E+00	1.957E+00	1.957E+00	138.96
	911.20	86	25.80*	1.981E+00	9.123E-01	9.123E-01	33.21
	968.97	50	15.80	1.889E+00	9.088E-01	9.088E-01	45.33
TH-228	74.82	168	10.28	5.094E+00	1.738E+00	1.738E+00	35.12
	77.11	264	17.10	5.365E+00	1.557E+00	1.557E+00	23.57
	238.63	449	43.60*	5.495E+00	1.013E+00	1.013E+00	12.55
	300.09	39	3.30	4.622E+00	1.373E+00	1.373E+00	76.89
TH-230	609.32	215	45.49*	2.683E+00	9.538E-01	9.538E-01	22.80
	1120.29	43	14.92	1.685E+00	9.323E-01	9.323E-01	38.48
	1764.49	35	15.30	1.129E+00	1.090E+00	1.090E+00	36.10
PA-231	283.69	-----	1.70	4.831E+00	-----	Line Not Found	-----
	301.36	39	5.35*	4.622E+00	8.467E-01	8.467E-01	76.89
TH-232	105.21	-----	1.10	7.155E+00	-----	Line Not Found	-----
	338.32	100	11.27	4.215E+00	1.134E+00	1.134E+00	31.65
	835.71	12	1.61	2.116E+00	1.957E+00	1.957E+00	138.96
	911.20	86	25.80*	1.981E+00	9.123E-01	9.123E-01	33.21
	968.97	50	15.80	1.889E+00	9.088E-01	9.088E-01	45.33
TH-234	63.29	21	3.70*	3.603E+00	8.506E-01	8.506E-01	252.49
	92.59	132	4.23	6.639E+00	2.536E+00	2.536E+00	48.92
U-234	609.32	215	45.49*	2.683E+00	9.538E-01	9.538E-01	22.80
	1120.29	43	14.92	1.685E+00	9.323E-01	9.323E-01	38.48
	1764.49	35	15.30	1.129E+00	1.090E+00	1.090E+00	36.10
U-235	89.96	64	3.47	6.460E+00	1.538E+00	1.538E+00	52.32
	93.35	132	5.60	6.639E+00	1.916E+00	1.916E+00	48.92
	143.76	-----	10.96*	7.247E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.922E+00	-----	Line Not Found	-----
	185.72	102	57.20	6.480E+00	1.493E-01	1.493E-01	66.77
	205.31	-----	5.01	6.095E+00	-----	Line Not Found	-----
U-238	63.29	21	3.70*	3.603E+00	8.506E-01	8.506E-01	252.49
	92.59	132	4.23	6.639E+00	2.536E+00	2.536E+00	48.92
AM-243	43.53	-----	5.90	7.707E-01	-----	Line Not Found	-----
	74.66	168	67.20*	5.094E+00	2.659E-01	2.659E-01	35.12
ANH-511	511.00	35	100.00*	3.064E+00	6.163E-02	6.163E-02	123.96

Flag: "*" = Keyline

Total number of lines in spectrum 56
 Number of unidentified lines 16
 Number of lines tentatively identified by NID 40 71.43%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.298E+01	1.298E+01	0.147E+01	11.35	
MN-54	312.05D	1.95	3.152E-02	6.135E-02	8.525E-02	138.96	
CD-109	461.40D	1.57	1.898E+00	2.978E+00	2.030E+00	68.17	
SN-126	2.30E+05Y	1.00	1.898E-01	1.898E-01	1.294E-01	68.17	
CS-134	2.07Y	1.32	7.517E-02	9.896E-02	6.798E-02	68.70	
BA-137M	30.08Y	1.02	7.232E-01	7.370E-01	1.132E-01	15.36	
CS-137	30.08Y	1.02	7.640E-01	7.785E-01	1.196E-01	15.36	
TL-208	1.41E+10Y	1.00	2.734E-01	2.734E-01	0.940E-01	34.39	
BI-211	7.04E+08Y	1.00	2.826E+00	2.826E+00	0.556E+00	19.69	
PB-212	1.41E+10Y	1.00	1.013E+00	1.013E+00	0.127E+00	12.55	
BI-214	1600.00Y	1.00	9.538E-01	9.541E-01	2.176E-01	22.80	
PB-214	1600.00Y	1.00	1.026E+00	1.026E+00	0.202E+00	19.69	
RN-222	1600.00Y	1.00	9.538E-01	9.541E-01	2.176E-01	22.80	
RA-224	1.41E+10Y	1.00	2.374E+00	2.374E+00	1.250E+00	52.67	
RA-226	1600.00Y	1.00	9.538E-01	9.541E-01	2.176E-01	22.80	
AC-228	1.41E+10Y	1.00	9.123E-01	9.123E-01	3.029E-01	33.21	
RA-228	1.41E+10Y	1.00	9.123E-01	9.123E-01	3.029E-01	33.21	
TH-228	1.41E+10Y	1.00	1.013E+00	1.013E+00	0.127E+00	12.55	
TH-230	7.54E+04Y	1.00	9.538E-01	9.538E-01	2.175E-01	22.80	
PA-231	7.04E+08Y	1.00	8.467E-01	8.467E-01	6.510E-01	76.89	
TH-232	1.41E+10Y	1.00	9.123E-01	9.123E-01	3.029E-01	33.21	
TH-234	4.47E+09Y	1.00	8.506E-01	8.506E-01	21.48E-01	252.49	
U-234	2.45E+05Y	1.00	9.538E-01	9.538E-01	2.175E-01	22.80	
U-235	7.04E+08Y	1.00	1.493E-01	1.493E-01	0.997E-01	66.77	K
U-238	4.47E+09Y	1.00	8.506E-01	8.506E-01	21.48E-01	252.49	
AM-243	7370.00Y	1.00	2.659E-01	2.659E-01	0.934E-01	35.12	
ANH-511	1.00E+09Y	1.00	6.163E-02	6.163E-02	7.640E-02	123.96	
Total Activity :			3.572E+01	3.689E+01			

Grand Total Activity : 3.572E+01 3.689E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	128.68	48	203	0.89	257.14	253	9	1.15E-02	****	7.39E+00	T
1	208.71	60	89	1.16	417.00	413	12	1.48E-02	63.0	6.03E+00	
1	210.22	30	87	1.16	420.00	413	12	7.31E-03	****	6.00E+00	T
3	243.51	26	103	1.44	486.50	472	26	6.56E-03	****	5.42E+00	T
0	270.38	40	91	1.43	540.20	536	9	1.00E-02	97.0	5.01E+00	T
0	327.86	54	97	2.44	655.01	650	13	1.38E-02	83.2	4.32E+00	T
0	438.11	14	40	0.67	875.32	872	8	3.61E-03	****	3.45E+00	T
0	462.81	38	66	1.93	924.67	918	12	9.87E-03	95.3	3.31E+00	T
0	471.19	5	33	0.53	941.41	939	6	1.22E-03	****	3.26E+00	
0	480.06	72	135	7.12	959.14	944	34	1.91E-02	****	3.21E+00	
0	533.31	20	28	2.54	1065.57	1059	11	5.24E-03	****	2.97E+00	
0	651.41	24	15	2.54	1301.62	1298	8	6.52E-03	71.3	2.55E+00	
0	727.72	36	9	0.97	1454.18	1449	9	9.71E-03	45.9	2.35E+00	T
3	799.26	14	4	2.04	1597.21	1582	19	3.90E-03	76.7	2.19E+00	
0	933.01	11	15	1.37	1864.68	1859	9	3.19E-03	****	1.95E+00	
0	954.17	17	30	6.47	1907.01	1892	20	4.67E-03	****	1.91E+00	T
0	965.07	26	13	1.94	1928.80	1924	9	7.14E-03	64.8	1.90E+00	T
0	1000.45	16	15	0.88	1999.57	1993	14	4.48E-03	****	1.84E+00	T
0	1052.34	6	23	1.50	2103.36	2097	12	1.63E-03	****	1.77E+00	
0	1093.39	13	11	2.16	2185.47	2179	12	3.66E-03	****	1.72E+00	T
0	1148.58	9	12	0.92	2295.89	2288	10	2.61E-03	****	1.65E+00	T
0	1151.13	11	12	1.35	2300.99	2298	8	3.15E-03	****	1.65E+00	
0	1300.05	10	2	3.25	2598.97	2594	9	2.73E-03	84.0	1.49E+00	
0	1352.11	10	4	1.16	2703.17	2698	9	2.74E-03	99.7	1.44E+00	
0	1378.52	9	11	0.88	2756.02	2747	16	2.59E-03	****	1.42E+00	
0	1425.60	15	0	4.00	2850.25	2845	11	4.44E-03	50.0	1.38E+00	
0	1508.11	10	3	0.64	3015.41	3009	10	2.84E-03	85.8	1.31E+00	
0	1729.99	12	2	1.93	3459.68	3454	9	3.40E-03	71.3	1.15E+00	
0	1871.53	6	0	0.99	3743.17	3739	7	1.67E-03	81.6	1.06E+00	

Flags: "T" = Tentatively associated

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235024.CNF;1
* Acquisition date   : 3-OCT-2016 08:59:12 Sensitivity      : 3.000
* Detector ID       : GAM29 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:01.43 Half life ratio : *****
* Sample date       : 8-DEC-2015 14:13:00 Nuclide Library : SOLID
* Sample ID         : G405235024 Analyst initials: MXR1
* Batch Number      : 1596249 Sample Quantity : 1.3896E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 25-JUN-2016 09:55:57 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM29_CAN.CNF;10
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.881E-01
MN-54	4.454E-02
CD-109	1.007E+00
SN-126	6.452E-02
CS-134	3.132E-02
BA-137M	2.412E-02
CS-137	2.548E-02
TL-208	2.806E-02
PB-212	3.853E-02
BI-214	4.714E-02
PB-214	5.875E-02
RN-222	4.714E-02
RA-224	4.129E-01
RA-226	4.714E-02
AC-228	9.568E-02
RA-228	9.568E-02
TH-228	3.853E-02
TH-230	4.712E-02
PA-231	3.894E-01
TH-232	9.568E-02
TH-234	9.342E-01
U-234	4.712E-02
U-235	1.493E-01
U-238	9.342E-01
AM-243	4.039E-02
ANH-511	2.384E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.101E+01	NOT IDENT.
NA-22	3.249E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.707E-02	NOT IDENT.
SC-46	2.434E-01	FAIL ABUN

V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
CO-56	2.511E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.889E-02	NOT IDENT.
CO-58	4.590E-01	NOT IDENT.
FE-59	4.218E+00	NOT IDENT.
CO-60	3.504E-02	NOT IDENT.
ZN-65	1.303E-01	NOT IDENT.
GE-68	1.911E+00	NOT IDENT.
AS-73	8.142E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.742E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.388E-01	NOT IDENT.
KR-85	5.708E+00	NOT IDENT.
SR-85	6.025E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.729E-01	NOT IDENT.
Y-91	3.244E+02	NOT IDENT.
NB-94	2.517E-02	NOT IDENT.
NB-95	5.733E-01	NOT IDENT.
NB-95M	1.896E+00	NOT IDENT.
ZR-95	1.283E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.895E-02	FAIL ABUN
RH-102	4.632E-02	NOT IDENT.
RU-103	3.800E+00	FAIL ABUN
RH-106	3.735E-01	NOT IDENT.
RU-106	3.735E-01	NOT IDENT.
AG-108M	2.330E-02	NOT IDENT.
AG-110M	7.581E-02	NOT IDENT.
SN-113	1.833E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.157E-01	NOT IDENT.
SB-124	1.282E+00	NOT IDENT.
SB-125	9.389E-02	FAIL ABUN
TE-125M	1.952E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.417E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-135	1.147E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	8.398E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.950E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.134E-01	NOT IDENT.
PM-144	5.283E-02	NOT IDENT.
PR-144	4.589E+00	NOT IDENT.
PM-146	3.988E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	6.563E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.273E-02	FAIL ABUN
EU-152	7.354E-02	FAIL ABUN
GD-153	1.380E-01	NOT IDENT.
EU-154	7.882E-02	NOT IDENT.
EU-155	9.764E-02	FAIL ABUN
TB-160	1.551E+00	FAIL ABUN
HO-166M	3.867E-02	FAIL ABUN
TM-171	1.766E+01	NOT IDENT.
HF-172	1.933E-01	FAIL ABUN
LU-172	5.989E-02	FAIL ABUN
LU-176	2.144E-02	FAIL ABUN
HF-181	2.822E+00	NOT IDENT.

TA-182	6.275E-01	FAIL ABUN
RE-183	2.531E+00	NOT IDENT.
RE-184	2.466E+01	NOT IDENT.
W-188	8.316E+01	FAIL ABUN
IR-192	4.303E-01	FAIL ABUN
HG-203	1.879E+00	FAIL ABUN
BI-207	3.988E-02	FAIL ABUN
PB-210	2.854E+00	NOT IDENT.
BI-211	3.869E-01	FAIL ABUN
PB-211	6.039E-01	NOT IDENT.
BI-212	5.190E-01	FAIL ABUN
RN-219	3.095E-01	FAIL ABUN
RA-223	4.607E-01	FAIL ABUN
AC-227	1.710E-01	FAIL ABUN
TH-227	1.710E-01	FAIL ABUN
TH-229	3.776E-01	FAIL ABUN
TH-231	4.607E-01	FAIL ABUN
PA-233	4.856E-02	FAIL ABUN
PA-234	1.807E-01	NOT IDENT.
PA-234M	3.806E+00	FAIL ABUN
NP-237	4.856E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.015E-01	NOT IDENT.
PU-239	3.134E+02	FAIL ABUN
AM-241	1.197E-01	NOT IDENT.
CM-243	7.807E-02	NOT IDENT.
BK-247	6.165E-02	NOT IDENT.
CM-247	3.205E-02	NOT IDENT.
CF-249	3.175E-02	NOT IDENT.
CF-251	9.068E-02	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235024.CNF;1
* Acquisition date   : 3-OCT-2016 08:59:12 Sensitivity      : 3.000
* Detector ID        : GAM29 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:01.43 Half life ratio  : *****
* Sample date        : 8-DEC-2015 14:13:00 Nuclide Library : SOLID
* Sample ID          : G405235024 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity : 1.3896E+02 GRAM
*                   : Quantity Err(%) : 1.4392E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 25-JUN-2016 09:55:57 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM29_CAN.CNF;10
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.298E+01	1.596E+00	1.596E+00
MN-54	6.135E-02	8.359E-02	8.359E-02
CD-109	1.215E+00	2.062E+00	2.062E+00
SN-126	7.744E-02	1.314E-01	1.314E-01
CS-134	9.896E-02	6.675E-02	6.675E-02
BA-137M	7.370E-01	1.154E-01	1.154E-01
CS-137	7.785E-01	1.219E-01	1.219E-01
TL-208	2.734E-01	9.285E-02	9.285E-02
PB-212	1.013E+00	1.356E-01	1.356E-01
BI-214	9.541E-01	2.171E-01	2.171E-01
PB-214	1.026E+00	2.025E-01	2.025E-01
RN-222	9.541E-01	2.171E-01	2.171E-01
RA-224	2.178E-01	1.370E+00	1.370E+00
RA-226	9.541E-01	2.171E-01	2.171E-01
AC-228	9.123E-01	3.006E-01	3.006E-01
RA-228	9.123E-01	3.006E-01	3.006E-01
TH-228	1.013E+00	1.356E-01	1.356E-01
TH-230	9.538E-01	2.171E-01	2.171E-01
PA-231	8.467E-01	6.631E-01	6.631E-01
TH-232	9.123E-01	3.006E-01	3.006E-01
TH-234	8.506E-01	2.113E+00	2.113E+00
U-234	9.538E-01	2.171E-01	2.171E-01
U-235	3.851E-02	1.724E-01	1.724E-01
U-238	8.506E-01	2.113E+00	2.113E+00
AM-243	1.607E-01	9.746E-02	9.746E-02
ANH-511	6.163E-02	7.491E-02	7.491E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	9.431E+00	1.240E+01	1.310E+01	NOT IDENT.
NA-22	7.646E-03	3.797E-02	3.813E-02	NOT IDENT.
NA-24	1.000E+41	4.382E+41	0.000E+00	SHORT HLIF
AL-26	2.291E-02	2.466E-02	2.674E-02	NOT IDENT.

SC-46	-2.693E-01	3.442E-01	3.650E-01	FAIL ABUN
V-48	-9.055E+03	1.129E+04	1.201E+04	SHORT HLIF
CR-51	-3.470E+02	3.961E+02	4.259E+02	SHORT HLIF
CO-56	-2.534E-01	3.561E-01	3.739E-01	NOT IDENT.
MN-56	-1.000E+41	1.396E+41	0.000E+00	SHORT HLIF
CO-57	1.558E-02	4.339E-02	4.395E-02	NOT IDENT.
CO-58	2.225E-01	5.021E-01	5.120E-01	NOT IDENT.
FE-59	2.115E+00	4.558E+00	4.657E+00	NOT IDENT.
CO-60	1.120E-02	4.076E-02	4.107E-02	NOT IDENT.
ZN-65	1.345E-01	1.374E-01	1.501E-01	NOT IDENT.
GE-68	-1.424E-02	2.313E+00	2.313E+00	NOT IDENT.
AS-73	8.773E+00	8.566E+00	9.434E+00	NOT IDENT.
AS-74	-3.451E+03	5.416E+03	5.635E+03	SHORT HLIF
SE-75	-8.318E-02	2.192E-01	2.224E-01	NOT IDENT.
BR-77	1.798E+38	1.556E+39	0.000E+00	SHORT HLIF
SR-82	-2.266E+01	4.547E+02	4.548E+02	SHORT HLIF
RB-83	6.235E-01	5.355E-01	6.047E-01	NOT IDENT.
KR-85	3.208E+00	6.713E+00	6.867E+00	NOT IDENT.
SR-85	3.371E-01	7.088E-01	7.249E-01	NOT IDENT.
RB-86	-3.282E+03	2.726E+04	2.730E+04	SHORT HLIF
Y-88	-4.574E-02	2.182E-01	2.192E-01	NOT IDENT.
Y-91	-3.038E+02	4.664E+02	4.861E+02	NOT IDENT.
NB-94	-1.188E-02	3.103E-02	3.149E-02	NOT IDENT.
NB-95	-7.194E-01	7.909E-01	8.548E-01	NOT IDENT.
NB-95M	1.462E+00	2.279E+00	2.372E+00	NOT IDENT.
ZR-95	1.729E+00	1.235E+00	1.460E+00	NOT IDENT.
NB-97	-1.000E+41	1.041E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	2.148E+41	0.000E+00	SHORT HLIF
MO-99	-3.130E+31	1.445E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	3.986E+41	0.000E+00	SHORT HLIF
RH-101	6.146E-02	7.266E-02	7.776E-02	FAIL ABUN
RH-102	-2.658E-03	5.395E-02	5.397E-02	NOT IDENT.
RU-103	-1.204E+00	4.498E+00	4.531E+00	FAIL ABUN
RH-106	2.714E-01	3.877E-01	4.066E-01	NOT IDENT.
RU-106	2.714E-01	3.877E-01	4.066E-01	NOT IDENT.
AG-108M	2.457E-03	2.876E-02	2.878E-02	NOT IDENT.
AG-110M	8.045E-03	8.857E-02	8.865E-02	NOT IDENT.
SN-113	-5.652E-02	2.109E-01	2.125E-01	NOT IDENT.
CD-115	1.278E+38	2.793E+39	0.000E+00	SHORT HLIF
SN-117M	2.248E+04	9.371E+04	9.426E+04	SHORT HLIF
TE-123M	1.418E-02	1.339E-01	1.340E-01	NOT IDENT.
SB-124	4.256E-01	1.338E+00	1.352E+00	NOT IDENT.
SB-125	-4.288E-03	1.060E-01	1.060E-01	FAIL ABUN
TE-125M	-2.771E+02	2.482E+02	2.779E+02	NOT IDENT.
I-126	-9.604E+04	8.878E+05	8.889E+05	SHORT HLIF
SB-126	6.220E+04	8.697E+05	8.701E+05	SHORT HLIF
SB-127	-1.280E+22	2.680E+22	0.000E+00	SHORT HLIF
I-131	6.239E+09	5.136E+09	5.855E+09	SHORT HLIF
I-132	1.000E+41	1.898E+42	0.000E+00	SHORT HLIF
TE-132	1.837E+26	3.844E+26	0.000E+00	SHORT HLIF
BA-133	-6.492E-03	4.293E-02	4.303E-02	NOT IDENT.
I-133	-1.000E+41	2.047E+41	0.000E+00	SHORT HLIF
CS-135	-2.064E-02	1.533E-01	1.536E-01	NOT IDENT.
I-135	1.000E+41	6.978E+41	0.000E+00	SHORT HLIF
CS-136	2.233E+05	2.479E+05	2.676E+05	SHORT HLIF
CE-139	-8.108E-02	1.071E-01	1.132E-01	NOT IDENT.
BA-140	2.003E+05	1.274E+06	1.277E+06	SHORT HLIF
LA-140	3.376E+04	3.585E+05	3.589E+05	SHORT HLIF
CE-141	3.964E+00	2.230E+01	2.237E+01	NOT IDENT.
CE-143	1.000E+41	8.622E+40	0.000E+00	SHORT HLIF
CE-144	4.415E-03	3.617E-01	3.617E-01	NOT IDENT.
PM-144	2.748E-02	5.813E-02	5.944E-02	NOT IDENT.
PR-144	2.387E+00	5.049E+00	5.162E+00	NOT IDENT.
PM-146	2.273E-02	4.260E-02	4.381E-02	NOT IDENT.
ND-147	6.708E+06	3.269E+07	3.282E+07	SHORT HLIF
PM-147	-2.367E+02	7.746E+02	7.819E+02	NOT IDENT.
PM-149	-4.743E+40	4.661E+40	0.000E+00	SHORT HLIF
EU-150	1.741E-02	2.575E-02	2.692E-02	FAIL ABUN
EU-152	-7.064E-02	8.845E-02	9.401E-02	FAIL ABUN
GD-153	6.911E-03	1.562E-01	1.562E-01	NOT IDENT.
EU-154	1.656E-02	9.259E-02	9.289E-02	NOT IDENT.
EU-155	1.163E-01	1.029E-01	1.155E-01	FAIL ABUN
TB-160	-1.887E-03	1.843E+00	1.843E+00	FAIL ABUN
HO-166M	-1.095E-02	4.704E-02	4.729E-02	FAIL ABUN
TM-171	-6.546E+00	1.998E+01	2.020E+01	NOT IDENT.
HF-172	1.328E-01	2.284E-01	2.361E-01	FAIL ABUN
LU-172	8.750E-02	1.013E-01	1.087E-01	FAIL ABUN
LU-176	1.356E-02	2.450E-02	2.525E-02	FAIL ABUN

HF-181	-1.184E+00	3.796E+00	3.834E+00	NOT IDENT.
TA-182	-1.535E-01	8.010E-01	8.040E-01	FAIL ABUN
RE-183	-1.494E-01	2.816E+00	2.817E+00	NOT IDENT.
RE-184	1.433E+01	2.701E+01	2.778E+01	NOT IDENT.
W-188	-4.208E+01	1.164E+02	1.180E+02	FAIL ABUN
IR-192	1.969E-01	5.029E-01	5.106E-01	FAIL ABUN
HG-203	-1.693E+00	2.471E+00	2.586E+00	FAIL ABUN
BI-207	-1.873E-02	5.149E-02	5.218E-02	FAIL ABUN
PB-210	-3.241E-01	3.128E+00	3.131E+00	NOT IDENT.
BI-211	2.826E+00	5.597E-01	1.392E+00	FAIL ABUN
PB-211	1.292E-01	6.637E-01	6.662E-01	NOT IDENT.
BI-212	1.226E+00	5.547E-01	7.831E-01	FAIL ABUN
RN-219	-1.207E-01	3.595E-01	3.636E-01	FAIL ABUN
RA-223	3.231E-01	5.190E-01	5.391E-01	FAIL ABUN
AC-227	-1.829E-01	2.282E-01	2.427E-01	FAIL ABUN
TH-227	-1.829E-01	2.282E-01	2.427E-01	FAIL ABUN
TH-229	3.173E-03	4.456E-01	4.456E-01	FAIL ABUN
TH-231	3.231E-01	5.190E-01	5.391E-01	FAIL ABUN
PA-233	-2.598E-02	6.276E-02	6.384E-02	FAIL ABUN
PA-234	-1.214E-01	3.088E-01	3.136E-01	NOT IDENT.
PA-234M	5.576E+00	6.285E+00	6.769E+00	FAIL ABUN
NP-237	-2.598E-02	6.276E-02	6.384E-02	FAIL ABUN
NP-238	-1.000E+41	1.245E+41	0.000E+00	SHORT HLIF
NP-239	4.189E-02	2.277E-01	2.285E-01	NOT IDENT.
PU-239	5.574E+02	6.517E+02	6.985E+02	FAIL ABUN
AM-241	1.625E-02	1.318E-01	1.320E-01	NOT IDENT.
CM-243	-6.249E-02	9.424E-02	9.836E-02	NOT IDENT.
BK-247	-8.779E-03	7.531E-02	7.542E-02	NOT IDENT.
CM-247	2.728E-02	3.349E-02	3.567E-02	NOT IDENT.
CF-249	-9.112E-03	3.637E-02	3.661E-02	NOT IDENT.
CF-251	8.050E-03	1.058E-01	1.058E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	93.1266	87.09	126.8845	136.47	79.2768
45.60	75.3984	87.57	126.9696	140.51	0.0000
46.54	85.1069	88.03	127.0510	143.76	66.7467
49.72	0.0000	88.34	53.3025	144.24	72.2530
51.35	99.4402	88.47	53.3120	145.44	70.1484
51.87	94.7076	89.96	95.8847	152.43	84.9860
52.39	88.9976	1093.63	78.1500	153.25	0.0000
52.97	81.3484	91.11	0.0000	323.87	59.7044
53.44	71.7276	92.59	78.3567	156.02	0.0000
54.07	78.6056	93.35	78.4365	158.56	0.0000
57.36	0.0000	94.56	70.2936	159.00	78.8631
57.53	86.9195	94.65	70.3019	162.33	76.8838
57.98	87.9672	94.67	70.3040	162.66	0.0000
59.27	96.0067	94.87	67.5644	163.33	69.1483
59.32	91.1165	97.43	74.7098	165.86	78.2555
59.54	91.1520	98.43	78.9630	176.31	59.8159
60.96	90.3965	98.44	78.9641	176.60	0.0000
61.17	90.4295	99.53	80.1153	177.52	61.0096
62.93	85.7740	100.11	83.2990	181.07	0.0000
63.29	85.8270	102.03	84.5466	181.52	58.9570
63.58	85.8691	103.18	76.3071	184.41	65.9253
64.28	77.7359	103.37	89.9171	143.76	65.9996
66.73	88.6375	105.21	67.0693	193.51	64.1467
67.24	104.6004	105.31	68.1257	197.03	75.8241
125.81	99.3759	106.12	82.8815	198.01	79.3348
67.75	99.3866	106.47	78.7193	201.83	70.3563
69.67	94.3792	109.28	86.3624	203.43	63.5182
70.83	117.1937	111.00	81.2650	205.31	50.8918
72.81	106.2046	111.76	0.0000	210.85	55.7644
72.87	106.2143	114.06	92.1537	215.65	62.9723
74.66	106.5095	116.30	0.0000	222.11	66.8030
74.82	106.5354	116.74	74.3798	227.09	52.9383
74.97	106.5596	119.76	69.3080	227.38	54.1266
77.11	106.9074	121.12	77.9590	228.16	0.0000
78.74	107.1686	121.22	77.9674	228.18	60.0466
79.69	107.3190	121.78	83.3606	116.74	60.0466
80.12	107.3869	122.06	66.2823	235.69	45.7798
80.19	0.0000	122.92	66.3466	235.96	45.7886
80.57	107.4581	123.07	65.2872	238.63	49.8333
81.00	107.5260	265.00	83.5391	238.98	0.0000
81.07	107.5374	125.81	65.8452	240.99	49.9186
81.75	107.6433	127.23	86.0193	242.00	49.9551
83.79	101.8501	127.91	94.6924	244.70	50.0519
84.00	85.5797	129.30	94.8361	252.40	0.0000
85.43	119.7834	131.20	96.4720	252.80	57.5317
86.55	113.1557	133.02	96.2994	254.15	0.0000
86.79	113.1937	133.52	86.6077	256.23	58.8709
86.94	126.8580	136.00	93.3486	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	58.0034	355.39	0.0000	584.27	26.4950
264.80	58.0093	356.01	42.1674	595.83	0.0000
265.00	54.3906	364.49	0.0000	427.87	29.9952
268.22	53.2987	366.42	0.0000	602.52	0.0000
269.46	38.7949	372.51	37.8215	604.72	22.8896
270.03	38.8096	375.05	46.4799	607.14	20.0464
271.23	38.8408	377.52	49.1270	609.32	20.0626
273.65	0.0000	356.01	30.2668	610.33	20.0703
276.40	43.8464	388.16	41.6016	614.28	18.6645
277.37	42.6552	388.63	0.0000	618.01	15.3359
277.60	42.6616	391.69	36.4689	620.36	23.0244
278.00	42.6733	264.66	37.5095	621.93	11.5190
279.20	58.5688	401.81	39.2770	630.19	0.0000
279.54	57.3616	402.40	29.6850	631.29	21.1908
279.70	57.3673	404.85	38.4633	633.25	12.5308
280.46	47.6265	410.95	28.9361	634.78	0.0000
283.69	40.3839	413.71	32.4887	635.95	19.2977
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	37.9790	423.72	0.0000	645.85	26.1453
285.90	0.0000	427.09	39.7742	657.76	27.7161
287.50	40.4836	427.87	38.9055	657.90	0.0000
290.67	45.8919	433.94	30.5946	661.66	17.5291
293.27	0.0000	439.40	28.0079	664.57	0.0000
351.93	32.8743	453.88	28.6471	666.33	0.0000
295.96	32.8898	463.37	29.6726	666.50	0.0000
879.38	19.7666	468.07	25.2309	667.71	0.0000
299.98	37.9187	473.00	0.0000	677.62	21.5452
300.09	37.9215	475.06	21.6953	685.70	0.0000
300.13	37.9225	476.78	21.7124	695.00	0.0000
301.36	54.4521	477.60	21.7202	696.49	24.6440
302.85	39.6377	482.18	21.7651	696.51	24.6440
256.23	44.6385	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	28.5953
306.78	38.4927	497.08	20.9958	697.49	27.6104
308.46	44.7473	505.52	27.4866	702.65	27.6593
311.90	47.3318	507.63	0.0000	706.68	10.8809
316.51	44.9659	511.00	32.1432	711.68	17.8352
319.41	0.0000	514.00	23.4487	720.70	0.0000
320.08	0.0000	514.00	23.4487	721.93	0.0000
321.04	47.5928	520.40	11.9870	722.78	10.4427
323.87	27.6000	520.69	0.0000	722.91	17.9026
325.23	35.1555	522.65	0.0000	723.31	17.9048
328.76	0.0000	527.90	0.0000	724.19	14.9249
333.37	39.1076	528.26	16.6523	727.33	9.9605
333.97	36.5969	529.59	16.6611	733.00	12.9725
334.37	36.6058	529.87	0.0000	735.93	13.9840
338.28	43.0136	531.02	0.0000	333.97	8.9941
338.32	43.0146	537.26	0.0000	739.50	0.0000
311.90	40.5342	546.56	0.0000	747.24	19.0487
340.48	40.5342	552.55	19.6226	748.06	17.0477
340.55	0.0000	563.25	23.4609	752.31	16.0671
344.28	49.9313	569.33	20.6957	753.82	0.0000
345.93	40.6602	946.00	23.5199	756.73	8.0452
351.06	43.3259	569.70	23.5209	756.80	8.0452
351.93	43.3477	583.19	26.4836	884.68	19.1515

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	27.2318	1274.44	12.9336	1620.50	6.4706
766.42	25.2187	1001.03	12.9497	1621.92	3.6985
766.84	25.2228	1002.74	14.5750	1678.03	0.0000
772.60	0.0000	1004.73	12.9624	1690.97	1.8718
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	0.9477
778.90	10.1278	1028.54	0.0000	1063.66	0.0000
783.70	0.0000	1037.84	18.5204	1771.35	0.9488
785.37	20.2962	1038.76	0.0000	1791.20	0.0000
792.07	16.7793	631.29	13.1016	1808.65	0.9547
794.95	12.2144	1048.07	0.0000	1810.72	0.0000
795.86	12.2178	1049.04	4.9160	1836.06	5.7539
810.06	10.2258	1050.41	11.4750		
810.29	10.2266	1063.66	20.8338		
344.28	12.2725	1077.00	0.0000		
810.76	12.2739	1077.34	15.4025		
815.77	0.0000	1085.87	18.7432		
1048.07	0.0000	1093.63	9.9412		
832.01	18.5295	1099.45	5.5310		
834.85	14.4238	1112.07	16.6431		
835.71	14.4278	1112.84	17.7565		
836.80	0.0000	1115.54	4.9969		
846.75	0.0000	1120.29	8.8939		
846.77	14.4751	1120.55	8.8945		
856.80	0.0000	1221.41	10.0078		
860.56	14.5338	1129.67	12.2568		
871.09	17.7028	1131.51	0.0000		
873.19	15.6293	1147.95	0.0000		
875.33	0.0000	1173.23	15.7591		
879.38	17.7450	1177.95	15.7762		
880.51	18.7947	1189.05	9.0378		
883.24	14.6295	1204.77	15.8730		
884.68	13.5903	1221.41	13.6563		
889.28	18.8423	1231.02	19.3879		
894.76	18.8716	1235.36	0.0000		
898.04	14.6916	1238.28	20.5620		
900.72	17.8529	1260.41	0.0000		
903.28	10.5094	1271.87	11.5072		
911.20	14.7463	1274.44	8.0596		
912.08	14.7497	1274.54	8.0601		
923.98	0.0000	1291.59	10.4011		
926.50	5.2889	1298.22	0.0000		
929.11	12.7026	1312.11	0.0000		
937.49	17.8247	1332.49	10.4912		
944.13	0.0000	1362.66	0.0000		
946.00	15.9515	1365.19	10.5630		
949.00	13.8363	1368.63	0.0000		
667.71	0.0000	1384.29	8.4832		
962.31	12.8179	1408.01	8.8788		
964.08	9.6178	1457.56	0.0000		
966.17	6.4155	1460.82	10.7666		
911.20	14.4459	1489.16	4.5105		
968.97	14.4459	1505.03	2.8955		
983.53	0.0000	1584.12	8.2645		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                   *
*                               Charleston, SC 29407                             *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235025.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM02.CNF;493
Background date : 2-OCT-2016 11:00:01.
Sample date      : 8-DEC-2015 13:38:00. Acquisition date : 3-OCT-2016 09:01:15.
Sample ID       : G405235025 Sample quantity : 1.38244E+02 GRAM
Detector name   : GAM02 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.48 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596249 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	3	72.58*	8	75	1.14	144.66	143	15	2.19E-03	162.1	2.95E+00
2	3	74.86*	86	183	1.14	149.21	143	15	2.40E-02	29.3	
3	3	77.02	165	168	0.95	153.52	143	15	4.59E-02	14.3	
4	0	87.50	30	232	0.94	174.46	169	8	8.38E-03	89.8	
5	0	92.77*	60	244	1.33	185.00	181	10	1.68E-02	54.2	
6	0	185.73*	76	182	1.47	370.75	366	11	2.10E-02	38.3	
7	0	238.46*	324	189	1.11	476.11	471	10	9.01E-02	9.8	
8	0	242.28	79	134	1.24	483.75	481	9	2.20E-02	29.9	
9	0	270.66	69	180	3.44	540.46	531	16	1.93E-02	45.3	
10	0	278.10	28	154	1.63	555.32	550	11	7.78E-03	87.9	
11	0	295.35	148	169	1.13	589.79	583	13	4.12E-02	19.8	
12	0	299.97	27	91	1.41	599.04	596	8	7.40E-03	65.2	
13	0	338.51*	88	105	1.56	676.04	672	12	2.45E-02	25.6	
14	0	351.90*	200	103	1.36	702.80	697	10	5.55E-02	12.0	
15	0	457.37	40	63	1.75	913.56	910	9	1.11E-02	38.6	
16	0	462.66	41	72	2.74	924.15	920	8	1.14E-02	39.1	
17	0	517.62	40	66	2.35	1033.97	1029	13	1.11E-02	44.5	
18	0	583.23*	90	62	1.50	1165.09	1158	14	2.50E-02	21.7	
19	0	609.31*	161	51	1.59	1217.22	1210	15	4.48E-02	12.8	
20	0	661.52*	1629	34	1.56	1321.56	1313	15	4.52E-01	2.6	
21	0	709.24	14	23	5.22	1416.93	1409	15	3.75E-03	81.3	
22	0	727.23	37	21	2.30	1452.88	1448	11	1.02E-02	29.5	
23	0	769.76	17	34	2.83	1537.87	1527	15	4.74E-03	78.1	
24	0	891.86	11	12	3.64	1781.91	1775	12	3.06E-03	69.8	
25	0	911.10*	83	14	2.19	1820.35	1815	11	2.30E-02	14.5	
26	0	941.84	17	19	3.94	1881.79	1874	16	4.64E-03	64.5	
27	0	965.23*	10	27	0.66	1928.54	1921	12	2.86E-03	108.1	
28	0	968.88*	33	15	1.54	1935.83	1932	11	9.21E-03	28.7	
29	0	1120.15*	34	18	1.42	2238.18	2229	14	9.43E-03	32.5	
30	0	1228.04	7	23	2.58	2453.83	2443	12	1.90E-03	153.8	
31	0	1258.08	25	23	4.37	2513.88	2501	24	7.03E-03	54.8	
32	0	1460.57*	306	11	2.50	2918.62	2911	15	8.51E-02	6.3	
33	0	1764.70*	25	3	2.33	3526.57	3520	12	6.90E-03	27.5	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235025.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 8-DEC-2015 13:38:00   Acquisition date  : 3-OCT-2016 09:01:15
Sample ID        : G405235025             Sample quantity  : 138.24 GRAM
Sample type      : SOLID                   Sample geometry  :
Detector name    : GAMMA2                 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00          Elapsed real time: 0 01:00:00.48   0.0%
Energy tolerance : 1.50 keV               Half life ratio  : 10.00
Errors propagated: No                      Systematic Error : 0.00 %
Efficiency type  : Linear                  Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.060E+00	1.410E+01	1.410E+01	12.62	OK
BA-137M	661.66	89.90*	2.016E+00	4.997E+00	5.092E+00	5.22	OK
CS-137	661.66	85.10*	2.016E+00	5.279E+00	5.379E+00	5.22	OK
HG-203	70.83	3.69	3.355E+00	-----	Line Not Found	-----	Absent
	72.87	6.19	3.544E+00	2.360E-01	2.043E+01	324.14	OK
	279.20	81.56*	4.164E+00	2.751E-02	2.381E+00	315.48	OK
TL-208	277.37	6.60	4.173E+00	-----	Line Not Found	-----	<<INT Reject
	583.19	85.00*	2.233E+00	2.666E-01	2.666E-01	43.48	OK
	860.56	12.50	1.634E+00	-----	Line Not Found	-----	Absent
PB-212	74.82	10.28	3.779E+00	7.765E-01	7.765E-01	115.07	OK
	77.11	17.10	3.992E+00	1.584E+00	1.584E+00	28.65	OK
	238.63	43.60*	4.703E+00	9.530E-01	9.530E-01	19.57	OK
	300.09	3.30	3.911E+00	1.222E+00	1.222E+00	130.41	OK
BI-214	609.32	45.49*	2.154E+00	9.207E-01	9.210E-01	25.70	OK
	1120.29	14.92	1.323E+00	9.153E-01	9.156E-01	64.96	OK
	1764.49	15.30	8.930E-01	9.290E-01	9.293E-01	55.03	OK
PB-214	74.82	5.80	3.775E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	3.992E+00	2.792E+00	2.793E+00	28.65	OK
	87.09	3.41	4.866E+00	1.178E+00	1.178E+00	179.68	OK
	242.00	7.25	4.651E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	3.962E+00	1.206E+00	1.206E+00	39.65	OK
	351.93	35.60*	3.416E+00	9.612E-01	9.615E-01	23.99	OK
RN-222	609.32	45.49*	2.154E+00	9.207E-01	9.210E-01	25.70	OK
	1120.29	14.92	1.323E+00	9.153E-01	9.156E-01	64.96	OK
	1764.49	15.30	8.930E-01	9.290E-01	9.293E-01	55.03	OK
RA-224	240.99	4.10*	4.647E+00	3.704E-01	3.704E-01	464.33	OK
RA-226	609.32	45.49*	2.154E+00	9.207E-01	9.210E-01	25.70	OK
	1120.29	14.92	1.323E+00	9.153E-01	9.156E-01	64.96	OK
	1764.49	15.30	8.930E-01	9.290E-01	9.293E-01	55.03	OK
AC-228	105.21	1.10	5.776E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.531E+00	1.301E+00	1.301E+00	51.16	OK
	794.95	4.25	1.740E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.672E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.561E+00	1.114E+00	1.114E+00	28.98	OK
	968.97	15.80	1.487E+00	7.606E-01	7.606E-01	57.36	OK
RA-228	105.21	1.10	5.776E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.531E+00	1.301E+00	1.301E+00	51.16	OK
	794.95	4.25	1.740E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.672E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.561E+00	1.114E+00	1.114E+00	28.98	OK
	968.97	15.80	1.487E+00	7.606E-01	7.606E-01	57.36	OK
TH-228	74.82	10.28	3.779E+00	7.765E-01	7.765E-01	115.07	OK
	77.11	17.10	3.992E+00	1.584E+00	1.584E+00	28.65	OK
	238.63	43.60*	4.703E+00	9.530E-01	9.530E-01	19.57	OK
	300.09	3.30	3.911E+00	1.222E+00	1.222E+00	130.41	OK
TH-230	609.32	45.49*	2.154E+00	9.207E-01	9.207E-01	25.70	OK
	1120.29	14.92	1.323E+00	9.153E-01	9.153E-01	64.96	OK
	1764.49	15.30	8.930E-01	9.290E-01	9.290E-01	55.03	OK
PA-231	283.69	1.70	4.097E+00	-----	Line Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	301.36	5.35*	3.911E+00	7.540E-01	7.540E-01	130.41	OK
TH-232	105.21	1.10	5.776E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.531E+00	1.301E+00	1.301E+00	51.16	OK
	835.71	1.61	1.672E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.561E+00	1.114E+00	1.114E+00	28.98	OK
	968.97	15.80	1.487E+00	7.606E-01	7.606E-01	57.36	OK
U-234	609.32	45.49*	2.154E+00	9.207E-01	9.207E-01	25.70	OK
	1120.29	14.92	1.323E+00	9.153E-01	9.153E-01	64.96	OK
	1764.49	15.30	8.930E-01	9.290E-01	9.290E-01	55.03	OK
AM-243	43.53	5.90	2.878E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	3.779E+00	1.188E-01	1.188E-01	115.07	OK

Flag: "*" = Keyline

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235025.CNF;1
* Acquisition date   : 3-OCT-2016 09:01:15 Sensitivity      : 3.000
* Detector ID        : GAM02 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.48 Half life ratio : *****
* Sample date        : 8-DEC-2015 13:38:00 Analyst initials: MXR1
* Sample ID          : G405235025 Sample Quantity : 1.3824E+02 GRAM
* Batch Number       : 1596249 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 22-AUG-2016 09:02:05 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.410E+01	1.743E+00	7.327E-01
BA-137M	5.092E+00	2.603E-01	8.412E-02
CS-137	5.379E+00	2.750E-01	8.887E-02
HG-203	2.381E+00	7.361E+00	6.196E+00
TL-208	2.666E-01	1.136E-01	7.886E-02
PB-212	9.530E-01	1.828E-01	1.378E-01
BI-214	9.210E-01	2.320E-01	1.646E-01
PB-214	9.615E-01	2.261E-01	1.913E-01
RN-222	9.210E-01	2.320E-01	1.646E-01
RA-224	3.704E-01	1.686E+00	1.667E+00
RA-226	9.210E-01	2.320E-01	1.646E-01
AC-228	1.114E+00	3.165E-01	3.234E-01
RA-228	1.114E+00	3.165E-01	3.234E-01
TH-228	9.530E-01	1.828E-01	1.378E-01
TH-230	9.207E-01	2.319E-01	1.645E-01
PA-231	7.540E-01	9.636E-01	1.125E+00
TH-232	1.114E+00	3.165E-01	3.234E-01
U-234	9.207E-01	2.319E-01	1.645E-01
AM-243	1.188E-01	1.340E-01	1.270E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.116E+01	2.205E+01	4.168E+01	NOT IDENT.
NA-22	2.517E-02	5.260E-02	1.115E-01	NOT IDENT.
NA-24	0.000E+00	7.426E+40	0.000E+00	SHORT HLIF
AL-26	-1.146E-02	3.389E-02	6.708E-02	NOT IDENT.
SC-46	7.694E-02	4.747E-01	8.380E-01	FAIL ABUN
V-48	0.000E+00	1.589E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	5.855E+02	0.000E+00	SHORT HLIF
MN-54	8.808E-03	7.637E-02	1.515E-01	NOT IDENT.
CO-56	-2.099E-01	5.713E-01	1.061E+00	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-5.256E-02	6.336E-02	1.059E-01	NOT IDENT.

CO-58	6.041E-02	6.614E-01	1.327E+00	NOT IDENT.
FE-59	1.134E+00	7.697E+00	1.540E+01	NOT IDENT.
CO-60	2.904E-03	5.003E-02	9.793E-02	NOT IDENT.
ZN-65	8.404E-02	2.056E-01	3.882E-01	NOT IDENT.
GE-68	-5.071E-01	2.600E+00	4.934E+00	NOT IDENT.
AS-73	2.324E+00	1.603E+01	3.032E+01	NOT IDENT.
AS-74	0.000E+00	8.622E+03	0.000E+00	SHORT HLIF
SE-75	-2.396E-01	3.288E-01	5.183E-01	FAIL ABUN
BR-77	0.000E+00	3.268E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	8.797E+02	0.000E+00	SHORT HLIF
RB-83	2.277E-01	1.076E+00	1.813E+00	NOT IDENT.
KR-85	-4.606E+01	1.729E+01	1.942E+01	NOT IDENT.
SR-85	-4.867E+00	1.827E+00	2.052E+00	NOT IDENT.
RB-86	0.000E+00	3.100E+04	0.000E+00	SHORT HLIF
Y-88	5.231E-02	1.540E-01	4.248E-01	NOT IDENT.
Y-91	-3.265E+02	6.188E+02	1.080E+03	NOT IDENT.
NB-94	1.383E-02	3.938E-02	7.290E-02	NOT IDENT.
NB-95	-5.155E-01	1.065E+00	1.735E+00	NOT IDENT.
NB-95M	-5.541E-01	3.365E+00	5.660E+00	NOT IDENT.
ZR-95	-4.858E-02	1.638E+00	3.231E+00	NOT IDENT.
NB-97	0.000E+00	1.364E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	7.813E+40	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.977E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-1.347E-02	4.720E-02	8.212E-02	NOT IDENT.
RH-102	-5.587E-02	7.999E-02	1.320E-01	NOT IDENT.
RU-103	5.291E+00	8.698E+00	1.691E+01	FAIL ABUN
RH-106	3.664E-01	6.435E-01	1.277E+00	NOT IDENT.
RU-106	3.664E-01	6.435E-01	1.277E+00	NOT IDENT.
AG-108M	-1.789E-02	4.639E-02	8.208E-02	NOT IDENT.
CD-109	1.703E+00	2.999E+00	2.952E+00	FAIL ABUN
AG-110M	3.027E-02	1.070E-01	2.175E-01	NOT IDENT.
SN-113	3.862E-01	3.802E-01	7.527E-01	NOT IDENT.
CD-115	0.000E+00	4.476E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.285E+05	0.000E+00	SHORT HLIF
TE-123M	-3.518E-02	1.753E-01	3.357E-01	NOT IDENT.
SB-124	-5.349E-01	1.858E+00	3.847E+00	NOT IDENT.
SB-125	1.483E-01	1.868E-01	3.607E-01	FAIL ABUN
TE-125M	8.963E+01	3.866E+02	7.050E+02	NOT IDENT.
I-126	0.000E+00	1.165E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.430E+06	0.000E+00	SHORT HLIF
SN-126	1.086E-01	1.912E-01	1.943E-01	FAIL ABUN
SB-127	0.000E+00	2.622E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	7.924E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	5.277E+26	0.000E+00	SHORT HLIF
BA-133	1.067E-03	6.629E-02	1.106E-01	NOT IDENT.
I-133	0.000E+00	1.258E+41	0.000E+00	SHORT HLIF
CS-134	6.142E-02	5.941E-02	1.307E-01	NOT IDENT.
CS-135	1.531E-01	1.950E-01	3.867E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	4.086E+05	0.000E+00	SHORT HLIF
CE-139	2.862E-02	1.241E-01	2.455E-01	NOT IDENT.
BA-140	0.000E+00	1.987E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	5.069E+05	0.000E+00	SHORT HLIF
CE-141	-4.192E+01	3.231E+01	5.107E+01	NOT IDENT.
CE-143	0.000E+00	1.280E+41	0.000E+00	SHORT HLIF
CE-144	-2.177E-01	4.719E-01	8.085E-01	NOT IDENT.
PM-144	1.131E-02	6.551E-02	1.314E-01	NOT IDENT.
PR-144	9.825E-01	5.690E+00	1.141E+01	NOT IDENT.
PM-146	-3.209E-03	8.445E-02	1.366E-01	NOT IDENT.
ND-147	0.000E+00	4.732E+07	0.000E+00	SHORT HLIF
PM-147	3.119E+02	1.017E+03	1.873E+03	NOT IDENT.
PM-149	0.000E+00	6.279E+40	0.000E+00	SHORT HLIF
EU-150	1.919E-02	4.046E-02	7.085E-02	FAIL ABUN
EU-152	2.596E-02	1.421E-01	2.429E-01	FAIL ABUN
GD-153	-5.715E-02	2.777E-01	4.591E-01	NOT IDENT.
EU-154	6.448E-02	1.295E-01	2.751E-01	NOT IDENT.
EU-155	7.081E-02	1.415E-01	2.650E-01	FAIL ABUN
TB-160	1.360E+00	2.113E+00	4.563E+00	FAIL ABUN
HO-166M	-1.342E-02	6.223E-02	1.058E-01	FAIL ABUN
TM-171	-1.346E+01	3.933E+01	7.211E+01	NOT IDENT.
HF-172	-2.579E-02	3.085E-01	5.465E-01	NOT IDENT.
LU-172	2.066E-02	9.199E-02	1.848E-01	FAIL ABUN
LU-176	-9.477E-03	3.347E-02	6.151E-02	FAIL ABUN
HF-181	1.524E+00	7.273E+00	1.350E+01	NOT IDENT.
TA-182	-3.884E-01	1.341E+00	2.081E+00	FAIL ABUN
RE-183	-1.506E+00	5.135E+00	9.379E+00	NOT IDENT.

RE-184	8.722E+00	3.298E+01	6.799E+01	NOT IDENT.
W-188	9.662E+01	1.655E+02	2.960E+02	NOT IDENT.
IR-192	-3.103E-02	6.270E-01	1.174E+00	FAIL ABUN
BI-207	1.700E-02	4.652E-02	9.940E-02	FAIL ABUN
PB-210	1.178E+00	6.676E+00	1.269E+01	NOT IDENT.
BI-211	0.000E+00	6.228E-01	9.734E-01	FAIL ABUN
PB-211	-4.126E-01	1.098E+00	1.953E+00	NOT IDENT.
BI-212	0.000E+00	9.447E-01	1.529E+00	FAIL ABUN
RN-219	-1.423E-01	6.267E-01	1.129E+00	FAIL ABUN
RA-223	3.427E-01	8.308E-01	1.603E+00	FAIL ABUN
AC-227	3.517E-02	2.972E-01	5.691E-01	FAIL ABUN
TH-227	3.517E-02	2.972E-01	5.691E-01	FAIL ABUN
TH-229	-3.194E-01	6.313E-01	1.173E+00	FAIL ABUN
TH-231	3.427E-01	8.308E-01	1.603E+00	FAIL ABUN
PA-233	-5.642E-02	7.810E-02	1.381E-01	FAIL ABUN
PA-234	-1.635E-01	3.451E-01	5.308E-01	NOT IDENT.
PA-234M	-5.196E+00	5.090E+00	8.894E+00	NOT IDENT.
TH-234	1.896E+00	1.987E+00	4.038E+00	FAIL ABUN
U-235	5.759E-02	2.464E-01	4.461E-01	FAIL ABUN
NP-237	-5.642E-02	7.810E-02	1.381E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
U-238	1.896E+00	1.987E+00	4.038E+00	FAIL ABUN
NP-239	1.878E-01	3.205E-01	5.998E-01	FAIL ABUN
PU-239	-2.524E+01	4.323E+02	7.636E+02	NOT IDENT.
AM-241	-3.896E-02	2.244E-01	4.127E-01	NOT IDENT.
CM-243	4.668E-02	1.316E-01	2.440E-01	FAIL ABUN
BK-247	-7.946E-02	1.143E-01	1.809E-01	NOT IDENT.
CM-247	4.401E-03	5.597E-02	1.036E-01	FAIL ABUN
CF-249	-4.305E-02	5.805E-02	1.004E-01	NOT IDENT.
CF-251	-7.255E-02	1.350E-01	2.527E-01	NOT IDENT.
ANH-511	-3.056E-02	6.123E-02	1.218E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	293	10.66*	1.060E+00	1.410E+01	1.410E+01	12.62
CD-109	88.03	36	3.70*	4.866E+00	1.086E+00	1.703E+00	179.68
SN-126	64.28	-----	9.60	2.600E+00	-----	Line Not Found	-----
	86.94	36	8.90	4.866E+00	4.513E-01	4.513E-01	179.68
	87.57	36	37.00*	4.866E+00	1.086E-01	1.086E-01	179.68
BA-137M	661.66	1667	89.90*	2.016E+00	4.997E+00	5.092E+00	5.22
CS-137	661.66	1667	85.10*	2.016E+00	5.279E+00	5.379E+00	5.22
HG-203	70.83	-----	3.69	3.355E+00	-----	Line Not Found	-----
	72.87	10	6.19	3.544E+00	2.360E-01	2.043E+01	324.14
	279.20	31	81.56*	4.164E+00	4.909E-02	4.248E+00	175.76
TL-208	277.37	31	6.60	4.164E+00	6.066E-01	6.066E-01	175.76
	583.19	93	85.00*	2.233E+00	2.666E-01	2.666E-01	43.48
	860.56	-----	12.50	1.634E+00	-----	Line Not Found	-----
BI-211	72.87	10	1.23	3.544E+00	1.188E+00	1.188E+00	324.14
	351.06	215	12.92*	3.416E+00	2.648E+00	2.648E+00	23.99
PB-212	74.82	104	10.28	3.779E+00	1.456E+00	1.456E+00	58.65
	77.11	199	17.10	3.992E+00	1.584E+00	1.584E+00	28.65
	238.63	360	43.60*	4.703E+00	9.530E-01	9.530E-01	19.57
	300.09	29	3.30	3.911E+00	1.222E+00	1.222E+00	130.41
BI-214	609.32	166	45.49*	2.154E+00	9.207E-01	9.210E-01	25.70
	1120.29	33	14.92	1.323E+00	9.153E-01	9.156E-01	64.96
	1764.49	23	15.30	8.930E-01	9.290E-01	9.293E-01	55.03
PB-214	74.82	104	5.80	3.779E+00	2.581E+00	2.581E+00	58.65
	77.11	199	9.70	3.992E+00	2.792E+00	2.793E+00	28.65
	87.09	36	3.41	4.866E+00	1.178E+00	1.178E+00	179.68
	242.00	88	7.25	4.647E+00	1.415E+00	1.416E+00	59.86
	295.22	162	18.42	3.962E+00	1.206E+00	1.206E+00	39.65
	351.93	215	35.60*	3.416E+00	9.612E-01	9.615E-01	23.99
RN-222	609.32	166	45.49*	2.154E+00	9.207E-01	9.210E-01	25.70
	1120.29	33	14.92	1.323E+00	9.153E-01	9.156E-01	64.96
	1764.49	23	15.30	8.930E-01	9.290E-01	9.293E-01	55.03
RA-224	240.99	88	4.10*	4.647E+00	2.502E+00	2.502E+00	59.86
RA-226	609.32	166	45.49*	2.154E+00	9.207E-01	9.210E-01	25.70
	1120.29	33	14.92	1.323E+00	9.153E-01	9.156E-01	64.96
	1764.49	23	15.30	8.930E-01	9.290E-01	9.293E-01	55.03
AC-228	105.21	-----	1.10	5.776E+00	-----	Line Not Found	-----
	338.32	95	11.27	3.531E+00	1.301E+00	1.301E+00	51.16
	794.95	-----	4.25	1.740E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.672E+00	-----	Line Not Found	-----
	911.20	83	25.80*	1.561E+00	1.114E+00	1.114E+00	28.98
	968.97	33	15.80	1.487E+00	7.606E-01	7.606E-01	57.36
RA-228	105.21	-----	1.10	5.776E+00	-----	Line Not Found	-----
	338.32	95	11.27	3.531E+00	1.301E+00	1.301E+00	51.16
	794.95	-----	4.25	1.740E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.672E+00	-----	Line Not Found	-----
	911.20	83	25.80*	1.561E+00	1.114E+00	1.114E+00	28.98
	968.97	33	15.80	1.487E+00	7.606E-01	7.606E-01	57.36

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	74.82	104	10.28	3.779E+00	1.456E+00	1.456E+00	58.65
	77.11	199	17.10	3.992E+00	1.584E+00	1.584E+00	28.65
	238.63	360	43.60*	4.703E+00	9.530E-01	9.530E-01	19.57
	300.09	29	3.30	3.911E+00	1.222E+00	1.222E+00	130.41
TH-230	609.32	166	45.49*	2.154E+00	9.207E-01	9.207E-01	25.70
	1120.29	33	14.92	1.323E+00	9.153E-01	9.153E-01	64.96
	1764.49	23	15.30	8.930E-01	9.290E-01	9.290E-01	55.03
PA-231	283.69	-----	1.70	4.097E+00	-----	Line Not Found	-----
	301.36	29	5.35*	3.911E+00	7.540E-01	7.540E-01	130.41
TH-232	105.21	-----	1.10	5.776E+00	-----	Line Not Found	-----
	338.32	95	11.27	3.531E+00	1.301E+00	1.301E+00	51.16
	835.71	-----	1.61	1.672E+00	-----	Line Not Found	-----
	911.20	83	25.80*	1.561E+00	1.114E+00	1.114E+00	28.98
U-234	968.97	33	15.80	1.487E+00	7.606E-01	7.606E-01	57.36
	609.32	166	45.49*	2.154E+00	9.207E-01	9.207E-01	25.70
	1120.29	33	14.92	1.323E+00	9.153E-01	9.153E-01	64.96
AM-243	1764.49	23	15.30	8.930E-01	9.290E-01	9.290E-01	55.03
	43.53	-----	5.90	2.878E-01	-----	Line Not Found	-----
	74.66	104	67.20*	3.779E+00	2.227E-01	2.227E-01	58.65

Flag: "*" = Keyline

Total number of lines in spectrum 33
 Number of unidentified lines 8
 Number of lines tentatively identified by NID 25 75.76%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.410E+01	1.410E+01	0.178E+01	12.62	
CD-109	461.40D	1.57	1.086E+00	1.703E+00	3.060E+00	179.68	
SN-126	2.30E+05Y	1.00	1.086E-01	1.086E-01	1.951E-01	179.68	
BA-137M	30.08Y	1.02	4.997E+00	5.092E+00	0.266E+00	5.22	
CS-137	30.08Y	1.02	5.279E+00	5.379E+00	0.281E+00	5.22	
HG-203	46.59D	86.6	4.909E-02	4.248E+00	7.467E+00	175.76	
TL-208	1.41E+10Y	1.00	2.666E-01	2.666E-01	1.159E-01	43.48	
BI-211	7.04E+08Y	1.00	2.648E+00	2.648E+00	0.635E+00	23.99	
PB-212	1.41E+10Y	1.00	9.530E-01	9.530E-01	1.865E-01	19.57	
BI-214	1600.00Y	1.00	9.207E-01	9.210E-01	2.367E-01	25.70	
PB-214	1600.00Y	1.00	9.612E-01	9.615E-01	2.307E-01	23.99	
RN-222	1600.00Y	1.00	9.207E-01	9.210E-01	2.367E-01	25.70	
RA-224	1.41E+10Y	1.00	2.502E+00	2.502E+00	1.498E+00	59.86	
RA-226	1600.00Y	1.00	9.207E-01	9.210E-01	2.367E-01	25.70	
AC-228	1.41E+10Y	1.00	1.114E+00	1.114E+00	0.323E+00	28.98	
RA-228	1.41E+10Y	1.00	1.114E+00	1.114E+00	0.323E+00	28.98	
TH-228	1.41E+10Y	1.00	9.530E-01	9.530E-01	1.865E-01	19.57	
TH-230	7.54E+04Y	1.00	9.207E-01	9.207E-01	2.366E-01	25.70	
PA-231	7.04E+08Y	1.00	7.540E-01	7.540E-01	9.833E-01	130.41	
TH-232	1.41E+10Y	1.00	1.114E+00	1.114E+00	0.323E+00	28.98	
U-234	2.45E+05Y	1.00	9.207E-01	9.207E-01	2.366E-01	25.70	
AM-243	7370.00Y	1.00	2.227E-01	2.227E-01	1.306E-01	58.65	
Total Activity :			4.283E+01	4.784E+01			

Grand Total Activity : 4.283E+01 4.784E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	92.77	72	290	1.33	185.00	181	10	1.68E-02	****	5.21E+00	T
0	185.73	86	206	1.47	370.75	366	11	2.10E-02	76.6	5.56E+00	T
0	270.66	76	197	3.44	540.46	531	16	1.93E-02	90.5	4.26E+00	T
0	457.37	42	66	1.75	913.56	910	9	1.11E-02	77.2	2.73E+00	
0	462.66	43	76	2.74	924.15	920	8	1.14E-02	78.2	2.71E+00	T
0	517.62	42	69	2.35	1033.97	1029	13	1.11E-02	88.9	2.46E+00	
0	709.24	14	23	5.22	1416.93	1409	15	3.75E-03	****	1.91E+00	
0	727.23	37	21	2.30	1452.88	1448	11	1.02E-02	59.1	1.87E+00	T
0	769.76	17	34	2.83	1537.87	1527	15	4.74E-03	****	1.79E+00	
0	891.86	11	12	3.64	1781.91	1775	12	3.06E-03	****	1.59E+00	
0	941.84	17	19	3.94	1881.79	1874	16	4.64E-03	****	1.52E+00	
0	965.23	10	27	0.66	1928.54	1921	12	2.86E-03	****	1.49E+00	T
0	1228.04	7	22	2.58	2453.83	2443	12	1.90E-03	****	1.23E+00	
0	1258.08	25	22	4.37	2513.88	2501	24	7.03E-03	****	1.20E+00	

Flags: "T" = Tentatively associated


```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235025.CNF;1
* Acquisition date   : 3-OCT-2016 09:01:15 Sensitivity      : 3.000
* Detector ID       : GAM02 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.48 Half life ratio : *****
* Sample date       : 8-DEC-2015 13:38:00 Nuclide Library : SOLID
* Sample ID        : G405235025 Analyst initials: MXR1
* Batch Number     : 1596249 Sample Quantity : 1.3824E+02 GRAM
* Wet wt corr      : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 22-AUG-2016 09:02:05 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;15
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	3.012E-01
BA-137M	3.786E-02
CS-137	4.000E-02
HG-203	2.905E+00
TL-208	3.549E-02
PB-212	6.521E-02
BI-214	7.465E-02
PB-214	8.946E-02
RN-222	7.465E-02
RA-224	7.941E-01
RA-226	7.465E-02
AC-228	1.433E-01
RA-228	1.433E-01
TH-228	6.521E-02
TH-230	7.463E-02
PA-231	5.264E-01
TH-232	1.433E-01
U-234	7.463E-02
AM-243	6.046E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.949E+01	NOT IDENT.
NA-22	4.802E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.511E-02	NOT IDENT.
SC-46	3.633E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	6.712E-02	NOT IDENT.
CO-56	4.642E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.982E-02	NOT IDENT.
CO-58	5.814E-01	NOT IDENT.

FE-59	6.660E+00	NOT IDENT.
CO-60	4.180E-02	NOT IDENT.
ZN-65	1.683E-01	NOT IDENT.
GE-68	2.104E+00	NOT IDENT.
AS-73	1.437E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	2.423E-01	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	8.308E-01	NOT IDENT.
KR-85	8.978E+00	NOT IDENT.
SR-85	9.483E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.520E-01	NOT IDENT.
Y-91	4.607E+02	NOT IDENT.
NB-94	3.256E-02	NOT IDENT.
NB-95	7.606E-01	NOT IDENT.
NB-95M	2.664E+00	NOT IDENT.
ZR-95	1.421E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.889E-02	NOT IDENT.
RH-102	5.860E-02	NOT IDENT.
RU-103	7.810E+00	FAIL ABUN
RH-106	5.762E-01	NOT IDENT.
RU-106	5.762E-01	NOT IDENT.
AG-108M	3.813E-02	NOT IDENT.
CD-109	1.410E+00	FAIL ABUN
AG-110M	9.403E-02	NOT IDENT.
SN-113	3.538E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.592E-01	NOT IDENT.
SB-124	1.399E+00	NOT IDENT.
SB-125	1.697E-01	FAIL ABUN
TE-125M	3.345E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SN-126	9.289E-02	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	5.149E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.876E-02	NOT IDENT.
CS-135	1.823E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	1.154E-01	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.399E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.810E-01	NOT IDENT.
PM-144	5.882E-02	NOT IDENT.
PR-144	5.109E+00	NOT IDENT.
PM-146	6.367E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	8.819E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	3.320E-02	FAIL ABUN
EU-152	1.130E-01	FAIL ABUN
GD-153	2.180E-01	NOT IDENT.
EU-154	1.186E-01	NOT IDENT.
EU-155	1.254E-01	FAIL ABUN
TB-160	2.009E+00	FAIL ABUN
HO-166M	4.563E-02	FAIL ABUN
TM-171	3.411E+01	NOT IDENT.
HF-172	2.583E-01	NOT IDENT.
LU-172	8.060E-02	FAIL ABUN
LU-176	2.865E-02	FAIL ABUN
HF-181	6.270E+00	NOT IDENT.
TA-182	9.043E-01	FAIL ABUN
RE-183	4.448E+00	NOT IDENT.
RE-184	2.960E+01	NOT IDENT.

W-188	1.388E+02	NOT IDENT.
IR-192	5.462E-01	FAIL ABUN
BI-207	4.238E-02	FAIL ABUN
PB-210	5.988E+00	NOT IDENT.
BI-211	4.698E-01	FAIL ABUN
PB-211	9.107E-01	NOT IDENT.
BI-212	7.049E-01	FAIL ABUN
RN-219	5.273E-01	FAIL ABUN
RA-223	7.501E-01	FAIL ABUN
AC-227	2.666E-01	FAIL ABUN
TH-227	2.666E-01	FAIL ABUN
TH-229	5.548E-01	FAIL ABUN
TH-231	7.501E-01	FAIL ABUN
PA-233	6.388E-02	FAIL ABUN
PA-234	2.246E-01	NOT IDENT.
PA-234M	3.838E+00	NOT IDENT.
TH-234	1.935E+00	FAIL ABUN
U-235	2.117E-01	FAIL ABUN
NP-237	6.388E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.935E+00	FAIL ABUN
NP-239	2.840E-01	FAIL ABUN
PU-239	3.621E+02	NOT IDENT.
AM-241	1.956E-01	NOT IDENT.
CM-243	1.154E-01	FAIL ABUN
BK-247	8.460E-02	NOT IDENT.
CM-247	4.836E-02	FAIL ABUN
CF-249	4.657E-02	NOT IDENT.
CF-251	1.186E-01	NOT IDENT.
ANH-511	5.790E-02	NOT IDENT.

```

*****
*                                     GEL Laboratories LLC                       *
*                                     2040 Savage Road                          *
*                                     Charleston, SC 29407                       *
*****
*                                     DETECTOR AND SAMPLE DATA                 *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235025.CNF;1
* Acquisition date   : 3-OCT-2016 09:01:15 Sensitivity      : 3.000
* Detector ID       : GAM02 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.48 Half life ratio : *****
* Sample date      : 8-DEC-2015 13:38:00 Nuclide Library : SOLID
* Sample ID       : G405235025 Analyst initials: MXR1
* Batch Number    : 1596249 Sample Quantity : 1.3824E+02 GRAM
* Wet wt corr     : 1.00000 Quantity Err(%) : 1.4467E-03 %
* Wet Weight      : 0.00000
* Dry Weight      : 0.00000
*****
*                                     CALIBRATION INFORMATION                   *
*
* Eff. Cal. date    : 22-AUG-2016 09:02:05 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.410E+01	1.892E+00	1.892E+00
BA-137M	5.092E+00	3.404E-01	3.404E-01
CS-137	5.379E+00	3.592E-01	3.592E-01
HG-203	2.381E+00	7.365E+00	7.365E+00
TL-208	2.666E-01	1.142E-01	1.142E-01
PB-212	9.530E-01	1.897E-01	1.897E-01
BI-214	9.210E-01	2.353E-01	2.353E-01
PB-214	9.615E-01	2.296E-01	2.296E-01
RN-222	9.210E-01	2.353E-01	2.353E-01
RA-224	3.704E-01	1.692E+00	1.692E+00
RA-226	9.210E-01	2.353E-01	2.353E-01
AC-228	1.114E+00	3.216E-01	3.216E-01
RA-228	1.114E+00	3.216E-01	3.216E-01
TH-228	9.530E-01	1.897E-01	1.897E-01
TH-230	9.207E-01	2.352E-01	2.352E-01
PA-231	7.540E-01	9.770E-01	9.770E-01
TH-232	1.114E+00	3.216E-01	3.216E-01
U-234	9.207E-01	2.352E-01	2.352E-01
AM-243	1.188E-01	1.348E-01	1.348E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.116E+01	2.205E+01	2.262E+01	NOT IDENT.
NA-22	2.517E-02	5.261E-02	5.382E-02	NOT IDENT.
NA-24	-1.000E+41	8.612E+40	0.000E+00	SHORT HLIF
AL-26	-1.146E-02	3.390E-02	3.429E-02	NOT IDENT.
SC-46	7.694E-02	4.747E-01	4.760E-01	FAIL ABUN
V-48	-6.158E+03	1.590E+04	1.614E+04	SHORT HLIF
CR-51	8.994E+01	5.855E+02	5.869E+02	SHORT HLIF
MN-54	8.808E-03	7.638E-02	7.648E-02	NOT IDENT.
CO-56	-2.099E-01	5.714E-01	5.792E-01	NOT IDENT.
MN-56	-1.000E+41	2.750E+41	0.000E+00	SHORT HLIF
CO-57	-5.256E-02	6.340E-02	6.769E-02	NOT IDENT.

CO-58	6.041E-02	6.614E-01	6.619E-01	NOT IDENT.
FE-59	1.134E+00	7.697E+00	7.714E+00	NOT IDENT.
CO-60	2.904E-03	5.003E-02	5.005E-02	NOT IDENT.
ZN-65	8.404E-02	2.056E-01	2.091E-01	NOT IDENT.
GE-68	-5.071E-01	2.600E+00	2.610E+00	NOT IDENT.
AS-73	2.324E+00	1.604E+01	1.607E+01	NOT IDENT.
AS-74	-3.375E+03	8.626E+03	8.759E+03	SHORT HLIF
SE-75	-2.396E-01	3.290E-01	3.463E-01	FAIL ABUN
BR-77	1.704E+38	1.475E+39	0.000E+00	SHORT HLIF
SR-82	2.385E+02	8.798E+02	8.864E+02	SHORT HLIF
RB-83	2.277E-01	1.077E+00	1.081E+00	NOT IDENT.
KR-85	-4.606E+01	1.740E+01	2.709E+01	NOT IDENT.
SR-85	-4.867E+00	1.838E+00	2.862E+00	NOT IDENT.
RB-86	-8.835E+02	3.100E+04	3.100E+04	SHORT HLIF
Y-88	5.231E-02	1.540E-01	1.558E-01	NOT IDENT.
Y-91	-3.265E+02	6.189E+02	6.362E+02	NOT IDENT.
NB-94	1.383E-02	3.939E-02	3.988E-02	NOT IDENT.
NB-95	-5.155E-01	1.065E+00	1.090E+00	NOT IDENT.
NB-95M	-5.541E-01	3.366E+00	3.375E+00	NOT IDENT.
ZR-95	-4.858E-02	1.638E+00	1.638E+00	NOT IDENT.
NB-97	1.000E+41	1.365E+41	0.000E+00	SHORT HLIF
ZR-97	-1.000E+41	7.823E+40	0.000E+00	SHORT HLIF
MO-99	5.166E+31	1.977E+32	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	2.763E+41	0.000E+00	SHORT HLIF
RH-101	-1.347E-02	4.726E-02	4.765E-02	NOT IDENT.
RH-102	-5.587E-02	8.012E-02	8.399E-02	NOT IDENT.
RU-103	5.291E+00	8.701E+00	9.022E+00	FAIL ABUN
RH-106	3.664E-01	6.439E-01	6.647E-01	NOT IDENT.
RU-106	3.664E-01	6.439E-01	6.647E-01	NOT IDENT.
AG-108M	-1.789E-02	4.640E-02	4.709E-02	NOT IDENT.
CD-109	1.703E+00	3.002E+00	3.099E+00	FAIL ABUN
AG-110M	3.027E-02	1.070E-01	1.078E-01	NOT IDENT.
SN-113	3.862E-01	3.805E-01	4.185E-01	NOT IDENT.
CD-115	-1.930E+39	4.489E+39	0.000E+00	SHORT HLIF
SN-117M	-1.162E+04	1.285E+05	1.286E+05	SHORT HLIF
TE-123M	-3.518E-02	1.753E-01	1.760E-01	NOT IDENT.
SB-124	-5.349E-01	1.859E+00	1.874E+00	NOT IDENT.
SB-125	1.483E-01	1.869E-01	1.985E-01	FAIL ABUN
TE-125M	8.963E+01	3.866E+02	3.887E+02	NOT IDENT.
I-126	7.253E+05	1.169E+06	1.214E+06	SHORT HLIF
SB-126	5.661E+05	1.434E+06	1.457E+06	SHORT HLIF
SN-126	1.086E-01	1.913E-01	1.974E-01	FAIL ABUN
SB-127	-2.502E+21	2.644E+22	0.000E+00	SHORT HLIF
I-131	-1.906E+08	7.924E+09	7.925E+09	SHORT HLIF
I-132	1.000E+41	1.906E+42	0.000E+00	SHORT HLIF
TE-132	-2.869E+26	5.404E+26	0.000E+00	SHORT HLIF
BA-133	1.067E-03	6.629E-02	6.629E-02	NOT IDENT.
I-133	-1.000E+41	2.203E+41	0.000E+00	SHORT HLIF
CS-134	6.142E-02	5.947E-02	6.560E-02	NOT IDENT.
CS-135	1.531E-01	1.952E-01	2.071E-01	NOT IDENT.
I-135	-1.000E+41	9.774E+41	0.000E+00	SHORT HLIF
CS-136	-4.679E+04	4.086E+05	4.091E+05	SHORT HLIF
CE-139	2.862E-02	1.242E-01	1.249E-01	NOT IDENT.
BA-140	-2.192E+05	1.987E+06	1.990E+06	SHORT HLIF
LA-140	-3.699E+04	5.069E+05	5.072E+05	SHORT HLIF
CE-141	-4.192E+01	3.236E+01	3.748E+01	NOT IDENT.
CE-143	1.000E+41	1.284E+41	0.000E+00	SHORT HLIF
CE-144	-2.177E-01	4.721E-01	4.822E-01	NOT IDENT.
PM-144	1.131E-02	6.551E-02	6.571E-02	NOT IDENT.
PR-144	9.825E-01	5.690E+00	5.708E+00	NOT IDENT.
PM-146	-3.209E-03	8.445E-02	8.446E-02	NOT IDENT.
ND-147	-2.152E+07	4.733E+07	4.832E+07	SHORT HLIF
PM-147	3.119E+02	1.017E+03	1.027E+03	NOT IDENT.
PM-149	2.724E+40	6.307E+40	0.000E+00	SHORT HLIF
EU-150	1.919E-02	4.047E-02	4.138E-02	FAIL ABUN
EU-152	2.596E-02	1.421E-01	1.426E-01	FAIL ABUN
GD-153	-5.715E-02	2.777E-01	2.789E-01	NOT IDENT.
EU-154	6.448E-02	1.296E-01	1.328E-01	NOT IDENT.
EU-155	7.081E-02	1.416E-01	1.452E-01	FAIL ABUN
TB-160	1.360E+00	2.115E+00	2.202E+00	FAIL ABUN
HO-166M	-1.342E-02	6.223E-02	6.253E-02	FAIL ABUN
TM-171	-1.346E+01	3.935E+01	3.981E+01	NOT IDENT.
HF-172	-2.579E-02	3.085E-01	3.087E-01	NOT IDENT.
LU-172	2.066E-02	9.201E-02	9.248E-02	FAIL ABUN
LU-176	-9.477E-03	3.348E-02	3.375E-02	FAIL ABUN
HF-181	1.524E+00	7.273E+00	7.305E+00	NOT IDENT.
TA-182	-3.884E-01	1.341E+00	1.353E+00	FAIL ABUN
RE-183	-1.506E+00	5.140E+00	5.185E+00	NOT IDENT.

RE-184	8.722E+00	3.304E+01	3.327E+01	NOT IDENT.
W-188	9.662E+01	1.659E+02	1.715E+02	NOT IDENT.
IR-192	-3.103E-02	6.270E-01	6.272E-01	FAIL ABUN
BI-207	1.700E-02	4.653E-02	4.715E-02	FAIL ABUN
PB-210	1.178E+00	6.676E+00	6.698E+00	NOT IDENT.
BI-211	2.648E+00	6.340E-01	1.352E+00	FAIL ABUN
PB-211	-4.126E-01	1.098E+00	1.114E+00	NOT IDENT.
BI-212	1.632E+00	9.483E-01	1.200E+00	FAIL ABUN
RN-219	-1.423E-01	6.270E-01	6.303E-01	FAIL ABUN
RA-223	3.427E-01	8.310E-01	8.453E-01	FAIL ABUN
AC-227	3.517E-02	2.973E-01	2.977E-01	FAIL ABUN
TH-227	3.517E-02	2.973E-01	2.977E-01	FAIL ABUN
TH-229	-3.194E-01	6.315E-01	6.477E-01	FAIL ABUN
TH-231	3.427E-01	8.310E-01	8.453E-01	FAIL ABUN
PA-233	-5.642E-02	7.815E-02	8.218E-02	FAIL ABUN
PA-234	-1.635E-01	3.925E-01	3.994E-01	NOT IDENT.
PA-234M	-5.196E+00	5.095E+00	5.608E+00	NOT IDENT.
TH-234	1.896E+00	2.031E+00	2.204E+00	FAIL ABUN
U-235	5.759E-02	2.464E-01	2.478E-01	FAIL ABUN
NP-237	-5.642E-02	7.815E-02	8.218E-02	FAIL ABUN
NP-238	-5.579E+40	5.144E+41	0.000E+00	SHORT HLIF
U-238	1.896E+00	2.031E+00	2.204E+00	FAIL ABUN
NP-239	1.878E-01	3.209E-01	3.319E-01	FAIL ABUN
PU-239	-2.524E+01	4.323E+02	4.325E+02	NOT IDENT.
AM-241	-3.896E-02	2.244E-01	2.251E-01	NOT IDENT.
CM-243	4.668E-02	1.317E-01	1.333E-01	FAIL ABUN
BK-247	-7.946E-02	1.155E-01	1.209E-01	NOT IDENT.
CM-247	4.401E-03	5.598E-02	5.601E-02	FAIL ABUN
CF-249	-4.305E-02	5.816E-02	6.131E-02	NOT IDENT.
CF-251	-7.255E-02	1.353E-01	1.392E-01	NOT IDENT.
ANH-511	-3.056E-02	6.124E-02	6.277E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	91.4849	87.09	139.2739	136.47	93.5441
45.60	82.8264	87.57	148.3922	140.51	0.0000
46.54	84.0705	88.03	154.5189	143.76	93.2419
49.72	0.0000	88.34	154.6079	144.24	76.1140
51.35	94.5186	88.47	132.8742	145.44	118.0415
51.87	110.2482	89.96	124.2040	152.43	107.9469
52.39	112.4799	1093.63	133.4018	153.25	0.0000
52.97	110.5624	91.11	0.0000	323.87	103.2168
53.44	105.4741	92.59	133.8708	156.02	0.0000
54.07	103.5515	93.35	134.0527	158.56	0.0000
57.36	0.0000	94.56	92.5958	159.00	116.7635
57.53	107.6116	94.65	92.6107	162.33	91.2813
57.98	121.4591	94.67	92.6138	162.66	0.0000
59.27	114.4208	94.87	92.6461	163.33	99.7768
59.32	114.4344	97.43	114.4188	165.86	76.5332
59.54	115.5547	98.43	99.7156	176.31	83.4392
60.96	145.7276	98.44	99.7176	176.60	0.0000
61.17	144.7350	99.53	101.0518	177.52	91.2282
62.93	97.2415	100.11	120.6917	181.07	0.0000
63.29	98.3912	102.03	110.7048	181.52	79.6532
63.58	118.7903	103.18	97.0526	184.41	92.8004
64.28	129.6987	103.37	92.4603	143.76	92.9355
66.73	101.3129	105.21	89.2633	193.51	115.4266
67.24	116.5331	105.31	89.2780	197.03	114.1199
125.81	119.8861	106.12	106.8116	198.01	112.4944
67.75	119.9039	106.47	91.7711	201.83	106.8195
69.67	131.6160	109.28	107.3577	203.43	108.7510
70.83	121.7933	111.00	119.3530	205.31	91.3883
72.81	128.8554	111.76	0.0000	210.85	119.3033
72.87	128.8716	114.06	89.3576	215.65	103.0092
74.66	129.3515	116.30	0.0000	222.11	90.2624
74.82	129.3938	116.74	88.5469	227.09	97.8831
74.97	129.4343	119.76	86.5811	227.38	97.9097
77.11	129.9988	121.12	78.4384	228.16	0.0000
78.74	113.4760	121.22	78.4500	228.18	93.4904
79.69	126.9782	121.78	105.8769	116.74	93.4904
80.12	118.2194	122.06	107.1112	235.69	90.9882
80.19	0.0000	122.92	85.7977	235.96	91.0117
80.57	109.4493	123.07	85.8170	238.63	103.4934
81.00	118.4237	265.00	90.6657	238.98	0.0000
81.07	118.4399	125.81	101.7189	240.99	133.7436
81.75	110.0721	127.23	115.1180	242.00	133.8677
83.79	122.0399	127.91	98.4273	244.70	75.3162
84.00	122.0883	129.30	114.2577	252.40	0.0000
85.43	135.8557	131.20	121.8023	252.80	81.8441
86.55	139.1339	133.02	96.7249	254.15	0.0000
86.79	139.1963	133.52	102.8415	256.23	71.0243
86.94	139.2351	136.00	94.6971	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	89.2012	355.39	0.0000	584.27	27.2334
264.80	89.2129	356.01	61.3036	595.83	0.0000
265.00	89.2285	364.49	0.0000	427.87	37.7346
268.22	71.7661	366.42	0.0000	602.52	0.0000
269.46	71.8413	372.51	70.5640	604.72	34.3689
270.03	71.8757	375.05	76.7422	607.14	39.5692
271.23	71.9494	377.52	61.6962	609.32	32.1460
273.65	0.0000	356.01	54.8438	610.33	32.1608
276.40	76.9551	388.16	71.2946	614.28	31.0682
277.37	75.1383	388.63	0.0000	618.01	31.1210
277.60	75.1530	391.69	58.1863	620.36	31.1539
278.00	75.1774	264.66	57.4936	621.93	20.7847
279.20	75.2523	401.81	71.9198	630.19	0.0000
279.54	71.9802	402.40	64.7509	631.29	31.3077
279.70	71.9896	404.85	73.0859	633.25	18.5690
280.46	81.9218	410.95	61.9983	634.78	0.0000
283.69	67.9775	413.71	71.4202	635.95	32.5345
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	67.1273	423.72	0.0000	645.85	24.5077
285.90	0.0000	427.09	70.9620	657.76	23.9312
287.50	80.5003	427.87	64.7322	657.90	0.0000
290.67	61.2417	433.94	66.0146	661.66	27.3208
293.27	0.0000	439.40	68.3312	664.57	0.0000
351.93	75.7589	453.88	63.6096	666.33	0.0000
295.96	75.8042	463.37	71.9508	666.50	0.0000
879.38	68.7949	468.07	66.2635	667.71	0.0000
299.98	61.6970	473.00	0.0000	677.62	20.4086
300.09	61.7023	475.06	72.9611	685.70	0.0000
300.13	61.7036	476.78	64.4385	695.00	0.0000
301.36	70.3822	477.60	58.0210	696.49	22.3587
302.85	67.5869	482.18	52.7823	696.51	22.3587
256.23	57.5952	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	21.4717
306.78	68.2742	497.08	38.0078	697.49	19.6837
308.46	56.8081	505.52	45.8153	702.65	18.6494
311.90	61.7852	507.63	0.0000	706.68	22.9914
316.51	61.0338	511.00	59.0762	711.68	15.8388
319.41	0.0000	514.00	136.4188	720.70	0.0000
320.08	0.0000	514.00	136.4188	721.93	0.0000
321.04	80.6832	520.40	36.2791	722.78	24.5877
323.87	61.3696	520.69	0.0000	722.91	28.9287
325.23	85.8104	522.65	0.0000	723.31	28.9336
328.76	0.0000	527.90	0.0000	724.19	24.6019
333.37	60.0333	528.26	41.9460	727.33	19.0178
333.97	61.8259	529.59	35.3477	733.00	14.5229
334.37	61.8439	529.87	0.0000	735.93	23.6268
338.28	61.0350	531.02	0.0000	333.97	19.0947
338.32	61.0363	537.26	0.0000	739.50	0.0000
311.90	61.1309	546.56	0.0000	747.24	16.4301
340.48	61.1309	552.55	40.2275	748.06	13.6958
340.55	0.0000	563.25	42.6866	752.31	24.6937
344.28	54.8699	569.33	42.8134	753.82	0.0000
345.93	60.5762	946.00	42.8165	756.73	18.3228
351.06	69.5372	569.70	38.3136	756.80	19.2395
351.93	69.5785	583.19	27.2197	884.68	14.6992

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	19.1229	1274.44	12.9381	1620.50	3.7273
766.42	20.2309	1001.03	17.9407	1621.92	3.7285
766.84	20.2336	1002.74	15.9561	1678.03	0.0000
772.60	0.0000	1004.73	10.9765	1690.97	3.7814
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	0.9591
778.90	19.4030	1028.54	0.0000	1063.66	9.6021
783.70	0.0000	1037.84	19.1508	1771.35	1.9208
785.37	17.5980	1038.76	0.0000	1791.20	0.0000
792.07	18.5706	631.29	12.1274	1808.65	4.8364
794.95	19.5202	1048.07	0.0000	1810.72	0.0000
795.86	13.9476	1049.04	21.2384	1836.06	0.9723
810.06	16.8250	1050.41	22.2592		
810.29	15.8918	1063.66	8.1260		
344.28	15.8929	1077.00	0.0000		
810.76	15.8944	1077.34	13.2579		
815.77	0.0000	1085.87	11.2457		
1048.07	0.0000	1093.63	13.3206		
832.01	18.8440	1099.45	12.3164		
834.85	18.8635	1112.07	15.1071		
835.71	23.5863	1112.84	18.1328		
836.80	0.0000	1115.54	9.8982		
846.75	0.0000	1120.29	16.5195		
846.77	20.8378	1120.55	16.5205		
856.80	0.0000	1221.41	9.9141		
860.56	7.6143	1129.67	10.3516		
871.09	18.1500	1131.51	0.0000		
873.19	19.1193	1147.95	0.0000		
875.33	0.0000	1173.23	10.4767		
879.38	11.4961	1177.95	17.8332		
880.51	18.2091	1189.05	12.6262		
883.24	10.5518	1204.77	16.9063		
884.68	10.9685	1221.41	18.6785		
889.28	10.7659	1231.02	18.7258		
894.76	24.6539	1235.36	0.0000		
898.04	9.9166	1238.28	15.9897		
900.72	15.4395	1260.41	0.0000		
903.28	12.5557	1271.87	18.2783		
911.20	20.3361	1274.44	8.6074		
912.08	24.7977	1274.54	8.6074		
923.98	0.0000	1291.59	8.6445		
926.50	15.5728	1298.22	0.0000		
929.11	16.5601	1312.11	0.0000		
937.49	15.6289	1332.49	10.9161		
944.13	0.0000	1362.66	0.0000		
946.00	15.6724	1365.19	4.4011		
949.00	16.9948	1368.63	0.0000		
667.71	0.0000	1384.29	6.6317		
962.31	18.9053	1408.01	11.1151		
964.08	26.7982	1457.56	0.0000		
966.17	0.0000	1460.82	7.2008		
911.20	12.6305	1489.16	4.5293		
968.97	12.6305	1505.03	5.4542		
983.53	0.0000	1584.12	9.2476		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235026.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM30.CNF;300
Background date : 2-OCT-2016 11:01:47.
Sample date     : 8-DEC-2015 10:15:00. Acquisition date : 3-OCT-2016 09:01:37.
Sample ID      : G405235026           Sample quantity  : 1.55202E+02 GRAM
Detector name  : GAM30                Detector geometry: CAN
Elapsed live time: 0 01:00:00.00      Elapsed real time: 0 01:00:01.46  0.0%
Energy tolerance : 1.50000 keV        Analyst Initials  : MXR1
Abundance limit : 75.00000            Sensitivity       : 3.00000
Batch ID       : 1596249              Detector SN#      :
Matrix Spike ID :                      LCS ID           : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.60*	33	153	1.01	126.92	124	8	9.21E-03	68.8	
2	2	74.83	152	174	1.19	149.38	145	14	4.23E-02	16.4	1.79E+00
3	2	77.11*	193	156	0.93	153.94	145	14	5.35E-02	12.7	
4	4	84.35*	31	183	1.47	168.43	163	28	8.48E-03	77.1	1.85E+00
5	4	87.28	109	125	1.10	174.28	163	28	3.04E-02	19.1	
6	4	89.75	59	96	1.07	179.22	163	28	1.65E-02	29.5	
7	4	92.88*	91	120	1.49	185.49	163	28	2.53E-02	27.8	
8	5	140.12*	28	52	1.03	279.98	278	16	7.68E-03	42.6	1.77E+00
9	5	143.67*	36	120	1.75	287.07	278	16	9.91E-03	62.0	
10	0	164.59	20	126	1.55	328.92	320	11	5.61E-03	111.0	
11	0	186.09*	57	131	1.05	371.92	366	11	1.58E-02	42.3	
12	0	209.99	29	150	1.30	419.73	414	13	8.18E-03	89.0	
13	5	238.66*	378	83	1.09	477.07	472	25	1.05E-01	6.6	1.34E+00
14	5	241.78	80	96	1.57	483.31	472	25	2.21E-02	25.9	
15	1	269.13	21	33	1.21	538.00	535	13	5.92E-03	44.1	3.06E+00
16	1	270.63	42	42	1.21	541.00	535	13	1.16E-02	31.0	
17	0	277.77	28	63	1.21	555.29	550	9	7.70E-03	55.1	
18	0	290.40	19	24	1.33	580.56	578	5	5.15E-03	46.5	
19	0	295.09*	146	65	1.37	589.93	583	13	4.07E-02	14.2	
20	4	300.23	32	52	1.82	600.22	596	24	8.96E-03	45.8	1.51E+00
21	4	307.04	22	69	1.83	613.84	596	24	6.08E-03	74.9	
22	0	338.45*	91	49	1.16	676.66	672	11	2.54E-02	18.3	
23	0	352.13*	224	79	1.06	704.02	699	11	6.21E-02	10.2	
24	0	412.99	29	9	0.92	825.76	823	8	7.93E-03	26.7	
25	0	486.39	19	32	3.61	972.59	966	11	5.29E-03	62.5	
26	0	511.00*	22	59	2.58	1021.81	1016	13	5.99E-03	89.1	
27	0	565.29	12	27	4.36	1130.42	1122	13	3.28E-03	98.1	
28	0	583.49*	130	33	1.67	1166.83	1161	10	3.61E-02	12.3	
29	0	609.62*	157	47	1.36	1219.10	1214	13	4.37E-02	12.3	
30	0	648.41	19	20	3.48	1296.69	1290	12	5.36E-03	52.3	
31	0	661.77	64	20	1.68	1323.42	1318	13	1.76E-02	19.1	
32	0	723.15	12	10	1.37	1446.22	1443	7	3.43E-03	53.3	
33	0	727.63	65	11	1.67	1455.17	1450	14	1.80E-02	16.4	
34	0	764.91	4	15	0.56	1529.75	1522	10	1.11E-03	187.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	767.85	23	7	1.19	1535.64	1531	9	6.44E-03	29.0	
36	0	795.50	19	28	2.00	1590.95	1582	14	5.28E-03	63.4	
37	0	860.66	24	19	1.23	1721.31	1714	13	6.54E-03	43.8	
38	0	911.55	99	35	1.49	1823.13	1815	14	2.75E-02	16.2	
39	0	956.30	22	8	3.97	1912.65	1906	15	5.97E-03	35.2	
40	0	966.07*	5	18	1.33	1932.21	1926	10	1.48E-03	164.5	
41	0	969.48*	61	10	1.64	1939.03	1935	10	1.70E-02	16.4	
42	0	1015.29	7	20	3.21	2030.68	2019	16	1.85E-03	155.6	
43	0	1072.58	15	7	1.22	2145.31	2140	10	4.29E-03	41.3	
44	0	1120.76*	39	17	0.87	2241.70	2237	10	1.09E-02	26.1	
45	0	1363.20	11	0	0.66	2726.82	2721	11	3.06E-03	30.2	
46	0	1373.89	6	2	0.80	2748.20	2745	7	1.68E-03	54.9	
47	0	1461.18*	371	0	1.70	2922.88	2916	14	1.03E-01	5.2	
48	0	1509.43	8	3	3.81	3019.44	3012	11	2.23E-03	53.6	
49	0	1589.74	10	6	1.03	3180.15	3172	12	2.78E-03	58.3	
50	0	1765.19*	41	0	1.21	3531.27	3525	13	1.14E-02	16.6	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235026.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 8-DEC-2015 10:15:00   Acquisition date : 3-OCT-2016 09:01:37
Sample ID        : G405235026             Sample quantity  : 155.20 GRAM
Sample type      : SOLID                   Sample geometry  :
Detector name    : GAMMA30                 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00           Elapsed real time: 0 01:00:01.46   0.0%
Energy tolerance : 1.50 keV                Half life ratio  : 10.00
Errors propagated: No                       Systematic Error : 0.00 %
Efficiency type  : Empirical                Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.307E+00	1.245E+01	1.245E+01	10.48	OK
NB-95	765.81	99.81*	2.266E+00	8.910E-03	2.292E-01	375.83	OK
CD-109	88.03	3.70*	6.554E+00	1.930E+00	3.028E+00	57.12	OK
SN-126	64.28	9.60	3.928E+00	5.635E-01	5.636E-01	137.56	OK
	86.94	8.90	6.554E+00	8.022E-01	8.022E-01	57.12	OK
	87.57	37.00*	6.554E+00	1.930E-01	1.930E-01	57.12	OK
CS-135	268.22	16.00*	4.925E+00	1.519E-01	1.519E-01	88.27	OK
BA-137M	661.66	89.90*	2.541E+00	1.423E-01	1.450E-01	38.11	OK
CS-137	661.66	85.10*	2.541E+00	1.503E-01	1.532E-01	38.11	OK
CE-139	165.86	80.00*	6.725E+00	2.208E-02	1.000E-01	221.95	OK
HG-203	70.83	3.69	4.957E+00	-----	Line Not Found	-----	Absent
	72.87	6.19	5.213E+00	-----	Line Not Found	-----	Absent
	279.20	81.56*	4.815E+00	1.615E-02	1.400E+00	271.55	OK
TL-208	277.37	6.60	4.820E+00	-----	Line Not Found	-----	<<INT Reject
	583.19	85.00*	2.799E+00	2.834E-01	2.834E-01	24.60	OK
	860.56	12.50	2.058E+00	4.553E-01	4.553E-01	87.56	OK
PB-212	74.82	10.28	5.442E+00	1.179E+00	1.179E+00	49.56	OK
	77.11	17.10	5.691E+00	1.248E+00	1.248E+00	25.50	OK
	238.63	43.60*	5.357E+00	9.204E-01	9.204E-01	13.13	OK
	300.09	3.30	4.554E+00	1.192E+00	1.192E+00	91.66	OK
BI-214	609.32	45.49*	2.707E+00	6.600E-01	6.602E-01	24.57	OK
	1120.29	14.92	1.645E+00	7.714E-01	7.717E-01	52.15	OK
	1764.49	15.30	1.121E+00	1.092E+00	1.093E+00	33.24	OK
PB-214	74.82	5.80	5.442E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	5.691E+00	2.200E+00	2.201E+00	25.50	OK
	87.09	3.41	6.542E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	5.305E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.611E+00	9.588E-01	9.591E-01	28.38	OK
	351.93	35.60*	4.059E+00	8.465E-01	8.468E-01	20.43	OK
RN-222	609.32	45.49*	2.707E+00	6.600E-01	6.602E-01	24.57	OK
	1120.29	14.92	1.645E+00	7.714E-01	7.717E-01	52.15	OK
	1764.49	15.30	1.121E+00	1.092E+00	1.093E+00	33.24	OK
RA-224	240.99	4.10*	5.309E+00	3.817E-01	3.817E-01	308.85	OK
RA-226	609.32	45.49*	2.707E+00	6.600E-01	6.602E-01	24.57	OK
	1120.29	14.92	1.645E+00	7.714E-01	7.717E-01	52.15	OK
	1764.49	15.30	1.121E+00	1.092E+00	1.093E+00	33.24	OK
AC-228	105.21	1.10	7.278E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.177E+00	1.064E+00	1.064E+00	36.57	OK
	794.95	4.25	2.196E+00	1.021E+00	1.021E+00	126.75	OK
	835.71	1.61	2.109E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.962E+00	9.663E-01	9.663E-01	32.35	OK
	968.97	15.80	1.863E+00	1.019E+00	1.019E+00	32.73	OK
RA-228	105.21	1.10	7.278E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.177E+00	1.064E+00	1.064E+00	36.57	OK
	794.95	4.25	2.196E+00	1.021E+00	1.021E+00	126.75	OK
	835.71	1.61	2.109E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.962E+00	9.663E-01	9.663E-01	32.35	OK
	968.97	15.80	1.863E+00	1.019E+00	1.019E+00	32.73	OK
TH-228	74.82	10.28	5.442E+00	1.179E+00	1.179E+00	49.56	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	77.11	17.10	5.691E+00	1.248E+00	1.248E+00	25.50	OK
	238.63	43.60*	5.357E+00	9.204E-01	9.204E-01	13.13	OK
	300.09	3.30	4.554E+00	1.192E+00	1.192E+00	91.66	OK
TH-229	85.43	14.70	6.345E+00	2.049E-01	2.049E-01	154.20	OK
	88.47	24.00	6.554E+00	2.975E-01	2.975E-01	57.12	OK
	193.51	4.41*	6.145E+00	-----	Line Not Found	-----	Absent
	210.85	2.80	5.837E+00	1.036E+00	1.036E+00	177.94	OK
TH-230	609.32	45.49*	2.707E+00	6.600E-01	6.600E-01	24.57	OK
	1120.29	14.92	1.645E+00	7.714E-01	7.714E-01	52.15	OK
	1764.49	15.30	1.121E+00	1.092E+00	1.092E+00	33.24	OK
PA-231	283.69	1.70	4.743E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	4.554E+00	7.353E-01	7.353E-01	91.66	OK
TH-232	105.21	1.10	7.278E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.177E+00	1.064E+00	1.064E+00	36.57	OK
	835.71	1.61	2.109E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.962E+00	9.663E-01	9.663E-01	32.35	OK
	968.97	15.80	1.863E+00	1.019E+00	1.019E+00	32.73	OK
TH-234	63.29	3.70*	3.928E+00	1.462E+00	1.462E+00	137.56	OK
	92.59	4.23	6.875E+00	1.939E+00	1.939E+00	55.61	OK
U-234	609.32	45.49*	2.707E+00	6.600E-01	6.600E-01	24.57	OK
	1120.29	14.92	1.645E+00	7.714E-01	7.714E-01	52.15	OK
	1764.49	15.30	1.121E+00	1.092E+00	1.092E+00	33.24	OK
U-235	89.96	3.47	6.708E+00	1.584E+00	1.584E+00	58.92	OK
	93.35	5.60	6.875E+00	1.465E+00	1.465E+00	55.61	OK
	143.76	10.96*	7.122E+00	2.726E-01	2.726E-01	123.99	OK
	163.33	5.08	6.725E+00	3.477E-01	3.477E-01	221.95	OK
	185.72	57.20	6.291E+00	9.212E-02	9.212E-02	84.53	OK
	205.31	5.01	5.922E+00	-----	Line Not Found	-----	Absent
U-238	63.29	3.70*	3.928E+00	1.462E+00	1.462E+00	137.56	OK
	92.59	4.23	6.875E+00	1.939E+00	1.939E+00	55.61	OK
AM-243	43.53	5.90	8.765E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	5.442E+00	1.804E-01	1.804E-01	49.56	OK
ANH-511	511.00	100.00*	3.091E+00	3.668E-02	3.668E-02	178.21	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235026.CNF;1 *
 * Acquisition date : 3-OCT-2016 09:01:37 Sensitivity : 3.000 *
 * Detector ID : GAM30 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:01.46 Half life ratio : ***** *
 * Sample date : 8-DEC-2015 10:15:00 Analyst initials: MXR1 *
 * Sample ID : G405235026 Sample Quantity : 1.5520E+02 GRAM *
 * Batch Number : 1596249 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 11-MAR-2016 05:58:49 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.245E+01	1.278E+00	3.163E-01
NB-95	2.292E-01	8.440E-01	1.532E-01
CD-109	3.028E+00	1.695E+00	1.577E+00
SN-126	1.930E-01	1.080E-01	1.009E-01
CS-135	1.519E-01	1.314E-01	2.124E-01
BA-137M	1.450E-01	5.415E-02	4.720E-02
CS-137	1.532E-01	5.720E-02	4.986E-02
CE-139	1.000E-01	2.175E-01	1.662E-01
HG-203	1.400E+00	3.727E+00	4.277E+00
TL-208	2.834E-01	6.830E-02	5.062E-02
PB-212	9.204E-01	1.185E-01	8.444E-02
BI-214	6.602E-01	1.590E-01	9.413E-02
PB-214	8.468E-01	1.695E-01	1.073E-01
RN-222	6.602E-01	1.590E-01	9.413E-02
RA-224	3.817E-01	1.155E+00	9.046E-01
RA-226	6.602E-01	1.590E-01	9.413E-02
AC-228	9.663E-01	3.064E-01	1.963E-01
RA-228	9.663E-01	3.064E-01	1.963E-01
TH-228	9.204E-01	1.185E-01	8.444E-02
TH-229	-2.684E-01	4.158E-01	7.241E-01
TH-230	6.600E-01	1.589E-01	9.409E-02
PA-231	7.353E-01	6.605E-01	5.885E-01
TH-232	9.663E-01	3.064E-01	1.963E-01
TH-234	1.462E+00	1.971E+00	1.588E+00
U-234	6.600E-01	1.589E-01	9.409E-02
U-235	2.726E-01	3.313E-01	2.892E-01
U-238	1.462E+00	1.971E+00	1.588E+00
AM-243	1.804E-01	8.762E-02	6.903E-02
ANH-511	3.668E-02	6.406E-02	4.362E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-4.614E+00	8.882E+00	1.663E+01	NOT IDENT.

NA-22	1.327E-02	3.109E-02	7.054E-02	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	1.336E-02	2.580E-02	6.224E-02	NOT IDENT.
SC-46	8.247E-02	2.832E-01	5.857E-01	FAIL ABUN
V-48	0.000E+00	1.349E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	3.244E+02	0.000E+00	SHORT HLIF
MN-54	4.931E-03	4.362E-02	8.809E-02	NOT IDENT.
CO-56	6.270E-02	3.105E-01	6.442E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	9.927E-03	3.585E-02	7.029E-02	NOT IDENT.
CO-58	2.969E-01	4.248E-01	9.347E-01	NOT IDENT.
FE-59	-1.656E-01	5.760E+00	1.096E+01	NOT IDENT.
CO-60	-2.654E-02	2.919E-02	4.943E-02	NOT IDENT.
ZN-65	-1.207E-01	1.907E-01	2.716E-01	NOT IDENT.
GE-68	1.598E-01	1.561E+00	3.032E+00	NOT IDENT.
AS-73	1.152E+00	5.597E+00	1.145E+01	NOT IDENT.
AS-74	0.000E+00	4.379E+03	0.000E+00	SHORT HLIF
SE-75	-1.264E-01	1.845E-01	3.115E-01	NOT IDENT.
BR-77	0.000E+00	2.207E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	5.523E+02	0.000E+00	SHORT HLIF
RB-83	-3.046E-01	5.354E-01	9.842E-01	NOT IDENT.
KR-85	1.452E+00	6.449E+00	1.169E+01	NOT IDENT.
SR-85	1.519E-01	6.820E-01	1.236E+00	NOT IDENT.
RB-86	0.000E+00	1.887E+04	0.000E+00	SHORT HLIF
Y-88	-4.737E-02	1.700E-01	3.548E-01	NOT IDENT.
Y-91	3.774E+01	4.010E+02	7.854E+02	NOT IDENT.
NB-94	1.287E-02	2.468E-02	5.133E-02	NOT IDENT.
NB-95M	-1.045E+00	2.239E+00	3.605E+00	NOT IDENT.
ZR-95	-7.945E-01	1.065E+00	1.829E+00	FAIL ABUN
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.434E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.054E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	8.347E+40	0.000E+00	SHORT HLIF
RH-101	-2.137E-02	2.686E-02	4.761E-02	NOT IDENT.
RH-102	3.756E-02	4.175E-02	9.383E-02	FAIL ABUN
RU-103	-2.637E+00	3.888E+00	7.093E+00	FAIL ABUN
RH-106	3.137E-01	3.596E-01	8.013E-01	NOT IDENT.
RU-106	3.137E-01	3.596E-01	8.013E-01	NOT IDENT.
AG-108M	5.223E-04	1.928E-02	3.910E-02	FAIL ABUN
AG-110M	-2.162E-02	7.255E-02	1.353E-01	FAIL ABUN
SN-113	-7.688E-02	1.636E-01	3.126E-01	NOT IDENT.
CD-115	0.000E+00	2.473E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	8.694E+04	0.000E+00	SHORT HLIF
TE-123M	-5.563E-02	1.164E-01	1.911E-01	NOT IDENT.
SB-124	-5.007E-01	1.075E+00	2.113E+00	FAIL ABUN
SB-125	-3.335E-03	7.016E-02	1.414E-01	NOT IDENT.
TE-125M	1.695E+02	2.106E+02	4.239E+02	NOT IDENT.
I-126	0.000E+00	7.471E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.062E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.328E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	3.850E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.058E+26	0.000E+00	SHORT HLIF
BA-133	-1.023E-02	3.653E-02	6.349E-02	FAIL ABUN
I-133	0.000E+00	1.294E+41	0.000E+00	SHORT HLIF
CS-134	6.688E-02	8.308E-02	9.467E-02	FAIL ABUN
I-135	0.000E+00	1.057E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.083E+05	0.000E+00	SHORT HLIF
BA-140	0.000E+00	9.168E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	2.511E+05	0.000E+00	SHORT HLIF
CE-141	1.269E+00	2.115E+01	3.988E+01	NOT IDENT.
CE-143	0.000E+00	7.451E+40	0.000E+00	SHORT HLIF
CE-144	-2.300E-01	2.824E-01	4.997E-01	NOT IDENT.
PM-144	-2.303E-02	4.145E-02	7.676E-02	NOT IDENT.
PR-144	-2.013E+00	3.599E+00	6.661E+00	NOT IDENT.
PM-146	6.808E-03	3.245E-02	6.656E-02	NOT IDENT.
ND-147	0.000E+00	2.604E+07	0.000E+00	SHORT HLIF
PM-147	-5.319E+02	6.518E+02	1.157E+03	NOT IDENT.
PM-149	0.000E+00	4.001E+40	0.000E+00	SHORT HLIF
EU-150	1.286E-02	1.963E-02	3.896E-02	FAIL ABUN
EU-152	-9.259E-02	6.418E-02	1.086E-01	NOT IDENT.
GD-153	-2.272E-01	1.255E-01	2.007E-01	NOT IDENT.
EU-154	3.051E-02	7.569E-02	1.714E-01	FAIL ABUN
EU-155	8.181E-02	7.943E-02	1.657E-01	FAIL ABUN
TB-160	1.600E-01	1.668E+00	3.253E+00	FAIL ABUN
HO-166M	-2.302E-02	4.155E-02	7.466E-02	NOT IDENT.
TM-171	-6.472E+00	1.393E+01	2.693E+01	NOT IDENT.
HF-172	-8.490E-03	1.795E-01	3.407E-01	FAIL ABUN

LU-172	1.469E-03	7.094E-02	1.347E-01	FAIL ABUN
LU-176	2.891E-02	4.244E-02	4.162E-02	FAIL ABUN
HF-181	1.970E+00	3.380E+00	6.703E+00	NOT IDENT.
TA-182	-4.880E-01	6.779E-01	1.222E+00	FAIL ABUN
RE-183	-8.280E-01	2.007E+00	3.871E+00	NOT IDENT.
RE-184	-1.644E+01	2.388E+01	4.063E+01	NOT IDENT.
W-188	1.085E+02	9.881E+01	1.811E+02	FAIL ABUN
IR-192	-8.973E-02	3.174E-01	6.287E-01	FAIL ABUN
BI-207	-4.942E-03	3.758E-02	7.097E-02	FAIL ABUN
PB-210	8.066E-01	1.978E+00	4.133E+00	NOT IDENT.
BI-211	0.000E+00	4.669E-01	6.745E-01	FAIL ABUN
PB-211	2.926E-02	4.865E-01	9.838E-01	NOT IDENT.
BI-212	0.000E+00	6.702E-01	1.233E+00	FAIL ABUN
RN-219	6.479E-02	2.920E-01	5.973E-01	FAIL ABUN
RA-223	-5.056E-02	4.101E-01	8.231E-01	FAIL ABUN
AC-227	9.580E-03	2.097E-01	3.847E-01	FAIL ABUN
TH-227	9.580E-03	2.097E-01	3.847E-01	FAIL ABUN
TH-231	-5.056E-02	4.101E-01	8.231E-01	FAIL ABUN
PA-233	-2.204E-02	4.683E-02	8.043E-02	FAIL ABUN
PA-234	-1.747E-01	2.018E-01	3.248E-01	NOT IDENT.
PA-234M	1.140E+00	2.777E+00	5.945E+00	FAIL ABUN
NP-237	-2.204E-02	4.683E-02	8.043E-02	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	1.059E-01	1.852E-01	3.714E-01	FAIL ABUN
PU-239	-8.761E+00	2.558E+02	4.846E+02	FAIL ABUN
AM-241	2.073E-02	9.276E-02	1.876E-01	NOT IDENT.
CM-243	-2.230E-02	7.324E-02	1.378E-01	FAIL ABUN
BK-247	-3.012E-02	6.189E-02	1.072E-01	FAIL ABUN
CM-247	4.372E-03	2.660E-02	5.413E-02	FAIL ABUN
CF-249	2.169E-02	2.702E-02	5.900E-02	NOT IDENT.
CF-251	-7.413E-02	9.965E-02	1.731E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	359	10.66*	1.307E+00	1.245E+01	1.245E+01	10.48
NB-95	765.81	4	99.81*	2.266E+00	8.910E-03	2.292E-01	375.83
CD-109	88.03	141	3.70*	6.554E+00	2.813E+00	4.415E+00	38.15
SN-126	64.28	44	9.60	3.928E+00	5.635E-01	5.636E-01	137.56
	86.94	141	8.90	6.554E+00	1.170E+00	1.170E+00	38.15
	87.57	141	37.00*	6.554E+00	2.813E-01	2.813E-01	38.15
CS-135	268.22	25	16.00*	4.925E+00	1.519E-01	1.519E-01	88.27
BA-137M	661.66	67	89.90*	2.541E+00	1.423E-01	1.450E-01	38.11
CS-137	661.66	67	85.10*	2.541E+00	1.503E-01	1.532E-01	38.11
CE-139	165.86	25	80.00*	6.725E+00	2.208E-02	1.000E-01	221.95
HG-203	70.83	-----	3.69	4.957E+00	-----	Line Not Found	-----
	72.87	-----	6.19	5.213E+00	-----	Line Not Found	-----
	279.20	32	81.56*	4.815E+00	3.949E-02	3.425E+00	110.14
TL-208	277.37	32	6.60	4.815E+00	4.880E-01	4.880E-01	110.14
	583.19	139	85.00*	2.799E+00	2.834E-01	2.834E-01	24.60
	860.56	24	12.50	2.058E+00	4.553E-01	4.553E-01	87.56
BI-211	72.87	-----	1.23	5.213E+00	-----	Line Not Found	-----
	351.06	253	12.92*	4.059E+00	2.332E+00	2.332E+00	20.43
PB-212	74.82	199	10.28	5.442E+00	1.720E+00	1.720E+00	32.78
	77.11	251	17.10	5.691E+00	1.248E+00	1.248E+00	25.50
	238.63	444	43.60*	5.357E+00	9.204E-01	9.204E-01	13.13
	300.09	37	3.30	4.554E+00	1.192E+00	1.192E+00	91.66
BI-214	609.32	168	45.49*	2.707E+00	6.600E-01	6.602E-01	24.57
	1120.29	39	14.92	1.645E+00	7.714E-01	7.717E-01	52.15
	1764.49	39	15.30	1.121E+00	1.092E+00	1.093E+00	33.24
PB-214	74.82	199	5.80	5.442E+00	3.049E+00	3.050E+00	32.78
	77.11	251	9.70	5.691E+00	2.200E+00	2.201E+00	25.50
	87.09	141	3.41	6.554E+00	3.052E+00	3.054E+00	38.15
	242.00	93	7.25	5.309E+00	1.175E+00	1.175E+00	51.81
	295.22	168	18.42	4.611E+00	9.588E-01	9.591E-01	28.38
RN-222	351.93	253	35.60*	4.059E+00	8.465E-01	8.468E-01	20.43
	609.32	168	45.49*	2.707E+00	6.600E-01	6.602E-01	24.57
	1120.29	39	14.92	1.645E+00	7.714E-01	7.717E-01	52.15
	1764.49	39	15.30	1.121E+00	1.092E+00	1.093E+00	33.24
RA-224	240.99	93	4.10*	5.309E+00	2.077E+00	2.077E+00	51.81
RA-226	609.32	168	45.49*	2.707E+00	6.600E-01	6.602E-01	24.57
	1120.29	39	14.92	1.645E+00	7.714E-01	7.717E-01	52.15
	1764.49	39	15.30	1.121E+00	1.092E+00	1.093E+00	33.24
AC-228	105.21	-----	1.10	7.278E+00	-----	Line Not Found	-----
	338.32	104	11.27	4.177E+00	1.064E+00	1.064E+00	36.57
	794.95	20	4.25	2.196E+00	1.021E+00	1.021E+00	126.75
	835.71	-----	1.61	2.109E+00	-----	Line Not Found	-----
	911.20	101	25.80*	1.962E+00	9.663E-01	9.663E-01	32.35
	968.97	62	15.80	1.863E+00	1.019E+00	1.019E+00	32.73
RA-228	105.21	-----	1.10	7.278E+00	-----	Line Not Found	-----
	338.32	104	11.27	4.177E+00	1.064E+00	1.064E+00	36.57
	794.95	20	4.25	2.196E+00	1.021E+00	1.021E+00	126.75

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	835.71	-----	1.61	2.109E+00	-----	Line Not Found	-----
	911.20	101	25.80*	1.962E+00	9.663E-01	9.663E-01	32.35
	968.97	62	15.80	1.863E+00	1.019E+00	1.019E+00	32.73
TH-228	74.82	199	10.28	5.442E+00	1.720E+00	1.720E+00	32.78
	77.11	251	17.10	5.691E+00	1.248E+00	1.248E+00	25.50
	238.63	444	43.60*	5.357E+00	9.204E-01	9.204E-01	13.13
	300.09	37	3.30	4.554E+00	1.192E+00	1.192E+00	91.66
TH-229	85.43	40	14.70	6.345E+00	2.049E-01	2.049E-01	154.20
	88.47	141	24.00	6.554E+00	4.337E-01	4.337E-01	38.15
	193.51	-----	4.41*	6.145E+00	-----	Line Not Found	-----
	210.85	35	2.80	5.837E+00	1.036E+00	1.036E+00	177.94
TH-230	609.32	168	45.49*	2.707E+00	6.600E-01	6.600E-01	24.57
	1120.29	39	14.92	1.645E+00	7.714E-01	7.714E-01	52.15
	1764.49	39	15.30	1.121E+00	1.092E+00	1.092E+00	33.24
PA-231	283.69	-----	1.70	4.743E+00	-----	Line Not Found	-----
	301.36	37	5.35*	4.554E+00	7.353E-01	7.353E-01	91.66
TH-232	105.21	-----	1.10	7.278E+00	-----	Line Not Found	-----
	338.32	104	11.27	4.177E+00	1.064E+00	1.064E+00	36.57
	835.71	-----	1.61	2.109E+00	-----	Line Not Found	-----
	911.20	101	25.80*	1.962E+00	9.663E-01	9.663E-01	32.35
	968.97	62	15.80	1.863E+00	1.019E+00	1.019E+00	32.73
TH-234	63.29	44	3.70*	3.928E+00	1.462E+00	1.462E+00	137.56
	92.59	117	4.23	6.875E+00	1.939E+00	1.939E+00	55.61
U-234	609.32	168	45.49*	2.707E+00	6.600E-01	6.600E-01	24.57
	1120.29	39	14.92	1.645E+00	7.714E-01	7.714E-01	52.15
	1764.49	39	15.30	1.121E+00	1.092E+00	1.092E+00	33.24
U-235	89.96	76	3.47	6.708E+00	1.584E+00	1.584E+00	58.92
	93.35	117	5.60	6.875E+00	1.465E+00	1.465E+00	55.61
	143.76	44	10.96*	7.122E+00	2.726E-01	2.726E-01	123.99
	163.33	25	5.08	6.725E+00	3.477E-01	3.477E-01	221.95
	185.72	69	57.20	6.291E+00	9.212E-02	9.212E-02	84.53
	205.31	-----	5.01	5.922E+00	-----	Line Not Found	-----
U-238	63.29	44	3.70*	3.928E+00	1.462E+00	1.462E+00	137.56
	92.59	117	4.23	6.875E+00	1.939E+00	1.939E+00	55.61
AM-243	43.53	-----	5.90	8.765E-01	-----	Line Not Found	-----
	74.66	199	67.20*	5.442E+00	2.631E-01	2.632E-01	32.78
ANH-511	511.00	23	100.00*	3.091E+00	3.668E-02	3.668E-02	178.21

Flag: "*" = Keyline

Total number of lines in spectrum 50
 Number of unidentified lines 8
 Number of lines tentatively identified by NID 42 84.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.245E+01	1.245E+01	0.130E+01	10.48	
NB-95	64.03D	25.7	8.910E-03	2.292E-01	8.613E-01	375.83	
CD-109	461.40D	1.57	2.813E+00	4.415E+00	1.684E+00	38.15	
SN-126	2.30E+05Y	1.00	2.813E-01	2.813E-01	1.073E-01	38.15	
CS-135	2.30E+06Y	1.00	1.519E-01	1.519E-01	1.341E-01	88.27	
BA-137M	30.08Y	1.02	1.423E-01	1.450E-01	0.553E-01	38.11	
CS-137	30.08Y	1.02	1.503E-01	1.532E-01	0.584E-01	38.11	
CE-139	137.64D	4.53	2.208E-02	1.000E-01	2.220E-01	221.95	
HG-203	46.59D	86.7	3.949E-02	3.425E+00	3.772E+00	110.14	
TL-208	1.41E+10Y	1.00	2.834E-01	2.834E-01	0.697E-01	24.60	
BI-211	7.04E+08Y	1.00	2.332E+00	2.332E+00	0.476E+00	20.43	
PB-212	1.41E+10Y	1.00	9.204E-01	9.204E-01	1.209E-01	13.13	
BI-214	1600.00Y	1.00	6.600E-01	6.602E-01	1.622E-01	24.57	
PB-214	1600.00Y	1.00	8.465E-01	8.468E-01	1.730E-01	20.43	
RN-222	1600.00Y	1.00	6.600E-01	6.602E-01	1.622E-01	24.57	
RA-224	1.41E+10Y	1.00	2.077E+00	2.077E+00	1.076E+00	51.81	
RA-226	1600.00Y	1.00	6.600E-01	6.602E-01	1.622E-01	24.57	
AC-228	1.41E+10Y	1.00	9.663E-01	9.663E-01	3.127E-01	32.35	
RA-228	1.41E+10Y	1.00	9.663E-01	9.663E-01	3.127E-01	32.35	
TH-228	1.41E+10Y	1.00	9.204E-01	9.204E-01	1.209E-01	13.13	
TH-229	7340.00Y	1.00	4.337E-01	4.337E-01	1.655E-01	38.15	K
TH-230	7.54E+04Y	1.00	6.600E-01	6.600E-01	1.622E-01	24.57	
PA-231	7.04E+08Y	1.00	7.353E-01	7.353E-01	6.740E-01	91.66	
TH-232	1.41E+10Y	1.00	9.663E-01	9.663E-01	3.127E-01	32.35	
TH-234	4.47E+09Y	1.00	1.462E+00	1.462E+00	2.011E+00	137.56	
U-234	2.45E+05Y	1.00	6.600E-01	6.600E-01	1.622E-01	24.57	
U-235	7.04E+08Y	1.00	2.726E-01	2.726E-01	3.380E-01	123.99	
U-238	4.47E+09Y	1.00	1.462E+00	1.462E+00	2.011E+00	137.56	
AM-243	7370.00Y	1.00	2.631E-01	2.632E-01	0.863E-01	32.78	
ANH-511	1.00E+09Y	1.00	3.668E-02	3.668E-02	6.537E-02	178.21	
Total Activity :			3.430E+01	3.959E+01			

Grand Total Activity : 3.430E+01 3.959E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
5	140.12	34	65	1.03	279.98	278	16	7.68E-03	85.2	7.18E+00	T
1	270.63	48	49	1.21	541.00	535	13	1.16E-02	62.1	4.91E+00	T
0	290.40	21	28	1.33	580.56	578	5	5.15E-03	92.9	4.66E+00	T
4	307.04	25	79	1.83	613.84	596	24	6.08E-03	****	4.48E+00	T
0	412.99	32	10	0.92	825.76	823	8	7.93E-03	53.3	3.61E+00	T
0	486.39	21	35	3.61	972.59	966	11	5.29E-03	****	3.21E+00	T
0	565.29	13	29	4.36	1130.42	1122	13	3.28E-03	****	2.87E+00	
0	648.41	20	21	3.48	1296.69	1290	12	5.36E-03	****	2.58E+00	
0	723.15	13	10	1.37	1446.22	1443	7	3.43E-03	****	2.37E+00	T
0	727.63	68	12	1.67	1455.17	1450	14	1.80E-02	32.8	2.36E+00	T
0	767.85	24	7	1.19	1535.64	1531	9	6.44E-03	58.0	2.26E+00	T
0	956.30	22	8	3.97	1912.65	1906	15	5.97E-03	70.3	1.88E+00	
0	966.07	5	18	1.33	1932.21	1926	10	1.48E-03	****	1.87E+00	T
0	1015.29	7	21	3.21	2030.68	2019	16	1.85E-03	****	1.79E+00	
0	1072.58	16	7	1.22	2145.31	2140	10	4.29E-03	82.6	1.71E+00	
0	1363.20	11	0	0.66	2726.82	2721	11	3.06E-03	60.3	1.39E+00	T
0	1373.89	6	2	0.80	2748.20	2745	7	1.68E-03	****	1.38E+00	
0	1509.43	8	3	3.81	3019.44	3012	11	2.23E-03	****	1.27E+00	
0	1589.74	10	6	1.03	3180.15	3172	12	2.78E-03	****	1.22E+00	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235026.CNF;1
* Acquisition date   : 3-OCT-2016 09:01:37 Sensitivity      : 3.000
* Detector ID       : GAM30 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:01.46 Half life ratio : *****
* Sample date       : 8-DEC-2015 10:15:00 Nuclide Library : SOLID
* Sample ID         : G405235026 Analyst initials: MXR1
* Batch Number      : 1596249 Sample Quantity : 1.5520E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 11-MAR-2016 05:58:49 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.108E-01
NB-95	0.000E+00
CD-109	7.432E-01
SN-126	4.756E-02
CS-135	9.751E-02
BA-137M	2.060E-02
CS-137	2.176E-02
CE-139	7.722E-02
HG-203	1.987E+00
TL-208	2.248E-02
PB-212	3.927E-02
BI-214	4.159E-02
PB-214	4.891E-02
RN-222	4.159E-02
RA-224	4.208E-01
RA-226	4.159E-02
AC-228	8.499E-02
RA-228	8.499E-02
TH-228	3.927E-02
TH-229	3.365E-01
TH-230	4.158E-02
PA-231	2.660E-01
TH-232	8.499E-02
TH-234	7.444E-01
U-234	4.158E-02
U-235	1.357E-01
U-238	7.444E-01
AM-243	3.258E-02
ANH-511	1.962E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	7.320E+00	NOT IDENT.
NA-22	2.967E-02	NOT IDENT.

NA-24	0.000E+00	SHORT HLIF
AL-26	2.515E-02	NOT IDENT.
SC-46	2.530E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	3.787E-02	NOT IDENT.
CO-56	2.747E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.276E-02	NOT IDENT.
CO-58	4.088E-01	NOT IDENT.
FE-59	4.727E+00	NOT IDENT.
CO-60	1.951E-02	NOT IDENT.
ZN-65	1.172E-01	NOT IDENT.
GE-68	1.255E+00	NOT IDENT.
AS-73	5.324E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.425E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.371E-01	NOT IDENT.
KR-85	5.311E+00	NOT IDENT.
SR-85	5.615E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.348E-01	NOT IDENT.
Y-91	3.351E+02	NOT IDENT.
NB-94	2.289E-02	NOT IDENT.
NB-95M	1.670E+00	NOT IDENT.
ZR-95	7.756E-01	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.214E-02	NOT IDENT.
RH-102	4.160E-02	FAIL ABUN
RU-103	3.075E+00	FAIL ABUN
RH-106	3.562E-01	NOT IDENT.
RU-106	3.562E-01	NOT IDENT.
AG-108M	1.739E-02	FAIL ABUN
AG-110M	5.716E-02	FAIL ABUN
SN-113	1.393E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	8.863E-02	NOT IDENT.
SB-124	6.794E-01	FAIL ABUN
SB-125	6.271E-02	NOT IDENT.
TE-125M	1.987E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.886E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	4.264E-02	FAIL ABUN
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.872E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.319E-01	NOT IDENT.
PM-144	3.348E-02	NOT IDENT.
PR-144	2.904E+00	NOT IDENT.
PM-146	2.985E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	5.373E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.777E-02	FAIL ABUN
EU-152	4.778E-02	NOT IDENT.
GD-153	9.219E-02	NOT IDENT.
EU-154	7.196E-02	FAIL ABUN
EU-155	7.769E-02	FAIL ABUN
TB-160	1.432E+00	FAIL ABUN
HO-166M	3.216E-02	NOT IDENT.
TM-171	1.250E+01	NOT IDENT.
HF-172	1.590E-01	FAIL ABUN
LU-172	5.883E-02	FAIL ABUN

LU-176	1.918E-02	FAIL ABUN
HF-181	2.999E+00	NOT IDENT.
TA-182	5.123E-01	FAIL ABUN
RE-183	1.802E+00	NOT IDENT.
RE-184	1.716E+01	NOT IDENT.
W-188	8.333E+01	FAIL ABUN
IR-192	2.828E-01	FAIL ABUN
BI-207	3.022E-02	FAIL ABUN
PB-210	1.928E+00	NOT IDENT.
BI-211	3.244E-01	FAIL ABUN
PB-211	4.428E-01	NOT IDENT.
BI-212	5.742E-01	FAIL ABUN
RN-219	2.707E-01	FAIL ABUN
RA-223	3.718E-01	FAIL ABUN
AC-227	1.781E-01	FAIL ABUN
TH-227	1.781E-01	FAIL ABUN
TH-231	3.718E-01	FAIL ABUN
PA-233	3.620E-02	FAIL ABUN
PA-234	1.332E-01	NOT IDENT.
PA-234M	2.535E+00	FAIL ABUN
NP-237	3.620E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.738E-01	FAIL ABUN
PU-239	2.272E+02	FAIL ABUN
AM-241	8.774E-02	NOT IDENT.
CM-243	6.415E-02	FAIL ABUN
BK-247	4.899E-02	FAIL ABUN
CM-247	2.450E-02	FAIL ABUN
CF-249	2.676E-02	NOT IDENT.
CF-251	8.032E-02	NOT IDENT.


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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235026.CNF;1
* Acquisition date   : 3-OCT-2016 09:01:37 Sensitivity      : 3.000
* Detector ID        : GAM30 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:01.46 Half life ratio  : *****
* Sample date        : 8-DEC-2015 10:15:00 Nuclide Library : SOLID
* Sample ID          : G405235026 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity : 1.5520E+02 GRAM
*                    : Quantity Err(%) : 1.2886E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                    : Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 11-MAR-2016 05:58:49 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.245E+01	1.693E+00	1.693E+00
NB-95	2.292E-01	8.443E-01	8.443E-01
CD-109	3.028E+00	1.733E+00	1.733E+00
SN-126	1.930E-01	1.099E-01	1.099E-01
CS-135	1.519E-01	1.322E-01	1.322E-01
BA-137M	1.450E-01	5.533E-02	5.533E-02
CS-137	1.532E-01	5.845E-02	5.845E-02
CE-139	1.000E-01	2.185E-01	2.185E-01
HG-203	1.397E+00	3.740E+00	3.740E+00
TL-208	2.834E-01	7.214E-02	7.214E-02
PB-212	9.204E-01	1.404E-01	1.404E-01
BI-214	6.602E-01	1.678E-01	1.678E-01
PB-214	8.468E-01	1.834E-01	1.834E-01
RN-222	6.602E-01	1.678E-01	1.678E-01
RA-224	3.817E-01	1.172E+00	1.172E+00
RA-226	6.602E-01	1.678E-01	1.678E-01
AC-228	9.663E-01	3.348E-01	3.348E-01
RA-228	9.663E-01	3.348E-01	3.348E-01
TH-228	9.204E-01	1.404E-01	1.404E-01
TH-229	-2.684E-01	4.162E-01	4.162E-01
TH-230	6.600E-01	1.677E-01	1.677E-01
PA-231	7.353E-01	6.809E-01	6.809E-01
TH-232	9.663E-01	3.348E-01	3.348E-01
TH-234	1.462E+00	1.998E+00	1.998E+00
U-234	6.600E-01	1.677E-01	1.677E-01
U-235	2.726E-01	3.319E-01	3.319E-01
U-238	1.462E+00	1.998E+00	1.998E+00
AM-243	1.804E-01	8.950E-02	8.950E-02
ANH-511	3.668E-02	6.413E-02	6.413E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-4.614E+00	8.891E+00	9.131E+00	NOT IDENT.

NA-22	1.327E-02	3.111E-02	3.168E-02	NOT IDENT.
NA-24	-1.000E+41	9.771E+41	0.000E+00	SHORT HLIF
AL-26	1.336E-02	2.581E-02	2.651E-02	NOT IDENT.
SC-46	8.247E-02	2.834E-01	2.858E-01	FAIL ABUN
V-48	1.525E+03	1.349E+04	1.351E+04	SHORT HLIF
CR-51	2.408E+02	3.250E+02	3.427E+02	SHORT HLIF
MN-54	4.931E-03	4.363E-02	4.368E-02	NOT IDENT.
CO-56	6.270E-02	3.106E-01	3.119E-01	NOT IDENT.
MN-56	1.000E+41	4.953E+41	0.000E+00	SHORT HLIF
CO-57	9.927E-03	3.586E-02	3.614E-02	NOT IDENT.
CO-58	2.969E-01	4.260E-01	4.466E-01	NOT IDENT.
FE-59	-1.656E-01	5.760E+00	5.761E+00	NOT IDENT.
CO-60	-2.654E-02	2.927E-02	3.163E-02	NOT IDENT.
ZN-65	-1.207E-01	1.922E-01	1.997E-01	NOT IDENT.
GE-68	1.598E-01	1.561E+00	1.563E+00	NOT IDENT.
AS-73	1.152E+00	5.602E+00	5.626E+00	NOT IDENT.
AS-74	-4.053E+02	4.379E+03	4.383E+03	SHORT HLIF
SE-75	-1.264E-01	1.848E-01	1.934E-01	NOT IDENT.
BR-77	1.715E+38	1.485E+39	0.000E+00	SHORT HLIF
SR-82	-2.361E+02	5.529E+02	5.630E+02	SHORT HLIF
RB-83	-3.046E-01	5.375E-01	5.548E-01	NOT IDENT.
KR-85	1.452E+00	6.450E+00	6.483E+00	NOT IDENT.
SR-85	1.519E-01	6.821E-01	6.856E-01	NOT IDENT.
RB-86	1.932E+03	1.887E+04	1.889E+04	SHORT HLIF
Y-88	-4.737E-02	1.701E-01	1.714E-01	NOT IDENT.
Y-91	3.774E+01	4.010E+02	4.013E+02	NOT IDENT.
NB-94	1.287E-02	2.471E-02	2.538E-02	NOT IDENT.
NB-95M	-1.045E+00	2.241E+00	2.290E+00	NOT IDENT.
ZR-95	-7.945E-01	1.067E+00	1.126E+00	FAIL ABUN
NB-97	1.000E+41	9.568E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.437E+41	0.000E+00	SHORT HLIF
MO-99	7.432E+31	1.057E+32	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	8.421E+40	0.000E+00	SHORT HLIF
RH-101	-2.137E-02	2.716E-02	2.882E-02	NOT IDENT.
RH-102	3.756E-02	4.194E-02	4.523E-02	FAIL ABUN
RU-103	-2.637E+00	3.895E+00	4.072E+00	FAIL ABUN
RH-106	3.137E-01	3.607E-01	3.875E-01	NOT IDENT.
RU-106	3.137E-01	3.607E-01	3.875E-01	NOT IDENT.
AG-108M	5.223E-04	1.928E-02	1.928E-02	FAIL ABUN
AG-110M	-2.162E-02	7.261E-02	7.326E-02	FAIL ABUN
SN-113	-7.688E-02	1.637E-01	1.673E-01	NOT IDENT.
CD-115	-1.509E+38	2.473E+39	0.000E+00	SHORT HLIF
SN-117M	-3.098E+04	8.704E+04	8.815E+04	SHORT HLIF
TE-123M	-5.563E-02	1.165E-01	1.191E-01	NOT IDENT.
SB-124	-5.007E-01	1.076E+00	1.099E+00	FAIL ABUN
SB-125	-3.335E-03	7.016E-02	7.018E-02	NOT IDENT.
TE-125M	1.695E+02	2.110E+02	2.244E+02	NOT IDENT.
I-126	-5.215E+05	7.512E+05	7.871E+05	SHORT HLIF
SB-126	2.268E+05	1.063E+06	1.068E+06	SHORT HLIF
SB-127	3.067E+21	1.394E+22	0.000E+00	SHORT HLIF
I-131	-1.018E+09	3.851E+09	3.879E+09	SHORT HLIF
I-132	-1.000E+41	1.892E+42	0.000E+00	SHORT HLIF
TE-132	-1.218E+26	3.099E+26	0.000E+00	SHORT HLIF
BA-133	-1.023E-02	3.653E-02	3.682E-02	FAIL ABUN
I-133	1.000E+41	2.226E+41	0.000E+00	SHORT HLIF
CS-134	6.688E-02	8.339E-02	8.867E-02	FAIL ABUN
I-135	-1.000E+41	6.860E+41	0.000E+00	SHORT HLIF
CS-136	-3.178E+04	2.084E+05	2.089E+05	SHORT HLIF
BA-140	8.059E+05	9.192E+05	9.884E+05	SHORT HLIF
LA-140	-4.952E+04	2.511E+05	2.521E+05	SHORT HLIF
CE-141	1.269E+00	2.115E+01	2.115E+01	NOT IDENT.
CE-143	1.000E+41	7.553E+40	0.000E+00	SHORT HLIF
CE-144	-2.300E-01	2.830E-01	3.014E-01	NOT IDENT.
PM-144	-2.303E-02	4.151E-02	4.279E-02	NOT IDENT.
PR-144	-2.013E+00	3.603E+00	3.715E+00	NOT IDENT.
PM-146	6.808E-03	3.246E-02	3.261E-02	NOT IDENT.
ND-147	1.454E+07	2.607E+07	2.688E+07	SHORT HLIF
PM-147	-5.319E+02	6.529E+02	6.955E+02	NOT IDENT.
PM-149	-3.301E+40	4.073E+40	0.000E+00	SHORT HLIF
EU-150	1.286E-02	1.966E-02	2.050E-02	FAIL ABUN
EU-152	-9.259E-02	6.473E-02	7.702E-02	NOT IDENT.
GD-153	-2.272E-01	1.267E-01	1.629E-01	NOT IDENT.
EU-154	3.051E-02	7.574E-02	7.698E-02	FAIL ABUN
EU-155	8.181E-02	7.973E-02	8.785E-02	FAIL ABUN
TB-160	1.600E-01	1.668E+00	1.670E+00	FAIL ABUN
HO-166M	-2.302E-02	4.161E-02	4.288E-02	NOT IDENT.
TM-171	-6.472E+00	1.394E+01	1.425E+01	NOT IDENT.
HF-172	-8.490E-03	1.795E-01	1.795E-01	FAIL ABUN

LU-172	1.469E-03	7.094E-02	7.095E-02	FAIL ABUN
LU-176	2.891E-02	4.251E-02	4.446E-02	FAIL ABUN
HF-181	1.970E+00	3.384E+00	3.498E+00	NOT IDENT.
TA-182	-4.880E-01	6.794E-01	7.142E-01	FAIL ABUN
RE-183	-8.280E-01	2.011E+00	2.045E+00	NOT IDENT.
RE-184	-1.644E+01	2.430E+01	2.540E+01	NOT IDENT.
W-188	1.085E+02	9.984E+01	1.112E+02	FAIL ABUN
IR-192	-8.973E-02	3.175E-01	3.201E-01	FAIL ABUN
BI-207	-4.942E-03	3.759E-02	3.766E-02	FAIL ABUN
PB-210	8.066E-01	1.979E+00	2.012E+00	NOT IDENT.
BI-211	2.332E+00	5.065E-01	1.167E+00	FAIL ABUN
PB-211	2.926E-02	4.865E-01	4.866E-01	NOT IDENT.
BI-212	2.085E+00	6.993E-01	1.172E+00	FAIL ABUN
RN-219	6.479E-02	2.922E-01	2.936E-01	FAIL ABUN
RA-223	-5.056E-02	4.102E-01	4.108E-01	FAIL ABUN
AC-227	9.580E-03	2.097E-01	2.098E-01	FAIL ABUN
TH-227	9.580E-03	2.097E-01	2.098E-01	FAIL ABUN
TH-231	-5.056E-02	4.102E-01	4.108E-01	FAIL ABUN
PA-233	-2.204E-02	4.687E-02	4.791E-02	FAIL ABUN
PA-234	-1.747E-01	2.851E-01	2.958E-01	NOT IDENT.
PA-234M	1.140E+00	2.783E+00	2.831E+00	FAIL ABUN
NP-237	-2.204E-02	4.687E-02	4.791E-02	FAIL ABUN
NP-238	1.000E+41	2.741E+41	0.000E+00	SHORT HLIF
NP-239	1.059E-01	1.855E-01	1.915E-01	FAIL ABUN
PU-239	-8.761E+00	2.558E+02	2.559E+02	FAIL ABUN
AM-241	2.073E-02	9.278E-02	9.325E-02	NOT IDENT.
CM-243	-2.230E-02	7.328E-02	7.397E-02	FAIL ABUN
BK-247	-3.012E-02	6.222E-02	6.368E-02	FAIL ABUN
CM-247	4.372E-03	2.661E-02	2.668E-02	FAIL ABUN
CF-249	2.169E-02	2.712E-02	2.883E-02	NOT IDENT.
CF-251	-7.413E-02	1.001E-01	1.055E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	49.1170	87.09	89.5969	136.47	69.9026
45.60	67.0512	87.57	89.6634	140.51	0.0000
46.54	50.3978	88.03	89.7272	143.76	76.9943
49.72	0.0000	88.34	89.7700	144.24	77.0366
51.35	49.0542	88.47	89.7883	145.44	77.1395
51.87	60.4421	89.96	89.9934	152.43	59.1218
52.39	66.1823	1093.63	90.0864	153.25	0.0000
52.97	51.1179	91.11	0.0000	323.87	81.1746
53.44	54.0115	92.59	90.3519	156.02	0.0000
54.07	70.2134	93.35	90.4545	158.56	0.0000
57.36	0.0000	94.56	66.5202	159.00	66.1533
57.53	70.7147	94.65	66.5291	162.33	60.8511
57.98	69.8221	94.67	66.5311	162.66	0.0000
59.27	65.2073	94.87	52.9688	163.33	60.9141
59.32	65.2138	97.43	78.7289	165.86	57.7415
59.54	65.2421	98.43	59.3877	176.31	60.5934
60.96	76.9696	98.44	59.3886	176.60	0.0000
61.17	77.0010	99.53	47.1750	177.52	73.0228
62.93	75.3307	100.11	64.6626	181.07	0.0000
63.29	75.3825	102.03	67.9260	181.52	58.6452
63.58	75.4238	103.18	68.0358	184.41	58.8079
64.28	75.5238	103.37	68.0539	143.76	58.8809
66.73	75.2205	105.21	52.7214	193.51	72.9990
67.24	75.2913	105.31	52.7288	197.03	62.9358
125.81	74.0523	106.12	63.1380	198.01	53.8295
67.75	74.0616	106.47	79.7370	201.83	51.7168
69.67	89.9659	109.28	54.0541	203.43	50.6393
70.83	78.3929	111.00	64.5978	205.31	70.7061
72.81	93.0885	111.76	0.0000	210.85	57.9216
72.87	93.0979	114.06	72.1817	215.65	56.9987
74.66	93.7157	116.30	0.0000	222.11	50.2942
74.82	93.7410	116.74	57.7372	227.09	54.0263
74.97	93.7650	119.76	56.9066	227.38	62.2630
77.11	94.1063	121.12	74.9500	228.16	0.0000
78.74	98.0050	121.22	74.9597	228.18	44.6710
79.69	109.4335	121.78	64.4472	116.74	44.6710
80.12	97.5641	122.06	57.0718	235.69	59.9262
80.19	0.0000	122.92	67.7134	235.96	59.9394
80.57	97.6366	123.07	70.9007	238.63	59.2773
81.00	109.6685	265.00	61.4232	238.98	0.0000
81.07	109.6811	125.81	65.8320	240.99	59.3887
81.75	97.1588	127.23	77.6466	242.00	59.4360
83.79	89.1317	127.91	58.5495	244.70	59.5627
84.00	89.1616	129.30	72.5104	252.40	0.0000
85.43	89.3640	131.20	68.4004	252.80	43.1554
86.55	89.5215	133.02	74.9753	254.15	0.0000
86.79	89.5548	133.52	70.7333	256.23	51.6819
86.94	89.5758	136.00	68.7891	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	52.0113	355.39	0.0000	584.27	15.8474
264.80	47.1778	356.01	38.5675	595.83	0.0000
265.00	47.1849	364.49	0.0000	427.87	20.3070
268.22	42.0416	366.42	0.0000	602.52	0.0000
269.46	35.2013	372.51	34.6191	604.72	17.4353
270.03	35.2163	375.05	22.5358	607.14	18.9073
271.23	35.2473	377.52	29.5120	609.32	19.4092
273.65	0.0000	356.01	29.6200	610.33	19.4173
276.40	37.8200	388.16	20.9595	614.28	11.6689
277.37	37.8456	388.63	0.0000	618.01	19.4775
277.60	37.8522	391.69	28.8763	620.36	19.4954
278.00	37.8636	264.66	27.2625	621.93	11.7051
279.20	57.0473	401.81	28.1602	630.19	0.0000
279.54	57.0616	402.40	28.1693	631.29	10.7695
279.70	39.1318	404.85	26.4441	633.25	19.5964
280.46	42.4161	410.95	21.2261	634.78	0.0000
283.69	34.3378	413.71	33.6582	635.95	18.6359
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	40.5189	423.72	0.0000	645.85	17.7239
285.90	0.0000	427.09	21.4106	657.76	16.3221
287.50	29.5115	427.87	21.4194	657.90	0.0000
290.67	22.1830	433.94	21.4878	661.66	15.8509
293.27	0.0000	439.40	19.7531	664.57	0.0000
351.93	19.7803	453.88	22.6140	666.33	0.0000
295.96	19.7905	463.37	26.3574	666.50	0.0000
879.38	27.2603	468.07	24.5967	667.71	0.0000
299.98	29.7671	473.00	0.0000	677.62	14.9506
300.09	29.7693	475.06	18.2825	685.70	0.0000
300.13	29.7700	476.78	28.3618	695.00	0.0000
301.36	29.7949	477.60	24.7121	696.49	18.0674
302.85	29.8250	482.18	16.5114	696.51	18.0674
256.23	29.8586	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	17.0685
306.78	29.9041	497.08	22.1729	697.49	17.0699
308.46	29.9377	505.52	16.6959	702.65	15.0897
311.90	35.0077	507.63	0.0000	706.68	19.1423
316.51	30.9335	511.00	26.9677	711.68	19.1770
319.41	0.0000	514.00	29.3326	720.70	0.0000
320.08	0.0000	514.00	29.3326	721.93	0.0000
321.04	30.1868	520.40	28.9528	722.78	21.2803
323.87	31.0817	520.69	0.0000	722.91	21.2811
325.23	49.6072	522.65	0.0000	723.31	19.7642
328.76	0.0000	527.90	0.0000	724.19	3.0416
333.37	23.3268	528.26	24.3697	727.33	4.5674
333.97	25.3644	529.59	18.7573	733.00	6.1023
334.37	31.7139	529.87	0.0000	735.93	19.3440
338.28	28.8245	531.02	0.0000	333.97	8.1491
338.32	28.8252	537.26	0.0000	739.50	0.0000
311.90	30.5618	546.56	0.0000	747.24	17.3763
340.48	30.5618	552.55	28.4241	748.06	10.2242
340.55	0.0000	563.25	15.2305	752.31	16.3828
344.28	38.2928	569.33	15.7474	753.82	0.0000
345.93	27.2578	946.00	18.6121	756.73	18.4592
351.06	35.8887	569.70	18.6137	756.80	19.4855
351.93	35.9075	583.19	21.1200	884.68	12.3369

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	0.0000	1274.44	8.8366	1620.50	1.9110
766.42	0.0000	1001.03	7.7423	1621.92	2.8674
766.84	13.8928	1002.74	7.7460	1678.03	0.0000
772.60	0.0000	1004.73	13.2861	1690.97	2.9046
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	0.0000
778.90	14.4666	1028.54	0.0000	1063.66	4.7142
783.70	0.0000	1037.84	17.8763	1771.35	1.9646
785.37	14.4979	1038.76	0.0000	1791.20	0.0000
792.07	12.4546	631.29	15.6794	1808.65	2.9663
794.95	14.5446	1048.07	0.0000	1810.72	0.0000
795.86	14.5492	1049.04	6.7241	1836.06	3.9739
810.06	9.3970	1050.41	6.7266		
810.29	11.4861	1063.66	12.3759		
344.28	8.3538	1077.00	0.0000		
810.76	9.3988	1077.34	5.0812		
815.77	0.0000	1085.87	14.7118		
1048.07	0.0000	1093.63	15.8753		
832.01	10.5155	1099.45	13.6279		
834.85	11.5778	1112.07	21.6471		
835.71	6.3169	1112.84	19.3726		
836.80	0.0000	1115.54	22.2374		
846.75	0.0000	1120.29	17.1265		
846.77	9.5087	1120.55	17.1277		
856.80	0.0000	1221.41	17.1301		
860.56	9.5500	1129.67	9.1556		
871.09	11.7108	1131.51	0.0000		
873.19	20.2408	1147.95	0.0000		
875.33	0.0000	1173.23	15.0408		
879.38	17.0775	1177.95	11.5837		
880.51	16.0156	1189.05	19.7448		
883.24	16.0291	1204.77	10.4934		
884.68	12.8291	1221.41	15.8027		
889.28	10.7060	1231.02	13.1992		
894.76	16.0858	1235.36	0.0000		
898.04	12.8813	1238.28	11.4591		
900.72	10.7430	1260.41	0.0000		
903.28	17.2025	1271.87	7.9953		
911.20	14.0103	1274.44	6.2224		
912.08	14.0140	1274.54	6.2224		
923.98	0.0000	1291.59	9.8163		
926.50	8.6611	1298.22	0.0000		
929.11	8.6676	1312.11	0.0000		
937.49	10.8614	1332.49	11.7083		
944.13	0.0000	1362.66	0.0000		
946.00	15.2436	1365.19	2.9029		
949.00	10.8980	1368.63	0.0000		
667.71	0.0000	1384.29	2.7328		
962.31	9.8459	1408.01	9.1559		
964.08	13.1348	1457.56	0.0000		
966.17	0.0000	1460.82	1.8516		
911.20	18.0851	1489.16	4.6558		
968.97	18.0851	1505.03	7.4731		
983.53	0.0000	1584.12	1.5182		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                   *
*                               Charleston, SC 29407                             *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235027.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM08.CNF;320
Background date : 2-OCT-2016 11:00:23.
Sample date     : 8-DEC-2015 10:19:00. Acquisition date : 3-OCT-2016 09:08:01.
Sample ID      : G405235027 Sample quantity : 1.58553E+02 GRAM
Detector name  : GAM08 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.68 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID      : 1596249 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	74.88*	97	130	1.18	150.02	146	12	2.71E-02	22.2	9.93E-01
2	1	76.98*	150	111	1.04	154.22	146	12	4.17E-02	14.4	
3	0	83.55*	49	147	1.67	167.36	165	8	1.37E-02	45.1	
4	0	87.08*	47	90	0.91	174.43	172	5	1.31E-02	34.2	
5	0	92.62*	24	216	1.16	185.52	181	10	6.60E-03	123.0	
6	0	129.17	33	96	1.54	258.64	255	8	9.21E-03	54.3	
7	0	185.97*	85	66	1.66	372.30	367	11	2.36E-02	23.1	
8	0	209.64	39	74	1.01	419.67	416	8	1.08E-02	41.6	
9	3	238.61*	312	54	1.16	477.63	472	29	8.66E-02	7.0	1.55E+00
10	3	241.91	74	66	1.79	484.23	472	29	2.05E-02	28.4	
11	0	295.39*	119	46	1.31	591.23	587	9	3.31E-02	14.2	
12	0	300.66	32	69	1.07	601.77	597	11	8.95E-03	52.2	
13	0	328.15	37	31	1.86	656.77	653	9	1.03E-02	31.1	
14	0	338.63*	67	76	1.43	677.75	672	13	1.85E-02	30.3	
15	0	351.96*	158	47	1.16	704.42	699	12	4.38E-02	12.1	
16	0	384.53	53	76	9.77	769.59	759	23	1.47E-02	44.7	
17	0	406.41	57	75	10.03	813.36	801	27	1.59E-02	44.0	
18	0	468.34	11	24	0.93	937.28	931	8	3.07E-03	82.4	
19	0	511.08*	52	66	2.48	1022.78	1014	22	1.45E-02	46.0	
20	0	576.94	8	14	0.59	1154.56	1150	8	2.18E-03	90.2	
21	0	583.60*	119	24	1.84	1167.88	1161	17	3.30E-02	13.5	
22	0	609.17*	148	26	1.68	1219.03	1211	15	4.11E-02	11.4	
23	0	628.44	9	14	1.01	1257.59	1254	6	2.60E-03	70.4	
24	0	663.83	29	24	5.39	1328.40	1319	17	8.17E-03	43.2	
25	0	669.11	14	4	0.58	1338.96	1336	8	3.89E-03	36.4	
26	0	727.14*	32	23	1.27	1455.07	1449	13	8.92E-03	36.8	
27	0	797.54	5	32	1.21	1595.91	1589	10	1.43E-03	210.7	
28	0	829.90	20	0	1.99	1660.65	1656	11	5.56E-03	22.4	
29	0	859.90*	21	10	2.66	1720.67	1713	14	5.83E-03	40.9	
30	0	911.33*	65	30	1.62	1823.57	1815	15	1.80E-02	22.6	
31	0	961.41*	5	6	0.94	1923.75	1921	6	1.39E-03	98.6	
32	0	969.81*	39	32	1.03	1940.57	1930	19	1.08E-02	39.3	
33	0	994.04	10	7	2.90	1989.03	1979	13	2.81E-03	61.0	
34	0	1001.96*	11	13	1.86	2004.89	1999	10	2.98E-03	72.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1071.27	13	8	1.78	2143.54	2138	11	3.63E-03	50.6	
36	0	1120.39*	26	25	2.18	2241.82	2231	17	7.19E-03	49.4	
37	0	1150.35	7	4	1.24	2301.74	2297	9	2.02E-03	63.2	
38	0	1154.66	16	2	1.98	2310.36	2306	9	4.35E-03	30.7	
39	0	1173.23	12	2	1.50	2347.51	2344	8	3.26E-03	36.1	
40	0	1302.27	4	6	0.81	2605.66	2600	8	1.10E-03	118.7	
41	0	1460.80	315	4	2.30	2922.80	2915	14	8.75E-02	5.8	
42	0	1728.85	19	0	1.76	3459.00	3452	12	5.28E-03	22.9	
43	0	1764.94*	19	4	1.68	3531.20	3523	13	5.22E-03	33.6	

Flag: "*" = Peak area was modified by background subtraction


```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235027.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 8-DEC-2015 10:19:00   Acquisition date : 3-OCT-2016 09:08:01
Sample ID         : G405235027           Sample quantity  : 158.55 GRAM
Sample type       : SOLID                 Sample geometry  :
Detector name     : GAMMA8               Detector geometry: CAN
Elapsed live time: 0 01:00:00.00         Elapsed real time: 0 01:00:00.68   0.0%
Energy tolerance  : 1.50 keV             Half life ratio  : 10.00
Errors propagated: No                    Systematic Error : 0.00 %
Efficiency type   : Linear                Efficiencies at  : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	9.671E-01	1.404E+01	1.404E+01	11.55	OK
CD-109	88.03	3.70*	4.287E+00	9.133E-01	1.433E+00	141.09	OK
SN-126	64.28	9.60	2.248E+00	----- Line	Not Found	-----	Absent
	86.94	8.90	4.287E+00	3.797E-01	3.797E-01	141.09	OK
	87.57	37.00*	4.287E+00	9.133E-02	9.134E-02	141.09	OK
TL-208	277.37	6.60	3.710E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.006E+00	3.567E-01	3.567E-01	27.01	OK
	860.56	12.50	1.479E+00	5.555E-01	5.555E-01	81.86	OK
PB-212	74.82	10.28	3.324E+00	1.222E+00	1.222E+00	66.34	OK
	77.11	17.10	3.513E+00	1.567E+00	1.567E+00	28.77	OK
	238.63	43.60*	4.174E+00	9.631E-01	9.631E-01	14.09	OK
	300.09	3.30	3.474E+00	1.544E+00	1.544E+00	104.34	OK
BI-214	609.32	45.49*	1.938E+00	8.533E-01	8.536E-01	22.78	OK
	1120.29	14.92	1.202E+00	6.847E-01	6.850E-01	98.80	OK
	1764.49	15.30	8.178E-01	6.740E-01	6.743E-01	67.14	OK
PB-214	74.82	5.80	3.318E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.513E+00	2.762E+00	2.763E+00	28.77	OK
	87.09	3.41	4.288E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.130E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.524E+00	1.009E+00	1.009E+00	28.32	OK
	351.93	35.60*	3.045E+00	7.856E-01	7.858E-01	24.22	OK
RN-222	609.32	45.49*	1.938E+00	8.533E-01	8.536E-01	22.78	OK
	1120.29	14.92	1.202E+00	6.847E-01	6.850E-01	98.80	OK
	1764.49	15.30	8.178E-01	6.740E-01	6.743E-01	67.14	OK
RA-224	240.99	4.10*	4.131E+00	6.650E-01	6.650E-01	222.68	OK
RA-226	609.32	45.49*	1.938E+00	8.533E-01	8.536E-01	22.78	OK
	1120.29	14.92	1.202E+00	6.847E-01	6.850E-01	98.80	OK
	1764.49	15.30	8.178E-01	6.740E-01	6.743E-01	67.14	OK
AC-228	105.21	1.10	5.138E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.146E+00	1.020E+00	1.020E+00	60.55	OK
	794.95	4.25	1.572E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.512E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.414E+00	8.645E-01	8.645E-01	45.16	OK
	968.97	15.80	1.347E+00	8.811E-01	8.811E-01	78.68	OK
RA-228	105.21	1.10	5.138E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.146E+00	1.020E+00	1.020E+00	60.55	OK
	794.95	4.25	1.572E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.512E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.414E+00	8.645E-01	8.645E-01	45.16	OK
	968.97	15.80	1.347E+00	8.811E-01	8.811E-01	78.68	OK
TH-228	74.82	10.28	3.324E+00	1.222E+00	1.222E+00	66.34	OK
	77.11	17.10	3.513E+00	1.567E+00	1.567E+00	28.77	OK
	238.63	43.60*	4.174E+00	9.631E-01	9.631E-01	14.09	OK
	300.09	3.30	3.474E+00	1.544E+00	1.544E+00	104.34	OK
TH-230	609.32	45.49*	1.938E+00	8.533E-01	8.533E-01	22.78	OK
	1120.29	14.92	1.202E+00	6.847E-01	6.847E-01	98.80	OK
	1764.49	15.30	8.178E-01	6.740E-01	6.740E-01	67.14	OK
PA-231	283.69	1.70	3.643E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.474E+00	9.521E-01	9.521E-01	104.34	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-232	105.21	1.10	5.138E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.146E+00	1.020E+00	1.020E+00	60.55	OK
	835.71	1.61	1.512E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.414E+00	8.645E-01	8.645E-01	45.16	OK
U-234	968.97	15.80	1.347E+00	8.811E-01	8.811E-01	78.68	OK
	609.32	45.49*	1.938E+00	8.533E-01	8.533E-01	22.78	OK
	1120.29	14.92	1.202E+00	6.847E-01	6.847E-01	98.80	OK
AM-243	1764.49	15.30	8.178E-01	6.740E-01	6.740E-01	67.14	OK
	43.53	5.90	2.327E-01	----- Line	Not Found	-----	Absent
ANH-511	74.66	67.20*	3.324E+00	1.870E-01	1.870E-01	66.34	OK
	511.00	100.00*	2.233E+00	1.215E-01	1.215E-01	91.93	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235027.CNF;1 *
 * Acquisition date : 3-OCT-2016 09:08:01 Sensitivity : 3.000 *
 * Detector ID : GAM08 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.68 Half life ratio : ***** *
 * Sample date : 8-DEC-2015 10:19:00 Analyst initials: MXR1 *
 * Sample ID : G405235027 Sample Quantity : 1.5855E+02 GRAM *
 * Batch Number : 1596249 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 21-JUL-2016 06:09:19 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;14 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.404E+01	1.589E+00	7.692E-01
CD-109	1.433E+00	1.982E+00	2.309E+00
SN-126	9.134E-02	1.263E-01	1.579E-01
TL-208	3.567E-01	9.441E-02	6.442E-02
PB-212	9.631E-01	1.330E-01	1.031E-01
BI-214	8.536E-01	1.906E-01	1.144E-01
PB-214	7.858E-01	1.865E-01	1.262E-01
RN-222	8.536E-01	1.906E-01	1.144E-01
RA-224	6.650E-01	1.451E+00	1.106E+00
RA-226	8.536E-01	1.906E-01	1.144E-01
AC-228	8.645E-01	3.826E-01	2.701E-01
RA-228	8.645E-01	3.826E-01	2.701E-01
TH-228	9.631E-01	1.330E-01	1.031E-01
TH-230	8.533E-01	1.905E-01	1.143E-01
PA-231	9.521E-01	9.735E-01	8.617E-01
TH-232	8.645E-01	3.826E-01	2.701E-01
U-234	8.533E-01	1.905E-01	1.143E-01
AM-243	1.870E-01	1.216E-01	1.125E-01
ANH-511	1.215E-01	1.095E-01	5.481E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	6.504E+00	1.145E+01	2.425E+01	NOT IDENT.
NA-22	4.213E-02	4.337E-02	1.038E-01	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	2.021E-02	3.844E-02	9.064E-02	NOT IDENT.
SC-46	-2.279E-01	3.905E-01	7.114E-01	FAIL ABUN
V-48	0.000E+00	1.140E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	4.416E+02	0.000E+00	SHORT HLIF
MN-54	2.085E-02	6.875E-02	1.308E-01	NOT IDENT.
CO-56	2.340E-01	4.575E-01	1.002E+00	NOT IDENT.
MN-56	0.000E+00	1.941E+41	0.000E+00	SHORT HLIF
CO-57	-1.607E-02	5.053E-02	9.168E-02	NOT IDENT.

CO-58	2.274E-01	5.281E-01	1.163E+00	NOT IDENT.
FE-59	-8.323E-01	6.966E+00	1.358E+01	NOT IDENT.
CO-60	-2.168E-02	4.226E-02	7.539E-02	FAIL ABUN
ZN-65	-1.915E-02	2.638E-01	4.365E-01	NOT IDENT.
GE-68	1.983E+00	2.631E+00	5.691E+00	NOT IDENT.
AS-73	-6.587E+00	1.307E+01	2.458E+01	NOT IDENT.
AS-74	0.000E+00	7.045E+03	0.000E+00	SHORT HLIF
SE-75	1.870E-01	2.150E-01	4.561E-01	NOT IDENT.
BR-77	0.000E+00	2.479E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.164E+02	0.000E+00	SHORT HLIF
RB-83	4.196E-01	7.599E-01	1.501E+00	NOT IDENT.
KR-85	3.660E+00	7.482E+00	1.513E+01	NOT IDENT.
SR-85	3.810E-01	7.908E-01	1.598E+00	NOT IDENT.
RB-86	0.000E+00	3.471E+04	0.000E+00	SHORT HLIF
Y-88	-8.357E-02	2.283E-01	4.508E-01	NOT IDENT.
Y-91	-2.909E+02	5.701E+02	1.012E+03	NOT IDENT.
NB-94	2.014E-02	3.428E-02	7.343E-02	NOT IDENT.
NB-95	-8.599E-01	9.997E-01	1.764E+00	NOT IDENT.
NB-95M	-2.035E+00	2.808E+00	4.596E+00	NOT IDENT.
ZR-95	2.936E-01	1.234E+00	2.664E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.306E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.891E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	9.131E-03	3.689E-02	6.517E-02	NOT IDENT.
RH-102	1.055E-02	6.795E-02	1.197E-01	NOT IDENT.
RU-103	4.992E-01	5.610E+00	1.108E+01	FAIL ABUN
RH-106	-8.768E-02	5.710E-01	1.056E+00	NOT IDENT.
RU-106	-8.768E-02	5.710E-01	1.056E+00	NOT IDENT.
AG-108M	6.716E-03	2.641E-02	5.349E-02	NOT IDENT.
AG-110M	-3.887E-02	8.707E-02	1.649E-01	NOT IDENT.
SN-113	1.470E-01	2.612E-01	4.943E-01	NOT IDENT.
CD-115	0.000E+00	3.789E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.062E+05	0.000E+00	SHORT HLIF
TE-123M	-9.638E-03	1.360E-01	2.481E-01	NOT IDENT.
SB-124	7.086E-02	1.721E+00	4.004E+00	NOT IDENT.
SB-125	-3.865E-02	1.081E-01	2.002E-01	NOT IDENT.
TE-125M	1.640E+01	3.259E+02	6.058E+02	NOT IDENT.
I-126	0.000E+00	7.697E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.382E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	2.081E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	5.044E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	7.139E+40	0.000E+00	SHORT HLIF
TE-132	0.000E+00	4.310E+26	0.000E+00	SHORT HLIF
BA-133	8.272E-03	4.338E-02	7.863E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	6.493E-02	6.034E-02	1.336E-01	NOT IDENT.
CS-135	1.302E-02	1.510E-01	2.983E-01	NOT IDENT.
I-135	0.000E+00	1.050E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.149E+05	0.000E+00	SHORT HLIF
BA-137M	5.530E-02	4.183E-02	8.721E-02	NOT IDENT.
CS-137	5.842E-02	4.419E-02	9.213E-02	NOT IDENT.
CE-139	4.175E-02	1.267E-01	2.372E-01	NOT IDENT.
BA-140	0.000E+00	1.417E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.892E+05	0.000E+00	SHORT HLIF
CE-141	-8.205E+00	2.795E+01	4.990E+01	NOT IDENT.
CE-143	0.000E+00	1.864E+41	0.000E+00	SHORT HLIF
CE-144	7.581E-03	3.674E-01	6.760E-01	NOT IDENT.
PM-144	9.004E-03	6.253E-02	1.271E-01	NOT IDENT.
PR-144	7.316E-01	5.425E+00	1.102E+01	NOT IDENT.
PM-146	-4.860E-02	4.515E-02	7.404E-02	NOT IDENT.
ND-147	0.000E+00	3.516E+07	0.000E+00	SHORT HLIF
PM-147	1.708E+02	8.258E+02	1.581E+03	NOT IDENT.
PM-149	0.000E+00	5.024E+40	0.000E+00	SHORT HLIF
EU-150	-3.078E-03	2.875E-02	4.961E-02	FAIL ABUN
EU-152	-2.251E-02	9.157E-02	1.560E-01	NOT IDENT.
GD-153	-2.881E-02	1.927E-01	3.602E-01	NOT IDENT.
EU-154	1.033E-01	1.063E-01	2.544E-01	NOT IDENT.
EU-155	1.347E-01	1.234E-01	2.515E-01	FAIL ABUN
TB-160	-8.125E-01	1.959E+00	3.684E+00	FAIL ABUN
HO-166M	-2.912E-02	4.958E-02	9.285E-02	NOT IDENT.
TM-171	-3.054E+00	3.295E+01	6.422E+01	NOT IDENT.
HF-172	-5.277E-02	2.759E-01	4.622E-01	FAIL ABUN
LU-172	-1.452E-02	8.554E-02	1.670E-01	FAIL ABUN
LU-176	-1.481E-03	2.347E-02	4.603E-02	FAIL ABUN
HF-181	-3.218E-01	4.122E+00	7.960E+00	NOT IDENT.
TA-182	-1.921E-02	9.545E-01	1.863E+00	FAIL ABUN
RE-183	-2.253E+00	3.904E+00	7.300E+00	NOT IDENT.

RE-184	-2.091E+01	3.319E+01	5.698E+01	NOT IDENT.
W-188	-1.239E+02	1.328E+02	2.051E+02	NOT IDENT.
IR-192	-5.255E-01	4.755E-01	8.214E-01	FAIL ABUN
HG-203	-9.311E-01	2.515E+00	4.758E+00	NOT IDENT.
BI-207	-2.076E-02	4.967E-02	9.162E-02	FAIL ABUN
PB-210	3.177E+00	6.242E+00	1.286E+01	NOT IDENT.
BI-211	0.000E+00	5.137E-01	7.917E-01	FAIL ABUN
PB-211	5.463E-01	6.832E-01	1.447E+00	NOT IDENT.
BI-212	1.426E+00	1.028E+00	1.486E+00	FAIL ABUN
RN-219	1.594E-01	3.681E-01	7.573E-01	NOT IDENT.
RA-223	2.525E-01	6.153E-01	1.135E+00	FAIL ABUN
AC-227	5.033E-02	2.330E-01	4.692E-01	FAIL ABUN
TH-227	5.033E-02	2.330E-01	4.692E-01	FAIL ABUN
TH-229	-1.659E-01	4.541E-01	8.847E-01	FAIL ABUN
TH-231	2.525E-01	6.153E-01	1.135E+00	FAIL ABUN
PA-233	1.298E-02	5.757E-02	1.162E-01	FAIL ABUN
PA-234	-3.659E-02	2.617E-01	5.191E-01	NOT IDENT.
PA-234M	4.681E+00	6.678E+00	1.131E+01	FAIL ABUN
TH-234	-8.951E-01	1.646E+00	3.154E+00	FAIL ABUN
U-235	-1.495E-02	2.094E-01	3.874E-01	FAIL ABUN
NP-237	1.298E-02	5.757E-02	1.162E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
U-238	-8.951E-01	1.646E+00	3.154E+00	FAIL ABUN
NP-239	4.169E-02	2.647E-01	5.019E-01	NOT IDENT.
PU-239	5.725E+02	6.099E+02	7.002E+02	FAIL ABUN
AM-241	1.133E-01	1.732E-01	3.575E-01	NOT IDENT.
CM-243	-7.545E-02	1.075E-01	1.904E-01	NOT IDENT.
BK-247	5.725E-02	7.294E-02	1.542E-01	FAIL ABUN
CM-247	2.614E-02	3.534E-02	7.457E-02	NOT IDENT.
CF-249	1.604E-02	4.279E-02	8.566E-02	NOT IDENT.
CF-251	-1.970E-02	1.169E-01	2.321E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	306	10.66*	9.671E-01	1.404E+01	1.404E+01	11.55
CD-109	88.03	62	3.70*	4.287E+00	1.843E+00	2.892E+00	68.45
SN-126	64.28	-----	9.60	2.248E+00	-----	Line Not Found	-----
	86.94	62	8.90	4.287E+00	7.662E-01	7.662E-01	68.45
	87.57	62	37.00*	4.287E+00	1.843E-01	1.843E-01	68.45
TL-208	277.37	-----	6.60	3.710E+00	-----	Line Not Found	-----
	583.19	128	85.00*	2.006E+00	3.567E-01	3.567E-01	27.01
	860.56	22	12.50	1.479E+00	5.555E-01	5.555E-01	81.86
BI-211	72.87	-----	1.23	3.135E+00	-----	Line Not Found	-----
	351.06	180	12.92*	3.045E+00	2.165E+00	2.165E+00	24.22
PB-212	74.82	129	10.28	3.324E+00	1.791E+00	1.791E+00	44.36
	77.11	199	17.10	3.513E+00	1.567E+00	1.567E+00	28.77
	238.63	370	43.60*	4.174E+00	9.631E-01	9.631E-01	14.09
	300.09	37	3.30	3.474E+00	1.544E+00	1.544E+00	104.34
BI-214	609.32	159	45.49*	1.938E+00	8.533E-01	8.536E-01	22.78
	1120.29	26	14.92	1.202E+00	6.847E-01	6.850E-01	98.80
	1764.49	18	15.30	8.178E-01	6.740E-01	6.743E-01	67.14
PB-214	74.82	129	5.80	3.324E+00	3.175E+00	3.176E+00	44.36
	77.11	199	9.70	3.513E+00	2.762E+00	2.763E+00	28.77
	87.09	62	3.41	4.287E+00	2.000E+00	2.000E+00	68.45
	242.00	88	7.25	4.131E+00	1.385E+00	1.385E+00	56.85
	295.22	138	18.42	3.524E+00	1.009E+00	1.009E+00	28.32
	351.93	180	35.60*	3.045E+00	7.856E-01	7.858E-01	24.22
RN-222	609.32	159	45.49*	1.938E+00	8.533E-01	8.536E-01	22.78
	1120.29	26	14.92	1.202E+00	6.847E-01	6.850E-01	98.80
	1764.49	18	15.30	8.178E-01	6.740E-01	6.743E-01	67.14
RA-224	240.99	88	4.10*	4.131E+00	2.449E+00	2.449E+00	56.85
RA-226	609.32	159	45.49*	1.938E+00	8.533E-01	8.536E-01	22.78
	1120.29	26	14.92	1.202E+00	6.847E-01	6.850E-01	98.80
	1764.49	18	15.30	8.178E-01	6.740E-01	6.743E-01	67.14
AC-228	105.21	-----	1.10	5.138E+00	-----	Line Not Found	-----
	338.32	76	11.27	3.146E+00	1.020E+00	1.020E+00	60.55
	794.95	-----	4.25	1.572E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.512E+00	-----	Line Not Found	-----
	911.20	67	25.80*	1.414E+00	8.645E-01	8.645E-01	45.16
	968.97	40	15.80	1.347E+00	8.811E-01	8.811E-01	78.68
RA-228	105.21	-----	1.10	5.138E+00	-----	Line Not Found	-----
	338.32	76	11.27	3.146E+00	1.020E+00	1.020E+00	60.55
	794.95	-----	4.25	1.572E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.512E+00	-----	Line Not Found	-----
	911.20	67	25.80*	1.414E+00	8.645E-01	8.645E-01	45.16
	968.97	40	15.80	1.347E+00	8.811E-01	8.811E-01	78.68
TH-228	74.82	129	10.28	3.324E+00	1.791E+00	1.791E+00	44.36
	77.11	199	17.10	3.513E+00	1.567E+00	1.567E+00	28.77
	238.63	370	43.60*	4.174E+00	9.631E-01	9.631E-01	14.09
	300.09	37	3.30	3.474E+00	1.544E+00	1.544E+00	104.34
TH-230	609.32	159	45.49*	1.938E+00	8.533E-01	8.533E-01	22.78

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	1120.29	26	14.92	1.202E+00	6.847E-01	6.847E-01	98.80
	1764.49	18	15.30	8.178E-01	6.740E-01	6.740E-01	67.14
PA-231	283.69	-----	1.70	3.643E+00	-----	Line Not Found	-----
	301.36	37	5.35*	3.474E+00	9.521E-01	9.521E-01	104.34
TH-232	105.21	-----	1.10	5.138E+00	-----	Line Not Found	-----
	338.32	76	11.27	3.146E+00	1.020E+00	1.020E+00	60.55
	835.71	-----	1.61	1.512E+00	-----	Line Not Found	-----
	911.20	67	25.80*	1.414E+00	8.645E-01	8.645E-01	45.16
	968.97	40	15.80	1.347E+00	8.811E-01	8.811E-01	78.68
U-234	609.32	159	45.49*	1.938E+00	8.533E-01	8.533E-01	22.78
	1120.29	26	14.92	1.202E+00	6.847E-01	6.847E-01	98.80
	1764.49	18	15.30	8.178E-01	6.740E-01	6.740E-01	67.14
AM-243	43.53	-----	5.90	2.327E-01	-----	Line Not Found	-----
	74.66	129	67.20*	3.324E+00	2.740E-01	2.740E-01	44.36
ANH-511	511.00	57	100.00*	2.233E+00	1.215E-01	1.215E-01	91.93

Flag: "*" = Keyline

Total number of lines in spectrum 43
 Number of unidentified lines 11
 Number of lines tentatively identified by NID 32 74.42%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.404E+01	1.404E+01	0.162E+01	11.55	
CD-109	461.40D	1.57	1.843E+00	2.892E+00	1.980E+00	68.45	
SN-126	2.30E+05Y	1.00	1.843E-01	1.843E-01	1.261E-01	68.45	
TL-208	1.41E+10Y	1.00	3.567E-01	3.567E-01	0.963E-01	27.01	
BI-211	7.04E+08Y	1.00	2.165E+00	2.165E+00	0.524E+00	24.22	
PB-212	1.41E+10Y	1.00	9.631E-01	9.631E-01	1.357E-01	14.09	
BI-214	1600.00Y	1.00	8.533E-01	8.536E-01	1.945E-01	22.78	
PB-214	1600.00Y	1.00	7.856E-01	7.858E-01	1.903E-01	24.22	
RN-222	1600.00Y	1.00	8.533E-01	8.536E-01	1.945E-01	22.78	
RA-224	1.41E+10Y	1.00	2.449E+00	2.449E+00	1.392E+00	56.85	
RA-226	1600.00Y	1.00	8.533E-01	8.536E-01	1.945E-01	22.78	
AC-228	1.41E+10Y	1.00	8.645E-01	8.645E-01	3.904E-01	45.16	
RA-228	1.41E+10Y	1.00	8.645E-01	8.645E-01	3.904E-01	45.16	
TH-228	1.41E+10Y	1.00	9.631E-01	9.631E-01	1.357E-01	14.09	
TH-230	7.54E+04Y	1.00	8.533E-01	8.533E-01	1.944E-01	22.78	
PA-231	7.04E+08Y	1.00	9.521E-01	9.521E-01	9.934E-01	104.34	
TH-232	1.41E+10Y	1.00	8.645E-01	8.645E-01	3.904E-01	45.16	
U-234	2.45E+05Y	1.00	8.533E-01	8.533E-01	1.944E-01	22.78	
AM-243	7370.00Y	1.00	2.740E-01	2.740E-01	1.216E-01	44.36	
ANH-511	1.00E+09Y	1.00	1.215E-01	1.215E-01	1.117E-01	91.93	
Total Activity :			3.195E+01	3.300E+01			

Grand Total Activity : 3.195E+01 3.300E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	83.55	65	194	1.67	167.36	165	8	1.37E-02	90.3	4.04E+00	T
0	92.62	31	281	1.16	185.52	181	10	6.60E-03	****	4.62E+00	T
0	129.17	42	121	1.54	258.64	255	8	9.21E-03	****	5.48E+00	T
0	185.97	104	80	1.66	372.30	367	11	2.36E-02	46.3	4.93E+00	T
0	209.64	47	89	1.01	419.67	416	8	1.08E-02	83.3	4.58E+00	T
0	328.15	43	35	1.86	656.77	653	9	1.03E-02	62.2	3.23E+00	T
0	384.53	60	86	9.77	769.59	759	23	1.47E-02	89.3	2.83E+00	T
0	406.41	64	84	10.03	813.36	801	27	1.59E-02	88.0	2.70E+00	T
0	468.34	12	26	0.93	937.28	931	8	3.07E-03	****	2.40E+00	T
0	576.94	8	15	0.59	1154.56	1150	8	2.18E-03	****	2.02E+00	T
0	628.44	10	15	1.01	1257.59	1254	6	2.60E-03	****	1.89E+00	T
0	663.83	31	25	5.39	1328.40	1319	17	8.17E-03	86.4	1.81E+00	T
0	669.11	15	4	0.58	1338.96	1336	8	3.89E-03	72.8	1.80E+00	T
0	727.14	34	24	1.27	1455.07	1449	13	8.92E-03	73.6	1.69E+00	T
0	797.54	5	33	1.21	1595.91	1589	10	1.43E-03	****	1.57E+00	T
0	829.90	21	0	1.99	1660.65	1656	11	5.56E-03	44.7	1.52E+00	T
0	961.41	5	6	0.94	1923.75	1921	6	1.39E-03	****	1.36E+00	T
0	994.04	10	7	2.90	1989.03	1979	13	2.81E-03	****	1.32E+00	T
0	1001.96	11	13	1.86	2004.89	1999	10	2.98E-03	****	1.31E+00	T
0	1071.27	13	8	1.78	2143.54	2138	11	3.63E-03	****	1.25E+00	T
0	1150.35	7	4	1.24	2301.74	2297	9	2.02E-03	****	1.18E+00	T
0	1154.66	16	2	1.98	2310.36	2306	9	4.35E-03	61.3	1.17E+00	T
0	1173.23	12	2	1.50	2347.51	2344	8	3.26E-03	72.2	1.16E+00	T
0	1302.27	4	6	0.81	2605.66	2600	8	1.10E-03	****	1.06E+00	T
0	1728.85	18	0	1.76	3459.00	3452	12	5.28E-03	45.9	8.34E-01	T

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
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DETECTOR AND SAMPLE DATA

```
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235027.CNF;1
* Acquisition date   : 3-OCT-2016 09:08:01 Sensitivity      : 3.000
* Detector ID        : GAM08 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.68 Half life ratio  : *****
* Sample date        : 8-DEC-2015 10:19:00 Nuclide Library : SOLID
* Sample ID          : G405235027 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity : 1.5855E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight       : 0.00000
*****
```

CALIBRATION INFORMATION

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* Eff. Cal. date    : 21-JUL-2016 06:09:19 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;14
*****
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	3.220E-01
CD-109	1.087E+00
SN-126	7.460E-02
TL-208	2.833E-02
PB-212	4.785E-02
BI-214	4.968E-02
PB-214	5.694E-02
RN-222	4.968E-02
RA-224	5.131E-01
RA-226	4.968E-02
AC-228	1.171E-01
RA-228	1.171E-01
TH-228	4.785E-02
TH-230	4.966E-02
PA-231	3.946E-01
TH-232	1.171E-01
U-234	4.966E-02
AM-243	5.314E-02
ANH-511	2.443E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.078E+01	NOT IDENT.
NA-22	4.445E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	3.727E-02	NOT IDENT.
SC-46	3.013E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.699E-02	NOT IDENT.
CO-56	4.363E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.267E-02	NOT IDENT.
CO-58	5.015E-01	NOT IDENT.

FE-59	5.782E+00	NOT IDENT.
CO-60	3.078E-02	FAIL ABUN
ZN-65	1.933E-01	NOT IDENT.
GE-68	2.495E+00	NOT IDENT.
AS-73	1.144E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	2.112E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	6.756E-01	NOT IDENT.
KR-85	6.840E+00	NOT IDENT.
SR-85	7.223E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.677E-01	NOT IDENT.
Y-91	4.292E+02	NOT IDENT.
NB-94	3.291E-02	NOT IDENT.
NB-95	7.773E-01	NOT IDENT.
NB-95M	2.131E+00	NOT IDENT.
ZR-95	1.141E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.039E-02	NOT IDENT.
RH-102	5.256E-02	NOT IDENT.
RU-103	4.899E+00	FAIL ABUN
RH-106	4.669E-01	NOT IDENT.
RU-106	4.669E-01	NOT IDENT.
AG-108M	2.386E-02	NOT IDENT.
AG-110M	6.812E-02	NOT IDENT.
SN-113	2.247E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.152E-01	NOT IDENT.
SB-124	1.499E+00	NOT IDENT.
SB-125	8.945E-02	NOT IDENT.
TE-125M	2.847E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.553E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	6.039E-02	NOT IDENT.
CS-135	1.381E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	3.949E-02	NOT IDENT.
CS-137	4.172E-02	NOT IDENT.
CE-139	1.112E-01	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.339E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.146E-01	NOT IDENT.
PM-144	5.683E-02	NOT IDENT.
PR-144	4.925E+00	NOT IDENT.
PM-146	3.240E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.353E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.257E-02	FAIL ABUN
EU-152	6.952E-02	NOT IDENT.
GD-153	1.684E-01	NOT IDENT.
EU-154	1.090E-01	NOT IDENT.
EU-155	1.186E-01	FAIL ABUN
TB-160	1.576E+00	FAIL ABUN
HO-166M	3.931E-02	NOT IDENT.
TM-171	3.001E+01	NOT IDENT.
HF-172	2.161E-01	FAIL ABUN
LU-172	7.206E-02	FAIL ABUN
LU-176	2.091E-02	FAIL ABUN
HF-181	3.504E+00	NOT IDENT.
TA-182	7.998E-01	FAIL ABUN
RE-183	3.393E+00	NOT IDENT.
RE-184	2.420E+01	NOT IDENT.

W-188	9.332E+01	NOT IDENT.
IR-192	3.699E-01	FAIL ABUN
HG-203	2.185E+00	NOT IDENT.
BI-207	3.872E-02	FAIL ABUN
PB-210	6.036E+00	NOT IDENT.
BI-211	3.790E-01	FAIL ABUN
PB-211	6.584E-01	NOT IDENT.
BI-212	6.844E-01	FAIL ABUN
RN-219	3.415E-01	NOT IDENT.
RA-223	5.161E-01	FAIL ABUN
AC-227	2.166E-01	FAIL ABUN
TH-227	2.166E-01	FAIL ABUN
TH-229	4.103E-01	FAIL ABUN
TH-231	5.161E-01	FAIL ABUN
PA-233	5.293E-02	FAIL ABUN
PA-234	2.198E-01	NOT IDENT.
PA-234M	5.067E+00	FAIL ABUN
TH-234	1.489E+00	FAIL ABUN
U-235	1.822E-01	FAIL ABUN
NP-237	5.293E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.489E+00	FAIL ABUN
NP-239	2.348E-01	NOT IDENT.
PU-239	3.303E+02	FAIL ABUN
AM-241	1.674E-01	NOT IDENT.
CM-243	8.855E-02	NOT IDENT.
BK-247	7.124E-02	FAIL ABUN
CM-247	3.388E-02	NOT IDENT.
CF-249	3.921E-02	NOT IDENT.
CF-251	1.082E-01	NOT IDENT.

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235027.CNF;1
* Acquisition date   : 3-OCT-2016 09:08:01 Sensitivity      : 3.000
* Detector ID        : GAM08 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.68 Half life ratio : *****
* Sample date        : 8-DEC-2015 10:19:00 Nuclide Library : SOLID
* Sample ID          : G405235027 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity : 1.5855E+02 GRAM
*                               Quantity Err(%) : 1.2614E-03 %
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight  : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 21-JUL-2016 06:09:19 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.404E+01	1.750E+00	1.750E+00
CD-109	1.433E+00	1.994E+00	1.994E+00
SN-126	9.134E-02	1.269E-01	1.269E-01
TL-208	3.567E-01	9.562E-02	9.562E-02
PB-212	9.631E-01	1.425E-01	1.425E-01
BI-214	8.536E-01	1.941E-01	1.941E-01
PB-214	7.858E-01	1.893E-01	1.893E-01
RN-222	8.536E-01	1.941E-01	1.941E-01
RA-224	6.650E-01	1.456E+00	1.456E+00
RA-226	8.536E-01	1.941E-01	1.941E-01
AC-228	8.645E-01	3.851E-01	3.851E-01
RA-228	8.645E-01	3.851E-01	3.851E-01
TH-228	9.631E-01	1.425E-01	1.425E-01
TH-230	8.533E-01	1.940E-01	1.940E-01
PA-231	9.521E-01	9.945E-01	9.945E-01
TH-232	8.645E-01	3.851E-01	3.851E-01
U-234	8.533E-01	1.940E-01	1.940E-01
AM-243	1.870E-01	1.226E-01	1.226E-01
ANH-511	1.215E-01	1.096E-01	1.096E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	6.504E+00	1.145E+01	1.182E+01	NOT IDENT.
NA-22	4.213E-02	4.339E-02	4.737E-02	NOT IDENT.
NA-24	1.000E+41	5.665E+41	0.000E+00	SHORT HLIF
AL-26	2.021E-02	3.846E-02	3.952E-02	NOT IDENT.
SC-46	-2.279E-01	3.906E-01	4.039E-01	FAIL ABUN
V-48	-6.902E+02	1.140E+04	1.141E+04	SHORT HLIF
CR-51	2.475E+02	4.417E+02	4.556E+02	SHORT HLIF
MN-54	2.085E-02	6.875E-02	6.939E-02	NOT IDENT.
CO-56	2.340E-01	4.576E-01	4.696E-01	NOT IDENT.
MN-56	1.000E+41	1.941E+41	0.000E+00	SHORT HLIF
CO-57	-1.607E-02	5.054E-02	5.106E-02	NOT IDENT.

CO-58	2.274E-01	5.282E-01	5.381E-01	NOT IDENT.
FE-59	-8.323E-01	6.966E+00	6.976E+00	NOT IDENT.
CO-60	-2.168E-02	4.227E-02	4.338E-02	FAIL ABUN
ZN-65	-1.915E-02	2.638E-01	2.639E-01	NOT IDENT.
GE-68	1.983E+00	2.632E+00	2.780E+00	NOT IDENT.
AS-73	-6.587E+00	1.314E+01	1.347E+01	NOT IDENT.
AS-74	-7.177E+02	7.045E+03	7.053E+03	SHORT HLIF
SE-75	1.870E-01	2.152E-01	2.311E-01	NOT IDENT.
BR-77	1.795E+38	1.554E+39	0.000E+00	SHORT HLIF
SR-82	1.349E+02	6.165E+02	6.195E+02	SHORT HLIF
RB-83	4.196E-01	7.621E-01	7.852E-01	NOT IDENT.
KR-85	3.660E+00	7.484E+00	7.664E+00	NOT IDENT.
SR-85	3.810E-01	7.909E-01	8.094E-01	NOT IDENT.
RB-86	1.391E+04	3.471E+04	3.527E+04	SHORT HLIF
Y-88	-8.357E-02	2.284E-01	2.315E-01	NOT IDENT.
Y-91	-2.909E+02	5.702E+02	5.851E+02	NOT IDENT.
NB-94	2.014E-02	3.429E-02	3.547E-02	NOT IDENT.
NB-95	-8.599E-01	1.000E+00	1.073E+00	NOT IDENT.
NB-95M	-2.035E+00	2.813E+00	2.959E+00	NOT IDENT.
ZR-95	2.936E-01	1.234E+00	1.241E+00	NOT IDENT.
NB-97	-1.000E+41	4.063E+42	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.307E+41	0.000E+00	SHORT HLIF
MO-99	-1.083E+32	1.892E+32	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	2.129E+41	0.000E+00	SHORT HLIF
RH-101	9.131E-03	3.693E-02	3.716E-02	NOT IDENT.
RH-102	1.055E-02	6.795E-02	6.812E-02	NOT IDENT.
RU-103	4.992E-01	5.610E+00	5.615E+00	FAIL ABUN
RH-106	-8.768E-02	5.711E-01	5.724E-01	NOT IDENT.
RU-106	-8.768E-02	5.711E-01	5.724E-01	NOT IDENT.
AG-108M	6.716E-03	2.641E-02	2.658E-02	NOT IDENT.
AG-110M	-3.887E-02	8.709E-02	8.884E-02	NOT IDENT.
SN-113	1.470E-01	2.613E-01	2.695E-01	NOT IDENT.
CD-115	-1.921E+39	3.805E+39	0.000E+00	SHORT HLIF
SN-117M	-7.708E+04	1.066E+05	1.121E+05	SHORT HLIF
TE-123M	-9.638E-03	1.360E-01	1.361E-01	NOT IDENT.
SB-124	7.086E-02	1.721E+00	1.721E+00	NOT IDENT.
SB-125	-3.865E-02	1.082E-01	1.096E-01	NOT IDENT.
TE-125M	1.640E+01	3.259E+02	3.260E+02	NOT IDENT.
I-126	8.055E+05	7.774E+05	8.580E+05	SHORT HLIF
SB-126	1.356E+06	1.405E+06	1.533E+06	SHORT HLIF
SB-127	-1.779E+22	3.212E+22	0.000E+00	SHORT HLIF
I-131	2.690E+09	5.045E+09	5.189E+09	SHORT HLIF
I-132	1.000E+41	1.850E+42	0.000E+00	SHORT HLIF
TE-132	2.099E+26	4.394E+26	0.000E+00	SHORT HLIF
BA-133	8.272E-03	4.338E-02	4.354E-02	FAIL ABUN
I-133	-1.000E+41	7.469E+41	0.000E+00	SHORT HLIF
CS-134	6.493E-02	6.040E-02	6.712E-02	NOT IDENT.
CS-135	1.302E-02	1.510E-01	1.511E-01	NOT IDENT.
I-135	-1.000E+41	6.858E+41	0.000E+00	SHORT HLIF
CS-136	8.062E+04	3.150E+05	3.171E+05	SHORT HLIF
BA-137M	5.530E-02	4.190E-02	4.875E-02	NOT IDENT.
CS-137	5.842E-02	4.426E-02	5.150E-02	NOT IDENT.
CE-139	4.175E-02	1.270E-01	1.284E-01	NOT IDENT.
BA-140	1.265E+06	1.418E+06	1.529E+06	SHORT HLIF
LA-140	-4.856E+05	4.898E+05	5.365E+05	SHORT HLIF
CE-141	-8.205E+00	2.795E+01	2.819E+01	NOT IDENT.
CE-143	1.000E+41	1.867E+41	0.000E+00	SHORT HLIF
CE-144	7.581E-03	3.674E-01	3.674E-01	NOT IDENT.
PM-144	9.004E-03	6.254E-02	6.267E-02	NOT IDENT.
PR-144	7.316E-01	5.425E+00	5.435E+00	NOT IDENT.
PM-146	-4.860E-02	4.529E-02	5.031E-02	NOT IDENT.
ND-147	1.296E+07	3.517E+07	3.565E+07	SHORT HLIF
PM-147	1.708E+02	8.259E+02	8.294E+02	NOT IDENT.
PM-149	-4.055E+40	5.102E+40	0.000E+00	SHORT HLIF
EU-150	-3.078E-03	2.875E-02	2.878E-02	FAIL ABUN
EU-152	-2.251E-02	9.158E-02	9.214E-02	NOT IDENT.
GD-153	-2.881E-02	1.927E-01	1.931E-01	NOT IDENT.
EU-154	1.033E-01	1.064E-01	1.161E-01	NOT IDENT.
EU-155	1.347E-01	1.237E-01	1.378E-01	FAIL ABUN
TB-160	-8.125E-01	1.960E+00	1.994E+00	FAIL ABUN
HO-166M	-2.912E-02	4.960E-02	5.131E-02	NOT IDENT.
TM-171	-3.054E+00	3.295E+01	3.298E+01	NOT IDENT.
HF-172	-5.277E-02	2.761E-01	2.771E-01	FAIL ABUN
LU-172	-1.452E-02	8.555E-02	8.580E-02	FAIL ABUN
LU-176	-1.481E-03	2.347E-02	2.348E-02	FAIL ABUN
HF-181	-3.218E-01	4.122E+00	4.124E+00	NOT IDENT.
TA-182	-1.921E-02	9.545E-01	9.546E-01	FAIL ABUN
RE-183	-2.253E+00	3.920E+00	4.050E+00	NOT IDENT.

RE-184	-2.091E+01	3.356E+01	3.486E+01	NOT IDENT.
W-188	-1.239E+02	1.335E+02	1.447E+02	NOT IDENT.
IR-192	-5.255E-01	4.760E-01	5.317E-01	FAIL ABUN
HG-203	-9.311E-01	2.516E+00	2.550E+00	NOT IDENT.
BI-207	-2.076E-02	4.968E-02	5.055E-02	FAIL ABUN
PB-210	3.177E+00	6.249E+00	6.411E+00	NOT IDENT.
BI-211	2.165E+00	5.227E-01	1.107E+00	FAIL ABUN
PB-211	5.463E-01	6.838E-01	7.268E-01	NOT IDENT.
BI-212	1.426E+00	1.031E+00	1.215E+00	FAIL ABUN
RN-219	1.594E-01	3.687E-01	3.756E-01	NOT IDENT.
RA-223	2.525E-01	6.155E-01	6.259E-01	FAIL ABUN
AC-227	5.033E-02	2.331E-01	2.342E-01	FAIL ABUN
TH-227	5.033E-02	2.331E-01	2.342E-01	FAIL ABUN
TH-229	-1.659E-01	4.541E-01	4.603E-01	FAIL ABUN
TH-231	2.525E-01	6.155E-01	6.259E-01	FAIL ABUN
PA-233	1.298E-02	5.757E-02	5.787E-02	FAIL ABUN
PA-234	-3.659E-02	2.651E-01	2.656E-01	NOT IDENT.
PA-234M	4.681E+00	6.681E+00	7.007E+00	FAIL ABUN
TH-234	-8.951E-01	1.658E+00	1.707E+00	FAIL ABUN
U-235	-1.495E-02	2.094E-01	2.095E-01	FAIL ABUN
NP-237	1.298E-02	5.757E-02	5.787E-02	FAIL ABUN
NP-238	1.000E+41	3.059E+41	0.000E+00	SHORT HLIF
U-238	-8.951E-01	1.658E+00	1.707E+00	FAIL ABUN
NP-239	4.169E-02	2.647E-01	2.654E-01	NOT IDENT.
PU-239	5.725E+02	6.104E+02	6.628E+02	FAIL ABUN
AM-241	1.133E-01	1.734E-01	1.807E-01	NOT IDENT.
CM-243	-7.545E-02	1.078E-01	1.130E-01	NOT IDENT.
BK-247	5.725E-02	7.384E-02	7.822E-02	FAIL ABUN
CM-247	2.614E-02	3.561E-02	3.751E-02	NOT IDENT.
CF-249	1.604E-02	4.281E-02	4.342E-02	NOT IDENT.
CF-251	-1.970E-02	1.170E-01	1.173E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	48.7462	87.09	107.2032	136.47	64.4216
45.60	68.0586	87.57	98.4812	140.51	0.0000
46.54	66.2352	88.03	86.0623	143.76	74.7101
49.72	0.0000	88.34	86.1123	144.24	71.1410
51.35	68.1366	88.47	86.1331	145.44	82.1248
51.87	71.2863	89.96	86.3730	152.43	63.3821
52.39	65.2659	1093.63	90.1777	153.25	0.0000
52.97	68.4295	91.11	0.0000	323.87	70.8574
53.44	66.4684	92.59	99.0311	156.02	0.0000
54.07	68.6258	93.35	99.1683	158.56	0.0000
57.36	0.0000	94.56	68.4899	159.00	58.9988
57.53	77.4974	94.65	68.5007	162.33	77.7589
57.98	71.3771	94.67	68.5035	162.66	0.0000
59.27	58.1129	94.87	68.5278	163.33	63.0255
59.32	58.1202	97.43	72.9554	165.86	66.9405
59.54	58.1512	98.43	68.5859	176.31	62.7602
60.96	87.5264	98.44	68.5873	176.60	0.0000
61.17	90.6978	99.53	68.7176	177.52	67.8766
62.93	78.5145	100.11	75.5524	181.07	0.0000
63.29	89.0581	102.03	74.6705	181.52	58.0889
63.58	83.8760	103.18	72.5488	184.41	63.3484
64.28	86.1129	103.37	75.9741	143.76	63.4422
66.73	89.7652	105.21	64.8352	193.51	62.2866
67.24	91.9828	105.31	63.7084	197.03	59.9562
125.81	85.7238	106.12	66.0726	198.01	60.0195
67.75	81.5029	106.47	75.2299	201.83	67.1526
69.67	80.7883	109.28	73.2876	203.43	64.6797
70.83	93.7813	111.00	67.7502	205.31	71.2887
72.81	88.4735	111.76	0.0000	210.85	56.0563
72.87	88.4848	114.06	68.0819	215.65	61.1354
74.66	95.6258	116.30	0.0000	222.11	60.6537
74.82	95.6578	116.74	67.2099	227.09	64.4847
74.97	95.6876	119.76	57.0462	227.38	63.6196
77.11	96.1134	121.12	54.8311	228.16	0.0000
78.74	85.2374	121.22	54.8397	228.18	54.8258
79.69	88.2962	121.78	58.3893	116.74	54.8258
80.12	67.3655	122.06	67.7603	235.69	72.1464
80.19	0.0000	122.92	69.0182	235.96	64.1470
80.57	67.4265	123.07	65.5233	238.63	55.3771
81.00	82.7226	265.00	67.9258	238.98	0.0000
81.07	89.9916	125.81	73.6240	240.99	55.5000
81.75	82.8455	127.23	58.0801	242.00	55.5524
83.79	97.7704	127.91	73.8515	244.70	55.6918
84.00	97.8106	129.30	63.7666	252.40	0.0000
85.43	83.4416	131.20	50.5221	252.80	45.6083
86.55	95.3570	133.02	55.4024	254.15	0.0000
86.79	95.4000	133.52	57.0264	256.23	44.4780
86.94	95.4277	136.00	60.8030	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	36.5804	355.39	0.0000	584.27	17.9180
264.80	39.3283	356.01	26.5155	595.83	0.0000
265.00	35.6762	364.49	0.0000	427.87	25.9574
268.22	50.4536	366.42	0.0000	602.52	0.0000
269.46	39.4875	372.51	32.7784	604.72	11.8732
270.03	44.1016	375.05	31.8405	607.14	14.7165
271.23	43.2268	377.52	26.9099	609.32	14.7313
273.65	0.0000	356.01	33.0289	610.33	14.7387
276.40	30.4850	388.16	33.1229	614.28	8.5184
277.37	40.6798	388.63	0.0000	618.01	15.9283
277.60	45.3114	391.69	24.1450	620.36	20.5020
278.00	42.5513	264.66	18.2142	621.93	21.6564
279.20	40.7424	401.81	22.2784	630.19	0.0000
279.54	41.6803	402.40	22.2865	631.29	15.4528
279.70	46.3175	404.85	22.3214	633.25	13.7480
280.46	40.7854	410.95	22.4078	634.78	0.0000
283.69	29.7422	413.71	18.3655	635.95	24.0881
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	46.5383	423.72	0.0000	645.85	27.6514
285.90	0.0000	427.09	28.8061	657.76	15.6357
287.50	41.0244	427.87	28.8197	657.90	0.0000
290.67	53.2833	433.94	19.6285	661.66	12.1821
293.27	0.0000	439.40	19.6927	664.57	0.0000
351.93	28.1476	453.88	31.3611	666.33	0.0000
295.96	28.1641	463.37	25.2271	666.50	0.0000
879.38	22.5786	468.07	30.0377	667.71	0.0000
299.98	39.5570	473.00	0.0000	677.62	17.5226
300.09	39.5604	475.06	22.2211	685.70	0.0000
300.13	39.5613	476.78	16.9466	695.00	0.0000
301.36	39.6006	477.60	14.8351	696.49	22.0787
302.85	38.2308	482.18	19.1224	696.51	22.0795
256.23	46.7879	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	26.5036
306.78	34.0884	497.08	17.1377	697.49	26.5054
308.46	37.9256	505.52	11.2981	702.65	17.7087
311.90	31.3726	507.63	0.0000	706.68	20.3987
316.51	45.7949	511.00	22.6626	711.68	15.9972
319.41	0.0000	514.00	22.6987	720.70	0.0000
320.08	0.0000	514.00	22.6987	721.93	0.0000
321.04	38.2943	520.40	19.5220	722.78	25.7115
323.87	24.4650	520.69	0.0000	722.91	25.7133
325.23	17.2870	522.65	0.0000	723.31	25.7177
328.76	0.0000	527.90	0.0000	724.19	20.0095
333.37	36.7162	528.26	25.0468	727.33	15.2050
333.97	36.2488	529.59	23.9748	733.00	24.3835
334.37	42.0610	529.87	0.0000	735.93	16.1554
338.28	39.7580	531.02	0.0000	333.97	14.3691
338.32	39.7588	537.26	0.0000	739.50	0.0000
311.90	39.8214	546.56	0.0000	747.24	19.8348
340.48	39.8214	552.55	19.8464	748.06	18.0371
340.55	0.0000	563.25	18.8442	752.31	11.7440
344.28	26.2958	569.33	25.5708	753.82	0.0000
345.93	30.2274	946.00	25.5736	756.73	9.9543
351.06	28.3805	569.70	23.3516	756.80	9.9547
351.93	28.3982	583.19	17.9089	884.68	13.6125

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	29.9687	1274.44	3.9359	1620.50	3.6908
766.42	21.8005	1001.03	10.8399	1621.92	0.0000
766.84	19.9872	1002.74	18.9305	1678.03	0.0000
772.60	0.0000	1004.73	17.3637	1690.97	2.8085
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	2.8500
778.90	13.6913	1028.54	0.0000	1063.66	12.3633
783.70	0.0000	1037.84	13.9530	1771.35	2.8538
785.37	11.8947	1038.76	0.0000	1791.20	0.0000
792.07	14.6772	631.29	4.9966	1808.65	3.8324
794.95	17.6314	1048.07	0.0000	1810.72	0.0000
795.86	15.6169	1049.04	13.0008	1836.06	4.8157
810.06	12.0058	1050.41	14.0068		
810.29	10.1594	1063.66	14.0624		
344.28	10.1601	1077.00	0.0000		
810.76	9.2374	1077.34	9.2204		
815.77	0.0000	1085.87	12.1326		
1048.07	0.0000	1093.63	13.1730		
832.01	16.3851	1099.45	12.1802		
834.85	11.9289	1112.07	17.9298		
835.71	14.9155	1112.84	22.8252		
836.80	0.0000	1115.54	21.2113		
846.75	0.0000	1120.29	15.3168		
846.77	10.2954	1120.55	15.3177		
856.80	0.0000	1221.41	14.7085		
860.56	9.4055	1129.67	10.2386		
871.09	13.2164	1131.51	0.0000		
873.19	18.8947	1147.95	0.0000		
875.33	0.0000	1173.23	10.3638		
879.38	16.0947	1177.95	13.2828		
880.51	11.3654	1189.05	9.3675		
883.24	12.3244	1204.77	15.6793		
884.68	11.3818	1221.41	12.5991		
889.28	16.1502	1231.02	15.7892		
894.76	18.0839	1235.36	0.0000		
898.04	11.4342	1238.28	8.4370		
900.72	14.3060	1260.41	0.0000		
903.28	17.4548	1271.87	9.5746		
911.20	14.3568	1274.44	4.2583		
912.08	14.3610	1274.54	4.2583		
923.98	0.0000	1291.59	9.6229		
926.50	8.6583	1298.22	0.0000		
929.11	14.4429	1312.11	0.0000		
937.49	13.5176	1332.49	9.7224		
944.13	0.0000	1362.66	0.0000		
946.00	11.6191	1365.19	5.4446		
949.00	12.5997	1368.63	0.0000		
667.71	0.0000	1384.29	6.5636		
962.31	11.6807	1408.01	7.7007		
964.08	15.5830	1457.56	0.0000		
966.17	20.7917	1460.82	8.9097		
911.20	16.7228	1489.16	2.2418		
968.97	16.7228	1505.03	2.2498		
983.53	0.0000	1584.12	14.6500		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235028.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM09.CNF;335
Background date    : 2-OCT-2016 11:00:29.
Sample date        : 23-NOV-2015 14:50:00 Acquisition date : 3-OCT-2016 09:08:29.
Sample ID          : G405235028 Sample quantity       : 1.25516E+02 GRAM
Detector name      : GAM09 Detector geometry         : CAN
Elapsed live time  : 0 01:00:00.00 Elapsed real time: 0 01:00:00.50 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials     : MXR1
Abundance limit   : 75.00000 Sensitivity        : 3.00000
Batch ID          : 1596249 Detector SN#         :
Matrix Spike ID   : LCS ID                          : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	5	63.45*	46	60	1.18	126.57	124	13	1.26E-02	31.4	1.14E+00
2	5	66.17*	22	106	1.34	132.01	124	13	6.21E-03	85.3	
3	2	75.00	99	123	1.03	149.68	146	14	2.74E-02	19.9	2.89E+00
4	2	77.13	148	96	0.90	153.94	146	14	4.11E-02	12.9	
5	0	87.01	36	162	1.27	173.71	171	7	9.87E-03	61.6	
6	0	92.87*	71	126	0.94	185.45	182	8	1.96E-02	32.1	
7	0	106.39	23	48	1.36	212.49	210	5	6.35E-03	51.1	
8	0	119.81	17	78	1.33	239.35	236	7	4.81E-03	87.5	
9	0	129.51	25	115	0.56	258.74	254	10	6.94E-03	82.7	
10	0	143.90*	28	86	1.04	287.53	284	8	7.69E-03	62.4	
11	0	186.28*	52	156	1.07	372.33	367	11	1.46E-02	50.5	
12	0	209.07	76	95	1.25	417.93	412	13	2.10E-02	28.8	
13	2	238.72*	400	67	1.01	477.25	472	16	1.11E-01	5.9	2.09E+00
14	2	241.86	95	55	1.33	483.54	472	16	2.64E-02	18.9	
15	0	252.87	17	52	1.06	505.57	501	8	4.69E-03	77.9	
16	0	271.22	26	77	3.19	542.28	536	11	7.35E-03	67.1	
17	0	295.22*	132	44	1.06	590.30	585	11	3.66E-02	13.2	
18	2	300.05	43	40	1.41	599.98	596	14	1.19E-02	30.7	1.09E+00
19	2	301.81	18	44	1.41	603.49	596	14	4.87E-03	75.5	
20	0	310.57	20	13	1.32	621.03	619	5	5.64E-03	34.9	
21	0	338.61*	61	78	1.09	677.12	672	12	1.68E-02	31.8	
22	2	351.87*	230	25	1.08	703.66	698	15	6.39E-02	7.4	4.86E-01
23	2	354.59	25	15	1.47	709.11	698	15	6.92E-03	37.7	
24	0	438.55	10	14	0.72	877.10	874	7	2.78E-03	69.6	
25	0	463.64	25	46	1.00	927.29	921	12	7.02E-03	56.8	
26	0	478.15*	14	18	0.63	956.32	951	10	3.99E-03	62.1	
27	8	510.76*	23	30	2.90	1021.58	1015	23	6.50E-03	67.7	1.65E+00
28	8	516.91	17	16	1.99	1033.88	1015	23	4.60E-03	49.8	
29	0	528.48	8	13	1.60	1057.04	1052	7	2.28E-03	82.4	
30	0	558.41*	14	11	1.80	1116.93	1114	7	3.95E-03	51.0	
31	0	564.80	37	33	8.03	1129.72	1121	21	1.03E-02	41.5	
32	0	578.37	11	12	0.66	1156.86	1150	10	2.93E-03	69.9	
33	0	583.01*	119	14	1.62	1166.15	1160	11	3.32E-02	11.2	
34	0	609.05*	182	13	1.22	1218.25	1211	13	5.05E-02	8.7	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	613.75	7	14	0.89	1227.64	1223	6	2.06E-03	86.5	
36	0	650.11	10	14	1.37	1300.41	1295	8	2.82E-03	70.9	
37	0	661.42	40	29	1.10	1323.03	1318	11	1.11E-02	30.2	
38	0	703.29	18	14	1.79	1406.82	1401	10	5.05E-03	45.8	
39	0	727.30	41	15	1.48	1454.86	1449	13	1.15E-02	25.1	
40	0	763.48	10	7	0.57	1527.25	1524	6	2.71E-03	54.4	
41	0	772.21	13	18	0.52	1544.73	1538	10	3.67E-03	68.0	
42	0	786.69	27	7	3.56	1573.70	1568	13	7.36E-03	27.8	
43	0	794.71	19	20	3.02	1589.74	1585	11	5.32E-03	50.1	
44	0	906.46	10	8	0.54	1813.34	1806	10	2.83E-03	59.5	
45	0	910.92*	61	10	1.51	1822.27	1818	10	1.70E-02	16.7	
46	0	928.71	11	10	3.73	1857.87	1850	13	3.15E-03	64.0	
47	0	933.91	22	5	1.90	1868.28	1863	10	6.17E-03	28.3	
48	0	969.07	60	8	1.31	1938.63	1933	13	1.67E-02	16.6	
49	0	1003.12	15	19	2.89	2006.77	2000	13	4.04E-03	71.4	
50	0	1078.97*	15	6	3.30	2158.55	2152	11	4.09E-03	41.6	
51	0	1097.54	7	6	0.75	2195.69	2191	8	2.02E-03	68.8	
52	0	1119.96	39	6	1.88	2240.55	2235	12	1.08E-02	20.4	
53	0	1124.78	10	4	0.83	2250.21	2247	7	2.64E-03	46.0	
54	0	1138.08	4	16	0.45	2276.82	2271	12	1.24E-03	180.2	
55	0	1156.29	13	20	3.87	2313.25	2302	16	3.74E-03	79.0	
56	0	1180.73	10	12	0.61	2362.16	2356	9	2.66E-03	75.5	
57	0	1378.46	7	6	1.23	2757.82	2752	8	1.92E-03	72.2	
58	0	1460.16*	313	0	1.95	2921.32	2914	15	8.69E-02	5.7	
59	0	1587.68	6	5	0.87	3176.50	3169	10	1.67E-03	80.8	
60	0	1763.90*	30	0	2.05	3529.12	3521	15	8.22E-03	19.8	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235028.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 23-NOV-2015 14:50:00 Acquisition date : 3-OCT-2016 09:08:29
Sample ID         : G405235028 Sample quantity   : 125.52 GRAM
Sample type       : SOLID Sample geometry    :
Detector name     : GAMMA9 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.50 0.0%
Energy tolerance  : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error    : 0.00 %
Efficiency type   : Linear Efficiencies at    : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
BE-7	477.60	10.44*	2.792E+00	2.997E-01	1.808E+01	124.28	OK
K-40	1460.82	10.66*	1.146E+00	1.455E+01	1.455E+01	11.45	OK
CD-109	88.03	3.70*	4.842E+00	3.338E-01	5.357E-01	497.78	OK
SN-126	64.28	9.60	2.286E+00	1.416E+00	1.416E+00	62.78	OK
	86.94	8.90	4.842E+00	1.388E-01	1.388E-01	497.78	OK
	87.57	37.00*	4.842E+00	3.338E-02	3.339E-02	497.78	OK
BA-137M	661.66	89.90*	2.157E+00	1.226E-01	1.250E-01	60.39	OK
CS-137	661.66	85.10*	2.157E+00	1.295E-01	1.321E-01	60.39	OK
PM-147	121.22	0.00*	6.261E+00	6.398E+02	8.035E+02	175.07	OK
EU-155	86.55	30.70	4.842E+00	4.024E-02	4.563E-02	497.78	OK
	105.31	21.10*	5.939E+00	1.210E-01	1.373E-01	102.30	OK
TL-208	277.37	6.60	4.352E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.382E+00	3.546E-01	3.546E-01	22.39	OK
	860.56	12.50	1.758E+00	-----	Line Not Found	-----	Absent
BI-211	72.87	1.23	3.448E+00	-----	Line Not Found	-----	Absent
	351.06	12.92*	3.589E+00	9.525E-02	9.525E-02	958.15	OK
BI-212	727.33	6.67*	2.003E+00	1.843E+00	1.843E+00	50.28	OK
	785.37	1.10	1.885E+00	7.548E+00	7.548E+00	55.52	OK
	1620.50	1.47	1.045E+00	-----	Line Not Found	-----	Absent
PB-212	74.82	10.28	3.689E+00	1.148E+00	1.148E+00	62.52	OK
	77.11	17.10	3.920E+00	1.490E+00	1.490E+00	25.72	OK
	238.63	43.60*	4.881E+00	1.192E+00	1.192E+00	11.89	OK
	300.09	3.30	4.087E+00	1.991E+00	1.991E+00	61.31	OK
BI-214	609.32	45.49*	2.302E+00	1.041E+00	1.041E+00	17.44	OK
	1120.29	14.92	1.429E+00	1.057E+00	1.057E+00	40.70	OK
	1764.49	15.30	9.659E-01	1.123E+00	1.124E+00	39.59	OK
PB-214	74.82	5.80	3.669E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	3.920E+00	2.627E+00	2.628E+00	25.72	OK
	87.09	3.41	4.849E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	4.832E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.141E+00	1.082E+00	1.083E+00	26.47	OK
	351.93	35.60*	3.588E+00	-----	Line Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.302E+00	1.041E+00	1.041E+00	17.44	OK
	1120.29	14.92	1.429E+00	1.057E+00	1.057E+00	40.70	OK
	1764.49	15.30	9.659E-01	1.123E+00	1.124E+00	39.59	OK
RA-224	240.99	4.10*	4.834E+00	1.125E+00	1.125E+00	111.80	OK
RA-226	609.32	45.49*	2.302E+00	1.041E+00	1.041E+00	17.44	OK
	1120.29	14.92	1.429E+00	1.057E+00	1.057E+00	40.70	OK
	1764.49	15.30	9.659E-01	1.123E+00	1.124E+00	39.59	OK
AC-228	105.21	1.10	5.939E+00	2.322E+00	2.322E+00	102.30	OK
	338.32	11.27	3.704E+00	9.016E-01	9.016E-01	63.62	OK
	794.95	4.25	1.870E+00	1.422E+00	1.422E+00	100.12	OK
	835.71	1.61	1.799E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.682E+00	8.265E-01	8.265E-01	33.32	OK
	968.97	15.80	1.603E+00	1.383E+00	1.383E+00	33.25	OK
RA-228	105.21	1.10	5.939E+00	2.322E+00	2.322E+00	102.30	OK
	338.32	11.27	3.704E+00	9.016E-01	9.016E-01	63.62	OK
	794.95	4.25	1.870E+00	1.422E+00	1.422E+00	100.12	OK
	835.71	1.61	1.799E+00	-----	Line Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	911.20	25.80*	1.682E+00	8.265E-01	8.265E-01	33.32	OK
	968.97	15.80	1.603E+00	1.383E+00	1.383E+00	33.25	OK
TH-228	74.82	10.28	3.689E+00	1.148E+00	1.148E+00	62.52	OK
	77.11	17.10	3.920E+00	1.490E+00	1.490E+00	25.72	OK
	238.63	43.60*	4.881E+00	1.192E+00	1.192E+00	11.89	OK
	300.09	3.30	4.087E+00	1.991E+00	1.991E+00	61.31	OK
TH-230	609.32	45.49*	2.302E+00	1.041E+00	1.041E+00	17.44	OK
	1120.29	14.92	1.429E+00	1.057E+00	1.057E+00	40.70	OK
	1764.49	15.30	9.659E-01	1.123E+00	1.123E+00	39.59	OK
PA-231	283.69	1.70	4.275E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	4.068E+00	5.038E-01	5.038E-01	150.97	OK
TH-232	105.21	1.10	5.939E+00	2.322E+00	2.322E+00	102.30	OK
	338.32	11.27	3.704E+00	9.016E-01	9.016E-01	63.62	OK
	835.71	1.61	1.799E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.682E+00	8.265E-01	8.265E-01	33.32	OK
	968.97	15.80	1.603E+00	1.383E+00	1.383E+00	33.25	OK
PA-233	300.13	6.63	4.087E+00	9.909E-01	9.909E-01	61.31	OK
	311.90	38.50*	3.975E+00	8.293E-02	8.293E-02	69.73	OK
	340.48	4.45	3.687E+00	-----	Line Not Found	-----	Absent
TH-234	63.29	3.70*	2.286E+00	3.673E+00	3.673E+00	62.78	OK
	92.59	4.23	5.269E+00	2.122E+00	2.122E+00	64.22	OK
U-234	609.32	45.49*	2.302E+00	1.041E+00	1.041E+00	17.44	OK
	1120.29	14.92	1.429E+00	1.057E+00	1.057E+00	40.70	OK
	1764.49	15.30	9.659E-01	1.123E+00	1.123E+00	39.59	OK
U-235	89.96	3.47	5.068E+00	-----	Line Not Found	-----	Absent
	93.35	5.60	5.269E+00	1.603E+00	1.603E+00	64.22	OK
	143.76	10.96*	6.310E+00	2.613E-01	2.613E-01	124.72	OK
	163.33	5.08	6.096E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	5.735E+00	1.027E-01	1.027E-01	101.07	OK
	205.31	5.01	5.415E+00	-----	Line Not Found	-----	Absent
U-238	63.29	3.70*	2.286E+00	3.673E+00	3.673E+00	62.78	OK
	92.59	4.23	5.269E+00	2.122E+00	2.122E+00	64.22	OK
AM-243	43.53	5.90	1.969E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	3.689E+00	1.756E-01	1.757E-01	62.52	OK
ANH-511	511.00	100.00*	2.647E+00	5.361E-02	5.361E-02	135.49	OK

Flag: "*" = Keyline


```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235028.CNF;1
* Acquisition date   : 3-OCT-2016 09:08:29 Sensitivity       : 3.000
* Detector ID       : GAM09 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.50 Half life ratio : *****
* Sample date       : 23-NOV-2015 14:50:00 Analyst initials: MXR1
* Sample ID         : G405235028 Sample Quantity : 1.2552E+02 GRAM
* Batch Number      : 1596249 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 3-JUN-2016 07:32:22 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
BE-7	1.808E+01	2.202E+01	2.537E+01
K-40	1.455E+01	1.633E+00	5.780E-01
CD-109	5.357E-01	2.613E+00	2.642E+00
SN-126	3.339E-02	1.629E-01	1.567E-01
BA-137M	1.250E-01	7.400E-02	6.889E-02
CS-137	1.321E-01	7.818E-02	7.278E-02
PM-147	8.035E+02	1.379E+03	1.471E+03
EU-155	1.373E-01	1.376E-01	1.936E-01
TL-208	3.546E-01	7.780E-02	5.179E-02
BI-211	9.525E-02	8.943E-01	2.961E-01
BI-212	1.843E+00	9.080E-01	8.217E-01
PB-212	1.192E+00	1.388E-01	1.019E-01
BI-214	1.041E+00	1.780E-01	1.173E-01
PB-214	1.117E+00	1.628E-01	3.643E-01
RN-222	1.041E+00	1.780E-01	1.173E-01
RA-224	1.125E+00	1.232E+00	1.092E+00
RA-226	1.041E+00	1.780E-01	1.173E-01
AC-228	8.265E-01	2.699E-01	2.702E-01
RA-228	8.265E-01	2.699E-01	2.702E-01
TH-228	1.192E+00	1.388E-01	1.019E-01
TH-230	1.041E+00	1.779E-01	1.173E-01
PA-231	5.038E-01	7.453E-01	7.462E-01
TH-232	8.265E-01	2.699E-01	2.702E-01
PA-233	8.293E-02	5.667E-02	9.811E-02
TH-234	3.673E+00	2.260E+00	2.660E+00
U-234	1.041E+00	1.779E-01	1.173E-01
U-235	2.613E-01	3.194E-01	3.047E-01
U-238	3.673E+00	2.260E+00	2.660E+00
AM-243	1.757E-01	1.076E-01	1.018E-01
ANH-511	5.361E-02	7.119E-02	4.918E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)
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NA-22	1.756E-02	4.724E-02	1.033E-01	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	-2.615E-02	3.992E-02	6.817E-02	NOT IDENT.
SC-46	-1.364E-01	3.834E-01	7.040E-01	FAIL ABUN
V-48	0.000E+00	2.257E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	6.119E+02	0.000E+00	SHORT HLIF
MN-54	3.315E-02	5.476E-02	1.373E-01	NOT IDENT.
CO-56	-5.328E-02	6.071E-01	9.791E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.256E-02	4.967E-02	8.579E-02	NOT IDENT.
CO-58	-1.170E-01	6.807E-01	1.291E+00	NOT IDENT.
FE-59	1.602E+00	7.670E+00	1.466E+01	NOT IDENT.
CO-60	-2.154E-03	3.686E-02	7.673E-02	NOT IDENT.
ZN-65	9.149E-02	1.921E-01	3.738E-01	NOT IDENT.
GE-68	4.253E-01	2.527E+00	5.191E+00	NOT IDENT.
AS-73	4.979E+00	1.469E+01	3.036E+01	NOT IDENT.
AS-74	0.000E+00	1.023E+04	0.000E+00	SHORT HLIF
SE-75	-7.611E-02	2.177E-01	3.834E-01	FAIL ABUN
BR-77	0.000E+00	1.945E+39	0.000E+00	SHORT HLIF
SR-82	0.000E+00	1.280E+03	0.000E+00	SHORT HLIF
RB-83	-3.059E-02	6.694E-01	1.212E+00	FAIL ABUN
KR-85	6.317E+00	7.064E+00	1.526E+01	NOT IDENT.
SR-85	7.776E-01	8.727E-01	1.885E+00	NOT IDENT.
RB-86	0.000E+00	5.587E+04	0.000E+00	SHORT HLIF
Y-88	1.465E-01	2.634E-01	6.554E-01	NOT IDENT.
Y-91	-5.891E+02	7.282E+02	1.267E+03	NOT IDENT.
NB-94	5.270E-02	4.734E-02	7.625E-02	FAIL ABUN
NB-95	-1.152E+00	1.662E+00	2.151E+00	NOT IDENT.
NB-95M	9.905E-01	3.326E+00	5.763E+00	NOT IDENT.
ZR-95	-1.217E+00	1.834E+00	3.156E+00	NOT IDENT.
NB-97	0.000E+00	1.486E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.540E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	8.116E+33	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	4.562E-03	3.112E-02	5.643E-02	NOT IDENT.
RH-102	-4.028E-03	5.142E-02	1.020E-01	NOT IDENT.
RU-103	-7.032E+00	7.433E+00	1.280E+01	FAIL ABUN
RH-106	1.548E-01	5.407E-01	1.101E+00	NOT IDENT.
RU-106	1.548E-01	5.407E-01	1.101E+00	NOT IDENT.
AG-108M	1.214E-02	2.629E-02	5.542E-02	FAIL ABUN
AG-110M	5.191E-02	9.494E-02	2.088E-01	FAIL ABUN
SN-113	5.300E-02	2.431E-01	4.966E-01	NOT IDENT.
CD-115	0.000E+00	1.614E+41	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	2.047E+05	0.000E+00	SHORT HLIF
TE-123M	-8.001E-02	1.355E-01	2.405E-01	NOT IDENT.
SB-124	-1.427E+00	2.073E+00	3.444E+00	NOT IDENT.
SB-125	1.741E-02	1.128E-01	2.259E-01	FAIL ABUN
TE-125M	7.959E+01	3.427E+02	6.264E+02	NOT IDENT.
I-126	0.000E+00	2.574E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	2.566E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	3.398E+23	0.000E+00	SHORT HLIF
I-131	0.000E+00	1.842E+10	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	9.253E+27	0.000E+00	SHORT HLIF
BA-133	0.000E+00	5.448E-02	6.917E-02	FAIL ABUN
I-133	0.000E+00	1.614E+41	0.000E+00	SHORT HLIF
CS-134	9.440E-02	9.262E-02	1.315E-01	FAIL ABUN
CS-135	1.502E-02	1.440E-01	2.481E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	7.482E+05	0.000E+00	SHORT HLIF
CE-139	-1.851E-02	1.115E-01	2.061E-01	NOT IDENT.
BA-140	0.000E+00	2.611E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	8.833E+05	0.000E+00	SHORT HLIF
CE-141	1.848E+01	3.181E+01	5.958E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	-2.757E-01	3.593E-01	5.769E-01	NOT IDENT.
PM-144	4.008E-03	6.903E-02	1.327E-01	FAIL ABUN
PR-144	3.695E-01	6.046E+00	1.162E+01	NOT IDENT.
PM-146	6.640E-03	3.953E-02	8.110E-02	NOT IDENT.
ND-147	0.000E+00	9.701E+07	0.000E+00	SHORT HLIF
PM-149	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
EU-150	2.547E-02	2.832E-02	5.375E-02	FAIL ABUN
EU-152	-1.123E-03	9.637E-02	1.745E-01	NOT IDENT.
GD-153	-1.396E-01	1.842E-01	3.311E-01	NOT IDENT.
EU-154	4.025E-02	1.144E-01	2.496E-01	NOT IDENT.
TB-160	-1.721E-01	2.134E+00	4.117E+00	FAIL ABUN
HO-166M	-6.627E-06	5.425E-02	1.067E-01	NOT IDENT.
TM-171	-3.799E+01	3.069E+01	5.512E+01	FAIL ABUN

HF-172	-9.466E-02	2.221E-01	3.752E-01	FAIL ABUN
LU-172	8.053E-03	1.025E-01	1.754E-01	FAIL ABUN
LU-176	1.258E-03	2.585E-02	4.393E-02	FAIL ABUN
HF-181	-2.856E+00	5.271E+00	8.511E+00	NOT IDENT.
TA-182	-2.635E-01	1.203E+00	2.305E+00	FAIL ABUN
RE-183	-1.317E+00	4.465E+00	8.714E+00	FAIL ABUN
RE-184	-1.442E+01	4.071E+01	6.438E+01	NOT IDENT.
W-188	-4.982E+01	1.307E+02	2.071E+02	FAIL ABUN
IR-192	2.345E-01	5.058E-01	9.876E-01	FAIL ABUN
HG-203	-1.792E+00	3.411E+00	5.806E+00	NOT IDENT.
BI-207	-1.288E-02	5.720E-02	1.054E-01	FAIL ABUN
PB-210	4.970E+00	7.193E+00	1.502E+01	NOT IDENT.
PB-211	1.667E-01	5.689E-01	1.190E+00	NOT IDENT.
RN-219	-9.467E-02	3.489E-01	6.765E-01	FAIL ABUN
RA-223	-1.686E-01	6.674E-01	1.164E+00	FAIL ABUN
AC-227	-1.360E-01	2.527E-01	3.935E-01	FAIL ABUN
TH-227	-1.360E-01	2.527E-01	3.935E-01	FAIL ABUN
TH-229	3.335E-02	4.608E-01	8.606E-01	FAIL ABUN
TH-231	-1.686E-01	6.674E-01	1.164E+00	FAIL ABUN
PA-234	1.703E-01	2.931E-01	6.240E-01	NOT IDENT.
PA-234M	3.661E-01	6.507E+00	1.145E+01	NOT IDENT.
NP-237	8.293E-02	5.667E-02	1.027E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	-1.455E-01	2.759E-01	4.615E-01	FAIL ABUN
PU-239	4.101E+02	6.648E+02	6.211E+02	FAIL ABUN
AM-241	1.354E-02	1.698E-01	3.410E-01	NOT IDENT.
CM-243	-5.031E-02	1.030E-01	1.751E-01	NOT IDENT.
BK-247	1.326E-02	6.734E-02	1.276E-01	FAIL ABUN
CM-247	-2.270E-02	3.109E-02	5.675E-02	NOT IDENT.
CF-249	-1.524E-02	4.413E-02	7.493E-02	FAIL ABUN
CF-251	7.510E-02	1.124E-01	2.225E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
BE-7	477.60	15	10.44*	2.792E+00	2.997E-01	1.808E+01	124.28
K-40	1460.82	297	10.66*	1.146E+00	1.455E+01	1.455E+01	11.45
CD-109	88.03	40	3.70*	4.842E+00	1.331E+00	2.136E+00	123.24
SN-126	64.28	52	9.60	2.286E+00	1.416E+00	1.416E+00	62.78
	86.94	40	8.90	4.842E+00	5.535E-01	5.535E-01	123.24
	87.57	40	37.00*	4.842E+00	1.331E-01	1.331E-01	123.24
BA-137M	661.66	40	89.90*	2.157E+00	1.226E-01	1.250E-01	60.39
CS-137	661.66	40	85.10*	2.157E+00	1.295E-01	1.321E-01	60.39
PM-147	121.22	19	0.00*	6.261E+00	6.398E+02	8.035E+02	175.07
EU-155	86.55	40	30.70	4.842E+00	1.605E-01	1.820E-01	123.24
	105.31	25	21.10*	5.939E+00	1.210E-01	1.373E-01	102.30
TL-208	277.37	-----	6.60	4.352E+00	-----	Line Not Found	-----
	583.19	120	85.00*	2.382E+00	3.546E-01	3.546E-01	22.39
	860.56	-----	12.50	1.758E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	3.448E+00	-----	Line Not Found	-----
	351.06	239	12.92*	3.589E+00	3.077E+00	3.077E+00	14.87
BI-212	727.33	41	6.67*	2.003E+00	1.843E+00	1.843E+00	50.28
	785.37	26	1.10	1.885E+00	7.548E+00	7.548E+00	55.52
	1620.50	-----	1.47	1.045E+00	-----	Line Not Found	-----
PB-212	74.82	112	10.28	3.689E+00	1.759E+00	1.759E+00	39.77
	77.11	167	17.10	3.920E+00	1.490E+00	1.490E+00	25.72
	238.63	424	43.60*	4.881E+00	1.192E+00	1.192E+00	11.89
	300.09	45	3.30	4.087E+00	1.991E+00	1.991E+00	61.31
BI-214	609.32	182	45.49*	2.302E+00	1.041E+00	1.041E+00	17.44
	1120.29	38	14.92	1.429E+00	1.057E+00	1.057E+00	40.70
	1764.49	28	15.30	9.659E-01	1.123E+00	1.124E+00	39.59
PB-214	74.82	112	5.80	3.689E+00	3.117E+00	3.119E+00	39.77
	77.11	167	9.70	3.920E+00	2.627E+00	2.628E+00	25.72
	87.09	40	3.41	4.842E+00	1.445E+00	1.445E+00	123.24
	242.00	101	7.25	4.834E+00	1.718E+00	1.719E+00	37.88
	295.22	138	18.42	4.141E+00	1.082E+00	1.083E+00	26.47
	351.93	239	35.60*	3.589E+00	1.117E+00	1.117E+00	14.87
RN-222	609.32	182	45.49*	2.302E+00	1.041E+00	1.041E+00	17.44
	1120.29	38	14.92	1.429E+00	1.057E+00	1.057E+00	40.70
	1764.49	28	15.30	9.659E-01	1.123E+00	1.124E+00	39.59
RA-224	240.99	101	4.10*	4.834E+00	3.039E+00	3.039E+00	37.88
RA-226	609.32	182	45.49*	2.302E+00	1.041E+00	1.041E+00	17.44
	1120.29	38	14.92	1.429E+00	1.057E+00	1.057E+00	40.70
	1764.49	28	15.30	9.659E-01	1.123E+00	1.124E+00	39.59
AC-228	105.21	25	1.10	5.939E+00	2.322E+00	2.322E+00	102.30
	338.32	63	11.27	3.704E+00	9.016E-01	9.016E-01	63.62
	794.95	19	4.25	1.870E+00	1.422E+00	1.422E+00	100.12
	835.71	-----	1.61	1.799E+00	-----	Line Not Found	-----
	911.20	60	25.80*	1.682E+00	8.265E-01	8.265E-01	33.32
	968.97	59	15.80	1.603E+00	1.383E+00	1.383E+00	33.25
RA-228	105.21	25	1.10	5.939E+00	2.322E+00	2.322E+00	102.30
	338.32	63	11.27	3.704E+00	9.016E-01	9.016E-01	63.62

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected Decay Corr		2-Sigma %Error
					pCi/GRAM	pCi/GRAM	
	794.95	19	4.25	1.870E+00	1.422E+00	1.422E+00	100.12
	835.71	-----	1.61	1.799E+00	-----	Line Not Found	-----
	911.20	60	25.80*	1.682E+00	8.265E-01	8.265E-01	33.32
	968.97	59	15.80	1.603E+00	1.383E+00	1.383E+00	33.25
TH-228	74.82	112	10.28	3.689E+00	1.759E+00	1.759E+00	39.77
	77.11	167	17.10	3.920E+00	1.490E+00	1.490E+00	25.72
	238.63	424	43.60*	4.881E+00	1.192E+00	1.192E+00	11.89
	300.09	45	3.30	4.087E+00	1.991E+00	1.991E+00	61.31
TH-230	609.32	182	45.49*	2.302E+00	1.041E+00	1.041E+00	17.44
	1120.29	38	14.92	1.429E+00	1.057E+00	1.057E+00	40.70
	1764.49	28	15.30	9.659E-01	1.123E+00	1.123E+00	39.59
PA-231	283.69	-----	1.70	4.275E+00	-----	Line Not Found	-----
	301.36	18	5.35*	4.068E+00	5.038E-01	5.038E-01	150.97
TH-232	105.21	25	1.10	5.939E+00	2.322E+00	2.322E+00	102.30
	338.32	63	11.27	3.704E+00	9.016E-01	9.016E-01	63.62
	835.71	-----	1.61	1.799E+00	-----	Line Not Found	-----
	911.20	60	25.80*	1.682E+00	8.265E-01	8.265E-01	33.32
	968.97	59	15.80	1.603E+00	1.383E+00	1.383E+00	33.25
PA-233	300.13	45	6.63	4.087E+00	9.909E-01	9.909E-01	61.31
	311.90	21	38.50*	3.975E+00	8.293E-02	8.293E-02	69.73
	340.48	-----	4.45	3.687E+00	-----	Line Not Found	-----
TH-234	63.29	52	3.70*	2.286E+00	3.673E+00	3.673E+00	62.78
	92.59	79	4.23	5.269E+00	2.122E+00	2.122E+00	64.22
U-234	609.32	182	45.49*	2.302E+00	1.041E+00	1.041E+00	17.44
	1120.29	38	14.92	1.429E+00	1.057E+00	1.057E+00	40.70
	1764.49	28	15.30	9.659E-01	1.123E+00	1.123E+00	39.59
U-235	89.96	-----	3.47	5.068E+00	-----	Line Not Found	-----
	93.35	79	5.60	5.269E+00	1.603E+00	1.603E+00	64.22
	143.76	30	10.96*	6.310E+00	2.613E-01	2.613E-01	124.72
	163.33	-----	5.08	6.096E+00	-----	Line Not Found	-----
	185.72	56	57.20	5.735E+00	1.027E-01	1.027E-01	101.07
	205.31	-----	5.01	5.415E+00	-----	Line Not Found	-----
U-238	63.29	52	3.70*	2.286E+00	3.673E+00	3.673E+00	62.78
	92.59	79	4.23	5.269E+00	2.122E+00	2.122E+00	64.22
AM-243	43.53	-----	5.90	1.969E-01	-----	Line Not Found	-----
	74.66	112	67.20*	3.689E+00	2.691E-01	2.691E-01	39.77
ANH-511	511.00	24	100.00*	2.647E+00	5.361E-02	5.361E-02	135.49

Flag: "*" = Keyline

Total number of lines in spectrum 60
 Number of unidentified lines 16
 Number of lines tentatively identified by NID 44 73.33%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
BE-7	53.22D	60.3	2.997E-01	1.808E+01	2.247E+01	124.28	
K-40	1.25E+09Y	1.00	1.455E+01	1.455E+01	0.167E+01	11.45	
CD-109	461.40D	1.60	1.331E+00	2.136E+00	2.633E+00	123.24	
SN-126	2.30E+05Y	1.00	1.331E-01	1.331E-01	1.641E-01	123.24	
BA-137M	30.08Y	1.02	1.226E-01	1.250E-01	0.755E-01	60.39	
CS-137	30.08Y	1.02	1.295E-01	1.321E-01	0.798E-01	60.39	
PM-147	2.62Y	1.26	6.398E+02	8.035E+02	14.07E+02	175.07	
EU-155	4.75Y	1.13	1.210E-01	1.373E-01	1.404E-01	102.30	
TL-208	1.41E+10Y	1.00	3.546E-01	3.546E-01	0.794E-01	22.39	
BI-211	7.04E+08Y	1.00	3.077E+00	3.077E+00	0.458E+00	14.87	
BI-212	1.41E+10Y	1.00	1.843E+00	1.843E+00	0.927E+00	50.28	
PB-212	1.41E+10Y	1.00	1.192E+00	1.192E+00	0.142E+00	11.89	
BI-214	1600.00Y	1.00	1.041E+00	1.041E+00	0.182E+00	17.44	
PB-214	1600.00Y	1.00	1.117E+00	1.117E+00	0.166E+00	14.87	
RN-222	1600.00Y	1.00	1.041E+00	1.041E+00	0.182E+00	17.44	
RA-224	1.41E+10Y	1.00	3.039E+00	3.039E+00	1.151E+00	37.88	
RA-226	1600.00Y	1.00	1.041E+00	1.041E+00	0.182E+00	17.44	
AC-228	1.41E+10Y	1.00	8.265E-01	8.265E-01	2.754E-01	33.32	
RA-228	1.41E+10Y	1.00	8.265E-01	8.265E-01	2.754E-01	33.32	
TH-228	1.41E+10Y	1.00	1.192E+00	1.192E+00	0.142E+00	11.89	
TH-230	7.54E+04Y	1.00	1.041E+00	1.041E+00	0.182E+00	17.44	
PA-231	7.04E+08Y	1.00	5.038E-01	5.038E-01	7.605E-01	150.97	
TH-232	1.41E+10Y	1.00	8.265E-01	8.265E-01	2.754E-01	33.32	
PA-233	2.14E+06Y	1.00	8.293E-02	8.293E-02	5.783E-02	69.73	
TH-234	4.47E+09Y	1.00	3.673E+00	3.673E+00	2.306E+00	62.78	
U-234	2.45E+05Y	1.00	1.041E+00	1.041E+00	0.182E+00	17.44	
U-235	7.04E+08Y	1.00	2.613E-01	2.613E-01	3.259E-01	124.72	
U-238	4.47E+09Y	1.00	3.673E+00	3.673E+00	2.306E+00	62.78	
AM-243	7370.00Y	1.00	2.691E-01	2.691E-01	1.070E-01	39.77	
ANH-511	1.00E+09Y	1.00	5.361E-02	5.361E-02	7.264E-02	135.49	
Total Activity :			6.845E+02	8.668E+02			

Grand Total Activity : 6.845E+02 8.668E+02

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
5	66.17	25	121	1.34	132.01	124	13	6.21E-03	****	2.63E+00	T
0	129.51	27	126	0.56	258.74	254	10	6.94E-03	****	6.34E+00	T
0	209.07	81	102	1.25	417.93	412	13	2.10E-02	57.7	5.35E+00	
0	252.87	18	55	1.06	505.57	501	8	4.69E-03	****	4.68E+00	T
0	271.22	28	81	3.19	542.28	536	11	7.35E-03	****	4.43E+00	T
2	354.59	26	16	1.47	709.11	698	15	6.92E-03	75.3	3.57E+00	T
0	438.55	10	14	0.72	877.10	874	7	2.78E-03	****	3.00E+00	T
0	463.64	26	47	1.00	927.29	921	12	7.02E-03	****	2.86E+00	T
8	516.91	17	17	1.99	1033.88	1015	23	4.60E-03	99.7	2.62E+00	
0	528.48	8	13	1.60	1057.04	1052	7	2.28E-03	****	2.58E+00	T
0	558.41	14	11	1.80	1116.93	1114	7	3.95E-03	****	2.47E+00	
0	564.80	37	33	8.03	1129.72	1121	21	1.03E-02	83.0	2.44E+00	
0	578.37	11	13	0.66	1156.86	1150	10	2.93E-03	****	2.40E+00	
0	613.75	7	14	0.89	1227.64	1223	6	2.06E-03	****	2.29E+00	T
0	650.11	10	14	1.37	1300.41	1295	8	2.82E-03	****	2.19E+00	
0	703.29	18	14	1.79	1406.82	1401	10	5.05E-03	91.7	2.06E+00	T
0	763.48	10	7	0.57	1527.25	1524	6	2.71E-03	****	1.93E+00	T
0	772.21	13	18	0.52	1544.73	1538	10	3.67E-03	****	1.91E+00	T
0	906.46	10	8	0.54	1813.34	1806	10	2.83E-03	****	1.69E+00	
0	928.71	11	9	3.73	1857.87	1850	13	3.15E-03	****	1.66E+00	T
0	933.91	22	5	1.90	1868.28	1863	10	6.17E-03	56.6	1.65E+00	
0	1003.12	14	19	2.89	2006.77	2000	13	4.04E-03	****	1.56E+00	T
0	1078.97	14	5	3.30	2158.55	2152	11	4.09E-03	83.1	1.47E+00	
0	1097.54	7	6	0.75	2195.69	2191	8	2.02E-03	****	1.45E+00	
0	1124.78	9	3	0.83	2250.21	2247	7	2.64E-03	92.1	1.42E+00	
0	1138.08	4	15	0.45	2276.82	2271	12	1.24E-03	****	1.41E+00	
0	1156.29	13	19	3.87	2313.25	2302	16	3.74E-03	****	1.39E+00	
0	1180.73	9	12	0.61	2362.16	2356	9	2.66E-03	****	1.37E+00	
0	1378.46	7	6	1.23	2757.82	2752	8	1.92E-03	****	1.20E+00	
0	1587.68	6	5	0.87	3176.50	3169	10	1.67E-03	****	1.06E+00	

Flags: "T" = Tentatively associated

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235028.CNF;1
* Acquisition date   : 3-OCT-2016 09:08:29 Sensitivity      : 3.000
* Detector ID       : GAM09 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.50 Half life ratio : *****
* Sample date       : 23-NOV-2015 14:50:00 Nuclide Library : SOLID
* Sample ID         : G405235028 Analyst initials: MXR1
* Batch Number      : 1596249 Sample Quantity : 1.2552E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 3-JUN-2016 07:32:22 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
BE-7	1.099E+01
K-40	2.228E-01
CD-109	1.247E+00
SN-126	7.373E-02
BA-137M	3.015E-02
CS-137	3.186E-02
PM-147	6.771E+02
EU-155	8.918E-02
TL-208	2.185E-02
BI-211	1.303E-01
BI-212	3.498E-01
PB-212	4.705E-02
BI-214	5.086E-02
PB-214	1.758E-01
RN-222	5.086E-02
RA-224	5.046E-01
RA-226	5.086E-02
AC-228	1.164E-01
RA-228	1.164E-01
TH-228	4.705E-02
TH-230	5.084E-02
PA-231	3.353E-01
TH-232	1.164E-01
PA-233	4.365E-02
TH-234	1.230E+00
U-234	5.084E-02
U-235	1.403E-01
U-238	1.230E+00
AM-243	4.748E-02
ANH-511	2.149E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
NA-22	4.375E-02 NOT IDENT.

NA-24	0.000E+00	SHORT HLIF
AL-26	2.552E-02	NOT IDENT.
SC-46	2.878E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.955E-02	NOT IDENT.
CO-56	4.124E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.944E-02	NOT IDENT.
CO-58	5.488E-01	NOT IDENT.
FE-59	5.998E+00	NOT IDENT.
CO-60	3.105E-02	NOT IDENT.
ZN-65	1.596E-01	NOT IDENT.
GE-68	2.214E+00	NOT IDENT.
AS-73	1.400E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.725E-01	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.185E-01	FAIL ABUN
KR-85	6.874E+00	NOT IDENT.
SR-85	8.490E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	2.601E-01	NOT IDENT.
Y-91	5.371E+02	NOT IDENT.
NB-94	3.416E-02	FAIL ABUN
NB-95	9.476E-01	NOT IDENT.
NB-95M	2.677E+00	NOT IDENT.
ZR-95	1.345E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.590E-02	NOT IDENT.
RH-102	4.337E-02	NOT IDENT.
RU-103	5.538E+00	FAIL ABUN
RH-106	4.852E-01	NOT IDENT.
RU-106	4.852E-01	NOT IDENT.
AG-108M	2.471E-02	FAIL ABUN
AG-110M	8.884E-02	FAIL ABUN
SN-113	2.227E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.102E-01	NOT IDENT.
SB-124	1.089E+00	NOT IDENT.
SB-125	1.018E-01	FAIL ABUN
TE-125M	2.903E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.063E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	5.896E-02	FAIL ABUN
CS-135	1.125E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	9.472E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.755E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.630E-01	NOT IDENT.
PM-144	5.912E-02	FAIL ABUN
PR-144	5.181E+00	NOT IDENT.
PM-146	3.572E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-149	0.000E+00	SHORT HLIF
EU-150	2.455E-02	FAIL ABUN
EU-152	7.841E-02	NOT IDENT.
GD-153	1.527E-01	NOT IDENT.
EU-154	1.056E-01	NOT IDENT.
TB-160	1.739E+00	FAIL ABUN
HO-166M	4.597E-02	NOT IDENT.
TM-171	2.493E+01	FAIL ABUN
HF-172	1.716E-01	FAIL ABUN

LU-172	7.553E-02	FAIL ABUN
LU-176	1.977E-02	FAIL ABUN
HF-181	3.624E+00	NOT IDENT.
TA-182	1.001E+00	FAIL ABUN
RE-183	4.009E+00	FAIL ABUN
RE-184	2.620E+01	NOT IDENT.
W-188	9.241E+01	FAIL ABUN
IR-192	4.449E-01	FAIL ABUN
HG-203	2.651E+00	NOT IDENT.
BI-207	4.529E-02	FAIL ABUN
PB-210	6.984E+00	NOT IDENT.
PB-211	5.268E-01	NOT IDENT.
RN-219	2.996E-01	FAIL ABUN
RA-223	5.283E-01	FAIL ABUN
AC-227	1.780E-01	FAIL ABUN
TH-227	1.780E-01	FAIL ABUN
TH-229	3.969E-01	FAIL ABUN
TH-231	5.283E-01	FAIL ABUN
PA-234	2.706E-01	NOT IDENT.
PA-234M	5.107E+00	NOT IDENT.
NP-237	4.592E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.139E-01	FAIL ABUN
PU-239	2.898E+02	FAIL ABUN
AM-241	1.573E-01	NOT IDENT.
CM-243	8.054E-02	NOT IDENT.
BK-247	5.770E-02	FAIL ABUN
CM-247	2.482E-02	NOT IDENT.
CF-249	3.370E-02	FAIL ABUN
CF-251	1.031E-01	NOT IDENT.

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235028.CNF;1
* Acquisition date   : 3-OCT-2016 09:08:29 Sensitivity      : 3.000
* Detector ID       : GAM09 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.50 Half life ratio : *****
* Sample date       : 23-NOV-2015 14:50:00 Nuclide Library : SOLID
* Sample ID        : G405235028 Analyst initials: MXR1
* Batch Number     : 1596249 Sample Quantity : 1.2552E+02 GRAM
*                               Quantity Err(%) : 1.5934E-03 %
* Wet wt corr      : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight     : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 3-JUN-2016 07:32:22 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
BE-7	1.808E+01	2.204E+01	2.204E+01
K-40	1.455E+01	1.800E+00	1.800E+00
CD-109	5.357E-01	2.621E+00	2.621E+00
SN-126	3.339E-02	1.633E-01	1.633E-01
BA-137M	1.250E-01	7.420E-02	7.420E-02
CS-137	1.321E-01	7.838E-02	7.838E-02
PM-147	8.035E+02	1.379E+03	1.379E+03
EU-155	1.373E-01	1.379E-01	1.379E-01
TL-208	3.546E-01	7.924E-02	7.924E-02
BI-211	9.525E-02	9.126E-01	9.126E-01
BI-212	1.843E+00	9.128E-01	9.128E-01
PB-212	1.192E+00	1.524E-01	1.524E-01
BI-214	1.041E+00	1.835E-01	1.835E-01
PB-214	1.117E+00	1.693E-01	1.693E-01
RN-222	1.041E+00	1.835E-01	1.835E-01
RA-224	1.125E+00	1.240E+00	1.240E+00
RA-226	1.041E+00	1.835E-01	1.835E-01
AC-228	8.265E-01	2.732E-01	2.732E-01
RA-228	8.265E-01	2.732E-01	2.732E-01
TH-228	1.192E+00	1.524E-01	1.524E-01
TH-230	1.041E+00	1.834E-01	1.834E-01
PA-231	5.038E-01	7.530E-01	7.530E-01
TH-232	8.265E-01	2.732E-01	2.732E-01
PA-233	8.293E-02	5.681E-02	5.681E-02
TH-234	3.673E+00	2.402E+00	2.402E+00
U-234	1.041E+00	1.834E-01	1.834E-01
U-235	2.613E-01	3.196E-01	3.196E-01
U-238	3.673E+00	2.402E+00	2.402E+00
AM-243	1.757E-01	1.088E-01	1.088E-01
ANH-511	5.361E-02	7.122E-02	7.122E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)
---------	-------------------------------------	-------------------------------	---------------------

NA-22	1.756E-02	4.725E-02	4.791E-02	NOT IDENT.
NA-24	-1.000E+41	1.020E+42	0.000E+00	SHORT HLIF
AL-26	-2.615E-02	3.996E-02	4.166E-02	NOT IDENT.
SC-46	-1.364E-01	3.835E-01	3.884E-01	FAIL ABUN
V-48	1.045E+04	2.257E+04	2.306E+04	SHORT HLIF
CR-51	2.576E+02	6.120E+02	6.229E+02	SHORT HLIF
MN-54	3.315E-02	6.478E-02	6.648E-02	NOT IDENT.
CO-56	-5.328E-02	5.071E-01	5.077E-01	NOT IDENT.
MN-56	-1.000E+41	1.094E+42	0.000E+00	SHORT HLIF
CO-57	-1.256E-02	4.968E-02	5.000E-02	NOT IDENT.
CO-58	-1.170E-01	6.807E-01	6.827E-01	NOT IDENT.
FE-59	1.602E+00	7.671E+00	7.705E+00	NOT IDENT.
CO-60	-2.154E-03	3.686E-02	3.687E-02	NOT IDENT.
ZN-65	9.149E-02	1.921E-01	1.965E-01	NOT IDENT.
GE-68	4.253E-01	2.527E+00	2.534E+00	NOT IDENT.
AS-73	4.979E+00	1.473E+01	1.490E+01	NOT IDENT.
AS-74	1.334E+02	1.023E+04	1.023E+04	SHORT HLIF
SE-75	-7.611E-02	2.177E-01	2.204E-01	FAIL ABUN
BR-77	1.670E+40	1.517E+41	0.000E+00	SHORT HLIF
SR-82	2.876E+02	1.280E+03	1.287E+03	SHORT HLIF
RB-83	-3.059E-02	6.694E-01	6.695E-01	FAIL ABUN
KR-85	6.317E+00	7.069E+00	7.621E+00	NOT IDENT.
SR-85	7.776E-01	8.733E-01	9.410E-01	NOT IDENT.
RB-86	-2.782E+03	5.587E+04	5.588E+04	SHORT HLIF
Y-88	1.465E-01	2.636E-01	2.718E-01	NOT IDENT.
Y-91	-5.891E+02	7.285E+02	7.754E+02	NOT IDENT.
NB-94	5.270E-02	4.740E-02	5.302E-02	FAIL ABUN
NB-95	-1.152E+00	1.662E+00	1.742E+00	NOT IDENT.
NB-95M	9.905E-01	3.326E+00	3.356E+00	NOT IDENT.
ZR-95	-1.217E+00	1.835E+00	1.915E+00	NOT IDENT.
NB-97	1.000E+41	1.487E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.540E+41	0.000E+00	SHORT HLIF
MO-99	3.489E+33	8.120E+33	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	2.294E+41	0.000E+00	SHORT HLIF
RH-101	4.562E-03	3.113E-02	3.120E-02	NOT IDENT.
RH-102	-4.028E-03	5.142E-02	5.145E-02	NOT IDENT.
RU-103	-7.032E+00	7.441E+00	8.088E+00	FAIL ABUN
RH-106	1.548E-01	5.408E-01	5.453E-01	NOT IDENT.
RU-106	1.548E-01	5.408E-01	5.453E-01	NOT IDENT.
AG-108M	1.214E-02	2.630E-02	2.686E-02	FAIL ABUN
AG-110M	5.191E-02	9.498E-02	9.782E-02	FAIL ABUN
SN-113	5.300E-02	2.431E-01	2.443E-01	NOT IDENT.
CD-115	1.000E+41	1.625E+41	0.000E+00	SHORT HLIF
SN-117M	-1.501E+05	2.055E+05	2.164E+05	SHORT HLIF
TE-123M	-8.001E-02	1.355E-01	1.403E-01	NOT IDENT.
SB-124	-1.427E+00	2.075E+00	2.172E+00	NOT IDENT.
SB-125	1.741E-02	1.128E-01	1.130E-01	FAIL ABUN
TE-125M	7.959E+01	3.427E+02	3.446E+02	NOT IDENT.
I-126	-2.242E+06	2.593E+06	2.783E+06	SHORT HLIF
SB-126	-1.766E+05	2.566E+06	2.567E+06	SHORT HLIF
SB-127	-3.841E+22	3.443E+23	0.000E+00	SHORT HLIF
I-131	-1.353E+10	1.843E+10	1.941E+10	SHORT HLIF
I-132	1.000E+41	2.096E+42	0.000E+00	SHORT HLIF
TE-132	1.051E+28	1.028E+28	0.000E+00	SHORT HLIF
BA-133	7.383E-02	5.457E-02	6.392E-02	FAIL ABUN
I-133	1.000E+41	2.492E+41	0.000E+00	SHORT HLIF
CS-134	9.440E-02	9.271E-02	1.020E-01	FAIL ABUN
CS-135	1.502E-02	1.441E-01	1.442E-01	NOT IDENT.
I-135	-1.000E+41	2.766E+42	0.000E+00	SHORT HLIF
CS-136	-4.440E+05	7.498E+05	7.761E+05	SHORT HLIF
CE-139	-1.851E-02	1.116E-01	1.119E-01	NOT IDENT.
BA-140	-1.436E+06	2.612E+06	2.691E+06	SHORT HLIF
LA-140	9.574E+03	8.833E+05	8.834E+05	SHORT HLIF
CE-141	1.848E+01	3.182E+01	3.289E+01	NOT IDENT.
CE-143	1.000E+41	2.630E+41	0.000E+00	SHORT HLIF
CE-144	-2.757E-01	3.596E-01	3.805E-01	NOT IDENT.
PM-144	4.008E-03	6.903E-02	6.906E-02	FAIL ABUN
PR-144	3.695E-01	6.046E+00	6.049E+00	NOT IDENT.
PM-146	6.640E-03	3.953E-02	3.965E-02	NOT IDENT.
ND-147	2.722E+07	9.703E+07	9.780E+07	SHORT HLIF
PM-149	-1.000E+41	2.133E+41	0.000E+00	SHORT HLIF
EU-150	2.547E-02	2.834E-02	3.058E-02	FAIL ABUN
EU-152	-1.123E-03	9.637E-02	9.637E-02	NOT IDENT.
GD-153	-1.396E-01	1.844E-01	1.949E-01	NOT IDENT.
EU-154	4.025E-02	1.144E-01	1.158E-01	NOT IDENT.
TB-160	-1.721E-01	2.134E+00	2.135E+00	FAIL ABUN
HO-166M	-6.627E-06	5.425E-02	5.425E-02	NOT IDENT.
TM-171	-3.799E+01	3.088E+01	3.531E+01	FAIL ABUN

HF-172	-9.466E-02	2.226E-01	2.267E-01	FAIL ABUN
LU-172	8.053E-03	1.025E-01	1.025E-01	FAIL ABUN
LU-176	1.258E-03	2.585E-02	2.585E-02	FAIL ABUN
HF-181	-2.856E+00	5.272E+00	5.427E+00	NOT IDENT.
TA-182	-2.635E-01	1.203E+00	1.209E+00	FAIL ABUN
RE-183	-1.317E+00	4.470E+00	4.509E+00	FAIL ABUN
RE-184	-1.442E+01	4.087E+01	4.138E+01	NOT IDENT.
W-188	-4.982E+01	1.308E+02	1.327E+02	FAIL ABUN
IR-192	2.345E-01	5.059E-01	5.168E-01	FAIL ABUN
HG-203	-1.792E+00	3.412E+00	3.506E+00	NOT IDENT.
BI-207	-1.288E-02	5.720E-02	5.750E-02	FAIL ABUN
PB-210	4.970E+00	7.208E+00	7.548E+00	NOT IDENT.
PB-211	1.667E-01	5.689E-01	5.739E-01	NOT IDENT.
RN-219	-9.467E-02	3.491E-01	3.517E-01	FAIL ABUN
RA-223	-1.686E-01	6.675E-01	6.718E-01	FAIL ABUN
AC-227	-1.360E-01	2.533E-01	2.606E-01	FAIL ABUN
TH-227	-1.360E-01	2.533E-01	2.606E-01	FAIL ABUN
TH-229	3.335E-02	4.608E-01	4.611E-01	FAIL ABUN
TH-231	-1.686E-01	6.675E-01	6.718E-01	FAIL ABUN
PA-234	1.703E-01	3.519E-01	3.602E-01	NOT IDENT.
PA-234M	3.661E-01	6.507E+00	6.509E+00	NOT IDENT.
NP-237	8.293E-02	5.681E-02	6.801E-02	FAIL ABUN
NP-238	1.000E+41	4.439E+41	0.000E+00	SHORT HLIF
NP-239	-1.455E-01	2.761E-01	2.838E-01	FAIL ABUN
PU-239	4.101E+02	6.650E+02	6.903E+02	FAIL ABUN
AM-241	1.354E-02	1.698E-01	1.699E-01	NOT IDENT.
CM-243	-5.031E-02	1.031E-01	1.056E-01	NOT IDENT.
BK-247	1.326E-02	6.740E-02	6.766E-02	FAIL ABUN
CM-247	-2.270E-02	3.132E-02	3.295E-02	NOT IDENT.
CF-249	-1.524E-02	4.415E-02	4.468E-02	FAIL ABUN
CF-251	7.510E-02	1.127E-01	1.177E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
74.66	38.0285	105.31	84.7366	131.20	51.9924
879.38	51.5907	86.79	84.7818	133.02	39.4293
46.54	36.0719	86.94	84.8099	133.52	50.9180
228.16	0.0000	87.09	84.8380	136.00	41.2183
52.39	31.0659	87.57	84.9283	136.47	46.0459
1093.63	38.2976	88.03	95.8227	739.50	0.0000
52.39	50.3473	306.78	95.8877	140.51	0.0000
125.81	48.8370	88.47	95.9152	143.76	45.6080
53.44	40.8900	143.76	51.0469	144.24	45.6417
54.07	30.5259	90.64	89.9037	145.44	38.9160
293.27	0.0000	531.02	0.0000	152.43	51.1280
482.18	46.2649	92.59	72.5764	1048.07	0.0000
57.98	49.5762	93.35	72.6928	154.21	47.3188
59.27	46.4984	94.56	50.9549	158.56	0.0000
59.32	46.5051	311.90	50.9641	159.00	51.6207
59.54	46.5343	946.00	50.9663	162.33	48.8744
60.96	43.7166	94.87	50.9877	537.26	0.0000
61.17	44.8360	97.43	57.2173	163.33	40.9531
62.93	50.2762	98.43	47.4797	165.86	46.1109
63.29	50.3260	98.44	47.4805	427.87	48.8064
290.67	50.3659	103.37	55.6658	176.60	0.0000
87.57	50.4621	116.74	55.6658	177.52	40.7379
66.73	50.7949	100.11	55.7306	181.07	0.0000
67.24	50.8633	102.03	45.1160	181.52	55.9688
67.68	55.6529	103.18	59.0852	184.41	61.6599
1221.41	55.6625	103.37	54.2821	185.72	61.7642
97.43	61.5354	911.20	42.3711	193.51	45.7422
279.20	64.8037	105.31	46.0118	197.03	42.8093
1063.66	76.6875	106.12	50.0250	198.01	38.6796
72.87	76.6992	106.47	50.0586	201.83	38.8597
351.06	76.6992	109.28	48.8017	203.43	43.1440
74.66	64.5773	111.00	56.9150	205.31	42.1863
238.63	64.6028	111.76	0.0000	210.85	33.9702
351.93	64.6028	114.06	65.5458	215.65	41.6321
238.63	64.6028	116.30	0.0000	222.11	38.7131
74.97	64.6266	116.74	65.5556	227.09	43.2538
77.11	64.9623	119.76	45.7012	227.38	42.1861
78.74	65.2151	264.66	44.8759	228.16	0.0000
256.23	68.8013	121.22	44.8835	228.18	25.9838
133.52	67.7230	344.28	53.6634	235.69	50.9384
364.49	0.0000	122.06	48.6953	235.96	64.0557
711.68	62.0486	122.92	43.7662	238.63	49.2737
356.01	56.3597	1274.44	40.0251	238.98	0.0000
323.87	48.3164	123.68	41.3195	240.99	49.3973
81.75	65.6755	125.81	46.4973	242.00	49.4501
83.79	61.3519	127.23	39.0512	244.70	30.8561
265.00	61.3810	127.91	45.4021	685.70	0.0000
193.51	75.5212	129.30	45.5076	388.16	38.8943

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
507.63	0.0000	345.93	21.7535	569.50	25.1686
256.23	40.1451	351.06	18.2021	569.70	25.1708
527.90	0.0000	351.93	18.2149	583.19	9.8596
264.66	32.6117	355.39	0.0000	584.27	14.0930
264.80	31.4915	356.01	27.6132	595.83	0.0000
265.00	26.9978	364.49	0.0000	600.60	17.0566
268.22	30.0928	366.42	0.0000	602.52	0.0000
269.46	38.4150	372.51	27.1435	604.72	15.6688
270.03	38.4357	375.05	19.7788	607.14	14.2621
401.81	38.4803	377.52	24.7693	609.32	14.2780
273.65	0.0000	383.85	27.3745	610.33	0.0000
276.40	50.0465	388.16	32.4548	614.28	8.5884
583.19	28.4615	666.33	0.0000	618.01	22.9463
277.60	27.3289	391.69	22.5269	884.68	15.3151
402.40	30.7565	400.66	18.4743	621.93	15.3275
279.20	46.7581	401.81	23.5316	630.19	0.0000
279.54	44.4915	402.40	25.2234	631.29	11.5493
279.70	44.4975	404.85	16.8449	633.25	17.3408
280.46	41.1042	410.95	27.9136	634.78	0.0000
301.36	32.0674	413.71	28.8148	635.95	12.5409
284.31	0.0000	720.70	0.0000	636.99	0.0000
285.41	34.4128	423.72	0.0000	1690.97	23.2646
285.90	0.0000	427.09	23.9497	657.76	5.8499
287.50	28.7331	427.87	25.6738	657.90	0.0000
290.67	29.2012	433.94	17.1863	661.66	16.6057
293.27	0.0000	439.40	15.5240	664.57	0.0000
295.22	21.6061	453.88	16.5427	666.33	0.0000
316.51	21.6204	463.37	13.1400	666.50	0.0000
298.58	20.8976	468.07	21.0864	667.71	0.0000
299.98	26.3488	473.00	0.0000	677.62	15.7474
300.09	26.3508	631.29	18.5322	685.70	0.0000
300.13	26.3522	696.49	14.1348	695.00	0.0000
311.90	26.3522	477.60	14.1419	696.49	21.8433
301.36	26.3813	482.18	17.2847	696.51	21.8433
302.85	26.4159	487.02	0.0000	697.00	0.0000
304.50	31.1230	492.35	0.0000	697.30	23.8379
304.85	0.0000	497.08	25.0452	697.49	23.8398
306.78	26.5079	505.52	12.1366	702.65	16.9260
308.46	26.5473	507.63	0.0000	706.68	13.4659
311.90	21.9280	511.00	16.2345	711.68	12.9968
316.51	21.2294	514.00	16.2634	720.70	0.0000
319.41	0.0000	514.00	16.2634	721.93	0.0000
320.08	0.0000	520.40	12.2432	722.78	9.0425
321.04	28.4150	520.69	0.0000	722.91	9.0428
323.87	36.7907	667.71	0.0000	723.31	13.5670
325.23	33.2688	527.90	0.0000	756.73	21.1119
1596.21	0.0000	528.26	10.9321	727.33	11.0743
333.37	25.1214	529.59	25.9835	733.00	15.1392
333.97	22.3410	529.87	0.0000	735.93	10.1058
334.37	23.9447	531.02	0.0000	737.46	17.1909
338.28	27.6248	537.26	0.0000	739.50	0.0000
338.32	27.6255	1260.41	0.0000	747.24	15.2332
340.48	27.6740	552.55	17.5481	748.06	13.2068
340.55	0.0000	795.86	18.1154	752.31	16.2845
344.28	26.5527	569.33	25.1664	753.82	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
756.73	18.3545	968.97	14.3864	1505.03	8.7133
756.80	18.3552	983.53	0.0000	1584.12	4.7341
763.94	21.4802	984.45	0.0000	1596.21	0.0000
765.81	30.7092	996.26	13.4053	1620.50	5.9667
1001.03	15.3589	1001.03	16.7841	1621.92	1.9895
766.84	12.2891	1002.74	10.0763	1678.03	0.0000
772.60	0.0000	1004.73	3.3610	1690.97	4.0400
776.52	0.0000	1021.30	0.0000	1750.46	0.0000
777.92	0.0000	1025.87	0.0000	1764.49	2.0519
778.90	12.3521	1028.54	0.0000	1770.23	3.0817
783.70	0.0000	1037.84	9.0625	1771.35	1.0274
785.37	11.3531	1038.76	0.0000	1791.20	0.0000
903.28	6.2097	1046.59	7.9525	1808.65	5.1770
794.95	14.5064	1048.07	0.0000	1810.72	0.0000
795.86	14.5121	1049.04	15.9175	1836.06	2.0823
801.95	12.4702	1050.41	10.2371		
810.06	8.3408	1063.66	12.5657		
810.29	10.4268	1077.00	0.0000		
810.45	10.4277	1077.34	8.0317		
810.76	12.5146	1085.87	5.7524		
815.77	0.0000	1093.63	12.1099		
818.51	0.0000	1099.45	5.1995		
832.01	10.5180	1112.07	10.4399		
834.85	9.4768	1112.84	6.9614		
835.71	10.5334	1115.54	6.9673		
836.80	0.0000	1120.29	6.9775		
846.75	0.0000	1120.55	6.9780		
846.77	10.5790	1121.30	3.4897		
856.80	0.0000	1808.65	9.7966		
860.56	18.0812	1131.51	0.0000		
871.09	12.8145	1147.95	0.0000		
873.19	7.4811	1332.49	11.5218		
875.33	0.0000	1177.95	11.3602		
879.38	10.7125	1189.05	14.2471		
880.51	5.3585	1204.77	18.7852		
883.24	10.7279	1221.41	17.0773		
884.68	6.4404	1231.02	11.7170		
889.28	9.6771	1235.36	0.0000		
894.76	10.7743	1238.28	15.3533		
1836.06	9.7090	1260.41	0.0000		
900.72	9.7185	1271.87	6.3818		
903.28	9.7277	1274.44	7.2988		
911.20	13.0083	1274.54	7.2988		
912.08	14.6393	1291.59	11.0002		
984.45	0.0000	1298.22	0.0000		
926.50	8.1757	1312.11	0.0000		
929.11	8.1833	1332.49	6.4877		
937.49	6.5664	1362.66	0.0000		
983.53	0.0000	1365.19	4.6744		
946.00	8.7819	1368.63	0.0000		
949.00	8.7913	1384.29	4.6976		
954.55	0.0000	1408.01	3.7808		
962.31	19.8735	1457.56	0.0000		
964.08	8.2858	1460.82	3.8311		
966.17	14.9255	1489.16	3.8577		


```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235029.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM19.CNF;561
Background date : 2-OCT-2016 11:01:07.
Sample date : 23-NOV-2015 11:10:00 Acquisition date : 3-OCT-2016 09:08:53.
Sample ID : G405235029 Sample quantity : 1.51202E+02 GRAM
Detector name : GAM19 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.76 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID : 1596249 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	62.52*	22	186	0.54	125.82	121	10	6.15E-03	119.5	
2	1	74.69*	131	171	1.30	150.19	143	18	3.65E-02	19.8	2.59E+00
3	1	77.07*	207	123	1.07	154.93	143	18	5.76E-02	11.1	
4	0	86.79	70	244	1.00	174.38	168	11	1.93E-02	45.1	
5	5	89.88	58	102	1.14	180.56	178	13	1.62E-02	28.4	4.40E-01
6	5	92.81*	74	173	1.56	186.43	178	13	2.04E-02	35.9	
7	0	129.14	51	116	0.79	259.12	256	8	1.41E-02	39.2	
8	0	143.25*	37	123	2.78	287.35	283	9	1.03E-02	57.4	
9	0	186.00*	71	143	1.49	372.89	369	11	1.98E-02	35.7	
10	0	209.48	40	105	0.91	419.88	416	10	1.11E-02	50.9	
11	4	238.55*	403	73	1.10	478.04	470	24	1.12E-01	6.2	5.95E-01
12	4	241.66	146	103	2.07	484.25	470	24	4.06E-02	20.7	
13	0	255.93	14	80	0.57	512.80	509	9	3.79E-03	121.7	
14	0	274.31	82	203	8.38	549.58	533	28	2.28E-02	50.4	
15	1	295.16*	139	75	1.62	591.29	586	26	3.86E-02	14.6	1.62E+00
16	1	300.36	31	75	1.63	601.70	586	26	8.50E-03	56.7	
17	0	338.55	56	63	1.51	678.12	674	9	1.55E-02	29.5	
18	0	351.84*	269	58	1.32	704.70	698	13	7.47E-02	8.6	
19	0	410.33	29	68	2.16	821.74	812	13	7.98E-03	62.1	
20	0	510.76*	49	47	2.14	1022.67	1016	16	1.35E-02	39.7	
21	0	583.11*	124	29	1.75	1167.44	1162	12	3.46E-02	12.7	
22	0	609.54*	151	43	1.53	1220.32	1212	14	4.20E-02	12.4	
23	0	625.69	17	8	0.91	1252.65	1249	8	4.72E-03	37.7	
24	0	661.59	108	24	1.26	1324.47	1319	11	2.99E-02	13.1	
25	1	723.01*	15	35	1.98	1447.36	1440	27	4.06E-03	83.9	1.19E+00
26	1	726.99	27	33	1.98	1455.34	1440	27	7.39E-03	48.0	
27	0	748.16	14	10	1.39	1497.69	1494	10	3.92E-03	52.6	
28	8	781.40	13	16	2.20	1564.19	1561	17	3.50E-03	54.1	2.80E+00
29	8	785.81	17	18	2.29	1573.03	1561	17	4.83E-03	52.7	
30	0	804.73	17	24	1.55	1610.87	1605	12	4.61E-03	64.1	
31	0	859.99	26	10	1.80	1721.45	1717	12	7.35E-03	30.0	
32	0	911.02*	74	22	1.31	1823.55	1818	12	2.06E-02	17.5	
33	0	946.99	22	13	4.32	1895.53	1886	17	6.21E-03	42.2	
34	4	963.76	18	15	2.84	1929.07	1920	23	4.95E-03	56.9	3.57E-01

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	4	968.62	53	6	1.82	1938.81	1920	23	1.46E-02	16.2	
36	0	1063.76*	10	22	1.73	2129.16	2121	15	2.67E-03	160.0	
37	0	1120.42	41	14	1.66	2242.54	2237	11	1.14E-02	23.4	
38	0	1134.69	13	15	3.50	2271.08	2263	15	3.61E-03	70.6	
39	0	1143.20	15	12	3.51	2288.11	2282	12	4.16E-03	53.0	
40	0	1168.70	19	12	1.24	2339.14	2333	13	5.26E-03	45.2	
41	0	1200.59	13	9	3.91	2402.95	2394	14	3.55E-03	59.9	
42	3	1203.95	11	2	1.89	2409.67	2407	13	3.16E-03	28.6	1.41E-01
43	3	1207.52	13	1	2.05	2416.82	2407	13	3.70E-03	28.3	
44	0	1236.70	32	28	8.17	2475.21	2464	27	8.92E-03	48.5	
45	0	1263.32	9	8	1.37	2528.47	2521	12	2.57E-03	71.8	
46	1	1272.80	20	6	2.30	2547.42	2542	19	5.48E-03	31.7	2.13E+00
47	1	1275.58	15	7	2.09	2553.00	2542	19	4.30E-03	41.9	
48	0	1280.93	7	4	1.39	2563.69	2560	7	1.81E-03	61.8	
49	0	1460.59	368	3	1.93	2923.18	2916	14	1.02E-01	5.3	
50	0	1511.05	7	5	1.34	3024.14	3017	10	1.94E-03	70.7	
51	0	1764.29*	34	0	3.25	3530.84	3522	15	9.40E-03	18.4	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235029.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 23-NOV-2015 11:10:00 Acquisition date : 3-OCT-2016 09:08:53
Sample ID        : G405235029 Sample quantity  : 151.20 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA19 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.76 0.0%
Energy tolerance : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error  : 0.00 %
Efficiency type  : Linear Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	TH-229	85.43
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
NA-22	1274.54	99.94*	1.297E+00	5.808E-02	7.308E-02	83.90	OK
K-40	1460.82	10.66*	1.161E+00	1.424E+01	1.424E+01	10.65	OK
Y-91	1204.77	0.26*	1.358E+00	1.576E+01	6.574E+02	57.20	OK
CD-109	88.03	3.70*	5.459E+00	1.234E+00	1.980E+00	160.25	OK
SN-126	64.28	9.60	3.426E+00	----- Line	Not Found	-----	Absent
	86.94	8.90	5.459E+00	5.128E-01	5.128E-01	160.25	OK
	87.57	37.00*	5.459E+00	1.234E-01	1.234E-01	160.25	OK
BA-137M	661.66	89.90*	2.164E+00	2.887E-01	2.945E-01	26.26	OK
CS-137	661.66	85.10*	2.164E+00	3.050E-01	3.111E-01	26.26	OK
TL-208	277.37	6.60	4.415E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.392E+00	3.231E-01	3.231E-01	25.47	OK
	860.56	12.50	1.764E+00	6.089E-01	6.089E-01	60.00	OK
BI-211	72.87	1.23	4.361E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.630E+00	3.842E-01	3.842E-01	255.35	OK
BI-212	727.33	6.67*	2.010E+00	1.025E+00	1.025E+00	95.99	OK
	785.37	1.10	1.892E+00	4.277E+00	4.277E+00	105.50	OK
	1620.50	1.47	1.063E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	4.533E+00	1.224E+00	1.224E+00	59.67	OK
	77.11	17.10	4.743E+00	1.624E+00	1.624E+00	22.16	OK
	238.63	43.60*	4.961E+00	1.074E+00	1.074E+00	12.45	OK
	300.09	3.30	4.139E+00	1.262E+00	1.262E+00	113.35	OK
BI-214	609.32	45.49*	2.309E+00	7.574E-01	7.577E-01	24.87	OK
	1120.29	14.92	1.437E+00	9.465E-01	9.468E-01	46.85	OK
	1764.49	15.30	9.862E-01	1.052E+00	1.052E+00	36.70	OK
PB-214	74.82	5.80	4.544E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	4.743E+00	2.862E+00	2.863E+00	22.16	OK
	87.09	3.41	5.478E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.908E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.198E+00	1.015E+00	1.016E+00	29.18	OK
	351.93	35.60*	3.629E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.309E+00	7.574E-01	7.577E-01	24.87	OK
	1120.29	14.92	1.437E+00	9.465E-01	9.468E-01	46.85	OK
	1764.49	15.30	9.862E-01	1.052E+00	1.052E+00	36.70	OK
RA-224	240.99	4.10*	4.913E+00	2.381E+00	2.381E+00	75.98	OK
RA-226	609.32	45.49*	2.309E+00	7.574E-01	7.577E-01	24.87	OK
	1120.29	14.92	1.437E+00	9.465E-01	9.468E-01	46.85	OK
	1764.49	15.30	9.862E-01	1.052E+00	1.052E+00	36.70	OK
AC-228	105.21	1.10	6.259E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.748E+00	7.358E-01	7.358E-01	58.98	OK
	794.95	4.25	1.875E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.803E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.687E+00	8.586E-01	8.586E-01	35.02	OK
	968.97	15.80	1.609E+00	1.038E+00	1.038E+00	32.48	OK
RA-228	105.21	1.10	6.259E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.748E+00	7.358E-01	7.358E-01	58.98	OK
	794.95	4.25	1.875E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.803E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.687E+00	8.586E-01	8.586E-01	35.02	OK
	968.97	15.80	1.609E+00	1.038E+00	1.038E+00	32.48	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	74.82	10.28	4.533E+00	1.224E+00	1.224E+00	59.67	OK
	77.11	17.10	4.743E+00	1.624E+00	1.624E+00	22.16	OK
	238.63	43.60*	4.961E+00	1.074E+00	1.074E+00	12.45	OK
	300.09	3.30	4.139E+00	1.262E+00	1.262E+00	113.35	OK
TH-229	85.43	14.70	5.459E+00	3.105E-01	3.105E-01	160.25	OK
	88.47	24.00	5.640E+00	2.705E-01	2.705E-01	56.87	OK
	193.51	4.41*	5.711E+00	-----	Line Not Found	-----	Absent
	210.85	2.80	5.435E+00	1.529E+00	1.529E+00	101.84	OK
TH-230	609.32	45.49*	2.309E+00	7.574E-01	7.574E-01	24.87	OK
	1120.29	14.92	1.437E+00	9.465E-01	9.465E-01	46.85	OK
	1764.49	15.30	9.862E-01	1.052E+00	1.052E+00	36.70	OK
PA-231	283.69	1.70	4.336E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	4.139E+00	7.782E-01	7.782E-01	113.35	OK
TH-232	105.21	1.10	6.259E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.748E+00	7.358E-01	7.358E-01	58.98	OK
	835.71	1.61	1.803E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.687E+00	8.586E-01	8.586E-01	35.02	OK
TH-234	968.97	15.80	1.609E+00	1.038E+00	1.038E+00	32.48	OK
	63.29	3.70*	3.208E+00	1.207E+00	1.207E+00	239.06	OK
	92.59	4.23	5.793E+00	1.879E+00	1.879E+00	71.76	OK
U-234	609.32	45.49*	2.309E+00	7.574E-01	7.574E-01	24.87	OK
	1120.29	14.92	1.437E+00	9.465E-01	9.465E-01	46.85	OK
	1764.49	15.30	9.862E-01	1.052E+00	1.052E+00	36.70	OK
U-235	89.96	3.47	5.640E+00	1.871E+00	1.871E+00	56.87	OK
	93.35	5.60	5.793E+00	1.419E+00	1.419E+00	71.76	OK
	143.76	10.96*	6.467E+00	3.153E-01	3.153E-01	114.86	OK
	163.33	5.08	6.216E+00	-----	Line Not Found	-----	Absent
U-238	185.72	57.20	5.841E+00	1.258E-01	1.258E-01	71.50	OK
	205.31	5.01	5.506E+00	-----	Line Not Found	-----	Absent
	63.29	3.70*	3.208E+00	1.207E+00	1.207E+00	239.06	OK
	92.59	4.23	5.793E+00	1.879E+00	1.879E+00	71.76	OK
AM-243	43.53	5.90	5.190E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	4.533E+00	1.873E-01	1.873E-01	59.67	OK
ANH-511	511.00	100.00*	2.663E+00	9.783E-02	9.783E-02	79.36	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235029.CNF;1 *
 * Acquisition date : 3-OCT-2016 09:08:53 Sensitivity : 3.000 *
 * Detector ID : GAM19 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.76 Half life ratio : ***** *
 * Sample date : 23-NOV-2015 11:10:00 Analyst initials: MXR1 *
 * Sample ID : G405235029 Sample Quantity : 1.5120E+02 GRAM *
 * Batch Number : 1596249 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 15-JUN-2016 10:35:16 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM19_CAN.CNF;17 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
NA-22	7.308E-02	6.009E-02	8.499E-02
K-40	1.424E+01	1.486E+00	5.018E-01
Y-91	6.574E+02	3.685E+02	9.545E+02
CD-109	1.980E+00	3.109E+00	1.938E+00
SN-126	1.234E-01	1.937E-01	1.371E-01
BA-137M	2.945E-01	7.580E-02	6.679E-02
CS-137	3.111E-01	8.007E-02	7.055E-02
TL-208	3.231E-01	8.062E-02	6.673E-02
BI-211	3.842E-01	9.615E-01	3.653E-01
BI-212	1.025E+00	9.640E-01	9.073E-01
PB-212	1.074E+00	1.310E-01	9.802E-02
BI-214	7.577E-01	1.846E-01	1.440E-01
PB-214	1.155E+00	1.937E-01	3.270E-01
RN-222	7.577E-01	1.846E-01	1.440E-01
RA-224	2.381E+00	1.773E+00	1.051E+00
RA-226	7.577E-01	1.846E-01	1.440E-01
AC-228	8.586E-01	2.947E-01	2.737E-01
RA-228	8.586E-01	2.947E-01	2.737E-01
TH-228	1.074E+00	1.310E-01	9.802E-02
TH-229	1.099E-01	4.780E-01	9.407E-01
TH-230	7.574E-01	1.846E-01	1.439E-01
PA-231	7.782E-01	8.644E-01	8.855E-01
TH-232	8.586E-01	2.947E-01	2.737E-01
TH-234	1.207E+00	2.828E+00	2.050E+00
U-234	7.574E-01	1.846E-01	1.439E-01
U-235	3.153E-01	3.549E-01	3.256E-01
U-238	1.207E+00	2.828E+00	2.050E+00
AM-243	1.873E-01	1.095E-01	8.635E-02
ANH-511	9.783E-02	7.608E-02	5.772E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.453E+01	1.671E+01	2.797E+01	NOT IDENT.

NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	5.527E-03	1.712E-02	4.800E-02	NOT IDENT.
SC-46	4.859E-02	4.254E-01	8.598E-01	FAIL ABUN
V-48	0.000E+00	2.902E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	6.549E+02	0.000E+00	SHORT HLIF
MN-54	5.341E-02	7.338E-02	1.554E-01	NOT IDENT.
CO-56	-1.196E-01	5.202E-01	1.002E+00	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.255E-02	4.811E-02	9.420E-02	NOT IDENT.
CO-58	-4.650E-03	7.415E-01	1.366E+00	NOT IDENT.
FE-59	-3.147E+00	7.184E+00	1.322E+01	NOT IDENT.
CO-60	1.764E-03	3.682E-02	7.433E-02	NOT IDENT.
ZN-65	-1.572E-01	1.983E-01	2.720E-01	NOT IDENT.
GE-68	-9.278E-01	2.040E+00	3.751E+00	NOT IDENT.
AS-73	-5.050E-01	9.791E+00	1.836E+01	NOT IDENT.
AS-74	0.000E+00	1.046E+04	0.000E+00	SHORT HLIF
SE-75	-1.882E-02	2.424E-01	4.155E-01	NOT IDENT.
BR-77	0.000E+00	1.919E+39	0.000E+00	SHORT HLIF
SR-82	0.000E+00	1.113E+03	0.000E+00	SHORT HLIF
RB-83	1.073E-01	7.244E-01	1.401E+00	NOT IDENT.
KR-85	-3.223E-01	8.982E+00	1.473E+01	NOT IDENT.
SR-85	-4.160E-02	1.112E+00	1.823E+00	NOT IDENT.
RB-86	0.000E+00	4.141E+04	0.000E+00	SHORT HLIF
Y-88	8.967E-02	2.204E-01	5.349E-01	NOT IDENT.
NB-94	4.531E-03	3.256E-02	6.536E-02	NOT IDENT.
NB-95	3.129E-01	1.035E+00	2.106E+00	NOT IDENT.
NB-95M	-5.126E-02	3.181E+00	5.462E+00	NOT IDENT.
ZR-95	4.002E-01	1.703E+00	3.490E+00	FAIL ABUN
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	9.997E+40	0.000E+00	SHORT HLIF
MO-99	0.000E+00	7.075E+33	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.348E+41	0.000E+00	SHORT HLIF
RH-101	-6.025E-03	3.588E-02	6.334E-02	NOT IDENT.
RH-102	2.108E-02	5.714E-02	1.140E-01	NOT IDENT.
RU-103	5.562E+00	8.283E+00	1.671E+01	FAIL ABUN
RH-106	-1.176E-01	5.939E-01	9.486E-01	NOT IDENT.
RU-106	-1.176E-01	5.939E-01	9.486E-01	NOT IDENT.
AG-108M	-1.943E-03	2.940E-02	5.510E-02	FAIL ABUN
AG-110M	-6.504E-02	9.867E-02	1.764E-01	NOT IDENT.
SN-113	-1.233E-01	2.916E-01	5.249E-01	NOT IDENT.
CD-115	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.975E+05	0.000E+00	SHORT HLIF
TE-123M	-2.844E-02	1.300E-01	2.524E-01	NOT IDENT.
SB-124	1.719E-01	2.269E+00	5.036E+00	FAIL ABUN
SB-125	-6.711E-02	1.221E-01	2.154E-01	NOT IDENT.
TE-125M	3.728E+01	3.485E+02	6.358E+02	NOT IDENT.
I-126	0.000E+00	1.936E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	3.089E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	3.556E+23	0.000E+00	SHORT HLIF
I-131	0.000E+00	2.150E+10	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.138E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.068E+28	0.000E+00	SHORT HLIF
BA-133	-7.632E-03	4.557E-02	7.581E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	4.499E-02	5.828E-02	1.230E-01	NOT IDENT.
CS-135	2.104E-02	1.352E-01	2.635E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	7.600E+05	0.000E+00	SHORT HLIF
CE-139	-2.342E-02	1.250E-01	2.409E-01	NOT IDENT.
BA-140	0.000E+00	3.081E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	1.063E+06	0.000E+00	SHORT HLIF
CE-141	-2.317E+00	3.524E+01	6.223E+01	NOT IDENT.
CE-143	0.000E+00	1.226E+41	0.000E+00	SHORT HLIF
CE-144	1.442E-01	4.299E-01	7.843E-01	NOT IDENT.
PM-144	-1.616E-02	5.745E-02	1.112E-01	NOT IDENT.
PR-144	-1.415E+00	5.030E+00	9.733E+00	NOT IDENT.
PM-146	3.302E-02	4.418E-02	9.098E-02	FAIL ABUN
ND-147	0.000E+00	9.122E+07	0.000E+00	SHORT HLIF
PM-147	-3.599E+02	8.051E+02	1.558E+03	NOT IDENT.
PM-149	0.000E+00	1.350E+41	0.000E+00	SHORT HLIF
EU-150	-5.813E-03	2.843E-02	4.715E-02	FAIL ABUN
EU-152	2.077E-02	9.563E-02	1.859E-01	FAIL ABUN
GD-153	6.480E-02	2.002E-01	3.735E-01	NOT IDENT.
EU-154	1.778E-01	1.462E-01	2.544E-01	FAIL ABUN
EU-155	2.016E-02	1.094E-01	2.020E-01	FAIL ABUN
TB-160	1.846E+00	2.382E+00	5.125E+00	FAIL ABUN
HO-166M	-1.935E-02	4.932E-02	9.416E-02	FAIL ABUN
TM-171	-5.108E+00	1.995E+01	3.692E+01	NOT IDENT.

HF-172	2.179E-02	2.578E-01	4.644E-01	FAIL ABUN
LU-172	-3.290E-02	7.642E-02	1.395E-01	FAIL ABUN
LU-176	1.887E-03	2.750E-02	4.748E-02	NOT IDENT.
HF-181	1.695E-01	5.978E+00	1.128E+01	NOT IDENT.
TA-182	-7.827E-01	1.081E+00	1.834E+00	FAIL ABUN
RE-183	-3.873E-01	3.611E+00	6.168E+00	NOT IDENT.
RE-184	1.204E+01	4.234E+01	8.666E+01	NOT IDENT.
W-188	-2.611E+01	1.555E+02	2.594E+02	FAIL ABUN
IR-192	-1.159E-01	5.398E-01	1.011E+00	FAIL ABUN
HG-203	-1.561E+00	3.603E+00	5.903E+00	NOT IDENT.
BI-207	4.348E-02	1.364E-01	2.539E-01	FAIL ABUN
PB-210	-1.349E+00	3.389E+00	6.214E+00	NOT IDENT.
PB-211	-2.626E-01	8.082E-01	1.296E+00	NOT IDENT.
RN-219	5.338E-02	4.152E-01	7.924E-01	NOT IDENT.
RA-223	8.816E-02	6.105E-01	1.178E+00	FAIL ABUN
AC-227	1.748E-01	4.169E-01	4.780E-01	FAIL ABUN
TH-227	1.748E-01	4.169E-01	4.780E-01	FAIL ABUN
TH-231	8.816E-02	6.105E-01	1.178E+00	FAIL ABUN
PA-233	2.158E-03	6.096E-02	1.168E-01	FAIL ABUN
PA-234	5.719E-01	4.732E-01	5.968E-01	FAIL ABUN
PA-234M	-1.459E+00	4.351E+00	8.286E+00	NOT IDENT.
NP-237	2.158E-03	6.096E-02	1.168E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	1.473E-01	2.327E-01	4.827E-01	NOT IDENT.
PU-239	0.000E+00	5.744E+02	6.895E+02	FAIL ABUN
AM-241	-3.107E-02	1.379E-01	2.326E-01	NOT IDENT.
CM-243	1.986E-02	9.940E-02	1.840E-01	NOT IDENT.
BK-247	-1.230E-02	7.877E-02	1.335E-01	NOT IDENT.
CM-247	1.685E-03	3.922E-02	7.085E-02	NOT IDENT.
CF-249	1.638E-03	4.231E-02	7.992E-02	NOT IDENT.
CF-251	4.163E-02	1.130E-01	2.261E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
NA-22	1274.54	15	99.94*	1.297E+00	5.808E-02	7.308E-02	83.90
K-40	1460.82	355	10.66*	1.161E+00	1.424E+01	1.424E+01	10.65
Y-91	1204.77	11	0.26*	1.358E+00	1.576E+01	6.574E+02	57.20
CD-109	88.03	88	3.70*	5.459E+00	2.169E+00	3.482E+00	90.26
SN-126	64.28	-----	9.60	3.426E+00	-----	Line Not Found	-----
	86.94	88	8.90	5.459E+00	9.018E-01	9.018E-01	90.26
	87.57	88	37.00*	5.459E+00	2.169E-01	2.169E-01	90.26
BA-137M	661.66	113	89.90*	2.164E+00	2.887E-01	2.945E-01	26.26
CS-137	661.66	113	85.10*	2.164E+00	3.050E-01	3.111E-01	26.26
TL-208	277.37	-----	6.60	4.415E+00	-----	Line Not Found	-----
	583.19	132	85.00*	2.392E+00	3.231E-01	3.231E-01	25.47
	860.56	27	12.50	1.764E+00	6.089E-01	6.089E-01	60.00
BI-211	72.87	-----	1.23	4.361E+00	-----	Line Not Found	-----
	351.06	300	12.92*	3.630E+00	3.182E+00	3.182E+00	17.11
BI-212	727.33	28	6.67*	2.010E+00	1.025E+00	1.025E+00	95.99
	785.37	18	1.10	1.892E+00	4.277E+00	4.277E+00	105.50
	1620.50	-----	1.47	1.063E+00	-----	Line Not Found	-----
PB-212	74.82	169	10.28	4.533E+00	1.797E+00	1.797E+00	39.57
	77.11	265	17.10	4.743E+00	1.624E+00	1.624E+00	22.16
	238.63	468	43.60*	4.961E+00	1.074E+00	1.074E+00	12.45
	300.09	35	3.30	4.139E+00	1.262E+00	1.262E+00	113.35
BI-214	609.32	160	45.49*	2.309E+00	7.574E-01	7.577E-01	24.87
	1120.29	41	14.92	1.437E+00	9.465E-01	9.468E-01	46.85
	1764.49	32	15.30	9.862E-01	1.052E+00	1.052E+00	36.70
PB-214	74.82	169	5.80	4.533E+00	3.185E+00	3.186E+00	39.57
	77.11	265	9.70	4.743E+00	2.862E+00	2.863E+00	22.16
	87.09	88	3.41	5.459E+00	2.354E+00	2.355E+00	90.26
	242.00	169	7.25	4.913E+00	2.362E+00	2.362E+00	41.46
	295.22	158	18.42	4.198E+00	1.015E+00	1.016E+00	29.18
	351.93	300	35.60*	3.630E+00	1.155E+00	1.155E+00	17.11
RN-222	609.32	160	45.49*	2.309E+00	7.574E-01	7.577E-01	24.87
	1120.29	41	14.92	1.437E+00	9.465E-01	9.468E-01	46.85
	1764.49	32	15.30	9.862E-01	1.052E+00	1.052E+00	36.70
RA-224	240.99	169	4.10*	4.913E+00	4.176E+00	4.176E+00	41.46
RA-226	609.32	160	45.49*	2.309E+00	7.574E-01	7.577E-01	24.87
	1120.29	41	14.92	1.437E+00	9.465E-01	9.468E-01	46.85
	1764.49	32	15.30	9.862E-01	1.052E+00	1.052E+00	36.70
AC-228	105.21	-----	1.10	6.259E+00	-----	Line Not Found	-----
	338.32	63	11.27	3.748E+00	7.358E-01	7.358E-01	58.98
	794.95	-----	4.25	1.875E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.803E+00	-----	Line Not Found	-----
	911.20	75	25.80*	1.687E+00	8.586E-01	8.586E-01	35.02
	968.97	53	15.80	1.609E+00	1.038E+00	1.038E+00	32.48
RA-228	105.21	-----	1.10	6.259E+00	-----	Line Not Found	-----
	338.32	63	11.27	3.748E+00	7.358E-01	7.358E-01	58.98
	794.95	-----	4.25	1.875E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.803E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	911.20	75	25.80*	1.687E+00	8.586E-01	8.586E-01	35.02
	968.97	53	15.80	1.609E+00	1.038E+00	1.038E+00	32.48
TH-228	74.82	169	10.28	4.533E+00	1.797E+00	1.797E+00	39.57
	77.11	265	17.10	4.743E+00	1.624E+00	1.624E+00	22.16
	238.63	468	43.60*	4.961E+00	1.074E+00	1.074E+00	12.45
	300.09	35	3.30	4.139E+00	1.262E+00	1.262E+00	113.35
TH-229	85.43	88	14.70	5.459E+00	5.460E-01	5.460E-01	90.26
	88.47	74	24.00	5.640E+00	2.705E-01	2.705E-01	56.87
	193.51	-----	4.41*	5.711E+00	-----	Line Not Found	-----
	210.85	47	2.80	5.435E+00	1.529E+00	1.529E+00	101.84
TH-230	609.32	160	45.49*	2.309E+00	7.574E-01	7.574E-01	24.87
	1120.29	41	14.92	1.437E+00	9.465E-01	9.465E-01	46.85
	1764.49	32	15.30	9.862E-01	1.052E+00	1.052E+00	36.70
PA-231	283.69	-----	1.70	4.336E+00	-----	Line Not Found	-----
	301.36	35	5.35*	4.139E+00	7.782E-01	7.782E-01	113.35
TH-232	105.21	-----	1.10	6.259E+00	-----	Line Not Found	-----
	338.32	63	11.27	3.748E+00	7.358E-01	7.358E-01	58.98
	835.71	-----	1.61	1.803E+00	-----	Line Not Found	-----
	911.20	75	25.80*	1.687E+00	8.586E-01	8.586E-01	35.02
	968.97	53	15.80	1.609E+00	1.038E+00	1.038E+00	32.48
TH-234	63.29	29	3.70*	3.208E+00	1.207E+00	1.207E+00	239.06
	92.59	93	4.23	5.793E+00	1.879E+00	1.879E+00	71.76
U-234	609.32	160	45.49*	2.309E+00	7.574E-01	7.574E-01	24.87
	1120.29	41	14.92	1.437E+00	9.465E-01	9.465E-01	46.85
	1764.49	32	15.30	9.862E-01	1.052E+00	1.052E+00	36.70
U-235	89.96	74	3.47	5.640E+00	1.871E+00	1.871E+00	56.87
	93.35	93	5.60	5.793E+00	1.419E+00	1.419E+00	71.76
	143.76	45	10.96*	6.467E+00	3.153E-01	3.153E-01	114.86
	163.33	-----	5.08	6.216E+00	-----	Line Not Found	-----
	185.72	85	57.20	5.841E+00	1.258E-01	1.258E-01	71.50
	205.31	-----	5.01	5.506E+00	-----	Line Not Found	-----
U-238	63.29	29	3.70*	3.208E+00	1.207E+00	1.207E+00	239.06
	92.59	93	4.23	5.793E+00	1.879E+00	1.879E+00	71.76
AM-243	43.53	-----	5.90	5.190E-01	-----	Line Not Found	-----
	74.66	169	67.20*	4.533E+00	2.749E-01	2.749E-01	39.57
ANH-511	511.00	52	100.00*	2.663E+00	9.783E-02	9.783E-02	79.36

Flag: "*" = Keyline

Total number of lines in spectrum 51
 Number of unidentified lines 11
 Number of lines tentatively identified by NID 40 78.43%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
NA-22	2.60Y	1.26	5.808E-02	7.308E-02	6.132E-02	83.90	
K-40	1.25E+09Y	1.00	1.424E+01	1.424E+01	0.152E+01	10.65	
Y-91	58.51D	41.7	1.576E+01	6.574E+02	3.760E+02	57.20	
CD-109	461.40D	1.60	2.169E+00	3.482E+00	3.142E+00	90.26	
SN-126	2.30E+05Y	1.00	2.169E-01	2.169E-01	1.958E-01	90.26	
BA-137M	30.08Y	1.02	2.887E-01	2.945E-01	0.773E-01	26.26	
CS-137	30.08Y	1.02	3.050E-01	3.111E-01	0.817E-01	26.26	
TL-208	1.41E+10Y	1.00	3.231E-01	3.231E-01	0.823E-01	25.47	
BI-211	7.04E+08Y	1.00	3.182E+00	3.182E+00	0.544E+00	17.11	
BI-212	1.41E+10Y	1.00	1.025E+00	1.025E+00	0.984E+00	95.99	
PB-212	1.41E+10Y	1.00	1.074E+00	1.074E+00	0.134E+00	12.45	
BI-214	1600.00Y	1.00	7.574E-01	7.577E-01	1.884E-01	24.87	
PB-214	1600.00Y	1.00	1.155E+00	1.155E+00	0.198E+00	17.11	
RN-222	1600.00Y	1.00	7.574E-01	7.577E-01	1.884E-01	24.87	
RA-224	1.41E+10Y	1.00	4.176E+00	4.176E+00	1.731E+00	41.46	
RA-226	1600.00Y	1.00	7.574E-01	7.577E-01	1.884E-01	24.87	
AC-228	1.41E+10Y	1.00	8.586E-01	8.586E-01	3.007E-01	35.02	
RA-228	1.41E+10Y	1.00	8.586E-01	8.586E-01	3.007E-01	35.02	
TH-228	1.41E+10Y	1.00	1.074E+00	1.074E+00	0.134E+00	12.45	
TH-229	7340.00Y	1.00	2.705E-01	2.705E-01	1.539E-01	56.87	K
TH-230	7.54E+04Y	1.00	7.574E-01	7.574E-01	1.883E-01	24.87	
PA-231	7.04E+08Y	1.00	7.782E-01	7.782E-01	8.821E-01	113.35	
TH-232	1.41E+10Y	1.00	8.586E-01	8.586E-01	3.007E-01	35.02	
TH-234	4.47E+09Y	1.00	1.207E+00	1.207E+00	2.886E+00	239.06	
U-234	2.45E+05Y	1.00	7.574E-01	7.574E-01	1.883E-01	24.87	
U-235	7.04E+08Y	1.00	3.153E-01	3.153E-01	3.621E-01	114.86	
U-238	4.47E+09Y	1.00	1.207E+00	1.207E+00	2.886E+00	239.06	
AM-243	7370.00Y	1.00	2.749E-01	2.749E-01	1.088E-01	39.57	
ANH-511	1.00E+09Y	1.00	9.783E-02	9.783E-02	7.763E-02	79.36	
Total Activity :			5.556E+01	6.986E+02			

Grand Total Activity : 5.556E+01 6.986E+02

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	129.14	62	143	0.79	259.12	256	8	1.41E-02	78.5	6.54E+00	T
0	255.93	16	93	0.57	512.80	509	9	3.79E-03	****	4.70E+00	T
0	274.31	94	232	8.38	549.58	533	28	2.28E-02	****	4.45E+00	T
0	410.33	32	75	2.16	821.74	812	13	7.98E-03	****	3.19E+00	T
0	625.69	18	8	0.91	1252.65	1249	8	4.72E-03	75.3	2.26E+00	
1	723.01	15	36	1.98	1447.36	1440	27	4.06E-03	****	2.02E+00	T
0	748.16	15	10	1.39	1497.69	1494	10	3.92E-03	****	1.97E+00	T
8	781.40	13	16	2.20	1564.19	1561	17	3.50E-03	****	1.90E+00	
0	804.73	17	25	1.55	1610.87	1605	12	4.61E-03	****	1.86E+00	
0	946.99	23	13	4.32	1895.53	1886	17	6.21E-03	84.4	1.64E+00	T
4	963.76	18	15	2.84	1929.07	1920	23	4.95E-03	****	1.62E+00	T
0	1063.76	10	22	1.73	2129.16	2121	15	2.67E-03	****	1.50E+00	T
0	1134.69	13	15	3.50	2271.08	2263	15	3.61E-03	****	1.42E+00	
0	1143.20	15	12	3.51	2288.11	2282	12	4.16E-03	****	1.41E+00	
0	1168.70	19	12	1.24	2339.14	2333	13	5.26E-03	90.3	1.39E+00	
0	1200.59	13	9	3.91	2402.95	2394	14	3.55E-03	****	1.36E+00	
3	1207.52	13	1	2.05	2416.82	2407	13	3.70E-03	56.6	1.35E+00	
0	1236.70	32	27	8.17	2475.21	2464	27	8.92E-03	97.0	1.33E+00	T
0	1263.32	9	8	1.37	2528.47	2521	12	2.57E-03	****	1.31E+00	
1	1272.80	19	6	2.30	2547.42	2542	19	5.48E-03	63.4	1.30E+00	T
0	1280.93	6	3	1.39	2563.69	2560	7	1.81E-03	****	1.29E+00	
0	1511.05	7	5	1.34	3024.14	3017	10	1.94E-03	****	1.13E+00	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235029.CNF;1
* Acquisition date   : 3-OCT-2016 09:08:53 Sensitivity      : 3.000
* Detector ID        : GAM19 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.76 Half life ratio  : *****
* Sample date        : 23-NOV-2015 11:10:00 Nuclide Library : SOLID
* Sample ID          : G405235029 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity : 1.5120E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 15-JUN-2016 10:35:16 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM19_CAN.CNF;17
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
NA-22	3.592E-02
K-40	1.963E-01
Y-91	3.970E+02
CD-109	9.125E-01
SN-126	6.504E-02
BA-137M	2.978E-02
CS-137	3.146E-02
TL-208	2.997E-02
BI-211	1.678E-01
BI-212	4.024E-01
PB-212	4.576E-02
BI-214	6.542E-02
PB-214	1.582E-01
RN-222	6.542E-02
RA-224	4.905E-01
RA-226	6.542E-02
AC-228	1.212E-01
RA-228	1.212E-01
TH-228	4.576E-02
TH-229	4.423E-01
TH-230	6.540E-02
PA-231	4.111E-01
TH-232	1.212E-01
TH-234	9.659E-01
U-234	6.540E-02
U-235	1.528E-01
U-238	9.659E-01
AM-243	4.080E-02
ANH-511	2.626E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.256E+01	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF

AL-26	1.701E-02	NOT IDENT.
SC-46	3.761E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	7.005E-02	NOT IDENT.
CO-56	4.361E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.424E-02	NOT IDENT.
CO-58	6.015E-01	NOT IDENT.
FE-59	5.496E+00	NOT IDENT.
CO-60	3.110E-02	NOT IDENT.
ZN-65	1.132E-01	NOT IDENT.
GE-68	1.556E+00	NOT IDENT.
AS-73	8.631E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.917E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	6.265E-01	NOT IDENT.
KR-85	6.727E+00	NOT IDENT.
SR-85	8.326E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	2.123E-01	NOT IDENT.
NB-94	2.934E-02	NOT IDENT.
NB-95	9.456E-01	NOT IDENT.
NB-95M	2.560E+00	NOT IDENT.
ZR-95	1.549E+00	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.975E-02	NOT IDENT.
RH-102	5.057E-02	NOT IDENT.
RU-103	7.631E+00	FAIL ABUN
RH-106	4.193E-01	NOT IDENT.
RU-106	4.193E-01	NOT IDENT.
AG-108M	2.503E-02	FAIL ABUN
AG-110M	7.513E-02	NOT IDENT.
SN-113	2.409E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.178E-01	NOT IDENT.
SB-124	1.998E+00	FAIL ABUN
SB-125	9.828E-02	NOT IDENT.
TE-125M	2.992E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.459E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.580E-02	NOT IDENT.
CS-135	1.221E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	1.135E-01	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.923E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.710E-01	NOT IDENT.
PM-144	4.951E-02	NOT IDENT.
PR-144	4.335E+00	NOT IDENT.
PM-146	4.144E-02	FAIL ABUN
ND-147	0.000E+00	SHORT HLIF
PM-147	7.308E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.162E-02	FAIL ABUN
EU-152	8.553E-02	FAIL ABUN
GD-153	1.765E-01	NOT IDENT.
EU-154	1.112E-01	FAIL ABUN
EU-155	9.483E-02	FAIL ABUN
TB-160	2.294E+00	FAIL ABUN
HO-166M	4.085E-02	FAIL ABUN
TM-171	1.728E+01	NOT IDENT.
HF-172	2.189E-01	FAIL ABUN

LU-172	5.959E-02	FAIL ABUN
LU-176	2.190E-02	NOT IDENT.
HF-181	5.107E+00	NOT IDENT.
TA-182	7.907E-01	FAIL ABUN
RE-183	2.900E+00	NOT IDENT.
RE-184	3.830E+01	NOT IDENT.
W-188	1.203E+02	FAIL ABUN
IR-192	4.643E-01	FAIL ABUN
HG-203	2.739E+00	NOT IDENT.
BI-207	1.208E-01	FAIL ABUN
PB-210	2.914E+00	NOT IDENT.
PB-211	5.911E-01	NOT IDENT.
RN-219	3.638E-01	NOT IDENT.
RA-223	5.439E-01	FAIL ABUN
AC-227	2.233E-01	FAIL ABUN
TH-227	2.233E-01	FAIL ABUN
TH-231	5.439E-01	FAIL ABUN
PA-233	5.388E-02	FAIL ABUN
PA-234	2.637E-01	FAIL ABUN
PA-234M	3.626E+00	NOT IDENT.
NP-237	5.388E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.275E-01	NOT IDENT.
PU-239	3.275E+02	FAIL ABUN
AM-241	1.091E-01	NOT IDENT.
CM-243	8.638E-02	NOT IDENT.
BK-247	6.165E-02	NOT IDENT.
CM-247	3.244E-02	NOT IDENT.
CF-249	3.680E-02	NOT IDENT.
CF-251	1.062E-01	NOT IDENT.

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235029.CNF;1
* Acquisition date   : 3-OCT-2016 09:08:53 Sensitivity      : 3.000
* Detector ID       : GAM19 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.76 Half life ratio : *****
* Sample date       : 23-NOV-2015 11:10:00 Nuclide Library : SOLID
* Sample ID         : G405235029 Analyst initials: MXR1
* Batch Number      : 1596249 Sample Quantity : 1.5120E+02 GRAM
*                               Quantity Err(%) : 1.3227E-03 %
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight  : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date    : 15-JUN-2016 10:35:16 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM19_CAN.CNF;17
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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
NA-22	7.308E-02	6.015E-02	6.015E-02
K-40	1.424E+01	1.663E+00	1.663E+00
Y-91	6.574E+02	3.693E+02	3.693E+02
CD-109	1.980E+00	3.119E+00	3.119E+00
SN-126	1.234E-01	1.942E-01	1.942E-01
BA-137M	2.945E-01	7.686E-02	7.686E-02
CS-137	3.111E-01	8.119E-02	8.119E-02
TL-208	3.231E-01	8.180E-02	8.180E-02
BI-211	3.842E-01	9.768E-01	9.768E-01
BI-212	1.025E+00	9.654E-01	9.654E-01
PB-212	1.074E+00	1.428E-01	1.428E-01
BI-214	7.577E-01	1.875E-01	1.875E-01
PB-214	1.155E+00	1.996E-01	1.996E-01
RN-222	7.577E-01	1.875E-01	1.875E-01
RA-224	2.381E+00	1.781E+00	1.781E+00
RA-226	7.577E-01	1.875E-01	1.875E-01
AC-228	8.586E-01	2.980E-01	2.980E-01
RA-228	8.586E-01	2.980E-01	2.980E-01
TH-228	1.074E+00	1.428E-01	1.428E-01
TH-229	1.099E-01	4.781E-01	4.781E-01
TH-230	7.574E-01	1.874E-01	1.874E-01
PA-231	7.782E-01	8.802E-01	8.802E-01
TH-232	8.586E-01	2.980E-01	2.980E-01
TH-234	1.207E+00	2.841E+00	2.841E+00
U-234	7.574E-01	1.874E-01	1.874E-01
U-235	3.153E-01	3.553E-01	3.553E-01
U-238	1.207E+00	2.841E+00	2.841E+00
AM-243	1.873E-01	1.107E-01	1.107E-01
ANH-511	9.783E-02	7.619E-02	7.619E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.453E+01	1.672E+01	1.796E+01	NOT IDENT.

NA-24	1.000E+41	3.370E+41	0.000E+00	SHORT HLIF
AL-26	5.527E-03	1.712E-02	1.730E-02	NOT IDENT.
SC-46	4.859E-02	4.254E-01	4.259E-01	FAIL ABUN
V-48	8.593E+03	2.902E+04	2.927E+04	SHORT HLIF
CR-51	2.128E+02	6.550E+02	6.619E+02	SHORT HLIF
MN-54	5.341E-02	7.342E-02	7.727E-02	NOT IDENT.
CO-56	-1.196E-01	5.203E-01	5.230E-01	NOT IDENT.
MN-56	-1.000E+41	4.574E+41	0.000E+00	SHORT HLIF
CO-57	-1.255E-02	4.811E-02	4.844E-02	NOT IDENT.
CO-58	-4.650E-03	7.415E-01	7.415E-01	NOT IDENT.
FE-59	-3.147E+00	7.188E+00	7.326E+00	NOT IDENT.
CO-60	1.764E-03	3.682E-02	3.683E-02	NOT IDENT.
ZN-65	-1.572E-01	1.984E-01	2.107E-01	NOT IDENT.
GE-68	-9.278E-01	2.040E+00	2.083E+00	NOT IDENT.
AS-73	-5.050E-01	9.792E+00	9.795E+00	NOT IDENT.
AS-74	6.443E+03	1.048E+04	1.087E+04	SHORT HLIF
SE-75	-1.882E-02	2.424E-01	2.426E-01	NOT IDENT.
BR-77	1.573E+40	1.430E+41	0.000E+00	SHORT HLIF
SR-82	3.226E+02	1.113E+03	1.123E+03	SHORT HLIF
RB-83	1.073E-01	7.245E-01	7.261E-01	NOT IDENT.
KR-85	-3.223E-01	8.982E+00	8.983E+00	NOT IDENT.
SR-85	-4.160E-02	1.112E+00	1.112E+00	NOT IDENT.
RB-86	-1.883E+04	4.142E+04	4.228E+04	SHORT HLIF
Y-88	8.967E-02	2.205E-01	2.242E-01	NOT IDENT.
NB-94	4.531E-03	3.256E-02	3.263E-02	NOT IDENT.
NB-95	3.129E-01	1.035E+00	1.045E+00	NOT IDENT.
NB-95M	-5.126E-02	3.181E+00	3.181E+00	NOT IDENT.
ZR-95	4.002E-01	1.703E+00	1.713E+00	FAIL ABUN
NB-97	-1.000E+41	2.803E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.001E+41	0.000E+00	SHORT HLIF
MO-99	2.584E+33	7.077E+33	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	1.352E+41	0.000E+00	SHORT HLIF
RH-101	-6.025E-03	3.589E-02	3.600E-02	NOT IDENT.
RH-102	2.108E-02	5.717E-02	5.795E-02	NOT IDENT.
RU-103	5.562E+00	8.287E+00	8.658E+00	FAIL ABUN
RH-106	-1.176E-01	5.939E-01	5.963E-01	NOT IDENT.
RU-106	-1.176E-01	5.939E-01	5.963E-01	NOT IDENT.
AG-108M	-1.943E-03	2.940E-02	2.941E-02	FAIL ABUN
AG-110M	-6.504E-02	9.872E-02	1.030E-01	NOT IDENT.
SN-113	-1.233E-01	2.916E-01	2.969E-01	NOT IDENT.
CD-115	-1.000E+41	2.080E+41	0.000E+00	SHORT HLIF
SN-117M	-4.185E+04	1.976E+05	1.985E+05	SHORT HLIF
TE-123M	-2.844E-02	1.300E-01	1.307E-01	NOT IDENT.
SB-124	1.719E-01	2.269E+00	2.271E+00	FAIL ABUN
SB-125	-6.711E-02	1.221E-01	1.258E-01	NOT IDENT.
TE-125M	3.728E+01	3.486E+02	3.490E+02	NOT IDENT.
I-126	3.262E+05	1.936E+06	1.942E+06	SHORT HLIF
SB-126	8.123E+04	3.089E+06	3.089E+06	SHORT HLIF
SB-127	-1.859E+23	4.455E+23	0.000E+00	SHORT HLIF
I-131	3.083E+09	2.150E+10	2.155E+10	SHORT HLIF
I-132	-1.000E+41	1.944E+42	0.000E+00	SHORT HLIF
TE-132	-3.774E+27	1.080E+28	0.000E+00	SHORT HLIF
BA-133	-7.632E-03	4.557E-02	4.570E-02	NOT IDENT.
I-133	-1.000E+41	7.518E+41	0.000E+00	SHORT HLIF
CS-134	4.499E-02	5.831E-02	6.174E-02	NOT IDENT.
CS-135	2.104E-02	1.352E-01	1.355E-01	NOT IDENT.
I-135	1.000E+41	7.389E+41	0.000E+00	SHORT HLIF
CS-136	9.174E+04	7.601E+05	7.612E+05	SHORT HLIF
CE-139	-2.342E-02	1.251E-01	1.255E-01	NOT IDENT.
BA-140	8.583E+04	3.081E+06	3.081E+06	SHORT HLIF
LA-140	-8.895E+05	1.064E+06	1.137E+06	SHORT HLIF
CE-141	-2.317E+00	3.524E+01	3.525E+01	NOT IDENT.
CE-143	1.000E+41	1.230E+41	0.000E+00	SHORT HLIF
CE-144	1.442E-01	4.300E-01	4.348E-01	NOT IDENT.
PM-144	-1.616E-02	5.746E-02	5.792E-02	NOT IDENT.
PR-144	-1.415E+00	5.030E+00	5.070E+00	NOT IDENT.
PM-146	3.302E-02	4.424E-02	4.668E-02	FAIL ABUN
ND-147	4.440E+07	9.125E+07	9.342E+07	SHORT HLIF
PM-147	-3.599E+02	8.053E+02	8.214E+02	NOT IDENT.
PM-149	-1.000E+41	1.368E+41	0.000E+00	SHORT HLIF
EU-150	-5.813E-03	2.843E-02	2.855E-02	FAIL ABUN
EU-152	2.077E-02	9.564E-02	9.609E-02	FAIL ABUN
GD-153	6.480E-02	2.002E-01	2.023E-01	NOT IDENT.
EU-154	1.778E-01	1.464E-01	1.669E-01	FAIL ABUN
EU-155	2.016E-02	1.094E-01	1.098E-01	FAIL ABUN
TB-160	1.846E+00	2.384E+00	2.525E+00	FAIL ABUN
HO-166M	-1.935E-02	4.933E-02	5.009E-02	FAIL ABUN
TM-171	-5.108E+00	1.996E+01	2.009E+01	NOT IDENT.

HF-172	2.179E-02	2.579E-01	2.581E-01	FAIL ABUN
LU-172	-3.290E-02	7.649E-02	7.791E-02	FAIL ABUN
LU-176	1.887E-03	2.750E-02	2.751E-02	NOT IDENT.
HF-181	1.695E-01	5.978E+00	5.978E+00	NOT IDENT.
TA-182	-7.827E-01	1.081E+00	1.138E+00	FAIL ABUN
RE-183	-3.873E-01	3.612E+00	3.616E+00	NOT IDENT.
RE-184	1.204E+01	4.245E+01	4.279E+01	NOT IDENT.
W-188	-2.611E+01	1.556E+02	1.560E+02	FAIL ABUN
IR-192	-1.159E-01	5.398E-01	5.423E-01	FAIL ABUN
HG-203	-1.561E+00	3.604E+00	3.672E+00	NOT IDENT.
BI-207	4.348E-02	1.364E-01	1.378E-01	FAIL ABUN
PB-210	-1.349E+00	3.391E+00	3.445E+00	NOT IDENT.
PB-211	-2.626E-01	8.083E-01	8.170E-01	NOT IDENT.
RN-219	5.338E-02	4.152E-01	4.159E-01	NOT IDENT.
RA-223	8.816E-02	6.105E-01	6.118E-01	FAIL ABUN
AC-227	1.748E-01	4.176E-01	4.249E-01	FAIL ABUN
TH-227	1.748E-01	4.176E-01	4.249E-01	FAIL ABUN
TH-231	8.816E-02	6.105E-01	6.118E-01	FAIL ABUN
PA-233	2.158E-03	6.096E-02	6.096E-02	FAIL ABUN
PA-234	5.719E-01	8.074E-01	8.476E-01	FAIL ABUN
PA-234M	-1.459E+00	4.352E+00	4.401E+00	NOT IDENT.
NP-237	2.158E-03	6.096E-02	6.096E-02	FAIL ABUN
NP-238	1.000E+41	3.756E+41	0.000E+00	SHORT HLIF
NP-239	1.473E-01	2.330E-01	2.423E-01	NOT IDENT.
PU-239	7.470E+02	5.753E+02	6.666E+02	FAIL ABUN
AM-241	-3.107E-02	1.379E-01	1.386E-01	NOT IDENT.
CM-243	1.986E-02	9.941E-02	9.982E-02	NOT IDENT.
BK-247	-1.230E-02	7.881E-02	7.900E-02	NOT IDENT.
CM-247	1.685E-03	3.922E-02	3.922E-02	NOT IDENT.
CF-249	1.638E-03	4.231E-02	4.232E-02	NOT IDENT.
CF-251	4.163E-02	1.131E-01	1.147E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	53.6616	879.38	112.8485	482.18	100.1077
45.60	62.8962	87.57	112.8741	133.52	92.4598
46.54	79.9083	87.09	112.8991	264.66	89.2840
49.72	0.0000	87.57	112.9795	122.06	100.4969
51.35	69.3568	88.03	87.2150	140.51	0.0000
51.87	78.5368	88.34	87.2545	143.76	77.0593
52.39	77.4805	193.51	87.2715	144.24	81.8637
52.97	75.2901	89.96	92.3206	145.44	81.9684
53.44	83.3542	90.64	92.4122	152.43	110.0975
125.81	70.8834	91.11	0.0000	153.25	0.0000
57.36	0.0000	63.29	92.6714	154.21	88.4151
57.53	81.7246	143.76	92.7717	156.02	0.0000
57.98	86.0189	94.56	89.6704	158.56	0.0000
1093.63	87.7696	94.65	92.9427	159.00	70.3743
57.98	87.7779	94.67	92.9456	162.33	73.2574
59.54	83.1923	94.87	92.9717	162.66	0.0000
60.96	77.2344	97.43	83.4825	163.33	66.2621
61.17	88.0817	311.90	78.6802	165.86	92.1119
62.93	88.3663	946.00	78.6816	176.31	78.7268
63.29	88.4241	99.53	75.1051	1048.07	0.0000
63.58	88.4705	1221.41	107.2021	177.52	71.6512
64.28	97.9062	265.00	79.0664	739.50	0.0000
66.73	112.3799	103.18	73.0014	181.52	78.2110
67.24	106.6219	103.37	73.0199	711.68	63.5464
67.68	103.1861	116.74	73.0199	185.72	78.5128
67.75	96.1619	105.21	74.4388	193.51	77.2448
69.67	106.6782	105.31	74.4484	197.03	88.4233
70.83	111.6041	106.12	78.2544	127.23	71.1644
72.81	98.1750	106.47	78.2900	306.78	85.1299
279.20	98.1851	109.28	82.3177	203.43	78.8307
72.87	98.1851	111.00	88.7489	205.31	68.8576
74.66	98.4751	228.16	0.0000	210.85	71.0243
74.82	98.5004	114.06	85.3279	215.65	72.2339
1063.66	98.5245	116.30	0.0000	222.11	80.0616
238.63	98.8665	116.74	73.8615	290.67	77.5769
351.93	98.8665	119.76	81.7165	177.52	74.7908
78.74	98.7248	121.12	86.9136	228.16	0.0000
79.69	86.1152	121.22	86.9241	228.18	74.8381
80.12	86.1735	121.78	86.1382	235.69	74.8086
80.19	0.0000	122.06	86.1673	256.23	65.8828
80.57	95.8154	122.92	83.7191	238.63	66.0181
81.00	97.4775	123.07	86.2711	238.98	0.0000
81.07	110.2734	123.68	82.9482	240.99	66.1377
81.75	100.7908	125.81	87.8240	242.00	66.1883
323.87	93.0818	127.23	84.1448	344.28	66.3235
84.00	93.1119	127.91	88.0399	252.40	0.0000
85.43	112.6192	129.30	85.1990	252.80	48.6146
86.55	112.8086	131.20	96.0583	254.15	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
256.23	56.3820	351.93	42.7203	583.19	26.1651
260.90	0.0000	507.63	0.0000	584.27	26.1773
264.66	49.0348	356.01	39.7633	595.83	0.0000
264.80	51.9247	364.49	0.0000	600.60	28.6407
265.00	51.9313	366.42	0.0000	602.52	0.0000
268.22	50.1232	372.51	32.9355	604.72	30.9825
269.46	50.1666	129.30	38.1359	607.14	33.3094
270.03	50.1867	377.52	35.0922	609.32	33.3377
271.23	50.2290	383.85	45.5737	497.08	33.3507
273.65	0.0000	388.16	44.6429	433.94	10.3663
356.01	50.4110	388.63	0.0000	696.49	23.0705
277.37	50.4448	391.69	49.9297	620.36	11.5454
277.60	50.4533	400.66	39.7194	621.93	22.5278
278.00	50.4670	401.81	39.7434	667.71	0.0000
279.20	61.1927	402.40	38.9195	631.29	16.2319
279.54	64.1215	404.85	42.4273	453.88	23.2064
279.70	64.1295	410.95	39.4104	595.83	0.0000
280.46	55.4136	413.71	52.0973	635.95	24.3915
283.69	58.4583	414.70	0.0000	636.99	0.0000
364.49	0.0000	423.72	0.0000	645.85	30.3132
285.41	56.5757	404.85	39.2116	884.68	32.3224
285.90	0.0000	427.87	46.6479	657.90	0.0000
402.40	46.8877	433.94	34.0306	661.66	22.8698
290.67	52.8618	333.97	33.0573	664.57	0.0000
293.27	0.0000	453.88	23.6288	666.33	0.0000
295.22	55.9679	463.37	20.5006	720.70	0.0000
295.96	55.9946	468.07	25.9541	667.71	0.0000
298.58	56.0920	685.70	0.0000	677.62	17.6953
299.98	56.1430	475.06	34.7207	685.70	0.0000
300.09	56.1476	476.78	33.6628	695.00	0.0000
300.13	56.1488	477.60	40.1940	696.49	23.1610
301.36	56.1940	482.18	30.4826	696.51	23.1610
302.85	56.2485	1596.21	0.0000	697.00	0.0000
304.50	47.4180	527.90	0.0000	697.30	21.3853
537.26	0.0000	497.08	26.3081	697.49	22.2778
306.78	46.0043	505.52	19.8073	702.65	24.1046
316.51	43.5775	507.63	0.0000	706.68	24.1383
311.90	46.6519	511.00	34.1964	711.68	18.8076
316.51	46.7877	514.00	38.1078	720.70	0.0000
531.02	0.0000	514.00	38.1078	721.93	0.0000
320.08	0.0000	520.40	22.1549	1690.97	20.6788
427.87	48.9183	238.98	0.0000	722.91	20.6795
323.87	46.0037	522.65	0.0000	1274.44	20.6823
325.23	54.0505	527.90	0.0000	724.19	20.6886
328.76	0.0000	528.26	25.5662	727.33	20.7111
388.16	51.9065	520.40	28.9178	733.00	14.4360
333.97	45.2838	529.87	0.0000	735.93	25.8048
334.37	49.8243	531.02	0.0000	737.46	14.4580
338.28	45.4019	537.26	0.0000	739.50	0.0000
911.20	45.4037	546.56	0.0000	747.24	20.3089
340.48	45.4623	552.55	22.4650	748.06	16.3240
340.55	0.0000	563.25	33.8489	752.31	24.7023
344.28	40.5029	795.86	31.6732	753.82	0.0000
345.93	36.4885	569.50	29.4129	756.73	18.1909
351.06	42.6990	569.70	29.4150	756.80	19.1005

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
763.94	26.4406	984.45	0.0000	1596.21	0.0000
765.81	21.8950	996.26	16.6176	1620.50	3.3697
766.42	13.6871	1001.03	15.6606	1621.92	3.3706
766.84	14.6016	1002.74	16.6467	1678.03	0.0000
772.60	0.0000	1004.73	17.6358	1690.97	4.5510
776.52	0.0000	1021.30	0.0000	1750.46	0.0000
777.92	0.0000	1025.87	0.0000	1764.49	1.8441
778.90	20.5235	1028.54	0.0000	1770.23	11.0760
783.70	0.0000	846.77	11.8616	1771.35	3.4618
727.33	14.6909	1038.76	0.0000	1791.20	0.0000
792.07	25.7655	1046.59	16.8423	1808.65	0.9291
794.95	23.0263	1048.07	0.0000	846.75	0.0000
795.86	21.1898	1049.04	19.8267	1836.06	2.8000
801.95	19.2010	621.93	19.8340		
810.06	20.7313	1063.66	10.9463		
810.29	19.2518	1077.00	0.0000		
810.45	18.5126	1077.34	11.9832		
810.76	18.5144	1085.87	11.0087		
815.77	0.0000	1093.63	16.0439		
818.51	0.0000	1099.45	12.0513		
832.01	19.5709	1112.07	11.0819		
834.85	18.6554	1112.84	13.0992		
835.71	21.4593	1115.54	17.7461		
1260.41	0.0000	609.32	11.1041		
846.75	0.0000	889.28	11.1047		
846.77	17.7876	1121.30	11.3094		
856.80	0.0000	1129.67	14.5705		
860.56	14.1023	1131.51	0.0000		
702.65	16.0335	1147.95	0.0000		
873.19	12.2688	1173.23	6.5445		
529.87	0.0000	1177.95	16.3799		
879.38	15.1279	1189.05	13.3436		
880.51	17.0250	1204.77	8.2422		
883.24	18.9319	1221.41	21.7191		
884.68	17.9928	1231.02	18.2435		
889.28	15.1729	1235.36	0.0000		
903.28	18.0468	1238.28	10.3827		
898.04	18.0641	1260.41	0.0000		
900.72	19.0302	1271.87	10.0441		
903.28	16.1876	1274.44	10.0500		
911.20	20.0425	1274.54	10.0500		
912.08	20.0477	1099.45	4.2034		
923.98	0.0000	1298.22	0.0000		
926.50	16.2970	1312.11	0.0000		
929.11	13.4313	1332.49	8.4824		
937.49	19.2334	1362.66	0.0000		
944.13	0.0000	1365.19	9.6103		
946.00	10.6039	1368.63	0.0000		
949.00	10.8059	1384.29	6.4325		
954.55	0.0000	1408.01	8.6196		
962.31	8.7157	1457.56	0.0000		
964.08	8.7201	1460.82	4.3564		
966.17	8.7251	696.51	5.4764		
968.97	9.3141	1505.03	5.2740		
983.53	0.0000	1584.12	11.1560		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235030.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM20.CNF;515
Background date : 2-OCT-2016 11:01:13.
Sample date      : 23-NOV-2015 14:44:00 Acquisition date : 3-OCT-2016 09:09:22.
Sample ID       : G405235030 Sample quantity : 1.31120E+02 GRAM
Detector name   : GAM20 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:15.23 0.4%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596249 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.17*	43	187	1.39	126.50	123	9	1.20E-02	60.3	
2	3	74.94	159	178	1.17	150.02	145	15	4.42E-02	15.9	1.23E+00
3	3	77.25	261	153	1.22	154.64	145	15	7.26E-02	10.4	
4	3	87.53	112	173	1.32	175.17	171	21	3.11E-02	21.2	2.21E+00
5	3	90.08*	53	130	1.19	180.28	171	21	1.46E-02	38.5	
6	3	92.88*	129	138	1.48	185.86	171	21	3.59E-02	21.1	
7	3	129.39	41	111	1.36	258.84	254	12	1.13E-02	47.8	1.57E+00
8	3	131.32	24	93	1.14	262.70	254	12	6.80E-03	72.2	
9	0	161.55	27	63	1.56	323.13	321	6	7.50E-03	50.3	
10	0	186.00*	133	130	1.69	372.01	366	13	3.69E-02	20.5	
11	0	208.97	59	86	1.23	417.91	415	9	1.64E-02	30.9	
12	4	238.54*	490	48	1.21	477.02	472	26	1.36E-01	5.2	1.10E+00
13	4	241.80	131	65	1.85	483.56	472	26	3.63E-02	18.0	
14	0	270.50	21	75	2.05	540.93	539	8	5.75E-03	77.9	
15	1	295.18*	162	65	1.27	590.27	585	20	4.51E-02	11.4	2.45E+00
16	1	300.19	38	69	1.51	600.27	585	20	1.07E-02	41.5	
17	0	327.64	36	51	1.31	655.16	650	9	9.89E-03	38.0	
18	0	338.27*	68	60	1.03	676.42	671	10	1.88E-02	24.9	
19	1	351.92*	231	50	1.55	703.72	699	17	6.40E-02	8.7	5.15E+00
20	1	355.92*	13	34	1.56	711.72	699	17	3.59E-03	101.2	
21	0	416.83	11	17	1.33	833.50	830	6	3.14E-03	64.3	
22	0	463.17	34	27	1.62	926.18	922	11	9.55E-03	33.0	
23	0	510.97*	40	53	1.72	1021.77	1016	13	1.11E-02	47.3	
24	0	583.15*	175	18	1.56	1166.14	1157	18	4.87E-02	9.6	
25	0	609.31*	164	50	1.46	1218.47	1213	13	4.57E-02	12.0	
26	0	657.26	19	9	1.53	1314.39	1306	14	5.14E-03	43.5	
27	0	661.74*	26	11	0.62	1323.34	1319	9	7.23E-03	31.7	
28	0	710.81	10	14	1.33	1421.52	1417	9	2.76E-03	77.6	
29	0	727.71	37	39	1.38	1455.33	1449	12	1.03E-02	37.4	
30	0	860.58	32	20	1.75	1721.19	1712	17	8.87E-03	37.4	
31	0	911.09*	86	16	1.67	1822.28	1815	13	2.38E-02	14.7	
32	0	922.69	17	10	4.74	1845.49	1837	12	4.81E-03	42.4	
33	0	969.00	57	24	2.10	1938.18	1933	11	1.59E-02	21.4	
34	0	1001.87*	10	3	1.31	2003.97	2000	7	2.81E-03	48.7	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1121.07	37	37	1.65	2242.58	2237	15	1.04E-02	37.9	
36	0	1238.15	21	11	2.37	2477.01	2472	9	5.79E-03	36.3	
37	0	1432.30	6	4	1.39	2865.83	2861	8	1.67E-03	70.7	
38	0	1460.87*	386	0	2.07	2923.05	2916	13	1.07E-01	5.1	
39	0	1504.53	8	3	0.56	3010.52	3004	10	2.31E-03	49.9	
40	0	1729.83	18	2	1.32	3461.94	3457	10	4.92E-03	28.9	
41	0	1764.61	44	12	2.38	3531.63	3522	15	1.23E-02	22.4	
42	0	1846.37	16	0	1.04	3695.50	3690	11	4.44E-03	25.0	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235030.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 23-NOV-2015 14:44:00 Acquisition date : 3-OCT-2016 09:09:22
Sample ID        : G405235030 Sample quantity   : 131.12 GRAM
Sample type      : SOLID Sample geometry    :
Detector name    : GAMMA20 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:15.23 0.4%
Energy tolerance : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type  : Linear Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.312E+00	1.507E+01	1.507E+01	10.25	OK
CD-109	88.03	3.70*	6.859E+00	1.859E+00	2.983E+00	67.66	OK
SN-126	64.28	9.60	4.772E+00	6.364E-01	6.364E-01	120.63	OK
	86.94	8.90	6.859E+00	7.727E-01	7.727E-01	67.66	OK
	87.57	37.00*	6.859E+00	1.859E-01	1.859E-01	67.66	OK
BA-137M	661.66	89.90*	2.464E+00	6.788E-02	6.924E-02	63.43	OK
CS-137	661.66	85.10*	2.464E+00	7.170E-02	7.314E-02	63.43	OK
TL-208	277.37	6.60	4.947E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.720E+00	4.419E-01	4.419E-01	19.14	OK
	860.56	12.50	2.011E+00	7.206E-01	7.206E-01	74.72	OK
PB-212	74.82	10.28	6.006E+00	1.071E+00	1.071E+00	52.68	OK
	77.11	17.10	6.195E+00	1.641E+00	1.641E+00	20.71	OK
	238.63	43.60*	5.554E+00	1.253E+00	1.253E+00	10.39	OK
	300.09	3.30	4.645E+00	1.532E+00	1.532E+00	82.97	OK
BI-214	609.32	45.49*	2.628E+00	7.998E-01	8.001E-01	24.10	OK
	1120.29	14.92	1.635E+00	8.518E-01	8.521E-01	75.87	OK
	1764.49	15.30	1.106E+00	1.404E+00	1.405E+00	44.86	OK
PB-214	74.82	5.80	5.996E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	6.195E+00	2.893E+00	2.894E+00	20.71	OK
	87.09	3.41	6.836E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	5.495E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.708E+00	1.144E+00	1.144E+00	22.73	OK
	351.93	35.60*	4.083E+00	9.572E-01	9.576E-01	17.36	OK
RN-222	609.32	45.49*	2.628E+00	7.998E-01	8.001E-01	24.10	OK
	1120.29	14.92	1.635E+00	8.518E-01	8.521E-01	75.87	OK
	1764.49	15.30	1.106E+00	1.404E+00	1.405E+00	44.86	OK
RA-224	240.99	4.10*	5.498E+00	1.568E+00	1.568E+00	87.46	OK
RA-226	609.32	45.49*	2.628E+00	7.998E-01	8.001E-01	24.10	OK
	1120.29	14.92	1.635E+00	8.518E-01	8.521E-01	75.87	OK
	1764.49	15.30	1.106E+00	1.404E+00	1.405E+00	44.86	OK
AC-228	105.21	1.10	7.453E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.217E+00	8.632E-01	8.632E-01	49.76	OK
	794.95	4.25	2.138E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	2.057E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.924E+00	9.747E-01	9.747E-01	29.48	OK
	968.97	15.80	1.834E+00	1.110E+00	1.110E+00	42.70	OK
RA-228	105.21	1.10	7.453E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.217E+00	8.632E-01	8.632E-01	49.76	OK
	794.95	4.25	2.138E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	2.057E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.924E+00	9.747E-01	9.747E-01	29.48	OK
	968.97	15.80	1.834E+00	1.110E+00	1.110E+00	42.70	OK
TH-228	74.82	10.28	6.006E+00	1.071E+00	1.071E+00	52.68	OK
	77.11	17.10	6.195E+00	1.641E+00	1.641E+00	20.71	OK
	238.63	43.60*	5.554E+00	1.253E+00	1.253E+00	10.39	OK
	300.09	3.30	4.645E+00	1.532E+00	1.532E+00	82.97	OK
TH-230	609.32	45.49*	2.628E+00	7.998E-01	7.998E-01	24.10	OK
	1120.29	14.92	1.635E+00	8.518E-01	8.518E-01	75.87	OK
	1764.49	15.30	1.106E+00	1.404E+00	1.404E+00	44.86	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
PA-231	283.69	1.70	4.860E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.645E+00	9.449E-01	9.449E-01	82.97	OK
TH-232	105.21	1.10	7.453E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.217E+00	8.632E-01	8.632E-01	49.76	OK
	835.71	1.61	2.057E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.924E+00	9.747E-01	9.747E-01	29.48	OK
	968.97	15.80	1.834E+00	1.110E+00	1.110E+00	42.70	OK
TH-234	63.29	3.70*	4.772E+00	1.651E+00	1.651E+00	120.63	OK
	92.59	4.23	7.103E+00	2.828E+00	2.828E+00	42.14	OK
U-234	609.32	45.49*	2.628E+00	7.998E-01	7.998E-01	24.10	OK
	1120.29	14.92	1.635E+00	8.518E-01	8.518E-01	75.87	OK
	1764.49	15.30	1.106E+00	1.404E+00	1.404E+00	44.86	OK
U-235	89.96	3.47	6.984E+00	1.434E+00	1.434E+00	77.01	OK
	93.35	5.60	7.103E+00	2.136E+00	2.136E+00	42.14	OK
	143.76	10.96*	7.370E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	7.024E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.563E+00	2.227E-01	2.227E-01	41.06	OK
	205.31	5.01	6.171E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	4.772E+00	1.651E+00	1.651E+00	120.63	OK
	92.59	4.23	7.103E+00	2.828E+00	2.828E+00	42.14	OK
AM-243	43.53	5.90	1.315E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	6.006E+00	1.639E-01	1.639E-01	52.68	OK
ANH-511	511.00	100.00*	3.019E+00	7.810E-02	7.810E-02	94.68	OK

Flag: "*" = Keyline

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235030.CNF;1
* Acquisition date   : 3-OCT-2016 09:09:22 Sensitivity      : 3.000
* Detector ID        : GAM20 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:15.23 Half life ratio  : *****
* Sample date        : 23-NOV-2015 14:44:00 Analyst initials: MXR1
* Sample ID          : G405235030 Sample Quantity : 1.3112E+02 GRAM
* Batch Number       : 1596249 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 30-JUN-2016 06:52:39 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM20_CAN.CNF;15
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.507E+01	1.514E+00	3.783E-01
CD-109	2.983E+00	1.978E+00	1.876E+00
SN-126	1.859E-01	1.233E-01	1.173E-01
BA-137M	6.924E-02	4.304E-02	5.190E-02
CS-137	7.314E-02	4.546E-02	5.483E-02
TL-208	4.419E-01	8.288E-02	4.272E-02
PB-212	1.253E+00	1.276E-01	8.896E-02
BI-214	8.001E-01	1.889E-01	1.294E-01
PB-214	9.576E-01	1.629E-01	1.188E-01
RN-222	8.001E-01	1.889E-01	1.294E-01
RA-224	1.568E+00	1.344E+00	9.536E-01
RA-226	8.001E-01	1.889E-01	1.294E-01
AC-228	9.747E-01	2.816E-01	2.158E-01
RA-228	9.747E-01	2.816E-01	2.158E-01
TH-228	1.253E+00	1.276E-01	8.896E-02
TH-230	7.998E-01	1.889E-01	1.294E-01
PA-231	9.449E-01	7.683E-01	7.239E-01
TH-232	9.747E-01	2.816E-01	2.158E-01
TH-234	1.651E+00	1.952E+00	1.661E+00
U-234	7.998E-01	1.889E-01	1.294E-01
U-235	-2.216E-02	1.820E-01	3.210E-01
U-238	1.651E+00	1.952E+00	1.661E+00
AM-243	1.639E-01	8.461E-02	7.554E-02
ANH-511	7.810E-02	7.247E-02	5.562E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-5.191E+00	1.334E+01	2.434E+01	NOT IDENT.
NA-22	-2.891E-02	4.082E-02	7.116E-02	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	3.919E-03	1.766E-02	4.726E-02	NOT IDENT.
SC-46	5.750E-02	3.774E-01	7.455E-01	FAIL ABUN
V-48	0.000E+00	2.440E+04	0.000E+00	SHORT HLIF

CR-51	0.000E+00	5.321E+02	0.000E+00	SHORT HLIF
MN-54	3.804E-02	5.866E-02	1.238E-01	NOT IDENT.
CO-56	2.432E-02	4.637E-01	8.989E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-5.382E-02	5.013E-02	8.085E-02	NOT IDENT.
CO-58	-2.598E-01	6.789E-01	1.196E+00	NOT IDENT.
FE-59	2.421E-01	8.558E+00	1.708E+01	NOT IDENT.
CO-60	2.369E-02	3.601E-02	8.216E-02	NOT IDENT.
ZN-65	6.554E-02	1.670E-01	3.266E-01	NOT IDENT.
GE-68	-5.813E-01	2.548E+00	4.883E+00	NOT IDENT.
AS-73	2.459E+00	6.369E+00	1.214E+01	NOT IDENT.
AS-74	0.000E+00	1.068E+04	0.000E+00	SHORT HLIF
SE-75	-5.855E-02	2.090E-01	3.937E-01	NOT IDENT.
BR-77	0.000E+00	1.790E+39	0.000E+00	SHORT HLIF
SR-82	0.000E+00	1.060E+03	0.000E+00	SHORT HLIF
RB-83	-2.797E-01	7.158E-01	1.294E+00	NOT IDENT.
KR-85	2.480E+00	7.227E+00	1.297E+01	NOT IDENT.
SR-85	3.059E-01	8.933E-01	1.603E+00	NOT IDENT.
RB-86	0.000E+00	5.102E+04	0.000E+00	SHORT HLIF
Y-88	-6.971E-02	2.168E-01	4.233E-01	NOT IDENT.
Y-91	-1.463E+02	5.109E+02	9.832E+02	NOT IDENT.
NB-94	-6.041E-03	3.051E-02	5.576E-02	NOT IDENT.
NB-95	-3.666E-01	1.205E+00	2.121E+00	NOT IDENT.
NB-95M	2.424E+00	2.635E+00	5.031E+00	NOT IDENT.
ZR-95	-8.124E-01	1.394E+00	2.384E+00	NOT IDENT.
NB-97	0.000E+00	8.517E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	6.694E+33	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	8.237E-03	3.475E-02	5.858E-02	NOT IDENT.
RH-102	-4.122E-03	6.028E-02	1.129E-01	NOT IDENT.
RU-103	-1.577E+00	6.996E+00	1.300E+01	FAIL ABUN
RH-106	-1.630E-01	5.076E-01	9.176E-01	NOT IDENT.
RU-106	-1.630E-01	5.076E-01	9.176E-01	NOT IDENT.
AG-108M	1.808E-02	2.465E-02	5.173E-02	NOT IDENT.
AG-110M	2.838E-02	8.461E-02	1.756E-01	FAIL ABUN
SN-113	5.595E-02	2.420E-01	4.747E-01	NOT IDENT.
CD-115	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	2.242E+05	0.000E+00	SHORT HLIF
TE-123M	5.483E-02	1.550E-01	2.624E-01	NOT IDENT.
SB-124	9.869E-02	1.958E+00	4.383E+00	NOT IDENT.
SB-125	2.725E-02	9.345E-02	1.864E-01	FAIL ABUN
TE-125M	-1.420E+02	3.103E+02	5.351E+02	NOT IDENT.
I-126	0.000E+00	1.881E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	2.675E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	2.891E+23	0.000E+00	SHORT HLIF
I-131	0.000E+00	1.492E+10	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	8.342E+27	0.000E+00	SHORT HLIF
BA-133	3.287E-02	6.517E-02	7.453E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	5.534E-02	5.875E-02	1.214E-01	NOT IDENT.
CS-135	8.038E-02	1.421E-01	2.623E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	5.874E+05	0.000E+00	SHORT HLIF
CE-139	-4.901E-02	1.118E-01	1.890E-01	NOT IDENT.
BA-140	0.000E+00	2.717E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	8.756E+05	0.000E+00	SHORT HLIF
CE-141	-4.732E+01	3.413E+01	5.290E+01	NOT IDENT.
CE-143	0.000E+00	1.204E+41	0.000E+00	SHORT HLIF
CE-144	-1.732E-01	4.037E-01	6.288E-01	NOT IDENT.
PM-144	4.007E-02	5.701E-02	1.174E-01	NOT IDENT.
PR-144	3.477E+00	4.986E+00	1.026E+01	NOT IDENT.
PM-146	-1.605E-02	3.918E-02	7.140E-02	NOT IDENT.
ND-147	0.000E+00	7.119E+07	0.000E+00	SHORT HLIF
PM-147	3.755E+02	7.836E+02	1.464E+03	NOT IDENT.
PM-149	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
EU-150	-8.685E-03	2.611E-02	4.296E-02	FAIL ABUN
EU-152	5.652E-02	8.423E-02	1.733E-01	NOT IDENT.
GD-153	-1.544E-02	1.937E-01	3.200E-01	NOT IDENT.
EU-154	-5.707E-02	9.728E-02	1.749E-01	NOT IDENT.
EU-155	1.721E-02	1.027E-01	1.873E-01	FAIL ABUN
TB-160	1.611E+00	2.126E+00	4.514E+00	FAIL ABUN
HO-166M	4.534E-02	6.894E-02	9.764E-02	FAIL ABUN
TM-171	9.197E-01	1.300E+01	2.426E+01	NOT IDENT.
HF-172	-7.889E-02	2.624E-01	4.157E-01	FAIL ABUN
LU-172	-1.581E-03	8.202E-02	1.616E-01	FAIL ABUN
LU-176	-9.895E-03	2.278E-02	4.200E-02	FAIL ABUN

HF-181	-5.063E-01	4.960E+00	9.421E+00	NOT IDENT.
TA-182	3.245E-01	1.046E+00	2.133E+00	FAIL ABUN
RE-183	2.875E-01	2.455E+00	4.555E+00	FAIL ABUN
RE-184	3.007E+01	4.311E+01	8.915E+01	NOT IDENT.
W-188	-4.717E+01	1.309E+02	2.163E+02	FAIL ABUN
IR-192	-3.451E-02	4.503E-01	8.673E-01	FAIL ABUN
HG-203	-1.845E+00	2.597E+00	4.678E+00	NOT IDENT.
BI-207	-4.604E-02	4.113E-02	6.609E-02	FAIL ABUN
PB-210	1.033E+00	1.856E+00	3.617E+00	NOT IDENT.
BI-211	0.000E+00	4.488E-01	8.123E-01	FAIL ABUN
PB-211	-4.082E-01	6.342E-01	1.123E+00	NOT IDENT.
BI-212	1.398E+00	1.024E+00	1.446E+00	FAIL ABUN
RN-219	1.717E-01	3.548E-01	7.156E-01	FAIL ABUN
RA-223	-2.322E-01	5.966E-01	9.761E-01	FAIL ABUN
AC-227	1.576E-01	2.101E-01	4.310E-01	FAIL ABUN
TH-227	1.576E-01	2.101E-01	4.310E-01	FAIL ABUN
TH-229	-3.144E-01	4.163E-01	7.625E-01	FAIL ABUN
TH-231	-2.322E-01	5.966E-01	9.761E-01	FAIL ABUN
PA-233	5.683E-03	5.437E-02	1.059E-01	FAIL ABUN
PA-234	4.956E-02	2.242E-01	4.775E-01	FAIL ABUN
PA-234M	3.779E+00	3.610E+00	8.733E+00	FAIL ABUN
NP-237	5.683E-03	5.437E-02	1.059E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	8.044E-02	2.107E-01	3.936E-01	NOT IDENT.
PU-239	5.533E+02	5.183E+02	6.391E+02	FAIL ABUN
AM-241	1.108E-01	1.030E-01	1.921E-01	NOT IDENT.
CM-243	5.665E-03	8.751E-02	1.591E-01	NOT IDENT.
BK-247	-7.044E-03	6.501E-02	1.246E-01	NOT IDENT.
CM-247	2.966E-02	3.276E-02	6.874E-02	NOT IDENT.
CF-249	-4.716E-03	3.330E-02	6.312E-02	NOT IDENT.
CF-251	8.311E-02	1.055E-01	2.163E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	368	10.66*	1.312E+00	1.507E+01	1.507E+01	10.25
CD-109	88.03	129	3.70*	6.859E+00	2.913E+00	4.675E+00	42.38
SN-126	64.28	51	9.60	4.772E+00	6.364E-01	6.364E-01	120.63
	86.94	129	8.90	6.859E+00	1.211E+00	1.211E+00	42.38
	87.57	129	37.00*	6.859E+00	2.913E-01	2.913E-01	42.38
BA-137M	661.66	26	89.90*	2.464E+00	6.788E-02	6.924E-02	63.43
CS-137	661.66	26	85.10*	2.464E+00	7.170E-02	7.314E-02	63.43
TL-208	277.37	-----	6.60	4.947E+00	-----	Line Not Found	-----
	583.19	178	85.00*	2.720E+00	4.419E-01	4.419E-01	19.14
	860.56	32	12.50	2.011E+00	7.206E-01	7.206E-01	74.72
BI-211	72.87	-----	1.23	5.823E+00	-----	Line Not Found	-----
	351.06	243	12.92*	4.083E+00	2.638E+00	2.638E+00	17.36
PB-212	74.82	185	10.28	6.006E+00	1.717E+00	1.717E+00	31.74
	77.11	304	17.10	6.195E+00	1.641E+00	1.641E+00	20.71
	238.63	530	43.60*	5.554E+00	1.253E+00	1.253E+00	10.39
	300.09	41	3.30	4.645E+00	1.532E+00	1.532E+00	82.97
BI-214	609.32	167	45.49*	2.628E+00	7.998E-01	8.001E-01	24.10
	1120.29	36	14.92	1.635E+00	8.518E-01	8.521E-01	75.87
	1764.49	42	15.30	1.106E+00	1.404E+00	1.405E+00	44.86
PB-214	74.82	185	5.80	6.006E+00	3.043E+00	3.044E+00	31.74
	77.11	304	9.70	6.195E+00	2.893E+00	2.894E+00	20.71
	87.09	129	3.41	6.859E+00	3.161E+00	3.162E+00	42.38
	242.00	141	7.25	5.498E+00	2.031E+00	2.032E+00	35.98
	295.22	173	18.42	4.708E+00	1.144E+00	1.144E+00	22.73
	351.93	243	35.60*	4.083E+00	9.572E-01	9.576E-01	17.36
RN-222	609.32	167	45.49*	2.628E+00	7.998E-01	8.001E-01	24.10
	1120.29	36	14.92	1.635E+00	8.518E-01	8.521E-01	75.87
	1764.49	42	15.30	1.106E+00	1.404E+00	1.405E+00	44.86
RA-224	240.99	141	4.10*	5.498E+00	3.591E+00	3.591E+00	35.98
RA-226	609.32	167	45.49*	2.628E+00	7.998E-01	8.001E-01	24.10
	1120.29	36	14.92	1.635E+00	8.518E-01	8.521E-01	75.87
	1764.49	42	15.30	1.106E+00	1.404E+00	1.405E+00	44.86
AC-228	105.21	-----	1.10	7.453E+00	-----	Line Not Found	-----
	338.32	72	11.27	4.217E+00	8.632E-01	8.632E-01	49.76
	794.95	-----	4.25	2.138E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.057E+00	-----	Line Not Found	-----
	911.20	84	25.80*	1.924E+00	9.747E-01	9.747E-01	29.48
	968.97	56	15.80	1.834E+00	1.110E+00	1.110E+00	42.70
RA-228	105.21	-----	1.10	7.453E+00	-----	Line Not Found	-----
	338.32	72	11.27	4.217E+00	8.632E-01	8.632E-01	49.76
	794.95	-----	4.25	2.138E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.057E+00	-----	Line Not Found	-----
	911.20	84	25.80*	1.924E+00	9.747E-01	9.747E-01	29.48
	968.97	56	15.80	1.834E+00	1.110E+00	1.110E+00	42.70
TH-228	74.82	185	10.28	6.006E+00	1.717E+00	1.717E+00	31.74
	77.11	304	17.10	6.195E+00	1.641E+00	1.641E+00	20.71
	238.63	530	43.60*	5.554E+00	1.253E+00	1.253E+00	10.39

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-230	300.09	41	3.30	4.645E+00	1.532E+00	1.532E+00	82.97
	609.32	167	45.49*	2.628E+00	7.998E-01	7.998E-01	24.10
	1120.29	36	14.92	1.635E+00	8.518E-01	8.518E-01	75.87
PA-231	1764.49	42	15.30	1.106E+00	1.404E+00	1.404E+00	44.86
	283.69	-----	1.70	4.860E+00	-----	Line Not Found	-----
	301.36	41	5.35*	4.645E+00	9.449E-01	9.449E-01	82.97
TH-232	105.21	-----	1.10	7.453E+00	-----	Line Not Found	-----
	338.32	72	11.27	4.217E+00	8.632E-01	8.632E-01	49.76
	835.71	-----	1.61	2.057E+00	-----	Line Not Found	-----
TH-234	911.20	84	25.80*	1.924E+00	9.747E-01	9.747E-01	29.48
	968.97	56	15.80	1.834E+00	1.110E+00	1.110E+00	42.70
	63.29	51	3.70*	4.772E+00	1.651E+00	1.651E+00	120.63
U-234	92.59	148	4.23	7.103E+00	2.828E+00	2.828E+00	42.14
	609.32	167	45.49*	2.628E+00	7.998E-01	7.998E-01	24.10
	1120.29	36	14.92	1.635E+00	8.518E-01	8.518E-01	75.87
U-235	1764.49	42	15.30	1.106E+00	1.404E+00	1.404E+00	44.86
	89.96	61	3.47	6.984E+00	1.434E+00	1.434E+00	77.01
	93.35	148	5.60	7.103E+00	2.136E+00	2.136E+00	42.14
U-238	143.76	-----	10.96*	7.370E+00	-----	Line Not Found	-----
	163.33	-----	5.08	7.024E+00	-----	Line Not Found	-----
	185.72	146	57.20	6.563E+00	2.227E-01	2.227E-01	41.06
AM-243	205.31	-----	5.01	6.171E+00	-----	Line Not Found	-----
	63.29	51	3.70*	4.772E+00	1.651E+00	1.651E+00	120.63
	92.59	148	4.23	7.103E+00	2.828E+00	2.828E+00	42.14
ANH-511	43.53	-----	5.90	1.315E+00	-----	Line Not Found	-----
	74.66	185	67.20*	6.006E+00	2.626E-01	2.626E-01	31.74
	511.00	41	100.00*	3.019E+00	7.810E-02	7.810E-02	94.68

Flag: "*" = Keyline

Total number of lines in spectrum 42
 Number of unidentified lines 5
 Number of lines tentatively identified by NID 37 88.10%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.507E+01	1.507E+01	0.155E+01	10.25	
CD-109	461.40D	1.60	2.913E+00	4.675E+00	1.981E+00	42.38	
SN-126	2.30E+05Y	1.00	2.913E-01	2.913E-01	1.235E-01	42.38	
BA-137M	30.08Y	1.02	6.788E-02	6.924E-02	4.392E-02	63.43	
CS-137	30.08Y	1.02	7.170E-02	7.314E-02	4.639E-02	63.43	
TL-208	1.41E+10Y	1.00	4.419E-01	4.419E-01	0.846E-01	19.14	
BI-211	7.04E+08Y	1.00	2.638E+00	2.638E+00	0.458E+00	17.36	
PB-212	1.41E+10Y	1.00	1.253E+00	1.253E+00	0.130E+00	10.39	
BI-214	1600.00Y	1.00	7.998E-01	8.001E-01	1.928E-01	24.10	
PB-214	1600.00Y	1.00	9.572E-01	9.576E-01	1.663E-01	17.36	
RN-222	1600.00Y	1.00	7.998E-01	8.001E-01	1.928E-01	24.10	
RA-224	1.41E+10Y	1.00	3.591E+00	3.591E+00	1.292E+00	35.98	
RA-226	1600.00Y	1.00	7.998E-01	8.001E-01	1.928E-01	24.10	
AC-228	1.41E+10Y	1.00	9.747E-01	9.747E-01	2.873E-01	29.48	
RA-228	1.41E+10Y	1.00	9.747E-01	9.747E-01	2.873E-01	29.48	
TH-228	1.41E+10Y	1.00	1.253E+00	1.253E+00	0.130E+00	10.39	
TH-230	7.54E+04Y	1.00	7.998E-01	7.998E-01	1.927E-01	24.10	
PA-231	7.04E+08Y	1.00	9.449E-01	9.449E-01	7.840E-01	82.97	
TH-232	1.41E+10Y	1.00	9.747E-01	9.747E-01	2.873E-01	29.48	
TH-234	4.47E+09Y	1.00	1.651E+00	1.651E+00	1.992E+00	120.63	
U-234	2.45E+05Y	1.00	7.998E-01	7.998E-01	1.927E-01	24.10	
U-235	7.04E+08Y	1.00	2.227E-01	2.227E-01	0.914E-01	41.06	K
U-238	4.47E+09Y	1.00	1.651E+00	1.651E+00	1.992E+00	120.63	
AM-243	7370.00Y	1.00	2.626E-01	2.626E-01	0.834E-01	31.74	
ANH-511	1.00E+09Y	1.00	7.810E-02	7.810E-02	7.395E-02	94.68	
Total Activity :			4.029E+01	4.205E+01			

Grand Total Activity : 4.029E+01 4.205E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
3	129.39	46	125	1.36	258.84	254	12	1.13E-02	95.6	7.54E+00	T
3	131.32	28	105	1.14	262.70	254	12	6.80E-03	****	7.52E+00	T
0	161.55	30	70	1.56	323.13	321	6	7.50E-03	****	7.06E+00	T
0	208.97	64	94	1.23	417.91	415	9	1.64E-02	61.7	6.10E+00	
0	270.50	22	81	2.05	540.93	539	8	5.75E-03	****	5.05E+00	T
0	327.64	38	54	1.31	655.16	650	9	9.89E-03	76.1	4.33E+00	T
1	355.92	14	35	1.56	711.72	699	17	3.59E-03	****	4.05E+00	T
0	416.83	12	17	1.33	833.50	830	6	3.14E-03	****	3.56E+00	
0	463.17	36	28	1.62	926.18	922	11	9.55E-03	66.1	3.27E+00	T
0	657.26	19	10	1.53	1314.39	1306	14	5.14E-03	86.9	2.48E+00	T
0	710.81	10	14	1.33	1421.52	1417	9	2.76E-03	****	2.33E+00	T
0	727.71	37	39	1.38	1455.33	1449	12	1.03E-02	74.7	2.29E+00	T
0	922.69	17	10	4.74	1845.49	1837	12	4.81E-03	84.8	1.91E+00	T
0	1001.87	10	3	1.31	2003.97	2000	7	2.81E-03	97.5	1.79E+00	T
0	1238.15	20	11	2.37	2477.01	2472	9	5.79E-03	72.6	1.51E+00	T
0	1432.30	6	4	1.39	2865.83	2861	8	1.67E-03	****	1.33E+00	
0	1504.53	8	3	0.56	3010.52	3004	10	2.31E-03	99.9	1.28E+00	T
0	1729.83	17	2	1.32	3461.94	3457	10	4.92E-03	57.9	1.13E+00	
0	1846.37	15	0	1.04	3695.50	3690	11	4.44E-03	50.0	1.06E+00	

Flags: "T" = Tentatively associated

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
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DETECTOR AND SAMPLE DATA

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* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235030.CNF;1
* Acquisition date   : 3-OCT-2016 09:09:22 Sensitivity      : 3.000
* Detector ID       : GAM20 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:15.23 Half life ratio : *****
* Sample date       : 23-NOV-2015 14:44:00 Nuclide Library : SOLID
* Sample ID        : G405235030 Analyst initials: MXR1
* Batch Number     : 1596249 Sample Quantity : 1.3112E+02 GRAM
* Wet wt corr      : 1.00000 Wet Weight      : 0.00000
* Dry Weight       : 0.00000
*****
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CALIBRATION INFORMATION

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* Eff. Cal. date    : 30-JUN-2016 06:52:39 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM20_CAN.CNF;15
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.337E-01
CD-109	8.871E-01
SN-126	5.546E-02
BA-137M	2.234E-02
CS-137	2.360E-02
TL-208	1.796E-02
PB-212	4.120E-02
BI-214	5.814E-02
PB-214	5.393E-02
RN-222	5.814E-02
RA-224	4.416E-01
RA-226	5.814E-02
AC-228	9.220E-02
RA-228	9.220E-02
TH-228	4.120E-02
TH-230	5.812E-02
PA-231	3.300E-01
TH-232	9.220E-02
TH-234	7.849E-01
U-234	5.812E-02
U-235	1.506E-01
U-238	7.849E-01
AM-243	3.576E-02
ANH-511	2.521E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	Notes
BE-7	1.074E+01	NOT IDENT.
NA-22	2.894E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.646E-02	NOT IDENT.
SC-46	3.189E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF

MN-54	5.427E-02	NOT IDENT.
CO-56	3.847E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	3.766E-02	NOT IDENT.
CO-58	5.167E-01	NOT IDENT.
FE-59	7.425E+00	NOT IDENT.
CO-60	3.496E-02	NOT IDENT.
ZN-65	1.404E-01	NOT IDENT.
GE-68	2.121E+00	NOT IDENT.
AS-73	5.709E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.806E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.732E-01	NOT IDENT.
KR-85	5.846E+00	NOT IDENT.
SR-85	7.226E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.551E-01	NOT IDENT.
Y-91	4.109E+02	NOT IDENT.
NB-94	2.454E-02	NOT IDENT.
NB-95	9.533E-01	NOT IDENT.
NB-95M	2.343E+00	NOT IDENT.
ZR-95	9.960E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.742E-02	NOT IDENT.
RH-102	5.004E-02	NOT IDENT.
RU-103	5.773E+00	FAIL ABUN
RH-106	4.039E-01	NOT IDENT.
RU-106	4.039E-01	NOT IDENT.
AG-108M	2.333E-02	NOT IDENT.
AG-110M	7.472E-02	FAIL ABUN
SN-113	2.157E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.229E-01	NOT IDENT.
SB-124	1.662E+00	NOT IDENT.
SB-125	8.378E-02	FAIL ABUN
TE-125M	2.498E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.393E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	5.498E-02	NOT IDENT.
CS-135	1.214E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	8.751E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.459E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.937E-01	NOT IDENT.
PM-144	5.263E-02	NOT IDENT.
PR-144	4.600E+00	NOT IDENT.
PM-146	3.163E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	6.855E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.951E-02	FAIL ABUN
EU-152	7.919E-02	NOT IDENT.
GD-153	1.506E-01	NOT IDENT.
EU-154	7.132E-02	NOT IDENT.
EU-155	8.785E-02	FAIL ABUN
TB-160	1.989E+00	FAIL ABUN
HO-166M	4.260E-02	FAIL ABUN
TM-171	1.137E+01	NOT IDENT.
HF-172	1.949E-01	FAIL ABUN
LU-172	7.063E-02	FAIL ABUN
LU-176	1.915E-02	FAIL ABUN
HF-181	4.179E+00	NOT IDENT.

TA-182	9.395E-01	FAIL ABUN
RE-183	2.146E+00	FAIL ABUN
RE-184	3.956E+01	NOT IDENT.
W-188	9.873E+01	FAIL ABUN
IR-192	3.923E-01	FAIL ABUN
HG-203	2.125E+00	NOT IDENT.
BI-207	2.681E-02	FAIL ABUN
PB-210	1.708E+00	NOT IDENT.
BI-211	3.913E-01	FAIL ABUN
PB-211	5.042E-01	NOT IDENT.
BI-212	6.719E-01	FAIL ABUN
RN-219	3.252E-01	FAIL ABUN
RA-223	4.426E-01	FAIL ABUN
AC-227	1.996E-01	FAIL ABUN
TH-227	1.996E-01	FAIL ABUN
TH-229	3.530E-01	FAIL ABUN
TH-231	4.426E-01	FAIL ABUN
PA-233	4.838E-02	FAIL ABUN
PA-234	2.040E-01	FAIL ABUN
PA-234M	3.848E+00	FAIL ABUN
NP-237	4.838E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.834E-01	NOT IDENT.
PU-239	3.027E+02	FAIL ABUN
AM-241	9.077E-02	NOT IDENT.
CM-243	7.428E-02	NOT IDENT.
BK-247	5.714E-02	NOT IDENT.
CM-247	3.138E-02	NOT IDENT.
CF-249	2.838E-02	NOT IDENT.
CF-251	1.013E-01	NOT IDENT.

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235030.CNF;1
* Acquisition date   : 3-OCT-2016 09:09:22 Sensitivity      : 3.000
* Detector ID        : GAM20 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:15.23 Half life ratio  : *****
* Sample date        : 23-NOV-2015 14:44:00 Nuclide Library : SOLID
* Sample ID          : G405235030 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity : 1.3112E+02 GRAM
*                   : Quantity Err(%) : 1.5253E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight       : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-JUN-2016 06:52:39 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM20_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.507E+01	1.706E+00	1.706E+00
CD-109	2.983E+00	2.004E+00	2.004E+00
SN-126	1.859E-01	1.245E-01	1.245E-01
BA-137M	6.924E-02	4.314E-02	4.314E-02
CS-137	7.314E-02	4.557E-02	4.557E-02
TL-208	4.419E-01	8.498E-02	8.498E-02
PB-212	1.253E+00	1.437E-01	1.437E-01
BI-214	8.001E-01	1.920E-01	1.920E-01
PB-214	9.576E-01	1.677E-01	1.677E-01
RN-222	8.001E-01	1.920E-01	1.920E-01
RA-224	1.568E+00	1.353E+00	1.353E+00
RA-226	8.001E-01	1.920E-01	1.920E-01
AC-228	9.747E-01	2.860E-01	2.860E-01
RA-228	9.747E-01	2.860E-01	2.860E-01
TH-228	1.253E+00	1.437E-01	1.437E-01
TH-230	7.998E-01	1.920E-01	1.920E-01
PA-231	9.449E-01	7.944E-01	7.944E-01
TH-232	9.747E-01	2.860E-01	2.860E-01
TH-234	1.651E+00	1.986E+00	1.986E+00
U-234	7.998E-01	1.920E-01	1.920E-01
U-235	-2.216E-02	1.820E-01	1.820E-01
U-238	1.651E+00	1.986E+00	1.986E+00
AM-243	1.639E-01	8.612E-02	8.612E-02
ANH-511	7.810E-02	7.254E-02	7.254E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-5.191E+00	1.335E+01	1.355E+01	NOT IDENT.
NA-22	-2.891E-02	4.083E-02	4.286E-02	NOT IDENT.
NA-24	1.000E+41	6.080E+41	0.000E+00	SHORT HLIF
AL-26	3.919E-03	1.766E-02	1.775E-02	NOT IDENT.
SC-46	5.750E-02	3.774E-01	3.782E-01	FAIL ABUN
V-48	-6.282E+03	2.441E+04	2.457E+04	SHORT HLIF

CR-51	4.764E+02	5.325E+02	5.742E+02	SHORT HLIF
MN-54	3.804E-02	5.868E-02	6.114E-02	NOT IDENT.
CO-56	2.432E-02	4.637E-01	4.638E-01	FAIL ABUN
MN-56	1.000E+41	1.548E+42	0.000E+00	SHORT HLIF
CO-57	-5.382E-02	5.019E-02	5.574E-02	NOT IDENT.
CO-58	-2.598E-01	6.790E-01	6.890E-01	NOT IDENT.
FE-59	2.421E-01	8.558E+00	8.558E+00	NOT IDENT.
CO-60	2.369E-02	3.602E-02	3.757E-02	NOT IDENT.
ZN-65	6.554E-02	1.670E-01	1.696E-01	NOT IDENT.
GE-68	-5.813E-01	2.548E+00	2.562E+00	NOT IDENT.
AS-73	2.459E+00	6.389E+00	6.485E+00	NOT IDENT.
AS-74	-2.231E+03	1.068E+04	1.073E+04	SHORT HLIF
SE-75	-5.855E-02	2.090E-01	2.107E-01	NOT IDENT.
BR-77	1.758E+40	1.597E+41	0.000E+00	SHORT HLIF
SR-82	-5.368E+02	1.060E+03	1.087E+03	SHORT HLIF
RB-83	-2.797E-01	7.168E-01	7.278E-01	NOT IDENT.
KR-85	2.480E+00	7.228E+00	7.313E+00	NOT IDENT.
SR-85	3.059E-01	8.934E-01	9.040E-01	NOT IDENT.
RB-86	-1.417E+04	5.102E+04	5.142E+04	SHORT HLIF
Y-88	-6.971E-02	2.169E-01	2.191E-01	NOT IDENT.
Y-91	-1.463E+02	5.109E+02	5.152E+02	NOT IDENT.
NB-94	-6.041E-03	3.051E-02	3.064E-02	NOT IDENT.
NB-95	-3.666E-01	1.205E+00	1.217E+00	NOT IDENT.
NB-95M	2.424E+00	2.642E+00	2.859E+00	NOT IDENT.
ZR-95	-8.124E-01	1.395E+00	1.442E+00	NOT IDENT.
NB-97	1.000E+41	8.528E+40	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	2.811E+41	0.000E+00	SHORT HLIF
MO-99	-5.817E+33	6.707E+33	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	2.102E+41	0.000E+00	SHORT HLIF
RH-101	8.237E-03	3.478E-02	3.498E-02	NOT IDENT.
RH-102	-4.122E-03	6.028E-02	6.031E-02	NOT IDENT.
RU-103	-1.577E+00	6.996E+00	7.032E+00	FAIL ABUN
RH-106	-1.630E-01	5.077E-01	5.130E-01	NOT IDENT.
RU-106	-1.630E-01	5.077E-01	5.130E-01	NOT IDENT.
AG-108M	1.808E-02	2.466E-02	2.597E-02	NOT IDENT.
AG-110M	2.838E-02	8.462E-02	8.558E-02	FAIL ABUN
SN-113	5.595E-02	2.420E-01	2.433E-01	NOT IDENT.
CD-115	1.000E+41	2.668E+41	0.000E+00	SHORT HLIF
SN-117M	1.581E+05	2.251E+05	2.361E+05	SHORT HLIF
TE-123M	5.483E-02	1.550E-01	1.570E-01	NOT IDENT.
SB-124	9.869E-02	1.958E+00	1.958E+00	NOT IDENT.
SB-125	2.725E-02	9.346E-02	9.426E-02	FAIL ABUN
TE-125M	-1.420E+02	3.104E+02	3.170E+02	NOT IDENT.
I-126	3.392E+05	1.882E+06	1.888E+06	SHORT HLIF
SB-126	5.891E+05	2.677E+06	2.690E+06	SHORT HLIF
SB-127	-2.647E+23	4.791E+23	0.000E+00	SHORT HLIF
I-131	1.256E+10	1.493E+10	1.597E+10	SHORT HLIF
I-132	1.000E+41	2.546E+42	0.000E+00	SHORT HLIF
TE-132	2.590E+27	8.415E+27	0.000E+00	SHORT HLIF
BA-133	3.287E-02	6.519E-02	6.685E-02	FAIL ABUN
I-133	-1.000E+41	3.947E+41	0.000E+00	SHORT HLIF
CS-134	5.534E-02	5.880E-02	6.387E-02	NOT IDENT.
CS-135	8.038E-02	1.422E-01	1.467E-01	NOT IDENT.
I-135	-1.000E+41	1.129E+42	0.000E+00	SHORT HLIF
CS-136	1.009E+04	5.874E+05	5.874E+05	SHORT HLIF
CE-139	-4.901E-02	1.122E-01	1.143E-01	NOT IDENT.
BA-140	-3.097E+05	2.717E+06	2.721E+06	SHORT HLIF
LA-140	-6.788E+05	8.762E+05	9.281E+05	SHORT HLIF
CE-141	-4.732E+01	3.419E+01	4.030E+01	NOT IDENT.
CE-143	1.000E+41	1.209E+41	0.000E+00	SHORT HLIF
CE-144	-1.732E-01	4.038E-01	4.113E-01	NOT IDENT.
PM-144	4.007E-02	5.707E-02	5.986E-02	NOT IDENT.
PR-144	3.477E+00	4.989E+00	5.229E+00	NOT IDENT.
PM-146	-1.605E-02	3.920E-02	3.986E-02	NOT IDENT.
ND-147	-5.655E+07	7.126E+07	7.568E+07	SHORT HLIF
PM-147	3.755E+02	7.838E+02	8.018E+02	NOT IDENT.
PM-149	-1.000E+41	2.231E+41	0.000E+00	SHORT HLIF
EU-150	-8.685E-03	2.611E-02	2.640E-02	FAIL ABUN
EU-152	5.652E-02	8.429E-02	8.806E-02	NOT IDENT.
GD-153	-1.544E-02	1.937E-01	1.938E-01	NOT IDENT.
EU-154	-5.707E-02	9.730E-02	1.006E-01	NOT IDENT.
EU-155	1.721E-02	1.027E-01	1.030E-01	FAIL ABUN
TB-160	1.611E+00	2.128E+00	2.249E+00	FAIL ABUN
HO-166M	4.534E-02	6.898E-02	7.194E-02	FAIL ABUN
TM-171	9.197E-01	1.300E+01	1.301E+01	NOT IDENT.
HF-172	-7.889E-02	2.627E-01	2.651E-01	FAIL ABUN
LU-172	-1.581E-03	8.202E-02	8.202E-02	FAIL ABUN
LU-176	-9.895E-03	2.279E-02	2.322E-02	FAIL ABUN

HF-181	-5.063E-01	4.960E+00	4.966E+00	NOT IDENT.
TA-182	3.245E-01	1.046E+00	1.056E+00	FAIL ABUN
RE-183	2.875E-01	2.456E+00	2.459E+00	FAIL ABUN
RE-184	3.007E+01	4.376E+01	4.581E+01	NOT IDENT.
W-188	-4.717E+01	1.310E+02	1.327E+02	FAIL ABUN
IR-192	-3.451E-02	4.503E-01	4.505E-01	FAIL ABUN
HG-203	-1.845E+00	2.598E+00	2.728E+00	NOT IDENT.
BI-207	-4.604E-02	4.117E-02	4.611E-02	FAIL ABUN
PB-210	1.033E+00	1.858E+00	1.916E+00	NOT IDENT.
BI-211	2.638E+00	4.639E-01	1.276E+00	FAIL ABUN
PB-211	-4.082E-01	6.345E-01	6.607E-01	NOT IDENT.
BI-212	1.398E+00	1.026E+00	1.204E+00	FAIL ABUN
RN-219	1.717E-01	3.554E-01	3.638E-01	FAIL ABUN
RA-223	-2.322E-01	5.968E-01	6.059E-01	FAIL ABUN
AC-227	1.576E-01	2.111E-01	2.228E-01	FAIL ABUN
TH-227	1.576E-01	2.111E-01	2.228E-01	FAIL ABUN
TH-229	-3.144E-01	4.166E-01	4.400E-01	FAIL ABUN
TH-231	-2.322E-01	5.968E-01	6.059E-01	FAIL ABUN
PA-233	5.683E-03	5.437E-02	5.444E-02	FAIL ABUN
PA-234	4.956E-02	2.312E-01	2.323E-01	FAIL ABUN
PA-234M	3.779E+00	3.614E+00	3.995E+00	FAIL ABUN
NP-237	5.683E-03	5.437E-02	5.444E-02	FAIL ABUN
NP-238	1.000E+41	1.834E+42	0.000E+00	SHORT HLIF
NP-239	8.044E-02	2.108E-01	2.139E-01	NOT IDENT.
PU-239	5.533E+02	5.189E+02	5.757E+02	FAIL ABUN
AM-241	1.108E-01	1.033E-01	1.148E-01	NOT IDENT.
CM-243	5.665E-03	8.751E-02	8.755E-02	NOT IDENT.
BK-247	-7.044E-03	6.502E-02	6.510E-02	NOT IDENT.
CM-247	2.966E-02	3.314E-02	3.574E-02	NOT IDENT.
CF-249	-4.716E-03	3.330E-02	3.337E-02	NOT IDENT.
CF-251	8.311E-02	1.059E-01	1.123E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	72.2845	87.09	101.5767	136.47	53.1785
45.60	72.5864	87.57	101.6419	140.51	0.0000
46.54	70.5825	88.03	101.7051	143.76	74.2628
49.72	0.0000	88.34	101.7472	144.24	70.6432
51.35	86.3422	88.47	101.7645	145.44	90.2372
51.87	79.9433	89.96	101.9658	152.43	73.6569
52.39	73.5314	1093.63	102.0568	153.25	0.0000
52.97	70.3618	91.11	0.0000	323.87	78.6992
53.44	73.6720	92.59	102.3162	156.02	0.0000
54.07	80.2634	93.35	102.4167	158.56	0.0000
57.36	0.0000	94.56	72.2255	159.00	59.2881
57.53	91.6674	94.65	72.2341	162.33	69.3796
57.98	85.1854	94.67	72.2360	162.66	0.0000
59.27	68.5909	94.87	72.2542	163.33	57.8691
59.32	68.5966	97.43	81.7423	165.86	62.1437
59.54	68.6222	98.43	75.2817	176.31	56.8617
60.96	87.8125	98.44	75.2827	176.60	0.0000
61.17	87.8433	99.53	80.0234	177.52	56.0841
62.93	98.0102	100.11	77.7596	181.07	0.0000
63.29	98.0681	102.03	67.4731	181.52	49.1356
63.58	98.1144	103.18	66.4024	184.41	63.1470
64.28	98.2260	103.37	64.0872	143.76	63.2164
66.73	113.7548	105.21	72.4037	193.51	67.8630
67.24	110.8887	105.31	72.4122	197.03	69.7564
125.81	110.9657	106.12	71.3131	198.01	59.5944
67.75	110.9779	106.47	72.5125	201.83	63.1910
69.67	134.6849	109.28	77.4462	203.43	51.3000
70.83	112.9942	111.00	65.8433	205.31	52.6601
72.81	128.2459	111.76	0.0000	210.85	73.5235
72.87	128.2573	114.06	57.8152	215.65	68.1823
74.66	105.4215	116.30	0.0000	222.11	56.3698
74.82	105.4466	116.74	54.4400	227.09	47.0017
74.97	105.4696	119.76	78.3720	227.38	47.0116
77.11	105.8002	121.12	60.6504	228.16	0.0000
78.74	96.2715	121.22	60.6571	228.18	41.8125
79.69	111.4645	121.78	83.3060	116.74	41.8125
80.12	120.5754	122.06	89.2834	235.69	42.0386
80.19	0.0000	122.92	65.5357	235.96	42.0464
80.57	110.0948	123.07	60.7796	238.63	52.6575
81.00	101.1073	265.00	69.1675	238.98	0.0000
81.07	98.0991	125.81	84.4660	240.99	52.7448
81.75	135.9586	127.23	65.4401	242.00	52.7820
83.79	115.1349	127.91	71.8764	244.70	52.8809
84.00	124.2604	129.30	76.7803	252.40	0.0000
85.43	139.6874	131.20	76.9326	252.80	51.4025
86.55	101.5027	133.02	73.8665	254.15	0.0000
86.79	101.5353	133.52	78.7248	256.23	39.0854
86.94	101.5564	136.00	68.8573	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	46.4511	355.39	0.0000	584.27	9.3977
264.80	46.4553	356.01	33.0026	595.83	0.0000
265.00	42.8877	364.49	0.0000	427.87	22.0621
268.22	40.2914	366.42	0.0000	602.52	0.0000
269.46	49.7334	372.51	31.3887	604.72	15.7825
270.03	44.3730	375.05	25.7157	607.14	30.0134
271.23	36.7817	377.52	39.0998	609.32	26.3489
273.65	0.0000	356.01	27.7456	610.33	26.3590
276.40	37.8044	388.16	28.7653	614.28	25.3408
277.37	29.7216	388.63	0.0000	618.01	25.3750
277.60	28.8255	391.69	29.7771	620.36	13.7570
278.00	32.4368	264.66	25.0859	621.93	22.2347
279.20	45.0857	401.81	26.0656	630.19	0.0000
279.54	50.5062	402.40	23.1763	631.29	21.2476
279.70	54.1199	404.85	35.7730	633.25	14.8835
280.46	49.6334	410.95	39.7588	634.78	0.0000
283.69	40.6915	413.71	13.1089	635.95	25.5391
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	47.9773	423.72	0.0000	645.85	20.2896
285.90	0.0000	427.09	24.4314	657.76	14.4767
287.50	32.6309	427.87	22.4848	657.90	0.0000
290.67	43.5938	433.94	18.6277	661.66	12.8853
293.27	0.0000	439.40	25.5551	664.57	0.0000
351.93	36.4290	453.88	25.7255	666.33	0.0000
295.96	36.4461	463.37	21.8608	666.50	0.0000
879.38	36.5039	468.07	25.3916	667.71	0.0000
299.98	36.5348	473.00	0.0000	677.62	17.2747
300.09	36.5373	475.06	13.9835	685.70	0.0000
300.13	36.5381	476.78	20.9910	695.00	0.0000
301.36	35.6508	477.60	23.9980	696.49	16.2982
302.85	41.1722	482.18	22.0421	696.51	16.2982
256.23	50.8298	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	17.3893
306.78	43.1034	497.08	24.2002	697.49	17.3906
308.46	37.6384	505.52	25.8045	702.65	20.6862
311.90	35.8754	507.63	0.0000	706.68	22.8944
316.51	31.3604	511.00	31.4421	711.68	16.3800
319.41	0.0000	514.00	22.8497	720.70	0.0000
320.08	0.0000	514.00	22.8497	721.93	0.0000
321.04	36.0666	520.40	25.4557	722.78	18.0831
323.87	38.9042	520.69	0.0000	722.91	18.0838
325.23	25.0291	522.65	0.0000	723.31	19.7307
328.76	0.0000	527.90	0.0000	724.19	19.7366
333.37	33.5259	528.26	16.3438	727.33	23.0491
333.97	39.1272	529.59	16.3529	733.00	18.4728
334.37	47.5220	529.87	0.0000	735.93	14.3081
338.28	39.2212	531.02	0.0000	333.97	9.9104
338.32	39.2220	537.26	0.0000	739.50	0.0000
311.90	44.8789	546.56	0.0000	747.24	27.6143
340.48	44.8789	552.55	26.8178	748.06	17.6777
340.55	0.0000	563.25	14.5013	752.31	17.7012
344.28	27.1710	569.33	25.9562	753.82	0.0000
345.93	42.2003	946.00	29.0721	756.73	14.4023
351.06	32.9143	569.70	29.0744	756.80	14.4028
351.93	32.9300	583.19	9.3937	884.68	22.2078

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	31.1081	1274.44	7.1118	1620.50	5.0671
766.42	24.4474	1001.03	11.5706	1621.92	5.0684
766.84	22.2274	1002.74	12.8224	1678.03	0.0000
772.60	0.0000	1004.73	5.7016	1690.97	3.0775
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	6.2307
778.90	10.0397	1028.54	0.0000	1063.66	2.7718
783.70	0.0000	1037.84	12.5764	1771.35	6.2380
785.37	17.8835	1038.76	0.0000	1791.20	0.0000
792.07	27.9999	631.29	13.5040	1808.65	1.0460
794.95	25.7823	1048.07	0.0000	1810.72	0.0000
795.86	17.9408	1049.04	9.9083	1836.06	4.2021
810.06	13.5127	1050.41	10.8127		
810.29	14.6398	1063.66	16.2719		
344.28	18.0189	1077.00	0.0000		
810.76	18.0208	1077.34	17.2327		
815.77	0.0000	1085.87	14.5420		
1048.07	0.0000	1093.63	16.3894		
832.01	17.0007	1099.45	14.5889		
834.85	10.2089	1112.07	10.9739		
835.71	12.4806	1112.84	10.0614		
836.80	0.0000	1115.54	8.7867		
846.75	0.0000	1120.29	16.4927		
846.77	11.3822	1120.55	16.4938		
856.80	0.0000	1221.41	16.4971		
860.56	9.1419	1129.67	13.7741		
871.09	19.4847	1131.51	0.0000		
873.19	12.6154	1147.95	0.0000		
875.33	0.0000	1173.23	11.1299		
879.38	10.3396	1177.95	10.2131		
880.51	13.7905	1189.05	14.8926		
883.24	17.2510	1204.77	11.2083		
884.68	8.0539	1221.41	14.9990		
889.28	10.3682	1231.02	10.3333		
894.76	19.6141	1235.36	0.0000		
898.04	13.8579	1238.28	18.0645		
900.72	25.4250	1260.41	0.0000		
903.28	12.7214	1271.87	13.2677		
911.20	11.5898	1274.44	11.3782		
912.08	13.9111	1274.54	12.3264		
923.98	0.0000	1291.59	6.6612		
926.50	3.4915	1298.22	0.0000		
929.11	8.1524	1312.11	0.0000		
937.49	19.2594	1332.49	5.7583		
944.13	0.0000	1362.66	0.0000		
946.00	9.6515	1365.19	9.6606		
949.00	15.8060	1368.63	0.0000		
667.71	0.0000	1384.29	6.7881		
962.31	21.1487	1408.01	6.8201		
964.08	18.3371	1457.56	0.0000		
966.17	22.5813	1460.82	1.9685		
911.20	23.8335	1489.16	4.9478		
968.97	23.8335	1505.03	12.7039		
983.53	0.0000	1584.12	8.0552		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235031.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM32.CNF;277
Background date : 2-OCT-2016 11:01:57.
Sample date : 26-NOV-2015 14:25:00 Acquisition date : 3-OCT-2016 09:09:51.
Sample ID : G405235031 Sample quantity : 1.39617E+02 GRAM
Detector name : GAM32 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.58 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID : 1596249 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	75.28	98	122	1.19	151.77	148	13	2.71E-02	20.7	4.09E+00
2	1	77.48	171	124	1.29	156.18	148	13	4.74E-02	14.4	
3	0	87.22	50	186	1.07	175.66	171	9	1.40E-02	50.9	
4	0	93.20*	62	172	1.17	187.61	184	8	1.72E-02	40.8	
5	0	144.44	41	124	1.75	290.10	284	10	1.13E-02	54.1	
6	0	186.03*	74	173	1.48	373.27	367	14	2.06E-02	40.1	
7	0	208.93	45	123	0.93	419.07	413	12	1.24E-02	51.9	
8	2	239.03*	405	66	1.28	479.27	472	19	1.12E-01	6.1	2.21E+00
9	2	242.11	76	93	1.59	485.43	472	19	2.12E-02	26.8	
10	0	271.27	33	108	2.19	543.76	536	13	9.10E-03	68.3	
11	0	295.94*	159	98	1.21	593.11	586	14	4.42E-02	15.5	
12	0	328.63	64	57	1.61	658.48	652	15	1.77E-02	28.6	
13	0	338.57	78	84	1.14	678.37	671	12	2.18E-02	26.0	
14	0	352.65*	230	90	1.30	706.53	699	16	6.39E-02	11.6	
15	0	367.02	18	36	2.46	735.27	730	11	4.95E-03	69.2	
16	0	463.71	15	28	0.67	928.65	925	9	4.17E-03	67.9	
17	0	511.32*	49	54	1.45	1023.88	1017	15	1.36E-02	40.0	
18	0	563.44	27	12	1.81	1128.11	1123	12	7.50E-03	32.1	
19	0	572.16	19	26	1.44	1145.56	1140	14	5.32E-03	65.0	
20	0	583.88*	97	45	1.17	1169.00	1163	13	2.71E-02	17.7	
21	0	609.76*	181	40	1.13	1220.77	1215	13	5.02E-02	10.5	
22	0	627.98	16	18	0.82	1257.20	1250	12	4.50E-03	57.9	
23	1	662.26	65	11	1.79	1325.76	1317	22	1.81E-02	16.7	8.01E-01
24	1	666.32	17	9	1.80	1333.89	1317	22	4.76E-03	40.1	
25	0	670.67	9	11	0.67	1342.59	1338	7	2.36E-03	71.9	
26	0	717.06	12	19	4.54	1435.36	1427	13	3.45E-03	78.2	
27	0	727.72*	20	11	1.31	1456.69	1452	9	5.44E-03	40.2	
28	0	768.71	33	23	6.07	1538.68	1531	15	9.03E-03	36.3	
29	0	785.95	14	7	1.61	1573.15	1569	9	3.77E-03	44.3	
30	0	799.40	25	50	4.04	1600.05	1583	29	6.94E-03	84.3	
31	0	883.49	9	2	1.23	1768.23	1764	8	2.54E-03	42.4	
32	0	911.73*	71	26	1.24	1824.72	1819	13	1.96E-02	19.4	
33	0	961.54	11	5	0.81	1924.35	1921	7	2.99E-03	49.4	
34	0	965.08*	14	9	0.96	1931.43	1927	9	4.01E-03	48.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	969.78	48	15	1.70	1940.82	1936	13	1.32E-02	22.6	
36	0	1054.10	7	17	3.99	2109.46	2100	11	1.81E-03	127.2	
37	0	1115.94	14	9	1.62	2233.14	2228	9	3.89E-03	47.0	
38	0	1120.87*	42	11	2.43	2243.02	2238	11	1.16E-02	22.1	
39	0	1175.28	8	7	1.28	2351.84	2345	9	2.22E-03	68.7	
40	7	1191.67	20	11	2.92	2384.61	2381	12	5.64E-03	31.6	5.19E+00
41	7	1194.36	8	9	1.83	2390.00	2381	12	2.15E-03	58.4	
42	0	1302.02	14	3	4.15	2605.31	2598	13	3.85E-03	37.9	
43	0	1378.71	10	11	1.52	2758.70	2751	11	2.78E-03	71.6	
44	0	1461.25*	324	0	2.25	2923.80	2917	15	8.99E-02	5.6	
45	0	1765.07*	32	0	2.89	3531.46	3524	13	8.90E-03	18.6	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235031.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 26-NOV-2015 14:25:00 Acquisition date : 3-OCT-2016 09:09:51
Sample ID        : G405235031 Sample quantity   : 139.62 GRAM
Sample type       : SOLID Sample geometry    :
Detector name    : GAMMA32 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.58 0.0%
Energy tolerance : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error    : 0.00 %
Efficiency type  : Linear Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.119E+00	1.398E+01	1.398E+01	11.23	OK
ZN-65	1115.54	50.60*	1.397E+00	1.045E-01	2.534E-01	93.95	OK
CD-109	88.03	3.70*	4.556E+00	8.954E-01	1.430E+00	220.35	OK
SN-126	64.28	9.60	2.229E+00	----- Line	Not Found	-----	Absent
	86.94	8.90	4.556E+00	3.722E-01	3.722E-01	220.35	OK
	87.57	37.00*	4.556E+00	8.954E-02	8.954E-02	220.35	OK
BA-137M	661.66	89.90*	2.104E+00	1.903E-01	1.941E-01	33.35	OK
CS-137	661.66	85.10*	2.104E+00	2.011E-01	2.051E-01	33.35	OK
CE-141	145.44	48.29*	6.092E+00	5.132E-02	3.958E+01	188.15	OK
TL-208	277.37	6.60	4.277E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.325E+00	2.750E-01	2.750E-01	35.35	OK
	860.56	12.50	1.714E+00	----- Line	Not Found	-----	Absent
BI-212	727.33	6.67*	1.953E+00	8.238E-01	8.238E-01	80.37	OK
	785.37	1.10	1.839E+00	3.649E+00	3.649E+00	88.65	OK
	1620.50	1.47	1.022E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	3.470E+00	1.154E+00	1.154E+00	65.05	OK
	77.11	17.10	3.695E+00	1.759E+00	1.759E+00	28.75	OK
	238.63	43.60*	4.787E+00	1.162E+00	1.162E+00	12.28	OK
	300.09	3.30	4.016E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.246E+00	9.824E-01	9.827E-01	20.96	OK
	1120.29	14.92	1.392E+00	1.065E+00	1.065E+00	44.24	OK
	1764.49	15.30	9.460E-01	1.121E+00	1.121E+00	37.23	OK
PB-214	74.82	5.80	3.423E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.695E+00	3.101E+00	3.102E+00	28.75	OK
	87.09	3.41	4.545E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.745E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.062E+00	1.254E+00	1.255E+00	31.06	OK
	351.93	35.60*	3.518E+00	1.068E+00	1.069E+00	23.21	OK
RN-222	609.32	45.49*	2.246E+00	9.824E-01	9.827E-01	20.96	OK
	1120.29	14.92	1.392E+00	1.065E+00	1.065E+00	44.24	OK
	1764.49	15.30	9.460E-01	1.121E+00	1.121E+00	37.23	OK
RA-224	240.99	4.10*	4.743E+00	3.688E-01	3.688E-01	356.75	OK
RA-226	609.32	45.49*	2.246E+00	9.824E-01	9.827E-01	20.96	OK
	1120.29	14.92	1.392E+00	1.065E+00	1.065E+00	44.24	OK
	1764.49	15.30	9.460E-01	1.121E+00	1.121E+00	37.23	OK
AC-228	105.21	1.10	5.586E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.639E+00	1.114E+00	1.114E+00	51.96	OK
	794.95	4.25	1.823E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.753E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.638E+00	8.982E-01	8.982E-01	38.82	OK
	968.97	15.80	1.561E+00	1.031E+00	1.031E+00	45.21	OK
RA-228	105.21	1.10	5.586E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.639E+00	1.114E+00	1.114E+00	51.96	OK
	794.95	4.25	1.823E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.753E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.638E+00	8.982E-01	8.982E-01	38.82	OK
	968.97	15.80	1.561E+00	1.031E+00	1.031E+00	45.21	OK
TH-228	74.82	10.28	3.470E+00	1.154E+00	1.154E+00	65.05	OK
	77.11	17.10	3.695E+00	1.759E+00	1.759E+00	28.75	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	238.63	43.60*	4.787E+00	1.162E+00	1.162E+00	12.28	OK
	300.09	3.30	4.016E+00	-----	Line Not Found	-----	Absent
TH-230	609.32	45.49*	2.246E+00	9.824E-01	9.824E-01	20.96	OK
	1120.29	14.92	1.392E+00	1.065E+00	1.065E+00	44.24	OK
	1764.49	15.30	9.460E-01	1.121E+00	1.121E+00	37.23	OK
TH-232	105.21	1.10	5.586E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.639E+00	1.114E+00	1.114E+00	51.96	OK
	835.71	1.61	1.753E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.638E+00	8.982E-01	8.982E-01	38.82	OK
	968.97	15.80	1.561E+00	1.031E+00	1.031E+00	45.21	OK
U-234	609.32	45.49*	2.246E+00	9.824E-01	9.824E-01	20.96	OK
	1120.29	14.92	1.392E+00	1.065E+00	1.065E+00	44.24	OK
	1764.49	15.30	9.460E-01	1.121E+00	1.121E+00	37.23	OK
U-235	89.96	3.47	4.758E+00	-----	Line Not Found	-----	Absent
	93.35	5.60	4.976E+00	1.429E+00	1.429E+00	81.61	OK
	143.76	10.96*	6.095E+00	-----	Line Not Found	-----	<<INT Reject
	163.33	5.08	5.924E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	5.605E+00	1.411E-01	1.411E-01	80.25	OK
	205.31	5.01	5.302E+00	-----	Line Not Found	-----	Absent
AM-243	43.53	5.90	1.701E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	3.470E+00	1.765E-01	1.765E-01	65.05	OK
ANH-511	511.00	100.00*	2.588E+00	1.067E-01	1.067E-01	80.01	OK

Flag: "*" = Keyline

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235031.CNF;1
* Acquisition date   : 3-OCT-2016 09:09:51 Sensitivity      : 3.000
* Detector ID       : GAM32 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.58 Half life ratio : *****
* Sample date       : 26-NOV-2015 14:25:00 Analyst initials: MXR1
* Sample ID         : G405235031 Sample Quantity : 1.3962E+02 GRAM
* Batch Number      : 1596249 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 23-AUG-2016 07:56:33 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;11
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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.398E+01	1.539E+00	7.486E-01
ZN-65	2.534E-01	2.333E-01	3.281E-01
CD-109	1.430E+00	3.089E+00	3.077E+00
SN-126	8.954E-02	1.934E-01	1.781E-01
BA-137M	1.941E-01	6.344E-02	5.102E-02
CS-137	2.051E-01	6.702E-02	5.390E-02
CE-141	3.958E+01	7.297E+01	6.698E+01
TL-208	2.750E-01	9.527E-02	6.553E-02
BI-212	8.238E-01	6.489E-01	7.965E-01
PB-212	1.162E+00	1.399E-01	9.344E-02
BI-214	9.827E-01	2.019E-01	1.212E-01
PB-214	1.069E+00	2.431E-01	1.382E-01
RN-222	9.827E-01	2.019E-01	1.212E-01
RA-224	3.688E-01	1.289E+00	1.001E+00
RA-226	9.827E-01	2.019E-01	1.212E-01
AC-228	8.982E-01	3.417E-01	2.730E-01
RA-228	8.982E-01	3.417E-01	2.730E-01
TH-228	1.162E+00	1.399E-01	9.344E-02
TH-230	9.824E-01	2.018E-01	1.211E-01
TH-232	8.982E-01	3.417E-01	2.730E-01
U-234	9.824E-01	2.018E-01	1.211E-01
U-235	3.792E-01	4.020E-01	4.136E-01
AM-243	1.765E-01	1.125E-01	1.255E-01
ANH-511	1.067E-01	8.368E-02	5.400E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-4.375E+00	1.407E+01	2.602E+01	NOT IDENT.
NA-22	2.714E-02	4.918E-02	1.076E-01	NOT IDENT.
NA-24	0.000E+00	1.129E+41	0.000E+00	SHORT HLIF
AL-26	-1.733E-02	3.578E-02	6.485E-02	NOT IDENT.
SC-46	8.642E-02	3.686E-01	7.552E-01	FAIL ABUN
V-48	0.000E+00	2.266E+04	0.000E+00	SHORT HLIF

CR-51	0.000E+00	6.299E+02	0.000E+00	SHORT HLIF
MN-54	-2.251E-02	7.482E-02	1.316E-01	NOT IDENT.
CO-56	6.602E-02	5.547E-01	1.073E+00	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.209E-02	5.630E-02	1.028E-01	NOT IDENT.
CO-58	-2.868E-02	6.680E-01	1.267E+00	NOT IDENT.
FE-59	7.864E-01	7.630E+00	1.584E+01	NOT IDENT.
CO-60	-1.891E-02	3.538E-02	6.479E-02	NOT IDENT.
GE-68	-1.027E+00	2.286E+00	4.299E+00	NOT IDENT.
AS-73	9.986E+00	1.955E+01	3.783E+01	NOT IDENT.
AS-74	0.000E+00	1.086E+04	0.000E+00	SHORT HLIF
SE-75	3.508E-02	2.303E-01	4.339E-01	NOT IDENT.
BR-77	0.000E+00	8.219E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	1.012E+03	0.000E+00	SHORT HLIF
RB-83	2.436E-01	6.334E-01	1.312E+00	NOT IDENT.
KR-85	7.363E+00	9.001E+00	1.690E+01	NOT IDENT.
SR-85	8.803E-01	1.078E+00	2.024E+00	NOT IDENT.
RB-86	0.000E+00	4.289E+04	0.000E+00	SHORT HLIF
Y-88	1.089E-01	2.289E-01	5.671E-01	NOT IDENT.
Y-91	-2.296E+02	5.789E+02	1.086E+03	NOT IDENT.
NB-94	2.991E-02	3.730E-02	7.610E-02	NOT IDENT.
NB-95	-5.163E-01	1.193E+00	1.806E+00	NOT IDENT.
NB-95M	-5.773E-01	2.845E+00	4.843E+00	NOT IDENT.
ZR-95	1.562E+00	1.743E+00	3.764E+00	NOT IDENT.
NB-97	0.000E+00	1.672E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	3.638E+33	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.406E+41	0.000E+00	SHORT HLIF
RH-101	8.540E-03	3.671E-02	6.721E-02	NOT IDENT.
RH-102	-4.078E-02	6.598E-02	9.701E-02	NOT IDENT.
RU-103	-5.023E+00	7.687E+00	1.341E+01	FAIL ABUN
RH-106	-6.563E-02	6.005E-01	9.996E-01	NOT IDENT.
RU-106	-6.563E-02	6.005E-01	9.996E-01	NOT IDENT.
AG-108M	1.395E-02	2.864E-02	5.819E-02	NOT IDENT.
AG-110M	9.579E-02	7.959E-02	1.881E-01	FAIL ABUN
SN-113	-5.297E-02	2.842E-01	5.306E-01	NOT IDENT.
CD-115	0.000E+00	1.186E+41	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.777E+05	0.000E+00	SHORT HLIF
TE-123M	-4.232E-02	1.427E-01	2.739E-01	NOT IDENT.
SB-124	3.304E-01	1.813E+00	4.393E+00	NOT IDENT.
SB-125	-8.641E-02	1.115E-01	1.933E-01	FAIL ABUN
TE-125M	7.801E+01	3.956E+02	7.207E+02	NOT IDENT.
I-126	0.000E+00	1.960E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	3.054E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	2.015E+23	0.000E+00	SHORT HLIF
I-131	0.000E+00	1.427E+10	0.000E+00	SHORT HLIF
I-132	0.000E+00	7.858E+40	0.000E+00	SHORT HLIF
TE-132	0.000E+00	5.187E+27	0.000E+00	SHORT HLIF
BA-133	-2.023E-02	4.523E-02	7.292E-02	NOT IDENT.
I-133	0.000E+00	1.376E+41	0.000E+00	SHORT HLIF
CS-134	3.667E-02	6.464E-02	1.284E-01	FAIL ABUN
CS-135	1.759E-02	1.624E-01	2.845E-01	NOT IDENT.
I-135	0.000E+00	1.339E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	7.284E+05	0.000E+00	SHORT HLIF
CE-139	3.429E-02	1.219E-01	2.428E-01	NOT IDENT.
BA-140	0.000E+00	2.846E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	7.893E+05	0.000E+00	SHORT HLIF
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	-3.216E-01	4.212E-01	6.965E-01	NOT IDENT.
PM-144	1.165E-02	6.301E-02	1.217E-01	NOT IDENT.
PR-144	1.018E+00	5.507E+00	1.063E+01	NOT IDENT.
PM-146	3.303E-03	4.718E-02	9.095E-02	NOT IDENT.
ND-147	0.000E+00	6.622E+07	0.000E+00	SHORT HLIF
PM-147	-4.625E+01	9.551E+02	1.705E+03	NOT IDENT.
PM-149	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
EU-150	-4.213E-03	3.597E-02	4.801E-02	FAIL ABUN
EU-152	-2.159E-04	1.060E-01	2.022E-01	FAIL ABUN
GD-153	-5.504E-02	2.355E-01	4.158E-01	NOT IDENT.
EU-154	5.825E-02	1.182E-01	2.571E-01	NOT IDENT.
EU-155	-9.052E-03	1.310E-01	2.344E-01	FAIL ABUN
TB-160	-7.102E-02	2.371E+00	3.997E+00	FAIL ABUN
HO-166M	-3.605E-02	7.798E-02	1.180E-01	NOT IDENT.
TM-171	3.902E+00	4.541E+01	8.493E+01	NOT IDENT.
HF-172	-2.723E-01	2.607E-01	4.192E-01	NOT IDENT.
LU-172	-1.317E-02	7.127E-02	1.412E-01	FAIL ABUN
LU-176	-1.385E-02	2.550E-02	4.650E-02	FAIL ABUN
HF-181	1.333E+00	5.734E+00	1.126E+01	NOT IDENT.
TA-182	1.057E-01	1.024E+00	2.066E+00	FAIL ABUN

RE-183	-1.978E+00	5.353E+00	9.626E+00	NOT IDENT.
RE-184	-5.128E+00	3.263E+01	6.161E+01	NOT IDENT.
W-188	-6.558E+01	1.394E+02	2.270E+02	NOT IDENT.
IR-192	-3.755E-01	5.903E-01	1.062E+00	FAIL ABUN
HG-203	2.157E+00	3.262E+00	6.567E+00	NOT IDENT.
BI-207	-1.820E-02	5.147E-02	9.798E-02	FAIL ABUN
PB-210	3.590E+00	8.738E+00	1.698E+01	NOT IDENT.
BI-211	0.000E+00	3.382E-01	7.893E-01	NOT IDENT.
PB-211	1.608E-01	7.550E-01	1.468E+00	NOT IDENT.
RN-219	-1.209E-01	4.508E-01	8.314E-01	FAIL ABUN
RA-223	6.234E-02	6.689E-01	1.170E+00	FAIL ABUN
AC-227	5.266E-02	2.289E-01	4.523E-01	NOT IDENT.
TH-227	5.266E-02	2.289E-01	4.523E-01	NOT IDENT.
TH-229	8.785E-02	5.032E-01	9.864E-01	FAIL ABUN
PA-231	9.055E-02	5.282E-01	9.263E-01	NOT IDENT.
TH-231	6.234E-02	6.689E-01	1.170E+00	FAIL ABUN
PA-233	-3.171E-03	6.204E-02	1.189E-01	NOT IDENT.
PA-234	6.928E-02	2.412E-01	5.230E-01	FAIL ABUN
PA-234M	-5.147E-01	4.015E+00	8.051E+00	NOT IDENT.
TH-234	1.369E-03	1.948E+00	3.628E+00	FAIL ABUN
NP-237	-3.171E-03	6.204E-02	1.189E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
U-238	1.369E-03	1.948E+00	3.628E+00	FAIL ABUN
NP-239	5.605E-02	2.818E-01	5.145E-01	NOT IDENT.
PU-239	1.082E+02	3.543E+02	6.482E+02	NOT IDENT.
AM-241	-1.804E-01	2.143E-01	3.672E-01	NOT IDENT.
CM-243	2.973E-02	1.157E-01	2.138E-01	NOT IDENT.
BK-247	2.027E-02	7.794E-02	1.404E-01	NOT IDENT.
CM-247	-6.403E-03	3.984E-02	7.448E-02	NOT IDENT.
CF-249	-2.454E-02	3.752E-02	6.666E-02	NOT IDENT.
CF-251	7.552E-02	1.234E-01	2.499E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	310	10.66*	1.119E+00	1.398E+01	1.398E+01	11.23
ZN-65	1115.54	14	50.60*	1.397E+00	1.045E-01	2.534E-01	93.95
CD-109	88.03	60	3.70*	4.556E+00	1.929E+00	3.082E+00	101.77
SN-126	64.28	-----	9.60	2.229E+00	-----	Line Not Found	-----
	86.94	60	8.90	4.556E+00	8.021E-01	8.021E-01	101.77
	87.57	60	37.00*	4.556E+00	1.929E-01	1.929E-01	101.77
BA-137M	661.66	67	89.90*	2.104E+00	1.903E-01	1.941E-01	33.35
CS-137	661.66	67	85.10*	2.104E+00	2.011E-01	2.051E-01	33.35
CE-141	145.44	47	48.29*	6.092E+00	8.607E-02	6.638E+01	108.17
TL-208	277.37	-----	6.60	4.277E+00	-----	Line Not Found	-----
	583.19	101	85.00*	2.325E+00	2.750E-01	2.750E-01	35.35
	860.56	-----	12.50	1.714E+00	-----	Line Not Found	-----
BI-212	727.33	20	6.67*	1.953E+00	8.238E-01	8.238E-01	80.37
	785.37	14	1.10	1.839E+00	3.649E+00	3.649E+00	88.65
	1620.50	-----	1.47	1.022E+00	-----	Line Not Found	-----
PB-212	74.82	119	10.28	3.470E+00	1.787E+00	1.787E+00	41.48
	77.11	207	17.10	3.695E+00	1.759E+00	1.759E+00	28.75
	238.63	451	43.60*	4.787E+00	1.162E+00	1.162E+00	12.28
	300.09	-----	3.30	4.016E+00	-----	Line Not Found	-----
BI-214	609.32	187	45.49*	2.246E+00	9.824E-01	9.827E-01	20.96
	1120.29	41	14.92	1.392E+00	1.065E+00	1.065E+00	44.24
	1764.49	30	15.30	9.460E-01	1.121E+00	1.121E+00	37.23
PB-214	74.82	119	5.80	3.470E+00	3.167E+00	3.168E+00	41.48
	77.11	207	9.70	3.695E+00	3.101E+00	3.102E+00	28.75
	87.09	60	3.41	4.556E+00	2.093E+00	2.094E+00	101.77
	242.00	85	7.25	4.743E+00	1.330E+00	1.331E+00	53.67
	295.22	174	18.42	4.062E+00	1.254E+00	1.255E+00	31.06
	351.93	249	35.60*	3.518E+00	1.068E+00	1.069E+00	23.21
RN-222	609.32	187	45.49*	2.246E+00	9.824E-01	9.827E-01	20.96
	1120.29	41	14.92	1.392E+00	1.065E+00	1.065E+00	44.24
	1764.49	30	15.30	9.460E-01	1.121E+00	1.121E+00	37.23
RA-224	240.99	85	4.10*	4.743E+00	2.353E+00	2.353E+00	53.67
RA-226	609.32	187	45.49*	2.246E+00	9.824E-01	9.827E-01	20.96
	1120.29	41	14.92	1.392E+00	1.065E+00	1.065E+00	44.24
	1764.49	30	15.30	9.460E-01	1.121E+00	1.121E+00	37.23
AC-228	105.21	-----	1.10	5.586E+00	-----	Line Not Found	-----
	338.32	85	11.27	3.639E+00	1.114E+00	1.114E+00	51.96
	794.95	-----	4.25	1.823E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.753E+00	-----	Line Not Found	-----
	911.20	71	25.80*	1.638E+00	8.982E-01	8.982E-01	38.82
	968.97	47	15.80	1.561E+00	1.031E+00	1.031E+00	45.21
RA-228	105.21	-----	1.10	5.586E+00	-----	Line Not Found	-----
	338.32	85	11.27	3.639E+00	1.114E+00	1.114E+00	51.96
	794.95	-----	4.25	1.823E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.753E+00	-----	Line Not Found	-----
	911.20	71	25.80*	1.638E+00	8.982E-01	8.982E-01	38.82
	968.97	47	15.80	1.561E+00	1.031E+00	1.031E+00	45.21

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	74.82	119	10.28	3.470E+00	1.787E+00	1.787E+00	41.48
	77.11	207	17.10	3.695E+00	1.759E+00	1.759E+00	28.75
	238.63	451	43.60*	4.787E+00	1.162E+00	1.162E+00	12.28
	300.09	-----	3.30	4.016E+00	-----	Line Not Found	-----
TH-230	609.32	187	45.49*	2.246E+00	9.824E-01	9.824E-01	20.96
	1120.29	41	14.92	1.392E+00	1.065E+00	1.065E+00	44.24
	1764.49	30	15.30	9.460E-01	1.121E+00	1.121E+00	37.23
TH-232	105.21	-----	1.10	5.586E+00	-----	Line Not Found	-----
	338.32	85	11.27	3.639E+00	1.114E+00	1.114E+00	51.96
	835.71	-----	1.61	1.753E+00	-----	Line Not Found	-----
	911.20	71	25.80*	1.638E+00	8.982E-01	8.982E-01	38.82
U-234	968.97	47	15.80	1.561E+00	1.031E+00	1.031E+00	45.21
	609.32	187	45.49*	2.246E+00	9.824E-01	9.824E-01	20.96
	1120.29	41	14.92	1.392E+00	1.065E+00	1.065E+00	44.24
U-235	1764.49	30	15.30	9.460E-01	1.121E+00	1.121E+00	37.23
	89.96	-----	3.47	4.758E+00	-----	Line Not Found	-----
	93.35	74	5.60	4.976E+00	1.429E+00	1.429E+00	81.61
	143.76	47	10.96*	6.092E+00	3.792E-01	3.792E-01	108.17
	163.33	-----	5.08	5.924E+00	-----	Line Not Found	-----
AM-243	185.72	84	57.20	5.605E+00	1.411E-01	1.411E-01	80.25
	205.31	-----	5.01	5.302E+00	-----	Line Not Found	-----
	43.53	-----	5.90	1.701E-01	-----	Line Not Found	-----
	74.66	119	67.20*	3.470E+00	2.733E-01	2.733E-01	41.48
ANH-511	511.00	51	100.00*	2.588E+00	1.067E-01	1.067E-01	80.01

Flag: "*" = Keyline

Total number of lines in spectrum 45
 Number of unidentified lines 13
 Number of lines tentatively identified by NID 32 71.11%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.398E+01	1.398E+01	0.157E+01	11.23	
ZN-65	244.06D	2.42	1.045E-01	2.534E-01	2.380E-01	93.95	
CD-109	461.40D	1.60	1.929E+00	3.082E+00	3.137E+00	101.77	
SN-126	2.30E+05Y	1.00	1.929E-01	1.929E-01	1.964E-01	101.77	
BA-137M	30.08Y	1.02	1.903E-01	1.941E-01	0.647E-01	33.35	
CS-137	30.08Y	1.02	2.011E-01	2.051E-01	0.684E-01	33.35	
CE-141	32.51D	771.	8.607E-02	6.638E+01	7.180E+01	108.17	
TL-208	1.41E+10Y	1.00	2.750E-01	2.750E-01	0.972E-01	35.35	
BI-212	1.41E+10Y	1.00	8.238E-01	8.238E-01	6.621E-01	80.37	
PB-212	1.41E+10Y	1.00	1.162E+00	1.162E+00	0.143E+00	12.28	
BI-214	1600.00Y	1.00	9.824E-01	9.827E-01	2.060E-01	20.96	
PB-214	1600.00Y	1.00	1.068E+00	1.069E+00	0.248E+00	23.21	
RN-222	1600.00Y	1.00	9.824E-01	9.827E-01	2.060E-01	20.96	
RA-224	1.41E+10Y	1.00	2.353E+00	2.353E+00	1.263E+00	53.67	
RA-226	1600.00Y	1.00	9.824E-01	9.827E-01	2.060E-01	20.96	
AC-228	1.41E+10Y	1.00	8.982E-01	8.982E-01	3.487E-01	38.82	
RA-228	1.41E+10Y	1.00	8.982E-01	8.982E-01	3.487E-01	38.82	
TH-228	1.41E+10Y	1.00	1.162E+00	1.162E+00	0.143E+00	12.28	
TH-230	7.54E+04Y	1.00	9.824E-01	9.824E-01	2.059E-01	20.96	
TH-232	1.41E+10Y	1.00	8.982E-01	8.982E-01	3.487E-01	38.82	
U-234	2.45E+05Y	1.00	9.824E-01	9.824E-01	2.059E-01	20.96	
U-235	7.04E+08Y	1.00	3.792E-01	3.792E-01	4.102E-01	108.17	
AM-243	7370.00Y	1.00	2.733E-01	2.733E-01	1.134E-01	41.48	
ANH-511	1.00E+09Y	1.00	1.067E-01	1.067E-01	0.854E-01	80.01	
Total Activity :			3.189E+01	9.950E+01			

Grand Total Activity : 3.189E+01 9.950E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	208.93	50	139	0.93	419.07	413	12	1.24E-02	****	5.24E+00	
0	271.27	36	119	2.19	543.76	536	13	9.10E-03	****	4.35E+00	T
0	328.63	69	62	1.61	658.48	652	15	1.77E-02	57.3	3.73E+00	T
0	367.02	19	39	2.46	735.27	730	11	4.95E-03	****	3.40E+00	T
0	463.71	16	30	0.67	928.65	925	9	4.17E-03	****	2.80E+00	T
0	563.44	28	12	1.81	1128.11	1123	12	7.50E-03	64.2	2.39E+00	T
0	572.16	20	27	1.44	1145.56	1140	14	5.32E-03	****	2.36E+00	
0	627.98	17	18	0.82	1257.20	1250	12	4.50E-03	****	2.19E+00	
1	666.32	18	9	1.80	1333.89	1317	22	4.76E-03	80.2	2.09E+00	T
0	670.67	9	11	0.67	1342.59	1338	7	2.36E-03	****	2.08E+00	
0	717.06	13	19	4.54	1435.36	1427	13	3.45E-03	****	1.98E+00	
0	768.71	33	23	6.07	1538.68	1531	15	9.03E-03	72.7	1.87E+00	
0	799.40	25	51	4.04	1600.05	1583	29	6.94E-03	****	1.81E+00	
0	883.49	9	2	1.23	1768.23	1764	8	2.54E-03	84.8	1.68E+00	T
0	961.54	11	5	0.81	1924.35	1921	7	2.99E-03	98.9	1.57E+00	T
0	965.08	14	9	0.96	1931.43	1927	9	4.01E-03	96.9	1.57E+00	T
0	1054.10	6	16	3.99	2109.46	2100	11	1.81E-03	****	1.46E+00	
0	1175.28	8	7	1.28	2351.84	2345	9	2.22E-03	****	1.34E+00	
7	1191.67	20	10	2.92	2384.61	2381	12	5.64E-03	63.1	1.33E+00	
7	1194.36	8	9	1.83	2390.00	2381	12	2.15E-03	****	1.32E+00	
0	1302.02	13	3	4.15	2605.31	2598	13	3.85E-03	75.8	1.23E+00	
0	1378.71	10	11	1.52	2758.70	2751	11	2.78E-03	****	1.18E+00	

Flags: "T" = Tentatively associated

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235031.CNF;1
* Acquisition date   : 3-OCT-2016 09:09:51 Sensitivity      : 3.000
* Detector ID       : GAM32 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.58 Half life ratio : *****
* Sample date       : 26-NOV-2015 14:25:00 Nuclide Library : SOLID
* Sample ID        : G405235031 Analyst initials: MXR1
* Batch Number     : 1596249 Sample Quantity : 1.3962E+02 GRAM
* Wet wt corr      : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date    : 23-AUG-2016 07:56:33 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;11
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	3.132E-01
ZN-65	1.389E-01
CD-109	1.467E+00
SN-126	8.456E-02
BA-137M	2.152E-02
CS-137	2.273E-02
CE-141	3.150E+01
TL-208	2.902E-02
BI-212	3.415E-01
PB-212	4.311E-02
BI-214	5.333E-02
PB-214	6.314E-02
RN-222	5.333E-02
RA-224	4.620E-01
RA-226	5.333E-02
AC-228	1.191E-01
RA-228	1.191E-01
TH-228	4.311E-02
TH-230	5.331E-02
TH-232	1.191E-01
U-234	5.331E-02
U-235	1.955E-01
AM-243	5.939E-02
ANH-511	2.413E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.150E+01	NOT IDENT.
NA-22	4.647E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.455E-02	NOT IDENT.
SC-46	3.194E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF

MN-54	5.738E-02	NOT IDENT.
CO-56	4.669E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.814E-02	NOT IDENT.
CO-58	5.461E-01	NOT IDENT.
FE-59	6.740E+00	NOT IDENT.
CO-60	2.563E-02	NOT IDENT.
GE-68	1.797E+00	NOT IDENT.
AS-73	1.777E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.994E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.766E-01	NOT IDENT.
KR-85	7.749E+00	NOT IDENT.
SR-85	9.281E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	2.226E-01	NOT IDENT.
Y-91	4.571E+02	NOT IDENT.
NB-94	3.437E-02	NOT IDENT.
NB-95	7.879E-01	NOT IDENT.
NB-95M	2.238E+00	NOT IDENT.
ZR-95	1.672E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.140E-02	NOT IDENT.
RH-102	4.141E-02	NOT IDENT.
RU-103	5.944E+00	FAIL ABUN
RH-106	4.394E-01	NOT IDENT.
RU-106	4.394E-01	NOT IDENT.
AG-108M	2.631E-02	NOT IDENT.
AG-110M	7.971E-02	FAIL ABUN
SN-113	2.420E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.277E-01	NOT IDENT.
SB-124	1.633E+00	NOT IDENT.
SB-125	8.627E-02	FAIL ABUN
TE-125M	3.391E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.280E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.790E-02	FAIL ABUN
CS-135	1.316E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	1.137E-01	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-143	0.000E+00	SHORT HLIF
CE-144	3.243E-01	NOT IDENT.
PM-144	5.416E-02	NOT IDENT.
PR-144	4.734E+00	NOT IDENT.
PM-146	4.101E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.965E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.185E-02	FAIL ABUN
EU-152	9.291E-02	FAIL ABUN
GD-153	1.955E-01	NOT IDENT.
EU-154	1.107E-01	NOT IDENT.
EU-155	1.098E-01	FAIL ABUN
TB-160	1.710E+00	FAIL ABUN
HO-166M	5.210E-02	NOT IDENT.
TM-171	3.986E+01	NOT IDENT.
HF-172	1.943E-01	NOT IDENT.
LU-172	5.936E-02	FAIL ABUN
LU-176	2.122E-02	FAIL ABUN
HF-181	5.073E+00	NOT IDENT.
TA-182	8.952E-01	FAIL ABUN
RE-183	4.479E+00	NOT IDENT.

RE-184	2.555E+01	NOT IDENT.
W-188	1.034E+02	NOT IDENT.
IR-192	4.871E-01	FAIL ABUN
HG-203	3.060E+00	NOT IDENT.
BI-207	4.209E-02	FAIL ABUN
PB-210	7.947E+00	NOT IDENT.
BI-211	3.784E-01	NOT IDENT.
PB-211	6.709E-01	NOT IDENT.
RN-219	3.799E-01	FAIL ABUN
RA-223	5.351E-01	FAIL ABUN
AC-227	2.087E-01	NOT IDENT.
TH-227	2.087E-01	NOT IDENT.
TH-229	4.620E-01	FAIL ABUN
PA-231	4.281E-01	NOT IDENT.
TH-231	5.351E-01	FAIL ABUN
PA-233	5.444E-02	NOT IDENT.
PA-234	2.230E-01	FAIL ABUN
PA-234M	3.451E+00	NOT IDENT.
TH-234	1.715E+00	FAIL ABUN
NP-237	5.444E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.715E+00	FAIL ABUN
NP-239	2.410E-01	NOT IDENT.
PU-239	3.043E+02	NOT IDENT.
AM-241	1.706E-01	NOT IDENT.
CM-243	1.001E-01	NOT IDENT.
BK-247	6.455E-02	NOT IDENT.
CM-247	3.395E-02	NOT IDENT.
CF-249	2.983E-02	NOT IDENT.
CF-251	1.173E-01	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235031.CNF;1
* Acquisition date   : 3-OCT-2016 09:09:51 Sensitivity      : 3.000
* Detector ID       : GAM32 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.58 Half life ratio  : *****
* Sample date       : 26-NOV-2015 14:25:00 Nuclide Library : SOLID
* Sample ID        : G405235031 Analyst initials: MXR1
* Batch Number     : 1596249 Sample Quantity : 1.3962E+02 GRAM
*                  : Quantity Err(%) : 1.4325E-03 %
* Wet wt corr      : 1.00000 Wet Weight      : 0.00000
*                  : Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 23-AUG-2016 07:56:33 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;11
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.398E+01	1.703E+00	1.703E+00
ZN-65	2.534E-01	2.335E-01	2.335E-01
CD-109	1.430E+00	3.097E+00	3.097E+00
SN-126	8.950E-02	1.938E-01	1.938E-01
BA-137M	1.941E-01	6.399E-02	6.399E-02
CS-137	2.051E-01	6.759E-02	6.759E-02
CE-141	3.958E+01	7.302E+01	7.302E+01
TL-208	2.750E-01	9.599E-02	9.599E-02
BI-212	8.238E-01	6.502E-01	6.502E-01
PB-212	1.162E+00	1.530E-01	1.530E-01
BI-214	9.827E-01	2.062E-01	2.062E-01
PB-214	1.069E+00	2.472E-01	2.472E-01
RN-222	9.827E-01	2.062E-01	2.062E-01
RA-224	3.680E-01	1.295E+00	1.295E+00
RA-226	9.827E-01	2.062E-01	2.062E-01
AC-228	8.982E-01	3.448E-01	3.448E-01
RA-228	8.982E-01	3.448E-01	3.448E-01
TH-228	1.162E+00	1.530E-01	1.530E-01
TH-230	9.824E-01	2.062E-01	2.062E-01
TH-232	8.982E-01	3.448E-01	3.448E-01
U-234	9.824E-01	2.062E-01	2.062E-01
U-235	3.792E-01	4.025E-01	4.025E-01
AM-243	1.765E-01	1.137E-01	1.137E-01
ANH-511	1.067E-01	8.379E-02	8.379E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-4.375E+00	1.408E+01	1.421E+01	NOT IDENT.
NA-22	2.714E-02	4.919E-02	5.068E-02	NOT IDENT.
NA-24	1.000E+41	1.217E+41	0.000E+00	SHORT HLIF
AL-26	-1.733E-02	3.579E-02	3.664E-02	NOT IDENT.
SC-46	8.642E-02	3.686E-01	3.706E-01	FAIL ABUN
V-48	1.544E+04	2.267E+04	2.372E+04	SHORT HLIF

CR-51	1.417E+02	6.299E+02	6.332E+02	SHORT HLIF
MN-54	-2.251E-02	7.483E-02	7.551E-02	NOT IDENT.
CO-56	6.602E-02	5.547E-01	5.555E-01	NOT IDENT.
MN-56	1.000E+41	7.923E+41	0.000E+00	SHORT HLIF
CO-57	1.209E-02	5.631E-02	5.657E-02	NOT IDENT.
CO-58	-2.868E-02	6.680E-01	6.681E-01	NOT IDENT.
FE-59	7.864E-01	7.630E+00	7.638E+00	NOT IDENT.
CO-60	-1.891E-02	3.539E-02	3.640E-02	NOT IDENT.
GE-68	-1.027E+00	2.286E+00	2.332E+00	NOT IDENT.
AS-73	9.986E+00	1.966E+01	2.017E+01	NOT IDENT.
AS-74	-1.574E+03	1.086E+04	1.089E+04	SHORT HLIF
SE-75	3.508E-02	2.304E-01	2.309E-01	NOT IDENT.
BR-77	6.827E+39	6.144E+40	0.000E+00	SHORT HLIF
SR-82	-4.920E+02	1.013E+03	1.037E+03	SHORT HLIF
RB-83	2.436E-01	6.343E-01	6.437E-01	NOT IDENT.
KR-85	7.363E+00	9.006E+00	9.598E+00	NOT IDENT.
SR-85	8.803E-01	1.079E+00	1.149E+00	NOT IDENT.
RB-86	-1.277E+04	4.289E+04	4.328E+04	SHORT HLIF
Y-88	1.089E-01	2.291E-01	2.343E-01	NOT IDENT.
Y-91	-2.296E+02	5.790E+02	5.882E+02	NOT IDENT.
NB-94	2.991E-02	3.732E-02	3.969E-02	NOT IDENT.
NB-95	-5.163E-01	1.193E+00	1.216E+00	NOT IDENT.
NB-95M	-5.773E-01	2.846E+00	2.858E+00	NOT IDENT.
ZR-95	1.562E+00	1.745E+00	1.881E+00	NOT IDENT.
NB-97	1.000E+41	1.672E+41	0.000E+00	SHORT HLIF
ZR-97	-1.000E+41	1.376E+43	0.000E+00	SHORT HLIF
MO-99	-1.495E+33	3.640E+33	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.409E+41	0.000E+00	SHORT HLIF
RH-101	8.540E-03	3.674E-02	3.694E-02	NOT IDENT.
RH-102	-4.078E-02	6.607E-02	6.858E-02	NOT IDENT.
RU-103	-5.023E+00	7.691E+00	8.017E+00	FAIL ABUN
RH-106	-6.563E-02	6.005E-01	6.012E-01	NOT IDENT.
RU-106	-6.563E-02	6.005E-01	6.012E-01	NOT IDENT.
AG-108M	1.395E-02	2.864E-02	2.933E-02	NOT IDENT.
AG-110M	9.579E-02	7.974E-02	9.068E-02	FAIL ABUN
SN-113	-5.297E-02	2.842E-01	2.852E-01	NOT IDENT.
CD-115	6.198E+39	1.186E+41	0.000E+00	SHORT HLIF
SN-117M	9.306E+03	1.777E+05	1.777E+05	SHORT HLIF
TE-123M	-4.232E-02	1.427E-01	1.440E-01	NOT IDENT.
SB-124	3.304E-01	1.813E+00	1.819E+00	NOT IDENT.
SB-125	-8.641E-02	1.115E-01	1.181E-01	FAIL ABUN
TE-125M	7.801E+01	3.957E+02	3.972E+02	NOT IDENT.
I-126	2.494E+06	1.991E+06	2.287E+06	SHORT HLIF
SB-126	-1.412E+06	3.066E+06	3.131E+06	SHORT HLIF
SB-127	-1.142E+22	2.021E+23	0.000E+00	SHORT HLIF
I-131	9.326E+09	1.427E+10	1.488E+10	SHORT HLIF
I-132	1.000E+41	1.923E+42	0.000E+00	SHORT HLIF
TE-132	7.335E+26	5.197E+27	0.000E+00	SHORT HLIF
BA-133	-2.023E-02	4.524E-02	4.615E-02	NOT IDENT.
I-133	-1.000E+41	2.331E+41	0.000E+00	SHORT HLIF
CS-134	3.667E-02	6.466E-02	6.674E-02	FAIL ABUN
CS-135	1.759E-02	1.624E-01	1.626E-01	NOT IDENT.
I-135	1.000E+41	7.171E+41	0.000E+00	SHORT HLIF
CS-136	2.163E+04	7.284E+05	7.285E+05	SHORT HLIF
CE-139	3.429E-02	1.221E-01	1.231E-01	NOT IDENT.
BA-140	3.653E+05	2.846E+06	2.851E+06	SHORT HLIF
LA-140	-4.757E+05	7.896E+05	8.183E+05	SHORT HLIF
CE-143	1.000E+41	2.451E+41	0.000E+00	SHORT HLIF
CE-144	-3.216E-01	4.216E-01	4.458E-01	NOT IDENT.
PM-144	1.165E-02	6.301E-02	6.323E-02	NOT IDENT.
PR-144	1.018E+00	5.508E+00	5.527E+00	NOT IDENT.
PM-146	3.303E-03	4.718E-02	4.720E-02	NOT IDENT.
ND-147	-1.085E+07	6.622E+07	6.640E+07	SHORT HLIF
PM-147	-4.625E+01	9.551E+02	9.553E+02	NOT IDENT.
PM-149	-1.000E+41	2.143E+41	0.000E+00	SHORT HLIF
EU-150	-4.213E-03	3.597E-02	3.602E-02	FAIL ABUN
EU-152	-2.159E-04	1.060E-01	1.060E-01	FAIL ABUN
GD-153	-5.504E-02	2.355E-01	2.368E-01	NOT IDENT.
EU-154	5.825E-02	1.182E-01	1.211E-01	NOT IDENT.
EU-155	-9.052E-03	1.310E-01	1.310E-01	FAIL ABUN
TB-160	-7.102E-02	2.371E+00	2.371E+00	FAIL ABUN
HO-166M	-3.605E-02	7.800E-02	7.968E-02	NOT IDENT.
TM-171	3.902E+00	4.541E+01	4.544E+01	NOT IDENT.
HF-172	-2.723E-01	2.644E-01	2.915E-01	NOT IDENT.
LU-172	-1.317E-02	7.129E-02	7.153E-02	FAIL ABUN
LU-176	-1.385E-02	2.550E-02	2.626E-02	FAIL ABUN
HF-181	1.333E+00	5.735E+00	5.766E+00	NOT IDENT.
TA-182	1.057E-01	1.024E+00	1.025E+00	FAIL ABUN

RE-183	-1.978E+00	5.363E+00	5.436E+00	NOT IDENT.
RE-184	-5.128E+00	3.265E+01	3.273E+01	NOT IDENT.
W-188	-6.558E+01	1.396E+02	1.427E+02	NOT IDENT.
IR-192	-3.755E-01	5.905E-01	6.143E-01	FAIL ABUN
HG-203	2.157E+00	3.264E+00	3.406E+00	NOT IDENT.
BI-207	-1.820E-02	5.147E-02	5.212E-02	FAIL ABUN
PB-210	3.590E+00	8.744E+00	8.893E+00	NOT IDENT.
BI-211	1.660E+00	3.463E-01	8.244E-01	NOT IDENT.
PB-211	1.608E-01	7.550E-01	7.585E-01	NOT IDENT.
RN-219	-1.209E-01	4.511E-01	4.544E-01	FAIL ABUN
RA-223	6.234E-02	6.689E-01	6.695E-01	FAIL ABUN
AC-227	5.266E-02	2.290E-01	2.302E-01	NOT IDENT.
TH-227	5.266E-02	2.290E-01	2.302E-01	NOT IDENT.
TH-229	8.785E-02	5.032E-01	5.048E-01	FAIL ABUN
PA-231	9.055E-02	5.285E-01	5.301E-01	NOT IDENT.
TH-231	6.234E-02	6.689E-01	6.695E-01	FAIL ABUN
PA-233	-3.171E-03	6.204E-02	6.206E-02	NOT IDENT.
PA-234	6.928E-02	2.539E-01	2.558E-01	FAIL ABUN
PA-234M	-5.147E-01	4.015E+00	4.022E+00	NOT IDENT.
TH-234	1.369E-03	1.948E+00	1.948E+00	FAIL ABUN
NP-237	-3.171E-03	6.204E-02	6.206E-02	FAIL ABUN
NP-238	1.000E+41	3.763E+41	0.000E+00	SHORT HLIF
U-238	1.369E-03	1.948E+00	1.948E+00	FAIL ABUN
NP-239	5.605E-02	2.818E-01	2.829E-01	NOT IDENT.
PU-239	1.082E+02	3.543E+02	3.577E+02	NOT IDENT.
AM-241	-1.804E-01	2.147E-01	2.296E-01	NOT IDENT.
CM-243	2.973E-02	1.157E-01	1.165E-01	NOT IDENT.
BK-247	2.027E-02	7.804E-02	7.858E-02	NOT IDENT.
CM-247	-6.403E-03	3.985E-02	3.995E-02	NOT IDENT.
CF-249	-2.454E-02	3.757E-02	3.916E-02	NOT IDENT.
CF-251	7.552E-02	1.237E-01	1.283E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	67.9872	87.09	116.4670	136.47	80.9586
45.60	57.0555	87.57	116.5350	140.51	0.0000
46.54	56.0303	88.03	139.6028	143.76	77.2956
49.72	0.0000	88.34	139.6547	144.24	77.3293
51.35	74.5733	88.47	142.8516	145.44	83.3016
51.87	73.5071	89.96	124.0261	152.43	64.3407
52.39	75.8340	1093.63	97.8692	153.25	0.0000
52.97	66.8429	91.11	0.0000	323.87	71.2228
53.44	68.0280	92.59	122.0207	156.02	0.0000
54.07	78.3123	93.35	122.1289	158.56	0.0000
57.36	0.0000	94.56	92.7254	159.00	69.8098
57.53	66.1910	94.65	92.7349	162.33	72.5644
57.98	68.5213	94.67	92.7372	162.66	0.0000
59.27	68.6579	94.87	92.7585	163.33	73.4793
59.32	76.6738	97.43	89.0211	165.86	65.9259
59.54	77.8445	98.43	97.5526	176.31	68.2073
60.96	73.4236	98.44	97.5539	176.60	0.0000
61.17	70.0040	99.53	74.7626	177.52	64.8148
62.93	87.4475	100.11	69.9848	181.07	0.0000
63.29	87.4939	102.03	89.4818	181.52	65.0169
63.58	82.9244	103.18	70.2233	184.41	67.7676
64.28	94.5386	103.37	66.6049	143.76	67.8350
66.73	83.3038	105.21	76.4462	193.51	69.1073
67.24	91.4697	105.31	76.4549	197.03	69.2865
125.81	90.3684	106.12	83.8095	198.01	69.3364
67.75	90.3773	106.47	75.3354	201.83	62.4876
69.67	91.7834	109.28	79.2183	203.43	59.4759
70.83	97.7492	111.00	84.2464	205.31	71.4666
72.81	108.9050	111.76	0.0000	210.85	50.4885
72.87	105.8018	114.06	71.0419	215.65	47.1023
74.66	104.1074	116.30	0.0000	222.11	55.3449
74.82	104.1298	116.74	68.7806	227.09	51.0521
74.97	104.1509	119.76	68.9908	227.38	47.4786
77.11	104.4463	121.12	69.0848	228.16	0.0000
78.74	101.9242	121.22	69.0917	228.18	51.0892
79.69	87.9193	121.78	72.8335	116.74	51.0892
80.12	78.5426	122.06	66.6797	235.69	54.0448
80.19	0.0000	122.92	61.7928	235.96	54.0540
80.57	110.0230	123.07	61.8019	238.63	47.8307
81.00	84.9210	265.00	66.7860	238.98	0.0000
81.07	84.9287	125.81	79.3188	240.99	47.9035
81.75	113.3364	127.23	62.0529	242.00	47.9342
83.79	80.4859	127.91	73.2708	244.70	54.3591
84.00	71.0353	129.30	70.8812	252.40	0.0000
85.43	105.9518	131.20	64.7810	252.80	49.1726
86.55	116.3900	133.02	67.3879	254.15	0.0000
86.79	116.4243	133.52	79.9043	256.23	43.8020
86.94	116.4460	136.00	72.5805	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	40.7262	355.39	0.0000	584.27	20.1334
264.80	38.5282	356.01	34.7073	595.83	0.0000
265.00	38.5325	364.49	0.0000	427.87	22.3792
268.22	48.2585	366.42	0.0000	602.52	0.0000
269.46	46.9150	372.51	31.4890	604.72	22.4108
270.03	46.9305	375.05	30.1650	607.14	17.6232
271.23	46.9637	377.52	33.1229	609.32	18.1711
273.65	0.0000	356.01	28.3368	610.33	18.1773
276.40	58.7464	388.16	34.2687	614.28	17.6662
277.37	49.9076	388.63	0.0000	618.01	22.5125
277.60	48.9898	391.69	39.2285	620.36	17.1660
278.00	46.2270	264.66	30.5282	621.93	19.3220
279.20	49.0351	401.81	42.3675	630.19	0.0000
279.54	59.2240	402.40	38.4366	631.29	19.3828
279.70	59.2292	404.85	34.5329	633.25	9.6976
280.46	67.5880	410.95	38.5858	634.78	0.0000
283.69	41.7426	413.71	28.7274	635.95	17.2559
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	50.1405	423.72	0.0000	645.85	11.9019
285.90	0.0000	427.09	34.8768	657.76	9.7760
287.50	35.3258	427.87	34.8889	657.90	0.0000
290.67	44.7031	433.94	22.9874	661.66	9.7881
293.27	0.0000	439.40	17.0308	664.57	0.0000
351.93	42.9509	453.88	27.2153	666.33	0.0000
295.96	42.9687	463.37	23.2751	666.50	0.0000
879.38	63.1439	468.07	27.3763	667.71	0.0000
299.98	42.1289	473.00	0.0000	677.62	17.4902
300.09	42.1317	475.06	18.3029	685.70	0.0000
300.13	42.1326	476.78	27.4735	695.00	0.0000
301.36	46.3770	477.60	23.4113	696.49	19.7930
302.85	49.6972	482.18	24.4741	696.51	19.7930
256.23	39.4186	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	20.8980
306.78	46.0462	497.08	29.7487	697.49	20.8995
308.46	36.6823	505.52	15.4382	702.65	16.5259
311.90	40.5207	507.63	0.0000	706.68	28.6798
316.51	52.9022	511.00	23.7225	711.68	26.5146
319.41	0.0000	514.00	26.3311	720.70	0.0000
320.08	0.0000	514.00	26.3311	721.93	0.0000
321.04	46.4011	520.40	13.4570	722.78	11.6395
323.87	36.9870	520.69	0.0000	722.91	14.9656
325.23	48.4019	522.65	0.0000	723.31	13.3042
328.76	0.0000	527.90	0.0000	724.19	19.9614
333.37	37.1711	528.26	13.4972	727.33	12.2103
333.97	37.1822	529.59	17.6585	733.00	6.6714
334.37	31.4686	529.87	0.0000	735.93	8.9030
338.28	42.9977	531.02	0.0000	333.97	17.8145
338.32	42.9987	537.26	0.0000	739.50	0.0000
311.90	45.9160	546.56	0.0000	747.24	6.6997
340.48	45.9160	552.55	34.5724	748.06	12.2859
340.55	0.0000	563.25	18.9309	752.31	12.3011
344.28	43.1296	569.33	27.4049	753.82	0.0000
345.93	48.3461	946.00	27.4060	756.73	11.1975
351.06	37.5067	569.70	27.4081	756.80	11.1979
351.93	37.5234	583.19	20.1257	884.68	6.7327

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	21.8931	1274.44	7.1567	1620.50	4.0481
766.42	21.3356	1001.03	10.7476	1621.92	6.0736
766.84	21.3379	1002.74	6.2720	1678.03	0.0000
772.60	0.0000	1004.73	12.5499	1690.97	2.0475
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	2.0714
778.90	12.3965	1028.54	0.0000	1063.66	9.3296
783.70	0.0000	1037.84	12.6473	1771.35	2.0736
785.37	10.1613	1038.76	0.0000	1791.20	0.0000
792.07	16.9678	631.29	5.7934	1808.65	6.2563
794.95	20.3782	1048.07	0.0000	1810.72	0.0000
795.86	20.3833	1049.04	15.9414	1836.06	2.0941
810.06	15.9169	1050.41	11.5977		
810.29	15.9180	1063.66	12.7234		
344.28	13.6445	1077.00	0.0000		
810.76	13.6455	1077.34	12.7627		
815.77	0.0000	1085.87	10.0473		
1048.07	0.0000	1093.63	10.9797		
832.01	12.5818	1099.45	10.0775		
834.85	18.3151	1112.07	11.7594		
835.71	14.8847	1112.84	7.3511		
836.80	0.0000	1115.54	10.2977		
846.75	0.0000	1120.29	10.3079		
846.77	13.7808	1120.55	10.3086		
856.80	0.0000	1221.41	10.3106		
860.56	12.6794	1129.67	11.0669		
871.09	8.0912	1131.51	0.0000		
873.19	9.2523	1147.95	0.0000		
875.33	0.0000	1173.23	7.4473		
879.38	12.1633	1177.95	5.9641		
880.51	15.6429	1189.05	4.4833		
883.24	8.1171	1204.77	13.1199		
884.68	5.2200	1221.41	13.1643		
889.28	8.1299	1231.02	11.3064		
894.76	8.1413	1235.36	0.0000		
898.04	16.2969	1238.28	16.9849		
900.72	6.9890	1260.41	0.0000		
903.28	9.3249	1271.87	14.2502		
911.20	15.7676	1274.44	8.5545		
912.08	15.7714	1274.54	8.5545		
923.98	0.0000	1291.59	10.4911		
926.50	7.9146	1298.22	0.0000		
929.11	18.4795	1312.11	0.0000		
937.49	17.6367	1332.49	8.6523		
944.13	0.0000	1362.66	0.0000		
946.00	8.8370	1365.19	9.6735		
949.00	12.3812	1368.63	0.0000		
667.71	0.0000	1384.29	4.8541		
962.31	0.0000	1408.01	6.8257		
964.08	0.0000	1457.56	0.0000		
966.17	10.6575	1460.82	8.8610		
911.20	11.3758	1489.16	3.9583		
968.97	11.3758	1505.03	8.9308		
983.53	0.0000	1584.12	8.0474		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235032.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM39.CNF;134
Background date : 2-OCT-2016 11:02:13.
Sample date     : 23-NOV-2015 11:48:00 Acquisition date : 3-OCT-2016 09:10:21.
Sample ID      : G405235032 Sample quantity   : 1.46947E+02 GRAM
Detector name  : GAM39 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:07.00 0.2%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1596249 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.54*	79	173	2.05	92.93	87	12	2.18E-02	36.2	
2	0	63.44*	93	303	1.39	126.72	119	14	2.60E-02	42.0	
3	3	74.79*	238	179	1.55	149.42	142	16	6.62E-02	13.0	3.58E+00
4	3	77.18*	305	135	1.08	154.20	142	16	8.47E-02	9.1	
5	0	84.33*	35	167	1.03	168.50	164	8	9.69E-03	68.1	
6	0	86.94	63	157	0.82	173.72	172	7	1.75E-02	35.2	
7	0	92.93*	83	163	1.29	185.71	182	9	2.30E-02	32.5	
8	0	185.82*	83	83	1.33	371.48	366	10	2.32E-02	24.5	
9	0	195.09	21	76	0.52	390.02	384	8	5.83E-03	75.8	
10	0	210.13	46	109	2.74	420.11	415	12	1.28E-02	47.9	
11	4	238.80*	373	65	1.33	477.45	469	21	1.03E-01	6.6	3.79E-01
12	4	241.85	115	59	1.90	483.56	469	21	3.21E-02	21.0	
13	0	295.22*	119	41	1.36	590.29	584	11	3.32E-02	14.2	
14	0	300.60*	23	57	0.93	601.04	596	9	6.32E-03	64.4	
15	0	327.47	57	45	2.41	654.79	648	12	1.59E-02	26.8	
16	0	338.81*	65	62	1.34	677.47	672	11	1.81E-02	27.4	
17	0	352.21*	164	79	1.40	704.28	699	13	4.57E-02	14.0	
18	0	463.35	30	17	1.02	926.56	923	7	8.26E-03	29.6	
19	0	511.57*	37	32	2.17	1023.02	1015	16	1.04E-02	47.1	
20	0	583.73*	86	42	1.27	1167.35	1160	14	2.39E-02	19.8	
21	0	601.68	21	6	1.81	1203.24	1200	7	5.73E-03	30.4	
22	0	609.44*	153	17	0.90	1218.76	1212	12	4.25E-02	10.1	
23	0	661.59	57	41	1.51	1323.08	1315	15	1.58E-02	28.0	
24	0	694.50	26	38	5.16	1388.89	1381	17	7.17E-03	58.3	
25	0	727.35*	39	16	1.72	1454.62	1448	13	1.07E-02	28.1	
26	0	785.08	30	15	1.43	1570.07	1563	13	8.24E-03	33.3	
27	0	870.59	16	13	0.75	1741.13	1736	13	4.44E-03	52.8	
28	0	875.67	8	6	0.75	1751.27	1748	7	2.35E-03	56.9	
29	0	911.48*	71	13	0.84	1822.90	1817	16	1.99E-02	16.9	
30	0	969.95*	27	34	1.59	1939.87	1931	14	7.59E-03	50.3	
31	0	1027.79	7	3	1.06	2055.57	2052	6	2.00E-03	52.9	
32	0	1095.58	7	12	1.47	2191.17	2186	9	2.08E-03	89.1	
33	0	1102.55	20	0	1.28	2205.10	2200	11	5.56E-03	22.4	
34	0	1120.45	28	9	0.68	2240.91	2236	9	7.83E-03	26.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1276.45	13	5	1.55	2552.96	2547	11	3.64E-03	43.9	
36	0	1378.17*	14	8	2.49	2756.43	2750	11	3.89E-03	50.0	
37	0	1408.72*	7	3	1.58	2817.55	2810	11	1.98E-03	63.9	
38	0	1461.03*	271	7	1.82	2922.19	2915	14	7.52E-02	6.5	
39	0	1764.74*	23	0	1.60	3529.75	3523	12	6.40E-03	21.9	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235032.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 23-NOV-2015 11:48:00 Acquisition date : 3-OCT-2016 09:10:21
Sample ID        : G405235032 Sample quantity   : 146.95 GRAM
Sample type      : SOLID Sample geometry    :
Detector name    : GAMMA39 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:07.00 0.2%
Energy tolerance : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error    : 0.00 %
Efficiency type  : Linear Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	8.983E-01	1.391E+01	1.391E+01	13.08	OK
CD-109	88.03	3.70*	6.756E+00	6.225E-01	9.991E-01	186.05	OK
SN-126	64.28	9.60	6.928E+00	9.148E-01	9.148E-01	84.02	OK
	86.94	8.90	6.756E+00	2.588E-01	2.588E-01	186.05	OK
	87.57	37.00*	6.756E+00	6.225E-02	6.225E-02	186.05	OK
BA-137M	661.66	89.90*	1.758E+00	1.909E-01	1.947E-01	56.06	OK
CS-137	661.66	85.10*	1.758E+00	2.017E-01	2.057E-01	56.06	OK
TL-208	277.37	6.60	3.709E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	1.951E+00	2.793E-01	2.793E-01	39.69	OK
	860.56	12.50	1.416E+00	-----	Line Not Found	-----	Absent
PB-210	46.54	4.25*	6.818E+00	1.809E+00	1.858E+00	72.39	OK
BI-212	727.33	6.67*	1.626E+00	1.877E+00	1.877E+00	56.14	OK
	785.37	1.10	1.527E+00	9.243E+00	9.243E+00	66.67	OK
	1620.50	1.47	8.143E-01	-----	Line Not Found	-----	Absent
PB-212	74.82	10.28	6.812E+00	1.591E+00	1.591E+00	37.30	OK
	77.11	17.10	6.799E+00	1.682E+00	1.682E+00	18.11	OK
	238.63	43.60*	4.209E+00	1.185E+00	1.185E+00	13.14	OK
	300.09	3.30	3.460E+00	1.139E+00	1.139E+00	128.73	OK
BI-214	609.32	45.49*	1.882E+00	9.574E-01	9.578E-01	20.12	OK
	1120.29	14.92	1.136E+00	8.399E-01	8.402E-01	53.71	OK
	1764.49	15.30	7.484E-01	9.708E-01	9.711E-01	43.82	OK
PB-214	74.82	5.80	6.812E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	6.799E+00	2.965E+00	2.967E+00	18.11	OK
	87.09	3.41	6.755E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	4.163E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	3.514E+00	1.058E+00	1.058E+00	28.48	OK
	351.93	35.60*	3.012E+00	8.653E-01	8.656E-01	27.98	OK
RN-222	609.32	45.49*	1.882E+00	9.574E-01	9.578E-01	20.12	OK
	1120.29	14.92	1.136E+00	8.399E-01	8.402E-01	53.71	OK
	1764.49	15.30	7.484E-01	9.708E-01	9.711E-01	43.82	OK
RA-224	240.99	4.10*	4.165E+00	2.073E+00	2.073E+00	84.04	OK
RA-226	609.32	45.49*	1.882E+00	9.574E-01	9.578E-01	20.12	OK
	1120.29	14.92	1.136E+00	8.399E-01	8.402E-01	53.71	OK
	1764.49	15.30	7.484E-01	9.708E-01	9.711E-01	43.82	OK
AC-228	105.21	1.10	6.612E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.116E+00	1.051E+00	1.051E+00	54.90	OK
	794.95	4.25	1.512E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.451E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.351E+00	1.058E+00	1.058E+00	33.79	OK
	968.97	15.80	1.283E+00	6.913E-01	6.913E-01	100.57	OK
RA-228	105.21	1.10	6.612E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.116E+00	1.051E+00	1.051E+00	54.90	OK
	794.95	4.25	1.512E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.451E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.351E+00	1.058E+00	1.058E+00	33.79	OK
	968.97	15.80	1.283E+00	6.913E-01	6.913E-01	100.57	OK
TH-228	74.82	10.28	6.812E+00	1.591E+00	1.591E+00	37.30	OK
	77.11	17.10	6.799E+00	1.682E+00	1.682E+00	18.11	OK
	238.63	43.60*	4.209E+00	1.185E+00	1.185E+00	13.14	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	300.09	3.30	3.460E+00	1.139E+00	1.139E+00	128.73	OK
TH-230	609.32	45.49*	1.882E+00	9.574E-01	9.574E-01	20.12	OK
	1120.29	14.92	1.136E+00	8.399E-01	8.399E-01	53.71	OK
	1764.49	15.30	7.484E-01	9.708E-01	9.708E-01	43.82	OK
PA-231	283.69	1.70	3.638E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.460E+00	7.028E-01	7.028E-01	128.73	OK
TH-232	105.21	1.10	6.612E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.116E+00	1.051E+00	1.051E+00	54.90	OK
	835.71	1.61	1.451E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.351E+00	1.058E+00	1.058E+00	33.79	OK
	968.97	15.80	1.283E+00	6.913E-01	6.913E-01	100.57	OK
TH-234	63.29	3.70*	6.928E+00	2.373E+00	2.373E+00	84.02	OK
	92.59	4.23	6.722E+00	1.838E+00	1.838E+00	65.07	OK
U-234	609.32	45.49*	1.882E+00	9.574E-01	9.574E-01	20.12	OK
	1120.29	14.92	1.136E+00	8.399E-01	8.399E-01	53.71	OK
	1764.49	15.30	7.484E-01	9.708E-01	9.708E-01	43.82	OK
U-238	63.29	3.70*	6.928E+00	2.373E+00	2.373E+00	84.02	OK
	92.59	4.23	6.722E+00	1.838E+00	1.838E+00	65.07	OK
AM-243	43.53	5.90	6.236E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	6.812E+00	2.434E-01	2.434E-01	37.30	OK
ANH-511	511.00	100.00*	2.181E+00	9.366E-02	9.366E-02	94.28	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235032.CNF;1 *
 * Acquisition date : 3-OCT-2016 09:10:21 Sensitivity : 3.000 *
 * Detector ID : GAM39 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:07.00 Half life ratio : ***** *
 * Sample date : 23-NOV-2015 11:48:00 Analyst initials: MXR1 *
 * Sample ID : G405235032 Sample Quantity : 1.4695E+02 GRAM *
 * Batch Number : 1596249 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 27-JUL-2016 13:04:01 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM39_CAN.CNF;4 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.391E+01	1.783E+00	7.664E-01
CD-109	9.991E-01	1.822E+00	1.959E+00
SN-126	6.225E-02	1.135E-01	1.220E-01
BA-137M	1.947E-01	1.070E-01	8.901E-02
CS-137	2.057E-01	1.130E-01	9.403E-02
TL-208	2.793E-01	1.086E-01	7.193E-02
PB-210	1.858E+00	1.318E+00	8.477E-01
BI-212	1.877E+00	1.033E+00	1.120E+00
PB-212	1.185E+00	1.527E-01	9.966E-02
BI-214	9.578E-01	1.889E-01	1.435E-01
PB-214	8.656E-01	2.374E-01	1.405E-01
RN-222	9.578E-01	1.889E-01	1.435E-01
RA-224	2.073E+00	1.707E+00	1.069E+00
RA-226	9.578E-01	1.889E-01	1.435E-01
AC-228	1.058E+00	3.503E-01	2.695E-01
RA-228	1.058E+00	3.503E-01	2.695E-01
TH-228	1.185E+00	1.527E-01	9.966E-02
TH-230	9.574E-01	1.888E-01	1.434E-01
PA-231	7.028E-01	8.866E-01	9.121E-01
TH-232	1.058E+00	3.503E-01	2.695E-01
TH-234	2.373E+00	1.954E+00	1.100E+00
U-234	9.574E-01	1.888E-01	1.434E-01
U-238	2.373E+00	1.954E+00	1.100E+00
AM-243	2.434E-01	8.898E-02	5.812E-02
ANH-511	9.366E-02	8.653E-02	5.689E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-6.462E+00	1.861E+01	3.370E+01	NOT IDENT.
NA-22	-7.868E-03	7.425E-02	1.247E-01	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	3.435E-03	3.741E-02	8.253E-02	NOT IDENT.
SC-46	1.055E-01	5.506E-01	1.131E+00	FAIL ABUN

V-48	0.000E+00	3.276E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	6.835E+02	0.000E+00	SHORT HLIF
MN-54	-1.174E-02	8.448E-02	1.652E-01	NOT IDENT.
CO-56	3.179E-03	6.325E-01	1.279E+00	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-7.879E-02	5.591E-02	8.788E-02	NOT IDENT.
CO-58	3.985E-01	7.408E-01	1.630E+00	NOT IDENT.
FE-59	6.214E+00	1.021E+01	1.841E+01	NOT IDENT.
CO-60	6.175E-03	4.475E-02	9.417E-02	NOT IDENT.
ZN-65	3.938E-02	2.435E-01	4.421E-01	NOT IDENT.
GE-68	-5.495E-02	3.006E+00	5.989E+00	NOT IDENT.
AS-73	-2.061E+00	3.140E+00	5.570E+00	NOT IDENT.
AS-74	0.000E+00	1.278E+04	0.000E+00	SHORT HLIF
SE-75	-6.568E-02	2.402E-01	4.567E-01	NOT IDENT.
BR-77	0.000E+00	2.221E+39	0.000E+00	SHORT HLIF
SR-82	0.000E+00	1.445E+03	0.000E+00	SHORT HLIF
RB-83	1.496E-01	8.844E-01	1.730E+00	NOT IDENT.
KR-85	6.786E+00	8.496E+00	1.650E+01	NOT IDENT.
SR-85	8.362E-01	1.051E+00	2.040E+00	NOT IDENT.
RB-86	0.000E+00	5.737E+04	0.000E+00	SHORT HLIF
Y-88	1.282E-01	1.653E-01	5.428E-01	NOT IDENT.
Y-91	-5.732E+02	8.145E+02	1.406E+03	NOT IDENT.
NB-94	-1.139E-02	4.232E-02	7.572E-02	FAIL ABUN
NB-95	2.377E-01	1.270E+00	2.436E+00	NOT IDENT.
NB-95M	3.200E-01	3.371E+00	5.933E+00	NOT IDENT.
ZR-95	1.020E+00	2.112E+00	4.292E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.022E+34	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.577E+41	0.000E+00	SHORT HLIF
RH-101	-3.871E-02	3.819E-02	6.240E-02	NOT IDENT.
RH-102	-6.147E-03	7.564E-02	1.414E-01	NOT IDENT.
RU-103	-5.187E+00	8.262E+00	1.445E+01	FAIL ABUN
RH-106	5.840E-01	5.986E-01	1.305E+00	NOT IDENT.
RU-106	5.840E-01	5.986E-01	1.305E+00	NOT IDENT.
AG-108M	-9.803E-03	3.101E-02	5.742E-02	NOT IDENT.
AG-110M	8.754E-03	1.377E-01	2.771E-01	NOT IDENT.
SN-113	-3.520E-01	3.081E-01	5.111E-01	NOT IDENT.
CD-115	0.000E+00	1.538E+41	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	2.127E+05	0.000E+00	SHORT HLIF
TE-123M	-4.061E-02	1.430E-01	2.772E-01	NOT IDENT.
SB-124	9.029E-01	2.943E+00	6.773E+00	NOT IDENT.
SB-125	-8.656E-02	1.246E-01	2.182E-01	FAIL ABUN
TE-125M	-2.878E+02	3.106E+02	5.160E+02	NOT IDENT.
I-126	0.000E+00	3.079E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	3.433E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	4.114E+23	0.000E+00	SHORT HLIF
I-131	0.000E+00	2.263E+10	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.110E+28	0.000E+00	SHORT HLIF
BA-133	-1.616E-02	5.183E-02	8.539E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	3.412E-04	6.250E-02	1.251E-01	NOT IDENT.
CS-135	-5.162E-02	1.712E-01	3.214E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	8.142E+05	0.000E+00	SHORT HLIF
CE-139	-1.305E-01	1.262E-01	2.299E-01	NOT IDENT.
BA-140	0.000E+00	3.535E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	1.380E+06	0.000E+00	SHORT HLIF
CE-141	-2.275E+01	3.372E+01	6.394E+01	NOT IDENT.
CE-143	0.000E+00	1.100E+41	0.000E+00	SHORT HLIF
CE-144	-6.124E-02	3.475E-01	6.852E-01	NOT IDENT.
PM-144	7.378E-02	7.863E-02	1.639E-01	NOT IDENT.
PR-144	6.445E+00	6.882E+00	1.434E+01	NOT IDENT.
PM-146	-4.878E-03	5.283E-02	9.995E-02	NOT IDENT.
ND-147	0.000E+00	1.137E+08	0.000E+00	SHORT HLIF
PM-147	-4.251E+02	8.860E+02	1.531E+03	NOT IDENT.
PM-149	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
EU-150	4.225E-03	3.281E-02	5.755E-02	FAIL ABUN
EU-152	4.650E-02	1.115E-01	2.152E-01	FAIL ABUN
GD-153	-1.553E-01	1.940E-01	2.981E-01	NOT IDENT.
EU-154	-3.456E-02	1.781E-01	2.931E-01	NOT IDENT.
EU-155	6.434E-02	1.064E-01	2.031E-01	FAIL ABUN
TB-160	4.028E-01	2.971E+00	5.426E+00	FAIL ABUN
HO-166M	2.250E-02	6.452E-02	1.299E-01	FAIL ABUN
TM-171	3.074E+00	5.872E+00	1.137E+01	NOT IDENT.
HF-172	-3.020E-01	2.639E-01	4.258E-01	FAIL ABUN
LU-172	5.645E-02	9.457E-02	1.930E-01	FAIL ABUN

LU-176	1.050E-02	2.740E-02	5.351E-02	FAIL ABUN
HF-181	5.006E+00	6.683E+00	1.395E+01	NOT IDENT.
TA-182	-4.823E-01	1.278E+00	2.355E+00	FAIL ABUN
RE-183	4.347E-01	1.419E+00	2.509E+00	NOT IDENT.
RE-184	3.156E+01	4.974E+01	1.085E+02	NOT IDENT.
W-188	-4.407E+01	1.548E+02	2.596E+02	FAIL ABUN
IR-192	1.918E-01	5.619E-01	1.134E+00	FAIL ABUN
HG-203	1.718E+00	3.512E+00	7.062E+00	NOT IDENT.
BI-207	9.375E-03	6.418E-02	1.294E-01	FAIL ABUN
BI-211	0.000E+00	6.539E-01	8.785E-01	FAIL ABUN
PB-211	6.792E-01	8.782E-01	1.794E+00	NOT IDENT.
RN-219	-8.680E-02	5.175E-01	9.636E-01	NOT IDENT.
RA-223	-4.522E-01	7.949E-01	1.265E+00	FAIL ABUN
AC-227	2.963E-02	2.816E-01	5.478E-01	FAIL ABUN
TH-227	2.963E-02	2.816E-01	5.478E-01	FAIL ABUN
TH-229	1.113E-01	4.786E-01	9.562E-01	FAIL ABUN
TH-231	-4.522E-01	7.949E-01	1.265E+00	FAIL ABUN
PA-233	-1.112E-02	6.766E-02	1.287E-01	FAIL ABUN
PA-234	-7.373E-02	3.457E-01	6.699E-01	NOT IDENT.
PA-234M	1.247E+00	4.672E+00	9.997E+00	NOT IDENT.
U-235	-3.449E-03	1.867E-01	3.696E-01	FAIL ABUN
NP-237	-1.112E-02	6.766E-02	1.287E-01	FAIL ABUN
NP-238	0.000E+00	1.535E+41	0.000E+00	SHORT HLIF
NP-239	9.117E-03	2.591E-01	4.694E-01	NOT IDENT.
PU-239	5.093E+02	3.321E+02	6.720E+02	NOT IDENT.
AM-241	-1.444E-02	6.603E-02	1.108E-01	NOT IDENT.
CM-243	-3.460E-03	9.758E-02	1.769E-01	NOT IDENT.
BK-247	-5.904E-02	7.827E-02	1.414E-01	FAIL ABUN
CM-247	-1.206E-02	4.764E-02	8.791E-02	NOT IDENT.
CF-249	-2.708E-03	4.882E-02	9.238E-02	NOT IDENT.
CF-251	-4.573E-02	1.222E-01	2.336E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	261	10.66*	8.983E-01	1.391E+01	1.391E+01	13.08
CD-109	88.03	78	3.70*	6.756E+00	1.597E+00	2.563E+00	70.40
SN-126	64.28	119	9.60	6.928E+00	9.148E-01	9.148E-01	84.02
	86.94	78	8.90	6.756E+00	6.640E-01	6.640E-01	70.40
	87.57	78	37.00*	6.756E+00	1.597E-01	1.597E-01	70.40
BA-137M	661.66	59	89.90*	1.758E+00	1.909E-01	1.947E-01	56.06
CS-137	661.66	59	85.10*	1.758E+00	2.017E-01	2.057E-01	56.06
TL-208	277.37	-----	6.60	3.709E+00	-----	Line Not Found	-----
	583.19	91	85.00*	1.951E+00	2.793E-01	2.793E-01	39.69
	860.56	-----	12.50	1.416E+00	-----	Line Not Found	-----
PB-210	46.54	103	4.25*	6.818E+00	1.809E+00	1.858E+00	72.39
BI-211	72.87	-----	1.23	6.824E+00	-----	Line Not Found	-----
	351.06	182	12.92*	3.012E+00	2.384E+00	2.384E+00	27.98
BI-212	727.33	40	6.67*	1.626E+00	1.877E+00	1.877E+00	56.14
	785.37	30	1.10	1.527E+00	9.243E+00	9.243E+00	66.67
	1620.50	-----	1.47	8.143E-01	-----	Line Not Found	-----
PB-212	74.82	300	10.28	6.812E+00	2.188E+00	2.188E+00	25.99
	77.11	383	17.10	6.799E+00	1.682E+00	1.682E+00	18.11
	238.63	426	43.60*	4.209E+00	1.185E+00	1.185E+00	13.14
	300.09	25	3.30	3.460E+00	1.139E+00	1.139E+00	128.73
BI-214	609.32	160	45.49*	1.882E+00	9.574E-01	9.578E-01	20.12
	1120.29	28	14.92	1.136E+00	8.399E-01	8.402E-01	53.71
	1764.49	22	15.30	7.484E-01	9.708E-01	9.711E-01	43.82
PB-214	74.82	300	5.80	6.812E+00	3.877E+00	3.879E+00	25.99
	77.11	383	9.70	6.799E+00	2.965E+00	2.967E+00	18.11
	87.09	78	3.41	6.756E+00	1.733E+00	1.734E+00	70.40
	242.00	132	7.25	4.165E+00	2.230E+00	2.231E+00	42.07
	295.22	134	18.42	3.514E+00	1.058E+00	1.058E+00	28.48
	351.93	182	35.60*	3.012E+00	8.653E-01	8.656E-01	27.98
RN-222	609.32	160	45.49*	1.882E+00	9.574E-01	9.578E-01	20.12
	1120.29	28	14.92	1.136E+00	8.399E-01	8.402E-01	53.71
	1764.49	22	15.30	7.484E-01	9.708E-01	9.711E-01	43.82
RA-224	240.99	132	4.10*	4.165E+00	3.943E+00	3.943E+00	42.07
RA-226	609.32	160	45.49*	1.882E+00	9.574E-01	9.578E-01	20.12
	1120.29	28	14.92	1.136E+00	8.399E-01	8.402E-01	53.71
	1764.49	22	15.30	7.484E-01	9.708E-01	9.711E-01	43.82
AC-228	105.21	-----	1.10	6.612E+00	-----	Line Not Found	-----
	338.32	72	11.27	3.116E+00	1.051E+00	1.051E+00	54.90
	794.95	-----	4.25	1.512E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.451E+00	-----	Line Not Found	-----
	911.20	72	25.80*	1.351E+00	1.058E+00	1.058E+00	33.79
	968.97	27	15.80	1.283E+00	6.913E-01	6.913E-01	100.57
RA-228	105.21	-----	1.10	6.612E+00	-----	Line Not Found	-----
	338.32	72	11.27	3.116E+00	1.051E+00	1.051E+00	54.90
	794.95	-----	4.25	1.512E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.451E+00	-----	Line Not Found	-----
	911.20	72	25.80*	1.351E+00	1.058E+00	1.058E+00	33.79

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	968.97	27	15.80	1.283E+00	6.913E-01	6.913E-01	100.57
	74.82	300	10.28	6.812E+00	2.188E+00	2.188E+00	25.99
	77.11	383	17.10	6.799E+00	1.682E+00	1.682E+00	18.11
TH-230	238.63	426	43.60*	4.209E+00	1.185E+00	1.185E+00	13.14
	300.09	25	3.30	3.460E+00	1.139E+00	1.139E+00	128.73
	609.32	160	45.49*	1.882E+00	9.574E-01	9.574E-01	20.12
	1120.29	28	14.92	1.136E+00	8.399E-01	8.399E-01	53.71
PA-231	1764.49	22	15.30	7.484E-01	9.708E-01	9.708E-01	43.82
	283.69	-----	1.70	3.638E+00	-----	Line Not Found	-----
TH-232	301.36	25	5.35*	3.460E+00	7.028E-01	7.028E-01	128.73
	105.21	-----	1.10	6.612E+00	-----	Line Not Found	-----
	338.32	72	11.27	3.116E+00	1.051E+00	1.051E+00	54.90
	835.71	-----	1.61	1.451E+00	-----	Line Not Found	-----
TH-234	911.20	72	25.80*	1.351E+00	1.058E+00	1.058E+00	33.79
	968.97	27	15.80	1.283E+00	6.913E-01	6.913E-01	100.57
	63.29	119	3.70*	6.928E+00	2.373E+00	2.373E+00	84.02
U-234	92.59	102	4.23	6.722E+00	1.838E+00	1.838E+00	65.07
	609.32	160	45.49*	1.882E+00	9.574E-01	9.574E-01	20.12
U-238	1120.29	28	14.92	1.136E+00	8.399E-01	8.399E-01	53.71
	1764.49	22	15.30	7.484E-01	9.708E-01	9.708E-01	43.82
	63.29	119	3.70*	6.928E+00	2.373E+00	2.373E+00	84.02
AM-243	92.59	102	4.23	6.722E+00	1.838E+00	1.838E+00	65.07
	43.53	-----	5.90	6.236E+00	-----	Line Not Found	-----
ANH-511	74.66	300	67.20*	6.812E+00	3.347E-01	3.347E-01	25.99
	511.00	40	100.00*	2.181E+00	9.366E-02	9.366E-02	94.28

Flag: "*" = Keyline

Total number of lines in spectrum 39
 Number of unidentified lines 5
 Number of lines tentatively identified by NID 34 87.18%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.391E+01	1.391E+01	0.182E+01	13.08	
CD-109	461.40D	1.60	1.597E+00	2.563E+00	1.805E+00	70.40	
SN-126	2.30E+05Y	1.00	1.597E-01	1.597E-01	1.124E-01	70.40	
BA-137M	30.08Y	1.02	1.909E-01	1.947E-01	1.092E-01	56.06	
CS-137	30.08Y	1.02	2.017E-01	2.057E-01	1.153E-01	56.06	
TL-208	1.41E+10Y	1.00	2.793E-01	2.793E-01	1.109E-01	39.69	
PB-210	22.20Y	1.03	1.809E+00	1.858E+00	1.345E+00	72.39	
BI-211	7.04E+08Y	1.00	2.384E+00	2.384E+00	0.667E+00	27.98	
BI-212	1.41E+10Y	1.00	1.877E+00	1.877E+00	1.054E+00	56.14	
PB-212	1.41E+10Y	1.00	1.185E+00	1.185E+00	0.156E+00	13.14	
BI-214	1600.00Y	1.00	9.574E-01	9.578E-01	1.927E-01	20.12	
PB-214	1600.00Y	1.00	8.653E-01	8.656E-01	2.422E-01	27.98	
RN-222	1600.00Y	1.00	9.574E-01	9.578E-01	1.927E-01	20.12	
RA-224	1.41E+10Y	1.00	3.943E+00	3.943E+00	1.659E+00	42.07	
RA-226	1600.00Y	1.00	9.574E-01	9.578E-01	1.927E-01	20.12	
AC-228	1.41E+10Y	1.00	1.058E+00	1.058E+00	0.357E+00	33.79	
RA-228	1.41E+10Y	1.00	1.058E+00	1.058E+00	0.357E+00	33.79	
TH-228	1.41E+10Y	1.00	1.185E+00	1.185E+00	0.156E+00	13.14	
TH-230	7.54E+04Y	1.00	9.574E-01	9.574E-01	1.927E-01	20.12	
PA-231	7.04E+08Y	1.00	7.028E-01	7.028E-01	9.047E-01	128.73	
TH-232	1.41E+10Y	1.00	1.058E+00	1.058E+00	0.357E+00	33.79	
TH-234	4.47E+09Y	1.00	2.373E+00	2.373E+00	1.994E+00	84.02	
U-234	2.45E+05Y	1.00	9.574E-01	9.574E-01	1.927E-01	20.12	
U-238	4.47E+09Y	1.00	2.373E+00	2.373E+00	1.994E+00	84.02	
AM-243	7370.00Y	1.00	3.347E-01	3.347E-01	0.870E-01	25.99	
ANH-511	1.00E+09Y	1.00	9.366E-02	9.366E-02	8.830E-02	94.28	
Total Activity :			4.343E+01	4.445E+01			

Grand Total Activity : 4.343E+01 4.445E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	84.33	43	209	1.03	168.50	164	8	9.69E-03	****	6.77E+00	T
0	185.82	97	96	1.33	371.48	366	10	2.32E-02	49.0	5.11E+00	T
0	195.09	24	88	0.52	390.02	384	8	5.83E-03	****	4.93E+00	
0	210.13	53	126	2.74	420.11	415	12	1.28E-02	95.9	4.66E+00	T
0	327.47	64	50	2.41	654.79	648	12	1.59E-02	53.6	3.21E+00	T
0	463.35	32	19	1.02	926.56	923	7	8.26E-03	59.2	2.37E+00	T
0	601.68	22	7	1.81	1203.24	1200	7	5.73E-03	60.8	1.90E+00	T
0	694.50	27	40	5.16	1388.89	1381	17	7.17E-03	****	1.69E+00	T
0	870.59	16	13	0.75	1741.13	1736	13	4.44E-03	****	1.40E+00	T
0	875.67	9	6	0.75	1751.27	1748	7	2.35E-03	****	1.40E+00	T
0	1027.79	7	3	1.06	2055.57	2052	6	2.00E-03	****	1.22E+00	T
0	1095.58	7	11	1.47	2191.17	2186	9	2.08E-03	****	1.16E+00	
0	1102.55	20	0	1.28	2205.10	2200	11	5.56E-03	44.7	1.15E+00	
0	1276.45	13	5	1.55	2552.96	2547	11	3.64E-03	87.8	1.01E+00	
0	1378.17	14	8	2.49	2756.43	2750	11	3.89E-03	****	9.48E-01	
0	1408.72	7	3	1.58	2817.55	2810	11	1.98E-03	****	9.29E-01	T

Flags: "T" = Tentatively associated

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235032.CNF;1
* Acquisition date   : 3-OCT-2016 09:10:21 Sensitivity      : 3.000
* Detector ID        : GAM39 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:07.00 Half life ratio  : *****
* Sample date        : 23-NOV-2015 11:48:00 Nuclide Library : SOLID
* Sample ID          : G405235032 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity : 1.4695E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight       : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 13:04:01 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM39_CAN.CNF;4
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	3.107E-01
CD-109	9.323E-01
SN-126	5.806E-02
BA-137M	3.995E-02
CS-137	4.220E-02
TL-208	3.169E-02
PB-210	3.974E-01
BI-212	4.950E-01
PB-212	4.590E-02
BI-214	6.348E-02
PB-214	6.355E-02
RN-222	6.348E-02
RA-224	4.924E-01
RA-226	6.348E-02
AC-228	1.146E-01
RA-228	1.146E-01
TH-228	4.590E-02
TH-230	6.346E-02
PA-231	4.171E-01
TH-232	1.146E-01
TH-234	5.213E-01
U-234	6.346E-02
U-238	5.213E-01
AM-243	2.745E-02
ANH-511	2.519E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.507E+01	NOT IDENT.
NA-22	5.372E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	3.177E-02	NOT IDENT.
SC-46	4.966E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF

CR-51	0.000E+00	SHORT HLIF
MN-54	7.287E-02	NOT IDENT.
CO-56	5.566E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.094E-02	NOT IDENT.
CO-58	7.117E-01	NOT IDENT.
FE-59	7.757E+00	NOT IDENT.
CO-60	3.910E-02	NOT IDENT.
ZN-65	1.914E-01	NOT IDENT.
GE-68	2.581E+00	NOT IDENT.
AS-73	2.631E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	2.087E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	7.729E-01	NOT IDENT.
KR-85	7.451E+00	NOT IDENT.
SR-85	9.215E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.963E-01	NOT IDENT.
Y-91	5.984E+02	NOT IDENT.
NB-94	3.364E-02	FAIL ABUN
NB-95	1.081E+00	NOT IDENT.
NB-95M	2.760E+00	NOT IDENT.
ZR-95	1.897E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.915E-02	NOT IDENT.
RH-102	6.258E-02	NOT IDENT.
RU-103	6.318E+00	FAIL ABUN
RH-106	5.832E-01	NOT IDENT.
RU-106	5.832E-01	NOT IDENT.
AG-108M	2.557E-02	NOT IDENT.
AG-110M	1.218E-01	NOT IDENT.
SN-113	2.288E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.290E-01	NOT IDENT.
SB-124	2.687E+00	NOT IDENT.
SB-125	9.742E-02	FAIL ABUN
TE-125M	2.394E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.860E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.528E-02	NOT IDENT.
CS-135	1.489E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	1.069E-01	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.987E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.196E-01	NOT IDENT.
PM-144	7.426E-02	NOT IDENT.
PR-144	6.498E+00	NOT IDENT.
PM-146	4.492E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.149E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.637E-02	FAIL ABUN
EU-152	9.847E-02	FAIL ABUN
GD-153	1.397E-01	NOT IDENT.
EU-154	1.256E-01	NOT IDENT.
EU-155	9.561E-02	FAIL ABUN
TB-160	2.370E+00	FAIL ABUN
HO-166M	5.707E-02	FAIL ABUN
TM-171	5.381E+00	NOT IDENT.
HF-172	1.988E-01	FAIL ABUN
LU-172	8.332E-02	FAIL ABUN
LU-176	2.450E-02	FAIL ABUN

HF-181	6.313E+00	NOT IDENT.
TA-182	1.013E+00	FAIL ABUN
RE-183	1.185E+00	NOT IDENT.
RE-184	4.783E+01	NOT IDENT.
W-188	1.183E+02	FAIL ABUN
IR-192	5.164E-01	FAIL ABUN
HG-203	3.272E+00	NOT IDENT.
BI-207	5.667E-02	FAIL ABUN
BI-211	4.211E-01	FAIL ABUN
PB-211	8.262E-01	NOT IDENT.
RN-219	4.415E-01	NOT IDENT.
RA-223	5.771E-01	FAIL ABUN
AC-227	2.548E-01	FAIL ABUN
TH-227	2.548E-01	FAIL ABUN
TH-229	4.450E-01	FAIL ABUN
TH-231	5.771E-01	FAIL ABUN
PA-233	5.881E-02	FAIL ABUN
PA-234	2.903E-01	NOT IDENT.
PA-234M	4.331E+00	NOT IDENT.
U-235	1.737E-01	FAIL ABUN
NP-237	5.881E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.204E-01	NOT IDENT.
PU-239	3.175E+02	NOT IDENT.
AM-241	5.245E-02	NOT IDENT.
CM-243	8.307E-02	NOT IDENT.
BK-247	6.448E-02	FAIL ABUN
CM-247	4.026E-02	NOT IDENT.
CF-249	4.228E-02	NOT IDENT.
CF-251	1.088E-01	NOT IDENT.

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235032.CNF;1
* Acquisition date   : 3-OCT-2016 09:10:21 Sensitivity      : 3.000
* Detector ID        : GAM39 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:07.00 Half life ratio  : *****
* Sample date        : 23-NOV-2015 11:48:00 Nuclide Library : SOLID
* Sample ID          : G405235032 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity : 1.4695E+02 GRAM
*                    : Quantity Err(%) : 1.3610E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                    : Dry Weight       : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 13:04:01 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM39_CAN.CNF;4
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.391E+01	1.925E+00	1.925E+00
CD-109	9.991E-01	1.834E+00	1.834E+00
SN-126	6.225E-02	1.142E-01	1.142E-01
BA-137M	1.947E-01	1.073E-01	1.073E-01
CS-137	2.057E-01	1.134E-01	1.134E-01
TL-208	2.793E-01	1.093E-01	1.093E-01
PB-210	1.858E+00	1.328E+00	1.328E+00
BI-212	1.877E+00	1.037E+00	1.037E+00
PB-212	1.185E+00	1.651E-01	1.651E-01
BI-214	9.578E-01	1.933E-01	1.933E-01
PB-214	8.656E-01	2.401E-01	2.401E-01
RN-222	9.578E-01	1.933E-01	1.933E-01
RA-224	2.073E+00	1.715E+00	1.715E+00
RA-226	9.578E-01	1.933E-01	1.933E-01
AC-228	1.058E+00	3.544E-01	3.544E-01
RA-228	1.058E+00	3.544E-01	3.544E-01
TH-228	1.185E+00	1.651E-01	1.651E-01
TH-230	9.574E-01	1.933E-01	1.933E-01
PA-231	7.028E-01	8.992E-01	8.992E-01
TH-232	1.058E+00	3.544E-01	3.544E-01
TH-234	2.373E+00	2.024E+00	2.024E+00
U-234	9.574E-01	1.933E-01	1.933E-01
U-238	2.373E+00	2.024E+00	2.024E+00
AM-243	2.434E-01	9.096E-02	9.096E-02
ANH-511	9.366E-02	8.662E-02	8.662E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-6.462E+00	1.861E+01	1.884E+01	NOT IDENT.
NA-22	-7.868E-03	7.425E-02	7.433E-02	NOT IDENT.
NA-24	-1.000E+41	4.673E+41	0.000E+00	SHORT HLIF
AL-26	3.435E-03	3.741E-02	3.744E-02	NOT IDENT.
SC-46	1.055E-01	5.507E-01	5.527E-01	FAIL ABUN

V-48	-4.997E+02	3.276E+04	3.276E+04	SHORT HLIF
CR-51	9.148E+01	6.835E+02	6.848E+02	SHORT HLIF
MN-54	-1.174E-02	8.448E-02	8.464E-02	NOT IDENT.
CO-56	3.179E-03	6.325E-01	6.325E-01	NOT IDENT.
MN-56	-1.000E+41	3.858E+43	0.000E+00	SHORT HLIF
CO-57	-7.879E-02	5.602E-02	6.633E-02	NOT IDENT.
CO-58	3.985E-01	7.410E-01	7.624E-01	NOT IDENT.
FE-59	6.214E+00	1.022E+01	1.060E+01	NOT IDENT.
CO-60	6.175E-03	4.475E-02	4.483E-02	NOT IDENT.
ZN-65	3.938E-02	2.435E-01	2.441E-01	NOT IDENT.
GE-68	-5.495E-02	3.006E+00	3.006E+00	NOT IDENT.
AS-73	-2.061E+00	3.169E+00	3.302E+00	NOT IDENT.
AS-74	-1.214E+03	1.278E+04	1.279E+04	SHORT HLIF
SE-75	-6.568E-02	2.402E-01	2.420E-01	NOT IDENT.
BR-77	1.724E+40	1.567E+41	0.000E+00	SHORT HLIF
SR-82	8.449E+02	1.445E+03	1.494E+03	SHORT HLIF
RB-83	1.496E-01	8.846E-01	8.872E-01	NOT IDENT.
KR-85	6.786E+00	8.501E+00	9.034E+00	NOT IDENT.
SR-85	8.362E-01	1.052E+00	1.117E+00	NOT IDENT.
RB-86	-7.807E+03	5.738E+04	5.748E+04	SHORT HLIF
Y-88	1.282E-01	1.655E-01	1.753E-01	NOT IDENT.
Y-91	-5.732E+02	8.147E+02	8.547E+02	NOT IDENT.
NB-94	-1.139E-02	4.232E-02	4.263E-02	FAIL ABUN
NB-95	2.377E-01	1.270E+00	1.274E+00	NOT IDENT.
NB-95M	3.200E-01	3.371E+00	3.374E+00	NOT IDENT.
ZR-95	1.020E+00	2.112E+00	2.162E+00	NOT IDENT.
NB-97	1.000E+41	1.625E+42	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	7.286E+41	0.000E+00	SHORT HLIF
MO-99	-6.571E+32	1.022E+34	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	1.580E+41	0.000E+00	SHORT HLIF
RH-101	-3.871E-02	3.883E-02	4.257E-02	NOT IDENT.
RH-102	-6.147E-03	7.564E-02	7.569E-02	NOT IDENT.
RU-103	-5.187E+00	8.266E+00	8.591E+00	FAIL ABUN
RH-106	5.840E-01	5.997E-01	6.549E-01	NOT IDENT.
RU-106	5.840E-01	5.997E-01	6.549E-01	NOT IDENT.
AG-108M	-9.803E-03	3.102E-02	3.133E-02	NOT IDENT.
AG-110M	8.754E-03	1.377E-01	1.378E-01	NOT IDENT.
SN-113	-3.520E-01	3.084E-01	3.468E-01	NOT IDENT.
CD-115	-1.000E+41	1.549E+41	0.000E+00	SHORT HLIF
SN-117M	-9.578E+04	2.130E+05	2.173E+05	SHORT HLIF
TE-123M	-4.061E-02	1.430E-01	1.442E-01	NOT IDENT.
SB-124	9.029E-01	2.944E+00	2.972E+00	NOT IDENT.
SB-125	-8.656E-02	1.246E-01	1.306E-01	FAIL ABUN
TE-125M	-2.878E+02	3.111E+02	3.371E+02	NOT IDENT.
I-126	-8.599E+05	3.082E+06	3.106E+06	SHORT HLIF
SB-126	-1.382E+06	3.444E+06	3.499E+06	SHORT HLIF
SB-127	-2.333E+23	5.316E+23	0.000E+00	SHORT HLIF
I-131	-2.147E+09	2.263E+10	2.265E+10	SHORT HLIF
I-132	1.000E+41	5.818E+42	0.000E+00	SHORT HLIF
TE-132	-7.447E+27	1.154E+28	0.000E+00	SHORT HLIF
BA-133	-1.616E-02	5.183E-02	5.234E-02	NOT IDENT.
I-133	-1.000E+41	3.252E+41	0.000E+00	SHORT HLIF
CS-134	3.412E-04	6.250E-02	6.250E-02	NOT IDENT.
CS-135	-5.162E-02	1.712E-01	1.728E-01	NOT IDENT.
I-135	-1.000E+41	1.021E+42	0.000E+00	SHORT HLIF
CS-136	-1.013E+05	8.143E+05	8.155E+05	SHORT HLIF
CE-139	-1.305E-01	1.289E-01	1.417E-01	NOT IDENT.
BA-140	-1.522E+05	3.535E+06	3.536E+06	SHORT HLIF
LA-140	-1.806E+06	1.383E+06	1.605E+06	SHORT HLIF
CE-141	-2.275E+01	3.374E+01	3.526E+01	NOT IDENT.
CE-143	1.000E+41	1.105E+41	0.000E+00	SHORT HLIF
CE-144	-6.124E-02	3.476E-01	3.487E-01	NOT IDENT.
PM-144	7.378E-02	7.877E-02	8.550E-02	NOT IDENT.
PR-144	6.445E+00	6.888E+00	7.476E+00	NOT IDENT.
PM-146	-4.878E-03	5.283E-02	5.287E-02	NOT IDENT.
ND-147	-6.719E+07	1.137E+08	1.177E+08	SHORT HLIF
PM-147	-4.251E+02	8.862E+02	9.067E+02	NOT IDENT.
PM-149	1.000E+41	4.643E+41	0.000E+00	SHORT HLIF
EU-150	4.225E-03	3.281E-02	3.287E-02	FAIL ABUN
EU-152	4.650E-02	1.115E-01	1.135E-01	FAIL ABUN
GD-153	-1.553E-01	1.942E-01	2.064E-01	NOT IDENT.
EU-154	-3.456E-02	1.781E-01	1.788E-01	NOT IDENT.
EU-155	6.434E-02	1.065E-01	1.104E-01	FAIL ABUN
TB-160	4.028E-01	2.972E+00	2.977E+00	FAIL ABUN
HO-166M	2.250E-02	6.453E-02	6.532E-02	FAIL ABUN
TM-171	3.074E+00	5.878E+00	6.039E+00	NOT IDENT.
HF-172	-3.020E-01	2.685E-01	3.010E-01	FAIL ABUN
LU-172	5.645E-02	9.475E-02	9.810E-02	FAIL ABUN

LU-176	1.050E-02	2.740E-02	2.780E-02	FAIL ABUN
HF-181	5.006E+00	6.686E+00	7.057E+00	NOT IDENT.
TA-182	-4.823E-01	1.278E+00	1.296E+00	FAIL ABUN
RE-183	4.347E-01	1.420E+00	1.434E+00	NOT IDENT.
RE-184	3.156E+01	5.036E+01	5.233E+01	NOT IDENT.
W-188	-4.407E+01	1.549E+02	1.562E+02	FAIL ABUN
IR-192	1.918E-01	5.620E-01	5.686E-01	FAIL ABUN
HG-203	1.718E+00	3.513E+00	3.597E+00	NOT IDENT.
BI-207	9.375E-03	6.418E-02	6.432E-02	FAIL ABUN
BI-211	2.384E+00	6.625E-01	1.263E+00	FAIL ABUN
PB-211	6.792E-01	8.789E-01	9.307E-01	NOT IDENT.
RN-219	-8.680E-02	5.176E-01	5.190E-01	NOT IDENT.
RA-223	-4.522E-01	7.953E-01	8.210E-01	FAIL ABUN
AC-227	2.963E-02	2.817E-01	2.820E-01	FAIL ABUN
TH-227	2.963E-02	2.817E-01	2.820E-01	FAIL ABUN
TH-229	1.113E-01	4.786E-01	4.812E-01	FAIL ABUN
TH-231	-4.522E-01	7.953E-01	8.210E-01	FAIL ABUN
PA-233	-1.112E-02	6.766E-02	6.785E-02	FAIL ABUN
PA-234	-7.373E-02	3.558E-01	3.574E-01	NOT IDENT.
PA-234M	1.247E+00	4.672E+00	4.706E+00	NOT IDENT.
U-235	-3.449E-03	1.867E-01	1.867E-01	FAIL ABUN
NP-237	-1.112E-02	6.766E-02	6.785E-02	FAIL ABUN
NP-238	-1.000E+41	1.536E+41	0.000E+00	SHORT HLIF
NP-239	9.117E-03	2.591E-01	2.591E-01	NOT IDENT.
PU-239	5.093E+02	3.328E+02	4.044E+02	NOT IDENT.
AM-241	-1.444E-02	6.604E-02	6.636E-02	NOT IDENT.
CM-243	-3.460E-03	9.759E-02	9.760E-02	NOT IDENT.
BK-247	-5.904E-02	7.917E-02	8.352E-02	FAIL ABUN
CM-247	-1.206E-02	4.768E-02	4.799E-02	NOT IDENT.
CF-249	-2.708E-03	4.882E-02	4.883E-02	NOT IDENT.
CF-251	-4.573E-02	1.223E-01	1.240E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	96.7190	87.09	129.2920	136.47	64.3860
45.60	75.0593	87.57	129.3771	140.51	0.0000
46.54	75.2030	88.03	129.4596	143.76	69.0807
49.72	0.0000	88.34	140.5708	144.24	73.3284
51.35	90.8022	88.47	140.5953	145.44	70.8853
51.87	83.8145	89.96	135.3411	152.43	59.4791
52.39	78.3038	1093.63	102.1932	153.25	0.0000
52.97	91.8274	91.11	0.0000	323.87	83.4133
53.44	105.3581	92.59	106.0352	156.02	0.0000
54.07	96.5040	93.35	106.1418	158.56	0.0000
57.36	0.0000	94.56	82.8195	159.00	66.6940
57.53	111.4159	94.65	84.4218	162.33	61.7563
57.98	87.3956	94.67	84.4245	162.66	0.0000
59.27	111.7584	94.87	84.4466	163.33	49.7942
59.32	111.7682	97.43	97.5172	165.86	81.7508
59.54	111.8111	98.43	90.0393	176.31	68.6243
60.96	107.9212	98.44	90.0404	176.60	0.0000
61.17	107.9600	99.53	72.1326	177.52	70.4366
62.93	108.2840	100.11	62.5609	181.07	0.0000
63.29	108.3500	102.03	92.8627	181.52	70.6822
63.58	108.4027	103.18	79.7109	184.41	55.9870
64.28	108.5297	103.37	79.7300	143.76	56.0495
66.73	116.2327	105.21	70.2251	193.51	55.5364
67.24	120.9213	105.31	70.2339	197.03	68.9594
125.81	114.8804	106.12	71.5155	198.01	53.0884
67.75	94.9785	106.47	71.5461	201.83	71.8918
69.67	102.9543	109.28	77.8740	203.43	62.2092
70.83	110.8396	111.00	52.4289	205.31	64.0825
72.81	96.1264	111.76	0.0000	210.85	49.1668
72.87	96.1353	114.06	67.3025	215.65	52.4913
74.66	96.3994	116.30	0.0000	222.11	57.7109
74.82	96.4228	116.74	78.5596	227.09	53.4015
74.97	96.4443	119.76	72.6719	227.38	57.0341
77.11	96.7552	121.12	78.9517	228.16	0.0000
78.74	105.9484	121.22	78.9604	228.18	60.6918
79.69	102.9753	121.78	99.9974	116.74	60.6918
80.12	74.9380	122.06	100.0289	235.69	57.3847
80.19	0.0000	122.92	55.6248	235.96	45.5521
80.57	117.1677	123.07	54.3978	238.63	45.6406
81.00	103.1720	265.00	76.7034	238.98	0.0000
81.07	106.3088	125.81	96.7246	240.99	45.7179
81.75	100.1536	127.23	94.3906	242.00	45.7509
83.79	100.4456	127.91	88.2462	244.70	30.2537
84.00	100.4753	129.30	58.5042	252.40	0.0000
85.43	94.3854	131.20	88.5593	252.80	47.9444
86.55	94.5331	133.02	73.7347	254.15	0.0000
86.79	94.5642	133.52	68.3550	256.23	57.3000
86.94	108.7720	136.00	62.6831	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	42.7572	355.39	0.0000	584.27	18.5356
264.80	47.4099	356.01	35.3672	595.83	0.0000
265.00	49.2756	364.49	0.0000	427.87	23.0405
268.22	59.6302	366.42	0.0000	602.52	0.0000
269.46	49.4222	372.51	36.6748	604.72	6.5933
270.03	46.6420	375.05	30.7692	607.14	16.4978
271.23	44.8125	377.52	29.8151	609.32	19.8135
273.65	0.0000	356.01	25.9259	610.33	28.0805
276.40	54.3325	388.16	39.9748	614.28	21.5051
277.37	61.8656	388.63	0.0000	618.01	23.1909
277.60	55.3125	391.69	43.0516	620.36	27.6326
278.00	43.1362	264.66	32.1849	621.93	12.1655
279.20	44.1084	401.81	43.2738	630.19	0.0000
279.54	60.0755	402.40	44.2936	631.29	21.0851
279.70	60.0820	404.85	32.2533	633.25	21.1005
280.46	53.5372	410.95	16.1758	634.78	0.0000
283.69	50.8250	413.71	27.3340	635.95	17.7858
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	45.2275	423.72	0.0000	645.85	24.5432
285.90	0.0000	427.09	30.5701	657.76	21.8470
287.50	39.6271	427.87	33.6398	657.90	0.0000
290.67	41.1246	433.94	26.5813	661.66	25.8039
293.27	0.0000	439.40	21.5255	664.57	0.0000
351.93	31.2873	453.88	27.8635	666.33	0.0000
295.96	31.3021	463.37	25.9125	666.50	0.0000
879.38	28.5028	468.07	20.7743	667.71	0.0000
299.98	38.5117	473.00	0.0000	677.62	21.4353
300.09	38.5142	475.06	29.1758	685.70	0.0000
300.13	38.5150	476.78	31.2836	695.00	0.0000
301.36	38.5447	477.60	27.1225	696.49	18.1680
302.85	34.2935	482.18	19.8609	696.51	18.1680
256.23	44.3402	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	27.2598
306.78	31.5109	497.08	24.1993	697.49	27.2607
308.46	33.4548	505.52	17.4238	702.65	25.0329
311.90	40.2295	507.63	0.0000	706.68	20.5093
316.51	29.7752	511.00	20.1106	711.68	13.6958
319.41	0.0000	514.00	17.4869	720.70	0.0000
320.08	0.0000	514.00	17.4869	721.93	0.0000
321.04	23.1138	520.40	21.2533	722.78	15.4649
323.87	47.7517	520.69	0.0000	722.91	15.4655
325.23	39.1001	522.65	0.0000	723.31	15.4677
328.76	0.0000	527.90	0.0000	724.19	10.3147
333.37	32.0104	528.26	24.5217	727.33	19.5034
333.97	37.8431	529.59	18.1351	733.00	15.5165
334.37	37.8519	529.87	0.0000	735.93	13.8062
338.28	35.9913	531.02	0.0000	333.97	17.2662
338.32	35.9920	537.26	0.0000	739.50	0.0000
311.90	42.3663	546.56	0.0000	747.24	12.7017
340.48	42.3663	552.55	23.6892	748.06	11.5503
340.55	0.0000	563.25	27.0355	752.31	16.1926
344.28	31.6235	569.33	28.1847	753.82	0.0000
345.93	42.0088	946.00	27.1016	756.73	13.8989
351.06	30.3718	569.70	27.1037	756.80	13.8994
351.93	30.3863	583.19	18.5280	884.68	16.2524

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	18.5853	1274.44	5.5834	1620.50	6.3794
766.42	17.4274	1001.03	7.4536	1621.92	7.4443
766.84	11.6199	1002.74	7.4570	1678.03	0.0000
772.60	0.0000	1004.73	15.8545	1690.97	3.2292
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	2.1798
778.90	20.9949	1028.54	0.0000	1063.66	5.4550
783.70	0.0000	1037.84	8.4644	1771.35	4.3647
785.37	14.9015	1038.76	0.0000	1791.20	0.0000
792.07	25.4724	631.29	10.3682	1808.65	3.2937
794.95	22.8579	1048.07	0.0000	1810.72	0.0000
795.86	19.3467	1049.04	15.0908	1836.06	0.0000
810.06	11.4817	1050.41	11.3218		
810.29	11.4825	1063.66	15.1455		
344.28	11.4833	1077.00	0.0000		
810.76	10.6011	1077.34	13.2968		
815.77	0.0000	1085.87	7.6143		
1048.07	0.0000	1093.63	7.6284		
832.01	18.6704	1099.45	3.8196		
834.85	20.4661	1112.07	15.3242		
835.71	22.2511	1112.84	14.3692		
836.80	0.0000	1115.54	12.2695		
846.75	0.0000	1120.29	10.5562		
846.77	15.1801	1120.55	9.2133		
856.80	0.0000	1221.41	10.7509		
860.56	12.5516	1129.67	12.5033		
871.09	12.9498	1131.51	0.0000		
873.19	0.0000	1147.95	0.0000		
875.33	0.0000	1173.23	17.4891		
879.38	14.4229	1177.95	20.4258		
880.51	15.6295	1189.05	9.7510		
883.24	20.7553	1204.77	17.6144		
884.68	17.1532	1221.41	16.6981		
889.28	15.3673	1231.02	15.7490		
894.76	16.2966	1235.36	0.0000		
898.04	12.6866	1238.28	14.7885		
900.72	19.9516	1260.41	0.0000		
903.28	11.7979	1271.87	7.9453		
911.20	10.9146	1274.44	14.3095		
912.08	10.9171	1274.54	14.3095		
923.98	0.0000	1291.59	6.9812		
926.50	12.7875	1298.22	0.0000		
929.11	14.6245	1312.11	0.0000		
937.49	17.4066	1332.49	7.0419		
944.13	0.0000	1362.66	0.0000		
946.00	16.5284	1365.19	6.0765		
949.00	11.9471	1368.63	0.0000		
667.71	0.0000	1384.29	6.1000		
962.31	20.9048	1408.01	3.0646		
964.08	16.2400	1457.56	0.0000		
966.17	25.1124	1460.82	6.1930		
911.20	23.0980	1489.16	4.1511		
968.97	23.0980	1505.03	5.2048		
983.53	0.0000	1584.12	8.4502		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235033.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM25.CNF;357
Background date : 2-OCT-2016 11:01:25.
Sample date      : 23-NOV-2015 11:53:00 Acquisition date : 3-OCT-2016 09:15:18.
Sample ID       : G405235033 Sample quantity : 1.66788E+02 GRAM
Detector name   : GAM25 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.54 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596249 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.58*	56	183	0.97	92.67	89	9	1.55E-02	47.3	
2	0	57.57*	18	141	0.98	114.63	113	6	5.03E-03	107.1	
3	0	63.27*	32	267	0.75	126.04	122	9	8.96E-03	96.2	
4	2	74.83*	229	166	0.95	149.16	143	15	6.37E-02	11.1	5.16E-01
5	2	77.19*	344	126	0.87	153.88	143	15	9.54E-02	7.5	
6	0	84.07*	63	140	2.09	167.62	164	7	1.76E-02	34.2	
7	0	88.48	219	216	3.77	176.45	171	11	6.07E-02	14.7	
8	0	92.91*	143	169	1.22	185.31	182	9	3.96E-02	19.6	
9	0	128.95	19	124	0.96	257.38	253	8	5.23E-03	105.5	
10	0	177.16	13	46	1.25	353.79	351	5	3.49E-03	84.9	
11	0	178.79	20	75	1.10	357.04	356	7	5.64E-03	72.6	
12	0	185.90*	100	127	1.58	371.27	365	11	2.78E-02	24.8	
13	0	191.54	14	52	0.90	382.54	379	6	3.84E-03	87.0	
14	0	210.34	60	76	0.98	420.14	416	10	1.66E-02	30.4	
15	4	238.76*	408	61	1.11	476.99	470	19	1.13E-01	6.0	1.33E+00
16	4	241.75	102	89	1.65	482.96	470	19	2.83E-02	22.7	
17	0	270.37	50	62	2.58	540.20	535	9	1.39E-02	31.9	
18	2	293.03	25	38	1.49	585.52	582	16	6.85E-03	50.3	5.34E-01
19	2	295.35*	131	45	1.15	590.16	582	16	3.63E-02	12.6	
20	0	300.61	22	68	0.99	600.67	597	10	6.11E-03	73.1	
21	0	338.48*	59	54	1.23	676.42	672	10	1.65E-02	27.0	
22	0	352.02*	252	50	1.18	703.49	698	11	6.99E-02	8.4	
23	0	422.96	11	25	0.63	845.40	841	6	2.98E-03	80.3	
24	0	463.13	26	16	1.45	925.75	922	8	7.29E-03	33.6	
25	0	511.36*	61	38	2.79	1022.21	1014	17	1.69E-02	30.6	
26	0	527.08	16	15	1.41	1053.66	1049	10	4.44E-03	51.7	
27	0	563.56	16	13	1.89	1126.63	1122	10	4.46E-03	48.3	
28	0	583.36*	91	42	0.99	1166.25	1160	12	2.52E-02	18.0	
29	0	609.42*	166	36	1.27	1218.37	1212	13	4.61E-02	10.9	
30	0	662.06	19	17	2.14	1323.68	1320	8	5.39E-03	43.7	
31	0	683.77	7	24	3.26	1367.12	1359	10	2.03E-03	132.6	
32	0	704.20	20	32	4.88	1408.00	1400	16	5.56E-03	67.1	
33	0	770.18	6	39	0.59	1539.99	1530	14	1.77E-03	210.2	
34	0	796.52	8	24	1.17	1592.69	1587	9	2.13E-03	122.1	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	805.08	15	10	4.41	1609.82	1602	14	4.10E-03	53.2	
36	0	814.59	9	11	0.60	1628.84	1624	8	2.40E-03	76.7	
37	0	860.60	26	18	2.74	1720.91	1715	12	7.11E-03	38.6	
38	0	911.28*	95	6	1.76	1822.33	1816	15	2.63E-02	12.3	
39	0	969.67*	34	24	1.56	1939.15	1933	13	9.51E-03	35.9	
40	0	981.44	9	4	1.46	1962.71	1958	9	2.59E-03	51.7	
41	0	1105.03	31	19	6.14	2210.03	2195	25	8.62E-03	41.6	
42	0	1121.65*	27	57	0.97	2243.29	2234	20	7.59E-03	69.6	
43	0	1239.96	7	30	0.67	2480.08	2471	12	2.05E-03	152.7	
44	0	1260.11	15	6	1.61	2520.40	2513	13	4.14E-03	43.5	
45	0	1265.43	16	0	1.39	2531.06	2526	10	4.44E-03	25.0	
46	0	1376.80	21	2	2.39	2753.97	2749	11	5.74E-03	26.8	
47	0	1389.44	7	2	1.56	2779.27	2775	8	1.91E-03	52.3	
48	0	1460.79*	342	0	2.43	2922.11	2915	16	9.50E-02	5.5	
49	0	1764.68*	30	0	2.15	3530.50	3524	13	8.28E-03	19.2	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235033.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 23-NOV-2015 11:53:00 Acquisition date : 3-OCT-2016 09:15:18
Sample ID         : G405235033 Sample quantity   : 166.79 GRAM
Sample type       : SOLID Sample geometry    :
Detector name     : GAMMA25 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.54 0.0%
Energy tolerance  : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error    : 0.00 %
Efficiency type   : Linear Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	87.09	U-235	89.96
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.131E+00	1.245E+01	1.245E+01	10.91	OK
CD-109	88.03	3.70*	9.261E+00	3.116E+00	5.000E+00	37.19	OK
SN-126	64.28	9.60	9.543E+00	2.217E-01	2.217E-01	192.38	OK
	86.94	8.90	9.280E+00	-----	Line Not Found	-----	Absent
	87.57	37.00*	9.261E+00	3.116E-01	3.116E-01	37.19	OK
BA-137M	661.66	89.90*	2.256E+00	4.661E-02	4.754E-02	87.40	OK
CS-137	661.66	85.10*	2.256E+00	4.924E-02	5.023E-02	87.40	OK
TL-208	277.37	6.60	4.809E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.510E+00	2.099E-01	2.099E-01	36.00	OK
	860.56	12.50	1.810E+00	5.330E-01	5.330E-01	77.30	OK
PB-210	46.54	4.25*	9.147E+00	9.292E-01	9.546E-01	94.62	OK
BI-211	72.87	1.23	9.424E+00	-----	Line Not Found	-----	Absent
	351.06	12.92*	3.893E+00	3.254E-01	3.254E-01	224.40	OK
PB-212	74.82	10.28	9.405E+00	9.975E-01	9.975E-01	34.80	OK
	77.11	17.10	9.382E+00	1.322E+00	1.322E+00	14.98	OK
	238.63	43.60*	5.476E+00	9.371E-01	9.371E-01	11.95	OK
	300.09	3.30	4.479E+00	7.962E-01	7.962E-01	146.20	OK
BI-214	609.32	45.49*	2.419E+00	7.421E-01	7.424E-01	21.77	OK
	1120.29	14.92	1.442E+00	5.778E-01	5.780E-01	139.21	OK
	1764.49	15.30	9.335E-01	8.916E-01	8.919E-01	38.47	OK
PB-214	74.82	5.80	9.405E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	9.382E+00	2.331E+00	2.332E+00	14.98	OK
	87.09	3.41	9.279E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	5.413E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.550E+00	8.355E-01	8.358E-01	25.28	OK
	351.93	35.60*	3.894E+00	-----	Line Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.419E+00	7.421E-01	7.424E-01	21.77	OK
	1120.29	14.92	1.442E+00	5.778E-01	5.780E-01	139.21	OK
	1764.49	15.30	9.335E-01	8.916E-01	8.919E-01	38.47	OK
RA-224	240.99	4.10*	5.418E+00	1.039E+00	1.039E+00	115.47	OK
RA-226	609.32	45.49*	2.419E+00	7.421E-01	7.424E-01	21.77	OK
	1120.29	14.92	1.442E+00	5.778E-01	5.780E-01	139.21	OK
	1764.49	15.30	9.335E-01	8.916E-01	8.919E-01	38.47	OK
AC-228	105.21	1.10	8.977E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.031E+00	6.879E-01	6.879E-01	54.05	OK
	794.95	4.25	1.935E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.856E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.725E+00	9.939E-01	9.939E-01	24.61	OK
	968.97	15.80	1.636E+00	6.143E-01	6.143E-01	71.84	OK
RA-228	105.21	1.10	8.977E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.031E+00	6.879E-01	6.879E-01	54.05	OK
	794.95	4.25	1.935E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.856E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.725E+00	9.939E-01	9.939E-01	24.61	OK
	968.97	15.80	1.636E+00	6.143E-01	6.143E-01	71.84	OK
TH-228	74.82	10.28	9.405E+00	9.975E-01	9.975E-01	34.80	OK
	77.11	17.10	9.382E+00	1.322E+00	1.322E+00	14.98	OK
	238.63	43.60*	5.476E+00	9.371E-01	9.371E-01	11.95	OK
	300.09	3.30	4.479E+00	7.962E-01	7.962E-01	146.20	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-229	85.43	14.70	9.313E+00	2.827E-01	2.828E-01	68.42	OK
	88.47	24.00	9.261E+00	4.803E-01	4.804E-01	37.19	OK
	193.51	4.41*	6.496E+00	-----	Line Not Found	-----	Absent
TH-230	210.85	2.80	6.083E+00	1.951E+00	1.951E+00	60.83	OK
	609.32	45.49*	2.419E+00	7.421E-01	7.421E-01	21.77	OK
	1120.29	14.92	1.442E+00	5.778E-01	5.778E-01	139.21	OK
PA-231	1764.49	15.30	9.335E-01	8.916E-01	8.916E-01	38.47	OK
	283.69	1.70	4.715E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	4.479E+00	4.911E-01	4.911E-01	146.20	OK
TH-232	105.21	1.10	8.977E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.031E+00	6.879E-01	6.879E-01	54.05	OK
	835.71	1.61	1.856E+00	-----	Line Not Found	-----	Absent
TH-234	911.20	25.80*	1.725E+00	9.939E-01	9.939E-01	24.61	OK
	968.97	15.80	1.636E+00	6.143E-01	6.143E-01	71.84	OK
	63.29	3.70*	9.543E+00	5.752E-01	5.752E-01	192.38	OK
U-234	92.59	4.23	9.200E+00	2.221E+00	2.221E+00	39.28	OK
	609.32	45.49*	2.419E+00	7.421E-01	7.421E-01	21.77	OK
	1120.29	14.92	1.442E+00	5.778E-01	5.778E-01	139.21	OK
U-235	1764.49	15.30	9.335E-01	8.916E-01	8.916E-01	38.47	OK
	89.96	3.47	9.261E+00	3.322E+00	3.322E+00	37.19	OK
	93.35	5.60	9.200E+00	1.677E+00	1.677E+00	39.28	OK
U-238	143.76	10.96*	7.922E+00	-----	Line Not Found	-----	Absent
	163.33	5.08	7.333E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	6.696E+00	1.475E-01	1.475E-01	49.63	OK
AM-243	205.31	5.01	6.202E+00	-----	Line Not Found	-----	Absent
	63.29	3.70*	9.543E+00	5.752E-01	5.752E-01	192.38	OK
	92.59	4.23	9.200E+00	2.221E+00	2.221E+00	39.28	OK
ANH-511	43.53	5.90	8.344E+00	-----	Line Not Found	-----	Absent
	74.66	67.20*	9.405E+00	1.526E-01	1.526E-01	34.80	OK
	511.00	100.00*	2.808E+00	1.086E-01	1.086E-01	61.15	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235033.CNF;1 *
 * Acquisition date : 3-OCT-2016 09:15:18 Sensitivity : 3.000 *
 * Detector ID : GAM25 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.54 Half life ratio : ***** *
 * Sample date : 23-NOV-2015 11:53:00 Analyst initials: MXR1 *
 * Sample ID : G405235033 Sample Quantity : 1.6679E+02 GRAM *
 * Batch Number : 1596249 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 1-AUG-2016 08:41:33 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM25_CAN.CNF;15 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.245E+01	1.331E+00	5.111E-01
CD-109	5.000E+00	1.823E+00	9.225E-01
SN-126	3.116E-01	1.136E-01	5.741E-02
BA-137M	4.754E-02	4.072E-02	6.128E-02
CS-137	5.023E-02	4.302E-02	6.473E-02
TL-208	2.099E-01	7.404E-02	5.157E-02
PB-210	9.546E-01	8.852E-01	5.458E-01
BI-211	3.254E-01	7.156E-01	2.390E-01
PB-212	9.371E-01	1.097E-01	7.373E-02
BI-214	7.424E-01	1.584E-01	1.029E-01
PB-214	9.540E-01	1.570E-01	2.740E-01
RN-222	7.424E-01	1.584E-01	1.029E-01
RA-224	1.039E+00	1.176E+00	7.916E-01
RA-226	7.424E-01	1.584E-01	1.029E-01
AC-228	9.939E-01	2.397E-01	1.898E-01
RA-228	9.939E-01	2.397E-01	1.898E-01
TH-228	9.371E-01	1.097E-01	7.373E-02
TH-229	-1.356E-01	3.616E-01	6.115E-01
TH-230	7.421E-01	1.583E-01	1.029E-01
PA-231	4.911E-01	7.036E-01	5.767E-01
TH-232	9.939E-01	2.397E-01	1.898E-01
TH-234	5.752E-01	1.084E+00	7.002E-01
U-234	7.421E-01	1.583E-01	1.029E-01
U-235	-6.673E-02	1.223E-01	2.284E-01
U-238	5.752E-01	1.084E+00	7.002E-01
AM-243	1.526E-01	5.205E-02	3.806E-02
ANH-511	1.086E-01	6.509E-02	3.849E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	5.797E+00		1.150E+01	2.428E+01	NOT IDENT.
NA-22	7.739E-03		4.402E-02	8.863E-02	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF

AL-26	-4.657E-03	2.551E-02	5.368E-02	NOT IDENT.
SC-46	-7.630E-02	3.097E-01	6.142E-01	FAIL ABUN
V-48	0.000E+00	2.247E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	4.591E+02	0.000E+00	SHORT HLIF
MN-54	2.332E-02	6.353E-02	1.317E-01	NOT IDENT.
CO-56	-1.888E-02	4.738E-01	9.496E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.701E-02	2.807E-02	5.350E-02	NOT IDENT.
CO-58	1.488E-01	5.994E-01	1.018E+00	NOT IDENT.
FE-59	-1.548E+00	6.509E+00	1.292E+01	NOT IDENT.
CO-60	-2.902E-02	3.783E-02	6.229E-02	NOT IDENT.
ZN-65	6.868E-02	1.823E-01	3.398E-01	NOT IDENT.
GE-68	-2.094E-01	2.278E+00	4.427E+00	NOT IDENT.
AS-73	-5.035E-02	1.581E+00	3.319E+00	NOT IDENT.
AS-74	0.000E+00	9.573E+03	0.000E+00	SHORT HLIF
SE-75	1.970E-02	1.682E-01	3.197E-01	NOT IDENT.
BR-77	0.000E+00	1.596E+39	0.000E+00	SHORT HLIF
SR-82	0.000E+00	8.813E+02	0.000E+00	SHORT HLIF
RB-83	-3.363E-01	5.111E-01	9.174E-01	NOT IDENT.
KR-85	5.943E+00	5.607E+00	1.228E+01	NOT IDENT.
SR-85	7.311E-01	6.935E-01	1.518E+00	NOT IDENT.
RB-86	0.000E+00	4.543E+04	0.000E+00	SHORT HLIF
Y-88	-8.004E-02	2.411E-01	4.697E-01	NOT IDENT.
Y-91	-4.258E+02	6.690E+02	1.157E+03	NOT IDENT.
NB-94	2.705E-02	2.873E-02	6.112E-02	NOT IDENT.
NB-95	5.409E-01	7.547E-01	1.530E+00	NOT IDENT.
NB-95M	5.313E-01	2.103E+00	3.768E+00	NOT IDENT.
ZR-95	-1.002E-01	1.520E+00	2.857E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	5.757E+33	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	7.546E-04	2.171E-02	4.029E-02	NOT IDENT.
RH-102	2.362E-02	5.353E-02	1.090E-01	NOT IDENT.
RU-103	-2.313E+00	5.470E+00	9.940E+00	FAIL ABUN
RH-106	5.091E-02	4.445E-01	8.725E-01	NOT IDENT.
RU-106	5.091E-02	4.445E-01	8.725E-01	NOT IDENT.
AG-108M	1.429E-02	2.158E-02	4.623E-02	NOT IDENT.
AG-110M	-5.220E-02	8.605E-02	1.581E-01	NOT IDENT.
SN-113	-1.333E-01	1.932E-01	3.581E-01	NOT IDENT.
CD-115	0.000E+00	1.014E+41	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.365E+05	0.000E+00	SHORT HLIF
TE-123M	2.838E-02	9.220E-02	1.852E-01	NOT IDENT.
SB-124	1.014E+00	2.487E+00	5.684E+00	NOT IDENT.
SB-125	-3.301E-03	8.494E-02	1.681E-01	FAIL ABUN
TE-125M	-1.522E+01	1.787E+02	3.591E+02	NOT IDENT.
I-126	0.000E+00	2.039E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.894E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	2.779E+23	0.000E+00	SHORT HLIF
I-131	0.000E+00	1.408E+10	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	7.686E+27	0.000E+00	SHORT HLIF
BA-133	1.032E-02	3.173E-02	6.073E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	2.949E-02	7.056E-02	1.044E-01	FAIL ABUN
CS-135	4.657E-02	1.153E-01	2.086E-01	NOT IDENT.
I-135	0.000E+00	8.535E+40	0.000E+00	SHORT HLIF
CS-136	0.000E+00	6.666E+05	0.000E+00	SHORT HLIF
CE-139	-5.265E-02	8.435E-02	1.548E-01	NOT IDENT.
BA-140	0.000E+00	2.373E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	9.283E+05	0.000E+00	SHORT HLIF
CE-141	-8.118E+00	2.186E+01	4.142E+01	NOT IDENT.
CE-143	0.000E+00	9.855E+40	0.000E+00	SHORT HLIF
CE-144	-1.102E-01	2.362E-01	4.502E-01	NOT IDENT.
PM-144	3.034E-02	4.212E-02	9.126E-02	NOT IDENT.
PR-144	2.670E+00	3.690E+00	7.997E+00	NOT IDENT.
PM-146	3.413E-04	2.975E-02	6.018E-02	NOT IDENT.
ND-147	0.000E+00	6.760E+07	0.000E+00	SHORT HLIF
PM-147	1.649E+02	4.869E+02	1.002E+03	NOT IDENT.
PM-149	0.000E+00	1.569E+41	0.000E+00	SHORT HLIF
EU-150	3.398E-02	1.919E-02	4.289E-02	FAIL ABUN
EU-152	1.815E-03	6.684E-02	1.362E-01	NOT IDENT.
GD-153	-3.060E-02	9.651E-02	1.895E-01	NOT IDENT.
EU-154	2.098E-02	1.075E-01	2.170E-01	NOT IDENT.
EU-155	2.049E-02	6.031E-02	1.249E-01	NOT IDENT.
TB-160	1.399E+00	1.713E+00	3.908E+00	FAIL ABUN
HO-166M	-2.306E-02	4.847E-02	8.553E-02	FAIL ABUN
TM-171	2.265E+00	2.968E+00	6.558E+00	NOT IDENT.

HF-172	1.815E-02	1.438E-01	2.703E-01	FAIL ABUN
LU-172	5.152E-02	6.525E-02	1.442E-01	FAIL ABUN
LU-176	-5.952E-03	2.034E-02	3.604E-02	FAIL ABUN
HF-181	-5.165E-01	4.276E+00	8.363E+00	FAIL ABUN
TA-182	1.570E-01	8.981E-01	1.797E+00	FAIL ABUN
RE-183	7.872E-01	1.652E+00	1.672E+00	FAIL ABUN
RE-184	-5.474E+00	3.609E+01	7.085E+01	NOT IDENT.
W-188	-7.519E+00	1.050E+02	1.775E+02	FAIL ABUN
IR-192	-9.633E-02	4.069E-01	8.085E-01	FAIL ABUN
HG-203	-1.666E+00	2.574E+00	4.423E+00	NOT IDENT.
BI-207	-7.231E-03	4.892E-02	9.341E-02	FAIL ABUN
PB-211	-6.909E-02	4.916E-01	9.714E-01	NOT IDENT.
BI-212	5.654E-01	5.254E-01	1.093E+00	NOT IDENT.
RN-219	2.788E-02	2.881E-01	5.832E-01	FAIL ABUN
RA-223	-1.224E-01	4.698E-01	9.264E-01	FAIL ABUN
AC-227	-2.602E-02	1.727E-01	3.182E-01	FAIL ABUN
TH-227	-2.602E-02	1.727E-01	3.182E-01	FAIL ABUN
TH-231	-1.224E-01	4.698E-01	9.264E-01	FAIL ABUN
PA-233	-2.878E-02	4.547E-02	8.707E-02	FAIL ABUN
PA-234	1.176E-01	2.449E-01	5.230E-01	NOT IDENT.
PA-234M	-1.218E+00	3.796E+00	7.333E+00	NOT IDENT.
NP-237	-2.878E-02	4.547E-02	8.707E-02	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	-6.581E-02	1.366E-01	2.642E-01	NOT IDENT.
PU-239	2.092E+02	4.327E+02	4.054E+02	FAIL ABUN
AM-241	-2.037E-02	3.827E-02	6.426E-02	NOT IDENT.
CM-243	1.669E-02	5.052E-02	1.054E-01	NOT IDENT.
BK-247	9.306E-03	5.382E-02	1.029E-01	FAIL ABUN
CM-247	1.127E-02	2.593E-02	5.447E-02	NOT IDENT.
CF-249	-2.139E-02	2.847E-02	5.241E-02	NOT IDENT.
CF-251	5.937E-02	9.882E-02	1.334E-01	FAIL ABUN

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	333	10.66*	1.131E+00	1.245E+01	1.245E+01	10.91
CD-109	88.03	296	3.70*	9.261E+00	3.886E+00	6.236E+00	29.40
SN-126	64.28	45	9.60	9.543E+00	2.217E-01	2.217E-01	192.38
	86.94	-----	8.90	9.280E+00	-----	Line Not Found	-----
	87.57	296	37.00*	9.261E+00	3.886E-01	3.886E-01	29.40
BA-137M	661.66	21	89.90*	2.256E+00	4.661E-02	4.754E-02	87.40
CS-137	661.66	21	85.10*	2.256E+00	4.924E-02	5.023E-02	87.40
TL-208	277.37	-----	6.60	4.809E+00	-----	Line Not Found	-----
	583.19	99	85.00*	2.510E+00	2.099E-01	2.099E-01	36.00
	860.56	27	12.50	1.810E+00	5.330E-01	5.330E-01	77.30
PB-210	46.54	80	4.25*	9.147E+00	9.292E-01	9.546E-01	94.62
BI-211	72.87	-----	1.23	9.424E+00	-----	Line Not Found	-----
	351.06	294	12.92*	3.893E+00	2.628E+00	2.628E+00	16.79
PB-212	74.82	316	10.28	9.405E+00	1.469E+00	1.469E+00	22.20
	77.11	471	17.10	9.382E+00	1.322E+00	1.322E+00	14.98
	238.63	497	43.60*	5.476E+00	9.371E-01	9.371E-01	11.95
	300.09	26	3.30	4.479E+00	7.962E-01	7.962E-01	146.20
BI-214	609.32	181	45.49*	2.419E+00	7.421E-01	7.424E-01	21.77
	1120.29	28	14.92	1.442E+00	5.778E-01	5.780E-01	139.21
	1764.49	28	15.30	9.335E-01	8.916E-01	8.919E-01	38.47
PB-214	74.82	316	5.80	9.405E+00	2.604E+00	2.605E+00	22.20
	77.11	471	9.70	9.382E+00	2.331E+00	2.332E+00	14.98
	87.09	296	3.41	9.261E+00	4.216E+00	4.218E+00	29.40
	242.00	124	7.25	5.418E+00	1.423E+00	1.424E+00	45.30
	295.22	156	18.42	4.550E+00	8.355E-01	8.358E-01	25.28
	351.93	294	35.60*	3.893E+00	9.536E-01	9.540E-01	16.79
RN-222	609.32	181	45.49*	2.419E+00	7.421E-01	7.424E-01	21.77
	1120.29	28	14.92	1.442E+00	5.778E-01	5.780E-01	139.21
	1764.49	28	15.30	9.335E-01	8.916E-01	8.919E-01	38.47
RA-224	240.99	124	4.10*	5.418E+00	2.516E+00	2.516E+00	45.30
RA-226	609.32	181	45.49*	2.419E+00	7.421E-01	7.424E-01	21.77
	1120.29	28	14.92	1.442E+00	5.778E-01	5.780E-01	139.21
	1764.49	28	15.30	9.335E-01	8.916E-01	8.919E-01	38.47
AC-228	105.21	-----	1.10	8.977E+00	-----	Line Not Found	-----
	338.32	69	11.27	4.031E+00	6.879E-01	6.879E-01	54.05
	794.95	-----	4.25	1.935E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.856E+00	-----	Line Not Found	-----
	911.20	98	25.80*	1.725E+00	9.939E-01	9.939E-01	24.61
	968.97	35	15.80	1.636E+00	6.143E-01	6.143E-01	71.84
RA-228	105.21	-----	1.10	8.977E+00	-----	Line Not Found	-----
	338.32	69	11.27	4.031E+00	6.879E-01	6.879E-01	54.05
	794.95	-----	4.25	1.935E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.856E+00	-----	Line Not Found	-----
	911.20	98	25.80*	1.725E+00	9.939E-01	9.939E-01	24.61
	968.97	35	15.80	1.636E+00	6.143E-01	6.143E-01	71.84
TH-228	74.82	316	10.28	9.405E+00	1.469E+00	1.469E+00	22.20
	77.11	471	17.10	9.382E+00	1.322E+00	1.322E+00	14.98

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	238.63	497	43.60*	5.476E+00	9.371E-01	9.371E-01	11.95
	300.09	26	3.30	4.479E+00	7.962E-01	7.962E-01	146.20
TH-229	85.43	86	14.70	9.313E+00	2.827E-01	2.828E-01	68.42
	88.47	296	24.00	9.261E+00	5.990E-01	5.991E-01	29.40
	193.51	-----	4.41*	6.496E+00	-----	Line Not Found	-----
	210.85	74	2.80	6.083E+00	1.951E+00	1.951E+00	60.83
TH-230	609.32	181	45.49*	2.419E+00	7.421E-01	7.421E-01	21.77
	1120.29	28	14.92	1.442E+00	5.778E-01	5.778E-01	139.21
	1764.49	28	15.30	9.335E-01	8.916E-01	8.916E-01	38.47
PA-231	283.69	-----	1.70	4.715E+00	-----	Line Not Found	-----
	301.36	26	5.35*	4.479E+00	4.911E-01	4.911E-01	146.20
TH-232	105.21	-----	1.10	8.977E+00	-----	Line Not Found	-----
	338.32	69	11.27	4.031E+00	6.879E-01	6.879E-01	54.05
	835.71	-----	1.61	1.856E+00	-----	Line Not Found	-----
	911.20	98	25.80*	1.725E+00	9.939E-01	9.939E-01	24.61
	968.97	35	15.80	1.636E+00	6.143E-01	6.143E-01	71.84
TH-234	63.29	45	3.70*	9.543E+00	5.752E-01	5.752E-01	192.38
	92.59	192	4.23	9.200E+00	2.221E+00	2.221E+00	39.28
U-234	609.32	181	45.49*	2.419E+00	7.421E-01	7.421E-01	21.77
	1120.29	28	14.92	1.442E+00	5.778E-01	5.778E-01	139.21
	1764.49	28	15.30	9.335E-01	8.916E-01	8.916E-01	38.47
U-235	89.96	296	3.47	9.261E+00	4.143E+00	4.143E+00	29.40
	93.35	192	5.60	9.200E+00	1.677E+00	1.677E+00	39.28
	143.76	-----	10.96*	7.922E+00	-----	Line Not Found	-----
	163.33	-----	5.08	7.333E+00	-----	Line Not Found	-----
	185.72	125	57.20	6.696E+00	1.475E-01	1.475E-01	49.63
	205.31	-----	5.01	6.202E+00	-----	Line Not Found	-----
U-238	63.29	45	3.70*	9.543E+00	5.752E-01	5.752E-01	192.38
	92.59	192	4.23	9.200E+00	2.221E+00	2.221E+00	39.28
AM-243	43.53	-----	5.90	8.344E+00	-----	Line Not Found	-----
	74.66	316	67.20*	9.405E+00	2.247E-01	2.247E-01	22.20
ANH-511	511.00	68	100.00*	2.808E+00	1.086E-01	1.086E-01	61.15

Flag: "*" = Keyline

Total number of lines in spectrum 49
 Number of unidentified lines 12
 Number of lines tentatively identified by NID 37 75.51%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.245E+01	1.245E+01	0.136E+01	10.91	
CD-109	461.40D	1.60	3.886E+00	6.236E+00	1.833E+00	29.40	
SN-126	2.30E+05Y	1.00	3.886E-01	3.886E-01	1.142E-01	29.40	
BA-137M	30.08Y	1.02	4.661E-02	4.754E-02	4.155E-02	87.40	
CS-137	30.08Y	1.02	4.924E-02	5.023E-02	4.390E-02	87.40	
TL-208	1.41E+10Y	1.00	2.099E-01	2.099E-01	0.756E-01	36.00	
PB-210	22.20Y	1.03	9.292E-01	9.546E-01	9.033E-01	94.62	
BI-211	7.04E+08Y	1.00	2.628E+00	2.628E+00	0.441E+00	16.79	
PB-212	1.41E+10Y	1.00	9.371E-01	9.371E-01	1.120E-01	11.95	
BI-214	1600.00Y	1.00	7.421E-01	7.424E-01	1.616E-01	21.77	
PB-214	1600.00Y	1.00	9.536E-01	9.540E-01	1.602E-01	16.79	
RN-222	1600.00Y	1.00	7.421E-01	7.424E-01	1.616E-01	21.77	
RA-224	1.41E+10Y	1.00	2.516E+00	2.516E+00	1.140E+00	45.30	
RA-226	1600.00Y	1.00	7.421E-01	7.424E-01	1.616E-01	21.77	
AC-228	1.41E+10Y	1.00	9.939E-01	9.939E-01	2.446E-01	24.61	
RA-228	1.41E+10Y	1.00	9.939E-01	9.939E-01	2.446E-01	24.61	
TH-228	1.41E+10Y	1.00	9.371E-01	9.371E-01	1.120E-01	11.95	
TH-229	7340.00Y	1.00	5.990E-01	5.991E-01	1.761E-01	29.40	K
TH-230	7.54E+04Y	1.00	7.421E-01	7.421E-01	1.616E-01	21.77	
PA-231	7.04E+08Y	1.00	4.911E-01	4.911E-01	7.180E-01	146.20	
TH-232	1.41E+10Y	1.00	9.939E-01	9.939E-01	2.446E-01	24.61	
TH-234	4.47E+09Y	1.00	5.752E-01	5.752E-01	11.06E-01	192.38	
U-234	2.45E+05Y	1.00	7.421E-01	7.421E-01	1.616E-01	21.77	
U-235	7.04E+08Y	1.00	1.475E-01	1.475E-01	0.732E-01	49.63	K
U-238	4.47E+09Y	1.00	5.752E-01	5.752E-01	11.06E-01	192.38	
AM-243	7370.00Y	1.00	2.247E-01	2.247E-01	0.499E-01	22.20	
ANH-511	1.00E+09Y	1.00	1.086E-01	1.086E-01	0.664E-01	61.15	
Total Activity :			3.534E+01	3.772E+01			

Grand Total Activity : 3.534E+01 3.772E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	57.57	26	199	0.98	114.63	113	6	5.03E-03	****	9.63E+00	T
0	128.95	25	162	0.96	257.38	253	8	5.23E-03	****	8.36E+00	T
0	177.16	16	58	1.25	353.79	351	5	3.49E-03	****	6.93E+00	T
0	178.79	26	94	1.10	357.04	356	7	5.64E-03	****	6.89E+00	
0	191.54	17	65	0.90	382.54	379	6	3.84E-03	****	6.55E+00	
0	270.37	60	75	2.58	540.20	535	9	1.39E-02	63.9	4.92E+00	T
2	293.03	29	45	1.49	585.52	582	16	6.85E-03	****	4.58E+00	T
0	422.96	12	29	0.63	845.40	841	6	2.98E-03	****	3.31E+00	T
0	463.13	30	18	1.45	925.75	922	8	7.29E-03	67.3	3.06E+00	T
0	527.08	18	17	1.41	1053.66	1049	10	4.44E-03	****	2.74E+00	T
0	563.56	18	14	1.89	1126.63	1122	10	4.46E-03	96.6	2.58E+00	T
0	683.77	8	26	3.26	1367.12	1359	10	2.03E-03	****	2.20E+00	
0	704.20	21	34	4.88	1408.00	1400	16	5.56E-03	****	2.14E+00	
0	770.18	7	41	0.59	1539.99	1530	14	1.77E-03	****	1.99E+00	
0	796.52	8	26	1.17	1592.69	1587	9	2.13E-03	****	1.93E+00	T
0	805.08	16	11	4.41	1609.82	1602	14	4.10E-03	****	1.91E+00	
0	814.59	9	12	0.60	1628.84	1624	8	2.40E-03	****	1.90E+00	T
0	981.44	10	4	1.46	1962.71	1958	9	2.59E-03	****	1.62E+00	
0	1105.03	31	19	6.14	2210.03	2195	25	8.62E-03	83.3	1.46E+00	
0	1239.96	7	30	0.67	2480.08	2471	12	2.05E-03	****	1.32E+00	
0	1260.11	15	6	1.61	2520.40	2513	13	4.14E-03	87.1	1.30E+00	T
0	1265.43	16	0	1.39	2531.06	2526	10	4.44E-03	50.0	1.29E+00	
0	1376.80	20	2	2.39	2753.97	2749	11	5.74E-03	53.5	1.20E+00	
0	1389.44	7	2	1.56	2779.27	2775	8	1.91E-03	****	1.19E+00	

Flags: "T" = Tentatively associated


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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
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DETECTOR AND SAMPLE DATA

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* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235033.CNF;1
* Acquisition date   : 3-OCT-2016 09:15:18 Sensitivity      : 3.000
* Detector ID        : GAM25 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.54 Half life ratio  : *****
* Sample date        : 23-NOV-2015 11:53:00 Nuclide Library : SOLID
* Sample ID          : G405235033 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity  : 1.6679E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
* Dry Weight         : 0.00000
*****
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CALIBRATION INFORMATION

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* Eff. Cal. date    : 1-AUG-2016 08:41:33 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM25_CAN.CNF;15
*****
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.044E-01
CD-109	4.300E-01
SN-126	2.676E-02
BA-137M	2.747E-02
CS-137	2.902E-02
TL-208	2.282E-02
PB-210	2.549E-01
BI-211	1.067E-01
PB-212	3.415E-02
BI-214	4.573E-02
PB-214	1.324E-01
RN-222	4.573E-02
RA-224	3.667E-01
RA-226	4.573E-02
AC-228	8.086E-02
RA-228	8.086E-02
TH-228	3.415E-02
TH-229	2.830E-01
TH-230	4.571E-02
PA-231	2.613E-01
TH-232	8.086E-02
TH-234	3.311E-01
U-234	4.571E-02
U-235	1.066E-01
U-238	3.311E-01
AM-243	1.797E-02
ANH-511	1.698E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.090E+01	NOT IDENT.
NA-22	3.827E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.009E-02	NOT IDENT.

SC-46	2.590E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.906E-02	NOT IDENT.
CO-56	4.172E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	2.473E-02	NOT IDENT.
CO-58	4.369E-01	NOT IDENT.
FE-59	5.448E+00	NOT IDENT.
CO-60	2.554E-02	NOT IDENT.
ZN-65	1.492E-01	NOT IDENT.
GE-68	1.924E+00	NOT IDENT.
AS-73	1.556E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.463E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	3.944E-01	NOT IDENT.
KR-85	5.584E+00	NOT IDENT.
SR-85	6.903E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.815E-01	NOT IDENT.
Y-91	5.053E+02	NOT IDENT.
NB-94	2.762E-02	NOT IDENT.
NB-95	6.696E-01	NOT IDENT.
NB-95M	1.741E+00	NOT IDENT.
ZR-95	1.255E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	1.876E-02	NOT IDENT.
RH-102	4.887E-02	NOT IDENT.
RU-103	4.338E+00	FAIL ABUN
RH-106	3.881E-01	NOT IDENT.
RU-106	3.881E-01	NOT IDENT.
AG-108M	2.094E-02	NOT IDENT.
AG-110M	6.742E-02	NOT IDENT.
SN-113	1.605E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	8.605E-02	NOT IDENT.
SB-124	2.347E+00	NOT IDENT.
SB-125	7.593E-02	FAIL ABUN
TE-125M	1.672E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.752E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	4.714E-02	FAIL ABUN
CS-135	9.612E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	7.188E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.928E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.096E-01	NOT IDENT.
PM-144	4.029E-02	NOT IDENT.
PR-144	3.531E+00	NOT IDENT.
PM-146	2.658E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	4.670E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.978E-02	FAIL ABUN
EU-152	6.172E-02	NOT IDENT.
GD-153	8.850E-02	NOT IDENT.
EU-154	9.379E-02	NOT IDENT.
EU-155	5.849E-02	NOT IDENT.
TB-160	1.715E+00	FAIL ABUN
HO-166M	3.728E-02	FAIL ABUN
TM-171	3.075E+00	NOT IDENT.
HF-172	1.256E-01	FAIL ABUN

LU-172	6.290E-02	FAIL ABUN
LU-176	1.646E-02	FAIL ABUN
HF-181	3.720E+00	FAIL ABUN
TA-182	7.831E-01	FAIL ABUN
RE-183	7.901E-01	FAIL ABUN
RE-184	3.093E+01	NOT IDENT.
W-188	8.078E+01	FAIL ABUN
IR-192	3.692E-01	FAIL ABUN
HG-203	2.032E+00	NOT IDENT.
BI-207	4.109E-02	FAIL ABUN
PB-211	4.365E-01	NOT IDENT.
BI-212	5.014E-01	NOT IDENT.
RN-219	2.636E-01	FAIL ABUN
RA-223	4.248E-01	FAIL ABUN
AC-227	1.459E-01	FAIL ABUN
TH-227	1.459E-01	FAIL ABUN
TH-231	4.248E-01	FAIL ABUN
PA-233	3.967E-02	FAIL ABUN
PA-234	2.304E-01	NOT IDENT.
PA-234M	3.201E+00	NOT IDENT.
NP-237	3.967E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.225E-01	NOT IDENT.
PU-239	1.902E+02	FAIL ABUN
AM-241	3.017E-02	NOT IDENT.
CM-243	4.913E-02	NOT IDENT.
BK-247	4.712E-02	FAIL ABUN
CM-247	2.467E-02	NOT IDENT.
CF-249	2.348E-02	NOT IDENT.
CF-251	6.124E-02	FAIL ABUN

```

*****
*                                     GEL Laboratories LLC                       *
*                                     2040 Savage Road                          *
*                                     Charleston, SC 29407                       *
*****
*                                     DETECTOR AND SAMPLE DATA                  *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235033.CNF;1
* Acquisition date   : 3-OCT-2016 09:15:18 Sensitivity      : 3.000
* Detector ID       : GAM25 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.54 Half life ratio : *****
* Sample date       : 23-NOV-2015 11:53:00 Nuclide Library : SOLID
* Sample ID         : G405235033 Analyst initials: MXR1
* Batch Number      : 1596249 Sample Quantity : 1.6679E+02 GRAM
* Wet wt corr       : 1.00000 Quantity Err(%) : 1.1991E-03 %
* Wet Weight        : 0.00000
* Dry Weight         : 0.00000
*****
*                                     CALIBRATION INFORMATION                    *
*
* Eff. Cal. date    : 1-AUG-2016 08:41:33 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM25_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.245E+01	1.481E+00	1.481E+00
CD-109	5.000E+00	1.874E+00	1.874E+00
SN-126	3.116E-01	1.156E-01	1.156E-01
BA-137M	4.754E-02	4.077E-02	4.077E-02
CS-137	5.023E-02	4.307E-02	4.307E-02
TL-208	2.099E-01	7.458E-02	7.458E-02
PB-210	9.546E-01	8.888E-01	8.888E-01
BI-211	3.254E-01	7.294E-01	7.294E-01
PB-212	9.371E-01	1.204E-01	1.204E-01
BI-214	7.424E-01	1.616E-01	1.616E-01
PB-214	9.540E-01	1.619E-01	1.619E-01
RN-222	7.424E-01	1.616E-01	1.616E-01
RA-224	1.039E+00	1.181E+00	1.181E+00
RA-226	7.424E-01	1.616E-01	1.616E-01
AC-228	9.939E-01	2.450E-01	2.450E-01
RA-228	9.939E-01	2.450E-01	2.450E-01
TH-228	9.371E-01	1.204E-01	1.204E-01
TH-229	-1.356E-01	3.616E-01	3.616E-01
TH-230	7.421E-01	1.615E-01	1.615E-01
PA-231	4.911E-01	7.114E-01	7.114E-01
TH-232	9.939E-01	2.450E-01	2.450E-01
TH-234	5.752E-01	1.092E+00	1.092E+00
U-234	7.421E-01	1.615E-01	1.615E-01
U-235	-6.673E-02	1.224E-01	1.224E-01
U-238	5.752E-01	1.092E+00	1.092E+00
AM-243	1.526E-01	5.366E-02	5.366E-02
ANH-511	1.086E-01	6.524E-02	6.524E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	5.797E+00	1.151E+01	1.180E+01	NOT IDENT.
NA-22	7.739E-03	4.402E-02	4.416E-02	NOT IDENT.
NA-24	-1.000E+41	6.763E+41	0.000E+00	SHORT HLIF

AL-26	-4.657E-03	2.551E-02	2.560E-02	NOT IDENT.
SC-46	-7.630E-02	3.097E-01	3.116E-01	FAIL ABUN
V-48	-1.526E+03	2.247E+04	2.248E+04	SHORT HLIF
CR-51	-1.861E+02	4.592E+02	4.668E+02	SHORT HLIF
MN-54	2.332E-02	6.354E-02	6.440E-02	NOT IDENT.
CO-56	-1.888E-02	4.738E-01	4.739E-01	NOT IDENT.
MN-56	-1.000E+41	3.414E+42	0.000E+00	SHORT HLIF
CO-57	-1.701E-02	2.808E-02	2.911E-02	NOT IDENT.
CO-58	1.488E-01	5.994E-01	6.032E-01	NOT IDENT.
FE-59	-1.548E+00	6.510E+00	6.547E+00	NOT IDENT.
CO-60	-2.902E-02	3.784E-02	4.004E-02	NOT IDENT.
ZN-65	6.868E-02	1.823E-01	1.849E-01	NOT IDENT.
GE-68	-2.094E-01	2.278E+00	2.280E+00	NOT IDENT.
AS-73	-5.035E-02	1.581E+00	1.582E+00	NOT IDENT.
AS-74	-6.126E+02	9.573E+03	9.577E+03	SHORT HLIF
SE-75	1.970E-02	1.682E-01	1.685E-01	NOT IDENT.
BR-77	1.363E+40	1.239E+41	0.000E+00	SHORT HLIF
SR-82	-2.913E+02	8.814E+02	8.911E+02	SHORT HLIF
RB-83	-3.363E-01	5.131E-01	5.351E-01	NOT IDENT.
KR-85	5.943E+00	5.612E+00	6.219E+00	NOT IDENT.
SR-85	7.311E-01	6.941E-01	7.684E-01	NOT IDENT.
RB-86	-1.944E+01	4.543E+04	4.543E+04	SHORT HLIF
Y-88	-8.004E-02	2.411E-01	2.438E-01	NOT IDENT.
Y-91	-4.258E+02	6.692E+02	6.961E+02	NOT IDENT.
NB-94	2.705E-02	2.875E-02	3.123E-02	NOT IDENT.
NB-95	5.409E-01	7.551E-01	7.935E-01	NOT IDENT.
NB-95M	5.313E-01	2.103E+00	2.117E+00	NOT IDENT.
ZR-95	-1.002E-01	1.520E+00	1.521E+00	NOT IDENT.
NB-97	1.000E+41	2.735E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	6.038E+41	0.000E+00	SHORT HLIF
MO-99	-5.458E+32	5.757E+33	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	1.017E+42	0.000E+00	SHORT HLIF
RH-101	7.546E-04	2.171E-02	2.171E-02	NOT IDENT.
RH-102	2.362E-02	5.357E-02	5.462E-02	NOT IDENT.
RU-103	-2.313E+00	5.471E+00	5.569E+00	FAIL ABUN
RH-106	5.091E-02	4.445E-01	4.451E-01	NOT IDENT.
RU-106	5.091E-02	4.445E-01	4.451E-01	NOT IDENT.
AG-108M	1.429E-02	2.159E-02	2.253E-02	NOT IDENT.
AG-110M	-5.220E-02	8.609E-02	8.925E-02	NOT IDENT.
SN-113	-1.333E-01	1.933E-01	2.024E-01	NOT IDENT.
CD-115	1.000E+41	1.031E+41	0.000E+00	SHORT HLIF
SN-117M	6.966E+04	1.368E+05	1.403E+05	SHORT HLIF
TE-123M	2.838E-02	9.221E-02	9.309E-02	NOT IDENT.
SB-124	1.014E+00	2.488E+00	2.530E+00	NOT IDENT.
SB-125	-3.301E-03	8.494E-02	8.496E-02	FAIL ABUN
TE-125M	-1.522E+01	1.787E+02	1.789E+02	NOT IDENT.
I-126	8.265E+05	2.043E+06	2.077E+06	SHORT HLIF
SB-126	3.727E+05	1.895E+06	1.903E+06	SHORT HLIF
SB-127	2.244E+22	2.797E+23	0.000E+00	SHORT HLIF
I-131	7.160E+08	1.408E+10	1.408E+10	SHORT HLIF
I-132	1.000E+41	4.736E+42	0.000E+00	SHORT HLIF
TE-132	4.058E+27	7.878E+27	0.000E+00	SHORT HLIF
BA-133	1.032E-02	3.174E-02	3.208E-02	NOT IDENT.
I-133	-1.000E+41	8.397E+41	0.000E+00	SHORT HLIF
CS-134	2.949E-02	7.057E-02	7.181E-02	FAIL ABUN
CS-135	4.657E-02	1.154E-01	1.172E-01	NOT IDENT.
I-135	1.000E+41	7.166E+41	0.000E+00	SHORT HLIF
CS-136	-4.422E+05	6.684E+05	6.975E+05	SHORT HLIF
CE-139	-5.265E-02	8.502E-02	8.827E-02	NOT IDENT.
BA-140	-5.634E+05	2.373E+06	2.386E+06	SHORT HLIF
LA-140	-2.105E+05	9.284E+05	9.332E+05	SHORT HLIF
CE-141	-8.118E+00	2.186E+01	2.217E+01	NOT IDENT.
CE-143	1.000E+41	9.912E+40	0.000E+00	SHORT HLIF
CE-144	-1.102E-01	2.363E-01	2.414E-01	NOT IDENT.
PM-144	3.034E-02	4.216E-02	4.432E-02	NOT IDENT.
PR-144	2.670E+00	3.692E+00	3.883E+00	NOT IDENT.
PM-146	3.413E-04	2.975E-02	2.975E-02	NOT IDENT.
ND-147	-4.752E+05	6.760E+07	6.760E+07	SHORT HLIF
PM-147	1.649E+02	4.870E+02	4.926E+02	NOT IDENT.
PM-149	-1.000E+41	1.585E+41	0.000E+00	SHORT HLIF
EU-150	3.398E-02	1.924E-02	2.460E-02	FAIL ABUN
EU-152	1.815E-03	6.684E-02	6.685E-02	NOT IDENT.
GD-153	-3.060E-02	9.653E-02	9.751E-02	NOT IDENT.
EU-154	2.098E-02	1.075E-01	1.079E-01	NOT IDENT.
EU-155	2.049E-02	6.033E-02	6.103E-02	NOT IDENT.
TB-160	1.399E+00	1.715E+00	1.827E+00	FAIL ABUN
HO-166M	-2.306E-02	4.848E-02	4.958E-02	FAIL ABUN
TM-171	2.265E+00	2.974E+00	3.144E+00	NOT IDENT.

HF-172	1.815E-02	1.438E-01	1.440E-01	FAIL	ABUN
LU-172	5.152E-02	6.546E-02	6.946E-02	FAIL	ABUN
LU-176	-5.952E-03	2.034E-02	2.052E-02	FAIL	ABUN
HF-181	-5.165E-01	4.276E+00	4.282E+00	FAIL	ABUN
TA-182	1.570E-01	8.981E-01	9.009E-01	FAIL	ABUN
RE-183	7.872E-01	1.657E+00	1.694E+00	FAIL	ABUN
RE-184	-5.474E+00	3.611E+01	3.620E+01	NOT	IDENT.
W-188	-7.519E+00	1.050E+02	1.050E+02	FAIL	ABUN
IR-192	-9.633E-02	4.069E-01	4.092E-01	FAIL	ABUN
HG-203	-1.666E+00	2.575E+00	2.682E+00	NOT	IDENT.
BI-207	-7.231E-03	4.892E-02	4.903E-02	FAIL	ABUN
PB-211	-6.909E-02	4.916E-01	4.926E-01	NOT	IDENT.
BI-212	5.654E-01	5.262E-01	5.846E-01	NOT	IDENT.
RN-219	2.788E-02	2.881E-01	2.884E-01	FAIL	ABUN
RA-223	-1.224E-01	4.699E-01	4.731E-01	FAIL	ABUN
AC-227	-2.602E-02	1.728E-01	1.732E-01	FAIL	ABUN
TH-227	-2.602E-02	1.728E-01	1.732E-01	FAIL	ABUN
TH-231	-1.224E-01	4.699E-01	4.731E-01	FAIL	ABUN
PA-233	-2.878E-02	4.549E-02	4.730E-02	FAIL	ABUN
PA-234	1.176E-01	2.794E-01	2.844E-01	NOT	IDENT.
PA-234M	-1.218E+00	3.796E+00	3.835E+00	NOT	IDENT.
NP-237	-2.878E-02	4.549E-02	4.730E-02	FAIL	ABUN
NP-238	-1.000E+41	9.347E+41	0.000E+00	SHORT	HLIF
NP-239	-6.581E-02	1.367E-01	1.399E-01	NOT	IDENT.
PU-239	2.092E+02	4.328E+02	4.430E+02	FAIL	ABUN
AM-241	-2.037E-02	3.830E-02	3.938E-02	NOT	IDENT.
CM-243	1.669E-02	5.054E-02	5.110E-02	NOT	IDENT.
BK-247	9.306E-03	5.386E-02	5.402E-02	FAIL	ABUN
CM-247	1.127E-02	2.599E-02	2.649E-02	NOT	IDENT.
CF-249	-2.139E-02	2.852E-02	3.011E-02	NOT	IDENT.
CF-251	5.937E-02	9.904E-02	1.026E-01	FAIL	ABUN

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	53.3078	87.09	63.1127	136.47	52.2037
45.60	66.9659	87.57	63.2048	140.51	0.0000
46.54	67.2744	88.03	63.2928	143.76	68.7161
49.72	0.0000	88.34	63.3521	144.24	61.9060
51.35	77.7822	88.47	63.3770	145.44	59.1028
51.87	68.9688	89.96	63.6598	152.43	65.9285
52.39	56.3553	1093.63	63.7880	153.25	0.0000
52.97	55.7473	91.11	0.0000	323.87	62.1495
53.44	73.9804	92.59	63.5753	156.02	0.0000
54.07	77.9694	93.35	63.7152	158.56	0.0000
57.36	0.0000	94.56	63.9373	159.00	51.5953
57.53	70.6758	94.65	54.6512	162.33	70.2455
57.98	70.8071	94.67	54.6545	162.66	0.0000
59.27	89.7519	94.87	54.6856	163.33	53.0370
59.32	89.7701	97.43	70.3174	165.86	70.7056
59.54	89.8506	98.43	66.9876	176.31	62.6450
60.96	90.3644	98.44	66.9894	176.60	0.0000
61.17	90.4400	99.53	56.5820	177.52	20.9256
62.93	100.4888	100.11	55.7864	181.07	0.0000
63.29	100.6294	102.03	65.8696	181.52	61.1037
63.58	100.7422	103.18	55.3583	184.41	58.2281
64.28	101.0137	103.37	55.3867	143.76	58.3561
66.73	80.7121	105.21	64.6342	193.51	60.1853
67.24	87.2493	105.31	64.6512	197.03	52.9612
125.81	97.5157	106.12	61.1892	198.01	62.7861
67.75	98.3403	106.47	63.0466	201.83	62.0767
69.67	90.9806	109.28	62.5981	203.43	56.7734
70.83	86.2386	111.00	70.1613	205.31	62.4142
72.81	95.2553	111.76	0.0000	210.85	50.7968
72.87	95.2749	114.06	67.0268	215.65	57.8367
74.66	95.8659	116.30	0.0000	222.11	46.0362
74.82	95.9176	116.74	64.6957	227.09	56.5437
74.97	95.9667	119.76	60.5120	227.38	57.6987
77.11	96.6630	121.12	56.0371	228.16	0.0000
78.74	79.7424	121.22	56.0504	228.18	45.3052
79.69	91.1005	121.78	61.7365	116.74	45.3052
80.12	83.4404	122.06	62.7133	235.69	44.2570
80.19	0.0000	122.92	49.7089	235.96	44.2735
80.57	85.2329	123.07	46.9116	238.63	52.8632
81.00	71.4050	265.00	53.5549	238.98	0.0000
81.07	71.4212	125.81	55.3921	240.99	53.0331
81.75	73.8136	127.23	60.6226	242.00	53.1054
83.79	83.2967	127.91	59.7679	244.70	50.9811
84.00	83.3516	129.30	59.9546	252.40	0.0000
85.43	71.2781	131.20	62.4393	252.80	50.3578
86.55	63.0089	133.02	63.3292	254.15	0.0000
86.79	63.0546	133.52	71.0834	256.23	43.5237
86.94	63.0839	136.00	55.0483	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	36.8579	355.39	0.0000	584.27	19.9107
264.80	35.6754	356.01	26.2988	595.83	0.0000
265.00	36.8740	364.49	0.0000	427.87	20.1171
268.22	38.2158	366.42	0.0000	602.52	0.0000
269.46	33.4901	372.51	40.9678	604.72	14.3300
270.03	33.5140	375.05	35.7088	607.14	14.3514
271.23	35.1619	377.52	38.4753	609.32	21.2907
273.65	0.0000	356.01	33.3009	610.33	21.3037
276.40	39.8069	388.16	36.1426	614.28	17.6179
277.37	48.3069	388.63	0.0000	618.01	20.3336
277.60	48.3203	391.69	35.3517	620.36	12.8604
278.00	42.3006	264.66	26.4978	621.93	20.3816
279.20	53.2544	401.81	28.3542	630.19	0.0000
279.54	56.9083	402.40	24.7083	631.29	19.4180
279.70	56.9198	404.85	28.4299	633.25	24.8409
280.46	46.0620	410.95	37.8010	634.78	0.0000
283.69	48.6731	413.71	25.8769	635.95	12.9810
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	53.6492	423.72	0.0000	645.85	11.9686
285.90	0.0000	427.09	20.5637	657.76	18.0778
287.50	39.1133	427.87	29.9303	657.90	0.0000
290.67	35.9863	433.94	21.6210	661.66	25.2555
293.27	0.0000	439.40	22.6621	664.57	0.0000
351.93	34.5309	453.88	19.1064	666.33	0.0000
295.96	34.5599	463.37	24.0621	666.50	0.0000
879.38	29.7114	468.07	28.0141	667.71	0.0000
299.98	34.7180	473.00	0.0000	677.62	14.9584
300.09	34.7223	475.06	29.1364	685.70	0.0000
300.13	34.7240	476.78	20.4219	695.00	0.0000
301.36	31.4602	477.60	19.4617	696.49	11.1963
302.85	38.1471	482.18	23.4351	696.51	11.1967
256.23	43.2021	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	16.8024
306.78	42.4792	497.08	19.7469	697.49	16.8036
308.46	42.5581	505.52	20.8620	702.65	16.8512
311.90	46.0694	507.63	0.0000	706.68	21.9542
316.51	41.2490	511.00	18.9497	711.68	21.4492
319.41	0.0000	514.00	18.9900	720.70	0.0000
320.08	0.0000	514.00	18.9907	721.93	0.0000
321.04	42.2963	520.40	20.0806	722.78	15.8981
323.87	42.4235	520.69	0.0000	722.91	15.8993
325.23	46.7330	522.65	0.0000	723.31	17.0386
328.76	0.0000	527.90	0.0000	724.19	29.5473
333.37	31.8779	528.26	16.6584	727.33	23.9044
333.97	18.0067	529.59	15.1575	733.00	27.4014
334.37	24.4475	529.87	0.0000	735.93	16.0081
338.28	39.6183	531.02	0.0000	333.97	14.8768
338.32	39.6192	537.26	0.0000	739.50	0.0000
311.90	44.0222	546.56	0.0000	747.24	21.8528
340.48	44.0222	552.55	13.3438	748.06	24.1633
340.55	0.0000	563.25	14.4728	752.31	20.7568
344.28	31.1946	569.33	29.0618	753.82	0.0000
345.93	32.9817	946.00	22.8361	756.73	18.4922
351.06	23.5541	569.70	22.8397	756.80	18.4928
351.93	23.5745	583.19	19.8976	884.68	13.9199

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	8.7079	1274.44	18.3361	1620.50	3.7621
766.42	13.9370	1001.03	16.4371	1621.92	4.7043
766.84	19.7482	1002.74	14.5129	1678.03	0.0000
772.60	0.0000	1004.73	10.6512	1690.97	4.7864
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	4.8721
778.90	18.4064	1028.54	0.0000	1063.66	8.7820
783.70	0.0000	1037.84	9.8083	1771.35	5.8562
785.37	13.1895	1038.76	0.0000	1791.20	0.0000
792.07	16.9383	631.29	18.6985	1808.65	3.9383
794.95	19.7887	1048.07	0.0000	1810.72	0.0000
795.86	15.9088	1049.04	19.7009	1836.06	5.9446
810.06	7.1191	1050.41	12.8120		
810.29	10.6798	1063.66	19.8096		
344.28	10.6809	1077.00	0.0000		
810.76	9.4954	1077.34	15.9287		
815.77	0.0000	1085.87	13.9821		
1048.07	0.0000	1093.63	8.0122		
832.01	28.7734	1099.45	9.0330		
834.85	20.7083	1112.07	14.5195		
835.71	18.9153	1112.84	12.9094		
836.80	0.0000	1115.54	12.9219		
846.75	0.0000	1120.29	14.1572		
846.77	18.1067	1120.55	14.1589		
856.80	0.0000	1221.41	14.1624		
860.56	10.9329	1129.67	19.4813		
871.09	17.3927	1131.51	0.0000		
873.19	11.9114	1147.95	0.0000		
875.33	0.0000	1173.23	14.4230		
879.38	9.1879	1177.95	11.3505		
880.51	10.1118	1189.05	16.5723		
883.24	15.6465	1204.77	23.9490		
884.68	17.4982	1221.41	13.6118		
889.28	11.9967	1231.02	18.9075		
894.76	12.9507	1235.36	0.0000		
898.04	12.0431	1238.28	21.0583		
900.72	16.6943	1260.41	0.0000		
903.28	17.6414	1271.87	11.7083		
911.20	11.1801	1274.44	11.7177		
912.08	11.1844	1274.54	11.7184		
923.98	0.0000	1291.59	9.6394		
926.50	15.9427	1298.22	0.0000		
929.11	12.2050	1312.11	0.0000		
937.49	28.2651	1332.49	14.1013		
944.13	0.0000	1362.66	0.0000		
946.00	13.2374	1365.19	7.6686		
949.00	14.2003	1368.63	0.0000		
667.71	0.0000	1384.29	8.8140		
962.31	19.9900	1408.01	3.3283		
964.08	15.2417	1457.56	0.0000		
966.17	16.7804	1460.82	5.4064		
911.20	18.1355	1489.16	10.8984		
968.97	18.1355	1505.03	8.2099		
983.53	0.0000	1584.12	6.5218		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235034.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM28.CNF;265
Background date : 2-OCT-2016 11:01:35.
Sample date     : 23-NOV-2015 11:20:00 Acquisition date : 3-OCT-2016 09:15:46.
Sample ID      : G405235034 Sample quantity   : 1.52487E+02 GRAM
Detector name  : GAM28 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.42 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID      : 1596249 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	2	60.47	29	26	1.08	121.00	120	19	8.11E-03	24.6	3.57E+00
2	2	63.24*	42	114	1.32	126.54	120	19	1.17E-02	50.2	
3	2	75.22*	141	147	1.32	150.53	143	21	3.93E-02	18.8	1.93E+00
4	2	77.22	258	142	1.35	154.53	143	21	7.18E-02	10.8	
5	0	87.28	44	133	0.86	174.66	172	6	1.21E-02	44.7	
6	0	89.87	41	96	1.33	179.85	178	5	1.15E-02	39.0	
7	0	92.97*	87	151	1.64	186.05	183	8	2.41E-02	28.7	
8	0	109.97	41	94	1.49	220.08	217	8	1.13E-02	43.8	
9	0	186.34*	82	137	1.80	372.94	368	12	2.29E-02	31.7	
10	3	238.92*	450	58	1.55	478.17	474	25	1.25E-01	5.7	2.65E+00
11	3	242.24	86	65	1.80	484.82	474	25	2.39E-02	27.6	
12	0	277.86	31	70	1.26	556.11	551	10	8.54E-03	54.6	
13	0	295.76	146	69	1.32	591.93	587	10	4.05E-02	13.6	
14	0	301.27	41	78	0.98	602.97	598	11	1.13E-02	45.2	
15	0	338.61	78	66	0.92	677.70	674	9	2.16E-02	21.8	
16	0	352.21*	258	63	1.58	704.91	699	12	7.17E-02	8.9	
17	0	371.44	23	34	1.52	743.40	739	9	6.26E-03	52.1	
18	0	511.41*	46	47	3.26	1023.57	1014	17	1.29E-02	43.2	
19	0	564.49	27	32	2.23	1129.79	1123	14	7.58E-03	47.7	
20	0	579.28	19	22	1.34	1159.39	1153	9	5.15E-03	51.6	
21	0	583.86*	120	35	1.60	1168.57	1163	12	3.33E-02	13.7	
22	0	609.82*	153	42	1.87	1220.53	1214	14	4.26E-02	12.4	
23	0	662.78*	41	53	1.69	1326.52	1320	12	1.14E-02	39.8	
24	0	729.51	37	60	3.28	1460.08	1450	26	1.02E-02	59.3	
25	0	767.85*	22	21	0.74	1536.82	1530	12	6.08E-03	47.9	
26	0	861.59	35	16	2.06	1724.45	1715	16	9.85E-03	30.2	
27	0	886.67	9	7	1.16	1774.63	1771	8	2.52E-03	58.4	
28	0	911.97*	90	18	1.79	1825.28	1818	15	2.50E-02	15.1	
29	0	969.38	71	39	5.81	1940.18	1925	26	1.99E-02	26.7	
30	0	1002.53*	13	23	0.71	2006.54	1999	19	3.62E-03	95.9	
31	3	1014.01	14	0	1.39	2029.50	2028	11	3.88E-03	14.3	9.90E-01
32	3	1016.81	19	0	1.70	2035.10	2028	11	5.25E-03	22.4	
33	0	1102.17	11	5	1.23	2205.96	2200	10	3.11E-03	47.7	
34	0	1121.77*	48	34	2.03	2245.18	2238	18	1.33E-02	31.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1157.11	8	13	1.16	2315.93	2311	9	2.34E-03	85.0	
36	0	1189.83	49	0	4.71	2381.41	2371	18	1.36E-02	14.3	
37	0	1345.72	24	0	2.53	2693.42	2684	17	6.67E-03	20.4	
38	0	1461.78*	369	15	1.86	2925.71	2919	14	1.03E-01	5.7	
39	0	1592.90	5	5	0.48	3188.16	3186	6	1.39E-03	81.9	
40	0	1730.16	16	3	2.30	3462.88	3457	11	4.52E-03	31.6	
41	0	1765.64*	37	0	1.95	3533.88	3526	15	1.03E-02	17.3	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235034.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 23-NOV-2015 11:20:00 Acquisition date : 3-OCT-2016 09:15:46
Sample ID        : G405235034 Sample quantity   : 152.49 GRAM
Sample type      : SOLID Sample geometry    :
Detector name    : GAMMA28 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.42 0.0%
Energy tolerance : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error    : 0.00 %
Efficiency type  : Linear Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.237E+00	1.332E+01	1.332E+01	11.33	OK
CD-109	88.03	3.70*	5.423E+00	4.194E-01	6.731E-01	296.78	OK
TE-125M	109.28	0.27*	6.445E+00	1.441E+01	6.460E+02	87.60	OK
SN-126	64.28	9.60	2.991E+00	9.454E-01	9.454E-01	100.42	OK
	86.94	8.90	5.423E+00	1.744E-01	1.744E-01	296.78	OK
	87.57	37.00*	5.423E+00	4.194E-02	4.194E-02	296.78	OK
BA-137M	661.66	89.90*	2.303E+00	1.028E-01	1.048E-01	79.68	OK
CS-137	661.66	85.10*	2.303E+00	1.086E-01	1.107E-01	79.68	OK
HG-203	70.83	3.69	3.912E+00	-----	Line Not Found	-----	Absent
	72.87	6.19	4.138E+00	-----	Line Not Found	-----	Absent
	279.20	81.56*	4.559E+00	2.198E-02	2.382E+00	234.08	OK
TL-208	277.37	6.60	4.566E+00	-----	Line Not Found	-----	<<INT Reject
	583.19	85.00*	2.539E+00	2.920E-01	2.920E-01	27.44	OK
	860.56	12.50	1.886E+00	7.583E-01	7.583E-01	60.47	OK
BI-211	72.87	1.23	4.138E+00	-----	Line Not Found	-----	Absent
	351.06	12.92*	3.783E+00	1.015E-01	1.015E-01	910.10	OK
PB-212	74.82	10.28	4.384E+00	1.417E+00	1.417E+00	54.14	OK
	77.11	17.10	4.583E+00	2.090E+00	2.090E+00	21.68	OK
	238.63	43.60*	5.101E+00	1.160E+00	1.160E+00	11.38	OK
	300.09	3.30	4.282E+00	1.613E+00	1.613E+00	90.48	OK
BI-214	609.32	45.49*	2.455E+00	7.170E-01	7.173E-01	24.75	OK
	1120.29	14.92	1.538E+00	1.025E+00	1.025E+00	62.84	OK
	1764.49	15.30	1.044E+00	1.085E+00	1.086E+00	34.63	OK
PB-214	74.82	5.80	4.343E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	4.583E+00	3.684E+00	3.685E+00	21.68	OK
	87.09	3.41	5.409E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	5.054E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.344E+00	1.022E+00	1.023E+00	27.12	OK
	351.93	35.60*	3.786E+00	-----	Line Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.455E+00	7.170E-01	7.173E-01	24.75	OK
	1120.29	14.92	1.538E+00	1.025E+00	1.025E+00	62.84	OK
	1764.49	15.30	1.044E+00	1.085E+00	1.086E+00	34.63	OK
RA-224	240.99	4.10*	5.051E+00	5.683E-01	5.683E-01	246.02	OK
RA-226	609.32	45.49*	2.455E+00	7.170E-01	7.173E-01	24.75	OK
	1120.29	14.92	1.538E+00	1.025E+00	1.025E+00	62.84	OK
	1764.49	15.30	1.044E+00	1.085E+00	1.086E+00	34.63	OK
AC-228	105.21	1.10	6.315E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.904E+00	9.786E-01	9.786E-01	43.53	OK
	794.95	4.25	2.005E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.930E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.806E+00	9.674E-01	9.674E-01	30.11	OK
	968.97	15.80	1.723E+00	1.306E+00	1.306E+00	53.35	OK
RA-228	105.21	1.10	6.315E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.904E+00	9.786E-01	9.786E-01	43.53	OK
	794.95	4.25	2.005E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.930E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.806E+00	9.674E-01	9.674E-01	30.11	OK
	968.97	15.80	1.723E+00	1.306E+00	1.306E+00	53.35	OK
TH-228	74.82	10.28	4.384E+00	1.417E+00	1.417E+00	54.14	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	77.11	17.10	4.583E+00	2.090E+00	2.090E+00	21.68	OK
	238.63	43.60*	5.101E+00	1.160E+00	1.160E+00	11.38	OK
	300.09	3.30	4.282E+00	1.613E+00	1.613E+00	90.48	OK
TH-230	609.32	45.49*	2.455E+00	7.170E-01	7.170E-01	24.75	OK
	1120.29	14.92	1.538E+00	1.025E+00	1.025E+00	62.84	OK
	1764.49	15.30	1.044E+00	1.085E+00	1.085E+00	34.63	OK
PA-231	283.69	1.70	4.487E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.282E+00	9.950E-01	9.950E-01	90.48	OK
TH-232	105.21	1.10	6.315E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.904E+00	9.786E-01	9.786E-01	43.53	OK
	835.71	1.61	1.930E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.806E+00	9.674E-01	9.674E-01	30.11	OK
	968.97	15.80	1.723E+00	1.306E+00	1.306E+00	53.35	OK
TH-234	63.29	3.70*	2.991E+00	2.453E+00	2.453E+00	100.42	OK
	92.59	4.23	5.783E+00	2.212E+00	2.212E+00	57.47	OK
U-234	609.32	45.49*	2.455E+00	7.170E-01	7.170E-01	24.75	OK
	1120.29	14.92	1.538E+00	1.025E+00	1.025E+00	62.84	OK
	1764.49	15.30	1.044E+00	1.085E+00	1.085E+00	34.63	OK
U-235	89.96	3.47	5.597E+00	1.330E+00	1.330E+00	77.94	OK
	93.35	5.60	5.783E+00	1.671E+00	1.671E+00	57.47	OK
	143.76	10.96*	6.593E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	6.352E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.975E+00	1.413E-01	1.413E-01	63.45	OK
	205.31	5.01	5.647E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	2.991E+00	2.453E+00	2.453E+00	100.42	OK
	92.59	4.23	5.783E+00	2.212E+00	2.212E+00	57.47	OK
AM-241	59.54	35.90*	2.628E+00	2.003E-01	2.006E-01	49.14	OK
AM-243	43.53	5.90	4.883E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	4.384E+00	2.168E-01	2.168E-01	54.14	OK
ANH-511	511.00	100.00*	2.814E+00	8.764E-02	8.764E-02	86.30	OK

Flag: "*" = Keyline

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235034.CNF;1
* Acquisition date   : 3-OCT-2016 09:15:46 Sensitivity      : 3.000
* Detector ID       : GAM28 Energy tolerance: 1.500
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time: 0 01:00:00.42 Half life ratio : *****
* Sample date       : 23-NOV-2015 11:20:00 Analyst initials: MXR1
* Sample ID         : G405235034 Sample Quantity : 1.5249E+02 GRAM
* Batch Number      : 1596249 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 1-AUG-2016 10:02:35 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;10
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.332E+01	1.478E+00	6.426E-01
CD-109	6.731E-01	1.958E+00	2.032E+00
TE-125M	6.460E+02	5.546E+02	5.213E+02
SN-126	4.194E-02	1.220E-01	1.273E-01
BA-137M	1.048E-01	8.185E-02	7.083E-02
CS-137	1.107E-01	8.646E-02	7.483E-02
HG-203	2.382E+00	5.463E+00	4.560E+00
TL-208	2.920E-01	7.852E-02	4.606E-02
BI-211	1.015E-01	9.051E-01	3.331E-01
PB-212	1.160E+00	1.293E-01	8.924E-02
BI-214	7.173E-01	1.739E-01	1.093E-01
PB-214	1.059E+00	1.847E-01	3.126E-01
RN-222	7.173E-01	1.739E-01	1.093E-01
RA-224	5.683E-01	1.370E+00	9.563E-01
RA-226	7.173E-01	1.739E-01	1.093E-01
AC-228	9.674E-01	2.854E-01	1.962E-01
RA-228	9.674E-01	2.854E-01	1.962E-01
TH-228	1.160E+00	1.293E-01	8.924E-02
TH-230	7.170E-01	1.739E-01	1.093E-01
PA-231	9.950E-01	8.823E-01	6.843E-01
TH-232	9.674E-01	2.854E-01	1.962E-01
TH-234	2.453E+00	2.414E+00	2.094E+00
U-234	7.170E-01	1.739E-01	1.092E-01
U-235	-1.439E-03	1.846E-01	3.356E-01
U-238	2.453E+00	2.414E+00	2.094E+00
AM-241	2.006E-01	9.659E-02	2.451E-01
AM-243	2.168E-01	1.151E-01	8.252E-02
ANH-511	8.764E-02	7.412E-02	4.272E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	8.348E-01	1.271E+01	2.481E+01	NOT IDENT.
NA-22	-4.777E-02	4.131E-02	6.204E-02	NOT IDENT.

NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	1.547E-02	2.448E-02	6.358E-02	NOT IDENT.
SC-46	-2.201E-01	3.903E-01	6.050E-01	FAIL ABUN
V-48	0.000E+00	2.604E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	6.097E+02	0.000E+00	SHORT HLIF
MN-54	2.235E-02	5.521E-02	1.175E-01	NOT IDENT.
CO-56	-1.782E-01	5.096E-01	9.679E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.905E-02	4.852E-02	8.596E-02	NOT IDENT.
CO-58	3.946E-02	6.144E-01	1.245E+00	NOT IDENT.
FE-59	-5.883E+00	8.378E+00	1.201E+01	NOT IDENT.
CO-60	1.348E-02	3.622E-02	7.706E-02	NOT IDENT.
ZN-65	-8.759E-02	1.973E-01	3.060E-01	NOT IDENT.
GE-68	-5.803E-01	2.493E+00	4.821E+00	NOT IDENT.
AS-73	-8.156E+00	9.830E+00	1.737E+01	NOT IDENT.
AS-74	0.000E+00	1.183E+04	0.000E+00	SHORT HLIF
SE-75	1.688E-01	2.081E-01	4.340E-01	NOT IDENT.
BR-77	0.000E+00	1.894E+39	0.000E+00	SHORT HLIF
SR-82	0.000E+00	9.634E+02	0.000E+00	SHORT HLIF
RB-83	-9.954E-02	6.778E-01	1.272E+00	NOT IDENT.
KR-85	8.167E+00	6.956E+00	1.395E+01	NOT IDENT.
SR-85	1.011E+00	8.612E-01	1.727E+00	NOT IDENT.
RB-86	0.000E+00	4.938E+04	0.000E+00	SHORT HLIF
Y-88	3.775E-02	1.239E-01	3.491E-01	NOT IDENT.
Y-91	5.339E+02	5.828E+02	1.290E+03	NOT IDENT.
NB-94	1.047E-02	2.836E-02	5.633E-02	NOT IDENT.
NB-95	-6.412E-02	9.401E-01	1.676E+00	NOT IDENT.
NB-95M	5.124E-01	2.638E+00	4.747E+00	NOT IDENT.
ZR-95	4.297E-01	1.518E+00	3.168E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.037E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	9.763E+33	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-6.833E-03	3.482E-02	6.242E-02	NOT IDENT.
RH-102	-2.568E-02	5.892E-02	1.040E-01	FAIL ABUN
RU-103	2.388E-01	6.790E+00	1.308E+01	FAIL ABUN
RH-106	-3.706E-02	4.378E-01	8.279E-01	NOT IDENT.
RU-106	-3.706E-02	4.378E-01	8.279E-01	NOT IDENT.
AG-108M	1.296E-04	2.579E-02	4.959E-02	NOT IDENT.
AG-110M	-6.847E-02	1.028E-01	1.550E-01	NOT IDENT.
SN-113	-2.662E-02	2.129E-01	4.078E-01	NOT IDENT.
CD-115	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	2.107E+05	0.000E+00	SHORT HLIF
TE-123M	-5.996E-02	1.441E-01	2.499E-01	NOT IDENT.
SB-124	1.555E-01	2.448E+00	5.061E+00	NOT IDENT.
SB-125	-1.639E-03	9.043E-02	1.746E-01	NOT IDENT.
I-126	0.000E+00	2.107E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	2.542E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	3.288E+23	0.000E+00	SHORT HLIF
I-131	0.000E+00	1.683E+10	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.823E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	9.151E+27	0.000E+00	SHORT HLIF
BA-133	3.794E-03	4.035E-02	7.104E-02	FAIL ABUN
I-133	0.000E+00	1.207E+41	0.000E+00	SHORT HLIF
CS-134	4.324E-02	4.652E-02	1.030E-01	FAIL ABUN
CS-135	-1.680E-01	1.393E-01	2.434E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	6.571E+05	0.000E+00	SHORT HLIF
CE-139	-4.221E-02	1.100E-01	2.133E-01	NOT IDENT.
BA-140	0.000E+00	2.742E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	1.076E+06	0.000E+00	SHORT HLIF
CE-141	-8.592E+00	3.332E+01	5.893E+01	NOT IDENT.
CE-143	0.000E+00	1.292E+41	0.000E+00	SHORT HLIF
CE-144	-9.719E-02	3.463E-01	6.169E-01	NOT IDENT.
PM-144	-1.774E-02	6.166E-02	1.095E-01	NOT IDENT.
PR-144	-1.539E+00	5.400E+00	9.596E+00	NOT IDENT.
PM-146	3.158E-02	4.136E-02	8.603E-02	NOT IDENT.
ND-147	0.000E+00	8.050E+07	0.000E+00	SHORT HLIF
PM-147	-3.560E+02	8.368E+02	1.478E+03	NOT IDENT.
PM-149	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
EU-150	8.007E-03	2.395E-02	4.590E-02	FAIL ABUN
EU-152	-4.794E-02	9.410E-02	1.721E-01	NOT IDENT.
GD-153	-1.638E-01	1.877E-01	3.242E-01	NOT IDENT.
EU-154	-1.140E-01	1.009E-01	1.531E-01	NOT IDENT.
EU-155	6.302E-02	1.069E-01	2.070E-01	FAIL ABUN
TB-160	6.260E-02	2.053E+00	4.109E+00	FAIL ABUN
HO-166M	-5.778E-02	5.685E-02	8.882E-02	NOT IDENT.
TM-171	1.286E+01	1.988E+01	4.027E+01	NOT IDENT.

HF-172	-1.829E-01	2.340E-01	3.986E-01	FAIL ABUN
LU-172	-3.839E-02	6.747E-02	1.212E-01	FAIL ABUN
LU-176	-8.265E-03	2.379E-02	4.245E-02	FAIL ABUN
HF-181	3.274E+00	5.054E+00	1.047E+01	NOT IDENT.
TA-182	-2.729E-01	9.655E-01	1.790E+00	FAIL ABUN
RE-183	-1.981E-01	3.687E+00	6.503E+00	FAIL ABUN
RE-184	-2.086E+00	3.266E+01	6.572E+01	NOT IDENT.
W-188	-1.149E+01	1.219E+02	2.131E+02	FAIL ABUN
IR-192	2.380E-01	4.900E-01	9.945E-01	FAIL ABUN
BI-207	2.278E-02	4.652E-02	9.781E-02	FAIL ABUN
PB-210	2.036E+00	3.637E+00	7.284E+00	NOT IDENT.
PB-211	-5.210E-02	6.358E-01	1.208E+00	NOT IDENT.
BI-212	1.109E+00	6.120E-01	1.318E+00	NOT IDENT.
RN-219	2.893E-02	3.732E-01	7.197E-01	NOT IDENT.
RA-223	-8.507E-03	5.594E-01	1.080E+00	FAIL ABUN
AC-227	-2.436E-02	1.927E-01	3.749E-01	FAIL ABUN
TH-227	-2.436E-02	1.927E-01	3.749E-01	FAIL ABUN
TH-229	-2.682E-01	4.271E-01	8.053E-01	FAIL ABUN
TH-231	-8.507E-03	5.594E-01	1.080E+00	FAIL ABUN
PA-233	-1.896E-02	5.582E-02	1.048E-01	FAIL ABUN
PA-234	-1.484E-01	2.345E-01	4.231E-01	FAIL ABUN
PA-234M	3.134E+00	3.917E+00	8.979E+00	FAIL ABUN
NP-237	-1.896E-02	5.582E-02	1.048E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	-1.174E-01	2.442E-01	4.301E-01	FAIL ABUN
PU-239	1.029E+02	3.251E+02	6.050E+02	NOT IDENT.
CM-243	4.367E-02	9.608E-02	1.848E-01	FAIL ABUN
BK-247	3.465E-02	6.670E-02	1.359E-01	NOT IDENT.
CM-247	1.436E-02	3.556E-02	7.047E-02	FAIL ABUN
CF-249	1.748E-02	3.125E-02	6.464E-02	NOT IDENT.
CF-251	8.237E-02	1.084E-01	2.250E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	357	10.66*	1.237E+00	1.332E+01	1.332E+01	11.33
CD-109	88.03	55	3.70*	5.423E+00	1.361E+00	2.185E+00	89.48
TE-125M	109.28	51	0.27*	6.445E+00	1.441E+01	6.460E+02	87.60
SN-126	64.28	55	9.60	2.991E+00	9.454E-01	9.454E-01	100.42
	86.94	55	8.90	5.423E+00	5.660E-01	5.660E-01	89.48
	87.57	55	37.00*	5.423E+00	1.361E-01	1.361E-01	89.48
BA-137M	661.66	43	89.90*	2.303E+00	1.028E-01	1.048E-01	79.68
CS-137	661.66	43	85.10*	2.303E+00	1.086E-01	1.107E-01	79.68
HG-203	70.83	-----	3.69	3.912E+00	-----	Line Not Found	-----
	72.87	-----	6.19	4.138E+00	-----	Line Not Found	-----
	279.20	35	81.56*	4.559E+00	4.672E-02	5.063E+00	109.26
TL-208	277.37	35	6.60	4.559E+00	5.774E-01	5.774E-01	109.26
	583.19	128	85.00*	2.539E+00	2.920E-01	2.920E-01	27.44
	860.56	36	12.50	1.886E+00	7.583E-01	7.583E-01	60.47
BI-211	72.87	-----	1.23	4.138E+00	-----	Line Not Found	-----
	351.06	290	12.92*	3.783E+00	2.918E+00	2.918E+00	17.79
PB-212	74.82	183	10.28	4.384E+00	1.994E+00	1.994E+00	37.68
	77.11	333	17.10	4.583E+00	2.090E+00	2.090E+00	21.68
	238.63	524	43.60*	5.101E+00	1.160E+00	1.160E+00	11.38
	300.09	46	3.30	4.282E+00	1.613E+00	1.613E+00	90.48
BI-214	609.32	163	45.49*	2.455E+00	7.170E-01	7.173E-01	24.75
	1120.29	48	14.92	1.538E+00	1.025E+00	1.025E+00	62.84
	1764.49	35	15.30	1.044E+00	1.085E+00	1.086E+00	34.63
PB-214	74.82	183	5.80	4.384E+00	3.534E+00	3.536E+00	37.68
	77.11	333	9.70	4.583E+00	3.684E+00	3.685E+00	21.68
	87.09	55	3.41	5.423E+00	1.477E+00	1.478E+00	89.48
	242.00	100	7.25	5.051E+00	1.344E+00	1.344E+00	55.12
	295.22	166	18.42	4.344E+00	1.022E+00	1.023E+00	27.12
	351.93	290	35.60*	3.783E+00	1.059E+00	1.059E+00	17.79
RN-222	609.32	163	45.49*	2.455E+00	7.170E-01	7.173E-01	24.75
	1120.29	48	14.92	1.538E+00	1.025E+00	1.025E+00	62.84
	1764.49	35	15.30	1.044E+00	1.085E+00	1.086E+00	34.63
RA-224	240.99	100	4.10*	5.051E+00	2.376E+00	2.376E+00	55.12
RA-226	609.32	163	45.49*	2.455E+00	7.170E-01	7.173E-01	24.75
	1120.29	48	14.92	1.538E+00	1.025E+00	1.025E+00	62.84
	1764.49	35	15.30	1.044E+00	1.085E+00	1.086E+00	34.63
AC-228	105.21	-----	1.10	6.315E+00	-----	Line Not Found	-----
	338.32	87	11.27	3.904E+00	9.786E-01	9.786E-01	43.53
	794.95	-----	4.25	2.005E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.930E+00	-----	Line Not Found	-----
	911.20	92	25.80*	1.806E+00	9.674E-01	9.674E-01	30.11
	968.97	72	15.80	1.723E+00	1.306E+00	1.306E+00	53.35
RA-228	105.21	-----	1.10	6.315E+00	-----	Line Not Found	-----
	338.32	87	11.27	3.904E+00	9.786E-01	9.786E-01	43.53
	794.95	-----	4.25	2.005E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.930E+00	-----	Line Not Found	-----
	911.20	92	25.80*	1.806E+00	9.674E-01	9.674E-01	30.11

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	968.97	72	15.80	1.723E+00	1.306E+00	1.306E+00	53.35
	74.82	183	10.28	4.384E+00	1.994E+00	1.994E+00	37.68
	77.11	333	17.10	4.583E+00	2.090E+00	2.090E+00	21.68
TH-230	238.63	524	43.60*	5.101E+00	1.160E+00	1.160E+00	11.38
	300.09	46	3.30	4.282E+00	1.613E+00	1.613E+00	90.48
	609.32	163	45.49*	2.455E+00	7.170E-01	7.170E-01	24.75
	1120.29	48	14.92	1.538E+00	1.025E+00	1.025E+00	62.84
PA-231	1764.49	35	15.30	1.044E+00	1.085E+00	1.085E+00	34.63
	283.69	-----	1.70	4.487E+00	-----	Line Not Found	-----
TH-232	301.36	46	5.35*	4.282E+00	9.950E-01	9.950E-01	90.48
	105.21	-----	1.10	6.315E+00	-----	Line Not Found	-----
	338.32	87	11.27	3.904E+00	9.786E-01	9.786E-01	43.53
	835.71	-----	1.61	1.930E+00	-----	Line Not Found	-----
TH-234	911.20	92	25.80*	1.806E+00	9.674E-01	9.674E-01	30.11
	968.97	72	15.80	1.723E+00	1.306E+00	1.306E+00	53.35
	63.29	55	3.70*	2.991E+00	2.453E+00	2.453E+00	100.42
U-234	92.59	110	4.23	5.783E+00	2.212E+00	2.212E+00	57.47
	609.32	163	45.49*	2.455E+00	7.170E-01	7.170E-01	24.75
U-235	1120.29	48	14.92	1.538E+00	1.025E+00	1.025E+00	62.84
	1764.49	35	15.30	1.044E+00	1.085E+00	1.085E+00	34.63
	89.96	52	3.47	5.597E+00	1.330E+00	1.330E+00	77.94
U-238	93.35	110	5.60	5.783E+00	1.671E+00	1.671E+00	57.47
	143.76	-----	10.96*	6.593E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.352E+00	-----	Line Not Found	-----
	185.72	98	57.20	5.975E+00	1.413E-01	1.413E-01	63.45
	205.31	-----	5.01	5.647E+00	-----	Line Not Found	-----
AM-241	63.29	55	3.70*	2.991E+00	2.453E+00	2.453E+00	100.42
	92.59	110	4.23	5.783E+00	2.212E+00	2.212E+00	57.47
AM-243	59.54	38	35.90*	2.628E+00	2.003E-01	2.006E-01	49.14
ANH-511	43.53	-----	5.90	4.883E-01	-----	Line Not Found	-----
	74.66	183	67.20*	4.384E+00	3.050E-01	3.051E-01	37.68
	511.00	50	100.00*	2.814E+00	8.764E-02	8.764E-02	86.30

Flag: "*" = Keyline

Total number of lines in spectrum 41
 Number of unidentified lines 10
 Number of lines tentatively identified by NID 31 75.61%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.332E+01	1.332E+01	0.151E+01	11.33	
CD-109	461.40D	1.60	1.361E+00	2.185E+00	1.955E+00	89.48	
TE-125M	57.40D	44.8	1.441E+01	6.460E+02	5.659E+02	87.60	
SN-126	2.30E+05Y	1.00	1.361E-01	1.361E-01	1.218E-01	89.48	
BA-137M	30.08Y	1.02	1.028E-01	1.048E-01	0.835E-01	79.68	
CS-137	30.08Y	1.02	1.086E-01	1.107E-01	0.882E-01	79.68	
HG-203	46.59D	108.	4.672E-02	5.063E+00	5.532E+00	109.26	
TL-208	1.41E+10Y	1.00	2.920E-01	2.920E-01	0.801E-01	27.44	
BI-211	7.04E+08Y	1.00	2.918E+00	2.918E+00	0.519E+00	17.79	
PB-212	1.41E+10Y	1.00	1.160E+00	1.160E+00	0.132E+00	11.38	
BI-214	1600.00Y	1.00	7.170E-01	7.173E-01	1.775E-01	24.75	
PB-214	1600.00Y	1.00	1.059E+00	1.059E+00	0.189E+00	17.79	
RN-222	1600.00Y	1.00	7.170E-01	7.173E-01	1.775E-01	24.75	
RA-224	1.41E+10Y	1.00	2.376E+00	2.376E+00	1.309E+00	55.12	
RA-226	1600.00Y	1.00	7.170E-01	7.173E-01	1.775E-01	24.75	
AC-228	1.41E+10Y	1.00	9.674E-01	9.674E-01	2.913E-01	30.11	
RA-228	1.41E+10Y	1.00	9.674E-01	9.674E-01	2.913E-01	30.11	
TH-228	1.41E+10Y	1.00	1.160E+00	1.160E+00	0.132E+00	11.38	
TH-230	7.54E+04Y	1.00	7.170E-01	7.170E-01	1.774E-01	24.75	
PA-231	7.04E+08Y	1.00	9.950E-01	9.950E-01	9.003E-01	90.48	
TH-232	1.41E+10Y	1.00	9.674E-01	9.674E-01	2.913E-01	30.11	
TH-234	4.47E+09Y	1.00	2.453E+00	2.453E+00	2.463E+00	100.42	
U-234	2.45E+05Y	1.00	7.170E-01	7.170E-01	1.774E-01	24.75	
U-235	7.04E+08Y	1.00	1.413E-01	1.413E-01	0.897E-01	63.45	K
U-238	4.47E+09Y	1.00	2.453E+00	2.453E+00	2.463E+00	100.42	
AM-241	432.60Y	1.00	2.003E-01	2.006E-01	0.986E-01	49.14	
AM-243	7370.00Y	1.00	3.050E-01	3.051E-01	1.149E-01	37.68	
ANH-511	1.00E+09Y	1.00	8.764E-02	8.764E-02	7.563E-02	86.30	
Total Activity :			5.157E+01	6.890E+02			

Grand Total Activity : 5.157E+01 6.890E+02

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	371.44	25	38	1.52	743.40	739	9	6.26E-03	****	3.63E+00	T
0	564.49	29	34	2.23	1129.79	1123	14	7.58E-03	95.4	2.61E+00	T
0	579.28	20	24	1.34	1159.39	1153	9	5.15E-03	****	2.55E+00	
0	729.51	38	63	3.28	1460.08	1450	26	1.02E-02	****	2.14E+00	
0	767.85	23	22	0.74	1536.82	1530	12	6.08E-03	95.7	2.06E+00	T
0	886.67	9	7	1.16	1774.63	1771	8	2.52E-03	****	1.85E+00	
0	1002.53	13	23	0.71	2006.54	1999	19	3.62E-03	****	1.68E+00	T
3	1014.01	14	0	1.39	2029.50	2028	11	3.88E-03	28.7	1.66E+00	
3	1016.81	19	0	1.70	2035.10	2028	11	5.25E-03	44.9	1.66E+00	
0	1102.17	11	5	1.23	2205.96	2200	10	3.11E-03	95.4	1.56E+00	
0	1157.11	8	12	1.16	2315.93	2311	9	2.34E-03	****	1.50E+00	
0	1189.83	48	0	4.71	2381.41	2371	18	1.36E-02	28.6	1.47E+00	T
0	1345.72	23	0	2.53	2693.42	2684	17	6.67E-03	40.8	1.33E+00	
0	1592.90	5	5	0.48	3188.16	3186	6	1.39E-03	****	1.15E+00	
0	1730.16	15	3	2.30	3462.88	3457	11	4.52E-03	63.3	1.06E+00	

Flags: "T" = Tentatively associated

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235034.CNF;1
* Acquisition date   : 3-OCT-2016 09:15:46 Sensitivity      : 3.000
* Detector ID        : GAM28 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.42 Half life ratio  : *****
* Sample date        : 23-NOV-2015 11:20:00 Nuclide Library : SOLID
* Sample ID          : G405235034 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity : 1.5249E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
* Dry Weight         : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 1-AUG-2016 10:02:35 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;10
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.705E-01
CD-109	9.592E-01
TE-125M	2.423E+02
SN-126	6.010E-02
BA-137M	3.206E-02
CS-137	3.387E-02
HG-203	2.076E+00
TL-208	1.985E-02
BI-211	1.524E-01
PB-212	4.148E-02
BI-214	4.852E-02
PB-214	1.512E-01
RN-222	4.852E-02
RA-224	4.446E-01
RA-226	4.852E-02
AC-228	8.353E-02
RA-228	8.353E-02
TH-228	4.148E-02
TH-230	4.850E-02
PA-231	3.118E-01
TH-232	8.353E-02
TH-234	9.822E-01
U-234	4.850E-02
U-235	1.580E-01
U-238	9.822E-01
AM-241	1.145E-01
AM-243	3.879E-02
ANH-511	1.892E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.106E+01	NOT IDENT.
NA-22	2.492E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF

AL-26	2.524E-02	NOT IDENT.
SC-46	2.526E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.165E-02	NOT IDENT.
CO-56	4.239E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.019E-02	NOT IDENT.
CO-58	5.473E-01	NOT IDENT.
FE-59	4.971E+00	NOT IDENT.
CO-60	3.291E-02	NOT IDENT.
ZN-65	1.319E-01	NOT IDENT.
GE-68	2.115E+00	NOT IDENT.
AS-73	8.050E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	2.015E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.666E-01	NOT IDENT.
KR-85	6.377E+00	NOT IDENT.
SR-85	7.895E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.228E-01	NOT IDENT.
Y-91	5.708E+02	NOT IDENT.
NB-94	2.506E-02	NOT IDENT.
NB-95	7.378E-01	NOT IDENT.
NB-95M	2.208E+00	NOT IDENT.
ZR-95	1.402E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.934E-02	NOT IDENT.
RH-102	4.598E-02	FAIL ABUN
RU-103	5.859E+00	FAIL ABUN
RH-106	3.627E-01	NOT IDENT.
RU-106	3.627E-01	NOT IDENT.
AG-108M	2.241E-02	NOT IDENT.
AG-110M	6.538E-02	NOT IDENT.
SN-113	1.835E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.168E-01	NOT IDENT.
SB-124	2.046E+00	NOT IDENT.
SB-125	7.844E-02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.237E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	4.620E-02	FAIL ABUN
CS-135	1.124E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	9.982E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.763E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.878E-01	NOT IDENT.
PM-144	4.912E-02	NOT IDENT.
PR-144	4.304E+00	NOT IDENT.
PM-146	3.919E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	6.916E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.109E-02	FAIL ABUN
EU-152	7.897E-02	NOT IDENT.
GD-153	1.520E-01	NOT IDENT.
EU-154	6.169E-02	NOT IDENT.
EU-155	9.744E-02	FAIL ABUN
TB-160	1.806E+00	FAIL ABUN
HO-166M	3.862E-02	NOT IDENT.
TM-171	1.877E+01	NOT IDENT.
HF-172	1.863E-01	FAIL ABUN

LU-172	5.122E-02	FAIL ABUN
LU-176	1.946E-02	FAIL ABUN
HF-181	4.734E+00	NOT IDENT.
TA-182	7.783E-01	FAIL ABUN
RE-183	3.044E+00	FAIL ABUN
RE-184	2.820E+01	NOT IDENT.
W-188	9.759E+01	FAIL ABUN
IR-192	4.580E-01	FAIL ABUN
BI-207	4.316E-02	FAIL ABUN
PB-210	3.425E+00	NOT IDENT.
PB-211	5.501E-01	NOT IDENT.
BI-212	6.117E-01	NOT IDENT.
RN-219	3.291E-01	NOT IDENT.
RA-223	4.968E-01	FAIL ABUN
AC-227	1.723E-01	FAIL ABUN
TH-227	1.723E-01	FAIL ABUN
TH-229	3.754E-01	FAIL ABUN
TH-231	4.968E-01	FAIL ABUN
PA-233	4.806E-02	FAIL ABUN
PA-234	1.794E-01	FAIL ABUN
PA-234M	4.011E+00	FAIL ABUN
NP-237	4.806E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.015E-01	FAIL ABUN
PU-239	2.857E+02	NOT IDENT.
CM-243	8.683E-02	FAIL ABUN
BK-247	6.302E-02	NOT IDENT.
CM-247	3.242E-02	FAIL ABUN
CF-249	2.932E-02	NOT IDENT.
CF-251	1.059E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235034.CNF;1 *
 * Acquisition date : 3-OCT-2016 09:15:46 Sensitivity : 3.000 *
 * Detector ID : GAM28 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.42 Half life ratio : ***** *
 * Sample date : 23-NOV-2015 11:20:00 Nuclide Library : SOLID *
 * Sample ID : G405235034 Analyst initials: MXR1 *
 * Batch Number : 1596249 Sample Quantity : 1.5249E+02 GRAM *
 * Quantity Err(%) : 1.3116E-03 % *
 * Wet wt corr : 1.00000 Wet Weight : 0.00000 *
 * Dry Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 1-AUG-2016 10:02:35 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;10 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.332E+01	1.635E+00	1.635E+00
CD-109	6.731E-01	1.968E+00	1.968E+00
TE-125M	6.460E+02	5.559E+02	5.559E+02
SN-126	4.194E-02	1.226E-01	1.226E-01
BA-137M	1.048E-01	8.197E-02	8.197E-02
CS-137	1.107E-01	8.660E-02	8.660E-02
HG-203	2.379E+00	5.472E+00	5.472E+00
TL-208	2.920E-01	7.952E-02	7.952E-02
BI-211	1.015E-01	9.217E-01	9.217E-01
PB-212	1.160E+00	1.434E-01	1.434E-01
BI-214	7.173E-01	1.767E-01	1.767E-01
PB-214	1.059E+00	1.900E-01	1.900E-01
RN-222	7.173E-01	1.767E-01	1.767E-01
RA-224	5.683E-01	1.376E+00	1.376E+00
RA-226	7.173E-01	1.767E-01	1.767E-01
AC-228	9.674E-01	2.898E-01	2.898E-01
RA-228	9.674E-01	2.898E-01	2.898E-01
TH-228	1.160E+00	1.434E-01	1.434E-01
TH-230	7.170E-01	1.766E-01	1.766E-01
PA-231	9.950E-01	9.075E-01	9.075E-01
TH-232	9.674E-01	2.898E-01	2.898E-01
TH-234	2.453E+00	2.474E+00	2.474E+00
U-234	7.170E-01	1.766E-01	1.766E-01
U-235	-1.439E-03	1.846E-01	1.846E-01
U-238	2.453E+00	2.474E+00	2.474E+00
AM-241	2.006E-01	9.769E-02	9.769E-02
AM-243	2.168E-01	1.164E-01	1.164E-01
ANH-511	8.764E-02	7.421E-02	7.421E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	8.348E-01	1.271E+01	1.272E+01	NOT IDENT.
NA-22	-4.777E-02	4.135E-02	4.662E-02	NOT IDENT.

NA-24	-1.000E+41	2.042E+41	0.000E+00	SHORT HLIF
AL-26	1.547E-02	2.450E-02	2.547E-02	NOT IDENT.
SC-46	-2.201E-01	3.904E-01	4.028E-01	FAIL ABUN
V-48	-1.653E+04	2.605E+04	2.710E+04	SHORT HLIF
CR-51	3.092E+02	6.099E+02	6.256E+02	SHORT HLIF
MN-54	2.235E-02	5.522E-02	5.613E-02	NOT IDENT.
CO-56	-1.782E-01	5.097E-01	5.160E-01	NOT IDENT.
MN-56	-1.000E+41	2.861E+41	0.000E+00	SHORT HLIF
CO-57	-1.905E-02	4.853E-02	4.929E-02	NOT IDENT.
CO-58	3.946E-02	6.144E-01	6.147E-01	NOT IDENT.
FE-59	-5.883E+00	8.389E+00	8.798E+00	NOT IDENT.
CO-60	1.348E-02	3.622E-02	3.673E-02	NOT IDENT.
ZN-65	-8.759E-02	1.973E-01	2.012E-01	NOT IDENT.
GE-68	-5.803E-01	2.493E+00	2.506E+00	NOT IDENT.
AS-73	-8.156E+00	9.972E+00	1.063E+01	NOT IDENT.
AS-74	-1.144E+04	1.187E+04	1.294E+04	SHORT HLIF
SE-75	1.688E-01	2.083E-01	2.217E-01	NOT IDENT.
BR-77	1.698E+40	1.544E+41	0.000E+00	SHORT HLIF
SR-82	-4.785E+02	9.636E+02	9.875E+02	SHORT HLIF
RB-83	-9.954E-02	6.779E-01	6.794E-01	NOT IDENT.
KR-85	8.167E+00	6.964E+00	7.877E+00	NOT IDENT.
SR-85	1.011E+00	8.622E-01	9.752E-01	NOT IDENT.
RB-86	6.148E+03	4.939E+04	4.946E+04	SHORT HLIF
Y-88	3.775E-02	1.239E-01	1.251E-01	NOT IDENT.
Y-91	5.339E+02	5.832E+02	6.309E+02	NOT IDENT.
NB-94	1.047E-02	2.837E-02	2.876E-02	NOT IDENT.
NB-95	-6.412E-02	9.401E-01	9.405E-01	NOT IDENT.
NB-95M	5.124E-01	2.638E+00	2.648E+00	NOT IDENT.
ZR-95	4.297E-01	1.518E+00	1.531E+00	NOT IDENT.
NB-97	1.000E+41	1.041E+42	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.038E+41	0.000E+00	SHORT HLIF
MO-99	-6.793E+33	9.776E+33	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	2.389E+42	0.000E+00	SHORT HLIF
RH-101	-6.833E-03	3.484E-02	3.497E-02	NOT IDENT.
RH-102	-2.568E-02	5.896E-02	6.008E-02	FAIL ABUN
RU-103	2.388E-01	6.790E+00	6.791E+00	FAIL ABUN
RH-106	-3.706E-02	4.378E-01	4.381E-01	NOT IDENT.
RU-106	-3.706E-02	4.378E-01	4.381E-01	NOT IDENT.
AG-108M	1.296E-04	2.579E-02	2.579E-02	NOT IDENT.
AG-110M	-6.847E-02	1.029E-01	1.074E-01	NOT IDENT.
SN-113	-2.662E-02	2.130E-01	2.133E-01	NOT IDENT.
CD-115	6.312E+40	3.113E+41	0.000E+00	SHORT HLIF
SN-117M	-5.127E+04	2.108E+05	2.120E+05	SHORT HLIF
TE-123M	-5.996E-02	1.442E-01	1.467E-01	NOT IDENT.
SB-124	1.555E-01	2.448E+00	2.449E+00	NOT IDENT.
SB-125	-1.639E-03	9.043E-02	9.043E-02	NOT IDENT.
I-126	1.378E+06	2.116E+06	2.205E+06	SHORT HLIF
SB-126	-6.778E+05	2.545E+06	2.564E+06	SHORT HLIF
SB-127	1.364E+23	3.833E+23	0.000E+00	SHORT HLIF
I-131	-1.753E+10	1.685E+10	1.861E+10	SHORT HLIF
I-132	-1.000E+41	1.950E+42	0.000E+00	SHORT HLIF
TE-132	-8.859E+27	9.898E+27	0.000E+00	SHORT HLIF
BA-133	3.794E-03	4.035E-02	4.039E-02	FAIL ABUN
I-133	-1.000E+41	2.251E+41	0.000E+00	SHORT HLIF
CS-134	4.324E-02	4.656E-02	5.048E-02	FAIL ABUN
CS-135	-1.680E-01	1.398E-01	1.590E-01	NOT IDENT.
I-135	-1.000E+41	9.394E+41	0.000E+00	SHORT HLIF
CS-136	-5.567E+05	6.601E+05	7.062E+05	SHORT HLIF
CE-139	-4.221E-02	1.104E-01	1.120E-01	NOT IDENT.
BA-140	-1.147E+06	2.743E+06	2.791E+06	SHORT HLIF
LA-140	9.198E+04	1.076E+06	1.077E+06	SHORT HLIF
CE-141	-8.592E+00	3.332E+01	3.354E+01	NOT IDENT.
CE-143	1.000E+41	1.297E+41	0.000E+00	SHORT HLIF
CE-144	-9.719E-02	3.463E-01	3.491E-01	NOT IDENT.
PM-144	-1.774E-02	6.167E-02	6.219E-02	NOT IDENT.
PR-144	-1.539E+00	5.401E+00	5.445E+00	NOT IDENT.
PM-146	3.158E-02	4.142E-02	4.380E-02	NOT IDENT.
ND-147	-4.384E+07	8.053E+07	8.292E+07	SHORT HLIF
PM-147	-3.560E+02	8.369E+02	8.522E+02	NOT IDENT.
PM-149	1.000E+41	2.522E+41	0.000E+00	SHORT HLIF
EU-150	8.007E-03	2.395E-02	2.422E-02	FAIL ABUN
EU-152	-4.794E-02	9.414E-02	9.659E-02	NOT IDENT.
GD-153	-1.638E-01	1.880E-01	2.019E-01	NOT IDENT.
EU-154	-1.140E-01	1.010E-01	1.134E-01	NOT IDENT.
EU-155	6.302E-02	1.070E-01	1.107E-01	FAIL ABUN
TB-160	6.260E-02	2.053E+00	2.053E+00	FAIL ABUN
HO-166M	-5.778E-02	5.693E-02	6.261E-02	NOT IDENT.
TM-171	1.286E+01	1.991E+01	2.074E+01	NOT IDENT.

HF-172	-1.829E-01	2.359E-01	2.499E-01	FAIL ABUN
LU-172	-3.839E-02	6.758E-02	6.977E-02	FAIL ABUN
LU-176	-8.265E-03	2.379E-02	2.408E-02	FAIL ABUN
HF-181	3.274E+00	5.056E+00	5.267E+00	NOT IDENT.
TA-182	-2.729E-01	9.656E-01	9.734E-01	FAIL ABUN
RE-183	-1.981E-01	3.687E+00	3.688E+00	FAIL ABUN
RE-184	-2.086E+00	3.267E+01	3.268E+01	NOT IDENT.
W-188	-1.149E+01	1.219E+02	1.220E+02	FAIL ABUN
IR-192	2.380E-01	4.901E-01	5.017E-01	FAIL ABUN
BI-207	2.278E-02	4.653E-02	4.765E-02	FAIL ABUN
PB-210	2.036E+00	3.642E+00	3.755E+00	NOT IDENT.
PB-211	-5.210E-02	6.358E-01	6.362E-01	NOT IDENT.
BI-212	1.109E+00	6.146E-01	7.922E-01	NOT IDENT.
RN-219	2.893E-02	3.732E-01	3.735E-01	NOT IDENT.
RA-223	-8.507E-03	5.594E-01	5.594E-01	FAIL ABUN
AC-227	-2.436E-02	1.928E-01	1.931E-01	FAIL ABUN
TH-227	-2.436E-02	1.928E-01	1.931E-01	FAIL ABUN
TH-229	-2.682E-01	4.273E-01	4.441E-01	FAIL ABUN
TH-231	-8.507E-03	5.594E-01	5.594E-01	FAIL ABUN
PA-233	-1.896E-02	5.582E-02	5.648E-02	FAIL ABUN
PA-234	-1.484E-01	2.895E-01	2.972E-01	FAIL ABUN
PA-234M	3.134E+00	3.919E+00	4.166E+00	FAIL ABUN
NP-237	-1.896E-02	5.582E-02	5.648E-02	FAIL ABUN
NP-238	-1.000E+41	4.811E+41	0.000E+00	SHORT HLIF
NP-239	-1.174E-01	2.444E-01	2.501E-01	FAIL ABUN
PU-239	1.029E+02	3.252E+02	3.285E+02	NOT IDENT.
CM-243	4.367E-02	9.617E-02	9.816E-02	FAIL ABUN
BK-247	3.465E-02	6.706E-02	6.886E-02	NOT IDENT.
CM-247	1.436E-02	3.564E-02	3.622E-02	FAIL ABUN
CF-249	1.748E-02	3.128E-02	3.226E-02	NOT IDENT.
CF-251	8.237E-02	1.088E-01	1.150E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	67.7320	87.09	106.0090	136.47	72.9840
45.60	79.5984	87.57	95.4818	140.51	0.0000
46.54	64.0330	88.03	95.5523	143.76	79.7523
49.72	0.0000	88.34	95.6004	144.24	71.2035
51.35	59.4449	88.47	95.6202	145.44	82.3668
51.87	52.0750	89.96	100.4113	152.43	66.9158
52.39	45.7516	1093.63	82.2431	153.25	0.0000
52.97	53.2681	91.11	0.0000	323.87	62.0819
53.44	69.3204	92.59	80.9670	156.02	0.0000
54.07	64.0764	93.35	81.0624	158.56	0.0000
57.36	0.0000	94.56	87.3433	159.00	78.6366
57.53	62.4014	94.65	87.3549	162.33	60.9648
57.98	73.2290	94.67	87.3578	162.66	0.0000
59.27	66.2270	94.87	87.3845	163.33	64.3750
59.32	67.6737	97.43	93.4962	165.86	80.4756
59.54	67.7043	98.43	77.4524	176.31	76.2680
60.96	75.8466	98.44	77.4534	176.60	0.0000
61.17	75.8789	99.53	60.2111	177.52	67.0283
62.93	76.1473	100.11	74.1694	181.07	0.0000
63.29	76.2016	102.03	84.8384	181.52	70.2799
63.58	76.2453	103.18	68.6828	184.41	76.8887
64.28	76.3505	103.37	69.8666	143.76	75.2768
66.73	76.7136	105.21	71.2193	193.51	77.5699
67.24	76.7884	105.31	71.2293	197.03	51.0212
125.81	76.8530	106.12	73.2601	198.01	57.1270
67.75	76.8626	106.47	67.0589	201.83	65.1489
69.67	83.7535	109.28	57.9307	203.43	61.7653
70.83	77.3070	111.00	69.4476	205.31	74.9438
72.81	82.0215	111.76	0.0000	210.85	74.4459
72.87	82.0300	114.06	75.6499	215.65	70.3670
74.66	82.2947	116.30	0.0000	222.11	61.0362
74.82	82.3179	116.74	85.4138	227.09	58.6329
74.97	82.3399	119.76	75.0370	227.38	66.6451
77.11	82.6516	121.12	82.3302	228.16	0.0000
78.74	82.8858	121.22	82.3407	228.18	67.5793
79.69	83.0213	121.78	84.7897	116.74	67.5793
80.12	83.0823	122.06	78.8473	235.69	55.0331
80.19	0.0000	122.92	56.2112	235.96	55.0450
80.57	83.1461	123.07	55.0261	238.63	58.3065
81.00	97.4491	265.00	65.8437	238.98	0.0000
81.07	97.4610	125.81	88.8320	240.99	58.4196
81.75	103.5772	127.23	86.5863	242.00	58.4679
83.79	90.3748	127.91	75.8284	244.70	58.5968
84.00	88.8997	129.30	86.8118	252.40	0.0000
85.43	110.2537	131.20	83.3925	252.80	50.8121
86.55	110.4550	133.02	62.9878	254.15	0.0000
86.79	110.4980	133.52	71.5101	256.23	45.4908
86.94	105.9827	136.00	86.3146	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	41.2106	355.39	0.0000	584.27	13.1577
264.80	43.0470	356.01	33.6451	595.83	0.0000
265.00	44.8858	364.49	0.0000	427.87	41.9583
268.22	74.3802	366.42	0.0000	602.52	0.0000
269.46	65.2596	372.51	31.0309	604.72	16.5912
270.03	62.5284	375.05	34.0381	607.14	19.9292
271.23	53.3814	377.52	32.6066	609.32	21.0557
273.65	0.0000	356.01	33.7205	610.33	21.0650
276.40	51.2792	388.16	23.8628	614.28	21.6550
277.37	40.6833	388.63	0.0000	618.01	17.7956
277.60	40.6896	391.69	28.8938	620.36	14.4727
278.00	40.7021	264.66	39.0579	621.93	17.8242
279.20	34.7198	401.81	37.0790	630.19	0.0000
279.54	34.7290	402.40	37.0918	631.29	25.7206
279.70	34.7328	404.85	36.1392	633.25	21.2644
280.46	33.3625	410.95	26.1904	634.78	0.0000
283.69	40.8731	413.71	44.3903	635.95	16.8060
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	38.1339	423.72	0.0000	645.85	22.4976
285.90	0.0000	427.09	25.4084	657.76	22.0391
287.50	40.9859	427.87	26.4359	657.90	0.0000
290.67	36.4117	433.94	29.5829	661.66	30.5629
293.27	0.0000	439.40	30.6927	664.57	0.0000
351.93	46.3660	453.88	23.7113	666.33	0.0000
295.96	46.3901	463.37	32.1157	666.50	0.0000
879.38	33.8005	468.07	18.6929	667.71	0.0000
299.98	35.2440	473.00	0.0000	677.62	22.7799
300.09	35.2463	475.06	18.7592	685.70	0.0000
300.13	35.2470	476.78	23.9906	695.00	0.0000
301.36	35.2776	477.60	21.9135	696.49	29.8276
302.85	39.5519	482.18	20.9176	696.51	29.8276
256.23	32.5269	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	20.6565
306.78	47.5925	497.08	24.2325	697.49	20.6580
308.46	44.4335	505.52	22.2159	702.65	17.2485
311.90	47.3806	507.63	0.0000	706.68	23.0322
316.51	37.0735	511.00	20.1529	711.68	28.8442
319.41	0.0000	514.00	19.1191	720.70	0.0000
320.08	0.0000	514.00	19.1191	721.93	0.0000
321.04	36.2327	520.40	24.5039	722.78	27.8047
323.87	44.8992	520.69	0.0000	722.91	27.8057
325.23	57.3694	522.65	0.0000	723.31	20.8572
328.76	0.0000	527.90	0.0000	724.19	10.4319
333.37	52.8706	528.26	17.1094	727.33	23.2088
333.97	36.9281	529.59	25.6797	733.00	23.2568
334.37	33.1860	529.87	0.0000	735.93	19.2070
338.28	55.9326	531.02	0.0000	333.97	26.2061
338.32	55.9338	537.26	0.0000	739.50	0.0000
311.90	40.5602	546.56	0.0000	747.24	15.7791
340.48	40.5602	552.55	20.5439	748.06	14.9066
340.55	0.0000	563.25	19.5564	752.31	16.6859
344.28	51.3071	569.33	29.4126	753.82	0.0000
345.93	36.8249	946.00	27.7806	756.73	16.7120
351.06	38.8892	569.70	27.7838	756.80	16.7126
351.93	38.9103	583.19	13.1519	884.68	9.8766

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	16.9424	1274.44	7.5930	1620.50	5.4907
766.42	21.1824	1001.03	8.5537	1621.92	4.3938
766.84	21.1853	1002.74	8.5578	1678.03	0.0000
772.60	0.0000	1004.73	8.5627	1690.97	5.5652
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	1.8051
778.90	17.7289	1028.54	0.0000	1063.66	0.0000
783.70	0.0000	1037.84	12.4835	1771.35	7.2293
785.37	23.0991	1038.76	0.0000	1791.20	0.0000
792.07	22.2618	631.29	5.7759	1808.65	1.8194
794.95	14.2617	1048.07	0.0000	1810.72	0.0000
795.86	14.2661	1049.04	21.1917	1836.06	0.9141
810.06	17.0228	1050.41	15.4180		
810.29	17.0239	1063.66	13.5394		
344.28	17.0245	1077.00	0.0000		
810.76	17.0268	1077.34	16.5020		
815.77	0.0000	1085.87	15.5674		
1048.07	0.0000	1093.63	15.5996		
832.01	17.1474	1099.45	15.6230		
834.85	13.5498	1112.07	13.7163		
835.71	15.3611	1112.84	15.6787		
836.80	0.0000	1115.54	18.8273		
846.75	0.0000	1120.29	13.7454		
846.77	20.8578	1120.55	13.7462		
856.80	0.0000	1221.41	13.7488		
860.56	9.1092	1129.67	17.3218		
871.09	11.8816	1131.51	0.0000		
873.19	12.8041	1147.95	0.0000		
875.33	0.0000	1173.23	13.9333		
879.38	17.4113	1177.95	20.9244		
880.51	11.9173	1189.05	8.9923		
883.24	10.2758	1204.77	10.0305		
884.68	17.6238	1221.41	18.1285		
889.28	14.7075	1231.02	18.1714		
894.76	13.8121	1235.36	0.0000		
898.04	12.9045	1238.28	18.2032		
900.72	13.8377	1260.41	0.0000		
903.28	12.9255	1271.87	8.1553		
911.20	11.1061	1274.44	16.3203		
912.08	11.1090	1274.54	16.3213		
923.98	0.0000	1291.59	8.1929		
926.50	12.0875	1298.22	0.0000		
929.11	11.1665	1312.11	0.0000		
937.49	17.7255	1332.49	8.2705		
944.13	0.0000	1362.66	0.0000		
946.00	16.8349	1365.19	5.2072		
949.00	14.9780	1368.63	0.0000		
667.71	0.0000	1384.29	5.2295		
962.31	19.5482	1408.01	4.2053		
964.08	7.5225	1457.56	0.0000		
966.17	7.5271	1460.82	9.5696		
911.20	7.5332	1489.16	2.1392		
968.97	7.5332	1505.03	4.2925		
983.53	0.0000	1584.12	8.7231		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235035.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM33.CNF;235
Background date : 2-OCT-2016 11:02:02.
Sample date     : 23-NOV-2015 11:06:00 Acquisition date : 3-OCT-2016 09:16:17.
Sample ID      : G405235035 Sample quantity   : 1.64073E+02 GRAM
Detector name  : GAM33 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.73 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID      : 1596249 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	40.90	20	82	1.43	81.97	76	8	5.54E-03	83.0	
2	0	64.05*	13	201	1.23	128.21	123	11	3.50E-03	224.5	
3	0	68.49	29	70	0.94	137.07	135	5	8.00E-03	47.8	
4	1	75.06*	75	124	1.10	150.20	143	16	2.10E-02	28.5	7.47E-01
5	1	77.06	157	107	1.11	154.20	143	16	4.35E-02	14.4	
6	8	87.03	43	192	1.33	174.11	169	25	1.19E-02	51.6	5.71E+00
7	8	89.83	46	179	1.43	179.69	169	25	1.27E-02	53.8	
8	8	94.27	59	90	1.25	188.57	169	25	1.65E-02	39.4	
9	0	118.51	29	67	0.92	236.98	234	7	7.98E-03	51.1	
10	0	128.82	20	95	0.93	257.58	255	7	5.55E-03	83.9	
11	0	154.68	20	36	1.34	309.23	307	5	5.54E-03	51.3	
12	6	163.47*	28	84	2.01	326.79	323	12	7.71E-03	60.8	1.98E+00
13	6	166.25	22	52	1.05	332.34	323	12	6.18E-03	58.4	
14	0	186.12*	44	102	1.06	372.05	368	10	1.22E-02	49.8	
15	0	209.48	73	82	1.63	418.71	414	10	2.02E-02	26.4	
16	0	224.37	47	105	3.68	448.45	442	13	1.32E-02	46.7	
17	5	238.59*	353	72	1.19	476.86	469	18	9.79E-02	6.8	1.56E+00
18	5	241.74	70	59	1.44	483.14	469	18	1.95E-02	22.5	
19	0	270.13	49	64	1.19	539.87	535	10	1.35E-02	34.2	
20	0	295.21	129	56	0.88	589.97	585	10	3.58E-02	14.1	
21	0	300.05	26	46	1.44	599.64	596	9	7.28E-03	50.2	
22	0	338.80*	72	46	1.05	677.07	673	10	2.00E-02	22.0	
23	0	351.99*	181	88	1.49	703.44	696	16	5.04E-02	13.8	
24	0	424.65	21	13	0.87	848.63	845	7	5.80E-03	36.6	
25	0	462.97	22	13	1.05	925.21	922	7	6.02E-03	35.6	
26	0	510.89*	25	38	2.74	1020.98	1014	14	6.83E-03	70.3	
27	0	562.17	17	7	1.41	1123.47	1120	7	4.70E-03	35.6	
28	0	583.40*	89	38	1.26	1165.92	1161	10	2.48E-02	17.5	
29	0	597.97	15	29	0.57	1195.04	1190	12	4.08E-03	81.4	
30	0	609.40*	138	48	1.36	1217.88	1213	12	3.83E-02	13.4	
31	0	644.53	8	25	2.18	1288.12	1283	12	2.31E-03	123.0	
32	0	661.59	9	36	0.60	1322.22	1319	9	2.50E-03	124.7	
33	0	705.95	11	14	0.95	1410.91	1408	7	3.06E-03	64.0	
34	0	727.69	23	12	2.01	1454.37	1451	8	6.27E-03	35.1	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	767.90	25	24	1.14	1534.78	1529	11	6.84E-03	43.9	
36	0	786.15	16	8	1.00	1571.25	1567	10	4.52E-03	40.2	
37	0	795.80	8	18	0.54	1590.56	1585	9	2.18E-03	107.6	
38	0	806.45	7	12	1.17	1611.85	1605	9	1.95E-03	100.0	
39	0	821.53	18	5	3.01	1642.01	1637	11	4.86E-03	34.8	
40	0	860.72	19	11	1.08	1720.37	1715	11	5.28E-03	40.9	
41	0	911.09*	88	6	1.57	1821.10	1814	13	2.44E-02	12.5	
42	3	965.06	37	7	2.28	1929.05	1921	22	1.03E-02	22.4	1.49E+00
43	3	969.50*	40	6	1.82	1937.94	1921	22	1.10E-02	20.6	
44	0	1121.12*	29	28	0.63	2241.23	2232	16	7.94E-03	45.9	
45	0	1137.59	7	2	1.41	2274.18	2271	7	1.96E-03	49.2	
46	0	1378.42	15	6	1.62	2756.10	2749	11	4.03E-03	40.9	
47	0	1406.85*	10	0	1.49	2813.00	2806	11	2.75E-03	35.8	
48	0	1460.88*	335	3	2.07	2921.16	2913	15	9.30E-02	5.7	
49	0	1501.18	7	2	1.36	3001.84	2998	7	2.04E-03	47.4	
50	0	1764.68*	27	0	2.61	3529.43	3522	13	7.45E-03	20.7	

Flag: "*" = Peak area was modified by background subtraction


```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235035.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 23-NOV-2015 11:06:00 Acquisition date : 3-OCT-2016 09:16:17
Sample ID        : G405235035 Sample quantity   : 164.07 GRAM
Sample type      : SOLID Sample geometry    :
Detector name    : GAMMA33 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.73 0.0%
Energy tolerance : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error    : 0.00 %
Efficiency type  : Linear Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.134E+00	1.233E+01	1.233E+01	11.33	OK
CD-109	88.03	3.70*	4.887E+00	5.956E-01	9.559E-01	255.58	OK
SN-126	64.28	9.60	2.549E+00	3.248E-01	3.248E-01	448.91	OK
	86.94	8.90	4.887E+00	2.476E-01	2.476E-01	255.58	OK
	87.57	37.00*	4.887E+00	5.956E-02	5.956E-02	255.58	OK
BA-137M	661.66	89.90*	2.115E+00	2.331E-02	2.378E-02	249.44	OK
CS-137	661.66	85.10*	2.115E+00	2.462E-02	2.512E-02	249.44	OK
CE-139	165.86	80.00*	5.922E+00	2.700E-02	1.319E-01	116.79	OK
TL-208	277.37	6.60	4.258E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.334E+00	2.253E-01	2.253E-01	35.00	OK
	860.56	12.50	1.727E+00	4.197E-01	4.197E-01	81.71	OK
BI-212	727.33	6.67*	1.965E+00	8.389E-01	8.389E-01	70.29	OK
	785.37	1.10	1.851E+00	3.852E+00	3.852E+00	80.37	OK
	1620.50	1.47	1.036E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	3.825E+00	6.676E-01	6.676E-01	104.28	OK
	77.11	17.10	4.028E+00	1.410E+00	1.410E+00	28.90	OK
	238.63	43.60*	4.776E+00	9.366E-01	9.366E-01	13.53	OK
	300.09	3.30	4.000E+00	1.071E+00	1.071E+00	100.50	OK
BI-214	609.32	45.49*	2.255E+00	6.677E-01	6.679E-01	26.76	OK
	1120.29	14.92	1.407E+00	6.277E-01	6.279E-01	91.79	OK
	1764.49	15.30	9.591E-01	7.932E-01	7.935E-01	41.37	OK
PB-214	74.82	5.80	3.800E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	4.028E+00	2.485E+00	2.486E+00	28.90	OK
	87.09	3.41	4.892E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.727E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.052E+00	9.326E-01	9.330E-01	28.15	OK
	351.93	35.60*	3.512E+00	7.685E-01	7.688E-01	27.69	OK
RN-222	609.32	45.49*	2.255E+00	6.677E-01	6.679E-01	26.76	OK
	1120.29	14.92	1.407E+00	6.277E-01	6.279E-01	91.79	OK
	1764.49	15.30	9.591E-01	7.932E-01	7.935E-01	41.37	OK
RA-224	240.99	4.10*	4.731E+00	3.453E-01	3.453E-01	292.72	OK
RA-226	609.32	45.49*	2.255E+00	6.677E-01	6.679E-01	26.76	OK
	1120.29	14.92	1.407E+00	6.277E-01	6.279E-01	91.79	OK
	1764.49	15.30	9.591E-01	7.932E-01	7.935E-01	41.37	OK
AC-228	105.21	1.10	5.839E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.624E+00	9.380E-01	9.380E-01	44.00	OK
	794.95	4.25	1.834E+00	4.858E-01	4.858E-01	215.11	OK
	835.71	1.61	1.766E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.653E+00	9.736E-01	9.736E-01	25.07	OK
	968.97	15.80	1.576E+00	7.468E-01	7.468E-01	41.20	OK
RA-228	105.21	1.10	5.839E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.624E+00	9.380E-01	9.380E-01	44.00	OK
	794.95	4.25	1.834E+00	4.858E-01	4.858E-01	215.11	OK
	835.71	1.61	1.766E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.653E+00	9.736E-01	9.736E-01	25.07	OK
	968.97	15.80	1.576E+00	7.468E-01	7.468E-01	41.20	OK
TH-228	74.82	10.28	3.825E+00	6.676E-01	6.676E-01	104.28	OK
	77.11	17.10	4.028E+00	1.410E+00	1.410E+00	28.90	OK
	238.63	43.60*	4.776E+00	9.366E-01	9.366E-01	13.53	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	300.09	3.30	4.000E+00	1.071E+00	1.071E+00	100.50	OK
TH-230	609.32	45.49*	2.255E+00	6.677E-01	6.677E-01	26.76	OK
	1120.29	14.92	1.407E+00	6.277E-01	6.277E-01	91.79	OK
	1764.49	15.30	9.591E-01	7.932E-01	7.932E-01	41.37	OK
PA-231	283.69	1.70	4.183E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.000E+00	6.604E-01	6.604E-01	100.50	OK
TH-232	105.21	1.10	5.839E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.624E+00	9.380E-01	9.380E-01	44.00	OK
	835.71	1.61	1.766E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.653E+00	9.736E-01	9.736E-01	25.07	OK
	968.97	15.80	1.576E+00	7.468E-01	7.468E-01	41.20	OK
U-234	609.32	45.49*	2.255E+00	6.677E-01	6.677E-01	26.76	OK
	1120.29	14.92	1.407E+00	6.277E-01	6.277E-01	91.79	OK
	1764.49	15.30	9.591E-01	7.932E-01	7.932E-01	41.37	OK
U-235	89.96	3.47	5.083E+00	1.587E+00	1.587E+00	107.70	OK
	93.35	5.60	5.355E+00	1.203E+00	1.203E+00	78.78	OK
	143.76	10.96*	6.181E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	5.962E+00	5.276E-01	5.276E-01	121.65	OK
	185.72	57.20	5.611E+00	7.762E-02	7.762E-02	99.67	OK
	205.31	5.01	5.295E+00	----- Line	Not Found	-----	Absent
AM-243	43.53	5.90	2.461E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.825E+00	1.021E-01	1.021E-01	104.28	OK
ANH-511	511.00	100.00*	2.593E+00	4.819E-02	4.819E-02	140.62	OK

Flag: "*" = Keyline

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235035.CNF;1
* Acquisition date   : 3-OCT-2016 09:16:17 Sensitivity      : 3.000
* Detector ID        : GAM33 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.73 Half life ratio : *****
* Sample date        : 23-NOV-2015 11:06:00 Analyst initials: MXR1
* Sample ID          : G405235035 Sample Quantity : 1.6407E+02 GRAM
* Batch Number       : 1596249 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 10-JUN-2016 07:00:49 Eff. Geometry : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.233E+01	1.369E+00	5.330E-01
CD-109	9.559E-01	2.394E+00	1.911E+00
SN-126	5.956E-02	1.492E-01	1.198E-01
BA-137M	2.378E-02	5.812E-02	6.443E-02
CS-137	2.512E-02	6.140E-02	6.806E-02
CE-139	1.319E-01	1.510E-01	1.884E-01
TL-208	2.253E-01	7.729E-02	6.325E-02
BI-212	8.389E-01	5.778E-01	1.017E+00
PB-212	9.366E-01	1.241E-01	8.057E-02
BI-214	6.679E-01	1.752E-01	1.140E-01
PB-214	7.688E-01	2.086E-01	1.131E-01
RN-222	6.679E-01	1.752E-01	1.140E-01
RA-224	3.453E-01	9.906E-01	8.635E-01
RA-226	6.679E-01	1.752E-01	1.140E-01
AC-228	9.736E-01	2.392E-01	1.926E-01
RA-228	9.736E-01	2.392E-01	1.926E-01
TH-228	9.366E-01	1.241E-01	8.057E-02
TH-230	6.677E-01	1.751E-01	1.139E-01
PA-231	6.604E-01	6.504E-01	7.170E-01
TH-232	9.736E-01	2.392E-01	1.926E-01
U-234	6.677E-01	1.751E-01	1.139E-01
U-235	4.831E-02	1.566E-01	3.110E-01
AM-243	1.021E-01	1.044E-01	8.539E-02
ANH-511	4.819E-02	6.640E-02	4.704E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	2.251E+00	1.393E+01	2.804E+01	NOT IDENT.
NA-22	1.208E-02	3.855E-02	8.363E-02	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	-1.033E-02	1.972E-02	3.617E-02	NOT IDENT.
SC-46	-8.621E-02	3.710E-01	7.030E-01	FAIL ABUN
V-48	0.000E+00	2.508E+04	0.000E+00	SHORT HLIF

CR-51	0.000E+00	4.792E+02	0.000E+00	SHORT HLIF
MN-54	3.984E-03	6.251E-02	1.212E-01	NOT IDENT.
CO-56	-1.071E-02	4.907E-01	9.465E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	4.350E-04	4.306E-02	7.707E-02	NOT IDENT.
CO-58	7.502E-01	5.416E-01	1.311E+00	NOT IDENT.
FE-59	3.728E+00	8.452E+00	1.799E+01	NOT IDENT.
CO-60	-1.357E-02	3.719E-02	7.075E-02	NOT IDENT.
ZN-65	6.778E-03	1.415E-01	2.661E-01	NOT IDENT.
GE-68	2.070E+00	2.329E+00	5.264E+00	NOT IDENT.
AS-73	-2.675E+00	1.010E+01	2.023E+01	NOT IDENT.
AS-74	0.000E+00	1.073E+04	0.000E+00	SHORT HLIF
SE-75	-8.750E-02	2.047E-01	3.577E-01	NOT IDENT.
BR-77	0.000E+00	1.823E+39	0.000E+00	SHORT HLIF
SR-82	0.000E+00	8.272E+02	0.000E+00	SHORT HLIF
RB-83	-7.747E-02	5.927E-01	1.167E+00	NOT IDENT.
KR-85	5.968E+00	6.150E+00	1.267E+01	NOT IDENT.
SR-85	7.378E-01	7.613E-01	1.568E+00	NOT IDENT.
RB-86	0.000E+00	4.446E+04	0.000E+00	SHORT HLIF
Y-88	3.215E-02	2.316E-01	5.087E-01	NOT IDENT.
Y-91	1.332E+02	5.795E+02	1.202E+03	NOT IDENT.
NB-94	2.102E-02	3.131E-02	6.092E-02	NOT IDENT.
NB-95	1.323E-01	9.351E-01	1.693E+00	NOT IDENT.
NB-95M	1.782E+00	2.459E+00	4.848E+00	NOT IDENT.
ZR-95	-2.318E-01	1.610E+00	3.050E+00	NOT IDENT.
NB-97	0.000E+00	1.382E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	7.175E+33	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-9.528E-04	3.162E-02	5.582E-02	NOT IDENT.
RH-102	3.375E-03	4.645E-02	9.395E-02	FAIL ABUN
RU-103	2.025E-01	6.227E+00	1.250E+01	FAIL ABUN
RH-106	-3.279E-01	4.390E-01	7.670E-01	NOT IDENT.
RU-106	-3.279E-01	4.390E-01	7.670E-01	NOT IDENT.
AG-108M	-4.500E-03	2.260E-02	4.435E-02	NOT IDENT.
AG-110M	4.260E-02	8.491E-02	1.825E-01	FAIL ABUN
SN-113	-2.090E-02	2.126E-01	4.222E-01	NOT IDENT.
CD-115	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.735E+05	0.000E+00	SHORT HLIF
TE-123M	-2.574E-02	1.175E-01	2.185E-01	NOT IDENT.
SB-124	1.221E+00	1.653E+00	4.539E+00	FAIL ABUN
SB-125	6.022E-02	1.010E-01	1.967E-01	FAIL ABUN
TE-125M	1.209E+02	2.995E+02	5.946E+02	NOT IDENT.
I-126	0.000E+00	1.922E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	2.329E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	2.768E+23	0.000E+00	SHORT HLIF
I-131	0.000E+00	1.576E+10	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.305E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	9.843E+27	0.000E+00	SHORT HLIF
BA-133	-9.869E-03	3.413E-02	5.972E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	3.225E-02	6.798E-02	9.161E-02	FAIL ABUN
CS-135	-1.342E-02	1.440E-01	2.388E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	4.578E+05	0.000E+00	SHORT HLIF
BA-140	0.000E+00	2.224E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	8.643E+05	0.000E+00	SHORT HLIF
CE-141	-1.916E+01	2.777E+01	4.947E+01	NOT IDENT.
CE-143	0.000E+00	1.256E+41	0.000E+00	SHORT HLIF
CE-144	5.756E-02	2.980E-01	5.831E-01	NOT IDENT.
PM-144	-4.602E-02	4.686E-02	7.668E-02	NOT IDENT.
PR-144	-4.000E+00	4.108E+00	6.735E+00	NOT IDENT.
PM-146	1.194E-02	3.579E-02	7.471E-02	NOT IDENT.
ND-147	0.000E+00	6.337E+07	0.000E+00	SHORT HLIF
PM-147	4.642E+01	7.112E+02	1.284E+03	NOT IDENT.
PM-149	0.000E+00	9.353E+40	0.000E+00	SHORT HLIF
EU-150	-6.931E-03	2.125E-02	3.955E-02	FAIL ABUN
EU-152	-1.637E-02	7.724E-02	1.458E-01	FAIL ABUN
GD-153	2.156E-02	1.643E-01	2.997E-01	FAIL ABUN
EU-154	3.822E-02	9.576E-02	2.096E-01	NOT IDENT.
EU-155	4.946E-02	1.059E-01	2.114E-01	FAIL ABUN
TB-160	8.292E-01	2.053E+00	4.211E+00	FAIL ABUN
HO-166M	2.036E-02	4.253E-02	9.148E-02	NOT IDENT.
TM-171	2.748E-01	2.331E+01	4.782E+01	NOT IDENT.
HF-172	1.131E-01	2.229E-01	4.148E-01	FAIL ABUN
LU-172	3.522E-02	6.618E-02	1.466E-01	FAIL ABUN
LU-176	-9.939E-03	1.988E-02	3.838E-02	FAIL ABUN
HF-181	-1.409E+00	4.890E+00	9.378E+00	NOT IDENT.

TA-182	-1.830E-03	8.743E-01	1.762E+00	FAIL ABUN
RE-183	-2.048E-01	3.389E+00	6.845E+00	FAIL ABUN
RE-184	-3.690E+00	3.036E+01	5.885E+01	NOT IDENT.
W-188	-8.986E+01	1.154E+02	1.901E+02	FAIL ABUN
IR-192	8.661E-02	4.353E-01	8.989E-01	FAIL ABUN
HG-203	-5.679E-01	2.352E+00	4.686E+00	NOT IDENT.
BI-207	1.311E-02	4.401E-02	9.336E-02	FAIL ABUN
PB-210	3.521E-01	4.807E+00	9.913E+00	NOT IDENT.
BI-211	0.000E+00	5.746E-01	7.122E-01	FAIL ABUN
PB-211	2.560E-01	5.632E-01	1.182E+00	NOT IDENT.
RN-219	4.562E-02	2.849E-01	5.887E-01	FAIL ABUN
RA-223	1.418E-02	4.697E-01	9.545E-01	FAIL ABUN
AC-227	4.818E-02	2.123E-01	3.996E-01	FAIL ABUN
TH-227	4.818E-02	2.123E-01	3.996E-01	FAIL ABUN
TH-229	-2.067E-01	4.153E-01	7.369E-01	FAIL ABUN
TH-231	1.418E-02	4.697E-01	9.545E-01	FAIL ABUN
PA-233	-2.122E-02	4.464E-02	8.664E-02	FAIL ABUN
PA-234	1.512E-01	2.361E-01	5.108E-01	FAIL ABUN
PA-234M	3.563E+00	4.139E+00	9.064E+00	FAIL ABUN
TH-234	8.427E-01	3.707E+00	2.795E+00	FAIL ABUN
NP-237	-2.122E-02	4.464E-02	8.664E-02	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
U-238	8.427E-01	3.707E+00	2.795E+00	FAIL ABUN
NP-239	-6.923E-03	2.110E-01	3.769E-01	NOT IDENT.
PU-239	2.999E+02	4.929E+02	5.588E+02	FAIL ABUN
AM-241	1.337E-02	1.443E-01	2.730E-01	NOT IDENT.
CM-243	-1.303E-02	9.263E-02	1.774E-01	NOT IDENT.
BK-247	-8.280E-03	6.511E-02	1.181E-01	FAIL ABUN
CM-247	-5.190E-03	2.683E-02	5.300E-02	NOT IDENT.
CF-249	-1.475E-02	3.155E-02	6.008E-02	NOT IDENT.
CF-251	-2.099E-02	9.731E-02	1.793E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	326	10.66*	1.134E+00	1.233E+01	1.233E+01	11.33
CD-109	88.03	58	3.70*	4.887E+00	1.455E+00	2.335E+00	103.28
SN-126	64.28	17	9.60	2.549E+00	3.248E-01	3.248E-01	448.91
	86.94	58	8.90	4.887E+00	6.049E-01	6.049E-01	103.28
	87.57	58	37.00*	4.887E+00	1.455E-01	1.455E-01	103.28
BA-137M	661.66	10	89.90*	2.115E+00	2.331E-02	2.378E-02	249.44
CS-137	661.66	10	85.10*	2.115E+00	2.462E-02	2.512E-02	249.44
CE-139	165.86	28	80.00*	5.922E+00	2.700E-02	1.319E-01	116.79
TL-208	277.37	-----	6.60	4.258E+00	-----	Line Not Found	-----
	583.19	98	85.00*	2.334E+00	2.253E-01	2.253E-01	35.00
	860.56	20	12.50	1.727E+00	4.197E-01	4.197E-01	81.71
BI-211	72.87	-----	1.23	3.591E+00	-----	Line Not Found	-----
	351.06	210	12.92*	3.512E+00	2.118E+00	2.118E+00	27.69
BI-212	727.33	24	6.67*	1.965E+00	8.389E-01	8.389E-01	70.29
	785.37	17	1.10	1.851E+00	3.852E+00	3.852E+00	80.37
	1620.50	-----	1.47	1.036E+00	-----	Line Not Found	-----
PB-212	74.82	103	10.28	3.825E+00	1.194E+00	1.194E+00	56.98
	77.11	212	17.10	4.028E+00	1.410E+00	1.410E+00	28.90
	238.63	426	43.60*	4.776E+00	9.366E-01	9.366E-01	13.53
	300.09	31	3.30	4.000E+00	1.071E+00	1.071E+00	100.50
BI-214	609.32	150	45.49*	2.255E+00	6.677E-01	6.679E-01	26.76
	1120.29	29	14.92	1.407E+00	6.277E-01	6.279E-01	91.79
	1764.49	25	15.30	9.591E-01	7.932E-01	7.935E-01	41.37
PB-214	74.82	103	5.80	3.825E+00	2.116E+00	2.117E+00	56.98
	77.11	212	9.70	4.028E+00	2.485E+00	2.486E+00	28.90
	87.09	58	3.41	4.887E+00	1.579E+00	1.579E+00	103.28
	242.00	85	7.25	4.731E+00	1.128E+00	1.128E+00	45.02
	295.22	152	18.42	4.052E+00	9.326E-01	9.330E-01	28.15
	351.93	210	35.60*	3.512E+00	7.685E-01	7.688E-01	27.69
RN-222	609.32	150	45.49*	2.255E+00	6.677E-01	6.679E-01	26.76
	1120.29	29	14.92	1.407E+00	6.277E-01	6.279E-01	91.79
	1764.49	25	15.30	9.591E-01	7.932E-01	7.935E-01	41.37
RA-224	240.99	85	4.10*	4.731E+00	1.994E+00	1.994E+00	45.02
RA-226	609.32	150	45.49*	2.255E+00	6.677E-01	6.679E-01	26.76
	1120.29	29	14.92	1.407E+00	6.277E-01	6.279E-01	91.79
	1764.49	25	15.30	9.591E-01	7.932E-01	7.935E-01	41.37
AC-228	105.21	-----	1.10	5.839E+00	-----	Line Not Found	-----
	338.32	84	11.27	3.624E+00	9.380E-01	9.380E-01	44.00
	794.95	8	4.25	1.834E+00	4.858E-01	4.858E-01	215.11
	835.71	-----	1.61	1.766E+00	-----	Line Not Found	-----
	911.20	91	25.80*	1.653E+00	9.736E-01	9.736E-01	25.07
	968.97	41	15.80	1.576E+00	7.468E-01	7.468E-01	41.20
RA-228	105.21	-----	1.10	5.839E+00	-----	Line Not Found	-----
	338.32	84	11.27	3.624E+00	9.380E-01	9.380E-01	44.00
	794.95	8	4.25	1.834E+00	4.858E-01	4.858E-01	215.11
	835.71	-----	1.61	1.766E+00	-----	Line Not Found	-----
	911.20	91	25.80*	1.653E+00	9.736E-01	9.736E-01	25.07

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	968.97	41	15.80	1.576E+00	7.468E-01	7.468E-01	41.20
	74.82	103	10.28	3.825E+00	1.194E+00	1.194E+00	56.98
	77.11	212	17.10	4.028E+00	1.410E+00	1.410E+00	28.90
TH-230	238.63	426	43.60*	4.776E+00	9.366E-01	9.366E-01	13.53
	300.09	31	3.30	4.000E+00	1.071E+00	1.071E+00	100.50
	609.32	150	45.49*	2.255E+00	6.677E-01	6.677E-01	26.76
	1120.29	29	14.92	1.407E+00	6.277E-01	6.277E-01	91.79
PA-231	1764.49	25	15.30	9.591E-01	7.932E-01	7.932E-01	41.37
	283.69	-----	1.70	4.183E+00	-----	Line Not Found	-----
TH-232	301.36	31	5.35*	4.000E+00	6.604E-01	6.604E-01	100.50
	105.21	-----	1.10	5.839E+00	-----	Line Not Found	-----
	338.32	84	11.27	3.624E+00	9.380E-01	9.380E-01	44.00
	835.71	-----	1.61	1.766E+00	-----	Line Not Found	-----
U-234	911.20	91	25.80*	1.653E+00	9.736E-01	9.736E-01	25.07
	968.97	41	15.80	1.576E+00	7.468E-01	7.468E-01	41.20
	609.32	150	45.49*	2.255E+00	6.677E-01	6.677E-01	26.76
	1120.29	29	14.92	1.407E+00	6.277E-01	6.277E-01	91.79
U-235	1764.49	25	15.30	9.591E-01	7.932E-01	7.932E-01	41.37
	89.96	61	3.47	5.083E+00	1.587E+00	1.587E+00	107.70
	93.35	79	5.60	5.355E+00	1.203E+00	1.203E+00	78.78
	143.76	-----	10.96*	6.181E+00	-----	Line Not Found	-----
AM-243	163.33	35	5.08	5.962E+00	5.276E-01	5.276E-01	121.65
	185.72	54	57.20	5.611E+00	7.762E-02	7.762E-02	99.67
	205.31	-----	5.01	5.295E+00	-----	Line Not Found	-----
	43.53	-----	5.90	2.461E-01	-----	Line Not Found	-----
ANH-511	74.66	103	67.20*	3.825E+00	1.826E-01	1.826E-01	56.98
	511.00	27	100.00*	2.593E+00	4.819E-02	4.819E-02	140.62

Flag: "*" = Keyline

Total number of lines in spectrum 50
 Number of unidentified lines 8
 Number of lines tentatively identified by NID 42 84.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.233E+01	1.233E+01	0.140E+01	11.33	
CD-109	461.40D	1.61	1.455E+00	2.335E+00	2.412E+00	103.28	
SN-126	2.30E+05Y	1.00	1.455E-01	1.455E-01	1.503E-01	103.28	
BA-137M	30.08Y	1.02	2.331E-02	2.378E-02	5.931E-02	249.44	
CS-137	30.08Y	1.02	2.462E-02	2.512E-02	6.265E-02	249.44	
CE-139	137.64D	4.88	2.700E-02	1.319E-01	1.540E-01	116.79	
TL-208	1.41E+10Y	1.00	2.253E-01	2.253E-01	0.789E-01	35.00	
BI-211	7.04E+08Y	1.00	2.118E+00	2.118E+00	0.586E+00	27.69	
BI-212	1.41E+10Y	1.00	8.389E-01	8.389E-01	5.896E-01	70.29	
PB-212	1.41E+10Y	1.00	9.366E-01	9.366E-01	1.267E-01	13.53	
BI-214	1600.00Y	1.00	6.677E-01	6.679E-01	1.787E-01	26.76	
PB-214	1600.00Y	1.00	7.685E-01	7.688E-01	2.129E-01	27.69	
RN-222	1600.00Y	1.00	6.677E-01	6.679E-01	1.787E-01	26.76	
RA-224	1.41E+10Y	1.00	1.994E+00	1.994E+00	0.898E+00	45.02	
RA-226	1600.00Y	1.00	6.677E-01	6.679E-01	1.787E-01	26.76	
AC-228	1.41E+10Y	1.00	9.736E-01	9.736E-01	2.441E-01	25.07	
RA-228	1.41E+10Y	1.00	9.736E-01	9.736E-01	2.441E-01	25.07	
TH-228	1.41E+10Y	1.00	9.366E-01	9.366E-01	1.267E-01	13.53	
TH-230	7.54E+04Y	1.00	6.677E-01	6.677E-01	1.787E-01	26.76	
PA-231	7.04E+08Y	1.00	6.604E-01	6.604E-01	6.637E-01	100.50	
TH-232	1.41E+10Y	1.00	9.736E-01	9.736E-01	2.441E-01	25.07	
U-234	2.45E+05Y	1.00	6.677E-01	6.677E-01	1.787E-01	26.76	
U-235	7.04E+08Y	1.00	7.762E-02	7.762E-02	7.737E-02	99.67	K
AM-243	7370.00Y	1.00	1.826E-01	1.826E-01	1.041E-01	56.98	
ANH-511	1.00E+09Y	1.00	4.819E-02	4.819E-02	6.776E-02	140.62	
Total Activity :			2.905E+01	3.004E+01			

Grand Total Activity : 2.905E+01 3.004E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	40.90	29	118	1.43	81.97	76	8	5.54E-03	****	1.12E-01	
0	68.49	39	96	0.94	137.07	135	5	8.00E-03	95.7	3.09E+00	T
0	118.51	37	87	0.92	236.98	234	7	7.98E-03	****	6.14E+00	T
0	128.82	26	123	0.93	257.58	255	7	5.55E-03	****	6.22E+00	T
0	154.68	25	46	1.34	309.23	307	5	5.54E-03	****	6.08E+00	T
0	209.48	89	101	1.63	418.71	414	10	2.02E-02	52.7	5.23E+00	T
0	224.37	58	127	3.68	448.45	442	13	1.32E-02	93.3	4.99E+00	
0	270.13	58	77	1.19	539.87	535	10	1.35E-02	68.3	4.35E+00	T
0	424.65	24	15	0.87	848.63	845	7	5.80E-03	73.3	3.01E+00	T
0	462.97	24	15	1.05	925.21	922	7	6.02E-03	71.2	2.81E+00	T
0	562.17	19	8	1.41	1123.47	1120	7	4.70E-03	71.2	2.40E+00	T
0	597.97	16	32	0.57	1195.04	1190	12	4.08E-03	****	2.29E+00	
0	644.53	9	27	2.18	1288.12	1283	12	2.31E-03	****	2.16E+00	T
0	705.95	12	15	0.95	1410.91	1408	7	3.06E-03	****	2.01E+00	T
0	767.90	26	26	1.14	1534.78	1529	11	6.84E-03	87.8	1.88E+00	T
0	806.45	7	13	1.17	1611.85	1605	9	1.95E-03	****	1.82E+00	
0	821.53	18	5	3.01	1642.01	1637	11	4.86E-03	69.6	1.79E+00	
3	965.06	38	7	2.28	1929.05	1921	22	1.03E-02	44.8	1.58E+00	T
0	1137.59	7	2	1.41	2274.18	2271	7	1.96E-03	98.5	1.39E+00	
0	1378.42	14	5	1.62	2756.10	2749	11	4.03E-03	81.7	1.19E+00	
0	1406.85	10	0	1.49	2813.00	2806	11	2.75E-03	71.6	1.17E+00	T
0	1501.18	7	2	1.36	3001.84	2998	7	2.04E-03	94.7	1.11E+00	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235035.CNF;1
* Acquisition date   : 3-OCT-2016 09:16:17 Sensitivity      : 3.000
* Detector ID        : GAM33 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.73 Half life ratio  : *****
* Sample date        : 23-NOV-2015 11:06:00 Nuclide Library : SOLID
* Sample ID          : G405235035 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity : 1.6407E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 10-JUN-2016 07:00:49 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.148E-01
CD-109	8.963E-01
SN-126	5.620E-02
BA-137M	2.878E-02
CS-137	3.041E-02
CE-139	8.734E-02
TL-208	2.839E-02
BI-212	4.600E-01
PB-212	3.713E-02
BI-214	5.074E-02
PB-214	5.135E-02
RN-222	5.074E-02
RA-224	3.979E-01
RA-226	5.074E-02
AC-228	8.142E-02
RA-228	8.142E-02
TH-228	3.713E-02
TH-230	5.072E-02
PA-231	3.278E-01
TH-232	8.142E-02
U-234	5.072E-02
U-235	1.457E-01
AM-243	4.003E-02
ANH-511	2.104E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.265E+01	NOT IDENT.
NA-22	3.559E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.143E-02	NOT IDENT.
SC-46	3.005E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF

MN-54	5.335E-02	NOT IDENT.
CO-56	4.119E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.571E-02	NOT IDENT.
CO-58	5.784E-01	NOT IDENT.
FE-59	7.941E+00	NOT IDENT.
CO-60	2.964E-02	NOT IDENT.
ZN-65	1.115E-01	NOT IDENT.
GE-68	2.330E+00	NOT IDENT.
AS-73	9.277E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.633E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.130E-01	NOT IDENT.
KR-85	5.726E+00	NOT IDENT.
SR-85	7.087E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	2.019E-01	NOT IDENT.
Y-91	5.251E+02	NOT IDENT.
NB-94	2.729E-02	NOT IDENT.
NB-95	7.441E-01	NOT IDENT.
NB-95M	2.258E+00	NOT IDENT.
ZR-95	1.339E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.602E-02	NOT IDENT.
RH-102	4.085E-02	FAIL ABUN
RU-103	5.553E+00	FAIL ABUN
RH-106	3.311E-01	NOT IDENT.
RU-106	3.311E-01	NOT IDENT.
AG-108M	1.975E-02	NOT IDENT.
AG-110M	7.885E-02	FAIL ABUN
SN-113	1.904E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.010E-01	NOT IDENT.
SB-124	1.777E+00	FAIL ABUN
SB-125	8.936E-02	FAIL ABUN
TE-125M	2.786E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.667E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	4.039E-02	FAIL ABUN
CS-135	1.100E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.289E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.707E-01	NOT IDENT.
PM-144	3.257E-02	NOT IDENT.
PR-144	2.862E+00	NOT IDENT.
PM-146	3.347E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	5.942E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.789E-02	FAIL ABUN
EU-152	6.575E-02	FAIL ABUN
GD-153	1.394E-01	FAIL ABUN
EU-154	8.968E-02	NOT IDENT.
EU-155	9.952E-02	FAIL ABUN
TB-160	1.851E+00	FAIL ABUN
HO-166M	3.983E-02	NOT IDENT.
TM-171	2.207E+01	NOT IDENT.
HF-172	1.943E-01	FAIL ABUN
LU-172	6.369E-02	FAIL ABUN
LU-176	1.741E-02	FAIL ABUN
HF-181	4.180E+00	NOT IDENT.
TA-182	7.619E-01	FAIL ABUN

RE-183	3.169E+00	FAIL ABUN
RE-184	2.465E+01	NOT IDENT.
W-188	8.598E+01	FAIL ABUN
IR-192	4.098E-01	FAIL ABUN
HG-203	2.138E+00	NOT IDENT.
BI-207	4.081E-02	FAIL ABUN
PB-210	4.604E+00	NOT IDENT.
BI-211	3.419E-01	FAIL ABUN
PB-211	5.360E-01	NOT IDENT.
RN-219	2.631E-01	FAIL ABUN
RA-223	4.337E-01	FAIL ABUN
AC-227	1.846E-01	FAIL ABUN
TH-227	1.846E-01	FAIL ABUN
TH-229	3.411E-01	FAIL ABUN
TH-231	4.337E-01	FAIL ABUN
PA-233	3.894E-02	FAIL ABUN
PA-234	2.226E-01	FAIL ABUN
PA-234M	4.043E+00	FAIL ABUN
TH-234	1.322E+00	FAIL ABUN
NP-237	3.894E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.322E+00	FAIL ABUN
NP-239	1.746E-01	NOT IDENT.
PU-239	2.624E+02	FAIL ABUN
AM-241	1.268E-01	NOT IDENT.
CM-243	8.303E-02	NOT IDENT.
BK-247	5.409E-02	FAIL ABUN
CM-247	2.364E-02	NOT IDENT.
CF-249	2.700E-02	NOT IDENT.
CF-251	8.297E-02	NOT IDENT.

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235035.CNF;1
* Acquisition date   : 3-OCT-2016 09:16:17 Sensitivity      : 3.000
* Detector ID       : GAM33 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.73 Half life ratio : *****
* Sample date       : 23-NOV-2015 11:06:00 Nuclide Library : SOLID
* Sample ID         : G405235035 Analyst initials: MXR1
* Batch Number      : 1596249 Sample Quantity : 1.6407E+02 GRAM
*                   Quantity Err(%) : 1.2190E-03 %
* Wet wt corr       : 1.00000 Wet Weight      : 0.00000
*                   Dry Weight      : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 10-JUN-2016 07:00:49 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.233E+01	1.512E+00	1.512E+00
CD-109	9.559E-01	2.402E+00	2.402E+00
SN-126	5.956E-02	1.496E-01	1.496E-01
BA-137M	2.378E-02	5.813E-02	5.813E-02
CS-137	2.512E-02	6.141E-02	6.141E-02
CE-139	1.319E-01	1.533E-01	1.533E-01
TL-208	2.253E-01	7.787E-02	7.787E-02
BI-212	8.389E-01	5.794E-01	5.794E-01
PB-212	9.366E-01	1.336E-01	1.336E-01
BI-214	6.679E-01	1.775E-01	1.775E-01
PB-214	7.688E-01	2.110E-01	2.110E-01
RN-222	6.679E-01	1.775E-01	1.775E-01
RA-224	3.453E-01	9.966E-01	9.966E-01
RA-226	6.679E-01	1.775E-01	1.775E-01
AC-228	9.736E-01	2.443E-01	2.443E-01
RA-228	9.736E-01	2.443E-01	2.443E-01
TH-228	9.366E-01	1.336E-01	1.336E-01
TH-230	6.677E-01	1.774E-01	1.774E-01
PA-231	6.604E-01	6.655E-01	6.655E-01
TH-232	9.736E-01	2.443E-01	2.443E-01
U-234	6.677E-01	1.774E-01	1.774E-01
U-235	4.831E-02	1.566E-01	1.566E-01
AM-243	1.021E-01	1.051E-01	1.051E-01
ANH-511	4.819E-02	6.643E-02	6.643E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	2.251E+00	1.393E+01	1.396E+01	NOT IDENT.
NA-22	1.208E-02	3.855E-02	3.893E-02	NOT IDENT.
NA-24	1.000E+41	7.360E+41	0.000E+00	SHORT HLIF
AL-26	-1.033E-02	1.973E-02	2.027E-02	NOT IDENT.
SC-46	-8.621E-02	3.710E-01	3.730E-01	FAIL ABUN
V-48	-1.048E+04	2.509E+04	2.553E+04	SHORT HLIF

CR-51	-4.693E+02	4.796E+02	5.242E+02	SHORT HLIF
MN-54	3.984E-03	6.251E-02	6.254E-02	NOT IDENT.
CO-56	-1.071E-02	4.907E-01	4.907E-01	NOT IDENT.
MN-56	-1.000E+41	3.439E+42	0.000E+00	SHORT HLIF
CO-57	4.350E-04	4.306E-02	4.306E-02	NOT IDENT.
CO-58	7.502E-01	5.425E-01	6.393E-01	NOT IDENT.
FE-59	3.728E+00	8.456E+00	8.622E+00	NOT IDENT.
CO-60	-1.357E-02	3.719E-02	3.769E-02	NOT IDENT.
ZN-65	6.778E-03	1.415E-01	1.415E-01	NOT IDENT.
GE-68	2.070E+00	2.330E+00	2.510E+00	NOT IDENT.
AS-73	-2.675E+00	1.011E+01	1.018E+01	NOT IDENT.
AS-74	2.573E+03	1.073E+04	1.079E+04	SHORT HLIF
SE-75	-8.750E-02	2.048E-01	2.086E-01	NOT IDENT.
BR-77	1.376E+40	1.251E+41	0.000E+00	SHORT HLIF
SR-82	1.210E+01	8.272E+02	8.272E+02	SHORT HLIF
RB-83	-7.747E-02	5.928E-01	5.938E-01	NOT IDENT.
KR-85	5.968E+00	6.155E+00	6.717E+00	NOT IDENT.
SR-85	7.378E-01	7.619E-01	8.314E-01	NOT IDENT.
RB-86	4.167E+04	4.450E+04	4.831E+04	SHORT HLIF
Y-88	3.215E-02	2.316E-01	2.321E-01	NOT IDENT.
Y-91	1.332E+02	5.795E+02	5.826E+02	NOT IDENT.
NB-94	2.102E-02	3.132E-02	3.272E-02	NOT IDENT.
NB-95	1.323E-01	9.351E-01	9.370E-01	NOT IDENT.
NB-95M	1.782E+00	2.463E+00	2.591E+00	NOT IDENT.
ZR-95	-2.318E-01	1.610E+00	1.614E+00	NOT IDENT.
NB-97	1.000E+41	1.383E+41	0.000E+00	SHORT HLIF
ZR-97	-1.000E+41	2.944E+42	0.000E+00	SHORT HLIF
MO-99	-4.416E+33	7.182E+33	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	8.984E+41	0.000E+00	SHORT HLIF
RH-101	-9.528E-04	3.162E-02	3.162E-02	NOT IDENT.
RH-102	3.375E-03	4.645E-02	4.648E-02	FAIL ABUN
RU-103	2.025E-01	6.227E+00	6.227E+00	FAIL ABUN
RH-106	-3.279E-01	4.394E-01	4.636E-01	NOT IDENT.
RU-106	-3.279E-01	4.394E-01	4.636E-01	NOT IDENT.
AG-108M	-4.500E-03	2.260E-02	2.269E-02	NOT IDENT.
AG-110M	4.260E-02	8.494E-02	8.708E-02	FAIL ABUN
SN-113	-2.090E-02	2.126E-01	2.128E-01	NOT IDENT.
CD-115	5.774E+40	2.786E+41	0.000E+00	SHORT HLIF
SN-117M	-6.967E+04	1.737E+05	1.765E+05	SHORT HLIF
TE-123M	-2.574E-02	1.175E-01	1.181E-01	NOT IDENT.
SB-124	1.221E+00	1.654E+00	1.743E+00	FAIL ABUN
SB-125	6.022E-02	1.010E-01	1.046E-01	FAIL ABUN
TE-125M	1.209E+02	2.996E+02	3.045E+02	NOT IDENT.
I-126	-1.058E+06	1.927E+06	1.986E+06	SHORT HLIF
SB-126	-5.671E+05	2.332E+06	2.346E+06	SHORT HLIF
SB-127	8.054E+22	3.002E+23	0.000E+00	SHORT HLIF
I-131	-7.539E+09	1.576E+10	1.613E+10	SHORT HLIF
I-132	-1.000E+41	1.946E+42	0.000E+00	SHORT HLIF
TE-132	-3.492E+27	9.955E+27	0.000E+00	SHORT HLIF
BA-133	-9.869E-03	3.413E-02	3.442E-02	NOT IDENT.
I-133	1.000E+41	3.751E+41	0.000E+00	SHORT HLIF
CS-134	3.225E-02	6.799E-02	6.953E-02	FAIL ABUN
CS-135	-1.342E-02	1.440E-01	1.441E-01	NOT IDENT.
I-135	-1.000E+41	2.184E+42	0.000E+00	SHORT HLIF
CS-136	-3.336E+05	4.593E+05	4.833E+05	SHORT HLIF
BA-140	3.406E+05	2.224E+06	2.230E+06	SHORT HLIF
LA-140	-1.752E+05	8.643E+05	8.679E+05	SHORT HLIF
CE-141	-1.916E+01	2.778E+01	2.910E+01	NOT IDENT.
CE-143	1.000E+41	1.261E+41	0.000E+00	SHORT HLIF
CE-144	5.756E-02	2.981E-01	2.992E-01	NOT IDENT.
PM-144	-4.602E-02	4.695E-02	5.133E-02	NOT IDENT.
PR-144	-4.000E+00	4.111E+00	4.489E+00	NOT IDENT.
PM-146	1.194E-02	3.580E-02	3.620E-02	NOT IDENT.
ND-147	-2.038E+07	6.338E+07	6.404E+07	SHORT HLIF
PM-147	4.642E+01	7.113E+02	7.116E+02	NOT IDENT.
PM-149	-1.000E+41	9.623E+40	0.000E+00	SHORT HLIF
EU-150	-6.931E-03	2.125E-02	2.148E-02	FAIL ABUN
EU-152	-1.637E-02	7.725E-02	7.760E-02	FAIL ABUN
GD-153	2.156E-02	1.643E-01	1.646E-01	FAIL ABUN
EU-154	3.822E-02	9.577E-02	9.731E-02	NOT IDENT.
EU-155	4.946E-02	1.060E-01	1.083E-01	FAIL ABUN
TB-160	8.292E-01	2.054E+00	2.087E+00	FAIL ABUN
HO-166M	2.036E-02	4.254E-02	4.352E-02	NOT IDENT.
TM-171	2.748E-01	2.331E+01	2.331E+01	NOT IDENT.
HF-172	1.131E-01	2.236E-01	2.294E-01	FAIL ABUN
LU-172	3.522E-02	6.628E-02	6.816E-02	FAIL ABUN
LU-176	-9.939E-03	1.989E-02	2.039E-02	FAIL ABUN
HF-181	-1.409E+00	4.890E+00	4.931E+00	NOT IDENT.

TA-182	-1.830E-03	8.743E-01	8.743E-01	FAIL ABUN
RE-183	-2.048E-01	3.389E+00	3.391E+00	FAIL ABUN
RE-184	-3.690E+00	3.038E+01	3.042E+01	NOT IDENT.
W-188	-8.986E+01	1.158E+02	1.227E+02	FAIL ABUN
IR-192	8.661E-02	4.353E-01	4.371E-01	FAIL ABUN
HG-203	-5.679E-01	2.352E+00	2.366E+00	NOT IDENT.
BI-207	1.311E-02	4.401E-02	4.441E-02	FAIL ABUN
PB-210	3.521E-01	4.807E+00	4.809E+00	NOT IDENT.
BI-211	2.118E+00	5.822E-01	1.118E+00	FAIL ABUN
PB-211	2.560E-01	5.633E-01	5.750E-01	NOT IDENT.
RN-219	4.562E-02	2.850E-01	2.857E-01	FAIL ABUN
RA-223	1.418E-02	4.697E-01	4.697E-01	FAIL ABUN
AC-227	4.818E-02	2.124E-01	2.135E-01	FAIL ABUN
TH-227	4.818E-02	2.124E-01	2.135E-01	FAIL ABUN
TH-229	-2.067E-01	4.154E-01	4.257E-01	FAIL ABUN
TH-231	1.418E-02	4.697E-01	4.697E-01	FAIL ABUN
PA-233	-2.122E-02	4.465E-02	4.566E-02	FAIL ABUN
PA-234	1.512E-01	2.927E-01	3.005E-01	FAIL ABUN
PA-234M	3.563E+00	4.141E+00	4.442E+00	FAIL ABUN
TH-234	8.427E-01	3.712E+00	3.731E+00	FAIL ABUN
NP-237	-2.122E-02	4.465E-02	4.566E-02	FAIL ABUN
NP-238	-1.000E+41	4.750E+41	0.000E+00	SHORT HLIF
U-238	8.427E-01	3.712E+00	3.731E+00	FAIL ABUN
NP-239	-6.923E-03	2.110E-01	2.110E-01	NOT IDENT.
PU-239	2.999E+02	4.931E+02	5.113E+02	FAIL ABUN
AM-241	1.337E-02	1.443E-01	1.444E-01	NOT IDENT.
CM-243	-1.303E-02	9.264E-02	9.282E-02	NOT IDENT.
BK-247	-8.280E-03	6.513E-02	6.524E-02	FAIL ABUN
CM-247	-5.190E-03	2.685E-02	2.695E-02	NOT IDENT.
CF-249	-1.475E-02	3.157E-02	3.227E-02	NOT IDENT.
CF-251	-2.099E-02	9.734E-02	9.780E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	43.6508	87.09	76.6525	136.47	51.5361
45.60	51.7159	87.57	76.7138	140.51	0.0000
46.54	55.6064	88.03	76.7721	143.76	50.8881
49.72	0.0000	88.34	76.8113	144.24	46.4899
51.35	45.7623	88.47	76.8276	145.44	66.5085
51.87	46.7719	89.96	77.0153	152.43	61.0929
52.39	47.7835	1093.63	77.1000	153.25	0.0000
52.97	46.8899	91.11	0.0000	323.87	45.9129
53.44	45.9820	92.59	77.3426	156.02	0.0000
54.07	45.0879	93.35	77.4359	158.56	0.0000
57.36	0.0000	94.56	77.5846	159.00	55.1691
57.53	49.2998	94.65	77.5955	162.33	57.2567
57.98	53.2179	94.67	77.5978	162.66	0.0000
59.27	55.6287	94.87	77.6224	163.33	54.3025
59.32	55.6346	97.43	54.0332	165.86	54.4526
59.54	55.6604	98.43	58.2794	176.31	51.6193
60.96	63.6164	98.44	58.2802	176.60	0.0000
61.17	66.2421	99.53	67.7597	177.52	56.2779
62.93	69.0899	100.11	67.8193	181.07	0.0000
63.29	69.1408	102.03	71.1553	181.52	62.2760
63.58	69.1815	103.18	74.4218	184.41	55.5190
64.28	69.2794	103.37	74.4430	143.76	50.9596
66.73	70.9321	105.21	74.6461	193.51	63.0258
67.24	71.0030	105.31	74.6569	197.03	57.3852
125.81	71.0640	106.12	82.1148	198.01	64.4733
67.75	71.0739	106.47	92.6896	201.83	65.8848
69.67	87.1917	109.28	60.2820	203.43	60.0932
70.83	65.5383	111.00	71.0316	205.31	55.0848
72.81	74.7528	111.76	0.0000	210.85	33.2209
72.87	74.7614	114.06	61.7551	215.65	48.8589
74.66	75.0086	116.30	0.0000	222.11	49.1423
74.82	75.0309	116.74	54.1476	227.09	49.7594
74.97	75.0515	119.76	55.8011	227.38	48.1665
77.11	75.3433	121.12	44.4360	228.16	0.0000
78.74	64.4800	121.22	50.1765	228.18	51.4134
79.69	76.6987	121.78	50.2139	116.74	51.4134
80.12	79.4499	122.06	53.1032	235.69	46.0872
80.19	0.0000	122.92	63.5810	235.96	46.0980
80.57	63.3403	123.07	63.5936	238.63	46.2023
81.00	55.2956	265.00	66.8811	238.98	0.0000
81.07	55.3023	125.81	60.5784	240.99	46.2939
81.75	85.0773	127.23	63.5801	242.00	46.3334
83.79	93.5070	127.91	67.9749	244.70	24.4406
84.00	93.5400	129.30	61.9384	252.40	0.0000
85.43	76.4402	131.20	56.6433	252.80	44.2864
86.55	76.5839	133.02	42.5801	254.15	0.0000
86.79	76.6142	133.52	52.4392	256.23	44.4089
86.94	76.6336	136.00	63.5605	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	44.7067	355.39	0.0000	584.27	10.4462
264.80	42.2281	356.01	27.8092	595.83	0.0000
265.00	42.2344	364.49	0.0000	427.87	18.0359
268.22	48.1516	366.42	0.0000	602.52	0.0000
269.46	41.1352	372.51	22.2992	604.72	22.5842
270.03	41.1533	375.05	33.9473	607.14	15.0720
271.23	41.6077	377.52	27.7355	609.32	22.1262
273.65	0.0000	356.01	34.1290	610.33	22.1352
276.40	45.9497	388.16	33.3167	614.28	16.6296
277.37	47.6554	388.63	0.0000	618.01	17.1605
277.60	47.6635	391.69	29.7773	620.36	14.1458
278.00	35.9681	264.66	20.8634	621.93	22.2444
279.20	40.1865	401.81	21.7847	630.19	0.0000
279.54	43.5470	402.40	25.4246	631.29	14.2108
279.70	41.0397	404.85	25.4604	633.25	16.2539
280.46	35.1965	410.95	31.0249	634.78	0.0000
283.69	34.4419	413.71	31.0733	635.95	12.2041
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	36.1684	423.72	0.0000	645.85	12.2534
285.90	0.0000	427.09	24.8621	657.76	15.3906
287.50	25.2728	427.87	23.4912	657.90	0.0000
290.67	44.3311	433.94	24.9565	661.66	23.6364
293.27	0.0000	439.40	21.3224	664.57	0.0000
351.93	27.9579	453.88	20.5547	666.33	0.0000
295.96	27.9727	463.37	16.9017	666.50	0.0000
879.38	20.3823	468.07	22.5908	667.71	0.0000
299.98	30.6042	473.00	0.0000	677.62	16.5469
300.09	30.6072	475.06	23.6170	685.70	0.0000
300.13	30.6079	476.78	25.5289	695.00	0.0000
301.36	38.2938	477.60	26.4858	696.49	21.8776
302.85	38.3340	482.18	26.5474	696.51	21.8776
256.23	28.1445	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	14.5896
306.78	40.1497	497.08	21.0153	697.49	14.5907
308.46	30.7896	505.52	23.0215	702.65	15.6635
311.90	33.4355	507.63	0.0000	706.68	14.1191
316.51	32.6825	511.00	24.0448	711.68	10.4781
319.41	0.0000	514.00	15.8924	720.70	0.0000
320.08	0.0000	514.00	15.8924	721.93	0.0000
321.04	30.1963	520.40	19.3229	722.78	26.5156
323.87	32.8480	520.69	0.0000	722.91	26.5166
325.23	32.8781	522.65	0.0000	723.31	20.5220
328.76	0.0000	527.90	0.0000	724.19	15.7916
333.37	34.7982	528.26	17.4565	727.33	30.0389
333.97	35.5083	529.59	15.5267	733.00	20.0677
334.37	30.0331	529.87	0.0000	735.93	15.8600
338.28	32.2929	531.02	0.0000	333.97	12.6953
338.32	32.2937	537.26	0.0000	739.50	0.0000
311.90	26.2213	546.56	0.0000	747.24	15.9259
340.48	26.2213	552.55	10.7892	748.06	7.4344
340.55	0.0000	563.25	19.2191	752.31	24.4646
344.28	31.5439	569.33	19.7664	753.82	0.0000
345.93	30.2619	946.00	19.7681	756.73	19.1770
351.06	32.5617	569.70	18.7812	756.80	19.1777
351.93	32.5798	583.19	25.8551	884.68	16.0223

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	14.4300	1274.44	11.5108	1620.50	3.0031
766.42	22.4509	1001.03	9.2214	1621.92	8.0103
766.84	22.4543	1002.74	16.1453	1678.03	0.0000
772.60	0.0000	1004.73	13.8467	1690.97	1.0148
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	1.0287
778.90	8.5908	1028.54	0.0000	1063.66	7.2089
783.70	0.0000	1037.84	10.4839	1771.35	3.0901
785.37	11.3011	1038.76	0.0000	1791.20	0.0000
792.07	17.8005	631.29	10.5095	1808.65	3.1111
794.95	16.1981	1048.07	0.0000	1810.72	0.0000
795.86	8.1018	1049.04	10.5168	1836.06	4.1685
810.06	11.7237	1050.41	7.8904		
810.29	10.4219	1063.66	12.3192		
344.28	8.6852	1077.00	0.0000		
810.76	5.4289	1077.34	10.5989		
815.77	0.0000	1085.87	9.7385		
1048.07	0.0000	1093.63	9.7586		
832.01	12.0299	1099.45	14.2168		
834.85	17.5143	1112.07	13.3731		
835.71	17.5195	1112.84	14.2676		
836.80	0.0000	1115.54	8.5670		
846.75	0.0000	1120.29	15.1894		
846.77	15.3860	1120.55	15.1904		
856.80	0.0000	1221.41	15.1935		
860.56	8.8319	1129.67	10.7490		
871.09	11.0775	1131.51	0.0000		
873.19	14.4108	1147.95	0.0000		
875.33	0.0000	1173.23	7.2471		
879.38	13.3286	1177.95	10.8838		
880.51	8.8890	1189.05	10.9146		
883.24	17.7936	1204.77	13.6972		
884.68	8.9007	1221.41	13.7540		
889.28	12.2568	1231.02	18.3826		
894.76	13.3940	1235.36	0.0000		
898.04	12.2909	1238.28	11.9701		
900.72	14.5377	1260.41	0.0000		
903.28	10.0726	1271.87	10.2111		
911.20	10.0975	1274.44	8.3595		
912.08	10.1005	1274.54	8.3595		
923.98	0.0000	1291.59	6.5283		
926.50	6.7637	1298.22	0.0000		
929.11	11.2821	1312.11	0.0000		
937.49	18.0977	1332.49	12.2407		
944.13	0.0000	1362.66	0.0000		
946.00	9.0723	1365.19	6.6403		
949.00	13.6206	1368.63	0.0000		
667.71	0.0000	1384.29	2.8581		
962.31	5.1282	1408.01	4.5973		
964.08	4.5609	1457.56	0.0000		
966.17	4.5636	1460.82	5.8129		
911.20	4.5674	1489.16	3.8984		
968.97	4.5674	1505.03	10.9525		
983.53	0.0000	1584.12	7.9507		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235036.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM36.CNF;52
Background date  : 2-OCT-2016 11:02:08.
Sample date     : 23-NOV-2015 11:12:00 Acquisition date : 3-OCT-2016 09:16:44.
Sample ID      : G405235036 Sample quantity   : 1.62257E+02 GRAM
Detector name   : GAM36 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.33 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity    : 3.00000
Batch ID       : 1596249 Detector SN#    :
Matrix Spike ID : LCS ID           : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	74.95*	71	98	0.87	149.88	146	12	1.98E-02	23.6	1.27E+00
2	1	77.10*	142	98	0.93	154.17	146	12	3.93E-02	14.4	
3	0	87.19	70	103	1.37	174.36	172	7	1.94E-02	26.7	
4	0	92.82*	40	128	1.50	185.62	182	8	1.11E-02	54.0	
5	0	137.93	30	71	1.27	275.85	272	8	8.20E-03	53.0	
6	0	147.89	22	44	0.75	295.77	293	6	6.02E-03	53.8	
7	0	186.09*	42	106	0.86	372.16	367	10	1.16E-02	50.7	
8	0	209.98	24	77	1.49	419.94	414	10	6.72E-03	71.0	
9	5	238.63*	256	31	0.93	477.25	472	16	7.12E-02	7.4	1.08E+00
10	5	241.61	71	38	1.78	483.20	472	16	1.96E-02	21.3	
11	0	245.61	22	30	1.35	491.21	488	7	6.11E-03	46.4	
12	0	270.50	26	49	0.77	540.98	536	8	7.11E-03	51.7	
13	0	295.45*	90	58	1.08	590.88	585	12	2.50E-02	20.3	
14	0	300.31	32	41	0.59	600.60	597	10	8.89E-03	41.1	
15	0	305.63	10	29	1.40	611.24	606	9	2.64E-03	112.4	
16	0	338.51	46	66	1.85	677.00	669	14	1.27E-02	40.7	
17	0	349.45	10	21	1.16	698.88	692	8	2.79E-03	86.2	
18	0	351.99*	137	33	1.28	703.96	700	10	3.81E-02	11.6	
19	0	409.99	19	22	1.70	819.95	815	10	5.20E-03	52.7	
20	0	464.25	11	35	1.29	928.46	923	12	2.99E-03	112.0	
21	5	515.57	16	12	2.21	1031.10	1014	22	4.52E-03	57.1	1.07E+00
22	0	538.68	12	36	5.95	1077.29	1062	18	3.45E-03	116.7	
23	0	543.65	22	7	2.36	1087.24	1083	10	6.09E-03	31.5	
24	0	562.29	8	1	0.71	1124.52	1123	5	2.13E-03	45.4	
25	0	583.75*	59	34	1.17	1167.42	1161	13	1.65E-02	24.2	
26	0	603.12	15	8	1.84	1206.16	1200	11	4.16E-03	45.1	
27	0	609.47*	106	8	1.28	1218.86	1214	11	2.95E-02	11.5	
28	0	727.30	22	11	0.77	1454.47	1450	10	6.19E-03	34.2	
29	0	900.61	13	0	0.83	1801.00	1797	8	3.61E-03	27.7	
30	0	905.40*	10	2	2.72	1810.56	1806	9	2.72E-03	45.1	
31	0	911.55*	50	5	2.04	1822.86	1818	10	1.39E-02	17.0	
32	4	966.14	9	7	1.83	1932.00	1930	12	2.62E-03	42.8	1.71E+00
33	4	969.14	15	7	1.68	1938.00	1930	12	4.25E-03	44.3	
34	0	1120.69*	27	8	2.39	2240.98	2233	16	7.60E-03	30.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1280.68*	5	9	0.47	2560.83	2554	9	1.52E-03	109.5	
36	0	1291.10	7	2	1.38	2581.65	2578	7	2.01E-03	48.1	
37	0	1461.09*	164	7	2.06	2921.44	2914	13	4.57E-02	8.5	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235036.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 23-NOV-2015 11:12:00 Acquisition date : 3-OCT-2016 09:16:44
Sample ID         : G405235036 Sample quantity   : 162.26 GRAM
Sample type       : SOLID Sample geometry    :
Detector name     : GAMMA36 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.33 0.0%
Energy tolerance  : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type   : Linear Efficiencies at   : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	6.546E-01	1.060E+01	1.060E+01	17.07	OK
CD-109	88.03	3.70*	4.292E+00	1.850E+00	2.970E+00	80.29	OK
SN-126	64.28	9.60	2.567E+00	-----	Line Not Found	-----	Absent
	86.94	8.90	4.292E+00	7.693E-01	7.693E-01	80.29	OK
	87.57	37.00*	4.292E+00	1.850E-01	1.850E-01	80.29	OK
TL-208	277.37	6.60	3.041E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	1.495E+00	2.349E-01	2.349E-01	48.40	OK
	860.56	12.50	1.058E+00	-----	Line Not Found	-----	Absent
PB-212	74.82	10.28	3.493E+00	7.135E-01	7.135E-01	87.15	OK
	77.11	17.10	3.655E+00	1.410E+00	1.410E+00	28.78	OK
	238.63	43.60*	3.499E+00	9.340E-01	9.340E-01	14.72	OK
	300.09	3.30	2.817E+00	1.868E+00	1.868E+00	82.17	OK
BI-214	609.32	45.49*	1.437E+00	8.142E-01	8.145E-01	22.99	OK
	1120.29	14.92	8.369E-01	1.019E+00	1.019E+00	60.99	OK
	1764.49	15.30	5.419E-01	-----	Line Not Found	-----	Absent
PB-214	74.82	5.80	3.482E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	3.655E+00	2.485E+00	2.486E+00	28.78	OK
	87.09	3.41	4.287E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	3.455E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	2.862E+00	9.287E-01	9.290E-01	40.66	OK
	351.93	35.60*	2.414E+00	8.501E-01	8.504E-01	23.27	OK
RN-222	609.32	45.49*	1.437E+00	8.142E-01	8.145E-01	22.99	OK
	1120.29	14.92	8.369E-01	1.019E+00	1.019E+00	60.99	OK
	1764.49	15.30	5.419E-01	-----	Line Not Found	-----	Absent
RA-224	240.99	4.10*	3.460E+00	1.123E+00	1.123E+00	120.72	OK
RA-226	609.32	45.49*	1.437E+00	8.142E-01	8.145E-01	22.99	OK
	1120.29	14.92	8.369E-01	1.019E+00	1.019E+00	60.99	OK
	1764.49	15.30	5.419E-01	-----	Line Not Found	-----	Absent
AC-228	105.21	1.10	4.933E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	2.507E+00	8.644E-01	8.644E-01	81.42	OK
	794.95	4.25	1.134E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.085E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.005E+00	9.219E-01	9.219E-01	34.07	OK
	968.97	15.80	9.524E-01	4.816E-01	4.816E-01	88.69	OK
RA-228	105.21	1.10	4.933E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	2.507E+00	8.644E-01	8.644E-01	81.42	OK
	794.95	4.25	1.134E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.085E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.005E+00	9.219E-01	9.219E-01	34.07	OK
	968.97	15.80	9.524E-01	4.816E-01	4.816E-01	88.69	OK
TH-228	74.82	10.28	3.493E+00	7.135E-01	7.135E-01	87.15	OK
	77.11	17.10	3.655E+00	1.410E+00	1.410E+00	28.78	OK
	238.63	43.60*	3.499E+00	9.340E-01	9.340E-01	14.72	OK
	300.09	3.30	2.817E+00	1.868E+00	1.868E+00	82.17	OK
TH-230	609.32	45.49*	1.437E+00	8.142E-01	8.142E-01	22.99	OK
	1120.29	14.92	8.369E-01	1.019E+00	1.019E+00	60.99	OK
	1764.49	15.30	5.419E-01	-----	Line Not Found	-----	Absent
PA-231	283.69	1.70	2.976E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	2.817E+00	1.152E+00	1.152E+00	82.17	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-232	105.21	1.10	4.933E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	2.507E+00	8.644E-01	8.644E-01	81.42	OK
	835.71	1.61	1.085E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.005E+00	9.219E-01	9.219E-01	34.07	OK
U-234	968.97	15.80	9.524E-01	4.816E-01	4.816E-01	88.69	OK
	609.32	45.49*	1.437E+00	8.142E-01	8.142E-01	22.99	OK
	1120.29	14.92	8.369E-01	1.019E+00	1.019E+00	60.99	OK
AM-243	1764.49	15.30	5.419E-01	-----	Line Not Found	-----	Absent
	43.53	5.90	5.957E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	3.493E+00	1.091E-01	1.092E-01	87.15	OK

Flag: "*" = Keyline


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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235036.CNF;1
* Acquisition date   : 3-OCT-2016 09:16:44 Sensitivity      : 3.000
* Detector ID       : GAM36 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.33 Half life ratio : *****
* Sample date       : 23-NOV-2015 11:12:00 Analyst initials: MXR1
* Sample ID         : G405235036 Sample Quantity : 1.6226E+02 GRAM
* Batch Number      : 1596249 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 1-JUN-2016 09:39:12 Eff. Geometry : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM36_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.060E+01	1.773E+00	7.126E-01
CD-109	2.970E+00	2.337E+00	2.096E+00
SN-126	1.850E-01	1.456E-01	1.313E-01
TL-208	2.349E-01	1.114E-01	5.556E-02
PB-212	9.340E-01	1.347E-01	9.819E-02
BI-214	8.145E-01	1.835E-01	1.360E-01
PB-214	8.504E-01	1.939E-01	1.167E-01
RN-222	8.145E-01	1.835E-01	1.360E-01
RA-224	1.123E+00	1.329E+00	1.054E+00
RA-226	8.145E-01	1.835E-01	1.360E-01
AC-228	9.219E-01	3.078E-01	2.486E-01
RA-228	9.219E-01	3.078E-01	2.486E-01
TH-228	9.340E-01	1.347E-01	9.819E-02
TH-230	8.142E-01	1.835E-01	1.359E-01
PA-231	1.152E+00	9.281E-01	6.582E-01
TH-232	9.219E-01	3.078E-01	2.486E-01
U-234	8.142E-01	1.835E-01	1.359E-01
AM-243	1.092E-01	9.322E-02	8.170E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.064E+01	1.355E+01	2.471E+01	NOT IDENT.
NA-22	3.170E-02	5.942E-02	1.290E-01	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	3.627E-02	4.312E-02	1.172E-01	NOT IDENT.
SC-46	2.299E-01	4.645E-01	1.052E+00	FAIL ABUN
V-48	0.000E+00	3.529E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	6.254E+02	0.000E+00	SHORT HLIF
MN-54	1.838E-02	7.036E-02	1.509E-01	NOT IDENT.
CO-56	-3.226E-02	5.935E-01	1.195E+00	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	2.380E-02	3.952E-02	8.466E-02	FAIL ABUN
CO-58	-1.390E-01	7.991E-01	1.559E+00	NOT IDENT.

FE-59	9.008E-01	8.271E+00	1.861E+01	FAIL ABUN
CO-60	-2.800E-02	4.645E-02	8.517E-02	NOT IDENT.
ZN-65	-5.428E-02	2.233E-01	3.929E-01	NOT IDENT.
GE-68	3.071E+00	3.110E+00	7.350E+00	NOT IDENT.
AS-73	-3.276E+00	7.927E+00	1.631E+01	NOT IDENT.
AS-74	0.000E+00	1.195E+04	0.000E+00	SHORT HLIF
SE-75	-1.110E-01	2.086E-01	3.721E-01	NOT IDENT.
BR-77	0.000E+00	1.977E+39	0.000E+00	SHORT HLIF
SR-82	0.000E+00	1.131E+03	0.000E+00	SHORT HLIF
RB-83	-1.912E-01	8.405E-01	1.607E+00	NOT IDENT.
KR-85	6.430E+00	7.474E+00	1.698E+01	NOT IDENT.
SR-85	7.952E-01	9.253E-01	2.102E+00	NOT IDENT.
RB-86	0.000E+00	6.654E+04	0.000E+00	SHORT HLIF
Y-88	-7.376E-03	2.799E-01	6.479E-01	NOT IDENT.
Y-91	4.011E+02	7.878E+02	1.777E+03	NOT IDENT.
NB-94	1.108E-02	3.145E-02	6.887E-02	NOT IDENT.
NB-95	-1.178E-01	1.104E+00	2.183E+00	NOT IDENT.
NB-95M	1.968E+00	2.817E+00	5.479E+00	NOT IDENT.
ZR-95	1.042E+00	1.878E+00	4.217E+00	NOT IDENT.
NB-97	0.000E+00	1.718E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.913E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	9.814E+33	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-1.598E-02	3.391E-02	6.459E-02	NOT IDENT.
RH-102	1.880E-02	7.656E-02	1.591E-01	NOT IDENT.
RU-103	-1.082E+00	6.248E+00	1.296E+01	FAIL ABUN
RH-106	9.562E-02	5.111E-01	1.109E+00	NOT IDENT.
RU-106	9.562E-02	5.111E-01	1.109E+00	NOT IDENT.
AG-108M	-5.279E-03	2.571E-02	5.252E-02	NOT IDENT.
AG-110M	3.206E-02	9.701E-02	2.211E-01	NOT IDENT.
SN-113	1.611E-01	2.368E-01	5.396E-01	NOT IDENT.
CD-115	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.982E+05	0.000E+00	SHORT HLIF
TE-123M	-7.255E-02	1.257E-01	2.334E-01	NOT IDENT.
SB-124	6.176E-01	2.853E+00	6.988E+00	NOT IDENT.
SB-125	1.210E-01	1.242E-01	2.806E-01	FAIL ABUN
TE-125M	1.274E+02	3.096E+02	6.431E+02	NOT IDENT.
I-126	0.000E+00	2.122E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	3.012E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	4.174E+23	0.000E+00	SHORT HLIF
I-131	0.000E+00	2.142E+10	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.394E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.056E+28	0.000E+00	SHORT HLIF
BA-133	-3.443E-03	4.624E-02	7.943E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	6.324E-02	5.968E-02	1.407E-01	FAIL ABUN
CS-135	6.958E-02	1.497E-01	2.835E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	6.074E+05	0.000E+00	SHORT HLIF
BA-137M	1.080E-02	3.802E-02	8.088E-02	NOT IDENT.
CS-137	1.141E-02	4.016E-02	8.544E-02	NOT IDENT.
CE-139	-1.998E-02	1.070E-01	2.065E-01	NOT IDENT.
BA-140	0.000E+00	1.003E+07	0.000E+00	SHORT HLIF
LA-140	0.000E+00	1.224E+06	0.000E+00	SHORT HLIF
CE-141	-6.765E+00	3.143E+01	5.496E+01	NOT IDENT.
CE-143	0.000E+00	1.726E+41	0.000E+00	SHORT HLIF
CE-144	1.124E-01	3.258E-01	6.706E-01	NOT IDENT.
PM-144	2.471E-03	6.715E-02	1.358E-01	NOT IDENT.
PR-144	2.396E-01	5.884E+00	1.191E+01	NOT IDENT.
PM-146	1.672E-02	4.152E-02	9.215E-02	NOT IDENT.
ND-147	0.000E+00	1.051E+08	0.000E+00	SHORT HLIF
PM-147	3.096E+02	7.296E+02	1.523E+03	NOT IDENT.
PM-149	0.000E+00	1.409E+41	0.000E+00	SHORT HLIF
EU-150	5.709E-03	3.261E-02	5.769E-02	FAIL ABUN
EU-152	-6.003E-02	1.197E-01	1.872E-01	FAIL ABUN
GD-153	-1.144E-01	1.635E-01	3.115E-01	NOT IDENT.
EU-154	6.950E-02	1.426E-01	3.077E-01	NOT IDENT.
EU-155	-1.761E-02	8.967E-02	1.793E-01	FAIL ABUN
TB-160	2.992E-01	2.082E+00	4.508E+00	FAIL ABUN
HO-166M	-1.913E-02	5.611E-02	1.080E-01	FAIL ABUN
TM-171	2.088E+00	1.620E+01	3.503E+01	NOT IDENT.
HF-172	1.068E-01	2.175E-01	4.515E-01	NOT IDENT.
LU-172	3.250E-02	8.303E-02	1.852E-01	FAIL ABUN
LU-176	1.985E-02	4.371E-02	3.638E-02	FAIL ABUN
HF-181	-3.044E+00	5.261E+00	9.995E+00	NOT IDENT.
TA-182	8.676E-01	1.177E+00	2.777E+00	FAIL ABUN
RE-183	-5.533E-01	2.781E+00	5.793E+00	NOT IDENT.
RE-184	2.855E+01	2.503E+01	7.678E+01	NOT IDENT.

W-188	7.686E+01	1.278E+02	2.514E+02	NOT IDENT.
IR-192	-4.386E-02	5.485E-01	1.033E+00	FAIL ABUN
HG-203	-2.129E+00	2.928E+00	5.016E+00	NOT IDENT.
BI-207	1.217E-03	5.013E-02	1.032E-01	FAIL ABUN
PB-210	1.423E-01	2.128E+00	4.604E+00	NOT IDENT.
BI-211	0.000E+00	5.342E-01	8.095E-01	FAIL ABUN
PB-211	3.558E-01	7.958E-01	1.656E+00	NOT IDENT.
BI-212	1.336E+00	8.951E-01	1.624E+00	FAIL ABUN
RN-219	5.605E-02	3.895E-01	8.222E-01	FAIL ABUN
RA-223	-3.544E-01	6.451E-01	1.119E+00	FAIL ABUN
AC-227	-3.757E-02	2.338E-01	4.388E-01	FAIL ABUN
TH-227	-3.757E-02	2.338E-01	4.388E-01	FAIL ABUN
TH-229	-3.053E-01	4.171E-01	7.455E-01	FAIL ABUN
TH-231	-3.544E-01	6.451E-01	1.119E+00	FAIL ABUN
PA-233	1.871E-02	6.343E-02	1.254E-01	FAIL ABUN
PA-234	1.488E-01	2.550E-01	6.124E-01	NOT IDENT.
PA-234M	3.609E+00	4.654E+00	1.117E+01	NOT IDENT.
TH-234	-1.884E-01	1.035E+00	2.145E+00	FAIL ABUN
U-235	4.722E-02	1.592E-01	3.157E-01	FAIL ABUN
NP-237	1.871E-02	6.343E-02	1.254E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
U-238	-1.884E-01	1.035E+00	2.145E+00	FAIL ABUN
NP-239	-8.077E-02	2.142E-01	4.165E-01	NOT IDENT.
PU-239	2.454E+02	2.999E+02	6.329E+02	NOT IDENT.
AM-241	2.294E-02	1.074E-01	2.313E-01	NOT IDENT.
CM-243	-2.489E-02	8.694E-02	1.720E-01	NOT IDENT.
BK-247	-1.090E-02	6.476E-02	1.227E-01	NOT IDENT.
CM-247	-4.952E-03	3.793E-02	7.696E-02	NOT IDENT.
CF-249	8.157E-04	3.414E-02	7.213E-02	NOT IDENT.
CF-251	4.614E-03	1.028E-01	2.027E-01	NOT IDENT.
ANH-511	-1.687E-02	4.760E-02	1.088E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	160	10.66*	6.546E-01	1.060E+01	1.060E+01	17.07
CD-109	88.03	93	3.70*	4.292E+00	2.706E+00	4.344E+00	53.37
SN-126	64.28	-----	9.60	2.567E+00	-----	Line Not Found	-----
	86.94	93	8.90	4.292E+00	1.125E+00	1.125E+00	53.37
	87.57	93	37.00*	4.292E+00	2.706E-01	2.706E-01	53.37
TL-208	277.37	-----	6.60	3.041E+00	-----	Line Not Found	-----
	583.19	64	85.00*	1.495E+00	2.349E-01	2.349E-01	48.40
	860.56	-----	12.50	1.058E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	3.327E+00	-----	Line Not Found	-----
	351.06	158	12.92*	2.414E+00	2.342E+00	2.342E+00	23.27
PB-212	74.82	96	10.28	3.493E+00	1.237E+00	1.237E+00	47.20
	77.11	190	17.10	3.655E+00	1.410E+00	1.410E+00	28.78
	238.63	308	43.60*	3.499E+00	9.340E-01	9.340E-01	14.72
	300.09	38	3.30	2.817E+00	1.868E+00	1.868E+00	82.17
BI-214	609.32	115	45.49*	1.437E+00	8.142E-01	8.145E-01	22.99
	1120.29	27	14.92	8.369E-01	1.019E+00	1.019E+00	60.99
	1764.49	-----	15.30	5.419E-01	-----	Line Not Found	-----
PB-214	74.82	96	5.80	3.493E+00	2.193E+00	2.194E+00	47.20
	77.11	190	9.70	3.655E+00	2.485E+00	2.486E+00	28.78
	87.09	93	3.41	4.292E+00	2.936E+00	2.938E+00	53.37
	242.00	85	7.25	3.460E+00	1.564E+00	1.564E+00	42.68
	295.22	106	18.42	2.862E+00	9.287E-01	9.290E-01	40.66
	351.93	158	35.60*	2.414E+00	8.501E-01	8.504E-01	23.27
RN-222	609.32	115	45.49*	1.437E+00	8.142E-01	8.145E-01	22.99
	1120.29	27	14.92	8.369E-01	1.019E+00	1.019E+00	60.99
	1764.49	-----	15.30	5.419E-01	-----	Line Not Found	-----
RA-224	240.99	85	4.10*	3.460E+00	2.765E+00	2.765E+00	42.68
RA-226	609.32	115	45.49*	1.437E+00	8.142E-01	8.145E-01	22.99
	1120.29	27	14.92	8.369E-01	1.019E+00	1.019E+00	60.99
	1764.49	-----	15.30	5.419E-01	-----	Line Not Found	-----
AC-228	105.21	-----	1.10	4.933E+00	-----	Line Not Found	-----
	338.32	53	11.27	2.507E+00	8.644E-01	8.644E-01	81.42
	794.95	-----	4.25	1.134E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.085E+00	-----	Line Not Found	-----
	911.20	52	25.80*	1.005E+00	9.219E-01	9.219E-01	34.07
	968.97	16	15.80	9.524E-01	4.816E-01	4.816E-01	88.69
RA-228	105.21	-----	1.10	4.933E+00	-----	Line Not Found	-----
	338.32	53	11.27	2.507E+00	8.644E-01	8.644E-01	81.42
	794.95	-----	4.25	1.134E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.085E+00	-----	Line Not Found	-----
	911.20	52	25.80*	1.005E+00	9.219E-01	9.219E-01	34.07
	968.97	16	15.80	9.524E-01	4.816E-01	4.816E-01	88.69
TH-228	74.82	96	10.28	3.493E+00	1.237E+00	1.237E+00	47.20
	77.11	190	17.10	3.655E+00	1.410E+00	1.410E+00	28.78
	238.63	308	43.60*	3.499E+00	9.340E-01	9.340E-01	14.72
	300.09	38	3.30	2.817E+00	1.868E+00	1.868E+00	82.17
TH-230	609.32	115	45.49*	1.437E+00	8.142E-01	8.142E-01	22.99

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected	Decay Corr	2-Sigma
					pCi/GRAM	pCi/GRAM	
	1120.29	27	14.92	8.369E-01	1.019E+00	1.019E+00	60.99
	1764.49	-----	15.30	5.419E-01	-----	Line Not Found	-----
PA-231	283.69	-----	1.70	2.976E+00	-----	Line Not Found	-----
	301.36	38	5.35*	2.817E+00	1.152E+00	1.152E+00	82.17
TH-232	105.21	-----	1.10	4.933E+00	-----	Line Not Found	-----
	338.32	53	11.27	2.507E+00	8.644E-01	8.644E-01	81.42
	835.71	-----	1.61	1.085E+00	-----	Line Not Found	-----
	911.20	52	25.80*	1.005E+00	9.219E-01	9.219E-01	34.07
	968.97	16	15.80	9.524E-01	4.816E-01	4.816E-01	88.69
U-234	609.32	115	45.49*	1.437E+00	8.142E-01	8.142E-01	22.99
	1120.29	27	14.92	8.369E-01	1.019E+00	1.019E+00	60.99
	1764.49	-----	15.30	5.419E-01	-----	Line Not Found	-----
AM-243	43.53	-----	5.90	5.957E-01	-----	Line Not Found	-----
	74.66	96	67.20*	3.493E+00	1.893E-01	1.893E-01	47.20

Flag: "*" = Keyline

Total number of lines in spectrum 37
 Number of unidentified lines 6
 Number of lines tentatively identified by NID 31 83.78%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.060E+01	1.060E+01	0.181E+01	17.07	
CD-109	461.40D	1.61	2.706E+00	4.344E+00	2.318E+00	53.37	
SN-126	2.30E+05Y	1.00	2.706E-01	2.706E-01	1.444E-01	53.37	
TL-208	1.41E+10Y	1.00	2.349E-01	2.349E-01	1.137E-01	48.40	
BI-211	7.04E+08Y	1.00	2.342E+00	2.342E+00	0.545E+00	23.27	
PB-212	1.41E+10Y	1.00	9.340E-01	9.340E-01	1.375E-01	14.72	
BI-214	1600.00Y	1.00	8.142E-01	8.145E-01	1.873E-01	22.99	
PB-214	1600.00Y	1.00	8.501E-01	8.504E-01	1.979E-01	23.27	
RN-222	1600.00Y	1.00	8.142E-01	8.145E-01	1.873E-01	22.99	
RA-224	1.41E+10Y	1.00	2.765E+00	2.765E+00	1.180E+00	42.68	
RA-226	1600.00Y	1.00	8.142E-01	8.145E-01	1.873E-01	22.99	
AC-228	1.41E+10Y	1.00	9.219E-01	9.219E-01	3.141E-01	34.07	
RA-228	1.41E+10Y	1.00	9.219E-01	9.219E-01	3.141E-01	34.07	
TH-228	1.41E+10Y	1.00	9.340E-01	9.340E-01	1.375E-01	14.72	
TH-230	7.54E+04Y	1.00	8.142E-01	8.142E-01	1.872E-01	22.99	
PA-231	7.04E+08Y	1.00	1.152E+00	1.152E+00	0.947E+00	82.17	
TH-232	1.41E+10Y	1.00	9.219E-01	9.219E-01	3.141E-01	34.07	
U-234	2.45E+05Y	1.00	8.142E-01	8.142E-01	1.872E-01	22.99	
AM-243	7370.00Y	1.00	1.893E-01	1.893E-01	0.894E-01	47.20	
Total Activity :			2.982E+01	3.146E+01			

Grand Total Activity : 2.982E+01 3.146E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	92.82	53	169	1.50	185.62	182	8	1.11E-02	****	4.56E+00	T
0	137.93	38	91	1.27	275.85	272	8	8.20E-03	****	5.02E+00	T
0	147.89	27	56	0.75	295.77	293	6	6.02E-03	****	4.90E+00	
0	186.09	51	131	0.86	372.16	367	10	1.16E-02	****	4.30E+00	T
0	209.98	29	94	1.49	419.94	414	10	6.72E-03	****	3.91E+00	T
0	245.61	26	36	1.35	491.21	488	7	6.11E-03	92.8	3.41E+00	T
0	270.50	30	59	0.77	540.98	536	8	7.11E-03	****	3.11E+00	T
0	305.63	11	33	1.40	611.24	606	9	2.64E-03	****	2.77E+00	T
0	349.45	12	24	1.16	698.88	692	8	2.79E-03	****	2.43E+00	
0	409.99	21	25	1.70	819.95	815	10	5.20E-03	****	2.08E+00	T
0	464.25	12	39	1.29	928.46	923	12	2.99E-03	****	1.85E+00	T
5	515.57	18	14	2.21	1031.10	1014	22	4.52E-03	****	1.68E+00	
0	538.68	14	39	5.95	1077.29	1062	18	3.45E-03	****	1.61E+00	T
0	543.65	24	8	2.36	1087.24	1083	10	6.09E-03	63.0	1.60E+00	
0	562.29	8	1	0.71	1124.52	1123	5	2.13E-03	90.8	1.55E+00	T
0	603.12	16	9	1.84	1206.16	1200	11	4.16E-03	90.3	1.45E+00	T
0	727.30	24	11	0.77	1454.47	1450	10	6.19E-03	68.4	1.23E+00	T
0	900.61	13	0	0.83	1801.00	1797	8	3.61E-03	55.5	1.02E+00	T
0	905.40	10	2	2.72	1810.56	1806	9	2.72E-03	90.2	1.01E+00	
4	966.14	10	7	1.83	1932.00	1930	12	2.62E-03	85.5	9.55E-01	T
0	1280.68	5	9	0.47	2560.83	2554	9	1.52E-03	****	7.41E-01	
0	1291.10	7	2	1.38	2581.65	2578	7	2.01E-03	96.2	7.36E-01	T

Flags: "T" = Tentatively associated

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235036.CNF;1
* Acquisition date   : 3-OCT-2016 09:16:44 Sensitivity      : 3.000
* Detector ID       : GAM36 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.33 Half life ratio : *****
* Sample date       : 23-NOV-2015 11:12:00 Nuclide Library : SOLID
* Sample ID         : G405235036 Analyst initials: MXR1
* Batch Number      : 1596249 Sample Quantity : 1.6226E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight      : 0.00000
*                   Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 1-JUN-2016 09:39:12 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM36_CAN.CNF;7
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.657E-01
CD-109	9.797E-01
SN-126	6.136E-02
TL-208	2.267E-02
PB-212	4.474E-02
BI-214	5.806E-02
PB-214	5.069E-02
RN-222	5.806E-02
RA-224	4.805E-01
RA-226	5.806E-02
AC-228	9.958E-02
RA-228	9.958E-02
TH-228	4.474E-02
TH-230	5.804E-02
PA-231	2.851E-01
TH-232	9.958E-02
U-234	5.804E-02
AM-243	3.791E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.026E+01	NOT IDENT.
NA-22	5.380E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	4.667E-02	NOT IDENT.
SC-46	4.416E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	6.354E-02	NOT IDENT.
CO-56	4.963E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.887E-02	FAIL ABUN
CO-58	6.532E-01	NOT IDENT.
FE-59	7.515E+00	FAIL ABUN

CO-60	3.264E-02	NOT IDENT.
ZN-65	1.598E-01	NOT IDENT.
GE-68	3.164E+00	NOT IDENT.
AS-73	7.481E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.641E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	6.938E-01	NOT IDENT.
KR-85	7.544E+00	NOT IDENT.
SR-85	9.338E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	2.295E-01	NOT IDENT.
Y-91	7.586E+02	NOT IDENT.
NB-94	2.932E-02	NOT IDENT.
NB-95	9.250E-01	NOT IDENT.
NB-95M	2.511E+00	NOT IDENT.
ZR-95	1.806E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.996E-02	NOT IDENT.
RH-102	6.983E-02	NOT IDENT.
RU-103	5.403E+00	FAIL ABUN
RH-106	4.712E-01	NOT IDENT.
RU-106	4.712E-01	NOT IDENT.
AG-108M	2.258E-02	NOT IDENT.
AG-110M	9.003E-02	NOT IDENT.
SN-113	2.388E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.062E-01	NOT IDENT.
SB-124	2.616E+00	NOT IDENT.
SB-125	1.267E-01	FAIL ABUN
TE-125M	2.991E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.501E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	6.150E-02	FAIL ABUN
CS-135	1.285E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	3.494E-02	NOT IDENT.
CS-137	3.691E-02	NOT IDENT.
CE-139	9.442E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.515E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.094E-01	NOT IDENT.
PM-144	5.863E-02	NOT IDENT.
PR-144	5.141E+00	NOT IDENT.
PM-146	4.014E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.029E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.610E-02	FAIL ABUN
EU-152	8.312E-02	FAIL ABUN
GD-153	1.435E-01	NOT IDENT.
EU-154	1.277E-01	NOT IDENT.
EU-155	8.223E-02	FAIL ABUN
TB-160	1.833E+00	FAIL ABUN
HO-166M	4.445E-02	FAIL ABUN
TM-171	1.609E+01	NOT IDENT.
HF-172	2.096E-01	NOT IDENT.
LU-172	7.634E-02	FAIL ABUN
LU-176	1.563E-02	FAIL ABUN
HF-181	4.214E+00	NOT IDENT.
TA-182	1.184E+00	FAIL ABUN
RE-183	2.664E+00	NOT IDENT.
RE-184	3.047E+01	NOT IDENT.
W-188	1.128E+02	NOT IDENT.

IR-192	4.590E-01	FAIL ABUN
HG-203	2.217E+00	NOT IDENT.
BI-207	4.169E-02	FAIL ABUN
PB-210	2.106E+00	NOT IDENT.
BI-211	3.838E-01	FAIL ABUN
PB-211	7.459E-01	NOT IDENT.
BI-212	7.333E-01	FAIL ABUN
RN-219	3.643E-01	FAIL ABUN
RA-223	4.964E-01	FAIL ABUN
AC-227	1.981E-01	FAIL ABUN
TH-227	1.981E-01	FAIL ABUN
TH-229	3.364E-01	FAIL ABUN
TH-231	4.964E-01	FAIL ABUN
PA-233	5.637E-02	FAIL ABUN
PA-234	2.513E-01	NOT IDENT.
PA-234M	4.763E+00	NOT IDENT.
TH-234	9.972E-01	FAIL ABUN
U-235	1.455E-01	FAIL ABUN
NP-237	5.637E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	9.972E-01	FAIL ABUN
NP-239	1.914E-01	NOT IDENT.
PU-239	2.954E+02	NOT IDENT.
AM-241	1.065E-01	NOT IDENT.
CM-243	7.924E-02	NOT IDENT.
BK-247	5.437E-02	NOT IDENT.
CM-247	3.419E-02	NOT IDENT.
CF-249	3.153E-02	NOT IDENT.
CF-251	9.264E-02	NOT IDENT.
ANH-511	5.056E-02	NOT IDENT.

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235036.CNF;1
* Acquisition date   : 3-OCT-2016 09:16:44 Sensitivity      : 3.000
* Detector ID        : GAM36 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.33 Half life ratio  : *****
* Sample date        : 23-NOV-2015 11:12:00 Nuclide Library : SOLID
* Sample ID          : G405235036 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity: 1.6226E+02 GRAM
*                               Quantity Err(%) : 1.2326E-03 %
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight  : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date     : 1-JUN-2016 09:39:12 Eff. Geometry   : CAN
* Eff. File           : DKA100:[CANBERRA.GAMMA]EFF_GAM36_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.060E+01	1.858E+00	1.858E+00
CD-109	2.970E+00	2.356E+00	2.356E+00
SN-126	1.850E-01	1.464E-01	1.464E-01
TL-208	2.349E-01	1.119E-01	1.119E-01
PB-212	9.340E-01	1.435E-01	1.435E-01
BI-214	8.145E-01	1.869E-01	1.869E-01
PB-214	8.504E-01	1.971E-01	1.971E-01
RN-222	8.145E-01	1.869E-01	1.869E-01
RA-224	1.123E+00	1.335E+00	1.335E+00
RA-226	8.145E-01	1.869E-01	1.869E-01
AC-228	9.219E-01	3.114E-01	3.114E-01
RA-228	9.219E-01	3.114E-01	3.114E-01
TH-228	9.340E-01	1.435E-01	1.435E-01
TH-230	8.142E-01	1.868E-01	1.868E-01
PA-231	1.152E+00	9.601E-01	9.601E-01
TH-232	9.219E-01	3.114E-01	3.114E-01
U-234	8.142E-01	1.868E-01	1.868E-01
AM-243	1.092E-01	9.402E-02	9.402E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.064E+01	1.356E+01	1.438E+01	NOT IDENT.
NA-22	3.170E-02	5.944E-02	6.113E-02	NOT IDENT.
NA-24	1.000E+41	2.638E+41	0.000E+00	SHORT HLIF
AL-26	3.627E-02	4.318E-02	4.618E-02	NOT IDENT.
SC-46	2.299E-01	4.646E-01	4.760E-01	FAIL ABUN
V-48	-4.571E+04	3.533E+04	4.090E+04	SHORT HLIF
CR-51	-3.855E+02	6.256E+02	6.493E+02	SHORT HLIF
MN-54	1.838E-02	7.037E-02	7.085E-02	NOT IDENT.
CO-56	-3.226E-02	5.935E-01	5.937E-01	NOT IDENT.
MN-56	-1.000E+41	1.555E+42	0.000E+00	SHORT HLIF
CO-57	2.380E-02	3.954E-02	4.097E-02	FAIL ABUN
CO-58	-1.390E-01	7.991E-01	8.016E-01	NOT IDENT.

FE-59	9.008E-01	8.271E+00	8.281E+00	FAIL ABUN
CO-60	-2.800E-02	4.646E-02	4.814E-02	NOT IDENT.
ZN-65	-5.428E-02	2.233E-01	2.246E-01	NOT IDENT.
GE-68	3.071E+00	3.112E+00	3.406E+00	NOT IDENT.
AS-73	-3.276E+00	7.955E+00	8.091E+00	NOT IDENT.
AS-74	4.053E+03	1.195E+04	1.209E+04	SHORT HLIF
SE-75	-1.110E-01	2.086E-01	2.145E-01	NOT IDENT.
BR-77	1.370E+40	1.246E+41	0.000E+00	SHORT HLIF
SR-82	4.368E+02	1.132E+03	1.149E+03	SHORT HLIF
RB-83	-1.912E-01	8.409E-01	8.453E-01	NOT IDENT.
KR-85	6.430E+00	7.479E+00	8.021E+00	NOT IDENT.
SR-85	7.952E-01	9.259E-01	9.928E-01	NOT IDENT.
RB-86	3.988E+04	6.656E+04	6.895E+04	SHORT HLIF
Y-88	-7.376E-03	2.799E-01	2.799E-01	NOT IDENT.
Y-91	4.011E+02	7.880E+02	8.084E+02	NOT IDENT.
NB-94	1.108E-02	3.145E-02	3.185E-02	NOT IDENT.
NB-95	-1.178E-01	1.104E+00	1.105E+00	NOT IDENT.
NB-95M	1.968E+00	2.821E+00	2.957E+00	NOT IDENT.
ZR-95	1.042E+00	1.878E+00	1.936E+00	NOT IDENT.
NB-97	-1.000E+41	1.719E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.914E+41	0.000E+00	SHORT HLIF
MO-99	3.797E+33	9.818E+33	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	6.280E+41	0.000E+00	SHORT HLIF
RH-101	-1.598E-02	3.404E-02	3.479E-02	NOT IDENT.
RH-102	1.880E-02	7.657E-02	7.704E-02	NOT IDENT.
RU-103	-1.082E+00	6.248E+00	6.267E+00	FAIL ABUN
RH-106	9.562E-02	5.111E-01	5.129E-01	NOT IDENT.
RU-106	9.562E-02	5.111E-01	5.129E-01	NOT IDENT.
AG-108M	-5.279E-03	2.571E-02	2.582E-02	NOT IDENT.
AG-110M	3.206E-02	9.702E-02	9.809E-02	NOT IDENT.
SN-113	1.611E-01	2.369E-01	2.478E-01	NOT IDENT.
CD-115	-7.985E+39	3.858E+41	0.000E+00	SHORT HLIF
SN-117M	-2.346E+05	2.003E+05	2.265E+05	SHORT HLIF
TE-123M	-7.255E-02	1.257E-01	1.299E-01	NOT IDENT.
SB-124	6.176E-01	2.853E+00	2.867E+00	NOT IDENT.
SB-125	1.210E-01	1.243E-01	1.357E-01	FAIL ABUN
TE-125M	1.274E+02	3.097E+02	3.150E+02	NOT IDENT.
I-126	2.106E+05	2.122E+06	2.124E+06	SHORT HLIF
SB-126	-1.624E+06	3.028E+06	3.115E+06	SHORT HLIF
SB-127	2.055E+23	5.121E+23	0.000E+00	SHORT HLIF
I-131	-2.268E+10	2.145E+10	2.376E+10	SHORT HLIF
I-132	-1.000E+41	1.946E+42	0.000E+00	SHORT HLIF
TE-132	1.296E+27	1.057E+28	0.000E+00	SHORT HLIF
BA-133	-3.443E-03	4.624E-02	4.626E-02	NOT IDENT.
I-133	-1.000E+41	8.737E+41	0.000E+00	SHORT HLIF
CS-134	6.324E-02	5.974E-02	6.619E-02	FAIL ABUN
CS-135	6.958E-02	1.498E-01	1.530E-01	NOT IDENT.
I-135	-1.000E+41	7.734E+41	0.000E+00	SHORT HLIF
CS-136	1.507E+05	6.076E+05	6.114E+05	SHORT HLIF
BA-137M	1.080E-02	3.802E-02	3.833E-02	NOT IDENT.
CS-137	1.141E-02	4.016E-02	4.049E-02	NOT IDENT.
CE-139	-1.998E-02	1.070E-01	1.074E-01	NOT IDENT.
BA-140	4.387E+06	1.004E+07	1.023E+07	SHORT HLIF
LA-140	-8.774E+05	1.224E+06	1.287E+06	SHORT HLIF
CE-141	-6.765E+00	3.143E+01	3.158E+01	NOT IDENT.
CE-143	1.000E+41	1.729E+41	0.000E+00	SHORT HLIF
CE-144	1.124E-01	3.259E-01	3.298E-01	NOT IDENT.
PM-144	2.471E-03	6.715E-02	6.716E-02	NOT IDENT.
PR-144	2.396E-01	5.884E+00	5.885E+00	NOT IDENT.
PM-146	1.672E-02	4.154E-02	4.222E-02	NOT IDENT.
ND-147	-6.125E+07	1.051E+08	1.087E+08	SHORT HLIF
PM-147	3.096E+02	7.297E+02	7.429E+02	NOT IDENT.
PM-149	1.000E+41	1.427E+41	0.000E+00	SHORT HLIF
EU-150	5.709E-03	3.261E-02	3.271E-02	FAIL ABUN
EU-152	-6.003E-02	1.197E-01	1.227E-01	FAIL ABUN
GD-153	-1.144E-01	1.636E-01	1.716E-01	NOT IDENT.
EU-154	6.950E-02	1.426E-01	1.460E-01	NOT IDENT.
EU-155	-1.761E-02	8.968E-02	9.003E-02	FAIL ABUN
TB-160	2.992E-01	2.082E+00	2.087E+00	FAIL ABUN
HO-166M	-1.913E-02	5.612E-02	5.678E-02	FAIL ABUN
TM-171	2.088E+00	1.620E+01	1.623E+01	NOT IDENT.
HF-172	1.068E-01	2.182E-01	2.234E-01	NOT IDENT.
LU-172	3.250E-02	8.310E-02	8.438E-02	FAIL ABUN
LU-176	1.985E-02	4.371E-02	4.462E-02	FAIL ABUN
HF-181	-3.044E+00	5.263E+00	5.439E+00	NOT IDENT.
TA-182	8.676E-01	1.178E+00	1.241E+00	FAIL ABUN
RE-183	-5.533E-01	2.782E+00	2.794E+00	NOT IDENT.
RE-184	2.855E+01	2.603E+01	2.904E+01	NOT IDENT.

W-188	7.686E+01	1.281E+02	1.327E+02	NOT IDENT.
IR-192	-4.386E-02	5.485E-01	5.488E-01	FAIL ABUN
HG-203	-2.129E+00	2.929E+00	3.083E+00	NOT IDENT.
BI-207	1.217E-03	5.013E-02	5.013E-02	FAIL ABUN
PB-210	1.423E-01	2.128E+00	2.129E+00	NOT IDENT.
BI-211	2.342E+00	5.443E-01	1.188E+00	FAIL ABUN
PB-211	3.558E-01	7.960E-01	8.120E-01	NOT IDENT.
BI-212	1.336E+00	8.976E-01	1.081E+00	FAIL ABUN
RN-219	5.605E-02	3.895E-01	3.904E-01	FAIL ABUN
RA-223	-3.544E-01	6.455E-01	6.649E-01	FAIL ABUN
AC-227	-3.757E-02	2.339E-01	2.345E-01	FAIL ABUN
TH-227	-3.757E-02	2.339E-01	2.345E-01	FAIL ABUN
TH-229	-3.053E-01	4.173E-01	4.394E-01	FAIL ABUN
TH-231	-3.544E-01	6.455E-01	6.649E-01	FAIL ABUN
PA-233	1.871E-02	6.344E-02	6.400E-02	FAIL ABUN
PA-234	1.488E-01	3.066E-01	3.139E-01	NOT IDENT.
PA-234M	3.609E+00	4.657E+00	4.933E+00	NOT IDENT.
TH-234	-1.884E-01	1.036E+00	1.039E+00	FAIL ABUN
U-235	4.722E-02	1.592E-01	1.606E-01	FAIL ABUN
NP-237	1.871E-02	6.344E-02	6.400E-02	FAIL ABUN
NP-238	1.000E+41	1.904E+42	0.000E+00	SHORT HLIF
U-238	-1.884E-01	1.036E+00	1.039E+00	FAIL ABUN
NP-239	-8.077E-02	2.143E-01	2.174E-01	NOT IDENT.
PU-239	2.454E+02	3.001E+02	3.199E+02	NOT IDENT.
AM-241	2.294E-02	1.074E-01	1.079E-01	NOT IDENT.
CM-243	-2.489E-02	8.697E-02	8.769E-02	NOT IDENT.
BK-247	-1.090E-02	6.479E-02	6.498E-02	NOT IDENT.
CM-247	-4.952E-03	3.794E-02	3.800E-02	NOT IDENT.
CF-249	8.157E-04	3.414E-02	3.414E-02	NOT IDENT.
CF-251	4.614E-03	1.028E-01	1.028E-01	NOT IDENT.
ANH-511	-1.687E-02	4.760E-02	4.821E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	22.6668	87.09	68.7588	136.47	39.9849
45.60	35.4275	87.57	68.8320	140.51	0.0000
46.54	30.8024	88.03	68.9016	143.76	39.1449
49.72	0.0000	88.34	68.9486	144.24	36.2361
51.35	44.9328	88.47	83.7051	145.44	41.8639
51.87	43.3996	89.96	72.7416	152.43	58.5067
52.39	40.2504	1093.63	58.6345	153.25	0.0000
52.97	47.5817	91.11	0.0000	323.87	48.7189
53.44	48.4589	92.59	74.9381	156.02	0.0000
54.07	32.3686	93.35	75.0592	158.56	0.0000
57.36	0.0000	94.56	48.9728	159.00	44.0557
57.53	31.8897	94.65	48.9820	162.33	43.2605
57.98	47.4881	94.67	48.9840	162.66	0.0000
59.27	36.1609	94.87	46.6140	163.33	42.3147
59.32	36.1661	97.43	50.4667	165.86	41.4548
59.54	41.9464	98.43	46.0549	176.31	44.1049
60.96	43.7685	98.44	46.0561	176.60	0.0000
61.17	55.3630	99.53	52.4935	177.52	36.9849
62.93	51.4845	100.11	56.1795	181.07	0.0000
63.29	53.1981	102.03	45.4803	181.52	45.4435
63.58	46.5856	103.18	56.5243	184.41	45.6154
64.28	48.3422	103.37	51.0734	143.76	45.6926
66.73	48.6631	105.21	44.8504	193.51	40.9037
67.24	52.9299	105.31	44.8593	197.03	45.2964
125.81	56.3559	106.12	46.7635	198.01	36.9141
67.75	56.3661	106.47	44.9603	201.83	32.8481
69.67	53.2682	109.28	50.7375	203.43	33.9736
70.83	61.0593	111.00	55.5295	205.31	39.7253
72.81	62.5033	111.76	0.0000	210.85	29.9905
72.87	62.5128	114.06	44.6766	215.65	26.9272
74.66	55.6565	116.30	0.0000	222.11	36.8923
74.82	55.6784	116.74	50.5072	227.09	33.8254
74.97	55.6992	119.76	47.0196	227.38	40.3852
77.11	55.9903	121.12	46.1902	228.16	0.0000
78.74	58.8038	121.22	40.5415	228.18	32.7740
79.69	54.3141	121.78	32.0874	116.74	32.7740
80.12	56.6827	122.06	32.1033	235.69	27.9039
80.19	0.0000	122.92	43.4991	235.96	24.9739
80.57	61.3745	123.07	43.5103	238.63	35.3589
81.00	49.5549	265.00	49.2380	238.98	0.0000
81.07	49.5628	125.81	46.5680	240.99	35.4478
81.75	60.9632	127.23	64.7811	242.00	35.4858
83.79	56.0000	127.91	61.9950	244.70	17.7935
84.00	57.1941	129.30	48.7565	252.40	0.0000
85.43	67.9186	131.20	65.2161	252.80	26.9154
86.55	64.5673	133.02	43.2875	254.15	0.0000
86.79	68.7124	133.52	41.3977	256.23	31.5111
86.94	68.7356	136.00	41.2435	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	26.1038	355.39	0.0000	584.27	6.6440
264.80	26.1073	356.01	19.6787	595.83	0.0000
265.00	22.7063	364.49	0.0000	427.87	12.9238
268.22	24.2969	366.42	0.0000	602.52	0.0000
269.46	34.2096	372.51	23.6688	604.72	2.8781
270.03	34.2279	375.05	22.4665	607.14	0.0000
271.23	31.9836	377.52	23.3419	609.32	11.5396
273.65	0.0000	356.01	16.7517	610.33	11.5454
276.40	26.4035	388.16	15.9648	614.28	13.0150
277.37	16.0867	388.63	0.0000	618.01	9.6590
277.60	19.5380	391.69	12.6364	620.36	9.6704
278.00	25.2945	264.66	24.5897	621.93	7.7425
279.20	29.9276	401.81	18.6699	630.19	0.0000
279.54	28.7857	402.40	22.9224	631.29	14.5856
279.70	26.4871	404.85	19.3906	633.25	13.6263
280.46	11.5244	410.95	13.6663	634.78	0.0000
283.69	21.9630	413.71	20.5391	635.95	8.7715
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	18.5249	423.72	0.0000	645.85	6.8556
285.90	0.0000	427.09	15.5475	657.76	9.8507
287.50	18.5610	427.87	16.4201	657.90	0.0000
290.67	17.0644	433.94	14.7522	661.66	10.8559
293.27	0.0000	439.40	12.1933	664.57	0.0000
351.93	26.4823	453.88	11.4308	666.33	0.0000
295.96	26.4996	463.37	13.2703	666.50	0.0000
879.38	16.4063	468.07	14.6413	667.71	0.0000
299.98	14.0804	473.00	0.0000	677.62	9.9443
300.09	14.0819	475.06	12.4779	685.70	0.0000
300.13	14.0823	476.78	12.4913	695.00	0.0000
301.36	14.0977	477.60	15.1756	696.49	13.0418
302.85	23.5278	482.18	15.2188	696.51	13.0418
256.23	29.8452	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	14.0501
306.78	15.7402	497.08	9.9376	697.49	14.0513
308.46	9.4580	505.52	9.5342	702.65	8.0482
311.90	22.5306	507.63	0.0000	706.68	8.0632
316.51	22.6205	511.00	11.8427	711.68	10.1017
319.41	0.0000	514.00	11.8638	720.70	0.0000
320.08	0.0000	514.00	11.8638	721.93	0.0000
321.04	22.7086	520.40	14.2898	722.78	6.0913
323.87	28.7542	520.69	0.0000	722.91	10.6602
325.23	32.3855	522.65	0.0000	723.31	12.1855
328.76	0.0000	527.90	0.0000	724.19	9.1428
333.37	25.7630	528.26	13.2510	727.33	8.1383
333.97	27.3870	529.59	11.0508	733.00	9.1783
334.37	27.3960	529.87	0.0000	735.93	13.2751
338.28	26.6762	531.02	0.0000	333.97	10.2185
338.32	26.6769	537.26	0.0000	739.50	0.0000
311.90	29.1533	546.56	0.0000	747.24	9.2358
340.48	29.1533	552.55	13.0612	748.06	9.2391
340.55	0.0000	563.25	12.6689	752.31	12.3413
344.28	29.2434	569.33	13.1820	753.82	0.0000
345.93	22.7751	946.00	13.1831	756.73	7.2131
351.06	14.7015	569.70	14.1260	756.80	6.1826
351.93	14.7118	583.19	6.6403	884.68	11.3697

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	11.3787	1274.44	5.6460	1620.50	1.0057
766.42	12.4165	1001.03	3.3931	1621.92	1.0060
766.84	8.2790	1002.74	11.3167	1678.03	0.0000
772.60	0.0000	1004.73	13.5894	1690.97	2.0430
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	1.0377
778.90	9.3615	1028.54	0.0000	1063.66	3.1166
783.70	0.0000	1037.84	6.8706	1771.35	2.0782
785.37	13.5586	1038.76	0.0000	1791.20	0.0000
792.07	9.4131	631.29	8.0385	1808.65	1.0472
794.95	7.3298	1048.07	0.0000	1810.72	0.0000
795.86	6.2852	1049.04	6.8955	1836.06	2.1061
810.06	10.5363	1050.41	3.4495		
810.29	8.4297	1063.66	5.7739		
344.28	7.3765	1077.00	0.0000		
810.76	10.5391	1077.34	4.6393		
815.77	0.0000	1085.87	8.1410		
1048.07	0.0000	1093.63	4.6634		
832.01	8.5036	1099.45	5.2562		
834.85	7.4492	1112.07	4.3973		
835.71	11.7099	1112.84	4.0215		
836.80	0.0000	1115.54	8.4521		
846.75	0.0000	1120.29	7.0537		
846.77	8.5534	1120.55	7.0542		
856.80	0.0000	1221.41	7.0562		
860.56	7.5244	1129.67	7.0742		
871.09	9.7134	1131.51	0.0000		
873.19	9.7211	1147.95	0.0000		
875.33	0.0000	1173.23	4.4800		
879.38	5.4134	1177.95	10.7673		
880.51	8.6650	1189.05	6.3015		
883.24	3.2528	1204.77	7.2349		
884.68	4.3394	1221.41	5.4525		
889.28	5.4338	1231.02	8.2013		
894.76	7.6229	1235.36	0.0000		
898.04	8.1772	1238.28	10.0446		
900.72	8.1854	1260.41	0.0000		
903.28	0.0000	1271.87	8.2958		
911.20	5.4781	1274.44	4.4276		
912.08	5.4799	1274.54	4.4279		
923.98	0.0000	1291.59	7.4146		
926.50	7.7124	1298.22	0.0000		
929.11	11.0282	1312.11	0.0000		
937.49	4.4246	1332.49	7.4971		
944.13	0.0000	1362.66	0.0000		
946.00	3.3286	1365.19	3.7810		
949.00	14.4393	1368.63	0.0000		
667.71	0.0000	1384.29	2.8499		
962.31	5.0219	1408.01	4.7787		
964.08	8.3749	1457.56	0.0000		
966.17	18.4383	1460.82	2.9055		
911.20	16.7786	1489.16	3.9009		
968.97	16.7786	1505.03	2.9370		
983.53	0.0000	1584.12	3.9895		
984.45	0.0000	1596.21	0.0000		


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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235037.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM41.CNF;119
Background date : 2-OCT-2016 11:02:18.
Sample date      : 30-NOV-2015 11:19:00 Acquisition date : 3-OCT-2016 09:17:13.
Sample ID       : G405235037 Sample quantity : 1.78756E+02 GRAM
Detector name   : GAM41 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:05.72 0.2%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596249 Detector SN# :
Matrix Spike ID : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.55*	39	87	0.98	93.39	90	7	1.09E-02	47.4	
2	2	61.13	25	121	1.32	122.54	120	18	6.90E-03	69.8	1.95E+00
3	2	63.48*	82	111	1.04	127.24	120	18	2.27E-02	25.8	
4	5	74.97*	179	168	1.14	150.21	145	15	4.96E-02	13.8	3.45E+00
5	5	77.27*	223	109	0.85	154.81	145	15	6.19E-02	9.9	
6	0	87.41	92	79	1.12	175.10	173	5	2.56E-02	17.8	
7	0	90.02	62	94	1.19	180.30	178	6	1.72E-02	27.9	
8	0	93.06*	110	130	1.18	186.39	183	10	3.06E-02	24.4	
9	0	143.25*	24	112	3.86	286.74	281	11	6.73E-03	89.4	
10	0	186.02*	101	95	1.20	372.24	365	14	2.81E-02	23.8	
11	0	210.01	26	83	0.92	420.23	415	9	7.11E-03	67.3	
12	0	230.38	23	52	0.87	460.95	458	8	6.36E-03	57.8	
13	0	238.99*	275	70	0.95	478.17	473	9	7.65E-02	8.3	
14	0	242.05	81	44	1.50	484.29	482	7	2.24E-02	17.8	
15	0	277.81	33	40	1.63	555.80	552	9	9.03E-03	38.7	
16	0	286.06	22	57	0.89	572.28	568	10	6.08E-03	68.1	
17	0	296.16	90	62	1.27	592.49	584	11	2.50E-02	19.6	
18	0	301.08	19	70	1.00	602.32	596	12	5.26E-03	90.9	
19	0	322.00	19	44	1.82	644.16	637	11	5.28E-03	71.4	
20	0	329.47*	14	52	0.89	659.08	653	9	3.80E-03	101.0	
21	0	338.97	38	58	0.92	678.08	674	12	1.04E-02	44.3	
22	0	352.20*	187	55	1.14	704.55	699	13	5.19E-02	11.0	
23	0	444.91	11	18	1.41	889.94	886	7	3.05E-03	72.2	
24	0	462.81*	39	21	1.42	925.74	919	12	1.09E-02	29.6	
25	0	511.40*	31	38	1.23	1022.90	1016	14	8.63E-03	54.5	
26	0	583.76*	77	32	1.53	1167.60	1159	14	2.15E-02	19.5	
27	0	609.85*	120	32	1.68	1219.79	1211	14	3.35E-02	13.7	
28	0	620.72	19	15	2.75	1241.53	1234	12	5.24E-03	47.1	
29	0	679.71	8	18	0.83	1359.50	1353	9	2.22E-03	101.9	
30	0	728.45*	17	20	1.12	1456.98	1450	10	4.70E-03	56.2	
31	0	767.97	37	37	6.58	1536.03	1520	24	1.03E-02	45.7	
32	0	886.62*	6	4	0.65	1773.35	1770	7	1.55E-03	78.4	
33	0	912.01*	43	10	1.13	1824.14	1817	12	1.20E-02	21.4	
34	0	965.51	25	12	1.69	1931.15	1925	12	7.02E-03	33.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	969.88*	38	7	1.57	1939.89	1936	9	1.05E-02	21.9	
36	0	1053.89	15	0	2.39	2107.93	2103	9	4.17E-03	25.8	
37	0	1121.45	26	15	1.57	2243.08	2235	12	7.16E-03	36.0	
38	0	1204.21	9	26	5.89	2408.65	2390	21	2.46E-03	148.2	
39	0	1207.05	15	5	1.54	2414.33	2410	10	4.17E-03	38.0	
40	0	1237.81	22	7	3.75	2475.86	2469	14	6.11E-03	33.2	
41	0	1264.29	10	5	0.78	2528.85	2521	13	2.65E-03	63.0	
42	0	1461.78*	275	0	1.92	2923.96	2917	14	7.63E-02	6.1	
43	0	1766.23	18	3	2.53	3533.15	3527	11	5.05E-03	29.4	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235037.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 30-NOV-2015 11:19:00 Acquisition date : 3-OCT-2016 09:17:13
Sample ID         : G405235037           Sample quantity  : 178.76 GRAM
Sample type       : SOLID                 Sample geometry   :
Detector name     : GAMMA41              Detector geometry: CAN
Elapsed live time: 0 01:00:00.00         Elapsed real time: 0 01:00:05.72    0.2%
Energy tolerance  : 1.50 keV             Half life ratio  : 10.00
Errors propagated: No                    Systematic Error : 0.00 %
Efficiency type   : Empirical            Efficiencies at  : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	8.926E-01	1.191E+01	1.191E+01	12.18	OK
Y-91	1204.77	0.26*	1.058E+00	1.372E+01	5.267E+02	296.36	OK
RH-106	621.93	9.93*	1.938E+00	4.592E-01	8.153E-01	94.29	OK
	1050.41	1.56	1.196E+00	-----	Line Not Found	-----	Absent
RU-106	621.93	9.93*	1.938E+00	4.592E-01	8.153E-01	94.29	OK
	1050.41	1.56	1.196E+00	-----	Line Not Found	-----	Absent
CD-109	88.03	3.70*	7.447E+00	1.367E+00	2.172E+00	55.08	OK
SN-126	64.28	9.60	7.794E+00	6.753E-01	6.753E-01	51.53	OK
	86.94	8.90	7.447E+00	5.685E-01	5.685E-01	55.08	OK
	87.57	37.00*	7.447E+00	1.367E-01	1.367E-01	55.08	OK
HG-203	70.83	3.69	7.737E+00	-----	Line Not Found	-----	Absent
	72.87	6.19	7.711E+00	-----	Line Not Found	-----	Absent
	279.20	81.56*	3.902E+00	3.626E-02	3.541E+00	115.06	OK
TL-208	277.37	6.60	3.907E+00	-----	Line Not Found	-----	<<INT Reject
	583.19	85.00*	2.050E+00	2.099E-01	2.099E-01	38.95	OK
	860.56	12.50	1.434E+00	-----	Line Not Found	-----	Absent
PB-210	46.54	4.25*	7.553E+00	7.803E-01	8.011E-01	94.74	OK
BI-211	72.87	1.23	7.711E+00	-----	Line Not Found	-----	Absent
	351.06	12.92*	3.212E+00	4.002E-01	4.002E-01	222.31	OK
PB-212	74.82	10.28	7.681E+00	9.891E-01	9.891E-01	41.37	OK
	77.11	17.10	7.644E+00	1.032E+00	1.032E+00	19.74	OK
	238.63	43.60*	4.381E+00	7.662E-01	7.662E-01	16.56	OK
	300.09	3.30	3.659E+00	8.094E-01	8.094E-01	181.75	OK
BI-214	609.32	45.49*	1.969E+00	6.315E-01	6.317E-01	27.31	OK
	1120.29	14.92	1.127E+00	6.586E-01	6.589E-01	71.98	OK
	1764.49	15.30	7.620E-01	-----	Line Not Found	-----	Absent
PB-214	74.82	5.80	7.683E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	7.644E+00	1.819E+00	1.820E+00	19.74	OK
	87.09	3.41	7.454E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	4.340E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	3.708E+00	6.813E-01	6.816E-01	39.20	OK
	351.93	35.60*	3.214E+00	-----	Line Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	1.969E+00	6.315E-01	6.317E-01	27.31	OK
	1120.29	14.92	1.127E+00	6.586E-01	6.589E-01	71.98	OK
	1764.49	15.30	7.620E-01	-----	Line Not Found	-----	Absent
RA-224	240.99	4.10*	4.340E+00	1.197E+00	1.197E+00	81.47	OK
RA-226	609.32	45.49*	1.969E+00	6.315E-01	6.317E-01	27.31	OK
	1120.29	14.92	1.127E+00	6.586E-01	6.589E-01	71.98	OK
	1764.49	15.30	7.620E-01	-----	Line Not Found	-----	Absent
AC-228	105.21	1.10	7.028E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.317E+00	5.105E-01	5.105E-01	88.51	OK
	794.95	4.25	1.543E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.473E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.360E+00	5.447E-01	5.447E-01	42.74	OK
	968.97	15.80	1.285E+00	8.194E-01	8.194E-01	43.89	OK
RA-228	105.21	1.10	7.028E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.317E+00	5.105E-01	5.105E-01	88.51	OK
	794.95	4.25	1.543E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.473E+00	-----	Line Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	911.20	25.80*	1.360E+00	5.447E-01	5.447E-01	42.74	OK
	968.97	15.80	1.285E+00	8.194E-01	8.194E-01	43.89	OK
TH-228	74.82	10.28	7.681E+00	9.891E-01	9.891E-01	41.37	OK
	77.11	17.10	7.644E+00	1.032E+00	1.032E+00	19.74	OK
	238.63	43.60*	4.381E+00	7.662E-01	7.662E-01	16.56	OK
	300.09	3.30	3.659E+00	8.094E-01	8.094E-01	181.75	OK
TH-230	609.32	45.49*	1.969E+00	6.315E-01	6.315E-01	27.31	OK
	1120.29	14.92	1.127E+00	6.586E-01	6.586E-01	71.98	OK
	1764.49	15.30	7.620E-01	-----	Line Not Found	-----	Absent
PA-231	283.69	1.70	3.838E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	3.659E+00	4.993E-01	4.993E-01	181.75	OK
TH-232	105.21	1.10	7.028E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.317E+00	5.105E-01	5.105E-01	88.51	OK
	835.71	1.61	1.473E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.360E+00	5.447E-01	5.447E-01	42.74	OK
	968.97	15.80	1.285E+00	8.194E-01	8.194E-01	43.89	OK
TH-234	63.29	3.70*	7.794E+00	1.752E+00	1.752E+00	51.53	OK
	92.59	4.23	7.320E+00	2.112E+00	2.112E+00	48.79	OK
U-234	609.32	45.49*	1.969E+00	6.315E-01	6.315E-01	27.31	OK
	1120.29	14.92	1.127E+00	6.586E-01	6.586E-01	71.98	OK
	1764.49	15.30	7.620E-01	-----	Line Not Found	-----	Absent
U-235	89.96	3.47	7.390E+00	1.435E+00	1.435E+00	55.85	OK
	93.35	5.60	7.320E+00	1.595E+00	1.595E+00	48.79	OK
	143.76	10.96*	6.105E+00	2.047E-01	2.047E-01	178.90	OK
	163.33	5.08	5.667E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	5.223E+00	1.858E-01	1.858E-01	47.55	OK
	205.31	5.01	4.887E+00	-----	Line Not Found	-----	Absent
U-238	63.29	3.70*	7.794E+00	1.752E+00	1.752E+00	51.53	OK
	92.59	4.23	7.320E+00	2.112E+00	2.112E+00	48.79	OK
AM-243	43.53	5.90	7.421E+00	-----	Line Not Found	-----	Absent
	74.66	67.20*	7.681E+00	1.513E-01	1.513E-01	41.37	OK
ANH-511	511.00	100.00*	2.313E+00	6.463E-02	6.463E-02	108.92	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235037.CNF;1 *
 * Acquisition date : 3-OCT-2016 09:17:13 Sensitivity : 3.000 *
 * Detector ID : GAM41 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:05.72 Half life ratio : ***** *
 * Sample date : 30-NOV-2015 11:19:00 Analyst initials: MXR1 *
 * Sample ID : G405235037 Sample Quantity : 1.7876E+02 GRAM *
 * Batch Number : 1596249 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 26-JAN-2016 06:01:47 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.191E+01	1.422E+00	4.971E-01
Y-91	5.267E+02	1.530E+03	1.627E+02
RH-106	8.153E-01	7.533E-01	9.015E-01
RU-106	8.153E-01	7.533E-01	9.015E-01
CD-109	2.172E+00	1.172E+00	1.205E+00
SN-126	1.367E-01	7.381E-02	8.663E-02
HG-203	3.541E+00	3.993E+00	4.637E+00
TL-208	2.099E-01	8.012E-02	6.035E-02
PB-210	8.011E-01	7.438E-01	6.551E-01
BI-211	4.002E-01	8.719E-01	3.181E-01
PB-212	7.662E-01	1.243E-01	8.523E-02
BI-214	6.317E-01	1.691E-01	1.118E-01
PB-214	8.269E-01	1.779E-01	2.782E-01
RN-222	6.317E-01	1.691E-01	1.118E-01
RA-224	1.197E+00	9.555E-01	8.243E-01
RA-226	6.317E-01	1.691E-01	1.118E-01
AC-228	5.447E-01	2.281E-01	2.023E-01
RA-228	5.447E-01	2.281E-01	2.023E-01
TH-228	7.662E-01	1.243E-01	8.523E-02
TH-230	6.315E-01	1.690E-01	1.118E-01
PA-231	4.993E-01	8.893E-01	6.810E-01
TH-232	5.447E-01	2.281E-01	2.023E-01
TH-234	1.752E+00	8.849E-01	8.832E-01
U-234	6.315E-01	1.690E-01	1.118E-01
U-235	2.047E-01	3.589E-01	2.927E-01
U-238	1.752E+00	8.849E-01	8.832E-01
AM-243	1.513E-01	6.135E-02	4.876E-02
ANH-511	6.463E-02	6.899E-02	4.164E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	4.951E+00	1.183E+01	2.443E+01	NOT IDENT.
NA-22	2.148E-02	5.785E-02	1.189E-01	NOT IDENT.

NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	-9.950E-03	2.081E-02	4.180E-02	NOT IDENT.
SC-46	1.846E-02	3.663E-01	6.833E-01	FAIL ABUN
V-48	0.000E+00	1.675E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	4.474E+02	0.000E+00	SHORT HLIF
MN-54	-1.910E-02	5.795E-02	1.123E-01	NOT IDENT.
CO-56	1.179E-01	5.198E-01	1.079E+00	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	9.342E-04	3.829E-02	7.865E-02	NOT IDENT.
CO-58	-3.216E-01	5.118E-01	9.465E-01	NOT IDENT.
FE-59	4.637E-01	6.280E+00	1.318E+01	NOT IDENT.
CO-60	-1.435E-02	3.329E-02	6.186E-02	NOT IDENT.
ZN-65	5.808E-02	1.972E-01	3.692E-01	NOT IDENT.
GE-68	4.767E-01	2.351E+00	4.899E+00	NOT IDENT.
AS-73	5.366E-01	2.100E+00	4.135E+00	NOT IDENT.
AS-74	0.000E+00	6.310E+03	0.000E+00	SHORT HLIF
SE-75	-5.786E-02	1.594E-01	3.076E-01	NOT IDENT.
BR-77	0.000E+00	2.365E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	7.176E+02	0.000E+00	SHORT HLIF
RB-83	2.332E-02	5.549E-01	1.101E+00	NOT IDENT.
KR-85	9.059E+00	6.785E+00	1.426E+01	NOT IDENT.
SR-85	1.041E+00	7.804E-01	1.640E+00	NOT IDENT.
RB-86	0.000E+00	3.723E+04	0.000E+00	SHORT HLIF
Y-88	-7.732E-02	1.100E-01	1.512E-01	NOT IDENT.
NB-94	3.035E-03	3.221E-02	6.550E-02	NOT IDENT.
NB-95	9.359E-01	8.413E-01	1.948E+00	NOT IDENT.
NB-95M	-8.811E-01	2.324E+00	3.952E+00	NOT IDENT.
ZR-95	-3.235E-01	1.504E+00	2.758E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.268E+33	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-1.423E-02	2.746E-02	5.414E-02	NOT IDENT.
RH-102	4.448E-03	4.258E-02	9.179E-02	FAIL ABUN
RU-103	6.983E-01	4.765E+00	9.746E+00	FAIL ABUN
AG-108M	9.877E-03	2.190E-02	4.602E-02	NOT IDENT.
AG-110M	-1.078E-01	1.126E-01	1.638E-01	FAIL ABUN
SN-113	-1.763E-01	2.004E-01	3.466E-01	NOT IDENT.
CD-115	0.000E+00	3.426E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.131E+05	0.000E+00	SHORT HLIF
TE-123M	-8.763E-02	1.073E-01	2.037E-01	NOT IDENT.
SB-124	-1.014E+00	1.570E+00	2.882E+00	NOT IDENT.
SB-125	6.964E-02	8.785E-02	1.897E-01	FAIL ABUN
TE-125M	-1.005E+01	2.120E+02	4.356E+02	NOT IDENT.
I-126	0.000E+00	1.283E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.709E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	6.987E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	8.087E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.020E+27	0.000E+00	SHORT HLIF
BA-133	1.961E-03	3.948E-02	6.973E-02	FAIL ABUN
I-133	0.000E+00	1.580E+41	0.000E+00	SHORT HLIF
CS-134	2.644E-02	4.629E-02	1.015E-01	NOT IDENT.
CS-135	5.875E-02	1.113E-01	2.332E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	4.886E+05	0.000E+00	SHORT HLIF
BA-137M	1.295E-02	3.584E-02	7.557E-02	NOT IDENT.
CS-137	1.368E-02	3.786E-02	7.983E-02	NOT IDENT.
CE-139	-4.497E-02	9.740E-02	1.898E-01	NOT IDENT.
BA-140	0.000E+00	2.103E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	6.695E+05	0.000E+00	SHORT HLIF
CE-141	5.951E+00	2.498E+01	4.682E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	3.493E-02	2.796E-01	5.776E-01	NOT IDENT.
PM-144	2.328E-02	5.124E-02	1.105E-01	NOT IDENT.
PR-144	2.387E+00	4.422E+00	9.645E+00	NOT IDENT.
PM-146	-3.748E-03	3.535E-02	6.848E-02	NOT IDENT.
ND-147	0.000E+00	5.077E+07	0.000E+00	SHORT HLIF
PM-147	3.548E+02	6.434E+02	1.369E+03	NOT IDENT.
PM-149	0.000E+00	1.335E+41	0.000E+00	SHORT HLIF
EU-150	2.641E-03	2.134E-02	4.085E-02	FAIL ABUN
EU-152	2.960E-02	8.183E-02	1.533E-01	FAIL ABUN
GD-153	-4.303E-02	1.307E-01	2.376E-01	NOT IDENT.
EU-154	6.833E-02	1.393E-01	2.917E-01	NOT IDENT.
EU-155	6.519E-02	7.019E-02	1.551E-01	FAIL ABUN
TB-160	8.906E-01	1.995E+00	4.307E+00	FAIL ABUN
HO-166M	2.744E-03	5.261E-02	1.080E-01	NOT IDENT.
TM-171	6.914E-01	4.234E+00	8.305E+00	NOT IDENT.

HF-172	-6.034E-02	1.846E-01	3.675E-01	FAIL ABUN
LU-172	8.908E-03	7.132E-02	1.480E-01	FAIL ABUN
LU-176	-3.688E-03	1.887E-02	3.673E-02	FAIL ABUN
HF-181	-1.086E+00	4.111E+00	7.737E+00	NOT IDENT.
TA-182	8.428E-01	1.028E+00	2.265E+00	FAIL ABUN
RE-183	-3.351E-01	9.872E-01	1.693E+00	NOT IDENT.
RE-184	-9.713E+00	2.597E+01	5.073E+01	NOT IDENT.
W-188	-6.489E+01	1.449E+02	1.820E+02	FAIL ABUN
IR-192	2.320E-01	4.392E-01	8.425E-01	FAIL ABUN
BI-207	-9.682E-03	5.354E-02	1.030E-01	FAIL ABUN
PB-211	4.972E-02	5.259E-01	1.051E+00	NOT IDENT.
BI-212	6.954E-01	7.661E-01	1.202E+00	FAIL ABUN
RN-219	-3.126E-01	3.188E-01	5.408E-01	NOT IDENT.
RA-223	-6.418E-01	7.388E-01	7.995E-01	FAIL ABUN
AC-227	-4.557E-02	1.756E-01	3.421E-01	FAIL ABUN
TH-227	-4.557E-02	1.756E-01	3.421E-01	FAIL ABUN
TH-229	-8.083E-02	3.831E-01	7.562E-01	FAIL ABUN
TH-231	-6.418E-01	7.388E-01	7.995E-01	FAIL ABUN
PA-233	1.631E-02	4.587E-02	9.512E-02	FAIL ABUN
PA-234	-2.836E-01	2.629E-01	4.289E-01	NOT IDENT.
PA-234M	3.633E+00	4.330E+00	9.626E+00	NOT IDENT.
NP-237	1.631E-02	4.587E-02	9.512E-02	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	-4.034E-02	1.757E-01	3.567E-01	FAIL ABUN
PU-239	1.881E+02	2.415E+02	5.190E+02	NOT IDENT.
AM-241	1.506E-02	4.595E-02	8.377E-02	NOT IDENT.
CM-243	-3.773E-02	6.573E-02	1.310E-01	FAIL ABUN
BK-247	-4.058E-02	5.590E-02	1.029E-01	NOT IDENT.
CM-247	-2.013E-02	2.738E-02	4.834E-02	FAIL ABUN
CF-249	3.363E-02	3.060E-02	6.815E-02	NOT IDENT.
CF-251	2.247E-02	9.675E-02	1.983E-01	FAIL ABUN

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	270	10.66*	8.926E-01	1.191E+01	1.191E+01	12.18
Y-91	1204.77	9	0.26*	1.058E+00	1.372E+01	5.267E+02	296.36
RH-106	621.93	21	9.93*	1.938E+00	4.592E-01	8.153E-01	94.29
	1050.41	-----	1.56	1.196E+00	-----	Line Not Found	-----
RU-106	621.93	21	9.93*	1.938E+00	4.592E-01	8.153E-01	94.29
	1050.41	-----	1.56	1.196E+00	-----	Line Not Found	-----
CD-109	88.03	131	3.70*	7.447E+00	1.995E+00	3.169E+00	35.67
SN-126	64.28	120	9.60	7.794E+00	6.753E-01	6.753E-01	51.53
	86.94	131	8.90	7.447E+00	8.295E-01	8.295E-01	35.67
	87.57	131	37.00*	7.447E+00	1.995E-01	1.995E-01	35.67
HG-203	70.83	-----	3.69	7.737E+00	-----	Line Not Found	-----
	72.87	-----	6.19	7.711E+00	-----	Line Not Found	-----
	279.20	40	81.56*	3.902E+00	5.325E-02	5.199E+00	77.37
TL-208	277.37	40	6.60	3.902E+00	6.580E-01	6.580E-01	77.37
	583.19	87	85.00*	2.050E+00	2.099E-01	2.099E-01	38.95
	860.56	-----	12.50	1.434E+00	-----	Line Not Found	-----
PB-210	46.54	60	4.25*	7.553E+00	7.803E-01	8.011E-01	94.74
BI-211	72.87	-----	1.23	7.711E+00	-----	Line Not Found	-----
	351.06	225	12.92*	3.212E+00	2.277E+00	2.277E+00	21.96
PB-212	74.82	258	10.28	7.681E+00	1.373E+00	1.373E+00	27.70
	77.11	321	17.10	7.644E+00	1.032E+00	1.032E+00	19.74
	238.63	348	43.60*	4.381E+00	7.662E-01	7.662E-01	16.56
	300.09	23	3.30	3.659E+00	8.094E-01	8.094E-01	181.75
BI-214	609.32	135	45.49*	1.969E+00	6.315E-01	6.317E-01	27.31
	1120.29	26	14.92	1.127E+00	6.586E-01	6.589E-01	71.98
	1764.49	-----	15.30	7.620E-01	-----	Line Not Found	-----
PB-214	74.82	258	5.80	7.681E+00	2.434E+00	2.435E+00	27.70
	77.11	321	9.70	7.644E+00	1.819E+00	1.820E+00	19.74
	87.09	131	3.41	7.447E+00	2.165E+00	2.166E+00	35.67
	242.00	102	7.25	4.340E+00	1.358E+00	1.359E+00	35.52
	295.22	111	18.42	3.708E+00	6.813E-01	6.816E-01	39.20
	351.93	225	35.60*	3.212E+00	8.266E-01	8.269E-01	21.96
RN-222	609.32	135	45.49*	1.969E+00	6.315E-01	6.317E-01	27.31
	1120.29	26	14.92	1.127E+00	6.586E-01	6.589E-01	71.98
	1764.49	-----	15.30	7.620E-01	-----	Line Not Found	-----
RA-224	240.99	102	4.10*	4.340E+00	2.402E+00	2.402E+00	35.52
RA-226	609.32	135	45.49*	1.969E+00	6.315E-01	6.317E-01	27.31
	1120.29	26	14.92	1.127E+00	6.586E-01	6.589E-01	71.98
	1764.49	-----	15.30	7.620E-01	-----	Line Not Found	-----
AC-228	105.21	-----	1.10	7.028E+00	-----	Line Not Found	-----
	338.32	45	11.27	3.317E+00	5.105E-01	5.105E-01	88.51
	794.95	-----	4.25	1.543E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.473E+00	-----	Line Not Found	-----
	911.20	45	25.80*	1.360E+00	5.447E-01	5.447E-01	42.74
	968.97	40	15.80	1.285E+00	8.194E-01	8.194E-01	43.89
RA-228	105.21	-----	1.10	7.028E+00	-----	Line Not Found	-----
	338.32	45	11.27	3.317E+00	5.105E-01	5.105E-01	88.51

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	794.95	-----	4.25	1.543E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.473E+00	-----	Line Not Found	-----
	911.20	45	25.80*	1.360E+00	5.447E-01	5.447E-01	42.74
	968.97	40	15.80	1.285E+00	8.194E-01	8.194E-01	43.89
TH-228	74.82	258	10.28	7.681E+00	1.373E+00	1.373E+00	27.70
	77.11	321	17.10	7.644E+00	1.032E+00	1.032E+00	19.74
	238.63	348	43.60*	4.381E+00	7.662E-01	7.662E-01	16.56
	300.09	23	3.30	3.659E+00	8.094E-01	8.094E-01	181.75
TH-230	609.32	135	45.49*	1.969E+00	6.315E-01	6.315E-01	27.31
	1120.29	26	14.92	1.127E+00	6.586E-01	6.586E-01	71.98
	1764.49	-----	15.30	7.620E-01	-----	Line Not Found	-----
PA-231	283.69	-----	1.70	3.838E+00	-----	Line Not Found	-----
	301.36	23	5.35*	3.659E+00	4.993E-01	4.993E-01	181.75
TH-232	105.21	-----	1.10	7.028E+00	-----	Line Not Found	-----
	338.32	45	11.27	3.317E+00	5.105E-01	5.105E-01	88.51
	835.71	-----	1.61	1.473E+00	-----	Line Not Found	-----
	911.20	45	25.80*	1.360E+00	5.447E-01	5.447E-01	42.74
	968.97	40	15.80	1.285E+00	8.194E-01	8.194E-01	43.89
TH-234	63.29	120	3.70*	7.794E+00	1.752E+00	1.752E+00	51.53
	92.59	156	4.23	7.320E+00	2.112E+00	2.112E+00	48.79
U-234	609.32	135	45.49*	1.969E+00	6.315E-01	6.315E-01	27.31
	1120.29	26	14.92	1.127E+00	6.586E-01	6.586E-01	71.98
	1764.49	-----	15.30	7.620E-01	-----	Line Not Found	-----
U-235	89.96	88	3.47	7.390E+00	1.435E+00	1.435E+00	55.85
	93.35	156	5.60	7.320E+00	1.595E+00	1.595E+00	48.79
	143.76	33	10.96*	6.105E+00	2.047E-01	2.047E-01	178.90
	163.33	-----	5.08	5.667E+00	-----	Line Not Found	-----
	185.72	132	57.20	5.223E+00	1.858E-01	1.858E-01	47.55
	205.31	-----	5.01	4.887E+00	-----	Line Not Found	-----
U-238	63.29	120	3.70*	7.794E+00	1.752E+00	1.752E+00	51.53
	92.59	156	4.23	7.320E+00	2.112E+00	2.112E+00	48.79
AM-243	43.53	-----	5.90	7.421E+00	-----	Line Not Found	-----
	74.66	258	67.20*	7.681E+00	2.101E-01	2.101E-01	27.70
ANH-511	511.00	36	100.00*	2.313E+00	6.463E-02	6.463E-02	108.92

Flag: "*" = Keyline

Total number of lines in spectrum 43
 Number of unidentified lines 8
 Number of lines tentatively identified by NID 35 81.40%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.191E+01	1.191E+01	0.145E+01	12.18	
Y-91	58.51D	38.4	1.372E+01	5.267E+02	15.61E+02	296.36	
RH-106	371.80D	1.78	4.592E-01	8.153E-01	7.687E-01	94.29	
RU-106	371.80D	1.78	4.592E-01	8.153E-01	7.687E-01	94.29	
CD-109	461.40D	1.59	1.995E+00	3.169E+00	1.130E+00	35.67	
SN-126	2.30E+05Y	1.00	1.995E-01	1.995E-01	0.712E-01	35.67	
HG-203	46.59D	97.6	5.325E-02	5.199E+00	4.023E+00	77.37	
TL-208	1.41E+10Y	1.00	2.099E-01	2.099E-01	0.818E-01	38.95	
PB-210	22.20Y	1.03	7.803E-01	8.011E-01	7.590E-01	94.74	
BI-211	7.04E+08Y	1.00	2.277E+00	2.277E+00	0.500E+00	21.96	
PB-212	1.41E+10Y	1.00	7.662E-01	7.662E-01	1.269E-01	16.56	
BI-214	1600.00Y	1.00	6.315E-01	6.317E-01	1.725E-01	27.31	
PB-214	1600.00Y	1.00	8.266E-01	8.269E-01	1.816E-01	21.96	
RN-222	1600.00Y	1.00	6.315E-01	6.317E-01	1.725E-01	27.31	
RA-224	1.41E+10Y	1.00	2.402E+00	2.402E+00	0.853E+00	35.52	
RA-226	1600.00Y	1.00	6.315E-01	6.317E-01	1.725E-01	27.31	
AC-228	1.41E+10Y	1.00	5.447E-01	5.447E-01	2.328E-01	42.74	
RA-228	1.41E+10Y	1.00	5.447E-01	5.447E-01	2.328E-01	42.74	
TH-228	1.41E+10Y	1.00	7.662E-01	7.662E-01	1.269E-01	16.56	
TH-230	7.54E+04Y	1.00	6.315E-01	6.315E-01	1.725E-01	27.31	
PA-231	7.04E+08Y	1.00	4.993E-01	4.993E-01	9.074E-01	181.75	
TH-232	1.41E+10Y	1.00	5.447E-01	5.447E-01	2.328E-01	42.74	
TH-234	4.47E+09Y	1.00	1.752E+00	1.752E+00	0.903E+00	51.53	
U-234	2.45E+05Y	1.00	6.315E-01	6.315E-01	1.725E-01	27.31	
U-235	7.04E+08Y	1.00	2.047E-01	2.047E-01	3.662E-01	178.90	
U-238	4.47E+09Y	1.00	1.752E+00	1.752E+00	0.903E+00	51.53	
AM-243	7370.00Y	1.00	2.101E-01	2.101E-01	0.582E-01	27.70	
ANH-511	1.00E+09Y	1.00	6.463E-02	6.463E-02	7.040E-02	108.92	
Total Activity :			4.609E+01	5.661E+02			

Grand Total Activity : 4.609E+01 5.661E+02

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
2	61.13	37	179	1.32	122.54	120	18	6.90E-03	****	7.80E+00	T
0	210.01	33	107	0.92	420.23	415	9	7.11E-03	****	4.81E+00	T
0	230.38	29	66	0.87	460.95	458	8	6.36E-03	****	4.50E+00	
0	286.06	27	71	0.89	572.28	568	10	6.08E-03	****	3.81E+00	T
0	322.00	23	54	1.82	644.16	637	11	5.28E-03	****	3.46E+00	T
0	329.47	17	63	0.89	659.08	653	9	3.80E-03	****	3.40E+00	T
0	444.91	13	21	1.41	889.94	886	7	3.05E-03	****	2.62E+00	
0	462.81	45	24	1.42	925.74	919	12	1.09E-02	59.2	2.53E+00	T
0	679.71	9	20	0.83	1359.50	1353	9	2.22E-03	****	1.78E+00	
0	728.45	18	22	1.12	1456.98	1450	10	4.70E-03	****	1.67E+00	T
0	767.97	40	40	6.58	1536.03	1520	24	1.03E-02	91.4	1.59E+00	T
0	886.62	6	4	0.65	1773.35	1770	7	1.55E-03	****	1.40E+00	
0	965.51	26	12	1.69	1931.15	1925	12	7.02E-03	67.6	1.29E+00	T
0	1053.89	15	0	2.39	2107.93	2103	9	4.17E-03	51.6	1.19E+00	
0	1207.05	15	5	1.54	2414.33	2410	10	4.17E-03	76.0	1.06E+00	
0	1237.81	22	7	3.75	2475.86	2469	14	6.11E-03	66.5	1.03E+00	T
0	1264.29	10	5	0.78	2528.85	2521	13	2.65E-03	****	1.01E+00	
0	1766.23	17	3	2.53	3533.15	3527	11	5.05E-03	58.8	7.61E-01	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235037.CNF;1
* Acquisition date   : 3-OCT-2016 09:17:13 Sensitivity      : 3.000
* Detector ID       : GAM41 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:05.72 Half life ratio : *****
* Sample date       : 30-NOV-2015 11:19:00 Nuclide Library : SOLID
* Sample ID         : G405235037 Analyst initials: MXR1
* Batch Number      : 1596249 Sample Quantity : 1.7876E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date    : 26-JAN-2016 06:01:47 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.880E-01
Y-91	0.000E+00
RH-106	3.958E-01
RU-106	3.958E-01
CD-109	5.662E-01
SN-126	4.102E-02
HG-203	2.131E+00
TL-208	2.676E-02
PB-210	3.069E-01
BI-211	1.445E-01
PB-212	3.941E-02
BI-214	4.926E-02
PB-214	1.339E-01
RN-222	4.926E-02
RA-224	3.778E-01
RA-226	4.926E-02
AC-228	8.443E-02
RA-228	8.443E-02
TH-228	3.941E-02
TH-230	4.924E-02
PA-231	3.094E-01
TH-232	8.443E-02
TH-234	4.195E-01
U-234	4.924E-02
U-235	1.371E-01
U-238	4.195E-01
AM-243	2.315E-02
ANH-511	1.823E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.093E+01	NOT IDENT.
NA-22	5.224E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF

AL-26	1.321E-02	NOT IDENT.
SC-46	2.877E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	4.823E-02	NOT IDENT.
CO-56	4.756E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	3.690E-02	NOT IDENT.
CO-58	3.937E-01	NOT IDENT.
FE-59	5.502E+00	NOT IDENT.
CO-60	2.424E-02	NOT IDENT.
ZN-65	1.603E-01	NOT IDENT.
GE-68	2.109E+00	NOT IDENT.
AS-73	1.953E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.386E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.812E-01	NOT IDENT.
KR-85	6.498E+00	NOT IDENT.
SR-85	7.474E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.766E-02	NOT IDENT.
NB-94	2.932E-02	NOT IDENT.
NB-95	8.702E-01	NOT IDENT.
NB-95M	1.819E+00	NOT IDENT.
ZR-95	1.191E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.538E-02	NOT IDENT.
RH-102	3.939E-02	FAIL ABUN
RU-103	4.236E+00	FAIL ABUN
AG-108M	2.053E-02	NOT IDENT.
AG-110M	6.831E-02	FAIL ABUN
SN-113	1.530E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	9.416E-02	NOT IDENT.
SB-124	9.109E-01	NOT IDENT.
SB-125	8.564E-02	FAIL ABUN
TE-125M	2.039E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.163E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	4.481E-02	NOT IDENT.
CS-135	1.071E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	3.411E-02	NOT IDENT.
CS-137	3.603E-02	NOT IDENT.
CE-139	8.841E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.190E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.700E-01	NOT IDENT.
PM-144	4.909E-02	NOT IDENT.
PR-144	4.287E+00	NOT IDENT.
PM-146	3.025E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	6.434E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.852E-02	FAIL ABUN
EU-152	6.938E-02	FAIL ABUN
GD-153	1.115E-01	NOT IDENT.
EU-154	1.283E-01	NOT IDENT.
EU-155	7.274E-02	FAIL ABUN
TB-160	1.888E+00	FAIL ABUN
HO-166M	4.762E-02	NOT IDENT.
TM-171	3.913E+00	NOT IDENT.
HF-172	1.722E-01	FAIL ABUN

LU-172	6.306E-02	FAIL ABUN
LU-176	1.656E-02	FAIL ABUN
HF-181	3.399E+00	NOT IDENT.
TA-182	9.997E-01	FAIL ABUN
RE-183	7.960E-01	NOT IDENT.
RE-184	2.070E+01	NOT IDENT.
W-188	8.240E+01	FAIL ABUN
IR-192	3.836E-01	FAIL ABUN
BI-207	4.478E-02	FAIL ABUN
PB-211	4.694E-01	NOT IDENT.
BI-212	5.480E-01	FAIL ABUN
RN-219	2.385E-01	NOT IDENT.
RA-223	3.556E-01	FAIL ABUN
AC-227	1.556E-01	FAIL ABUN
TH-227	1.556E-01	FAIL ABUN
TH-229	3.506E-01	FAIL ABUN
TH-231	3.556E-01	FAIL ABUN
PA-233	4.312E-02	FAIL ABUN
PA-234	1.773E-01	NOT IDENT.
PA-234M	4.256E+00	NOT IDENT.
NP-237	4.312E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.666E-01	FAIL ABUN
PU-239	2.441E+02	NOT IDENT.
AM-241	3.960E-02	NOT IDENT.
CM-243	6.118E-02	FAIL ABUN
BK-247	4.642E-02	NOT IDENT.
CM-247	2.124E-02	FAIL ABUN
CF-249	3.098E-02	NOT IDENT.
CF-251	9.250E-02	FAIL ABUN

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235037.CNF;1
* Acquisition date   : 3-OCT-2016 09:17:13 Sensitivity      : 3.000
* Detector ID        : GAM41 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:05.72 Half life ratio  : *****
* Sample date        : 30-NOV-2015 11:19:00 Nuclide Library : SOLID
* Sample ID          : G405235037 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity  : 1.7876E+02 GRAM
*                   : Quantity Err(%) : 1.1188E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 06:01:47 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.191E+01	1.747E+00	1.747E+00
Y-91	5.267E+02	1.530E+03	1.530E+03
RH-106	8.153E-01	7.574E-01	7.574E-01
RU-106	8.153E-01	7.574E-01	7.574E-01
CD-109	2.172E+00	1.203E+00	1.203E+00
SN-126	1.367E-01	7.540E-02	7.540E-02
HG-203	3.541E+00	4.013E+00	4.013E+00
TL-208	2.099E-01	8.210E-02	8.210E-02
PB-210	8.011E-01	7.505E-01	7.505E-01
BI-211	4.002E-01	9.023E-01	9.023E-01
PB-212	7.662E-01	1.440E-01	1.440E-01
BI-214	6.317E-01	1.773E-01	1.773E-01
PB-214	8.269E-01	1.914E-01	1.914E-01
RN-222	6.317E-01	1.773E-01	1.773E-01
RA-224	1.197E+00	9.744E-01	9.744E-01
RA-226	6.317E-01	1.773E-01	1.773E-01
AC-228	5.447E-01	2.371E-01	2.371E-01
RA-228	5.447E-01	2.371E-01	2.371E-01
TH-228	7.662E-01	1.440E-01	1.440E-01
TH-230	6.315E-01	1.772E-01	1.772E-01
PA-231	4.993E-01	8.964E-01	8.964E-01
TH-232	5.447E-01	2.371E-01	2.371E-01
TH-234	1.752E+00	9.852E-01	9.852E-01
U-234	6.315E-01	1.772E-01	1.772E-01
U-235	2.047E-01	3.596E-01	3.596E-01
U-238	1.752E+00	9.852E-01	9.852E-01
AM-243	1.513E-01	6.427E-02	6.427E-02
ANH-511	6.463E-02	6.921E-02	6.921E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	4.951E+00	1.184E+01	1.204E+01	NOT IDENT.
NA-22	2.148E-02	5.788E-02	5.868E-02	NOT IDENT.

NA-24	1.000E+41	2.350E+41	0.000E+00	SHORT HLIF
AL-26	-9.950E-03	2.083E-02	2.131E-02	NOT IDENT.
SC-46	1.846E-02	3.663E-01	3.664E-01	FAIL ABUN
V-48	2.110E+03	1.676E+04	1.678E+04	SHORT HLIF
CR-51	3.204E+02	4.482E+02	4.709E+02	SHORT HLIF
MN-54	-1.910E-02	5.798E-02	5.862E-02	NOT IDENT.
CO-56	1.179E-01	5.199E-01	5.226E-01	FAIL ABUN
MN-56	1.000E+41	4.410E+41	0.000E+00	SHORT HLIF
CO-57	9.342E-04	3.829E-02	3.829E-02	NOT IDENT.
CO-58	-3.216E-01	5.128E-01	5.329E-01	NOT IDENT.
FE-59	4.637E-01	6.280E+00	6.284E+00	NOT IDENT.
CO-60	-1.435E-02	3.331E-02	3.393E-02	NOT IDENT.
ZN-65	5.808E-02	1.975E-01	1.992E-01	NOT IDENT.
GE-68	4.767E-01	2.352E+00	2.362E+00	NOT IDENT.
AS-73	5.366E-01	2.104E+00	2.118E+00	NOT IDENT.
AS-74	-2.462E+03	6.315E+03	6.412E+03	SHORT HLIF
SE-75	-5.786E-02	1.595E-01	1.616E-01	NOT IDENT.
BR-77	1.458E+39	1.296E+40	0.000E+00	SHORT HLIF
SR-82	-2.573E+01	7.176E+02	7.177E+02	SHORT HLIF
RB-83	2.332E-02	5.549E-01	5.550E-01	NOT IDENT.
KR-85	9.059E+00	6.829E+00	7.957E+00	NOT IDENT.
SR-85	1.041E+00	7.855E-01	9.150E-01	NOT IDENT.
RB-86	2.215E+04	3.742E+04	3.873E+04	SHORT HLIF
Y-88	-7.732E-02	1.102E-01	1.155E-01	NOT IDENT.
NB-94	3.035E-03	3.221E-02	3.224E-02	NOT IDENT.
NB-95	9.359E-01	8.460E-01	9.453E-01	NOT IDENT.
NB-95M	-8.811E-01	2.326E+00	2.360E+00	NOT IDENT.
ZR-95	-3.235E-01	1.505E+00	1.512E+00	NOT IDENT.
NB-97	1.000E+41	2.243E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	6.296E+41	0.000E+00	SHORT HLIF
MO-99	8.364E+32	1.271E+33	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	8.473E+42	0.000E+00	SHORT HLIF
RH-101	-1.423E-02	2.762E-02	2.836E-02	NOT IDENT.
RH-102	4.448E-03	4.258E-02	4.263E-02	FAIL ABUN
RU-103	6.983E-01	4.765E+00	4.776E+00	FAIL ABUN
AG-108M	9.877E-03	2.192E-02	2.237E-02	NOT IDENT.
AG-110M	-1.078E-01	1.132E-01	1.232E-01	FAIL ABUN
SN-113	-1.763E-01	2.009E-01	2.160E-01	NOT IDENT.
CD-115	-4.606E+39	3.427E+40	0.000E+00	SHORT HLIF
SN-117M	1.469E+04	1.131E+05	1.133E+05	SHORT HLIF
TE-123M	-8.763E-02	1.076E-01	1.146E-01	NOT IDENT.
SB-124	-1.014E+00	1.572E+00	1.637E+00	NOT IDENT.
SB-125	6.964E-02	8.804E-02	9.347E-02	FAIL ABUN
TE-125M	-1.005E+01	2.120E+02	2.121E+02	NOT IDENT.
I-126	6.486E+05	1.287E+06	1.320E+06	SHORT HLIF
SB-126	-9.864E+05	1.721E+06	1.778E+06	SHORT HLIF
SB-127	-4.399E+22	9.354E+22	0.000E+00	SHORT HLIF
I-131	1.201E+09	8.088E+09	8.106E+09	SHORT HLIF
I-132	1.000E+41	1.909E+42	0.000E+00	SHORT HLIF
TE-132	-7.918E+25	2.021E+27	0.000E+00	SHORT HLIF
BA-133	1.961E-03	3.949E-02	3.949E-02	FAIL ABUN
I-133	1.000E+41	2.440E+41	0.000E+00	SHORT HLIF
CS-134	2.644E-02	4.637E-02	4.787E-02	NOT IDENT.
CS-135	5.875E-02	1.115E-01	1.146E-01	NOT IDENT.
I-135	-1.000E+41	8.129E+41	0.000E+00	SHORT HLIF
CS-136	2.405E+05	4.907E+05	5.026E+05	SHORT HLIF
BA-137M	1.295E-02	3.586E-02	3.633E-02	NOT IDENT.
CS-137	1.368E-02	3.788E-02	3.838E-02	NOT IDENT.
CE-139	-4.497E-02	9.789E-02	9.996E-02	NOT IDENT.
BA-140	2.016E+06	2.110E+06	2.298E+06	SHORT HLIF
LA-140	-6.821E+05	6.716E+05	7.386E+05	SHORT HLIF
CE-141	5.951E+00	2.499E+01	2.513E+01	NOT IDENT.
CE-143	1.000E+41	7.079E+41	0.000E+00	SHORT HLIF
CE-144	3.493E-02	2.797E-01	2.801E-01	NOT IDENT.
PM-144	2.328E-02	5.129E-02	5.235E-02	NOT IDENT.
PR-144	2.387E+00	4.427E+00	4.556E+00	NOT IDENT.
PM-146	-3.748E-03	3.535E-02	3.539E-02	NOT IDENT.
ND-147	-1.141E+07	5.079E+07	5.105E+07	SHORT HLIF
PM-147	3.548E+02	6.447E+02	6.643E+02	NOT IDENT.
PM-149	1.000E+41	1.356E+41	0.000E+00	SHORT HLIF
EU-150	2.641E-03	2.134E-02	2.138E-02	FAIL ABUN
EU-152	2.960E-02	8.188E-02	8.296E-02	FAIL ABUN
GD-153	-4.303E-02	1.308E-01	1.322E-01	NOT IDENT.
EU-154	6.833E-02	1.394E-01	1.427E-01	NOT IDENT.
EU-155	6.519E-02	7.057E-02	7.644E-02	FAIL ABUN
TB-160	8.906E-01	1.998E+00	2.038E+00	FAIL ABUN
HO-166M	2.744E-03	5.261E-02	5.262E-02	NOT IDENT.
TM-171	6.914E-01	4.235E+00	4.246E+00	NOT IDENT.

HF-172	-6.034E-02	1.850E-01	1.870E-01	FAIL ABUN
LU-172	8.908E-03	7.134E-02	7.146E-02	FAIL ABUN
LU-176	-3.688E-03	1.887E-02	1.894E-02	FAIL ABUN
HF-181	-1.086E+00	4.112E+00	4.142E+00	NOT IDENT.
TA-182	8.428E-01	1.030E+00	1.098E+00	FAIL ABUN
RE-183	-3.351E-01	9.894E-01	1.001E+00	NOT IDENT.
RE-184	-9.713E+00	2.610E+01	2.646E+01	NOT IDENT.
W-188	-6.489E+01	1.452E+02	1.481E+02	FAIL ABUN
IR-192	2.320E-01	4.397E-01	4.520E-01	FAIL ABUN
BI-207	-9.682E-03	5.357E-02	5.374E-02	FAIL ABUN
PB-211	4.972E-02	5.259E-01	5.264E-01	NOT IDENT.
BI-212	6.954E-01	7.688E-01	8.303E-01	FAIL ABUN
RN-219	-3.126E-01	3.220E-01	3.515E-01	NOT IDENT.
RA-223	-6.418E-01	7.415E-01	7.959E-01	FAIL ABUN
AC-227	-4.557E-02	1.757E-01	1.769E-01	FAIL ABUN
TH-227	-4.557E-02	1.757E-01	1.769E-01	FAIL ABUN
TH-229	-8.083E-02	3.832E-01	3.849E-01	FAIL ABUN
TH-231	-6.418E-01	7.415E-01	7.959E-01	FAIL ABUN
PA-233	1.631E-02	4.589E-02	4.648E-02	FAIL ABUN
PA-234	-2.836E-01	4.190E-01	4.381E-01	NOT IDENT.
PA-234M	3.633E+00	4.361E+00	4.659E+00	NOT IDENT.
NP-237	1.631E-02	4.589E-02	4.648E-02	FAIL ABUN
NP-238	-1.000E+41	4.469E+41	0.000E+00	SHORT HLIF
NP-239	-4.034E-02	1.758E-01	1.768E-01	FAIL ABUN
PU-239	1.881E+02	2.425E+02	2.569E+02	NOT IDENT.
AM-241	1.506E-02	4.600E-02	4.650E-02	NOT IDENT.
CM-243	-3.773E-02	6.589E-02	6.805E-02	FAIL ABUN
BK-247	-4.058E-02	5.658E-02	5.947E-02	NOT IDENT.
CM-247	-2.013E-02	2.762E-02	2.907E-02	FAIL ABUN
CF-249	3.363E-02	3.082E-02	3.435E-02	NOT IDENT.
CF-251	2.247E-02	9.680E-02	9.733E-02	FAIL ABUN

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	57.4984	87.09	123.9638	136.47	72.5224
45.60	68.6647	87.57	106.5029	140.51	0.0000
46.54	73.8750	88.03	80.2402	143.76	72.1645
49.72	0.0000	88.34	80.2739	144.24	72.1991
51.35	91.1306	88.47	80.2876	145.44	64.2524
51.87	101.8809	89.96	98.0457	152.43	77.2665
52.39	78.2630	1093.63	40.2603	153.25	0.0000
52.97	72.4112	91.11	0.0000	323.87	53.9978
53.44	83.1661	92.59	78.2043	156.02	0.0000
54.07	89.2087	93.35	83.3318	158.56	0.0000
57.36	0.0000	94.56	83.4628	159.00	66.8969
57.53	110.1053	94.65	83.4723	162.33	52.5938
57.98	92.6242	94.67	83.4743	162.66	0.0000
59.27	89.6297	94.87	72.1102	163.33	62.6253
59.32	89.6374	97.43	86.3074	165.86	71.8662
59.54	89.6713	98.43	73.1997	176.31	57.8429
60.96	119.1815	98.44	73.2006	176.60	0.0000
61.17	119.2234	99.53	64.4772	177.52	59.7414
62.93	119.5741	100.11	66.2219	181.07	0.0000
63.29	119.6449	102.03	83.3998	181.52	56.7185
63.58	119.7023	103.18	73.2904	184.41	42.5274
64.28	119.8396	103.37	79.2743	143.76	42.5742
66.73	120.3141	105.21	56.3847	193.51	58.6844
67.24	120.4123	105.31	56.3918	197.03	61.6548
125.81	107.1077	106.12	73.5515	198.01	67.3125
67.75	107.1191	106.47	74.4382	201.83	60.0163
69.67	126.9777	109.28	68.6776	203.43	50.7030
70.83	100.2966	111.00	86.8801	205.31	50.7777
72.81	107.9610	111.76	0.0000	210.85	43.9140
72.87	124.3303	114.06	72.5126	215.65	43.6014
74.66	118.1038	116.30	0.0000	222.11	48.5762
74.82	118.1316	116.74	72.7339	227.09	40.1513
74.97	118.1580	119.76	72.1116	227.38	41.5941
77.11	118.5315	121.12	67.8695	228.16	0.0000
78.74	95.7097	121.22	67.8771	228.18	45.9238
79.69	99.1455	121.78	66.1776	116.74	45.9238
80.12	104.1669	122.06	76.6500	235.69	53.3885
80.19	0.0000	122.92	79.3380	235.96	53.3987
80.57	102.5790	123.07	83.7109	238.63	50.6084
81.00	92.7090	265.00	76.7861	238.98	0.0000
81.07	92.7181	125.81	77.8379	240.99	40.5542
81.75	132.5814	127.23	87.5910	242.00	40.5833
83.79	97.2274	127.91	74.5071	244.70	30.4951
84.00	94.7623	129.30	65.8379	252.40	0.0000
85.43	123.2671	131.20	86.2016	252.80	35.0468
86.55	135.1343	133.02	67.8583	254.15	0.0000
86.79	135.1780	133.52	66.1301	256.23	38.0558
86.94	123.9388	136.00	63.6475	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	33.3643	355.39	0.0000	584.27	20.6689
264.80	40.2376	356.01	31.0870	595.83	0.0000
265.00	40.2426	364.49	0.0000	427.87	18.4857
268.22	33.4425	366.42	0.0000	602.52	0.0000
269.46	30.5169	372.51	19.8620	604.72	26.0358
270.03	39.3913	375.05	28.2623	607.14	18.5306
271.23	44.3500	377.52	25.1543	609.32	18.5456
273.65	0.0000	356.01	25.2368	610.33	18.5527
276.40	38.5652	388.16	17.9152	614.28	6.9673
277.37	33.6417	388.63	0.0000	618.01	6.9768
277.60	33.6465	391.69	31.6718	620.36	12.8020
278.00	33.6555	264.66	24.3912	621.93	17.4670
279.20	43.0920	401.81	32.8940	630.19	0.0000
279.54	43.1017	402.40	27.5964	631.29	11.3921
279.70	50.5383	404.85	22.3168	633.25	12.2769
280.46	44.6136	410.95	27.7128	634.78	0.0000
283.69	40.2347	413.71	30.9523	635.95	21.9444
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	36.7975	423.72	0.0000	645.85	10.5707
285.90	0.0000	427.09	19.3359	657.76	19.4608
287.50	28.3811	427.87	18.2683	657.90	0.0000
290.67	41.9077	433.94	17.2432	661.66	21.2585
293.27	0.0000	439.40	22.6898	664.57	0.0000
351.93	30.0183	453.88	20.6664	666.33	0.0000
295.96	27.0286	463.37	20.7554	666.50	0.0000
879.38	18.0480	468.07	26.2725	667.71	0.0000
299.98	33.1161	473.00	0.0000	677.62	15.6755
300.09	33.1182	475.06	21.9617	685.70	0.0000
300.13	33.1195	476.78	21.9784	695.00	0.0000
301.36	33.1437	477.60	18.6882	696.49	16.1345
302.85	27.1423	482.18	20.9289	696.51	15.2382
256.23	39.2444	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	17.0355
306.78	31.2371	497.08	13.3036	697.49	19.7267
308.46	29.2513	505.52	26.7026	702.65	23.3538
311.90	26.2788	507.63	0.0000	706.68	20.6865
316.51	25.8434	511.00	16.7276	711.68	18.0182
319.41	0.0000	514.00	15.0738	720.70	0.0000
320.08	0.0000	514.00	15.0738	721.93	0.0000
321.04	29.4685	520.40	15.6737	722.78	11.5734
323.87	42.7485	520.69	0.0000	722.91	15.9146
325.23	24.4468	522.65	0.0000	723.31	18.8106
328.76	0.0000	527.90	0.0000	724.19	20.2631
333.37	31.9287	528.26	19.0939	727.33	19.0159
333.97	29.4826	529.59	13.4854	733.00	18.1439
334.37	36.8613	529.87	0.0000	735.93	15.4369
338.28	30.7855	531.02	0.0000	333.97	18.1702
338.32	30.7861	537.26	0.0000	739.50	0.0000
311.90	30.8234	546.56	0.0000	747.24	9.1135
340.48	30.8234	552.55	15.8793	748.06	15.4965
340.55	0.0000	563.25	15.9460	752.31	15.5178
344.28	24.7104	569.33	22.8337	753.82	0.0000
345.93	32.9779	946.00	20.5518	756.73	15.8443
351.06	33.0703	569.70	20.5532	756.80	15.8443
351.93	33.0859	583.19	20.6602	884.68	10.9937

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	11.0002	1274.44	14.6750	1620.50	7.8122
766.42	11.0024	1001.03	8.8157	1621.92	3.3490
766.84	11.0039	1002.74	13.7193	1678.03	0.0000
772.60	0.0000	1004.73	18.6283	1690.97	3.6152
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	4.5752
778.90	7.3633	1028.54	0.0000	1063.66	1.5264
783.70	0.0000	1037.84	5.9319	1771.35	1.5268
785.37	11.0669	1038.76	0.0000	1791.20	0.0000
792.07	17.5585	631.29	10.8986	1808.65	2.7649
794.95	15.7243	1048.07	0.0000	1810.72	0.0000
795.86	12.9528	1049.04	15.8623	1836.06	1.8515
810.06	12.0792	1050.41	14.2813		
810.29	12.0800	1063.66	16.9149		
344.28	13.0101	1077.00	0.0000		
810.76	13.9407	1077.34	10.9812		
815.77	0.0000	1085.87	5.0015		
1048.07	0.0000	1093.63	10.0220		
832.01	10.2877	1099.45	8.0288		
834.85	15.9126	1112.07	11.0725		
835.71	14.9800	1112.84	12.0813		
836.80	0.0000	1115.54	11.2834		
846.75	0.0000	1120.29	11.0940		
846.77	15.9676	1120.55	11.0947		
856.80	0.0000	1221.41	6.4563		
860.56	16.0314	1129.67	11.1182		
871.09	10.4045	1131.51	0.0000		
873.19	13.2498	1147.95	0.0000		
875.33	0.0000	1173.23	16.3350		
879.38	12.3252	1177.95	11.2424		
880.51	9.4836	1189.05	12.2952		
883.24	19.7412	1204.77	0.0000		
884.68	16.7111	1221.41	10.3198		
889.28	9.1269	1231.02	13.7882		
894.76	10.4740	1235.36	0.0000		
898.04	10.4834	1238.28	14.5007		
900.72	11.4448	1260.41	0.0000		
903.28	9.5441	1271.87	14.6058		
911.20	8.6086	1274.44	12.5259		
912.08	8.6105	1274.54	13.5705		
923.98	0.0000	1291.59	5.2383		
926.50	11.5261	1298.22	0.0000		
929.11	11.5342	1312.11	0.0000		
937.49	14.4502	1332.49	7.3961		
944.13	0.0000	1362.66	0.0000		
946.00	18.3454	1365.19	4.2546		
949.00	10.6294	1368.63	0.0000		
667.71	0.0000	1384.29	8.5420		
962.31	9.3094	1408.01	2.1455		
964.08	3.1046	1457.56	0.0000		
966.17	7.7656	1460.82	3.2514		
911.20	0.0000	1489.16	1.0897		
968.97	0.0000	1505.03	5.4645		
983.53	0.0000	1584.12	4.4353		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235038.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM43.CNF;151
Background date    : 2-OCT-2016 11:02:23.
Sample date       : 30-NOV-2015 10:40:00 Acquisition date : 3-OCT-2016 09:17:37.
Sample ID        : G405235038 Sample quantity   : 1.70192E+02 GRAM
Detector name    : GAM43 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.65 0.0%
Energy tolerance : 1.50000 keV Analyst Initials  : MXR1
Abundance limit  : 75.00000 Sensitivity    : 3.00000
Batch ID        : 1596249 Detector SN#    :
Matrix Spike ID  : LCS ID      : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	42.96	32	134	2.91	85.69	81	9	9.02E-03	66.7	
2	0	51.69	60	85	1.57	103.16	99	8	1.68E-02	29.7	
3	0	54.53*	29	66	1.03	108.84	107	6	7.93E-03	49.3	
4	1	74.69	82	111	1.23	149.18	144	15	2.28E-02	25.0	9.49E-01
5	1	77.06	145	123	1.11	153.92	144	15	4.04E-02	15.0	
6	0	88.08	101	157	3.87	175.96	171	11	2.81E-02	26.0	
7	0	92.78*	51	105	1.51	185.37	182	7	1.42E-02	38.0	
8	0	111.81	14	88	0.44	223.43	219	7	3.77E-03	120.3	
9	4	126.75	17	45	1.21	253.32	252	10	4.75E-03	52.2	4.25E+00
10	4	129.11	37	109	1.39	258.05	252	10	1.04E-02	51.4	
11	0	185.96*	66	117	1.23	371.78	366	9	1.82E-02	33.2	
12	0	209.35	30	84	1.34	418.57	415	10	8.40E-03	59.2	
13	4	238.57*	356	63	1.10	477.03	469	20	9.89E-02	6.6	4.42E-01
14	4	241.64	77	94	1.71	483.18	469	20	2.15E-02	29.0	
15	0	258.87	27	67	0.94	517.65	512	10	7.41E-03	60.7	
16	3	266.78	22	35	1.56	533.46	531	14	6.11E-03	42.2	1.95E+00
17	3	270.05	36	67	1.95	540.00	531	14	9.98E-03	45.9	
18	0	277.60	24	67	0.98	555.11	549	10	6.55E-03	70.0	
19	0	295.27*	111	46	1.57	590.45	586	10	3.08E-02	15.2	
20	0	299.95*	26	39	1.21	599.82	596	8	7.33E-03	46.1	
21	0	308.04	7	47	0.55	616.00	609	8	2.01E-03	169.6	
22	0	338.35	75	46	1.04	676.64	673	8	2.08E-02	19.5	
23	0	351.67*	182	54	1.38	703.29	697	12	5.06E-02	11.0	
24	0	389.09	10	20	0.94	778.14	774	6	2.78E-03	78.4	
25	0	392.32	14	21	1.32	784.61	780	7	3.83E-03	55.9	
26	0	463.79	71	24	2.35	927.58	918	19	1.98E-02	20.2	
27	0	490.97	26	39	6.33	981.95	973	19	7.28E-03	59.8	
28	0	511.12*	2	45	2.79	1022.26	1015	14	4.37E-04	*****	
29	0	583.09*	109	15	1.70	1166.23	1161	10	3.03E-02	12.0	
30	0	609.40*	112	34	1.45	1218.87	1212	11	3.12E-02	13.9	
31	0	661.42	40	16	1.16	1322.93	1317	13	1.10E-02	26.3	
32	0	720.47	16	16	1.24	1441.05	1437	10	4.54E-03	51.0	
33	0	728.72	61	32	2.78	1457.56	1446	26	1.71E-02	28.4	
34	0	769.43	18	29	1.31	1538.98	1533	14	5.11E-03	65.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	796.61	9	25	3.78	1593.35	1581	14	2.62E-03	115.9	
36	0	827.72	16	8	2.40	1655.58	1650	11	4.46E-03	42.6	
37	1	854.43	15	16	2.04	1709.00	1703	20	4.28E-03	57.4	7.43E+00
38	1	856.93	29	15	2.04	1714.00	1703	20	8.14E-03	30.9	
39	0	911.28*	69	40	1.30	1822.73	1815	16	1.92E-02	24.0	
40	1	965.12	20	11	2.34	1930.43	1926	24	5.52E-03	34.1	1.79E+00
41	1	968.70	45	13	2.34	1937.57	1926	24	1.26E-02	24.4	
42	0	1032.96	9	5	1.42	2066.10	2062	8	2.58E-03	54.9	
43	4	1065.40	16	7	2.20	2131.00	2125	14	4.39E-03	35.8	4.26E-01
44	4	1067.83	8	1	1.80	2135.85	2125	14	2.14E-03	53.6	
45	0	1120.89	18	25	1.43	2241.98	2235	15	4.98E-03	63.0	
46	0	1177.22	15	13	1.65	2354.66	2348	14	4.27E-03	57.1	
47	0	1244.93	6	9	0.47	2490.08	2484	8	1.69E-03	97.0	
48	0	1460.55*	307	3	2.10	2921.34	2913	15	8.52E-02	5.9	
49	0	1764.03*	17	0	0.72	3528.30	3520	15	4.77E-03	26.5	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235038.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 30-NOV-2015 10:40:00 Acquisition date : 3-OCT-2016 09:17:37
Sample ID         : G405235038 Sample quantity   : 170.19 GRAM
Sample type       : SOLID Sample geometry    :
Detector name     : GAMMA43 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.65 0.0%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type   : Linear Efficiencies at  : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.002E+00	1.238E+01	1.238E+01	11.86	OK
AS-73	53.44	10.30*	9.178E-01	1.918E+00	2.738E+01	98.59	OK
CD-109	88.03	3.70*	4.365E+00	3.050E+00	4.845E+00	64.96	OK
SN-113	391.69	64.94*	3.112E+00	3.501E-02	2.237E-01	111.79	OK
SN-126	64.28	9.60	1.983E+00	-----	Line Not Found	-----	Absent
	86.94	8.90	4.365E+00	1.268E+00	1.268E+00	64.96	OK
	87.57	37.00*	4.365E+00	3.050E-01	3.050E-01	64.96	OK
CS-135	268.22	16.00*	4.342E+00	1.698E-01	1.698E-01	84.47	OK
BA-137M	661.66	89.90*	1.974E+00	1.071E-01	1.092E-01	52.70	OK
CS-137	661.66	85.10*	1.974E+00	1.131E-01	1.154E-01	52.70	OK
TM-171	51.35	0.27	6.497E-01	2.199E+02	2.982E+02	59.33	OK
	52.39	0.47*	6.497E-01	1.263E+02	1.713E+02	59.33	OK
	66.73	0.14	2.262E+00	-----	Line Not Found	-----	Absent
TL-208	277.37	6.60	4.202E+00	4.542E-01	4.542E-01	139.97	OK
	583.19	85.00*	2.199E+00	2.845E-01	2.845E-01	23.91	OK
	860.56	12.50	1.582E+00	-----	Line Not Found	-----	Absent
PB-212	74.82	10.28	3.134E+00	1.118E+00	1.118E+00	71.23	OK
	77.11	17.10	3.377E+00	1.546E+00	1.546E+00	30.01	OK
	238.63	43.60*	4.739E+00	9.370E-01	9.370E-01	13.13	OK
	300.09	3.30	3.937E+00	1.076E+00	1.076E+00	92.17	OK
BI-214	609.32	45.49*	2.117E+00	5.666E-01	5.668E-01	27.84	OK
	1120.29	14.92	1.266E+00	4.246E-01	4.247E-01	125.97	OK
	1764.49	15.30	8.365E-01	5.620E-01	5.622E-01	52.95	OK
PB-214	74.82	5.80	3.147E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	3.377E+00	2.725E+00	2.726E+00	30.01	OK
	87.09	3.41	4.287E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	4.688E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	3.990E+00	8.000E-01	8.003E-01	30.31	OK
	351.93	35.60*	3.428E+00	7.757E-01	7.760E-01	22.09	OK
RN-222	609.32	45.49*	2.117E+00	5.666E-01	5.668E-01	27.84	OK
	1120.29	14.92	1.266E+00	4.246E-01	4.247E-01	125.97	OK
	1764.49	15.30	8.365E-01	5.620E-01	5.622E-01	52.95	OK
RA-224	240.99	4.10*	4.694E+00	7.685E-01	7.685E-01	174.16	OK
RA-226	609.32	45.49*	2.117E+00	5.666E-01	5.668E-01	27.84	OK
	1120.29	14.92	1.266E+00	4.246E-01	4.247E-01	125.97	OK
	1764.49	15.30	8.365E-01	5.620E-01	5.622E-01	52.95	OK
AC-228	105.21	1.10	5.396E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.546E+00	9.761E-01	9.761E-01	39.05	OK
	794.95	4.25	1.691E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.621E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.508E+00	8.193E-01	8.193E-01	48.07	OK
	968.97	15.80	1.432E+00	9.129E-01	9.129E-01	48.81	OK
RA-228	105.21	1.10	5.396E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.546E+00	9.761E-01	9.761E-01	39.05	OK
	794.95	4.25	1.691E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.621E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.508E+00	8.193E-01	8.193E-01	48.07	OK
	968.97	15.80	1.432E+00	9.129E-01	9.129E-01	48.81	OK
TH-228	74.82	10.28	3.134E+00	1.118E+00	1.118E+00	71.23	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	77.11	17.10	3.377E+00	1.546E+00	1.546E+00	30.01	OK
	238.63	43.60*	4.739E+00	9.370E-01	9.370E-01	13.13	OK
	300.09	3.30	3.937E+00	1.076E+00	1.076E+00	92.17	OK
TH-230	609.32	45.49*	2.117E+00	5.666E-01	5.666E-01	27.84	OK
	1120.29	14.92	1.266E+00	4.246E-01	4.246E-01	125.97	OK
	1764.49	15.30	8.365E-01	5.620E-01	5.620E-01	52.95	OK
PA-231	283.69	1.70	4.127E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.937E+00	6.635E-01	6.635E-01	92.17	OK
TH-232	105.21	1.10	5.396E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.546E+00	9.761E-01	9.761E-01	39.05	OK
	835.71	1.61	1.621E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.508E+00	8.193E-01	8.193E-01	48.07	OK
	968.97	15.80	1.432E+00	9.129E-01	9.129E-01	48.81	OK
U-234	609.32	45.49*	2.117E+00	5.666E-01	5.666E-01	27.84	OK
	1120.29	14.92	1.266E+00	4.246E-01	4.246E-01	125.97	OK
	1764.49	15.30	8.365E-01	5.620E-01	5.620E-01	52.95	OK
AM-243	43.53	5.90	1.014E-01	3.532E+01	3.532E+01	133.45	OK
	74.66	67.20*	3.134E+00	1.711E-01	1.711E-01	71.23	OK
CF-249	252.80	2.50	4.533E+00	----- Line	Not Found	-----	Absent
	333.37	14.60	3.593E+00	----- Line	Not Found	-----	Absent
	388.16	66.00*	3.135E+00	2.481E-02	2.485E-02	156.84	OK
ANH-511	511.00	100.00*	2.465E+00	3.170E-03	3.170E-03	2134.97	OK

Flag: "*" = Keyline

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235038.CNF;1
* Acquisition date   : 3-OCT-2016 09:17:37 Sensitivity      : 3.000
* Detector ID       : GAM43 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.65 Half life ratio : *****
* Sample date       : 30-NOV-2015 10:40:00 Analyst initials: MXR1
* Sample ID         : G405235038 Sample Quantity : 1.7019E+02 GRAM
* Batch Number      : 1596249 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 6-SEP-2016 07:25:20 Eff. Geometry : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.238E+01	1.439E+00	6.582E-01
AS-73	2.738E+01	2.645E+01	2.522E+01
CD-109	4.845E+00	3.084E+00	2.130E+00
SN-113	2.237E-01	2.451E-01	4.203E-01
SN-126	3.050E-01	1.942E-01	1.352E-01
CS-135	1.698E-01	1.406E-01	2.407E-01
BA-137M	1.092E-01	5.640E-02	5.907E-02
CS-137	1.154E-01	5.958E-02	6.240E-02
TM-171	1.713E+02	9.960E+01	5.971E+01
TL-208	2.845E-01	6.666E-02	6.132E-02
PB-212	9.370E-01	1.206E-01	8.681E-02
BI-214	5.668E-01	1.547E-01	1.317E-01
PB-214	7.760E-01	1.680E-01	1.140E-01
RN-222	5.668E-01	1.547E-01	1.317E-01
RA-224	7.685E-01	1.312E+00	9.308E-01
RA-226	5.668E-01	1.547E-01	1.317E-01
AC-228	8.193E-01	3.860E-01	2.602E-01
RA-228	8.193E-01	3.860E-01	2.602E-01
TH-228	9.370E-01	1.206E-01	8.681E-02
TH-230	5.666E-01	1.546E-01	1.316E-01
PA-231	6.635E-01	5.993E-01	7.396E-01
TH-232	8.193E-01	3.860E-01	2.602E-01
U-234	5.666E-01	1.546E-01	1.316E-01
AM-243	1.711E-01	1.194E-01	1.051E-01
CF-249	2.485E-02	3.819E-02	3.879E-02
ANH-511	3.170E-03	6.633E-02	4.723E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-5.736E+00		1.263E+01	2.251E+01	NOT IDENT.
NA-22	-1.412E-02		4.877E-02	9.365E-02	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF
AL-26	-1.236E-02		3.111E-02	5.866E-02	NOT IDENT.

SC-46	2.703E-01	3.968E-01	8.625E-01	FAIL ABUN
V-48	0.000E+00	2.035E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	4.353E+02	0.000E+00	SHORT HLIF
MN-54	2.686E-02	6.304E-02	1.314E-01	NOT IDENT.
CO-56	-3.201E-03	4.586E-01	9.115E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	5.143E-03	4.857E-02	9.125E-02	NOT IDENT.
CO-58	1.387E-01	6.086E-01	1.247E+00	NOT IDENT.
FE-59	2.372E+00	8.065E+00	1.626E+01	NOT IDENT.
CO-60	1.128E-02	4.240E-02	8.942E-02	NOT IDENT.
ZN-65	0.000E+00	1.607E-01	2.792E-01	NOT IDENT.
GE-68	-2.413E-01	2.007E+00	3.901E+00	NOT IDENT.
AS-74	0.000E+00	6.439E+03	0.000E+00	SHORT HLIF
SE-75	3.837E-02	2.005E-01	3.632E-01	NOT IDENT.
BR-77	0.000E+00	2.312E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	1.044E+03	0.000E+00	SHORT HLIF
RB-83	-2.502E-01	7.342E-01	1.419E+00	NOT IDENT.
KR-85	-2.349E+00	7.961E+00	1.253E+01	NOT IDENT.
SR-85	-2.721E-01	9.159E-01	1.441E+00	NOT IDENT.
RB-86	0.000E+00	3.308E+04	0.000E+00	SHORT HLIF
Y-88	-8.303E-02	1.711E-01	3.177E-01	NOT IDENT.
Y-91	-1.197E+02	5.995E+02	1.165E+03	NOT IDENT.
NB-94	-1.205E-02	2.924E-02	5.483E-02	NOT IDENT.
NB-95	-9.290E-02	9.182E-01	1.570E+00	NOT IDENT.
NB-95M	-3.887E-01	2.454E+00	4.255E+00	NOT IDENT.
ZR-95	8.792E-01	1.478E+00	3.183E+00	NOT IDENT.
NB-97	0.000E+00	9.864E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.403E+33	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.525E+41	0.000E+00	SHORT HLIF
RH-101	2.937E-02	3.003E-02	6.382E-02	FAIL ABUN
RH-102	1.634E-02	5.397E-02	1.130E-01	NOT IDENT.
RU-103	-3.664E+00	7.344E+00	1.116E+01	FAIL ABUN
RH-106	-4.074E-02	4.694E-01	9.335E-01	NOT IDENT.
RU-106	-4.074E-02	4.694E-01	9.335E-01	NOT IDENT.
AG-108M	-1.106E-02	2.638E-02	4.762E-02	NOT IDENT.
AG-110M	-1.242E-01	1.035E-01	1.604E-01	NOT IDENT.
CD-115	0.000E+00	3.462E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.160E+05	0.000E+00	SHORT HLIF
TE-123M	2.577E-02	1.123E-01	2.318E-01	NOT IDENT.
SB-124	1.463E+00	1.779E+00	4.871E+00	NOT IDENT.
SB-125	-6.762E-02	9.768E-02	1.697E-01	FAIL ABUN
TE-125M	3.479E+01	3.382E+02	5.900E+02	NOT IDENT.
I-126	0.000E+00	1.433E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	2.521E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	9.023E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	9.615E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.838E+27	0.000E+00	SHORT HLIF
BA-133	5.826E-03	3.982E-02	7.036E-02	FAIL ABUN
I-133	0.000E+00	9.779E+40	0.000E+00	SHORT HLIF
CS-134	4.068E-02	9.241E-02	1.113E-01	FAIL ABUN
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	4.898E+05	0.000E+00	SHORT HLIF
CE-139	-1.039E-01	9.441E-02	1.748E-01	NOT IDENT.
BA-140	0.000E+00	2.035E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	6.136E+05	0.000E+00	SHORT HLIF
CE-141	-1.347E+01	2.513E+01	4.921E+01	NOT IDENT.
CE-143	0.000E+00	1.415E+41	0.000E+00	SHORT HLIF
CE-144	-2.379E-01	3.257E-01	6.022E-01	NOT IDENT.
PM-144	1.692E-02	5.685E-02	1.160E-01	NOT IDENT.
PR-144	1.550E+00	4.970E+00	1.016E+01	NOT IDENT.
PM-146	-1.941E-02	4.176E-02	7.563E-02	NOT IDENT.
ND-147	0.000E+00	4.899E+07	0.000E+00	SHORT HLIF
PM-147	3.652E+01	8.214E+02	1.537E+03	NOT IDENT.
PM-149	0.000E+00	1.410E+41	0.000E+00	SHORT HLIF
EU-150	-1.836E-02	2.754E-02	4.297E-02	FAIL ABUN
EU-152	-3.342E-02	8.725E-02	1.613E-01	FAIL ABUN
GD-153	-1.124E-01	1.983E-01	3.575E-01	NOT IDENT.
EU-154	-4.213E-02	1.217E-01	2.310E-01	NOT IDENT.
EU-155	2.382E-02	1.030E-01	1.989E-01	NOT IDENT.
TB-160	1.138E+00	1.776E+00	3.923E+00	FAIL ABUN
HO-166M	-3.298E-02	5.440E-02	9.885E-02	NOT IDENT.
HF-172	2.024E-01	2.069E-01	4.546E-01	FAIL ABUN
LU-172	-3.067E-02	7.432E-02	1.334E-01	FAIL ABUN
LU-176	1.058E-02	3.517E-02	4.423E-02	FAIL ABUN
HF-181	2.507E-01	4.386E+00	8.466E+00	NOT IDENT.
TA-182	3.567E-01	1.128E+00	2.303E+00	FAIL ABUN

RE-183	2.083E+00	5.140E+00	9.809E+00	NOT IDENT.
RE-184	-1.787E+01	3.726E+01	6.436E+01	NOT IDENT.
W-188	2.622E+01	1.143E+02	2.062E+02	NOT IDENT.
IR-192	3.321E-01	4.274E-01	9.004E-01	FAIL ABUN
HG-203	-2.113E-01	2.204E+00	3.861E+00	NOT IDENT.
BI-207	-8.451E-03	5.413E-02	8.826E-02	FAIL ABUN
PB-210	-3.340E+00	9.826E+00	1.762E+01	NOT IDENT.
BI-211	0.000E+00	4.626E-01	7.270E-01	FAIL ABUN
PB-211	-2.421E-01	6.675E-01	1.217E+00	NOT IDENT.
BI-212	0.000E+00	1.336E+00	1.339E+00	FAIL ABUN
RN-219	1.009E-01	3.491E-01	6.917E-01	FAIL ABUN
RA-223	1.027E-01	5.134E-01	1.019E+00	FAIL ABUN
AC-227	-2.400E-02	2.142E-01	3.730E-01	FAIL ABUN
TH-227	-2.400E-02	2.142E-01	3.730E-01	FAIL ABUN
TH-229	1.758E-03	3.749E-01	7.516E-01	FAIL ABUN
TH-231	1.027E-01	5.134E-01	1.019E+00	FAIL ABUN
PA-233	3.351E-02	5.235E-02	1.084E-01	FAIL ABUN
PA-234	-9.969E-02	3.011E-01	5.528E-01	FAIL ABUN
PA-234M	-3.021E+00	3.889E+00	6.504E+00	NOT IDENT.
TH-234	-1.459E-01	1.591E+00	3.114E+00	FAIL ABUN
U-235	2.090E-01	1.573E-01	3.451E-01	FAIL ABUN
NP-237	3.351E-02	5.235E-02	1.084E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
U-238	-1.459E-01	1.591E+00	3.114E+00	FAIL ABUN
NP-239	1.137E-01	2.239E-01	4.401E-01	FAIL ABUN
PU-239	5.759E+02	5.796E+02	6.423E+02	FAIL ABUN
AM-241	-1.384E-01	1.909E-01	3.534E-01	NOT IDENT.
CM-243	-4.867E-02	9.784E-02	1.768E-01	FAIL ABUN
BK-247	4.107E-03	6.672E-02	1.188E-01	NOT IDENT.
CM-247	1.285E-02	3.248E-02	6.498E-02	FAIL ABUN
CF-251	-7.742E-02	9.753E-02	1.842E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	300	10.66*	1.002E+00	1.238E+01	1.238E+01	11.86
AS-73	53.44	41	10.30*	9.178E-01	1.918E+00	2.738E+01	98.59
CD-109	88.03	139	3.70*	4.365E+00	3.787E+00	6.016E+00	51.98
SN-113	391.69	16	64.94*	3.112E+00	3.501E-02	2.237E-01	111.79
SN-126	64.28	-----	9.60	1.983E+00	-----	Line Not Found	-----
	86.94	139	8.90	4.365E+00	1.575E+00	1.575E+00	51.98
	87.57	139	37.00*	4.365E+00	3.787E-01	3.787E-01	51.98
CS-135	268.22	27	16.00*	4.342E+00	1.698E-01	1.698E-01	84.47
BA-137M	661.66	43	89.90*	1.974E+00	1.071E-01	1.092E-01	52.70
CS-137	661.66	43	85.10*	1.974E+00	1.131E-01	1.154E-01	52.70
TM-171	51.35	87	0.27	6.497E-01	2.199E+02	2.982E+02	59.33
	52.39	87	0.47*	6.497E-01	1.263E+02	1.713E+02	59.33
	66.73	-----	0.14	2.262E+00	-----	Line Not Found	-----
TL-208	277.37	29	6.60	4.202E+00	4.542E-01	4.542E-01	139.97
	583.19	121	85.00*	2.199E+00	2.845E-01	2.845E-01	23.91
	860.56	-----	12.50	1.582E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	2.941E+00	-----	Line Not Found	-----
	351.06	215	12.92*	3.428E+00	2.137E+00	2.137E+00	22.09
PB-212	74.82	115	10.28	3.134E+00	1.570E+00	1.570E+00	49.99
	77.11	202	17.10	3.377E+00	1.546E+00	1.546E+00	30.01
	238.63	439	43.60*	4.739E+00	9.370E-01	9.370E-01	13.13
	300.09	32	3.30	3.937E+00	1.076E+00	1.076E+00	92.17
BI-214	609.32	124	45.49*	2.117E+00	5.666E-01	5.668E-01	27.84
	1120.29	18	14.92	1.266E+00	4.246E-01	4.247E-01	125.97
	1764.49	16	15.30	8.365E-01	5.620E-01	5.622E-01	52.95
PB-214	74.82	115	5.80	3.134E+00	2.782E+00	2.783E+00	49.99
	77.11	202	9.70	3.377E+00	2.725E+00	2.726E+00	30.01
	87.09	139	3.41	4.365E+00	4.110E+00	4.111E+00	51.98
	242.00	95	7.25	4.694E+00	1.235E+00	1.235E+00	58.08
	295.22	133	18.42	3.990E+00	8.000E-01	8.003E-01	30.31
RN-222	351.93	215	35.60*	3.428E+00	7.757E-01	7.760E-01	22.09
	609.32	124	45.49*	2.117E+00	5.666E-01	5.668E-01	27.84
	1120.29	18	14.92	1.266E+00	4.246E-01	4.247E-01	125.97
	1764.49	16	15.30	8.365E-01	5.620E-01	5.622E-01	52.95
RA-224	240.99	95	4.10*	4.694E+00	2.183E+00	2.183E+00	58.08
RA-226	609.32	124	45.49*	2.117E+00	5.666E-01	5.668E-01	27.84
	1120.29	18	14.92	1.266E+00	4.246E-01	4.247E-01	125.97
	1764.49	16	15.30	8.365E-01	5.620E-01	5.622E-01	52.95
AC-228	105.21	-----	1.10	5.396E+00	-----	Line Not Found	-----
	338.32	88	11.27	3.546E+00	9.761E-01	9.761E-01	39.05
	794.95	-----	4.25	1.691E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.621E+00	-----	Line Not Found	-----
	911.20	72	25.80*	1.508E+00	8.193E-01	8.193E-01	48.07
	968.97	47	15.80	1.432E+00	9.129E-01	9.129E-01	48.81
RA-228	105.21	-----	1.10	5.396E+00	-----	Line Not Found	-----
	338.32	88	11.27	3.546E+00	9.761E-01	9.761E-01	39.05
	794.95	-----	4.25	1.691E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	835.71	-----	1.61	1.621E+00	-----	Line Not Found	-----
	911.20	72	25.80*	1.508E+00	8.193E-01	8.193E-01	48.07
	968.97	47	15.80	1.432E+00	9.129E-01	9.129E-01	48.81
TH-228	74.82	115	10.28	3.134E+00	1.570E+00	1.570E+00	49.99
	77.11	202	17.10	3.377E+00	1.546E+00	1.546E+00	30.01
	238.63	439	43.60*	4.739E+00	9.370E-01	9.370E-01	13.13
	300.09	32	3.30	3.937E+00	1.076E+00	1.076E+00	92.17
TH-230	609.32	124	45.49*	2.117E+00	5.666E-01	5.666E-01	27.84
	1120.29	18	14.92	1.266E+00	4.246E-01	4.246E-01	125.97
	1764.49	16	15.30	8.365E-01	5.620E-01	5.620E-01	52.95
PA-231	283.69	-----	1.70	4.127E+00	-----	Line Not Found	-----
	301.36	32	5.35*	3.937E+00	6.635E-01	6.635E-01	92.17
TH-232	105.21	-----	1.10	5.396E+00	-----	Line Not Found	-----
	338.32	88	11.27	3.546E+00	9.761E-01	9.761E-01	39.05
	835.71	-----	1.61	1.621E+00	-----	Line Not Found	-----
	911.20	72	25.80*	1.508E+00	8.193E-01	8.193E-01	48.07
	968.97	47	15.80	1.432E+00	9.129E-01	9.129E-01	48.81
U-234	609.32	124	45.49*	2.117E+00	5.666E-01	5.666E-01	27.84
	1120.29	18	14.92	1.266E+00	4.246E-01	4.246E-01	125.97
	1764.49	16	15.30	8.365E-01	5.620E-01	5.620E-01	52.95
AM-243	43.53	48	5.90	1.014E-01	3.532E+01	3.532E+01	133.45
	74.66	115	67.20*	3.134E+00	2.401E-01	2.401E-01	49.99
CF-249	252.80	-----	2.50	4.533E+00	-----	Line Not Found	-----
	333.37	-----	14.60	3.593E+00	-----	Line Not Found	-----
	388.16	12	66.00*	3.135E+00	2.481E-02	2.485E-02	156.84
ANH-511	511.00	2	100.00*	2.465E+00	3.170E-03	3.170E-03	2134.97

Flag: "*" = Keyline

Total number of lines in spectrum 49
 Number of unidentified lines 9
 Number of lines tentatively identified by NID 40 81.63%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.238E+01	1.238E+01	0.147E+01	11.86	
AS-73	80.30D	14.3	1.918E+00	2.738E+01	2.699E+01	98.59	
CD-109	461.40D	1.59	3.787E+00	6.016E+00	3.127E+00	51.98	
SN-113	115.09D	6.39	3.501E-02	2.237E-01	2.501E-01	111.79	
SN-126	2.30E+05Y	1.00	3.787E-01	3.787E-01	1.969E-01	51.98	
CS-135	2.30E+06Y	1.00	1.698E-01	1.698E-01	1.435E-01	84.47	
BA-137M	30.08Y	1.02	1.071E-01	1.092E-01	0.575E-01	52.70	
CS-137	30.08Y	1.02	1.131E-01	1.154E-01	0.608E-01	52.70	
TM-171	1.92Y	1.36	1.263E+02	1.713E+02	1.016E+02	59.33	
TL-208	1.41E+10Y	1.00	2.845E-01	2.845E-01	0.680E-01	23.91	
BI-211	7.04E+08Y	1.00	2.137E+00	2.137E+00	0.472E+00	22.09	
PB-212	1.41E+10Y	1.00	9.370E-01	9.370E-01	1.230E-01	13.13	
BI-214	1600.00Y	1.00	5.666E-01	5.668E-01	1.578E-01	27.84	
PB-214	1600.00Y	1.00	7.757E-01	7.760E-01	1.714E-01	22.09	
RN-222	1600.00Y	1.00	5.666E-01	5.668E-01	1.578E-01	27.84	
RA-224	1.41E+10Y	1.00	2.183E+00	2.183E+00	1.268E+00	58.08	
RA-226	1600.00Y	1.00	5.666E-01	5.668E-01	1.578E-01	27.84	
AC-228	1.41E+10Y	1.00	8.193E-01	8.193E-01	3.939E-01	48.07	
RA-228	1.41E+10Y	1.00	8.193E-01	8.193E-01	3.939E-01	48.07	
TH-228	1.41E+10Y	1.00	9.370E-01	9.370E-01	1.230E-01	13.13	
TH-230	7.54E+04Y	1.00	5.666E-01	5.666E-01	1.578E-01	27.84	
PA-231	7.04E+08Y	1.00	6.635E-01	6.635E-01	6.116E-01	92.17	
TH-232	1.41E+10Y	1.00	8.193E-01	8.193E-01	3.939E-01	48.07	
U-234	2.45E+05Y	1.00	5.666E-01	5.666E-01	1.578E-01	27.84	
AM-243	7370.00Y	1.00	2.401E-01	2.401E-01	1.200E-01	49.99	
CF-249	351.00Y	1.00	2.481E-02	2.485E-02	3.897E-02	156.84	
ANH-511	1.00E+09Y	1.00	3.170E-03	3.170E-03	67.68E-03	2134.97	
Total Activity :			1.587E+02	2.315E+02			

Grand Total Activity : 1.587E+02 2.315E+02

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	92.78	70	144	1.51	185.37	182	7	1.42E-02	75.9	4.71E+00	T
0	111.81	18	118	0.44	223.43	219	7	3.77E-03	****	5.64E+00	T
4	126.75	23	59	1.21	253.32	252	10	4.75E-03	****	5.96E+00	T
4	129.11	49	143	1.39	258.05	252	10	1.04E-02	****	5.98E+00	T
0	185.96	83	148	1.23	371.78	366	9	1.82E-02	66.4	5.57E+00	T
0	209.35	38	105	1.34	418.57	415	10	8.40E-03	****	5.19E+00	
0	258.87	33	82	0.94	517.65	512	10	7.41E-03	****	4.45E+00	
3	270.05	44	81	1.95	540.00	531	14	9.98E-03	91.8	4.30E+00	T
0	308.04	9	56	0.55	616.00	609	8	2.01E-03	****	3.85E+00	T
0	463.79	81	27	2.35	927.58	918	19	1.98E-02	40.4	2.68E+00	T
0	490.97	30	44	6.33	981.95	973	19	7.28E-03	****	2.55E+00	T
0	720.47	18	17	1.24	1441.05	1437	10	4.54E-03	****	1.84E+00	T
0	728.72	66	34	2.78	1457.56	1446	26	1.71E-02	56.8	1.82E+00	T
0	769.43	20	31	1.31	1538.98	1533	14	5.11E-03	****	1.74E+00	
0	796.61	10	26	3.78	1593.35	1581	14	2.62E-03	****	1.69E+00	T
0	827.72	17	8	2.40	1655.58	1650	11	4.46E-03	85.2	1.63E+00	
1	854.43	16	17	2.04	1709.00	1703	20	4.28E-03	****	1.59E+00	
1	856.93	31	16	2.04	1714.00	1703	20	8.14E-03	61.8	1.59E+00	T
1	965.12	21	11	2.34	1930.43	1926	24	5.52E-03	68.2	1.44E+00	T
0	1032.96	10	5	1.42	2066.10	2062	8	2.58E-03	****	1.36E+00	
4	1065.40	16	7	2.20	2131.00	2125	14	4.39E-03	71.7	1.32E+00	
4	1067.83	8	1	1.80	2135.85	2125	14	2.14E-03	****	1.32E+00	
0	1177.22	15	13	1.65	2354.66	2348	14	4.27E-03	****	1.21E+00	T
0	1244.93	6	9	0.47	2490.08	2484	8	1.69E-03	****	1.16E+00	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235038.CNF;1
* Acquisition date   : 3-OCT-2016 09:17:37 Sensitivity      : 3.000
* Detector ID       : GAM43 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.65 Half life ratio : *****
* Sample date       : 30-NOV-2015 10:40:00 Nuclide Library : SOLID
* Sample ID         : G405235038 Analyst initials: MXR1
* Batch Number      : 1596249 Sample Quantity : 1.7019E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                           *
*
* Eff. Cal. date    : 6-SEP-2016 07:25:20 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;7
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.725E-01
AS-73	1.147E+01
CD-109	1.000E+00
SN-113	1.903E-01
SN-126	6.348E-02
CS-135	1.111E-01
BA-137M	2.598E-02
CS-137	2.744E-02
TM-171	2.715E+01
TL-208	2.734E-02
PB-212	4.032E-02
BI-214	5.938E-02
PB-214	5.180E-02
RN-222	5.938E-02
RA-224	4.323E-01
RA-226	5.938E-02
AC-228	1.144E-01
RA-228	1.144E-01
TH-228	4.032E-02
TH-230	5.936E-02
PA-231	3.396E-01
TH-232	1.144E-01
U-234	5.936E-02
AM-243	4.942E-02
CF-249	1.635E-02
ANH-511	2.108E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	9.992E+00	NOT IDENT.
NA-22	4.012E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.196E-02	NOT IDENT.
SC-46	3.803E-01	FAIL ABUN

V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.818E-02	NOT IDENT.
CO-56	3.949E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.280E-02	NOT IDENT.
CO-58	5.476E-01	NOT IDENT.
FE-59	7.116E+00	NOT IDENT.
CO-60	3.849E-02	NOT IDENT.
ZN-65	1.169E-01	NOT IDENT.
GE-68	1.632E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.669E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	6.414E-01	NOT IDENT.
KR-85	5.644E+00	NOT IDENT.
SR-85	6.491E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.031E-01	NOT IDENT.
Y-91	5.072E+02	NOT IDENT.
NB-94	2.411E-02	NOT IDENT.
NB-95	6.859E-01	NOT IDENT.
NB-95M	1.977E+00	NOT IDENT.
ZR-95	1.411E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.000E-02	FAIL ABUN
RH-102	5.018E-02	NOT IDENT.
RU-103	4.956E+00	FAIL ABUN
RH-106	4.134E-01	NOT IDENT.
RU-106	4.134E-01	NOT IDENT.
AG-108M	2.137E-02	NOT IDENT.
AG-110M	6.734E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.081E-01	NOT IDENT.
SB-124	1.933E+00	NOT IDENT.
SB-125	7.582E-02	FAIL ABUN
TE-125M	2.771E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.201E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	5.002E-02	FAIL ABUN
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	8.090E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.302E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.805E-01	NOT IDENT.
PM-144	5.210E-02	NOT IDENT.
PR-144	4.562E+00	NOT IDENT.
PM-146	3.390E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.202E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.962E-02	FAIL ABUN
EU-152	7.357E-02	FAIL ABUN
GD-153	1.678E-01	NOT IDENT.
EU-154	9.911E-02	NOT IDENT.
EU-155	9.297E-02	NOT IDENT.
TB-160	1.710E+00	FAIL ABUN
HO-166M	4.327E-02	NOT IDENT.
HF-172	2.141E-01	FAIL ABUN
LU-172	5.647E-02	FAIL ABUN
LU-176	2.036E-02	FAIL ABUN
HF-181	3.772E+00	NOT IDENT.
TA-182	1.028E+00	FAIL ABUN
RE-183	4.584E+00	NOT IDENT.

RE-184	2.777E+01	NOT IDENT.
W-188	9.476E+01	NOT IDENT.
IR-192	4.135E-01	FAIL ABUN
HG-203	1.749E+00	NOT IDENT.
BI-207	3.784E-02	FAIL ABUN
PB-210	8.202E+00	NOT IDENT.
BI-211	3.494E-01	FAIL ABUN
PB-211	5.535E-01	NOT IDENT.
BI-212	6.189E-01	FAIL ABUN
RN-219	3.146E-01	FAIL ABUN
RA-223	4.663E-01	FAIL ABUN
AC-227	1.716E-01	FAIL ABUN
TH-227	1.716E-01	FAIL ABUN
TH-229	3.491E-01	FAIL ABUN
TH-231	4.663E-01	FAIL ABUN
PA-233	4.989E-02	FAIL ABUN
PA-234	2.415E-01	FAIL ABUN
PA-234M	2.729E+00	NOT IDENT.
TH-234	1.462E+00	FAIL ABUN
U-235	1.628E-01	FAIL ABUN
NP-237	4.989E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.462E+00	FAIL ABUN
NP-239	2.059E-01	FAIL ABUN
PU-239	3.040E+02	FAIL ABUN
AM-241	1.639E-01	NOT IDENT.
CM-243	8.239E-02	FAIL ABUN
BK-247	5.455E-02	NOT IDENT.
CM-247	2.962E-02	FAIL ABUN
CF-251	8.557E-02	NOT IDENT.

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235038.CNF;1
* Acquisition date   : 3-OCT-2016 09:17:37 Sensitivity      : 3.000
* Detector ID        : GAM43 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.65 Half life ratio  : *****
* Sample date        : 30-NOV-2015 10:40:00 Nuclide Library : SOLID
* Sample ID          : G405235038 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity : 1.7019E+02 GRAM
*                   : Quantity Err(%) : 1.1751E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight       : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 6-SEP-2016 07:25:20 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.238E+01	1.578E+00	1.578E+00
AS-73	2.738E+01	2.705E+01	2.705E+01
CD-109	4.845E+00	3.113E+00	3.113E+00
SN-113	2.237E-01	2.453E-01	2.453E-01
SN-126	3.050E-01	1.953E-01	1.953E-01
CS-135	1.698E-01	1.411E-01	1.411E-01
BA-137M	1.092E-01	5.659E-02	5.659E-02
CS-137	1.154E-01	5.978E-02	5.978E-02
TM-171	1.713E+02	1.008E+02	1.008E+02
TL-208	2.845E-01	6.776E-02	6.776E-02
PB-212	9.370E-01	1.306E-01	1.306E-01
BI-214	5.668E-01	1.566E-01	1.566E-01
PB-214	7.760E-01	1.711E-01	1.711E-01
RN-222	5.668E-01	1.566E-01	1.566E-01
RA-224	7.685E-01	1.316E+00	1.316E+00
RA-226	5.668E-01	1.566E-01	1.566E-01
AC-228	8.193E-01	3.883E-01	3.883E-01
RA-228	8.193E-01	3.883E-01	3.883E-01
TH-228	9.370E-01	1.306E-01	1.306E-01
TH-230	5.666E-01	1.565E-01	1.565E-01
PA-231	6.635E-01	6.158E-01	6.158E-01
TH-232	8.193E-01	3.883E-01	3.883E-01
U-234	5.666E-01	1.565E-01	1.565E-01
AM-243	1.711E-01	1.202E-01	1.202E-01
CF-249	2.485E-02	3.825E-02	3.825E-02
ANH-511	3.170E-03	6.633E-02	6.633E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-5.736E+00	1.264E+01	1.290E+01	NOT IDENT.
NA-22	-1.412E-02	4.878E-02	4.919E-02	NOT IDENT.
NA-24	1.000E+41	2.190E+41	0.000E+00	SHORT HLIF
AL-26	-1.236E-02	3.112E-02	3.162E-02	NOT IDENT.

SC-46	2.703E-01	3.969E-01	4.152E-01	FAIL ABUN
V-48	-1.199E+04	2.036E+04	2.106E+04	SHORT HLIF
CR-51	-6.908E+01	4.353E+02	4.364E+02	SHORT HLIF
MN-54	2.686E-02	6.305E-02	6.420E-02	NOT IDENT.
CO-56	-3.201E-03	4.586E-01	4.586E-01	NOT IDENT.
MN-56	-1.000E+41	3.143E+43	0.000E+00	SHORT HLIF
CO-57	5.143E-03	4.857E-02	4.863E-02	NOT IDENT.
CO-58	1.387E-01	6.086E-01	6.119E-01	NOT IDENT.
FE-59	2.372E+00	8.066E+00	8.137E+00	NOT IDENT.
CO-60	1.128E-02	4.240E-02	4.270E-02	NOT IDENT.
ZN-65	0.000E+00	1.607E-01	0.000E+00	NOT IDENT.
GE-68	-2.413E-01	2.007E+00	2.010E+00	NOT IDENT.
AS-74	1.938E+03	6.441E+03	6.500E+03	SHORT HLIF
SE-75	3.837E-02	2.005E-01	2.013E-01	NOT IDENT.
BR-77	1.797E+39	1.597E+40	0.000E+00	SHORT HLIF
SR-82	-7.878E+02	1.044E+03	1.103E+03	SHORT HLIF
RB-83	-2.502E-01	7.350E-01	7.436E-01	NOT IDENT.
KR-85	-2.349E+00	7.962E+00	8.032E+00	NOT IDENT.
SR-85	-2.721E-01	9.160E-01	9.241E-01	NOT IDENT.
RB-86	1.139E+03	3.308E+04	3.308E+04	SHORT HLIF
Y-88	-8.303E-02	1.712E-01	1.753E-01	NOT IDENT.
Y-91	-1.197E+02	5.995E+02	6.020E+02	NOT IDENT.
NB-94	-1.205E-02	2.924E-02	2.974E-02	NOT IDENT.
NB-95	-9.290E-02	9.182E-01	9.192E-01	NOT IDENT.
NB-95M	-3.887E-01	2.455E+00	2.461E+00	NOT IDENT.
ZR-95	8.792E-01	1.478E+00	1.530E+00	NOT IDENT.
NB-97	1.000E+41	9.874E+40	0.000E+00	SHORT HLIF
ZR-97	-1.000E+41	6.661E+41	0.000E+00	SHORT HLIF
MO-99	-1.597E+32	1.403E+33	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.528E+41	0.000E+00	SHORT HLIF
RH-101	2.937E-02	3.049E-02	3.324E-02	FAIL ABUN
RH-102	1.634E-02	5.399E-02	5.449E-02	NOT IDENT.
RU-103	-3.664E+00	7.346E+00	7.529E+00	FAIL ABUN
RH-106	-4.074E-02	4.694E-01	4.698E-01	NOT IDENT.
RU-106	-4.074E-02	4.694E-01	4.698E-01	NOT IDENT.
AG-108M	-1.106E-02	2.638E-02	2.685E-02	NOT IDENT.
AG-110M	-1.242E-01	1.037E-01	1.179E-01	NOT IDENT.
CD-115	-4.955E+40	3.581E+40	0.000E+00	SHORT HLIF
SN-117M	-2.620E+04	1.160E+05	1.166E+05	SHORT HLIF
TE-123M	2.577E-02	1.123E-01	1.129E-01	NOT IDENT.
SB-124	1.463E+00	1.781E+00	1.899E+00	NOT IDENT.
SB-125	-6.762E-02	9.772E-02	1.024E-01	FAIL ABUN
TE-125M	3.479E+01	3.382E+02	3.386E+02	NOT IDENT.
I-126	-4.637E+05	1.435E+06	1.450E+06	SHORT HLIF
SB-126	2.522E+06	2.567E+06	2.807E+06	SHORT HLIF
SB-127	-2.615E+22	9.749E+22	0.000E+00	SHORT HLIF
I-131	7.203E+09	9.621E+09	1.015E+10	SHORT HLIF
I-132	1.000E+41	2.054E+42	0.000E+00	SHORT HLIF
TE-132	-5.779E+26	1.853E+27	0.000E+00	SHORT HLIF
BA-133	5.826E-03	3.982E-02	3.991E-02	FAIL ABUN
I-133	1.000E+41	2.100E+41	0.000E+00	SHORT HLIF
CS-134	4.068E-02	9.243E-02	9.423E-02	FAIL ABUN
I-135	1.000E+41	1.305E+42	0.000E+00	SHORT HLIF
CS-136	-1.930E+05	4.903E+05	4.979E+05	SHORT HLIF
CE-139	-1.039E-01	9.669E-02	1.074E-01	NOT IDENT.
BA-140	-3.555E+05	2.035E+06	2.041E+06	SHORT HLIF
LA-140	-6.638E+05	6.144E+05	6.834E+05	SHORT HLIF
CE-141	-1.347E+01	2.513E+01	2.586E+01	NOT IDENT.
CE-143	1.000E+41	1.419E+41	0.000E+00	SHORT HLIF
CE-144	-2.379E-01	3.260E-01	3.432E-01	NOT IDENT.
PM-144	1.692E-02	5.686E-02	5.737E-02	NOT IDENT.
PR-144	1.550E+00	4.970E+00	5.019E+00	NOT IDENT.
PM-146	-1.941E-02	4.179E-02	4.269E-02	NOT IDENT.
ND-147	-2.956E+07	4.901E+07	5.079E+07	SHORT HLIF
PM-147	3.652E+01	8.214E+02	8.216E+02	NOT IDENT.
PM-149	1.000E+41	1.428E+41	0.000E+00	SHORT HLIF
EU-150	-1.836E-02	2.755E-02	2.877E-02	FAIL ABUN
EU-152	-3.342E-02	8.727E-02	8.856E-02	FAIL ABUN
GD-153	-1.124E-01	1.984E-01	2.047E-01	NOT IDENT.
EU-154	-4.213E-02	1.217E-01	1.232E-01	NOT IDENT.
EU-155	2.382E-02	1.030E-01	1.035E-01	NOT IDENT.
TB-160	1.138E+00	1.777E+00	1.850E+00	FAIL ABUN
HO-166M	-3.298E-02	5.443E-02	5.642E-02	NOT IDENT.
HF-172	2.024E-01	2.095E-01	2.285E-01	FAIL ABUN
LU-172	-3.067E-02	7.438E-02	7.566E-02	FAIL ABUN
LU-176	1.058E-02	3.518E-02	3.550E-02	FAIL ABUN
HF-181	2.507E-01	4.386E+00	4.388E+00	NOT IDENT.
TA-182	3.567E-01	1.128E+00	1.140E+00	FAIL ABUN

RE-183	2.083E+00	5.151E+00	5.236E+00	NOT IDENT.
RE-184	-1.787E+01	3.752E+01	3.837E+01	NOT IDENT.
W-188	2.622E+01	1.143E+02	1.150E+02	NOT IDENT.
IR-192	3.321E-01	4.276E-01	4.531E-01	FAIL ABUN
HG-203	-2.113E-01	2.204E+00	2.206E+00	NOT IDENT.
BI-207	-8.451E-03	5.413E-02	5.426E-02	FAIL ABUN
PB-210	-3.340E+00	9.832E+00	9.947E+00	NOT IDENT.
BI-211	2.137E+00	4.725E-01	1.073E+00	FAIL ABUN
PB-211	-2.421E-01	6.676E-01	6.764E-01	NOT IDENT.
BI-212	2.400E+00	1.342E+00	1.723E+00	FAIL ABUN
RN-219	1.009E-01	3.493E-01	3.522E-01	FAIL ABUN
RA-223	1.027E-01	5.134E-01	5.155E-01	FAIL ABUN
AC-227	-2.400E-02	2.142E-01	2.145E-01	FAIL ABUN
TH-227	-2.400E-02	2.142E-01	2.145E-01	FAIL ABUN
TH-229	1.758E-03	3.749E-01	3.749E-01	FAIL ABUN
TH-231	1.027E-01	5.134E-01	5.155E-01	FAIL ABUN
PA-233	3.351E-02	5.237E-02	5.451E-02	FAIL ABUN
PA-234	-9.969E-02	3.220E-01	3.251E-01	FAIL ABUN
PA-234M	-3.021E+00	3.892E+00	4.123E+00	NOT IDENT.
TH-234	-1.459E-01	1.592E+00	1.593E+00	FAIL ABUN
U-235	2.090E-01	1.577E-01	1.837E-01	FAIL ABUN
NP-237	3.351E-02	5.237E-02	5.451E-02	FAIL ABUN
NP-238	-1.000E+41	2.624E+41	0.000E+00	SHORT HLIF
U-238	-1.459E-01	1.592E+00	1.593E+00	FAIL ABUN
NP-239	1.137E-01	2.241E-01	2.299E-01	FAIL ABUN
PU-239	5.759E+02	5.802E+02	6.356E+02	FAIL ABUN
AM-241	-1.384E-01	1.912E-01	2.011E-01	NOT IDENT.
CM-243	-4.867E-02	9.795E-02	1.004E-01	FAIL ABUN
BK-247	4.107E-03	6.672E-02	6.675E-02	NOT IDENT.
CM-247	1.285E-02	3.255E-02	3.306E-02	FAIL ABUN
CF-251	-7.742E-02	9.792E-02	1.040E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	68.8594	87.09	79.7662	136.47	80.3799
45.60	57.9438	87.57	79.8461	140.51	0.0000
46.54	69.1879	88.03	79.9228	143.76	56.7160
49.72	0.0000	88.34	79.9741	144.24	67.7686
51.35	50.5560	88.47	79.9953	145.44	83.1620
51.87	50.6340	89.96	67.1245	152.43	77.1451
52.39	33.8077	1093.63	67.2178	153.25	0.0000
52.97	33.8651	91.11	0.0000	323.87	63.5892
53.44	33.9114	92.59	80.6692	156.02	0.0000
54.07	33.9731	93.35	74.5771	158.56	0.0000
57.36	0.0000	94.56	74.7563	159.00	59.6878
57.53	55.7471	94.65	74.7695	162.33	65.1733
57.98	58.6783	94.67	74.7725	162.66	0.0000
59.27	74.3243	94.87	79.4774	163.33	42.6372
59.32	75.4116	97.43	90.4476	165.86	75.0864
59.54	71.1447	98.43	63.5532	176.31	63.7236
60.96	72.4976	98.44	63.5544	176.60	0.0000
61.17	72.5380	99.53	79.0191	177.52	74.4587
62.93	85.9262	100.11	73.2031	181.07	0.0000
63.29	72.9421	102.03	60.4341	181.52	74.8339
63.58	59.9228	103.18	74.8139	184.41	71.5259
64.28	66.5797	103.37	74.8409	143.76	71.6414
66.73	87.8613	105.21	63.1757	193.51	56.9508
67.24	81.3750	105.31	63.1870	197.03	68.9886
125.81	79.2625	106.12	78.8025	198.01	67.2507
67.75	79.2757	106.47	80.0476	201.83	72.1137
69.67	82.9697	109.28	76.8521	203.43	64.9302
70.83	85.7905	111.00	71.0649	205.31	59.1132
72.81	90.6542	111.76	0.0000	210.85	59.0221
72.87	90.6673	114.06	61.3553	215.65	59.3372
74.66	82.8384	116.30	0.0000	222.11	57.8879
74.82	82.8689	116.74	58.3949	227.09	52.5644
74.97	82.8977	119.76	78.2588	227.38	50.7025
77.11	83.3053	121.12	72.3087	228.16	0.0000
78.74	84.3652	121.22	72.3208	228.18	52.6248
79.69	67.9372	121.78	73.6148	116.74	52.6248
80.12	66.4910	122.06	73.6491	235.69	61.0881
80.19	0.0000	122.92	72.5247	235.96	56.8420
80.57	81.6833	123.07	75.0014	238.63	56.9977
81.00	83.2749	265.00	85.3331	238.98	0.0000
81.07	83.2878	125.81	79.0430	240.99	57.1344
81.75	90.9949	127.23	89.1266	242.00	57.1930
83.79	59.4081	127.91	89.2246	244.70	44.4447
84.00	73.1509	129.30	89.4221	252.40	0.0000
85.43	76.4313	131.20	71.4208	252.80	39.5031
86.55	79.6763	133.02	63.2962	254.15	0.0000
86.79	79.7160	133.52	79.0154	256.23	46.4016
86.94	79.7414	136.00	75.3021	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	39.4676	355.39	0.0000	584.27	15.9849
264.80	40.9353	356.01	31.5692	595.83	0.0000
265.00	40.9430	364.49	0.0000	427.87	28.3889
268.22	48.8892	366.42	0.0000	602.52	0.0000
269.46	48.9451	372.51	35.1531	604.72	30.8335
270.03	48.9716	375.05	33.0832	607.14	39.6905
271.23	52.9486	377.52	31.0043	609.32	28.5119
273.65	0.0000	356.01	25.7749	610.33	20.6124
276.40	41.3779	388.16	9.6953	614.28	33.1919
277.37	41.4147	388.63	0.0000	618.01	28.6339
277.60	41.4232	391.69	30.7776	620.36	24.0433
278.00	26.6391	264.66	29.3401	621.93	21.2852
279.20	32.5945	401.81	29.3632	630.19	0.0000
279.54	41.4967	402.40	29.3747	631.29	17.6635
279.70	41.5027	404.85	40.3220	633.25	18.6102
280.46	38.5644	410.95	36.1119	634.78	0.0000
283.69	39.6688	413.71	28.5047	635.95	13.0443
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	39.7298	423.72	0.0000	645.85	14.9775
285.90	0.0000	427.09	32.0769	657.76	7.5308
287.50	51.7440	427.87	34.3067	657.90	0.0000
290.67	38.9175	433.94	32.2203	661.66	17.9180
293.27	0.0000	439.40	24.5289	664.57	0.0000
351.93	39.0722	453.88	29.2553	666.33	0.0000
295.96	39.0976	463.37	16.9775	666.50	0.0000
879.38	24.1143	468.07	22.1343	667.71	0.0000
299.98	31.6884	473.00	0.0000	677.62	15.1997
300.09	31.6916	475.06	20.5181	685.70	0.0000
300.13	31.6923	476.78	21.6804	695.00	0.0000
301.36	42.3008	477.60	27.3994	696.49	22.0349
302.85	39.3293	482.18	21.7507	696.51	22.0349
256.23	40.3947	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	23.0010
306.78	34.9078	497.08	29.4486	697.49	23.0032
308.46	45.5960	505.52	22.6294	702.65	23.0559
311.90	33.5338	507.63	0.0000	706.68	19.2474
316.51	29.5817	511.00	23.2823	711.68	24.1119
319.41	0.0000	514.00	33.2338	720.70	0.0000
320.08	0.0000	514.00	33.2338	721.93	0.0000
321.04	34.8114	520.40	35.1099	722.78	15.5059
323.87	35.9179	520.69	0.0000	722.91	15.5068
325.23	35.9570	522.65	0.0000	723.31	15.5093
328.76	0.0000	527.90	0.0000	724.19	15.5151
333.37	44.6713	528.26	23.8030	727.33	21.7506
333.97	51.2100	529.59	11.4690	733.00	21.8032
334.37	41.9123	529.87	0.0000	735.93	17.1526
338.28	49.8271	531.02	0.0000	333.97	20.2846
338.32	49.8291	537.26	0.0000	739.50	0.0000
311.90	45.2337	546.56	0.0000	747.24	15.6680
340.48	45.2337	552.55	16.9729	748.06	19.5917
340.55	0.0000	563.25	22.4602	752.31	16.6825
344.28	42.7601	569.33	18.9265	753.82	0.0000
345.93	37.5930	946.00	19.8294	756.73	13.7637
351.06	33.5475	569.70	20.7328	756.80	13.7642
351.93	33.5697	583.19	22.6936	884.68	18.9322

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	17.3680	1274.44	9.6671	1620.50	6.0920
766.42	18.9516	1001.03	17.2129	1621.92	4.0625
766.84	15.7959	1002.74	7.5349	1678.03	0.0000
772.60	0.0000	1004.73	10.7712	1690.97	1.0309
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.1403
778.90	15.8735	1028.54	0.0000	1063.66	14.6720
783.70	0.0000	1037.84	8.7100	1771.35	5.2412
785.37	12.9310	1038.76	0.0000	1791.20	0.0000
792.07	9.5748	631.29	12.0098	1808.65	5.2808
794.95	18.9722	1048.07	0.0000	1810.72	0.0000
795.86	23.9729	1049.04	14.2045	1836.06	3.1857
810.06	17.0768	1050.41	8.7451		
810.29	18.0829	1063.66	14.0500		
344.28	18.0840	1077.00	0.0000		
810.76	15.0719	1077.34	9.9212		
815.77	0.0000	1085.87	8.8423		
1048.07	0.0000	1093.63	14.4028		
832.01	19.4514	1099.45	13.3191		
834.85	15.2129	1112.07	10.0272		
835.71	13.1888	1112.84	11.1444		
836.80	0.0000	1115.54	8.9224		
846.75	0.0000	1120.29	16.7542		
846.77	14.2636	1120.55	16.7551		
856.80	0.0000	1221.41	16.7587		
860.56	13.1086	1129.67	19.0410		
871.09	16.4502	1131.51	0.0000		
873.19	14.4050	1147.95	0.0000		
875.33	0.0000	1173.23	7.5631		
879.38	9.2815	1177.95	10.9055		
880.51	11.3488	1189.05	15.4992		
883.24	16.5239	1204.77	17.3997		
884.68	22.7318	1221.41	19.3214		
889.28	11.3850	1231.02	16.6052		
894.76	8.2966	1235.36	0.0000		
898.04	13.4979	1238.28	17.1668		
900.72	14.5503	1260.41	0.0000		
903.28	19.0218	1271.87	8.3962		
911.20	17.7346	1274.44	15.8703		
912.08	17.7398	1274.54	14.9367		
923.98	0.0000	1291.59	9.3784		
926.50	17.8306	1298.22	0.0000		
929.11	17.8472	1312.11	0.0000		
937.49	22.1113	1332.49	10.4274		
944.13	0.0000	1362.66	0.0000		
946.00	20.0646	1365.19	5.7357		
949.00	20.0849	1368.63	0.0000		
667.71	0.0000	1384.29	9.6060		
962.31	16.9912	1408.01	4.8315		
964.08	15.3013	1457.56	0.0000		
966.17	15.9499	1460.82	7.8305		
911.20	15.9654	1489.16	1.9709		
968.97	15.9654	1505.03	9.8911		
983.53	0.0000	1584.12	12.0861		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                 *
*                               Charleston, SC 29407                            *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235039.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM44.CNF;111
Background date : 2-OCT-2016 11:02:28.
Sample date     : 30-NOV-2015 10:43:00 Acquisition date : 3-OCT-2016 09:18:06.
Sample ID      : G405235039 Sample quantity   : 1.75326E+02 GRAM
Detector name  : GAM44 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.74 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID      : 1596249 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	40.61*	26	86	1.05	81.66	78	8	7.12E-03	67.4	
2	3	75.04	84	131	1.16	150.54	146	13	2.33E-02	24.9	7.66E-01
3	3	77.09*	141	92	1.05	154.65	146	13	3.91E-02	14.7	
4	0	87.13	37	119	0.69	174.74	172	6	1.03E-02	49.8	
5	0	92.79*	58	128	0.83	186.05	183	8	1.60E-02	37.7	
6	0	178.00	32	55	1.05	356.55	353	8	8.78E-03	44.2	
7	0	181.98	22	57	0.94	364.51	362	7	6.00E-03	62.2	
8	0	186.14*	72	103	0.80	372.82	368	10	2.01E-02	29.6	
9	0	209.28	49	90	1.05	419.14	414	10	1.37E-02	39.1	
10	0	238.57*	271	110	1.19	477.73	472	10	7.52E-02	9.6	
11	0	241.92	55	48	0.89	484.44	482	6	1.53E-02	24.8	
12	0	259.16	32	57	1.18	518.92	514	10	8.84E-03	47.9	
13	0	272.46	16	73	0.63	545.55	541	10	4.51E-03	104.6	
14	2	295.31	106	63	1.54	591.25	586	25	2.93E-02	16.4	2.19E+00
15	2	300.41	34	50	1.56	601.46	586	25	9.38E-03	43.7	
16	0	338.82	88	57	1.67	678.32	673	14	2.44E-02	21.0	
17	0	351.74*	244	28	1.35	704.17	696	16	6.77E-02	8.2	
18	0	419.10	19	24	0.99	838.96	835	8	5.40E-03	50.1	
19	0	462.78	41	29	1.37	926.37	919	15	1.13E-02	33.2	
20	0	510.73*	75	22	1.97	1022.31	1014	15	2.08E-02	21.6	
21	0	518.48	13	18	0.76	1037.82	1033	10	3.68E-03	67.9	
22	0	583.37*	93	38	1.46	1167.68	1163	13	2.58E-02	17.3	
23	0	596.54	6	20	0.64	1194.03	1188	9	1.71E-03	137.5	
24	0	609.37*	158	12	1.39	1219.70	1214	14	4.39E-02	9.3	
25	0	728.90	17	40	1.37	1458.93	1452	15	4.59E-03	88.1	
26	0	795.09	15	22	1.72	1591.39	1582	12	4.30E-03	64.6	
27	0	861.58	26	9	4.22	1724.45	1719	12	7.35E-03	29.8	
28	0	911.87*	58	27	0.89	1825.11	1817	18	1.61E-02	25.1	
29	0	969.18*	36	8	2.19	1939.81	1935	12	1.00E-02	24.1	
30	0	1011.06	11	5	1.16	2023.64	2017	9	3.06E-03	46.5	
31	0	1031.91	8	10	0.50	2065.38	2060	10	2.22E-03	82.0	
32	0	1104.71	13	4	1.29	2211.07	2208	7	3.62E-03	39.3	
33	0	1120.13	34	3	2.31	2241.95	2236	11	9.57E-03	19.4	
34	0	1136.61	8	5	0.85	2274.93	2272	6	2.14E-03	61.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1156.28	14	6	4.08	2314.30	2308	11	3.75E-03	43.3	
36	0	1318.67	10	7	1.32	2639.37	2631	13	2.64E-03	64.1	
37	0	1360.33	7	2	0.95	2722.75	2718	8	1.94E-03	51.5	
38	0	1460.76*	347	15	2.26	2923.82	2914	20	9.64E-02	6.1	
39	0	1764.36	25	0	0.67	3531.64	3526	10	6.94E-03	20.0	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235039.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 30-NOV-2015 10:43:00 Acquisition date : 3-OCT-2016 09:18:06
Sample ID        : G405235039 Sample quantity  : 175.33 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA44 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.74 0.0%
Energy tolerance : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error  : 0.00 %
Efficiency type  : Linear Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.030E+00	1.326E+01	1.326E+01	12.16	OK
CD-109	88.03	3.70*	4.450E+00	6.341E-01	1.007E+00	214.94	OK
SN-126	64.28	9.60	2.161E+00	----- Line	Not Found	-----	Absent
	86.94	8.90	4.450E+00	2.636E-01	2.636E-01	214.94	OK
	87.57	37.00*	4.450E+00	6.341E-02	6.341E-02	214.94	OK
TL-208	277.37	6.60	4.074E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.178E+00	2.398E-01	2.398E-01	34.57	OK
	860.56	12.50	1.591E+00	6.033E-01	6.033E-01	59.55	OK
BI-211	72.87	1.23	3.135E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.338E+00	7.570E-01	7.570E-01	111.45	OK
PB-212	74.82	10.28	3.363E+00	1.044E+00	1.044E+00	72.10	OK
	77.11	17.10	3.570E+00	1.404E+00	1.404E+00	29.48	OK
	238.63	43.60*	4.587E+00	7.262E-01	7.262E-01	19.24	OK
	300.09	3.30	3.815E+00	1.398E+00	1.398E+00	87.41	OK
BI-214	609.32	45.49*	2.102E+00	7.863E-01	7.865E-01	18.53	OK
	1120.29	14.92	1.288E+00	7.831E-01	7.834E-01	38.74	OK
	1764.49	15.30	8.674E-01	7.675E-01	7.678E-01	40.00	OK
PB-214	74.82	5.80	3.340E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.570E+00	2.476E+00	2.477E+00	29.48	OK
	87.09	3.41	4.447E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.538E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.870E+00	7.744E-01	7.747E-01	32.77	OK
	351.93	35.60*	3.336E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.102E+00	7.863E-01	7.865E-01	18.53	OK
	1120.29	14.92	1.288E+00	7.831E-01	7.834E-01	38.74	OK
	1764.49	15.30	8.674E-01	7.675E-01	7.678E-01	40.00	OK
RA-224	240.99	4.10*	4.539E+00	2.131E-01	2.131E-01	424.31	OK
RA-226	609.32	45.49*	2.102E+00	7.863E-01	7.865E-01	18.53	OK
	1120.29	14.92	1.288E+00	7.831E-01	7.834E-01	38.74	OK
	1764.49	15.30	8.674E-01	7.675E-01	7.678E-01	40.00	OK
AC-228	105.21	1.10	5.460E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.446E+00	1.162E+00	1.162E+00	42.03	OK
	794.95	4.25	1.696E+00	9.848E-01	9.848E-01	129.26	OK
	835.71	1.61	1.630E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.520E+00	6.656E-01	6.656E-01	50.14	OK
	968.97	15.80	1.448E+00	7.020E-01	7.020E-01	48.17	OK
RA-228	105.21	1.10	5.460E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.446E+00	1.162E+00	1.162E+00	42.03	OK
	794.95	4.25	1.696E+00	9.848E-01	9.848E-01	129.26	OK
	835.71	1.61	1.630E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.520E+00	6.656E-01	6.656E-01	50.14	OK
	968.97	15.80	1.448E+00	7.020E-01	7.020E-01	48.17	OK
TH-228	74.82	10.28	3.363E+00	1.044E+00	1.044E+00	72.10	OK
	77.11	17.10	3.570E+00	1.404E+00	1.404E+00	29.48	OK
	238.63	43.60*	4.587E+00	7.262E-01	7.262E-01	19.24	OK
	300.09	3.30	3.815E+00	1.398E+00	1.398E+00	87.41	OK
TH-230	609.32	45.49*	2.102E+00	7.863E-01	7.863E-01	18.53	OK
	1120.29	14.92	1.288E+00	7.831E-01	7.831E-01	38.74	OK
	1764.49	15.30	8.674E-01	7.675E-01	7.675E-01	40.00	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
PA-231	283.69	1.70	4.000E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	3.815E+00	8.623E-01	8.623E-01	87.41	OK
TH-232	105.21	1.10	5.460E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.446E+00	1.162E+00	1.162E+00	42.03	OK
	835.71	1.61	1.630E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.520E+00	6.656E-01	6.656E-01	50.14	OK
U-234	968.97	15.80	1.448E+00	7.020E-01	7.020E-01	48.17	OK
	609.32	45.49*	2.102E+00	7.863E-01	7.863E-01	18.53	OK
	1120.29	14.92	1.288E+00	7.831E-01	7.831E-01	38.74	OK
	1764.49	15.30	8.674E-01	7.675E-01	7.675E-01	40.00	OK
AM-243	43.53	5.90	1.573E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	3.363E+00	1.597E-01	1.597E-01	72.10	OK
ANH-511	511.00	100.00*	2.432E+00	1.498E-01	1.498E-01	43.22	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235039.CNF;1
* Acquisition date   : 3-OCT-2016 09:18:06 Sensitivity      : 3.000
* Detector ID        : GAM44 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.74 Half life ratio : *****
* Sample date        : 30-NOV-2015 10:43:00 Analyst initials: MXR1
* Sample ID          : G405235039 Sample Quantity : 1.7533E+02 GRAM
* Batch Number       : 1596249 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 6-SEP-2016 04:59:25 Eff. Geometry   : CAN
* Eff. File           : DKA100:[CANBERRA.GAMMA]EFF_GAM44_CAN.CNF;3
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.326E+01	1.580E+00	6.697E-01
CD-109	1.007E+00	2.121E+00	2.206E+00
SN-126	6.341E-02	1.336E-01	1.451E-01
TL-208	2.398E-01	8.122E-02	5.900E-02
BI-211	7.570E-01	8.268E-01	2.611E-01
PB-212	7.262E-01	1.369E-01	8.133E-02
BI-214	7.865E-01	1.428E-01	5.130E-02
PB-214	1.049E+00	1.679E-01	2.705E-01
RN-222	7.865E-01	1.428E-01	5.130E-02
RA-224	2.131E-01	8.863E-01	1.002E+00
RA-226	7.865E-01	1.428E-01	5.130E-02
AC-228	6.656E-01	3.271E-01	2.215E-01
RA-228	6.656E-01	3.271E-01	2.215E-01
TH-228	7.262E-01	1.369E-01	8.133E-02
TH-230	7.863E-01	1.428E-01	5.128E-02
PA-231	8.623E-01	7.387E-01	7.205E-01
TH-232	6.656E-01	3.271E-01	2.215E-01
U-234	7.863E-01	1.428E-01	5.128E-02
AM-243	1.597E-01	1.128E-01	9.712E-02
ANH-511	1.498E-01	6.346E-02	4.247E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	5.243E+00		9.283E+00	2.066E+01	NOT IDENT.
NA-22	1.652E-02		3.994E-02	8.728E-02	NOT IDENT.
NA-24	0.000E+00		1.922E+41	0.000E+00	SHORT HLIF
AL-26	4.463E-03		1.791E-02	4.736E-02	NOT IDENT.
SC-46	3.230E-03		3.450E-01	7.165E-01	FAIL ABUN
V-48	0.000E+00		1.799E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00		4.103E+02	0.000E+00	SHORT HLIF
MN-54	6.097E-02		5.493E-02	1.260E-01	NOT IDENT.
CO-56	-3.090E-01		5.054E-01	8.620E-01	NOT IDENT.
MN-56	0.000E+00		1.666E+41	0.000E+00	SHORT HLIF

CO-57	-7.484E-03	3.959E-02	7.670E-02	NOT IDENT.
CO-58	-7.752E-02	5.647E-01	1.070E+00	NOT IDENT.
FE-59	-5.222E+00	7.033E+00	1.183E+01	NOT IDENT.
CO-60	-8.632E-03	3.585E-02	6.948E-02	NOT IDENT.
ZN-65	7.066E-02	1.719E-01	3.344E-01	NOT IDENT.
GE-68	1.875E+00	2.148E+00	4.931E+00	NOT IDENT.
AS-73	2.388E+00	1.164E+01	2.484E+01	NOT IDENT.
AS-74	0.000E+00	1.034E+04	0.000E+00	SHORT HLIF
SE-75	7.491E-02	1.913E-01	3.718E-01	NOT IDENT.
BR-77	0.000E+00	2.624E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	7.916E+02	0.000E+00	SHORT HLIF
RB-83	-6.218E-02	5.262E-01	9.413E-01	NOT IDENT.
KR-85	3.336E+00	7.501E+00	1.191E+01	NOT IDENT.
SR-85	3.821E-01	8.629E-01	1.370E+00	NOT IDENT.
RB-86	0.000E+00	3.330E+04	0.000E+00	SHORT HLIF
Y-88	-9.573E-02	1.845E-01	3.575E-01	NOT IDENT.
Y-91	1.148E+02	5.506E+02	1.130E+03	NOT IDENT.
NB-94	1.948E-02	2.932E-02	6.179E-02	NOT IDENT.
NB-95	-9.620E-01	9.766E-01	1.579E+00	NOT IDENT.
NB-95M	-1.519E+00	2.407E+00	3.782E+00	NOT IDENT.
ZR-95	4.581E-01	1.437E+00	2.929E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.759E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.106E+33	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-1.440E-02	2.937E-02	5.499E-02	NOT IDENT.
RH-102	-7.529E-03	4.589E-02	8.928E-02	NOT IDENT.
RU-103	-2.584E+00	5.040E+00	9.413E+00	FAIL ABUN
RH-106	-2.712E-01	4.400E-01	7.843E-01	NOT IDENT.
RU-106	-2.712E-01	4.400E-01	7.843E-01	NOT IDENT.
AG-108M	-1.626E-03	1.942E-02	3.939E-02	NOT IDENT.
AG-110M	3.866E-02	9.659E-02	2.081E-01	NOT IDENT.
SN-113	-7.694E-02	1.833E-01	3.543E-01	NOT IDENT.
CD-115	0.000E+00	2.298E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.196E+05	0.000E+00	SHORT HLIF
TE-123M	-2.888E-02	1.149E-01	2.161E-01	NOT IDENT.
SB-124	-9.616E-02	1.738E+00	3.755E+00	NOT IDENT.
SB-125	-4.279E-02	8.552E-02	1.617E-01	FAIL ABUN
TE-125M	-4.637E+01	2.518E+02	4.920E+02	NOT IDENT.
I-126	0.000E+00	1.212E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.678E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	9.117E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	7.179E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.688E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.781E+27	0.000E+00	SHORT HLIF
BA-133	-2.530E-02	3.716E-02	6.099E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	6.496E-02	8.228E-02	1.044E-01	FAIL ABUN
CS-135	-4.172E-02	1.274E-01	2.267E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.451E+05	0.000E+00	SHORT HLIF
BA-137M	3.342E-02	3.149E-02	6.981E-02	NOT IDENT.
CS-137	3.531E-02	3.327E-02	7.375E-02	NOT IDENT.
CE-139	3.897E-02	9.331E-02	1.863E-01	NOT IDENT.
BA-140	0.000E+00	1.929E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.378E+05	0.000E+00	SHORT HLIF
CE-141	-4.003E-02	2.481E+01	4.789E+01	NOT IDENT.
CE-143	0.000E+00	1.203E+41	0.000E+00	SHORT HLIF
CE-144	4.438E-02	3.091E-01	6.095E-01	NOT IDENT.
PM-144	2.998E-02	5.585E-02	1.148E-01	NOT IDENT.
PR-144	2.630E+00	4.874E+00	1.002E+01	NOT IDENT.
PM-146	-1.209E-02	3.848E-02	7.393E-02	NOT IDENT.
ND-147	0.000E+00	3.972E+07	0.000E+00	SHORT HLIF
PM-147	1.716E+02	6.675E+02	1.348E+03	NOT IDENT.
PM-149	0.000E+00	1.911E+41	0.000E+00	SHORT HLIF
EU-150	1.204E-02	2.187E-02	4.305E-02	FAIL ABUN
EU-152	-1.932E-02	7.201E-02	1.279E-01	NOT IDENT.
GD-153	-1.216E-01	1.455E-01	2.701E-01	NOT IDENT.
EU-154	3.807E-02	9.700E-02	2.115E-01	NOT IDENT.
EU-155	-6.484E-02	9.195E-02	1.718E-01	FAIL ABUN
TB-160	-8.553E-01	1.696E+00	3.246E+00	FAIL ABUN
HO-166M	-4.712E-02	5.402E-02	8.980E-02	NOT IDENT.
TM-171	-2.068E+01	2.838E+01	5.554E+01	NOT IDENT.
HF-172	5.585E-02	1.978E-01	3.963E-01	NOT IDENT.
LU-172	-4.625E-02	5.750E-02	1.001E-01	FAIL ABUN
LU-176	-1.041E-03	2.284E-02	4.166E-02	FAIL ABUN
HF-181	1.437E-01	3.402E+00	7.025E+00	NOT IDENT.
TA-182	-2.623E-01	1.024E+00	1.930E+00	FAIL ABUN

RE-183	2.188E+00	3.788E+00	8.248E+00	NOT IDENT.
RE-184	-3.405E+00	2.920E+01	5.957E+01	NOT IDENT.
W-188	1.452E+01	1.003E+02	1.895E+02	NOT IDENT.
IR-192	2.705E-02	3.866E-01	7.977E-01	FAIL ABUN
HG-203	-5.983E-02	2.089E+00	4.283E+00	NOT IDENT.
BI-207	-1.693E-03	4.688E-02	9.373E-02	FAIL ABUN
PB-210	5.454E+00	6.175E+00	1.401E+01	NOT IDENT.
PB-211	1.141E-01	4.985E-01	1.042E+00	NOT IDENT.
BI-212	8.082E-01	5.029E-01	1.140E+00	NOT IDENT.
RN-219	1.119E-01	3.117E-01	6.533E-01	FAIL ABUN
RA-223	2.153E-01	4.781E-01	1.014E+00	FAIL ABUN
AC-227	-1.229E-01	2.223E-01	3.497E-01	FAIL ABUN
TH-227	-1.229E-01	2.223E-01	3.497E-01	FAIL ABUN
TH-229	-6.383E-02	3.761E-01	7.027E-01	FAIL ABUN
TH-231	2.153E-01	4.781E-01	1.014E+00	FAIL ABUN
PA-233	-2.411E-03	4.832E-02	9.814E-02	FAIL ABUN
PA-234	-1.025E-01	2.354E-01	4.520E-01	NOT IDENT.
PA-234M	-1.321E-01	3.478E+00	7.102E+00	NOT IDENT.
TH-234	1.396E+00	1.253E+00	2.786E+00	FAIL ABUN
U-235	6.815E-02	1.477E-01	2.974E-01	FAIL ABUN
NP-237	-2.411E-03	4.832E-02	9.814E-02	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
U-238	1.396E+00	1.253E+00	2.786E+00	FAIL ABUN
NP-239	7.875E-03	1.966E-01	3.902E-01	NOT IDENT.
PU-239	6.336E+01	2.626E+02	5.225E+02	NOT IDENT.
AM-241	3.515E-02	1.553E-01	3.283E-01	NOT IDENT.
CM-243	3.830E-02	7.988E-02	1.664E-01	NOT IDENT.
BK-247	-1.032E-02	6.550E-02	1.193E-01	NOT IDENT.
CM-247	-5.977E-03	2.931E-02	5.761E-02	NOT IDENT.
CF-249	-1.810E-03	2.889E-02	5.831E-02	NOT IDENT.
CF-251	1.837E-01	1.590E-01	1.899E-01	FAIL ABUN

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	340	10.66*	1.030E+00	1.326E+01	1.326E+01	12.16
CD-109	88.03	52	3.70*	4.450E+00	1.348E+00	2.141E+00	99.62
SN-126	64.28	-----	9.60	2.161E+00	-----	Line Not Found	-----
	86.94	52	8.90	4.450E+00	5.603E-01	5.603E-01	99.62
	87.57	52	37.00*	4.450E+00	1.348E-01	1.348E-01	99.62
TL-208	277.37	-----	6.60	4.074E+00	-----	Line Not Found	-----
	583.19	104	85.00*	2.178E+00	2.398E-01	2.398E-01	34.57
	860.56	28	12.50	1.591E+00	6.033E-01	6.033E-01	59.55
BI-211	72.87	-----	1.23	3.135E+00	-----	Line Not Found	-----
	351.06	291	12.92*	3.338E+00	2.891E+00	2.891E+00	16.33
PB-212	74.82	120	10.28	3.363E+00	1.481E+00	1.481E+00	49.90
	77.11	200	17.10	3.570E+00	1.404E+00	1.404E+00	29.48
	238.63	339	43.60*	4.587E+00	7.262E-01	7.262E-01	19.24
	300.09	41	3.30	3.815E+00	1.398E+00	1.398E+00	87.41
BI-214	609.32	176	45.49*	2.102E+00	7.863E-01	7.865E-01	18.53
	1120.29	35	14.92	1.288E+00	7.831E-01	7.834E-01	38.74
	1764.49	24	15.30	8.674E-01	7.675E-01	7.678E-01	40.00
PB-214	74.82	120	5.80	3.363E+00	2.624E+00	2.625E+00	49.90
	77.11	200	9.70	3.570E+00	2.476E+00	2.477E+00	29.48
	87.09	52	3.41	4.450E+00	1.462E+00	1.463E+00	99.62
	242.00	69	7.25	4.539E+00	8.949E-01	8.952E-01	49.62
	295.22	129	18.42	3.870E+00	7.744E-01	7.747E-01	32.77
	351.93	291	35.60*	3.338E+00	1.049E+00	1.049E+00	16.33
RN-222	609.32	176	45.49*	2.102E+00	7.863E-01	7.865E-01	18.53
	1120.29	35	14.92	1.288E+00	7.831E-01	7.834E-01	38.74
	1764.49	24	15.30	8.674E-01	7.675E-01	7.678E-01	40.00
RA-224	240.99	69	4.10*	4.539E+00	1.582E+00	1.582E+00	49.62
RA-226	609.32	176	45.49*	2.102E+00	7.863E-01	7.865E-01	18.53
	1120.29	35	14.92	1.288E+00	7.831E-01	7.834E-01	38.74
	1764.49	24	15.30	8.674E-01	7.675E-01	7.678E-01	40.00
AC-228	105.21	-----	1.10	5.460E+00	-----	Line Not Found	-----
	338.32	105	11.27	3.446E+00	1.162E+00	1.162E+00	42.03
	794.95	17	4.25	1.696E+00	9.848E-01	9.848E-01	129.26
	835.71	-----	1.61	1.630E+00	-----	Line Not Found	-----
	911.20	61	25.80*	1.520E+00	6.656E-01	6.656E-01	50.14
	968.97	37	15.80	1.448E+00	7.020E-01	7.020E-01	48.17
RA-228	105.21	-----	1.10	5.460E+00	-----	Line Not Found	-----
	338.32	105	11.27	3.446E+00	1.162E+00	1.162E+00	42.03
	794.95	17	4.25	1.696E+00	9.848E-01	9.848E-01	129.26
	835.71	-----	1.61	1.630E+00	-----	Line Not Found	-----
	911.20	61	25.80*	1.520E+00	6.656E-01	6.656E-01	50.14
	968.97	37	15.80	1.448E+00	7.020E-01	7.020E-01	48.17
TH-228	74.82	120	10.28	3.363E+00	1.481E+00	1.481E+00	49.90
	77.11	200	17.10	3.570E+00	1.404E+00	1.404E+00	29.48
	238.63	339	43.60*	4.587E+00	7.262E-01	7.262E-01	19.24
	300.09	41	3.30	3.815E+00	1.398E+00	1.398E+00	87.41
TH-230	609.32	176	45.49*	2.102E+00	7.863E-01	7.863E-01	18.53

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	1120.29	35	14.92	1.288E+00	7.831E-01	7.831E-01	38.74
	1764.49	24	15.30	8.674E-01	7.675E-01	7.675E-01	40.00
PA-231	283.69	-----	1.70	4.000E+00	-----	Line Not Found	-----
	301.36	41	5.35*	3.815E+00	8.623E-01	8.623E-01	87.41
TH-232	105.21	-----	1.10	5.460E+00	-----	Line Not Found	-----
	338.32	105	11.27	3.446E+00	1.162E+00	1.162E+00	42.03
	835.71	-----	1.61	1.630E+00	-----	Line Not Found	-----
	911.20	61	25.80*	1.520E+00	6.656E-01	6.656E-01	50.14
	968.97	37	15.80	1.448E+00	7.020E-01	7.020E-01	48.17
U-234	609.32	176	45.49*	2.102E+00	7.863E-01	7.863E-01	18.53
	1120.29	35	14.92	1.288E+00	7.831E-01	7.831E-01	38.74
	1764.49	24	15.30	8.674E-01	7.675E-01	7.675E-01	40.00
AM-243	43.53	-----	5.90	1.573E-01	-----	Line Not Found	-----
	74.66	120	67.20*	3.363E+00	2.265E-01	2.265E-01	49.90
ANH-511	511.00	85	100.00*	2.432E+00	1.498E-01	1.498E-01	43.22

Flag: "*" = Keyline

Total number of lines in spectrum 39
 Number of unidentified lines 13
 Number of lines tentatively identified by NID 26 66.67%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.326E+01	1.326E+01	0.161E+01	12.16	
CD-109	461.40D	1.59	1.348E+00	2.141E+00	2.132E+00	99.62	
SN-126	2.30E+05Y	1.00	1.348E-01	1.348E-01	1.343E-01	99.62	
TL-208	1.41E+10Y	1.00	2.398E-01	2.398E-01	0.829E-01	34.57	
BI-211	7.04E+08Y	1.00	2.891E+00	2.891E+00	0.472E+00	16.33	
PB-212	1.41E+10Y	1.00	7.262E-01	7.262E-01	1.397E-01	19.24	
BI-214	1600.00Y	1.00	7.863E-01	7.865E-01	1.457E-01	18.53	
PB-214	1600.00Y	1.00	1.049E+00	1.049E+00	0.171E+00	16.33	
RN-222	1600.00Y	1.00	7.863E-01	7.865E-01	1.457E-01	18.53	
RA-224	1.41E+10Y	1.00	1.582E+00	1.582E+00	0.785E+00	49.62	
RA-226	1600.00Y	1.00	7.863E-01	7.865E-01	1.457E-01	18.53	
AC-228	1.41E+10Y	1.00	6.656E-01	6.656E-01	3.337E-01	50.14	
RA-228	1.41E+10Y	1.00	6.656E-01	6.656E-01	3.337E-01	50.14	
TH-228	1.41E+10Y	1.00	7.262E-01	7.262E-01	1.397E-01	19.24	
TH-230	7.54E+04Y	1.00	7.863E-01	7.863E-01	1.457E-01	18.53	
PA-231	7.04E+08Y	1.00	8.623E-01	8.623E-01	7.537E-01	87.41	
TH-232	1.41E+10Y	1.00	6.656E-01	6.656E-01	3.337E-01	50.14	
U-234	2.45E+05Y	1.00	7.863E-01	7.863E-01	1.457E-01	18.53	
AM-243	7370.00Y	1.00	2.265E-01	2.265E-01	1.130E-01	49.90	
ANH-511	1.00E+09Y	1.00	1.498E-01	1.498E-01	0.648E-01	43.22	
Total Activity :			2.913E+01	2.992E+01			

Grand Total Activity : 2.913E+01 2.992E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	40.61	39	131	1.05	81.66	78	8	7.12E-03	****	5.88E-02	
0	92.79	80	179	0.83	186.05	183	8	1.60E-02	75.5	4.84E+00	T
0	178.00	41	72	1.05	356.55	353	8	8.78E-03	88.3	5.53E+00	T
0	181.98	28	74	0.94	364.51	362	7	6.00E-03	****	5.46E+00	T
0	186.14	93	133	0.80	372.82	368	10	2.01E-02	59.2	5.40E+00	T
0	209.28	63	114	1.05	419.14	414	10	1.37E-02	78.3	5.03E+00	
0	259.16	39	71	1.18	518.92	514	10	8.84E-03	95.8	4.30E+00	
0	272.46	20	90	0.63	545.55	541	10	4.51E-03	****	4.13E+00	T
0	419.10	23	28	0.99	838.96	835	8	5.40E-03	****	2.87E+00	
0	462.78	47	34	1.37	926.37	919	15	1.13E-02	66.4	2.64E+00	T
0	518.48	15	20	0.76	1037.82	1033	10	3.68E-03	****	2.40E+00	
0	596.54	7	22	0.64	1194.03	1188	9	1.71E-03	****	2.14E+00	T
0	728.90	18	44	1.37	1458.93	1452	15	4.59E-03	****	1.82E+00	
0	1011.06	11	5	1.16	2023.64	2017	9	3.06E-03	92.9	1.40E+00	
0	1031.91	8	10	0.50	2065.38	2060	10	2.22E-03	****	1.38E+00	
0	1104.71	13	4	1.29	2211.07	2208	7	3.62E-03	78.6	1.30E+00	
0	1136.61	8	5	0.85	2274.93	2272	6	2.14E-03	****	1.27E+00	
0	1156.28	14	6	4.08	2314.30	2308	11	3.75E-03	86.5	1.25E+00	
0	1318.67	9	6	1.32	2639.37	2631	13	2.64E-03	****	1.12E+00	
0	1360.33	7	2	0.95	2722.75	2718	8	1.94E-03	****	1.10E+00	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235039.CNF;1
* Acquisition date   : 3-OCT-2016 09:18:06 Sensitivity      : 3.000
* Detector ID       : GAM44 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.74 Half life ratio : *****
* Sample date      : 30-NOV-2015 10:43:00 Nuclide Library : SOLID
* Sample ID       : G405235039 Analyst initials: MXR1
* Batch Number    : 1596249 Sample Quantity : 1.7533E+02 GRAM
* Wet wt corr     : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 6-SEP-2016 04:59:25 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM44_CAN.CNF;3
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.814E-01
CD-109	1.042E+00
SN-126	6.871E-02
TL-208	2.623E-02
BI-211	1.163E-01
PB-212	3.755E-02
BI-214	1.931E-02
PB-214	1.301E-01
RN-222	1.931E-02
RA-224	4.678E-01
RA-226	1.931E-02
AC-228	9.554E-02
RA-228	9.554E-02
TH-228	3.755E-02
TH-230	1.930E-02
PA-231	3.299E-01
TH-232	9.554E-02
U-234	1.930E-02
AM-243	4.568E-02
ANH-511	1.873E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	9.075E+00	NOT IDENT.
NA-22	3.726E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.678E-02	NOT IDENT.
SC-46	3.091E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.573E-02	NOT IDENT.
CO-56	3.721E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.557E-02	NOT IDENT.

CO-58	4.616E-01	NOT IDENT.
FE-59	4.944E+00	NOT IDENT.
CO-60	2.883E-02	NOT IDENT.
ZN-65	1.455E-01	NOT IDENT.
GE-68	2.161E+00	NOT IDENT.
AS-73	1.144E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.711E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.034E-01	NOT IDENT.
KR-85	5.345E+00	NOT IDENT.
SR-85	6.146E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.267E-01	NOT IDENT.
Y-91	4.928E+02	NOT IDENT.
NB-94	2.767E-02	NOT IDENT.
NB-95	6.929E-01	NOT IDENT.
NB-95M	1.739E+00	NOT IDENT.
ZR-95	1.289E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.561E-02	NOT IDENT.
RH-102	3.846E-02	NOT IDENT.
RU-103	4.088E+00	FAIL ABUN
RH-106	3.398E-01	NOT IDENT.
RU-106	3.398E-01	NOT IDENT.
AG-108M	1.727E-02	NOT IDENT.
AG-110M	9.166E-02	NOT IDENT.
SN-113	1.573E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.003E-01	NOT IDENT.
SB-124	1.406E+00	NOT IDENT.
SB-125	7.186E-02	FAIL ABUN
TE-125M	2.286E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.732E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	4.669E-02	FAIL ABUN
CS-135	1.041E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	3.143E-02	NOT IDENT.
CS-137	3.320E-02	NOT IDENT.
CE-139	8.666E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.237E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.844E-01	NOT IDENT.
PM-144	5.162E-02	NOT IDENT.
PR-144	4.506E+00	NOT IDENT.
PM-146	3.308E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	6.263E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.966E-02	FAIL ABUN
EU-152	5.685E-02	NOT IDENT.
GD-153	1.245E-01	NOT IDENT.
EU-154	9.017E-02	NOT IDENT.
EU-155	7.961E-02	FAIL ABUN
TB-160	1.380E+00	FAIL ABUN
HO-166M	3.890E-02	NOT IDENT.
TM-171	2.547E+01	NOT IDENT.
HF-172	1.851E-01	NOT IDENT.
LU-172	4.026E-02	FAIL ABUN
LU-176	1.907E-02	FAIL ABUN
HF-181	3.056E+00	NOT IDENT.
TA-182	8.472E-01	FAIL ABUN
RE-183	3.843E+00	NOT IDENT.

RE-184	2.553E+01	NOT IDENT.
W-188	8.639E+01	NOT IDENT.
IR-192	3.620E-01	FAIL ABUN
HG-203	1.958E+00	NOT IDENT.
BI-207	4.084E-02	FAIL ABUN
PB-210	6.516E+00	NOT IDENT.
PB-211	4.664E-01	NOT IDENT.
BI-212	5.207E-01	NOT IDENT.
RN-219	2.955E-01	FAIL ABUN
RA-223	4.639E-01	FAIL ABUN
AC-227	1.598E-01	FAIL ABUN
TH-227	1.598E-01	FAIL ABUN
TH-229	3.245E-01	FAIL ABUN
TH-231	4.639E-01	FAIL ABUN
PA-233	4.473E-02	FAIL ABUN
PA-234	1.924E-01	NOT IDENT.
PA-234M	3.049E+00	NOT IDENT.
TH-234	1.307E+00	FAIL ABUN
U-235	1.390E-01	FAIL ABUN
NP-237	4.473E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.307E+00	FAIL ABUN
NP-239	1.812E-01	NOT IDENT.
PU-239	2.443E+02	NOT IDENT.
AM-241	1.528E-01	NOT IDENT.
CM-243	7.739E-02	NOT IDENT.
BK-247	5.475E-02	NOT IDENT.
CM-247	2.595E-02	NOT IDENT.
CF-249	2.612E-02	NOT IDENT.
CF-251	8.839E-02	FAIL ABUN

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235039.CNF;1
* Acquisition date   : 3-OCT-2016 09:18:06 Sensitivity      : 3.000
* Detector ID        : GAM44 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.74 Half life ratio : *****
* Sample date        : 30-NOV-2015 10:43:00 Nuclide Library : SOLID
* Sample ID          : G405235039 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity: 1.7533E+02 GRAM
*                               Quantity Err(%) : 1.1407E-03 %
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight  : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date     : 6-SEP-2016 04:59:25 Eff. Geometry   : CAN
* Eff. File           : DKA100:[CANBERRA.GAMMA]EFF_GAM44_CAN.CNF;3
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.326E+01	1.724E+00	1.724E+00
CD-109	1.007E+00	2.128E+00	2.128E+00
SN-126	6.341E-02	1.339E-01	1.339E-01
TL-208	2.398E-01	8.186E-02	8.186E-02
BI-211	7.570E-01	8.377E-01	8.377E-01
PB-212	7.262E-01	1.422E-01	1.422E-01
BI-214	7.865E-01	1.467E-01	1.467E-01
PB-214	1.049E+00	1.735E-01	1.735E-01
RN-222	7.865E-01	1.467E-01	1.467E-01
RA-224	2.131E-01	8.909E-01	8.909E-01
RA-226	7.865E-01	1.467E-01	1.467E-01
AC-228	6.656E-01	3.288E-01	3.288E-01
RA-228	6.656E-01	3.288E-01	3.288E-01
TH-228	7.262E-01	1.422E-01	1.422E-01
TH-230	7.863E-01	1.467E-01	1.467E-01
PA-231	8.623E-01	7.613E-01	7.613E-01
TH-232	6.656E-01	3.288E-01	3.288E-01
U-234	7.863E-01	1.467E-01	1.467E-01
AM-243	1.597E-01	1.136E-01	1.136E-01
ANH-511	1.498E-01	6.375E-02	6.375E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	5.243E+00	9.285E+00	9.581E+00	NOT IDENT.
NA-22	1.652E-02	3.994E-02	4.063E-02	NOT IDENT.
NA-24	-1.000E+41	1.974E+41	0.000E+00	SHORT HLIF
AL-26	4.463E-03	1.791E-02	1.803E-02	NOT IDENT.
SC-46	3.230E-03	3.450E-01	3.450E-01	FAIL ABUN
V-48	-8.919E+03	1.799E+04	1.844E+04	SHORT HLIF
CR-51	1.329E+02	4.103E+02	4.147E+02	SHORT HLIF
MN-54	6.097E-02	5.499E-02	6.148E-02	NOT IDENT.
CO-56	-3.090E-01	5.056E-01	5.244E-01	NOT IDENT.
MN-56	-1.000E+41	1.666E+41	0.000E+00	SHORT HLIF

CO-57	-7.484E-03	3.959E-02	3.973E-02	NOT IDENT.
CO-58	-7.752E-02	5.647E-01	5.658E-01	NOT IDENT.
FE-59	-5.222E+00	7.043E+00	7.426E+00	NOT IDENT.
CO-60	-8.632E-03	3.585E-02	3.606E-02	NOT IDENT.
ZN-65	7.066E-02	1.719E-01	1.748E-01	NOT IDENT.
GE-68	1.875E+00	2.149E+00	2.310E+00	NOT IDENT.
AS-73	2.388E+00	1.165E+01	1.170E+01	NOT IDENT.
AS-74	3.836E+03	1.034E+04	1.048E+04	SHORT HLIF
SE-75	7.491E-02	1.913E-01	1.943E-01	NOT IDENT.
BR-77	1.392E+39	1.237E+40	0.000E+00	SHORT HLIF
SR-82	5.203E+01	7.916E+02	7.920E+02	SHORT HLIF
RB-83	-6.218E-02	5.263E-01	5.270E-01	NOT IDENT.
KR-85	3.336E+00	7.502E+00	7.651E+00	NOT IDENT.
SR-85	3.821E-01	8.631E-01	8.801E-01	NOT IDENT.
RB-86	3.786E+04	3.335E+04	3.746E+04	SHORT HLIF
Y-88	-9.573E-02	1.847E-01	1.896E-01	NOT IDENT.
Y-91	1.148E+02	5.507E+02	5.531E+02	NOT IDENT.
NB-94	1.948E-02	2.933E-02	3.062E-02	NOT IDENT.
NB-95	-9.620E-01	9.775E-01	1.069E+00	NOT IDENT.
NB-95M	-1.519E+00	2.410E+00	2.505E+00	NOT IDENT.
ZR-95	4.581E-01	1.437E+00	1.451E+00	NOT IDENT.
NB-97	-1.000E+41	2.180E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.760E+41	0.000E+00	SHORT HLIF
MO-99	-6.006E+32	1.107E+33	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	3.595E+41	0.000E+00	SHORT HLIF
RH-101	-1.440E-02	2.949E-02	3.020E-02	NOT IDENT.
RH-102	-7.529E-03	4.590E-02	4.602E-02	NOT IDENT.
RU-103	-2.584E+00	5.042E+00	5.174E+00	FAIL ABUN
RH-106	-2.712E-01	4.403E-01	4.570E-01	NOT IDENT.
RU-106	-2.712E-01	4.403E-01	4.570E-01	NOT IDENT.
AG-108M	-1.626E-03	1.942E-02	1.943E-02	NOT IDENT.
AG-110M	3.866E-02	9.661E-02	9.817E-02	NOT IDENT.
SN-113	-7.694E-02	1.833E-01	1.866E-01	NOT IDENT.
CD-115	1.191E+40	2.308E+40	0.000E+00	SHORT HLIF
SN-117M	7.387E+04	1.200E+05	1.245E+05	SHORT HLIF
TE-123M	-2.888E-02	1.149E-01	1.157E-01	NOT IDENT.
SB-124	-9.616E-02	1.738E+00	1.739E+00	NOT IDENT.
SB-125	-4.279E-02	8.554E-02	8.768E-02	FAIL ABUN
TE-125M	-4.637E+01	2.518E+02	2.527E+02	NOT IDENT.
I-126	1.661E+05	1.212E+06	1.214E+06	SHORT HLIF
SB-126	-1.473E+06	1.701E+06	1.826E+06	SHORT HLIF
SB-127	1.312E+23	2.064E+23	0.000E+00	SHORT HLIF
I-131	-4.759E+09	7.182E+09	7.496E+09	SHORT HLIF
I-132	-1.000E+41	1.906E+42	0.000E+00	SHORT HLIF
TE-132	9.811E+26	1.828E+27	0.000E+00	SHORT HLIF
BA-133	-2.530E-02	3.718E-02	3.889E-02	NOT IDENT.
I-133	1.000E+41	9.506E+41	0.000E+00	SHORT HLIF
CS-134	6.496E-02	8.233E-02	8.738E-02	FAIL ABUN
CS-135	-4.172E-02	1.274E-01	1.288E-01	NOT IDENT.
I-135	1.000E+41	2.240E+42	0.000E+00	SHORT HLIF
CS-136	-6.943E+04	3.452E+05	3.466E+05	SHORT HLIF
BA-137M	3.342E-02	3.153E-02	3.494E-02	NOT IDENT.
CS-137	3.531E-02	3.331E-02	3.691E-02	NOT IDENT.
CE-139	3.897E-02	9.364E-02	9.527E-02	NOT IDENT.
BA-140	9.426E+05	1.930E+06	1.976E+06	SHORT HLIF
LA-140	-1.865E+04	4.378E+05	4.379E+05	SHORT HLIF
CE-141	-4.003E-02	2.481E+01	2.481E+01	NOT IDENT.
CE-143	1.000E+41	1.208E+41	0.000E+00	SHORT HLIF
CE-144	4.438E-02	3.091E-01	3.097E-01	NOT IDENT.
PM-144	2.998E-02	5.588E-02	5.749E-02	NOT IDENT.
PR-144	2.630E+00	4.875E+00	5.017E+00	NOT IDENT.
PM-146	-1.209E-02	3.849E-02	3.888E-02	NOT IDENT.
ND-147	-1.703E+07	3.973E+07	4.046E+07	SHORT HLIF
PM-147	1.716E+02	6.675E+02	6.720E+02	NOT IDENT.
PM-149	-1.000E+41	1.923E+41	0.000E+00	SHORT HLIF
EU-150	1.204E-02	2.188E-02	2.254E-02	FAIL ABUN
EU-152	-1.932E-02	7.202E-02	7.254E-02	NOT IDENT.
GD-153	-1.216E-01	1.456E-01	1.556E-01	NOT IDENT.
EU-154	3.807E-02	9.701E-02	9.851E-02	NOT IDENT.
EU-155	-6.484E-02	9.207E-02	9.660E-02	FAIL ABUN
TB-160	-8.553E-01	1.696E+00	1.740E+00	FAIL ABUN
HO-166M	-4.712E-02	5.408E-02	5.811E-02	NOT IDENT.
TM-171	-2.068E+01	2.844E+01	2.993E+01	NOT IDENT.
HF-172	5.585E-02	1.980E-01	1.996E-01	NOT IDENT.
LU-172	-4.625E-02	5.769E-02	6.134E-02	FAIL ABUN
LU-176	-1.041E-03	2.284E-02	2.285E-02	FAIL ABUN
HF-181	1.437E-01	3.402E+00	3.403E+00	NOT IDENT.
TA-182	-2.623E-01	1.024E+00	1.031E+00	FAIL ABUN

RE-183	2.188E+00	3.804E+00	3.930E+00	NOT IDENT.
RE-184	-3.405E+00	2.922E+01	2.926E+01	NOT IDENT.
W-188	1.452E+01	1.003E+02	1.005E+02	NOT IDENT.
IR-192	2.705E-02	3.866E-01	3.868E-01	FAIL ABUN
HG-203	-5.983E-02	2.089E+00	2.089E+00	NOT IDENT.
BI-207	-1.693E-03	4.688E-02	4.688E-02	FAIL ABUN
PB-210	5.454E+00	6.195E+00	6.665E+00	NOT IDENT.
PB-211	1.141E-01	4.985E-01	5.012E-01	NOT IDENT.
BI-212	8.082E-01	5.046E-01	6.223E-01	NOT IDENT.
RN-219	1.119E-01	3.120E-01	3.161E-01	FAIL ABUN
RA-223	2.153E-01	4.783E-01	4.880E-01	FAIL ABUN
AC-227	-1.229E-01	2.228E-01	2.296E-01	FAIL ABUN
TH-227	-1.229E-01	2.228E-01	2.296E-01	FAIL ABUN
TH-229	-6.383E-02	3.761E-01	3.772E-01	FAIL ABUN
TH-231	2.153E-01	4.783E-01	4.880E-01	FAIL ABUN
PA-233	-2.411E-03	4.832E-02	4.833E-02	FAIL ABUN
PA-234	-1.025E-01	2.630E-01	2.671E-01	NOT IDENT.
PA-234M	-1.321E-01	3.478E+00	3.479E+00	NOT IDENT.
TH-234	1.396E+00	1.291E+00	1.436E+00	FAIL ABUN
U-235	6.815E-02	1.478E-01	1.509E-01	FAIL ABUN
NP-237	-2.411E-03	4.832E-02	4.833E-02	FAIL ABUN
NP-238	1.000E+41	6.595E+41	0.000E+00	SHORT HLIF
U-238	1.396E+00	1.291E+00	1.436E+00	FAIL ABUN
NP-239	7.875E-03	1.966E-01	1.966E-01	NOT IDENT.
PU-239	6.336E+01	2.626E+02	2.642E+02	NOT IDENT.
AM-241	3.515E-02	1.553E-01	1.561E-01	NOT IDENT.
CM-243	3.830E-02	7.996E-02	8.180E-02	NOT IDENT.
BK-247	-1.032E-02	6.553E-02	6.570E-02	NOT IDENT.
CM-247	-5.977E-03	2.932E-02	2.945E-02	NOT IDENT.
CF-249	-1.810E-03	2.889E-02	2.890E-02	NOT IDENT.
CF-251	1.837E-01	1.604E-01	1.805E-01	FAIL ABUN

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	48.2185	87.09	90.6453	136.47	65.5134
45.60	55.0496	87.57	105.2002	140.51	0.0000
46.54	42.7447	88.03	97.4013	143.76	57.5377
49.72	0.0000	88.34	97.4630	144.24	57.5781
51.35	45.1748	88.47	97.4886	145.44	67.4719
51.87	47.0528	89.96	49.5518	152.43	56.0528
52.39	51.6545	1093.63	82.0372	153.25	0.0000
52.97	44.4788	91.11	0.0000	323.87	59.4959
53.44	39.0847	92.59	63.7588	156.02	0.0000
54.07	45.5284	93.35	63.8540	158.56	0.0000
57.36	0.0000	94.56	54.6708	159.00	60.9955
57.53	56.9976	94.65	54.6804	162.33	50.1286
57.98	50.6236	94.67	54.6825	162.66	0.0000
59.27	59.1111	94.87	54.7038	163.33	68.0423
59.32	59.1189	97.43	64.3589	165.86	50.3627
59.54	56.3805	98.43	62.4659	176.31	34.7836
60.96	63.0852	98.44	62.4671	176.60	0.0000
61.17	67.7608	99.53	58.5571	177.52	31.8072
62.93	53.1497	100.11	64.6846	181.07	0.0000
63.29	46.6652	102.03	68.9727	181.52	36.5313
63.58	57.9075	103.18	49.8056	184.41	36.6602
64.28	71.1091	103.37	49.8232	143.76	35.1888
66.73	57.4230	105.21	69.3738	193.51	52.1157
67.24	65.0349	105.31	69.3862	197.03	55.8186
125.81	66.9921	106.12	60.2905	198.01	48.8964
67.75	67.0029	106.47	60.3283	201.83	52.6190
69.67	70.1581	109.28	61.6571	203.43	55.0573
70.83	72.2525	111.00	59.7815	205.31	48.5214
72.81	68.7673	111.76	0.0000	210.85	47.2461
72.87	68.7772	114.06	76.6755	215.65	51.0566
74.66	83.4476	116.30	0.0000	222.11	51.4109
74.82	83.4781	116.74	56.2070	227.09	45.6712
74.97	83.5066	119.76	62.7667	227.38	37.2694
77.11	83.9095	121.12	52.4223	228.16	0.0000
78.74	74.8559	121.22	52.4311	228.18	43.3169
79.69	67.2518	121.78	59.8258	116.74	43.3169
80.12	62.1367	122.06	58.8032	235.69	58.2026
80.19	0.0000	122.92	62.0398	235.96	58.2180
80.57	67.3804	123.07	62.0551	238.63	48.6462
81.00	69.0646	265.00	63.1691	238.98	0.0000
81.07	72.9664	125.81	61.2723	240.99	65.8273
81.75	76.9700	127.23	73.0567	242.00	35.7943
83.79	84.8067	127.91	69.9558	244.70	19.5764
84.00	82.2338	129.30	63.7344	252.40	0.0000
85.43	85.0983	131.20	64.9893	252.80	35.7632
86.55	90.5450	133.02	64.1025	254.15	0.0000
86.79	90.5892	133.52	62.0135	256.23	49.4910
86.94	90.6180	136.00	57.9543	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	37.4139	355.39	0.0000	584.27	21.6375
264.80	44.9033	356.01	36.3224	595.83	0.0000
265.00	44.9110	364.49	0.0000	427.87	16.2049
268.22	48.7988	366.42	0.0000	602.52	0.0000
269.46	50.1074	372.51	28.1398	604.72	17.1747
270.03	45.1198	375.05	30.9197	607.14	10.9422
271.23	43.4973	377.52	29.1517	609.32	3.1298
273.65	0.0000	356.01	24.7072	610.33	3.1312
276.40	31.5155	388.16	25.6997	614.28	14.1180
277.37	39.3656	388.63	0.0000	618.01	18.8577
277.60	39.3732	391.69	26.6825	620.36	17.8301
278.00	37.0310	264.66	24.0698	621.93	19.9432
279.20	38.7563	401.81	25.0148	630.19	0.0000
279.54	42.9814	402.40	30.5864	631.29	14.7611
279.70	40.4590	404.85	21.3529	633.25	16.8854
280.46	37.9559	410.95	28.8979	634.78	0.0000
283.69	36.3731	413.71	28.0170	635.95	17.9636
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	33.8867	423.72	0.0000	645.85	15.9241
285.90	0.0000	427.09	8.4791	657.76	17.0794
287.50	27.1595	427.87	28.2776	657.90	0.0000
290.67	33.1919	433.94	17.9791	661.66	13.9019
293.27	0.0000	439.40	14.2432	664.57	0.0000
351.93	39.3029	453.88	28.7451	666.33	0.0000
295.96	39.3282	463.37	16.3837	666.50	0.0000
879.38	39.4161	468.07	14.4974	667.71	0.0000
299.98	39.4629	473.00	0.0000	677.62	8.6172
300.09	39.4667	475.06	21.3519	685.70	0.0000
300.13	39.4676	476.78	18.4592	695.00	0.0000
301.36	39.5088	477.60	11.6641	696.49	19.5513
302.85	39.5584	482.18	14.6198	696.51	19.5520
256.23	37.4607	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	20.6452
306.78	40.1208	497.08	20.6454	697.49	28.2534
308.46	38.8806	505.52	20.7449	702.65	16.3367
311.90	36.3920	507.63	0.0000	706.68	17.4564
316.51	31.3110	511.00	18.8276	711.68	25.1478
319.41	0.0000	514.00	17.8667	720.70	0.0000
320.08	0.0000	514.00	17.8667	721.93	0.0000
321.04	38.4087	520.40	13.4478	722.78	13.1836
323.87	31.4971	520.69	0.0000	722.91	11.5361
325.23	42.9179	522.65	0.0000	723.31	11.5382
328.76	0.0000	527.90	0.0000	724.19	14.8403
333.37	25.3875	528.26	7.0031	727.33	14.3097
333.97	27.7804	529.59	12.0142	733.00	9.9305
334.37	33.0826	529.87	0.0000	735.93	8.8379
338.28	26.5466	531.02	0.0000	333.97	11.0547
338.32	26.5472	537.26	0.0000	739.50	0.0000
311.90	26.5918	546.56	0.0000	747.24	21.0897
340.48	26.5918	552.55	20.2718	748.06	16.6553
340.55	0.0000	563.25	28.5400	752.31	13.3477
344.28	25.3358	569.33	20.4500	753.82	0.0000
345.93	18.6920	946.00	20.4517	756.73	14.4864
351.06	22.3389	569.70	20.4541	756.80	14.4869
351.93	22.3531	583.19	21.6255	884.68	15.6469

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	31.3177	1274.44	10.0352	1620.50	4.3054
766.42	24.6121	1001.03	12.7922	1621.92	2.1534
766.84	24.6166	1002.74	7.3137	1678.03	0.0000
772.60	0.0000	1004.73	16.1009	1690.97	3.2781
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	1.7750
778.90	15.7415	1028.54	0.0000	1063.66	0.0000
783.70	0.0000	1037.84	14.7939	1771.35	2.2219
785.37	18.0371	1038.76	0.0000	1791.20	0.0000
792.07	15.8246	631.29	8.3441	1808.65	1.1193
794.95	20.3687	1048.07	0.0000	1810.72	0.0000
795.86	16.9800	1049.04	6.4950	1836.06	4.5012
810.06	15.9363	1050.41	8.3546		
810.29	15.9380	1063.66	15.8462		
344.28	14.8001	1077.00	0.0000		
810.76	14.8022	1077.34	8.4243		
815.77	0.0000	1085.87	10.3232		
1048.07	0.0000	1093.63	12.2296		
832.01	19.5151	1099.45	16.1551		
834.85	8.0442	1112.07	17.0277		
835.71	16.0941	1112.84	14.1925		
836.80	0.0000	1115.54	10.6060		
846.75	0.0000	1120.29	12.3279		
846.77	20.7788	1120.55	10.6217		
856.80	0.0000	1221.41	7.5884		
860.56	11.6032	1129.67	12.3621		
871.09	12.8127	1131.51	0.0000		
873.19	16.3197	1147.95	0.0000		
875.33	0.0000	1173.23	9.6307		
879.38	15.7725	1177.95	11.5723		
880.51	14.9025	1189.05	8.7067		
883.24	17.5494	1204.77	13.6035		
884.68	14.0469	1221.41	20.5001		
889.28	13.1909	1231.02	18.5964		
894.76	8.8113	1235.36	0.0000		
898.04	11.4678	1238.28	18.6335		
900.72	13.2449	1260.41	0.0000		
903.28	13.2568	1271.87	8.9072		
911.20	13.2944	1274.44	7.9229		
912.08	13.2985	1274.54	7.9229		
923.98	0.0000	1291.59	10.9436		
926.50	8.9105	1298.22	0.0000		
929.11	10.7021	1312.11	0.0000		
937.49	9.8388	1332.49	10.0555		
944.13	0.0000	1362.66	0.0000		
946.00	15.2501	1365.19	1.3519		
949.00	11.6737	1368.63	0.0000		
667.71	0.0000	1384.29	4.0752		
962.31	18.9428	1408.01	8.1982		
964.08	14.4414	1457.56	0.0000		
966.17	18.7872	1460.82	9.3417		
911.20	18.9857	1489.16	4.1797		
968.97	18.9857	1505.03	6.2926		
983.53	0.0000	1584.12	4.2712		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235040.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM12.CNF;467
Background date : 2-OCT-2016 11:00:40.
Sample date      : 30-NOV-2015 13:23:00 Acquisition date : 3-OCT-2016 09:20:08.
Sample ID       : G405235040 Sample quantity : 1.72014E+02 GRAM
Detector name   : GAM12 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.56 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1596249 Detector SN# :
Matrix Spike ID : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	4	36.14*	36	28	1.76	72.12	68	16	1.00E-02	43.6	3.61E+00
2	4	37.58*	14	34	1.21	75.00	68	16	3.75E-03	109.4	
3	0	59.26	30	88	1.29	118.36	116	7	8.19E-03	55.7	
4	2	74.85	94	171	1.54	149.53	144	16	2.62E-02	27.3	5.56E-01
5	2	77.41*	132	142	1.29	154.66	144	16	3.66E-02	18.5	
6	0	86.98	39	148	1.46	173.78	171	7	1.07E-02	54.6	
7	0	93.16*	65	128	1.65	186.14	182	9	1.80E-02	37.2	
8	0	116.83	22	72	0.49	233.50	230	6	6.07E-03	65.4	
9	0	154.17	12	103	1.17	308.17	305	7	3.27E-03	146.6	
10	0	185.69*	95	84	1.20	371.22	367	10	2.65E-02	21.6	
11	2	238.54*	360	85	1.46	476.93	470	22	1.00E-01	7.1	2.19E+00
12	2	241.43	98	68	1.75	482.70	470	22	2.72E-02	25.9	
13	0	270.09	53	66	1.26	540.03	535	10	1.47E-02	32.2	
14	4	295.02	119	53	1.69	589.89	585	21	3.32E-02	14.6	2.17E+00
15	4	299.82	29	57	2.18	599.50	585	21	8.17E-03	60.5	
16	0	310.07	16	61	1.78	620.00	612	11	4.53E-03	95.6	
17	0	328.27	22	57	1.37	656.40	649	9	6.12E-03	57.5	
18	0	338.20*	72	66	1.19	676.27	670	11	2.01E-02	25.2	
19	0	351.83*	184	49	1.27	703.52	698	11	5.12E-02	10.6	
20	0	433.68	14	42	0.71	867.27	859	12	3.97E-03	94.3	
21	0	463.28	33	49	1.84	926.47	919	13	9.25E-03	46.6	
22	0	510.64*	16	74	1.60	1021.23	1017	14	4.51E-03	126.1	
23	0	568.90	45	48	1.95	1137.78	1131	16	1.25E-02	37.5	
24	0	583.04*	97	32	1.52	1166.07	1159	14	2.69E-02	16.2	
25	0	609.35*	155	52	1.51	1218.71	1210	15	4.32E-02	13.1	
26	0	662.07	51	30	2.69	1324.19	1317	12	1.41E-02	25.8	
27	0	696.57	8	33	4.22	1393.23	1382	15	2.34E-03	153.4	
28	0	711.78	22	8	0.53	1423.66	1420	10	6.07E-03	31.9	
29	0	727.75	21	36	0.71	1455.61	1449	11	5.96E-03	58.1	
30	0	786.26	17	18	2.75	1572.70	1564	12	4.82E-03	54.4	
31	0	809.27	11	4	1.67	1618.73	1615	7	2.92E-03	42.7	
32	5	839.82	10	4	1.36	1679.87	1678	14	2.70E-03	38.5	5.98E-01
33	5	842.93	23	7	2.76	1686.08	1678	14	6.43E-03	32.8	
34	0	860.90	23	19	2.12	1722.04	1718	9	6.49E-03	38.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	911.13*	78	7	2.06	1822.57	1817	13	2.15E-02	13.7	
36	0	918.40	6	4	0.49	1837.13	1833	6	1.54E-03	73.7	
37	0	934.87	23	8	2.45	1870.07	1864	12	6.45E-03	32.8	
38	0	954.97	9	6	1.47	1910.29	1903	11	2.36E-03	63.5	
39	0	969.92	36	33	1.09	1940.23	1931	12	1.01E-02	35.5	
40	0	1099.51	7	20	4.47	2199.60	2189	12	1.94E-03	142.1	
41	0	1120.28	42	21	1.75	2241.15	2234	14	1.17E-02	27.8	
42	0	1185.40	12	6	2.75	2371.50	2365	12	3.33E-03	50.0	
43	0	1238.67	26	6	0.74	2478.13	2474	10	7.35E-03	26.9	
44	0	1242.98	7	2	0.62	2486.77	2484	6	2.04E-03	45.7	
45	0	1255.12	11	24	3.73	2511.07	2499	18	3.08E-03	112.8	
46	0	1321.66	10	2	2.11	2644.27	2638	10	2.78E-03	42.7	
47	0	1325.88	7	0	0.58	2652.71	2650	6	1.94E-03	37.8	
48	0	1337.19	8	2	0.69	2675.36	2672	6	2.08E-03	44.7	
49	0	1340.06	6	3	0.52	2681.10	2678	6	1.60E-03	63.6	
50	0	1460.76	350	0	2.12	2922.75	2916	14	9.72E-02	5.3	
51	0	1589.14	10	3	3.47	3179.79	3173	13	2.67E-03	50.5	
52	0	1764.76	16	9	4.12	3531.46	3525	12	4.49E-03	44.6	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235040.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 30-NOV-2015 13:23:00 Acquisition date : 3-OCT-2016 09:20:08
Sample ID        : G405235040 Sample quantity  : 172.01 GRAM
Sample type       : SOLID Sample geometry   :
Detector name    : GAMMA12 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.56 0.0%
Energy tolerance : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error  : 0.00 %
Efficiency type  : Linear Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.082E+00	1.295E+01	1.295E+01	10.69	OK
CO-58	810.76	99.45*	1.744E+00	2.810E-02	5.708E-01	85.45	OK
CD-109	88.03	3.70*	4.287E+00	6.705E-01	1.065E+00	242.14	OK
SN-126	64.28	9.60	2.033E+00	-----	Line Not Found	-----	Absent
	86.94	8.90	4.287E+00	2.788E-01	2.788E-01	242.14	OK
	87.57	37.00*	4.287E+00	6.705E-02	6.705E-02	242.14	OK
BA-137M	661.66	89.90*	2.040E+00	1.320E-01	1.345E-01	51.51	OK
CS-137	661.66	85.10*	2.040E+00	1.394E-01	1.421E-01	51.51	OK
PR-144	696.51	1.34*	1.960E+00	1.521E+00	3.217E+00	306.78	OK
	1489.16	0.28	1.064E+00	-----	Line Not Found	-----	Absent
TL-208	277.37	6.60	4.142E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.256E+00	2.451E-01	2.451E-01	32.38	OK
	860.56	12.50	1.662E+00	5.180E-01	5.180E-01	77.70	OK
BI-212	727.33	6.67*	1.894E+00	7.986E-01	7.986E-01	116.26	OK
	785.37	1.10	1.783E+00	4.118E+00	4.118E+00	108.79	OK
	1620.50	1.47	9.870E-01	-----	Line Not Found	-----	Absent
PB-212	74.82	10.28	3.170E+00	1.286E+00	1.286E+00	76.32	OK
	77.11	17.10	3.429E+00	1.374E+00	1.374E+00	37.08	OK
	238.63	43.60*	4.647E+00	9.611E-01	9.611E-01	14.14	OK
	300.09	3.30	3.891E+00	1.207E+00	1.207E+00	121.08	OK
BI-214	609.32	45.49*	2.179E+00	7.560E-01	7.563E-01	26.14	OK
	1120.29	14.92	1.350E+00	9.249E-01	9.253E-01	55.63	OK
	1764.49	15.30	9.120E-01	4.811E-01	4.813E-01	89.14	OK
PB-214	74.82	5.80	3.167E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	3.429E+00	2.422E+00	2.423E+00	37.08	OK
	87.09	3.41	4.296E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	4.599E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	3.942E+00	8.680E-01	8.683E-01	29.19	OK
	351.93	35.60*	3.411E+00	7.832E-01	7.835E-01	21.24	OK
RN-222	609.32	45.49*	2.179E+00	7.560E-01	7.563E-01	26.14	OK
	1120.29	14.92	1.350E+00	9.249E-01	9.253E-01	55.63	OK
	1764.49	15.30	9.120E-01	4.811E-01	4.813E-01	89.14	OK
RA-224	240.99	4.10*	4.607E+00	1.262E+00	1.262E+00	120.32	OK
RA-226	609.32	45.49*	2.179E+00	7.560E-01	7.563E-01	26.14	OK
	1120.29	14.92	1.350E+00	9.249E-01	9.253E-01	55.63	OK
	1764.49	15.30	9.120E-01	4.811E-01	4.813E-01	89.14	OK
AC-228	105.21	1.10	5.379E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.525E+00	9.430E-01	9.430E-01	50.35	OK
	794.95	4.25	1.768E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.701E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.590E+00	8.631E-01	8.631E-01	27.35	OK
	968.97	15.80	1.513E+00	6.904E-01	6.904E-01	71.06	OK
RA-228	105.21	1.10	5.379E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.525E+00	9.430E-01	9.430E-01	50.35	OK
	794.95	4.25	1.768E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.701E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.590E+00	8.631E-01	8.631E-01	27.35	OK
	968.97	15.80	1.513E+00	6.904E-01	6.904E-01	71.06	OK
TH-228	74.82	10.28	3.170E+00	1.286E+00	1.286E+00	76.32	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	77.11	17.10	3.429E+00	1.374E+00	1.374E+00	37.08	OK
	238.63	43.60*	4.647E+00	9.611E-01	9.611E-01	14.14	OK
	300.09	3.30	3.891E+00	1.207E+00	1.207E+00	121.08	OK
TH-230	609.32	45.49*	2.179E+00	7.560E-01	7.560E-01	26.14	OK
	1120.29	14.92	1.350E+00	9.249E-01	9.250E-01	55.63	OK
	1764.49	15.30	9.120E-01	4.811E-01	4.811E-01	89.14	OK
TH-232	105.21	1.10	5.379E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.525E+00	9.430E-01	9.430E-01	50.35	OK
	835.71	1.61	1.701E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.590E+00	8.631E-01	8.631E-01	27.35	OK
	968.97	15.80	1.513E+00	6.904E-01	6.904E-01	71.06	OK
U-234	609.32	45.49*	2.179E+00	7.560E-01	7.560E-01	26.14	OK
	1120.29	14.92	1.350E+00	9.249E-01	9.250E-01	55.63	OK
	1764.49	15.30	9.120E-01	4.811E-01	4.811E-01	89.14	OK
AM-241	59.54	35.90*	1.495E+00	3.456E-01	3.461E-01	111.43	OK
AM-243	43.53	5.90	2.347E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	3.170E+00	1.968E-01	1.968E-01	76.32	OK
ANH-511	511.00	100.00*	2.510E+00	3.192E-02	3.192E-02	252.30	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                       *
*                               2040 Savage Road                          *
*                               Charleston, SC 29407                     *
*****
*                               DETECTOR AND SAMPLE DATA                 *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235040.CNF;1
* Acquisition date   : 3-OCT-2016 09:20:08 Sensitivity      : 3.000
* Detector ID       : GAM12 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.56 Half life ratio : *****
* Sample date       : 30-NOV-2015 13:23:00 Analyst initials: MXR1
* Sample ID         : G405235040 Sample Quantity : 1.7201E+02 GRAM
* Batch Number      : 1596249 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                   *
*
* Eff. Cal. date    : 22-SEP-2016 11:41:01 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM12_CAN.CNF;13
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.295E+01	1.356E+00	4.622E-01
CO-58	5.708E-01	4.780E-01	1.071E+00
CD-109	1.065E+00	2.527E+00	2.870E+00
SN-126	6.705E-02	1.591E-01	1.822E-01
BA-137M	1.345E-01	6.791E-02	5.994E-02
CS-137	1.421E-01	7.174E-02	6.332E-02
PR-144	3.217E+00	9.670E+00	6.447E+00
TL-208	2.451E-01	7.777E-02	5.007E-02
BI-212	7.986E-01	9.099E-01	8.785E-01
PB-212	9.611E-01	1.332E-01	8.824E-02
BI-214	7.563E-01	1.938E-01	1.300E-01
PB-214	7.835E-01	1.631E-01	1.070E-01
RN-222	7.563E-01	1.938E-01	1.300E-01
RA-224	1.262E+00	1.488E+00	9.454E-01
RA-226	7.563E-01	1.938E-01	1.300E-01
AC-228	8.631E-01	2.313E-01	2.020E-01
RA-228	8.631E-01	2.313E-01	2.020E-01
TH-228	9.611E-01	1.332E-01	8.824E-02
TH-230	7.560E-01	1.937E-01	1.300E-01
TH-232	8.631E-01	2.313E-01	2.020E-01
U-234	7.560E-01	1.937E-01	1.300E-01
AM-241	3.461E-01	3.779E-01	3.665E-01
AM-243	1.968E-01	1.472E-01	1.090E-01
ANH-511	3.192E-02	7.892E-02	4.917E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-5.510E+00	1.165E+01	2.120E+01	NOT IDENT.
NA-22	-2.605E-02	3.679E-02	6.434E-02	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	3.655E-03	2.971E-02	6.474E-02	NOT IDENT.
SC-46	-1.997E-01	3.379E-01	6.293E-01	FAIL ABUN
V-48	0.000E+00	1.728E+04	0.000E+00	SHORT HLIF

CR-51	0.000E+00	4.942E+02	0.000E+00	SHORT HLIF
MN-54	1.118E-02	5.682E-02	1.186E-01	NOT IDENT.
CO-56	1.057E-01	3.900E-01	7.747E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.864E-02	4.421E-02	9.225E-02	NOT IDENT.
FE-59	4.862E+00	1.355E+01	1.477E+01	FAIL ABUN
CO-60	-8.745E-03	3.492E-02	5.893E-02	NOT IDENT.
ZN-65	2.053E-02	1.586E-01	2.936E-01	NOT IDENT.
GE-68	2.099E-01	2.160E+00	4.428E+00	NOT IDENT.
AS-73	-1.083E+01	1.604E+01	2.876E+01	NOT IDENT.
AS-74	0.000E+00	7.006E+03	0.000E+00	SHORT HLIF
SE-75	-1.393E-02	1.958E-01	3.654E-01	NOT IDENT.
BR-77	0.000E+00	2.472E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	8.126E+02	0.000E+00	SHORT HLIF
RB-83	2.144E-02	6.767E-01	1.306E+00	NOT IDENT.
KR-85	1.675E+00	7.881E+00	1.376E+01	NOT IDENT.
SR-85	1.917E-01	9.057E-01	1.582E+00	NOT IDENT.
RB-86	0.000E+00	3.628E+04	0.000E+00	SHORT HLIF
Y-88	1.230E-01	2.291E-01	5.435E-01	NOT IDENT.
Y-91	2.977E+02	5.810E+02	1.223E+03	NOT IDENT.
NB-94	8.461E-03	2.810E-02	5.607E-02	NOT IDENT.
NB-95	-8.984E-02	8.139E-01	1.628E+00	NOT IDENT.
NB-95M	2.774E+00	2.690E+00	5.176E+00	NOT IDENT.
ZR-95	7.492E-02	1.627E+00	3.085E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.047E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.208E+33	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	2.038E-02	3.455E-02	7.177E-02	NOT IDENT.
RH-102	9.662E-03	5.963E-02	1.160E-01	FAIL ABUN
RU-103	6.176E+00	5.541E+00	1.240E+01	FAIL ABUN
RH-106	2.252E-02	4.572E-01	8.870E-01	NOT IDENT.
RU-106	2.252E-02	4.572E-01	8.870E-01	NOT IDENT.
AG-108M	2.777E-02	5.133E-02	4.782E-02	FAIL ABUN
AG-110M	4.762E-02	8.962E-02	1.969E-01	NOT IDENT.
SN-113	9.502E-02	2.388E-01	4.793E-01	NOT IDENT.
CD-115	0.000E+00	3.192E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.465E+05	0.000E+00	SHORT HLIF
TE-123M	-5.088E-02	1.299E-01	2.518E-01	NOT IDENT.
SB-124	-7.465E-01	1.909E+00	3.633E+00	NOT IDENT.
SB-125	-1.222E-01	1.133E-01	1.596E-01	FAIL ABUN
TE-125M	2.179E+02	2.902E+02	6.187E+02	NOT IDENT.
I-126	0.000E+00	1.308E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.839E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	7.591E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	9.512E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.949E+27	0.000E+00	SHORT HLIF
BA-133	2.374E-03	3.724E-02	6.607E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	5.001E-02	4.828E-02	1.085E-01	FAIL ABUN
CS-135	1.438E-01	1.335E-01	2.646E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	4.275E+05	0.000E+00	SHORT HLIF
CE-139	4.305E-02	9.510E-02	1.973E-01	NOT IDENT.
BA-140	0.000E+00	1.594E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	5.716E+05	0.000E+00	SHORT HLIF
CE-141	-1.054E+01	2.674E+01	5.208E+01	NOT IDENT.
CE-143	0.000E+00	7.831E+40	0.000E+00	SHORT HLIF
CE-144	-1.168E-01	3.322E-01	6.532E-01	NOT IDENT.
PM-144	3.688E-02	1.109E-01	9.315E-02	FAIL ABUN
PM-146	4.302E-03	4.119E-02	8.055E-02	NOT IDENT.
ND-147	0.000E+00	4.816E+07	0.000E+00	SHORT HLIF
PM-147	8.258E+02	7.543E+02	1.643E+03	NOT IDENT.
PM-149	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
EU-150	1.016E-02	2.381E-02	4.419E-02	FAIL ABUN
EU-152	-2.983E-02	8.740E-02	1.638E-01	FAIL ABUN
GD-153	2.578E-02	1.825E-01	3.424E-01	NOT IDENT.
EU-154	-5.921E-02	9.084E-02	1.613E-01	NOT IDENT.
EU-155	1.112E-02	1.031E-01	2.119E-01	FAIL ABUN
TB-160	1.228E+00	1.583E+00	3.665E+00	FAIL ABUN
HO-166M	9.904E-02	6.199E-02	1.134E-01	FAIL ABUN
TM-171	-3.224E+00	3.515E+01	6.700E+01	NOT IDENT.
HF-172	7.206E-02	2.255E-01	4.634E-01	NOT IDENT.
LU-172	-3.215E-03	1.013E-01	1.734E-01	FAIL ABUN
LU-176	-6.254E-03	2.198E-02	3.717E-02	FAIL ABUN
HF-181	2.035E+00	4.611E+00	9.390E+00	NOT IDENT.
TA-182	-4.575E-01	7.802E-01	1.409E+00	FAIL ABUN

RE-183	7.625E+00	8.327E+00	9.525E+00	FAIL ABUN
RE-184	5.040E+00	3.152E+01	6.557E+01	NOT IDENT.
W-188	1.599E+01	1.208E+02	2.149E+02	NOT IDENT.
IR-192	2.863E-02	4.810E-01	9.154E-01	FAIL ABUN
HG-203	1.581E+00	2.532E+00	5.203E+00	NOT IDENT.
BI-207	1.108E-02	3.946E-02	8.433E-02	FAIL ABUN
PB-210	4.707E+00	6.881E+00	1.394E+01	NOT IDENT.
BI-211	0.000E+00	4.493E-01	7.265E-01	FAIL ABUN
PB-211	3.784E-01	6.576E-01	1.340E+00	NOT IDENT.
RN-219	-4.178E-02	3.760E-01	7.153E-01	FAIL ABUN
RA-223	-1.179E-01	5.697E-01	9.681E-01	FAIL ABUN
AC-227	8.106E-02	2.059E-01	4.180E-01	FAIL ABUN
TH-227	8.106E-02	2.059E-01	4.180E-01	FAIL ABUN
TH-229	3.593E-01	4.398E-01	9.166E-01	FAIL ABUN
PA-231	4.441E-01	4.183E-01	8.293E-01	NOT IDENT.
TH-231	-1.179E-01	5.697E-01	9.681E-01	FAIL ABUN
PA-233	4.532E-03	5.972E-02	1.055E-01	FAIL ABUN
PA-234	7.769E-02	2.107E-01	4.636E-01	FAIL ABUN
PA-234M	-9.195E-01	4.037E+00	7.943E+00	NOT IDENT.
TH-234	1.104E+00	1.816E+00	3.602E+00	FAIL ABUN
U-235	-6.166E-02	1.672E-01	3.288E-01	FAIL ABUN
NP-237	4.532E-03	5.972E-02	1.055E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
U-238	1.104E+00	1.816E+00	3.602E+00	FAIL ABUN
NP-239	2.808E-01	3.602E-01	4.731E-01	FAIL ABUN
PU-239	1.204E+01	3.104E+02	6.240E+02	NOT IDENT.
CM-243	-3.044E-02	9.247E-02	1.849E-01	NOT IDENT.
BK-247	1.772E-02	6.728E-02	1.231E-01	NOT IDENT.
CM-247	-5.995E-03	3.520E-02	6.644E-02	NOT IDENT.
CF-249	9.005E-04	3.234E-02	6.331E-02	NOT IDENT.
CF-251	-1.447E-02	9.716E-02	1.917E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	342	10.66*	1.082E+00	1.295E+01	1.295E+01	10.69
CO-58	810.76	11	99.45*	1.744E+00	2.810E-02	5.708E-01	85.45
CD-109	88.03	53	3.70*	4.287E+00	1.470E+00	2.335E+00	109.26
SN-126	64.28	-----	9.60	2.033E+00	-----	Line Not Found	-----
	86.94	53	8.90	4.287E+00	6.113E-01	6.113E-01	109.26
	87.57	53	37.00*	4.287E+00	1.470E-01	1.470E-01	109.26
BA-137M	661.66	55	89.90*	2.040E+00	1.320E-01	1.345E-01	51.51
CS-137	661.66	55	85.10*	2.040E+00	1.394E-01	1.421E-01	51.51
PR-144	696.51	9	1.34*	1.960E+00	1.521E+00	3.217E+00	306.78
	1489.16	-----	0.28	1.064E+00	-----	Line Not Found	-----
TL-208	277.37	-----	6.60	4.142E+00	-----	Line Not Found	-----
	583.19	108	85.00*	2.256E+00	2.451E-01	2.451E-01	32.38
	860.56	25	12.50	1.662E+00	5.180E-01	5.180E-01	77.70
BI-211	72.87	-----	1.23	2.964E+00	-----	Line Not Found	-----
	351.06	218	12.92*	3.411E+00	2.158E+00	2.158E+00	21.24
BI-212	727.33	23	6.67*	1.894E+00	7.986E-01	7.986E-01	116.26
	785.37	19	1.10	1.783E+00	4.118E+00	4.118E+00	108.79
	1620.50	-----	1.47	9.870E-01	-----	Line Not Found	-----
PB-212	74.82	133	10.28	3.170E+00	1.776E+00	1.776E+00	54.69
	77.11	185	17.10	3.429E+00	1.374E+00	1.374E+00	37.08
	238.63	446	43.60*	4.647E+00	9.611E-01	9.611E-01	14.14
	300.09	35	3.30	3.891E+00	1.207E+00	1.207E+00	121.08
BI-214	609.32	172	45.49*	2.179E+00	7.560E-01	7.563E-01	26.14
	1120.29	43	14.92	1.350E+00	9.249E-01	9.253E-01	55.63
	1764.49	15	15.30	9.120E-01	4.811E-01	4.813E-01	89.14
PB-214	74.82	133	5.80	3.170E+00	3.148E+00	3.149E+00	54.69
	77.11	185	9.70	3.429E+00	2.422E+00	2.423E+00	37.08
	87.09	53	3.41	4.287E+00	1.596E+00	1.596E+00	109.26
	242.00	121	7.25	4.607E+00	1.582E+00	1.582E+00	51.87
	295.22	144	18.42	3.942E+00	8.680E-01	8.683E-01	29.19
RN-222	351.93	218	35.60*	3.411E+00	7.832E-01	7.835E-01	21.24
	609.32	172	45.49*	2.179E+00	7.560E-01	7.563E-01	26.14
	1120.29	43	14.92	1.350E+00	9.249E-01	9.253E-01	55.63
	1764.49	15	15.30	9.120E-01	4.811E-01	4.813E-01	89.14
RA-224	240.99	121	4.10*	4.607E+00	2.797E+00	2.797E+00	51.87
RA-226	609.32	172	45.49*	2.179E+00	7.560E-01	7.563E-01	26.14
	1120.29	43	14.92	1.350E+00	9.249E-01	9.253E-01	55.63
	1764.49	15	15.30	9.120E-01	4.811E-01	4.813E-01	89.14
AC-228	105.21	-----	1.10	5.379E+00	-----	Line Not Found	-----
	338.32	86	11.27	3.525E+00	9.430E-01	9.430E-01	50.35
	794.95	-----	4.25	1.768E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.701E+00	-----	Line Not Found	-----
	911.20	81	25.80*	1.590E+00	8.631E-01	8.631E-01	27.35
	968.97	38	15.80	1.513E+00	6.904E-01	6.904E-01	71.06
RA-228	105.21	-----	1.10	5.379E+00	-----	Line Not Found	-----
	338.32	86	11.27	3.525E+00	9.430E-01	9.430E-01	50.35
	794.95	-----	4.25	1.768E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	835.71	-----	1.61	1.701E+00	-----	Line Not Found	-----
	911.20	81	25.80*	1.590E+00	8.631E-01	8.631E-01	27.35
	968.97	38	15.80	1.513E+00	6.904E-01	6.904E-01	71.06
TH-228	74.82	133	10.28	3.170E+00	1.776E+00	1.776E+00	54.69
	77.11	185	17.10	3.429E+00	1.374E+00	1.374E+00	37.08
	238.63	446	43.60*	4.647E+00	9.611E-01	9.611E-01	14.14
	300.09	35	3.30	3.891E+00	1.207E+00	1.207E+00	121.08
TH-230	609.32	172	45.49*	2.179E+00	7.560E-01	7.560E-01	26.14
	1120.29	43	14.92	1.350E+00	9.249E-01	9.250E-01	55.63
	1764.49	15	15.30	9.120E-01	4.811E-01	4.811E-01	89.14
TH-232	105.21	-----	1.10	5.379E+00	-----	Line Not Found	-----
	338.32	86	11.27	3.525E+00	9.430E-01	9.430E-01	50.35
	835.71	-----	1.61	1.701E+00	-----	Line Not Found	-----
	911.20	81	25.80*	1.590E+00	8.631E-01	8.631E-01	27.35
	968.97	38	15.80	1.513E+00	6.904E-01	6.904E-01	71.06
U-234	609.32	172	45.49*	2.179E+00	7.560E-01	7.560E-01	26.14
	1120.29	43	14.92	1.350E+00	9.249E-01	9.250E-01	55.63
	1764.49	15	15.30	9.120E-01	4.811E-01	4.811E-01	89.14
AM-241	59.54	42	35.90*	1.495E+00	3.456E-01	3.461E-01	111.43
AM-243	43.53	-----	5.90	2.347E-01	-----	Line Not Found	-----
	74.66	133	67.20*	3.170E+00	2.717E-01	2.717E-01	54.69
ANH-511	511.00	18	100.00*	2.510E+00	3.192E-02	3.192E-02	252.30

Flag: "*" = Keyline

Total number of lines in spectrum 52
 Number of unidentified lines 15
 Number of lines tentatively identified by NID 37 71.15%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.295E+01	1.295E+01	0.138E+01	10.69	
CO-58	70.86D	20.3	2.810E-02	5.708E-01	4.877E-01	85.45	
CD-109	461.40D	1.59	1.470E+00	2.335E+00	2.551E+00	109.26	
SN-126	2.30E+05Y	1.00	1.470E-01	1.470E-01	1.607E-01	109.26	
BA-137M	30.08Y	1.02	1.320E-01	1.345E-01	0.693E-01	51.51	
CS-137	30.08Y	1.02	1.394E-01	1.421E-01	0.732E-01	51.51	
PR-144	284.91D	2.11	1.521E+00	3.217E+00	9.868E+00	306.78	
TL-208	1.41E+10Y	1.00	2.451E-01	2.451E-01	0.794E-01	32.38	
BI-211	7.04E+08Y	1.00	2.158E+00	2.158E+00	0.458E+00	21.24	
BI-212	1.41E+10Y	1.00	7.986E-01	7.986E-01	9.285E-01	116.26	
PB-212	1.41E+10Y	1.00	9.611E-01	9.611E-01	1.359E-01	14.14	
BI-214	1600.00Y	1.00	7.560E-01	7.563E-01	1.977E-01	26.14	
PB-214	1600.00Y	1.00	7.832E-01	7.835E-01	1.664E-01	21.24	
RN-222	1600.00Y	1.00	7.560E-01	7.563E-01	1.977E-01	26.14	
RA-224	1.41E+10Y	1.00	2.797E+00	2.797E+00	1.451E+00	51.87	
RA-226	1600.00Y	1.00	7.560E-01	7.563E-01	1.977E-01	26.14	
AC-228	1.41E+10Y	1.00	8.631E-01	8.631E-01	2.361E-01	27.35	
RA-228	1.41E+10Y	1.00	8.631E-01	8.631E-01	2.361E-01	27.35	
TH-228	1.41E+10Y	1.00	9.611E-01	9.611E-01	1.359E-01	14.14	
TH-230	7.54E+04Y	1.00	7.560E-01	7.560E-01	1.976E-01	26.14	
TH-232	1.41E+10Y	1.00	8.631E-01	8.631E-01	2.361E-01	27.35	
U-234	2.45E+05Y	1.00	7.560E-01	7.560E-01	1.976E-01	26.14	
AM-241	432.60Y	1.00	3.456E-01	3.461E-01	3.856E-01	111.43	
AM-243	7370.00Y	1.00	2.717E-01	2.717E-01	1.486E-01	54.69	
ANH-511	1.00E+09Y	1.00	3.192E-02	3.192E-02	8.053E-02	252.30	
Total Activity :			3.211E+01	3.522E+01			

Grand Total Activity : 3.211E+01 3.522E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
4	36.14	55	42	1.76	72.12	68	16	1.00E-02	87.2	2.66E-02	
4	37.58	20	51	1.21	75.00	68	16	3.75E-03	****	4.73E-02	
0	93.16	89	175	1.65	186.14	182	9	1.80E-02	74.4	4.74E+00	T
0	116.83	29	97	0.49	233.50	230	6	6.07E-03	****	5.74E+00	T
0	154.17	15	134	1.17	308.17	305	7	3.27E-03	****	5.86E+00	T
0	185.69	122	107	1.20	371.22	367	10	2.65E-02	43.2	5.45E+00	T
0	270.09	64	81	1.26	540.03	535	10	1.47E-02	64.3	4.23E+00	T
0	310.07	20	73	1.78	620.00	612	11	4.53E-03	****	3.79E+00	
0	328.27	26	68	1.37	656.40	649	9	6.12E-03	****	3.61E+00	T
0	433.68	16	48	0.71	867.27	859	12	3.97E-03	****	2.87E+00	T
0	463.28	38	56	1.84	926.47	919	13	9.25E-03	93.2	2.72E+00	T
0	568.90	50	53	1.95	1137.78	1131	16	1.25E-02	75.0	2.30E+00	T
0	711.78	24	9	0.53	1423.66	1420	10	6.07E-03	63.9	1.93E+00	T
5	839.82	10	4	1.36	1679.87	1678	14	2.70E-03	76.9	1.69E+00	
5	842.93	24	8	2.76	1686.08	1678	14	6.43E-03	65.7	1.69E+00	
0	918.40	6	5	0.49	1837.13	1833	6	1.54E-03	****	1.58E+00	
0	934.87	24	8	2.45	1870.07	1864	12	6.45E-03	65.6	1.56E+00	
0	954.97	9	6	1.47	1910.29	1903	11	2.36E-03	****	1.53E+00	T
0	1099.51	7	20	4.47	2199.60	2189	12	1.94E-03	****	1.37E+00	T
0	1185.40	12	6	2.75	2371.50	2365	12	3.33E-03	****	1.29E+00	
0	1238.67	27	6	0.74	2478.13	2474	10	7.35E-03	53.8	1.24E+00	T
0	1242.98	7	2	0.62	2486.77	2484	6	2.04E-03	91.5	1.24E+00	
0	1255.12	11	24	3.73	2511.07	2499	18	3.08E-03	****	1.23E+00	
0	1321.66	10	2	2.11	2644.27	2638	10	2.78E-03	85.4	1.18E+00	
0	1325.88	7	0	0.58	2652.71	2650	6	1.94E-03	75.6	1.18E+00	
0	1337.19	7	1	0.69	2675.36	2672	6	2.08E-03	89.4	1.17E+00	
0	1340.06	6	3	0.52	2681.10	2678	6	1.60E-03	****	1.17E+00	
0	1589.14	9	3	3.47	3179.79	3173	13	2.67E-03	****	1.00E+00	

Flags: "T" = Tentatively associated

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235040.CNF;1
* Acquisition date   : 3-OCT-2016 09:20:08 Sensitivity      : 3.000
* Detector ID       : GAM12 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.56 Half life ratio  : *****
* Sample date       : 30-NOV-2015 13:23:00 Nuclide Library : SOLID
* Sample ID        : G405235040 Analyst initials: MXR1
* Batch Number     : 1596249 Sample Quantity  : 1.7201E+02 GRAM
* Wet wt corr      : 1.00000 Wet Weight      : 0.00000
* Dry Weight       : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 22-SEP-2016 11:41:01 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM12_CAN.CNF;13
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.792E-01
CO-58	4.640E-01
CD-109	1.371E+00
SN-126	8.705E-02
BA-137M	2.656E-02
CS-137	2.806E-02
PR-144	2.730E+00
TL-208	2.182E-02
BI-212	3.909E-01
PB-212	4.100E-02
BI-214	5.881E-02
PB-214	4.833E-02
RN-222	5.881E-02
RA-224	4.393E-01
RA-226	5.881E-02
AC-228	8.619E-02
RA-228	8.619E-02
TH-228	4.100E-02
TH-230	5.878E-02
TH-232	8.619E-02
U-234	5.878E-02
AM-241	1.712E-01
AM-243	5.140E-02
ANH-511	2.212E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	9.365E+00	NOT IDENT.
NA-22	2.598E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.569E-02	NOT IDENT.
SC-46	2.667E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF

MN-54	5.220E-02	NOT IDENT.
CO-56	3.300E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	4.330E-02	NOT IDENT.
FE-59	6.444E+00	FAIL ABUN
CO-60	2.374E-02	NOT IDENT.
ZN-65	1.257E-01	NOT IDENT.
GE-68	1.918E+00	NOT IDENT.
AS-73	1.339E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.679E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.868E-01	NOT IDENT.
KR-85	6.280E+00	NOT IDENT.
SR-85	7.216E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	2.214E-01	NOT IDENT.
Y-91	5.420E+02	NOT IDENT.
NB-94	2.489E-02	NOT IDENT.
NB-95	7.199E-01	NOT IDENT.
NB-95M	2.436E+00	NOT IDENT.
ZR-95	1.371E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.397E-02	NOT IDENT.
RH-102	5.193E-02	FAIL ABUN
RU-103	5.591E+00	FAIL ABUN
RH-106	3.922E-01	NOT IDENT.
RU-106	3.922E-01	NOT IDENT.
AG-108M	2.151E-02	FAIL ABUN
AG-110M	8.636E-02	NOT IDENT.
SN-113	2.200E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.180E-01	NOT IDENT.
SB-124	1.360E+00	NOT IDENT.
SB-125	7.090E-02	FAIL ABUN
TE-125M	2.915E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.988E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	4.890E-02	FAIL ABUN
CS-135	1.231E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	9.208E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.445E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.060E-01	NOT IDENT.
PM-144	4.092E-02	FAIL ABUN
PM-146	3.643E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.730E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.023E-02	FAIL ABUN
EU-152	7.484E-02	FAIL ABUN
GD-153	1.603E-01	NOT IDENT.
EU-154	6.553E-02	NOT IDENT.
EU-155	9.952E-02	FAIL ABUN
TB-160	1.596E+00	FAIL ABUN
HO-166M	5.083E-02	FAIL ABUN
TM-171	3.121E+01	NOT IDENT.
HF-172	2.185E-01	NOT IDENT.
LU-172	7.721E-02	FAIL ABUN
LU-176	1.683E-02	FAIL ABUN
HF-181	4.246E+00	NOT IDENT.
TA-182	5.903E-01	FAIL ABUN
RE-183	4.465E+00	FAIL ABUN

RE-184	2.865E+01	NOT IDENT.
W-188	9.913E+01	NOT IDENT.
IR-192	4.210E-01	FAIL ABUN
HG-203	2.419E+00	NOT IDENT.
BI-207	3.631E-02	FAIL ABUN
PB-210	6.569E+00	NOT IDENT.
BI-211	3.492E-01	FAIL ABUN
PB-211	6.160E-01	NOT IDENT.
RN-219	3.268E-01	FAIL ABUN
RA-223	4.410E-01	FAIL ABUN
AC-227	1.939E-01	FAIL ABUN
TH-227	1.939E-01	FAIL ABUN
TH-229	4.313E-01	FAIL ABUN
PA-231	3.844E-01	NOT IDENT.
TH-231	4.410E-01	FAIL ABUN
PA-233	4.842E-02	FAIL ABUN
PA-234	1.990E-01	FAIL ABUN
PA-234M	3.484E+00	NOT IDENT.
TH-234	1.709E+00	FAIL ABUN
U-235	1.546E-01	FAIL ABUN
NP-237	4.842E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.709E+00	FAIL ABUN
NP-239	2.224E-01	FAIL ABUN
PU-239	2.948E+02	NOT IDENT.
CM-243	8.650E-02	NOT IDENT.
BK-247	5.663E-02	NOT IDENT.
CM-247	3.039E-02	NOT IDENT.
CF-249	2.865E-02	NOT IDENT.
CF-251	8.923E-02	NOT IDENT.

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235040.CNF;1
* Acquisition date   : 3-OCT-2016 09:20:08 Sensitivity      : 3.000
* Detector ID        : GAM12 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.56 Half life ratio  : *****
* Sample date        : 30-NOV-2015 13:23:00 Nuclide Library : SOLID
* Sample ID          : G405235040 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity : 1.7201E+02 GRAM
*                   : Quantity Err(%) : 1.1627E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight       : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 22-SEP-2016 11:41:01 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM12_CAN.CNF;13
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.295E+01	1.517E+00	1.517E+00
CO-58	5.708E-01	4.786E-01	4.786E-01
CD-109	1.065E+00	2.533E+00	2.533E+00
SN-126	6.705E-02	1.595E-01	1.595E-01
BA-137M	1.345E-01	6.816E-02	6.816E-02
CS-137	1.421E-01	7.201E-02	7.201E-02
PR-144	3.217E+00	9.671E+00	9.671E+00
TL-208	2.451E-01	7.848E-02	7.848E-02
BI-212	7.986E-01	9.109E-01	9.109E-01
PB-212	9.611E-01	1.429E-01	1.429E-01
BI-214	7.563E-01	1.965E-01	1.965E-01
PB-214	7.835E-01	1.665E-01	1.665E-01
RN-222	7.563E-01	1.965E-01	1.965E-01
RA-224	1.262E+00	1.493E+00	1.493E+00
RA-226	7.563E-01	1.965E-01	1.965E-01
AC-228	8.631E-01	2.355E-01	2.355E-01
RA-228	8.631E-01	2.355E-01	2.355E-01
TH-228	9.611E-01	1.429E-01	1.429E-01
TH-230	7.560E-01	1.964E-01	1.964E-01
TH-232	8.631E-01	2.355E-01	2.355E-01
U-234	7.560E-01	1.964E-01	1.964E-01
AM-241	3.461E-01	3.788E-01	3.788E-01
AM-243	1.968E-01	1.480E-01	1.480E-01
ANH-511	3.192E-02	7.893E-02	7.893E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-5.510E+00	1.166E+01	1.192E+01	NOT IDENT.
NA-22	-2.605E-02	3.680E-02	3.863E-02	NOT IDENT.
NA-24	1.000E+41	3.840E+41	0.000E+00	SHORT HLIF
AL-26	3.655E-03	2.971E-02	2.975E-02	NOT IDENT.
SC-46	-1.997E-01	3.380E-01	3.498E-01	FAIL ABUN
V-48	-1.061E+04	1.728E+04	1.793E+04	SHORT HLIF

CR-51	-9.408E+01	4.942E+02	4.960E+02	SHORT HLIF
MN-54	1.118E-02	5.683E-02	5.705E-02	NOT IDENT.
CO-56	1.057E-01	3.901E-01	3.929E-01	FAIL ABUN
MN-56	1.000E+41	3.691E+41	0.000E+00	SHORT HLIF
CO-57	1.864E-02	4.422E-02	4.501E-02	NOT IDENT.
FE-59	4.862E+00	1.355E+01	1.373E+01	FAIL ABUN
CO-60	-8.745E-03	3.492E-02	3.514E-02	NOT IDENT.
ZN-65	2.053E-02	1.586E-01	1.588E-01	NOT IDENT.
GE-68	2.099E-01	2.160E+00	2.162E+00	NOT IDENT.
AS-73	-1.083E+01	1.619E+01	1.691E+01	NOT IDENT.
AS-74	1.824E+02	7.006E+03	7.006E+03	SHORT HLIF
SE-75	-1.393E-02	1.958E-01	1.959E-01	NOT IDENT.
BR-77	1.784E+39	1.585E+40	0.000E+00	SHORT HLIF
SR-82	6.831E+02	8.132E+02	8.696E+02	SHORT HLIF
RB-83	2.144E-02	6.767E-01	6.768E-01	NOT IDENT.
KR-85	1.675E+00	7.881E+00	7.918E+00	NOT IDENT.
SR-85	1.917E-01	9.057E-01	9.099E-01	NOT IDENT.
RB-86	1.561E+03	3.628E+04	3.628E+04	SHORT HLIF
Y-88	1.230E-01	2.292E-01	2.359E-01	NOT IDENT.
Y-91	2.977E+02	5.811E+02	5.964E+02	NOT IDENT.
NB-94	8.461E-03	2.810E-02	2.836E-02	NOT IDENT.
NB-95	-8.984E-02	8.139E-01	8.149E-01	NOT IDENT.
NB-95M	2.774E+00	2.699E+00	2.975E+00	NOT IDENT.
ZR-95	7.492E-02	1.627E+00	1.627E+00	NOT IDENT.
NB-97	1.000E+41	9.049E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.048E+41	0.000E+00	SHORT HLIF
MO-99	6.152E+31	1.208E+33	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	7.838E+41	0.000E+00	SHORT HLIF
RH-101	2.038E-02	3.475E-02	3.594E-02	NOT IDENT.
RH-102	9.662E-03	5.964E-02	5.980E-02	FAIL ABUN
RU-103	6.176E+00	5.549E+00	6.208E+00	FAIL ABUN
RH-106	2.252E-02	4.572E-01	4.573E-01	NOT IDENT.
RU-106	2.252E-02	4.572E-01	4.573E-01	NOT IDENT.
AG-108M	2.777E-02	5.134E-02	5.284E-02	FAIL ABUN
AG-110M	4.762E-02	8.965E-02	9.218E-02	NOT IDENT.
SN-113	9.502E-02	2.388E-01	2.426E-01	NOT IDENT.
CD-115	-2.288E+40	3.220E+40	0.000E+00	SHORT HLIF
SN-117M	-9.273E+04	1.469E+05	1.527E+05	SHORT HLIF
TE-123M	-5.088E-02	1.299E-01	1.319E-01	NOT IDENT.
SB-124	-7.465E-01	1.910E+00	1.939E+00	NOT IDENT.
SB-125	-1.222E-01	1.134E-01	1.261E-01	FAIL ABUN
TE-125M	2.179E+02	2.904E+02	3.066E+02	NOT IDENT.
I-126	2.075E+05	1.308E+06	1.311E+06	SHORT HLIF
SB-126	-5.838E+05	1.842E+06	1.861E+06	SHORT HLIF
SB-127	6.613E+21	7.648E+22	0.000E+00	SHORT HLIF
I-131	4.771E+09	9.515E+09	9.755E+09	SHORT HLIF
I-132	1.000E+41	6.859E+42	0.000E+00	SHORT HLIF
TE-132	1.845E+27	2.095E+27	0.000E+00	SHORT HLIF
BA-133	2.374E-03	3.724E-02	3.725E-02	NOT IDENT.
I-133	-1.000E+41	8.787E+42	0.000E+00	SHORT HLIF
CS-134	5.001E-02	4.833E-02	5.333E-02	FAIL ABUN
CS-135	1.438E-01	1.339E-01	1.487E-01	NOT IDENT.
I-135	1.000E+41	1.162E+42	0.000E+00	SHORT HLIF
CS-136	-9.550E+04	4.277E+05	4.298E+05	SHORT HLIF
CE-139	4.305E-02	9.550E-02	9.745E-02	NOT IDENT.
BA-140	3.900E+05	1.594E+06	1.603E+06	SHORT HLIF
LA-140	1.140E+05	5.716E+05	5.739E+05	SHORT HLIF
CE-141	-1.054E+01	2.674E+01	2.716E+01	NOT IDENT.
CE-143	1.000E+41	7.901E+40	0.000E+00	SHORT HLIF
CE-144	-1.168E-01	3.323E-01	3.364E-01	NOT IDENT.
PM-144	3.688E-02	1.109E-01	1.121E-01	FAIL ABUN
PM-146	4.302E-03	4.119E-02	4.124E-02	NOT IDENT.
ND-147	-3.261E+06	4.816E+07	4.819E+07	SHORT HLIF
PM-147	8.258E+02	7.552E+02	8.420E+02	NOT IDENT.
PM-149	-1.000E+41	2.688E+41	0.000E+00	SHORT HLIF
EU-150	1.016E-02	2.381E-02	2.425E-02	FAIL ABUN
EU-152	-2.983E-02	8.741E-02	8.844E-02	FAIL ABUN
GD-153	2.578E-02	1.825E-01	1.829E-01	NOT IDENT.
EU-154	-5.921E-02	9.088E-02	9.471E-02	NOT IDENT.
EU-155	1.112E-02	1.031E-01	1.033E-01	FAIL ABUN
TB-160	1.228E+00	1.585E+00	1.679E+00	FAIL ABUN
HO-166M	9.904E-02	6.222E-02	7.658E-02	FAIL ABUN
TM-171	-3.224E+00	3.515E+01	3.518E+01	NOT IDENT.
HF-172	7.206E-02	2.258E-01	2.281E-01	NOT IDENT.
LU-172	-3.215E-03	1.013E-01	1.013E-01	FAIL ABUN
LU-176	-6.254E-03	2.198E-02	2.216E-02	FAIL ABUN
HF-181	2.035E+00	4.611E+00	4.702E+00	NOT IDENT.
TA-182	-4.575E-01	7.804E-01	8.072E-01	FAIL ABUN

RE-183	7.625E+00	8.414E+00	9.089E+00	FAIL ABUN
RE-184	5.040E+00	3.154E+01	3.162E+01	NOT IDENT.
W-188	1.599E+01	1.208E+02	1.210E+02	NOT IDENT.
IR-192	2.863E-02	4.810E-01	4.811E-01	FAIL ABUN
HG-203	1.581E+00	2.533E+00	2.632E+00	NOT IDENT.
BI-207	1.108E-02	3.946E-02	3.978E-02	FAIL ABUN
PB-210	4.707E+00	6.895E+00	7.214E+00	NOT IDENT.
BI-211	2.158E+00	4.599E-01	1.076E+00	FAIL ABUN
PB-211	3.784E-01	6.579E-01	6.797E-01	NOT IDENT.
RN-219	-4.178E-02	3.760E-01	3.765E-01	FAIL ABUN
RA-223	-1.179E-01	5.698E-01	5.722E-01	FAIL ABUN
AC-227	8.106E-02	2.062E-01	2.094E-01	FAIL ABUN
TH-227	8.106E-02	2.062E-01	2.094E-01	FAIL ABUN
TH-229	3.593E-01	4.401E-01	4.690E-01	FAIL ABUN
PA-231	4.441E-01	4.289E-01	4.733E-01	NOT IDENT.
TH-231	-1.179E-01	5.698E-01	5.722E-01	FAIL ABUN
PA-233	4.532E-03	5.972E-02	5.975E-02	FAIL ABUN
PA-234	7.769E-02	2.287E-01	2.314E-01	FAIL ABUN
PA-234M	-9.195E-01	4.037E+00	4.059E+00	NOT IDENT.
TH-234	1.104E+00	1.833E+00	1.899E+00	FAIL ABUN
U-235	-6.166E-02	1.673E-01	1.696E-01	FAIL ABUN
NP-237	4.532E-03	5.972E-02	5.975E-02	FAIL ABUN
NP-238	-1.000E+41	2.125E+41	0.000E+00	SHORT HLIF
U-238	1.104E+00	1.833E+00	1.899E+00	FAIL ABUN
NP-239	2.808E-01	3.609E-01	3.825E-01	FAIL ABUN
PU-239	1.204E+01	3.104E+02	3.105E+02	NOT IDENT.
CM-243	-3.044E-02	9.251E-02	9.352E-02	NOT IDENT.
BK-247	1.772E-02	6.738E-02	6.785E-02	NOT IDENT.
CM-247	-5.995E-03	3.521E-02	3.531E-02	NOT IDENT.
CF-249	9.005E-04	3.234E-02	3.234E-02	NOT IDENT.
CF-251	-1.447E-02	9.717E-02	9.739E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	51.9531	87.09	132.1236	136.47	66.4241
45.60	85.5104	87.57	153.2205	140.51	0.0000
46.54	70.9532	88.03	153.2949	143.76	82.1577
49.72	0.0000	88.34	142.6056	144.24	70.4471
51.35	72.6906	88.47	142.6250	145.44	88.5932
51.87	73.9776	89.96	136.8226	152.43	74.9796
52.39	61.6936	1093.63	136.9188	153.25	0.0000
52.97	70.3883	91.11	0.0000	323.87	88.2753
53.44	75.3776	92.59	103.5413	156.02	0.0000
54.07	80.3913	93.35	103.6212	158.56	0.0000
57.36	0.0000	94.56	67.4359	159.00	84.9359
57.53	76.2164	94.65	67.4423	162.33	76.9026
57.98	81.2358	94.67	67.4435	162.66	0.0000
59.27	67.2592	94.87	67.4569	163.33	80.6228
59.32	67.2635	97.43	68.9297	165.86	55.9880
59.54	67.2831	98.43	59.8844	176.31	59.1732
60.96	91.5419	98.44	59.8851	176.60	0.0000
61.17	104.8859	99.53	67.7684	177.52	63.8494
62.93	98.8662	100.11	79.1075	181.07	0.0000
63.29	85.1390	102.03	70.5450	181.52	52.8884
63.58	85.1703	103.18	77.5980	184.41	65.5423
64.28	85.2458	103.37	77.6120	143.76	66.0649
66.73	98.9191	105.21	76.8738	193.51	65.4683
67.24	99.8204	105.31	76.8809	197.03	71.2415
125.81	105.7492	106.12	83.0598	198.01	59.0926
67.75	105.7581	106.47	76.9646	201.83	62.9972
69.67	83.2896	109.28	71.0274	203.43	64.0025
70.83	89.7234	111.00	86.9483	205.31	49.0007
72.81	103.8670	111.76	0.0000	210.85	71.8631
72.87	103.8745	114.06	68.6947	215.65	57.8490
74.66	92.2432	116.30	0.0000	222.11	65.6898
74.82	92.2598	116.74	58.2656	227.09	68.7480
74.97	92.2759	119.76	74.3532	227.38	66.8498
77.11	92.5015	121.12	58.4892	228.16	0.0000
78.74	79.0685	121.22	59.3805	228.18	46.8168
79.69	97.0254	121.78	66.5031	116.74	46.8168
80.12	103.4580	122.06	68.2930	235.69	59.0157
80.19	0.0000	122.92	83.4324	235.96	60.4647
80.57	111.1767	123.07	87.8813	238.63	57.6733
81.00	111.2298	265.00	90.5916	238.98	0.0000
81.07	102.2882	125.81	82.7482	240.99	57.7502
81.75	104.9236	127.23	89.0828	242.00	57.7832
83.79	85.9204	127.91	82.8946	244.70	47.7437
84.00	85.9398	129.30	96.3762	252.40	0.0000
85.43	116.9034	131.20	84.9090	252.80	46.5049
86.55	110.6120	133.02	82.3512	254.15	0.0000
86.79	132.0813	133.52	81.4894	256.23	47.5625
86.94	132.1025	136.00	61.0156	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	44.4635	355.39	0.0000	584.27	15.5199
264.80	45.6374	356.01	29.0410	595.83	0.0000
265.00	39.4980	364.49	0.0000	427.87	15.5990
268.22	36.6348	366.42	0.0000	602.52	0.0000
269.46	43.9902	372.51	36.9463	604.72	26.7754
270.03	44.0030	375.05	45.2049	607.14	30.1443
271.23	44.0314	377.52	43.1954	609.32	30.1641
273.65	0.0000	356.01	32.9987	610.33	30.1740
276.40	51.0172	388.16	29.9588	614.28	15.1051
277.37	46.1346	388.63	0.0000	618.01	23.5233
277.60	46.1404	391.69	35.1753	620.36	20.1775
278.00	46.1499	264.66	39.4581	621.93	19.0655
279.20	46.1786	401.81	39.4766	630.19	0.0000
279.54	40.2901	402.40	41.5641	631.29	22.4927
279.70	40.2935	404.85	33.2845	633.25	22.5065
280.46	52.1072	410.95	35.4513	634.78	0.0000
283.69	56.1326	413.71	34.4468	635.95	30.4080
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	44.3536	423.72	0.0000	645.85	11.2952
285.90	0.0000	427.09	42.4981	657.76	17.0020
287.50	49.3347	427.87	40.9368	657.90	0.0000
290.67	44.4717	433.94	36.2983	661.66	20.4250
293.27	0.0000	439.40	30.5759	664.57	0.0000
351.93	38.6295	453.88	28.6232	666.33	0.0000
295.96	38.6437	463.37	29.7882	666.50	0.0000
879.38	38.6937	468.07	23.9781	667.71	0.0000
299.98	38.7207	473.00	0.0000	677.62	17.0990
300.09	38.7223	475.06	16.0263	685.70	0.0000
300.13	38.7231	476.78	21.3818	695.00	0.0000
301.36	32.7858	477.60	25.6655	696.49	12.6064
302.85	29.8267	482.18	23.5657	696.51	10.3143
256.23	29.8511	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	13.7554
306.78	35.8608	497.08	13.9992	697.49	13.7563
308.46	38.8810	505.52	23.3288	702.65	17.2198
311.90	40.4431	507.63	0.0000	706.68	15.1701
316.51	41.0325	511.00	27.0523	711.68	17.2626
319.41	0.0000	514.00	32.4963	720.70	0.0000
320.08	0.0000	514.00	32.4963	721.93	0.0000
321.04	39.1143	520.40	26.0537	722.78	29.4356
323.87	39.1658	520.69	0.0000	722.91	29.4366
325.23	43.7133	522.65	0.0000	723.31	24.2454
328.76	0.0000	527.90	0.0000	724.19	17.3218
333.37	34.7997	528.26	25.0355	727.33	21.9602
333.97	31.7820	529.59	14.1569	733.00	17.3633
334.37	28.7609	529.87	0.0000	735.93	17.3767
338.28	44.4816	531.02	0.0000	333.97	19.7019
338.32	44.4825	537.26	0.0000	739.50	0.0000
311.90	42.5024	546.56	0.0000	747.24	13.9438
340.48	42.5024	552.55	15.3621	748.06	15.1090
340.55	0.0000	563.25	24.7751	752.31	15.1259
344.28	43.5888	569.33	24.2720	753.82	0.0000
345.93	36.5200	946.00	24.2738	756.73	20.9678
351.06	29.4862	569.70	24.2756	756.80	20.9685
351.93	29.4974	583.19	15.5142	884.68	17.5067

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	21.0183	1274.44	14.8003	1620.50	3.1053
766.42	20.1454	1001.03	16.6679	1621.92	5.1767
766.84	17.5195	1002.74	12.0423	1678.03	0.0000
772.60	0.0000	1004.73	12.9742	1690.97	5.2304
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	5.2866
778.90	17.5751	1028.54	0.0000	1063.66	9.5235
783.70	0.0000	1037.84	11.1995	1771.35	5.2914
785.37	7.0417	1038.76	0.0000	1791.20	0.0000
792.07	17.6343	631.29	9.3500	1808.65	4.2556
794.95	15.0000	1048.07	0.0000	1810.72	0.0000
795.86	15.0037	1049.04	14.9678	1836.06	3.2040
810.06	14.1719	1050.41	13.1002		
810.29	14.1729	1063.66	10.3219		
344.28	14.1733	1077.00	0.0000		
810.76	14.1743	1077.34	13.1737		
815.77	0.0000	1085.87	12.2542		
1048.07	0.0000	1093.63	22.6582		
832.01	12.4683	1099.45	18.1488		
834.85	16.0417	1112.07	16.1097		
835.71	19.0163	1112.84	20.5798		
836.80	0.0000	1115.54	10.6210		
846.75	0.0000	1120.29	13.2882		
846.77	8.5808	1120.55	13.2891		
856.80	0.0000	1221.41	13.2916		
860.56	23.3173	1129.67	17.1167		
871.09	12.5871	1131.51	0.0000		
873.19	10.7944	1147.95	0.0000		
875.33	0.0000	1173.23	11.5093		
879.38	8.1076	1177.95	12.4795		
880.51	13.5164	1189.05	7.6958		
883.24	17.1318	1204.77	14.4736		
884.68	11.7257	1221.41	14.5184		
889.28	16.2532	1231.02	14.5450		
894.76	9.9453	1235.36	0.0000		
898.04	15.3819	1238.28	21.7492		
900.72	11.7697	1260.41	0.0000		
903.28	14.4946	1271.87	11.7231		
911.20	11.4097	1274.44	11.7290		
912.08	11.4120	1274.54	11.7290		
923.98	0.0000	1291.59	5.8828		
926.50	10.0184	1298.22	0.0000		
929.11	4.3743	1312.11	0.0000		
937.49	13.1480	1332.49	7.9009		
944.13	0.0000	1362.66	0.0000		
946.00	9.1483	1365.19	6.9526		
949.00	5.8588	1368.63	0.0000		
667.71	0.0000	1384.29	3.9861		
962.31	10.2833	1408.01	7.0034		
964.08	19.1052	1457.56	0.0000		
966.17	16.1734	1460.82	4.0374		
911.20	18.3905	1489.16	2.0281		
968.97	18.3905	1505.03	6.0996		
983.53	0.0000	1584.12	8.2349		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621354.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM16.CNF;440
Background date  : 2-OCT-2016 11:00:50.
Sample date      : 12-SEP-2016 00:00:00 Acquisition date : 3-OCT-2016 09:20:38.
Sample ID       : G1203621354 Sample quantity  : 1.78756E+02 GRAM
Detector name   : GAM16 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.18 0.0%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity    : 3.00000
Batch ID        : 1596249 Detector SN#    :
Matrix Spike ID : LCS ID          : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	92.48*	46	60	1.41	184.98	178	15	1.29E-02	42.6	
2	0	111.49	18	29	1.43	222.97	218	9	4.91E-03	60.1	
3	0	144.01*	17	35	1.23	287.97	283	11	4.76E-03	74.8	
4	0	185.87*	6	35	2.03	371.66	368	9	1.57E-03	218.9	
5	0	199.03*	16	26	1.28	397.97	393	8	4.49E-03	63.9	
6	0	273.79	23	68	5.30	547.42	534	21	6.41E-03	91.8	
7	0	299.66	22	9	0.88	599.14	595	9	6.11E-03	32.5	
8	0	383.80	8	22	0.80	767.34	760	10	2.15E-03	119.8	
9	0	422.80	16	6	2.99	845.31	840	9	4.33E-03	39.1	
10	0	511.46*	19	9	2.61	1022.57	1016	16	5.15E-03	70.0	
11	0	551.98	7	2	1.46	1103.57	1100	7	2.07E-03	46.7	
12	0	565.28	9	9	1.58	1130.16	1126	11	2.62E-03	67.7	
13	0	638.92	7	9	0.59	1277.39	1269	11	1.94E-03	97.2	
14	0	838.68	7	5	1.37	1676.81	1672	10	1.94E-03	70.7	
15	0	849.09	8	0	1.49	1697.63	1695	6	2.22E-03	35.4	
16	0	1461.40*	4	5	0.89	2922.12	2916	10	1.05E-03	136.7	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621354.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 12-SEP-2016 00:00:00 Acquisition date : 3-OCT-2016 09:20:38
Sample ID         : G1203621354 Sample quantity   : 178.76 GRAM
Sample type       : SOLID Sample geometry    :
Detector name     : GAMMA16 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.18 0.0%
Energy tolerance  : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error    : 0.00 %
Efficiency type   : Linear Efficiencies at   : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
U-235	143.76	CE-141	145.44

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.215E+00	1.203E-01	1.203E-01	273.45	OK
CE-141	145.44	48.29*	6.768E+00	2.709E-02	4.277E-02	166.66	OK
U-235	89.96	3.47	5.608E+00	----- Line	Not Found	-----	Absent
	93.35	5.60	5.774E+00	8.508E-01	8.508E-01	85.24	OK
	143.76	10.96*	6.770E+00	----- Line	Not Found	-----	<<INT Reject
	163.33	5.08	6.541E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.166E+00	8.759E-03	8.759E-03	437.85	OK
	205.31	5.01	5.819E+00	----- Line	Not Found	-----	Absent
ANH-511	511.00	100.00*	2.835E+00	3.146E-02	3.146E-02	139.98	OK

Flag: "*" = Keyline

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621354.CNF;1
* Acquisition date   : 3-OCT-2016 09:20:38 Sensitivity      : 3.000
* Detector ID       : GAM16 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.18 Half life ratio : *****
* Sample date       : 12-SEP-2016 00:00:00 Analyst initials: MXR1
* Sample ID         : G1203621354 Sample Quantity : 1.7876E+02 GRAM
* Batch Number      : 1596249 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date    : 23-SEP-2016 08:25:42 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM16_CAN.CNF;14
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.203E-01	3.224E-01	4.423E-01
CE-141	4.277E-02	6.985E-02	4.733E-02
U-235	1.305E-01	1.913E-01	1.847E-01
ANH-511	3.146E-02	4.315E-02	2.498E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-8.196E-02		1.605E-01	3.033E-01	NOT IDENT.
NA-22	-3.268E-03		1.382E-02	2.963E-02	NOT IDENT.
NA-24	0.000E+00		2.654E+08	0.000E+00	SHORT HLIF
AL-26	-2.113E-02		2.232E-02	3.495E-02	NOT IDENT.
SC-46	-5.940E-03		1.535E-02	3.152E-02	NOT IDENT.
V-48	-3.725E-03		3.951E-02	8.527E-02	NOT IDENT.
CR-51	-5.904E-02		2.081E-01	4.194E-01	NOT IDENT.
MN-54	-9.996E-03		2.156E-02	3.567E-02	NOT IDENT.
CO-56	8.005E-03		1.918E-02	4.236E-02	NOT IDENT.
MN-56	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF
CO-57	-2.793E-03		9.920E-03	1.955E-02	NOT IDENT.
CO-58	-9.923E-03		1.852E-02	3.614E-02	NOT IDENT.
FE-59	-3.439E-02		4.188E-02	7.070E-02	NOT IDENT.
CO-60	3.549E-03		1.450E-02	3.602E-02	NOT IDENT.
ZN-65	-1.849E-03		3.450E-02	7.490E-02	NOT IDENT.
GE-68	2.389E-01		3.694E-01	1.050E+00	NOT IDENT.
AS-73	-7.761E-02		4.120E-01	8.695E-01	NOT IDENT.
AS-74	2.345E-02		6.759E-02	1.437E-01	NOT IDENT.
SE-75	-2.877E-02		2.497E-02	3.829E-02	NOT IDENT.
BR-77	-3.293E+01		2.741E+01	4.947E+01	NOT IDENT.
SR-82	-9.639E-02		1.598E-01	2.756E-01	NOT IDENT.
RB-83	3.589E-02		3.236E-02	8.191E-02	FAIL ABUN
KR-85	4.513E+00		3.668E+00	8.776E+00	NOT IDENT.
SR-85	2.544E-02		2.075E-02	4.962E-02	NOT IDENT.
RB-86	1.416E-01		3.250E-01	8.465E-01	NOT IDENT.
Y-88	-4.175E-03		1.593E-02	3.664E-02	NOT IDENT.

Y-91	-4.335E+00	7.522E+00	1.382E+01	NOT IDENT.
NB-94	-3.675E-03	1.843E-02	3.535E-02	NOT IDENT.
NB-95	4.021E-03	1.515E-02	3.523E-02	NOT IDENT.
NB-95M	-1.822E-02	4.654E-02	8.496E-02	NOT IDENT.
ZR-95	-9.992E-03	3.568E-02	6.837E-02	NOT IDENT.
NB-97	0.000E+00	1.603E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	4.378E+08	0.000E+00	SHORT HLIF
MO-99	-8.378E+00	2.729E+01	5.212E+01	NOT IDENT.
TC-99M	0.000E+00	4.994E+23	0.000E+00	SHORT HLIF
RH-101	-4.797E-03	1.177E-02	2.266E-02	FAIL ABUN
RH-102	5.097E-03	2.416E-02	5.295E-02	NOT IDENT.
RU-103	2.010E-02	2.270E-02	5.333E-02	NOT IDENT.
RH-106	-1.539E-02	1.472E-01	2.988E-01	NOT IDENT.
RU-106	-1.539E-02	1.472E-01	2.988E-01	NOT IDENT.
AG-108M	-5.794E-03	1.447E-02	2.809E-02	NOT IDENT.
CD-109	4.947E-02	2.679E-01	5.464E-01	NOT IDENT.
AG-110M	-2.342E-02	2.084E-02	3.214E-02	NOT IDENT.
SN-113	-6.025E-03	2.378E-02	4.737E-02	NOT IDENT.
CD-115	1.203E+01	3.738E+01	8.272E+01	NOT IDENT.
SN-117M	1.659E-02	2.693E-02	5.953E-02	NOT IDENT.
TE-123M	5.520E-03	1.104E-02	2.383E-02	NOT IDENT.
SB-124	9.344E-03	3.751E-02	9.952E-02	NOT IDENT.
SB-125	3.455E-02	3.759E-02	9.238E-02	NOT IDENT.
TE-125M	-2.689E+00	3.779E+00	6.245E+00	NOT IDENT.
I-126	-1.158E-01	1.580E-01	2.690E-01	NOT IDENT.
SB-126	-4.417E-02	9.452E-02	1.826E-01	NOT IDENT.
SN-126	8.352E-03	2.663E-02	5.532E-02	NOT IDENT.
SB-127	-1.324E+00	2.239E+00	3.945E+00	NOT IDENT.
I-131	4.884E-02	9.468E-02	2.123E-01	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	1.497E-01	1.279E+00	2.513E+00	FAIL ABUN
BA-133	-7.059E-03	1.841E-02	3.657E-02	FAIL ABUN
I-133	0.000E+00	3.624E+05	0.000E+00	SHORT HLIF
CS-134	7.014E-03	1.931E-02	4.271E-02	NOT IDENT.
CS-135	4.886E-03	6.127E-02	1.325E-01	NOT IDENT.
I-135	0.000E+00	1.707E+22	0.000E+00	SHORT HLIF
CS-136	-2.788E-02	5.064E-02	9.663E-02	FAIL ABUN
BA-137M	-1.475E-02	1.893E-02	3.187E-02	NOT IDENT.
CS-137	-1.558E-02	2.000E-02	3.367E-02	NOT IDENT.
CE-139	-4.285E-03	1.390E-02	2.624E-02	NOT IDENT.
BA-140	-8.493E-02	1.818E-01	3.420E-01	FAIL ABUN
LA-140	-9.886E-02	8.816E-02	1.180E-01	NOT IDENT.
CE-143	0.000E+00	1.277E+03	0.000E+00	SHORT HLIF
CE-144	-7.222E-02	7.936E-02	1.390E-01	NOT IDENT.
PM-144	-4.886E-03	1.789E-02	3.406E-02	NOT IDENT.
PR-144	-3.668E-01	1.343E+00	2.557E+00	NOT IDENT.
PM-146	1.896E-03	1.559E-02	3.467E-02	NOT IDENT.
ND-147	-3.394E-01	3.225E-01	4.955E-01	FAIL ABUN
PM-147	1.232E+02	2.642E+02	5.862E+02	NOT IDENT.
PM-149	9.794E+01	2.886E+02	6.356E+02	NOT IDENT.
EU-150	5.203E-03	1.246E-02	2.751E-02	NOT IDENT.
EU-152	-3.694E-02	4.644E-02	8.594E-02	NOT IDENT.
GD-153	-1.229E-02	3.678E-02	6.684E-02	NOT IDENT.
EU-154	-9.229E-03	3.904E-02	8.369E-02	NOT IDENT.
EU-155	-2.888E-02	3.696E-02	6.782E-02	NOT IDENT.
TB-160	-1.756E-02	7.490E-02	1.527E-01	FAIL ABUN
HO-166M	-2.132E-02	3.657E-02	6.409E-02	FAIL ABUN
TM-171	-1.465E+00	7.523E+00	1.602E+01	NOT IDENT.
HF-172	-9.223E-03	7.061E-02	1.424E-01	NOT IDENT.
LU-172	-3.036E-02	2.993E-02	4.704E-02	NOT IDENT.
LU-176	1.223E-03	1.077E-02	2.339E-02	NOT IDENT.
HF-181	1.194E-03	2.099E-02	4.488E-02	NOT IDENT.
TA-182	-4.403E-03	7.623E-02	1.630E-01	NOT IDENT.
RE-183	8.638E-03	8.641E-02	1.905E-01	NOT IDENT.
RE-184	-5.311E-03	3.913E-02	9.157E-02	NOT IDENT.
W-188	1.309E+00	3.508E+00	7.710E+00	NOT IDENT.
IR-192	1.686E-03	1.791E-02	3.789E-02	NOT IDENT.
HG-203	-3.844E-03	2.133E-02	3.927E-02	NOT IDENT.
BI-207	-7.275E-03	2.318E-02	4.659E-02	NOT IDENT.
TL-208	1.068E-03	1.483E-02	3.336E-02	NOT IDENT.
PB-210	-6.798E-02	1.892E+00	4.125E+00	NOT IDENT.
BI-211	1.147E-02	1.074E-01	2.225E-01	NOT IDENT.
PB-211	6.915E-02	3.478E-01	7.428E-01	NOT IDENT.
BI-212	2.834E-03	2.220E-01	4.607E-01	NOT IDENT.
PB-212	-4.025E-02	2.735E-02	4.741E-02	FAIL ABUN
BI-214	2.178E-02	4.304E-02	9.221E-02	NOT IDENT.
PB-214	2.002E-02	3.820E-02	8.331E-02	NOT IDENT.
RN-219	5.933E-03	1.785E-01	3.780E-01	NOT IDENT.

RN-222	2.178E-02	4.304E-02	9.221E-02	NOT IDENT.
RA-223	2.099E-01	3.049E-01	6.907E-01	FAIL ABUN
RA-224	1.697E-01	2.767E-01	6.183E-01	NOT IDENT.
RA-226	2.178E-02	4.304E-02	9.221E-02	NOT IDENT.
AC-227	2.399E-03	1.093E-01	2.330E-01	FAIL ABUN
TH-227	2.399E-03	1.093E-01	2.330E-01	FAIL ABUN
AC-228	-4.298E-02	6.603E-02	1.411E-01	NOT IDENT.
RA-228	-4.298E-02	6.603E-02	1.411E-01	NOT IDENT.
TH-228	-4.025E-02	2.735E-02	4.741E-02	FAIL ABUN
TH-229	-1.046E-01	2.207E-01	4.018E-01	NOT IDENT.
TH-230	2.178E-02	4.304E-02	9.221E-02	NOT IDENT.
PA-231	2.805E-02	1.797E-01	3.648E-01	NOT IDENT.
TH-231	2.099E-01	3.049E-01	6.907E-01	FAIL ABUN
TH-232	-4.298E-02	6.603E-02	1.411E-01	NOT IDENT.
PA-233	-1.360E-02	2.509E-02	4.934E-02	FAIL ABUN
PA-234	-7.284E-02	1.478E-01	2.846E-01	FAIL ABUN
PA-234M	-9.380E-01	1.908E+00	4.369E+00	NOT IDENT.
TH-234	-5.147E-01	6.441E-01	1.333E+00	FAIL ABUN
U-234	2.178E-02	4.304E-02	9.221E-02	NOT IDENT.
NP-237	-1.360E-02	2.509E-02	4.934E-02	FAIL ABUN
NP-238	0.000E+00	6.197E+01	0.000E+00	SHORT HLIF
U-238	-5.147E-01	6.441E-01	1.333E+00	FAIL ABUN
NP-239	4.052E-02	8.103E-02	1.863E-01	NOT IDENT.
PU-239	7.359E+01	1.306E+02	2.864E+02	NOT IDENT.
AM-241	-8.443E-03	6.021E-02	1.285E-01	NOT IDENT.
AM-243	1.957E-03	1.791E-02	3.897E-02	NOT IDENT.
CM-243	8.762E-03	3.572E-02	7.845E-02	NOT IDENT.
BK-247	-5.194E-02	4.312E-02	6.525E-02	NOT IDENT.
CM-247	-3.138E-03	1.690E-02	3.438E-02	NOT IDENT.
CF-249	1.870E-03	1.873E-02	3.975E-02	NOT IDENT.
CF-251	1.446E-02	5.694E-02	1.156E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	4	10.66*	1.215E+00	1.203E-01	1.203E-01	273.45
CE-141	145.44	23	48.29*	6.768E+00	2.961E-02	4.674E-02	149.62
U-235	89.96	-----	3.47	5.608E+00	-----	Line Not Found	-----
	93.35	66	5.60	5.774E+00	8.508E-01	8.508E-01	85.24
	143.76	23	10.96*	6.768E+00	1.305E-01	1.305E-01	149.62
	163.33	-----	5.08	6.541E+00	-----	Line Not Found	-----
	185.72	7	57.20	6.166E+00	8.759E-03	8.759E-03	437.85
	205.31	-----	5.01	5.819E+00	-----	Line Not Found	-----
ANH-511	511.00	21	100.00*	2.835E+00	3.146E-02	3.146E-02	139.98

Flag: "*" = Keyline

Total number of lines in spectrum 16
 Number of unidentified lines 4
 Number of lines tentatively identified by NID 12 75.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.203E-01	1.203E-01	3.290E-01	273.45	
CE-141	32.51D	1.58	2.961E-02	4.674E-02	6.994E-02	149.62	
U-235	7.04E+08Y	1.00	1.305E-01	1.305E-01	1.952E-01	149.62	
ANH-511	1.00E+09Y	1.00	3.146E-02	3.146E-02	4.403E-02	139.98	
Total Activity :			3.119E-01	3.290E-01			

Grand Total Activity : 3.119E-01 3.290E-01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	111.49	24	41	1.43	222.97	218	9	4.91E-03	****	6.58E+00	T
0	199.03	21	33	1.28	397.97	393	8	4.49E-03	****	5.93E+00	T
0	273.79	29	84	5.30	547.42	534	21	6.41E-03	****	4.73E+00	T
0	299.66	27	11	0.88	599.14	595	9	6.11E-03	65.1	4.40E+00	T
0	383.80	9	27	0.80	767.34	760	10	2.15E-03	****	3.59E+00	T
0	422.80	18	8	2.99	845.31	840	9	4.33E-03	78.2	3.31E+00	T
0	551.98	8	2	1.46	1103.57	1100	7	2.07E-03	93.3	2.66E+00	T
0	565.28	11	10	1.58	1130.16	1126	11	2.62E-03	****	2.61E+00	
0	638.92	8	10	0.59	1277.39	1269	11	1.94E-03	****	2.37E+00	
0	838.68	7	5	1.37	1676.81	1672	10	1.94E-03	****	1.91E+00	
0	849.09	9	0	1.49	1697.63	1695	6	2.22E-03	70.7	1.89E+00	

Flags: "T" = Tentatively associated

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621354.CNF;1
* Acquisition date   : 3-OCT-2016 09:20:38 Sensitivity       : 3.000
* Detector ID        : GAM16 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.18 Half life ratio  : *****
* Sample date        : 12-SEP-2016 00:00:00 Nuclide Library : SOLID
* Sample ID          : G1203621354 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity : 1.7876E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight       : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 23-SEP-2016 08:25:42 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM16_CAN.CNF;14
*****

```

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.767E-01
CE-141	2.064E-02
U-235	8.394E-02
ANH-511	1.038E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.263E-01	NOT IDENT.
NA-22	1.050E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.173E-02	NOT IDENT.
SC-46	1.192E-02	NOT IDENT.
V-48	3.384E-02	NOT IDENT.
CR-51	1.845E-01	NOT IDENT.
MN-54	1.462E-02	NOT IDENT.
CO-56	1.742E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	8.629E-03	NOT IDENT.
CO-58	1.435E-02	NOT IDENT.
FE-59	2.600E-02	NOT IDENT.
CO-60	1.357E-02	NOT IDENT.
ZN-65	2.942E-02	NOT IDENT.
GE-68	4.029E-01	NOT IDENT.
AS-73	3.864E-01	NOT IDENT.
AS-74	6.255E-02	NOT IDENT.
SE-75	1.672E-02	NOT IDENT.
BR-77	2.213E+01	NOT IDENT.
SR-82	1.032E-01	NOT IDENT.
RB-83	3.530E-02	FAIL ABUN
KR-85	3.898E+00	NOT IDENT.
SR-85	2.204E-02	NOT IDENT.
RB-86	3.277E-01	NOT IDENT.
Y-88	1.158E-02	NOT IDENT.
Y-91	4.896E+00	NOT IDENT.

NB-94	1.497E-02	NOT IDENT.
NB-95	1.398E-02	NOT IDENT.
NB-95M	3.658E-02	NOT IDENT.
ZR-95	2.757E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	2.094E+01	NOT IDENT.
TC-99M	0.000E+00	SHORT HLIF
RH-101	9.956E-03	FAIL ABUN
RH-102	2.199E-02	NOT IDENT.
RU-103	2.336E-02	NOT IDENT.
RH-106	1.236E-01	NOT IDENT.
RU-106	1.236E-01	NOT IDENT.
AG-108M	1.199E-02	NOT IDENT.
CD-109	2.408E-01	NOT IDENT.
AG-110M	1.139E-02	NOT IDENT.
SN-113	2.069E-02	NOT IDENT.
CD-115	3.520E+01	NOT IDENT.
SN-117M	2.652E-02	NOT IDENT.
TE-123M	1.065E-02	NOT IDENT.
SB-124	3.526E-02	NOT IDENT.
SB-125	3.994E-02	NOT IDENT.
TE-125M	2.658E+00	NOT IDENT.
I-126	1.097E-01	NOT IDENT.
SB-126	7.433E-02	NOT IDENT.
SN-126	2.451E-02	NOT IDENT.
SB-127	1.633E+00	NOT IDENT.
I-131	9.355E-02	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	1.123E+00	FAIL ABUN
BA-133	1.572E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	1.783E-02	NOT IDENT.
CS-135	5.829E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	3.423E-02	FAIL ABUN
BA-137M	1.307E-02	NOT IDENT.
CS-137	1.380E-02	NOT IDENT.
CE-139	1.179E-02	NOT IDENT.
BA-140	1.421E-01	FAIL ABUN
LA-140	4.182E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	6.078E-02	NOT IDENT.
PM-144	1.423E-02	NOT IDENT.
PR-144	1.068E+00	NOT IDENT.
PM-146	1.435E-02	NOT IDENT.
ND-147	1.835E-01	FAIL ABUN
PM-147	2.599E+02	NOT IDENT.
PM-149	2.825E+02	NOT IDENT.
EU-150	1.218E-02	NOT IDENT.
EU-152	3.714E-02	NOT IDENT.
GD-153	2.959E-02	NOT IDENT.
EU-154	2.965E-02	NOT IDENT.
EU-155	2.919E-02	NOT IDENT.
TB-160	6.335E-02	FAIL ABUN
HO-166M	2.702E-02	FAIL ABUN
TM-171	7.020E+00	NOT IDENT.
HF-172	6.283E-02	NOT IDENT.
LU-172	1.741E-02	NOT IDENT.
LU-176	1.019E-02	NOT IDENT.
HF-181	1.888E-02	NOT IDENT.
TA-182	6.422E-02	NOT IDENT.
RE-183	8.459E-02	NOT IDENT.
RE-184	3.278E-02	NOT IDENT.
W-188	3.439E+00	NOT IDENT.
IR-192	1.681E-02	NOT IDENT.
HG-203	1.742E-02	NOT IDENT.
BI-207	1.835E-02	NOT IDENT.
TL-208	1.393E-02	NOT IDENT.
PB-210	1.844E+00	NOT IDENT.
BI-211	9.911E-02	NOT IDENT.
PB-211	3.249E-01	NOT IDENT.
BI-212	1.889E-01	NOT IDENT.
PB-212	2.102E-02	FAIL ABUN
BI-214	4.080E-02	NOT IDENT.
PB-214	3.724E-02	NOT IDENT.
RN-219	1.625E-01	NOT IDENT.
RN-222	4.080E-02	NOT IDENT.

RA-223	3.085E-01	FAIL ABUN
RA-224	2.805E-01	NOT IDENT.
RA-226	4.080E-02	NOT IDENT.
AC-227	1.035E-01	FAIL ABUN
TH-227	1.035E-01	FAIL ABUN
AC-228	5.783E-02	NOT IDENT.
RA-228	5.783E-02	NOT IDENT.
TH-228	2.102E-02	FAIL ABUN
TH-229	1.776E-01	NOT IDENT.
TH-230	4.080E-02	NOT IDENT.
PA-231	1.564E-01	NOT IDENT.
TH-231	3.085E-01	FAIL ABUN
TH-232	5.783E-02	NOT IDENT.
PA-233	2.095E-02	FAIL ABUN
PA-234	1.142E-01	FAIL ABUN
PA-234M	1.766E+00	NOT IDENT.
TH-234	6.068E-01	FAIL ABUN
U-234	4.080E-02	NOT IDENT.
NP-237	2.095E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	6.068E-01	FAIL ABUN
NP-239	8.129E-02	NOT IDENT.
PU-239	1.286E+02	NOT IDENT.
AM-241	5.676E-02	NOT IDENT.
AM-243	1.726E-02	NOT IDENT.
CM-243	3.444E-02	NOT IDENT.
BK-247	2.842E-02	NOT IDENT.
CM-247	1.476E-02	NOT IDENT.
CF-249	1.730E-02	NOT IDENT.
CF-251	5.215E-02	NOT IDENT.


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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621354.CNF;1
* Acquisition date   : 3-OCT-2016 09:20:38 Sensitivity      : 3.000
* Detector ID        : GAM16 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.18 Half life ratio  : *****
* Sample date        : 12-SEP-2016 00:00:00 Nuclide Library : SOLID
* Sample ID          : G1203621354 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity : 1.7876E+02 GRAM
*                   : Quantity Err(%) : 1.1188E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight       : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 23-SEP-2016 08:25:42 Eff. Geometry   : CAN
* Eff. File           : DKA100:[CANBERRA.GAMMA]EFF_GAM16_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.203E-01	3.225E-01	3.225E-01
CE-141	4.277E-02	6.987E-02	6.987E-02
U-235	1.305E-01	1.914E-01	1.914E-01
ANH-511	3.146E-02	4.317E-02	4.317E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-8.196E-02	1.605E-01	1.647E-01	NOT IDENT.
NA-22	-3.268E-03	1.382E-02	1.390E-02	NOT IDENT.
NA-24	1.313E+08	2.654E+08	2.720E+08	SHORT HLIF
AL-26	-2.113E-02	2.236E-02	2.431E-02	NOT IDENT.
SC-46	-5.940E-03	1.535E-02	1.558E-02	NOT IDENT.
V-48	-3.725E-03	3.951E-02	3.955E-02	NOT IDENT.
CR-51	-5.904E-02	2.081E-01	2.098E-01	NOT IDENT.
MN-54	-9.996E-03	2.157E-02	2.203E-02	NOT IDENT.
CO-56	8.005E-03	1.919E-02	1.952E-02	NOT IDENT.
MN-56	1.000E+41	2.419E+41	0.000E+00	SHORT HLIF
CO-57	-2.793E-03	9.921E-03	1.000E-02	NOT IDENT.
CO-58	-9.923E-03	1.852E-02	1.905E-02	NOT IDENT.
FE-59	-3.439E-02	4.196E-02	4.473E-02	NOT IDENT.
CO-60	3.549E-03	1.450E-02	1.459E-02	NOT IDENT.
ZN-65	-1.849E-03	3.450E-02	3.451E-02	NOT IDENT.
GE-68	2.389E-01	3.695E-01	3.849E-01	NOT IDENT.
AS-73	-7.761E-02	4.123E-01	4.138E-01	NOT IDENT.
AS-74	2.345E-02	6.762E-02	6.844E-02	NOT IDENT.
SE-75	-2.877E-02	2.501E-02	2.818E-02	NOT IDENT.
BR-77	-3.293E+01	3.418E+01	3.726E+01	NOT IDENT.
SR-82	-9.639E-02	1.599E-01	1.657E-01	NOT IDENT.
RB-83	3.589E-02	3.273E-02	3.651E-02	FAIL ABUN
KR-85	4.513E+00	3.673E+00	4.199E+00	NOT IDENT.
SR-85	2.544E-02	2.077E-02	2.373E-02	NOT IDENT.
RB-86	1.416E-01	3.251E-01	3.313E-01	NOT IDENT.
Y-88	-4.175E-03	1.593E-02	1.604E-02	NOT IDENT.

Y-91	-4.335E+00	7.523E+00	7.773E+00	NOT IDENT.
NB-94	-3.675E-03	1.843E-02	1.850E-02	NOT IDENT.
NB-95	4.021E-03	1.515E-02	1.526E-02	NOT IDENT.
NB-95M	-1.822E-02	4.656E-02	4.728E-02	NOT IDENT.
ZR-95	-9.992E-03	3.569E-02	3.597E-02	NOT IDENT.
NB-97	1.000E+41	1.604E+41	0.000E+00	SHORT HLIF
ZR-97	2.002E+08	4.379E+08	4.471E+08	SHORT HLIF
MO-99	-8.378E+00	2.730E+01	2.756E+01	NOT IDENT.
TC-99M	-1.787E+23	4.997E+23	0.000E+00	SHORT HLIF
RH-101	-4.797E-03	1.180E-02	1.200E-02	FAIL ABUN
RH-102	5.097E-03	2.416E-02	2.427E-02	NOT IDENT.
RU-103	2.010E-02	2.272E-02	2.446E-02	NOT IDENT.
RH-106	-1.539E-02	1.472E-01	1.473E-01	NOT IDENT.
RU-106	-1.539E-02	1.472E-01	1.473E-01	NOT IDENT.
AG-108M	-5.794E-03	1.447E-02	1.471E-02	NOT IDENT.
CD-109	4.947E-02	2.680E-01	2.689E-01	NOT IDENT.
AG-110M	-2.342E-02	2.087E-02	2.339E-02	NOT IDENT.
SN-113	-6.025E-03	2.378E-02	2.394E-02	NOT IDENT.
CD-115	1.203E+01	3.738E+01	3.778E+01	NOT IDENT.
SN-117M	1.659E-02	2.694E-02	2.796E-02	NOT IDENT.
TE-123M	5.520E-03	1.104E-02	1.132E-02	NOT IDENT.
SB-124	9.344E-03	3.752E-02	3.775E-02	NOT IDENT.
SB-125	3.455E-02	3.762E-02	4.072E-02	NOT IDENT.
TE-125M	-2.689E+00	3.782E+00	3.971E+00	NOT IDENT.
I-126	-1.158E-01	1.582E-01	1.666E-01	NOT IDENT.
SB-126	-4.417E-02	9.462E-02	9.670E-02	NOT IDENT.
SN-126	8.352E-03	2.663E-02	2.690E-02	NOT IDENT.
SB-127	-1.324E+00	2.244E+00	2.322E+00	NOT IDENT.
I-131	4.884E-02	9.471E-02	9.723E-02	NOT IDENT.
I-132	1.000E+41	7.094E+41	0.000E+00	SHORT HLIF
TE-132	1.497E-01	1.279E+00	1.281E+00	FAIL ABUN
BA-133	-7.059E-03	1.842E-02	1.869E-02	FAIL ABUN
I-133	-8.566E+04	3.626E+05	3.646E+05	SHORT HLIF
CS-134	7.014E-03	1.931E-02	1.957E-02	NOT IDENT.
CS-135	4.886E-03	6.127E-02	6.131E-02	NOT IDENT.
I-135	2.219E+22	2.022E+22	0.000E+00	SHORT HLIF
CS-136	-2.788E-02	5.070E-02	5.223E-02	FAIL ABUN
BA-137M	-1.475E-02	1.894E-02	2.008E-02	NOT IDENT.
CS-137	-1.558E-02	2.001E-02	2.121E-02	NOT IDENT.
CE-139	-4.285E-03	1.393E-02	1.406E-02	NOT IDENT.
BA-140	-8.493E-02	1.818E-01	1.858E-01	FAIL ABUN
LA-140	-9.886E-02	8.829E-02	9.890E-02	NOT IDENT.
CE-143	2.193E+02	1.277E+03	1.281E+03	SHORT HLIF
CE-144	-7.222E-02	7.946E-02	8.587E-02	NOT IDENT.
PM-144	-4.886E-03	1.789E-02	1.803E-02	NOT IDENT.
PR-144	-3.668E-01	1.344E+00	1.354E+00	NOT IDENT.
PM-146	1.896E-03	1.559E-02	1.561E-02	NOT IDENT.
ND-147	-3.394E-01	3.229E-01	3.573E-01	FAIL ABUN
PM-147	1.232E+02	2.643E+02	2.701E+02	NOT IDENT.
PM-149	9.794E+01	2.889E+02	2.922E+02	NOT IDENT.
EU-150	5.203E-03	1.246E-02	1.268E-02	NOT IDENT.
EU-152	-3.694E-02	4.649E-02	4.938E-02	NOT IDENT.
GD-153	-1.229E-02	3.679E-02	3.721E-02	NOT IDENT.
EU-154	-9.229E-03	3.904E-02	3.926E-02	NOT IDENT.
EU-155	-2.888E-02	3.702E-02	3.924E-02	NOT IDENT.
TB-160	-1.756E-02	7.491E-02	7.533E-02	FAIL ABUN
HO-166M	-2.132E-02	3.659E-02	3.783E-02	FAIL ABUN
TM-171	-1.465E+00	7.524E+00	7.553E+00	NOT IDENT.
HF-172	-9.223E-03	7.062E-02	7.074E-02	NOT IDENT.
LU-172	-3.036E-02	3.008E-02	3.305E-02	NOT IDENT.
LU-176	1.223E-03	1.077E-02	1.078E-02	NOT IDENT.
HF-181	1.194E-03	2.099E-02	2.100E-02	NOT IDENT.
TA-182	-4.403E-03	7.623E-02	7.626E-02	NOT IDENT.
RE-183	8.638E-03	8.641E-02	8.650E-02	NOT IDENT.
RE-184	-5.311E-03	3.913E-02	3.920E-02	NOT IDENT.
W-188	1.309E+00	3.511E+00	3.560E+00	NOT IDENT.
IR-192	1.686E-03	1.791E-02	1.793E-02	NOT IDENT.
HG-203	-3.844E-03	2.133E-02	2.140E-02	NOT IDENT.
BI-207	-7.275E-03	2.318E-02	2.341E-02	NOT IDENT.
TL-208	1.068E-03	1.483E-02	1.484E-02	NOT IDENT.
PB-210	-6.798E-02	1.892E+00	1.892E+00	NOT IDENT.
BI-211	1.147E-02	1.074E-01	1.075E-01	NOT IDENT.
PB-211	6.915E-02	3.478E-01	3.492E-01	NOT IDENT.
BI-212	2.834E-03	2.220E-01	2.220E-01	NOT IDENT.
PB-212	-4.025E-02	2.744E-02	3.289E-02	FAIL ABUN
BI-214	2.178E-02	4.305E-02	4.415E-02	NOT IDENT.
PB-214	2.002E-02	3.821E-02	3.926E-02	NOT IDENT.
RN-219	5.933E-03	1.785E-01	1.786E-01	NOT IDENT.

RN-222	2.178E-02	4.305E-02	4.415E-02	NOT IDENT.
RA-223	2.099E-01	3.052E-01	3.195E-01	FAIL ABUN
RA-224	1.697E-01	2.768E-01	2.872E-01	NOT IDENT.
RA-226	2.178E-02	4.305E-02	4.415E-02	NOT IDENT.
AC-227	2.399E-03	1.093E-01	1.093E-01	FAIL ABUN
TH-227	2.399E-03	1.093E-01	1.093E-01	FAIL ABUN
AC-228	-4.298E-02	6.606E-02	6.885E-02	NOT IDENT.
RA-228	-4.298E-02	6.606E-02	6.885E-02	NOT IDENT.
TH-228	-4.025E-02	2.744E-02	3.289E-02	FAIL ABUN
TH-229	-1.046E-01	2.208E-01	2.258E-01	NOT IDENT.
TH-230	2.178E-02	4.305E-02	4.415E-02	NOT IDENT.
PA-231	2.805E-02	1.798E-01	1.803E-01	NOT IDENT.
TH-231	2.099E-01	3.052E-01	3.195E-01	FAIL ABUN
TH-232	-4.298E-02	6.606E-02	6.885E-02	NOT IDENT.
PA-233	-1.360E-02	2.510E-02	2.584E-02	FAIL ABUN
PA-234	-7.284E-02	1.697E-01	1.729E-01	FAIL ABUN
PA-234M	-9.380E-01	1.908E+00	1.954E+00	NOT IDENT.
TH-234	-5.147E-01	6.541E-01	6.940E-01	FAIL ABUN
U-234	2.178E-02	4.305E-02	4.415E-02	NOT IDENT.
NP-237	-1.360E-02	2.510E-02	2.584E-02	FAIL ABUN
NP-238	3.348E+01	6.199E+01	6.380E+01	SHORT HLIF
U-238	-5.147E-01	6.541E-01	6.940E-01	FAIL ABUN
NP-239	4.052E-02	8.110E-02	8.313E-02	NOT IDENT.
PU-239	7.359E+01	1.306E+02	1.348E+02	NOT IDENT.
AM-241	-8.443E-03	6.021E-02	6.033E-02	NOT IDENT.
AM-243	1.957E-03	1.791E-02	1.793E-02	NOT IDENT.
CM-243	8.762E-03	3.573E-02	3.594E-02	NOT IDENT.
BK-247	-5.194E-02	4.438E-02	5.017E-02	NOT IDENT.
CM-247	-3.138E-03	1.691E-02	1.696E-02	NOT IDENT.
CF-249	1.870E-03	1.873E-02	1.875E-02	NOT IDENT.
CF-251	1.446E-02	5.696E-02	5.733E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	19.1250	87.09	21.6729	136.47	15.4885
45.60	17.4169	87.57	16.2705	140.51	19.2908
46.54	14.7095	88.03	16.2856	143.76	15.6543
49.72	12.0661	88.34	19.0117	144.24	15.6652
51.35	16.7863	88.47	19.0167	145.44	15.6921
51.87	18.6793	89.96	21.4574	152.43	24.9014
52.39	14.9656	1093.63	21.4864	153.25	23.7961
52.97	14.9902	91.11	21.5063	323.87	19.2889
53.44	19.7006	92.59	21.5687	156.02	18.1990
54.07	24.4343	93.35	21.6005	158.56	14.8374
57.36	0.0000	94.56	21.6510	159.00	17.1300
57.53	23.7174	94.65	21.6546	162.33	24.0883
57.98	19.9464	94.67	21.6555	162.66	20.6559
59.27	20.0145	94.87	21.6638	163.33	21.8226
59.32	20.9703	97.43	24.8793	165.86	31.1137
59.54	20.9824	98.43	22.8486	176.31	37.3672
60.96	28.7179	98.44	22.8491	176.60	30.3719
61.17	28.7335	99.53	10.4070	177.52	24.5591
62.93	20.2036	100.11	19.7947	181.07	21.1424
63.29	29.8515	102.03	18.8189	181.52	27.0300
63.58	29.8731	103.18	9.4291	184.41	18.8694
64.28	31.8560	103.37	14.6725	143.76	27.1672
66.73	30.1060	105.21	23.1331	193.51	26.2254
67.24	24.3090	105.31	22.0855	197.03	20.7465
125.81	28.2283	106.12	20.0109	198.01	15.5773
67.75	25.3123	106.47	14.7541	201.83	24.0692
69.67	27.3843	109.28	19.7692	203.43	24.1122
70.83	21.5747	111.00	22.3066	205.31	30.2036
72.81	26.5993	111.76	22.3357	210.85	21.8795
72.87	26.6031	114.06	24.2027	215.65	34.2122
74.66	18.7969	116.30	19.2921	222.11	14.7631
74.82	26.7209	116.74	10.7256	227.09	24.7330
74.97	26.7299	119.76	24.7920	227.38	24.7403
77.11	24.8680	121.12	16.2044	228.16	22.2841
78.74	28.9498	121.22	15.1265	228.18	22.2847
79.69	22.0072	121.78	23.7918	116.74	22.2847
80.12	25.0313	122.06	22.7206	235.69	17.4654
80.19	25.0351	122.92	26.0023	235.96	17.4701
80.57	22.0487	123.07	26.0085	238.63	30.8627
81.00	18.0564	265.00	17.3558	238.98	30.8736
81.07	18.0592	125.81	20.6798	240.99	23.4105
81.75	32.1516	127.23	22.9075	242.00	26.7814
83.79	20.1810	127.91	26.2079	244.70	25.1743
84.00	20.1898	129.30	18.6039	252.40	26.2073
85.43	29.3620	131.20	17.5610	252.80	24.5260
86.55	22.3256	133.02	22.0120	254.15	0.0000
86.79	21.6597	133.52	28.6375	256.23	21.2121
86.94	21.6663	136.00	14.3721	260.90	22.1576

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	33.3522	355.39	0.0000	584.27	5.2895
264.80	33.3561	356.01	16.5934	595.83	11.7041
265.00	33.3625	364.49	12.9863	427.87	11.7314
268.22	17.1594	366.42	19.5068	602.52	0.0000
269.46	17.1790	372.51	14.9271	604.72	6.4119
270.03	17.1879	375.05	12.1502	607.14	17.1185
271.23	17.2066	377.52	9.8309	609.32	9.6394
273.65	17.2441	356.01	14.1064	610.33	12.8589
276.40	22.0406	388.16	14.1486	614.28	7.5153
277.37	20.7622	388.63	14.1531	618.01	10.7552
277.60	20.7661	391.69	18.9107	620.36	8.6139
278.00	20.7734	264.66	13.3184	621.93	8.6204
279.20	23.3954	401.81	12.3766	630.19	0.0000
279.54	23.4025	402.40	14.2865	631.29	6.4941
279.70	24.9662	404.85	14.3100	633.25	9.7504
280.46	20.8188	410.95	14.3680	634.78	8.1311
283.69	25.2275	413.71	13.4346	635.95	11.3895
284.31	20.8896	414.70	12.4829	636.99	10.8525
285.41	16.5535	423.72	8.6929	645.85	9.8079
285.90	17.4320	427.09	4.6463	657.76	4.3830
287.50	19.2021	427.87	5.8108	657.90	0.0000
290.67	18.3793	433.94	15.5553	661.66	14.2695
293.27	0.0000	439.40	13.6579	664.57	0.0000
351.93	15.8152	453.88	6.8905	666.33	13.2002
295.96	15.8251	463.37	7.9202	666.50	12.1011
879.38	10.5735	468.07	6.9497	667.71	0.0000
299.98	9.7038	473.00	8.9617	677.62	8.8447
300.09	9.7047	475.06	13.9573	685.70	13.3145
300.13	9.7049	476.78	7.9837	695.00	11.1410
301.36	10.5981	477.60	12.9799	696.49	11.1483
302.85	15.9170	482.18	9.0101	696.51	11.1483
256.23	11.6883	487.02	10.0395	697.00	14.4959
304.85	15.0576	492.35	11.0774	697.30	16.7279
306.78	14.1947	497.08	8.0781	697.49	16.7297
308.46	13.3258	505.52	16.7410	702.65	12.2958
311.90	16.0360	507.63	0.0000	706.68	14.5568
316.51	19.6730	511.00	8.1417	711.68	15.7101
319.41	17.9264	514.00	8.1553	720.70	6.7588
320.08	21.5229	514.00	8.1553	721.93	0.0000
321.04	25.1295	520.40	4.0921	722.78	3.3824
323.87	15.2914	520.69	5.1160	722.91	1.1275
325.23	21.6113	522.65	0.0000	723.31	2.2555
328.76	21.6714	527.90	8.2178	724.19	2.2563
333.37	21.7495	528.26	5.1371	727.33	5.6482
333.97	15.4128	529.59	8.2253	733.00	7.9263
334.37	18.1384	529.87	0.0000	735.93	3.4011
338.28	14.5547	531.02	10.2897	333.97	9.0755
338.32	14.5550	537.26	12.3892	739.50	7.9479
311.90	20.9575	546.56	0.0000	747.24	2.2781
340.48	20.9575	552.55	4.6837	748.06	3.4183
340.55	22.7809	563.25	4.7098	752.31	3.4243
344.28	22.8455	569.33	11.0242	753.82	4.5685
345.93	13.7244	946.00	6.3000	756.73	8.0043
351.06	16.5330	569.70	6.3008	756.80	5.7176
351.93	12.8672	583.19	4.2293	884.68	4.5874

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	3.4431	1274.44	7.4849	1620.50	5.5142
766.42	3.4440	1001.03	2.8112	1621.92	4.4126
766.84	6.8892	1002.74	1.8752	1678.03	0.0000
772.60	0.0000	1004.73	6.5674	1690.97	1.1194
776.52	6.9158	507.63	0.0000	1750.46	0.0000
739.50	5.7664	1025.87	0.0000	1764.49	4.5459
778.90	4.6149	1028.54	0.0000	1063.66	1.8205
783.70	5.7798	1037.84	2.8445	1771.35	1.8209
785.37	2.3134	1038.76	0.0000	1791.20	0.0000
792.07	8.1182	631.29	3.8030	1808.65	6.4207
794.95	5.8055	1048.07	4.7559	1810.72	0.0000
795.86	5.8075	1049.04	4.7574	1836.06	1.8443
810.06	11.3873	1050.41	5.7114		
810.29	8.7601	1063.66	6.6907		
344.28	8.7607	1077.00	1.9194		
810.76	8.7619	1077.34	0.9598		
815.77	6.1451	1085.87	5.7740		
1048.07	4.3939	1093.63	9.6460		
832.01	5.2998	1099.45	7.7305		
834.85	11.3184	1112.07	1.9398		
835.71	9.9070	1112.84	3.8806		
836.80	0.0000	1115.54	4.8547		
846.75	0.0000	1120.29	7.7783		
846.77	4.2634	1120.55	6.8065		
856.80	6.2406	1221.41	8.7534		
860.56	7.1421	1129.67	1.9500		
871.09	3.5847	1131.51	0.0000		
873.19	13.4532	1147.95	0.0000		
875.33	0.0000	1173.23	1.9747		
879.38	9.8878	1177.95	3.9546		
880.51	5.3956	1189.05	0.9918		
883.24	9.9016	1204.77	4.9808		
884.68	9.0060	1221.41	5.0037		
889.28	5.4126	1231.02	4.0134		
894.76	1.8077	1235.36	4.0183		
898.04	3.6196	1238.28	3.0161		
900.72	2.7173	1260.41	0.0000		
903.28	2.7198	1271.87	3.0434		
911.20	4.5456	1274.44	3.0456		
912.08	2.7282	1274.54	3.0456		
923.98	0.0000	1291.59	5.0989		
926.50	5.4838	1298.22	0.0000		
929.11	3.6592	1312.11	2.0505		
937.49	2.7523	1332.49	2.0613		
944.13	5.5172	1362.66	0.0000		
946.00	9.2010	1365.19	2.0784		
949.00	6.4474	1368.63	0.0000		
667.71	0.0000	1384.29	2.0883		
962.31	6.4762	1408.01	3.1507		
964.08	5.5543	1457.56	0.0000		
966.17	8.3372	1460.82	5.3183		
911.20	6.4907	1489.16	3.2122		
968.97	6.4907	1505.03	2.1494		
983.53	5.5904	1584.12	3.2822		
984.45	0.0000	1596.21	9.8729		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                 *
*                               Charleston, SC 29407                          *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621355.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM27.CNF;330
Background date : 2-OCT-2016 11:01:30.
Sample date      : 30-NOV-2015 10:40:00 Acquisition date : 3-OCT-2016 09:21:06.
Sample ID       : G1203621355 Sample quantity : 1.70095E+02 GRAM
Detector name   : GAM27 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.94 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596249 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.85*	19	136	1.58	93.01	89	8	5.25E-03	115.3	
2	0	63.28*	36	167	1.00	125.87	122	7	1.01E-02	63.9	
3	2	72.95	35	212	1.23	145.23	142	15	9.80E-03	68.3	4.62E+00
4	2	75.00*	161	168	0.95	149.32	142	15	4.47E-02	15.1	
5	2	77.05	284	168	1.24	153.43	142	15	7.89E-02	10.1	
6	0	87.08	63	227	1.15	173.50	171	7	1.75E-02	41.5	
7	5	89.88	59	82	1.22	179.10	177	12	1.65E-02	21.8	9.35E-01
8	5	92.83*	45	196	1.29	185.01	177	12	1.25E-02	60.7	
9	0	128.35	50	106	2.38	256.06	252	8	1.39E-02	38.2	
10	0	143.77*	15	81	0.75	286.91	284	6	4.10E-03	103.6	
11	0	163.65*	7	133	1.40	326.69	324	8	1.98E-03	287.1	
12	0	186.05*	70	106	1.72	371.51	367	8	1.93E-02	30.4	
13	0	209.11	46	77	0.85	417.64	415	8	1.29E-02	35.6	
14	0	225.87	20	54	1.27	451.18	449	6	5.45E-03	63.0	
15	0	238.68*	404	161	1.14	476.81	471	10	1.12E-01	7.8	
16	0	241.80	88	74	1.22	483.06	481	6	2.46E-02	19.3	
17	0	270.69	42	70	2.21	540.85	536	11	1.16E-02	41.7	
18	0	295.59*	200	74	1.08	590.67	586	11	5.56E-02	11.1	
19	0	300.50	53	52	1.18	600.50	597	8	1.47E-02	27.3	
20	0	328.98	15	76	1.29	657.49	651	10	4.26E-03	108.8	
21	0	338.07*	90	57	1.34	675.67	669	11	2.49E-02	20.1	
22	0	351.90*	312	69	1.28	703.35	697	13	8.67E-02	7.9	
23	0	463.97	20	71	3.36	927.58	919	13	5.57E-03	89.7	
24	0	491.06	17	20	1.56	981.79	979	9	4.68E-03	52.2	
25	0	511.06*	73	55	1.83	1021.80	1016	15	2.02E-02	29.1	
26	0	583.46*	155	42	1.46	1166.67	1159	16	4.30E-02	12.7	
27	0	609.47*	202	53	1.46	1218.71	1212	15	5.62E-02	10.7	
28	0	642.39	15	18	1.60	1284.60	1279	9	4.26E-03	57.7	
29	0	663.05*	17	46	1.97	1325.95	1320	15	4.77E-03	93.8	
30	0	728.29	38	41	1.82	1456.48	1448	15	1.05E-02	40.3	
31	0	742.43	27	12	0.81	1484.78	1480	10	7.42E-03	31.4	
32	0	845.51	8	7	1.23	1691.05	1687	6	2.11E-03	67.4	
33	0	860.29	29	12	1.45	1720.62	1715	10	7.93E-03	29.8	
34	0	881.21	15	17	3.68	1762.50	1754	14	4.12E-03	65.1	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	893.41	69	26	15.20	1786.90	1773	33	1.93E-02	24.9	
36	0	911.45*	90	43	1.14	1823.01	1817	13	2.50E-02	18.6	
37	0	927.40	23	14	4.86	1854.93	1846	15	6.46E-03	41.5	
38	0	969.64*	55	45	1.46	1939.47	1934	14	1.54E-02	29.4	
39	0	1120.31*	66	11	1.73	2240.99	2235	11	1.83E-02	16.1	
40	0	1126.44	10	6	1.44	2253.27	2250	8	2.72E-03	54.1	
41	0	1177.68	15	2	0.98	2355.81	2352	8	4.13E-03	30.8	
42	0	1180.97	13	2	0.76	2362.41	2359	8	3.72E-03	32.5	
43	0	1193.17	10	17	3.36	2386.82	2379	10	2.79E-03	83.6	
44	0	1237.59	31	19	0.92	2475.71	2467	15	8.73E-03	34.9	
45	0	1279.23	12	1	0.64	2559.04	2556	8	3.22E-03	35.6	
46	0	1297.27	6	16	2.86	2595.15	2585	13	1.66E-03	144.7	
47	0	1364.61	4	6	1.23	2729.93	2722	9	1.19E-03	116.7	
48	0	1376.86	31	0	1.21	2754.45	2747	14	8.61E-03	18.0	
49	0	1409.66	18	3	3.28	2820.10	2813	14	4.94E-03	32.4	
50	0	1460.82*	417	4	2.06	2922.50	2915	16	1.16E-01	5.1	
51	0	1765.04*	27	7	2.24	3531.43	3524	13	7.52E-03	29.0	

Flag: "*" = Peak area was modified by background subtraction


```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621355.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 30-NOV-2015 10:40:00 Acquisition date : 3-OCT-2016 09:21:06
Sample ID        : G1203621355 Sample quantity  : 170.10 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA27 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.94 0.0%
Energy tolerance : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error  : 0.00 %
Efficiency type  : Linear Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.403E+00	1.202E+01	1.202E+01	10.14	OK
CO-56	846.77	99.94*	2.182E+00	1.621E-02	2.572E-01	134.83	OK
	1037.84	14.17	1.863E+00	----- Line	Not Found	-----	Absent
	1238.28	66.90	1.617E+00	1.282E-01	2.033E+00	69.84	OK
	1771.35	15.47	1.172E+00	----- Line	Not Found	-----	Absent
CD-109	88.03	3.70*	7.559E+00	2.810E-01	4.463E-01	409.78	OK
SN-126	64.28	9.60	5.534E+00	4.297E-01	4.297E-01	127.75	OK
	86.94	8.90	7.559E+00	1.168E-01	1.168E-01	409.78	OK
	87.57	37.00*	7.559E+00	2.810E-02	2.810E-02	409.78	OK
BA-137M	661.66	89.90*	2.620E+00	3.503E-02	3.572E-02	187.70	OK
CS-137	661.66	85.10*	2.620E+00	3.701E-02	3.773E-02	187.70	OK
TL-208	277.37	6.60	5.132E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.885E+00	3.083E-01	3.083E-01	25.31	OK
	860.56	12.50	2.153E+00	4.920E-01	4.920E-01	59.57	OK
PB-210	46.54	4.25*	2.754E+00	1.042E+00	1.070E+00	230.61	OK
PB-212	74.82	10.28	6.772E+00	7.609E-01	7.609E-01	58.94	OK
	77.11	17.10	6.937E+00	1.470E+00	1.470E+00	20.11	OK
	238.63	43.60*	5.748E+00	8.762E-01	8.762E-01	15.68	OK
	300.09	3.30	4.823E+00	1.763E+00	1.763E+00	54.55	OK
BI-214	609.32	45.49*	2.791E+00	7.732E-01	7.735E-01	21.38	OK
	1120.29	14.92	1.754E+00	1.129E+00	1.129E+00	32.27	OK
	1764.49	15.30	1.177E+00	6.303E-01	6.305E-01	58.08	OK
PB-214	74.82	5.80	6.757E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	6.937E+00	2.591E+00	2.592E+00	20.11	OK
	87.09	3.41	7.559E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.693E+00	1.163E+00	1.164E+00	38.53	OK
	295.22	18.42	4.885E+00	1.180E+00	1.180E+00	22.14	OK
	351.93	35.60*	4.262E+00	1.069E+00	1.069E+00	15.89	OK
RN-222	609.32	45.49*	2.791E+00	7.732E-01	7.735E-01	21.38	OK
	1120.29	14.92	1.754E+00	1.129E+00	1.129E+00	32.27	OK
	1764.49	15.30	1.177E+00	6.303E-01	6.305E-01	58.08	OK
RA-226	609.32	45.49*	2.791E+00	7.732E-01	7.735E-01	21.38	OK
	1120.29	14.92	1.754E+00	1.129E+00	1.129E+00	32.27	OK
	1764.49	15.30	1.177E+00	6.303E-01	6.305E-01	58.08	OK
AC-228	105.21	1.10	8.060E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.399E+00	9.435E-01	9.435E-01	40.20	OK
	794.95	4.25	2.286E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.201E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	2.060E+00	7.786E-01	7.786E-01	37.20	OK
	968.97	15.80	1.964E+00	8.137E-01	8.137E-01	58.83	OK
RA-228	105.21	1.10	8.060E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.399E+00	9.435E-01	9.435E-01	40.20	OK
	794.95	4.25	2.286E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.201E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	2.060E+00	7.786E-01	7.786E-01	37.20	OK
	968.97	15.80	1.964E+00	8.137E-01	8.137E-01	58.83	OK
TH-228	74.82	10.28	6.772E+00	7.609E-01	7.609E-01	58.94	OK
	77.11	17.10	6.937E+00	1.470E+00	1.470E+00	20.11	OK
	238.63	43.60*	5.748E+00	8.762E-01	8.762E-01	15.68	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	300.09	3.30	4.823E+00	1.763E+00	1.763E+00	54.55	OK
TH-230	609.32	45.49*	2.791E+00	7.732E-01	7.732E-01	21.38	OK
	1120.29	14.92	1.754E+00	1.129E+00	1.129E+00	32.27	OK
	1764.49	15.30	1.177E+00	6.303E-01	6.303E-01	58.08	OK
PA-231	283.69	1.70	5.044E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.823E+00	1.087E+00	1.087E+00	54.55	OK
TH-232	105.21	1.10	8.060E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.399E+00	9.435E-01	9.435E-01	40.20	OK
	835.71	1.61	2.201E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	2.060E+00	7.786E-01	7.786E-01	37.20	OK
	968.97	15.80	1.964E+00	8.137E-01	8.137E-01	58.83	OK
TH-234	63.29	3.70*	5.534E+00	1.115E+00	1.115E+00	127.75	OK
	92.59	4.23	7.793E+00	8.209E-01	8.209E-01	121.48	OK
U-234	609.32	45.49*	2.791E+00	7.732E-01	7.732E-01	21.38	OK
	1120.29	14.92	1.754E+00	1.129E+00	1.129E+00	32.27	OK
	1764.49	15.30	1.177E+00	6.303E-01	6.303E-01	58.08	OK
U-235	89.96	3.47	7.683E+00	1.346E+00	1.346E+00	43.58	OK
	93.35	5.60	7.793E+00	6.201E-01	6.201E-01	121.48	OK
	143.76	10.96*	7.743E+00	1.001E-01	1.001E-01	207.10	OK
	163.33	5.08	7.318E+00	1.089E-01	1.089E-01	574.18	OK
	185.72	57.20	6.810E+00	9.991E-02	9.991E-02	60.79	OK
	205.31	5.01	6.393E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	5.534E+00	1.115E+00	1.115E+00	127.75	OK
	92.59	4.23	7.793E+00	8.209E-01	8.209E-01	121.48	OK
AM-243	43.53	5.90	2.021E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	6.772E+00	1.164E-01	1.164E-01	58.94	OK
ANH-511	511.00	100.00*	3.191E+00	1.133E-01	1.133E-01	58.16	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621355.CNF;1
* Acquisition date   : 3-OCT-2016 09:21:06 Sensitivity      : 3.000
* Detector ID        : GAM27 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.94 Half life ratio : *****
* Sample date        : 30-NOV-2015 10:40:00 Analyst initials: MXR1
* Sample ID          : G1203621355 Sample Quantity : 1.7010E+02 GRAM
* Batch Number       : 1596249 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 3-OCT-2016 06:09:32 Eff. Geometry   : CAN
* Eff. File           : DKA100:[CANBERRA.GAMMA]EFF_GAM27_CAN.CNF;13
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.202E+01	1.195E+00	4.316E-01
CO-56	2.572E-01	3.398E-01	7.009E-01
CD-109	4.463E-01	1.792E+00	1.622E+00
SN-126	2.810E-02	1.129E-01	1.024E-01
BA-137M	3.572E-02	6.570E-02	4.983E-02
CS-137	3.773E-02	6.941E-02	5.264E-02
TL-208	3.083E-01	7.646E-02	4.442E-02
PB-210	1.070E+00	2.417E+00	1.808E+00
PB-212	8.762E-01	1.346E-01	8.079E-02
BI-214	7.735E-01	1.621E-01	9.914E-02
PB-214	1.069E+00	1.665E-01	9.042E-02
RN-222	7.735E-01	1.621E-01	9.914E-02
RA-226	7.735E-01	1.621E-01	9.914E-02
AC-228	7.786E-01	2.839E-01	1.841E-01
RA-228	7.786E-01	2.839E-01	1.841E-01
TH-228	8.762E-01	1.346E-01	8.079E-02
TH-230	7.732E-01	1.620E-01	9.910E-02
PA-231	1.087E+00	5.814E-01	5.989E-01
TH-232	7.786E-01	2.839E-01	1.841E-01
TH-234	1.115E+00	1.396E+00	1.264E+00
U-234	7.732E-01	1.620E-01	9.910E-02
U-235	1.001E-01	2.032E-01	2.518E-01
U-238	1.115E+00	1.396E+00	1.264E+00
AM-243	1.164E-01	6.724E-02	5.755E-02
ANH-511	1.133E-01	6.461E-02	4.140E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	3.678E+00	1.018E+01	2.073E+01	NOT IDENT.
NA-22	2.007E-02	3.275E-02	6.762E-02	NOT IDENT.
NA-24	0.000E+00	1.163E+41	0.000E+00	SHORT HLIF
AL-26	1.348E-03	2.044E-02	4.652E-02	NOT IDENT.
SC-46	1.969E-01	3.186E-01	6.883E-01	FAIL ABUN

V-48	0.000E+00	1.530E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	3.922E+02	0.000E+00	SHORT HLIF
MN-54	2.301E-02	4.982E-02	1.054E-01	NOT IDENT.
MN-56	0.000E+00	1.321E+41	0.000E+00	SHORT HLIF
CO-57	-4.736E-03	3.484E-02	6.586E-02	NOT IDENT.
CO-58	-1.976E-01	4.286E-01	8.210E-01	NOT IDENT.
FE-59	-3.122E+00	6.409E+00	1.170E+01	NOT IDENT.
CO-60	3.445E-03	2.518E-02	5.302E-02	NOT IDENT.
ZN-65	4.042E-03	1.320E-01	2.349E-01	NOT IDENT.
GE-68	2.096E+00	2.037E+00	4.508E+00	NOT IDENT.
AS-73	-1.544E+00	3.929E+00	7.706E+00	NOT IDENT.
AS-74	0.000E+00	5.787E+03	0.000E+00	SHORT HLIF
SE-75	-6.294E-02	1.598E-01	3.110E-01	NOT IDENT.
BR-77	0.000E+00	2.583E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.968E+02	0.000E+00	SHORT HLIF
RB-83	3.257E-02	5.307E-01	1.040E+00	NOT IDENT.
KR-85	7.659E-01	6.101E+00	1.068E+01	NOT IDENT.
SR-85	8.767E-02	7.020E-01	1.229E+00	NOT IDENT.
RB-86	0.000E+00	3.195E+04	0.000E+00	SHORT HLIF
Y-88	2.683E-02	1.421E-01	3.400E-01	NOT IDENT.
Y-91	-3.144E+02	4.620E+02	8.069E+02	NOT IDENT.
NB-94	-2.081E-02	2.563E-02	4.271E-02	NOT IDENT.
NB-95	-9.650E-01	7.396E-01	1.098E+00	NOT IDENT.
NB-95M	-4.666E-01	2.107E+00	3.739E+00	NOT IDENT.
ZR-95	7.913E-01	1.365E+00	2.755E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.139E+33	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.693E+41	0.000E+00	SHORT HLIF
RH-101	0.000E+00	4.806E-02	4.741E-02	FAIL ABUN
RH-102	2.394E-02	4.712E-02	9.612E-02	NOT IDENT.
RU-103	1.021E+00	4.656E+00	9.393E+00	FAIL ABUN
RH-106	7.037E-02	4.641E-01	8.916E-01	NOT IDENT.
RU-106	7.037E-02	4.641E-01	8.916E-01	NOT IDENT.
AG-108M	-1.534E-02	2.186E-02	3.870E-02	NOT IDENT.
AG-110M	3.414E-03	9.427E-02	1.282E-01	NOT IDENT.
SN-113	-1.954E-02	1.656E-01	3.248E-01	NOT IDENT.
CD-115	0.000E+00	3.293E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.140E+05	0.000E+00	SHORT HLIF
TE-123M	6.327E-02	1.058E-01	2.078E-01	NOT IDENT.
SB-124	6.668E-01	1.779E+00	3.969E+00	NOT IDENT.
SB-125	1.810E-02	7.460E-02	1.511E-01	FAIL ABUN
TE-125M	1.075E+02	2.210E+02	4.391E+02	NOT IDENT.
I-126	0.000E+00	1.049E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.521E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	8.688E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	7.297E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.554E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.819E+27	0.000E+00	SHORT HLIF
BA-133	-3.907E-02	3.499E-02	5.465E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	1.935E-02	3.801E-02	7.724E-02	FAIL ABUN
CS-135	-3.494E-02	1.022E-01	1.784E-01	NOT IDENT.
I-135	0.000E+00	1.742E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.398E+05	0.000E+00	SHORT HLIF
CE-139	2.436E-02	9.839E-02	1.730E-01	NOT IDENT.
BA-140	0.000E+00	1.615E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	5.438E+05	0.000E+00	SHORT HLIF
CE-141	-7.203E+00	2.469E+01	4.148E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	6.426E-02	2.633E-01	5.098E-01	NOT IDENT.
PM-144	8.028E-03	4.591E-02	8.860E-02	NOT IDENT.
PR-144	-2.579E-01	4.136E+00	7.714E+00	NOT IDENT.
PM-146	-1.331E-02	2.789E-02	5.190E-02	NOT IDENT.
ND-147	0.000E+00	4.112E+07	0.000E+00	SHORT HLIF
PM-147	-1.748E+02	5.920E+02	1.105E+03	NOT IDENT.
PM-149	0.000E+00	1.313E+41	0.000E+00	SHORT HLIF
EU-150	6.773E-03	1.866E-02	3.517E-02	FAIL ABUN
EU-152	-2.135E-02	6.860E-02	1.320E-01	NOT IDENT.
GD-153	-1.419E-01	1.253E-01	2.217E-01	NOT IDENT.
EU-154	3.377E-02	8.418E-02	1.642E-01	NOT IDENT.
EU-155	6.871E-02	7.541E-02	1.551E-01	FAIL ABUN
TB-160	-4.399E-01	1.406E+00	2.733E+00	FAIL ABUN
HO-166M	1.746E-02	4.678E-02	9.286E-02	NOT IDENT.
TM-171	-8.480E-01	7.778E+00	1.566E+01	NOT IDENT.
HF-172	-1.107E-01	1.765E-01	2.904E-01	FAIL ABUN
LU-172	1.076E-02	5.610E-02	1.152E-01	FAIL ABUN
LU-176	-1.847E-02	1.786E-02	3.221E-02	FAIL ABUN

HF-181	1.264E+00	3.195E+00	6.672E+00	NOT IDENT.
TA-182	2.691E-01	6.952E-01	1.447E+00	FAIL ABUN
RE-183	1.175E-02	1.620E+00	3.234E+00	FAIL ABUN
RE-184	1.190E+01	2.907E+01	5.578E+01	FAIL ABUN
W-188	4.785E+01	9.976E+01	1.976E+02	FAIL ABUN
IR-192	7.654E-02	3.865E-01	7.803E-01	FAIL ABUN
HG-203	-1.326E-02	2.120E+00	4.222E+00	FAIL ABUN
BI-207	2.323E-02	3.724E-02	8.010E-02	FAIL ABUN
BI-211	0.000E+00	4.586E-01	6.803E-01	FAIL ABUN
PB-211	-1.684E-01	5.093E-01	9.648E-01	NOT IDENT.
BI-212	0.000E+00	8.728E-01	1.043E+00	FAIL ABUN
RN-219	-6.253E-02	2.896E-01	5.558E-01	FAIL ABUN
RA-223	-2.036E-01	4.961E-01	8.402E-01	FAIL ABUN
RA-224	0.000E+00	7.768E-01	1.223E+00	FAIL ABUN
AC-227	3.791E-02	1.769E-01	3.602E-01	FAIL ABUN
TH-227	3.791E-02	1.769E-01	3.602E-01	FAIL ABUN
TH-229	1.694E-01	3.792E-01	7.245E-01	FAIL ABUN
TH-231	-2.036E-01	4.961E-01	8.402E-01	FAIL ABUN
PA-233	-3.877E-02	4.164E-02	7.577E-02	FAIL ABUN
PA-234	-1.719E-01	2.017E-01	3.534E-01	FAIL ABUN
PA-234M	8.732E-01	3.256E+00	6.693E+00	NOT IDENT.
NP-237	-3.877E-02	4.164E-02	7.577E-02	FAIL ABUN
NP-238	0.000E+00	1.915E+41	0.000E+00	SHORT HLIF
NP-239	1.071E-01	1.685E-01	3.395E-01	NOT IDENT.
PU-239	0.000E+00	4.339E+02	4.530E+02	FAIL ABUN
AM-241	-1.913E-02	7.794E-02	1.409E-01	NOT IDENT.
CM-243	-3.200E-02	6.561E-02	1.221E-01	NOT IDENT.
BK-247	-1.725E-02	5.235E-02	1.025E-01	NOT IDENT.
CM-247	3.584E-03	2.661E-02	5.293E-02	NOT IDENT.
CF-249	9.104E-03	2.940E-02	5.940E-02	NOT IDENT.
CF-251	-2.734E-02	1.003E-01	1.810E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	407	10.66*	1.403E+00	1.202E+01	1.202E+01	10.14
CO-56	846.77	8	99.94*	2.182E+00	1.621E-02	2.572E-01	134.83
	1037.84	-----	14.17	1.863E+00	-----	Line Not Found	-----
	1238.28	31	66.90	1.617E+00	1.282E-01	2.033E+00	69.84
	1771.35	-----	15.47	1.172E+00	-----	Line Not Found	-----
CD-109	88.03	86	3.70*	7.559E+00	1.364E+00	2.167E+00	83.01
SN-126	64.28	52	9.60	5.534E+00	4.297E-01	4.297E-01	127.75
	86.94	86	8.90	7.559E+00	5.672E-01	5.672E-01	83.01
	87.57	86	37.00*	7.559E+00	1.364E-01	1.364E-01	83.01
BA-137M	661.66	19	89.90*	2.620E+00	3.503E-02	3.572E-02	187.70
CS-137	661.66	19	85.10*	2.620E+00	3.701E-02	3.773E-02	187.70
TL-208	277.37	-----	6.60	5.132E+00	-----	Line Not Found	-----
	583.19	171	85.00*	2.885E+00	3.083E-01	3.083E-01	25.31
	860.56	30	12.50	2.153E+00	4.920E-01	4.920E-01	59.57
PB-210	46.54	28	4.25*	2.754E+00	1.042E+00	1.070E+00	230.61
BI-211	72.87	49	1.23	6.592E+00	2.686E+00	2.686E+00	136.52
	351.06	367	12.92*	4.262E+00	2.945E+00	2.945E+00	15.89
PB-212	74.82	225	10.28	6.772E+00	1.424E+00	1.424E+00	30.20
	77.11	395	17.10	6.937E+00	1.470E+00	1.470E+00	20.11
	238.63	497	43.60*	5.748E+00	8.762E-01	8.762E-01	15.68
	300.09	64	3.30	4.823E+00	1.763E+00	1.763E+00	54.55
BI-214	609.32	222	45.49*	2.791E+00	7.732E-01	7.735E-01	21.38
	1120.29	67	14.92	1.754E+00	1.129E+00	1.129E+00	32.27
	1764.49	26	15.30	1.177E+00	6.303E-01	6.305E-01	58.08
PB-214	74.82	225	5.80	6.772E+00	2.524E+00	2.525E+00	30.20
	77.11	395	9.70	6.937E+00	2.591E+00	2.592E+00	20.11
	87.09	86	3.41	7.559E+00	1.480E+00	1.481E+00	83.01
	242.00	109	7.25	5.693E+00	1.163E+00	1.164E+00	38.53
	295.22	241	18.42	4.885E+00	1.180E+00	1.180E+00	22.14
	351.93	367	35.60*	4.262E+00	1.069E+00	1.069E+00	15.89
RN-222	609.32	222	45.49*	2.791E+00	7.732E-01	7.735E-01	21.38
	1120.29	67	14.92	1.754E+00	1.129E+00	1.129E+00	32.27
	1764.49	26	15.30	1.177E+00	6.303E-01	6.305E-01	58.08
RA-224	240.99	109	4.10*	5.693E+00	2.057E+00	2.057E+00	38.53
RA-226	609.32	222	45.49*	2.791E+00	7.732E-01	7.735E-01	21.38
	1120.29	67	14.92	1.754E+00	1.129E+00	1.129E+00	32.27
	1764.49	26	15.30	1.177E+00	6.303E-01	6.305E-01	58.08
AC-228	105.21	-----	1.10	8.060E+00	-----	Line Not Found	-----
	338.32	106	11.27	4.399E+00	9.435E-01	9.435E-01	40.20
	794.95	-----	4.25	2.286E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.201E+00	-----	Line Not Found	-----
	911.20	94	25.80*	2.060E+00	7.786E-01	7.786E-01	37.20
	968.97	57	15.80	1.964E+00	8.137E-01	8.137E-01	58.83
RA-228	105.21	-----	1.10	8.060E+00	-----	Line Not Found	-----
	338.32	106	11.27	4.399E+00	9.435E-01	9.435E-01	40.20
	794.95	-----	4.25	2.286E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.201E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	911.20	94	25.80*	2.060E+00	7.786E-01	7.786E-01	37.20
	968.97	57	15.80	1.964E+00	8.137E-01	8.137E-01	58.83
TH-228	74.82	225	10.28	6.772E+00	1.424E+00	1.424E+00	30.20
	77.11	395	17.10	6.937E+00	1.470E+00	1.470E+00	20.11
	238.63	497	43.60*	5.748E+00	8.762E-01	8.762E-01	15.68
	300.09	64	3.30	4.823E+00	1.763E+00	1.763E+00	54.55
TH-230	609.32	222	45.49*	2.791E+00	7.732E-01	7.732E-01	21.38
	1120.29	67	14.92	1.754E+00	1.129E+00	1.129E+00	32.27
	1764.49	26	15.30	1.177E+00	6.303E-01	6.303E-01	58.08
PA-231	283.69	-----	1.70	5.044E+00	-----	Line Not Found	-----
	301.36	64	5.35*	4.823E+00	1.087E+00	1.087E+00	54.55
TH-232	105.21	-----	1.10	8.060E+00	-----	Line Not Found	-----
	338.32	106	11.27	4.399E+00	9.435E-01	9.435E-01	40.20
	835.71	-----	1.61	2.201E+00	-----	Line Not Found	-----
	911.20	94	25.80*	2.060E+00	7.786E-01	7.786E-01	37.20
	968.97	57	15.80	1.964E+00	8.137E-01	8.137E-01	58.83
TH-234	63.29	52	3.70*	5.534E+00	1.115E+00	1.115E+00	127.75
	92.59	61	4.23	7.793E+00	8.209E-01	8.209E-01	121.48
U-234	609.32	222	45.49*	2.791E+00	7.732E-01	7.732E-01	21.38
	1120.29	67	14.92	1.754E+00	1.129E+00	1.129E+00	32.27
	1764.49	26	15.30	1.177E+00	6.303E-01	6.303E-01	58.08
U-235	89.96	81	3.47	7.683E+00	1.346E+00	1.346E+00	43.58
	93.35	61	5.60	7.793E+00	6.201E-01	6.201E-01	121.48
	143.76	19	10.96*	7.743E+00	1.001E-01	1.001E-01	207.10
	163.33	9	5.08	7.318E+00	1.089E-01	1.089E-01	574.18
	185.72	88	57.20	6.810E+00	9.991E-02	9.991E-02	60.79
	205.31	-----	5.01	6.393E+00	-----	Line Not Found	-----
U-238	63.29	52	3.70*	5.534E+00	1.115E+00	1.115E+00	127.75
	92.59	61	4.23	7.793E+00	8.209E-01	8.209E-01	121.48
AM-243	43.53	-----	5.90	2.021E+00	-----	Line Not Found	-----
	74.66	225	67.20*	6.772E+00	2.179E-01	2.179E-01	30.20
ANH-511	511.00	82	100.00*	3.191E+00	1.133E-01	1.133E-01	58.16

Flag: "*" = Keyline

Total number of lines in spectrum 51
 Number of unidentified lines 9
 Number of lines tentatively identified by NID 42 82.35%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.202E+01	1.202E+01	0.122E+01	10.14	
CO-56	77.23D	15.9	1.621E-02	2.572E-01	3.468E-01	134.83	
CD-109	461.40D	1.59	1.364E+00	2.167E+00	1.799E+00	83.01	
SN-126	2.30E+05Y	1.00	1.364E-01	1.364E-01	1.133E-01	83.01	
BA-137M	30.08Y	1.02	3.503E-02	3.572E-02	6.704E-02	187.70	
CS-137	30.08Y	1.02	3.701E-02	3.773E-02	7.082E-02	187.70	
TL-208	1.41E+10Y	1.00	3.083E-01	3.083E-01	0.780E-01	25.31	
PB-210	22.20Y	1.03	1.042E+00	1.070E+00	2.467E+00	230.61	
BI-211	7.04E+08Y	1.00	2.945E+00	2.945E+00	0.468E+00	15.89	
PB-212	1.41E+10Y	1.00	8.762E-01	8.762E-01	1.374E-01	15.68	
BI-214	1600.00Y	1.00	7.732E-01	7.735E-01	1.654E-01	21.38	
PB-214	1600.00Y	1.00	1.069E+00	1.069E+00	0.170E+00	15.89	
RN-222	1600.00Y	1.00	7.732E-01	7.735E-01	1.654E-01	21.38	
RA-224	1.41E+10Y	1.00	2.057E+00	2.057E+00	0.793E+00	38.53	
RA-226	1600.00Y	1.00	7.732E-01	7.735E-01	1.654E-01	21.38	
AC-228	1.41E+10Y	1.00	7.786E-01	7.786E-01	2.896E-01	37.20	
RA-228	1.41E+10Y	1.00	7.786E-01	7.786E-01	2.896E-01	37.20	
TH-228	1.41E+10Y	1.00	8.762E-01	8.762E-01	1.374E-01	15.68	
TH-230	7.54E+04Y	1.00	7.732E-01	7.732E-01	1.653E-01	21.38	
PA-231	7.04E+08Y	1.00	1.087E+00	1.087E+00	0.593E+00	54.55	
TH-232	1.41E+10Y	1.00	7.786E-01	7.786E-01	2.896E-01	37.20	
TH-234	4.47E+09Y	1.00	1.115E+00	1.115E+00	1.424E+00	127.75	
U-234	2.45E+05Y	1.00	7.732E-01	7.732E-01	1.653E-01	21.38	
U-235	7.04E+08Y	1.00	1.001E-01	1.001E-01	2.073E-01	207.10	
U-238	4.47E+09Y	1.00	1.115E+00	1.115E+00	1.424E+00	127.75	
AM-243	7370.00Y	1.00	2.179E-01	2.179E-01	0.658E-01	30.20	
ANH-511	1.00E+09Y	1.00	1.133E-01	1.133E-01	0.659E-01	58.16	
Total Activity :			3.273E+01	3.381E+01			

Grand Total Activity : 3.273E+01 3.381E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	128.35	66	140	2.38	256.06	252	8	1.39E-02	76.5	8.00E+00	T
0	209.11	58	96	0.85	417.64	415	8	1.29E-02	71.1	6.31E+00	
0	225.87	24	67	1.27	451.18	449	6	5.45E-03	****	5.98E+00	T
0	270.69	51	85	2.21	540.85	536	11	1.16E-02	83.4	5.23E+00	T
0	328.98	18	90	1.29	657.49	651	10	4.26E-03	****	4.49E+00	T
0	463.97	23	81	3.36	927.58	919	13	5.57E-03	****	3.44E+00	T
0	491.06	19	23	1.56	981.79	979	9	4.68E-03	****	3.29E+00	T
0	642.39	17	19	1.60	1284.60	1279	9	4.26E-03	****	2.68E+00	
0	728.29	41	44	1.82	1456.48	1448	15	1.05E-02	80.6	2.44E+00	T
0	742.43	29	13	0.81	1484.78	1480	10	7.42E-03	62.7	2.41E+00	
0	881.21	16	18	3.68	1762.50	1754	14	4.12E-03	****	2.11E+00	T
0	893.41	73	27	15.20	1786.90	1773	33	1.93E-02	49.8	2.09E+00	T
0	927.40	24	14	4.86	1854.93	1846	15	6.46E-03	83.0	2.03E+00	T
0	1126.44	10	6	1.44	2253.27	2250	8	2.72E-03	****	1.75E+00	
0	1177.68	15	2	0.98	2355.81	2352	8	4.13E-03	61.6	1.68E+00	T
0	1180.97	13	2	0.76	2362.41	2359	8	3.72E-03	65.1	1.68E+00	
0	1193.17	10	17	3.36	2386.82	2379	10	2.79E-03	****	1.67E+00	
0	1279.23	12	1	0.64	2559.04	2556	8	3.22E-03	71.2	1.57E+00	
0	1297.27	6	16	2.86	2595.15	2585	13	1.66E-03	****	1.55E+00	T
0	1364.61	4	6	1.23	2729.93	2722	9	1.19E-03	****	1.49E+00	T
0	1376.86	31	0	1.21	2754.45	2747	14	8.61E-03	35.9	1.48E+00	
0	1409.66	17	3	3.28	2820.10	2813	14	4.94E-03	64.8	1.45E+00	

Flags: "T" = Tentatively associated

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621355.CNF;1
* Acquisition date   : 3-OCT-2016 09:21:06 Sensitivity      : 3.000
* Detector ID        : GAM27 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.94 Half life ratio  : *****
* Sample date        : 30-NOV-2015 10:40:00 Nuclide Library : SOLID
* Sample ID          : G1203621355 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity : 1.7010E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   Dry Weight      : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 3-OCT-2016 06:09:32 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM27_CAN.CNF;13
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.754E-01
CO-56	3.057E-01
CD-109	7.742E-01
SN-126	4.887E-02
BA-137M	2.224E-02
CS-137	2.349E-02
TL-208	1.967E-02
PB-210	8.441E-01
PB-212	3.785E-02
BI-214	4.468E-02
PB-214	4.105E-02
RN-222	4.468E-02
RA-226	4.468E-02
AC-228	8.052E-02
RA-228	8.052E-02
TH-228	3.785E-02
TH-230	4.467E-02
PA-231	2.748E-01
TH-232	8.052E-02
TH-234	5.997E-01
U-234	4.466E-02
U-235	1.183E-01
U-238	5.997E-01
AM-243	2.732E-02
ANH-511	1.874E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	9.383E+00	NOT IDENT.
NA-22	2.900E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.802E-02	NOT IDENT.
SC-46	3.068E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF

CR-51	0.000E+00	SHORT HLIF
MN-54	4.715E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.086E-02	NOT IDENT.
CO-58	3.546E-01	NOT IDENT.
FE-59	5.117E+00	NOT IDENT.
CO-60	2.205E-02	NOT IDENT.
ZN-65	1.010E-01	NOT IDENT.
GE-68	2.024E+00	NOT IDENT.
AS-73	3.625E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.434E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.673E-01	NOT IDENT.
KR-85	4.862E+00	NOT IDENT.
SR-85	5.594E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.305E-01	NOT IDENT.
Y-91	3.492E+02	NOT IDENT.
NB-94	1.889E-02	NOT IDENT.
NB-95	4.751E-01	NOT IDENT.
NB-95M	1.745E+00	NOT IDENT.
ZR-95	1.244E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.228E-02	FAIL ABUN
RH-102	4.330E-02	NOT IDENT.
RU-103	4.212E+00	FAIL ABUN
RH-106	4.055E-01	NOT IDENT.
RU-106	4.055E-01	NOT IDENT.
AG-108M	1.743E-02	NOT IDENT.
AG-110M	5.466E-02	NOT IDENT.
SN-113	1.466E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	9.770E-02	NOT IDENT.
SB-124	1.627E+00	NOT IDENT.
SB-125	6.843E-02	FAIL ABUN
TE-125M	2.073E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.478E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.444E-02	FAIL ABUN
CS-135	8.165E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	8.129E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.951E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.393E-01	NOT IDENT.
PM-144	3.987E-02	NOT IDENT.
PR-144	3.471E+00	NOT IDENT.
PM-146	2.288E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	5.173E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.608E-02	FAIL ABUN
EU-152	6.030E-02	NOT IDENT.
GD-153	1.039E-01	NOT IDENT.
EU-154	7.033E-02	NOT IDENT.
EU-155	7.322E-02	FAIL ABUN
TB-160	1.182E+00	FAIL ABUN
HO-166M	4.183E-02	NOT IDENT.
TM-171	7.333E+00	NOT IDENT.
HF-172	1.354E-01	FAIL ABUN
LU-172	5.023E-02	FAIL ABUN
LU-176	1.468E-02	FAIL ABUN
HF-181	2.978E+00	NOT IDENT.

TA-182	6.345E-01	FAIL ABUN
RE-183	1.532E+00	FAIL ABUN
RE-184	2.467E+01	FAIL ABUN
W-188	9.201E+01	FAIL ABUN
IR-192	3.604E-01	FAIL ABUN
HG-203	1.962E+00	FAIL ABUN
BI-207	3.550E-02	FAIL ABUN
BI-211	3.288E-01	FAIL ABUN
PB-211	4.388E-01	NOT IDENT.
BI-212	4.835E-01	FAIL ABUN
RN-219	2.531E-01	FAIL ABUN
RA-223	3.852E-01	FAIL ABUN
RA-224	5.843E-01	FAIL ABUN
AC-227	1.678E-01	FAIL ABUN
TH-227	1.678E-01	FAIL ABUN
TH-229	3.404E-01	FAIL ABUN
TH-231	3.852E-01	FAIL ABUN
PA-233	3.437E-02	FAIL ABUN
PA-234	1.512E-01	FAIL ABUN
PA-234M	2.967E+00	NOT IDENT.
NP-237	3.437E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.596E-01	NOT IDENT.
PU-239	2.136E+02	FAIL ABUN
AM-241	6.676E-02	NOT IDENT.
CM-243	5.705E-02	NOT IDENT.
BK-247	4.725E-02	NOT IDENT.
CM-247	2.419E-02	NOT IDENT.
CF-249	2.728E-02	NOT IDENT.
CF-251	8.517E-02	NOT IDENT.

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621355.CNF;1
* Acquisition date   : 3-OCT-2016 09:21:06 Sensitivity      : 3.000
* Detector ID        : GAM27 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.94 Half life ratio : *****
* Sample date        : 30-NOV-2015 10:40:00 Nuclide Library : SOLID
* Sample ID          : G1203621355 Analyst initials: MXR1
* Batch Number       : 1596249 Sample Quantity : 1.7010E+02 GRAM
*                               Quantity Err(%) : 1.1758E-03 %
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight  : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 3-OCT-2016 06:09:32 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM27_CAN.CNF;13
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.202E+01	1.349E+00	1.349E+00
CO-56	2.572E-01	3.400E-01	3.400E-01
CD-109	4.465E-01	1.805E+00	1.805E+00
SN-126	2.811E-02	1.136E-01	1.136E-01
BA-137M	3.572E-02	6.572E-02	6.572E-02
CS-137	3.773E-02	6.943E-02	6.943E-02
TL-208	3.083E-01	7.759E-02	7.759E-02
PB-210	1.070E+00	2.419E+00	2.419E+00
PB-212	8.762E-01	1.426E-01	1.426E-01
BI-214	7.735E-01	1.655E-01	1.655E-01
PB-214	1.069E+00	1.725E-01	1.725E-01
RN-222	7.735E-01	1.655E-01	1.655E-01
RA-226	7.735E-01	1.655E-01	1.655E-01
AC-228	7.786E-01	2.866E-01	2.866E-01
RA-228	7.786E-01	2.866E-01	2.866E-01
TH-228	8.762E-01	1.426E-01	1.426E-01
TH-230	7.732E-01	1.654E-01	1.654E-01
PA-231	1.087E+00	6.261E-01	6.261E-01
TH-232	7.786E-01	2.866E-01	2.866E-01
TH-234	1.115E+00	1.417E+00	1.417E+00
U-234	7.732E-01	1.654E-01	1.654E-01
U-235	1.001E-01	2.032E-01	2.032E-01
U-238	1.115E+00	1.417E+00	1.417E+00
AM-243	1.164E-01	6.878E-02	6.878E-02
ANH-511	1.133E-01	6.477E-02	6.477E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	3.678E+00	1.018E+01	1.031E+01	NOT IDENT.
NA-22	2.007E-02	3.275E-02	3.398E-02	NOT IDENT.
NA-24	1.000E+41	1.246E+41	0.000E+00	SHORT HLIF
AL-26	1.348E-03	2.044E-02	2.045E-02	NOT IDENT.
SC-46	1.969E-01	3.187E-01	3.308E-01	FAIL ABUN

V-48	-7.696E+03	1.530E+04	1.569E+04	SHORT HLIF
CR-51	-1.543E+01	3.922E+02	3.923E+02	SHORT HLIF
MN-54	2.301E-02	4.983E-02	5.090E-02	NOT IDENT.
MN-56	1.000E+41	1.322E+41	0.000E+00	SHORT HLIF
CO-57	-4.736E-03	3.484E-02	3.490E-02	NOT IDENT.
CO-58	-1.976E-01	4.287E-01	4.379E-01	NOT IDENT.
FE-59	-3.122E+00	6.413E+00	6.566E+00	NOT IDENT.
CO-60	3.445E-03	2.518E-02	2.523E-02	NOT IDENT.
ZN-65	4.042E-03	1.320E-01	1.320E-01	NOT IDENT.
GE-68	2.096E+00	2.039E+00	2.247E+00	NOT IDENT.
AS-73	-1.544E+00	3.942E+00	4.003E+00	NOT IDENT.
AS-74	5.615E+03	5.806E+03	6.333E+03	SHORT HLIF
SE-75	-6.294E-02	1.598E-01	1.623E-01	NOT IDENT.
BR-77	1.681E+39	1.495E+40	0.000E+00	SHORT HLIF
SR-82	9.295E+02	6.982E+02	8.143E+02	SHORT HLIF
RB-83	3.257E-02	5.307E-01	5.309E-01	NOT IDENT.
KR-85	7.659E-01	6.101E+00	6.111E+00	NOT IDENT.
SR-85	8.767E-02	7.020E-01	7.031E-01	NOT IDENT.
RB-86	3.506E+04	3.199E+04	3.568E+04	SHORT HLIF
Y-88	2.683E-02	1.421E-01	1.426E-01	NOT IDENT.
Y-91	-3.144E+02	4.621E+02	4.834E+02	NOT IDENT.
NB-94	-2.081E-02	2.565E-02	2.731E-02	NOT IDENT.
NB-95	-9.650E-01	7.407E-01	8.590E-01	NOT IDENT.
NB-95M	-4.666E-01	2.107E+00	2.118E+00	NOT IDENT.
ZR-95	7.913E-01	1.365E+00	1.411E+00	NOT IDENT.
NB-97	1.000E+41	2.440E+41	0.000E+00	SHORT HLIF
ZR-97	-1.000E+41	6.698E+41	0.000E+00	SHORT HLIF
MO-99	5.807E+32	1.140E+33	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	1.696E+41	0.000E+00	SHORT HLIF
RH-101	6.413E-02	4.945E-02	5.728E-02	FAIL ABUN
RH-102	2.394E-02	4.716E-02	4.838E-02	NOT IDENT.
RU-103	1.021E+00	4.657E+00	4.679E+00	FAIL ABUN
RH-106	7.037E-02	4.641E-01	4.652E-01	NOT IDENT.
RU-106	7.037E-02	4.641E-01	4.652E-01	NOT IDENT.
AG-108M	-1.534E-02	2.186E-02	2.293E-02	NOT IDENT.
AG-110M	3.414E-03	9.427E-02	9.429E-02	NOT IDENT.
SN-113	-1.954E-02	1.656E-01	1.659E-01	NOT IDENT.
CD-115	-4.280E+39	3.294E+40	0.000E+00	SHORT HLIF
SN-117M	4.373E+04	1.142E+05	1.158E+05	SHORT HLIF
TE-123M	6.327E-02	1.059E-01	1.096E-01	NOT IDENT.
SB-124	6.668E-01	1.779E+00	1.804E+00	NOT IDENT.
SB-125	1.810E-02	7.460E-02	7.505E-02	FAIL ABUN
TE-125M	1.075E+02	2.211E+02	2.263E+02	NOT IDENT.
I-126	8.075E+04	1.049E+06	1.050E+06	SHORT HLIF
SB-126	-2.045E+05	1.521E+06	1.524E+06	SHORT HLIF
SB-127	2.156E+21	8.694E+22	0.000E+00	SHORT HLIF
I-131	-3.985E+09	7.299E+09	7.517E+09	SHORT HLIF
I-132	-1.000E+41	1.905E+42	0.000E+00	SHORT HLIF
TE-132	9.226E+25	1.819E+27	0.000E+00	SHORT HLIF
BA-133	-3.907E-02	3.502E-02	3.920E-02	NOT IDENT.
I-133	1.000E+41	1.497E+42	0.000E+00	SHORT HLIF
CS-134	1.935E-02	3.801E-02	3.900E-02	FAIL ABUN
CS-135	-3.494E-02	1.022E-01	1.034E-01	NOT IDENT.
I-135	-1.000E+41	7.173E+41	0.000E+00	SHORT HLIF
CS-136	4.882E+04	3.398E+05	3.406E+05	SHORT HLIF
CE-139	2.436E-02	9.851E-02	9.912E-02	NOT IDENT.
BA-140	3.266E+05	1.615E+06	1.621E+06	SHORT HLIF
LA-140	-3.715E+05	5.441E+05	5.693E+05	SHORT HLIF
CE-141	-7.203E+00	2.469E+01	2.490E+01	NOT IDENT.
CE-143	-1.000E+41	2.110E+41	0.000E+00	SHORT HLIF
CE-144	6.426E-02	2.633E-01	2.649E-01	NOT IDENT.
PM-144	8.028E-03	4.591E-02	4.606E-02	NOT IDENT.
PR-144	-2.579E-01	4.136E+00	4.138E+00	NOT IDENT.
PM-146	-1.331E-02	2.791E-02	2.854E-02	NOT IDENT.
ND-147	-7.226E+06	4.112E+07	4.125E+07	SHORT HLIF
PM-147	-1.748E+02	5.921E+02	5.973E+02	NOT IDENT.
PM-149	-1.000E+41	1.332E+41	0.000E+00	SHORT HLIF
EU-150	6.773E-03	1.866E-02	1.891E-02	FAIL ABUN
EU-152	-2.135E-02	6.861E-02	6.928E-02	NOT IDENT.
GD-153	-1.419E-01	1.256E-01	1.410E-01	NOT IDENT.
EU-154	3.377E-02	8.419E-02	8.555E-02	NOT IDENT.
EU-155	6.871E-02	7.557E-02	8.167E-02	FAIL ABUN
TB-160	-4.399E-01	1.406E+00	1.420E+00	FAIL ABUN
HO-166M	1.746E-02	4.678E-02	4.744E-02	NOT IDENT.
TM-171	-8.480E-01	7.778E+00	7.787E+00	NOT IDENT.
HF-172	-1.107E-01	1.774E-01	1.843E-01	FAIL ABUN
LU-172	1.076E-02	5.611E-02	5.632E-02	FAIL ABUN
LU-176	-1.847E-02	1.788E-02	1.972E-02	FAIL ABUN

HF-181	1.264E+00	3.196E+00	3.246E+00	NOT IDENT.
TA-182	2.691E-01	6.952E-01	7.057E-01	FAIL ABUN
RE-183	1.175E-02	1.620E+00	1.620E+00	FAIL ABUN
RE-184	1.190E+01	2.921E+01	2.970E+01	FAIL ABUN
W-188	4.785E+01	9.991E+01	1.022E+02	FAIL ABUN
IR-192	7.654E-02	3.865E-01	3.880E-01	FAIL ABUN
HG-203	-1.326E-02	2.120E+00	2.120E+00	FAIL ABUN
BI-207	2.323E-02	3.725E-02	3.870E-02	FAIL ABUN
BI-211	2.945E+00	4.775E-01	1.411E+00	FAIL ABUN
PB-211	-1.684E-01	5.094E-01	5.150E-01	NOT IDENT.
BI-212	1.105E+00	8.746E-01	1.007E+00	FAIL ABUN
RN-219	-6.253E-02	2.897E-01	2.911E-01	FAIL ABUN
RA-223	-2.036E-01	4.962E-01	5.047E-01	FAIL ABUN
RA-224	2.057E+00	7.847E-01	1.215E+00	FAIL ABUN
AC-227	3.791E-02	1.770E-01	1.778E-01	FAIL ABUN
TH-227	3.791E-02	1.770E-01	1.778E-01	FAIL ABUN
TH-229	1.694E-01	3.793E-01	3.869E-01	FAIL ABUN
TH-231	-2.036E-01	4.962E-01	5.047E-01	FAIL ABUN
PA-233	-3.877E-02	4.169E-02	4.520E-02	FAIL ABUN
PA-234	-1.719E-01	2.817E-01	2.922E-01	FAIL ABUN
PA-234M	8.732E-01	3.256E+00	3.280E+00	NOT IDENT.
NP-237	-3.877E-02	4.169E-02	4.520E-02	FAIL ABUN
NP-238	-1.000E+41	1.916E+41	0.000E+00	SHORT HLIF
NP-239	1.071E-01	1.687E-01	1.755E-01	NOT IDENT.
PU-239	5.790E+02	4.346E+02	5.070E+02	FAIL ABUN
AM-241	-1.913E-02	7.795E-02	7.843E-02	NOT IDENT.
CM-243	-3.200E-02	6.568E-02	6.724E-02	NOT IDENT.
BK-247	-1.725E-02	5.246E-02	5.304E-02	NOT IDENT.
CM-247	3.584E-03	2.662E-02	2.667E-02	NOT IDENT.
CF-249	9.104E-03	2.941E-02	2.970E-02	NOT IDENT.
CF-251	-2.734E-02	1.004E-01	1.011E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	75.5737	87.09	145.1000	136.47	86.1691
45.60	65.5803	87.57	145.2323	140.51	0.0000
46.54	65.7580	88.03	145.3587	143.76	80.1685
49.72	0.0000	88.34	109.0829	144.24	90.1517
51.35	80.1621	88.47	109.1099	145.44	84.1762
51.87	78.3396	89.96	108.0118	152.43	77.6201
52.39	74.5741	1093.63	108.1489	153.25	0.0000
52.97	86.3281	91.11	0.0000	323.87	73.1543
53.44	94.2045	92.59	108.5374	156.02	0.0000
54.07	97.2776	93.35	108.6886	158.56	0.0000
57.36	0.0000	94.56	80.6340	159.00	67.7617
57.53	116.7861	94.65	80.6468	162.33	79.7767
57.98	107.0919	94.67	80.6497	162.66	0.0000
59.27	116.9610	94.87	80.6790	163.33	81.0510
59.32	116.9755	97.43	105.5757	165.86	73.8410
59.54	117.0384	98.43	76.9175	176.31	94.2609
60.96	113.4834	98.44	76.9191	176.60	0.0000
61.17	114.8610	99.53	74.9251	177.52	93.1999
62.93	114.3490	100.11	70.7146	181.07	0.0000
63.29	114.4455	102.03	77.3992	181.52	89.6317
63.58	114.5236	103.18	80.7827	184.41	83.5045
64.28	121.0283	103.37	80.8084	143.76	91.6706
66.73	120.3735	105.21	71.3330	193.51	69.3522
67.24	135.5768	105.31	71.3446	197.03	81.8331
125.81	126.6643	106.12	85.5130	198.01	62.3570
67.75	126.6835	106.47	93.1446	201.83	65.0693
69.67	125.2081	109.28	81.6084	203.43	82.3974
70.83	137.6747	111.00	80.7455	205.31	59.1482
72.81	116.9153	111.76	0.0000	210.85	69.4061
72.87	116.9302	114.06	71.2740	215.65	63.5212
74.66	117.3768	116.30	0.0000	222.11	70.2034
74.82	117.4163	116.74	67.1711	227.09	65.5102
74.97	117.4532	119.76	70.8052	227.38	59.2276
77.11	117.9778	121.12	75.3872	228.16	0.0000
78.74	126.2642	121.22	78.7250	228.18	60.5354
79.69	89.3810	121.78	81.0117	116.74	60.5354
80.12	99.0923	122.06	77.7155	235.69	71.1382
80.19	0.0000	122.92	77.8165	235.96	67.3450
80.57	99.1816	123.07	68.9388	238.63	73.8850
81.00	103.4035	265.00	62.3245	238.98	0.0000
81.07	98.2471	125.81	80.3870	240.99	102.1375
81.75	115.9854	127.23	70.4862	242.00	46.0052
83.79	109.5202	127.91	70.5571	244.70	49.9646
84.00	109.5652	129.30	77.8075	252.40	0.0000
85.43	125.1682	131.20	76.5228	252.80	55.9301
86.55	133.7998	133.02	83.4928	254.15	0.0000
86.79	145.0164	133.52	72.2607	256.23	57.8293
86.94	145.0577	136.00	73.6487	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	54.7853	355.39	0.0000	584.27	20.2463
264.80	53.0523	356.01	43.4348	595.83	0.0000
265.00	53.0623	364.49	0.0000	427.87	26.8483
268.22	45.7965	366.42	0.0000	602.52	0.0000
269.46	47.1555	372.51	30.2337	604.72	40.3503
270.03	47.1786	375.05	40.6966	607.14	22.6218
271.23	47.2269	377.52	35.0759	609.32	28.0365
273.65	0.0000	356.01	39.0331	610.33	28.0492
276.40	57.0998	388.16	37.2354	614.28	14.5909
277.37	43.9585	388.63	0.0000	618.01	25.9844
277.60	43.9677	391.69	30.6230	620.36	23.8441
278.00	51.0190	264.66	42.3520	621.93	31.4544
279.20	58.1152	401.81	38.5303	630.19	0.0000
279.54	59.0135	402.40	35.6541	631.29	20.6954
279.70	58.1394	404.85	39.5711	633.25	20.7140
280.46	55.5326	410.95	40.6935	634.78	0.0000
283.69	45.0764	413.71	39.7938	635.95	22.9226
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	52.2228	423.72	0.0000	645.85	13.1567
285.90	0.0000	427.09	38.1677	657.76	21.4924
287.50	47.8795	427.87	27.4155	657.90	0.0000
290.67	51.2039	433.94	37.3452	661.66	23.1849
293.27	0.0000	439.40	31.5521	664.57	0.0000
351.93	45.5049	453.88	24.8622	666.33	0.0000
295.96	45.5329	463.37	32.9993	666.50	0.0000
879.38	34.8923	468.07	33.0886	667.71	0.0000
299.98	44.3367	473.00	0.0000	677.62	21.1222
300.09	44.3397	475.06	35.2336	685.70	0.0000
300.13	44.3417	476.78	26.1989	695.00	0.0000
301.36	41.6950	477.60	25.2029	696.49	24.6542
302.85	43.0908	482.18	18.1930	696.51	28.0162
256.23	39.1024	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	36.9934
306.78	54.0320	497.08	22.4194	697.49	36.9961
308.46	35.1668	505.52	27.6411	702.65	31.4590
311.90	47.9191	507.63	0.0000	706.68	19.1319
316.51	45.3674	511.00	30.8029	711.68	20.2991
319.41	0.0000	514.00	32.3947	720.70	0.0000
320.08	0.0000	514.00	32.3947	721.93	0.0000
321.04	41.8831	520.40	25.7975	722.78	23.7908
323.87	49.2726	520.69	0.0000	722.91	23.7916
325.23	28.7718	522.65	0.0000	723.31	18.6968
328.76	0.0000	527.90	0.0000	724.19	18.7035
333.37	35.8397	528.26	25.9033	727.33	23.8344
333.97	31.7184	529.59	23.8479	733.00	17.0636
334.37	40.0042	529.87	0.0000	735.93	26.1951
338.28	43.3473	531.02	0.0000	333.97	13.6753
338.32	43.3482	537.26	0.0000	739.50	0.0000
311.90	40.1839	546.56	0.0000	747.24	25.7419
340.48	40.1839	552.55	26.2278	748.06	20.6001
340.55	0.0000	563.25	16.8757	752.31	21.7809
344.28	42.6103	569.33	31.7371	753.82	0.0000
345.93	34.4996	946.00	31.7395	756.73	20.6704
351.06	32.5782	569.70	31.7419	756.80	20.6711
351.93	32.5989	583.19	20.2362	884.68	19.5774

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	32.2679	1274.44	18.7335	1620.50	3.2950
766.42	27.6650	1001.03	13.1331	1621.92	8.7896
766.84	25.3641	1002.74	18.7720	1678.03	0.0000
772.60	0.0000	1004.73	15.9660	1690.97	4.4578
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.6189
778.90	25.4823	1028.54	0.0000	1063.66	15.3979
783.70	0.0000	1037.84	26.5662	1771.35	3.3973
785.37	17.4170	1038.76	0.0000	1791.20	0.0000
792.07	18.6257	631.29	23.7839	1808.65	3.6500
794.95	13.9844	1048.07	0.0000	1810.72	0.0000
795.86	16.3208	1049.04	12.3763	1836.06	2.7519
810.06	19.3380	1050.41	19.0491		
810.29	19.3393	1063.66	13.3873		
344.28	19.3406	1077.00	0.0000		
810.76	18.4634	1077.34	13.4412		
815.77	0.0000	1085.87	12.5128		
1048.07	0.0000	1093.63	13.5061		
832.01	26.5833	1099.45	22.2251		
834.85	18.6275	1112.07	10.6683		
835.71	23.9571	1112.84	12.6112		
836.80	0.0000	1115.54	12.4266		
846.75	0.0000	1120.29	13.6104		
846.77	15.6788	1120.55	13.6112		
856.80	0.0000	1221.41	12.9655		
860.56	14.3237	1129.67	18.7148		
871.09	17.0726	1131.51	0.0000		
873.19	17.4708	1147.95	0.0000		
875.33	0.0000	1173.23	7.8936		
879.38	17.1225	1177.95	11.0653		
880.51	17.1289	1189.05	17.4410		
883.24	14.4380	1204.77	21.8939		
884.68	10.8340	1221.41	12.9952		
889.28	15.3725	1231.02	22.4492		
894.76	15.4016	1235.36	0.0000		
898.04	15.4187	1238.28	19.0777		
900.72	15.4332	1260.41	0.0000		
903.28	14.5381	1271.87	11.1423		
911.20	16.3993	1274.44	8.1089		
912.08	16.4042	1274.54	6.4871		
923.98	0.0000	1291.59	14.6602		
926.50	21.9785	1298.22	0.0000		
929.11	17.5980	1312.11	0.0000		
937.49	20.2202	1332.49	7.2000		
944.13	0.0000	1362.66	0.0000		
946.00	21.1989	1365.19	3.3180		
949.00	15.6838	1368.63	0.0000		
667.71	0.0000	1384.29	6.2498		
962.31	21.3119	1408.01	5.2377		
964.08	17.8008	1457.56	0.0000		
966.17	26.7196	1460.82	6.3629		
911.20	18.5718	1489.16	8.5391		
968.97	18.5718	1505.03	10.7117		
983.53	0.0000	1584.12	9.8091		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621356.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM06.CNF;499
Background date  : 2-OCT-2016 11:00:12.
Sample date     : 12-SEP-2016 00:00:00 Acquisition date : 3-OCT-2016 09:11:02.
Sample ID      : G1203621356 Sample quantity   : 1.15000E+02 GRAM
Detector name   : GAM06 Detector geometry: CAN
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:04.89 0.5%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity    : 3.00000
Batch ID       : 1596249 Detector SN#    :
Matrix Spike ID : LCS ID      : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	37.09	94	2568	1.24	73.94	72	5	1.04E-01	81.9	
2	9	45.10	450	2604	1.83	89.95	87	10	5.00E-01	17.4	1.64E+00
3	9	46.51*	5038	2670	0.92	92.76	87	10	5.60E+00	2.2	
4	0	51.85	142	2206	1.45	103.43	102	5	1.58E-01	50.2	
5	0	59.50	14909	3321	0.98	118.71	114	11	1.66E+01	1.1	
6	0	88.00	2482	1352	1.01	175.67	171	10	2.76E+00	3.4	
7	0	122.28	298	865	1.02	244.18	240	9	3.31E-01	18.8	
8	0	164.58	98	639	1.37	328.71	325	8	1.09E-01	46.0	
9	0	167.41	39	491	1.38	334.36	333	6	4.30E-02	91.6	
10	0	225.90	80	770	1.51	451.26	448	8	8.91E-02	61.0	
11	0	284.90	66	474	1.57	569.18	567	7	7.33E-02	55.8	
12	0	385.80	72	471	1.33	770.85	767	8	7.99E-02	53.6	
13	0	661.30	11854	494	1.46	1321.61	1316	14	1.32E+01	1.0	
14	0	739.32	61	264	4.33	1477.62	1472	11	6.81E-02	53.1	
15	0	891.33	42	198	0.73	1781.56	1779	6	4.64E-02	55.6	
16	0	996.25	42	227	1.32	1991.39	1987	8	4.62E-02	64.9	
17	0	1086.07	81	406	6.36	2171.03	2164	17	9.05E-02	57.9	
18	0	1115.01	167	346	4.31	2228.91	2221	15	1.85E-01	25.6	
19	0	1162.31	49	105	1.81	2323.52	2321	9	5.48E-02	39.6	
20	0	1172.54	7487	330	1.92	2343.98	2334	20	8.32E+00	1.3	
21	0	1331.69	6682	73	2.13	2662.34	2653	18	7.42E+00	1.3	
22	0	1351.56	22	9	2.31	2702.08	2696	12	2.47E-02	34.2	
23	0	1398.56	11	10	0.88	2796.11	2791	10	1.19E-02	71.4	
24	0	1484.54	7	15	1.16	2968.13	2960	10	7.27E-03	123.9	
25	0	1548.58	15	7	2.25	3096.27	3087	14	1.67E-02	45.5	
26	0	1585.08	7	6	0.59	3169.29	3160	12	7.78E-03	79.5	

Flag: "*" = Peak area was modified by background subtraction

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621356.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4
Sample title : MXR1
Sample date : 12-SEP-2016 00:00:00 Acquisition date : 3-OCT-2016 09:11:02
Sample ID : G1203621356 Sample quantity : 115.00 GRAM
Sample type : SOLID Sample geometry :
Detector name : GAMMA6 Detector geometry: CAN
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:04.89 0.5%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type : Empirical Efficiencies at : Peak Energy
Abundance limit : 75.00

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
CO-57	122.06	312	85.60*	6.177E+00	1.540E+00	1.627E+00	37.61
	136.47	-----	10.68	6.083E+00	-----	Line Not Found	-----
CO-60	1173.23	7132	99.85	1.227E+00	1.520E+02	1.532E+02	2.60
	1332.49	6329	99.98*	1.092E+00	1.514E+02	1.526E+02	2.52
ZN-65	1115.54	159	50.60*	1.285E+00	6.384E+00	6.784E+00	51.23
CD-109	88.03	2636	3.70*	5.253E+00	3.541E+02	3.657E+02	6.86
SN-126	64.28	-----	9.60	2.772E+00	-----	Line Not Found	-----
	86.94	2636	8.90	5.253E+00	1.472E+02	1.472E+02	6.86
	87.57	2636	37.00*	5.253E+00	3.541E+01	3.541E+01	6.86
BA-137M	661.66	11577	89.90*	2.028E+00	1.658E+02	1.660E+02	2.00
CS-137	661.66	11577	85.10*	2.028E+00	1.751E+02	1.754E+02	2.00
CE-139	165.86	101	80.00*	5.647E+00	5.856E-01	6.522E-01	91.98
PM-147	121.22	312	0.00*	6.177E+00	4.626E+04	4.698E+04	37.61
PM-149	285.90	67	3.10*	3.879E+00	1.450E+01	1.181E+04	111.62
TM-171	51.35	154	0.27	1.156E+00	1.290E+03	1.318E+03	100.40
	52.39	154	0.47*	1.156E+00	7.413E+02	7.572E+02	100.40
	66.73	-----	0.14	3.097E+00	-----	Line Not Found	-----
PB-210	46.54	5485	4.25*	6.176E-01	5.456E+03	5.466E+03	4.39
AM-241	59.54	16078	35.90*	2.126E+00	5.502E+02	5.503E+02	2.27

Flag: "*" = Keyline

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621356.CNF;1
* Acquisition date   : 3-OCT-2016 09:11:02 Sensitivity      : 3.000
* Detector ID        : GAM06 Energy tolerance: 1.500
* Elapsed live time  : 0 00:15:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:15:04.89 Half life ratio : *****
* Sample date        : 12-SEP-2016 00:00:00 Analyst initials: MXR1
* Sample ID          : G1203621356 Sample Quantity : 1.1500E+02 GRAM
* Batch Number       : 1596249 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 8-MAR-2016 07:26:53 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM06_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
CO-57	1.627E+00	5.996E-01	5.200E-01
CO-60	1.526E+02	3.766E+00	7.581E-01
ZN-65	6.784E+00	3.406E+00	2.990E+00
CD-109	3.657E+02	2.458E+01	1.573E+01
SN-126	3.541E+01	2.380E+00	1.532E+00
BA-137M	1.660E+02	3.261E+00	1.030E+00
CS-137	1.754E+02	3.445E+00	1.088E+00
CE-139	6.522E-01	5.879E-01	5.730E-01
PM-147	4.698E+04	1.732E+04	1.501E+04
PM-149	1.181E+04	1.292E+04	1.770E+04
TM-171	7.572E+02	7.450E+02	9.011E+02
PB-210	5.466E+03	2.349E+02	1.949E+02
AM-241	5.503E+02	1.222E+01	5.831E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.900E+00	6.816E+00	1.190E+01	NOT IDENT.
NA-22	1.218E-01	4.037E-01	7.655E-01	NOT IDENT.
NA-24	0.000E+00	4.969E+09	0.000E+00	SHORT HLIF
AL-26	1.818E-01	2.534E-01	5.666E-01	NOT IDENT.
K-40	2.569E-01	2.569E+00	5.087E+00	NOT IDENT.
SC-46	8.129E-01	9.793E-01	1.540E+00	NOT IDENT.
V-48	-3.611E-01	1.899E+00	3.376E+00	NOT IDENT.
CR-51	7.870E+00	6.403E+00	1.208E+01	NOT IDENT.
MN-54	2.281E-01	6.938E-01	1.195E+00	NOT IDENT.
CO-56	-7.242E-01	8.545E-01	1.385E+00	NOT IDENT.
MN-56	0.000E+00	1.170E+41	0.000E+00	SHORT HLIF
CO-58	-3.445E-01	8.146E-01	1.355E+00	NOT IDENT.
FE-59	-1.166E+00	2.025E+00	3.508E+00	NOT IDENT.
GE-68	2.860E+00	2.610E+01	4.665E+01	NOT IDENT.
AS-73	-2.100E+01	2.669E+01	4.415E+01	NOT IDENT.
AS-74	-1.482E+00	1.940E+00	3.269E+00	NOT IDENT.
SE-75	4.911E-01	6.981E-01	1.193E+00	FAIL ABUN

BR-77	1.824E+02	7.495E+02	1.270E+03	NOT IDENT.
SR-82	1.460E-01	6.875E+00	1.178E+01	NOT IDENT.
RB-83	6.953E-01	1.238E+00	2.231E+00	NOT IDENT.
KR-85	-4.998E+01	1.071E+02	1.852E+02	NOT IDENT.
SR-85	-2.829E-01	6.060E-01	1.048E+00	NOT IDENT.
RB-86	5.068E+00	2.010E+01	3.617E+01	NOT IDENT.
Y-88	1.861E-01	3.101E-01	6.718E-01	NOT IDENT.
Y-91	-1.102E+02	2.525E+02	4.423E+02	NOT IDENT.
NB-94	1.422E-02	5.048E-01	8.744E-01	NOT IDENT.
NB-95	1.502E-01	7.252E-01	1.255E+00	NOT IDENT.
NB-95M	1.075E+00	1.742E+00	2.986E+00	NOT IDENT.
ZR-95	-5.329E-01	1.334E+00	2.239E+00	NOT IDENT.
NB-97	0.000E+00	5.816E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.203E+10	0.000E+00	SHORT HLIF
MO-99	1.529E+03	1.590E+03	1.722E+03	FAIL ABUN
TC-99M	0.000E+00	1.311E+25	0.000E+00	SHORT HLIF
RH-101	-5.671E-02	3.599E-01	6.257E-01	NOT IDENT.
RH-102	-5.007E-02	8.620E-01	1.498E+00	NOT IDENT.
RU-103	6.113E-01	7.813E-01	1.418E+00	NOT IDENT.
RH-106	-1.772E+00	5.129E+00	8.791E+00	NOT IDENT.
RU-106	-1.772E+00	5.129E+00	8.791E+00	NOT IDENT.
AG-108M	1.015E-01	5.671E-01	1.011E+00	NOT IDENT.
AG-110M	-2.468E-01	1.090E+00	1.813E+00	NOT IDENT.
SN-113	4.319E-01	7.584E-01	1.384E+00	NOT IDENT.
CD-115	4.932E+02	1.318E+03	2.356E+03	NOT IDENT.
SN-117M	6.257E-01	8.749E-01	1.547E+00	NOT IDENT.
TE-123M	1.149E-01	3.439E-01	6.001E-01	NOT IDENT.
SB-124	-8.329E-01	7.390E-01	1.073E+00	NOT IDENT.
SB-125	-9.187E-01	1.645E+00	2.871E+00	NOT IDENT.
TE-125M	6.992E+01	1.179E+02	2.118E+02	NOT IDENT.
I-126	-3.153E-01	5.416E+00	8.351E+00	NOT IDENT.
SB-126	1.420E+00	3.273E+00	5.766E+00	NOT IDENT.
SB-127	-4.207E+01	6.444E+01	1.078E+02	NOT IDENT.
I-131	-3.580E-01	3.103E+00	5.574E+00	FAIL ABUN
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	1.188E+01	4.376E+01	6.845E+01	NOT IDENT.
BA-133	-1.834E-01	6.572E-01	1.175E+00	NOT IDENT.
I-133	0.000E+00	1.446E+07	0.000E+00	SHORT HLIF
CS-134	-1.346E-01	7.171E-01	1.212E+00	NOT IDENT.
CS-135	3.058E-01	2.324E+00	3.880E+00	NOT IDENT.
I-135	0.000E+00	4.270E+23	0.000E+00	SHORT HLIF
CS-136	-1.037E-01	3.030E+00	5.394E+00	NOT IDENT.
BA-140	2.364E+00	6.151E+00	1.099E+01	NOT IDENT.
LA-140	2.730E-01	9.107E-01	1.847E+00	NOT IDENT.
CE-141	-5.769E-01	8.028E-01	1.357E+00	NOT IDENT.
CE-143	0.000E+00	4.336E+04	0.000E+00	SHORT HLIF
CE-144	1.140E+00	2.299E+00	4.074E+00	NOT IDENT.
PM-144	-5.622E-02	5.315E-01	9.145E-01	NOT IDENT.
PR-144	-4.644E+00	3.989E+01	6.859E+01	NOT IDENT.
PM-146	-5.729E-01	8.390E-01	1.451E+00	NOT IDENT.
ND-147	-9.134E-01	1.371E+01	2.407E+01	NOT IDENT.
EU-150	-1.768E-01	3.984E-01	7.119E-01	NOT IDENT.
EU-152	-2.253E-01	1.440E+00	2.593E+00	FAIL ABUN
GD-153	-4.815E-01	9.736E-01	1.700E+00	NOT IDENT.
EU-154	3.175E-01	1.137E+00	2.153E+00	FAIL ABUN
EU-155	2.236E-01	1.233E+00	2.189E+00	FAIL ABUN
TB-160	9.867E-01	2.934E+00	5.021E+00	FAIL ABUN
HO-166M	7.945E-01	9.576E-01	1.723E+00	NOT IDENT.
HF-172	2.123E+00	2.339E+00	3.926E+00	FAIL ABUN
LU-172	-3.481E-01	1.541E+00	2.379E+00	FAIL ABUN
LU-176	-9.479E-02	3.846E-01	6.956E-01	FAIL ABUN
HF-181	-2.714E-01	9.176E-01	1.601E+00	NOT IDENT.
TA-182	-1.101E+00	1.741E+00	3.010E+00	NOT IDENT.
RE-183	0.000E+00	5.916E+00	1.229E+01	FAIL ABUN
RE-184	9.017E-01	3.102E+00	5.271E+00	NOT IDENT.
W-188	-8.103E+01	1.177E+02	1.888E+02	FAIL ABUN
IR-192	-3.332E-01	5.418E-01	9.665E-01	NOT IDENT.
HG-203	-1.094E-01	6.467E-01	1.063E+00	NOT IDENT.
BI-207	-3.845E-01	1.022E+00	1.793E+00	NOT IDENT.
TL-208	-1.255E-01	5.507E-01	9.552E-01	NOT IDENT.
BI-211	2.417E+00	3.053E+00	5.656E+00	NOT IDENT.
PB-211	2.617E+00	1.173E+01	2.112E+01	NOT IDENT.
BI-212	3.240E+00	8.152E+00	1.431E+01	NOT IDENT.
PB-212	1.849E-01	7.737E-01	1.311E+00	NOT IDENT.
BI-214	-3.655E-01	1.097E+00	1.887E+00	NOT IDENT.
PB-214	8.612E-01	1.111E+00	2.057E+00	FAIL ABUN
RN-219	-9.777E-01	6.652E+00	1.184E+01	NOT IDENT.
RN-222	-3.655E-01	1.097E+00	1.887E+00	NOT IDENT.

RA-223	6.770E+00	9.522E+00	1.766E+01	NOT IDENT.
RA-224	-4.861E+00	8.388E+00	1.374E+01	NOT IDENT.
RA-226	-3.655E-01	1.097E+00	1.887E+00	NOT IDENT.
AC-227	2.578E-02	3.693E+00	6.160E+00	NOT IDENT.
TH-227	2.578E-02	3.693E+00	6.160E+00	NOT IDENT.
AC-228	1.598E+00	3.237E+00	5.530E+00	NOT IDENT.
RA-228	1.598E+00	3.237E+00	5.530E+00	NOT IDENT.
TH-228	1.849E-01	7.737E-01	1.311E+00	NOT IDENT.
TH-229	2.881E-01	6.823E+00	1.161E+01	FAIL ABUN
TH-230	-3.655E-01	1.097E+00	1.887E+00	NOT IDENT.
PA-231	-1.169E+00	6.678E+00	1.212E+01	FAIL ABUN
TH-231	6.770E+00	9.522E+00	1.766E+01	NOT IDENT.
TH-232	1.598E+00	3.237E+00	5.530E+00	NOT IDENT.
PA-233	4.085E-01	9.866E-01	1.816E+00	NOT IDENT.
PA-234	-3.750E+00	7.176E+00	1.260E+01	NOT IDENT.
PA-234M	4.808E+01	9.825E+01	1.672E+02	NOT IDENT.
TH-234	-3.161E+00	1.747E+01	2.925E+01	NOT IDENT.
U-234	-3.655E-01	1.097E+00	1.887E+00	NOT IDENT.
U-235	4.519E-02	2.294E+00	3.983E+00	FAIL ABUN
NP-237	4.085E-01	9.866E-01	1.816E+00	NOT IDENT.
NP-238	0.000E+00	3.252E+03	0.000E+00	SHORT HLIF
U-238	-3.161E+00	1.747E+01	2.925E+01	NOT IDENT.
NP-239	4.003E+00	3.145E+00	5.739E+00	NOT IDENT.
PU-239	-7.410E+02	3.782E+03	6.563E+03	NOT IDENT.
AM-243	8.737E-02	6.262E-01	1.127E+00	NOT IDENT.
CM-243	7.468E-01	1.220E+00	2.198E+00	NOT IDENT.
BK-247	7.513E-01	1.215E+00	2.069E+00	FAIL ABUN
CM-247	-1.226E-01	6.205E-01	1.102E+00	NOT IDENT.
CF-249	-5.793E-02	6.933E-01	1.115E+00	NOT IDENT.
CF-251	6.516E-01	1.500E+00	2.613E+00	FAIL ABUN
ANH-511	6.898E-03	4.657E-01	8.338E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
CO-57	122.06	312	85.60*	6.177E+00	1.540E+00	1.627E+00	37.61
	136.47	-----	10.68	6.083E+00	-----	Line Not Found	-----
CO-60	1173.23	7132	99.85	1.227E+00	1.520E+02	1.532E+02	2.60
	1332.49	6329	99.98*	1.092E+00	1.514E+02	1.526E+02	2.52
ZN-65	1115.54	159	50.60*	1.285E+00	6.384E+00	6.784E+00	51.23
CD-109	88.03	2636	3.70*	5.253E+00	3.541E+02	3.657E+02	6.86
SN-126	64.28	-----	9.60	2.772E+00	-----	Line Not Found	-----
	86.94	2636	8.90	5.253E+00	1.472E+02	1.472E+02	6.86
	87.57	2636	37.00*	5.253E+00	3.541E+01	3.541E+01	6.86
BA-137M	661.66	11577	89.90*	2.028E+00	1.658E+02	1.660E+02	2.00
CS-137	661.66	11577	85.10*	2.028E+00	1.751E+02	1.754E+02	2.00
CE-139	165.86	101	80.00*	5.647E+00	5.856E-01	6.522E-01	91.98
PM-147	121.22	312	0.00*	6.177E+00	4.626E+04	4.698E+04	37.61
PM-149	285.90	67	3.10*	3.879E+00	1.450E+01	1.181E+04	111.62
TM-171	51.35	154	0.27	1.156E+00	1.290E+03	1.318E+03	100.40
	52.39	154	0.47*	1.156E+00	7.413E+02	7.572E+02	100.40
	66.73	-----	0.14	3.097E+00	-----	Line Not Found	-----
PB-210	46.54	5485	4.25*	6.176E-01	5.456E+03	5.466E+03	4.39
AM-241	59.54	16078	35.90*	2.126E+00	5.502E+02	5.503E+02	2.27

Flag: "*" = Keyline

Total number of lines in spectrum 26
 Number of unidentified lines 9
 Number of lines tentatively identified by NID 17 65.38%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	271.74D	1.06	1.540E+00	1.627E+00	0.612E+00	37.61	
CO-60	5.27Y	1.01	1.514E+02	1.526E+02	0.038E+02	2.52	
ZN-65	244.06D	1.06	6.384E+00	6.784E+00	3.476E+00	51.23	
CD-109	461.40D	1.03	3.541E+02	3.657E+02	0.251E+02	6.86	
SN-126	2.30E+05Y	1.00	3.541E+01	3.541E+01	0.243E+01	6.86	
BA-137M	30.08Y	1.00	1.658E+02	1.660E+02	0.033E+02	2.00	
CS-137	30.08Y	1.00	1.751E+02	1.754E+02	0.035E+02	2.00	
CE-139	137.64D	1.11	5.856E-01	6.522E-01	5.999E-01	91.98	
PM-147	2.62Y	1.02	4.626E+04	4.698E+04	1.767E+04	37.61	
PM-149	53.08H	815.	1.450E+01	1.181E+04	1.319E+04	111.62	
TM-171	1.92Y	1.02	7.413E+02	7.572E+02	7.602E+02	100.40	
PB-210	22.20Y	1.00	5.456E+03	5.466E+03	0.240E+03	4.39	
AM-241	432.60Y	1.00	5.502E+02	5.503E+02	0.125E+02	2.27	
Total Activity :			5.392E+04	6.648E+04			

Grand Total Activity : 5.392E+04 6.648E+04

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	37.09	103	2821	1.24	73.94	72	5	1.04E-01	****	1.01E-01	
9	45.10	491	2838	1.83	89.95	87	10	5.00E-01	34.9	5.04E-01	T
0	167.41	40	508	1.38	334.36	333	6	4.30E-02	****	5.60E+00	
0	225.90	82	787	1.51	451.26	448	8	8.91E-02	****	4.61E+00	T
0	385.80	72	471	1.33	770.85	767	8	7.99E-02	****	3.08E+00	
0	739.32	60	256	4.33	1477.62	1472	11	6.81E-02	****	1.85E+00	T
0	891.33	40	191	0.73	1781.56	1779	6	4.64E-02	****	1.57E+00	
0	996.25	40	218	1.32	1991.39	1987	8	4.62E-02	****	1.42E+00	T
0	1086.07	78	388	6.36	2171.03	2164	17	9.05E-02	****	1.32E+00	T
0	1162.31	47	100	1.81	2323.52	2321	9	5.48E-02	79.3	1.24E+00	
0	1351.56	21	8	2.31	2702.08	2696	12	2.47E-02	68.5	1.08E+00	
0	1398.56	10	10	0.88	2796.11	2791	10	1.19E-02	****	1.04E+00	
0	1484.54	6	15	1.16	2968.13	2960	10	7.27E-03	****	9.90E-01	
0	1548.58	14	7	2.25	3096.27	3087	14	1.67E-02	90.9	9.55E-01	
0	1585.08	7	6	0.59	3169.29	3160	12	7.78E-03	****	9.36E-01	T

Flags: "T" = Tentatively associated

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621356.CNF;1
* Acquisition date   : 3-OCT-2016 09:11:02 Sensitivity      : 3.000
* Detector ID       : GAM06 Energy tolerance: 1.500
* Elapsed live time: 0 00:15:00.00 Abundance limit : 75.000
* Elapsed real time: 0 00:15:04.89 Half life ratio : *****
* Sample date       : 12-SEP-2016 00:00:00 Nuclide Library : SOLID
* Sample ID         : G1203621356 Analyst initials: MXR1
* Batch Number      : 1596249 Sample Quantity : 1.1500E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 8-MAR-2016 07:26:53 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM06_CAN.CNF;14
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
CO-57	2.530E-01
CO-60	3.467E-01
ZN-65	1.438E+00
CD-109	7.678E+00
SN-126	7.477E-01
BA-137M	4.959E-01
CS-137	5.239E-01
CE-139	2.778E-01
PM-147	7.302E+03
PM-149	8.612E+03
TM-171	4.443E+02
PB-210	9.613E+01
AM-241	2.870E+00

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	5.782E+00	NOT IDENT.
NA-22	3.514E-01	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.417E-01	NOT IDENT.
K-40	2.216E+00	NOT IDENT.
SC-46	7.435E-01	NOT IDENT.
V-48	1.627E+00	NOT IDENT.
CR-51	5.869E+00	NOT IDENT.
MN-54	5.754E-01	NOT IDENT.
CO-56	6.668E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-58	6.523E-01	NOT IDENT.
FE-59	1.688E+00	NOT IDENT.
GE-68	2.247E+01	NOT IDENT.
AS-73	2.177E+01	NOT IDENT.
AS-74	1.573E+00	NOT IDENT.
SE-75	5.800E-01	FAIL ABUN
BR-77	6.175E+02	NOT IDENT.

SR-82	5.653E+00	NOT IDENT.
RB-83	1.078E+00	NOT IDENT.
KR-85	8.933E+01	NOT IDENT.
SR-85	5.056E-01	NOT IDENT.
RB-86	1.741E+01	NOT IDENT.
Y-88	2.873E-01	NOT IDENT.
Y-91	2.066E+02	NOT IDENT.
NB-94	4.190E-01	NOT IDENT.
NB-95	6.029E-01	NOT IDENT.
NB-95M	1.453E+00	NOT IDENT.
ZR-95	1.075E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	8.266E+02	FAIL ABUN
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.043E-01	NOT IDENT.
RH-102	7.191E-01	NOT IDENT.
RU-103	6.869E-01	NOT IDENT.
RH-106	4.223E+00	NOT IDENT.
RU-106	4.223E+00	NOT IDENT.
AG-108M	4.921E-01	NOT IDENT.
AG-110M	8.742E-01	NOT IDENT.
SN-113	6.721E-01	NOT IDENT.
CD-115	1.137E+03	NOT IDENT.
SN-117M	7.525E-01	NOT IDENT.
TE-123M	2.918E-01	NOT IDENT.
SB-124	4.303E-01	NOT IDENT.
SB-125	1.394E+00	NOT IDENT.
TE-125M	1.031E+02	NOT IDENT.
I-126	4.009E+00	NOT IDENT.
SB-126	2.769E+00	NOT IDENT.
SB-127	5.163E+01	NOT IDENT.
I-131	2.702E+00	FAIL ABUN
I-132	0.000E+00	SHORT HLIF
TE-132	3.333E+01	NOT IDENT.
BA-133	5.702E-01	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.818E-01	NOT IDENT.
CS-135	1.886E+00	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	2.598E+00	NOT IDENT.
BA-140	5.305E+00	NOT IDENT.
LA-140	7.970E-01	NOT IDENT.
CE-141	6.590E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.982E+00	NOT IDENT.
PM-144	4.384E-01	NOT IDENT.
PR-144	3.288E+01	NOT IDENT.
PM-146	7.056E-01	NOT IDENT.
ND-147	1.161E+01	NOT IDENT.
EU-150	3.453E-01	NOT IDENT.
EU-152	1.257E+00	FAIL ABUN
GD-153	8.274E-01	NOT IDENT.
EU-154	9.877E-01	FAIL ABUN
EU-155	1.066E+00	FAIL ABUN
TB-160	2.421E+00	FAIL ABUN
HO-166M	8.276E-01	NOT IDENT.
HF-172	1.911E+00	FAIL ABUN
LU-172	1.146E+00	FAIL ABUN
LU-176	3.376E-01	FAIL ABUN
HF-181	7.769E-01	NOT IDENT.
TA-182	1.380E+00	NOT IDENT.
RE-183	6.083E+00	FAIL ABUN
RE-184	2.546E+00	NOT IDENT.
W-188	9.159E+01	FAIL ABUN
IR-192	4.687E-01	NOT IDENT.
HG-203	5.167E-01	NOT IDENT.
BI-207	8.616E-01	NOT IDENT.
TL-208	4.592E-01	NOT IDENT.
BI-211	2.746E+00	NOT IDENT.
PB-211	1.025E+01	NOT IDENT.
BI-212	6.876E+00	NOT IDENT.
PB-212	6.374E-01	NOT IDENT.
BI-214	9.082E-01	NOT IDENT.
PB-214	9.989E-01	FAIL ABUN
RN-219	5.744E+00	NOT IDENT.
RN-222	9.082E-01	NOT IDENT.
RA-223	8.583E+00	NOT IDENT.

RA-224	6.673E+00	NOT IDENT.
RA-226	9.082E-01	NOT IDENT.
AC-227	2.992E+00	NOT IDENT.
TH-227	2.992E+00	NOT IDENT.
AC-228	2.677E+00	NOT IDENT.
RA-228	2.677E+00	NOT IDENT.
TH-228	6.374E-01	NOT IDENT.
TH-229	5.651E+00	FAIL ABUN
TH-230	9.082E-01	NOT IDENT.
PA-231	5.884E+00	FAIL ABUN
TH-231	8.583E+00	NOT IDENT.
TH-232	2.677E+00	NOT IDENT.
PA-233	8.831E-01	NOT IDENT.
PA-234	6.106E+00	NOT IDENT.
PA-234M	8.070E+01	NOT IDENT.
TH-234	1.426E+01	NOT IDENT.
U-234	9.082E-01	NOT IDENT.
U-235	1.938E+00	FAIL ABUN
NP-237	8.831E-01	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	1.426E+01	NOT IDENT.
NP-239	2.797E+00	NOT IDENT.
PU-239	3.190E+03	NOT IDENT.
AM-243	5.507E-01	NOT IDENT.
CM-243	1.070E+00	NOT IDENT.
BK-247	1.006E+00	FAIL ABUN
CM-247	5.348E-01	NOT IDENT.
CF-249	5.404E-01	NOT IDENT.
CF-251	1.269E+00	FAIL ABUN
ANH-511	4.028E-01	NOT IDENT.

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621356.CNF;1
* Acquisition date   : 3-OCT-2016 09:11:02 Sensitivity      : 3.000
* Detector ID       : GAM06 Energy tolerance: 1.500
* Elapsed live time : 0 00:15:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:15:04.89 Half life ratio : *****
* Sample date       : 12-SEP-2016 00:00:00 Nuclide Library : SOLID
* Sample ID         : G1203621356 Analyst initials: MXR1
* Batch Number      : 1596249 Sample Quantity : 1.1500E+02 GRAM
*                               Quantity Err(%) : 1.7391E-03 %
* Wet wt corr       : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight      : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 8-MAR-2016 07:26:53 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM06_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
CO-57	1.627E+00	6.110E-01	6.110E-01
CO-60	1.526E+02	1.245E+01	1.245E+01
ZN-65	6.784E+00	3.615E+00	3.615E+00
CD-109	3.657E+02	4.352E+01	4.352E+01
SN-126	3.541E+01	3.774E+00	3.774E+00
BA-137M	1.660E+02	1.409E+01	1.409E+01
CS-137	1.754E+02	1.488E+01	1.488E+01
CE-139	6.522E-01	6.035E-01	6.035E-01
PM-147	4.698E+04	1.765E+04	1.765E+04
PM-149	1.181E+04	1.306E+04	1.306E+04
TM-171	7.572E+02	7.483E+02	7.483E+02
PB-210	5.466E+03	5.253E+02	5.253E+02
AM-241	5.503E+02	4.434E+01	4.434E+01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.900E+00	6.818E+00	6.872E+00	NOT IDENT.
NA-22	1.218E-01	4.038E-01	4.075E-01	NOT IDENT.
NA-24	-5.212E+08	4.970E+09	4.975E+09	SHORT HLIF
AL-26	1.818E-01	2.538E-01	2.667E-01	NOT IDENT.
K-40	2.569E-01	2.569E+00	2.572E+00	NOT IDENT.
SC-46	8.129E-01	9.843E-01	1.050E+00	NOT IDENT.
V-48	-3.611E-01	1.900E+00	1.907E+00	NOT IDENT.
CR-51	7.870E+00	6.445E+00	7.357E+00	NOT IDENT.
MN-54	2.281E-01	6.943E-01	7.018E-01	NOT IDENT.
CO-56	-7.242E-01	8.585E-01	9.185E-01	NOT IDENT.
MN-56	-1.000E+41	1.175E+41	0.000E+00	SHORT HLIF
CO-58	-3.445E-01	8.155E-01	8.301E-01	NOT IDENT.
FE-59	-1.166E+00	2.037E+00	2.103E+00	NOT IDENT.
GE-68	2.860E+00	2.610E+01	2.614E+01	NOT IDENT.
AS-73	-2.100E+01	2.704E+01	2.865E+01	NOT IDENT.
AS-74	-1.482E+00	1.946E+00	2.058E+00	NOT IDENT.
SE-75	4.911E-01	6.996E-01	7.338E-01	FAIL ABUN

BR-77	1.824E+02	7.581E+02	7.625E+02	NOT IDENT.
SR-82	1.460E+01	6.875E+00	6.876E+00	NOT IDENT.
RB-83	6.953E-01	1.243E+00	1.282E+00	NOT IDENT.
KR-85	-4.998E+01	1.072E+02	1.095E+02	NOT IDENT.
SR-85	-2.829E-01	6.065E-01	6.198E-01	NOT IDENT.
RB-86	5.068E+00	2.012E+01	2.025E+01	NOT IDENT.
Y-88	1.861E-01	3.104E-01	3.215E-01	NOT IDENT.
Y-91	-1.102E+02	2.527E+02	2.575E+02	NOT IDENT.
NB-94	1.422E-02	5.048E-01	5.048E-01	NOT IDENT.
NB-95	1.502E-01	7.254E-01	7.285E-01	NOT IDENT.
NB-95M	1.075E+00	1.745E+00	1.812E+00	NOT IDENT.
ZR-95	-5.329E-01	1.335E+00	1.356E+00	NOT IDENT.
NB-97	1.000E+41	5.875E+40	0.000E+00	SHORT HLIF
ZR-97	2.497E+08	1.203E+10	1.203E+10	SHORT HLIF
MO-99	1.529E+03	1.598E+03	1.740E+03	FAIL ABUN
TC-99M	-8.303E+22	1.311E+25	0.000E+00	SHORT HLIF
RH-101	-5.671E-02	3.601E-01	3.610E-01	NOT IDENT.
RH-102	-5.007E-02	8.620E-01	8.623E-01	NOT IDENT.
RU-103	6.113E-01	7.832E-01	8.303E-01	NOT IDENT.
RH-106	-1.772E+00	5.132E+00	5.194E+00	NOT IDENT.
RU-106	-1.772E+00	5.132E+00	5.194E+00	NOT IDENT.
AG-108M	1.015E-01	5.671E-01	5.690E-01	NOT IDENT.
AG-110M	-2.468E-01	1.090E+00	1.096E+00	NOT IDENT.
SN-113	4.319E-01	7.593E-01	7.838E-01	NOT IDENT.
CD-115	4.932E+02	1.319E+03	1.337E+03	NOT IDENT.
SN-117M	6.257E-01	8.761E-01	9.203E-01	NOT IDENT.
TE-123M	1.149E-01	3.440E-01	3.479E-01	NOT IDENT.
SB-124	-8.329E-01	7.417E-01	8.314E-01	NOT IDENT.
SB-125	-9.187E-01	1.647E+00	1.698E+00	NOT IDENT.
TE-125M	6.992E+01	1.180E+02	1.222E+02	NOT IDENT.
I-126	-3.153E-01	5.416E+00	5.418E+00	NOT IDENT.
SB-126	1.420E+00	3.278E+00	3.339E+00	NOT IDENT.
SB-127	-4.207E+01	6.467E+01	6.740E+01	NOT IDENT.
I-131	-3.580E-01	3.104E+00	3.108E+00	FAIL ABUN
I-132	-1.000E+41	5.004E+41	0.000E+00	SHORT HLIF
TE-132	1.188E+01	4.378E+01	4.410E+01	NOT IDENT.
BA-133	-1.834E-01	6.574E-01	6.626E-01	NOT IDENT.
I-133	5.749E+06	1.449E+07	1.472E+07	SHORT HLIF
CS-134	-1.346E-01	7.173E-01	7.198E-01	NOT IDENT.
CS-135	3.058E-01	2.325E+00	2.329E+00	NOT IDENT.
I-135	-1.860E+23	4.368E+23	0.000E+00	SHORT HLIF
CS-136	-1.037E-01	3.030E+00	3.030E+00	NOT IDENT.
BA-140	2.364E+00	6.155E+00	6.246E+00	NOT IDENT.
LA-140	2.730E-01	9.110E-01	9.193E-01	NOT IDENT.
CE-141	-5.769E-01	8.038E-01	8.448E-01	NOT IDENT.
CE-143	-3.131E+04	4.346E+04	4.570E+04	SHORT HLIF
CE-144	1.140E+00	2.301E+00	2.358E+00	NOT IDENT.
PM-144	-5.622E-02	5.316E-01	5.322E-01	NOT IDENT.
PR-144	-4.644E+00	3.989E+01	3.995E+01	NOT IDENT.
PM-146	-5.729E-01	8.412E-01	8.799E-01	NOT IDENT.
ND-147	-9.134E-01	1.371E+01	1.372E+01	NOT IDENT.
EU-150	-1.768E-01	3.987E-01	4.066E-01	NOT IDENT.
EU-152	-2.253E-01	1.440E+00	1.443E+00	FAIL ABUN
GD-153	-4.815E-01	9.743E-01	9.982E-01	NOT IDENT.
EU-154	3.175E-01	1.138E+00	1.146E+00	FAIL ABUN
EU-155	2.236E-01	1.233E+00	1.237E+00	FAIL ABUN
TB-160	9.867E-01	2.936E+00	2.970E+00	FAIL ABUN
HO-166M	7.945E-01	9.606E-01	1.025E+00	NOT IDENT.
HF-172	2.123E+00	2.367E+00	2.554E+00	FAIL ABUN
LU-172	-3.481E-01	1.542E+00	1.550E+00	FAIL ABUN
LU-176	-9.479E-02	3.847E-01	3.870E-01	FAIL ABUN
HF-181	-2.714E-01	9.179E-01	9.260E-01	NOT IDENT.
TA-182	-1.101E+00	1.744E+00	1.813E+00	NOT IDENT.
RE-183	7.211E+01	9.687E+00	3.392E+01	FAIL ABUN
RE-184	9.017E-01	3.105E+00	3.131E+00	NOT IDENT.
W-188	-8.103E+01	1.182E+02	1.238E+02	FAIL ABUN
IR-192	-3.332E-01	5.427E-01	5.631E-01	NOT IDENT.
HG-203	-1.094E-01	6.468E-01	6.487E-01	NOT IDENT.
BI-207	-3.845E-01	1.024E+00	1.038E+00	NOT IDENT.
TL-208	-1.255E-01	5.508E-01	5.537E-01	NOT IDENT.
BI-211	2.417E+00	3.061E+00	3.249E+00	NOT IDENT.
PB-211	2.617E+00	1.173E+01	1.179E+01	NOT IDENT.
BI-212	3.240E+00	8.158E+00	8.287E+00	NOT IDENT.
PB-212	1.849E-01	7.739E-01	7.784E-01	NOT IDENT.
BI-214	-3.655E-01	1.098E+00	1.110E+00	NOT IDENT.
PB-214	8.612E-01	1.114E+00	1.180E+00	FAIL ABUN
RN-219	-9.777E-01	6.654E+00	6.668E+00	NOT IDENT.
RN-222	-3.655E-01	1.098E+00	1.110E+00	NOT IDENT.

RA-223	6.770E+00	9.548E+00	1.002E+01	NOT IDENT.
RA-224	-4.861E+00	8.400E+00	8.681E+00	NOT IDENT.
RA-226	-3.655E-01	1.098E+00	1.110E+00	NOT IDENT.
AC-227	2.578E-02	3.693E+00	3.693E+00	NOT IDENT.
TH-227	2.578E-02	3.693E+00	3.693E+00	NOT IDENT.
AC-228	1.598E+00	3.244E+00	3.323E+00	NOT IDENT.
RA-228	1.598E+00	3.244E+00	3.323E+00	NOT IDENT.
TH-228	1.849E-01	7.739E-01	7.784E-01	NOT IDENT.
TH-229	2.881E-01	6.823E+00	6.824E+00	FAIL ABUN
TH-230	-3.655E-01	1.098E+00	1.110E+00	NOT IDENT.
PA-231	-1.169E+00	6.684E+00	6.704E+00	FAIL ABUN
TH-231	6.770E+00	9.548E+00	1.002E+01	NOT IDENT.
TH-232	1.598E+00	3.244E+00	3.323E+00	NOT IDENT.
PA-233	4.085E-01	9.874E-01	1.004E+00	NOT IDENT.
PA-234	-3.750E+00	8.374E+00	8.543E+00	NOT IDENT.
PA-234M	4.808E+01	9.851E+01	1.009E+02	NOT IDENT.
TH-234	-3.161E+00	1.749E+01	1.754E+01	NOT IDENT.
U-234	-3.655E-01	1.098E+00	1.110E+00	NOT IDENT.
U-235	4.519E-02	2.294E+00	2.295E+00	FAIL ABUN
NP-237	4.085E-01	9.874E-01	1.004E+00	NOT IDENT.
NP-238	9.343E+02	3.255E+03	3.282E+03	SHORT HLIF
U-238	-3.161E+00	1.749E+01	1.754E+01	NOT IDENT.
NP-239	4.003E+00	3.169E+00	3.647E+00	NOT IDENT.
PU-239	-7.410E+02	3.783E+03	3.798E+03	NOT IDENT.
AM-243	8.737E-02	6.263E-01	6.275E-01	NOT IDENT.
CM-243	7.468E-01	1.222E+00	1.268E+00	NOT IDENT.
BK-247	7.513E-01	1.226E+00	1.272E+00	FAIL ABUN
CM-247	-1.226E-01	6.209E-01	6.233E-01	NOT IDENT.
CF-249	-5.793E-02	6.933E-01	6.938E-01	NOT IDENT.
CF-251	6.516E-01	1.502E+00	1.530E+00	FAIL ABUN
ANH-511	6.898E-03	4.657E-01	4.657E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	1841.6368	87.09	540.2142	136.47	460.9942
45.60	1632.1157	87.57	540.7593	140.51	426.1465
46.54	1637.0526	88.03	541.2784	143.76	420.8557
49.72	1436.5237	88.34	541.6288	144.24	399.0442
51.35	1549.3970	88.47	541.7759	145.44	418.7352
51.87	1588.1833	89.96	477.9510	152.43	392.0894
52.39	1590.6327	90.64	485.0193	153.25	408.5446
52.97	1670.1371	91.11	459.8628	154.21	377.0555
53.44	1700.5043	92.59	474.0950	156.02	407.9984
54.07	1766.8883	93.35	448.7623	158.56	373.9821
57.36	0.0000	94.56	435.3367	159.00	386.0335
57.53	1896.7218	94.65	435.4156	162.33	361.5121
57.98	1234.1639	94.67	435.4328	162.66	377.5258
59.27	1238.5405	94.87	435.6045	163.33	406.7118
59.32	1238.7048	97.43	466.9885	165.86	329.9534
59.54	1239.4467	98.43	431.8263	176.31	398.3127
60.96	1244.1995	98.44	431.8365	176.60	375.3414
61.17	1244.8989	99.53	425.9043	177.52	347.1316
62.93	483.8324	100.11	442.0270	181.07	391.8653
63.29	508.3216	102.03	438.7333	181.52	376.5805
63.58	535.1631	103.18	424.9270	184.41	463.5320
64.28	585.5295	103.37	425.0786	185.72	443.1284
66.73	544.6443	105.21	456.1524	193.51	427.1057
67.24	587.2230	105.31	456.2370	197.03	428.8974
67.68	615.2103	106.12	442.0823	198.01	456.5096
67.75	615.3185	106.47	465.1269	201.83	418.8242
69.67	596.2616	109.28	411.8016	203.43	430.9726
70.83	568.5532	111.00	414.0692	205.31	412.5306
72.81	570.3317	111.76	417.6237	210.85	463.2906
72.87	546.4139	114.06	432.3581	215.65	448.4814
74.66	573.7481	116.30	444.1089	222.11	478.3616
74.82	573.9606	116.74	413.2031	227.09	449.7927
74.97	592.7150	119.76	460.5810	227.38	435.9221
77.11	606.8308	121.12	417.2996	228.16	431.6065
78.74	575.3989	121.22	417.3686	228.18	431.6178
79.69	593.5003	121.78	417.7574	235.69	394.5819
80.12	623.1636	122.06	417.9518	235.96	417.0800
80.19	623.2599	122.92	418.5507	238.63	382.7823
80.57	634.1205	123.07	418.6542	238.98	384.1026
81.00	641.3106	123.68	414.6590	240.99	414.4981
81.07	641.4095	125.81	387.4579	242.00	387.6539
81.75	637.6574	127.23	422.5348	244.70	400.6040
83.79	614.3232	127.91	446.6158	252.40	389.3047
84.00	598.1945	129.30	410.5677	252.80	377.4751
85.43	627.8812	131.20	412.8418	254.15	0.0000
86.55	539.6000	133.02	410.9207	256.23	376.3369
86.79	539.8682	133.52	396.7395	260.90	370.7928
86.94	540.0412	136.00	433.6263	264.66	364.8504

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.80	352.7736	364.49	338.2066	600.60	219.9227
265.00	368.5981	366.42	368.6027	602.52	0.0000
268.22	389.1797	372.51	332.2588	604.72	214.2797
269.46	405.4677	375.05	345.2649	607.14	216.5708
270.03	393.4985	1093.63	321.0511	609.32	226.9834
271.23	408.5777	383.85	342.1172	610.33	202.6600
273.65	398.4865	388.16	323.0641	614.28	217.3422
276.40	357.8354	388.63	333.8947	618.01	189.1176
277.37	391.2734	391.69	335.0645	620.36	198.5469
277.60	391.3513	400.66	357.8993	621.93	212.0116
278.00	417.2699	401.81	349.1598	630.19	0.0000
279.20	395.6115	402.40	361.9377	631.29	191.3735
279.54	376.0659	404.85	341.7550	633.25	201.8459
279.70	376.1219	410.95	396.7425	634.78	217.4564
280.46	392.3735	413.71	373.8317	635.95	199.0155
283.69	317.4495	414.70	405.0286	636.99	182.6105
284.31	370.2850	423.72	355.2798	645.85	204.1021
285.41	390.4193	427.09	371.6702	657.76	221.9183
285.90	425.2024	427.87	392.0595	657.90	0.0000
287.50	364.7453	433.94	410.2072	661.66	219.1858
290.67	381.0799	439.40	393.1544	664.57	0.0000
293.27	0.0000	453.88	449.0684	666.33	194.5598
295.22	362.6666	463.37	442.3387	666.50	194.5750
295.96	339.2031	468.07	469.9850	667.71	0.0000
298.58	358.7325	473.00	437.3877	677.62	178.7435
299.98	372.0931	475.06	400.0995	685.70	195.2301
300.09	372.1295	476.78	409.9898	695.00	168.4976
300.13	372.1385	477.60	397.8772	696.49	182.3931
301.36	371.7025	482.18	366.6733	696.51	182.3931
302.85	355.4464	487.02	325.8087	697.00	180.3137
304.50	378.5610	492.35	327.7942	697.30	186.6992
304.85	370.3027	497.08	279.8274	697.49	184.5953
306.78	368.3877	505.52	255.1984	702.65	174.3835
308.46	376.4778	507.63	0.0000	706.68	169.3710
311.90	380.1000	511.00	251.1715	711.68	165.4696
316.51	373.0986	514.00	265.1476	720.70	176.8399
319.41	331.5927	514.00	265.1476	721.93	0.0000
320.08	325.8281	520.40	243.7690	722.78	169.4887
321.04	377.0369	520.69	241.8672	722.91	173.7927
323.87	348.9738	522.65	0.0000	723.31	183.4757
325.23	362.9910	527.90	238.9488	724.19	205.0126
328.76	348.6494	528.26	240.9496	727.33	183.7958
333.37	353.3668	529.59	243.0729	733.00	206.8672
333.97	366.4058	529.87	0.0000	735.93	171.5254
334.37	359.6604	531.02	245.2193	737.46	194.3115
338.28	377.1281	537.26	234.3029	739.50	199.8822
338.32	381.4512	546.56	0.0000	747.24	214.6289
340.48	351.0408	552.55	222.4182	748.06	204.9423
340.55	351.0657	563.25	222.6875	752.31	197.6999
344.28	340.8382	569.33	225.4023	753.82	192.3910
345.93	349.0748	569.50	225.4207	756.73	206.7765
351.06	326.9728	569.70	225.4391	756.80	206.7765
351.93	328.0572	583.19	213.9707	763.94	192.1133
355.39	0.0000	584.27	206.0427	765.81	190.0718
356.01	368.3571	595.83	243.6575	766.42	202.1405

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
766.84	205.4567	1002.74	241.3669	1678.03	0.0000
772.60	0.0000	1004.73	243.3125	1690.97	16.0611
776.52	190.9143	1021.30	0.0000	1750.46	0.0000
777.92	216.2703	1025.87	0.0000	1764.49	15.2219
778.90	216.3585	1028.54	0.0000	1770.23	15.2390
783.70	212.3738	1037.84	216.1124	1771.35	9.7993
785.37	213.6242	1038.76	0.0000	1791.20	0.0000
792.07	194.3262	1046.59	215.8037	1808.65	5.4852
794.95	198.9697	1048.07	229.5129	1810.72	0.0000
795.86	201.2546	1049.04	236.8499	1836.06	6.6182
801.95	230.5638	1050.41	211.5260		
810.06	223.5160	1063.66	216.0687		
810.29	212.4191	1077.00	210.5573		
810.45	225.7813	1077.34	219.7412		
810.76	236.9296	1085.87	214.8047		
815.77	212.8777	1093.63	242.9238		
818.51	219.7973	1099.45	238.7498		
832.01	211.9790	1112.07	239.8518		
834.85	212.2097	1112.84	210.1108		
835.71	213.4021	1115.54	210.2770		
836.80	0.0000	1120.29	164.7548		
846.75	0.0000	1120.55	169.2188		
846.77	259.4238	1121.30	175.6973		
856.80	232.1015	1129.67	146.9871		
860.56	239.2381	1131.51	0.0000		
871.09	252.6948	1147.95	0.0000		
873.19	250.6152	1173.23	109.3093		
875.33	0.0000	1177.95	78.5078		
879.38	227.2111	1189.05	75.7275		
880.51	229.5928	1204.77	77.9711		
883.24	226.3916	1221.41	52.5427		
884.68	253.9685	1231.02	34.4839		
889.28	220.0156	1235.36	43.1570		
894.76	254.8989	1238.28	41.2704		
898.04	260.9539	1260.41	0.0000		
900.72	276.1621	1271.87	39.7162		
903.28	253.3814	1274.44	36.8357		
911.20	282.9822	1274.54	36.8357		
912.08	283.0719	1291.59	26.2930		
923.98	0.0000	1298.22	0.0000		
926.50	292.6465	1312.11	27.4155		
929.11	302.2225	1332.49	38.3906		
937.49	314.7693	1362.66	0.0000		
944.13	334.7746	1365.19	12.9048		
946.00	349.9043	1368.63	0.0000		
949.00	323.9335	1384.29	20.9474		
954.55	0.0000	1408.01	9.0313		
962.31	298.0709	1457.56	0.0000		
964.08	307.0807	1460.82	13.2142		
966.17	271.0984	1489.16	9.3566		
968.97	256.3254	1505.03	17.4628		
983.53	240.7143	1584.12	3.3473		
984.45	0.0000	1596.21	10.4889		
996.26	259.7588	1620.50	7.3815		
1001.03	228.7188	1621.92	12.6584		

03-Oct-2016

Batch# 1596252 Product: Y solid Date: 10/3/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			n/a
Samples have been blank corrected (if required). Blank correction reported included (if required).			n/a
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			n/a
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	Der# 1563784
Sample was correctly preserved if required.			n/a
Smears Taken for Radioactive batches.			n/a
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			n/a
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			n/a
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		n/a 10/3/16 Der# 1563784
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		
Aliquot Correction completed if required.			n/a
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)			n/a

Primary Review Performed By: B. Wall 10/3/16

Secondary Review Performed By: [Signature] 10/3/16

DATA EXCEPTION REPORT

Mo.Day Yr. 03-OCT-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GAMMA SPECTROMETER	Test / Method: DOE HASL 300, 4.5.2.3/Ga-01-R	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596252	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
Sample received out of holding for sample 405235041, sample 405235042, sample 405235043, sample 405235044, sample 405235045, sample 405235046, sample 405235047, sample 405235048, sample 405235049, sample 405235050, sample 405235051, sample 405235052, sample 405235053, sample 405235054, sample 405235055, sample 405235056, sample 405235057, sample 405235058, sample 405235059, sample 405235060 and DUP 1203621362		Samples were analyzed as soon as possible. Reporting results.	

Originator's Name:
Bryan Williams 03-OCT-16

Data Validator/Group Leader:
Spencer Collins 03-OCT-16

Gamma Spec Queue Sheet

1.9 - 10/2/16

09/16/2016

Batch #: 1596252 Analyst: MXRI First Client Due Date: 09/30/2016 Internal Due Date: 09/30/2016
 Gamma LCS Isotope: Mixed Gamma LCS Code: 1556 Expiration Date: 4/1/37 Vol: 1.0 mL
 Initials: M.S. Prep Date: 9/12/16 Library: SOLID Balance ID: N/A

Sample ID	Client Description / Container ID	Type	Hazard Code	Client	Matrix	Collect Date	Geometry	Aliquot (g/F)	Detector	Sealing Date/Time (if Applicable)
405235041-1	4.4D.R.1.4	SAMPLE		MJWC001	SOIL	30-NOV-15 13:27:00	CAN	181.483 g	28	9/12/16
405235042-1	4.4D.R.2.3	SAMPLE		MJWC001	SOIL	30-NOV-15 13:53:00		176.8 g	8	
405235043-1	4.4D.R.2.4	SAMPLE		MJWC001	SOIL	30-NOV-15 13:59:00		165.795 g	9	
405235044-1	4.4D.R.4.2	SAMPLE		MJWC001	SOIL	30-NOV-15 13:50:00		128.844 g	32	
405235045-1	4.4D.R.5.2	SAMPLE		MJWC001	SOIL	30-NOV-15 14:15:00		130.599 g	39	
405235046-1	4.5A.R.1.3	SAMPLE		MJWC001	SOIL	07-DEC-15 10:02:00		156.928 g	20	
405235047-1	4.5A.R.1.4	SAMPLE		MJWC001	SOIL	07-DEC-15 10:10:00		151.349 g	25	
405235048-1	4.5B.R.1.2	SAMPLE		MJWC001	SOIL	07-DEC-15 13:28:00		131.577 g	28	
405235049-1	4.5B.R.1.3	SAMPLE		MJWC001	SOIL	07-DEC-15 13:33:00		147.303 g	33	
405235050-1	4.5B.R.1.4	SAMPLE		MJWC001	SOIL	07-DEC-15 13:42:00		171.604 g	36	
405235051-1	4.5B.R.2.3	SAMPLE		MJWC001	SOIL	07-DEC-15 13:02:00		153.012 g	41	
405235052-1	4.5B.R.2.4	SAMPLE		MJWC001	SOIL	07-DEC-15 13:11:00		165.245 g	44	
405235053-1	4.5C.R.5.2	SAMPLE		MJWC001	SOIL	01-DEC-15 14:24:00		113.628 g	31	
405235054-1	4.5C.R.1.3	SAMPLE		MJWC001	SOIL	02-DEC-15 14:51:00		146.461 g	43	
405235055-1	4.5C.R.1.4	SAMPLE		MJWC001	SOIL	02-DEC-15 14:59:00		142.583 g	11	
405235056-1	4.5C.R.2.2	SAMPLE		MJWC001	SOIL	02-DEC-15 14:50:00		101.481 g	1	
405235057-1	4.5C.R.2.3	SAMPLE		MJWC001	SOIL	02-DEC-15 14:55:00		115.835 g	8	
405235058-1	4.5C.R.2.4	SAMPLE		MJWC001	SOIL	02-DEC-15 15:00:00		140.622 g	6	
405235059-1	5.1A.R.1.2	SAMPLE		MJWC001	SOIL	16-DEC-15 12:26:00		154.222 g	7	
405235060-1	5.1A.R.1.3	SAMPLE		MJWC001	SOIL	16-DEC-15 12:33:00		152.266 g	18	
1203621361-1	MB	MB		QC ACCOUNT	SOIL	9/12/16		181.483	24	
1203621362-1	DUP 4.4D.R.1.4(405235041)	DUP		QC ACCOUNT	SOIL	30-NOV-15 13:27:00		181.483	29	
1203621363-1	LCS	LCS		QC ACCOUNT	SOIL	9/12/16		115	11	

Data Reviewed By: B. C. [Signature] 9/16/16
 Page 1 of 1


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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                 *
*                               Charleston, SC 29407                            *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235041.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM28.CNF;265
Background date : 2-OCT-2016 11:01:35.
Sample date     : 30-NOV-2015 13:27:00 Acquisition date : 3-OCT-2016 05:54:08.
Sample ID      : G405235041 Sample quantity   : 1.81483E+02 GRAM
Detector name  : GAM28 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.41 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID      : 1596252 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	3	74.82*	126	198	1.48	149.74	142	19	3.50E-02	23.2	1.55E+00
2	3	77.24	171	204	1.31	154.57	142	19	4.74E-02	16.4	
3	0	87.41	39	259	1.54	174.93	169	11	1.09E-02	81.4	
4	0	93.17*	30	155	1.25	186.45	183	8	8.22E-03	81.9	
5	0	116.91	33	143	1.43	233.97	227	10	9.21E-03	70.4	
6	0	186.22*	71	116	1.21	372.69	369	10	1.96E-02	32.4	
7	0	208.98	42	91	0.95	418.24	414	8	1.17E-02	42.2	
8	4	238.89*	340	95	1.24	478.12	472	24	9.45E-02	7.2	2.49E+00
9	4	241.70	104	112	1.97	483.75	472	24	2.88E-02	29.0	
10	0	295.86	125	89	1.11	592.13	585	11	3.46E-02	17.1	
11	0	300.31	34	39	1.85	601.04	597	8	9.39E-03	36.6	
12	0	338.63	80	51	0.97	677.73	672	12	2.22E-02	21.1	
13	0	352.28*	215	72	1.60	705.06	699	12	5.98E-02	10.6	
14	0	448.85	16	19	2.29	898.35	894	9	4.56E-03	52.9	
15	0	463.26	47	36	1.37	927.19	922	12	1.31E-02	27.2	
16	0	480.40	21	30	4.87	961.49	955	13	5.97E-03	56.3	
17	0	511.83*	56	76	2.11	1024.40	1014	22	1.57E-02	45.7	
18	0	523.66	13	14	1.36	1048.08	1044	9	3.47E-03	60.1	
19	0	583.75*	126	51	1.51	1168.34	1161	16	3.50E-02	15.1	
20	0	601.53	28	30	3.98	1203.93	1197	15	7.78E-03	46.6	
21	0	609.77*	191	32	1.75	1220.43	1211	18	5.29E-02	10.2	
22	0	618.45	16	39	3.06	1237.79	1229	17	4.41E-03	92.8	
23	0	662.53*	17	25	1.48	1326.02	1321	9	4.66E-03	62.3	
24	0	675.73	15	26	3.34	1352.44	1345	13	4.14E-03	75.2	
25	0	727.33	30	23	1.44	1455.73	1448	13	8.43E-03	37.1	
26	0	816.35	15	10	0.53	1633.90	1628	11	4.07E-03	50.7	
27	0	861.08	17	16	1.30	1723.41	1717	12	4.76E-03	54.5	
28	0	867.40	24	18	3.86	1736.07	1729	17	6.73E-03	44.1	
29	0	912.08*	67	23	1.35	1825.49	1817	15	1.86E-02	20.0	
30	0	969.82	51	35	1.33	1941.06	1935	14	1.42E-02	28.3	
31	0	1120.37*	49	26	1.35	2242.38	2234	16	1.37E-02	28.0	
32	0	1183.05	13	13	5.36	2367.85	2360	13	3.61E-03	63.5	
33	0	1239.39	16	25	2.13	2480.60	2476	9	4.46E-03	61.2	
34	0	1461.82*	383	7	2.08	2925.80	2919	13	1.07E-01	5.3	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1540.81	9	0	0.62	3083.89	3079	10	2.50E-03	33.3	
36	0	1765.92*	28	8	2.73	3534.45	3526	16	7.85E-03	30.2	
37	0	1848.94	13	3	1.48	3700.61	3695	10	3.74E-03	35.0	

Flag: "*" = Peak area was modified by background subtraction

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235041.CNF;1
 Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
 Sample title : MXR1
 Sample date : 30-NOV-2015 13:27:00 Acquisition date : 3-OCT-2016 05:54:08
 Sample ID : G405235041 Sample quantity : 181.48 GRAM
 Sample type : SOLID Sample geometry :
 Detector name : GAMMA28 Detector geometry: CAN
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.41 0.0%
 Energy tolerance : 1.50 keV Half life ratio : 10.00
 Errors propagated: No Systematic Error : 0.00 %
 Efficiency type : Linear Efficiencies at : Peak Energy
 Abundance limit : 75.00

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.237E+00	1.183E+01	1.183E+01	10.64	OK
CD-109	88.03	3.70*	5.432E+00	4.268E-01	6.777E-01	447.68	OK
SN-126	64.28	9.60	3.124E+00	-----	Line Not Found	-----	Absent
	86.94	8.90	5.432E+00	1.775E-01	1.775E-01	447.68	OK
	87.57	37.00*	5.432E+00	4.268E-02	4.268E-02	447.68	OK
BA-137M	661.66	89.90*	2.304E+00	3.721E-02	3.794E-02	124.68	OK
CS-137	661.66	85.10*	2.304E+00	3.931E-02	4.008E-02	124.68	OK
TL-208	277.37	6.60	4.566E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.539E+00	2.731E-01	2.731E-01	30.19	OK
	860.56	12.50	1.887E+00	3.210E-01	3.210E-01	108.96	OK
BI-211	72.87	1.23	4.138E+00	-----	Line Not Found	-----	Absent
	351.06	12.92*	3.783E+00	8.826E-03	8.826E-03	*****	OK
PB-212	74.82	10.28	4.344E+00	1.256E+00	1.256E+00	64.18	OK
	77.11	17.10	4.585E+00	1.313E+00	1.313E+00	32.89	OK
	238.63	43.60*	5.101E+00	8.071E-01	8.071E-01	14.30	OK
	300.09	3.30	4.293E+00	1.224E+00	1.224E+00	73.14	OK
BI-214	609.32	45.49*	2.455E+00	7.939E-01	7.942E-01	20.48	OK
	1120.29	14.92	1.539E+00	9.149E-01	9.152E-01	55.98	OK
	1764.49	15.30	1.044E+00	6.974E-01	6.977E-01	60.31	OK
PB-214	74.82	5.80	4.343E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	4.585E+00	2.315E+00	2.316E+00	32.89	OK
	87.09	3.41	5.409E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	5.054E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.343E+00	7.994E-01	7.997E-01	34.29	OK
	351.93	35.60*	3.786E+00	-----	Line Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.455E+00	7.939E-01	7.942E-01	20.48	OK
	1120.29	14.92	1.539E+00	9.149E-01	9.152E-01	55.98	OK
	1764.49	15.30	1.044E+00	6.974E-01	6.977E-01	60.31	OK
RA-224	240.99	4.10*	5.059E+00	1.221E+00	1.221E+00	131.43	OK
RA-226	609.32	45.49*	2.455E+00	7.939E-01	7.942E-01	20.48	OK
	1120.29	14.92	1.539E+00	9.149E-01	9.152E-01	55.98	OK
	1764.49	15.30	1.044E+00	6.974E-01	6.977E-01	60.31	OK
AC-228	105.21	1.10	6.315E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.904E+00	9.153E-01	9.153E-01	42.22	OK
	794.95	4.25	2.005E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.930E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.806E+00	6.291E-01	6.291E-01	39.97	OK
	968.97	15.80	1.723E+00	8.137E-01	8.137E-01	56.63	OK
RA-228	105.21	1.10	6.315E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.904E+00	9.153E-01	9.153E-01	42.22	OK
	794.95	4.25	2.005E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.930E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.806E+00	6.291E-01	6.291E-01	39.97	OK
	968.97	15.80	1.723E+00	8.137E-01	8.137E-01	56.63	OK
TH-228	74.82	10.28	4.344E+00	1.256E+00	1.256E+00	64.18	OK
	77.11	17.10	4.585E+00	1.313E+00	1.313E+00	32.89	OK
	238.63	43.60*	5.101E+00	8.071E-01	8.071E-01	14.30	OK
	300.09	3.30	4.293E+00	1.224E+00	1.224E+00	73.14	OK
TH-230	609.32	45.49*	2.455E+00	7.939E-01	7.939E-01	20.48	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	1120.29	14.92	1.539E+00	9.149E-01	9.149E-01	55.98	OK
	1764.49	15.30	1.044E+00	6.974E-01	6.974E-01	60.31	OK
PA-231	283.69	1.70	4.487E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	4.293E+00	7.547E-01	7.547E-01	73.14	OK
TH-232	105.21	1.10	6.315E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.904E+00	9.153E-01	9.153E-01	42.22	OK
	835.71	1.61	1.930E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.806E+00	6.291E-01	6.291E-01	39.97	OK
	968.97	15.80	1.723E+00	8.137E-01	8.137E-01	56.63	OK
U-234	609.32	45.49*	2.455E+00	7.939E-01	7.939E-01	20.48	OK
	1120.29	14.92	1.539E+00	9.149E-01	9.149E-01	55.98	OK
	1764.49	15.30	1.044E+00	6.974E-01	6.974E-01	60.31	OK
AM-243	43.53	5.90	4.883E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	4.344E+00	1.922E-01	1.922E-01	64.18	OK
ANH-511	511.00	100.00*	2.812E+00	9.561E-02	9.561E-02	91.39	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235041.CNF;1
* Acquisition date   : 3-OCT-2016 05:54:08 Sensitivity      : 3.000
* Detector ID       : GAM28 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.41 Half life ratio : *****
* Sample date       : 30-NOV-2015 13:27:00 Analyst initials: MXR1
* Sample ID         : G405235041 Sample Quantity : 1.8148E+02 GRAM
* Batch Number      : 1596252 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date    : 1-AUG-2016 10:02:35 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;10
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.183E+01	1.233E+00	4.280E-01
CD-109	6.777E-01	2.973E+00	2.012E+00
SN-126	4.268E-02	1.873E-01	1.275E-01
BA-137M	3.794E-02	4.636E-02	5.412E-02
CS-137	4.008E-02	4.898E-02	5.717E-02
TL-208	2.731E-01	8.080E-02	4.938E-02
BI-211	8.826E-03	8.712E-01	2.838E-01
PB-212	8.071E-01	1.131E-01	7.667E-02
BI-214	7.942E-01	1.594E-01	8.436E-02
PB-214	8.029E-01	1.668E-01	2.522E-01
RN-222	7.942E-01	1.594E-01	8.436E-02
RA-224	1.221E+00	1.572E+00	8.215E-01
RA-226	7.942E-01	1.594E-01	8.436E-02
AC-228	6.291E-01	2.464E-01	2.040E-01
RA-228	6.291E-01	2.464E-01	2.040E-01
TH-228	8.071E-01	1.131E-01	7.667E-02
TH-230	7.939E-01	1.594E-01	8.433E-02
PA-231	7.547E-01	5.410E-01	6.421E-01
TH-232	6.291E-01	2.464E-01	2.040E-01
U-234	7.939E-01	1.594E-01	8.433E-02
AM-243	1.922E-01	1.209E-01	8.042E-02
ANH-511	9.561E-02	8.563E-02	4.218E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-2.191E-01	1.151E+01	2.013E+01	NOT IDENT.
NA-22	-3.133E-03	4.147E-02	8.013E-02	NOT IDENT.
NA-24	0.000E+00	1.640E+41	0.000E+00	SHORT HLIF
AL-26	9.807E-03	1.932E-02	5.027E-02	NOT IDENT.
SC-46	-5.154E-02	3.074E-01	6.107E-01	FAIL ABUN
V-48	0.000E+00	1.631E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	4.114E+02	0.000E+00	SHORT HLIF
MN-54	-1.507E-02	4.486E-02	8.755E-02	NOT IDENT.

CO-56	2.359E-01	3.183E-01	7.383E-01	FAIL ABUN
MN-56	0.000E+00	1.330E+41	0.000E+00	SHORT HLIF
CO-57	2.007E-02	3.755E-02	7.512E-02	NOT IDENT.
CO-58	-5.366E-01	5.507E-01	7.859E-01	NOT IDENT.
FE-59	-2.765E+00	7.132E+00	1.321E+01	NOT IDENT.
CO-60	1.676E-02	3.302E-02	7.121E-02	NOT IDENT.
ZN-65	3.236E-02	1.379E-01	2.582E-01	NOT IDENT.
GE-68	3.568E-01	1.967E+00	4.110E+00	NOT IDENT.
AS-73	7.118E-01	7.667E+00	1.542E+01	NOT IDENT.
AS-74	0.000E+00	6.412E+03	0.000E+00	SHORT HLIF
SE-75	3.921E-02	1.560E-01	3.226E-01	NOT IDENT.
BR-77	0.000E+00	2.013E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.619E+02	0.000E+00	SHORT HLIF
RB-83	-7.956E-02	5.151E-01	8.069E-01	NOT IDENT.
KR-85	1.199E+01	6.695E+00	1.484E+01	NOT IDENT.
SR-85	1.374E+00	7.680E-01	1.702E+00	NOT IDENT.
RB-86	0.000E+00	3.086E+04	0.000E+00	SHORT HLIF
Y-88	-3.347E-02	1.661E-01	3.512E-01	NOT IDENT.
Y-91	-8.323E+01	4.945E+02	9.417E+02	NOT IDENT.
NB-94	3.764E-03	2.770E-02	5.314E-02	NOT IDENT.
NB-95	-2.157E-01	7.525E-01	1.468E+00	NOT IDENT.
NB-95M	6.486E-01	2.187E+00	4.070E+00	NOT IDENT.
ZR-95	-4.732E-01	1.213E+00	2.353E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	9.670E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	7.707E-04	2.980E-02	5.632E-02	NOT IDENT.
RH-102	7.192E-03	4.975E-02	9.731E-02	NOT IDENT.
RU-103	4.882E+00	4.914E+00	1.085E+01	FAIL ABUN
RH-106	-6.489E-02	4.481E-01	7.483E-01	NOT IDENT.
RU-106	-6.489E-02	4.481E-01	7.483E-01	NOT IDENT.
AG-108M	-1.657E-03	2.181E-02	4.250E-02	NOT IDENT.
AG-110M	-2.353E-02	6.819E-02	1.333E-01	NOT IDENT.
SN-113	-1.516E-01	1.871E-01	3.351E-01	NOT IDENT.
CD-115	0.000E+00	2.626E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.185E+05	0.000E+00	SHORT HLIF
TE-123M	4.146E-02	1.180E-01	2.263E-01	NOT IDENT.
SB-124	-5.395E-01	1.225E+00	2.288E+00	NOT IDENT.
SB-125	-5.858E-02	7.809E-02	1.397E-01	FAIL ABUN
TE-125M	3.575E+02	2.626E+02	5.525E+02	NOT IDENT.
I-126	0.000E+00	1.294E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.650E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	7.770E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	8.049E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.684E+27	0.000E+00	SHORT HLIF
BA-133	5.065E-03	3.547E-02	6.415E-02	NOT IDENT.
I-133	0.000E+00	1.811E+41	0.000E+00	SHORT HLIF
CS-134	2.947E-02	3.597E-02	8.122E-02	NOT IDENT.
CS-135	-3.974E-02	1.121E-01	2.176E-01	NOT IDENT.
I-135	0.000E+00	1.017E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	4.021E+05	0.000E+00	SHORT HLIF
CE-139	-2.894E-02	8.760E-02	1.763E-01	NOT IDENT.
BA-140	0.000E+00	1.663E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	6.030E+05	0.000E+00	SHORT HLIF
CE-141	-4.633E+00	2.484E+01	4.568E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	-2.477E-01	2.927E-01	5.104E-01	NOT IDENT.
PM-144	-7.349E-03	4.538E-02	8.436E-02	FAIL ABUN
PR-144	-6.410E-01	3.959E+00	7.358E+00	NOT IDENT.
PM-146	4.002E-02	3.280E-02	7.211E-02	NOT IDENT.
ND-147	0.000E+00	4.119E+07	0.000E+00	SHORT HLIF
PM-147	-2.057E+02	6.735E+02	1.248E+03	NOT IDENT.
PM-149	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
EU-150	-1.533E-02	1.960E-02	3.101E-02	FAIL ABUN
EU-152	-3.274E-02	7.623E-02	1.371E-01	NOT IDENT.
GD-153	-2.430E-02	1.542E-01	2.939E-01	NOT IDENT.
EU-154	-7.654E-03	1.013E-01	1.957E-01	NOT IDENT.
EU-155	1.440E-01	9.169E-02	1.967E-01	FAIL ABUN
TB-160	-1.598E-01	1.485E+00	2.989E+00	FAIL ABUN
HO-166M	4.164E-02	4.165E-02	9.240E-02	NOT IDENT.
TM-171	3.747E+00	1.817E+01	3.684E+01	NOT IDENT.
HF-172	1.520E-01	1.927E-01	3.887E-01	NOT IDENT.
LU-172	-1.882E-02	5.670E-02	1.080E-01	FAIL ABUN
LU-176	-1.850E-04	2.079E-02	4.115E-02	FAIL ABUN
HF-181	-1.030E+00	4.586E+00	7.676E+00	NOT IDENT.
TA-182	8.049E-02	8.034E-01	1.591E+00	FAIL ABUN

RE-183	7.150E-01	2.591E+00	5.320E+00	NOT IDENT.
RE-184	-9.123E+00	2.949E+01	5.672E+01	NOT IDENT.
W-188	-7.636E+01	1.150E+02	1.905E+02	NOT IDENT.
IR-192	-1.241E-01	4.075E-01	7.863E-01	FAIL ABUN
HG-203	1.115E+00	2.026E+00	4.255E+00	NOT IDENT.
BI-207	-5.187E-03	3.713E-02	7.285E-02	FAIL ABUN
PB-210	2.871E-01	2.941E+00	5.962E+00	NOT IDENT.
PB-211	1.675E-01	5.050E-01	1.033E+00	NOT IDENT.
BI-212	9.611E-01	6.997E-01	9.733E-01	FAIL ABUN
RN-219	9.597E-02	2.962E-01	6.035E-01	NOT IDENT.
RA-223	1.121E-01	4.307E-01	8.828E-01	FAIL ABUN
AC-227	3.136E-02	1.768E-01	3.607E-01	FAIL ABUN
TH-227	3.136E-02	1.768E-01	3.607E-01	FAIL ABUN
TH-229	-1.910E-01	3.872E-01	7.594E-01	FAIL ABUN
TH-231	1.121E-01	4.307E-01	8.828E-01	FAIL ABUN
PA-233	-1.434E-02	4.449E-02	8.618E-02	FAIL ABUN
PA-234	6.026E-03	2.016E-01	4.124E-01	NOT IDENT.
PA-234M	-2.242E+00	3.002E+00	5.820E+00	NOT IDENT.
TH-234	1.378E-01	1.031E+00	2.078E+00	FAIL ABUN
U-235	8.410E-02	1.545E-01	3.035E-01	FAIL ABUN
NP-237	-1.434E-02	4.449E-02	8.618E-02	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
U-238	1.378E-01	1.031E+00	2.078E+00	FAIL ABUN
NP-239	3.654E-01	5.044E-01	4.283E-01	FAIL ABUN
PU-239	1.305E+02	2.816E+02	5.474E+02	NOT IDENT.
AM-241	5.439E-02	1.190E-01	2.450E-01	NOT IDENT.
CM-243	-1.148E-01	8.637E-02	1.472E-01	NOT IDENT.
BK-247	-3.643E-03	5.211E-02	1.047E-01	NOT IDENT.
CM-247	7.164E-03	2.740E-02	5.541E-02	NOT IDENT.
CF-249	1.758E-02	2.798E-02	5.915E-02	NOT IDENT.
CF-251	-2.456E-03	8.975E-02	1.833E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	377	10.66*	1.237E+00	1.183E+01	1.183E+01	10.64
CD-109	88.03	57	3.70*	5.432E+00	1.164E+00	1.847E+00	162.79
SN-126	64.28	-----	9.60	3.124E+00	-----	Line Not Found	-----
	86.94	57	8.90	5.432E+00	4.837E-01	4.837E-01	162.79
	87.57	57	37.00*	5.432E+00	1.164E-01	1.164E-01	162.79
BA-137M	661.66	19	89.90*	2.304E+00	3.721E-02	3.794E-02	124.68
CS-137	661.66	19	85.10*	2.304E+00	3.931E-02	4.008E-02	124.68
TL-208	277.37	-----	6.60	4.566E+00	-----	Line Not Found	-----
	583.19	142	85.00*	2.539E+00	2.731E-01	2.731E-01	30.19
	860.56	18	12.50	1.887E+00	3.210E-01	3.210E-01	108.96
BI-211	72.87	-----	1.23	4.138E+00	-----	Line Not Found	-----
	351.06	261	12.92*	3.783E+00	2.211E+00	2.211E+00	21.20
PB-212	74.82	184	10.28	4.344E+00	1.707E+00	1.707E+00	46.35
	77.11	249	17.10	4.585E+00	1.313E+00	1.313E+00	32.89
	238.63	434	43.60*	5.101E+00	8.071E-01	8.071E-01	14.30
	300.09	42	3.30	4.293E+00	1.224E+00	1.224E+00	73.14
BI-214	609.32	214	45.49*	2.455E+00	7.939E-01	7.942E-01	20.48
	1120.29	51	14.92	1.539E+00	9.149E-01	9.152E-01	55.98
	1764.49	27	15.30	1.044E+00	6.974E-01	6.977E-01	60.31
PB-214	74.82	184	5.80	4.344E+00	3.026E+00	3.027E+00	46.35
	77.11	249	9.70	4.585E+00	2.315E+00	2.316E+00	32.89
	87.09	57	3.41	5.432E+00	1.263E+00	1.263E+00	162.79
	242.00	132	7.25	5.059E+00	1.490E+00	1.490E+00	58.06
	295.22	155	18.42	4.343E+00	7.994E-01	7.997E-01	34.29
	351.93	261	35.60*	3.783E+00	8.026E-01	8.029E-01	21.20
RN-222	609.32	214	45.49*	2.455E+00	7.939E-01	7.942E-01	20.48
	1120.29	51	14.92	1.539E+00	9.149E-01	9.152E-01	55.98
	1764.49	27	15.30	1.044E+00	6.974E-01	6.977E-01	60.31
RA-224	240.99	132	4.10*	5.059E+00	2.634E+00	2.634E+00	58.06
RA-226	609.32	214	45.49*	2.455E+00	7.939E-01	7.942E-01	20.48
	1120.29	51	14.92	1.539E+00	9.149E-01	9.152E-01	55.98
	1764.49	27	15.30	1.044E+00	6.974E-01	6.977E-01	60.31
AC-228	105.21	-----	1.10	6.315E+00	-----	Line Not Found	-----
	338.32	97	11.27	3.904E+00	9.153E-01	9.153E-01	42.22
	794.95	-----	4.25	2.005E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.930E+00	-----	Line Not Found	-----
	911.20	71	25.80*	1.806E+00	6.291E-01	6.291E-01	39.97
	968.97	54	15.80	1.723E+00	8.137E-01	8.137E-01	56.63
RA-228	105.21	-----	1.10	6.315E+00	-----	Line Not Found	-----
	338.32	97	11.27	3.904E+00	9.153E-01	9.153E-01	42.22
	794.95	-----	4.25	2.005E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.930E+00	-----	Line Not Found	-----
	911.20	71	25.80*	1.806E+00	6.291E-01	6.291E-01	39.97
	968.97	54	15.80	1.723E+00	8.137E-01	8.137E-01	56.63
TH-228	74.82	184	10.28	4.344E+00	1.707E+00	1.707E+00	46.35
	77.11	249	17.10	4.585E+00	1.313E+00	1.313E+00	32.89
	238.63	434	43.60*	5.101E+00	8.071E-01	8.071E-01	14.30

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-230	300.09	42	3.30	4.293E+00	1.224E+00	1.224E+00	73.14
	609.32	214	45.49*	2.455E+00	7.939E-01	7.939E-01	20.48
	1120.29	51	14.92	1.539E+00	9.149E-01	9.149E-01	55.98
PA-231	1764.49	27	15.30	1.044E+00	6.974E-01	6.974E-01	60.31
	283.69	-----	1.70	4.487E+00	-----	Line Not Found	-----
TH-232	301.36	42	5.35*	4.293E+00	7.547E-01	7.547E-01	73.14
	105.21	-----	1.10	6.315E+00	-----	Line Not Found	-----
	338.32	97	11.27	3.904E+00	9.153E-01	9.153E-01	42.22
U-234	835.71	-----	1.61	1.930E+00	-----	Line Not Found	-----
	911.20	71	25.80*	1.806E+00	6.291E-01	6.291E-01	39.97
	968.97	54	15.80	1.723E+00	8.137E-01	8.137E-01	56.63
AM-243	609.32	214	45.49*	2.455E+00	7.939E-01	7.939E-01	20.48
	1120.29	51	14.92	1.539E+00	9.149E-01	9.149E-01	55.98
ANH-511	1764.49	27	15.30	1.044E+00	6.974E-01	6.974E-01	60.31
	43.53	-----	5.90	4.883E-01	-----	Line Not Found	-----
AM-243	74.66	184	67.20*	4.344E+00	2.612E-01	2.612E-01	46.35
	511.00	65	100.00*	2.812E+00	9.561E-02	9.561E-02	91.39

Flag: "*" = Keyline

Total number of lines in spectrum 37
 Number of unidentified lines 8
 Number of lines tentatively identified by NID 29 78.38%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.183E+01	1.183E+01	0.126E+01	10.64	
CD-109	461.40D	1.59	1.164E+00	1.847E+00	3.007E+00	162.79	
SN-126	2.30E+05Y	1.00	1.164E-01	1.164E-01	1.894E-01	162.79	
BA-137M	30.08Y	1.02	3.721E-02	3.794E-02	4.731E-02	124.68	
CS-137	30.08Y	1.02	3.931E-02	4.008E-02	4.998E-02	124.68	
TL-208	1.41E+10Y	1.00	2.731E-01	2.731E-01	0.824E-01	30.19	
BI-211	7.04E+08Y	1.00	2.211E+00	2.211E+00	0.469E+00	21.20	
PB-212	1.41E+10Y	1.00	8.071E-01	8.071E-01	1.154E-01	14.30	
BI-214	1600.00Y	1.00	7.939E-01	7.942E-01	1.627E-01	20.48	
PB-214	1600.00Y	1.00	8.026E-01	8.029E-01	1.702E-01	21.20	
RN-222	1600.00Y	1.00	7.939E-01	7.942E-01	1.627E-01	20.48	
RA-224	1.41E+10Y	1.00	2.634E+00	2.634E+00	1.530E+00	58.06	
RA-226	1600.00Y	1.00	7.939E-01	7.942E-01	1.627E-01	20.48	
AC-228	1.41E+10Y	1.00	6.291E-01	6.291E-01	2.514E-01	39.97	
RA-228	1.41E+10Y	1.00	6.291E-01	6.291E-01	2.514E-01	39.97	
TH-228	1.41E+10Y	1.00	8.071E-01	8.071E-01	1.154E-01	14.30	
TH-230	7.54E+04Y	1.00	7.939E-01	7.939E-01	1.626E-01	20.48	
PA-231	7.04E+08Y	1.00	7.547E-01	7.547E-01	5.520E-01	73.14	
TH-232	1.41E+10Y	1.00	6.291E-01	6.291E-01	2.514E-01	39.97	
U-234	2.45E+05Y	1.00	7.939E-01	7.939E-01	1.626E-01	20.48	
AM-243	7370.00Y	1.00	2.612E-01	2.612E-01	1.210E-01	46.35	
ANH-511	1.00E+09Y	1.00	9.561E-02	9.561E-02	8.738E-02	91.39	

Total Activity : 2.769E+01 2.837E+01

Grand Total Activity : 2.769E+01 2.837E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	93.17	42	222	1.25	186.45	183	8	8.22E-03	****	5.79E+00	T
0	116.91	46	199	1.43	233.97	227	10	9.21E-03	****	6.57E+00	T
0	186.22	93	152	1.21	372.69	369	10	1.96E-02	64.7	5.98E+00	T
0	208.98	55	118	0.95	418.24	414	8	1.17E-02	84.4	5.58E+00	
0	448.85	19	22	2.29	898.35	894	9	4.56E-03	****	3.12E+00	
0	463.26	55	42	1.37	927.19	922	12	1.31E-02	54.5	3.04E+00	T
0	480.40	25	34	4.87	961.49	955	13	5.97E-03	****	2.96E+00	
0	523.66	14	16	1.36	1048.08	1044	9	3.47E-03	****	2.76E+00	T
0	601.53	32	34	3.98	1203.93	1197	15	7.78E-03	93.3	2.48E+00	T
0	618.45	18	44	3.06	1237.79	1229	17	4.41E-03	****	2.43E+00	T
0	675.73	16	29	3.34	1352.44	1345	13	4.14E-03	****	2.27E+00	
0	727.33	33	25	1.44	1455.73	1448	13	8.43E-03	74.3	2.15E+00	T
0	816.35	16	11	0.53	1633.90	1628	11	4.07E-03	****	1.97E+00	T
0	867.40	26	19	3.86	1736.07	1729	17	6.73E-03	88.3	1.88E+00	
0	1183.05	13	13	5.36	2367.85	2360	13	3.61E-03	****	1.47E+00	
0	1239.39	16	25	2.13	2480.60	2476	9	4.46E-03	****	1.42E+00	T
0	1540.81	9	0	0.62	3083.89	3079	10	2.50E-03	66.7	1.18E+00	
0	1848.94	13	2	1.48	3700.61	3695	10	3.74E-03	70.0	9.99E-01	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235041.CNF;1
* Acquisition date   : 3-OCT-2016 05:54:08 Sensitivity      : 3.000
* Detector ID       : GAM28 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.41 Half life ratio : *****
* Sample date       : 30-NOV-2015 13:27:00 Nuclide Library : SOLID
* Sample ID        : G405235041 Analyst initials: MXR1
* Batch Number     : 1596252 Sample Quantity : 1.8148E+02 GRAM
* Wet wt corr      : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 1-AUG-2016 10:02:35 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;10
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.709E-01
CD-109	9.572E-01
SN-126	6.063E-02
BA-137M	2.419E-02
CS-137	2.555E-02
TL-208	2.197E-02
BI-211	1.297E-01
PB-212	3.562E-02
BI-214	3.693E-02
PB-214	1.217E-01
RN-222	3.693E-02
RA-224	3.817E-01
RA-226	3.693E-02
AC-228	8.962E-02
RA-228	8.962E-02
TH-228	3.562E-02
TH-230	3.691E-02
PA-231	2.948E-01
TH-232	8.962E-02
U-234	3.691E-02
AM-243	3.805E-02
ANH-511	1.899E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	9.013E+00	NOT IDENT.
NA-22	3.492E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.960E-02	NOT IDENT.
SC-46	2.653E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	3.782E-02	NOT IDENT.
CO-56	3.211E-01	FAIL ABUN

MN-56	0.000E+00	SHORT HLIF
CO-57	3.517E-02	NOT IDENT.
CO-58	3.330E-01	NOT IDENT.
FE-59	5.822E+00	NOT IDENT.
CO-60	3.085E-02	NOT IDENT.
ZN-65	1.115E-01	NOT IDENT.
GE-68	1.808E+00	NOT IDENT.
AS-73	7.186E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.485E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	3.473E-01	NOT IDENT.
KR-85	6.908E+00	NOT IDENT.
SR-85	7.923E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.339E-01	NOT IDENT.
Y-91	4.129E+02	NOT IDENT.
NB-94	2.392E-02	NOT IDENT.
NB-95	6.551E-01	NOT IDENT.
NB-95M	1.903E+00	NOT IDENT.
ZR-95	1.033E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.653E-02	NOT IDENT.
RH-102	4.354E-02	NOT IDENT.
RU-103	4.907E+00	FAIL ABUN
RH-106	3.308E-01	NOT IDENT.
RU-106	3.308E-01	NOT IDENT.
AG-108M	1.920E-02	NOT IDENT.
AG-110M	5.654E-02	NOT IDENT.
SN-113	1.507E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.063E-01	NOT IDENT.
SB-124	7.659E-01	NOT IDENT.
SB-125	6.222E-02	FAIL ABUN
TE-125M	2.616E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.936E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.612E-02	NOT IDENT.
CS-135	1.007E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	8.243E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.148E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.375E-01	NOT IDENT.
PM-144	3.742E-02	FAIL ABUN
PR-144	3.264E+00	NOT IDENT.
PM-146	3.278E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	5.832E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.390E-02	FAIL ABUN
EU-152	6.245E-02	NOT IDENT.
GD-153	1.383E-01	NOT IDENT.
EU-154	8.526E-02	NOT IDENT.
EU-155	9.310E-02	FAIL ABUN
TB-160	1.296E+00	FAIL ABUN
HO-166M	4.126E-02	NOT IDENT.
TM-171	1.723E+01	NOT IDENT.
HF-172	1.831E-01	NOT IDENT.
LU-172	4.605E-02	FAIL ABUN
LU-176	1.906E-02	FAIL ABUN
HF-181	3.456E+00	NOT IDENT.
TA-182	7.004E-01	FAIL ABUN
RE-183	2.491E+00	NOT IDENT.

RE-184	2.491E+01	NOT IDENT.
W-188	8.802E+01	NOT IDENT.
IR-192	3.615E-01	FAIL ABUN
HG-203	1.970E+00	NOT IDENT.
BI-207	3.154E-02	FAIL ABUN
PB-210	2.790E+00	NOT IDENT.
PB-211	4.700E-01	NOT IDENT.
BI-212	4.460E-01	FAIL ABUN
RN-219	2.753E-01	NOT IDENT.
RA-223	4.043E-01	FAIL ABUN
AC-227	1.672E-01	FAIL ABUN
TH-227	1.672E-01	FAIL ABUN
TH-229	3.561E-01	FAIL ABUN
TH-231	4.043E-01	FAIL ABUN
PA-233	3.935E-02	FAIL ABUN
PA-234	1.788E-01	NOT IDENT.
PA-234M	2.502E+00	NOT IDENT.
TH-234	9.821E-01	FAIL ABUN
U-235	1.433E-01	FAIL ABUN
NP-237	3.935E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	9.821E-01	FAIL ABUN
NP-239	2.023E-01	FAIL ABUN
PU-239	2.590E+02	NOT IDENT.
AM-241	1.155E-01	NOT IDENT.
CM-243	6.873E-02	NOT IDENT.
BK-247	4.808E-02	NOT IDENT.
CM-247	2.528E-02	NOT IDENT.
CF-249	2.700E-02	NOT IDENT.
CF-251	8.589E-02	NOT IDENT.

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235041.CNF;1
* Acquisition date   : 3-OCT-2016 05:54:08 Sensitivity      : 3.000
* Detector ID       : GAM28 Energy tolerance: 1.500
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time: 0 01:00:00.41 Half life ratio : *****
* Sample date      : 30-NOV-2015 13:27:00 Nuclide Library : SOLID
* Sample ID       : G405235041 Analyst initials: MXR1
* Batch Number    : 1596252 Sample Quantity : 1.8148E+02 GRAM
*                               Quantity Err(%) : 1.1020E-03 %
* Wet wt corr     : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight     : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date   : 1-AUG-2016 10:02:35 Eff. Geometry   : CAN
* Eff. File       : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;10
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.183E+01	1.380E+00	1.380E+00
CD-109	6.777E-01	2.977E+00	2.977E+00
SN-126	4.268E-02	1.875E-01	1.875E-01
BA-137M	3.794E-02	4.639E-02	4.639E-02
CS-137	4.008E-02	4.901E-02	4.901E-02
TL-208	2.731E-01	8.164E-02	8.164E-02
BI-211	8.826E-03	8.817E-01	8.817E-01
PB-212	8.071E-01	1.211E-01	1.211E-01
BI-214	7.942E-01	1.631E-01	1.631E-01
PB-214	8.029E-01	1.702E-01	1.702E-01
RN-222	7.942E-01	1.631E-01	1.631E-01
RA-224	1.221E+00	1.577E+00	1.577E+00
RA-226	7.942E-01	1.631E-01	1.631E-01
AC-228	6.291E-01	2.485E-01	2.485E-01
RA-228	6.291E-01	2.485E-01	2.485E-01
TH-228	8.071E-01	1.211E-01	1.211E-01
TH-230	7.939E-01	1.630E-01	1.630E-01
PA-231	7.547E-01	5.645E-01	5.645E-01
TH-232	6.291E-01	2.485E-01	2.485E-01
U-234	7.939E-01	1.630E-01	1.630E-01
AM-243	1.922E-01	1.218E-01	1.218E-01
ANH-511	9.561E-02	8.572E-02	8.572E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-2.191E-01	1.151E+01	1.151E+01	NOT IDENT.
NA-22	-3.133E-03	4.147E-02	4.149E-02	NOT IDENT.
NA-24	1.000E+41	1.700E+41	0.000E+00	SHORT HLIF
AL-26	9.807E-03	1.933E-02	1.983E-02	NOT IDENT.
SC-46	-5.154E-02	3.074E-01	3.082E-01	FAIL ABUN
V-48	2.863E+03	1.631E+04	1.636E+04	SHORT HLIF
CR-51	-1.913E+02	4.115E+02	4.204E+02	SHORT HLIF
MN-54	-1.507E-02	4.487E-02	4.538E-02	NOT IDENT.

CO-56	2.359E-01	3.184E-01	3.357E-01	FAIL ABUN
MN-56	1.000E+41	1.330E+41	0.000E+00	SHORT HLIF
CO-57	2.007E-02	3.756E-02	3.864E-02	NOT IDENT.
CO-58	-5.366E-01	5.512E-01	6.020E-01	NOT IDENT.
FE-59	-2.765E+00	7.135E+00	7.243E+00	NOT IDENT.
CO-60	1.676E-02	3.302E-02	3.387E-02	NOT IDENT.
ZN-65	3.236E-02	1.379E-01	1.386E-01	NOT IDENT.
GE-68	3.568E-01	1.967E+00	1.974E+00	NOT IDENT.
AS-73	7.118E-01	7.668E+00	7.675E+00	NOT IDENT.
AS-74	-7.144E+02	6.412E+03	6.420E+03	SHORT HLIF
SE-75	3.921E-02	1.560E-01	1.570E-01	NOT IDENT.
BR-77	1.436E+39	1.275E+40	0.000E+00	SHORT HLIF
SR-82	-1.409E+02	6.620E+02	6.650E+02	SHORT HLIF
RB-83	-7.956E-02	5.153E-01	5.165E-01	NOT IDENT.
KR-85	1.199E+01	6.713E+00	8.619E+00	NOT IDENT.
SR-85	1.374E+00	7.701E-01	9.882E-01	NOT IDENT.
RB-86	-1.011E+03	3.086E+04	3.086E+04	SHORT HLIF
Y-88	-3.347E-02	1.661E-01	1.668E-01	NOT IDENT.
Y-91	-8.323E+01	4.945E+02	4.959E+02	NOT IDENT.
NB-94	3.764E-03	2.770E-02	2.775E-02	NOT IDENT.
NB-95	-2.157E-01	7.525E-01	7.588E-01	NOT IDENT.
NB-95M	6.486E-01	2.188E+00	2.207E+00	NOT IDENT.
ZR-95	-4.732E-01	1.214E+00	1.232E+00	NOT IDENT.
NB-97	1.000E+41	2.113E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	2.218E+41	0.000E+00	SHORT HLIF
MO-99	-6.514E+32	9.682E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	2.065E+41	0.000E+00	SHORT HLIF
RH-101	7.707E-04	2.980E-02	2.980E-02	NOT IDENT.
RH-102	7.192E-03	4.975E-02	4.986E-02	NOT IDENT.
RU-103	4.882E+00	4.920E+00	5.390E+00	FAIL ABUN
RH-106	-6.489E-02	4.481E-01	4.490E-01	NOT IDENT.
RU-106	-6.489E-02	4.481E-01	4.490E-01	NOT IDENT.
AG-108M	-1.657E-03	2.181E-02	2.183E-02	NOT IDENT.
AG-110M	-2.353E-02	6.820E-02	6.902E-02	NOT IDENT.
SN-113	-1.516E-01	1.872E-01	1.992E-01	NOT IDENT.
CD-115	1.503E+40	2.640E+40	0.000E+00	SHORT HLIF
SN-117M	6.715E+04	1.187E+05	1.225E+05	SHORT HLIF
TE-123M	4.146E-02	1.181E-01	1.195E-01	NOT IDENT.
SB-124	-5.395E-01	1.225E+00	1.249E+00	NOT IDENT.
SB-125	-5.858E-02	7.813E-02	8.247E-02	FAIL ABUN
TE-125M	3.575E+02	2.634E+02	3.088E+02	NOT IDENT.
I-126	6.654E+04	1.294E+06	1.294E+06	SHORT HLIF
SB-126	9.420E+05	1.660E+06	1.713E+06	SHORT HLIF
SB-127	-3.575E+22	9.264E+22	0.000E+00	SHORT HLIF
I-131	-5.677E+09	8.053E+09	8.450E+09	SHORT HLIF
I-132	-1.000E+41	1.909E+42	0.000E+00	SHORT HLIF
TE-132	4.747E+26	1.695E+27	0.000E+00	SHORT HLIF
BA-133	5.065E-03	3.547E-02	3.554E-02	NOT IDENT.
I-133	-1.000E+41	2.594E+41	0.000E+00	SHORT HLIF
CS-134	2.947E-02	3.599E-02	3.836E-02	NOT IDENT.
CS-135	-3.974E-02	1.121E-01	1.135E-01	NOT IDENT.
I-135	1.000E+41	7.026E+41	0.000E+00	SHORT HLIF
CS-136	-4.347E+04	4.022E+05	4.026E+05	SHORT HLIF
CE-139	-2.894E-02	8.780E-02	8.876E-02	NOT IDENT.
BA-140	-8.930E+05	1.664E+06	1.712E+06	SHORT HLIF
LA-140	-7.616E+04	6.030E+05	6.040E+05	SHORT HLIF
CE-141	-4.633E+00	2.484E+01	2.493E+01	NOT IDENT.
CE-143	-1.000E+41	3.231E+41	0.000E+00	SHORT HLIF
CE-144	-2.477E-01	2.931E-01	3.136E-01	NOT IDENT.
PM-144	-7.349E-03	4.539E-02	4.551E-02	FAIL ABUN
PR-144	-6.410E-01	3.959E+00	3.969E+00	NOT IDENT.
PM-146	4.002E-02	3.292E-02	3.754E-02	NOT IDENT.
ND-147	-2.792E+07	4.122E+07	4.309E+07	SHORT HLIF
PM-147	-2.057E+02	6.736E+02	6.799E+02	NOT IDENT.
PM-149	6.814E+40	4.470E+41	0.000E+00	SHORT HLIF
EU-150	-1.533E-02	1.961E-02	2.080E-02	FAIL ABUN
EU-152	-3.274E-02	7.625E-02	7.766E-02	NOT IDENT.
GD-153	-2.430E-02	1.542E-01	1.546E-01	NOT IDENT.
EU-154	-7.654E-03	1.013E-01	1.013E-01	NOT IDENT.
EU-155	1.440E-01	9.226E-02	1.128E-01	FAIL ABUN
TB-160	-1.598E-01	1.485E+00	1.487E+00	FAIL ABUN
HO-166M	4.164E-02	4.172E-02	4.574E-02	NOT IDENT.
TM-171	3.747E+00	1.817E+01	1.825E+01	NOT IDENT.
HF-172	1.520E-01	1.943E-01	2.060E-01	NOT IDENT.
LU-172	-1.882E-02	5.674E-02	5.737E-02	FAIL ABUN
LU-176	-1.850E-04	2.079E-02	2.079E-02	FAIL ABUN
HF-181	-1.030E+00	4.586E+00	4.610E+00	NOT IDENT.
TA-182	8.049E-02	8.034E-01	8.043E-01	FAIL ABUN

RE-183	7.150E-01	2.594E+00	2.614E+00	NOT IDENT.
RE-184	-9.123E+00	2.957E+01	2.986E+01	NOT IDENT.
W-188	-7.636E+01	1.153E+02	1.203E+02	NOT IDENT.
IR-192	-1.241E-01	4.075E-01	4.113E-01	FAIL ABUN
HG-203	1.115E+00	2.027E+00	2.088E+00	NOT IDENT.
BI-207	-5.187E-03	3.713E-02	3.720E-02	FAIL ABUN
PB-210	2.871E-01	2.941E+00	2.944E+00	NOT IDENT.
PB-211	1.675E-01	5.051E-01	5.107E-01	NOT IDENT.
BI-212	9.611E-01	7.014E-01	8.244E-01	FAIL ABUN
RN-219	9.597E-02	2.964E-01	2.996E-01	NOT IDENT.
RA-223	1.121E-01	4.308E-01	4.337E-01	FAIL ABUN
AC-227	3.136E-02	1.768E-01	1.774E-01	FAIL ABUN
TH-227	3.136E-02	1.768E-01	1.774E-01	FAIL ABUN
TH-229	-1.910E-01	3.873E-01	3.967E-01	FAIL ABUN
TH-231	1.121E-01	4.308E-01	4.337E-01	FAIL ABUN
PA-233	-1.434E-02	4.450E-02	4.497E-02	FAIL ABUN
PA-234	6.026E-03	2.017E-01	2.018E-01	NOT IDENT.
PA-234M	-2.242E+00	3.003E+00	3.169E+00	NOT IDENT.
TH-234	1.378E-01	1.032E+00	1.033E+00	FAIL ABUN
U-235	8.410E-02	1.545E-01	1.591E-01	FAIL ABUN
NP-237	-1.434E-02	4.450E-02	4.497E-02	FAIL ABUN
NP-238	-1.000E+41	7.561E+41	0.000E+00	SHORT HLIF
U-238	1.378E-01	1.032E+00	1.033E+00	FAIL ABUN
NP-239	3.654E-01	5.053E-01	5.315E-01	FAIL ABUN
PU-239	1.305E+02	2.816E+02	2.877E+02	NOT IDENT.
AM-241	5.439E-02	1.190E-01	1.215E-01	NOT IDENT.
CM-243	-1.148E-01	8.702E-02	1.012E-01	NOT IDENT.
BK-247	-3.643E-03	5.212E-02	5.215E-02	NOT IDENT.
CM-247	7.164E-03	2.742E-02	2.761E-02	NOT IDENT.
CF-249	1.758E-02	2.801E-02	2.911E-02	NOT IDENT.
CF-251	-2.456E-03	8.975E-02	8.976E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	63.5639	87.09	127.2108	136.47	87.5808
45.60	77.5038	87.57	127.3091	140.51	0.0000
46.54	64.0330	88.03	127.4031	143.76	72.3906
49.72	0.0000	88.34	127.4672	144.24	74.8864
51.35	57.3219	88.47	127.4937	145.44	87.2842
51.87	53.1378	89.96	95.8471	152.43	86.7427
52.39	61.7115	1093.63	125.6492	153.25	0.0000
52.97	57.5295	91.11	0.0000	323.87	78.2232
53.44	57.5892	92.59	116.8675	156.02	0.0000
54.07	61.9405	93.35	117.0052	158.56	0.0000
57.36	0.0000	94.56	87.3433	159.00	72.3956
57.53	73.1602	94.65	87.3549	162.33	70.9864
57.98	65.6907	94.67	87.3578	162.66	0.0000
59.27	68.0267	94.87	87.3845	163.33	62.7029
59.32	77.7527	97.43	84.2620	165.86	77.1224
59.54	77.7879	98.43	85.5444	176.31	67.7938
60.96	93.1830	98.44	85.5456	176.60	0.0000
61.17	102.9785	99.53	86.8429	177.52	74.6645
62.93	76.1473	100.11	64.8983	181.07	0.0000
63.29	81.6446	102.03	84.8384	181.52	74.6245
63.58	72.9776	103.18	93.1293	184.41	64.0739
64.28	74.1690	103.37	102.4711	143.76	76.9876
66.73	75.6177	105.21	63.0466	193.51	87.9125
67.24	82.2733	105.31	63.0555	197.03	80.4233
125.81	79.0488	106.12	86.5093	198.01	78.7660
67.75	79.0587	106.47	97.0795	201.83	63.4116
69.67	95.5084	109.28	69.2820	203.43	73.9444
70.83	89.8233	111.00	108.2912	205.31	58.8222
72.81	103.0811	111.76	0.0000	210.85	57.8051
72.87	103.0917	114.06	85.1061	215.65	62.4507
74.66	103.4245	116.30	0.0000	222.11	59.2670
74.82	103.4536	116.74	87.7864	227.09	65.7399
74.97	103.4812	119.76	65.1114	227.38	57.7590
77.11	103.8729	121.12	75.1711	228.16	0.0000
78.74	104.1674	121.22	75.1807	228.18	59.5765
79.69	124.1581	121.78	64.4880	116.74	59.5765
80.12	110.7764	122.06	59.7328	235.69	61.7444
80.19	0.0000	122.92	71.7590	235.96	61.7578
80.57	110.8615	123.07	72.9694	238.63	57.4095
81.00	107.9436	265.00	83.8011	238.98	0.0000
81.07	107.9568	125.81	68.4246	240.99	57.5208
81.75	106.5794	127.23	87.7889	242.00	57.5684
83.79	112.9684	127.91	104.7154	244.70	57.6953
84.00	99.4471	129.30	90.4289	252.40	0.0000
85.43	126.8673	131.20	73.7238	252.80	47.1827
86.55	127.0989	133.02	78.7347	254.15	0.0000
86.79	127.1484	133.52	81.2064	256.23	50.9497
86.94	127.1792	136.00	79.0204	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	40.2948	355.39	0.0000	584.27	21.9295
264.80	39.3834	356.01	36.5707	595.83	0.0000
265.00	43.9697	364.49	0.0000	427.87	23.1875
268.22	59.6878	366.42	0.0000	602.52	0.0000
269.46	50.5532	372.51	30.5383	604.72	0.0000
270.03	45.9768	375.05	39.4645	607.14	16.6077
271.23	57.0629	377.52	29.6423	609.32	16.6229
273.65	0.0000	356.01	31.7370	610.33	16.6302
276.40	51.7412	388.16	26.8456	614.28	9.9946
277.37	50.8542	388.63	0.0000	618.01	16.6833
277.60	50.8620	391.69	39.8535	620.36	16.6992
278.00	49.9526	264.66	34.0505	621.93	21.7233
279.20	41.6638	401.81	31.0662	630.19	0.0000
279.54	44.4531	402.40	32.0794	631.29	22.3657
279.70	46.3104	404.85	29.1121	633.25	21.2644
280.46	52.8240	410.95	33.2417	634.78	0.0000
283.69	50.1625	413.71	29.2572	635.95	25.7692
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	46.5047	423.72	0.0000	645.85	22.4976
285.90	0.0000	427.09	30.4901	657.76	11.8672
287.50	48.4379	427.87	33.5532	657.90	0.0000
290.67	60.2194	433.94	30.6030	661.66	23.7711
293.27	0.0000	439.40	22.5080	664.57	0.0000
351.93	44.9609	453.88	16.0824	666.33	0.0000
295.96	44.9844	463.37	24.8638	666.50	0.0000
879.38	33.8005	468.07	23.3661	667.71	0.0000
299.98	26.7854	473.00	0.0000	677.62	18.7935
300.09	26.7872	475.06	21.8857	685.70	0.0000
300.13	26.7878	476.78	20.3399	695.00	0.0000
301.36	42.3331	477.60	25.0439	696.49	22.9443
302.85	45.2021	482.18	31.3763	696.51	22.9443
256.23	47.5176	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	27.5420
306.78	52.8805	497.08	16.8574	697.49	27.5439
308.46	34.0342	505.52	23.8028	702.65	25.2979
311.90	42.6425	507.63	0.0000	706.68	13.8193
316.51	49.4313	511.00	27.5777	711.68	11.5377
319.41	0.0000	514.00	27.6165	720.70	0.0000
320.08	0.0000	514.00	27.6165	721.93	0.0000
321.04	49.5815	520.40	14.9154	722.78	19.1157
323.87	35.3462	520.69	0.0000	722.91	19.1164
325.23	53.5448	522.65	0.0000	723.31	22.5953
328.76	0.0000	527.90	0.0000	724.19	24.3411
333.37	33.1643	528.26	17.6440	727.33	19.7275
333.97	38.9476	529.59	18.1898	733.00	23.2568
334.37	36.0718	529.87	0.0000	735.93	8.1484
338.28	27.9663	531.02	0.0000	333.97	11.6471
338.32	27.9669	537.26	0.0000	739.50	0.0000
311.90	34.7659	546.56	0.0000	747.24	15.7791
340.48	34.7659	552.55	30.2752	748.06	10.5223
340.55	0.0000	563.25	27.1617	752.31	22.8333
344.28	42.9818	569.33	20.6978	753.82	0.0000
345.93	34.8867	946.00	16.3416	756.73	21.9894
351.06	37.9169	569.70	16.3434	756.80	21.9902
351.93	37.9376	583.19	21.9198	884.68	20.2822

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	24.7076	1274.44	10.4404	1620.50	6.5889
766.42	22.0650	1001.03	14.2561	1621.92	3.2953
766.84	16.7717	1002.74	11.4104	1678.03	0.0000
772.60	0.0000	1004.73	18.0769	1690.97	3.3391
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	4.5127
778.90	10.6373	1028.54	0.0000	1063.66	4.5173
783.70	0.0000	1037.84	13.4437	1771.35	1.5061
785.37	11.5496	1038.76	0.0000	1791.20	0.0000
792.07	12.4666	631.29	14.4397	1808.65	1.8194
794.95	13.3704	1048.07	0.0000	1810.72	0.0000
795.86	12.4828	1049.04	17.3386	1836.06	4.5706
810.06	21.5024	1050.41	15.4180		
810.29	21.5039	1063.66	15.4736		
344.28	22.9383	1077.00	0.0000		
810.76	22.9414	1077.34	12.6191		
815.77	0.0000	1085.87	12.6485		
1048.07	0.0000	1093.63	14.6246		
832.01	11.7325	1099.45	23.4346		
834.85	17.1631	1112.07	11.1970		
835.71	21.6863	1112.84	11.7590		
836.80	0.0000	1115.54	10.9826		
846.75	0.0000	1120.29	11.7817		
846.77	8.1617	1120.55	11.7825		
856.80	0.0000	1221.41	11.7847		
860.56	14.5747	1129.67	6.8893		
871.09	11.6988	1131.51	0.0000		
873.19	16.0966	1147.95	0.0000		
875.33	0.0000	1173.23	12.9381		
879.38	15.5785	1177.95	12.7539		
880.51	13.7508	1189.05	19.4120		
883.24	13.7622	1204.77	19.0580		
884.68	13.7686	1221.41	17.1214		
889.28	16.5460	1231.02	12.1143		
894.76	12.8913	1235.36	0.0000		
898.04	17.5133	1238.28	16.1807		
900.72	13.8377	1260.41	0.0000		
903.28	21.2347	1271.87	17.3300		
911.20	17.5846	1274.44	16.3203		
912.08	17.5893	1274.54	16.3213		
923.98	0.0000	1291.59	16.3857		
926.50	12.0875	1298.22	0.0000		
929.11	13.0276	1312.11	0.0000		
937.49	20.5243	1332.49	9.3043		
944.13	0.0000	1362.66	0.0000		
946.00	14.0291	1365.19	3.1243		
949.00	14.0419	1368.63	0.0000		
667.71	0.0000	1384.29	5.2295		
962.31	19.7362	1408.01	12.6160		
964.08	10.5314	1457.56	0.0000		
966.17	19.5705	1460.82	5.3165		
911.20	24.4829	1489.16	6.4175		
968.97	24.4829	1505.03	6.4387		
983.53	0.0000	1584.12	7.6328		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235042.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM08.CNF;320
Background date : 2-OCT-2016 11:00:23.
Sample date     : 30-NOV-2015 13:53:00 Acquisition date : 3-OCT-2016 06:55:55.
Sample ID      : G405235042 Sample quantity   : 1.76800E+02 GRAM
Detector name  : GAM08 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.67 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity    : 3.00000
Batch ID       : 1596252 Detector SN#    :
Matrix Spike ID : LCS ID           : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	62.99*	19	93	1.39	126.24	123	7	5.23E-03	92.6	
2	1	74.79*	105	121	1.18	149.84	144	16	2.91E-02	20.2	1.23E+00
3	1	76.94*	124	120	1.18	154.13	144	16	3.45E-02	17.6	
4	3	92.73*	66	150	1.48	185.74	170	23	1.84E-02	39.3	3.36E+00
5	3	94.82	23	83	1.08	189.91	170	23	6.40E-03	75.5	
6	0	144.04*	5	87	0.88	288.40	285	6	1.45E-03	298.1	
7	0	185.86*	47	92	1.29	372.09	368	9	1.31E-02	42.6	
8	0	213.01	94	223	8.20	426.41	412	27	2.61E-02	46.0	
9	0	238.59*	234	119	1.00	477.59	473	9	6.50E-02	10.9	
10	0	241.76	56	49	1.65	483.93	482	6	1.55E-02	24.4	
11	0	270.96	27	71	0.73	542.35	537	10	7.56E-03	61.4	
12	1	295.37*	101	39	1.55	591.20	586	19	2.81E-02	15.6	1.13E+00
13	1	300.25	21	44	1.55	600.95	586	19	5.85E-03	61.0	
14	0	307.48	13	62	4.45	615.43	607	12	3.66E-03	123.5	
15	0	339.27*	66	63	1.39	679.03	672	14	1.82E-02	29.5	
16	0	352.15*	170	83	1.43	704.81	699	14	4.72E-02	14.1	
17	0	370.31	33	57	7.15	741.13	733	18	9.30E-03	56.2	
18	0	463.41	30	29	2.78	927.42	922	12	8.28E-03	40.9	
19	0	511.28*	47	22	2.42	1023.18	1017	19	1.31E-02	35.4	
20	0	583.44*	110	15	1.59	1167.56	1162	14	3.07E-02	12.2	
21	0	609.45*	121	49	1.46	1219.61	1214	14	3.37E-02	15.5	
22	0	661.74	81	29	1.57	1324.21	1319	11	2.24E-02	17.2	
23	0	728.09*	34	18	1.63	1456.96	1449	15	9.58E-03	33.5	
24	0	733.46	9	8	1.77	1467.71	1463	7	2.43E-03	65.1	
25	0	794.49	16	8	1.29	1589.80	1583	11	4.36E-03	43.5	
26	0	861.60*	14	23	0.73	1724.07	1714	19	3.97E-03	87.4	
27	0	911.20*	66	11	1.11	1823.30	1816	15	1.82E-02	17.1	
28	0	924.29	9	2	0.53	1849.49	1845	7	2.51E-03	41.5	
29	0	971.14*	23	41	1.02	1943.22	1933	16	6.49E-03	67.1	
30	0	1001.34*	17	3	0.62	2003.65	1997	13	4.76E-03	35.7	
31	0	1028.25	8	19	1.42	2057.47	2051	10	2.12E-03	115.0	
32	0	1120.48*	24	7	1.57	2241.99	2237	10	6.79E-03	30.3	
33	0	1155.72	18	8	1.59	2312.49	2305	17	4.94E-03	44.4	
34	0	1163.80	9	9	1.26	2328.65	2322	12	2.63E-03	70.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1168.05	10	7	1.08	2337.17	2333	9	2.76E-03	57.1	
36	0	1261.90	12	7	1.33	2524.91	2519	11	3.41E-03	52.5	
37	0	1301.59	13	0	0.83	2604.31	2599	10	3.61E-03	27.7	
38	0	1460.69	305	4	2.03	2922.58	2915	15	8.48E-02	5.9	
39	0	1764.43*	18	0	1.18	3530.17	3523	13	4.88E-03	28.1	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235042.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 30-NOV-2015 13:53:00 Acquisition date : 3-OCT-2016 06:55:55
Sample ID        : G405235042 Sample quantity  : 176.80 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA8 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.67 0.0%
Energy tolerance : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error  : 0.00 %
Efficiency type  : Linear Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	9.672E-01	1.233E+01	1.233E+01	11.78	OK
BA-137M	661.66	89.90*	1.815E+00	2.313E-01	2.358E-01	34.47	OK
CS-137	661.66	85.10*	1.815E+00	2.443E-01	2.491E-01	34.47	OK
TL-208	277.37	6.60	3.710E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.006E+00	3.083E-01	3.083E-01	24.40	OK
	860.56	12.50	1.477E+00	3.489E-01	3.489E-01	174.76	OK
PB-212	74.82	10.28	3.316E+00	1.414E+00	1.414E+00	54.34	OK
	77.11	17.10	3.509E+00	1.258E+00	1.258E+00	35.22	OK
	238.63	43.60*	4.174E+00	6.871E-01	6.871E-01	21.74	OK
	300.09	3.30	3.477E+00	9.534E-01	9.534E-01	121.97	OK
BI-214	609.32	45.49*	1.937E+00	6.508E-01	6.511E-01	30.99	OK
	1120.29	14.92	1.202E+00	5.911E-01	5.913E-01	60.69	OK
	1764.49	15.30	8.180E-01	5.677E-01	5.679E-01	56.10	OK
PB-214	74.82	5.80	3.318E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	3.509E+00	2.218E+00	2.218E+00	35.22	OK
	87.09	3.41	4.288E+00	-----	Line Not Found	-----	Absent
	242.00	7.25	4.130E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	3.525E+00	8.110E-01	8.113E-01	31.12	OK
	351.93	35.60*	3.044E+00	7.984E-01	7.987E-01	28.20	OK
RN-222	609.32	45.49*	1.937E+00	6.508E-01	6.511E-01	30.99	OK
	1120.29	14.92	1.202E+00	5.911E-01	5.913E-01	60.69	OK
	1764.49	15.30	8.180E-01	5.677E-01	5.679E-01	56.10	OK
RA-224	240.99	4.10*	4.133E+00	3.237E-01	3.237E-01	298.89	OK
RA-226	609.32	45.49*	1.937E+00	6.508E-01	6.511E-01	30.99	OK
	1120.29	14.92	1.202E+00	5.911E-01	5.913E-01	60.69	OK
	1764.49	15.30	8.180E-01	5.677E-01	5.679E-01	56.10	OK
TH-228	74.82	10.28	3.316E+00	1.414E+00	1.414E+00	54.34	OK
	77.11	17.10	3.509E+00	1.258E+00	1.258E+00	35.22	OK
	238.63	43.60*	4.174E+00	6.871E-01	6.871E-01	21.74	OK
	300.09	3.30	3.477E+00	9.534E-01	9.534E-01	121.97	OK
TH-230	609.32	45.49*	1.937E+00	6.508E-01	6.508E-01	30.99	OK
	1120.29	14.92	1.202E+00	5.911E-01	5.911E-01	60.69	OK
	1764.49	15.30	8.180E-01	5.677E-01	5.677E-01	56.10	OK
PA-231	283.69	1.70	3.643E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	3.477E+00	5.881E-01	5.881E-01	121.97	OK
TH-234	63.29	3.70*	2.108E+00	1.498E+00	1.498E+00	185.14	OK
	92.59	4.23	4.622E+00	2.017E+00	2.017E+00	78.54	OK
U-234	609.32	45.49*	1.937E+00	6.508E-01	6.508E-01	30.99	OK
	1120.29	14.92	1.202E+00	5.911E-01	5.911E-01	60.69	OK
	1764.49	15.30	8.180E-01	5.677E-01	5.677E-01	56.10	OK
U-235	89.96	3.47	4.467E+00	-----	Line Not Found	-----	Absent
	93.35	5.60	4.622E+00	1.523E+00	1.523E+00	78.54	OK
	143.76	10.96*	5.442E+00	4.947E-02	4.947E-02	596.16	OK
	163.33	5.08	5.246E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	4.930E+00	9.198E-02	9.198E-02	85.11	OK
	205.31	5.01	4.641E+00	-----	Line Not Found	-----	Absent
U-238	63.29	3.70*	2.108E+00	1.498E+00	1.498E+00	185.14	OK
	92.59	4.23	4.622E+00	2.017E+00	2.017E+00	78.54	OK
AM-243	43.53	5.90	2.327E-01	-----	Line Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	74.66	67.20*	3.316E+00	2.163E-01	2.163E-01	54.34	OK
ANH-511	511.00	100.00*	2.232E+00	1.023E-01	1.023E-01	70.85	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235042.CNF;1 *
 * Acquisition date : 3-OCT-2016 06:55:55 Sensitivity : 3.000 *
 * Detector ID : GAM08 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.67 Half life ratio : ***** *
 * Sample date : 30-NOV-2015 13:53:00 Analyst initials: MXR1 *
 * Sample ID : G405235042 Sample Quantity : 1.7680E+02 GRAM *
 * Batch Number : 1596252 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 21-JUL-2016 06:09:19 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;14 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.233E+01	1.423E+00	6.159E-01
BA-137M	2.358E-01	7.965E-02	6.643E-02
CS-137	2.491E-01	8.415E-02	7.018E-02
TL-208	3.083E-01	7.372E-02	6.311E-02
PB-212	6.871E-01	1.464E-01	1.010E-01
BI-214	6.511E-01	1.977E-01	1.309E-01
PB-214	7.987E-01	2.207E-01	1.220E-01
RN-222	6.511E-01	1.977E-01	1.309E-01
RA-224	3.237E-01	9.481E-01	1.062E+00
RA-226	6.511E-01	1.977E-01	1.309E-01
TH-228	6.871E-01	1.464E-01	1.010E-01
TH-230	6.508E-01	1.976E-01	1.309E-01
PA-231	5.881E-01	7.029E-01	6.746E-01
TH-234	1.498E+00	2.718E+00	2.540E+00
U-234	6.508E-01	1.976E-01	1.309E-01
U-235	4.947E-02	2.890E-01	3.150E-01
U-238	1.498E+00	2.718E+00	2.540E+00
AM-243	2.163E-01	1.152E-01	9.787E-02
ANH-511	1.023E-01	7.103E-02	4.036E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.495E+01	1.265E+01	2.850E+01	NOT IDENT.
NA-22	-1.235E-02	3.734E-02	7.060E-02	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	8.641E-03	1.952E-02	5.458E-02	NOT IDENT.
SC-46	7.510E-02	4.817E-01	9.700E-01	FAIL ABUN
V-48	0.000E+00	1.689E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	4.524E+02	0.000E+00	SHORT HLIF
MN-54	3.215E-02	4.896E-02	1.131E-01	NOT IDENT.
CO-56	-2.901E-01	4.658E-01	8.545E-01	NOT IDENT.
MN-56	0.000E+00	1.617E+41	0.000E+00	SHORT HLIF
CO-57	1.767E-02	4.884E-02	9.585E-02	NOT IDENT.

CO-58	-4.666E-01	5.904E-01	1.055E+00	NOT IDENT.
FE-59	-5.049E+00	7.984E+00	1.408E+01	NOT IDENT.
CO-60	5.863E-03	3.677E-02	7.723E-02	NOT IDENT.
ZN-65	3.864E-02	1.443E-01	2.827E-01	NOT IDENT.
GE-68	-1.369E+00	2.448E+00	4.398E+00	NOT IDENT.
AS-73	-1.025E+01	1.199E+01	2.243E+01	NOT IDENT.
AS-74	0.000E+00	7.929E+03	0.000E+00	SHORT HLIF
SE-75	5.548E-02	2.054E-01	4.219E-01	NOT IDENT.
BR-77	0.000E+00	2.623E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	7.896E+02	0.000E+00	SHORT HLIF
RB-83	-9.802E-02	5.823E-01	1.069E+00	NOT IDENT.
KR-85	6.097E+00	5.934E+00	1.322E+01	NOT IDENT.
SR-85	6.954E-01	6.805E-01	1.515E+00	NOT IDENT.
RB-86	0.000E+00	3.924E+04	0.000E+00	SHORT HLIF
Y-88	3.127E-02	6.945E-02	2.753E-01	NOT IDENT.
Y-91	-5.682E+01	5.592E+02	1.082E+03	NOT IDENT.
NB-94	-1.328E-02	2.623E-02	5.022E-02	NOT IDENT.
NB-95	-2.528E-01	8.902E-01	1.730E+00	NOT IDENT.
NB-95M	-4.655E-01	2.690E+00	4.769E+00	NOT IDENT.
ZR-95	4.518E-01	1.375E+00	2.967E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.331E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.027E+33	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.838E+41	0.000E+00	SHORT HLIF
RH-101	9.922E-03	3.491E-02	6.760E-02	NOT IDENT.
RH-102	-8.216E-03	4.404E-02	8.467E-02	NOT IDENT.
RU-103	2.616E+00	5.933E+00	1.239E+01	FAIL ABUN
RH-106	-3.175E-01	4.677E-01	7.996E-01	NOT IDENT.
RU-106	-3.175E-01	4.677E-01	7.996E-01	NOT IDENT.
AG-108M	-6.266E-03	2.733E-02	5.201E-02	NOT IDENT.
CD-109	8.134E-02	1.168E+00	2.260E+00	NOT IDENT.
AG-110M	-1.853E-02	9.769E-02	1.924E-01	NOT IDENT.
SN-113	-4.937E-02	2.262E-01	4.350E-01	NOT IDENT.
CD-115	0.000E+00	3.202E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.378E+05	0.000E+00	SHORT HLIF
TE-123M	2.142E-02	1.354E-01	2.566E-01	NOT IDENT.
SB-124	1.157E-02	1.920E+00	4.303E+00	NOT IDENT.
SB-125	8.939E-02	1.008E-01	2.176E-01	FAIL ABUN
TE-125M	-1.322E+02	3.099E+02	5.665E+02	NOT IDENT.
I-126	0.000E+00	1.659E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.785E+06	0.000E+00	SHORT HLIF
SN-126	3.738E-02	7.618E-02	1.516E-01	FAIL ABUN
SB-127	0.000E+00	8.020E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	1.060E+10	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.057E+27	0.000E+00	SHORT HLIF
BA-133	1.310E-02	3.859E-02	7.271E-02	NOT IDENT.
I-133	0.000E+00	1.241E+41	0.000E+00	SHORT HLIF
CS-134	7.066E-02	6.025E-02	9.993E-02	FAIL ABUN
CS-135	7.375E-04	1.330E-01	2.411E-01	NOT IDENT.
I-135	0.000E+00	1.030E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.564E+05	0.000E+00	SHORT HLIF
CE-139	-7.099E-02	1.126E-01	1.968E-01	NOT IDENT.
BA-140	0.000E+00	1.762E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	6.662E+05	0.000E+00	SHORT HLIF
CE-141	7.939E+00	4.638E+01	5.258E+01	FAIL ABUN
CE-143	0.000E+00	1.507E+41	0.000E+00	SHORT HLIF
CE-144	-3.430E-02	3.694E-01	6.850E-01	NOT IDENT.
PM-144	-1.214E-03	4.960E-02	1.016E-01	NOT IDENT.
PR-144	-5.977E-02	4.334E+00	8.886E+00	NOT IDENT.
PM-146	4.624E-03	4.204E-02	8.344E-02	NOT IDENT.
ND-147	0.000E+00	4.802E+07	0.000E+00	SHORT HLIF
PM-147	2.994E+02	8.013E+02	1.581E+03	NOT IDENT.
PM-149	0.000E+00	1.792E+41	0.000E+00	SHORT HLIF
EU-150	9.557E-03	2.385E-02	4.526E-02	FAIL ABUN
EU-152	-3.597E-03	8.187E-02	1.468E-01	NOT IDENT.
GD-153	1.846E-01	1.794E-01	3.565E-01	NOT IDENT.
EU-154	-3.016E-02	9.116E-02	1.724E-01	NOT IDENT.
EU-155	3.030E-02	1.114E-01	2.189E-01	NOT IDENT.
TB-160	-3.385E-01	2.036E+00	4.000E+00	NOT IDENT.
HO-166M	-3.375E-02	5.772E-02	1.082E-01	FAIL ABUN
TM-171	1.165E+01	2.787E+01	5.840E+01	NOT IDENT.
HF-172	-5.657E-02	2.454E-01	4.555E-01	FAIL ABUN
LU-172	-8.596E-02	7.803E-02	1.271E-01	FAIL ABUN
LU-176	2.135E-02	5.166E-02	3.864E-02	FAIL ABUN
HF-181	2.002E+00	4.765E+00	9.808E+00	NOT IDENT.
TA-182	2.198E-01	9.055E-01	1.857E+00	FAIL ABUN
RE-183	-4.373E-02	3.753E+00	7.573E+00	NOT IDENT.

RE-184	-1.125E+00	3.339E+01	6.727E+01	NOT IDENT.
W-188	1.987E+01	1.196E+02	2.197E+02	FAIL ABUN
IR-192	-4.992E-01	4.595E-01	8.093E-01	FAIL ABUN
HG-203	-3.595E+00	2.484E+00	4.248E+00	NOT IDENT.
BI-207	6.315E-03	3.790E-02	8.061E-02	FAIL ABUN
PB-210	-3.347E+00	5.445E+00	1.058E+01	NOT IDENT.
BI-211	0.000E+00	6.079E-01	7.644E-01	FAIL ABUN
PB-211	5.547E-02	6.223E-01	1.238E+00	NOT IDENT.
BI-212	0.000E+00	9.296E-01	1.302E+00	FAIL ABUN
RN-219	-1.052E-01	3.421E-01	6.507E-01	FAIL ABUN
RA-223	4.151E-02	5.534E-01	1.082E+00	FAIL ABUN
AC-227	-6.853E-02	1.989E-01	3.892E-01	FAIL ABUN
TH-227	-6.853E-02	1.989E-01	3.892E-01	FAIL ABUN
AC-228	0.000E+00	2.700E-01	5.024E-01	FAIL ABUN
RA-228	0.000E+00	2.700E-01	5.024E-01	FAIL ABUN
TH-229	-4.067E-02	4.114E-01	8.342E-01	NOT IDENT.
TH-231	4.151E-02	5.534E-01	1.082E+00	FAIL ABUN
TH-232	0.000E+00	2.700E-01	5.024E-01	FAIL ABUN
PA-233	-1.259E-02	6.296E-02	1.165E-01	FAIL ABUN
PA-234	-1.738E-01	2.461E-01	4.376E-01	FAIL ABUN
PA-234M	6.851E+00	4.793E+00	8.846E+00	FAIL ABUN
NP-237	-1.259E-02	6.296E-02	1.165E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	4.936E-02	2.323E-01	4.536E-01	NOT IDENT.
PU-239	9.967E+01	3.116E+02	6.049E+02	NOT IDENT.
AM-241	1.412E-01	1.644E-01	3.327E-01	NOT IDENT.
CM-243	-5.309E-02	1.008E-01	1.857E-01	NOT IDENT.
BK-247	2.102E-02	6.631E-02	1.371E-01	NOT IDENT.
CM-247	3.517E-03	3.081E-02	6.187E-02	NOT IDENT.
CF-249	6.041E-03	3.398E-02	6.864E-02	NOT IDENT.
CF-251	2.810E-02	1.029E-01	2.153E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	299	10.66*	9.672E-01	1.233E+01	1.233E+01	11.78
BA-137M	661.66	89	89.90*	1.815E+00	2.313E-01	2.358E-01	34.47
CS-137	661.66	89	85.10*	1.815E+00	2.443E-01	2.491E-01	34.47
CE-141	145.44	7	48.29*	5.442E+00	1.123E-02	7.939E+00	596.16
TL-208	277.37	-----	6.60	3.710E+00	-----	Line Not Found	-----
	583.19	124	85.00*	2.006E+00	3.083E-01	3.083E-01	24.40
	860.56	15	12.50	1.477E+00	3.489E-01	3.489E-01	174.76
BI-211	72.87	-----	1.23	3.135E+00	-----	Line Not Found	-----
	351.06	204	12.92*	3.044E+00	2.200E+00	2.200E+00	28.20
PB-212	74.82	150	10.28	3.316E+00	1.871E+00	1.871E+00	40.34
	77.11	178	17.10	3.509E+00	1.258E+00	1.258E+00	35.22
	238.63	295	43.60*	4.174E+00	6.871E-01	6.871E-01	21.74
	300.09	26	3.30	3.477E+00	9.534E-01	9.534E-01	121.97
BI-214	609.32	135	45.49*	1.937E+00	6.508E-01	6.511E-01	30.99
	1120.29	25	14.92	1.202E+00	5.911E-01	5.913E-01	60.69
	1764.49	17	15.30	8.180E-01	5.677E-01	5.679E-01	56.10
PB-214	74.82	150	5.80	3.316E+00	3.317E+00	3.318E+00	40.34
	77.11	178	9.70	3.509E+00	2.218E+00	2.218E+00	35.22
	87.09	-----	3.41	4.288E+00	-----	Line Not Found	-----
	242.00	70	7.25	4.133E+00	9.941E-01	9.945E-01	48.83
	295.22	124	18.42	3.525E+00	8.110E-01	8.113E-01	31.12
	351.93	204	35.60*	3.044E+00	7.984E-01	7.987E-01	28.20
RN-222	609.32	135	45.49*	1.937E+00	6.508E-01	6.511E-01	30.99
	1120.29	25	14.92	1.202E+00	5.911E-01	5.913E-01	60.69
	1764.49	17	15.30	8.180E-01	5.677E-01	5.679E-01	56.10
RA-224	240.99	70	4.10*	4.133E+00	1.758E+00	1.758E+00	48.83
RA-226	609.32	135	45.49*	1.937E+00	6.508E-01	6.511E-01	30.99
	1120.29	25	14.92	1.202E+00	5.911E-01	5.913E-01	60.69
	1764.49	17	15.30	8.180E-01	5.677E-01	5.679E-01	56.10
TH-228	74.82	150	10.28	3.316E+00	1.871E+00	1.871E+00	40.34
	77.11	178	17.10	3.509E+00	1.258E+00	1.258E+00	35.22
	238.63	295	43.60*	4.174E+00	6.871E-01	6.871E-01	21.74
	300.09	26	3.30	3.477E+00	9.534E-01	9.534E-01	121.97
TH-230	609.32	135	45.49*	1.937E+00	6.508E-01	6.508E-01	30.99
	1120.29	25	14.92	1.202E+00	5.911E-01	5.911E-01	60.69
	1764.49	17	15.30	8.180E-01	5.677E-01	5.677E-01	56.10
PA-231	283.69	-----	1.70	3.643E+00	-----	Line Not Found	-----
	301.36	26	5.35*	3.477E+00	5.881E-01	5.881E-01	121.97
TH-234	63.29	28	3.70*	2.108E+00	1.498E+00	1.498E+00	185.14
	92.59	93	4.23	4.622E+00	2.017E+00	2.017E+00	78.54
U-234	609.32	135	45.49*	1.937E+00	6.508E-01	6.508E-01	30.99
	1120.29	25	14.92	1.202E+00	5.911E-01	5.911E-01	60.69
	1764.49	17	15.30	8.180E-01	5.677E-01	5.677E-01	56.10
U-235	89.96	-----	3.47	4.467E+00	-----	Line Not Found	-----
	93.35	93	5.60	4.622E+00	1.523E+00	1.523E+00	78.54
	143.76	7	10.96*	5.442E+00	4.947E-02	4.947E-02	596.16
	163.33	-----	5.08	5.246E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	185.72	61	57.20	4.930E+00	9.198E-02	9.198E-02	85.11
	205.31	-----	5.01	4.641E+00	-----	Line Not Found	-----
U-238	63.29	28	3.70*	2.108E+00	1.498E+00	1.498E+00	185.14
	92.59	93	4.23	4.622E+00	2.017E+00	2.017E+00	78.54
AM-243	43.53	-----	5.90	2.327E-01	-----	Line Not Found	-----
	74.66	150	67.20*	3.316E+00	2.863E-01	2.863E-01	40.34
ANH-511	511.00	54	100.00*	2.232E+00	1.023E-01	1.023E-01	70.85

Flag: "*" = Keyline

Total number of lines in spectrum 39
 Number of unidentified lines 7
 Number of lines tentatively identified by NID 32 82.05%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.233E+01	1.233E+01	0.145E+01	11.78	
BA-137M	30.08Y	1.02	2.313E-01	2.358E-01	0.813E-01	34.47	
CS-137	30.08Y	1.02	2.443E-01	2.491E-01	0.859E-01	34.47	
CE-141	32.51D	707.	1.123E-02	7.939E+00	47.33E+00	596.16	
TL-208	1.41E+10Y	1.00	3.083E-01	3.083E-01	0.752E-01	24.40	
BI-211	7.04E+08Y	1.00	2.200E+00	2.200E+00	0.620E+00	28.20	
PB-212	1.41E+10Y	1.00	6.871E-01	6.871E-01	1.494E-01	21.74	
BI-214	1600.00Y	1.00	6.508E-01	6.511E-01	2.017E-01	30.99	
PB-214	1600.00Y	1.00	7.984E-01	7.987E-01	2.252E-01	28.20	
RN-222	1600.00Y	1.00	6.508E-01	6.511E-01	2.017E-01	30.99	
RA-224	1.41E+10Y	1.00	1.758E+00	1.758E+00	0.858E+00	48.83	
RA-226	1600.00Y	1.00	6.508E-01	6.511E-01	2.017E-01	30.99	
TH-228	1.41E+10Y	1.00	6.871E-01	6.871E-01	1.494E-01	21.74	
TH-230	7.54E+04Y	1.00	6.508E-01	6.508E-01	2.017E-01	30.99	
PA-231	7.04E+08Y	1.00	5.881E-01	5.881E-01	7.173E-01	121.97	
TH-234	4.47E+09Y	1.00	1.498E+00	1.498E+00	2.773E+00	185.14	
U-234	2.45E+05Y	1.00	6.508E-01	6.508E-01	2.017E-01	30.99	
U-235	7.04E+08Y	1.00	4.947E-02	4.947E-02	29.49E-02	596.16	
U-238	4.47E+09Y	1.00	1.498E+00	1.498E+00	2.773E+00	185.14	
AM-243	7370.00Y	1.00	2.863E-01	2.863E-01	1.155E-01	40.34	
ANH-511	1.00E+09Y	1.00	1.023E-01	1.023E-01	0.725E-01	70.85	
Total Activity :			2.653E+01	3.447E+01			
Grand Total Activity :			2.653E+01	3.447E+01			

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
3	94.82	32	116	1.08	189.91	170	23	6.40E-03	****	4.73E+00	T
0	213.01	120	284	8.20	426.41	412	27	2.61E-02	92.0	4.53E+00	
0	270.96	34	88	0.73	542.35	537	10	7.56E-03	****	3.78E+00	T
0	307.48	16	75	4.45	615.43	607	12	3.66E-03	****	3.41E+00	T
0	339.27	79	76	1.39	679.03	672	14	1.82E-02	58.9	3.14E+00	T
0	370.31	40	67	7.15	741.13	733	18	9.30E-03	****	2.92E+00	
0	463.41	34	34	2.78	927.42	922	12	8.28E-03	81.9	2.42E+00	T
0	728.09	37	19	1.63	1456.96	1449	15	9.58E-03	66.9	1.68E+00	T
0	733.46	9	9	1.77	1467.71	1463	7	2.43E-03	****	1.67E+00	T
0	794.49	17	9	1.29	1589.80	1583	11	4.36E-03	87.0	1.57E+00	T
0	911.20	69	12	1.11	1823.30	1816	15	1.82E-02	34.2	1.41E+00	T
0	924.29	10	2	0.53	1849.49	1845	7	2.51E-03	82.9	1.40E+00	T
0	971.14	24	43	1.02	1943.22	1933	16	6.49E-03	****	1.35E+00	
0	1001.34	18	3	0.62	2003.65	1997	13	4.76E-03	71.4	1.31E+00	T
0	1028.25	8	20	1.42	2057.47	2051	10	2.12E-03	****	1.29E+00	T
0	1155.72	18	8	1.59	2312.49	2305	17	4.94E-03	88.7	1.17E+00	
0	1163.80	10	9	1.26	2328.65	2322	12	2.63E-03	****	1.17E+00	
0	1168.05	10	7	1.08	2337.17	2333	9	2.76E-03	****	1.16E+00	
0	1261.90	12	7	1.33	2524.91	2519	11	3.41E-03	****	1.09E+00	T
0	1301.59	13	0	0.83	2604.31	2599	10	3.61E-03	55.5	1.07E+00	

Flags: "T" = Tentatively associated

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235042.CNF;1
* Acquisition date   : 3-OCT-2016 06:55:55 Sensitivity      : 3.000
* Detector ID       : GAM08 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.67 Half life ratio : *****
* Sample date       : 30-NOV-2015 13:53:00 Nuclide Library : SOLID
* Sample ID         : G405235042 Analyst initials: MXR1
* Batch Number      : 1596252 Sample Quantity : 1.7680E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 21-JUL-2016 06:09:19 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;14
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.514E-01
BA-137M	2.948E-02
CS-137	3.114E-02
TL-208	2.803E-02
PB-212	4.711E-02
BI-214	5.866E-02
PB-214	5.534E-02
RN-222	5.866E-02
RA-224	4.945E-01
RA-226	5.866E-02
TH-228	4.711E-02
TH-230	5.864E-02
PA-231	3.042E-01
TH-234	1.189E+00
U-234	5.864E-02
U-235	1.470E-01
U-238	1.189E+00
AM-243	4.605E-02
ANH-511	1.747E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.290E+01	NOT IDENT.
NA-22	2.853E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.004E-02	NOT IDENT.
SC-46	4.326E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	4.876E-02	NOT IDENT.
CO-56	3.644E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.496E-02	NOT IDENT.
CO-58	4.491E-01	NOT IDENT.

FE-59	6.011E+00	NOT IDENT.
CO-60	3.236E-02	NOT IDENT.
ZN-65	1.183E-01	NOT IDENT.
GE-68	1.875E+00	NOT IDENT.
AS-73	1.037E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.948E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.621E-01	NOT IDENT.
KR-85	5.947E+00	NOT IDENT.
SR-85	6.816E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	8.295E-02	NOT IDENT.
Y-91	4.649E+02	NOT IDENT.
NB-94	2.165E-02	NOT IDENT.
NB-95	7.619E-01	NOT IDENT.
NB-95M	2.219E+00	NOT IDENT.
ZR-95	1.296E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.178E-02	NOT IDENT.
RH-102	3.569E-02	NOT IDENT.
RU-103	5.532E+00	FAIL ABUN
RH-106	3.435E-01	NOT IDENT.
RU-106	3.435E-01	NOT IDENT.
AG-108M	2.337E-02	NOT IDENT.
CD-109	1.067E+00	NOT IDENT.
AG-110M	8.297E-02	NOT IDENT.
SN-113	1.960E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.199E-01	NOT IDENT.
SB-124	1.656E+00	NOT IDENT.
SB-125	9.908E-02	FAIL ABUN
TE-125M	2.649E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SN-126	7.182E-02	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.290E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	4.409E-02	FAIL ABUN
CS-135	1.105E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	9.133E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.460E+01	FAIL ABUN
CE-143	0.000E+00	SHORT HLIF
CE-144	3.206E-01	NOT IDENT.
PM-144	4.458E-02	NOT IDENT.
PR-144	3.902E+00	NOT IDENT.
PM-146	3.751E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.399E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.059E-02	FAIL ABUN
EU-152	6.568E-02	NOT IDENT.
GD-153	1.673E-01	NOT IDENT.
EU-154	6.967E-02	NOT IDENT.
EU-155	1.029E-01	NOT IDENT.
TB-160	1.741E+00	NOT IDENT.
HO-166M	4.766E-02	FAIL ABUN
TM-171	2.725E+01	NOT IDENT.
HF-172	2.138E-01	FAIL ABUN
LU-172	5.311E-02	FAIL ABUN
LU-176	1.740E-02	FAIL ABUN
HF-181	4.412E+00	NOT IDENT.
TA-182	8.038E-01	FAIL ABUN
RE-183	3.531E+00	NOT IDENT.
RE-184	2.912E+01	NOT IDENT.

W-188	1.007E+02	FAIL ABUN
IR-192	3.646E-01	FAIL ABUN
HG-203	1.925E+00	NOT IDENT.
BI-207	3.389E-02	FAIL ABUN
PB-210	4.926E+00	NOT IDENT.
BI-211	3.668E-01	FAIL ABUN
PB-211	5.596E-01	NOT IDENT.
BI-212	5.980E-01	FAIL ABUN
RN-219	2.915E-01	FAIL ABUN
RA-223	4.941E-01	FAIL ABUN
AC-227	1.782E-01	FAIL ABUN
TH-227	1.782E-01	FAIL ABUN
AC-228	2.350E-01	FAIL ABUN
RA-228	2.350E-01	FAIL ABUN
TH-229	3.878E-01	NOT IDENT.
TH-231	4.941E-01	FAIL ABUN
TH-232	2.350E-01	FAIL ABUN
PA-233	5.352E-02	FAIL ABUN
PA-234	1.829E-01	FAIL ABUN
PA-234M	3.889E+00	FAIL ABUN
NP-237	5.352E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.120E-01	NOT IDENT.
PU-239	2.843E+02	NOT IDENT.
AM-241	1.559E-01	NOT IDENT.
CM-243	8.673E-02	NOT IDENT.
BK-247	6.321E-02	NOT IDENT.
CM-247	2.783E-02	NOT IDENT.
CF-249	3.103E-02	NOT IDENT.
CF-251	1.005E-01	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235042.CNF;1
* Acquisition date   : 3-OCT-2016 06:55:55 Sensitivity      : 3.000
* Detector ID        : GAM08 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.67 Half life ratio  : *****
* Sample date        : 30-NOV-2015 13:53:00 Nuclide Library : SOLID
* Sample ID          : G405235042 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity : 1.7680E+02 GRAM
*                   : Quantity Err(%) : 1.1312E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight       : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 21-JUL-2016 06:09:19 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.233E+01	1.562E+00	1.562E+00
BA-137M	2.358E-01	8.030E-02	8.030E-02
CS-137	2.491E-01	8.482E-02	8.482E-02
TL-208	3.083E-01	7.488E-02	7.488E-02
PB-212	6.871E-01	1.509E-01	1.509E-01
BI-214	6.511E-01	1.997E-01	1.997E-01
PB-214	7.987E-01	2.232E-01	2.232E-01
RN-222	6.511E-01	1.997E-01	1.997E-01
RA-224	3.237E-01	9.529E-01	9.529E-01
RA-226	6.511E-01	1.997E-01	1.997E-01
TH-228	6.871E-01	1.509E-01	1.509E-01
TH-230	6.508E-01	1.996E-01	1.996E-01
PA-231	5.881E-01	7.140E-01	7.140E-01
TH-234	1.498E+00	2.738E+00	2.738E+00
U-234	6.508E-01	1.996E-01	1.996E-01
U-235	4.947E-02	2.890E-01	2.890E-01
U-238	1.498E+00	2.738E+00	2.738E+00
AM-243	2.163E-01	1.163E-01	1.163E-01
ANH-511	1.023E-01	7.116E-02	7.116E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.495E+01	1.267E+01	1.435E+01	NOT IDENT.
NA-22	-1.235E-02	3.734E-02	3.775E-02	NOT IDENT.
NA-24	1.000E+41	4.268E+41	0.000E+00	SHORT HLIF
AL-26	8.641E-03	1.953E-02	1.991E-02	NOT IDENT.
SC-46	7.510E-02	4.817E-01	4.829E-01	FAIL ABUN
V-48	1.342E+04	1.690E+04	1.795E+04	SHORT HLIF
CR-51	8.273E+01	4.525E+02	4.540E+02	SHORT HLIF
MN-54	3.215E-02	4.898E-02	5.107E-02	NOT IDENT.
CO-56	-2.901E-01	4.660E-01	4.840E-01	NOT IDENT.
MN-56	-1.000E+41	1.618E+41	0.000E+00	SHORT HLIF
CO-57	1.767E-02	4.884E-02	4.949E-02	NOT IDENT.

CO-58	-4.666E-01	5.908E-01	6.271E-01	NOT IDENT.
FE-59	-5.049E+00	7.992E+00	8.310E+00	NOT IDENT.
CO-60	5.863E-03	3.677E-02	3.687E-02	NOT IDENT.
ZN-65	3.864E-02	1.443E-01	1.453E-01	NOT IDENT.
GE-68	-1.369E+00	2.449E+00	2.525E+00	NOT IDENT.
AS-73	-1.025E+01	1.218E+01	1.303E+01	NOT IDENT.
AS-74	-3.921E+03	7.936E+03	8.130E+03	SHORT HLIF
SE-75	5.548E-02	2.054E-01	2.069E-01	NOT IDENT.
BR-77	1.231E+39	1.094E+40	0.000E+00	SHORT HLIF
SR-82	-2.936E+01	7.896E+02	7.897E+02	SHORT HLIF
RB-83	-9.802E-02	5.824E-01	5.841E-01	NOT IDENT.
KR-85	6.097E+00	5.939E+00	6.544E+00	NOT IDENT.
SR-85	6.954E-01	6.811E-01	7.497E-01	NOT IDENT.
RB-86	-1.880E+04	3.925E+04	4.015E+04	SHORT HLIF
Y-88	3.127E-02	6.948E-02	7.090E-02	NOT IDENT.
Y-91	-5.682E+01	5.592E+02	5.598E+02	NOT IDENT.
NB-94	-1.328E-02	2.624E-02	2.691E-02	NOT IDENT.
NB-95	-2.528E-01	8.902E-01	8.975E-01	NOT IDENT.
NB-95M	-4.655E-01	2.690E+00	2.698E+00	NOT IDENT.
ZR-95	4.518E-01	1.375E+00	1.390E+00	NOT IDENT.
NB-97	1.000E+41	2.204E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.332E+41	0.000E+00	SHORT HLIF
MO-99	7.632E+31	1.027E+33	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.840E+41	0.000E+00	SHORT HLIF
RH-101	9.922E-03	3.495E-02	3.524E-02	NOT IDENT.
RH-102	-8.216E-03	4.404E-02	4.420E-02	NOT IDENT.
RU-103	2.616E+00	5.935E+00	6.051E+00	FAIL ABUN
RH-106	-3.175E-01	4.681E-01	4.895E-01	NOT IDENT.
RU-106	-3.175E-01	4.681E-01	4.895E-01	NOT IDENT.
AG-108M	-6.266E-03	2.733E-02	2.747E-02	NOT IDENT.
CD-109	8.134E-02	1.168E+00	1.168E+00	NOT IDENT.
AG-110M	-1.853E-02	9.769E-02	9.805E-02	NOT IDENT.
SN-113	-4.937E-02	2.262E-01	2.273E-01	NOT IDENT.
CD-115	3.469E+40	3.266E+40	0.000E+00	SHORT HLIF
SN-117M	5.137E+04	1.380E+05	1.399E+05	SHORT HLIF
TE-123M	2.142E-02	1.354E-01	1.357E-01	NOT IDENT.
SB-124	1.157E-02	1.920E+00	1.920E+00	NOT IDENT.
SB-125	8.939E-02	1.008E-01	1.086E-01	FAIL ABUN
TE-125M	-1.322E+02	3.100E+02	3.157E+02	NOT IDENT.
I-126	-1.299E+05	1.659E+06	1.660E+06	SHORT HLIF
SB-126	-8.927E+05	1.794E+06	1.838E+06	SHORT HLIF
SN-126	3.738E-02	7.622E-02	7.806E-02	FAIL ABUN
SB-127	3.571E+22	9.471E+22	0.000E+00	SHORT HLIF
I-131	-1.329E+09	1.060E+10	1.062E+10	SHORT HLIF
I-132	1.000E+41	1.932E+42	0.000E+00	SHORT HLIF
TE-132	4.759E+26	2.066E+27	0.000E+00	SHORT HLIF
BA-133	1.310E-02	3.859E-02	3.904E-02	NOT IDENT.
I-133	-1.000E+41	2.233E+41	0.000E+00	SHORT HLIF
CS-134	7.066E-02	6.032E-02	6.822E-02	FAIL ABUN
CS-135	7.375E-04	1.330E-01	1.330E-01	NOT IDENT.
I-135	1.000E+41	7.029E+41	0.000E+00	SHORT HLIF
CS-136	-2.869E+05	3.578E+05	3.805E+05	SHORT HLIF
CE-139	-7.099E-02	1.135E-01	1.179E-01	NOT IDENT.
BA-140	2.571E+05	1.762E+06	1.766E+06	SHORT HLIF
LA-140	-1.908E+05	6.663E+05	6.718E+05	SHORT HLIF
CE-141	7.939E+00	4.639E+01	4.652E+01	FAIL ABUN
CE-143	1.000E+41	1.511E+41	0.000E+00	SHORT HLIF
CE-144	-3.430E-02	3.694E-01	3.698E-01	NOT IDENT.
PM-144	-1.214E-03	4.960E-02	4.960E-02	NOT IDENT.
PR-144	-5.977E-02	4.334E+00	4.334E+00	NOT IDENT.
PM-146	4.624E-03	4.204E-02	4.209E-02	NOT IDENT.
ND-147	-5.879E+07	4.813E+07	5.495E+07	SHORT HLIF
PM-147	2.994E+02	8.014E+02	8.127E+02	NOT IDENT.
PM-149	-1.000E+41	1.806E+41	0.000E+00	SHORT HLIF
EU-150	9.557E-03	2.385E-02	2.424E-02	FAIL ABUN
EU-152	-3.597E-03	8.187E-02	8.188E-02	NOT IDENT.
GD-153	1.846E-01	1.798E-01	1.981E-01	NOT IDENT.
EU-154	-3.016E-02	9.117E-02	9.218E-02	NOT IDENT.
EU-155	3.030E-02	1.115E-01	1.123E-01	NOT IDENT.
TB-160	-3.385E-01	2.036E+00	2.041E+00	NOT IDENT.
HO-166M	-3.375E-02	5.775E-02	5.972E-02	FAIL ABUN
TM-171	1.165E+01	2.788E+01	2.837E+01	NOT IDENT.
HF-172	-5.657E-02	2.455E-01	2.468E-01	FAIL ABUN
LU-172	-8.596E-02	7.851E-02	8.756E-02	FAIL ABUN
LU-176	2.135E-02	5.167E-02	5.255E-02	FAIL ABUN
HF-181	2.002E+00	4.766E+00	4.850E+00	NOT IDENT.
TA-182	2.198E-01	9.056E-01	9.110E-01	FAIL ABUN
RE-183	-4.373E-02	3.753E+00	3.753E+00	NOT IDENT.

RE-184	-1.125E+00	3.339E+01	3.339E+01	NOT IDENT.
W-188	1.987E+01	1.196E+02	1.199E+02	FAIL ABUN
IR-192	-4.992E-01	4.600E-01	5.121E-01	FAIL ABUN
HG-203	-3.595E+00	2.489E+00	2.970E+00	NOT IDENT.
BI-207	6.315E-03	3.790E-02	3.800E-02	FAIL ABUN
PB-210	-3.347E+00	5.454E+00	5.659E+00	NOT IDENT.
BI-211	2.200E+00	6.158E-01	1.167E+00	FAIL ABUN
PB-211	5.547E-02	6.223E-01	6.228E-01	NOT IDENT.
BI-212	1.417E+00	9.324E-01	1.130E+00	FAIL ABUN
RN-219	-1.052E-01	3.424E-01	3.456E-01	FAIL ABUN
RA-223	4.151E-02	5.534E-01	5.537E-01	FAIL ABUN
AC-227	-6.853E-02	1.991E-01	2.015E-01	FAIL ABUN
TH-227	-6.853E-02	1.991E-01	2.015E-01	FAIL ABUN
AC-228	8.044E-01	2.731E-01	4.539E-01	FAIL ABUN
RA-228	8.044E-01	2.731E-01	4.539E-01	FAIL ABUN
TH-229	-4.067E-02	4.114E-01	4.118E-01	NOT IDENT.
TH-231	4.151E-02	5.534E-01	5.537E-01	FAIL ABUN
TH-232	8.044E-01	2.731E-01	4.539E-01	FAIL ABUN
PA-233	-1.259E-02	6.296E-02	6.321E-02	FAIL ABUN
PA-234	-1.738E-01	3.164E-01	3.260E-01	FAIL ABUN
PA-234M	6.851E+00	4.803E+00	5.710E+00	FAIL ABUN
NP-237	-1.259E-02	6.296E-02	6.321E-02	FAIL ABUN
NP-238	1.000E+41	3.207E+41	0.000E+00	SHORT HLIF
NP-239	4.936E-02	2.323E-01	2.334E-01	NOT IDENT.
PU-239	9.967E+01	3.116E+02	3.148E+02	NOT IDENT.
AM-241	1.412E-01	1.647E-01	1.766E-01	NOT IDENT.
CM-243	-5.309E-02	1.009E-01	1.037E-01	NOT IDENT.
BK-247	2.102E-02	6.644E-02	6.711E-02	NOT IDENT.
CM-247	3.517E-03	3.081E-02	3.085E-02	NOT IDENT.
CF-249	6.041E-03	3.398E-02	3.409E-02	NOT IDENT.
CF-251	2.810E-02	1.030E-01	1.037E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	72.6218	87.09	91.4164	136.47	82.3165
45.60	65.0560	87.57	91.4993	140.51	0.0000
46.54	75.2672	88.03	91.5791	143.76	65.0701
49.72	0.0000	88.34	91.6323	144.24	70.7391
51.35	51.8652	88.47	91.6545	145.44	66.0219
51.87	48.8820	89.96	91.9097	152.43	71.9144
52.39	50.9890	1093.63	92.0256	153.25	0.0000
52.97	59.2375	91.11	0.0000	323.87	64.7490
53.44	64.4232	92.59	92.3549	156.02	0.0000
54.07	65.5530	93.35	92.4828	158.56	0.0000
57.36	0.0000	94.56	92.6848	159.00	63.9153
57.53	59.9313	94.65	92.6993	162.33	70.3533
57.98	64.1359	94.67	92.7031	162.66	0.0000
59.27	53.9620	94.87	92.7361	163.33	55.6107
59.32	53.9688	97.43	52.3782	165.86	70.6594
59.54	53.9975	98.43	79.8295	176.31	61.9234
60.96	66.6868	98.44	79.8311	176.60	0.0000
61.17	68.1102	99.53	70.9706	177.52	60.3347
62.93	71.1865	100.11	68.7865	181.07	0.0000
63.29	71.2465	102.03	73.5391	181.52	61.8773
63.58	69.8967	103.18	85.0182	184.41	72.2172
64.28	64.4097	103.37	80.5099	143.76	62.5963
66.73	79.2046	105.21	76.2097	193.51	60.5801
67.24	88.8110	105.31	73.9472	197.03	58.2431
125.81	89.9571	106.12	69.4902	198.01	54.0176
67.75	85.7368	106.47	76.3697	201.83	57.6824
69.67	79.3709	109.28	73.2876	203.43	46.5694
70.83	99.4650	111.00	82.6782	205.31	53.1425
72.81	84.5493	111.76	0.0000	210.85	58.2290
72.87	84.5601	114.06	66.9280	215.65	58.5153
74.66	84.8814	116.30	0.0000	222.11	59.7746
74.82	84.9097	116.74	63.7335	227.09	65.3680
74.97	84.9362	119.76	72.1809	227.38	60.0852
77.11	85.3141	121.12	61.8308	228.16	0.0000
78.74	75.1245	121.22	61.8405	228.18	56.5944
79.69	68.0315	121.78	64.2282	116.74	56.5944
80.12	75.3335	122.06	67.7603	235.69	64.1301
80.19	0.0000	122.92	73.6974	235.96	72.1653
80.57	66.7015	123.07	67.8634	238.63	64.3088
81.00	66.7586	265.00	80.8083	238.98	0.0000
81.07	69.6709	125.81	84.5892	240.99	61.7662
81.75	83.9356	127.23	75.3472	242.00	38.9763
83.79	86.0963	127.91	84.8507	244.70	37.7267
84.00	86.1317	129.30	73.2135	252.40	0.0000
85.43	98.0805	131.20	81.7038	252.80	42.5316
86.55	91.3227	133.02	72.4189	254.15	0.0000
86.79	91.3638	133.52	71.2830	256.23	45.3857
86.94	91.3904	136.00	67.9563	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	43.8965	355.39	0.0000	584.27	21.2776
264.80	43.9014	356.01	25.0424	595.83	0.0000
265.00	41.1649	364.49	0.0000	427.87	22.5716
268.22	39.9042	366.42	0.0000	602.52	0.0000
269.46	36.7326	372.51	29.7986	604.72	13.5693
270.03	36.7513	375.05	31.3430	607.14	16.9806
271.23	36.7887	377.52	25.1159	609.32	24.9299
273.65	0.0000	356.01	23.0201	610.33	24.9425
276.40	35.1039	388.16	27.1005	614.28	17.0367
277.37	39.7552	388.63	0.0000	618.01	19.3415
277.60	41.6125	391.69	31.1873	620.36	14.8070
278.00	36.0761	264.66	24.2856	621.93	20.5166
279.20	49.0761	401.81	29.3670	630.19	0.0000
279.54	51.8688	402.40	25.3255	631.29	11.4465
279.70	52.8020	404.85	28.4090	633.25	10.3110
280.46	44.4932	410.95	28.5190	634.78	0.0000
283.69	35.3188	413.71	28.5685	635.95	20.6470
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	52.1229	423.72	0.0000	645.85	19.5864
285.90	0.0000	427.09	27.7773	657.76	17.3730
287.50	42.8892	427.87	21.6148	657.90	0.0000
290.67	37.8592	433.94	29.9594	661.66	20.8835
293.27	0.0000	439.40	26.9479	664.57	0.0000
351.93	39.4066	453.88	25.0889	666.33	0.0000
295.96	39.4297	463.37	21.0225	666.50	0.0000
879.38	39.5126	468.07	22.1331	667.71	0.0000
299.98	39.5570	473.00	0.0000	677.62	16.6465
300.09	39.5604	475.06	30.6862	685.70	0.0000
300.13	39.5613	476.78	18.0058	695.00	0.0000
301.36	28.2861	477.60	14.8351	696.49	17.6630
302.85	45.3105	482.18	21.2472	696.51	17.6636
256.23	39.6989	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	20.3194
306.78	39.7698	497.08	16.0666	697.49	20.3208
308.46	42.6663	505.52	12.9121	702.65	18.5942
311.90	46.7736	507.63	0.0000	706.68	14.1904
316.51	45.7949	511.00	14.0292	711.68	25.7733
319.41	0.0000	514.00	14.0516	720.70	0.0000
320.08	0.0000	514.00	14.0516	721.93	0.0000
321.04	40.2090	520.40	15.6176	722.78	12.8558
323.87	33.5794	520.69	0.0000	722.91	12.8566
325.23	37.4551	522.65	0.0000	723.31	11.4301
328.76	0.0000	527.90	0.0000	724.19	15.7217
333.37	42.0304	528.26	14.1569	727.33	20.0348
333.97	27.5491	529.59	18.5260	733.00	17.2119
334.37	34.8091	529.87	0.0000	735.93	10.0522
338.28	30.0609	531.02	0.0000	333.97	16.7640
338.32	30.0615	537.26	0.0000	739.50	0.0000
311.90	30.1088	546.56	0.0000	747.24	19.8348
340.48	30.1088	552.55	16.5387	748.06	11.7241
340.55	0.0000	563.25	17.7357	752.31	22.5845
344.28	24.8349	569.33	14.4531	753.82	0.0000
345.93	31.2025	946.00	14.4547	756.73	12.6691
351.06	32.2950	569.70	12.2318	756.80	12.6696
351.93	32.3152	583.19	21.2668	884.68	16.3350

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	21.7954	1274.44	6.2975	1620.50	2.7681
766.42	22.7089	1001.03	9.8544	1621.92	7.3836
766.84	21.8042	1002.74	11.0428	1678.03	0.0000
772.60	0.0000	1004.73	3.1570	1690.97	3.7447
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	0.9500
778.90	15.5168	1028.54	0.0000	1063.66	4.7551
783.70	0.0000	1037.84	8.9698	1771.35	2.8538
785.37	16.4696	1038.76	0.0000	1791.20	0.0000
792.07	11.7418	631.29	7.9946	1808.65	0.9581
794.95	16.1622	1048.07	0.0000	1810.72	0.0000
795.86	13.2284	1049.04	11.0007	1836.06	0.0000
810.06	15.6999	1050.41	10.0049		
810.29	15.7009	1063.66	8.0356		
344.28	15.7020	1077.00	0.0000		
810.76	19.3985	1077.34	17.1442		
815.77	0.0000	1085.87	20.2209		
1048.07	0.0000	1093.63	18.2395		
832.01	16.7574	1099.45	18.2703		
834.85	7.4556	1112.07	10.1874		
835.71	13.0511	1112.84	13.2468		
836.80	0.0000	1115.54	6.5266		
846.75	0.0000	1120.29	9.1901		
846.77	17.7829	1120.55	9.1906		
856.80	0.0000	1221.41	11.4399		
860.56	11.2866	1129.67	14.3341		
871.09	9.4403	1131.51	0.0000		
873.19	14.1710	1147.95	0.0000		
875.33	0.0000	1173.23	8.2910		
879.38	17.0414	1177.95	7.2640		
880.51	11.3654	1189.05	15.6125		
883.24	16.1165	1204.77	13.5887		
884.68	15.1758	1221.41	11.5492		
889.28	20.9003	1231.02	17.8944		
894.76	18.0839	1235.36	0.0000		
898.04	12.3871	1238.28	14.7648		
900.72	14.3060	1260.41	0.0000		
903.28	14.3184	1271.87	3.1915		
911.20	9.5712	1274.44	8.5166		
912.08	9.5740	1274.54	8.5166		
923.98	0.0000	1291.59	7.4845		
926.50	9.2355	1298.22	0.0000		
929.11	7.7029	1312.11	0.0000		
937.49	13.5176	1332.49	6.4816		
944.13	0.0000	1362.66	0.0000		
946.00	15.4922	1365.19	4.3557		
949.00	12.5997	1368.63	0.0000		
667.71	0.0000	1384.29	6.5636		
962.31	24.4738	1408.01	4.4004		
964.08	23.3745	1457.56	0.0000		
966.17	17.1531	1460.82	6.6823		
911.20	23.4119	1489.16	4.4836		
968.97	23.4119	1505.03	6.7493		
983.53	0.0000	1584.12	10.9875		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235043.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM09.CNF;335
Background date  : 2-OCT-2016 11:00:29.
Sample date      : 30-NOV-2015 13:59:00 Acquisition date : 3-OCT-2016 06:56:18.
Sample ID        : G405235043 Sample quantity   : 1.65795E+02 GRAM
Detector name    : GAM09 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.51 0.0%
Energy tolerance : 1.50000 keV Analyst Initials  : MXR1
Abundance limit  : 75.00000 Sensitivity    : 3.00000
Batch ID         : 1596252 Detector SN#    :
Matrix Spike ID  : LCS ID       : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.36*	40	126	1.26	126.39	123	9	1.11E-02	54.6	
2	2	74.99	98	122	1.03	149.66	145	14	2.73E-02	20.3	3.15E+00
3	2	77.16	145	101	0.90	154.00	145	14	4.02E-02	13.2	
4	1	87.24	64	110	0.96	174.17	170	13	1.78E-02	27.8	2.34E+00
5	1	90.12	47	84	0.93	179.93	170	13	1.30E-02	35.8	
6	0	92.99*	61	119	1.25	185.68	182	8	1.71E-02	35.8	
7	0	143.38*	17	102	0.94	286.49	284	8	4.80E-03	105.4	
8	2	185.90*	84	73	1.16	371.57	365	14	2.34E-02	21.5	5.47E+00
9	2	188.10	21	84	1.25	375.98	365	14	5.83E-03	78.3	
10	7	238.69*	369	60	1.10	477.20	473	16	1.02E-01	6.2	2.73E+00
11	7	241.63	96	60	2.14	483.08	473	16	2.67E-02	23.8	
12	0	270.56	33	76	1.21	540.97	534	11	9.06E-03	54.9	
13	0	277.63	34	61	1.13	555.12	550	10	9.42E-03	46.7	
14	2	295.16*	156	36	1.27	590.18	583	24	4.32E-02	10.8	1.85E+00
15	2	300.32	33	48	1.41	600.51	583	24	9.27E-03	38.0	
16	1	338.43*	92	27	1.32	676.76	672	21	2.55E-02	14.5	1.43E+00
17	1	343.92	18	24	1.33	687.76	672	21	4.89E-03	57.0	
18	0	352.00*	212	55	1.04	703.92	699	11	5.90E-02	9.7	
19	0	369.64	69	51	8.98	739.21	728	23	1.91E-02	29.7	
20	0	462.19	55	15	0.92	924.39	918	12	1.53E-02	19.5	
21	0	510.73*	23	70	1.41	1021.52	1014	14	6.35E-03	90.2	
22	0	532.02	19	17	1.04	1064.11	1061	9	5.30E-03	44.3	
23	0	558.91*	6	11	1.21	1117.92	1114	7	1.79E-03	107.0	
24	0	583.04*	121	24	1.44	1166.20	1160	12	3.37E-02	12.3	
25	0	608.93*	149	14	1.39	1218.01	1210	12	4.14E-02	9.8	
26	0	630.75	16	12	1.71	1261.66	1258	7	4.42E-03	44.1	
27	3	656.18	13	18	1.94	1312.56	1308	27	3.53E-03	58.5	1.86E+00
28	3	661.39	26	15	1.95	1322.97	1308	27	7.10E-03	39.3	
29	0	727.56	45	12	2.11	1455.38	1449	12	1.25E-02	21.4	
30	0	767.05	31	11	2.94	1534.38	1528	11	8.64E-03	27.3	
31	0	785.17	22	8	1.49	1570.66	1564	10	6.14E-03	31.6	
32	0	796.66	17	20	0.85	1593.64	1588	13	4.58E-03	60.4	
33	0	910.81*	63	12	1.56	1822.04	1816	12	1.76E-02	17.3	
34	0	935.55	16	22	0.58	1871.55	1864	17	4.46E-03	70.6	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	968.97	39	20	1.06	1938.44	1934	9	1.08E-02	26.2	
36	0	1001.21*	6	12	1.57	2002.94	1995	10	1.71E-03	122.6	
37	0	1008.00	6	10	0.70	2016.53	2011	7	1.77E-03	92.0	
38	0	1086.29	11	10	1.94	2173.18	2168	10	3.06E-03	61.7	
39	0	1119.57	42	6	2.99	2239.77	2234	11	1.15E-02	19.0	
40	0	1175.33	16	11	3.35	2351.36	2346	12	4.53E-03	48.7	
41	0	1200.56	29	3	5.17	2401.84	2396	14	8.11E-03	22.8	
42	0	1238.33	13	16	0.69	2477.42	2472	9	3.64E-03	61.3	
43	0	1271.23	16	0	0.98	2543.25	2537	12	4.44E-03	25.0	
44	0	1377.36	7	3	1.05	2755.63	2752	6	1.97E-03	53.6	
45	0	1450.18*	5	0	0.96	2901.33	2898	6	1.42E-03	48.7	
46	0	1460.09*	377	4	2.13	2921.16	2911	18	1.05E-01	5.4	
47	0	1607.01	7	2	0.94	3215.17	3212	6	1.81E-03	49.3	
48	0	1763.59*	31	0	1.32	3528.50	3522	13	8.49E-03	19.4	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235043.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 30-NOV-2015 13:59:00 Acquisition date : 3-OCT-2016 06:56:18
Sample ID        : G405235043 Sample quantity   : 165.79 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA9 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.51 0.0%
Energy tolerance : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error  : 0.00 %
Efficiency type  : Linear Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PA-234M	766.42	NB-95	765.81
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.146E+00	1.361E+01	1.361E+01	10.73	OK
NB-95	765.81	99.81*	1.922E+00	7.079E-02	1.980E+00	64.76	OK
CD-109	88.03	3.70*	4.861E+00	1.169E+00	1.856E+00	105.33	OK
SN-126	64.28	9.60	2.275E+00	1.153E+00	1.153E+00	109.24	OK
	86.94	8.90	4.861E+00	4.860E-01	4.860E-01	105.33	OK
	87.57	37.00*	4.861E+00	1.169E-01	1.169E-01	105.33	OK
BA-137M	661.66	89.90*	2.157E+00	6.441E-02	6.567E-02	78.66	OK
CS-137	661.66	85.10*	2.157E+00	6.804E-02	6.938E-02	78.66	OK
TL-208	277.37	6.60	4.349E+00	6.397E-01	6.397E-01	93.46	OK
	583.19	85.00*	2.382E+00	2.978E-01	2.978E-01	24.69	OK
	860.56	12.50	1.758E+00	----- Line	Not Found	-----	Absent
BI-212	727.33	6.67*	2.003E+00	1.627E+00	1.627E+00	42.86	OK
	785.37	1.10	1.888E+00	5.097E+00	5.097E+00	63.14	OK
	1620.50	1.47	1.045E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	3.688E+00	9.898E-01	9.898E-01	67.41	OK
	77.11	17.10	3.924E+00	1.334E+00	1.334E+00	26.50	OK
	238.63	43.60*	4.882E+00	9.538E-01	9.538E-01	12.38	OK
	300.09	3.30	4.084E+00	1.329E+00	1.329E+00	76.02	OK
BI-214	609.32	45.49*	2.302E+00	7.025E-01	7.028E-01	19.58	OK
	1120.29	14.92	1.430E+00	8.894E-01	8.898E-01	37.99	OK
	1764.49	15.30	9.661E-01	8.891E-01	8.894E-01	38.85	OK
PB-214	74.82	5.80	3.669E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.924E+00	2.351E+00	2.352E+00	26.50	OK
	87.09	3.41	4.849E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.832E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.142E+00	1.096E+00	1.097E+00	21.60	OK
	351.93	35.60*	3.588E+00	8.760E-01	8.763E-01	19.50	OK
RN-222	609.32	45.49*	2.302E+00	7.025E-01	7.028E-01	19.58	OK
	1120.29	14.92	1.430E+00	8.894E-01	8.898E-01	37.99	OK
	1764.49	15.30	9.661E-01	8.891E-01	8.894E-01	38.85	OK
RA-224	240.99	4.10*	4.838E+00	7.219E-01	7.219E-01	185.06	OK
RA-226	609.32	45.49*	2.302E+00	7.025E-01	7.028E-01	19.58	OK
	1120.29	14.92	1.430E+00	8.894E-01	8.898E-01	37.99	OK
	1764.49	15.30	9.661E-01	8.891E-01	8.894E-01	38.85	OK
AC-228	105.21	1.10	5.896E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.705E+00	1.164E+00	1.164E+00	29.06	OK
	794.95	4.25	1.870E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.799E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.682E+00	6.848E-01	6.848E-01	34.51	OK
	968.97	15.80	1.603E+00	7.182E-01	7.182E-01	52.38	OK
RA-228	105.21	1.10	5.896E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.705E+00	1.164E+00	1.164E+00	29.06	OK
	794.95	4.25	1.870E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.799E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.682E+00	6.848E-01	6.848E-01	34.51	OK
	968.97	15.80	1.603E+00	7.182E-01	7.182E-01	52.38	OK
TH-228	74.82	10.28	3.688E+00	9.898E-01	9.898E-01	67.41	OK
	77.11	17.10	3.924E+00	1.334E+00	1.334E+00	26.50	OK
	238.63	43.60*	4.882E+00	9.538E-01	9.538E-01	12.38	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	300.09	3.30	4.084E+00	1.329E+00	1.329E+00	76.02	OK
TH-230	609.32	45.49*	2.302E+00	7.025E-01	7.025E-01	19.58	OK
	1120.29	14.92	1.430E+00	8.894E-01	8.894E-01	37.99	OK
	1764.49	15.30	9.661E-01	8.891E-01	8.891E-01	38.85	OK
PA-231	283.69	1.70	4.275E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.084E+00	8.196E-01	8.196E-01	76.02	OK
TH-232	105.21	1.10	5.896E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.705E+00	1.164E+00	1.164E+00	29.06	OK
	835.71	1.61	1.799E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.682E+00	6.848E-01	6.848E-01	34.51	OK
	968.97	15.80	1.603E+00	7.182E-01	7.182E-01	52.38	OK
PA-234M	766.42	0.32	1.924E+00	----- Line	Not Found	-----	<<INT Reject
	1001.03	0.84*	1.562E+00	2.181E+00	2.181E+00	245.11	OK
TH-234	63.29	3.70*	2.275E+00	2.992E+00	2.992E+00	109.24	OK
	92.59	4.23	5.276E+00	1.671E+00	1.671E+00	71.54	OK
U-234	609.32	45.49*	2.302E+00	7.025E-01	7.025E-01	19.58	OK
	1120.29	14.92	1.430E+00	8.894E-01	8.894E-01	37.99	OK
	1764.49	15.30	9.661E-01	8.891E-01	8.891E-01	38.85	OK
U-235	89.96	3.47	5.079E+00	1.616E+00	1.616E+00	71.57	OK
	93.35	5.60	5.276E+00	1.262E+00	1.262E+00	71.54	OK
	143.76	10.96*	6.313E+00	1.450E-01	1.450E-01	210.79	OK
	163.33	5.08	6.096E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.741E+00	1.453E-01	1.453E-01	42.94	OK
	205.31	5.01	5.415E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	2.275E+00	2.992E+00	2.992E+00	109.24	OK
	92.59	4.23	5.276E+00	1.671E+00	1.671E+00	71.54	OK
AM-243	43.53	5.90	1.969E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.688E+00	1.514E-01	1.514E-01	67.41	OK
ANH-511	511.00	100.00*	2.647E+00	4.355E-02	4.355E-02	180.49	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235043.CNF;1
* Acquisition date   : 3-OCT-2016 06:56:18 Sensitivity      : 3.000
* Detector ID       : GAM09 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.51 Half life ratio : *****
* Sample date       : 30-NOV-2015 13:59:00 Analyst initials: MXR1
* Sample ID         : G405235043 Sample Quantity : 1.6579E+02 GRAM
* Batch Number      : 1596252 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 3-JUN-2016 07:32:22 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.361E+01	1.432E+00	4.430E-01
NB-95	1.980E+00	1.257E+00	1.295E+00
CD-109	1.856E+00	1.916E+00	1.782E+00
SN-126	1.169E-01	1.207E-01	1.130E-01
BA-137M	6.567E-02	5.063E-02	4.764E-02
CS-137	6.938E-02	5.348E-02	5.033E-02
TL-208	2.978E-01	7.204E-02	4.698E-02
BI-212	1.627E+00	6.836E-01	7.695E-01
PB-212	9.538E-01	1.157E-01	7.710E-02
BI-214	7.028E-01	1.349E-01	8.726E-02
PB-214	8.763E-01	1.674E-01	9.397E-02
RN-222	7.028E-01	1.349E-01	8.726E-02
RA-224	7.219E-01	1.309E+00	8.266E-01
RA-226	7.028E-01	1.349E-01	8.726E-02
AC-228	6.848E-01	2.316E-01	2.162E-01
RA-228	6.848E-01	2.316E-01	2.162E-01
TH-228	9.538E-01	1.157E-01	7.710E-02
TH-230	7.025E-01	1.348E-01	8.723E-02
PA-231	8.196E-01	6.106E-01	5.796E-01
TH-232	6.848E-01	2.316E-01	2.162E-01
PA-234M	2.181E+00	5.238E+00	6.979E+00
TH-234	2.992E+00	3.203E+00	2.269E+00
U-234	7.025E-01	1.348E-01	8.723E-02
U-235	1.450E-01	2.995E-01	2.542E-01
U-238	2.992E+00	3.203E+00	2.269E+00
AM-243	1.514E-01	1.000E-01	8.182E-02
ANH-511	4.355E-02	7.703E-02	4.957E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-5.083E+00		1.049E+01	2.008E+01	NOT IDENT.
NA-22	-3.298E-02		4.607E-02	6.771E-02	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF

AL-26	-1.929E-02	1.898E-02	1.310E-02	NOT IDENT.
SC-46	-6.499E-04	2.958E-01	5.945E-01	FAIL ABUN
V-48	0.000E+00	1.674E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	3.952E+02	0.000E+00	SHORT HLIF
MN-54	-2.346E-02	6.064E-02	1.105E-01	NOT IDENT.
CO-56	-7.088E-02	4.541E-01	8.636E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.012E-02	3.674E-02	7.207E-02	NOT IDENT.
CO-58	-6.584E-02	5.251E-01	1.017E+00	NOT IDENT.
FE-59	-1.864E+00	7.402E+00	1.343E+01	NOT IDENT.
CO-60	1.303E-02	2.081E-02	5.449E-02	NOT IDENT.
ZN-65	4.101E-02	1.211E-01	2.417E-01	NOT IDENT.
GE-68	-9.442E-01	2.044E+00	3.711E+00	NOT IDENT.
AS-73	6.689E-01	9.848E+00	2.137E+01	NOT IDENT.
AS-74	0.000E+00	5.697E+03	0.000E+00	SHORT HLIF
SE-75	1.556E-01	1.574E-01	3.378E-01	NOT IDENT.
BR-77	0.000E+00	2.072E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	5.913E+02	0.000E+00	SHORT HLIF
RB-83	4.079E-02	5.848E-01	1.190E+00	NOT IDENT.
KR-85	2.432E+00	7.155E+00	1.334E+01	NOT IDENT.
SR-85	2.780E-01	8.211E-01	1.531E+00	NOT IDENT.
RB-86	0.000E+00	3.324E+04	0.000E+00	SHORT HLIF
Y-88	-1.493E-03	1.027E-01	2.683E-01	NOT IDENT.
Y-91	1.700E+01	4.088E+02	7.785E+02	NOT IDENT.
NB-94	2.445E-02	2.626E-02	5.825E-02	NOT IDENT.
NB-95M	8.954E-01	2.118E+00	3.928E+00	NOT IDENT.
ZR-95	7.360E-01	1.261E+00	2.736E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.726E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.060E+33	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-1.272E-02	2.820E-02	5.405E-02	NOT IDENT.
RH-102	7.303E-02	6.318E-02	1.150E-01	FAIL ABUN
RU-103	-1.355E+00	4.568E+00	9.041E+00	FAIL ABUN
RH-106	-1.012E-01	3.653E-01	7.117E-01	NOT IDENT.
RU-106	-1.012E-01	3.653E-01	7.117E-01	NOT IDENT.
AG-108M	1.481E-02	2.037E-02	4.547E-02	NOT IDENT.
AG-110M	-6.400E-03	9.520E-02	1.830E-01	NOT IDENT.
SN-113	6.763E-02	1.714E-01	3.709E-01	NOT IDENT.
CD-115	0.000E+00	3.341E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.103E+05	0.000E+00	SHORT HLIF
TE-123M	2.882E-02	1.070E-01	2.150E-01	NOT IDENT.
SB-124	-9.836E-03	1.580E+00	3.550E+00	NOT IDENT.
SB-125	3.695E-02	8.420E-02	1.797E-01	FAIL ABUN
TE-125M	6.063E+01	2.445E+02	5.020E+02	NOT IDENT.
I-126	0.000E+00	1.057E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.368E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	7.099E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	8.207E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.522E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.630E+27	0.000E+00	SHORT HLIF
BA-133	-2.088E-02	3.135E-02	4.720E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	6.551E-02	7.757E-02	9.008E-02	FAIL ABUN
CS-135	-1.554E-02	9.616E-02	1.812E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.927E+05	0.000E+00	SHORT HLIF
CE-139	-5.700E-02	8.154E-02	1.496E-01	NOT IDENT.
BA-140	0.000E+00	1.548E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.165E+05	0.000E+00	SHORT HLIF
CE-141	-2.573E+00	2.420E+01	4.376E+01	NOT IDENT.
CE-143	0.000E+00	1.305E+41	0.000E+00	SHORT HLIF
CE-144	1.490E-01	2.697E-01	5.630E-01	NOT IDENT.
PM-144	-1.161E-02	4.815E-02	9.171E-02	NOT IDENT.
PR-144	-1.012E+00	4.200E+00	7.999E+00	NOT IDENT.
PM-146	-2.848E-02	3.418E-02	6.265E-02	NOT IDENT.
ND-147	0.000E+00	6.773E+07	0.000E+00	SHORT HLIF
PM-147	-3.271E+02	6.308E+02	1.212E+03	NOT IDENT.
PM-149	0.000E+00	1.636E+41	0.000E+00	SHORT HLIF
EU-150	1.443E-02	2.087E-02	4.023E-02	FAIL ABUN
EU-152	9.991E-02	1.117E-01	1.407E-01	FAIL ABUN
GD-153	-7.806E-02	1.391E-01	2.692E-01	NOT IDENT.
EU-154	-7.594E-02	1.133E-01	1.693E-01	NOT IDENT.
EU-155	5.660E-02	8.148E-02	1.747E-01	FAIL ABUN
TB-160	8.732E-01	1.486E+00	3.303E+00	FAIL ABUN
HO-166M	-1.685E-02	3.937E-02	7.378E-02	FAIL ABUN
TM-171	-6.819E+00	2.278E+01	4.796E+01	NOT IDENT.
HF-172	-2.022E-02	1.833E-01	3.626E-01	FAIL ABUN

LU-172	1.477E-03	6.615E-02	1.284E-01	FAIL ABUN
LU-176	1.063E-02	2.043E-02	4.075E-02	FAIL ABUN
HF-181	2.753E+00	3.720E+00	8.291E+00	NOT IDENT.
TA-182	-4.634E-01	8.979E-01	1.665E+00	NOT IDENT.
RE-183	-5.402E-01	3.429E+00	7.173E+00	NOT IDENT.
RE-184	5.587E-01	3.089E+01	6.047E+01	NOT IDENT.
W-188	-8.200E+00	9.014E+01	1.569E+02	FAIL ABUN
IR-192	-7.425E-02	4.095E-01	7.529E-01	FAIL ABUN
HG-203	-4.247E-02	2.137E+00	3.752E+00	NOT IDENT.
BI-207	-1.958E-02	3.944E-02	7.065E-02	FAIL ABUN
PB-210	-7.391E-01	5.468E+00	1.150E+01	NOT IDENT.
BI-211	0.000E+00	4.612E-01	7.057E-01	FAIL ABUN
PB-211	1.140E-01	4.836E-01	1.024E+00	NOT IDENT.
RN-219	-5.026E-02	2.822E-01	5.695E-01	FAIL ABUN
RA-223	2.867E-01	4.449E-01	9.125E-01	FAIL ABUN
AC-227	-8.344E-02	1.874E-01	3.388E-01	FAIL ABUN
TH-227	-8.344E-02	1.874E-01	3.388E-01	FAIL ABUN
TH-229	-3.259E-01	3.564E-01	6.281E-01	FAIL ABUN
TH-231	2.867E-01	4.449E-01	9.125E-01	FAIL ABUN
PA-233	1.935E-02	4.971E-02	9.780E-02	FAIL ABUN
PA-234	4.847E-02	2.372E-01	4.792E-01	NOT IDENT.
NP-237	1.935E-02	4.971E-02	9.780E-02	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	-4.255E-02	1.709E-01	3.385E-01	FAIL ABUN
PU-239	4.167E+01	2.540E+02	5.099E+02	NOT IDENT.
AM-241	5.728E-02	1.417E-01	3.076E-01	NOT IDENT.
CM-243	3.221E-03	7.276E-02	1.489E-01	FAIL ABUN
BK-247	3.348E-02	5.776E-02	1.107E-01	NOT IDENT.
CM-247	2.355E-03	2.560E-02	5.329E-02	FAIL ABUN
CF-249	3.848E-02	2.778E-02	6.265E-02	NOT IDENT.
CF-251	-3.990E-02	8.458E-02	1.579E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	367	10.66*	1.146E+00	1.361E+01	1.361E+01	10.73
NB-95	765.81	33	99.81*	1.922E+00	7.778E-02	2.176E+00	54.67
CD-109	88.03	87	3.70*	4.861E+00	2.179E+00	3.460E+00	55.60
SN-126	64.28	56	9.60	2.275E+00	1.153E+00	1.153E+00	109.24
	86.94	87	8.90	4.861E+00	9.061E-01	9.061E-01	55.60
	87.57	87	37.00*	4.861E+00	2.179E-01	2.179E-01	55.60
BA-137M	661.66	28	89.90*	2.157E+00	6.441E-02	6.567E-02	78.66
CS-137	661.66	28	85.10*	2.157E+00	6.804E-02	6.938E-02	78.66
TL-208	277.37	41	6.60	4.349E+00	6.397E-01	6.397E-01	93.46
	583.19	133	85.00*	2.382E+00	2.978E-01	2.978E-01	24.69
	860.56	-----	12.50	1.758E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	3.448E+00	-----	Line Not Found	-----
	351.06	247	12.92*	3.588E+00	2.414E+00	2.414E+00	19.50
BI-212	727.33	48	6.67*	2.003E+00	1.627E+00	1.627E+00	42.86
	785.37	23	1.10	1.888E+00	5.097E+00	5.097E+00	63.14
	1620.50	-----	1.47	1.045E+00	-----	Line Not Found	-----
PB-212	74.82	135	10.28	3.688E+00	1.608E+00	1.608E+00	40.64
	77.11	198	17.10	3.924E+00	1.334E+00	1.334E+00	26.50
	238.63	448	43.60*	4.882E+00	9.538E-01	9.538E-01	12.38
	300.09	40	3.30	4.084E+00	1.329E+00	1.329E+00	76.02
BI-214	609.32	162	45.49*	2.302E+00	7.025E-01	7.028E-01	19.58
	1120.29	42	14.92	1.430E+00	8.894E-01	8.898E-01	37.99
	1764.49	29	15.30	9.661E-01	8.891E-01	8.894E-01	38.85
PB-214	74.82	135	5.80	3.688E+00	2.851E+00	2.852E+00	40.64
	77.11	198	9.70	3.924E+00	2.351E+00	2.352E+00	26.50
	87.09	87	3.41	4.861E+00	2.365E+00	2.366E+00	55.60
	242.00	117	7.25	4.838E+00	1.505E+00	1.505E+00	47.68
	295.22	185	18.42	4.142E+00	1.096E+00	1.097E+00	21.60
	351.93	247	35.60*	3.588E+00	8.760E-01	8.763E-01	19.50
RN-222	609.32	162	45.49*	2.302E+00	7.025E-01	7.028E-01	19.58
	1120.29	42	14.92	1.430E+00	8.894E-01	8.898E-01	37.99
	1764.49	29	15.30	9.661E-01	8.891E-01	8.894E-01	38.85
RA-224	240.99	117	4.10*	4.838E+00	2.661E+00	2.661E+00	47.68
RA-226	609.32	162	45.49*	2.302E+00	7.025E-01	7.028E-01	19.58
	1120.29	42	14.92	1.430E+00	8.894E-01	8.898E-01	37.99
	1764.49	29	15.30	9.661E-01	8.891E-01	8.894E-01	38.85
AC-228	105.21	-----	1.10	5.896E+00	-----	Line Not Found	-----
	338.32	107	11.27	3.705E+00	1.164E+00	1.164E+00	29.06
	794.95	-----	4.25	1.870E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.799E+00	-----	Line Not Found	-----
	911.20	66	25.80*	1.682E+00	6.848E-01	6.848E-01	34.51
	968.97	40	15.80	1.603E+00	7.182E-01	7.182E-01	52.38
RA-228	105.21	-----	1.10	5.896E+00	-----	Line Not Found	-----
	338.32	107	11.27	3.705E+00	1.164E+00	1.164E+00	29.06
	794.95	-----	4.25	1.870E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.799E+00	-----	Line Not Found	-----
	911.20	66	25.80*	1.682E+00	6.848E-01	6.848E-01	34.51

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	968.97	40	15.80	1.603E+00	7.182E-01	7.182E-01	52.38
	74.82	135	10.28	3.688E+00	1.608E+00	1.608E+00	40.64
	77.11	198	17.10	3.924E+00	1.334E+00	1.334E+00	26.50
TH-230	238.63	448	43.60*	4.882E+00	9.538E-01	9.538E-01	12.38
	300.09	40	3.30	4.084E+00	1.329E+00	1.329E+00	76.02
	609.32	162	45.49*	2.302E+00	7.025E-01	7.025E-01	19.58
	1120.29	42	14.92	1.430E+00	8.894E-01	8.894E-01	37.99
	1764.49	29	15.30	9.661E-01	8.891E-01	8.891E-01	38.85
PA-231	283.69	-----	1.70	4.275E+00	-----	Line Not Found	-----
TH-232	301.36	40	5.35*	4.084E+00	8.196E-01	8.196E-01	76.02
	105.21	-----	1.10	5.896E+00	-----	Line Not Found	-----
	338.32	107	11.27	3.705E+00	1.164E+00	1.164E+00	29.06
	835.71	-----	1.61	1.799E+00	-----	Line Not Found	-----
PA-234M	911.20	66	25.80*	1.682E+00	6.848E-01	6.848E-01	34.51
	968.97	40	15.80	1.603E+00	7.182E-01	7.182E-01	52.38
	766.42	33	0.32	1.922E+00	2.426E+01	2.426E+01	54.67
TH-234	1001.03	6	0.84*	1.562E+00	2.181E+00	2.181E+00	245.11
	63.29	56	3.70*	2.275E+00	2.992E+00	2.992E+00	109.24
	92.59	82	4.23	5.276E+00	1.671E+00	1.671E+00	71.54
U-234	609.32	162	45.49*	2.302E+00	7.025E-01	7.025E-01	19.58
	1120.29	42	14.92	1.430E+00	8.894E-01	8.894E-01	37.99
	1764.49	29	15.30	9.661E-01	8.891E-01	8.891E-01	38.85
U-235	89.96	63	3.47	5.079E+00	1.616E+00	1.616E+00	71.57
	93.35	82	5.60	5.276E+00	1.262E+00	1.262E+00	71.54
	143.76	22	10.96*	6.313E+00	1.450E-01	1.450E-01	210.79
	163.33	-----	5.08	6.096E+00	-----	Line Not Found	-----
	185.72	105	57.20	5.741E+00	1.453E-01	1.453E-01	42.94
U-238	205.31	-----	5.01	5.415E+00	-----	Line Not Found	-----
	63.29	56	3.70*	2.275E+00	2.992E+00	2.992E+00	109.24
	92.59	82	4.23	5.276E+00	1.671E+00	1.671E+00	71.54
AM-243	43.53	-----	5.90	1.969E-01	-----	Line Not Found	-----
ANH-511	74.66	135	67.20*	3.688E+00	2.460E-01	2.461E-01	40.64
	511.00	25	100.00*	2.647E+00	4.355E-02	4.355E-02	180.49

Flag: "*" = Keyline

Total number of lines in spectrum 48
 Number of unidentified lines 11
 Number of lines tentatively identified by NID 37 77.08%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.361E+01	1.361E+01	0.146E+01	10.73	
NB-95	64.03D	28.0	7.778E-02	2.176E+00	1.190E+00	54.67	
CD-109	461.40D	1.59	2.179E+00	3.460E+00	1.924E+00	55.60	
SN-126	2.30E+05Y	1.00	2.179E-01	2.179E-01	1.212E-01	55.60	
BA-137M	30.08Y	1.02	6.441E-02	6.567E-02	5.166E-02	78.66	
CS-137	30.08Y	1.02	6.804E-02	6.938E-02	5.457E-02	78.66	
TL-208	1.41E+10Y	1.00	2.978E-01	2.978E-01	0.735E-01	24.69	
BI-211	7.04E+08Y	1.00	2.414E+00	2.414E+00	0.471E+00	19.50	
BI-212	1.41E+10Y	1.00	1.627E+00	1.627E+00	0.698E+00	42.86	
PB-212	1.41E+10Y	1.00	9.538E-01	9.538E-01	1.181E-01	12.38	
BI-214	1600.00Y	1.00	7.025E-01	7.028E-01	1.376E-01	19.58	
PB-214	1600.00Y	1.00	8.760E-01	8.763E-01	1.709E-01	19.50	
RN-222	1600.00Y	1.00	7.025E-01	7.028E-01	1.376E-01	19.58	
RA-224	1.41E+10Y	1.00	2.661E+00	2.661E+00	1.269E+00	47.68	
RA-226	1600.00Y	1.00	7.025E-01	7.028E-01	1.376E-01	19.58	
AC-228	1.41E+10Y	1.00	6.848E-01	6.848E-01	2.363E-01	34.51	
RA-228	1.41E+10Y	1.00	6.848E-01	6.848E-01	2.363E-01	34.51	
TH-228	1.41E+10Y	1.00	9.538E-01	9.538E-01	1.181E-01	12.38	
TH-230	7.54E+04Y	1.00	7.025E-01	7.025E-01	1.376E-01	19.58	
PA-231	7.04E+08Y	1.00	8.196E-01	8.196E-01	6.231E-01	76.02	
TH-232	1.41E+10Y	1.00	6.848E-01	6.848E-01	2.363E-01	34.51	
PA-234M	4.47E+09Y	1.00	2.181E+00	2.181E+00	5.345E+00	245.11	
TH-234	4.47E+09Y	1.00	2.992E+00	2.992E+00	3.268E+00	109.24	
U-234	2.45E+05Y	1.00	7.025E-01	7.025E-01	1.376E-01	19.58	
U-235	7.04E+08Y	1.00	1.450E-01	1.450E-01	3.056E-01	210.79	
U-238	4.47E+09Y	1.00	2.992E+00	2.992E+00	3.268E+00	109.24	
AM-243	7370.00Y	1.00	2.460E-01	2.461E-01	1.000E-01	40.64	
ANH-511	1.00E+09Y	1.00	4.355E-02	4.355E-02	7.860E-02	180.49	
Total Activity :			4.099E+01	4.437E+01			

Grand Total Activity : 4.099E+01 4.437E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
2	188.10	26	105	1.25	375.98	365	14	5.83E-03	****	5.70E+00	
0	270.56	39	92	1.21	540.97	534	11	9.06E-03	****	4.44E+00	T
1	343.92	21	29	1.33	687.76	672	21	4.89E-03	****	3.66E+00	T
0	369.64	80	59	8.98	739.21	728	23	1.91E-02	59.4	3.45E+00	
0	462.19	62	17	0.92	924.39	918	12	1.53E-02	39.0	2.87E+00	T
0	532.02	21	19	1.04	1064.11	1061	9	5.30E-03	88.6	2.56E+00	T
0	558.91	7	12	1.21	1117.92	1114	7	1.79E-03	****	2.46E+00	
0	630.75	17	13	1.71	1261.66	1258	7	4.42E-03	88.3	2.24E+00	T
3	656.18	14	20	1.94	1312.56	1308	27	3.53E-03	****	2.17E+00	
0	796.66	17	21	0.85	1593.64	1588	13	4.58E-03	****	1.87E+00	T
0	935.55	17	23	0.58	1871.55	1864	17	4.46E-03	****	1.65E+00	
0	1008.00	7	10	0.70	2016.53	2011	7	1.77E-03	****	1.55E+00	
0	1086.29	11	10	1.94	2173.18	2168	10	3.06E-03	****	1.46E+00	T
0	1175.33	16	11	3.35	2351.36	2346	12	4.53E-03	97.4	1.37E+00	
0	1200.56	29	3	5.17	2401.84	2396	14	8.11E-03	45.6	1.35E+00	
0	1238.33	13	16	0.69	2477.42	2472	9	3.64E-03	****	1.32E+00	T
0	1271.23	16	0	0.98	2543.25	2537	12	4.44E-03	50.0	1.29E+00	T
0	1377.36	7	3	1.05	2755.63	2752	6	1.97E-03	****	1.21E+00	
0	1450.18	5	0	0.96	2901.33	2898	6	1.42E-03	97.4	1.15E+00	
0	1607.01	6	1	0.94	3215.17	3212	6	1.81E-03	98.5	1.05E+00	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235043.CNF;1
* Acquisition date   : 3-OCT-2016 06:56:18 Sensitivity      : 3.000
* Detector ID       : GAM09 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.51 Half life ratio : *****
* Sample date       : 30-NOV-2015 13:59:00 Nuclide Library : SOLID
* Sample ID        : G405235043 Analyst initials: MXR1
* Batch Number     : 1596252 Sample Quantity : 1.6579E+02 GRAM
* Wet wt corr      : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 3-JUN-2016 07:32:22 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.708E-01
NB-95	5.553E-01
CD-109	8.325E-01
SN-126	5.280E-02
BA-137M	2.049E-02
CS-137	2.164E-02
TL-208	2.035E-02
BI-212	3.374E-01
PB-212	3.549E-02
BI-214	3.755E-02
PB-214	4.193E-02
RN-222	3.755E-02
RA-224	3.805E-01
RA-226	3.755E-02
AC-228	9.363E-02
RA-228	9.363E-02
TH-228	3.549E-02
TH-230	3.754E-02
PA-231	2.600E-01
TH-232	9.363E-02
PA-234M	3.012E+00
TH-234	1.054E+00
U-234	3.754E-02
U-235	1.175E-01
U-238	1.054E+00
AM-243	3.817E-02
ANH-511	2.237E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.834E+00	NOT IDENT.
NA-22	2.780E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	0.000E+00	NOT IDENT.

SC-46	2.505E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	4.830E-02	NOT IDENT.
CO-56	3.758E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	3.333E-02	NOT IDENT.
CO-58	4.387E-01	NOT IDENT.
FE-59	5.795E+00	NOT IDENT.
CO-60	2.164E-02	NOT IDENT.
ZN-65	1.002E-01	NOT IDENT.
GE-68	1.566E+00	NOT IDENT.
AS-73	9.783E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.544E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.305E-01	NOT IDENT.
KR-85	6.080E+00	NOT IDENT.
SR-85	6.976E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	8.480E-02	NOT IDENT.
Y-91	3.212E+02	NOT IDENT.
NB-94	2.604E-02	NOT IDENT.
NB-95M	1.815E+00	NOT IDENT.
ZR-95	1.201E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.519E-02	NOT IDENT.
RH-102	5.160E-02	FAIL ABUN
RU-103	3.926E+00	FAIL ABUN
RH-106	3.057E-01	NOT IDENT.
RU-106	3.057E-01	NOT IDENT.
AG-108M	2.038E-02	NOT IDENT.
AG-110M	7.968E-02	NOT IDENT.
SN-113	1.662E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	9.984E-02	NOT IDENT.
SB-124	1.329E+00	NOT IDENT.
SB-125	8.112E-02	FAIL ABUN
TE-125M	2.342E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.050E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	3.981E-02	FAIL ABUN
CS-135	8.150E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	6.840E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.034E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.616E-01	NOT IDENT.
PM-144	4.033E-02	NOT IDENT.
PR-144	3.518E+00	NOT IDENT.
PM-146	2.756E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	5.593E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.829E-02	FAIL ABUN
EU-152	6.342E-02	FAIL ABUN
GD-153	1.245E-01	NOT IDENT.
EU-154	6.989E-02	NOT IDENT.
EU-155	8.128E-02	FAIL ABUN
TB-160	1.421E+00	FAIL ABUN
HO-166M	3.114E-02	FAIL ABUN
TM-171	2.187E+01	NOT IDENT.
HF-172	1.686E-01	FAIL ABUN
LU-172	5.492E-02	FAIL ABUN

LU-176	1.865E-02	FAIL ABUN
HF-181	3.706E+00	NOT IDENT.
TA-182	7.209E-01	NOT IDENT.
RE-183	3.324E+00	NOT IDENT.
RE-184	2.621E+01	NOT IDENT.
W-188	7.025E+01	FAIL ABUN
IR-192	3.405E-01	FAIL ABUN
HG-203	1.697E+00	NOT IDENT.
BI-207	2.960E-02	FAIL ABUN
PB-210	5.325E+00	NOT IDENT.
BI-211	3.391E-01	FAIL ABUN
PB-211	4.586E-01	NOT IDENT.
RN-219	2.545E-01	FAIL ABUN
RA-223	4.140E-01	FAIL ABUN
AC-227	1.546E-01	FAIL ABUN
TH-227	1.546E-01	FAIL ABUN
TH-229	2.875E-01	FAIL ABUN
TH-231	4.140E-01	FAIL ABUN
PA-233	4.465E-02	FAIL ABUN
PA-234	2.076E-01	NOT IDENT.
NP-237	4.465E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.558E-01	FAIL ABUN
PU-239	2.384E+02	NOT IDENT.
AM-241	1.432E-01	NOT IDENT.
CM-243	6.888E-02	FAIL ABUN
BK-247	5.055E-02	NOT IDENT.
CM-247	2.386E-02	FAIL ABUN
CF-249	2.838E-02	NOT IDENT.
CF-251	7.248E-02	NOT IDENT.

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235043.CNF;1
* Acquisition date   : 3-OCT-2016 06:56:18 Sensitivity      : 3.000
* Detector ID       : GAM09 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.51 Half life ratio : *****
* Sample date       : 30-NOV-2015 13:59:00 Nuclide Library : SOLID
* Sample ID        : G405235043 Analyst initials: MXR1
* Batch Number     : 1596252 Sample Quantity : 1.6579E+02 GRAM
*                               Quantity Err(%) : 1.2063E-03 %
* Wet wt corr      : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight     : 0.00000
*****
*
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 3-JUN-2016 07:32:22 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.361E+01	1.598E+00	1.598E+00
NB-95	1.980E+00	1.260E+00	1.260E+00
CD-109	1.856E+00	1.932E+00	1.932E+00
SN-126	1.169E-01	1.215E-01	1.215E-01
BA-137M	6.567E-02	5.071E-02	5.071E-02
CS-137	6.938E-02	5.356E-02	5.356E-02
TL-208	2.978E-01	7.314E-02	7.314E-02
BI-212	1.627E+00	6.885E-01	6.885E-01
PB-212	9.538E-01	1.262E-01	1.262E-01
BI-214	7.028E-01	1.382E-01	1.382E-01
PB-214	8.763E-01	1.713E-01	1.713E-01
RN-222	7.028E-01	1.382E-01	1.382E-01
RA-224	7.219E-01	1.316E+00	1.316E+00
RA-226	7.028E-01	1.382E-01	1.382E-01
AC-228	6.848E-01	2.342E-01	2.342E-01
RA-228	6.848E-01	2.342E-01	2.342E-01
TH-228	9.538E-01	1.262E-01	1.262E-01
TH-230	7.025E-01	1.381E-01	1.381E-01
PA-231	8.196E-01	6.352E-01	6.352E-01
TH-232	6.848E-01	2.342E-01	2.342E-01
PA-234M	2.181E+00	5.239E+00	5.239E+00
TH-234	2.992E+00	3.271E+00	3.271E+00
U-234	7.025E-01	1.381E-01	1.381E-01
U-235	1.450E-01	2.996E-01	2.996E-01
U-238	2.992E+00	3.271E+00	3.271E+00
AM-243	1.514E-01	1.012E-01	1.012E-01
ANH-511	4.355E-02	7.705E-02	7.705E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-5.083E+00	1.050E+01	1.074E+01	NOT IDENT.
NA-22	-3.298E-02	4.608E-02	4.842E-02	NOT IDENT.
NA-24	1.000E+41	2.714E+41	0.000E+00	SHORT HLIF

AL-26	-1.929E-02	1.902E-02	2.091E-02	NOT IDENT.
SC-46	-6.499E-04	2.958E-01	2.958E-01	FAIL ABUN
V-48	6.456E+03	1.675E+04	1.700E+04	SHORT HLIF
CR-51	8.305E+01	3.952E+02	3.970E+02	SHORT HLIF
MN-54	-2.346E-02	6.064E-02	6.156E-02	NOT IDENT.
CO-56	-7.088E-02	4.541E-01	4.552E-01	FAIL ABUN
MN-56	-1.000E+41	6.120E+41	0.000E+00	SHORT HLIF
CO-57	-1.012E-02	3.674E-02	3.702E-02	NOT IDENT.
CO-58	-6.584E-02	5.251E-01	5.260E-01	NOT IDENT.
FE-59	-1.864E+00	7.403E+00	7.451E+00	NOT IDENT.
CO-60	1.303E-02	2.081E-02	2.162E-02	NOT IDENT.
ZN-65	4.101E-02	1.211E-01	1.225E-01	NOT IDENT.
GE-68	-9.442E-01	2.044E+00	2.088E+00	NOT IDENT.
AS-73	6.689E-01	9.849E+00	9.853E+00	NOT IDENT.
AS-74	3.681E+01	5.697E+03	5.697E+03	SHORT HLIF
SE-75	1.556E-01	1.576E-01	1.725E-01	NOT IDENT.
BR-77	1.707E+39	1.516E+40	0.000E+00	SHORT HLIF
SR-82	-2.042E+02	5.914E+02	5.985E+02	SHORT HLIF
RB-83	4.079E-02	5.848E-01	5.851E-01	NOT IDENT.
KR-85	2.432E+00	7.156E+00	7.239E+00	NOT IDENT.
SR-85	2.780E-01	8.212E-01	8.307E-01	NOT IDENT.
RB-86	-1.835E+04	3.325E+04	3.426E+04	SHORT HLIF
Y-88	-1.493E-03	1.027E-01	1.027E-01	NOT IDENT.
Y-91	1.700E+01	4.088E+02	4.088E+02	NOT IDENT.
NB-94	2.445E-02	2.628E-02	2.850E-02	NOT IDENT.
NB-95M	8.954E-01	2.120E+00	2.158E+00	NOT IDENT.
ZR-95	7.360E-01	1.261E+00	1.304E+00	NOT IDENT.
NB-97	1.000E+41	7.501E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.727E+41	0.000E+00	SHORT HLIF
MO-99	-2.204E+32	1.060E+33	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	3.088E+41	0.000E+00	SHORT HLIF
RH-101	-1.272E-02	2.829E-02	2.887E-02	NOT IDENT.
RH-102	7.303E-02	6.346E-02	7.150E-02	FAIL ABUN
RU-103	-1.355E+00	4.569E+00	4.609E+00	FAIL ABUN
RH-106	-1.012E-01	3.653E-01	3.682E-01	NOT IDENT.
RU-106	-1.012E-01	3.653E-01	3.682E-01	NOT IDENT.
AG-108M	1.481E-02	2.038E-02	2.145E-02	NOT IDENT.
AG-110M	-6.400E-03	9.520E-02	9.524E-02	NOT IDENT.
SN-113	6.763E-02	1.715E-01	1.742E-01	NOT IDENT.
CD-115	6.029E+39	3.343E+40	0.000E+00	SHORT HLIF
SN-117M	3.007E+04	1.104E+05	1.112E+05	SHORT HLIF
TE-123M	2.882E-02	1.070E-01	1.078E-01	NOT IDENT.
SB-124	-9.836E-03	1.580E+00	1.580E+00	NOT IDENT.
SB-125	3.695E-02	8.422E-02	8.585E-02	FAIL ABUN
TE-125M	6.063E+01	2.445E+02	2.461E+02	NOT IDENT.
I-126	3.889E+05	1.059E+06	1.073E+06	SHORT HLIF
SB-126	2.324E+05	1.369E+06	1.373E+06	SHORT HLIF
SB-127	-5.464E+22	1.048E+23	0.000E+00	SHORT HLIF
I-131	-1.029E+09	8.207E+09	8.220E+09	SHORT HLIF
I-132	-1.000E+41	1.903E+42	0.000E+00	SHORT HLIF
TE-132	7.295E+25	1.630E+27	0.000E+00	SHORT HLIF
BA-133	-2.088E-02	3.136E-02	3.275E-02	FAIL ABUN
I-133	1.000E+41	8.721E+42	0.000E+00	SHORT HLIF
CS-134	6.551E-02	7.763E-02	8.305E-02	FAIL ABUN
CS-135	-1.554E-02	9.616E-02	9.642E-02	NOT IDENT.
I-135	-1.000E+41	1.188E+42	0.000E+00	SHORT HLIF
CS-136	-2.153E+04	3.927E+05	3.929E+05	SHORT HLIF
CE-139	-5.700E-02	8.235E-02	8.626E-02	NOT IDENT.
BA-140	1.218E+06	1.548E+06	1.643E+06	SHORT HLIF
LA-140	5.954E+04	4.165E+05	4.173E+05	SHORT HLIF
CE-141	-2.573E+00	2.420E+01	2.423E+01	NOT IDENT.
CE-143	1.000E+41	1.309E+41	0.000E+00	SHORT HLIF
CE-144	1.490E-01	2.698E-01	2.780E-01	NOT IDENT.
PM-144	-1.161E-02	4.815E-02	4.844E-02	NOT IDENT.
PR-144	-1.012E+00	4.200E+00	4.225E+00	NOT IDENT.
PM-146	-2.848E-02	3.424E-02	3.657E-02	NOT IDENT.
ND-147	7.802E+07	6.787E+07	7.644E+07	SHORT HLIF
PM-147	-3.271E+02	6.310E+02	6.480E+02	NOT IDENT.
PM-149	1.000E+41	1.651E+41	0.000E+00	SHORT HLIF
EU-150	1.443E-02	2.088E-02	2.187E-02	FAIL ABUN
EU-152	9.991E-02	1.118E-01	1.206E-01	FAIL ABUN
GD-153	-7.806E-02	1.392E-01	1.436E-01	NOT IDENT.
EU-154	-7.594E-02	1.134E-01	1.184E-01	NOT IDENT.
EU-155	5.660E-02	8.158E-02	8.548E-02	FAIL ABUN
TB-160	8.732E-01	1.487E+00	1.538E+00	FAIL ABUN
HO-166M	-1.685E-02	3.938E-02	4.011E-02	FAIL ABUN
TM-171	-6.819E+00	2.279E+01	2.299E+01	NOT IDENT.
HF-172	-2.022E-02	1.834E-01	1.836E-01	FAIL ABUN

LU-172	1.477E-03	6.615E-02	6.616E-02	FAIL ABUN
LU-176	1.063E-02	2.043E-02	2.099E-02	FAIL ABUN
HF-181	2.753E+00	3.721E+00	3.923E+00	NOT IDENT.
TA-182	-4.634E-01	8.981E-01	9.220E-01	NOT IDENT.
RE-183	-5.402E-01	3.430E+00	3.438E+00	NOT IDENT.
RE-184	5.587E-01	3.089E+01	3.089E+01	NOT IDENT.
W-188	-8.200E+00	9.014E+01	9.022E+01	FAIL ABUN
IR-192	-7.425E-02	4.095E-01	4.108E-01	FAIL ABUN
HG-203	-4.247E-02	2.137E+00	2.137E+00	NOT IDENT.
BI-207	-1.958E-02	3.944E-02	4.042E-02	FAIL ABUN
PB-210	-7.391E-01	5.468E+00	5.478E+00	NOT IDENT.
BI-211	2.414E+00	4.735E-01	1.187E+00	FAIL ABUN
PB-211	1.140E-01	4.837E-01	4.864E-01	NOT IDENT.
RN-219	-5.026E-02	2.823E-01	2.832E-01	FAIL ABUN
RA-223	2.867E-01	4.452E-01	4.636E-01	FAIL ABUN
AC-227	-8.344E-02	1.878E-01	1.915E-01	FAIL ABUN
TH-227	-8.344E-02	1.878E-01	1.915E-01	FAIL ABUN
TH-229	-3.259E-01	3.567E-01	3.858E-01	FAIL ABUN
TH-231	2.867E-01	4.452E-01	4.636E-01	FAIL ABUN
PA-233	1.935E-02	4.971E-02	5.047E-02	FAIL ABUN
PA-234	4.847E-02	2.436E-01	2.445E-01	NOT IDENT.
NP-237	1.935E-02	4.971E-02	5.047E-02	FAIL ABUN
NP-238	-1.000E+41	2.896E+41	0.000E+00	SHORT HLIF
NP-239	-4.255E-02	1.709E-01	1.720E-01	FAIL ABUN
PU-239	4.167E+01	2.540E+02	2.547E+02	NOT IDENT.
AM-241	5.728E-02	1.418E-01	1.441E-01	NOT IDENT.
CM-243	3.221E-03	7.276E-02	7.277E-02	FAIL ABUN
BK-247	3.348E-02	5.816E-02	6.008E-02	NOT IDENT.
CM-247	2.355E-03	2.560E-02	2.562E-02	FAIL ABUN
CF-249	3.848E-02	2.795E-02	3.290E-02	NOT IDENT.
CF-251	-3.990E-02	8.470E-02	8.659E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	41.9090	87.09	67.6372	136.47	52.7609
45.60	52.3724	87.57	67.7092	140.51	0.0000
46.54	45.4820	88.03	67.7770	143.76	50.4599
49.72	0.0000	88.34	67.8230	144.24	50.4972
51.35	43.8109	88.47	67.8425	145.44	60.9684
51.87	40.6912	89.96	68.0626	152.43	54.0777
52.39	40.7574	1093.63	31.7307	153.25	0.0000
52.97	44.8339	91.11	0.0000	323.87	55.2053
53.44	38.4847	92.59	49.5644	156.02	0.0000
54.07	46.5922	93.35	49.6439	158.56	0.0000
57.36	0.0000	94.56	53.3249	159.00	51.6207
57.53	55.1932	94.65	53.3345	162.33	40.8949
57.98	56.8908	94.67	53.3368	162.66	0.0000
59.27	53.0245	94.87	53.3592	163.33	47.9451
59.32	53.0322	97.43	57.2173	165.86	51.1230
59.54	53.0654	98.43	54.6465	176.31	47.7896
60.96	59.0175	98.44	54.6474	176.60	0.0000
61.17	59.0523	99.53	52.9723	177.52	50.9224
62.93	56.8698	100.11	58.4272	181.07	0.0000
63.29	56.9261	102.03	46.9207	181.52	40.9528
63.58	56.9712	103.18	52.4532	184.41	55.4939
64.28	57.0801	103.37	49.7586	143.76	55.5878
66.73	51.0724	105.21	49.0294	193.51	57.1778
67.24	50.0294	105.31	46.3145	197.03	57.4271
125.81	63.4443	106.12	51.8441	198.01	52.2697
67.75	64.2902	106.47	53.6992	201.83	46.2115
69.67	57.0601	109.28	59.4770	203.43	46.3008
70.83	68.4506	111.00	71.6028	205.31	43.2409
72.81	72.1764	111.76	0.0000	210.85	49.8938
72.87	72.1875	114.06	56.3140	215.65	38.4296
74.66	64.5773	116.30	0.0000	222.11	51.6174
74.82	64.6028	116.74	49.1667	227.09	42.1724
74.97	64.6266	119.76	42.9032	227.38	31.3692
77.11	64.9623	121.12	58.8996	228.16	0.0000
78.74	61.7827	121.22	58.9097	228.18	40.0583
79.69	74.5347	121.78	48.6714	116.74	40.0583
80.12	68.8708	122.06	56.1868	235.69	40.7507
80.19	0.0000	122.92	48.7681	235.96	49.4976
80.57	67.7938	123.07	47.8425	238.63	44.8938
81.00	70.1620	265.00	61.0402	238.98	0.0000
81.07	73.6250	125.81	61.2633	240.99	45.0064
81.75	65.6755	127.23	72.7485	242.00	45.0546
83.79	74.0853	127.91	63.3738	244.70	27.9175
84.00	74.1204	129.30	65.4171	252.40	0.0000
85.43	73.1975	131.20	64.6735	252.80	31.1155
86.55	67.5563	133.02	57.2360	254.15	0.0000
86.79	67.5923	133.52	46.7809	256.23	44.6057
86.94	67.6147	136.00	55.5968	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	22.4908	355.39	0.0000	584.27	14.0930
264.80	20.9943	356.01	24.3646	595.83	0.0000
265.00	26.9978	364.49	0.0000	427.87	24.6374
268.22	29.3405	366.42	0.0000	602.52	0.0000
269.46	29.3762	372.51	17.2731	604.72	14.2444
270.03	29.3920	375.05	29.6682	607.14	12.3605
271.23	36.2168	377.52	19.8154	609.32	12.8502
273.65	0.0000	356.01	14.9315	610.33	18.5709
276.40	31.8478	388.16	12.4826	614.28	13.3597
277.37	31.8768	388.63	0.0000	618.01	12.4292
277.60	31.8837	391.69	20.0239	620.36	16.2723
278.00	31.8956	264.66	25.1923	621.93	15.3275
279.20	30.4118	401.81	26.0528	630.19	0.0000
279.54	30.4215	402.40	23.5418	631.29	24.5423
279.70	31.9469	404.85	21.8984	633.25	23.1211
280.46	31.9700	410.95	26.2218	634.78	0.0000
283.69	37.7937	413.71	28.8148	635.95	19.2936
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	20.6477	423.72	0.0000	645.85	12.6017
285.90	0.0000	427.09	23.0944	657.76	12.6747
287.50	33.3304	427.87	23.1064	657.90	0.0000
290.67	26.1274	433.94	16.3270	661.66	12.6985
293.27	0.0000	439.40	21.5612	664.57	0.0000
351.93	25.4644	453.88	28.7320	666.33	0.0000
295.96	25.4811	463.37	18.3959	666.50	0.0000
879.38	25.5416	468.07	26.3580	667.71	0.0000
299.98	25.5738	473.00	0.0000	677.62	12.7948
300.09	25.5758	475.06	18.5322	685.70	0.0000
300.13	25.5771	476.78	21.2021	695.00	0.0000
301.36	25.6053	477.60	22.0968	696.49	20.8505
302.85	29.5236	482.18	15.0687	696.51	20.8505
256.23	37.3477	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	17.8784
306.78	30.4061	497.08	17.8894	697.49	17.8799
308.46	40.9921	505.52	20.2277	702.65	12.9434
311.90	30.5425	507.63	0.0000	706.68	15.9596
316.51	33.0236	511.00	28.8613	711.68	13.9966
319.41	0.0000	514.00	29.8163	720.70	0.0000
320.08	0.0000	514.00	29.8163	721.93	0.0000
321.04	34.3348	520.40	21.7656	722.78	15.0708
323.87	22.5492	520.69	0.0000	722.91	15.0714
325.23	45.1505	522.65	0.0000	723.31	13.5670
328.76	0.0000	527.90	0.0000	724.19	19.6039
333.37	23.9252	528.26	15.0317	727.33	17.1148
333.97	22.3410	529.59	17.7782	733.00	9.6891
334.37	20.7521	529.87	0.0000	735.93	14.1481
338.28	20.4184	531.02	0.0000	333.97	12.1348
338.32	20.4189	537.26	0.0000	739.50	0.0000
311.90	20.4547	546.56	0.0000	747.24	20.3109
340.48	20.4547	552.55	22.1660	748.06	18.2864
340.55	0.0000	563.25	19.5089	752.31	13.2312
344.28	20.5180	569.33	21.4380	753.82	0.0000
345.93	22.5592	946.00	21.4399	756.73	11.2166
351.06	23.0559	569.70	19.5773	756.80	11.2171
351.93	23.0722	583.19	14.0851	884.68	10.7401

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	12.2837	1274.44	11.7296	1620.50	2.9833
766.42	12.2871	1001.03	13.4272	1621.92	1.9895
766.84	12.2891	1002.74	13.4351	1678.03	0.0000
772.60	0.0000	1004.73	11.2032	1690.97	3.0300
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	2.0519
778.90	7.4112	1028.54	0.0000	1063.66	4.1089
783.70	0.0000	1037.84	7.9297	1771.35	4.1096
785.37	9.2889	1038.76	0.0000	1791.20	0.0000
792.07	15.5243	631.29	11.3607	1808.65	2.0708
794.95	9.3256	1048.07	0.0000	1810.72	0.0000
795.86	9.3292	1049.04	11.3696	1836.06	1.0411
810.06	15.6390	1050.41	19.3367		
810.29	13.5549	1063.66	11.4233		
344.28	13.5559	1077.00	0.0000		
810.76	14.6004	1077.34	12.6212		
815.77	0.0000	1085.87	4.6019		
1048.07	0.0000	1093.63	11.5332		
832.01	12.6216	1099.45	16.1761		
834.85	21.0596	1112.07	15.0799		
835.71	14.7468	1112.84	11.6024		
836.80	0.0000	1115.54	5.2255		
846.75	0.0000	1120.29	10.4663		
846.77	16.9264	1120.55	10.4670		
856.80	0.0000	1221.41	6.9795		
860.56	17.0176	1129.67	9.3301		
871.09	7.4751	1131.51	0.0000		
873.19	5.3436	1147.95	0.0000		
875.33	0.0000	1173.23	15.5987		
879.38	7.4987	1177.95	9.9401		
880.51	18.2188	1189.05	16.0280		
883.24	9.6552	1204.77	7.1563		
884.68	16.1011	1221.41	19.7737		
889.28	9.6771	1231.02	14.4209		
894.76	16.1615	1235.36	0.0000		
898.04	11.8665	1238.28	18.7853		
900.72	20.5168	1260.41	0.0000		
903.28	14.0511	1271.87	2.7350		
911.20	14.0923	1274.44	14.5977		
912.08	21.1456	1274.54	14.5977		
923.98	0.0000	1291.59	6.4168		
926.50	10.9009	1298.22	0.0000		
929.11	8.1833	1312.11	0.0000		
937.49	12.0384	1332.49	1.8536		
944.13	0.0000	1362.66	0.0000		
946.00	12.0751	1365.19	7.4790		
949.00	14.2859	1368.63	0.0000		
667.71	0.0000	1384.29	11.2742		
962.31	15.4572	1408.01	3.7808		
964.08	18.2288	1457.56	0.0000		
966.17	28.1926	1460.82	3.8311		
911.20	18.8130	1489.16	4.8221		
968.97	18.8130	1505.03	5.8088		
983.53	0.0000	1584.12	12.8215		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235044.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM32.CNF;277
Background date    : 2-OCT-2016 11:01:57.
Sample date        : 30-NOV-2015 13:50:00 Acquisition date : 3-OCT-2016 06:56:59.
Sample ID          : G405235044 Sample quantity : 1.28844E+02 GRAM
Detector name      : GAM32 Detector geometry: CAN
Elapsed live time  : 0 01:00:00.00 Elapsed real time: 0 01:00:00.59 0.0%
Energy tolerance   : 1.50000 keV Analyst Initials : MXR1
Abundance limit    : 75.00000 Sensitivity : 3.00000
Batch ID           : 1596252 Detector SN# :
Matrix Spike ID    : LCS ID : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	54.86	38	83	1.11	110.93	107	8	1.05E-02	44.8	
2	4	75.44	130	180	1.59	152.10	147	14	3.62E-02	22.5	1.51E+00
3	4	77.42	151	126	1.15	156.04	147	14	4.19E-02	15.1	
4	0	89.77	51	263	3.52	180.75	172	12	1.42E-02	65.4	
5	0	93.17*	51	125	1.15	187.55	184	8	1.41E-02	43.2	
6	0	186.38*	115	148	1.59	373.98	368	15	3.20E-02	25.3	
7	0	210.19	53	121	2.38	421.60	415	11	1.46E-02	43.3	
8	2	239.04*	388	58	1.26	479.30	472	17	1.08E-01	6.2	2.43E+00
9	2	242.11	97	44	1.49	485.45	472	17	2.70E-02	15.9	
10	0	271.41	25	68	1.42	544.04	538	9	6.81E-03	63.7	
11	0	295.65*	146	52	1.43	592.53	587	10	4.06E-02	12.6	
12	0	299.84	34	43	1.58	600.89	598	8	9.45E-03	37.3	
13	0	339.15	63	103	1.30	679.52	672	15	1.75E-02	37.1	
14	0	352.37*	232	59	1.31	705.97	701	12	6.43E-02	9.5	
15	0	391.59	21	44	2.32	784.40	780	10	5.85E-03	63.3	
16	0	466.45	20	59	5.18	934.13	925	15	5.61E-03	86.4	
17	0	511.13*	71	41	2.83	1023.49	1015	14	1.96E-02	26.3	
18	0	583.63*	107	35	1.27	1168.50	1162	12	2.97E-02	15.0	
19	0	609.82*	181	36	1.60	1220.89	1215	10	5.04E-02	9.8	
20	0	662.31	93	43	1.22	1325.87	1321	12	2.59E-02	17.4	
21	0	729.12*	26	48	0.74	1459.49	1451	17	7.21E-03	64.3	
22	0	774.90	9	31	4.60	1551.05	1544	14	2.57E-03	132.5	
23	0	795.25	13	18	1.03	1591.76	1586	10	3.58E-03	67.2	
24	0	835.57	20	6	4.54	1672.40	1666	12	5.56E-03	33.2	
25	0	841.13	22	6	1.58	1683.51	1678	11	5.97E-03	30.2	
26	0	860.36	40	10	2.46	1721.97	1715	13	1.12E-02	22.3	
27	0	911.98*	80	31	1.59	1825.21	1820	12	2.23E-02	18.4	
28	0	969.82	71	11	1.47	1940.90	1935	12	1.97E-02	15.3	
29	0	993.29	20	6	1.51	1987.85	1981	14	5.53E-03	35.7	
30	0	1028.32	10	5	2.60	2057.90	2051	10	2.72E-03	53.5	
31	0	1038.30	8	8	0.66	2077.88	2073	8	2.22E-03	70.7	
32	0	1120.99*	40	24	1.68	2243.25	2238	13	1.12E-02	29.4	
33	0	1157.37	16	5	2.46	2316.02	2312	9	4.38E-03	38.1	
34	0	1171.94	12	6	1.87	2345.15	2341	8	3.40E-03	44.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1322.39	7	8	3.09	2646.06	2639	11	1.97E-03	86.5	
36	0	1377.89	22	7	1.35	2757.07	2749	14	6.11E-03	33.2	
37	0	1461.23*	330	0	2.11	2923.75	2918	13	9.16E-02	5.6	
38	5	1492.06	7	1	1.39	2985.42	2984	11	1.83E-03	27.3	6.33E-01
39	5	1494.77*	10	2	1.92	2990.84	2984	11	2.68E-03	46.7	
40	0	1765.20*	34	3	2.54	3531.71	3526	11	9.53E-03	20.2	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235044.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 30-NOV-2015 13:50:00 Acquisition date : 3-OCT-2016 06:56:59
Sample ID         : G405235044 Sample quantity   : 128.84 GRAM
Sample type       : SOLID Sample geometry    :
Detector name     : GAMMA32 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.59 0.0%
Energy tolerance  : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error    : 0.00 %
Efficiency type   : Linear Efficiencies at   : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.119E+00	1.532E+01	1.532E+01	11.13	OK
MN-54	834.85	99.98*	1.753E+00	6.575E-02	1.302E-01	66.33	OK
AS-73	53.44	10.30*	1.124E+00	2.236E+00	3.186E+01	89.65	OK
SN-113	391.69	64.94*	3.225E+00	6.089E-02	3.886E-01	126.61	OK
BA-137M	661.66	89.90*	2.104E+00	2.882E-01	2.939E-01	34.77	OK
CS-137	661.66	85.10*	2.104E+00	3.045E-01	3.105E-01	34.77	OK
TL-208	277.37	6.60	4.277E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.326E+00	3.194E-01	3.194E-01	29.96	OK
	860.56	12.50	1.714E+00	1.087E+00	1.087E+00	44.65	OK
PB-212	74.82	10.28	3.488E+00	1.754E+00	1.754E+00	63.15	OK
	77.11	17.10	3.688E+00	1.602E+00	1.602E+00	30.19	OK
	238.63	43.60*	4.787E+00	1.161E+00	1.161E+00	12.49	OK
	300.09	3.30	4.019E+00	1.581E+00	1.581E+00	74.58	OK
BI-214	609.32	45.49*	2.246E+00	1.044E+00	1.045E+00	19.61	OK
	1120.29	14.92	1.392E+00	1.099E+00	1.099E+00	58.70	OK
	1764.49	15.30	9.460E-01	1.296E+00	1.297E+00	40.46	OK
PB-214	74.82	5.80	3.423E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.688E+00	2.824E+00	2.825E+00	30.19	OK
	87.09	3.41	4.545E+00	----- Line	Not Found	-----	Absent
	242.00	7.25	4.745E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.065E+00	1.204E+00	1.204E+00	25.26	OK
	351.93	35.60*	3.520E+00	1.127E+00	1.128E+00	18.92	OK
RN-222	609.32	45.49*	2.246E+00	1.044E+00	1.045E+00	19.61	OK
	1120.29	14.92	1.392E+00	1.099E+00	1.099E+00	58.70	OK
	1764.49	15.30	9.460E-01	1.296E+00	1.297E+00	40.46	OK
RA-224	240.99	4.10*	4.743E+00	9.949E-01	9.949E-01	113.31	OK
RA-226	609.32	45.49*	2.246E+00	1.044E+00	1.045E+00	19.61	OK
	1120.29	14.92	1.392E+00	1.099E+00	1.099E+00	58.70	OK
	1764.49	15.30	9.460E-01	1.296E+00	1.297E+00	40.46	OK
AC-228	105.21	1.10	5.586E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.634E+00	9.413E-01	9.413E-01	74.12	OK
	794.95	4.25	1.822E+00	9.610E-01	9.610E-01	134.35	OK
	835.71	1.61	1.753E+00	4.083E+00	4.083E+00	66.33	OK
	911.20	25.80*	1.638E+00	1.089E+00	1.089E+00	36.74	OK
	968.97	15.80	1.561E+00	1.644E+00	1.644E+00	30.57	OK
RA-228	105.21	1.10	5.586E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.634E+00	9.413E-01	9.413E-01	74.12	OK
	794.95	4.25	1.822E+00	9.610E-01	9.610E-01	134.35	OK
	835.71	1.61	1.753E+00	4.083E+00	4.083E+00	66.33	OK
	911.20	25.80*	1.638E+00	1.089E+00	1.089E+00	36.74	OK
	968.97	15.80	1.561E+00	1.644E+00	1.644E+00	30.57	OK
TH-228	74.82	10.28	3.488E+00	1.754E+00	1.754E+00	63.15	OK
	77.11	17.10	3.688E+00	1.602E+00	1.602E+00	30.19	OK
	238.63	43.60*	4.787E+00	1.161E+00	1.161E+00	12.49	OK
	300.09	3.30	4.019E+00	1.581E+00	1.581E+00	74.58	OK
TH-230	609.32	45.49*	2.246E+00	1.044E+00	1.044E+00	19.61	OK
	1120.29	14.92	1.392E+00	1.099E+00	1.099E+00	58.70	OK
	1764.49	15.30	9.460E-01	1.296E+00	1.296E+00	40.46	OK
TH-232	105.21	1.10	5.586E+00	----- Line	Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	338.32	11.27	3.634E+00	9.413E-01	9.413E-01	74.12	OK
	835.71	1.61	1.753E+00	4.083E+00	4.083E+00	66.33	OK
	911.20	25.80*	1.638E+00	1.089E+00	1.089E+00	36.74	OK
	968.97	15.80	1.561E+00	1.644E+00	1.644E+00	30.57	OK
U-234	609.32	45.49*	2.246E+00	1.044E+00	1.044E+00	19.61	OK
	1120.29	14.92	1.392E+00	1.099E+00	1.099E+00	58.70	OK
	1764.49	15.30	9.460E-01	1.296E+00	1.296E+00	40.46	OK
U-235	89.96	3.47	4.745E+00	2.057E+00	2.057E+00	130.83	OK
	93.35	5.60	4.974E+00	1.206E+00	1.206E+00	86.31	OK
	143.76	10.96*	6.095E+00	-----	Line Not Found	-----	Absent
	163.33	5.08	5.924E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	5.599E+00	2.286E-01	2.286E-01	50.50	OK
	205.31	5.01	5.302E+00	-----	Line Not Found	-----	Absent
AM-243	43.53	5.90	1.701E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	3.488E+00	2.684E-01	2.684E-01	63.15	OK
ANH-511	511.00	100.00*	2.589E+00	1.623E-01	1.623E-01	52.51	OK

Flag: "*" = Keyline

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235044.CNF;1
* Acquisition date   : 3-OCT-2016 06:56:59 Sensitivity      : 3.000
* Detector ID       : GAM32 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.59 Half life ratio : *****
* Sample date      : 30-NOV-2015 13:50:00 Analyst initials: MXR1
* Sample ID       : G405235044 Sample Quantity : 1.2884E+02 GRAM
* Batch Number    : 1596252 Wet Weight : 0.00000
* Wet wt corr    : 1.00000 Dry Weight : 0.00000
* Nuclide Library : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 23-AUG-2016 07:56:33 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;11
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.532E+01	1.671E+00	4.511E-01
MN-54	1.302E-01	8.467E-02	1.251E-01
AS-73	3.186E+01	2.799E+01	3.319E+01
SN-113	3.886E-01	4.821E-01	5.433E-01
BA-137M	2.939E-01	1.001E-01	7.404E-02
CS-137	3.105E-01	1.058E-01	7.822E-02
TL-208	3.194E-01	9.377E-02	7.671E-02
PB-212	1.161E+00	1.422E-01	1.001E-01
BI-214	1.045E+00	2.008E-01	1.519E-01
PB-214	1.128E+00	2.091E-01	1.500E-01
RN-222	1.045E+00	2.008E-01	1.519E-01
RA-224	9.949E-01	1.105E+00	1.072E+00
RA-226	1.045E+00	2.008E-01	1.519E-01
AC-228	1.089E+00	3.921E-01	2.638E-01
RA-228	1.089E+00	3.921E-01	2.638E-01
TH-228	1.161E+00	1.422E-01	1.001E-01
TH-230	1.044E+00	2.008E-01	1.518E-01
TH-232	1.089E+00	3.921E-01	2.638E-01
U-234	1.044E+00	2.007E-01	1.518E-01
U-235	5.108E-02	1.911E-01	3.779E-01
AM-243	2.684E-01	1.661E-01	1.194E-01
ANH-511	1.623E-01	8.350E-02	5.915E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	2.506E+00		1.547E+01	3.001E+01	NOT IDENT.
NA-22	-8.921E-03		5.188E-02	1.010E-01	NOT IDENT.
NA-24	0.000E+00		9.800E+40	0.000E+00	SHORT HLIF
AL-26	6.046E-03		2.175E-02	5.847E-02	NOT IDENT.
SC-46	4.123E-02		4.229E-01	8.253E-01	FAIL ABUN
V-48	0.000E+00		2.167E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00		6.341E+02	0.000E+00	SHORT HLIF
CO-56	5.512E-01		5.713E-01	1.223E+00	FAIL ABUN

MN-56	0.000E+00	1.040E+41	0.000E+00	SHORT HLIF
CO-57	3.406E-02	5.823E-02	1.086E-01	NOT IDENT.
CO-58	-1.143E-01	7.650E-01	1.399E+00	NOT IDENT.
FE-59	-4.330E+00	7.303E+00	1.328E+01	NOT IDENT.
CO-60	-1.343E-02	4.507E-02	8.589E-02	FAIL ABUN
ZN-65	4.067E-02	1.891E-01	3.581E-01	NOT IDENT.
GE-68	-5.810E-01	2.754E+00	5.325E+00	NOT IDENT.
AS-74	0.000E+00	9.203E+03	0.000E+00	SHORT HLIF
SE-75	2.311E-02	2.574E-01	4.937E-01	NOT IDENT.
BR-77	0.000E+00	2.549E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	8.952E+02	0.000E+00	SHORT HLIF
RB-83	1.167E-01	7.457E-01	1.459E+00	NOT IDENT.
KR-85	6.281E+00	9.799E+00	1.784E+01	NOT IDENT.
SR-85	7.154E-01	1.124E+00	2.045E+00	NOT IDENT.
RB-86	0.000E+00	4.291E+04	0.000E+00	SHORT HLIF
Y-88	-4.482E-03	1.911E-01	4.407E-01	NOT IDENT.
Y-91	-3.384E+02	7.146E+02	1.301E+03	NOT IDENT.
NB-94	1.416E-02	4.069E-02	7.803E-02	NOT IDENT.
NB-95	-1.161E+00	1.098E+00	1.683E+00	NOT IDENT.
NB-95M	-1.288E+00	3.004E+00	4.916E+00	NOT IDENT.
ZR-95	-2.196E-01	1.750E+00	3.245E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.025E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.442E+33	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-1.262E-02	4.516E-02	7.724E-02	NOT IDENT.
RH-102	-2.012E-02	6.996E-02	1.264E-01	NOT IDENT.
RU-103	2.299E+00	7.164E+00	1.426E+01	FAIL ABUN
RH-106	-4.744E-01	5.920E-01	9.785E-01	NOT IDENT.
RU-106	-4.744E-01	5.920E-01	9.785E-01	NOT IDENT.
AG-108M	2.176E-02	3.465E-02	6.963E-02	NOT IDENT.
CD-109	2.428E+00	1.849E+00	3.319E+00	NOT IDENT.
AG-110M	3.685E-02	1.118E-01	2.257E-01	NOT IDENT.
CD-115	0.000E+00	4.189E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.595E+05	0.000E+00	SHORT HLIF
TE-123M	5.386E-02	1.461E-01	2.907E-01	NOT IDENT.
SB-124	-9.120E-01	2.422E+00	4.624E+00	NOT IDENT.
SB-125	8.443E-02	1.266E-01	2.561E-01	NOT IDENT.
TE-125M	5.334E+02	3.889E+02	7.665E+02	NOT IDENT.
I-126	0.000E+00	1.684E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	2.052E+06	0.000E+00	SHORT HLIF
SN-126	1.573E-01	1.174E-01	2.112E-01	NOT IDENT.
SB-127	0.000E+00	1.116E+23	0.000E+00	SHORT HLIF
I-131	0.000E+00	1.133E+10	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.453E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.439E+27	0.000E+00	SHORT HLIF
BA-133	1.622E-02	4.874E-02	8.748E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	6.337E-02	8.343E-02	1.326E-01	FAIL ABUN
CS-135	1.792E-02	1.576E-01	2.761E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	4.740E+05	0.000E+00	SHORT HLIF
CE-139	9.947E-03	1.365E-01	2.636E-01	NOT IDENT.
BA-140	0.000E+00	2.122E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	7.184E+05	0.000E+00	SHORT HLIF
CE-141	-6.399E+00	3.227E+01	6.163E+01	NOT IDENT.
CE-143	0.000E+00	1.187E+41	0.000E+00	SHORT HLIF
CE-144	9.855E-02	4.739E-01	8.445E-01	NOT IDENT.
PM-144	3.148E-02	6.516E-02	1.308E-01	NOT IDENT.
PR-144	2.710E+00	5.678E+00	1.139E+01	NOT IDENT.
PM-146	3.352E-03	5.285E-02	1.005E-01	NOT IDENT.
ND-147	0.000E+00	6.956E+07	0.000E+00	SHORT HLIF
PM-147	-1.808E+02	1.058E+03	1.838E+03	NOT IDENT.
PM-149	0.000E+00	1.233E+41	0.000E+00	SHORT HLIF
EU-150	6.617E-03	3.070E-02	5.401E-02	FAIL ABUN
EU-152	-5.155E-02	1.185E-01	1.897E-01	NOT IDENT.
GD-153	-1.069E-01	2.415E-01	4.129E-01	NOT IDENT.
EU-154	2.369E-03	1.204E-01	2.444E-01	NOT IDENT.
EU-155	1.676E-01	1.345E-01	2.648E-01	NOT IDENT.
TB-160	5.871E-01	1.933E+00	3.981E+00	FAIL ABUN
HO-166M	-4.417E-02	6.777E-02	1.138E-01	NOT IDENT.
TM-171	7.814E-01	4.477E+01	7.632E+01	NOT IDENT.
HF-172	3.331E-01	7.772E-01	5.414E-01	FAIL ABUN
LU-172	-3.785E-03	7.576E-02	1.534E-01	FAIL ABUN
LU-176	4.001E-03	2.484E-02	4.856E-02	FAIL ABUN
HF-181	3.763E+00	5.799E+00	1.183E+01	NOT IDENT.
TA-182	-6.339E-01	1.090E+00	1.950E+00	FAIL ABUN
RE-183	-8.362E-01	6.026E+00	9.996E+00	NOT IDENT.

RE-184	-2.181E+01	4.265E+01	7.224E+01	NOT IDENT.
W-188	-1.266E+02	1.539E+02	2.354E+02	NOT IDENT.
IR-192	-9.195E-02	5.634E-01	1.057E+00	FAIL ABUN
HG-203	6.113E-01	3.203E+00	6.174E+00	NOT IDENT.
BI-207	-4.214E-02	4.513E-02	7.618E-02	FAIL ABUN
PB-210	1.356E+00	1.040E+01	1.925E+01	NOT IDENT.
BI-211	0.000E+00	5.759E-01	8.395E-01	FAIL ABUN
PB-211	-1.771E-01	7.765E-01	1.433E+00	NOT IDENT.
BI-212	1.169E+00	7.675E-01	1.618E+00	NOT IDENT.
RN-219	1.888E-02	4.558E-01	8.647E-01	FAIL ABUN
RA-223	-3.368E-01	7.014E-01	1.268E+00	FAIL ABUN
AC-227	-3.623E-02	2.456E-01	4.646E-01	FAIL ABUN
TH-227	-3.623E-02	2.456E-01	4.646E-01	FAIL ABUN
TH-229	3.743E-02	5.301E-01	1.021E+00	FAIL ABUN
PA-231	5.779E-01	4.931E-01	9.741E-01	NOT IDENT.
TH-231	-3.368E-01	7.014E-01	1.268E+00	FAIL ABUN
PA-233	4.165E-02	6.750E-02	1.359E-01	FAIL ABUN
PA-234	-1.260E-01	2.940E-01	5.549E-01	FAIL ABUN
PA-234M	1.419E+00	4.281E+00	9.168E+00	NOT IDENT.
TH-234	-2.028E+00	2.086E+00	3.544E+00	FAIL ABUN
NP-237	4.165E-02	6.750E-02	1.359E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
U-238	-2.028E+00	2.086E+00	3.544E+00	FAIL ABUN
NP-239	2.873E-02	3.333E-01	5.902E-01	NOT IDENT.
PU-239	3.179E+02	4.286E+02	7.909E+02	NOT IDENT.
AM-241	-2.473E-02	2.382E-01	4.294E-01	NOT IDENT.
CM-243	-1.356E-01	1.305E-01	2.098E-01	NOT IDENT.
BK-247	2.219E-03	8.321E-02	1.591E-01	NOT IDENT.
CM-247	2.447E-02	3.973E-02	8.037E-02	NOT IDENT.
CF-249	-2.829E-02	4.991E-02	7.748E-02	NOT IDENT.
CF-251	-2.551E-03	1.168E-01	2.259E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	314	10.66*	1.119E+00	1.532E+01	1.532E+01	11.13
MN-54	834.85	20	99.98*	1.753E+00	6.575E-02	1.302E-01	66.33
AS-73	53.44	44	10.30*	1.124E+00	2.236E+00	3.186E+01	89.65
SN-113	391.69	22	64.94*	3.225E+00	6.089E-02	3.886E-01	126.61
BA-137M	661.66	94	89.90*	2.104E+00	2.882E-01	2.939E-01	34.77
CS-137	661.66	94	85.10*	2.104E+00	3.045E-01	3.105E-01	34.77
TL-208	277.37	-----	6.60	4.277E+00	-----	Line Not Found	-----
	583.19	108	85.00*	2.326E+00	3.194E-01	3.194E-01	29.96
	860.56	40	12.50	1.714E+00	1.087E+00	1.087E+00	44.65
BI-211	72.87	-----	1.23	3.214E+00	-----	Line Not Found	-----
	351.06	242	12.92*	3.520E+00	3.106E+00	3.106E+00	18.92
PB-212	74.82	150	10.28	3.488E+00	2.434E+00	2.434E+00	44.97
	77.11	173	17.10	3.688E+00	1.602E+00	1.602E+00	30.19
	238.63	416	43.60*	4.787E+00	1.161E+00	1.161E+00	12.49
	300.09	36	3.30	4.019E+00	1.581E+00	1.581E+00	74.58
BI-214	609.32	183	45.49*	2.246E+00	1.044E+00	1.045E+00	19.61
	1120.29	39	14.92	1.392E+00	1.099E+00	1.099E+00	58.70
	1764.49	32	15.30	9.460E-01	1.296E+00	1.297E+00	40.46
PB-214	74.82	150	5.80	3.488E+00	4.314E+00	4.315E+00	44.97
	77.11	173	9.70	3.688E+00	2.824E+00	2.825E+00	30.19
	87.09	-----	3.41	4.545E+00	-----	Line Not Found	-----
	242.00	104	7.25	4.743E+00	1.766E+00	1.767E+00	31.72
	295.22	155	18.42	4.065E+00	1.204E+00	1.204E+00	25.26
	351.93	242	35.60*	3.520E+00	1.127E+00	1.128E+00	18.92
RN-222	609.32	183	45.49*	2.246E+00	1.044E+00	1.045E+00	19.61
	1120.29	39	14.92	1.392E+00	1.099E+00	1.099E+00	58.70
	1764.49	32	15.30	9.460E-01	1.296E+00	1.297E+00	40.46
RA-224	240.99	104	4.10*	4.743E+00	3.124E+00	3.124E+00	31.72
RA-226	609.32	183	45.49*	2.246E+00	1.044E+00	1.045E+00	19.61
	1120.29	39	14.92	1.392E+00	1.099E+00	1.099E+00	58.70
	1764.49	32	15.30	9.460E-01	1.296E+00	1.297E+00	40.46
AC-228	105.21	-----	1.10	5.586E+00	-----	Line Not Found	-----
	338.32	66	11.27	3.634E+00	9.413E-01	9.413E-01	74.12
	794.95	13	4.25	1.822E+00	9.610E-01	9.610E-01	134.35
	835.71	20	1.61	1.753E+00	4.083E+00	4.083E+00	66.33
	911.20	79	25.80*	1.638E+00	1.089E+00	1.089E+00	36.74
	968.97	70	15.80	1.561E+00	1.644E+00	1.644E+00	30.57
RA-228	105.21	-----	1.10	5.586E+00	-----	Line Not Found	-----
	338.32	66	11.27	3.634E+00	9.413E-01	9.413E-01	74.12
	794.95	13	4.25	1.822E+00	9.610E-01	9.610E-01	134.35
	835.71	20	1.61	1.753E+00	4.083E+00	4.083E+00	66.33
	911.20	79	25.80*	1.638E+00	1.089E+00	1.089E+00	36.74
	968.97	70	15.80	1.561E+00	1.644E+00	1.644E+00	30.57
TH-228	74.82	150	10.28	3.488E+00	2.434E+00	2.434E+00	44.97
	77.11	173	17.10	3.688E+00	1.602E+00	1.602E+00	30.19
	238.63	416	43.60*	4.787E+00	1.161E+00	1.161E+00	12.49
	300.09	36	3.30	4.019E+00	1.581E+00	1.581E+00	74.58

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected	Decay Corr	2-Sigma
					pCi/GRAM	pCi/GRAM	
TH-230	609.32	183	45.49*	2.246E+00	1.044E+00	1.044E+00	19.61
	1120.29	39	14.92	1.392E+00	1.099E+00	1.099E+00	58.70
	1764.49	32	15.30	9.460E-01	1.296E+00	1.296E+00	40.46
TH-232	105.21	-----	1.10	5.586E+00	-----	Line Not Found	-----
	338.32	66	11.27	3.634E+00	9.413E-01	9.413E-01	74.12
	835.71	20	1.61	1.753E+00	4.083E+00	4.083E+00	66.33
	911.20	79	25.80*	1.638E+00	1.089E+00	1.089E+00	36.74
	968.97	70	15.80	1.561E+00	1.644E+00	1.644E+00	30.57
U-234	609.32	183	45.49*	2.246E+00	1.044E+00	1.044E+00	19.61
	1120.29	39	14.92	1.392E+00	1.099E+00	1.099E+00	58.70
	1764.49	32	15.30	9.460E-01	1.296E+00	1.296E+00	40.46
U-235	89.96	58	3.47	4.745E+00	2.057E+00	2.057E+00	130.83
	93.35	58	5.60	4.974E+00	1.206E+00	1.206E+00	86.31
	143.76	-----	10.96*	6.095E+00	-----	Line Not Found	-----
	163.33	-----	5.08	5.924E+00	-----	Line Not Found	-----
	185.72	126	57.20	5.599E+00	2.286E-01	2.286E-01	50.50
AM-243	205.31	-----	5.01	5.302E+00	-----	Line Not Found	-----
	43.53	-----	5.90	1.701E-01	-----	Line Not Found	-----
ANH-511	74.66	150	67.20*	3.488E+00	3.723E-01	3.723E-01	44.97
	511.00	72	100.00*	2.589E+00	1.623E-01	1.623E-01	52.51

Flag: "*" = Keyline

Total number of lines in spectrum 40
 Number of unidentified lines 10
 Number of lines tentatively identified by NID 30 75.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.532E+01	1.532E+01	0.171E+01	11.13	
MN-54	312.05D	1.98	6.575E-02	1.302E-01	0.864E-01	66.33	
AS-73	80.30D	14.2	2.236E+00	3.186E+01	2.856E+01	89.65	
SN-113	115.09D	6.38	6.089E-02	3.886E-01	4.919E-01	126.61	
BA-137M	30.08Y	1.02	2.882E-01	2.939E-01	1.022E-01	34.77	
CS-137	30.08Y	1.02	3.045E-01	3.105E-01	1.079E-01	34.77	
TL-208	1.41E+10Y	1.00	3.194E-01	3.194E-01	0.957E-01	29.96	
BI-211	7.04E+08Y	1.00	3.106E+00	3.106E+00	0.588E+00	18.92	
PB-212	1.41E+10Y	1.00	1.161E+00	1.161E+00	0.145E+00	12.49	
BI-214	1600.00Y	1.00	1.044E+00	1.045E+00	0.205E+00	19.61	
PB-214	1600.00Y	1.00	1.127E+00	1.128E+00	0.213E+00	18.92	
RN-222	1600.00Y	1.00	1.044E+00	1.045E+00	0.205E+00	19.61	
RA-224	1.41E+10Y	1.00	3.124E+00	3.124E+00	0.991E+00	31.72	
RA-226	1600.00Y	1.00	1.044E+00	1.045E+00	0.205E+00	19.61	
AC-228	1.41E+10Y	1.00	1.089E+00	1.089E+00	0.400E+00	36.74	
RA-228	1.41E+10Y	1.00	1.089E+00	1.089E+00	0.400E+00	36.74	
TH-228	1.41E+10Y	1.00	1.161E+00	1.161E+00	0.145E+00	12.49	
TH-230	7.54E+04Y	1.00	1.044E+00	1.044E+00	0.205E+00	19.61	
TH-232	1.41E+10Y	1.00	1.089E+00	1.089E+00	0.400E+00	36.74	
U-234	2.45E+05Y	1.00	1.044E+00	1.044E+00	0.205E+00	19.61	
U-235	7.04E+08Y	1.00	2.286E-01	2.286E-01	1.155E-01	50.50	K
AM-243	7370.00Y	1.00	3.723E-01	3.723E-01	1.675E-01	44.97	
ANH-511	1.00E+09Y	1.00	1.623E-01	1.623E-01	0.852E-01	52.51	
Total Activity :			3.753E+01	6.756E+01			

Grand Total Activity : 3.753E+01 6.756E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	210.19	57	131	2.38	421.60	415	11	1.46E-02	86.7	5.22E+00	T
0	271.41	26	72	1.42	544.04	538	9	6.81E-03	****	4.35E+00	T
0	466.45	21	60	5.18	934.13	925	15	5.61E-03	****	2.79E+00	
0	729.12	26	48	0.74	1459.49	1451	17	7.21E-03	****	1.95E+00	
0	774.90	9	31	4.60	1551.05	1544	14	2.57E-03	****	1.86E+00	
0	841.13	21	5	1.58	1683.51	1678	11	5.97E-03	60.4	1.74E+00	
0	993.29	19	6	1.51	1987.85	1981	14	5.53E-03	71.3	1.53E+00	
0	1028.32	10	5	2.60	2057.90	2051	10	2.72E-03	****	1.49E+00	T
0	1038.30	8	8	0.66	2077.88	2073	8	2.22E-03	****	1.48E+00	T
0	1157.37	15	5	2.46	2316.02	2312	9	4.38E-03	76.2	1.36E+00	
0	1171.94	12	6	1.87	2345.15	2341	8	3.40E-03	89.6	1.34E+00	T
0	1322.39	7	8	3.09	2646.06	2639	11	1.97E-03	****	1.22E+00	
0	1377.89	21	7	1.35	2757.07	2749	14	6.11E-03	66.5	1.18E+00	
5	1492.06	6	1	1.39	2985.42	2984	11	1.83E-03	54.6	1.10E+00	
5	1494.77	9	2	1.92	2990.84	2984	11	2.68E-03	93.3	1.10E+00	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235044.CNF;1
* Acquisition date   : 3-OCT-2016 06:56:59 Sensitivity      : 3.000
* Detector ID       : GAM32 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.59 Half life ratio : *****
* Sample date       : 30-NOV-2015 13:50:00 Nuclide Library : SOLID
* Sample ID        : G405235044 Analyst initials: MXR1
* Batch Number     : 1596252 Sample Quantity : 1.2884E+02 GRAM
* Wet wt corr      : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 23-AUG-2016 07:56:33 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;11
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.595E-01
MN-54	5.356E-02
AS-73	1.542E+01
SN-113	2.472E-01
BA-137M	3.273E-02
CS-137	3.458E-02
TL-208	3.433E-02
PB-212	4.617E-02
BI-214	6.814E-02
PB-214	6.861E-02
RN-222	6.814E-02
RA-224	4.948E-01
RA-226	6.814E-02
AC-228	1.132E-01
RA-228	1.132E-01
TH-228	4.617E-02
TH-230	6.812E-02
TH-232	1.132E-01
U-234	6.812E-02
U-235	1.768E-01
AM-243	5.614E-02
ANH-511	2.649E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.346E+01	NOT IDENT.
NA-22	4.261E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.071E-02	NOT IDENT.
SC-46	3.521E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
CO-56	5.390E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF

CO-57	5.083E-02	NOT IDENT.
CO-58	6.092E-01	NOT IDENT.
FE-59	5.444E+00	NOT IDENT.
CO-60	3.566E-02	FAIL ABUN
ZN-65	1.523E-01	NOT IDENT.
GE-68	2.287E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	2.285E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	6.466E-01	NOT IDENT.
KR-85	8.165E+00	NOT IDENT.
SR-85	9.362E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.562E-01	NOT IDENT.
Y-91	5.618E+02	NOT IDENT.
NB-94	3.505E-02	NOT IDENT.
NB-95	7.227E-01	NOT IDENT.
NB-95M	2.270E+00	NOT IDENT.
ZR-95	1.407E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.627E-02	NOT IDENT.
RH-102	5.558E-02	NOT IDENT.
RU-103	6.369E+00	FAIL ABUN
RH-106	4.248E-01	NOT IDENT.
RU-106	4.248E-01	NOT IDENT.
AG-108M	3.183E-02	NOT IDENT.
CD-109	1.584E+00	NOT IDENT.
AG-110M	9.756E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.357E-01	NOT IDENT.
SB-124	1.731E+00	NOT IDENT.
SB-125	1.170E-01	NOT IDENT.
TE-125M	3.616E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SN-126	1.008E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.982E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.953E-02	FAIL ABUN
CS-135	1.266E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	1.237E-01	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.886E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.969E-01	NOT IDENT.
PM-144	5.828E-02	NOT IDENT.
PR-144	5.074E+00	NOT IDENT.
PM-146	4.548E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	8.597E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.469E-02	FAIL ABUN
EU-152	8.606E-02	NOT IDENT.
GD-153	1.933E-01	NOT IDENT.
EU-154	1.030E-01	NOT IDENT.
EU-155	1.246E-01	NOT IDENT.
TB-160	1.692E+00	FAIL ABUN
HO-166M	4.951E-02	NOT IDENT.
TM-171	3.540E+01	NOT IDENT.
HF-172	2.545E-01	FAIL ABUN
LU-172	6.462E-02	FAIL ABUN
LU-176	2.210E-02	FAIL ABUN
HF-181	5.354E+00	NOT IDENT.
TA-182	8.296E-01	FAIL ABUN
RE-183	4.656E+00	NOT IDENT.
RE-184	3.090E+01	NOT IDENT.

W-188	1.073E+02	NOT IDENT.
IR-192	4.829E-01	FAIL ABUN
HG-203	2.861E+00	NOT IDENT.
BI-207	3.065E-02	FAIL ABUN
PB-210	9.049E+00	NOT IDENT.
BI-211	4.023E-01	FAIL ABUN
PB-211	6.490E-01	NOT IDENT.
BI-212	7.481E-01	NOT IDENT.
RN-219	3.939E-01	FAIL ABUN
RA-223	5.808E-01	FAIL ABUN
AC-227	2.136E-01	FAIL ABUN
TH-227	2.136E-01	FAIL ABUN
TH-229	4.771E-01	FAIL ABUN
PA-231	4.495E-01	NOT IDENT.
TH-231	5.808E-01	FAIL ABUN
PA-233	6.260E-02	FAIL ABUN
PA-234	2.360E-01	FAIL ABUN
PA-234M	3.965E+00	NOT IDENT.
TH-234	1.667E+00	FAIL ABUN
NP-237	6.260E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.667E+00	FAIL ABUN
NP-239	2.778E-01	NOT IDENT.
PU-239	3.743E+02	NOT IDENT.
AM-241	2.009E-01	NOT IDENT.
CM-243	9.768E-02	NOT IDENT.
BK-247	7.347E-02	NOT IDENT.
CM-247	3.665E-02	NOT IDENT.
CF-249	3.499E-02	NOT IDENT.
CF-251	1.048E-01	NOT IDENT.

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235044.CNF;1
* Acquisition date   : 3-OCT-2016 06:56:59 Sensitivity      : 3.000
* Detector ID        : GAM32 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.59 Half life ratio : *****
* Sample date        : 30-NOV-2015 13:50:00 Nuclide Library : SOLID
* Sample ID          : G405235044 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity : 1.2884E+02 GRAM
*                               Quantity Err(%) : 1.5523E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight       : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date     : 23-AUG-2016 07:56:33 Eff. Geometry  : CAN
* Eff. File           : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;11
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.532E+01	1.853E+00	1.853E+00
MN-54	1.302E-01	8.485E-02	8.485E-02
AS-73	3.186E+01	2.875E+01	2.875E+01
SN-113	3.886E-01	4.824E-01	4.824E-01
BA-137M	2.939E-01	1.009E-01	1.009E-01
CS-137	3.105E-01	1.066E-01	1.066E-01
TL-208	3.194E-01	9.475E-02	9.475E-02
PB-212	1.161E+00	1.550E-01	1.550E-01
BI-214	1.045E+00	2.058E-01	2.058E-01
PB-214	1.128E+00	2.143E-01	2.143E-01
RN-222	1.045E+00	2.058E-01	2.058E-01
RA-224	9.949E-01	1.115E+00	1.115E+00
RA-226	1.045E+00	2.058E-01	2.058E-01
AC-228	1.089E+00	3.960E-01	3.960E-01
RA-228	1.089E+00	3.960E-01	3.960E-01
TH-228	1.161E+00	1.550E-01	1.550E-01
TH-230	1.044E+00	2.057E-01	2.057E-01
TH-232	1.089E+00	3.960E-01	3.960E-01
U-234	1.044E+00	2.057E-01	2.057E-01
U-235	5.108E-02	1.911E-01	1.911E-01
AM-243	2.684E-01	1.675E-01	1.675E-01
ANH-511	1.623E-01	8.376E-02	8.376E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	2.506E+00	1.547E+01	1.551E+01	NOT IDENT.
NA-22	-8.921E-03	5.188E-02	5.203E-02	NOT IDENT.
NA-24	1.000E+41	1.077E+41	0.000E+00	SHORT HLIF
AL-26	6.046E-03	2.176E-02	2.193E-02	NOT IDENT.
SC-46	4.123E-02	4.229E-01	4.234E-01	FAIL ABUN
V-48	-1.319E+04	2.167E+04	2.248E+04	SHORT HLIF
CR-51	-1.960E+02	6.341E+02	6.403E+02	SHORT HLIF
CO-56	5.512E-01	5.717E-01	6.234E-01	FAIL ABUN

MN-56	1.000E+41	1.040E+41	0.000E+00	SHORT HLIF
CO-57	3.406E-02	5.825E-02	6.024E-02	NOT IDENT.
CO-58	-1.143E-01	7.650E-01	7.667E-01	NOT IDENT.
FE-59	-4.330E+00	7.310E+00	7.566E+00	NOT IDENT.
CO-60	-1.343E-02	4.507E-02	4.547E-02	FAIL ABUN
ZN-65	4.067E-02	1.891E-01	1.900E-01	NOT IDENT.
GE-68	-5.810E-01	2.755E+00	2.767E+00	NOT IDENT.
AS-74	3.403E+03	9.208E+03	9.335E+03	SHORT HLIF
SE-75	2.311E-02	2.574E-01	2.576E-01	NOT IDENT.
BR-77	2.083E+39	1.850E+40	0.000E+00	SHORT HLIF
SR-82	9.421E+02	8.963E+02	9.918E+02	SHORT HLIF
RB-83	1.167E-01	7.459E-01	7.478E-01	NOT IDENT.
KR-85	6.281E+00	9.802E+00	1.020E+01	NOT IDENT.
SR-85	7.154E-01	1.125E+00	1.170E+00	NOT IDENT.
RB-86	-1.259E+04	4.291E+04	4.328E+04	SHORT HLIF
Y-88	-4.482E-03	1.911E-01	1.911E-01	NOT IDENT.
Y-91	-3.384E+02	7.147E+02	7.308E+02	NOT IDENT.
NB-94	1.416E-02	4.069E-02	4.119E-02	NOT IDENT.
NB-95	-1.161E+00	1.099E+00	1.218E+00	NOT IDENT.
NB-95M	-1.288E+00	3.005E+00	3.061E+00	NOT IDENT.
ZR-95	-2.196E-01	1.750E+00	1.753E+00	NOT IDENT.
NB-97	1.000E+41	2.404E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.026E+41	0.000E+00	SHORT HLIF
MO-99	-1.064E+32	1.442E+33	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	3.275E+41	0.000E+00	SHORT HLIF
RH-101	-1.262E-02	4.522E-02	4.558E-02	NOT IDENT.
RH-102	-2.012E-02	6.998E-02	7.056E-02	NOT IDENT.
RU-103	2.299E+00	7.164E+00	7.239E+00	FAIL ABUN
RH-106	-4.744E-01	5.927E-01	6.301E-01	NOT IDENT.
RU-106	-4.744E-01	5.927E-01	6.301E-01	NOT IDENT.
AG-108M	2.176E-02	3.466E-02	3.602E-02	NOT IDENT.
CD-109	2.428E+00	1.859E+00	2.157E+00	NOT IDENT.
AG-110M	3.685E-02	1.119E-01	1.131E-01	NOT IDENT.
CD-115	2.749E+39	4.189E+40	0.000E+00	SHORT HLIF
SN-117M	-4.939E+04	1.596E+05	1.612E+05	SHORT HLIF
TE-123M	5.386E-02	1.461E-01	1.481E-01	NOT IDENT.
SB-124	-9.120E-01	2.422E+00	2.457E+00	NOT IDENT.
SB-125	8.443E-02	1.267E-01	1.323E-01	NOT IDENT.
TE-125M	5.334E+02	3.901E+02	4.583E+02	NOT IDENT.
I-126	1.239E+05	1.684E+06	1.685E+06	SHORT HLIF
SB-126	-1.046E+06	2.062E+06	2.115E+06	SHORT HLIF
SN-126	1.573E-01	1.179E-01	1.375E-01	NOT IDENT.
SB-127	5.625E+22	1.369E+23	0.000E+00	SHORT HLIF
I-131	1.357E+09	1.133E+10	1.135E+10	SHORT HLIF
I-132	-1.000E+41	1.902E+42	0.000E+00	SHORT HLIF
TE-132	-7.437E+26	2.459E+27	0.000E+00	SHORT HLIF
BA-133	1.622E-02	4.874E-02	4.929E-02	NOT IDENT.
I-133	-1.000E+41	1.905E+42	0.000E+00	SHORT HLIF
CS-134	6.337E-02	8.347E-02	8.822E-02	FAIL ABUN
CS-135	1.792E-02	1.576E-01	1.578E-01	NOT IDENT.
I-135	-1.000E+41	5.696E+42	0.000E+00	SHORT HLIF
CS-136	-3.287E+05	4.753E+05	4.979E+05	SHORT HLIF
CE-139	9.947E-03	1.365E-01	1.366E-01	NOT IDENT.
BA-140	1.717E+06	2.123E+06	2.259E+06	SHORT HLIF
LA-140	-5.228E+05	7.189E+05	7.565E+05	SHORT HLIF
CE-141	-6.399E+00	3.227E+01	3.240E+01	NOT IDENT.
CE-143	1.000E+41	1.191E+41	0.000E+00	SHORT HLIF
CE-144	9.855E-02	4.739E-01	4.760E-01	NOT IDENT.
PM-144	3.148E-02	6.519E-02	6.672E-02	NOT IDENT.
PR-144	2.710E+00	5.679E+00	5.809E+00	NOT IDENT.
PM-146	3.352E-03	5.285E-02	5.287E-02	NOT IDENT.
ND-147	3.136E+06	6.956E+07	6.957E+07	SHORT HLIF
PM-147	-1.808E+02	1.058E+03	1.062E+03	NOT IDENT.
PM-149	-1.000E+41	1.253E+41	0.000E+00	SHORT HLIF
EU-150	6.617E-03	3.070E-02	3.084E-02	FAIL ABUN
EU-152	-5.155E-02	1.186E-01	1.208E-01	NOT IDENT.
GD-153	-1.069E-01	2.416E-01	2.463E-01	NOT IDENT.
EU-154	2.369E-03	1.204E-01	1.204E-01	NOT IDENT.
EU-155	1.676E-01	1.350E-01	1.547E-01	NOT IDENT.
TB-160	5.871E-01	1.933E+00	1.951E+00	FAIL ABUN
HO-166M	-4.417E-02	6.781E-02	7.067E-02	NOT IDENT.
TM-171	7.814E-01	4.477E+01	4.477E+01	NOT IDENT.
HF-172	3.331E-01	2.825E-01	3.199E-01	FAIL ABUN
LU-172	-3.785E-03	7.576E-02	7.578E-02	FAIL ABUN
LU-176	4.001E-03	2.484E-02	2.491E-02	FAIL ABUN
HF-181	3.763E+00	5.801E+00	6.044E+00	NOT IDENT.
TA-182	-6.339E-01	1.090E+00	1.127E+00	FAIL ABUN
RE-183	-8.362E-01	6.027E+00	6.039E+00	NOT IDENT.

RE-184	-2.181E+01	4.298E+01	4.409E+01	NOT IDENT.
W-188	-1.266E+02	1.546E+02	1.648E+02	NOT IDENT.
IR-192	-9.195E-02	5.635E-01	5.650E-01	FAIL ABUN
HG-203	6.113E-01	3.203E+00	3.215E+00	NOT IDENT.
BI-207	-4.214E-02	4.516E-02	4.900E-02	FAIL ABUN
PB-210	1.356E+00	1.040E+01	1.042E+01	NOT IDENT.
BI-211	3.106E+00	5.925E-01	1.521E+00	FAIL ABUN
PB-211	-1.771E-01	7.766E-01	7.807E-01	NOT IDENT.
BI-212	1.169E+00	7.697E-01	9.328E-01	NOT IDENT.
RN-219	1.888E-02	4.558E-01	4.559E-01	FAIL ABUN
RA-223	-3.368E-01	7.017E-01	7.179E-01	FAIL ABUN
AC-227	-3.623E-02	2.457E-01	2.462E-01	FAIL ABUN
TH-227	-3.623E-02	2.457E-01	2.462E-01	FAIL ABUN
TH-229	3.743E-02	5.301E-01	5.304E-01	FAIL ABUN
PA-231	5.779E-01	5.082E-01	5.711E-01	NOT IDENT.
TH-231	-3.368E-01	7.017E-01	7.179E-01	FAIL ABUN
PA-233	4.165E-02	6.753E-02	7.009E-02	FAIL ABUN
PA-234	-1.260E-01	3.274E-01	3.323E-01	FAIL ABUN
PA-234M	1.419E+00	4.282E+00	4.329E+00	NOT IDENT.
TH-234	-2.028E+00	2.134E+00	2.321E+00	FAIL ABUN
NP-237	4.165E-02	6.753E-02	7.009E-02	FAIL ABUN
NP-238	-1.000E+41	3.908E+41	0.000E+00	SHORT HLIF
U-238	-2.028E+00	2.134E+00	2.321E+00	FAIL ABUN
NP-239	2.873E-02	3.333E-01	3.335E-01	NOT IDENT.
PU-239	3.179E+02	4.289E+02	4.522E+02	NOT IDENT.
AM-241	-2.473E-02	2.382E-01	2.384E-01	NOT IDENT.
CM-243	-1.356E-01	1.311E-01	1.447E-01	NOT IDENT.
BK-247	2.219E-03	8.321E-02	8.321E-02	NOT IDENT.
CM-247	2.447E-02	3.995E-02	4.144E-02	NOT IDENT.
CF-249	-2.829E-02	4.996E-02	5.156E-02	NOT IDENT.
CF-251	-2.551E-03	1.168E-01	1.168E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	81.3617	87.09	99.8288	136.47	73.4470
45.60	69.3616	87.57	99.8871	140.51	0.0000
46.54	72.8394	88.03	99.9429	143.76	64.6930
49.72	0.0000	88.34	99.9801	144.24	67.2428
51.35	54.2351	88.47	99.9961	145.44	77.4116
51.87	52.7743	89.96	81.0940	152.43	66.0339
52.39	54.3289	1093.63	81.1599	153.25	0.0000
52.97	55.8913	91.11	0.0000	323.87	62.7439
53.44	57.4459	92.59	94.1075	156.02	0.0000
54.07	56.7480	93.35	94.1909	158.56	0.0000
57.36	0.0000	94.56	62.3499	159.00	57.8910
57.53	63.9085	94.65	62.3562	162.33	70.0033
57.98	65.4759	94.67	62.3578	162.66	0.0000
59.27	74.3794	94.87	62.3721	163.33	81.1690
59.32	83.5401	97.43	84.2091	165.86	76.2001
59.54	73.2654	98.43	65.0351	176.31	69.0706
60.96	74.5708	98.44	65.0359	176.60	0.0000
61.17	78.0372	99.53	81.9977	177.52	55.3086
62.93	90.8994	100.11	80.8445	181.07	0.0000
63.29	97.8550	102.03	66.5067	181.52	52.0135
63.58	85.2279	103.18	93.2275	184.41	57.3418
64.28	72.6333	103.37	87.1919	143.76	61.7473
66.73	80.9898	105.21	54.6045	193.51	66.4830
67.24	99.5746	105.31	54.6106	197.03	81.5652
125.81	90.3684	106.12	72.8778	198.01	63.1926
67.75	90.3773	106.47	76.5505	201.83	75.6892
69.67	101.0780	109.28	58.4996	203.43	67.8465
70.83	96.1976	111.00	84.2464	205.31	74.1135
72.81	71.5662	111.76	0.0000	210.85	65.1035
72.87	85.5750	114.06	78.3911	215.65	72.8753
74.66	81.8822	116.30	0.0000	222.11	61.5935
74.82	81.8999	116.74	83.5193	227.09	53.7390
74.97	81.9164	119.76	72.6868	227.38	54.6452
77.11	82.1487	121.12	74.0195	228.16	0.0000
78.74	87.8116	121.22	74.0268	228.18	60.9485
79.69	87.9193	121.78	59.2544	116.74	60.9485
80.12	84.8260	122.06	58.0361	235.69	58.0982
80.19	0.0000	122.92	85.2740	235.96	58.1080
80.57	103.7360	123.07	85.2866	238.63	47.8307
81.00	89.6389	265.00	66.7860	238.98	0.0000
81.07	89.6470	125.81	53.2924	240.99	47.9035
81.75	80.2800	127.23	86.8741	242.00	47.9342
83.79	104.1583	127.91	99.3503	244.70	54.3591
84.00	102.6066	129.30	83.3165	252.40	0.0000
85.43	98.0449	131.20	83.4678	252.80	43.7090
86.55	99.7628	133.02	81.1151	254.15	0.0000
86.79	99.7923	133.52	76.1588	256.23	46.5396
86.94	99.8109	136.00	72.5805	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	50.4491	355.39	0.0000	584.27	24.3720
264.80	48.6189	356.01	28.9227	595.83	0.0000
265.00	48.6243	364.49	0.0000	427.87	15.9851
268.22	38.6068	366.42	0.0000	602.52	0.0000
269.46	40.0157	372.51	36.9316	604.72	30.4146
270.03	42.3295	375.05	29.1919	607.14	24.0317
271.23	42.3595	377.52	36.0455	609.32	25.6533
273.65	0.0000	356.01	34.1996	610.33	22.4543
276.40	43.4132	388.16	39.6538	614.28	19.2722
277.37	54.5287	388.63	0.0000	618.01	17.1523
277.60	52.6872	391.69	34.3250	620.36	7.5101
278.00	49.9252	264.66	36.4369	621.93	24.6892
279.20	49.9603	401.81	34.4852	630.19	0.0000
279.54	59.2240	402.40	26.6100	631.29	21.5365
279.70	59.2292	404.85	34.5329	633.25	19.3953
280.46	61.1069	410.95	29.6814	634.78	0.0000
283.69	38.9597	413.71	29.7180	635.95	18.3344
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	48.2834	423.72	0.0000	645.85	23.8038
285.90	0.0000	427.09	31.8874	657.76	14.6640
287.50	31.6073	427.87	26.9143	657.90	0.0000
290.67	53.0850	433.94	27.9846	661.66	19.5762
293.27	0.0000	439.40	29.0525	664.57	0.0000
351.93	46.2189	453.88	29.2313	666.33	0.0000
295.96	46.2381	463.37	29.3469	666.50	0.0000
879.38	33.6768	468.07	27.3763	667.71	0.0000
299.98	39.3203	473.00	0.0000	677.62	14.2108
300.09	39.3229	475.06	23.3870	685.70	0.0000
300.13	39.3237	476.78	24.4209	695.00	0.0000
301.36	26.7019	477.60	23.4113	696.49	16.4941
302.85	40.7892	482.18	21.4149	696.51	16.4941
256.23	30.9717	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	20.8980
306.78	31.9504	497.08	19.4905	697.49	24.1995
308.46	43.2663	505.52	30.8765	702.65	19.8311
311.90	34.8667	507.63	0.0000	706.68	25.3706
316.51	40.6213	511.00	24.7539	711.68	23.2003
319.41	0.0000	514.00	27.8800	720.70	0.0000
320.08	0.0000	514.00	27.8800	721.93	0.0000
321.04	40.7193	520.40	18.6328	722.78	9.9767
323.87	48.3676	520.69	0.0000	722.91	16.6284
325.23	48.4019	522.65	0.0000	723.31	16.6302
328.76	0.0000	527.90	0.0000	724.19	18.2980
333.37	22.8745	528.26	19.7267	727.33	21.0905
333.97	34.3220	529.59	21.8135	733.00	16.6785
334.37	38.6205	529.87	0.0000	735.93	13.3545
338.28	34.3982	531.02	0.0000	333.97	14.4742
338.32	34.3989	537.26	0.0000	739.50	0.0000
311.90	34.4370	546.56	0.0000	747.24	20.0991
340.48	34.4370	552.55	25.1436	748.06	14.5197
340.55	0.0000	563.25	17.8792	752.31	10.0646
344.28	40.2543	569.33	15.8105	753.82	0.0000
345.93	36.4515	946.00	15.8112	756.73	15.6765
351.06	41.8344	569.70	20.0290	756.80	15.6771
351.93	38.4855	583.19	24.3626	884.68	15.7096

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	25.8226	1274.44	4.2940	1620.50	2.0240
766.42	26.9502	1001.03	8.0607	1621.92	1.0123
766.84	21.3379	1002.74	8.0640	1678.03	0.0000
772.60	0.0000	1004.73	11.6535	1690.97	5.1187
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	2.0714
778.90	11.8330	1028.54	0.0000	1063.66	5.1831
783.70	0.0000	1037.84	11.7440	1771.35	2.0736
785.37	9.0322	1038.76	0.0000	1791.20	0.0000
792.07	10.1807	631.29	10.8625	1808.65	1.0427
794.95	16.9818	1048.07	0.0000	1810.72	0.0000
795.86	16.9861	1049.04	10.8691	1836.06	2.0941
810.06	17.0538	1050.41	9.9667		
810.29	17.0551	1063.66	9.9969		
344.28	17.0557	1077.00	0.0000		
810.76	17.0569	1077.34	14.5859		
815.77	0.0000	1085.87	13.7009		
1048.07	0.0000	1093.63	10.0648		
832.01	13.7256	1099.45	11.9098		
834.85	12.0193	1112.07	12.8618		
835.71	12.0223	1112.84	13.7833		
836.80	0.0000	1115.54	8.8266		
846.75	0.0000	1120.29	11.9645		
846.77	8.2685	1120.55	11.9653		
856.80	0.0000	1221.41	11.9677		
860.56	13.8320	1129.67	7.3779		
871.09	13.8706	1131.51	0.0000		
873.19	13.8784	1147.95	0.0000		
875.33	0.0000	1173.23	19.3629		
879.38	8.1088	1177.95	17.7058		
880.51	16.2222	1189.05	11.2083		
883.24	6.9575	1204.77	18.7427		
884.68	10.4399	1221.41	16.9255		
889.28	10.4528	1231.02	19.7862		
894.76	8.1413	1235.36	0.0000		
898.04	13.9688	1238.28	18.8721		
900.72	3.4945	1260.41	0.0000		
903.28	17.4841	1271.87	4.7501		
911.20	12.2637	1274.44	9.5050		
912.08	12.2667	1274.54	11.4060		
923.98	0.0000	1291.59	7.6299		
926.50	7.9146	1298.22	0.0000		
929.11	14.9596	1312.11	0.0000		
937.49	15.8730	1332.49	10.5750		
944.13	0.0000	1362.66	0.0000		
946.00	15.0229	1365.19	5.8041		
949.00	12.3812	1368.63	0.0000		
667.71	0.0000	1384.29	4.4381		
962.31	17.7454	1408.01	3.9004		
964.08	12.7824	1457.56	0.0000		
966.17	19.8939	1460.82	1.9691		
911.20	24.8845	1489.16	3.1666		
968.97	24.8845	1505.03	5.9539		
983.53	0.0000	1584.12	8.0474		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235045.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM39.CNF;134
Background date : 2-OCT-2016 11:02:13.
Sample date     : 30-NOV-2015 14:15:00 Acquisition date : 3-OCT-2016 06:57:26.
Sample ID      : G405235045 Sample quantity   : 1.30599E+02 GRAM
Detector name  : GAM39 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:06.96 0.2%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1596252 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.69*	45	126	0.82	93.22	90	8	1.25E-02	47.8	
2	0	63.24*	94	265	1.19	126.33	121	12	2.62E-02	37.2	
3	2	74.84*	212	189	1.41	149.51	143	18	5.89E-02	13.3	2.59E+00
4	2	77.22*	319	173	1.27	154.29	143	18	8.87E-02	9.7	
5	2	87.36	77	167	1.42	174.55	171	20	2.14E-02	28.8	2.92E+00
6	2	89.78	71	172	1.28	179.41	171	20	1.97E-02	33.6	
7	2	92.73*	92	132	1.20	185.29	171	20	2.54E-02	26.3	
8	0	98.29	33	128	0.63	196.43	193	8	9.03E-03	62.8	
9	0	129.50	60	137	1.58	258.85	253	13	1.65E-02	42.5	
10	1	185.71*	58	59	1.44	371.26	365	19	1.62E-02	32.2	3.39E+00
11	1	188.58	36	57	1.32	377.00	365	19	9.93E-03	43.3	
12	4	238.76*	293	102	1.27	477.36	473	15	8.14E-02	8.7	1.57E+00
13	4	241.52	110	107	1.92	482.89	473	15	3.06E-02	26.5	
14	0	253.81	31	144	3.13	507.47	496	19	8.58E-03	94.5	
15	0	270.62*	38	124	2.47	541.09	538	13	1.04E-02	63.2	
16	0	295.68*	129	111	1.70	591.20	585	13	3.59E-02	19.2	
17	0	328.16	28	49	0.91	656.17	652	9	7.87E-03	48.4	
18	0	338.56*	53	65	1.51	676.97	671	11	1.47E-02	33.3	
19	0	352.21*	205	83	1.41	704.28	696	16	5.70E-02	12.4	
20	0	402.02	23	34	1.43	803.90	798	11	6.37E-03	54.3	
21	0	405.46	18	8	0.72	810.79	808	6	5.11E-03	33.2	
22	0	511.00*	27	60	1.44	1021.86	1015	15	7.63E-03	73.8	
23	0	518.51	19	35	4.84	1036.89	1031	14	5.28E-03	69.9	
24	0	550.08	43	29	7.41	1100.04	1090	23	1.19E-02	36.1	
25	0	583.56*	119	44	1.97	1167.01	1158	19	3.31E-02	16.9	
26	0	609.72*	104	67	1.67	1219.33	1212	15	2.90E-02	20.0	
27	0	626.25	14	30	0.54	1252.38	1246	13	3.93E-03	83.3	
28	0	634.04	13	18	1.26	1267.96	1262	8	3.63E-03	64.5	
29	0	653.39	8	27	0.93	1306.68	1299	12	2.12E-03	141.4	
30	0	661.71	223	45	1.27	1323.32	1316	14	6.19E-02	9.3	
31	0	731.13	78	48	11.48	1462.16	1446	40	2.16E-02	32.2	
32	0	801.05	6	23	3.85	1602.02	1593	12	1.80E-03	161.8	
33	0	911.52*	63	31	1.45	1822.98	1815	16	1.75E-02	24.4	
34	0	949.47	13	7	2.86	1898.90	1893	10	3.49E-03	49.6	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	1	965.08	24	21	2.03	1930.11	1921	23	6.77E-03	37.6	8.95E-01
36	1	969.68*	25	13	2.03	1939.31	1921	23	6.86E-03	37.1	
37	0	1120.38	26	11	1.89	2240.76	2236	10	7.08E-03	30.6	
38	0	1219.97	9	8	1.03	2439.98	2435	8	2.58E-03	61.8	
39	0	1351.60	7	2	0.80	2703.30	2697	10	1.82E-03	59.6	
40	0	1461.00*	218	3	1.69	2922.13	2916	15	6.05E-02	7.2	
41	0	1764.89*	25	6	2.03	3530.06	3522	12	6.96E-03	28.6	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235045.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 30-NOV-2015 14:15:00 Acquisition date : 3-OCT-2016 06:57:26
Sample ID         : G405235045 Sample quantity   : 130.60 GRAM
Sample type       : SOLID Sample geometry    :
Detector name     : GAMMA39 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:06.96 0.2%
Energy tolerance  : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type   : Linear Efficiencies at   : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	8.983E-01	1.246E+01	1.246E+01	14.40	OK
CD-109	88.03	3.70*	6.753E+00	9.131E-01	1.450E+00	137.17	OK
SN-126	64.28	9.60	6.931E+00	9.550E-01	9.550E-01	74.43	OK
	86.94	8.90	6.753E+00	3.796E-01	3.796E-01	137.17	OK
	87.57	37.00*	6.753E+00	9.131E-02	9.131E-02	137.17	OK
BA-137M	661.66	89.90*	1.758E+00	8.171E-01	8.331E-01	18.55	OK
CS-137	661.66	85.10*	1.758E+00	8.632E-01	8.801E-01	18.55	OK
TL-208	277.37	6.60	3.709E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	1.952E+00	4.201E-01	4.201E-01	33.77	OK
	860.56	12.50	1.416E+00	-----	Line Not Found	-----	Absent
PB-210	46.54	4.25*	6.835E+00	1.060E+00	1.088E+00	95.59	OK
PB-212	74.82	10.28	6.812E+00	1.330E+00	1.330E+00	44.93	OK
	77.11	17.10	6.799E+00	1.830E+00	1.830E+00	19.49	OK
	238.63	43.60*	4.209E+00	9.906E-01	9.906E-01	17.39	OK
	300.09	3.30	3.465E+00	-----	Line Not Found	-----	Absent
BI-214	609.32	45.49*	1.882E+00	7.116E-01	7.119E-01	40.00	OK
	1120.29	14.92	1.136E+00	8.399E-01	8.402E-01	61.26	OK
	1764.49	15.30	7.483E-01	1.182E+00	1.182E+00	57.30	OK
PB-214	74.82	5.80	6.812E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	6.799E+00	3.226E+00	3.227E+00	19.49	OK
	87.09	3.41	6.755E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	4.163E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	3.510E+00	1.225E+00	1.226E+00	38.30	OK
	351.93	35.60*	3.012E+00	1.158E+00	1.159E+00	24.76	OK
RN-219	271.23	10.80	3.788E+00	5.644E-01	5.644E-01	126.49	OK
	401.81	6.60*	2.683E+00	7.771E-01	7.771E-01	108.62	OK
RN-222	609.32	45.49*	1.882E+00	7.116E-01	7.119E-01	40.00	OK
	1120.29	14.92	1.136E+00	8.399E-01	8.402E-01	61.26	OK
	1764.49	15.30	7.483E-01	1.182E+00	1.182E+00	57.30	OK
RA-224	240.99	4.10*	4.170E+00	1.830E+00	1.830E+00	124.19	OK
RA-226	609.32	45.49*	1.882E+00	7.116E-01	7.119E-01	40.00	OK
	1120.29	14.92	1.136E+00	8.399E-01	8.402E-01	61.26	OK
	1764.49	15.30	7.483E-01	1.182E+00	1.182E+00	57.30	OK
AC-228	105.21	1.10	6.612E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.118E+00	9.148E-01	9.148E-01	66.59	OK
	794.95	4.25	1.512E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.451E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.351E+00	1.024E+00	1.024E+00	48.76	OK
	968.97	15.80	1.283E+00	6.878E-01	6.878E-01	74.10	OK
RA-228	105.21	1.10	6.612E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.118E+00	9.148E-01	9.148E-01	66.59	OK
	794.95	4.25	1.512E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.451E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.351E+00	1.024E+00	1.024E+00	48.76	OK
	968.97	15.80	1.283E+00	6.878E-01	6.878E-01	74.10	OK
TH-228	74.82	10.28	6.812E+00	1.330E+00	1.330E+00	44.93	OK
	77.11	17.10	6.799E+00	1.830E+00	1.830E+00	19.49	OK
	238.63	43.60*	4.209E+00	9.906E-01	9.906E-01	17.39	OK
	300.09	3.30	3.465E+00	-----	Line Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	609.32	45.49*	1.882E+00	7.116E-01	7.116E-01	40.00	OK
	1120.29	14.92	1.136E+00	8.399E-01	8.399E-01	61.26	OK
	1764.49	15.30	7.483E-01	1.182E+00	1.182E+00	57.30	OK
TH-232	105.21	1.10	6.612E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.118E+00	9.148E-01	9.148E-01	66.59	OK
	835.71	1.61	1.451E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.351E+00	1.024E+00	1.024E+00	48.76	OK
	968.97	15.80	1.283E+00	6.878E-01	6.878E-01	74.10	OK
TH-234	63.29	3.70*	6.931E+00	2.478E+00	2.478E+00	74.43	OK
	92.59	4.23	6.723E+00	2.120E+00	2.120E+00	52.64	OK
U-234	609.32	45.49*	1.882E+00	7.116E-01	7.116E-01	40.00	OK
	1120.29	14.92	1.136E+00	8.399E-01	8.399E-01	61.26	OK
	1764.49	15.30	7.483E-01	1.182E+00	1.182E+00	57.30	OK
U-235	89.96	3.47	6.741E+00	2.003E+00	2.003E+00	67.29	OK
	93.35	5.60	6.723E+00	1.602E+00	1.602E+00	52.64	OK
	143.76	10.96*	5.959E+00	-----	Line Not Found	-----	Absent
	163.33	5.08	5.556E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	5.108E+00	1.256E-01	1.256E-01	64.32	OK
U-238	205.31	5.01	4.746E+00	-----	Line Not Found	-----	Absent
	63.29	3.70*	6.931E+00	2.478E+00	2.478E+00	74.43	OK
	92.59	4.23	6.723E+00	2.120E+00	2.120E+00	52.64	OK
AM-243	43.53	5.90	6.236E+00	-----	Line Not Found	-----	Absent
	74.66	67.20*	6.812E+00	2.035E-01	2.035E-01	44.93	OK
CM-247	278.00	3.40	3.702E+00	-----	Line Not Found	-----	Absent
	287.50	2.00	3.596E+00	-----	Line Not Found	-----	Absent
	402.40	72.00*	2.683E+00	7.124E-02	7.124E-02	108.62	OK
ANH-511	511.00	100.00*	2.183E+00	7.425E-02	7.425E-02	147.59	OK

Flag: "*" = Keyline

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235045.CNF;1
* Acquisition date   : 3-OCT-2016 06:57:26 Sensitivity      : 3.000
* Detector ID       : GAM39 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:06.96 Half life ratio : *****
* Sample date       : 30-NOV-2015 14:15:00 Analyst initials: MXR1
* Sample ID         : G405235045 Sample Quantity : 1.3060E+02 GRAM
* Batch Number      : 1596252 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 27-JUL-2016 13:04:01 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM39_CAN.CNF;4
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.246E+01	1.759E+00	9.655E-01
CD-109	1.450E+00	1.949E+00	2.011E+00
SN-126	9.131E-02	1.227E-01	1.266E-01
BA-137M	8.331E-01	1.515E-01	8.879E-02
CS-137	8.801E-01	1.600E-01	9.379E-02
TL-208	4.201E-01	1.390E-01	8.596E-02
PB-210	1.088E+00	1.019E+00	1.013E+00
PB-212	9.906E-01	1.688E-01	1.370E-01
BI-214	7.119E-01	2.791E-01	1.914E-01
PB-214	1.159E+00	2.811E-01	1.463E-01
RN-219	7.771E-01	8.272E-01	8.942E-01
RN-222	7.119E-01	2.791E-01	1.914E-01
RA-224	1.830E+00	2.228E+00	1.470E+00
RA-226	7.119E-01	2.791E-01	1.914E-01
AC-228	1.024E+00	4.895E-01	3.751E-01
RA-228	1.024E+00	4.895E-01	3.751E-01
TH-228	9.906E-01	1.688E-01	1.370E-01
TH-230	7.116E-01	2.790E-01	1.913E-01
TH-232	1.024E+00	4.895E-01	3.751E-01
TH-234	2.478E+00	1.807E+00	1.248E+00
U-234	7.116E-01	2.790E-01	1.913E-01
U-235	-1.990E-01	1.996E-01	3.622E-01
U-238	2.478E+00	1.807E+00	1.248E+00
AM-243	2.035E-01	8.962E-02	6.731E-02
CM-247	7.124E-02	7.583E-02	8.208E-02
ANH-511	7.425E-02	1.074E-01	6.394E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.751E+00		2.149E+01	4.017E+01	NOT IDENT.
NA-22	4.445E-02		5.918E-02	1.349E-01	NOT IDENT.
NA-24	0.000E+00		1.432E+41	0.000E+00	SHORT HLIF
AL-26	-8.668E-03		1.699E-02	2.134E-02	NOT IDENT.

SC-46	-5.846E-02	5.860E-01	1.146E+00	FAIL ABUN
V-48	0.000E+00	3.139E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	6.613E+02	0.000E+00	SHORT HLIF
MN-54	1.545E-02	8.954E-02	1.816E-01	NOT IDENT.
CO-56	4.078E-01	6.426E-01	1.407E+00	NOT IDENT.
MN-56	0.000E+00	1.576E+41	0.000E+00	SHORT HLIF
CO-57	-3.654E-03	5.449E-02	9.604E-02	NOT IDENT.
CO-58	-4.402E-01	7.885E-01	1.456E+00	NOT IDENT.
FE-59	2.037E+00	9.875E+00	2.042E+01	NOT IDENT.
CO-60	3.264E-02	5.325E-02	1.195E-01	NOT IDENT.
ZN-65	1.253E-01	2.324E-01	4.662E-01	NOT IDENT.
GE-68	6.924E-01	2.970E+00	6.224E+00	NOT IDENT.
AS-73	-4.170E-01	3.118E+00	5.609E+00	NOT IDENT.
AS-74	0.000E+00	1.086E+04	0.000E+00	SHORT HLIF
SE-75	-2.095E-01	2.733E-01	4.849E-01	FAIL ABUN
BR-77	0.000E+00	3.012E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	1.209E+03	0.000E+00	SHORT HLIF
RB-83	-3.386E-01	1.046E+00	1.656E+00	NOT IDENT.
KR-85	1.421E+01	1.096E+01	1.978E+01	NOT IDENT.
SR-85	1.628E+00	1.257E+00	2.269E+00	NOT IDENT.
RB-86	0.000E+00	4.581E+04	0.000E+00	SHORT HLIF
Y-88	-1.176E-01	2.608E-01	4.803E-01	NOT IDENT.
Y-91	6.397E+02	8.695E+02	1.859E+03	NOT IDENT.
NB-94	-1.941E-02	4.900E-02	8.496E-02	NOT IDENT.
NB-95	7.626E-02	1.446E+00	2.664E+00	NOT IDENT.
NB-95M	1.422E+00	3.906E+00	6.866E+00	NOT IDENT.
ZR-95	-2.056E-01	1.979E+00	3.678E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.815E+33	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-4.958E-03	4.141E-02	6.638E-02	NOT IDENT.
RH-102	7.185E-02	1.172E-01	1.808E-01	NOT IDENT.
RU-103	2.587E+00	9.471E+00	1.836E+01	FAIL ABUN
RH-106	1.318E-01	7.418E-01	1.294E+00	NOT IDENT.
RU-106	1.318E-01	7.418E-01	1.294E+00	NOT IDENT.
AG-108M	-6.352E-03	3.896E-02	7.200E-02	NOT IDENT.
AG-110M	-5.919E-03	1.410E-01	2.799E-01	NOT IDENT.
SN-113	6.530E-02	3.406E-01	6.542E-01	NOT IDENT.
CD-115	0.000E+00	5.024E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.651E+05	0.000E+00	SHORT HLIF
TE-123M	3.697E-02	1.543E-01	3.045E-01	NOT IDENT.
SB-124	1.262E+00	3.157E+00	7.318E+00	NOT IDENT.
SB-125	2.918E-02	1.279E-01	2.511E-01	NOT IDENT.
TE-125M	1.444E+02	3.487E+02	6.389E+02	NOT IDENT.
I-126	0.000E+00	2.273E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	3.068E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.232E+23	0.000E+00	SHORT HLIF
I-131	0.000E+00	1.435E+10	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.922E+27	0.000E+00	SHORT HLIF
BA-133	1.791E-03	5.375E-02	9.266E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	8.342E-02	9.081E-02	1.777E-01	FAIL ABUN
CS-135	1.249E-02	2.037E-01	3.500E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	6.216E+05	0.000E+00	SHORT HLIF
CE-139	-5.362E-02	1.317E-01	2.472E-01	NOT IDENT.
BA-140	0.000E+00	3.037E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	1.052E+06	0.000E+00	SHORT HLIF
CE-141	-2.619E+01	3.200E+01	5.883E+01	NOT IDENT.
CE-143	0.000E+00	1.346E+41	0.000E+00	SHORT HLIF
CE-144	-1.957E-01	4.220E-01	7.114E-01	NOT IDENT.
PM-144	-2.872E-03	8.994E-02	1.642E-01	NOT IDENT.
PR-144	3.310E-01	7.749E+00	1.431E+01	NOT IDENT.
PM-146	9.024E-03	6.539E-02	1.242E-01	FAIL ABUN
ND-147	0.000E+00	8.100E+07	0.000E+00	SHORT HLIF
PM-147	-9.931E+01	9.089E+02	1.598E+03	NOT IDENT.
PM-149	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
EU-150	-1.350E-02	4.044E-02	6.529E-02	FAIL ABUN
EU-152	7.796E-02	1.224E-01	2.469E-01	FAIL ABUN
GD-153	2.676E-01	3.293E-01	3.699E-01	FAIL ABUN
EU-154	1.120E-01	1.453E-01	3.316E-01	NOT IDENT.
EU-155	1.119E-01	1.167E-01	2.243E-01	FAIL ABUN
TB-160	3.131E-01	2.750E+00	5.584E+00	FAIL ABUN
HO-166M	-5.493E-02	8.688E-02	1.449E-01	FAIL ABUN
TM-171	-4.845E+00	6.447E+00	1.105E+01	NOT IDENT.
HF-172	-9.526E-02	2.935E-01	4.588E-01	FAIL ABUN

LU-172	8.858E-02	1.092E-01	2.413E-01	FAIL ABUN
LU-176	-1.185E-03	3.308E-02	6.085E-02	FAIL ABUN
HF-181	-2.819E+00	6.867E+00	1.225E+01	NOT IDENT.
TA-182	1.167E+00	1.413E+00	2.752E+00	FAIL ABUN
RE-183	-2.629E-01	1.463E+00	2.617E+00	NOT IDENT.
RE-184	-1.577E+01	4.880E+01	9.253E+01	NOT IDENT.
W-188	-9.552E+01	2.001E+02	3.197E+02	FAIL ABUN
IR-192	1.602E-01	6.201E-01	1.215E+00	FAIL ABUN
HG-203	-6.154E-01	3.619E+00	6.762E+00	NOT IDENT.
BI-207	1.393E-02	6.840E-02	1.392E-01	FAIL ABUN
BI-211	0.000E+00	7.743E-01	1.056E+00	FAIL ABUN
PB-211	1.095E+00	7.122E-01	1.517E+00	FAIL ABUN
BI-212	6.161E-01	8.263E-01	1.649E+00	NOT IDENT.
RA-223	1.374E-01	8.338E-01	1.453E+00	FAIL ABUN
AC-227	-1.511E-01	3.262E-01	5.279E-01	NOT IDENT.
TH-227	-1.511E-01	3.262E-01	5.279E-01	NOT IDENT.
TH-229	1.256E-01	6.026E-01	1.067E+00	FAIL ABUN
PA-231	7.262E-01	6.223E-01	1.248E+00	NOT IDENT.
TH-231	1.374E-01	8.338E-01	1.453E+00	FAIL ABUN
PA-233	-1.932E-02	7.146E-02	1.329E-01	NOT IDENT.
PA-234	-3.674E-01	4.776E-01	6.938E-01	FAIL ABUN
PA-234M	-2.144E+00	6.396E+00	1.208E+01	NOT IDENT.
NP-237	-1.932E-02	7.146E-02	1.329E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	-5.772E-02	2.933E-01	5.093E-01	FAIL ABUN
PU-239	0.000E+00	8.128E+02	7.298E+02	FAIL ABUN
AM-241	3.412E-03	7.181E-02	1.204E-01	NOT IDENT.
CM-243	-3.753E-02	1.064E-01	1.836E-01	FAIL ABUN
BK-247	-5.036E-02	9.351E-02	1.696E-01	NOT IDENT.
CF-249	-7.312E-03	4.930E-02	9.183E-02	FAIL ABUN
CF-251	-6.946E-03	1.387E-01	2.661E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	208	10.66*	8.983E-01	1.246E+01	1.246E+01	14.40
CD-109	88.03	89	3.70*	6.753E+00	2.042E+00	3.242E+00	57.56
SN-126	64.28	111	9.60	6.931E+00	9.550E-01	9.550E-01	74.43
	86.94	89	8.90	6.753E+00	8.490E-01	8.490E-01	57.56
	87.57	89	37.00*	6.753E+00	2.042E-01	2.042E-01	57.56
BA-137M	661.66	225	89.90*	1.758E+00	8.171E-01	8.331E-01	18.55
CS-137	661.66	225	85.10*	1.758E+00	8.632E-01	8.801E-01	18.55
TL-208	277.37	-----	6.60	3.709E+00	-----	Line Not Found	-----
	583.19	121	85.00*	1.952E+00	4.201E-01	4.201E-01	33.77
	860.56	-----	12.50	1.416E+00	-----	Line Not Found	-----
PB-210	46.54	54	4.25*	6.835E+00	1.060E+00	1.088E+00	95.59
BI-211	72.87	-----	1.23	6.824E+00	-----	Line Not Found	-----
	351.06	216	12.92*	3.012E+00	3.191E+00	3.191E+00	24.76
PB-212	74.82	246	10.28	6.812E+00	2.022E+00	2.022E+00	26.51
	77.11	370	17.10	6.799E+00	1.830E+00	1.830E+00	19.49
	238.63	316	43.60*	4.209E+00	9.906E-01	9.906E-01	17.39
	300.09	-----	3.30	3.465E+00	-----	Line Not Found	-----
BI-214	609.32	106	45.49*	1.882E+00	7.116E-01	7.119E-01	40.00
	1120.29	25	14.92	1.136E+00	8.399E-01	8.402E-01	61.26
	1764.49	24	15.30	7.483E-01	1.182E+00	1.182E+00	57.30
PB-214	74.82	246	5.80	6.812E+00	3.583E+00	3.584E+00	26.51
	77.11	370	9.70	6.799E+00	3.226E+00	3.227E+00	19.49
	87.09	89	3.41	6.753E+00	2.216E+00	2.217E+00	57.56
	242.00	119	7.25	4.170E+00	2.260E+00	2.261E+00	52.95
	295.22	138	18.42	3.510E+00	1.225E+00	1.226E+00	38.30
	351.93	216	35.60*	3.012E+00	1.158E+00	1.159E+00	24.76
RN-219	271.23	40	10.80	3.788E+00	5.644E-01	5.644E-01	126.49
	401.81	24	6.60*	2.683E+00	7.771E-01	7.771E-01	108.62
RN-222	609.32	106	45.49*	1.882E+00	7.116E-01	7.119E-01	40.00
	1120.29	25	14.92	1.136E+00	8.399E-01	8.402E-01	61.26
	1764.49	24	15.30	7.483E-01	1.182E+00	1.182E+00	57.30
RA-224	240.99	119	4.10*	4.170E+00	3.997E+00	3.997E+00	52.95
RA-226	609.32	106	45.49*	1.882E+00	7.116E-01	7.119E-01	40.00
	1120.29	25	14.92	1.136E+00	8.399E-01	8.402E-01	61.26
	1764.49	24	15.30	7.483E-01	1.182E+00	1.182E+00	57.30
AC-228	105.21	-----	1.10	6.612E+00	-----	Line Not Found	-----
	338.32	56	11.27	3.118E+00	9.148E-01	9.148E-01	66.59
	794.95	-----	4.25	1.512E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.451E+00	-----	Line Not Found	-----
	911.20	62	25.80*	1.351E+00	1.024E+00	1.024E+00	48.76
	968.97	24	15.80	1.283E+00	6.878E-01	6.878E-01	74.10
RA-228	105.21	-----	1.10	6.612E+00	-----	Line Not Found	-----
	338.32	56	11.27	3.118E+00	9.148E-01	9.148E-01	66.59
	794.95	-----	4.25	1.512E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.451E+00	-----	Line Not Found	-----
	911.20	62	25.80*	1.351E+00	1.024E+00	1.024E+00	48.76
	968.97	24	15.80	1.283E+00	6.878E-01	6.878E-01	74.10

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	74.82	246	10.28	6.812E+00	2.022E+00	2.022E+00	26.51
	77.11	370	17.10	6.799E+00	1.830E+00	1.830E+00	19.49
	238.63	316	43.60*	4.209E+00	9.906E-01	9.906E-01	17.39
	300.09	-----	3.30	3.465E+00	-----	Line Not Found	-----
TH-230	609.32	106	45.49*	1.882E+00	7.116E-01	7.116E-01	40.00
	1120.29	25	14.92	1.136E+00	8.399E-01	8.399E-01	61.26
	1764.49	24	15.30	7.483E-01	1.182E+00	1.182E+00	57.30
TH-232	105.21	-----	1.10	6.612E+00	-----	Line Not Found	-----
	338.32	56	11.27	3.118E+00	9.148E-01	9.148E-01	66.59
	835.71	-----	1.61	1.451E+00	-----	Line Not Found	-----
	911.20	62	25.80*	1.351E+00	1.024E+00	1.024E+00	48.76
TH-234	968.97	24	15.80	1.283E+00	6.878E-01	6.878E-01	74.10
	63.29	111	3.70*	6.931E+00	2.478E+00	2.478E+00	74.43
	92.59	105	4.23	6.723E+00	2.120E+00	2.120E+00	52.64
U-234	609.32	106	45.49*	1.882E+00	7.116E-01	7.116E-01	40.00
	1120.29	25	14.92	1.136E+00	8.399E-01	8.399E-01	61.26
	1764.49	24	15.30	7.483E-01	1.182E+00	1.182E+00	57.30
U-235	89.96	81	3.47	6.741E+00	2.003E+00	2.003E+00	67.29
	93.35	105	5.60	6.723E+00	1.602E+00	1.602E+00	52.64
	143.76	-----	10.96*	5.959E+00	-----	Line Not Found	-----
	163.33	-----	5.08	5.556E+00	-----	Line Not Found	-----
	185.72	64	57.20	5.108E+00	1.256E-01	1.256E-01	64.32
U-238	205.31	-----	5.01	4.746E+00	-----	Line Not Found	-----
	63.29	111	3.70*	6.931E+00	2.478E+00	2.478E+00	74.43
	92.59	105	4.23	6.723E+00	2.120E+00	2.120E+00	52.64
AM-243	43.53	-----	5.90	6.236E+00	-----	Line Not Found	-----
	74.66	246	67.20*	6.812E+00	3.093E-01	3.093E-01	26.51
CM-247	278.00	-----	3.40	3.702E+00	-----	Line Not Found	-----
	287.50	-----	2.00	3.596E+00	-----	Line Not Found	-----
	402.40	24	72.00*	2.683E+00	7.124E-02	7.124E-02	108.62
ANH-511	511.00	28	100.00*	2.183E+00	7.425E-02	7.425E-02	147.59

Flag: "*" = Keyline

Total number of lines in spectrum 41
 Number of unidentified lines 7
 Number of lines tentatively identified by NID 34 82.93%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.246E+01	1.246E+01	0.179E+01	14.40	
CD-109	461.40D	1.59	2.042E+00	3.242E+00	1.866E+00	57.56	
SN-126	2.30E+05Y	1.00	2.042E-01	2.042E-01	1.175E-01	57.56	
BA-137M	30.08Y	1.02	8.171E-01	8.331E-01	1.546E-01	18.55	
CS-137	30.08Y	1.02	8.632E-01	8.801E-01	1.633E-01	18.55	
TL-208	1.41E+10Y	1.00	4.201E-01	4.201E-01	1.419E-01	33.77	
PB-210	22.20Y	1.03	1.060E+00	1.088E+00	1.040E+00	95.59	
BI-211	7.04E+08Y	1.00	3.191E+00	3.191E+00	0.790E+00	24.76	
PB-212	1.41E+10Y	1.00	9.906E-01	9.906E-01	1.723E-01	17.39	
BI-214	1600.00Y	1.00	7.116E-01	7.119E-01	2.848E-01	40.00	
PB-214	1600.00Y	1.00	1.158E+00	1.159E+00	0.287E+00	24.76	
RN-219	7.04E+08Y	1.00	7.771E-01	7.771E-01	8.441E-01	108.62	
RN-222	1600.00Y	1.00	7.116E-01	7.119E-01	2.848E-01	40.00	
RA-224	1.41E+10Y	1.00	3.997E+00	3.997E+00	2.116E+00	52.95	
RA-226	1600.00Y	1.00	7.116E-01	7.119E-01	2.848E-01	40.00	
AC-228	1.41E+10Y	1.00	1.024E+00	1.024E+00	0.499E+00	48.76	
RA-228	1.41E+10Y	1.00	1.024E+00	1.024E+00	0.499E+00	48.76	
TH-228	1.41E+10Y	1.00	9.906E-01	9.906E-01	1.723E-01	17.39	
TH-230	7.54E+04Y	1.00	7.116E-01	7.116E-01	2.847E-01	40.00	
TH-232	1.41E+10Y	1.00	1.024E+00	1.024E+00	0.499E+00	48.76	
TH-234	4.47E+09Y	1.00	2.478E+00	2.478E+00	1.844E+00	74.43	
U-234	2.45E+05Y	1.00	7.116E-01	7.116E-01	2.847E-01	40.00	
U-235	7.04E+08Y	1.00	1.256E-01	1.256E-01	0.808E-01	64.32	K
U-238	4.47E+09Y	1.00	2.478E+00	2.478E+00	1.844E+00	74.43	
AM-243	7370.00Y	1.00	3.093E-01	3.093E-01	0.820E-01	26.51	
CM-247	1.56E+07Y	1.00	7.124E-02	7.124E-02	7.738E-02	108.62	
ANH-511	1.00E+09Y	1.00	7.425E-02	7.425E-02	10.96E-02	147.59	
Total Activity :			4.114E+01	4.240E+01			

Grand Total Activity : 4.114E+01 4.240E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	98.29	37	147	0.63	196.43	193	8	9.03E-03	****	6.68E+00	T
0	129.50	67	153	1.58	258.85	253	13	1.65E-02	85.0	6.24E+00	T
1	188.58	39	62	1.32	377.00	365	19	9.93E-03	86.7	5.05E+00	
0	253.81	33	155	3.13	507.47	496	19	8.58E-03	****	4.00E+00	T
0	328.16	30	51	0.91	656.17	652	9	7.87E-03	96.9	3.20E+00	T
0	405.46	19	8	0.72	810.79	808	6	5.11E-03	66.4	2.66E+00	T
0	518.51	19	36	4.84	1036.89	1031	14	5.28E-03	****	2.16E+00	
0	550.08	44	30	7.41	1100.04	1090	23	1.19E-02	72.2	2.05E+00	
0	626.25	14	30	0.54	1252.38	1246	13	3.93E-03	****	1.84E+00	
0	634.04	13	18	1.26	1267.96	1262	8	3.63E-03	****	1.82E+00	T
0	653.39	8	28	0.93	1306.68	1299	12	2.12E-03	****	1.78E+00	
0	731.13	78	48	11.48	1462.16	1446	40	2.16E-02	64.5	1.62E+00	
0	801.05	6	22	3.85	1602.02	1593	12	1.80E-03	****	1.50E+00	T
0	949.47	12	7	2.86	1898.90	1893	10	3.49E-03	99.2	1.31E+00	T
1	965.08	24	21	2.03	1930.11	1921	23	6.77E-03	75.2	1.29E+00	T
0	1219.97	9	7	1.03	2439.98	2435	8	2.58E-03	****	1.06E+00	T
0	1351.60	6	2	0.80	2703.30	2697	10	1.82E-03	****	9.64E-01	

Flags: "T" = Tentatively associated


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*****
*                               GEL Laboratories LLC                       *
*                               2040 Savage Road                          *
*                               Charleston, SC 29407                      *
*****
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DETECTOR AND SAMPLE DATA

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* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235045.CNF;1
* Acquisition date   : 3-OCT-2016 06:57:26 Sensitivity      : 3.000
* Detector ID        : GAM39 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:06.96 Half life ratio  : *****
* Sample date        : 30-NOV-2015 14:15:00 Nuclide Library : SOLID
* Sample ID          : G405235045 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity : 1.3060E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight       : 0.00000
*****
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CALIBRATION INFORMATION

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* Eff. Cal. date    : 27-JUL-2016 13:04:01 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM39_CAN.CNF;4
*****
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	4.016E-01
CD-109	9.544E-01
SN-126	6.008E-02
BA-137M	3.932E-02
CS-137	4.154E-02
TL-208	3.823E-02
PB-210	4.774E-01
PB-212	6.418E-02
BI-214	8.649E-02
PB-214	6.573E-02
RN-219	4.024E-01
RN-222	8.649E-02
RA-224	6.886E-01
RA-226	8.649E-02
AC-228	1.651E-01
RA-228	1.651E-01
TH-228	6.418E-02
TH-230	8.646E-02
TH-232	1.651E-01
TH-234	5.923E-01
U-234	8.646E-02
U-235	1.688E-01
U-238	5.923E-01
AM-243	3.189E-02
CM-247	3.694E-02
ANH-511	2.835E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.828E+01	NOT IDENT.
NA-22	5.784E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	0.000E+00	NOT IDENT.
SC-46	5.007E-01	FAIL ABUN

V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	8.010E-02	NOT IDENT.
CO-56	6.172E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.478E-02	NOT IDENT.
CO-58	6.206E-01	NOT IDENT.
FE-59	8.768E+00	NOT IDENT.
CO-60	5.086E-02	NOT IDENT.
ZN-65	2.007E-01	NOT IDENT.
GE-68	2.659E+00	NOT IDENT.
AS-73	2.646E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	2.217E-01	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	7.310E-01	NOT IDENT.
KR-85	9.005E+00	NOT IDENT.
SR-85	1.033E+00	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.597E-01	NOT IDENT.
Y-91	8.218E+02	NOT IDENT.
NB-94	3.778E-02	NOT IDENT.
NB-95	1.191E+00	NOT IDENT.
NB-95M	3.222E+00	NOT IDENT.
ZR-95	1.582E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.094E-02	NOT IDENT.
RH-102	8.143E-02	NOT IDENT.
RU-103	8.293E+00	FAIL ABUN
RH-106	5.710E-01	NOT IDENT.
RU-106	5.710E-01	NOT IDENT.
AG-108M	3.251E-02	NOT IDENT.
AG-110M	1.216E-01	NOT IDENT.
SN-113	2.988E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.421E-01	NOT IDENT.
SB-124	2.937E+00	NOT IDENT.
SB-125	1.126E-01	NOT IDENT.
TE-125M	3.008E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.180E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	8.080E-02	FAIL ABUN
CS-135	1.620E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	1.150E-01	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.743E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.308E-01	NOT IDENT.
PM-144	7.367E-02	NOT IDENT.
PR-144	6.419E+00	NOT IDENT.
PM-146	5.651E-02	FAIL ABUN
ND-147	0.000E+00	SHORT HLIF
PM-147	7.439E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.998E-02	FAIL ABUN
EU-152	1.133E-01	FAIL ABUN
GD-153	1.749E-01	FAIL ABUN
EU-154	1.424E-01	NOT IDENT.
EU-155	1.056E-01	FAIL ABUN
TB-160	2.434E+00	FAIL ABUN
HO-166M	6.366E-02	FAIL ABUN
TM-171	5.196E+00	NOT IDENT.
HF-172	2.140E-01	FAIL ABUN
LU-172	1.061E-01	FAIL ABUN

LU-176	2.793E-02	FAIL ABUN
HF-181	5.468E+00	NOT IDENT.
TA-182	1.200E+00	FAIL ABUN
RE-183	1.238E+00	NOT IDENT.
RE-184	4.001E+01	NOT IDENT.
W-188	1.480E+02	FAIL ABUN
IR-192	5.550E-01	FAIL ABUN
HG-203	3.123E+00	NOT IDENT.
BI-207	6.061E-02	FAIL ABUN
BI-211	5.080E-01	FAIL ABUN
PB-211	6.800E-01	FAIL ABUN
BI-212	7.520E-01	NOT IDENT.
RA-223	6.649E-01	FAIL ABUN
AC-227	2.428E-01	NOT IDENT.
TH-227	2.428E-01	NOT IDENT.
TH-229	4.967E-01	FAIL ABUN
PA-231	5.811E-01	NOT IDENT.
TH-231	6.649E-01	FAIL ABUN
PA-233	6.028E-02	NOT IDENT.
PA-234	2.971E-01	FAIL ABUN
PA-234M	5.297E+00	NOT IDENT.
NP-237	6.028E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.389E-01	FAIL ABUN
PU-239	3.445E+02	FAIL ABUN
AM-241	5.694E-02	NOT IDENT.
CM-243	8.584E-02	FAIL ABUN
BK-247	7.793E-02	NOT IDENT.
CF-249	4.157E-02	FAIL ABUN
CF-251	1.243E-01	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235045.CNF;1
* Acquisition date   : 3-OCT-2016 06:57:26 Sensitivity      : 3.000
* Detector ID        : GAM39 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:06.96 Half life ratio  : *****
* Sample date        : 30-NOV-2015 14:15:00 Nuclide Library : SOLID
* Sample ID          : G405235045 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity : 1.3060E+02 GRAM
*                   : Quantity Err(%) : 1.5314E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 27-JUL-2016 13:04:01 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM39_CAN.CNF;4
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.246E+01	1.876E+00	1.876E+00
CD-109	1.450E+00	1.965E+00	1.965E+00
SN-126	9.131E-02	1.237E-01	1.237E-01
BA-137M	8.331E-01	1.557E-01	1.557E-01
CS-137	8.801E-01	1.644E-01	1.644E-01
TL-208	4.201E-01	1.402E-01	1.402E-01
PB-210	1.088E+00	1.023E+00	1.023E+00
PB-212	9.906E-01	1.768E-01	1.768E-01
BI-214	7.119E-01	2.807E-01	2.807E-01
PB-214	1.159E+00	2.852E-01	2.852E-01
RN-219	7.771E-01	8.329E-01	8.329E-01
RN-222	7.119E-01	2.807E-01	2.807E-01
RA-224	1.830E+00	2.234E+00	2.234E+00
RA-226	7.119E-01	2.807E-01	2.807E-01
AC-228	1.024E+00	4.923E-01	4.923E-01
RA-228	1.024E+00	4.923E-01	4.923E-01
TH-228	9.906E-01	1.768E-01	1.768E-01
TH-230	7.116E-01	2.806E-01	2.806E-01
TH-232	1.024E+00	4.923E-01	4.923E-01
TH-234	2.478E+00	1.889E+00	1.889E+00
U-234	7.116E-01	2.806E-01	2.806E-01
U-235	-1.990E-01	1.999E-01	1.999E-01
U-238	2.478E+00	1.889E+00	1.889E+00
AM-243	2.035E-01	9.148E-02	9.148E-02
CM-247	7.124E-02	7.677E-02	7.677E-02
ANH-511	7.425E-02	1.074E-01	1.074E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.751E+00	2.149E+01	2.150E+01	NOT IDENT.
NA-22	4.445E-02	5.920E-02	6.250E-02	NOT IDENT.
NA-24	-1.000E+41	1.500E+41	0.000E+00	SHORT HLIF
AL-26	-8.668E-03	1.700E-02	1.744E-02	NOT IDENT.

SC-46	-5.846E-02	5.860E-01	5.866E-01	FAIL ABUN
V-48	2.548E+03	3.139E+04	3.141E+04	SHORT HLIF
CR-51	-2.672E+02	6.614E+02	6.723E+02	SHORT HLIF
MN-54	1.545E-02	8.955E-02	8.982E-02	NOT IDENT.
CO-56	4.078E-01	6.429E-01	6.686E-01	NOT IDENT.
MN-56	1.000E+41	1.576E+41	0.000E+00	SHORT HLIF
CO-57	-3.654E-03	5.449E-02	5.451E-02	NOT IDENT.
CO-58	-4.402E-01	7.887E-01	8.133E-01	NOT IDENT.
FE-59	2.037E+00	9.876E+00	9.919E+00	NOT IDENT.
CO-60	3.264E-02	5.327E-02	5.526E-02	NOT IDENT.
ZN-65	1.253E-01	2.325E-01	2.392E-01	NOT IDENT.
GE-68	6.924E-01	2.970E+00	2.987E+00	NOT IDENT.
AS-73	-4.170E-01	3.119E+00	3.125E+00	NOT IDENT.
AS-74	-4.862E+03	1.086E+04	1.108E+04	SHORT HLIF
SE-75	-2.095E-01	2.735E-01	2.894E-01	FAIL ABUN
BR-77	1.768E+39	1.570E+40	0.000E+00	SHORT HLIF
SR-82	-2.467E+02	1.210E+03	1.215E+03	SHORT HLIF
RB-83	-3.386E-01	1.048E+00	1.059E+00	NOT IDENT.
KR-85	1.421E+01	1.097E+01	1.270E+01	NOT IDENT.
SR-85	1.628E+00	1.259E+00	1.457E+00	NOT IDENT.
RB-86	5.743E+03	4.581E+04	4.589E+04	SHORT HLIF
Y-88	-1.176E-01	2.609E-01	2.662E-01	NOT IDENT.
Y-91	6.397E+02	8.698E+02	9.164E+02	NOT IDENT.
NB-94	-1.941E-02	4.901E-02	4.979E-02	NOT IDENT.
NB-95	7.626E-02	1.446E+00	1.446E+00	NOT IDENT.
NB-95M	1.422E+00	3.907E+00	3.959E+00	NOT IDENT.
ZR-95	-2.056E-01	1.979E+00	1.982E+00	NOT IDENT.
NB-97	-1.000E+41	3.808E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	2.985E+42	0.000E+00	SHORT HLIF
MO-99	-8.621E+32	1.816E+33	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	2.893E+41	0.000E+00	SHORT HLIF
RH-101	-4.958E-03	4.142E-02	4.148E-02	NOT IDENT.
RH-102	7.185E-02	1.174E-01	1.218E-01	NOT IDENT.
RU-103	2.587E+00	9.472E+00	9.544E+00	FAIL ABUN
RH-106	1.318E-01	7.419E-01	7.443E-01	NOT IDENT.
RU-106	1.318E-01	7.419E-01	7.443E-01	NOT IDENT.
AG-108M	-6.352E-03	3.896E-02	3.907E-02	NOT IDENT.
AG-110M	-5.919E-03	1.410E-01	1.411E-01	NOT IDENT.
SN-113	6.530E-02	3.406E-01	3.419E-01	NOT IDENT.
CD-115	-4.432E+40	5.090E+40	0.000E+00	SHORT HLIF
SN-117M	6.192E+04	1.653E+05	1.676E+05	SHORT HLIF
TE-123M	3.697E-02	1.543E-01	1.552E-01	NOT IDENT.
SB-124	1.262E+00	3.157E+00	3.208E+00	NOT IDENT.
SB-125	2.918E-02	1.279E-01	1.286E-01	NOT IDENT.
TE-125M	1.444E+02	3.488E+02	3.548E+02	NOT IDENT.
I-126	-2.537E+04	2.273E+06	2.273E+06	SHORT HLIF
SB-126	-6.603E+05	3.070E+06	3.085E+06	SHORT HLIF
SB-127	-6.841E+22	1.565E+23	0.000E+00	SHORT HLIF
I-131	7.795E+09	1.435E+10	1.478E+10	SHORT HLIF
I-132	1.000E+41	2.206E+42	0.000E+00	SHORT HLIF
TE-132	-2.439E+27	3.094E+27	0.000E+00	SHORT HLIF
BA-133	1.791E-03	5.375E-02	5.375E-02	NOT IDENT.
I-133	1.000E+41	6.330E+41	0.000E+00	SHORT HLIF
CS-134	8.342E-02	9.088E-02	9.835E-02	FAIL ABUN
CS-135	1.249E-02	2.037E-01	2.038E-01	NOT IDENT.
I-135	-1.000E+41	8.207E+41	0.000E+00	SHORT HLIF
CS-136	-2.253E+05	6.221E+05	6.304E+05	SHORT HLIF
CE-139	-5.362E-02	1.321E-01	1.343E-01	NOT IDENT.
BA-140	-2.679E+06	3.039E+06	3.270E+06	SHORT HLIF
LA-140	-1.973E+05	1.052E+06	1.056E+06	SHORT HLIF
CE-141	-2.619E+01	3.202E+01	3.413E+01	NOT IDENT.
CE-143	1.000E+41	1.350E+41	0.000E+00	SHORT HLIF
CE-144	-1.957E-01	4.221E-01	4.313E-01	NOT IDENT.
PM-144	-2.872E-03	8.994E-02	8.995E-02	NOT IDENT.
PR-144	3.310E-01	7.749E+00	7.750E+00	NOT IDENT.
PM-146	9.024E-03	6.539E-02	6.552E-02	FAIL ABUN
ND-147	6.312E+07	8.107E+07	8.592E+07	SHORT HLIF
PM-147	-9.931E+01	9.089E+02	9.100E+02	NOT IDENT.
PM-149	-1.000E+41	2.673E+41	0.000E+00	SHORT HLIF
EU-150	-1.350E-02	4.044E-02	4.090E-02	FAIL ABUN
EU-152	7.796E-02	1.225E-01	1.274E-01	FAIL ABUN
GD-153	2.676E-01	3.297E-01	3.511E-01	FAIL ABUN
EU-154	1.120E-01	1.454E-01	1.539E-01	NOT IDENT.
EU-155	1.119E-01	1.170E-01	1.274E-01	FAIL ABUN
TB-160	3.131E-01	2.751E+00	2.754E+00	FAIL ABUN
HO-166M	-5.493E-02	8.694E-02	9.039E-02	FAIL ABUN
TM-171	-4.845E+00	6.461E+00	6.820E+00	NOT IDENT.
HF-172	-9.526E-02	2.939E-01	2.970E-01	FAIL ABUN

LU-172	8.858E-02	1.096E-01	1.166E-01	FAIL ABUN
LU-176	-1.185E-03	3.308E-02	3.308E-02	FAIL ABUN
HF-181	-2.819E+00	6.868E+00	6.985E+00	NOT IDENT.
TA-182	1.167E+00	1.414E+00	1.509E+00	FAIL ABUN
RE-183	-2.629E-01	1.464E+00	1.468E+00	NOT IDENT.
RE-184	-1.577E+01	4.895E+01	4.947E+01	NOT IDENT.
W-188	-9.552E+01	2.004E+02	2.049E+02	FAIL ABUN
IR-192	1.602E-01	6.201E-01	6.243E-01	FAIL ABUN
HG-203	-6.154E-01	3.619E+00	3.630E+00	NOT IDENT.
BI-207	1.393E-02	6.840E-02	6.869E-02	FAIL ABUN
BI-211	3.191E+00	7.874E-01	1.640E+00	FAIL ABUN
PB-211	1.095E+00	7.144E-01	8.682E-01	FAIL ABUN
BI-212	6.161E-01	8.269E-01	8.723E-01	NOT IDENT.
RA-223	1.374E-01	8.338E-01	8.361E-01	FAIL ABUN
AC-227	-1.511E-01	3.268E-01	3.338E-01	NOT IDENT.
TH-227	-1.511E-01	3.268E-01	3.338E-01	NOT IDENT.
TH-229	1.256E-01	6.026E-01	6.053E-01	FAIL ABUN
PA-231	7.262E-01	6.414E-01	7.201E-01	NOT IDENT.
TH-231	1.374E-01	8.338E-01	8.361E-01	FAIL ABUN
PA-233	-1.932E-02	7.147E-02	7.200E-02	NOT IDENT.
PA-234	-3.674E-01	6.362E-01	6.574E-01	FAIL ABUN
PA-234M	-2.144E+00	6.397E+00	6.469E+00	NOT IDENT.
NP-237	-1.932E-02	7.147E-02	7.200E-02	FAIL ABUN
NP-238	1.000E+41	5.675E+41	0.000E+00	SHORT HLIF
NP-239	-5.772E-02	2.933E-01	2.945E-01	FAIL ABUN
PU-239	9.757E+02	8.140E+02	9.252E+02	FAIL ABUN
AM-241	3.412E-03	7.181E-02	7.183E-02	NOT IDENT.
CM-243	-3.753E-02	1.064E-01	1.078E-01	FAIL ABUN
BK-247	-5.036E-02	9.406E-02	9.676E-02	NOT IDENT.
CF-249	-7.312E-03	4.931E-02	4.942E-02	FAIL ABUN
CF-251	-6.946E-03	1.387E-01	1.387E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	77.6683	87.09	114.7072	136.47	61.8774
45.60	86.8333	87.57	114.7827	140.51	0.0000
46.54	90.6860	88.03	114.8560	143.76	73.2930
49.72	0.0000	88.34	114.9048	144.24	77.5426
51.35	101.5943	88.47	114.9248	145.44	70.0414
51.87	97.2249	89.96	115.1586	152.43	80.7216
52.39	91.7273	1093.63	115.2645	153.25	0.0000
52.97	90.7076	91.11	0.0000	323.87	68.0924
53.44	85.1831	92.59	115.5664	156.02	0.0000
54.07	78.5497	93.35	115.6826	158.56	0.0000
57.36	0.0000	94.56	95.5609	159.00	60.7087
57.53	100.5002	94.65	78.8468	162.33	63.4718
57.98	106.2309	94.67	78.8493	162.66	0.0000
59.27	111.7584	94.87	78.8700	163.33	61.8135
59.32	111.7682	97.43	95.9186	165.86	68.8428
59.54	101.2344	98.43	88.8387	176.31	59.0690
60.96	87.8517	98.44	88.8399	176.60	0.0000
61.17	104.5508	99.53	73.7355	177.52	67.8279
62.93	116.2628	100.11	96.2476	181.07	0.0000
63.29	116.3336	102.03	57.8884	181.52	64.1375
63.58	116.3903	103.18	78.5032	184.41	58.6114
64.28	116.5266	103.37	78.5220	143.76	58.6768
66.73	133.0559	105.21	62.9604	193.51	56.8587
67.24	134.6972	105.31	62.9684	197.03	61.0025
125.81	119.4756	106.12	83.6368	198.01	60.1668
67.75	121.0210	106.47	83.6726	201.83	67.4540
69.67	129.0770	109.28	75.4405	203.43	78.2058
70.83	132.3917	111.00	86.5686	205.31	69.4227
72.81	107.7079	111.76	0.0000	210.85	62.5759
72.87	107.7179	114.06	75.8683	215.65	48.4536
74.66	108.0137	116.30	0.0000	222.11	60.4161
74.82	108.0400	116.74	82.2421	227.09	65.1680
74.97	108.0641	119.76	64.0498	227.38	68.8031
77.11	108.4125	121.12	62.9146	228.16	0.0000
78.74	108.6750	121.22	62.9216	228.18	76.0912
79.69	88.9332	121.78	65.4304	116.74	76.0912
80.12	88.9889	122.06	65.4510	235.69	68.3151
80.19	0.0000	122.92	69.2220	235.96	65.5950
80.57	93.7341	123.07	64.2883	238.63	73.0249
81.00	104.7352	265.00	61.8576	238.98	0.0000
81.07	104.7454	125.81	72.7501	240.99	73.1486
81.75	125.1921	127.23	66.2390	242.00	73.2015
83.79	98.8762	127.91	67.1169	244.70	39.8799
84.00	98.9053	129.30	67.2176	252.40	0.0000
85.43	117.9817	131.20	67.3550	252.80	43.3343
86.55	114.6214	133.02	61.6539	254.15	0.0000
86.79	114.6591	133.52	70.0222	256.23	54.0654
86.94	114.6835	136.00	61.8473	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	52.0522	355.39	0.0000	584.27	21.8066
264.80	49.2691	356.01	27.9990	595.83	0.0000
265.00	52.9945	364.49	0.0000	427.87	34.0122
268.22	50.3130	366.42	0.0000	602.52	0.0000
269.46	47.5573	372.51	32.7100	604.72	28.0214
270.03	53.1719	375.05	32.7543	607.14	34.6454
271.23	56.9492	377.52	35.7781	609.32	29.7202
273.65	0.0000	356.01	34.9003	610.33	29.7323
276.40	63.2318	388.16	32.9792	614.28	21.5051
277.37	54.8354	388.63	0.0000	618.01	23.1909
277.60	49.2188	391.69	34.0408	620.36	14.9216
278.00	48.3876	264.66	27.1560	621.93	16.5894
279.20	52.5547	401.81	27.1719	630.19	0.0000
279.54	54.4434	402.40	27.1802	631.29	16.6461
279.70	54.4493	404.85	22.6781	633.25	9.9950
280.46	46.0232	410.95	31.3406	634.78	0.0000
283.69	41.4129	413.71	38.4701	635.95	20.0090
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	50.8810	423.72	0.0000	645.85	16.7340
285.90	0.0000	427.09	34.6461	657.76	23.5276
287.50	53.7796	427.87	22.4266	657.90	0.0000
290.67	63.8141	433.94	31.6931	661.66	20.1943
293.27	0.0000	439.40	27.6757	664.57	0.0000
351.93	51.1974	453.88	31.9915	666.33	0.0000
295.96	51.2216	463.37	25.9125	666.50	0.0000
879.38	54.1553	468.07	24.9292	667.71	0.0000
299.98	49.9226	473.00	0.0000	677.62	18.0508
300.09	49.9258	475.06	29.1758	685.70	0.0000
300.13	49.9269	476.78	20.8557	695.00	0.0000
301.36	37.6882	477.60	31.2952	696.49	26.1165
302.85	58.1084	482.18	29.2686	696.51	24.9810
256.23	47.6776	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	26.1239
306.78	41.0596	497.08	25.2515	697.49	26.1249
308.46	33.4548	505.52	26.9277	702.65	27.3086
311.90	36.3981	507.63	0.0000	706.68	12.5334
316.51	33.6171	511.00	20.6398	711.68	26.2503
319.41	0.0000	514.00	12.7178	720.70	0.0000
320.08	0.0000	514.00	12.7178	721.93	0.0000
321.04	34.6707	520.40	23.9099	722.78	10.3099
323.87	36.1755	520.69	0.0000	722.91	10.3103
325.23	34.7556	522.65	0.0000	723.31	15.4677
328.76	0.0000	527.90	0.0000	724.19	22.3485
333.37	53.8356	528.26	24.5217	727.33	19.5034
333.97	49.4872	529.59	21.3354	733.00	19.5393
334.37	39.3077	529.87	0.0000	735.93	19.5587
338.28	38.9095	531.02	0.0000	333.97	19.5684
338.32	38.9103	537.26	0.0000	739.50	0.0000
311.90	39.4445	546.56	0.0000	747.24	19.6300
340.48	39.4445	552.55	12.9214	748.06	13.8604
340.55	0.0000	563.25	24.8727	752.31	15.0360
344.28	31.2331	569.33	14.0923	753.82	0.0000
345.93	41.0319	946.00	14.0929	756.73	13.8989
351.06	26.4529	569.70	15.1781	756.80	13.8994
351.93	26.4655	583.19	21.7977	884.68	27.8613

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	23.2316	1274.44	10.2363	1620.50	4.2529
766.42	16.2655	1001.03	16.7706	1621.92	6.3809
766.84	17.4298	1002.74	8.3892	1678.03	0.0000
772.60	0.0000	1004.73	16.7871	1690.97	3.2292
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	6.9754
778.90	12.8302	1028.54	0.0000	1063.66	5.4550
783.70	0.0000	1037.84	15.0479	1771.35	3.2736
785.37	12.2718	1038.76	0.0000	1791.20	0.0000
792.07	20.2022	631.29	10.3682	1808.65	1.0979
794.95	15.4730	1048.07	0.0000	1810.72	0.0000
795.86	19.6984	1049.04	14.1476	1836.06	3.3083
810.06	14.1313	1050.41	12.2653		
810.29	14.1323	1063.66	13.2523		
344.28	14.1333	1077.00	0.0000		
810.76	16.7850	1077.34	9.4977		
815.77	0.0000	1085.87	12.3732		
1048.07	0.0000	1093.63	9.5355		
832.01	15.1142	1099.45	10.5038		
834.85	16.9068	1112.07	13.4087		
835.71	13.3507	1112.84	9.5795		
836.80	0.0000	1115.54	7.6685		
846.75	0.0000	1120.29	14.3948		
846.77	10.7153	1120.55	14.3958		
856.80	0.0000	1221.41	18.4301		
860.56	12.5516	1129.67	11.5415		
871.09	15.2880	1131.51	0.0000		
873.19	15.2973	1147.95	0.0000		
875.33	0.0000	1173.23	8.7446		
879.38	14.4229	1177.95	17.5078		
880.51	16.2307	1189.05	17.5518		
883.24	14.4385	1204.77	10.7643		
884.68	15.3476	1221.41	7.8579		
889.28	17.1753	1231.02	16.7333		
894.76	17.2019	1235.36	0.0000		
898.04	10.8743	1238.28	10.8449		
900.72	15.4171	1260.41	0.0000		
903.28	17.2431	1271.87	10.9248		
911.20	18.1909	1274.44	5.9623		
912.08	18.1952	1274.54	5.9623		
923.98	0.0000	1291.59	7.9785		
926.50	18.2678	1298.22	0.0000		
929.11	19.1947	1312.11	0.0000		
937.49	25.6519	1332.49	6.0359		
944.13	0.0000	1362.66	0.0000		
946.00	22.0378	1365.19	7.0893		
949.00	10.1091	1368.63	0.0000		
667.71	0.0000	1384.29	8.1333		
962.31	14.7563	1408.01	3.0646		
964.08	14.7637	1457.56	0.0000		
966.17	14.7720	1460.82	8.2573		
911.20	14.7827	1489.16	2.0756		
968.97	14.7827	1505.03	6.2457		
983.53	0.0000	1584.12	6.3376		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235046.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM20.CNF;515
Background date : 2-OCT-2016 11:01:13.
Sample date      : 7-DEC-2015 10:02:00. Acquisition date : 3-OCT-2016 06:57:53.
Sample ID       : G405235046           Sample quantity  : 1.56928E+02 GRAM
Detector name   : GAM20                 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00        Elapsed real time: 0 01:00:14.88 0.4%
Energy tolerance: 1.50000 keV          Analyst Initials  : MXR1
Abundance limit : 75.00000             Sensitivity       : 3.00000
Batch ID        : 1596252              Detector SN#      :
Matrix Spike ID :                       LCS ID           : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	6	27.05*	50	13	1.29	54.31	51	12	1.38E-02	24.7	2.07E+00
2	6	28.79*	29	45	1.13	57.79	51	12	7.95E-03	54.7	
3	0	32.30*	16	90	1.75	64.80	63	6	4.37E-03	103.0	
4	0	36.95*	32	150	2.80	74.10	72	11	8.93E-03	77.4	
5	0	63.44*	47	194	0.85	127.03	124	8	1.31E-02	54.5	
6	2	74.90	178	197	1.36	149.93	145	14	4.95E-02	15.8	2.15E+00
7	2	77.25	310	160	1.11	154.64	145	14	8.60E-02	9.1	
8	0	87.38	120	133	1.05	174.87	172	6	3.32E-02	17.9	
9	0	93.51*	52	280	1.50	187.13	181	10	1.44E-02	65.1	
10	0	99.39*	37	114	1.98	198.89	195	8	1.04E-02	53.0	
11	0	131.15	41	194	3.89	262.37	254	13	1.14E-02	72.5	
12	0	180.90	42	99	1.44	361.81	357	9	1.18E-02	45.1	
13	0	185.56*	107	126	1.81	371.12	366	12	2.98E-02	23.9	
14	0	208.31	17	113	0.72	416.59	414	8	4.84E-03	108.0	
15	2	238.58*	437	62	1.13	477.11	471	19	1.21E-01	5.7	1.05E+00
16	2	241.74	114	74	1.54	483.43	471	19	3.16E-02	17.5	
17	0	295.01*	166	90	1.34	589.92	582	15	4.62E-02	14.7	
18	0	300.35	41	84	0.79	600.60	596	13	1.15E-02	47.8	
19	0	328.73	61	77	4.87	657.34	650	15	1.69E-02	34.3	
20	0	338.48*	61	56	1.13	676.85	671	9	1.69E-02	26.0	
21	0	351.89*	251	51	1.17	703.64	698	10	6.98E-02	8.3	
22	0	445.11	9	30	0.80	890.05	884	8	2.46E-03	114.7	
23	0	510.66*	29	68	2.09	1021.16	1013	14	8.11E-03	70.9	
24	0	548.49	8	17	0.78	1096.82	1089	9	2.11E-03	106.5	
25	0	583.27*	121	48	1.74	1166.38	1160	16	3.37E-02	15.5	
26	0	609.38*	207	22	1.60	1218.60	1213	13	5.74E-02	8.6	
27	0	661.42*	66	24	1.54	1322.72	1315	14	1.82E-02	20.5	
28	0	727.53	32	16	2.18	1454.97	1450	11	8.87E-03	31.5	
29	0	736.94	28	21	4.54	1473.80	1466	14	7.78E-03	39.5	
30	0	768.78	30	37	1.30	1537.51	1531	13	8.30E-03	46.6	
31	0	786.28	29	17	0.79	1572.53	1568	11	7.92E-03	33.4	
32	0	882.98	10	16	1.01	1766.01	1757	12	2.69E-03	92.3	
33	0	887.80	16	7	1.20	1775.67	1770	10	4.32E-03	41.5	
34	0	911.36*	112	17	1.73	1822.82	1816	14	3.11E-02	12.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	964.70	13	25	2.59	1929.58	1923	12	3.63E-03	80.4	
36	0	969.38	63	5	1.49	1938.94	1934	10	1.76E-02	14.2	
37	0	989.92	9	4	1.42	1980.05	1977	6	2.43E-03	50.9	
38	0	1010.46	18	12	1.45	2021.17	2016	12	5.00E-03	45.1	
39	0	1080.88	27	8	2.47	2162.12	2153	16	7.54E-03	30.2	
40	2	1117.13	14	0	1.60	2234.70	2233	26	3.77E-03	26.5	5.65E-01
41	2	1120.44	58	6	2.22	2241.33	2233	26	1.60E-02	17.2	
42	0	1174.53	18	14	3.77	2349.61	2342	14	5.00E-03	50.0	
43	0	1214.72	16	10	1.04	2430.08	2423	11	4.32E-03	48.3	
44	0	1238.62	36	13	1.06	2477.94	2471	13	1.01E-02	26.3	
45	0	1263.96	12	3	0.62	2528.68	2525	7	3.28E-03	39.0	
46	0	1377.92	23	4	2.06	2756.91	2750	14	6.25E-03	27.5	
47	0	1460.87*	383	4	1.84	2923.06	2917	15	1.06E-01	5.3	
48	0	1509.50	16	4	3.13	3020.48	3012	14	4.53E-03	34.8	
49	0	1764.35	38	0	1.91	3531.11	3525	12	1.06E-02	16.2	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235046.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 7-DEC-2015 10:02:00   Acquisition date : 3-OCT-2016 06:57:53
Sample ID        : G405235046             Sample quantity  : 156.93 GRAM
Sample type      : SOLID                   Sample geometry  :
Detector name    : GAMMA20                 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00           Elapsed real time: 0 01:00:14.88   0.4%
Energy tolerance : 1.50 keV                Half life ratio  : 10.00
Errors propagated: No                       Systematic Error : 0.00 %
Efficiency type  : Linear                   Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.312E+00	1.269E+01	1.269E+01	10.54	OK
SC-46	889.28	99.98*	1.963E+00	3.897E-02	4.696E-01	83.02	OK
	1120.55	99.99	1.635E+00	1.683E-01	2.028E+00	34.44	OK
CD-109	88.03	3.70*	6.851E+00	1.952E+00	3.068E+00	55.60	OK
SN-126	64.28	9.60	4.805E+00	6.542E-01	6.542E-01	108.99	OK
	86.94	8.90	6.851E+00	8.116E-01	8.116E-01	55.60	OK
	87.57	37.00*	6.851E+00	1.952E-01	1.952E-01	55.60	OK
BA-137M	661.66	89.90*	2.465E+00	1.506E-01	1.535E-01	40.91	OK
CS-137	661.66	85.10*	2.465E+00	1.591E-01	1.621E-01	40.91	OK
TL-208	277.37	6.60	4.947E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.719E+00	2.705E-01	2.705E-01	30.91	OK
	860.56	12.50	2.011E+00	----- Line	Not Found	-----	Absent
BI-212	727.33	6.67*	2.289E+00	1.051E+00	1.051E+00	62.94	OK
	785.37	1.10	2.156E+00	5.987E+00	5.987E+00	66.71	OK
	1620.50	1.47	1.197E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	6.003E+00	1.220E+00	1.220E+00	49.27	OK
	77.11	17.10	6.195E+00	1.837E+00	1.837E+00	18.29	OK
	238.63	43.60*	5.553E+00	1.020E+00	1.020E+00	11.49	OK
	300.09	3.30	4.643E+00	1.487E+00	1.487E+00	95.58	OK
BI-214	609.32	45.49*	2.627E+00	8.865E-01	8.868E-01	17.11	OK
	1120.29	14.92	1.635E+00	1.128E+00	1.128E+00	34.44	OK
	1764.49	15.30	1.106E+00	1.017E+00	1.017E+00	32.44	OK
PB-214	74.82	5.80	5.996E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	6.195E+00	3.239E+00	3.240E+00	18.29	OK
	87.09	3.41	6.836E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.495E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.711E+00	1.061E+00	1.062E+00	29.44	OK
	351.93	35.60*	4.084E+00	9.393E-01	9.396E-01	16.64	OK
RN-222	609.32	45.49*	2.627E+00	8.865E-01	8.868E-01	17.11	OK
	1120.29	14.92	1.635E+00	1.128E+00	1.128E+00	34.44	OK
	1764.49	15.30	1.106E+00	1.017E+00	1.017E+00	32.44	OK
RA-224	240.99	4.10*	5.499E+00	9.734E-01	9.734E-01	117.17	OK
RA-226	609.32	45.49*	2.627E+00	8.865E-01	8.868E-01	17.11	OK
	1120.29	14.92	1.635E+00	1.128E+00	1.128E+00	34.44	OK
	1764.49	15.30	1.106E+00	1.017E+00	1.017E+00	32.44	OK
AC-228	105.21	1.10	7.453E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.215E+00	6.986E-01	6.986E-01	51.98	OK
	794.95	4.25	2.138E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.057E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.923E+00	1.105E+00	1.105E+00	24.93	OK
	968.97	15.80	1.833E+00	1.062E+00	1.062E+00	28.37	OK
RA-228	105.21	1.10	7.453E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.215E+00	6.986E-01	6.986E-01	51.98	OK
	794.95	4.25	2.138E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.057E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.923E+00	1.105E+00	1.105E+00	24.93	OK
	968.97	15.80	1.833E+00	1.062E+00	1.062E+00	28.37	OK
TH-228	74.82	10.28	6.003E+00	1.220E+00	1.220E+00	49.27	OK
	77.11	17.10	6.195E+00	1.837E+00	1.837E+00	18.29	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	238.63	43.60*	5.553E+00	1.020E+00	1.020E+00	11.49	OK
	300.09	3.30	4.643E+00	1.487E+00	1.487E+00	95.58	OK
TH-230	609.32	45.49*	2.627E+00	8.865E-01	8.865E-01	17.11	OK
	1120.29	14.92	1.635E+00	1.128E+00	1.128E+00	34.44	OK
	1764.49	15.30	1.106E+00	1.017E+00	1.017E+00	32.44	OK
PA-231	283.69	1.70	4.860E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.643E+00	9.175E-01	9.175E-01	95.58	OK
TH-232	105.21	1.10	7.453E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.215E+00	6.986E-01	6.986E-01	51.98	OK
	835.71	1.61	2.057E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.923E+00	1.105E+00	1.105E+00	24.93	OK
	968.97	15.80	1.833E+00	1.062E+00	1.062E+00	28.37	OK
TH-234	63.29	3.70*	4.805E+00	1.697E+00	1.697E+00	108.99	OK
	92.59	4.23	7.128E+00	1.062E+00	1.062E+00	130.16	OK
U-234	609.32	45.49*	2.627E+00	8.865E-01	8.865E-01	17.11	OK
	1120.29	14.92	1.635E+00	1.128E+00	1.128E+00	34.44	OK
	1764.49	15.30	1.106E+00	1.017E+00	1.017E+00	32.44	OK
U-238	63.29	3.70*	4.805E+00	1.697E+00	1.697E+00	108.99	OK
	92.59	4.23	7.128E+00	1.062E+00	1.062E+00	130.16	OK
AM-243	43.53	5.90	1.315E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	6.003E+00	1.866E-01	1.866E-01	49.27	OK
ANH-511	511.00	100.00*	3.021E+00	5.052E-02	5.052E-02	141.86	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235046.CNF;1
* Acquisition date   : 3-OCT-2016 06:57:53 Sensitivity      : 3.000
* Detector ID       : GAM20 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:14.88 Half life ratio : *****
* Sample date       : 7-DEC-2015 10:02:00 Analyst initials: MXR1
* Sample ID         : G405235046 Sample Quantity : 1.5693E+02 GRAM
* Batch Number      : 1596252 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date    : 30-JUN-2016 06:52:39 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM20_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.269E+01	1.311E+00	5.147E-01
SC-46	4.696E-01	3.821E-01	6.020E-01
CD-109	3.068E+00	1.672E+00	1.930E+00
SN-126	1.952E-01	1.064E-01	1.232E-01
BA-137M	1.535E-01	6.152E-02	5.128E-02
CS-137	1.621E-01	6.499E-02	5.417E-02
TL-208	2.705E-01	8.194E-02	5.019E-02
BI-212	1.051E+00	6.481E-01	6.314E-01
PB-212	1.020E+00	1.149E-01	7.929E-02
BI-214	8.868E-01	1.487E-01	8.519E-02
PB-214	9.396E-01	1.532E-01	1.067E-01
RN-222	8.868E-01	1.487E-01	8.519E-02
RA-224	9.734E-01	1.118E+00	8.498E-01
RA-226	8.868E-01	1.487E-01	8.519E-02
AC-228	1.105E+00	2.701E-01	1.828E-01
RA-228	1.105E+00	2.701E-01	1.828E-01
TH-228	1.020E+00	1.149E-01	7.929E-02
TH-230	8.865E-01	1.486E-01	8.516E-02
PA-231	9.175E-01	8.594E-01	6.520E-01
TH-232	1.105E+00	2.701E-01	1.828E-01
TH-234	1.697E+00	1.813E+00	1.671E+00
U-234	8.865E-01	1.486E-01	8.516E-02
U-238	1.697E+00	1.813E+00	1.671E+00
AM-243	1.866E-01	9.009E-02	7.188E-02
ANH-511	5.052E-02	7.024E-02	4.670E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-5.115E+00	1.107E+01	2.023E+01	NOT IDENT.
NA-22	-1.917E-02	4.237E-02	7.807E-02	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	1.086E-02	2.590E-02	6.097E-02	NOT IDENT.
V-48	0.000E+00	1.139E+04	0.000E+00	SHORT HLIF

CR-51	0.000E+00	3.656E+02	0.000E+00	SHORT HLIF
MN-54	-4.845E-02	5.460E-02	8.750E-02	NOT IDENT.
CO-56	1.518E-01	4.115E-01	8.268E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-3.777E-02	3.927E-02	6.622E-02	NOT IDENT.
CO-58	5.550E-03	4.930E-01	9.453E-01	NOT IDENT.
FE-59	-1.985E+00	5.718E+00	1.090E+01	NOT IDENT.
CO-60	1.430E-02	3.034E-02	6.764E-02	FAIL ABUN
ZN-65	3.964E-02	1.497E-01	2.823E-01	NOT IDENT.
GE-68	-1.014E+00	1.792E+00	2.779E+00	NOT IDENT.
AS-73	1.646E+00	4.739E+00	9.386E+00	NOT IDENT.
AS-74	0.000E+00	4.220E+03	0.000E+00	SHORT HLIF
SE-75	3.793E-03	1.565E-01	3.119E-01	NOT IDENT.
BR-77	0.000E+00	2.802E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.008E+02	0.000E+00	SHORT HLIF
RB-83	3.339E-02	5.459E-01	1.068E+00	NOT IDENT.
KR-85	5.665E-01	7.039E+00	1.215E+01	NOT IDENT.
SR-85	5.953E-02	7.518E-01	1.298E+00	NOT IDENT.
RB-86	0.000E+00	2.212E+04	0.000E+00	SHORT HLIF
Y-88	1.568E-02	1.020E-01	2.722E-01	NOT IDENT.
Y-91	-2.924E+02	5.226E+02	9.439E+02	NOT IDENT.
NB-94	2.041E-02	2.513E-02	5.369E-02	NOT IDENT.
NB-95	3.249E-02	9.390E-01	1.569E+00	NOT IDENT.
NB-95M	-6.130E-01	2.090E+00	3.604E+00	NOT IDENT.
ZR-95	1.472E-01	1.330E+00	2.561E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.267E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	2.104E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	9.118E-03	3.061E-02	5.340E-02	NOT IDENT.
RH-102	1.775E-02	4.669E-02	9.560E-02	NOT IDENT.
RU-103	1.059E+00	4.673E+00	9.369E+00	FAIL ABUN
RH-106	-1.928E-01	4.256E-01	7.655E-01	NOT IDENT.
RU-106	-1.928E-01	4.256E-01	7.655E-01	NOT IDENT.
AG-108M	8.832E-03	2.139E-02	4.404E-02	NOT IDENT.
AG-110M	2.149E-03	8.411E-02	1.197E-01	NOT IDENT.
SN-113	-9.181E-02	1.833E-01	3.389E-01	NOT IDENT.
CD-115	0.000E+00	3.586E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	9.641E+04	0.000E+00	SHORT HLIF
TE-123M	3.681E-02	1.211E-01	2.248E-01	NOT IDENT.
SB-124	-3.225E-01	1.841E+00	3.677E+00	NOT IDENT.
SB-125	-5.840E-03	8.387E-02	1.625E-01	NOT IDENT.
TE-125M	1.597E+02	2.287E+02	4.481E+02	NOT IDENT.
I-126	0.000E+00	8.697E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.073E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	2.244E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	4.461E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.712E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.775E+26	0.000E+00	SHORT HLIF
BA-133	2.859E-03	3.448E-02	6.442E-02	NOT IDENT.
I-133	0.000E+00	1.850E+41	0.000E+00	SHORT HLIF
CS-134	2.659E-02	4.811E-02	9.665E-02	NOT IDENT.
CS-135	-7.178E-02	1.210E-01	2.261E-01	NOT IDENT.
I-135	0.000E+00	1.632E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.761E+05	0.000E+00	SHORT HLIF
CE-139	-5.926E-02	1.010E-01	1.731E-01	NOT IDENT.
BA-140	0.000E+00	8.619E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.160E+05	0.000E+00	SHORT HLIF
CE-141	3.271E+00	2.081E+01	3.867E+01	NOT IDENT.
CE-143	0.000E+00	7.946E+40	0.000E+00	SHORT HLIF
CE-144	-1.112E-01	3.246E-01	5.279E-01	NOT IDENT.
PM-144	-6.332E-03	4.154E-02	7.840E-02	NOT IDENT.
PR-144	-5.377E-01	3.612E+00	6.822E+00	NOT IDENT.
PM-146	8.016E-03	2.997E-02	6.164E-02	FAIL ABUN
ND-147	0.000E+00	2.688E+07	0.000E+00	SHORT HLIF
PM-147	-2.573E+01	6.262E+02	1.160E+03	NOT IDENT.
PM-149	0.000E+00	4.503E+40	0.000E+00	SHORT HLIF
EU-150	2.957E-02	2.439E-02	4.329E-02	FAIL ABUN
EU-152	-2.624E-02	7.325E-02	1.387E-01	FAIL ABUN
GD-153	-6.298E-02	1.605E-01	2.662E-01	NOT IDENT.
EU-154	-6.036E-02	1.047E-01	1.886E-01	NOT IDENT.
EU-155	3.293E-02	9.435E-02	1.793E-01	FAIL ABUN
TB-160	1.519E-01	1.752E+00	3.037E+00	FAIL ABUN
HO-166M	2.843E-02	4.399E-02	9.315E-02	FAIL ABUN
TM-171	-3.299E+00	1.153E+01	2.173E+01	NOT IDENT.
HF-172	-1.727E-01	2.236E-01	3.476E-01	FAIL ABUN
LU-172	-3.901E-04	7.317E-02	1.447E-01	FAIL ABUN
LU-176	4.360E-03	1.993E-02	3.845E-02	FAIL ABUN

HF-181	-1.825E+00	3.746E+00	6.828E+00	NOT IDENT.
TA-182	-7.189E-02	7.464E-01	1.466E+00	FAIL ABUN
RE-183	8.555E-02	1.801E+00	3.461E+00	NOT IDENT.
RE-184	1.310E+01	2.741E+01	5.575E+01	NOT IDENT.
W-188	-3.759E+01	9.494E+01	1.602E+02	FAIL ABUN
IR-192	1.964E-01	3.964E-01	8.104E-01	FAIL ABUN
HG-203	2.030E-01	2.051E+00	4.059E+00	NOT IDENT.
BI-207	1.858E-02	3.790E-02	8.239E-02	FAIL ABUN
PB-210	1.886E+00	1.478E+00	3.170E+00	NOT IDENT.
BI-211	0.000E+00	4.220E-01	7.389E-01	FAIL ABUN
PB-211	2.369E-01	5.108E-01	1.054E+00	NOT IDENT.
RN-219	-9.674E-03	3.102E-01	6.031E-01	NOT IDENT.
RA-223	2.368E-01	4.959E-01	9.336E-01	FAIL ABUN
AC-227	1.446E-01	2.003E-01	4.146E-01	FAIL ABUN
TH-227	1.446E-01	2.003E-01	4.146E-01	FAIL ABUN
TH-229	2.438E-02	3.644E-01	7.304E-01	FAIL ABUN
TH-231	2.368E-01	4.959E-01	9.336E-01	FAIL ABUN
PA-233	-6.129E-04	4.304E-02	8.536E-02	FAIL ABUN
PA-234	6.111E-02	2.261E-01	4.758E-01	FAIL ABUN
PA-234M	-3.214E-01	3.541E+00	7.209E+00	NOT IDENT.
U-235	-2.878E-02	1.651E-01	2.979E-01	FAIL ABUN
NP-237	-6.129E-04	4.304E-02	8.536E-02	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	1.386E-01	2.049E-01	3.993E-01	FAIL ABUN
PU-239	1.953E+02	2.743E+02	5.298E+02	NOT IDENT.
AM-241	-6.961E-02	8.839E-02	1.588E-01	NOT IDENT.
CM-243	-3.105E-02	8.490E-02	1.530E-01	FAIL ABUN
BK-247	2.122E-02	5.382E-02	1.108E-01	NOT IDENT.
CM-247	-7.907E-03	2.716E-02	5.145E-02	NOT IDENT.
CF-249	-3.610E-03	2.972E-02	5.744E-02	NOT IDENT.
CF-251	-2.636E-02	9.359E-02	1.651E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	371	10.66*	1.312E+00	1.269E+01	1.269E+01	10.54
SC-46	889.28	16	99.98*	1.963E+00	3.897E-02	4.696E-01	83.02
	1120.55	58	99.99	1.635E+00	1.683E-01	2.028E+00	34.44
CD-109	88.03	155	3.70*	6.851E+00	2.930E+00	4.605E+00	35.71
SN-126	64.28	63	9.60	4.805E+00	6.542E-01	6.542E-01	108.99
	86.94	155	8.90	6.851E+00	1.218E+00	1.218E+00	35.71
	87.57	155	37.00*	6.851E+00	2.930E-01	2.930E-01	35.71
BA-137M	661.66	70	89.90*	2.465E+00	1.506E-01	1.535E-01	40.91
CS-137	661.66	70	85.10*	2.465E+00	1.591E-01	1.621E-01	40.91
TL-208	277.37	-----	6.60	4.947E+00	-----	Line Not Found	-----
	583.19	131	85.00*	2.719E+00	2.705E-01	2.705E-01	30.91
	860.56	-----	12.50	2.011E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	5.823E+00	-----	Line Not Found	-----
	351.06	285	12.92*	4.084E+00	2.588E+00	2.588E+00	16.64
BI-212	727.33	34	6.67*	2.289E+00	1.051E+00	1.051E+00	62.94
	785.37	30	1.10	2.156E+00	5.987E+00	5.987E+00	66.71
	1620.50	-----	1.47	1.197E+00	-----	Line Not Found	-----
PB-212	74.82	235	10.28	6.003E+00	1.818E+00	1.818E+00	31.59
	77.11	407	17.10	6.195E+00	1.837E+00	1.837E+00	18.29
	238.63	516	43.60*	5.553E+00	1.020E+00	1.020E+00	11.49
	300.09	48	3.30	4.643E+00	1.487E+00	1.487E+00	95.58
BI-214	609.32	221	45.49*	2.627E+00	8.865E-01	8.868E-01	17.11
	1120.29	58	14.92	1.635E+00	1.128E+00	1.128E+00	34.44
	1764.49	36	15.30	1.106E+00	1.017E+00	1.017E+00	32.44
PB-214	74.82	235	5.80	6.003E+00	3.223E+00	3.224E+00	31.59
	77.11	407	9.70	6.195E+00	3.239E+00	3.240E+00	18.29
	87.09	155	3.41	6.851E+00	3.180E+00	3.181E+00	35.71
	242.00	134	7.25	5.499E+00	1.612E+00	1.612E+00	35.01
	295.22	192	18.42	4.711E+00	1.061E+00	1.062E+00	29.44
	351.93	285	35.60*	4.084E+00	9.393E-01	9.396E-01	16.64
RN-222	609.32	221	45.49*	2.627E+00	8.865E-01	8.868E-01	17.11
	1120.29	58	14.92	1.635E+00	1.128E+00	1.128E+00	34.44
	1764.49	36	15.30	1.106E+00	1.017E+00	1.017E+00	32.44
RA-224	240.99	134	4.10*	5.499E+00	2.850E+00	2.850E+00	35.01
RA-226	609.32	221	45.49*	2.627E+00	8.865E-01	8.868E-01	17.11
	1120.29	58	14.92	1.635E+00	1.128E+00	1.128E+00	34.44
	1764.49	36	15.30	1.106E+00	1.017E+00	1.017E+00	32.44
AC-228	105.21	-----	1.10	7.453E+00	-----	Line Not Found	-----
	338.32	69	11.27	4.215E+00	6.986E-01	6.986E-01	51.98
	794.95	-----	4.25	2.138E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.057E+00	-----	Line Not Found	-----
	911.20	115	25.80*	1.923E+00	1.105E+00	1.105E+00	24.93
	968.97	64	15.80	1.833E+00	1.062E+00	1.062E+00	28.37
RA-228	105.21	-----	1.10	7.453E+00	-----	Line Not Found	-----
	338.32	69	11.27	4.215E+00	6.986E-01	6.986E-01	51.98
	794.95	-----	4.25	2.138E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.057E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	911.20	115	25.80*	1.923E+00	1.105E+00	1.105E+00	24.93
	968.97	64	15.80	1.833E+00	1.062E+00	1.062E+00	28.37
TH-228	74.82	235	10.28	6.003E+00	1.818E+00	1.818E+00	31.59
	77.11	407	17.10	6.195E+00	1.837E+00	1.837E+00	18.29
	238.63	516	43.60*	5.553E+00	1.020E+00	1.020E+00	11.49
	300.09	48	3.30	4.643E+00	1.487E+00	1.487E+00	95.58
TH-230	609.32	221	45.49*	2.627E+00	8.865E-01	8.865E-01	17.11
	1120.29	58	14.92	1.635E+00	1.128E+00	1.128E+00	34.44
	1764.49	36	15.30	1.106E+00	1.017E+00	1.017E+00	32.44
PA-231	283.69	-----	1.70	4.860E+00	-----	Line Not Found	-----
	301.36	48	5.35*	4.643E+00	9.175E-01	9.175E-01	95.58
TH-232	105.21	-----	1.10	7.453E+00	-----	Line Not Found	-----
	338.32	69	11.27	4.215E+00	6.986E-01	6.986E-01	51.98
	835.71	-----	1.61	2.057E+00	-----	Line Not Found	-----
	911.20	115	25.80*	1.923E+00	1.105E+00	1.105E+00	24.93
	968.97	64	15.80	1.833E+00	1.062E+00	1.062E+00	28.37
TH-234	63.29	63	3.70*	4.805E+00	1.697E+00	1.697E+00	108.99
	92.59	67	4.23	7.128E+00	1.062E+00	1.062E+00	130.16
U-234	609.32	221	45.49*	2.627E+00	8.865E-01	8.865E-01	17.11
	1120.29	58	14.92	1.635E+00	1.128E+00	1.128E+00	34.44
	1764.49	36	15.30	1.106E+00	1.017E+00	1.017E+00	32.44
U-238	63.29	63	3.70*	4.805E+00	1.697E+00	1.697E+00	108.99
	92.59	67	4.23	7.128E+00	1.062E+00	1.062E+00	130.16
AM-243	43.53	-----	5.90	1.315E+00	-----	Line Not Found	-----
	74.66	235	67.20*	6.003E+00	2.782E-01	2.782E-01	31.59
ANH-511	511.00	32	100.00*	3.021E+00	5.052E-02	5.052E-02	141.86

Flag: "*" = Keyline

Total number of lines in spectrum 49
 Number of unidentified lines 16
 Number of lines tentatively identified by NID 33 67.35%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.269E+01	1.269E+01	0.134E+01	10.54	
SC-46	83.79D	12.1	3.897E-02	4.696E-01	3.899E-01	83.02	
CD-109	461.40D	1.57	2.930E+00	4.605E+00	1.645E+00	35.71	
SN-126	2.30E+05Y	1.00	2.930E-01	2.930E-01	1.047E-01	35.71	
BA-137M	30.08Y	1.02	1.506E-01	1.535E-01	0.628E-01	40.91	
CS-137	30.08Y	1.02	1.591E-01	1.621E-01	0.663E-01	40.91	
TL-208	1.41E+10Y	1.00	2.705E-01	2.705E-01	0.836E-01	30.91	
BI-211	7.04E+08Y	1.00	2.588E+00	2.588E+00	0.431E+00	16.64	
BI-212	1.41E+10Y	1.00	1.051E+00	1.051E+00	0.661E+00	62.94	
PB-212	1.41E+10Y	1.00	1.020E+00	1.020E+00	0.117E+00	11.49	
BI-214	1600.00Y	1.00	8.865E-01	8.868E-01	1.517E-01	17.11	
PB-214	1600.00Y	1.00	9.393E-01	9.396E-01	1.563E-01	16.64	
RN-222	1600.00Y	1.00	8.865E-01	8.868E-01	1.517E-01	17.11	
RA-224	1.41E+10Y	1.00	2.850E+00	2.850E+00	0.998E+00	35.01	
RA-226	1600.00Y	1.00	8.865E-01	8.868E-01	1.517E-01	17.11	
AC-228	1.41E+10Y	1.00	1.105E+00	1.105E+00	0.276E+00	24.93	
RA-228	1.41E+10Y	1.00	1.105E+00	1.105E+00	0.276E+00	24.93	
TH-228	1.41E+10Y	1.00	1.020E+00	1.020E+00	0.117E+00	11.49	
TH-230	7.54E+04Y	1.00	8.865E-01	8.865E-01	1.516E-01	17.11	
PA-231	7.04E+08Y	1.00	9.175E-01	9.175E-01	8.769E-01	95.58	
TH-232	1.41E+10Y	1.00	1.105E+00	1.105E+00	0.276E+00	24.93	
TH-234	4.47E+09Y	1.00	1.697E+00	1.697E+00	1.850E+00	108.99	
U-234	2.45E+05Y	1.00	8.865E-01	8.865E-01	1.516E-01	17.11	
U-238	4.47E+09Y	1.00	1.697E+00	1.697E+00	1.850E+00	108.99	
AM-243	7370.00Y	1.00	2.782E-01	2.782E-01	0.879E-01	31.59	
ANH-511	1.00E+09Y	1.00	5.052E-02	5.052E-02	7.167E-02	141.86	

Total Activity : 3.839E+01 4.050E+01

Grand Total Activity : 3.839E+01 4.050E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
6	27.05	71	19	1.29	54.31	51	12	1.38E-02	49.4	4.65E-07	
6	28.79	41	65	1.13	57.79	51	12	7.95E-03	****	4.59E-05	
0	32.30	22	128	1.75	64.80	63	6	4.37E-03	****	9.28E-03	
0	36.95	45	210	2.80	74.10	72	11	8.93E-03	****	2.24E-01	
0	99.39	48	146	1.98	198.89	195	8	1.04E-02	****	7.32E+00	T
0	131.15	51	243	3.89	262.37	254	13	1.14E-02	****	7.52E+00	T
0	180.90	51	120	1.44	361.81	357	9	1.18E-02	90.2	6.67E+00	T
0	185.56	130	153	1.81	371.12	366	12	2.98E-02	47.9	6.57E+00	T
0	208.31	21	135	0.72	416.59	414	8	4.84E-03	****	6.11E+00	
0	328.73	69	88	4.87	657.34	650	15	1.69E-02	68.5	4.32E+00	T
0	445.11	10	33	0.80	890.05	884	8	2.46E-03	****	3.37E+00	
0	548.49	8	19	0.78	1096.82	1089	9	2.11E-03	****	2.85E+00	
0	736.94	29	22	4.54	1473.80	1466	14	7.78E-03	79.1	2.27E+00	T
0	768.78	31	39	1.30	1537.51	1531	13	8.30E-03	93.1	2.19E+00	
0	882.98	10	17	1.01	1766.01	1757	12	2.69E-03	****	1.97E+00	T
0	964.70	13	25	2.59	1929.58	1923	12	3.63E-03	****	1.84E+00	T
0	989.92	9	4	1.42	1980.05	1977	6	2.43E-03	****	1.80E+00	
0	1010.46	18	12	1.45	2021.17	2016	12	5.00E-03	90.3	1.77E+00	
0	1080.88	27	8	2.47	2162.12	2153	16	7.54E-03	60.3	1.68E+00	
2	1117.13	14	0	1.60	2234.70	2233	26	3.77E-03	53.1	1.64E+00	
0	1174.53	18	14	3.77	2349.61	2342	14	5.00E-03	****	1.57E+00	T
0	1214.72	15	10	1.04	2430.08	2423	11	4.32E-03	96.5	1.53E+00	
0	1238.62	36	13	1.06	2477.94	2471	13	1.01E-02	52.6	1.51E+00	T
0	1263.96	12	3	0.62	2528.68	2525	7	3.28E-03	77.9	1.48E+00	
0	1377.92	22	3	2.06	2756.91	2750	14	6.25E-03	55.0	1.38E+00	
0	1509.50	16	4	3.13	3020.48	3012	14	4.53E-03	69.7	1.28E+00	

Flags: "T" = Tentatively associated

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235046.CNF;1
* Acquisition date   : 3-OCT-2016 06:57:53 Sensitivity      : 3.000
* Detector ID       : GAM20 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:14.88 Half life ratio : *****
* Sample date       : 7-DEC-2015 10:02:00 Nuclide Library : SOLID
* Sample ID         : G405235046 Analyst initials: MXR1
* Batch Number      : 1596252 Sample Quantity : 1.5693E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 30-JUN-2016 06:52:39 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM20_CAN.CNF;15
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.107E-01
SC-46	2.604E-01
CD-109	9.221E-01
SN-126	5.887E-02
BA-137M	2.257E-02
CS-137	2.385E-02
TL-208	2.220E-02
BI-212	2.722E-01
PB-212	3.683E-02
BI-214	3.700E-02
PB-214	4.870E-02
RN-222	3.700E-02
RA-224	3.947E-01
RA-226	3.700E-02
AC-228	7.807E-02
RA-228	7.807E-02
TH-228	3.683E-02
TH-230	3.699E-02
PA-231	2.986E-01
TH-232	7.807E-02
TH-234	7.959E-01
U-234	3.699E-02
U-238	7.959E-01
AM-243	3.420E-02
ANH-511	2.113E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	9.099E+00	NOT IDENT.
NA-22	3.350E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.447E-02	NOT IDENT.
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF

MN-54	3.747E-02	NOT IDENT.
CO-56	3.650E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	3.081E-02	NOT IDENT.
CO-58	4.126E-01	NOT IDENT.
FE-59	4.690E+00	NOT IDENT.
CO-60	2.869E-02	FAIL ABUN
ZN-65	1.226E-01	NOT IDENT.
GE-68	1.128E+00	NOT IDENT.
AS-73	4.414E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.431E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.779E-01	NOT IDENT.
KR-85	5.535E+00	NOT IDENT.
SR-85	5.911E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	9.266E-02	NOT IDENT.
Y-91	4.143E+02	NOT IDENT.
NB-94	2.401E-02	NOT IDENT.
NB-95	7.061E-01	NOT IDENT.
NB-95M	1.674E+00	NOT IDENT.
ZR-95	1.138E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.510E-02	NOT IDENT.
RH-102	4.237E-02	NOT IDENT.
RU-103	4.200E+00	FAIL ABUN
RH-106	3.372E-01	NOT IDENT.
RU-106	3.372E-01	NOT IDENT.
AG-108M	1.986E-02	NOT IDENT.
AG-110M	4.917E-02	NOT IDENT.
SN-113	1.524E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.058E-01	NOT IDENT.
SB-124	1.459E+00	NOT IDENT.
SB-125	7.327E-02	NOT IDENT.
TE-125M	2.111E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.937E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	4.355E-02	NOT IDENT.
CS-135	1.047E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	8.093E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.815E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.467E-01	NOT IDENT.
PM-144	3.419E-02	NOT IDENT.
PR-144	2.975E+00	NOT IDENT.
PM-146	2.736E-02	FAIL ABUN
ND-147	0.000E+00	SHORT HLIF
PM-147	5.399E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.997E-02	FAIL ABUN
EU-152	6.296E-02	FAIL ABUN
GD-153	1.252E-01	NOT IDENT.
EU-154	8.073E-02	NOT IDENT.
EU-155	8.469E-02	FAIL ABUN
TB-160	1.320E+00	FAIL ABUN
HO-166M	4.130E-02	FAIL ABUN
TM-171	1.022E+01	NOT IDENT.
HF-172	1.628E-01	FAIL ABUN
LU-172	6.387E-02	FAIL ABUN
LU-176	1.764E-02	FAIL ABUN
HF-181	3.053E+00	NOT IDENT.

TA-182	6.346E-01	FAIL ABUN
RE-183	1.631E+00	NOT IDENT.
RE-184	2.464E+01	NOT IDENT.
W-188	7.305E+01	FAIL ABUN
IR-192	3.741E-01	FAIL ABUN
HG-203	1.881E+00	NOT IDENT.
BI-207	3.593E-02	FAIL ABUN
PB-210	1.498E+00	NOT IDENT.
BI-211	3.568E-01	FAIL ABUN
PB-211	4.779E-01	NOT IDENT.
RN-219	2.737E-01	NOT IDENT.
RA-223	4.279E-01	FAIL ABUN
AC-227	1.937E-01	FAIL ABUN
TH-227	1.937E-01	FAIL ABUN
TH-229	3.409E-01	FAIL ABUN
TH-231	4.279E-01	FAIL ABUN
PA-233	3.876E-02	FAIL ABUN
PA-234	2.085E-01	FAIL ABUN
PA-234M	3.166E+00	NOT IDENT.
U-235	1.404E-01	FAIL ABUN
NP-237	3.876E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.881E-01	FAIL ABUN
PU-239	2.504E+02	NOT IDENT.
AM-241	7.483E-02	NOT IDENT.
CM-243	7.192E-02	FAIL ABUN
BK-247	5.099E-02	NOT IDENT.
CM-247	2.317E-02	NOT IDENT.
CF-249	2.600E-02	NOT IDENT.
CF-251	7.666E-02	NOT IDENT.


```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235046.CNF;1
* Acquisition date   : 3-OCT-2016 06:57:53 Sensitivity      : 3.000
* Detector ID        : GAM20 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:14.88 Half life ratio  : *****
* Sample date        : 7-DEC-2015 10:02:00 Nuclide Library : SOLID
* Sample ID          : G405235046 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity : 1.5693E+02 GRAM
*                    : Quantity Err(%) : 1.2745E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                    : Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 30-JUN-2016 06:52:39 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM20_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.269E+01	1.468E+00	1.468E+00
SC-46	4.696E-01	3.826E-01	3.826E-01
CD-109	3.068E+00	1.701E+00	1.701E+00
SN-126	1.952E-01	1.078E-01	1.078E-01
BA-137M	1.535E-01	6.187E-02	6.187E-02
CS-137	1.621E-01	6.536E-02	6.536E-02
TL-208	2.705E-01	8.274E-02	8.274E-02
BI-212	1.051E+00	6.503E-01	6.503E-01
PB-212	1.020E+00	1.269E-01	1.269E-01
BI-214	8.868E-01	1.534E-01	1.534E-01
PB-214	9.396E-01	1.581E-01	1.581E-01
RN-222	8.868E-01	1.534E-01	1.534E-01
RA-224	9.734E-01	1.126E+00	1.126E+00
RA-226	8.868E-01	1.534E-01	1.534E-01
AC-228	1.105E+00	2.759E-01	2.759E-01
RA-228	1.105E+00	2.759E-01	2.759E-01
TH-228	1.020E+00	1.269E-01	1.269E-01
TH-230	8.865E-01	1.534E-01	1.534E-01
PA-231	9.175E-01	8.814E-01	8.814E-01
TH-232	1.105E+00	2.759E-01	2.759E-01
TH-234	1.697E+00	1.852E+00	1.852E+00
U-234	8.865E-01	1.534E-01	1.534E-01
U-238	1.697E+00	1.852E+00	1.852E+00
AM-243	1.866E-01	9.155E-02	9.155E-02
ANH-511	5.052E-02	7.027E-02	7.027E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-5.115E+00	1.108E+01	1.131E+01	NOT IDENT.
NA-22	-1.917E-02	4.237E-02	4.324E-02	NOT IDENT.
NA-24	-1.000E+41	6.259E+41	0.000E+00	SHORT HLIF
AL-26	1.086E-02	2.591E-02	2.637E-02	NOT IDENT.
V-48	-5.929E+03	1.139E+04	1.170E+04	SHORT HLIF

CR-51	1.126E+02	3.656E+02	3.691E+02	SHORT HLIF
MN-54	-4.845E-02	5.464E-02	5.885E-02	NOT IDENT.
CO-56	1.518E-01	4.115E-01	4.172E-01	FAIL ABUN
MN-56	1.000E+41	2.735E+41	0.000E+00	SHORT HLIF
CO-57	-3.777E-02	3.930E-02	4.283E-02	NOT IDENT.
CO-58	5.550E-03	4.930E-01	4.930E-01	NOT IDENT.
FE-59	-1.985E+00	5.720E+00	5.790E+00	NOT IDENT.
CO-60	1.430E-02	3.034E-02	3.102E-02	FAIL ABUN
ZN-65	3.964E-02	1.497E-01	1.507E-01	NOT IDENT.
GE-68	-1.014E+00	1.792E+00	1.850E+00	NOT IDENT.
AS-73	1.646E+00	4.751E+00	4.809E+00	NOT IDENT.
AS-74	-1.713E+00	4.220E+03	4.220E+03	SHORT HLIF
SE-75	3.793E-03	1.565E-01	1.565E-01	NOT IDENT.
BR-77	2.488E+38	2.161E+39	0.000E+00	SHORT HLIF
SR-82	1.806E+02	6.009E+02	6.063E+02	SHORT HLIF
RB-83	3.339E-02	5.459E-01	5.461E-01	NOT IDENT.
KR-85	5.665E-01	7.039E+00	7.043E+00	NOT IDENT.
SR-85	5.953E-02	7.518E-01	7.523E-01	NOT IDENT.
RB-86	-1.386E+04	2.213E+04	2.299E+04	SHORT HLIF
Y-88	1.568E-02	1.021E-01	1.023E-01	NOT IDENT.
Y-91	-2.924E+02	5.227E+02	5.391E+02	NOT IDENT.
NB-94	2.041E-02	2.515E-02	2.678E-02	NOT IDENT.
NB-95	3.249E-02	9.390E-01	9.391E-01	NOT IDENT.
NB-95M	-6.130E-01	2.090E+00	2.108E+00	NOT IDENT.
ZR-95	1.472E-01	1.330E+00	1.331E+00	NOT IDENT.
NB-97	1.000E+41	3.004E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.268E+41	0.000E+00	SHORT HLIF
MO-99	7.318E+31	2.104E+32	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	4.564E+41	0.000E+00	SHORT HLIF
RH-101	9.118E-03	3.066E-02	3.093E-02	NOT IDENT.
RH-102	1.775E-02	4.671E-02	4.739E-02	NOT IDENT.
RU-103	1.059E+00	4.673E+00	4.697E+00	FAIL ABUN
RH-106	-1.928E-01	4.258E-01	4.345E-01	NOT IDENT.
RU-106	-1.928E-01	4.258E-01	4.345E-01	NOT IDENT.
AG-108M	8.832E-03	2.139E-02	2.176E-02	NOT IDENT.
AG-110M	2.149E-03	8.411E-02	8.411E-02	NOT IDENT.
SN-113	-9.181E-02	1.834E-01	1.880E-01	NOT IDENT.
CD-115	3.850E+39	3.654E+39	0.000E+00	SHORT HLIF
SN-117M	-1.833E+04	9.643E+04	9.679E+04	SHORT HLIF
TE-123M	3.681E-02	1.211E-01	1.222E-01	NOT IDENT.
SB-124	-3.225E-01	1.841E+00	1.847E+00	NOT IDENT.
SB-125	-5.840E-03	8.387E-02	8.391E-02	NOT IDENT.
TE-125M	1.597E+02	2.289E+02	2.399E+02	NOT IDENT.
I-126	-5.194E+05	8.726E+05	9.035E+05	SHORT HLIF
SB-126	-2.742E+04	1.073E+06	1.073E+06	SHORT HLIF
SB-127	-1.038E+22	2.662E+22	0.000E+00	SHORT HLIF
I-131	-3.345E+08	4.461E+09	4.463E+09	SHORT HLIF
I-132	-1.000E+41	1.862E+42	0.000E+00	SHORT HLIF
TE-132	-6.031E+25	3.783E+26	0.000E+00	SHORT HLIF
BA-133	2.859E-03	3.448E-02	3.450E-02	NOT IDENT.
I-133	-1.000E+41	2.592E+41	0.000E+00	SHORT HLIF
CS-134	2.659E-02	4.812E-02	4.959E-02	NOT IDENT.
CS-135	-7.178E-02	1.211E-01	1.254E-01	NOT IDENT.
I-135	-1.000E+41	6.992E+41	0.000E+00	SHORT HLIF
CS-136	-2.112E+04	2.761E+05	2.763E+05	SHORT HLIF
CE-139	-5.926E-02	1.017E-01	1.051E-01	NOT IDENT.
BA-140	4.661E+05	8.621E+05	8.873E+05	SHORT HLIF
LA-140	-2.072E+05	4.161E+05	4.265E+05	SHORT HLIF
CE-141	3.271E+00	2.081E+01	2.086E+01	NOT IDENT.
CE-143	1.000E+41	8.011E+40	0.000E+00	SHORT HLIF
CE-144	-1.112E-01	3.246E-01	3.285E-01	NOT IDENT.
PM-144	-6.332E-03	4.154E-02	4.164E-02	NOT IDENT.
PR-144	-5.377E-01	3.612E+00	3.621E+00	NOT IDENT.
PM-146	8.016E-03	2.997E-02	3.019E-02	FAIL ABUN
ND-147	-1.122E+07	2.689E+07	2.736E+07	SHORT HLIF
PM-147	-2.573E+01	6.262E+02	6.263E+02	NOT IDENT.
PM-149	-4.003E+40	4.588E+40	0.000E+00	SHORT HLIF
EU-150	2.957E-02	2.442E-02	2.782E-02	FAIL ABUN
EU-152	-2.624E-02	7.327E-02	7.422E-02	FAIL ABUN
GD-153	-6.298E-02	1.606E-01	1.631E-01	NOT IDENT.
EU-154	-6.036E-02	1.047E-01	1.082E-01	NOT IDENT.
EU-155	3.293E-02	9.438E-02	9.554E-02	FAIL ABUN
TB-160	1.519E-01	1.752E+00	1.753E+00	FAIL ABUN
HO-166M	2.843E-02	4.402E-02	4.584E-02	FAIL ABUN
TM-171	-3.299E+00	1.154E+01	1.163E+01	NOT IDENT.
HF-172	-1.727E-01	2.253E-01	2.384E-01	FAIL ABUN
LU-172	-3.901E-04	7.317E-02	7.317E-02	FAIL ABUN
LU-176	4.360E-03	1.993E-02	2.003E-02	FAIL ABUN

HF-181	-1.825E+00	3.747E+00	3.836E+00	NOT IDENT.
TA-182	-7.189E-02	7.464E-01	7.471E-01	FAIL ABUN
RE-183	8.555E-02	1.801E+00	1.802E+00	NOT IDENT.
RE-184	1.310E+01	2.759E+01	2.822E+01	NOT IDENT.
W-188	-3.759E+01	9.503E+01	9.653E+01	FAIL ABUN
IR-192	1.964E-01	3.965E-01	4.062E-01	FAIL ABUN
HG-203	2.030E-01	2.051E+00	2.053E+00	NOT IDENT.
BI-207	1.858E-02	3.791E-02	3.882E-02	FAIL ABUN
PB-210	1.886E+00	1.487E+00	1.713E+00	NOT IDENT.
BI-211	2.588E+00	4.375E-01	1.246E+00	FAIL ABUN
PB-211	2.369E-01	5.109E-01	5.220E-01	NOT IDENT.
RN-219	-9.674E-03	3.102E-01	3.102E-01	NOT IDENT.
RA-223	2.368E-01	4.961E-01	5.074E-01	FAIL ABUN
AC-227	1.446E-01	2.013E-01	2.115E-01	FAIL ABUN
TH-227	1.446E-01	2.013E-01	2.115E-01	FAIL ABUN
TH-229	2.438E-02	3.644E-01	3.645E-01	FAIL ABUN
TH-231	2.368E-01	4.961E-01	5.074E-01	FAIL ABUN
PA-233	-6.129E-04	4.304E-02	4.304E-02	FAIL ABUN
PA-234	6.111E-02	2.366E-01	2.382E-01	FAIL ABUN
PA-234M	-3.214E-01	3.541E+00	3.544E+00	NOT IDENT.
U-235	-2.878E-02	1.651E-01	1.656E-01	FAIL ABUN
NP-237	-6.129E-04	4.304E-02	4.304E-02	FAIL ABUN
NP-238	4.781E+40	5.270E+41	0.000E+00	SHORT HLIF
NP-239	1.386E-01	2.052E-01	2.145E-01	FAIL ABUN
PU-239	1.953E+02	2.744E+02	2.882E+02	NOT IDENT.
AM-241	-6.961E-02	8.853E-02	9.393E-02	NOT IDENT.
CM-243	-3.105E-02	8.495E-02	8.609E-02	FAIL ABUN
BK-247	2.122E-02	5.399E-02	5.483E-02	NOT IDENT.
CM-247	-7.907E-03	2.719E-02	2.743E-02	NOT IDENT.
CF-249	-3.610E-03	2.972E-02	2.977E-02	NOT IDENT.
CF-251	-2.636E-02	9.364E-02	9.439E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	82.9146	87.09	128.9682	136.47	78.5592
45.60	91.8005	87.57	152.2725	140.51	0.0000
46.54	54.5410	88.03	152.3671	143.76	88.8718
49.72	0.0000	88.34	155.4788	144.24	73.0792
51.35	83.1043	88.47	155.5053	145.44	69.5070
51.87	95.0677	89.96	153.5216	152.43	72.4293
52.39	89.7516	1093.63	155.9520	153.25	0.0000
52.97	82.2692	91.11	0.0000	323.87	88.5366
53.44	74.7554	92.59	136.8048	156.02	0.0000
54.07	78.0941	93.35	136.9392	158.56	0.0000
57.36	0.0000	94.56	89.1293	159.00	72.8749
57.53	79.6633	94.65	89.1400	162.33	75.5742
57.98	87.3697	94.67	89.1423	162.66	0.0000
59.27	110.5481	94.87	89.1647	163.33	70.6829
59.32	110.5574	97.43	90.9961	165.86	84.5154
59.54	110.5986	98.43	79.9144	176.31	62.7151
60.96	96.5938	98.44	79.9155	176.60	0.0000
61.17	96.6277	99.53	80.0234	177.52	62.7808
62.93	133.2498	100.11	83.5626	181.07	0.0000
63.29	133.3285	102.03	65.1465	181.52	52.9153
63.58	133.3915	103.18	94.7497	184.41	56.8323
64.28	133.5432	103.37	92.0526	143.76	56.8948
66.73	125.5735	105.21	86.4173	193.51	64.4698
67.24	103.4961	105.31	86.4274	197.03	85.9195
125.81	109.4862	106.12	79.4966	198.01	66.4052
67.75	109.4982	106.47	86.5471	201.83	77.7079
69.67	125.7801	109.28	70.4057	203.43	66.6901
70.83	107.0471	111.00	96.4134	205.31	62.9353
72.81	137.1933	111.76	0.0000	210.85	74.8134
72.87	137.2054	114.06	100.2916	215.65	60.4147
74.66	127.8517	116.30	0.0000	222.11	66.7766
74.82	127.8821	116.74	71.0088	227.09	54.8353
74.97	127.9099	119.76	45.1233	227.38	54.8469
77.11	128.3109	121.12	61.8397	228.16	0.0000
78.74	114.3224	121.22	61.8464	228.18	55.7500
79.69	114.4770	121.78	78.5457	116.74	55.7500
80.12	108.5178	122.06	83.3311	235.69	64.3716
80.19	0.0000	122.92	51.2370	235.96	64.3835
80.57	81.4400	123.07	54.8208	238.63	57.0456
81.00	98.0891	265.00	50.0868	238.98	0.0000
81.07	107.1544	125.81	95.6219	240.99	57.1401
81.75	120.0967	127.23	73.4206	242.00	57.1805
83.79	118.1648	127.91	84.6545	244.70	46.2708
84.00	112.1374	129.30	79.1797	252.40	0.0000
85.43	130.5773	131.20	79.3368	252.80	53.1750
86.55	133.8163	133.02	75.4723	254.15	0.0000
86.79	133.8593	133.52	77.1182	256.23	52.4100
86.94	128.9424	136.00	70.0653	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	41.0913	355.39	0.0000	584.27	19.8396
264.80	41.0951	356.01	25.4592	595.83	0.0000
265.00	37.5267	364.49	0.0000	427.87	16.8092
268.22	64.4663	366.42	0.0000	602.52	0.0000
269.46	38.5322	372.51	33.2910	604.72	9.4695
270.03	36.7534	375.05	40.9546	607.14	15.7965
271.23	59.2096	377.52	33.3779	609.32	14.7554
273.65	0.0000	356.01	34.4429	610.33	14.7611
276.40	52.2061	388.16	32.6006	614.28	22.1732
277.37	53.1386	388.63	0.0000	618.01	23.2604
277.60	42.3375	391.69	34.5798	620.36	19.0481
278.00	38.7439	264.66	26.0508	621.93	24.3523
279.20	51.3976	401.81	32.8234	630.19	0.0000
279.54	54.1138	402.40	31.8674	631.29	15.9357
279.70	54.1199	404.85	25.1378	633.25	17.0098
280.46	49.6334	410.95	36.8496	634.78	0.0000
283.69	35.2660	413.71	29.1309	635.95	14.8978
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	41.6407	423.72	0.0000	645.85	17.0859
285.90	0.0000	427.09	27.3631	657.76	12.8682
287.50	32.6309	427.87	29.3280	657.90	0.0000
290.67	43.5938	433.94	22.5494	661.66	18.2541
293.27	0.0000	439.40	30.9610	664.57	0.0000
351.93	40.9827	453.88	17.8099	666.33	0.0000
295.96	41.0019	463.37	27.8228	666.50	0.0000
879.38	21.9023	468.07	29.8724	667.71	0.0000
299.98	39.7316	473.00	0.0000	677.62	23.7528
300.09	39.7343	475.06	28.9658	685.70	0.0000
300.13	39.7352	476.78	19.9915	695.00	0.0000
301.36	39.7644	477.60	33.9972	696.49	17.3848
302.85	39.7998	482.18	31.0593	696.51	17.3848
256.23	41.2134	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	9.7815
306.78	37.4174	497.08	22.1835	697.49	8.6953
308.46	41.3104	505.52	19.7329	702.65	14.1537
311.90	33.1157	507.63	0.0000	706.68	15.2629
316.51	39.6616	511.00	30.4279	711.68	13.1040
319.41	0.0000	514.00	33.5129	720.70	0.0000
320.08	0.0000	514.00	33.5129	721.93	0.0000
321.04	43.4649	520.40	23.4193	722.78	18.0831
323.87	31.9570	520.69	0.0000	722.91	18.0838
325.23	43.1056	522.65	0.0000	723.31	31.2403
328.76	0.0000	527.90	0.0000	724.19	24.6707
333.37	41.9073	528.26	15.3223	727.33	13.1709
333.97	22.3584	529.59	25.5513	733.00	8.7965
334.37	41.9312	529.87	0.0000	735.93	14.3081
338.28	52.2949	531.02	0.0000	333.97	14.3150
338.32	52.2961	537.26	0.0000	739.50	0.0000
311.90	36.4641	546.56	0.0000	747.24	16.5686
340.48	36.4641	552.55	17.5347	748.06	18.7826
340.55	0.0000	563.25	21.7520	752.31	17.7012
344.28	38.4141	569.33	24.9180	753.82	0.0000
345.93	31.5096	946.00	22.8424	756.73	19.9417
351.06	36.6760	569.70	22.8442	756.80	19.9424
351.93	36.6934	583.19	19.8311	884.68	26.6494

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	26.6641	1274.44	8.0008	1620.50	5.0671
766.42	28.3368	1001.03	15.1308	1621.92	6.0820
766.84	25.0058	1002.74	11.5757	1678.03	0.0000
772.60	0.0000	1004.73	14.2539	1690.97	6.1549
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.1154
778.90	32.3501	1028.54	0.0000	1063.66	6.2366
783.70	0.0000	1037.84	14.3730	1771.35	4.1587
785.37	25.1486	1038.76	0.0000	1791.20	0.0000
792.07	30.9119	631.29	15.3046	1808.65	3.1379
794.95	11.2097	1048.07	0.0000	1810.72	0.0000
795.86	20.1833	1049.04	18.9159	1836.06	1.0505
810.06	15.7648	1050.41	10.8127		
810.29	15.7660	1063.66	10.8479		
344.28	15.7665	1077.00	0.0000		
810.76	15.7682	1077.34	11.6094		
815.77	0.0000	1085.87	8.7252		
1048.07	0.0000	1093.63	19.1210		
832.01	13.6006	1099.45	16.4125		
834.85	22.6864	1112.07	10.0594		
835.71	12.4806	1112.84	12.1956		
836.80	0.0000	1115.54	11.7156		
846.75	0.0000	1120.29	9.1626		
846.77	14.7969	1120.55	9.1632		
856.80	0.0000	1221.41	9.1650		
860.56	17.1411	1129.67	13.2231		
871.09	8.0231	1131.51	0.0000		
873.19	11.4685	1147.95	0.0000		
875.33	0.0000	1173.23	11.1299		
879.38	13.7861	1177.95	16.3410		
880.51	13.7905	1189.05	13.0310		
883.24	6.9004	1204.77	24.2845		
884.68	6.9033	1221.41	14.9990		
889.28	13.8242	1231.02	13.1515		
894.76	13.8452	1235.36	0.0000		
898.04	15.0127	1238.28	11.2903		
900.72	16.1795	1260.41	0.0000		
903.28	13.8779	1271.87	12.3200		
911.20	11.5898	1274.44	18.0154		
912.08	11.5926	1274.54	17.0673		
923.98	0.0000	1291.59	12.3708		
926.50	16.2935	1298.22	0.0000		
929.11	12.8110	1312.11	0.0000		
937.49	17.5085	1332.49	6.7180		
944.13	0.0000	1362.66	0.0000		
946.00	14.0386	1365.19	4.8303		
949.00	18.4404	1368.63	0.0000		
667.71	0.0000	1384.29	9.0508		
962.31	11.2793	1408.01	4.8715		
964.08	19.7477	1457.56	0.0000		
966.17	0.0000	1460.82	6.8898		
911.20	15.5359	1489.16	5.9374		
968.97	15.5359	1505.03	6.3520		
983.53	0.0000	1584.12	9.0621		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235047.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM25.CNF;357
Background date : 2-OCT-2016 11:01:25.
Sample date     : 7-DEC-2015 10:10:00. Acquisition date : 3-OCT-2016 07:00:30.
Sample ID      : G405235047           Sample quantity  : 1.51349E+02 GRAM
Detector name  : GAM25                Detector geometry: CAN
Elapsed live time: 0 01:00:00.00      Elapsed real time: 0 01:00:00.56  0.0%
Energy tolerance: 1.50000 keV         Analyst Initials  : MXR1
Abundance limit: 75.00000             Sensitivity       : 3.00000
Batch ID       : 1596252              Detector SN#      :
Matrix Spike ID:                       LCS ID           : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.64*	68	221	1.04	92.79	88	10	1.88E-02	44.2	
2	0	53.35*	38	110	1.16	106.19	104	6	1.06E-02	47.4	
3	0	63.13*	55	241	0.72	125.75	122	8	1.54E-02	52.4	
4	2	74.85*	165	227	0.76	149.19	146	16	4.59E-02	14.8	4.09E+00
5	2	77.15*	430	177	0.79	153.79	146	16	1.20E-01	6.8	
6	0	83.83*	32	143	1.14	167.14	165	6	8.93E-03	62.3	
7	0	88.17	244	264	3.47	175.83	170	12	6.78E-02	14.9	
8	0	92.83*	126	159	1.39	185.15	182	8	3.51E-02	20.8	
9	0	129.09	23	138	0.78	257.66	254	8	6.33E-03	91.8	
10	0	186.02*	86	134	1.12	371.50	368	9	2.40E-02	27.7	
11	0	209.42	37	106	0.99	418.30	414	9	1.01E-02	53.4	
12	3	238.77*	449	80	1.03	477.00	470	17	1.25E-01	5.7	1.25E+00
13	3	241.67	110	104	1.54	482.79	470	17	3.07E-02	22.3	
14	0	270.41	44	83	0.79	540.29	535	10	1.22E-02	41.4	
15	4	276.52	17	12	0.83	552.49	551	9	4.79E-03	36.9	3.14E+00
16	4	277.89*	25	44	1.33	555.24	551	9	6.92E-03	53.1	
17	0	295.19*	169	64	1.19	589.83	583	12	4.69E-02	12.4	
18	0	300.34	43	53	0.90	600.13	596	9	1.20E-02	34.1	
19	0	328.32	41	58	2.39	656.11	651	10	1.13E-02	38.3	
20	0	338.88*	96	66	1.56	677.21	671	15	2.66E-02	21.6	
21	0	352.09*	268	74	1.08	703.63	698	11	7.45E-02	8.8	
22	0	447.74	22	11	2.19	894.95	892	7	5.97E-03	33.0	
23	0	464.79	14	49	0.90	929.06	922	11	3.80E-03	101.3	
24	0	482.67	19	23	1.77	964.83	962	8	5.14E-03	50.1	
25	0	511.26*	8	62	1.24	1022.01	1015	13	2.17E-03	241.1	
26	0	556.69	15	21	0.64	1112.89	1105	11	4.10E-03	66.5	
27	0	583.58*	108	42	1.32	1166.69	1162	13	3.00E-02	15.6	
28	0	588.90	8	19	1.25	1177.33	1174	7	2.36E-03	89.5	
29	0	609.55*	185	54	1.40	1218.63	1212	15	5.13E-02	11.4	
30	0	626.45	36	45	7.10	1252.45	1238	21	1.01E-02	50.1	
31	0	690.83	17	18	2.00	1381.24	1372	12	4.61E-03	56.8	
32	0	694.35	10	13	1.38	1388.28	1385	6	2.71E-03	67.5	
33	0	727.11	37	7	1.72	1453.82	1449	10	1.02E-02	21.6	
34	0	797.89	30	28	5.52	1595.43	1586	18	8.39E-03	46.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	877.76	4	17	1.25	1755.24	1749	8	1.17E-03	179.1	
36	0	911.59*	78	28	1.93	1822.94	1816	14	2.17E-02	18.5	
37	0	922.94	8	5	1.72	1845.64	1841	7	2.16E-03	60.6	
38	0	964.31	21	6	1.90	1928.42	1922	11	5.92E-03	30.5	
39	0	969.34*	61	0	2.33	1938.49	1933	13	1.69E-02	13.8	
40	0	1009.53	5	10	0.67	2018.92	2013	8	1.35E-03	128.3	
41	0	1120.86*	39	18	1.60	2241.72	2233	14	1.08E-02	28.2	
42	0	1154.11	9	19	0.42	2308.26	2297	13	2.51E-03	105.8	
43	0	1178.35	18	13	4.77	2356.78	2351	13	5.00E-03	47.5	
44	0	1258.31	16	18	1.86	2516.80	2509	17	4.57E-03	62.7	
45	0	1338.77	5	9	4.35	2677.86	2668	11	1.39E-03	133.0	
46	0	1460.65*	402	0	1.98	2921.82	2913	18	1.12E-01	5.0	
47	0	1764.66*	42	4	2.63	3530.46	3523	14	1.17E-02	18.5	

Flag: "*" = Peak area was modified by background subtraction


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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235047.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 7-DEC-2015 10:10:00   Acquisition date  : 3-OCT-2016 07:00:30
Sample ID        : G405235047             Sample quantity  : 151.35 GRAM
Sample type      : SOLID                   Sample geometry  :
Detector name    : GAMMA25                 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00           Elapsed real time: 0 01:00:00.56   0.0%
Energy tolerance : 1.50 keV                Half life ratio  : 10.00
Errors propagated: No                       Systematic Error : 0.00 %
Efficiency type  : Linear                   Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.131E+00	1.597E+01	1.597E+01	10.05	OK
AS-73	53.44	10.30*	9.638E+00	2.507E-01	3.366E+00	94.70	OK
CD-109	88.03	3.70*	9.265E+00	3.424E+00	5.381E+00	39.59	OK
SN-126	64.28	9.60	9.545E+00	3.905E-01	3.905E-01	104.75	OK
	86.94	8.90	9.265E+00	1.423E+00	1.423E+00	39.59	OK
	87.57	37.00*	9.265E+00	3.424E-01	3.424E-01	39.59	OK
HG-203	70.83	3.69	9.445E+00	-----	Line Not Found	-----	Absent
	72.87	6.19	9.424E+00	-----	Line Not Found	-----	Absent
	279.20	81.56*	4.801E+00	1.447E-02	1.272E+00	268.94	OK
TL-208	277.37	6.60	4.809E+00	-----	Line Not Found	-----	<<INT Reject
	583.19	85.00*	2.509E+00	2.673E-01	2.673E-01	31.22	OK
	860.56	12.50	1.810E+00	-----	Line Not Found	-----	Absent
PB-210	46.54	4.25*	9.157E+00	1.149E+00	1.179E+00	88.41	OK
PB-212	74.82	10.28	9.404E+00	4.478E-01	4.478E-01	80.06	OK
	77.11	17.10	9.382E+00	1.704E+00	1.704E+00	13.54	OK
	238.63	43.60*	5.476E+00	1.083E+00	1.083E+00	11.42	OK
	300.09	3.30	4.483E+00	1.645E+00	1.645E+00	68.26	OK
BI-214	609.32	45.49*	2.418E+00	8.813E-01	8.816E-01	22.84	OK
	1120.29	14.92	1.443E+00	8.896E-01	8.899E-01	56.43	OK
	1764.49	15.30	9.335E-01	1.386E+00	1.387E+00	37.02	OK
PB-214	74.82	5.80	9.405E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	9.382E+00	3.005E+00	3.006E+00	13.54	OK
	87.09	3.41	9.279E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	5.413E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.552E+00	1.135E+00	1.136E+00	24.72	OK
	351.93	35.60*	3.893E+00	1.074E+00	1.074E+00	17.57	OK
RN-222	609.32	45.49*	2.418E+00	8.813E-01	8.816E-01	22.84	OK
	1120.29	14.92	1.443E+00	8.896E-01	8.899E-01	56.43	OK
	1764.49	15.30	9.335E-01	1.386E+00	1.387E+00	37.02	OK
RA-224	240.99	4.10*	5.420E+00	8.483E-01	8.483E-01	161.11	OK
RA-226	609.32	45.49*	2.418E+00	8.813E-01	8.816E-01	22.84	OK
	1120.29	14.92	1.443E+00	8.896E-01	8.899E-01	56.43	OK
	1764.49	15.30	9.335E-01	1.386E+00	1.387E+00	37.02	OK
AC-228	105.21	1.10	8.977E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.027E+00	1.176E+00	1.176E+00	43.10	OK
	794.95	4.25	1.935E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.856E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.724E+00	8.859E-01	8.859E-01	37.10	OK
	968.97	15.80	1.637E+00	1.177E+00	1.177E+00	27.51	OK
RA-228	105.21	1.10	8.977E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.027E+00	1.176E+00	1.176E+00	43.10	OK
	794.95	4.25	1.935E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.856E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.724E+00	8.859E-01	8.859E-01	37.10	OK
	968.97	15.80	1.637E+00	1.177E+00	1.177E+00	27.51	OK
TH-228	74.82	10.28	9.404E+00	4.478E-01	4.478E-01	80.06	OK
	77.11	17.10	9.382E+00	1.704E+00	1.704E+00	13.54	OK
	238.63	43.60*	5.476E+00	1.083E+00	1.083E+00	11.42	OK
	300.09	3.30	4.483E+00	1.645E+00	1.645E+00	68.26	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	609.32	45.49*	2.418E+00	8.813E-01	8.813E-01	22.84	OK
	1120.29	14.92	1.443E+00	8.896E-01	8.896E-01	56.43	OK
	1764.49	15.30	9.335E-01	1.386E+00	1.386E+00	37.02	OK
PA-231	283.69	1.70	4.715E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.483E+00	1.014E+00	1.014E+00	68.26	OK
TH-232	105.21	1.10	8.977E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.027E+00	1.176E+00	1.176E+00	43.10	OK
	835.71	1.61	1.856E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.724E+00	8.859E-01	8.859E-01	37.10	OK
TH-234	968.97	15.80	1.637E+00	1.177E+00	1.177E+00	27.51	OK
	63.29	3.70*	9.545E+00	1.013E+00	1.013E+00	104.75	OK
	92.59	4.23	9.202E+00	2.029E+00	2.029E+00	41.59	OK
U-234	609.32	45.49*	2.418E+00	8.813E-01	8.813E-01	22.84	OK
	1120.29	14.92	1.443E+00	8.896E-01	8.896E-01	56.43	OK
	1764.49	15.30	9.335E-01	1.386E+00	1.386E+00	37.02	OK
U-238	63.29	3.70*	9.545E+00	1.013E+00	1.013E+00	104.75	OK
	92.59	4.23	9.202E+00	2.029E+00	2.029E+00	41.59	OK
AM-243	43.53	5.90	8.344E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	9.404E+00	6.851E-02	6.851E-02	80.06	OK
ANH-511	511.00	100.00*	2.809E+00	1.484E-02	1.484E-02	482.27	OK

Flag: "*" = Keyline

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235047.CNF;1
* Acquisition date   : 3-OCT-2016 07:00:30 Sensitivity      : 3.000
* Detector ID       : GAM25 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.56 Half life ratio  : *****
* Sample date      : 7-DEC-2015 10:10:00 Analyst initials: MXR1
* Sample ID       : G405235047 Sample Quantity : 1.5135E+02 GRAM
* Batch Number    : 1596252 Wet Weight      : 0.00000
* Wet wt corr     : 1.00000 Dry Weight     : 0.00000
* Nuclide Library : SOLID.NLB;6
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 1-AUG-2016 08:41:33 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM25_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.597E+01	1.573E+00	4.293E-01
AS-73	3.366E+00	3.124E+00	2.878E+00
CD-109	5.381E+00	2.088E+00	1.045E+00
SN-126	3.424E-01	1.329E-01	6.644E-02
HG-203	1.272E+00	3.352E+00	3.925E+00
TL-208	2.673E-01	8.178E-02	6.899E-02
PB-210	1.179E+00	1.022E+00	6.320E-01
PB-212	1.083E+00	1.212E-01	9.189E-02
BI-214	8.816E-01	1.974E-01	1.195E-01
PB-214	1.074E+00	1.849E-01	1.203E-01
RN-222	8.816E-01	1.974E-01	1.195E-01
RA-224	8.483E-01	1.339E+00	9.866E-01
RA-226	8.816E-01	1.974E-01	1.195E-01
AC-228	8.859E-01	3.221E-01	2.472E-01
RA-228	8.859E-01	3.221E-01	2.472E-01
TH-228	1.083E+00	1.212E-01	9.189E-02
TH-230	8.813E-01	1.973E-01	1.194E-01
PA-231	1.014E+00	6.786E-01	6.694E-01
TH-232	8.859E-01	3.221E-01	2.472E-01
TH-234	1.013E+00	1.040E+00	7.514E-01
U-234	8.813E-01	1.973E-01	1.194E-01
U-238	1.013E+00	1.040E+00	7.514E-01
AM-243	6.851E-02	5.375E-02	4.420E-02
ANH-511	1.484E-02	7.016E-02	4.474E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.498E+00	1.024E+01	1.979E+01	NOT IDENT.
NA-22	1.892E-02	4.591E-02	9.629E-02	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	1.641E-02	1.857E-02	5.896E-02	NOT IDENT.
SC-46	2.375E-01	3.539E-01	7.786E-01	FAIL ABUN
V-48	0.000E+00	1.554E+04	0.000E+00	SHORT HLIF

CR-51	0.000E+00	3.623E+02	0.000E+00	SHORT HLIF
MN-54	3.114E-02	6.194E-02	1.311E-01	NOT IDENT.
CO-56	1.064E-02	4.034E-01	8.232E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.562E-02	3.077E-02	6.282E-02	NOT IDENT.
CO-58	5.071E-01	5.222E-01	1.195E+00	NOT IDENT.
FE-59	3.160E-01	7.548E+00	1.493E+01	NOT IDENT.
CO-60	3.414E-02	4.531E-02	9.255E-02	NOT IDENT.
ZN-65	1.009E-01	2.076E-01	3.865E-01	NOT IDENT.
GE-68	1.277E+00	2.743E+00	5.617E+00	NOT IDENT.
AS-74	0.000E+00	5.628E+03	0.000E+00	SHORT HLIF
SE-75	1.437E-01	1.597E-01	3.281E-01	NOT IDENT.
BR-77	0.000E+00	2.953E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.800E+02	0.000E+00	SHORT HLIF
RB-83	3.605E-01	5.972E-01	1.248E+00	NOT IDENT.
KR-85	4.580E-01	6.606E+00	1.160E+01	NOT IDENT.
SR-85	4.702E-02	7.055E-01	1.238E+00	NOT IDENT.
RB-86	0.000E+00	3.500E+04	0.000E+00	SHORT HLIF
Y-88	6.973E-02	1.498E-01	4.127E-01	NOT IDENT.
Y-91	7.802E+01	6.323E+02	1.220E+03	NOT IDENT.
NB-94	-9.474E-03	3.525E-02	6.307E-02	NOT IDENT.
NB-95	1.140E-01	8.681E-01	1.646E+00	NOT IDENT.
NB-95M	3.327E-01	2.338E+00	4.011E+00	NOT IDENT.
ZR-95	9.346E-01	1.592E+00	3.205E+00	NOT IDENT.
NB-97	0.000E+00	1.808E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.920E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-1.326E-02	2.612E-02	4.489E-02	NOT IDENT.
RH-102	-3.004E-02	5.983E-02	9.153E-02	NOT IDENT.
RU-103	-5.389E-01	5.149E+00	9.684E+00	FAIL ABUN
RH-106	2.099E-01	4.636E-01	9.457E-01	NOT IDENT.
RU-106	2.099E-01	4.636E-01	9.457E-01	NOT IDENT.
AG-108M	8.297E-03	2.274E-02	4.695E-02	NOT IDENT.
AG-110M	-4.504E-02	9.872E-02	1.840E-01	NOT IDENT.
SN-113	9.424E-03	2.025E-01	4.016E-01	NOT IDENT.
CD-115	0.000E+00	4.158E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	7.316E+04	0.000E+00	SHORT HLIF
TE-123M	4.133E-02	9.566E-02	1.902E-01	NOT IDENT.
SB-124	-1.156E+00	1.636E+00	2.812E+00	NOT IDENT.
SB-125	-1.212E-03	8.542E-02	1.687E-01	FAIL ABUN
TE-125M	1.087E+02	1.724E+02	3.564E+02	NOT IDENT.
I-126	0.000E+00	8.372E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.319E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	2.848E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	4.385E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	4.264E+26	0.000E+00	SHORT HLIF
BA-133	4.513E-02	3.874E-02	7.902E-02	FAIL ABUN
I-133	0.000E+00	1.076E+41	0.000E+00	SHORT HLIF
CS-134	6.562E-02	5.098E-02	1.153E-01	NOT IDENT.
CS-135	9.733E-02	1.108E-01	2.139E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.344E+05	0.000E+00	SHORT HLIF
BA-137M	5.086E-02	3.696E-02	8.035E-02	NOT IDENT.
CS-137	5.372E-02	3.904E-02	8.488E-02	NOT IDENT.
CE-139	3.480E-02	9.004E-02	1.761E-01	NOT IDENT.
BA-140	0.000E+00	1.194E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.190E+05	0.000E+00	SHORT HLIF
CE-141	-1.922E+01	1.915E+01	3.371E+01	NOT IDENT.
CE-143	0.000E+00	1.696E+41	0.000E+00	SHORT HLIF
CE-144	-2.232E-02	2.469E-01	4.765E-01	NOT IDENT.
PM-144	-4.633E-02	6.018E-02	8.427E-02	NOT IDENT.
PR-144	-4.041E+00	5.229E+00	7.316E+00	NOT IDENT.
PM-146	1.016E-02	3.492E-02	7.165E-02	NOT IDENT.
ND-147	0.000E+00	3.219E+07	0.000E+00	SHORT HLIF
PM-147	3.208E+02	5.398E+02	1.108E+03	NOT IDENT.
PM-149	0.000E+00	4.846E+40	0.000E+00	SHORT HLIF
EU-150	8.107E-03	2.252E-02	4.244E-02	FAIL ABUN
EU-152	4.306E-03	8.512E-02	1.540E-01	FAIL ABUN
GD-153	-4.498E-02	9.529E-02	1.812E-01	NOT IDENT.
EU-154	4.277E-02	1.118E-01	2.336E-01	NOT IDENT.
EU-155	5.468E-02	7.004E-02	1.454E-01	NOT IDENT.
TB-160	1.515E-01	1.780E+00	3.262E+00	FAIL ABUN
HO-166M	2.706E-03	5.909E-02	1.113E-01	NOT IDENT.
TM-171	0.000E+00	6.866E+00	6.828E+00	FAIL ABUN
HF-172	1.406E-01	1.631E-01	3.198E-01	FAIL ABUN
LU-172	5.697E-02	8.025E-02	1.724E-01	FAIL ABUN

LU-176	-4.754E-03	2.189E-02	3.866E-02	FAIL ABUN
HF-181	5.741E+00	5.637E+00	8.816E+00	FAIL ABUN
TA-182	6.906E-02	1.102E+00	2.100E+00	FAIL ABUN
RE-183	-3.469E-02	6.934E-01	1.427E+00	NOT IDENT.
RE-184	1.807E+01	2.820E+01	6.177E+01	NOT IDENT.
W-188	-5.588E+01	1.114E+02	1.726E+02	FAIL ABUN
IR-192	1.113E-01	3.827E-01	7.877E-01	FAIL ABUN
BI-207	-1.804E-02	4.080E-02	7.525E-02	FAIL ABUN
BI-211	0.000E+00	5.094E-01	7.673E-01	FAIL ABUN
PB-211	4.898E-01	5.806E-01	1.240E+00	NOT IDENT.
BI-212	0.000E+00	5.759E-01	1.156E+00	FAIL ABUN
RN-219	6.834E-02	3.174E-01	6.423E-01	FAIL ABUN
RA-223	1.866E-02	5.773E-01	1.045E+00	FAIL ABUN
AC-227	1.689E-01	1.997E-01	3.983E-01	FAIL ABUN
TH-227	1.689E-01	1.997E-01	3.983E-01	FAIL ABUN
TH-229	2.414E-01	3.557E-01	7.116E-01	FAIL ABUN
TH-231	1.866E-02	5.773E-01	1.045E+00	FAIL ABUN
PA-233	6.112E-03	4.972E-02	1.007E-01	FAIL ABUN
PA-234	2.434E-01	2.739E-01	6.077E-01	NOT IDENT.
PA-234M	2.972E+00	4.197E+00	9.205E+00	NOT IDENT.
U-235	6.915E-02	1.391E-01	2.752E-01	FAIL ABUN
NP-237	6.112E-03	4.972E-02	1.007E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	1.134E-01	1.602E-01	3.308E-01	FAIL ABUN
PU-239	2.625E+02	4.723E+02	4.801E+02	FAIL ABUN
AM-241	-2.899E-02	3.793E-02	6.903E-02	NOT IDENT.
CM-243	-1.313E-03	5.876E-02	1.166E-01	FAIL ABUN
BK-247	4.518E-02	5.654E-02	1.144E-01	FAIL ABUN
CM-247	5.547E-03	3.083E-02	6.176E-02	FAIL ABUN
CF-249	8.787E-03	3.316E-02	6.707E-02	NOT IDENT.
CF-251	-4.824E-02	9.093E-02	1.641E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	388	10.66*	1.131E+00	1.597E+01	1.597E+01	10.05
AS-73	53.44	50	10.30*	9.638E+00	2.507E-01	3.366E+00	94.70
CD-109	88.03	309	3.70*	9.265E+00	4.470E+00	7.025E+00	29.77
SN-126	64.28	72	9.60	9.545E+00	3.905E-01	3.905E-01	104.75
	86.94	309	8.90	9.265E+00	1.858E+00	1.858E+00	29.77
	87.57	309	37.00*	9.265E+00	4.470E-01	4.470E-01	29.77
HG-203	70.83	-----	3.69	9.445E+00	-----	Line Not Found	-----
	72.87	-----	6.19	9.424E+00	-----	Line Not Found	-----
	279.20	28	81.56*	4.801E+00	3.609E-02	3.174E+00	106.15
TL-208	277.37	28	6.60	4.801E+00	4.460E-01	4.460E-01	106.15
	583.19	115	85.00*	2.509E+00	2.673E-01	2.673E-01	31.22
	860.56	-----	12.50	1.810E+00	-----	Line Not Found	-----
PB-210	46.54	90	4.25*	9.157E+00	1.149E+00	1.179E+00	88.41
BI-211	72.87	-----	1.23	9.424E+00	-----	Line Not Found	-----
	351.06	300	12.92*	3.893E+00	2.959E+00	2.959E+00	17.57
PB-212	74.82	212	10.28	9.404E+00	1.088E+00	1.088E+00	29.55
	77.11	551	17.10	9.382E+00	1.704E+00	1.704E+00	13.54
	238.63	521	43.60*	5.476E+00	1.083E+00	1.083E+00	11.42
	300.09	49	3.30	4.483E+00	1.645E+00	1.645E+00	68.26
BI-214	609.32	195	45.49*	2.418E+00	8.813E-01	8.816E-01	22.84
	1120.29	39	14.92	1.443E+00	8.896E-01	8.899E-01	56.43
	1764.49	40	15.30	9.335E-01	1.386E+00	1.387E+00	37.02
PB-214	74.82	212	5.80	9.404E+00	1.929E+00	1.930E+00	29.55
	77.11	551	9.70	9.382E+00	3.005E+00	3.006E+00	13.54
	87.09	309	3.41	9.265E+00	4.850E+00	4.852E+00	29.77
	242.00	128	7.25	5.420E+00	1.615E+00	1.616E+00	44.59
	295.22	192	18.42	4.552E+00	1.135E+00	1.136E+00	24.72
	351.93	300	35.60*	3.893E+00	1.074E+00	1.074E+00	17.57
RN-222	609.32	195	45.49*	2.418E+00	8.813E-01	8.816E-01	22.84
	1120.29	39	14.92	1.443E+00	8.896E-01	8.899E-01	56.43
	1764.49	40	15.30	9.335E-01	1.386E+00	1.387E+00	37.02
RA-224	240.99	128	4.10*	5.420E+00	2.856E+00	2.856E+00	44.59
RA-226	609.32	195	45.49*	2.418E+00	8.813E-01	8.816E-01	22.84
	1120.29	39	14.92	1.443E+00	8.896E-01	8.899E-01	56.43
	1764.49	40	15.30	9.335E-01	1.386E+00	1.387E+00	37.02
AC-228	105.21	-----	1.10	8.977E+00	-----	Line Not Found	-----
	338.32	108	11.27	4.027E+00	1.176E+00	1.176E+00	43.10
	794.95	-----	4.25	1.935E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.856E+00	-----	Line Not Found	-----
	911.20	79	25.80*	1.724E+00	8.859E-01	8.859E-01	37.10
	968.97	61	15.80	1.637E+00	1.177E+00	1.177E+00	27.51
RA-228	105.21	-----	1.10	8.977E+00	-----	Line Not Found	-----
	338.32	108	11.27	4.027E+00	1.176E+00	1.176E+00	43.10
	794.95	-----	4.25	1.935E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.856E+00	-----	Line Not Found	-----
	911.20	79	25.80*	1.724E+00	8.859E-01	8.859E-01	37.10
	968.97	61	15.80	1.637E+00	1.177E+00	1.177E+00	27.51

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	74.82	212	10.28	9.404E+00	1.088E+00	1.088E+00	29.55
	77.11	551	17.10	9.382E+00	1.704E+00	1.704E+00	13.54
	238.63	521	43.60*	5.476E+00	1.083E+00	1.083E+00	11.42
TH-230	300.09	49	3.30	4.483E+00	1.645E+00	1.645E+00	68.26
	609.32	195	45.49*	2.418E+00	8.813E-01	8.813E-01	22.84
	1120.29	39	14.92	1.443E+00	8.896E-01	8.896E-01	56.43
	1764.49	40	15.30	9.335E-01	1.386E+00	1.386E+00	37.02
PA-231	283.69	-----	1.70	4.715E+00	-----	Line Not Found	-----
	301.36	49	5.35*	4.483E+00	1.014E+00	1.014E+00	68.26
TH-232	105.21	-----	1.10	8.977E+00	-----	Line Not Found	-----
	338.32	108	11.27	4.027E+00	1.176E+00	1.176E+00	43.10
	835.71	-----	1.61	1.856E+00	-----	Line Not Found	-----
	911.20	79	25.80*	1.724E+00	8.859E-01	8.859E-01	37.10
TH-234	968.97	61	15.80	1.637E+00	1.177E+00	1.177E+00	27.51
	63.29	72	3.70*	9.545E+00	1.013E+00	1.013E+00	104.75
	92.59	159	4.23	9.202E+00	2.029E+00	2.029E+00	41.59
U-234	609.32	195	45.49*	2.418E+00	8.813E-01	8.813E-01	22.84
	1120.29	39	14.92	1.443E+00	8.896E-01	8.896E-01	56.43
	1764.49	40	15.30	9.335E-01	1.386E+00	1.386E+00	37.02
U-238	63.29	72	3.70*	9.545E+00	1.013E+00	1.013E+00	104.75
	92.59	159	4.23	9.202E+00	2.029E+00	2.029E+00	41.59
AM-243	43.53	-----	5.90	8.344E+00	-----	Line Not Found	-----
	74.66	212	67.20*	9.404E+00	1.665E-01	1.665E-01	29.55
ANH-511	511.00	8	100.00*	2.809E+00	1.484E-02	1.484E-02	482.27

Flag: "*" = Keyline

Total number of lines in spectrum 47
 Number of unidentified lines 11
 Number of lines tentatively identified by NID 36 76.60%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.597E+01	1.597E+01	0.160E+01	10.05	
AS-73	80.30D	13.4	2.507E-01	3.366E+00	3.188E+00	94.70	
CD-109	461.40D	1.57	4.470E+00	7.025E+00	2.091E+00	29.77	
SN-126	2.30E+05Y	1.00	4.470E-01	4.470E-01	1.331E-01	29.77	
HG-203	46.59D	87.9	3.609E-02	3.174E+00	3.369E+00	106.15	
TL-208	1.41E+10Y	1.00	2.673E-01	2.673E-01	0.834E-01	31.22	
PB-210	22.20Y	1.03	1.149E+00	1.179E+00	1.043E+00	88.41	
BI-211	7.04E+08Y	1.00	2.959E+00	2.959E+00	0.520E+00	17.57	
PB-212	1.41E+10Y	1.00	1.083E+00	1.083E+00	0.124E+00	11.42	
BI-214	1600.00Y	1.00	8.813E-01	8.816E-01	2.014E-01	22.84	
PB-214	1600.00Y	1.00	1.074E+00	1.074E+00	0.189E+00	17.57	
RN-222	1600.00Y	1.00	8.813E-01	8.816E-01	2.014E-01	22.84	
RA-224	1.41E+10Y	1.00	2.856E+00	2.856E+00	1.273E+00	44.59	
RA-226	1600.00Y	1.00	8.813E-01	8.816E-01	2.014E-01	22.84	
AC-228	1.41E+10Y	1.00	8.859E-01	8.859E-01	3.286E-01	37.10	
RA-228	1.41E+10Y	1.00	8.859E-01	8.859E-01	3.286E-01	37.10	
TH-228	1.41E+10Y	1.00	1.083E+00	1.083E+00	0.124E+00	11.42	
TH-230	7.54E+04Y	1.00	8.813E-01	8.813E-01	2.013E-01	22.84	
PA-231	7.04E+08Y	1.00	1.014E+00	1.014E+00	0.692E+00	68.26	
TH-232	1.41E+10Y	1.00	8.859E-01	8.859E-01	3.286E-01	37.10	
TH-234	4.47E+09Y	1.00	1.013E+00	1.013E+00	1.061E+00	104.75	
U-234	2.45E+05Y	1.00	8.813E-01	8.813E-01	2.013E-01	22.84	
U-238	4.47E+09Y	1.00	1.013E+00	1.013E+00	1.061E+00	104.75	
AM-243	7370.00Y	1.00	1.665E-01	1.665E-01	0.492E-01	29.55	
ANH-511	1.00E+09Y	1.00	1.484E-02	1.484E-02	7.159E-02	482.27	
Total Activity :			4.193E+01	5.077E+01			

Grand Total Activity : 4.193E+01 5.077E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	83.83	41	181	1.14	167.14	165	6	8.93E-03	****	9.32E+00	T
0	129.09	28	169	0.78	257.66	254	8	6.33E-03	****	8.36E+00	T
0	186.02	103	159	1.12	371.50	368	9	2.40E-02	55.3	6.69E+00	T
0	209.42	43	125	0.99	418.30	414	9	1.01E-02	****	6.10E+00	T
0	270.41	50	95	0.79	540.29	535	10	1.22E-02	82.9	4.92E+00	T
4	276.52	20	14	0.83	552.49	551	9	4.79E-03	73.7	4.82E+00	T
0	328.32	46	66	2.39	656.11	651	10	1.13E-02	76.5	4.14E+00	T
0	447.74	23	11	2.19	894.95	892	7	5.97E-03	66.0	3.15E+00	
0	464.79	15	54	0.90	929.06	922	11	3.80E-03	****	3.05E+00	T
0	482.67	20	25	1.77	964.83	962	8	5.14E-03	****	2.95E+00	T
0	556.69	16	23	0.64	1112.89	1105	11	4.10E-03	****	2.61E+00	
0	588.90	9	20	1.25	1177.33	1174	7	2.36E-03	****	2.49E+00	
0	626.45	38	47	7.10	1252.45	1238	21	1.01E-02	****	2.36E+00	
0	690.83	17	19	2.00	1381.24	1372	12	4.61E-03	****	2.18E+00	
0	694.35	10	14	1.38	1388.28	1385	6	2.71E-03	****	2.17E+00	T
0	727.11	38	8	1.72	1453.82	1449	10	1.02E-02	43.1	2.09E+00	T
0	797.89	31	29	5.52	1595.43	1586	18	8.39E-03	93.6	1.93E+00	
0	877.76	4	17	1.25	1755.24	1749	8	1.17E-03	****	1.78E+00	
0	922.94	8	5	1.72	1845.64	1841	7	2.16E-03	****	1.71E+00	T
0	964.31	22	6	1.90	1928.42	1922	11	5.92E-03	61.0	1.64E+00	T
0	1009.53	5	10	0.67	2018.92	2013	8	1.35E-03	****	1.58E+00	
0	1154.11	9	19	0.42	2308.26	2297	13	2.51E-03	****	1.41E+00	
0	1178.35	18	13	4.77	2356.78	2351	13	5.00E-03	95.1	1.38E+00	T
0	1258.31	16	17	1.86	2516.80	2509	17	4.57E-03	****	1.30E+00	
0	1338.77	5	9	4.35	2677.86	2668	11	1.39E-03	****	1.23E+00	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235047.CNF;1
* Acquisition date   : 3-OCT-2016 07:00:30 Sensitivity      : 3.000
* Detector ID       : GAM25 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.56 Half life ratio : *****
* Sample date       : 7-DEC-2015 10:10:00 Nuclide Library : SOLID
* Sample ID         : G405235047 Analyst initials: MXR1
* Batch Number      : 1596252 Sample Quantity : 1.5135E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 1-AUG-2016 08:41:33 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM25_CAN.CNF;15
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.586E-01
AS-73	1.341E+00
CD-109	4.897E-01
SN-126	3.112E-02
HG-203	1.804E+00
TL-208	3.126E-02
PB-210	2.967E-01
PB-212	4.300E-02
BI-214	5.348E-02
PB-214	5.512E-02
RN-222	5.348E-02
RA-224	4.618E-01
RA-226	5.348E-02
AC-228	1.083E-01
RA-228	1.083E-01
TH-228	4.300E-02
TH-230	5.346E-02
PA-231	3.054E-01
TH-232	1.083E-01
TH-234	3.552E-01
U-234	5.346E-02
U-238	3.552E-01
AM-243	2.096E-02
ANH-511	1.991E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.772E+00	NOT IDENT.
NA-22	4.158E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.207E-02	NOT IDENT.
SC-46	3.426E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF

MN-54	5.836E-02	NOT IDENT.
CO-56	3.561E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	2.931E-02	NOT IDENT.
CO-58	5.290E-01	NOT IDENT.
FE-59	6.575E+00	NOT IDENT.
CO-60	4.017E-02	NOT IDENT.
ZN-65	1.715E-01	NOT IDENT.
GE-68	2.504E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.505E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.613E-01	NOT IDENT.
KR-85	5.199E+00	NOT IDENT.
SR-85	5.549E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.528E-01	NOT IDENT.
Y-91	5.420E+02	NOT IDENT.
NB-94	2.833E-02	NOT IDENT.
NB-95	7.335E-01	NOT IDENT.
NB-95M	1.873E+00	NOT IDENT.
ZR-95	1.440E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.096E-02	NOT IDENT.
RH-102	3.966E-02	NOT IDENT.
RU-103	4.306E+00	FAIL ABUN
RH-106	4.217E-01	NOT IDENT.
RU-106	4.217E-01	NOT IDENT.
AG-108M	2.110E-02	NOT IDENT.
AG-110M	7.976E-02	NOT IDENT.
SN-113	1.823E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	8.857E-02	NOT IDENT.
SB-124	9.427E-01	NOT IDENT.
SB-125	7.561E-02	FAIL ABUN
TE-125M	1.669E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.643E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	5.220E-02	NOT IDENT.
CS-135	9.808E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	3.673E-02	NOT IDENT.
CS-137	3.880E-02	NOT IDENT.
CE-139	8.247E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.571E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.220E-01	NOT IDENT.
PM-144	3.646E-02	NOT IDENT.
PR-144	3.164E+00	NOT IDENT.
PM-146	3.202E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	5.177E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.941E-02	FAIL ABUN
EU-152	7.013E-02	FAIL ABUN
GD-153	8.412E-02	NOT IDENT.
EU-154	1.007E-01	NOT IDENT.
EU-155	6.846E-02	NOT IDENT.
TB-160	1.403E+00	FAIL ABUN
HO-166M	4.969E-02	NOT IDENT.
TM-171	3.197E+00	FAIL ABUN
HF-172	1.498E-01	FAIL ABUN
LU-172	7.630E-02	FAIL ABUN
LU-176	1.763E-02	FAIL ABUN

HF-181	4.009E+00	FAIL ABUN
TA-182	9.341E-01	FAIL ABUN
RE-183	6.703E-01	NOT IDENT.
RE-184	2.715E+01	NOT IDENT.
W-188	7.878E+01	FAIL ABUN
IR-192	3.605E-01	FAIL ABUN
BI-207	3.148E-02	FAIL ABUN
BI-211	3.700E-01	FAIL ABUN
PB-211	5.664E-01	NOT IDENT.
BI-212	5.288E-01	FAIL ABUN
RN-219	2.907E-01	FAIL ABUN
RA-223	4.807E-01	FAIL ABUN
AC-227	1.848E-01	FAIL ABUN
TH-227	1.848E-01	FAIL ABUN
TH-229	3.311E-01	FAIL ABUN
TH-231	4.807E-01	FAIL ABUN
PA-233	4.615E-02	FAIL ABUN
PA-234	2.699E-01	NOT IDENT.
PA-234M	4.094E+00	NOT IDENT.
U-235	1.294E-01	FAIL ABUN
NP-237	4.615E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.551E-01	FAIL ABUN
PU-239	2.265E+02	FAIL ABUN
AM-241	3.240E-02	NOT IDENT.
CM-243	5.442E-02	FAIL ABUN
BK-247	5.254E-02	FAIL ABUN
CM-247	2.809E-02	FAIL ABUN
CF-249	3.058E-02	NOT IDENT.
CF-251	7.613E-02	NOT IDENT.

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235047.CNF;1
* Acquisition date   : 3-OCT-2016 07:00:30 Sensitivity      : 3.000
* Detector ID       : GAM25 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.56 Half life ratio  : *****
* Sample date       : 7-DEC-2015 10:10:00 Nuclide Library : SOLID
* Sample ID         : G405235047 Analyst initials: MXR1
* Batch Number      : 1596252 Sample Quantity : 1.5135E+02 GRAM
*                   :                               Quantity Err(%) : 1.3214E-03 %
* Wet wt corr       : 1.00000 Wet Weight      : 0.00000
*                   :                               Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 1-AUG-2016 08:41:33 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM25_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.597E+01	1.780E+00	1.780E+00
AS-73	3.366E+00	3.200E+00	3.200E+00
CD-109	5.381E+00	2.143E+00	2.143E+00
SN-126	3.424E-01	1.352E-01	1.352E-01
HG-203	1.272E+00	3.359E+00	3.359E+00
TL-208	2.673E-01	8.256E-02	8.256E-02
PB-210	1.179E+00	1.026E+00	1.026E+00
PB-212	1.083E+00	1.341E-01	1.341E-01
BI-214	8.816E-01	2.010E-01	2.010E-01
PB-214	1.074E+00	1.902E-01	1.902E-01
RN-222	8.816E-01	2.010E-01	2.010E-01
RA-224	8.483E-01	1.347E+00	1.347E+00
RA-226	8.816E-01	2.010E-01	2.010E-01
AC-228	8.859E-01	3.252E-01	3.252E-01
RA-228	8.859E-01	3.252E-01	3.252E-01
TH-228	1.083E+00	1.341E-01	1.341E-01
TH-230	8.813E-01	2.009E-01	2.009E-01
PA-231	1.014E+00	7.123E-01	7.123E-01
TH-232	8.859E-01	3.252E-01	3.252E-01
TH-234	1.013E+00	1.064E+00	1.064E+00
U-234	8.813E-01	2.009E-01	2.009E-01
U-238	1.013E+00	1.064E+00	1.064E+00
AM-243	6.851E-02	5.532E-02	5.532E-02
ANH-511	1.484E-02	7.016E-02	7.016E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.498E+00	1.024E+01	1.026E+01	NOT IDENT.
NA-22	1.892E-02	4.592E-02	4.671E-02	NOT IDENT.
NA-24	-1.000E+41	2.491E+41	0.000E+00	SHORT HLIF
AL-26	1.641E-02	1.860E-02	2.001E-02	NOT IDENT.
SC-46	2.375E-01	3.540E-01	3.699E-01	FAIL ABUN
V-48	5.650E+03	1.554E+04	1.575E+04	SHORT HLIF

CR-51	-3.670E+02	3.627E+02	3.986E+02	SHORT HLIF
MN-54	3.114E-02	6.196E-02	6.353E-02	NOT IDENT.
CO-56	1.064E-02	4.034E-01	4.035E-01	NOT IDENT.
MN-56	1.000E+41	4.464E+42	0.000E+00	SHORT HLIF
CO-57	1.562E-02	3.077E-02	3.157E-02	NOT IDENT.
CO-58	5.071E-01	5.227E-01	5.705E-01	NOT IDENT.
FE-59	3.160E-01	7.548E+00	7.550E+00	NOT IDENT.
CO-60	3.414E-02	4.533E-02	4.787E-02	NOT IDENT.
ZN-65	1.009E-01	2.076E-01	2.126E-01	NOT IDENT.
GE-68	1.277E+00	2.743E+00	2.803E+00	NOT IDENT.
AS-74	1.744E+03	5.630E+03	5.684E+03	SHORT HLIF
SE-75	1.437E-01	1.598E-01	1.725E-01	NOT IDENT.
BR-77	2.638E+38	2.291E+39	0.000E+00	SHORT HLIF
SR-82	2.920E+02	6.801E+02	6.927E+02	SHORT HLIF
RB-83	3.605E-01	5.992E-01	6.209E-01	NOT IDENT.
KR-85	4.580E-01	6.606E+00	6.609E+00	NOT IDENT.
SR-85	4.702E-02	7.055E-01	7.058E-01	NOT IDENT.
RB-86	1.543E+04	3.501E+04	3.569E+04	SHORT HLIF
Y-88	6.973E-02	1.498E-01	1.531E-01	NOT IDENT.
Y-91	7.802E+01	6.323E+02	6.333E+02	NOT IDENT.
NB-94	-9.474E-03	3.525E-02	3.551E-02	NOT IDENT.
NB-95	1.140E-01	8.681E-01	8.696E-01	NOT IDENT.
NB-95M	3.327E-01	2.339E+00	2.343E+00	NOT IDENT.
ZR-95	9.346E-01	1.593E+00	1.648E+00	NOT IDENT.
NB-97	-1.000E+41	1.809E+41	0.000E+00	SHORT HLIF
ZR-97	-1.000E+41	2.320E+41	0.000E+00	SHORT HLIF
MO-99	1.127E+32	1.921E+32	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	3.386E+41	0.000E+00	SHORT HLIF
RH-101	-1.326E-02	2.623E-02	2.691E-02	NOT IDENT.
RH-102	-3.004E-02	5.988E-02	6.139E-02	NOT IDENT.
RU-103	-5.389E-01	5.149E+00	5.155E+00	FAIL ABUN
RH-106	2.099E-01	4.638E-01	4.733E-01	NOT IDENT.
RU-106	2.099E-01	4.638E-01	4.733E-01	NOT IDENT.
AG-108M	8.297E-03	2.274E-02	2.305E-02	NOT IDENT.
AG-110M	-4.504E-02	9.874E-02	1.008E-01	NOT IDENT.
SN-113	9.424E-03	2.025E-01	2.025E-01	NOT IDENT.
CD-115	3.397E+37	4.158E+39	0.000E+00	SHORT HLIF
SN-117M	2.569E+04	7.323E+04	7.414E+04	SHORT HLIF
TE-123M	4.133E-02	9.568E-02	9.747E-02	NOT IDENT.
SB-124	-1.156E+00	1.637E+00	1.718E+00	NOT IDENT.
SB-125	-1.212E-03	8.542E-02	8.542E-02	FAIL ABUN
TE-125M	1.087E+02	1.725E+02	1.793E+02	NOT IDENT.
I-126	3.238E+05	8.383E+05	8.510E+05	SHORT HLIF
SB-126	-3.794E+04	1.319E+06	1.319E+06	SHORT HLIF
SB-127	-8.473E+21	3.079E+22	0.000E+00	SHORT HLIF
I-131	1.985E+09	4.386E+09	4.477E+09	SHORT HLIF
I-132	-1.000E+41	2.025E+42	0.000E+00	SHORT HLIF
TE-132	1.425E+26	4.303E+26	0.000E+00	SHORT HLIF
BA-133	4.513E-02	6.879E-02	4.380E-02	FAIL ABUN
I-133	1.000E+41	2.110E+41	0.000E+00	SHORT HLIF
CS-134	6.562E-02	5.105E-02	5.901E-02	NOT IDENT.
CS-135	9.733E-02	1.110E-01	1.194E-01	NOT IDENT.
I-135	1.000E+41	8.825E+41	0.000E+00	SHORT HLIF
CS-136	9.445E+04	3.345E+05	3.372E+05	SHORT HLIF
BA-137M	5.086E-02	3.702E-02	4.354E-02	NOT IDENT.
CS-137	5.372E-02	3.911E-02	4.600E-02	NOT IDENT.
CE-139	3.480E-02	9.031E-02	9.167E-02	NOT IDENT.
BA-140	-6.689E+04	1.194E+06	1.194E+06	SHORT HLIF
LA-140	-3.217E+05	4.193E+05	4.436E+05	SHORT HLIF
CE-141	-1.922E+01	1.917E+01	2.103E+01	NOT IDENT.
CE-143	1.000E+41	1.699E+41	0.000E+00	SHORT HLIF
CE-144	-2.232E-02	2.469E-01	2.471E-01	NOT IDENT.
PM-144	-4.633E-02	6.025E-02	6.377E-02	NOT IDENT.
PR-144	-4.041E+00	5.232E+00	5.540E+00	NOT IDENT.
PM-146	1.016E-02	3.493E-02	3.523E-02	NOT IDENT.
ND-147	-1.229E+06	3.219E+07	3.219E+07	SHORT HLIF
PM-147	3.208E+02	5.400E+02	5.590E+02	NOT IDENT.
PM-149	-1.762E+40	4.862E+40	0.000E+00	SHORT HLIF
EU-150	8.107E-03	2.253E-02	2.282E-02	FAIL ABUN
EU-152	4.306E-03	8.512E-02	8.514E-02	FAIL ABUN
GD-153	-4.498E-02	9.532E-02	9.746E-02	NOT IDENT.
EU-154	4.277E-02	1.118E-01	1.134E-01	NOT IDENT.
EU-155	5.468E-02	7.015E-02	7.435E-02	NOT IDENT.
TB-160	1.515E-01	1.780E+00	1.781E+00	FAIL ABUN
HO-166M	2.706E-03	5.909E-02	5.910E-02	NOT IDENT.
TM-171	7.398E+00	6.896E+00	7.660E+00	FAIL ABUN
HF-172	1.406E-01	1.647E-01	1.764E-01	FAIL ABUN
LU-172	5.697E-02	8.045E-02	8.445E-02	FAIL ABUN

LU-176	-4.754E-03	2.190E-02	2.200E-02	FAIL ABUN
HF-181	5.741E+00	5.643E+00	6.208E+00	FAIL ABUN
TA-182	6.906E-02	1.102E+00	1.102E+00	FAIL ABUN
RE-183	-3.469E-02	6.934E-01	6.936E-01	NOT IDENT.
RE-184	1.807E+01	2.853E+01	2.967E+01	NOT IDENT.
W-188	-5.588E+01	1.116E+02	1.144E+02	FAIL ABUN
IR-192	1.113E-01	3.827E-01	3.860E-01	FAIL ABUN
BI-207	-1.804E-02	4.081E-02	4.161E-02	FAIL ABUN
BI-211	2.959E+00	5.262E-01	1.434E+00	FAIL ABUN
PB-211	4.898E-01	5.811E-01	6.217E-01	NOT IDENT.
BI-212	1.362E+00	5.800E-01	8.448E-01	FAIL ABUN
RN-219	6.834E-02	3.175E-01	3.190E-01	FAIL ABUN
RA-223	1.866E-02	5.773E-01	5.774E-01	FAIL ABUN
AC-227	1.689E-01	2.010E-01	2.149E-01	FAIL ABUN
TH-227	1.689E-01	2.010E-01	2.149E-01	FAIL ABUN
TH-229	2.414E-01	3.559E-01	3.722E-01	FAIL ABUN
TH-231	1.866E-02	5.773E-01	5.774E-01	FAIL ABUN
PA-233	6.112E-03	4.973E-02	4.980E-02	FAIL ABUN
PA-234	2.434E-01	3.906E-01	4.057E-01	NOT IDENT.
PA-234M	2.972E+00	4.199E+00	4.407E+00	NOT IDENT.
U-235	6.915E-02	1.392E-01	1.426E-01	FAIL ABUN
NP-237	6.112E-03	4.973E-02	4.980E-02	FAIL ABUN
NP-238	-1.000E+41	2.115E+41	0.000E+00	SHORT HLIF
NP-239	1.134E-01	1.605E-01	1.684E-01	FAIL ABUN
PU-239	2.625E+02	4.724E+02	4.870E+02	FAIL ABUN
AM-241	-2.899E-02	3.799E-02	4.018E-02	NOT IDENT.
CM-243	-1.313E-03	5.876E-02	5.876E-02	FAIL ABUN
BK-247	4.518E-02	5.727E-02	6.078E-02	FAIL ABUN
CM-247	5.547E-03	3.085E-02	3.095E-02	FAIL ABUN
CF-249	8.787E-03	3.316E-02	3.340E-02	NOT IDENT.
CF-251	-4.824E-02	9.109E-02	9.365E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	80.6820	87.09	73.3472	136.47	50.2703
45.60	78.6121	87.57	73.4542	140.51	0.0000
46.54	78.9743	88.03	73.5565	143.76	60.8629
49.72	0.0000	88.34	73.6254	144.24	63.8713
51.35	58.3366	88.47	73.6543	145.44	76.8336
51.87	76.4654	89.96	73.9830	152.43	72.9209
52.39	74.1385	1093.63	60.3400	153.25	0.0000
52.97	61.7740	91.11	0.0000	323.87	71.1712
53.44	61.9020	92.59	69.3549	156.02	0.0000
54.07	62.0727	93.35	69.5074	158.56	0.0000
57.36	0.0000	94.56	68.5873	159.00	52.6070
57.53	80.6626	94.65	67.4419	162.33	53.9567
57.98	76.1945	94.67	67.4460	162.66	0.0000
59.27	93.8785	94.87	67.4844	163.33	63.2365
59.32	93.8974	97.43	62.4067	165.86	64.5573
59.54	93.9817	98.43	67.8691	176.31	54.2923
60.96	93.4804	98.44	67.8708	176.60	0.0000
61.17	93.5587	99.53	49.5093	177.52	66.9619
62.93	99.7037	100.11	61.0994	181.07	0.0000
63.29	99.8432	102.03	63.1992	181.52	66.3713
63.58	99.9551	103.18	66.0728	184.41	79.0491
64.28	113.6404	103.37	66.1067	143.76	67.9053
66.73	108.3242	105.21	67.3273	193.51	46.2137
67.24	101.3475	105.31	67.3450	197.03	59.4463
125.81	101.5122	106.12	69.2878	198.01	58.4561
67.75	99.1398	106.47	70.2519	201.83	55.5423
69.67	89.3703	109.28	58.9692	203.43	57.8652
70.83	112.3797	111.00	76.5396	205.31	58.3993
72.81	117.2373	111.76	0.0000	210.85	54.4777
72.87	130.2905	114.06	73.4540	215.65	55.6122
74.66	112.2532	116.30	0.0000	222.11	64.0015
74.82	112.3138	116.74	59.1504	227.09	47.4967
74.97	112.3713	119.76	68.8906	227.38	50.9106
77.11	113.1866	121.12	55.1032	228.16	0.0000
78.74	113.7991	121.22	55.1162	228.18	52.1010
79.69	114.1534	121.78	57.9949	116.74	52.1010
80.12	114.3133	122.06	54.2892	235.69	62.5702
80.19	0.0000	122.92	64.7154	235.96	62.5936
80.57	80.2192	123.07	65.6763	238.63	71.2504
81.00	87.0248	265.00	75.1648	238.98	0.0000
81.07	87.0446	125.81	52.8743	240.99	71.4794
81.75	87.2343	127.23	79.5671	242.00	71.5768
83.79	77.6685	127.91	70.8360	244.70	50.9811
84.00	77.7198	129.30	71.3745	252.40	0.0000
85.43	95.0375	131.20	67.5364	252.80	40.9889
86.55	73.2265	133.02	60.4506	254.15	0.0000
86.79	73.2796	133.52	64.3593	256.23	38.8184
86.94	73.3138	136.00	53.1168	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	26.1572	355.39	0.0000	584.27	31.4380
264.80	32.1078	356.01	26.2988	595.83	0.0000
265.00	28.5476	364.49	0.0000	427.87	25.4111
268.22	25.4772	366.42	0.0000	602.52	0.0000
269.46	26.3137	372.51	32.0618	604.72	19.1067
270.03	26.3325	375.05	34.8161	607.14	27.1083
271.23	26.3714	377.52	28.6328	609.32	24.4843
273.65	0.0000	356.01	39.6011	610.33	24.4993
276.40	36.9922	388.16	31.6248	614.28	24.0244
277.37	41.0609	388.63	0.0000	618.01	25.6846
277.60	41.0723	391.69	31.7259	620.36	17.6830
278.00	41.0920	264.66	25.5841	621.93	17.1634
279.20	43.5718	401.81	27.4396	630.19	0.0000
279.54	35.5173	402.40	31.1141	631.29	21.0361
279.70	35.5244	404.85	24.7615	633.25	24.8409
280.46	40.4053	410.95	31.3472	634.78	0.0000
283.69	31.6375	413.71	28.6494	635.95	24.8802
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	26.8246	423.72	0.0000	645.85	19.5850
285.90	0.0000	427.09	28.9761	657.76	27.3905
287.50	34.2241	427.87	25.2537	657.90	0.0000
290.67	47.4365	433.94	21.6210	661.66	17.5690
293.27	0.0000	439.40	25.4949	664.57	0.0000
351.93	36.1752	453.88	20.0618	666.33	0.0000
295.96	36.2057	463.37	15.3997	666.50	0.0000
879.38	19.8076	468.07	20.2861	667.71	0.0000
299.98	28.1051	473.00	0.0000	677.62	19.9446
300.09	28.1085	475.06	24.2803	685.70	0.0000
300.13	28.1099	476.78	17.5045	695.00	0.0000
301.36	36.4277	477.60	22.3809	696.49	25.1917
302.85	31.5128	482.18	20.5057	696.51	25.1926
256.23	23.2627	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	21.8431
306.78	39.9805	497.08	21.7216	697.49	21.8447
308.46	33.3789	505.52	23.8423	702.65	30.3322
311.90	38.5308	507.63	0.0000	706.68	21.3912
316.51	34.5145	511.00	21.9418	711.68	22.5781
319.41	0.0000	514.00	23.9873	720.70	0.0000
320.08	0.0000	514.00	23.9883	721.93	0.0000
321.04	39.7586	520.40	19.0765	722.78	20.4404
323.87	40.7266	520.69	0.0000	722.91	20.4419
325.23	43.3342	522.65	0.0000	723.31	15.3347
328.76	0.0000	527.90	0.0000	724.19	17.0465
333.37	29.5642	528.26	27.2593	727.33	19.3512
333.97	32.1548	529.59	17.1785	733.00	14.8424
334.37	28.3077	529.87	0.0000	735.93	14.8646
338.28	34.4507	531.02	0.0000	333.97	13.7324
338.32	34.4515	537.26	0.0000	739.50	0.0000
311.90	34.5272	546.56	0.0000	747.24	19.5525
340.48	34.5272	552.55	16.9364	748.06	16.1089
340.55	0.0000	563.25	16.5404	752.31	24.2163
344.28	33.7941	569.33	29.0618	753.82	0.0000
345.93	32.9817	946.00	30.1021	756.73	18.4922
351.06	40.1293	569.70	32.1832	756.80	18.4928
351.93	40.1639	583.19	31.4172	884.68	28.9998

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	20.8989	1274.44	13.5108	1620.50	4.7026
766.42	23.2284	1001.03	10.6358	1621.92	6.5861
766.84	20.9099	1002.74	17.6920	1678.03	0.0000
772.60	0.0000	1004.73	23.2390	1690.97	4.7864
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	1.9488
778.90	20.1594	1028.54	0.0000	1063.66	17.5641
783.70	0.0000	1037.84	12.7509	1771.35	1.9521
785.37	19.3447	1038.76	0.0000	1791.20	0.0000
792.07	15.5268	631.29	15.7461	1808.65	0.0000
794.95	14.1348	1048.07	0.0000	1810.72	0.0000
795.86	14.1411	1049.04	9.8505	1836.06	0.9908
810.06	14.2383	1050.41	10.8409		
810.29	12.4598	1063.66	12.8762		
344.28	12.4611	1077.00	0.0000		
810.76	9.7922	1077.34	16.9243		
815.77	0.0000	1085.87	9.9872		
1048.07	0.0000	1093.63	12.0183		
832.01	19.7817	1099.45	15.0549		
834.85	16.2065	1112.07	18.1494		
835.71	16.2131	1112.84	28.2393		
836.80	0.0000	1115.54	14.5371		
846.75	0.0000	1120.29	15.1685		
846.77	13.5800	1120.55	15.1703		
856.80	0.0000	1221.41	9.7113		
860.56	13.6661	1129.67	7.1025		
871.09	17.0876	1131.51	0.0000		
873.19	11.7281	1147.95	0.0000		
875.33	0.0000	1173.23	11.5384		
879.38	11.7605	1177.95	18.5735		
880.51	13.2372	1189.05	15.5365		
883.24	14.7261	1204.77	19.7839		
884.68	19.3401	1221.41	20.9412		
889.28	11.0739	1231.02	16.8066		
894.76	13.8757	1235.36	0.0000		
898.04	16.6750	1238.28	17.8996		
900.72	21.3316	1260.41	0.0000		
903.28	11.1420	1271.87	11.7083		
911.20	16.7701	1274.44	9.5872		
912.08	16.7767	1274.54	9.5878		
923.98	0.0000	1291.59	9.6394		
926.50	10.5034	1298.22	0.0000		
929.11	17.8380	1312.11	0.0000		
937.49	16.9590	1332.49	6.9422		
944.13	0.0000	1362.66	0.0000		
946.00	11.3463	1365.19	7.6686		
949.00	21.7738	1368.63	0.0000		
667.71	0.0000	1384.29	6.6105		
962.31	16.7535	1408.01	5.5472		
964.08	9.1450	1457.56	0.0000		
966.17	0.0000	1460.82	2.7032		
911.20	3.0544	1489.16	5.4492		
968.97	3.0544	1505.03	10.0343		
983.53	0.0000	1584.12	9.3169		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235048.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM28.CNF;265
Background date : 2-OCT-2016 11:01:35.
Sample date     : 7-DEC-2015 13:28:00. Acquisition date : 3-OCT-2016 07:00:55.
Sample ID      : G405235048           Sample quantity  : 1.31577E+02 GRAM
Detector name  : GAM28                Detector geometry: CAN
Elapsed live time: 0 01:00:00.00      Elapsed real time: 0 01:00:00.46  0.0%
Energy tolerance : 1.50000 keV       Analyst Initials  : MXR1
Abundance limit : 75.00000           Sensitivity       : 3.00000
Batch ID       : 1596252             Detector SN#      :
Matrix Spike ID :                     LCS ID            : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.54*	30	134	1.88	127.16	124	7	8.42E-03	67.7	
2	2	75.02*	110	164	1.35	150.13	145	19	3.06E-02	22.6	1.09E+00
3	2	77.22	231	123	1.22	154.53	145	19	6.41E-02	10.8	
4	2	79.44	52	121	1.36	158.97	145	19	1.44E-02	47.1	
5	0	87.82	69	247	3.04	175.75	172	10	1.91E-02	44.3	
6	2	92.89*	58	171	1.25	185.90	181	13	1.62E-02	41.8	7.13E-01
7	2	95.17	25	122	1.12	190.46	181	13	6.89E-03	86.9	
8	0	105.77	18	100	1.24	211.67	208	6	5.13E-03	88.7	
9	0	115.15	30	139	0.65	230.46	227	10	8.20E-03	77.7	
10	0	128.10	15	128	1.28	256.36	254	8	4.25E-03	129.8	
11	0	140.47*	18	134	1.82	281.13	275	9	4.97E-03	120.5	
12	0	144.18*	18	86	1.36	288.55	286	6	5.03E-03	87.4	
13	0	185.94*	65	174	1.59	372.14	367	11	1.81E-02	42.4	
14	3	238.97*	416	83	1.39	478.27	474	17	1.15E-01	6.3	4.18E-01
15	3	241.98	118	66	1.57	484.30	474	17	3.28E-02	17.7	
16	0	271.68	35	97	2.26	543.75	536	12	9.61E-03	59.2	
17	0	295.65	148	110	1.50	591.71	586	11	4.12E-02	16.0	
18	0	338.88	84	78	0.97	678.25	672	10	2.34E-02	22.3	
19	0	352.49*	304	60	1.56	705.49	698	16	8.44E-02	8.3	
20	0	428.57	23	50	4.00	857.75	851	12	6.45E-03	64.7	
21	0	496.82	14	24	1.08	994.35	990	8	3.81E-03	69.2	
22	0	510.95*	71	59	1.78	1022.64	1014	16	1.98E-02	30.7	
23	0	583.58*	136	19	1.65	1168.00	1163	11	3.77E-02	10.8	
24	0	599.58	32	34	3.31	1200.03	1192	14	8.93E-03	42.7	
25	0	609.81*	187	39	1.98	1220.52	1215	12	5.21E-02	10.1	
26	0	653.27	17	9	1.37	1307.50	1303	8	4.59E-03	41.1	
27	0	662.11*	508	49	1.84	1325.18	1318	15	1.41E-01	5.4	
28	0	679.99*	16	17	0.80	1360.96	1357	8	4.47E-03	52.7	
29	0	727.75	28	16	2.07	1456.57	1452	10	7.85E-03	31.9	
30	0	783.28	13	22	1.73	1567.70	1562	10	3.58E-03	74.1	
31	0	795.70	35	9	3.72	1592.56	1587	12	9.81E-03	23.9	
32	0	861.65	12	18	0.58	1724.56	1721	9	3.32E-03	72.7	
33	0	912.02*	88	32	1.56	1825.38	1820	14	2.45E-02	17.4	
34	0	955.13	17	22	2.23	1911.65	1902	15	4.66E-03	66.2	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	969.93	49	23	2.70	1941.28	1936	11	1.37E-02	24.0	
36	0	1000.35*	23	0	2.62	2002.17	1996	12	6.37E-03	23.9	
37	0	1120.64*	64	15	2.10	2242.92	2235	15	1.78E-02	18.4	
38	0	1461.76*	397	3	2.14	2925.67	2919	13	1.10E-01	5.1	
39	0	1510.25	9	4	1.43	3022.72	3018	8	2.50E-03	50.9	
40	0	1517.03	5	5	0.72	3036.30	3030	10	1.39E-03	94.9	
41	0	1631.84	12	0	0.62	3266.08	3261	10	3.33E-03	28.9	
42	0	1766.05*	36	7	1.49	3534.71	3527	12	1.01E-02	22.3	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235048.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 7-DEC-2015 13:28:00   Acquisition date  : 3-OCT-2016 07:00:55
Sample ID        : G405235048             Sample quantity  : 131.58 GRAM
Sample type      : SOLID                   Sample geometry  :
Detector name    : GAMMA28                Detector geometry: CAN
Elapsed live time: 0 01:00:00.00          Elapsed real time: 0 01:00:00.46   0.0%
Energy tolerance : 1.50 keV               Half life ratio  : 10.00
Errors propagated: No                      Systematic Error : 0.00 %
Efficiency type  : Linear                  Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.237E+00	1.636E+01	1.636E+01	10.27	OK
RU-103	497.08	91.00*	2.878E+00	3.079E-02	6.229E+00	138.39	OK
	610.33	5.76	2.455E+00	7.687E+00	1.555E+03	20.25	OK
CD-109	88.03	3.70*	5.460E+00	1.205E+00	1.893E+00	167.38	OK
SN-126	64.28	9.60	3.030E+00	7.008E-01	7.008E-01	135.48	OK
	86.94	8.90	5.460E+00	5.008E-01	5.008E-01	167.38	OK
	87.57	37.00*	5.460E+00	1.205E-01	1.205E-01	167.38	OK
BA-137M	661.66	89.90*	2.305E+00	1.413E+00	1.440E+00	10.79	OK
CS-137	661.66	85.10*	2.305E+00	1.493E+00	1.522E+00	10.79	OK
CE-141	145.44	48.29*	6.589E+00	9.228E-03	5.623E+00	733.36	OK
EU-155	86.55	30.70	5.460E+00	1.452E-01	1.637E-01	167.38	OK
	105.31	21.10*	6.332E+00	9.010E-02	1.016E-01	177.47	OK
TL-208	277.37	6.60	4.566E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.539E+00	3.661E-01	3.661E-01	21.63	OK
	860.56	12.50	1.886E+00	2.867E-01	2.867E-01	145.48	OK
BI-211	72.87	1.23	4.138E+00	-----	Line Not Found	-----	Absent
	351.06	12.92*	3.781E+00	6.364E-01	6.364E-01	184.21	OK
PB-212	74.82	10.28	4.364E+00	9.956E-01	9.956E-01	77.00	OK
	77.11	17.10	4.583E+00	1.957E+00	1.957E+00	21.68	OK
	238.63	43.60*	5.100E+00	1.156E+00	1.156E+00	12.51	OK
BI-214	300.09	3.30	4.295E+00	-----	Line Not Found	-----	Absent
	609.32	45.49*	2.455E+00	9.734E-01	9.737E-01	20.25	OK
	1120.29	14.92	1.539E+00	1.546E+00	1.546E+00	36.87	OK
PB-214	1764.49	15.30	1.045E+00	-----	Line Not Found	-----	Absent
	74.82	5.80	4.343E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	4.583E+00	3.450E+00	3.451E+00	21.68	OK
	87.09	3.41	5.409E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	5.054E+00	-----	Line Not Found	-----	<<INT Reject
RN-222	295.22	18.42	4.345E+00	1.128E+00	1.129E+00	31.95	OK
	351.93	35.60*	3.786E+00	-----	Line Not Found	-----	<<INT Reject
	609.32	45.49*	2.455E+00	9.734E-01	9.737E-01	20.25	OK
	1120.29	14.92	1.539E+00	1.546E+00	1.546E+00	36.87	OK
	1764.49	15.30	1.045E+00	-----	Line Not Found	-----	Absent
RA-224	240.99	4.10*	5.054E+00	1.526E+00	1.526E+00	91.57	OK
RA-226	609.32	45.49*	2.455E+00	9.734E-01	9.737E-01	20.25	OK
	1120.29	14.92	1.539E+00	1.546E+00	1.546E+00	36.87	OK
	1764.49	15.30	1.045E+00	-----	Line Not Found	-----	Absent
AC-228	105.21	1.10	6.332E+00	1.728E+00	1.728E+00	177.47	OK
	338.32	11.27	3.901E+00	1.159E+00	1.159E+00	44.69	OK
	794.95	4.25	2.004E+00	2.358E+00	2.358E+00	47.73	OK
	835.71	1.61	1.930E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.806E+00	1.067E+00	1.067E+00	34.78	OK
RA-228	968.97	15.80	1.723E+00	1.018E+00	1.018E+00	47.91	OK
	105.21	1.10	6.332E+00	1.728E+00	1.728E+00	177.47	OK
	338.32	11.27	3.901E+00	1.159E+00	1.159E+00	44.69	OK
	794.95	4.25	2.004E+00	2.358E+00	2.358E+00	47.73	OK
	835.71	1.61	1.930E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.806E+00	1.067E+00	1.067E+00	34.78	OK
	968.97	15.80	1.723E+00	1.018E+00	1.018E+00	47.91	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	74.82	10.28	4.364E+00	9.956E-01	9.956E-01	77.00	OK
	77.11	17.10	4.583E+00	1.957E+00	1.957E+00	21.68	OK
	238.63	43.60*	5.100E+00	1.156E+00	1.156E+00	12.51	OK
TH-230	300.09	3.30	4.295E+00	-----	Line Not Found	-----	Absent
	609.32	45.49*	2.455E+00	9.734E-01	9.734E-01	20.25	OK
	1120.29	14.92	1.539E+00	1.546E+00	1.546E+00	36.87	OK
TH-232	1764.49	15.30	1.045E+00	-----	Line Not Found	-----	Absent
	105.21	1.10	6.332E+00	1.728E+00	1.728E+00	177.47	OK
	338.32	11.27	3.901E+00	1.159E+00	1.159E+00	44.69	OK
TH-234	835.71	1.61	1.930E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.806E+00	1.067E+00	1.067E+00	34.78	OK
	968.97	15.80	1.723E+00	1.018E+00	1.018E+00	47.91	OK
U-234	63.29	3.70*	3.030E+00	1.818E+00	1.818E+00	135.48	OK
	92.59	4.23	5.779E+00	1.570E+00	1.570E+00	83.57	OK
	609.32	45.49*	2.455E+00	9.734E-01	9.734E-01	20.25	OK
U-235	1120.29	14.92	1.539E+00	1.546E+00	1.546E+00	36.87	OK
	1764.49	15.30	1.045E+00	-----	Line Not Found	-----	Absent
	89.96	3.47	5.602E+00	-----	Line Not Found	-----	Absent
U-238	93.35	5.60	5.779E+00	1.186E+00	1.186E+00	83.57	OK
	143.76	10.96*	6.593E+00	-----	Line Not Found	-----	<<INT Reject
	163.33	5.08	6.352E+00	-----	Line Not Found	-----	Absent
AM-243	185.72	57.20	5.981E+00	1.197E-01	1.197E-01	84.89	OK
	205.31	5.01	5.647E+00	-----	Line Not Found	-----	Absent
	63.29	3.70*	3.030E+00	1.818E+00	1.818E+00	135.48	OK
ANH-511	92.59	4.23	5.779E+00	1.570E+00	1.570E+00	83.57	OK
	43.53	5.90	4.883E-01	-----	Line Not Found	-----	Absent
ANH-511	74.66	67.20*	4.364E+00	1.523E-01	1.523E-01	77.00	OK
	511.00	100.00*	2.816E+00	1.484E-01	1.484E-01	61.42	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235048.CNF;1 *
 * Acquisition date : 3-OCT-2016 07:00:55 Sensitivity : 3.000 *
 * Detector ID : GAM28 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.46 Half life ratio : ***** *
 * Sample date : 7-DEC-2015 13:28:00 Analyst initials: MXR1 *
 * Sample ID : G405235048 Sample Quantity : 1.3158E+02 GRAM *
 * Batch Number : 1596252 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 1-AUG-2016 10:02:35 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;10 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.636E+01	1.647E+00	6.664E-01
RU-103	6.229E+00	8.448E+00	1.105E+01
CD-109	1.893E+00	3.105E+00	2.489E+00
SN-126	1.205E-01	1.976E-01	1.593E-01
BA-137M	1.440E+00	1.523E-01	6.579E-02
CS-137	1.522E+00	1.609E-01	6.950E-02
CE-141	5.623E+00	4.041E+01	5.007E+01
EU-155	1.016E-01	1.767E-01	2.334E-01
TL-208	3.661E-01	7.763E-02	7.269E-02
BI-211	6.364E-01	1.149E+00	3.563E-01
PB-212	1.156E+00	1.417E-01	1.140E-01
BI-214	9.737E-01	1.932E-01	1.386E-01
PB-214	1.360E+00	2.215E-01	3.598E-01
RN-222	9.737E-01	1.932E-01	1.386E-01
RA-224	1.526E+00	1.370E+00	1.222E+00
RA-226	9.737E-01	1.932E-01	1.386E-01
AC-228	1.067E+00	3.635E-01	2.743E-01
RA-228	1.067E+00	3.635E-01	2.743E-01
TH-228	1.156E+00	1.417E-01	1.140E-01
TH-230	9.734E-01	1.932E-01	1.385E-01
TH-232	1.067E+00	3.635E-01	2.743E-01
TH-234	1.818E+00	2.414E+00	2.644E+00
U-234	9.734E-01	1.932E-01	1.385E-01
U-235	1.603E-01	2.747E-01	4.061E-01
U-238	1.818E+00	2.414E+00	2.644E+00
AM-243	1.523E-01	1.149E-01	9.726E-02
ANH-511	1.484E-01	8.936E-02	5.887E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.122E+00		1.683E+01	3.086E+01	NOT IDENT.
NA-22	3.668E-02		4.882E-02	1.075E-01	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF

AL-26	6.615E-03	2.369E-02	6.016E-02	NOT IDENT.
SC-46	7.763E-02	4.141E-01	8.393E-01	FAIL ABUN
V-48	0.000E+00	1.755E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	4.886E+02	0.000E+00	SHORT HLIF
MN-54	2.311E-02	6.839E-02	1.404E-01	NOT IDENT.
CO-56	4.028E-01	5.151E-01	1.116E+00	NOT IDENT.
MN-56	0.000E+00	1.284E+41	0.000E+00	SHORT HLIF
CO-57	-4.445E-03	5.719E-02	1.011E-01	NOT IDENT.
CO-58	5.473E-02	5.371E-01	1.103E+00	NOT IDENT.
FE-59	-2.871E+00	6.836E+00	1.254E+01	NOT IDENT.
CO-60	1.241E-02	3.878E-02	8.247E-02	NOT IDENT.
ZN-65	7.111E-02	1.912E-01	3.588E-01	NOT IDENT.
GE-68	-2.365E+00	2.651E+00	4.572E+00	NOT IDENT.
AS-73	-3.549E+00	1.079E+01	1.932E+01	NOT IDENT.
AS-74	0.000E+00	8.245E+03	0.000E+00	SHORT HLIF
SE-75	-7.304E-02	2.172E-01	4.040E-01	NOT IDENT.
BR-77	0.000E+00	3.316E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	8.583E+02	0.000E+00	SHORT HLIF
RB-83	4.221E-01	7.417E-01	1.486E+00	NOT IDENT.
KR-85	8.618E+00	9.504E+00	1.757E+01	NOT IDENT.
SR-85	9.158E-01	1.013E+00	1.873E+00	NOT IDENT.
RB-86	0.000E+00	3.268E+04	0.000E+00	SHORT HLIF
Y-88	-2.699E-02	2.250E-01	4.790E-01	NOT IDENT.
Y-91	-2.762E+02	5.997E+02	1.072E+03	NOT IDENT.
NB-94	3.432E-02	3.332E-02	7.074E-02	NOT IDENT.
NB-95	-1.003E+00	1.043E+00	1.810E+00	NOT IDENT.
NB-95M	-3.520E-01	3.172E+00	5.348E+00	NOT IDENT.
ZR-95	5.605E-01	1.458E+00	3.059E+00	NOT IDENT.
NB-97	0.000E+00	1.195E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	8.485E+40	0.000E+00	SHORT HLIF
MO-99	0.000E+00	2.715E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	2.590E-02	6.588E-02	7.111E-02	FAIL ABUN
RH-102	4.350E-02	6.814E-02	1.372E-01	NOT IDENT.
RH-106	5.829E-01	4.841E-01	1.079E+00	NOT IDENT.
RU-106	5.829E-01	4.841E-01	1.079E+00	NOT IDENT.
AG-108M	5.930E-03	3.257E-02	5.977E-02	NOT IDENT.
AG-110M	-3.118E-02	1.085E-01	2.057E-01	NOT IDENT.
SN-113	6.313E-02	2.706E-01	5.199E-01	NOT IDENT.
CD-115	0.000E+00	4.428E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.246E+05	0.000E+00	SHORT HLIF
TE-123M	-3.515E-02	1.623E-01	2.787E-01	NOT IDENT.
SB-124	-2.351E+00	1.881E+00	9.527E-01	NOT IDENT.
SB-125	1.761E-01	2.234E-01	2.451E-01	FAIL ABUN
TE-125M	9.495E+01	3.277E+02	5.999E+02	NOT IDENT.
I-126	0.000E+00	1.031E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.348E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	2.857E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	6.345E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.781E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	4.963E+26	0.000E+00	SHORT HLIF
BA-133	-9.114E-03	4.620E-02	7.656E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	0.000E+00	7.228E-02	1.316E-01	FAIL ABUN
CS-135	-3.619E-02	1.493E-01	2.500E-01	NOT IDENT.
I-135	0.000E+00	8.777E+40	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.365E+05	0.000E+00	SHORT HLIF
CE-139	-3.694E-03	1.241E-01	2.395E-01	NOT IDENT.
BA-140	0.000E+00	1.464E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.043E+05	0.000E+00	SHORT HLIF
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	5.094E-01	3.990E-01	7.839E-01	FAIL ABUN
PM-144	1.300E-02	6.183E-02	1.176E-01	NOT IDENT.
PR-144	1.113E+00	5.371E+00	1.021E+01	NOT IDENT.
PM-146	-1.524E-02	5.696E-02	1.027E-01	NOT IDENT.
ND-147	0.000E+00	3.747E+07	0.000E+00	SHORT HLIF
PM-147	-5.018E+02	9.528E+02	1.622E+03	NOT IDENT.
PM-149	0.000E+00	7.246E+40	0.000E+00	SHORT HLIF
EU-150	1.114E-04	3.134E-02	5.312E-02	FAIL ABUN
EU-152	1.540E-02	1.126E-01	2.141E-01	NOT IDENT.
GD-153	6.185E-02	2.184E-01	3.750E-01	NOT IDENT.
EU-154	8.987E-02	1.196E-01	2.634E-01	NOT IDENT.
TB-160	-1.076E+00	1.991E+00	3.630E+00	FAIL ABUN
HO-166M	1.626E-03	5.814E-02	1.091E-01	FAIL ABUN
TM-171	-9.139E+00	2.562E+01	4.581E+01	NOT IDENT.
HF-172	-3.073E-03	3.026E-01	4.930E-01	FAIL ABUN
LU-172	3.354E-02	8.580E-02	1.765E-01	FAIL ABUN
LU-176	-1.213E-02	2.829E-02	5.151E-02	FAIL ABUN

HF-181	-1.503E+00	5.321E+00	9.594E+00	NOT IDENT.
TA-182	8.899E-02	8.587E-01	1.722E+00	FAIL ABUN
RE-183	4.972E-01	3.302E+00	6.224E+00	NOT IDENT.
RE-184	1.600E+01	3.386E+01	7.076E+01	NOT IDENT.
W-188	-7.076E+01	1.374E+02	2.214E+02	FAIL ABUN
IR-192	3.741E-01	5.436E-01	1.087E+00	FAIL ABUN
HG-203	-1.814E-02	2.738E+00	5.194E+00	NOT IDENT.
BI-207	-1.596E-02	4.596E-02	8.598E-02	FAIL ABUN
PB-210	1.340E+00	4.413E+00	8.351E+00	NOT IDENT.
PB-211	8.252E-01	7.860E-01	1.619E+00	FAIL ABUN
BI-212	1.132E+00	7.082E-01	1.288E+00	FAIL ABUN
RN-219	3.568E-02	4.606E-01	8.673E-01	FAIL ABUN
RA-223	1.968E-01	6.763E-01	1.309E+00	FAIL ABUN
AC-227	-2.699E-02	2.495E-01	4.721E-01	FAIL ABUN
TH-227	-2.699E-02	2.495E-01	4.721E-01	FAIL ABUN
TH-229	9.613E-02	5.592E-01	1.081E+00	FAIL ABUN
PA-231	1.950E-01	5.331E-01	1.031E+00	NOT IDENT.
TH-231	1.968E-01	6.763E-01	1.309E+00	FAIL ABUN
PA-233	-3.749E-02	6.581E-02	1.183E-01	NOT IDENT.
PA-234	3.449E-02	2.443E-01	5.059E-01	FAIL ABUN
PA-234M	9.084E+00	4.260E+00	1.009E+01	FAIL ABUN
NP-237	-3.749E-02	6.581E-02	1.183E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	3.553E-02	2.635E-01	4.781E-01	FAIL ABUN
PU-239	2.347E+02	5.972E+02	6.686E+02	FAIL ABUN
AM-241	-5.943E-02	1.515E-01	2.721E-01	NOT IDENT.
CM-243	-7.438E-02	1.250E-01	1.942E-01	NOT IDENT.
BK-247	-3.949E-02	7.927E-02	1.377E-01	FAIL ABUN
CM-247	-1.111E-02	4.322E-02	7.862E-02	NOT IDENT.
CF-249	-4.551E-03	4.584E-02	8.491E-02	NOT IDENT.
CF-251	3.599E-02	1.250E-01	2.459E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	378	10.66*	1.237E+00	1.636E+01	1.636E+01	10.27
RU-103	497.08	14	91.00*	2.878E+00	3.079E-02	6.229E+00	138.39
	610.33	191	5.76	2.455E+00	7.687E+00	1.555E+03	20.25
CD-109	88.03	79	3.70*	5.460E+00	2.245E+00	3.527E+00	88.60
SN-126	64.28	36	9.60	3.030E+00	7.008E-01	7.008E-01	135.48
	86.94	79	8.90	5.460E+00	9.332E-01	9.332E-01	88.60
	87.57	79	37.00*	5.460E+00	2.245E-01	2.245E-01	88.60
BA-137M	661.66	513	89.90*	2.305E+00	1.413E+00	1.440E+00	10.79
CS-137	661.66	513	85.10*	2.305E+00	1.493E+00	1.522E+00	10.79
CE-141	145.44	20	48.29*	6.589E+00	3.639E-02	2.217E+01	174.83
EU-155	86.55	79	30.70	5.460E+00	2.705E-01	3.051E-01	88.60
	105.31	21	21.10*	6.332E+00	9.010E-02	1.016E-01	177.47
TL-208	277.37	-----	6.60	4.566E+00	-----	Line Not Found	-----
	583.19	139	85.00*	2.539E+00	3.661E-01	3.661E-01	21.63
	860.56	12	12.50	1.886E+00	2.867E-01	2.867E-01	145.48
BI-211	72.87	-----	1.23	4.138E+00	-----	Line Not Found	-----
	351.06	321	12.92*	3.781E+00	3.746E+00	3.746E+00	16.62
PB-212	74.82	128	10.28	4.364E+00	1.632E+00	1.632E+00	45.28
	77.11	269	17.10	4.583E+00	1.957E+00	1.957E+00	21.68
	238.63	450	43.60*	5.100E+00	1.156E+00	1.156E+00	12.51
	300.09	-----	3.30	4.295E+00	-----	Line Not Found	-----
BI-214	609.32	191	45.49*	2.455E+00	9.734E-01	9.737E-01	20.25
	1120.29	62	14.92	1.539E+00	1.546E+00	1.546E+00	36.87
	1764.49	-----	15.30	1.045E+00	-----	Line Not Found	-----
PB-214	74.82	128	5.80	4.364E+00	2.893E+00	2.894E+00	45.28
	77.11	269	9.70	4.583E+00	3.450E+00	3.451E+00	21.68
	87.09	79	3.41	5.460E+00	2.436E+00	2.436E+00	88.60
	242.00	128	7.25	5.054E+00	1.992E+00	1.992E+00	35.32
	295.22	158	18.42	4.345E+00	1.128E+00	1.129E+00	31.95
	351.93	321	35.60*	3.781E+00	1.359E+00	1.360E+00	16.62
RN-222	609.32	191	45.49*	2.455E+00	9.734E-01	9.737E-01	20.25
	1120.29	62	14.92	1.539E+00	1.546E+00	1.546E+00	36.87
	1764.49	-----	15.30	1.045E+00	-----	Line Not Found	-----
RA-224	240.99	128	4.10*	5.054E+00	3.522E+00	3.522E+00	35.32
RA-226	609.32	191	45.49*	2.455E+00	9.734E-01	9.737E-01	20.25
	1120.29	62	14.92	1.539E+00	1.546E+00	1.546E+00	36.87
	1764.49	-----	15.30	1.045E+00	-----	Line Not Found	-----
AC-228	105.21	21	1.10	6.332E+00	1.728E+00	1.728E+00	177.47
	338.32	89	11.27	3.901E+00	1.159E+00	1.159E+00	44.69
	794.95	35	4.25	2.004E+00	2.358E+00	2.358E+00	47.73
	835.71	-----	1.61	1.930E+00	-----	Line Not Found	-----
	911.20	87	25.80*	1.806E+00	1.067E+00	1.067E+00	34.78
	968.97	49	15.80	1.723E+00	1.018E+00	1.018E+00	47.91
RA-228	105.21	21	1.10	6.332E+00	1.728E+00	1.728E+00	177.47
	338.32	89	11.27	3.901E+00	1.159E+00	1.159E+00	44.69
	794.95	35	4.25	2.004E+00	2.358E+00	2.358E+00	47.73
	835.71	-----	1.61	1.930E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	911.20	87	25.80*	1.806E+00	1.067E+00	1.067E+00	34.78
	968.97	49	15.80	1.723E+00	1.018E+00	1.018E+00	47.91
	74.82	128	10.28	4.364E+00	1.632E+00	1.632E+00	45.28
	77.11	269	17.10	4.583E+00	1.957E+00	1.957E+00	21.68
TH-230	238.63	450	43.60*	5.100E+00	1.156E+00	1.156E+00	12.51
	300.09	-----	3.30	4.295E+00	-----	Line Not Found	-----
	609.32	191	45.49*	2.455E+00	9.734E-01	9.734E-01	20.25
	1120.29	62	14.92	1.539E+00	1.546E+00	1.546E+00	36.87
TH-232	1764.49	-----	15.30	1.045E+00	-----	Line Not Found	-----
	105.21	21	1.10	6.332E+00	1.728E+00	1.728E+00	177.47
	338.32	89	11.27	3.901E+00	1.159E+00	1.159E+00	44.69
	835.71	-----	1.61	1.930E+00	-----	Line Not Found	-----
TH-234	911.20	87	25.80*	1.806E+00	1.067E+00	1.067E+00	34.78
	968.97	49	15.80	1.723E+00	1.018E+00	1.018E+00	47.91
	63.29	36	3.70*	3.030E+00	1.818E+00	1.818E+00	135.48
	92.59	67	4.23	5.779E+00	1.570E+00	1.570E+00	83.57
U-234	609.32	191	45.49*	2.455E+00	9.734E-01	9.734E-01	20.25
	1120.29	62	14.92	1.539E+00	1.546E+00	1.546E+00	36.87
	1764.49	-----	15.30	1.045E+00	-----	Line Not Found	-----
	89.96	-----	3.47	5.602E+00	-----	Line Not Found	-----
U-235	93.35	67	5.60	5.779E+00	1.186E+00	1.186E+00	83.57
	143.76	20	10.96*	6.589E+00	1.603E-01	1.603E-01	174.83
	163.33	-----	5.08	6.352E+00	-----	Line Not Found	-----
	185.72	72	57.20	5.981E+00	1.197E-01	1.197E-01	84.89
U-238	205.31	-----	5.01	5.647E+00	-----	Line Not Found	-----
	63.29	36	3.70*	3.030E+00	1.818E+00	1.818E+00	135.48
	92.59	67	4.23	5.779E+00	1.570E+00	1.570E+00	83.57
	43.53	-----	5.90	4.883E-01	-----	Line Not Found	-----
AM-243	74.66	128	67.20*	4.364E+00	2.497E-01	2.497E-01	45.28
	511.00	73	100.00*	2.816E+00	1.484E-01	1.484E-01	61.42

Flag: "*" = Keyline

Total number of lines in spectrum 42
 Number of unidentified lines 6
 Number of lines tentatively identified by NID 36 85.71%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.636E+01	1.636E+01	0.168E+01	10.27	
RU-103	39.26D	202.	3.079E-02	6.229E+00	8.620E+00	138.39	
CD-109	461.40D	1.57	2.245E+00	3.527E+00	3.125E+00	88.60	
SN-126	2.30E+05Y	1.00	2.245E-01	2.245E-01	1.989E-01	88.60	
BA-137M	30.08Y	1.02	1.413E+00	1.440E+00	0.155E+00	10.79	
CS-137	30.08Y	1.02	1.493E+00	1.522E+00	0.164E+00	10.79	
CE-141	32.51D	609.	3.639E-02	2.217E+01	3.877E+01	174.83	
EU-155	4.75Y	1.13	9.010E-02	1.016E-01	1.803E-01	177.47	
TL-208	1.41E+10Y	1.00	3.661E-01	3.661E-01	0.792E-01	21.63	
BI-211	7.04E+08Y	1.00	3.746E+00	3.746E+00	0.622E+00	16.62	
PB-212	1.41E+10Y	1.00	1.156E+00	1.156E+00	0.145E+00	12.51	
BI-214	1600.00Y	1.00	9.734E-01	9.737E-01	1.972E-01	20.25	
PB-214	1600.00Y	1.00	1.359E+00	1.360E+00	0.226E+00	16.62	
RN-222	1600.00Y	1.00	9.734E-01	9.737E-01	1.972E-01	20.25	
RA-224	1.41E+10Y	1.00	3.522E+00	3.522E+00	1.244E+00	35.32	
RA-226	1600.00Y	1.00	9.734E-01	9.737E-01	1.972E-01	20.25	
AC-228	1.41E+10Y	1.00	1.067E+00	1.067E+00	0.371E+00	34.78	
RA-228	1.41E+10Y	1.00	1.067E+00	1.067E+00	0.371E+00	34.78	
TH-228	1.41E+10Y	1.00	1.156E+00	1.156E+00	0.145E+00	12.51	
TH-230	7.54E+04Y	1.00	9.734E-01	9.734E-01	1.971E-01	20.25	
TH-232	1.41E+10Y	1.00	1.067E+00	1.067E+00	0.371E+00	34.78	
TH-234	4.47E+09Y	1.00	1.818E+00	1.818E+00	2.464E+00	135.48	
U-234	2.45E+05Y	1.00	9.734E-01	9.734E-01	1.971E-01	20.25	
U-235	7.04E+08Y	1.00	1.603E-01	1.603E-01	2.803E-01	174.83	
U-238	4.47E+09Y	1.00	1.818E+00	1.818E+00	2.464E+00	135.48	
AM-243	7370.00Y	1.00	2.497E-01	2.497E-01	1.131E-01	45.28	
ANH-511	1.00E+09Y	1.00	1.484E-01	1.484E-01	0.912E-01	61.42	
Total Activity :			4.546E+01	7.515E+01			

Grand Total Activity : 4.546E+01 7.515E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
2	79.44	60	141	1.36	158.97	145	19	1.44E-02	94.1	4.79E+00	T
2	95.17	29	140	1.12	190.46	181	13	6.89E-03	****	5.90E+00	T
0	115.15	34	158	0.65	230.46	227	10	8.20E-03	****	6.55E+00	T
0	128.10	17	144	1.28	256.36	254	8	4.25E-03	****	6.65E+00	T
0	140.47	20	150	1.82	281.13	275	9	4.97E-03	****	6.62E+00	T
0	271.68	37	105	2.26	543.75	536	12	9.61E-03	****	4.64E+00	T
0	428.57	24	52	4.00	857.75	851	12	6.45E-03	****	3.23E+00	T
0	599.58	33	34	3.31	1200.03	1192	14	8.93E-03	85.4	2.49E+00	T
0	653.27	17	10	1.37	1307.50	1303	8	4.59E-03	82.1	2.33E+00	
0	679.99	16	17	0.80	1360.96	1357	8	4.47E-03	****	2.26E+00	
0	727.75	28	16	2.07	1456.57	1452	10	7.85E-03	63.9	2.14E+00	T
0	783.28	13	22	1.73	1567.70	1562	10	3.58E-03	****	2.03E+00	T
0	955.13	16	22	2.23	1911.65	1902	15	4.66E-03	****	1.74E+00	T
0	1000.35	22	0	2.62	2002.17	1996	12	6.37E-03	47.8	1.68E+00	T
0	1510.25	9	4	1.43	3022.72	3018	8	2.50E-03	****	1.20E+00	
0	1517.03	5	5	0.72	3036.30	3030	10	1.39E-03	****	1.20E+00	
0	1631.84	11	0	0.62	3266.08	3261	10	3.33E-03	57.7	1.12E+00	
0	1766.05	34	7	1.49	3534.71	3527	12	1.01E-02	44.6	1.04E+00	

Flags: "T" = Tentatively associated

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
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DETECTOR AND SAMPLE DATA

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*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235048.CNF;1
* Acquisition date   : 3-OCT-2016 07:00:55 Sensitivity      : 3.000
* Detector ID        : GAM28 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.46 Half life ratio  : *****
* Sample date        : 7-DEC-2015 13:28:00 Nuclide Library : SOLID
* Sample ID          : G405235048 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity : 1.3158E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
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CALIBRATION INFORMATION

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*
* Eff. Cal. date     : 1-AUG-2016 10:02:35 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;10
*****
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.747E-01
RU-103	4.920E+00
CD-109	1.182E+00
SN-126	7.567E-02
BA-137M	2.905E-02
CS-137	3.069E-02
CE-141	2.351E+01
EU-155	1.099E-01
TL-208	3.272E-02
BI-211	1.621E-01
PB-212	5.344E-02
BI-214	6.229E-02
PB-214	1.741E-01
RN-222	6.229E-02
RA-224	5.728E-01
RA-226	6.229E-02
AC-228	1.205E-01
RA-228	1.205E-01
TH-228	5.344E-02
TH-230	6.226E-02
TH-232	1.205E-01
TH-234	1.249E+00
U-234	6.226E-02
U-235	1.920E-01
U-238	1.249E+00
AM-243	4.586E-02
ANH-511	2.665E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.416E+01	NOT IDENT.
NA-22	4.681E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.252E-02	NOT IDENT.

SC-46	3.688E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	6.235E-02	NOT IDENT.
CO-56	4.972E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.750E-02	NOT IDENT.
CO-58	4.766E-01	NOT IDENT.
FE-59	5.318E+00	NOT IDENT.
CO-60	3.480E-02	NOT IDENT.
ZN-65	1.561E-01	NOT IDENT.
GE-68	1.959E+00	NOT IDENT.
AS-73	9.032E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.858E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	6.726E-01	NOT IDENT.
KR-85	8.107E+00	NOT IDENT.
SR-85	8.641E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.850E-01	NOT IDENT.
Y-91	4.637E+02	NOT IDENT.
NB-94	3.182E-02	NOT IDENT.
NB-95	8.068E-01	NOT IDENT.
NB-95M	2.513E+00	NOT IDENT.
ZR-95	1.351E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.346E-02	FAIL ABUN
RH-102	6.183E-02	NOT IDENT.
RH-106	4.823E-01	NOT IDENT.
RU-106	4.823E-01	NOT IDENT.
AG-108M	2.717E-02	NOT IDENT.
AG-110M	8.952E-02	NOT IDENT.
SN-113	2.386E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.309E-01	NOT IDENT.
SB-124	0.000E+00	NOT IDENT.
SB-125	1.125E-01	FAIL ABUN
TE-125M	2.825E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.470E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.981E-02	FAIL ABUN
CS-135	1.144E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	1.126E-01	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-143	0.000E+00	SHORT HLIF
CE-144	3.695E-01	FAIL ABUN
PM-144	5.250E-02	NOT IDENT.
PR-144	4.559E+00	NOT IDENT.
PM-146	4.702E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.581E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.444E-02	FAIL ABUN
EU-152	9.906E-02	NOT IDENT.
GD-153	1.765E-01	NOT IDENT.
EU-154	1.147E-01	NOT IDENT.
TB-160	1.566E+00	FAIL ABUN
HO-166M	4.791E-02	FAIL ABUN
TM-171	2.140E+01	NOT IDENT.
HF-172	2.321E-01	FAIL ABUN
LU-172	7.764E-02	FAIL ABUN
LU-176	2.376E-02	FAIL ABUN
HF-181	4.345E+00	NOT IDENT.

TA-182	7.377E-01	FAIL ABUN
RE-183	2.910E+00	NOT IDENT.
RE-184	3.133E+01	NOT IDENT.
W-188	1.018E+02	FAIL ABUN
IR-192	5.047E-01	FAIL ABUN
HG-203	2.410E+00	NOT IDENT.
BI-207	3.639E-02	FAIL ABUN
PB-210	3.932E+00	NOT IDENT.
PB-211	7.479E-01	FAIL ABUN
BI-212	5.897E-01	FAIL ABUN
RN-219	3.987E-01	FAIL ABUN
RA-223	6.059E-01	FAIL ABUN
AC-227	2.189E-01	FAIL ABUN
TH-227	2.189E-01	FAIL ABUN
TH-229	5.095E-01	FAIL ABUN
PA-231	4.813E-01	NOT IDENT.
TH-231	6.059E-01	FAIL ABUN
PA-233	5.421E-02	NOT IDENT.
PA-234	2.161E-01	FAIL ABUN
PA-234M	4.498E+00	FAIL ABUN
NP-237	5.421E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.237E-01	FAIL ABUN
PU-239	3.153E+02	FAIL ABUN
AM-241	1.270E-01	NOT IDENT.
CM-243	9.082E-02	NOT IDENT.
BK-247	6.325E-02	FAIL ABUN
CM-247	3.610E-02	NOT IDENT.
CF-249	3.905E-02	NOT IDENT.
CF-251	1.154E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235048.CNF;1 *
 * Acquisition date : 3-OCT-2016 07:00:55 Sensitivity : 3.000 *
 * Detector ID : GAM28 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.46 Half life ratio : ***** *
 * Sample date : 7-DEC-2015 13:28:00 Nuclide Library : SOLID *
 * Sample ID : G405235048 Analyst initials: MXR1 *
 * Batch Number : 1596252 Sample Quantity : 1.3158E+02 GRAM *
 * Quantity Err(%) : 1.5200E-03 % *
 * Wet wt corr : 1.00000 Wet Weight : 0.00000 *
 * Dry Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 1-AUG-2016 10:02:35 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;10 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.636E+01	1.857E+00	1.857E+00
RU-103	6.229E+00	8.453E+00	8.453E+00
CD-109	1.893E+00	3.115E+00	3.115E+00
SN-126	1.205E-01	1.982E-01	1.982E-01
BA-137M	1.440E+00	1.646E-01	1.646E-01
CS-137	1.522E+00	1.739E-01	1.739E-01
CE-141	5.623E+00	4.043E+01	4.043E+01
EU-155	1.016E-01	1.769E-01	1.769E-01
TL-208	3.661E-01	7.920E-02	7.920E-02
BI-211	6.364E-01	1.165E+00	1.165E+00
PB-212	1.156E+00	1.545E-01	1.545E-01
BI-214	9.737E-01	1.978E-01	1.978E-01
PB-214	1.360E+00	2.287E-01	2.287E-01
RN-222	9.737E-01	1.978E-01	1.978E-01
RA-224	1.526E+00	1.379E+00	1.379E+00
RA-226	9.737E-01	1.978E-01	1.978E-01
AC-228	1.067E+00	3.677E-01	3.677E-01
RA-228	1.067E+00	3.677E-01	3.677E-01
TH-228	1.156E+00	1.545E-01	1.545E-01
TH-230	9.734E-01	1.977E-01	1.977E-01
TH-232	1.067E+00	3.677E-01	3.677E-01
TH-234	1.818E+00	2.448E+00	2.448E+00
U-234	9.734E-01	1.977E-01	1.977E-01
U-235	1.603E-01	2.748E-01	2.748E-01
U-238	1.818E+00	2.448E+00	2.448E+00
AM-243	1.523E-01	1.160E-01	1.160E-01
ANH-511	1.484E-01	8.956E-02	8.956E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.122E+00	1.683E+01	1.684E+01	NOT IDENT.
NA-22	3.668E-02	4.884E-02	5.156E-02	NOT IDENT.
NA-24	-1.000E+41	4.768E+41	0.000E+00	SHORT HLIF

AL-26	6.615E-03	2.370E-02	2.389E-02	NOT IDENT.
SC-46	7.763E-02	4.141E-01	4.156E-01	FAIL ABUN
V-48	-4.998E+02	1.755E+04	1.755E+04	SHORT HLIF
CR-51	-5.934E+01	4.887E+02	4.894E+02	SHORT HLIF
MN-54	2.311E-02	6.840E-02	6.919E-02	NOT IDENT.
CO-56	4.028E-01	5.154E-01	5.464E-01	NOT IDENT.
MN-56	1.000E+41	1.284E+41	0.000E+00	SHORT HLIF
CO-57	-4.445E-03	5.719E-02	5.723E-02	NOT IDENT.
CO-58	5.473E-02	5.371E-01	5.377E-01	NOT IDENT.
FE-59	-2.871E+00	6.840E+00	6.961E+00	NOT IDENT.
CO-60	1.241E-02	3.878E-02	3.919E-02	NOT IDENT.
ZN-65	7.111E-02	1.912E-01	1.939E-01	NOT IDENT.
GE-68	-2.365E+00	2.652E+00	2.858E+00	NOT IDENT.
AS-73	-3.549E+00	1.081E+01	1.093E+01	NOT IDENT.
AS-74	-3.353E+03	8.250E+03	8.387E+03	SHORT HLIF
SE-75	-7.304E-02	2.173E-01	2.198E-01	NOT IDENT.
BR-77	2.705E+38	2.348E+39	0.000E+00	SHORT HLIF
SR-82	-4.613E+02	8.585E+02	8.834E+02	SHORT HLIF
RB-83	4.221E-01	7.440E-01	7.679E-01	NOT IDENT.
KR-85	8.618E+00	9.511E+00	1.027E+01	NOT IDENT.
SR-85	9.158E-01	1.014E+00	1.095E+00	NOT IDENT.
RB-86	-3.646E+04	3.272E+04	3.662E+04	SHORT HLIF
Y-88	-2.699E-02	2.250E-01	2.253E-01	NOT IDENT.
Y-91	-2.762E+02	5.998E+02	6.126E+02	NOT IDENT.
NB-94	3.432E-02	3.335E-02	3.676E-02	NOT IDENT.
NB-95	-1.003E+00	1.044E+00	1.138E+00	NOT IDENT.
NB-95M	-3.520E-01	3.172E+00	3.176E+00	NOT IDENT.
ZR-95	5.605E-01	1.459E+00	1.480E+00	NOT IDENT.
NB-97	1.000E+41	1.196E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	8.495E+40	0.000E+00	SHORT HLIF
MO-99	1.190E+31	2.715E+32	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	2.364E+41	0.000E+00	SHORT HLIF
RH-101	2.590E-02	6.605E-02	6.707E-02	FAIL ABUN
RH-102	4.350E-02	6.824E-02	7.100E-02	NOT IDENT.
RH-106	5.829E-01	4.855E-01	5.520E-01	NOT IDENT.
RU-106	5.829E-01	4.855E-01	5.520E-01	NOT IDENT.
AG-108M	5.930E-03	3.257E-02	3.268E-02	NOT IDENT.
AG-110M	-3.118E-02	1.085E-01	1.094E-01	NOT IDENT.
SN-113	6.313E-02	2.706E-01	2.721E-01	NOT IDENT.
CD-115	-2.381E+39	4.449E+39	0.000E+00	SHORT HLIF
SN-117M	1.417E+04	1.246E+05	1.247E+05	SHORT HLIF
TE-123M	-3.515E-02	1.623E-01	1.631E-01	NOT IDENT.
SB-124	-2.351E+00	1.886E+00	2.163E+00	NOT IDENT.
SB-125	1.761E-01	2.235E-01	2.372E-01	FAIL ABUN
TE-125M	9.495E+01	3.278E+02	3.305E+02	NOT IDENT.
I-126	-7.382E+04	1.031E+06	1.032E+06	SHORT HLIF
SB-126	-7.545E+05	1.355E+06	1.397E+06	SHORT HLIF
SB-127	-4.602E+20	2.858E+22	0.000E+00	SHORT HLIF
I-131	1.481E+09	6.346E+09	6.381E+09	SHORT HLIF
I-132	-1.000E+41	1.862E+42	0.000E+00	SHORT HLIF
TE-132	-4.221E+26	5.253E+26	0.000E+00	SHORT HLIF
BA-133	-9.114E-03	4.620E-02	4.638E-02	NOT IDENT.
I-133	-1.000E+41	1.273E+42	0.000E+00	SHORT HLIF
CS-134	1.545E-01	7.259E-02	1.006E-01	FAIL ABUN
CS-135	-3.619E-02	1.493E-01	1.502E-01	NOT IDENT.
I-135	-1.000E+41	6.852E+41	0.000E+00	SHORT HLIF
CS-136	-3.752E+05	3.390E+05	3.788E+05	SHORT HLIF
CE-139	-3.694E-03	1.241E-01	1.241E-01	NOT IDENT.
BA-140	7.368E+04	1.464E+06	1.465E+06	SHORT HLIF
LA-140	-1.070E+05	4.044E+05	4.072E+05	SHORT HLIF
CE-143	1.000E+41	2.514E+41	0.000E+00	SHORT HLIF
CE-144	5.094E-01	4.000E-01	4.612E-01	FAIL ABUN
PM-144	1.300E-02	6.183E-02	6.211E-02	NOT IDENT.
PR-144	1.113E+00	5.371E+00	5.394E+00	NOT IDENT.
PM-146	-1.524E-02	5.697E-02	5.739E-02	NOT IDENT.
ND-147	-6.558E+06	3.747E+07	3.759E+07	SHORT HLIF
PM-147	-5.018E+02	9.531E+02	9.796E+02	NOT IDENT.
PM-149	3.943E+40	7.298E+40	0.000E+00	SHORT HLIF
EU-150	1.114E-04	3.134E-02	3.134E-02	FAIL ABUN
EU-152	1.540E-02	1.126E-01	1.129E-01	NOT IDENT.
GD-153	6.185E-02	2.184E-01	2.202E-01	NOT IDENT.
EU-154	8.987E-02	1.197E-01	1.263E-01	NOT IDENT.
TB-160	-1.076E+00	1.992E+00	2.050E+00	FAIL ABUN
HO-166M	1.626E-03	5.815E-02	5.815E-02	FAIL ABUN
TM-171	-9.139E+00	2.563E+01	2.596E+01	NOT IDENT.
HF-172	-3.073E-03	3.026E-01	3.026E-01	FAIL ABUN
LU-172	3.354E-02	8.587E-02	8.719E-02	FAIL ABUN
LU-176	-1.213E-02	2.830E-02	2.882E-02	FAIL ABUN

HF-181	-1.503E+00	5.322E+00	5.365E+00	NOT IDENT.
TA-182	8.899E-02	8.587E-01	8.597E-01	FAIL ABUN
RE-183	4.972E-01	3.303E+00	3.310E+00	NOT IDENT.
RE-184	1.600E+01	3.408E+01	3.483E+01	NOT IDENT.
W-188	-7.076E+01	1.377E+02	1.413E+02	FAIL ABUN
IR-192	3.741E-01	5.438E-01	5.694E-01	FAIL ABUN
HG-203	-1.814E-02	2.738E+00	2.738E+00	NOT IDENT.
BI-207	-1.596E-02	4.596E-02	4.652E-02	FAIL ABUN
PB-210	1.340E+00	4.414E+00	4.455E+00	NOT IDENT.
PB-211	8.252E-01	7.871E-01	8.706E-01	FAIL ABUN
BI-212	1.132E+00	7.106E-01	8.747E-01	FAIL ABUN
RN-219	3.568E-02	4.606E-01	4.609E-01	FAIL ABUN
RA-223	1.968E-01	6.764E-01	6.822E-01	FAIL ABUN
AC-227	-2.699E-02	2.495E-01	2.498E-01	FAIL ABUN
TH-227	-2.699E-02	2.495E-01	2.498E-01	FAIL ABUN
TH-229	9.613E-02	5.592E-01	5.609E-01	FAIL ABUN
PA-231	1.950E-01	5.347E-01	5.419E-01	NOT IDENT.
TH-231	1.968E-01	6.764E-01	6.822E-01	FAIL ABUN
PA-233	-3.749E-02	6.584E-02	6.797E-02	NOT IDENT.
PA-234	3.449E-02	2.474E-01	2.479E-01	FAIL ABUN
PA-234M	9.084E+00	4.278E+00	5.922E+00	FAIL ABUN
NP-237	-3.749E-02	6.584E-02	6.797E-02	FAIL ABUN
NP-238	-1.000E+41	2.414E+41	0.000E+00	SHORT HLIF
NP-239	3.553E-02	2.635E-01	2.640E-01	FAIL ABUN
PU-239	2.347E+02	5.973E+02	6.066E+02	FAIL ABUN
AM-241	-5.943E-02	1.515E-01	1.539E-01	NOT IDENT.
CM-243	-7.438E-02	1.252E-01	1.296E-01	NOT IDENT.
BK-247	-3.949E-02	7.967E-02	8.164E-02	FAIL ABUN
CM-247	-1.111E-02	4.326E-02	4.355E-02	NOT IDENT.
CF-249	-4.551E-03	4.584E-02	4.588E-02	NOT IDENT.
CF-251	3.599E-02	1.250E-01	1.261E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	59.3957	87.09	119.6387	136.47	76.2277
45.60	79.5984	87.57	119.7312	140.51	0.0000
46.54	74.5302	88.03	119.8196	143.76	83.4332
49.72	0.0000	88.34	119.8798	144.24	73.6588
51.35	60.5064	88.47	119.9047	145.44	78.6787
51.87	60.5771	89.96	109.5396	152.43	89.2211
52.39	72.3514	1093.63	109.6575	153.25	0.0000
52.97	72.4445	91.11	0.0000	323.87	79.4648
53.44	73.5862	92.59	117.6313	156.02	0.0000
54.07	74.7558	93.35	117.7700	158.56	0.0000
57.36	0.0000	94.56	117.9901	159.00	84.8776
57.53	74.2361	94.65	118.0057	162.33	78.5026
57.98	65.6907	94.67	118.0096	162.66	0.0000
59.27	78.8245	94.87	118.0457	163.33	82.7679
59.32	75.5929	97.43	73.8735	165.86	82.9904
59.54	75.6271	98.43	66.2777	176.31	83.8948
60.96	72.2348	98.44	66.2785	176.60	0.0000
61.17	72.2656	99.53	83.3692	177.52	72.1191
62.93	97.9036	100.11	78.8050	181.07	0.0000
63.29	97.9735	102.03	60.4329	181.52	66.4465
63.58	98.0296	103.18	79.1599	184.41	78.5974
64.28	103.2549	103.37	86.9451	143.76	78.6984
66.73	100.8236	105.21	87.5648	193.51	87.0507
67.24	92.1461	105.31	87.5771	197.03	84.7471
125.81	111.9858	106.12	85.7299	198.01	79.6315
67.75	111.9998	106.47	85.7730	201.83	80.7847
69.67	102.4879	109.28	79.8504	203.43	64.3751
70.83	86.8783	111.00	77.6872	205.31	97.6012
72.81	103.4505	111.76	0.0000	210.85	94.5901
72.87	96.0711	114.06	63.0416	215.65	72.1262
74.66	91.1915	116.30	0.0000	222.11	75.1895
74.82	91.2171	116.74	67.6192	227.09	71.0701
74.97	91.2415	119.76	63.5234	227.38	73.7539
77.11	91.5869	121.12	82.3302	228.16	0.0000
78.74	91.8465	121.22	82.3407	228.18	67.5793
79.69	91.9966	121.78	85.9839	116.74	67.5793
80.12	92.0642	122.06	83.6259	235.69	84.5630
80.19	0.0000	122.92	96.8747	235.96	65.7854
80.57	92.1349	123.07	83.7354	238.63	75.3500
81.00	97.4491	265.00	77.8153	238.98	0.0000
81.07	97.4610	125.81	86.4311	240.99	75.4961
81.75	91.5683	127.23	86.5863	242.00	75.5585
83.79	88.1154	127.91	81.8465	244.70	62.2028
84.00	94.9268	129.30	81.9889	252.40	0.0000
85.43	105.7228	131.20	101.5214	252.80	53.5342
86.55	128.6120	133.02	70.2556	254.15	0.0000
86.79	128.6621	133.52	58.1777	256.23	56.4086
86.94	119.6090	136.00	81.0465	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	50.3686	355.39	0.0000	584.27	27.4119
264.80	48.3592	356.01	35.1079	595.83	0.0000
265.00	52.7637	364.49	0.0000	427.87	23.1875
268.22	44.0771	366.42	0.0000	602.52	0.0000
269.46	56.9872	372.51	43.3447	604.72	13.2729
270.03	57.0112	375.05	45.3842	607.14	28.2330
271.23	57.0629	377.52	44.4635	609.32	26.5967
273.65	0.0000	356.01	39.6712	610.33	26.6084
276.40	60.9807	388.16	45.7370	614.28	23.3208
277.37	51.7788	388.63	0.0000	618.01	26.6934
277.60	48.0877	391.69	37.8608	620.36	23.3789
278.00	53.6528	264.66	49.0728	621.93	10.0261
279.20	55.5518	401.81	42.0897	630.19	0.0000
279.54	61.1230	402.40	47.1167	631.29	19.0109
279.70	61.1298	404.85	31.1198	633.25	27.9795
280.46	58.3845	410.95	34.2490	634.78	0.0000
283.69	57.5940	413.71	47.4169	635.95	25.7692
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	52.0853	423.72	0.0000	645.85	21.3727
285.90	0.0000	427.09	33.5391	657.76	11.3021
287.50	48.4379	427.87	33.5532	657.90	0.0000
290.67	50.4163	433.94	30.6030	661.66	19.2433
293.27	0.0000	439.40	33.7620	664.57	0.0000
351.93	59.0112	453.88	44.3298	666.33	0.0000
295.96	59.0420	463.37	44.5476	666.50	0.0000
879.38	70.4178	468.07	39.4627	667.71	0.0000
299.98	54.9806	473.00	0.0000	677.62	22.2104
300.09	54.9842	475.06	45.8557	685.70	0.0000
300.13	45.1162	476.78	43.8090	695.00	0.0000
301.36	57.3848	477.60	42.7834	696.49	20.6499
302.85	68.7449	482.18	35.5599	696.51	20.6499
256.23	49.9689	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	22.9517
306.78	55.7134	497.08	22.1254	697.49	20.6580
308.46	45.3789	505.52	25.3896	702.65	13.7988
311.90	51.1710	507.63	0.0000	706.68	23.0322
316.51	42.7771	511.00	30.7597	711.68	17.3065
319.41	0.0000	514.00	30.2720	720.70	0.0000
320.08	0.0000	514.00	30.2720	721.93	0.0000
321.04	41.0001	520.40	22.3732	722.78	10.4268
323.87	45.8545	520.69	0.0000	722.91	10.4271
325.23	45.8955	522.65	0.0000	723.31	6.9524
328.76	0.0000	527.90	0.0000	724.19	10.4319
333.37	50.4674	528.26	18.1787	727.33	18.5671
333.97	44.7177	529.59	19.2598	733.00	16.7449
334.37	50.5005	529.87	0.0000	735.93	18.6250
338.28	47.2534	531.02	0.0000	333.97	15.1413
338.32	47.2544	537.26	0.0000	739.50	0.0000
311.90	52.1488	546.56	0.0000	747.24	14.9025
340.48	52.1488	552.55	24.8689	748.06	14.9066
340.55	0.0000	563.25	21.7293	752.31	21.0769
344.28	48.4029	569.33	22.8765	753.82	0.0000
345.93	43.0270	946.00	19.6099	756.73	14.9528
351.06	34.0280	569.70	19.6121	756.80	14.9533
351.93	34.0465	583.19	27.3997	884.68	23.8096

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	34.4142	1274.44	9.1116	1620.50	4.3926
766.42	34.4214	1001.03	7.6033	1621.92	7.6891
766.84	30.0125	1002.74	12.1711	1678.03	0.0000
772.60	0.0000	1004.73	7.6113	1690.97	6.6782
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	5.4152
778.90	14.1831	1028.54	0.0000	1063.66	30.7179
783.70	0.0000	1037.84	16.3245	1771.35	12.6513
785.37	17.0578	1038.76	0.0000	1791.20	0.0000
792.07	8.5485	631.29	9.6265	1808.65	1.8194
794.95	15.1531	1048.07	0.0000	1810.72	0.0000
795.86	15.1577	1049.04	14.4489	1836.06	4.5706
810.06	16.1268	1050.41	11.5635		
810.29	16.1279	1063.66	13.5394		
344.28	12.5444	1077.00	0.0000		
810.76	12.5461	1077.34	18.4434		
815.77	0.0000	1085.87	16.5403		
1048.07	0.0000	1093.63	13.6497		
832.01	18.0499	1099.45	14.6466		
834.85	17.1631	1112.07	12.7366		
835.71	12.6503	1112.84	11.1991		
836.80	0.0000	1115.54	10.9826		
846.75	0.0000	1120.29	15.7090		
846.77	13.6029	1120.55	15.7100		
856.80	0.0000	1221.41	15.7129		
860.56	7.2874	1129.67	18.6996		
871.09	13.7096	1131.51	0.0000		
873.19	20.1208	1147.95	0.0000		
875.33	0.0000	1173.23	14.9286		
879.38	19.2440	1177.95	21.9208		
880.51	16.5009	1189.05	7.9932		
883.24	14.6797	1204.77	19.0580		
884.68	18.3582	1221.41	11.0786		
889.28	15.6267	1231.02	20.1904		
894.76	15.6537	1235.36	0.0000		
898.04	15.6698	1238.28	16.1807		
900.72	17.5278	1260.41	0.0000		
903.28	14.7720	1271.87	15.2911		
911.20	17.5846	1274.44	8.1602		
912.08	17.5893	1274.54	8.1606		
923.98	0.0000	1291.59	10.2411		
926.50	16.7366	1298.22	0.0000		
929.11	13.0276	1312.11	0.0000		
937.49	22.3901	1332.49	7.2367		
944.13	0.0000	1362.66	0.0000		
946.00	10.2880	1365.19	5.2072		
949.00	13.4802	1368.63	0.0000		
667.71	0.0000	1384.29	5.2295		
962.31	30.0742	1408.01	6.3080		
964.08	23.8211	1457.56	0.0000		
966.17	24.0867	1460.82	7.4431		
911.20	25.4246	1489.16	4.2783		
968.97	25.4246	1505.03	0.0000		
983.53	0.0000	1584.12	8.7231		
984.45	0.0000	1596.21	0.0000		


```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                   *
*                               Charleston, SC 29407                             *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235049.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM33.CNF;235
Background date : 2-OCT-2016 11:02:02.
Sample date     : 7-DEC-2015 13:33:00. Acquisition date : 3-OCT-2016 07:01:16.
Sample ID      : G405235049 Sample quantity   : 1.47303E+02 GRAM
Detector name  : GAM33 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.77 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID      : 1596252 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.19*	48	120	1.13	126.50	122	9	1.35E-02	44.7	
2	10	73.22	33	112	2.59	146.53	144	18	9.05E-03	57.1	2.73E+00
3	10	74.90*	93	169	1.47	149.88	144	18	2.58E-02	29.0	
4	10	77.17	205	153	1.40	154.41	144	18	5.71E-02	12.9	
5	0	87.63	86	227	4.11	175.31	171	11	2.38E-02	35.7	
6	0	92.73*	78	215	1.71	185.50	182	13	2.16E-02	42.7	
7	0	185.77*	31	162	1.16	371.33	367	10	8.61E-03	83.1	
8	0	207.99	32	157	0.62	415.73	410	13	8.90E-03	82.3	
9	3	238.66*	380	69	1.17	477.00	470	25	1.05E-01	6.4	1.83E+00
10	3	241.51	87	71	1.62	482.69	470	25	2.41E-02	26.6	
11	3	245.47	41	47	1.63	490.60	470	25	1.14E-02	37.3	
12	0	270.40	23	77	0.53	540.40	536	9	6.35E-03	72.1	
13	0	274.70	19	51	1.37	549.00	545	7	5.30E-03	66.7	
14	0	277.39	25	58	0.70	554.37	552	8	7.06E-03	55.0	
15	0	295.34	121	75	1.13	590.25	586	10	3.37E-02	16.0	
16	0	300.67	46	66	0.74	600.90	596	11	1.27E-02	38.3	
17	0	328.12*	23	72	1.58	655.74	647	12	6.29E-03	79.0	
18	0	338.02*	93	48	0.88	675.52	671	10	2.59E-02	17.6	
19	0	351.99*	202	62	1.39	703.44	698	9	5.61E-02	10.0	
20	0	432.80	20	32	1.01	864.90	861	8	5.47E-03	54.7	
21	0	471.21	30	139	11.76	941.67	921	28	8.35E-03	115.1	
22	0	511.13*	36	39	2.65	1021.45	1016	12	1.01E-02	47.2	
23	0	576.91	15	15	0.59	1152.93	1149	7	4.14E-03	50.9	
24	0	583.28*	119	34	1.14	1165.67	1161	12	3.31E-02	13.6	
25	0	609.36*	212	23	1.45	1217.81	1211	13	5.89E-02	8.4	
26	5	661.65	160	20	1.79	1322.34	1317	17	4.44E-02	9.6	1.53E+00
27	5	665.34	20	6	2.13	1329.71	1317	17	5.52E-03	42.2	
28	3	727.15	35	17	2.11	1453.29	1447	18	9.70E-03	30.6	8.28E-01
29	3	731.15	16	1	2.09	1461.28	1447	18	4.38E-03	33.1	
30	0	743.62	20	18	3.75	1486.23	1477	18	5.65E-03	53.6	
31	0	768.25	16	41	2.55	1535.47	1523	17	4.41E-03	97.0	
32	0	794.57	21	28	4.48	1588.09	1576	16	5.77E-03	61.0	
33	0	809.82	14	3	0.74	1618.59	1615	7	3.84E-03	34.8	
34	0	860.63	24	15	0.82	1720.19	1714	12	6.71E-03	37.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	911.23*	87	14	1.32	1821.40	1816	13	2.41E-02	14.1	
36	0	969.41*	51	37	1.57	1937.74	1929	15	1.42E-02	29.9	
37	0	1015.67	7	8	1.41	2030.29	2026	8	1.94E-03	79.5	
38	0	1021.36	10	2	1.90	2041.66	2039	6	2.86E-03	36.7	
39	0	1063.75*	10	12	0.74	2126.45	2119	12	2.82E-03	76.1	
40	0	1097.44	9	12	0.49	2193.86	2184	12	2.54E-03	82.6	
41	0	1121.55*	24	28	0.93	2242.10	2233	14	6.56E-03	52.3	
42	0	1216.62	14	11	2.12	2432.32	2427	9	3.86E-03	51.0	
43	0	1267.42	7	6	0.88	2533.97	2528	8	2.04E-03	68.1	
44	0	1290.36	10	13	0.61	2579.88	2571	14	2.73E-03	86.4	
45	0	1338.05	5	4	0.97	2675.30	2670	8	1.39E-03	82.5	
46	0	1367.85	6	5	1.10	2734.94	2731	7	1.55E-03	80.4	
47	0	1460.94*	322	4	1.71	2921.28	2915	15	8.94E-02	5.8	
48	0	1589.47	10	4	0.60	3178.58	3175	7	2.64E-03	46.0	
49	0	1764.74*	31	0	2.92	3529.56	3521	15	8.56E-03	19.1	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235049.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 7-DEC-2015 13:33:00   Acquisition date  : 3-OCT-2016 07:01:16
Sample ID         : G405235049           Sample quantity   : 147.30 GRAM
Sample type       : SOLID                 Sample geometry   :
Detector name    : GAMMA33              Detector geometry : CAN
Elapsed live time: 0 01:00:00.00        Elapsed real time: 0 01:00:00.77   0.0%
Energy tolerance : 1.50 keV             Half life ratio   : 10.00
Errors propagated: No                   Systematic Error  : 0.00 %
Efficiency type  : Linear                Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.133E+00	1.307E+01	1.307E+01	11.59	OK
CO-58	810.76	99.45*	1.810E+00	4.001E-02	7.582E-01	69.57	OK
CD-109	88.03	3.70*	4.931E+00	2.128E+00	3.343E+00	101.05	OK
SN-126	64.28	9.60	2.441E+00	1.346E+00	1.346E+00	89.42	OK
	86.94	8.90	4.931E+00	8.846E-01	8.846E-01	101.05	OK
	87.57	37.00*	4.931E+00	2.128E-01	2.128E-01	101.05	OK
BA-137M	661.66	89.90*	2.115E+00	4.469E-01	4.554E-01	19.25	OK
CS-137	661.66	85.10*	2.115E+00	4.721E-01	4.811E-01	19.25	OK
TL-208	277.37	6.60	4.258E+00	5.203E-01	5.203E-01	109.91	OK
	583.19	85.00*	2.334E+00	3.231E-01	3.231E-01	27.18	OK
	860.56	12.50	1.727E+00	5.793E-01	5.793E-01	75.89	OK
PB-212	74.82	10.28	3.808E+00	1.002E+00	1.002E+00	89.84	OK
	77.11	17.10	4.039E+00	1.906E+00	1.906E+00	25.78	OK
	238.63	43.60*	4.775E+00	1.064E+00	1.064E+00	12.85	OK
	300.09	3.30	3.993E+00	1.988E+00	1.988E+00	76.62	OK
BI-214	609.32	45.49*	2.255E+00	1.106E+00	1.106E+00	16.85	OK
	1120.29	14.92	1.406E+00	5.678E-01	5.680E-01	104.69	OK
	1764.49	15.30	9.591E-01	1.010E+00	1.011E+00	38.27	OK
PB-214	74.82	5.80	3.800E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	4.039E+00	3.359E+00	3.361E+00	25.78	OK
	87.09	3.41	4.892E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.727E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.051E+00	9.297E-01	9.300E-01	32.05	OK
	351.93	35.60*	3.512E+00	9.108E-01	9.111E-01	20.02	OK
RN-222	609.32	45.49*	2.255E+00	1.106E+00	1.106E+00	16.85	OK
	1120.29	14.92	1.406E+00	5.678E-01	5.680E-01	104.69	OK
	1764.49	15.30	9.591E-01	1.010E+00	1.011E+00	38.27	OK
RA-224	240.99	4.10*	4.734E+00	9.609E-01	9.609E-01	154.07	OK
RA-226	609.32	45.49*	2.255E+00	1.106E+00	1.106E+00	16.85	OK
	1120.29	14.92	1.406E+00	5.678E-01	5.680E-01	104.69	OK
	1764.49	15.30	9.591E-01	1.010E+00	1.011E+00	38.27	OK
AC-228	105.21	1.10	5.839E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.630E+00	1.288E+00	1.288E+00	35.17	OK
	794.95	4.25	1.836E+00	1.390E+00	1.390E+00	122.09	OK
	835.71	1.61	1.766E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.653E+00	1.047E+00	1.047E+00	28.16	OK
	968.97	15.80	1.576E+00	1.052E+00	1.052E+00	59.76	OK
RA-228	105.21	1.10	5.839E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.630E+00	1.288E+00	1.288E+00	35.17	OK
	794.95	4.25	1.836E+00	1.390E+00	1.390E+00	122.09	OK
	835.71	1.61	1.766E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.653E+00	1.047E+00	1.047E+00	28.16	OK
	968.97	15.80	1.576E+00	1.052E+00	1.052E+00	59.76	OK
TH-228	74.82	10.28	3.808E+00	1.002E+00	1.002E+00	89.84	OK
	77.11	17.10	4.039E+00	1.906E+00	1.906E+00	25.78	OK
	238.63	43.60*	4.775E+00	1.064E+00	1.064E+00	12.85	OK
	300.09	3.30	3.993E+00	1.988E+00	1.988E+00	76.62	OK
TH-230	609.32	45.49*	2.255E+00	1.106E+00	1.106E+00	16.85	OK
	1120.29	14.92	1.406E+00	5.678E-01	5.678E-01	104.69	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	1764.49	15.30	9.591E-01	1.010E+00	1.011E+00	38.27	OK
PA-231	283.69	1.70	4.183E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.993E+00	1.227E+00	1.227E+00	76.62	OK
TH-232	105.21	1.10	5.839E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.630E+00	1.288E+00	1.288E+00	35.17	OK
	835.71	1.61	1.766E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.653E+00	1.047E+00	1.047E+00	28.16	OK
	968.97	15.80	1.576E+00	1.052E+00	1.052E+00	59.76	OK
TH-234	63.29	3.70*	2.441E+00	3.492E+00	3.492E+00	89.42	OK
	92.59	4.23	5.266E+00	2.207E+00	2.207E+00	85.46	OK
U-234	609.32	45.49*	2.255E+00	1.106E+00	1.106E+00	16.85	OK
	1120.29	14.92	1.406E+00	5.678E-01	5.678E-01	104.69	OK
	1764.49	15.30	9.591E-01	1.010E+00	1.010E+00	38.27	OK
U-238	63.29	3.70*	2.441E+00	3.492E+00	3.492E+00	89.42	OK
	92.59	4.23	5.266E+00	2.207E+00	2.207E+00	85.46	OK
AM-243	43.53	5.90	2.461E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.808E+00	1.533E-01	1.533E-01	89.84	OK
ANH-511	511.00	100.00*	2.592E+00	7.630E-02	7.630E-02	94.30	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235049.CNF;1
* Acquisition date   : 3-OCT-2016 07:01:16 Sensitivity      : 3.000
* Detector ID       : GAM33 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.77 Half life ratio : *****
* Sample date       : 7-DEC-2015 13:33:00 Analyst initials: MXR1
* Sample ID        : G405235049 Sample Quantity : 1.4730E+02 GRAM
* Batch Number     : 1596252 Wet Weight : 0.00000
* Wet wt corr      : 1.00000 Dry Weight : 0.00000
* Nuclide Library  : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date    : 10-JUN-2016 07:00:49 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.307E+01	1.484E+00	5.034E-01
CO-58	7.582E-01	5.170E-01	7.993E-01
CD-109	3.343E+00	3.310E+00	2.225E+00
SN-126	2.128E-01	2.107E-01	1.425E-01
BA-137M	4.554E-01	8.590E-02	6.954E-02
CS-137	4.811E-01	9.075E-02	7.346E-02
TL-208	3.231E-01	8.606E-02	6.056E-02
PB-212	1.064E+00	1.340E-01	1.001E-01
BI-214	1.106E+00	1.826E-01	1.091E-01
PB-214	9.111E-01	1.788E-01	1.315E-01
RN-222	1.106E+00	1.826E-01	1.091E-01
RA-224	9.609E-01	1.451E+00	1.073E+00
RA-226	1.106E+00	1.826E-01	1.091E-01
AC-228	1.047E+00	2.889E-01	2.024E-01
RA-228	1.047E+00	2.889E-01	2.024E-01
TH-228	1.064E+00	1.340E-01	1.001E-01
TH-230	1.106E+00	1.826E-01	1.090E-01
PA-231	1.227E+00	9.209E-01	6.541E-01
TH-232	1.047E+00	2.889E-01	2.024E-01
TH-234	3.492E+00	3.061E+00	2.449E+00
U-234	1.106E+00	1.825E-01	1.090E-01
U-238	3.492E+00	3.061E+00	2.449E+00
AM-243	1.533E-01	1.350E-01	9.399E-02
ANH-511	7.630E-02	7.052E-02	5.863E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.221E+01	1.055E+01	1.738E+01	NOT IDENT.
NA-22	2.539E-02	4.514E-02	9.975E-02	NOT IDENT.
NA-24	0.000E+00	1.575E+41	0.000E+00	SHORT HLIF
AL-26	7.665E-03	2.004E-02	5.442E-02	NOT IDENT.
SC-46	-1.930E-01	3.950E-01	7.000E-01	FAIL ABUN
V-48	0.000E+00	1.631E+04	0.000E+00	SHORT HLIF

CR-51	0.000E+00	3.940E+02	0.000E+00	SHORT HLIF
MN-54	-4.259E-03	6.172E-02	1.173E-01	NOT IDENT.
CO-56	-3.144E-02	4.413E-01	8.455E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-7.400E-03	4.603E-02	8.555E-02	NOT IDENT.
FE-59	1.278E+00	5.854E+00	1.153E+01	FAIL ABUN
CO-60	6.073E-05	3.063E-02	5.900E-02	NOT IDENT.
ZN-65	-7.186E-02	1.911E-01	3.126E-01	NOT IDENT.
GE-68	-1.254E-01	2.033E+00	4.166E+00	NOT IDENT.
AS-73	2.037E+00	1.171E+01	2.348E+01	NOT IDENT.
AS-74	0.000E+00	6.171E+03	0.000E+00	SHORT HLIF
SE-75	-7.025E-02	2.272E-01	3.949E-01	NOT IDENT.
BR-77	0.000E+00	3.132E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	7.490E+02	0.000E+00	SHORT HLIF
RB-83	1.911E-01	6.309E-01	1.288E+00	NOT IDENT.
KR-85	5.945E+00	7.189E+00	1.421E+01	NOT IDENT.
SR-85	6.302E-01	7.663E-01	1.514E+00	NOT IDENT.
RB-86	0.000E+00	2.525E+04	0.000E+00	SHORT HLIF
Y-88	-1.244E-01	1.779E-01	2.891E-01	NOT IDENT.
Y-91	1.748E+02	5.545E+02	1.153E+03	NOT IDENT.
NB-94	-3.501E-02	3.117E-02	4.921E-02	NOT IDENT.
NB-95	5.625E-01	9.123E-01	1.882E+00	NOT IDENT.
NB-95M	1.092E-01	2.721E+00	4.528E+00	NOT IDENT.
ZR-95	3.557E-01	1.129E+00	2.392E+00	NOT IDENT.
NB-97	0.000E+00	1.601E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.929E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.782E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	1.786E-02	3.229E-02	6.345E-02	NOT IDENT.
RH-102	2.911E-04	5.074E-02	1.006E-01	FAIL ABUN
RU-103	2.516E+00	5.743E+00	1.184E+01	FAIL ABUN
RH-106	-2.765E-01	4.620E-01	8.209E-01	NOT IDENT.
RU-106	-2.765E-01	4.620E-01	8.209E-01	NOT IDENT.
AG-108M	4.062E-02	4.355E-02	6.170E-02	FAIL ABUN
AG-110M	2.267E-02	9.083E-02	1.856E-01	NOT IDENT.
SN-113	1.497E-01	2.129E-01	4.533E-01	NOT IDENT.
CD-115	0.000E+00	4.184E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.046E+05	0.000E+00	SHORT HLIF
TE-123M	3.333E-02	1.283E-01	2.434E-01	NOT IDENT.
SB-124	2.304E+00	1.989E+00	5.375E+00	NOT IDENT.
SB-125	1.073E-03	9.645E-02	1.834E-01	NOT IDENT.
TE-125M	1.209E+02	2.879E+02	5.587E+02	NOT IDENT.
I-126	0.000E+00	1.266E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.276E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	2.428E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	5.319E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	5.054E+26	0.000E+00	SHORT HLIF
BA-133	8.003E-03	4.236E-02	8.152E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	9.106E-02	1.090E-01	1.082E-01	FAIL ABUN
CS-135	-2.384E-03	1.586E-01	2.617E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.902E+05	0.000E+00	SHORT HLIF
CE-139	-2.357E-02	1.125E-01	2.036E-01	NOT IDENT.
BA-140	0.000E+00	1.265E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	2.844E+05	0.000E+00	SHORT HLIF
CE-141	-1.131E+01	2.447E+01	4.363E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	1.190E-01	3.591E-01	6.890E-01	NOT IDENT.
PM-144	1.731E-03	5.304E-02	1.031E-01	NOT IDENT.
PR-144	1.972E-01	4.617E+00	8.987E+00	NOT IDENT.
PM-146	-9.144E-03	4.275E-02	8.190E-02	NOT IDENT.
ND-147	0.000E+00	3.196E+07	0.000E+00	SHORT HLIF
PM-147	1.761E+02	7.686E+02	1.483E+03	NOT IDENT.
PM-149	0.000E+00	5.964E+40	0.000E+00	SHORT HLIF
EU-150	-7.554E-03	2.361E-02	4.062E-02	FAIL ABUN
EU-152	-1.926E-02	7.680E-02	1.499E-01	FAIL ABUN
GD-153	-5.941E-02	1.948E-01	3.301E-01	NOT IDENT.
EU-154	6.468E-02	1.111E-01	2.460E-01	NOT IDENT.
EU-155	-2.088E-02	1.098E-01	2.047E-01	FAIL ABUN
TB-160	1.574E+00	1.755E+00	3.931E+00	FAIL ABUN
HO-166M	-2.492E-02	5.337E-02	9.579E-02	FAIL ABUN
TM-171	-1.740E+01	2.827E+01	5.313E+01	NOT IDENT.
HF-172	-7.752E-02	2.060E-01	3.754E-01	FAIL ABUN
LU-172	-4.987E-02	8.386E-02	1.298E-01	FAIL ABUN
LU-176	1.997E-02	2.346E-02	4.998E-02	FAIL ABUN
HF-181	-9.543E-01	3.924E+00	7.531E+00	NOT IDENT.

TA-182	9.744E-03	9.093E-01	1.709E+00	FAIL ABUN
RE-183	-2.148E+00	3.507E+00	6.554E+00	NOT IDENT.
RE-184	1.519E+00	3.528E+01	6.697E+01	NOT IDENT.
W-188	3.457E+01	1.054E+02	2.084E+02	FAIL ABUN
IR-192	-3.428E-01	4.034E-01	7.359E-01	FAIL ABUN
HG-203	-4.527E-01	2.589E+00	4.554E+00	FAIL ABUN
BI-207	4.788E-02	7.142E-02	1.033E-01	FAIL ABUN
PB-210	2.201E+00	5.293E+00	1.093E+01	NOT IDENT.
BI-211	0.000E+00	4.925E-01	8.068E-01	FAIL ABUN
PB-211	-9.557E-02	6.164E-01	1.198E+00	NOT IDENT.
BI-212	0.000E+00	8.393E-01	1.354E+00	FAIL ABUN
RN-219	7.810E-02	3.837E-01	7.681E-01	FAIL ABUN
RA-223	-3.259E-02	5.823E-01	1.039E+00	FAIL ABUN
AC-227	6.674E-02	2.077E-01	3.940E-01	FAIL ABUN
TH-227	6.674E-02	2.077E-01	3.940E-01	FAIL ABUN
TH-229	-9.114E-03	4.860E-01	8.849E-01	FAIL ABUN
TH-231	-3.259E-02	5.823E-01	1.039E+00	FAIL ABUN
PA-233	-2.429E-02	4.963E-02	9.468E-02	FAIL ABUN
PA-234	1.804E-01	2.888E-01	6.058E-01	NOT IDENT.
PA-234M	-2.468E+00	4.834E+00	8.513E+00	NOT IDENT.
U-235	-8.013E-02	1.749E-01	3.193E-01	FAIL ABUN
NP-237	-2.429E-02	4.963E-02	9.468E-02	FAIL ABUN
NP-238	0.000E+00	1.228E+41	0.000E+00	SHORT HLIF
NP-239	-2.527E-01	2.467E-01	4.238E-01	FAIL ABUN
PU-239	8.011E+01	3.009E+02	5.759E+02	NOT IDENT.
AM-241	9.052E-02	1.635E-01	3.147E-01	NOT IDENT.
CM-243	-2.619E-03	9.952E-02	1.885E-01	FAIL ABUN
BK-247	-4.551E-02	7.741E-02	1.301E-01	NOT IDENT.
CM-247	1.137E-02	3.279E-02	6.713E-02	FAIL ABUN
CF-249	3.025E-02	3.318E-02	7.239E-02	NOT IDENT.
CF-251	7.615E-04	1.213E-01	2.223E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	310	10.66*	1.133E+00	1.307E+01	1.307E+01	11.59
CO-58	810.76	14	99.45*	1.810E+00	4.001E-02	7.582E-01	69.57
CD-109	88.03	107	3.70*	4.931E+00	2.985E+00	4.689E+00	71.45
SN-126	64.28	62	9.60	2.441E+00	1.346E+00	1.346E+00	89.42
	86.94	107	8.90	4.931E+00	1.241E+00	1.241E+00	71.45
	87.57	107	37.00*	4.931E+00	2.985E-01	2.985E-01	71.45
BA-137M	661.66	167	89.90*	2.115E+00	4.469E-01	4.554E-01	19.25
CS-137	661.66	167	85.10*	2.115E+00	4.721E-01	4.811E-01	19.25
TL-208	277.37	29	6.60	4.258E+00	5.203E-01	5.203E-01	109.91
	583.19	126	85.00*	2.334E+00	3.231E-01	3.231E-01	27.18
	860.56	25	12.50	1.727E+00	5.793E-01	5.793E-01	75.89
BI-211	72.87	41	1.23	3.629E+00	4.698E+00	4.698E+00	114.29
	351.06	223	12.92*	3.512E+00	2.510E+00	2.510E+00	20.02
PB-212	74.82	117	10.28	3.808E+00	1.527E+00	1.527E+00	57.94
	77.11	258	17.10	4.039E+00	1.906E+00	1.906E+00	25.78
	238.63	434	43.60*	4.775E+00	1.064E+00	1.064E+00	12.85
	300.09	51	3.30	3.993E+00	1.988E+00	1.988E+00	76.62
BI-214	609.32	223	45.49*	2.255E+00	1.106E+00	1.106E+00	16.85
	1120.29	23	14.92	1.406E+00	5.678E-01	5.680E-01	104.69
	1764.49	29	15.30	9.591E-01	1.010E+00	1.011E+00	38.27
PB-214	74.82	117	5.80	3.808E+00	2.706E+00	2.707E+00	57.94
	77.11	258	9.70	4.039E+00	3.359E+00	3.361E+00	25.78
	87.09	107	3.41	4.931E+00	3.238E+00	3.240E+00	71.45
	242.00	99	7.25	4.734E+00	1.473E+00	1.474E+00	53.11
	295.22	136	18.42	4.051E+00	9.297E-01	9.300E-01	32.05
	351.93	223	35.60*	3.512E+00	9.108E-01	9.111E-01	20.02
RN-222	609.32	223	45.49*	2.255E+00	1.106E+00	1.106E+00	16.85
	1120.29	23	14.92	1.406E+00	5.678E-01	5.680E-01	104.69
	1764.49	29	15.30	9.591E-01	1.010E+00	1.011E+00	38.27
RA-224	240.99	99	4.10*	4.734E+00	2.605E+00	2.605E+00	53.11
RA-226	609.32	223	45.49*	2.255E+00	1.106E+00	1.106E+00	16.85
	1120.29	23	14.92	1.406E+00	5.678E-01	5.680E-01	104.69
	1764.49	29	15.30	9.591E-01	1.010E+00	1.011E+00	38.27
AC-228	105.21	-----	1.10	5.839E+00	-----	Line Not Found	-----
	338.32	103	11.27	3.630E+00	1.288E+00	1.288E+00	35.17
	794.95	21	4.25	1.836E+00	1.390E+00	1.390E+00	122.09
	835.71	-----	1.61	1.766E+00	-----	Line Not Found	-----
	911.20	88	25.80*	1.653E+00	1.047E+00	1.047E+00	28.16
	968.97	51	15.80	1.576E+00	1.052E+00	1.052E+00	59.76
RA-228	105.21	-----	1.10	5.839E+00	-----	Line Not Found	-----
	338.32	103	11.27	3.630E+00	1.288E+00	1.288E+00	35.17
	794.95	21	4.25	1.836E+00	1.390E+00	1.390E+00	122.09
	835.71	-----	1.61	1.766E+00	-----	Line Not Found	-----
	911.20	88	25.80*	1.653E+00	1.047E+00	1.047E+00	28.16
	968.97	51	15.80	1.576E+00	1.052E+00	1.052E+00	59.76
TH-228	74.82	117	10.28	3.808E+00	1.527E+00	1.527E+00	57.94
	77.11	258	17.10	4.039E+00	1.906E+00	1.906E+00	25.78

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	238.63	434	43.60*	4.775E+00	1.064E+00	1.064E+00	12.85
	300.09	51	3.30	3.993E+00	1.988E+00	1.988E+00	76.62
TH-230	609.32	223	45.49*	2.255E+00	1.106E+00	1.106E+00	16.85
	1120.29	23	14.92	1.406E+00	5.678E-01	5.678E-01	104.69
	1764.49	29	15.30	9.591E-01	1.010E+00	1.011E+00	38.27
PA-231	283.69	-----	1.70	4.183E+00	-----	Line Not Found	-----
	301.36	51	5.35*	3.993E+00	1.227E+00	1.227E+00	76.62
TH-232	105.21	-----	1.10	5.839E+00	-----	Line Not Found	-----
	338.32	103	11.27	3.630E+00	1.288E+00	1.288E+00	35.17
	835.71	-----	1.61	1.766E+00	-----	Line Not Found	-----
	911.20	88	25.80*	1.653E+00	1.047E+00	1.047E+00	28.16
	968.97	51	15.80	1.576E+00	1.052E+00	1.052E+00	59.76
TH-234	63.29	62	3.70*	2.441E+00	3.492E+00	3.492E+00	89.42
	92.59	96	4.23	5.266E+00	2.207E+00	2.207E+00	85.46
U-234	609.32	223	45.49*	2.255E+00	1.106E+00	1.106E+00	16.85
	1120.29	23	14.92	1.406E+00	5.678E-01	5.678E-01	104.69
	1764.49	29	15.30	9.591E-01	1.010E+00	1.010E+00	38.27
U-238	63.29	62	3.70*	2.441E+00	3.492E+00	3.492E+00	89.42
	92.59	96	4.23	5.266E+00	2.207E+00	2.207E+00	85.46
AM-243	43.53	-----	5.90	2.461E-01	-----	Line Not Found	-----
	74.66	117	67.20*	3.808E+00	2.336E-01	2.336E-01	57.94
ANH-511	511.00	39	100.00*	2.592E+00	7.630E-02	7.630E-02	94.30

Flag: "*" = Keyline

Total number of lines in spectrum 49
 Number of unidentified lines 11
 Number of lines tentatively identified by NID 38 77.55%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.307E+01	1.307E+01	0.151E+01	11.59	
CO-58	70.86D	19.0	4.001E-02	7.582E-01	5.275E-01	69.57	
CD-109	461.40D	1.57	2.985E+00	4.689E+00	3.350E+00	71.45	
SN-126	2.30E+05Y	1.00	2.985E-01	2.985E-01	2.132E-01	71.45	
BA-137M	30.08Y	1.02	4.469E-01	4.554E-01	0.877E-01	19.25	
CS-137	30.08Y	1.02	4.721E-01	4.811E-01	0.926E-01	19.25	
TL-208	1.41E+10Y	1.00	3.231E-01	3.231E-01	0.878E-01	27.18	
BI-211	7.04E+08Y	1.00	2.510E+00	2.510E+00	0.503E+00	20.02	
PB-212	1.41E+10Y	1.00	1.064E+00	1.064E+00	0.137E+00	12.85	
BI-214	1600.00Y	1.00	1.106E+00	1.106E+00	0.186E+00	16.85	
PB-214	1600.00Y	1.00	9.108E-01	9.111E-01	1.824E-01	20.02	
RN-222	1600.00Y	1.00	1.106E+00	1.106E+00	0.186E+00	16.85	
RA-224	1.41E+10Y	1.00	2.605E+00	2.605E+00	1.384E+00	53.11	
RA-226	1600.00Y	1.00	1.106E+00	1.106E+00	0.186E+00	16.85	
AC-228	1.41E+10Y	1.00	1.047E+00	1.047E+00	0.295E+00	28.16	
RA-228	1.41E+10Y	1.00	1.047E+00	1.047E+00	0.295E+00	28.16	
TH-228	1.41E+10Y	1.00	1.064E+00	1.064E+00	0.137E+00	12.85	
TH-230	7.54E+04Y	1.00	1.106E+00	1.106E+00	0.186E+00	16.85	
PA-231	7.04E+08Y	1.00	1.227E+00	1.227E+00	0.940E+00	76.62	
TH-232	1.41E+10Y	1.00	1.047E+00	1.047E+00	0.295E+00	28.16	
TH-234	4.47E+09Y	1.00	3.492E+00	3.492E+00	3.123E+00	89.42	
U-234	2.45E+05Y	1.00	1.106E+00	1.106E+00	0.186E+00	16.85	
U-238	4.47E+09Y	1.00	3.492E+00	3.492E+00	3.123E+00	89.42	
AM-243	7370.00Y	1.00	2.336E-01	2.336E-01	1.353E-01	57.94	
ANH-511	1.00E+09Y	1.00	7.630E-02	7.630E-02	7.196E-02	94.30	
Total Activity :			4.297E+01	4.542E+01			

Grand Total Activity : 4.297E+01 4.542E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	185.77	36	189	1.16	371.33	367	10	8.61E-03	****	5.62E+00	T
0	207.99	37	182	0.62	415.73	410	13	8.90E-03	****	5.25E+00	
3	245.47	47	54	1.63	490.60	470	25	1.14E-02	74.5	4.68E+00	T
0	270.40	26	87	0.53	540.40	536	9	6.35E-03	****	4.34E+00	T
0	274.70	22	58	1.37	549.00	545	7	5.30E-03	****	4.29E+00	T
0	328.12	25	80	1.58	655.74	647	12	6.29E-03	****	3.72E+00	T
0	432.80	21	35	1.01	864.90	861	8	5.47E-03	****	2.96E+00	T
0	471.21	32	150	11.76	941.67	921	28	8.35E-03	****	2.77E+00	
0	576.91	16	16	0.59	1152.93	1149	7	4.14E-03	****	2.35E+00	
5	665.34	21	6	2.13	1329.71	1317	17	5.52E-03	84.4	2.11E+00	T
3	727.15	36	17	2.11	1453.29	1447	18	9.70E-03	61.1	1.97E+00	T
3	731.15	16	1	2.09	1461.28	1447	18	4.38E-03	66.3	1.96E+00	
0	743.62	21	18	3.75	1486.23	1477	18	5.65E-03	****	1.93E+00	
0	768.25	16	42	2.55	1535.47	1523	17	4.41E-03	****	1.88E+00	T
0	1015.67	7	8	1.41	2030.29	2026	8	1.94E-03	****	1.52E+00	
0	1021.36	10	2	1.90	2041.66	2039	6	2.86E-03	73.4	1.51E+00	T
0	1063.75	10	12	0.74	2126.45	2119	12	2.82E-03	****	1.47E+00	T
0	1097.44	9	12	0.49	2193.86	2184	12	2.54E-03	****	1.43E+00	
0	1216.62	14	11	2.12	2432.32	2427	9	3.86E-03	****	1.32E+00	
0	1267.42	7	6	0.88	2533.97	2528	8	2.04E-03	****	1.28E+00	
0	1290.36	10	13	0.61	2579.88	2571	14	2.73E-03	****	1.26E+00	T
0	1338.05	5	4	0.97	2675.30	2670	8	1.39E-03	****	1.22E+00	
0	1367.85	5	5	1.10	2734.94	2731	7	1.55E-03	****	1.20E+00	T
0	1589.47	9	3	0.60	3178.58	3175	7	2.64E-03	92.1	1.05E+00	

Flags: "T" = Tentatively associated

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235049.CNF;1
* Acquisition date   : 3-OCT-2016 07:01:16 Sensitivity      : 3.000
* Detector ID       : GAM33 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.77 Half life ratio : *****
* Sample date       : 7-DEC-2015 13:33:00 Nuclide Library : SOLID
* Sample ID         : G405235049 Analyst initials: MXR1
* Batch Number      : 1596252 Sample Quantity : 1.4730E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight      : 0.00000
*                   Dry Weight      : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 10-JUN-2016 07:00:49 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.943E-01
CO-58	3.255E-01
CD-109	1.050E+00
SN-126	6.725E-02
BA-137M	3.099E-02
CS-137	3.274E-02
TL-208	2.672E-02
PB-212	4.661E-02
BI-214	4.765E-02
PB-214	6.003E-02
RN-222	4.765E-02
RA-224	4.997E-01
RA-226	4.765E-02
AC-228	8.478E-02
RA-228	8.478E-02
TH-228	4.661E-02
TH-230	4.764E-02
PA-231	2.934E-01
TH-232	8.478E-02
TH-234	1.143E+00
U-234	4.764E-02
U-238	1.143E+00
AM-243	4.409E-02
ANH-511	2.658E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	7.438E+00	NOT IDENT.
NA-22	4.306E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.983E-02	NOT IDENT.
SC-46	2.999E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF

MN-54	5.093E-02	NOT IDENT.
CO-56	3.631E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.980E-02	NOT IDENT.
FE-59	4.828E+00	FAIL ABUN
CO-60	2.318E-02	NOT IDENT.
ZN-65	1.334E-01	NOT IDENT.
GE-68	1.761E+00	NOT IDENT.
AS-73	1.094E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.817E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.747E-01	NOT IDENT.
KR-85	6.435E+00	NOT IDENT.
SR-85	6.856E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	9.138E-02	NOT IDENT.
Y-91	5.053E+02	NOT IDENT.
NB-94	2.111E-02	NOT IDENT.
NB-95	8.443E-01	NOT IDENT.
NB-95M	2.108E+00	NOT IDENT.
ZR-95	1.020E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.968E-02	NOT IDENT.
RH-102	4.360E-02	FAIL ABUN
RU-103	5.325E+00	FAIL ABUN
RH-106	3.543E-01	NOT IDENT.
RU-106	3.543E-01	NOT IDENT.
AG-108M	2.819E-02	FAIL ABUN
AG-110M	7.966E-02	NOT IDENT.
SN-113	2.058E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.135E-01	NOT IDENT.
SB-124	2.223E+00	NOT IDENT.
SB-125	8.188E-02	NOT IDENT.
TE-125M	2.622E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.727E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	4.821E-02	FAIL ABUN
CS-135	1.206E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	9.485E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.033E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.226E-01	NOT IDENT.
PM-144	4.537E-02	NOT IDENT.
PR-144	3.956E+00	NOT IDENT.
PM-146	3.670E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	6.898E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.824E-02	FAIL ABUN
EU-152	6.713E-02	FAIL ABUN
GD-153	1.542E-01	NOT IDENT.
EU-154	1.063E-01	NOT IDENT.
EU-155	9.568E-02	FAIL ABUN
TB-160	1.721E+00	FAIL ABUN
HO-166M	4.138E-02	FAIL ABUN
TM-171	2.460E+01	NOT IDENT.
HF-172	1.736E-01	FAIL ABUN
LU-172	5.440E-02	FAIL ABUN
LU-176	2.305E-02	FAIL ABUN
HF-181	3.321E+00	NOT IDENT.
TA-182	7.333E-01	FAIL ABUN

RE-183	3.037E+00	NOT IDENT.
RE-184	2.950E+01	NOT IDENT.
W-188	9.555E+01	FAIL ABUN
IR-192	3.299E-01	FAIL ABUN
HG-203	2.095E+00	FAIL ABUN
BI-207	4.516E-02	FAIL ABUN
PB-210	5.083E+00	NOT IDENT.
BI-211	3.878E-01	FAIL ABUN
PB-211	5.388E-01	NOT IDENT.
BI-212	6.233E-01	FAIL ABUN
RN-219	3.498E-01	FAIL ABUN
RA-223	4.717E-01	FAIL ABUN
AC-227	1.803E-01	FAIL ABUN
TH-227	1.803E-01	FAIL ABUN
TH-229	4.126E-01	FAIL ABUN
TH-231	4.717E-01	FAIL ABUN
PA-233	4.254E-02	FAIL ABUN
PA-234	2.666E-01	NOT IDENT.
PA-234M	3.715E+00	NOT IDENT.
U-235	1.489E-01	FAIL ABUN
NP-237	4.254E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.968E-01	FAIL ABUN
PU-239	2.694E+02	NOT IDENT.
AM-241	1.469E-01	NOT IDENT.
CM-243	8.807E-02	FAIL ABUN
BK-247	5.962E-02	NOT IDENT.
CM-247	3.042E-02	FAIL ABUN
CF-249	3.286E-02	NOT IDENT.
CF-251	1.039E-01	NOT IDENT.

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235049.CNF;1
* Acquisition date   : 3-OCT-2016 07:01:16 Sensitivity      : 3.000
* Detector ID        : GAM33 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.77 Half life ratio  : *****
* Sample date        : 7-DEC-2015 13:33:00 Nuclide Library : SOLID
* Sample ID          : G405235049 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity : 1.4730E+02 GRAM
*                   : Quantity Err(%) : 1.3577E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight      : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 10-JUN-2016 07:00:49 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.307E+01	1.632E+00	1.632E+00
CO-58	7.582E-01	5.180E-01	5.180E-01
CD-109	3.343E+00	3.326E+00	3.326E+00
SN-126	2.128E-01	2.114E-01	2.114E-01
BA-137M	4.554E-01	8.810E-02	8.810E-02
CS-137	4.811E-01	9.306E-02	9.306E-02
TL-208	3.231E-01	8.714E-02	8.714E-02
PB-212	1.064E+00	1.452E-01	1.452E-01
BI-214	1.106E+00	1.887E-01	1.887E-01
PB-214	9.111E-01	1.827E-01	1.827E-01
RN-222	1.106E+00	1.887E-01	1.887E-01
RA-224	9.609E-01	1.456E+00	1.456E+00
RA-226	1.106E+00	1.887E-01	1.887E-01
AC-228	1.047E+00	2.938E-01	2.938E-01
RA-228	1.047E+00	2.938E-01	2.938E-01
TH-228	1.064E+00	1.452E-01	1.452E-01
TH-230	1.106E+00	1.886E-01	1.886E-01
PA-231	1.227E+00	9.574E-01	9.574E-01
TH-232	1.047E+00	2.938E-01	2.938E-01
TH-234	3.492E+00	3.157E+00	3.157E+00
U-234	1.106E+00	1.886E-01	1.886E-01
U-238	3.492E+00	3.157E+00	3.157E+00
AM-243	1.533E-01	1.357E-01	1.357E-01
ANH-511	7.630E-02	7.058E-02	7.058E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.221E+01	1.056E+01	1.191E+01	NOT IDENT.
NA-22	2.539E-02	4.515E-02	4.658E-02	NOT IDENT.
NA-24	1.000E+41	1.635E+41	0.000E+00	SHORT HLIF
AL-26	7.665E-03	2.004E-02	2.034E-02	NOT IDENT.
SC-46	-1.930E-01	3.950E-01	4.045E-01	FAIL ABUN
V-48	1.153E+04	1.632E+04	1.713E+04	SHORT HLIF

CR-51	2.755E+02	3.941E+02	4.133E+02	SHORT HLIF
MN-54	-4.259E-03	6.172E-02	6.175E-02	NOT IDENT.
CO-56	-3.144E-02	4.413E-01	4.415E-01	NOT IDENT.
MN-56	-1.000E+41	1.329E+42	0.000E+00	SHORT HLIF
CO-57	-7.400E-03	4.604E-02	4.616E-02	NOT IDENT.
FE-59	1.278E+00	5.854E+00	5.883E+00	FAIL ABUN
CO-60	6.073E-05	3.063E-02	3.063E-02	NOT IDENT.
ZN-65	-7.186E-02	1.911E-01	1.938E-01	NOT IDENT.
GE-68	-1.254E-01	2.033E+00	2.034E+00	NOT IDENT.
AS-73	2.037E+00	1.172E+01	1.176E+01	NOT IDENT.
AS-74	2.445E+03	6.174E+03	6.271E+03	SHORT HLIF
SE-75	-7.025E-02	2.273E-01	2.294E-01	NOT IDENT.
BR-77	2.487E+38	2.159E+39	0.000E+00	SHORT HLIF
SR-82	-8.216E+01	7.490E+02	7.499E+02	SHORT HLIF
RB-83	1.911E-01	6.315E-01	6.373E-01	NOT IDENT.
KR-85	5.945E+00	7.193E+00	7.676E+00	NOT IDENT.
SR-85	6.302E-01	7.667E-01	8.177E-01	NOT IDENT.
RB-86	-1.557E+03	2.525E+04	2.526E+04	SHORT HLIF
Y-88	-1.244E-01	1.781E-01	1.867E-01	NOT IDENT.
Y-91	1.748E+02	5.546E+02	5.601E+02	NOT IDENT.
NB-94	-3.501E-02	3.121E-02	3.497E-02	NOT IDENT.
NB-95	5.625E-01	9.126E-01	9.472E-01	NOT IDENT.
NB-95M	1.092E-01	2.721E+00	2.722E+00	NOT IDENT.
ZR-95	3.557E-01	1.129E+00	1.140E+00	NOT IDENT.
NB-97	1.000E+41	1.601E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.929E+41	0.000E+00	SHORT HLIF
MO-99	-1.303E+32	1.785E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.025E+42	0.000E+00	SHORT HLIF
RH-101	1.786E-02	3.245E-02	3.343E-02	NOT IDENT.
RH-102	2.911E-04	5.074E-02	5.074E-02	FAIL ABUN
RU-103	2.516E+00	5.744E+00	5.855E+00	FAIL ABUN
RH-106	-2.765E-01	4.623E-01	4.788E-01	NOT IDENT.
RU-106	-2.765E-01	4.623E-01	4.788E-01	NOT IDENT.
AG-108M	4.062E-02	4.358E-02	4.727E-02	FAIL ABUN
AG-110M	2.267E-02	9.083E-02	9.141E-02	NOT IDENT.
SN-113	1.497E-01	2.130E-01	2.234E-01	NOT IDENT.
CD-115	-1.335E+39	4.191E+39	0.000E+00	SHORT HLIF
SN-117M	-8.136E+04	1.050E+05	1.113E+05	SHORT HLIF
TE-123M	3.333E-02	1.283E-01	1.292E-01	NOT IDENT.
SB-124	2.304E+00	1.993E+00	2.247E+00	NOT IDENT.
SB-125	1.073E-03	9.645E-02	9.646E-02	NOT IDENT.
TE-125M	1.209E+02	2.880E+02	2.931E+02	NOT IDENT.
I-126	1.530E+06	1.283E+06	1.457E+06	SHORT HLIF
SB-126	-2.492E+05	1.277E+06	1.282E+06	SHORT HLIF
SB-127	8.943E+21	2.723E+22	0.000E+00	SHORT HLIF
I-131	-1.745E+09	5.320E+09	5.377E+09	SHORT HLIF
I-132	-1.000E+41	1.906E+42	0.000E+00	SHORT HLIF
TE-132	-3.481E+26	5.249E+26	0.000E+00	SHORT HLIF
BA-133	8.003E-03	4.237E-02	4.252E-02	FAIL ABUN
I-133	1.000E+41	5.820E+42	0.000E+00	SHORT HLIF
CS-134	9.106E-02	1.090E-01	1.165E-01	FAIL ABUN
CS-135	-2.384E-03	1.586E-01	1.586E-01	NOT IDENT.
I-135	-1.000E+41	7.400E+41	0.000E+00	SHORT HLIF
CS-136	1.383E+05	2.906E+05	2.972E+05	SHORT HLIF
CE-139	-2.357E-02	1.126E-01	1.131E-01	NOT IDENT.
BA-140	-1.282E+05	1.265E+06	1.267E+06	SHORT HLIF
LA-140	-5.470E+04	2.844E+05	2.855E+05	SHORT HLIF
CE-141	-1.131E+01	2.447E+01	2.500E+01	NOT IDENT.
CE-143	1.000E+41	1.787E+42	0.000E+00	SHORT HLIF
CE-144	1.190E-01	3.591E-01	3.631E-01	NOT IDENT.
PM-144	1.731E-03	5.304E-02	5.305E-02	NOT IDENT.
PR-144	1.972E-01	4.617E+00	4.618E+00	NOT IDENT.
PM-146	-9.144E-03	4.276E-02	4.296E-02	NOT IDENT.
ND-147	9.035E+06	3.196E+07	3.222E+07	SHORT HLIF
PM-147	1.761E+02	7.686E+02	7.727E+02	NOT IDENT.
PM-149	8.219E+39	5.966E+40	0.000E+00	SHORT HLIF
EU-150	-7.554E-03	2.361E-02	2.386E-02	FAIL ABUN
EU-152	-1.926E-02	7.680E-02	7.729E-02	FAIL ABUN
GD-153	-5.941E-02	1.948E-01	1.967E-01	NOT IDENT.
EU-154	6.468E-02	1.112E-01	1.149E-01	NOT IDENT.
EU-155	-2.088E-02	1.098E-01	1.102E-01	FAIL ABUN
TB-160	1.574E+00	1.757E+00	1.895E+00	FAIL ABUN
HO-166M	-2.492E-02	5.338E-02	5.455E-02	FAIL ABUN
TM-171	-1.740E+01	2.831E+01	2.938E+01	NOT IDENT.
HF-172	-7.752E-02	2.063E-01	2.093E-01	FAIL ABUN
LU-172	-4.987E-02	8.401E-02	8.697E-02	FAIL ABUN
LU-176	1.997E-02	2.348E-02	2.515E-02	FAIL ABUN
HF-181	-9.543E-01	3.925E+00	3.948E+00	NOT IDENT.

TA-182	9.744E-03	9.093E-01	9.093E-01	FAIL ABUN
RE-183	-2.148E+00	3.523E+00	3.654E+00	NOT IDENT.
RE-184	1.519E+00	3.528E+01	3.529E+01	NOT IDENT.
W-188	3.457E+01	1.055E+02	1.067E+02	FAIL ABUN
IR-192	-3.428E-01	4.036E-01	4.322E-01	FAIL ABUN
HG-203	-4.527E-01	2.589E+00	2.597E+00	FAIL ABUN
BI-207	4.788E-02	7.144E-02	7.463E-02	FAIL ABUN
PB-210	2.201E+00	5.297E+00	5.389E+00	NOT IDENT.
BI-211	2.510E+00	5.050E-01	1.239E+00	FAIL ABUN
PB-211	-9.557E-02	6.164E-01	6.180E-01	NOT IDENT.
BI-212	1.401E+00	8.423E-01	1.053E+00	FAIL ABUN
RN-219	7.810E-02	3.838E-01	3.855E-01	FAIL ABUN
RA-223	-3.259E-02	5.823E-01	5.825E-01	FAIL ABUN
AC-227	6.674E-02	2.079E-01	2.101E-01	FAIL ABUN
TH-227	6.674E-02	2.079E-01	2.101E-01	FAIL ABUN
TH-229	-9.114E-03	4.860E-01	4.860E-01	FAIL ABUN
TH-231	-3.259E-02	5.823E-01	5.825E-01	FAIL ABUN
PA-233	-2.429E-02	4.965E-02	5.084E-02	FAIL ABUN
PA-234	1.804E-01	3.549E-01	3.641E-01	NOT IDENT.
PA-234M	-2.468E+00	4.836E+00	4.962E+00	NOT IDENT.
U-235	-8.013E-02	1.750E-01	1.787E-01	FAIL ABUN
NP-237	-2.429E-02	4.965E-02	5.084E-02	FAIL ABUN
NP-238	1.000E+41	1.229E+41	0.000E+00	SHORT HLIF
NP-239	-2.527E-01	2.476E-01	2.726E-01	FAIL ABUN
PU-239	8.011E+01	3.009E+02	3.031E+02	NOT IDENT.
AM-241	9.052E-02	1.637E-01	1.687E-01	NOT IDENT.
CM-243	-2.619E-03	9.952E-02	9.953E-02	FAIL ABUN
BK-247	-4.551E-02	7.795E-02	8.061E-02	NOT IDENT.
CM-247	1.137E-02	3.284E-02	3.324E-02	FAIL ABUN
CF-249	3.025E-02	3.327E-02	3.596E-02	NOT IDENT.
CF-251	7.615E-04	1.213E-01	1.213E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	52.3810	87.09	92.6644	136.47	71.2733
45.60	55.4770	87.57	92.7384	140.51	0.0000
46.54	50.8940	88.03	92.8090	143.76	59.7382
49.72	0.0000	88.34	92.8563	144.24	70.8418
51.35	61.0164	88.47	92.8761	145.44	73.1593
51.87	58.2263	89.96	82.1497	152.43	68.1708
52.39	64.9855	1093.63	82.2400	153.25	0.0000
52.97	56.4592	91.11	0.0000	323.87	71.6689
53.44	58.4355	92.59	82.4988	156.02	0.0000
54.07	59.4776	93.35	82.5983	158.56	0.0000
57.36	0.0000	94.56	82.7570	159.00	57.4209
57.53	69.5998	94.65	82.7686	162.33	77.9745
57.98	66.7643	94.67	82.7710	162.66	0.0000
59.27	53.0413	94.87	82.7972	163.33	46.3834
59.32	53.0470	97.43	72.0443	165.86	66.9314
59.54	53.0716	98.43	63.8298	176.31	65.3844
60.96	63.6164	98.44	63.8307	176.60	0.0000
61.17	66.2421	99.53	80.2692	177.52	67.7632
62.93	65.5051	100.11	78.2530	181.07	0.0000
63.29	65.5533	102.03	79.5266	181.52	70.7332
63.58	65.5919	103.18	79.6628	184.41	78.6520
64.28	66.6651	103.37	68.1520	143.76	66.0158
66.73	73.5592	105.21	59.9271	193.51	64.1930
67.24	71.0030	105.31	72.5539	197.03	60.8986
125.81	71.0640	106.12	68.4290	198.01	72.6790
67.75	74.0353	106.47	68.4639	201.83	72.9438
69.67	83.2284	109.28	63.4547	203.43	56.5583
70.83	75.4683	111.00	72.0918	205.31	64.5280
72.81	76.7462	111.76	0.0000	210.85	49.0404
72.87	76.7550	114.06	69.2083	215.65	50.0506
74.66	77.0088	116.30	0.0000	222.11	70.7170
74.82	77.0317	116.74	81.2214	227.09	56.5813
74.97	77.0529	119.76	57.9473	227.38	63.8206
77.11	77.3525	121.12	61.2787	228.16	0.0000
78.74	77.5775	121.22	54.8357	228.18	63.8651
79.69	77.7079	121.78	60.2567	116.74	63.8651
80.12	76.7567	122.06	63.5085	235.69	59.8326
80.19	0.0000	122.92	45.2611	235.96	59.8465
80.57	76.8170	123.07	45.2700	238.63	60.7925
81.00	66.0850	265.00	48.5427	238.98	0.0000
81.07	66.0930	125.81	58.4149	240.99	60.9131
81.75	95.8808	127.23	57.4388	242.00	60.9650
83.79	81.3104	127.91	60.7435	244.70	61.1015
84.00	81.3391	129.30	64.1117	252.40	0.0000
85.43	97.8435	131.20	72.9827	252.80	33.2148
86.55	92.5814	133.02	68.7832	254.15	0.0000
86.79	92.6180	133.52	64.4565	256.23	33.3067
86.94	92.6416	136.00	70.1357	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	50.9159	355.39	0.0000	584.27	18.9026
264.80	52.1642	356.01	34.9602	595.83	0.0000
265.00	52.1719	364.49	0.0000	427.87	19.0379
268.22	46.4912	366.42	0.0000	602.52	0.0000
269.46	44.8748	372.51	33.8948	604.72	15.0562
270.03	44.8945	375.05	27.6939	607.14	19.5936
271.23	44.9363	377.52	32.2090	609.32	16.0918
273.65	0.0000	356.01	30.5365	610.33	16.0983
276.40	30.0762	388.16	19.8099	614.28	22.6767
277.37	41.3849	388.63	0.0000	618.01	18.1699
277.60	41.3920	391.69	22.5586	620.36	22.2292
278.00	41.4051	264.66	29.0273	621.93	20.2222
279.20	47.7215	401.81	31.7693	630.19	0.0000
279.54	47.7343	402.40	26.3326	631.29	14.2108
279.70	42.7148	404.85	29.0977	633.25	16.2539
280.46	45.2527	410.95	31.0249	634.78	0.0000
283.69	42.8424	413.71	39.2986	635.95	19.3232
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	44.5797	423.72	0.0000	645.85	10.2112
285.90	0.0000	427.09	18.4163	657.76	16.9297
287.50	41.2790	427.87	23.2148	657.90	0.0000
290.67	35.4648	433.94	19.4106	661.66	22.6087
293.27	0.0000	439.40	27.8119	664.57	0.0000
351.93	44.4785	453.88	28.0292	666.33	0.0000
295.96	44.5020	463.37	27.2306	666.50	0.0000
879.38	45.8602	468.07	27.2972	667.71	0.0000
299.98	25.5035	473.00	0.0000	677.62	18.6152
300.09	25.5060	475.06	11.3362	685.70	0.0000
300.13	25.5066	476.78	25.5289	695.00	0.0000
301.36	25.5292	477.60	25.5399	696.49	17.7104
302.85	37.0562	482.18	21.8068	696.51	17.7104
256.23	39.6582	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	13.5475
306.78	32.4614	497.08	21.0153	697.49	14.5907
308.46	37.6317	505.52	26.4747	702.65	26.1058
311.90	33.4355	507.63	0.0000	706.68	16.7337
316.51	37.8429	511.00	31.7391	711.68	18.8606
319.41	0.0000	514.00	18.7819	720.70	0.0000
320.08	0.0000	514.00	18.7819	721.93	0.0000
321.04	37.2709	520.40	19.3229	722.78	17.3614
323.87	33.7124	520.69	0.0000	722.91	12.6270
325.23	35.4738	522.65	0.0000	723.31	12.6289
328.76	0.0000	527.90	0.0000	724.19	15.7916
333.37	28.7085	528.26	24.2452	727.33	13.7019
333.97	31.3308	529.59	21.3492	733.00	11.0900
334.37	32.6447	529.87	0.0000	735.93	6.3440
338.28	24.4379	531.02	0.0000	333.97	12.6953
338.32	24.4385	537.26	0.0000	739.50	0.0000
311.90	31.4656	546.56	0.0000	747.24	12.7407
340.48	31.4656	552.55	16.6742	748.06	7.9654
340.55	0.0000	563.25	17.7407	752.31	13.8278
344.28	28.0391	569.33	13.8365	753.82	0.0000
345.93	35.0863	946.00	13.8376	756.73	8.5231
351.06	36.9619	569.70	14.8273	756.80	8.5234
351.93	36.9824	583.19	18.8941	884.68	16.0223

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	16.0333	1274.44	18.4173	1620.50	4.0042
766.42	16.0364	1001.03	18.4427	1621.92	5.0064
766.84	16.0388	1002.74	16.1453	1678.03	0.0000
772.60	0.0000	1004.73	9.2311	1690.97	1.0148
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	5.1437
778.90	12.8862	1028.54	0.0000	1063.66	8.2388
783.70	0.0000	1037.84	6.9893	1771.35	4.1201
785.37	14.2071	1038.76	0.0000	1791.20	0.0000
792.07	19.4187	631.29	10.5095	1808.65	1.0370
794.95	17.8179	1048.07	0.0000	1810.72	0.0000
795.86	9.7222	1049.04	9.6404	1836.06	4.1685
810.06	11.3981	1050.41	14.9041		
810.29	13.0273	1063.66	7.9195		
344.28	13.0278	1077.00	0.0000		
810.76	6.5146	1077.34	10.5989		
815.77	0.0000	1085.87	9.7385		
1048.07	0.0000	1093.63	15.6138		
832.01	15.3108	1099.45	7.1084		
834.85	15.3250	1112.07	9.8069		
835.71	10.9497	1112.84	11.5924		
836.80	0.0000	1115.54	15.7062		
846.75	0.0000	1120.29	12.5089		
846.77	13.1880	1120.55	12.5098		
856.80	0.0000	1221.41	12.5123		
860.56	6.6239	1129.67	2.6873		
871.09	12.1852	1131.51	0.0000		
873.19	7.7596	1147.95	0.0000		
875.33	0.0000	1173.23	17.2118		
879.38	7.7750	1177.95	18.1396		
880.51	12.2224	1189.05	20.0100		
883.24	13.3452	1204.77	13.6972		
884.68	10.0133	1221.41	12.2257		
889.28	15.5996	1231.02	11.0295		
894.76	13.3940	1235.36	0.0000		
898.04	10.0562	1238.28	16.5740		
900.72	10.0646	1260.41	0.0000		
903.28	17.9069	1271.87	12.7307		
911.20	8.9756	1274.44	8.3595		
912.08	8.9782	1274.54	8.3595		
923.98	0.0000	1291.59	11.9375		
926.50	18.0365	1298.22	0.0000		
929.11	16.9232	1312.11	0.0000		
937.49	20.3599	1332.49	4.5196		
944.13	0.0000	1362.66	0.0000		
946.00	11.3403	1365.19	7.5889		
949.00	19.2959	1368.63	0.0000		
667.71	0.0000	1384.29	6.6689		
962.31	13.6753	1408.01	6.7043		
964.08	20.5239	1457.56	0.0000		
966.17	22.2477	1460.82	3.8752		
911.20	23.9788	1489.16	2.9238		
968.97	23.9788	1505.03	6.8453		
983.53	0.0000	1584.12	5.3005		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235050.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM36.CNF;52
Background date  : 2-OCT-2016 11:02:08.
Sample date     : 7-DEC-2015 13:42:00. Acquisition date : 3-OCT-2016 07:01:40.
Sample ID      : G405235050 Sample quantity   : 1.71604E+02 GRAM
Detector name   : GAM36 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.33 0.0%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity    : 3.00000
Batch ID       : 1596252 Detector SN#     :
Matrix Spike ID : LCS ID                : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.21*	18	81	1.02	92.38	90	8	4.90E-03	93.3	
2	0	63.24*	37	126	1.19	126.44	122	9	1.03E-02	57.9	
3	2	74.87*	100	73	0.87	149.72	144	21	2.79E-02	16.4	1.39E+00
4	2	77.13*	135	66	0.92	154.22	144	21	3.74E-02	12.8	
5	2	80.83	18	69	1.05	161.63	144	21	4.90E-03	84.7	
6	0	87.28	79	98	1.29	174.52	171	7	2.19E-02	23.7	
7	2	89.70	36	25	0.97	179.37	178	14	1.01E-02	19.8	2.77E+00
8	2	92.70*	61	83	1.08	185.37	178	14	1.68E-02	28.7	
9	0	186.15*	63	71	1.24	372.29	368	10	1.75E-02	29.5	
10	0	227.19	25	51	1.71	454.36	451	8	7.05E-03	52.8	
11	0	238.61*	226	101	1.06	477.20	471	10	6.27E-02	10.9	
12	0	262.50	28	99	6.92	524.99	513	19	7.87E-03	86.6	
13	0	270.55	23	30	1.43	541.09	538	6	6.30E-03	43.7	
14	0	295.36*	59	54	0.97	590.71	586	10	1.64E-02	26.8	
15	0	303.06	39	99	7.57	606.11	596	20	1.08E-02	66.2	
16	0	327.54*	33	35	0.88	655.06	650	10	9.10E-03	38.7	
17	0	338.76	34	40	0.84	677.51	673	10	9.51E-03	37.8	
18	9	350.03	10	6	1.76	700.05	699	12	2.73E-03	47.6	7.59E+00
19	9	351.88*	158	28	1.35	703.75	699	12	4.39E-02	9.9	
20	0	426.49	25	24	6.53	852.94	845	16	6.94E-03	48.2	
21	0	511.05*	20	27	2.74	1022.06	1016	11	5.45E-03	69.2	
22	2	583.18*	61	14	1.72	1166.29	1158	22	1.68E-02	19.1	9.52E-01
23	2	587.54	12	17	1.43	1175.00	1158	22	3.41E-03	62.2	
24	0	601.50	12	27	4.23	1202.92	1192	17	3.25E-03	110.0	
25	0	609.43*	98	14	1.40	1218.78	1212	14	2.73E-02	13.4	
26	0	635.18	5	13	0.51	1270.27	1265	8	1.45E-03	124.1	
27	0	662.20	16	14	1.29	1324.30	1320	9	4.55E-03	47.5	
28	0	700.74	8	14	0.96	1401.36	1395	10	2.17E-03	98.7	
29	0	727.85	18	8	1.27	1455.57	1451	9	4.89E-03	38.6	
30	0	763.74	9	14	4.41	1527.33	1519	14	2.50E-03	94.3	
31	0	768.42	15	3	1.48	1536.69	1533	7	4.09E-03	33.4	
32	0	794.70	31	7	0.66	1589.24	1581	15	8.51E-03	26.5	
33	0	897.43	7	8	0.68	1794.64	1789	9	1.86E-03	88.6	
34	0	910.82*	60	7	2.02	1821.41	1813	14	1.66E-02	16.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	955.36	13	0	1.50	1910.46	1905	10	3.61E-03	27.7	
36	0	965.48	13	8	1.11	1930.69	1925	10	3.47E-03	49.8	
37	0	969.05	35	2	1.95	1937.84	1934	9	9.76E-03	18.5	
38	0	1019.06	16	0	4.53	2037.81	2031	13	4.44E-03	25.0	
39	0	1120.22*	16	10	0.83	2240.05	2235	10	4.58E-03	44.4	
40	0	1239.25	8	11	1.27	2478.00	2471	11	2.22E-03	87.7	
41	0	1305.01	8	5	0.96	2609.47	2605	9	2.08E-03	62.7	
42	0	1461.06*	205	0	2.09	2921.39	2915	13	5.69E-02	7.1	
43	0	1764.65*	9	5	0.71	3528.17	3522	11	2.43E-03	66.3	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235050.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 7-DEC-2015 13:42:00   Acquisition date  : 3-OCT-2016 07:01:40
Sample ID        : G405235050             Sample quantity  : 171.60 GRAM
Sample type       : SOLID                  Sample geometry  :
Detector name    : GAMMA36                Detector geometry: CAN
Elapsed live time: 0 01:00:00.00          Elapsed real time: 0 01:00:00.33   0.0%
Energy tolerance : 1.50 keV               Half life ratio  : 10.00
Errors propagated: No                      Systematic Error : 0.00 %
Efficiency type  : Linear                  Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	6.546E-01	1.255E+01	1.255E+01	14.12	OK
CD-109	88.03	3.70*	4.297E+00	2.459E+00	3.863E+00	59.22	OK
SB-125	176.31	6.89	4.460E+00	-----	Line Not Found	-----	Absent
	321.04	0.42	2.640E+00	-----	Line Not Found	-----	Absent
	427.87	29.80*	2.005E+00	2.114E-01	2.599E-01	96.33	OK
	463.37	10.56	1.852E+00	-----	Line Not Found	-----	Absent
	600.60	17.77	1.455E+00	2.187E-01	2.689E-01	220.01	OK
	635.95	11.29	1.385E+00	1.604E-01	1.972E-01	248.20	OK
SN-126	64.28	9.60	2.468E+00	9.790E-01	9.790E-01	115.79	OK
	86.94	8.90	4.297E+00	1.022E+00	1.022E+00	59.22	OK
	87.57	37.00*	4.297E+00	2.459E-01	2.459E-01	59.22	OK
BA-137M	661.66	89.90*	1.334E+00	6.517E-02	6.642E-02	94.95	OK
CS-137	661.66	85.10*	1.334E+00	6.884E-02	7.016E-02	94.95	OK
TL-208	277.37	6.60	3.041E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	1.496E+00	2.315E-01	2.315E-01	38.11	OK
	860.56	12.50	1.058E+00	-----	Line Not Found	-----	Absent
PB-210	46.54	4.25*	8.252E-01	3.242E+00	3.326E+00	186.69	OK
BI-211	72.87	1.23	3.327E+00	-----	Line Not Found	-----	Absent
	351.06	12.92*	2.415E+00	9.855E-01	9.855E-01	103.12	OK
PB-212	74.82	10.28	3.486E+00	1.385E+00	1.385E+00	42.80	OK
	77.11	17.10	3.657E+00	1.319E+00	1.319E+00	25.66	OK
	238.63	43.60*	3.500E+00	8.007E-01	8.007E-01	21.88	OK
	300.09	3.30	2.819E+00	-----	Line Not Found	-----	Absent
BI-214	609.32	45.49*	1.437E+00	7.244E-01	7.246E-01	26.85	OK
	1120.29	14.92	8.373E-01	5.866E-01	5.868E-01	88.76	OK
	1764.49	15.30	5.418E-01	4.384E-01	4.386E-01	132.56	OK
PB-214	74.82	5.80	3.482E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	3.657E+00	2.325E+00	2.326E+00	25.66	OK
	87.09	3.41	4.287E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	3.455E+00	-----	Line Not Found	-----	Absent
	295.22	18.42	2.863E+00	5.924E-01	5.926E-01	53.64	OK
	351.93	35.60*	2.414E+00	-----	Line Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	1.437E+00	7.244E-01	7.246E-01	26.85	OK
	1120.29	14.92	8.373E-01	5.866E-01	5.868E-01	88.76	OK
	1764.49	15.30	5.418E-01	4.384E-01	4.386E-01	132.56	OK
RA-226	609.32	45.49*	1.437E+00	7.244E-01	7.246E-01	26.85	OK
	1120.29	14.92	8.373E-01	5.866E-01	5.868E-01	88.76	OK
	1764.49	15.30	5.418E-01	4.384E-01	4.386E-01	132.56	OK
AC-228	105.21	1.10	4.933E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	2.506E+00	6.299E-01	6.299E-01	75.66	OK
	794.95	4.25	1.134E+00	2.961E+00	2.961E+00	53.09	OK
	835.71	1.61	1.085E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.006E+00	1.053E+00	1.053E+00	32.94	OK
	968.97	15.80	9.525E-01	1.059E+00	1.059E+00	36.92	OK
RA-228	105.21	1.10	4.933E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	2.506E+00	6.299E-01	6.299E-01	75.66	OK
	794.95	4.25	1.134E+00	2.961E+00	2.961E+00	53.09	OK
	835.71	1.61	1.085E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.006E+00	1.053E+00	1.053E+00	32.94	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	968.97	15.80	9.525E-01	1.059E+00	1.059E+00	36.92	OK
	74.82	10.28	3.486E+00	1.385E+00	1.385E+00	42.80	OK
	77.11	17.10	3.657E+00	1.319E+00	1.319E+00	25.66	OK
	238.63	43.60*	3.500E+00	8.007E-01	8.007E-01	21.88	OK
TH-230	300.09	3.30	2.819E+00	----- Line	Not Found	-----	Absent
	609.32	45.49*	1.437E+00	7.244E-01	7.244E-01	26.85	OK
	1120.29	14.92	8.373E-01	5.866E-01	5.866E-01	88.76	OK
	1764.49	15.30	5.418E-01	4.384E-01	4.384E-01	132.56	OK
TH-232	105.21	1.10	4.933E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.506E+00	6.299E-01	6.299E-01	75.66	OK
	835.71	1.61	1.085E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.006E+00	1.053E+00	1.053E+00	32.94	OK
TH-234	968.97	15.80	9.525E-01	1.059E+00	1.059E+00	36.92	OK
	63.29	3.70*	2.468E+00	2.540E+00	2.540E+00	115.79	OK
	92.59	4.23	4.552E+00	1.892E+00	1.892E+00	57.46	OK
U-234	609.32	45.49*	1.437E+00	7.244E-01	7.244E-01	26.85	OK
	1120.29	14.92	8.373E-01	5.866E-01	5.866E-01	88.76	OK
	1764.49	15.30	5.418E-01	4.384E-01	4.384E-01	132.56	OK
U-235	89.96	3.47	4.418E+00	1.428E+00	1.428E+00	39.64	OK
	93.35	5.60	4.552E+00	1.429E+00	1.429E+00	57.46	OK
	143.76	10.96*	4.954E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	4.674E+00	----- Line	Not Found	-----	Absent
U-238	185.72	57.20	4.296E+00	1.429E-01	1.429E-01	59.00	OK
	205.31	5.01	3.984E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	2.468E+00	2.540E+00	2.540E+00	115.79	OK
AM-243	92.59	4.23	4.552E+00	1.892E+00	1.892E+00	57.46	OK
	43.53	5.90	5.957E-01	----- Line	Not Found	-----	Absent
ANH-511	74.66	67.20*	3.486E+00	2.119E-01	2.120E-01	42.80	OK
	511.00	100.00*	1.690E+00	5.738E-02	5.738E-02	138.38	OK

Flag: "*" = Keyline

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235050.CNF;1
* Acquisition date   : 3-OCT-2016 07:01:40 Sensitivity      : 3.000
* Detector ID       : GAM36 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.33 Half life ratio : *****
* Sample date       : 7-DEC-2015 13:42:00 Analyst initials: MXR1
* Sample ID         : G405235050 Sample Quantity : 1.7160E+02 GRAM
* Batch Number      : 1596252 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 1-JUN-2016 09:39:12 Eff. Geometry : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM36_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.255E+01	1.737E+00	8.223E-01
CD-109	3.863E+00	2.242E+00	1.569E+00
SB-125	2.599E-01	2.454E-01	2.009E-01
SN-126	2.459E-01	1.427E-01	1.124E-01
BA-137M	6.642E-02	6.180E-02	8.421E-02
CS-137	7.016E-02	6.529E-02	8.896E-02
TL-208	2.315E-01	8.647E-02	6.129E-02
PB-210	3.326E+00	6.086E+00	4.500E+00
BI-211	9.855E-01	9.959E-01	3.467E-01
PB-212	8.007E-01	1.717E-01	1.140E-01
BI-214	7.246E-01	1.907E-01	1.197E-01
PB-214	9.503E-01	1.835E-01	3.357E-01
RN-222	7.246E-01	1.907E-01	1.197E-01
RA-226	7.246E-01	1.907E-01	1.197E-01
AC-228	1.053E+00	3.398E-01	2.708E-01
RA-228	1.053E+00	3.398E-01	2.708E-01
TH-228	8.007E-01	1.717E-01	1.140E-01
TH-230	7.244E-01	1.906E-01	1.197E-01
TH-232	1.053E+00	3.398E-01	2.708E-01
TH-234	2.540E+00	2.882E+00	1.919E+00
U-234	7.244E-01	1.906E-01	1.197E-01
U-235	7.049E-02	1.766E-01	3.540E-01
U-238	2.540E+00	2.882E+00	1.919E+00
AM-243	2.120E-01	8.891E-02	7.184E-02
ANH-511	5.738E-02	7.781E-02	6.892E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	5.186E-01	1.085E+01	2.321E+01	NOT IDENT.
NA-22	8.759E-04	5.428E-02	1.152E-01	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	-2.649E-02	3.778E-02	6.149E-02	NOT IDENT.
SC-46	-1.420E-01	3.637E-01	6.838E-01	FAIL ABUN

V-48	0.000E+00	1.680E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	3.971E+02	0.000E+00	SHORT HLIF
MN-54	-2.864E-02	7.340E-02	1.361E-01	NOT IDENT.
CO-56	-5.145E-02	5.192E-01	1.033E+00	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-6.166E-03	3.951E-02	7.917E-02	NOT IDENT.
CO-58	1.804E-01	4.878E-01	1.136E+00	NOT IDENT.
FE-59	6.390E-01	7.582E+00	1.642E+01	NOT IDENT.
CO-60	-1.833E-02	3.382E-02	6.445E-02	NOT IDENT.
ZN-65	4.087E-02	1.851E-01	3.782E-01	NOT IDENT.
GE-68	-3.244E-01	2.487E+00	4.885E+00	NOT IDENT.
AS-73	-4.126E+00	6.353E+00	1.300E+01	NOT IDENT.
AS-74	0.000E+00	7.176E+03	0.000E+00	SHORT HLIF
SE-75	-6.605E-03	2.268E-01	4.012E-01	NOT IDENT.
BR-77	0.000E+00	4.008E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	8.294E+02	0.000E+00	SHORT HLIF
RB-83	1.325E-01	5.587E-01	1.250E+00	NOT IDENT.
KR-85	3.824E+00	7.365E+00	1.505E+01	NOT IDENT.
SR-85	4.066E-01	7.853E-01	1.605E+00	NOT IDENT.
RB-86	0.000E+00	3.046E+04	0.000E+00	SHORT HLIF
Y-88	-6.631E-02	2.108E-01	4.436E-01	FAIL ABUN
Y-91	1.459E+02	6.492E+02	1.399E+03	NOT IDENT.
NB-94	5.731E-03	3.353E-02	6.457E-02	NOT IDENT.
NB-95	5.050E-01	1.053E+00	1.852E+00	NOT IDENT.
NB-95M	-1.150E-01	2.496E+00	4.409E+00	NOT IDENT.
ZR-95	3.079E-01	1.687E+00	3.393E+00	NOT IDENT.
NB-97	0.000E+00	1.816E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	2.077E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-2.673E-02	2.826E-02	5.204E-02	NOT IDENT.
RH-102	-2.757E-02	6.786E-02	1.131E-01	NOT IDENT.
RU-103	3.330E+00	4.878E+00	1.155E+01	FAIL ABUN
RH-106	-1.784E-02	5.749E-01	1.172E+00	NOT IDENT.
RU-106	-1.784E-02	5.749E-01	1.172E+00	NOT IDENT.
AG-108M	-1.800E-02	2.331E-02	4.351E-02	NOT IDENT.
AG-110M	5.908E-03	1.134E-01	2.321E-01	FAIL ABUN
SN-113	-1.267E-01	2.203E-01	4.284E-01	NOT IDENT.
CD-115	0.000E+00	4.117E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	8.980E+04	0.000E+00	SHORT HLIF
TE-123M	-8.092E-02	1.130E-01	2.087E-01	NOT IDENT.
SB-124	-1.059E+00	1.467E+00	1.416E+00	NOT IDENT.
TE-125M	2.075E+02	2.485E+02	5.384E+02	NOT IDENT.
I-126	0.000E+00	1.167E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.261E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	3.050E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	5.900E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.911E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	8.708E+26	0.000E+00	SHORT HLIF
BA-133	-1.023E-02	4.627E-02	7.735E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.009E-01	1.519E-01	FAIL ABUN
CS-135	-3.451E-02	1.415E-01	2.420E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.636E+05	0.000E+00	SHORT HLIF
CE-139	-5.049E-02	8.923E-02	1.673E-01	NOT IDENT.
BA-140	0.000E+00	1.290E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.995E+05	0.000E+00	SHORT HLIF
CE-141	-1.165E+01	2.362E+01	4.384E+01	NOT IDENT.
CE-143	0.000E+00	1.669E+41	0.000E+00	SHORT HLIF
CE-144	-1.069E-01	3.257E-01	6.342E-01	FAIL ABUN
PM-144	-9.170E-04	5.191E-02	9.768E-02	NOT IDENT.
PR-144	-5.838E-02	4.516E+00	8.508E+00	NOT IDENT.
PM-146	-2.352E-02	4.604E-02	8.884E-02	NOT IDENT.
ND-147	0.000E+00	3.648E+07	0.000E+00	SHORT HLIF
PM-147	4.273E+02	6.682E+02	1.441E+03	NOT IDENT.
PM-149	0.000E+00	6.313E+40	0.000E+00	SHORT HLIF
EU-150	1.233E-02	2.643E-02	5.344E-02	FAIL ABUN
EU-152	-1.903E-02	9.506E-02	1.756E-01	FAIL ABUN
GD-153	-2.205E-01	1.651E-01	2.727E-01	NOT IDENT.
EU-154	-1.454E-03	1.321E-01	2.790E-01	NOT IDENT.
EU-155	1.191E-01	9.630E-02	2.150E-01	FAIL ABUN
TB-160	-1.134E+00	2.083E+00	3.713E+00	FAIL ABUN
HO-166M	1.215E-02	6.496E-02	1.352E-01	FAIL ABUN
TM-171	3.224E+00	1.481E+01	3.277E+01	NOT IDENT.
HF-172	3.257E-02	1.921E-01	3.950E-01	FAIL ABUN
LU-172	-1.693E-03	7.624E-02	1.555E-01	FAIL ABUN
LU-176	-1.761E-03	2.815E-02	4.885E-02	FAIL ABUN

HF-181	-8.911E-01	4.476E+00	9.045E+00	NOT IDENT.
TA-182	2.495E-01	8.907E-01	2.025E+00	FAIL ABUN
RE-183	1.068E+00	2.222E+00	4.968E+00	NOT IDENT.
RE-184	2.926E+01	2.914E+01	7.270E+01	NOT IDENT.
W-188	1.966E+01	1.146E+02	2.096E+02	FAIL ABUN
IR-192	-1.459E-01	3.695E-01	6.746E-01	FAIL ABUN
HG-203	-4.548E-01	2.344E+00	4.397E+00	NOT IDENT.
BI-207	-4.601E-03	6.561E-02	1.258E-01	FAIL ABUN
PB-211	8.667E-02	6.513E-01	1.387E+00	FAIL ABUN
BI-212	1.016E+00	7.686E-01	1.418E+00	FAIL ABUN
RN-219	-1.212E-01	3.718E-01	7.451E-01	FAIL ABUN
RA-223	6.744E-02	6.119E-01	1.103E+00	FAIL ABUN
RA-224	5.292E-01	7.537E-01	1.408E+00	NOT IDENT.
AC-227	-1.323E-01	2.415E-01	3.925E-01	FAIL ABUN
TH-227	-1.323E-01	2.415E-01	3.925E-01	FAIL ABUN
TH-229	-8.710E-03	4.030E-01	7.918E-01	FAIL ABUN
PA-231	2.909E-01	5.052E-01	9.602E-01	NOT IDENT.
TH-231	6.744E-02	6.119E-01	1.103E+00	FAIL ABUN
PA-233	-4.939E-02	5.971E-02	9.985E-02	NOT IDENT.
PA-234	4.934E-02	3.090E-01	6.449E-01	NOT IDENT.
PA-234M	1.565E+00	4.278E+00	9.702E+00	NOT IDENT.
NP-237	-4.939E-02	5.971E-02	9.985E-02	NOT IDENT.
NP-238	0.000E+00	1.454E+41	0.000E+00	SHORT HLIF
NP-239	-9.777E-02	2.083E-01	4.058E-01	FAIL ABUN
PU-239	2.082E+02	2.717E+02	5.808E+02	NOT IDENT.
AM-241	-4.695E-02	1.066E-01	2.036E-01	NOT IDENT.
CM-243	-3.837E-02	8.216E-02	1.618E-01	FAIL ABUN
BK-247	9.963E-04	7.866E-02	1.399E-01	NOT IDENT.
CM-247	-1.347E-02	3.376E-02	6.705E-02	NOT IDENT.
CF-249	1.280E-02	3.812E-02	8.234E-02	NOT IDENT.
CF-251	2.427E-02	1.020E-01	2.063E-01	FAIL ABUN

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	200	10.66*	6.546E-01	1.255E+01	1.255E+01	14.12
CD-109	88.03	109	3.70*	4.297E+00	3.005E+00	4.721E+00	47.47
SB-125	176.31	-----	6.89	4.460E+00	-----	Line Not Found	-----
	321.04	-----	0.42	2.640E+00	-----	Line Not Found	-----
	427.87	29	29.80*	2.005E+00	2.114E-01	2.599E-01	96.33
	463.37	-----	10.56	1.852E+00	-----	Line Not Found	-----
	600.60	13	17.77	1.455E+00	2.187E-01	2.689E-01	220.01
	635.95	6	11.29	1.385E+00	1.604E-01	1.972E-01	248.20
SN-126	64.28	53	9.60	2.468E+00	9.790E-01	9.790E-01	115.79
	86.94	109	8.90	4.297E+00	1.249E+00	1.249E+00	47.47
	87.57	109	37.00*	4.297E+00	3.005E-01	3.005E-01	47.47
BA-137M	661.66	18	89.90*	1.334E+00	6.517E-02	6.642E-02	94.95
CS-137	661.66	18	85.10*	1.334E+00	6.884E-02	7.016E-02	94.95
TL-208	277.37	-----	6.60	3.041E+00	-----	Line Not Found	-----
	583.19	67	85.00*	1.496E+00	2.315E-01	2.315E-01	38.11
	860.56	-----	12.50	1.058E+00	-----	Line Not Found	-----
PB-210	46.54	26	4.25*	8.252E-01	3.242E+00	3.326E+00	186.69
BI-211	72.87	-----	1.23	3.327E+00	-----	Line Not Found	-----
	351.06	187	12.92*	2.415E+00	2.618E+00	2.618E+00	19.71
PB-212	74.82	141	10.28	3.486E+00	1.720E+00	1.720E+00	32.87
	77.11	189	17.10	3.657E+00	1.319E+00	1.319E+00	25.66
	238.63	279	43.60*	3.500E+00	8.007E-01	8.007E-01	21.88
	300.09	-----	3.30	2.819E+00	-----	Line Not Found	-----
BI-214	609.32	108	45.49*	1.437E+00	7.244E-01	7.246E-01	26.85
	1120.29	17	14.92	8.373E-01	5.866E-01	5.868E-01	88.76
	1764.49	8	15.30	5.418E-01	4.384E-01	4.386E-01	132.56
PB-214	74.82	141	5.80	3.486E+00	3.048E+00	3.049E+00	32.87
	77.11	189	9.70	3.657E+00	2.325E+00	2.326E+00	25.66
	87.09	109	3.41	4.297E+00	3.260E+00	3.262E+00	47.47
	242.00	-----	7.25	3.455E+00	-----	Line Not Found	-----
	295.22	71	18.42	2.863E+00	5.924E-01	5.926E-01	53.64
	351.93	187	35.60*	2.415E+00	9.500E-01	9.503E-01	19.71
RN-222	609.32	108	45.49*	1.437E+00	7.244E-01	7.246E-01	26.85
	1120.29	17	14.92	8.373E-01	5.866E-01	5.868E-01	88.76
	1764.49	8	15.30	5.418E-01	4.384E-01	4.386E-01	132.56
RA-226	609.32	108	45.49*	1.437E+00	7.244E-01	7.246E-01	26.85
	1120.29	17	14.92	8.373E-01	5.866E-01	5.868E-01	88.76
	1764.49	8	15.30	5.418E-01	4.384E-01	4.386E-01	132.56
AC-228	105.21	-----	1.10	4.933E+00	-----	Line Not Found	-----
	338.32	41	11.27	2.506E+00	6.299E-01	6.299E-01	75.66
	794.95	33	4.25	1.134E+00	2.961E+00	2.961E+00	53.09
	835.71	-----	1.61	1.085E+00	-----	Line Not Found	-----
	911.20	62	25.80*	1.006E+00	1.053E+00	1.053E+00	32.94
	968.97	36	15.80	9.525E-01	1.059E+00	1.059E+00	36.92
RA-228	105.21	-----	1.10	4.933E+00	-----	Line Not Found	-----
	338.32	41	11.27	2.506E+00	6.299E-01	6.299E-01	75.66
	794.95	33	4.25	1.134E+00	2.961E+00	2.961E+00	53.09

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	835.71	-----	1.61	1.085E+00	-----	Line Not Found	-----
	911.20	62	25.80*	1.006E+00	1.053E+00	1.053E+00	32.94
	968.97	36	15.80	9.525E-01	1.059E+00	1.059E+00	36.92
TH-228	74.82	141	10.28	3.486E+00	1.720E+00	1.720E+00	32.87
	77.11	189	17.10	3.657E+00	1.319E+00	1.319E+00	25.66
	238.63	279	43.60*	3.500E+00	8.007E-01	8.007E-01	21.88
	300.09	-----	3.30	2.819E+00	-----	Line Not Found	-----
TH-230	609.32	108	45.49*	1.437E+00	7.244E-01	7.244E-01	26.85
	1120.29	17	14.92	8.373E-01	5.866E-01	5.866E-01	88.76
	1764.49	8	15.30	5.418E-01	4.384E-01	4.384E-01	132.56
TH-232	105.21	-----	1.10	4.933E+00	-----	Line Not Found	-----
	338.32	41	11.27	2.506E+00	6.299E-01	6.299E-01	75.66
	835.71	-----	1.61	1.085E+00	-----	Line Not Found	-----
	911.20	62	25.80*	1.006E+00	1.053E+00	1.053E+00	32.94
	968.97	36	15.80	9.525E-01	1.059E+00	1.059E+00	36.92
TH-234	63.29	53	3.70*	2.468E+00	2.540E+00	2.540E+00	115.79
	92.59	83	4.23	4.552E+00	1.892E+00	1.892E+00	57.46
U-234	609.32	108	45.49*	1.437E+00	7.244E-01	7.244E-01	26.85
	1120.29	17	14.92	8.373E-01	5.866E-01	5.866E-01	88.76
	1764.49	8	15.30	5.418E-01	4.384E-01	4.384E-01	132.56
U-235	89.96	50	3.47	4.418E+00	1.428E+00	1.428E+00	39.64
	93.35	83	5.60	4.552E+00	1.429E+00	1.429E+00	57.46
	143.76	-----	10.96*	4.954E+00	-----	Line Not Found	-----
	163.33	-----	5.08	4.674E+00	-----	Line Not Found	-----
	185.72	80	57.20	4.296E+00	1.429E-01	1.429E-01	59.00
	205.31	-----	5.01	3.984E+00	-----	Line Not Found	-----
U-238	63.29	53	3.70*	2.468E+00	2.540E+00	2.540E+00	115.79
	92.59	83	4.23	4.552E+00	1.892E+00	1.892E+00	57.46
AM-243	43.53	-----	5.90	5.957E-01	-----	Line Not Found	-----
	74.66	141	67.20*	3.486E+00	2.631E-01	2.631E-01	32.87
ANH-511	511.00	22	100.00*	1.690E+00	5.738E-02	5.738E-02	138.38

Flag: "*" = Keyline

Total number of lines in spectrum 43
 Number of unidentified lines 7
 Number of lines tentatively identified by NID 36 83.72%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.255E+01	1.255E+01	0.177E+01	14.12	
CD-109	461.40D	1.57	3.005E+00	4.721E+00	2.241E+00	47.47	
SB-125	2.76Y	1.23	2.114E-01	2.599E-01	2.504E-01	96.33	
SN-126	2.30E+05Y	1.00	3.005E-01	3.005E-01	1.427E-01	47.47	
BA-137M	30.08Y	1.02	6.517E-02	6.642E-02	6.306E-02	94.95	
CS-137	30.08Y	1.02	6.884E-02	7.016E-02	6.662E-02	94.95	
TL-208	1.41E+10Y	1.00	2.315E-01	2.315E-01	0.882E-01	38.11	
PB-210	22.20Y	1.03	3.242E+00	3.326E+00	6.210E+00	186.69	
BI-211	7.04E+08Y	1.00	2.618E+00	2.618E+00	0.516E+00	19.71	
PB-212	1.41E+10Y	1.00	8.007E-01	8.007E-01	1.752E-01	21.88	
BI-214	1600.00Y	1.00	7.244E-01	7.246E-01	1.945E-01	26.85	
PB-214	1600.00Y	1.00	9.500E-01	9.503E-01	1.873E-01	19.71	
RN-222	1600.00Y	1.00	7.244E-01	7.246E-01	1.945E-01	26.85	
RA-226	1600.00Y	1.00	7.244E-01	7.246E-01	1.945E-01	26.85	
AC-228	1.41E+10Y	1.00	1.053E+00	1.053E+00	0.347E+00	32.94	
RA-228	1.41E+10Y	1.00	1.053E+00	1.053E+00	0.347E+00	32.94	
TH-228	1.41E+10Y	1.00	8.007E-01	8.007E-01	1.752E-01	21.88	
TH-230	7.54E+04Y	1.00	7.244E-01	7.244E-01	1.945E-01	26.85	
TH-232	1.41E+10Y	1.00	1.053E+00	1.053E+00	0.347E+00	32.94	
TH-234	4.47E+09Y	1.00	2.540E+00	2.540E+00	2.941E+00	115.79	
U-234	2.45E+05Y	1.00	7.244E-01	7.244E-01	1.945E-01	26.85	
U-235	7.04E+08Y	1.00	1.429E-01	1.429E-01	0.843E-01	59.00	K
U-238	4.47E+09Y	1.00	2.540E+00	2.540E+00	2.941E+00	115.79	
AM-243	7370.00Y	1.00	2.631E-01	2.631E-01	0.865E-01	32.87	
ANH-511	1.00E+09Y	1.00	5.738E-02	5.738E-02	7.940E-02	138.38	
Total Activity :			3.717E+01	3.902E+01			

Grand Total Activity : 3.717E+01 3.902E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
2	80.83	25	96	1.05	161.63	144	21	4.90E-03	****	3.91E+00	T
0	227.19	32	63	1.71	454.36	451	8	7.05E-03	****	3.66E+00	T
0	262.50	35	121	6.92	524.99	513	19	7.87E-03	****	3.20E+00	
0	270.55	28	37	1.43	541.09	538	6	6.30E-03	87.3	3.11E+00	T
0	303.06	47	119	7.57	606.11	596	20	1.08E-02	****	2.79E+00	T
0	327.54	39	42	0.88	655.06	650	10	9.10E-03	77.3	2.59E+00	T
9	350.03	12	8	1.76	700.05	699	12	2.73E-03	95.1	2.43E+00	
2	587.54	14	19	1.43	1175.00	1158	22	3.41E-03	****	1.49E+00	
0	700.74	8	15	0.96	1401.36	1395	10	2.17E-03	****	1.27E+00	
0	727.85	19	9	1.27	1455.57	1451	9	4.89E-03	77.2	1.23E+00	T
0	763.74	10	15	4.41	1527.33	1519	14	2.50E-03	****	1.17E+00	T
0	768.42	16	4	1.48	1536.69	1533	7	4.09E-03	66.7	1.17E+00	
0	897.43	7	9	0.68	1794.64	1789	9	1.86E-03	****	1.02E+00	T
0	955.36	14	0	1.50	1910.46	1905	10	3.61E-03	55.5	9.65E-01	T
0	965.48	13	8	1.11	1930.69	1925	10	3.47E-03	99.6	9.56E-01	T
0	1019.06	16	0	4.53	2037.81	2031	13	4.44E-03	50.0	9.11E-01	
0	1239.25	8	11	1.27	2478.00	2471	11	2.22E-03	****	7.64E-01	T
0	1305.01	7	4	0.96	2609.47	2605	9	2.08E-03	****	7.28E-01	

Flags: "T" = Tentatively associated

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
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DETECTOR AND SAMPLE DATA

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* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235050.CNF;1
* Acquisition date   : 3-OCT-2016 07:01:40 Sensitivity      : 3.000
* Detector ID       : GAM36 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.33 Half life ratio  : *****
* Sample date       : 7-DEC-2015 13:42:00 Nuclide Library : SOLID
* Sample ID        : G405235050 Analyst initials: MXR1
* Batch Number     : 1596252 Sample Quantity  : 1.7160E+02 GRAM
* Wet wt corr      : 1.00000 Wet Weight      : 0.00000
* Dry Weight       : 0.00000
*****
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CALIBRATION INFORMATION

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* Eff. Cal. date    : 1-JUN-2016 09:39:12 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM36_CAN.CNF;7
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	3.252E-01
CD-109	7.204E-01
SB-125	8.759E-02
SN-126	5.210E-02
BA-137M	3.688E-02
CS-137	3.896E-02
TL-208	2.578E-02
PB-210	2.062E+00
BI-211	1.533E-01
PB-212	5.285E-02
BI-214	5.042E-02
PB-214	1.606E-01
RN-222	5.042E-02
RA-226	5.042E-02
AC-228	1.119E-01
RA-228	1.119E-01
TH-228	5.285E-02
TH-230	5.041E-02
TH-232	1.119E-01
TH-234	8.876E-01
U-234	5.041E-02
U-235	1.651E-01
U-238	8.876E-01
AM-243	3.311E-02
ANH-511	3.079E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	9.944E+00	NOT IDENT.
NA-22	4.750E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.943E-02	NOT IDENT.
SC-46	2.704E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF

CR-51	0.000E+00	SHORT HLIF
MN-54	5.707E-02	NOT IDENT.
CO-56	4.319E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	3.639E-02	NOT IDENT.
CO-58	4.634E-01	NOT IDENT.
FE-59	6.849E+00	NOT IDENT.
CO-60	2.283E-02	NOT IDENT.
ZN-65	1.557E-01	NOT IDENT.
GE-68	1.974E+00	NOT IDENT.
AS-73	5.925E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.813E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.320E-01	NOT IDENT.
KR-85	6.629E+00	NOT IDENT.
SR-85	7.066E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.402E-01	FAIL ABUN
Y-91	5.951E+02	NOT IDENT.
NB-94	2.742E-02	NOT IDENT.
NB-95	7.901E-01	NOT IDENT.
NB-95M	2.017E+00	NOT IDENT.
ZR-95	1.450E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.380E-02	NOT IDENT.
RH-102	4.735E-02	NOT IDENT.
RU-103	4.978E+00	FAIL ABUN
RH-106	5.088E-01	NOT IDENT.
RU-106	5.088E-01	NOT IDENT.
AG-108M	1.825E-02	NOT IDENT.
AG-110M	9.733E-02	FAIL ABUN
SN-113	1.871E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	9.507E-02	NOT IDENT.
SB-124	0.000E+00	NOT IDENT.
TE-125M	2.511E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.421E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	6.764E-02	FAIL ABUN
CS-135	1.084E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	7.575E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.028E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.932E-01	FAIL ABUN
PM-144	4.023E-02	NOT IDENT.
PR-144	3.506E+00	NOT IDENT.
PM-146	3.880E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	6.649E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.411E-02	FAIL ABUN
EU-152	7.780E-02	FAIL ABUN
GD-153	1.251E-01	NOT IDENT.
EU-154	1.148E-01	NOT IDENT.
EU-155	1.005E-01	FAIL ABUN
TB-160	1.508E+00	FAIL ABUN
HO-166M	5.851E-02	FAIL ABUN
TM-171	1.504E+01	NOT IDENT.
HF-172	1.823E-01	FAIL ABUN
LU-172	6.250E-02	FAIL ABUN
LU-176	2.199E-02	FAIL ABUN
HF-181	3.931E+00	NOT IDENT.

TA-182	8.341E-01	FAIL ABUN
RE-183	2.291E+00	NOT IDENT.
RE-184	3.066E+01	NOT IDENT.
W-188	9.408E+01	FAIL ABUN
IR-192	2.894E-01	FAIL ABUN
HG-203	1.974E+00	NOT IDENT.
BI-207	5.349E-02	FAIL ABUN
PB-211	6.151E-01	FAIL ABUN
BI-212	6.340E-01	FAIL ABUN
RN-219	3.280E-01	FAIL ABUN
RA-223	4.915E-01	FAIL ABUN
RA-224	6.596E-01	NOT IDENT.
AC-227	1.759E-01	FAIL ABUN
TH-227	1.759E-01	FAIL ABUN
TH-229	3.612E-01	FAIL ABUN
PA-231	4.382E-01	NOT IDENT.
TH-231	4.915E-01	FAIL ABUN
PA-233	4.390E-02	NOT IDENT.
PA-234	2.703E-01	NOT IDENT.
PA-234M	4.070E+00	NOT IDENT.
NP-237	4.390E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	1.868E-01	FAIL ABUN
PU-239	2.703E+02	NOT IDENT.
AM-241	9.303E-02	NOT IDENT.
CM-243	7.444E-02	FAIL ABUN
BK-247	6.333E-02	NOT IDENT.
CM-247	2.943E-02	NOT IDENT.
CF-249	3.684E-02	NOT IDENT.
CF-251	9.480E-02	FAIL ABUN

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235050.CNF;1
* Acquisition date   : 3-OCT-2016 07:01:40 Sensitivity      : 3.000
* Detector ID        : GAM36 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.33 Half life ratio  : *****
* Sample date        : 7-DEC-2015 13:42:00 Nuclide Library : SOLID
* Sample ID          : G405235050 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity : 1.7160E+02 GRAM
*                   : Quantity Err(%) : 1.1655E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight       : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 1-JUN-2016 09:39:12 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM36_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.255E+01	1.856E+00	1.856E+00
CD-109	3.863E+00	2.267E+00	2.267E+00
SB-125	2.599E-01	2.456E-01	2.456E-01
SN-126	2.459E-01	1.437E-01	1.437E-01
BA-137M	6.642E-02	6.187E-02	6.187E-02
CS-137	7.016E-02	6.536E-02	6.536E-02
TL-208	2.315E-01	8.703E-02	8.703E-02
PB-210	3.326E+00	6.093E+00	6.093E+00
BI-211	9.855E-01	1.002E+00	1.002E+00
PB-212	8.007E-01	1.768E-01	1.768E-01
BI-214	7.246E-01	1.932E-01	1.932E-01
PB-214	9.503E-01	1.877E-01	1.877E-01
RN-222	7.246E-01	1.932E-01	1.932E-01
RA-226	7.246E-01	1.932E-01	1.932E-01
AC-228	1.053E+00	3.441E-01	3.441E-01
RA-228	1.053E+00	3.441E-01	3.441E-01
TH-228	8.007E-01	1.768E-01	1.768E-01
TH-230	7.244E-01	1.931E-01	1.931E-01
TH-232	1.053E+00	3.441E-01	3.441E-01
TH-234	2.540E+00	2.937E+00	2.937E+00
U-234	7.244E-01	1.931E-01	1.931E-01
U-235	7.049E-02	1.766E-01	1.766E-01
U-238	2.540E+00	2.937E+00	2.937E+00
AM-243	2.120E-01	9.009E-02	9.009E-02
ANH-511	5.738E-02	7.785E-02	7.785E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	5.186E-01	1.085E+01	1.085E+01	NOT IDENT.
NA-22	8.759E-04	5.428E-02	5.428E-02	NOT IDENT.
NA-24	1.000E+41	6.064E+41	0.000E+00	SHORT HLIF
AL-26	-2.649E-02	3.782E-02	3.966E-02	NOT IDENT.
SC-46	-1.420E-01	3.637E-01	3.693E-01	FAIL ABUN

V-48	2.724E+03	1.680E+04	1.685E+04	SHORT HLIF
CR-51	2.742E+02	3.973E+02	4.161E+02	SHORT HLIF
MN-54	-2.864E-02	7.341E-02	7.454E-02	NOT IDENT.
CO-56	-5.145E-02	5.192E-01	5.198E-01	FAIL ABUN
MN-56	-1.000E+41	1.060E+42	0.000E+00	SHORT HLIF
CO-57	-6.166E-03	3.951E-02	3.961E-02	NOT IDENT.
CO-58	1.804E-01	4.879E-01	4.946E-01	NOT IDENT.
FE-59	6.390E-01	7.582E+00	7.588E+00	NOT IDENT.
CO-60	-1.833E-02	3.383E-02	3.482E-02	NOT IDENT.
ZN-65	4.087E-02	1.851E-01	1.860E-01	NOT IDENT.
GE-68	-3.244E-01	2.487E+00	2.491E+00	NOT IDENT.
AS-73	-4.126E+00	6.409E+00	6.673E+00	NOT IDENT.
AS-74	-5.756E+02	7.176E+03	7.181E+03	SHORT HLIF
SE-75	-6.605E-03	2.268E-01	2.268E-01	NOT IDENT.
BR-77	1.869E+38	1.623E+39	0.000E+00	SHORT HLIF
SR-82	-6.093E+01	8.295E+02	8.299E+02	SHORT HLIF
RB-83	1.325E-01	5.590E-01	5.622E-01	NOT IDENT.
KR-85	3.824E+00	7.366E+00	7.565E+00	NOT IDENT.
SR-85	4.066E-01	7.855E-01	8.066E-01	NOT IDENT.
RB-86	-5.591E+03	3.046E+04	3.057E+04	SHORT HLIF
Y-88	-6.631E-02	2.108E-01	2.129E-01	FAIL ABUN
Y-91	1.459E+02	6.492E+02	6.525E+02	NOT IDENT.
NB-94	5.731E-03	3.353E-02	3.363E-02	NOT IDENT.
NB-95	5.050E-01	1.053E+00	1.078E+00	NOT IDENT.
NB-95M	-1.150E-01	2.496E+00	2.496E+00	NOT IDENT.
ZR-95	3.079E-01	1.687E+00	1.693E+00	NOT IDENT.
NB-97	1.000E+41	1.816E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	3.256E+42	0.000E+00	SHORT HLIF
MO-99	2.561E+32	2.085E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	2.569E+41	0.000E+00	SHORT HLIF
RH-101	-2.673E-02	2.867E-02	3.110E-02	NOT IDENT.
RH-102	-2.757E-02	6.789E-02	6.902E-02	NOT IDENT.
RU-103	3.330E+00	4.881E+00	5.107E+00	FAIL ABUN
RH-106	-1.784E-02	5.749E-01	5.750E-01	NOT IDENT.
RU-106	-1.784E-02	5.749E-01	5.750E-01	NOT IDENT.
AG-108M	-1.800E-02	2.332E-02	2.469E-02	NOT IDENT.
AG-110M	5.908E-03	1.134E-01	1.134E-01	FAIL ABUN
SN-113	-1.267E-01	2.204E-01	2.277E-01	NOT IDENT.
CD-115	-9.636E+38	4.121E+39	0.000E+00	SHORT HLIF
SN-117M	-3.114E+04	8.987E+04	9.096E+04	SHORT HLIF
TE-123M	-8.092E-02	1.130E-01	1.188E-01	NOT IDENT.
SB-124	-1.059E+00	1.468E+00	1.544E+00	NOT IDENT.
TE-125M	2.075E+02	2.488E+02	2.658E+02	NOT IDENT.
I-126	1.293E+06	1.180E+06	1.316E+06	SHORT HLIF
SB-126	-5.115E+05	1.264E+06	1.285E+06	SHORT HLIF
SB-127	-2.163E+22	4.266E+22	0.000E+00	SHORT HLIF
I-131	1.759E+09	5.900E+09	5.953E+09	SHORT HLIF
I-132	-1.000E+41	1.863E+42	0.000E+00	SHORT HLIF
TE-132	8.409E+26	9.358E+26	0.000E+00	SHORT HLIF
BA-133	-1.023E-02	4.627E-02	4.650E-02	FAIL ABUN
I-133	1.000E+41	2.748E+41	0.000E+00	SHORT HLIF
CS-134	1.940E-01	1.013E-01	1.338E-01	FAIL ABUN
CS-135	-3.451E-02	1.415E-01	1.424E-01	NOT IDENT.
I-135	-1.000E+41	7.670E+41	0.000E+00	SHORT HLIF
CS-136	-1.827E+05	3.641E+05	3.733E+05	SHORT HLIF
CE-139	-5.049E-02	8.980E-02	9.264E-02	NOT IDENT.
BA-140	-6.535E+05	1.290E+06	1.324E+06	SHORT HLIF
LA-140	-2.890E+05	4.997E+05	5.164E+05	SHORT HLIF
CE-141	-1.165E+01	2.362E+01	2.420E+01	NOT IDENT.
CE-143	1.000E+41	1.673E+41	0.000E+00	SHORT HLIF
CE-144	-1.069E-01	3.258E-01	3.293E-01	FAIL ABUN
PM-144	-9.170E-04	5.191E-02	5.191E-02	NOT IDENT.
PR-144	-5.838E-02	4.516E+00	4.516E+00	NOT IDENT.
PM-146	-2.352E-02	4.607E-02	4.727E-02	NOT IDENT.
ND-147	1.322E+07	3.649E+07	3.697E+07	SHORT HLIF
PM-147	4.273E+02	6.685E+02	6.957E+02	NOT IDENT.
PM-149	-2.438E+40	6.335E+40	0.000E+00	SHORT HLIF
EU-150	1.233E-02	2.643E-02	2.701E-02	FAIL ABUN
EU-152	-1.903E-02	9.507E-02	9.545E-02	FAIL ABUN
GD-153	-2.205E-01	1.656E-01	1.931E-01	NOT IDENT.
EU-154	-1.454E-03	1.321E-01	1.321E-01	NOT IDENT.
EU-155	1.191E-01	9.667E-02	1.106E-01	FAIL ABUN
TB-160	-1.134E+00	2.084E+00	2.146E+00	FAIL ABUN
HO-166M	1.215E-02	6.496E-02	6.519E-02	FAIL ABUN
TM-171	3.224E+00	1.481E+01	1.488E+01	NOT IDENT.
HF-172	3.257E-02	1.922E-01	1.928E-01	FAIL ABUN
LU-172	-1.693E-03	7.624E-02	7.624E-02	FAIL ABUN
LU-176	-1.761E-03	2.815E-02	2.816E-02	FAIL ABUN

HF-181	-8.911E-01	4.477E+00	4.495E+00	NOT IDENT.
TA-182	2.495E-01	8.908E-01	8.979E-01	FAIL ABUN
RE-183	1.068E+00	2.228E+00	2.279E+00	NOT IDENT.
RE-184	2.926E+01	2.997E+01	3.275E+01	NOT IDENT.
W-188	1.966E+01	1.146E+02	1.150E+02	FAIL ABUN
IR-192	-1.459E-01	3.696E-01	3.754E-01	FAIL ABUN
HG-203	-4.548E-01	2.344E+00	2.353E+00	NOT IDENT.
BI-207	-4.601E-03	6.561E-02	6.565E-02	FAIL ABUN
PB-211	8.667E-02	6.513E-01	6.525E-01	FAIL ABUN
BI-212	1.016E+00	7.703E-01	8.961E-01	FAIL ABUN
RN-219	-1.212E-01	3.721E-01	3.761E-01	FAIL ABUN
RA-223	6.744E-02	6.119E-01	6.126E-01	FAIL ABUN
RA-224	5.292E-01	7.542E-01	7.910E-01	NOT IDENT.
AC-227	-1.323E-01	2.421E-01	2.493E-01	FAIL ABUN
TH-227	-1.323E-01	2.421E-01	2.493E-01	FAIL ABUN
TH-229	-8.710E-03	4.030E-01	4.030E-01	FAIL ABUN
PA-231	2.909E-01	5.090E-01	5.257E-01	NOT IDENT.
TH-231	6.744E-02	6.119E-01	6.126E-01	FAIL ABUN
PA-233	-4.939E-02	5.976E-02	6.377E-02	NOT IDENT.
PA-234	4.934E-02	3.141E-01	3.149E-01	NOT IDENT.
PA-234M	1.565E+00	4.279E+00	4.336E+00	NOT IDENT.
NP-237	-4.939E-02	5.976E-02	6.377E-02	NOT IDENT.
NP-238	1.000E+41	1.455E+41	0.000E+00	SHORT HLIF
NP-239	-9.777E-02	2.085E-01	2.131E-01	FAIL ABUN
PU-239	2.082E+02	2.719E+02	2.876E+02	NOT IDENT.
AM-241	-4.695E-02	1.067E-01	1.087E-01	NOT IDENT.
CM-243	-3.837E-02	8.224E-02	8.404E-02	FAIL ABUN
BK-247	9.963E-04	7.866E-02	7.866E-02	NOT IDENT.
CM-247	-1.347E-02	3.384E-02	3.438E-02	NOT IDENT.
CF-249	1.280E-02	3.813E-02	3.857E-02	NOT IDENT.
CF-251	2.427E-02	1.021E-01	1.026E-01	FAIL ABUN

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	6.2529	87.09	54.0667	136.47	43.5320
45.60	40.1511	87.57	54.1243	140.51	0.0000
46.54	40.2801	88.03	42.4010	143.76	54.8029
49.72	0.0000	88.34	42.4299	144.24	52.8852
51.35	32.8973	88.47	42.4420	145.44	59.8523
51.87	38.5774	89.96	49.6772	152.43	58.5067
52.39	37.8354	1093.63	49.7505	153.25	0.0000
52.97	43.5493	91.11	0.0000	323.87	47.7246
53.44	46.8436	92.59	49.9587	156.02	0.0000
54.07	41.2700	93.35	50.0395	158.56	0.0000
57.36	0.0000	94.56	50.1672	159.00	48.0608
57.53	40.0665	94.65	50.1766	162.33	46.2787
57.98	38.4817	94.67	50.1788	162.66	0.0000
59.27	58.0766	94.87	49.0045	163.33	44.3297
59.32	58.0849	97.43	61.2810	165.86	40.4437
59.54	46.0588	98.43	46.9580	176.31	46.1563
60.96	48.4482	98.44	46.9592	176.60	0.0000
61.17	46.2735	99.53	41.6328	177.52	39.0396
62.93	50.6541	100.11	41.6815	181.07	0.0000
63.29	50.7045	102.03	48.2092	181.52	38.2138
63.58	50.7451	103.18	59.2593	184.41	41.4685
64.28	50.8427	103.37	52.8975	143.76	34.2694
66.73	58.1720	105.21	43.0197	193.51	36.7085
67.24	57.1306	105.31	43.0284	197.03	45.2964
125.81	51.3091	106.12	53.1820	198.01	33.7500
67.75	51.3184	106.47	69.7343	201.83	50.8616
69.67	56.6504	109.28	47.0475	203.43	39.2820
70.83	56.5364	111.00	60.1569	205.31	46.8192
72.81	46.0252	111.76	0.0000	210.85	55.6967
72.87	46.0322	114.06	55.8458	215.65	29.0814
74.66	46.2377	116.30	0.0000	222.11	37.9774
74.82	46.2559	116.74	54.2484	227.09	34.9165
74.97	46.2732	119.76	43.2580	227.38	34.9277
77.11	46.5150	121.12	43.3622	228.16	0.0000
78.74	46.6971	121.22	36.7702	228.18	30.5891
79.69	46.8026	121.78	42.4687	116.74	30.5891
80.12	46.8500	122.06	46.2665	235.69	39.6530
80.19	0.0000	122.92	51.0642	235.96	36.7264
80.57	46.8994	123.07	51.0774	238.63	54.1433
81.00	46.9468	265.00	55.8662	238.98	0.0000
81.07	46.9542	125.81	44.6672	240.99	56.1256
81.75	55.7378	127.23	56.2071	242.00	45.8359
83.79	61.2500	127.91	47.6885	244.70	33.3627
84.00	42.0201	129.30	44.9324	252.40	0.0000
85.43	81.9707	131.20	46.9940	252.80	25.7939
86.55	54.0017	133.02	50.0211	254.15	0.0000
86.79	54.0303	133.52	56.8015	256.23	34.5122
86.94	54.0485	136.00	43.4990	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	30.2653	355.39	0.0000	584.27	9.4914
264.80	30.2694	356.01	22.9585	595.83	0.0000
265.00	30.2751	364.49	0.0000	427.87	9.5732
268.22	28.8525	366.42	0.0000	602.52	0.0000
269.46	27.3677	372.51	21.1774	604.72	8.6342
270.03	30.8051	375.05	23.7146	607.14	5.7632
271.23	41.1218	377.52	12.5046	609.32	9.6163
273.65	0.0000	356.01	21.7772	610.33	9.6212
276.40	30.9955	388.16	20.1660	614.28	5.7844
277.37	32.1733	388.63	0.0000	618.01	20.2839
277.60	31.0309	391.69	22.7455	620.36	12.5715
278.00	26.4442	264.66	21.1980	621.93	13.5494
279.20	28.7766	401.81	22.0645	630.19	0.0000
279.54	32.2400	402.40	22.0734	631.29	13.1270
279.70	28.7903	404.85	17.0093	633.25	8.7598
280.46	26.5060	410.95	14.5205	634.78	0.0000
283.69	15.0273	413.71	14.5485	635.95	11.6953
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	28.9452	423.72	0.0000	645.85	7.8350
285.90	0.0000	427.09	15.5475	657.76	8.8656
287.50	20.8812	427.87	15.5559	657.90	0.0000
290.67	23.2697	433.94	16.4878	661.66	16.7773
293.27	0.0000	439.40	21.7738	664.57	0.0000
351.93	29.5978	453.88	21.9823	666.33	0.0000
295.96	29.6171	463.37	19.4631	666.50	0.0000
879.38	32.8125	468.07	12.4229	667.71	0.0000
299.98	26.5964	473.00	0.0000	677.62	11.9331
300.09	26.5992	475.06	11.5866	685.70	0.0000
300.13	26.5999	476.78	11.5990	695.00	0.0000
301.36	26.6289	477.60	11.6048	696.49	7.5241
302.85	26.6649	482.18	17.0092	696.51	7.5241
256.23	26.7036	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	7.5269
306.78	28.3323	497.08	7.2274	697.49	9.0330
308.46	31.5267	505.52	19.0684	702.65	9.0542
311.90	29.6455	507.63	0.0000	706.68	12.0947
316.51	16.6677	511.00	23.6855	711.68	12.1221
319.41	0.0000	514.00	12.3201	720.70	0.0000
320.08	0.0000	514.00	12.3201	721.93	0.0000
321.04	25.0990	520.40	7.3281	722.78	9.7461
323.87	20.7669	520.69	0.0000	722.91	13.7060
325.23	23.9893	522.65	0.0000	723.31	12.1855
328.76	0.0000	527.90	0.0000	724.19	7.6190
333.37	21.7375	528.26	13.8031	727.33	8.1383
333.97	21.7485	529.59	11.0508	733.00	6.1189
334.37	25.7845	529.87	0.0000	735.93	15.3174
338.28	20.6134	531.02	0.0000	333.97	8.1748
338.32	20.6140	537.26	0.0000	739.50	0.0000
311.90	30.7729	546.56	0.0000	747.24	9.2358
340.48	30.7729	552.55	15.8600	748.06	11.2923
340.55	0.0000	563.25	15.0150	752.31	14.3982
344.28	23.1510	569.33	6.5910	753.82	0.0000
345.93	19.5215	946.00	5.6499	756.73	9.8922
351.06	19.6021	569.70	5.6504	756.80	7.7283
351.93	19.6157	583.19	9.4861	884.68	10.8529

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	6.2065	1274.44	11.2919	1620.50	3.0170
766.42	6.2083	1001.03	4.5241	1621.92	3.0179
766.84	6.2092	1002.74	7.9217	1678.03	0.0000
772.60	0.0000	1004.73	6.7947	1690.97	2.0430
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	5.1883
778.90	7.2811	1028.54	0.0000	1063.66	6.2333
783.70	0.0000	1037.84	5.7255	1771.35	3.1174
785.37	11.4727	1038.76	0.0000	1791.20	0.0000
792.07	6.2754	631.29	6.8901	1808.65	4.1887
794.95	6.2827	1048.07	0.0000	1810.72	0.0000
795.86	6.2852	1049.04	4.5970	1836.06	2.1061
810.06	3.1609	1050.41	4.5993		
810.29	4.2148	1063.66	11.5479		
344.28	4.2152	1077.00	0.0000		
810.76	4.2157	1077.34	6.9590		
815.77	0.0000	1085.87	6.9780		
1048.07	0.0000	1093.63	5.8293		
832.01	8.5036	1099.45	7.8843		
834.85	12.7700	1112.07	6.1562		
835.71	12.7744	1112.84	7.0376		
836.80	0.0000	1115.54	5.6348		
846.75	0.0000	1120.29	7.9354		
846.77	9.6226	1120.55	7.9360		
856.80	0.0000	1221.41	11.2898		
860.56	12.8989	1129.67	11.4956		
871.09	14.0304	1131.51	0.0000		
873.19	8.6410	1147.95	0.0000		
875.33	0.0000	1173.23	8.9600		
879.38	10.8268	1177.95	12.5619		
880.51	7.5819	1189.05	15.3035		
883.24	7.5899	1204.77	9.0436		
884.68	8.6787	1221.41	5.4525		
889.28	7.6073	1231.02	5.4675		
894.76	8.1674	1235.36	0.0000		
898.04	4.9063	1238.28	7.3052		
900.72	9.8225	1260.41	0.0000		
903.28	2.6219	1271.87	6.4523		
911.20	7.6694	1274.44	7.3794		
912.08	6.5759	1274.54	7.3799		
923.98	0.0000	1291.59	4.6341		
926.50	6.6106	1298.22	0.0000		
929.11	12.1311	1312.11	0.0000		
937.49	6.6370	1332.49	4.6857		
944.13	0.0000	1362.66	0.0000		
946.00	7.7668	1365.19	4.7263		
949.00	7.7750	1368.63	0.0000		
667.71	0.0000	1384.29	3.7998		
962.31	8.3698	1408.01	2.8672		
964.08	8.3749	1457.56	0.0000		
966.17	0.0000	1460.82	4.8425		
911.20	8.3893	1489.16	3.9009		
968.97	8.3893	1505.03	4.8950		
983.53	0.0000	1584.12	3.9895		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235051.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM41.CNF;119
Background date : 2-OCT-2016 11:02:18.
Sample date     : 7-DEC-2015 13:02:00. Acquisition date : 3-OCT-2016 07:04:39.
Sample ID      : G405235051 Sample quantity : 1.53012E+02 GRAM
Detector name  : GAM41 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:05.93 0.2%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID      : 1596252 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.53*	22	188	1.04	93.36	88	10	6.24E-03	121.4	
2	0	63.22*	50	256	0.73	126.73	122	10	1.39E-02	64.6	
3	6	74.93*	232	180	1.26	150.14	145	14	6.46E-02	11.9	1.87E+00
4	6	77.27*	289	113	0.78	154.82	145	14	8.03E-02	8.2	
5	2	84.44*	58	115	1.51	169.16	166	26	1.61E-02	33.6	1.75E+00
6	2	87.37	128	124	1.32	175.00	166	26	3.56E-02	17.3	
7	2	89.91	76	103	1.16	180.08	166	26	2.11E-02	25.0	
8	2	92.78*	107	95	1.19	185.83	166	26	2.97E-02	21.6	
9	0	156.62	39	94	4.03	313.48	307	11	1.07E-02	51.7	
10	0	186.12*	65	118	1.02	372.45	368	10	1.80E-02	35.8	
11	0	238.79*	304	100	0.89	477.78	473	9	8.43E-02	8.4	
12	0	241.96	76	65	1.22	484.10	482	7	2.12E-02	21.5	
13	0	260.11	19	50	0.86	520.41	515	9	5.14E-03	72.4	
14	0	271.39	65	64	3.61	542.96	535	15	1.80E-02	30.7	
15	5	277.18	48	15	2.39	554.54	550	19	1.33E-02	21.2	1.41E+00
16	5	280.70	19	31	1.98	561.57	550	19	5.40E-03	66.1	
17	0	295.61	109	58	1.44	591.39	587	10	3.03E-02	16.1	
18	0	300.46	19	41	0.90	601.08	597	8	5.29E-03	63.0	
19	0	328.52*	24	65	2.29	657.20	651	12	6.74E-03	71.0	
20	0	338.49	61	54	1.19	677.12	672	12	1.70E-02	26.8	
21	0	352.28*	198	38	1.06	704.71	700	10	5.51E-02	9.3	
22	0	458.10	10	19	1.05	916.32	910	8	2.76E-03	85.9	
23	0	494.31	14	20	1.18	988.71	982	10	3.89E-03	65.5	
24	0	512.04*	24	55	2.31	1024.17	1015	22	6.73E-03	91.7	
25	0	543.77	11	12	1.00	1087.64	1081	9	3.02E-03	67.2	
26	0	548.25	12	30	0.60	1096.59	1090	16	3.31E-03	104.1	
27	0	583.75*	112	13	1.33	1167.58	1163	13	3.10E-02	11.8	
28	0	609.86*	142	42	1.34	1219.80	1214	14	3.96E-02	12.9	
29	0	662.29*	41	27	1.49	1324.66	1318	13	1.14E-02	30.6	
30	0	728.27*	39	16	1.54	1456.62	1450	14	1.08E-02	28.0	
31	0	735.71	27	12	3.28	1471.51	1464	16	7.46E-03	34.7	
32	0	786.96	10	10	0.70	1574.02	1570	7	2.81E-03	61.3	
33	0	853.65	13	12	0.97	1707.39	1698	12	3.61E-03	60.1	
34	0	860.64	33	3	3.12	1721.38	1715	13	9.09E-03	20.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	900.96	10	18	3.43	1802.03	1794	13	2.65E-03	100.2	
36	0	911.87*	61	23	1.48	1823.85	1817	15	1.70E-02	21.5	
37	0	970.76*	23	43	1.28	1941.66	1931	15	6.27E-03	68.4	
38	0	1028.71	13	4	0.99	2057.58	2054	8	3.61E-03	38.5	
39	0	1048.47	8	11	1.45	2097.10	2090	9	2.35E-03	78.6	
40	0	1121.13	38	11	1.56	2242.45	2234	16	1.05E-02	26.0	
41	0	1134.76	9	14	4.57	2269.70	2259	18	2.54E-03	100.0	
42	0	1205.40	7	12	1.52	2411.03	2405	11	2.00E-03	97.7	
43	0	1238.36	28	7	3.28	2476.97	2471	13	7.82E-03	26.6	
44	0	1342.79	10	2	1.34	2685.89	2680	10	2.65E-03	44.8	
45	0	1461.79*	261	8	1.95	2923.97	2916	15	7.25E-02	6.7	
46	0	1765.78	31	0	2.15	3532.26	3525	13	8.61E-03	18.0	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235051.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 7-DEC-2015 13:02:00   Acquisition date  : 3-OCT-2016 07:04:39
Sample ID         : G405235051           Sample quantity   : 153.01 GRAM
Sample type       : SOLID                 Sample geometry   :
Detector name     : GAMMA41              Detector geometry : CAN
Elapsed live time : 0 01:00:00.00         Elapsed real time: 0 01:00:05.93   0.2%
Energy tolerance  : 1.50 keV             Half life ratio   : 10.00
Errors propagated: No                    Systematic Error  : 0.00 %
Efficiency type   : Empirical            Efficiencies at   : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	8.926E-01	1.300E+01	1.300E+01	13.33	OK
Y-91	1204.77	0.26*	1.057E+00	1.267E+01	4.470E+02	195.37	OK
CD-109	88.03	3.70*	7.448E+00	2.086E+00	3.278E+00	49.90	OK
SN-126	64.28	9.60	7.794E+00	4.293E-01	4.293E-01	129.22	OK
	86.94	8.90	7.448E+00	8.674E-01	8.674E-01	49.90	OK
	87.57	37.00*	7.448E+00	2.086E-01	2.086E-01	49.90	OK
BA-137M	661.66	89.90*	1.826E+00	1.288E-01	1.313E-01	61.28	OK
CS-137	661.66	85.10*	1.826E+00	1.361E-01	1.387E-01	61.28	OK
TL-208	277.37	6.60	3.909E+00	1.048E+00	1.048E+00	42.35	OK
	583.19	85.00*	2.050E+00	3.357E-01	3.357E-01	23.63	OK
	860.56	12.50	1.434E+00	9.175E-01	9.175E-01	41.72	OK
PB-210	46.54	4.25*	7.553E+00	4.626E-01	4.746E-01	242.82	OK
BI-211	72.87	1.23	7.711E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.211E+00	1.678E-01	1.678E-01	557.00	OK
PB-212	74.82	10.28	7.682E+00	1.364E+00	1.364E+00	34.74	OK
	77.11	17.10	7.644E+00	1.400E+00	1.400E+00	16.44	OK
	238.63	43.60*	4.384E+00	9.086E-01	9.086E-01	16.78	OK
	300.09	3.30	3.665E+00	8.817E-01	8.817E-01	125.98	OK
BI-214	609.32	45.49*	1.969E+00	8.289E-01	8.292E-01	25.86	OK
	1120.29	14.92	1.127E+00	1.101E+00	1.102E+00	51.95	OK
	1764.49	15.30	7.616E-01	1.234E+00	1.235E+00	35.92	OK
PB-214	74.82	5.80	7.683E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	7.644E+00	2.469E+00	2.470E+00	16.44	OK
	87.09	3.41	7.454E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.340E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.713E+00	8.949E-01	8.952E-01	32.29	OK
	351.93	35.60*	3.214E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	1.969E+00	8.289E-01	8.292E-01	25.86	OK
	1120.29	14.92	1.127E+00	1.101E+00	1.102E+00	51.95	OK
	1764.49	15.30	7.616E-01	1.234E+00	1.235E+00	35.92	OK
RA-224	240.99	4.10*	4.341E+00	8.710E-01	8.710E-01	134.52	OK
RA-226	609.32	45.49*	1.969E+00	8.289E-01	8.292E-01	25.86	OK
	1120.29	14.92	1.127E+00	1.101E+00	1.102E+00	51.95	OK
	1764.49	15.30	7.616E-01	1.234E+00	1.235E+00	35.92	OK
TH-228	74.82	10.28	7.682E+00	1.364E+00	1.364E+00	34.74	OK
	77.11	17.10	7.644E+00	1.400E+00	1.400E+00	16.44	OK
	238.63	43.60*	4.384E+00	9.086E-01	9.086E-01	16.78	OK
	300.09	3.30	3.665E+00	8.817E-01	8.817E-01	125.98	OK
TH-229	85.43	14.70	7.510E+00	3.303E-01	3.303E-01	67.29	OK
	88.47	24.00	7.448E+00	3.217E-01	3.217E-01	49.90	OK
	193.51	4.41*	5.088E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	4.797E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	1.969E+00	8.289E-01	8.289E-01	25.86	OK
	1120.29	14.92	1.127E+00	1.101E+00	1.101E+00	51.95	OK
	1764.49	15.30	7.616E-01	1.234E+00	1.234E+00	35.92	OK
PA-231	283.69	1.70	3.838E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.665E+00	5.438E-01	5.438E-01	125.98	OK
TH-234	63.29	3.70*	7.794E+00	1.114E+00	1.114E+00	129.22	OK
	92.59	4.23	7.327E+00	2.152E+00	2.152E+00	43.13	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
U-234	609.32	45.49*	1.969E+00	8.289E-01	8.289E-01	25.86	OK
	1120.29	14.92	1.127E+00	1.101E+00	1.101E+00	51.95	OK
	1764.49	15.30	7.616E-01	1.234E+00	1.234E+00	35.92	OK
U-235	89.96	3.47	7.392E+00	1.853E+00	1.853E+00	50.01	OK
	93.35	5.60	7.327E+00	1.626E+00	1.626E+00	43.13	OK
	143.76	10.96*	6.093E+00	-----	Line Not Found	-----	Absent
	163.33	5.08	5.667E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	5.221E+00	1.270E-01	1.270E-01	71.51	OK
U-238	205.31	5.01	4.887E+00	-----	Line Not Found	-----	Absent
	63.29	3.70*	7.794E+00	1.114E+00	1.114E+00	129.22	OK
	92.59	4.23	7.327E+00	2.152E+00	2.152E+00	43.13	OK
AM-243	43.53	5.90	7.421E+00	-----	Line Not Found	-----	Absent
ANH-511	74.66	67.20*	7.682E+00	2.087E-01	2.087E-01	34.74	OK
	511.00	100.00*	2.310E+00	5.569E-02	5.569E-02	183.43	OK

Flag: "*" = Keyline

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235051.CNF;1
* Acquisition date   : 3-OCT-2016 07:04:39 Sensitivity      : 3.000
* Detector ID       : GAM41 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:05.93 Half life ratio : *****
* Sample date       : 7-DEC-2015 13:02:00 Analyst initials: MXR1
* Sample ID         : G405235051 Sample Quantity : 1.5301E+02 GRAM
* Batch Number      : 1596252 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 26-JAN-2016 06:01:47 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.300E+01	1.698E+00	5.762E-01
Y-91	4.470E+02	8.558E+02	1.170E+03
CD-109	3.278E+00	1.603E+00	1.471E+00
SN-126	2.086E-01	1.020E-01	9.347E-02
BA-137M	1.313E-01	7.883E-02	7.425E-02
CS-137	1.387E-01	8.328E-02	7.844E-02
TL-208	3.357E-01	7.773E-02	6.576E-02
PB-210	4.746E-01	1.130E+00	7.877E-01
BI-211	1.678E-01	9.159E-01	3.364E-01
PB-212	9.086E-01	1.494E-01	1.177E-01
BI-214	8.292E-01	2.101E-01	1.538E-01
PB-214	9.561E-01	1.742E-01	3.267E-01
RN-222	8.292E-01	2.101E-01	1.538E-01
RA-224	8.710E-01	1.148E+00	1.294E+00
RA-226	8.292E-01	2.101E-01	1.538E-01
TH-228	9.086E-01	1.494E-01	1.177E-01
TH-229	-2.973E-01	4.543E-01	8.385E-01
TH-230	8.289E-01	2.101E-01	1.537E-01
PA-231	5.438E-01	6.714E-01	8.080E-01
TH-234	1.114E+00	1.411E+00	9.795E-01
U-234	8.289E-01	2.101E-01	1.537E-01
U-235	4.726E-02	1.889E-01	3.814E-01
U-238	1.114E+00	1.411E+00	9.795E-01
AM-243	2.087E-01	7.104E-02	5.273E-02
ANH-511	5.569E-02	1.001E-01	4.910E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-9.905E+00	1.264E+01	2.128E+01	NOT IDENT.
NA-22	-3.849E-02	6.037E-02	1.040E-01	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	1.664E-03	1.836E-02	5.113E-02	NOT IDENT.
SC-46	2.488E-01	4.412E-01	9.554E-01	FAIL ABUN

V-48	0.000E+00	1.406E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	3.986E+02	0.000E+00	SHORT HLIF
MN-54	3.448E-03	6.698E-02	1.359E-01	NOT IDENT.
CO-56	-1.502E-01	5.118E-01	8.557E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.592E-02	4.512E-02	9.149E-02	NOT IDENT.
CO-58	-4.077E-01	5.687E-01	1.016E+00	NOT IDENT.
FE-59	4.668E-01	8.611E+00	1.706E+01	NOT IDENT.
CO-60	1.536E-02	4.084E-02	9.061E-02	NOT IDENT.
ZN-65	6.570E-02	1.945E-01	3.750E-01	NOT IDENT.
GE-68	4.490E-01	2.176E+00	4.672E+00	NOT IDENT.
AS-73	2.039E+00	2.404E+00	4.729E+00	NOT IDENT.
AS-74	0.000E+00	6.889E+03	0.000E+00	SHORT HLIF
SE-75	-1.930E-01	2.066E-01	3.385E-01	FAIL ABUN
BR-77	0.000E+00	3.519E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	8.857E+02	0.000E+00	SHORT HLIF
RB-83	3.740E-01	7.598E-01	1.413E+00	NOT IDENT.
KR-85	6.826E+00	7.254E+00	1.537E+01	NOT IDENT.
SR-85	7.262E-01	7.737E-01	1.639E+00	NOT IDENT.
RB-86	0.000E+00	2.824E+04	0.000E+00	SHORT HLIF
Y-88	7.026E-02	1.131E-01	3.972E-01	NOT IDENT.
NB-94	-1.570E-02	3.316E-02	6.234E-02	NOT IDENT.
NB-95	1.098E-01	9.230E-01	1.873E+00	NOT IDENT.
NB-95M	-3.960E-01	2.489E+00	4.241E+00	NOT IDENT.
ZR-95	1.370E-01	1.662E+00	3.362E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	2.544E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.241E+41	0.000E+00	SHORT HLIF
RH-101	-1.179E-02	3.198E-02	6.172E-02	NOT IDENT.
RH-102	2.537E-02	6.707E-02	1.406E-01	NOT IDENT.
RU-103	-2.731E+00	7.010E+00	1.096E+01	FAIL ABUN
RH-106	4.272E-02	5.094E-01	9.857E-01	NOT IDENT.
RU-106	4.272E-02	5.094E-01	9.857E-01	NOT IDENT.
AG-108M	5.362E-03	3.040E-02	5.904E-02	NOT IDENT.
AG-110M	-5.692E-02	1.085E-01	2.067E-01	NOT IDENT.
SN-113	-8.789E-03	2.399E-01	4.566E-01	NOT IDENT.
CD-115	0.000E+00	4.233E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.069E+05	0.000E+00	SHORT HLIF
TE-123M	-2.612E-02	1.380E-01	2.396E-01	NOT IDENT.
SB-124	-5.218E-01	1.617E+00	3.487E+00	NOT IDENT.
SB-125	-2.784E-02	1.162E-01	2.139E-01	NOT IDENT.
TE-125M	-1.675E+01	2.421E+02	4.789E+02	NOT IDENT.
I-126	0.000E+00	1.258E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.222E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	2.780E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	6.007E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.214E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	4.475E+26	0.000E+00	SHORT HLIF
BA-133	-6.117E-03	4.514E-02	7.584E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	4.308E-02	4.045E-02	9.921E-02	NOT IDENT.
CS-135	5.576E-02	1.594E-01	2.868E-01	NOT IDENT.
I-135	0.000E+00	8.234E+40	0.000E+00	SHORT HLIF
CS-136	0.000E+00	5.085E+05	0.000E+00	SHORT HLIF
CE-139	1.499E-03	1.113E-01	2.182E-01	NOT IDENT.
BA-140	0.000E+00	1.592E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	6.103E+05	0.000E+00	SHORT HLIF
CE-141	-5.610E+00	2.576E+01	4.975E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	-2.612E-01	3.344E-01	6.250E-01	NOT IDENT.
PM-144	-1.271E-02	5.816E-02	1.136E-01	NOT IDENT.
PR-144	-1.122E+00	5.052E+00	9.862E+00	NOT IDENT.
PM-146	1.233E-02	4.551E-02	8.241E-02	FAIL ABUN
ND-147	0.000E+00	3.647E+07	0.000E+00	SHORT HLIF
PM-147	5.635E+02	7.602E+02	1.583E+03	NOT IDENT.
PM-149	0.000E+00	6.451E+40	0.000E+00	SHORT HLIF
EU-150	2.322E-02	2.665E-02	4.924E-02	FAIL ABUN
EU-152	-4.215E-02	1.073E-01	1.855E-01	NOT IDENT.
GD-153	-5.847E-03	1.593E-01	2.862E-01	NOT IDENT.
EU-154	-6.285E-02	1.416E-01	2.551E-01	NOT IDENT.
EU-155	7.073E-02	8.831E-02	1.856E-01	FAIL ABUN
TB-160	3.949E-01	1.749E+00	3.755E+00	FAIL ABUN
HO-166M	2.629E-03	6.136E-02	1.240E-01	FAIL ABUN
TM-171	-4.548E+00	5.503E+00	9.567E+00	NOT IDENT.
HF-172	7.144E-05	2.174E-01	4.284E-01	FAIL ABUN
LU-172	4.815E-02	9.393E-02	1.999E-01	FAIL ABUN
LU-176	3.198E-03	2.297E-02	4.520E-02	FAIL ABUN

HF-181	3.504E-02	3.953E+00	7.685E+00	NOT IDENT.
TA-182	3.794E-01	1.170E+00	2.381E+00	FAIL ABUN
RE-183	4.452E-01	1.069E+00	2.036E+00	NOT IDENT.
RE-184	-2.397E+00	4.090E+01	7.080E+01	NOT IDENT.
W-188	3.965E+01	1.145E+02	2.194E+02	FAIL ABUN
IR-192	1.141E-01	4.360E-01	8.704E-01	FAIL ABUN
HG-203	2.914E+00	2.444E+00	4.930E+00	NOT IDENT.
BI-207	-3.388E-02	6.251E-02	1.118E-01	FAIL ABUN
PB-211	1.721E-01	7.210E-01	1.408E+00	NOT IDENT.
BI-212	0.000E+00	9.842E-01	1.501E+00	FAIL ABUN
RN-219	2.931E-01	3.618E-01	7.664E-01	FAIL ABUN
RA-223	1.282E-01	6.579E-01	1.162E+00	FAIL ABUN
AC-227	1.819E-03	2.360E-01	4.121E-01	FAIL ABUN
TH-227	1.819E-03	2.360E-01	4.121E-01	FAIL ABUN
AC-228	0.000E+00	3.673E-01	5.974E-01	FAIL ABUN
RA-228	0.000E+00	3.673E-01	5.974E-01	FAIL ABUN
TH-231	1.282E-01	6.579E-01	1.162E+00	FAIL ABUN
TH-232	0.000E+00	3.673E-01	5.974E-01	FAIL ABUN
PA-233	5.092E-02	6.010E-02	1.256E-01	FAIL ABUN
PA-234	2.470E-02	2.577E-01	5.399E-01	NOT IDENT.
PA-234M	1.659E-01	5.139E+00	1.011E+01	NOT IDENT.
NP-237	5.092E-02	6.010E-02	1.256E-01	FAIL ABUN
NP-238	0.000E+00	1.144E+41	0.000E+00	SHORT HLIF
NP-239	2.606E-02	2.200E-01	4.407E-01	FAIL ABUN
PU-239	-9.135E+01	2.876E+02	5.568E+02	NOT IDENT.
AM-241	3.959E-02	5.594E-02	1.010E-01	NOT IDENT.
CM-243	-1.313E-02	8.149E-02	1.613E-01	FAIL ABUN
BK-247	-6.742E-02	7.765E-02	1.180E-01	FAIL ABUN
CM-247	-3.867E-04	3.580E-02	6.831E-02	FAIL ABUN
CF-249	4.362E-03	3.545E-02	6.945E-02	NOT IDENT.
CF-251	-7.098E-02	1.159E-01	2.158E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	252	10.66*	8.926E-01	1.300E+01	1.300E+01	13.33
Y-91	1204.77	7	0.26*	1.057E+00	1.267E+01	4.470E+02	195.37
CD-109	88.03	164	3.70*	7.448E+00	2.911E+00	4.574E+00	34.58
SN-126	64.28	65	9.60	7.794E+00	4.293E-01	4.293E-01	129.22
	86.94	164	8.90	7.448E+00	1.210E+00	1.210E+00	34.58
	87.57	164	37.00*	7.448E+00	2.911E-01	2.911E-01	34.58
BA-137M	661.66	43	89.90*	1.826E+00	1.288E-01	1.313E-01	61.28
CS-137	661.66	43	85.10*	1.826E+00	1.361E-01	1.387E-01	61.28
TL-208	277.37	55	6.60	3.909E+00	1.048E+00	1.048E+00	42.35
	583.19	119	85.00*	2.050E+00	3.357E-01	3.357E-01	23.63
	860.56	34	12.50	1.434E+00	9.175E-01	9.175E-01	41.72
PB-210	46.54	30	4.25*	7.553E+00	4.626E-01	4.746E-01	242.82
BI-211	72.87	-----	1.23	7.711E+00	-----	Line Not Found	-----
	351.06	223	12.92*	3.211E+00	2.633E+00	2.633E+00	18.59
PB-212	74.82	301	10.28	7.682E+00	1.869E+00	1.869E+00	23.80
	77.11	373	17.10	7.644E+00	1.400E+00	1.400E+00	16.44
	238.63	354	43.60*	4.384E+00	9.086E-01	9.086E-01	16.78
	300.09	22	3.30	3.665E+00	8.817E-01	8.817E-01	125.98
BI-214	609.32	151	45.49*	1.969E+00	8.289E-01	8.292E-01	25.86
	1120.29	38	14.92	1.127E+00	1.101E+00	1.102E+00	51.95
	1764.49	29	15.30	7.616E-01	1.234E+00	1.235E+00	35.92
PB-214	74.82	301	5.80	7.682E+00	3.312E+00	3.314E+00	23.80
	77.11	373	9.70	7.644E+00	2.469E+00	2.470E+00	16.44
	87.09	164	3.41	7.448E+00	3.159E+00	3.160E+00	34.58
	242.00	89	7.25	4.341E+00	1.387E+00	1.388E+00	42.98
	295.22	125	18.42	3.713E+00	8.949E-01	8.952E-01	32.29
	351.93	223	35.60*	3.211E+00	9.557E-01	9.561E-01	18.59
RN-222	609.32	151	45.49*	1.969E+00	8.289E-01	8.292E-01	25.86
	1120.29	38	14.92	1.127E+00	1.101E+00	1.102E+00	51.95
	1764.49	29	15.30	7.616E-01	1.234E+00	1.235E+00	35.92
RA-224	240.99	89	4.10*	4.341E+00	2.453E+00	2.453E+00	42.98
RA-226	609.32	151	45.49*	1.969E+00	8.289E-01	8.292E-01	25.86
	1120.29	38	14.92	1.127E+00	1.101E+00	1.102E+00	51.95
	1764.49	29	15.30	7.616E-01	1.234E+00	1.235E+00	35.92
TH-228	74.82	301	10.28	7.682E+00	1.869E+00	1.869E+00	23.80
	77.11	373	17.10	7.644E+00	1.400E+00	1.400E+00	16.44
	238.63	354	43.60*	4.384E+00	9.086E-01	9.086E-01	16.78
	300.09	22	3.30	3.665E+00	8.817E-01	8.817E-01	125.98
TH-229	85.43	74	14.70	7.510E+00	3.303E-01	3.303E-01	67.29
	88.47	164	24.00	7.448E+00	4.488E-01	4.488E-01	34.58
	193.51	-----	4.41*	5.088E+00	-----	Line Not Found	-----
	210.85	-----	2.80	4.797E+00	-----	Line Not Found	-----
TH-230	609.32	151	45.49*	1.969E+00	8.289E-01	8.289E-01	25.86
	1120.29	38	14.92	1.127E+00	1.101E+00	1.101E+00	51.95
	1764.49	29	15.30	7.616E-01	1.234E+00	1.234E+00	35.92
PA-231	283.69	-----	1.70	3.838E+00	-----	Line Not Found	-----
	301.36	22	5.35*	3.665E+00	5.438E-01	5.438E-01	125.98

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-234	63.29	65	3.70*	7.794E+00	1.114E+00	1.114E+00	129.22
	92.59	136	4.23	7.327E+00	2.152E+00	2.152E+00	43.13
U-234	609.32	151	45.49*	1.969E+00	8.289E-01	8.289E-01	25.86
	1120.29	38	14.92	1.127E+00	1.101E+00	1.101E+00	51.95
	1764.49	29	15.30	7.616E-01	1.234E+00	1.234E+00	35.92
U-235	89.96	97	3.47	7.392E+00	1.853E+00	1.853E+00	50.01
	93.35	136	5.60	7.327E+00	1.626E+00	1.626E+00	43.13
	143.76	-----	10.96*	6.093E+00	-----	Line Not Found	-----
	163.33	-----	5.08	5.667E+00	-----	Line Not Found	-----
	185.72	77	57.20	5.221E+00	1.270E-01	1.270E-01	71.51
U-238	205.31	-----	5.01	4.887E+00	-----	Line Not Found	-----
	63.29	65	3.70*	7.794E+00	1.114E+00	1.114E+00	129.22
AM-243	92.59	136	4.23	7.327E+00	2.152E+00	2.152E+00	43.13
	43.53	-----	5.90	7.421E+00	-----	Line Not Found	-----
ANH-511	74.66	301	67.20*	7.682E+00	2.859E-01	2.859E-01	23.80
	511.00	26	100.00*	2.310E+00	5.569E-02	5.569E-02	183.43

Flag: "*" = Keyline

Total number of lines in spectrum 46
 Number of unidentified lines 9
 Number of lines tentatively identified by NID 37 80.43%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.300E+01	1.300E+01	0.173E+01	13.33	
Y-91	58.51D	35.3	1.267E+01	4.470E+02	8.732E+02	195.37	
CD-109	461.40D	1.57	2.911E+00	4.574E+00	1.582E+00	34.58	
SN-126	2.30E+05Y	1.00	2.911E-01	2.911E-01	1.007E-01	34.58	
BA-137M	30.08Y	1.02	1.288E-01	1.313E-01	0.804E-01	61.28	
CS-137	30.08Y	1.02	1.361E-01	1.387E-01	0.850E-01	61.28	
TL-208	1.41E+10Y	1.00	3.357E-01	3.357E-01	0.793E-01	23.63	
PB-210	22.20Y	1.03	4.626E-01	4.746E-01	11.53E-01	242.82	
BI-211	7.04E+08Y	1.00	2.633E+00	2.633E+00	0.489E+00	18.59	
PB-212	1.41E+10Y	1.00	9.086E-01	9.086E-01	1.525E-01	16.78	
BI-214	1600.00Y	1.00	8.289E-01	8.292E-01	2.144E-01	25.86	
PB-214	1600.00Y	1.00	9.557E-01	9.561E-01	1.777E-01	18.59	
RN-222	1600.00Y	1.00	8.289E-01	8.292E-01	2.144E-01	25.86	
RA-224	1.41E+10Y	1.00	2.453E+00	2.453E+00	1.054E+00	42.98	
RA-226	1600.00Y	1.00	8.289E-01	8.292E-01	2.144E-01	25.86	
TH-228	1.41E+10Y	1.00	9.086E-01	9.086E-01	1.525E-01	16.78	
TH-229	7340.00Y	1.00	4.488E-01	4.488E-01	1.552E-01	34.58	K
TH-230	7.54E+04Y	1.00	8.289E-01	8.289E-01	2.144E-01	25.86	
PA-231	7.04E+08Y	1.00	5.438E-01	5.438E-01	6.851E-01	125.98	
TH-234	4.47E+09Y	1.00	1.114E+00	1.114E+00	1.439E+00	129.22	
U-234	2.45E+05Y	1.00	8.289E-01	8.289E-01	2.144E-01	25.86	
U-235	7.04E+08Y	1.00	1.270E-01	1.270E-01	0.908E-01	71.51	K
U-238	4.47E+09Y	1.00	1.114E+00	1.114E+00	1.439E+00	129.22	
AM-243	7370.00Y	1.00	2.859E-01	2.859E-01	0.681E-01	23.80	
ANH-511	1.00E+09Y	1.00	5.569E-02	5.569E-02	10.21E-02	183.43	
Total Activity :			4.563E+01	4.816E+02			

Grand Total Activity : 4.563E+01 4.816E+02

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	156.62	47	114	4.03	313.48	307	11	1.07E-02	****	5.81E+00	T
0	260.11	21	57	0.86	520.41	515	9	5.14E-03	****	4.11E+00	T
0	271.39	75	74	3.61	542.96	535	15	1.80E-02	61.5	3.97E+00	T
5	280.70	22	36	1.98	561.57	550	19	5.40E-03	****	3.87E+00	T
0	328.52	27	74	2.29	657.20	651	12	6.74E-03	****	3.41E+00	T
0	338.49	69	61	1.19	677.12	672	12	1.70E-02	53.5	3.32E+00	T
0	458.10	11	21	1.05	916.32	910	8	2.76E-03	****	2.55E+00	
0	494.31	15	22	1.18	988.71	982	10	3.89E-03	****	2.38E+00	
0	543.77	12	13	1.00	1087.64	1081	9	3.02E-03	****	2.19E+00	
0	548.25	13	32	0.60	1096.59	1090	16	3.31E-03	****	2.17E+00	
0	728.27	41	17	1.54	1456.62	1450	14	1.08E-02	56.1	1.67E+00	T
0	735.71	28	13	3.28	1471.51	1464	16	7.46E-03	69.4	1.66E+00	T
0	786.96	10	10	0.70	1574.02	1570	7	2.81E-03	****	1.56E+00	
0	853.65	13	12	0.97	1707.39	1698	12	3.61E-03	****	1.44E+00	
0	900.96	10	19	3.43	1802.03	1794	13	2.65E-03	****	1.37E+00	T
0	911.87	62	23	1.48	1823.85	1817	15	1.70E-02	43.0	1.36E+00	T
0	970.76	23	44	1.28	1941.66	1931	15	6.27E-03	****	1.28E+00	
0	1028.71	13	4	0.99	2057.58	2054	8	3.61E-03	76.9	1.22E+00	T
0	1048.47	8	11	1.45	2097.10	2090	9	2.35E-03	****	1.20E+00	T
0	1134.76	9	14	4.57	2269.70	2259	18	2.54E-03	****	1.12E+00	
0	1238.36	28	7	3.28	2476.97	2471	13	7.82E-03	53.2	1.03E+00	T
0	1342.79	9	2	1.34	2685.89	2680	10	2.65E-03	89.5	9.61E-01	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235051.CNF;1
* Acquisition date   : 3-OCT-2016 07:04:39 Sensitivity      : 3.000
* Detector ID       : GAM41 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:05.93 Half life ratio : *****
* Sample date       : 7-DEC-2015 13:02:00 Nuclide Library : SOLID
* Sample ID        : G405235051 Analyst initials: MXR1
* Batch Number     : 1596252 Sample Quantity : 1.5301E+02 GRAM
* Wet wt corr      : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 26-JAN-2016 06:01:47 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.179E-01
Y-91	4.991E+02
CD-109	6.947E-01
SN-126	4.415E-02
BA-137M	3.290E-02
CS-137	3.476E-02
TL-208	2.896E-02
PB-210	3.707E-01
BI-211	1.516E-01
PB-212	5.519E-02
BI-214	6.928E-02
PB-214	1.574E-01
RN-222	6.928E-02
RA-224	6.081E-01
RA-226	6.928E-02
TH-228	5.519E-02
TH-229	3.880E-01
TH-230	6.926E-02
PA-231	3.685E-01
TH-234	4.649E-01
U-234	6.926E-02
U-235	1.801E-01
U-238	4.649E-01
AM-243	2.498E-02
ANH-511	2.159E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	9.296E+00	NOT IDENT.
NA-22	4.368E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.664E-02	NOT IDENT.
SC-46	4.192E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF

CR-51	0.000E+00	SHORT HLIF
MN-54	5.897E-02	NOT IDENT.
CO-56	3.586E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	4.305E-02	NOT IDENT.
CO-58	4.228E-01	NOT IDENT.
FE-59	7.405E+00	NOT IDENT.
CO-60	3.759E-02	NOT IDENT.
ZN-65	1.599E-01	NOT IDENT.
GE-68	1.949E+00	NOT IDENT.
AS-73	2.243E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.526E-01	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	6.315E-01	NOT IDENT.
KR-85	6.960E+00	NOT IDENT.
SR-85	7.421E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.344E-01	NOT IDENT.
NB-94	2.723E-02	NOT IDENT.
NB-95	8.259E-01	NOT IDENT.
NB-95M	1.956E+00	NOT IDENT.
ZR-95	1.481E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.896E-02	NOT IDENT.
RH-102	6.285E-02	NOT IDENT.
RU-103	4.837E+00	FAIL ABUN
RH-106	4.306E-01	NOT IDENT.
RU-106	4.306E-01	NOT IDENT.
AG-108M	2.668E-02	NOT IDENT.
AG-110M	8.801E-02	NOT IDENT.
SN-113	2.061E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.114E-01	NOT IDENT.
SB-124	1.177E+00	NOT IDENT.
SB-125	9.649E-02	NOT IDENT.
TE-125M	2.251E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.422E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	4.282E-02	NOT IDENT.
CS-135	1.325E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	1.020E-01	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.341E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.916E-01	NOT IDENT.
PM-144	4.983E-02	NOT IDENT.
PR-144	4.325E+00	NOT IDENT.
PM-146	3.665E-02	FAIL ABUN
ND-147	0.000E+00	SHORT HLIF
PM-147	7.448E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.244E-02	FAIL ABUN
EU-152	8.445E-02	NOT IDENT.
GD-153	1.350E-01	NOT IDENT.
EU-154	1.072E-01	NOT IDENT.
EU-155	8.742E-02	FAIL ABUN
TB-160	1.592E+00	FAIL ABUN
HO-166M	5.461E-02	FAIL ABUN
TM-171	4.516E+00	NOT IDENT.
HF-172	2.012E-01	FAIL ABUN
LU-172	8.739E-02	FAIL ABUN
LU-176	2.054E-02	FAIL ABUN
HF-181	3.364E+00	NOT IDENT.

TA-182	1.043E+00	FAIL ABUN
RE-183	9.650E-01	NOT IDENT.
RE-184	3.073E+01	NOT IDENT.
W-188	1.006E+02	FAIL ABUN
IR-192	3.950E-01	FAIL ABUN
HG-203	2.273E+00	NOT IDENT.
BI-207	4.812E-02	FAIL ABUN
PB-211	6.399E-01	NOT IDENT.
BI-212	6.899E-01	FAIL ABUN
RN-219	3.468E-01	FAIL ABUN
RA-223	5.307E-01	FAIL ABUN
AC-227	1.884E-01	FAIL ABUN
TH-227	1.884E-01	FAIL ABUN
AC-228	2.795E-01	FAIL ABUN
RA-228	2.795E-01	FAIL ABUN
TH-231	5.307E-01	FAIL ABUN
TH-232	2.795E-01	FAIL ABUN
PA-233	5.773E-02	FAIL ABUN
PA-234	2.271E-01	NOT IDENT.
PA-234M	4.410E+00	NOT IDENT.
NP-237	5.773E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.071E-01	FAIL ABUN
PU-239	2.610E+02	NOT IDENT.
AM-241	4.792E-02	NOT IDENT.
CM-243	7.576E-02	FAIL ABUN
BK-247	5.329E-02	FAIL ABUN
CM-247	3.081E-02	FAIL ABUN
CF-249	3.118E-02	NOT IDENT.
CF-251	1.004E-01	NOT IDENT.

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*****
*                                     GEL Laboratories LLC                       *
*                                     2040 Savage Road                          *
*                                     Charleston, SC 29407                       *
*****
*                                     DETECTOR AND SAMPLE DATA                 *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235051.CNF;1
* Acquisition date   : 3-OCT-2016 07:04:39 Sensitivity      : 3.000
* Detector ID       : GAM41 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:05.93 Half life ratio : *****
* Sample date       : 7-DEC-2015 13:02:00 Nuclide Library : SOLID
* Sample ID         : G405235051 Analyst initials: MXR1
* Batch Number      : 1596252 Sample Quantity : 1.5301E+02 GRAM
*                   :                               Quantity Err(%) : 1.3071E-03 %
* Wet wt corr       : 1.00000 Wet Weight      : 0.00000
*                   :                               Dry Weight      : 0.00000
*****
*                                     CALIBRATION INFORMATION                   *
*
* Eff. Cal. date    : 26-JAN-2016 06:01:47 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.300E+01	2.028E+00	2.028E+00
Y-91	4.470E+02	8.566E+02	8.566E+02
CD-109	3.278E+00	1.650E+00	1.650E+00
SN-126	2.086E-01	1.044E-01	1.044E-01
BA-137M	1.313E-01	7.956E-02	7.956E-02
CS-137	1.387E-01	8.405E-02	8.405E-02
TL-208	3.357E-01	8.285E-02	8.285E-02
PB-210	4.746E-01	1.131E+00	1.131E+00
BI-211	1.678E-01	9.645E-01	9.645E-01
PB-212	9.086E-01	1.725E-01	1.725E-01
BI-214	8.292E-01	2.215E-01	2.215E-01
PB-214	9.561E-01	1.923E-01	1.923E-01
RN-222	8.292E-01	2.215E-01	2.215E-01
RA-224	8.710E-01	1.169E+00	1.169E+00
RA-226	8.292E-01	2.215E-01	2.215E-01
TH-228	9.086E-01	1.725E-01	1.725E-01
TH-229	-2.973E-01	4.551E-01	4.551E-01
TH-230	8.289E-01	2.215E-01	2.215E-01
PA-231	5.438E-01	6.826E-01	6.826E-01
TH-234	1.114E+00	1.437E+00	1.437E+00
U-234	8.289E-01	2.215E-01	2.215E-01
U-235	4.726E-02	1.890E-01	1.890E-01
U-238	1.114E+00	1.437E+00	1.437E+00
AM-243	2.087E-01	7.567E-02	7.567E-02
ANH-511	5.569E-02	1.002E-01	1.002E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-9.905E+00	1.267E+01	1.343E+01	NOT IDENT.
NA-22	-3.849E-02	6.045E-02	6.289E-02	NOT IDENT.
NA-24	-1.000E+41	4.876E+41	0.000E+00	SHORT HLIF
AL-26	1.664E-03	1.836E-02	1.838E-02	NOT IDENT.
SC-46	2.488E-01	4.421E-01	4.561E-01	FAIL ABUN

V-48	-1.673E+04	1.425E+04	1.612E+04	SHORT HLIF
CR-51	-4.343E+02	4.004E+02	4.457E+02	SHORT HLIF
MN-54	3.448E-03	6.698E-02	6.700E-02	NOT IDENT.
CO-56	-1.502E-01	5.120E-01	5.165E-01	FAIL ABUN
MN-56	-1.000E+41	3.409E+41	0.000E+00	SHORT HLIF
CO-57	1.592E-02	4.516E-02	4.573E-02	NOT IDENT.
CO-58	-4.077E-01	5.701E-01	5.990E-01	NOT IDENT.
FE-59	4.668E-01	8.611E+00	8.614E+00	NOT IDENT.
CO-60	1.536E-02	4.086E-02	4.144E-02	NOT IDENT.
ZN-65	6.570E-02	1.948E-01	1.970E-01	NOT IDENT.
GE-68	4.490E-01	2.178E+00	2.187E+00	NOT IDENT.
AS-73	2.039E+00	2.449E+00	2.616E+00	NOT IDENT.
AS-74	-1.552E+03	6.891E+03	6.927E+03	SHORT HLIF
SE-75	-1.930E-01	2.073E-01	2.248E-01	FAIL ABUN
BR-77	2.139E+38	1.858E+39	0.000E+00	SHORT HLIF
SR-82	7.499E+02	8.887E+02	9.508E+02	SHORT HLIF
RB-83	3.740E-01	7.620E-01	7.805E-01	NOT IDENT.
KR-85	6.826E+00	7.278E+00	7.901E+00	NOT IDENT.
SR-85	7.262E-01	7.762E-01	8.424E-01	NOT IDENT.
RB-86	1.049E+04	2.829E+04	2.869E+04	SHORT HLIF
Y-88	7.026E-02	1.132E-01	1.175E-01	NOT IDENT.
NB-94	-1.570E-02	3.319E-02	3.394E-02	NOT IDENT.
NB-95	1.098E-01	9.231E-01	9.244E-01	NOT IDENT.
NB-95M	-3.960E-01	2.490E+00	2.496E+00	NOT IDENT.
ZR-95	1.370E-01	1.662E+00	1.663E+00	NOT IDENT.
NB-97	-1.000E+41	3.611E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	4.071E+41	0.000E+00	SHORT HLIF
MO-99	5.418E+31	2.545E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.249E+41	0.000E+00	SHORT HLIF
RH-101	-1.179E-02	3.208E-02	3.252E-02	NOT IDENT.
RH-102	2.537E-02	6.712E-02	6.809E-02	NOT IDENT.
RU-103	-2.731E+00	7.015E+00	7.122E+00	FAIL ABUN
RH-106	4.272E-02	5.094E-01	5.097E-01	NOT IDENT.
RU-106	4.272E-02	5.094E-01	5.097E-01	NOT IDENT.
AG-108M	5.362E-03	3.041E-02	3.050E-02	NOT IDENT.
AG-110M	-5.692E-02	1.087E-01	1.117E-01	NOT IDENT.
SN-113	-8.789E-03	2.399E-01	2.399E-01	NOT IDENT.
CD-115	6.370E+38	4.235E+39	0.000E+00	SHORT HLIF
SN-117M	-9.312E+04	1.077E+05	1.156E+05	SHORT HLIF
TE-123M	-2.612E-02	1.380E-01	1.385E-01	NOT IDENT.
SB-124	-5.218E-01	1.617E+00	1.634E+00	NOT IDENT.
SB-125	-2.784E-02	1.163E-01	1.169E-01	NOT IDENT.
TE-125M	-1.675E+01	2.421E+02	2.422E+02	NOT IDENT.
I-126	-1.208E+05	1.258E+06	1.259E+06	SHORT HLIF
SB-126	9.679E+05	1.238E+06	1.313E+06	SHORT HLIF
SB-127	-2.878E+21	2.808E+22	0.000E+00	SHORT HLIF
I-131	1.067E+09	6.007E+09	6.027E+09	SHORT HLIF
I-132	1.000E+41	1.858E+42	0.000E+00	SHORT HLIF
TE-132	2.030E+26	4.553E+26	0.000E+00	SHORT HLIF
BA-133	-6.117E-03	4.514E-02	4.523E-02	FAIL ABUN
I-133	1.000E+41	1.213E+42	0.000E+00	SHORT HLIF
CS-134	4.308E-02	4.068E-02	4.507E-02	NOT IDENT.
CS-135	5.576E-02	1.595E-01	1.615E-01	NOT IDENT.
I-135	1.000E+41	6.846E+41	0.000E+00	SHORT HLIF
CS-136	3.302E+05	5.122E+05	5.334E+05	SHORT HLIF
CE-139	1.499E-03	1.113E-01	1.113E-01	NOT IDENT.
BA-140	2.603E+05	1.592E+06	1.596E+06	SHORT HLIF
LA-140	-2.351E+05	6.106E+05	6.197E+05	SHORT HLIF
CE-141	-5.610E+00	2.577E+01	2.589E+01	NOT IDENT.
CE-143	-1.000E+41	2.461E+41	0.000E+00	SHORT HLIF
CE-144	-2.612E-01	3.358E-01	3.558E-01	NOT IDENT.
PM-144	-1.271E-02	5.818E-02	5.846E-02	NOT IDENT.
PR-144	-1.122E+00	5.053E+00	5.078E+00	NOT IDENT.
PM-146	1.233E-02	4.553E-02	4.587E-02	FAIL ABUN
ND-147	1.143E+07	3.648E+07	3.685E+07	SHORT HLIF
PM-147	5.635E+02	7.631E+02	8.042E+02	NOT IDENT.
PM-149	-2.023E+40	6.468E+40	0.000E+00	SHORT HLIF
EU-150	2.322E-02	2.673E-02	2.870E-02	FAIL ABUN
EU-152	-4.215E-02	1.073E-01	1.090E-01	NOT IDENT.
GD-153	-5.847E-03	1.593E-01	1.593E-01	NOT IDENT.
EU-154	-6.285E-02	1.417E-01	1.445E-01	NOT IDENT.
EU-155	7.073E-02	8.866E-02	9.422E-02	FAIL ABUN
TB-160	3.949E-01	3.749E+00	1.758E+00	FAIL ABUN
HO-166M	2.629E-03	6.136E-02	6.137E-02	FAIL ABUN
TM-171	-4.548E+00	5.537E+00	5.905E+00	NOT IDENT.
HF-172	7.144E-05	2.174E-01	2.174E-01	FAIL ABUN
LU-172	4.815E-02	9.440E-02	9.686E-02	FAIL ABUN
LU-176	3.198E-03	2.298E-02	2.302E-02	FAIL ABUN

HF-181	3.504E-02	3.953E+00	3.953E+00	NOT IDENT.
TA-182	3.794E-01	1.171E+00	1.183E+00	FAIL ABUN
RE-183	4.452E-01	1.072E+00	1.091E+00	NOT IDENT.
RE-184	-2.397E+00	4.091E+01	4.092E+01	NOT IDENT.
W-188	3.965E+01	1.146E+02	1.160E+02	FAIL ABUN
IR-192	1.141E-01	4.361E-01	4.391E-01	FAIL ABUN
HG-203	2.914E+00	2.457E+00	2.786E+00	NOT IDENT.
BI-207	-3.388E-02	6.275E-02	6.458E-02	FAIL ABUN
PB-211	1.721E-01	7.212E-01	7.253E-01	NOT IDENT.
BI-212	1.791E+00	9.983E-01	1.284E+00	FAIL ABUN
RN-219	2.931E-01	3.642E-01	3.875E-01	FAIL ABUN
RA-223	1.282E-01	6.580E-01	6.605E-01	FAIL ABUN
AC-227	1.819E-03	2.360E-01	2.360E-01	FAIL ABUN
TH-227	1.819E-03	2.360E-01	2.360E-01	FAIL ABUN
AC-228	8.719E-01	3.817E-01	5.479E-01	FAIL ABUN
RA-228	8.719E-01	3.817E-01	5.479E-01	FAIL ABUN
TH-231	1.282E-01	6.580E-01	6.605E-01	FAIL ABUN
TH-232	8.719E-01	3.817E-01	5.479E-01	FAIL ABUN
PA-233	5.092E-02	6.027E-02	6.449E-02	FAIL ABUN
PA-234	2.470E-02	2.592E-01	2.595E-01	NOT IDENT.
PA-234M	1.659E-01	5.139E+00	5.140E+00	NOT IDENT.
NP-237	5.092E-02	6.027E-02	6.449E-02	FAIL ABUN
NP-238	-1.000E+41	1.152E+41	0.000E+00	SHORT HLIF
NP-239	2.606E-02	2.200E-01	2.203E-01	FAIL ABUN
PU-239	-9.135E+01	2.878E+02	2.907E+02	NOT IDENT.
AM-241	3.959E-02	5.620E-02	5.896E-02	NOT IDENT.
CM-243	-1.313E-02	8.150E-02	8.172E-02	FAIL ABUN
BK-247	-6.742E-02	7.900E-02	8.464E-02	FAIL ABUN
CM-247	-3.867E-04	3.580E-02	3.580E-02	FAIL ABUN
CF-249	4.362E-03	3.546E-02	3.551E-02	NOT IDENT.
CF-251	-7.098E-02	1.164E-01	1.207E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	79.2546	87.09	96.8336	136.47	82.2510
45.60	85.4408	87.57	96.8968	140.51	0.0000
46.54	85.6012	88.03	96.9570	143.76	74.8373
49.72	0.0000	88.34	96.9977	144.24	73.9818
51.35	104.1492	88.47	97.0142	145.44	90.1319
51.87	130.3128	89.96	97.2077	152.43	67.3836
52.39	113.8370	1093.63	97.2956	153.25	0.0000
52.97	87.8431	91.11	0.0000	323.87	66.1473
53.44	83.1661	92.59	97.5452	156.02	0.0000
54.07	88.0192	93.35	97.6414	158.56	0.0000
57.36	0.0000	94.56	69.5523	159.00	63.7328
57.53	113.6957	94.65	69.5603	162.33	68.0092
57.98	98.2136	94.67	69.5620	162.66	0.0000
59.27	99.2329	94.87	83.4960	163.33	78.0547
59.32	105.6440	97.43	93.9227	165.86	68.2274
59.54	92.8738	98.43	76.2497	176.31	58.7611
60.96	107.5443	98.44	76.2506	176.60	0.0000
61.17	107.5821	99.53	79.7481	177.52	72.6087
62.93	115.9506	100.11	83.2019	181.07	0.0000
63.29	116.0193	102.03	98.7181	181.52	58.1018
63.58	116.0750	103.18	88.6302	184.41	55.4706
64.28	116.2081	103.37	83.5364	143.76	62.0103
66.73	140.9741	105.21	68.3451	193.51	65.2049
67.24	129.7371	105.31	68.3537	197.03	59.7865
125.81	116.8447	106.12	76.1172	198.01	71.0521
67.75	116.8572	106.47	90.6948	201.83	65.6428
69.67	122.0940	109.28	78.9792	203.43	58.2146
70.83	122.3129	111.00	89.4607	205.31	55.4793
72.81	135.7691	111.76	0.0000	210.85	62.3295
72.87	117.7866	114.06	77.6921	215.65	62.5585
74.66	108.2618	116.30	0.0000	222.11	45.7188
74.82	108.2873	116.74	78.7951	227.09	44.9312
74.97	108.3115	119.76	84.2751	227.38	50.6779
77.11	108.6539	121.12	67.8695	228.16	0.0000
78.74	117.1618	121.22	67.8771	228.18	41.1401
79.69	127.2367	121.78	74.8852	116.74	41.1401
80.12	119.0479	122.06	76.6500	235.69	50.5026
80.19	0.0000	122.92	82.8254	235.96	50.5122
80.57	96.7883	123.07	78.4790	238.63	76.6355
81.00	99.3311	265.00	79.4038	238.98	0.0000
81.07	99.3408	125.81	76.0887	240.99	81.1084
81.75	102.7506	127.23	85.8392	242.00	52.1785
83.79	118.0025	127.91	84.1492	244.70	49.3730
84.00	91.0217	129.30	82.5168	252.40	0.0000
85.43	91.2010	131.20	70.3687	252.80	45.7555
86.55	96.7628	133.02	89.0089	254.15	0.0000
86.79	96.7941	133.52	82.8830	256.23	38.0558
86.94	96.8142	136.00	74.2554	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	44.7474	355.39	0.0000	584.27	18.3724
264.80	45.6353	356.01	31.0870	595.83	0.0000
265.00	45.6410	364.49	0.0000	427.87	20.7964
268.22	42.7867	366.42	0.0000	602.52	0.0000
269.46	36.9156	372.51	38.6787	604.72	13.8857
270.03	36.9293	375.05	30.3558	607.14	20.8469
271.23	36.9583	377.52	36.6833	609.32	27.8184
273.65	0.0000	356.01	23.1337	610.33	27.8291
276.40	25.2157	388.16	24.2382	614.28	12.1927
277.37	25.2313	388.63	0.0000	618.01	27.9072
277.60	25.2349	391.69	29.5603	620.36	10.4744
278.00	25.2416	264.66	24.3912	621.93	15.1381
279.20	25.2608	401.81	19.0997	630.19	0.0000
279.54	25.2665	402.40	28.6578	631.29	19.2789
279.70	25.2691	404.85	29.7557	633.25	24.5538
280.46	25.2811	410.95	33.0422	634.78	0.0000
283.69	22.3526	413.71	24.5484	635.95	11.4111
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	26.8522	423.72	0.0000	645.85	11.4516
285.90	0.0000	427.09	32.2266	657.76	18.3993
287.50	33.8582	427.87	32.2382	657.90	0.0000
290.67	34.7235	433.94	26.9424	661.66	20.3728
293.27	0.0000	439.40	28.0921	664.57	0.0000
351.93	31.5192	453.88	17.9472	666.33	0.0000
295.96	31.5333	463.37	27.3097	666.50	0.0000
879.38	36.0959	468.07	19.7043	667.71	0.0000
299.98	28.6003	473.00	0.0000	677.62	20.4851
300.09	28.6021	475.06	18.6674	685.70	0.0000
300.13	28.6032	476.78	15.3848	695.00	0.0000
301.36	36.1567	477.60	26.3833	696.49	19.7200
302.85	24.1265	482.18	16.5228	696.51	19.7200
256.23	37.7350	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	20.6219
306.78	31.2371	497.08	24.9442	697.49	17.9333
308.46	34.2947	505.52	18.3581	702.65	21.5574
311.90	29.3109	507.63	0.0000	706.68	18.8877
316.51	28.3771	511.00	17.8428	711.68	18.0182
319.41	0.0000	514.00	17.8652	720.70	0.0000
320.08	0.0000	514.00	17.8652	721.93	0.0000
321.04	29.4685	520.40	16.7932	722.78	17.3602
323.87	33.5881	520.69	0.0000	722.91	17.3613
325.23	42.7819	522.65	0.0000	723.31	20.2576
328.76	0.0000	527.90	0.0000	724.19	17.3684
333.37	27.6306	528.26	16.8475	727.33	13.0395
333.97	20.4740	529.59	19.1042	733.00	3.6288
334.37	33.7896	529.87	0.0000	735.93	11.6230
338.28	31.8117	531.02	0.0000	333.97	11.6289
338.32	31.8123	537.26	0.0000	739.50	0.0000
311.90	32.3645	546.56	0.0000	747.24	17.3156
340.48	32.3645	552.55	23.8190	748.06	18.2312
340.55	0.0000	563.25	14.8070	752.31	19.1690
344.28	42.0078	569.33	20.5503	753.82	0.0000
345.93	36.0695	946.00	23.9771	756.73	17.3678
351.06	27.9031	569.70	23.9788	756.80	17.3678
351.93	24.8145	583.19	18.3646	884.68	17.4066

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	17.4171	1274.44	12.7183	1620.50	3.3481
766.42	16.5037	1001.03	13.7133	1621.92	4.4653
766.84	16.5059	1002.74	11.7594	1678.03	0.0000
772.60	0.0000	1004.73	9.8044	1690.97	2.7114
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	4.5752
778.90	19.3286	1028.54	0.0000	1063.66	3.0529
783.70	0.0000	1037.84	10.8751	1771.35	10.0767
785.37	17.7070	1038.76	0.0000	1791.20	0.0000
792.07	15.7103	631.29	12.6820	1808.65	0.9216
794.95	9.2496	1048.07	0.0000	1810.72	0.0000
795.86	4.6260	1049.04	12.6898	1836.06	0.0000
810.06	19.5125	1050.41	12.6945		
810.29	19.5138	1063.66	18.9049		
344.28	17.6565	1077.00	0.0000		
810.76	14.8701	1077.34	6.9880		
815.77	0.0000	1085.87	12.0037		
1048.07	0.0000	1093.63	11.0242		
832.01	18.7048	1099.45	14.0504		
834.85	14.0405	1112.07	7.0461		
835.71	14.9800	1112.84	9.2048		
836.80	0.0000	1115.54	8.0596		
846.75	0.0000	1120.29	8.0684		
846.77	12.0227	1120.55	8.0688		
856.80	0.0000	1221.41	8.0703		
860.56	7.5442	1129.67	8.0859		
871.09	17.9714	1131.51	0.0000		
873.19	15.1426	1147.95	0.0000		
875.33	0.0000	1173.23	13.2722		
879.38	8.5328	1177.95	15.3305		
880.51	16.1222	1189.05	6.1476		
883.24	8.5419	1204.77	11.3102		
884.68	13.2929	1221.41	13.4158		
889.28	11.4086	1231.02	11.3753		
894.76	7.6174	1235.36	0.0000		
898.04	16.7734	1238.28	8.2861		
900.72	15.2598	1260.41	0.0000		
903.28	15.2705	1271.87	4.1731		
911.20	13.3912	1274.44	13.5697		
912.08	13.3942	1274.54	15.6583		
923.98	0.0000	1291.59	8.3813		
926.50	9.6051	1298.22	0.0000		
929.11	20.1848	1312.11	0.0000		
937.49	18.3036	1332.49	5.2829		
944.13	0.0000	1362.66	0.0000		
946.00	8.6899	1365.19	2.1273		
949.00	11.5957	1368.63	0.0000		
667.71	0.0000	1384.29	4.2710		
962.31	15.5156	1408.01	5.3638		
964.08	13.9707	1457.56	0.0000		
966.17	23.2969	1460.82	3.2514		
911.20	21.3716	1489.16	6.5380		
968.97	21.3716	1505.03	6.5574		
983.53	0.0000	1584.12	3.3265		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                 *
*                               Charleston, SC 29407                            *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235052.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM44.CNF;111
Background date : 2-OCT-2016 11:02:28.
Sample date     : 7-DEC-2015 13:11:00. Acquisition date : 3-OCT-2016 07:04:59.
Sample ID      : G405235052           Sample quantity  : 1.65245E+02 GRAM
Detector name  : GAM44                Detector geometry: CAN
Elapsed live time: 0 01:00:00.00      Elapsed real time: 0 01:00:00.77  0.0%
Energy tolerance : 1.50000 keV        Analyst Initials  : MXR1
Abundance limit : 75.00000            Sensitivity       : 3.00000
Batch ID       : 1596252              Detector SN#      :
Matrix Spike ID :                      LCS ID           : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	74.84	80	118	0.93	150.13	143	18	2.23E-02	23.8	8.91E-01
2	1	77.17*	136	109	1.06	154.81	143	18	3.78E-02	15.2	
3	0	87.28	49	140	1.47	175.02	172	7	1.35E-02	43.0	
4	2	89.95	44	78	1.04	180.38	178	15	1.22E-02	30.6	1.63E+00
5	2	92.79*	63	116	1.21	186.05	178	15	1.76E-02	33.0	
6	0	143.99	28	88	1.00	288.49	285	7	7.76E-03	59.1	
7	6	183.84*	13	47	1.51	368.22	366	17	3.67E-03	85.7	1.34E+00
8	6	185.83*	38	74	1.39	372.21	366	17	1.06E-02	47.0	
9	0	227.79	17	78	1.51	456.15	451	8	4.68E-03	94.9	
10	5	238.68*	329	79	1.20	477.95	473	28	9.14E-02	7.1	9.25E-01
11	5	241.86	87	80	1.54	484.31	473	28	2.42E-02	22.9	
12	0	255.61	10	66	1.29	511.82	507	8	2.87E-03	139.5	
13	0	270.60	32	40	1.30	541.82	539	6	8.93E-03	35.8	
14	0	295.22	125	55	1.20	591.09	585	11	3.47E-02	14.6	
15	0	300.90	17	42	0.98	602.44	599	7	4.81E-03	68.8	
16	0	328.45	48	51	1.10	657.58	653	11	1.34E-02	32.3	
17	0	339.15	88	84	1.24	678.98	673	13	2.45E-02	24.5	
18	0	351.95*	231	97	1.33	704.59	697	16	6.41E-02	11.7	
19	0	372.61	25	49	4.02	745.94	739	14	6.94E-03	62.7	
20	0	511.08*	38	43	2.59	1023.01	1015	16	1.06E-02	47.9	
21	0	517.16	24	22	1.39	1035.19	1030	9	6.55E-03	41.7	
22	0	583.31*	74	51	1.26	1167.56	1162	13	2.04E-02	23.3	
23	0	609.48*	134	40	1.82	1219.93	1214	11	3.72E-02	12.2	
24	0	661.81	50	19	1.00	1324.65	1321	8	1.38E-02	21.1	
25	0	676.17	10	25	0.53	1353.40	1346	13	2.75E-03	110.4	
26	0	728.23	15	39	0.67	1457.57	1449	12	4.26E-03	85.3	
27	0	755.54	16	13	0.86	1512.22	1505	11	4.36E-03	52.1	
28	0	760.26	15	9	0.52	1521.68	1516	12	4.09E-03	48.6	
29	0	768.70	22	6	2.08	1538.58	1535	8	6.03E-03	29.1	
30	0	873.29	17	21	4.16	1747.89	1737	18	4.71E-03	69.6	
31	0	911.29*	71	18	1.68	1823.94	1819	10	1.97E-02	16.5	
32	4	964.88	27	8	2.64	1931.20	1925	19	7.36E-03	31.6	6.84E-01
33	4	969.04*	36	11	1.77	1939.53	1925	19	9.96E-03	23.4	
34	0	1033.95	9	14	0.82	2069.46	2062	11	2.57E-03	84.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1120.27	57	8	1.45	2242.23	2235	15	1.57E-02	17.0	
36	0	1238.15	40	0	0.82	2478.18	2471	16	1.11E-02	15.8	
37	0	1277.10	11	1	0.84	2556.16	2553	6	2.93E-03	35.8	
38	0	1308.72	11	4	1.33	2619.44	2614	9	2.96E-03	47.0	
39	0	1343.50	13	0	1.00	2689.08	2683	12	3.61E-03	27.7	
40	0	1460.79*	351	7	2.14	2923.88	2917	14	9.76E-02	5.6	
41	0	1765.23	19	7	0.91	3533.38	3525	12	5.31E-03	34.7	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235052.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 7-DEC-2015 13:11:00   Acquisition date  : 3-OCT-2016 07:04:59
Sample ID        : G405235052             Sample quantity  : 165.24 GRAM
Sample type      : SOLID                   Sample geometry  :
Detector name    : GAMMA44                Detector geometry: CAN
Elapsed live time: 0 01:00:00.00          Elapsed real time: 0 01:00:00.77   0.0%
Energy tolerance : 1.50 keV               Half life ratio  : 10.00
Errors propagated: No                     Systematic Error : 0.00 %
Efficiency type  : Linear                  Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.030E+00	1.416E+01	1.416E+01	11.24	OK
CD-109	88.03	3.70*	4.461E+00	9.321E-01	1.465E+00	168.44	OK
SN-126	64.28	9.60	2.161E+00	----- Line	Not Found	-----	Absent
	86.94	8.90	4.461E+00	3.875E-01	3.875E-01	168.44	OK
	87.57	37.00*	4.461E+00	9.321E-02	9.321E-02	168.44	OK
BA-137M	661.66	89.90*	1.965E+00	1.373E-01	1.399E-01	42.18	OK
CS-137	661.66	85.10*	1.965E+00	1.450E-01	1.478E-01	42.18	OK
CE-141	145.44	48.29*	5.917E+00	3.792E-02	2.311E+01	181.44	OK
TL-208	277.37	6.60	4.074E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.178E+00	1.978E-01	1.978E-01	46.53	OK
	860.56	12.50	1.592E+00	----- Line	Not Found	-----	Absent
BI-211	72.87	1.23	3.135E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.336E+00	2.268E-01	2.268E-01	442.79	OK
PB-212	74.82	10.28	3.342E+00	9.186E-01	9.186E-01	77.05	OK
	77.11	17.10	3.578E+00	1.376E+00	1.376E+00	30.45	OK
	238.63	43.60*	4.585E+00	9.072E-01	9.072E-01	14.24	OK
	300.09	3.30	3.810E+00	7.400E-01	7.400E-01	137.50	OK
BI-214	609.32	45.49*	2.101E+00	6.925E-01	6.928E-01	24.32	OK
	1120.29	14.92	1.288E+00	1.348E+00	1.348E+00	33.98	OK
	1764.49	15.30	8.670E-01	6.211E-01	6.214E-01	69.40	OK
PB-214	74.82	5.80	3.340E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.578E+00	2.426E+00	2.427E+00	30.45	OK
	87.09	3.41	4.447E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.538E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.870E+00	9.441E-01	9.444E-01	29.12	OK
	351.93	35.60*	3.336E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.101E+00	6.925E-01	6.928E-01	24.32	OK
	1120.29	14.92	1.288E+00	1.348E+00	1.348E+00	33.98	OK
	1764.49	15.30	8.670E-01	6.211E-01	6.214E-01	69.40	OK
RA-224	240.99	4.10*	4.540E+00	9.091E-01	9.091E-01	140.33	OK
RA-226	609.32	45.49*	2.101E+00	6.925E-01	6.928E-01	24.32	OK
	1120.29	14.92	1.288E+00	1.348E+00	1.348E+00	33.98	OK
	1764.49	15.30	8.670E-01	6.211E-01	6.214E-01	69.40	OK
AC-228	105.21	1.10	5.460E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.443E+00	1.207E+00	1.207E+00	48.95	OK
	794.95	4.25	1.696E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.630E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.521E+00	8.518E-01	8.518E-01	33.07	OK
	968.97	15.80	1.448E+00	7.324E-01	7.324E-01	46.79	OK
RA-228	105.21	1.10	5.460E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.443E+00	1.207E+00	1.207E+00	48.95	OK
	794.95	4.25	1.696E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.630E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.521E+00	8.518E-01	8.518E-01	33.07	OK
	968.97	15.80	1.448E+00	7.324E-01	7.324E-01	46.79	OK
TH-228	74.82	10.28	3.342E+00	9.186E-01	9.186E-01	77.05	OK
	77.11	17.10	3.578E+00	1.376E+00	1.376E+00	30.45	OK
	238.63	43.60*	4.585E+00	9.072E-01	9.072E-01	14.24	OK
	300.09	3.30	3.810E+00	7.400E-01	7.400E-01	137.50	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	609.32	45.49*	2.101E+00	6.925E-01	6.925E-01	24.32	OK
	1120.29	14.92	1.288E+00	1.348E+00	1.348E+00	33.98	OK
	1764.49	15.30	8.670E-01	6.211E-01	6.211E-01	69.40	OK
PA-231	283.69	1.70	4.000E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.810E+00	4.565E-01	4.565E-01	137.50	OK
TH-232	105.21	1.10	5.460E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.443E+00	1.207E+00	1.207E+00	48.95	OK
	835.71	1.61	1.630E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.521E+00	8.518E-01	8.518E-01	33.07	OK
U-234	968.97	15.80	1.448E+00	7.324E-01	7.324E-01	46.79	OK
	609.32	45.49*	2.101E+00	6.925E-01	6.925E-01	24.32	OK
	1120.29	14.92	1.288E+00	1.348E+00	1.348E+00	33.98	OK
U-235	1764.49	15.30	8.670E-01	6.211E-01	6.211E-01	69.40	OK
	89.96	3.47	4.655E+00	1.664E+00	1.664E+00	61.21	OK
	93.35	5.60	4.842E+00	1.422E+00	1.422E+00	66.02	OK
AM-243	143.76	10.96*	5.918E+00	----- Line	Not Found	-----	<<INT Reject
	163.33	5.08	5.731E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.405E+00	7.020E-02	7.020E-02	94.05	OK
	205.31	5.01	5.095E+00	----- Line	Not Found	-----	Absent
	43.53	5.90	1.573E-01	----- Line	Not Found	-----	Absent
ANH-511	74.66	67.20*	3.342E+00	1.405E-01	1.405E-01	77.05	OK
	511.00	100.00*	2.430E+00	7.973E-02	7.973E-02	95.89	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235052.CNF;1
* Acquisition date   : 3-OCT-2016 07:04:59 Sensitivity      : 3.000
* Detector ID       : GAM44 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.77 Half life ratio : *****
* Sample date       : 7-DEC-2015 13:11:00 Analyst initials: MXR1
* Sample ID         : G405235052 Sample Quantity : 1.6524E+02 GRAM
* Batch Number      : 1596252 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date    : 6-SEP-2016 04:59:25 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM44_CAN.CNF;3
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.416E+01	1.560E+00	5.992E-01
CD-109	1.465E+00	2.418E+00	1.864E+00
SN-126	9.321E-02	1.539E-01	1.417E-01
BA-137M	1.399E-01	5.784E-02	5.965E-02
CS-137	1.478E-01	6.110E-02	6.301E-02
CE-141	2.311E+01	4.110E+01	4.062E+01
TL-208	1.978E-01	9.018E-02	6.347E-02
BI-211	2.268E-01	9.842E-01	3.315E-01
PB-212	9.072E-01	1.266E-01	8.443E-02
BI-214	6.928E-01	1.651E-01	1.308E-01
PB-214	1.027E+00	2.346E-01	3.187E-01
RN-222	6.928E-01	1.651E-01	1.308E-01
RA-224	9.091E-01	1.250E+00	9.052E-01
RA-226	6.928E-01	1.651E-01	1.308E-01
AC-228	8.518E-01	2.761E-01	2.468E-01
RA-228	8.518E-01	2.761E-01	2.468E-01
TH-228	9.072E-01	1.266E-01	8.443E-02
TH-230	6.925E-01	1.651E-01	1.307E-01
PA-231	4.565E-01	6.151E-01	6.774E-01
TH-232	8.518E-01	2.761E-01	2.468E-01
U-234	6.925E-01	1.651E-01	1.307E-01
U-235	2.505E-01	2.900E-01	3.374E-01
AM-243	1.405E-01	1.061E-01	9.419E-02
ANH-511	7.973E-02	7.492E-02	4.675E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	5.078E+00	1.179E+01	2.446E+01	NOT IDENT.
NA-22	-4.709E-04	4.743E-02	8.435E-02	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	2.565E-03	3.326E-02	7.052E-02	NOT IDENT.
SC-46	-1.242E-01	3.861E-01	7.500E-01	FAIL ABUN
V-48	0.000E+00	1.297E+04	0.000E+00	SHORT HLIF

CR-51	0.000E+00	3.780E+02	0.000E+00	SHORT HLIF
MN-54	-1.868E-02	6.175E-02	1.118E-01	NOT IDENT.
CO-56	-2.089E-01	4.671E-01	8.216E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	2.319E-02	4.537E-02	9.129E-02	NOT IDENT.
CO-58	-6.565E-02	6.036E-01	1.133E+00	NOT IDENT.
FE-59	-1.102E+00	6.391E+00	1.258E+01	NOT IDENT.
CO-60	6.926E-03	3.033E-02	6.734E-02	NOT IDENT.
ZN-65	-1.140E-01	1.891E-01	2.862E-01	NOT IDENT.
GE-68	-1.309E-02	2.177E+00	4.422E+00	NOT IDENT.
AS-73	-1.359E+00	1.371E+01	2.782E+01	NOT IDENT.
AS-74	0.000E+00	5.435E+03	0.000E+00	SHORT HLIF
SE-75	-2.272E-02	1.935E-01	3.516E-01	NOT IDENT.
BR-77	0.000E+00	2.976E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.557E+02	0.000E+00	SHORT HLIF
RB-83	-5.029E-01	6.740E-01	1.019E+00	NOT IDENT.
KR-85	8.711E+00	5.855E+00	1.240E+01	NOT IDENT.
SR-85	9.287E-01	6.245E-01	1.323E+00	NOT IDENT.
RB-86	0.000E+00	2.684E+04	0.000E+00	SHORT HLIF
Y-88	3.866E-03	1.022E-01	2.863E-01	NOT IDENT.
Y-91	-2.922E+01	5.285E+02	1.040E+03	NOT IDENT.
NB-94	9.007E-03	3.567E-02	6.959E-02	NOT IDENT.
NB-95	7.526E-01	6.721E-01	1.424E+00	NOT IDENT.
NB-95M	-5.399E-01	2.510E+00	4.127E+00	NOT IDENT.
ZR-95	2.042E+00	2.086E+00	2.693E+00	FAIL ABUN
NB-97	0.000E+00	1.736E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	2.173E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-2.063E-02	3.034E-02	5.514E-02	NOT IDENT.
RH-102	-6.334E-03	4.881E-02	9.485E-02	NOT IDENT.
RU-103	2.050E+00	5.283E+00	1.098E+01	FAIL ABUN
RH-106	-2.491E-01	4.662E-01	8.376E-01	NOT IDENT.
RU-106	-2.491E-01	4.662E-01	8.376E-01	NOT IDENT.
AG-108M	1.034E-05	2.625E-02	5.205E-02	NOT IDENT.
AG-110M	-7.645E-02	9.590E-02	1.727E-01	FAIL ABUN
SN-113	2.238E-01	2.040E-01	4.546E-01	NOT IDENT.
CD-115	0.000E+00	3.639E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	9.785E+04	0.000E+00	SHORT HLIF
TE-123M	-4.514E-02	1.313E-01	2.409E-01	NOT IDENT.
SB-124	-6.261E-02	1.386E+00	3.156E+00	NOT IDENT.
SB-125	-3.326E-02	9.688E-02	1.847E-01	NOT IDENT.
TE-125M	2.643E+01	2.573E+02	5.068E+02	NOT IDENT.
I-126	0.000E+00	9.732E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.238E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	2.248E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	4.380E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	8.165E+26	0.000E+00	SHORT HLIF
BA-133	1.889E-02	3.694E-02	7.206E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	6.979E-03	4.658E-02	9.184E-02	NOT IDENT.
CS-135	8.429E-03	1.271E-01	2.356E-01	NOT IDENT.
I-135	0.000E+00	1.494E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.098E+05	0.000E+00	SHORT HLIF
CE-139	-3.729E-03	1.039E-01	1.957E-01	NOT IDENT.
BA-140	0.000E+00	1.322E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	3.814E+05	0.000E+00	SHORT HLIF
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	-8.229E-02	3.166E-01	5.963E-01	NOT IDENT.
PM-144	-2.043E-02	5.660E-02	1.027E-01	NOT IDENT.
PR-144	-1.746E+00	4.924E+00	8.941E+00	NOT IDENT.
PM-146	-9.611E-03	3.967E-02	7.647E-02	NOT IDENT.
ND-147	0.000E+00	3.374E+07	0.000E+00	SHORT HLIF
PM-147	3.370E+02	7.818E+02	1.566E+03	NOT IDENT.
PM-149	0.000E+00	5.844E+40	0.000E+00	SHORT HLIF
EU-150	-1.239E-02	2.869E-02	4.416E-02	FAIL ABUN
EU-152	-2.530E-02	8.774E-02	1.527E-01	FAIL ABUN
GD-153	5.218E-02	1.667E-01	3.151E-01	NOT IDENT.
EU-154	-3.556E-03	1.157E-01	2.048E-01	FAIL ABUN
EU-155	5.619E-02	1.017E-01	2.077E-01	FAIL ABUN
TB-160	6.498E-01	2.117E+00	4.179E+00	FAIL ABUN
HO-166M	-2.757E-03	5.332E-02	1.024E-01	FAIL ABUN
TM-171	-2.908E+00	3.255E+01	6.632E+01	NOT IDENT.
HF-172	1.615E-01	2.086E-01	4.286E-01	NOT IDENT.
LU-172	-3.505E-02	6.371E-02	1.177E-01	FAIL ABUN
LU-176	1.238E-02	2.034E-02	4.360E-02	FAIL ABUN
HF-181	-5.949E-01	3.582E+00	7.025E+00	NOT IDENT.

TA-182	-9.336E-01	1.067E+00	1.808E+00	FAIL ABUN
RE-183	-9.267E-01	3.633E+00	7.315E+00	NOT IDENT.
RE-184	1.339E+01	3.005E+01	6.483E+01	NOT IDENT.
W-188	-1.392E+02	1.004E+02	1.479E+02	FAIL ABUN
IR-192	-1.763E-01	3.991E-01	7.722E-01	FAIL ABUN
HG-203	4.008E-01	2.127E+00	4.375E+00	NOT IDENT.
BI-207	-4.335E-02	4.505E-02	7.599E-02	FAIL ABUN
PB-210	1.292E+00	6.720E+00	1.422E+01	NOT IDENT.
PB-211	-4.806E-01	6.684E-01	1.221E+00	NOT IDENT.
BI-212	6.115E-01	1.023E+00	1.225E+00	FAIL ABUN
RN-219	2.462E-01	3.367E-01	7.241E-01	FAIL ABUN
RA-223	-5.160E-02	5.894E-01	1.054E+00	FAIL ABUN
AC-227	1.368E-01	3.743E-01	3.983E-01	FAIL ABUN
TH-227	1.368E-01	3.743E-01	3.983E-01	FAIL ABUN
TH-229	1.215E-01	3.985E-01	7.721E-01	FAIL ABUN
TH-231	-5.160E-02	5.894E-01	1.054E+00	FAIL ABUN
PA-233	2.694E-02	5.046E-02	1.073E-01	FAIL ABUN
PA-234	-1.333E-01	2.619E-01	4.925E-01	NOT IDENT.
PA-234M	2.979E+00	3.777E+00	8.571E+00	NOT IDENT.
TH-234	2.685E-01	1.471E+00	3.000E+00	FAIL ABUN
NP-237	2.694E-02	5.046E-02	1.073E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
U-238	2.685E-01	1.471E+00	3.000E+00	FAIL ABUN
NP-239	-1.431E-02	2.103E-01	4.082E-01	FAIL ABUN
PU-239	2.114E+02	2.728E+02	5.600E+02	NOT IDENT.
AM-241	6.150E-02	1.657E-01	3.488E-01	NOT IDENT.
CM-243	-4.899E-02	9.466E-02	1.777E-01	FAIL ABUN
BK-247	-3.478E-02	6.913E-02	1.195E-01	NOT IDENT.
CM-247	1.793E-02	3.227E-02	6.780E-02	NOT IDENT.
CF-249	-6.726E-03	3.109E-02	6.101E-02	NOT IDENT.
CF-251	-1.197E-02	1.045E-01	1.949E-01	FAIL ABUN

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	342	10.66*	1.030E+00	1.416E+01	1.416E+01	11.24
CD-109	88.03	65	3.70*	4.461E+00	1.802E+00	2.832E+00	85.98
SN-126	64.28	-----	9.60	2.161E+00	-----	Line Not Found	-----
	86.94	65	8.90	4.461E+00	7.492E-01	7.492E-01	85.98
	87.57	65	37.00*	4.461E+00	1.802E-01	1.802E-01	85.98
BA-137M	661.66	53	89.90*	1.965E+00	1.373E-01	1.399E-01	42.18
CS-137	661.66	53	85.10*	1.965E+00	1.450E-01	1.478E-01	42.18
CE-141	145.44	36	48.29*	5.917E+00	5.686E-02	3.466E+01	118.12
TL-208	277.37	-----	6.60	4.074E+00	-----	Line Not Found	-----
	583.19	81	85.00*	2.178E+00	1.978E-01	1.978E-01	46.53
	860.56	-----	12.50	1.592E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	3.135E+00	-----	Line Not Found	-----
	351.06	268	12.92*	3.336E+00	2.828E+00	2.828E+00	23.31
PB-212	74.82	110	10.28	3.342E+00	1.451E+00	1.451E+00	47.59
	77.11	185	17.10	3.578E+00	1.376E+00	1.376E+00	30.45
	238.63	399	43.60*	4.585E+00	9.072E-01	9.072E-01	14.24
	300.09	20	3.30	3.810E+00	7.400E-01	7.400E-01	137.50
BI-214	609.32	146	45.49*	2.101E+00	6.925E-01	6.928E-01	24.32
	1120.29	57	14.92	1.288E+00	1.348E+00	1.348E+00	33.98
	1764.49	18	15.30	8.670E-01	6.211E-01	6.214E-01	69.40
PB-214	74.82	110	5.80	3.342E+00	2.572E+00	2.573E+00	47.59
	77.11	185	9.70	3.578E+00	2.426E+00	2.427E+00	30.45
	87.09	65	3.41	4.461E+00	1.956E+00	1.956E+00	85.98
	242.00	106	7.25	4.540E+00	1.458E+00	1.459E+00	45.74
	295.22	148	18.42	3.870E+00	9.441E-01	9.444E-01	29.12
	351.93	268	35.60*	3.336E+00	1.026E+00	1.027E+00	23.31
RN-222	609.32	146	45.49*	2.101E+00	6.925E-01	6.928E-01	24.32
	1120.29	57	14.92	1.288E+00	1.348E+00	1.348E+00	33.98
	1764.49	18	15.30	8.670E-01	6.211E-01	6.214E-01	69.40
RA-224	240.99	106	4.10*	4.540E+00	2.579E+00	2.579E+00	45.74
RA-226	609.32	146	45.49*	2.101E+00	6.925E-01	6.928E-01	24.32
	1120.29	57	14.92	1.288E+00	1.348E+00	1.348E+00	33.98
	1764.49	18	15.30	8.670E-01	6.211E-01	6.214E-01	69.40
AC-228	105.21	-----	1.10	5.460E+00	-----	Line Not Found	-----
	338.32	103	11.27	3.443E+00	1.207E+00	1.207E+00	48.95
	794.95	-----	4.25	1.696E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.630E+00	-----	Line Not Found	-----
	911.20	74	25.80*	1.521E+00	8.518E-01	8.518E-01	33.07
	968.97	37	15.80	1.448E+00	7.324E-01	7.324E-01	46.79
RA-228	105.21	-----	1.10	5.460E+00	-----	Line Not Found	-----
	338.32	103	11.27	3.443E+00	1.207E+00	1.207E+00	48.95
	794.95	-----	4.25	1.696E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.630E+00	-----	Line Not Found	-----
	911.20	74	25.80*	1.521E+00	8.518E-01	8.518E-01	33.07
	968.97	37	15.80	1.448E+00	7.324E-01	7.324E-01	46.79
TH-228	74.82	110	10.28	3.342E+00	1.451E+00	1.451E+00	47.59
	77.11	185	17.10	3.578E+00	1.376E+00	1.376E+00	30.45

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	238.63	399	43.60*	4.585E+00	9.072E-01	9.072E-01	14.24
	300.09	20	3.30	3.810E+00	7.400E-01	7.400E-01	137.50
TH-230	609.32	146	45.49*	2.101E+00	6.925E-01	6.925E-01	24.32
	1120.29	57	14.92	1.288E+00	1.348E+00	1.348E+00	33.98
	1764.49	18	15.30	8.670E-01	6.211E-01	6.211E-01	69.40
PA-231	283.69	-----	1.70	4.000E+00	-----	Line Not Found	-----
	301.36	20	5.35*	3.810E+00	4.565E-01	4.565E-01	137.50
TH-232	105.21	-----	1.10	5.460E+00	-----	Line Not Found	-----
	338.32	103	11.27	3.443E+00	1.207E+00	1.207E+00	48.95
	835.71	-----	1.61	1.630E+00	-----	Line Not Found	-----
	911.20	74	25.80*	1.521E+00	8.518E-01	8.518E-01	33.07
	968.97	37	15.80	1.448E+00	7.324E-01	7.324E-01	46.79
U-234	609.32	146	45.49*	2.101E+00	6.925E-01	6.925E-01	24.32
	1120.29	57	14.92	1.288E+00	1.348E+00	1.348E+00	33.98
	1764.49	18	15.30	8.670E-01	6.211E-01	6.211E-01	69.40
U-235	89.96	59	3.47	4.655E+00	1.664E+00	1.664E+00	61.21
	93.35	85	5.60	4.842E+00	1.422E+00	1.422E+00	66.02
	143.76	36	10.96*	5.917E+00	2.505E-01	2.505E-01	118.12
	163.33	-----	5.08	5.731E+00	-----	Line Not Found	-----
	185.72	48	57.20	5.405E+00	7.020E-02	7.020E-02	94.05
	205.31	-----	5.01	5.095E+00	-----	Line Not Found	-----
AM-243	43.53	-----	5.90	1.573E-01	-----	Line Not Found	-----
	74.66	110	67.20*	3.342E+00	2.220E-01	2.220E-01	47.59
ANH-511	511.00	43	100.00*	2.430E+00	7.973E-02	7.973E-02	95.89

Flag: "*" = Keyline

Total number of lines in spectrum 41
 Number of unidentified lines 7
 Number of lines tentatively identified by NID 34 82.93%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.416E+01	1.416E+01	0.159E+01	11.24	
CD-109	461.40D	1.57	1.802E+00	2.832E+00	2.435E+00	85.98	
SN-126	2.30E+05Y	1.00	1.802E-01	1.802E-01	1.550E-01	85.98	
BA-137M	30.08Y	1.02	1.373E-01	1.399E-01	0.590E-01	42.18	
CS-137	30.08Y	1.02	1.450E-01	1.478E-01	0.623E-01	42.18	
CE-141	32.51D	610.	5.686E-02	3.466E+01	4.094E+01	118.12	
TL-208	1.41E+10Y	1.00	1.978E-01	1.978E-01	0.920E-01	46.53	
BI-211	7.04E+08Y	1.00	2.828E+00	2.828E+00	0.659E+00	23.31	
PB-212	1.41E+10Y	1.00	9.072E-01	9.072E-01	1.292E-01	14.24	
BI-214	1600.00Y	1.00	6.925E-01	6.928E-01	1.685E-01	24.32	
PB-214	1600.00Y	1.00	1.026E+00	1.027E+00	0.239E+00	23.31	
RN-222	1600.00Y	1.00	6.925E-01	6.928E-01	1.685E-01	24.32	
RA-224	1.41E+10Y	1.00	2.579E+00	2.579E+00	1.179E+00	45.74	
RA-226	1600.00Y	1.00	6.925E-01	6.928E-01	1.685E-01	24.32	
AC-228	1.41E+10Y	1.00	8.518E-01	8.518E-01	2.817E-01	33.07	
RA-228	1.41E+10Y	1.00	8.518E-01	8.518E-01	2.817E-01	33.07	
TH-228	1.41E+10Y	1.00	9.072E-01	9.072E-01	1.292E-01	14.24	
TH-230	7.54E+04Y	1.00	6.925E-01	6.925E-01	1.684E-01	24.32	
PA-231	7.04E+08Y	1.00	4.565E-01	4.565E-01	6.276E-01	137.50	
TH-232	1.41E+10Y	1.00	8.518E-01	8.518E-01	2.817E-01	33.07	
U-234	2.45E+05Y	1.00	6.925E-01	6.925E-01	1.684E-01	24.32	
U-235	7.04E+08Y	1.00	2.505E-01	2.505E-01	2.959E-01	118.12	
AM-243	7370.00Y	1.00	2.220E-01	2.220E-01	1.057E-01	47.59	
ANH-511	1.00E+09Y	1.00	7.973E-02	7.973E-02	7.645E-02	95.89	
Total Activity :			3.195E+01	6.759E+01			

Grand Total Activity : 3.195E+01 6.759E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
6	183.84	17	59	1.51	368.22	366	17	3.67E-03	****	5.44E+00	T
0	227.79	21	95	1.51	456.15	451	8	4.68E-03	****	4.75E+00	T
0	255.61	12	79	1.29	511.82	507	8	2.87E-03	****	4.35E+00	T
0	270.60	38	48	1.30	541.82	539	6	8.93E-03	71.7	4.16E+00	T
0	328.45	56	59	1.10	657.58	653	11	1.34E-02	64.6	3.54E+00	T
0	372.61	29	57	4.02	745.94	739	14	6.94E-03	****	3.18E+00	T
0	517.16	26	25	1.39	1035.19	1030	9	6.55E-03	83.4	2.41E+00	
0	676.17	11	27	0.53	1353.40	1346	13	2.75E-03	****	1.93E+00	T
0	728.23	16	41	0.67	1457.57	1449	12	4.26E-03	****	1.82E+00	T
0	755.54	17	14	0.86	1512.22	1505	11	4.36E-03	****	1.77E+00	T
0	760.26	16	10	0.52	1521.68	1516	12	4.09E-03	97.1	1.76E+00	
0	768.70	23	7	2.08	1538.58	1535	8	6.03E-03	58.3	1.74E+00	
0	873.29	18	22	4.16	1747.89	1737	18	4.71E-03	****	1.57E+00	T
4	964.88	27	9	2.64	1931.20	1925	19	7.36E-03	63.1	1.45E+00	T
0	1033.95	9	14	0.82	2069.46	2062	11	2.57E-03	****	1.37E+00	
0	1238.15	40	0	0.82	2478.18	2471	16	1.11E-02	31.6	1.19E+00	T
0	1277.10	10	1	0.84	2556.16	2553	6	2.93E-03	71.6	1.16E+00	
0	1308.72	11	4	1.33	2619.44	2614	9	2.96E-03	94.0	1.13E+00	
0	1343.50	13	0	1.00	2689.08	2683	12	3.61E-03	55.5	1.11E+00	

Flags: "T" = Tentatively associated

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235052.CNF;1
* Acquisition date   : 3-OCT-2016 07:04:59 Sensitivity      : 3.000
* Detector ID       : GAM44 Energy tolerance: 1.500
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time: 0 01:00:00.77 Half life ratio : *****
* Sample date       : 7-DEC-2015 13:11:00 Nuclide Library : SOLID
* Sample ID         : G405235052 Analyst initials: MXR1
* Batch Number      : 1596252 Sample Quantity : 1.6524E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 6-SEP-2016 04:59:25 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM44_CAN.CNF;3
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.430E-01
CD-109	8.690E-01
SN-126	6.680E-02
BA-137M	2.616E-02
CS-137	2.763E-02
CE-141	1.890E+01
TL-208	2.829E-02
BI-211	1.508E-01
PB-212	3.894E-02
BI-214	5.873E-02
PB-214	1.540E-01
RN-222	5.873E-02
RA-224	4.176E-01
RA-226	5.873E-02
AC-228	1.074E-01
RA-228	1.074E-01
TH-228	3.894E-02
TH-230	5.871E-02
PA-231	3.068E-01
TH-232	1.074E-01
U-234	5.871E-02
U-235	1.585E-01
AM-243	4.408E-02
ANH-511	2.074E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.103E+01	NOT IDENT.
NA-22	3.546E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.796E-02	NOT IDENT.
SC-46	3.261E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF

MN-54	4.837E-02	NOT IDENT.
CO-56	3.526E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	4.279E-02	NOT IDENT.
CO-58	4.946E-01	NOT IDENT.
FE-59	5.373E+00	NOT IDENT.
CO-60	2.744E-02	NOT IDENT.
ZN-65	1.206E-01	NOT IDENT.
GE-68	1.895E+00	NOT IDENT.
AS-73	1.295E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.609E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.426E-01	NOT IDENT.
KR-85	5.558E+00	NOT IDENT.
SR-85	5.928E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	9.051E-02	NOT IDENT.
Y-91	4.502E+02	NOT IDENT.
NB-94	3.140E-02	NOT IDENT.
NB-95	6.180E-01	NOT IDENT.
NB-95M	1.916E+00	NOT IDENT.
ZR-95	1.175E+00	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.561E-02	NOT IDENT.
RH-102	4.093E-02	NOT IDENT.
RU-103	4.916E+00	FAIL ABUN
RH-106	3.644E-01	NOT IDENT.
RU-106	3.644E-01	NOT IDENT.
AG-108M	2.347E-02	NOT IDENT.
AG-110M	7.350E-02	FAIL ABUN
SN-113	2.074E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.126E-01	NOT IDENT.
SB-124	1.118E+00	NOT IDENT.
SB-125	8.296E-02	NOT IDENT.
TE-125M	2.367E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.270E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	4.017E-02	NOT IDENT.
CS-135	1.081E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	9.125E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-143	0.000E+00	SHORT HLIF
CE-144	2.772E-01	NOT IDENT.
PM-144	4.534E-02	NOT IDENT.
PR-144	3.948E+00	NOT IDENT.
PM-146	3.415E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.332E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.011E-02	FAIL ABUN
EU-152	6.889E-02	FAIL ABUN
GD-153	1.468E-01	NOT IDENT.
EU-154	8.597E-02	FAIL ABUN
EU-155	9.729E-02	FAIL ABUN
TB-160	1.850E+00	FAIL ABUN
HO-166M	4.485E-02	FAIL ABUN
TM-171	3.077E+01	NOT IDENT.
HF-172	2.008E-01	NOT IDENT.
LU-172	4.856E-02	FAIL ABUN
LU-176	1.995E-02	FAIL ABUN
HF-181	3.085E+00	NOT IDENT.
TA-182	7.851E-01	FAIL ABUN

RE-183	3.384E+00	NOT IDENT.
RE-184	2.852E+01	NOT IDENT.
W-188	6.577E+01	FAIL ABUN
IR-192	3.499E-01	FAIL ABUN
HG-203	2.015E+00	NOT IDENT.
BI-207	3.162E-02	FAIL ABUN
PB-210	6.601E+00	NOT IDENT.
PB-211	5.528E-01	NOT IDENT.
BI-212	5.603E-01	FAIL ABUN
RN-219	3.293E-01	FAIL ABUN
RA-223	4.819E-01	FAIL ABUN
AC-227	1.833E-01	FAIL ABUN
TH-227	1.833E-01	FAIL ABUN
TH-229	3.578E-01	FAIL ABUN
TH-231	4.819E-01	FAIL ABUN
PA-233	4.908E-02	FAIL ABUN
PA-234	2.107E-01	NOT IDENT.
PA-234M	3.756E+00	NOT IDENT.
TH-234	1.411E+00	FAIL ABUN
NP-237	4.908E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.411E+00	FAIL ABUN
NP-239	1.895E-01	FAIL ABUN
PU-239	2.622E+02	NOT IDENT.
AM-241	1.626E-01	NOT IDENT.
CM-243	8.278E-02	FAIL ABUN
BK-247	5.460E-02	NOT IDENT.
CM-247	3.089E-02	NOT IDENT.
CF-249	2.731E-02	NOT IDENT.
CF-251	9.055E-02	FAIL ABUN

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235052.CNF;1
* Acquisition date   : 3-OCT-2016 07:04:59 Sensitivity      : 3.000
* Detector ID       : GAM44 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.77 Half life ratio  : *****
* Sample date       : 7-DEC-2015 13:11:00 Nuclide Library : SOLID
* Sample ID        : G405235052 Analyst initials: MXR1
* Batch Number     : 1596252 Sample Quantity : 1.6524E+02 GRAM
*                  : Quantity Err(%) : 1.2103E-03 %
* Wet wt corr      : 1.00000 Wet Weight      : 0.00000
*                  : Dry Weight      : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 6-SEP-2016 04:59:25 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM44_CAN.CNF;3
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.416E+01	1.726E+00	1.726E+00
CD-109	1.465E+00	2.426E+00	2.426E+00
SN-126	9.321E-02	1.544E-01	1.544E-01
BA-137M	1.399E-01	5.815E-02	5.815E-02
CS-137	1.478E-01	6.143E-02	6.143E-02
CE-141	2.313E+01	4.111E+01	4.111E+01
TL-208	1.978E-01	9.057E-02	9.057E-02
BI-211	2.268E-01	9.970E-01	9.970E-01
PB-212	9.072E-01	1.354E-01	1.354E-01
BI-214	6.928E-01	1.678E-01	1.678E-01
PB-214	1.027E+00	2.384E-01	2.384E-01
RN-222	6.928E-01	1.678E-01	1.678E-01
RA-224	9.091E-01	1.256E+00	1.256E+00
RA-226	6.928E-01	1.678E-01	1.678E-01
AC-228	8.518E-01	2.795E-01	2.795E-01
RA-228	8.518E-01	2.795E-01	2.795E-01
TH-228	9.072E-01	1.354E-01	1.354E-01
TH-230	6.925E-01	1.677E-01	1.677E-01
PA-231	4.565E-01	6.228E-01	6.228E-01
TH-232	8.518E-01	2.795E-01	2.795E-01
U-234	6.925E-01	1.677E-01	1.677E-01
U-235	2.505E-01	2.903E-01	2.903E-01
AM-243	1.405E-01	1.070E-01	1.070E-01
ANH-511	7.973E-02	7.499E-02	7.499E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	5.078E+00	1.179E+01	1.201E+01	NOT IDENT.
NA-22	-4.709E-04	4.743E-02	4.743E-02	NOT IDENT.
NA-24	1.000E+41	7.082E+41	0.000E+00	SHORT HLIF
AL-26	2.565E-03	3.326E-02	3.328E-02	NOT IDENT.
SC-46	-1.242E-01	3.861E-01	3.901E-01	FAIL ABUN
V-48	-6.508E+03	1.297E+04	1.330E+04	SHORT HLIF

CR-51	1.591E+02	3.780E+02	3.848E+02	SHORT HLIF
MN-54	-1.868E-02	6.175E-02	6.232E-02	NOT IDENT.
CO-56	-2.089E-01	4.672E-01	4.766E-01	FAIL ABUN
MN-56	-1.000E+41	2.199E+41	0.000E+00	SHORT HLIF
CO-57	2.319E-02	4.538E-02	4.657E-02	NOT IDENT.
CO-58	-6.565E-02	6.036E-01	6.044E-01	NOT IDENT.
FE-59	-1.102E+00	6.391E+00	6.411E+00	NOT IDENT.
CO-60	6.926E-03	3.033E-02	3.049E-02	NOT IDENT.
ZN-65	-1.140E-01	1.892E-01	1.960E-01	NOT IDENT.
GE-68	-1.309E-02	2.177E+00	2.177E+00	NOT IDENT.
AS-73	-1.359E+00	1.372E+01	1.373E+01	NOT IDENT.
AS-74	1.111E+03	5.436E+03	5.459E+03	SHORT HLIF
SE-75	-2.272E-02	1.935E-01	1.938E-01	NOT IDENT.
BR-77	2.132E+38	1.851E+39	0.000E+00	SHORT HLIF
SR-82	4.813E+02	6.561E+02	6.911E+02	SHORT HLIF
RB-83	-5.029E-01	6.775E-01	7.145E-01	NOT IDENT.
KR-85	8.711E+00	5.865E+00	7.058E+00	NOT IDENT.
SR-85	9.287E-01	6.257E-01	7.528E-01	NOT IDENT.
RB-86	-1.209E+03	2.684E+04	2.684E+04	SHORT HLIF
Y-88	3.866E-03	1.022E-01	1.022E-01	NOT IDENT.
Y-91	-2.922E+01	5.285E+02	5.286E+02	NOT IDENT.
NB-94	9.007E-03	3.567E-02	3.590E-02	NOT IDENT.
NB-95	7.526E-01	6.729E-01	7.536E-01	NOT IDENT.
NB-95M	-5.399E-01	2.510E+00	2.522E+00	NOT IDENT.
ZR-95	2.042E+00	2.087E+00	2.281E+00	FAIL ABUN
NB-97	1.000E+41	1.736E+41	0.000E+00	SHORT HLIF
ZR-97	-1.000E+41	3.070E+41	0.000E+00	SHORT HLIF
MO-99	4.542E+31	2.173E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	6.857E+41	0.000E+00	SHORT HLIF
RH-101	-2.063E-02	3.057E-02	3.195E-02	NOT IDENT.
RH-102	-6.334E-03	4.881E-02	4.890E-02	NOT IDENT.
RU-103	2.050E+00	5.284E+00	5.364E+00	FAIL ABUN
RH-106	-2.491E-01	4.665E-01	4.798E-01	NOT IDENT.
RU-106	-2.491E-01	4.665E-01	4.798E-01	NOT IDENT.
AG-108M	1.034E-05	2.625E-02	2.625E-02	NOT IDENT.
AG-110M	-7.645E-02	9.598E-02	1.020E-01	FAIL ABUN
SN-113	2.238E-01	2.042E-01	2.278E-01	NOT IDENT.
CD-115	9.063E+35	3.639E+39	0.000E+00	SHORT HLIF
SN-117M	-3.524E+03	9.785E+04	9.786E+04	SHORT HLIF
TE-123M	-4.514E-02	1.313E-01	1.329E-01	NOT IDENT.
SB-124	-6.261E-02	1.386E+00	1.387E+00	NOT IDENT.
SB-125	-3.326E-02	9.689E-02	9.805E-02	NOT IDENT.
TE-125M	2.643E+01	2.573E+02	2.576E+02	NOT IDENT.
I-126	4.940E+05	9.756E+05	1.001E+06	SHORT HLIF
SB-126	4.295E+05	1.241E+06	1.256E+06	SHORT HLIF
SB-127	-5.030E+21	2.353E+22	0.000E+00	SHORT HLIF
I-131	-1.318E+09	4.381E+09	4.421E+09	SHORT HLIF
I-132	1.000E+41	1.875E+42	0.000E+00	SHORT HLIF
TE-132	4.391E+26	8.359E+26	0.000E+00	SHORT HLIF
BA-133	1.889E-02	3.694E-02	3.791E-02	NOT IDENT.
I-133	1.000E+41	6.820E+41	0.000E+00	SHORT HLIF
CS-134	6.979E-03	4.658E-02	4.669E-02	NOT IDENT.
CS-135	8.429E-03	1.271E-01	1.271E-01	NOT IDENT.
I-135	1.000E+41	6.958E+41	0.000E+00	SHORT HLIF
CS-136	-4.572E+03	3.098E+05	3.098E+05	SHORT HLIF
CE-139	-3.729E-03	1.039E-01	1.039E-01	NOT IDENT.
BA-140	-7.780E+05	1.322E+06	1.368E+06	SHORT HLIF
LA-140	-1.006E+05	3.814E+05	3.841E+05	SHORT HLIF
CE-143	1.000E+41	1.074E+42	0.000E+00	SHORT HLIF
CE-144	-8.229E-02	3.167E-01	3.188E-01	NOT IDENT.
PM-144	-2.043E-02	5.662E-02	5.736E-02	NOT IDENT.
PR-144	-1.746E+00	4.924E+00	4.987E+00	NOT IDENT.
PM-146	-9.611E-03	3.968E-02	3.992E-02	NOT IDENT.
ND-147	4.848E+06	3.374E+07	3.381E+07	SHORT HLIF
PM-147	3.370E+02	7.819E+02	7.965E+02	NOT IDENT.
PM-149	1.357E+40	5.851E+40	0.000E+00	SHORT HLIF
EU-150	-1.239E-02	2.869E-02	2.923E-02	FAIL ABUN
EU-152	-2.530E-02	8.775E-02	8.849E-02	FAIL ABUN
GD-153	5.218E-02	1.667E-01	1.683E-01	NOT IDENT.
EU-154	-3.556E-03	1.157E-01	1.157E-01	FAIL ABUN
EU-155	5.619E-02	1.018E-01	1.049E-01	FAIL ABUN
TB-160	6.498E-01	2.117E+00	2.138E+00	FAIL ABUN
HO-166M	-2.757E-03	5.332E-02	5.334E-02	FAIL ABUN
TM-171	-2.908E+00	3.255E+01	3.257E+01	NOT IDENT.
HF-172	1.615E-01	2.102E-01	2.225E-01	NOT IDENT.
LU-172	-3.505E-02	6.381E-02	6.574E-02	FAIL ABUN
LU-176	1.238E-02	2.034E-02	2.110E-02	FAIL ABUN
HF-181	-5.949E-01	3.582E+00	3.592E+00	NOT IDENT.

TA-182	-9.336E-01	1.068E+00	1.148E+00	FAIL ABUN
RE-183	-9.267E-01	3.636E+00	3.660E+00	NOT IDENT.
RE-184	1.339E+01	3.022E+01	3.082E+01	NOT IDENT.
W-188	-1.392E+02	1.016E+02	1.194E+02	FAIL ABUN
IR-192	-1.763E-01	3.992E-01	4.070E-01	FAIL ABUN
HG-203	4.008E-01	2.127E+00	2.135E+00	NOT IDENT.
BI-207	-4.335E-02	4.508E-02	4.914E-02	FAIL ABUN
PB-210	1.292E+00	6.721E+00	6.746E+00	NOT IDENT.
PB-211	-4.806E-01	6.688E-01	7.030E-01	NOT IDENT.
BI-212	6.115E-01	1.023E+00	1.060E+00	FAIL ABUN
RN-219	2.462E-01	3.381E-01	3.559E-01	FAIL ABUN
RA-223	-5.160E-02	5.894E-01	5.898E-01	FAIL ABUN
AC-227	1.368E-01	3.747E-01	3.797E-01	FAIL ABUN
TH-227	1.368E-01	3.747E-01	3.797E-01	FAIL ABUN
TH-229	1.215E-01	3.985E-01	4.023E-01	FAIL ABUN
TH-231	-5.160E-02	5.894E-01	5.898E-01	FAIL ABUN
PA-233	2.694E-02	5.048E-02	5.192E-02	FAIL ABUN
PA-234	-1.333E-01	3.030E-01	3.089E-01	NOT IDENT.
PA-234M	2.979E+00	3.779E+00	4.011E+00	NOT IDENT.
TH-234	2.685E-01	1.472E+00	1.477E+00	FAIL ABUN
NP-237	2.694E-02	5.048E-02	5.192E-02	FAIL ABUN
NP-238	-1.000E+41	3.151E+41	0.000E+00	SHORT HLIF
U-238	2.685E-01	1.472E+00	1.477E+00	FAIL ABUN
NP-239	-1.431E-02	2.103E-01	2.104E-01	FAIL ABUN
PU-239	2.114E+02	2.730E+02	2.892E+02	NOT IDENT.
AM-241	6.150E-02	1.658E-01	1.681E-01	NOT IDENT.
CM-243	-4.899E-02	9.477E-02	9.731E-02	FAIL ABUN
BK-247	-3.478E-02	6.948E-02	7.123E-02	NOT IDENT.
CM-247	1.793E-02	3.241E-02	3.340E-02	NOT IDENT.
CF-249	-6.726E-03	3.109E-02	3.124E-02	NOT IDENT.
CF-251	-1.197E-02	1.045E-01	1.047E-01	FAIL ABUN

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	56.4509	87.09	90.6453	136.47	56.9215
45.60	50.6102	87.57	90.7352	140.51	0.0000
46.54	52.5403	88.03	63.1792	143.76	59.7089
49.72	0.0000	88.34	63.2192	144.24	59.7509
51.35	60.5342	88.47	63.2358	145.44	59.4914
51.87	68.7695	89.96	72.6759	152.43	62.6473
52.39	54.3732	1093.63	72.7750	153.25	0.0000
52.97	50.8329	91.11	0.0000	323.87	82.6332
53.44	59.9905	92.59	73.0569	156.02	0.0000
54.07	52.8130	93.35	73.1660	158.56	0.0000
57.36	0.0000	94.56	73.3389	159.00	77.6306
57.53	59.7555	94.65	73.3518	162.33	64.6101
57.98	56.1462	94.67	73.3546	162.66	0.0000
59.27	53.5694	94.87	73.3831	163.33	82.5432
59.32	53.5765	97.43	54.9732	165.86	64.9119
59.54	55.4562	98.43	62.4659	176.31	45.3699
60.96	65.8683	98.44	62.4671	176.60	0.0000
61.17	76.1149	99.53	72.6916	177.52	60.2065
62.93	65.2716	100.11	66.7060	181.07	0.0000
63.29	71.8644	102.03	64.9155	181.52	56.3190
63.58	73.7854	103.18	74.2002	184.41	51.5533
64.28	77.6586	103.37	74.2264	143.76	51.6357
66.73	71.5434	105.21	61.2122	193.51	47.4832
67.24	91.4259	105.31	61.2231	197.03	61.6330
125.81	91.5244	106.12	76.6405	198.01	58.2100
67.75	91.5392	106.47	76.6886	201.83	58.4656
69.67	77.1107	109.28	64.7400	203.43	58.5716
70.83	93.8015	111.00	70.0887	205.31	58.6952
72.81	70.6775	111.76	0.0000	210.85	62.6011
72.87	70.6876	114.06	67.3501	215.65	51.0566
74.66	70.9784	116.30	0.0000	222.11	41.8461
74.82	71.0044	116.74	58.2888	227.09	46.8731
74.97	71.0286	119.76	70.0895	227.38	46.8874
77.11	71.3713	121.12	62.9068	228.16	0.0000
78.74	71.6293	121.22	62.9173	228.18	43.3169
79.69	72.4250	121.78	70.3216	116.74	43.3169
80.12	71.1983	122.06	63.0034	235.69	61.4361
80.19	0.0000	122.92	75.7095	235.96	61.4524
80.57	63.4930	123.07	83.0907	238.63	47.4301
81.00	68.7403	265.00	77.9086	238.98	0.0000
81.07	64.8590	125.81	55.9902	240.99	47.5420
81.75	72.7480	127.23	71.9979	242.00	47.5902
83.79	84.8067	127.91	68.8959	244.70	47.7175
84.00	77.0126	129.30	55.2365	252.40	0.0000
85.43	86.4075	131.20	68.1855	252.80	36.1743
86.55	90.5450	133.02	63.0341	254.15	0.0000
86.79	90.5892	133.52	64.1519	256.23	46.1916
86.94	90.6180	136.00	56.8810	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	41.1553	355.39	0.0000	584.27	22.6678
264.80	47.3979	356.01	24.2150	595.83	0.0000
265.00	47.4061	364.49	0.0000	427.87	24.9307
268.22	40.0400	366.42	0.0000	602.52	0.0000
269.46	41.3386	372.51	30.8630	604.72	12.4907
270.03	45.1198	375.05	28.6462	607.14	21.8844
271.23	45.1703	377.52	24.5967	609.32	26.0813
273.65	0.0000	356.01	33.8579	610.33	31.3123
276.40	44.5419	388.16	27.5354	614.28	20.3926
277.37	43.7396	388.63	0.0000	618.01	9.4288
277.60	43.7480	391.69	20.2419	620.36	10.4883
278.00	43.7639	264.66	34.2532	621.93	19.9432
279.20	42.1265	401.81	23.1618	630.19	0.0000
279.54	48.0381	402.40	26.8789	631.29	14.7611
279.70	52.2595	404.85	42.7057	633.25	14.7747
280.46	47.2340	410.95	31.6945	634.78	0.0000
283.69	38.0649	413.71	25.2153	635.95	12.6802
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	42.3584	423.72	0.0000	645.85	15.9241
285.90	0.0000	427.09	31.0899	657.76	14.4108
287.50	37.3443	427.87	31.1053	657.90	0.0000
290.67	45.9580	433.94	28.3881	661.66	17.1100
293.27	0.0000	439.40	30.3854	664.57	0.0000
351.93	37.5941	453.88	26.8288	666.33	0.0000
295.96	37.6182	463.37	25.0574	666.50	0.0000
879.38	48.8417	468.07	25.1288	667.71	0.0000
299.98	49.7576	473.00	0.0000	677.62	17.7729
300.09	49.7623	475.06	29.1162	685.70	0.0000
300.13	49.7635	476.78	24.2884	695.00	0.0000
301.36	30.9199	477.60	22.3561	696.49	23.8960
302.85	29.6688	482.18	19.4930	696.51	23.8969
256.23	24.5432	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	17.3854
306.78	29.3357	497.08	19.6623	697.49	16.3000
308.46	34.5605	505.52	16.2996	702.65	25.0496
311.90	30.3266	507.63	0.0000	706.68	22.9115
316.51	38.2690	511.00	20.8094	711.68	17.4941
319.41	0.0000	514.00	5.9556	720.70	0.0000
320.08	0.0000	514.00	5.9556	721.93	0.0000
321.04	37.5358	520.40	25.4014	722.78	18.1274
323.87	39.3713	520.69	0.0000	722.91	19.7761
325.23	31.5315	522.65	0.0000	723.31	19.7798
328.76	0.0000	527.90	0.0000	724.19	23.0850
333.37	35.2604	528.26	18.0081	727.33	20.9142
333.97	44.0959	529.59	25.0295	733.00	20.9645
334.37	38.3758	529.87	0.0000	735.93	17.6758
338.28	36.2804	531.02	0.0000	333.97	23.2148
338.32	36.2812	537.26	0.0000	739.50	0.0000
311.90	36.3421	546.56	0.0000	747.24	13.3198
340.48	36.3421	552.55	13.1767	748.06	14.4346
340.55	0.0000	563.25	21.4050	752.31	18.3530
344.28	33.3366	569.33	24.5400	753.82	0.0000
345.93	28.0380	946.00	24.5420	756.73	3.3430
351.06	33.9551	569.70	24.5449	756.80	3.3431
351.93	33.9767	583.19	22.6553	884.68	8.9411

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	3.3555	1274.44	17.3336	1620.50	7.5345
766.42	8.3905	1001.03	9.1373	1621.92	8.6138
766.84	8.3920	1002.74	15.5417	1678.03	0.0000
772.60	0.0000	1004.73	15.5520	1690.97	2.1854
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	1.1094
778.90	13.4927	1028.54	0.0000	1063.66	3.3322
783.70	0.0000	1037.84	7.3970	1771.35	1.1110
785.37	7.8912	1038.76	0.0000	1791.20	0.0000
792.07	14.6943	631.29	10.1984	1808.65	4.4771
794.95	12.4475	1048.07	0.0000	1810.72	0.0000
795.86	14.7160	1049.04	7.4229	1836.06	0.9002
810.06	18.2129	1050.41	13.9243		
810.29	18.2148	1063.66	17.7104		
344.28	17.0770	1077.00	0.0000		
810.76	17.0795	1077.34	12.1685		
815.77	0.0000	1085.87	8.4463		
1048.07	0.0000	1093.63	12.2296		
832.01	12.6274	1099.45	13.1934		
834.85	17.2375	1112.07	12.2978		
835.71	13.7949	1112.84	14.0573		
836.80	0.0000	1115.54	16.6665		
846.75	0.0000	1120.29	7.5864		
846.77	17.3157	1120.55	7.5869		
856.80	0.0000	1221.41	7.5884		
860.56	4.6413	1129.67	2.8528		
871.09	15.1423	1131.51	0.0000		
873.19	15.1540	1147.95	0.0000		
875.33	0.0000	1173.23	13.4830		
879.38	16.3567	1177.95	17.3584		
880.51	9.6428	1189.05	14.5111		
883.24	19.3044	1204.77	14.5752		
884.68	19.3145	1221.41	25.3811		
889.28	18.4673	1231.02	16.9652		
894.76	16.7415	1235.36	0.0000		
898.04	14.9964	1238.28	7.8457		
900.72	15.0109	1260.41	0.0000		
903.28	13.2568	1271.87	9.2371		
911.20	15.0670	1274.44	9.5074		
912.08	15.6036	1274.54	9.5074		
923.98	0.0000	1291.59	8.9539		
926.50	14.2568	1298.22	0.0000		
929.11	16.0532	1312.11	0.0000		
937.49	18.7832	1332.49	5.0278		
944.13	0.0000	1362.66	0.0000		
946.00	17.0442	1365.19	8.1113		
949.00	14.3677	1368.63	0.0000		
667.71	0.0000	1384.29	7.1316		
962.31	12.9894	1408.01	4.0991		
964.08	12.6362	1457.56	0.0000		
966.17	12.6452	1460.82	6.2278		
911.20	12.6572	1489.16	4.1797		
968.97	12.6572	1505.03	9.4389		
983.53	0.0000	1584.12	5.3391		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235053.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM31.CNF;306
Background date : 2-OCT-2016 11:01:52.
Sample date     : 1-DEC-2015 14:24:00. Acquisition date : 3-OCT-2016 07:06:55.
Sample ID      : G405235053 Sample quantity : 1.13628E+02 GRAM
Detector name  : GAM31 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:06.45 0.2%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID      : 1596252 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	34.92	33	156	0.67	69.51	68	6	9.25E-03	61.1	
2	0	46.45*	48	257	1.31	92.54	88	8	1.34E-02	61.2	
3	0	52.85*	10	207	1.27	105.34	104	6	2.77E-03	235.6	
4	0	63.32*	33	247	0.92	126.25	123	7	9.07E-03	87.3	
5	3	74.89	160	203	1.09	149.38	146	12	4.43E-02	16.1	1.26E+00
6	3	77.09*	250	111	0.87	153.78	146	12	6.95E-02	9.4	
7	3	87.25*	84	82	0.91	174.08	170	21	2.33E-02	19.7	1.59E+00
8	3	89.89	77	123	1.28	179.36	170	21	2.15E-02	27.7	
9	3	92.79*	104	115	1.29	185.16	170	21	2.89E-02	22.5	
10	0	129.83	63	54	2.25	259.17	255	8	1.76E-02	23.8	
11	0	186.17*	90	77	1.30	371.79	366	11	2.50E-02	22.7	
12	0	192.13	19	37	0.95	383.69	381	5	5.14E-03	54.1	
13	0	209.30	29	38	0.92	418.00	415	6	8.05E-03	38.6	
14	0	213.16	6	61	0.75	425.72	422	7	1.61E-03	225.0	
15	6	237.07*	9	15	1.45	473.50	472	17	2.58E-03	76.1	4.83E+00
16	6	238.66*	323	45	1.29	476.68	472	17	8.96E-02	6.8	
17	6	241.75*	93	81	2.13	482.85	472	17	2.58E-02	28.7	
18	0	253.16	24	27	1.27	505.66	503	7	6.63E-03	41.2	
19	0	295.61*	90	75	1.21	590.50	585	12	2.50E-02	22.5	
20	0	301.10	19	51	1.74	601.48	596	9	5.25E-03	72.3	
21	0	317.48	11	20	1.17	634.21	631	6	3.15E-03	72.1	
22	0	338.66*	60	59	1.19	676.54	672	12	1.67E-02	28.8	
23	0	352.12*	203	57	1.20	703.44	698	12	5.64E-02	10.5	
24	0	393.88	15	14	1.55	786.91	784	6	4.26E-03	45.7	
25	0	417.46	32	41	0.77	834.03	827	14	8.89E-03	46.4	
26	0	463.71	19	55	1.02	926.48	920	12	5.39E-03	79.2	
27	0	583.40*	63	32	1.73	1165.69	1159	15	1.76E-02	23.4	
28	0	609.81*	137	33	1.29	1218.48	1214	10	3.82E-02	12.0	
29	0	662.11	45	32	1.47	1323.01	1316	12	1.25E-02	29.6	
30	0	679.68	18	31	3.97	1358.14	1347	18	5.12E-03	74.9	
31	0	706.37	9	21	3.43	1411.47	1404	12	2.41E-03	111.3	
32	0	727.99	31	12	4.14	1454.68	1448	13	8.49E-03	30.2	
33	0	771.11	28	17	5.25	1540.88	1534	14	7.83E-03	38.6	
34	4	785.68	12	14	1.70	1570.00	1566	12	3.30E-03	56.4	1.63E+00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	4	788.17	13	4	1.43	1574.97	1566	12	3.49E-03	40.1	
36	0	795.74	13	7	1.73	1590.11	1585	10	3.56E-03	48.5	
37	0	804.59*	17	19	4.07	1607.78	1601	15	4.71E-03	62.0	
38	0	842.05	18	8	1.27	1682.66	1676	10	5.06E-03	36.7	
39	0	861.42	11	20	0.85	1721.38	1712	13	2.92E-03	92.0	
40	0	866.61	16	2	2.09	1731.76	1727	9	4.38E-03	30.4	
41	0	873.71	15	3	1.95	1745.95	1740	10	4.24E-03	32.2	
42	0	911.70*	57	8	1.63	1821.88	1817	10	1.59E-02	16.6	
43	0	935.55	5	17	2.41	1869.56	1860	11	1.25E-03	181.0	
44	0	964.65	24	8	1.57	1927.71	1921	11	6.68E-03	30.8	
45	0	969.69	20	19	0.69	1937.80	1933	10	5.55E-03	47.2	
46	0	1093.35	11	2	1.54	2184.98	2181	8	3.11E-03	36.8	
47	0	1121.84	18	21	1.49	2241.92	2235	11	4.88E-03	56.8	
48	0	1151.31	6	12	0.61	2300.83	2290	12	1.67E-03	122.5	
49	0	1174.94	14	11	1.53	2348.06	2342	12	3.86E-03	60.2	
50	0	1239.26	47	4	0.68	2476.62	2468	18	1.30E-02	18.0	
51	0	1305.66	10	2	0.90	2609.36	2605	9	2.79E-03	41.1	
52	0	1461.40*	222	3	2.11	2920.68	2913	14	6.16E-02	7.0	
53	0	1580.37	8	0	0.83	3158.50	3155	8	2.22E-03	35.4	
54	0	1765.49*	21	0	1.97	3528.57	3523	10	5.81E-03	23.4	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235053.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 1-DEC-2015 14:24:00   Acquisition date : 3-OCT-2016 07:06:55
Sample ID        : G405235053             Sample quantity  : 113.63 GRAM
Sample type       : SOLID                  Sample geometry  :
Detector name    : GAMMA31                Detector geometry: CAN
Elapsed live time: 0 01:00:00.00          Elapsed real time: 0 01:00:06.45   0.2%
Energy tolerance : 1.50 keV               Half life ratio  : 10.00
Errors propagated: No                     Systematic Error : 0.00 %
Efficiency type  : Linear                  Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	6.945E-01	1.865E+01	1.865E+01	14.10	OK
AS-73	53.44	10.30*	5.707E+00	1.204E-01	1.699E+00	471.25	OK
NB-95M	235.69	24.80*	3.221E+00	7.798E-02	2.158E+00	152.26	OK
CD-109	88.03	3.70*	5.391E+00	1.807E+00	2.865E+00	69.72	OK
SN-126	64.28	9.60	5.587E+00	4.291E-01	4.291E-01	174.69	OK
	86.94	8.90	5.391E+00	7.513E-01	7.513E-01	69.72	OK
	87.57	37.00*	5.391E+00	1.807E-01	1.807E-01	69.72	OK
BA-137M	661.66	89.90*	1.340E+00	2.395E-01	2.442E-01	59.17	OK
CS-137	661.66	85.10*	1.340E+00	2.530E-01	2.580E-01	59.17	OK
TL-208	277.37	6.60	2.816E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	1.486E+00	3.237E-01	3.237E-01	46.76	OK
	860.56	12.50	1.083E+00	4.936E-01	4.936E-01	184.06	OK
PB-210	46.54	4.25*	5.476E+00	1.482E+00	1.521E+00	122.39	OK
BI-211	72.87	1.23	5.491E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	2.285E+00	1.179E+00	1.179E+00	151.34	OK
BI-212	727.33	6.67*	1.241E+00	2.367E+00	2.367E+00	60.41	OK
	785.37	1.10	1.167E+00	5.920E+00	5.920E+00	112.83	OK
	1620.50	1.47	6.312E-01	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	5.476E+00	1.299E+00	1.299E+00	54.73	OK
	77.11	17.10	5.460E+00	1.877E+00	1.877E+00	18.80	OK
	238.63	43.60*	3.203E+00	1.549E+00	1.549E+00	13.65	OK
	300.09	3.30	2.621E+00	1.451E+00	1.451E+00	144.54	OK
BI-214	609.32	45.49*	1.433E+00	1.361E+00	1.361E+00	23.96	OK
	1120.29	14.92	8.740E-01	----- Line	Not Found	-----	Absent
	1764.49	15.30	5.810E-01	1.453E+00	1.453E+00	46.87	OK
PB-214	74.82	5.80	5.476E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.460E+00	3.308E+00	3.309E+00	18.80	OK
	87.09	3.41	5.392E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	3.165E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	2.664E+00	1.218E+00	1.219E+00	44.95	OK
	351.93	35.60*	2.286E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	1.433E+00	1.361E+00	1.361E+00	23.96	OK
	1120.29	14.92	8.740E-01	----- Line	Not Found	-----	Absent
	1764.49	15.30	5.810E-01	1.453E+00	1.453E+00	46.87	OK
RA-224	240.99	4.10*	3.168E+00	2.630E+00	2.630E+00	110.71	OK
RA-226	609.32	45.49*	1.433E+00	1.361E+00	1.361E+00	23.96	OK
	1120.29	14.92	8.740E-01	----- Line	Not Found	-----	Absent
	1764.49	15.30	5.810E-01	1.453E+00	1.453E+00	46.87	OK
AC-228	105.21	1.10	5.215E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.364E+00	1.495E+00	1.495E+00	57.51	OK
	794.95	4.25	1.155E+00	1.669E+00	1.669E+00	97.08	OK
	835.71	1.61	1.110E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.035E+00	1.359E+00	1.359E+00	33.22	OK
	968.97	15.80	9.842E-01	8.136E-01	8.136E-01	94.46	OK
RA-228	105.21	1.10	5.215E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.364E+00	1.495E+00	1.495E+00	57.51	OK
	794.95	4.25	1.155E+00	1.669E+00	1.669E+00	97.08	OK
	835.71	1.61	1.110E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.035E+00	1.359E+00	1.359E+00	33.22	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	968.97	15.80	9.842E-01	8.136E-01	8.136E-01	94.46	OK
	74.82	10.28	5.476E+00	1.299E+00	1.299E+00	54.73	OK
	77.11	17.10	5.460E+00	1.877E+00	1.877E+00	18.80	OK
	238.63	43.60*	3.203E+00	1.549E+00	1.549E+00	13.65	OK
TH-230	300.09	3.30	2.621E+00	1.451E+00	1.451E+00	144.54	OK
	609.32	45.49*	1.433E+00	1.361E+00	1.361E+00	23.96	OK
	1120.29	14.92	8.740E-01	-----	Line Not Found	-----	Absent
PA-231	1764.49	15.30	5.810E-01	1.453E+00	1.453E+00	46.87	OK
	283.69	1.70	2.761E+00	-----	Line Not Found	-----	Absent
TH-232	301.36	5.35*	2.621E+00	8.948E-01	8.948E-01	144.54	OK
	105.21	1.10	5.215E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	2.364E+00	1.495E+00	1.495E+00	57.51	OK
TH-234	835.71	1.61	1.110E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.035E+00	1.359E+00	1.359E+00	33.22	OK
	968.97	15.80	9.842E-01	8.136E-01	8.136E-01	94.46	OK
	63.29	3.70*	5.587E+00	1.113E+00	1.113E+00	174.69	OK
U-234	92.59	4.23	5.346E+00	3.199E+00	3.199E+00	45.04	OK
	609.32	45.49*	1.433E+00	1.361E+00	1.361E+00	23.96	OK
U-235	1120.29	14.92	8.740E-01	-----	Line Not Found	-----	Absent
	1764.49	15.30	5.810E-01	1.453E+00	1.453E+00	46.87	OK
	89.96	3.47	5.370E+00	2.885E+00	2.885E+00	55.41	OK
U-238	93.35	5.60	5.346E+00	2.416E+00	2.416E+00	45.04	OK
	143.76	10.96*	4.611E+00	-----	Line Not Found	-----	Absent
	163.33	5.08	4.273E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	3.902E+00	2.725E-01	2.725E-01	45.34	OK
AM-243	205.31	5.01	3.621E+00	-----	Line Not Found	-----	Absent
	63.29	3.70*	5.587E+00	1.113E+00	1.113E+00	174.69	OK
AM-243	92.59	4.23	5.346E+00	3.199E+00	3.199E+00	45.04	OK
	43.53	5.90	5.049E+00	-----	Line Not Found	-----	Absent
	74.66	67.20*	5.476E+00	1.987E-01	1.987E-01	54.73	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235053.CNF;1 *
 * Acquisition date : 3-OCT-2016 07:06:55 Sensitivity : 3.000 *
 * Detector ID : GAM31 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:06.45 Half life ratio : ***** *
 * Sample date : 1-DEC-2015 14:24:00 Analyst initials: MXR1 *
 * Sample ID : G405235053 Sample Quantity : 1.1363E+02 GRAM *
 * Batch Number : 1596252 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 15-JUN-2016 06:54:07 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM31_CAN.CNF;7 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.865E+01	2.577E+00	9.734E-01
AS-73	1.699E+00	7.848E+00	9.571E+00
NB-95M	2.158E+00	3.220E+00	7.112E+00
CD-109	2.865E+00	1.957E+00	2.331E+00
SN-126	1.807E-01	1.235E-01	1.469E-01
BA-137M	2.442E-01	1.416E-01	1.196E-01
CS-137	2.580E-01	1.496E-01	1.263E-01
TL-208	3.237E-01	1.483E-01	1.132E-01
PB-210	1.521E+00	1.825E+00	1.575E+00
BI-211	1.179E+00	1.749E+00	6.353E-01
BI-212	2.367E+00	1.401E+00	1.623E+00
PB-212	1.549E+00	2.072E-01	1.508E-01
BI-214	1.361E+00	3.196E-01	2.487E-01
PB-214	1.647E+00	3.387E-01	6.060E-01
RN-222	1.361E+00	3.196E-01	2.487E-01
RA-224	2.630E+00	2.853E+00	1.619E+00
RA-226	1.361E+00	3.196E-01	2.487E-01
AC-228	1.359E+00	4.425E-01	4.269E-01
RA-228	1.359E+00	4.425E-01	4.269E-01
TH-228	1.549E+00	2.072E-01	1.508E-01
TH-230	1.361E+00	3.195E-01	2.486E-01
PA-231	8.948E-01	1.268E+00	1.247E+00
TH-232	1.359E+00	4.425E-01	4.269E-01
TH-234	1.113E+00	1.906E+00	1.934E+00
U-234	1.361E+00	3.195E-01	2.486E-01
U-235	1.112E-01	2.856E-01	5.214E-01
U-238	1.113E+00	1.906E+00	1.934E+00
AM-243	1.987E-01	1.066E-01	9.914E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.162E+01	2.455E+01	4.373E+01	NOT IDENT.
NA-22	-4.217E-02	9.695E-02	1.752E-01	NOT IDENT.

NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	-8.769E-03	5.684E-02	1.230E-01	NOT IDENT.
SC-46	8.840E-02	6.221E-01	1.323E+00	FAIL ABUN
V-48	0.000E+00	3.685E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	8.926E+02	0.000E+00	SHORT HLIF
MN-54	-2.729E-02	1.379E-01	2.479E-01	NOT IDENT.
CO-56	6.006E-01	1.077E+00	2.176E+00	FAIL ABUN
MN-56	0.000E+00	1.814E+41	0.000E+00	SHORT HLIF
CO-57	3.881E-02	6.601E-02	1.278E-01	NOT IDENT.
CO-58	6.132E-02	1.226E+00	2.113E+00	NOT IDENT.
FE-59	3.195E+00	1.567E+01	3.178E+01	NOT IDENT.
CO-60	-4.484E-03	8.580E-02	1.676E-01	NOT IDENT.
ZN-65	1.647E-01	3.409E-01	6.743E-01	NOT IDENT.
GE-68	-2.607E-01	3.669E+00	7.472E+00	NOT IDENT.
AS-74	0.000E+00	1.473E+04	0.000E+00	SHORT HLIF
SE-75	-1.205E-01	4.214E-01	7.135E-01	NOT IDENT.
BR-77	0.000E+00	2.762E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	1.813E+03	0.000E+00	SHORT HLIF
RB-83	1.675E+00	1.272E+00	2.846E+00	NOT IDENT.
KR-85	-3.053E+01	1.857E+01	2.840E+01	NOT IDENT.
SR-85	-3.468E+00	2.109E+00	3.225E+00	NOT IDENT.
RB-86	0.000E+00	5.854E+04	0.000E+00	SHORT HLIF
Y-88	1.564E-01	3.224E-01	9.000E-01	NOT IDENT.
Y-91	1.363E+02	1.088E+03	2.191E+03	NOT IDENT.
NB-94	-7.107E-03	6.854E-02	1.112E-01	NOT IDENT.
NB-95	3.041E-03	2.217E+00	3.635E+00	NOT IDENT.
ZR-95	2.419E-01	3.079E+00	5.864E+00	NOT IDENT.
NB-97	0.000E+00	1.929E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.549E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	2.084E+33	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.143E+41	0.000E+00	SHORT HLIF
RH-101	-1.496E-02	5.119E-02	8.373E-02	NOT IDENT.
RH-102	-9.265E-04	9.445E-02	1.834E-01	NOT IDENT.
RU-103	-1.245E+00	9.576E+00	1.845E+01	FAIL ABUN
RH-106	2.162E-01	8.727E-01	1.746E+00	NOT IDENT.
RU-106	2.162E-01	8.727E-01	1.746E+00	NOT IDENT.
AG-108M	7.238E-03	5.566E-02	1.074E-01	NOT IDENT.
AG-110M	2.637E-03	1.349E-01	2.888E-01	FAIL ABUN
SN-113	-1.369E-01	4.188E-01	6.919E-01	NOT IDENT.
CD-115	0.000E+00	4.224E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	2.118E+05	0.000E+00	SHORT HLIF
TE-123M	-2.899E-02	2.079E-01	3.712E-01	NOT IDENT.
SB-124	-1.536E-01	5.196E+00	1.048E+01	NOT IDENT.
SB-125	3.211E-02	1.991E-01	3.874E-01	FAIL ABUN
TE-125M	3.297E+01	4.267E+02	7.870E+02	NOT IDENT.
I-126	0.000E+00	2.091E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	2.884E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.488E+23	0.000E+00	SHORT HLIF
I-131	0.000E+00	1.572E+10	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.806E+27	0.000E+00	SHORT HLIF
BA-133	6.087E-03	8.316E-02	1.453E-01	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	1.099E-01	1.046E-01	1.998E-01	FAIL ABUN
CS-135	1.598E-02	2.682E-01	4.724E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	7.328E+05	0.000E+00	SHORT HLIF
CE-139	1.094E-01	1.869E-01	3.541E-01	NOT IDENT.
BA-140	0.000E+00	3.403E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	1.283E+06	0.000E+00	SHORT HLIF
CE-141	-1.163E+01	4.342E+01	7.463E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	3.845E-01	5.588E-01	1.016E+00	NOT IDENT.
PM-144	-4.117E-03	9.409E-02	1.787E-01	NOT IDENT.
PR-144	-2.133E+00	8.554E+00	1.556E+01	NOT IDENT.
PM-146	6.430E-02	7.829E-02	1.655E-01	NOT IDENT.
ND-147	0.000E+00	6.963E+07	0.000E+00	SHORT HLIF
PM-147	-1.987E+02	1.102E+03	1.995E+03	NOT IDENT.
PM-149	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
EU-150	3.877E-03	4.925E-02	8.644E-02	FAIL ABUN
EU-152	8.353E-02	1.595E-01	3.032E-01	FAIL ABUN
GD-153	-2.851E-02	2.426E-01	4.105E-01	NOT IDENT.
EU-154	-1.030E-01	2.368E-01	4.280E-01	FAIL ABUN
EU-155	-4.819E-02	1.468E-01	2.627E-01	FAIL ABUN
TB-160	-3.728E-01	3.322E+00	6.676E+00	FAIL ABUN
HO-166M	-5.595E-02	1.134E-01	1.843E-01	NOT IDENT.
TM-171	3.572E+00	1.649E+01	1.971E+01	FAIL ABUN
HF-172	1.564E-01	3.590E-01	6.356E-01	FAIL ABUN

LU-172	1.714E-01	1.238E-01	3.016E-01	FAIL ABUN
LU-176	-2.145E-02	3.821E-02	7.012E-02	FAIL ABUN
HF-181	4.405E-03	8.388E+00	1.619E+01	NOT IDENT.
TA-182	6.625E-01	1.889E+00	3.902E+00	FAIL ABUN
RE-183	-4.310E-01	2.217E+00	4.075E+00	NOT IDENT.
RE-184	-3.087E+01	6.468E+01	1.200E+02	NOT IDENT.
W-188	-5.636E+01	2.052E+02	3.482E+02	FAIL ABUN
IR-192	6.475E-01	9.149E-01	1.773E+00	FAIL ABUN
HG-203	-3.671E+00	5.096E+00	8.102E+00	NOT IDENT.
BI-207	-7.355E-02	9.382E-02	1.605E-01	FAIL ABUN
PB-211	-4.319E-01	1.037E+00	1.910E+00	NOT IDENT.
RN-219	-2.174E-01	6.073E-01	1.126E+00	NOT IDENT.
RA-223	2.570E-01	1.012E+00	2.007E+00	FAIL ABUN
AC-227	1.942E-01	3.963E-01	6.999E-01	FAIL ABUN
TH-227	1.942E-01	3.963E-01	6.999E-01	FAIL ABUN
TH-229	7.441E-01	7.895E-01	1.383E+00	FAIL ABUN
TH-231	2.570E-01	1.012E+00	2.007E+00	FAIL ABUN
PA-233	2.688E-02	1.023E-01	2.033E-01	FAIL ABUN
PA-234	1.555E-01	5.005E-01	1.059E+00	FAIL ABUN
PA-234M	4.413E-01	7.927E+00	1.580E+01	NOT IDENT.
NP-237	2.688E-02	1.023E-01	2.033E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	1.391E-01	3.487E-01	6.601E-01	NOT IDENT.
PU-239	0.000E+00	6.651E+02	9.589E+02	FAIL ABUN
AM-241	-1.079E-02	1.060E-01	1.953E-01	NOT IDENT.
CM-243	1.828E-02	1.318E-01	2.457E-01	NOT IDENT.
BK-247	1.855E-02	1.380E-01	2.460E-01	NOT IDENT.
CM-247	-1.538E-02	5.768E-02	1.080E-01	NOT IDENT.
CF-249	-8.217E-03	5.797E-02	1.112E-01	FAIL ABUN
CF-251	-7.304E-02	2.008E-01	3.460E-01	NOT IDENT.
ANH-511	-8.832E-02	9.035E-02	1.794E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	209	10.66*	6.945E-01	1.865E+01	1.865E+01	14.10
AS-73	53.44	11	10.30*	5.707E+00	1.204E-01	1.699E+00	471.25
NB-95M	235.69	9	24.80*	3.221E+00	7.798E-02	2.158E+00	152.26
CD-109	88.03	88	3.70*	5.391E+00	2.930E+00	4.645E+00	39.40
SN-126	64.28	35	9.60	5.587E+00	4.291E-01	4.291E-01	174.69
	86.94	88	8.90	5.391E+00	1.218E+00	1.218E+00	39.40
	87.57	88	37.00*	5.391E+00	2.930E-01	2.930E-01	39.40
BA-137M	661.66	44	89.90*	1.340E+00	2.395E-01	2.442E-01	59.17
CS-137	661.66	44	85.10*	1.340E+00	2.530E-01	2.580E-01	59.17
TL-208	277.37	-----	6.60	2.816E+00	-----	Line Not Found	-----
	583.19	62	85.00*	1.486E+00	3.237E-01	3.237E-01	46.76
	860.56	10	12.50	1.083E+00	4.936E-01	4.936E-01	184.06
PB-210	46.54	52	4.25*	5.476E+00	1.482E+00	1.521E+00	122.39
BI-211	72.87	-----	1.23	5.491E+00	-----	Line Not Found	-----
	351.06	203	12.92*	2.285E+00	4.536E+00	4.536E+00	20.99
BI-212	727.33	30	6.67*	1.241E+00	2.367E+00	2.367E+00	60.41
	785.37	11	1.10	1.167E+00	5.920E+00	5.920E+00	112.83
	1620.50	-----	1.47	6.312E-01	-----	Line Not Found	-----
PB-212	74.82	169	10.28	5.476E+00	1.986E+00	1.986E+00	32.23
	77.11	265	17.10	5.460E+00	1.877E+00	1.877E+00	18.80
	238.63	327	43.60*	3.203E+00	1.549E+00	1.549E+00	13.65
	300.09	19	3.30	2.621E+00	1.451E+00	1.451E+00	144.54
BI-214	609.32	134	45.49*	1.433E+00	1.361E+00	1.361E+00	23.96
	1120.29	-----	14.92	8.740E-01	-----	Line Not Found	-----
	1764.49	20	15.30	5.810E-01	1.453E+00	1.453E+00	46.87
PB-214	74.82	169	5.80	5.476E+00	3.521E+00	3.522E+00	32.23
	77.11	265	9.70	5.460E+00	3.308E+00	3.309E+00	18.80
	87.09	88	3.41	5.391E+00	3.179E+00	3.180E+00	39.40
	242.00	94	7.25	3.168E+00	2.705E+00	2.706E+00	57.39
	295.22	90	18.42	2.664E+00	1.218E+00	1.219E+00	44.95
	351.93	203	35.60*	2.285E+00	1.646E+00	1.647E+00	20.99
RN-222	609.32	134	45.49*	1.433E+00	1.361E+00	1.361E+00	23.96
	1120.29	-----	14.92	8.740E-01	-----	Line Not Found	-----
	1764.49	20	15.30	5.810E-01	1.453E+00	1.453E+00	46.87
RA-224	240.99	94	4.10*	3.168E+00	4.784E+00	4.784E+00	57.39
RA-226	609.32	134	45.49*	1.433E+00	1.361E+00	1.361E+00	23.96
	1120.29	-----	14.92	8.740E-01	-----	Line Not Found	-----
	1764.49	20	15.30	5.810E-01	1.453E+00	1.453E+00	46.87
AC-228	105.21	-----	1.10	5.215E+00	-----	Line Not Found	-----
	338.32	60	11.27	2.364E+00	1.495E+00	1.495E+00	57.51
	794.95	12	4.25	1.155E+00	1.669E+00	1.669E+00	97.08
	835.71	-----	1.61	1.110E+00	-----	Line Not Found	-----
	911.20	55	25.80*	1.035E+00	1.359E+00	1.359E+00	33.22
	968.97	19	15.80	9.842E-01	8.136E-01	8.136E-01	94.46
RA-228	105.21	-----	1.10	5.215E+00	-----	Line Not Found	-----
	338.32	60	11.27	2.364E+00	1.495E+00	1.495E+00	57.51
	794.95	12	4.25	1.155E+00	1.669E+00	1.669E+00	97.08

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	835.71	-----	1.61	1.110E+00	-----	Line Not Found	-----
	911.20	55	25.80*	1.035E+00	1.359E+00	1.359E+00	33.22
	968.97	19	15.80	9.842E-01	8.136E-01	8.136E-01	94.46
TH-228	74.82	169	10.28	5.476E+00	1.986E+00	1.986E+00	32.23
	77.11	265	17.10	5.460E+00	1.877E+00	1.877E+00	18.80
	238.63	327	43.60*	3.203E+00	1.549E+00	1.549E+00	13.65
	300.09	19	3.30	2.621E+00	1.451E+00	1.451E+00	144.54
TH-230	609.32	134	45.49*	1.433E+00	1.361E+00	1.361E+00	23.96
	1120.29	-----	14.92	8.740E-01	-----	Line Not Found	-----
	1764.49	20	15.30	5.810E-01	1.453E+00	1.453E+00	46.87
PA-231	283.69	-----	1.70	2.761E+00	-----	Line Not Found	-----
	301.36	19	5.35*	2.621E+00	8.948E-01	8.948E-01	144.54
TH-232	105.21	-----	1.10	5.215E+00	-----	Line Not Found	-----
	338.32	60	11.27	2.364E+00	1.495E+00	1.495E+00	57.51
	835.71	-----	1.61	1.110E+00	-----	Line Not Found	-----
	911.20	55	25.80*	1.035E+00	1.359E+00	1.359E+00	33.22
	968.97	19	15.80	9.842E-01	8.136E-01	8.136E-01	94.46
TH-234	63.29	35	3.70*	5.587E+00	1.113E+00	1.113E+00	174.69
	92.59	109	4.23	5.346E+00	3.199E+00	3.199E+00	45.04
U-234	609.32	134	45.49*	1.433E+00	1.361E+00	1.361E+00	23.96
	1120.29	-----	14.92	8.740E-01	-----	Line Not Found	-----
	1764.49	20	15.30	5.810E-01	1.453E+00	1.453E+00	46.87
U-235	89.96	81	3.47	5.370E+00	2.885E+00	2.885E+00	55.41
	93.35	109	5.60	5.346E+00	2.416E+00	2.416E+00	45.04
	143.76	-----	10.96*	4.611E+00	-----	Line Not Found	-----
	163.33	-----	5.08	4.273E+00	-----	Line Not Found	-----
	185.72	92	57.20	3.902E+00	2.725E-01	2.725E-01	45.34
	205.31	-----	5.01	3.621E+00	-----	Line Not Found	-----
U-238	63.29	35	3.70*	5.587E+00	1.113E+00	1.113E+00	174.69
	92.59	109	4.23	5.346E+00	3.199E+00	3.199E+00	45.04
AM-243	43.53	-----	5.90	5.049E+00	-----	Line Not Found	-----
	74.66	169	67.20*	5.476E+00	3.039E-01	3.039E-01	32.23

Flag: "*" = Keyline

Total number of lines in spectrum 54
 Number of unidentified lines 15
 Number of lines tentatively identified by NID 39 72.22%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.865E+01	1.865E+01	0.263E+01	14.10	
AS-73	80.30D	14.1	1.204E-01	1.699E+00	8.008E+00	471.25	
NB-95M	64.03D	27.7	7.798E-02	2.158E+00	3.285E+00	152.26	
CD-109	461.40D	1.59	2.930E+00	4.645E+00	1.830E+00	39.40	
SN-126	2.30E+05Y	1.00	2.930E-01	2.930E-01	1.154E-01	39.40	
BA-137M	30.08Y	1.02	2.395E-01	2.442E-01	1.445E-01	59.17	
CS-137	30.08Y	1.02	2.530E-01	2.580E-01	1.526E-01	59.17	
TL-208	1.41E+10Y	1.00	3.237E-01	3.237E-01	1.513E-01	46.76	
PB-210	22.20Y	1.03	1.482E+00	1.521E+00	1.862E+00	122.39	
BI-211	7.04E+08Y	1.00	4.536E+00	4.536E+00	0.952E+00	20.99	
BI-212	1.41E+10Y	1.00	2.367E+00	2.367E+00	1.430E+00	60.41	
PB-212	1.41E+10Y	1.00	1.549E+00	1.549E+00	0.211E+00	13.65	
BI-214	1600.00Y	1.00	1.361E+00	1.361E+00	0.326E+00	23.96	
PB-214	1600.00Y	1.00	1.646E+00	1.647E+00	0.346E+00	20.99	
RN-222	1600.00Y	1.00	1.361E+00	1.361E+00	0.326E+00	23.96	
RA-224	1.41E+10Y	1.00	4.784E+00	4.784E+00	2.745E+00	57.39	
RA-226	1600.00Y	1.00	1.361E+00	1.361E+00	0.326E+00	23.96	
AC-228	1.41E+10Y	1.00	1.359E+00	1.359E+00	0.451E+00	33.22	
RA-228	1.41E+10Y	1.00	1.359E+00	1.359E+00	0.451E+00	33.22	
TH-228	1.41E+10Y	1.00	1.549E+00	1.549E+00	0.211E+00	13.65	
TH-230	7.54E+04Y	1.00	1.361E+00	1.361E+00	0.326E+00	23.96	
PA-231	7.04E+08Y	1.00	8.948E-01	8.948E-01	12.93E-01	144.54	
TH-232	1.41E+10Y	1.00	1.359E+00	1.359E+00	0.451E+00	33.22	
TH-234	4.47E+09Y	1.00	1.113E+00	1.113E+00	1.945E+00	174.69	
U-234	2.45E+05Y	1.00	1.361E+00	1.361E+00	0.326E+00	23.96	
U-235	7.04E+08Y	1.00	2.725E-01	2.725E-01	1.236E-01	45.34	K
U-238	4.47E+09Y	1.00	1.113E+00	1.113E+00	1.945E+00	174.69	
AM-243	7370.00Y	1.00	3.039E-01	3.039E-01	0.980E-01	32.23	
Total Activity :			5.538E+01	6.081E+01			

Grand Total Activity : 5.538E+01 6.081E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	34.92	36	170	0.67	69.51	68	6	9.25E-03	****	1.44E+00	
0	129.83	66	56	2.25	259.17	255	8	1.76E-02	47.7	4.85E+00	T
0	192.13	19	37	0.95	383.69	381	5	5.14E-03	****	3.81E+00	T
0	209.30	30	39	0.92	418.00	415	6	8.05E-03	77.3	3.57E+00	
0	213.16	6	62	0.75	425.72	422	7	1.61E-03	****	3.51E+00	
0	253.16	24	27	1.27	505.66	503	7	6.63E-03	82.5	3.05E+00	T
0	317.48	11	20	1.17	634.21	631	6	3.15E-03	****	2.50E+00	T
0	393.88	15	14	1.55	786.91	784	6	4.26E-03	91.5	2.07E+00	
0	417.46	32	41	0.77	834.03	827	14	8.89E-03	92.7	1.97E+00	
0	463.71	19	54	1.02	926.48	920	12	5.39E-03	****	1.80E+00	T
0	679.68	18	30	3.97	1358.14	1347	18	5.12E-03	****	1.31E+00	
0	706.37	8	21	3.43	1411.47	1404	12	2.41E-03	****	1.27E+00	T
0	771.11	27	16	5.25	1540.88	1534	14	7.83E-03	77.2	1.18E+00	T
4	788.17	12	4	1.43	1574.97	1566	12	3.49E-03	80.2	1.16E+00	
0	804.59	16	19	4.07	1607.78	1601	15	4.71E-03	****	1.14E+00	
0	842.05	18	8	1.27	1682.66	1676	10	5.06E-03	73.5	1.10E+00	
0	866.61	15	2	2.09	1731.76	1727	9	4.38E-03	60.9	1.08E+00	
0	873.71	15	3	1.95	1745.95	1740	10	4.24E-03	64.5	1.07E+00	T
0	935.55	4	16	2.41	1869.56	1860	11	1.25E-03	****	1.01E+00	
0	964.65	23	8	1.57	1927.71	1921	11	6.68E-03	61.5	9.88E-01	T
0	1093.35	11	2	1.54	2184.98	2181	8	3.11E-03	73.7	8.92E-01	T
0	1121.84	17	20	1.49	2241.92	2235	11	4.88E-03	****	8.73E-01	T
0	1151.31	6	11	0.61	2300.83	2290	12	1.67E-03	****	8.54E-01	
0	1174.94	13	11	1.53	2348.06	2342	12	3.86E-03	****	8.40E-01	
0	1239.26	44	4	0.68	2476.62	2468	18	1.30E-02	36.0	8.03E-01	T
0	1305.66	10	2	0.90	2609.36	2605	9	2.79E-03	82.3	7.67E-01	
0	1580.37	8	0	0.83	3158.50	3155	8	2.22E-03	70.7	6.46E-01	

Flags: "T" = Tentatively associated


```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235053.CNF;1
* Acquisition date   : 3-OCT-2016 07:06:55 Sensitivity      : 3.000
* Detector ID       : GAM31 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:06.45 Half life ratio : *****
* Sample date       : 1-DEC-2015 14:24:00 Nuclide Library : SOLID
* Sample ID         : G405235053 Analyst initials: MXR1
* Batch Number      : 1596252 Sample Quantity : 1.1363E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 15-JUN-2016 06:54:07 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM31_CAN.CNF;7
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	3.666E-01
AS-73	4.568E+00
NB-95M	3.246E+00
CD-109	1.093E+00
SN-126	6.890E-02
BA-137M	5.222E-02
CS-137	5.517E-02
TL-208	4.953E-02
PB-210	7.476E-01
BI-211	2.873E-01
BI-212	7.039E-01
PB-212	6.897E-02
BI-214	1.107E-01
PB-214	2.921E-01
RN-222	1.107E-01
RA-224	7.404E-01
RA-226	1.107E-01
AC-228	1.801E-01
RA-228	1.801E-01
TH-228	6.897E-02
TH-230	1.106E-01
PA-231	5.592E-01
TH-232	1.801E-01
TH-234	9.232E-01
U-234	1.106E-01
U-235	2.428E-01
U-238	9.232E-01
AM-243	4.711E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.921E+01	NOT IDENT.
NA-22	7.339E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF

AL-26	4.579E-02	NOT IDENT.
SC-46	5.544E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	1.081E-01	NOT IDENT.
CO-56	9.605E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	5.928E-02	NOT IDENT.
CO-58	8.979E-01	NOT IDENT.
FE-59	1.378E+01	NOT IDENT.
CO-60	7.065E-02	NOT IDENT.
ZN-65	2.892E-01	NOT IDENT.
GE-68	3.064E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	3.261E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	1.280E+00	NOT IDENT.
KR-85	1.288E+01	NOT IDENT.
SR-85	1.463E+00	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	3.324E-01	NOT IDENT.
Y-91	9.379E+02	NOT IDENT.
NB-94	4.860E-02	NOT IDENT.
NB-95	1.610E+00	NOT IDENT.
ZR-95	2.554E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.862E-02	NOT IDENT.
RH-102	7.831E-02	NOT IDENT.
RU-103	7.920E+00	FAIL ABUN
RH-106	7.599E-01	NOT IDENT.
RU-106	7.599E-01	NOT IDENT.
AG-108M	4.850E-02	NOT IDENT.
AG-110M	1.173E-01	FAIL ABUN
SN-113	3.038E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.709E-01	NOT IDENT.
SB-124	4.185E+00	NOT IDENT.
SB-125	1.744E-01	FAIL ABUN
TE-125M	3.671E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	6.588E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	8.793E-02	FAIL ABUN
CS-135	2.168E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	1.646E-01	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	3.449E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	4.722E-01	NOT IDENT.
PM-144	7.678E-02	NOT IDENT.
PR-144	6.688E+00	NOT IDENT.
PM-146	7.439E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	9.180E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	3.925E-02	FAIL ABUN
EU-152	1.365E-01	FAIL ABUN
GD-153	1.910E-01	NOT IDENT.
EU-154	1.793E-01	FAIL ABUN
EU-155	1.220E-01	FAIL ABUN
TB-160	2.811E+00	FAIL ABUN
HO-166M	7.909E-02	NOT IDENT.
TM-171	9.400E+00	FAIL ABUN
HF-172	2.956E-01	FAIL ABUN
LU-172	1.292E-01	FAIL ABUN

LU-176	3.133E-02	FAIL ABUN
HF-181	7.132E+00	NOT IDENT.
TA-182	1.691E+00	FAIL ABUN
RE-183	1.940E+00	NOT IDENT.
RE-184	5.091E+01	NOT IDENT.
W-188	1.567E+02	FAIL ABUN
IR-192	8.093E-01	FAIL ABUN
HG-203	3.673E+00	NOT IDENT.
BI-207	6.693E-02	FAIL ABUN
PB-211	8.376E-01	NOT IDENT.
RN-219	4.964E-01	NOT IDENT.
RA-223	9.119E-01	FAIL ABUN
AC-227	3.185E-01	FAIL ABUN
TH-227	3.185E-01	FAIL ABUN
TH-229	6.377E-01	FAIL ABUN
TH-231	9.119E-01	FAIL ABUN
PA-233	9.245E-02	FAIL ABUN
PA-234	4.553E-01	FAIL ABUN
PA-234M	6.794E+00	NOT IDENT.
NP-237	9.245E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	3.075E-01	NOT IDENT.
PU-239	4.500E+02	FAIL ABUN
AM-241	9.318E-02	NOT IDENT.
CM-243	1.144E-01	NOT IDENT.
BK-247	1.128E-01	NOT IDENT.
CM-247	4.788E-02	NOT IDENT.
CF-249	4.911E-02	FAIL ABUN
CF-251	1.601E-01	NOT IDENT.
ANH-511	8.431E-02	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235053.CNF;1
* Acquisition date   : 3-OCT-2016 07:06:55 Sensitivity      : 3.000
* Detector ID        : GAM31 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:06.45 Half life ratio  : *****
* Sample date        : 1-DEC-2015 14:24:00 Nuclide Library : SOLID
* Sample ID          : G405235053 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity : 1.1363E+02 GRAM
*                    : Quantity Err(%) : 1.7601E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                    : Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 15-JUN-2016 06:54:07 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM31_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.865E+01	2.755E+00	2.755E+00
AS-73	1.699E+00	7.856E+00	7.856E+00
NB-95M	2.158E+00	3.224E+00	3.224E+00
CD-109	2.865E+00	1.984E+00	1.984E+00
SN-126	1.807E-01	1.248E-01	1.248E-01
BA-137M	2.442E-01	1.420E-01	1.420E-01
CS-137	2.580E-01	1.500E-01	1.500E-01
TL-208	3.237E-01	1.489E-01	1.489E-01
PB-210	1.521E+00	1.830E+00	1.830E+00
BI-211	1.179E+00	1.761E+00	1.761E+00
BI-212	2.367E+00	1.407E+00	1.407E+00
PB-212	1.549E+00	2.228E-01	2.228E-01
BI-214	1.361E+00	3.249E-01	3.249E-01
PB-214	1.647E+00	3.456E-01	3.456E-01
RN-222	1.361E+00	3.249E-01	3.249E-01
RA-224	2.630E+00	2.860E+00	2.860E+00
RA-226	1.361E+00	3.249E-01	3.249E-01
AC-228	1.359E+00	4.479E-01	4.479E-01
RA-228	1.359E+00	4.479E-01	4.479E-01
TH-228	1.549E+00	2.228E-01	2.228E-01
TH-230	1.361E+00	3.248E-01	3.248E-01
PA-231	8.948E-01	1.282E+00	1.282E+00
TH-232	1.359E+00	4.479E-01	4.479E-01
TH-234	1.113E+00	1.922E+00	1.922E+00
U-234	1.361E+00	3.248E-01	3.248E-01
U-235	1.112E-01	2.857E-01	2.857E-01
U-238	1.113E+00	1.922E+00	1.922E+00
AM-243	1.987E-01	1.081E-01	1.081E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.162E+01	2.455E+01	2.510E+01	NOT IDENT.
NA-22	-4.217E-02	9.697E-02	9.881E-02	NOT IDENT.

NA-24	-1.000E+41	2.992E+41	0.000E+00	SHORT HLIF
AL-26	-8.769E-03	5.685E-02	5.698E-02	NOT IDENT.
SC-46	8.840E-02	6.221E-01	6.234E-01	FAIL ABUN
V-48	1.428E+04	3.686E+04	3.741E+04	SHORT HLIF
CR-51	-2.080E+01	8.926E+02	8.926E+02	SHORT HLIF
MN-54	-2.729E-02	1.379E-01	1.384E-01	NOT IDENT.
CO-56	6.006E-01	1.077E+00	1.111E+00	FAIL ABUN
MN-56	1.000E+41	1.814E+41	0.000E+00	SHORT HLIF
CO-57	3.881E-02	6.603E-02	6.831E-02	NOT IDENT.
CO-58	6.132E-02	1.226E+00	1.226E+00	NOT IDENT.
FE-59	3.195E+00	1.567E+01	1.573E+01	NOT IDENT.
CO-60	-4.484E-03	8.580E-02	8.582E-02	NOT IDENT.
ZN-65	1.647E-01	3.409E-01	3.489E-01	NOT IDENT.
GE-68	-2.607E-01	3.669E+00	3.671E+00	NOT IDENT.
AS-74	-6.317E+03	1.474E+04	1.501E+04	SHORT HLIF
SE-75	-1.205E-01	4.215E-01	4.249E-01	NOT IDENT.
BR-77	2.065E+39	1.828E+40	0.000E+00	SHORT HLIF
SR-82	5.037E+01	1.813E+03	1.813E+03	SHORT HLIF
RB-83	1.675E+00	1.292E+00	1.497E+00	NOT IDENT.
KR-85	-3.053E+01	1.861E+01	2.315E+01	NOT IDENT.
SR-85	-3.468E+00	2.114E+00	2.629E+00	NOT IDENT.
RB-86	-2.194E+04	5.854E+04	5.937E+04	SHORT HLIF
Y-88	1.564E-01	3.226E-01	3.302E-01	NOT IDENT.
Y-91	1.363E+02	1.088E+03	1.089E+03	NOT IDENT.
NB-94	-7.107E-03	6.854E-02	6.861E-02	NOT IDENT.
NB-95	3.041E-03	2.217E+00	2.217E+00	NOT IDENT.
ZR-95	2.419E-01	3.079E+00	3.081E+00	NOT IDENT.
NB-97	1.000E+41	1.929E+41	0.000E+00	SHORT HLIF
ZR-97	-1.000E+41	1.550E+41	0.000E+00	SHORT HLIF
MO-99	2.120E+33	2.090E+33	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	1.147E+41	0.000E+00	SHORT HLIF
RH-101	-1.496E-02	5.126E-02	5.171E-02	NOT IDENT.
RH-102	-9.265E-04	9.445E-02	9.445E-02	NOT IDENT.
RU-103	-1.245E+00	9.576E+00	9.592E+00	FAIL ABUN
RH-106	2.162E-01	8.728E-01	8.782E-01	NOT IDENT.
RU-106	2.162E-01	8.728E-01	8.782E-01	NOT IDENT.
AG-108M	7.238E-03	5.566E-02	5.576E-02	NOT IDENT.
AG-110M	2.637E-03	1.349E-01	1.349E-01	FAIL ABUN
SN-113	-1.369E-01	4.188E-01	4.233E-01	NOT IDENT.
CD-115	-6.488E+39	4.226E+40	0.000E+00	SHORT HLIF
SN-117M	-6.911E+04	2.120E+05	2.143E+05	SHORT HLIF
TE-123M	-2.899E-02	2.079E-01	2.083E-01	NOT IDENT.
SB-124	-1.536E-01	5.196E+00	5.196E+00	NOT IDENT.
SB-125	3.211E-02	1.991E-01	1.997E-01	FAIL ABUN
TE-125M	3.297E+01	4.267E+02	4.269E+02	NOT IDENT.
I-126	1.095E+06	2.097E+06	2.154E+06	SHORT HLIF
SB-126	1.263E+06	2.894E+06	2.949E+06	SHORT HLIF
SB-127	4.091E+22	1.595E+23	0.000E+00	SHORT HLIF
I-131	7.012E+09	1.572E+10	1.604E+10	SHORT HLIF
I-132	-1.000E+41	1.920E+42	0.000E+00	SHORT HLIF
TE-132	1.453E+27	2.870E+27	0.000E+00	SHORT HLIF
BA-133	6.087E-03	8.316E-02	8.321E-02	NOT IDENT.
I-133	-1.000E+41	3.567E+41	0.000E+00	SHORT HLIF
CS-134	1.099E-01	1.047E-01	1.158E-01	FAIL ABUN
CS-135	1.598E-02	2.682E-01	2.683E-01	NOT IDENT.
I-135	-1.000E+41	7.508E+41	0.000E+00	SHORT HLIF
CS-136	-8.042E+02	7.328E+05	7.328E+05	SHORT HLIF
CE-139	1.094E-01	1.882E-01	1.945E-01	NOT IDENT.
BA-140	-1.774E+06	3.404E+06	3.497E+06	SHORT HLIF
LA-140	-2.828E+05	1.283E+06	1.290E+06	SHORT HLIF
CE-141	-1.163E+01	4.342E+01	4.374E+01	NOT IDENT.
CE-143	1.000E+41	4.432E+41	0.000E+00	SHORT HLIF
CE-144	3.845E-01	5.592E-01	5.854E-01	NOT IDENT.
PM-144	-4.117E-03	9.409E-02	9.411E-02	NOT IDENT.
PR-144	-2.133E+00	8.554E+00	8.608E+00	NOT IDENT.
PM-146	6.430E-02	7.843E-02	8.362E-02	NOT IDENT.
ND-147	2.814E+07	6.964E+07	7.079E+07	SHORT HLIF
PM-147	-1.987E+02	1.102E+03	1.105E+03	NOT IDENT.
PM-149	7.516E+40	6.692E+41	0.000E+00	SHORT HLIF
EU-150	3.877E-03	4.925E-02	4.928E-02	FAIL ABUN
EU-152	8.353E-02	1.596E-01	1.640E-01	FAIL ABUN
GD-153	-2.851E-02	2.426E-01	2.430E-01	NOT IDENT.
EU-154	-1.030E-01	2.369E-01	2.414E-01	FAIL ABUN
EU-155	-4.819E-02	1.468E-01	1.484E-01	FAIL ABUN
TB-160	-3.728E-01	3.322E+00	3.326E+00	FAIL ABUN
HO-166M	-5.595E-02	1.134E-01	1.162E-01	NOT IDENT.
TM-171	3.572E+00	1.650E+01	1.658E+01	FAIL ABUN
HF-172	1.564E-01	3.599E-01	3.667E-01	FAIL ABUN

LU-172	1.714E-01	1.250E-01	1.469E-01	FAIL ABUN
LU-176	-2.145E-02	3.822E-02	3.942E-02	FAIL ABUN
HF-181	4.405E-03	8.388E+00	8.388E+00	NOT IDENT.
TA-182	6.625E-01	1.889E+00	1.912E+00	FAIL ABUN
RE-183	-4.310E-01	2.218E+00	2.227E+00	NOT IDENT.
RE-184	-3.087E+01	6.512E+01	6.659E+01	NOT IDENT.
W-188	-5.636E+01	2.053E+02	2.069E+02	FAIL ABUN
IR-192	6.475E-01	9.153E-01	9.607E-01	FAIL ABUN
HG-203	-3.671E+00	5.099E+00	5.361E+00	NOT IDENT.
BI-207	-7.355E-02	9.386E-02	9.955E-02	FAIL ABUN
PB-211	-4.319E-01	1.037E+00	1.056E+00	NOT IDENT.
RN-219	-2.174E-01	6.079E-01	6.158E-01	NOT IDENT.
RA-223	2.570E-01	1.012E+00	1.019E+00	FAIL ABUN
AC-227	1.942E-01	3.972E-01	4.067E-01	FAIL ABUN
TH-227	1.942E-01	3.972E-01	4.067E-01	FAIL ABUN
TH-229	7.441E-01	7.903E-01	8.586E-01	FAIL ABUN
TH-231	2.570E-01	1.012E+00	1.019E+00	FAIL ABUN
PA-233	2.688E-02	1.023E-01	1.030E-01	FAIL ABUN
PA-234	1.555E-01	5.312E-01	5.358E-01	FAIL ABUN
PA-234M	4.413E-01	7.927E+00	7.930E+00	NOT IDENT.
NP-237	2.688E-02	1.023E-01	1.030E-01	FAIL ABUN
NP-238	1.000E+41	3.104E+41	0.000E+00	SHORT HLIF
NP-239	1.391E-01	3.488E-01	3.544E-01	NOT IDENT.
PU-239	1.423E+03	6.681E+02	9.263E+02	FAIL ABUN
AM-241	-1.079E-02	1.060E-01	1.062E-01	NOT IDENT.
CM-243	1.828E-02	1.318E-01	1.321E-01	NOT IDENT.
BK-247	1.855E-02	1.381E-01	1.383E-01	NOT IDENT.
CM-247	-1.538E-02	5.773E-02	5.815E-02	NOT IDENT.
CF-249	-8.217E-03	5.798E-02	5.809E-02	FAIL ABUN
CF-251	-7.304E-02	2.010E-01	2.037E-01	NOT IDENT.
ANH-511	-8.832E-02	9.043E-02	9.880E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	100.7624	87.09	76.5680	136.47	61.9439
45.60	115.4579	87.57	76.6492	140.51	0.0000
46.54	115.8266	88.03	76.7267	143.76	49.9167
49.72	0.0000	88.34	76.7792	144.24	45.7026
51.35	110.3970	88.47	76.8005	145.44	52.1761
51.87	122.2180	89.96	77.0502	152.43	44.1212
52.39	136.4078	1093.63	77.1631	153.25	0.0000
52.97	145.4134	91.11	0.0000	323.87	58.2641
53.44	145.6249	92.59	77.4847	156.02	0.0000
54.07	140.6323	93.35	77.6093	158.56	0.0000
57.36	0.0000	94.56	59.6516	159.00	47.8068
57.53	137.6566	94.65	59.6628	162.33	44.7599
57.98	137.8370	94.67	59.6651	162.66	0.0000
59.27	152.6341	94.87	59.6904	163.33	53.5698
59.32	152.6557	97.43	62.6152	165.86	46.0804
59.54	146.4992	98.43	57.8414	176.31	51.1948
60.96	148.2875	98.44	57.8423	176.60	0.0000
61.17	148.3752	99.53	59.9352	177.52	59.0799
62.93	147.0000	100.11	55.0865	181.07	0.0000
63.29	147.1464	102.03	57.2725	181.52	52.2956
63.58	147.2633	103.18	58.3923	184.41	42.7436
64.28	125.5188	103.37	58.4144	143.76	42.8161
66.73	134.8522	105.21	64.5859	193.51	57.6541
67.24	134.1216	105.31	64.5983	197.03	57.1442
125.81	117.8353	106.12	54.7457	198.01	50.3473
67.75	117.8560	106.47	65.7392	201.83	41.3855
69.67	117.5293	109.28	63.0875	203.43	42.6170
70.83	147.3474	111.00	60.2774	205.31	38.0953
72.81	119.7028	111.76	0.0000	210.85	32.5356
72.87	119.7206	114.06	59.6090	215.65	40.5076
74.66	121.8031	116.30	0.0000	222.11	35.3133
74.82	121.8500	116.74	53.8079	227.09	42.6121
74.97	121.8950	119.76	58.1816	227.38	39.0732
77.11	122.5297	121.12	48.0894	228.16	0.0000
78.74	83.8829	121.22	48.0976	228.18	31.9974
79.69	90.3457	121.78	45.0719	116.74	31.9974
80.12	67.8274	122.06	43.0440	235.69	36.6413
80.19	0.0000	122.92	50.2935	235.96	36.6520
80.57	76.7005	123.07	55.4399	238.63	38.3550
81.00	83.0707	265.00	59.6094	238.98	0.0000
81.07	84.9724	125.81	49.5125	240.99	38.4512
81.75	83.2150	127.23	53.7680	242.00	38.4922
83.79	69.6704	127.91	51.0696	244.70	35.3848
84.00	65.9019	129.30	50.8430	252.40	0.0000
85.43	94.0861	131.20	38.8600	252.80	26.7618
86.55	76.4764	133.02	41.7609	254.15	0.0000
86.79	76.5167	133.52	43.1882	256.23	26.0413
86.94	76.5430	136.00	56.6516	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	43.0856	355.39	0.0000	584.27	16.4596
264.80	43.0910	356.01	30.6746	595.83	0.0000
265.00	38.1739	364.49	0.0000	427.87	25.9389
268.22	40.7656	366.42	0.0000	602.52	0.0000
269.46	27.2100	372.51	18.9103	604.72	18.7156
270.03	32.1747	375.05	24.3600	607.14	26.5469
271.23	43.3623	377.52	22.5978	609.32	21.8870
273.65	0.0000	356.01	25.4285	610.33	21.8981
276.40	26.1468	388.16	20.9542	614.28	12.5386
277.37	27.4174	388.63	0.0000	618.01	15.7025
277.60	27.4235	391.69	21.9219	620.36	14.6733
278.00	14.9641	264.66	22.0645	621.93	12.5869
279.20	44.9429	401.81	23.0026	630.19	0.0000
279.54	46.2060	402.40	23.9328	631.29	11.5922
279.70	46.2127	404.85	22.1304	633.25	8.4388
280.46	29.9978	410.95	21.1143	634.78	0.0000
283.69	31.7602	413.71	30.6193	635.95	12.6753
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	30.9741	423.72	0.0000	645.85	10.6144
285.90	0.0000	427.09	21.5382	657.76	12.8110
287.50	31.8731	427.87	25.2977	657.90	0.0000
290.67	31.5460	433.94	27.2831	661.66	16.0437
293.27	0.0000	439.40	19.8289	664.57	0.0000
351.93	29.1431	453.88	16.2052	666.33	0.0000
295.96	29.1627	463.37	22.0590	666.50	0.0000
879.38	20.3350	468.07	25.9728	667.71	0.0000
299.98	29.2680	473.00	0.0000	677.62	12.9321
300.09	29.2708	475.06	19.3237	685.70	0.0000
300.13	29.2722	476.78	20.3117	695.00	0.0000
301.36	25.4822	477.60	22.2574	696.49	13.0459
302.85	33.1705	482.18	18.4391	696.51	15.2202
256.23	25.5533	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	14.1383
306.78	31.5793	497.08	13.7106	697.49	14.1394
308.46	29.9165	505.52	29.5288	702.65	16.3531
311.90	30.0062	507.63	0.0000	706.68	14.1992
316.51	29.6955	511.00	33.5746	711.68	16.4203
319.41	0.0000	514.00	63.3125	720.70	0.0000
320.08	0.0000	514.00	63.3125	721.93	0.0000
321.04	27.9967	520.40	10.9226	722.78	13.2017
323.87	29.4498	520.69	0.0000	722.91	13.2026
325.23	39.0216	522.65	0.0000	723.31	14.8557
328.76	0.0000	527.90	0.0000	724.19	14.8612
333.37	28.2874	528.26	13.9647	727.33	14.3309
333.97	31.4458	529.59	13.9749	733.00	3.3154
334.37	28.8347	529.87	0.0000	735.93	16.5985
338.28	21.9147	531.02	0.0000	333.97	21.0387
338.32	21.9152	537.26	0.0000	739.50	0.0000
311.90	21.9538	546.56	0.0000	747.24	11.1202
340.48	21.9538	552.55	17.1909	748.06	12.2367
340.55	0.0000	563.25	19.3263	752.31	12.2591
344.28	19.8193	569.33	24.4932	753.82	0.0000
345.93	27.3432	946.00	24.4951	756.73	14.5155
351.06	30.1118	569.70	24.4980	756.80	14.5160
351.93	30.1325	583.19	16.4505	884.68	17.9206

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	20.1768	1274.44	12.8452	1620.50	2.1782
766.42	25.2274	1001.03	11.0277	1621.92	2.1790
766.84	26.9141	1002.74	12.8734	1678.03	0.0000
772.60	0.0000	1004.73	7.3611	1690.97	5.5310
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	0.0000
778.90	14.6525	1028.54	0.0000	1063.66	9.9000
783.70	0.0000	1037.84	8.3732	1771.35	3.6010
785.37	14.6922	1038.76	0.0000	1791.20	0.0000
792.07	6.7998	631.29	6.5313	1808.65	3.6287
794.95	6.8079	1048.07	0.0000	1810.72	0.0000
795.86	6.8105	1049.04	11.2053	1836.06	0.9123
810.06	10.2751	1050.41	13.0789		
810.29	6.8506	1063.66	15.9500		
344.28	6.8511	1077.00	0.0000		
810.76	10.2781	1077.34	7.5391		
815.77	0.0000	1085.87	4.7247		
1048.07	0.0000	1093.63	4.5469		
832.01	10.3656	1099.45	12.3367		
834.85	14.9895	1112.07	12.3851		
835.71	12.4572	1112.84	13.3412		
836.80	0.0000	1115.54	7.6299		
846.75	0.0000	1120.29	11.4617		
846.77	12.7429	1120.55	11.4631		
856.80	0.0000	1221.41	11.4653		
860.56	6.9880	1129.67	6.7056		
871.09	3.5082	1131.51	0.0000		
873.19	8.7775	1147.95	0.0000		
875.33	0.0000	1173.23	13.9764		
879.38	10.5575	1177.95	6.2203		
880.51	11.4424	1189.05	13.6522		
883.24	9.6918	1204.77	10.7758		
884.68	6.1709	1221.41	10.8275		
889.28	7.9478	1231.02	11.2807		
894.76	9.7338	1235.36	0.0000		
898.04	10.6318	1238.28	12.8580		
900.72	8.8687	1260.41	0.0000		
903.28	15.0908	1271.87	15.9756		
911.20	9.7932	1274.44	12.9889		
912.08	9.7965	1274.54	12.9897		
923.98	0.0000	1291.59	13.0508		
926.50	7.1624	1298.22	0.0000		
929.11	7.1689	1312.11	0.0000		
937.49	8.6288	1332.49	10.1501		
944.13	0.0000	1362.66	0.0000		
946.00	9.9174	1365.19	4.0952		
949.00	9.0253	1368.63	0.0000		
667.71	0.0000	1384.29	4.1157		
962.31	4.3526	1408.01	6.2109		
964.08	10.1623	1457.56	0.0000		
966.17	14.5283	1460.82	3.1469		
911.20	14.5425	1489.16	1.0562		
968.97	14.5425	1505.03	5.3015		
983.53	0.0000	1584.12	8.6411		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235054.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM43.CNF;151
Background date  : 2-OCT-2016 11:02:23.
Sample date      : 2-DEC-2015 14:51:00. Acquisition date : 3-OCT-2016 07:07:21.
Sample ID        : G405235054          Sample quantity  : 1.46461E+02 GRAM
Detector name    : GAM43              Detector geometry: CAN
Elapsed live time: 0 01:00:00.00      Elapsed real time: 0 01:00:00.68  0.0%
Energy tolerance : 1.50000 keV        Analyst Initials  : MXR1
Abundance limit  : 75.00000           Sensitivity       : 3.00000
Batch ID         : 1596252            Detector SN#      :
Matrix Spike ID  :                    LCS ID            : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	59.35	33	103	1.50	118.49	115	8	9.17E-03	55.9	
2	1	74.65	136	132	1.23	149.08	141	24	3.77E-02	15.8	3.07E+00
3	1	76.99	191	110	1.12	153.77	141	24	5.30E-02	12.2	
4	1	80.99	35	89	1.25	161.77	141	24	9.67E-03	52.0	
5	0	86.94	50	103	1.04	173.69	171	6	1.39E-02	35.0	
6	5	89.52	43	64	1.06	178.85	177	16	1.20E-02	29.9	1.03E+00
7	5	92.80*	102	165	1.76	185.41	177	16	2.83E-02	27.3	
8	0	114.29	31	107	2.27	228.39	225	9	8.52E-03	63.6	
9	0	129.76	28	109	1.28	259.36	253	9	7.80E-03	70.3	
10	0	143.95*	13	116	1.38	287.74	283	9	3.63E-03	153.0	
11	0	185.66*	107	102	1.54	371.19	365	12	2.96E-02	21.9	
12	0	208.40	52	122	0.68	416.67	412	11	1.44E-02	43.5	
13	0	219.04	41	128	6.21	437.95	429	15	1.12E-02	62.8	
14	4	238.49*	425	42	1.03	476.87	469	20	1.18E-01	5.5	1.31E+00
15	4	241.58	122	70	1.68	483.05	469	20	3.40E-02	17.7	
16	0	295.04*	142	50	1.24	590.00	585	9	3.93E-02	12.4	
17	0	320.25	25	45	0.65	640.43	634	12	7.01E-03	56.8	
18	0	338.38	86	70	1.26	676.71	670	14	2.40E-02	23.2	
19	0	351.85*	240	49	1.19	703.65	698	11	6.66E-02	8.7	
20	0	382.39	38	84	7.31	764.75	748	21	1.05E-02	62.6	
21	0	409.10	36	21	3.19	818.17	813	10	1.00E-02	29.5	
22	0	441.72	21	18	1.10	883.43	880	8	5.77E-03	41.7	
23	0	464.44	19	55	3.37	928.88	920	13	5.18E-03	85.3	
24	0	511.23*	16	83	1.42	1022.49	1014	14	4.47E-03	134.7	
25	0	566.62	7	30	1.47	1133.29	1126	10	1.94E-03	151.2	
26	0	582.95*	117	21	1.55	1165.95	1161	13	3.25E-02	12.4	
27	0	609.22*	150	44	1.71	1218.50	1210	19	4.16E-02	13.4	
28	0	722.93	12	7	1.22	1445.96	1443	6	3.23E-03	50.7	
29	0	726.85	44	9	2.06	1453.81	1449	11	1.23E-02	19.6	
30	0	767.75	27	13	1.88	1535.63	1530	10	7.62E-03	30.8	
31	0	774.19	19	11	1.77	1548.50	1543	10	5.37E-03	40.5	
32	0	833.02	6	9	0.72	1666.18	1660	8	1.58E-03	103.8	
33	0	884.64	15	5	0.85	1769.43	1765	9	4.03E-03	40.8	
34	0	888.09	4	4	0.58	1776.34	1773	7	1.01E-03	103.7	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	890.84	9	1	0.95	1781.84	1779	6	2.42E-03	40.2	
36	0	902.44	10	15	4.10	1805.04	1797	12	2.75E-03	84.5	
37	0	910.91	98	4	1.79	1821.99	1814	17	2.71E-02	11.2	
38	0	922.79	19	17	4.11	1845.74	1836	17	5.41E-03	53.4	
39	0	969.69	39	41	0.72	1939.57	1929	17	1.09E-02	42.6	
40	0	1042.99	8	8	1.24	2086.17	2080	10	2.26E-03	78.8	
41	0	1120.95	39	26	1.27	2242.11	2235	20	1.08E-02	35.4	
42	0	1215.78	19	6	3.78	2431.79	2425	13	5.34E-03	35.3	
43	0	1314.44	4	4	0.94	2629.13	2623	8	1.11E-03	100.0	
44	0	1341.47	10	3	0.96	2683.18	2676	11	2.79E-03	45.2	
45	0	1353.06	6	2	0.75	2706.35	2702	8	1.63E-03	59.0	
46	0	1460.66*	336	0	1.99	2921.57	2914	18	9.33E-02	5.5	
47	0	1764.57*	29	0	2.08	3529.38	3522	14	8.10E-03	19.6	
48	0	1847.26	12	0	2.31	3694.75	3690	10	3.33E-03	28.9	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235054.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 2-DEC-2015 14:51:00   Acquisition date  : 3-OCT-2016 07:07:21
Sample ID        : G405235054             Sample quantity  : 146.46 GRAM
Sample type       : SOLID                  Sample geometry   :
Detector name    : GAMMA43                Detector geometry: CAN
Elapsed live time: 0 01:00:00.00          Elapsed real time: 0 01:00:00.68   0.0%
Energy tolerance : 1.50 keV               Half life ratio  : 10.00
Errors propagated: No                     Systematic Error : 0.00 %
Efficiency type  : Linear                  Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.001E+00	1.552E+01	1.552E+01	11.02	OK
SC-46	889.28	99.98*	1.541E+00	1.220E-02	1.530E-01	207.36	OK
	1120.55	99.99	1.265E+00	1.561E-01	1.957E+00	70.74	OK
CD-109	88.03	3.70*	4.275E+00	9.991E-01	1.581E+00	143.54	OK
SN-126	64.28	9.60	1.983E+00	----- Line	Not Found	-----	Absent
	86.94	8.90	4.275E+00	4.153E-01	4.153E-01	143.54	OK
	87.57	37.00*	4.275E+00	9.991E-02	9.991E-02	143.54	OK
TL-208	277.37	6.60	4.205E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.199E+00	3.376E-01	3.376E-01	24.76	OK
	860.56	12.50	1.582E+00	----- Line	Not Found	-----	Absent
BI-211	72.87	1.23	2.941E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.426E+00	1.521E-02	1.521E-02	6072.10	OK
PB-212	74.82	10.28	3.129E+00	2.088E+00	2.088E+00	41.68	OK
	77.11	17.10	3.370E+00	2.127E+00	2.127E+00	24.49	OK
	238.63	43.60*	4.741E+00	1.202E+00	1.202E+00	11.04	OK
	300.09	3.30	3.935E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.118E+00	8.347E-01	8.350E-01	26.88	OK
	1120.29	14.92	1.265E+00	1.046E+00	1.046E+00	70.74	OK
	1764.49	15.30	8.362E-01	1.103E+00	1.103E+00	39.19	OK
PB-214	74.82	5.80	3.147E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.370E+00	3.749E+00	3.750E+00	24.49	OK
	87.09	3.41	4.287E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.688E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.992E+00	1.106E+00	1.106E+00	24.81	OK
	351.93	35.60*	3.426E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.118E+00	8.347E-01	8.350E-01	26.88	OK
	1120.29	14.92	1.265E+00	1.046E+00	1.046E+00	70.74	OK
	1764.49	15.30	8.362E-01	1.103E+00	1.103E+00	39.19	OK
RA-224	240.99	4.10*	4.695E+00	1.761E+00	1.761E+00	79.67	OK
RA-226	609.32	45.49*	2.118E+00	8.347E-01	8.350E-01	26.88	OK
	1120.29	14.92	1.265E+00	1.046E+00	1.046E+00	70.74	OK
	1764.49	15.30	8.362E-01	1.103E+00	1.103E+00	39.19	OK
AC-228	105.21	1.10	5.396E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.546E+00	1.225E+00	1.225E+00	46.39	OK
	794.95	4.25	1.691E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.621E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.508E+00	1.296E+00	1.296E+00	22.47	OK
	968.97	15.80	1.431E+00	8.914E-01	8.914E-01	85.15	OK
RA-228	105.21	1.10	5.396E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.546E+00	1.225E+00	1.225E+00	46.39	OK
	794.95	4.25	1.691E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.621E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.508E+00	1.296E+00	1.296E+00	22.47	OK
	968.97	15.80	1.431E+00	8.914E-01	8.914E-01	85.15	OK
TH-228	74.82	10.28	3.129E+00	2.088E+00	2.088E+00	41.68	OK
	77.11	17.10	3.370E+00	2.127E+00	2.127E+00	24.49	OK
	238.63	43.60*	4.741E+00	1.202E+00	1.202E+00	11.04	OK
	300.09	3.30	3.935E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.118E+00	8.347E-01	8.347E-01	26.88	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	1120.29	14.92	1.265E+00	1.046E+00	1.046E+00	70.74	OK
	1764.49	15.30	8.362E-01	1.103E+00	1.103E+00	39.19	OK
TH-232	105.21	1.10	5.396E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.546E+00	1.225E+00	1.225E+00	46.39	OK
	835.71	1.61	1.621E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.508E+00	1.296E+00	1.296E+00	22.47	OK
	968.97	15.80	1.431E+00	8.914E-01	8.914E-01	85.15	OK
U-234	609.32	45.49*	2.118E+00	8.347E-01	8.347E-01	26.88	OK
	1120.29	14.92	1.265E+00	1.046E+00	1.046E+00	70.74	OK
	1764.49	15.30	8.362E-01	1.103E+00	1.103E+00	39.19	OK
U-235	89.96	3.47	4.476E+00	1.770E+00	1.770E+00	59.83	OK
	93.35	5.60	4.711E+00	2.441E+00	2.441E+00	54.61	OK
	143.76	10.96*	6.023E+00	1.209E-01	1.209E-01	306.07	OK
	163.33	5.08	5.876E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.570E+00	1.999E-01	1.999E-01	43.72	OK
	205.31	5.01	5.260E+00	----- Line	Not Found	-----	Absent
AM-241	59.54	35.90*	1.428E+00	4.218E-01	4.223E-01	111.73	OK
AM-243	43.53	5.90	1.216E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.129E+00	3.195E-01	3.195E-01	41.68	OK
ANH-511	511.00	100.00*	2.464E+00	3.567E-02	3.567E-02	269.31	OK

Flag: "*" = Keyline

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235054.CNF;1
* Acquisition date   : 3-OCT-2016 07:07:21 Sensitivity      : 3.000
* Detector ID       : GAM43 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.68 Half life ratio : *****
* Sample date       : 2-DEC-2015 14:51:00 Analyst initials: MXR1
* Sample ID         : G405235054 Sample Quantity : 1.4646E+02 GRAM
* Batch Number      : 1596252 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 6-SEP-2016 07:25:20 Eff. Geometry : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;7
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.552E+01	1.677E+00	5.157E-01
SC-46	1.530E-01	3.108E-01	1.152E-01
CD-109	1.581E+00	2.224E+00	2.332E+00
SN-126	9.991E-02	1.405E-01	1.485E-01
TL-208	3.376E-01	8.191E-02	7.719E-02
BI-211	1.521E-02	9.053E-01	3.806E-01
PB-212	1.202E+00	1.300E-01	9.611E-02
BI-214	8.350E-01	2.200E-01	1.211E-01
PB-214	1.112E+00	1.888E-01	3.461E-01
RN-222	8.350E-01	2.200E-01	1.211E-01
RA-224	1.761E+00	1.375E+00	1.031E+00
RA-226	8.350E-01	2.200E-01	1.211E-01
AC-228	1.296E+00	2.854E-01	2.273E-01
RA-228	1.296E+00	2.854E-01	2.273E-01
TH-228	1.202E+00	1.300E-01	9.611E-02
TH-230	8.347E-01	2.199E-01	1.210E-01
TH-232	1.296E+00	2.854E-01	2.273E-01
U-234	8.347E-01	2.199E-01	1.210E-01
U-235	1.209E-01	3.628E-01	3.434E-01
AM-241	4.223E-01	4.624E-01	4.211E-01
AM-243	3.195E-01	1.305E-01	1.225E-01
ANH-511	3.567E-02	9.414E-02	6.666E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-4.010E+00		1.522E+01	2.731E+01	NOT IDENT.
NA-22	1.351E-02		4.553E-02	9.890E-02	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF
AL-26	-7.073E-04		2.539E-02	5.852E-02	NOT IDENT.
V-48	0.000E+00		1.636E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00		9.109E+02	0.000E+00	SHORT HLIF
MN-54	-5.347E-02		8.349E-02	1.217E-01	NOT IDENT.
CO-56	5.346E-02		4.945E-01	9.964E-01	NOT IDENT.

MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.423E-02	5.200E-02	9.678E-02	NOT IDENT.
CO-58	-3.193E-01	6.514E-01	1.179E+00	NOT IDENT.
FE-59	-6.345E-01	9.474E+00	1.774E+01	NOT IDENT.
CO-60	9.919E-03	3.967E-02	8.633E-02	NOT IDENT.
ZN-65	-1.844E-01	2.496E-01	3.338E-01	NOT IDENT.
GE-68	1.968E+00	2.654E+00	5.774E+00	NOT IDENT.
AS-73	5.872E+00	1.930E+01	3.759E+01	NOT IDENT.
AS-74	0.000E+00	6.773E+03	0.000E+00	SHORT HLIF
SE-75	-1.202E-01	2.122E-01	3.855E-01	NOT IDENT.
BR-77	0.000E+00	1.288E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	1.047E+03	0.000E+00	SHORT HLIF
RB-83	4.129E-01	7.755E-01	1.622E+00	NOT IDENT.
KR-85	6.607E+00	9.456E+00	1.703E+01	NOT IDENT.
SR-85	7.420E-01	1.062E+00	1.914E+00	NOT IDENT.
RB-86	0.000E+00	3.808E+04	0.000E+00	SHORT HLIF
Y-88	1.067E-01	2.734E-01	6.370E-01	NOT IDENT.
Y-91	-1.996E+02	5.378E+02	1.028E+03	NOT IDENT.
NB-94	4.359E-02	3.490E-02	7.821E-02	NOT IDENT.
NB-95	3.122E-01	1.190E+00	2.113E+00	NOT IDENT.
NB-95M	-7.960E-01	2.917E+00	4.860E+00	NOT IDENT.
ZR-95	-5.800E-01	1.550E+00	2.888E+00	FAIL ABUN
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	7.257E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-2.173E-02	4.177E-02	6.511E-02	NOT IDENT.
RH-102	3.239E-02	6.329E-02	1.334E-01	FAIL ABUN
RU-103	8.324E-01	6.924E+00	1.314E+01	FAIL ABUN
RH-106	3.598E-02	5.063E-01	1.020E+00	NOT IDENT.
RU-106	3.598E-02	5.063E-01	1.020E+00	NOT IDENT.
AG-108M	1.463E-03	2.826E-02	5.371E-02	FAIL ABUN
AG-110M	1.566E-01	1.253E-01	2.549E-01	FAIL ABUN
SN-113	4.918E-02	2.585E-01	4.966E-01	NOT IDENT.
CD-115	0.000E+00	2.199E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.400E+05	0.000E+00	SHORT HLIF
TE-123M	2.600E-02	1.429E-01	2.836E-01	NOT IDENT.
SB-124	9.314E-03	2.371E+00	5.094E+00	FAIL ABUN
SB-125	1.178E-01	1.121E-01	2.364E-01	FAIL ABUN
TE-125M	-6.842E+01	3.182E+02	5.709E+02	NOT IDENT.
I-126	0.000E+00	1.380E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	2.031E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	6.976E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	7.918E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.444E+27	0.000E+00	SHORT HLIF
BA-133	-1.789E-02	4.913E-02	7.821E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	3.433E-02	5.312E-02	1.134E-01	NOT IDENT.
CS-135	-2.465E-02	1.432E-01	2.696E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	5.068E+05	0.000E+00	SHORT HLIF
BA-137M	-4.439E-03	4.073E-02	7.821E-02	NOT IDENT.
CS-137	-4.689E-03	4.303E-02	8.262E-02	NOT IDENT.
CE-139	5.433E-02	1.184E-01	2.388E-01	NOT IDENT.
BA-140	0.000E+00	1.973E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	6.045E+05	0.000E+00	SHORT HLIF
CE-141	1.859E+01	5.575E+01	5.063E+01	FAIL ABUN
CE-143	0.000E+00	6.699E+40	0.000E+00	SHORT HLIF
CE-144	-8.299E-02	3.789E-01	7.097E-01	FAIL ABUN
PM-144	2.420E-02	5.510E-02	1.158E-01	NOT IDENT.
PR-144	2.108E+00	4.801E+00	1.009E+01	NOT IDENT.
PM-146	4.022E-02	4.464E-02	9.503E-02	NOT IDENT.
ND-147	0.000E+00	5.542E+07	0.000E+00	SHORT HLIF
PM-147	6.992E+02	8.977E+02	1.744E+03	NOT IDENT.
PM-149	0.000E+00	1.102E+41	0.000E+00	SHORT HLIF
EU-150	3.134E-04	2.641E-02	4.519E-02	FAIL ABUN
EU-152	-5.728E-02	1.164E-01	1.821E-01	NOT IDENT.
GD-153	-1.661E-01	2.432E-01	3.825E-01	NOT IDENT.
EU-154	3.504E-02	1.118E-01	2.432E-01	FAIL ABUN
EU-155	1.012E-01	1.353E-01	2.607E-01	FAIL ABUN
TB-160	5.072E-01	2.464E+00	4.417E+00	FAIL ABUN
HO-166M	3.067E-02	6.914E-02	1.410E-01	FAIL ABUN
TM-171	-3.926E+01	4.874E+01	8.606E+01	NOT IDENT.
HF-172	6.398E-02	2.869E-01	4.864E-01	FAIL ABUN
LU-172	-1.178E-01	9.316E-02	1.330E-01	FAIL ABUN
LU-176	7.663E-03	2.368E-02	4.686E-02	FAIL ABUN
HF-181	-1.270E-01	5.104E+00	9.522E+00	NOT IDENT.

TA-182	6.423E-01	1.097E+00	2.182E+00	FAIL ABUN
RE-183	9.110E+00	9.974E+00	1.010E+01	FAIL ABUN
RE-184	3.519E+01	5.828E+01	8.691E+01	FAIL ABUN
W-188	2.453E+01	1.430E+02	2.479E+02	NOT IDENT.
IR-192	-4.296E-01	6.059E-01	9.246E-01	FAIL ABUN
HG-203	-2.098E+00	2.797E+00	4.952E+00	NOT IDENT.
BI-207	-2.219E-02	5.014E-02	8.911E-02	FAIL ABUN
PB-210	2.532E+00	1.049E+01	2.072E+01	NOT IDENT.
PB-211	-1.013E+00	7.892E-01	1.006E+00	FAIL ABUN
BI-212	0.000E+00	7.412E-01	1.514E+00	FAIL ABUN
RN-219	2.876E-01	3.762E-01	7.780E-01	NOT IDENT.
RA-223	-1.866E-01	6.284E-01	1.025E+00	FAIL ABUN
AC-227	-5.008E-02	2.225E-01	4.193E-01	FAIL ABUN
TH-227	-5.008E-02	2.225E-01	4.193E-01	FAIL ABUN
TH-229	1.847E-01	4.558E-01	9.137E-01	FAIL ABUN
PA-231	3.344E-01	4.556E-01	9.238E-01	NOT IDENT.
TH-231	-1.866E-01	6.284E-01	1.025E+00	FAIL ABUN
PA-233	-1.938E-02	6.151E-02	1.132E-01	NOT IDENT.
PA-234	-1.068E-01	3.195E-01	5.832E-01	FAIL ABUN
PA-234M	-3.132E+00	4.935E+00	8.429E+00	FAIL ABUN
TH-234	1.355E+00	1.928E+00	3.641E+00	FAIL ABUN
NP-237	-1.938E-02	6.151E-02	1.132E-01	NOT IDENT.
NP-238	0.000E+00	7.173E+00	0.000E+00	SHORT HLIF
U-238	1.355E+00	1.928E+00	3.641E+00	FAIL ABUN
NP-239	-1.463E-01	2.923E-01	4.606E-01	NOT IDENT.
PU-239	4.577E+02	6.308E+02	6.731E+02	FAIL ABUN
CM-243	8.128E-03	1.140E-01	2.102E-01	NOT IDENT.
BK-247	-3.669E-02	6.994E-02	1.277E-01	NOT IDENT.
CM-247	2.675E-02	3.317E-02	6.940E-02	NOT IDENT.
CF-249	1.211E-02	4.119E-02	7.985E-02	NOT IDENT.
CF-251	-3.552E-02	1.151E-01	2.197E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	323	10.66*	1.001E+00	1.552E+01	1.552E+01	11.02
SC-46	889.28	4	99.98*	1.541E+00	1.220E-02	1.530E-01	207.36
	1120.55	39	99.99	1.265E+00	1.561E-01	1.957E+00	70.74
CD-109	88.03	62	3.70*	4.275E+00	2.018E+00	3.195E+00	69.94
SN-126	64.28	-----	9.60	1.983E+00	-----	Line Not Found	-----
	86.94	62	8.90	4.275E+00	8.390E-01	8.390E-01	69.94
	87.57	62	37.00*	4.275E+00	2.018E-01	2.018E-01	69.94
CE-141	145.44	16	48.29*	6.023E+00	2.745E-02	1.859E+01	306.07
TL-208	277.37	-----	6.60	4.205E+00	-----	Line Not Found	-----
	583.19	123	85.00*	2.199E+00	3.376E-01	3.376E-01	24.76
	860.56	-----	12.50	1.582E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	2.941E+00	-----	Line Not Found	-----
	351.06	264	12.92*	3.426E+00	3.062E+00	3.062E+00	17.33
PB-212	74.82	170	10.28	3.129E+00	2.712E+00	2.712E+00	31.58
	77.11	239	17.10	3.370E+00	2.127E+00	2.127E+00	24.49
	238.63	485	43.60*	4.741E+00	1.202E+00	1.202E+00	11.04
	300.09	-----	3.30	3.935E+00	-----	Line Not Found	-----
BI-214	609.32	157	45.49*	2.118E+00	8.347E-01	8.350E-01	26.88
	1120.29	39	14.92	1.265E+00	1.046E+00	1.046E+00	70.74
	1764.49	28	15.30	8.362E-01	1.103E+00	1.103E+00	39.19
PB-214	74.82	170	5.80	3.129E+00	4.807E+00	4.809E+00	31.58
	77.11	239	9.70	3.370E+00	3.749E+00	3.750E+00	24.49
	87.09	62	3.41	4.275E+00	2.190E+00	2.191E+00	69.94
	242.00	140	7.25	4.695E+00	2.101E+00	2.102E+00	35.42
	295.22	159	18.42	3.992E+00	1.106E+00	1.106E+00	24.81
	351.93	264	35.60*	3.426E+00	1.111E+00	1.112E+00	17.33
RN-222	609.32	157	45.49*	2.118E+00	8.347E-01	8.350E-01	26.88
	1120.29	39	14.92	1.265E+00	1.046E+00	1.046E+00	70.74
	1764.49	28	15.30	8.362E-01	1.103E+00	1.103E+00	39.19
RA-224	240.99	140	4.10*	4.695E+00	3.716E+00	3.716E+00	35.42
RA-226	609.32	157	45.49*	2.118E+00	8.347E-01	8.350E-01	26.88
	1120.29	39	14.92	1.265E+00	1.046E+00	1.046E+00	70.74
	1764.49	28	15.30	8.362E-01	1.103E+00	1.103E+00	39.19
AC-228	105.21	-----	1.10	5.396E+00	-----	Line Not Found	-----
	338.32	96	11.27	3.546E+00	1.225E+00	1.225E+00	46.39
	794.95	-----	4.25	1.691E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.621E+00	-----	Line Not Found	-----
	911.20	98	25.80*	1.508E+00	1.296E+00	1.296E+00	22.47
	968.97	39	15.80	1.431E+00	8.914E-01	8.914E-01	85.15
RA-228	105.21	-----	1.10	5.396E+00	-----	Line Not Found	-----
	338.32	96	11.27	3.546E+00	1.225E+00	1.225E+00	46.39
	794.95	-----	4.25	1.691E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.621E+00	-----	Line Not Found	-----
	911.20	98	25.80*	1.508E+00	1.296E+00	1.296E+00	22.47
	968.97	39	15.80	1.431E+00	8.914E-01	8.914E-01	85.15
TH-228	74.82	170	10.28	3.129E+00	2.712E+00	2.712E+00	31.58
	77.11	239	17.10	3.370E+00	2.127E+00	2.127E+00	24.49

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	238.63	485	43.60*	4.741E+00	1.202E+00	1.202E+00	11.04
	300.09	-----	3.30	3.935E+00	-----	Line Not Found	-----
TH-230	609.32	157	45.49*	2.118E+00	8.347E-01	8.347E-01	26.88
	1120.29	39	14.92	1.265E+00	1.046E+00	1.046E+00	70.74
	1764.49	28	15.30	8.362E-01	1.103E+00	1.103E+00	39.19
TH-232	105.21	-----	1.10	5.396E+00	-----	Line Not Found	-----
	338.32	96	11.27	3.546E+00	1.225E+00	1.225E+00	46.39
	835.71	-----	1.61	1.621E+00	-----	Line Not Found	-----
	911.20	98	25.80*	1.508E+00	1.296E+00	1.296E+00	22.47
	968.97	39	15.80	1.431E+00	8.914E-01	8.914E-01	85.15
U-234	609.32	157	45.49*	2.118E+00	8.347E-01	8.347E-01	26.88
	1120.29	39	14.92	1.265E+00	1.046E+00	1.046E+00	70.74
	1764.49	28	15.30	8.362E-01	1.103E+00	1.103E+00	39.19
U-235	89.96	54	3.47	4.476E+00	1.770E+00	1.770E+00	59.83
	93.35	126	5.60	4.711E+00	2.441E+00	2.441E+00	54.61
	143.76	16	10.96*	6.023E+00	1.209E-01	1.209E-01	306.07
	163.33	-----	5.08	5.876E+00	-----	Line Not Found	-----
	185.72	124	57.20	5.570E+00	1.999E-01	1.999E-01	43.72
	205.31	-----	5.01	5.260E+00	-----	Line Not Found	-----
AM-241	59.54	42	35.90*	1.428E+00	4.218E-01	4.223E-01	111.73
AM-243	43.53	-----	5.90	1.216E-01	-----	Line Not Found	-----
	74.66	170	67.20*	3.129E+00	4.149E-01	4.149E-01	31.58
ANH-511	511.00	17	100.00*	2.464E+00	3.567E-02	3.567E-02	269.31

Flag: "*" = Keyline

Total number of lines in spectrum 48
 Number of unidentified lines 13
 Number of lines tentatively identified by NID 35 72.92%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.552E+01	1.552E+01	0.171E+01	11.02	
SC-46	83.79D	12.5	1.220E-02	1.530E-01	3.172E-01	207.36	
CD-109	461.40D	1.58	2.018E+00	3.195E+00	2.234E+00	69.94	
SN-126	2.30E+05Y	1.00	2.018E-01	2.018E-01	1.412E-01	69.94	
CE-141	32.51D	677.	2.745E-02	1.859E+01	5.689E+01	306.07	
TL-208	1.41E+10Y	1.00	3.376E-01	3.376E-01	0.836E-01	24.76	
BI-211	7.04E+08Y	1.00	3.062E+00	3.062E+00	0.531E+00	17.33	
PB-212	1.41E+10Y	1.00	1.202E+00	1.202E+00	0.133E+00	11.04	
BI-214	1600.00Y	1.00	8.347E-01	8.350E-01	2.245E-01	26.88	
PB-214	1600.00Y	1.00	1.111E+00	1.112E+00	0.193E+00	17.33	
RN-222	1600.00Y	1.00	8.347E-01	8.350E-01	2.245E-01	26.88	
RA-224	1.41E+10Y	1.00	3.716E+00	3.716E+00	1.316E+00	35.42	
RA-226	1600.00Y	1.00	8.347E-01	8.350E-01	2.245E-01	26.88	
AC-228	1.41E+10Y	1.00	1.296E+00	1.296E+00	0.291E+00	22.47	
RA-228	1.41E+10Y	1.00	1.296E+00	1.296E+00	0.291E+00	22.47	
TH-228	1.41E+10Y	1.00	1.202E+00	1.202E+00	0.133E+00	11.04	
TH-230	7.54E+04Y	1.00	8.347E-01	8.347E-01	2.244E-01	26.88	
TH-232	1.41E+10Y	1.00	1.296E+00	1.296E+00	0.291E+00	22.47	
U-234	2.45E+05Y	1.00	8.347E-01	8.347E-01	2.244E-01	26.88	
U-235	7.04E+08Y	1.00	1.209E-01	1.209E-01	3.702E-01	306.07	
AM-241	432.60Y	1.00	4.218E-01	4.223E-01	4.719E-01	111.73	
AM-243	7370.00Y	1.00	4.149E-01	4.149E-01	1.310E-01	31.58	
ANH-511	1.00E+09Y	1.00	3.567E-02	3.567E-02	9.606E-02	269.31	
Total Activity :			3.747E+01	5.735E+01			

Grand Total Activity : 3.747E+01 5.735E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	80.99	43	111	1.25	161.77	141	24	9.67E-03	****	3.76E+00	T
0	114.29	37	130	2.27	228.39	225	9	8.52E-03	****	5.72E+00	T
0	129.76	34	131	1.28	259.36	253	9	7.80E-03	****	5.99E+00	T
0	208.40	60	141	0.68	416.67	412	11	1.44E-02	87.0	5.21E+00	
0	219.04	47	147	6.21	437.95	429	15	1.12E-02	****	5.04E+00	
0	320.25	28	50	0.65	640.43	634	12	7.01E-03	****	3.72E+00	T
0	382.39	41	92	7.31	764.75	748	21	1.05E-02	****	3.18E+00	T
0	409.10	39	23	3.19	818.17	813	10	1.00E-02	58.9	3.00E+00	
0	441.72	22	20	1.10	883.43	880	8	5.77E-03	83.4	2.80E+00	
0	464.44	20	60	3.37	928.88	920	13	5.18E-03	****	2.68E+00	T
0	566.62	7	32	1.47	1133.29	1126	10	1.94E-03	****	2.25E+00	
0	722.93	12	8	1.22	1445.96	1443	6	3.23E-03	****	1.83E+00	T
0	726.85	46	9	2.06	1453.81	1449	11	1.23E-02	39.3	1.82E+00	T
0	767.75	28	13	1.88	1535.63	1530	10	7.62E-03	61.5	1.74E+00	T
0	774.19	20	11	1.77	1548.50	1543	10	5.37E-03	81.0	1.73E+00	
0	833.02	6	9	0.72	1666.18	1660	8	1.58E-03	****	1.63E+00	T
0	884.64	15	6	0.85	1769.43	1765	9	4.03E-03	81.7	1.55E+00	T
0	890.84	9	1	0.95	1781.84	1779	6	2.42E-03	80.5	1.54E+00	
0	902.44	10	15	4.10	1805.04	1797	12	2.75E-03	****	1.52E+00	T
0	922.79	20	17	4.11	1845.74	1836	17	5.41E-03	****	1.49E+00	T
0	1042.99	8	8	1.24	2086.17	2080	10	2.26E-03	****	1.35E+00	
0	1215.78	19	6	3.78	2431.79	2425	13	5.34E-03	70.6	1.18E+00	
0	1314.44	4	4	0.94	2629.13	2623	8	1.11E-03	****	1.10E+00	
0	1341.47	10	3	0.96	2683.18	2676	11	2.79E-03	90.3	1.08E+00	
0	1353.06	6	2	0.75	2706.35	2702	8	1.63E-03	****	1.07E+00	
0	1847.26	11	0	2.31	3694.75	3690	10	3.33E-03	57.7	7.99E-01	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235054.CNF;1
* Acquisition date   : 3-OCT-2016 07:07:21 Sensitivity      : 3.000
* Detector ID        : GAM43 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.68 Half life ratio  : *****
* Sample date        : 2-DEC-2015 14:51:00 Nuclide Library : SOLID
* Sample ID          : G405235054 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity : 1.4646E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 6-SEP-2016 07:25:20 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;7
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.925E-01
SC-46	0.000E+00
CD-109	1.094E+00
SN-126	6.965E-02
TL-208	3.480E-02
BI-211	1.741E-01
PB-212	4.456E-02
BI-214	5.316E-02
PB-214	1.672E-01
RN-222	5.316E-02
RA-224	4.778E-01
RA-226	5.316E-02
AC-228	9.553E-02
RA-228	9.553E-02
TH-228	4.456E-02
TH-230	5.314E-02
TH-232	9.553E-02
U-234	5.314E-02
U-235	1.606E-01
AM-241	1.962E-01
AM-243	5.772E-02
ANH-511	3.044E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.225E+01	NOT IDENT.
NA-22	4.173E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.073E-02	NOT IDENT.
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.226E-02	NOT IDENT.
CO-56	4.298E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF

CO-57	4.522E-02	NOT IDENT.
CO-58	5.047E-01	NOT IDENT.
FE-59	7.741E+00	NOT IDENT.
CO-60	3.600E-02	NOT IDENT.
ZN-65	1.409E-01	NOT IDENT.
GE-68	2.523E+00	NOT IDENT.
AS-73	1.755E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.763E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	7.349E-01	NOT IDENT.
KR-85	7.810E+00	NOT IDENT.
SR-85	8.775E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	2.551E-01	NOT IDENT.
Y-91	4.295E+02	NOT IDENT.
NB-94	3.533E-02	NOT IDENT.
NB-95	9.455E-01	NOT IDENT.
NB-95M	2.263E+00	NOT IDENT.
ZR-95	1.242E+00	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.040E-02	NOT IDENT.
RH-102	5.951E-02	FAIL ABUN
RU-103	5.885E+00	FAIL ABUN
RH-106	4.493E-01	NOT IDENT.
RU-106	4.493E-01	NOT IDENT.
AG-108M	2.408E-02	FAIL ABUN
AG-110M	1.128E-01	FAIL ABUN
SN-113	2.260E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.331E-01	NOT IDENT.
SB-124	1.981E+00	FAIL ABUN
SB-125	1.079E-01	FAIL ABUN
TE-125M	2.658E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.550E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	5.025E-02	NOT IDENT.
CS-135	1.244E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	3.504E-02	NOT IDENT.
CS-137	3.701E-02	NOT IDENT.
CE-139	1.122E-01	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.361E+01	FAIL ABUN
CE-143	0.000E+00	SHORT HLIF
CE-144	3.318E-01	FAIL ABUN
PM-144	5.116E-02	NOT IDENT.
PR-144	4.458E+00	NOT IDENT.
PM-146	4.306E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	8.176E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.047E-02	FAIL ABUN
EU-152	8.296E-02	NOT IDENT.
GD-153	1.790E-01	NOT IDENT.
EU-154	1.028E-01	FAIL ABUN
EU-155	1.231E-01	FAIL ABUN
TB-160	1.926E+00	FAIL ABUN
HO-166M	6.344E-02	FAIL ABUN
TM-171	4.001E+01	NOT IDENT.
HF-172	2.283E-01	FAIL ABUN
LU-172	5.476E-02	FAIL ABUN
LU-176	2.144E-02	FAIL ABUN
HF-181	4.254E+00	NOT IDENT.
TA-182	9.505E-01	FAIL ABUN

RE-183	4.697E+00	FAIL ABUN
RE-184	3.862E+01	FAIL ABUN
W-188	1.147E+02	NOT IDENT.
IR-192	4.215E-01	FAIL ABUN
HG-203	2.276E+00	NOT IDENT.
BI-207	3.732E-02	FAIL ABUN
PB-210	9.681E+00	NOT IDENT.
PB-211	4.405E-01	FAIL ABUN
BI-212	6.991E-01	FAIL ABUN
RN-219	3.534E-01	NOT IDENT.
RA-223	4.633E-01	FAIL ABUN
AC-227	1.927E-01	FAIL ABUN
TH-227	1.927E-01	FAIL ABUN
TH-229	4.266E-01	FAIL ABUN
PA-231	4.276E-01	NOT IDENT.
TH-231	4.633E-01	FAIL ABUN
PA-233	5.170E-02	NOT IDENT.
PA-234	2.515E-01	FAIL ABUN
PA-234M	3.614E+00	FAIL ABUN
TH-234	1.713E+00	FAIL ABUN
NP-237	5.170E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	1.713E+00	FAIL ABUN
NP-239	2.143E-01	NOT IDENT.
PU-239	3.172E+02	FAIL ABUN
CM-243	9.835E-02	NOT IDENT.
BK-247	5.832E-02	NOT IDENT.
CM-247	3.143E-02	NOT IDENT.
CF-249	3.646E-02	NOT IDENT.
CF-251	1.025E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235054.CNF;1
* Acquisition date : 3-OCT-2016 07:07:21 Sensitivity : 3.000
* Detector ID : GAM43 Energy tolerance: 1.500
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time: 0 01:00:00.68 Half life ratio : *****
* Sample date : 2-DEC-2015 14:51:00 Nuclide Library : SOLID
* Sample ID : G405235054 Analyst initials: MXR1
* Batch Number : 1596252 Sample Quantity : 1.4646E+02 GRAM
Quantity Err(%) : 1.3656E-03 %
* Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

* Eff. Cal. date : 6-SEP-2016 07:25:20 Eff. Geometry : CAN
* Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;7

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Table with 4 columns: Nuclide, Activity (pCi/GRAM), Act Error (1.96-sigma), TPU (1.96-sigma). Lists nuclides like K-40, SC-46, CD-109, SN-126, TL-208, BI-211, PB-212, BI-214, PB-214, RN-222, RA-224, RA-226, AC-228, RA-228, TH-228, TH-230, TH-232, U-234, U-235, AM-241, AM-243, ANH-511.

---- Non-Identified Nuclides ----

Table with 5 columns: Nuclide, Key-Line Activity (pCi/GRAM), K.L Act error (1.96-sigma), TPU (1.96-sigma), and identification status (e.g., NOT IDENT., SHORT HLIF).

MN-56	1.000E+41	9.252E+41	0.000E+00	SHORT HLIF
CO-57	1.423E-02	5.200E-02	5.239E-02	NOT IDENT.
CO-58	-3.193E-01	6.516E-01	6.673E-01	NOT IDENT.
FE-59	-6.345E-01	9.474E+00	9.478E+00	NOT IDENT.
CO-60	9.919E-03	3.968E-02	3.993E-02	NOT IDENT.
ZN-65	-1.844E-01	2.497E-01	2.632E-01	NOT IDENT.
GE-68	1.968E+00	2.655E+00	2.799E+00	NOT IDENT.
AS-73	5.872E+00	1.934E+01	1.952E+01	NOT IDENT.
AS-74	1.610E+03	6.774E+03	6.813E+03	SHORT HLIF
SE-75	-1.202E-01	2.123E-01	2.191E-01	NOT IDENT.
BR-77	1.190E+39	1.050E+40	0.000E+00	SHORT HLIF
SR-82	5.027E+01	1.047E+03	1.047E+03	SHORT HLIF
RB-83	4.129E-01	7.775E-01	7.995E-01	NOT IDENT.
KR-85	6.607E+00	9.460E+00	9.918E+00	NOT IDENT.
SR-85	7.420E-01	1.063E+00	1.114E+00	NOT IDENT.
RB-86	2.367E+04	3.809E+04	3.956E+04	SHORT HLIF
Y-88	1.067E-01	2.735E-01	2.777E-01	NOT IDENT.
Y-91	-1.996E+02	5.379E+02	5.453E+02	NOT IDENT.
NB-94	4.359E-02	3.495E-02	4.009E-02	NOT IDENT.
NB-95	3.122E-01	1.190E+00	1.198E+00	NOT IDENT.
NB-95M	-7.960E-01	2.918E+00	2.940E+00	NOT IDENT.
ZR-95	-5.800E-01	1.550E+00	1.572E+00	FAIL ABUN
NB-97	1.000E+41	3.737E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	2.783E+41	0.000E+00	SHORT HLIF
MO-99	3.133E+32	7.261E+32	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	1.492E+42	0.000E+00	SHORT HLIF
RH-101	-2.173E-02	4.196E-02	4.309E-02	NOT IDENT.
RH-102	3.239E-02	6.335E-02	6.501E-02	FAIL ABUN
RU-103	8.324E-01	6.925E+00	6.935E+00	FAIL ABUN
RH-106	3.598E-02	5.063E-01	5.066E-01	NOT IDENT.
RU-106	3.598E-02	5.063E-01	5.066E-01	NOT IDENT.
AG-108M	1.463E-03	2.826E-02	2.826E-02	FAIL ABUN
AG-110M	1.566E-01	1.256E-01	1.441E-01	FAIL ABUN
SN-113	4.918E-02	2.585E-01	2.594E-01	NOT IDENT.
CD-115	4.496E+39	2.201E+40	0.000E+00	SHORT HLIF
SN-117M	5.210E+04	1.401E+05	1.421E+05	SHORT HLIF
TE-123M	2.600E-02	1.429E-01	1.434E-01	NOT IDENT.
SB-124	9.314E-03	2.371E+00	2.371E+00	FAIL ABUN
SB-125	1.178E-01	1.122E-01	1.241E-01	FAIL ABUN
TE-125M	-6.842E+01	3.182E+02	3.197E+02	NOT IDENT.
I-126	-3.929E+05	1.381E+06	1.393E+06	SHORT HLIF
SB-126	1.523E+06	2.051E+06	2.163E+06	SHORT HLIF
SB-127	3.402E+22	8.449E+22	0.000E+00	SHORT HLIF
I-131	-2.282E+09	7.919E+09	7.986E+09	SHORT HLIF
I-132	-1.000E+41	6.113E+42	0.000E+00	SHORT HLIF
TE-132	-5.877E+26	1.464E+27	0.000E+00	SHORT HLIF
BA-133	-1.789E-02	4.913E-02	4.979E-02	FAIL ABUN
I-133	-1.000E+41	6.871E+41	0.000E+00	SHORT HLIF
CS-134	3.433E-02	5.314E-02	5.535E-02	NOT IDENT.
CS-135	-2.465E-02	1.433E-01	1.437E-01	NOT IDENT.
I-135	-1.000E+41	1.157E+42	0.000E+00	SHORT HLIF
CS-136	7.616E+04	5.069E+05	5.080E+05	SHORT HLIF
BA-137M	-4.439E-03	4.073E-02	4.078E-02	NOT IDENT.
CS-137	-4.689E-03	4.303E-02	4.308E-02	NOT IDENT.
CE-139	5.433E-02	1.189E-01	1.214E-01	NOT IDENT.
BA-140	-7.218E+05	1.973E+06	2.000E+06	SHORT HLIF
LA-140	4.028E+05	6.048E+05	6.314E+05	SHORT HLIF
CE-141	1.859E+01	5.576E+01	5.638E+01	FAIL ABUN
CE-143	1.000E+41	6.779E+40	0.000E+00	SHORT HLIF
CE-144	-8.299E-02	3.789E-01	3.808E-01	FAIL ABUN
PM-144	2.420E-02	5.512E-02	5.619E-02	NOT IDENT.
PR-144	2.108E+00	4.802E+00	4.895E+00	NOT IDENT.
PM-146	4.022E-02	4.474E-02	4.827E-02	NOT IDENT.
ND-147	-5.996E+07	5.552E+07	6.175E+07	SHORT HLIF
PM-147	6.992E+02	8.982E+02	9.519E+02	NOT IDENT.
PM-149	1.000E+41	1.124E+41	0.000E+00	SHORT HLIF
EU-150	3.134E-04	2.641E-02	2.641E-02	FAIL ABUN
EU-152	-5.728E-02	1.165E-01	1.193E-01	NOT IDENT.
GD-153	-1.661E-01	2.434E-01	2.546E-01	NOT IDENT.
EU-154	3.504E-02	1.118E-01	1.129E-01	FAIL ABUN
EU-155	1.012E-01	1.355E-01	1.430E-01	FAIL ABUN
TB-160	5.072E-01	2.464E+00	2.475E+00	FAIL ABUN
HO-166M	3.067E-02	6.916E-02	7.053E-02	FAIL ABUN
TM-171	-3.926E+01	4.887E+01	5.198E+01	NOT IDENT.
HF-172	6.398E-02	2.871E-01	2.885E-01	FAIL ABUN
LU-172	-1.178E-01	9.392E-02	1.079E-01	FAIL ABUN
LU-176	7.663E-03	2.368E-02	2.393E-02	FAIL ABUN
HF-181	-1.270E-01	5.104E+00	5.105E+00	NOT IDENT.

TA-182	6.423E-01	1.097E+00	1.135E+00	FAIL ABUN
RE-183	9.110E+00	1.008E+01	1.088E+01	FAIL ABUN
RE-184	3.519E+01	5.891E+01	6.101E+01	FAIL ABUN
W-188	2.453E+01	1.430E+02	1.435E+02	NOT IDENT.
IR-192	-4.296E-01	6.061E-01	6.363E-01	FAIL ABUN
HG-203	-2.098E+00	2.798E+00	2.954E+00	NOT IDENT.
BI-207	-2.219E-02	5.014E-02	5.113E-02	FAIL ABUN
PB-210	2.532E+00	1.050E+01	1.056E+01	NOT IDENT.
PB-211	-1.013E+00	7.909E-01	9.134E-01	FAIL ABUN
BI-212	1.926E+00	7.476E-01	1.146E+00	FAIL ABUN
RN-219	2.876E-01	3.779E-01	3.996E-01	NOT IDENT.
RA-223	-1.866E-01	6.285E-01	6.341E-01	FAIL ABUN
AC-227	-5.008E-02	2.226E-01	2.237E-01	FAIL ABUN
TH-227	-5.008E-02	2.226E-01	2.237E-01	FAIL ABUN
TH-229	1.847E-01	4.559E-01	4.635E-01	FAIL ABUN
PA-231	3.344E-01	4.612E-01	4.852E-01	NOT IDENT.
TH-231	-1.866E-01	6.285E-01	6.341E-01	FAIL ABUN
PA-233	-1.938E-02	6.152E-02	6.213E-02	NOT IDENT.
PA-234	-1.068E-01	3.420E-01	3.454E-01	FAIL ABUN
PA-234M	-3.132E+00	4.937E+00	5.135E+00	FAIL ABUN
TH-234	1.355E+00	1.951E+00	2.045E+00	FAIL ABUN
NP-237	-1.938E-02	6.152E-02	6.213E-02	NOT IDENT.
NP-238	-1.000E+41	7.184E+40	0.000E+00	SHORT HLIF
U-238	1.355E+00	1.951E+00	2.045E+00	FAIL ABUN
NP-239	-1.463E-01	2.926E-01	2.999E-01	NOT IDENT.
PU-239	4.577E+02	6.311E+02	6.640E+02	FAIL ABUN
CM-243	8.128E-03	1.140E-01	1.140E-01	NOT IDENT.
BK-247	-3.669E-02	7.033E-02	7.225E-02	NOT IDENT.
CM-247	2.675E-02	3.348E-02	3.558E-02	NOT IDENT.
CF-249	1.211E-02	4.121E-02	4.157E-02	NOT IDENT.
CF-251	-3.552E-02	1.151E-01	1.162E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	56.5264	87.09	88.9700	136.47	69.4951
45.60	58.9785	87.57	76.0074	140.51	0.0000
46.54	62.2691	88.03	76.0804	143.76	70.2601
49.72	0.0000	88.34	76.1292	144.24	70.3099
51.35	71.6210	88.47	76.1494	145.44	64.9173
51.87	64.3473	89.96	69.4391	152.43	78.0023
52.39	75.0109	1093.63	69.5357	153.25	0.0000
52.97	62.4388	91.11	0.0000	323.87	71.3231
53.44	56.1657	92.59	69.8099	156.02	0.0000
54.07	66.8845	93.35	69.9161	158.56	0.0000
57.36	0.0000	94.56	70.0841	159.00	74.3935
57.53	55.7471	94.65	70.0964	162.33	76.4701
57.98	62.9718	94.67	70.0992	162.66	0.0000
59.27	62.4755	94.87	70.1271	163.33	81.7939
59.32	62.4839	97.43	87.7068	165.86	68.9747
59.54	62.5211	98.43	67.4762	176.31	71.6891
60.96	77.9079	98.44	67.4775	176.60	0.0000
61.17	77.9513	99.53	56.6107	177.52	70.9131
62.93	62.3599	100.11	60.2154	181.07	0.0000
63.29	59.5149	102.03	73.4689	181.52	58.7980
63.58	65.3704	103.18	68.8763	184.41	61.6911
64.28	86.2262	103.37	68.9011	143.76	61.7907
66.73	70.2891	105.21	75.0956	193.51	57.8548
67.24	67.0794	105.31	75.1091	197.03	66.2654
125.81	84.7669	106.12	84.7724	198.01	63.6155
67.75	84.7810	106.47	83.6318	201.83	67.5495
69.67	76.7009	109.28	66.0447	203.43	47.1887
70.83	84.3113	111.00	57.8156	205.31	50.8648
72.81	89.1681	111.76	0.0000	210.85	71.9332
72.87	89.1809	114.06	70.2357	215.65	62.5822
74.66	89.5551	116.30	0.0000	222.11	50.4185
74.82	89.5880	116.74	72.9936	227.09	59.1349
74.97	89.6191	119.76	67.2536	227.38	66.6643
77.11	90.0598	121.12	56.3763	228.16	0.0000
78.74	90.3912	121.22	56.3857	228.18	64.8412
79.69	90.5829	121.78	61.3457	116.74	64.8412
80.12	90.6696	122.06	61.3743	235.69	68.1914
80.19	0.0000	122.92	79.9001	235.96	53.9999
80.57	90.7593	123.07	71.3128	238.63	54.1478
81.00	90.8453	265.00	78.7690	238.98	0.0000
81.07	90.8594	125.81	72.4561	240.99	54.2777
81.75	78.8622	127.23	80.8741	242.00	54.3333
83.79	61.6930	127.91	71.8754	244.70	41.5773
84.00	75.4368	129.30	72.0345	252.40	0.0000
85.43	87.1317	131.20	63.1161	252.80	37.5761
86.55	88.8697	133.02	59.9648	254.15	0.0000
86.79	88.9140	133.52	74.0145	256.23	47.3683
86.94	88.9423	136.00	72.7921	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	48.7254	355.39	0.0000	584.27	28.1552
264.80	48.7325	356.01	39.4615	595.83	0.0000
265.00	46.7920	364.49	0.0000	427.87	12.8208
268.22	50.8447	366.42	0.0000	602.52	0.0000
269.46	47.9662	372.51	35.1531	604.72	19.0874
270.03	46.0333	375.05	22.4112	607.14	17.4565
271.23	43.1433	377.52	22.4514	609.32	17.4750
273.65	0.0000	356.01	35.4405	610.33	17.4837
276.40	39.4076	388.16	32.3175	614.28	16.2271
277.37	53.2474	388.63	0.0000	618.01	21.1126
277.60	53.2584	391.69	31.3175	620.36	14.7959
278.00	51.3049	264.66	22.8201	621.93	17.5835
279.20	58.2750	401.81	21.7505	630.19	0.0000
279.54	64.2211	402.40	19.5831	631.29	16.7338
279.70	64.2303	404.85	39.2322	633.25	26.0543
280.46	37.5756	410.95	37.7533	634.78	0.0000
283.69	53.5529	413.71	18.0895	635.95	14.9077
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	41.7163	423.72	0.0000	645.85	20.5941
285.90	0.0000	427.09	28.7586	657.76	21.6509
287.50	53.7341	427.87	21.0267	657.90	0.0000
290.67	47.8984	433.94	24.4430	661.66	26.4055
293.27	0.0000	439.40	25.0864	664.57	0.0000
351.93	46.0852	453.88	15.7528	666.33	0.0000
295.96	37.5938	463.37	29.4277	666.50	0.0000
879.38	46.7214	468.07	25.5396	667.71	0.0000
299.98	36.2153	473.00	0.0000	677.62	20.8996
300.09	36.2190	475.06	27.3574	685.70	0.0000
300.13	36.2197	476.78	23.9625	695.00	0.0000
301.36	38.2721	477.60	29.6827	696.49	14.3706
302.85	58.4897	482.18	24.0403	696.51	14.3706
256.23	40.3947	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	18.2091
306.78	33.3901	497.08	23.0969	697.49	18.2108
308.46	36.4768	505.52	34.8145	702.65	13.4493
311.90	42.6793	507.63	0.0000	706.68	26.9464
316.51	50.4930	511.00	37.2516	711.68	21.2185
319.41	0.0000	514.00	27.9863	720.70	0.0000
320.08	0.0000	514.00	27.9863	721.93	0.0000
321.04	32.7637	520.40	23.6992	722.78	23.2588
323.87	35.4048	520.69	0.0000	722.91	23.2603
325.23	52.3945	522.65	0.0000	723.31	20.1621
328.76	0.0000	527.90	0.0000	724.19	0.0000
333.37	31.0217	528.26	24.6846	727.33	7.7681
333.97	31.0364	529.59	22.9380	733.00	9.0847
334.37	27.9415	529.87	0.0000	735.93	18.5170
338.28	28.0278	531.02	0.0000	333.97	21.4548
338.32	28.0289	537.26	0.0000	739.50	0.0000
311.90	38.9946	546.56	0.0000	747.24	17.6265
340.48	38.9946	552.55	22.3328	748.06	24.4896
340.55	0.0000	563.25	20.1243	752.31	16.6825
344.28	45.3674	569.33	31.7244	753.82	0.0000
345.93	38.8461	946.00	25.9585	756.73	16.7131
351.06	38.7893	569.70	20.1920	756.80	16.7136
351.93	38.8149	583.19	28.1401	884.68	22.0876

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	20.5258	1274.44	11.8154	1620.50	2.0307
766.42	14.2137	1001.03	19.3645	1621.92	3.0469
766.84	12.4111	1002.74	13.9934	1678.03	0.0000
772.60	0.0000	1004.73	15.0797	1690.97	4.1234
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	2.0936
778.90	7.9368	1028.54	0.0000	1063.66	1.7467
783.70	0.0000	1037.84	10.4520	1771.35	2.9950
785.37	15.9150	1038.76	0.0000	1791.20	0.0000
792.07	23.9370	631.29	5.2406	1808.65	2.1123
794.95	11.9824	1048.07	0.0000	1810.72	0.0000
795.86	12.9853	1049.04	14.2045	1836.06	3.1857
810.06	10.0452	1050.41	14.2108		
810.29	12.0553	1063.66	13.1719		
344.28	12.0560	1077.00	0.0000		
810.76	17.0815	1077.34	8.8188		
815.77	0.0000	1085.87	14.3687		
1048.07	0.0000	1093.63	21.0503		
832.01	10.1309	1099.45	16.6489		
834.85	21.0952	1112.07	8.9131		
835.71	17.8557	1112.84	11.1444		
836.80	0.0000	1115.54	19.6292		
846.75	0.0000	1120.29	15.6372		
846.77	12.2260	1120.55	15.6381		
856.80	0.0000	1221.41	15.6415		
860.56	19.4581	1129.67	19.7130		
871.09	21.5909	1131.51	0.0000		
873.19	10.2893	1147.95	0.0000		
875.33	0.0000	1173.23	14.5211		
879.38	13.2004	1177.95	9.9967		
880.51	16.5073	1189.05	10.0289		
883.24	18.1763	1204.77	11.9050		
884.68	14.8790	1221.41	9.2007		
889.28	0.0000	1231.02	15.6827		
894.76	8.2966	1235.36	0.0000		
898.04	19.9354	1238.28	15.7142		
900.72	16.6289	1260.41	0.0000		
903.28	11.0960	1271.87	15.8595		
911.20	9.3889	1274.44	7.4684		
912.08	9.3917	1274.54	7.4684		
923.98	0.0000	1291.59	7.5027		
926.50	11.7472	1298.22	0.0000		
929.11	20.1568	1312.11	0.0000		
937.49	14.7408	1332.49	6.6356		
944.13	0.0000	1362.66	0.0000		
946.00	16.8965	1365.19	2.8679		
949.00	15.8565	1368.63	0.0000		
667.71	0.0000	1384.29	8.6454		
962.31	11.8938	1408.01	9.6631		
964.08	15.3013	1457.56	0.0000		
966.17	25.5198	1460.82	2.9364		
911.20	20.2229	1489.16	5.9127		
968.97	20.2229	1505.03	5.9347		
983.53	0.0000	1584.12	4.0287		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235055.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM11.CNF;517
Background date  : 2-OCT-2016 11:00:34.
Sample date     : 2-DEC-2015 14:59:00. Acquisition date : 3-OCT-2016 07:18:44.
Sample ID      : G405235055           Sample quantity  : 1.42583E+02 GRAM
Detector name   : GAM11              Detector geometry: CAN
Elapsed live time: 0 01:00:00.00      Elapsed real time: 0 01:00:00.58  0.0%
Energy tolerance: 1.50000 keV        Analyst Initials  : MXR1
Abundance limit : 75.00000          Sensitivity       : 3.00000
Batch ID       : 1596252            Detector SN#      :
Matrix Spike ID :                    LCS ID             : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.34*	14	132	0.86	126.58	124	7	3.93E-03	142.8	
2	1	73.12*	22	130	1.00	146.16	143	17	6.03E-03	88.0	4.65E+00
3	1	74.95*	158	127	1.01	149.82	143	17	4.38E-02	14.2	
4	1	77.09*	247	122	1.01	154.11	143	17	6.87E-02	9.8	
5	5	87.10	125	155	1.45	174.14	165	29	3.48E-02	19.9	5.13E+00
6	5	88.77	45	148	1.52	177.48	165	29	1.24E-02	58.2	
7	5	90.10	90	110	1.12	180.13	165	29	2.50E-02	23.2	
8	5	92.62*	112	128	1.53	185.18	165	29	3.12E-02	23.3	
9	0	186.16*	95	138	1.39	372.40	368	11	2.63E-02	27.8	
10	0	209.16	55	101	1.29	418.42	413	10	1.54E-02	36.6	
11	0	216.23	10	77	1.18	432.57	429	7	2.67E-03	154.9	
12	6	238.58*	444	50	0.96	477.29	471	20	1.23E-01	5.5	1.70E+00
13	6	241.80	115	87	1.97	483.74	471	20	3.20E-02	22.6	
14	0	270.53	29	74	0.75	541.23	538	9	8.08E-03	57.0	
15	3	277.21	35	48	1.28	554.60	551	13	9.71E-03	38.4	1.99E+00
16	3	280.00*	15	48	1.61	560.20	551	13	4.03E-03	89.8	
17	0	295.32*	132	84	1.02	590.85	586	10	3.68E-02	15.7	
18	0	299.81	21	75	0.72	599.83	599	7	5.90E-03	71.0	
19	0	328.23	43	50	2.96	656.71	652	10	1.19E-02	34.6	
20	0	338.39*	102	47	1.07	677.03	673	10	2.84E-02	16.4	
21	0	352.03*	260	82	1.29	704.33	697	13	7.23E-02	9.6	
22	0	409.52	26	41	0.78	819.37	815	9	7.08E-03	49.2	
23	0	463.24	31	32	0.97	926.88	924	6	8.49E-03	33.3	
24	0	466.55	15	25	0.61	933.50	930	8	4.26E-03	62.5	
25	0	511.15*	55	39	1.68	1022.75	1015	16	1.54E-02	33.8	
26	0	546.28	12	9	1.33	1093.04	1090	6	3.44E-03	47.4	
27	0	583.16*	138	22	1.47	1166.82	1161	12	3.83E-02	11.3	
28	0	609.52*	163	46	1.38	1219.56	1214	11	4.52E-02	11.5	
29	0	724.04	16	11	2.30	1448.71	1445	7	4.31E-03	43.0	
30	0	727.29*	21	24	1.41	1455.21	1452	9	5.95E-03	47.0	
31	0	795.61	20	15	0.98	1591.89	1586	12	5.45E-03	48.1	
32	0	806.09	25	27	5.27	1612.85	1597	21	7.00E-03	54.7	
33	0	835.33	22	17	1.88	1671.35	1665	11	5.97E-03	42.5	
34	0	861.31	21	24	3.79	1723.33	1717	16	5.83E-03	56.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	902.13	24	17	3.44	1804.99	1796	17	6.64E-03	44.5	
36	0	911.50*	85	20	1.66	1823.73	1818	15	2.35E-02	16.0	
37	0	968.97*	54	11	1.04	1938.70	1934	9	1.49E-02	18.2	
38	0	992.16	6	7	0.59	1985.10	1982	8	1.78E-03	77.8	
39	0	1004.93	15	3	1.99	2010.65	2007	8	4.10E-03	34.5	
40	0	1011.06	6	8	0.74	2022.90	2017	8	1.73E-03	88.1	
41	0	1120.75*	41	30	2.17	2242.33	2235	12	1.14E-02	31.5	
42	0	1218.96	10	16	0.54	2438.77	2431	12	2.80E-03	88.8	
43	0	1238.47	24	11	0.87	2477.79	2472	11	6.67E-03	33.7	
44	0	1307.89	8	4	0.65	2616.65	2613	7	2.15E-03	59.4	
45	0	1311.09	6	2	0.98	2623.04	2620	7	1.67E-03	55.4	
46	0	1378.42	18	3	1.37	2757.71	2751	14	4.98E-03	32.2	
47	0	1460.98*	409	12	1.83	2922.82	2915	16	1.14E-01	5.3	
48	0	1510.64	6	3	1.33	3022.13	3018	8	1.67E-03	68.7	
49	0	1765.50*	9	18	1.53	3531.79	3524	10	2.49E-03	97.1	

Flag: "*" = Peak area was modified by background subtraction


```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235055.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 2-DEC-2015 14:59:00   Acquisition date  : 3-OCT-2016 07:18:44
Sample ID         : G405235055             Sample quantity  : 142.58 GRAM
Sample type       : SOLID                   Sample geometry  :
Detector name    : GAMMA11                 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00           Elapsed real time: 0 01:00:00.58   0.0%
Energy tolerance : 1.50 keV                Half life ratio  : 10.00
Errors propagated: No                       Systematic Error : 0.00 %
Efficiency type  : Linear                   Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.238E+00	1.566E+01	1.566E+01	10.65	OK
MN-54	834.85	99.98*	1.951E+00	5.867E-02	1.157E-01	84.94	OK
CD-109	88.03	3.70*	6.347E+00	1.222E+00	1.934E+00	116.41	OK
SN-126	64.28	9.60	3.887E+00	2.492E-01	2.492E-01	285.54	OK
	86.94	8.90	6.243E+00	1.089E+00	1.089E+00	53.79	OK
	87.57	37.00*	6.243E+00	2.620E-01	2.620E-01	53.79	OK
HG-203	70.83	3.69	4.810E+00	----- Line	Not Found	-----	Absent
	72.87	6.19	5.060E+00	4.502E-01	4.252E+01	176.05	OK
	279.20	81.56*	4.679E+00	2.224E-02	2.101E+00	179.62	OK
TL-208	277.37	6.60	4.717E+00	6.579E-01	6.579E-01	76.73	OK
	583.19	85.00*	2.582E+00	3.451E-01	3.451E-01	22.59	OK
	860.56	12.50	1.906E+00	4.681E-01	4.681E-01	113.09	OK
BI-211	72.87	1.23	5.060E+00	2.266E+00	2.266E+00	176.05	OK
	351.06	12.92*	3.883E+00	4.031E-01	4.031E-01	245.18	OK
PB-212	74.82	10.28	5.247E+00	1.369E+00	1.369E+00	41.15	OK
	77.11	17.10	5.454E+00	1.718E+00	1.718E+00	19.51	OK
	238.63	43.60*	5.301E+00	1.140E+00	1.140E+00	10.96	OK
	300.09	3.30	4.428E+00	8.462E-01	8.462E-01	142.02	OK
BI-214	609.32	45.49*	2.494E+00	7.851E-01	7.853E-01	22.91	OK
	1120.29	14.92	1.547E+00	9.205E-01	9.209E-01	62.91	OK
	1764.49	15.30	1.039E+00	2.798E-01	2.799E-01	194.22	OK
PB-214	74.82	5.80	5.234E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.454E+00	3.028E+00	3.029E+00	19.51	OK
	87.09	3.41	6.242E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.244E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.482E+00	9.343E-01	9.346E-01	31.36	OK
	351.93	35.60*	3.884E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.494E+00	7.851E-01	7.853E-01	22.91	OK
	1120.29	14.92	1.547E+00	9.205E-01	9.209E-01	62.91	OK
	1764.49	15.30	1.039E+00	2.798E-01	2.799E-01	194.22	OK
RA-224	240.99	4.10*	5.247E+00	1.519E+00	1.519E+00	100.40	OK
RA-226	609.32	45.49*	2.494E+00	7.851E-01	7.853E-01	22.91	OK
	1120.29	14.92	1.547E+00	9.205E-01	9.209E-01	62.91	OK
	1764.49	15.30	1.039E+00	2.798E-01	2.799E-01	194.22	OK
AC-228	105.21	1.10	7.023E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.011E+00	1.305E+00	1.305E+00	32.77	OK
	794.95	4.25	2.027E+00	1.219E+00	1.219E+00	96.12	OK
	835.71	1.61	1.951E+00	3.643E+00	3.643E+00	84.94	OK
	911.20	25.80*	1.823E+00	9.506E-01	9.506E-01	32.02	OK
	968.97	15.80	1.738E+00	1.028E+00	1.028E+00	36.48	OK
RA-228	105.21	1.10	7.023E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.011E+00	1.305E+00	1.305E+00	32.77	OK
	794.95	4.25	2.027E+00	1.219E+00	1.219E+00	96.12	OK
	835.71	1.61	1.951E+00	3.643E+00	3.643E+00	84.94	OK
	911.20	25.80*	1.823E+00	9.506E-01	9.506E-01	32.02	OK
	968.97	15.80	1.738E+00	1.028E+00	1.028E+00	36.48	OK
TH-228	74.82	10.28	5.247E+00	1.369E+00	1.369E+00	41.15	OK
	77.11	17.10	5.454E+00	1.718E+00	1.718E+00	19.51	OK
	238.63	43.60*	5.301E+00	1.140E+00	1.140E+00	10.96	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	300.09	3.30	4.428E+00	8.462E-01	8.462E-01	142.02	OK
TH-230	609.32	45.49*	2.494E+00	7.851E-01	7.851E-01	22.91	OK
	1120.29	14.92	1.547E+00	9.205E-01	9.206E-01	62.91	OK
	1764.49	15.30	1.039E+00	2.798E-01	2.798E-01	194.22	OK
TH-232	105.21	1.10	7.023E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.011E+00	1.305E+00	1.305E+00	32.77	OK
	835.71	1.61	1.951E+00	3.643E+00	3.643E+00	84.94	OK
	911.20	25.80*	1.823E+00	9.506E-01	9.506E-01	32.02	OK
	968.97	15.80	1.738E+00	1.028E+00	1.028E+00	36.48	OK
TH-234	63.29	3.70*	3.887E+00	6.466E-01	6.466E-01	285.54	OK
	92.59	4.23	6.560E+00	2.586E+00	2.586E+00	46.65	OK
U-234	609.32	45.49*	2.494E+00	7.851E-01	7.851E-01	22.91	OK
	1120.29	14.92	1.547E+00	9.205E-01	9.205E-01	62.91	OK
	1764.49	15.30	1.039E+00	2.798E-01	2.798E-01	194.22	OK
U-235	89.96	3.47	6.425E+00	2.578E+00	2.578E+00	46.33	OK
	93.35	5.60	6.560E+00	1.953E+00	1.953E+00	46.65	OK
	143.76	10.96*	7.059E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	6.731E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.280E+00	1.592E-01	1.592E-01	55.51	OK
	205.31	5.01	5.902E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	3.887E+00	6.466E-01	6.466E-01	285.54	OK
	92.59	4.23	6.560E+00	2.586E+00	2.586E+00	46.65	OK
AM-243	43.53	5.90	9.310E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	5.247E+00	2.095E-01	2.095E-01	41.15	OK
ANH-511	511.00	100.00*	2.867E+00	1.076E-01	1.076E-01	67.65	OK

Flag: "*" = Keyline

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235055.CNF;1
* Acquisition date   : 3-OCT-2016 07:18:44 Sensitivity      : 3.000
* Detector ID       : GAM11 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.58 Half life ratio : *****
* Sample date      : 2-DEC-2015 14:59:00 Analyst initials: MXR1
* Sample ID       : G405235055 Sample Quantity : 1.4258E+02 GRAM
* Batch Number    : 1596252 Wet Weight : 0.00000
* Wet wt corr     : 1.00000 Dry Weight : 0.00000
* Nuclide Library : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 2-AUG-2016 10:31:39 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.566E+01	1.635E+00	7.527E-01
MN-54	1.157E-01	9.631E-02	1.061E-01
CD-109	1.934E+00	2.207E+00	1.583E+00
SN-126	2.620E-01	1.381E-01	1.004E-01
HG-203	2.101E+00	3.698E+00	4.402E+00
TL-208	3.451E-01	7.639E-02	6.780E-02
BI-211	4.031E-01	9.685E-01	3.207E-01
PB-212	1.140E+00	1.224E-01	8.561E-02
BI-214	7.853E-01	1.764E-01	1.117E-01
PB-214	1.081E+00	2.029E-01	3.276E-01
RN-222	7.853E-01	1.764E-01	1.117E-01
RA-224	1.519E+00	1.495E+00	9.180E-01
RA-226	7.853E-01	1.764E-01	1.117E-01
AC-228	9.506E-01	2.983E-01	1.994E-01
RA-228	9.506E-01	2.983E-01	1.994E-01
TH-228	1.140E+00	1.224E-01	8.561E-02
TH-230	7.851E-01	1.763E-01	1.116E-01
TH-232	9.506E-01	2.983E-01	1.994E-01
TH-234	6.466E-01	1.809E+00	1.744E+00
U-234	7.851E-01	1.763E-01	1.116E-01
U-235	1.054E-01	1.839E-01	3.559E-01
U-238	6.466E-01	1.809E+00	1.744E+00
AM-243	2.095E-01	8.449E-02	7.061E-02
ANH-511	1.076E-01	7.132E-02	4.428E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	2.135E+00	1.313E+01	2.602E+01	NOT IDENT.
NA-22	-7.539E-03	3.370E-02	6.721E-02	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	-2.270E-02	2.650E-02	3.826E-02	NOT IDENT.
SC-46	-1.034E-01	3.186E-01	5.819E-01	FAIL ABUN
V-48	0.000E+00	1.852E+04	0.000E+00	SHORT HLIF

CR-51	0.000E+00	3.940E+02	0.000E+00	SHORT HLIF
CO-56	-9.827E-02	4.747E-01	8.743E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.965E-02	4.152E-02	7.600E-02	NOT IDENT.
CO-58	5.349E-01	5.409E-01	1.165E+00	NOT IDENT.
FE-59	-2.997E+00	6.039E+00	1.130E+01	NOT IDENT.
CO-60	5.845E-03	3.957E-02	8.222E-02	NOT IDENT.
ZN-65	-5.151E-02	1.780E-01	2.958E-01	NOT IDENT.
GE-68	8.335E-01	2.155E+00	4.619E+00	NOT IDENT.
AS-73	2.915E-01	6.694E+00	1.341E+01	NOT IDENT.
AS-74	0.000E+00	6.458E+03	0.000E+00	SHORT HLIF
SE-75	1.280E-01	2.108E-01	4.065E-01	FAIL ABUN
BR-77	0.000E+00	1.213E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	5.781E+02	0.000E+00	SHORT HLIF
RB-83	1.943E-01	5.513E-01	1.149E+00	NOT IDENT.
KR-85	4.389E+00	7.099E+00	1.350E+01	NOT IDENT.
SR-85	4.913E-01	7.974E-01	1.516E+00	NOT IDENT.
RB-86	0.000E+00	3.281E+04	0.000E+00	SHORT HLIF
Y-88	5.113E-02	1.433E-01	3.836E-01	NOT IDENT.
Y-91	5.437E+01	4.841E+02	9.935E+02	NOT IDENT.
NB-94	2.015E-03	2.978E-02	5.755E-02	NOT IDENT.
NB-95	-7.864E-01	9.864E-01	1.645E+00	NOT IDENT.
NB-95M	7.041E-01	2.337E+00	4.087E+00	NOT IDENT.
ZR-95	1.273E+00	1.398E+00	3.065E+00	FAIL ABUN
NB-97	0.000E+00	1.777E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.451E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	7.218E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-8.904E-03	3.026E-02	5.594E-02	NOT IDENT.
RH-102	2.331E-02	5.997E-02	1.209E-01	NOT IDENT.
RU-103	-1.254E+00	5.342E+00	1.024E+01	FAIL ABUN
RH-106	-3.852E-01	4.630E-01	7.868E-01	NOT IDENT.
RU-106	-3.852E-01	4.630E-01	7.868E-01	NOT IDENT.
AG-108M	-1.872E-02	2.145E-02	3.788E-02	FAIL ABUN
AG-110M	7.178E-02	1.000E-01	2.123E-01	NOT IDENT.
SN-113	-1.212E-01	2.078E-01	3.857E-01	NOT IDENT.
CD-115	0.000E+00	1.703E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.170E+05	0.000E+00	SHORT HLIF
TE-123M	-2.961E-02	1.236E-01	2.261E-01	NOT IDENT.
SB-124	-7.729E-01	1.971E+00	3.721E+00	FAIL ABUN
SB-125	3.077E-03	1.046E-01	2.047E-01	FAIL ABUN
TE-125M	4.238E+01	2.603E+02	5.035E+02	NOT IDENT.
I-126	0.000E+00	1.091E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.564E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	5.586E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	6.899E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.256E+27	0.000E+00	SHORT HLIF
BA-133	-7.207E-03	3.586E-02	6.292E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	8.021E-02	7.556E-02	1.061E-01	FAIL ABUN
CS-135	-8.247E-02	1.558E-01	2.408E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.942E+05	0.000E+00	SHORT HLIF
BA-137M	-1.994E-03	2.939E-02	6.125E-02	NOT IDENT.
CS-137	-2.107E-03	3.105E-02	6.470E-02	NOT IDENT.
CE-139	6.543E-02	1.032E-01	2.023E-01	NOT IDENT.
BA-140	0.000E+00	1.696E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	6.159E+05	0.000E+00	SHORT HLIF
CE-141	-2.425E+01	2.762E+01	4.810E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	7.253E-02	3.338E-01	6.393E-01	NOT IDENT.
PM-144	2.415E-02	5.483E-02	1.108E-01	NOT IDENT.
PR-144	2.030E+00	4.767E+00	9.618E+00	NOT IDENT.
PM-146	-4.580E-04	3.984E-02	7.823E-02	NOT IDENT.
ND-147	0.000E+00	4.655E+07	0.000E+00	SHORT HLIF
PM-147	-5.363E+01	6.984E+02	1.324E+03	NOT IDENT.
PM-149	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
EU-150	-6.984E-03	2.588E-02	4.469E-02	FAIL ABUN
EU-152	-5.224E-03	7.306E-02	1.457E-01	NOT IDENT.
GD-153	-9.376E-02	1.649E-01	2.789E-01	NOT IDENT.
EU-154	-1.843E-02	8.236E-02	1.643E-01	FAIL ABUN
EU-155	4.286E-02	9.480E-02	1.876E-01	FAIL ABUN
TB-160	-6.734E-02	1.655E+00	3.197E+00	FAIL ABUN
HO-166M	-5.234E-03	5.855E-02	1.099E-01	FAIL ABUN
TM-171	-7.729E-01	1.458E+01	2.911E+01	NOT IDENT.
HF-172	-3.845E-02	2.111E-01	3.938E-01	FAIL ABUN
LU-172	4.600E-02	6.608E-02	1.490E-01	FAIL ABUN

LU-176	-1.423E-02	2.274E-02	3.781E-02	FAIL ABUN
HF-181	-3.849E+00	4.018E+00	6.906E+00	NOT IDENT.
TA-182	5.096E-02	8.101E-01	1.486E+00	FAIL ABUN
RE-183	-1.584E-01	2.217E+00	4.397E+00	NOT IDENT.
RE-184	0.000E+00	6.264E+01	6.706E+01	FAIL ABUN
W-188	4.864E+01	1.191E+02	2.096E+02	FAIL ABUN
IR-192	-9.828E-02	4.658E-01	8.178E-01	FAIL ABUN
BI-207	2.538E-02	4.149E-02	9.231E-02	FAIL ABUN
PB-210	-1.565E-01	2.157E+00	4.309E+00	NOT IDENT.
PB-211	4.857E-01	7.072E-01	1.356E+00	NOT IDENT.
BI-212	7.973E-01	7.343E-01	1.204E+00	FAIL ABUN
RN-219	-2.008E-01	3.705E-01	6.866E-01	FAIL ABUN
RA-223	3.371E-03	5.541E-01	9.988E-01	FAIL ABUN
AC-227	-4.685E-02	2.038E-01	3.629E-01	FAIL ABUN
TH-227	-4.685E-02	2.038E-01	3.629E-01	FAIL ABUN
TH-229	2.503E-01	4.606E-01	8.830E-01	FAIL ABUN
PA-231	4.614E-01	4.617E-01	9.078E-01	NOT IDENT.
TH-231	3.371E-03	5.541E-01	9.988E-01	FAIL ABUN
PA-233	-4.883E-03	5.664E-02	1.011E-01	FAIL ABUN
PA-234	-7.978E-02	2.245E-01	4.036E-01	NOT IDENT.
PA-234M	2.193E-01	4.447E+00	7.990E+00	NOT IDENT.
NP-237	-4.883E-03	5.664E-02	1.011E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	-1.615E-01	2.036E-01	3.634E-01	FAIL ABUN
PU-239	8.953E+01	2.788E+02	5.389E+02	NOT IDENT.
AM-241	2.645E-02	1.014E-01	2.048E-01	NOT IDENT.
CM-243	-7.247E-02	8.916E-02	1.604E-01	FAIL ABUN
BK-247	4.946E-02	7.313E-02	1.413E-01	NOT IDENT.
CM-247	-3.300E-02	3.395E-02	5.992E-02	FAIL ABUN
CF-249	8.827E-03	3.478E-02	7.019E-02	NOT IDENT.
CF-251	1.028E-01	9.801E-02	1.997E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	393	10.66*	1.238E+00	1.566E+01	1.566E+01	10.65
MN-54	834.85	22	99.98*	1.951E+00	5.867E-02	1.157E-01	84.94
CD-109	88.03	55	3.70*	6.347E+00	1.222E+00	1.934E+00	116.41
SN-126	64.28	18	9.60	3.887E+00	2.492E-01	2.492E-01	285.54
	86.94	153	8.90	6.243E+00	1.447E+00	1.447E+00	39.73
	87.57	153	37.00*	6.243E+00	3.481E-01	3.481E-01	39.73
HG-203	70.83	-----	3.69	4.810E+00	-----	Line Not Found	-----
	72.87	27	6.19	5.060E+00	4.502E-01	4.252E+01	176.05
	279.20	16	81.56*	4.679E+00	2.224E-02	2.101E+00	179.62
TL-208	277.37	39	6.60	4.717E+00	6.579E-01	6.579E-01	76.73
	583.19	144	85.00*	2.582E+00	3.451E-01	3.451E-01	22.59
	860.56	21	12.50	1.906E+00	4.681E-01	4.681E-01	113.09
BI-211	72.87	27	1.23	5.060E+00	2.266E+00	2.266E+00	176.05
	351.06	284	12.92*	3.883E+00	2.977E+00	2.977E+00	19.15
PB-212	74.82	194	10.28	5.247E+00	1.897E+00	1.897E+00	28.41
	77.11	304	17.10	5.454E+00	1.718E+00	1.718E+00	19.51
	238.63	500	43.60*	5.301E+00	1.140E+00	1.140E+00	10.96
	300.09	23	3.30	4.428E+00	8.462E-01	8.462E-01	142.02
BI-214	609.32	169	45.49*	2.494E+00	7.851E-01	7.853E-01	22.91
	1120.29	40	14.92	1.547E+00	9.205E-01	9.209E-01	62.91
	1764.49	8	15.30	1.039E+00	2.798E-01	2.799E-01	194.22
PB-214	74.82	194	5.80	5.247E+00	3.361E+00	3.363E+00	28.41
	77.11	304	9.70	5.454E+00	3.028E+00	3.029E+00	19.51
	87.09	153	3.41	6.243E+00	3.777E+00	3.778E+00	39.73
	242.00	130	7.25	5.247E+00	1.793E+00	1.794E+00	45.24
	295.22	147	18.42	4.482E+00	9.343E-01	9.346E-01	31.36
	351.93	284	35.60*	3.883E+00	1.081E+00	1.081E+00	19.15
RN-222	609.32	169	45.49*	2.494E+00	7.851E-01	7.853E-01	22.91
	1120.29	40	14.92	1.547E+00	9.205E-01	9.209E-01	62.91
	1764.49	8	15.30	1.039E+00	2.798E-01	2.799E-01	194.22
RA-224	240.99	130	4.10*	5.247E+00	3.171E+00	3.171E+00	45.24
RA-226	609.32	169	45.49*	2.494E+00	7.851E-01	7.853E-01	22.91
	1120.29	40	14.92	1.547E+00	9.205E-01	9.209E-01	62.91
	1764.49	8	15.30	1.039E+00	2.798E-01	2.799E-01	194.22
AC-228	105.21	-----	1.10	7.023E+00	-----	Line Not Found	-----
	338.32	112	11.27	4.011E+00	1.305E+00	1.305E+00	32.77
	794.95	20	4.25	2.027E+00	1.219E+00	1.219E+00	96.12
	835.71	22	1.61	1.951E+00	3.643E+00	3.643E+00	84.94
	911.20	85	25.80*	1.823E+00	9.506E-01	9.506E-01	32.02
	968.97	54	15.80	1.738E+00	1.028E+00	1.028E+00	36.48
RA-228	105.21	-----	1.10	7.023E+00	-----	Line Not Found	-----
	338.32	112	11.27	4.011E+00	1.305E+00	1.305E+00	32.77
	794.95	20	4.25	2.027E+00	1.219E+00	1.219E+00	96.12
	835.71	22	1.61	1.951E+00	3.643E+00	3.643E+00	84.94
	911.20	85	25.80*	1.823E+00	9.506E-01	9.506E-01	32.02
	968.97	54	15.80	1.738E+00	1.028E+00	1.028E+00	36.48
TH-228	74.82	194	10.28	5.247E+00	1.897E+00	1.897E+00	28.41

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	77.11	304	17.10	5.454E+00	1.718E+00	1.718E+00	19.51
	238.63	500	43.60*	5.301E+00	1.140E+00	1.140E+00	10.96
	300.09	23	3.30	4.428E+00	8.462E-01	8.462E-01	142.02
TH-230	609.32	169	45.49*	2.494E+00	7.851E-01	7.851E-01	22.91
	1120.29	40	14.92	1.547E+00	9.205E-01	9.206E-01	62.91
	1764.49	8	15.30	1.039E+00	2.798E-01	2.798E-01	194.22
TH-232	105.21	-----	1.10	7.023E+00	-----	Line Not Found	-----
	338.32	112	11.27	4.011E+00	1.305E+00	1.305E+00	32.77
	835.71	22	1.61	1.951E+00	3.643E+00	3.643E+00	84.94
	911.20	85	25.80*	1.823E+00	9.506E-01	9.506E-01	32.02
	968.97	54	15.80	1.738E+00	1.028E+00	1.028E+00	36.48
TH-234	63.29	18	3.70*	3.887E+00	6.466E-01	6.466E-01	285.54
	92.59	136	4.23	6.560E+00	2.586E+00	2.586E+00	46.65
U-234	609.32	169	45.49*	2.494E+00	7.851E-01	7.851E-01	22.91
	1120.29	40	14.92	1.547E+00	9.205E-01	9.205E-01	62.91
	1764.49	8	15.30	1.039E+00	2.798E-01	2.798E-01	194.22
U-235	89.96	109	3.47	6.425E+00	2.578E+00	2.578E+00	46.33
	93.35	136	5.60	6.560E+00	1.953E+00	1.953E+00	46.65
	143.76	-----	10.96*	7.059E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.731E+00	-----	Line Not Found	-----
	185.72	109	57.20	6.280E+00	1.592E-01	1.592E-01	55.51
	205.31	-----	5.01	5.902E+00	-----	Line Not Found	-----
U-238	63.29	18	3.70*	3.887E+00	6.466E-01	6.466E-01	285.54
	92.59	136	4.23	6.560E+00	2.586E+00	2.586E+00	46.65
AM-243	43.53	-----	5.90	9.310E-01	-----	Line Not Found	-----
	74.66	194	67.20*	5.247E+00	2.901E-01	2.901E-01	28.41
ANH-511	511.00	59	100.00*	2.867E+00	1.076E-01	1.076E-01	67.65

Flag: "*" = Keyline

Total number of lines in spectrum 49
 Number of unidentified lines 9
 Number of lines tentatively identified by NID 40 81.63%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.566E+01	1.566E+01	0.167E+01	10.65	
MN-54	312.05D	1.97	5.867E-02	1.157E-01	0.983E-01	84.94	
CD-109	461.40D	1.58	1.222E+00	1.934E+00	2.252E+00	116.41	
SN-126	2.30E+05Y	1.00	3.481E-01	3.481E-01	1.383E-01	39.73	
HG-203	46.59D	94.5	2.224E-02	2.101E+00	3.774E+00	179.62	
TL-208	1.41E+10Y	1.00	3.451E-01	3.451E-01	0.780E-01	22.59	
BI-211	7.04E+08Y	1.00	2.977E+00	2.977E+00	0.570E+00	19.15	
PB-212	1.41E+10Y	1.00	1.140E+00	1.140E+00	0.125E+00	10.96	
BI-214	1600.00Y	1.00	7.851E-01	7.853E-01	1.800E-01	22.91	
PB-214	1600.00Y	1.00	1.081E+00	1.081E+00	0.207E+00	19.15	
RN-222	1600.00Y	1.00	7.851E-01	7.853E-01	1.800E-01	22.91	
RA-224	1.41E+10Y	1.00	3.171E+00	3.171E+00	1.435E+00	45.24	
RA-226	1600.00Y	1.00	7.851E-01	7.853E-01	1.800E-01	22.91	
AC-228	1.41E+10Y	1.00	9.506E-01	9.506E-01	3.044E-01	32.02	
RA-228	1.41E+10Y	1.00	9.506E-01	9.506E-01	3.044E-01	32.02	
TH-228	1.41E+10Y	1.00	1.140E+00	1.140E+00	0.125E+00	10.96	
TH-230	7.54E+04Y	1.00	7.851E-01	7.851E-01	1.799E-01	22.91	
TH-232	1.41E+10Y	1.00	9.506E-01	9.506E-01	3.044E-01	32.02	
TH-234	4.47E+09Y	1.00	6.466E-01	6.466E-01	18.46E-01	285.54	
U-234	2.45E+05Y	1.00	7.851E-01	7.851E-01	1.799E-01	22.91	
U-235	7.04E+08Y	1.00	1.592E-01	1.592E-01	0.884E-01	55.51	K
U-238	4.47E+09Y	1.00	6.466E-01	6.466E-01	18.46E-01	285.54	
AM-243	7370.00Y	1.00	2.901E-01	2.901E-01	0.824E-01	28.41	
ANH-511	1.00E+09Y	1.00	1.076E-01	1.076E-01	0.728E-01	67.65	
Total Activity :			3.580E+01	3.865E+01			

Grand Total Activity : 3.580E+01 3.865E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	209.16	63	114	1.29	418.42	413	10	1.54E-02	73.2	5.83E+00	
0	216.23	11	88	1.18	432.57	429	7	2.67E-03	****	5.70E+00	T
0	270.53	32	82	0.75	541.23	538	9	8.08E-03	****	4.81E+00	T
0	328.23	47	55	2.96	656.71	652	10	1.19E-02	69.2	4.11E+00	T
0	409.52	27	44	0.78	819.37	815	9	7.08E-03	98.3	3.43E+00	T
0	463.24	33	35	0.97	926.88	924	6	8.49E-03	66.6	3.10E+00	T
0	466.55	16	26	0.61	933.50	930	8	4.26E-03	****	3.09E+00	
0	546.28	13	9	1.33	1093.04	1090	6	3.44E-03	94.9	2.72E+00	T
0	724.04	16	11	2.30	1448.71	1445	7	4.31E-03	86.0	2.18E+00	T
0	727.29	22	25	1.41	1455.21	1452	9	5.95E-03	94.0	2.17E+00	T
0	806.09	26	27	5.27	1612.85	1597	21	7.00E-03	****	2.01E+00	
0	902.13	24	17	3.44	1804.99	1796	17	6.64E-03	89.0	1.84E+00	T
0	992.16	6	7	0.59	1985.10	1982	8	1.78E-03	****	1.71E+00	
0	1004.93	15	3	1.99	2010.65	2007	8	4.10E-03	69.0	1.69E+00	T
0	1011.06	6	8	0.74	2022.90	2017	8	1.73E-03	****	1.68E+00	
0	1218.96	10	16	0.54	2438.77	2431	12	2.80E-03	****	1.44E+00	
0	1238.47	23	11	0.87	2477.79	2472	11	6.67E-03	67.3	1.43E+00	T
0	1307.89	8	4	0.65	2616.65	2613	7	2.15E-03	****	1.36E+00	
0	1311.09	6	2	0.98	2623.04	2620	7	1.67E-03	****	1.36E+00	T
0	1378.42	17	3	1.37	2757.71	2751	14	4.98E-03	64.3	1.30E+00	
0	1510.64	6	3	1.33	3022.13	3018	8	1.67E-03	****	1.20E+00	

Flags: "T" = Tentatively associated

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235055.CNF;1
* Acquisition date   : 3-OCT-2016 07:18:44 Sensitivity      : 3.000
* Detector ID        : GAM11 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.58 Half life ratio  : *****
* Sample date        : 2-DEC-2015 14:59:00 Nuclide Library : SOLID
* Sample ID          : G405235055 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity : 1.4258E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 2-AUG-2016 10:31:39 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;14
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	3.222E-01
MN-54	4.574E-02
CD-109	7.401E-01
SN-126	4.696E-02
HG-203	2.019E+00
TL-208	3.059E-02
BI-211	1.457E-01
PB-212	3.960E-02
BI-214	4.942E-02
PB-214	1.585E-01
RN-222	4.942E-02
RA-224	4.247E-01
RA-226	4.942E-02
AC-228	8.436E-02
RA-228	8.436E-02
TH-228	3.960E-02
TH-230	4.940E-02
TH-232	8.436E-02
TH-234	8.192E-01
U-234	4.940E-02
U-235	1.683E-01
U-238	8.192E-01
AM-243	3.315E-02
ANH-511	1.960E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.177E+01	NOT IDENT.
NA-22	2.716E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.209E-02	NOT IDENT.
SC-46	2.422E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF

CO-56	3.790E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	3.535E-02	NOT IDENT.
CO-58	5.100E-01	NOT IDENT.
FE-59	4.705E+00	NOT IDENT.
CO-60	3.515E-02	NOT IDENT.
ZN-65	1.261E-01	NOT IDENT.
GE-68	2.004E+00	NOT IDENT.
AS-73	6.282E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.882E-01	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.076E-01	NOT IDENT.
KR-85	6.128E+00	NOT IDENT.
SR-85	6.882E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.394E-01	NOT IDENT.
Y-91	4.260E+02	NOT IDENT.
NB-94	2.552E-02	NOT IDENT.
NB-95	7.275E-01	NOT IDENT.
NB-95M	1.891E+00	NOT IDENT.
ZR-95	1.360E+00	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.615E-02	NOT IDENT.
RH-102	5.423E-02	NOT IDENT.
RU-103	4.517E+00	FAIL ABUN
RH-106	3.407E-01	NOT IDENT.
RU-106	3.407E-01	NOT IDENT.
AG-108M	1.646E-02	FAIL ABUN
AG-110M	9.371E-02	NOT IDENT.
SN-113	1.728E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.054E-01	NOT IDENT.
SB-124	1.393E+00	FAIL ABUN
SB-125	9.321E-02	FAIL ABUN
TE-125M	2.361E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.821E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	4.754E-02	FAIL ABUN
CS-135	1.109E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	2.710E-02	NOT IDENT.
CS-137	2.863E-02	NOT IDENT.
CE-139	9.467E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.256E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.999E-01	NOT IDENT.
PM-144	4.958E-02	NOT IDENT.
PR-144	4.302E+00	NOT IDENT.
PM-146	3.515E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	6.166E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.043E-02	FAIL ABUN
EU-152	6.554E-02	NOT IDENT.
GD-153	1.302E-01	NOT IDENT.
EU-154	6.639E-02	FAIL ABUN
EU-155	8.808E-02	FAIL ABUN
TB-160	1.359E+00	FAIL ABUN
HO-166M	4.890E-02	FAIL ABUN
TM-171	1.359E+01	NOT IDENT.
HF-172	1.844E-01	FAIL ABUN
LU-172	6.465E-02	FAIL ABUN
LU-176	1.709E-02	FAIL ABUN

HF-181	3.005E+00	NOT IDENT.
TA-182	6.254E-01	FAIL ABUN
RE-183	2.053E+00	NOT IDENT.
RE-184	2.943E+01	FAIL ABUN
W-188	9.638E+01	FAIL ABUN
IR-192	3.718E-01	FAIL ABUN
BI-207	4.008E-02	FAIL ABUN
PB-210	2.020E+00	NOT IDENT.
PB-211	6.221E-01	NOT IDENT.
BI-212	5.519E-01	FAIL ABUN
RN-219	3.114E-01	FAIL ABUN
RA-223	4.550E-01	FAIL ABUN
AC-227	1.659E-01	FAIL ABUN
TH-227	1.659E-01	FAIL ABUN
TH-229	4.141E-01	FAIL ABUN
PA-231	4.227E-01	NOT IDENT.
TH-231	4.550E-01	FAIL ABUN
PA-233	4.609E-02	FAIL ABUN
PA-234	1.678E-01	NOT IDENT.
PA-234M	3.489E+00	NOT IDENT.
NP-237	4.609E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.685E-01	FAIL ABUN
PU-239	2.530E+02	NOT IDENT.
AM-241	9.609E-02	NOT IDENT.
CM-243	7.493E-02	FAIL ABUN
BK-247	6.559E-02	NOT IDENT.
CM-247	2.703E-02	FAIL ABUN
CF-249	3.199E-02	NOT IDENT.
CF-251	9.317E-02	NOT IDENT.

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235055.CNF;1
* Acquisition date   : 3-OCT-2016 07:18:44 Sensitivity      : 3.000
* Detector ID        : GAM11 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.58 Half life ratio  : *****
* Sample date        : 2-DEC-2015 14:59:00 Nuclide Library : SOLID
* Sample ID          : G405235055 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity : 1.4258E+02 GRAM
*                   : Quantity Err(%) : 1.4027E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 2-AUG-2016 10:31:39 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.566E+01	1.828E+00	1.828E+00
MN-54	1.157E-01	9.643E-02	9.643E-02
CD-109	1.934E+00	2.212E+00	2.212E+00
SN-126	2.620E-01	1.395E-01	1.395E-01
HG-203	2.101E+00	3.700E+00	3.700E+00
TL-208	3.451E-01	7.779E-02	7.779E-02
BI-211	4.031E-01	9.814E-01	9.814E-01
PB-212	1.140E+00	1.365E-01	1.365E-01
BI-214	7.853E-01	1.795E-01	1.795E-01
PB-214	1.081E+00	2.078E-01	2.078E-01
RN-222	7.853E-01	1.795E-01	1.795E-01
RA-224	1.519E+00	1.501E+00	1.501E+00
RA-226	7.853E-01	1.795E-01	1.795E-01
AC-228	9.506E-01	3.023E-01	3.023E-01
RA-228	9.506E-01	3.023E-01	3.023E-01
TH-228	1.140E+00	1.365E-01	1.365E-01
TH-230	7.851E-01	1.795E-01	1.795E-01
TH-232	9.506E-01	3.023E-01	3.023E-01
TH-234	6.466E-01	1.815E+00	1.815E+00
U-234	7.851E-01	1.795E-01	1.795E-01
U-235	1.054E-01	1.840E-01	1.840E-01
U-238	6.466E-01	1.815E+00	1.815E+00
AM-243	2.095E-01	8.608E-02	8.608E-02
ANH-511	1.076E-01	7.145E-02	7.145E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	2.135E+00	1.313E+01	1.316E+01	NOT IDENT.
NA-22	-7.539E-03	3.370E-02	3.387E-02	NOT IDENT.
NA-24	1.000E+41	2.584E+41	0.000E+00	SHORT HLIF
AL-26	-2.270E-02	2.654E-02	2.844E-02	NOT IDENT.
SC-46	-1.034E-01	3.187E-01	3.221E-01	FAIL ABUN
V-48	5.826E+03	1.852E+04	1.870E+04	SHORT HLIF

CR-51	-2.688E+02	3.941E+02	4.123E+02	SHORT HLIF
CO-56	-9.827E-02	4.747E-01	4.768E-01	FAIL ABUN
MN-56	-1.000E+41	4.830E+41	0.000E+00	SHORT HLIF
CO-57	-1.965E-02	4.153E-02	4.247E-02	NOT IDENT.
CO-58	5.349E-01	5.414E-01	5.927E-01	NOT IDENT.
FE-59	-2.997E+00	6.043E+00	6.192E+00	NOT IDENT.
CO-60	5.845E-03	3.957E-02	3.966E-02	NOT IDENT.
ZN-65	-5.151E-02	1.780E-01	1.795E-01	NOT IDENT.
GE-68	8.335E-01	2.155E+00	2.188E+00	NOT IDENT.
AS-73	2.915E-01	6.695E+00	6.696E+00	NOT IDENT.
AS-74	6.843E+03	6.483E+03	7.180E+03	SHORT HLIF
SE-75	1.280E-01	2.109E-01	2.187E-01	FAIL ABUN
BR-77	1.130E+39	9.968E+39	0.000E+00	SHORT HLIF
SR-82	-8.309E+01	5.781E+02	5.793E+02	SHORT HLIF
RB-83	1.943E-01	5.519E-01	5.588E-01	NOT IDENT.
KR-85	4.389E+00	7.101E+00	7.372E+00	NOT IDENT.
SR-85	4.913E-01	7.977E-01	8.279E-01	NOT IDENT.
RB-86	-1.047E+04	3.281E+04	3.315E+04	SHORT HLIF
Y-88	5.113E-02	1.433E-01	1.452E-01	NOT IDENT.
Y-91	5.437E+01	4.841E+02	4.847E+02	NOT IDENT.
NB-94	2.015E-03	2.978E-02	2.980E-02	NOT IDENT.
NB-95	-7.864E-01	9.870E-01	1.049E+00	NOT IDENT.
NB-95M	7.041E-01	2.338E+00	2.359E+00	NOT IDENT.
ZR-95	1.273E+00	1.399E+00	1.512E+00	FAIL ABUN
NB-97	1.000E+41	1.777E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.451E+41	0.000E+00	SHORT HLIF
MO-99	8.174E+31	7.219E+32	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	7.433E+41	0.000E+00	SHORT HLIF
RH-101	-8.904E-03	3.031E-02	3.057E-02	NOT IDENT.
RH-102	2.331E-02	6.000E-02	6.091E-02	NOT IDENT.
RU-103	-1.254E+00	5.342E+00	5.372E+00	FAIL ABUN
RH-106	-3.852E-01	4.636E-01	4.951E-01	NOT IDENT.
RU-106	-3.852E-01	4.636E-01	4.951E-01	NOT IDENT.
AG-108M	-1.872E-02	2.147E-02	2.307E-02	FAIL ABUN
AG-110M	7.178E-02	1.001E-01	1.052E-01	NOT IDENT.
SN-113	-1.212E-01	2.079E-01	2.149E-01	NOT IDENT.
CD-115	6.075E+38	1.703E+40	0.000E+00	SHORT HLIF
SN-117M	-3.391E+04	1.171E+05	1.181E+05	SHORT HLIF
TE-123M	-2.961E-02	1.236E-01	1.243E-01	NOT IDENT.
SB-124	-7.729E-01	1.972E+00	2.002E+00	FAIL ABUN
SB-125	3.077E-03	1.046E-01	1.046E-01	FAIL ABUN
TE-125M	4.238E+01	2.604E+02	2.611E+02	NOT IDENT.
I-126	1.381E+06	1.108E+06	1.271E+06	SHORT HLIF
SB-126	-9.968E+04	1.564E+06	1.565E+06	SHORT HLIF
SB-127	-7.840E+21	5.693E+22	0.000E+00	SHORT HLIF
I-131	6.016E+09	6.905E+09	7.418E+09	SHORT HLIF
I-132	-1.000E+41	2.068E+42	0.000E+00	SHORT HLIF
TE-132	3.828E+26	1.266E+27	0.000E+00	SHORT HLIF
BA-133	-7.207E-03	3.587E-02	3.601E-02	FAIL ABUN
I-133	1.000E+41	2.903E+41	0.000E+00	SHORT HLIF
CS-134	8.021E-02	7.564E-02	8.384E-02	FAIL ABUN
CS-135	-8.247E-02	1.559E-01	1.603E-01	NOT IDENT.
I-135	1.000E+41	7.480E+41	0.000E+00	SHORT HLIF
CS-136	-4.421E+04	3.943E+05	3.948E+05	SHORT HLIF
BA-137M	-1.994E-03	2.939E-02	2.940E-02	NOT IDENT.
CS-137	-2.107E-03	3.105E-02	3.106E-02	NOT IDENT.
CE-139	6.543E-02	1.040E-01	1.081E-01	NOT IDENT.
BA-140	1.882E+06	1.698E+06	1.898E+06	SHORT HLIF
LA-140	-4.197E+05	6.162E+05	6.446E+05	SHORT HLIF
CE-141	-2.425E+01	2.764E+01	2.973E+01	NOT IDENT.
CE-143	1.000E+41	2.204E+42	0.000E+00	SHORT HLIF
CE-144	7.253E-02	3.338E-01	3.354E-01	NOT IDENT.
PM-144	2.415E-02	5.485E-02	5.592E-02	NOT IDENT.
PR-144	2.030E+00	4.768E+00	4.855E+00	NOT IDENT.
PM-146	-4.580E-04	3.984E-02	3.984E-02	NOT IDENT.
ND-147	-7.527E+06	4.655E+07	4.667E+07	SHORT HLIF
PM-147	-5.363E+01	6.984E+02	6.988E+02	NOT IDENT.
PM-149	2.313E+39	2.510E+41	0.000E+00	SHORT HLIF
EU-150	-6.984E-03	2.588E-02	2.608E-02	FAIL ABUN
EU-152	-5.224E-03	7.306E-02	7.310E-02	NOT IDENT.
GD-153	-9.376E-02	1.650E-01	1.704E-01	NOT IDENT.
EU-154	-1.843E-02	8.237E-02	8.279E-02	FAIL ABUN
EU-155	4.286E-02	9.485E-02	9.680E-02	FAIL ABUN
TB-160	-6.734E-02	1.655E+00	1.656E+00	FAIL ABUN
HO-166M	-5.234E-03	5.855E-02	5.860E-02	FAIL ABUN
TM-171	-7.729E-01	1.458E+01	1.458E+01	NOT IDENT.
HF-172	-3.845E-02	2.112E-01	2.119E-01	FAIL ABUN
LU-172	4.600E-02	6.625E-02	6.942E-02	FAIL ABUN

LU-176	-1.423E-02	2.275E-02	2.364E-02	FAIL ABUN
HF-181	-3.849E+00	4.021E+00	4.379E+00	NOT IDENT.
TA-182	5.096E-02	8.101E-01	8.104E-01	FAIL ABUN
RE-183	-1.584E-01	2.217E+00	2.218E+00	NOT IDENT.
RE-184	7.182E+01	6.503E+01	7.265E+01	FAIL ABUN
W-188	4.864E+01	1.192E+02	1.212E+02	FAIL ABUN
IR-192	-9.828E-02	4.658E-01	4.679E-01	FAIL ABUN
BI-207	2.538E-02	4.150E-02	4.305E-02	FAIL ABUN
PB-210	-1.565E-01	2.157E+00	2.158E+00	NOT IDENT.
PB-211	4.857E-01	7.076E-01	7.407E-01	NOT IDENT.
BI-212	7.973E-01	7.354E-01	8.185E-01	FAIL ABUN
RN-219	-2.008E-01	3.714E-01	3.822E-01	FAIL ABUN
RA-223	3.371E-03	5.541E-01	5.541E-01	FAIL ABUN
AC-227	-4.685E-02	2.039E-01	2.050E-01	FAIL ABUN
TH-227	-4.685E-02	2.039E-01	2.050E-01	FAIL ABUN
TH-229	2.503E-01	4.607E-01	4.744E-01	FAIL ABUN
PA-231	4.614E-01	4.721E-01	5.159E-01	NOT IDENT.
TH-231	3.371E-03	5.541E-01	5.541E-01	FAIL ABUN
PA-233	-4.883E-03	5.664E-02	5.668E-02	FAIL ABUN
PA-234	-7.978E-02	2.423E-01	2.450E-01	NOT IDENT.
PA-234M	2.193E-01	4.447E+00	4.448E+00	NOT IDENT.
NP-237	-4.883E-03	5.664E-02	5.668E-02	FAIL ABUN
NP-238	1.000E+41	4.420E+41	0.000E+00	SHORT HLIF
NP-239	-1.615E-01	2.040E-01	2.166E-01	FAIL ABUN
PU-239	8.953E+01	2.788E+02	2.817E+02	NOT IDENT.
AM-241	2.645E-02	1.015E-01	1.022E-01	NOT IDENT.
CM-243	-7.247E-02	8.941E-02	9.519E-02	FAIL ABUN
BK-247	4.946E-02	7.381E-02	7.710E-02	NOT IDENT.
CM-247	-3.300E-02	3.440E-02	3.748E-02	FAIL ABUN
CF-249	8.827E-03	3.478E-02	3.501E-02	NOT IDENT.
CF-251	1.028E-01	9.869E-02	1.090E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	55.4826	87.09	69.5624	136.47	58.4507
45.60	62.6247	87.57	69.6319	140.51	0.0000
46.54	66.2062	88.03	69.6979	143.76	76.7111
49.72	0.0000	88.34	69.7420	144.24	68.4663
51.35	63.7357	88.47	69.7606	145.44	99.7617
51.87	62.9705	89.96	69.9729	152.43	72.4218
52.39	68.2495	1093.63	70.0689	153.25	0.0000
52.97	56.2492	91.11	0.0000	323.87	53.6622
53.44	72.7896	92.59	70.3432	156.02	0.0000
54.07	83.3379	93.35	70.4488	158.56	0.0000
57.36	0.0000	94.56	70.6171	159.00	67.7861
57.53	83.2703	94.65	70.6295	162.33	67.0279
57.98	67.5750	94.67	70.6323	162.66	0.0000
59.27	81.9015	94.87	70.6600	163.33	71.3787
59.32	81.9125	97.43	80.6072	165.86	56.6538
59.54	71.3851	98.43	64.0961	176.31	72.5922
60.96	76.6674	98.44	64.0976	176.60	0.0000
61.17	76.7098	99.53	86.7110	177.52	43.4045
62.93	80.0254	100.11	91.6283	181.07	0.0000
63.29	80.0996	102.03	72.5985	181.52	59.9800
63.58	80.1590	103.18	91.1837	184.41	67.1245
64.28	80.3023	103.37	87.3344	143.76	66.8667
66.73	76.6081	105.21	68.1559	193.51	63.0683
67.24	88.9891	105.31	68.1682	197.03	47.7746
125.81	87.2861	106.12	69.2439	198.01	67.8506
67.75	89.1009	106.47	79.0466	201.83	53.6257
69.67	63.8988	109.28	71.5982	203.43	66.0356
70.83	91.8828	111.00	76.7348	205.31	68.7941
72.81	78.3443	111.76	0.0000	210.85	51.1639
72.87	78.3555	114.06	70.2205	215.65	53.3261
74.66	78.6809	116.30	0.0000	222.11	65.1243
74.82	78.7098	116.74	72.5294	227.09	39.0515
74.97	78.7373	119.76	61.9134	227.38	37.9146
77.11	79.1205	121.12	63.0538	228.16	0.0000
78.74	79.4092	121.22	63.0639	228.18	45.9955
79.69	86.3614	121.78	70.1357	116.74	45.9955
80.12	81.5037	122.06	70.1682	235.69	44.8086
80.19	0.0000	122.92	64.2441	235.96	52.5488
80.57	74.1675	123.07	64.2598	238.63	51.1422
81.00	70.5252	265.00	64.3237	238.98	0.0000
81.07	70.5356	125.81	76.6477	240.99	51.2637
81.75	79.3151	127.23	75.8108	242.00	51.3154
83.79	69.0826	127.91	75.8932	244.70	38.9806
84.00	69.1130	129.30	70.9891	252.40	0.0000
85.43	69.3219	131.20	73.2360	252.80	43.6134
86.55	69.4845	133.02	57.1228	254.15	0.0000
86.79	69.5190	133.52	71.4580	256.23	42.5753
86.94	69.5410	136.00	62.5079	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	40.5327	355.39	0.0000	584.27	28.6023
264.80	40.5379	356.01	28.3063	595.83	0.0000
265.00	42.9313	364.49	0.0000	427.87	20.8821
268.22	57.4131	366.42	0.0000	602.52	0.0000
269.46	39.9160	372.51	27.7839	604.72	23.9141
270.03	33.5474	375.05	35.6631	607.14	19.4540
271.23	33.5841	377.52	38.3407	609.32	19.9740
273.65	0.0000	356.01	34.1369	610.33	19.9837
276.40	40.9737	388.16	31.6069	614.28	19.5222
277.37	41.0100	388.63	0.0000	618.01	14.0410
277.60	41.0183	391.69	33.4448	620.36	11.0452
278.00	41.0339	264.66	30.1097	621.93	24.1162
279.20	41.0775	401.81	40.7694	630.19	0.0000
279.54	41.0909	402.40	44.3319	631.29	20.1880
279.70	41.0961	404.85	29.3080	633.25	31.3204
280.46	37.0924	410.95	20.0652	634.78	0.0000
283.69	33.9652	413.71	25.4628	635.95	23.2677
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	40.0919	423.72	0.0000	645.85	18.2944
285.90	0.0000	427.09	32.4478	657.76	16.3522
287.50	36.5140	427.87	34.2682	657.90	0.0000
290.67	35.8019	433.94	25.3494	661.66	12.2861
293.27	0.0000	439.40	34.5225	664.57	0.0000
351.93	35.5349	453.88	26.5869	666.33	0.0000
295.96	35.5579	463.37	16.5989	666.50	0.0000
879.38	44.2408	468.07	16.6465	667.71	0.0000
299.98	42.6531	473.00	0.0000	677.62	14.4386
300.09	42.6563	475.06	26.0039	685.70	0.0000
300.13	42.6584	476.78	32.5384	695.00	0.0000
301.36	40.6498	477.60	27.9034	696.49	18.7207
302.85	42.7568	482.18	27.0471	696.51	18.7214
256.23	37.8766	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	24.9707
306.78	40.8361	497.08	21.6388	697.49	23.9321
308.46	42.1327	505.52	18.4348	702.65	19.8149
311.90	37.2830	507.63	0.0000	706.68	21.9391
316.51	37.4240	511.00	19.9146	711.68	23.0339
319.41	0.0000	514.00	22.7979	720.70	0.0000
320.08	0.0000	514.00	22.7979	721.93	0.0000
321.04	28.3811	520.40	15.2533	722.78	17.3580
323.87	35.1384	520.69	0.0000	722.91	17.3594
325.23	37.6895	522.65	0.0000	723.31	11.0486
328.76	0.0000	527.90	0.0000	724.19	9.4739
333.37	34.1406	528.26	19.1496	727.33	22.1356
333.97	43.0126	529.59	18.2060	733.00	21.5546
334.37	41.7606	529.87	0.0000	735.93	20.1001
338.28	40.6191	531.02	0.0000	333.97	17.9961
338.32	40.6201	537.26	0.0000	739.50	0.0000
311.90	25.4303	546.56	0.0000	747.24	17.0072
340.48	25.4303	552.55	18.4325	748.06	19.1396
340.55	0.0000	563.25	22.4394	752.31	19.1733
344.28	28.0552	569.33	21.5318	753.82	0.0000
345.93	26.8140	946.00	20.5557	756.73	10.6714
351.06	33.3284	569.70	17.6206	756.80	10.6718
351.93	33.3506	583.19	28.5858	884.68	21.4063

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	31.0627	1274.44	6.9924	1620.50	6.1919
766.42	31.0709	1001.03	15.4075	1621.92	7.2264
766.84	22.5031	1002.74	11.2117	1678.03	0.0000
772.60	0.0000	1004.73	12.8548	1690.97	5.2386
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	6.8086
778.90	10.7682	1028.54	0.0000	1063.66	3.1952
783.70	0.0000	1037.84	15.0597	1771.35	3.1959
785.37	8.6370	1038.76	0.0000	1791.20	0.0000
792.07	9.7427	631.29	13.3255	1808.65	5.3665
794.95	11.3797	1048.07	0.0000	1810.72	0.0000
795.86	11.3835	1049.04	17.7808	1836.06	1.0792
810.06	4.9059	1050.41	12.4517		
810.29	3.2710	1063.66	8.9313		
344.28	3.2711	1077.00	0.0000		
810.76	6.5432	1077.34	10.7629		
815.77	0.0000	1085.87	16.1873		
1048.07	0.0000	1093.63	8.1129		
832.01	18.1415	1099.45	12.6422		
834.85	13.2085	1112.07	11.7844		
835.71	13.2129	1112.84	13.6002		
836.80	0.0000	1115.54	14.5186		
846.75	0.0000	1120.29	12.7217		
846.77	16.5851	1120.55	12.7225		
856.80	0.0000	1221.41	10.1808		
860.56	13.3369	1129.67	16.4026		
871.09	15.6201	1131.51	0.0000		
873.19	16.7487	1147.95	0.0000		
875.33	0.0000	1173.23	19.3812		
879.38	11.1914	1177.95	10.1655		
880.51	12.3155	1189.05	12.9797		
883.24	15.6896	1204.77	11.1746		
884.68	11.2130	1221.41	8.9813		
889.28	11.2317	1231.02	15.0088		
894.76	8.4402	1235.36	0.0000		
898.04	13.5205	1238.28	15.0391		
900.72	15.7893	1260.41	0.0000		
903.28	15.8035	1271.87	9.4855		
911.20	10.1880	1274.44	7.5938		
912.08	10.1913	1274.54	7.5938		
923.98	0.0000	1291.59	11.4426		
926.50	12.5196	1298.22	0.0000		
929.11	15.9482	1312.11	0.0000		
937.49	14.8525	1332.49	8.6743		
944.13	0.0000	1362.66	0.0000		
946.00	11.4583	1365.19	4.8596		
949.00	14.9112	1368.63	0.0000		
667.71	0.0000	1384.29	3.1250		
962.31	19.5885	1408.01	7.8589		
964.08	19.0237	1457.56	0.0000		
966.17	15.5759	1460.82	11.9407		
911.20	15.0127	1489.16	2.0034		
968.97	15.0127	1505.03	9.3840		
983.53	0.0000	1584.12	3.0712		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                   *
*                               Charleston, SC 29407                             *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235056.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM01.CNF;402
Background date : 2-OCT-2016 10:59:55.
Sample date     : 2-DEC-2015 14:50:00. Acquisition date : 3-OCT-2016 07:50:44.
Sample ID      : G405235056 Sample quantity : 1.01481E+02 GRAM
Detector name   : GAM01 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.36 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1596252 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.24*	29	118	1.18	127.18	124	8	8.09E-03	70.2	
2	3	74.92	119	129	1.09	150.53	147	15	3.30E-02	18.0	6.86E-01
3	3	77.27*	187	109	1.17	155.24	147	15	5.20E-02	12.3	
4	4	84.19*	37	167	1.77	169.08	164	31	1.02E-02	68.8	1.36E+00
5	4	87.35	99	142	1.64	175.39	164	31	2.76E-02	24.7	
6	4	89.92	67	131	1.63	180.54	164	31	1.87E-02	37.0	
7	4	92.69*	115	96	1.25	186.07	164	31	3.20E-02	19.9	
8	0	118.89	25	73	0.89	238.46	235	7	6.90E-03	61.0	
9	0	129.46	46	109	1.07	259.61	256	10	1.28E-02	44.8	
10	0	185.72*	105	107	1.62	372.12	365	13	2.91E-02	23.7	
11	0	209.81	34	104	0.96	420.28	415	10	9.49E-03	59.0	
12	5	238.68*	358	58	1.03	478.02	474	19	9.95E-02	6.3	6.39E+00
13	5	241.62*	99	93	2.17	483.90	474	19	2.74E-02	31.0	
14	0	270.14	34	63	1.11	540.93	535	10	9.46E-03	46.7	
15	0	277.36	32	43	0.69	555.37	552	8	8.81E-03	40.2	
16	0	295.66*	115	98	1.19	591.97	585	13	3.20E-02	20.2	
17	0	301.88	25	73	3.81	604.41	598	12	6.95E-03	71.8	
18	0	329.38	16	72	1.44	659.39	651	12	4.33E-03	111.9	
19	0	338.46*	66	65	1.04	677.55	672	11	1.82E-02	27.5	
20	0	352.05*	246	60	1.38	704.73	700	12	6.82E-02	9.2	
21	0	402.08	50	95	8.98	804.77	790	26	1.40E-02	55.5	
22	0	435.49	11	33	1.25	871.57	865	10	2.92E-03	106.2	
23	0	463.09	23	19	1.49	926.77	922	8	6.31E-03	39.9	
24	0	510.91*	39	46	2.44	1022.39	1014	17	1.07E-02	49.4	
25	0	565.33*	50	27	5.07	1131.21	1122	18	1.40E-02	28.9	
26	0	583.25*	89	24	1.47	1167.05	1160	14	2.48E-02	16.2	
27	0	609.44*	193	19	1.39	1219.40	1215	12	5.36E-02	8.7	
28	0	661.77	51	24	1.07	1324.04	1321	9	1.41E-02	22.5	
29	0	719.57	23	9	2.59	1439.62	1435	11	6.47E-03	31.7	
30	0	770.32	30	30	4.46	1541.09	1530	21	8.25E-03	50.5	
31	0	786.97	8	16	0.88	1574.38	1568	8	2.22E-03	93.5	
32	0	795.19	13	15	1.42	1590.81	1585	10	3.61E-03	62.3	
33	0	879.40	9	4	0.96	1759.18	1756	7	2.36E-03	50.1	
34	0	883.43	4	9	0.53	1767.23	1762	7	1.12E-03	131.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	911.67*	63	20	1.42	1823.70	1819	13	1.76E-02	20.9	
36	0	920.31	9	13	0.94	1840.98	1833	11	2.37E-03	90.5	
37	0	923.70	9	12	1.26	1847.74	1843	10	2.54E-03	83.7	
38	0	969.18	37	12	1.19	1938.68	1935	10	1.03E-02	24.1	
39	0	1043.52	9	5	1.47	2087.31	2081	10	2.58E-03	55.4	
40	0	1109.70	18	3	3.67	2219.61	2214	11	5.08E-03	29.2	
41	0	1120.23*	28	18	1.84	2240.67	2236	10	7.86E-03	33.8	
42	0	1225.45	6	12	0.50	2451.03	2447	8	1.59E-03	113.3	
43	0	1266.62	6	4	0.89	2533.33	2530	6	1.78E-03	63.9	
44	0	1275.23	5	7	1.39	2550.54	2543	10	1.26E-03	122.1	
45	0	1378.12	16	5	0.54	2756.24	2751	10	4.55E-03	35.3	
46	0	1460.75*	288	0	1.63	2921.40	2914	14	7.99E-02	6.0	
47	0	1589.26	8	1	1.39	3178.30	3175	6	2.10E-03	44.4	
48	0	1764.50*	30	7	1.53	3528.60	3522	10	8.19E-03	26.0	
49	0	1799.81	6	0	0.99	3599.17	3596	6	1.67E-03	40.8	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235056.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 2-DEC-2015 14:50:00   Acquisition date : 3-OCT-2016 07:50:44
Sample ID         : G405235056           Sample quantity  : 101.48 GRAM
Sample type       : SOLID                 Sample geometry  :
Detector name     : GAMMA1               Detector geometry: CAN
Elapsed live time: 0 01:00:00.00         Elapsed real time: 0 01:00:00.36   0.0%
Energy tolerance  : 1.50 keV             Half life ratio  : 10.00
Errors propagated: No                    Systematic Error : 0.00 %
Efficiency type   : Linear                Efficiencies at  : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
NA-22	1274.54	99.94*	1.095E+00	2.878E-02	3.596E-02	244.20	OK
K-40	1460.82	10.66*	9.709E-01	1.922E+01	1.922E+01	11.93	OK
CD-109	88.03	3.70*	4.590E+00	3.160E+00	5.003E+00	67.98	OK
SN-126	64.28	9.60	2.294E+00	9.696E-01	9.696E-01	140.35	OK
	86.94	8.90	4.590E+00	1.314E+00	1.314E+00	67.98	OK
	87.57	37.00*	4.590E+00	3.160E-01	3.160E-01	67.98	OK
BA-137M	661.66	89.90*	1.883E+00	2.112E-01	2.154E-01	44.91	OK
CS-137	661.66	85.10*	1.883E+00	2.232E-01	2.275E-01	44.91	OK
TL-208	277.37	6.60	3.944E+00	8.703E-01	8.703E-01	80.47	OK
	583.19	85.00*	2.090E+00	3.536E-01	3.536E-01	32.35	OK
	860.56	12.50	1.520E+00	-----	Line Not Found	-----	Absent
BI-211	72.87	1.23	3.328E+00	-----	Line Not Found	-----	Absent
	351.06	12.92*	3.215E+00	9.152E-01	9.152E-01	167.70	OK
PB-212	74.82	10.28	3.532E+00	1.722E+00	1.722E+00	52.62	OK
	77.11	17.10	3.757E+00	2.130E+00	2.130E+00	24.57	OK
	238.63	43.60*	4.454E+00	1.321E+00	1.321E+00	12.53	OK
	300.09	3.30	3.690E+00	-----	Line Not Found	-----	Absent
BI-214	609.32	45.49*	2.015E+00	1.479E+00	1.480E+00	17.43	OK
	1120.29	14.92	1.223E+00	1.078E+00	1.078E+00	67.61	OK
	1764.49	15.30	8.116E-01	1.637E+00	1.638E+00	52.01	OK
PB-214	74.82	5.80	3.522E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	3.757E+00	3.755E+00	3.757E+00	24.57	OK
	87.09	3.41	4.572E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	4.406E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	3.737E+00	1.193E+00	1.193E+00	40.38	OK
	351.93	35.60*	3.216E+00	-----	Line Not Found	-----	<<INT Reject
RN-219	271.23	10.80	4.031E+00	5.586E-01	5.586E-01	93.47	OK
	401.81	6.60*	2.865E+00	1.886E+00	1.886E+00	110.94	OK
RN-222	609.32	45.49*	2.015E+00	1.479E+00	1.480E+00	17.43	OK
	1120.29	14.92	1.223E+00	1.078E+00	1.078E+00	67.61	OK
	1764.49	15.30	8.116E-01	1.637E+00	1.638E+00	52.01	OK
RA-224	240.99	4.10*	4.411E+00	1.794E+00	1.794E+00	143.11	OK
RA-226	609.32	45.49*	2.015E+00	1.479E+00	1.480E+00	17.43	OK
	1120.29	14.92	1.223E+00	1.078E+00	1.078E+00	67.61	OK
	1764.49	15.30	8.116E-01	1.637E+00	1.638E+00	52.01	OK
AC-228	105.21	1.10	5.519E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.327E+00	1.243E+00	1.243E+00	54.91	OK
	794.95	4.25	1.621E+00	1.321E+00	1.321E+00	124.51	OK
	835.71	1.61	1.557E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.450E+00	1.181E+00	1.181E+00	41.80	OK
	968.97	15.80	1.379E+00	1.190E+00	1.190E+00	48.16	OK
RA-228	105.21	1.10	5.519E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.327E+00	1.243E+00	1.243E+00	54.91	OK
	794.95	4.25	1.621E+00	1.321E+00	1.321E+00	124.51	OK
	835.71	1.61	1.557E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.450E+00	1.181E+00	1.181E+00	41.80	OK
	968.97	15.80	1.379E+00	1.190E+00	1.190E+00	48.16	OK
TH-228	74.82	10.28	3.532E+00	1.722E+00	1.722E+00	52.62	OK
	77.11	17.10	3.757E+00	2.130E+00	2.130E+00	24.57	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	238.63	43.60*	4.454E+00	1.321E+00	1.321E+00	12.53	OK
	300.09	3.30	3.690E+00	-----	Line Not Found	-----	Absent
TH-229	85.43	14.70	4.354E+00	4.200E-01	4.200E-01	137.59	OK
	88.47	24.00	4.590E+00	4.872E-01	4.873E-01	67.98	OK
	193.51	4.41*	5.168E+00	-----	Line Not Found	-----	Absent
	210.85	2.80	4.899E+00	1.787E+00	1.787E+00	118.06	OK
TH-230	609.32	45.49*	2.015E+00	1.479E+00	1.480E+00	17.43	OK
	1120.29	14.92	1.223E+00	1.078E+00	1.078E+00	67.61	OK
	1764.49	15.30	8.116E-01	1.637E+00	1.637E+00	52.01	OK
PA-231	283.69	1.70	3.870E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	3.671E+00	9.078E-01	9.078E-01	143.69	OK
TH-232	105.21	1.10	5.519E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.327E+00	1.243E+00	1.243E+00	54.91	OK
	835.71	1.61	1.557E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.450E+00	1.181E+00	1.181E+00	41.80	OK
	968.97	15.80	1.379E+00	1.190E+00	1.190E+00	48.16	OK
TH-234	63.29	3.70*	2.294E+00	2.516E+00	2.516E+00	140.35	OK
	92.59	4.23	4.940E+00	4.012E+00	4.012E+00	39.80	OK
U-234	609.32	45.49*	2.015E+00	1.479E+00	1.479E+00	17.43	OK
	1120.29	14.92	1.223E+00	1.078E+00	1.078E+00	67.61	OK
	1764.49	15.30	8.116E-01	1.637E+00	1.637E+00	52.01	OK
U-235	89.96	3.47	4.767E+00	2.967E+00	2.967E+00	73.97	OK
	93.35	5.60	4.940E+00	3.031E+00	3.031E+00	39.80	OK
	143.76	10.96*	5.868E+00	-----	Line Not Found	-----	Absent
	163.33	5.08	5.647E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	5.297E+00	2.485E-01	2.485E-01	47.46	OK
	205.31	5.01	4.973E+00	-----	Line Not Found	-----	Absent
U-238	63.29	3.70*	2.294E+00	2.516E+00	2.516E+00	140.35	OK
	92.59	4.23	4.940E+00	4.012E+00	4.012E+00	39.80	OK
AM-243	43.53	5.90	3.822E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	3.532E+00	2.634E-01	2.634E-01	52.62	OK
CM-247	278.00	3.40	3.944E+00	1.689E+00	1.689E+00	80.47	OK
	287.50	2.00	3.826E+00	-----	Line Not Found	-----	Absent
	402.40	72.00*	2.865E+00	1.729E-01	1.729E-01	110.94	OK
ANH-511	511.00	100.00*	2.335E+00	1.168E-01	1.168E-01	98.90	OK

Flag: "*" = Keyline


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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235056.CNF;1
* Acquisition date   : 3-OCT-2016 07:50:44 Sensitivity      : 3.000
* Detector ID       : GAM01 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.36 Half life ratio  : *****
* Sample date      : 2-DEC-2015 14:50:00 Analyst initials: MXR1
* Sample ID       : G405235056 Sample Quantity : 1.0148E+02 GRAM
* Batch Number    : 1596252 Wet Weight      : 0.00000
* Wet wt corr    : 1.00000 Dry Weight      : 0.00000
* Nuclide Library : SOLID.NLB;6
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 20-JUL-2016 07:03:55 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM01_CAN.CNF;9
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
NA-22	3.596E-02	8.607E-02	1.623E-01
K-40	1.922E+01	2.247E+00	9.665E-01
CD-109	5.003E+00	3.333E+00	2.829E+00
SN-126	3.160E-01	2.105E-01	1.799E-01
BA-137M	2.154E-01	9.478E-02	8.188E-02
CS-137	2.275E-01	1.001E-01	8.650E-02
TL-208	3.536E-01	1.121E-01	8.415E-02
BI-211	9.152E-01	1.504E+00	5.541E-01
PB-212	1.321E+00	1.622E-01	1.463E-01
BI-214	1.480E+00	2.528E-01	1.585E-01
PB-214	1.526E+00	2.742E-01	5.099E-01
RN-219	1.886E+00	2.050E+00	1.157E+00
RN-222	1.480E+00	2.528E-01	1.585E-01
RA-224	1.794E+00	2.516E+00	1.569E+00
RA-226	1.480E+00	2.528E-01	1.585E-01
AC-228	1.181E+00	4.839E-01	4.780E-01
RA-228	1.181E+00	4.839E-01	4.780E-01
TH-228	1.321E+00	1.622E-01	1.463E-01
TH-229	-7.270E-01	7.080E-01	1.211E+00
TH-230	1.480E+00	2.527E-01	1.584E-01
PA-231	9.078E-01	1.278E+00	1.149E+00
TH-232	1.181E+00	4.839E-01	4.780E-01
TH-234	2.516E+00	3.460E+00	4.004E+00
U-234	1.479E+00	2.527E-01	1.584E-01
U-235	1.323E-03	2.863E-01	5.332E-01
U-238	2.516E+00	3.460E+00	4.004E+00
AM-243	2.634E-01	1.358E-01	1.527E-01
CM-247	1.729E-01	1.879E-01	1.062E-01
ANH-511	1.168E-01	1.132E-01	7.738E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-8.317E+00	1.757E+01	3.114E+01	NOT IDENT.

NA-24	0.000E+00	1.638E+41	0.000E+00	SHORT HLIF
AL-26	-8.408E-03	4.021E-02	8.619E-02	NOT IDENT.
SC-46	-2.005E-01	4.825E-01	8.570E-01	FAIL ABUN
V-48	0.000E+00	2.715E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	7.276E+02	0.000E+00	SHORT HLIF
MN-54	2.357E-02	9.243E-02	1.838E-01	NOT IDENT.
CO-56	-1.269E-01	7.765E-01	1.424E+00	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	5.378E-02	7.240E-02	1.319E-01	NOT IDENT.
CO-58	-5.712E-01	9.971E-01	1.685E+00	NOT IDENT.
FE-59	-3.805E+00	1.249E+01	2.198E+01	NOT IDENT.
CO-60	4.963E-02	6.260E-02	1.449E-01	NOT IDENT.
ZN-65	-2.445E-01	3.013E-01	3.769E-01	NOT IDENT.
GE-68	-1.554E+00	3.948E+00	6.833E+00	NOT IDENT.
AS-73	1.065E+00	1.931E+01	3.355E+01	NOT IDENT.
AS-74	0.000E+00	1.161E+04	0.000E+00	SHORT HLIF
SE-75	4.107E-01	3.104E-01	6.141E-01	FAIL ABUN
BR-77	0.000E+00	1.621E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	1.439E+03	0.000E+00	SHORT HLIF
RB-83	2.602E-01	9.162E-01	1.828E+00	NOT IDENT.
KR-85	3.894E+00	1.076E+01	1.932E+01	NOT IDENT.
SR-85	4.377E-01	1.210E+00	2.172E+00	NOT IDENT.
RB-86	0.000E+00	5.748E+04	0.000E+00	SHORT HLIF
Y-88	-6.096E-02	3.556E-01	7.446E-01	NOT IDENT.
Y-91	-7.074E+02	8.861E+02	1.537E+03	NOT IDENT.
NB-94	5.150E-03	4.562E-02	8.771E-02	NOT IDENT.
NB-95	-8.782E-01	1.565E+00	2.279E+00	NOT IDENT.
NB-95M	-1.423E+00	4.446E+00	7.129E+00	NOT IDENT.
ZR-95	4.433E-01	2.447E+00	4.714E+00	NOT IDENT.
NB-97	0.000E+00	1.436E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.223E+33	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.657E+41	0.000E+00	SHORT HLIF
RH-101	-2.685E-02	5.212E-02	8.382E-02	NOT IDENT.
RH-102	-2.462E-02	9.129E-02	1.650E-01	NOT IDENT.
RU-103	-1.435E-01	9.725E+00	1.824E+01	FAIL ABUN
RH-106	8.675E-02	7.708E-01	1.479E+00	NOT IDENT.
RU-106	8.675E-02	7.708E-01	1.479E+00	NOT IDENT.
AG-108M	3.834E-02	4.025E-02	8.450E-02	NOT IDENT.
AG-110M	6.092E-02	1.573E-01	3.112E-01	FAIL ABUN
SN-113	7.437E-02	3.723E-01	6.830E-01	NOT IDENT.
CD-115	0.000E+00	2.779E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.803E+05	0.000E+00	SHORT HLIF
TE-123M	6.262E-02	1.880E-01	3.603E-01	NOT IDENT.
SB-124	2.949E+00	2.653E+00	7.907E+00	NOT IDENT.
SB-125	7.366E-02	1.513E-01	3.017E-01	FAIL ABUN
TE-125M	2.398E+02	5.144E+02	9.023E+02	NOT IDENT.
I-126	0.000E+00	2.205E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	3.043E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	9.620E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	1.308E+10	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.284E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.104E+27	0.000E+00	SHORT HLIF
BA-133	-2.190E-02	7.246E-02	1.157E-01	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	8.693E-02	1.061E-01	1.698E-01	FAIL ABUN
CS-135	2.504E-02	2.262E-01	3.838E-01	NOT IDENT.
I-135	0.000E+00	8.597E+40	0.000E+00	SHORT HLIF
CS-136	0.000E+00	4.883E+05	0.000E+00	SHORT HLIF
CE-139	-4.365E-03	1.647E-01	3.064E-01	NOT IDENT.
BA-140	0.000E+00	2.606E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	8.560E+05	0.000E+00	SHORT HLIF
CE-141	5.775E+00	4.223E+01	7.912E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	-2.250E-01	5.813E-01	9.450E-01	NOT IDENT.
PM-144	-1.405E-02	9.562E-02	1.735E-01	NOT IDENT.
PR-144	-1.173E+00	8.339E+00	1.515E+01	NOT IDENT.
PM-146	-5.622E-02	7.224E-02	1.217E-01	NOT IDENT.
ND-147	0.000E+00	7.615E+07	0.000E+00	SHORT HLIF
PM-147	6.631E+02	1.236E+03	2.213E+03	NOT IDENT.
PM-149	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
EU-150	1.302E-02	4.168E-02	7.271E-02	FAIL ABUN
EU-152	-4.123E-02	1.359E-01	2.460E-01	NOT IDENT.
GD-153	-3.395E-02	3.101E-01	4.791E-01	NOT IDENT.
EU-154	8.791E-02	2.104E-01	3.576E-01	FAIL ABUN
EU-155	8.291E-02	1.812E-01	3.193E-01	FAIL ABUN
TB-160	2.476E+00	2.431E+00	5.699E+00	FAIL ABUN
HO-166M	-1.346E-02	8.706E-02	1.598E-01	FAIL ABUN

TM-171	-2.061E+00	4.545E+01	7.822E+01	NOT IDENT.
HF-172	2.944E-01	3.454E-01	6.337E-01	FAIL ABUN
LU-172	-2.267E-02	1.069E-01	1.962E-01	FAIL ABUN
LU-176	-1.540E-02	3.814E-02	6.050E-02	FAIL ABUN
HF-181	3.098E+00	6.816E+00	1.368E+01	NOT IDENT.
TA-182	-4.430E-01	1.488E+00	2.471E+00	FAIL ABUN
RE-183	-4.553E-01	6.173E+00	1.058E+01	NOT IDENT.
RE-184	8.850E+00	4.939E+01	9.761E+01	NOT IDENT.
W-188	-5.362E+01	1.982E+02	3.199E+02	FAIL ABUN
IR-192	2.829E-01	7.398E-01	1.431E+00	FAIL ABUN
HG-203	-3.501E+00	4.243E+00	6.329E+00	NOT IDENT.
BI-207	1.941E-02	8.051E-02	1.573E-01	FAIL ABUN
PB-210	-2.426E+00	7.363E+00	1.260E+01	NOT IDENT.
PB-211	-6.006E-01	1.022E+00	1.778E+00	NOT IDENT.
BI-212	1.071E+00	8.800E-01	1.856E+00	NOT IDENT.
RA-223	-1.870E-01	8.835E-01	1.445E+00	FAIL ABUN
AC-227	-8.628E-02	3.606E-01	6.548E-01	NOT IDENT.
TH-227	-8.628E-02	3.606E-01	6.548E-01	NOT IDENT.
TH-231	-1.870E-01	8.835E-01	1.445E+00	FAIL ABUN
PA-233	-2.617E-02	9.190E-02	1.663E-01	NOT IDENT.
PA-234	-4.521E-01	4.511E-01	6.750E-01	FAIL ABUN
PA-234M	1.111E-01	8.053E+00	1.541E+01	NOT IDENT.
NP-237	-2.617E-02	9.190E-02	1.663E-01	NOT IDENT.
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	-8.382E-03	4.284E-01	6.651E-01	FAIL ABUN
PU-239	8.918E+02	7.830E+02	9.430E+02	FAIL ABUN
AM-241	-8.625E-02	2.930E-01	4.494E-01	NOT IDENT.
CM-243	-5.985E-02	1.650E-01	2.708E-01	FAIL ABUN
BK-247	8.175E-02	1.086E-01	2.007E-01	FAIL ABUN
CF-249	1.794E-02	5.157E-02	1.014E-01	NOT IDENT.
CF-251	1.485E-01	1.675E-01	3.313E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
NA-22	1274.54	4	99.94*	1.095E+00	2.878E-02	3.596E-02	244.20
K-40	1460.82	269	10.66*	9.709E-01	1.922E+01	1.922E+01	11.93
CD-109	88.03	98	3.70*	4.590E+00	4.260E+00	6.743E+00	49.35
SN-126	64.28	29	9.60	2.294E+00	9.696E-01	9.696E-01	140.35
	86.94	98	8.90	4.590E+00	1.771E+00	1.771E+00	49.35
	87.57	98	37.00*	4.590E+00	4.260E-01	4.260E-01	49.35
BA-137M	661.66	48	89.90*	1.883E+00	2.112E-01	2.154E-01	44.91
CS-137	661.66	48	85.10*	1.883E+00	2.232E-01	2.275E-01	44.91
TL-208	277.37	31	6.60	3.944E+00	8.703E-01	8.703E-01	80.47
	583.19	85	85.00*	2.090E+00	3.536E-01	3.536E-01	32.35
	860.56	-----	12.50	1.520E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	3.328E+00	-----	Line Not Found	-----
	351.06	236	12.92*	3.215E+00	4.202E+00	4.202E+00	18.34
PB-212	74.82	118	10.28	3.532E+00	2.395E+00	2.395E+00	36.09
	77.11	185	17.10	3.757E+00	2.130E+00	2.130E+00	24.57
	238.63	347	43.60*	4.454E+00	1.321E+00	1.321E+00	12.53
	300.09	-----	3.30	3.690E+00	-----	Line Not Found	-----
BI-214	609.32	183	45.49*	2.015E+00	1.479E+00	1.480E+00	17.43
	1120.29	27	14.92	1.223E+00	1.078E+00	1.078E+00	67.61
	1764.49	27	15.30	8.116E-01	1.637E+00	1.638E+00	52.01
PB-214	74.82	118	5.80	3.532E+00	4.244E+00	4.246E+00	36.09
	77.11	185	9.70	3.757E+00	3.755E+00	3.757E+00	24.57
	87.09	98	3.41	4.590E+00	4.622E+00	4.624E+00	49.35
	242.00	95	7.25	4.411E+00	2.207E+00	2.208E+00	62.04
	295.22	111	18.42	3.737E+00	1.193E+00	1.193E+00	40.38
	351.93	236	35.60*	3.215E+00	1.525E+00	1.526E+00	18.34
RN-219	271.23	33	10.80	4.031E+00	5.586E-01	5.586E-01	93.47
	401.81	48	6.60*	2.865E+00	1.886E+00	1.886E+00	110.94
RN-222	609.32	183	45.49*	2.015E+00	1.479E+00	1.480E+00	17.43
	1120.29	27	14.92	1.223E+00	1.078E+00	1.078E+00	67.61
	1764.49	27	15.30	8.116E-01	1.637E+00	1.638E+00	52.01
RA-224	240.99	95	4.10*	4.411E+00	3.903E+00	3.903E+00	62.04
RA-226	609.32	183	45.49*	2.015E+00	1.479E+00	1.480E+00	17.43
	1120.29	27	14.92	1.223E+00	1.078E+00	1.078E+00	67.61
	1764.49	27	15.30	8.116E-01	1.637E+00	1.638E+00	52.01
AC-228	105.21	-----	1.10	5.519E+00	-----	Line Not Found	-----
	338.32	63	11.27	3.327E+00	1.243E+00	1.243E+00	54.91
	794.95	12	4.25	1.621E+00	1.321E+00	1.321E+00	124.51
	835.71	-----	1.61	1.557E+00	-----	Line Not Found	-----
	911.20	60	25.80*	1.450E+00	1.181E+00	1.181E+00	41.80
	968.97	35	15.80	1.379E+00	1.190E+00	1.190E+00	48.16
RA-228	105.21	-----	1.10	5.519E+00	-----	Line Not Found	-----
	338.32	63	11.27	3.327E+00	1.243E+00	1.243E+00	54.91
	794.95	12	4.25	1.621E+00	1.321E+00	1.321E+00	124.51
	835.71	-----	1.61	1.557E+00	-----	Line Not Found	-----
	911.20	60	25.80*	1.450E+00	1.181E+00	1.181E+00	41.80
	968.97	35	15.80	1.379E+00	1.190E+00	1.190E+00	48.16

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected Decay Corr		2-Sigma %Error
					pCi/GRAM	pCi/GRAM	
TH-228	74.82	118	10.28	3.532E+00	2.395E+00	2.395E+00	36.09
	77.11	185	17.10	3.757E+00	2.130E+00	2.130E+00	24.57
	238.63	347	43.60*	4.454E+00	1.321E+00	1.321E+00	12.53
	300.09	-----	3.30	3.690E+00	-----	Line Not Found	-----
TH-229	85.43	36	14.70	4.354E+00	4.200E-01	4.200E-01	137.59
	88.47	98	24.00	4.590E+00	6.567E-01	6.568E-01	49.35
	193.51	-----	4.41*	5.168E+00	-----	Line Not Found	-----
	210.85	33	2.80	4.899E+00	1.787E+00	1.787E+00	118.06
TH-230	609.32	183	45.49*	2.015E+00	1.479E+00	1.480E+00	17.43
	1120.29	27	14.92	1.223E+00	1.078E+00	1.078E+00	67.61
	1764.49	27	15.30	8.116E-01	1.637E+00	1.637E+00	52.01
PA-231	283.69	-----	1.70	3.870E+00	-----	Line Not Found	-----
	301.36	24	5.35*	3.671E+00	9.078E-01	9.078E-01	143.69
TH-232	105.21	-----	1.10	5.519E+00	-----	Line Not Found	-----
	338.32	63	11.27	3.327E+00	1.243E+00	1.243E+00	54.91
	835.71	-----	1.61	1.557E+00	-----	Line Not Found	-----
	911.20	60	25.80*	1.450E+00	1.181E+00	1.181E+00	41.80
TH-234	968.97	35	15.80	1.379E+00	1.190E+00	1.190E+00	48.16
	63.29	29	3.70*	2.294E+00	2.516E+00	2.516E+00	140.35
	92.59	113	4.23	4.940E+00	4.012E+00	4.012E+00	39.80
U-234	609.32	183	45.49*	2.015E+00	1.479E+00	1.479E+00	17.43
	1120.29	27	14.92	1.223E+00	1.078E+00	1.078E+00	67.61
	1764.49	27	15.30	8.116E-01	1.637E+00	1.637E+00	52.01
U-235	89.96	66	3.47	4.767E+00	2.967E+00	2.967E+00	73.97
	93.35	113	5.60	4.940E+00	3.031E+00	3.031E+00	39.80
	143.76	-----	10.96*	5.868E+00	-----	Line Not Found	-----
	163.33	-----	5.08	5.647E+00	-----	Line Not Found	-----
	185.72	102	57.20	5.297E+00	2.485E-01	2.485E-01	47.46
U-238	205.31	-----	5.01	4.973E+00	-----	Line Not Found	-----
	63.29	29	3.70*	2.294E+00	2.516E+00	2.516E+00	140.35
	92.59	113	4.23	4.940E+00	4.012E+00	4.012E+00	39.80
AM-243	43.53	-----	5.90	3.822E-01	-----	Line Not Found	-----
	74.66	118	67.20*	3.532E+00	3.663E-01	3.663E-01	36.09
CM-247	278.00	31	3.40	3.944E+00	1.689E+00	1.689E+00	80.47
	287.50	-----	2.00	3.826E+00	-----	Line Not Found	-----
	402.40	48	72.00*	2.865E+00	1.729E-01	1.729E-01	110.94
ANH-511	511.00	37	100.00*	2.335E+00	1.168E-01	1.168E-01	98.90

Flag: "*" = Keyline

Total number of lines in spectrum 49
 Number of unidentified lines 12
 Number of lines tentatively identified by NID 37 75.51%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
NA-22	2.60Y	1.25	2.878E-02	3.596E-02	8.782E-02	244.20	
K-40	1.25E+09Y	1.00	1.922E+01	1.922E+01	0.229E+01	11.93	
CD-109	461.40D	1.58	4.260E+00	6.743E+00	3.327E+00	49.35	
SN-126	2.30E+05Y	1.00	4.260E-01	4.260E-01	2.102E-01	49.35	
BA-137M	30.08Y	1.02	2.112E-01	2.154E-01	0.967E-01	44.91	
CS-137	30.08Y	1.02	2.232E-01	2.275E-01	1.022E-01	44.91	
TL-208	1.41E+10Y	1.00	3.536E-01	3.536E-01	1.144E-01	32.35	
BI-211	7.04E+08Y	1.00	4.202E+00	4.202E+00	0.771E+00	18.34	
PB-212	1.41E+10Y	1.00	1.321E+00	1.321E+00	0.166E+00	12.53	
BI-214	1600.00Y	1.00	1.479E+00	1.480E+00	0.258E+00	17.43	
PB-214	1600.00Y	1.00	1.525E+00	1.526E+00	0.280E+00	18.34	
RN-219	7.04E+08Y	1.00	1.886E+00	1.886E+00	2.092E+00	110.94	
RN-222	1600.00Y	1.00	1.479E+00	1.480E+00	0.258E+00	17.43	
RA-224	1.41E+10Y	1.00	3.903E+00	3.903E+00	2.422E+00	62.04	
RA-226	1600.00Y	1.00	1.479E+00	1.480E+00	0.258E+00	17.43	
AC-228	1.41E+10Y	1.00	1.181E+00	1.181E+00	0.494E+00	41.80	
RA-228	1.41E+10Y	1.00	1.181E+00	1.181E+00	0.494E+00	41.80	
TH-228	1.41E+10Y	1.00	1.321E+00	1.321E+00	0.166E+00	12.53	
TH-229	7340.00Y	1.00	6.567E-01	6.568E-01	3.241E-01	49.35	K
TH-230	7.54E+04Y	1.00	1.479E+00	1.480E+00	0.258E+00	17.43	
PA-231	7.04E+08Y	1.00	9.078E-01	9.078E-01	13.04E-01	143.69	
TH-232	1.41E+10Y	1.00	1.181E+00	1.181E+00	0.494E+00	41.80	
TH-234	4.47E+09Y	1.00	2.516E+00	2.516E+00	3.531E+00	140.35	
U-234	2.45E+05Y	1.00	1.479E+00	1.479E+00	0.258E+00	17.43	
U-235	7.04E+08Y	1.00	2.485E-01	2.485E-01	1.179E-01	47.46	K
U-238	4.47E+09Y	1.00	2.516E+00	2.516E+00	3.531E+00	140.35	
AM-243	7370.00Y	1.00	3.663E-01	3.663E-01	1.322E-01	36.09	
CM-247	1.56E+07Y	1.00	1.729E-01	1.729E-01	1.918E-01	110.94	
ANH-511	1.00E+09Y	1.00	1.168E-01	1.168E-01	1.155E-01	98.90	
Total Activity :			5.732E+01	5.982E+01			

Grand Total Activity : 5.732E+01 5.982E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	118.89	24	72	0.89	238.46	235	7	6.90E-03	****	5.83E+00	T
0	129.46	45	107	1.07	259.61	256	10	1.28E-02	89.6	5.91E+00	T
0	329.38	15	70	1.44	659.39	651	12	4.33E-03	****	3.41E+00	T
0	435.49	10	31	1.25	871.57	865	10	2.92E-03	****	2.67E+00	
0	463.09	22	18	1.49	926.77	922	8	6.31E-03	79.7	2.54E+00	T
0	565.33	48	26	5.07	1131.21	1122	18	1.40E-02	57.7	2.14E+00	
0	719.57	22	8	2.59	1439.62	1435	11	6.47E-03	63.5	1.76E+00	T
0	770.32	28	29	4.46	1541.09	1530	21	8.25E-03	****	1.66E+00	
0	786.97	8	15	0.88	1574.38	1568	8	2.22E-03	****	1.63E+00	
0	879.40	8	3	0.96	1759.18	1756	7	2.36E-03	****	1.49E+00	T
0	883.43	4	8	0.53	1767.23	1762	7	1.12E-03	****	1.49E+00	T
0	920.31	8	13	0.94	1840.98	1833	11	2.37E-03	****	1.44E+00	
0	923.70	9	11	1.26	1847.74	1843	10	2.54E-03	****	1.43E+00	T
0	1043.52	9	4	1.47	2087.31	2081	10	2.58E-03	****	1.30E+00	
0	1109.70	17	3	3.67	2219.61	2214	11	5.08E-03	58.5	1.23E+00	
0	1225.45	5	12	0.50	2451.03	2447	8	1.59E-03	****	1.13E+00	
0	1266.62	6	3	0.89	2533.33	2530	6	1.78E-03	****	1.10E+00	
0	1378.12	15	4	0.54	2756.24	2751	10	4.55E-03	70.7	1.02E+00	
0	1589.26	7	1	1.39	3178.30	3175	6	2.10E-03	88.8	8.98E-01	
0	1799.81	6	0	0.99	3599.17	3596	6	1.67E-03	81.6	7.96E-01	

Flags: "T" = Tentatively associated

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
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DETECTOR AND SAMPLE DATA

```
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235056.CNF;1
* Acquisition date   : 3-OCT-2016 07:50:44 Sensitivity      : 3.000
* Detector ID        : GAM01 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.36 Half life ratio  : *****
* Sample date        : 2-DEC-2015 14:50:00 Nuclide Library : SOLID
* Sample ID          : G405235056 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity : 1.0148E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight       : 0.00000
*****
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CALIBRATION INFORMATION

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* Eff. Cal. date    : 20-JUL-2016 07:03:55 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM01_CAN.CNF;9
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
NA-22	6.986E-02
K-40	3.874E-01
CD-109	1.323E+00
SN-126	8.413E-02
BA-137M	3.496E-02
CS-137	3.693E-02
TL-208	3.648E-02
BI-211	2.532E-01
PB-212	6.806E-02
BI-214	6.839E-02
PB-214	2.464E-01
RN-219	5.262E-01
RN-222	6.839E-02
RA-224	7.297E-01
RA-226	6.839E-02
AC-228	2.125E-01
RA-228	2.125E-01
TH-228	6.806E-02
TH-229	5.620E-01
TH-230	6.836E-02
PA-231	5.241E-01
TH-232	2.125E-01
TH-234	1.885E+00
U-234	6.836E-02
U-235	2.512E-01
U-238	1.885E+00
AM-243	7.211E-02
CM-247	4.830E-02
ANH-511	3.443E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.350E+01	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF

AL-26	3.054E-02	NOT IDENT.
SC-46	3.443E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	7.935E-02	NOT IDENT.
CO-56	6.115E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	6.163E-02	NOT IDENT.
CO-58	7.182E-01	NOT IDENT.
FE-59	9.336E+00	NOT IDENT.
CO-60	6.197E-02	NOT IDENT.
ZN-65	1.504E-01	NOT IDENT.
GE-68	2.883E+00	NOT IDENT.
AS-73	1.568E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	2.829E-01	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	8.018E-01	NOT IDENT.
KR-85	8.619E+00	NOT IDENT.
SR-85	9.688E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	2.788E-01	NOT IDENT.
Y-91	6.447E+02	NOT IDENT.
NB-94	3.831E-02	NOT IDENT.
NB-95	9.765E-01	NOT IDENT.
NB-95M	3.321E+00	NOT IDENT.
ZR-95	2.061E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.896E-02	NOT IDENT.
RH-102	7.191E-02	NOT IDENT.
RU-103	8.113E+00	FAIL ABUN
RH-106	6.501E-01	NOT IDENT.
RU-106	6.501E-01	NOT IDENT.
AG-108M	3.815E-02	NOT IDENT.
AG-110M	1.342E-01	FAIL ABUN
SN-113	3.086E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.679E-01	NOT IDENT.
SB-124	3.121E+00	NOT IDENT.
SB-125	1.357E-01	FAIL ABUN
TE-125M	4.250E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	5.254E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	7.540E-02	FAIL ABUN
CS-135	1.766E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	1.429E-01	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	3.718E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	4.406E-01	NOT IDENT.
PM-144	7.687E-02	NOT IDENT.
PR-144	6.711E+00	NOT IDENT.
PM-146	5.426E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	1.032E+03	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	3.323E-02	FAIL ABUN
EU-152	1.111E-01	NOT IDENT.
GD-153	2.236E-01	NOT IDENT.
EU-154	1.511E-01	FAIL ABUN
EU-155	1.500E-01	FAIL ABUN
TB-160	2.436E+00	FAIL ABUN
HO-166M	6.956E-02	FAIL ABUN
TM-171	3.657E+01	NOT IDENT.

HF-172	2.965E-01	FAIL ABUN
LU-172	8.087E-02	FAIL ABUN
LU-176	2.732E-02	FAIL ABUN
HF-181	6.096E+00	NOT IDENT.
TA-182	1.030E+00	FAIL ABUN
RE-183	4.942E+00	NOT IDENT.
RE-184	4.171E+01	NOT IDENT.
W-188	1.464E+02	FAIL ABUN
IR-192	6.554E-01	FAIL ABUN
HG-203	2.871E+00	NOT IDENT.
BI-207	6.806E-02	FAIL ABUN
PB-210	5.898E+00	NOT IDENT.
PB-211	7.966E-01	NOT IDENT.
BI-212	8.428E-01	NOT IDENT.
RA-223	6.507E-01	FAIL ABUN
AC-227	3.026E-01	NOT IDENT.
TH-227	3.026E-01	NOT IDENT.
TH-231	6.507E-01	FAIL ABUN
PA-233	7.591E-02	NOT IDENT.
PA-234	2.787E-01	FAIL ABUN
PA-234M	6.829E+00	NOT IDENT.
NP-237	7.591E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	3.110E-01	FAIL ABUN
PU-239	4.449E+02	FAIL ABUN
AM-241	2.099E-01	NOT IDENT.
CM-243	1.265E-01	FAIL ABUN
BK-247	9.228E-02	FAIL ABUN
CF-249	4.558E-02	NOT IDENT.
CF-251	1.551E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235056.CNF;1 *
 * Acquisition date : 3-OCT-2016 07:50:44 Sensitivity : 3.000 *
 * Detector ID : GAM01 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.36 Half life ratio : ***** *
 * Sample date : 2-DEC-2015 14:50:00 Nuclide Library : SOLID *
 * Sample ID : G405235056 Analyst initials: MXR1 *
 * Batch Number : 1596252 Sample Quantity : 1.0148E+02 GRAM *
 * Quantity Err(%) : 1.9708E-03 % *
 * Wet wt corr : 1.00000 Wet Weight : 0.00000 *
 * Dry Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 20-JUL-2016 07:03:55 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM01_CAN.CNF;9 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
NA-22	3.596E-02	8.608E-02	8.608E-02
K-40	1.922E+01	2.460E+00	2.460E+00
CD-109	5.003E+00	3.365E+00	3.365E+00
SN-126	3.160E-01	2.119E-01	2.119E-01
BA-137M	2.154E-01	9.523E-02	9.523E-02
CS-137	2.275E-01	1.006E-01	1.006E-01
TL-208	3.536E-01	1.131E-01	1.131E-01
BI-211	9.152E-01	1.518E+00	1.518E+00
PB-212	1.321E+00	1.766E-01	1.766E-01
BI-214	1.480E+00	2.607E-01	2.607E-01
PB-214	1.526E+00	2.815E-01	2.815E-01
RN-219	1.886E+00	2.064E+00	2.064E+00
RN-222	1.480E+00	2.607E-01	2.607E-01
RA-224	1.794E+00	2.521E+00	2.521E+00
RA-226	1.480E+00	2.607E-01	2.607E-01
AC-228	1.181E+00	4.876E-01	4.876E-01
RA-228	1.181E+00	4.876E-01	4.876E-01
TH-228	1.321E+00	1.766E-01	1.766E-01
TH-229	-7.270E-01	7.088E-01	7.088E-01
TH-230	1.480E+00	2.606E-01	2.606E-01
PA-231	9.078E-01	1.293E+00	1.293E+00
TH-232	1.181E+00	4.876E-01	4.876E-01
TH-234	2.516E+00	3.505E+00	3.505E+00
U-234	1.479E+00	2.606E-01	2.606E-01
U-235	1.323E-03	2.863E-01	2.863E-01
U-238	2.516E+00	3.505E+00	3.505E+00
AM-243	2.634E-01	1.374E-01	1.374E-01
CM-247	1.729E-01	1.902E-01	1.902E-01
ANH-511	1.168E-01	1.133E-01	1.133E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)
BE-7	-8.317E+00	1.757E+01	1.796E+01 NOT IDENT.

NA-24	1.000E+41	1.698E+41	0.000E+00	SHORT HLIF
AL-26	-8.408E-03	4.022E-02	4.039E-02	NOT IDENT.
SC-46	-2.005E-01	4.826E-01	4.910E-01	FAIL ABUN
V-48	2.328E+04	2.716E+04	2.912E+04	SHORT HLIF
CR-51	7.961E+01	7.276E+02	7.285E+02	SHORT HLIF
MN-54	2.357E-02	9.243E-02	9.304E-02	NOT IDENT.
CO-56	-1.269E-01	7.766E-01	7.787E-01	NOT IDENT.
MN-56	-1.000E+41	6.597E+41	0.000E+00	SHORT HLIF
CO-57	5.378E-02	7.244E-02	7.639E-02	NOT IDENT.
CO-58	-5.712E-01	9.974E-01	1.030E+00	NOT IDENT.
FE-59	-3.805E+00	1.249E+01	1.261E+01	NOT IDENT.
CO-60	4.963E-02	6.263E-02	6.651E-02	NOT IDENT.
ZN-65	-2.445E-01	3.014E-01	3.209E-01	NOT IDENT.
GE-68	-1.554E+00	3.948E+00	4.010E+00	NOT IDENT.
AS-73	1.065E+00	1.931E+01	1.931E+01	NOT IDENT.
AS-74	-8.097E+03	1.163E+04	1.218E+04	SHORT HLIF
SE-75	4.107E-01	3.111E-01	3.620E-01	FAIL ABUN
BR-77	1.320E+39	1.165E+40	0.000E+00	SHORT HLIF
SR-82	-1.120E+03	1.440E+03	1.526E+03	SHORT HLIF
RB-83	2.602E-01	9.169E-01	9.243E-01	NOT IDENT.
KR-85	3.894E+00	1.076E+01	1.091E+01	NOT IDENT.
SR-85	4.377E-01	1.210E+00	1.226E+00	NOT IDENT.
RB-86	-2.691E+04	5.749E+04	5.876E+04	SHORT HLIF
Y-88	-6.096E-02	3.557E-01	3.567E-01	NOT IDENT.
Y-91	-7.074E+02	8.865E+02	9.421E+02	NOT IDENT.
NB-94	5.150E-03	4.563E-02	4.568E-02	NOT IDENT.
NB-95	-8.782E-01	1.565E+00	1.615E+00	NOT IDENT.
NB-95M	-1.423E+00	4.448E+00	4.494E+00	NOT IDENT.
ZR-95	4.433E-01	2.448E+00	2.456E+00	NOT IDENT.
NB-97	-1.000E+41	1.437E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	2.376E+41	0.000E+00	SHORT HLIF
MO-99	-1.177E+33	1.226E+33	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	1.659E+41	0.000E+00	SHORT HLIF
RH-101	-2.685E-02	5.235E-02	5.373E-02	NOT IDENT.
RH-102	-2.462E-02	9.131E-02	9.199E-02	NOT IDENT.
RU-103	-1.435E-01	9.725E+00	9.725E+00	FAIL ABUN
RH-106	8.675E-02	7.708E-01	7.718E-01	NOT IDENT.
RU-106	8.675E-02	7.708E-01	7.718E-01	NOT IDENT.
AG-108M	3.834E-02	4.028E-02	4.383E-02	NOT IDENT.
AG-110M	6.092E-02	1.573E-01	1.597E-01	FAIL ABUN
SN-113	7.437E-02	3.723E-01	3.738E-01	NOT IDENT.
CD-115	2.222E+40	2.809E+40	0.000E+00	SHORT HLIF
SN-117M	8.576E+04	1.806E+05	1.847E+05	SHORT HLIF
TE-123M	6.262E-02	1.880E-01	1.901E-01	NOT IDENT.
SB-124	2.949E+00	2.657E+00	2.971E+00	NOT IDENT.
SB-125	7.366E-02	1.514E-01	1.550E-01	FAIL ABUN
TE-125M	2.398E+02	5.146E+02	5.258E+02	NOT IDENT.
I-126	-2.409E+05	2.205E+06	2.208E+06	SHORT HLIF
SB-126	4.891E+06	3.182E+06	3.871E+06	SHORT HLIF
SB-127	-3.246E+22	1.064E+23	0.000E+00	SHORT HLIF
I-131	-8.032E+09	1.309E+10	1.358E+10	SHORT HLIF
I-132	1.000E+41	1.889E+42	0.000E+00	SHORT HLIF
TE-132	4.936E+26	2.114E+27	0.000E+00	SHORT HLIF
BA-133	-2.190E-02	7.247E-02	7.314E-02	FAIL ABUN
I-133	-1.000E+41	9.507E+41	0.000E+00	SHORT HLIF
CS-134	8.693E-02	1.061E-01	1.131E-01	FAIL ABUN
CS-135	2.504E-02	2.262E-01	2.265E-01	NOT IDENT.
I-135	-1.000E+41	6.961E+41	0.000E+00	SHORT HLIF
CS-136	-3.382E+04	4.883E+05	4.886E+05	SHORT HLIF
CE-139	-4.365E-03	1.647E-01	1.647E-01	NOT IDENT.
BA-140	-1.651E+06	2.607E+06	2.711E+06	SHORT HLIF
LA-140	-2.335E+05	8.560E+05	8.625E+05	SHORT HLIF
CE-141	5.775E+00	4.223E+01	4.231E+01	NOT IDENT.
CE-143	1.000E+41	2.275E+41	0.000E+00	SHORT HLIF
CE-144	-2.250E-01	5.814E-01	5.902E-01	NOT IDENT.
PM-144	-1.405E-02	9.562E-02	9.583E-02	NOT IDENT.
PR-144	-1.173E+00	8.339E+00	8.356E+00	NOT IDENT.
PM-146	-5.622E-02	7.235E-02	7.666E-02	NOT IDENT.
ND-147	7.175E+06	7.615E+07	7.622E+07	SHORT HLIF
PM-147	6.631E+02	1.236E+03	1.272E+03	NOT IDENT.
PM-149	1.000E+41	4.117E+41	0.000E+00	SHORT HLIF
EU-150	1.302E-02	4.168E-02	4.209E-02	FAIL ABUN
EU-152	-4.123E-02	1.359E-01	1.371E-01	NOT IDENT.
GD-153	-3.395E-02	3.101E-01	3.105E-01	NOT IDENT.
EU-154	8.791E-02	2.104E-01	2.141E-01	FAIL ABUN
EU-155	8.291E-02	1.813E-01	1.851E-01	FAIL ABUN
TB-160	2.476E+00	2.435E+00	2.679E+00	FAIL ABUN
HO-166M	-1.346E-02	8.707E-02	8.728E-02	FAIL ABUN

TM-171	-2.061E+00	4.545E+01	4.546E+01	NOT IDENT.
HF-172	2.944E-01	3.487E-01	3.731E-01	FAIL ABUN
LU-172	-2.267E-02	1.069E-01	1.074E-01	FAIL ABUN
LU-176	-1.540E-02	3.814E-02	3.877E-02	FAIL ABUN
HF-181	3.098E+00	6.818E+00	6.959E+00	NOT IDENT.
TA-182	-4.430E-01	1.488E+00	1.502E+00	FAIL ABUN
RE-183	-4.553E-01	6.173E+00	6.176E+00	NOT IDENT.
RE-184	8.850E+00	4.944E+01	4.960E+01	NOT IDENT.
W-188	-5.362E+01	1.983E+02	1.998E+02	FAIL ABUN
IR-192	2.829E-01	7.399E-01	7.508E-01	FAIL ABUN
HG-203	-3.501E+00	4.246E+00	4.530E+00	NOT IDENT.
BI-207	1.941E-02	8.051E-02	8.099E-02	FAIL ABUN
PB-210	-2.426E+00	7.366E+00	7.447E+00	NOT IDENT.
PB-211	-6.006E-01	1.023E+00	1.058E+00	NOT IDENT.
BI-212	1.071E+00	8.816E-01	1.005E+00	NOT IDENT.
RA-223	-1.870E-01	8.835E-01	8.875E-01	FAIL ABUN
AC-227	-8.628E-02	3.608E-01	3.629E-01	NOT IDENT.
TH-227	-8.628E-02	3.608E-01	3.629E-01	NOT IDENT.
TH-231	-1.870E-01	8.835E-01	8.875E-01	FAIL ABUN
PA-233	-2.617E-02	9.190E-02	9.266E-02	NOT IDENT.
PA-234	-4.521E-01	6.863E-01	7.160E-01	FAIL ABUN
PA-234M	1.111E-01	8.053E+00	8.053E+00	NOT IDENT.
NP-237	-2.617E-02	9.190E-02	9.266E-02	NOT IDENT.
NP-238	1.000E+41	3.683E+41	0.000E+00	SHORT HLIF
NP-239	-8.382E-03	4.284E-01	4.284E-01	FAIL ABUN
PU-239	8.918E+02	7.840E+02	8.811E+02	FAIL ABUN
AM-241	-8.625E-02	2.930E-01	2.956E-01	NOT IDENT.
CM-243	-5.985E-02	1.651E-01	1.673E-01	FAIL ABUN
BK-247	8.175E-02	1.098E-01	1.158E-01	FAIL ABUN
CF-249	1.794E-02	5.159E-02	5.222E-02	NOT IDENT.
CF-251	1.485E-01	1.683E-01	1.811E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	80.8814	879.38	69.2091	482.18	68.1542
45.60	59.0989	87.57	69.2191	133.52	73.2301
46.54	70.7781	87.09	69.2291	264.66	61.5581
49.72	0.0000	87.57	69.2607	122.06	61.5789
51.35	67.7282	88.03	69.2909	140.51	0.0000
51.87	73.6162	88.34	69.3113	143.76	78.0153
52.39	70.1573	193.51	69.3196	144.24	72.9518
52.97	60.8478	89.96	69.4170	145.44	78.1079
53.44	66.7384	90.64	69.4609	152.43	73.3682
125.81	72.6501	91.11	0.0000	153.25	0.0000
57.36	0.0000	63.29	69.5866	154.21	55.5202
57.53	70.6071	143.76	69.6349	156.02	0.0000
57.98	68.2905	94.56	69.7118	158.56	0.0000
1093.63	75.4714	94.65	69.7175	159.00	55.6994
57.98	75.4761	94.67	69.7188	162.33	66.1280
59.54	75.4958	94.87	69.7314	162.66	0.0000
60.96	56.7167	97.43	65.3963	163.33	53.2813
61.17	69.3375	311.90	65.4545	165.86	64.5592
62.93	86.4541	946.00	65.4553	176.31	71.9234
63.29	86.4899	99.53	61.4235	1048.07	0.0000
63.58	86.5186	1221.41	62.6839	177.52	52.8991
64.28	94.8906	265.00	72.6382	739.50	0.0000
66.73	74.5357	103.18	76.4078	181.52	70.4177
67.24	79.3386	103.37	76.4206	711.68	65.3168
67.68	86.9181	116.74	76.4206	185.72	65.3687
67.75	95.2594	105.21	69.1340	193.51	77.9338
69.67	95.4602	105.31	69.1400	197.03	61.4230
70.83	79.6499	106.12	71.6584	127.23	65.8485
72.81	90.9928	106.47	77.8589	306.78	57.1950
279.20	90.9986	109.28	75.5659	203.43	56.3672
72.87	90.9986	111.00	88.0794	205.31	68.7713
74.66	97.1676	228.16	0.0000	210.85	51.7403
74.82	97.1837	114.06	78.3511	215.65	68.2852
1063.66	97.1988	116.30	0.0000	222.11	48.0580
238.63	97.4136	116.74	69.7966	290.67	55.3260
351.93	97.4136	119.76	73.2962	177.52	58.9048
78.74	97.5755	121.12	56.2816	228.16	0.0000
79.69	81.9936	121.22	52.5336	228.18	52.6795
80.12	67.5532	121.78	51.3054	235.69	69.9210
80.19	0.0000	122.06	51.3166	256.23	65.8968
80.57	82.0657	122.92	68.1341	238.63	59.2552
81.00	82.1010	123.07	68.1419	238.98	0.0000
81.07	82.1067	123.68	76.8632	240.99	59.3278
81.75	74.9126	125.81	51.4658	242.00	59.3586
323.87	69.0091	127.23	70.3711	344.28	43.2295
84.00	69.0234	127.91	75.4367	252.40	0.0000
85.43	69.1191	129.30	63.7694	252.80	61.4936
86.55	69.1935	131.20	64.2807	254.15	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
256.23	54.3518	351.93	37.8206	583.19	14.3241
260.90	0.0000	507.63	0.0000	584.27	14.3287
264.66	23.1955	356.01	38.3568	595.83	0.0000
264.80	30.0197	364.49	0.0000	600.60	21.5947
265.00	30.0224	366.42	0.0000	602.52	0.0000
268.22	42.3705	372.51	22.8794	604.72	24.7090
269.46	37.3815	129.30	37.2163	607.14	24.7256
270.03	37.3915	377.52	23.8795	609.32	13.4015
271.23	50.6447	383.85	33.5132	497.08	13.4052
273.65	0.0000	388.16	22.0590	433.94	7.7423
356.01	57.6308	388.63	0.0000	696.49	23.7684
277.37	40.2680	391.69	26.5067	620.36	18.6138
277.60	40.2725	400.66	33.7268	621.93	16.5527
278.00	40.2805	401.81	33.7418	667.71	0.0000
279.20	48.0887	402.40	33.7489	631.29	18.6702
279.54	48.0962	404.85	33.7795	453.88	14.5292
279.70	48.1004	410.95	34.8230	595.83	0.0000
280.46	39.8688	413.71	24.2071	635.95	18.6943
283.69	40.3879	414.70	0.0000	636.99	0.0000
364.49	0.0000	423.72	0.0000	645.85	18.7449
285.41	42.2574	404.85	28.2165	884.68	18.8057
285.90	0.0000	427.87	20.4386	657.90	0.0000
402.40	44.1377	433.94	16.5812	661.66	11.5044
290.67	44.2021	333.97	20.5223	664.57	0.0000
293.27	0.0000	453.88	34.3762	666.33	0.0000
295.22	38.7572	463.37	22.1709	720.70	0.0000
295.96	38.7700	468.07	27.6343	667.71	0.0000
298.58	41.5887	685.70	0.0000	677.62	16.8047
299.98	36.0666	475.06	22.7529	685.70	0.0000
300.09	36.0682	476.78	18.8067	695.00	0.0000
300.13	36.0690	477.60	19.8018	696.49	22.1647
301.36	36.0888	482.18	16.8575	696.51	22.1647
302.85	36.1126	1596.21	0.0000	697.00	0.0000
304.50	29.1897	527.90	0.0000	697.30	14.7799
537.26	0.0000	497.08	21.9221	697.49	14.7804
306.78	36.1761	505.52	23.9800	702.65	14.7998
316.51	37.1313	507.63	0.0000	706.68	20.1063
311.90	41.8359	511.00	22.0204	711.68	16.9538
316.51	33.5361	514.00	18.0337	720.70	0.0000
531.02	0.0000	514.00	18.0337	721.93	0.0000
320.08	0.0000	520.40	14.0547	1690.97	12.7510
427.87	27.0683	238.98	0.0000	722.91	12.7515
323.87	30.8395	522.65	0.0000	1274.44	19.1287
325.23	28.0518	527.90	0.0000	724.19	27.1052
328.76	0.0000	528.26	17.1086	727.33	15.9570
388.16	39.4083	520.40	22.1495	733.00	12.7837
333.97	32.3795	529.87	0.0000	735.93	11.7269
334.37	29.5691	531.02	0.0000	737.46	11.7314
338.28	36.6688	537.26	0.0000	739.50	0.0000
911.20	36.6696	546.56	0.0000	747.24	12.8291
340.48	36.7021	552.55	18.2505	748.06	8.5544
340.55	0.0000	563.25	18.3091	752.31	9.6335
344.28	33.9324	795.86	22.9276	753.82	0.0000
345.93	30.1829	569.50	21.3999	756.73	12.8589
351.06	37.8076	569.70	21.4016	756.80	12.8589

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
763.94	8.0508	984.45	0.0000	1596.21	0.0000
765.81	19.3308	996.26	13.5601	1620.50	3.7656
766.42	8.5928	1001.03	14.7038	1621.92	5.6495
766.84	8.5938	1002.74	12.4462	1678.03	0.0000
772.60	0.0000	1004.73	14.7149	1690.97	0.0000
776.52	0.0000	1021.30	0.0000	1750.46	0.0000
777.92	0.0000	1025.87	0.0000	1764.49	7.6826
778.90	9.6962	1028.54	0.0000	1770.23	6.7274
783.70	0.0000	846.77	6.8364	1771.35	0.9612
727.33	17.2643	1038.76	0.0000	1791.20	0.0000
792.07	16.2109	1046.59	1.7120	1808.65	2.8978
794.95	10.8146	1048.07	0.0000	846.75	0.0000
795.86	11.3579	1049.04	7.9929	1836.06	3.8777
801.95	21.6650	621.93	6.8530		
810.06	14.1087	1063.66	11.4510		
810.29	19.5366	1077.00	0.0000		
810.45	18.4519	1077.34	13.7773		
810.76	17.3678	1085.87	16.0998		
815.77	0.0000	1093.63	9.2135		
818.51	0.0000	1099.45	13.8359		
832.01	10.9082	1112.07	5.2006		
834.85	10.9151	1112.84	6.9351		
835.71	13.1011	1115.54	13.8770		
1260.41	0.0000	609.32	11.5747		
846.75	0.0000	889.28	11.5755		
846.77	14.2283	1121.30	13.8926		
856.80	0.0000	1129.67	15.0736		
860.56	9.8811	1131.51	0.0000		
702.65	8.8037	1147.95	0.0000		
873.19	13.2119	1173.23	12.2714		
529.87	0.0000	1177.95	12.2825		
879.38	9.9225	1189.05	14.9435		
880.51	0.0000	1204.77	16.7479		
883.24	16.5515	1221.41	11.3164		
884.68	14.9008	1231.02	8.8556		
889.28	8.8392	1235.36	0.0000		
903.28	3.3186	1238.28	15.9598		
898.04	8.8558	1260.41	0.0000		
900.72	8.8610	1271.87	7.1343		
903.28	9.9741	1274.44	12.8470		
911.20	21.6479	1274.54	12.8479		
912.08	21.6519	1099.45	6.2634		
923.98	0.0000	1298.22	0.0000		
926.50	11.6946	1312.11	0.0000		
929.11	6.6863	1332.49	5.4053		
937.49	11.1637	1362.66	0.0000		
944.13	0.0000	1365.19	7.2456		
946.00	17.8939	1368.63	0.0000		
949.00	7.8334	1384.29	3.6338		
954.55	0.0000	1408.01	7.2949		
962.31	20.1995	1457.56	0.0000		
964.08	16.1654	1460.82	5.5166		
966.17	11.7924	696.51	5.5404		
968.97	10.1133	1505.03	3.7024		
983.53	0.0000	1584.12	3.7461		


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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235057.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM05.CNF;477
Background date : 2-OCT-2016 11:00:07.
Sample date     : 2-DEC-2015 14:55:00. Acquisition date : 3-OCT-2016 07:51:32.
Sample ID      : G405235057 Sample quantity : 1.15835E+02 GRAM
Detector name  : GAM05 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.59 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1596252 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	31.49	24	93	0.53	64.83	63	6	6.56E-03	67.5	
2	0	46.20*	37	164	0.70	94.21	91	8	1.03E-02	66.2	
3	0	62.83*	129	200	0.90	127.46	123	9	3.57E-02	22.4	
4	1	72.69	36	136	0.93	147.17	144	18	9.90E-03	55.4	2.04E+00
5	1	74.52*	241	137	0.94	150.83	144	18	6.69E-02	10.4	
6	1	76.70*	384	139	0.94	155.17	144	18	1.07E-01	7.3	
7	5	83.62*	56	118	0.96	169.01	166	27	1.55E-02	33.4	8.49E-01
8	5	86.72*	141	150	1.41	175.21	166	27	3.92E-02	17.4	
9	5	89.64	120	107	1.03	181.04	166	27	3.34E-02	16.5	
10	5	92.39*	133	118	1.15	186.54	166	27	3.70E-02	17.7	
11	0	117.65	33	73	1.66	237.01	234	7	9.18E-03	46.4	
12	3	128.93	45	77	1.28	259.56	256	13	1.26E-02	37.2	2.80E+00
13	3	130.85	36	59	1.17	263.40	256	13	9.96E-03	43.2	
14	0	143.91*	12	135	1.40	289.50	284	9	3.37E-03	176.9	
15	0	185.50*	93	101	0.87	372.62	368	9	2.60E-02	23.0	
16	0	209.04	35	88	1.04	419.68	416	8	9.61E-03	50.0	
17	0	231.76	20	69	1.82	465.07	462	7	5.69E-03	70.5	
18	3	238.36*	424	59	0.96	478.27	471	17	1.18E-01	5.7	1.06E+00
19	3	241.38	130	58	1.50	484.31	471	17	3.62E-02	13.6	
20	3	269.63	40	39	1.55	540.77	537	25	1.10E-02	33.2	1.16E+00
21	3	276.86	18	66	1.56	555.22	537	25	5.01E-03	81.6	
22	0	284.39	15	64	4.54	570.27	562	11	4.11E-03	110.7	
23	0	287.37	41	31	2.31	576.23	572	10	1.14E-02	29.6	
24	0	294.89*	169	57	1.09	591.26	586	10	4.70E-02	11.5	
25	0	299.82	29	67	1.12	601.10	597	10	7.99E-03	55.9	
26	0	310.55	26	47	3.44	622.55	616	11	7.28E-03	54.2	
27	0	327.51	29	35	1.59	656.45	653	7	7.95E-03	39.1	
28	0	338.09*	119	45	1.11	677.59	672	13	3.29E-02	15.1	
29	0	351.68*	259	68	1.05	704.76	700	11	7.20E-02	8.8	
30	0	373.77	19	33	1.57	748.92	746	7	5.27E-03	54.6	
31	0	463.11	34	26	1.17	927.48	924	8	9.36E-03	31.4	
32	0	510.47*	44	67	1.39	1022.12	1014	16	1.21E-02	49.8	
33	0	583.14*	115	42	1.27	1167.37	1160	14	3.18E-02	15.4	
34	0	609.27*	205	27	1.24	1219.59	1213	14	5.70E-02	9.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	661.41	72	22	1.45	1323.81	1316	13	1.99E-02	18.1	
36	0	665.98	21	15	1.75	1332.95	1329	11	5.90E-03	42.5	
37	0	727.39	31	15	2.33	1455.68	1451	10	8.61E-03	29.5	
38	0	802.80*	18	7	0.66	1606.41	1601	9	5.03E-03	38.1	
39	0	806.83	19	6	0.95	1614.45	1611	8	5.28E-03	33.7	
40	0	842.74	22	11	2.80	1686.23	1681	11	6.11E-03	36.1	
41	0	904.18	14	6	0.91	1809.04	1805	8	3.95E-03	39.8	
42	0	911.32*	112	18	1.67	1823.31	1817	12	3.12E-02	12.2	
43	0	957.80	11	7	0.95	1916.20	1913	8	3.12E-03	52.0	
44	0	964.81	14	6	1.01	1930.22	1927	7	3.82E-03	41.3	
45	0	969.02	69	6	1.29	1938.64	1934	12	1.92E-02	14.0	
46	0	1000.86*	10	17	0.67	2002.27	1992	14	2.66E-03	100.5	
47	0	1006.36	7	3	1.10	2013.27	2010	6	2.06E-03	51.5	
48	0	1021.14*	8	14	1.42	2042.80	2039	9	2.19E-03	93.2	
49	0	1045.66	9	5	0.62	2091.82	2087	8	2.43E-03	58.3	
50	0	1120.83*	29	23	1.55	2242.07	2233	18	8.06E-03	43.1	
51	0	1239.14	23	26	1.40	2478.53	2473	14	6.47E-03	49.8	
52	0	1279.37	5	12	4.20	2558.95	2549	12	1.39E-03	145.6	
53	0	1285.23	6	2	0.64	2570.67	2567	7	1.74E-03	53.2	
54	0	1337.51	7	8	1.34	2675.16	2668	11	1.85E-03	92.1	
55	0	1396.44	8	2	0.70	2792.94	2788	9	2.19E-03	49.1	
56	0	1408.26	12	0	1.74	2816.58	2812	10	3.33E-03	28.9	
57	0	1461.08*	321	19	2.41	2922.16	2914	15	8.93E-02	6.3	
58	0	1764.58	41	0	1.07	3528.80	3523	13	1.14E-02	15.6	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235057.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 2-DEC-2015 14:55:00   Acquisition date  : 3-OCT-2016 07:51:32
Sample ID        : G405235057             Sample quantity  : 115.83 GRAM
Sample type      : SOLID                   Sample geometry  :
Detector name    : GAMMA5                 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00          Elapsed real time: 0 01:00:00.59   0.0%
Energy tolerance : 1.50 keV               Half life ratio  : 10.00
Errors propagated: No                      Systematic Error : 0.00 %
Efficiency type  : Linear                  Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	TH-229	85.43
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.244E+00	1.482E+01	1.482E+01	12.70	OK
CD-109	88.03	3.70*	8.914E+00	1.772E+00	2.806E+00	60.17	OK
SN-126	64.28	9.60	9.124E+00	1.029E+00	1.029E+00	44.76	OK
	86.94	8.90	8.914E+00	7.368E-01	7.368E-01	60.17	OK
	87.57	37.00*	8.914E+00	1.772E-01	1.772E-01	60.17	OK
CS-135	268.22	16.00*	5.038E+00	3.243E-01	3.243E-01	66.49	OK
BA-137M	661.66	89.90*	2.417E+00	2.089E-01	2.129E-01	36.21	OK
CS-137	661.66	85.10*	2.417E+00	2.207E-01	2.250E-01	36.21	OK
TL-208	277.37	6.60	4.930E+00	3.652E-01	3.652E-01	163.20	OK
	583.19	85.00*	2.673E+00	3.217E-01	3.217E-01	30.77	OK
	860.56	12.50	1.959E+00	----- Line	Not Found	-----	Absent
PB-210	46.54	4.25*	9.666E+00	6.380E-01	6.549E-01	132.41	OK
PB-212	74.82	10.28	8.979E+00	1.087E+00	1.087E+00	37.83	OK
	77.11	17.10	8.967E+00	1.741E+00	1.741E+00	14.56	OK
	238.63	43.60*	5.564E+00	1.160E+00	1.160E+00	11.42	OK
	300.09	3.30	4.617E+00	1.239E+00	1.239E+00	111.85	OK
BI-214	609.32	45.49*	2.581E+00	1.112E+00	1.112E+00	18.02	OK
	1120.29	14.92	1.575E+00	7.645E-01	7.648E-01	86.25	OK
	1764.49	15.30	1.032E+00	1.574E+00	1.574E+00	31.23	OK
PB-214	74.82	5.80	8.977E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	8.967E+00	3.070E+00	3.071E+00	14.56	OK
	787.09	3.41	8.912E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.497E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.681E+00	1.290E+00	1.290E+00	23.00	OK
	351.93	35.60*	4.043E+00	1.173E+00	1.174E+00	17.65	OK
RN-222	609.32	45.49*	2.581E+00	1.112E+00	1.112E+00	18.02	OK
	1120.29	14.92	1.575E+00	7.645E-01	7.648E-01	86.25	OK
	1764.49	15.30	1.032E+00	1.574E+00	1.574E+00	31.23	OK
RA-224	240.99	4.10*	5.508E+00	1.542E+00	1.542E+00	75.39	OK
RA-226	609.32	45.49*	2.581E+00	1.112E+00	1.112E+00	18.02	OK
	1120.29	14.92	1.575E+00	7.645E-01	7.648E-01	86.25	OK
	1764.49	15.30	1.032E+00	1.574E+00	1.574E+00	31.23	OK
AC-228	105.21	1.10	8.704E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.178E+00	1.645E+00	1.645E+00	30.14	OK
	794.95	4.25	2.087E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.005E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.870E+00	1.457E+00	1.457E+00	24.31	OK
	968.97	15.80	1.779E+00	1.530E+00	1.530E+00	27.95	OK
RA-228	105.21	1.10	8.704E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.178E+00	1.645E+00	1.645E+00	30.14	OK
	794.95	4.25	2.087E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.005E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.870E+00	1.457E+00	1.457E+00	24.31	OK
	968.97	15.80	1.779E+00	1.530E+00	1.530E+00	27.95	OK
TH-228	74.82	10.28	8.979E+00	1.087E+00	1.087E+00	37.83	OK
	77.11	17.10	8.967E+00	1.741E+00	1.741E+00	14.56	OK
	238.63	43.60*	5.564E+00	1.160E+00	1.160E+00	11.42	OK
	300.09	3.30	4.617E+00	1.239E+00	1.239E+00	111.85	OK
TH-229	85.43	14.70	8.914E+00	4.461E-01	4.461E-01	60.17	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	88.47	24.00	8.893E+00	3.886E-01	3.886E-01	33.02	OK
	193.51	4.41*	6.511E+00	-----	Line Not Found	-----	Absent
	210.85	2.80	6.116E+00	-----	Line Not Found	-----	Absent
TH-230	609.32	45.49*	2.581E+00	1.112E+00	1.112E+00	18.02	OK
	1120.29	14.92	1.575E+00	7.645E-01	7.645E-01	86.25	OK
	1764.49	15.30	1.032E+00	1.574E+00	1.574E+00	31.23	OK
TH-232	105.21	1.10	8.704E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.178E+00	1.645E+00	1.645E+00	30.14	OK
	835.71	1.61	2.005E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.870E+00	1.457E+00	1.457E+00	24.31	OK
	968.97	15.80	1.779E+00	1.530E+00	1.530E+00	27.95	OK
PA-233	300.13	6.63	4.617E+00	6.166E-01	6.166E-01	111.85	OK
	311.90	38.50*	4.484E+00	9.945E-02	9.945E-02	108.41	OK
	340.48	4.45	4.154E+00	-----	Line Not Found	-----	Absent
TH-234	63.29	3.70*	9.124E+00	2.669E+00	2.669E+00	44.76	OK
	92.59	4.23	8.869E+00	2.447E+00	2.447E+00	35.39	OK
U-234	609.32	45.49*	2.581E+00	1.112E+00	1.112E+00	18.02	OK
	1120.29	14.92	1.575E+00	7.645E-01	7.645E-01	86.25	OK
	1764.49	15.30	1.032E+00	1.574E+00	1.574E+00	31.23	OK
U-235	89.96	3.47	8.893E+00	2.688E+00	2.688E+00	33.02	OK
	93.35	5.60	8.869E+00	1.849E+00	1.849E+00	35.39	OK
	143.76	10.96*	7.805E+00	9.619E-02	9.619E-02	353.72	OK
	163.33	5.08	7.279E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	6.705E+00	1.634E-01	1.634E-01	45.99	OK
	205.31	5.01	6.238E+00	-----	Line Not Found	-----	Absent
U-238	63.29	3.70*	9.124E+00	2.669E+00	2.669E+00	44.76	OK
	92.59	4.23	8.869E+00	2.447E+00	2.447E+00	35.39	OK
PU-239	129.30	0.01*	8.197E+00	5.946E+02	5.946E+02	74.31	OK
	375.05	0.00	3.844E+00	2.064E+03	2.064E+03	109.17	OK
	413.71	0.00	3.534E+00	-----	Line Not Found	-----	Absent
AM-243	43.53	5.90	9.491E+00	-----	Line Not Found	-----	Absent
	74.66	67.20*	8.979E+00	1.663E-01	1.663E-01	37.83	OK
ANH-511	511.00	100.00*	2.976E+00	9.425E-02	9.425E-02	99.66	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235057.CNF;1
* Acquisition date   : 3-OCT-2016 07:51:32 Sensitivity      : 3.000
* Detector ID       : GAM05 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.59 Half life ratio : *****
* Sample date       : 2-DEC-2015 14:55:00 Analyst initials: MXR1
* Sample ID         : G405235057 Sample Quantity : 1.1583E+02 GRAM
* Batch Number      : 1596252 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 4-SEP-2016 08:00:28 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;20
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.482E+01	1.845E+00	6.930E-01
CD-109	2.806E+00	1.654E+00	1.283E+00
SN-126	1.772E-01	1.045E-01	8.100E-02
CS-135	3.243E-01	2.113E-01	2.661E-01
BA-137M	2.129E-01	7.556E-02	7.185E-02
CS-137	2.250E-01	7.982E-02	7.590E-02
TL-208	3.217E-01	9.701E-02	6.547E-02
PB-210	6.549E-01	8.498E-01	6.972E-01
PB-212	1.160E+00	1.298E-01	9.511E-02
BI-214	1.112E+00	1.964E-01	1.275E-01
PB-214	1.174E+00	2.030E-01	1.304E-01
RN-222	1.112E+00	1.964E-01	1.275E-01
RA-224	1.542E+00	1.139E+00	1.020E+00
RA-226	1.112E+00	1.964E-01	1.275E-01
AC-228	1.457E+00	3.470E-01	2.959E-01
RA-228	1.457E+00	3.470E-01	2.959E-01
TH-228	1.160E+00	1.298E-01	9.511E-02
TH-229	-1.705E-01	4.424E-01	7.744E-01
TH-230	1.112E+00	1.964E-01	1.275E-01
TH-232	1.457E+00	3.470E-01	2.959E-01
PA-233	9.945E-02	1.057E-01	9.168E-02
TH-234	2.669E+00	1.171E+00	8.652E-01
U-234	1.112E+00	1.964E-01	1.275E-01
U-235	9.619E-02	3.334E-01	2.876E-01
U-238	2.669E+00	1.171E+00	8.652E-01
PU-239	5.946E+02	4.330E+02	4.347E+02
AM-243	1.663E-01	6.167E-02	5.094E-02
ANH-511	9.425E-02	9.205E-02	5.649E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-4.080E-01	1.560E+01	2.970E+01	NOT IDENT.
NA-22	1.150E-02	5.274E-02	9.900E-02	NOT IDENT.

NA-24	0.000E+00	1.887E+41	0.000E+00	SHORT HLIF
AL-26	-2.923E-03	4.248E-02	8.481E-02	NOT IDENT.
SC-46	3.292E-01	4.356E-01	9.297E-01	FAIL ABUN
V-48	0.000E+00	2.219E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	6.096E+02	0.000E+00	SHORT HLIF
MN-54	-1.825E-02	8.935E-02	1.588E-01	NOT IDENT.
CO-56	-1.867E-01	6.254E-01	1.032E+00	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.356E-02	4.248E-02	7.717E-02	NOT IDENT.
CO-58	-5.131E-01	8.645E-01	1.246E+00	NOT IDENT.
FE-59	-2.163E+00	7.424E+00	1.420E+01	NOT IDENT.
CO-60	-6.648E-03	4.244E-02	7.341E-02	NOT IDENT.
ZN-65	-3.291E-02	1.991E-01	3.378E-01	NOT IDENT.
GE-68	1.482E+00	2.539E+00	5.533E+00	NOT IDENT.
AS-73	1.372E+00	2.258E+00	4.518E+00	NOT IDENT.
AS-74	0.000E+00	8.017E+03	0.000E+00	SHORT HLIF
SE-75	-1.731E-02	2.457E-01	4.334E-01	NOT IDENT.
BR-77	0.000E+00	1.296E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	9.019E+02	0.000E+00	SHORT HLIF
RB-83	5.226E-01	6.834E-01	1.456E+00	NOT IDENT.
KR-85	-2.533E+00	9.981E+00	1.621E+01	NOT IDENT.
SR-85	-2.890E-01	1.121E+00	1.820E+00	NOT IDENT.
RB-86	0.000E+00	3.750E+04	0.000E+00	SHORT HLIF
Y-88	2.007E-01	2.412E-01	6.413E-01	NOT IDENT.
Y-91	-4.706E+02	5.827E+02	9.852E+02	NOT IDENT.
NB-94	2.358E-02	3.520E-02	7.225E-02	NOT IDENT.
NB-95	-6.240E-01	1.155E+00	1.971E+00	NOT IDENT.
NB-95M	-1.684E-01	2.511E+00	4.468E+00	NOT IDENT.
ZR-95	-4.362E-01	1.798E+00	3.251E+00	NOT IDENT.
NB-97	0.000E+00	1.642E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	9.557E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	8.332E+40	0.000E+00	SHORT HLIF
RH-101	-2.473E-02	2.979E-02	4.689E-02	NOT IDENT.
RH-102	5.794E-03	7.128E-02	1.363E-01	FAIL ABUN
RU-103	-2.458E+00	6.735E+00	1.238E+01	FAIL ABUN
RH-106	-1.378E-01	5.142E-01	9.486E-01	NOT IDENT.
RU-106	-1.378E-01	5.142E-01	9.486E-01	NOT IDENT.
AG-108M	1.293E-02	2.933E-02	5.944E-02	NOT IDENT.
AG-110M	1.235E-02	1.124E-01	2.164E-01	NOT IDENT.
SN-113	-2.551E-02	2.405E-01	4.626E-01	NOT IDENT.
CD-115	0.000E+00	2.162E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.254E+05	0.000E+00	SHORT HLIF
TE-123M	1.236E-02	1.313E-01	2.427E-01	NOT IDENT.
SB-124	8.533E-01	2.134E+00	5.179E+00	NOT IDENT.
SB-125	2.586E-03	9.572E-02	1.885E-01	FAIL ABUN
TE-125M	7.125E+01	2.584E+02	4.920E+02	NOT IDENT.
I-126	0.000E+00	1.858E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.868E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	7.977E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	9.673E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.470E+27	0.000E+00	SHORT HLIF
BA-133	3.118E-02	4.185E-02	8.175E-02	FAIL ABUN
I-133	0.000E+00	1.054E+41	0.000E+00	SHORT HLIF
CS-134	8.100E-02	6.282E-02	1.359E-01	FAIL ABUN
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	4.575E+05	0.000E+00	SHORT HLIF
CE-139	2.891E-02	1.040E-01	1.959E-01	NOT IDENT.
BA-140	0.000E+00	1.950E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	6.868E+05	0.000E+00	SHORT HLIF
CE-141	-6.913E+00	2.633E+01	4.381E+01	NOT IDENT.
CE-143	0.000E+00	1.002E+41	0.000E+00	SHORT HLIF
CE-144	6.266E-03	2.721E-01	4.785E-01	NOT IDENT.
PM-144	4.109E-02	6.091E-02	1.259E-01	NOT IDENT.
PR-144	3.545E+00	5.302E+00	1.095E+01	NOT IDENT.
PM-146	5.332E-02	4.458E-02	9.779E-02	NOT IDENT.
ND-147	0.000E+00	4.966E+07	0.000E+00	SHORT HLIF
PM-147	-1.960E+02	7.428E+02	1.255E+03	NOT IDENT.
PM-149	0.000E+00	5.800E+40	0.000E+00	SHORT HLIF
EU-150	1.283E-02	3.042E-02	5.234E-02	FAIL ABUN
EU-152	9.310E-02	9.925E-02	2.031E-01	FAIL ABUN
GD-153	-5.012E-03	1.443E-01	2.694E-01	NOT IDENT.
EU-154	2.812E-02	1.289E-01	2.420E-01	NOT IDENT.
EU-155	3.631E-02	8.797E-02	1.702E-01	FAIL ABUN
TB-160	-4.829E-01	2.026E+00	3.683E+00	FAIL ABUN
HO-166M	-7.540E-03	6.419E-02	1.198E-01	FAIL ABUN
TM-171	1.374E-01	4.592E+00	8.916E+00	NOT IDENT.

HF-172	-2.133E-02	2.188E-01	3.740E-01	FAIL ABUN
LU-172	-4.430E-02	7.225E-02	1.299E-01	FAIL ABUN
LU-176	-8.702E-03	2.509E-02	3.893E-02	FAIL ABUN
HF-181	-2.728E+00	4.912E+00	8.827E+00	NOT IDENT.
TA-182	-8.829E-01	1.139E+00	1.940E+00	FAIL ABUN
RE-183	2.162E-01	1.000E+00	1.957E+00	NOT IDENT.
RE-184	4.936E+01	3.847E+01	8.300E+01	FAIL ABUN
W-188	2.368E-01	1.422E+02	2.053E+02	FAIL ABUN
IR-192	-2.643E-02	5.317E-01	9.364E-01	FAIL ABUN
HG-203	-2.678E-01	3.354E+00	4.749E+00	FAIL ABUN
BI-207	9.534E-03	5.008E-02	1.035E-01	FAIL ABUN
BI-211	0.000E+00	5.591E-01	1.000E+00	FAIL ABUN
PB-211	-1.130E-02	6.654E-01	1.291E+00	NOT IDENT.
BI-212	1.310E+00	7.566E-01	1.425E+00	FAIL ABUN
RN-219	-1.032E-01	3.581E-01	6.770E-01	NOT IDENT.
RA-223	-2.873E-01	6.702E-01	1.015E+00	FAIL ABUN
AC-227	-1.220E-02	2.177E-01	3.902E-01	FAIL ABUN
TH-227	-1.220E-02	2.177E-01	3.902E-01	FAIL ABUN
PA-231	3.039E-02	5.201E-01	8.531E-01	FAIL ABUN
TH-231	-2.873E-01	6.702E-01	1.015E+00	FAIL ABUN
PA-234	4.694E-02	3.417E-01	6.469E-01	FAIL ABUN
PA-234M	4.103E+00	8.086E+00	1.091E+01	FAIL ABUN
NP-237	9.945E-02	1.057E-01	1.119E-01	FAIL ABUN
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	3.358E-01	3.052E-01	3.731E-01	FAIL ABUN
AM-241	2.664E-03	5.058E-02	9.129E-02	NOT IDENT.
CM-243	-3.432E-02	7.706E-02	1.402E-01	FAIL ABUN
BK-247	4.861E-02	7.488E-02	1.437E-01	FAIL ABUN
CM-247	-1.586E-02	3.372E-02	6.222E-02	FAIL ABUN
CF-249	3.662E-02	4.189E-02	8.713E-02	NOT IDENT.
CF-251	-9.189E-03	1.076E-01	1.952E-01	FAIL ABUN

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	303	10.66*	1.244E+00	1.482E+01	1.482E+01	12.70
CD-109	88.03	151	3.70*	8.914E+00	2.961E+00	4.687E+00	34.81
SN-126	64.28	139	9.60	9.124E+00	1.029E+00	1.029E+00	44.76
	86.94	151	8.90	8.914E+00	1.231E+00	1.231E+00	34.81
	87.57	151	37.00*	8.914E+00	2.961E-01	2.961E-01	34.81
CS-135	268.22	40	16.00*	5.038E+00	3.243E-01	3.243E-01	66.49
BA-137M	661.66	70	89.90*	2.417E+00	2.089E-01	2.129E-01	36.21
CS-137	661.66	70	85.10*	2.417E+00	2.207E-01	2.250E-01	36.21
TL-208	277.37	18	6.60	4.930E+00	3.652E-01	3.652E-01	163.20
	583.19	113	85.00*	2.673E+00	3.217E-01	3.217E-01	30.77
	860.56	-----	12.50	1.959E+00	-----	Line Not Found	-----
PB-210	46.54	40	4.25*	9.666E+00	6.380E-01	6.549E-01	132.41
BI-211	72.87	38	1.23	8.991E+00	2.246E+00	2.246E+00	110.80
	351.06	261	12.92*	4.043E+00	3.233E+00	3.233E+00	17.65
PB-212	74.82	258	10.28	8.979E+00	1.815E+00	1.815E+00	20.70
	77.11	412	17.10	8.967E+00	1.741E+00	1.741E+00	14.56
	238.63	434	43.60*	5.564E+00	1.160E+00	1.160E+00	11.42
	300.09	29	3.30	4.617E+00	1.239E+00	1.239E+00	111.85
BI-214	609.32	201	45.49*	2.581E+00	1.112E+00	1.112E+00	18.02
	1120.29	28	14.92	1.575E+00	7.645E-01	7.648E-01	86.25
	1764.49	38	15.30	1.032E+00	1.574E+00	1.574E+00	31.23
PB-214	74.82	258	5.80	8.979E+00	3.217E+00	3.218E+00	20.70
	77.11	412	9.70	8.967E+00	3.070E+00	3.071E+00	14.56
	87.09	151	3.41	8.914E+00	3.213E+00	3.214E+00	34.81
	242.00	133	7.25	5.508E+00	2.162E+00	2.162E+00	27.13
	295.22	172	18.42	4.681E+00	1.290E+00	1.290E+00	23.00
	351.93	261	35.60*	4.043E+00	1.173E+00	1.174E+00	17.65
RN-222	609.32	201	45.49*	2.581E+00	1.112E+00	1.112E+00	18.02
	1120.29	28	14.92	1.575E+00	7.645E-01	7.648E-01	86.25
	1764.49	38	15.30	1.032E+00	1.574E+00	1.574E+00	31.23
RA-224	240.99	133	4.10*	5.508E+00	3.822E+00	3.822E+00	27.13
RA-226	609.32	201	45.49*	2.581E+00	1.112E+00	1.112E+00	18.02
	1120.29	28	14.92	1.575E+00	7.645E-01	7.648E-01	86.25
	1764.49	38	15.30	1.032E+00	1.574E+00	1.574E+00	31.23
AC-228	105.21	-----	1.10	8.704E+00	-----	Line Not Found	-----
	338.32	120	11.27	4.178E+00	1.645E+00	1.645E+00	30.14
	794.95	-----	4.25	2.087E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.005E+00	-----	Line Not Found	-----
	911.20	108	25.80*	1.870E+00	1.457E+00	1.457E+00	24.31
	968.97	66	15.80	1.779E+00	1.530E+00	1.530E+00	27.95
RA-228	105.21	-----	1.10	8.704E+00	-----	Line Not Found	-----
	338.32	120	11.27	4.178E+00	1.645E+00	1.645E+00	30.14
	794.95	-----	4.25	2.087E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.005E+00	-----	Line Not Found	-----
	911.20	108	25.80*	1.870E+00	1.457E+00	1.457E+00	24.31
	968.97	66	15.80	1.779E+00	1.530E+00	1.530E+00	27.95
TH-228	74.82	258	10.28	8.979E+00	1.815E+00	1.815E+00	20.70

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	77.11	412	17.10	8.967E+00	1.741E+00	1.741E+00	14.56
	238.63	434	43.60*	5.564E+00	1.160E+00	1.160E+00	11.42
	300.09	29	3.30	4.617E+00	1.239E+00	1.239E+00	111.85
TH-229	85.43	151	14.70	8.914E+00	7.453E-01	7.454E-01	34.81
	88.47	128	24.00	8.893E+00	3.886E-01	3.886E-01	33.02
	193.51	-----	4.41*	6.511E+00	-----	Line Not Found	-----
	210.85	-----	2.80	6.116E+00	-----	Line Not Found	-----
TH-230	609.32	201	45.49*	2.581E+00	1.112E+00	1.112E+00	18.02
	1120.29	28	14.92	1.575E+00	7.645E-01	7.645E-01	86.25
	1764.49	38	15.30	1.032E+00	1.574E+00	1.574E+00	31.23
TH-232	105.21	-----	1.10	8.704E+00	-----	Line Not Found	-----
	338.32	120	11.27	4.178E+00	1.645E+00	1.645E+00	30.14
	835.71	-----	1.61	2.005E+00	-----	Line Not Found	-----
	911.20	108	25.80*	1.870E+00	1.457E+00	1.457E+00	24.31
	968.97	66	15.80	1.779E+00	1.530E+00	1.530E+00	27.95
PA-233	300.13	29	6.63	4.617E+00	6.166E-01	6.166E-01	111.85
	311.90	26	38.50*	4.484E+00	9.945E-02	9.945E-02	108.41
	340.48	-----	4.45	4.154E+00	-----	Line Not Found	-----
TH-234	63.29	139	3.70*	9.124E+00	2.669E+00	2.669E+00	44.76
	92.59	142	4.23	8.869E+00	2.447E+00	2.447E+00	35.39
U-234	609.32	201	45.49*	2.581E+00	1.112E+00	1.112E+00	18.02
	1120.29	28	14.92	1.575E+00	7.645E-01	7.645E-01	86.25
	1764.49	38	15.30	1.032E+00	1.574E+00	1.574E+00	31.23
U-235	89.96	128	3.47	8.893E+00	2.688E+00	2.688E+00	33.02
	93.35	142	5.60	8.869E+00	1.849E+00	1.849E+00	35.39
	143.76	13	10.96*	7.805E+00	9.619E-02	9.619E-02	353.72
	163.33	-----	5.08	7.279E+00	-----	Line Not Found	-----
	185.72	97	57.20	6.705E+00	1.634E-01	1.634E-01	45.99
	205.31	-----	5.01	6.238E+00	-----	Line Not Found	-----
U-238	63.29	139	3.70*	9.124E+00	2.669E+00	2.669E+00	44.76
	92.59	142	4.23	8.869E+00	2.447E+00	2.447E+00	35.39
PU-239	129.30	47	0.01*	8.197E+00	5.946E+02	5.946E+02	74.31
	375.05	19	0.00	3.844E+00	2.064E+03	2.064E+03	109.17
	413.71	-----	0.00	3.534E+00	-----	Line Not Found	-----
AM-243	43.53	-----	5.90	9.491E+00	-----	Line Not Found	-----
	74.66	258	67.20*	8.979E+00	2.776E-01	2.777E-01	20.70
ANH-511	511.00	43	100.00*	2.976E+00	9.425E-02	9.425E-02	99.66

Flag: "*" = Keyline

Total number of lines in spectrum 58
 Number of unidentified lines 11
 Number of lines tentatively identified by NID 47 81.03%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.482E+01	1.482E+01	0.188E+01	12.70	
CD-109	461.40D	1.58	2.961E+00	4.687E+00	1.632E+00	34.81	
SN-126	2.30E+05Y	1.00	2.961E-01	2.961E-01	1.031E-01	34.81	
CS-135	2.30E+06Y	1.00	3.243E-01	3.243E-01	2.156E-01	66.49	
BA-137M	30.08Y	1.02	2.089E-01	2.129E-01	0.771E-01	36.21	
CS-137	30.08Y	1.02	2.207E-01	2.250E-01	0.814E-01	36.21	
TL-208	1.41E+10Y	1.00	3.217E-01	3.217E-01	0.990E-01	30.77	
PB-210	22.20Y	1.03	6.380E-01	6.549E-01	8.672E-01	132.41	
BI-211	7.04E+08Y	1.00	3.233E+00	3.233E+00	0.571E+00	17.65	
PB-212	1.41E+10Y	1.00	1.160E+00	1.160E+00	0.132E+00	11.42	
BI-214	1600.00Y	1.00	1.112E+00	1.112E+00	0.200E+00	18.02	
PB-214	1600.00Y	1.00	1.173E+00	1.174E+00	0.207E+00	17.65	
RN-222	1600.00Y	1.00	1.112E+00	1.112E+00	0.200E+00	18.02	
RA-224	1.41E+10Y	1.00	3.822E+00	3.822E+00	1.037E+00	27.13	
RA-226	1600.00Y	1.00	1.112E+00	1.112E+00	0.200E+00	18.02	
AC-228	1.41E+10Y	1.00	1.457E+00	1.457E+00	0.354E+00	24.31	
RA-228	1.41E+10Y	1.00	1.457E+00	1.457E+00	0.354E+00	24.31	
TH-228	1.41E+10Y	1.00	1.160E+00	1.160E+00	0.132E+00	11.42	
TH-229	7340.00Y	1.00	3.886E-01	3.886E-01	1.283E-01	33.02	K
TH-230	7.54E+04Y	1.00	1.112E+00	1.112E+00	0.200E+00	18.02	
TH-232	1.41E+10Y	1.00	1.457E+00	1.457E+00	0.354E+00	24.31	
PA-233	2.14E+06Y	1.00	9.945E-02	9.945E-02	10.78E-02	108.41	
TH-234	4.47E+09Y	1.00	2.669E+00	2.669E+00	1.194E+00	44.76	
U-234	2.45E+05Y	1.00	1.112E+00	1.112E+00	0.200E+00	18.02	
U-235	7.04E+08Y	1.00	9.619E-02	9.619E-02	34.02E-02	353.72	
U-238	4.47E+09Y	1.00	2.669E+00	2.669E+00	1.194E+00	44.76	
PU-239	24110.00Y	1.00	5.946E+02	5.946E+02	4.418E+02	74.31	
AM-243	7370.00Y	1.00	2.776E-01	2.777E-01	0.575E-01	20.70	
ANH-511	1.00E+09Y	1.00	9.425E-02	9.425E-02	9.393E-02	99.66	
Total Activity :			6.412E+02	6.429E+02			

Grand Total Activity : 6.412E+02 6.429E+02

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	31.49	26	104	0.53	64.83	63	6	6.56E-03	****	1.49E+00	
5	83.62	60	126	0.96	169.01	166	27	1.55E-02	66.8	8.93E+00	T
0	117.65	35	77	1.66	237.01	234	7	9.18E-03	92.7	8.46E+00	T
3	130.85	38	61	1.17	263.40	256	13	9.96E-03	86.3	8.15E+00	T
0	209.04	36	91	1.04	419.68	416	8	9.61E-03	99.9	6.15E+00	
0	231.76	21	70	1.82	465.07	462	7	5.69E-03	****	5.69E+00	
0	284.39	15	65	4.54	570.27	562	11	4.11E-03	****	4.82E+00	T
0	287.37	42	31	2.31	576.23	572	10	1.14E-02	59.2	4.78E+00	T
0	327.51	29	36	1.59	656.45	653	7	7.95E-03	78.2	4.29E+00	T
0	463.11	33	26	1.17	927.48	924	8	9.36E-03	62.8	3.22E+00	T
0	665.98	21	14	1.75	1332.95	1329	11	5.90E-03	85.0	2.40E+00	T
0	727.39	30	15	2.33	1455.68	1451	10	8.61E-03	59.0	2.24E+00	T
0	802.80	18	7	0.66	1606.41	1601	9	5.03E-03	76.2	2.07E+00	T
0	806.83	18	6	0.95	1614.45	1611	8	5.28E-03	67.4	2.06E+00	
0	842.74	21	11	2.80	1686.23	1681	11	6.11E-03	72.3	1.99E+00	
0	904.18	14	6	0.91	1809.04	1805	8	3.95E-03	79.5	1.88E+00	T
0	957.80	11	7	0.95	1916.20	1913	8	3.12E-03	****	1.80E+00	
0	964.81	13	6	1.01	1930.22	1927	7	3.82E-03	82.6	1.78E+00	T
0	1000.86	9	17	0.67	2002.27	1992	14	2.66E-03	****	1.73E+00	T
0	1006.36	7	2	1.10	2013.27	2010	6	2.06E-03	****	1.72E+00	
0	1021.14	8	14	1.42	2042.80	2039	9	2.19E-03	****	1.70E+00	T
0	1045.66	8	5	0.62	2091.82	2087	8	2.43E-03	****	1.67E+00	T
0	1239.14	22	24	1.40	2478.53	2473	14	6.47E-03	99.6	1.44E+00	T
0	1279.37	5	11	4.20	2558.95	2549	12	1.39E-03	****	1.40E+00	
0	1285.23	6	2	0.64	2570.67	2567	7	1.74E-03	****	1.40E+00	
0	1337.51	6	8	1.34	2675.16	2668	11	1.85E-03	****	1.35E+00	
0	1396.44	7	2	0.70	2792.94	2788	9	2.19E-03	98.3	1.30E+00	
0	1408.26	11	0	1.74	2816.58	2812	10	3.33E-03	57.7	1.29E+00	T

Flags: "T" = Tentatively associated

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235057.CNF;1 *
 * Acquisition date : 3-OCT-2016 07:51:32 Sensitivity : 3.000 *
 * Detector ID : GAM05 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.59 Half life ratio : ***** *
 * Sample date : 2-DEC-2015 14:55:00 Nuclide Library : SOLID *
 * Sample ID : G405235057 Analyst initials: MXR1 *
 * Batch Number : 1596252 Sample Quantity : 1.1583E+02 GRAM *
 * Wet wt corr : 1.00000 Wet Weight : 0.00000 *
 * Dry Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 4-SEP-2016 08:00:28 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;20 *

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.807E-01
CD-109	5.988E-01
SN-126	3.779E-02
CS-135	1.221E-01
BA-137M	3.180E-02
CS-137	3.360E-02
TL-208	2.887E-02
PB-210	3.262E-01
PB-212	4.390E-02
BI-214	5.627E-02
PB-214	5.906E-02
RN-222	5.627E-02
RA-224	4.711E-01
RA-226	5.627E-02
AC-228	1.298E-01
RA-228	1.298E-01
TH-228	4.390E-02
TH-229	3.563E-01
TH-230	5.625E-02
TH-232	1.298E-01
PA-233	4.070E-02
TH-234	4.061E-01
U-234	5.625E-02
U-235	1.334E-01
U-238	4.061E-01
PU-239	2.001E+02
AM-243	2.399E-02
ANH-511	2.529E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.341E+01	NOT IDENT.
NA-22	4.175E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF

AL-26	3.373E-02	NOT IDENT.
SC-46	4.073E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	7.079E-02	NOT IDENT.
CO-56	4.475E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	3.588E-02	NOT IDENT.
CO-58	5.376E-01	NOT IDENT.
FE-59	5.971E+00	NOT IDENT.
CO-60	2.950E-02	NOT IDENT.
ZN-65	1.429E-01	NOT IDENT.
GE-68	2.402E+00	NOT IDENT.
AS-73	2.130E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.995E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	6.498E-01	NOT IDENT.
KR-85	7.381E+00	NOT IDENT.
SR-85	8.288E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	2.560E-01	NOT IDENT.
Y-91	4.076E+02	NOT IDENT.
NB-94	3.231E-02	NOT IDENT.
NB-95	8.736E-01	NOT IDENT.
NB-95M	2.060E+00	NOT IDENT.
ZR-95	1.422E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.155E-02	NOT IDENT.
RH-102	6.084E-02	FAIL ABUN
RU-103	5.488E+00	FAIL ABUN
RH-106	4.127E-01	NOT IDENT.
RU-106	4.127E-01	NOT IDENT.
AG-108M	2.685E-02	NOT IDENT.
AG-110M	9.351E-02	NOT IDENT.
SN-113	2.082E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.129E-01	NOT IDENT.
SB-124	2.016E+00	NOT IDENT.
SB-125	8.363E-02	FAIL ABUN
TE-125M	2.307E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.712E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	6.144E-02	FAIL ABUN
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	9.077E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.030E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.183E-01	NOT IDENT.
PM-144	5.613E-02	NOT IDENT.
PR-144	4.882E+00	NOT IDENT.
PM-146	4.430E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	5.810E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.396E-02	FAIL ABUN
EU-152	9.314E-02	FAIL ABUN
GD-153	1.263E-01	NOT IDENT.
EU-154	1.020E-01	NOT IDENT.
EU-155	7.963E-02	FAIL ABUN
TB-160	1.558E+00	FAIL ABUN
HO-166M	5.281E-02	FAIL ABUN
TM-171	4.187E+00	NOT IDENT.
HF-172	1.740E-01	FAIL ABUN

LU-172	5.316E-02	FAIL ABUN
LU-176	1.738E-02	FAIL ABUN
HF-181	3.893E+00	NOT IDENT.
TA-182	8.289E-01	FAIL ABUN
RE-183	9.206E-01	NOT IDENT.
RE-184	3.664E+01	FAIL ABUN
W-188	9.300E+01	FAIL ABUN
IR-192	4.255E-01	FAIL ABUN
HG-203	2.165E+00	FAIL ABUN
BI-207	4.450E-02	FAIL ABUN
BI-211	4.835E-01	FAIL ABUN
PB-211	5.806E-01	NOT IDENT.
BI-212	6.538E-01	FAIL ABUN
RN-219	3.016E-01	NOT IDENT.
RA-223	4.564E-01	FAIL ABUN
AC-227	1.773E-01	FAIL ABUN
TH-227	1.773E-01	FAIL ABUN
PA-231	3.907E-01	FAIL ABUN
TH-231	4.564E-01	FAIL ABUN
PA-234	2.832E-01	FAIL ABUN
PA-234M	4.853E+00	FAIL ABUN
NP-237	5.080E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.733E-01	FAIL ABUN
AM-241	4.294E-02	NOT IDENT.
CM-243	6.512E-02	FAIL ABUN
BK-247	6.610E-02	FAIL ABUN
CM-247	2.772E-02	FAIL ABUN
CF-249	3.998E-02	NOT IDENT.
CF-251	9.015E-02	FAIL ABUN

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DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235057.CNF;1 *
 * Acquisition date : 3-OCT-2016 07:51:32 Sensitivity : 3.000 *
 * Detector ID : GAM05 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.59 Half life ratio : ***** *
 * Sample date : 2-DEC-2015 14:55:00 Nuclide Library : SOLID *
 * Sample ID : G405235057 Analyst initials: MXR1 *
 * Batch Number : 1596252 Sample Quantity : 1.1583E+02 GRAM *
 * Quantity Err(%) : 1.7266E-03 % *
 * Wet wt corr : 1.00000 Wet Weight : 0.00000 *
 * Dry Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 4-SEP-2016 08:00:28 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;20 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.482E+01	2.001E+00	2.001E+00
CD-109	2.806E+00	1.687E+00	1.687E+00
SN-126	1.772E-01	1.061E-01	1.061E-01
CS-135	3.243E-01	2.124E-01	2.124E-01
BA-137M	2.129E-01	7.611E-02	7.611E-02
CS-137	2.250E-01	8.040E-02	8.040E-02
TL-208	3.217E-01	9.798E-02	9.798E-02
PB-210	6.549E-01	8.519E-01	8.519E-01
PB-212	1.160E+00	1.437E-01	1.437E-01
BI-214	1.112E+00	2.021E-01	2.021E-01
PB-214	1.174E+00	2.088E-01	2.088E-01
RN-222	1.112E+00	2.021E-01	2.021E-01
RA-224	1.542E+00	1.152E+00	1.152E+00
RA-226	1.112E+00	2.021E-01	2.021E-01
AC-228	1.457E+00	3.549E-01	3.549E-01
RA-228	1.457E+00	3.549E-01	3.549E-01
TH-228	1.160E+00	1.437E-01	1.437E-01
TH-229	-1.705E-01	4.425E-01	4.425E-01
TH-230	1.112E+00	2.021E-01	2.021E-01
TH-232	1.457E+00	3.549E-01	3.549E-01
PA-233	9.945E-02	1.058E-01	1.058E-01
TH-234	2.669E+00	1.311E+00	1.311E+00
U-234	1.112E+00	2.021E-01	2.021E-01
U-235	9.619E-02	3.335E-01	3.335E-01
U-238	2.669E+00	1.311E+00	1.311E+00
PU-239	5.946E+02	4.338E+02	4.338E+02
AM-243	1.663E-01	6.408E-02	6.408E-02
ANH-511	9.425E-02	9.213E-02	9.213E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-4.080E-01	1.560E+01	1.560E+01	NOT IDENT.
NA-22	1.150E-02	5.274E-02	5.300E-02	NOT IDENT.

NA-24	1.000E+41	1.939E+41	0.000E+00	SHORT HLIF
AL-26	-2.923E-03	4.248E-02	4.250E-02	NOT IDENT.
SC-46	3.292E-01	4.358E-01	4.604E-01	FAIL ABUN
V-48	-7.745E+03	2.219E+04	2.246E+04	SHORT HLIF
CR-51	-4.315E+02	6.099E+02	6.401E+02	SHORT HLIF
MN-54	-1.825E-02	8.935E-02	8.973E-02	NOT IDENT.
CO-56	-1.867E-01	6.254E-01	6.311E-01	FAIL ABUN
MN-56	-1.000E+41	3.275E+41	0.000E+00	SHORT HLIF
CO-57	-1.356E-02	4.248E-02	4.292E-02	NOT IDENT.
CO-58	-5.131E-01	8.648E-01	8.952E-01	NOT IDENT.
FE-59	-2.163E+00	7.425E+00	7.489E+00	NOT IDENT.
CO-60	-6.648E-03	4.244E-02	4.254E-02	NOT IDENT.
ZN-65	-3.291E-02	1.991E-01	1.996E-01	NOT IDENT.
GE-68	1.482E+00	2.539E+00	2.626E+00	NOT IDENT.
AS-73	1.372E+00	2.275E+00	2.358E+00	NOT IDENT.
AS-74	1.536E+03	8.018E+03	8.048E+03	SHORT HLIF
SE-75	-1.731E-02	2.457E-01	2.458E-01	NOT IDENT.
BR-77	1.158E+39	1.022E+40	0.000E+00	SHORT HLIF
SR-82	5.007E+02	9.022E+02	9.300E+02	SHORT HLIF
RB-83	5.226E-01	6.872E-01	7.264E-01	NOT IDENT.
KR-85	-2.533E+00	9.981E+00	1.005E+01	NOT IDENT.
SR-85	-2.890E-01	1.121E+00	1.129E+00	NOT IDENT.
RB-86	1.513E+04	3.751E+04	3.812E+04	SHORT HLIF
Y-88	2.007E-01	2.416E-01	2.580E-01	NOT IDENT.
Y-91	-4.706E+02	5.830E+02	6.204E+02	NOT IDENT.
NB-94	2.358E-02	3.522E-02	3.679E-02	NOT IDENT.
NB-95	-6.240E-01	1.156E+00	1.189E+00	NOT IDENT.
NB-95M	-1.684E-01	2.511E+00	2.512E+00	NOT IDENT.
ZR-95	-4.362E-01	1.798E+00	1.809E+00	NOT IDENT.
NB-97	1.000E+41	1.642E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	2.092E+41	0.000E+00	SHORT HLIF
MO-99	-4.577E+31	9.557E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	8.390E+40	0.000E+00	SHORT HLIF
RH-101	-2.473E-02	3.013E-02	3.212E-02	NOT IDENT.
RH-102	5.794E-03	7.128E-02	7.133E-02	FAIL ABUN
RU-103	-2.458E+00	6.736E+00	6.826E+00	FAIL ABUN
RH-106	-1.378E-01	5.143E-01	5.180E-01	NOT IDENT.
RU-106	-1.378E-01	5.143E-01	5.180E-01	NOT IDENT.
AG-108M	1.293E-02	2.933E-02	2.991E-02	NOT IDENT.
AG-110M	1.235E-02	1.124E-01	1.125E-01	NOT IDENT.
SN-113	-2.551E-02	2.405E-01	2.407E-01	NOT IDENT.
CD-115	1.871E+40	2.190E+40	0.000E+00	SHORT HLIF
SN-117M	-5.451E+04	1.256E+05	1.280E+05	SHORT HLIF
TE-123M	1.236E-02	1.313E-01	1.315E-01	NOT IDENT.
SB-124	8.533E-01	2.134E+00	2.169E+00	NOT IDENT.
SB-125	2.586E-03	9.572E-02	9.573E-02	FAIL ABUN
TE-125M	7.125E+01	2.584E+02	2.604E+02	NOT IDENT.
I-126	2.231E+06	1.884E+06	2.135E+06	SHORT HLIF
SB-126	-1.558E+06	1.891E+06	2.017E+06	SHORT HLIF
SB-127	-3.139E+22	9.110E+22	0.000E+00	SHORT HLIF
I-131	2.122E+08	9.673E+09	9.674E+09	SHORT HLIF
I-132	1.000E+41	1.939E+42	0.000E+00	SHORT HLIF
TE-132	5.883E+26	1.490E+27	0.000E+00	SHORT HLIF
BA-133	3.118E-02	4.187E-02	4.417E-02	FAIL ABUN
I-133	1.000E+41	2.124E+41	0.000E+00	SHORT HLIF
CS-134	8.100E-02	6.291E-02	7.274E-02	FAIL ABUN
I-135	1.000E+41	1.132E+42	0.000E+00	SHORT HLIF
CS-136	-2.198E+05	4.581E+05	4.687E+05	SHORT HLIF
CE-139	2.891E-02	1.042E-01	1.050E-01	NOT IDENT.
BA-140	-7.912E+05	1.950E+06	1.982E+06	SHORT HLIF
LA-140	-3.570E+04	6.868E+05	6.870E+05	SHORT HLIF
CE-141	-6.913E+00	2.634E+01	2.652E+01	NOT IDENT.
CE-143	1.000E+41	1.007E+41	0.000E+00	SHORT HLIF
CE-144	6.266E-03	2.721E-01	2.721E-01	NOT IDENT.
PM-144	4.109E-02	6.096E-02	6.371E-02	NOT IDENT.
PR-144	3.545E+00	5.304E+00	5.539E+00	NOT IDENT.
PM-146	5.332E-02	4.475E-02	5.079E-02	NOT IDENT.
ND-147	-3.013E+07	4.969E+07	5.151E+07	SHORT HLIF
PM-147	-1.960E+02	7.429E+02	7.481E+02	NOT IDENT.
PM-149	1.000E+41	6.211E+40	0.000E+00	SHORT HLIF
EU-150	1.283E-02	3.042E-02	3.097E-02	FAIL ABUN
EU-152	9.310E-02	9.938E-02	1.079E-01	FAIL ABUN
GD-153	-5.012E-03	1.443E-01	1.443E-01	NOT IDENT.
EU-154	2.812E-02	1.289E-01	1.295E-01	NOT IDENT.
EU-155	3.631E-02	8.801E-02	8.952E-02	FAIL ABUN
TB-160	-4.829E-01	2.026E+00	2.038E+00	FAIL ABUN
HO-166M	-7.540E-03	6.419E-02	6.428E-02	FAIL ABUN
TM-171	1.374E-01	4.592E+00	4.593E+00	NOT IDENT.

HF-172	-2.133E-02	2.188E-01	2.190E-01	FAIL ABUN
LU-172	-4.430E-02	7.239E-02	7.510E-02	FAIL ABUN
LU-176	-8.702E-03	2.509E-02	2.540E-02	FAIL ABUN
HF-181	-2.728E+00	4.914E+00	5.065E+00	NOT IDENT.
TA-182	-8.829E-01	1.140E+00	1.207E+00	FAIL ABUN
RE-183	2.162E-01	1.001E+00	1.006E+00	NOT IDENT.
RE-184	4.936E+01	4.031E+01	4.604E+01	FAIL ABUN
W-188	2.368E-01	1.422E+02	1.422E+02	FAIL ABUN
IR-192	-2.643E-02	5.317E-01	5.319E-01	FAIL ABUN
HG-203	-2.678E-01	3.354E+00	3.356E+00	FAIL ABUN
BI-207	9.534E-03	5.008E-02	5.027E-02	FAIL ABUN
BI-211	3.233E+00	5.776E-01	1.568E+00	FAIL ABUN
PB-211	-1.130E-02	6.654E-01	6.654E-01	NOT IDENT.
BI-212	1.310E+00	7.595E-01	9.619E-01	FAIL ABUN
RN-219	-1.032E-01	3.583E-01	3.613E-01	NOT IDENT.
RA-223	-2.873E-01	6.705E-01	6.829E-01	FAIL ABUN
AC-227	-1.220E-02	2.177E-01	2.177E-01	FAIL ABUN
TH-227	-1.220E-02	2.177E-01	2.177E-01	FAIL ABUN
PA-231	3.039E-02	5.201E-01	5.203E-01	FAIL ABUN
TH-231	-2.873E-01	6.705E-01	6.829E-01	FAIL ABUN
PA-234	4.694E-02	3.459E-01	3.466E-01	FAIL ABUN
PA-234M	4.103E+00	8.088E+00	8.296E+00	FAIL ABUN
NP-237	9.945E-02	1.058E-01	1.149E-01	FAIL ABUN
NP-238	-1.000E+41	2.483E+41	0.000E+00	SHORT HLIF
NP-239	3.358E-01	3.064E-01	3.418E-01	FAIL ABUN
AM-241	2.664E-03	5.058E-02	5.060E-02	NOT IDENT.
CM-243	-3.432E-02	7.712E-02	7.866E-02	FAIL ABUN
BK-247	4.861E-02	7.551E-02	7.863E-02	FAIL ABUN
CM-247	-1.586E-02	3.382E-02	3.457E-02	FAIL ABUN
CF-249	3.662E-02	4.199E-02	4.512E-02	NOT IDENT.
CF-251	-9.189E-03	1.076E-01	1.076E-01	FAIL ABUN

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	63.4503	87.09	64.9837	136.47	47.6878
45.60	70.4172	87.57	65.0611	140.51	0.0000
46.54	70.6720	88.03	65.1345	143.76	55.1985
49.72	0.0000	88.34	65.1836	144.24	55.2438
51.35	79.8433	88.47	65.2045	145.44	59.3106
51.87	76.8232	89.96	65.4405	152.43	59.0054
52.39	69.0301	1093.63	65.5477	153.25	0.0000
52.97	68.3754	91.11	0.0000	323.87	52.1555
53.44	66.8949	92.59	65.8526	156.02	0.0000
54.07	59.8580	93.35	65.9706	158.56	0.0000
57.36	0.0000	94.56	60.7934	159.00	57.6123
57.53	72.6732	94.65	60.8063	162.33	46.7384
57.98	78.4414	94.67	60.8089	162.66	0.0000
59.27	77.9597	94.87	60.8369	163.33	45.7938
59.32	77.9725	97.43	71.0959	165.86	48.0169
59.54	82.3627	98.43	80.2770	176.31	52.9276
60.96	83.8263	98.44	80.2787	176.60	0.0000
61.17	77.6180	99.53	56.0621	177.52	50.9417
62.93	78.0475	100.11	66.9998	181.07	0.0000
63.29	78.1346	102.03	59.1021	181.52	43.2210
63.58	78.2046	103.18	61.0745	184.41	49.3494
64.28	86.8973	103.37	66.5712	143.76	49.4412
66.73	89.7589	105.21	57.6816	193.51	52.1059
67.24	99.0508	105.31	61.3572	197.03	49.1501
125.81	91.6787	106.12	67.8857	198.01	72.7522
67.75	86.6955	106.47	79.8712	201.83	69.8976
69.67	86.0665	109.28	69.2648	203.43	56.0363
70.83	77.3814	111.00	58.3915	205.31	56.1752
72.81	87.1200	111.76	0.0000	210.85	53.6776
72.87	87.1349	114.06	49.7428	215.65	38.3149
74.66	87.5687	116.30	0.0000	222.11	39.7271
74.82	87.6072	116.74	62.5153	227.09	48.8514
74.97	87.6434	119.76	44.0227	227.38	51.0895
77.11	88.1549	121.12	58.0124	228.16	0.0000
78.74	88.5400	121.22	58.0236	228.18	38.5398
79.69	83.8790	121.78	57.7706	116.74	38.5398
80.12	86.2740	122.06	65.3829	235.69	48.2326
80.19	0.0000	122.92	51.2541	235.96	48.2484
80.57	82.9204	123.07	51.2689	238.63	48.3986
81.00	67.4484	265.00	64.6361	238.98	0.0000
81.07	67.4609	125.81	62.3536	240.99	48.5312
81.75	94.7266	127.23	61.2439	242.00	45.1984
83.79	64.4496	127.91	45.0335	244.70	40.8043
84.00	64.4841	129.30	45.1497	252.40	0.0000
85.43	64.7167	131.20	45.3082	252.80	41.1784
86.55	64.8974	133.02	41.2676	254.15	0.0000
86.79	64.9357	133.52	36.1416	256.23	34.4458
86.94	64.9600	136.00	48.6206	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	46.3501	355.39	0.0000	584.27	18.7271
264.80	46.3574	356.01	21.4866	595.83	0.0000
265.00	32.4570	364.49	0.0000	427.87	28.8466
268.22	41.8744	366.42	0.0000	602.52	0.0000
269.46	35.7176	372.51	30.7537	604.72	26.9176
270.03	35.7391	375.05	34.6704	607.14	17.9692
271.23	35.7840	377.52	36.0262	609.32	18.9900
273.65	0.0000	356.01	38.7964	610.33	19.0008
276.40	35.9777	388.16	27.6829	614.28	13.5297
277.37	36.0142	388.63	0.0000	618.01	15.0629
277.60	36.0227	391.69	28.6279	620.36	20.1099
278.00	36.0376	264.66	23.5871	621.93	18.1143
279.20	37.6514	401.81	26.2311	630.19	0.0000
279.54	37.6641	402.40	28.8669	631.29	20.2271
279.70	37.6699	404.85	27.1685	633.25	21.2606
280.46	37.6997	410.95	45.7846	634.78	0.0000
283.69	30.7322	413.71	30.8806	635.95	17.2359
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	4.7363	423.72	0.0000	645.85	23.4399
285.90	0.0000	427.09	16.0400	657.76	10.7670
287.50	26.8952	427.87	20.5073	657.90	0.0000
290.67	30.9488	433.94	23.2848	661.66	20.0356
293.27	0.0000	439.40	17.9818	664.57	0.0000
351.93	31.8856	453.88	15.4415	666.33	0.0000
295.96	21.5387	463.37	23.7720	666.50	0.0000
879.38	23.9929	468.07	30.2688	667.71	0.0000
299.98	35.2380	473.00	0.0000	677.62	14.5013
300.09	35.2415	475.06	28.5687	685.70	0.0000
300.13	35.2433	476.78	24.9115	695.00	0.0000
301.36	38.4932	477.60	29.5404	696.49	14.6369
302.85	40.1550	482.18	25.9270	696.51	14.6375
256.23	38.6094	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	20.9188
306.78	29.0208	497.08	25.2460	697.49	23.0125
308.46	29.0669	505.52	22.5630	702.65	15.7300
311.90	21.0615	507.63	0.0000	706.68	22.0647
316.51	34.1694	511.00	24.5284	711.68	17.9048
319.41	0.0000	514.00	39.6980	720.70	0.0000
320.08	0.0000	514.00	39.6980	721.93	0.0000
321.04	20.8329	520.40	14.2346	722.78	15.8820
323.87	34.4027	520.69	0.0000	722.91	12.7065
325.23	18.0428	522.65	0.0000	723.31	14.2976
328.76	0.0000	527.90	0.0000	724.19	9.5358
333.37	38.0039	528.26	13.3506	727.33	14.8551
333.97	31.4115	529.59	13.3614	733.00	14.8949
334.37	28.1147	529.87	0.0000	735.93	17.0462
338.28	23.6491	531.02	0.0000	333.97	13.8596
338.32	23.6497	537.26	0.0000	739.50	0.0000
311.90	24.9420	546.56	0.0000	747.24	13.9225
340.48	24.9420	552.55	19.3538	748.06	18.2133
340.55	0.0000	563.25	25.3187	752.31	20.3962
344.28	26.0260	569.33	17.5906	753.82	0.0000
345.93	36.7562	946.00	17.5928	756.73	19.3616
351.06	31.0456	569.70	15.6393	756.80	19.3623
351.93	31.0689	583.19	18.7163	884.68	18.3461

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	28.0820	1274.44	8.5321	1620.50	2.1292
766.42	25.9287	1001.03	12.4641	1621.92	6.3896
766.84	20.5308	1002.74	14.2534	1678.03	0.0000
772.60	0.0000	1004.73	3.5658	1690.97	2.1642
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	4.3999
778.90	10.8643	1028.54	0.0000	1063.66	4.4053
783.70	0.0000	1037.84	9.0192	1771.35	3.3049
785.37	25.0599	1038.76	0.0000	1791.20	0.0000
792.07	21.8555	631.29	10.1322	1808.65	5.5527
794.95	18.6007	1048.07	0.0000	1810.72	0.0000
795.86	13.1353	1049.04	17.3848	1836.06	1.1170
810.06	16.5204	1050.41	18.6353		
810.29	19.8259	1063.66	10.9197		
344.28	19.8274	1077.00	0.0000		
810.76	21.4828	1077.34	9.1425		
815.77	0.0000	1085.87	17.4205		
1048.07	0.0000	1093.63	11.9503		
832.01	15.5632	1099.45	11.9733		
834.85	25.5989	1112.07	11.0984		
835.71	24.4949	1112.84	12.3340		
836.80	0.0000	1115.54	11.8516		
846.75	0.0000	1120.29	12.0550		
846.77	13.4224	1120.55	12.0566		
856.80	0.0000	1221.41	12.0590		
860.56	19.1236	1129.67	17.6733		
871.09	12.4269	1131.51	0.0000		
873.19	6.7842	1147.95	0.0000		
875.33	0.0000	1173.23	16.9761		
879.38	12.4685	1177.95	9.4452		
880.51	15.8765	1189.05	12.3216		
883.24	13.6230	1204.77	15.2383		
884.68	12.4950	1221.41	20.1015		
889.28	9.1042	1231.02	18.2404		
894.76	9.1237	1235.36	0.0000		
898.04	15.9875	1238.28	12.5073		
900.72	12.0031	1260.41	0.0000		
903.28	17.1643	1271.87	3.1094		
911.20	17.2180	1274.44	7.7793		
912.08	17.2235	1274.54	7.7793		
923.98	0.0000	1291.59	8.7951		
926.50	17.3199	1298.22	0.0000		
929.11	15.0254	1312.11	0.0000		
937.49	18.5521	1332.49	6.3273		
944.13	0.0000	1362.66	0.0000		
946.00	15.1222	1365.19	5.9861		
949.00	13.9746	1368.63	0.0000		
667.71	0.0000	1384.29	2.0057		
962.31	10.5333	1408.01	6.0557		
964.08	12.6483	1457.56	0.0000		
966.17	3.5161	1460.82	6.1403		
911.20	8.4475	1489.16	10.3088		
968.97	8.4475	1505.03	6.2102		
983.53	0.0000	1584.12	9.4982		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                 *
*                               Charleston, SC 29407                            *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235058.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM06.CNF;499
Background date : 2-OCT-2016 11:00:12.
Sample date     : 2-DEC-2015 15:00:00. Acquisition date : 3-OCT-2016 07:51:57.
Sample ID      : G405235058           Sample quantity  : 1.40622E+02 GRAM
Detector name   : GAM06               Detector geometry: CAN
Elapsed live time: 0 01:00:00.00      Elapsed real time: 0 01:00:00.66  0.0%
Energy tolerance: 1.50000 keV         Analyst Initials  : MXR1
Abundance limit : 75.00000           Sensitivity       : 3.00000
Batch ID       : 1596252             Detector SN#      :
Matrix Spike ID :                     LCS ID            : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.38*	25	133	1.24	126.47	123	8	7.03E-03	83.1	
2	4	74.89*	124	128	1.36	149.48	143	19	3.43E-02	18.8	1.73E+00
3	4	77.17	202	88	1.14	154.03	143	19	5.60E-02	11.1	
4	4	79.22	51	87	1.37	158.13	143	19	1.41E-02	44.5	
5	0	87.15	60	120	1.49	173.97	171	6	1.67E-02	31.6	
6	3	89.98	65	94	1.13	179.63	177	14	1.80E-02	24.7	2.15E+00
7	3	92.87*	76	129	1.28	185.40	177	14	2.12E-02	30.3	
8	0	102.61	24	88	1.23	204.88	200	8	6.65E-03	71.4	
9	0	129.51	27	161	0.96	258.63	253	12	7.57E-03	95.3	
10	0	153.61	30	81	0.86	306.80	304	7	8.19E-03	53.7	
11	0	177.33	25	64	0.86	354.20	349	8	7.06E-03	58.5	
12	0	185.74*	66	127	1.23	370.99	365	11	1.84E-02	35.9	
13	0	209.36	52	96	1.19	418.21	412	10	1.44E-02	38.1	
14	4	238.57*	359	46	1.18	476.59	469	24	9.97E-02	6.3	1.28E+00
15	4	241.97*	100	62	1.70	483.37	469	24	2.79E-02	19.8	
16	0	289.24	42	55	2.13	577.85	573	13	1.18E-02	39.3	
17	0	295.20*	129	58	1.27	589.77	585	10	3.58E-02	14.4	
18	0	314.64	8	52	0.69	628.63	622	8	2.22E-03	160.1	
19	0	338.31	71	70	1.18	675.94	670	13	1.99E-02	26.7	
20	0	351.91	239	57	1.06	703.12	697	12	6.64E-02	9.0	
21	0	358.65	20	45	1.42	716.60	712	9	5.56E-03	64.5	
22	0	401.80	39	73	6.83	802.84	788	22	1.08E-02	59.4	
23	0	408.85	33	56	3.49	816.93	810	18	9.03E-03	56.0	
24	0	463.77	32	33	1.61	926.71	921	12	9.00E-03	40.6	
25	0	546.34	10	12	1.41	1091.79	1088	8	2.65E-03	71.1	
26	0	583.42*	73	48	0.82	1165.92	1157	16	2.04E-02	24.4	
27	0	609.15*	160	35	1.32	1217.36	1212	13	4.46E-02	11.4	
28	0	614.41	8	11	1.72	1227.87	1224	8	2.17E-03	79.9	
29	0	637.75	20	13	0.92	1274.53	1269	13	5.45E-03	44.2	
30	0	782.94	9	11	1.11	1564.83	1558	9	2.43E-03	76.9	
31	0	860.04*	15	8	1.25	1719.00	1715	8	4.03E-03	44.7	
32	0	911.12*	43	35	1.63	1821.14	1814	14	1.19E-02	33.2	
33	0	967.76	89	19	4.91	1934.42	1924	20	2.47E-02	16.2	
34	0	1070.72	10	8	1.02	2140.32	2132	11	2.66E-03	66.6	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1074.01	7	4	1.12	2146.91	2144	6	1.89E-03	61.8	
36	0	1119.38	47	0	1.63	2237.66	2232	11	1.31E-02	14.6	
37	0	1184.25	16	8	3.85	2367.40	2361	12	4.46E-03	44.5	
38	0	1211.50	10	19	4.02	2421.91	2411	13	2.76E-03	96.8	
39	0	1238.54*	13	20	0.96	2476.01	2466	14	3.63E-03	79.6	
40	0	1274.57	13	8	0.59	2548.08	2541	15	3.68E-03	52.9	
41	0	1280.43	13	4	2.12	2559.80	2555	9	3.58E-03	40.4	
42	0	1291.47	8	0	1.35	2581.88	2579	6	2.22E-03	35.4	
43	0	1459.92*	268	5	2.15	2918.87	2911	18	7.43E-02	6.5	
44	0	1558.82	8	0	0.88	3116.75	3111	11	2.22E-03	35.4	
45	0	1764.00	29	6	2.40	3527.33	3522	11	7.92E-03	24.6	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235058.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 2-DEC-2015 15:00:00   Acquisition date : 3-OCT-2016 07:51:57
Sample ID        : G405235058             Sample quantity  : 140.62 GRAM
Sample type      : SOLID                   Sample geometry  :
Detector name    : GAMMA6                 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00          Elapsed real time: 0 01:00:00.66   0.0%
Energy tolerance : 1.50 keV               Half life ratio  : 10.00
Errors propagated: No                     Systematic Error : 0.00 %
Efficiency type  : Empirical              Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
NA-22	1274.54	99.94*	1.136E+00	6.042E-02	7.552E-02	105.89	OK
K-40	1460.82	10.66*	1.005E+00	1.278E+01	1.278E+01	12.92	OK
CD-109	88.03	3.70*	5.194E+00	1.008E+00	1.596E+00	129.43	OK
SN-126	64.28	9.60	2.650E+00	6.557E-01	6.557E-01	166.19	OK
	86.94	8.90	5.194E+00	4.192E-01	4.192E-01	129.43	OK
	87.57	37.00*	5.194E+00	1.008E-01	1.008E-01	129.43	OK
TL-208	277.37	6.60	3.958E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.242E+00	2.136E-01	2.136E-01	48.76	OK
	860.56	12.50	1.625E+00	3.833E-01	3.833E-01	89.41	OK
BI-211	72.87	1.23	3.859E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.304E+00	2.400E-01	2.400E-01	435.46	OK
PB-212	74.82	10.28	4.088E+00	1.302E+00	1.302E+00	56.98	OK
	77.11	17.10	4.331E+00	1.770E+00	1.770E+00	22.26	OK
	238.63	43.60*	4.430E+00	1.110E+00	1.110E+00	12.54	OK
	300.09	3.30	3.729E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.167E+00	8.998E-01	9.001E-01	22.81	OK
	1120.29	14.92	1.281E+00	1.290E+00	1.290E+00	29.17	OK
	1764.49	15.30	8.593E-01	1.090E+00	1.091E+00	49.19	OK
PB-214	74.82	5.80	4.080E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	4.331E+00	3.121E+00	3.122E+00	22.26	OK
	87.09	3.41	5.190E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.384E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.776E+00	1.089E+00	1.090E+00	28.83	OK
	351.93	35.60*	3.304E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.167E+00	8.998E-01	9.001E-01	22.81	OK
	1120.29	14.92	1.281E+00	1.290E+00	1.290E+00	29.17	OK
	1764.49	15.30	8.593E-01	1.090E+00	1.091E+00	49.19	OK
RA-224	240.99	4.10*	4.384E+00	1.403E+00	1.403E+00	102.14	OK
RA-226	609.32	45.49*	2.167E+00	8.998E-01	9.001E-01	22.81	OK
	1120.29	14.92	1.281E+00	1.290E+00	1.290E+00	29.17	OK
	1764.49	15.30	8.593E-01	1.090E+00	1.091E+00	49.19	OK
AC-228	105.21	1.10	6.007E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.404E+00	1.082E+00	1.082E+00	53.31	OK
	794.95	4.25	1.739E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.666E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.544E+00	5.761E-01	5.761E-01	66.46	OK
	968.97	15.80	1.463E+00	2.045E+00	2.045E+00	32.42	OK
RA-228	105.21	1.10	6.007E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.404E+00	1.082E+00	1.082E+00	53.31	OK
	794.95	4.25	1.739E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.666E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.544E+00	5.761E-01	5.761E-01	66.46	OK
	968.97	15.80	1.463E+00	2.045E+00	2.045E+00	32.42	OK
TH-228	74.82	10.28	4.088E+00	1.302E+00	1.302E+00	56.98	OK
	77.11	17.10	4.331E+00	1.770E+00	1.770E+00	22.26	OK
	238.63	43.60*	4.430E+00	1.110E+00	1.110E+00	12.54	OK
	300.09	3.30	3.729E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.167E+00	8.998E-01	8.998E-01	22.81	OK
	1120.29	14.92	1.281E+00	1.290E+00	1.290E+00	29.17	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	1764.49	15.30	8.593E-01	1.090E+00	1.090E+00	49.19	OK
TH-232	105.21	1.10	6.007E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.404E+00	1.082E+00	1.082E+00	53.31	OK
	835.71	1.61	1.666E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.544E+00	5.761E-01	5.761E-01	66.46	OK
	968.97	15.80	1.463E+00	2.045E+00	2.045E+00	32.42	OK
TH-234	63.29	3.70*	2.650E+00	1.701E+00	1.701E+00	166.19	OK
	92.59	4.23	5.546E+00	2.088E+00	2.088E+00	60.51	OK
U-234	609.32	45.49*	2.167E+00	8.998E-01	8.998E-01	22.81	OK
	1120.29	14.92	1.281E+00	1.290E+00	1.290E+00	29.17	OK
	1764.49	15.30	8.593E-01	1.090E+00	1.090E+00	49.19	OK
U-235	89.96	3.47	5.381E+00	2.237E+00	2.237E+00	49.44	OK
	93.35	5.60	5.546E+00	1.577E+00	1.577E+00	60.51	OK
	143.76	10.96*	5.990E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	5.669E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.267E+00	1.340E-01	1.340E-01	71.82	OK
	205.31	5.01	4.931E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	2.650E+00	1.701E+00	1.701E+00	166.19	OK
	92.59	4.23	5.546E+00	2.088E+00	2.088E+00	60.51	OK
AM-243	43.53	5.90	3.924E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	4.088E+00	1.992E-01	1.992E-01	56.98	OK
CM-247	278.00	3.40	3.951E+00	----- Line	Not Found	-----	Absent
	287.50	2.00	3.852E+00	----- Line	Not Found	-----	Absent
	402.40	72.00*	2.988E+00	1.037E-01	1.037E-01	118.78	OK

Flag: "*" = Keyline

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235058.CNF;1
* Acquisition date   : 3-OCT-2016 07:51:57 Sensitivity      : 3.000
* Detector ID       : GAM06 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.66 Half life ratio  : *****
* Sample date       : 2-DEC-2015 15:00:00 Analyst initials: MXR1
* Sample ID         : G405235058 Sample Quantity : 1.4062E+02 GRAM
* Batch Number      : 1596252 Wet Weight      : 0.00000
* Wet wt corr       : 1.00000 Dry Weight       : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 8-MAR-2016 07:26:53 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM06_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
NA-22	7.552E-02	7.836E-02	9.996E-02
K-40	1.278E+01	1.618E+00	7.994E-01
CD-109	1.596E+00	2.025E+00	2.003E+00
SN-126	1.008E-01	1.279E-01	1.272E-01
TL-208	2.136E-01	1.020E-01	6.600E-02
BI-211	2.400E-01	1.024E+00	3.567E-01
PB-212	1.110E+00	1.364E-01	9.399E-02
BI-214	9.001E-01	2.012E-01	1.463E-01
PB-214	1.177E+00	2.085E-01	3.626E-01
RN-222	9.001E-01	2.012E-01	1.463E-01
RA-224	1.403E+00	1.404E+00	1.008E+00
RA-226	9.001E-01	2.012E-01	1.463E-01
AC-228	5.761E-01	3.752E-01	2.910E-01
RA-228	5.761E-01	3.752E-01	2.910E-01
TH-228	1.110E+00	1.364E-01	9.399E-02
TH-230	8.998E-01	2.012E-01	1.463E-01
TH-232	5.761E-01	3.752E-01	2.910E-01
TH-234	1.701E+00	2.771E+00	2.380E+00
U-234	8.998E-01	2.012E-01	1.463E-01
U-235	-1.530E-01	1.872E-01	3.260E-01
U-238	1.701E+00	2.771E+00	2.380E+00
AM-243	1.992E-01	1.112E-01	8.266E-02
CM-247	1.037E-01	1.207E-01	6.739E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-4.102E+00		1.362E+01	2.569E+01	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF
AL-26	1.269E-02		1.758E-02	5.887E-02	NOT IDENT.
SC-46	-1.707E-01		4.398E-01	7.772E-01	FAIL ABUN
V-48	0.000E+00		1.713E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00		5.082E+02	0.000E+00	SHORT HLIF
MN-54	1.705E-03		6.077E-02	1.186E-01	NOT IDENT.

CO-56	1.384E-01	4.630E-01	9.559E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-2.016E-02	4.351E-02	7.949E-02	NOT IDENT.
CO-58	1.792E-01	6.560E-01	1.320E+00	NOT IDENT.
FE-59	-1.947E+00	7.246E+00	1.413E+01	FAIL ABUN
CO-60	-2.169E-02	4.225E-02	7.685E-02	NOT IDENT.
ZN-65	8.983E-02	1.839E-01	3.719E-01	NOT IDENT.
GE-68	2.020E+00	2.047E+00	4.873E+00	NOT IDENT.
AS-73	7.549E+00	1.039E+01	2.208E+01	NOT IDENT.
AS-74	0.000E+00	7.044E+03	0.000E+00	SHORT HLIF
SE-75	-2.326E-02	2.292E-01	4.117E-01	FAIL ABUN
BR-77	0.000E+00	1.361E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	8.291E+02	0.000E+00	SHORT HLIF
RB-83	-3.538E-01	6.272E-01	1.136E+00	NOT IDENT.
KR-85	-1.858E+01	9.356E+00	1.389E+01	NOT IDENT.
SR-85	-2.090E+00	1.051E+00	1.560E+00	NOT IDENT.
RB-86	0.000E+00	3.208E+04	0.000E+00	SHORT HLIF
Y-88	6.817E-02	1.110E-01	3.905E-01	NOT IDENT.
Y-91	-2.083E+02	7.454E+02	1.216E+03	NOT IDENT.
NB-94	-1.263E-02	3.108E-02	5.598E-02	NOT IDENT.
NB-95	5.774E-01	9.991E-01	2.050E+00	NOT IDENT.
NB-95M	1.957E-01	2.765E+00	4.683E+00	NOT IDENT.
ZR-95	-2.882E-01	1.759E+00	3.263E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.022E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	7.855E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-2.229E-02	3.652E-02	5.969E-02	NOT IDENT.
RH-102	6.837E-02	6.025E-02	1.357E-01	NOT IDENT.
RU-103	-2.835E+00	5.818E+00	1.072E+01	FAIL ABUN
RH-106	2.237E-02	4.221E-01	8.509E-01	NOT IDENT.
RU-106	2.237E-02	4.221E-01	8.509E-01	NOT IDENT.
AG-108M	-3.215E-02	2.698E-02	4.484E-02	FAIL ABUN
AG-110M	5.421E-02	8.817E-02	1.971E-01	NOT IDENT.
SN-113	-7.223E-02	2.496E-01	4.541E-01	NOT IDENT.
CD-115	0.000E+00	2.009E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	1.359E+05	0.000E+00	SHORT HLIF
TE-123M	-3.504E-02	1.363E-01	2.485E-01	NOT IDENT.
SB-124	7.596E-02	3.073E+00	6.265E+00	NOT IDENT.
SB-125	-2.627E-02	1.070E-01	2.044E-01	FAIL ABUN
TE-125M	9.559E+01	2.871E+02	5.625E+02	NOT IDENT.
I-126	0.000E+00	1.303E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.648E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	6.412E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	9.269E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.869E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.592E+27	0.000E+00	SHORT HLIF
BA-133	4.894E-03	5.346E-02	7.836E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	5.284E-02	5.281E-02	1.164E-01	NOT IDENT.
CS-135	3.380E-02	1.620E-01	2.983E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.683E+05	0.000E+00	SHORT HLIF
BA-137M	4.642E-02	3.850E-02	8.476E-02	NOT IDENT.
CS-137	4.904E-02	4.067E-02	8.954E-02	NOT IDENT.
CE-139	-8.686E-02	1.131E-01	1.949E-01	NOT IDENT.
BA-140	0.000E+00	1.662E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	6.663E+05	0.000E+00	SHORT HLIF
CE-141	2.817E+01	2.646E+01	5.419E+01	NOT IDENT.
CE-143	0.000E+00	6.984E+40	0.000E+00	SHORT HLIF
CE-144	-7.366E-02	3.891E-01	6.645E-01	FAIL ABUN
PM-144	1.324E-02	5.214E-02	1.058E-01	NOT IDENT.
PR-144	1.189E+00	4.549E+00	9.238E+00	NOT IDENT.
PM-146	1.308E-02	4.512E-02	9.156E-02	NOT IDENT.
ND-147	0.000E+00	5.207E+07	0.000E+00	SHORT HLIF
PM-147	-3.347E+01	7.316E+02	1.394E+03	NOT IDENT.
PM-149	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
EU-150	-1.835E-02	2.882E-02	4.702E-02	FAIL ABUN
EU-152	1.166E-03	9.081E-02	1.739E-01	NOT IDENT.
GD-153	-5.349E-02	1.574E-01	2.953E-01	FAIL ABUN
EU-154	1.846E-01	1.916E-01	2.716E-01	FAIL ABUN
EU-155	2.398E-02	1.112E-01	2.016E-01	FAIL ABUN
TB-160	1.937E+00	1.786E+00	4.239E+00	FAIL ABUN
HO-166M	7.871E-03	5.148E-02	1.036E-01	FAIL ABUN
TM-171	-2.742E+01	2.468E+01	4.497E+01	NOT IDENT.
HF-172	4.928E-02	2.480E-01	4.426E-01	FAIL ABUN
LU-172	5.876E-02	9.137E-02	1.987E-01	FAIL ABUN
LU-176	-1.208E-02	2.141E-02	4.057E-02	FAIL ABUN

HF-181	8.071E-01	4.529E+00	9.173E+00	NOT IDENT.
TA-182	-1.536E-02	1.066E+00	2.109E+00	FAIL ABUN
RE-183	1.327E+00	3.440E+00	7.050E+00	NOT IDENT.
RE-184	1.813E+01	3.674E+01	7.623E+01	NOT IDENT.
W-188	0.000E+00	2.591E+02	2.156E+02	FAIL ABUN
IR-192	-7.938E-03	5.172E-01	9.318E-01	FAIL ABUN
HG-203	-3.093E+00	3.173E+00	5.047E+00	NOT IDENT.
BI-207	-1.544E-02	5.957E-02	1.003E-01	FAIL ABUN
PB-210	2.381E+00	4.614E+00	9.569E+00	NOT IDENT.
PB-211	5.370E-01	6.003E-01	1.138E+00	NOT IDENT.
BI-212	1.783E-01	5.427E-01	1.076E+00	NOT IDENT.
RN-219	0.000E+00	1.317E+00	7.759E-01	FAIL ABUN
RA-223	5.720E-01	5.498E-01	1.211E+00	FAIL ABUN
AC-227	4.106E-02	2.457E-01	4.551E-01	FAIL ABUN
TH-227	4.106E-02	2.457E-01	4.551E-01	FAIL ABUN
TH-229	3.130E-02	4.717E-01	8.765E-01	FAIL ABUN
PA-231	-4.929E-02	4.551E-01	8.940E-01	NOT IDENT.
TH-231	5.720E-01	5.498E-01	1.211E+00	FAIL ABUN
PA-233	2.051E-02	6.940E-02	1.286E-01	NOT IDENT.
PA-234	-1.490E-01	2.800E-01	5.238E-01	NOT IDENT.
PA-234M	2.711E+00	5.044E+00	1.066E+01	NOT IDENT.
NP-237	2.051E-02	6.940E-02	1.286E-01	NOT IDENT.
NP-238	0.000E+00	8.269E+00	0.000E+00	SHORT HLIF
NP-239	-6.698E-02	2.234E-01	4.153E-01	FAIL ABUN
PU-239	4.395E+02	8.211E+02	6.694E+02	FAIL ABUN
AM-241	-2.189E-02	1.575E-01	2.870E-01	NOT IDENT.
CM-243	1.252E-01	1.753E-01	1.629E-01	FAIL ABUN
BK-247	-1.648E-02	7.841E-02	1.388E-01	FAIL ABUN
CF-249	3.881E-03	3.619E-02	7.266E-02	NOT IDENT.
CF-251	1.658E-01	1.901E-01	2.156E-01	FAIL ABUN
ANH-511	-7.462E-03	5.064E-02	1.081E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
NA-22	1274.54	13	99.94*	1.136E+00	6.042E-02	7.552E-02	105.89
K-40	1460.82	257	10.66*	1.005E+00	1.278E+01	1.278E+01	12.92
CD-109	88.03	72	3.70*	5.194E+00	2.012E+00	3.185E+00	63.25
SN-126	64.28	31	9.60	2.650E+00	6.557E-01	6.557E-01	166.19
	86.94	72	8.90	5.194E+00	8.365E-01	8.365E-01	63.25
	87.57	72	37.00*	5.194E+00	2.012E-01	2.012E-01	63.25
TL-208	277.37	-----	6.60	3.958E+00	-----	Line Not Found	-----
	583.19	76	85.00*	2.242E+00	2.136E-01	2.136E-01	48.76
	860.56	15	12.50	1.625E+00	3.833E-01	3.833E-01	89.41
BI-211	72.87	-----	1.23	3.859E+00	-----	Line Not Found	-----
	351.06	259	12.92*	3.304E+00	3.241E+00	3.241E+00	18.08
PB-212	74.82	151	10.28	4.088E+00	1.917E+00	1.917E+00	37.59
	77.11	246	17.10	4.331E+00	1.770E+00	1.770E+00	22.26
	238.63	402	43.60*	4.430E+00	1.110E+00	1.110E+00	12.54
	300.09	-----	3.30	3.729E+00	-----	Line Not Found	-----
BI-214	609.32	166	45.49*	2.167E+00	8.998E-01	9.001E-01	22.81
	1120.29	46	14.92	1.281E+00	1.290E+00	1.290E+00	29.17
	1764.49	27	15.30	8.593E-01	1.090E+00	1.091E+00	49.19
PB-214	74.82	151	5.80	4.088E+00	3.397E+00	3.398E+00	37.59
	77.11	246	9.70	4.331E+00	3.121E+00	3.122E+00	22.26
	87.09	72	3.41	5.194E+00	2.183E+00	2.184E+00	63.25
	242.00	112	7.25	4.384E+00	1.883E+00	1.883E+00	39.68
	295.22	142	18.42	3.776E+00	1.089E+00	1.090E+00	28.83
	351.93	259	35.60*	3.304E+00	1.176E+00	1.177E+00	18.08
RN-222	609.32	166	45.49*	2.167E+00	8.998E-01	9.001E-01	22.81
	1120.29	46	14.92	1.281E+00	1.290E+00	1.290E+00	29.17
	1764.49	27	15.30	8.593E-01	1.090E+00	1.091E+00	49.19
RA-224	240.99	112	4.10*	4.384E+00	3.329E+00	3.329E+00	39.68
RA-226	609.32	166	45.49*	2.167E+00	8.998E-01	9.001E-01	22.81
	1120.29	46	14.92	1.281E+00	1.290E+00	1.290E+00	29.17
	1764.49	27	15.30	8.593E-01	1.090E+00	1.091E+00	49.19
AC-228	105.21	-----	1.10	6.007E+00	-----	Line Not Found	-----
	338.32	78	11.27	3.404E+00	1.082E+00	1.082E+00	53.31
	794.95	-----	4.25	1.739E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.666E+00	-----	Line Not Found	-----
	911.20	43	25.80*	1.544E+00	5.761E-01	5.761E-01	66.46
	968.97	89	15.80	1.463E+00	2.045E+00	2.045E+00	32.42
RA-228	105.21	-----	1.10	6.007E+00	-----	Line Not Found	-----
	338.32	78	11.27	3.404E+00	1.082E+00	1.082E+00	53.31
	794.95	-----	4.25	1.739E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.666E+00	-----	Line Not Found	-----
	911.20	43	25.80*	1.544E+00	5.761E-01	5.761E-01	66.46
	968.97	89	15.80	1.463E+00	2.045E+00	2.045E+00	32.42
TH-228	74.82	151	10.28	4.088E+00	1.917E+00	1.917E+00	37.59
	77.11	246	17.10	4.331E+00	1.770E+00	1.770E+00	22.26
	238.63	402	43.60*	4.430E+00	1.110E+00	1.110E+00	12.54
	300.09	-----	3.30	3.729E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-230	609.32	166	45.49*	2.167E+00	8.998E-01	8.998E-01	22.81
	1120.29	46	14.92	1.281E+00	1.290E+00	1.290E+00	29.17
	1764.49	27	15.30	8.593E-01	1.090E+00	1.090E+00	49.19
TH-232	105.21	-----	1.10	6.007E+00	-----	Line Not Found	-----
	338.32	78	11.27	3.404E+00	1.082E+00	1.082E+00	53.31
	835.71	-----	1.61	1.666E+00	-----	Line Not Found	-----
	911.20	43	25.80*	1.544E+00	5.761E-01	5.761E-01	66.46
	968.97	89	15.80	1.463E+00	2.045E+00	2.045E+00	32.42
TH-234	63.29	31	3.70*	2.650E+00	1.701E+00	1.701E+00	166.19
	92.59	92	4.23	5.546E+00	2.088E+00	2.088E+00	60.51
U-234	609.32	166	45.49*	2.167E+00	8.998E-01	8.998E-01	22.81
	1120.29	46	14.92	1.281E+00	1.290E+00	1.290E+00	29.17
	1764.49	27	15.30	8.593E-01	1.090E+00	1.090E+00	49.19
U-235	89.96	78	3.47	5.381E+00	2.237E+00	2.237E+00	49.44
	93.35	92	5.60	5.546E+00	1.577E+00	1.577E+00	60.51
	143.76	-----	10.96*	5.990E+00	-----	Line Not Found	-----
	163.33	-----	5.08	5.669E+00	-----	Line Not Found	-----
	185.72	76	57.20	5.267E+00	1.340E-01	1.340E-01	71.82
U-238	205.31	-----	5.01	4.931E+00	-----	Line Not Found	-----
	63.29	31	3.70*	2.650E+00	1.701E+00	1.701E+00	166.19
AM-243	92.59	92	4.23	5.546E+00	2.088E+00	2.088E+00	60.51
	43.53	-----	5.90	3.924E-01	-----	Line Not Found	-----
CM-247	74.66	151	67.20*	4.088E+00	2.932E-01	2.932E-01	37.59
	278.00	-----	3.40	3.951E+00	-----	Line Not Found	-----
CM-247	287.50	-----	2.00	3.852E+00	-----	Line Not Found	-----
	402.40	42	72.00*	2.988E+00	1.037E-01	1.037E-01	118.78

Flag: "*" = Keyline

Total number of lines in spectrum 45
 Number of unidentified lines 9
 Number of lines tentatively identified by NID 36 80.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
NA-22	2.60Y	1.25	6.042E-02	7.552E-02	7.996E-02	105.89	
K-40	1.25E+09Y	1.00	1.278E+01	1.278E+01	0.165E+01	12.92	
CD-109	461.40D	1.58	2.012E+00	3.185E+00	2.014E+00	63.25	
SN-126	2.30E+05Y	1.00	2.012E-01	2.012E-01	1.273E-01	63.25	
TL-208	1.41E+10Y	1.00	2.136E-01	2.136E-01	1.041E-01	48.76	
BI-211	7.04E+08Y	1.00	3.241E+00	3.241E+00	0.586E+00	18.08	
PB-212	1.41E+10Y	1.00	1.110E+00	1.110E+00	0.139E+00	12.54	
BI-214	1600.00Y	1.00	8.998E-01	9.001E-01	2.053E-01	22.81	
PB-214	1600.00Y	1.00	1.176E+00	1.177E+00	0.213E+00	18.08	
RN-222	1600.00Y	1.00	8.998E-01	9.001E-01	2.053E-01	22.81	
RA-224	1.41E+10Y	1.00	3.329E+00	3.329E+00	1.321E+00	39.68	
RA-226	1600.00Y	1.00	8.998E-01	9.001E-01	2.053E-01	22.81	
AC-228	1.41E+10Y	1.00	5.761E-01	5.761E-01	3.829E-01	66.46	
RA-228	1.41E+10Y	1.00	5.761E-01	5.761E-01	3.829E-01	66.46	
TH-228	1.41E+10Y	1.00	1.110E+00	1.110E+00	0.139E+00	12.54	
TH-230	7.54E+04Y	1.00	8.998E-01	8.998E-01	2.053E-01	22.81	
TH-232	1.41E+10Y	1.00	5.761E-01	5.761E-01	3.829E-01	66.46	
TH-234	4.47E+09Y	1.00	1.701E+00	1.701E+00	2.827E+00	166.19	
U-234	2.45E+05Y	1.00	8.998E-01	8.998E-01	2.053E-01	22.81	
U-235	7.04E+08Y	1.00	1.340E-01	1.340E-01	0.962E-01	71.82	K
U-238	4.47E+09Y	1.00	1.701E+00	1.701E+00	2.827E+00	166.19	
AM-243	7370.00Y	1.00	2.932E-01	2.932E-01	1.102E-01	37.59	
CM-247	1.56E+07Y	1.00	1.037E-01	1.037E-01	1.232E-01	118.78	
Total Activity :			3.540E+01	3.659E+01			

Grand Total Activity : 3.540E+01 3.659E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
4	79.22	62	106	1.37	158.13	143	19	1.41E-02	88.9	4.54E+00	T
0	102.61	29	105	1.23	204.88	200	8	6.65E-03	****	5.94E+00	T
0	129.51	32	188	0.96	258.63	253	12	7.57E-03	****	6.15E+00	T
0	153.61	34	93	0.86	306.80	304	7	8.19E-03	****	5.84E+00	T
0	177.33	29	73	0.86	354.20	349	8	7.06E-03	****	5.42E+00	T
0	209.36	59	108	1.19	418.21	412	10	1.44E-02	76.1	4.86E+00	T
0	289.24	47	60	2.13	577.85	573	13	1.18E-02	78.5	3.83E+00	T
0	314.64	9	57	0.69	628.63	622	8	2.22E-03	****	3.60E+00	
0	358.65	22	49	1.42	716.60	712	9	5.56E-03	****	3.26E+00	
0	408.85	35	59	3.49	816.93	810	18	9.03E-03	****	2.95E+00	
0	463.77	34	35	1.61	926.71	921	12	9.00E-03	81.2	2.68E+00	T
0	546.34	10	13	1.41	1091.79	1088	8	2.65E-03	****	2.36E+00	T
0	614.41	8	12	1.72	1227.87	1224	8	2.17E-03	****	2.15E+00	T
0	637.75	20	14	0.92	1274.53	1269	13	5.45E-03	88.4	2.09E+00	T
0	782.94	9	11	1.11	1564.83	1558	9	2.43E-03	****	1.76E+00	T
0	1070.72	9	8	1.02	2140.32	2132	11	2.66E-03	****	1.33E+00	
0	1074.01	7	4	1.12	2146.91	2144	6	1.89E-03	****	1.33E+00	
0	1184.25	16	8	3.85	2367.40	2361	12	4.46E-03	88.9	1.22E+00	
0	1211.50	10	19	4.02	2421.91	2411	13	2.76E-03	****	1.19E+00	
0	1238.54	13	19	0.96	2476.01	2466	14	3.63E-03	****	1.17E+00	T
0	1280.43	13	4	2.12	2559.80	2555	9	3.58E-03	80.9	1.13E+00	
0	1291.47	8	0	1.35	2581.88	2579	6	2.22E-03	70.7	1.12E+00	T
0	1558.82	8	0	0.88	3116.75	3111	11	2.22E-03	70.7	9.49E-01	

Flags: "T" = Tentatively associated

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235058.CNF;1
* Acquisition date   : 3-OCT-2016 07:51:57 Sensitivity      : 3.000
* Detector ID       : GAM06 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.66 Half life ratio : *****
* Sample date      : 2-DEC-2015 15:00:00 Nuclide Library : SOLID
* Sample ID       : G405235058 Analyst initials: MXR1
* Batch Number    : 1596252 Sample Quantity : 1.4062E+02 GRAM
* Wet wt corr     : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date    : 8-MAR-2016 07:26:53 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM06_CAN.CNF;14
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
NA-22	4.199E-02
K-40	3.321E-01
CD-109	9.394E-01
SN-126	5.968E-02
TL-208	2.913E-02
BI-211	1.609E-01
PB-212	4.311E-02
BI-214	6.569E-02
PB-214	1.750E-01
RN-222	6.569E-02
RA-224	4.623E-01
RA-226	6.569E-02
AC-228	1.272E-01
RA-228	1.272E-01
TH-228	4.311E-02
TH-230	6.566E-02
TH-232	1.272E-01
TH-234	1.112E+00
U-234	6.566E-02
U-235	1.515E-01
U-238	1.112E+00
AM-243	3.853E-02
CM-247	3.024E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.139E+01	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.086E-02	NOT IDENT.
SC-46	3.305E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.062E-02	NOT IDENT.
CO-56	4.088E-01	FAIL ABUN

MN-56	0.000E+00	SHORT HLIF
CO-57	3.661E-02	NOT IDENT.
CO-58	5.741E-01	NOT IDENT.
FE-59	5.907E+00	FAIL ABUN
CO-60	3.100E-02	NOT IDENT.
ZN-65	1.592E-01	NOT IDENT.
GE-68	2.064E+00	NOT IDENT.
AS-73	1.026E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.877E-01	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.898E-01	NOT IDENT.
KR-85	6.218E+00	NOT IDENT.
SR-85	6.984E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.316E-01	NOT IDENT.
Y-91	5.207E+02	NOT IDENT.
NB-94	2.418E-02	NOT IDENT.
NB-95	9.133E-01	NOT IDENT.
NB-95M	2.156E+00	NOT IDENT.
ZR-95	1.428E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.769E-02	NOT IDENT.
RH-102	6.057E-02	NOT IDENT.
RU-103	4.652E+00	FAIL ABUN
RH-106	3.639E-01	NOT IDENT.
RU-106	3.639E-01	NOT IDENT.
AG-108M	1.951E-02	FAIL ABUN
AG-110M	8.370E-02	NOT IDENT.
SN-113	2.034E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.150E-01	NOT IDENT.
SB-124	2.555E+00	NOT IDENT.
SB-125	9.143E-02	FAIL ABUN
TE-125M	2.627E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.531E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.166E-02	NOT IDENT.
CS-135	1.376E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	3.827E-02	NOT IDENT.
CS-137	4.043E-02	NOT IDENT.
CE-139	8.965E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.532E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.088E-01	FAIL ABUN
PM-144	4.608E-02	NOT IDENT.
PR-144	4.026E+00	NOT IDENT.
PM-146	4.113E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	6.433E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.122E-02	FAIL ABUN
EU-152	7.826E-02	NOT IDENT.
GD-153	1.366E-01	FAIL ABUN
EU-154	1.163E-01	FAIL ABUN
EU-155	9.402E-02	FAIL ABUN
TB-160	1.834E+00	FAIL ABUN
HO-166M	4.466E-02	FAIL ABUN
TM-171	2.066E+01	NOT IDENT.
HF-172	2.065E-01	FAIL ABUN
LU-172	8.732E-02	FAIL ABUN
LU-176	1.811E-02	FAIL ABUN
HF-181	4.062E+00	NOT IDENT.

TA-182	9.093E-01	FAIL ABUN
RE-183	3.284E+00	NOT IDENT.
RE-184	3.321E+01	NOT IDENT.
W-188	9.768E+01	FAIL ABUN
IR-192	4.215E-01	FAIL ABUN
HG-203	2.304E+00	NOT IDENT.
BI-207	4.276E-02	FAIL ABUN
PB-210	4.484E+00	NOT IDENT.
PB-211	5.029E-01	NOT IDENT.
BI-212	4.794E-01	NOT IDENT.
RN-219	3.503E-01	FAIL ABUN
RA-223	5.524E-01	FAIL ABUN
AC-227	2.088E-01	FAIL ABUN
TH-227	2.088E-01	FAIL ABUN
TH-229	4.050E-01	FAIL ABUN
PA-231	4.095E-01	NOT IDENT.
TH-231	5.524E-01	FAIL ABUN
PA-233	5.897E-02	NOT IDENT.
PA-234	2.211E-01	NOT IDENT.
PA-234M	4.717E+00	NOT IDENT.
NP-237	5.897E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	1.922E-01	FAIL ABUN
PU-239	3.152E+02	FAIL ABUN
AM-241	1.334E-01	NOT IDENT.
CM-243	7.521E-02	FAIL ABUN
BK-247	6.330E-02	FAIL ABUN
CF-249	3.266E-02	NOT IDENT.
CF-251	9.973E-02	FAIL ABUN
ANH-511	5.111E-02	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235058.CNF;1
* Acquisition date   : 3-OCT-2016 07:51:57 Sensitivity      : 3.000
* Detector ID        : GAM06 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.66 Half life ratio  : *****
* Sample date        : 2-DEC-2015 15:00:00 Nuclide Library : SOLID
* Sample ID          : G405235058 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity : 1.4062E+02 GRAM
*                    : Quantity Err(%) : 1.4223E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                    : Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 8-MAR-2016 07:26:53 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM06_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
NA-22	7.552E-02	7.862E-02	7.862E-02
K-40	1.278E+01	1.950E+00	1.950E+00
CD-109	1.596E+00	2.046E+00	2.046E+00
SN-126	1.008E-01	1.292E-01	1.292E-01
TL-208	2.136E-01	1.037E-01	1.037E-01
BI-211	2.400E-01	1.097E+00	1.097E+00
PB-212	1.110E+00	1.691E-01	1.691E-01
BI-214	9.001E-01	2.153E-01	2.153E-01
PB-214	1.177E+00	2.337E-01	2.337E-01
RN-222	9.001E-01	2.153E-01	2.153E-01
RA-224	1.403E+00	1.432E+00	1.432E+00
RA-226	9.001E-01	2.153E-01	2.153E-01
AC-228	5.761E-01	3.827E-01	3.827E-01
RA-228	5.761E-01	3.827E-01	3.827E-01
TH-228	1.110E+00	1.691E-01	1.691E-01
TH-230	8.998E-01	2.152E-01	2.152E-01
TH-232	5.761E-01	3.827E-01	3.827E-01
TH-234	1.701E+00	2.797E+00	2.797E+00
U-234	8.998E-01	2.152E-01	2.152E-01
U-235	-1.530E-01	1.875E-01	1.875E-01
U-238	1.701E+00	2.797E+00	2.797E+00
AM-243	1.992E-01	1.132E-01	1.132E-01
CM-247	1.037E-01	1.222E-01	1.222E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-4.102E+00	1.362E+01	1.375E+01	NOT IDENT.
NA-24	1.000E+41	1.630E+43	0.000E+00	SHORT HLIF
AL-26	1.269E-02	1.761E-02	1.851E-02	NOT IDENT.
SC-46	-1.707E-01	4.403E-01	4.470E-01	FAIL ABUN
V-48	3.213E+03	1.713E+04	1.720E+04	SHORT HLIF
CR-51	3.086E+02	5.090E+02	5.277E+02	SHORT HLIF
MN-54	1.705E-03	6.077E-02	6.078E-02	NOT IDENT.

CO-56	1.384E-01	4.633E-01	4.675E-01	FAIL ABUN
MN-56	1.000E+41	3.348E+41	0.000E+00	SHORT HLIF
CO-57	-2.016E-02	4.353E-02	4.447E-02	NOT IDENT.
CO-58	1.792E-01	6.563E-01	6.612E-01	NOT IDENT.
FE-59	-1.947E+00	7.255E+00	7.308E+00	FAIL ABUN
CO-60	-2.169E-02	4.229E-02	4.340E-02	NOT IDENT.
ZN-65	8.983E-02	1.846E-01	1.890E-01	NOT IDENT.
GE-68	2.020E+00	2.075E+00	2.266E+00	NOT IDENT.
AS-73	7.549E+00	1.051E+01	1.105E+01	NOT IDENT.
AS-74	-3.527E+03	7.054E+03	7.231E+03	SHORT HLIF
SE-75	-2.326E-02	2.292E-01	2.294E-01	FAIL ABUN
BR-77	1.107E+39	9.771E+39	0.000E+00	SHORT HLIF
SR-82	2.146E+01	8.291E+02	8.291E+02	SHORT HLIF
RB-83	-3.538E-01	6.297E-01	6.496E-01	NOT IDENT.
KR-85	-1.858E+01	9.492E+00	1.266E+01	NOT IDENT.
SR-85	-2.090E+00	1.067E+00	1.423E+00	NOT IDENT.
RB-86	2.281E+04	3.231E+04	3.391E+04	SHORT HLIF
Y-88	6.817E-02	1.111E-01	1.153E-01	NOT IDENT.
Y-91	-2.083E+02	7.456E+02	7.515E+02	NOT IDENT.
NB-94	-1.263E-02	3.111E-02	3.162E-02	NOT IDENT.
NB-95	5.774E-01	1.001E+00	1.034E+00	NOT IDENT.
NB-95M	1.957E-01	2.765E+00	2.767E+00	NOT IDENT.
ZR-95	-2.882E-01	1.759E+00	1.764E+00	NOT IDENT.
NB-97	-1.000E+41	4.274E+41	0.000E+00	SHORT HLIF
ZR-97	-1.000E+41	1.026E+41	0.000E+00	SHORT HLIF
MO-99	3.047E+32	7.863E+32	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	2.984E+41	0.000E+00	SHORT HLIF
RH-101	-2.229E-02	3.677E-02	3.812E-02	NOT IDENT.
RH-102	6.837E-02	6.071E-02	6.809E-02	NOT IDENT.
RU-103	-2.835E+00	5.823E+00	5.962E+00	FAIL ABUN
RH-106	2.237E-02	4.221E-01	4.222E-01	NOT IDENT.
RU-106	2.237E-02	4.221E-01	4.222E-01	NOT IDENT.
AG-108M	-3.215E-02	2.712E-02	3.075E-02	FAIL ABUN
AG-110M	5.421E-02	8.843E-02	9.175E-02	NOT IDENT.
SN-113	-7.223E-02	2.496E-01	2.517E-01	NOT IDENT.
CD-115	-3.768E+39	2.010E+40	0.000E+00	SHORT HLIF
SN-117M	-7.517E+04	1.363E+05	1.404E+05	SHORT HLIF
TE-123M	-3.504E-02	1.363E-01	1.373E-01	NOT IDENT.
SB-124	7.596E-02	3.073E+00	3.074E+00	NOT IDENT.
SB-125	-2.627E-02	1.070E-01	1.076E-01	FAIL ABUN
TE-125M	9.559E+01	2.872E+02	2.904E+02	NOT IDENT.
I-126	-1.044E+05	1.303E+06	1.304E+06	SHORT HLIF
SB-126	-1.950E+05	1.649E+06	1.651E+06	SHORT HLIF
SB-127	-2.415E+22	7.253E+22	0.000E+00	SHORT HLIF
I-131	-5.715E+09	9.284E+09	9.634E+09	SHORT HLIF
I-132	-1.000E+41	1.894E+42	0.000E+00	SHORT HLIF
TE-132	3.407E+26	1.599E+27	0.000E+00	SHORT HLIF
BA-133	4.894E-03	5.346E-02	5.351E-02	NOT IDENT.
I-133	-1.000E+41	5.326E+41	0.000E+00	SHORT HLIF
CS-134	5.284E-02	5.310E-02	5.820E-02	NOT IDENT.
CS-135	3.380E-02	1.621E-01	1.628E-01	NOT IDENT.
I-135	1.000E+41	8.141E+41	0.000E+00	SHORT HLIF
CS-136	2.296E+05	3.709E+05	3.850E+05	SHORT HLIF
BA-137M	4.642E-02	3.869E-02	4.399E-02	NOT IDENT.
CS-137	4.904E-02	4.087E-02	4.647E-02	NOT IDENT.
CE-139	-8.686E-02	1.145E-01	1.211E-01	NOT IDENT.
BA-140	6.440E+05	1.663E+06	1.688E+06	SHORT HLIF
LA-140	-3.322E+05	6.668E+05	6.834E+05	SHORT HLIF
CE-141	2.817E+01	2.654E+01	2.942E+01	NOT IDENT.
CE-143	1.000E+41	7.109E+40	0.000E+00	SHORT HLIF
CE-144	-7.366E-02	3.891E-01	3.905E-01	FAIL ABUN
PM-144	1.324E-02	5.216E-02	5.250E-02	NOT IDENT.
PR-144	1.189E+00	4.551E+00	4.582E+00	NOT IDENT.
PM-146	1.308E-02	4.514E-02	4.553E-02	NOT IDENT.
ND-147	-7.103E+06	5.208E+07	5.217E+07	SHORT HLIF
PM-147	-3.347E+01	7.317E+02	7.318E+02	NOT IDENT.
PM-149	-3.033E+40	3.220E+41	0.000E+00	SHORT HLIF
EU-150	-1.835E-02	2.887E-02	3.004E-02	FAIL ABUN
EU-152	1.166E-03	9.081E-02	9.081E-02	NOT IDENT.
GD-153	-5.349E-02	1.574E-01	1.593E-01	FAIL ABUN
EU-154	1.846E-01	1.922E-01	2.094E-01	FAIL ABUN
EU-155	2.398E-02	1.113E-01	1.118E-01	FAIL ABUN
TB-160	1.937E+00	1.803E+00	2.004E+00	FAIL ABUN
HO-166M	7.871E-03	5.148E-02	5.160E-02	FAIL ABUN
TM-171	-2.742E+01	2.481E+01	2.771E+01	NOT IDENT.
HF-172	4.928E-02	2.481E-01	2.491E-01	FAIL ABUN
LU-172	5.876E-02	9.209E-02	9.583E-02	FAIL ABUN
LU-176	-1.208E-02	2.144E-02	2.212E-02	FAIL ABUN

HF-181	8.071E-01	4.529E+00	4.544E+00	NOT IDENT.
TA-182	-1.536E-02	1.066E+00	1.066E+00	FAIL ABUN
RE-183	1.327E+00	3.446E+00	3.498E+00	NOT IDENT.
RE-184	1.813E+01	3.707E+01	3.796E+01	NOT IDENT.
W-188	3.367E+02	2.634E+02	3.040E+02	FAIL ABUN
IR-192	-7.938E-03	5.172E-01	5.172E-01	FAIL ABUN
HG-203	-3.093E+00	3.186E+00	3.478E+00	NOT IDENT.
BI-207	-1.544E-02	5.963E-02	6.003E-02	FAIL ABUN
PB-210	2.381E+00	4.618E+00	4.742E+00	NOT IDENT.
PB-211	5.370E-01	6.022E-01	6.491E-01	NOT IDENT.
BI-212	1.783E-01	5.430E-01	5.489E-01	NOT IDENT.
RN-219	1.131E+00	1.327E+00	1.422E+00	FAIL ABUN
RA-223	5.720E-01	5.530E-01	6.101E-01	FAIL ABUN
AC-227	4.106E-02	2.457E-01	2.464E-01	FAIL ABUN
TH-227	4.106E-02	2.457E-01	2.464E-01	FAIL ABUN
TH-229	3.130E-02	4.717E-01	4.719E-01	FAIL ABUN
PA-231	-4.929E-02	4.553E-01	4.558E-01	NOT IDENT.
TH-231	5.720E-01	5.530E-01	6.101E-01	FAIL ABUN
PA-233	2.051E-02	6.943E-02	7.004E-02	NOT IDENT.
PA-234	-1.490E-01	3.284E-01	3.352E-01	NOT IDENT.
PA-234M	2.711E+00	5.061E+00	5.206E+00	NOT IDENT.
NP-237	2.051E-02	6.943E-02	7.004E-02	NOT IDENT.
NP-238	-1.000E+41	8.394E+40	0.000E+00	SHORT HLIF
NP-239	-6.698E-02	2.235E-01	2.255E-01	FAIL ABUN
PU-239	4.395E+02	8.217E+02	8.453E+02	FAIL ABUN
AM-241	-2.189E-02	1.575E-01	1.578E-01	NOT IDENT.
CM-243	1.252E-01	1.758E-01	1.846E-01	FAIL ABUN
BK-247	-1.648E-02	7.849E-02	7.884E-02	FAIL ABUN
CF-249	3.881E-03	3.619E-02	3.624E-02	NOT IDENT.
CF-251	1.658E-01	1.913E-01	2.053E-01	FAIL ABUN
ANH-511	-7.462E-03	5.065E-02	5.076E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	62.9377	879.38	77.4414	482.18	66.2441
45.60	71.0732	87.57	77.4662	133.52	62.1524
46.54	56.6870	87.09	77.4911	264.66	54.0733
49.72	0.0000	87.57	76.2976	122.06	58.2747
51.35	44.4594	88.03	76.3708	140.51	0.0000
51.87	60.2444	88.34	76.4203	143.76	72.5976
52.39	64.7096	193.51	76.4410	144.24	63.1732
52.97	54.3087	89.96	72.8428	145.44	45.3542
53.44	43.8576	90.64	72.9449	152.43	53.9833
125.81	43.9379	91.11	0.0000	153.25	0.0000
57.36	0.0000	63.29	73.2342	154.21	58.7480
57.53	56.7952	143.76	73.3461	156.02	0.0000
57.98	54.2001	94.56	65.7842	158.56	0.0000
1093.63	59.7424	94.65	65.7961	159.00	56.9910
57.98	62.4257	94.67	65.7987	162.33	62.6525
59.54	61.8682	94.87	65.8247	162.66	0.0000
60.96	56.1338	97.43	58.3736	163.33	53.0023
61.17	56.1653	311.90	46.7893	165.86	59.6955
62.93	66.6320	946.00	46.7904	176.31	41.8118
63.29	66.6947	99.53	53.4008	1048.07	0.0000
63.58	66.7451	1221.41	46.9409	177.52	42.6109
64.28	66.8660	265.00	41.2233	739.50	0.0000
66.73	67.8911	103.18	49.8371	181.52	59.0714
67.24	86.1867	103.37	49.8549	711.68	60.0257
67.68	90.2309	116.74	49.8549	185.72	60.1230
67.75	90.2467	105.21	59.2406	193.51	48.3304
69.67	72.0521	105.31	59.2516	197.03	55.3052
70.83	97.9736	106.12	45.4939	127.23	49.7189
72.81	62.7549	106.47	70.2638	306.78	48.8061
279.20	62.7638	109.28	59.6814	203.43	57.9937
72.87	62.7638	111.00	52.8811	205.31	51.6613
74.66	63.0289	228.16	0.0000	210.85	48.9284
74.82	63.0522	114.06	55.1733	215.65	46.1163
1063.66	63.0745	116.30	0.0000	222.11	55.7314
238.63	63.3863	116.74	57.4453	290.67	39.6876
351.93	63.3863	119.76	43.5593	177.52	46.7059
78.74	63.6213	121.12	48.7357	228.16	0.0000
79.69	63.7567	121.22	48.7438	228.18	50.2515
80.12	51.3046	121.78	45.7399	235.69	43.9733
80.19	0.0000	122.06	54.9134	256.23	41.2367
80.57	53.8611	122.92	54.9921	238.63	41.3499
81.00	50.1514	123.07	49.9125	238.98	0.0000
81.07	50.1591	123.68	57.1006	240.99	41.4498
81.75	65.3042	125.81	60.0287	242.00	41.4920
323.87	64.3336	127.23	69.7388	344.28	41.6058
84.00	64.3627	127.91	63.6556	252.40	0.0000
85.43	92.4099	129.30	63.7975	252.80	39.5450
86.55	77.4029	131.20	63.9905	254.15	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
256.23	38.4753	351.93	28.7159	583.19	19.0866
260.90	0.0000	507.63	0.0000	584.27	19.0966
264.66	37.5760	356.01	26.1865	595.83	0.0000
264.80	35.1561	364.49	0.0000	600.60	18.2424
265.00	40.0123	366.42	0.0000	602.52	0.0000
268.22	43.7827	372.51	28.2773	604.72	16.7565
269.46	42.6167	129.30	19.4765	607.14	30.5029
270.03	34.1113	377.52	22.1720	609.32	25.9555
271.23	51.2247	383.85	26.7279	497.08	25.9690
273.65	0.0000	388.16	25.0229	433.94	16.8364
356.01	41.6658	388.63	0.0000	696.49	9.2003
277.37	39.2500	391.69	29.0270	620.36	12.2813
277.60	39.2578	400.66	25.6930	621.93	11.2663
278.00	41.7270	401.81	25.7133	667.71	0.0000
279.20	56.5159	402.40	25.7238	631.29	10.2889
279.54	54.0748	404.85	8.1370	453.88	16.9921
279.70	54.0829	410.95	20.4272	595.83	0.0000
280.46	44.2804	413.71	31.3800	635.95	6.1870
283.69	40.7092	414.70	0.0000	636.99	0.0000
364.49	0.0000	423.72	0.0000	645.85	13.4687
285.41	39.5361	404.85	24.7780	884.68	18.7537
285.90	0.0000	427.87	27.5452	657.90	0.0000
402.40	33.0086	433.94	30.4199	661.66	13.5686
290.67	29.7913	333.97	31.4524	664.57	0.0000
293.27	0.0000	453.88	22.4067	666.33	0.0000
295.22	29.9106	463.37	19.7221	720.70	0.0000
295.96	29.9297	468.07	16.9534	667.71	0.0000
298.58	43.3312	685.70	0.0000	677.62	9.4629
299.98	39.0448	475.06	15.1338	685.70	0.0000
300.09	39.0486	476.78	27.4589	695.00	0.0000
300.13	39.0495	477.60	24.6305	696.49	12.7251
301.36	41.7643	482.18	18.0487	696.51	12.7251
302.85	32.6174	1596.21	0.0000	697.00	0.0000
304.50	30.9884	527.90	0.0000	697.30	15.9119
537.26	0.0000	497.08	20.1246	697.49	13.7916
306.78	31.0486	505.52	26.0013	702.65	18.0763
316.51	27.2274	507.63	0.0000	706.68	18.1088
311.90	35.3973	511.00	35.7436	711.68	11.7430
316.51	30.4570	514.00	59.9969	720.70	0.0000
531.02	0.0000	514.00	59.9969	721.93	0.0000
320.08	0.0000	520.40	19.4238	1690.97	18.2361
427.87	38.2132	238.98	0.0000	722.91	15.0191
323.87	21.2789	522.65	0.0000	1274.44	17.1673
325.23	35.7878	527.90	0.0000	724.19	20.3939
328.76	0.0000	528.26	17.5591	727.33	18.2721
388.16	33.4498	520.40	18.5477	733.00	12.9292
333.97	39.9013	529.87	0.0000	735.93	21.5755
334.37	39.9146	531.02	0.0000	737.46	10.7951
338.28	32.7189	537.26	0.0000	739.50	0.0000
911.20	32.7204	546.56	0.0000	747.24	10.8398
340.48	25.8752	552.55	17.7935	748.06	7.5905
340.55	0.0000	563.25	17.8945	752.31	16.2939
344.28	26.9902	795.86	17.9524	753.82	0.0000
345.93	22.8674	569.50	17.9539	756.73	18.5011
351.06	28.6971	569.70	17.9553	756.80	18.5011

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
763.94	15.2817	984.45	0.0000	1596.21	0.0000
765.81	15.2931	996.26	15.1645	1620.50	6.3270
766.42	14.2045	1001.03	13.4015	1621.92	7.3841
766.84	16.3928	1002.74	12.5153	1678.03	0.0000
772.60	0.0000	1004.73	16.1016	1690.97	6.4244
776.52	0.0000	1021.30	0.0000	1750.46	0.0000
777.92	0.0000	1025.87	0.0000	1764.49	1.7396
778.90	6.5896	1028.54	0.0000	1770.23	6.5310
783.70	0.0000	846.77	8.1381	1771.35	2.1776
727.33	9.9104	1038.76	0.0000	1791.20	0.0000
792.07	20.9784	1046.59	11.7876	1808.65	0.0000
794.95	7.7377	1048.07	0.0000	846.75	0.0000
795.86	9.9521	1049.04	7.2598	1836.06	0.0000
801.95	15.5187	621.93	6.3549		
810.06	14.4563	1063.66	13.1282		
810.29	13.3457	1077.00	0.0000		
810.45	12.2345	1077.34	2.9299		
810.76	12.2358	1085.87	8.2617		
815.77	0.0000	1093.63	11.0420		
818.51	0.0000	1099.45	11.0618		
832.01	12.3374	1112.07	13.8803		
834.85	11.2280	1112.84	10.5783		
835.71	12.3549	1115.54	7.4106		
1260.41	0.0000	609.32	8.9057		
846.75	0.0000	889.28	8.9063		
846.77	9.0234	1121.30	5.9391		
856.80	0.0000	1129.67	12.0939		
860.56	5.1022	1131.51	0.0000		
702.65	4.5531	1147.95	0.0000		
873.19	9.1133	1173.23	15.0771		
529.87	0.0000	1177.95	9.0586		
879.38	4.5671	1189.05	9.0873		
880.51	11.4225	1204.77	15.2139		
883.24	10.2905	1221.41	13.3745		
884.68	5.7200	1231.02	18.3914		
889.28	14.8969	1235.36	0.0000		
903.28	18.3711	1238.28	12.4771		
898.04	11.4958	1260.41	0.0000		
900.72	17.2601	1271.87	3.0998		
903.28	10.3656	1274.44	9.3059		
911.20	16.1704	1274.54	9.3059		
912.08	16.1755	1099.45	9.7382		
923.98	0.0000	1298.22	0.0000		
926.50	8.1291	1312.11	0.0000		
929.11	9.2992	1332.49	9.8438		
937.49	11.6581	1362.66	0.0000		
944.13	0.0000	1365.19	3.9707		
946.00	14.9082	1368.63	0.0000		
949.00	6.1451	1384.29	2.9925		
954.55	0.0000	1408.01	3.0104		
962.31	16.9318	1457.56	0.0000		
964.08	14.1187	1460.82	8.1318		
966.17	14.1289	696.51	5.1169		
968.97	14.1421	1505.03	5.1361		
983.53	0.0000	1584.12	8.3682		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235059.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM07.CNF;484
Background date : 2-OCT-2016 11:00:17.
Sample date     : 16-DEC-2015 12:26:00 Acquisition date : 3-OCT-2016 07:52:25.
Sample ID      : G405235059 Sample quantity   : 1.54222E+02 GRAM
Detector name  : GAM07 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.48 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1596252 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.60*	15	144	1.36	127.70	124	7	4.04E-03	144.1	
2	2	72.79	29	97	1.24	146.07	143	17	8.04E-03	54.1	1.91E+00
3	2	74.78*	152	115	1.08	150.05	143	17	4.23E-02	13.8	
4	2	77.22	184	113	1.07	154.93	143	17	5.11E-02	11.8	
5	0	87.32	66	157	1.23	175.11	171	8	1.83E-02	35.2	
6	0	92.80*	71	121	1.62	186.09	183	7	1.98E-02	30.0	
7	0	134.52	38	90	0.71	269.50	266	8	1.06E-02	46.7	
8	0	148.88	16	49	0.66	298.21	296	5	4.52E-03	69.4	
9	0	179.99	17	99	0.62	360.41	359	8	4.86E-03	100.4	
10	0	186.25*	68	108	0.79	372.93	368	10	1.90E-02	32.1	
11	0	209.57	49	102	1.94	419.57	415	11	1.36E-02	42.5	
12	4	238.62*	351	53	1.15	477.65	471	28	9.75E-02	6.5	1.45E+00
13	4	241.92	99	65	1.87	484.24	471	28	2.76E-02	21.5	
14	0	278.61	26	46	1.41	557.62	553	10	7.15E-03	52.7	
15	0	295.23*	138	53	1.33	590.84	586	11	3.84E-02	13.6	
16	0	338.34*	71	51	1.08	677.05	673	10	1.98E-02	22.8	
17	0	352.03*	198	60	1.24	704.43	698	12	5.51E-02	10.7	
18	0	382.20	12	21	0.78	764.75	762	7	3.33E-03	69.6	
19	0	399.15	20	35	1.03	798.65	794	11	5.52E-03	62.4	
20	0	452.96	23	44	1.83	906.24	896	16	6.46E-03	67.0	
21	0	463.12	32	27	1.23	926.56	921	11	8.87E-03	36.4	
22	2	510.65*	15	22	1.85	1021.59	1016	16	4.28E-03	93.3	9.12E-01
23	2	513.20	19	20	1.69	1026.69	1016	16	5.37E-03	62.8	
24	2	583.03*	110	17	1.92	1166.33	1159	27	3.06E-02	12.6	2.47E+00
25	2	588.34*	19	18	1.93	1176.94	1159	27	5.36E-03	49.1	
26	0	598.02	10	30	0.50	1196.30	1187	12	2.78E-03	114.0	
27	0	609.32*	159	58	1.63	1218.89	1210	18	4.42E-02	13.9	
28	0	657.01	24	18	2.79	1314.27	1305	15	6.58E-03	44.8	
29	0	661.62	25	10	1.98	1323.48	1319	10	6.94E-03	31.0	
30	0	670.17	7	32	4.30	1340.57	1328	16	1.94E-03	184.6	
31	0	727.18*	34	28	1.59	1454.57	1448	14	9.39E-03	38.0	
32	0	769.31	35	23	6.17	1538.83	1528	19	9.72E-03	37.3	
33	0	860.05	17	9	0.78	1720.29	1715	10	4.60E-03	43.1	
34	0	911.05*	44	15	0.96	1822.26	1815	13	1.23E-02	25.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	963.99	14	8	0.63	1928.14	1922	9	3.79E-03	47.7	
36	0	968.61*	50	18	1.51	1937.38	1932	11	1.39E-02	22.5	
37	0	1121.69	29	36	2.37	2243.49	2232	18	8.19E-03	51.1	
38	0	1236.82	39	10	4.95	2473.72	2464	20	1.08E-02	25.5	
39	0	1244.12	14	3	1.57	2488.33	2485	8	3.89E-03	35.7	
40	0	1250.13	21	0	1.06	2500.33	2494	13	5.83E-03	21.8	
41	0	1460.43*	277	9	2.49	2920.91	2914	16	7.69E-02	6.5	
42	0	1763.79*	32	0	1.67	3527.61	3521	13	8.98E-03	19.1	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235059.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 16-DEC-2015 12:26:00 Acquisition date : 3-OCT-2016 07:52:25
Sample ID         : G405235059 Sample quantity   : 154.22 GRAM
Sample type       : SOLID Sample geometry    :
Detector name    : GAMMA7 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.48 0.0%
Energy tolerance : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type  : Linear Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.122E+00	1.089E+01	1.089E+01	13.08	OK
KR-85	514.00	0.43*	2.624E+00	8.956E+00	9.438E+00	125.53	OK
SR-85	514.00	96.00*	2.624E+00	4.049E-02	9.167E-01	125.53	OK
CD-109	88.03	3.70*	5.750E+00	1.010E+00	1.566E+00	137.29	OK
SN-126	64.28	9.60	3.539E+00	2.749E-01	2.749E-01	288.28	OK
	86.94	8.90	5.750E+00	4.201E-01	4.201E-01	137.29	OK
	87.57	37.00*	5.750E+00	1.010E-01	1.010E-01	137.29	OK
BA-137M	661.66	89.90*	2.138E+00	6.687E-02	6.811E-02	61.97	OK
CS-137	661.66	85.10*	2.138E+00	7.064E-02	7.195E-02	61.97	OK
CE-144	80.12	1.36	5.243E+00	----- Line	Not Found	-----	Absent
	133.52	11.09*	6.655E+00	3.103E-01	6.312E-01	93.36	OK
HG-203	70.83	3.69	4.380E+00	----- Line	Not Found	-----	Absent
	72.87	6.19	4.582E+00	6.482E-01	4.981E+01	108.28	OK
	279.20	81.56*	4.361E+00	1.716E-02	1.319E+00	252.06	OK
TL-208	277.37	6.60	4.377E+00	----- Line	Not Found	-----	<<INT Reject
	583.19	85.00*	2.366E+00	2.859E-01	2.859E-01	25.13	OK
	860.56	12.50	1.737E+00	3.815E-01	3.815E-01	86.16	OK
PB-212	74.82	10.28	4.777E+00	1.398E+00	1.398E+00	40.28	OK
	77.11	17.10	5.000E+00	1.359E+00	1.359E+00	23.60	OK
	238.63	43.60*	4.930E+00	9.310E-01	9.310E-01	12.94	OK
	300.09	3.30	4.103E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.284E+00	7.943E-01	7.946E-01	27.84	OK
	1120.29	14.92	1.404E+00	6.828E-01	6.831E-01	102.23	OK
	1764.49	15.30	9.426E-01	1.032E+00	1.032E+00	38.16	OK
PB-214	74.82	5.80	4.781E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.000E+00	2.395E+00	2.396E+00	23.60	OK
	87.09	3.41	5.736E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.877E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.159E+00	1.006E+00	1.007E+00	27.17	OK
	351.93	35.60*	3.591E+00	8.509E-01	8.512E-01	21.49	OK
RN-222	609.32	45.49*	2.284E+00	7.943E-01	7.946E-01	27.84	OK
	1120.29	14.92	1.404E+00	6.828E-01	6.831E-01	102.23	OK
	1764.49	15.30	9.426E-01	1.032E+00	1.032E+00	38.16	OK
RA-224	240.99	4.10*	4.879E+00	1.048E+00	1.048E+00	124.88	OK
RA-226	609.32	45.49*	2.284E+00	7.943E-01	7.946E-01	27.84	OK
	1120.29	14.92	1.404E+00	6.828E-01	6.831E-01	102.23	OK
	1764.49	15.30	9.426E-01	1.032E+00	1.032E+00	38.16	OK
AC-228	105.21	1.10	6.488E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.713E+00	9.407E-01	9.407E-01	45.57	OK
	794.95	4.25	1.849E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.777E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.660E+00	5.125E-01	5.125E-01	50.05	OK
	968.97	15.80	1.581E+00	9.879E-01	9.879E-01	45.02	OK
RA-228	105.21	1.10	6.488E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.713E+00	9.407E-01	9.407E-01	45.57	OK
	794.95	4.25	1.849E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.777E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.660E+00	5.125E-01	5.125E-01	50.05	OK
	968.97	15.80	1.581E+00	9.879E-01	9.879E-01	45.02	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	74.82	10.28	4.777E+00	1.398E+00	1.398E+00	40.28	OK
	77.11	17.10	5.000E+00	1.359E+00	1.359E+00	23.60	OK
	238.63	43.60*	4.930E+00	9.310E-01	9.310E-01	12.94	OK
	300.09	3.30	4.103E+00	-----	Line Not Found	-----	Absent
TH-230	609.32	45.49*	2.284E+00	7.943E-01	7.943E-01	27.84	OK
	1120.29	14.92	1.404E+00	6.828E-01	6.828E-01	102.23	OK
	1764.49	15.30	9.426E-01	1.032E+00	1.032E+00	38.16	OK
	105.21	1.10	6.488E+00	-----	Line Not Found	-----	Absent
TH-232	338.32	11.27	3.713E+00	9.407E-01	9.407E-01	45.57	OK
	835.71	1.61	1.777E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.660E+00	5.125E-01	5.125E-01	50.05	OK
	968.97	15.80	1.581E+00	9.879E-01	9.879E-01	45.02	OK
TH-234	63.29	3.70*	3.539E+00	7.133E-01	7.133E-01	288.28	OK
	92.59	4.23	6.049E+00	1.730E+00	1.730E+00	60.04	OK
U-234	609.32	45.49*	2.284E+00	7.943E-01	7.943E-01	27.84	OK
	1120.29	14.92	1.404E+00	6.828E-01	6.828E-01	102.23	OK
	1764.49	15.30	9.426E-01	1.032E+00	1.032E+00	38.16	OK
U-238	63.29	3.70*	3.539E+00	7.133E-01	7.133E-01	288.28	OK
	92.59	4.23	6.049E+00	1.730E+00	1.730E+00	60.04	OK
AM-243	43.53	5.90	6.933E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	4.777E+00	2.139E-01	2.139E-01	40.28	OK
ANH-511	511.00	100.00*	2.635E+00	3.091E-02	3.091E-02	186.67	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235059.CNF;1 *
 * Acquisition date : 3-OCT-2016 07:52:25 Sensitivity : 3.000 *
 * Detector ID : GAM07 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.48 Half life ratio : ***** *
 * Sample date : 16-DEC-2015 12:26:00 Analyst initials: MXR1 *
 * Sample ID : G405235059 Sample Quantity : 1.5422E+02 GRAM *
 * Batch Number : 1596252 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 19-AUG-2016 11:09:59 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM07_CAN.CNF;15 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.089E+01	1.396E+00	5.482E-01
KR-85	9.438E+00	1.161E+01	1.007E+01
SR-85	9.167E-01	1.128E+00	9.777E-01
CD-109	1.566E+00	2.108E+00	2.042E+00
SN-126	1.010E-01	1.360E-01	1.235E-01
BA-137M	6.811E-02	4.136E-02	5.203E-02
CS-137	7.195E-02	4.370E-02	5.497E-02
CE-144	6.312E-01	5.775E-01	6.368E-01
HG-203	1.319E+00	3.257E+00	3.283E+00
TL-208	2.859E-01	7.039E-02	5.315E-02
PB-212	9.310E-01	1.181E-01	8.188E-02
BI-214	7.946E-01	2.168E-01	1.003E-01
PB-214	8.512E-01	1.793E-01	1.119E-01
RN-222	7.946E-01	2.168E-01	1.003E-01
RA-224	1.048E+00	1.283E+00	8.779E-01
RA-226	7.946E-01	2.168E-01	1.003E-01
AC-228	5.125E-01	2.514E-01	1.938E-01
RA-228	5.125E-01	2.514E-01	1.938E-01
TH-228	9.310E-01	1.181E-01	8.188E-02
TH-230	7.943E-01	2.167E-01	1.002E-01
TH-232	5.125E-01	2.514E-01	1.938E-01
TH-234	7.133E-01	2.015E+00	1.894E+00
U-234	7.943E-01	2.167E-01	1.002E-01
U-238	7.133E-01	2.015E+00	1.894E+00
AM-243	2.139E-01	8.445E-02	7.012E-02
ANH-511	3.091E-02	5.655E-02	4.124E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	7.517E+00		1.102E+01	2.294E+01	NOT IDENT.
NA-22	-1.128E-02		3.941E-02	7.530E-02	NOT IDENT.
NA-24	0.000E+00		1.022E+41	0.000E+00	SHORT HLIF
AL-26	1.592E-02		1.801E-02	5.723E-02	NOT IDENT.

SC-46	4.706E-02	2.583E-01	5.613E-01	FAIL ABUN
V-48	0.000E+00	8.489E+03	0.000E+00	SHORT HLIF
CR-51	0.000E+00	3.034E+02	0.000E+00	SHORT HLIF
MN-54	1.713E-02	5.108E-02	1.101E-01	NOT IDENT.
CO-56	1.229E-01	3.322E-01	7.339E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	9.700E-04	4.375E-02	8.216E-02	NOT IDENT.
CO-58	-4.837E-01	5.007E-01	7.692E-01	NOT IDENT.
FE-59	-1.555E-01	4.542E+00	9.330E+00	NOT IDENT.
CO-60	-3.350E-02	3.385E-02	5.224E-02	NOT IDENT.
ZN-65	-9.375E-02	1.761E-01	2.691E-01	NOT IDENT.
GE-68	1.547E-01	2.376E+00	4.753E+00	NOT IDENT.
AS-73	1.536E+00	6.234E+00	1.259E+01	NOT IDENT.
AS-74	0.000E+00	5.219E+03	0.000E+00	SHORT HLIF
SE-75	3.439E-02	1.517E-01	3.126E-01	FAIL ABUN
BR-77	0.000E+00	2.049E+36	0.000E+00	SHORT HLIF
SR-82	0.000E+00	5.713E+02	0.000E+00	SHORT HLIF
RB-83	6.140E-02	5.735E-01	1.129E+00	NOT IDENT.
RB-86	0.000E+00	2.103E+04	0.000E+00	SHORT HLIF
Y-88	1.011E-02	1.654E-01	3.892E-01	NOT IDENT.
Y-91	1.307E+02	4.997E+02	1.013E+03	NOT IDENT.
NB-94	3.563E-03	3.026E-02	5.843E-02	NOT IDENT.
NB-95	1.723E-01	6.969E-01	1.380E+00	NOT IDENT.
NB-95M	-6.126E-01	2.043E+00	3.555E+00	NOT IDENT.
ZR-95	1.402E+00	1.311E+00	2.880E+00	NOT IDENT.
NB-97	0.000E+00	8.772E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.858E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-2.778E-03	3.109E-02	5.766E-02	NOT IDENT.
RH-102	1.395E-02	6.030E-02	1.186E-01	NOT IDENT.
RU-103	-7.381E-01	3.839E+00	7.400E+00	FAIL ABUN
RH-106	2.025E-01	4.601E-01	9.427E-01	NOT IDENT.
RU-106	2.025E-01	4.601E-01	9.427E-01	NOT IDENT.
AG-108M	-1.490E-03	2.210E-02	4.348E-02	NOT IDENT.
AG-110M	-2.896E-02	8.181E-02	1.588E-01	FAIL ABUN
SN-113	1.070E-01	1.674E-01	3.605E-01	NOT IDENT.
CD-115	0.000E+00	2.577E+38	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	5.855E+04	0.000E+00	SHORT HLIF
TE-123M	-1.493E-02	1.121E-01	2.048E-01	NOT IDENT.
SB-124	5.087E-01	1.730E+00	3.951E+00	NOT IDENT.
SB-125	-8.908E-04	9.241E-02	1.808E-01	FAIL ABUN
TE-125M	-2.700E+01	2.166E+02	4.046E+02	NOT IDENT.
I-126	0.000E+00	5.751E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	6.989E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	4.437E+21	0.000E+00	SHORT HLIF
I-131	0.000E+00	2.211E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	5.996E+25	0.000E+00	SHORT HLIF
BA-133	2.962E-02	3.615E-02	7.228E-02	NOT IDENT.
I-133	0.000E+00	1.747E+41	0.000E+00	SHORT HLIF
CS-134	4.534E-02	4.753E-02	1.030E-01	NOT IDENT.
CS-135	-7.331E-02	1.201E-01	2.259E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.051E+05	0.000E+00	SHORT HLIF
CE-139	4.492E-02	1.001E-01	1.912E-01	NOT IDENT.
BA-140	0.000E+00	7.700E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	1.968E+05	0.000E+00	SHORT HLIF
CE-141	-7.395E+00	2.023E+01	3.319E+01	NOT IDENT.
CE-143	0.000E+00	1.585E+41	0.000E+00	SHORT HLIF
PM-144	-7.689E-03	5.624E-02	1.040E-01	NOT IDENT.
PR-144	-7.228E-01	4.857E+00	8.963E+00	NOT IDENT.
PM-146	7.277E-02	9.556E-02	7.303E-02	FAIL ABUN
ND-147	0.000E+00	1.914E+07	0.000E+00	SHORT HLIF
PM-147	-1.964E+02	7.712E+02	1.416E+03	NOT IDENT.
PM-149	0.000E+00	3.386E+39	0.000E+00	SHORT HLIF
EU-150	1.155E-02	2.408E-02	4.548E-02	FAIL ABUN
EU-152	7.353E-02	8.385E-02	1.790E-01	FAIL ABUN
GD-153	-2.923E-02	1.502E-01	2.806E-01	NOT IDENT.
EU-154	-3.012E-02	9.645E-02	1.833E-01	NOT IDENT.
EU-155	1.494E-02	9.463E-02	1.818E-01	FAIL ABUN
TB-160	1.505E-01	1.227E+00	2.650E+00	FAIL ABUN
HO-166M	2.305E-02	5.073E-02	1.044E-01	NOT IDENT.
TM-171	1.147E+01	1.577E+01	3.302E+01	NOT IDENT.
HF-172	-4.844E-02	1.948E-01	3.582E-01	FAIL ABUN
LU-172	3.773E-02	6.077E-02	1.381E-01	FAIL ABUN
LU-176	1.260E-02	2.082E-02	4.372E-02	FAIL ABUN
HF-181	7.512E-01	3.840E+00	7.579E+00	FAIL ABUN

TA-182	5.890E-01	7.914E-01	1.752E+00	FAIL ABUN
RE-183	1.356E+00	2.158E+00	4.444E+00	NOT IDENT.
RE-184	1.928E+01	2.132E+01	4.980E+01	NOT IDENT.
W-188	2.429E+01	9.271E+01	1.721E+02	FAIL ABUN
IR-192	-4.843E-02	4.043E-01	7.776E-01	FAIL ABUN
BI-207	4.790E-02	4.467E-02	1.037E-01	FAIL ABUN
PB-210	1.110E+00	2.483E+00	5.099E+00	NOT IDENT.
BI-211	0.000E+00	4.938E-01	7.661E-01	FAIL ABUN
PB-211	-1.553E-01	6.407E-01	1.158E+00	NOT IDENT.
BI-212	0.000E+00	9.695E-01	1.263E+00	FAIL ABUN
RN-219	-1.461E-01	3.692E-01	6.090E-01	NOT IDENT.
RA-223	-4.198E-01	5.266E-01	9.556E-01	FAIL ABUN
AC-227	9.510E-03	1.800E-01	3.635E-01	NOT IDENT.
TH-227	9.510E-03	1.800E-01	3.635E-01	NOT IDENT.
TH-229	-3.598E-01	4.533E-01	7.603E-01	FAIL ABUN
PA-231	4.705E-02	3.484E-01	6.817E-01	NOT IDENT.
TH-231	-4.198E-01	5.266E-01	9.556E-01	FAIL ABUN
PA-233	1.272E-02	5.619E-02	1.128E-01	NOT IDENT.
PA-234	1.094E-01	2.485E-01	5.372E-01	NOT IDENT.
PA-234M	-2.999E+00	3.997E+00	7.239E+00	NOT IDENT.
U-235	-4.179E-02	1.642E-01	2.964E-01	FAIL ABUN
NP-237	1.272E-02	5.619E-02	1.128E-01	NOT IDENT.
NP-238	0.000E+00	2.881E+40	0.000E+00	SHORT HLIF
NP-239	3.381E-03	2.131E-01	4.026E-01	FAIL ABUN
PU-239	-2.255E+01	2.991E+02	5.531E+02	NOT IDENT.
AM-241	-4.930E-02	1.177E-01	2.055E-01	NOT IDENT.
CM-243	-1.268E-02	8.494E-02	1.596E-01	FAIL ABUN
BK-247	1.355E-02	5.526E-02	1.140E-01	NOT IDENT.
CM-247	-2.023E-02	3.396E-02	5.398E-02	FAIL ABUN
CF-249	-2.376E-04	3.370E-02	6.606E-02	NOT IDENT.
CF-251	5.777E-02	1.120E-01	2.005E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	268	10.66*	1.122E+00	1.089E+01	1.089E+01	13.08
KR-85	514.00	21	0.43*	2.624E+00	8.956E+00	9.438E+00	125.53
SR-85	514.00	21	96.00*	2.624E+00	4.049E-02	9.167E-01	125.53
CD-109	88.03	85	3.70*	5.750E+00	1.938E+00	3.004E+00	70.39
SN-126	64.28	19	9.60	3.539E+00	2.749E-01	2.749E-01	288.28
	86.94	85	8.90	5.750E+00	8.057E-01	8.057E-01	70.39
	87.57	85	37.00*	5.750E+00	1.938E-01	1.938E-01	70.39
BA-137M	661.66	26	89.90*	2.138E+00	6.687E-02	6.811E-02	61.97
CS-137	661.66	26	85.10*	2.138E+00	7.064E-02	7.195E-02	61.97
CE-144	80.12	-----	1.36	5.243E+00	-----	Line Not Found	-----
	133.52	47	11.09*	6.655E+00	3.103E-01	6.312E-01	93.36
HG-203	70.83	-----	3.69	4.380E+00	-----	Line Not Found	-----
	72.87	38	6.19	4.582E+00	6.482E-01	4.981E+01	108.28
	279.20	30	81.56*	4.361E+00	4.065E-02	3.123E+00	105.50
TL-208	277.37	30	6.60	4.361E+00	5.023E-01	5.023E-01	105.50
	583.19	118	85.00*	2.366E+00	2.859E-01	2.859E-01	25.13
	860.56	17	12.50	1.737E+00	3.815E-01	3.815E-01	86.16
BI-211	72.87	38	1.23	4.582E+00	3.262E+00	3.262E+00	108.28
	351.06	223	12.92*	3.591E+00	2.345E+00	2.345E+00	21.49
PB-212	74.82	198	10.28	4.777E+00	1.966E+00	1.966E+00	27.55
	77.11	239	17.10	5.000E+00	1.359E+00	1.359E+00	23.60
	238.63	411	43.60*	4.930E+00	9.310E-01	9.310E-01	12.94
	300.09	-----	3.30	4.103E+00	-----	Line Not Found	-----
BI-214	609.32	170	45.49*	2.284E+00	7.943E-01	7.946E-01	27.84
	1120.29	29	14.92	1.404E+00	6.828E-01	6.831E-01	102.23
	1764.49	31	15.30	9.426E-01	1.032E+00	1.032E+00	38.16
PB-214	74.82	198	5.80	4.777E+00	3.485E+00	3.486E+00	27.55
	77.11	239	9.70	5.000E+00	2.395E+00	2.396E+00	23.60
	87.09	85	3.41	5.750E+00	2.103E+00	2.104E+00	70.39
	242.00	116	7.25	4.879E+00	1.599E+00	1.600E+00	43.01
	295.22	158	18.42	4.159E+00	1.006E+00	1.007E+00	27.17
	351.93	223	35.60*	3.591E+00	8.509E-01	8.512E-01	21.49
RN-222	609.32	170	45.49*	2.284E+00	7.943E-01	7.946E-01	27.84
	1120.29	29	14.92	1.404E+00	6.828E-01	6.831E-01	102.23
	1764.49	31	15.30	9.426E-01	1.032E+00	1.032E+00	38.16
RA-224	240.99	116	4.10*	4.879E+00	2.828E+00	2.828E+00	43.01
RA-226	609.32	170	45.49*	2.284E+00	7.943E-01	7.946E-01	27.84
	1120.29	29	14.92	1.404E+00	6.828E-01	6.831E-01	102.23
	1764.49	31	15.30	9.426E-01	1.032E+00	1.032E+00	38.16
AC-228	105.21	-----	1.10	6.488E+00	-----	Line Not Found	-----
	338.32	81	11.27	3.713E+00	9.407E-01	9.407E-01	45.57
	794.95	-----	4.25	1.849E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.777E+00	-----	Line Not Found	-----
	911.20	45	25.80*	1.660E+00	5.125E-01	5.125E-01	50.05
	968.97	51	15.80	1.581E+00	9.879E-01	9.879E-01	45.02
RA-228	105.21	-----	1.10	6.488E+00	-----	Line Not Found	-----
	338.32	81	11.27	3.713E+00	9.407E-01	9.407E-01	45.57

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	794.95	-----	4.25	1.849E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.777E+00	-----	Line Not Found	-----
	911.20	45	25.80*	1.660E+00	5.125E-01	5.125E-01	50.05
	968.97	51	15.80	1.581E+00	9.879E-01	9.879E-01	45.02
TH-228	74.82	198	10.28	4.777E+00	1.966E+00	1.966E+00	27.55
	77.11	239	17.10	5.000E+00	1.359E+00	1.359E+00	23.60
	238.63	411	43.60*	4.930E+00	9.310E-01	9.310E-01	12.94
	300.09	-----	3.30	4.103E+00	-----	Line Not Found	-----
TH-230	609.32	170	45.49*	2.284E+00	7.943E-01	7.943E-01	27.84
	1120.29	29	14.92	1.404E+00	6.828E-01	6.828E-01	102.23
	1764.49	31	15.30	9.426E-01	1.032E+00	1.032E+00	38.16
TH-232	105.21	-----	1.10	6.488E+00	-----	Line Not Found	-----
	338.32	81	11.27	3.713E+00	9.407E-01	9.407E-01	45.57
	835.71	-----	1.61	1.777E+00	-----	Line Not Found	-----
	911.20	45	25.80*	1.660E+00	5.125E-01	5.125E-01	50.05
	968.97	51	15.80	1.581E+00	9.879E-01	9.879E-01	45.02
TH-234	63.29	19	3.70*	3.539E+00	7.133E-01	7.133E-01	288.28
	92.59	91	4.23	6.049E+00	1.730E+00	1.730E+00	60.04
U-234	609.32	170	45.49*	2.284E+00	7.943E-01	7.943E-01	27.84
	1120.29	29	14.92	1.404E+00	6.828E-01	6.828E-01	102.23
	1764.49	31	15.30	9.426E-01	1.032E+00	1.032E+00	38.16
U-238	63.29	19	3.70*	3.539E+00	7.133E-01	7.133E-01	288.28
	92.59	91	4.23	6.049E+00	1.730E+00	1.730E+00	60.04
AM-243	43.53	-----	5.90	6.933E-01	-----	Line Not Found	-----
	74.66	198	67.20*	4.777E+00	3.008E-01	3.008E-01	27.55
ANH-511	511.00	17	100.00*	2.635E+00	3.091E-02	3.091E-02	186.67

Flag: "*" = Keyline

Total number of lines in spectrum 42
 Number of unidentified lines 9
 Number of lines tentatively identified by NID 33 78.57%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.089E+01	1.089E+01	0.142E+01	13.08	
KR-85	10.56Y	1.05	8.956E+00	9.438E+00	11.85E+00	125.53	
SR-85	64.84D	22.6	4.049E-02	9.167E-01	11.51E-01	125.53	
CD-109	461.40D	1.55	1.938E+00	3.004E+00	2.115E+00	70.39	
SN-126	2.30E+05Y	1.00	1.938E-01	1.938E-01	1.364E-01	70.39	
BA-137M	30.08Y	1.02	6.687E-02	6.811E-02	4.221E-02	61.97	
CS-137	30.08Y	1.02	7.064E-02	7.195E-02	4.459E-02	61.97	
CE-144	284.91D	2.03	3.103E-01	6.312E-01	5.892E-01	93.36	
HG-203	46.59D	76.8	4.065E-02	3.123E+00	3.295E+00	105.50	
TL-208	1.41E+10Y	1.00	2.859E-01	2.859E-01	0.718E-01	25.13	
BI-211	7.04E+08Y	1.00	2.345E+00	2.345E+00	0.504E+00	21.49	
PB-212	1.41E+10Y	1.00	9.310E-01	9.310E-01	1.205E-01	12.94	
BI-214	1600.00Y	1.00	7.943E-01	7.946E-01	2.212E-01	27.84	
PB-214	1600.00Y	1.00	8.509E-01	8.512E-01	1.829E-01	21.49	
RN-222	1600.00Y	1.00	7.943E-01	7.946E-01	2.212E-01	27.84	
RA-224	1.41E+10Y	1.00	2.828E+00	2.828E+00	1.216E+00	43.01	
RA-226	1600.00Y	1.00	7.943E-01	7.946E-01	2.212E-01	27.84	
AC-228	1.41E+10Y	1.00	5.125E-01	5.125E-01	2.565E-01	50.05	
RA-228	1.41E+10Y	1.00	5.125E-01	5.125E-01	2.565E-01	50.05	
TH-228	1.41E+10Y	1.00	9.310E-01	9.310E-01	1.205E-01	12.94	
TH-230	7.54E+04Y	1.00	7.943E-01	7.943E-01	2.212E-01	27.84	
TH-232	1.41E+10Y	1.00	5.125E-01	5.125E-01	2.565E-01	50.05	
TH-234	4.47E+09Y	1.00	7.133E-01	7.133E-01	20.56E-01	288.28	
U-234	2.45E+05Y	1.00	7.943E-01	7.943E-01	2.212E-01	27.84	
U-238	4.47E+09Y	1.00	7.133E-01	7.133E-01	20.56E-01	288.28	
AM-243	7370.00Y	1.00	3.008E-01	3.008E-01	0.829E-01	27.55	
ANH-511	1.00E+09Y	1.00	3.091E-02	3.091E-02	5.771E-02	186.67	
Total Activity :			3.795E+01	4.378E+01			

Grand Total Activity : 3.795E+01 4.378E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	148.88	20	60	0.66	298.21	296	5	4.52E-03	****	6.50E+00	
0	179.99	21	118	0.62	360.41	359	8	4.86E-03	****	5.96E+00	T
0	186.25	82	129	0.79	372.93	368	10	1.90E-02	64.2	5.85E+00	T
0	209.57	58	121	1.94	419.57	415	11	1.36E-02	85.0	5.42E+00	T
0	382.20	13	23	0.78	764.75	762	7	3.33E-03	****	3.35E+00	
0	399.15	22	39	1.03	798.65	794	11	5.52E-03	****	3.23E+00	
0	452.96	26	48	1.83	906.24	896	16	6.46E-03	****	2.91E+00	T
0	463.12	35	30	1.23	926.56	921	11	8.87E-03	72.7	2.86E+00	T
2	588.34	21	19	1.93	1176.94	1159	27	5.36E-03	98.3	2.35E+00	
0	598.02	11	32	0.50	1196.30	1187	12	2.78E-03	****	2.32E+00	
0	657.01	25	19	2.79	1314.27	1305	15	6.58E-03	89.5	2.15E+00	T
0	670.17	7	34	4.30	1340.57	1328	16	1.94E-03	****	2.12E+00	
0	727.18	35	29	1.59	1454.57	1448	14	9.39E-03	76.1	1.98E+00	T
0	769.31	36	24	6.17	1538.83	1528	19	9.72E-03	74.7	1.90E+00	
0	963.99	14	8	0.63	1928.14	1922	9	3.79E-03	95.3	1.59E+00	T
0	1236.82	38	10	4.95	2473.72	2464	20	1.08E-02	51.0	1.29E+00	T
0	1244.12	14	3	1.57	2488.33	2485	8	3.89E-03	71.4	1.29E+00	
0	1250.13	21	0	1.06	2500.33	2494	13	5.83E-03	43.6	1.28E+00	

Flags: "T" = Tentatively associated

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235059.CNF;1
* Acquisition date   : 3-OCT-2016 07:52:25 Sensitivity      : 3.000
* Detector ID        : GAM07 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.48 Half life ratio  : *****
* Sample date        : 16-DEC-2015 12:26:00 Nuclide Library : SOLID
* Sample ID          : G405235059 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity  : 1.5422E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
* Dry Weight         : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 19-AUG-2016 11:09:59 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM07_CAN.CNF;15
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.186E-01
KR-85	4.402E+00
SR-85	4.275E-01
CD-109	9.696E-01
SN-126	5.842E-02
BA-137M	2.243E-02
CS-137	2.369E-02
CE-144	2.991E-01
HG-203	1.492E+00
TL-208	2.320E-02
PB-212	3.771E-02
BI-214	4.361E-02
PB-214	5.057E-02
RN-222	4.361E-02
RA-224	4.044E-01
RA-226	4.361E-02
AC-228	8.121E-02
RA-228	8.121E-02
TH-228	3.771E-02
TH-230	4.359E-02
TH-232	8.121E-02
TH-234	8.916E-01
U-234	4.359E-02
U-238	8.916E-01
AM-243	3.284E-02
ANH-511	1.803E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.042E+01	NOT IDENT.
NA-22	3.112E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.142E-02	NOT IDENT.
SC-46	2.362E-01	FAIL ABUN

V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	4.782E-02	NOT IDENT.
CO-56	3.144E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	3.849E-02	NOT IDENT.
CO-58	3.199E-01	NOT IDENT.
FE-59	3.884E+00	NOT IDENT.
CO-60	2.004E-02	NOT IDENT.
ZN-65	1.131E-01	NOT IDENT.
GE-68	2.075E+00	NOT IDENT.
AS-73	5.889E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.423E-01	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.036E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.457E-01	NOT IDENT.
Y-91	4.452E+02	NOT IDENT.
NB-94	2.589E-02	NOT IDENT.
NB-95	6.063E-01	NOT IDENT.
NB-95M	1.645E+00	NOT IDENT.
ZR-95	1.288E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.700E-02	NOT IDENT.
RH-102	5.298E-02	NOT IDENT.
RU-103	3.219E+00	FAIL ABUN
RH-106	4.190E-01	NOT IDENT.
RU-106	4.190E-01	NOT IDENT.
AG-108M	1.923E-02	NOT IDENT.
AG-110M	6.717E-02	FAIL ABUN
SN-113	1.616E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	9.524E-02	NOT IDENT.
SB-124	1.568E+00	NOT IDENT.
SB-125	8.122E-02	FAIL ABUN
TE-125M	1.888E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.286E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	4.591E-02	NOT IDENT.
CS-135	1.034E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	8.951E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.548E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
PM-144	4.621E-02	NOT IDENT.
PR-144	3.982E+00	NOT IDENT.
PM-146	3.252E-02	FAIL ABUN
ND-147	0.000E+00	SHORT HLIF
PM-147	6.623E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.081E-02	FAIL ABUN
EU-152	8.213E-02	FAIL ABUN
GD-153	1.312E-01	NOT IDENT.
EU-154	7.561E-02	NOT IDENT.
EU-155	8.512E-02	FAIL ABUN
TB-160	1.110E+00	FAIL ABUN
HO-166M	4.603E-02	NOT IDENT.
TM-171	1.548E+01	NOT IDENT.
HF-172	1.666E-01	FAIL ABUN
LU-172	5.911E-02	FAIL ABUN
LU-176	2.004E-02	FAIL ABUN
HF-181	3.427E+00	FAIL ABUN
TA-182	7.658E-01	FAIL ABUN

RE-183	2.087E+00	NOT IDENT.
RE-184	2.170E+01	NOT IDENT.
W-188	7.866E+01	FAIL ABUN
IR-192	3.560E-01	FAIL ABUN
BI-207	4.564E-02	FAIL ABUN
PB-210	2.392E+00	NOT IDENT.
BI-211	3.684E-01	FAIL ABUN
PB-211	5.221E-01	NOT IDENT.
BI-212	5.804E-01	FAIL ABUN
RN-219	2.722E-01	NOT IDENT.
RA-223	4.330E-01	FAIL ABUN
AC-227	1.661E-01	NOT IDENT.
TH-227	1.661E-01	NOT IDENT.
TH-229	3.525E-01	FAIL ABUN
PA-231	3.093E-01	NOT IDENT.
TH-231	4.330E-01	FAIL ABUN
PA-233	5.192E-02	NOT IDENT.
PA-234	2.339E-01	NOT IDENT.
PA-234M	3.101E+00	NOT IDENT.
U-235	1.385E-01	FAIL ABUN
NP-237	5.192E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	1.880E-01	FAIL ABUN
PU-239	2.599E+02	NOT IDENT.
AM-241	9.611E-02	NOT IDENT.
CM-243	7.444E-02	FAIL ABUN
BK-247	5.193E-02	NOT IDENT.
CM-247	2.403E-02	FAIL ABUN
CF-249	2.989E-02	NOT IDENT.
CF-251	9.357E-02	NOT IDENT.

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235059.CNF;1
* Acquisition date   : 3-OCT-2016 07:52:25 Sensitivity      : 3.000
* Detector ID       : GAM07 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.48 Half life ratio : *****
* Sample date       : 16-DEC-2015 12:26:00 Nuclide Library : SOLID
* Sample ID         : G405235059 Analyst initials: MXR1
* Batch Number      : 1596252 Sample Quantity : 1.5422E+02 GRAM
*                               Quantity Err(%) : 1.2968E-03 %
* Wet wt corr       : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight      : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 19-AUG-2016 11:09:59 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM07_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.089E+01	1.508E+00	1.508E+00
KR-85	9.438E+00	1.162E+01	1.162E+01
SR-85	9.167E-01	1.128E+00	1.128E+00
CD-109	1.566E+00	2.119E+00	2.119E+00
SN-126	1.010E-01	1.366E-01	1.366E-01
BA-137M	6.811E-02	4.147E-02	4.147E-02
CS-137	7.195E-02	4.381E-02	4.381E-02
CE-144	6.312E-01	5.785E-01	5.785E-01
HG-203	1.318E+00	3.264E+00	3.264E+00
TL-208	2.859E-01	7.143E-02	7.143E-02
PB-212	9.310E-01	1.280E-01	1.280E-01
BI-214	7.946E-01	2.195E-01	2.195E-01
PB-214	8.512E-01	1.827E-01	1.827E-01
RN-222	7.946E-01	2.195E-01	2.195E-01
RA-224	1.048E+00	1.289E+00	1.289E+00
RA-226	7.946E-01	2.195E-01	2.195E-01
AC-228	5.125E-01	2.528E-01	2.528E-01
RA-228	5.125E-01	2.528E-01	2.528E-01
TH-228	9.310E-01	1.280E-01	1.280E-01
TH-230	7.943E-01	2.194E-01	2.194E-01
TH-232	5.125E-01	2.528E-01	2.528E-01
TH-234	7.133E-01	2.021E+00	2.021E+00
U-234	7.943E-01	2.194E-01	2.194E-01
U-238	7.133E-01	2.021E+00	2.021E+00
AM-243	2.139E-01	8.617E-02	8.617E-02
ANH-511	3.091E-02	5.657E-02	5.657E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	7.517E+00	1.102E+01	1.153E+01	NOT IDENT.
NA-22	-1.128E-02	3.941E-02	3.974E-02	NOT IDENT.
NA-24	1.000E+41	1.107E+41	0.000E+00	SHORT HLIF
AL-26	1.592E-02	1.804E-02	1.941E-02	NOT IDENT.

SC-46	4.706E-02	2.583E-01	2.592E-01	FAIL ABUN
V-48	-3.711E+02	8.489E+03	8.491E+03	SHORT HLIF
CR-51	1.104E+02	3.035E+02	3.075E+02	SHORT HLIF
MN-54	1.713E-02	5.109E-02	5.167E-02	NOT IDENT.
CO-56	1.229E-01	3.323E-01	3.369E-01	FAIL ABUN
MN-56	1.000E+41	2.704E+41	0.000E+00	SHORT HLIF
CO-57	9.700E-04	4.375E-02	4.376E-02	NOT IDENT.
CO-58	-4.837E-01	5.012E-01	5.465E-01	NOT IDENT.
FE-59	-1.555E-01	4.542E+00	4.543E+00	NOT IDENT.
CO-60	-3.350E-02	3.388E-02	3.709E-02	NOT IDENT.
ZN-65	-9.375E-02	1.762E-01	1.812E-01	NOT IDENT.
GE-68	1.547E-01	2.376E+00	2.377E+00	NOT IDENT.
AS-73	1.536E+00	6.242E+00	6.281E+00	NOT IDENT.
AS-74	-5.451E+02	5.219E+03	5.225E+03	SHORT HLIF
SE-75	3.439E-02	1.517E-01	1.525E-01	FAIL ABUN
BR-77	1.615E+37	1.361E+38	0.000E+00	SHORT HLIF
SR-82	-2.799E+02	5.715E+02	5.852E+02	SHORT HLIF
RB-83	6.140E-02	5.736E-01	5.742E-01	NOT IDENT.
RB-86	5.340E+03	2.103E+04	2.117E+04	SHORT HLIF
Y-88	1.011E-02	1.654E-01	1.655E-01	NOT IDENT.
Y-91	1.307E+02	4.997E+02	5.032E+02	NOT IDENT.
NB-94	3.563E-03	3.026E-02	3.030E-02	NOT IDENT.
NB-95	1.723E-01	6.970E-01	7.013E-01	NOT IDENT.
NB-95M	-6.126E-01	2.043E+00	2.062E+00	NOT IDENT.
ZR-95	1.402E+00	1.312E+00	1.457E+00	NOT IDENT.
NB-97	1.000E+41	8.783E+40	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	3.836E+42	0.000E+00	SHORT HLIF
MO-99	-1.984E+29	1.858E+31	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	6.515E+41	0.000E+00	SHORT HLIF
RH-101	-2.778E-03	3.109E-02	3.112E-02	NOT IDENT.
RH-102	1.395E-02	6.031E-02	6.064E-02	NOT IDENT.
RU-103	-7.381E-01	3.839E+00	3.854E+00	FAIL ABUN
RH-106	2.025E-01	4.603E-01	4.693E-01	NOT IDENT.
RU-106	2.025E-01	4.603E-01	4.693E-01	NOT IDENT.
AG-108M	-1.490E-03	2.210E-02	2.211E-02	NOT IDENT.
AG-110M	-2.896E-02	8.183E-02	8.286E-02	FAIL ABUN
SN-113	1.070E-01	1.674E-01	1.742E-01	NOT IDENT.
CD-115	-7.974E+37	2.581E+38	0.000E+00	SHORT HLIF
SN-117M	-2.712E+04	5.864E+04	5.990E+04	SHORT HLIF
TE-123M	-1.493E-02	1.121E-01	1.123E-01	NOT IDENT.
SB-124	5.087E-01	1.730E+00	1.745E+00	NOT IDENT.
SB-125	-8.908E-04	9.241E-02	9.241E-02	FAIL ABUN
TE-125M	-2.700E+01	2.166E+02	2.170E+02	NOT IDENT.
I-126	9.486E+04	5.753E+05	5.769E+05	SHORT HLIF
SB-126	-6.315E+05	7.085E+05	7.636E+05	SHORT HLIF
SB-127	-1.457E+21	4.846E+21	0.000E+00	SHORT HLIF
I-131	6.764E+08	2.211E+09	2.232E+09	SHORT HLIF
I-132	-1.000E+41	1.919E+42	0.000E+00	SHORT HLIF
TE-132	-4.833E+25	6.293E+25	0.000E+00	SHORT HLIF
BA-133	2.962E-02	3.617E-02	3.856E-02	NOT IDENT.
I-133	1.000E+41	2.480E+41	0.000E+00	SHORT HLIF
CS-134	4.534E-02	4.757E-02	5.178E-02	NOT IDENT.
CS-135	-7.331E-02	1.202E-01	1.246E-01	NOT IDENT.
I-135	1.000E+41	8.580E+41	0.000E+00	SHORT HLIF
CS-136	-1.130E+05	2.055E+05	2.117E+05	SHORT HLIF
CE-139	4.492E-02	1.005E-01	1.025E-01	NOT IDENT.
BA-140	-6.681E+04	7.700E+05	7.706E+05	SHORT HLIF
LA-140	9.152E+04	1.969E+05	2.012E+05	SHORT HLIF
CE-141	-7.395E+00	2.024E+01	2.051E+01	NOT IDENT.
CE-143	1.000E+41	1.588E+41	0.000E+00	SHORT HLIF
PM-144	-7.689E-03	5.624E-02	5.635E-02	NOT IDENT.
PR-144	-7.228E-01	4.857E+00	4.868E+00	NOT IDENT.
PM-146	7.277E-02	9.570E-02	1.012E-01	FAIL ABUN
ND-147	4.171E+06	1.914E+07	1.924E+07	SHORT HLIF
PM-147	-1.964E+02	7.712E+02	7.763E+02	NOT IDENT.
PM-149	-6.735E+38	3.389E+39	0.000E+00	SHORT HLIF
EU-150	1.155E-02	2.409E-02	2.464E-02	FAIL ABUN
EU-152	7.353E-02	8.395E-02	9.025E-02	FAIL ABUN
GD-153	-2.923E-02	1.502E-01	1.508E-01	NOT IDENT.
EU-154	-3.012E-02	9.646E-02	9.741E-02	NOT IDENT.
EU-155	1.494E-02	9.464E-02	9.488E-02	FAIL ABUN
TB-160	1.505E-01	1.227E+00	1.229E+00	FAIL ABUN
HO-166M	2.305E-02	5.075E-02	5.180E-02	NOT IDENT.
TM-171	1.147E+01	1.581E+01	1.663E+01	NOT IDENT.
HF-172	-4.844E-02	1.950E-01	1.962E-01	FAIL ABUN
LU-172	3.773E-02	6.089E-02	6.322E-02	FAIL ABUN
LU-176	1.260E-02	2.083E-02	2.159E-02	FAIL ABUN
HF-181	7.512E-01	3.841E+00	3.856E+00	FAIL ABUN

TA-182	5.890E-01	7.917E-01	8.350E-01	FAIL ABUN
RE-183	1.356E+00	2.169E+00	2.253E+00	NOT IDENT.
RE-184	1.928E+01	2.179E+01	2.346E+01	NOT IDENT.
W-188	2.429E+01	9.275E+01	9.340E+01	FAIL ABUN
IR-192	-4.843E-02	4.043E-01	4.049E-01	FAIL ABUN
BI-207	4.790E-02	4.471E-02	4.965E-02	FAIL ABUN
PB-210	1.110E+00	2.485E+00	2.535E+00	NOT IDENT.
BI-211	2.345E+00	5.048E-01	1.171E+00	FAIL ABUN
PB-211	-1.553E-01	6.408E-01	6.446E-01	NOT IDENT.
BI-212	1.300E+00	9.717E-01	1.135E+00	FAIL ABUN
RN-219	-1.461E-01	3.697E-01	3.755E-01	NOT IDENT.
RA-223	-4.198E-01	5.272E-01	5.602E-01	FAIL ABUN
AC-227	9.510E-03	1.800E-01	1.800E-01	NOT IDENT.
TH-227	9.510E-03	1.800E-01	1.800E-01	NOT IDENT.
TH-229	-3.598E-01	4.536E-01	4.817E-01	FAIL ABUN
PA-231	4.705E-02	3.485E-01	3.492E-01	NOT IDENT.
TH-231	-4.198E-01	5.272E-01	5.602E-01	FAIL ABUN
PA-233	1.272E-02	5.619E-02	5.649E-02	NOT IDENT.
PA-234	1.094E-01	2.782E-01	2.826E-01	NOT IDENT.
PA-234M	-2.999E+00	3.999E+00	4.221E+00	NOT IDENT.
U-235	-4.179E-02	1.642E-01	1.653E-01	FAIL ABUN
NP-237	1.272E-02	5.619E-02	5.649E-02	NOT IDENT.
NP-238	-1.519E+40	2.882E+40	0.000E+00	SHORT HLIF
NP-239	3.381E-03	2.131E-01	2.131E-01	FAIL ABUN
PU-239	-2.255E+01	2.991E+02	2.993E+02	NOT IDENT.
AM-241	-4.930E-02	1.178E-01	1.199E-01	NOT IDENT.
CM-243	-1.268E-02	8.495E-02	8.514E-02	FAIL ABUN
BK-247	1.355E-02	5.532E-02	5.566E-02	NOT IDENT.
CM-247	-2.023E-02	3.413E-02	3.533E-02	FAIL ABUN
CF-249	-2.376E-04	3.370E-02	3.370E-02	NOT IDENT.
CF-251	5.777E-02	1.122E-01	1.152E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	61.8428	87.09	102.9616	136.47	51.4932
45.60	57.4230	87.57	103.0528	140.51	0.0000
46.54	57.5739	88.03	119.2779	143.76	68.8229
49.72	0.0000	88.34	119.3454	144.24	61.9794
51.35	64.1545	88.47	101.1167	145.44	73.5732
51.87	58.4010	89.96	88.7174	152.43	67.2784
52.39	58.4795	1093.63	88.8264	153.25	0.0000
52.97	60.5187	91.11	0.0000	323.87	74.4053
53.44	64.5002	92.59	96.5653	156.02	0.0000
54.07	67.5397	93.35	96.6951	158.56	0.0000
57.36	0.0000	94.56	86.6078	159.00	61.9848
57.53	65.1581	94.65	86.6214	162.33	65.7600
57.98	65.2286	94.67	86.6245	162.66	0.0000
59.27	87.2403	94.87	86.6550	163.33	59.9610
59.32	87.2507	97.43	64.2096	165.86	61.3231
59.54	80.6830	98.43	81.4719	176.31	65.6583
60.96	72.9904	98.44	81.4731	176.60	0.0000
61.17	67.7149	99.53	64.4398	177.52	52.5991
62.93	86.9879	100.11	64.5030	181.07	0.0000
63.29	87.0594	102.03	64.7113	181.52	52.8375
63.58	87.1170	103.18	68.0762	184.41	67.4647
64.28	82.9090	103.37	68.0978	143.76	49.8673
66.73	95.4640	105.21	68.3035	193.51	73.0042
67.24	85.8119	105.31	68.3146	197.03	54.9584
125.81	88.9265	106.12	48.8607	198.01	79.4667
67.75	88.9399	106.47	49.9745	201.83	73.6478
69.67	90.6631	109.28	64.3877	203.43	62.7049
70.83	81.3916	111.00	72.2227	205.31	54.2031
72.81	72.5357	111.76	0.0000	210.85	52.0322
72.87	72.5449	114.06	73.6677	215.65	54.7717
74.66	72.8130	116.30	0.0000	222.11	41.7577
74.82	72.8369	116.74	66.2425	227.09	46.1545
74.97	72.8596	119.76	68.7633	227.38	52.0432
77.11	73.1754	121.12	73.3477	228.16	0.0000
78.74	85.4764	121.22	76.6932	228.18	62.1635
79.69	78.7304	121.78	81.2066	116.74	62.1635
80.12	78.7965	122.06	73.4499	235.69	58.3753
80.19	0.0000	122.92	61.2859	235.96	52.0430
80.57	65.0300	123.07	61.2993	238.63	45.8097
81.00	73.3926	265.00	58.0073	238.98	0.0000
81.07	74.7878	125.81	64.9013	240.99	45.9091
81.75	78.0064	127.23	75.1253	242.00	45.9514
83.79	79.3555	127.91	54.9962	244.70	46.0646
84.00	84.9584	129.30	83.2195	252.40	0.0000
85.43	86.5839	131.20	66.1531	252.80	48.9774
86.55	102.8584	133.02	88.9309	254.15	0.0000
86.79	102.9040	133.52	79.9432	256.23	37.0599
86.94	102.9332	136.00	57.5141	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	31.2539	355.39	0.0000	584.27	15.8899
264.80	29.5217	356.01	20.9486	595.83	0.0000
265.00	31.2634	364.49	0.0000	427.87	22.4159
268.22	49.6361	366.42	0.0000	602.52	0.0000
269.46	37.4841	372.51	31.0698	604.72	17.6461
270.03	37.5025	375.05	26.4067	607.14	14.9889
271.23	37.5401	377.52	27.3946	609.32	15.0043
273.65	0.0000	356.01	32.7256	610.33	15.0111
276.40	27.6195	388.16	30.4388	614.28	8.0560
277.37	34.2226	388.63	0.0000	618.01	21.5194
277.60	33.3521	391.69	17.1606	620.36	21.5422
278.00	33.3629	264.66	24.4500	621.93	16.1682
279.20	33.3961	401.81	30.2247	630.19	0.0000
279.54	33.4054	402.40	31.6760	631.29	20.5656
279.70	33.4093	404.85	32.3012	633.25	22.7500
280.46	46.1864	410.95	33.7752	634.78	0.0000
283.69	38.1059	413.71	28.9996	635.95	24.9466
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	40.6318	423.72	0.0000	645.85	10.8936
285.90	0.0000	427.09	29.2358	657.76	22.9952
287.50	40.7011	427.87	26.3249	657.90	0.0000
290.67	33.2642	433.94	20.5493	661.66	13.1621
293.27	0.0000	439.40	25.5239	664.57	0.0000
351.93	39.1714	453.88	21.7793	666.33	0.0000
295.96	39.1947	463.37	21.8971	666.50	0.0000
879.38	33.4732	468.07	13.4725	667.71	0.0000
299.98	25.4675	473.00	0.0000	677.62	14.3558
300.09	25.4698	475.06	22.0407	685.70	0.0000
300.13	25.4709	476.78	28.0786	695.00	0.0000
301.36	29.5209	477.60	23.0749	696.49	23.3729
302.85	42.0937	482.18	27.1566	696.51	23.3729
256.23	33.1797	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	22.2673
306.78	30.5434	497.08	17.2369	697.49	23.3823
308.46	38.6774	505.52	22.9161	702.65	18.9687
311.90	40.5835	507.63	0.0000	706.68	16.7645
316.51	38.9145	511.00	16.3428	711.68	13.4390
319.41	0.0000	514.00	16.3685	720.70	0.0000
320.08	0.0000	514.00	16.3685	721.93	0.0000
321.04	28.1499	520.40	21.5554	722.78	15.1864
323.87	44.5887	520.69	0.0000	722.91	11.8125
325.23	50.0978	522.65	0.0000	723.31	11.8142
328.76	0.0000	527.90	0.0000	724.19	3.3767
333.37	20.8916	528.26	22.6732	727.33	15.7773
333.97	30.2513	529.59	18.5632	733.00	11.8599
334.37	33.0110	529.87	0.0000	735.93	9.0465
338.28	28.5056	531.02	0.0000	333.97	10.1836
338.32	28.5069	537.26	0.0000	739.50	0.0000
311.90	24.8665	546.56	0.0000	747.24	7.9508
340.48	24.8665	552.55	20.8643	748.06	14.7705
340.55	0.0000	563.25	15.7306	752.31	14.7948
344.28	27.7039	569.33	29.4504	753.82	0.0000
345.93	27.7362	946.00	29.4526	756.73	11.4001
351.06	29.6921	569.70	28.4030	756.80	11.4006
351.93	29.7096	583.19	15.8813	884.68	17.1478

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	14.8720	1274.44	12.9998	1620.50	5.4312
766.42	14.8757	1001.03	16.7388	1621.92	2.1731
766.84	14.8778	1002.74	15.8171	1678.03	0.0000
772.60	0.0000	1004.73	12.1030	1690.97	3.3058
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	2.2360
778.90	16.0958	1028.54	0.0000	1063.66	3.3576
783.70	0.0000	1037.84	9.4037	1771.35	1.1194
785.37	19.5926	1038.76	0.0000	1791.20	0.0000
792.07	24.2633	631.29	16.0288	1808.65	0.0000
794.95	15.0360	1048.07	0.0000	1810.72	0.0000
795.86	11.5702	1049.04	14.1531	1836.06	2.7199
810.06	17.4463	1050.41	11.3269		
810.29	17.4475	1063.66	7.5811		
344.28	18.6120	1077.00	0.0000		
810.76	18.6139	1077.34	15.2227		
815.77	0.0000	1085.87	13.3523		
1048.07	0.0000	1093.63	6.6911		
832.01	16.7056	1099.45	8.6177		
834.85	11.4417	1112.07	6.5893		
835.71	10.5648	1112.84	9.2268		
836.80	0.0000	1115.54	15.3896		
846.75	0.0000	1120.29	10.5945		
846.77	8.8388	1120.55	10.5958		
856.80	0.0000	1221.41	10.5978		
860.56	9.9473	1129.67	6.7599		
871.09	15.1536	1131.51	0.0000		
873.19	8.9203	1147.95	0.0000		
875.33	0.0000	1173.23	17.5924		
879.38	8.0456	1177.95	15.6572		
880.51	12.5200	1189.05	10.7966		
883.24	5.3707	1204.77	14.7849		
884.68	13.4335	1221.41	8.9099		
889.28	8.0725	1231.02	6.3516		
894.76	12.5807	1235.36	0.0000		
898.04	8.9963	1238.28	12.7273		
900.72	14.4067	1260.41	0.0000		
903.28	7.2095	1271.87	8.0234		
911.20	9.0359	1274.44	10.0360		
912.08	13.0153	1274.54	10.0360		
923.98	0.0000	1291.59	9.0714		
926.50	9.0817	1298.22	0.0000		
929.11	9.9983	1312.11	0.0000		
937.49	21.8745	1332.49	11.2001		
944.13	0.0000	1362.66	0.0000		
946.00	10.9673	1365.19	4.1050		
949.00	19.2113	1368.63	0.0000		
667.71	0.0000	1384.29	6.1857		
962.31	11.7598	1408.01	6.2201		
964.08	22.0620	1457.56	0.0000		
966.17	22.0767	1460.82	5.2466		
911.20	10.3117	1489.16	4.2241		
968.97	10.3117	1505.03	10.5975		
983.53	0.0000	1584.12	9.7020		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235060.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM18.CNF;511
Background date : 2-OCT-2016 11:01:02.
Sample date     : 16-DEC-2015 12:33:00 Acquisition date : 3-OCT-2016 07:52:52.
Sample ID      : G405235060 Sample quantity   : 1.52266E+02 GRAM
Detector name   : GAM18 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.97 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1596252 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	52.18	14	130	1.29	105.19	101	7	3.75E-03	142.4	
2	0	63.20*	11	195	1.10	127.21	122	9	2.97E-03	243.0	
3	4	74.85	151	154	1.15	150.50	146	13	4.21E-02	15.8	4.04E-01
4	4	77.19*	196	142	1.18	155.16	146	13	5.45E-02	12.8	
5	0	84.19*	30	127	1.13	169.15	166	6	8.40E-03	63.6	
6	4	87.07	93	106	1.34	174.91	172	21	2.58E-02	20.1	2.30E+00
7	4	89.95	74	119	1.16	180.67	172	21	2.05E-02	27.0	
8	4	92.65*	92	113	1.12	186.05	172	21	2.56E-02	24.3	
9	0	98.34	83	101	2.24	197.43	193	9	2.30E-02	24.8	
10	3	105.29	55	98	1.38	211.31	205	15	1.52E-02	35.0	1.67E+00
11	3	107.63	32	64	1.04	216.00	205	15	8.93E-03	45.0	
12	0	129.29	30	124	1.11	259.27	255	8	8.40E-03	67.0	
13	0	166.52	94	215	5.83	333.68	324	19	2.61E-02	39.1	
14	0	209.69	74	161	1.29	419.95	414	13	2.05E-02	37.4	
15	4	238.86*	414	95	1.23	478.25	473	16	1.15E-01	6.3	5.06E+00
16	4	241.93	131	68	1.53	484.38	473	16	3.63E-02	17.1	
17	0	277.02	44	70	1.73	554.50	550	9	1.21E-02	38.2	
18	0	295.58*	199	99	1.08	591.59	586	12	5.53E-02	12.4	
19	0	328.12	52	96	6.58	656.64	648	16	1.45E-02	44.7	
20	0	337.01*	25	211	1.46	674.41	671	18	6.91E-03	140.8	
21	0	352.22*	359	98	1.30	704.79	698	14	9.98E-02	8.0	
22	0	463.23	27	44	1.48	926.66	921	10	7.47E-03	50.4	
23	0	511.13*	64	86	3.11	1022.40	1013	19	1.77E-02	41.8	
24	0	584.24*	130	90	1.10	1168.51	1160	19	3.62E-02	20.5	
25	0	609.73*	265	89	1.94	1219.48	1213	17	7.36E-02	10.5	
26	0	661.89	51	24	2.64	1323.73	1317	12	1.42E-02	23.8	
27	0	728.51	50	33	0.90	1456.88	1449	14	1.38E-02	28.9	
28	0	770.32	52	55	4.57	1540.47	1527	22	1.45E-02	38.9	
29	0	794.93*	25	22	2.36	1589.66	1582	15	7.05E-03	46.7	
30	0	861.65	30	24	1.63	1723.03	1715	14	8.39E-03	39.2	
31	0	912.24*	121	35	1.79	1824.15	1816	18	3.36E-02	15.2	
32	0	936.58	34	59	2.90	1872.80	1862	26	9.49E-03	60.8	
33	0	970.08*	53	41	1.53	1939.78	1933	14	1.47E-02	29.9	
34	0	1072.48	7	31	0.49	2144.48	2134	16	1.96E-03	173.7	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1100.48	34	28	8.92	2200.47	2187	23	9.46E-03	44.2	
36	0	1121.39*	51	31	2.03	2242.26	2236	12	1.42E-02	27.2	
37	0	1238.36	52	8	1.96	2476.12	2467	17	1.43E-02	19.0	
38	0	1281.49	26	17	8.79	2562.33	2551	22	7.34E-03	43.8	
39	0	1416.11	14	7	1.58	2831.50	2825	14	3.89E-03	48.2	
40	0	1461.62*	538	0	2.88	2922.49	2912	20	1.49E-01	4.4	
41	0	1624.62	8	7	1.34	3248.40	3240	13	2.08E-03	79.0	
42	0	1766.95*	25	21	1.91	3533.01	3522	16	7.02E-03	46.2	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235060.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 16-DEC-2015 12:33:00 Acquisition date : 3-OCT-2016 07:52:52
Sample ID        : G405235060 Sample quantity  : 152.27 GRAM
Sample type       : SOLID Sample geometry   :
Detector name    : GAMMA18 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.97 0.0%
Energy tolerance : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error  : 0.00 %
Efficiency type  : Linear Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.911E+00	1.258E+01	1.258E+01	8.70	OK
AS-73	53.44	10.30*	1.379E+00	6.226E-01	7.731E+00	284.82	OK
CD-109	88.03	3.70*	6.119E+00	1.619E+00	2.510E+00	65.60	OK
SN-126	64.28	9.60	3.086E+00	2.325E-01	2.325E-01	486.00	OK
	86.94	8.90	6.119E+00	6.732E-01	6.732E-01	65.60	OK
	87.57	37.00*	6.119E+00	1.619E-01	1.619E-01	65.60	OK
BA-137M	661.66	89.90*	3.371E+00	8.731E-02	8.893E-02	47.55	OK
CS-137	661.66	85.10*	3.371E+00	9.223E-02	9.395E-02	47.55	OK
CE-139	165.86	80.00*	7.900E+00	8.805E-02	3.828E-01	78.21	OK
EU-155	86.55	30.70	6.119E+00	1.952E-01	2.193E-01	65.60	OK
	105.31	21.10*	7.389E+00	2.170E-01	2.439E-01	70.02	OK
TM-171	51.35	0.27	1.379E+00	2.375E+01	3.169E+01	284.82	OK
	52.39	0.47*	1.379E+00	1.364E+01	1.821E+01	284.82	OK
	66.73	0.14	3.622E+00	-----	Line Not Found	-----	Absent
TL-208	277.37	6.60	6.132E+00	6.083E-01	6.083E-01	76.34	OK
	583.19	85.00*	3.673E+00	2.195E-01	2.195E-01	41.05	OK
	860.56	12.50	2.812E+00	4.335E-01	4.335E-01	78.30	OK
BI-211	72.87	1.23	4.495E+00	-----	Line Not Found	-----	Absent
	351.06	12.92*	5.219E+00	9.795E-02	9.795E-02	868.18	OK
PB-212	74.82	10.28	4.756E+00	1.387E+00	1.387E+00	46.14	OK
	77.11	17.10	5.050E+00	1.440E+00	1.440E+00	25.57	OK
	238.63	43.60*	6.719E+00	8.109E-01	8.109E-01	12.67	OK
	300.09	3.30	5.819E+00	-----	Line Not Found	-----	Absent
BI-214	609.32	45.49*	3.566E+00	8.545E-01	8.548E-01	21.01	OK
	1120.29	14.92	2.335E+00	7.203E-01	7.205E-01	54.33	OK
	1764.49	15.30	1.634E+00	-----	Line Not Found	-----	Absent
PB-214	74.82	5.80	4.752E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	5.050E+00	2.539E+00	2.540E+00	25.57	OK
	87.09	3.41	6.121E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	6.668E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	5.877E+00	1.033E+00	1.033E+00	24.89	OK
	351.93	35.60*	5.221E+00	-----	Line Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	3.566E+00	8.545E-01	8.548E-01	21.01	OK
	1120.29	14.92	2.335E+00	7.203E-01	7.205E-01	54.33	OK
	1764.49	15.30	1.634E+00	-----	Line Not Found	-----	Absent
RA-224	240.99	4.10*	6.669E+00	9.142E-01	9.142E-01	113.85	OK
RA-226	609.32	45.49*	3.566E+00	8.545E-01	8.548E-01	21.01	OK
	1120.29	14.92	2.335E+00	7.203E-01	7.205E-01	54.33	OK
	1764.49	15.30	1.634E+00	-----	Line Not Found	-----	Absent
AC-228	105.21	1.10	7.389E+00	4.163E+00	4.163E+00	70.02	OK
	338.32	11.27	5.379E+00	2.278E-01	2.278E-01	281.64	OK
	794.95	4.25	2.973E+00	1.022E+00	1.022E+00	93.48	OK
	835.71	1.61	2.872E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	2.703E+00	8.687E-01	8.687E-01	30.43	OK
	968.97	15.80	2.589E+00	6.436E-01	6.436E-01	59.83	OK
RA-228	105.21	1.10	7.389E+00	4.163E+00	4.163E+00	70.02	OK
	338.32	11.27	5.379E+00	2.278E-01	2.278E-01	281.64	OK
	794.95	4.25	2.973E+00	1.022E+00	1.022E+00	93.48	OK
	835.71	1.61	2.872E+00	-----	Line Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	911.20	25.80*	2.703E+00	8.687E-01	8.687E-01	30.43	OK
	968.97	15.80	2.589E+00	6.436E-01	6.436E-01	59.83	OK
TH-228	74.82	10.28	4.756E+00	1.387E+00	1.387E+00	46.14	OK
	77.11	17.10	5.050E+00	1.440E+00	1.440E+00	25.57	OK
	238.63	43.60*	6.719E+00	8.109E-01	8.109E-01	12.67	OK
	300.09	3.30	5.819E+00	-----	Line Not Found	-----	Absent
TH-229	85.43	14.70	5.837E+00	2.220E-01	2.220E-01	127.28	OK
	88.47	24.00	6.119E+00	2.496E-01	2.497E-01	65.60	OK
	193.51	4.41*	7.490E+00	-----	Line Not Found	-----	Absent
	210.85	2.80	7.213E+00	2.121E+00	2.121E+00	74.87	OK
TH-230	609.32	45.49*	3.566E+00	8.545E-01	8.545E-01	21.01	OK
	1120.29	14.92	2.335E+00	7.203E-01	7.203E-01	54.33	OK
	1764.49	15.30	1.634E+00	-----	Line Not Found	-----	Absent
TH-232	105.21	1.10	7.389E+00	4.163E+00	4.163E+00	70.02	OK
	338.32	11.27	5.379E+00	2.278E-01	2.278E-01	281.64	OK
	835.71	1.61	2.872E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	2.703E+00	8.687E-01	8.687E-01	30.43	OK
	968.97	15.80	2.589E+00	6.436E-01	6.436E-01	59.83	OK
TH-234	63.29	3.70*	3.086E+00	6.033E-01	6.033E-01	486.00	OK
	92.59	4.23	6.599E+00	2.060E+00	2.060E+00	48.52	OK
U-234	609.32	45.49*	3.566E+00	8.545E-01	8.545E-01	21.01	OK
	1120.29	14.92	2.335E+00	7.203E-01	7.203E-01	54.33	OK
	1764.49	15.30	1.634E+00	-----	Line Not Found	-----	Absent
U-238	63.29	3.70*	3.086E+00	6.033E-01	6.033E-01	486.00	OK
	92.59	4.23	6.599E+00	2.060E+00	2.060E+00	48.52	OK
AM-243	43.53	5.90	3.443E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	4.756E+00	2.122E-01	2.122E-01	46.14	OK
ANH-511	511.00	100.00*	4.028E+00	8.422E-02	8.422E-02	83.59	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235060.CNF;1 *
 * Acquisition date : 3-OCT-2016 07:52:52 Sensitivity : 3.000 *
 * Detector ID : GAM18 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.97 Half life ratio : ***** *
 * Sample date : 16-DEC-2015 12:33:00 Analyst initials: MXR1 *
 * Sample ID : G405235060 Sample Quantity : 1.5227E+02 GRAM *
 * Batch Number : 1596252 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 25-JUN-2016 08:25:19 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM18_CAN.CNF;10 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.258E+01	1.073E+00	4.220E-01
AS-73	7.731E+00	2.158E+01	1.736E+01
CD-109	2.510E+00	1.614E+00	1.485E+00
SN-126	1.619E-01	1.041E-01	9.638E-02
BA-137M	8.893E-02	4.144E-02	4.779E-02
CS-137	9.395E-02	4.377E-02	5.049E-02
CE-139	3.828E-01	2.934E-01	1.495E-01
EU-155	2.439E-01	1.674E-01	1.640E-01
TM-171	1.821E+01	5.082E+01	4.304E+01
TL-208	2.195E-01	8.832E-02	4.724E-02
BI-211	9.795E-02	8.334E-01	2.654E-01
PB-212	8.109E-01	1.007E-01	7.359E-02
BI-214	8.548E-01	1.760E-01	1.083E-01
PB-214	1.069E+00	1.672E-01	2.692E-01
RN-222	8.548E-01	1.760E-01	1.083E-01
RA-224	9.142E-01	1.020E+00	7.882E-01
RA-226	8.548E-01	1.760E-01	1.083E-01
AC-228	8.687E-01	2.591E-01	1.617E-01
RA-228	8.687E-01	2.591E-01	1.617E-01
TH-228	8.109E-01	1.007E-01	7.359E-02
TH-229	-3.947E-02	3.454E-01	6.788E-01
TH-230	8.545E-01	1.759E-01	1.082E-01
TH-232	8.687E-01	2.591E-01	1.617E-01
TH-234	6.033E-01	2.874E+00	2.136E+00
U-234	8.545E-01	1.759E-01	1.082E-01
U-238	6.033E-01	2.874E+00	2.136E+00
AM-243	2.122E-01	9.595E-02	7.523E-02
ANH-511	8.422E-02	6.899E-02	3.998E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-5.557E+00	8.733E+00	1.478E+01	NOT IDENT.
NA-22	2.268E-02	4.171E-02	7.560E-02	NOT IDENT.

NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	-2.989E-04	1.908E-02	4.029E-02	NOT IDENT.
SC-46	-7.038E-02	2.922E-01	5.247E-01	FAIL ABUN
V-48	0.000E+00	8.240E+03	0.000E+00	SHORT HLIF
CR-51	0.000E+00	2.845E+02	0.000E+00	SHORT HLIF
MN-54	1.610E-02	5.573E-02	1.060E-01	NOT IDENT.
CO-56	3.776E-01	3.590E-01	7.502E-01	FAIL ABUN
MN-56	0.000E+00	9.528E+40	0.000E+00	SHORT HLIF
CO-57	4.337E-03	3.855E-02	7.303E-02	NOT IDENT.
CO-58	7.600E-02	4.554E-01	8.663E-01	NOT IDENT.
FE-59	0.000E+00	1.023E+01	9.408E+00	FAIL ABUN
CO-60	1.634E-02	2.645E-02	5.680E-02	NOT IDENT.
ZN-65	4.146E-02	1.594E-01	2.741E-01	NOT IDENT.
GE-68	-4.203E-01	1.888E+00	3.046E+00	NOT IDENT.
AS-74	0.000E+00	3.459E+03	0.000E+00	SHORT HLIF
SE-75	-4.605E-02	1.588E-01	2.988E-01	NOT IDENT.
BR-77	0.000E+00	1.745E+36	0.000E+00	SHORT HLIF
SR-82	0.000E+00	4.995E+02	0.000E+00	SHORT HLIF
RB-83	2.200E-01	4.577E-01	9.376E-01	NOT IDENT.
KR-85	1.238E+01	6.724E+00	1.359E+01	NOT IDENT.
SR-85	1.198E+00	6.527E-01	1.318E+00	NOT IDENT.
RB-86	0.000E+00	1.777E+04	0.000E+00	SHORT HLIF
Y-88	-4.490E-03	1.644E-01	3.309E-01	NOT IDENT.
Y-91	-5.238E+01	3.562E+02	6.648E+02	NOT IDENT.
NB-94	-2.393E-04	2.378E-02	4.447E-02	NOT IDENT.
NB-95	1.615E-01	5.690E-01	1.109E+00	NOT IDENT.
NB-95M	9.593E-01	1.887E+00	3.429E+00	NOT IDENT.
ZR-95	8.370E-01	1.007E+00	2.092E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.051E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.892E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	3.778E-03	2.789E-02	4.893E-02	NOT IDENT.
RH-102	-3.628E-02	4.095E-02	7.046E-02	NOT IDENT.
RU-103	-1.015E+00	4.028E+00	7.599E+00	FAIL ABUN
RH-106	-3.191E-01	3.943E-01	6.886E-01	NOT IDENT.
RU-106	-3.191E-01	3.943E-01	6.886E-01	NOT IDENT.
AG-108M	-2.547E-05	2.128E-02	3.946E-02	NOT IDENT.
AG-110M	3.550E-02	7.729E-02	1.529E-01	FAIL ABUN
SN-113	-2.955E-05	1.553E-01	2.921E-01	NOT IDENT.
CD-115	0.000E+00	1.989E+38	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	5.101E+04	0.000E+00	SHORT HLIF
TE-123M	2.728E-02	1.006E-01	1.880E-01	NOT IDENT.
SB-124	2.685E-01	1.046E+00	2.390E+00	NOT IDENT.
SB-125	2.614E-02	8.280E-02	1.580E-01	FAIL ABUN
TE-125M	-1.277E+02	2.022E+02	3.333E+02	NOT IDENT.
I-126	0.000E+00	5.246E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	6.304E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	3.855E+21	0.000E+00	SHORT HLIF
I-131	0.000E+00	2.065E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	5.094E+25	0.000E+00	SHORT HLIF
BA-133	7.916E-03	3.483E-02	6.022E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	6.643E-02	6.086E-02	8.178E-02	FAIL ABUN
CS-135	2.868E-02	1.188E-01	2.308E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	1.433E+05	0.000E+00	SHORT HLIF
BA-140	0.000E+00	6.668E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	2.154E+05	0.000E+00	SHORT HLIF
CE-141	-1.295E+01	1.806E+01	3.148E+01	NOT IDENT.
CE-143	0.000E+00	9.214E+40	0.000E+00	SHORT HLIF
CE-144	-2.495E-01	2.813E-01	4.850E-01	NOT IDENT.
PM-144	3.621E-02	4.308E-02	8.859E-02	NOT IDENT.
PR-144	3.123E+00	3.726E+00	7.660E+00	NOT IDENT.
PM-146	9.919E-03	3.422E-02	6.507E-02	NOT IDENT.
ND-147	0.000E+00	1.537E+07	0.000E+00	SHORT HLIF
PM-147	-7.533E+01	6.585E+02	1.229E+03	NOT IDENT.
PM-149	0.000E+00	2.804E+39	0.000E+00	SHORT HLIF
EU-150	5.816E-03	2.852E-02	3.932E-02	FAIL ABUN
EU-152	2.385E-02	8.200E-02	1.428E-01	NOT IDENT.
GD-153	0.000E+00	2.857E-01	2.985E-01	FAIL ABUN
EU-154	6.113E-02	1.034E-01	1.886E-01	NOT IDENT.
TB-160	1.267E-01	1.410E+00	2.652E+00	FAIL ABUN
HO-166M	-3.137E-02	4.273E-02	7.382E-02	NOT IDENT.
HF-172	-8.909E-02	1.977E-01	3.265E-01	FAIL ABUN
LU-172	4.267E-02	6.744E-02	1.248E-01	FAIL ABUN
LU-176	-1.803E-04	1.849E-02	3.524E-02	FAIL ABUN

HF-181	3.068E+00	3.180E+00	6.393E+00	NOT IDENT.
TA-182	-2.158E-01	7.473E-01	1.351E+00	FAIL ABUN
RE-183	5.465E-01	2.527E+00	5.193E+00	NOT IDENT.
RE-184	5.823E+00	1.670E+01	3.349E+01	NOT IDENT.
W-188	9.420E+00	8.269E+01	1.442E+02	FAIL ABUN
IR-192	-8.742E-02	3.319E-01	6.161E-01	FAIL ABUN
HG-203	-2.850E-01	1.735E+00	2.937E+00	NOT IDENT.
BI-207	1.454E-02	4.325E-02	7.645E-02	FAIL ABUN
PB-210	2.770E+00	4.415E+00	9.309E+00	NOT IDENT.
PB-211	1.805E-01	5.147E-01	9.913E-01	NOT IDENT.
BI-212	0.000E+00	6.855E-01	9.833E-01	FAIL ABUN
RN-219	-2.561E-02	2.713E-01	5.031E-01	NOT IDENT.
RA-223	1.134E-02	5.329E-01	9.020E-01	FAIL ABUN
AC-227	-7.758E-03	1.889E-01	3.623E-01	NOT IDENT.
TH-227	-7.758E-03	1.889E-01	3.623E-01	NOT IDENT.
PA-231	2.007E-01	3.755E-01	7.107E-01	NOT IDENT.
TH-231	1.134E-02	5.329E-01	9.020E-01	FAIL ABUN
PA-233	-2.676E-02	4.398E-02	7.919E-02	NOT IDENT.
PA-234	-1.247E-02	2.597E-01	4.351E-01	FAIL ABUN
PA-234M	-4.999E-01	3.162E+00	5.920E+00	NOT IDENT.
U-235	-5.600E-02	1.548E-01	2.781E-01	FAIL ABUN
NP-237	-2.676E-02	4.398E-02	7.919E-02	FAIL ABUN
NP-238	0.000E+00	2.948E+00	0.000E+00	SHORT HLIF
NP-239	5.043E-02	1.882E-01	3.640E-01	FAIL ABUN
PU-239	3.616E+02	4.747E+02	5.111E+02	FAIL ABUN
AM-241	-3.858E-02	1.363E-01	2.492E-01	NOT IDENT.
CM-243	5.940E-03	7.980E-02	1.536E-01	FAIL ABUN
BK-247	-1.357E-02	5.673E-02	1.073E-01	FAIL ABUN
CM-247	-2.657E-02	2.618E-02	4.327E-02	FAIL ABUN
CF-249	1.658E-03	2.597E-02	4.928E-02	NOT IDENT.
CF-251	-4.537E-02	8.860E-02	1.528E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	520	10.66*	1.911E+00	1.258E+01	1.258E+01	8.70
AS-73	53.44	18	10.30*	1.379E+00	6.226E-01	7.731E+00	284.82
CD-109	88.03	118	3.70*	6.119E+00	2.571E+00	3.986E+00	40.27
SN-126	64.28	14	9.60	3.086E+00	2.325E-01	2.325E-01	486.00
	86.94	118	8.90	6.119E+00	1.069E+00	1.069E+00	40.27
	87.57	118	37.00*	6.119E+00	2.571E-01	2.571E-01	40.27
BA-137M	661.66	54	89.90*	3.371E+00	8.731E-02	8.893E-02	47.55
CS-137	661.66	54	85.10*	3.371E+00	9.223E-02	9.395E-02	47.55
CE-139	165.86	113	80.00*	7.900E+00	8.805E-02	3.828E-01	78.21
EU-155	86.55	118	30.70	6.119E+00	3.099E-01	3.482E-01	40.27
	105.31	69	21.10*	7.389E+00	2.170E-01	2.439E-01	70.02
TM-171	51.35	18	0.27	1.379E+00	2.375E+01	3.169E+01	284.82
	52.39	18	0.47*	1.379E+00	1.364E+01	1.821E+01	284.82
	66.73	-----	0.14	3.622E+00	-----	Line Not Found	-----
TL-208	277.37	50	6.60	6.132E+00	6.083E-01	6.083E-01	76.34
	583.19	139	85.00*	3.673E+00	2.195E-01	2.195E-01	41.05
	860.56	31	12.50	2.812E+00	4.335E-01	4.335E-01	78.30
BI-211	72.87	-----	1.23	4.495E+00	-----	Line Not Found	-----
	351.06	403	12.92*	5.219E+00	2.945E+00	2.945E+00	15.96
PB-212	74.82	195	10.28	4.756E+00	1.970E+00	1.970E+00	31.64
	77.11	252	17.10	5.050E+00	1.440E+00	1.440E+00	25.57
	238.63	482	43.60*	6.719E+00	8.109E-01	8.109E-01	12.67
	300.09	-----	3.30	5.819E+00	-----	Line Not Found	-----
BI-214	609.32	281	45.49*	3.566E+00	8.545E-01	8.548E-01	21.01
	1120.29	51	14.92	2.335E+00	7.203E-01	7.205E-01	54.33
	1764.49	-----	15.30	1.634E+00	-----	Line Not Found	-----
PB-214	74.82	195	5.80	4.756E+00	3.491E+00	3.492E+00	31.64
	77.11	252	9.70	5.050E+00	2.539E+00	2.540E+00	25.57
	87.09	118	3.41	6.119E+00	2.790E+00	2.791E+00	40.27
	242.00	152	7.25	6.669E+00	1.550E+00	1.551E+00	34.16
	295.22	227	18.42	5.877E+00	1.033E+00	1.033E+00	24.89
	351.93	403	35.60*	5.219E+00	1.069E+00	1.069E+00	15.96
RN-222	609.32	281	45.49*	3.566E+00	8.545E-01	8.548E-01	21.01
	1120.29	51	14.92	2.335E+00	7.203E-01	7.205E-01	54.33
	1764.49	-----	15.30	1.634E+00	-----	Line Not Found	-----
RA-224	240.99	152	4.10*	6.669E+00	2.741E+00	2.741E+00	34.16
RA-226	609.32	281	45.49*	3.566E+00	8.545E-01	8.548E-01	21.01
	1120.29	51	14.92	2.335E+00	7.203E-01	7.205E-01	54.33
	1764.49	-----	15.30	1.634E+00	-----	Line Not Found	-----
AC-228	105.21	69	1.10	7.389E+00	4.163E+00	4.163E+00	70.02
	338.32	28	11.27	5.379E+00	2.278E-01	2.278E-01	281.64
	794.95	26	4.25	2.973E+00	1.022E+00	1.022E+00	93.48
	835.71	-----	1.61	2.872E+00	-----	Line Not Found	-----
	911.20	123	25.80*	2.703E+00	8.687E-01	8.687E-01	30.43
	968.97	53	15.80	2.589E+00	6.436E-01	6.436E-01	59.83
RA-228	105.21	69	1.10	7.389E+00	4.163E+00	4.163E+00	70.02
	338.32	28	11.27	5.379E+00	2.278E-01	2.278E-01	281.64

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected Decay Corr		2-Sigma %Error
					pCi/GRAM	pCi/GRAM	
	794.95	26	4.25	2.973E+00	1.022E+00	1.022E+00	93.48
	835.71	-----	1.61	2.872E+00	-----	Line Not Found	-----
	911.20	123	25.80*	2.703E+00	8.687E-01	8.687E-01	30.43
	968.97	53	15.80	2.589E+00	6.436E-01	6.436E-01	59.83
TH-228	74.82	195	10.28	4.756E+00	1.970E+00	1.970E+00	31.64
	77.11	252	17.10	5.050E+00	1.440E+00	1.440E+00	25.57
	238.63	482	43.60*	6.719E+00	8.109E-01	8.109E-01	12.67
	300.09	-----	3.30	5.819E+00	-----	Line Not Found	-----
TH-229	85.43	39	14.70	5.837E+00	2.220E-01	2.220E-01	127.28
	88.47	118	24.00	6.119E+00	3.964E-01	3.965E-01	40.27
	193.51	-----	4.41*	7.490E+00	-----	Line Not Found	-----
	210.85	87	2.80	7.213E+00	2.121E+00	2.121E+00	74.87
TH-230	609.32	281	45.49*	3.566E+00	8.545E-01	8.545E-01	21.01
	1120.29	51	14.92	2.335E+00	7.203E-01	7.203E-01	54.33
	1764.49	-----	15.30	1.634E+00	-----	Line Not Found	-----
TH-232	105.21	69	1.10	7.389E+00	4.163E+00	4.163E+00	70.02
	338.32	28	11.27	5.379E+00	2.278E-01	2.278E-01	281.64
	835.71	-----	1.61	2.872E+00	-----	Line Not Found	-----
	911.20	123	25.80*	2.703E+00	8.687E-01	8.687E-01	30.43
	968.97	53	15.80	2.589E+00	6.436E-01	6.436E-01	59.83
TH-234	63.29	14	3.70*	3.086E+00	6.033E-01	6.033E-01	486.00
	92.59	117	4.23	6.599E+00	2.060E+00	2.060E+00	48.52
U-234	609.32	281	45.49*	3.566E+00	8.545E-01	8.545E-01	21.01
	1120.29	51	14.92	2.335E+00	7.203E-01	7.203E-01	54.33
	1764.49	-----	15.30	1.634E+00	-----	Line Not Found	-----
U-238	63.29	14	3.70*	3.086E+00	6.033E-01	6.033E-01	486.00
	92.59	117	4.23	6.599E+00	2.060E+00	2.060E+00	48.52
AM-243	43.53	-----	5.90	3.443E-01	-----	Line Not Found	-----
	74.66	195	67.20*	4.756E+00	3.013E-01	3.014E-01	31.64
ANH-511	511.00	69	100.00*	4.028E+00	8.422E-02	8.422E-02	83.59

Flag: "*" = Keyline

Total number of lines in spectrum 42
 Number of unidentified lines 6
 Number of lines tentatively identified by NID 36 85.71%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.258E+01	1.258E+01	0.109E+01	8.70	
AS-73	80.30D	12.4	6.226E-01	7.731E+00	22.02E+00	284.82	
CD-109	461.40D	1.55	2.571E+00	3.986E+00	1.605E+00	40.27	
SN-126	2.30E+05Y	1.00	2.571E-01	2.571E-01	1.036E-01	40.27	
BA-137M	30.08Y	1.02	8.731E-02	8.893E-02	4.228E-02	47.55	
CS-137	30.08Y	1.02	9.223E-02	9.395E-02	4.467E-02	47.55	
CE-139	137.64D	4.35	8.805E-02	3.828E-01	2.994E-01	78.21	
EU-155	4.75Y	1.12	2.170E-01	2.439E-01	1.708E-01	70.02	
TM-171	1.92Y	1.33	1.364E+01	1.821E+01	5.186E+01	284.82	
TL-208	1.41E+10Y	1.00	2.195E-01	2.195E-01	0.901E-01	41.05	
BI-211	7.04E+08Y	1.00	2.945E+00	2.945E+00	0.470E+00	15.96	
PB-212	1.41E+10Y	1.00	8.109E-01	8.109E-01	1.028E-01	12.67	
BI-214	1600.00Y	1.00	8.545E-01	8.548E-01	1.796E-01	21.01	
PB-214	1600.00Y	1.00	1.069E+00	1.069E+00	0.171E+00	15.96	
RN-222	1600.00Y	1.00	8.545E-01	8.548E-01	1.796E-01	21.01	
RA-224	1.41E+10Y	1.00	2.741E+00	2.741E+00	0.936E+00	34.16	
RA-226	1600.00Y	1.00	8.545E-01	8.548E-01	1.796E-01	21.01	
AC-228	1.41E+10Y	1.00	8.687E-01	8.687E-01	2.644E-01	30.43	
RA-228	1.41E+10Y	1.00	8.687E-01	8.687E-01	2.644E-01	30.43	
TH-228	1.41E+10Y	1.00	8.109E-01	8.109E-01	1.028E-01	12.67	
TH-229	7340.00Y	1.00	3.964E-01	3.965E-01	1.597E-01	40.27	K
TH-230	7.54E+04Y	1.00	8.545E-01	8.545E-01	1.795E-01	21.01	
TH-232	1.41E+10Y	1.00	8.687E-01	8.687E-01	2.644E-01	30.43	
TH-234	4.47E+09Y	1.00	6.033E-01	6.033E-01	29.32E-01	486.00	
U-234	2.45E+05Y	1.00	8.545E-01	8.545E-01	1.795E-01	21.01	
U-238	4.47E+09Y	1.00	6.033E-01	6.033E-01	29.32E-01	486.00	
AM-243	7370.00Y	1.00	3.013E-01	3.014E-01	0.954E-01	31.64	
ANH-511	1.00E+09Y	1.00	8.422E-02	8.422E-02	7.039E-02	83.59	
Total Activity :			4.762E+01	6.103E+01			

Grand Total Activity : 4.762E+01 6.103E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
4	89.95	94	151	1.16	180.67	172	21	2.05E-02	54.1	6.38E+00	T
0	98.34	104	127	2.24	197.43	193	9	2.30E-02	49.6	7.00E+00	T
3	107.63	40	80	1.04	216.00	205	15	8.93E-03	90.0	7.50E+00	T
0	129.29	37	152	1.11	259.27	255	8	8.40E-03	****	8.04E+00	T
0	328.12	59	108	6.58	656.64	648	16	1.45E-02	89.4	5.48E+00	T
0	463.23	29	48	1.48	926.66	921	10	7.47E-03	****	4.31E+00	T
0	728.51	52	35	0.90	1456.88	1449	14	1.38E-02	57.8	3.16E+00	T
0	770.32	54	57	4.57	1540.47	1527	22	1.45E-02	77.7	3.04E+00	T
0	936.58	35	60	2.90	1872.80	1862	26	9.49E-03	****	2.65E+00	T
0	1072.48	7	31	0.49	2144.48	2134	16	1.96E-03	****	2.41E+00	T
0	1100.48	34	28	8.92	2200.47	2187	23	9.46E-03	88.5	2.37E+00	T
0	1238.36	51	8	1.96	2476.12	2467	17	1.43E-02	38.1	2.17E+00	T
0	1281.49	26	16	8.79	2562.33	2551	22	7.34E-03	87.6	2.12E+00	T
0	1416.11	14	7	1.58	2831.50	2825	14	3.89E-03	96.4	1.96E+00	T
0	1624.62	7	6	1.34	3248.40	3240	13	2.08E-03	****	1.75E+00	T
0	1766.95	24	20	1.91	3533.01	3522	16	7.02E-03	92.4	1.63E+00	T

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235060.CNF;1
* Acquisition date   : 3-OCT-2016 07:52:52 Sensitivity      : 3.000
* Detector ID       : GAM18 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.97 Half life ratio : *****
* Sample date       : 16-DEC-2015 12:33:00 Nuclide Library : SOLID
* Sample ID         : G405235060 Analyst initials: MXR1
* Batch Number      : 1596252 Sample Quantity : 1.5227E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 25-JUN-2016 08:25:19 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM18_CAN.CNF;10
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.781E-01
AS-73	8.124E+00
CD-109	6.940E-01
SN-126	4.505E-02
BA-137M	2.160E-02
CS-137	2.282E-02
CE-139	6.990E-02
EU-155	7.686E-02
TM-171	2.006E+01
TL-208	2.143E-02
BI-211	1.224E-01
PB-212	3.441E-02
BI-214	4.992E-02
PB-214	1.309E-01
RN-222	4.992E-02
RA-224	3.686E-01
RA-226	4.992E-02
AC-228	7.114E-02
RA-228	7.114E-02
TH-228	3.441E-02
TH-229	3.181E-01
TH-230	4.990E-02
TH-232	7.114E-02
TH-234	1.005E+00
U-234	4.990E-02
U-238	1.005E+00
AM-243	3.536E-02
ANH-511	1.828E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	6.692E+00	NOT IDENT.
NA-22	3.389E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF

AL-26	1.596E-02	NOT IDENT.
SC-46	2.348E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	4.847E-02	NOT IDENT.
CO-56	3.423E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	3.431E-02	NOT IDENT.
CO-58	3.927E-01	NOT IDENT.
FE-59	4.229E+00	FAIL ABUN
CO-60	2.476E-02	NOT IDENT.
ZN-65	1.240E-01	NOT IDENT.
GE-68	1.339E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.392E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.287E-01	NOT IDENT.
KR-85	6.379E+00	NOT IDENT.
SR-85	6.189E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.370E-01	NOT IDENT.
Y-91	2.953E+02	NOT IDENT.
NB-94	2.012E-02	NOT IDENT.
NB-95	5.018E-01	NOT IDENT.
NB-95M	1.617E+00	NOT IDENT.
ZR-95	9.502E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.292E-02	NOT IDENT.
RH-102	3.115E-02	NOT IDENT.
RU-103	3.481E+00	FAIL ABUN
RH-106	3.105E-01	NOT IDENT.
RU-106	3.105E-01	NOT IDENT.
AG-108M	1.804E-02	NOT IDENT.
AG-110M	6.883E-02	FAIL ABUN
SN-113	1.333E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	8.827E-02	NOT IDENT.
SB-124	9.563E-01	NOT IDENT.
SB-125	7.281E-02	FAIL ABUN
TE-125M	1.548E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.784E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	3.739E-02	FAIL ABUN
CS-135	1.085E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.483E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.264E-01	NOT IDENT.
PM-144	4.062E-02	NOT IDENT.
PR-144	3.512E+00	NOT IDENT.
PM-146	2.986E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	5.754E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.831E-02	FAIL ABUN
EU-152	6.625E-02	NOT IDENT.
GD-153	1.410E-01	FAIL ABUN
EU-154	8.464E-02	NOT IDENT.
TB-160	1.192E+00	FAIL ABUN
HO-166M	3.298E-02	NOT IDENT.
HF-172	1.527E-01	FAIL ABUN
LU-172	5.635E-02	FAIL ABUN
LU-176	1.632E-02	FAIL ABUN
HF-181	2.956E+00	NOT IDENT.

TA-182	6.088E-01	FAIL ABUN
RE-183	2.429E+00	NOT IDENT.
RE-184	1.476E+01	NOT IDENT.
W-188	6.681E+01	FAIL ABUN
IR-192	2.849E-01	FAIL ABUN
HG-203	1.361E+00	NOT IDENT.
BI-207	3.443E-02	FAIL ABUN
PB-210	4.381E+00	NOT IDENT.
PB-211	4.571E-01	NOT IDENT.
BI-212	4.594E-01	FAIL ABUN
RN-219	2.295E-01	NOT IDENT.
RA-223	4.195E-01	FAIL ABUN
AC-227	1.698E-01	NOT IDENT.
TH-227	1.698E-01	NOT IDENT.
PA-231	3.330E-01	NOT IDENT.
TH-231	4.195E-01	FAIL ABUN
PA-233	3.641E-02	NOT IDENT.
PA-234	1.961E-01	FAIL ABUN
PA-234M	2.642E+00	NOT IDENT.
U-235	1.311E-01	FAIL ABUN
NP-237	3.641E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.705E-01	FAIL ABUN
PU-239	2.416E+02	FAIL ABUN
AM-241	1.166E-01	NOT IDENT.
CM-243	7.201E-02	FAIL ABUN
BK-247	4.994E-02	FAIL ABUN
CM-247	1.962E-02	FAIL ABUN
CF-249	2.249E-02	NOT IDENT.
CF-251	7.114E-02	NOT IDENT.

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235060.CNF;1
* Acquisition date   : 3-OCT-2016 07:52:52 Sensitivity      : 3.000
* Detector ID        : GAM18 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.97 Half life ratio : *****
* Sample date        : 16-DEC-2015 12:33:00 Nuclide Library : SOLID
* Sample ID          : G405235060 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity : 1.5227E+02 GRAM
*                               Quantity Err(%) : 1.3135E-03 %
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight  : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date     : 25-JUN-2016 08:25:19 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM18_CAN.CNF;10
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.258E+01	1.258E+00	1.258E+00
AS-73	7.731E+00	2.164E+01	2.164E+01
CD-109	2.510E+00	1.637E+00	1.637E+00
SN-126	1.619E-01	1.053E-01	1.053E-01
BA-137M	8.893E-02	4.161E-02	4.161E-02
CS-137	9.395E-02	4.396E-02	4.396E-02
CE-139	3.828E-01	3.033E-01	3.033E-01
EU-155	2.439E-01	1.683E-01	1.683E-01
TM-171	1.821E+01	5.084E+01	5.084E+01
TL-208	2.195E-01	8.882E-02	8.882E-02
BI-211	9.795E-02	8.513E-01	8.513E-01
PB-212	8.109E-01	1.095E-01	1.095E-01
BI-214	8.548E-01	1.798E-01	1.798E-01
PB-214	1.069E+00	1.730E-01	1.730E-01
RN-222	8.548E-01	1.798E-01	1.798E-01
RA-224	9.142E-01	1.028E+00	1.028E+00
RA-226	8.548E-01	1.798E-01	1.798E-01
AC-228	8.687E-01	2.629E-01	2.629E-01
RA-228	8.687E-01	2.629E-01	2.629E-01
TH-228	8.109E-01	1.095E-01	1.095E-01
TH-229	-3.947E-02	3.454E-01	3.454E-01
TH-230	8.545E-01	1.797E-01	1.797E-01
TH-232	8.687E-01	2.629E-01	2.629E-01
TH-234	6.033E-01	2.877E+00	2.877E+00
U-234	8.545E-01	1.797E-01	1.797E-01
U-238	6.033E-01	2.877E+00	2.877E+00
AM-243	2.122E-01	9.750E-02	9.750E-02
ANH-511	8.422E-02	6.907E-02	6.907E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-5.557E+00	8.736E+00	9.088E+00	NOT IDENT.
NA-22	2.268E-02	4.171E-02	4.295E-02	NOT IDENT.

NA-24	1.000E+41	7.562E+41	0.000E+00	SHORT HLIF
AL-26	-2.989E-04	1.908E-02	1.908E-02	NOT IDENT.
SC-46	-7.038E-02	2.922E-01	2.939E-01	FAIL ABUN
V-48	6.086E+03	8.244E+03	8.688E+03	SHORT HLIF
CR-51	7.805E+01	2.845E+02	2.867E+02	SHORT HLIF
MN-54	1.610E-02	5.573E-02	5.620E-02	NOT IDENT.
CO-56	3.776E-01	3.593E-01	3.976E-01	FAIL ABUN
MN-56	1.000E+41	9.537E+40	0.000E+00	SHORT HLIF
CO-57	4.337E-03	3.855E-02	3.860E-02	NOT IDENT.
CO-58	7.600E-02	4.554E-01	4.567E-01	NOT IDENT.
FE-59	1.180E+01	1.027E+01	1.156E+01	FAIL ABUN
CO-60	1.634E-02	2.646E-02	2.747E-02	NOT IDENT.
ZN-65	4.146E-02	1.594E-01	1.605E-01	NOT IDENT.
GE-68	-4.203E-01	1.888E+00	1.897E+00	NOT IDENT.
AS-74	-2.237E+03	3.464E+03	3.608E+03	SHORT HLIF
SE-75	-4.605E-02	1.588E-01	1.601E-01	NOT IDENT.
BR-77	1.405E+37	1.184E+38	0.000E+00	SHORT HLIF
SR-82	1.925E+02	4.996E+02	5.070E+02	SHORT HLIF
RB-83	2.200E-01	4.587E-01	4.693E-01	NOT IDENT.
KR-85	1.238E+01	6.743E+00	8.753E+00	NOT IDENT.
SR-85	1.198E+00	6.545E-01	8.485E-01	NOT IDENT.
RB-86	-4.772E+03	1.778E+04	1.791E+04	SHORT HLIF
Y-88	-4.490E-03	1.644E-01	1.644E-01	NOT IDENT.
Y-91	-5.238E+01	3.562E+02	3.569E+02	NOT IDENT.
NB-94	-2.393E-04	2.378E-02	2.378E-02	NOT IDENT.
NB-95	1.615E-01	5.690E-01	5.737E-01	NOT IDENT.
NB-95M	9.593E-01	1.889E+00	1.938E+00	NOT IDENT.
ZR-95	8.370E-01	1.007E+00	1.076E+00	NOT IDENT.
NB-97	-1.000E+41	1.996E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.052E+41	0.000E+00	SHORT HLIF
MO-99	-3.870E+30	1.892E+31	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	3.611E+42	0.000E+00	SHORT HLIF
RH-101	3.778E-03	2.790E-02	2.795E-02	NOT IDENT.
RH-102	-3.628E-02	4.105E-02	4.419E-02	NOT IDENT.
RU-103	-1.015E+00	4.028E+00	4.054E+00	FAIL ABUN
RH-106	-3.191E-01	3.948E-01	4.202E-01	NOT IDENT.
RU-106	-3.191E-01	3.948E-01	4.202E-01	NOT IDENT.
AG-108M	-2.547E-05	2.128E-02	2.128E-02	NOT IDENT.
AG-110M	3.550E-02	7.731E-02	7.895E-02	FAIL ABUN
SN-113	-2.955E-05	1.553E-01	1.553E-01	NOT IDENT.
CD-115	2.784E+37	1.989E+38	0.000E+00	SHORT HLIF
SN-117M	1.238E+04	5.103E+04	5.133E+04	SHORT HLIF
TE-123M	2.728E-02	1.006E-01	1.013E-01	NOT IDENT.
SB-124	2.685E-01	1.046E+00	1.053E+00	NOT IDENT.
SB-125	2.614E-02	8.281E-02	8.364E-02	FAIL ABUN
TE-125M	-1.277E+02	2.023E+02	2.103E+02	NOT IDENT.
I-126	1.801E+05	5.252E+05	5.314E+05	SHORT HLIF
SB-126	2.980E+05	6.328E+05	6.469E+05	SHORT HLIF
SB-127	-3.301E+21	5.862E+21	0.000E+00	SHORT HLIF
I-131	7.324E+08	2.066E+09	2.092E+09	SHORT HLIF
I-132	1.000E+41	1.998E+42	0.000E+00	SHORT HLIF
TE-132	3.772E+24	5.096E+25	0.000E+00	SHORT HLIF
BA-133	7.916E-03	3.483E-02	3.501E-02	FAIL ABUN
I-133	-1.000E+41	3.059E+41	0.000E+00	SHORT HLIF
CS-134	6.643E-02	6.092E-02	6.788E-02	FAIL ABUN
CS-135	2.868E-02	1.188E-01	1.195E-01	NOT IDENT.
I-135	-1.000E+41	1.825E+42	0.000E+00	SHORT HLIF
CS-136	-3.901E+04	1.433E+05	1.444E+05	SHORT HLIF
BA-140	7.617E+05	6.676E+05	7.507E+05	SHORT HLIF
LA-140	-1.309E+05	2.155E+05	2.235E+05	SHORT HLIF
CE-141	-1.295E+01	1.807E+01	1.899E+01	NOT IDENT.
CE-143	1.000E+41	9.268E+40	0.000E+00	SHORT HLIF
CE-144	-2.495E-01	2.817E-01	3.033E-01	NOT IDENT.
PM-144	3.621E-02	4.314E-02	4.612E-02	NOT IDENT.
PR-144	3.123E+00	3.728E+00	3.985E+00	NOT IDENT.
PM-146	9.919E-03	3.423E-02	3.452E-02	NOT IDENT.
ND-147	7.832E+05	1.537E+07	1.538E+07	SHORT HLIF
PM-147	-7.533E+01	6.585E+02	6.594E+02	NOT IDENT.
PM-149	1.084E+39	2.813E+39	0.000E+00	SHORT HLIF
EU-150	5.816E-03	2.852E-02	2.864E-02	FAIL ABUN
EU-152	2.385E-02	8.201E-02	8.271E-02	NOT IDENT.
GD-153	5.877E-01	2.877E-01	3.911E-01	FAIL ABUN
EU-154	6.113E-02	1.034E-01	1.070E-01	NOT IDENT.
TB-160	1.267E-01	1.410E+00	1.411E+00	FAIL ABUN
HO-166M	-3.137E-02	4.277E-02	4.505E-02	NOT IDENT.
HF-172	-8.909E-02	1.982E-01	2.023E-01	FAIL ABUN
LU-172	4.267E-02	6.757E-02	7.026E-02	FAIL ABUN
LU-176	-1.803E-04	1.849E-02	1.849E-02	FAIL ABUN

HF-181	3.068E+00	3.183E+00	3.471E+00	NOT IDENT.
TA-182	-2.158E-01	7.474E-01	7.537E-01	FAIL ABUN
RE-183	5.465E-01	2.528E+00	2.540E+00	NOT IDENT.
RE-184	5.823E+00	1.676E+01	1.696E+01	NOT IDENT.
W-188	9.420E+00	8.270E+01	8.281E+01	FAIL ABUN
IR-192	-8.742E-02	3.320E-01	3.343E-01	FAIL ABUN
HG-203	-2.850E-01	1.735E+00	1.739E+00	NOT IDENT.
BI-207	1.454E-02	4.325E-02	4.375E-02	FAIL ABUN
PB-210	2.770E+00	4.423E+00	4.596E+00	NOT IDENT.
PB-211	1.805E-01	5.148E-01	5.212E-01	NOT IDENT.
BI-212	1.210E+00	6.882E-01	8.781E-01	FAIL ABUN
RN-219	-2.561E-02	2.714E-01	2.716E-01	NOT IDENT.
RA-223	1.134E-02	5.329E-01	5.330E-01	FAIL ABUN
AC-227	-7.758E-03	1.889E-01	1.889E-01	NOT IDENT.
TH-227	-7.758E-03	1.889E-01	1.889E-01	NOT IDENT.
PA-231	2.007E-01	3.780E-01	3.886E-01	NOT IDENT.
TH-231	1.134E-02	5.329E-01	5.330E-01	FAIL ABUN
PA-233	-2.676E-02	4.400E-02	4.562E-02	NOT IDENT.
PA-234	-1.247E-02	2.601E-01	2.602E-01	FAIL ABUN
PA-234M	-4.999E-01	3.162E+00	3.170E+00	NOT IDENT.
U-235	-5.600E-02	1.549E-01	1.569E-01	FAIL ABUN
NP-237	-2.676E-02	4.400E-02	4.562E-02	FAIL ABUN
NP-238	-7.812E+38	2.948E+40	0.000E+00	SHORT HLIF
NP-239	5.043E-02	1.882E-01	1.896E-01	FAIL ABUN
PU-239	3.616E+02	4.750E+02	5.022E+02	FAIL ABUN
AM-241	-3.858E-02	1.364E-01	1.375E-01	NOT IDENT.
CM-243	5.940E-03	7.980E-02	7.984E-02	FAIL ABUN
BK-247	-1.357E-02	5.679E-02	5.712E-02	FAIL ABUN
CM-247	-2.657E-02	2.656E-02	2.914E-02	FAIL ABUN
CF-249	1.658E-03	2.597E-02	2.598E-02	NOT IDENT.
CF-251	-4.537E-02	8.874E-02	9.107E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	65.8718	87.09	68.5842	136.47	72.9871
45.60	66.6366	87.57	68.6937	140.51	0.0000
46.54	63.6707	88.03	68.7978	143.76	90.1889
49.72	0.0000	88.34	68.8683	144.24	82.2854
51.35	62.7398	88.47	68.8977	145.44	98.5465
51.87	62.9030	89.96	69.2342	152.43	86.0864
52.39	63.0653	1093.63	69.3869	153.25	0.0000
52.97	64.9547	91.11	0.0000	323.87	60.7209
53.44	70.8146	92.59	69.8211	156.02	0.0000
54.07	65.3026	93.35	69.9888	158.56	0.0000
57.36	0.0000	94.56	70.2553	159.00	71.9414
57.53	61.1352	94.65	70.2750	162.33	64.9100
57.98	65.6367	94.67	70.2793	162.66	0.0000
59.27	70.4227	94.87	62.2862	163.33	69.0060
59.32	70.4385	97.43	49.9532	165.86	69.3538
59.54	77.5589	98.43	50.1049	176.31	75.6458
60.96	70.9540	98.44	50.1064	176.60	0.0000
61.17	71.0193	99.53	58.4234	177.52	73.3722
62.93	84.9819	100.11	51.0387	181.07	0.0000
63.29	85.1129	102.03	51.3298	181.52	81.3086
63.58	85.2182	103.18	74.1632	184.41	146.1388
64.28	85.1714	103.37	74.2044	143.76	78.2078
66.73	93.3158	105.21	74.5994	193.51	77.1954
67.24	96.5461	105.31	74.6208	197.03	85.2640
125.81	85.7698	106.12	74.7938	198.01	85.4068
67.75	85.7942	106.47	74.8680	201.83	84.2584
69.67	72.6618	109.28	72.6664	203.43	76.8036
70.83	89.9334	111.00	80.0327	205.31	71.9081
72.81	76.9702	111.76	0.0000	210.85	70.8349
72.87	76.9879	114.06	87.0718	215.65	69.9893
74.66	81.5758	116.30	0.0000	222.11	72.1095
74.82	81.6249	116.74	67.3754	227.09	70.0042
74.97	81.6707	119.76	74.3754	227.38	62.0561
77.11	82.3205	121.12	75.7176	228.16	0.0000
78.74	90.1071	121.22	75.7368	228.18	66.5695
79.69	85.3210	121.78	82.3463	116.74	66.5695
80.12	80.3503	122.06	78.0677	235.69	76.7451
80.19	0.0000	122.92	57.5919	235.96	79.4694
80.57	78.5629	123.07	64.1360	238.63	69.4139
81.00	89.5572	265.00	71.8557	238.98	0.0000
81.07	89.5793	125.81	81.7248	240.99	69.6520
81.75	73.1176	127.23	70.2952	242.00	69.7538
83.79	82.6797	127.91	76.2811	244.70	51.8366
84.00	82.7389	129.30	76.1710	252.40	0.0000
85.43	70.1516	131.20	63.5832	252.80	59.7890
86.55	68.4603	133.02	79.0820	254.15	0.0000
86.79	68.5148	133.52	88.0975	256.23	74.8602
86.94	68.5495	136.00	69.5428	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	69.1763	355.39	0.0000	584.27	32.0203
264.80	69.1883	356.01	45.2559	595.83	0.0000
265.00	66.4007	364.49	0.0000	427.87	57.1198
268.22	75.1383	366.42	0.0000	602.52	0.0000
269.46	79.9659	372.51	40.2010	604.72	48.8719
270.03	75.3174	375.05	44.5447	607.14	58.1281
271.23	74.4932	377.52	48.9059	609.32	46.9125
273.65	0.0000	356.01	31.0231	610.33	46.9424
276.40	56.9580	388.16	35.4492	614.28	41.4914
277.37	57.0288	388.63	0.0000	618.01	32.0913
277.60	51.3413	391.69	36.6466	620.36	34.7102
278.00	51.3677	264.66	35.8708	621.93	41.5001
279.20	57.1619	401.81	38.0854	630.19	0.0000
279.54	57.1875	402.40	50.0823	631.29	32.0372
279.70	52.9086	404.85	40.3754	633.25	32.0765
280.46	52.9605	410.95	47.1861	634.78	0.0000
283.69	56.5297	413.71	46.2050	635.95	25.3145
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	51.8511	423.72	0.0000	645.85	23.5100
285.90	0.0000	427.09	36.7410	657.76	28.4168
287.50	63.5387	427.87	40.1089	657.90	0.0000
290.67	50.7413	433.94	38.0826	661.66	29.6704
293.27	0.0000	439.40	55.1429	664.57	0.0000
351.93	56.3704	453.88	33.0392	666.33	0.0000
295.96	56.4211	463.37	32.1517	666.50	0.0000
879.38	73.1888	468.07	34.5807	667.71	0.0000
299.98	58.6499	473.00	0.0000	677.62	25.9579
300.09	46.9258	475.06	37.0957	685.70	0.0000
300.13	46.9287	476.78	32.5032	695.00	0.0000
301.36	61.0975	477.60	41.8176	696.49	27.2530
302.85	72.5833	482.18	32.6433	696.51	27.2530
256.23	59.9501	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	33.3243
306.78	53.2134	497.08	38.0390	697.49	28.2786
308.46	53.3177	505.52	31.3409	702.65	25.3227
311.90	55.5146	507.63	0.0000	706.68	27.4112
316.51	55.8109	511.00	38.4452	711.68	34.6143
319.41	0.0000	514.00	37.2772	720.70	0.0000
320.08	0.0000	514.00	37.2772	721.93	0.0000
321.04	61.3083	520.40	30.6133	722.78	40.9753
323.87	58.7904	520.69	0.0000	722.91	40.9778
325.23	56.3634	522.65	0.0000	723.31	40.9875
328.76	0.0000	527.90	0.0000	724.19	34.4459
333.37	51.7958	528.26	32.6019	727.33	24.6467
333.97	54.8789	529.59	37.1663	733.00	21.4271
334.37	61.0034	529.87	0.0000	735.93	23.7314
338.28	63.3043	531.02	0.0000	333.97	23.7510
338.32	63.3081	537.26	0.0000	739.50	0.0000
311.90	63.4556	546.56	0.0000	747.24	30.1054
340.48	63.4556	552.55	39.6249	748.06	28.0415
340.55	0.0000	563.25	34.3510	752.31	29.1467
344.28	49.3262	569.33	39.1571	753.82	0.0000
345.93	55.5897	946.00	37.2961	756.73	20.8679
351.06	47.6106	569.70	36.3685	756.80	19.8251
351.93	47.6546	583.19	31.9974	884.68	23.4609

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	26.2100	1274.44	24.2709	1620.50	11.4526
766.42	26.2184	1001.03	22.4479	1621.92	8.1832
766.84	26.2245	1002.74	21.5277	1678.03	0.0000
772.60	0.0000	1004.73	21.5457	1690.97	3.8879
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	9.8991
778.90	24.2782	1028.54	0.0000	1063.66	3.3987
783.70	0.0000	1037.84	24.6835	1771.35	6.7994
785.37	22.2407	1038.76	0.0000	1791.20	0.0000
792.07	25.5051	631.29	21.9118	1808.65	5.0024
794.95	17.0283	1048.07	0.0000	1810.72	0.0000
795.86	17.0366	1049.04	15.2578	1836.06	8.0563
810.06	32.1725	1050.41	16.2197		
810.29	30.0311	1063.66	22.3786		
344.28	30.0328	1077.00	0.0000		
810.76	28.9652	1077.34	20.8901		
815.77	0.0000	1085.87	15.4773		
1048.07	0.0000	1093.63	19.4043		
832.01	32.5223	1099.45	21.3909		
834.85	33.6527	1112.07	23.4469		
835.71	42.3551	1112.84	30.2946		
836.80	0.0000	1115.54	26.0859		
846.75	0.0000	1120.29	35.9308		
846.77	20.7447	1120.55	29.4009		
856.80	0.0000	1221.41	29.4097		
860.56	26.3760	1129.67	17.7003		
871.09	29.8205	1131.51	0.0000		
873.19	24.3220	1147.95	0.0000		
875.33	0.0000	1173.23	16.9830		
879.38	25.5009	1177.95	26.0178		
880.51	25.5142	1189.05	32.1469		
883.24	25.5465	1204.77	23.2336		
884.68	21.1176	1221.41	32.5109		
889.28	27.8450	1231.02	27.1810		
894.76	24.5647	1235.36	0.0000		
898.04	21.2469	1238.28	30.6548		
900.72	27.9907	1260.41	0.0000		
903.28	14.5718	1271.87	16.2383		
911.20	17.9985	1274.44	17.2371		
912.08	18.9062	1274.54	17.2380		
923.98	0.0000	1291.59	17.3348		
926.50	16.1081	1298.22	0.0000		
929.11	19.6545	1312.11	0.0000		
937.49	27.3142	1332.49	9.4843		
944.13	0.0000	1362.66	0.0000		
946.00	28.9384	1365.19	14.9058		
949.00	25.6211	1368.63	0.0000		
667.71	0.0000	1384.29	22.4899		
962.31	33.3604	1408.01	13.4833		
964.08	26.0942	1457.56	0.0000		
966.17	38.4084	1460.82	9.8609		
911.20	35.9931	1489.16	6.4437		
968.97	35.9931	1505.03	15.7203		
983.53	0.0000	1584.12	11.3418		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621361.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM24.CNF;330
Background date  : 2-OCT-2016 11:01:18.
Sample date      : 12-SEP-2016 00:00:00 Acquisition date : 3-OCT-2016 07:53:26.
Sample ID       : G1203621361 Sample quantity  : 1.81483E+02 GRAM
Detector name    : GAM24 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:01.55 0.0%
Energy tolerance : 1.50000 keV Analyst Initials  : MXR1
Abundance limit  : 75.00000 Sensitivity    : 3.00000
Batch ID        : 1596252 Detector SN#     :
Matrix Spike ID : LCS ID              : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.60*	14	31	0.91	93.26	89	8	3.93E-03	81.4	
2	3	63.13*	4	36	1.35	126.33	122	31	1.24E-03	261.2	3.68E+00
3	3	66.47*	7	27	1.02	133.00	122	31	1.89E-03	132.6	
4	3	73.06	12	36	1.38	146.17	122	31	3.25E-03	96.2	
5	3	75.07*	15	23	1.14	150.21	122	31	4.14E-03	59.1	
6	0	84.41*	22	47	0.64	168.88	164	10	6.00E-03	65.9	
7	0	181.10	10	12	1.19	362.32	361	4	2.83E-03	59.7	
8	1	191.50	19	27	1.33	383.12	366	21	5.33E-03	47.5	4.49E+00
9	0	211.96	16	32	1.39	424.05	418	9	4.32E-03	73.1	
10	0	306.90	18	43	3.21	613.97	605	17	4.86E-03	88.6	
11	0	331.10	25	17	0.95	662.39	657	11	7.03E-03	38.5	
12	0	337.70	29	8	4.44	675.60	668	15	7.92E-03	28.1	
13	0	409.56	10	12	1.75	819.37	813	8	2.71E-03	69.4	
14	0	569.81	18	3	1.56	1139.97	1135	10	5.13E-03	28.3	
15	0	641.91	7	10	0.86	1284.22	1277	9	2.03E-03	89.2	
16	0	781.57	9	2	1.41	1563.65	1558	9	2.40E-03	46.4	
17	0	1294.14	6	0	0.96	2589.33	2586	6	1.67E-03	40.8	

Flag: "*" = Peak area was modified by background subtraction

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621361.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4
Sample title : MXR1
Sample date : 12-SEP-2016 00:00:00 Acquisition date : 3-OCT-2016 07:53:26
Sample ID : G1203621361 Sample quantity : 181.48 GRAM
Sample type : SOLID Sample geometry :
Detector name : GAMMA24 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:01.55 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type : Linear Efficiencies at : Peak Energy
Abundance limit : 75.00

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
PB-210	46.54	22	4.25*	2.450E+00	8.655E-01	8.671E-01	162.73
AM-243	43.53	-----	5.90	1.694E+00	-----	Line Not Found	-----
	74.66	22	67.20*	6.751E+00	1.985E-02	1.985E-02	118.19

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621361.CNF;1 *
 * Acquisition date : 3-OCT-2016 07:53:26 Sensitivity : 3.000 *
 * Detector ID : GAM24 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:01.55 Half life ratio : ***** *
 * Sample date : 12-SEP-2016 00:00:00 Analyst initials: MXR1 *
 * Sample ID : G1203621361 Sample Quantity : 1.8148E+02 GRAM *
 * Batch Number : 1596252 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 17-JUN-2016 07:45:20 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM24_CAN.CNF;7 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
PB-210	8.671E-01	1.383E+00	1.139E+00
AM-243	1.985E-02	2.300E-02	2.924E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	5.083E-02		1.425E-01	3.198E-01	NOT IDENT.
NA-22	8.425E-04		1.088E-02	2.720E-02	NOT IDENT.
NA-24	0.000E+00		1.866E+08	0.000E+00	SHORT HLIF
AL-26	-1.587E-02		1.555E-02	1.019E-02	NOT IDENT.
K-40	-1.089E-01		1.708E-01	3.500E-01	NOT IDENT.
SC-46	-1.338E-02		1.742E-02	3.001E-02	NOT IDENT.
V-48	-2.147E-02		3.061E-02	5.669E-02	NOT IDENT.
CR-51	5.287E-02		1.805E-01	3.960E-01	NOT IDENT.
MN-54	-1.049E-02		1.623E-02	2.783E-02	NOT IDENT.
CO-56	1.008E-02		2.022E-02	4.496E-02	NOT IDENT.
MN-56	0.000E+00		1.528E+41	0.000E+00	SHORT HLIF
CO-57	-6.419E-03		8.602E-03	1.555E-02	NOT IDENT.
CO-58	7.859E-03		1.802E-02	4.075E-02	NOT IDENT.
FE-59	-1.580E-02		2.430E-02	4.506E-02	NOT IDENT.
CO-60	1.433E-02		1.469E-02	4.094E-02	NOT IDENT.
ZN-65	8.535E-03		3.984E-02	8.774E-02	NOT IDENT.
GE-68	2.552E-01		4.443E-01	1.130E+00	NOT IDENT.
AS-73	-4.145E-02		1.536E-01	3.019E-01	NOT IDENT.
AS-74	1.504E-03		5.796E-02	1.188E-01	NOT IDENT.
SE-75	1.002E-02		1.998E-02	4.448E-02	NOT IDENT.
BR-77	-2.546E+00		2.272E+01	4.783E+01	NOT IDENT.
SR-82	2.193E-02		1.853E-01	3.552E-01	NOT IDENT.
RB-83	7.944E-03		2.447E-02	5.750E-02	NOT IDENT.
KR-85	-1.077E+01		5.521E+00	8.373E+00	NOT IDENT.
SR-85	-6.100E-02		3.123E-02	4.735E-02	NOT IDENT.
RB-86	1.950E-01		3.453E-01	8.775E-01	NOT IDENT.
Y-88	3.774E-03		1.971E-02	4.743E-02	NOT IDENT.
Y-91	-1.230E+00		7.191E+00	1.541E+01	NOT IDENT.

NB-94	4.237E-03	1.744E-02	3.634E-02	NOT IDENT.
NB-95	-5.581E-03	1.674E-02	3.215E-02	NOT IDENT.
NB-95M	-1.053E-02	4.315E-02	9.025E-02	NOT IDENT.
ZR-95	4.166E-03	3.394E-02	7.166E-02	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	5.550E+08	0.000E+00	SHORT HLIF
MO-99	-7.767E+00	2.491E+01	4.798E+01	FAIL ABUN
TC-99M	0.000E+00	3.637E+23	0.000E+00	SHORT HLIF
RH-101	1.476E-03	1.077E-02	2.225E-02	NOT IDENT.
RH-102	5.533E-03	2.142E-02	4.788E-02	NOT IDENT.
RU-103	-1.478E-02	1.940E-02	3.474E-02	NOT IDENT.
RH-106	3.409E-02	1.318E-01	2.906E-01	NOT IDENT.
RU-106	3.409E-02	1.318E-01	2.906E-01	NOT IDENT.
AG-108M	6.198E-03	1.372E-02	3.041E-02	NOT IDENT.
CD-109	1.316E-03	2.225E-01	4.290E-01	NOT IDENT.
AG-110M	-3.511E-03	2.331E-02	4.581E-02	NOT IDENT.
SN-113	9.437E-03	1.982E-02	4.449E-02	NOT IDENT.
CD-115	1.772E+01	4.154E+01	9.000E+01	NOT IDENT.
SN-117M	-4.194E-03	2.848E-02	5.529E-02	NOT IDENT.
TE-123M	2.596E-03	1.046E-02	2.161E-02	NOT IDENT.
SB-124	-1.053E-02	4.213E-02	8.802E-02	NOT IDENT.
SB-125	-4.232E-02	3.698E-02	6.117E-02	NOT IDENT.
TE-125M	3.022E-01	3.727E+00	7.616E+00	NOT IDENT.
I-126	-4.795E-02	1.074E-01	2.039E-01	NOT IDENT.
SB-126	-3.335E-02	9.273E-02	1.752E-01	NOT IDENT.
SN-126	9.800E-03	2.013E-02	4.233E-02	FAIL ABUN
SB-127	-6.387E-01	1.336E+00	2.517E+00	NOT IDENT.
I-131	4.115E-02	7.123E-02	1.678E-01	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	-1.025E-01	1.097E+00	2.102E+00	NOT IDENT.
BA-133	-6.204E-04	1.870E-02	3.895E-02	NOT IDENT.
I-133	0.000E+00	4.340E+05	0.000E+00	SHORT HLIF
CS-134	-8.249E-03	1.710E-02	3.159E-02	FAIL ABUN
CS-135	1.893E-03	5.851E-02	1.255E-01	NOT IDENT.
I-135	0.000E+00	1.148E+22	0.000E+00	SHORT HLIF
CS-136	-4.382E-02	5.679E-02	1.016E-01	NOT IDENT.
BA-137M	2.663E-03	1.359E-02	2.994E-02	NOT IDENT.
CS-137	2.814E-03	1.435E-02	3.163E-02	NOT IDENT.
CE-139	-1.022E-03	1.249E-02	2.426E-02	NOT IDENT.
BA-140	1.999E-01	1.786E-01	4.315E-01	NOT IDENT.
LA-140	-1.503E-02	5.703E-02	1.165E-01	NOT IDENT.
CE-141	-2.172E-02	2.514E-02	4.379E-02	NOT IDENT.
CE-143	0.000E+00	1.000E+03	0.000E+00	SHORT HLIF
CE-144	3.865E-02	6.539E-02	1.441E-01	NOT IDENT.
PM-144	-1.381E-03	1.695E-02	3.374E-02	NOT IDENT.
PR-144	-1.144E-01	1.270E+00	2.525E+00	NOT IDENT.
PM-146	-1.143E-02	1.823E-02	3.402E-02	NOT IDENT.
ND-147	2.901E-02	4.257E-01	8.797E-01	NOT IDENT.
PM-147	-1.922E+02	2.532E+02	4.572E+02	NOT IDENT.
PM-149	2.042E+02	2.830E+02	6.421E+02	NOT IDENT.
EU-150	7.724E-03	8.214E-03	1.898E-02	NOT IDENT.
EU-152	1.383E-02	4.045E-02	8.931E-02	NOT IDENT.
GD-153	-7.600E-03	3.074E-02	6.072E-02	NOT IDENT.
EU-154	3.944E-03	3.149E-02	7.928E-02	NOT IDENT.
EU-155	-1.714E-02	2.941E-02	5.559E-02	NOT IDENT.
TB-160	-9.336E-03	5.400E-02	1.086E-01	FAIL ABUN
HO-166M	-8.732E-04	2.717E-02	5.555E-02	FAIL ABUN
TM-171	-1.036E+00	2.947E+00	6.087E+00	FAIL ABUN
HF-172	1.749E-02	6.942E-02	1.445E-01	FAIL ABUN
LU-172	-5.810E-03	2.053E-02	4.350E-02	FAIL ABUN
LU-176	2.061E-02	3.580E-02	2.683E-02	FAIL ABUN
HF-181	-2.601E-03	2.072E-02	4.258E-02	NOT IDENT.
TA-182	1.301E-02	5.601E-02	1.361E-01	FAIL ABUN
RE-183	7.863E-03	3.921E-02	8.681E-02	FAIL ABUN
RE-184	-1.591E-02	6.839E-02	1.304E-01	NOT IDENT.
W-188	-3.575E-01	2.727E+00	5.766E+00	FAIL ABUN
IR-192	5.539E-03	1.303E-02	2.992E-02	NOT IDENT.
HG-203	1.574E-02	1.736E-02	4.043E-02	FAIL ABUN
BI-207	-1.265E-02	1.932E-02	3.591E-02	FAIL ABUN
TL-208	1.101E-02	2.031E-02	4.155E-02	NOT IDENT.
BI-211	-3.067E-02	9.367E-02	1.919E-01	FAIL ABUN
PB-211	5.158E-02	3.101E-01	6.124E-01	NOT IDENT.
BI-212	1.793E-02	2.377E-01	4.863E-01	NOT IDENT.
PB-212	4.675E-03	2.370E-02	5.148E-02	FAIL ABUN
BI-214	1.102E-02	3.905E-02	8.256E-02	NOT IDENT.
PB-214	-5.032E-03	3.503E-02	7.316E-02	FAIL ABUN
RN-219	-1.890E-02	1.356E-01	2.874E-01	NOT IDENT.
RN-222	1.102E-02	3.905E-02	8.256E-02	NOT IDENT.

RA-223	5.608E-02	2.687E-01	5.818E-01	FAIL ABUN
RA-224	-2.299E-01	2.271E-01	4.247E-01	NOT IDENT.
RA-226	1.102E-02	3.905E-02	8.256E-02	NOT IDENT.
AC-227	-2.798E-02	9.981E-02	2.056E-01	NOT IDENT.
TH-227	-2.798E-02	9.981E-02	2.056E-01	NOT IDENT.
AC-228	2.649E-03	6.232E-02	1.388E-01	FAIL ABUN
RA-228	2.649E-03	6.232E-02	1.388E-01	FAIL ABUN
TH-228	4.675E-03	2.370E-02	5.148E-02	FAIL ABUN
TH-229	-2.463E-02	2.048E-01	3.633E-01	FAIL ABUN
TH-230	1.102E-02	3.905E-02	8.256E-02	NOT IDENT.
PA-231	2.464E-02	1.735E-01	3.494E-01	NOT IDENT.
TH-231	5.608E-02	2.687E-01	5.818E-01	FAIL ABUN
TH-232	2.649E-03	6.232E-02	1.388E-01	FAIL ABUN
PA-233	1.142E-02	2.503E-02	5.313E-02	NOT IDENT.
PA-234	5.794E-02	1.336E-01	3.078E-01	FAIL ABUN
PA-234M	1.223E+00	2.026E+00	4.849E+00	NOT IDENT.
TH-234	1.346E-01	6.889E-01	7.164E-01	FAIL ABUN
U-234	1.102E-02	3.905E-02	8.256E-02	NOT IDENT.
U-235	-1.238E-02	6.765E-02	1.389E-01	NOT IDENT.
NP-237	1.142E-02	2.503E-02	5.313E-02	NOT IDENT.
NP-238	0.000E+00	5.014E+01	0.000E+00	SHORT HLIF
U-238	1.346E-01	6.889E-01	7.164E-01	FAIL ABUN
NP-239	2.474E-02	9.305E-02	1.957E-01	NOT IDENT.
PU-239	-7.617E+01	1.164E+02	2.128E+02	NOT IDENT.
AM-241	9.456E-03	2.924E-02	6.198E-02	NOT IDENT.
CM-243	2.281E-03	3.079E-02	6.483E-02	NOT IDENT.
BK-247	9.729E-03	3.420E-02	7.460E-02	FAIL ABUN
CM-247	1.879E-03	1.264E-02	2.818E-02	NOT IDENT.
CF-249	1.532E-03	1.453E-02	3.181E-02	NOT IDENT.
CF-251	6.146E-02	5.357E-02	1.195E-01	NOT IDENT.
ANH-511	-2.504E-02	3.025E-02	6.659E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
PB-210	46.54	22	4.25*	2.450E+00	8.655E-01	8.671E-01	162.73
AM-243	43.53	-----	5.90	1.694E+00	-----	Line Not Found	-----
	74.66	22	67.20*	6.751E+00	1.985E-02	1.985E-02	118.19

Flag: "*" = Keyline

Total number of lines in spectrum 17
Number of unidentified lines 5
Number of lines tentatively identified by NID 12 70.59%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
PB-210	22.20Y	1.00	8.655E-01	8.671E-01	14.11E-01	162.73	
AM-243	7370.00Y	1.00	1.985E-02	1.985E-02	2.347E-02	118.19	
Total Activity :			8.854E-01	8.870E-01			

Grand Total Activity : 8.854E-01 8.870E-01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
3	63.13	7	54	1.35	126.33	122	31	1.24E-03	****	5.51E+00	T
3	66.47	10	40	1.02	133.00	122	31	1.89E-03	****	5.92E+00	T
3	73.06	17	53	1.38	146.17	122	31	3.25E-03	****	6.58E+00	T
0	84.41	31	67	0.64	168.88	164	10	6.00E-03	****	7.36E+00	T
0	181.10	13	16	1.19	362.32	361	4	2.83E-03	****	6.81E+00	T
1	191.50	25	36	1.33	383.12	366	21	5.33E-03	95.0	6.57E+00	
0	211.96	20	42	1.39	424.05	418	9	4.32E-03	****	6.14E+00	T
0	306.90	22	53	3.21	613.97	605	17	4.86E-03	****	4.64E+00	T
0	331.10	31	20	0.95	662.39	657	11	7.03E-03	77.0	4.36E+00	
0	337.70	35	9	4.44	675.60	668	15	7.92E-03	56.2	4.30E+00	T
0	409.56	12	15	1.75	819.37	813	8	2.71E-03	****	3.68E+00	T
0	569.81	21	3	1.56	1139.97	1135	10	5.13E-03	56.5	2.84E+00	T
0	641.91	8	11	0.86	1284.22	1277	9	2.03E-03	****	2.59E+00	
0	781.57	9	3	1.41	1563.65	1558	9	2.40E-03	92.8	2.23E+00	
0	1294.14	6	0	0.96	2589.33	2586	6	1.67E-03	81.6	1.50E+00	

Flags: "T" = Tentatively associated

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621361.CNF;1
* Acquisition date   : 3-OCT-2016 07:53:26 Sensitivity      : 3.000
* Detector ID        : GAM24 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:01.55 Half life ratio  : *****
* Sample date        : 12-SEP-2016 00:00:00 Nuclide Library : SOLID
* Sample ID          : G1203621361 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity : 1.8148E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   Dry Weight      : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 17-JUN-2016 07:45:20 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM24_CAN.CNF;7
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
PB-210	5.074E-01
AM-243	1.322E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.369E-01	NOT IDENT.
NA-22	9.778E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	0.000E+00	NOT IDENT.
K-40	1.356E-01	NOT IDENT.
SC-46	1.159E-02	NOT IDENT.
V-48	2.054E-02	NOT IDENT.
CR-51	1.750E-01	NOT IDENT.
MN-54	1.105E-02	NOT IDENT.
CO-56	1.913E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	6.812E-03	NOT IDENT.
CO-58	1.706E-02	NOT IDENT.
FE-59	1.424E-02	NOT IDENT.
CO-60	1.655E-02	NOT IDENT.
ZN-65	3.675E-02	NOT IDENT.
GE-68	4.566E-01	NOT IDENT.
AS-73	1.321E-01	NOT IDENT.
AS-74	5.106E-02	NOT IDENT.
SE-75	2.001E-02	NOT IDENT.
BR-77	2.156E+01	NOT IDENT.
SR-82	1.467E-01	NOT IDENT.
RB-83	2.363E-02	NOT IDENT.
KR-85	3.743E+00	NOT IDENT.
SR-85	2.116E-02	NOT IDENT.
RB-86	3.543E-01	NOT IDENT.
Y-88	1.775E-02	NOT IDENT.
Y-91	5.923E+00	NOT IDENT.
NB-94	1.575E-02	NOT IDENT.

NB-95	1.283E-02	NOT IDENT.
NB-95M	3.971E-02	NOT IDENT.
ZR-95	2.993E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	1.948E+01	FAIL ABUN
TC-99M	0.000E+00	SHORT HLIF
RH-101	9.956E-03	NOT IDENT.
RH-102	1.991E-02	NOT IDENT.
RU-103	1.437E-02	NOT IDENT.
RH-106	1.221E-01	NOT IDENT.
RU-106	1.221E-01	NOT IDENT.
AG-108M	1.334E-02	NOT IDENT.
CD-109	1.913E-01	NOT IDENT.
AG-110M	1.874E-02	NOT IDENT.
SN-113	1.951E-02	NOT IDENT.
CD-115	3.954E+01	NOT IDENT.
SN-117M	2.476E-02	NOT IDENT.
TE-123M	9.671E-03	NOT IDENT.
SB-124	3.119E-02	NOT IDENT.
SB-125	2.488E-02	NOT IDENT.
TE-125M	3.434E+00	NOT IDENT.
I-126	7.976E-02	NOT IDENT.
SB-126	7.246E-02	NOT IDENT.
SN-126	1.891E-02	FAIL ABUN
SB-127	9.570E-01	NOT IDENT.
I-131	7.245E-02	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	9.302E-01	NOT IDENT.
BA-133	1.713E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	1.264E-02	FAIL ABUN
CS-135	5.542E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	3.834E-02	NOT IDENT.
BA-137M	1.239E-02	NOT IDENT.
CS-137	1.309E-02	NOT IDENT.
CE-139	1.093E-02	NOT IDENT.
BA-140	1.898E-01	NOT IDENT.
LA-140	4.310E-02	NOT IDENT.
CE-141	1.924E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	6.452E-02	NOT IDENT.
PM-144	1.436E-02	NOT IDENT.
PR-144	1.074E+00	NOT IDENT.
PM-146	1.430E-02	NOT IDENT.
ND-147	3.821E-01	NOT IDENT.
PM-147	2.008E+02	NOT IDENT.
PM-149	2.892E+02	NOT IDENT.
EU-150	8.046E-03	NOT IDENT.
EU-152	3.931E-02	NOT IDENT.
GD-153	2.743E-02	NOT IDENT.
EU-154	2.884E-02	NOT IDENT.
EU-155	2.404E-02	NOT IDENT.
TB-160	4.269E-02	FAIL ABUN
HO-166M	2.327E-02	FAIL ABUN
TM-171	2.673E+00	FAIL ABUN
HF-172	6.515E-02	FAIL ABUN
LU-172	1.633E-02	FAIL ABUN
LU-176	1.203E-02	FAIL ABUN
HF-181	1.807E-02	NOT IDENT.
TA-182	5.274E-02	FAIL ABUN
RE-183	3.859E-02	FAIL ABUN
RE-184	5.365E-02	NOT IDENT.
W-188	2.500E+00	FAIL ABUN
IR-192	1.300E-02	NOT IDENT.
HG-203	1.818E-02	FAIL ABUN
BI-207	1.356E-02	FAIL ABUN
TL-208	1.830E-02	NOT IDENT.
BI-211	8.483E-02	FAIL ABUN
PB-211	2.638E-01	NOT IDENT.
BI-212	2.060E-01	NOT IDENT.
PB-212	2.328E-02	FAIL ABUN
BI-214	3.650E-02	NOT IDENT.
PB-214	3.253E-02	FAIL ABUN
RN-219	1.195E-01	NOT IDENT.
RN-222	3.650E-02	NOT IDENT.
RA-223	2.570E-01	FAIL ABUN

RA-224	1.859E-01	NOT IDENT.
RA-226	3.650E-02	NOT IDENT.
AC-227	9.087E-02	NOT IDENT.
TH-227	9.087E-02	NOT IDENT.
AC-228	5.810E-02	FAIL ABUN
RA-228	5.810E-02	FAIL ABUN
TH-228	2.328E-02	FAIL ABUN
TH-229	1.604E-01	FAIL ABUN
TH-230	3.650E-02	NOT IDENT.
PA-231	1.508E-01	NOT IDENT.
TH-231	2.570E-01	FAIL ABUN
TH-232	5.810E-02	FAIL ABUN
PA-233	2.315E-02	NOT IDENT.
PA-234	1.289E-01	FAIL ABUN
PA-234M	2.053E+00	NOT IDENT.
TH-234	3.273E-01	FAIL ABUN
U-234	3.650E-02	NOT IDENT.
U-235	6.205E-02	NOT IDENT.
NP-237	2.315E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	3.273E-01	FAIL ABUN
NP-239	8.804E-02	NOT IDENT.
PU-239	9.392E+01	NOT IDENT.
AM-241	2.745E-02	NOT IDENT.
CM-243	2.864E-02	NOT IDENT.
BK-247	3.343E-02	FAIL ABUN
CM-247	1.187E-02	NOT IDENT.
CF-249	1.355E-02	NOT IDENT.
CF-251	5.463E-02	NOT IDENT.
ANH-511	3.139E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621361.CNF;1 *
 * Acquisition date : 3-OCT-2016 07:53:26 Sensitivity : 3.000 *
 * Detector ID : GAM24 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:01.55 Half life ratio : ***** *
 * Sample date : 12-SEP-2016 00:00:00 Nuclide Library : SOLID *
 * Sample ID : G1203621361 Analyst initials: MXR1 *
 * Batch Number : 1596252 Sample Quantity : 1.8148E+02 GRAM *
 * Quantity Err(%) : 1.1020E-03 % *
 * Wet wt corr : 1.00000 Wet Weight : 0.00000 *
 * Dry Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 17-JUN-2016 07:45:20 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM24_CAN.CNF;7 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
PB-210	8.671E-01	1.385E+00	1.385E+00
AM-243	1.985E-02	2.303E-02	2.303E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	5.083E-02	1.425E-01	1.443E-01	NOT IDENT.
NA-22	8.425E-04	1.088E-02	1.089E-02	NOT IDENT.
NA-24	5.683E+07	1.866E+08	1.883E+08	SHORT HLIF
AL-26	-1.587E-02	1.559E-02	1.715E-02	NOT IDENT.
K-40	-1.089E-01	1.709E-01	1.778E-01	NOT IDENT.
SC-46	-1.338E-02	1.743E-02	1.844E-02	NOT IDENT.
V-48	-2.147E-02	3.062E-02	3.211E-02	NOT IDENT.
CR-51	5.287E-02	1.806E-01	1.821E-01	NOT IDENT.
MN-54	-1.049E-02	1.624E-02	1.691E-02	NOT IDENT.
CO-56	1.008E-02	2.023E-02	2.073E-02	NOT IDENT.
MN-56	1.000E+41	1.529E+41	0.000E+00	SHORT HLIF
CO-57	-6.419E-03	8.608E-03	9.081E-03	NOT IDENT.
CO-58	7.859E-03	1.802E-02	1.836E-02	NOT IDENT.
FE-59	-1.580E-02	2.433E-02	2.535E-02	NOT IDENT.
CO-60	1.433E-02	1.470E-02	1.606E-02	NOT IDENT.
ZN-65	8.535E-03	3.984E-02	4.003E-02	NOT IDENT.
GE-68	2.552E-01	4.444E-01	4.591E-01	NOT IDENT.
AS-73	-4.145E-02	1.538E-01	1.550E-01	NOT IDENT.
AS-74	1.504E-03	5.796E-02	5.796E-02	NOT IDENT.
SE-75	1.002E-02	1.999E-02	2.049E-02	NOT IDENT.
BR-77	-2.546E+00	2.278E+01	2.281E+01	NOT IDENT.
SR-82	2.193E-02	1.853E-01	1.856E-01	NOT IDENT.
RB-83	7.944E-03	2.449E-02	2.475E-02	NOT IDENT.
KR-85	-1.077E+01	5.538E+00	7.365E+00	NOT IDENT.
SR-85	-6.100E-02	3.133E-02	4.168E-02	NOT IDENT.
RB-86	1.950E-01	3.454E-01	3.564E-01	NOT IDENT.
Y-88	3.774E-03	1.971E-02	1.978E-02	NOT IDENT.
Y-91	-1.230E+00	7.191E+00	7.212E+00	NOT IDENT.

NB-94	4.237E-03	1.744E-02	1.755E-02	NOT IDENT.
NB-95	-5.581E-03	1.674E-02	1.693E-02	NOT IDENT.
NB-95M	-1.053E-02	4.315E-02	4.341E-02	NOT IDENT.
ZR-95	4.166E-03	3.394E-02	3.400E-02	NOT IDENT.
NB-97	-1.000E+41	3.817E+41	0.000E+00	SHORT HLIF
ZR-97	-1.260E+09	5.573E+08	7.958E+08	SHORT HLIF
MO-99	-7.767E+00	2.491E+01	2.516E+01	FAIL ABUN
TC-99M	2.463E+23	3.645E+23	0.000E+00	SHORT HLIF
RH-101	1.476E-03	1.078E-02	1.080E-02	NOT IDENT.
RH-102	5.533E-03	2.143E-02	2.157E-02	NOT IDENT.
RU-103	-1.478E-02	1.942E-02	2.053E-02	NOT IDENT.
RH-106	3.409E-02	1.318E-01	1.327E-01	NOT IDENT.
RU-106	3.409E-02	1.318E-01	1.327E-01	NOT IDENT.
AG-108M	6.198E-03	1.372E-02	1.400E-02	NOT IDENT.
CD-109	1.316E-03	2.225E-01	2.225E-01	NOT IDENT.
AG-110M	-3.511E-03	2.331E-02	2.336E-02	NOT IDENT.
SN-113	9.437E-03	1.982E-02	2.027E-02	NOT IDENT.
CD-115	1.772E+01	4.155E+01	4.231E+01	NOT IDENT.
SN-117M	-4.194E-03	2.848E-02	2.855E-02	NOT IDENT.
TE-123M	2.596E-03	1.046E-02	1.053E-02	NOT IDENT.
SB-124	-1.053E-02	4.213E-02	4.240E-02	NOT IDENT.
SB-125	-4.232E-02	3.702E-02	4.165E-02	NOT IDENT.
TE-125M	3.022E-01	3.727E+00	3.729E+00	NOT IDENT.
I-126	-4.795E-02	1.074E-01	1.096E-01	NOT IDENT.
SB-126	-3.335E-02	9.279E-02	9.400E-02	NOT IDENT.
SN-126	9.800E-03	2.014E-02	2.062E-02	FAIL ABUN
SB-127	-6.387E-01	1.338E+00	1.369E+00	NOT IDENT.
I-131	4.115E-02	7.125E-02	7.363E-02	NOT IDENT.
I-132	-1.000E+41	7.291E+41	0.000E+00	SHORT HLIF
TE-132	-1.025E-01	1.097E+00	1.098E+00	NOT IDENT.
BA-133	-6.204E-04	1.870E-02	1.870E-02	NOT IDENT.
I-133	2.013E+05	4.350E+05	4.443E+05	SHORT HLIF
CS-134	-8.249E-03	1.710E-02	1.750E-02	FAIL ABUN
CS-135	1.893E-03	5.851E-02	5.852E-02	NOT IDENT.
I-135	-6.036E+21	1.185E+22	0.000E+00	SHORT HLIF
CS-136	-4.382E-02	5.690E-02	6.024E-02	NOT IDENT.
BA-137M	2.663E-03	1.359E-02	1.364E-02	NOT IDENT.
CS-137	2.814E-03	1.435E-02	1.441E-02	NOT IDENT.
CE-139	-1.022E-03	1.249E-02	1.250E-02	NOT IDENT.
BA-140	1.999E-01	1.788E-01	2.003E-01	NOT IDENT.
LA-140	-1.503E-02	5.703E-02	5.743E-02	NOT IDENT.
CE-141	-2.172E-02	2.516E-02	2.700E-02	NOT IDENT.
CE-143	1.540E+01	1.000E+03	1.000E+03	SHORT HLIF
CE-144	3.865E-02	6.543E-02	6.771E-02	NOT IDENT.
PM-144	-1.381E-03	1.695E-02	1.696E-02	NOT IDENT.
PR-144	-1.144E-01	1.270E+00	1.272E+00	NOT IDENT.
PM-146	-1.143E-02	1.824E-02	1.896E-02	NOT IDENT.
ND-147	2.901E-02	4.257E-01	4.259E-01	NOT IDENT.
PM-147	-1.922E+02	2.534E+02	2.678E+02	NOT IDENT.
PM-149	2.042E+02	2.844E+02	2.989E+02	NOT IDENT.
EU-150	7.724E-03	8.220E-03	8.927E-03	NOT IDENT.
EU-152	1.383E-02	4.046E-02	4.094E-02	NOT IDENT.
GD-153	-7.600E-03	3.074E-02	3.093E-02	NOT IDENT.
EU-154	3.944E-03	3.149E-02	3.154E-02	NOT IDENT.
EU-155	-1.714E-02	2.944E-02	3.044E-02	NOT IDENT.
TB-160	-9.336E-03	5.401E-02	5.417E-02	FAIL ABUN
HO-166M	-8.732E-04	2.717E-02	2.717E-02	FAIL ABUN
TM-171	-1.036E+00	2.949E+00	2.985E+00	FAIL ABUN
HF-172	1.749E-02	6.948E-02	6.992E-02	FAIL ABUN
LU-172	-5.810E-03	2.054E-02	2.071E-02	FAIL ABUN
LU-176	2.061E-02	3.581E-02	3.700E-02	FAIL ABUN
HF-181	-2.601E-03	2.072E-02	2.076E-02	NOT IDENT.
TA-182	1.301E-02	5.601E-02	5.632E-02	FAIL ABUN
RE-183	7.863E-03	3.922E-02	3.938E-02	FAIL ABUN
RE-184	-1.591E-02	6.840E-02	6.878E-02	NOT IDENT.
W-188	-3.575E-01	2.728E+00	2.732E+00	FAIL ABUN
IR-192	5.539E-03	1.304E-02	1.327E-02	NOT IDENT.
HG-203	1.574E-02	1.737E-02	1.877E-02	FAIL ABUN
BI-207	-1.265E-02	1.933E-02	2.015E-02	FAIL ABUN
TL-208	1.101E-02	2.032E-02	2.092E-02	NOT IDENT.
BI-211	-3.067E-02	9.368E-02	9.470E-02	FAIL ABUN
PB-211	5.158E-02	3.101E-01	3.110E-01	NOT IDENT.
BI-212	1.793E-02	2.377E-01	2.379E-01	NOT IDENT.
PB-212	4.675E-03	2.370E-02	2.380E-02	FAIL ABUN
BI-214	1.102E-02	3.905E-02	3.936E-02	NOT IDENT.
PB-214	-5.032E-03	3.503E-02	3.510E-02	FAIL ABUN
RN-219	-1.890E-02	1.356E-01	1.359E-01	NOT IDENT.
RN-222	1.102E-02	3.905E-02	3.936E-02	NOT IDENT.

RA-223	5.608E-02	2.688E-01	2.700E-01	FAIL ABUN
RA-224	-2.299E-01	2.274E-01	2.499E-01	NOT IDENT.
RA-226	1.102E-02	3.905E-02	3.936E-02	NOT IDENT.
AC-227	-2.798E-02	9.988E-02	1.007E-01	NOT IDENT.
TH-227	-2.798E-02	9.988E-02	1.007E-01	NOT IDENT.
AC-228	2.649E-03	6.232E-02	6.233E-02	FAIL ABUN
RA-228	2.649E-03	6.232E-02	6.233E-02	FAIL ABUN
TH-228	4.675E-03	2.370E-02	2.380E-02	FAIL ABUN
TH-229	-2.463E-02	2.048E-01	2.051E-01	FAIL ABUN
TH-230	1.102E-02	3.905E-02	3.936E-02	NOT IDENT.
PA-231	2.464E-02	1.736E-01	1.740E-01	NOT IDENT.
TH-231	5.608E-02	2.688E-01	2.700E-01	FAIL ABUN
TH-232	2.649E-03	6.232E-02	6.233E-02	FAIL ABUN
PA-233	1.142E-02	2.504E-02	2.556E-02	NOT IDENT.
PA-234	5.794E-02	1.492E-01	1.514E-01	FAIL ABUN
PA-234M	1.223E+00	2.027E+00	2.100E+00	NOT IDENT.
TH-234	1.346E-01	6.896E-01	6.922E-01	FAIL ABUN
U-234	1.102E-02	3.905E-02	3.936E-02	NOT IDENT.
U-235	-1.238E-02	6.765E-02	6.788E-02	NOT IDENT.
NP-237	1.142E-02	2.504E-02	2.556E-02	NOT IDENT.
NP-238	-2.515E+01	5.015E+01	5.141E+01	SHORT HLIF
U-238	1.346E-01	6.896E-01	6.922E-01	FAIL ABUN
NP-239	2.474E-02	9.307E-02	9.374E-02	NOT IDENT.
PU-239	-7.617E+01	1.164E+02	1.214E+02	NOT IDENT.
AM-241	9.456E-03	2.925E-02	2.956E-02	NOT IDENT.
CM-243	2.281E-03	3.079E-02	3.081E-02	NOT IDENT.
BK-247	9.729E-03	3.426E-02	3.454E-02	FAIL ABUN
CM-247	1.879E-03	1.264E-02	1.267E-02	NOT IDENT.
CF-249	1.532E-03	1.454E-02	1.455E-02	NOT IDENT.
CF-251	6.146E-02	5.401E-02	6.070E-02	NOT IDENT.
ANH-511	-2.504E-02	3.027E-02	3.230E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	23.3467	87.09	12.7275	136.47	17.0416
45.60	22.4884	87.57	16.9832	140.51	20.5491
46.54	22.5396	88.03	22.6610	143.76	18.3359
49.72	21.0634	88.34	21.2553	144.24	18.3462
51.35	17.8385	88.47	21.2598	145.44	29.8542
51.87	17.8594	89.96	21.3104	152.43	39.3530
52.39	21.8536	90.64	38.4002	153.25	22.0117
52.97	22.8766	91.11	59.7777	154.21	23.1952
53.44	17.9220	92.59	34.2383	156.02	27.8903
54.07	23.9291	93.35	22.4953	158.56	26.8029
57.36	0.0000	94.56	67.6123	159.00	20.9864
57.53	22.0989	94.65	60.1084	162.33	17.5518
57.98	19.1034	94.67	60.1101	162.66	30.4338
59.27	16.1303	94.87	51.5387	163.33	31.6274
59.32	16.1320	97.43	33.4155	165.86	29.3636
59.54	16.1393	98.43	17.2727	176.31	23.7476
60.96	21.5818	98.44	17.2729	176.60	21.3791
61.17	21.5910	99.53	34.6023	177.52	20.2103
62.93	29.4543	100.11	28.1386	181.07	14.3172
63.29	29.4754	102.03	18.4504	181.52	17.5066
63.58	29.4925	103.18	21.7429	184.41	19.1531
64.28	29.5332	103.37	18.4865	185.72	19.1780
66.73	29.6742	105.21	20.7165	193.51	20.9335
67.24	29.7031	105.31	20.7194	197.03	16.9644
67.68	29.7281	106.12	25.1105	198.01	24.2575
67.75	29.7321	106.47	26.2152	201.83	21.9098
69.67	29.8401	109.28	21.9330	203.43	23.1615
70.83	29.9045	111.00	25.2835	205.31	25.6437
72.81	30.0133	111.76	24.2097	210.85	18.4094
72.87	30.0167	114.06	27.5978	215.65	16.0235
74.66	30.1138	116.30	19.9308	222.11	18.5939
74.82	30.1224	116.74	23.2664	227.09	23.6537
74.97	30.1304	119.76	18.9105	227.38	23.6595
77.11	22.2490	121.12	27.8593	228.16	21.1831
78.74	28.2391	121.22	27.8629	228.18	21.1836
79.69	30.7296	121.78	24.5373	235.69	20.9002
80.12	25.1611	122.06	26.7779	235.96	23.4134
80.19	23.7660	122.92	18.9888	238.63	16.7611
80.57	22.3825	123.07	18.9926	238.98	19.2808
81.00	22.3989	123.68	26.8341	240.99	29.3888
81.07	22.4015	125.81	24.6654	242.00	22.6903
81.75	23.8291	127.23	22.4635	244.70	16.8447
83.79	26.3721	127.91	25.8554	252.40	16.1018
84.00	26.3813	129.30	28.1528	252.80	14.4114
85.43	26.4437	131.20	25.9620	254.15	0.0000
86.55	19.7809	133.02	18.1013	256.23	22.9510
86.79	12.7213	133.52	16.9805	260.90	23.0350
86.94	12.7244	136.00	22.7094	264.66	20.5352

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.80	20.5371	364.49	8.2449	600.60	14.4489
265.00	21.3964	366.42	10.0889	602.52	0.0000
268.22	18.8754	372.51	8.2852	604.72	19.6432
269.46	20.6104	375.05	17.5176	607.14	18.6284
270.03	23.1971	377.52	13.8501	609.32	10.3589
271.23	17.1985	383.85	8.3414	610.33	15.5444
273.65	15.5068	388.16	10.2207	614.28	6.2280
276.40	19.8555	388.63	10.2237	618.01	11.4360
277.37	21.5973	391.69	12.1039	620.36	5.2032
277.60	20.7373	400.66	8.4230	621.93	7.2891
278.00	16.4217	401.81	9.3652	630.19	0.0000
279.20	15.5713	402.40	8.4315	631.29	6.2720
279.54	22.4977	404.85	11.2576	633.25	10.4614
279.70	22.5003	410.95	11.2964	634.78	8.3743
280.46	26.8424	413.71	11.3140	635.95	7.8546
283.69	22.5664	414.70	16.0368	636.99	7.8580
284.31	27.7865	423.72	15.1689	645.85	8.4118
285.41	23.4641	427.09	15.1969	657.76	13.7342
285.90	18.2562	427.87	17.1039	657.90	0.0000
287.50	18.2774	433.94	12.3935	661.66	6.3486
290.67	15.7024	439.40	18.1666	664.57	0.0000
293.27	0.0000	453.88	15.4157	666.33	7.4204
295.22	14.0033	463.37	16.4598	666.50	8.4808
295.96	14.8861	468.07	11.6467	667.71	0.0000
298.58	17.5456	473.00	10.7030	677.62	8.5176
299.98	11.8551	475.06	11.6880	685.70	6.4082
300.09	6.5866	476.78	4.8743	695.00	10.7182
300.13	6.5868	477.60	8.7773	696.49	11.7967
301.36	11.8666	482.18	11.7300	696.51	11.7967
302.85	9.2392	487.02	12.7379	697.00	15.0168
304.50	13.2141	492.35	14.7363	697.30	13.9458
304.85	13.2172	497.08	14.7705	697.49	13.9469
306.78	13.2349	505.52	12.8537	702.65	11.8240
308.46	13.2504	507.63	0.0000	706.68	13.9950
311.90	10.6252	511.00	22.8007	711.68	6.4712
316.51	10.6587	514.00	58.5727	720.70	10.8215
319.41	15.1296	514.00	58.5727	721.93	0.0000
320.08	16.0269	520.40	4.9788	722.78	8.6641
321.04	14.2552	520.69	5.9756	722.91	5.4152
323.87	16.9601	522.65	0.0000	723.31	5.4161
325.23	18.7625	527.90	12.9905	724.19	9.7518
328.76	16.1195	528.26	10.9942	727.33	6.5088
333.37	2.6948	529.59	13.0011	733.00	7.6093
333.97	2.6958	529.87	0.0000	735.93	9.7939
334.37	2.6965	531.02	14.0103	737.46	8.7106
338.28	9.4618	537.26	7.0253	739.50	8.7168
338.32	9.4620	546.56	0.0000	747.24	3.2780
340.48	17.5969	552.55	10.1062	748.06	3.2789
340.55	17.5977	563.25	8.1240	752.31	4.3786
344.28	14.4736	569.33	6.1094	753.82	7.6665
345.93	14.4886	569.50	6.1099	756.73	7.6745
351.06	15.4443	569.70	6.1104	756.80	7.6748
351.93	15.4526	583.19	8.1953	763.94	4.3966
355.39	0.0000	584.27	8.1992	765.81	7.6993
356.01	18.2263	595.83	12.3599	766.42	12.1011

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
766.84	13.2031	1002.74	4.4452	1678.03	0.0000
772.60	0.0000	1004.73	7.1165	1690.97	3.1227
776.52	6.6240	1021.30	0.0000	1750.46	0.0000
777.92	3.3136	1025.87	0.0000	1764.49	4.2205
778.90	8.2870	1028.54	0.0000	1770.23	2.1124
783.70	8.3008	1037.84	3.5916	1771.35	3.1694
785.37	0.0000	1038.76	0.0000	1791.20	0.0000
792.07	6.6597	1046.59	2.7001	1808.65	4.2542
794.95	6.6663	1048.07	8.1035	1810.72	0.0000
795.86	6.6685	1049.04	5.4038	1836.06	2.1373
801.95	1.1137	1050.41	2.7030		
810.06	5.5839	1063.66	7.2339		
810.29	4.4674	1077.00	2.7226		
810.45	4.4676	1077.34	2.7230		
810.76	5.5851	1085.87	3.6389		
815.77	5.5945	1093.63	4.5581		
818.51	7.8394	1099.45	3.6521		
832.01	3.3749	1112.07	9.1608		
834.85	10.1342	1112.84	9.1626		
835.71	10.1371	1115.54	7.3350		
836.80	0.0000	1120.29	6.4262		
846.75	0.0000	1120.55	6.4266		
846.77	6.7825	1121.30	2.7548		
856.80	5.6706	1129.67	5.5217		
860.56	4.5418	1131.51	0.0000		
871.09	10.2539	1147.95	0.0000		
873.19	6.8403	1173.23	0.9306		
875.33	0.0000	1177.95	2.7951		
879.38	5.7115	1189.05	5.6056		
880.51	5.7135	1204.77	4.6896		
883.24	5.7186	1221.41	2.8253		
884.68	8.0094	1231.02	0.9440		
889.28	5.7294	1235.36	4.7247		
894.76	5.7391	1238.28	1.8912		
898.04	10.3411	1260.41	0.0000		
900.72	4.5999	1271.87	1.9065		
903.28	9.2070	1274.44	1.9076		
911.20	3.4611	1274.54	1.9077		
912.08	3.4620	1291.59	1.5322		
923.98	0.0000	1298.22	0.0000		
926.50	3.4773	1312.11	6.7355		
929.11	4.6401	1332.49	0.9667		
937.49	3.4889	1362.66	0.0000		
944.13	6.9917	1365.19	3.8955		
946.00	2.3319	1368.63	0.0000		
949.00	7.0017	1384.29	0.9780		
954.55	0.0000	1408.01	0.9832		
962.31	7.0295	1457.56	0.0000		
964.08	10.5498	1460.82	2.9830		
966.17	7.0374	1489.16	2.0005		
968.97	2.6412	1505.03	4.0142		
983.53	6.1891	1584.12	1.0197		
984.45	0.0000	1596.21	4.0886		
996.26	8.8739	1620.50	2.0541		
1001.03	2.6658	1621.92	5.1364		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621362.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM29.CNF;354
Background date : 2-OCT-2016 11:01:41.
Sample date     : 30-NOV-2015 13:27:00 Acquisition date : 3-OCT-2016 07:54:00.
Sample ID      : G1203621362 Sample quantity   : 1.81483E+02 GRAM
Detector name  : GAM29 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:01.45 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1596252 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	2	74.86*	121	162	1.08	149.65	145	16	3.35E-02	18.8	1.15E+00
2	2	77.22*	181	163	1.22	154.37	145	16	5.02E-02	14.6	
3	0	84.04*	36	146	1.16	167.99	165	7	1.01E-02	58.6	
4	3	86.89	92	125	1.36	173.68	171	32	2.56E-02	21.4	1.65E+00
5	3	90.20	44	159	1.35	180.29	171	32	1.23E-02	51.6	
6	3	92.91*	95	113	1.08	185.69	171	32	2.63E-02	22.4	
7	0	128.29	62	170	1.37	256.36	251	11	1.71E-02	43.3	
8	0	159.92	49	234	3.84	319.53	314	16	1.36E-02	71.2	
9	0	186.23*	53	139	1.26	372.08	367	9	1.47E-02	45.2	
10	0	194.46	31	116	1.33	388.54	383	10	8.61E-03	69.6	
11	3	207.21	28	31	1.23	414.00	412	12	7.66E-03	31.6	3.06E+00
12	3	209.20	54	99	1.55	417.97	412	12	1.51E-02	37.0	
13	5	238.64*	334	85	1.02	476.79	472	15	9.29E-02	7.1	1.89E+00
14	5	241.48	84	103	1.75	482.45	472	15	2.33E-02	27.6	
15	0	295.24*	165	78	1.13	589.85	584	10	4.57E-02	12.8	
16	0	329.40	12	69	0.49	658.10	652	8	3.28E-03	126.0	
17	0	334.02	19	38	1.24	667.34	665	7	5.28E-03	59.4	
18	0	338.38*	89	56	0.94	676.04	672	10	2.46E-02	19.2	
19	0	351.93*	271	64	1.31	703.12	698	12	7.52E-02	8.6	
20	0	397.75	7	29	1.24	794.65	790	7	1.82E-03	140.4	
21	0	400.82	17	34	3.16	800.79	796	9	4.62E-03	67.8	
22	0	405.54	18	45	0.67	810.22	805	10	5.00E-03	73.6	
23	0	463.19	32	33	2.50	925.42	922	9	8.81E-03	37.5	
24	0	510.81*	13	70	1.23	1020.60	1014	14	3.72E-03	156.3	
25	0	547.02*	11	29	0.74	1092.97	1089	9	2.95E-03	99.4	
26	0	583.62*	116	49	1.03	1166.13	1160	12	3.21E-02	15.7	
27	0	609.36*	172	49	1.14	1217.57	1213	9	4.77E-02	10.8	
28	0	662.86	25	41	1.13	1324.51	1318	13	6.94E-03	57.1	
29	0	684.20	11	15	1.02	1367.17	1363	8	3.18E-03	66.4	
30	3	709.15	11	5	1.40	1417.06	1415	22	3.18E-03	40.0	1.01E+00
31	3	712.16	13	18	1.80	1423.06	1415	22	3.70E-03	72.4	
32	0	727.66	27	44	0.78	1454.05	1446	16	7.44E-03	58.7	
33	0	750.81	15	9	1.16	1500.33	1496	8	4.10E-03	45.0	
34	0	757.59	11	16	0.52	1513.91	1506	11	3.07E-03	77.1	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	768.46	19	30	3.80	1535.63	1528	12	5.23E-03	62.7	
36	0	795.83	27	25	3.40	1590.35	1585	13	7.58E-03	42.8	
37	0	860.59	23	25	4.07	1719.85	1712	14	6.50E-03	49.5	
38	0	894.62	15	12	1.44	1787.89	1782	11	4.06E-03	55.1	
39	0	911.51*	62	31	1.57	1821.68	1817	11	1.71E-02	22.0	
40	0	915.66	15	5	1.47	1829.98	1827	8	4.06E-03	38.7	
41	0	934.11*	20	11	2.04	1866.87	1860	11	5.68E-03	40.5	
42	0	955.28	8	9	0.69	1909.21	1902	9	2.23E-03	76.0	
43	2	964.83	22	11	1.94	1928.33	1924	24	6.14E-03	38.4	3.59E-01
44	2	968.70*	46	15	1.95	1936.06	1924	24	1.29E-02	24.1	
45	0	984.31	28	41	7.88	1967.27	1951	26	7.65E-03	69.3	
46	0	1000.59*	9	10	0.87	1999.84	1994	10	2.48E-03	79.2	
47	0	1120.76*	51	20	1.49	2240.22	2235	13	1.42E-02	23.2	
48	0	1170.26	9	17	1.84	2339.27	2333	10	2.48E-03	93.6	
49	0	1238.99*	16	32	1.39	2476.79	2469	13	4.39E-03	79.8	
50	0	1327.38	6	10	0.56	2653.67	2647	10	1.61E-03	110.2	
51	0	1377.71*	15	2	0.98	2754.40	2750	9	4.05E-03	34.8	
52	0	1395.69	7	5	0.64	2790.38	2785	9	1.81E-03	70.7	
53	0	1408.25	7	10	1.19	2815.51	2810	10	2.08E-03	86.8	
54	0	1460.91*	473	11	1.85	2920.93	2913	14	1.31E-01	4.9	
55	0	1593.69	4	7	0.95	3186.75	3181	7	1.11E-03	120.5	
56	0	1730.19	14	3	1.12	3460.08	3454	9	3.98E-03	32.8	
57	0	1764.63*	32	0	2.25	3529.05	3523	11	8.89E-03	19.7	
58	0	1846.28	10	0	1.05	3692.60	3686	11	2.78E-03	31.6	

Flag: "*" = Peak area was modified by background subtraction


```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621362.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 30-NOV-2015 13:27:00 Acquisition date : 3-OCT-2016 07:54:00
Sample ID         : G1203621362           Sample quantity  : 181.48 GRAM
Sample type       : SOLID                  Sample geometry   :
Detector name     : GAMMA29               Detector geometry: CAN
Elapsed live time: 0 01:00:00.00          Elapsed real time: 0 01:00:01.45    0.0%
Energy tolerance  : 1.50 keV              Half life ratio   : 10.00
Errors propagated: No                     Systematic Error  : 0.00 %
Efficiency type   : Linear                 Efficiencies at   : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.347E+00	1.339E+01	1.339E+01	9.73	OK
CD-109	88.03	3.70*	6.242E+00	1.468E+00	2.330E+00	70.96	OK
TE-123M	159.00	84.00*	6.985E+00	4.621E-02	2.767E-01	142.35	OK
SN-126	64.28	9.60	3.737E+00	-----	Line Not Found	-----	Absent
	86.94	8.90	6.242E+00	6.102E-01	6.102E-01	70.96	OK
	87.57	37.00*	6.242E+00	1.468E-01	1.468E-01	70.96	OK
BA-137M	661.66	89.90*	2.518E+00	5.071E-02	5.170E-02	114.17	OK
CS-137	661.66	85.10*	2.518E+00	5.357E-02	5.462E-02	114.17	OK
TL-208	277.37	6.60	4.914E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.771E+00	2.297E-01	2.297E-01	31.44	OK
	860.56	12.50	2.069E+00	3.998E-01	3.998E-01	98.91	OK
PB-212	74.82	10.28	5.108E+00	8.367E-01	8.367E-01	64.85	OK
	77.11	17.10	5.368E+00	1.187E+00	1.187E+00	29.14	OK
	238.63	43.60*	5.496E+00	7.363E-01	7.363E-01	14.13	OK
	300.09	3.30	4.626E+00	-----	Line Not Found	-----	Absent
BI-214	609.32	45.49*	2.683E+00	6.541E-01	6.544E-01	21.56	OK
	1120.29	14.92	1.685E+00	8.658E-01	8.661E-01	46.46	OK
	1764.49	15.30	1.129E+00	7.309E-01	7.311E-01	39.34	OK
PB-214	74.82	5.80	5.103E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	5.368E+00	2.092E+00	2.093E+00	29.14	OK
	87.09	3.41	6.257E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	5.441E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.685E+00	9.801E-01	9.805E-01	25.67	OK
	351.93	35.60*	4.087E+00	9.335E-01	9.338E-01	17.17	OK
RN-222	609.32	45.49*	2.683E+00	6.541E-01	6.544E-01	21.56	OK
	1120.29	14.92	1.685E+00	8.658E-01	8.661E-01	46.46	OK
	1764.49	15.30	1.129E+00	7.309E-01	7.311E-01	39.34	OK
RA-224	240.99	4.10*	5.449E+00	2.414E-01	2.414E-01	487.99	OK
RA-226	609.32	45.49*	2.683E+00	6.541E-01	6.544E-01	21.56	OK
	1120.29	14.92	1.685E+00	8.658E-01	8.661E-01	46.46	OK
	1764.49	15.30	1.129E+00	7.309E-01	7.311E-01	39.34	OK
AC-228	105.21	1.10	7.155E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.214E+00	9.416E-01	9.416E-01	38.45	OK
	794.95	4.25	2.196E+00	1.309E+00	1.309E+00	85.63	OK
	835.71	1.61	2.116E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.981E+00	5.294E-01	5.294E-01	43.94	OK
	968.97	15.80	1.890E+00	6.731E-01	6.731E-01	48.20	OK
RA-228	105.21	1.10	7.155E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.214E+00	9.416E-01	9.416E-01	38.45	OK
	794.95	4.25	2.196E+00	1.309E+00	1.309E+00	85.63	OK
	835.71	1.61	2.116E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.981E+00	5.294E-01	5.294E-01	43.94	OK
	968.97	15.80	1.890E+00	6.731E-01	6.731E-01	48.20	OK
TH-228	74.82	10.28	5.108E+00	8.367E-01	8.367E-01	64.85	OK
	77.11	17.10	5.368E+00	1.187E+00	1.187E+00	29.14	OK
	238.63	43.60*	5.496E+00	7.363E-01	7.363E-01	14.13	OK
	300.09	3.30	4.626E+00	-----	Line Not Found	-----	Absent
TH-230	609.32	45.49*	2.683E+00	6.541E-01	6.541E-01	21.56	OK
	1120.29	14.92	1.685E+00	8.658E-01	8.658E-01	46.46	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	1764.49	15.30	1.129E+00	7.309E-01	7.309E-01	39.34	OK
TH-232	105.21	1.10	7.155E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.214E+00	9.416E-01	9.416E-01	38.45	OK
	835.71	1.61	2.116E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.981E+00	5.294E-01	5.294E-01	43.94	OK
	968.97	15.80	1.890E+00	6.731E-01	6.731E-01	48.20	OK
U-234	609.32	45.49*	2.683E+00	6.541E-01	6.541E-01	21.56	OK
	1120.29	14.92	1.685E+00	8.658E-01	8.658E-01	46.46	OK
	1764.49	15.30	1.129E+00	7.309E-01	7.309E-01	39.34	OK
U-235	89.96	3.47	6.473E+00	1.167E+00	1.167E+00	103.23	OK
	93.35	5.60	6.639E+00	1.505E+00	1.505E+00	44.72	OK
	143.76	10.96*	7.247E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	6.922E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.471E+00	7.775E-02	7.775E-02	90.32	OK
	205.31	5.01	6.095E+00	----- Line	Not Found	-----	Absent
AM-243	43.53	5.90	7.707E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	5.108E+00	1.280E-01	1.280E-01	64.85	OK
ANH-511	511.00	100.00*	3.065E+00	2.085E-02	2.085E-02	312.60	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621362.CNF;1
* Acquisition date   : 3-OCT-2016 07:54:00 Sensitivity      : 3.000
* Detector ID        : GAM29 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:01.45 Half life ratio : *****
* Sample date        : 30-NOV-2015 13:27:00 Analyst initials: MXR1
* Sample ID          : G1203621362 Sample Quantity : 1.8148E+02 GRAM
* Batch Number       : 1596252 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 25-JUN-2016 09:55:57 Eff. Geometry : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM29_CAN.CNF;10
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.339E+01	1.276E+00	5.070E-01
CD-109	2.330E+00	1.621E+00	1.436E+00
TE-123M	2.767E-01	3.860E-01	1.844E-01
SN-126	1.468E-01	1.021E-01	9.090E-02
BA-137M	5.170E-02	5.785E-02	4.530E-02
CS-137	5.462E-02	6.111E-02	4.785E-02
TL-208	2.297E-01	7.078E-02	5.229E-02
PB-212	7.363E-01	1.020E-01	7.430E-02
BI-214	6.544E-01	1.383E-01	9.840E-02
PB-214	9.338E-01	1.572E-01	8.672E-02
RN-222	6.544E-01	1.383E-01	9.840E-02
RA-224	2.414E-01	1.154E+00	7.961E-01
RA-226	6.544E-01	1.383E-01	9.840E-02
AC-228	5.294E-01	2.280E-01	2.060E-01
RA-228	5.294E-01	2.280E-01	2.060E-01
TH-228	7.363E-01	1.020E-01	7.430E-02
TH-230	6.541E-01	1.382E-01	9.837E-02
TH-232	5.294E-01	2.280E-01	2.060E-01
U-234	6.541E-01	1.382E-01	9.837E-02
U-235	-2.847E-02	1.491E-01	2.793E-01
AM-243	1.280E-01	8.136E-02	6.750E-02
ANH-511	2.085E-02	6.386E-02	3.988E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	9.094E-01		9.337E+00	1.918E+01	NOT IDENT.
NA-22	-1.468E-02		2.842E-02	4.947E-02	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF
AL-26	6.821E-04		2.041E-02	4.558E-02	NOT IDENT.
SC-46	2.276E-01		2.941E-01	6.100E-01	FAIL ABUN
V-48	0.000E+00		5.505E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00		3.635E+02	0.000E+00	SHORT HLIF
MN-54	4.316E-02		4.434E-02	9.957E-02	NOT IDENT.

CO-56	1.033E-01	3.510E-01	7.251E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	4.277E-03	3.403E-02	6.743E-02	NOT IDENT.
CO-58	5.487E-02	3.594E-01	7.535E-01	NOT IDENT.
FE-59	-2.740E+00	5.065E+00	8.886E+00	NOT IDENT.
CO-60	-7.006E-03	3.288E-02	6.029E-02	NOT IDENT.
ZN-65	2.254E-02	1.305E-01	2.364E-01	NOT IDENT.
GE-68	-4.440E-01	1.798E+00	3.335E+00	NOT IDENT.
AS-73	4.681E+00	6.756E+00	1.454E+01	NOT IDENT.
AS-74	0.000E+00	5.841E+03	0.000E+00	SHORT HLIF
SE-75	1.286E-01	1.656E-01	3.349E-01	FAIL ABUN
BR-77	0.000E+00	1.859E+38	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.413E+02	0.000E+00	SHORT HLIF
RB-83	1.582E-01	4.759E-01	1.002E+00	NOT IDENT.
KR-85	3.418E-01	5.153E+00	9.424E+00	NOT IDENT.
SR-85	3.880E-02	5.918E-01	1.082E+00	NOT IDENT.
RB-86	0.000E+00	2.904E+04	0.000E+00	SHORT HLIF
Y-88	1.079E-02	1.566E-01	3.510E-01	NOT IDENT.
Y-91	-1.819E+02	4.831E+02	8.560E+02	NOT IDENT.
NB-94	6.682E-03	2.111E-02	4.379E-02	NOT IDENT.
NB-95	-2.330E-01	7.290E-01	1.205E+00	NOT IDENT.
NB-95M	1.479E+00	2.217E+00	4.075E+00	NOT IDENT.
ZR-95	1.124E+00	1.698E+00	2.308E+00	FAIL ABUN
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	8.295E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.480E+41	0.000E+00	SHORT HLIF
RH-101	0.000E+00	7.055E-02	5.013E-02	FAIL ABUN
RH-102	4.599E-02	3.920E-02	9.085E-02	NOT IDENT.
RU-103	-3.314E+00	4.665E+00	8.641E+00	FAIL ABUN
RH-106	4.064E-02	3.430E-01	7.010E-01	NOT IDENT.
RU-106	4.064E-02	3.430E-01	7.010E-01	NOT IDENT.
AG-108M	8.960E-03	1.862E-02	3.996E-02	NOT IDENT.
AG-110M	-1.036E-02	7.142E-02	1.380E-01	NOT IDENT.
SN-113	1.274E-01	1.557E-01	3.462E-01	NOT IDENT.
CD-115	0.000E+00	2.181E+40	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	4.072E+05	0.000E+00	SHORT HLIF
SB-124	-5.048E-01	1.334E+00	2.677E+00	NOT IDENT.
SB-125	1.686E-03	7.121E-02	1.455E-01	FAIL ABUN
TE-125M	1.314E+01	2.277E+02	4.490E+02	NOT IDENT.
I-126	0.000E+00	9.963E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.227E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	8.784E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	6.253E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.650E+27	0.000E+00	SHORT HLIF
BA-133	-1.667E-03	2.947E-02	5.432E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	8.629E-02	7.241E-02	9.031E-02	FAIL ABUN
CS-135	-7.265E-02	1.100E-01	1.910E-01	NOT IDENT.
I-135	0.000E+00	7.372E+40	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.324E+05	0.000E+00	SHORT HLIF
CE-139	-6.776E-03	9.510E-02	1.668E-01	NOT IDENT.
BA-140	0.000E+00	1.469E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.049E+05	0.000E+00	SHORT HLIF
CE-141	3.839E+00	2.286E+01	4.447E+01	NOT IDENT.
CE-143	0.000E+00	1.806E+41	0.000E+00	SHORT HLIF
CE-144	-4.504E-02	2.679E-01	5.138E-01	NOT IDENT.
PM-144	-6.136E-04	4.134E-02	8.140E-02	NOT IDENT.
PR-144	-6.429E-02	3.605E+00	7.094E+00	NOT IDENT.
PM-146	-2.209E-02	2.514E-02	4.586E-02	NOT IDENT.
ND-147	0.000E+00	3.356E+07	0.000E+00	SHORT HLIF
PM-147	-5.927E-01	6.148E+02	1.202E+03	NOT IDENT.
PM-149	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
EU-150	2.388E-02	2.780E-02	3.802E-02	FAIL ABUN
EU-152	1.248E-02	6.054E-02	1.272E-01	FAIL ABUN
GD-153	-1.710E-02	1.401E-01	2.538E-01	NOT IDENT.
EU-154	-3.249E-02	7.015E-02	1.240E-01	FAIL ABUN
EU-155	4.094E-02	8.398E-02	1.705E-01	FAIL ABUN
TB-160	-8.481E-01	1.164E+00	2.009E+00	FAIL ABUN
HO-166M	4.695E-02	6.660E-02	8.460E-02	FAIL ABUN
TM-171	1.623E+00	1.449E+01	3.014E+01	NOT IDENT.
HF-172	1.635E-01	1.695E-01	3.358E-01	FAIL ABUN
LU-172	1.780E-02	5.510E-02	1.130E-01	FAIL ABUN
LU-176	-2.430E-02	1.933E-02	3.043E-02	FAIL ABUN
HF-181	-8.918E-01	3.035E+00	6.002E+00	NOT IDENT.
TA-182	-5.704E-01	7.761E-01	1.283E+00	FAIL ABUN
RE-183	7.041E-01	2.223E+00	4.656E+00	NOT IDENT.

RE-184	-1.718E+01	2.791E+01	4.908E+01	FAIL ABUN
W-188	9.367E+00	8.920E+01	1.566E+02	NOT IDENT.
IR-192	1.371E-01	3.548E-01	6.946E-01	FAIL ABUN
HG-203	2.471E-01	2.085E+00	3.934E+00	NOT IDENT.
BI-207	4.148E-03	2.953E-02	6.034E-02	FAIL ABUN
PB-210	-1.075E+00	2.373E+00	4.790E+00	NOT IDENT.
BI-211	0.000E+00	4.329E-01	6.209E-01	FAIL ABUN
PB-211	6.406E-01	9.241E-01	1.076E+00	FAIL ABUN
BI-212	7.755E-01	8.917E-01	9.038E-01	FAIL ABUN
RN-219	3.362E-01	4.468E-01	4.997E-01	FAIL ABUN
RA-223	-1.952E-01	4.837E-01	8.512E-01	FAIL ABUN
AC-227	4.606E-02	1.642E-01	3.185E-01	FAIL ABUN
TH-227	4.606E-02	1.642E-01	3.185E-01	FAIL ABUN
TH-229	6.036E-01	8.236E-01	6.840E-01	FAIL ABUN
PA-231	-1.822E-01	3.419E-01	5.962E-01	NOT IDENT.
TH-231	-1.952E-01	4.837E-01	8.512E-01	FAIL ABUN
PA-233	2.428E-02	4.514E-02	8.861E-02	NOT IDENT.
PA-234	-2.679E-02	1.968E-01	3.775E-01	NOT IDENT.
PA-234M	2.492E+00	3.870E+00	6.166E+00	FAIL ABUN
TH-234	8.227E-01	9.835E-01	2.126E+00	FAIL ABUN
NP-237	2.428E-02	4.514E-02	8.861E-02	NOT IDENT.
NP-238	0.000E+00	1.358E+41	0.000E+00	SHORT HLIF
U-238	8.227E-01	9.835E-01	2.126E+00	FAIL ABUN
NP-239	-3.416E-02	1.776E-01	3.430E-01	NOT IDENT.
PU-239	0.000E+00	6.370E+02	4.999E+02	FAIL ABUN
AM-241	-6.995E-02	9.698E-02	1.877E-01	NOT IDENT.
CM-243	-6.220E-02	7.506E-02	1.388E-01	NOT IDENT.
BK-247	2.966E-02	5.635E-02	1.110E-01	FAIL ABUN
CM-247	3.387E-03	2.860E-02	4.380E-02	NOT IDENT.
CF-249	-2.697E-02	2.478E-02	4.482E-02	FAIL ABUN
CF-251	4.046E-02	8.095E-02	1.621E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	465	10.66*	1.347E+00	1.339E+01	1.339E+01	9.73
CD-109	88.03	132	3.70*	6.242E+00	2.371E+00	3.765E+00	42.83
TE-123M	159.00	66	84.00*	6.985E+00	4.621E-02	2.767E-01	142.35
SN-126	64.28	-----	9.60	3.737E+00	-----	Line Not Found	-----
	86.94	132	8.90	6.242E+00	9.857E-01	9.857E-01	42.83
	87.57	132	37.00*	6.242E+00	2.371E-01	2.371E-01	42.83
BA-137M	661.66	28	89.90*	2.518E+00	5.071E-02	5.170E-02	114.17
CS-137	661.66	28	85.10*	2.518E+00	5.357E-02	5.462E-02	114.17
TL-208	277.37	-----	6.60	4.914E+00	-----	Line Not Found	-----
	583.19	131	85.00*	2.771E+00	2.297E-01	2.297E-01	31.44
	860.56	25	12.50	2.069E+00	3.998E-01	3.998E-01	98.91
BI-211	72.87	-----	1.23	4.875E+00	-----	Line Not Found	-----
	351.06	328	12.92*	4.087E+00	2.572E+00	2.572E+00	17.17
PB-212	74.82	176	10.28	5.108E+00	1.390E+00	1.390E+00	37.69
	77.11	263	17.10	5.368E+00	1.187E+00	1.187E+00	29.14
	238.63	426	43.60*	5.496E+00	7.363E-01	7.363E-01	14.13
	300.09	-----	3.30	4.626E+00	-----	Line Not Found	-----
BI-214	609.32	193	45.49*	2.683E+00	6.541E-01	6.544E-01	21.56
	1120.29	53	14.92	1.685E+00	8.658E-01	8.661E-01	46.46
	1764.49	31	15.30	1.129E+00	7.309E-01	7.311E-01	39.34
PB-214	74.82	176	5.80	5.108E+00	2.463E+00	2.464E+00	37.69
	77.11	263	9.70	5.368E+00	2.092E+00	2.093E+00	29.14
	87.09	132	3.41	6.242E+00	2.573E+00	2.574E+00	42.83
	242.00	107	7.25	5.449E+00	1.117E+00	1.117E+00	55.24
	295.22	204	18.42	4.685E+00	9.801E-01	9.805E-01	25.67
	351.93	328	35.60*	4.087E+00	9.335E-01	9.338E-01	17.17
RN-222	609.32	193	45.49*	2.683E+00	6.541E-01	6.544E-01	21.56
	1120.29	53	14.92	1.685E+00	8.658E-01	8.661E-01	46.46
	1764.49	31	15.30	1.129E+00	7.309E-01	7.311E-01	39.34
RA-224	240.99	107	4.10*	5.449E+00	1.974E+00	1.974E+00	55.24
RA-226	609.32	193	45.49*	2.683E+00	6.541E-01	6.544E-01	21.56
	1120.29	53	14.92	1.685E+00	8.658E-01	8.661E-01	46.46
	1764.49	31	15.30	1.129E+00	7.309E-01	7.311E-01	39.34
AC-228	105.21	-----	1.10	7.155E+00	-----	Line Not Found	-----
	338.32	108	11.27	4.214E+00	9.416E-01	9.416E-01	38.45
	794.95	30	4.25	2.196E+00	1.309E+00	1.309E+00	85.63
	835.71	-----	1.61	2.116E+00	-----	Line Not Found	-----
	911.20	65	25.80*	1.981E+00	5.294E-01	5.294E-01	43.94
	968.97	49	15.80	1.890E+00	6.731E-01	6.731E-01	48.20
RA-228	105.21	-----	1.10	7.155E+00	-----	Line Not Found	-----
	338.32	108	11.27	4.214E+00	9.416E-01	9.416E-01	38.45
	794.95	30	4.25	2.196E+00	1.309E+00	1.309E+00	85.63
	835.71	-----	1.61	2.116E+00	-----	Line Not Found	-----
	911.20	65	25.80*	1.981E+00	5.294E-01	5.294E-01	43.94
	968.97	49	15.80	1.890E+00	6.731E-01	6.731E-01	48.20
TH-228	74.82	176	10.28	5.108E+00	1.390E+00	1.390E+00	37.69
	77.11	263	17.10	5.368E+00	1.187E+00	1.187E+00	29.14

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	238.63	426	43.60*	5.496E+00	7.363E-01	7.363E-01	14.13
	300.09	-----	3.30	4.626E+00	-----	Line Not Found	-----
TH-230	609.32	193	45.49*	2.683E+00	6.541E-01	6.541E-01	21.56
	1120.29	53	14.92	1.685E+00	8.658E-01	8.658E-01	46.46
	1764.49	31	15.30	1.129E+00	7.309E-01	7.309E-01	39.34
TH-232	105.21	-----	1.10	7.155E+00	-----	Line Not Found	-----
	338.32	108	11.27	4.214E+00	9.416E-01	9.416E-01	38.45
	835.71	-----	1.61	2.116E+00	-----	Line Not Found	-----
	911.20	65	25.80*	1.981E+00	5.294E-01	5.294E-01	43.94
	968.97	49	15.80	1.890E+00	6.731E-01	6.731E-01	48.20
U-234	609.32	193	45.49*	2.683E+00	6.541E-01	6.541E-01	21.56
	1120.29	53	14.92	1.685E+00	8.658E-01	8.658E-01	46.46
	1764.49	31	15.30	1.129E+00	7.309E-01	7.309E-01	39.34
U-235	89.96	63	3.47	6.473E+00	1.167E+00	1.167E+00	103.23
	93.35	135	5.60	6.639E+00	1.505E+00	1.505E+00	44.72
	143.76	-----	10.96*	7.247E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.922E+00	-----	Line Not Found	-----
	185.72	70	57.20	6.471E+00	7.775E-02	7.775E-02	90.32
	205.31	-----	5.01	6.095E+00	-----	Line Not Found	-----
AM-243	43.53	-----	5.90	7.707E-01	-----	Line Not Found	-----
	74.66	176	67.20*	5.108E+00	2.126E-01	2.126E-01	37.69
ANH-511	511.00	15	100.00*	3.065E+00	2.085E-02	2.085E-02	312.60

Flag: "*" = Keyline

Total number of lines in spectrum 58
 Number of unidentified lines 15
 Number of lines tentatively identified by NID 43 74.14%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.339E+01	1.339E+01	0.130E+01	9.73	
CD-109	461.40D	1.59	2.371E+00	3.765E+00	1.612E+00	42.83	
TE-123M	119.20D	5.99	4.621E-02	2.767E-01	3.939E-01	142.35	
SN-126	2.30E+05Y	1.00	2.371E-01	2.371E-01	1.015E-01	42.83	
BA-137M	30.08Y	1.02	5.071E-02	5.170E-02	5.903E-02	114.17	
CS-137	30.08Y	1.02	5.357E-02	5.462E-02	6.236E-02	114.17	
TL-208	1.41E+10Y	1.00	2.297E-01	2.297E-01	0.722E-01	31.44	
BI-211	7.04E+08Y	1.00	2.572E+00	2.572E+00	0.442E+00	17.17	
PB-212	1.41E+10Y	1.00	7.363E-01	7.363E-01	1.041E-01	14.13	
BI-214	1600.00Y	1.00	6.541E-01	6.544E-01	1.411E-01	21.56	
PB-214	1600.00Y	1.00	9.335E-01	9.338E-01	1.604E-01	17.17	
RN-222	1600.00Y	1.00	6.541E-01	6.544E-01	1.411E-01	21.56	
RA-224	1.41E+10Y	1.00	1.974E+00	1.974E+00	1.091E+00	55.24	
RA-226	1600.00Y	1.00	6.541E-01	6.544E-01	1.411E-01	21.56	
AC-228	1.41E+10Y	1.00	5.294E-01	5.294E-01	2.327E-01	43.94	
RA-228	1.41E+10Y	1.00	5.294E-01	5.294E-01	2.327E-01	43.94	
TH-228	1.41E+10Y	1.00	7.363E-01	7.363E-01	1.041E-01	14.13	
TH-230	7.54E+04Y	1.00	6.541E-01	6.541E-01	1.410E-01	21.56	
TH-232	1.41E+10Y	1.00	5.294E-01	5.294E-01	2.327E-01	43.94	
U-234	2.45E+05Y	1.00	6.541E-01	6.541E-01	1.410E-01	21.56	
U-235	7.04E+08Y	1.00	7.775E-02	7.775E-02	7.022E-02	90.32	K
AM-243	7370.00Y	1.00	2.126E-01	2.126E-01	0.801E-01	37.69	
ANH-511	1.00E+09Y	1.00	2.085E-02	2.085E-02	6.516E-02	312.60	
Total Activity :			2.850E+01	3.013E+01			

Grand Total Activity : 2.850E+01 3.013E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	84.04	53	211	1.16	167.99	165	7	1.01E-02	****	6.02E+00	T
0	128.29	85	235	1.37	256.36	251	11	1.71E-02	86.6	7.39E+00	T
0	194.46	41	152	1.33	388.54	383	10	8.61E-03	****	6.31E+00	T
3	207.21	36	40	1.23	414.00	412	12	7.66E-03	63.2	6.06E+00	
3	209.20	70	129	1.55	417.97	412	12	1.51E-02	74.0	6.02E+00	
0	329.40	14	85	0.49	658.10	652	8	3.28E-03	****	4.30E+00	T
0	334.02	23	46	1.24	667.34	665	7	5.28E-03	****	4.26E+00	T
0	397.75	8	35	1.24	794.65	790	7	1.82E-03	****	3.72E+00	
0	400.82	20	41	3.16	800.79	796	9	4.62E-03	****	3.69E+00	T
0	405.54	21	54	0.67	810.22	805	10	5.00E-03	****	3.66E+00	T
0	463.19	37	39	2.50	925.42	922	9	8.81E-03	74.9	3.30E+00	T
0	547.02	12	33	0.74	1092.97	1089	9	2.95E-03	****	2.91E+00	T
0	684.20	13	16	1.02	1367.17	1363	8	3.18E-03	****	2.46E+00	T
3	709.15	13	5	1.40	1417.06	1415	22	3.18E-03	80.1	2.39E+00	
3	712.16	15	20	1.80	1423.06	1415	22	3.70E-03	****	2.39E+00	T
0	727.66	29	48	0.78	1454.05	1446	16	7.44E-03	****	2.35E+00	T
0	750.81	16	10	1.16	1500.33	1496	8	4.10E-03	89.9	2.29E+00	
0	757.59	12	17	0.52	1513.91	1506	11	3.07E-03	****	2.28E+00	T
0	768.46	20	33	3.80	1535.63	1528	12	5.23E-03	****	2.25E+00	
0	894.62	16	13	1.44	1787.89	1782	11	4.06E-03	****	2.01E+00	T
0	915.66	15	6	1.47	1829.98	1827	8	4.06E-03	77.5	1.97E+00	
0	934.11	22	12	2.04	1866.87	1860	11	5.68E-03	81.0	1.94E+00	
0	955.28	8	9	0.69	1909.21	1902	9	2.23E-03	****	1.91E+00	T
2	964.83	23	11	1.94	1928.33	1924	24	6.14E-03	76.8	1.90E+00	T
0	984.31	29	43	7.88	1967.27	1951	26	7.65E-03	****	1.87E+00	T
0	1000.59	9	10	0.87	1999.84	1994	10	2.48E-03	****	1.84E+00	T
0	1170.26	9	17	1.84	2339.27	2333	10	2.48E-03	****	1.63E+00	
0	1238.99	16	33	1.39	2476.79	2469	13	4.39E-03	****	1.55E+00	T
0	1327.38	6	10	0.56	2653.67	2647	10	1.61E-03	****	1.46E+00	
0	1377.71	14	2	0.98	2754.40	2750	9	4.05E-03	69.5	1.42E+00	
0	1395.69	6	4	0.64	2790.38	2785	9	1.81E-03	****	1.40E+00	
0	1408.25	7	9	1.19	2815.51	2810	10	2.08E-03	****	1.39E+00	T
0	1593.69	4	7	0.95	3186.75	3181	7	1.11E-03	****	1.24E+00	
0	1730.19	14	3	1.12	3460.08	3454	9	3.98E-03	65.6	1.15E+00	
0	1846.28	9	0	1.05	3692.60	3686	11	2.78E-03	63.2	1.08E+00	

Flags: "T" = Tentatively associated

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621362.CNF;1
* Acquisition date   : 3-OCT-2016 07:54:00 Sensitivity      : 3.000
* Detector ID        : GAM29 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:01.45 Half life ratio  : *****
* Sample date        : 30-NOV-2015 13:27:00 Nuclide Library : SOLID
* Sample ID          : G1203621362 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity : 1.8148E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight       : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 25-JUN-2016 09:55:57 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM29_CAN.CNF;10
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.140E-01
CD-109	6.756E-01
TE-123M	8.596E-02
SN-126	4.277E-02
BA-137M	2.002E-02
CS-137	2.115E-02
TL-208	2.365E-02
PB-212	3.463E-02
BI-214	4.440E-02
PB-214	3.925E-02
RN-222	4.440E-02
RA-224	3.711E-01
RA-226	4.440E-02
AC-228	9.169E-02
RA-228	9.169E-02
TH-228	3.463E-02
TH-230	4.438E-02
TH-232	9.169E-02
U-234	4.438E-02
U-235	1.319E-01
AM-243	3.191E-02
ANH-511	1.801E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.621E+00	NOT IDENT.
NA-22	2.001E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.766E-02	NOT IDENT.
SC-46	2.684E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	4.436E-02	NOT IDENT.
CO-56	3.187E-01	FAIL ABUN

MN-56	0.000E+00	SHORT HLIF
CO-57	3.157E-02	NOT IDENT.
CO-58	3.219E-01	NOT IDENT.
FE-59	3.725E+00	NOT IDENT.
CO-60	2.579E-02	NOT IDENT.
ZN-65	1.021E-01	NOT IDENT.
GE-68	1.442E+00	NOT IDENT.
AS-73	6.857E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.555E-01	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.497E-01	NOT IDENT.
KR-85	4.241E+00	NOT IDENT.
SR-85	4.871E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.368E-01	NOT IDENT.
Y-91	3.749E+02	NOT IDENT.
NB-94	1.947E-02	NOT IDENT.
NB-95	5.304E-01	NOT IDENT.
NB-95M	1.914E+00	NOT IDENT.
ZR-95	1.023E+00	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.360E-02	FAIL ABUN
RH-102	4.075E-02	NOT IDENT.
RU-103	3.845E+00	FAIL ABUN
RH-106	3.108E-01	NOT IDENT.
RU-106	3.108E-01	NOT IDENT.
AG-108M	1.809E-02	NOT IDENT.
AG-110M	5.977E-02	NOT IDENT.
SN-113	1.575E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
SB-124	9.889E-01	NOT IDENT.
SB-125	6.576E-02	FAIL ABUN
TE-125M	2.115E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.465E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	4.106E-02	FAIL ABUN
CS-135	8.801E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	7.815E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.099E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.409E-01	NOT IDENT.
PM-144	3.635E-02	NOT IDENT.
PR-144	3.168E+00	NOT IDENT.
PM-146	1.991E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	5.646E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.753E-02	FAIL ABUN
EU-152	5.798E-02	FAIL ABUN
GD-153	1.193E-01	NOT IDENT.
EU-154	5.045E-02	FAIL ABUN
EU-155	8.062E-02	FAIL ABUN
TB-160	8.238E-01	FAIL ABUN
HO-166M	3.779E-02	FAIL ABUN
TM-171	1.413E+01	NOT IDENT.
HF-172	1.578E-01	FAIL ABUN
LU-172	4.927E-02	FAIL ABUN
LU-176	1.381E-02	FAIL ABUN
HF-181	2.649E+00	NOT IDENT.
TA-182	5.546E-01	FAIL ABUN
RE-183	2.189E+00	NOT IDENT.
RE-184	2.139E+01	FAIL ABUN

W-188	7.157E+01	NOT IDENT.
IR-192	3.179E-01	FAIL ABUN
HG-203	1.820E+00	NOT IDENT.
BI-207	2.570E-02	FAIL ABUN
PB-210	2.260E+00	NOT IDENT.
BI-211	2.993E-01	FAIL ABUN
PB-211	4.950E-01	FAIL ABUN
BI-212	4.148E-01	FAIL ABUN
RN-219	2.254E-01	FAIL ABUN
RA-223	3.912E-01	FAIL ABUN
AC-227	1.471E-01	FAIL ABUN
TH-227	1.471E-01	FAIL ABUN
TH-229	3.202E-01	FAIL ABUN
PA-231	2.738E-01	NOT IDENT.
TH-231	3.912E-01	FAIL ABUN
PA-233	4.084E-02	NOT IDENT.
PA-234	1.638E-01	NOT IDENT.
PA-234M	2.711E+00	FAIL ABUN
TH-234	1.016E+00	FAIL ABUN
NP-237	4.084E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	1.016E+00	FAIL ABUN
NP-239	1.609E-01	NOT IDENT.
PU-239	2.367E+02	FAIL ABUN
AM-241	8.805E-02	NOT IDENT.
CM-243	6.513E-02	NOT IDENT.
BK-247	5.154E-02	FAIL ABUN
CM-247	1.966E-02	NOT IDENT.
CF-249	2.002E-02	FAIL ABUN
CF-251	7.572E-02	NOT IDENT.

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*****
*                                     GEL Laboratories LLC                       *
*                                     2040 Savage Road                          *
*                                     Charleston, SC 29407                       *
*****
*
*                                     DETECTOR AND SAMPLE DATA                  *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621362.CNF;1
* Acquisition date   : 3-OCT-2016 07:54:00 Sensitivity      : 3.000
* Detector ID        : GAM29 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:01.45 Half life ratio : *****
* Sample date        : 30-NOV-2015 13:27:00 Nuclide Library : SOLID
* Sample ID          : G1203621362 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity : 1.8148E+02 GRAM
* Wet wt corr        : 1.00000 Quantity Err(%) : 1.1020E-03 %
* Dry Weight         : 0.00000 Wet Weight : 0.00000
*                    : 0.00000 Dry Weight : 0.00000
*****
*
*                                     CALIBRATION INFORMATION                    *
*
* Eff. Cal. date     : 25-JUN-2016 09:55:57 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM29_CAN.CNF;10
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.339E+01	1.456E+00	1.456E+00
CD-109	2.330E+00	1.642E+00	1.642E+00
TE-123M	2.767E-01	3.862E-01	3.862E-01
SN-126	1.468E-01	1.031E-01	1.031E-01
BA-137M	5.170E-02	5.789E-02	5.789E-02
CS-137	5.462E-02	6.116E-02	6.116E-02
TL-208	2.297E-01	7.146E-02	7.146E-02
PB-212	7.363E-01	1.092E-01	1.092E-01
BI-214	6.544E-01	1.411E-01	1.411E-01
PB-214	9.338E-01	1.619E-01	1.619E-01
RN-222	6.544E-01	1.411E-01	1.411E-01
RA-224	2.414E-01	1.160E+00	1.160E+00
RA-226	6.544E-01	1.411E-01	1.411E-01
AC-228	5.294E-01	2.296E-01	2.296E-01
RA-228	5.294E-01	2.296E-01	2.296E-01
TH-228	7.363E-01	1.092E-01	1.092E-01
TH-230	6.541E-01	1.411E-01	1.411E-01
TH-232	5.294E-01	2.296E-01	2.296E-01
U-234	6.541E-01	1.411E-01	1.411E-01
U-235	-2.847E-02	1.491E-01	1.491E-01
AM-243	1.280E-01	8.244E-02	8.244E-02
ANH-511	2.085E-02	6.387E-02	6.387E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	9.094E-01	9.338E+00	9.347E+00	NOT IDENT.
NA-22	-1.468E-02	2.842E-02	2.918E-02	NOT IDENT.
NA-24	1.000E+41	3.468E+41	0.000E+00	SHORT HLIF
AL-26	6.821E-04	2.041E-02	2.041E-02	NOT IDENT.
SC-46	2.276E-01	2.942E-01	3.116E-01	FAIL ABUN
V-48	4.053E+04	5.507E+04	5.803E+04	SHORT HLIF
CR-51	9.687E+01	3.635E+02	3.661E+02	SHORT HLIF
MN-54	4.316E-02	4.438E-02	4.846E-02	NOT IDENT.

CO-56	1.033E-01	3.510E-01	3.541E-01	FAIL ABUN
MN-56	1.000E+41	3.321E+41	0.000E+00	SHORT HLIF
CO-57	4.277E-03	3.403E-02	3.409E-02	NOT IDENT.
CO-58	5.487E-02	3.594E-01	3.603E-01	NOT IDENT.
FE-59	-2.740E+00	5.069E+00	5.217E+00	NOT IDENT.
CO-60	-7.006E-03	3.288E-02	3.304E-02	NOT IDENT.
ZN-65	2.254E-02	1.305E-01	1.309E-01	NOT IDENT.
GE-68	-4.440E-01	1.798E+00	1.809E+00	NOT IDENT.
AS-73	4.681E+00	6.824E+00	7.143E+00	NOT IDENT.
AS-74	1.611E+03	5.843E+03	5.887E+03	SHORT HLIF
SE-75	1.286E-01	1.657E-01	1.755E-01	FAIL ABUN
BR-77	1.342E+39	1.192E+40	0.000E+00	SHORT HLIF
SR-82	1.332E+01	6.413E+02	6.413E+02	SHORT HLIF
RB-83	1.582E-01	4.764E-01	4.817E-01	NOT IDENT.
KR-85	3.418E-01	5.153E+00	5.155E+00	NOT IDENT.
SR-85	3.880E-02	5.918E-01	5.920E-01	NOT IDENT.
RB-86	-1.577E+04	2.904E+04	2.990E+04	SHORT HLIF
Y-88	1.079E-02	1.566E-01	1.566E-01	NOT IDENT.
Y-91	-1.819E+02	4.831E+02	4.900E+02	NOT IDENT.
NB-94	6.682E-03	2.111E-02	2.132E-02	NOT IDENT.
NB-95	-2.330E-01	7.290E-01	7.366E-01	NOT IDENT.
NB-95M	1.479E+00	2.220E+00	2.318E+00	NOT IDENT.
ZR-95	1.124E+00	1.699E+00	1.773E+00	FAIL ABUN
NB-97	1.000E+41	7.605E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	2.077E+41	0.000E+00	SHORT HLIF
MO-99	4.417E+32	8.301E+32	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.483E+41	0.000E+00	SHORT HLIF
RH-101	8.318E-02	7.214E-02	8.131E-02	FAIL ABUN
RH-102	4.599E-02	3.938E-02	4.450E-02	NOT IDENT.
RU-103	-3.314E+00	4.668E+00	4.901E+00	FAIL ABUN
RH-106	4.064E-02	3.430E-01	3.435E-01	NOT IDENT.
RU-106	4.064E-02	3.430E-01	3.435E-01	NOT IDENT.
AG-108M	8.960E-03	1.862E-02	1.906E-02	NOT IDENT.
AG-110M	-1.036E-02	7.142E-02	7.157E-02	NOT IDENT.
SN-113	1.274E-01	1.558E-01	1.660E-01	NOT IDENT.
CD-115	-1.050E+39	2.181E+40	0.000E+00	SHORT HLIF
SN-117M	2.919E+05	4.088E+05	4.294E+05	SHORT HLIF
SB-124	-5.048E-01	1.334E+00	1.354E+00	NOT IDENT.
SB-125	1.686E-03	7.122E-02	7.122E-02	FAIL ABUN
TE-125M	1.314E+01	2.277E+02	2.278E+02	NOT IDENT.
I-126	3.437E+05	9.975E+05	1.009E+06	SHORT HLIF
SB-126	1.948E+06	1.282E+06	1.554E+06	SHORT HLIF
SB-127	6.744E+22	1.295E+23	0.000E+00	SHORT HLIF
I-131	2.067E+09	6.253E+09	6.322E+09	SHORT HLIF
I-132	1.000E+41	1.931E+42	0.000E+00	SHORT HLIF
TE-132	8.806E+25	1.651E+27	0.000E+00	SHORT HLIF
BA-133	-1.667E-03	2.947E-02	2.948E-02	NOT IDENT.
I-133	1.000E+41	3.076E+41	0.000E+00	SHORT HLIF
CS-134	8.629E-02	7.251E-02	8.228E-02	FAIL ABUN
CS-135	-7.265E-02	1.101E-01	1.149E-01	NOT IDENT.
I-135	-1.000E+41	6.993E+41	0.000E+00	SHORT HLIF
CS-136	-1.218E+05	3.326E+05	3.371E+05	SHORT HLIF
CE-139	-6.776E-03	9.511E-02	9.516E-02	NOT IDENT.
BA-140	5.208E+05	1.469E+06	1.487E+06	SHORT HLIF
LA-140	-1.579E+05	4.049E+05	4.112E+05	SHORT HLIF
CE-141	3.839E+00	2.286E+01	2.292E+01	NOT IDENT.
CE-143	1.000E+41	1.809E+41	0.000E+00	SHORT HLIF
CE-144	-4.504E-02	2.679E-01	2.687E-01	NOT IDENT.
PM-144	-6.136E-04	4.134E-02	4.134E-02	NOT IDENT.
PR-144	-6.429E-02	3.605E+00	3.605E+00	NOT IDENT.
PM-146	-2.209E-02	2.519E-02	2.709E-02	NOT IDENT.
ND-147	2.020E+06	3.356E+07	3.358E+07	SHORT HLIF
PM-147	-5.927E-01	6.148E+02	6.148E+02	NOT IDENT.
PM-149	-1.993E+40	4.142E+41	0.000E+00	SHORT HLIF
EU-150	2.388E-02	2.782E-02	2.983E-02	FAIL ABUN
EU-152	1.248E-02	6.055E-02	6.081E-02	FAIL ABUN
GD-153	-1.710E-02	1.401E-01	1.404E-01	NOT IDENT.
EU-154	-3.249E-02	7.016E-02	7.167E-02	FAIL ABUN
EU-155	4.094E-02	8.403E-02	8.603E-02	FAIL ABUN
TB-160	-8.481E-01	1.165E+00	1.226E+00	FAIL ABUN
HO-166M	4.695E-02	6.665E-02	6.993E-02	FAIL ABUN
TM-171	1.623E+00	1.449E+01	1.450E+01	NOT IDENT.
HF-172	1.635E-01	1.716E-01	1.867E-01	FAIL ABUN
LU-172	1.780E-02	5.513E-02	5.571E-02	FAIL ABUN
LU-176	-2.430E-02	1.936E-02	2.225E-02	FAIL ABUN
HF-181	-8.918E-01	3.035E+00	3.062E+00	NOT IDENT.
TA-182	-5.704E-01	7.764E-01	8.179E-01	FAIL ABUN
RE-183	7.041E-01	2.226E+00	2.248E+00	NOT IDENT.

RE-184	-1.718E+01	2.822E+01	2.927E+01	FAIL ABUN
W-188	9.367E+00	8.921E+01	8.931E+01	NOT IDENT.
IR-192	1.371E-01	3.549E-01	3.602E-01	FAIL ABUN
HG-203	2.471E-01	2.085E+00	2.088E+00	NOT IDENT.
BI-207	4.148E-03	2.953E-02	2.959E-02	FAIL ABUN
PB-210	-1.075E+00	2.375E+00	2.424E+00	NOT IDENT.
BI-211	2.572E+00	4.479E-01	1.243E+00	FAIL ABUN
PB-211	6.406E-01	9.247E-01	9.687E-01	FAIL ABUN
BI-212	7.755E-01	8.926E-01	9.586E-01	FAIL ABUN
RN-219	3.362E-01	4.487E-01	4.736E-01	FAIL ABUN
RA-223	-1.952E-01	4.839E-01	4.918E-01	FAIL ABUN
AC-227	4.606E-02	1.643E-01	1.656E-01	FAIL ABUN
TH-227	4.606E-02	1.643E-01	1.656E-01	FAIL ABUN
TH-229	6.036E-01	8.241E-01	8.679E-01	FAIL ABUN
PA-231	-1.822E-01	3.441E-01	3.537E-01	NOT IDENT.
TH-231	-1.952E-01	4.839E-01	4.918E-01	FAIL ABUN
PA-233	2.428E-02	4.515E-02	4.646E-02	NOT IDENT.
PA-234	-2.679E-02	1.991E-01	1.995E-01	NOT IDENT.
PA-234M	2.492E+00	3.871E+00	4.031E+00	FAIL ABUN
TH-234	8.227E-01	1.000E+00	1.067E+00	FAIL ABUN
NP-237	2.428E-02	4.515E-02	4.646E-02	NOT IDENT.
NP-238	1.000E+41	1.359E+41	0.000E+00	SHORT HLIF
U-238	8.227E-01	1.000E+00	1.067E+00	FAIL ABUN
NP-239	-3.416E-02	1.776E-01	1.783E-01	NOT IDENT.
PU-239	7.510E+02	6.378E+02	7.221E+02	FAIL ABUN
AM-241	-6.995E-02	9.712E-02	1.021E-01	NOT IDENT.
CM-243	-6.220E-02	7.529E-02	8.034E-02	NOT IDENT.
BK-247	2.966E-02	5.666E-02	5.822E-02	FAIL ABUN
CM-247	3.387E-03	2.861E-02	2.865E-02	NOT IDENT.
CF-249	-2.697E-02	2.488E-02	2.769E-02	FAIL ABUN
CF-251	4.046E-02	8.107E-02	8.310E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	79.8228	87.09	84.5897	136.47	72.7609
45.60	90.6690	87.57	84.6464	140.51	0.0000
46.54	87.9756	88.03	84.7007	143.76	94.1019
49.72	0.0000	88.34	84.7372	144.24	81.0109
51.35	81.0969	88.47	84.7524	145.44	89.8777
51.87	83.1107	89.96	84.9265	152.43	77.2600
52.39	73.5198	1093.63	85.0053	153.25	0.0000
52.97	80.3800	91.11	0.0000	323.87	70.7607
53.44	73.6662	92.59	85.2301	156.02	0.0000
54.07	78.6056	93.35	85.3168	158.56	0.0000
57.36	0.0000	94.56	85.4550	159.00	63.3127
57.53	76.1766	94.65	85.4651	162.33	63.5127
57.98	75.2608	94.67	85.4676	162.66	0.0000
59.27	87.1897	94.87	85.4897	163.33	63.5718
59.32	95.0355	97.43	85.7779	165.86	76.0196
59.54	95.0725	98.43	85.8895	176.31	72.2305
60.96	103.1699	98.44	85.8908	176.60	0.0000
61.17	103.2076	99.53	86.0112	177.52	56.4903
62.93	110.4218	100.11	86.0756	181.07	0.0000
63.29	99.6382	102.03	75.1525	181.52	72.5625
63.58	99.6871	103.18	89.1992	184.41	86.3848
64.28	129.4501	103.37	99.3270	143.76	85.3443
66.73	102.1977	105.21	82.7887	193.51	56.1284
67.24	109.2346	105.31	86.9913	197.03	59.7402
125.81	121.2386	106.12	84.9798	198.01	62.8547
67.75	121.2516	106.47	90.2648	201.83	71.5096
69.67	97.7024	109.28	86.3624	203.43	69.2926
70.83	103.8762	111.00	89.7081	205.31	60.1448
72.81	112.2162	111.76	0.0000	210.85	74.3525
72.87	112.2264	114.06	78.3836	215.65	64.1384
74.66	100.4807	116.30	0.0000	222.11	65.6310
74.82	100.5051	116.74	81.8178	227.09	62.3496
74.97	100.5280	119.76	78.9045	227.38	57.6566
77.11	100.8560	121.12	79.0270	228.16	0.0000
78.74	101.1024	121.22	79.0354	228.18	52.9823
79.69	95.8447	121.78	79.0857	116.74	52.9823
80.12	91.8530	122.06	69.4895	235.69	63.1445
80.19	0.0000	122.92	94.1694	235.96	63.1567
80.57	83.1280	123.07	87.7631	238.63	62.8849
81.00	79.1229	265.00	62.8328	238.98	0.0000
81.07	79.1313	125.81	57.2567	240.99	62.9925
81.75	93.4263	127.23	90.3203	242.00	63.0386
83.79	96.4181	127.91	90.3882	244.70	54.0243
84.00	96.4470	129.30	90.5253	252.40	0.0000
85.43	77.5870	131.20	76.3137	252.80	47.9431
86.55	80.4360	133.02	76.8231	254.15	0.0000
86.79	80.4630	133.52	80.1121	256.23	43.2521
86.94	84.5720	136.00	68.3833	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	41.0858	355.39	0.0000	584.27	30.2799
264.80	49.5496	356.01	33.2228	595.83	0.0000
265.00	45.9298	364.49	0.0000	427.87	19.0446
268.22	60.5667	366.42	0.0000	602.52	0.0000
269.46	56.9800	372.51	32.6640	604.72	28.6121
270.03	44.8736	375.05	28.4044	607.14	31.5015
271.23	57.0475	377.52	40.5082	609.32	28.6609
273.65	0.0000	356.01	38.0497	610.33	25.8047
276.40	41.4105	388.16	39.8682	614.28	25.8431
277.37	49.9675	388.63	0.0000	618.01	21.0869
277.60	49.9750	391.69	22.5760	620.36	18.2277
278.00	54.8657	264.66	26.1694	621.93	19.1984
279.20	48.8074	401.81	23.5662	630.19	0.0000
279.54	63.4639	402.40	23.5734	631.29	11.5586
279.70	63.4702	404.85	28.8475	633.25	23.1338
280.46	41.5205	410.95	36.8278	634.78	0.0000
283.69	44.0552	413.71	32.4887	635.95	12.5435
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	52.6805	423.72	0.0000	645.85	15.4935
285.90	0.0000	427.09	33.5871	657.76	21.8811
287.50	39.2568	427.87	29.1791	657.90	0.0000
290.67	36.0579	433.94	23.9436	661.66	19.4767
293.27	0.0000	439.40	32.0090	664.57	0.0000
351.93	39.4492	453.88	25.0662	666.33	0.0000
295.96	32.8898	463.37	31.4709	666.50	0.0000
879.38	39.5332	468.07	20.2748	667.71	0.0000
299.98	37.0944	473.00	0.0000	677.62	12.7313
300.09	37.0972	475.06	25.3112	685.70	0.0000
300.13	37.0981	476.78	20.8077	695.00	0.0000
301.36	53.2146	477.60	25.3403	696.49	23.6582
302.85	43.3537	482.18	22.6720	696.51	23.6582
256.23	27.2791	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	20.7069
306.78	57.1182	497.08	31.9502	697.49	18.7356
308.46	27.3456	505.52	19.2406	702.65	17.7810
311.90	33.6305	507.63	0.0000	706.68	10.3864
316.51	32.4754	511.00	29.3880	711.68	20.8077
319.41	0.0000	514.00	26.2073	720.70	0.0000
320.08	0.0000	514.00	26.2073	721.93	0.0000
321.04	40.0781	520.40	21.2078	722.78	19.3937
323.87	51.4364	520.69	0.0000	722.91	20.8864
325.23	43.9444	522.65	0.0000	723.31	20.8889
328.76	0.0000	527.90	0.0000	724.19	23.8799
333.37	42.8922	528.26	17.5775	727.33	18.9250
333.97	40.3828	529.59	14.8099	733.00	16.4651
334.37	40.3926	529.87	0.0000	735.93	15.9818
338.28	32.8928	531.02	0.0000	333.97	18.9876
338.32	32.8936	537.26	0.0000	739.50	0.0000
311.90	32.9340	546.56	0.0000	747.24	15.0385
340.48	32.9340	552.55	26.1634	748.06	13.5379
340.55	0.0000	563.25	17.8303	752.31	9.0377
344.28	32.1591	569.33	31.0436	753.82	0.0000
345.93	33.0364	946.00	31.9871	756.73	15.6882
351.06	30.5830	569.70	31.9884	756.80	15.6882
351.93	30.5984	583.19	30.2669	884.68	12.0957

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	22.6932	1274.44	21.0171	1620.50	6.4706
766.42	22.1925	1001.03	14.5684	1621.92	5.5477
766.84	22.1960	1002.74	16.1945	1678.03	0.0000
772.60	0.0000	1004.73	19.4436	1690.97	4.6796
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	4.7385
778.90	21.2683	1028.54	0.0000	1063.66	1.2648
783.70	0.0000	1037.84	11.9838	1771.35	3.7952
785.37	14.2074	1038.76	0.0000	1791.20	0.0000
792.07	19.8301	631.29	16.3770	1808.65	3.8188
794.95	18.3215	1048.07	0.0000	1810.72	0.0000
795.86	18.3267	1049.04	18.5716	1836.06	3.8359
810.06	15.3387	1050.41	4.3714		
810.29	15.3400	1063.66	9.8687		
344.28	10.2271	1077.00	0.0000		
810.76	10.2283	1077.34	16.5027		
815.77	0.0000	1085.87	12.1279		
1048.07	0.0000	1093.63	12.1503		
832.01	22.6472	1099.45	14.3806		
834.85	11.3330	1112.07	15.5335		
835.71	12.3667	1112.84	15.5369		
836.80	0.0000	1115.54	11.6595		
846.75	0.0000	1120.29	16.6760		
846.77	14.4751	1120.55	16.6772		
856.80	0.0000	1221.41	16.6797		
860.56	14.5338	1129.67	13.3711		
871.09	14.5788	1131.51	0.0000		
873.19	13.5454	1147.95	0.0000		
875.33	0.0000	1173.23	20.2617		
879.38	13.5697	1177.95	19.1568		
880.51	10.4415	1189.05	19.2052		
883.24	7.3147	1204.77	21.5420		
884.68	15.6812	1221.41	22.7604		
889.28	9.4211	1231.02	20.5283		
894.76	23.0653	1235.36	0.0000		
898.04	15.7410	1238.28	18.2773		
900.72	25.2041	1260.41	0.0000		
903.28	22.0698	1271.87	8.0550		
911.20	22.1194	1274.44	10.3623		
912.08	22.1245	1274.54	10.3630		
923.98	0.0000	1291.59	12.7125		
926.50	11.6356	1298.22	0.0000		
929.11	19.0540	1312.11	0.0000		
937.49	11.1404	1332.49	13.9883		
944.13	0.0000	1362.66	0.0000		
946.00	15.9515	1365.19	7.9222		
949.00	12.7720	1368.63	0.0000		
667.71	0.0000	1384.29	6.1857		
962.31	11.2156	1408.01	8.8788		
964.08	17.0983	1457.56	0.0000		
966.17	17.1081	1460.82	9.8694		
911.20	17.1211	1489.16	9.9231		
968.97	17.1211	1505.03	4.5242		
983.53	0.0000	1584.12	3.6731		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621363.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM11.CNF;517
Background date : 2-OCT-2016 11:00:34.
Sample date     : 12-SEP-2016 00:00:00 Acquisition date : 3-OCT-2016 05:45:34.
Sample ID      : G1203621363 Sample quantity   : 1.15000E+02 GRAM
Detector name  : GAM11 Detector geometry: CAN
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:06.48 0.7%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity     : 3.00000
Batch ID       : 1596252 Detector SN#    :
Matrix Spike ID : LCS ID           : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.43*	11869	6185	0.84	92.73	88	9	1.32E+01	15.0	1.37E+01
2	5	58.09	828	4025	1.41	116.07	113	12	9.20E-01	0.7	
3	5	59.50	23283	2291	0.88	118.90	113	12	2.59E+01	33.9	
4	0	79.25	191	1329	1.39	158.42	155	8	2.12E-01	38.6	
5	0	83.11*	164	1277	1.78	166.16	163	8	1.82E-01	2.7	
6	0	87.94	3417	1521	0.83	175.82	171	10	3.80E+00	27.1	
7	0	122.04	207	982	0.74	244.06	241	8	2.30E-01	41.0	
8	0	279.02*	95	512	1.69	558.24	555	7	1.06E-01	46.9	
9	0	346.35	90	554	1.26	692.98	689	8	9.98E-02	62.6	
10	0	351.38*	72	611	2.18	703.04	700	9	8.05E-02	82.2	
11	0	484.34	47	493	1.68	969.09	966	8	5.26E-02	35.0	
12	0	523.51	93	318	1.14	1047.47	1044	8	1.03E-01	0.9	
13	0	661.65*	14716	578	1.39	1323.87	1317	15	1.64E+01	55.0	
14	0	747.77	67	337	0.83	1496.19	1490	12	7.41E-02	132.5	
15	0	754.57	53	257	1.47	1509.78	1505	8	5.85E-02	73.4	
16	0	812.46	29	384	1.80	1625.61	1618	11	3.23E-02	118.8	
17	0	950.54	56	457	1.94	1901.83	1895	10	6.17E-02	33.1	
18	0	962.27*	28	368	0.94	1925.31	1923	8	3.14E-02	209.7	
19	0	1116.17	117	334	1.16	2233.16	2228	12	1.30E-01	1.1	
20	0	1121.69*	12	194	0.97	2244.20	2243	8	1.29E-02	161.0	
21	0	1173.30	9325	342	1.78	2347.45	2338	17	1.04E+01	1.1	
22	0	1248.71	6	33	0.51	2498.28	2493	8	7.14E-03	1.1	
23	0	1332.59*	8448	127	1.84	2666.03	2657	19	9.39E+00	73.6	
24	0	1529.97	11	12	1.19	3060.79	3053	13	1.22E-02	48.1	
25	0	1609.64	15	9	3.90	3220.12	3214	12	1.65E-02	94.5	
26	0	1647.87	8	14	3.49	3296.57	3289	11	9.09E-03	109.2	
27	0	1795.57	7	14	1.34	3591.92	3587	9	7.22E-03	78.6	
28	0	1916.83	8	7	0.64	3834.38	3825	14	8.89E-03	31.4	
29	0	1928.89	19	3	0.75	3858.50	3851	14	2.07E-02		

Flag: "*" = Peak area was modified by background subtraction

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621363.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4
Sample title : MXR1
Sample date : 12-SEP-2016 00:00:00 Acquisition date : 3-OCT-2016 05:45:34
Sample ID : G1203621363 Sample quantity : 115.00 GRAM
Sample type : SOLID Sample geometry :
Detector name : GAMMA11 Detector geometry: CAN
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:06.48 0.7%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type : Linear Efficiencies at : Peak Energy
Abundance limit : 75.00

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
CO-57	122.06	217	85.60*	7.219E+00	9.181E-01	9.692E-01	54.18
	136.47	-----	10.68	7.146E+00	-----	Line Not Found	-----
CO-60	1173.23	8882	99.85	1.491E+00	1.558E+02	1.570E+02	2.26
	1332.49	8001	99.98*	1.340E+00	1.559E+02	1.571E+02	2.27
ZN-65	1115.54	112	50.60*	1.552E+00	3.724E+00	3.955E+00	66.10
CD-109	88.03	3628	3.70*	6.296E+00	4.067E+02	4.199E+02	5.48
SN-126	64.28	-----	9.60	4.012E+00	-----	Line Not Found	-----
	86.94	3628	8.90	6.296E+00	1.691E+02	1.691E+02	5.48
	87.57	3628	37.00*	6.296E+00	4.067E+01	4.067E+01	5.48
BA-137M	661.66	14372	89.90*	2.339E+00	1.785E+02	1.787E+02	1.80
CS-137	661.66	14372	85.10*	2.339E+00	1.886E+02	1.888E+02	1.80
PM-147	121.22	217	0.00*	7.219E+00	2.758E+04	2.800E+04	54.18
HG-203	70.83	-----	3.69	4.810E+00	-----	Line Not Found	-----
	72.87	-----	6.19	5.033E+00	-----	Line Not Found	-----
	279.20	96	81.56*	4.692E+00	6.570E-01	9.012E-01	82.00
PB-210	46.54	12924	4.25*	1.359E+00	5.843E+03	5.854E+03	3.02
BI-211	72.87	-----	1.23	5.033E+00	-----	Line Not Found	-----
	351.06	73	12.92*	3.889E+00	3.777E+00	3.777E+00	125.27
AM-241	59.54	25108	35.90*	3.356E+00	5.441E+02	5.442E+02	1.46

Flag: "*" = Keyline

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621363.CNF;1
* Acquisition date   : 3-OCT-2016 05:45:34 Sensitivity       : 3.000
* Detector ID       : GAM11 Energy tolerance: 1.500
* Elapsed live time : 0 00:15:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:15:06.48 Half life ratio : *****
* Sample date       : 12-SEP-2016 00:00:00 Analyst initials: MXR1
* Sample ID         : G1203621363 Sample Quantity : 1.1500E+02 GRAM
* Batch Number      : 1596252 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 2-AUG-2016 10:31:39 Eff. Geometry : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
CO-57	9.692E-01	5.146E-01	4.902E-01
CO-60	1.571E+02	3.493E+00	7.217E-01
ZN-65	3.955E+00	2.562E+00	2.638E+00
CD-109	4.199E+02	2.253E+01	1.295E+01
SN-126	4.067E+01	2.182E+00	1.260E+00
BA-137M	1.787E+02	3.146E+00	9.642E-01
CS-137	1.888E+02	3.323E+00	1.019E+00
PM-147	2.800E+04	1.487E+04	1.400E+04
HG-203	9.012E-01	7.241E-01	8.785E-01
PB-210	5.854E+03	1.732E+02	1.041E+02
BI-211	3.777E+00	4.636E+00	4.860E+00
AM-241	5.442E+02	7.766E+00	4.131E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	2.361E+00	6.023E+00	1.078E+01	NOT IDENT.
NA-22	-1.262E-01	3.311E-01	5.897E-01	NOT IDENT.
NA-24	0.000E+00	4.671E+09	0.000E+00	SHORT HLIF
AL-26	3.251E-01	2.787E-01	6.182E-01	NOT IDENT.
K-40	-1.005E+00	2.190E+00	3.961E+00	NOT IDENT.
SC-46	6.565E-01	8.353E-01	1.452E+00	FAIL ABUN
V-48	-2.380E-01	1.841E+00	3.056E+00	NOT IDENT.
CR-51	1.364E-01	5.498E+00	1.003E+01	NOT IDENT.
MN-54	8.471E-03	6.506E-01	1.105E+00	NOT IDENT.
CO-56	6.011E-01	7.259E-01	1.279E+00	NOT IDENT.
MN-56	0.000E+00	1.223E+41	0.000E+00	SHORT HLIF
CO-58	1.392E-01	7.196E-01	1.237E+00	NOT IDENT.
FE-59	7.674E-01	1.801E+00	3.255E+00	NOT IDENT.
GE-68	7.808E+00	2.304E+01	4.163E+01	NOT IDENT.
AS-73	-1.905E+01	1.565E+01	2.782E+01	NOT IDENT.
AS-74	-4.548E-01	1.701E+00	2.948E+00	NOT IDENT.
SE-75	2.961E-01	6.057E-01	1.029E+00	FAIL ABUN
BR-77	8.649E+01	6.523E+02	1.102E+03	NOT IDENT.

SR-82	-3.962E+00	6.319E+00	1.051E+01	NOT IDENT.
RB-83	-1.573E-01	1.275E+00	2.005E+00	NOT IDENT.
KR-85	-1.076E+01	1.029E+02	1.809E+02	NOT IDENT.
SR-85	-6.062E-02	5.815E-01	1.023E+00	NOT IDENT.
RB-86	1.005E+00	1.787E+01	3.196E+01	NOT IDENT.
Y-88	-7.479E-02	3.186E-01	5.777E-01	NOT IDENT.
Y-91	4.385E+01	2.053E+02	3.793E+02	NOT IDENT.
NB-94	-4.242E-02	4.528E-01	7.821E-01	NOT IDENT.
NB-95	-3.273E-01	6.407E-01	1.074E+00	NOT IDENT.
NB-95M	7.626E-01	1.537E+00	2.627E+00	NOT IDENT.
ZR-95	2.396E-01	1.267E+00	1.971E+00	NOT IDENT.
NB-97	0.000E+00	1.088E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	9.912E+09	0.000E+00	SHORT HLIF
MO-99	6.896E+01	8.901E+02	1.539E+03	NOT IDENT.
TC-99M	0.000E+00	7.650E+24	0.000E+00	SHORT HLIF
RH-101	-1.543E-01	3.223E-01	5.560E-01	NOT IDENT.
RH-102	3.538E-02	8.329E-01	1.455E+00	NOT IDENT.
RU-103	4.764E-01	7.050E-01	1.277E+00	NOT IDENT.
RH-106	2.461E+00	4.742E+00	8.469E+00	NOT IDENT.
RU-106	2.461E+00	4.742E+00	8.469E+00	NOT IDENT.
AG-108M	4.979E-01	5.191E-01	9.483E-01	NOT IDENT.
AG-110M	-1.126E+00	9.986E-01	1.600E+00	NOT IDENT.
SN-113	-1.261E-01	6.918E-01	1.235E+00	NOT IDENT.
CD-115	1.159E+03	1.191E+03	1.992E+03	NOT IDENT.
SN-117M	1.978E-02	7.636E-01	1.322E+00	NOT IDENT.
TE-123M	-9.382E-02	3.048E-01	5.213E-01	NOT IDENT.
SB-124	1.480E-01	6.182E-01	1.244E+00	NOT IDENT.
SB-125	5.573E-01	1.533E+00	2.760E+00	NOT IDENT.
TE-125M	-7.839E+01	1.070E+02	1.848E+02	NOT IDENT.
I-126	-1.379E+00	5.035E+00	7.683E+00	FAIL ABUN
SB-126	2.324E+00	3.009E+00	5.384E+00	NOT IDENT.
SB-127	-1.079E+00	5.496E+01	9.550E+01	NOT IDENT.
I-131	-5.030E-01	2.815E+00	5.056E+00	FAIL ABUN
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	-2.361E+01	3.447E+01	5.667E+01	NOT IDENT.
BA-133	2.451E-01	6.569E-01	1.086E+00	NOT IDENT.
I-133	0.000E+00	1.131E+07	0.000E+00	SHORT HLIF
CS-134	-1.715E-01	6.811E-01	1.150E+00	NOT IDENT.
CS-135	1.285E+00	2.010E+00	3.430E+00	NOT IDENT.
I-135	0.000E+00	2.400E+23	0.000E+00	SHORT HLIF
CS-136	1.699E+00	2.537E+00	4.662E+00	NOT IDENT.
CE-139	9.897E-03	3.140E-01	5.423E-01	NOT IDENT.
BA-140	6.420E-01	5.536E+00	9.809E+00	NOT IDENT.
LA-140	-1.362E-01	7.487E-01	1.401E+00	NOT IDENT.
CE-141	4.788E-01	7.126E-01	1.266E+00	NOT IDENT.
CE-143	0.000E+00	3.547E+04	0.000E+00	SHORT HLIF
CE-144	1.131E-01	2.024E+00	3.544E+00	FAIL ABUN
PM-144	-6.812E-02	4.903E-01	8.444E-01	NOT IDENT.
PR-144	-5.151E+00	3.681E+01	6.339E+01	NOT IDENT.
PM-146	1.784E-01	7.527E-01	1.343E+00	FAIL ABUN
ND-147	-1.611E+00	1.189E+01	2.090E+01	NOT IDENT.
PM-149	8.191E+03	8.289E+03	1.428E+04	NOT IDENT.
EU-150	-4.957E-02	3.460E-01	6.263E-01	FAIL ABUN
EU-152	-1.397E-01	1.476E+00	2.403E+00	FAIL ABUN
GD-153	2.539E-01	8.941E-01	1.600E+00	NOT IDENT.
EU-154	-3.241E-01	9.387E-01	1.678E+00	FAIL ABUN
EU-155	1.291E-01	1.072E+00	1.904E+00	FAIL ABUN
TB-160	-1.035E+00	2.836E+00	4.706E+00	FAIL ABUN
HO-166M	-3.273E-01	8.291E-01	1.409E+00	FAIL ABUN
TM-171	-1.563E+01	3.027E+02	5.472E+02	NOT IDENT.
HF-172	-9.408E-01	2.096E+00	3.341E+00	FAIL ABUN
LU-172	-2.990E-01	1.151E+00	2.030E+00	FAIL ABUN
LU-176	1.367E-01	3.732E-01	6.249E-01	FAIL ABUN
HF-181	9.245E-02	8.533E-01	1.364E+00	FAIL ABUN
TA-182	7.318E-02	1.689E+00	3.091E+00	FAIL ABUN
RE-183	0.000E+00	7.846E+00	9.511E+00	FAIL ABUN
RE-184	1.196E+00	2.803E+00	4.798E+00	NOT IDENT.
W-188	-7.911E+01	1.058E+02	1.702E+02	NOT IDENT.
IR-192	-3.021E-01	5.300E-01	8.525E-01	NOT IDENT.
BI-207	5.956E-01	9.396E-01	1.718E+00	NOT IDENT.
TL-208	-4.315E-01	5.089E-01	8.616E-01	NOT IDENT.
PB-211	3.525E+00	1.102E+01	1.992E+01	NOT IDENT.
BI-212	-1.371E+00	7.064E+00	1.210E+01	NOT IDENT.
PB-212	-2.450E-02	7.074E-01	1.188E+00	NOT IDENT.
BI-214	1.150E-01	9.607E-01	1.693E+00	FAIL ABUN
PB-214	1.371E+00	1.683E+00	1.880E+00	FAIL ABUN
RN-219	4.541E-01	6.367E+00	1.143E+01	NOT IDENT.
RN-222	1.150E-01	9.607E-01	1.693E+00	FAIL ABUN

RA-223	2.893E+00	8.439E+00	1.551E+01	FAIL ABUN
RA-224	-1.636E+00	7.647E+00	1.273E+01	NOT IDENT.
RA-226	1.150E-01	9.607E-01	1.693E+00	FAIL ABUN
AC-227	1.333E+00	3.421E+00	5.792E+00	FAIL ABUN
TH-227	1.333E+00	3.421E+00	5.792E+00	FAIL ABUN
AC-228	-2.568E+00	2.820E+00	4.559E+00	NOT IDENT.
RA-228	-2.568E+00	2.820E+00	4.559E+00	NOT IDENT.
TH-228	-2.450E-02	7.074E-01	1.188E+00	NOT IDENT.
TH-229	-8.972E-01	6.039E+00	1.024E+01	FAIL ABUN
TH-230	1.150E-01	9.607E-01	1.693E+00	FAIL ABUN
PA-231	-7.880E-01	6.409E+00	1.054E+01	NOT IDENT.
TH-231	2.893E+00	8.439E+00	1.551E+01	FAIL ABUN
TH-232	-2.568E+00	2.820E+00	4.559E+00	NOT IDENT.
PA-233	1.358E-01	9.376E-01	1.553E+00	NOT IDENT.
PA-234	-3.540E+00	7.560E+00	1.094E+01	NOT IDENT.
PA-234M	1.182E+02	8.249E+01	1.553E+02	NOT IDENT.
TH-234	2.714E+00	1.268E+01	2.156E+01	NOT IDENT.
U-234	1.150E-01	9.607E-01	1.693E+00	FAIL ABUN
U-235	6.448E-01	2.040E+00	3.586E+00	NOT IDENT.
NP-237	1.358E-01	9.376E-01	1.553E+00	NOT IDENT.
NP-238	0.000E+00	3.044E+03	0.000E+00	SHORT HLIF
U-238	2.714E+00	1.268E+01	2.156E+01	NOT IDENT.
NP-239	-1.961E-01	2.712E+00	4.764E+00	FAIL ABUN
PU-239	2.654E+03	3.394E+03	6.089E+03	NOT IDENT.
AM-243	-3.661E-01	5.147E-01	9.083E-01	NOT IDENT.
CM-243	-3.044E-01	1.095E+00	1.923E+00	FAIL ABUN
BK-247	3.790E-01	1.055E+00	1.783E+00	FAIL ABUN
CM-247	2.140E-01	5.785E-01	1.047E+00	FAIL ABUN
CF-249	3.677E-02	5.769E-01	1.040E+00	NOT IDENT.
CF-251	2.301E-01	1.383E+00	2.387E+00	NOT IDENT.
ANH-511	-1.054E-01	4.336E-01	7.712E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
CO-57	122.06	217	85.60*	7.219E+00	9.181E-01	9.692E-01	54.18
	136.47	-----	10.68	7.146E+00	-----	Line Not Found	-----
CO-60	1173.23	8882	99.85	1.491E+00	1.558E+02	1.570E+02	2.26
	1332.49	8001	99.98*	1.340E+00	1.559E+02	1.571E+02	2.27
ZN-65	1115.54	112	50.60*	1.552E+00	3.724E+00	3.955E+00	66.10
CD-109	88.03	3628	3.70*	6.296E+00	4.067E+02	4.199E+02	5.48
SN-126	64.28	-----	9.60	4.012E+00	-----	Line Not Found	-----
	86.94	3628	8.90	6.296E+00	1.691E+02	1.691E+02	5.48
	87.57	3628	37.00*	6.296E+00	4.067E+01	4.067E+01	5.48
BA-137M	661.66	14372	89.90*	2.339E+00	1.785E+02	1.787E+02	1.80
CS-137	661.66	14372	85.10*	2.339E+00	1.886E+02	1.888E+02	1.80
PM-147	121.22	217	0.00*	7.219E+00	2.758E+04	2.800E+04	54.18
HG-203	70.83	-----	3.69	4.810E+00	-----	Line Not Found	-----
	72.87	-----	6.19	5.033E+00	-----	Line Not Found	-----
	279.20	96	81.56*	4.692E+00	6.570E-01	9.012E-01	82.00
PB-210	46.54	12924	4.25*	1.359E+00	5.843E+03	5.854E+03	3.02
BI-211	72.87	-----	1.23	5.033E+00	-----	Line Not Found	-----
	351.06	73	12.92*	3.889E+00	3.777E+00	3.777E+00	125.27
AM-241	59.54	25108	35.90*	3.356E+00	5.441E+02	5.442E+02	1.46

Flag: "*" = Keyline

Total number of lines in spectrum 29
 Number of unidentified lines 10
 Number of lines tentatively identified by NID 19 65.52%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	271.74D	1.06	9.181E-01	9.692E-01	5.251E-01	54.18	
CO-60	5.27Y	1.01	1.559E+02	1.571E+02	0.036E+02	2.27	
ZN-65	244.06D	1.06	3.724E+00	3.955E+00	2.614E+00	66.10	
CD-109	461.40D	1.03	4.067E+02	4.199E+02	0.230E+02	5.48	
SN-126	2.30E+05Y	1.00	4.067E+01	4.067E+01	0.223E+01	5.48	
BA-137M	30.08Y	1.00	1.785E+02	1.787E+02	0.032E+02	1.80	
CS-137	30.08Y	1.00	1.886E+02	1.888E+02	0.034E+02	1.80	
PM-147	2.62Y	1.02	2.758E+04	2.800E+04	1.517E+04	54.18	
HG-203	46.59D	1.37	6.570E-01	9.012E-01	7.389E-01	82.00	
PB-210	22.20Y	1.00	5.843E+03	5.854E+03	0.177E+03	3.02	
BI-211	7.04E+08Y	1.00	3.777E+00	3.777E+00	4.731E+00	125.27	
AM-241	432.60Y	1.00	5.441E+02	5.442E+02	0.079E+02	1.46	
Total Activity :			3.494E+04	3.540E+04			

Grand Total Activity : 3.494E+04 3.540E+04

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
5	58.09	894	4344	1.41	116.07	113	12	9.20E-01	30.0	3.15E+00	T
0	79.25	204	1417	1.39	158.42	155	8	2.12E-01	67.7	5.65E+00	T
0	83.11	174	1359	1.78	166.16	163	8	1.82E-01	77.2	5.96E+00	T
0	346.35	90	556	1.26	692.98	689	8	9.98E-02	93.8	3.94E+00	T
0	484.34	47	488	1.68	969.09	966	8	5.26E-02	****	2.99E+00	
0	523.51	92	314	1.14	1047.47	1044	8	1.03E-01	70.0	2.81E+00	T
0	747.77	65	328	0.83	1496.19	1490	12	7.41E-02	****	2.13E+00	T
0	754.57	51	250	1.47	1509.78	1505	8	5.85E-02	****	2.11E+00	T
0	812.46	28	372	1.80	1625.61	1618	11	3.23E-02	****	1.99E+00	
0	950.54	53	440	1.94	1901.83	1895	10	6.17E-02	****	1.76E+00	
0	962.27	27	353	0.94	1925.31	1923	8	3.14E-02	****	1.75E+00	T
0	1121.69	11	185	0.97	2244.20	2243	8	1.29E-02	****	1.55E+00	T
0	1248.71	6	31	0.51	2498.28	2493	8	7.14E-03	****	1.42E+00	
0	1529.97	10	11	1.19	3060.79	3053	13	1.22E-02	****	1.19E+00	
0	1609.64	14	9	3.90	3220.12	3214	12	1.65E-02	96.2	1.13E+00	
0	1647.87	8	13	3.49	3296.57	3289	11	9.09E-03	****	1.11E+00	
0	1795.57	6	13	1.34	3591.92	3587	9	7.22E-03	****	1.02E+00	
0	1916.83	7	7	0.64	3834.38	3825	14	8.89E-03	****	9.58E-01	
0	1928.89	17	3	0.75	3858.50	3851	14	2.07E-02	62.7	9.52E-01	

Flags: "T" = Tentatively associated

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621363.CNF;1
* Acquisition date   : 3-OCT-2016 05:45:34 Sensitivity      : 3.000
* Detector ID        : GAM11 Energy tolerance: 1.500
* Elapsed live time  : 0 00:15:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:15:06.48 Half life ratio  : *****
* Sample date        : 12-SEP-2016 00:00:00 Nuclide Library : SOLID
* Sample ID          : G1203621363 Analyst initials: MXR1
* Batch Number       : 1596252 Sample Quantity : 1.1500E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   Dry Weight      : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 2-AUG-2016 10:31:39 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;14
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
CO-57	2.391E-01
CO-60	3.345E-01
ZN-65	1.272E+00
CD-109	6.319E+00
SN-126	6.146E-01
BA-137M	4.655E-01
CS-137	4.917E-01
PM-147	6.825E+03
HG-203	4.267E-01
PB-210	5.148E+01
BI-211	2.360E+00
AM-241	2.036E+00

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	5.246E+00	NOT IDENT.
NA-22	2.692E-01	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.745E-01	NOT IDENT.
K-40	1.714E+00	NOT IDENT.
SC-46	7.038E-01	FAIL ABUN
V-48	1.477E+00	NOT IDENT.
CR-51	4.873E+00	NOT IDENT.
MN-54	5.338E-01	NOT IDENT.
CO-56	6.177E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-58	5.971E-01	NOT IDENT.
FE-59	1.573E+00	NOT IDENT.
GE-68	2.010E+01	NOT IDENT.
AS-73	1.375E+01	NOT IDENT.
AS-74	1.420E+00	NOT IDENT.
SE-75	5.008E-01	FAIL ABUN
BR-77	5.371E+02	NOT IDENT.
SR-82	5.054E+00	NOT IDENT.

RB-83	9.700E-01	NOT IDENT.
KR-85	8.764E+01	NOT IDENT.
SR-85	4.954E-01	NOT IDENT.
RB-86	1.542E+01	NOT IDENT.
Y-88	2.483E-01	NOT IDENT.
Y-91	1.778E+02	NOT IDENT.
NB-94	3.753E-01	NOT IDENT.
NB-95	5.158E-01	NOT IDENT.
NB-95M	1.280E+00	NOT IDENT.
ZR-95	9.469E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	7.409E+02	NOT IDENT.
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.707E-01	NOT IDENT.
RH-102	7.016E-01	NOT IDENT.
RU-103	6.192E-01	NOT IDENT.
RH-106	4.085E+00	NOT IDENT.
RU-106	4.085E+00	NOT IDENT.
AG-108M	4.624E-01	NOT IDENT.
AG-110M	7.730E-01	NOT IDENT.
SN-113	6.005E-01	NOT IDENT.
CD-115	9.620E+02	NOT IDENT.
SN-117M	6.433E-01	NOT IDENT.
TE-123M	2.537E-01	NOT IDENT.
SB-124	5.351E-01	NOT IDENT.
SB-125	1.344E+00	NOT IDENT.
TE-125M	9.002E+01	NOT IDENT.
I-126	3.699E+00	FAIL ABUN
SB-126	2.594E+00	NOT IDENT.
SB-127	4.583E+01	NOT IDENT.
I-131	2.457E+00	FAIL ABUN
I-132	0.000E+00	SHORT HLIF
TE-132	2.761E+01	NOT IDENT.
BA-133	5.285E-01	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.544E-01	NOT IDENT.
CS-135	1.670E+00	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	2.249E+00	NOT IDENT.
CE-139	2.638E-01	NOT IDENT.
BA-140	4.739E+00	NOT IDENT.
LA-140	5.982E-01	NOT IDENT.
CE-141	6.166E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.725E+00	FAIL ABUN
PM-144	4.059E-01	NOT IDENT.
PR-144	3.047E+01	NOT IDENT.
PM-146	6.546E-01	FAIL ABUN
ND-147	1.008E+01	NOT IDENT.
PM-149	6.947E+03	NOT IDENT.
EU-150	3.041E-01	FAIL ABUN
EU-152	1.168E+00	FAIL ABUN
GD-153	7.811E-01	NOT IDENT.
EU-154	7.666E-01	FAIL ABUN
EU-155	9.281E-01	FAIL ABUN
TB-160	2.278E+00	FAIL ABUN
HO-166M	6.753E-01	FAIL ABUN
TM-171	2.703E+02	NOT IDENT.
HF-172	1.626E+00	FAIL ABUN
LU-172	9.793E-01	FAIL ABUN
LU-176	3.038E-01	FAIL ABUN
HF-181	6.617E-01	FAIL ABUN
TA-182	1.443E+00	FAIL ABUN
RE-183	4.717E+00	FAIL ABUN
RE-184	2.324E+00	NOT IDENT.
W-188	8.272E+01	NOT IDENT.
IR-192	4.141E-01	NOT IDENT.
BI-207	8.299E-01	NOT IDENT.
TL-208	4.148E-01	NOT IDENT.
PB-211	9.694E+00	NOT IDENT.
BI-212	5.810E+00	NOT IDENT.
PB-212	5.790E-01	NOT IDENT.
BI-214	8.155E-01	FAIL ABUN
PB-214	9.149E-01	FAIL ABUN
RN-219	5.561E+00	NOT IDENT.
RN-222	8.155E-01	FAIL ABUN
RA-223	7.545E+00	FAIL ABUN

RA-224	6.203E+00	NOT IDENT.
RA-226	8.155E-01	FAIL ABUN
AC-227	2.823E+00	FAIL ABUN
TH-227	2.823E+00	FAIL ABUN
AC-228	2.205E+00	NOT IDENT.
RA-228	2.205E+00	NOT IDENT.
TH-228	5.790E-01	NOT IDENT.
TH-229	4.989E+00	FAIL ABUN
TH-230	8.155E-01	FAIL ABUN
PA-231	5.123E+00	NOT IDENT.
TH-231	7.545E+00	FAIL ABUN
TH-232	2.205E+00	NOT IDENT.
PA-233	7.555E-01	NOT IDENT.
PA-234	5.305E+00	NOT IDENT.
PA-234M	7.521E+01	NOT IDENT.
TH-234	1.053E+01	NOT IDENT.
U-234	8.155E-01	FAIL ABUN
U-235	1.747E+00	NOT IDENT.
NP-237	7.555E-01	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	1.053E+01	NOT IDENT.
NP-239	2.320E+00	FAIL ABUN
PU-239	2.967E+03	NOT IDENT.
AM-243	4.441E-01	NOT IDENT.
CM-243	9.374E-01	FAIL ABUN
BK-247	8.676E-01	FAIL ABUN
CM-247	5.098E-01	FAIL ABUN
CF-249	5.051E-01	NOT IDENT.
CF-251	1.162E+00	NOT IDENT.
ANH-511	3.734E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621363.CNF;1 *
 * Acquisition date : 3-OCT-2016 05:45:34 Sensitivity : 3.000 *
 * Detector ID : GAM11 Energy tolerance: 1.500 *
 * Elapsed live time: 0 00:15:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 00:15:06.48 Half life ratio : ***** *
 * Sample date : 12-SEP-2016 00:00:00 Nuclide Library : SOLID *
 * Sample ID : G1203621363 Analyst initials: MXR1 *
 * Batch Number : 1596252 Sample Quantity : 1.1500E+02 GRAM *
 * Quantity Err(%) : 1.7391E-03 % *
 * Wet wt corr : 1.00000 Wet Weight : 0.00000 *
 * Dry Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 2-AUG-2016 10:31:39 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;14 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
CO-57	9.692E-01	5.165E-01	5.165E-01
CO-60	1.571E+02	6.753E+00	6.753E+00
ZN-65	3.955E+00	2.566E+00	2.566E+00
CD-109	4.199E+02	4.101E+01	4.101E+01
SN-126	4.067E+01	3.337E+00	3.337E+00
BA-137M	1.787E+02	8.302E+00	8.302E+00
CS-137	1.888E+02	8.751E+00	8.751E+00
PM-147	2.800E+04	1.492E+04	1.492E+04
HG-203	9.012E-01	7.253E-01	7.253E-01
PB-210	5.854E+03	5.374E+02	5.374E+02
BI-211	3.777E+00	4.639E+00	4.639E+00
AM-241	5.442E+02	4.078E+01	4.078E+01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	2.361E+00	6.024E+00	6.117E+00	NOT IDENT.
NA-22	-1.262E-01	3.311E-01	3.359E-01	NOT IDENT.
NA-24	-3.221E+08	4.671E+09	4.673E+09	SHORT HLIF
AL-26	3.251E-01	2.795E-01	3.156E-01	NOT IDENT.
K-40	-1.005E+00	2.191E+00	2.237E+00	NOT IDENT.
SC-46	6.565E-01	8.358E-01	8.866E-01	FAIL ABUN
V-48	-2.380E-01	1.841E+00	1.844E+00	NOT IDENT.
CR-51	1.364E-01	5.498E+00	5.498E+00	NOT IDENT.
MN-54	8.471E-03	6.506E-01	6.506E-01	NOT IDENT.
CO-56	6.011E-01	7.264E-01	7.753E-01	NOT IDENT.
MN-56	1.000E+41	1.224E+41	0.000E+00	SHORT HLIF
CO-58	1.392E-01	7.197E-01	7.224E-01	NOT IDENT.
FE-59	7.674E-01	1.801E+00	1.834E+00	NOT IDENT.
GE-68	7.808E+00	2.304E+01	2.331E+01	NOT IDENT.
AS-73	-1.905E+01	1.613E+01	1.828E+01	NOT IDENT.
AS-74	-4.548E-01	1.702E+00	1.714E+00	NOT IDENT.
SE-75	2.961E-01	6.058E-01	6.204E-01	FAIL ABUN
BR-77	8.649E+01	6.544E+02	6.556E+02	NOT IDENT.

SR-82	-3.962E+00	6.321E+00	6.568E+00	NOT IDENT.
RB-83	-1.573E+01	1.275E+00	1.277E+00	NOT IDENT.
KR-85	-1.076E+01	1.029E+02	1.030E+02	NOT IDENT.
SR-85	-6.062E-02	5.815E-01	5.822E-01	NOT IDENT.
RB-86	1.005E+00	1.787E+01	1.788E+01	NOT IDENT.
Y-88	-7.479E-02	3.186E-01	3.204E-01	NOT IDENT.
Y-91	4.385E+01	2.053E+02	2.062E+02	NOT IDENT.
NB-94	-4.242E-02	4.528E-01	4.532E-01	NOT IDENT.
NB-95	-3.273E-01	6.409E-01	6.577E-01	NOT IDENT.
NB-95M	7.626E-01	1.538E+00	1.576E+00	NOT IDENT.
ZR-95	2.396E-01	1.267E+00	1.272E+00	NOT IDENT.
NB-97	1.000E+41	1.089E+41	0.000E+00	SHORT HLIF
ZR-97	-2.917E+09	9.913E+09	1.000E+10	SHORT HLIF
MO-99	6.896E+01	8.901E+02	8.907E+02	NOT IDENT.
TC-99M	-5.812E+23	7.650E+24	0.000E+00	SHORT HLIF
RH-101	-1.543E-01	3.235E-01	3.309E-01	NOT IDENT.
RH-102	3.538E-02	8.329E-01	8.330E-01	NOT IDENT.
RU-103	4.764E-01	7.054E-01	7.374E-01	NOT IDENT.
RH-106	2.461E+00	4.745E+00	4.873E+00	NOT IDENT.
RU-106	2.461E+00	4.745E+00	4.873E+00	NOT IDENT.
AG-108M	4.979E-01	5.195E-01	5.659E-01	NOT IDENT.
AG-110M	-1.126E+00	1.000E+00	1.122E+00	NOT IDENT.
SN-113	-1.261E-01	6.918E-01	6.941E-01	NOT IDENT.
CD-115	1.159E+03	1.193E+03	1.302E+03	NOT IDENT.
SN-117M	1.978E-02	7.636E-01	7.637E-01	NOT IDENT.
TE-123M	-9.382E-02	3.048E-01	3.077E-01	NOT IDENT.
SB-124	1.480E-01	6.183E-01	6.218E-01	NOT IDENT.
SB-125	5.573E-01	1.533E+00	1.554E+00	NOT IDENT.
TE-125M	-7.839E+01	1.071E+02	1.128E+02	NOT IDENT.
I-126	-1.379E+00	5.036E+00	5.074E+00	FAIL ABUN
SB-126	2.324E+00	3.018E+00	3.195E+00	NOT IDENT.
SB-127	-1.079E+00	5.496E+01	5.496E+01	NOT IDENT.
I-131	-5.030E-01	2.815E+00	2.824E+00	FAIL ABUN
I-132	1.000E+41	3.210E+41	0.000E+00	SHORT HLIF
TE-132	-2.361E+01	3.453E+01	3.613E+01	NOT IDENT.
BA-133	2.451E-01	6.569E-01	6.662E-01	NOT IDENT.
I-133	-9.551E+06	1.139E+07	1.218E+07	SHORT HLIF
CS-134	-1.715E-01	6.812E-01	6.856E-01	NOT IDENT.
CS-135	1.285E+00	2.012E+00	2.094E+00	NOT IDENT.
I-135	1.294E+23	2.480E+23	0.000E+00	SHORT HLIF
CS-136	1.699E+00	2.541E+00	2.654E+00	NOT IDENT.
CE-139	9.897E-03	3.140E-01	3.141E-01	NOT IDENT.
BA-140	6.420E-01	5.536E+00	5.543E+00	NOT IDENT.
LA-140	-1.362E-01	7.487E-01	7.513E-01	NOT IDENT.
CE-141	4.788E-01	7.129E-01	7.449E-01	NOT IDENT.
CE-143	9.974E+03	3.547E+04	3.575E+04	SHORT HLIF
CE-144	1.131E-01	2.024E+00	2.025E+00	FAIL ABUN
PM-144	-6.812E-02	4.903E-01	4.913E-01	NOT IDENT.
PR-144	-5.151E+00	3.681E+01	3.688E+01	NOT IDENT.
PM-146	1.784E-01	7.528E-01	7.570E-01	FAIL ABUN
ND-147	-1.611E+00	1.189E+01	1.191E+01	NOT IDENT.
PM-149	8.191E+03	8.362E+03	9.141E+03	NOT IDENT.
EU-150	-4.957E-02	3.460E-01	3.467E-01	FAIL ABUN
EU-152	-1.397E-01	1.476E+00	1.477E+00	FAIL ABUN
GD-153	2.539E-01	8.943E-01	9.016E-01	NOT IDENT.
EU-154	-3.241E-01	9.388E-01	9.501E-01	FAIL ABUN
EU-155	1.291E-01	1.072E+00	1.073E+00	FAIL ABUN
TB-160	-1.035E+00	2.836E+00	2.874E+00	FAIL ABUN
HO-166M	-3.273E-01	8.293E-01	8.423E-01	FAIL ABUN
TM-171	-1.563E+01	3.027E+02	3.028E+02	NOT IDENT.
HF-172	-9.408E-01	2.102E+00	2.144E+00	FAIL ABUN
LU-172	-2.990E-01	1.152E+00	1.159E+00	FAIL ABUN
LU-176	1.367E-01	3.732E-01	3.783E-01	FAIL ABUN
HF-181	9.245E-02	8.533E-01	8.543E-01	FAIL ABUN
TA-182	7.318E-02	1.689E+00	1.690E+00	FAIL ABUN
RE-183	2.665E+01	8.325E+00	1.462E+01	FAIL ABUN
RE-184	1.196E+00	2.804E+00	2.856E+00	NOT IDENT.
W-188	-7.911E+01	1.062E+02	1.120E+02	NOT IDENT.
IR-192	-3.021E-01	5.302E-01	5.474E-01	NOT IDENT.
BI-207	5.956E-01	9.399E-01	9.775E-01	NOT IDENT.
TL-208	-4.315E-01	5.093E-01	5.452E-01	NOT IDENT.
PB-211	3.525E+00	1.102E+01	1.114E+01	NOT IDENT.
BI-212	-1.371E+00	7.065E+00	7.092E+00	NOT IDENT.
PB-212	-2.450E-02	7.074E-01	7.074E-01	NOT IDENT.
BI-214	1.150E-01	9.607E-01	9.621E-01	FAIL ABUN
PB-214	1.371E+00	1.684E+00	1.793E+00	FAIL ABUN
RN-219	4.541E-01	6.368E+00	6.371E+00	NOT IDENT.
RN-222	1.150E-01	9.607E-01	9.621E-01	FAIL ABUN

RA-223	2.893E+00	8.441E+00	8.541E+00	FAIL ABUN
RA-224	-1.636E+00	7.647E+00	7.683E+00	NOT IDENT.
RA-226	1.150E-01	9.607E-01	9.621E-01	FAIL ABUN
AC-227	1.333E+00	3.426E+00	3.478E+00	FAIL ABUN
TH-227	1.333E+00	3.426E+00	3.478E+00	FAIL ABUN
AC-228	-2.568E+00	2.823E+00	3.052E+00	NOT IDENT.
RA-228	-2.568E+00	2.823E+00	3.052E+00	NOT IDENT.
TH-228	-2.450E-02	7.074E-01	7.074E-01	NOT IDENT.
TH-229	-8.972E-01	6.039E+00	6.053E+00	FAIL ABUN
TH-230	1.150E-01	9.607E-01	9.621E-01	FAIL ABUN
PA-231	-7.880E-01	6.411E+00	6.421E+00	NOT IDENT.
TH-231	2.893E+00	8.441E+00	8.541E+00	FAIL ABUN
TH-232	-2.568E+00	2.823E+00	3.052E+00	NOT IDENT.
PA-233	1.358E-01	9.376E-01	9.396E-01	NOT IDENT.
PA-234	-3.540E+00	8.577E+00	8.724E+00	NOT IDENT.
PA-234M	1.182E+02	8.265E+01	9.835E+01	NOT IDENT.
TH-234	2.714E+00	1.269E+01	1.275E+01	NOT IDENT.
U-234	1.150E-01	9.607E-01	9.621E-01	FAIL ABUN
U-235	6.448E-01	2.040E+00	2.061E+00	NOT IDENT.
NP-237	1.358E-01	9.376E-01	9.396E-01	NOT IDENT.
NP-238	-2.836E+03	3.046E+03	3.304E+03	SHORT HLIF
U-238	2.714E+00	1.269E+01	1.275E+01	NOT IDENT.
NP-239	-1.961E-01	2.712E+00	2.713E+00	FAIL ABUN
PU-239	2.654E+03	3.396E+03	3.600E+03	NOT IDENT.
AM-243	-3.661E-01	5.152E-01	5.410E-01	NOT IDENT.
CM-243	-3.044E-01	1.095E+00	1.104E+00	FAIL ABUN
BK-247	3.790E-01	1.057E+00	1.071E+00	FAIL ABUN
CM-247	2.140E-01	5.796E-01	5.876E-01	FAIL ABUN
CF-249	3.677E-02	5.770E-01	5.772E-01	NOT IDENT.
CF-251	2.301E-01	1.383E+00	1.387E+00	NOT IDENT.
ANH-511	-1.054E-01	4.336E-01	4.362E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	2607.1199	87.09	526.4185	136.47	462.4787
45.60	2305.2644	87.57	526.9440	140.51	447.7479
46.54	2312.1226	88.03	527.4438	143.76	456.1200
49.72	1998.8229	88.34	527.7771	144.24	464.7412
51.35	2036.0985	88.47	527.9181	145.44	423.9873
51.87	2091.8289	89.96	598.8670	152.43	487.0103
52.39	2084.6348	90.64	558.0259	153.25	478.1124
52.97	2249.9666	91.11	535.8098	154.21	441.9241
53.44	2294.6055	92.59	485.7486	156.02	460.9651
54.07	2239.7058	93.35	575.0147	158.56	429.7643
57.36	0.0000	94.56	518.1766	159.00	449.0831
57.53	1544.4453	94.65	518.2677	162.33	436.2131
57.98	1546.3274	94.67	518.2885	162.66	436.4070
59.27	1551.7247	94.87	531.8596	163.33	443.1870
59.32	1551.9331	97.43	522.9874	165.86	419.0242
59.54	1552.8472	98.43	507.6409	176.31	455.0555
60.96	1558.7084	98.44	507.6530	176.60	455.2222
61.17	1559.5687	99.53	516.4120	177.52	431.8752
62.93	636.6469	100.11	537.2310	181.07	416.3553
63.29	569.5972	102.03	474.3099	181.52	443.8521
63.58	561.7068	103.18	481.1395	184.41	467.3179
64.28	596.0218	103.37	500.7175	185.72	471.3557
66.73	617.6526	105.21	494.6171	193.51	487.9491
67.24	625.6205	105.31	476.2035	197.03	496.6341
67.68	634.3989	106.12	486.6575	198.01	472.7295
67.75	652.5067	106.47	501.6041	201.83	432.3575
69.67	594.0779	109.28	509.0335	203.43	477.9187
70.83	641.0640	111.00	462.3766	205.31	458.7520
72.81	629.4874	111.76	499.4379	210.85	510.1346
72.87	629.5770	114.06	468.7961	215.65	553.6837
74.66	674.2770	116.30	461.6581	222.11	524.4224
74.82	669.9482	116.74	462.0022	227.09	501.9272
74.97	661.9428	119.76	495.3075	227.38	490.5913
77.11	588.8037	121.12	497.7583	228.16	513.9859
78.74	658.6654	121.22	497.8380	228.18	513.9995
79.69	660.0477	121.78	509.9864	235.69	449.6315
80.12	660.6736	122.06	510.2233	235.96	448.5966
80.19	660.7770	122.92	510.9417	238.63	470.7408
80.57	595.1940	123.07	511.0659	238.98	460.4400
81.00	595.7524	123.68	490.4684	240.99	485.8404
81.07	595.8406	125.81	467.9542	242.00	456.0076
81.75	596.7222	127.23	477.1027	244.70	495.8334
83.79	591.8694	127.91	436.1330	252.40	461.8872
84.00	592.1306	129.30	427.9627	252.80	464.4241
85.43	595.7939	131.20	484.1711	254.15	0.0000
86.55	525.8289	133.02	433.5213	256.23	454.1367
86.79	526.0895	133.52	439.9770	260.90	416.9625
86.94	526.2561	136.00	429.3574	264.66	401.7507

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.80	401.8022	364.49	397.0626	600.60	234.6748
265.00	406.6546	366.42	382.0649	602.52	0.0000
268.22	404.2838	372.51	385.5010	604.72	224.1943
269.46	435.8824	375.05	380.9866	607.14	250.4076
270.03	467.2668	1093.63	394.7345	609.32	223.7083
271.23	429.3968	383.85	402.6404	610.33	218.8218
273.65	438.7730	388.16	376.6493	614.28	237.2700
276.40	425.8051	388.63	402.2409	618.01	220.6445
277.37	443.8730	391.69	406.6187	620.36	235.9658
277.60	443.9629	400.66	415.3367	621.93	224.0798
278.00	428.0396	401.81	431.6240	630.19	0.0000
279.20	374.5297	402.40	414.0597	631.29	237.2089
279.54	380.2926	404.85	411.2007	633.25	244.5011
279.70	380.3406	410.95	436.9745	634.78	218.3906
280.46	362.8601	413.71	379.7089	635.95	230.6533
283.69	395.4521	414.70	444.3293	636.99	224.6919
284.31	428.4413	423.72	423.5953	645.85	219.5332
285.41	379.0503	427.09	439.8474	657.76	240.6841
285.90	370.7042	427.87	434.6649	657.90	0.0000
287.50	377.3111	433.94	443.6139	661.66	256.9849
290.67	440.6077	439.40	432.4403	664.57	0.0000
293.27	0.0000	453.88	460.2279	666.33	233.9375
295.22	410.4895	463.37	501.6549	666.50	204.7115
295.96	409.5292	468.07	482.7480	667.71	0.0000
298.58	376.0472	473.00	477.6889	677.62	200.0783
299.98	394.9511	475.06	469.9277	685.70	189.4187
300.09	394.9805	476.78	396.9679	695.00	183.9717
300.13	395.0001	477.60	400.8795	696.49	210.0879
301.36	394.1797	482.18	335.7568	696.51	210.0961
302.85	377.4106	487.02	378.7976	697.00	202.8552
304.50	410.0557	492.35	327.4431	697.30	195.6039
304.85	410.1671	497.08	311.4102	697.49	190.4165
306.78	383.6118	505.52	318.5909	702.65	191.8913
308.46	421.3269	507.63	0.0000	706.68	196.4071
311.90	403.8994	511.00	297.7704	711.68	190.5535
316.51	407.9217	514.00	318.2200	720.70	199.7025
319.41	388.4661	514.00	318.2200	721.93	0.0000
320.08	375.3296	520.40	296.0085	722.78	232.4924
321.04	376.4664	520.69	290.3381	722.91	226.1979
323.87	397.3989	522.65	0.0000	723.31	232.5464
325.23	409.5594	527.90	218.2681	724.19	202.1094
328.76	367.8872	528.26	244.7316	727.33	198.1665
333.37	369.2239	529.59	274.0484	733.00	204.9804
333.97	378.6793	529.87	0.0000	735.93	231.6805
334.37	396.5147	531.02	253.1611	737.46	211.7187
338.28	365.5723	537.26	264.6047	739.50	218.2547
338.32	365.5811	546.56	0.0000	747.24	214.7154
340.48	418.7523	552.55	247.3840	748.06	214.7894
340.55	418.7723	563.25	248.7848	752.31	204.5156
344.28	404.2505	569.33	238.8075	753.82	208.9040
345.93	382.2054	569.50	241.7738	756.73	192.0850
351.06	374.3032	569.70	250.6042	756.80	192.0923
351.93	374.5527	583.19	257.2723	763.94	195.8672
355.39	0.0000	584.27	246.5719	765.81	217.4386
356.01	397.5753	595.83	243.0461	766.42	201.4253

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
766.84	221.8158	1002.74	307.4464	1678.03	0.0000
772.60	0.0000	1004.73	294.4922	1690.97	10.4773
776.52	235.6014	1021.30	0.0000	1750.46	0.0000
777.92	234.6587	1025.87	0.0000	1764.49	17.0215
778.90	218.5950	1028.54	0.0000	1770.23	10.6506
783.70	217.9374	1037.84	240.0692	1771.35	20.2408
785.37	233.2002	1038.76	0.0000	1791.20	0.0000
792.07	238.1543	1046.59	253.1845	1808.65	8.5864
794.95	251.4372	1048.07	222.1985	1810.72	0.0000
795.86	250.4380	1049.04	215.1472	1836.06	15.1083
801.95	241.2588	1050.41	245.4756		
810.06	242.0266	1063.66	242.9307		
810.29	242.0537	1077.00	251.1182		
810.45	242.0627	1077.34	245.7538		
810.76	242.0989	1085.87	227.5209		
815.77	240.9296	1093.63	257.8085		
818.51	241.7367	1099.45	254.6503		
832.01	257.2800	1112.07	259.6199		
834.85	266.3713	1112.84	259.6724		
835.71	251.0449	1115.54	240.5932		
836.80	0.0000	1120.29	185.3730		
846.75	0.0000	1120.55	185.3855		
846.77	225.5571	1121.30	134.5315		
856.80	258.5934	1129.67	180.4285		
860.56	257.8470	1131.51	0.0000		
871.09	280.0464	1147.95	0.0000		
873.19	255.6962	1173.23	134.7452		
875.33	0.0000	1177.95	134.5538		
879.38	315.5977	1189.05	90.8582		
880.51	301.1692	1204.77	69.8410		
883.24	267.8441	1221.41	65.4883		
884.68	319.5697	1231.02	49.7166		
889.28	286.4081	1235.36	63.8662		
894.76	319.6040	1238.28	46.0571		
898.04	282.8040	1260.41	0.0000		
900.72	321.4252	1271.87	40.7875		
903.28	290.1080	1274.44	43.6641		
911.20	336.2036	1274.54	43.6641		
912.08	297.8120	1291.59	39.0956		
923.98	0.0000	1298.22	0.0000		
926.50	343.7191	1312.11	38.3496		
929.11	323.5215	1332.49	53.9731		
937.49	325.6116	1362.66	0.0000		
944.13	336.6597	1365.19	27.2139		
946.00	372.9688	1368.63	0.0000		
949.00	330.3398	1384.29	25.3906		
954.55	0.0000	1408.01	22.5943		
962.31	337.0367	1457.56	0.0000		
964.08	314.7565	1460.82	17.9110		
966.17	299.4028	1489.16	20.0342		
968.97	296.7902	1505.03	22.1195		
983.53	281.9971	1584.12	17.4036		
984.45	0.0000	1596.21	13.3444		
996.26	282.0281	1620.50	12.3838		
1001.03	245.9951	1621.92	10.3235		

Batch# 1596254 Product: GAMMA ^{MSWC} Date: 10/3/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.		NA	
Samples have been blank corrected (if required). Blank correction reported included (if required).		NA	
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits. Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		SEE NARRATIVE
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).		NA	
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	DER# - 1563729
Sample was correctly preserved if required.		NA	
Smears Taken for Radioactive batches.		NA	
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.		NA	
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)		NA	
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER# - 1563729
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		
Aliquot Correction completed if required.		NA	
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)		NA	

Primary Review Performed By: [Signature] 10/3/16

Secondary Review Performed By: [Signature] 10/3/16
10/3/16

10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 03-OCT-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GAMMA SPECTROMETER	Test / Method: DOE HASL 300, 4.5.2.3/Ga-01-R	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596254	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Sample received and analyzed out of holding:</p> <p>405235061,062,063,064,065,066,067,068,069,070,071,072,073,074,075,076,077,078, 1203621365DUP</p>		<p>1. Reporting Results</p>	

Originator's Name:
Tim Winters 03-OCT-16

Data Validator/Group Leader:
Bryan Williams 03-OCT-16

Gamma Spec Queue Sheet

1.A. - 10/3/16

09/16/2016

Batch #: 1596254 Analyst: MXRI First Client Due Date: 10/04/2016 Internal Due Date: 09/30/2016
 Gamma LCS Isotope: Mixed Gamma LCS Code: 1556 Expiration Date: 4/1/37 Vol: 10 mL
 Initials: MS Prep Date: 9/12/16 Library: SOLID Balance ID: N/A

Sample ID	Client Description / Container ID	Type	Hazard Code	Client	Matrix	Collect Date	Geometry	Wet/Dry Aliquot (1/g/F)	Detector	Sealing Date/Time (if Applicable)
405235061-1	5.1.B.R.2.2	SAMPLE		MJWC001	SOIL	14-DEC-15 13:47:00	CAN	144.233 g	20	9/12/16
405235062-1	5.2.A.R.1.2	SAMPLE		MJWC001	SOIL	14-DEC-15 13:10:00	RF	146.441 g	36	
405235063-1	5.2.A.R.1.3	SAMPLE		MJWC001	SOIL	14-DEC-15 13:15:00	RF	147.883 g	44	
405235064-1	5.2.A.R.1.4	SAMPLE		MJWC001	SOIL	14-DEC-15 13:25:00	RF	174.637 g	2	
405235065-1	5.2.A.R.2.3	SAMPLE		MJWC001	SOIL	14-DEC-15 13:56:00	RF	147.836 g	25	
405235066-1	5.2.A.R.2.4	SAMPLE		MJWC001	SOIL	14-DEC-15 14:00:00	RF	157.422 g	33	
405235067-1	5.2.A.R.6.2	SAMPLE		MJWC001	SOIL	11-DEC-15 11:30:00	RF	158.21 g	41	
405235068-1	5.2.A.R.4.2	SAMPLE		MJWC001	SOIL	11-DEC-15 10:27:00	RF	140.907 g	21	
405235069-1	5.2.B.R.1.4	SAMPLE		MJWC001	SOIL	16-DEC-15 12:45:00	RF	156.084 g	43	
405235070-1	5.2.B.R.3.2	SAMPLE		MJWC001	SOIL	11-DEC-15 10:10:00	RF	145.32 g	11	
405235071-1	5.2.B.R.4.2	SAMPLE		MJWC001	SOIL	11-DEC-15 10:25:00	RF	149.695 g	1	
405235072-1	5.2.B.R.2.4	SAMPLE		MJWC001	SOIL	15-DEC-15 13:35:00	RF	166.107 g	5	
405235073-1	5.2.B.R.8.2	SAMPLE		MJWC001	SOIL	11-DEC-15 11:35:00	RF	147.132 g	6	
405235074-1	5.3.A.R.1.3	SAMPLE		MJWC001	SOIL	15-DEC-15 14:10:00	RF	169.068 g	7	
405235075-1	5.4.A.R.1.3	SAMPLE		MJWC001	SOIL	16-DEC-15 09:31:00	RF	151.411 g	18	
405235076-1	5.4.A.R.4.2	SAMPLE		MJWC001	SOIL	11-DEC-15 14:19:00	RF	144.47 g	24	
405235077-1	5.5.A.R.1.3	SAMPLE		MJWC001	SOIL	17-DEC-15 13:30:00	RF	172.799 g	29	
405235078-1	5.6.A.R.1.3	SAMPLE		MJWC001	SOIL	17-DEC-15 12:40:00	RF	156.072 g	20	
1203621364-1	MB	MB		QC ACCOUNT	SOIL	9/12/16	RF	174.437	2	
1203621365-1	DUP 5.1.B.R.2.2(405235061)	DUP		QC ACCOUNT	SOIL	14-DEC-15 13:47:00	RF	144.233	19	
1203621366-1	LCS	LCS		QC ACCOUNT	SOIL	9/12/16	RF	115	11	

GEL Laboratories LLC, Radiochemistry Division

Data Reviewed By: *[Signature]* 10/3/16 Page 1 of 1


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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                 *
*                               Charleston, SC 29407                            *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235061.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM20.CNF;515
Background date  : 2-OCT-2016 11:01:13.
Sample date     : 14-DEC-2015 13:47:00 Acquisition date : 3-OCT-2016 05:52:51.
Sample ID      : G405235061 Sample quantity   : 1.44233E+02 GRAM
Detector name   : GAM20 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:14.55 0.4%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity    : 3.00000
Batch ID       : 1596254 Detector SN#    :
Matrix Spike ID : LCS ID       : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	47.05*	34	141	1.86	94.29	88	10	9.48E-03	68.7	
2	0	63.50*	10	165	0.72	127.15	124	8	2.88E-03	224.3	
3	2	74.92	168	176	1.23	149.98	146	14	4.67E-02	15.0	2.03E-01
4	2	77.15	242	142	0.98	154.43	146	14	6.73E-02	10.6	
5	5	87.37	56	225	1.29	174.87	170	22	1.56E-02	44.6	4.08E+00
6	5	92.64*	75	225	1.85	185.40	170	22	2.09E-02	44.6	
7	0	129.70	19	117	1.40	259.47	253	8	5.17E-03	104.1	
8	0	144.40*	29	125	1.38	288.84	283	10	8.03E-03	75.5	
9	0	186.06*	86	116	0.97	372.12	367	10	2.38E-02	27.2	
10	0	209.70	21	89	1.39	419.38	415	8	5.92E-03	79.9	
11	4	238.52*	330	77	1.17	476.98	473	14	9.16E-02	7.1	4.51E+00
12	4	241.49	70	71	1.43	482.93	473	14	1.96E-02	23.7	
13	0	270.20	43	71	1.58	540.33	535	9	1.20E-02	38.6	
14	0	295.09*	194	30	1.17	590.08	585	10	5.40E-02	9.0	
15	4	299.97	43	25	2.01	599.84	595	21	1.20E-02	28.1	1.97E+00
16	4	304.96	23	21	2.01	609.83	595	21	6.44E-03	53.2	
17	2	351.90*	302	38	1.30	703.68	697	19	8.39E-02	6.8	2.90E+00
18	2	356.36*	19	29	1.71	712.60	697	19	5.26E-03	58.2	
19	0	510.90*	56	24	1.74	1021.62	1016	13	1.56E-02	28.2	
20	0	583.44*	112	29	1.29	1166.72	1161	13	3.11E-02	14.2	
21	0	609.37*	203	29	1.26	1218.58	1212	13	5.64E-02	9.0	
22	0	623.21	33	31	5.67	1246.28	1237	18	9.16E-03	43.5	
23	0	723.27	67	42	11.05	1446.45	1431	31	1.85E-02	32.5	
24	1	763.00	19	30	1.83	1525.94	1518	23	5.18E-03	55.1	3.60E+00
25	1	768.40	38	20	1.84	1536.75	1518	23	1.06E-02	25.5	
26	0	796.11	32	14	3.96	1592.18	1583	18	9.02E-03	31.8	
27	0	861.13	19	11	2.54	1722.29	1716	12	5.20E-03	43.4	
28	0	911.42*	85	8	1.78	1822.93	1818	11	2.35E-02	12.9	
29	0	1001.94*	19	8	3.13	2004.11	1994	16	5.34E-03	41.7	
30	0	1120.51	58	17	2.04	2241.46	2232	17	1.61E-02	21.0	
31	0	1156.21	21	4	2.57	2312.95	2308	11	5.70E-03	30.9	
32	0	1305.58	17	2	3.63	2612.04	2608	10	4.74E-03	29.4	
33	0	1320.12	5	5	1.29	2641.15	2636	7	1.49E-03	81.9	
34	0	1332.48	6	3	1.23	2665.90	2661	7	1.57E-03	68.6	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1460.95*	293	16	1.97	2923.21	2916	16	8.15E-02	6.6	
36	0	1587.68	19	0	2.16	3177.11	3172	11	5.28E-03	22.9	
37	0	1764.42	39	0	2.10	3531.26	3525	13	1.08E-02	16.0	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235061.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 14-DEC-2015 13:47:00 Acquisition date : 3-OCT-2016 05:52:51
Sample ID        : G405235061 Sample quantity   : 144.23 GRAM
Sample type      : SOLID Sample geometry    :
Detector name    : GAMMA20 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:14.55 0.4%
Energy tolerance : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error    : 0.00 %
Efficiency type  : Linear Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.312E+00	1.049E+01	1.049E+01	13.27	OK
RH-106	621.93	9.93*	2.582E+00	6.971E-01	1.205E+00	87.04	OK
	1050.41	1.56	1.721E+00	----- Line	Not Found	-----	Absent
RU-106	621.93	9.93*	2.582E+00	6.971E-01	1.205E+00	87.04	OK
	1050.41	1.56	1.721E+00	----- Line	Not Found	-----	Absent
CD-109	88.03	3.70*	6.851E+00	2.608E-01	4.055E-01	488.47	OK
SN-126	64.28	9.60	4.813E+00	1.467E-01	1.467E-01	448.65	OK
	86.94	8.90	6.851E+00	1.084E-01	1.084E-01	488.47	OK
	87.57	37.00*	6.851E+00	2.608E-02	2.608E-02	488.47	OK
CE-141	145.44	48.29*	7.360E+00	1.879E-02	9.847E+00	411.67	OK
TL-208	277.37	6.60	4.947E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.719E+00	2.641E-01	2.641E-01	28.47	OK
	860.56	12.50	2.010E+00	3.924E-01	3.924E-01	86.73	OK
PB-210	46.54	4.25*	2.063E+00	2.605E+00	2.671E+00	137.44	OK
PB-212	74.82	10.28	6.005E+00	1.057E+00	1.057E+00	51.32	OK
	77.11	17.10	6.187E+00	1.477E+00	1.477E+00	21.12	OK
	238.63	43.60*	5.554E+00	8.023E-01	8.023E-01	14.23	OK
	300.09	3.30	4.648E+00	1.625E+00	1.625E+00	56.28	OK
BI-214	609.32	45.49*	2.627E+00	9.221E-01	9.224E-01	18.09	OK
	1120.29	14.92	1.635E+00	1.218E+00	1.218E+00	41.93	OK
	1764.49	15.30	1.106E+00	1.131E+00	1.132E+00	32.03	OK
PB-214	74.82	5.80	5.996E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	6.187E+00	2.603E+00	2.604E+00	21.12	OK
	87.09	3.41	6.836E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.503E+00	1.040E+00	1.040E+00	47.31	OK
	295.22	18.42	4.710E+00	1.296E+00	1.297E+00	18.01	OK
	351.93	35.60*	4.084E+00	1.185E+00	1.185E+00	13.60	OK
RN-222	609.32	45.49*	2.627E+00	9.221E-01	9.224E-01	18.09	OK
	1120.29	14.92	1.635E+00	1.218E+00	1.218E+00	41.93	OK
	1764.49	15.30	1.106E+00	1.131E+00	1.132E+00	32.03	OK
RA-226	609.32	45.49*	2.627E+00	9.221E-01	9.224E-01	18.09	OK
	1120.29	14.92	1.635E+00	1.218E+00	1.218E+00	41.93	OK
	1764.49	15.30	1.106E+00	1.131E+00	1.132E+00	32.03	OK
TH-228	74.82	10.28	6.005E+00	1.057E+00	1.057E+00	51.32	OK
	77.11	17.10	6.187E+00	1.477E+00	1.477E+00	21.12	OK
	238.63	43.60*	5.554E+00	8.023E-01	8.023E-01	14.23	OK
	300.09	3.30	4.648E+00	1.625E+00	1.625E+00	56.28	OK
TH-230	609.32	45.49*	2.627E+00	9.221E-01	9.221E-01	18.09	OK
	1120.29	14.92	1.635E+00	1.218E+00	1.218E+00	41.93	OK
	1764.49	15.30	1.106E+00	1.131E+00	1.131E+00	32.03	OK
PA-231	283.69	1.70	4.860E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.648E+00	1.003E+00	1.003E+00	56.28	OK
TH-234	63.29	3.70*	4.813E+00	3.806E-01	3.806E-01	448.65	OK
	92.59	4.23	7.094E+00	1.596E+00	1.596E+00	89.29	OK
U-234	609.32	45.49*	2.627E+00	9.221E-01	9.221E-01	18.09	OK
	1120.29	14.92	1.635E+00	1.218E+00	1.218E+00	41.93	OK
	1764.49	15.30	1.106E+00	1.131E+00	1.131E+00	32.03	OK
U-235	89.96	3.47	6.978E+00	----- Line	Not Found	-----	Absent
	93.35	5.60	7.094E+00	1.205E+00	1.205E+00	89.29	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	143.76	10.96*	7.370E+00	-----	Line Not Found	-----	<<INT Reject
	163.33	5.08	7.024E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	6.562E+00	1.374E-01	1.374E-01	54.37	OK
	205.31	5.01	6.171E+00	-----	Line Not Found	-----	Absent
U-238	63.29	3.70*	4.813E+00	3.806E-01	3.806E-01	448.65	OK
	92.59	4.23	7.094E+00	1.596E+00	1.596E+00	89.29	OK
AM-243	43.53	5.90	1.315E+00	-----	Line Not Found	-----	Absent
	74.66	67.20*	6.005E+00	1.618E-01	1.618E-01	51.32	OK
ANH-511	511.00	100.00*	3.020E+00	1.028E-01	1.028E-01	56.43	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235061.CNF;1 *
 * Acquisition date : 3-OCT-2016 05:52:51 Sensitivity : 3.000 *
 * Detector ID : GAM20 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:14.55 Half life ratio : ***** *
 * Sample date : 14-DEC-2015 13:47:00 Analyst initials: MXR1 *
 * Sample ID : G405235061 Sample Quantity : 1.4423E+02 GRAM *
 * Batch Number : 1596254 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 30-JUN-2016 06:52:39 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM20_CAN.CNF;15 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.049E+01	1.365E+00	6.736E-01
RH-106	1.205E+00	1.028E+00	8.265E-01
RU-106	1.205E+00	1.028E+00	8.265E-01
CD-109	4.055E-01	1.941E+00	1.693E+00
SN-126	2.608E-02	1.249E-01	1.092E-01
CE-141	9.847E+00	3.973E+01	3.272E+01
TL-208	2.641E-01	7.368E-02	5.153E-02
PB-210	2.671E+00	3.598E+00	2.670E+00
PB-212	8.023E-01	1.119E-01	9.156E-02
BI-214	9.224E-01	1.635E-01	1.144E-01
PB-214	1.185E+00	1.580E-01	1.019E-01
RN-222	9.224E-01	1.635E-01	1.144E-01
RA-226	9.224E-01	1.635E-01	1.144E-01
TH-228	8.023E-01	1.119E-01	9.156E-02
TH-230	9.221E-01	1.635E-01	1.143E-01
PA-231	1.003E+00	5.530E-01	5.207E-01
TH-234	3.806E-01	1.673E+00	1.517E+00
U-234	9.221E-01	1.635E-01	1.143E-01
U-235	2.202E-01	3.258E-01	3.296E-01
U-238	3.806E-01	1.673E+00	1.517E+00
AM-243	1.618E-01	8.137E-02	7.110E-02
ANH-511	1.028E-01	5.685E-02	4.379E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	2.103E+00	8.541E+00	1.735E+01	NOT IDENT.
NA-22	2.263E-02	3.835E-02	8.532E-02	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	3.341E-03	2.110E-02	5.056E-02	NOT IDENT.
SC-46	1.455E-01	3.348E-01	6.793E-01	FAIL ABUN
V-48	0.000E+00	1.073E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	2.904E+02	0.000E+00	SHORT HLIF
MN-54	1.118E-02	5.531E-02	1.083E-01	NOT IDENT.

CO-56	1.252E-01	4.148E-01	8.212E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.944E-02	4.150E-02	7.234E-02	NOT IDENT.
CO-58	-1.763E-01	4.682E-01	8.355E-01	NOT IDENT.
FE-59	1.482E+00	6.619E+00	1.333E+01	NOT IDENT.
CO-60	2.241E-02	3.014E-02	7.007E-02	FAIL ABUN
ZN-65	5.364E-02	1.523E-01	2.933E-01	NOT IDENT.
GE-68	-1.261E-01	1.861E+00	3.752E+00	NOT IDENT.
AS-73	-5.461E-01	4.568E+00	8.583E+00	NOT IDENT.
AS-74	0.000E+00	4.121E+03	0.000E+00	SHORT HLIF
SE-75	-7.514E-03	1.710E-01	3.196E-01	NOT IDENT.
BR-77	0.000E+00	3.342E+36	0.000E+00	SHORT HLIF
SR-82	0.000E+00	4.979E+02	0.000E+00	SHORT HLIF
RB-83	-2.305E-01	5.087E-01	9.239E-01	NOT IDENT.
KR-85	5.112E+00	5.638E+00	1.141E+01	NOT IDENT.
SR-85	5.040E-01	5.581E-01	1.129E+00	NOT IDENT.
RB-86	0.000E+00	1.716E+04	0.000E+00	SHORT HLIF
Y-88	3.545E-02	2.028E-01	4.448E-01	NOT IDENT.
Y-91	2.840E+02	4.399E+02	9.527E+02	NOT IDENT.
NB-94	1.661E-02	3.025E-02	6.099E-02	NOT IDENT.
NB-95	2.592E-02	7.292E-01	1.379E+00	NOT IDENT.
NB-95M	8.731E-01	2.068E+00	3.784E+00	NOT IDENT.
ZR-95	9.818E-01	1.218E+00	2.454E+00	FAIL ABUN
NB-97	0.000E+00	1.259E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.689E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	3.388E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	2.804E-03	3.232E-02	5.442E-02	NOT IDENT.
RH-102	-2.559E-02	5.229E-02	9.278E-02	NOT IDENT.
RU-103	-2.462E-02	4.020E+00	7.849E+00	FAIL ABUN
AG-108M	7.692E-04	2.295E-02	4.483E-02	FAIL ABUN
AG-110M	-3.411E-02	8.526E-02	1.504E-01	FAIL ABUN
SN-113	6.533E-02	1.539E-01	3.220E-01	NOT IDENT.
CD-115	0.000E+00	3.473E+38	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	6.443E+04	0.000E+00	SHORT HLIF
TE-123M	-3.991E-02	1.152E-01	2.000E-01	NOT IDENT.
SB-124	-8.677E-01	1.251E+00	2.061E+00	FAIL ABUN
SB-125	6.802E-02	8.319E-02	1.778E-01	NOT IDENT.
TE-125M	3.041E+01	2.320E+02	4.273E+02	NOT IDENT.
I-126	0.000E+00	5.188E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	6.290E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	6.595E+21	0.000E+00	SHORT HLIF
I-131	0.000E+00	2.524E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.028E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	8.026E+25	0.000E+00	SHORT HLIF
BA-133	4.539E-02	5.178E-02	6.865E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	0.000E+00	7.700E-02	9.666E-02	FAIL ABUN
CS-135	4.088E-02	1.409E-01	2.537E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	1.572E+05	0.000E+00	SHORT HLIF
BA-137M	2.377E-02	3.696E-02	7.412E-02	NOT IDENT.
CS-137	2.511E-02	3.904E-02	7.830E-02	NOT IDENT.
CE-139	-6.957E-03	9.511E-02	1.694E-01	NOT IDENT.
BA-140	0.000E+00	6.666E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	2.283E+05	0.000E+00	SHORT HLIF
CE-143	0.000E+00	1.281E+41	0.000E+00	SHORT HLIF
CE-144	-2.494E-02	2.867E-01	5.177E-01	NOT IDENT.
PM-144	-4.298E-03	4.781E-02	8.976E-02	NOT IDENT.
PR-144	-3.856E-01	4.137E+00	7.764E+00	NOT IDENT.
PM-146	-3.211E-03	3.908E-02	7.458E-02	NOT IDENT.
ND-147	0.000E+00	1.810E+07	0.000E+00	SHORT HLIF
PM-147	1.414E+02	7.047E+02	1.308E+03	NOT IDENT.
PM-149	0.000E+00	5.532E+39	0.000E+00	SHORT HLIF
EU-150	-1.318E-02	2.075E-02	3.774E-02	FAIL ABUN
EU-152	3.094E-02	7.822E-02	1.583E-01	NOT IDENT.
GD-153	-5.501E-02	1.629E-01	2.674E-01	NOT IDENT.
EU-154	3.306E-02	9.801E-02	2.084E-01	FAIL ABUN
EU-155	7.278E-02	9.118E-02	1.782E-01	FAIL ABUN
TB-160	4.628E-01	1.511E+00	3.047E+00	FAIL ABUN
HO-166M	-7.262E-03	4.619E-02	8.655E-02	NOT IDENT.
TM-171	-3.157E+00	1.160E+01	2.151E+01	NOT IDENT.
HF-172	-2.114E-02	2.275E-01	3.755E-01	FAIL ABUN
LU-172	1.170E-02	8.097E-02	1.618E-01	FAIL ABUN
LU-176	-1.219E-03	1.764E-02	3.133E-02	FAIL ABUN
HF-181	1.071E+00	3.102E+00	6.336E+00	NOT IDENT.
TA-182	-2.480E-01	7.955E-01	1.499E+00	FAIL ABUN
RE-183	6.950E-01	1.742E+00	3.381E+00	NOT IDENT.

RE-184	1.265E+01	2.306E+01	4.817E+01	NOT IDENT.
W-188	2.977E+01	8.254E+01	1.544E+02	FAIL ABUN
IR-192	9.261E-02	3.407E-01	6.881E-01	FAIL ABUN
HG-203	-1.126E+00	1.852E+00	3.412E+00	NOT IDENT.
BI-207	9.041E-03	4.043E-02	8.457E-02	FAIL ABUN
BI-211	0.000E+00	4.353E-01	8.295E-01	FAIL ABUN
PB-211	-6.994E-02	5.213E-01	1.002E+00	NOT IDENT.
BI-212	8.436E-01	5.042E-01	1.119E+00	NOT IDENT.
RN-219	4.697E-02	3.294E-01	6.471E-01	FAIL ABUN
RA-223	-1.475E-01	4.706E-01	8.903E-01	FAIL ABUN
RA-224	0.000E+00	8.524E-01	1.364E+00	FAIL ABUN
AC-227	-1.198E-01	1.890E-01	3.496E-01	FAIL ABUN
TH-227	-1.198E-01	1.890E-01	3.496E-01	FAIL ABUN
AC-228	0.000E+00	2.267E-01	4.972E-01	FAIL ABUN
RA-228	0.000E+00	2.267E-01	4.972E-01	FAIL ABUN
TH-229	-1.695E-01	3.839E-01	7.320E-01	FAIL ABUN
TH-231	-1.475E-01	4.706E-01	8.903E-01	FAIL ABUN
TH-232	0.000E+00	2.267E-01	4.972E-01	FAIL ABUN
PA-233	-1.104E-02	4.417E-02	8.476E-02	FAIL ABUN
PA-234	2.651E-02	1.818E-01	3.933E-01	FAIL ABUN
PA-234M	6.646E+00	5.427E+00	7.908E+00	FAIL ABUN
NP-237	-1.104E-02	4.417E-02	8.476E-02	FAIL ABUN
NP-238	0.000E+00	6.108E+40	0.000E+00	SHORT HLIF
NP-239	-7.460E-02	2.160E-01	3.816E-01	NOT IDENT.
PU-239	2.427E+02	4.952E+02	5.470E+02	FAIL ABUN
AM-241	1.781E-02	9.076E-02	1.726E-01	NOT IDENT.
CM-243	-9.227E-03	8.586E-02	1.559E-01	NOT IDENT.
BK-247	-3.439E-03	6.820E-02	1.193E-01	NOT IDENT.
CM-247	9.215E-03	2.991E-02	5.985E-02	NOT IDENT.
CF-249	-7.496E-03	2.820E-02	5.354E-02	NOT IDENT.
CF-251	5.177E-03	9.199E-02	1.831E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	282	10.66*	1.312E+00	1.049E+01	1.049E+01	13.27
RH-106	621.93	34	9.93*	2.582E+00	6.971E-01	1.205E+00	87.04
RU-106	1050.41	-----	1.56	1.721E+00	-----	Line Not Found	-----
	621.93	34	9.93*	2.582E+00	6.971E-01	1.205E+00	87.04
	1050.41	-----	1.56	1.721E+00	-----	Line Not Found	-----
CD-109	88.03	69	3.70*	6.851E+00	1.412E+00	2.195E+00	89.18
SN-126	64.28	13	9.60	4.813E+00	1.467E-01	1.467E-01	448.65
	86.94	69	8.90	6.851E+00	5.870E-01	5.870E-01	89.18
	87.57	69	37.00*	6.851E+00	1.412E-01	1.412E-01	89.18
CE-141	145.44	34	48.29*	7.360E+00	4.997E-02	2.619E+01	151.00
TL-208	277.37	-----	6.60	4.947E+00	-----	Line Not Found	-----
	583.19	117	85.00*	2.719E+00	2.641E-01	2.641E-01	28.47
	860.56	19	12.50	2.010E+00	3.924E-01	3.924E-01	86.73
PB-210	46.54	44	4.25*	2.063E+00	2.605E+00	2.671E+00	137.44
BI-211	72.87	-----	1.23	5.823E+00	-----	Line Not Found	-----
	351.06	331	12.92*	4.084E+00	3.265E+00	3.265E+00	13.60
PB-212	74.82	209	10.28	6.005E+00	1.762E+00	1.762E+00	30.05
	77.11	300	17.10	6.187E+00	1.477E+00	1.477E+00	21.12
	238.63	373	43.60*	5.554E+00	8.023E-01	8.023E-01	14.23
	300.09	48	3.30	4.648E+00	1.625E+00	1.625E+00	56.28
BI-214	609.32	212	45.49*	2.627E+00	9.221E-01	9.224E-01	18.09
	1120.29	57	14.92	1.635E+00	1.218E+00	1.218E+00	41.93
	1764.49	37	15.30	1.106E+00	1.131E+00	1.132E+00	32.03
PB-214	74.82	209	5.80	6.005E+00	3.123E+00	3.124E+00	30.05
	77.11	300	9.70	6.187E+00	2.603E+00	2.604E+00	21.12
	87.09	69	3.41	6.851E+00	1.532E+00	1.533E+00	89.18
	242.00	80	7.25	5.503E+00	1.040E+00	1.040E+00	47.31
	295.22	216	18.42	4.710E+00	1.296E+00	1.297E+00	18.01
	351.93	331	35.60*	4.084E+00	1.185E+00	1.185E+00	13.60
RN-222	609.32	212	45.49*	2.627E+00	9.221E-01	9.224E-01	18.09
	1120.29	57	14.92	1.635E+00	1.218E+00	1.218E+00	41.93
	1764.49	37	15.30	1.106E+00	1.131E+00	1.132E+00	32.03
RA-224	240.99	80	4.10*	5.503E+00	1.838E+00	1.838E+00	47.31
RA-226	609.32	212	45.49*	2.627E+00	9.221E-01	9.224E-01	18.09
	1120.29	57	14.92	1.635E+00	1.218E+00	1.218E+00	41.93
	1764.49	37	15.30	1.106E+00	1.131E+00	1.132E+00	32.03
TH-228	74.82	209	10.28	6.005E+00	1.762E+00	1.762E+00	30.05
	77.11	300	17.10	6.187E+00	1.477E+00	1.477E+00	21.12
	238.63	373	43.60*	5.554E+00	8.023E-01	8.023E-01	14.23
	300.09	48	3.30	4.648E+00	1.625E+00	1.625E+00	56.28
TH-230	609.32	212	45.49*	2.627E+00	9.221E-01	9.221E-01	18.09
	1120.29	57	14.92	1.635E+00	1.218E+00	1.218E+00	41.93
	1764.49	37	15.30	1.106E+00	1.131E+00	1.131E+00	32.03
PA-231	283.69	-----	1.70	4.860E+00	-----	Line Not Found	-----
	301.36	48	5.35*	4.648E+00	1.003E+00	1.003E+00	56.28
TH-234	63.29	13	3.70*	4.813E+00	3.806E-01	3.806E-01	448.65
	92.59	92	4.23	7.094E+00	1.596E+00	1.596E+00	89.29

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
U-234	609.32	212	45.49*	2.627E+00	9.221E-01	9.221E-01	18.09
	1120.29	57	14.92	1.635E+00	1.218E+00	1.218E+00	41.93
	1764.49	37	15.30	1.106E+00	1.131E+00	1.131E+00	32.03
U-235	89.96	-----	3.47	6.978E+00	-----	Line Not Found	-----
	93.35	92	5.60	7.094E+00	1.205E+00	1.205E+00	89.29
	143.76	34	10.96*	7.360E+00	2.202E-01	2.202E-01	151.00
	163.33	-----	5.08	7.024E+00	-----	Line Not Found	-----
	185.72	99	57.20	6.562E+00	1.374E-01	1.374E-01	54.37
U-238	205.31	-----	5.01	6.171E+00	-----	Line Not Found	-----
	63.29	13	3.70*	4.813E+00	3.806E-01	3.806E-01	448.65
	92.59	92	4.23	7.094E+00	1.596E+00	1.596E+00	89.29
AM-243	43.53	-----	5.90	1.315E+00	-----	Line Not Found	-----
	74.66	209	67.20*	6.005E+00	2.696E-01	2.696E-01	30.05
ANH-511	511.00	60	100.00*	3.020E+00	1.028E-01	1.028E-01	56.43

Flag: "*" = Keyline

Total number of lines in spectrum 37
 Number of unidentified lines 5
 Number of lines tentatively identified by NID 32 86.49%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.049E+01	1.049E+01	0.139E+01	13.27	
RH-106	371.80D	1.73	6.971E-01	1.205E+00	1.049E+00	87.04	
RU-106	371.80D	1.73	6.971E-01	1.205E+00	1.049E+00	87.04	
CD-109	461.40D	1.55	1.412E+00	2.195E+00	1.957E+00	89.18	
SN-126	2.30E+05Y	1.00	1.412E-01	1.412E-01	1.259E-01	89.18	
CE-141	32.51D	524.	4.997E-02	2.619E+01	3.955E+01	151.00	
TL-208	1.41E+10Y	1.00	2.641E-01	2.641E-01	0.752E-01	28.47	
PB-210	22.20Y	1.03	2.605E+00	2.671E+00	3.671E+00	137.44	
BI-211	7.04E+08Y	1.00	3.265E+00	3.265E+00	0.444E+00	13.60	
PB-212	1.41E+10Y	1.00	8.023E-01	8.023E-01	1.142E-01	14.23	
BI-214	1600.00Y	1.00	9.221E-01	9.224E-01	1.669E-01	18.09	
PB-214	1600.00Y	1.00	1.185E+00	1.185E+00	0.161E+00	13.60	
RN-222	1600.00Y	1.00	9.221E-01	9.224E-01	1.669E-01	18.09	
RA-224	1.41E+10Y	1.00	1.838E+00	1.838E+00	0.870E+00	47.31	
RA-226	1600.00Y	1.00	9.221E-01	9.224E-01	1.669E-01	18.09	
TH-228	1.41E+10Y	1.00	8.023E-01	8.023E-01	1.142E-01	14.23	
TH-230	7.54E+04Y	1.00	9.221E-01	9.221E-01	1.668E-01	18.09	
PA-231	7.04E+08Y	1.00	1.003E+00	1.003E+00	0.564E+00	56.28	
TH-234	4.47E+09Y	1.00	3.806E-01	3.806E-01	17.08E-01	448.65	
U-234	2.45E+05Y	1.00	9.221E-01	9.221E-01	1.668E-01	18.09	
U-235	7.04E+08Y	1.00	2.202E-01	2.202E-01	3.324E-01	151.00	
U-238	4.47E+09Y	1.00	3.806E-01	3.806E-01	17.08E-01	448.65	
AM-243	7370.00Y	1.00	2.696E-01	2.696E-01	0.810E-01	30.05	
ANH-511	1.00E+09Y	1.00	1.028E-01	1.028E-01	0.580E-01	56.43	
Total Activity :			3.122E+01	5.923E+01			

Grand Total Activity : 3.122E+01 5.923E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	129.70	22	140	1.40	259.47	253	8	5.17E-03	****	7.53E+00	T
0	209.70	24	102	1.39	419.38	415	8	5.92E-03	****	6.08E+00	T
0	270.20	48	79	1.58	540.33	535	9	1.20E-02	77.1	5.05E+00	T
4	304.96	26	24	2.01	609.83	595	21	6.44E-03	****	4.59E+00	T
2	356.36	21	32	1.71	712.60	697	19	5.26E-03	****	4.04E+00	T
0	723.27	69	43	11.05	1446.45	1431	31	1.85E-02	64.9	2.30E+00	T
1	763.00	19	31	1.83	1525.94	1518	23	5.18E-03	****	2.21E+00	T
1	768.40	39	21	1.84	1536.75	1518	23	1.06E-02	51.1	2.19E+00	
0	796.11	33	14	3.96	1592.18	1583	18	9.02E-03	63.6	2.14E+00	T
0	911.42	85	8	1.78	1822.93	1818	11	2.35E-02	25.9	1.92E+00	T
0	1001.94	19	8	3.13	2004.11	1994	16	5.34E-03	83.3	1.79E+00	T
0	1156.21	20	4	2.57	2312.95	2308	11	5.70E-03	61.7	1.59E+00	
0	1305.58	17	2	3.63	2612.04	2608	10	4.74E-03	58.8	1.44E+00	
0	1320.12	5	5	1.29	2641.15	2636	7	1.49E-03	****	1.43E+00	
0	1332.48	5	3	1.23	2665.90	2661	7	1.57E-03	****	1.42E+00	T
0	1587.68	18	0	2.16	3177.11	3172	11	5.28E-03	45.9	1.22E+00	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235061.CNF;1
* Acquisition date   : 3-OCT-2016 05:52:51 Sensitivity      : 3.000
* Detector ID        : GAM20 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:14.55 Half life ratio  : *****
* Sample date        : 14-DEC-2015 13:47:00 Nuclide Library : SOLID
* Sample ID          : G405235061 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity : 1.4423E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 30-JUN-2016 06:52:39 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM20_CAN.CNF;15
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.863E-01
RH-106	3.648E-01
RU-106	3.648E-01
CD-109	8.009E-01
SN-126	5.169E-02
CE-141	1.526E+01
TL-208	2.265E-02
PB-210	1.242E+00
PB-212	4.275E-02
BI-214	5.116E-02
PB-214	4.594E-02
RN-222	5.116E-02
RA-226	5.116E-02
TH-228	4.275E-02
TH-230	5.114E-02
PA-231	2.308E-01
TH-234	7.161E-01
U-234	5.114E-02
U-235	1.557E-01
U-238	7.161E-01
AM-243	3.369E-02
ANH-511	1.950E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	7.678E+00	NOT IDENT.
NA-22	3.670E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.875E-02	NOT IDENT.
SC-46	2.983E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	4.749E-02	NOT IDENT.
CO-56	3.616E-01	NOT IDENT.

MN-56	0.000E+00	SHORT HLIF
CO-57	3.375E-02	NOT IDENT.
CO-58	3.573E-01	NOT IDENT.
FE-59	5.929E+00	NOT IDENT.
CO-60	2.949E-02	FAIL ABUN
ZN-65	1.269E-01	NOT IDENT.
GE-68	1.598E+00	NOT IDENT.
AS-73	4.012E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.465E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.047E-01	NOT IDENT.
KR-85	5.123E+00	NOT IDENT.
SR-85	5.068E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.775E-01	NOT IDENT.
Y-91	4.190E+02	NOT IDENT.
NB-94	2.744E-02	NOT IDENT.
NB-95	6.112E-01	NOT IDENT.
NB-95M	1.766E+00	NOT IDENT.
ZR-95	1.084E+00	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.550E-02	NOT IDENT.
RH-102	4.055E-02	NOT IDENT.
RU-103	3.465E+00	FAIL ABUN
AG-108M	2.009E-02	FAIL ABUN
AG-110M	6.390E-02	FAIL ABUN
SN-113	1.435E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	9.318E-02	NOT IDENT.
SB-124	6.516E-01	FAIL ABUN
SB-125	8.036E-02	NOT IDENT.
TE-125M	2.010E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.127E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	4.320E-02	FAIL ABUN
CS-135	1.179E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	3.376E-02	NOT IDENT.
CS-137	3.566E-02	NOT IDENT.
CE-139	7.890E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-143	0.000E+00	SHORT HLIF
CE-144	2.406E-01	NOT IDENT.
PM-144	3.954E-02	NOT IDENT.
PR-144	3.420E+00	NOT IDENT.
PM-146	3.358E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	6.116E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.706E-02	FAIL ABUN
EU-152	7.229E-02	NOT IDENT.
GD-153	1.254E-01	NOT IDENT.
EU-154	8.953E-02	FAIL ABUN
EU-155	8.378E-02	FAIL ABUN
TB-160	1.323E+00	FAIL ABUN
HO-166M	3.757E-02	NOT IDENT.
TM-171	1.006E+01	NOT IDENT.
HF-172	1.760E-01	FAIL ABUN
LU-172	7.180E-02	FAIL ABUN
LU-176	1.396E-02	FAIL ABUN
HF-181	2.822E+00	NOT IDENT.
TA-182	6.474E-01	FAIL ABUN
RE-183	1.591E+00	NOT IDENT.
RE-184	2.104E+01	NOT IDENT.

W-188	7.014E+01	FAIL ABUN
IR-192	3.128E-01	FAIL ABUN
HG-203	1.562E+00	NOT IDENT.
BI-207	3.660E-02	FAIL ABUN
BI-211	4.012E-01	FAIL ABUN
PB-211	4.481E-01	NOT IDENT.
BI-212	5.129E-01	NOT IDENT.
RN-219	2.935E-01	FAIL ABUN
RA-223	4.033E-01	FAIL ABUN
RA-224	6.496E-01	FAIL ABUN
AC-227	1.601E-01	FAIL ABUN
TH-227	1.601E-01	FAIL ABUN
AC-228	2.343E-01	FAIL ABUN
RA-228	2.343E-01	FAIL ABUN
TH-229	3.399E-01	FAIL ABUN
TH-231	4.033E-01	FAIL ABUN
TH-232	2.343E-01	FAIL ABUN
PA-233	3.817E-02	FAIL ABUN
PA-234	1.648E-01	FAIL ABUN
PA-234M	3.480E+00	FAIL ABUN
NP-237	3.817E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.784E-01	NOT IDENT.
PU-239	2.579E+02	FAIL ABUN
AM-241	8.140E-02	NOT IDENT.
CM-243	7.306E-02	NOT IDENT.
BK-247	5.489E-02	NOT IDENT.
CM-247	2.717E-02	NOT IDENT.
CF-249	2.385E-02	NOT IDENT.
CF-251	8.521E-02	NOT IDENT.

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235061.CNF;1
* Acquisition date   : 3-OCT-2016 05:52:51 Sensitivity      : 3.000
* Detector ID        : GAM20 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:14.55 Half life ratio : *****
* Sample date        : 14-DEC-2015 13:47:00 Nuclide Library : SOLID
* Sample ID          : G405235061 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity : 1.4423E+02 GRAM
*                               Quantity Err(%) : 1.3866E-03 %
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight  : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date     : 30-JUN-2016 06:52:39 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM20_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.049E+01	1.471E+00	1.471E+00
RH-106	1.205E+00	1.031E+00	1.031E+00
RU-106	1.205E+00	1.031E+00	1.031E+00
CD-109	4.084E-01	1.954E+00	1.954E+00
SN-126	2.627E-02	1.257E-01	1.257E-01
CE-141	9.847E+00	3.975E+01	3.975E+01
TL-208	2.641E-01	7.453E-02	7.453E-02
PB-210	2.671E+00	3.604E+00	3.604E+00
PB-212	8.023E-01	1.197E-01	1.197E-01
BI-214	9.224E-01	1.682E-01	1.682E-01
PB-214	1.185E+00	1.655E-01	1.655E-01
RN-222	9.224E-01	1.682E-01	1.682E-01
RA-226	9.224E-01	1.682E-01	1.682E-01
TH-228	8.023E-01	1.197E-01	1.197E-01
TH-230	9.221E-01	1.682E-01	1.682E-01
PA-231	1.003E+00	5.929E-01	5.929E-01
TH-234	3.806E-01	1.675E+00	1.675E+00
U-234	9.221E-01	1.682E-01	1.682E-01
U-235	2.202E-01	3.260E-01	3.260E-01
U-238	3.806E-01	1.675E+00	1.675E+00
AM-243	1.619E-01	8.306E-02	8.306E-02
ANH-511	1.028E-01	5.701E-02	5.701E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	2.103E+00	8.542E+00	8.594E+00	NOT IDENT.
NA-22	2.263E-02	3.836E-02	3.969E-02	NOT IDENT.
NA-24	1.000E+41	3.879E+41	0.000E+00	SHORT HLIF
AL-26	3.341E-03	2.111E-02	2.116E-02	NOT IDENT.
SC-46	1.455E-01	3.349E-01	3.412E-01	FAIL ABUN
V-48	-9.514E+02	1.073E+04	1.074E+04	SHORT HLIF
CR-51	3.303E+01	2.904E+02	2.908E+02	SHORT HLIF
MN-54	1.118E-02	5.532E-02	5.555E-02	NOT IDENT.

CO-56	1.252E-01	4.148E-01	4.187E-01	NOT IDENT.
MN-56	1.000E+41	3.350E+41	0.000E+00	SHORT HLIF
CO-57	-1.944E-02	4.151E-02	4.243E-02	NOT IDENT.
CO-58	-1.763E-01	4.682E-01	4.749E-01	NOT IDENT.
FE-59	1.482E+00	6.620E+00	6.653E+00	NOT IDENT.
CO-60	2.241E-02	3.015E-02	3.180E-02	FAIL ABUN
ZN-65	5.364E-02	1.523E-01	1.542E-01	NOT IDENT.
GE-68	-1.261E-01	1.861E+00	1.862E+00	NOT IDENT.
AS-73	-5.461E-01	4.569E+00	4.576E+00	NOT IDENT.
AS-74	1.281E+02	4.121E+03	4.122E+03	SHORT HLIF
SE-75	-7.514E-03	1.710E-01	1.711E-01	NOT IDENT.
BR-77	2.395E+37	2.031E+38	0.000E+00	SHORT HLIF
SR-82	-3.985E+02	4.983E+02	5.296E+02	SHORT HLIF
RB-83	-2.305E-01	5.097E-01	5.202E-01	NOT IDENT.
KR-85	5.112E+00	5.642E+00	6.094E+00	NOT IDENT.
SR-85	5.040E-01	5.584E-01	6.029E-01	NOT IDENT.
RB-86	-5.600E+03	1.716E+04	1.735E+04	SHORT HLIF
Y-88	3.545E-02	2.028E-01	2.034E-01	NOT IDENT.
Y-91	2.840E+02	4.401E+02	4.583E+02	NOT IDENT.
NB-94	1.661E-02	3.025E-02	3.117E-02	NOT IDENT.
NB-95	2.592E-02	7.292E-01	7.293E-01	NOT IDENT.
NB-95M	8.731E-01	2.069E+00	2.106E+00	NOT IDENT.
ZR-95	9.818E-01	1.219E+00	1.297E+00	FAIL ABUN
NB-97	1.000E+41	1.260E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.689E+41	0.000E+00	SHORT HLIF
MO-99	-1.627E+30	3.388E+31	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	2.919E+41	0.000E+00	SHORT HLIF
RH-101	2.804E-03	3.232E-02	3.235E-02	NOT IDENT.
RH-102	-2.559E-02	5.233E-02	5.359E-02	NOT IDENT.
RU-103	-2.462E-02	4.020E+00	4.020E+00	FAIL ABUN
AG-108M	7.692E-04	2.295E-02	2.295E-02	FAIL ABUN
AG-110M	-3.411E-02	8.528E-02	8.665E-02	FAIL ABUN
SN-113	6.533E-02	1.540E-01	1.568E-01	NOT IDENT.
CD-115	-1.109E+38	3.478E+38	0.000E+00	SHORT HLIF
SN-117M	-1.240E+04	6.445E+04	6.469E+04	SHORT HLIF
TE-123M	-3.991E-02	1.153E-01	1.167E-01	NOT IDENT.
SB-124	-8.677E-01	1.252E+00	1.311E+00	FAIL ABUN
SB-125	6.802E-02	8.323E-02	8.870E-02	NOT IDENT.
TE-125M	3.041E+01	2.320E+02	2.324E+02	NOT IDENT.
I-126	2.887E+05	5.203E+05	5.363E+05	SHORT HLIF
SB-126	-2.392E+05	6.305E+05	6.397E+05	SHORT HLIF
SB-127	-3.615E+21	8.197E+21	0.000E+00	SHORT HLIF
I-131	4.626E+07	2.524E+09	2.524E+09	SHORT HLIF
I-132	-1.000E+41	1.813E+42	0.000E+00	SHORT HLIF
TE-132	5.459E+25	8.315E+25	0.000E+00	SHORT HLIF
BA-133	4.539E-02	5.181E-02	5.571E-02	FAIL ABUN
I-133	-1.000E+41	6.569E+41	0.000E+00	SHORT HLIF
CS-134	1.235E-01	7.718E-02	9.516E-02	FAIL ABUN
CS-135	4.088E-02	1.409E-01	1.421E-01	NOT IDENT.
I-135	1.000E+41	7.522E+41	0.000E+00	SHORT HLIF
CS-136	5.635E+04	1.573E+05	1.594E+05	SHORT HLIF
BA-137M	2.377E-02	3.697E-02	3.850E-02	NOT IDENT.
CS-137	2.511E-02	3.906E-02	4.067E-02	NOT IDENT.
CE-139	-6.957E-03	9.512E-02	9.517E-02	NOT IDENT.
BA-140	-1.382E+05	6.667E+05	6.696E+05	SHORT HLIF
LA-140	-4.039E+04	2.283E+05	2.291E+05	SHORT HLIF
CE-143	1.000E+41	1.284E+41	0.000E+00	SHORT HLIF
CE-144	-2.494E-02	2.867E-01	2.869E-01	NOT IDENT.
PM-144	-4.298E-03	4.781E-02	4.785E-02	NOT IDENT.
PR-144	-3.856E-01	4.137E+00	4.141E+00	NOT IDENT.
PM-146	-3.211E-03	3.909E-02	3.911E-02	NOT IDENT.
ND-147	8.346E+06	1.811E+07	1.850E+07	SHORT HLIF
PM-147	1.414E+02	7.047E+02	7.076E+02	NOT IDENT.
PM-149	-1.701E+39	5.545E+39	0.000E+00	SHORT HLIF
EU-150	-1.318E-02	2.076E-02	2.159E-02	FAIL ABUN
EU-152	3.094E-02	7.824E-02	7.947E-02	NOT IDENT.
GD-153	-5.501E-02	1.629E-01	1.648E-01	NOT IDENT.
EU-154	3.306E-02	9.802E-02	9.915E-02	FAIL ABUN
EU-155	7.278E-02	9.132E-02	9.704E-02	FAIL ABUN
TB-160	4.628E-01	1.511E+00	1.526E+00	FAIL ABUN
HO-166M	-7.262E-03	4.620E-02	4.631E-02	NOT IDENT.
TM-171	-3.157E+00	1.160E+01	1.169E+01	NOT IDENT.
HF-172	-2.114E-02	2.275E-01	2.277E-01	FAIL ABUN
LU-172	1.170E-02	8.098E-02	8.115E-02	FAIL ABUN
LU-176	-1.219E-03	1.764E-02	1.764E-02	FAIL ABUN
HF-181	1.071E+00	3.103E+00	3.140E+00	NOT IDENT.
TA-182	-2.480E-01	7.956E-01	8.034E-01	FAIL ABUN
RE-183	6.950E-01	1.746E+00	1.774E+00	NOT IDENT.

RE-184	1.265E+01	2.325E+01	2.394E+01	NOT IDENT.
W-188	2.977E+01	8.261E+01	8.369E+01	FAIL ABUN
IR-192	9.261E-02	3.408E-01	3.433E-01	FAIL ABUN
HG-203	-1.126E+00	1.852E+00	1.921E+00	NOT IDENT.
BI-207	9.041E-03	4.044E-02	4.064E-02	FAIL ABUN
BI-211	3.265E+00	4.589E-01	1.542E+00	FAIL ABUN
PB-211	-6.994E-02	5.213E-01	5.222E-01	NOT IDENT.
BI-212	8.436E-01	5.060E-01	6.330E-01	NOT IDENT.
RN-219	4.697E-02	3.295E-01	3.301E-01	FAIL ABUN
RA-223	-1.475E-01	4.706E-01	4.753E-01	FAIL ABUN
RA-224	1.838E+00	8.580E-01	1.193E+00	FAIL ABUN
AC-227	-1.198E-01	1.897E-01	1.972E-01	FAIL ABUN
TH-227	-1.198E-01	1.897E-01	1.972E-01	FAIL ABUN
AC-228	8.942E-01	2.313E-01	4.647E-01	FAIL ABUN
RA-228	8.942E-01	2.313E-01	4.647E-01	FAIL ABUN
TH-229	-1.695E-01	3.840E-01	3.915E-01	FAIL ABUN
TH-231	-1.475E-01	4.706E-01	4.753E-01	FAIL ABUN
TH-232	8.942E-01	2.313E-01	4.647E-01	FAIL ABUN
PA-233	-1.104E-02	4.417E-02	4.445E-02	FAIL ABUN
PA-234	2.651E-02	1.843E-01	1.847E-01	FAIL ABUN
PA-234M	6.646E+00	5.435E+00	6.206E+00	FAIL ABUN
NP-237	-1.104E-02	4.417E-02	4.445E-02	FAIL ABUN
NP-238	-4.446E+39	6.108E+40	0.000E+00	SHORT HLIF
NP-239	-7.460E-02	2.161E-01	2.187E-01	NOT IDENT.
PU-239	2.427E+02	4.953E+02	5.072E+02	FAIL ABUN
AM-241	1.781E-02	9.077E-02	9.112E-02	NOT IDENT.
CM-243	-9.227E-03	8.586E-02	8.596E-02	NOT IDENT.
BK-247	-3.439E-03	6.820E-02	6.822E-02	NOT IDENT.
CM-247	9.215E-03	2.995E-02	3.024E-02	NOT IDENT.
CF-249	-7.496E-03	2.820E-02	2.841E-02	NOT IDENT.
CF-251	5.177E-03	9.200E-02	9.203E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	75.1192	87.09	102.7180	136.47	55.5957
45.60	58.7096	87.57	102.7840	140.51	0.0000
46.54	58.8187	88.03	102.8478	143.76	53.5666
49.72	0.0000	88.34	102.8904	144.24	53.5914
51.35	69.0737	88.47	102.9079	145.44	65.0358
51.87	77.7827	89.96	103.1115	152.43	71.2017
52.39	77.8568	1093.63	103.2035	153.25	0.0000
52.97	79.0217	91.11	0.0000	323.87	73.7805
53.44	71.5052	92.59	103.4658	156.02	0.0000
54.07	69.4170	93.35	103.5674	158.56	0.0000
57.36	0.0000	94.56	70.6888	159.00	66.6991
57.53	66.5680	94.65	70.6972	162.33	84.2467
57.98	75.3564	94.67	70.6991	162.66	0.0000
59.27	86.4683	94.87	70.7169	163.33	64.4827
59.32	86.4756	97.43	81.7423	165.86	63.3866
59.54	86.5078	98.43	74.1235	176.31	61.8789
60.96	84.8854	98.44	74.1245	176.60	0.0000
61.17	84.9152	99.53	89.3015	177.52	59.4325
62.93	94.7065	100.11	74.2778	181.07	0.0000
63.29	94.7624	102.03	63.9832	181.52	61.7345
63.58	94.8072	103.18	90.8665	184.41	65.6729
64.28	94.9150	103.37	76.9047	143.76	69.9595
66.73	112.2775	105.21	63.0612	193.51	66.1664
67.24	84.2754	105.31	63.0687	197.03	51.8919
125.81	99.1294	106.12	81.8347	198.01	56.1890
67.75	99.1403	106.47	81.8689	201.83	63.1910
69.67	113.5360	109.28	79.7931	203.43	65.8351
70.83	102.5868	111.00	78.7768	205.31	69.3572
72.81	105.8774	111.76	0.0000	210.85	59.3348
72.87	105.8868	114.06	53.0956	215.65	51.7841
74.66	108.7861	116.30	0.0000	222.11	58.1043
74.82	108.8120	116.74	78.1096	227.09	49.6129
74.97	108.8356	119.76	71.2473	227.38	49.6234
77.11	109.1768	121.12	64.2181	228.16	0.0000
78.74	97.7757	121.22	64.2251	228.18	40.0703
79.69	96.4017	121.78	66.6448	116.74	40.0703
80.12	84.4027	122.06	76.1885	235.69	55.1756
80.19	0.0000	122.92	63.1526	235.96	55.1859
80.57	93.5052	123.07	60.7796	238.63	66.6995
81.00	95.0710	265.00	65.5899	238.98	0.0000
81.07	104.1359	125.81	78.0913	240.99	66.8100
81.75	102.7242	127.23	71.8245	242.00	51.4624
83.79	115.1349	127.91	64.6888	244.70	37.0166
84.00	103.0452	129.30	55.9856	252.40	0.0000
85.43	121.4673	131.20	59.3022	252.80	36.3363
86.55	102.6432	133.02	63.8303	254.15	0.0000
86.79	102.6762	133.52	60.2486	256.23	51.5217
86.94	102.6974	136.00	56.7771	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	41.8060	355.39	0.0000	584.27	17.7512
264.80	41.8098	356.01	28.2880	595.83	0.0000
265.00	45.5682	364.49	0.0000	427.87	18.9104
268.22	51.0358	366.42	0.0000	602.52	0.0000
269.46	43.9088	372.51	29.4863	604.72	12.6260
270.03	43.9247	375.05	27.6206	607.14	22.1151
271.23	45.7529	377.52	32.4242	609.32	24.2410
273.65	0.0000	356.01	36.3564	610.33	24.2503
276.40	38.7045	388.16	25.8887	614.28	19.0056
277.37	47.7347	388.63	0.0000	618.01	23.7891
277.60	49.5439	391.69	17.2899	620.36	19.0481
278.00	46.8531	264.66	31.8398	621.93	19.0583
279.20	50.4959	401.81	29.9272	630.19	0.0000
279.54	50.5062	402.40	28.0047	631.29	22.3099
279.70	44.1979	404.85	26.1046	633.25	18.0729
280.46	39.7067	410.95	31.0313	634.78	0.0000
283.69	32.5532	413.71	20.3916	635.95	21.2826
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	38.9250	423.72	0.0000	645.85	20.2896
285.90	0.0000	427.09	27.3631	657.76	11.7958
287.50	29.9116	427.87	18.5744	657.90	0.0000
290.67	27.2461	433.94	24.5102	661.66	22.5492
293.27	0.0000	439.40	18.6749	664.57	0.0000
351.93	32.7861	453.88	28.6938	666.33	0.0000
295.96	16.4008	463.37	22.8545	666.50	0.0000
879.38	16.4268	468.07	24.8937	667.71	0.0000
299.98	20.5508	473.00	0.0000	677.62	19.4341
300.09	20.5522	475.06	22.9729	685.70	0.0000
300.13	20.5527	476.78	19.9915	695.00	0.0000
301.36	20.5678	477.60	16.9986	696.49	19.5579
302.85	20.5861	482.18	18.0344	696.51	19.5579
256.23	20.6067	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	17.3893
306.78	23.3859	497.08	19.1585	697.49	16.3037
308.46	16.5242	505.52	27.3224	702.65	19.5974
311.90	31.2760	507.63	0.0000	706.68	23.9846
316.51	29.5156	511.00	22.3138	711.68	16.3800
319.41	0.0000	514.00	13.7098	720.70	0.0000
320.08	0.0000	514.00	13.7098	721.93	0.0000
321.04	29.5931	520.40	22.4010	722.78	15.3433
323.87	36.1253	520.69	0.0000	722.91	15.3438
325.23	42.6421	522.65	0.0000	723.31	15.3461
328.76	0.0000	527.90	0.0000	724.19	15.3507
333.37	28.8695	528.26	17.3652	727.33	15.3660
333.97	40.0588	529.59	20.4411	733.00	11.5455
334.37	50.3174	529.87	0.0000	735.93	7.7044
338.28	34.5520	531.02	0.0000	333.97	16.5173
338.32	34.5528	537.26	0.0000	739.50	0.0000
311.90	86.0179	546.56	0.0000	747.24	15.4640
340.48	86.0179	552.55	18.5662	748.06	17.6777
340.55	0.0000	563.25	26.9310	752.31	16.5948
344.28	30.9187	569.33	14.5355	753.82	0.0000
345.93	39.3870	946.00	17.6509	756.73	9.9708
351.06	28.2123	569.70	17.6523	756.80	9.9712
351.93	28.2257	583.19	17.7436	884.68	19.9871

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	19.9980	1274.44	8.5342	1620.50	4.0537
766.42	20.0024	1001.03	5.3403	1621.92	6.0820
766.84	20.0046	1002.74	5.3427	1678.03	0.0000
772.60	0.0000	1004.73	8.5523	1690.97	4.1033
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	1.0385
778.90	8.9242	1028.54	0.0000	1063.66	3.1183
783.70	0.0000	1037.84	14.3730	1771.35	0.0000
785.37	15.6480	1038.76	0.0000	1791.20	0.0000
792.07	15.1199	631.29	9.9030	1808.65	2.0919
794.95	7.8468	1048.07	0.0000	1810.72	0.0000
795.86	7.8491	1049.04	9.9083	1836.06	4.2021
810.06	11.2606	1050.41	6.3074		
810.29	12.3875	1063.66	11.7519		
344.28	14.6403	1077.00	0.0000		
810.76	15.7682	1077.34	11.7908		
815.77	0.0000	1085.87	13.6331		
1048.07	0.0000	1093.63	19.1210		
832.01	11.3338	1099.45	19.1479		
834.85	14.7461	1112.07	12.5416		
835.71	12.4806	1112.84	10.2443		
836.80	0.0000	1115.54	10.2512		
846.75	0.0000	1120.29	11.9114		
846.77	14.7969	1120.55	11.9122		
856.80	0.0000	1221.41	11.9146		
860.56	10.2847	1129.67	6.4279		
871.09	16.0462	1131.51	0.0000		
873.19	19.4965	1147.95	0.0000		
875.33	0.0000	1173.23	11.1299		
879.38	11.4884	1177.95	9.2847		
880.51	11.4921	1189.05	16.7542		
883.24	12.6507	1204.77	11.2083		
884.68	14.9572	1221.41	16.8739		
889.28	12.6722	1231.02	15.9697		
894.76	12.6914	1235.36	0.0000		
898.04	10.3934	1238.28	19.7580		
900.72	11.5568	1260.41	0.0000		
903.28	10.4084	1271.87	14.2154		
911.20	11.5898	1274.44	9.4818		
912.08	11.5926	1274.54	7.5854		
923.98	0.0000	1291.59	10.4676		
926.50	13.9658	1298.22	0.0000		
929.11	12.8110	1312.11	0.0000		
937.49	17.5085	1332.49	9.2133		
944.13	0.0000	1362.66	0.0000		
946.00	7.8967	1365.19	6.7625		
949.00	9.6592	1368.63	0.0000		
667.71	0.0000	1384.29	0.9697		
962.31	21.1487	1408.01	2.9229		
964.08	22.0398	1457.56	0.0000		
966.17	43.2219	1460.82	10.8268		
911.20	16.7717	1489.16	2.9687		
968.97	16.7717	1505.03	3.9700		
983.53	0.0000	1584.12	4.8331		
984.45	0.0000	1596.21	0.0000		

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*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235062.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM36.CNF;52
Background date : 2-OCT-2016 11:02:08.
Sample date     : 14-DEC-2015 13:10:00 Acquisition date : 3-OCT-2016 05:53:13.
Sample ID      : G405235062 Sample quantity   : 1.46441E+02 GRAM
Detector name  : GAM36 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.31 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity      : 3.00000
Batch ID       : 1596254 Detector SN#      :
Matrix Spike ID : LCS ID                : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.67*	25	104	1.10	127.31	123	8	7.06E-03	73.9	
2	1	74.95*	71	111	0.94	149.86	146	12	1.96E-02	25.9	9.68E-01
3	1	77.07*	133	86	0.95	154.11	146	12	3.70E-02	14.9	
4	0	87.35	24	188	0.93	174.68	169	10	6.68E-03	108.5	
5	8	90.00	43	59	0.95	179.97	178	14	1.19E-02	28.1	1.95E+00
6	8	93.03*	79	120	1.81	186.03	178	14	2.19E-02	31.7	
7	0	185.92*	70	90	1.33	371.83	366	12	1.95E-02	30.6	
8	0	209.69	49	87	1.93	419.37	413	12	1.35E-02	41.8	
9	0	229.01	19	44	0.59	458.01	454	8	5.17E-03	66.8	
10	5	238.59*	234	37	1.12	477.16	465	24	6.50E-02	8.0	3.77E+00
11	5	241.87	57	56	1.79	483.73	465	24	1.58E-02	33.6	
12	0	295.42*	89	56	1.07	590.82	586	9	2.48E-02	18.7	
13	1	327.91*	26	14	1.32	655.80	652	11	7.36E-03	34.1	2.77E+00
14	1	329.89*	14	9	1.32	659.76	652	11	4.00E-03	48.9	
15	0	332.46	16	13	1.13	664.90	663	6	4.52E-03	42.1	
16	0	338.28	47	31	0.98	676.54	672	10	1.30E-02	26.4	
17	0	351.98*	155	32	1.18	703.94	700	11	4.31E-02	10.9	
18	0	388.58	27	19	0.91	777.13	771	11	7.62E-03	36.3	
19	0	463.83	12	19	0.68	927.63	921	9	3.45E-03	70.5	
20	0	477.51	15	21	4.35	954.97	946	13	4.30E-03	67.8	
21	0	482.27	14	9	1.43	964.50	959	9	3.96E-03	46.2	
22	0	505.99	10	5	1.57	1011.94	1009	6	2.91E-03	44.6	
23	0	510.80*	29	26	2.46	1021.55	1015	13	8.01E-03	49.2	
24	0	583.24*	56	5	1.23	1166.40	1162	10	1.56E-02	16.0	
25	0	609.52*	107	10	1.24	1218.96	1213	13	2.98E-02	11.9	
26	0	661.76	17	9	1.30	1323.41	1319	9	4.72E-03	40.0	
27	0	727.92	8	17	0.95	1455.71	1450	11	2.18E-03	107.0	
28	0	754.46	16	2	2.30	1508.78	1504	10	4.38E-03	31.2	
29	0	768.34	17	3	1.53	1536.53	1533	7	4.67E-03	30.4	
30	0	794.98	16	2	1.00	1589.79	1585	9	4.41E-03	30.3	
31	0	820.27	6	3	1.37	1640.37	1637	6	1.76E-03	58.0	
32	0	911.40*	52	9	1.24	1822.58	1816	13	1.43E-02	19.2	
33	5	964.75	18	10	2.70	1929.24	1923	19	5.08E-03	42.0	1.21E+00
34	5	969.39	18	4	1.53	1938.50	1923	19	5.03E-03	33.7	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1053.83	6	7	0.60	2107.33	2102	7	1.67E-03	83.7	
36	0	1121.35*	24	9	0.79	2242.31	2234	17	6.62E-03	35.3	
37	0	1173.95	9	2	1.53	2347.47	2344	7	2.61E-03	39.9	
38	0	1188.54	8	3	1.23	2376.64	2373	7	2.25E-03	51.1	
39	0	1233.94	13	0	0.98	2467.38	2462	10	3.61E-03	27.7	
40	0	1461.11*	145	6	2.00	2921.49	2915	13	4.04E-02	9.2	
41	0	1765.02*	16	0	1.50	3528.90	3522	11	4.37E-03	28.7	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235062.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 14-DEC-2015 13:10:00 Acquisition date : 3-OCT-2016 05:53:13
Sample ID        : G405235062 Sample quantity   : 146.44 GRAM
Sample type      : SOLID Sample geometry    :
Detector name    : GAMMA36 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.31 0.0%
Energy tolerance : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error    : 0.00 %
Efficiency type  : Linear Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
BE-7	477.60	10.44*	1.801E+00	4.525E-01	2.075E+01	135.53	OK
K-40	1460.82	10.66*	6.546E-01	1.027E+01	1.027E+01	18.32	OK
CD-109	88.03	3.70*	4.301E+00	6.347E-02	9.868E-02	326.46	OK
SN-126	64.28	9.60	2.509E+00	6.880E-01	6.880E-01	147.76	OK
	86.94	8.90	4.301E+00	2.639E-02	2.639E-02	326.46	OK
	87.57	37.00*	4.301E+00	6.347E-03	6.347E-03	326.46	OK
BA-137M	661.66	89.90*	1.335E+00	7.558E-02	7.699E-02	80.01	OK
CS-137	661.66	85.10*	1.335E+00	7.984E-02	8.133E-02	80.01	OK
TL-208	277.37	6.60	3.041E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	1.496E+00	2.377E-01	2.377E-01	32.07	OK
	860.56	12.50	1.058E+00	-----	Line Not Found	-----	Absent
BI-211	72.87	1.23	3.327E+00	-----	Line Not Found	-----	Absent
	351.06	12.92*	2.414E+00	1.316E-01	1.316E-01	893.25	OK
PB-212	74.82	10.28	3.492E+00	7.150E-01	7.150E-01	96.01	OK
	77.11	17.10	3.653E+00	1.371E+00	1.371E+00	29.79	OK
	238.63	43.60*	3.500E+00	8.970E-01	8.970E-01	15.92	OK
	300.09	3.30	2.819E+00	-----	Line Not Found	-----	Absent
BI-214	609.32	45.49*	1.437E+00	8.806E-01	8.809E-01	23.71	OK
	1120.29	14.92	8.365E-01	9.682E-01	9.685E-01	70.51	OK
	1764.49	15.30	5.417E-01	9.188E-01	9.191E-01	57.44	OK
PB-214	74.82	5.80	3.482E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	3.653E+00	2.416E+00	2.417E+00	29.79	OK
	87.09	3.41	4.287E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	3.455E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	2.862E+00	9.735E-01	9.738E-01	37.36	OK
	351.93	35.60*	2.414E+00	-----	Line Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	1.437E+00	8.806E-01	8.809E-01	23.71	OK
	1120.29	14.92	8.365E-01	9.682E-01	9.685E-01	70.51	OK
	1764.49	15.30	5.417E-01	9.188E-01	9.191E-01	57.44	OK
RA-224	240.99	4.10*	3.457E+00	6.254E-01	6.254E-01	272.29	OK
RA-226	609.32	45.49*	1.437E+00	8.806E-01	8.809E-01	23.71	OK
	1120.29	14.92	8.365E-01	9.682E-01	9.685E-01	70.51	OK
	1764.49	15.30	5.417E-01	9.188E-01	9.191E-01	57.44	OK
AC-228	105.21	1.10	4.933E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	2.509E+00	9.408E-01	9.408E-01	52.75	OK
	794.95	4.25	1.134E+00	1.725E+00	1.725E+00	60.55	OK
	835.71	1.61	1.085E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.005E+00	1.029E+00	1.029E+00	38.34	OK
	968.97	15.80	9.522E-01	6.186E-01	6.186E-01	67.37	OK
RA-228	105.21	1.10	4.933E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	2.509E+00	9.408E-01	9.408E-01	52.75	OK
	794.95	4.25	1.134E+00	1.725E+00	1.725E+00	60.55	OK
	835.71	1.61	1.085E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.005E+00	1.029E+00	1.029E+00	38.34	OK
	968.97	15.80	9.522E-01	6.186E-01	6.186E-01	67.37	OK
TH-228	74.82	10.28	3.492E+00	7.150E-01	7.150E-01	96.01	OK
	77.11	17.10	3.653E+00	1.371E+00	1.371E+00	29.79	OK
	238.63	43.60*	3.500E+00	8.970E-01	8.970E-01	15.92	OK
	300.09	3.30	2.819E+00	-----	Line Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	609.32	45.49*	1.437E+00	8.806E-01	8.806E-01	23.71	OK
	1120.29	14.92	8.365E-01	9.682E-01	9.682E-01	70.51	OK
	1764.49	15.30	5.417E-01	9.188E-01	9.188E-01	57.44	OK
TH-232	105.21	1.10	4.933E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	2.509E+00	9.408E-01	9.408E-01	52.75	OK
	835.71	1.61	1.085E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.005E+00	1.029E+00	1.029E+00	38.34	OK
TH-234	968.97	15.80	9.522E-01	6.186E-01	6.186E-01	67.37	OK
	63.29	3.70*	2.509E+00	1.785E+00	1.785E+00	147.76	OK
	92.59	4.23	4.565E+00	2.580E+00	2.580E+00	63.39	OK
U-234	609.32	45.49*	1.437E+00	8.806E-01	8.806E-01	23.71	OK
	1120.29	14.92	8.365E-01	9.682E-01	9.682E-01	70.51	OK
	1764.49	15.30	5.417E-01	9.188E-01	9.188E-01	57.44	OK
U-235	89.96	3.47	4.432E+00	1.762E+00	1.762E+00	56.15	OK
	93.35	5.60	4.565E+00	1.949E+00	1.949E+00	63.39	OK
	143.76	10.96*	4.954E+00	-----	Line Not Found	-----	Absent
	163.33	5.08	4.674E+00	-----	Line Not Found	-----	Absent
U-238	185.72	57.20	4.300E+00	1.704E-01	1.704E-01	61.18	OK
	205.31	5.01	3.984E+00	-----	Line Not Found	-----	Absent
	63.29	3.70*	2.509E+00	1.785E+00	1.785E+00	147.76	OK
AM-243	92.59	4.23	4.565E+00	2.580E+00	2.580E+00	63.39	OK
	43.53	5.90	5.957E-01	-----	Line Not Found	-----	Absent
CF-249	74.66	67.20*	3.492E+00	1.094E-01	1.094E-01	96.01	OK
	252.80	2.50	3.319E+00	-----	Line Not Found	-----	Absent
ANH-511	333.37	14.60	2.552E+00	2.482E-01	2.486E-01	84.24	OK
	388.16	66.00*	2.193E+00	1.062E-01	1.064E-01	72.51	OK
	511.00	100.00*	1.690E+00	9.326E-02	9.326E-02	98.40	OK

Flag: "*" = Keyline

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235062.CNF;1
* Acquisition date   : 3-OCT-2016 05:53:13 Sensitivity      : 3.000
* Detector ID       : GAM36 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.31 Half life ratio  : *****
* Sample date       : 14-DEC-2015 13:10:00 Analyst initials: MXR1
* Sample ID         : G405235062 Sample Quantity : 1.4644E+02 GRAM
* Batch Number      : 1596254 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 1-JUN-2016 09:39:12 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM36_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
BE-7	2.075E+01	2.756E+01	2.757E+01
K-40	1.027E+01	1.844E+00	6.783E-01
CD-109	9.868E-02	3.217E+00	2.295E+00
SN-126	6.347E-03	2.069E-01	1.484E-01
BA-137M	7.699E-02	6.037E-02	7.037E-02
CS-137	8.133E-02	6.377E-02	7.434E-02
TL-208	2.377E-01	7.468E-02	6.431E-02
BI-211	1.316E-01	1.152E+00	4.287E-01
PB-212	8.970E-01	1.399E-01	9.570E-02
BI-214	8.809E-01	2.047E-01	1.436E-01
PB-214	1.022E+00	2.188E-01	3.941E-01
RN-222	8.809E-01	2.047E-01	1.436E-01
RA-224	6.254E-01	1.669E+00	1.028E+00
RA-226	8.809E-01	2.047E-01	1.436E-01
AC-228	1.029E+00	3.868E-01	3.133E-01
RA-228	1.029E+00	3.868E-01	3.133E-01
TH-228	8.970E-01	1.399E-01	9.570E-02
TH-230	8.806E-01	2.046E-01	1.436E-01
TH-232	1.029E+00	3.868E-01	3.133E-01
TH-234	1.785E+00	2.585E+00	2.083E+00
U-234	8.806E-01	2.046E-01	1.436E-01
U-235	4.347E-02	1.917E-01	3.691E-01
U-238	1.785E+00	2.585E+00	2.083E+00
AM-243	1.094E-01	1.029E-01	8.911E-02
CF-249	1.064E-01	7.559E-02	8.007E-02
ANH-511	9.326E-02	8.994E-02	6.738E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
NA-22	-6.126E-03		5.722E-02	1.193E-01	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF
AL-26	-1.378E-03		4.784E-02	1.048E-01	NOT IDENT.
SC-46	-5.265E-02		3.170E-01	6.522E-01	FAIL ABUN

V-48	0.000E+00	1.141E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	4.444E+02	0.000E+00	SHORT HLIF
MN-54	-4.324E-02	8.256E-02	1.466E-01	NOT IDENT.
CO-56	2.954E-02	6.216E-01	1.240E+00	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	4.853E-02	4.361E-02	9.479E-02	NOT IDENT.
CO-58	-3.751E-01	7.033E-01	1.254E+00	NOT IDENT.
FE-59	8.973E-01	7.129E+00	1.572E+01	NOT IDENT.
CO-60	-3.067E-02	4.656E-02	8.343E-02	FAIL ABUN
ZN-65	8.957E-02	1.722E-01	3.974E-01	NOT IDENT.
GE-68	-1.790E+00	3.451E+00	5.921E+00	NOT IDENT.
AS-73	-4.405E+00	6.594E+00	1.298E+01	NOT IDENT.
AS-74	0.000E+00	4.829E+03	0.000E+00	SHORT HLIF
SE-75	9.369E-02	2.400E-01	4.714E-01	NOT IDENT.
BR-77	0.000E+00	4.210E+36	0.000E+00	SHORT HLIF
SR-82	0.000E+00	7.000E+02	0.000E+00	SHORT HLIF
RB-83	1.164E-01	7.901E-01	1.640E+00	NOT IDENT.
KR-85	3.266E+00	9.559E+00	1.828E+01	NOT IDENT.
SR-85	3.223E-01	9.467E-01	1.811E+00	NOT IDENT.
RB-86	0.000E+00	3.064E+04	0.000E+00	SHORT HLIF
Y-88	-1.449E-01	2.736E-01	4.941E-01	NOT IDENT.
Y-91	-1.986E+01	6.917E+02	1.418E+03	NOT IDENT.
NB-94	-1.361E-02	4.281E-02	8.025E-02	NOT IDENT.
NB-95	8.616E-01	8.284E-01	1.972E+00	NOT IDENT.
NB-95M	1.931E+00	2.329E+00	4.802E+00	NOT IDENT.
ZR-95	-4.345E-01	1.564E+00	2.653E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	8.754E+40	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.292E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-3.487E-02	3.226E-02	5.667E-02	NOT IDENT.
RH-102	5.146E-02	6.391E-02	1.504E-01	FAIL ABUN
RU-103	3.935E+00	5.572E+00	1.270E+01	FAIL ABUN
RH-106	1.010E-02	5.234E-01	1.099E+00	NOT IDENT.
RU-106	1.010E-02	5.234E-01	1.099E+00	NOT IDENT.
AG-108M	-5.706E-03	2.759E-02	5.582E-02	NOT IDENT.
AG-110M	-7.338E-03	1.186E-01	2.375E-01	NOT IDENT.
SN-113	-6.791E-02	2.628E-01	4.673E-01	NOT IDENT.
CD-115	0.000E+00	5.243E+38	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	7.064E+04	0.000E+00	SHORT HLIF
TE-123M	-4.641E-02	1.303E-01	2.429E-01	NOT IDENT.
SB-124	-5.841E-01	1.929E+00	4.131E+00	NOT IDENT.
SB-125	-7.819E-03	9.643E-02	2.005E-01	FAIL ABUN
TE-125M	1.764E+01	2.612E+02	5.179E+02	NOT IDENT.
I-126	0.000E+00	6.941E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	9.374E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	7.084E+21	0.000E+00	SHORT HLIF
I-131	0.000E+00	3.450E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.159E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.915E+26	0.000E+00	SHORT HLIF
BA-133	7.281E-03	4.577E-02	8.249E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	1.123E-01	6.664E-02	1.519E-01	FAIL ABUN
CS-135	-7.422E-02	1.766E-01	3.124E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.865E+05	0.000E+00	SHORT HLIF
CE-139	3.731E-02	1.164E-01	2.298E-01	NOT IDENT.
BA-140	0.000E+00	9.772E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.535E+05	0.000E+00	SHORT HLIF
CE-141	8.082E-01	2.146E+01	4.067E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	9.830E-02	3.553E-01	7.101E-01	NOT IDENT.
PM-144	-3.112E-02	6.164E-02	1.129E-01	FAIL ABUN
PR-144	-2.719E+00	5.332E+00	9.750E+00	NOT IDENT.
PM-146	3.664E-02	4.769E-02	1.084E-01	NOT IDENT.
ND-147	0.000E+00	2.842E+07	0.000E+00	SHORT HLIF
PM-147	6.002E+02	7.814E+02	1.648E+03	NOT IDENT.
PM-149	0.000E+00	8.538E+39	0.000E+00	SHORT HLIF
EU-150	1.621E-02	2.924E-02	5.185E-02	FAIL ABUN
EU-152	-4.821E-02	1.010E-01	1.745E-01	FAIL ABUN
GD-153	-1.030E-01	1.758E-01	3.082E-01	NOT IDENT.
EU-154	-1.926E-02	1.395E-01	2.892E-01	NOT IDENT.
EU-155	-9.589E-03	9.956E-02	1.966E-01	FAIL ABUN
TB-160	-1.407E+00	2.244E+00	3.855E+00	FAIL ABUN
HO-166M	4.556E-02	5.973E-02	1.410E-01	NOT IDENT.
TM-171	4.841E+00	1.591E+01	3.442E+01	NOT IDENT.
HF-172	1.951E-01	2.167E-01	4.604E-01	FAIL ABUN
LU-172	-9.367E-03	8.663E-02	1.715E-01	FAIL ABUN

LU-176	-1.640E-02	2.777E-02	4.745E-02	FAIL ABUN
HF-181	6.637E+00	6.008E+00	1.022E+01	FAIL ABUN
TA-182	-7.525E-01	9.199E-01	1.580E+00	FAIL ABUN
RE-183	1.549E-01	2.289E+00	4.795E+00	NOT IDENT.
RE-184	-1.067E+01	2.735E+01	5.103E+01	NOT IDENT.
W-188	1.869E+01	1.288E+02	2.282E+02	FAIL ABUN
IR-192	-1.938E-01	5.030E-01	8.880E-01	FAIL ABUN
HG-203	9.781E-01	2.504E+00	4.934E+00	NOT IDENT.
BI-207	7.678E-02	5.971E-02	1.517E-01	FAIL ABUN
PB-210	-4.107E-01	2.477E+00	5.103E+00	NOT IDENT.
PB-211	-3.912E-01	7.320E-01	1.405E+00	NOT IDENT.
BI-212	5.068E-01	1.063E+00	1.476E+00	FAIL ABUN
RN-219	1.230E-01	4.321E-01	9.147E-01	NOT IDENT.
RA-223	9.480E-01	6.396E-01	1.417E+00	FAIL ABUN
AC-227	-2.493E-01	2.529E-01	4.131E-01	NOT IDENT.
TH-227	-2.493E-01	2.529E-01	4.131E-01	NOT IDENT.
TH-229	1.345E-01	4.614E-01	9.136E-01	FAIL ABUN
PA-231	2.593E-01	5.449E-01	1.071E+00	NOT IDENT.
TH-231	9.480E-01	6.396E-01	1.417E+00	FAIL ABUN
PA-233	2.404E-02	5.971E-02	1.210E-01	NOT IDENT.
PA-234	-1.190E-01	3.444E-01	6.363E-01	NOT IDENT.
PA-234M	2.732E+00	5.606E+00	1.244E+01	NOT IDENT.
NP-237	2.404E-02	5.971E-02	1.210E-01	NOT IDENT.
NP-238	0.000E+00	7.189E+00	0.000E+00	SHORT HLIF
NP-239	-2.750E-02	2.115E-01	4.157E-01	FAIL ABUN
PU-239	2.985E+02	3.061E+02	6.476E+02	NOT IDENT.
AM-241	1.746E-02	1.260E-01	2.464E-01	NOT IDENT.
CM-243	6.845E-02	9.415E-02	1.989E-01	FAIL ABUN
BK-247	4.815E-02	8.327E-02	1.678E-01	NOT IDENT.
CM-247	1.886E-02	3.649E-02	8.038E-02	NOT IDENT.
CF-251	-4.609E-02	1.096E-01	2.020E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
BE-7	477.60	17	10.44*	1.801E+00	4.525E-01	2.075E+01	135.53
K-40	1460.82	140	10.66*	6.546E-01	1.027E+01	1.027E+01	18.32
CD-109	88.03	30	3.70*	4.301E+00	9.606E-01	1.493E+00	217.00
SN-126	64.28	32	9.60	2.509E+00	6.880E-01	6.880E-01	147.76
	86.94	30	8.90	4.301E+00	3.994E-01	3.994E-01	217.00
	87.57	30	37.00*	4.301E+00	9.606E-02	9.606E-02	217.00
BA-137M	661.66	18	89.90*	1.335E+00	7.558E-02	7.699E-02	80.01
CS-137	661.66	18	85.10*	1.335E+00	7.984E-02	8.133E-02	80.01
TL-208	277.37	-----	6.60	3.041E+00	-----	Line Not Found	-----
	583.19	59	85.00*	1.496E+00	2.377E-01	2.377E-01	32.07
	860.56	-----	12.50	1.058E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	3.327E+00	-----	Line Not Found	-----
	351.06	171	12.92*	2.414E+00	2.814E+00	2.814E+00	21.85
PB-212	74.82	89	10.28	3.492E+00	1.264E+00	1.264E+00	51.81
	77.11	167	17.10	3.653E+00	1.371E+00	1.371E+00	29.79
	238.63	267	43.60*	3.500E+00	8.970E-01	8.970E-01	15.92
	300.09	-----	3.30	2.819E+00	-----	Line Not Found	-----
BI-214	609.32	112	45.49*	1.437E+00	8.806E-01	8.809E-01	23.71
	1120.29	24	14.92	8.365E-01	9.682E-01	9.685E-01	70.51
	1764.49	15	15.30	5.417E-01	9.188E-01	9.191E-01	57.44
PB-214	74.82	89	5.80	3.492E+00	2.241E+00	2.242E+00	51.81
	77.11	167	9.70	3.653E+00	2.416E+00	2.417E+00	29.79
	87.09	30	3.41	4.301E+00	1.042E+00	1.043E+00	217.00
	242.00	65	7.25	3.457E+00	1.327E+00	1.328E+00	67.19
	295.22	100	18.42	2.862E+00	9.735E-01	9.738E-01	37.36
	351.93	171	35.60*	2.414E+00	1.021E+00	1.022E+00	21.85
RN-222	609.32	112	45.49*	1.437E+00	8.806E-01	8.809E-01	23.71
	1120.29	24	14.92	8.365E-01	9.682E-01	9.685E-01	70.51
	1764.49	15	15.30	5.417E-01	9.188E-01	9.191E-01	57.44
RA-224	240.99	65	4.10*	3.457E+00	2.347E+00	2.347E+00	67.19
RA-226	609.32	112	45.49*	1.437E+00	8.806E-01	8.809E-01	23.71
	1120.29	24	14.92	8.365E-01	9.682E-01	9.685E-01	70.51
	1764.49	15	15.30	5.417E-01	9.188E-01	9.191E-01	57.44
AC-228	105.21	-----	1.10	4.933E+00	-----	Line Not Found	-----
	338.32	52	11.27	2.509E+00	9.408E-01	9.408E-01	52.75
	794.95	16	4.25	1.134E+00	1.725E+00	1.725E+00	60.55
	835.71	-----	1.61	1.085E+00	-----	Line Not Found	-----
	911.20	52	25.80*	1.005E+00	1.029E+00	1.029E+00	38.34
	968.97	18	15.80	9.522E-01	6.186E-01	6.186E-01	67.37
RA-228	105.21	-----	1.10	4.933E+00	-----	Line Not Found	-----
	338.32	52	11.27	2.509E+00	9.408E-01	9.408E-01	52.75
	794.95	16	4.25	1.134E+00	1.725E+00	1.725E+00	60.55
	835.71	-----	1.61	1.085E+00	-----	Line Not Found	-----
	911.20	52	25.80*	1.005E+00	1.029E+00	1.029E+00	38.34
	968.97	18	15.80	9.522E-01	6.186E-01	6.186E-01	67.37
TH-228	74.82	89	10.28	3.492E+00	1.264E+00	1.264E+00	51.81
	77.11	167	17.10	3.653E+00	1.371E+00	1.371E+00	29.79

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	238.63	267	43.60*	3.500E+00	8.970E-01	8.970E-01	15.92
	300.09	-----	3.30	2.819E+00	-----	Line Not Found	-----
TH-230	609.32	112	45.49*	1.437E+00	8.806E-01	8.806E-01	23.71
	1120.29	24	14.92	8.365E-01	9.682E-01	9.682E-01	70.51
	1764.49	15	15.30	5.417E-01	9.188E-01	9.188E-01	57.44
TH-232	105.21	-----	1.10	4.933E+00	-----	Line Not Found	-----
	338.32	52	11.27	2.509E+00	9.408E-01	9.408E-01	52.75
	835.71	-----	1.61	1.085E+00	-----	Line Not Found	-----
	911.20	52	25.80*	1.005E+00	1.029E+00	1.029E+00	38.34
	968.97	18	15.80	9.522E-01	6.186E-01	6.186E-01	67.37
TH-234	63.29	32	3.70*	2.509E+00	1.785E+00	1.785E+00	147.76
	92.59	97	4.23	4.565E+00	2.580E+00	2.580E+00	63.39
U-234	609.32	112	45.49*	1.437E+00	8.806E-01	8.806E-01	23.71
	1120.29	24	14.92	8.365E-01	9.682E-01	9.682E-01	70.51
	1764.49	15	15.30	5.417E-01	9.188E-01	9.188E-01	57.44
U-235	89.96	53	3.47	4.432E+00	1.762E+00	1.762E+00	56.15
	93.35	97	5.60	4.565E+00	1.949E+00	1.949E+00	63.39
	143.76	-----	10.96*	4.954E+00	-----	Line Not Found	-----
	163.33	-----	5.08	4.674E+00	-----	Line Not Found	-----
	185.72	82	57.20	4.300E+00	1.704E-01	1.704E-01	61.18
	205.31	-----	5.01	3.984E+00	-----	Line Not Found	-----
U-238	63.29	32	3.70*	2.509E+00	1.785E+00	1.785E+00	147.76
	92.59	97	4.23	4.565E+00	2.580E+00	2.580E+00	63.39
AM-243	43.53	-----	5.90	5.957E-01	-----	Line Not Found	-----
	74.66	89	67.20*	3.492E+00	1.934E-01	1.934E-01	51.81
CF-249	252.80	-----	2.50	3.319E+00	-----	Line Not Found	-----
	333.37	18	14.60	2.552E+00	2.482E-01	2.486E-01	84.24
	388.16	30	66.00*	2.193E+00	1.062E-01	1.064E-01	72.51
ANH-511	511.00	31	100.00*	1.690E+00	9.326E-02	9.326E-02	98.40

Flag: "*" = Keyline

Total number of lines in spectrum 41
 Number of unidentified lines 3
 Number of lines tentatively identified by NID 38 92.68%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
BE-7	53.22D	45.9	4.525E-01	2.075E+01	2.812E+01	135.53	
K-40	1.25E+09Y	1.00	1.027E+01	1.027E+01	0.188E+01	18.32	
CD-109	461.40D	1.55	9.606E-01	1.493E+00	3.241E+00	217.00	
SN-126	2.30E+05Y	1.00	9.606E-02	9.606E-02	20.85E-02	217.00	
BA-137M	30.08Y	1.02	7.558E-02	7.699E-02	6.160E-02	80.01	
CS-137	30.08Y	1.02	7.984E-02	8.133E-02	6.507E-02	80.01	
TL-208	1.41E+10Y	1.00	2.377E-01	2.377E-01	0.762E-01	32.07	
BI-211	7.04E+08Y	1.00	2.814E+00	2.814E+00	0.615E+00	21.85	
PB-212	1.41E+10Y	1.00	8.970E-01	8.970E-01	1.428E-01	15.92	
BI-214	1600.00Y	1.00	8.806E-01	8.809E-01	2.089E-01	23.71	
PB-214	1600.00Y	1.00	1.021E+00	1.022E+00	0.223E+00	21.85	
RN-222	1600.00Y	1.00	8.806E-01	8.809E-01	2.089E-01	23.71	
RA-224	1.41E+10Y	1.00	2.347E+00	2.347E+00	1.577E+00	67.19	
RA-226	1600.00Y	1.00	8.806E-01	8.809E-01	2.089E-01	23.71	
AC-228	1.41E+10Y	1.00	1.029E+00	1.029E+00	0.395E+00	38.34	
RA-228	1.41E+10Y	1.00	1.029E+00	1.029E+00	0.395E+00	38.34	
TH-228	1.41E+10Y	1.00	8.970E-01	8.970E-01	1.428E-01	15.92	
TH-230	7.54E+04Y	1.00	8.806E-01	8.806E-01	2.088E-01	23.71	
TH-232	1.41E+10Y	1.00	1.029E+00	1.029E+00	0.395E+00	38.34	
TH-234	4.47E+09Y	1.00	1.785E+00	1.785E+00	2.638E+00	147.76	
U-234	2.45E+05Y	1.00	8.806E-01	8.806E-01	2.088E-01	23.71	
U-235	7.04E+08Y	1.00	1.704E-01	1.704E-01	1.042E-01	61.18	K
U-238	4.47E+09Y	1.00	1.785E+00	1.785E+00	2.638E+00	147.76	
AM-243	7370.00Y	1.00	1.934E-01	1.934E-01	1.002E-01	51.81	
CF-249	351.00Y	1.00	1.062E-01	1.064E-01	0.771E-01	72.51	
ANH-511	1.00E+09Y	1.00	9.326E-02	9.326E-02	9.177E-02	98.40	
Total Activity :			3.177E+01	5.261E+01			

Grand Total Activity : 3.177E+01 5.261E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	209.69	56	101	1.93	419.37	413	12	1.35E-02	83.6	3.92E+00	T
0	229.01	21	51	0.59	458.01	454	8	5.17E-03	****	3.63E+00	T
1	327.91	29	16	1.32	655.80	652	11	7.36E-03	68.3	2.59E+00	T
1	329.89	16	10	1.32	659.76	652	11	4.00E-03	97.8	2.57E+00	
0	463.83	13	20	0.68	927.63	921	9	3.45E-03	****	1.85E+00	T
0	482.27	15	9	1.43	964.50	959	9	3.96E-03	92.4	1.78E+00	T
0	505.99	11	5	1.57	1011.94	1009	6	2.91E-03	89.1	1.71E+00	T
0	727.92	8	18	0.95	1455.71	1450	11	2.18E-03	****	1.23E+00	T
0	754.46	16	2	2.30	1508.78	1504	10	4.38E-03	62.4	1.19E+00	T
0	768.34	17	3	1.53	1536.53	1533	7	4.67E-03	60.8	1.17E+00	T
0	820.27	6	3	1.37	1640.37	1637	6	1.76E-03	****	1.10E+00	
5	964.75	18	10	2.70	1929.24	1923	19	5.08E-03	84.1	9.56E-01	T
0	1053.83	6	7	0.60	2107.33	2102	7	1.67E-03	****	8.84E-01	
0	1173.95	9	2	1.53	2347.47	2344	7	2.61E-03	79.7	8.03E-01	T
0	1188.54	8	3	1.23	2376.64	2373	7	2.25E-03	****	7.94E-01	T
0	1233.94	13	0	0.98	2467.38	2462	10	3.61E-03	55.5	7.67E-01	T

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235062.CNF;1
* Acquisition date   : 3-OCT-2016 05:53:13 Sensitivity      : 3.000
* Detector ID       : GAM36 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.31 Half life ratio : *****
* Sample date       : 14-DEC-2015 13:10:00 Nuclide Library : SOLID
* Sample ID         : G405235062 Analyst initials: MXR1
* Batch Number      : 1596254 Sample Quantity : 1.4644E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 1-JUN-2016 09:39:12 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM36_CAN.CNF;7
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
BE-7	1.204E+01
K-40	2.392E-01
CD-109	1.076E+00
SN-126	6.955E-02
BA-137M	2.916E-02
CS-137	3.080E-02
TL-208	2.656E-02
BI-211	1.914E-01
PB-212	4.310E-02
BI-214	6.093E-02
PB-214	1.888E-01
RN-222	6.093E-02
RA-224	4.629E-01
RA-226	6.093E-02
AC-228	1.295E-01
RA-228	1.295E-01
TH-228	4.310E-02
TH-230	6.091E-02
TH-232	1.295E-01
TH-234	9.601E-01
U-234	6.091E-02
U-235	1.711E-01
U-238	9.601E-01
AM-243	4.137E-02
CF-249	3.507E-02
ANH-511	2.947E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
NA-22	4.801E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	3.924E-02	NOT IDENT.
SC-46	2.481E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF

CR-51	0.000E+00	SHORT HLIF
MN-54	6.080E-02	NOT IDENT.
CO-56	5.280E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.384E-02	NOT IDENT.
CO-58	5.141E-01	NOT IDENT.
FE-59	6.445E+00	NOT IDENT.
CO-60	3.084E-02	FAIL ABUN
ZN-65	1.607E-01	NOT IDENT.
GE-68	2.428E+00	NOT IDENT.
AS-73	5.880E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	2.146E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	7.190E-01	NOT IDENT.
KR-85	8.111E+00	NOT IDENT.
SR-85	8.032E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.562E-01	NOT IDENT.
Y-91	5.976E+02	NOT IDENT.
NB-94	3.451E-02	NOT IDENT.
NB-95	8.408E-01	NOT IDENT.
NB-95M	2.202E+00	NOT IDENT.
ZR-95	1.062E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.582E-02	NOT IDENT.
RH-102	6.461E-02	FAIL ABUN
RU-103	5.541E+00	FAIL ABUN
RH-106	4.620E-01	NOT IDENT.
RU-106	4.620E-01	NOT IDENT.
AG-108M	2.389E-02	NOT IDENT.
AG-110M	9.754E-02	NOT IDENT.
SN-113	2.039E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.113E-01	NOT IDENT.
SB-124	1.306E+00	NOT IDENT.
SB-125	8.550E-02	FAIL ABUN
TE-125M	2.400E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.613E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	6.641E-02	FAIL ABUN
CS-135	1.418E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	1.063E-01	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.873E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.283E-01	NOT IDENT.
PM-144	4.663E-02	FAIL ABUN
PR-144	4.027E+00	NOT IDENT.
PM-146	4.775E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.615E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.293E-02	FAIL ABUN
EU-152	7.580E-02	FAIL ABUN
GD-153	1.415E-01	NOT IDENT.
EU-154	1.160E-01	NOT IDENT.
EU-155	9.032E-02	FAIL ABUN
TB-160	1.550E+00	FAIL ABUN
HO-166M	6.001E-02	NOT IDENT.
TM-171	1.570E+01	NOT IDENT.
HF-172	2.130E-01	FAIL ABUN
LU-172	6.818E-02	FAIL ABUN
LU-176	2.093E-02	FAIL ABUN

HF-181	4.506E+00	FAIL ABUN
TA-182	5.914E-01	FAIL ABUN
RE-183	2.193E+00	NOT IDENT.
RE-184	1.977E+01	NOT IDENT.
W-188	1.027E+02	FAIL ABUN
IR-192	3.927E-01	FAIL ABUN
HG-203	2.235E+00	NOT IDENT.
BI-207	6.494E-02	FAIL ABUN
PB-210	2.340E+00	NOT IDENT.
PB-211	6.126E-01	NOT IDENT.
BI-212	6.515E-01	FAIL ABUN
RN-219	4.062E-01	NOT IDENT.
RA-223	6.395E-01	FAIL ABUN
AC-227	1.833E-01	NOT IDENT.
TH-227	1.833E-01	NOT IDENT.
TH-229	4.173E-01	FAIL ABUN
PA-231	4.875E-01	NOT IDENT.
TH-231	6.395E-01	FAIL ABUN
PA-233	5.362E-02	NOT IDENT.
PA-234	2.578E-01	NOT IDENT.
PA-234M	5.316E+00	NOT IDENT.
NP-237	5.362E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	1.896E-01	FAIL ABUN
PU-239	3.009E+02	NOT IDENT.
AM-241	1.134E-01	NOT IDENT.
CM-243	9.211E-02	FAIL ABUN
BK-247	7.633E-02	NOT IDENT.
CM-247	3.549E-02	NOT IDENT.
CF-251	9.150E-02	NOT IDENT.

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235062.CNF;1
* Acquisition date   : 3-OCT-2016 05:53:13 Sensitivity      : 3.000
* Detector ID        : GAM36 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.31 Half life ratio  : *****
* Sample date        : 14-DEC-2015 13:10:00 Nuclide Library : SOLID
* Sample ID          : G405235062 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity : 1.4644E+02 GRAM
*                   : Quantity Err(%) : 1.3657E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 1-JUN-2016 09:39:12 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM36_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
BE-7	2.075E+01	2.758E+01	2.758E+01
K-40	1.027E+01	1.921E+00	1.921E+00
CD-109	9.868E-02	3.221E+00	3.221E+00
SN-126	6.347E-03	2.072E-01	2.072E-01
BA-137M	7.699E-02	6.046E-02	6.046E-02
CS-137	8.133E-02	6.387E-02	6.387E-02
TL-208	2.377E-01	7.537E-02	7.537E-02
BI-211	1.316E-01	1.164E+00	1.164E+00
PB-212	8.970E-01	1.477E-01	1.477E-01
BI-214	8.809E-01	2.082E-01	2.082E-01
PB-214	1.022E+00	2.229E-01	2.229E-01
RN-222	8.809E-01	2.082E-01	2.082E-01
RA-224	6.254E-01	1.673E+00	1.673E+00
RA-226	8.809E-01	2.082E-01	2.082E-01
AC-228	1.029E+00	3.904E-01	3.904E-01
RA-228	1.029E+00	3.904E-01	3.904E-01
TH-228	8.970E-01	1.477E-01	1.477E-01
TH-230	8.806E-01	2.081E-01	2.081E-01
TH-232	1.029E+00	3.904E-01	3.904E-01
TH-234	1.785E+00	2.615E+00	2.615E+00
U-234	8.806E-01	2.081E-01	2.081E-01
U-235	4.347E-02	1.917E-01	1.917E-01
U-238	1.785E+00	2.615E+00	2.615E+00
AM-243	1.094E-01	1.037E-01	1.037E-01
CF-249	1.064E-01	7.609E-02	7.609E-02
ANH-511	9.326E-02	9.002E-02	9.002E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
NA-22	-6.126E-03	5.722E-02	5.729E-02	NOT IDENT.
NA-24	-1.000E+41	3.126E+41	0.000E+00	SHORT HLIF
AL-26	-1.378E-03	4.784E-02	4.785E-02	NOT IDENT.
SC-46	-5.265E-02	3.170E-01	3.179E-01	FAIL ABUN

V-48	4.628E+03	1.141E+04	1.160E+04	SHORT HLIF
CR-51	-1.408E+02	4.444E+02	4.489E+02	SHORT HLIF
MN-54	-4.324E-02	8.258E-02	8.485E-02	NOT IDENT.
CO-56	2.954E-02	6.216E-01	6.217E-01	NOT IDENT.
MN-56	1.000E+41	1.785E+42	0.000E+00	SHORT HLIF
CO-57	4.853E-02	4.367E-02	4.885E-02	NOT IDENT.
CO-58	-3.751E-01	7.035E-01	7.236E-01	NOT IDENT.
FE-59	8.973E-01	7.129E+00	7.141E+00	NOT IDENT.
CO-60	-3.067E-02	4.657E-02	4.858E-02	FAIL ABUN
ZN-65	8.957E-02	1.722E-01	1.769E-01	NOT IDENT.
GE-68	-1.790E+00	3.451E+00	3.544E+00	NOT IDENT.
AS-73	-4.405E+00	6.656E+00	6.946E+00	NOT IDENT.
AS-74	3.866E+02	4.829E+03	4.833E+03	SHORT HLIF
SE-75	9.369E-02	2.400E-01	2.437E-01	NOT IDENT.
BR-77	2.698E+37	2.288E+38	0.000E+00	SHORT HLIF
SR-82	4.558E+02	7.003E+02	7.299E+02	SHORT HLIF
RB-83	1.164E-01	7.902E-01	7.920E-01	NOT IDENT.
KR-85	3.266E+00	9.560E+00	9.672E+00	NOT IDENT.
SR-85	3.223E-01	9.468E-01	9.579E-01	NOT IDENT.
RB-86	-1.146E+04	3.064E+04	3.108E+04	SHORT HLIF
Y-88	-1.449E-01	2.738E-01	2.815E-01	NOT IDENT.
Y-91	-1.986E+01	6.917E+02	6.918E+02	NOT IDENT.
NB-94	-1.361E-02	4.282E-02	4.326E-02	NOT IDENT.
NB-95	8.616E-01	8.292E-01	9.157E-01	NOT IDENT.
NB-95M	1.931E+00	2.334E+00	2.491E+00	NOT IDENT.
ZR-95	-4.345E-01	1.564E+00	1.577E+00	NOT IDENT.
NB-97	1.000E+41	4.922E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	8.763E+40	0.000E+00	SHORT HLIF
MO-99	-1.941E+31	4.294E+31	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	3.395E+41	0.000E+00	SHORT HLIF
RH-101	-3.487E-02	3.287E-02	3.644E-02	NOT IDENT.
RH-102	5.146E-02	6.404E-02	6.812E-02	FAIL ABUN
RU-103	3.935E+00	5.575E+00	5.850E+00	FAIL ABUN
RH-106	1.010E-02	5.234E-01	5.234E-01	NOT IDENT.
RU-106	1.010E-02	5.234E-01	5.234E-01	NOT IDENT.
AG-108M	-5.706E-03	2.759E-02	2.771E-02	NOT IDENT.
AG-110M	-7.338E-03	1.186E-01	1.186E-01	NOT IDENT.
SN-113	-6.791E-02	2.628E-01	2.646E-01	NOT IDENT.
CD-115	8.343E+37	5.246E+38	0.000E+00	SHORT HLIF
SN-117M	-1.342E+04	7.066E+04	7.092E+04	SHORT HLIF
TE-123M	-4.641E-02	1.303E-01	1.320E-01	NOT IDENT.
SB-124	-5.841E-01	1.929E+00	1.947E+00	NOT IDENT.
SB-125	-7.819E-03	9.644E-02	9.650E-02	FAIL ABUN
TE-125M	1.764E+01	2.612E+02	2.613E+02	NOT IDENT.
I-126	-1.316E+05	6.943E+05	6.968E+05	SHORT HLIF
SB-126	2.394E+05	9.384E+05	9.446E+05	SHORT HLIF
SB-127	-2.769E+21	8.005E+21	0.000E+00	SHORT HLIF
I-131	-2.580E+09	3.452E+09	3.643E+09	SHORT HLIF
I-132	-1.000E+41	1.814E+42	0.000E+00	SHORT HLIF
TE-132	1.462E+26	2.001E+26	0.000E+00	SHORT HLIF
BA-133	7.281E-03	4.578E-02	4.589E-02	NOT IDENT.
I-133	-1.000E+41	4.481E+41	0.000E+00	SHORT HLIF
CS-134	1.123E-01	6.681E-02	8.382E-02	FAIL ABUN
CS-135	-7.422E-02	1.767E-01	1.799E-01	NOT IDENT.
I-135	-1.000E+41	1.472E+42	0.000E+00	SHORT HLIF
CS-136	7.146E+04	2.867E+05	2.885E+05	SHORT HLIF
CE-139	3.731E-02	1.166E-01	1.178E-01	NOT IDENT.
BA-140	-3.784E+05	9.773E+05	9.921E+05	SHORT HLIF
LA-140	-7.554E+04	4.535E+05	4.548E+05	SHORT HLIF
CE-141	8.082E-01	2.146E+01	2.146E+01	NOT IDENT.
CE-143	1.000E+41	9.032E+42	0.000E+00	SHORT HLIF
CE-144	9.830E-02	3.553E-01	3.581E-01	NOT IDENT.
PM-144	-3.112E-02	6.167E-02	6.325E-02	FAIL ABUN
PR-144	-2.719E+00	5.333E+00	5.472E+00	NOT IDENT.
PM-146	3.664E-02	4.776E-02	5.054E-02	NOT IDENT.
ND-147	8.488E+05	2.842E+07	2.843E+07	SHORT HLIF
PM-147	6.002E+02	7.819E+02	8.274E+02	NOT IDENT.
PM-149	-5.573E+39	8.622E+39	0.000E+00	SHORT HLIF
EU-150	1.621E-02	2.925E-02	3.015E-02	FAIL ABUN
EU-152	-4.821E-02	1.010E-01	1.033E-01	FAIL ABUN
GD-153	-1.030E-01	1.759E-01	1.820E-01	NOT IDENT.
EU-154	-1.926E-02	1.395E-01	1.398E-01	NOT IDENT.
EU-155	-9.589E-03	9.956E-02	9.966E-02	FAIL ABUN
TB-160	-1.407E+00	2.245E+00	2.333E+00	FAIL ABUN
HO-166M	4.556E-02	5.978E-02	6.321E-02	NOT IDENT.
TM-171	4.841E+00	1.592E+01	1.607E+01	NOT IDENT.
HF-172	1.951E-01	2.190E-01	2.360E-01	FAIL ABUN
LU-172	-9.367E-03	8.663E-02	8.674E-02	FAIL ABUN

LU-176	-1.640E-02	2.778E-02	2.874E-02	FAIL ABUN
HF-181	6.637E+00	6.015E+00	6.718E+00	FAIL ABUN
TA-182	-7.525E-01	9.203E-01	9.809E-01	FAIL ABUN
RE-183	1.549E-01	2.290E+00	2.291E+00	NOT IDENT.
RE-184	-1.067E+01	2.746E+01	2.788E+01	NOT IDENT.
W-188	1.869E+01	1.288E+02	1.291E+02	FAIL ABUN
IR-192	-1.938E-01	5.031E-01	5.106E-01	FAIL ABUN
HG-203	9.781E-01	2.505E+00	2.543E+00	NOT IDENT.
BI-207	7.678E-02	5.979E-02	6.908E-02	FAIL ABUN
PB-210	-4.107E-01	2.477E+00	2.484E+00	NOT IDENT.
PB-211	-3.912E-01	7.323E-01	7.532E-01	NOT IDENT.
BI-212	5.068E-01	1.063E+00	1.087E+00	FAIL ABUN
RN-219	1.230E-01	4.324E-01	4.359E-01	NOT IDENT.
RA-223	9.480E-01	6.423E-01	7.715E-01	FAIL ABUN
AC-227	-2.493E-01	2.550E-01	2.787E-01	NOT IDENT.
TH-227	-2.493E-01	2.550E-01	2.787E-01	NOT IDENT.
TH-229	1.345E-01	4.615E-01	4.654E-01	FAIL ABUN
PA-231	2.593E-01	5.477E-01	5.601E-01	NOT IDENT.
TH-231	9.480E-01	6.423E-01	7.715E-01	FAIL ABUN
PA-233	2.404E-02	5.972E-02	6.070E-02	NOT IDENT.
PA-234	-1.190E-01	3.703E-01	3.742E-01	NOT IDENT.
PA-234M	2.732E+00	5.608E+00	5.741E+00	NOT IDENT.
NP-237	2.404E-02	5.972E-02	6.070E-02	NOT IDENT.
NP-238	-9.649E+39	7.189E+40	0.000E+00	SHORT HLIF
NP-239	-2.750E-02	2.115E-01	2.119E-01	FAIL ABUN
PU-239	2.985E+02	3.064E+02	3.346E+02	NOT IDENT.
AM-241	1.746E-02	1.260E-01	1.262E-01	NOT IDENT.
CM-243	6.845E-02	9.436E-02	9.928E-02	FAIL ABUN
BK-247	4.815E-02	8.383E-02	8.659E-02	NOT IDENT.
CM-247	1.886E-02	3.663E-02	3.761E-02	NOT IDENT.
CF-251	-4.609E-02	1.098E-01	1.117E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
74.66	14.0690	105.31	75.1328	131.20	57.5436
879.38	39.3639	86.79	75.1725	133.02	48.0972
46.54	37.1209	86.94	75.1979	133.52	45.2487
228.16	0.0000	87.09	75.2233	136.00	47.3656
52.39	32.8973	87.57	75.3034	136.47	45.4667
1093.63	35.3626	88.03	75.3796	739.50	0.0000
52.39	31.3953	306.78	75.4310	140.51	0.0000
125.81	37.0976	88.47	38.9052	143.76	47.9525
53.44	41.9977	143.76	56.7739	144.24	51.9058
54.07	38.8423	90.64	48.5659	145.44	43.1722
293.27	0.0000	531.02	0.0000	152.43	58.5067
482.18	44.9726	92.59	48.7692	1048.07	0.0000
57.98	37.6630	93.35	48.8481	154.21	40.7648
59.27	42.7356	94.56	48.9728	158.56	0.0000
59.32	42.7417	311.90	48.9820	159.00	47.0595
59.54	41.6723	946.00	48.9840	162.33	40.2423
60.96	55.0547	94.87	33.4665	537.26	0.0000
61.17	44.0700	97.43	45.6604	163.33	48.3596
62.93	46.5021	98.43	39.7337	165.86	44.4881
63.29	46.5484	98.44	39.7347	427.87	47.1820
290.67	46.5856	103.37	39.8226	176.60	0.0000
87.57	46.6752	116.74	39.8226	177.52	38.0123
66.73	59.2907	100.11	39.8693	181.07	0.0000
67.24	48.7291	102.03	49.1188	181.52	37.1810
67.68	47.9446	103.18	31.9089	184.41	38.3584
1221.41	47.9533	103.37	39.2171	185.72	38.4233
97.43	54.1138	911.20	44.8504	193.51	32.5132
279.20	59.3632	105.31	44.8593	197.03	40.0294
1063.66	47.7298	106.12	44.0127	198.01	40.0781
72.87	47.7371	106.47	41.2901	201.83	42.3846
351.06	47.7371	109.28	52.5825	203.43	39.2820
74.66	56.5128	111.00	48.1255	205.31	31.2128
238.63	56.5350	111.76	0.0000	210.85	35.3460
351.93	56.5350	114.06	33.5075	215.65	35.5439
238.63	56.5350	116.30	0.0000	222.11	28.2118
74.97	56.5561	116.74	38.3480	227.09	45.1005
77.11	56.8517	119.76	47.9600	227.38	42.2043
78.74	50.7327	264.66	44.3049	228.16	0.0000
256.23	53.1585	121.22	35.8274	228.18	22.9418
133.52	52.0555	344.28	37.7499	235.69	27.5368
364.49	0.0000	122.06	31.1591	235.96	27.5448
711.68	46.3204	122.92	52.0098	238.63	27.6241
356.01	43.4692	1274.44	52.0232	238.98	0.0000
323.87	43.4761	123.68	53.0255	240.99	27.6936
81.75	54.8669	125.81	35.1636	242.00	27.7233
83.79	51.3333	127.23	55.2545	244.70	32.6213
265.00	51.3580	127.91	55.3186	685.70	0.0000
193.51	74.9447	129.30	39.1964	388.16	28.0369

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
507.63	0.0000	345.93	23.1818	569.50	10.3582
256.23	36.0127	351.06	23.2774	569.70	9.4173
527.90	0.0000	351.93	23.2937	583.19	7.5889
264.66	28.3737	355.39	0.0000	584.27	7.5931
264.80	28.3775	356.01	14.7590	595.83	0.0000
265.00	24.9769	364.49	0.0000	600.60	13.4024
268.22	39.8621	366.42	0.0000	602.52	0.0000
269.46	33.0693	372.51	22.4231	604.72	8.6342
270.03	34.2279	375.05	14.9777	607.14	11.5264
401.81	26.2723	377.52	17.5064	609.32	10.5779
273.65	0.0000	383.85	25.1276	610.33	10.5833
276.40	30.9955	388.16	16.8050	614.28	2.8922
583.19	27.5771	666.33	0.0000	618.01	9.6590
277.60	26.4337	391.69	18.9546	884.68	17.4067
402.40	27.5940	400.66	21.1980	621.93	7.7425
279.20	25.3234	401.81	17.8213	630.19	0.0000
279.54	29.9371	402.40	13.5837	631.29	5.8342
279.70	31.0935	404.85	19.5607	633.25	11.6797
280.46	28.8109	410.95	18.7912	634.78	0.0000
301.36	25.4308	413.71	23.9622	635.95	9.7461
284.31	0.0000	720.70	0.0000	636.99	0.0000
285.41	30.1030	423.72	0.0000	1690.97	9.7937
285.90	0.0000	427.09	11.2287	657.76	8.8656
287.50	23.2013	427.87	12.0990	657.90	0.0000
290.67	24.8210	433.94	13.8844	661.66	7.8952
293.27	0.0000	439.40	16.5481	664.57	0.0000
295.22	26.8717	453.88	10.5515	666.33	0.0000
316.51	26.8893	463.37	11.5009	666.50	0.0000
298.58	42.1875	468.07	10.6482	667.71	0.0000
299.98	18.7739	473.00	0.0000	677.62	12.9275
300.09	23.4698	631.29	16.0430	685.70	0.0000
300.13	23.4705	696.49	16.0602	695.00	0.0000
311.90	23.4705	477.60	16.0682	696.49	12.0386
301.36	27.0205	482.18	9.3998	696.51	12.0386
302.85	36.4681	487.02	0.0000	697.00	0.0000
304.50	24.7401	492.35	0.0000	697.30	12.0430
304.85	0.0000	497.08	9.0342	697.49	14.0513
306.78	27.1518	505.52	10.8962	702.65	16.0964
308.46	21.2805	507.63	0.0000	706.68	11.0868
311.90	15.4157	511.00	16.3976	711.68	5.0509
316.51	25.0016	514.00	16.4268	720.70	0.0000
319.41	0.0000	514.00	16.4268	721.93	0.0000
320.08	0.0000	520.40	13.7402	722.78	9.1370
321.04	35.8557	520.69	0.0000	722.91	6.0916
323.87	9.5847	667.71	0.0000	723.31	6.0928
325.23	19.1914	527.90	0.0000	756.73	10.6666
1596.21	0.0000	528.26	8.2819	727.33	9.1556
333.37	20.9325	529.59	11.9717	733.00	12.2378
333.97	12.0825	529.87	0.0000	735.93	10.2116
334.37	7.2519	531.02	0.0000	737.46	8.1748
338.28	25.4637	537.26	0.0000	739.50	0.0000
338.32	25.4643	1260.41	0.0000	747.24	7.1834
340.48	24.2944	552.55	14.9271	748.06	11.2923
340.55	0.0000	795.86	15.0150	752.31	7.7133
344.28	20.7141	569.33	10.3573	753.82	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
756.73	7.7283	968.97	5.5929	1505.03	4.8950
756.80	7.7283	983.53	0.0000	1584.12	5.9843
763.94	10.8529	984.45	0.0000	1596.21	0.0000
765.81	3.1033	996.26	4.5168	1620.50	5.0284
1001.03	9.3124	1001.03	5.6551	1621.92	2.0120
766.84	9.3138	1002.74	5.6584	1678.03	0.0000
772.60	0.0000	1004.73	10.1920	1690.97	2.0430
776.52	0.0000	1021.30	0.0000	1750.46	0.0000
777.92	0.0000	1025.87	0.0000	1764.49	1.0377
778.90	5.2008	1028.54	0.0000	1770.23	6.2333
783.70	0.0000	1037.84	5.7255	1771.35	3.1174
785.37	7.3008	1038.76	0.0000	1791.20	0.0000
903.28	10.9819	1046.59	9.1868	1808.65	3.1415
794.95	6.2827	1048.07	0.0000	1810.72	0.0000
795.86	10.9990	1049.04	6.8955	1836.06	3.1591
801.95	11.5514	1050.41	6.8989		
810.06	11.5899	1063.66	2.3096		
810.29	11.5908	1077.00	0.0000		
810.45	11.5917	1077.34	11.5983		
810.76	11.5931	1085.87	4.6520		
815.77	0.0000	1093.63	5.8293		
818.51	0.0000	1099.45	6.1323		
832.01	7.4406	1112.07	5.2767		
834.85	12.7700	1112.84	8.7970		
835.71	9.5808	1115.54	2.8174		
836.80	0.0000	1120.29	7.0537		
846.75	0.0000	1120.55	7.0542		
846.77	10.6917	1121.30	7.0562		
856.80	0.0000	1808.65	7.0742		
860.56	8.5993	1131.51	0.0000		
871.09	4.3171	1147.95	0.0000		
873.19	12.9614	1332.49	3.5840		
875.33	0.0000	1177.95	2.8713		
879.38	10.8268	1189.05	7.2017		
880.51	8.6650	1204.77	9.9479		
883.24	6.5056	1221.41	8.1788		
884.68	7.5939	1231.02	2.9160		
889.28	4.3470	1235.36	0.0000		
894.76	6.5339	1238.28	1.4610		
1836.06	7.6320	1260.41	0.0000		
900.72	5.4569	1271.87	7.3740		
903.28	6.5547	1274.44	6.4570		
911.20	7.6694	1274.54	6.4574		
912.08	7.6719	1291.59	2.7805		
984.45	0.0000	1298.22	0.0000		
926.50	7.7124	1312.11	0.0000		
929.11	9.9254	1332.49	6.5599		
937.49	9.9554	1362.66	0.0000		
983.53	0.0000	1365.19	3.7810		
946.00	8.8763	1368.63	0.0000		
949.00	4.4429	1384.29	7.5996		
954.55	0.0000	1408.01	2.8672		
962.31	3.3479	1457.56	0.0000		
964.08	5.5833	1460.82	1.9370		
966.17	5.5874	1489.16	1.9504		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235063.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM44.CNF;111
Background date : 2-OCT-2016 11:02:28.
Sample date     : 14-DEC-2015 13:15:00 Acquisition date : 3-OCT-2016 05:53:40.
Sample ID      : G405235063 Sample quantity   : 1.47883E+02 GRAM
Detector name  : GAM44 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.75 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID      : 1596254 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	4	63.34*	28	84	1.37	127.13	124	11	7.86E-03	55.9	1.27E+00
2	4	65.77	22	74	1.09	131.99	124	11	6.15E-03	60.8	
3	1	74.80	58	125	0.93	150.05	147	13	1.60E-02	31.6	1.70E+00
4	1	77.17*	122	99	1.06	154.81	147	13	3.40E-02	16.3	
5	0	84.27	35	105	1.37	169.00	167	6	9.84E-03	48.3	
6	4	87.25	48	112	0.95	174.98	172	20	1.33E-02	35.9	7.10E-01
7	4	89.87	41	142	1.45	180.22	172	20	1.14E-02	56.1	
8	4	92.67*	54	118	1.46	185.81	172	20	1.50E-02	44.0	
9	0	110.26	36	121	1.05	221.01	217	9	1.00E-02	57.6	
10	0	144.83	20	98	1.24	290.17	287	7	5.65E-03	84.0	
11	0	154.39	21	81	0.83	309.31	306	6	5.83E-03	71.2	
12	0	185.93*	62	122	1.29	372.41	367	10	1.73E-02	36.6	
13	3	205.54	25	60	1.56	411.64	408	29	6.99E-03	55.0	9.60E-01
14	3	209.50	35	61	1.20	419.57	408	29	9.60E-03	42.4	
15	3	211.70	27	79	1.57	423.96	408	29	7.55E-03	65.5	
16	6	238.68*	340	65	1.10	477.96	473	17	9.44E-02	6.8	9.83E-01
17	6	241.60	77	100	1.82	483.79	473	17	2.14E-02	34.5	
18	0	270.36	23	50	1.37	541.35	537	9	6.37E-03	59.2	
19	0	295.45	147	79	1.11	591.55	586	12	4.08E-02	14.7	
20	0	300.07	37	37	1.75	600.78	597	7	1.02E-02	32.0	
21	0	338.64	65	96	1.32	677.96	672	14	1.80E-02	34.2	
22	0	352.00*	202	51	1.30	704.69	700	10	5.61E-02	9.8	
23	1	401.23	24	24	1.53	803.20	799	19	6.79E-03	38.3	1.54E+00
24	1	405.01	21	18	1.53	810.76	799	19	5.78E-03	45.3	
25	0	463.97	19	37	2.60	928.75	922	10	5.24E-03	64.9	
26	0	511.35*	56	22	2.47	1023.57	1017	16	1.56E-02	28.4	
27	0	520.52	11	16	0.87	1041.91	1038	8	3.06E-03	69.8	
28	5	543.58	10	6	1.56	1088.05	1086	12	2.87E-03	36.7	8.91E-01
29	5	546.66	15	10	1.65	1094.23	1086	12	4.25E-03	45.8	
30	0	583.42*	84	33	1.19	1167.77	1162	10	2.33E-02	17.2	
31	0	609.58*	154	53	1.54	1220.14	1214	15	4.28E-02	13.6	
32	0	678.72	7	12	0.61	1358.50	1352	8	2.00E-03	95.1	
33	0	711.57	13	12	0.64	1424.23	1420	8	3.49E-03	55.7	
34	0	728.58	18	31	1.89	1458.28	1449	14	5.12E-03	68.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	746.85	12	5	1.29	1494.85	1491	7	3.31E-03	43.0	
36	0	773.10	15	13	1.59	1547.37	1541	10	4.21E-03	53.4	
37	0	776.26	10	0	0.95	1553.70	1551	6	2.78E-03	31.6	
38	0	795.67	12	27	0.63	1592.54	1584	12	3.37E-03	90.4	
39	0	840.54	15	8	1.51	1682.34	1678	8	4.28E-03	40.6	
40	0	862.77	11	31	1.71	1726.83	1719	15	2.97E-03	116.3	
41	0	911.20*	87	25	1.62	1823.77	1815	18	2.41E-02	17.8	
42	0	969.25*	31	20	2.05	1939.94	1935	10	8.70E-03	32.7	
43	0	1000.74	22	3	0.97	2002.97	1998	11	6.12E-03	25.9	
44	0	1120.34	51	17	1.56	2242.37	2235	14	1.42E-02	22.2	
45	0	1377.40	7	4	0.55	2756.93	2752	8	1.94E-03	62.3	
46	0	1460.71*	261	14	2.25	2923.72	2917	14	7.26E-02	7.0	
47	0	1764.37	25	4	2.04	3531.65	3525	11	6.81E-03	27.1	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235063.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 14-DEC-2015 13:15:00 Acquisition date : 3-OCT-2016 05:53:40
Sample ID         : G405235063           Sample quantity  : 147.88 GRAM
Sample type       : SOLID                 Sample geometry   :
Detector name     : GAMMA44              Detector geometry: CAN
Elapsed live time: 0 01:00:00.00         Elapsed real time: 0 01:00:00.75   0.0%
Energy tolerance  : 1.50 keV             Half life ratio   : 10.00
Errors propagated: No                    Systematic Error  : 0.00 %
Efficiency type   : Linear                Efficiencies at   : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.030E+00	1.163E+01	1.163E+01	13.95	OK
CD-109	88.03	3.70*	4.459E+00	7.567E-01	1.176E+00	179.82	OK
TE-125M	109.28	0.27*	5.627E+00	1.475E+01	5.118E+02	115.11	OK
SN-126	64.28	9.60	2.050E+00	9.341E-01	9.341E-01	111.73	OK
	86.94	8.90	4.459E+00	3.146E-01	3.146E-01	179.82	OK
	87.57	37.00*	4.459E+00	7.567E-02	7.567E-02	179.82	OK
CE-141	145.44	48.29*	5.912E+00	1.345E-02	7.054E+00	560.68	OK
TL-208	277.37	6.60	4.074E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.178E+00	2.434E-01	2.434E-01	34.32	OK
	860.56	12.50	1.592E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	3.338E+00	4.161E-01	4.161E-01	170.92	OK
	77.11	17.10	3.578E+00	1.279E+00	1.279E+00	32.68	OK
	238.63	43.60*	4.585E+00	9.891E-01	9.891E-01	13.62	OK
	300.09	3.30	3.818E+00	1.663E+00	1.663E+00	64.02	OK
BI-214	609.32	45.49*	2.101E+00	8.600E-01	8.603E-01	27.23	OK
	1120.29	14.92	1.288E+00	1.341E+00	1.341E+00	44.37	OK
	1764.49	15.30	8.674E-01	8.854E-01	8.858E-01	54.19	OK
PB-214	74.82	5.80	3.340E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.578E+00	2.254E+00	2.255E+00	32.68	OK
	87.09	3.41	4.447E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.538E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.868E+00	1.177E+00	1.178E+00	29.49	OK
	351.93	35.60*	3.336E+00	9.566E-01	9.569E-01	19.55	OK
RN-219	271.23	10.80	4.160E+00	2.940E-01	2.940E-01	118.36	OK
	401.81	6.60*	2.983E+00	6.899E-01	6.899E-01	76.53	OK
RN-222	609.32	45.49*	2.101E+00	8.600E-01	8.603E-01	27.23	OK
	1120.29	14.92	1.288E+00	1.341E+00	1.341E+00	44.37	OK
	1764.49	15.30	8.674E-01	8.854E-01	8.858E-01	54.19	OK
RA-224	240.99	4.10*	4.543E+00	3.268E-01	3.268E-01	542.80	OK
RA-226	609.32	45.49*	2.101E+00	8.600E-01	8.603E-01	27.23	OK
	1120.29	14.92	1.288E+00	1.341E+00	1.341E+00	44.37	OK
	1764.49	15.30	8.674E-01	8.854E-01	8.858E-01	54.19	OK
AC-228	105.21	1.10	5.460E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.448E+00	9.424E-01	9.424E-01	68.32	OK
	794.95	4.25	1.695E+00	8.749E-01	8.749E-01	180.84	OK
	835.71	1.61	1.630E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.521E+00	1.136E+00	1.136E+00	35.58	OK
	968.97	15.80	1.448E+00	6.987E-01	6.987E-01	65.47	OK
RA-228	105.21	1.10	5.460E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.448E+00	9.424E-01	9.424E-01	68.32	OK
	794.95	4.25	1.695E+00	8.749E-01	8.749E-01	180.84	OK
	835.71	1.61	1.630E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.521E+00	1.136E+00	1.136E+00	35.58	OK
	968.97	15.80	1.448E+00	6.987E-01	6.987E-01	65.47	OK
TH-228	74.82	10.28	3.338E+00	4.161E-01	4.161E-01	170.92	OK
	77.11	17.10	3.578E+00	1.279E+00	1.279E+00	32.68	OK
	238.63	43.60*	4.585E+00	9.891E-01	9.891E-01	13.62	OK
	300.09	3.30	3.818E+00	1.663E+00	1.663E+00	64.02	OK
TH-229	85.43	14.70	4.223E+00	3.627E-01	3.627E-01	96.63	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	88.47	24.00	4.459E+00	1.167E-01	1.167E-01	179.82	OK
	193.51	4.41*	5.283E+00	-----	Line Not Found	-----	Absent
	210.85	2.80	4.994E+00	1.143E+00	1.143E+00	131.04	OK
TH-230	609.32	45.49*	2.101E+00	8.600E-01	8.600E-01	27.23	OK
	1120.29	14.92	1.288E+00	1.341E+00	1.341E+00	44.37	OK
	1764.49	15.30	8.674E-01	8.854E-01	8.855E-01	54.19	OK
PA-231	283.69	1.70	4.000E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	3.818E+00	1.026E+00	1.026E+00	64.02	OK
TH-232	105.21	1.10	5.460E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.448E+00	9.424E-01	9.424E-01	68.32	OK
	835.71	1.61	1.630E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.521E+00	1.136E+00	1.136E+00	35.58	OK
	968.97	15.80	1.448E+00	6.987E-01	6.987E-01	65.47	OK
TH-234	63.29	3.70*	2.050E+00	2.424E+00	2.424E+00	111.73	OK
	92.59	4.23	4.835E+00	1.664E+00	1.664E+00	88.03	OK
U-234	609.32	45.49*	2.101E+00	8.600E-01	8.600E-01	27.23	OK
	1120.29	14.92	1.288E+00	1.341E+00	1.341E+00	44.37	OK
	1764.49	15.30	8.674E-01	8.854E-01	8.854E-01	54.19	OK
U-235	89.96	3.47	4.649E+00	1.608E+00	1.608E+00	112.29	OK
	93.35	5.60	4.835E+00	1.257E+00	1.257E+00	88.03	OK
	143.76	10.96*	5.918E+00	-----	Line Not Found	-----	<<INT Reject
	163.33	5.08	5.731E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	5.403E+00	1.197E-01	1.197E-01	73.11	OK
	205.31	5.01	5.091E+00	5.815E-01	5.815E-01	109.95	OK
U-238	63.29	3.70*	2.050E+00	2.424E+00	2.424E+00	111.73	OK
	92.59	4.23	4.835E+00	1.664E+00	1.664E+00	88.03	OK
AM-243	43.53	5.90	1.573E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	3.338E+00	6.366E-02	6.366E-02	170.92	OK
CM-247	278.00	3.40	4.067E+00	-----	Line Not Found	-----	Absent
	287.50	2.00	3.956E+00	-----	Line Not Found	-----	Absent
	402.40	72.00*	2.983E+00	6.324E-02	6.324E-02	76.53	OK
ANH-511	511.00	100.00*	2.429E+00	1.255E-01	1.255E-01	56.85	OK

Flag: "*" = Keyline

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235063.CNF;1
* Acquisition date   : 3-OCT-2016 05:53:40 Sensitivity      : 3.000
* Detector ID       : GAM44 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.75 Half life ratio : *****
* Sample date       : 14-DEC-2015 13:15:00 Analyst initials: MXR1
* Sample ID         : G405235063 Sample Quantity : 1.4788E+02 GRAM
* Batch Number      : 1596254 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 6-SEP-2016 04:59:25 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM44_CAN.CNF;3
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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.163E+01	1.590E+00	8.231E-01
CD-109	1.176E+00	2.073E+00	1.870E+00
TE-125M	5.118E+02	5.773E+02	5.037E+02
SN-126	7.567E-02	1.334E-01	1.212E-01
CE-141	7.054E+00	3.876E+01	4.035E+01
TL-208	2.434E-01	8.186E-02	7.148E-02
PB-212	9.891E-01	1.321E-01	8.930E-02
BI-214	8.603E-01	2.296E-01	1.248E-01
PB-214	9.569E-01	1.834E-01	1.327E-01
RN-219	6.899E-01	5.174E-01	7.187E-01
RN-222	8.603E-01	2.296E-01	1.248E-01
RA-224	3.268E-01	1.738E+00	9.576E-01
RA-226	8.603E-01	2.296E-01	1.248E-01
AC-228	1.136E+00	3.959E-01	2.269E-01
RA-228	1.136E+00	3.959E-01	2.269E-01
TH-228	9.891E-01	1.321E-01	8.930E-02
TH-229	2.170E-01	4.726E-01	9.051E-01
TH-230	8.600E-01	2.295E-01	1.248E-01
PA-231	1.026E+00	6.435E-01	8.960E-01
TH-232	1.136E+00	3.959E-01	2.269E-01
TH-234	2.424E+00	2.654E+00	2.806E+00
U-234	8.600E-01	2.295E-01	1.248E-01
U-235	1.909E-01	3.144E-01	3.688E-01
U-238	2.424E+00	2.654E+00	2.806E+00
AM-243	6.366E-02	1.066E-01	1.039E-01
CM-247	6.324E-02	4.743E-02	6.597E-02
ANH-511	1.255E-01	6.992E-02	4.576E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	3.200E+00		9.086E+00	1.926E+01	NOT IDENT.
NA-22	2.212E-02		4.504E-02	9.953E-02	NOT IDENT.
NA-24	0.000E+00		1.321E+41	0.000E+00	SHORT HLIF

AL-26	-3.505E-02	3.864E-02	5.583E-02	NOT IDENT.
SC-46	-3.425E-01	4.021E-01	7.099E-01	FAIL ABUN
V-48	0.000E+00	1.221E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	3.083E+02	0.000E+00	SHORT HLIF
MN-54	7.283E-02	7.115E-02	1.545E-01	NOT IDENT.
CO-56	-9.726E-02	5.283E-01	9.622E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.636E-02	4.904E-02	9.535E-02	NOT IDENT.
CO-58	-9.557E-02	4.462E-01	8.454E-01	NOT IDENT.
FE-59	8.441E+00	6.596E+00	1.562E+01	NOT IDENT.
CO-60	-1.242E-02	3.931E-02	7.482E-02	NOT IDENT.
ZN-65	7.991E-02	2.182E-01	4.074E-01	NOT IDENT.
GE-68	1.089E+00	1.922E+00	4.429E+00	NOT IDENT.
AS-73	1.684E+00	1.374E+01	2.770E+01	NOT IDENT.
AS-74	0.000E+00	4.651E+03	0.000E+00	SHORT HLIF
SE-75	-5.889E-02	1.904E-01	3.335E-01	FAIL ABUN
BR-77	0.000E+00	3.969E+36	0.000E+00	SHORT HLIF
SR-82	0.000E+00	3.812E+02	0.000E+00	SHORT HLIF
RB-83	5.872E-01	8.037E-01	1.285E+00	FAIL ABUN
KR-85	6.739E+00	6.693E+00	1.462E+01	NOT IDENT.
SR-85	6.637E-01	6.624E-01	1.447E+00	NOT IDENT.
RB-86	0.000E+00	1.785E+04	0.000E+00	SHORT HLIF
Y-88	-1.821E-01	1.963E-01	3.046E-01	NOT IDENT.
Y-91	-2.375E+02	5.230E+02	9.574E+02	NOT IDENT.
NB-94	1.326E-02	2.681E-02	5.712E-02	NOT IDENT.
NB-95	1.592E-01	8.432E-01	1.645E+00	NOT IDENT.
NB-95M	2.462E-01	2.407E+00	4.064E+00	NOT IDENT.
ZR-95	2.142E-01	1.564E+00	3.024E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	3.899E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.350E+41	0.000E+00	SHORT HLIF
RH-101	-4.416E-02	3.278E-02	5.433E-02	NOT IDENT.
RH-102	3.669E-02	5.999E-02	1.266E-01	NOT IDENT.
RU-103	-2.181E+00	5.050E+00	9.321E+00	FAIL ABUN
RH-106	-3.128E-02	4.938E-01	9.513E-01	NOT IDENT.
RU-106	-3.128E-02	4.938E-01	9.513E-01	NOT IDENT.
AG-108M	-4.664E-03	2.191E-02	4.286E-02	NOT IDENT.
AG-110M	5.776E-03	1.062E-01	2.169E-01	FAIL ABUN
SN-113	-1.233E-01	1.936E-01	3.552E-01	NOT IDENT.
CD-115	0.000E+00	4.675E+38	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	7.516E+04	0.000E+00	SHORT HLIF
TE-123M	8.559E-02	1.297E-01	2.549E-01	NOT IDENT.
SB-124	-1.613E-01	2.258E+00	4.571E+00	NOT IDENT.
SB-125	9.090E-02	1.187E-01	2.475E-01	FAIL ABUN
I-126	0.000E+00	6.620E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	8.110E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	7.638E+21	0.000E+00	SHORT HLIF
I-131	0.000E+00	2.869E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.095E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.122E+26	0.000E+00	SHORT HLIF
BA-133	4.348E-02	3.887E-02	8.122E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	5.696E-02	1.009E-01	1.189E-01	FAIL ABUN
CS-135	4.569E-03	1.301E-01	2.381E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.334E+05	0.000E+00	SHORT HLIF
BA-137M	2.924E-02	4.049E-02	8.363E-02	NOT IDENT.
CS-137	3.089E-02	4.277E-02	8.834E-02	NOT IDENT.
CE-139	-8.175E-02	1.103E-01	1.906E-01	NOT IDENT.
BA-140	0.000E+00	8.554E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	3.004E+05	0.000E+00	SHORT HLIF
CE-143	0.000E+00	8.105E+40	0.000E+00	SHORT HLIF
CE-144	6.516E-02	3.306E-01	6.369E-01	NOT IDENT.
PM-144	1.627E-02	5.329E-02	1.078E-01	NOT IDENT.
PR-144	1.408E+00	4.614E+00	9.333E+00	NOT IDENT.
PM-146	-9.657E-03	4.266E-02	8.149E-02	FAIL ABUN
ND-147	0.000E+00	2.385E+07	0.000E+00	SHORT HLIF
PM-147	3.574E+02	8.541E+02	1.674E+03	NOT IDENT.
PM-149	0.000E+00	6.978E+39	0.000E+00	SHORT HLIF
EU-150	7.598E-03	2.569E-02	4.787E-02	FAIL ABUN
EU-152	-5.850E-03	1.064E-01	1.873E-01	NOT IDENT.
GD-153	7.267E-02	1.730E-01	3.248E-01	NOT IDENT.
EU-154	5.439E-02	1.108E-01	2.448E-01	NOT IDENT.
EU-155	1.034E-01	1.159E-01	2.362E-01	FAIL ABUN
TB-160	5.961E-01	1.754E+00	3.768E+00	FAIL ABUN
HO-166M	6.590E-02	7.199E-02	1.304E-01	FAIL ABUN
TM-171	-9.680E+00	3.579E+01	6.997E+01	FAIL ABUN

HF-172	1.058E-01	2.131E-01	4.231E-01	FAIL ABUN
LU-172	-4.453E-02	8.206E-02	1.496E-01	FAIL ABUN
LU-176	8.463E-03	2.022E-02	4.260E-02	FAIL ABUN
HF-181	-2.553E-01	3.431E+00	6.756E+00	NOT IDENT.
TA-182	2.742E-01	9.965E-01	2.034E+00	FAIL ABUN
RE-183	-5.749E-01	4.043E+00	7.973E+00	FAIL ABUN
RE-184	-8.429E+00	2.806E+01	5.256E+01	NOT IDENT.
W-188	-8.826E+01	1.089E+02	1.752E+02	FAIL ABUN
IR-192	1.715E-02	4.312E-01	8.591E-01	FAIL ABUN
HG-203	-6.890E-01	1.883E+00	3.655E+00	NOT IDENT.
BI-207	1.354E-02	5.154E-02	1.075E-01	FAIL ABUN
PB-210	2.430E+00	7.416E+00	1.544E+01	NOT IDENT.
BI-211	0.000E+00	5.050E-01	8.217E-01	FAIL ABUN
PB-211	1.031E+00	9.151E-01	1.377E+00	FAIL ABUN
BI-212	7.967E-01	1.070E+00	1.324E+00	FAIL ABUN
RA-223	2.211E-01	5.556E-01	1.147E+00	FAIL ABUN
AC-227	3.202E-02	2.304E-01	4.249E-01	FAIL ABUN
TH-227	3.202E-02	2.304E-01	4.249E-01	FAIL ABUN
TH-231	2.211E-01	5.556E-01	1.147E+00	FAIL ABUN
PA-233	9.428E-03	5.455E-02	1.108E-01	FAIL ABUN
PA-234	-5.251E-02	2.831E-01	5.586E-01	FAIL ABUN
PA-234M	9.446E+00	4.798E+00	1.099E+01	FAIL ABUN
NP-237	9.428E-03	5.455E-02	1.108E-01	FAIL ABUN
NP-238	0.000E+00	6.618E+40	0.000E+00	SHORT HLIF
NP-239	-1.518E-01	2.458E-01	4.429E-01	NOT IDENT.
PU-239	3.049E+02	2.953E+02	6.070E+02	NOT IDENT.
AM-241	1.400E-01	1.970E-01	4.111E-01	NOT IDENT.
CM-243	-4.340E-02	1.027E-01	1.901E-01	NOT IDENT.
BK-247	-5.989E-03	6.501E-02	1.177E-01	FAIL ABUN
CF-249	-8.936E-03	3.328E-02	6.415E-02	NOT IDENT.
CF-251	-8.984E-02	1.146E-01	1.957E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	252	10.66*	1.030E+00	1.163E+01	1.163E+01	13.95
CD-109	88.03	60	3.70*	4.459E+00	1.842E+00	2.863E+00	71.81
TE-125M	109.28	44	0.27*	5.627E+00	1.475E+01	5.118E+02	115.11
SN-126	64.28	36	9.60	2.050E+00	9.341E-01	9.341E-01	111.73
	86.94	60	8.90	4.459E+00	7.657E-01	7.657E-01	71.81
	87.57	60	37.00*	4.459E+00	1.842E-01	1.842E-01	71.81
CE-141	145.44	24	48.29*	5.912E+00	4.332E-02	2.272E+01	168.05
TL-208	277.37	-----	6.60	4.074E+00	-----	Line Not Found	-----
	583.19	89	85.00*	2.178E+00	2.434E-01	2.434E-01	34.32
	860.56	-----	12.50	1.592E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	3.135E+00	-----	Line Not Found	-----
	351.06	224	12.92*	3.336E+00	2.636E+00	2.636E+00	19.55
PB-212	74.82	73	10.28	3.338E+00	1.080E+00	1.080E+00	63.29
	77.11	154	17.10	3.578E+00	1.279E+00	1.279E+00	32.68
	238.63	389	43.60*	4.585E+00	9.891E-01	9.891E-01	13.62
	300.09	41	3.30	3.818E+00	1.663E+00	1.663E+00	64.02
BI-214	609.32	162	45.49*	2.101E+00	8.600E-01	8.603E-01	27.23
	1120.29	51	14.92	1.288E+00	1.341E+00	1.341E+00	44.37
	1764.49	23	15.30	8.674E-01	8.854E-01	8.858E-01	54.19
PB-214	74.82	73	5.80	3.338E+00	1.915E+00	1.915E+00	63.29
	77.11	154	9.70	3.578E+00	2.254E+00	2.255E+00	32.68
	87.09	60	3.41	4.459E+00	1.998E+00	1.999E+00	71.81
	242.00	88	7.25	4.543E+00	1.362E+00	1.363E+00	69.10
	295.22	165	18.42	3.868E+00	1.177E+00	1.178E+00	29.49
	351.93	224	35.60*	3.336E+00	9.566E-01	9.569E-01	19.55
RN-219	271.23	26	10.80	4.160E+00	2.940E-01	2.940E-01	118.36
	401.81	27	6.60*	2.983E+00	6.899E-01	6.899E-01	76.53
RN-222	609.32	162	45.49*	2.101E+00	8.600E-01	8.603E-01	27.23
	1120.29	51	14.92	1.288E+00	1.341E+00	1.341E+00	44.37
	1764.49	23	15.30	8.674E-01	8.854E-01	8.858E-01	54.19
RA-224	240.99	88	4.10*	4.543E+00	2.409E+00	2.409E+00	69.10
RA-226	609.32	162	45.49*	2.101E+00	8.600E-01	8.603E-01	27.23
	1120.29	51	14.92	1.288E+00	1.341E+00	1.341E+00	44.37
	1764.49	23	15.30	8.674E-01	8.854E-01	8.858E-01	54.19
AC-228	105.21	-----	1.10	5.460E+00	-----	Line Not Found	-----
	338.32	72	11.27	3.448E+00	9.424E-01	9.424E-01	68.32
	794.95	12	4.25	1.695E+00	8.749E-01	8.749E-01	180.84
	835.71	-----	1.61	1.630E+00	-----	Line Not Found	-----
	911.20	88	25.80*	1.521E+00	1.136E+00	1.136E+00	35.58
	968.97	31	15.80	1.448E+00	6.987E-01	6.987E-01	65.47
RA-228	105.21	-----	1.10	5.460E+00	-----	Line Not Found	-----
	338.32	72	11.27	3.448E+00	9.424E-01	9.424E-01	68.32
	794.95	12	4.25	1.695E+00	8.749E-01	8.749E-01	180.84
	835.71	-----	1.61	1.630E+00	-----	Line Not Found	-----
	911.20	88	25.80*	1.521E+00	1.136E+00	1.136E+00	35.58
	968.97	31	15.80	1.448E+00	6.987E-01	6.987E-01	65.47
TH-228	74.82	73	10.28	3.338E+00	1.080E+00	1.080E+00	63.29

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	77.11	154	17.10	3.578E+00	1.279E+00	1.279E+00	32.68
	238.63	389	43.60*	4.585E+00	9.891E-01	9.891E-01	13.62
	300.09	41	3.30	3.818E+00	1.663E+00	1.663E+00	64.02
TH-229	85.43	44	14.70	4.223E+00	3.627E-01	3.627E-01	96.63
	88.47	60	24.00	4.459E+00	2.839E-01	2.840E-01	71.81
	193.51	-----	4.41*	5.283E+00	-----	Line Not Found	-----
	210.85	31	2.80	4.994E+00	1.143E+00	1.143E+00	131.04
TH-230	609.32	162	45.49*	2.101E+00	8.600E-01	8.600E-01	27.23
	1120.29	51	14.92	1.288E+00	1.341E+00	1.341E+00	44.37
	1764.49	23	15.30	8.674E-01	8.854E-01	8.855E-01	54.19
PA-231	283.69	-----	1.70	4.000E+00	-----	Line Not Found	-----
	301.36	41	5.35*	3.818E+00	1.026E+00	1.026E+00	64.02
TH-232	105.21	-----	1.10	5.460E+00	-----	Line Not Found	-----
	338.32	72	11.27	3.448E+00	9.424E-01	9.424E-01	68.32
	835.71	-----	1.61	1.630E+00	-----	Line Not Found	-----
	911.20	88	25.80*	1.521E+00	1.136E+00	1.136E+00	35.58
	968.97	31	15.80	1.448E+00	6.987E-01	6.987E-01	65.47
TH-234	63.29	36	3.70*	2.050E+00	2.424E+00	2.424E+00	111.73
	92.59	67	4.23	4.835E+00	1.664E+00	1.664E+00	88.03
U-234	609.32	162	45.49*	2.101E+00	8.600E-01	8.600E-01	27.23
	1120.29	51	14.92	1.288E+00	1.341E+00	1.341E+00	44.37
	1764.49	23	15.30	8.674E-01	8.854E-01	8.854E-01	54.19
U-235	89.96	51	3.47	4.649E+00	1.608E+00	1.608E+00	112.29
	93.35	67	5.60	4.835E+00	1.257E+00	1.257E+00	88.03
	143.76	24	10.96*	5.912E+00	1.909E-01	1.909E-01	168.05
	163.33	-----	5.08	5.731E+00	-----	Line Not Found	-----
	185.72	73	57.20	5.403E+00	1.197E-01	1.197E-01	73.11
	205.31	29	5.01	5.091E+00	5.815E-01	5.815E-01	109.95
U-238	63.29	36	3.70*	2.050E+00	2.424E+00	2.424E+00	111.73
	92.59	67	4.23	4.835E+00	1.664E+00	1.664E+00	88.03
AM-243	43.53	-----	5.90	1.573E-01	-----	Line Not Found	-----
	74.66	73	67.20*	3.338E+00	1.653E-01	1.653E-01	63.29
CM-247	278.00	-----	3.40	4.067E+00	-----	Line Not Found	-----
	287.50	-----	2.00	3.956E+00	-----	Line Not Found	-----
	402.40	27	72.00*	2.983E+00	6.324E-02	6.324E-02	76.53
ANH-511	511.00	60	100.00*	2.429E+00	1.255E-01	1.255E-01	56.85

Flag: "*" = Keyline

Total number of lines in spectrum 47
 Number of unidentified lines 5
 Number of lines tentatively identified by NID 42 89.36%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.163E+01	1.163E+01	0.162E+01	13.95	
CD-109	461.40D	1.55	1.842E+00	2.863E+00	2.056E+00	71.81	
TE-125M	57.40D	34.7	1.475E+01	5.118E+02	5.891E+02	115.11	
SN-126	2.30E+05Y	1.00	1.842E-01	1.842E-01	1.323E-01	71.81	
CE-141	32.51D	524.	4.332E-02	2.272E+01	3.818E+01	168.05	
TL-208	1.41E+10Y	1.00	2.434E-01	2.434E-01	0.835E-01	34.32	
BI-211	7.04E+08Y	1.00	2.636E+00	2.636E+00	0.515E+00	19.55	
PB-212	1.41E+10Y	1.00	9.891E-01	9.891E-01	1.347E-01	13.62	
BI-214	1600.00Y	1.00	8.600E-01	8.603E-01	2.343E-01	27.23	
PB-214	1600.00Y	1.00	9.566E-01	9.569E-01	1.871E-01	19.55	
RN-219	7.04E+08Y	1.00	6.899E-01	6.899E-01	5.280E-01	76.53	
RN-222	1600.00Y	1.00	8.600E-01	8.603E-01	2.343E-01	27.23	
RA-224	1.41E+10Y	1.00	2.409E+00	2.409E+00	1.664E+00	69.10	
RA-226	1600.00Y	1.00	8.600E-01	8.603E-01	2.343E-01	27.23	
AC-228	1.41E+10Y	1.00	1.136E+00	1.136E+00	0.404E+00	35.58	
RA-228	1.41E+10Y	1.00	1.136E+00	1.136E+00	0.404E+00	35.58	
TH-228	1.41E+10Y	1.00	9.891E-01	9.891E-01	1.347E-01	13.62	
TH-229	7340.00Y	1.00	2.839E-01	2.840E-01	2.039E-01	71.81	K
TH-230	7.54E+04Y	1.00	8.600E-01	8.600E-01	2.342E-01	27.23	
PA-231	7.04E+08Y	1.00	1.026E+00	1.026E+00	0.657E+00	64.02	
TH-232	1.41E+10Y	1.00	1.136E+00	1.136E+00	0.404E+00	35.58	
TH-234	4.47E+09Y	1.00	2.424E+00	2.424E+00	2.708E+00	111.73	
U-234	2.45E+05Y	1.00	8.600E-01	8.600E-01	2.342E-01	27.23	
U-235	7.04E+08Y	1.00	1.909E-01	1.909E-01	3.208E-01	168.05	
U-238	4.47E+09Y	1.00	2.424E+00	2.424E+00	2.708E+00	111.73	
AM-243	7370.00Y	1.00	1.653E-01	1.653E-01	1.046E-01	63.29	
CM-247	1.56E+07Y	1.00	6.324E-02	6.324E-02	4.840E-02	76.53	
ANH-511	1.00E+09Y	1.00	1.255E-01	1.255E-01	0.713E-01	56.85	
Total Activity :			5.177E+01	5.725E+02			

Grand Total Activity : 5.177E+01 5.725E+02

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
4	65.77	28	94	1.09	131.99	124	11	6.15E-03	****	2.34E+00	T
0	154.39	25	96	0.83	309.31	306	6	5.83E-03	****	5.83E+00	T
3	209.50	40	71	1.20	419.57	408	29	9.60E-03	84.7	5.03E+00	
1	405.01	23	20	1.53	810.76	799	19	5.78E-03	90.5	2.96E+00	T
0	463.97	20	40	2.60	928.75	922	10	5.24E-03	****	2.64E+00	T
0	520.52	12	17	0.87	1041.91	1038	8	3.06E-03	****	2.39E+00	T
5	543.58	11	6	1.56	1088.05	1086	12	2.87E-03	73.4	2.31E+00	
5	546.66	16	11	1.65	1094.23	1086	12	4.25E-03	91.6	2.30E+00	T
0	678.72	8	12	0.61	1358.50	1352	8	2.00E-03	****	1.93E+00	T
0	711.57	13	13	0.64	1424.23	1420	8	3.49E-03	****	1.85E+00	T
0	728.58	19	32	1.89	1458.28	1449	14	5.12E-03	****	1.82E+00	T
0	746.85	12	5	1.29	1494.85	1491	7	3.31E-03	85.9	1.78E+00	T
0	773.10	16	13	1.59	1547.37	1541	10	4.21E-03	****	1.73E+00	T
0	776.26	10	0	0.95	1553.70	1551	6	2.78E-03	63.2	1.73E+00	T
0	840.54	16	8	1.51	1682.34	1678	8	4.28E-03	81.1	1.62E+00	
0	862.77	11	32	1.71	1726.83	1719	15	2.97E-03	****	1.59E+00	
0	1000.74	22	3	0.97	2002.97	1998	11	6.12E-03	51.8	1.41E+00	T
0	1377.40	7	4	0.55	2756.93	2752	8	1.94E-03	****	1.08E+00	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235063.CNF;1
* Acquisition date   : 3-OCT-2016 05:53:40 Sensitivity      : 3.000
* Detector ID        : GAM44 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.75 Half life ratio  : *****
* Sample date        : 14-DEC-2015 13:15:00 Nuclide Library : SOLID
* Sample ID          : G405235063 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity : 1.4788E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 6-SEP-2016 04:59:25 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM44_CAN.CNF;3
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	3.487E-01
CD-109	8.669E-01
TE-125M	2.351E+02
SN-126	5.617E-02
CE-141	1.884E+01
TL-208	3.193E-02
PB-212	4.106E-02
BI-214	5.504E-02
PB-214	6.037E-02
RN-219	3.232E-01
RN-222	5.504E-02
RA-224	4.403E-01
RA-226	5.504E-02
AC-228	9.566E-02
RA-228	9.566E-02
TH-228	4.106E-02
TH-229	4.216E-01
TH-230	5.502E-02
PA-231	4.129E-01
TH-232	9.566E-02
TH-234	1.306E+00
U-234	5.502E-02
U-235	1.732E-01
U-238	1.306E+00
AM-243	4.868E-02
CM-247	2.967E-02
ANH-511	1.997E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.423E+00	NOT IDENT.
NA-22	4.235E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.978E-02	NOT IDENT.

SC-46	3.038E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	6.903E-02	NOT IDENT.
CO-56	4.206E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.461E-02	NOT IDENT.
CO-58	3.481E-01	NOT IDENT.
FE-59	6.897E+00	NOT IDENT.
CO-60	3.051E-02	NOT IDENT.
ZN-65	1.793E-01	NOT IDENT.
GE-68	1.870E+00	NOT IDENT.
AS-73	1.287E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.510E-01	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.730E-01	FAIL ABUN
KR-85	6.603E+00	NOT IDENT.
SR-85	6.532E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	9.627E-02	NOT IDENT.
Y-91	4.074E+02	NOT IDENT.
NB-94	2.481E-02	NOT IDENT.
NB-95	7.262E-01	NOT IDENT.
NB-95M	1.882E+00	NOT IDENT.
ZR-95	1.336E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.502E-02	NOT IDENT.
RH-102	5.619E-02	NOT IDENT.
RU-103	4.102E+00	FAIL ABUN
RH-106	4.164E-01	NOT IDENT.
RU-106	4.164E-01	NOT IDENT.
AG-108M	1.862E-02	NOT IDENT.
AG-110M	9.451E-02	FAIL ABUN
SN-113	1.565E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.192E-01	NOT IDENT.
SB-124	1.814E+00	NOT IDENT.
SB-125	1.134E-01	FAIL ABUN
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.695E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.315E-02	FAIL ABUN
CS-135	1.083E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	3.777E-02	NOT IDENT.
CS-137	3.990E-02	NOT IDENT.
CE-139	8.833E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-143	0.000E+00	SHORT HLIF
CE-144	2.959E-01	NOT IDENT.
PM-144	4.734E-02	NOT IDENT.
PR-144	4.099E+00	NOT IDENT.
PM-146	3.626E-02	FAIL ABUN
ND-147	0.000E+00	SHORT HLIF
PM-147	7.831E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.178E-02	FAIL ABUN
EU-152	8.547E-02	NOT IDENT.
GD-153	1.509E-01	NOT IDENT.
EU-154	1.042E-01	NOT IDENT.
EU-155	1.110E-01	FAIL ABUN
TB-160	1.637E+00	FAIL ABUN
HO-166M	5.821E-02	FAIL ABUN
TM-171	3.241E+01	FAIL ABUN
HF-172	1.969E-01	FAIL ABUN

LU-172	6.347E-02	FAIL ABUN
LU-176	1.926E-02	FAIL ABUN
HF-181	2.958E+00	NOT IDENT.
TA-182	8.903E-01	FAIL ABUN
RE-183	3.709E+00	FAIL ABUN
RE-184	2.252E+01	NOT IDENT.
W-188	7.922E+01	FAIL ABUN
IR-192	3.923E-01	FAIL ABUN
HG-203	1.656E+00	NOT IDENT.
BI-207	4.668E-02	FAIL ABUN
PB-210	7.168E+00	NOT IDENT.
BI-211	3.945E-01	FAIL ABUN
PB-211	6.251E-01	FAIL ABUN
BI-212	6.043E-01	FAIL ABUN
RA-223	5.235E-01	FAIL ABUN
AC-227	1.951E-01	FAIL ABUN
TH-227	1.951E-01	FAIL ABUN
TH-231	5.235E-01	FAIL ABUN
PA-233	5.040E-02	FAIL ABUN
PA-234	2.400E-01	FAIL ABUN
PA-234M	4.908E+00	FAIL ABUN
NP-237	5.040E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.056E-01	NOT IDENT.
PU-239	2.841E+02	NOT IDENT.
AM-241	1.927E-01	NOT IDENT.
CM-243	8.842E-02	NOT IDENT.
BK-247	5.321E-02	FAIL ABUN
CF-249	2.856E-02	NOT IDENT.
CF-251	9.031E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235063.CNF;1 *
 * Acquisition date : 3-OCT-2016 05:53:40 Sensitivity : 3.000 *
 * Detector ID : GAM44 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.75 Half life ratio : ***** *
 * Sample date : 14-DEC-2015 13:15:00 Nuclide Library : SOLID *
 * Sample ID : G405235063 Analyst initials: MXR1 *
 * Batch Number : 1596254 Sample Quantity : 1.4788E+02 GRAM *
 * Quantity Err(%) : 1.3524E-03 % *
 * Wet wt corr : 1.00000 Wet Weight : 0.00000 *
 * Dry Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 6-SEP-2016 04:59:25 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM44_CAN.CNF;3 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.163E+01	1.702E+00	1.702E+00
CD-109	1.176E+00	2.086E+00	2.086E+00
TE-125M	5.118E+02	5.781E+02	5.781E+02
SN-126	7.567E-02	1.341E-01	1.341E-01
CE-141	7.050E+00	3.878E+01	3.878E+01
TL-208	2.434E-01	8.251E-02	8.251E-02
PB-212	9.891E-01	1.421E-01	1.421E-01
BI-214	8.603E-01	2.325E-01	2.325E-01
PB-214	9.569E-01	1.876E-01	1.876E-01
RN-219	6.899E-01	5.246E-01	5.246E-01
RN-222	8.603E-01	2.325E-01	2.325E-01
RA-224	3.268E-01	1.744E+00	1.744E+00
RA-226	8.603E-01	2.325E-01	2.325E-01
AC-228	1.136E+00	4.002E-01	4.002E-01
RA-228	1.136E+00	4.002E-01	4.002E-01
TH-228	9.891E-01	1.421E-01	1.421E-01
TH-229	2.170E-01	4.727E-01	4.727E-01
TH-230	8.600E-01	2.324E-01	2.324E-01
PA-231	1.026E+00	6.797E-01	6.797E-01
TH-232	1.136E+00	4.002E-01	4.002E-01
TH-234	2.424E+00	2.708E+00	2.708E+00
U-234	8.600E-01	2.324E-01	2.324E-01
U-235	1.909E-01	3.145E-01	3.145E-01
U-238	2.424E+00	2.708E+00	2.708E+00
AM-243	6.366E-02	1.075E-01	1.075E-01
CM-247	6.324E-02	4.861E-02	4.861E-02
ANH-511	1.255E-01	7.010E-02	7.010E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	3.200E+00	9.087E+00	9.201E+00	NOT IDENT.
NA-22	2.212E-02	4.505E-02	4.614E-02	NOT IDENT.
NA-24	-1.000E+41	1.388E+41	0.000E+00	SHORT HLIF

AL-26	-3.505E-02	3.870E-02	4.180E-02	NOT IDENT.
SC-46	-3.425E-01	4.024E-01	4.310E-01	FAIL ABUN
V-48	4.727E+01	1.221E+04	1.221E+04	SHORT HLIF
CR-51	4.340E+01	3.083E+02	3.090E+02	SHORT HLIF
MN-54	7.283E-02	7.122E-02	7.842E-02	NOT IDENT.
CO-56	-9.726E-02	5.283E-01	5.301E-01	NOT IDENT.
MN-56	-1.000E+41	5.144E+41	0.000E+00	SHORT HLIF
CO-57	1.636E-02	4.904E-02	4.959E-02	NOT IDENT.
CO-58	-9.557E-02	4.462E-01	4.483E-01	NOT IDENT.
FE-59	8.441E+00	6.624E+00	7.639E+00	NOT IDENT.
CO-60	-1.242E-02	3.932E-02	3.971E-02	NOT IDENT.
ZN-65	7.991E-02	2.182E-01	2.212E-01	NOT IDENT.
GE-68	1.089E+00	1.922E+00	1.984E+00	NOT IDENT.
AS-73	1.684E+00	1.375E+01	1.377E+01	NOT IDENT.
AS-74	3.817E+02	4.651E+03	4.654E+03	SHORT HLIF
SE-75	-5.889E-02	1.904E-01	1.923E-01	FAIL ABUN
BR-77	2.973E+37	2.520E+38	0.000E+00	SHORT HLIF
SR-82	6.151E+02	3.823E+02	4.723E+02	SHORT HLIF
RB-83	5.872E-01	8.077E-01	8.500E-01	FAIL ABUN
KR-85	6.739E+00	6.698E+00	7.355E+00	NOT IDENT.
SR-85	6.637E-01	6.630E-01	7.274E-01	NOT IDENT.
RB-86	1.616E+04	1.787E+04	1.930E+04	SHORT HLIF
Y-88	-1.821E-01	1.967E-01	2.131E-01	NOT IDENT.
Y-91	-2.375E+02	5.231E+02	5.339E+02	NOT IDENT.
NB-94	1.326E-02	2.682E-02	2.748E-02	NOT IDENT.
NB-95	1.592E-01	8.433E-01	8.463E-01	NOT IDENT.
NB-95M	2.462E-01	2.407E+00	2.410E+00	NOT IDENT.
ZR-95	2.142E-01	1.564E+00	1.567E+00	NOT IDENT.
NB-97	1.000E+41	7.694E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	7.676E+41	0.000E+00	SHORT HLIF
MO-99	2.974E+31	3.905E+31	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	1.353E+41	0.000E+00	SHORT HLIF
RH-101	-4.416E-02	3.374E-02	3.917E-02	NOT IDENT.
RH-102	3.669E-02	6.006E-02	6.230E-02	NOT IDENT.
RU-103	-2.181E+00	5.052E+00	5.146E+00	FAIL ABUN
RH-106	-3.128E-02	4.938E-01	4.941E-01	NOT IDENT.
RU-106	-3.128E-02	4.938E-01	4.941E-01	NOT IDENT.
AG-108M	-4.664E-03	2.191E-02	2.201E-02	NOT IDENT.
AG-110M	5.776E-03	1.062E-01	1.062E-01	FAIL ABUN
SN-113	-1.233E-01	1.937E-01	2.015E-01	NOT IDENT.
CD-115	2.448E+38	4.696E+38	0.000E+00	SHORT HLIF
SN-117M	1.310E+04	7.518E+04	7.541E+04	SHORT HLIF
TE-123M	8.559E-02	1.298E-01	1.354E-01	NOT IDENT.
SB-124	-1.613E-01	2.258E+00	2.259E+00	NOT IDENT.
SB-125	9.090E-02	1.187E-01	1.256E-01	FAIL ABUN
I-126	-4.375E+05	6.646E+05	6.933E+05	SHORT HLIF
SB-126	-1.847E+05	8.117E+05	8.160E+05	SHORT HLIF
SB-127	-1.244E+21	7.820E+21	0.000E+00	SHORT HLIF
I-131	-1.666E+09	2.870E+09	2.967E+09	SHORT HLIF
I-132	-1.000E+41	1.814E+42	0.000E+00	SHORT HLIF
TE-132	-5.729E+25	1.145E+26	0.000E+00	SHORT HLIF
BA-133	4.348E-02	3.891E-02	4.357E-02	NOT IDENT.
I-133	1.000E+41	7.702E+41	0.000E+00	SHORT HLIF
CS-134	5.696E-02	1.010E-01	1.042E-01	FAIL ABUN
CS-135	4.569E-03	1.301E-01	1.301E-01	NOT IDENT.
I-135	1.000E+41	7.470E+41	0.000E+00	SHORT HLIF
CS-136	-1.183E+05	2.337E+05	2.397E+05	SHORT HLIF
BA-137M	2.924E-02	4.051E-02	4.260E-02	NOT IDENT.
CS-137	3.089E-02	4.279E-02	4.500E-02	NOT IDENT.
CE-139	-8.175E-02	1.116E-01	1.175E-01	NOT IDENT.
BA-140	1.573E+05	8.555E+05	8.584E+05	SHORT HLIF
LA-140	6.169E+04	3.004E+05	3.017E+05	SHORT HLIF
CE-143	1.000E+41	8.166E+40	0.000E+00	SHORT HLIF
CE-144	6.516E-02	3.306E-01	3.319E-01	NOT IDENT.
PM-144	1.627E-02	5.330E-02	5.380E-02	NOT IDENT.
PR-144	1.408E+00	4.615E+00	4.658E+00	NOT IDENT.
PM-146	-9.657E-03	4.266E-02	4.289E-02	FAIL ABUN
ND-147	-2.092E+07	2.388E+07	2.567E+07	SHORT HLIF
PM-147	3.574E+02	8.542E+02	8.693E+02	NOT IDENT.
PM-149	-1.286E+39	6.984E+39	0.000E+00	SHORT HLIF
EU-150	7.598E-03	2.569E-02	2.592E-02	FAIL ABUN
EU-152	-5.850E-03	1.064E-01	1.064E-01	NOT IDENT.
GD-153	7.267E-02	1.731E-01	1.761E-01	NOT IDENT.
EU-154	5.439E-02	1.108E-01	1.135E-01	NOT IDENT.
EU-155	1.034E-01	1.161E-01	1.251E-01	FAIL ABUN
TB-160	5.961E-01	1.754E+00	1.774E+00	FAIL ABUN
HO-166M	6.590E-02	7.208E-02	7.796E-02	FAIL ABUN
TM-171	-9.680E+00	3.580E+01	3.607E+01	FAIL ABUN

HF-172	1.058E-01	2.137E-01	2.190E-01	FAIL ABUN
LU-172	-4.453E-02	8.219E-02	8.460E-02	FAIL ABUN
LU-176	8.463E-03	2.023E-02	2.058E-02	FAIL ABUN
HF-181	-2.553E-01	3.431E+00	3.433E+00	NOT IDENT.
TA-182	2.742E-01	9.965E-01	1.004E+00	FAIL ABUN
RE-183	-5.749E-01	4.044E+00	4.052E+00	FAIL ABUN
RE-184	-8.429E+00	2.813E+01	2.838E+01	NOT IDENT.
W-188	-8.826E+01	1.093E+02	1.163E+02	FAIL ABUN
IR-192	1.715E-02	4.312E-01	4.313E-01	FAIL ABUN
HG-203	-6.890E-01	1.883E+00	1.908E+00	NOT IDENT.
BI-207	1.354E-02	5.154E-02	5.190E-02	FAIL ABUN
PB-210	2.430E+00	7.419E+00	7.499E+00	NOT IDENT.
BI-211	2.636E+00	5.186E-01	1.296E+00	FAIL ABUN
PB-211	1.031E+00	9.166E-01	1.028E+00	FAIL ABUN
BI-212	7.967E-01	1.071E+00	1.129E+00	FAIL ABUN
RA-223	2.211E-01	5.557E-01	5.646E-01	FAIL ABUN
AC-227	3.202E-02	2.304E-01	2.309E-01	FAIL ABUN
TH-227	3.202E-02	2.304E-01	2.309E-01	FAIL ABUN
TH-231	2.211E-01	5.557E-01	5.646E-01	FAIL ABUN
PA-233	9.428E-03	5.455E-02	5.471E-02	FAIL ABUN
PA-234	-5.251E-02	2.894E-01	2.904E-01	FAIL ABUN
PA-234M	9.446E+00	4.816E+00	6.428E+00	FAIL ABUN
NP-237	9.428E-03	5.455E-02	5.471E-02	FAIL ABUN
NP-238	1.001E+40	6.618E+40	0.000E+00	SHORT HLIF
NP-239	-1.518E-01	2.461E-01	2.555E-01	NOT IDENT.
PU-239	3.049E+02	2.956E+02	3.260E+02	NOT IDENT.
AM-241	1.400E-01	1.973E-01	2.072E-01	NOT IDENT.
CM-243	-4.340E-02	1.028E-01	1.046E-01	NOT IDENT.
BK-247	-5.989E-03	6.502E-02	6.508E-02	FAIL ABUN
CF-249	-8.936E-03	3.329E-02	3.353E-02	NOT IDENT.
CF-251	-8.984E-02	1.150E-01	1.220E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	55.5689	87.09	53.8617	136.47	61.2174
45.60	47.9465	87.57	53.9151	140.51	0.0000
46.54	49.8688	88.03	53.9656	143.76	69.4795
49.72	0.0000	88.34	53.9998	144.24	67.3556
51.35	60.5342	88.47	54.0139	145.44	66.7464
51.87	64.2452	89.96	54.1766	152.43	61.5482
52.39	55.2794	1093.63	54.2504	153.25	0.0000
52.97	47.2020	91.11	0.0000	323.87	67.2083
53.44	51.8100	92.59	54.4606	156.02	0.0000
54.07	58.2764	93.35	54.5420	158.56	0.0000
57.36	0.0000	94.56	42.6699	159.00	55.4504
57.53	58.8362	94.65	42.6774	162.33	66.8381
57.98	62.5892	94.67	42.6790	162.66	0.0000
59.27	52.6458	94.87	42.6956	163.33	54.6570
59.32	52.6528	97.43	48.2692	165.86	70.5078
59.54	59.1533	98.43	60.4509	176.31	46.5041
60.96	68.0330	98.44	60.4520	176.60	0.0000
61.17	68.0702	99.53	65.6244	177.52	64.7504
62.93	59.6769	100.11	65.6953	181.07	0.0000
63.29	59.7314	102.03	67.9584	181.52	66.9740
63.58	59.7755	103.18	69.1180	184.41	64.1553
64.28	59.8813	103.37	69.1424	143.76	64.2578
66.73	57.7368	105.21	60.1920	193.51	52.1157
67.24	54.0387	105.31	60.2028	197.03	58.1444
125.81	66.6775	106.12	70.8499	198.01	55.8816
67.75	66.6883	106.47	70.8943	201.83	56.1270
69.67	75.8466	109.28	65.7676	203.43	46.8573
70.83	66.5484	111.00	65.9658	205.31	51.6518
72.81	92.9632	111.76	0.0000	210.85	51.9707
72.87	92.9765	114.06	55.2616	215.65	52.2440
74.66	72.8967	116.30	0.0000	222.11	45.4329
74.82	72.9234	116.74	69.7383	227.09	54.0843
74.97	72.9483	119.76	70.0895	227.38	54.1008
77.11	73.3003	121.12	60.8099	228.16	0.0000
78.74	60.6591	121.22	60.8201	228.18	64.9753
79.69	55.6121	121.78	68.2224	116.74	64.9753
80.12	64.7257	122.06	63.0034	235.69	50.1189
80.19	0.0000	122.92	66.2458	235.96	50.1322
80.57	62.1973	123.07	65.2104	238.63	43.7816
81.00	60.9584	265.00	62.1163	238.98	0.0000
81.07	50.5900	125.81	49.6517	240.99	43.8849
81.75	61.0564	127.23	75.1742	242.00	43.9294
83.79	65.2359	127.91	78.4353	244.70	32.6274
84.00	70.4861	129.30	48.8631	252.40	0.0000
85.43	74.6246	131.20	67.1201	252.80	40.6961
86.55	51.1776	133.02	65.1709	254.15	0.0000
86.79	51.2026	133.52	53.4599	256.23	39.5928
86.94	51.2188	136.00	54.7346	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	36.1668	355.39	0.0000	584.27	13.9098
264.80	31.1829	356.01	17.4886	595.83	0.0000
265.00	31.1882	364.49	0.0000	427.87	18.6980
268.22	33.7838	366.42	0.0000	602.52	0.0000
269.46	32.5698	372.51	19.9702	604.72	20.2974
270.03	32.5865	375.05	31.8291	607.14	28.1371
271.23	27.6041	377.52	30.0627	609.32	18.7786
273.65	0.0000	356.01	30.1976	610.33	18.7874
276.40	35.2974	388.16	25.6997	614.28	17.2553
277.37	44.5807	388.63	0.0000	618.01	17.8100
277.60	44.5894	391.69	26.6825	620.36	18.8789
278.00	34.5062	264.66	26.8471	621.93	15.7446
279.20	37.0713	401.81	26.8677	630.19	0.0000
279.54	48.8809	402.40	26.8789	631.29	13.7067
279.70	50.5737	404.85	26.9232	633.25	22.1621
280.46	47.2340	410.95	23.4912	634.78	0.0000
283.69	42.2943	413.71	26.1492	635.95	14.7935
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	47.4414	423.72	0.0000	645.85	15.9241
285.90	0.0000	427.09	27.3214	657.76	22.4167
287.50	39.8905	427.87	28.2776	657.90	0.0000
290.67	44.6814	433.94	17.0328	661.66	19.2488
293.27	0.0000	439.40	26.5872	664.57	0.0000
351.93	35.8853	453.88	24.9124	666.33	0.0000
295.96	35.9083	463.37	20.2386	666.50	0.0000
879.38	15.4237	468.07	23.1958	667.71	0.0000
299.98	42.4655	473.00	0.0000	677.62	11.3101
300.09	42.4696	475.06	23.2930	685.70	0.0000
300.13	42.4706	476.78	18.4592	695.00	0.0000
301.36	46.3799	477.60	12.6361	696.49	14.1204
302.85	20.6392	482.18	17.5437	696.51	14.1209
256.23	38.7524	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	13.0391
306.78	24.1588	497.08	23.5947	697.49	14.1267
308.46	25.0564	505.52	16.2996	702.65	9.8020
311.90	31.1931	507.63	0.0000	706.68	9.8192
316.51	36.5295	511.00	15.8548	711.68	24.6011
319.41	0.0000	514.00	15.8815	720.70	0.0000
320.08	0.0000	514.00	15.8815	721.93	0.0000
321.04	30.5524	520.40	16.9343	722.78	8.2397
323.87	30.6222	520.69	0.0000	722.91	9.8881
325.23	42.9179	522.65	0.0000	723.31	9.8899
328.76	0.0000	527.90	0.0000	724.19	21.4360
333.37	34.3789	528.26	16.0072	727.33	13.2090
333.97	29.1033	529.59	17.0201	733.00	19.8611
334.37	34.4059	529.87	0.0000	735.93	17.6758
338.28	33.6257	531.02	0.0000	333.97	19.8984
338.32	33.6265	537.26	0.0000	739.50	0.0000
311.90	33.6829	546.56	0.0000	747.24	4.9949
340.48	33.6829	552.55	19.2582	748.06	9.9932
340.55	0.0000	563.25	22.4243	752.31	15.5723
344.28	37.3370	569.33	14.3150	753.82	0.0000
345.93	30.2633	946.00	14.3162	756.73	17.8294
351.06	33.9551	569.70	14.3179	756.80	17.8301
351.93	33.9767	583.19	23.6851	884.68	15.6469

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	16.7773	1274.44	7.2983	1620.50	3.2291
766.42	19.0185	1001.03	7.3098	1621.92	6.4603
766.84	16.1127	1002.74	8.7765	1678.03	0.0000
772.60	0.0000	1004.73	11.7098	1690.97	5.4636
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.5500
778.90	11.8061	1028.54	0.0000	1063.66	2.2214
783.70	0.0000	1037.84	12.9447	1771.35	1.1110
785.37	12.4005	1038.76	0.0000	1791.20	0.0000
792.07	10.1730	631.29	10.1984	1808.65	7.8348
794.95	13.5791	1048.07	0.0000	1810.72	0.0000
795.86	15.2820	1049.04	12.0621	1836.06	5.4015
810.06	12.5214	1050.41	14.8525		
810.29	12.5227	1063.66	12.1177		
344.28	9.1077	1077.00	0.0000		
810.76	9.1090	1077.34	5.6162		
815.77	0.0000	1085.87	11.2617		
1048.07	0.0000	1093.63	15.9925		
832.01	11.4795	1099.45	6.5967		
834.85	11.4917	1112.07	18.9197		
835.71	13.7949	1112.84	18.3827		
836.80	0.0000	1115.54	13.6362		
846.75	0.0000	1120.29	13.2762		
846.77	18.4701	1120.55	13.2771		
856.80	0.0000	1221.41	13.2797		
860.56	12.7635	1129.67	12.3621		
871.09	20.9663	1131.51	0.0000		
873.19	17.4854	1147.95	0.0000		
875.33	0.0000	1173.23	17.3353		
879.38	11.3913	1177.95	5.7861		
880.51	10.5194	1189.05	17.4133		
883.24	19.3044	1204.77	15.5469		
884.68	14.9248	1221.41	13.6667		
889.28	21.1055	1231.02	13.7026		
894.76	15.8604	1235.36	0.0000		
898.04	14.9964	1238.28	16.6721		
900.72	12.3619	1260.41	0.0000		
903.28	15.1507	1271.87	15.8350		
911.20	9.7492	1274.44	6.9325		
912.08	9.7522	1274.54	6.9325		
923.98	0.0000	1291.59	6.9641		
926.50	7.1284	1298.22	0.0000		
929.11	11.5940	1312.11	0.0000		
937.49	11.6277	1332.49	9.0500		
944.13	0.0000	1362.66	0.0000		
946.00	14.3530	1365.19	5.0696		
949.00	10.7758	1368.63	0.0000		
667.71	0.0000	1384.29	4.0752		
962.31	16.2367	1408.01	8.1982		
964.08	10.1090	1457.56	0.0000		
966.17	17.3420	1460.82	10.3796		
911.20	22.6021	1489.16	4.1797		
968.97	22.6021	1505.03	9.4389		
983.53	0.0000	1584.12	9.6103		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235064.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM02.CNF;493
Background date : 2-OCT-2016 11:00:01.
Sample date     : 14-DEC-2015 13:25:00 Acquisition date : 3-OCT-2016 05:44:14.
Sample ID      : G405235064 Sample quantity   : 1.74637E+02 GRAM
Detector name  : GAM02 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.40 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID      : 1596254 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.31*	47	136	1.09	126.12	123	8	1.30E-02	48.5	
2	3	69.84*	31	203	1.45	139.18	135	22	8.52E-03	85.4	1.69E+00
3	3	74.62*	111	182	1.33	148.73	135	22	3.09E-02	24.2	
4	3	77.01	151	160	1.47	153.51	135	22	4.19E-02	16.5	
5	0	84.14*	56	149	1.31	167.76	165	7	1.55E-02	39.7	
6	0	87.30	57	159	1.13	174.06	172	6	1.58E-02	37.3	
7	2	89.95	72	100	1.08	179.37	177	13	2.01E-02	21.1	3.86E+00
8	2	92.51*	97	159	1.37	184.48	177	13	2.69E-02	27.9	
9	0	128.68	33	132	0.62	256.75	252	8	9.11E-03	63.2	
10	0	185.97*	105	145	1.44	371.24	367	12	2.91E-02	26.4	
11	0	209.88	47	118	0.87	419.00	414	10	1.29E-02	46.3	
12	2	238.55*	398	75	1.44	476.30	469	19	1.10E-01	6.5	1.64E+00
13	2	241.65	114	92	1.65	482.49	469	19	3.18E-02	18.9	
14	0	269.89	26	99	1.25	538.93	536	8	7.13E-03	70.2	
15	0	276.36	25	108	3.45	551.85	547	11	6.97E-03	82.4	
16	0	294.95	168	93	1.20	589.00	582	13	4.67E-02	14.2	
17	0	299.94	61	42	2.83	598.97	595	8	1.69E-02	22.5	
18	0	315.18	13	55	2.17	629.42	624	8	3.63E-03	101.4	
19	0	338.30*	70	89	1.01	675.63	670	12	1.95E-02	29.9	
20	0	351.90*	290	62	1.33	702.80	696	15	8.07E-02	8.5	
21	0	403.01	12	51	1.34	804.94	799	10	3.40E-03	112.0	
22	0	438.14	14	29	1.83	875.14	871	8	4.00E-03	69.1	
23	0	511.01*	34	55	1.73	1020.76	1014	13	9.44E-03	56.1	
24	0	528.15	18	30	3.38	1055.03	1049	11	4.88E-03	65.2	
25	0	583.31*	121	31	1.36	1165.26	1157	16	3.36E-02	14.1	
26	0	597.29*	10	28	1.89	1193.20	1185	10	2.84E-03	107.0	
27	0	609.23*	204	26	1.71	1217.06	1212	12	5.67E-02	8.8	
28	0	726.96	56	26	1.16	1452.34	1446	12	1.55E-02	23.0	
29	0	793.58	39	12	4.48	1585.49	1579	12	1.08E-02	23.9	
30	0	835.02	18	9	1.57	1668.29	1665	8	5.06E-03	36.0	
31	0	838.66	12	8	0.57	1675.58	1672	8	3.33E-03	50.0	
32	0	859.44*	20	24	0.96	1717.11	1710	14	5.45E-03	58.9	
33	0	911.40*	81	17	1.69	1820.94	1814	15	2.24E-02	16.6	
34	0	953.87	14	13	2.61	1905.84	1900	12	3.94E-03	56.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	969.35*	39	32	1.51	1936.78	1929	14	1.09E-02	35.9	
36	0	1003.26	33	9	1.70	2004.55	1997	18	9.17E-03	27.5	
37	0	1058.18	12	8	1.80	2114.32	2110	9	3.35E-03	52.6	
38	0	1074.10	17	13	3.21	2146.13	2139	14	4.76E-03	51.9	
39	0	1087.17	8	13	0.74	2172.26	2163	11	2.12E-03	100.3	
40	0	1119.91*	64	10	2.42	2237.70	2230	14	1.78E-02	17.0	
41	0	1125.22	18	7	2.73	2248.31	2244	10	5.00E-03	36.7	
42	0	1232.75	9	14	0.90	2463.23	2457	10	2.49E-03	86.8	
43	0	1334.41	9	7	3.85	2666.45	2661	12	2.60E-03	62.2	
44	0	1379.13	12	17	2.96	2755.82	2748	14	3.32E-03	79.5	
45	0	1460.70*	341	11	1.94	2918.88	2911	15	9.47E-02	5.9	
46	0	1589.05	9	6	1.46	3175.44	3166	11	2.43E-03	62.8	
47	0	1764.11*	36	0	2.29	3525.39	3518	13	9.98E-03	18.8	
48	0	1847.41	11	0	1.24	3691.91	3687	9	3.06E-03	30.2	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235064.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 14-DEC-2015 13:25:00 Acquisition date : 3-OCT-2016 05:44:14
Sample ID        : G405235064 Sample quantity   : 174.64 GRAM
Sample type      : SOLID Sample geometry    :
Detector name    : GAMMA2 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.40 0.0%
Energy tolerance : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error    : 0.00 %
Efficiency type  : Linear Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.059E+00	1.272E+01	1.272E+01	11.85	OK
MN-54	834.85	99.98*	1.673E+00	4.977E-02	9.556E-02	71.97	OK
CD-109	88.03	3.70*	4.852E+00	8.019E-01	1.247E+00	182.02	OK
SN-126	64.28	9.60	2.482E+00	1.218E+00	1.218E+00	97.07	OK
	86.94	8.90	4.852E+00	3.334E-01	3.334E-01	182.02	OK
	87.57	37.00*	4.852E+00	8.019E-02	8.019E-02	182.02	OK
TL-208	277.37	6.60	4.186E+00	4.795E-01	4.795E-01	164.82	OK
	583.19	85.00*	2.233E+00	3.057E-01	3.057E-01	28.18	OK
	860.56	12.50	1.635E+00	4.371E-01	4.371E-01	117.87	OK
BI-211	72.87	1.23	3.574E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.417E+00	5.100E-02	5.100E-02	2158.25	OK
PB-212	74.82	10.28	3.755E+00	1.086E+00	1.086E+00	80.71	OK
	77.11	17.10	3.991E+00	1.347E+00	1.347E+00	33.05	OK
	238.63	43.60*	4.702E+00	1.042E+00	1.042E+00	13.04	OK
	300.09	3.30	3.912E+00	2.461E+00	2.461E+00	44.99	OK
BI-214	609.32	45.49*	2.155E+00	9.933E-01	9.937E-01	17.59	OK
	1120.29	14.92	1.323E+00	1.424E+00	1.425E+00	34.02	OK
	1764.49	15.30	8.933E-01	1.075E+00	1.075E+00	37.62	OK
PB-214	74.82	5.80	3.775E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.991E+00	2.375E+00	2.375E+00	33.05	OK
	87.09	3.41	4.837E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.651E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.967E+00	1.204E+00	1.205E+00	28.34	OK
	351.93	35.60*	3.416E+00	----- Line	Not Found	-----	<<INT Reject
RN-219	271.23	10.80	4.267E+00	2.947E-01	2.947E-01	140.49	OK
	401.81	6.60*	3.043E+00	3.069E-01	3.069E-01	224.08	OK
RN-222	609.32	45.49*	2.155E+00	9.933E-01	9.937E-01	17.59	OK
	1120.29	14.92	1.323E+00	1.424E+00	1.425E+00	34.02	OK
	1764.49	15.30	8.933E-01	1.075E+00	1.075E+00	37.62	OK
RA-224	240.99	4.10*	4.656E+00	1.086E+00	1.086E+00	125.05	OK
RA-226	609.32	45.49*	2.155E+00	9.933E-01	9.937E-01	17.59	OK
	1120.29	14.92	1.323E+00	1.424E+00	1.425E+00	34.02	OK
	1764.49	15.30	8.933E-01	1.075E+00	1.075E+00	37.62	OK
AC-228	105.21	1.10	5.776E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.533E+00	9.078E-01	9.078E-01	59.76	OK
	794.95	4.25	1.742E+00	2.423E+00	2.423E+00	47.83	OK
	835.71	1.61	1.673E+00	3.090E+00	3.090E+00	71.97	OK
	911.20	25.80*	1.561E+00	9.028E-01	9.028E-01	33.11	OK
	968.97	15.80	1.486E+00	7.497E-01	7.497E-01	71.73	OK
RA-228	105.21	1.10	5.776E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.533E+00	9.078E-01	9.078E-01	59.76	OK
	794.95	4.25	1.742E+00	2.423E+00	2.423E+00	47.83	OK
	835.71	1.61	1.673E+00	3.090E+00	3.090E+00	71.97	OK
	911.20	25.80*	1.561E+00	9.028E-01	9.028E-01	33.11	OK
	968.97	15.80	1.486E+00	7.497E-01	7.497E-01	71.73	OK
TH-228	74.82	10.28	3.755E+00	1.086E+00	1.086E+00	80.71	OK
	77.11	17.10	3.991E+00	1.347E+00	1.347E+00	33.05	OK
	238.63	43.60*	4.702E+00	1.042E+00	1.042E+00	13.04	OK
	300.09	3.30	3.912E+00	2.461E+00	2.461E+00	44.99	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-229	85.43	14.70	4.615E+00	4.966E-01	4.967E-01	79.31	OK
	88.47	24.00	4.852E+00	1.236E-01	1.236E-01	182.02	OK
	193.51	4.41*	5.427E+00	-----	Line Not Found	-----	Absent
TH-230	210.85	2.80	5.154E+00	1.760E+00	1.760E+00	92.62	OK
	609.32	45.49*	2.155E+00	9.933E-01	9.933E-01	17.59	OK
	1120.29	14.92	1.323E+00	1.424E+00	1.424E+00	34.02	OK
PA-231	1764.49	15.30	8.933E-01	1.075E+00	1.075E+00	37.62	OK
	283.69	1.70	4.097E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	3.912E+00	1.518E+00	1.518E+00	44.99	OK
TH-232	105.21	1.10	5.776E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.533E+00	9.078E-01	9.078E-01	59.76	OK
	835.71	1.61	1.673E+00	3.090E+00	3.090E+00	71.97	OK
TH-234	911.20	25.80*	1.561E+00	9.028E-01	9.028E-01	33.11	OK
	968.97	15.80	1.486E+00	7.497E-01	7.497E-01	71.73	OK
	63.29	3.70*	2.482E+00	3.160E+00	3.160E+00	97.07	OK
U-234	92.59	4.23	5.192E+00	2.639E+00	2.639E+00	55.72	OK
	609.32	45.49*	2.155E+00	9.933E-01	9.933E-01	17.59	OK
	1120.29	14.92	1.323E+00	1.424E+00	1.424E+00	34.02	OK
U-235	1764.49	15.30	8.933E-01	1.075E+00	1.075E+00	37.62	OK
	89.96	3.47	5.033E+00	2.479E+00	2.479E+00	42.11	OK
	93.35	5.60	5.192E+00	1.994E+00	1.994E+00	55.72	OK
U-238	143.76	10.96*	6.127E+00	-----	Line Not Found	-----	Absent
	163.33	5.08	5.908E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	5.554E+00	1.823E-01	1.823E-01	52.89	OK
AM-243	205.31	5.01	5.230E+00	-----	Line Not Found	-----	Absent
	63.29	3.70*	2.482E+00	3.160E+00	3.160E+00	97.07	OK
	92.59	4.23	5.192E+00	2.639E+00	2.639E+00	55.72	OK
CM-247	43.53	5.90	2.878E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	3.755E+00	1.661E-01	1.661E-01	80.71	OK
	278.00	3.40	4.166E+00	-----	Line Not Found	-----	Absent
ANH-511	287.50	2.00	4.052E+00	-----	Line Not Found	-----	Absent
	402.40	72.00*	3.043E+00	2.813E-02	2.813E-02	224.08	OK
	511.00	100.00*	2.490E+00	6.665E-02	6.665E-02	112.29	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235064.CNF;1 *
 * Acquisition date : 3-OCT-2016 05:44:14 Sensitivity : 3.000 *
 * Detector ID : GAM02 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.40 Half life ratio : ***** *
 * Sample date : 14-DEC-2015 13:25:00 Analyst initials: MXR1 *
 * Sample ID : G405235064 Sample Quantity : 1.7464E+02 GRAM *
 * Batch Number : 1596254 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 22-AUG-2016 09:02:05 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;15 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.272E+01	1.477E+00	7.189E-01
MN-54	9.556E-02	6.740E-02	1.149E-01
CD-109	1.247E+00	2.224E+00	1.967E+00
SN-126	8.019E-02	1.430E-01	1.508E-01
TL-208	3.057E-01	8.443E-02	5.768E-02
BI-211	5.100E-02	1.079E+00	3.163E-01
PB-212	1.042E+00	1.331E-01	8.452E-02
BI-214	9.937E-01	1.713E-01	1.291E-01
PB-214	1.223E+00	2.035E-01	3.143E-01
RN-219	3.069E-01	6.739E-01	6.562E-01
RN-222	9.937E-01	1.713E-01	1.291E-01
RA-224	1.086E+00	1.331E+00	9.062E-01
RA-226	9.937E-01	1.713E-01	1.291E-01
AC-228	9.028E-01	2.929E-01	2.437E-01
RA-228	9.028E-01	2.929E-01	2.437E-01
TH-228	1.042E+00	1.331E-01	8.452E-02
TH-229	1.250E-01	4.421E-01	9.032E-01
TH-230	9.933E-01	1.713E-01	1.291E-01
PA-231	1.518E+00	6.692E-01	7.117E-01
TH-232	9.028E-01	2.929E-01	2.437E-01
TH-234	3.160E+00	3.006E+00	2.481E+00
U-234	9.933E-01	1.713E-01	1.291E-01
U-235	-7.491E-02	1.838E-01	3.330E-01
U-238	3.160E+00	3.006E+00	2.481E+00
AM-243	1.661E-01	1.314E-01	9.466E-02
CM-247	2.813E-02	6.177E-02	6.023E-02
ANH-511	6.665E-02	7.334E-02	5.493E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.088E+01		1.085E+01	2.334E+01	NOT IDENT.
NA-22	-1.702E-02		4.001E-02	7.256E-02	NOT IDENT.
NA-24	0.000E+00		1.251E+41	0.000E+00	SHORT HLIF

AL-26	-9.232E-03	2.320E-02	4.616E-02	NOT IDENT.
SC-46	-1.475E-02	3.957E-01	7.508E-01	FAIL ABUN
V-48	0.000E+00	1.085E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	3.364E+02	0.000E+00	SHORT HLIF
CO-56	-2.600E-01	3.995E-01	7.243E-01	NOT IDENT.
MN-56	0.000E+00	1.518E+41	0.000E+00	SHORT HLIF
CO-57	-6.523E-03	4.895E-02	9.082E-02	NOT IDENT.
CO-58	3.314E-01	5.276E-01	1.143E+00	NOT IDENT.
FE-59	-1.219E+00	6.200E+00	1.175E+01	NOT IDENT.
CO-60	2.207E-02	3.626E-02	7.555E-02	NOT IDENT.
ZN-65	4.758E-02	1.785E-01	3.255E-01	NOT IDENT.
GE-68	-1.153E+00	2.337E+00	3.562E+00	NOT IDENT.
AS-73	-1.207E+01	1.115E+01	2.043E+01	NOT IDENT.
AS-74	0.000E+00	7.512E+03	0.000E+00	SHORT HLIF
SE-75	-2.044E-01	1.851E-01	3.319E-01	NOT IDENT.
BR-77	0.000E+00	3.984E+36	0.000E+00	SHORT HLIF
SR-82	0.000E+00	5.435E+02	0.000E+00	SHORT HLIF
RB-83	-1.391E-01	5.710E-01	1.064E+00	FAIL ABUN
KR-85	6.033E+00	7.159E+00	1.380E+01	NOT IDENT.
SR-85	5.946E-01	7.088E-01	1.366E+00	NOT IDENT.
RB-86	0.000E+00	2.096E+04	0.000E+00	SHORT HLIF
Y-88	-9.246E-02	1.747E-01	3.255E-01	NOT IDENT.
Y-91	-9.496E+01	5.123E+02	9.572E+02	NOT IDENT.
NB-94	3.664E-03	2.747E-02	5.653E-02	NOT IDENT.
NB-95	-8.729E-01	8.362E-01	1.457E+00	NOT IDENT.
NB-95M	2.955E-01	2.090E+00	3.799E+00	NOT IDENT.
ZR-95	8.121E-01	1.261E+00	2.744E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.404E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	3.338E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.122E+41	0.000E+00	SHORT HLIF
RH-101	5.339E-02	6.611E-02	5.970E-02	FAIL ABUN
RH-102	4.409E-02	5.775E-02	1.210E-01	NOT IDENT.
RU-103	3.718E+00	4.577E+00	9.788E+00	FAIL ABUN
RH-106	-4.159E-01	5.380E-01	9.006E-01	NOT IDENT.
RU-106	-4.159E-01	5.380E-01	9.006E-01	NOT IDENT.
AG-108M	5.923E-04	2.712E-02	4.742E-02	NOT IDENT.
AG-110M	8.109E-02	9.835E-02	2.165E-01	NOT IDENT.
SN-113	-1.032E-01	2.043E-01	3.756E-01	NOT IDENT.
CD-115	0.000E+00	8.051E+38	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	6.476E+04	0.000E+00	SHORT HLIF
TE-123M	4.731E-02	1.162E-01	2.425E-01	NOT IDENT.
SB-124	-2.392E-01	1.213E+00	2.681E+00	NOT IDENT.
SB-125	-3.662E-02	9.281E-02	1.719E-01	NOT IDENT.
TE-125M	-2.925E+02	2.589E+02	4.455E+02	NOT IDENT.
I-126	0.000E+00	6.235E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	7.780E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	6.450E+21	0.000E+00	SHORT HLIF
I-131	0.000E+00	2.725E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	9.878E+25	0.000E+00	SHORT HLIF
BA-133	-1.518E-02	4.015E-02	6.663E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	4.298E-02	5.356E-02	1.068E-01	NOT IDENT.
CS-135	1.528E-01	1.562E-01	3.015E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.031E+05	0.000E+00	SHORT HLIF
BA-137M	-3.502E-03	3.806E-02	7.222E-02	NOT IDENT.
CS-137	-3.700E-03	4.021E-02	7.629E-02	NOT IDENT.
CE-139	-4.424E-03	1.005E-01	2.034E-01	NOT IDENT.
BA-140	0.000E+00	9.511E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	2.471E+05	0.000E+00	SHORT HLIF
CE-141	7.282E-01	2.150E+01	3.986E+01	NOT IDENT.
CE-143	0.000E+00	5.038E+40	0.000E+00	SHORT HLIF
CE-144	-1.791E-01	3.233E-01	5.761E-01	NOT IDENT.
PM-144	-1.047E-02	4.936E-02	9.708E-02	NOT IDENT.
PR-144	-9.336E-01	4.269E+00	8.391E+00	NOT IDENT.
PM-146	1.112E-02	4.142E-02	8.249E-02	NOT IDENT.
ND-147	0.000E+00	2.362E+07	0.000E+00	SHORT HLIF
PM-147	6.477E+02	8.134E+02	1.625E+03	NOT IDENT.
PM-149	0.000E+00	6.019E+39	0.000E+00	SHORT HLIF
EU-150	4.356E-03	2.689E-02	4.795E-02	FAIL ABUN
EU-152	2.032E-02	8.833E-02	1.763E-01	FAIL ABUN
GD-153	3.802E-02	1.813E-01	3.527E-01	FAIL ABUN
EU-154	-3.965E-02	9.886E-02	1.803E-01	FAIL ABUN
EU-155	-7.531E-03	1.115E-01	2.103E-01	FAIL ABUN
TB-160	6.434E-01	1.659E+00	3.503E+00	FAIL ABUN
HO-166M	4.141E-02	5.548E-02	1.204E-01	NOT IDENT.

TM-171	-3.264E+00	2.766E+01	5.478E+01	NOT IDENT.
HF-172	-3.543E-02	2.395E-01	4.074E-01	FAIL ABUN
LU-172	4.526E-02	7.501E-02	1.603E-01	FAIL ABUN
LU-176	3.419E-03	2.244E-02	4.478E-02	FAIL ABUN
HF-181	1.829E+00	3.811E+00	7.745E+00	NOT IDENT.
TA-182	-1.155E-01	8.680E-01	1.641E+00	FAIL ABUN
RE-183	-1.869E+00	3.170E+00	6.016E+00	NOT IDENT.
RE-184	2.810E+01	2.895E+01	6.354E+01	NOT IDENT.
W-188	-2.330E+01	1.129E+02	1.943E+02	FAIL ABUN
IR-192	3.450E-01	6.857E-01	7.965E-01	FAIL ABUN
HG-203	-6.008E-01	2.439E+00	4.185E+00	FAIL ABUN
BI-207	-2.806E-02	4.443E-02	7.019E-02	FAIL ABUN
PB-210	1.929E+00	5.088E+00	1.041E+01	NOT IDENT.
PB-211	5.414E-02	6.578E-01	1.161E+00	NOT IDENT.
BI-212	0.000E+00	9.352E-01	1.426E+00	FAIL ABUN
RA-223	-1.002E-01	5.604E-01	1.079E+00	FAIL ABUN
AC-227	-3.852E-02	2.002E-01	3.924E-01	FAIL ABUN
TH-227	-3.852E-02	2.002E-01	3.924E-01	FAIL ABUN
TH-231	-1.002E-01	5.604E-01	1.079E+00	FAIL ABUN
PA-233	-1.392E-02	5.856E-02	1.013E-01	FAIL ABUN
PA-234	7.504E-02	2.552E-01	5.316E-01	NOT IDENT.
PA-234M	-9.695E-02	4.935E+00	9.043E+00	NOT IDENT.
NP-237	-1.392E-02	5.856E-02	1.013E-01	FAIL ABUN
NP-238	0.000E+00	6.697E+40	0.000E+00	SHORT HLIF
NP-239	-9.472E-02	2.333E-01	4.260E-01	FAIL ABUN
PU-239	4.859E+02	6.018E+02	6.403E+02	FAIL ABUN
AM-241	9.787E-02	1.635E-01	3.158E-01	NOT IDENT.
CM-243	-2.158E-02	9.944E-02	1.860E-01	FAIL ABUN
BK-247	-8.514E-02	6.822E-02	1.207E-01	FAIL ABUN
CF-249	3.085E-02	3.463E-02	7.356E-02	NOT IDENT.
CF-251	-5.730E-03	1.044E-01	2.106E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	334	10.66*	1.059E+00	1.272E+01	1.272E+01	11.85
MN-54	834.85	19	99.98*	1.673E+00	4.977E-02	9.556E-02	71.97
CD-109	88.03	80	3.70*	4.852E+00	1.912E+00	2.972E+00	74.55
SN-126	64.28	68	9.60	2.482E+00	1.218E+00	1.218E+00	97.07
	86.94	80	8.90	4.852E+00	7.949E-01	7.949E-01	74.55
	87.57	80	37.00*	4.852E+00	1.912E-01	1.912E-01	74.55
TL-208	277.37	31	6.60	4.186E+00	4.795E-01	4.795E-01	164.82
	583.19	135	85.00*	2.233E+00	3.057E-01	3.057E-01	28.18
	860.56	21	12.50	1.635E+00	4.371E-01	4.371E-01	117.87
BI-211	72.87	-----	1.23	3.574E+00	-----	Line Not Found	-----
	351.06	346	12.92*	3.417E+00	3.370E+00	3.370E+00	16.97
PB-212	74.82	158	10.28	3.755E+00	1.765E+00	1.765E+00	48.42
	77.11	214	17.10	3.991E+00	1.347E+00	1.347E+00	33.05
	238.63	497	43.60*	4.702E+00	1.042E+00	1.042E+00	13.04
	300.09	74	3.30	3.912E+00	2.461E+00	2.461E+00	44.99
BI-214	609.32	226	45.49*	2.155E+00	9.933E-01	9.937E-01	17.59
	1120.29	65	14.92	1.323E+00	1.424E+00	1.425E+00	34.02
	1764.49	34	15.30	8.933E-01	1.075E+00	1.075E+00	37.62
PB-214	74.82	158	5.80	3.755E+00	3.128E+00	3.130E+00	48.42
	77.11	214	9.70	3.991E+00	2.375E+00	2.375E+00	33.05
	87.09	80	3.41	4.852E+00	2.075E+00	2.075E+00	74.55
	242.00	143	7.25	4.656E+00	1.819E+00	1.819E+00	37.83
	295.22	205	18.42	3.967E+00	1.204E+00	1.205E+00	28.34
	351.93	346	35.60*	3.417E+00	1.223E+00	1.223E+00	16.97
RN-219	271.23	32	10.80	4.267E+00	2.947E-01	2.947E-01	140.49
	401.81	14	6.60*	3.043E+00	3.069E-01	3.069E-01	224.08
RN-222	609.32	226	45.49*	2.155E+00	9.933E-01	9.937E-01	17.59
	1120.29	65	14.92	1.323E+00	1.424E+00	1.425E+00	34.02
	1764.49	34	15.30	8.933E-01	1.075E+00	1.075E+00	37.62
RA-224	240.99	143	4.10*	4.656E+00	3.216E+00	3.216E+00	37.83
RA-226	609.32	226	45.49*	2.155E+00	9.933E-01	9.937E-01	17.59
	1120.29	65	14.92	1.323E+00	1.424E+00	1.425E+00	34.02
	1764.49	34	15.30	8.933E-01	1.075E+00	1.075E+00	37.62
AC-228	105.21	-----	1.10	5.776E+00	-----	Line Not Found	-----
	338.32	84	11.27	3.533E+00	9.078E-01	9.078E-01	59.76
	794.95	42	4.25	1.742E+00	2.423E+00	2.423E+00	47.83
	835.71	19	1.61	1.673E+00	3.090E+00	3.090E+00	71.97
	911.20	85	25.80*	1.561E+00	9.028E-01	9.028E-01	33.11
	968.97	41	15.80	1.486E+00	7.497E-01	7.497E-01	71.73
RA-228	105.21	-----	1.10	5.776E+00	-----	Line Not Found	-----
	338.32	84	11.27	3.533E+00	9.078E-01	9.078E-01	59.76
	794.95	42	4.25	1.742E+00	2.423E+00	2.423E+00	47.83
	835.71	19	1.61	1.673E+00	3.090E+00	3.090E+00	71.97
	911.20	85	25.80*	1.561E+00	9.028E-01	9.028E-01	33.11
	968.97	41	15.80	1.486E+00	7.497E-01	7.497E-01	71.73
TH-228	74.82	158	10.28	3.755E+00	1.765E+00	1.765E+00	48.42
	77.11	214	17.10	3.991E+00	1.347E+00	1.347E+00	33.05

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	238.63	497	43.60*	4.702E+00	1.042E+00	1.042E+00	13.04
	300.09	74	3.30	3.912E+00	2.461E+00	2.461E+00	44.99
TH-229	85.43	78	14.70	4.615E+00	4.966E-01	4.967E-01	79.31
	88.47	80	24.00	4.852E+00	2.948E-01	2.948E-01	74.55
	193.51	-----	4.41*	5.427E+00	-----	Line Not Found	-----
	210.85	59	2.80	5.154E+00	1.760E+00	1.760E+00	92.62
TH-230	609.32	226	45.49*	2.155E+00	9.933E-01	9.933E-01	17.59
	1120.29	65	14.92	1.323E+00	1.424E+00	1.424E+00	34.02
	1764.49	34	15.30	8.933E-01	1.075E+00	1.075E+00	37.62
PA-231	283.69	-----	1.70	4.097E+00	-----	Line Not Found	-----
	301.36	74	5.35*	3.912E+00	1.518E+00	1.518E+00	44.99
TH-232	105.21	-----	1.10	5.776E+00	-----	Line Not Found	-----
	338.32	84	11.27	3.533E+00	9.078E-01	9.078E-01	59.76
	835.71	19	1.61	1.673E+00	3.090E+00	3.090E+00	71.97
	911.20	85	25.80*	1.561E+00	9.028E-01	9.028E-01	33.11
	968.97	41	15.80	1.486E+00	7.497E-01	7.497E-01	71.73
TH-234	63.29	68	3.70*	2.482E+00	3.160E+00	3.160E+00	97.07
	92.59	135	4.23	5.192E+00	2.639E+00	2.639E+00	55.72
U-234	609.32	226	45.49*	2.155E+00	9.933E-01	9.933E-01	17.59
	1120.29	65	14.92	1.323E+00	1.424E+00	1.424E+00	34.02
	1764.49	34	15.30	8.933E-01	1.075E+00	1.075E+00	37.62
U-235	89.96	101	3.47	5.033E+00	2.479E+00	2.479E+00	42.11
	93.35	135	5.60	5.192E+00	1.994E+00	1.994E+00	55.72
	143.76	-----	10.96*	6.127E+00	-----	Line Not Found	-----
	163.33	-----	5.08	5.908E+00	-----	Line Not Found	-----
	185.72	135	57.20	5.554E+00	1.823E-01	1.823E-01	52.89
	205.31	-----	5.01	5.230E+00	-----	Line Not Found	-----
U-238	63.29	68	3.70*	2.482E+00	3.160E+00	3.160E+00	97.07
	92.59	135	4.23	5.192E+00	2.639E+00	2.639E+00	55.72
AM-243	43.53	-----	5.90	2.878E-01	-----	Line Not Found	-----
	74.66	158	67.20*	3.755E+00	2.700E-01	2.700E-01	48.42
CM-247	278.00	-----	3.40	4.166E+00	-----	Line Not Found	-----
	287.50	-----	2.00	4.052E+00	-----	Line Not Found	-----
	402.40	14	72.00*	3.043E+00	2.813E-02	2.813E-02	224.08
ANH-511	511.00	39	100.00*	2.490E+00	6.665E-02	6.665E-02	112.29

Flag: "*" = Keyline

Total number of lines in spectrum 48
 Number of unidentified lines 9
 Number of lines tentatively identified by NID 39 81.25%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.272E+01	1.272E+01	0.151E+01	11.85	
MN-54	312.05D	1.92	4.977E-02	9.556E-02	6.877E-02	71.97	
CD-109	461.40D	1.55	1.912E+00	2.972E+00	2.216E+00	74.55	
SN-126	2.30E+05Y	1.00	1.912E-01	1.912E-01	1.425E-01	74.55	
TL-208	1.41E+10Y	1.00	3.057E-01	3.057E-01	0.862E-01	28.18	
BI-211	7.04E+08Y	1.00	3.370E+00	3.370E+00	0.572E+00	16.97	
PB-212	1.41E+10Y	1.00	1.042E+00	1.042E+00	0.136E+00	13.04	
BI-214	1600.00Y	1.00	9.933E-01	9.937E-01	1.748E-01	17.59	
PB-214	1600.00Y	1.00	1.223E+00	1.223E+00	0.208E+00	16.97	
RN-219	7.04E+08Y	1.00	3.069E-01	3.069E-01	6.876E-01	224.08	
RN-222	1600.00Y	1.00	9.933E-01	9.937E-01	1.748E-01	17.59	
RA-224	1.41E+10Y	1.00	3.216E+00	3.216E+00	1.216E+00	37.83	
RA-226	1600.00Y	1.00	9.933E-01	9.937E-01	1.748E-01	17.59	
AC-228	1.41E+10Y	1.00	9.028E-01	9.028E-01	2.989E-01	33.11	
RA-228	1.41E+10Y	1.00	9.028E-01	9.028E-01	2.989E-01	33.11	
TH-228	1.41E+10Y	1.00	1.042E+00	1.042E+00	0.136E+00	13.04	
TH-229	7340.00Y	1.00	2.948E-01	2.948E-01	2.198E-01	74.55	K
TH-230	7.54E+04Y	1.00	9.933E-01	9.933E-01	1.748E-01	17.59	
PA-231	7.04E+08Y	1.00	1.518E+00	1.518E+00	0.683E+00	44.99	
TH-232	1.41E+10Y	1.00	9.028E-01	9.028E-01	2.989E-01	33.11	
TH-234	4.47E+09Y	1.00	3.160E+00	3.160E+00	3.068E+00	97.07	
U-234	2.45E+05Y	1.00	9.933E-01	9.933E-01	1.748E-01	17.59	
U-235	7.04E+08Y	1.00	1.823E-01	1.823E-01	0.964E-01	52.89	K
U-238	4.47E+09Y	1.00	3.160E+00	3.160E+00	3.068E+00	97.07	
AM-243	7370.00Y	1.00	2.700E-01	2.700E-01	1.308E-01	48.42	
CM-247	1.56E+07Y	1.00	2.813E-02	2.813E-02	6.303E-02	224.08	
ANH-511	1.00E+09Y	1.00	6.665E-02	6.665E-02	7.484E-02	112.29	
Total Activity :			4.173E+01	4.284E+01			

Grand Total Activity : 4.173E+01 4.284E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
3	69.84	44	291	1.45	139.18	135	22	8.52E-03	****	3.25E+00	T
0	128.68	44	177	0.62	256.75	252	8	9.11E-03	****	6.17E+00	T
0	315.18	16	66	2.17	629.42	624	8	3.63E-03	****	3.75E+00	T
0	438.14	17	33	1.83	875.14	871	8	4.00E-03	****	2.83E+00	T
0	528.15	20	34	3.38	1055.03	1049	11	4.88E-03	****	2.42E+00	T
0	597.29	11	31	1.89	1193.20	1185	10	2.84E-03	****	2.19E+00	T
0	726.96	60	29	1.16	1452.34	1446	12	1.55E-02	45.9	1.87E+00	T
0	838.66	13	8	0.57	1675.58	1672	8	3.33E-03	****	1.67E+00	T
0	953.87	15	13	2.61	1905.84	1900	12	3.94E-03	****	1.51E+00	T
0	1003.26	34	9	1.70	2004.55	1997	18	9.17E-03	55.0	1.45E+00	T
0	1058.18	12	8	1.80	2114.32	2110	9	3.35E-03	****	1.39E+00	T
0	1074.10	18	13	3.21	2146.13	2139	14	4.76E-03	****	1.37E+00	T
0	1087.17	8	14	0.74	2172.26	2163	11	2.12E-03	****	1.36E+00	T
0	1125.22	18	7	2.73	2248.31	2244	10	5.00E-03	73.5	1.32E+00	T
0	1232.75	9	14	0.90	2463.23	2457	10	2.49E-03	****	1.22E+00	T
0	1334.41	9	7	3.85	2666.45	2661	12	2.60E-03	****	1.14E+00	T
0	1379.13	12	17	2.96	2755.82	2748	14	3.32E-03	****	1.11E+00	T
0	1589.05	8	6	1.46	3175.44	3166	11	2.43E-03	****	9.83E-01	T
0	1847.41	10	0	1.24	3691.91	3687	9	3.06E-03	60.3	8.55E-01	T

Flags: "T" = Tentatively associated

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235064.CNF;1
* Acquisition date   : 3-OCT-2016 05:44:14 Sensitivity      : 3.000
* Detector ID       : GAM02 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.40 Half life ratio : *****
* Sample date       : 14-DEC-2015 13:25:00 Nuclide Library : SOLID
* Sample ID         : G405235064 Analyst initials: MXR1
* Batch Number      : 1596254 Sample Quantity : 1.7464E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 22-AUG-2016 09:02:05 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;15
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	3.073E-01
MN-54	5.055E-02
CD-109	9.283E-01
SN-126	7.183E-02
TL-208	2.564E-02
BI-211	1.442E-01
PB-212	3.922E-02
BI-214	5.837E-02
PB-214	1.522E-01
RN-219	2.976E-01
RN-222	5.837E-02
RA-224	4.205E-01
RA-226	5.837E-02
AC-228	1.070E-01
RA-228	1.070E-01
TH-228	3.922E-02
TH-229	4.254E-01
TH-230	5.835E-02
PA-231	3.261E-01
TH-232	1.070E-01
TH-234	1.170E+00
U-234	5.835E-02
U-235	1.571E-01
U-238	1.170E+00
AM-243	4.477E-02
CM-247	2.732E-02
ANH-511	2.502E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.065E+01	NOT IDENT.
NA-22	3.011E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.635E-02	NOT IDENT.

SC-46	3.327E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
CO-56	3.115E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.284E-02	NOT IDENT.
CO-58	5.091E-01	NOT IDENT.
FE-59	5.114E+00	NOT IDENT.
CO-60	3.204E-02	NOT IDENT.
ZN-65	1.424E-01	NOT IDENT.
GE-68	1.494E+00	NOT IDENT.
AS-73	9.587E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.526E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.735E-01	FAIL ABUN
KR-85	6.304E+00	NOT IDENT.
SR-85	6.238E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.165E-01	NOT IDENT.
Y-91	4.193E+02	NOT IDENT.
NB-94	2.511E-02	NOT IDENT.
NB-95	6.479E-01	NOT IDENT.
NB-95M	1.772E+00	NOT IDENT.
ZR-95	1.225E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.805E-02	FAIL ABUN
RH-102	5.453E-02	NOT IDENT.
RU-103	4.424E+00	FAIL ABUN
RH-106	4.005E-01	NOT IDENT.
RU-106	4.005E-01	NOT IDENT.
AG-108M	2.133E-02	NOT IDENT.
AG-110M	9.663E-02	NOT IDENT.
SN-113	1.700E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.143E-01	NOT IDENT.
SB-124	9.497E-01	NOT IDENT.
SB-125	7.725E-02	NOT IDENT.
TE-125M	2.088E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.022E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	4.809E-02	NOT IDENT.
CS-135	1.417E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	3.271E-02	NOT IDENT.
CS-137	3.456E-02	NOT IDENT.
CE-139	9.579E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.881E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.691E-01	NOT IDENT.
PM-144	4.304E-02	NOT IDENT.
PR-144	3.719E+00	NOT IDENT.
PM-146	3.746E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.676E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.215E-02	FAIL ABUN
EU-152	8.120E-02	FAIL ABUN
GD-153	1.669E-01	FAIL ABUN
EU-154	7.497E-02	FAIL ABUN
EU-155	9.927E-02	FAIL ABUN
TB-160	1.544E+00	FAIL ABUN
HO-166M	5.435E-02	NOT IDENT.
TM-171	2.577E+01	NOT IDENT.

HF-172	1.914E-01	FAIL ABUN
LU-172	7.073E-02	FAIL ABUN
LU-176	2.067E-02	FAIL ABUN
HF-181	3.519E+00	NOT IDENT.
TA-182	7.150E-01	FAIL ABUN
RE-183	2.817E+00	NOT IDENT.
RE-184	2.863E+01	NOT IDENT.
W-188	9.006E+01	FAIL ABUN
IR-192	3.667E-01	FAIL ABUN
HG-203	1.948E+00	FAIL ABUN
BI-207	2.921E-02	FAIL ABUN
PB-210	4.908E+00	NOT IDENT.
PB-211	5.267E-01	NOT IDENT.
BI-212	6.646E-01	FAIL ABUN
RA-223	4.971E-01	FAIL ABUN
AC-227	1.814E-01	FAIL ABUN
TH-227	1.814E-01	FAIL ABUN
TH-231	4.971E-01	FAIL ABUN
PA-233	4.642E-02	FAIL ABUN
PA-234	2.329E-01	NOT IDENT.
PA-234M	4.031E+00	NOT IDENT.
NP-237	4.642E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.997E-01	FAIL ABUN
PU-239	3.038E+02	FAIL ABUN
AM-241	1.489E-01	NOT IDENT.
CM-243	8.753E-02	FAIL ABUN
BK-247	5.555E-02	FAIL ABUN
CF-249	3.381E-02	NOT IDENT.
CF-251	9.890E-02	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235064.CNF;1
* Acquisition date   : 3-OCT-2016 05:44:14 Sensitivity      : 3.000
* Detector ID        : GAM02 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.40 Half life ratio  : *****
* Sample date        : 14-DEC-2015 13:25:00 Nuclide Library : SOLID
* Sample ID          : G405235064 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity : 1.7464E+02 GRAM
*                    : Quantity Err(%) : 1.1452E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                    : Dry Weight       : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 22-AUG-2016 09:02:05 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.272E+01	1.619E+00	1.619E+00
MN-54	9.556E-02	6.752E-02	6.752E-02
CD-109	1.247E+00	2.236E+00	2.236E+00
SN-126	8.019E-02	1.438E-01	1.438E-01
TL-208	3.057E-01	8.543E-02	8.543E-02
BI-211	5.100E-02	1.098E+00	1.098E+00
PB-212	1.042E+00	1.442E-01	1.442E-01
BI-214	9.937E-01	1.766E-01	1.766E-01
PB-214	1.223E+00	2.098E-01	2.098E-01
RN-219	3.069E-01	6.750E-01	6.750E-01
RN-222	9.937E-01	1.766E-01	1.766E-01
RA-224	1.086E+00	1.339E+00	1.339E+00
RA-226	9.937E-01	1.766E-01	1.766E-01
AC-228	9.028E-01	2.965E-01	2.965E-01
RA-228	9.028E-01	2.965E-01	2.965E-01
TH-228	1.042E+00	1.442E-01	1.442E-01
TH-229	1.250E-01	4.422E-01	4.422E-01
TH-230	9.933E-01	1.765E-01	1.765E-01
PA-231	1.518E+00	7.436E-01	7.436E-01
TH-232	9.028E-01	2.965E-01	2.965E-01
TH-234	3.160E+00	3.087E+00	3.087E+00
U-234	9.933E-01	1.765E-01	1.765E-01
U-235	-7.491E-02	1.839E-01	1.839E-01
U-238	3.160E+00	3.087E+00	3.087E+00
AM-243	1.661E-01	1.324E-01	1.324E-01
CM-247	2.813E-02	6.195E-02	6.195E-02
ANH-511	6.665E-02	7.339E-02	7.339E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.088E+01	1.086E+01	1.192E+01	NOT IDENT.
NA-22	-1.702E-02	4.001E-02	4.074E-02	NOT IDENT.
NA-24	1.000E+41	1.322E+41	0.000E+00	SHORT HLIF

AL-26	-9.232E-03	2.321E-02	2.358E-02	NOT IDENT.
SC-46	-1.475E-02	3.957E-01	3.957E-01	FAIL ABUN
V-48	4.653E+03	1.085E+04	1.105E+04	SHORT HLIF
CR-51	2.221E+02	3.366E+02	3.512E+02	SHORT HLIF
CO-56	-2.600E-01	3.996E-01	4.165E-01	NOT IDENT.
MN-56	-1.000E+41	1.518E+41	0.000E+00	SHORT HLIF
CO-57	-6.523E-03	4.895E-02	4.904E-02	NOT IDENT.
CO-58	3.314E-01	5.278E-01	5.486E-01	NOT IDENT.
FE-59	-1.219E+00	6.201E+00	6.225E+00	NOT IDENT.
CO-60	2.207E-02	3.627E-02	3.761E-02	NOT IDENT.
ZN-65	4.758E-02	1.785E-01	1.798E-01	NOT IDENT.
GE-68	-1.153E+00	2.337E+00	2.394E+00	NOT IDENT.
AS-73	-1.207E+01	1.142E+01	1.265E+01	NOT IDENT.
AS-74	3.580E+03	7.517E+03	7.689E+03	SHORT HLIF
SE-75	-2.044E-01	1.853E-01	2.070E-01	NOT IDENT.
BR-77	3.119E+37	2.644E+38	0.000E+00	SHORT HLIF
SR-82	-2.871E+02	5.437E+02	5.588E+02	SHORT HLIF
RB-83	-1.391E-01	5.713E-01	5.748E-01	FAIL ABUN
KR-85	6.033E+00	7.163E+00	7.662E+00	NOT IDENT.
SR-85	5.946E-01	7.092E-01	7.581E-01	NOT IDENT.
RB-86	-3.928E+03	2.096E+04	2.103E+04	SHORT HLIF
Y-88	-9.246E-02	1.748E-01	1.797E-01	NOT IDENT.
Y-91	-9.496E+01	5.123E+02	5.141E+02	NOT IDENT.
NB-94	3.664E-03	2.747E-02	2.752E-02	NOT IDENT.
NB-95	-8.729E-01	8.371E-01	9.250E-01	NOT IDENT.
NB-95M	2.955E-01	2.090E+00	2.094E+00	NOT IDENT.
ZR-95	8.121E-01	1.262E+00	1.314E+00	NOT IDENT.
NB-97	1.000E+41	2.401E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.404E+41	0.000E+00	SHORT HLIF
MO-99	1.398E+31	3.340E+31	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.127E+41	0.000E+00	SHORT HLIF
RH-101	5.339E-02	6.682E-02	7.102E-02	FAIL ABUN
RH-102	4.409E-02	5.787E-02	6.118E-02	NOT IDENT.
RU-103	3.718E+00	4.581E+00	4.878E+00	FAIL ABUN
RH-106	-4.159E-01	5.387E-01	5.704E-01	NOT IDENT.
RU-106	-4.159E-01	5.387E-01	5.704E-01	NOT IDENT.
AG-108M	5.923E-04	2.712E-02	2.712E-02	NOT IDENT.
AG-110M	8.109E-02	9.844E-02	1.050E-01	NOT IDENT.
SN-113	-1.032E-01	2.044E-01	2.096E-01	NOT IDENT.
CD-115	6.303E+38	8.129E+38	0.000E+00	SHORT HLIF
SN-117M	2.618E+04	6.483E+04	6.590E+04	SHORT HLIF
TE-123M	4.731E-02	1.162E-01	1.181E-01	NOT IDENT.
SB-124	-2.392E-01	1.213E+00	1.218E+00	NOT IDENT.
SB-125	-3.662E-02	9.282E-02	9.428E-02	NOT IDENT.
TE-125M	-2.925E+02	2.594E+02	2.910E+02	NOT IDENT.
I-126	3.144E+05	6.250E+05	6.408E+05	SHORT HLIF
SB-126	1.351E+05	7.784E+05	7.808E+05	SHORT HLIF
SB-127	-4.343E+21	8.707E+21	0.000E+00	SHORT HLIF
I-131	1.720E+09	2.726E+09	2.834E+09	SHORT HLIF
I-132	1.000E+41	1.827E+42	0.000E+00	SHORT HLIF
TE-132	1.081E+26	1.078E+26	0.000E+00	SHORT HLIF
BA-133	-1.518E-02	4.015E-02	4.073E-02	FAIL ABUN
I-133	1.000E+41	3.479E+41	0.000E+00	SHORT HLIF
CS-134	4.298E-02	5.360E-02	5.699E-02	NOT IDENT.
CS-135	1.528E-01	1.565E-01	1.710E-01	NOT IDENT.
I-135	1.000E+41	7.010E+41	0.000E+00	SHORT HLIF
CS-136	4.291E+04	2.032E+05	2.041E+05	SHORT HLIF
BA-137M	-3.502E-03	3.806E-02	3.810E-02	NOT IDENT.
CS-137	-3.700E-03	4.021E-02	4.025E-02	NOT IDENT.
CE-139	-4.424E-03	1.005E-01	1.005E-01	NOT IDENT.
BA-140	5.977E+05	9.515E+05	9.889E+05	SHORT HLIF
LA-140	-2.225E+04	2.471E+05	2.473E+05	SHORT HLIF
CE-141	7.282E-01	2.150E+01	2.151E+01	NOT IDENT.
CE-143	1.000E+41	5.136E+40	0.000E+00	SHORT HLIF
CE-144	-1.791E-01	3.235E-01	3.334E-01	NOT IDENT.
PM-144	-1.047E-02	4.936E-02	4.959E-02	NOT IDENT.
PR-144	-9.336E-01	4.270E+00	4.290E+00	NOT IDENT.
PM-146	1.112E-02	4.143E-02	4.173E-02	NOT IDENT.
ND-147	6.753E+06	2.362E+07	2.382E+07	SHORT HLIF
PM-147	6.477E+02	8.139E+02	8.647E+02	NOT IDENT.
PM-149	-2.136E+39	6.037E+39	0.000E+00	SHORT HLIF
EU-150	4.356E-03	2.689E-02	2.696E-02	FAIL ABUN
EU-152	2.032E-02	8.834E-02	8.881E-02	FAIL ABUN
GD-153	3.802E-02	1.813E-01	1.821E-01	FAIL ABUN
EU-154	-3.965E-02	9.887E-02	1.005E-01	FAIL ABUN
EU-155	-7.531E-03	1.115E-01	1.116E-01	FAIL ABUN
TB-160	6.434E-01	1.660E+00	1.685E+00	FAIL ABUN
HO-166M	4.141E-02	5.553E-02	5.858E-02	NOT IDENT.

TM-171	-3.264E+00	2.766E+01	2.770E+01	NOT IDENT.
HF-172	-3.543E-02	2.396E-01	2.401E-01	FAIL ABUN
LU-172	4.526E-02	7.515E-02	7.787E-02	FAIL ABUN
LU-176	3.419E-03	2.244E-02	2.249E-02	FAIL ABUN
HF-181	1.829E+00	3.812E+00	3.900E+00	NOT IDENT.
TA-182	-1.155E-01	8.680E-01	8.696E-01	FAIL ABUN
RE-183	-1.869E+00	3.184E+00	3.293E+00	NOT IDENT.
RE-184	2.810E+01	2.969E+01	3.228E+01	NOT IDENT.
W-188	-2.330E+01	1.130E+02	1.134E+02	FAIL ABUN
IR-192	3.450E-01	6.859E-01	7.033E-01	FAIL ABUN
HG-203	-6.008E-01	2.440E+00	2.455E+00	FAIL ABUN
BI-207	-2.806E-02	4.444E-02	4.621E-02	FAIL ABUN
PB-210	1.929E+00	5.091E+00	5.165E+00	NOT IDENT.
PB-211	5.414E-02	6.578E-01	6.583E-01	NOT IDENT.
BI-212	2.079E+00	9.411E-01	1.328E+00	FAIL ABUN
RA-223	-1.002E-01	5.604E-01	5.622E-01	FAIL ABUN
AC-227	-3.852E-02	2.003E-01	2.010E-01	FAIL ABUN
TH-227	-3.852E-02	2.003E-01	2.010E-01	FAIL ABUN
TH-231	-1.002E-01	5.604E-01	5.622E-01	FAIL ABUN
PA-233	-1.392E-02	5.857E-02	5.890E-02	FAIL ABUN
PA-234	7.504E-02	2.692E-01	2.713E-01	NOT IDENT.
PA-234M	-9.695E-02	4.935E+00	4.935E+00	NOT IDENT.
NP-237	-1.392E-02	5.857E-02	5.890E-02	FAIL ABUN
NP-238	-1.062E+40	6.697E+40	0.000E+00	SHORT HLIF
NP-239	-9.472E-02	2.335E-01	2.373E-01	FAIL ABUN
PU-239	4.859E+02	6.022E+02	6.408E+02	FAIL ABUN
AM-241	9.787E-02	1.636E-01	1.695E-01	NOT IDENT.
CM-243	-2.158E-02	9.946E-02	9.993E-02	FAIL ABUN
BK-247	-8.514E-02	7.035E-02	8.014E-02	FAIL ABUN
CF-249	3.085E-02	3.473E-02	3.741E-02	NOT IDENT.
CF-251	-5.730E-03	1.044E-01	1.045E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	85.3859	87.09	112.3177	136.47	82.6104
45.60	87.9392	87.57	134.9020	140.51	0.0000
46.54	74.8432	88.03	94.5115	143.76	89.5613
49.72	0.0000	88.34	94.5660	144.24	93.3011
51.35	84.1319	88.47	94.5884	145.44	92.2199
51.87	90.4867	89.96	100.8687	152.43	100.5022
52.39	87.4844	1093.63	100.9935	153.25	0.0000
52.97	109.5193	91.11	0.0000	323.87	72.1274
53.44	106.5184	92.59	101.3485	156.02	0.0000
54.07	76.3562	93.35	101.4862	158.56	0.0000
57.36	0.0000	94.56	66.7905	159.00	80.0664
57.53	97.0614	94.65	66.8012	162.33	82.9069
57.98	87.6618	94.67	66.8034	162.66	0.0000
59.27	80.5184	94.87	66.8267	163.33	89.7153
59.32	80.5279	97.43	86.9583	165.86	89.1485
59.54	74.9162	98.43	71.0617	176.31	85.9934
60.96	79.4233	98.44	71.0631	176.60	0.0000
61.17	92.2331	99.53	98.7551	177.52	80.9970
62.93	90.8300	100.11	116.0939	181.07	0.0000
63.29	90.9049	102.03	83.0286	181.52	87.3616
63.58	90.9655	103.18	83.1879	184.41	76.0448
64.28	91.1106	103.37	91.3046	143.76	85.1909
66.73	75.4458	105.21	96.2189	193.51	80.7118
67.24	66.8986	105.31	96.2347	197.03	94.0836
125.81	87.8445	106.12	88.2357	198.01	54.9391
67.75	87.8575	106.47	84.8011	201.83	88.4325
69.67	100.8815	109.28	106.1907	203.43	80.6862
70.83	101.1320	111.00	91.2700	205.31	80.4041
72.81	101.5556	111.76	0.0000	210.85	62.3028
72.87	101.5683	114.06	83.4788	215.65	69.2648
74.66	101.9465	116.30	0.0000	222.11	75.0697
74.82	101.9799	116.74	86.1857	227.09	71.8408
74.97	102.0118	119.76	88.9532	227.38	67.3691
77.11	102.4567	121.12	74.8731	228.16	0.0000
78.74	116.4234	121.22	74.8841	228.18	53.9368
79.69	100.4014	121.78	92.7910	116.74	53.9368
80.12	93.0978	122.06	96.4001	235.69	61.1115
80.19	0.0000	122.92	98.9057	235.96	61.1272
80.57	95.3984	123.07	98.9279	238.63	55.3781
81.00	103.6207	265.00	88.2798	238.98	0.0000
81.07	103.6349	125.81	84.5663	240.99	55.4991
81.75	103.7717	127.23	76.7454	242.00	55.5506
83.79	99.7155	127.91	87.6243	244.70	58.8835
84.00	99.7551	129.30	104.2351	252.40	0.0000
85.43	111.9690	131.20	70.7498	252.80	55.1758
86.55	112.2047	133.02	95.5158	254.15	0.0000
86.79	112.2551	133.52	81.0633	256.23	54.4212
86.94	112.2864	136.00	72.8439	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	65.9717	355.39	0.0000	584.27	21.5598
264.80	70.6269	356.01	38.8754	595.83	0.0000
265.00	70.6392	364.49	0.0000	427.87	13.7217
268.22	57.3197	366.42	0.0000	602.52	0.0000
269.46	74.1738	372.51	42.3384	604.72	10.3107
270.03	70.0089	375.05	47.4590	607.14	18.9244
271.23	57.9333	377.52	50.5707	609.32	29.8499
273.65	0.0000	356.01	32.5000	610.33	29.8636
276.40	61.0010	388.16	28.5178	614.28	10.3561
277.37	61.0499	388.63	0.0000	618.01	21.8999
277.60	61.0618	391.69	38.7909	620.36	19.6154
278.00	69.0692	264.66	24.6401	621.93	33.4864
279.20	66.3161	401.81	31.8502	630.19	0.0000
279.54	57.8665	402.40	31.8615	631.29	17.3932
279.70	57.8740	404.85	30.8813	633.25	22.0507
280.46	48.0231	410.95	27.8992	634.78	0.0000
283.69	57.5921	413.71	26.9119	635.95	18.5911
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	54.8364	423.72	0.0000	645.85	29.7593
285.90	0.0000	427.09	35.4810	657.76	22.8754
287.50	42.6178	427.87	32.3661	657.90	0.0000
290.67	58.3932	433.94	26.7202	661.66	27.3208
293.27	0.0000	439.40	26.8069	664.57	0.0000
351.93	38.5941	453.88	28.6243	666.33	0.0000
295.96	38.6172	463.37	28.7803	666.50	0.0000
879.38	25.7981	468.07	28.8567	667.71	0.0000
299.98	41.6096	473.00	0.0000	677.62	25.7325
300.09	41.6132	475.06	26.8239	685.70	0.0000
300.13	41.6140	476.78	20.4055	695.00	0.0000
301.36	40.2184	477.60	21.4893	696.49	23.2531
302.85	37.3885	482.18	25.8525	696.51	23.2531
256.23	48.3800	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	24.1556
306.78	45.1956	497.08	18.4609	697.49	21.4731
308.46	47.1796	505.52	21.2714	702.65	19.7253
311.90	40.5465	507.63	0.0000	706.68	24.2487
316.51	47.9551	511.00	35.0081	711.68	18.8986
319.41	0.0000	514.00	23.0104	720.70	0.0000
320.08	0.0000	514.00	23.0104	721.93	0.0000
321.04	40.8276	520.40	25.2854	722.78	20.2487
323.87	49.6802	520.69	0.0000	722.91	18.8037
325.23	39.9798	522.65	0.0000	723.31	18.8068
328.76	0.0000	527.90	0.0000	724.19	13.0245
333.37	55.9134	528.26	26.4922	727.33	19.0178
333.97	45.6334	529.59	26.5107	733.00	15.5603
334.37	41.2292	529.87	0.0000	735.93	19.0832
338.28	41.3463	531.02	0.0000	333.97	20.9132
338.32	41.3472	537.26	0.0000	739.50	0.0000
311.90	42.8902	546.56	0.0000	747.24	20.0812
340.48	42.8902	552.55	35.7578	748.06	22.8264
340.55	0.0000	563.25	26.9600	752.31	26.5229
344.28	41.5232	569.33	20.2800	753.82	0.0000
345.93	46.0260	946.00	20.2815	756.73	15.5743
351.06	35.7620	569.70	16.9031	756.80	17.4072
351.93	35.7832	583.19	21.5490	884.68	22.9675

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	32.1780	1274.44	14.3314	1620.50	7.4547
766.42	22.9897	1001.03	15.9473	1621.92	6.5249
766.84	16.5547	1002.74	13.9615	1678.03	0.0000
772.60	0.0000	1004.73	13.9701	1690.97	2.8361
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.1971
778.90	11.0874	1028.54	0.0000	1063.66	2.7434
783.70	0.0000	1037.84	14.1111	1771.35	3.2013
785.37	16.6718	1038.76	0.0000	1791.20	0.0000
792.07	15.7850	631.29	12.1274	1808.65	3.8691
794.95	20.8216	1048.07	0.0000	1810.72	0.0000
795.86	16.3652	1049.04	7.0795	1836.06	4.8616
810.06	15.8903	1050.41	15.1767		
810.29	14.0222	1063.66	14.8976		
344.28	14.0231	1077.00	0.0000		
810.76	14.9595	1077.34	14.6856		
815.77	0.0000	1085.87	8.1787		
1048.07	0.0000	1093.63	12.2959		
832.01	27.1354	1099.45	17.4482		
834.85	18.1090	1112.07	16.4805		
835.71	0.0000	1112.84	14.8359		
836.80	0.0000	1115.54	13.1977		
846.75	0.0000	1120.29	18.1715		
846.77	19.8907	1120.55	18.1726		
856.80	0.0000	1221.41	8.2617		
860.56	14.2767	1129.67	14.9063		
871.09	12.4184	1131.51	0.0000		
873.19	21.9872	1147.95	0.0000		
875.33	0.0000	1173.23	17.8104		
879.38	14.3701	1177.95	14.6862		
880.51	21.0842	1189.05	17.8871		
883.24	18.2259	1204.77	19.0195		
884.68	13.4365	1221.41	16.9805		
889.28	19.2249	1231.02	18.7258		
894.76	15.4087	1235.36	0.0000		
898.04	13.4976	1238.28	20.7104		
900.72	20.2643	1260.41	0.0000		
903.28	15.4531	1271.87	11.8271		
911.20	17.4309	1274.44	11.8352		
912.08	17.4359	1274.54	11.8352		
923.98	0.0000	1291.59	18.3696		
926.50	7.7864	1298.22	0.0000		
929.11	28.2495	1312.11	0.0000		
937.49	27.3506	1332.49	5.2397		
944.13	0.0000	1362.66	0.0000		
946.00	13.7133	1365.19	6.6017		
949.00	14.1187	1368.63	0.0000		
667.71	0.0000	1384.29	0.0000		
962.31	20.4807	1408.01	12.2266		
964.08	11.0346	1457.56	0.0000		
966.17	23.6609	1460.82	11.7013		
911.20	24.6689	1489.16	6.3410		
968.97	24.6689	1505.03	9.9994		
983.53	0.0000	1584.12	7.7063		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235065.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM25.CNF;357
Background date : 2-OCT-2016 11:01:25.
Sample date      : 14-DEC-2015 13:56:00 Acquisition date : 3-OCT-2016 05:57:14.
Sample ID       : G405235065 Sample quantity : 1.47836E+02 GRAM
Detector name   : GAM25 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.55 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596254 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.44*	40	119	0.86	92.38	89	7	1.10E-02	51.5	
2	0	63.16*	25	241	0.77	125.82	123	8	6.83E-03	115.5	
3	0	77.20*	369	186	0.79	153.89	152	6	1.02E-01	8.0	
4	0	84.17*	35	110	1.21	167.84	166	5	9.62E-03	50.4	
5	0	87.07	109	150	1.36	173.63	171	6	3.04E-02	20.0	
6	4	89.80	70	82	0.89	179.09	177	15	1.95E-02	19.5	1.37E+00
7	4	92.88*	90	190	1.27	185.25	177	15	2.49E-02	30.8	
8	0	128.38	43	118	1.40	256.24	254	8	1.21E-02	45.9	
9	0	143.37*	23	136	0.62	286.21	283	8	6.28E-03	93.7	
10	0	186.18*	92	138	1.08	371.83	367	10	2.55E-02	27.2	
11	0	208.76	42	80	0.99	416.97	414	7	1.16E-02	38.6	
12	7	238.80*	442	73	1.11	477.05	470	19	1.23E-01	5.8	2.17E+00
13	7	241.74	94	101	1.44	482.93	470	19	2.62E-02	22.1	
14	0	270.43	52	53	1.66	540.33	536	9	1.46E-02	29.0	
15	0	295.25*	191	78	1.08	589.95	584	12	5.32E-02	11.9	
16	0	300.81	54	35	1.68	601.08	597	11	1.49E-02	26.0	
17	0	338.56*	117	69	1.25	676.58	670	14	3.24E-02	18.1	
18	0	352.23*	322	62	1.13	703.92	698	12	8.96E-02	7.5	
19	0	463.82	61	24	2.14	927.11	921	14	1.70E-02	21.4	
20	0	481.66	24	31	2.95	962.81	957	11	6.80E-03	48.0	
21	0	493.76	2	16	1.29	987.00	984	6	5.86E-04	317.8	
22	0	511.14*	30	57	1.51	1021.77	1016	15	8.24E-03	65.8	
23	0	567.01	15	9	1.64	1133.53	1130	7	4.18E-03	41.6	
24	0	583.50*	143	34	1.29	1166.52	1160	14	3.97E-02	12.2	
25	0	609.37*	203	45	1.56	1218.28	1211	14	5.63E-02	10.1	
26	0	629.40	13	20	0.64	1258.35	1253	12	3.54E-03	76.8	
27	0	678.03	9	6	1.27	1355.63	1352	7	2.44E-03	59.5	
28	0	703.73	13	36	0.62	1407.06	1398	11	3.71E-03	90.9	
29	0	719.29	15	9	0.56	1438.19	1434	8	4.17E-03	44.2	
30	0	723.13	9	14	0.78	1445.87	1441	9	2.60E-03	78.2	
31	0	728.25	21	30	2.45	1456.11	1449	11	5.70E-03	56.5	
32	0	756.56	16	24	0.95	1512.75	1506	12	4.44E-03	66.1	
33	0	764.38	9	19	0.99	1528.39	1520	11	2.55E-03	98.0	
34	0	768.17	31	13	1.38	1535.97	1531	9	8.52E-03	28.1	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	788.47	30	21	5.45	1576.59	1568	19	8.33E-03	42.7	
36	0	795.50	14	11	1.86	1590.66	1586	9	3.78E-03	52.1	
37	0	860.86	16	24	1.03	1721.44	1711	16	4.58E-03	70.8	
38	0	870.66*	11	15	1.03	1741.04	1737	10	3.10E-03	73.1	
39	0	877.54	13	20	0.85	1754.80	1748	14	3.67E-03	78.1	
40	0	911.22*	102	12	1.80	1822.20	1814	16	2.83E-02	12.8	
41	0	929.74	16	5	1.04	1859.25	1853	9	4.40E-03	35.2	
42	0	969.29*	67	10	1.34	1938.39	1934	11	1.85E-02	16.7	
43	0	1008.96	8	4	2.72	2017.77	2013	8	2.29E-03	54.2	
44	0	1064.60	16	13	4.05	2129.13	2122	16	4.46E-03	54.6	
45	0	1120.51*	56	13	1.51	2241.02	2233	17	1.57E-02	19.9	
46	0	1339.15	8	6	0.64	2678.61	2669	14	2.22E-03	77.6	
47	0	1460.76*	366	9	2.07	2922.03	2913	16	1.02E-01	5.6	
48	0	1571.36	9	3	0.63	3143.45	3137	11	2.59E-03	47.4	
49	0	1730.34	7	4	0.81	3461.74	3455	9	1.84E-03	69.3	
50	2	1763.43	26	8	2.44	3528.00	3519	18	7.29E-03	31.2	9.69E-01
51	2	1765.85*	12	4	1.97	3532.83	3519	18	3.21E-03	52.6	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235065.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 14-DEC-2015 13:56:00 Acquisition date : 3-OCT-2016 05:57:14
Sample ID        : G405235065 Sample quantity   : 147.84 GRAM
Sample type      : SOLID Sample geometry    :
Detector name    : GAMMA25 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.55 0.0%
Energy tolerance : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error    : 0.00 %
Efficiency type  : Linear Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.131E+00	1.486E+01	1.486E+01	11.10	OK
NB-94	702.65	99.81*	2.143E+00	3.288E-02	3.288E-02	181.73	OK
	871.09	99.89	1.793E+00	3.212E-02	3.212E-02	146.30	OK
NB-95	765.81	99.81*	2.000E+00	2.402E-02	5.772E-01	196.03	OK
ZR-95	724.19	44.27	2.095E+00	5.293E-02	1.272E+00	156.31	OK
	756.73	54.38*	2.017E+00	7.627E-02	1.833E+00	132.29	OK
CD-109	88.03	3.70*	9.279E+00	8.157E-01	1.268E+00	105.12	OK
SN-126	64.28	9.60	9.545E+00	1.744E-01	1.744E-01	231.10	OK
	86.94	8.90	9.279E+00	3.391E-01	3.391E-01	105.12	OK
	87.57	37.00*	9.279E+00	8.157E-02	8.157E-02	105.12	OK
TL-208	277.37	6.60	4.809E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.509E+00	3.592E-01	3.592E-01	24.49	OK
	860.56	12.50	1.810E+00	3.759E-01	3.759E-01	141.57	OK
PB-210	46.54	4.25*	9.121E+00	6.790E-01	6.963E-01	102.93	OK
BI-211	72.87	1.23	9.424E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.891E+00	1.187E-02	1.187E-02	8508.91	OK
PB-212	74.82	10.28	9.405E+00	----- Line	Not Found	-----	Absent
	77.11	17.10	9.382E+00	1.471E+00	1.471E+00	16.04	OK
	238.63	43.60*	5.475E+00	1.078E+00	1.078E+00	11.56	OK
	300.09	3.30	4.476E+00	2.071E+00	2.071E+00	52.03	OK
BI-214	609.32	45.49*	2.419E+00	9.839E-01	9.843E-01	20.11	OK
	1120.29	14.92	1.443E+00	1.318E+00	1.318E+00	39.79	OK
	1764.49	15.30	9.342E-01	8.800E-01	8.803E-01	62.46	OK
PB-214	74.82	5.80	9.405E+00	----- Line	Not Found	-----	Absent
	77.11	9.70	9.382E+00	2.594E+00	2.595E+00	16.04	OK
	87.09	3.41	9.279E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.413E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.551E+00	1.304E+00	1.305E+00	23.76	OK
	351.93	35.60*	3.894E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.419E+00	9.839E-01	9.843E-01	20.11	OK
	1120.29	14.92	1.443E+00	1.318E+00	1.318E+00	39.79	OK
	1764.49	15.30	9.342E-01	8.800E-01	8.803E-01	62.46	OK
RA-224	240.99	4.10*	5.418E+00	1.653E-01	1.653E-01	738.01	OK
RA-226	609.32	45.49*	2.419E+00	9.839E-01	9.843E-01	20.11	OK
	1120.29	14.92	1.443E+00	1.318E+00	1.318E+00	39.79	OK
	1764.49	15.30	9.342E-01	8.800E-01	8.803E-01	62.46	OK
AC-228	105.21	1.10	8.977E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.030E+00	1.448E+00	1.448E+00	36.11	OK
	794.95	4.25	1.934E+00	8.621E-01	8.621E-01	104.16	OK
	835.71	1.61	1.856E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.725E+00	1.174E+00	1.174E+00	25.50	OK
	968.97	15.80	1.637E+00	1.313E+00	1.313E+00	33.42	OK
RA-228	105.21	1.10	8.977E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.030E+00	1.448E+00	1.448E+00	36.11	OK
	794.95	4.25	1.934E+00	8.621E-01	8.621E-01	104.16	OK
	835.71	1.61	1.856E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.725E+00	1.174E+00	1.174E+00	25.50	OK
	968.97	15.80	1.637E+00	1.313E+00	1.313E+00	33.42	OK
TH-228	74.82	10.28	9.405E+00	----- Line	Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	77.11	17.10	9.382E+00	1.471E+00	1.471E+00	16.04	OK
	238.63	43.60*	5.475E+00	1.078E+00	1.078E+00	11.56	OK
	300.09	3.30	4.476E+00	2.071E+00	2.071E+00	52.03	OK
TH-229	85.43	14.70	9.312E+00	1.608E-01	1.608E-01	100.75	OK
	88.47	24.00	9.244E+00	1.997E-01	1.997E-01	38.94	OK
	193.51	4.41*	6.496E+00	-----	Line Not Found	-----	Absent
	210.85	2.80	6.071E+00	-----	Line Not Found	-----	Absent
TH-230	609.32	45.49*	2.419E+00	9.839E-01	9.839E-01	20.11	OK
	1120.29	14.92	1.443E+00	1.318E+00	1.318E+00	39.79	OK
	1764.49	15.30	9.342E-01	8.800E-01	8.800E-01	62.46	OK
PA-231	283.69	1.70	4.715E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	4.476E+00	1.278E+00	1.278E+00	52.03	OK
TH-232	105.21	1.10	8.977E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.030E+00	1.448E+00	1.448E+00	36.11	OK
	835.71	1.61	1.856E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.725E+00	1.174E+00	1.174E+00	25.50	OK
	968.97	15.80	1.637E+00	1.313E+00	1.313E+00	33.42	OK
TH-234	63.29	3.70*	9.545E+00	4.526E-01	4.526E-01	231.10	OK
	92.59	4.23	9.201E+00	1.453E+00	1.453E+00	61.52	OK
U-234	609.32	45.49*	2.419E+00	9.839E-01	9.839E-01	20.11	OK
	1120.29	14.92	1.443E+00	1.318E+00	1.318E+00	39.79	OK
	1764.49	15.30	9.342E-01	8.800E-01	8.800E-01	62.46	OK
U-235	89.96	3.47	9.244E+00	1.381E+00	1.381E+00	38.94	OK
	93.35	5.60	9.201E+00	1.098E+00	1.098E+00	61.52	OK
	143.76	10.96*	7.933E+00	1.581E-01	1.581E-01	187.34	OK
	163.33	5.08	7.333E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	6.688E+00	1.426E-01	1.426E-01	54.41	OK
	205.31	5.01	6.202E+00	-----	Line Not Found	-----	Absent
U-238	63.29	3.70*	9.545E+00	4.526E-01	4.526E-01	231.10	OK
	92.59	4.23	9.201E+00	1.453E+00	1.453E+00	61.52	OK
ANH-511	511.00	100.00*	2.809E+00	5.731E-02	5.731E-02	131.62	OK

Flag: "*" = Keyline

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235065.CNF;1
* Acquisition date   : 3-OCT-2016 05:57:14 Sensitivity      : 3.000
* Detector ID        : GAM25 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.55 Half life ratio : *****
* Sample date        : 14-DEC-2015 13:56:00 Analyst initials: MXR1
* Sample ID          : G405235065 Sample Quantity : 1.4784E+02 GRAM
* Batch Number       : 1596254 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 1-AUG-2016 08:41:33 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM25_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.486E+01	1.616E+00	7.067E-01
NB-94	3.288E-02	5.856E-02	5.875E-02
NB-95	5.772E-01	1.109E+00	9.378E-01
ZR-95	1.833E+00	2.376E+00	2.466E+00
CD-109	1.268E+00	1.306E+00	1.203E+00
SN-126	8.157E-02	8.404E-02	6.914E-02
TL-208	3.592E-01	8.621E-02	5.023E-02
PB-210	6.963E-01	7.023E-01	5.653E-01
BI-211	1.187E-02	9.898E-01	2.940E-01
PB-212	1.078E+00	1.221E-01	7.821E-02
BI-214	9.843E-01	1.940E-01	1.289E-01
PB-214	1.309E+00	1.920E-01	3.340E-01
RN-222	9.843E-01	1.940E-01	1.289E-01
RA-224	1.653E-01	1.196E+00	8.397E-01
RA-226	9.843E-01	1.940E-01	1.289E-01
AC-228	1.174E+00	2.934E-01	2.334E-01
RA-228	1.174E+00	2.934E-01	2.334E-01
TH-228	1.078E+00	1.221E-01	7.821E-02
TH-229	-1.970E-01	3.778E-01	6.735E-01
TH-230	9.839E-01	1.939E-01	1.289E-01
PA-231	1.278E+00	6.515E-01	6.390E-01
TH-232	1.174E+00	2.934E-01	2.334E-01
TH-234	4.526E-01	1.025E+00	7.537E-01
U-234	9.839E-01	1.939E-01	1.289E-01
U-235	1.581E-01	2.903E-01	2.564E-01
U-238	4.526E-01	1.025E+00	7.537E-01
ANH-511	5.731E-02	7.393E-02	5.250E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-6.901E+00		1.161E+01	1.818E+01	NOT IDENT.
NA-22	-4.344E-03		4.848E-02	9.269E-02	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF

AL-26	-1.085E-02	2.661E-02	5.204E-02	NOT IDENT.
SC-46	-5.542E-02	3.828E-01	7.426E-01	FAIL ABUN
V-48	0.000E+00	1.104E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	2.892E+02	0.000E+00	SHORT HLIF
MN-54	-3.158E-03	5.967E-02	1.184E-01	NOT IDENT.
CO-56	1.014E-02	4.465E-01	8.920E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	4.635E-03	3.497E-02	6.847E-02	NOT IDENT.
CO-58	3.920E-02	4.089E-01	8.651E-01	NOT IDENT.
FE-59	-1.522E+00	6.602E+00	1.260E+01	NOT IDENT.
CO-60	2.932E-02	4.520E-02	9.091E-02	NOT IDENT.
ZN-65	2.576E-02	1.345E-01	2.573E-01	NOT IDENT.
GE-68	1.431E-01	2.646E+00	5.160E+00	NOT IDENT.
AS-73	-3.791E-02	1.465E+00	2.988E+00	NOT IDENT.
AS-74	0.000E+00	4.502E+03	0.000E+00	SHORT HLIF
SE-75	1.137E-01	1.752E-01	3.437E-01	NOT IDENT.
BR-77	0.000E+00	3.641E+36	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.229E+02	0.000E+00	SHORT HLIF
RB-83	2.900E-01	5.290E-01	1.112E+00	NOT IDENT.
KR-85	-2.600E+00	6.358E+00	1.163E+01	NOT IDENT.
SR-85	-2.606E-01	6.293E-01	1.150E+00	NOT IDENT.
RB-86	0.000E+00	2.452E+04	0.000E+00	SHORT HLIF
Y-88	-8.054E-02	1.823E-01	3.509E-01	NOT IDENT.
Y-91	-2.273E+02	5.631E+02	1.008E+03	NOT IDENT.
NB-95M	2.939E-01	1.931E+00	3.343E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	3.757E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	0.000E+00	4.981E-02	4.539E-02	FAIL ABUN
RH-102	-1.785E-02	5.444E-02	8.725E-02	FAIL ABUN
RU-103	-9.891E-01	6.045E+00	1.001E+01	FAIL ABUN
RH-106	3.707E-01	4.672E-01	9.915E-01	NOT IDENT.
RU-106	3.707E-01	4.672E-01	9.915E-01	NOT IDENT.
AG-108M	5.613E-03	2.548E-02	5.105E-02	FAIL ABUN
AG-110M	1.575E-02	1.022E-01	2.017E-01	FAIL ABUN
SN-113	-8.336E-02	1.269E-01	4.077E-01	NOT IDENT.
CD-115	0.000E+00	3.930E+38	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	5.153E+04	0.000E+00	SHORT HLIF
TE-123M	5.296E-02	9.254E-02	1.856E-01	NOT IDENT.
SB-124	5.497E-02	1.745E+00	3.873E+00	FAIL ABUN
SB-125	-1.972E-02	8.097E-02	1.560E-01	FAIL ABUN
TE-125M	5.498E+01	1.728E+02	3.461E+02	NOT IDENT.
I-126	0.000E+00	6.895E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	8.695E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	7.675E+21	0.000E+00	SHORT HLIF
I-131	0.000E+00	2.636E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	9.377E+25	0.000E+00	SHORT HLIF
BA-133	1.043E-02	3.553E-02	6.661E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	5.612E-02	5.729E-02	1.050E-01	FAIL ABUN
CS-135	2.022E-02	1.320E-01	2.266E-01	NOT IDENT.
I-135	0.000E+00	1.398E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.470E+05	0.000E+00	SHORT HLIF
BA-137M	3.077E-02	3.495E-02	7.330E-02	NOT IDENT.
CS-137	3.251E-02	3.693E-02	7.743E-02	NOT IDENT.
CE-139	-8.346E-02	8.969E-02	1.565E-01	NOT IDENT.
BA-140	0.000E+00	7.917E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	2.978E+05	0.000E+00	SHORT HLIF
CE-141	-4.775E+00	1.867E+01	3.237E+01	NOT IDENT.
CE-143	0.000E+00	5.565E+40	0.000E+00	SHORT HLIF
CE-144	-2.116E-01	2.579E-01	4.657E-01	NOT IDENT.
PM-144	-1.456E-02	6.253E-02	9.960E-02	NOT IDENT.
PR-144	-1.218E+00	5.419E+00	8.647E+00	NOT IDENT.
PM-146	1.254E-02	3.599E-02	7.402E-02	NOT IDENT.
ND-147	0.000E+00	2.163E+07	0.000E+00	SHORT HLIF
PM-147	-1.949E+01	6.185E+02	1.197E+03	NOT IDENT.
PM-149	0.000E+00	5.747E+39	0.000E+00	SHORT HLIF
EU-150	1.532E-02	2.339E-02	4.532E-02	FAIL ABUN
EU-152	6.961E-02	7.899E-02	1.597E-01	NOT IDENT.
GD-153	-7.477E-02	1.056E-01	1.809E-01	NOT IDENT.
EU-154	2.279E-02	1.154E-01	2.332E-01	FAIL ABUN
EU-155	4.990E-02	7.185E-02	1.476E-01	FAIL ABUN
TB-160	-4.775E-01	1.793E+00	3.005E+00	FAIL ABUN
HO-166M	-1.525E-02	6.095E-02	1.097E-01	NOT IDENT.
TM-171	1.164E+00	3.402E+00	7.105E+00	NOT IDENT.
HF-172	8.276E-02	1.772E-01	3.322E-01	FAIL ABUN

LU-172	-2.428E-02	8.992E-02	1.664E-01	FAIL ABUN
LU-176	5.709E-04	2.073E-02	3.787E-02	FAIL ABUN
HF-181	6.843E+00	6.438E+00	8.037E+00	FAIL ABUN
TA-182	-1.754E-02	1.012E+00	1.920E+00	FAIL ABUN
RE-183	-5.597E-01	7.075E-01	1.382E+00	NOT IDENT.
RE-184	1.302E+01	3.003E+01	6.065E+01	NOT IDENT.
W-188	-2.242E+01	9.657E+01	1.562E+02	FAIL ABUN
IR-192	-1.148E-01	3.812E-01	7.391E-01	FAIL ABUN
HG-203	4.076E-01	2.104E+00	3.893E+00	NOT IDENT.
BI-207	7.335E-02	7.851E-02	9.962E-02	FAIL ABUN
PB-211	-5.729E-01	5.527E-01	9.563E-01	NOT IDENT.
BI-212	7.749E-01	8.578E-01	1.269E+00	FAIL ABUN
RN-219	9.840E-02	3.435E-01	6.934E-01	FAIL ABUN
RA-223	-1.676E-01	4.941E-01	9.544E-01	FAIL ABUN
AC-227	-1.276E-01	1.984E-01	3.376E-01	FAIL ABUN
TH-227	-1.276E-01	1.984E-01	3.376E-01	FAIL ABUN
TH-231	-1.676E-01	4.941E-01	9.544E-01	FAIL ABUN
PA-233	-2.903E-02	5.116E-02	9.687E-02	FAIL ABUN
PA-234	-8.797E-02	2.785E-01	5.257E-01	NOT IDENT.
PA-234M	2.684E+00	4.477E+00	9.596E+00	NOT IDENT.
NP-237	-2.903E-02	5.116E-02	9.687E-02	FAIL ABUN
NP-238	0.000E+00	6.207E+40	0.000E+00	SHORT HLIF
NP-239	-1.210E-01	1.705E-01	3.152E-01	NOT IDENT.
PU-239	0.000E+00	4.534E+02	4.901E+02	FAIL ABUN
AM-241	5.032E-03	3.900E-02	7.996E-02	NOT IDENT.
AM-243	0.000E+00	3.511E-02	7.741E-02	NOT IDENT.
CM-243	-2.975E-02	6.169E-02	1.175E-01	NOT IDENT.
BK-247	7.139E-02	6.064E-02	1.258E-01	FAIL ABUN
CM-247	5.325E-03	3.107E-02	6.211E-02	NOT IDENT.
CF-249	9.598E-03	3.310E-02	6.711E-02	NOT IDENT.
CF-251	-2.393E-02	9.529E-02	1.755E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	353	10.66*	1.131E+00	1.486E+01	1.486E+01	11.10
NB-94	702.65	14	99.81*	2.143E+00	3.288E-02	3.288E-02	181.73
	871.09	11	99.89	1.793E+00	3.212E-02	3.212E-02	146.30
NB-95	765.81	9	99.81*	2.000E+00	2.402E-02	5.772E-01	196.03
ZR-95	724.19	10	44.27	2.095E+00	5.293E-02	1.272E+00	156.31
	756.73	16	54.38*	2.017E+00	7.627E-02	1.833E+00	132.29
CD-109	88.03	136	3.70*	9.279E+00	2.018E+00	3.136E+00	40.08
SN-126	64.28	31	9.60	9.545E+00	1.744E-01	1.744E-01	231.10
	86.94	136	8.90	9.279E+00	8.388E-01	8.388E-01	40.08
	87.57	136	37.00*	9.279E+00	2.018E-01	2.018E-01	40.08
TL-208	277.37	-----	6.60	4.809E+00	-----	Line Not Found	-----
	583.19	151	85.00*	2.509E+00	3.592E-01	3.592E-01	24.49
	860.56	17	12.50	1.810E+00	3.759E-01	3.759E-01	141.57
PB-210	46.54	52	4.25*	9.121E+00	6.790E-01	6.963E-01	102.93
BI-211	72.87	-----	1.23	9.424E+00	-----	Line Not Found	-----
	351.06	357	12.92*	3.891E+00	3.605E+00	3.605E+00	14.97
PB-212	74.82	-----	10.28	9.405E+00	-----	Line Not Found	-----
	77.11	465	17.10	9.382E+00	1.471E+00	1.471E+00	16.04
	238.63	507	43.60*	5.475E+00	1.078E+00	1.078E+00	11.56
	300.09	60	3.30	4.476E+00	2.071E+00	2.071E+00	52.03
BI-214	609.32	213	45.49*	2.419E+00	9.839E-01	9.843E-01	20.11
	1120.29	56	14.92	1.443E+00	1.318E+00	1.318E+00	39.79
	1764.49	25	15.30	9.342E-01	8.800E-01	8.803E-01	62.46
PB-214	74.82	-----	5.80	9.405E+00	-----	Line Not Found	-----
	77.11	465	9.70	9.382E+00	2.594E+00	2.595E+00	16.04
	87.09	136	3.41	9.279E+00	2.189E+00	2.190E+00	40.08
	242.00	108	7.25	5.418E+00	1.398E+00	1.398E+00	44.11
	295.22	215	18.42	4.551E+00	1.304E+00	1.305E+00	23.76
RN-222	351.93	357	35.60*	3.891E+00	1.308E+00	1.309E+00	14.97
	609.32	213	45.49*	2.419E+00	9.839E-01	9.843E-01	20.11
	1120.29	56	14.92	1.443E+00	1.318E+00	1.318E+00	39.79
	1764.49	25	15.30	9.342E-01	8.800E-01	8.803E-01	62.46
RA-224	240.99	108	4.10*	5.418E+00	2.471E+00	2.471E+00	44.11
RA-226	609.32	213	45.49*	2.419E+00	9.839E-01	9.843E-01	20.11
	1120.29	56	14.92	1.443E+00	1.318E+00	1.318E+00	39.79
	1764.49	25	15.30	9.342E-01	8.800E-01	8.803E-01	62.46
AC-228	105.21	-----	1.10	8.977E+00	-----	Line Not Found	-----
	338.32	130	11.27	4.030E+00	1.448E+00	1.448E+00	36.11
	794.95	14	4.25	1.934E+00	8.621E-01	8.621E-01	104.16
	835.71	-----	1.61	1.856E+00	-----	Line Not Found	-----
	911.20	103	25.80*	1.725E+00	1.174E+00	1.174E+00	25.50
	968.97	67	15.80	1.637E+00	1.313E+00	1.313E+00	33.42
RA-228	105.21	-----	1.10	8.977E+00	-----	Line Not Found	-----
	338.32	130	11.27	4.030E+00	1.448E+00	1.448E+00	36.11
	794.95	14	4.25	1.934E+00	8.621E-01	8.621E-01	104.16
	835.71	-----	1.61	1.856E+00	-----	Line Not Found	-----
	911.20	103	25.80*	1.725E+00	1.174E+00	1.174E+00	25.50

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	968.97	67	15.80	1.637E+00	1.313E+00	1.313E+00	33.42
TH-228	74.82	-----	10.28	9.405E+00	-----	Line Not Found	-----
	77.11	465	17.10	9.382E+00	1.471E+00	1.471E+00	16.04
	238.63	507	43.60*	5.475E+00	1.078E+00	1.078E+00	11.56
	300.09	60	3.30	4.476E+00	2.071E+00	2.071E+00	52.03
TH-229	85.43	43	14.70	9.312E+00	1.608E-01	1.608E-01	100.75
	88.47	87	24.00	9.244E+00	1.997E-01	1.997E-01	38.94
	193.51	-----	4.41*	6.496E+00	-----	Line Not Found	-----
	210.85	-----	2.80	6.071E+00	-----	Line Not Found	-----
TH-230	609.32	213	45.49*	2.419E+00	9.839E-01	9.839E-01	20.11
	1120.29	56	14.92	1.443E+00	1.318E+00	1.318E+00	39.79
	1764.49	25	15.30	9.342E-01	8.800E-01	8.800E-01	62.46
PA-231	283.69	-----	1.70	4.715E+00	-----	Line Not Found	-----
	301.36	60	5.35*	4.476E+00	1.278E+00	1.278E+00	52.03
TH-232	105.21	-----	1.10	8.977E+00	-----	Line Not Found	-----
	338.32	130	11.27	4.030E+00	1.448E+00	1.448E+00	36.11
	835.71	-----	1.61	1.856E+00	-----	Line Not Found	-----
	911.20	103	25.80*	1.725E+00	1.174E+00	1.174E+00	25.50
	968.97	67	15.80	1.637E+00	1.313E+00	1.313E+00	33.42
TH-234	63.29	31	3.70*	9.545E+00	4.526E-01	4.526E-01	231.10
	92.59	111	4.23	9.201E+00	1.453E+00	1.453E+00	61.52
U-234	609.32	213	45.49*	2.419E+00	9.839E-01	9.839E-01	20.11
	1120.29	56	14.92	1.443E+00	1.318E+00	1.318E+00	39.79
	1764.49	25	15.30	9.342E-01	8.800E-01	8.800E-01	62.46
U-235	89.96	87	3.47	9.244E+00	1.381E+00	1.381E+00	38.94
	93.35	111	5.60	9.201E+00	1.098E+00	1.098E+00	61.52
	143.76	27	10.96*	7.933E+00	1.581E-01	1.581E-01	187.34
	163.33	-----	5.08	7.333E+00	-----	Line Not Found	-----
	185.72	107	57.20	6.688E+00	1.426E-01	1.426E-01	54.41
	205.31	-----	5.01	6.202E+00	-----	Line Not Found	-----
U-238	63.29	31	3.70*	9.545E+00	4.526E-01	4.526E-01	231.10
	92.59	111	4.23	9.201E+00	1.453E+00	1.453E+00	61.52
ANH-511	511.00	32	100.00*	2.809E+00	5.731E-02	5.731E-02	131.62

Flag: "*" = Keyline

Total number of lines in spectrum 51
 Number of unidentified lines 9
 Number of lines tentatively identified by NID 42 82.35%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.486E+01	1.486E+01	0.165E+01	11.10	
NB-94	20300.00Y	1.00	3.288E-02	3.288E-02	5.976E-02	181.73	
NB-95	64.03D	24.0	2.402E-02	5.772E-01	11.31E-01	196.03	
ZR-95	64.03D	24.0	7.627E-02	1.833E+00	2.424E+00	132.29	
CD-109	461.40D	1.55	2.018E+00	3.136E+00	1.257E+00	40.08	
SN-126	2.30E+05Y	1.00	2.018E-01	2.018E-01	0.809E-01	40.08	
TL-208	1.41E+10Y	1.00	3.592E-01	3.592E-01	0.880E-01	24.49	
PB-210	22.20Y	1.03	6.790E-01	6.963E-01	7.167E-01	102.93	
BI-211	7.04E+08Y	1.00	3.605E+00	3.605E+00	0.540E+00	14.97	
PB-212	1.41E+10Y	1.00	1.078E+00	1.078E+00	0.125E+00	11.56	
BI-214	1600.00Y	1.00	9.839E-01	9.843E-01	1.979E-01	20.11	
PB-214	1600.00Y	1.00	1.308E+00	1.309E+00	0.196E+00	14.97	
RN-222	1600.00Y	1.00	9.839E-01	9.843E-01	1.979E-01	20.11	
RA-224	1.41E+10Y	1.00	2.471E+00	2.471E+00	1.090E+00	44.11	
RA-226	1600.00Y	1.00	9.839E-01	9.843E-01	1.979E-01	20.11	
AC-228	1.41E+10Y	1.00	1.174E+00	1.174E+00	0.299E+00	25.50	
RA-228	1.41E+10Y	1.00	1.174E+00	1.174E+00	0.299E+00	25.50	
TH-228	1.41E+10Y	1.00	1.078E+00	1.078E+00	0.125E+00	11.56	
TH-229	7340.00Y	1.00	1.997E-01	1.997E-01	0.778E-01	38.94	K
TH-230	7.54E+04Y	1.00	9.839E-01	9.839E-01	1.979E-01	20.11	
PA-231	7.04E+08Y	1.00	1.278E+00	1.278E+00	0.665E+00	52.03	
TH-232	1.41E+10Y	1.00	1.174E+00	1.174E+00	0.299E+00	25.50	
TH-234	4.47E+09Y	1.00	4.526E-01	4.526E-01	10.46E-01	231.10	
U-234	2.45E+05Y	1.00	9.839E-01	9.839E-01	1.979E-01	20.11	
U-235	7.04E+08Y	1.00	1.581E-01	1.581E-01	2.962E-01	187.34	
U-238	4.47E+09Y	1.00	4.526E-01	4.526E-01	10.46E-01	231.10	
ANH-511	1.00E+09Y	1.00	5.731E-02	5.731E-02	7.543E-02	131.62	
Total Activity :			3.883E+01	4.227E+01			

Grand Total Activity : 3.883E+01 4.227E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	128.38	53	142	1.40	256.24	254	8	1.21E-02	91.8	8.38E+00	T
0	208.76	48	93	0.99	416.97	414	7	1.16E-02	77.2	6.12E+00	
0	270.43	59	60	1.66	540.33	536	9	1.46E-02	58.0	4.92E+00	T
0	463.82	66	26	2.14	927.11	921	14	1.70E-02	42.8	3.05E+00	T
0	481.66	26	33	2.95	962.81	957	11	6.80E-03	96.0	2.96E+00	T
0	493.76	2	17	1.29	987.00	984	6	5.86E-04	****	2.89E+00	T
0	567.01	16	9	1.64	1133.53	1130	7	4.18E-03	83.3	2.57E+00	
0	629.40	13	21	0.64	1258.35	1253	12	3.54E-03	****	2.35E+00	T
0	678.03	9	6	1.27	1355.63	1352	7	2.44E-03	****	2.21E+00	T
0	719.29	16	9	0.56	1438.19	1434	8	4.17E-03	88.4	2.10E+00	T
0	728.25	21	32	2.45	1456.11	1449	11	5.70E-03	****	2.08E+00	T
0	768.17	32	14	1.38	1535.97	1531	9	8.52E-03	56.2	1.99E+00	T
0	788.47	31	22	5.45	1576.59	1568	19	8.33E-03	85.3	1.95E+00	
0	877.54	13	20	0.85	1754.80	1748	14	3.67E-03	****	1.78E+00	
0	929.74	16	5	1.04	1859.25	1853	9	4.40E-03	70.4	1.70E+00	T
0	1008.96	8	4	2.72	2017.77	2013	8	2.29E-03	****	1.58E+00	
0	1064.60	16	13	4.05	2129.13	2122	16	4.46E-03	****	1.51E+00	T
0	1339.15	8	6	0.64	2678.61	2669	14	2.22E-03	****	1.23E+00	
0	1571.36	9	3	0.63	3143.45	3137	11	2.59E-03	94.8	1.05E+00	
0	1730.34	6	4	0.81	3461.74	3455	9	1.84E-03	****	9.53E-01	
2	1765.85	11	4	1.97	3532.83	3519	18	3.21E-03	****	9.33E-01	

Flags: "T" = Tentatively associated


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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235065.CNF;1
* Acquisition date   : 3-OCT-2016 05:57:14 Sensitivity      : 3.000
* Detector ID       : GAM25 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.55 Half life ratio : *****
* Sample date       : 14-DEC-2015 13:56:00 Nuclide Library : SOLID
* Sample ID        : G405235065 Analyst initials: MXR1
* Batch Number     : 1596254 Sample Quantity : 1.4784E+02 GRAM
* Wet wt corr      : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 1-AUG-2016 08:41:33 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM25_CAN.CNF;15
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.961E-01
NB-94	2.610E-02
NB-95	3.843E-01
ZR-95	1.080E+00
CD-109	5.681E-01
SN-126	3.243E-02
TL-208	2.181E-02
PB-210	2.630E-01
BI-211	1.329E-01
PB-212	3.610E-02
BI-214	5.807E-02
PB-214	1.619E-01
RN-222	5.807E-02
RA-224	3.877E-01
RA-226	5.807E-02
AC-228	1.010E-01
RA-228	1.010E-01
TH-228	3.610E-02
TH-229	3.116E-01
TH-230	5.805E-02
PA-231	2.896E-01
TH-232	1.010E-01
TH-234	3.560E-01
U-234	5.805E-02
U-235	1.199E-01
U-238	3.560E-01
ANH-511	2.374E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.046E+00	NOT IDENT.
NA-22	3.967E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.844E-02	NOT IDENT.

SC-46	3.263E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.199E-02	NOT IDENT.
CO-56	3.929E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.213E-02	NOT IDENT.
CO-58	3.672E-01	NOT IDENT.
FE-59	5.488E+00	NOT IDENT.
CO-60	3.923E-02	NOT IDENT.
ZN-65	1.068E-01	NOT IDENT.
GE-68	2.274E+00	NOT IDENT.
AS-73	1.400E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.586E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.956E-01	NOT IDENT.
KR-85	5.199E+00	NOT IDENT.
SR-85	5.141E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.232E-01	NOT IDENT.
Y-91	4.401E+02	NOT IDENT.
NB-95M	1.546E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.119E-02	FAIL ABUN
RH-102	3.741E-02	FAIL ABUN
RU-103	4.525E+00	FAIL ABUN
RH-106	4.443E-01	NOT IDENT.
RU-106	4.443E-01	NOT IDENT.
AG-108M	2.310E-02	FAIL ABUN
AG-110M	8.859E-02	FAIL ABUN
SN-113	1.857E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	8.641E-02	NOT IDENT.
SB-124	1.500E+00	FAIL ABUN
SB-125	6.910E-02	FAIL ABUN
TE-125M	1.625E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.017E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	4.696E-02	FAIL ABUN
CS-135	1.043E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	3.312E-02	NOT IDENT.
CS-137	3.499E-02	NOT IDENT.
CE-139	7.277E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.519E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.166E-01	NOT IDENT.
PM-144	4.408E-02	NOT IDENT.
PR-144	3.828E+00	NOT IDENT.
PM-146	3.314E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	5.617E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.081E-02	FAIL ABUN
EU-152	7.284E-02	NOT IDENT.
GD-153	8.402E-02	NOT IDENT.
EU-154	1.002E-01	FAIL ABUN
EU-155	6.949E-02	FAIL ABUN
TB-160	1.285E+00	FAIL ABUN
HO-166M	4.873E-02	NOT IDENT.
TM-171	3.333E+00	NOT IDENT.
HF-172	1.558E-01	FAIL ABUN
LU-172	7.313E-02	FAIL ABUN

LU-176	1.720E-02	FAIL ABUN
HF-181	3.656E+00	FAIL ABUN
TA-182	8.462E-01	FAIL ABUN
RE-183	6.498E-01	NOT IDENT.
RE-184	2.702E+01	NOT IDENT.
W-188	7.096E+01	FAIL ABUN
IR-192	3.378E-01	FAIL ABUN
HG-203	1.802E+00	NOT IDENT.
BI-207	4.354E-02	FAIL ABUN
PB-211	4.235E-01	NOT IDENT.
BI-212	5.841E-01	FAIL ABUN
RN-219	3.156E-01	FAIL ABUN
RA-223	4.346E-01	FAIL ABUN
AC-227	1.542E-01	FAIL ABUN
TH-227	1.542E-01	FAIL ABUN
TH-231	4.346E-01	FAIL ABUN
PA-233	4.415E-02	FAIL ABUN
PA-234	2.281E-01	NOT IDENT.
PA-234M	4.278E+00	NOT IDENT.
NP-237	4.415E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.470E-01	NOT IDENT.
PU-239	2.313E+02	FAIL ABUN
AM-241	3.784E-02	NOT IDENT.
AM-243	3.755E-02	NOT IDENT.
CM-243	5.482E-02	NOT IDENT.
BK-247	5.813E-02	FAIL ABUN
CM-247	2.820E-02	NOT IDENT.
CF-249	3.053E-02	NOT IDENT.
CF-251	8.172E-02	NOT IDENT.

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*****
*                                     GEL Laboratories LLC                       *
*                                     2040 Savage Road                          *
*                                     Charleston, SC 29407                       *
*****
*                                     DETECTOR AND SAMPLE DATA                  *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235065.CNF;1
* Acquisition date   : 3-OCT-2016 05:57:14 Sensitivity      : 3.000
* Detector ID        : GAM25 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.55 Half life ratio : *****
* Sample date        : 14-DEC-2015 13:56:00 Nuclide Library : SOLID
* Sample ID          : G405235065 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity : 1.4784E+02 GRAM
* Wet wt corr        : 1.00000 Quantity Err(%) : 1.3529E-03 %
* Wet Weight         : 0.00000
* Dry Weight         : 0.00000
*****
*                                     CALIBRATION INFORMATION                    *
*
* Eff. Cal. date     : 1-AUG-2016 08:41:33 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM25_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.486E+01	1.793E+00	1.793E+00
NB-94	3.288E-02	5.858E-02	5.858E-02
NB-95	5.772E-01	1.109E+00	1.109E+00
ZR-95	1.833E+00	2.377E+00	2.377E+00
CD-109	1.268E+00	1.331E+00	1.331E+00
SN-126	8.157E-02	8.550E-02	8.550E-02
TL-208	3.592E-01	8.755E-02	8.755E-02
PB-210	6.963E-01	7.049E-01	7.049E-01
BI-211	1.187E-02	1.014E+00	1.014E+00
PB-212	1.078E+00	1.347E-01	1.347E-01
BI-214	9.843E-01	1.985E-01	1.985E-01
PB-214	1.309E+00	1.995E-01	1.995E-01
RN-222	9.843E-01	1.985E-01	1.985E-01
RA-224	1.653E-01	1.205E+00	1.205E+00
RA-226	9.843E-01	1.985E-01	1.985E-01
AC-228	1.174E+00	2.995E-01	2.995E-01
RA-228	1.174E+00	2.995E-01	2.995E-01
TH-228	1.078E+00	1.347E-01	1.347E-01
TH-229	-1.970E-01	3.779E-01	3.779E-01
TH-230	9.839E-01	1.985E-01	1.985E-01
PA-231	1.278E+00	7.062E-01	7.062E-01
TH-232	1.174E+00	2.995E-01	2.995E-01
TH-234	4.526E-01	1.030E+00	1.030E+00
U-234	9.839E-01	1.985E-01	1.985E-01
U-235	1.581E-01	2.904E-01	2.904E-01
U-238	4.526E-01	1.030E+00	1.030E+00
ANH-511	5.731E-02	7.396E-02	7.396E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-6.901E+00	1.161E+01	1.202E+01	NOT IDENT.
NA-22	-4.344E-03	4.848E-02	4.852E-02	NOT IDENT.
NA-24	1.000E+41	4.017E+41	0.000E+00	SHORT HLIF

AL-26	-1.085E-02	2.662E-02	2.706E-02	NOT IDENT.
SC-46	-5.542E-02	3.828E-01	3.836E-01	FAIL ABUN
V-48	-3.132E+03	1.104E+04	1.113E+04	SHORT HLIF
CR-51	-4.443E+01	2.892E+02	2.899E+02	SHORT HLIF
MN-54	-3.158E-03	5.967E-02	5.969E-02	NOT IDENT.
CO-56	1.014E-02	4.465E-01	4.465E-01	NOT IDENT.
MN-56	1.000E+41	3.824E+42	0.000E+00	SHORT HLIF
CO-57	4.635E-03	3.497E-02	3.504E-02	NOT IDENT.
CO-58	3.920E-02	4.089E-01	4.093E-01	NOT IDENT.
FE-59	-1.522E+00	6.603E+00	6.638E+00	NOT IDENT.
CO-60	2.932E-02	4.521E-02	4.711E-02	NOT IDENT.
ZN-65	2.576E-02	1.345E-01	1.350E-01	NOT IDENT.
GE-68	1.431E-01	2.646E+00	2.647E+00	NOT IDENT.
AS-73	-3.791E-02	1.465E+00	1.465E+00	NOT IDENT.
AS-74	-4.534E+02	4.502E+03	4.507E+03	SHORT HLIF
SE-75	1.137E-01	1.753E-01	1.826E-01	NOT IDENT.
BR-77	3.215E+37	2.726E+38	0.000E+00	SHORT HLIF
SR-82	1.189E+02	6.229E+02	6.253E+02	SHORT HLIF
RB-83	2.900E-01	5.305E-01	5.463E-01	NOT IDENT.
KR-85	-2.600E+00	6.359E+00	6.466E+00	NOT IDENT.
SR-85	-2.606E-01	6.294E-01	6.402E-01	NOT IDENT.
RB-86	2.732E+03	2.452E+04	2.455E+04	SHORT HLIF
Y-88	-8.054E-02	1.824E-01	1.860E-01	NOT IDENT.
Y-91	-2.273E+02	5.632E+02	5.724E+02	NOT IDENT.
NB-95M	2.939E-01	1.931E+00	1.935E+00	NOT IDENT.
NB-97	-1.000E+41	1.996E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	3.460E+41	0.000E+00	SHORT HLIF
MO-99	-8.368E+30	3.758E+31	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	3.833E+41	0.000E+00	SHORT HLIF
RH-101	5.539E-02	5.081E-02	5.662E-02	FAIL ABUN
RH-102	-1.785E-02	5.445E-02	5.505E-02	FAIL ABUN
RU-103	-9.891E-01	6.046E+00	6.062E+00	FAIL ABUN
RH-106	3.707E-01	4.678E-01	4.968E-01	NOT IDENT.
RU-106	3.707E-01	4.678E-01	4.968E-01	NOT IDENT.
AG-108M	5.613E-03	2.548E-02	2.561E-02	FAIL ABUN
AG-110M	1.575E-02	1.022E-01	1.025E-01	FAIL ABUN
SN-113	-8.336E-02	2.169E-01	2.201E-01	NOT IDENT.
CD-115	-1.938E+38	3.945E+38	0.000E+00	SHORT HLIF
SN-117M	2.954E+04	5.165E+04	5.334E+04	SHORT HLIF
TE-123M	5.296E-02	9.257E-02	9.560E-02	NOT IDENT.
SB-124	5.497E-02	1.745E+00	1.746E+00	FAIL ABUN
SB-125	-1.972E-02	8.098E-02	8.146E-02	FAIL ABUN
TE-125M	5.498E+01	1.728E+02	1.746E+02	NOT IDENT.
I-126	-1.155E+04	6.895E+05	6.896E+05	SHORT HLIF
SB-126	1.003E+06	8.890E+05	9.974E+05	SHORT HLIF
SB-127	-2.120E+21	8.188E+21	0.000E+00	SHORT HLIF
I-131	-2.499E+08	2.636E+09	2.639E+09	SHORT HLIF
I-132	1.000E+41	1.866E+42	0.000E+00	SHORT HLIF
TE-132	4.300E+25	9.532E+25	0.000E+00	SHORT HLIF
BA-133	1.043E-02	3.553E-02	3.584E-02	NOT IDENT.
I-133	1.000E+41	3.942E+41	0.000E+00	SHORT HLIF
CS-134	5.612E-02	5.734E-02	6.267E-02	FAIL ABUN
CS-135	2.022E-02	1.320E-01	1.323E-01	NOT IDENT.
I-135	-1.000E+41	6.781E+41	0.000E+00	SHORT HLIF
CS-136	-2.961E+04	2.470E+05	2.474E+05	SHORT HLIF
BA-137M	3.077E-02	3.498E-02	3.763E-02	NOT IDENT.
CS-137	3.251E-02	3.695E-02	3.975E-02	NOT IDENT.
CE-139	-8.346E-02	9.125E-02	9.870E-02	NOT IDENT.
BA-140	4.143E+05	7.919E+05	8.136E+05	SHORT HLIF
LA-140	2.034E+05	2.979E+05	3.117E+05	SHORT HLIF
CE-141	-4.775E+00	1.867E+01	1.879E+01	NOT IDENT.
CE-143	1.000E+41	5.654E+40	0.000E+00	SHORT HLIF
CE-144	-2.116E-01	2.581E-01	2.752E-01	NOT IDENT.
PM-144	-1.456E-02	6.253E-02	6.288E-02	NOT IDENT.
PR-144	-1.218E+00	5.420E+00	5.447E+00	NOT IDENT.
PM-146	1.254E-02	3.600E-02	3.644E-02	NOT IDENT.
ND-147	-8.930E+06	2.164E+07	2.201E+07	SHORT HLIF
PM-147	-1.949E+01	6.185E+02	6.185E+02	NOT IDENT.
PM-149	-1.566E+39	5.757E+39	0.000E+00	SHORT HLIF
EU-150	1.532E-02	2.340E-02	2.440E-02	FAIL ABUN
EU-152	6.961E-02	7.909E-02	8.508E-02	NOT IDENT.
GD-153	-7.477E-02	1.057E-01	1.109E-01	NOT IDENT.
EU-154	2.279E-02	1.154E-01	1.158E-01	FAIL ABUN
EU-155	4.990E-02	7.194E-02	7.537E-02	FAIL ABUN
TB-160	-4.775E-01	1.793E+00	1.806E+00	FAIL ABUN
HO-166M	-1.525E-02	6.095E-02	6.134E-02	NOT IDENT.
TM-171	1.164E+00	3.403E+00	3.443E+00	NOT IDENT.
HF-172	8.276E-02	1.777E-01	1.816E-01	FAIL ABUN

LU-172	-2.428E-02	8.996E-02	9.062E-02	FAIL ABUN
LU-176	5.709E-04	2.073E-02	2.073E-02	FAIL ABUN
HF-181	6.843E+00	6.445E+00	7.145E+00	FAIL ABUN
TA-182	-1.754E-02	1.012E+00	1.012E+00	FAIL ABUN
RE-183	-5.597E-01	7.127E-01	7.561E-01	NOT IDENT.
RE-184	1.302E+01	3.019E+01	3.076E+01	NOT IDENT.
W-188	-2.242E+01	9.660E+01	9.713E+01	FAIL ABUN
IR-192	-1.148E-01	3.812E-01	3.847E-01	FAIL ABUN
HG-203	4.076E-01	2.104E+00	2.112E+00	NOT IDENT.
BI-207	7.335E-02	7.856E-02	8.523E-02	FAIL ABUN
PB-211	-5.729E-01	5.534E-01	6.107E-01	NOT IDENT.
BI-212	7.749E-01	8.587E-01	9.270E-01	FAIL ABUN
RN-219	9.840E-02	3.437E-01	3.466E-01	FAIL ABUN
RA-223	-1.676E-01	4.942E-01	5.000E-01	FAIL ABUN
AC-227	-1.276E-01	1.991E-01	2.072E-01	FAIL ABUN
TH-227	-1.276E-01	1.991E-01	2.072E-01	FAIL ABUN
TH-231	-1.676E-01	4.942E-01	5.000E-01	FAIL ABUN
PA-233	-2.903E-02	5.117E-02	5.282E-02	FAIL ABUN
PA-234	-8.797E-02	2.961E-01	2.988E-01	NOT IDENT.
PA-234M	2.684E+00	4.478E+00	4.639E+00	NOT IDENT.
NP-237	-2.903E-02	5.117E-02	5.282E-02	FAIL ABUN
NP-238	4.101E+40	6.210E+40	0.000E+00	SHORT HLIF
NP-239	-1.210E-01	1.708E-01	1.793E-01	NOT IDENT.
PU-239	5.042E+02	4.539E+02	5.077E+02	FAIL ABUN
AM-241	5.032E-03	3.900E-02	3.907E-02	NOT IDENT.
AM-243	1.656E-01	3.655E-02	8.313E-02	NOT IDENT.
CM-243	-2.975E-02	6.175E-02	6.319E-02	NOT IDENT.
BK-247	7.139E-02	6.232E-02	7.014E-02	FAIL ABUN
CM-247	5.325E-03	3.109E-02	3.118E-02	NOT IDENT.
CF-249	9.598E-03	3.311E-02	3.339E-02	NOT IDENT.
CF-251	-2.393E-02	9.533E-02	9.594E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	43.2225	87.09	76.7587	136.47	81.2058
45.60	59.6870	87.57	76.8707	140.51	0.0000
46.54	59.9619	88.03	97.5052	143.76	68.7161
49.72	0.0000	88.34	97.5965	144.24	68.7845
51.35	74.7906	88.47	97.6348	145.44	73.5501
51.87	70.4681	89.96	84.8797	152.43	75.9177
52.39	66.8749	1093.63	85.0506	153.25	0.0000
52.97	67.0474	91.11	0.0000	323.87	61.1471
53.44	71.7157	92.59	85.5377	156.02	0.0000
54.07	74.9415	93.35	85.7258	158.56	0.0000
57.36	0.0000	94.56	86.0247	159.00	49.5720
57.53	90.6494	94.65	86.0465	162.33	66.1733
57.98	98.5142	94.67	86.0518	162.66	0.0000
59.27	83.5621	94.87	86.1007	163.33	58.1368
59.32	95.1872	97.43	69.1454	165.86	80.9528
59.54	95.2726	98.43	52.8850	176.31	59.5127
60.96	111.1378	98.44	52.8864	176.60	0.0000
61.17	111.2309	99.53	64.5389	177.52	66.9619
62.93	96.5634	100.11	61.9849	181.07	0.0000
63.29	96.6986	102.03	61.4189	181.52	68.8295
63.58	96.8069	103.18	75.0016	184.41	69.1679
64.28	97.0678	103.37	75.0400	143.76	64.7222
66.73	100.8901	105.21	69.1227	193.51	62.3348
67.24	107.4656	105.31	69.1409	197.03	51.8804
125.81	100.7129	106.12	65.6884	198.01	60.6211
67.75	101.5384	106.47	81.9605	201.83	63.1658
69.67	115.9398	109.28	71.6703	203.43	62.2324
70.83	122.8900	111.00	77.4508	205.31	55.4793
72.81	237.7312	111.76	0.0000	210.85	83.9252
72.87	237.7802	114.06	86.3084	215.65	60.0612
74.66	133.2836	116.30	0.0000	222.11	57.2645
74.82	128.9833	116.74	81.3318	227.09	66.7216
74.97	118.1129	119.76	65.1668	227.38	72.4063
77.11	179.2810	121.12	78.4520	228.16	0.0000
78.74	78.6349	121.22	78.4706	228.18	53.2336
79.69	85.5456	121.78	73.8968	116.74	53.2336
80.12	77.8777	122.06	74.8816	235.69	47.3092
80.19	0.0000	122.92	83.4735	235.96	47.3268
80.57	86.9042	123.07	79.7498	238.63	48.2664
81.00	94.5558	265.00	79.8626	238.98	0.0000
81.07	94.5773	125.81	65.4634	240.99	48.4215
81.75	83.8791	127.23	70.7263	242.00	48.4875
83.79	84.4223	127.91	67.0412	244.70	61.7952
84.00	90.1099	129.30	68.5195	252.40	0.0000
85.43	69.5810	131.20	67.5364	252.80	57.3845
86.55	76.6324	133.02	78.6818	254.15	0.0000
86.79	76.6880	133.52	77.8075	256.23	49.4052
86.94	76.7237	136.00	77.2607	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	35.6689	355.39	0.0000	584.27	14.6711
264.80	29.7295	356.01	26.2988	595.83	0.0000
265.00	28.5476	364.49	0.0000	427.87	26.4699
268.22	41.4005	366.42	0.0000	602.52	0.0000
269.46	43.0587	372.51	39.1866	604.72	23.8834
270.03	43.0895	375.05	35.7088	607.14	27.6398
271.23	43.1532	377.52	37.5806	609.32	27.6779
273.65	0.0000	356.01	26.1007	610.33	27.6948
276.40	50.6633	388.16	29.8176	614.28	20.8211
277.37	50.7222	388.63	0.0000	618.01	25.6846
277.60	50.7363	391.69	41.6969	620.36	30.0075
278.00	55.5950	264.66	29.2389	621.93	15.0180
279.20	44.7821	401.81	30.1835	630.19	0.0000
279.54	53.2759	402.40	30.1990	631.29	16.1816
279.70	53.2866	404.85	34.8496	633.25	30.7811
280.46	41.2134	410.95	36.8791	634.78	0.0000
283.69	34.0712	413.71	29.5736	635.95	15.1444
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	45.1141	423.72	0.0000	645.85	20.6730
285.90	0.0000	427.09	29.9108	657.76	18.6256
287.50	29.3350	427.87	23.3831	657.90	0.0000
290.67	37.6221	433.94	27.2613	661.66	17.5690
293.27	0.0000	439.40	24.5506	664.57	0.0000
351.93	19.7319	453.88	20.0618	666.33	0.0000
295.96	19.7485	463.37	27.9120	666.50	0.0000
879.38	24.7595	468.07	18.8371	667.71	0.0000
299.98	31.4115	473.00	0.0000	677.62	14.4044
300.09	31.4154	475.06	24.2803	685.70	0.0000
300.13	31.4170	476.78	24.7981	695.00	0.0000
301.36	31.4602	477.60	29.1925	696.49	23.5122
302.85	29.8542	482.18	20.5057	696.51	23.5131
256.23	26.5859	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	20.1628
306.78	32.4841	497.08	31.1014	697.49	20.1643
308.46	36.7168	505.52	19.3719	702.65	21.3448
311.90	45.2318	507.63	0.0000	706.68	25.3317
316.51	42.9327	511.00	29.9207	711.68	24.8359
319.41	0.0000	514.00	29.9841	720.70	0.0000
320.08	0.0000	514.00	29.9854	721.93	0.0000
321.04	33.8371	520.40	16.0645	722.78	13.6270
323.87	37.3327	520.69	0.0000	722.91	13.6279
325.23	45.8833	522.65	0.0000	723.31	13.6309
328.76	0.0000	527.90	0.0000	724.19	13.6372
333.37	39.8474	528.26	19.1825	727.33	27.3193
333.97	30.8687	529.59	17.1785	733.00	15.0708
334.37	36.0280	529.87	0.0000	735.93	17.1515
338.28	26.6993	531.02	0.0000	333.97	10.2993
338.32	26.6999	537.26	0.0000	739.50	0.0000
311.90	26.7586	546.56	0.0000	747.24	12.6516
340.48	26.7586	552.55	25.6612	748.06	16.1089
340.55	0.0000	563.25	23.2599	752.31	13.8379
344.28	22.0962	569.33	18.6826	753.82	0.0000
345.93	29.5100	946.00	20.2411	756.73	16.6430
351.06	29.6608	569.70	20.2443	756.80	16.6436
351.93	29.6864	583.19	14.6614	884.68	10.4399

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	6.9663	1274.44	15.4409	1620.50	1.8811
766.42	6.9685	1001.03	12.5695	1621.92	3.7635
766.84	6.9700	1002.74	11.0575	1678.03	0.0000
772.60	0.0000	1004.73	23.2390	1690.97	3.8291
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	8.7697
778.90	13.1474	1028.54	0.0000	1063.66	16.5883
783.70	0.0000	1037.84	12.7509	1771.35	7.8082
785.37	16.8826	1038.76	0.0000	1791.20	0.0000
792.07	0.0000	631.29	13.7778	1808.65	3.9383
794.95	14.1348	1048.07	0.0000	1810.72	0.0000
795.86	14.1411	1049.04	18.7159	1836.06	3.9631
810.06	10.6787	1050.41	9.8553		
810.29	9.7898	1063.66	20.8000		
344.28	9.7908	1077.00	0.0000		
810.76	9.7922	1077.34	17.9198		
815.77	0.0000	1085.87	7.9897		
1048.07	0.0000	1093.63	21.0320		
832.01	17.9834	1099.45	15.0549		
834.85	18.0072	1112.07	15.1245		
835.71	18.9153	1112.84	16.1367		
836.80	0.0000	1115.54	6.4609		
846.75	0.0000	1120.29	12.1348		
846.77	18.1067	1120.55	12.1362		
856.80	0.0000	1221.41	12.1392		
860.56	9.1107	1129.67	11.1611		
871.09	19.0404	1131.51	0.0000		
873.19	14.6602	1147.95	0.0000		
875.33	0.0000	1173.23	24.7251		
879.38	14.7007	1177.95	14.4460		
880.51	13.2372	1189.05	19.6796		
883.24	13.2535	1204.77	20.8252		
884.68	15.7879	1221.41	18.8470		
889.28	19.3792	1231.02	13.6554		
894.76	15.7258	1235.36	0.0000		
898.04	21.3070	1238.28	24.2171		
900.72	20.4041	1260.41	0.0000		
903.28	16.9782	1271.87	10.6439		
911.20	13.9751	1274.44	10.6525		
912.08	13.9806	1274.54	12.7837		
923.98	0.0000	1291.59	9.6394		
926.50	12.0039	1298.22	0.0000		
929.11	13.5193	1312.11	0.0000		
937.49	18.8434	1332.49	6.9422		
944.13	0.0000	1362.66	0.0000		
946.00	17.9650	1365.19	8.7642		
949.00	13.2536	1368.63	0.0000		
667.71	0.0000	1384.29	3.3052		
962.31	20.9419	1408.01	7.7661		
964.08	16.7659	1457.56	0.0000		
966.17	12.2039	1460.82	9.0107		
911.20	20.0445	1489.16	6.3574		
968.97	20.0445	1505.03	7.2977		
983.53	0.0000	1584.12	6.5218		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                   *
*                               Charleston, SC 29407                             *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235066.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM33.CNF;235
Background date  : 2-OCT-2016 11:02:02.
Sample date     : 14-DEC-2015 14:00:00 Acquisition date : 3-OCT-2016 05:57:37.
Sample ID      : G405235066 Sample quantity   : 1.57422E+02 GRAM
Detector name   : GAM33 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.75 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity    : 3.00000
Batch ID       : 1596254 Detector SN#   :
Matrix Spike ID : LCS ID           : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	2	74.91*	77	158	1.21	149.90	145	15	2.14E-02	29.0	1.19E+00
2	2	77.25	157	131	1.22	154.58	145	15	4.35E-02	15.3	
3	0	87.89	65	258	1.16	175.82	171	11	1.80E-02	49.8	
4	0	93.42*	92	176	1.16	186.86	182	11	2.55E-02	32.0	
5	0	125.24	25	45	0.94	250.43	249	4	6.95E-03	42.7	
6	0	143.63*	36	103	1.16	287.15	283	8	1.00E-02	54.3	
7	0	186.03*	88	81	1.28	371.86	368	8	2.44E-02	22.9	
8	0	209.91	49	96	1.09	419.56	415	10	1.35E-02	40.5	
9	0	232.51	23	45	0.97	464.70	462	6	6.26E-03	51.6	
10	0	238.60*	292	139	1.00	476.88	473	8	8.12E-02	9.3	
11	0	241.76	98	80	1.44	483.18	481	6	2.72E-02	18.1	
12	0	269.71	57	82	1.73	539.02	533	13	1.60E-02	34.9	
13	0	295.54	205	67	1.28	590.63	585	13	5.68E-02	11.0	
14	0	300.53	27	42	1.79	600.60	598	8	7.38E-03	45.9	
15	4	327.86*	25	45	1.91	655.21	646	37	7.03E-03	55.2	1.28E+00
16	4	332.76	26	28	1.31	665.00	646	37	7.30E-03	41.0	
17	4	338.30*	80	23	1.38	676.08	646	37	2.21E-02	16.4	
18	0	352.00*	256	27	1.34	703.46	700	9	7.12E-02	7.3	
19	0	403.07	8	45	1.03	805.49	800	10	2.33E-03	150.6	
20	0	479.37	12	47	3.51	957.98	945	14	3.44E-03	122.5	
21	0	482.57	7	25	1.47	964.37	960	8	1.93E-03	128.9	
22	0	493.30	16	20	2.85	985.82	980	11	4.34E-03	60.4	
23	0	511.28*	27	80	1.90	1021.76	1014	19	7.51E-03	90.0	
24	0	537.31	18	29	0.55	1073.78	1066	14	5.06E-03	68.9	
25	0	547.20	13	15	0.76	1093.56	1087	10	3.67E-03	61.2	
26	0	550.83	16	15	1.50	1100.81	1098	7	4.55E-03	45.5	
27	0	583.44*	134	24	1.52	1165.99	1159	16	3.72E-02	12.2	
28	0	609.29*	181	43	1.19	1217.67	1211	14	5.03E-02	10.8	
29	0	665.62	66	20	4.94	1330.28	1319	28	1.84E-02	23.0	
30	0	727.48	30	19	0.73	1453.95	1449	10	8.44E-03	32.7	
31	1	761.47	16	24	1.76	1521.90	1507	40	4.46E-03	62.3	2.89E+00
32	1	768.68	22	26	1.77	1536.32	1507	40	6.19E-03	46.4	
33	0	781.60	18	9	1.12	1562.17	1557	9	5.00E-03	38.2	
34	0	822.07	10	13	0.85	1643.08	1636	9	2.77E-03	73.2	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	831.18	10	9	1.62	1661.31	1656	9	2.77E-03	62.8	
36	0	849.74	12	7	1.61	1698.41	1695	7	3.21E-03	48.4	
37	0	861.28	19	8	2.06	1721.49	1717	11	5.39E-03	36.4	
38	0	873.87	14	1	1.76	1746.67	1744	6	3.81E-03	30.2	
39	0	911.84*	75	43	1.50	1822.62	1815	17	2.09E-02	23.2	
40	0	934.32	28	12	0.99	1867.57	1860	16	7.91E-03	32.9	
41	0	964.85	15	13	1.04	1928.63	1925	8	4.23E-03	49.1	
42	0	969.82*	49	30	1.84	1938.57	1933	16	1.36E-02	28.7	
43	0	1079.64	16	7	1.58	2158.25	2154	10	4.47E-03	40.2	
44	0	1121.57*	16	27	1.67	2242.13	2233	12	4.51E-03	69.7	
45	0	1209.50	16	22	3.74	2418.06	2408	18	4.39E-03	74.7	
46	0	1225.89	11	5	1.39	2450.86	2448	7	3.12E-03	44.7	
47	0	1279.54	10	7	1.01	2558.22	2552	10	2.88E-03	57.6	
48	0	1295.04	11	6	3.42	2589.24	2582	11	2.92E-03	53.1	
49	0	1378.23	12	3	1.29	2755.74	2750	9	3.46E-03	35.9	
50	0	1461.07*	356	4	1.78	2921.53	2914	17	9.90E-02	5.5	
51	0	1764.76*	43	0	1.87	3529.59	3524	11	1.19E-02	16.0	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235066.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 14-DEC-2015 14:00:00 Acquisition date : 3-OCT-2016 05:57:37
Sample ID        : G405235066 Sample quantity   : 157.42 GRAM
Sample type      : SOLID Sample geometry    :
Detector name    : GAMMA33 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.75 0.0%
Energy tolerance : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error    : 0.00 %
Efficiency type  : Linear Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.133E+00	1.363E+01	1.363E+01	11.02	OK
CD-109	88.03	3.70*	4.949E+00	8.003E-01	1.244E+00	275.99	OK
SN-126	64.28	9.60	2.578E+00	-----	Line Not Found	-----	Absent
	86.94	8.90	4.949E+00	3.327E-01	3.327E-01	275.99	OK
	87.57	37.00*	4.949E+00	8.003E-02	8.003E-02	275.99	OK
CS-135	268.22	16.00*	4.353E+00	4.598E-01	4.598E-01	69.88	OK
TL-208	277.37	6.60	4.258E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.333E+00	3.468E-01	3.468E-01	24.30	OK
	860.56	12.50	1.726E+00	4.421E-01	4.421E-01	72.71	OK
PB-212	74.82	10.28	3.809E+00	3.818E-01	3.818E-01	194.45	OK
	77.11	17.10	4.047E+00	1.422E+00	1.422E+00	30.55	OK
	238.63	43.60*	4.776E+00	7.919E-01	7.919E-01	18.50	OK
	300.09	3.30	3.995E+00	1.111E+00	1.111E+00	91.90	OK
BI-214	609.32	45.49*	2.255E+00	9.030E-01	9.033E-01	21.54	OK
	1120.29	14.92	1.406E+00	3.689E-01	3.690E-01	139.45	OK
	1764.49	15.30	9.590E-01	1.318E+00	1.318E+00	31.95	OK
PB-214	74.82	5.80	3.800E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	4.047E+00	2.507E+00	2.508E+00	30.55	OK
	87.09	3.41	4.892E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	4.727E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.049E+00	1.515E+00	1.516E+00	21.95	OK
	351.93	35.60*	3.512E+00	1.112E+00	1.112E+00	14.65	OK
RN-222	609.32	45.49*	2.255E+00	9.030E-01	9.033E-01	21.54	OK
	1120.29	14.92	1.406E+00	3.689E-01	3.690E-01	139.45	OK
	1764.49	15.30	9.590E-01	1.318E+00	1.318E+00	31.95	OK
RA-224	240.99	4.10*	4.731E+00	1.683E-01	1.683E-01	703.88	OK
RA-226	609.32	45.49*	2.255E+00	9.030E-01	9.033E-01	21.54	OK
	1120.29	14.92	1.406E+00	3.689E-01	3.690E-01	139.45	OK
	1764.49	15.30	9.590E-01	1.318E+00	1.318E+00	31.95	OK
AC-228	105.21	1.10	5.839E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.628E+00	1.061E+00	1.061E+00	32.79	OK
	794.95	4.25	1.835E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.766E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.652E+00	8.612E-01	8.612E-01	46.46	OK
	968.97	15.80	1.575E+00	9.513E-01	9.513E-01	57.44	OK
RA-228	105.21	1.10	5.839E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.628E+00	1.061E+00	1.061E+00	32.79	OK
	794.95	4.25	1.835E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.766E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.652E+00	8.612E-01	8.612E-01	46.46	OK
	968.97	15.80	1.575E+00	9.513E-01	9.513E-01	57.44	OK
TH-228	74.82	10.28	3.809E+00	3.818E-01	3.818E-01	194.45	OK
	77.11	17.10	4.047E+00	1.422E+00	1.422E+00	30.55	OK
	238.63	43.60*	4.776E+00	7.919E-01	7.919E-01	18.50	OK
	300.09	3.30	3.995E+00	1.111E+00	1.111E+00	91.90	OK
TH-230	609.32	45.49*	2.255E+00	9.030E-01	9.030E-01	21.54	OK
	1120.29	14.92	1.406E+00	3.689E-01	3.689E-01	139.45	OK
	1764.49	15.30	9.590E-01	1.318E+00	1.318E+00	31.95	OK
PA-231	283.69	1.70	4.183E+00	-----	Line Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	301.36	5.35*	3.995E+00	6.853E-01	6.853E-01	91.90	OK
TH-232	105.21	1.10	5.839E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.628E+00	1.061E+00	1.061E+00	32.79	OK
	835.71	1.61	1.766E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.652E+00	8.612E-01	8.612E-01	46.46	OK
	968.97	15.80	1.575E+00	9.513E-01	9.513E-01	57.44	OK
U-234	609.32	45.49*	2.255E+00	9.030E-01	9.030E-01	21.54	OK
	1120.29	14.92	1.406E+00	3.689E-01	3.689E-01	139.45	OK
	1764.49	15.30	9.590E-01	1.318E+00	1.318E+00	31.95	OK
U-235	89.96	3.47	5.092E+00	----- Line	Not Found	-----	Absent
	93.35	5.60	5.306E+00	1.904E+00	1.904E+00	64.00	OK
	143.76	10.96*	6.182E+00	3.160E-01	3.160E-01	108.58	OK
	163.33	5.08	5.963E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.613E+00	1.579E-01	1.579E-01	45.87	OK
	205.31	5.01	5.295E+00	----- Line	Not Found	-----	Absent
AM-243	43.53	5.90	2.461E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.809E+00	5.841E-02	5.842E-02	194.45	OK
CM-247	278.00	3.40	4.251E+00	----- Line	Not Found	-----	Absent
	287.50	2.00	4.139E+00	----- Line	Not Found	-----	Absent
	402.40	72.00*	3.142E+00	1.980E-02	1.980E-02	301.27	OK
ANH-511	511.00	100.00*	2.591E+00	5.441E-02	5.441E-02	179.92	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235066.CNF;1
* Acquisition date   : 3-OCT-2016 05:57:37 Sensitivity      : 3.000
* Detector ID       : GAM33 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.75 Half life ratio : *****
* Sample date       : 14-DEC-2015 14:00:00 Analyst initials: MXR1
* Sample ID         : G405235066 Sample Quantity : 1.5742E+02 GRAM
* Batch Number      : 1596254 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 10-JUN-2016 07:00:49 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.363E+01	1.472E+00	5.902E-01
CD-109	1.244E+00	3.365E+00	2.309E+00
SN-126	8.003E-02	2.165E-01	1.495E-01
CS-135	4.598E-01	3.149E-01	2.140E-01
TL-208	3.468E-01	8.259E-02	5.293E-02
PB-212	7.919E-01	1.436E-01	1.133E-01
BI-214	9.033E-01	1.907E-01	9.393E-02
PB-214	1.112E+00	1.597E-01	1.158E-01
RN-222	9.033E-01	1.907E-01	9.393E-02
RA-224	1.683E-01	1.161E+00	1.280E+00
RA-226	9.033E-01	1.907E-01	9.393E-02
AC-228	8.612E-01	3.921E-01	2.092E-01
RA-228	8.612E-01	3.921E-01	2.092E-01
TH-228	7.919E-01	1.436E-01	1.133E-01
TH-230	9.030E-01	1.906E-01	9.390E-02
PA-231	6.853E-01	6.171E-01	6.582E-01
TH-232	8.612E-01	3.921E-01	2.092E-01
U-234	9.030E-01	1.906E-01	9.390E-02
U-235	3.160E-01	3.363E-01	3.024E-01
AM-243	5.842E-02	1.113E-01	9.349E-02
CM-247	1.980E-02	5.846E-02	5.853E-02
ANH-511	5.441E-02	9.595E-02	5.050E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-7.443E+00	1.216E+01	1.933E+01	NOT IDENT.
NA-22	5.034E-03	3.635E-02	7.094E-02	NOT IDENT.
NA-24	0.000E+00	1.084E+41	0.000E+00	SHORT HLIF
AL-26	1.001E-02	2.018E-02	5.505E-02	NOT IDENT.
SC-46	-1.658E-02	2.739E-01	5.499E-01	FAIL ABUN
V-48	0.000E+00	8.568E+03	0.000E+00	SHORT HLIF
CR-51	0.000E+00	2.904E+02	0.000E+00	SHORT HLIF
MN-54	-9.583E-03	7.195E-02	1.188E-01	NOT IDENT.

CO-56	9.684E-03	3.839E-01	6.840E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	3.917E-02	4.439E-02	9.045E-02	NOT IDENT.
CO-58	3.632E-02	4.861E-01	9.623E-01	NOT IDENT.
FE-59	-1.466E+00	4.479E+00	8.864E+00	NOT IDENT.
CO-60	-2.054E-03	3.394E-02	6.952E-02	NOT IDENT.
ZN-65	8.785E-02	1.742E-01	3.432E-01	NOT IDENT.
GE-68	-7.222E-02	2.336E+00	4.200E+00	NOT IDENT.
AS-73	-8.102E+00	9.377E+00	1.747E+01	NOT IDENT.
AS-74	0.000E+00	4.162E+03	0.000E+00	SHORT HLIF
SE-75	4.292E-03	1.801E-01	3.074E-01	NOT IDENT.
BR-77	0.000E+00	4.280E+36	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.437E+02	0.000E+00	SHORT HLIF
RB-83	-3.002E-01	6.108E-01	1.125E+00	NOT IDENT.
KR-85	3.992E-01	6.342E+00	1.252E+01	NOT IDENT.
SR-85	3.821E-02	6.279E-01	1.239E+00	NOT IDENT.
RB-86	0.000E+00	2.069E+04	0.000E+00	SHORT HLIF
Y-88	-2.956E-03	1.405E-01	3.267E-01	NOT IDENT.
Y-91	-8.607E+01	4.232E+02	7.321E+02	NOT IDENT.
NB-94	1.978E-02	2.529E-02	5.579E-02	NOT IDENT.
NB-95	3.569E-02	6.525E-01	1.295E+00	NOT IDENT.
NB-95M	-8.355E-02	2.648E+00	3.860E+00	NOT IDENT.
ZR-95	1.340E+00	1.345E+00	2.946E+00	NOT IDENT.
NB-97	0.000E+00	1.626E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	3.769E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-1.292E-02	3.346E-02	5.627E-02	NOT IDENT.
RH-102	9.594E-03	5.214E-02	1.054E-01	NOT IDENT.
RU-103	3.710E+00	4.479E+00	9.260E+00	FAIL ABUN
RH-106	-3.908E-02	4.115E-01	8.046E-01	NOT IDENT.
RU-106	-3.908E-02	4.115E-01	8.046E-01	NOT IDENT.
AG-108M	-5.630E-03	2.295E-02	4.462E-02	NOT IDENT.
AG-110M	-4.578E-02	8.237E-02	1.433E-01	NOT IDENT.
SN-113	-9.855E-02	1.996E-01	3.762E-01	NOT IDENT.
CD-115	0.000E+00	4.335E+38	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	6.958E+04	0.000E+00	SHORT HLIF
TE-123M	-7.498E-02	1.300E-01	2.304E-01	NOT IDENT.
SB-124	-3.960E-01	1.728E+00	3.476E+00	NOT IDENT.
SB-125	-4.793E-02	8.678E-02	1.618E-01	NOT IDENT.
TE-125M	1.504E+02	2.528E+02	5.027E+02	NOT IDENT.
I-126	0.000E+00	1.505E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	7.793E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	6.305E+21	0.000E+00	SHORT HLIF
I-131	0.000E+00	2.421E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	9.296E+25	0.000E+00	SHORT HLIF
BA-133	-5.271E-03	4.182E-02	7.372E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	3.738E-02	5.386E-02	1.113E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	1.999E+05	0.000E+00	SHORT HLIF
BA-137M	4.766E-02	3.147E-02	7.311E-02	NOT IDENT.
CS-137	5.035E-02	3.325E-02	7.724E-02	NOT IDENT.
CE-139	3.106E-02	1.101E-01	2.090E-01	NOT IDENT.
BA-140	0.000E+00	1.802E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	2.768E+05	0.000E+00	SHORT HLIF
CE-141	-3.102E+00	1.965E+01	3.367E+01	NOT IDENT.
CE-143	0.000E+00	1.727E+41	0.000E+00	SHORT HLIF
CE-144	-8.942E-02	3.272E-01	6.048E-01	NOT IDENT.
PM-144	-5.011E-02	4.621E-02	7.339E-02	NOT IDENT.
PR-144	-4.339E+00	4.001E+00	6.355E+00	NOT IDENT.
PM-146	7.869E-03	4.209E-02	8.461E-02	NOT IDENT.
ND-147	0.000E+00	2.171E+07	0.000E+00	SHORT HLIF
PM-147	4.383E+02	7.779E+02	1.549E+03	NOT IDENT.
PM-149	0.000E+00	5.583E+39	0.000E+00	SHORT HLIF
EU-150	4.121E-02	3.312E-02	4.265E-02	FAIL ABUN
EU-152	-1.339E-02	8.072E-02	1.523E-01	FAIL ABUN
GD-153	-7.730E-02	1.786E-01	3.028E-01	NOT IDENT.
EU-154	2.384E-02	9.217E-02	1.843E-01	FAIL ABUN
EU-155	8.918E-02	9.900E-02	2.042E-01	FAIL ABUN
TB-160	-1.679E+00	1.579E+00	2.394E+00	FAIL ABUN
HO-166M	3.825E-02	4.747E-02	1.048E-01	NOT IDENT.
TM-171	-4.540E+00	2.330E+01	4.649E+01	NOT IDENT.
HF-172	2.887E-01	2.414E-01	4.283E-01	FAIL ABUN
LU-172	4.950E-02	7.020E-02	1.572E-01	FAIL ABUN
LU-176	-1.364E-02	2.107E-02	3.977E-02	FAIL ABUN
HF-181	2.028E+00	5.125E+00	7.441E+00	FAIL ABUN

TA-182	1.052E-01	1.001E+00	1.788E+00	FAIL ABUN
RE-183	1.676E+00	3.108E+00	6.473E+00	NOT IDENT.
RE-184	8.704E-01	2.489E+01	4.835E+01	NOT IDENT.
W-188	-6.511E+00	1.029E+02	1.851E+02	NOT IDENT.
IR-192	1.746E-01	3.605E-01	7.621E-01	FAIL ABUN
HG-203	1.610E-01	2.000E+00	4.038E+00	NOT IDENT.
BI-207	5.367E-03	3.978E-02	8.420E-02	FAIL ABUN
PB-210	4.628E+00	4.679E+00	1.033E+01	NOT IDENT.
BI-211	0.000E+00	4.400E-01	7.767E-01	FAIL ABUN
PB-211	-9.432E-02	6.226E-01	1.093E+00	FAIL ABUN
BI-212	1.163E+00	7.461E-01	1.189E+00	FAIL ABUN
RN-219	2.160E-01	6.377E-01	7.285E-01	FAIL ABUN
RA-223	-2.711E-01	5.497E-01	9.297E-01	FAIL ABUN
AC-227	9.681E-02	2.199E-01	4.205E-01	FAIL ABUN
TH-227	9.681E-02	2.199E-01	4.205E-01	FAIL ABUN
TH-229	-4.881E-01	4.351E-01	7.145E-01	FAIL ABUN
TH-231	-2.711E-01	5.497E-01	9.297E-01	FAIL ABUN
PA-233	1.288E-02	5.506E-02	1.123E-01	FAIL ABUN
PA-234	-2.113E-01	2.665E-01	4.331E-01	FAIL ABUN
PA-234M	3.533E+00	4.433E+00	9.538E+00	NOT IDENT.
TH-234	-2.287E-01	1.460E+00	2.912E+00	FAIL ABUN
NP-237	1.288E-02	5.506E-02	1.123E-01	FAIL ABUN
NP-238	0.000E+00	5.388E+40	0.000E+00	SHORT HLIF
U-238	-2.287E-01	1.460E+00	2.912E+00	FAIL ABUN
NP-239	1.425E-01	2.245E-01	4.513E-01	NOT IDENT.
PU-239	3.127E+02	3.111E+02	6.297E+02	NOT IDENT.
AM-241	6.229E-02	1.526E-01	3.129E-01	NOT IDENT.
CM-243	-9.302E-02	9.417E-02	1.660E-01	NOT IDENT.
BK-247	-2.424E-02	6.537E-02	1.043E-01	NOT IDENT.
CF-249	-1.814E-02	3.201E-02	5.995E-02	FAIL ABUN
CF-251	6.243E-02	1.047E-01	2.058E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	345	10.66*	1.133E+00	1.363E+01	1.363E+01	11.02
CD-109	88.03	84	3.70*	4.949E+00	2.197E+00	3.415E+00	99.57
SN-126	64.28	-----	9.60	2.578E+00	-----	Line Not Found	-----
	86.94	84	8.90	4.949E+00	9.133E-01	9.133E-01	99.57
	87.57	84	37.00*	4.949E+00	2.197E-01	2.197E-01	99.57
CS-135	268.22	67	16.00*	4.353E+00	4.598E-01	4.598E-01	69.88
TL-208	277.37	-----	6.60	4.258E+00	-----	Line Not Found	-----
	583.19	144	85.00*	2.333E+00	3.468E-01	3.468E-01	24.30
	860.56	20	12.50	1.726E+00	4.421E-01	4.421E-01	72.71
BI-211	72.87	-----	1.23	3.591E+00	-----	Line Not Found	-----
	351.06	291	12.92*	3.512E+00	3.064E+00	3.064E+00	14.65
PB-212	74.82	102	10.28	3.809E+00	1.237E+00	1.237E+00	58.08
	77.11	206	17.10	4.047E+00	1.422E+00	1.422E+00	30.55
	238.63	346	43.60*	4.776E+00	7.919E-01	7.919E-01	18.50
	300.09	31	3.30	3.995E+00	1.111E+00	1.111E+00	91.90
BI-214	609.32	194	45.49*	2.255E+00	9.030E-01	9.033E-01	21.54
	1120.29	16	14.92	1.406E+00	3.689E-01	3.690E-01	139.45
	1764.49	41	15.30	9.590E-01	1.318E+00	1.318E+00	31.95
PB-214	74.82	102	5.80	3.809E+00	2.192E+00	2.193E+00	58.08
	77.11	206	9.70	4.047E+00	2.507E+00	2.508E+00	30.55
	87.09	84	3.41	4.949E+00	2.384E+00	2.384E+00	99.57
	242.00	116	7.25	4.731E+00	1.610E+00	1.611E+00	36.10
	295.22	237	18.42	4.049E+00	1.515E+00	1.516E+00	21.95
	351.93	291	35.60*	3.512E+00	1.112E+00	1.112E+00	14.65
RN-222	609.32	194	45.49*	2.255E+00	9.030E-01	9.033E-01	21.54
	1120.29	16	14.92	1.406E+00	3.689E-01	3.690E-01	139.45
	1764.49	41	15.30	9.590E-01	1.318E+00	1.318E+00	31.95
RA-224	240.99	116	4.10*	4.731E+00	2.848E+00	2.848E+00	36.10
RA-226	609.32	194	45.49*	2.255E+00	9.030E-01	9.033E-01	21.54
	1120.29	16	14.92	1.406E+00	3.689E-01	3.690E-01	139.45
	1764.49	41	15.30	9.590E-01	1.318E+00	1.318E+00	31.95
AC-228	105.21	-----	1.10	5.839E+00	-----	Line Not Found	-----
	338.32	91	11.27	3.628E+00	1.061E+00	1.061E+00	32.79
	794.95	-----	4.25	1.835E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.766E+00	-----	Line Not Found	-----
	911.20	77	25.80*	1.652E+00	8.612E-01	8.612E-01	46.46
	968.97	50	15.80	1.575E+00	9.513E-01	9.513E-01	57.44
RA-228	105.21	-----	1.10	5.839E+00	-----	Line Not Found	-----
	338.32	91	11.27	3.628E+00	1.061E+00	1.061E+00	32.79
	794.95	-----	4.25	1.835E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.766E+00	-----	Line Not Found	-----
	911.20	77	25.80*	1.652E+00	8.612E-01	8.612E-01	46.46
	968.97	50	15.80	1.575E+00	9.513E-01	9.513E-01	57.44
TH-228	74.82	102	10.28	3.809E+00	1.237E+00	1.237E+00	58.08
	77.11	206	17.10	4.047E+00	1.422E+00	1.422E+00	30.55
	238.63	346	43.60*	4.776E+00	7.919E-01	7.919E-01	18.50
	300.09	31	3.30	3.995E+00	1.111E+00	1.111E+00	91.90

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-230	609.32	194	45.49*	2.255E+00	9.030E-01	9.030E-01	21.54
	1120.29	16	14.92	1.406E+00	3.689E-01	3.689E-01	139.45
	1764.49	41	15.30	9.590E-01	1.318E+00	1.318E+00	31.95
PA-231	283.69	-----	1.70	4.183E+00	-----	Line Not Found	-----
	301.36	31	5.35*	3.995E+00	6.853E-01	6.853E-01	91.90
TH-232	105.21	-----	1.10	5.839E+00	-----	Line Not Found	-----
	338.32	91	11.27	3.628E+00	1.061E+00	1.061E+00	32.79
	835.71	-----	1.61	1.766E+00	-----	Line Not Found	-----
	911.20	77	25.80*	1.652E+00	8.612E-01	8.612E-01	46.46
U-234	968.97	50	15.80	1.575E+00	9.513E-01	9.513E-01	57.44
	609.32	194	45.49*	2.255E+00	9.030E-01	9.030E-01	21.54
	1120.29	16	14.92	1.406E+00	3.689E-01	3.689E-01	139.45
U-235	1764.49	41	15.30	9.590E-01	1.318E+00	1.318E+00	31.95
	89.96	-----	3.47	5.092E+00	-----	Line Not Found	-----
	93.35	119	5.60	5.306E+00	1.904E+00	1.904E+00	64.00
	143.76	45	10.96*	6.182E+00	3.160E-01	3.160E-01	108.58
	163.33	-----	5.08	5.963E+00	-----	Line Not Found	-----
AM-243	185.72	106	57.20	5.613E+00	1.579E-01	1.579E-01	45.87
	205.31	-----	5.01	5.295E+00	-----	Line Not Found	-----
	43.53	-----	5.90	2.461E-01	-----	Line Not Found	-----
	74.66	102	67.20*	3.809E+00	1.892E-01	1.892E-01	58.08
CM-247	278.00	-----	3.40	4.251E+00	-----	Line Not Found	-----
	287.50	-----	2.00	4.139E+00	-----	Line Not Found	-----
ANH-511	402.40	9	72.00*	3.142E+00	1.980E-02	1.980E-02	301.27
	511.00	30	100.00*	2.591E+00	5.441E-02	5.441E-02	179.92

Flag: "*" = Keyline

Total number of lines in spectrum 51
 Number of unidentified lines 15
 Number of lines tentatively identified by NID 36 70.59%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.363E+01	1.363E+01	0.150E+01	11.02	
CD-109	461.40D	1.55	2.197E+00	3.415E+00	3.400E+00	99.57	
SN-126	2.30E+05Y	1.00	2.197E-01	2.197E-01	2.187E-01	99.57	
CS-135	2.30E+06Y	1.00	4.598E-01	4.598E-01	3.213E-01	69.88	
TL-208	1.41E+10Y	1.00	3.468E-01	3.468E-01	0.843E-01	24.30	
BI-211	7.04E+08Y	1.00	3.064E+00	3.064E+00	0.449E+00	14.65	
PB-212	1.41E+10Y	1.00	7.919E-01	7.919E-01	1.465E-01	18.50	
BI-214	1600.00Y	1.00	9.030E-01	9.033E-01	1.946E-01	21.54	
PB-214	1600.00Y	1.00	1.112E+00	1.112E+00	0.163E+00	14.65	
RN-222	1600.00Y	1.00	9.030E-01	9.033E-01	1.946E-01	21.54	
RA-224	1.41E+10Y	1.00	2.848E+00	2.848E+00	1.028E+00	36.10	
RA-226	1600.00Y	1.00	9.030E-01	9.033E-01	1.946E-01	21.54	
AC-228	1.41E+10Y	1.00	8.612E-01	8.612E-01	4.001E-01	46.46	
RA-228	1.41E+10Y	1.00	8.612E-01	8.612E-01	4.001E-01	46.46	
TH-228	1.41E+10Y	1.00	7.919E-01	7.919E-01	1.465E-01	18.50	
TH-230	7.54E+04Y	1.00	9.030E-01	9.030E-01	1.945E-01	21.54	
PA-231	7.04E+08Y	1.00	6.853E-01	6.853E-01	6.297E-01	91.90	
TH-232	1.41E+10Y	1.00	8.612E-01	8.612E-01	4.001E-01	46.46	
U-234	2.45E+05Y	1.00	9.030E-01	9.030E-01	1.945E-01	21.54	
U-235	7.04E+08Y	1.00	3.160E-01	3.160E-01	3.431E-01	108.58	
AM-243	7370.00Y	1.00	1.892E-01	1.892E-01	1.099E-01	58.08	
CM-247	1.56E+07Y	1.00	1.980E-02	1.980E-02	5.965E-02	301.27	
ANH-511	1.00E+09Y	1.00	5.441E-02	5.441E-02	9.790E-02	179.92	
Total Activity :			3.382E+01	3.504E+01			

Grand Total Activity : 3.382E+01 3.504E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	125.24	32	57	0.94	250.43	249	4	6.95E-03	85.3	6.21E+00	T
0	209.91	58	115	1.09	419.56	415	10	1.35E-02	80.9	5.22E+00	T
0	232.51	27	54	0.97	464.70	462	6	6.26E-03	****	4.87E+00	
4	327.86	29	52	1.91	655.21	646	37	7.03E-03	****	3.72E+00	T
4	332.76	30	33	1.31	665.00	646	37	7.30E-03	82.0	3.68E+00	T
0	479.37	14	51	3.51	957.98	945	14	3.44E-03	****	2.73E+00	
0	482.57	8	28	1.47	964.37	960	8	1.93E-03	****	2.71E+00	T
0	493.30	17	22	2.85	985.82	980	11	4.34E-03	****	2.67E+00	T
0	537.31	20	31	0.55	1073.78	1066	14	5.06E-03	****	2.49E+00	T
0	547.20	14	16	0.76	1093.56	1087	10	3.67E-03	****	2.45E+00	T
0	550.83	18	16	1.50	1100.81	1098	7	4.55E-03	90.9	2.44E+00	
0	665.62	70	21	4.94	1330.28	1319	28	1.84E-02	46.0	2.10E+00	T
0	727.48	32	20	0.73	1453.95	1449	10	8.44E-03	65.5	1.97E+00	T
1	761.47	17	25	1.76	1521.90	1507	40	4.46E-03	****	1.90E+00	
1	768.68	23	27	1.77	1536.32	1507	40	6.19E-03	92.9	1.88E+00	
0	781.60	19	9	1.12	1562.17	1557	9	5.00E-03	76.4	1.86E+00	
0	822.07	10	14	0.85	1643.08	1636	9	2.77E-03	****	1.79E+00	
0	831.18	10	9	1.62	1661.31	1656	9	2.77E-03	****	1.77E+00	T
0	849.74	12	8	1.61	1698.41	1695	7	3.21E-03	96.8	1.74E+00	
0	873.87	14	1	1.76	1746.67	1744	6	3.81E-03	60.5	1.71E+00	T
0	934.32	29	12	0.99	1867.57	1860	16	7.91E-03	65.9	1.62E+00	
0	964.85	16	13	1.04	1928.63	1925	8	4.23E-03	98.3	1.58E+00	T
0	1079.64	16	7	1.58	2158.25	2154	10	4.47E-03	80.3	1.45E+00	
0	1209.50	16	22	3.74	2418.06	2408	18	4.39E-03	****	1.32E+00	
0	1225.89	11	5	1.39	2450.86	2448	7	3.12E-03	89.5	1.31E+00	
0	1279.54	10	7	1.01	2558.22	2552	10	2.88E-03	****	1.27E+00	
0	1295.04	10	5	3.42	2589.24	2582	11	2.92E-03	****	1.25E+00	
0	1378.23	12	2	1.29	2755.74	2750	9	3.46E-03	71.9	1.19E+00	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235066.CNF;1
* Acquisition date   : 3-OCT-2016 05:57:37 Sensitivity      : 3.000
* Detector ID       : GAM33 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.75 Half life ratio : *****
* Sample date       : 14-DEC-2015 14:00:00 Nuclide Library : SOLID
* Sample ID         : G405235066 Analyst initials: MXR1
* Batch Number      : 1596254 Sample Quantity : 1.5742E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 10-JUN-2016 07:00:49 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.413E-01
CD-109	1.096E+00
SN-126	7.093E-02
CS-135	9.730E-02
TL-208	2.310E-02
PB-212	5.339E-02
BI-214	4.047E-02
PB-214	5.248E-02
RN-222	4.047E-02
RA-224	6.051E-01
RA-226	4.047E-02
AC-228	8.915E-02
RA-228	8.915E-02
TH-228	5.339E-02
TH-230	4.046E-02
PA-231	2.973E-01
TH-232	8.915E-02
U-234	4.046E-02
U-235	1.410E-01
AM-243	4.399E-02
CM-247	2.630E-02
ANH-511	2.267E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.591E+00	NOT IDENT.
NA-22	2.909E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.061E-02	NOT IDENT.
SC-46	2.305E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.223E-02	NOT IDENT.
CO-56	2.893E-01	NOT IDENT.

MN-56	0.000E+00	SHORT HLIF
CO-57	4.246E-02	NOT IDENT.
CO-58	4.162E-01	NOT IDENT.
FE-59	3.644E+00	NOT IDENT.
CO-60	2.884E-02	NOT IDENT.
ZN-65	1.505E-01	NOT IDENT.
GE-68	1.803E+00	NOT IDENT.
AS-73	8.016E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.394E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.007E-01	NOT IDENT.
KR-85	5.630E+00	NOT IDENT.
SR-85	5.572E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.157E-01	NOT IDENT.
Y-91	3.047E+02	NOT IDENT.
NB-94	2.460E-02	NOT IDENT.
NB-95	5.632E-01	NOT IDENT.
NB-95M	1.793E+00	NOT IDENT.
ZR-95	1.320E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.620E-02	NOT IDENT.
RH-102	4.644E-02	NOT IDENT.
RU-103	4.135E+00	FAIL ABUN
RH-106	3.501E-01	NOT IDENT.
RU-106	3.501E-01	NOT IDENT.
AG-108M	1.980E-02	NOT IDENT.
AG-110M	5.953E-02	NOT IDENT.
SN-113	1.692E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.077E-01	NOT IDENT.
SB-124	1.336E+00	NOT IDENT.
SB-125	7.168E-02	NOT IDENT.
TE-125M	2.364E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.357E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.012E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	3.300E-02	NOT IDENT.
CS-137	3.486E-02	NOT IDENT.
CE-139	9.816E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.562E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.820E-01	NOT IDENT.
PM-144	3.094E-02	NOT IDENT.
PR-144	2.679E+00	NOT IDENT.
PM-146	3.831E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.260E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.938E-02	FAIL ABUN
EU-152	6.875E-02	FAIL ABUN
GD-153	1.413E-01	NOT IDENT.
EU-154	7.647E-02	FAIL ABUN
EU-155	9.576E-02	FAIL ABUN
TB-160	9.815E-01	FAIL ABUN
HO-166M	4.627E-02	NOT IDENT.
TM-171	2.138E+01	NOT IDENT.
HF-172	2.009E-01	FAIL ABUN
LU-172	6.883E-02	FAIL ABUN
LU-176	1.804E-02	FAIL ABUN
HF-181	3.348E+00	FAIL ABUN
TA-182	7.852E-01	FAIL ABUN

RE-183	3.024E+00	NOT IDENT.
RE-184	2.091E+01	NOT IDENT.
W-188	8.493E+01	NOT IDENT.
IR-192	3.474E-01	FAIL ABUN
HG-203	1.864E+00	NOT IDENT.
BI-207	3.600E-02	FAIL ABUN
PB-210	4.800E+00	NOT IDENT.
BI-211	3.737E-01	FAIL ABUN
PB-211	4.898E-01	FAIL ABUN
BI-212	5.439E-01	FAIL ABUN
RN-219	3.319E-01	FAIL ABUN
RA-223	4.198E-01	FAIL ABUN
AC-227	1.944E-01	FAIL ABUN
TH-227	1.944E-01	FAIL ABUN
TH-229	3.290E-01	FAIL ABUN
TH-231	4.198E-01	FAIL ABUN
PA-233	5.164E-02	FAIL ABUN
PA-234	1.824E-01	FAIL ABUN
PA-234M	4.261E+00	NOT IDENT.
TH-234	1.379E+00	FAIL ABUN
NP-237	5.164E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.379E+00	FAIL ABUN
NP-239	2.114E-01	NOT IDENT.
PU-239	2.973E+02	NOT IDENT.
AM-241	1.465E-01	NOT IDENT.
CM-243	7.714E-02	NOT IDENT.
BK-247	4.699E-02	NOT IDENT.
CF-249	2.682E-02	FAIL ABUN
CF-251	9.599E-02	NOT IDENT.


```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235066.CNF;1
* Acquisition date   : 3-OCT-2016 05:57:37 Sensitivity      : 3.000
* Detector ID       : GAM33 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.75 Half life ratio : *****
* Sample date       : 14-DEC-2015 14:00:00 Nuclide Library : SOLID
* Sample ID         : G405235066 Analyst initials: MXR1
* Batch Number      : 1596254 Sample Quantity : 1.5742E+02 GRAM
*                               Quantity Err(%) : 1.2705E-03 %
* Wet wt corr       : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight      : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date    : 10-JUN-2016 07:00:49 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.363E+01	1.634E+00	1.634E+00
CD-109	1.244E+00	3.377E+00	3.377E+00
SN-126	8.003E-02	2.172E-01	2.172E-01
CS-135	4.598E-01	3.164E-01	3.164E-01
TL-208	3.468E-01	8.389E-02	8.389E-02
PB-212	7.919E-01	1.496E-01	1.496E-01
BI-214	9.033E-01	1.946E-01	1.946E-01
PB-214	1.112E+00	1.662E-01	1.662E-01
RN-222	9.033E-01	1.946E-01	1.946E-01
RA-224	1.683E-01	1.174E+00	1.174E+00
RA-226	9.033E-01	1.946E-01	1.946E-01
AC-228	8.612E-01	3.946E-01	3.946E-01
RA-228	8.612E-01	3.946E-01	3.946E-01
TH-228	7.919E-01	1.496E-01	1.496E-01
TH-230	9.030E-01	1.945E-01	1.945E-01
PA-231	6.853E-01	6.342E-01	6.342E-01
TH-232	8.612E-01	3.946E-01	3.946E-01
U-234	9.030E-01	1.945E-01	1.945E-01
U-235	3.160E-01	3.366E-01	3.366E-01
AM-243	5.842E-02	1.126E-01	1.126E-01
CM-247	1.980E-02	5.855E-02	5.855E-02
ANH-511	5.441E-02	9.597E-02	9.597E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-7.443E+00	1.216E+01	1.262E+01	NOT IDENT.
NA-22	5.034E-03	3.635E-02	3.642E-02	NOT IDENT.
NA-24	1.000E+41	1.165E+41	0.000E+00	SHORT HLIF
AL-26	1.001E-02	2.019E-02	2.069E-02	NOT IDENT.
SC-46	-1.658E-02	2.739E-01	2.740E-01	FAIL ABUN
V-48	-2.537E+03	8.568E+03	8.644E+03	SHORT HLIF
CR-51	-5.744E+01	2.904E+02	2.915E+02	SHORT HLIF
MN-54	-9.583E-03	7.196E-02	7.209E-02	NOT IDENT.

CO-56	9.684E-03	3.839E-01	3.839E-01	NOT IDENT.
MN-56	1.000E+41	2.699E+42	0.000E+00	SHORT HLIF
CO-57	3.917E-02	4.443E-02	4.781E-02	NOT IDENT.
CO-58	3.632E-02	4.861E-01	4.864E-01	NOT IDENT.
FE-59	-1.466E+00	4.480E+00	4.529E+00	NOT IDENT.
CO-60	-2.054E-03	3.394E-02	3.395E-02	NOT IDENT.
ZN-65	8.785E-02	1.742E-01	1.787E-01	NOT IDENT.
GE-68	-7.222E-02	2.336E+00	2.336E+00	NOT IDENT.
AS-73	-8.102E+00	9.525E+00	1.020E+01	NOT IDENT.
AS-74	9.235E+02	4.163E+03	4.184E+03	SHORT HLIF
SE-75	4.292E-03	1.801E-01	1.801E-01	NOT IDENT.
BR-77	2.360E+37	2.001E+38	0.000E+00	SHORT HLIF
SR-82	3.193E+02	6.439E+02	6.597E+02	SHORT HLIF
RB-83	-3.002E-01	6.122E-01	6.270E-01	NOT IDENT.
KR-85	3.992E-01	6.342E+00	6.344E+00	NOT IDENT.
SR-85	3.821E-02	6.279E-01	6.281E-01	NOT IDENT.
RB-86	9.919E+03	2.069E+04	2.117E+04	SHORT HLIF
Y-88	-2.956E-03	1.405E-01	1.405E-01	NOT IDENT.
Y-91	-8.607E+01	4.232E+02	4.250E+02	NOT IDENT.
NB-94	1.978E-02	2.530E-02	2.682E-02	NOT IDENT.
NB-95	3.569E-02	6.525E-01	6.527E-01	NOT IDENT.
NB-95M	-8.355E-02	2.648E+00	2.648E+00	NOT IDENT.
ZR-95	1.340E+00	1.346E+00	1.475E+00	NOT IDENT.
NB-97	1.000E+41	1.627E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	2.008E+41	0.000E+00	SHORT HLIF
MO-99	-2.504E+31	3.774E+31	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	2.972E+42	0.000E+00	SHORT HLIF
RH-101	-1.292E-02	3.354E-02	3.405E-02	NOT IDENT.
RH-102	9.594E-03	5.215E-02	5.233E-02	NOT IDENT.
RU-103	3.710E+00	4.483E+00	4.784E+00	FAIL ABUN
RH-106	-3.908E-02	4.115E-01	4.119E-01	NOT IDENT.
RU-106	-3.908E-02	4.115E-01	4.119E-01	NOT IDENT.
AG-108M	-5.630E-03	2.295E-02	2.309E-02	NOT IDENT.
AG-110M	-4.578E-02	8.240E-02	8.495E-02	NOT IDENT.
SN-113	-9.855E-02	1.996E-01	2.045E-01	NOT IDENT.
CD-115	-2.108E+38	4.352E+38	0.000E+00	SHORT HLIF
SN-117M	1.847E+04	6.962E+04	7.011E+04	SHORT HLIF
TE-123M	-7.498E-02	1.301E-01	1.344E-01	NOT IDENT.
SB-124	-3.960E-01	1.728E+00	1.737E+00	NOT IDENT.
SB-125	-4.793E-02	8.680E-02	8.945E-02	NOT IDENT.
TE-125M	1.504E+02	2.530E+02	2.619E+02	NOT IDENT.
I-126	3.335E+06	1.569E+06	2.173E+06	SHORT HLIF
SB-126	2.235E+05	7.803E+05	7.868E+05	SHORT HLIF
SB-127	3.196E+21	7.634E+21	0.000E+00	SHORT HLIF
I-131	-1.141E+08	2.421E+09	2.421E+09	SHORT HLIF
I-132	1.000E+41	1.824E+42	0.000E+00	SHORT HLIF
TE-132	7.402E+25	9.752E+25	0.000E+00	SHORT HLIF
BA-133	-5.271E-03	4.182E-02	4.189E-02	NOT IDENT.
I-133	1.000E+41	3.070E+41	0.000E+00	SHORT HLIF
CS-134	3.738E-02	5.388E-02	5.645E-02	NOT IDENT.
I-135	1.000E+41	8.986E+41	0.000E+00	SHORT HLIF
CS-136	-1.602E+05	2.007E+05	2.133E+05	SHORT HLIF
BA-137M	4.766E-02	3.154E-02	3.816E-02	NOT IDENT.
CS-137	5.035E-02	3.332E-02	4.031E-02	NOT IDENT.
CE-139	3.106E-02	1.103E-01	1.112E-01	NOT IDENT.
BA-140	1.335E+06	1.803E+06	1.901E+06	SHORT HLIF
LA-140	-3.256E+05	2.772E+05	3.137E+05	SHORT HLIF
CE-141	-3.102E+00	1.965E+01	1.970E+01	NOT IDENT.
CE-143	1.000E+41	1.730E+41	0.000E+00	SHORT HLIF
CE-144	-8.942E-02	3.272E-01	3.297E-01	NOT IDENT.
PM-144	-5.011E-02	4.631E-02	5.152E-02	NOT IDENT.
PR-144	-4.339E+00	4.005E+00	4.457E+00	NOT IDENT.
PM-146	7.869E-03	4.210E-02	4.225E-02	NOT IDENT.
ND-147	5.131E+06	2.171E+07	2.183E+07	SHORT HLIF
PM-147	4.383E+02	7.781E+02	8.028E+02	NOT IDENT.
PM-149	1.719E+39	5.595E+39	0.000E+00	SHORT HLIF
EU-150	4.121E-02	3.316E-02	3.801E-02	FAIL ABUN
EU-152	-1.339E-02	8.072E-02	8.095E-02	FAIL ABUN
GD-153	-7.730E-02	1.787E-01	1.820E-01	NOT IDENT.
EU-154	2.384E-02	9.217E-02	9.280E-02	FAIL ABUN
EU-155	8.918E-02	9.920E-02	1.070E-01	FAIL ABUN
TB-160	-1.679E+00	1.582E+00	1.754E+00	FAIL ABUN
HO-166M	3.825E-02	4.751E-02	5.055E-02	NOT IDENT.
TM-171	-4.540E+00	2.330E+01	2.339E+01	NOT IDENT.
HF-172	2.887E-01	2.459E-01	2.782E-01	FAIL ABUN
LU-172	4.950E-02	7.038E-02	7.383E-02	FAIL ABUN
LU-176	-1.364E-02	2.107E-02	2.195E-02	FAIL ABUN
HF-181	2.028E+00	5.126E+00	5.207E+00	FAIL ABUN

TA-182	1.052E-01	1.001E+00	1.002E+00	FAIL ABUN
RE-183	1.676E+00	3.119E+00	3.209E+00	NOT IDENT.
RE-184	8.704E-01	2.489E+01	2.489E+01	NOT IDENT.
W-188	-6.511E+00	1.029E+02	1.029E+02	NOT IDENT.
IR-192	1.746E-01	3.606E-01	3.691E-01	FAIL ABUN
HG-203	1.610E-01	2.000E+00	2.002E+00	NOT IDENT.
BI-207	5.367E-03	3.978E-02	3.985E-02	FAIL ABUN
PB-210	4.628E+00	4.698E+00	5.140E+00	NOT IDENT.
BI-211	3.064E+00	4.606E-01	1.456E+00	FAIL ABUN
PB-211	-9.432E-02	6.226E-01	6.241E-01	FAIL ABUN
BI-212	1.163E+00	7.484E-01	9.136E-01	FAIL ABUN
RN-219	2.160E-01	6.383E-01	6.457E-01	FAIL ABUN
RA-223	-2.711E-01	5.500E-01	5.634E-01	FAIL ABUN
AC-227	9.681E-02	2.203E-01	2.245E-01	FAIL ABUN
TH-227	9.681E-02	2.203E-01	2.245E-01	FAIL ABUN
TH-229	-4.881E-01	4.358E-01	4.882E-01	FAIL ABUN
TH-231	-2.711E-01	5.500E-01	5.634E-01	FAIL ABUN
PA-233	1.288E-02	5.506E-02	5.537E-02	FAIL ABUN
PA-234	-2.113E-01	3.598E-01	3.722E-01	FAIL ABUN
PA-234M	3.533E+00	4.435E+00	4.713E+00	NOT IDENT.
TH-234	-2.287E-01	1.461E+00	1.464E+00	FAIL ABUN
NP-237	1.288E-02	5.506E-02	5.537E-02	FAIL ABUN
NP-238	-2.737E+40	5.389E+40	0.000E+00	SHORT HLIF
U-238	-2.287E-01	1.461E+00	1.464E+00	FAIL ABUN
NP-239	1.425E-01	2.248E-01	2.338E-01	NOT IDENT.
PU-239	3.127E+02	3.114E+02	3.418E+02	NOT IDENT.
AM-241	6.229E-02	1.527E-01	1.552E-01	NOT IDENT.
CM-243	-9.302E-02	9.457E-02	1.034E-01	NOT IDENT.
BK-247	-2.424E-02	6.556E-02	6.646E-02	NOT IDENT.
CF-249	-1.814E-02	3.204E-02	3.307E-02	FAIL ABUN
CF-251	6.243E-02	1.050E-01	1.087E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	55.1871	87.09	114.4678	136.47	67.9837
45.60	62.9993	87.57	114.5592	140.51	0.0000
46.54	39.5842	88.03	114.6464	143.76	64.1632
49.72	0.0000	88.34	114.7049	144.24	61.9866
51.35	49.5758	88.47	114.7292	145.44	59.1187
51.87	43.9083	89.96	88.3109	152.43	72.6410
52.39	47.7835	1093.63	88.4080	153.25	0.0000
52.97	62.2008	91.11	0.0000	323.87	62.7103
53.44	58.4355	92.59	64.6240	156.02	0.0000
54.07	45.0879	93.35	64.7020	158.56	0.0000
57.36	0.0000	94.56	64.8263	159.00	83.3166
57.53	63.7998	94.65	64.8354	162.33	65.5438
57.98	56.1207	94.67	64.8373	162.66	0.0000
59.27	63.0674	94.87	64.8578	163.33	90.5042
59.32	63.0741	97.43	73.4298	165.86	72.6035
59.54	63.1034	98.43	54.1165	176.31	58.5018
60.96	91.5297	98.44	54.1173	176.60	0.0000
61.17	84.7509	99.53	65.6748	177.52	51.6838
62.93	74.3043	100.11	68.8626	181.07	0.0000
63.29	87.0782	102.03	50.2273	181.52	77.2684
63.58	87.1295	103.18	62.8917	184.41	74.0254
64.28	89.2136	103.37	80.7339	143.76	78.7557
66.73	77.8283	105.21	60.9785	193.51	70.0287
67.24	77.9061	105.31	55.7298	197.03	69.0965
125.81	77.9730	106.12	62.1125	198.01	67.9900
67.75	75.0224	106.47	66.3574	201.83	62.3552
69.67	79.2651	109.28	64.5123	203.43	62.4498
70.83	66.2003	111.00	79.5130	205.31	64.5280
72.81	93.0257	111.76	0.0000	210.85	52.2043
72.87	93.0364	114.06	67.0788	215.65	60.7757
74.66	85.0097	116.30	0.0000	222.11	58.7311
74.82	85.0350	116.74	58.7786	227.09	55.3774
74.97	85.0584	119.76	74.0437	227.38	56.5956
77.11	85.3891	121.12	68.8042	228.16	0.0000
78.74	77.9133	121.22	61.2870	228.18	39.7651
79.69	72.6619	121.78	51.6486	116.74	39.7651
80.12	63.2906	122.06	58.1265	235.69	58.2155
80.19	0.0000	122.92	66.0955	235.96	58.2290
80.57	70.0787	123.07	66.1086	238.63	89.1624
81.00	79.5717	265.00	66.1620	238.98	0.0000
81.07	79.5813	125.81	47.5973	240.99	99.8975
81.75	85.0773	127.23	70.8051	242.00	52.0234
83.79	75.8897	127.91	78.0988	244.70	35.8462
84.00	75.9165	129.30	69.5449	252.40	0.0000
85.43	105.9971	131.20	64.2684	252.80	38.1355
86.55	114.3652	133.02	73.1504	254.15	0.0000
86.79	114.4105	133.52	69.9189	256.23	41.9418
86.94	114.4396	136.00	71.2316	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	31.4602	355.39	0.0000	584.27	15.9180
264.80	34.7761	356.01	37.0790	595.83	0.0000
265.00	34.7813	364.49	0.0000	427.87	23.0459
268.22	33.6231	366.42	0.0000	602.52	0.0000
269.46	33.6561	372.51	23.1912	604.72	22.5842
270.03	33.6709	375.05	27.6939	607.14	12.0576
271.23	33.7022	377.52	31.3143	609.32	13.0746
273.65	0.0000	356.01	19.7589	610.33	13.0799
276.40	47.6206	388.16	32.4163	614.28	25.7003
277.37	43.4751	388.63	0.0000	618.01	19.1794
277.60	43.4825	391.69	34.2891	620.36	15.1563
278.00	46.0057	264.66	24.4918	621.93	16.1777
279.20	46.8843	401.81	26.3231	630.19	0.0000
279.54	52.7589	402.40	26.3326	631.29	16.2409
279.70	49.4151	404.85	27.2791	633.25	20.3174
280.46	47.7667	410.95	21.8999	634.78	0.0000
283.69	42.0024	413.71	18.2784	635.95	22.3742
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	35.3273	423.72	0.0000	645.85	14.2957
285.90	0.0000	427.09	26.7037	657.76	9.2344
287.50	32.8547	427.87	27.6367	657.90	0.0000
290.67	43.0645	433.94	24.0322	661.66	10.2767
293.27	0.0000	439.40	19.4683	664.57	0.0000
351.93	38.1244	453.88	28.0292	666.33	0.0000
295.96	38.1445	463.37	20.6577	666.50	0.0000
879.38	17.8345	468.07	15.0605	667.71	0.0000
299.98	17.8525	473.00	0.0000	677.62	15.5127
300.09	17.8542	475.06	31.1745	685.70	0.0000
300.13	17.8546	476.78	31.2020	695.00	0.0000
301.36	29.3586	477.60	31.2155	696.49	21.8776
302.85	44.7231	482.18	21.3327	696.51	21.8776
256.23	25.5859	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	17.7159
306.78	42.7124	497.08	12.8958	697.49	18.7595
308.46	31.6448	505.52	20.1438	702.65	10.4423
311.90	39.4367	507.63	0.0000	706.68	13.5962
316.51	28.3822	511.00	25.9684	711.68	10.4781
319.41	0.0000	514.00	26.0057	720.70	0.0000
320.08	0.0000	514.00	26.0057	721.93	0.0000
321.04	19.4119	520.40	28.9844	722.78	18.9397
323.87	37.6023	520.69	0.0000	722.91	26.8323
325.23	32.8781	522.65	0.0000	723.31	23.6792
328.76	0.0000	527.90	0.0000	724.19	22.1083
333.37	33.0583	528.26	22.3056	727.33	14.7559
333.97	33.0714	529.59	16.4971	733.00	14.7867
334.37	33.0799	529.87	0.0000	735.93	20.0893
338.28	33.1657	531.02	0.0000	333.97	15.8691
338.32	33.1665	537.26	0.0000	739.50	0.0000
311.90	31.4656	546.56	0.0000	747.24	6.3704
340.48	31.4656	552.55	10.2988	748.06	11.6826
340.55	0.0000	563.25	28.5823	752.31	7.9776
344.28	31.5439	569.33	23.7197	753.82	0.0000
345.93	29.8233	946.00	23.7217	756.73	12.7847
351.06	31.6816	569.70	19.7697	756.80	12.7852
351.93	31.6992	583.19	15.9108	884.68	12.8179

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	12.8267	1274.44	10.3597	1620.50	5.0052
766.42	12.8291	1001.03	10.3740	1621.92	5.0064
766.84	12.8311	1002.74	17.2986	1678.03	0.0000
772.60	0.0000	1004.73	19.6161	1690.97	5.0739
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.0862
778.90	16.1078	1028.54	0.0000	1063.66	7.2089
783.70	0.0000	1037.84	9.3190	1771.35	2.0601
785.37	14.5300	1038.76	0.0000	1791.20	0.0000
792.07	17.2611	631.29	9.6337	1808.65	1.0370
794.95	8.6390	1048.07	0.0000	1810.72	0.0000
795.86	18.3641	1049.04	18.4045	1836.06	2.0842
810.06	11.9408	1050.41	12.2739		
810.29	11.9417	1063.66	9.6794		
344.28	13.0278	1077.00	0.0000		
810.76	13.0293	1077.34	12.7187		
815.77	0.0000	1085.87	8.0943		
1048.07	0.0000	1093.63	9.7586		
832.01	18.0449	1099.45	9.7740		
834.85	19.7036	1112.07	13.3731		
835.71	19.7095	1112.84	16.0510		
836.80	0.0000	1115.54	11.4227		
846.75	0.0000	1120.29	16.0829		
846.77	9.8910	1120.55	16.0840		
856.80	0.0000	1221.41	12.8698		
860.56	12.1438	1129.67	11.6448		
871.09	8.3081	1131.51	0.0000		
873.19	15.5193	1147.95	0.0000		
875.33	0.0000	1173.23	10.8706		
879.38	17.7715	1177.95	16.3257		
880.51	10.0001	1189.05	11.8241		
883.24	11.1210	1204.77	10.2272		
884.68	13.3511	1221.41	16.1380		
889.28	7.7998	1231.02	12.2550		
894.76	11.1617	1235.36	0.0000		
898.04	7.8215	1238.28	11.0493		
900.72	13.4194	1260.41	0.0000		
903.28	13.4302	1271.87	4.6414		
911.20	11.2195	1274.44	5.9445		
912.08	11.2227	1274.54	5.9445		
923.98	0.0000	1291.59	14.9219		
926.50	12.4001	1298.22	0.0000		
929.11	11.8463	1312.11	0.0000		
937.49	11.8766	1332.49	8.4743		
944.13	0.0000	1362.66	0.0000		
946.00	18.1445	1365.19	5.6917		
949.00	12.4856	1368.63	0.0000		
667.71	0.0000	1384.29	1.9054		
962.31	11.9659	1408.01	4.7888		
964.08	8.5516	1457.56	0.0000		
966.17	6.8455	1460.82	6.7817		
911.20	15.4149	1489.16	3.8984		
968.97	15.4149	1505.03	3.9116		
983.53	0.0000	1584.12	4.9692		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235067.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM41.CNF;119
Background date : 2-OCT-2016 11:02:18.
Sample date      : 11-DEC-2015 11:30:00 Acquisition date : 3-OCT-2016 05:58:05.
Sample ID       : G405235067 Sample quantity : 1.58210E+02 GRAM
Detector name   : GAM41 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:05.88 0.2%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596254 Detector SN# :
Matrix Spike ID : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.36*	10	138	1.04	93.03	89	9	2.82E-03	225.4	
2	0	63.36*	68	157	0.77	127.01	123	7	1.88E-02	36.1	
3	5	74.94*	208	133	0.76	150.15	147	20	5.78E-02	10.6	2.56E+00
4	5	77.28*	317	145	1.10	154.84	147	20	8.80E-02	8.5	
5	1	84.37*	44	97	1.37	169.01	166	17	1.23E-02	41.4	4.30E+00
6	1	87.42	94	130	1.18	175.10	166	17	2.61E-02	22.5	
7	1	89.99	82	123	1.38	180.25	166	17	2.29E-02	22.4	
8	0	92.86*	83	155	1.06	185.99	183	8	2.32E-02	31.4	
9	0	108.64*	23	77	1.29	217.53	215	6	6.30E-03	66.8	
10	0	122.75	27	89	1.67	245.75	241	8	7.54E-03	63.8	
11	0	130.29	25	152	0.60	260.83	254	12	6.84E-03	102.4	
12	0	143.77*	18	168	0.61	287.78	282	13	4.93E-03	155.3	
13	0	185.75*	99	125	1.15	371.70	366	13	2.75E-02	26.3	
14	0	209.29	57	78	0.93	418.78	414	10	1.59E-02	31.6	
15	4	238.88*	313	40	1.01	477.94	474	24	8.70E-02	6.5	1.44E+00
16	4	242.00	113	50	1.75	484.19	474	24	3.14E-02	17.6	
17	1	270.56	45	37	1.63	541.30	534	39	1.24E-02	30.8	2.82E+00
18	1	277.33	34	30	1.63	554.82	534	39	9.50E-03	38.0	
19	6	295.55	115	53	1.65	591.25	585	25	3.19E-02	15.2	2.44E+00
20	6	300.50	32	70	2.67	601.17	585	25	8.91E-03	65.2	
21	0	339.27	77	48	1.24	678.68	674	12	2.14E-02	21.6	
22	0	352.36*	213	62	1.40	704.86	699	14	5.92E-02	10.5	
23	0	463.71*	23	29	1.69	927.53	920	13	6.27E-03	55.7	
24	0	484.21	9	45	4.26	968.53	956	16	2.58E-03	163.1	
25	0	511.76*	22	15	2.56	1023.62	1018	11	6.09E-03	58.5	
26	0	533.36	28	18	1.91	1066.81	1060	12	7.86E-03	35.4	
27	0	583.70*	76	21	1.16	1167.49	1161	12	2.11E-02	17.0	
28	0	610.08*	127	31	1.20	1220.24	1213	14	3.53E-02	13.1	
29	0	656.84	30	4	4.81	1313.76	1306	15	8.44E-03	22.8	
30	0	661.99*	21	6	1.69	1324.07	1321	8	5.79E-03	31.6	
31	0	680.22	30	12	1.94	1360.53	1352	16	8.36E-03	31.5	
32	0	714.94	14	21	1.55	1429.97	1423	15	3.94E-03	77.1	
33	0	727.83*	39	15	1.21	1455.74	1450	12	1.08E-02	26.1	
34	0	861.59	9	10	0.65	1723.29	1716	9	2.51E-03	73.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	912.10*	50	14	1.65	1824.31	1819	10	1.38E-02	20.7	
36	0	970.45*	32	37	2.02	1941.03	1936	17	8.90E-03	46.0	
37	0	1059.63	12	6	4.05	2119.42	2114	11	3.26E-03	54.3	
38	0	1071.72	8	4	1.03	2143.61	2140	6	2.12E-03	56.8	
39	0	1120.90	21	13	0.67	2241.98	2237	11	5.77E-03	40.8	
40	0	1127.20	20	12	6.46	2254.59	2247	16	5.46E-03	45.5	
41	0	1142.06	10	8	0.90	2284.33	2278	10	2.65E-03	68.6	
42	0	1170.74	12	3	3.30	2341.70	2335	12	3.41E-03	39.9	
43	0	1202.84	11	13	0.73	2405.91	2400	13	3.06E-03	74.0	
44	5	1318.88	8	3	1.80	2638.06	2636	12	2.21E-03	41.9	6.98E-01
45	5	1321.68	12	2	2.43	2643.67	2636	12	3.37E-03	35.1	
46	0	1455.16	5	2	1.19	2910.73	2906	8	1.39E-03	66.3	
47	0	1461.81*	232	0	1.46	2924.02	2916	15	6.44E-02	6.6	
48	0	1766.28	26	7	1.71	3533.27	3525	14	7.17E-03	29.4	

Flag: "*" = Peak area was modified by background subtraction


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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235067.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-DEC-2015 11:30:00 Acquisition date : 3-OCT-2016 05:58:05
Sample ID        : G405235067 Sample quantity  : 158.21 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA41 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:05.88 0.2%
Energy tolerance : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error  : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	8.926E-01	1.120E+01	1.120E+01	13.29	OK
CO-57	122.06	85.60*	6.593E+00	2.890E-02	6.162E-02	127.57	OK
	136.47	10.68	6.262E+00	-----	Line Not Found	-----	Absent
CD-109	88.03	3.70*	7.447E+00	1.261E+00	1.970E+00	78.21	OK
TE-125M	109.28	0.27*	6.943E+00	7.351E+00	2.647E+02	133.58	OK
SN-126	64.28	9.60	7.794E+00	5.773E-01	5.773E-01	72.11	OK
	86.94	8.90	7.447E+00	5.244E-01	5.244E-01	78.21	OK
	87.57	37.00*	7.447E+00	1.261E-01	1.261E-01	78.21	OK
BA-137M	661.66	89.90*	1.826E+00	6.412E-02	6.533E-02	63.26	OK
CS-137	661.66	85.10*	1.826E+00	6.773E-02	6.901E-02	63.26	OK
TL-208	277.37	6.60	3.908E+00	7.353E-01	7.353E-01	76.06	OK
	583.19	85.00*	2.050E+00	2.228E-01	2.228E-01	34.08	OK
	860.56	12.50	1.432E+00	2.477E-01	2.477E-01	147.07	OK
PB-210	46.54	4.25*	7.546E+00	2.074E-01	2.127E-01	450.83	OK
BI-211	72.87	1.23	7.711E+00	-----	Line Not Found	-----	Absent
	351.06	12.92*	3.210E+00	2.328E-01	2.328E-01	417.38	OK
PB-212	74.82	10.28	7.682E+00	1.135E+00	1.135E+00	34.02	OK
	77.11	17.10	7.644E+00	1.520E+00	1.520E+00	17.07	OK
	238.63	43.60*	4.383E+00	9.221E-01	9.221E-01	13.08	OK
	300.09	3.30	3.664E+00	1.459E+00	1.459E+00	130.43	OK
BI-214	609.32	45.49*	1.969E+00	7.239E-01	7.241E-01	26.14	OK
	1120.29	14.92	1.128E+00	5.864E-01	5.866E-01	81.62	OK
	1764.49	15.30	7.620E-01	-----	Line Not Found	-----	Absent
PB-214	74.82	5.80	7.683E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	7.644E+00	2.679E+00	2.680E+00	17.07	OK
	87.09	3.41	7.454E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	4.340E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	3.714E+00	9.238E-01	9.241E-01	30.44	OK
	351.93	35.60*	3.214E+00	-----	Line Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	1.969E+00	7.239E-01	7.241E-01	26.14	OK
	1120.29	14.92	1.128E+00	5.864E-01	5.866E-01	81.62	OK
	1764.49	15.30	7.620E-01	-----	Line Not Found	-----	Absent
RA-224	240.99	4.10*	4.340E+00	1.934E+00	1.934E+00	69.81	OK
RA-226	609.32	45.49*	1.969E+00	7.239E-01	7.241E-01	26.14	OK
	1120.29	14.92	1.128E+00	5.864E-01	5.866E-01	81.62	OK
	1764.49	15.30	7.620E-01	-----	Line Not Found	-----	Absent
AC-228	105.21	1.10	7.028E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.315E+00	1.122E+00	1.122E+00	43.21	OK
	794.95	4.25	1.543E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.473E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.360E+00	6.909E-01	6.909E-01	41.42	OK
	968.97	15.80	1.285E+00	7.632E-01	7.632E-01	91.98	OK
RA-228	105.21	1.10	7.028E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.315E+00	1.122E+00	1.122E+00	43.21	OK
	794.95	4.25	1.543E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.473E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.360E+00	6.909E-01	6.909E-01	41.42	OK
	968.97	15.80	1.285E+00	7.632E-01	7.632E-01	91.98	OK
TH-228	74.82	10.28	7.682E+00	1.135E+00	1.135E+00	34.02	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	77.11	17.10	7.644E+00	1.520E+00	1.520E+00	17.07	OK
	238.63	43.60*	4.383E+00	9.221E-01	9.221E-01	13.08	OK
	300.09	3.30	3.664E+00	1.459E+00	1.459E+00	130.43	OK
TH-229	85.43	14.70	7.511E+00	2.497E-01	2.497E-01	82.75	OK
	88.47	24.00	7.447E+00	1.945E-01	1.945E-01	78.21	OK
	193.51	4.41*	5.088E+00	-----	Line Not Found	-----	Absent
	210.85	2.80	4.797E+00	-----	Line Not Found	-----	Absent
TH-230	609.32	45.49*	1.969E+00	7.239E-01	7.239E-01	26.14	OK
	1120.29	14.92	1.128E+00	5.864E-01	5.864E-01	81.62	OK
	1764.49	15.30	7.620E-01	-----	Line Not Found	-----	Absent
PA-231	283.69	1.70	3.838E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	3.664E+00	9.000E-01	9.000E-01	130.43	OK
TH-232	105.21	1.10	7.028E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.315E+00	1.122E+00	1.122E+00	43.21	OK
	835.71	1.61	1.473E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.360E+00	6.909E-01	6.909E-01	41.42	OK
	968.97	15.80	1.285E+00	7.632E-01	7.632E-01	91.98	OK
TH-234	63.29	3.70*	7.794E+00	1.498E+00	1.498E+00	72.11	OK
	92.59	4.23	7.325E+00	1.661E+00	1.661E+00	62.80	OK
U-234	609.32	45.49*	1.969E+00	7.239E-01	7.239E-01	26.14	OK
	1120.29	14.92	1.128E+00	5.864E-01	5.864E-01	81.62	OK
	1764.49	15.30	7.620E-01	-----	Line Not Found	-----	Absent
U-235	89.96	3.47	7.390E+00	1.986E+00	1.986E+00	44.73	OK
	93.35	5.60	7.325E+00	1.254E+00	1.254E+00	62.80	OK
	143.76	10.96*	6.093E+00	1.572E-01	1.572E-01	310.61	OK
	163.33	5.08	5.667E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	5.228E+00	1.913E-01	1.913E-01	52.56	OK
	205.31	5.01	4.887E+00	-----	Line Not Found	-----	Absent
U-238	63.29	3.70*	7.794E+00	1.498E+00	1.498E+00	72.11	OK
	92.59	4.23	7.325E+00	1.661E+00	1.661E+00	62.80	OK
AM-243	43.53	5.90	7.421E+00	-----	Line Not Found	-----	Absent
	74.66	67.20*	7.682E+00	1.736E-01	1.736E-01	34.02	OK
ANH-511	511.00	100.00*	2.311E+00	4.929E-02	4.929E-02	117.03	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235067.CNF;1
* Acquisition date   : 3-OCT-2016 05:58:05 Sensitivity      : 3.000
* Detector ID       : GAM41 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:05.88 Half life ratio : *****
* Sample date       : 11-DEC-2015 11:30:00 Analyst initials: MXR1
* Sample ID         : G405235067 Sample Quantity : 1.5821E+02 GRAM
* Batch Number      : 1596254 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 26-JAN-2016 06:01:47 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.120E+01	1.459E+00	6.988E-01
CO-57	6.162E-02	7.703E-02	7.738E-02
CD-109	1.970E+00	1.510E+00	1.481E+00
TE-125M	2.647E+02	3.466E+02	4.037E+02
SN-126	1.261E-01	9.668E-02	9.469E-02
BA-137M	6.533E-02	4.050E-02	3.484E-02
CS-137	6.901E-02	4.278E-02	3.681E-02
TL-208	2.228E-01	7.439E-02	6.020E-02
PB-210	2.127E-01	9.399E-01	6.838E-01
BI-211	2.328E-01	9.521E-01	3.580E-01
PB-212	9.221E-01	1.182E-01	8.785E-02
BI-214	7.241E-01	1.855E-01	1.211E-01
PB-214	1.009E+00	2.085E-01	3.241E-01
RN-222	7.241E-01	1.855E-01	1.211E-01
RA-224	1.934E+00	1.323E+00	9.416E-01
RA-226	7.241E-01	1.855E-01	1.211E-01
AC-228	6.909E-01	2.805E-01	2.554E-01
RA-228	6.909E-01	2.805E-01	2.554E-01
TH-228	9.221E-01	1.182E-01	8.785E-02
TH-229	-2.520E-01	4.320E-01	8.075E-01
TH-230	7.239E-01	1.854E-01	1.211E-01
PA-231	9.000E-01	1.150E+00	7.548E-01
TH-232	6.909E-01	2.805E-01	2.554E-01
TH-234	1.498E+00	1.058E+00	9.162E-01
U-234	7.239E-01	1.854E-01	1.211E-01
U-235	1.572E-01	4.786E-01	3.320E-01
U-238	1.498E+00	1.058E+00	9.162E-01
AM-243	1.736E-01	5.788E-02	5.389E-02
ANH-511	4.929E-02	5.653E-02	4.634E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.889E+00		1.376E+01	2.280E+01	NOT IDENT.

NA-22	-2.462E-02	5.315E-02	9.581E-02	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	8.693E-04	1.724E-02	4.787E-02	NOT IDENT.
SC-46	6.380E-02	3.158E-01	6.845E-01	FAIL ABUN
V-48	0.000E+00	1.094E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	4.056E+02	0.000E+00	SHORT HLIF
MN-54	-5.215E-02	6.438E-02	1.128E-01	NOT IDENT.
CO-56	-1.095E-01	4.586E-01	8.952E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-58	-1.871E-02	6.181E-01	1.238E+00	NOT IDENT.
FE-59	3.198E+00	5.907E+00	1.338E+01	NOT IDENT.
CO-60	-3.032E-02	4.305E-02	7.252E-02	NOT IDENT.
ZN-65	2.595E-01	1.927E-01	4.427E-01	NOT IDENT.
GE-68	-1.969E+00	2.512E+00	4.277E+00	NOT IDENT.
AS-73	-1.159E-01	2.165E+00	4.036E+00	NOT IDENT.
AS-74	0.000E+00	5.143E+03	0.000E+00	SHORT HLIF
SE-75	1.035E-01	2.093E-01	3.901E-01	NOT IDENT.
BR-77	0.000E+00	8.710E+36	0.000E+00	SHORT HLIF
SR-82	0.000E+00	5.916E+02	0.000E+00	SHORT HLIF
RB-83	-2.336E-01	5.900E-01	1.066E+00	NOT IDENT.
KR-85	6.789E+00	8.319E+00	1.581E+01	NOT IDENT.
SR-85	6.906E-01	8.508E-01	1.616E+00	NOT IDENT.
RB-86	0.000E+00	2.855E+04	0.000E+00	SHORT HLIF
Y-88	6.631E-03	1.686E-01	4.156E-01	NOT IDENT.
Y-91	2.555E+02	6.723E+02	1.254E+03	NOT IDENT.
NB-94	1.316E-03	3.469E-02	6.958E-02	NOT IDENT.
NB-95	-8.016E-02	7.291E-01	1.466E+00	NOT IDENT.
NB-95M	2.899E-01	2.157E+00	3.851E+00	NOT IDENT.
ZR-95	5.122E-02	1.445E+00	2.938E+00	NOT IDENT.
NB-97	0.000E+00	4.472E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.449E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	9.300E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	1.038E-02	2.916E-02	5.473E-02	NOT IDENT.
RH-102	3.301E-03	6.001E-02	1.228E-01	NOT IDENT.
RU-103	-2.782E+00	5.290E+00	9.339E+00	FAIL ABUN
RH-106	-8.336E-02	4.480E-01	8.374E-01	NOT IDENT.
RU-106	-8.336E-02	4.480E-01	8.374E-01	NOT IDENT.
AG-108M	-5.505E-03	2.352E-02	4.433E-02	NOT IDENT.
AG-110M	2.327E-02	1.036E-01	2.231E-01	FAIL ABUN
SN-113	-1.883E-02	2.125E-01	4.061E-01	NOT IDENT.
CD-115	0.000E+00	1.617E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	7.601E+04	0.000E+00	SHORT HLIF
TE-123M	-2.405E-02	1.206E-01	2.352E-01	NOT IDENT.
SB-124	-5.155E-02	1.693E+00	3.940E+00	NOT IDENT.
SB-125	-3.137E-02	1.174E-01	2.155E-01	FAIL ABUN
I-126	0.000E+00	7.319E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.051E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.146E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	3.829E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.948E+26	0.000E+00	SHORT HLIF
BA-133	4.767E-03	4.588E-02	7.999E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	3.471E-02	4.968E-02	1.102E-01	NOT IDENT.
CS-135	7.849E-02	1.303E-01	2.681E-01	NOT IDENT.
I-135	0.000E+00	1.774E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.006E+05	0.000E+00	SHORT HLIF
CE-139	-3.591E-02	1.008E-01	1.937E-01	NOT IDENT.
BA-140	0.000E+00	1.283E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.136E+05	0.000E+00	SHORT HLIF
CE-141	2.541E+00	2.167E+01	4.320E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	-4.287E-03	3.443E-01	6.178E-01	NOT IDENT.
PM-144	1.602E-02	6.033E-02	1.245E-01	NOT IDENT.
PR-144	1.705E+00	5.171E+00	1.077E+01	NOT IDENT.
PM-146	-2.274E-02	4.022E-02	7.112E-02	NOT IDENT.
ND-147	0.000E+00	3.111E+07	0.000E+00	SHORT HLIF
PM-147	-5.293E+02	8.555E+02	1.452E+03	NOT IDENT.
PM-149	0.000E+00	1.644E+40	0.000E+00	SHORT HLIF
EU-150	-1.177E-04	2.422E-02	4.474E-02	FAIL ABUN
EU-152	-2.768E-02	1.120E-01	1.847E-01	FAIL ABUN
GD-153	-7.463E-02	1.388E-01	2.576E-01	NOT IDENT.
EU-154	-4.760E-02	1.267E-01	2.335E-01	FAIL ABUN
EU-155	6.449E-02	9.823E-02	1.876E-01	FAIL ABUN
TB-160	4.565E-01	1.873E+00	3.943E+00	FAIL ABUN
HO-166M	-2.157E-02	7.509E-02	1.253E-01	FAIL ABUN
TM-171	1.387E+00	5.056E+00	9.653E+00	NOT IDENT.

HF-172	5.805E-02	2.498E-01	3.785E-01	FAIL ABUN
LU-172	-1.890E-02	8.107E-02	1.558E-01	FAIL ABUN
LU-176	-5.312E-03	2.280E-02	3.849E-02	FAIL ABUN
HF-181	-4.713E-03	4.331E+00	8.258E+00	NOT IDENT.
TA-182	-6.420E-01	1.116E+00	1.957E+00	FAIL ABUN
RE-183	4.663E-01	1.020E+00	1.959E+00	NOT IDENT.
RE-184	5.259E+01	3.567E+01	8.327E+01	NOT IDENT.
W-188	-2.689E+00	1.130E+02	1.957E+02	FAIL ABUN
IR-192	3.864E-01	4.272E-01	9.067E-01	FAIL ABUN
HG-203	1.482E+00	2.211E+00	4.557E+00	NOT IDENT.
BI-207	-1.844E-02	3.889E-02	6.003E-02	FAIL ABUN
PB-211	2.869E-02	6.683E-01	1.287E+00	NOT IDENT.
BI-212	0.000E+00	8.883E-01	1.521E+00	FAIL ABUN
RN-219	8.025E-02	3.445E-01	6.876E-01	FAIL ABUN
RA-223	-1.621E-01	5.794E-01	1.084E+00	FAIL ABUN
AC-227	-1.213E-01	2.188E-01	4.030E-01	FAIL ABUN
TH-227	-1.213E-01	2.188E-01	4.030E-01	FAIL ABUN
TH-231	-1.621E-01	5.794E-01	1.084E+00	FAIL ABUN
PA-233	2.280E-02	5.585E-02	1.132E-01	FAIL ABUN
PA-234	-6.323E-02	2.680E-01	5.236E-01	FAIL ABUN
PA-234M	-2.854E-01	4.223E+00	8.354E+00	NOT IDENT.
NP-237	2.280E-02	5.585E-02	1.132E-01	FAIL ABUN
NP-238	0.000E+00	1.275E+41	0.000E+00	SHORT HLIF
NP-239	-4.410E-03	2.216E-01	4.420E-01	FAIL ABUN
PU-239	3.638E+02	7.300E+02	5.759E+02	FAIL ABUN
AM-241	1.892E-02	5.751E-02	1.009E-01	NOT IDENT.
CM-243	-6.583E-02	8.111E-02	1.546E-01	FAIL ABUN
BK-247	1.824E-02	7.491E-02	1.351E-01	FAIL ABUN
CM-247	-1.947E-03	3.173E-02	6.094E-02	FAIL ABUN
CF-249	2.034E-02	3.709E-02	7.582E-02	NOT IDENT.
CF-251	-4.218E-02	1.064E-01	2.033E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	225	10.66*	8.926E-01	1.120E+01	1.120E+01	13.29
CO-57	122.06	34	85.60*	6.593E+00	2.890E-02	6.162E-02	127.57
	136.47	-----	10.68	6.262E+00	-----	Line Not Found	-----
CD-109	88.03	123	3.70*	7.447E+00	2.113E+00	3.300E+00	45.06
TE-125M	109.28	29	0.27*	6.943E+00	7.351E+00	2.647E+02	133.58
SN-126	64.28	91	9.60	7.794E+00	5.773E-01	5.773E-01	72.11
	86.94	123	8.90	7.447E+00	8.783E-01	8.784E-01	45.06
	87.57	123	37.00*	7.447E+00	2.113E-01	2.113E-01	45.06
BA-137M	661.66	22	89.90*	1.826E+00	6.412E-02	6.533E-02	63.26
CS-137	661.66	22	85.10*	1.826E+00	6.773E-02	6.901E-02	63.26
TL-208	277.37	40	6.60	3.908E+00	7.353E-01	7.353E-01	76.06
	583.19	82	85.00*	2.050E+00	2.228E-01	2.228E-01	34.08
	860.56	9	12.50	1.432E+00	2.477E-01	2.477E-01	147.07
PB-210	46.54	14	4.25*	7.546E+00	2.074E-01	2.127E-01	450.83
BI-211	72.87	-----	1.23	7.711E+00	-----	Line Not Found	-----
	351.06	243	12.92*	3.210E+00	2.778E+00	2.778E+00	21.10
PB-212	74.82	276	10.28	7.682E+00	1.656E+00	1.656E+00	21.25
	77.11	419	17.10	7.644E+00	1.520E+00	1.520E+00	17.07
	238.63	371	43.60*	4.383E+00	9.221E-01	9.221E-01	13.08
	300.09	37	3.30	3.664E+00	1.459E+00	1.459E+00	130.43
BI-214	609.32	137	45.49*	1.969E+00	7.239E-01	7.241E-01	26.14
	1120.29	21	14.92	1.128E+00	5.864E-01	5.866E-01	81.62
	1764.49	-----	15.30	7.620E-01	-----	Line Not Found	-----
PB-214	74.82	276	5.80	7.682E+00	2.935E+00	2.936E+00	21.25
	77.11	419	9.70	7.644E+00	2.679E+00	2.680E+00	17.07
	87.09	123	3.41	7.447E+00	2.292E+00	2.293E+00	45.06
	242.00	134	7.25	4.340E+00	2.018E+00	2.018E+00	35.19
	295.22	133	18.42	3.714E+00	9.238E-01	9.241E-01	30.44
	351.93	243	35.60*	3.210E+00	1.008E+00	1.009E+00	21.10
RN-222	609.32	137	45.49*	1.969E+00	7.239E-01	7.241E-01	26.14
	1120.29	21	14.92	1.128E+00	5.864E-01	5.866E-01	81.62
	1764.49	-----	15.30	7.620E-01	-----	Line Not Found	-----
RA-224	240.99	134	4.10*	4.340E+00	3.568E+00	3.568E+00	35.19
RA-226	609.32	137	45.49*	1.969E+00	7.239E-01	7.241E-01	26.14
	1120.29	21	14.92	1.128E+00	5.864E-01	5.866E-01	81.62
	1764.49	-----	15.30	7.620E-01	-----	Line Not Found	-----
AC-228	105.21	-----	1.10	7.028E+00	-----	Line Not Found	-----
	338.32	88	11.27	3.315E+00	1.122E+00	1.122E+00	43.21
	794.95	-----	4.25	1.543E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.473E+00	-----	Line Not Found	-----
	911.20	51	25.80*	1.360E+00	6.909E-01	6.909E-01	41.42
	968.97	33	15.80	1.285E+00	7.632E-01	7.632E-01	91.98
RA-228	105.21	-----	1.10	7.028E+00	-----	Line Not Found	-----
	338.32	88	11.27	3.315E+00	1.122E+00	1.122E+00	43.21
	794.95	-----	4.25	1.543E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.473E+00	-----	Line Not Found	-----
	911.20	51	25.80*	1.360E+00	6.909E-01	6.909E-01	41.42

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	968.97	33	15.80	1.285E+00	7.632E-01	7.632E-01	91.98
	74.82	276	10.28	7.682E+00	1.656E+00	1.656E+00	21.25
	77.11	419	17.10	7.644E+00	1.520E+00	1.520E+00	17.07
TH-229	238.63	371	43.60*	4.383E+00	9.221E-01	9.221E-01	13.08
	300.09	37	3.30	3.664E+00	1.459E+00	1.459E+00	130.43
	85.43	58	14.70	7.511E+00	2.497E-01	2.497E-01	82.75
TH-230	88.47	123	24.00	7.447E+00	3.257E-01	3.257E-01	45.06
	193.51	-----	4.41*	5.088E+00	-----	Line Not Found	-----
	210.85	-----	2.80	4.797E+00	-----	Line Not Found	-----
PA-231	609.32	137	45.49*	1.969E+00	7.239E-01	7.239E-01	26.14
	1120.29	21	14.92	1.128E+00	5.864E-01	5.864E-01	81.62
	1764.49	-----	15.30	7.620E-01	-----	Line Not Found	-----
TH-232	283.69	-----	1.70	3.838E+00	-----	Line Not Found	-----
	301.36	37	5.35*	3.664E+00	9.000E-01	9.000E-01	130.43
	105.21	-----	1.10	7.028E+00	-----	Line Not Found	-----
TH-234	338.32	88	11.27	3.315E+00	1.122E+00	1.122E+00	43.21
	835.71	-----	1.61	1.473E+00	-----	Line Not Found	-----
	911.20	51	25.80*	1.360E+00	6.909E-01	6.909E-01	41.42
U-234	968.97	33	15.80	1.285E+00	7.632E-01	7.632E-01	91.98
	63.29	91	3.70*	7.794E+00	1.498E+00	1.498E+00	72.11
	92.59	108	4.23	7.325E+00	1.661E+00	1.661E+00	62.80
U-235	609.32	137	45.49*	1.969E+00	7.239E-01	7.239E-01	26.14
	1120.29	21	14.92	1.128E+00	5.864E-01	5.864E-01	81.62
	1764.49	-----	15.30	7.620E-01	-----	Line Not Found	-----
U-238	89.96	107	3.47	7.390E+00	1.986E+00	1.986E+00	44.73
	93.35	108	5.60	7.325E+00	1.254E+00	1.254E+00	62.80
	143.76	22	10.96*	6.093E+00	1.572E-01	1.572E-01	310.61
AM-243	163.33	-----	5.08	5.667E+00	-----	Line Not Found	-----
	185.72	121	57.20	5.228E+00	1.913E-01	1.913E-01	52.56
	205.31	-----	5.01	4.887E+00	-----	Line Not Found	-----
ANH-511	63.29	91	3.70*	7.794E+00	1.498E+00	1.498E+00	72.11
	92.59	108	4.23	7.325E+00	1.661E+00	1.661E+00	62.80
	43.53	-----	5.90	7.421E+00	-----	Line Not Found	-----
ANH-511	74.66	276	67.20*	7.682E+00	2.533E-01	2.534E-01	21.25
	511.00	24	100.00*	2.311E+00	4.929E-02	4.929E-02	117.03

Flag: "*" = Keyline

Total number of lines in spectrum 48
 Number of unidentified lines 15
 Number of lines tentatively identified by NID 33 68.75%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.120E+01	1.120E+01	0.149E+01	13.29	
CO-57	271.74D	2.13	2.890E-02	6.162E-02	7.860E-02	127.57	
CD-109	461.40D	1.56	2.113E+00	3.300E+00	1.487E+00	45.06	
TE-125M	57.40D	36.0	7.351E+00	2.647E+02	3.536E+02	133.58	
SN-126	2.30E+05Y	1.00	2.113E-01	2.113E-01	0.952E-01	45.06	
BA-137M	30.08Y	1.02	6.412E-02	6.533E-02	4.133E-02	63.26	
CS-137	30.08Y	1.02	6.773E-02	6.901E-02	4.366E-02	63.26	
TL-208	1.41E+10Y	1.00	2.228E-01	2.228E-01	0.759E-01	34.08	
PB-210	22.20Y	1.03	2.074E-01	2.127E-01	9.591E-01	450.83	
BI-211	7.04E+08Y	1.00	2.778E+00	2.778E+00	0.586E+00	21.10	
PB-212	1.41E+10Y	1.00	9.221E-01	9.221E-01	1.206E-01	13.08	
BI-214	1600.00Y	1.00	7.239E-01	7.241E-01	1.893E-01	26.14	
PB-214	1600.00Y	1.00	1.008E+00	1.009E+00	0.213E+00	21.10	
RN-222	1600.00Y	1.00	7.239E-01	7.241E-01	1.893E-01	26.14	
RA-224	1.41E+10Y	1.00	3.568E+00	3.568E+00	1.256E+00	35.19	
RA-226	1600.00Y	1.00	7.239E-01	7.241E-01	1.893E-01	26.14	
AC-228	1.41E+10Y	1.00	6.909E-01	6.909E-01	2.862E-01	41.42	
RA-228	1.41E+10Y	1.00	6.909E-01	6.909E-01	2.862E-01	41.42	
TH-228	1.41E+10Y	1.00	9.221E-01	9.221E-01	1.206E-01	13.08	
TH-229	7340.00Y	1.00	3.257E-01	3.257E-01	1.468E-01	45.06	K
TH-230	7.54E+04Y	1.00	7.239E-01	7.239E-01	1.892E-01	26.14	
PA-231	7.04E+08Y	1.00	9.000E-01	9.000E-01	11.74E-01	130.43	
TH-232	1.41E+10Y	1.00	6.909E-01	6.909E-01	2.862E-01	41.42	
TH-234	4.47E+09Y	1.00	1.498E+00	1.498E+00	1.080E+00	72.11	
U-234	2.45E+05Y	1.00	7.239E-01	7.239E-01	1.892E-01	26.14	
U-235	7.04E+08Y	1.00	1.572E-01	1.572E-01	4.883E-01	310.61	
U-238	4.47E+09Y	1.00	1.498E+00	1.498E+00	1.080E+00	72.11	
AM-243	7370.00Y	1.00	2.533E-01	2.534E-01	0.538E-01	21.25	
ANH-511	1.00E+09Y	1.00	4.929E-02	4.929E-02	5.769E-02	117.03	
Total Activity :			4.104E+01	2.997E+02			

Grand Total Activity : 4.104E+01 2.997E+02

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	130.29	31	192	0.60	260.83	254	12	6.84E-03	****	6.41E+00	T
0	209.29	69	93	0.93	418.78	414	10	1.59E-02	63.3	4.82E+00	
1	270.56	52	43	1.63	541.30	534	39	1.24E-02	61.6	3.98E+00	T
0	463.71	25	32	1.69	927.53	920	13	6.27E-03	****	2.53E+00	T
0	484.21	10	49	4.26	968.53	956	16	2.58E-03	****	2.43E+00	
0	533.36	31	19	1.91	1066.81	1060	12	7.86E-03	70.7	2.23E+00	
0	656.84	32	4	4.81	1313.76	1306	15	8.44E-03	45.6	1.84E+00	T
0	680.22	32	13	1.94	1360.53	1352	16	8.36E-03	63.0	1.78E+00	
0	714.94	15	22	1.55	1429.97	1423	15	3.94E-03	****	1.70E+00	
0	727.83	41	16	1.21	1455.74	1450	12	1.08E-02	52.2	1.67E+00	T
0	1059.63	12	6	4.05	2119.42	2114	11	3.26E-03	****	1.19E+00	
0	1071.72	8	4	1.03	2143.61	2140	6	2.12E-03	****	1.17E+00	
0	1127.20	20	12	6.46	2254.59	2247	16	5.46E-03	91.0	1.12E+00	
0	1142.06	10	8	0.90	2284.33	2278	10	2.65E-03	****	1.11E+00	
0	1170.74	12	3	3.30	2341.70	2335	12	3.41E-03	79.9	1.08E+00	
0	1202.84	11	13	0.73	2405.91	2400	13	3.06E-03	****	1.06E+00	
5	1318.88	8	3	1.80	2638.06	2636	12	2.21E-03	83.7	9.76E-01	
5	1321.68	12	2	2.43	2643.67	2636	12	3.37E-03	70.3	9.74E-01	
0	1455.16	5	2	1.19	2910.73	2906	8	1.39E-03	****	8.96E-01	
0	1766.28	24	7	1.71	3533.27	3525	14	7.17E-03	58.7	7.61E-01	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235067.CNF;1
* Acquisition date   : 3-OCT-2016 05:58:05 Sensitivity      : 3.000
* Detector ID       : GAM41 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:05.88 Half life ratio : *****
* Sample date       : 11-DEC-2015 11:30:00 Nuclide Library : SOLID
* Sample ID         : G405235067 Analyst initials: MXR1
* Batch Number      : 1596254 Sample Quantity : 1.5821E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 26-JAN-2016 06:01:47 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.814E-01
CO-57	3.609E-02
CD-109	7.011E-01
TE-125M	1.886E+02
SN-126	4.482E-02
BA-137M	1.331E-02
CS-137	1.406E-02
TL-208	2.630E-02
PB-210	3.193E-01
BI-211	1.628E-01
PB-212	4.038E-02
BI-214	5.316E-02
PB-214	1.562E-01
RN-222	5.316E-02
RA-224	4.328E-01
RA-226	5.316E-02
AC-228	1.090E-01
RA-228	1.090E-01
TH-228	4.038E-02
TH-229	3.734E-01
TH-230	5.314E-02
PA-231	3.429E-01
TH-232	1.090E-01
TH-234	4.338E-01
U-234	5.314E-02
U-235	1.557E-01
U-238	4.338E-01
AM-243	2.560E-02
ANH-511	2.029E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.016E+01	NOT IDENT.
NA-22	3.988E-02	NOT IDENT.

NA-24	0.000E+00	SHORT HLIF
AL-26	1.529E-02	NOT IDENT.
SC-46	2.873E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	4.776E-02	NOT IDENT.
CO-56	3.828E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-58	5.396E-01	NOT IDENT.
FE-59	5.666E+00	NOT IDENT.
CO-60	2.879E-02	NOT IDENT.
ZN-65	1.949E-01	NOT IDENT.
GE-68	1.768E+00	NOT IDENT.
AS-73	1.904E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.793E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.623E-01	NOT IDENT.
KR-85	7.204E+00	NOT IDENT.
SR-85	7.363E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.473E-01	NOT IDENT.
Y-91	5.473E+02	NOT IDENT.
NB-94	3.097E-02	NOT IDENT.
NB-95	6.301E-01	NOT IDENT.
NB-95M	1.772E+00	NOT IDENT.
ZR-95	1.283E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.551E-02	NOT IDENT.
RH-102	5.420E-02	NOT IDENT.
RU-103	4.087E+00	FAIL ABUN
RH-106	3.587E-01	NOT IDENT.
RU-106	3.587E-01	NOT IDENT.
AG-108M	1.940E-02	NOT IDENT.
AG-110M	9.685E-02	FAIL ABUN
SN-113	1.820E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.096E-01	NOT IDENT.
SB-124	1.446E+00	NOT IDENT.
SB-125	9.763E-02	FAIL ABUN
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.641E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	4.854E-02	NOT IDENT.
CS-135	1.235E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	9.007E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.029E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.888E-01	NOT IDENT.
PM-144	5.555E-02	NOT IDENT.
PR-144	4.803E+00	NOT IDENT.
PM-146	3.114E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	6.809E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.025E-02	FAIL ABUN
EU-152	8.433E-02	FAIL ABUN
GD-153	1.210E-01	NOT IDENT.
EU-154	9.703E-02	FAIL ABUN
EU-155	8.857E-02	FAIL ABUN
TB-160	1.705E+00	FAIL ABUN
HO-166M	5.549E-02	FAIL ABUN
TM-171	4.567E+00	NOT IDENT.
HF-172	1.766E-01	FAIL ABUN

LU-172	6.575E-02	FAIL ABUN
LU-176	1.724E-02	FAIL ABUN
HF-181	3.694E+00	NOT IDENT.
TA-182	8.395E-01	FAIL ABUN
RE-183	9.300E-01	NOT IDENT.
RE-184	3.745E+01	NOT IDENT.
W-188	8.936E+01	FAIL ABUN
IR-192	4.157E-01	FAIL ABUN
HG-203	2.102E+00	NOT IDENT.
BI-207	2.247E-02	FAIL ABUN
PB-211	5.815E-01	NOT IDENT.
BI-212	7.015E-01	FAIL ABUN
RN-219	3.084E-01	FAIL ABUN
RA-223	4.930E-01	FAIL ABUN
AC-227	1.843E-01	FAIL ABUN
TH-227	1.843E-01	FAIL ABUN
TH-231	4.930E-01	FAIL ABUN
PA-233	5.166E-02	FAIL ABUN
PA-234	2.203E-01	FAIL ABUN
PA-234M	3.553E+00	NOT IDENT.
NP-237	5.166E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.081E-01	FAIL ABUN
PU-239	2.710E+02	FAIL ABUN
AM-241	4.796E-02	NOT IDENT.
CM-243	7.255E-02	FAIL ABUN
BK-247	6.200E-02	FAIL ABUN
CM-247	2.722E-02	FAIL ABUN
CF-249	3.447E-02	NOT IDENT.
CF-251	9.429E-02	NOT IDENT.

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235067.CNF;1
* Acquisition date   : 3-OCT-2016 05:58:05 Sensitivity      : 3.000
* Detector ID        : GAM41 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:05.88 Half life ratio  : *****
* Sample date        : 11-DEC-2015 11:30:00 Nuclide Library : SOLID
* Sample ID          : G405235067 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity : 1.5821E+02 GRAM
*                   : Quantity Err(%) : 1.2641E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight      : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 26-JAN-2016 06:01:47 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.120E+01	1.744E+00	1.744E+00
CO-57	6.162E-02	7.737E-02	7.737E-02
CD-109	1.970E+00	1.538E+00	1.538E+00
TE-125M	2.647E+02	3.478E+02	3.478E+02
SN-126	1.261E-01	9.821E-02	9.821E-02
BA-137M	6.533E-02	4.085E-02	4.085E-02
CS-137	6.901E-02	4.315E-02	4.315E-02
TL-208	2.228E-01	7.679E-02	7.679E-02
PB-210	2.127E-01	9.403E-01	9.403E-01
BI-211	2.328E-01	1.002E+00	1.002E+00
PB-212	9.221E-01	1.470E-01	1.470E-01
BI-214	7.241E-01	1.953E-01	1.953E-01
PB-214	1.009E+00	2.256E-01	2.256E-01
RN-222	7.241E-01	1.953E-01	1.953E-01
RA-224	1.934E+00	1.352E+00	1.352E+00
RA-226	7.241E-01	1.953E-01	1.953E-01
AC-228	6.909E-01	2.922E-01	2.922E-01
RA-228	6.909E-01	2.922E-01	2.922E-01
TH-228	9.221E-01	1.470E-01	1.470E-01
TH-229	-2.520E-01	4.327E-01	4.327E-01
TH-230	7.239E-01	1.953E-01	1.953E-01
PA-231	9.000E-01	1.168E+00	1.168E+00
TH-232	6.909E-01	2.922E-01	2.922E-01
TH-234	1.498E+00	1.121E+00	1.121E+00
U-234	7.239E-01	1.953E-01	1.953E-01
U-235	1.572E-01	4.789E-01	4.789E-01
U-238	1.498E+00	1.121E+00	1.121E+00
AM-243	1.736E-01	6.234E-02	6.234E-02
ANH-511	4.929E-02	5.669E-02	5.669E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)
BE-7	-1.889E+00	1.376E+01	1.379E+01 NOT IDENT.

NA-22	-2.462E-02	5.319E-02	5.434E-02	NOT IDENT.
NA-24	-1.000E+41	3.243E+41	0.000E+00	SHORT HLIF
AL-26	8.693E-04	1.724E-02	1.725E-02	NOT IDENT.
SC-46	6.380E-02	3.158E-01	3.171E-01	FAIL ABUN
V-48	-1.470E+03	1.094E+04	1.096E+04	SHORT HLIF
CR-51	-1.358E+02	4.058E+02	4.104E+02	SHORT HLIF
MN-54	-5.215E-02	6.460E-02	6.875E-02	NOT IDENT.
CO-56	-1.095E-01	4.587E-01	4.614E-01	NOT IDENT.
MN-56	-1.000E+41	4.343E+41	0.000E+00	SHORT HLIF
CO-58	-1.871E-02	6.181E-01	6.182E-01	NOT IDENT.
FE-59	3.198E+00	5.936E+00	6.109E+00	NOT IDENT.
CO-60	-3.032E-02	4.311E-02	4.523E-02	NOT IDENT.
ZN-65	2.595E-01	1.983E-01	2.302E-01	NOT IDENT.
GE-68	-1.969E+00	2.533E+00	2.684E+00	NOT IDENT.
AS-73	-1.159E-01	2.165E+00	2.165E+00	NOT IDENT.
AS-74	2.401E+03	5.150E+03	5.262E+03	SHORT HLIF
SE-75	1.035E-01	2.095E-01	2.146E-01	NOT IDENT.
BR-77	6.797E+37	5.823E+38	0.000E+00	SHORT HLIF
SR-82	-5.021E+01	5.916E+02	5.920E+02	SHORT HLIF
RB-83	-2.336E-01	5.911E-01	6.004E-01	NOT IDENT.
KR-85	6.789E+00	8.340E+00	8.884E+00	NOT IDENT.
SR-85	6.906E-01	8.528E-01	9.079E-01	NOT IDENT.
RB-86	-2.624E+04	2.889E+04	3.121E+04	SHORT HLIF
Y-88	6.631E-03	1.686E-01	1.687E-01	NOT IDENT.
Y-91	2.555E+02	6.726E+02	6.824E+02	NOT IDENT.
NB-94	1.316E-03	3.469E-02	3.469E-02	NOT IDENT.
NB-95	-8.016E-02	7.291E-01	7.300E-01	NOT IDENT.
NB-95M	2.899E-01	2.157E+00	2.161E+00	NOT IDENT.
ZR-95	5.122E-02	1.445E+00	1.445E+00	NOT IDENT.
NB-97	1.000E+41	4.547E+40	0.000E+00	SHORT HLIF
ZR-97	-1.000E+41	1.451E+41	0.000E+00	SHORT HLIF
MO-99	1.673E+31	9.302E+31	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	8.210E+41	0.000E+00	SHORT HLIF
RH-101	1.038E-02	2.924E-02	2.961E-02	NOT IDENT.
RH-102	3.301E-03	6.001E-02	6.003E-02	NOT IDENT.
RU-103	-2.782E+00	5.296E+00	5.442E+00	FAIL ABUN
RH-106	-8.336E-02	4.481E-01	4.496E-01	NOT IDENT.
RU-106	-8.336E-02	4.481E-01	4.496E-01	NOT IDENT.
AG-108M	-5.505E-03	2.352E-02	2.365E-02	NOT IDENT.
AG-110M	2.327E-02	1.036E-01	1.041E-01	FAIL ABUN
SN-113	-1.883E-02	2.125E-01	2.127E-01	NOT IDENT.
CD-115	-6.921E+38	1.623E+39	0.000E+00	SHORT HLIF
SN-117M	2.576E+02	7.601E+04	7.601E+04	SHORT HLIF
TE-123M	-2.405E-02	1.207E-01	1.212E-01	NOT IDENT.
SB-124	-5.155E-02	1.693E+00	1.694E+00	NOT IDENT.
SB-125	-3.137E-02	1.174E-01	1.182E-01	FAIL ABUN
I-126	1.052E+06	7.491E+05	8.866E+05	SHORT HLIF
SB-126	3.624E+05	1.054E+06	1.067E+06	SHORT HLIF
SB-127	6.846E+20	1.149E+22	0.000E+00	SHORT HLIF
I-131	-1.144E+09	3.830E+09	3.865E+09	SHORT HLIF
I-132	1.000E+41	1.845E+42	0.000E+00	SHORT HLIF
TE-132	3.680E+25	1.954E+26	0.000E+00	SHORT HLIF
BA-133	4.767E-03	4.588E-02	4.593E-02	FAIL ABUN
I-133	-1.000E+41	9.978E+41	0.000E+00	SHORT HLIF
CS-134	3.471E-02	4.979E-02	5.219E-02	NOT IDENT.
CS-135	7.849E-02	1.305E-01	1.353E-01	NOT IDENT.
I-135	-1.000E+41	6.937E+41	0.000E+00	SHORT HLIF
CS-136	-9.018E+03	3.006E+05	3.007E+05	SHORT HLIF
CE-139	-3.591E-02	1.011E-01	1.024E-01	NOT IDENT.
BA-140	-9.103E+05	1.285E+06	1.349E+06	SHORT HLIF
LA-140	1.562E+05	4.138E+05	4.198E+05	SHORT HLIF
CE-141	2.541E+00	2.167E+01	2.170E+01	NOT IDENT.
CE-143	-1.000E+41	2.068E+42	0.000E+00	SHORT HLIF
CE-144	-4.287E-03	3.443E-01	3.443E-01	NOT IDENT.
PM-144	1.602E-02	6.035E-02	6.078E-02	NOT IDENT.
PR-144	1.705E+00	5.173E+00	5.230E+00	NOT IDENT.
PM-146	-2.274E-02	4.029E-02	4.157E-02	NOT IDENT.
ND-147	2.742E+06	3.111E+07	3.114E+07	SHORT HLIF
PM-147	-5.293E+02	8.577E+02	8.903E+02	NOT IDENT.
PM-149	-7.583E+39	1.654E+40	0.000E+00	SHORT HLIF
EU-150	-1.177E-04	2.422E-02	2.422E-02	FAIL ABUN
EU-152	-2.768E-02	1.120E-01	1.127E-01	FAIL ABUN
GD-153	-7.463E-02	1.390E-01	1.430E-01	NOT IDENT.
EU-154	-4.760E-02	1.267E-01	1.285E-01	FAIL ABUN
EU-155	6.449E-02	9.849E-02	1.027E-01	FAIL ABUN
TB-160	4.565E-01	1.874E+00	1.885E+00	FAIL ABUN
HO-166M	-2.157E-02	7.512E-02	7.574E-02	FAIL ABUN
TM-171	1.387E+00	5.059E+00	5.097E+00	NOT IDENT.

HF-172	5.805E-02	2.500E-01	2.514E-01	FAIL ABUN
LU-172	-1.890E-02	8.115E-02	8.160E-02	FAIL ABUN
LU-176	-5.312E-03	2.280E-02	2.293E-02	FAIL ABUN
HF-181	-4.713E-03	4.331E+00	4.331E+00	NOT IDENT.
TA-182	-6.420E-01	1.117E+00	1.154E+00	FAIL ABUN
RE-183	4.663E-01	1.024E+00	1.045E+00	NOT IDENT.
RE-184	5.259E+01	3.818E+01	4.494E+01	NOT IDENT.
W-188	-2.689E+00	1.130E+02	1.130E+02	FAIL ABUN
IR-192	3.864E-01	4.285E-01	4.626E-01	FAIL ABUN
HG-203	1.482E+00	2.214E+00	2.313E+00	NOT IDENT.
BI-207	-1.844E-02	3.901E-02	3.988E-02	FAIL ABUN
PB-211	2.869E-02	6.683E-01	6.684E-01	NOT IDENT.
BI-212	1.735E+00	9.030E-01	1.195E+00	FAIL ABUN
RN-219	8.025E-02	3.447E-01	3.466E-01	FAIL ABUN
RA-223	-1.621E-01	5.796E-01	5.842E-01	FAIL ABUN
AC-227	-1.213E-01	2.196E-01	2.263E-01	FAIL ABUN
TH-227	-1.213E-01	2.196E-01	2.263E-01	FAIL ABUN
TH-231	-1.621E-01	5.796E-01	5.842E-01	FAIL ABUN
PA-233	2.280E-02	5.589E-02	5.683E-02	FAIL ABUN
PA-234	-6.323E-02	2.777E-01	2.791E-01	FAIL ABUN
PA-234M	-2.854E-01	4.223E+00	4.225E+00	NOT IDENT.
NP-237	2.280E-02	5.589E-02	5.683E-02	FAIL ABUN
NP-238	-1.000E+41	1.282E+41	0.000E+00	SHORT HLIF
NP-239	-4.410E-03	2.216E-01	2.216E-01	FAIL ABUN
PU-239	3.638E+02	7.311E+02	7.493E+02	FAIL ABUN
AM-241	1.892E-02	5.757E-02	5.820E-02	NOT IDENT.
CM-243	-6.583E-02	8.152E-02	8.676E-02	FAIL ABUN
BK-247	1.824E-02	7.501E-02	7.546E-02	FAIL ABUN
CM-247	-1.947E-03	3.174E-02	3.175E-02	FAIL ABUN
CF-249	2.034E-02	3.716E-02	3.827E-02	NOT IDENT.
CF-251	-4.218E-02	1.066E-01	1.083E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	71.4845	87.09	105.1814	136.47	73.4068
45.60	66.7140	87.57	105.2499	140.51	0.0000
46.54	66.8393	88.03	105.3153	143.76	76.6191
49.72	0.0000	88.34	105.3595	144.24	76.6559
51.35	85.2130	88.47	105.3775	145.44	76.7460
51.87	85.2957	89.96	120.6716	152.43	69.1805
52.39	88.9352	1093.63	108.1994	153.25	0.0000
52.97	91.4043	91.11	0.0000	323.87	63.8974
53.44	87.9185	92.59	88.2952	156.02	0.0000
54.07	96.3454	93.35	88.3823	158.56	0.0000
57.36	0.0000	94.56	74.6107	159.00	67.8009
57.53	98.1373	94.65	74.6192	162.33	68.0092
57.98	103.0045	94.67	74.6210	162.66	0.0000
59.27	102.4339	94.87	77.1705	163.33	68.9786
59.32	108.8454	97.43	94.4304	165.86	66.4080
59.54	110.4878	98.43	89.8052	176.31	66.1062
60.96	118.7802	98.44	89.8063	176.60	0.0000
61.17	118.8220	99.53	76.3545	177.52	63.4178
62.93	106.2881	100.11	79.8059	181.07	0.0000
63.29	106.3510	102.03	92.7610	181.52	55.3351
63.58	124.1357	103.18	95.4479	184.41	57.3196
64.28	132.3481	103.37	97.1750	143.76	57.3827
66.73	121.5294	105.21	76.8883	193.51	62.4104
67.24	109.4657	105.31	76.8979	197.03	54.1815
125.81	111.9762	106.12	85.9526	198.01	52.3542
67.75	111.9881	106.47	91.1226	201.83	56.2653
69.67	155.0593	109.28	66.9606	203.43	65.7261
70.83	130.8748	111.00	85.1597	205.31	55.0092
72.81	137.4049	111.76	0.0000	210.85	49.5803
72.87	150.5051	114.06	71.6494	215.65	49.2885
74.66	119.7441	116.30	0.0000	222.11	52.3861
74.82	119.7723	116.74	87.4539	227.09	48.7552
74.97	119.7990	119.76	76.8901	227.38	49.7217
77.11	120.1778	121.12	92.6680	228.16	0.0000
78.74	120.4622	121.22	92.6783	228.18	49.7508
79.69	120.6270	121.78	64.4361	116.74	49.7508
80.12	120.7013	122.06	64.4557	235.69	41.8450
80.19	0.0000	122.92	58.8496	235.96	41.8530
80.57	120.7785	123.07	58.8593	238.63	43.3786
81.00	120.8528	265.00	64.1338	238.98	0.0000
81.07	120.8647	125.81	55.0987	240.99	43.4509
81.75	120.9805	127.23	55.1824	242.00	43.4821
83.79	59.8323	127.91	64.4267	244.70	43.5645
84.00	107.2310	129.30	71.1049	252.40	0.0000
85.43	104.9436	131.20	71.2483	252.80	31.1527
86.55	105.1045	133.02	68.7396	254.15	0.0000
86.79	105.1384	133.52	68.7753	256.23	48.7895
86.94	105.1602	136.00	74.2554	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	33.8549	355.39	0.0000	584.27	16.0758
264.80	36.8027	356.01	32.6414	595.83	0.0000
265.00	36.8073	364.49	0.0000	427.87	23.1071
268.22	35.4097	366.42	0.0000	602.52	0.0000
269.46	35.4390	372.51	20.9074	604.72	26.0358
270.03	35.4521	375.05	28.2623	607.14	17.3724
271.23	35.4800	377.52	24.1062	609.32	17.3865
273.65	0.0000	356.01	23.1337	610.33	17.3932
276.40	35.5986	388.16	25.2920	614.28	15.6764
277.37	35.6206	388.63	0.0000	618.01	11.6280
277.60	35.6257	391.69	26.3931	620.36	16.2935
278.00	35.6353	264.66	32.8751	621.93	13.9736
279.20	35.6624	401.81	22.2830	630.19	0.0000
279.54	35.6704	402.40	24.4122	631.29	18.4026
279.70	35.6741	404.85	28.6930	633.25	17.5385
280.46	35.6909	410.95	21.3175	634.78	0.0000
283.69	35.7642	413.71	34.1543	635.95	20.1889
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	28.3440	423.72	0.0000	645.85	16.7369
285.90	0.0000	427.09	33.3008	657.76	8.4920
287.50	35.8499	427.87	35.4620	657.90	0.0000
290.67	37.4176	433.94	19.3986	661.66	3.5431
293.27	0.0000	439.40	20.5288	664.57	0.0000
351.93	33.0201	453.88	23.9296	666.33	0.0000
295.96	33.0349	463.37	18.5706	666.50	0.0000
879.38	33.0880	468.07	19.7043	667.71	0.0000
299.98	33.1161	473.00	0.0000	677.62	8.9066
300.09	33.1182	475.06	24.7069	685.70	0.0000
300.13	33.1195	476.78	13.1870	695.00	0.0000
301.36	33.1437	477.60	24.7343	696.49	19.7200
302.85	33.1739	482.18	24.2335	696.51	18.8236
256.23	27.1692	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	19.7253
306.78	28.7180	497.08	23.2813	697.49	18.8300
308.46	36.3120	505.52	16.6891	702.65	21.5574
311.90	30.3217	507.63	0.0000	706.68	26.9824
316.51	26.3502	511.00	16.7276	711.68	24.5047
319.41	0.0000	514.00	21.7733	720.70	0.0000
320.08	0.0000	514.00	21.7733	721.93	0.0000
321.04	32.5169	520.40	19.0323	722.78	10.1268
323.87	38.6772	520.69	0.0000	722.91	13.0210
325.23	40.7446	522.65	0.0000	723.31	11.5758
328.76	0.0000	527.90	0.0000	724.19	20.2631
333.37	24.5605	528.26	25.2713	727.33	12.6772
333.97	30.7111	529.59	20.2280	733.00	17.4182
334.37	39.9331	529.87	0.0000	735.93	15.4369
338.28	28.7332	531.02	0.0000	333.97	14.5361
338.32	28.7337	537.26	0.0000	739.50	0.0000
311.90	28.7685	546.56	0.0000	747.24	12.7589
340.48	28.7685	552.55	14.7451	748.06	14.5850
340.55	0.0000	563.25	22.7799	752.31	18.2562
344.28	41.6989	569.33	27.4004	753.82	0.0000
345.93	30.9167	946.00	30.8276	756.73	15.5396
351.06	34.1038	569.70	30.8298	756.80	15.5396
351.93	34.1199	583.19	16.0690	884.68	14.6582

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	13.7503	1274.44	9.7833	1620.50	5.5801
766.42	15.5868	1001.03	9.7952	1621.92	4.4653
766.84	13.7549	1002.74	15.6792	1678.03	0.0000
772.60	0.0000	1004.73	9.8044	1690.97	2.7114
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.6602
778.90	17.4878	1028.54	0.0000	1063.66	1.5264
783.70	0.0000	1037.84	17.7957	1771.35	10.9928
785.37	25.8228	1038.76	0.0000	1791.20	0.0000
792.07	28.6481	631.29	17.8341	1808.65	0.9216
794.95	12.9494	1048.07	0.0000	1810.72	0.0000
795.86	11.1024	1049.04	11.8967	1836.06	1.8515
810.06	18.5834	1050.41	5.9506		
810.29	19.5138	1063.66	6.3680		
344.28	17.6565	1077.00	0.0000		
810.76	15.7995	1077.34	14.9744		
815.77	0.0000	1085.87	15.0046		
1048.07	0.0000	1093.63	12.0264		
832.01	14.0286	1099.45	6.0216		
834.85	18.7207	1112.07	12.0791		
835.71	12.1712	1112.84	18.1219		
836.80	0.0000	1115.54	4.8357		
846.75	0.0000	1120.29	14.5230		
846.77	14.0891	1120.55	14.5239		
856.80	0.0000	1221.41	14.5266		
860.56	12.0707	1129.67	11.3203		
871.09	9.4586	1131.51	0.0000		
873.19	16.0890	1147.95	0.0000		
875.33	0.0000	1173.23	17.9685		
879.38	11.3771	1177.95	15.3305		
880.51	13.2771	1189.05	8.1968		
883.24	10.4401	1204.77	11.5158		
884.68	9.4949	1221.41	18.5757		
889.28	7.6057	1231.02	11.3753		
894.76	18.0914	1235.36	0.0000		
898.04	15.2485	1238.28	13.4650		
900.72	24.7971	1260.41	0.0000		
903.28	9.5441	1271.87	8.3462		
911.20	11.4781	1274.44	11.4821		
912.08	11.4807	1274.54	12.5266		
923.98	0.0000	1291.59	11.5244		
926.50	15.3682	1298.22	0.0000		
929.11	11.5342	1312.11	0.0000		
937.49	15.4136	1332.49	10.5658		
944.13	0.0000	1362.66	0.0000		
946.00	11.5865	1365.19	6.3820		
949.00	11.5957	1368.63	0.0000		
667.71	0.0000	1384.29	4.2710		
962.31	18.4248	1408.01	7.5093		
964.08	12.1966	1457.56	0.0000		
966.17	15.5313	1460.82	5.7803		
911.20	27.9773	1489.16	5.4483		
968.97	27.9773	1505.03	6.5574		
983.53	0.0000	1584.12	3.3265		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235068.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM31.CNF;306
Background date : 2-OCT-2016 11:01:52.
Sample date     : 11-DEC-2015 10:27:00 Acquisition date : 3-OCT-2016 06:05:07.
Sample ID      : G405235068 Sample quantity   : 1.40907E+02 GRAM
Detector name  : GAM31 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:06.51 0.2%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID      : 1596254 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.54*	51	278	0.94	92.73	88	10	1.43E-02	64.0	
2	0	63.01*	141	338	1.37	125.65	120	12	3.91E-02	28.3	
3	5	74.84	145	128	0.83	149.28	145	15	4.02E-02	13.7	3.96E+00
4	5	77.04*	244	136	1.12	153.68	145	15	6.78E-02	10.9	
5	4	84.04*	20	161	1.39	167.67	162	29	5.48E-03	108.6	1.75E+00
6	4	87.12*	64	129	1.19	173.83	162	29	1.78E-02	31.7	
7	4	90.01	32	135	1.41	179.60	162	29	8.85E-03	67.8	
8	4	92.77*	95	105	1.24	185.11	162	29	2.63E-02	23.4	
9	0	115.24	26	91	0.60	230.03	226	8	7.14E-03	68.0	
10	0	143.81*	36	84	0.83	287.13	284	8	9.92E-03	48.6	
11	4	185.93*	70	57	1.54	371.31	366	14	1.95E-02	24.6	2.42E+00
12	4	187.50	24	56	1.65	374.45	366	14	6.76E-03	74.7	
13	0	209.79	34	59	1.59	418.99	415	8	9.49E-03	42.3	
14	0	238.61*	209	76	0.93	476.58	471	9	5.80E-02	10.5	
15	0	242.06*	43	54	1.13	483.48	481	7	1.18E-02	34.2	
16	0	277.62	15	47	3.13	554.56	548	9	4.18E-03	86.2	
17	0	295.32*	104	48	0.88	589.92	585	10	2.88E-02	16.1	
18	0	329.09	16	34	0.77	657.42	652	8	4.56E-03	66.2	
19	0	338.68*	44	45	1.21	676.58	672	11	1.23E-02	33.6	
20	0	351.89*	152	45	1.10	702.99	697	12	4.21E-02	12.4	
21	0	463.26	22	14	0.71	925.57	922	8	6.20E-03	35.8	
22	0	511.42*	33	29	1.93	1021.84	1015	13	9.20E-03	47.4	
23	0	519.95	14	20	1.44	1038.87	1031	10	3.86E-03	66.0	
24	0	552.89	18	10	2.11	1104.71	1101	8	4.96E-03	40.4	
25	0	583.71*	76	12	1.66	1166.31	1161	12	2.11E-02	15.3	
26	0	609.71*	102	32	1.26	1218.29	1213	12	2.82E-02	15.1	
27	0	632.56	13	17	1.69	1263.95	1257	11	3.61E-03	70.1	
28	0	661.91	22	12	2.02	1322.62	1315	12	6.09E-03	38.2	
29	0	719.56	22	10	2.39	1437.84	1433	13	5.99E-03	37.0	
30	0	729.51	25	19	4.46	1457.73	1448	16	6.85E-03	45.2	
31	0	769.36*	16	11	3.26	1537.38	1532	11	4.54E-03	50.7	
32	0	803.84*	8	5	1.40	1606.30	1602	7	2.34E-03	60.9	
33	0	836.89*	8	6	0.98	1672.36	1668	9	2.15E-03	76.5	
34	0	840.72	13	1	1.48	1680.01	1677	7	3.50E-03	32.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	875.20	13	5	1.52	1748.92	1744	10	3.61E-03	42.5	
36	0	911.73*	30	7	2.07	1821.94	1817	9	8.32E-03	25.5	
37	0	946.61	10	6	0.95	1891.67	1886	9	2.70E-03	57.5	
38	0	969.85	36	9	1.30	1938.12	1933	12	9.86E-03	23.7	
39	0	1002.44*	6	10	2.92	2003.25	1993	13	1.73E-03	113.4	
40	0	1120.52	45	3	2.02	2239.27	2234	12	1.24E-02	16.9	
41	0	1157.48	8	15	1.52	2313.16	2306	12	2.17E-03	105.7	
42	0	1231.79	6	5	1.47	2461.70	2458	7	1.72E-03	72.7	
43	0	1238.29	10	15	1.44	2474.70	2468	12	2.76E-03	84.3	
44	0	1461.56*	155	0	1.76	2921.00	2914	13	4.30E-02	8.2	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235068.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-DEC-2015 10:27:00 Acquisition date : 3-OCT-2016 06:05:07
Sample ID        : G405235068 Sample quantity   : 140.91 GRAM
Sample type      : SOLID Sample geometry    :
Detector name    : GAMMA31 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:06.51 0.2%
Energy tolerance : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type  : Linear Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	6.944E-01	1.069E+01	1.069E+01	16.44	OK
CD-109	88.03	3.70*	5.391E+00	9.560E-01	1.493E+00	141.28	OK
SN-126	64.28	9.60	5.591E+00	1.731E+00	1.731E+00	56.68	OK
	86.94	8.90	5.391E+00	3.974E-01	3.974E-01	141.28	OK
	87.57	37.00*	5.391E+00	9.560E-02	9.560E-02	141.28	OK
BA-137M	661.66	89.90*	1.340E+00	9.971E-02	1.016E-01	76.37	OK
CS-137	661.66	85.10*	1.340E+00	1.053E-01	1.073E-01	76.37	OK
TL-208	277.37	6.60	2.813E+00	4.776E-01	4.776E-01	172.42	OK
	583.19	85.00*	1.486E+00	3.334E-01	3.334E-01	30.59	OK
	860.56	12.50	1.084E+00	-----	Line Not Found	-----	Absent
PB-210	46.54	4.25*	5.485E+00	1.485E+00	1.523E+00	128.02	OK
PB-212	74.82	10.28	5.476E+00	9.929E-01	9.929E-01	50.45	OK
	77.11	17.10	5.460E+00	1.698E+00	1.698E+00	21.86	OK
	238.63	43.60*	3.203E+00	8.924E-01	8.924E-01	21.09	OK
	300.09	3.30	2.629E+00	-----	Line Not Found	-----	Absent
BI-214	609.32	45.49*	1.433E+00	8.612E-01	8.615E-01	30.24	OK
	1120.29	14.92	8.738E-01	1.793E+00	1.794E+00	33.81	OK
	1764.49	15.30	5.813E-01	-----	Line Not Found	-----	Absent
PB-214	74.82	5.80	5.476E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	5.460E+00	2.994E+00	2.995E+00	21.86	OK
	87.09	3.41	5.392E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	3.165E+00	1.106E+00	1.106E+00	68.50	OK
	295.22	18.42	2.666E+00	1.238E+00	1.238E+00	32.25	OK
	351.93	35.60*	2.286E+00	1.077E+00	1.077E+00	24.83	OK
RN-222	609.32	45.49*	1.433E+00	8.612E-01	8.615E-01	30.24	OK
	1120.29	14.92	8.738E-01	1.793E+00	1.794E+00	33.81	OK
	1764.49	15.30	5.813E-01	-----	Line Not Found	-----	Absent
RA-226	609.32	45.49*	1.433E+00	8.612E-01	8.615E-01	30.24	OK
	1120.29	14.92	8.738E-01	1.793E+00	1.794E+00	33.81	OK
	1764.49	15.30	5.813E-01	-----	Line Not Found	-----	Absent
AC-228	105.21	1.10	5.215E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	2.364E+00	9.611E-01	9.611E-01	67.21	OK
	794.95	4.25	1.156E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.109E+00	2.330E+00	2.330E+00	153.03	OK
	911.20	25.80*	1.035E+00	5.983E-01	5.983E-01	51.06	OK
	968.97	15.80	9.841E-01	1.211E+00	1.211E+00	47.47	OK
RA-228	105.21	1.10	5.215E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	2.364E+00	9.611E-01	9.611E-01	67.21	OK
	794.95	4.25	1.156E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.109E+00	2.330E+00	2.330E+00	153.03	OK
	911.20	25.80*	1.035E+00	5.983E-01	5.983E-01	51.06	OK
	968.97	15.80	9.841E-01	1.211E+00	1.211E+00	47.47	OK
TH-228	74.82	10.28	5.476E+00	9.929E-01	9.929E-01	50.45	OK
	77.11	17.10	5.460E+00	1.698E+00	1.698E+00	21.86	OK
	238.63	43.60*	3.203E+00	8.924E-01	8.924E-01	21.09	OK
	300.09	3.30	2.629E+00	-----	Line Not Found	-----	Absent
TH-229	85.43	14.70	5.413E+00	1.601E-01	1.602E-01	217.11	OK
	88.47	24.00	5.391E+00	1.474E-01	1.474E-01	141.28	OK
	193.51	4.41*	3.791E+00	-----	Line Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	210.85	2.80	3.560E+00	2.065E+00	2.065E+00	84.64	OK
TH-230	609.32	45.49*	1.433E+00	8.612E-01	8.612E-01	30.24	OK
	1120.29	14.92	8.738E-01	1.793E+00	1.793E+00	33.81	OK
	1764.49	15.30	5.813E-01	-----	Line Not Found	-----	Absent
TH-232	105.21	1.10	5.215E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	2.364E+00	9.611E-01	9.611E-01	67.21	OK
	835.71	1.61	1.109E+00	2.330E+00	2.330E+00	153.03	OK
	911.20	25.80*	1.035E+00	5.983E-01	5.983E-01	51.06	OK
	968.97	15.80	9.841E-01	1.211E+00	1.211E+00	47.47	OK
TH-234	63.29	3.70*	5.591E+00	4.492E+00	4.492E+00	56.68	OK
	92.59	4.23	5.346E+00	2.688E+00	2.688E+00	46.83	OK
U-234	609.32	45.49*	1.433E+00	8.612E-01	8.612E-01	30.24	OK
	1120.29	14.92	8.738E-01	1.793E+00	1.793E+00	33.81	OK
	1764.49	15.30	5.813E-01	-----	Line Not Found	-----	Absent
U-235	89.96	3.47	5.369E+00	1.098E+00	1.098E+00	135.57	OK
	93.35	5.60	5.346E+00	2.030E+00	2.030E+00	46.83	OK
	143.76	10.96*	4.610E+00	4.384E-01	4.384E-01	97.11	OK
	163.33	5.08	4.273E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	3.905E+00	1.909E-01	1.909E-01	49.24	OK
	205.31	5.01	3.621E+00	-----	Line Not Found	-----	Absent
U-238	63.29	3.70*	5.591E+00	4.492E+00	4.492E+00	56.68	OK
	92.59	4.23	5.346E+00	2.688E+00	2.688E+00	46.83	OK
AM-243	43.53	5.90	5.049E+00	-----	Line Not Found	-----	Absent
	74.66	67.20*	5.476E+00	1.519E-01	1.519E-01	50.45	OK
ANH-511	511.00	100.00*	1.658E+00	1.120E-01	1.120E-01	94.85	OK

Flag: "*" = Keyline


```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235068.CNF;1
* Acquisition date   : 3-OCT-2016 06:05:07 Sensitivity      : 3.000
* Detector ID        : GAM31 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:06.51 Half life ratio : *****
* Sample date        : 11-DEC-2015 10:27:00 Analyst initials: MXR1
* Sample ID          : G405235068 Sample Quantity : 1.4091E+02 GRAM
* Batch Number       : 1596254 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 15-JUN-2016 06:54:07 Eff. Geometry : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM31_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.069E+01	1.723E+00	1.958E-01
CD-109	1.493E+00	2.067E+00	1.713E+00
SN-126	9.560E-02	1.324E-01	1.096E-01
BA-137M	1.016E-01	7.604E-02	8.583E-02
CS-137	1.073E-01	8.032E-02	9.067E-02
TL-208	3.334E-01	9.993E-02	7.921E-02
PB-210	1.523E+00	1.911E+00	1.254E+00
PB-212	8.924E-01	1.844E-01	1.300E-01
BI-214	8.615E-01	2.553E-01	1.601E-01
PB-214	1.077E+00	2.622E-01	1.575E-01
RN-222	8.615E-01	2.553E-01	1.601E-01
RA-226	8.615E-01	2.553E-01	1.601E-01
AC-228	5.983E-01	2.994E-01	4.099E-01
RA-228	5.983E-01	2.994E-01	4.099E-01
TH-228	8.924E-01	1.844E-01	1.300E-01
TH-229	-3.292E-01	5.827E-01	1.011E+00
TH-230	8.612E-01	2.552E-01	1.600E-01
TH-232	5.983E-01	2.994E-01	4.099E-01
TH-234	4.492E+00	2.495E+00	1.421E+00
U-234	8.612E-01	2.552E-01	1.600E-01
U-235	4.384E-01	4.172E-01	4.212E-01
U-238	4.492E+00	2.495E+00	1.421E+00
AM-243	1.519E-01	7.510E-02	7.344E-02
ANH-511	1.120E-01	1.041E-01	8.199E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	4.472E+00	1.606E+01	3.280E+01	NOT IDENT.
NA-22	1.986E-02	5.325E-02	1.227E-01	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	-2.300E-02	5.199E-02	1.013E-01	NOT IDENT.
SC-46	1.296E-01	4.540E-01	1.007E+00	FAIL ABUN
V-48	0.000E+00	1.731E+04	0.000E+00	SHORT HLIF

CR-51	0.000E+00	4.574E+02	0.000E+00	SHORT HLIF
MN-54	3.464E-02	8.857E-02	1.764E-01	NOT IDENT.
CO-56	-2.422E-01	5.957E-01	1.060E+00	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	2.620E-02	4.980E-02	1.001E-01	NOT IDENT.
CO-58	8.435E-02	8.493E-01	1.667E+00	NOT IDENT.
FE-59	-1.391E+00	1.012E+01	1.986E+01	NOT IDENT.
CO-60	-1.952E-02	6.536E-02	1.234E-01	NOT IDENT.
ZN-65	2.643E-01	1.996E-01	5.108E-01	NOT IDENT.
GE-68	1.726E+00	3.942E+00	8.369E+00	NOT IDENT.
AS-73	-1.626E+00	3.600E+00	6.757E+00	NOT IDENT.
AS-74	0.000E+00	6.846E+03	0.000E+00	SHORT HLIF
SE-75	-1.112E-02	2.482E-01	4.557E-01	NOT IDENT.
BR-77	0.000E+00	1.379E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	9.864E+02	0.000E+00	SHORT HLIF
RB-83	1.149E+00	1.487E+00	1.993E+00	FAIL ABUN
KR-85	1.320E+01	1.337E+01	2.325E+01	NOT IDENT.
SR-85	1.348E+00	1.369E+00	2.379E+00	NOT IDENT.
RB-86	0.000E+00	4.144E+04	0.000E+00	SHORT HLIF
Y-88	-1.357E-01	3.765E-01	7.483E-01	NOT IDENT.
Y-91	3.099E+01	8.319E+02	1.653E+03	NOT IDENT.
NB-94	-2.935E-03	5.579E-02	1.028E-01	NOT IDENT.
NB-95	2.340E-01	1.267E+00	2.272E+00	NOT IDENT.
NB-95M	-1.254E+00	3.164E+00	5.011E+00	NOT IDENT.
ZR-95	7.702E-01	1.988E+00	4.129E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.176E+32	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-4.569E-02	4.167E-02	7.096E-02	NOT IDENT.
RH-102	1.068E-01	1.467E-01	1.980E-01	FAIL ABUN
RU-103	3.633E+00	7.298E+00	1.547E+01	FAIL ABUN
RH-106	3.073E-01	7.155E-01	1.489E+00	NOT IDENT.
RU-106	3.073E-01	7.155E-01	1.489E+00	NOT IDENT.
AG-108M	5.132E-04	3.671E-02	7.318E-02	NOT IDENT.
AG-110M	-3.555E-02	1.357E-01	2.689E-01	NOT IDENT.
SN-113	-2.922E-01	2.722E-01	4.615E-01	NOT IDENT.
CD-115	0.000E+00	1.599E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	9.773E+04	0.000E+00	SHORT HLIF
TE-123M	9.658E-02	1.495E-01	3.000E-01	NOT IDENT.
SB-124	-8.631E-01	3.515E+00	6.777E+00	NOT IDENT.
SB-125	-4.405E-02	1.232E-01	2.350E-01	FAIL ABUN
TE-125M	8.862E+01	2.626E+02	5.215E+02	NOT IDENT.
I-126	0.000E+00	1.130E+06	0.000E+00	SHORT HLIF
SB-126	0.000E+00	2.173E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.975E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	4.617E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.994E+26	0.000E+00	SHORT HLIF
BA-133	-6.029E-03	5.625E-02	9.980E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	7.486E-02	6.960E-02	1.593E-01	NOT IDENT.
CS-135	-1.805E-01	2.255E-01	3.666E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	3.749E+05	0.000E+00	SHORT HLIF
CE-139	-6.925E-02	1.348E-01	2.385E-01	NOT IDENT.
BA-140	0.000E+00	1.453E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	5.563E+05	0.000E+00	SHORT HLIF
CE-141	3.398E+00	3.001E+01	5.182E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	-8.120E-02	4.275E-01	7.934E-01	NOT IDENT.
PM-144	1.596E-02	8.657E-02	1.700E-01	NOT IDENT.
PR-144	3.554E+00	7.147E+00	1.479E+01	NOT IDENT.
PM-146	1.583E-03	5.641E-02	1.128E-01	FAIL ABUN
ND-147	0.000E+00	3.638E+07	0.000E+00	SHORT HLIF
PM-147	5.748E+02	8.385E+02	1.718E+03	NOT IDENT.
PM-149	0.000E+00	2.235E+40	0.000E+00	SHORT HLIF
EU-150	3.462E-03	3.452E-02	6.337E-02	FAIL ABUN
EU-152	-9.092E-02	1.277E-01	2.204E-01	NOT IDENT.
GD-153	-1.268E-01	1.727E-01	2.838E-01	NOT IDENT.
EU-154	5.290E-02	1.320E-01	3.051E-01	NOT IDENT.
EU-155	6.667E-02	1.076E-01	2.185E-01	FAIL ABUN
TB-160	-1.441E+00	3.011E+00	4.846E+00	FAIL ABUN
HO-166M	-2.656E-02	9.723E-02	1.684E-01	NOT IDENT.
TM-171	-3.650E+00	8.279E+00	1.557E+01	NOT IDENT.
HF-172	1.495E-01	2.639E-01	5.260E-01	FAIL ABUN
LU-172	6.472E-03	1.243E-01	2.507E-01	FAIL ABUN
LU-176	-2.207E-02	2.811E-02	5.161E-02	FAIL ABUN

HF-181	-1.574E-01	6.308E+00	1.228E+01	NOT IDENT.
TA-182	-3.451E-01	1.191E+00	2.281E+00	FAIL ABUN
RE-183	1.749E+00	1.582E+00	3.254E+00	NOT IDENT.
RE-184	-1.444E+01	3.955E+01	7.653E+01	NOT IDENT.
W-188	1.201E+02	1.436E+02	2.909E+02	FAIL ABUN
IR-192	3.002E-01	5.801E-01	1.226E+00	FAIL ABUN
HG-203	-1.136E+00	3.446E+00	5.433E+00	NOT IDENT.
BI-207	-2.036E-02	3.990E-02	7.650E-02	FAIL ABUN
BI-211	0.000E+00	7.221E-01	1.104E+00	FAIL ABUN
PB-211	-3.059E-01	9.182E-01	1.742E+00	NOT IDENT.
BI-212	5.943E-01	7.658E-01	1.579E+00	NOT IDENT.
RN-219	7.448E-01	5.228E-01	1.196E+00	NOT IDENT.
RA-223	2.950E-01	8.190E-01	1.558E+00	FAIL ABUN
RA-224	0.000E+00	1.312E+00	1.923E+00	FAIL ABUN
AC-227	-1.052E-01	2.873E-01	5.016E-01	NOT IDENT.
TH-227	-1.052E-01	2.873E-01	5.016E-01	NOT IDENT.
PA-231	4.789E-01	5.909E-01	1.264E+00	NOT IDENT.
TH-231	2.950E-01	8.190E-01	1.558E+00	FAIL ABUN
PA-233	3.054E-02	8.027E-02	1.663E-01	NOT IDENT.
PA-234	4.288E-01	4.830E-01	8.629E-01	FAIL ABUN
PA-234M	4.103E+00	9.122E+00	1.297E+01	FAIL ABUN
NP-237	3.054E-02	8.027E-02	1.663E-01	NOT IDENT.
NP-238	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
NP-239	4.019E-01	5.354E-01	4.900E-01	FAIL ABUN
PU-239	9.966E+01	3.697E+02	7.145E+02	NOT IDENT.
AM-241	2.063E-03	8.357E-02	1.514E-01	NOT IDENT.
CM-243	-2.183E-02	1.001E-01	1.891E-01	FAIL ABUN
BK-247	2.102E-02	8.871E-02	1.692E-01	FAIL ABUN
CM-247	2.711E-02	5.036E-02	1.050E-01	FAIL ABUN
CF-249	3.777E-02	4.634E-02	1.021E-01	NOT IDENT.
CF-251	1.857E-01	1.365E-01	2.907E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	149	10.66*	6.944E-01	1.069E+01	1.069E+01	16.44
CD-109	88.03	78	3.70*	5.391E+00	2.070E+00	3.234E+00	63.31
SN-126	64.28	174	9.60	5.591E+00	1.731E+00	1.731E+00	56.68
	86.94	78	8.90	5.391E+00	8.607E-01	8.607E-01	63.31
	87.57	78	37.00*	5.391E+00	2.070E-01	2.070E-01	63.31
BA-137M	661.66	23	89.90*	1.340E+00	9.971E-02	1.016E-01	76.37
CS-137	661.66	23	85.10*	1.340E+00	1.053E-01	1.073E-01	76.37
TL-208	277.37	17	6.60	2.813E+00	4.776E-01	4.776E-01	172.42
	583.19	79	85.00*	1.486E+00	3.334E-01	3.334E-01	30.59
	860.56	-----	12.50	1.084E+00	-----	Line Not Found	-----
PB-210	46.54	65	4.25*	5.485E+00	1.485E+00	1.523E+00	128.02
BI-211	72.87	-----	1.23	5.491E+00	-----	Line Not Found	-----
	351.06	164	12.92*	2.286E+00	2.967E+00	2.967E+00	24.83
PB-212	74.82	177	10.28	5.476E+00	1.675E+00	1.675E+00	27.44
	77.11	298	17.10	5.460E+00	1.698E+00	1.698E+00	21.86
	238.63	234	43.60*	3.203E+00	8.924E-01	8.924E-01	21.09
	300.09	-----	3.30	2.629E+00	-----	Line Not Found	-----
BI-214	609.32	105	45.49*	1.433E+00	8.612E-01	8.615E-01	30.24
	1120.29	44	14.92	8.738E-01	1.793E+00	1.794E+00	33.81
	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----
PB-214	74.82	177	5.80	5.476E+00	2.969E+00	2.970E+00	27.44
	77.11	298	9.70	5.460E+00	2.994E+00	2.995E+00	21.86
	87.09	78	3.41	5.391E+00	2.247E+00	2.247E+00	63.31
	242.00	48	7.25	3.165E+00	1.106E+00	1.106E+00	68.50
	295.22	114	18.42	2.666E+00	1.238E+00	1.238E+00	32.25
	351.93	164	35.60*	2.286E+00	1.077E+00	1.077E+00	24.83
RN-222	609.32	105	45.49*	1.433E+00	8.612E-01	8.615E-01	30.24
	1120.29	44	14.92	8.738E-01	1.793E+00	1.794E+00	33.81
	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----
RA-224	240.99	48	4.10*	3.165E+00	1.955E+00	1.955E+00	68.50
RA-226	609.32	105	45.49*	1.433E+00	8.612E-01	8.615E-01	30.24
	1120.29	44	14.92	8.738E-01	1.793E+00	1.794E+00	33.81
	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----
AC-228	105.21	-----	1.10	5.215E+00	-----	Line Not Found	-----
	338.32	48	11.27	2.364E+00	9.611E-01	9.611E-01	67.21
	794.95	-----	4.25	1.156E+00	-----	Line Not Found	-----
	835.71	8	1.61	1.109E+00	2.330E+00	2.330E+00	153.03
	911.20	30	25.80*	1.035E+00	5.983E-01	5.983E-01	51.06
	968.97	35	15.80	9.841E-01	1.211E+00	1.211E+00	47.47
RA-228	105.21	-----	1.10	5.215E+00	-----	Line Not Found	-----
	338.32	48	11.27	2.364E+00	9.611E-01	9.611E-01	67.21
	794.95	-----	4.25	1.156E+00	-----	Line Not Found	-----
	835.71	8	1.61	1.109E+00	2.330E+00	2.330E+00	153.03
	911.20	30	25.80*	1.035E+00	5.983E-01	5.983E-01	51.06
	968.97	35	15.80	9.841E-01	1.211E+00	1.211E+00	47.47
TH-228	74.82	177	10.28	5.476E+00	1.675E+00	1.675E+00	27.44
	77.11	298	17.10	5.460E+00	1.698E+00	1.698E+00	21.86

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	238.63	234	43.60*	3.203E+00	8.924E-01	8.924E-01	21.09
	300.09	-----	3.30	2.629E+00	-----	Line Not Found	-----
TH-229	85.43	24	14.70	5.413E+00	1.601E-01	1.602E-01	217.11
	88.47	78	24.00	5.391E+00	3.192E-01	3.192E-01	63.31
	193.51	-----	4.41*	3.791E+00	-----	Line Not Found	-----
	210.85	39	2.80	3.560E+00	2.065E+00	2.065E+00	84.64
TH-230	609.32	105	45.49*	1.433E+00	8.612E-01	8.612E-01	30.24
	1120.29	44	14.92	8.738E-01	1.793E+00	1.793E+00	33.81
	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----
TH-232	105.21	-----	1.10	5.215E+00	-----	Line Not Found	-----
	338.32	48	11.27	2.364E+00	9.611E-01	9.611E-01	67.21
	835.71	8	1.61	1.109E+00	2.330E+00	2.330E+00	153.03
	911.20	30	25.80*	1.035E+00	5.983E-01	5.983E-01	51.06
TH-234	968.97	35	15.80	9.841E-01	1.211E+00	1.211E+00	47.47
	63.29	174	3.70*	5.591E+00	4.492E+00	4.492E+00	56.68
	92.59	114	4.23	5.346E+00	2.688E+00	2.688E+00	46.83
U-234	609.32	105	45.49*	1.433E+00	8.612E-01	8.612E-01	30.24
	1120.29	44	14.92	8.738E-01	1.793E+00	1.793E+00	33.81
	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----
U-235	89.96	38	3.47	5.369E+00	1.098E+00	1.098E+00	135.57
	93.35	114	5.60	5.346E+00	2.030E+00	2.030E+00	46.83
	143.76	42	10.96*	4.610E+00	4.384E-01	4.384E-01	97.11
	163.33	-----	5.08	4.273E+00	-----	Line Not Found	-----
	185.72	80	57.20	3.905E+00	1.909E-01	1.909E-01	49.24
	205.31	-----	5.01	3.621E+00	-----	Line Not Found	-----
U-238	63.29	174	3.70*	5.591E+00	4.492E+00	4.492E+00	56.68
	92.59	114	4.23	5.346E+00	2.688E+00	2.688E+00	46.83
AM-243	43.53	-----	5.90	5.049E+00	-----	Line Not Found	-----
	74.66	177	67.20*	5.476E+00	2.563E-01	2.563E-01	27.44
ANH-511	511.00	35	100.00*	1.658E+00	1.120E-01	1.120E-01	94.85

Flag: "*" = Keyline

Total number of lines in spectrum 44
 Number of unidentified lines 6
 Number of lines tentatively identified by NID 38 86.36%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.069E+01	1.069E+01	0.176E+01	16.44	
CD-109	461.40D	1.56	2.070E+00	3.234E+00	2.047E+00	63.31	
SN-126	2.30E+05Y	1.00	2.070E-01	2.070E-01	1.311E-01	63.31	
BA-137M	30.08Y	1.02	9.971E-02	1.016E-01	0.776E-01	76.37	
CS-137	30.08Y	1.02	1.053E-01	1.073E-01	0.820E-01	76.37	
TL-208	1.41E+10Y	1.00	3.334E-01	3.334E-01	1.020E-01	30.59	
PB-210	22.20Y	1.03	1.485E+00	1.523E+00	1.950E+00	128.02	
BI-211	7.04E+08Y	1.00	2.967E+00	2.967E+00	0.737E+00	24.83	
PB-212	1.41E+10Y	1.00	8.924E-01	8.924E-01	1.882E-01	21.09	
BI-214	1600.00Y	1.00	8.612E-01	8.615E-01	2.605E-01	30.24	
PB-214	1600.00Y	1.00	1.077E+00	1.077E+00	0.268E+00	24.83	
RN-222	1600.00Y	1.00	8.612E-01	8.615E-01	2.605E-01	30.24	
RA-224	1.41E+10Y	1.00	1.955E+00	1.955E+00	1.339E+00	68.50	
RA-226	1600.00Y	1.00	8.612E-01	8.615E-01	2.605E-01	30.24	
AC-228	1.41E+10Y	1.00	5.983E-01	5.983E-01	3.055E-01	51.06	
RA-228	1.41E+10Y	1.00	5.983E-01	5.983E-01	3.055E-01	51.06	
TH-228	1.41E+10Y	1.00	8.924E-01	8.924E-01	1.882E-01	21.09	
TH-229	7340.00Y	1.00	3.192E-01	3.192E-01	2.021E-01	63.31	K
TH-230	7.54E+04Y	1.00	8.612E-01	8.612E-01	2.604E-01	30.24	
TH-232	1.41E+10Y	1.00	5.983E-01	5.983E-01	3.055E-01	51.06	
TH-234	4.47E+09Y	1.00	4.492E+00	4.492E+00	2.546E+00	56.68	
U-234	2.45E+05Y	1.00	8.612E-01	8.612E-01	2.604E-01	30.24	
U-235	7.04E+08Y	1.00	4.384E-01	4.384E-01	4.257E-01	97.11	
U-238	4.47E+09Y	1.00	4.492E+00	4.492E+00	2.546E+00	56.68	
AM-243	7370.00Y	1.00	2.563E-01	2.563E-01	0.703E-01	27.44	
ANH-511	1.00E+09Y	1.00	1.120E-01	1.120E-01	1.062E-01	94.85	
Total Activity :			3.899E+01	4.019E+01			

Grand Total Activity : 3.899E+01 4.019E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	115.24	30	108	0.60	230.03	226	8	7.14E-03	****	5.08E+00	T
4	187.50	28	64	1.65	374.45	366	14	6.76E-03	****	3.88E+00	
0	329.09	18	37	0.77	657.42	652	8	4.56E-03	****	2.42E+00	T
0	463.26	24	15	0.71	925.57	922	8	6.20E-03	71.7	1.80E+00	T
0	519.95	15	21	1.44	1038.87	1031	10	3.86E-03	****	1.64E+00	T
0	552.89	19	11	2.11	1104.71	1101	8	4.96E-03	80.8	1.55E+00	T
0	632.56	13	18	1.69	1263.95	1257	11	3.61E-03	****	1.39E+00	T
0	719.56	22	11	2.39	1437.84	1433	13	5.99E-03	74.1	1.25E+00	T
0	729.51	25	20	4.46	1457.73	1448	16	6.85E-03	90.4	1.24E+00	
0	769.36	17	11	3.26	1537.38	1532	11	4.54E-03	****	1.19E+00	
0	803.84	9	5	1.40	1606.30	1602	7	2.34E-03	****	1.15E+00	
0	840.72	13	1	1.48	1680.01	1677	7	3.50E-03	65.5	1.10E+00	
0	875.20	13	5	1.52	1748.92	1744	10	3.61E-03	85.0	1.07E+00	T
0	946.61	10	6	0.95	1891.67	1886	9	2.70E-03	****	1.00E+00	T
0	1002.44	6	10	2.92	2003.25	1993	13	1.73E-03	****	9.58E-01	T
0	1157.48	8	15	1.52	2313.16	2306	12	2.17E-03	****	8.50E-01	
0	1231.79	6	5	1.47	2461.70	2458	7	1.72E-03	****	8.07E-01	T
0	1238.29	10	15	1.44	2474.70	2468	12	2.76E-03	****	8.03E-01	T

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
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DETECTOR AND SAMPLE DATA

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* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235068.CNF;1
* Acquisition date   : 3-OCT-2016 06:05:07 Sensitivity      : 3.000
* Detector ID        : GAM31 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:06.51 Half life ratio  : *****
* Sample date        : 11-DEC-2015 10:27:00 Nuclide Library : SOLID
* Sample ID          : G405235068 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity : 1.4091E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight       : 0.00000
*****
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CALIBRATION INFORMATION

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* Eff. Cal. date    : 15-JUN-2016 06:54:07 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM31_CAN.CNF;7
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	0.000E+00
CD-109	7.970E-01
SN-126	5.097E-02
BA-137M	3.670E-02
CS-137	3.877E-02
TL-208	3.378E-02
PB-210	5.933E-01
PB-212	5.966E-02
BI-214	6.876E-02
PB-214	6.960E-02
RN-222	6.876E-02
RA-226	6.876E-02
AC-228	1.777E-01
RA-228	1.777E-01
TH-228	5.966E-02
TH-229	4.606E-01
TH-230	6.874E-02
TH-232	1.777E-01
TH-234	6.735E-01
U-234	6.874E-02
U-235	1.957E-01
U-238	6.735E-01
AM-243	3.465E-02
ANH-511	3.655E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.448E+01	NOT IDENT.
NA-22	4.986E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	3.792E-02	NOT IDENT.
SC-46	4.227E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF

MN-54	7.550E-02	NOT IDENT.
CO-56	4.341E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	4.627E-02	NOT IDENT.
CO-58	7.156E-01	NOT IDENT.
FE-59	8.454E+00	NOT IDENT.
CO-60	5.098E-02	NOT IDENT.
ZN-65	2.174E-01	NOT IDENT.
GE-68	3.650E+00	NOT IDENT.
AS-73	3.209E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	2.037E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	8.875E-01	FAIL ABUN
KR-85	1.054E+01	NOT IDENT.
SR-85	1.078E+00	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	2.847E-01	NOT IDENT.
Y-91	7.125E+02	NOT IDENT.
NB-94	4.567E-02	NOT IDENT.
NB-95	9.828E-01	NOT IDENT.
NB-95M	2.274E+00	NOT IDENT.
ZR-95	1.786E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.278E-02	NOT IDENT.
RH-102	8.806E-02	FAIL ABUN
RU-103	6.833E+00	FAIL ABUN
RH-106	6.534E-01	NOT IDENT.
RU-106	6.534E-01	NOT IDENT.
AG-108M	3.229E-02	NOT IDENT.
AG-110M	1.128E-01	NOT IDENT.
SN-113	1.979E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.384E-01	NOT IDENT.
SB-124	2.625E+00	NOT IDENT.
SB-125	1.017E-01	FAIL ABUN
TE-125M	2.411E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.432E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	6.991E-02	NOT IDENT.
CS-135	1.672E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	1.093E-01	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	2.400E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.674E-01	NOT IDENT.
PM-144	7.488E-02	NOT IDENT.
PR-144	6.520E+00	NOT IDENT.
PM-146	4.953E-02	FAIL ABUN
ND-147	0.000E+00	SHORT HLIF
PM-147	7.928E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.840E-02	FAIL ABUN
EU-152	9.771E-02	NOT IDENT.
GD-153	1.303E-01	NOT IDENT.
EU-154	1.243E-01	NOT IDENT.
EU-155	1.015E-01	FAIL ABUN
TB-160	2.031E+00	FAIL ABUN
HO-166M	7.349E-02	NOT IDENT.
TM-171	7.400E+00	NOT IDENT.
HF-172	2.446E-01	FAIL ABUN
LU-172	1.079E-01	FAIL ABUN
LU-176	2.271E-02	FAIL ABUN
HF-181	5.463E+00	NOT IDENT.

TA-182	9.409E-01	FAIL ABUN
RE-183	1.552E+00	NOT IDENT.
RE-184	3.212E+01	NOT IDENT.
W-188	1.324E+02	FAIL ABUN
IR-192	5.546E-01	FAIL ABUN
HG-203	2.446E+00	NOT IDENT.
BI-207	2.736E-02	FAIL ABUN
BI-211	5.269E-01	FAIL ABUN
PB-211	7.739E-01	NOT IDENT.
BI-212	7.013E-01	NOT IDENT.
RN-219	5.431E-01	NOT IDENT.
RA-223	7.029E-01	FAIL ABUN
RA-224	9.044E-01	FAIL ABUN
AC-227	2.247E-01	NOT IDENT.
TH-227	2.247E-01	NOT IDENT.
PA-231	5.791E-01	NOT IDENT.
TH-231	7.029E-01	FAIL ABUN
PA-233	7.553E-02	NOT IDENT.
PA-234	3.710E-01	FAIL ABUN
PA-234M	5.579E+00	FAIL ABUN
NP-237	7.553E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	2.261E-01	FAIL ABUN
PU-239	3.326E+02	NOT IDENT.
AM-241	7.193E-02	NOT IDENT.
CM-243	8.745E-02	FAIL ABUN
BK-247	7.611E-02	FAIL ABUN
CM-247	4.746E-02	FAIL ABUN
CF-249	4.569E-02	NOT IDENT.
CF-251	1.346E-01	NOT IDENT.

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235068.CNF;1
* Acquisition date   : 3-OCT-2016 06:05:07 Sensitivity      : 3.000
* Detector ID        : GAM31 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:06.51 Half life ratio  : *****
* Sample date        : 11-DEC-2015 10:27:00 Nuclide Library : SOLID
* Sample ID          : G405235068 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity : 1.4091E+02 GRAM
*                   : Quantity Err(%) : 1.4194E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 15-JUN-2016 06:54:07 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM31_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.069E+01	1.811E+00	1.811E+00
CD-109	1.494E+00	2.082E+00	2.082E+00
SN-126	9.563E-02	1.332E-01	1.332E-01
BA-137M	1.016E-01	7.616E-02	7.616E-02
CS-137	1.073E-01	8.046E-02	8.046E-02
TL-208	3.334E-01	1.009E-01	1.009E-01
PB-210	1.523E+00	1.915E+00	1.915E+00
PB-212	8.924E-01	1.904E-01	1.904E-01
BI-214	8.615E-01	2.580E-01	2.580E-01
PB-214	1.077E+00	2.660E-01	2.660E-01
RN-222	8.615E-01	2.580E-01	2.580E-01
RA-226	8.615E-01	2.580E-01	2.580E-01
AC-228	5.983E-01	3.010E-01	3.010E-01
RA-228	5.983E-01	3.010E-01	3.010E-01
TH-228	8.924E-01	1.904E-01	1.904E-01
TH-229	-3.292E-01	5.829E-01	5.829E-01
TH-230	8.612E-01	2.579E-01	2.579E-01
TH-232	5.983E-01	3.010E-01	3.010E-01
TH-234	4.492E+00	2.686E+00	2.686E+00
U-234	8.612E-01	2.579E-01	2.579E-01
U-235	4.384E-01	4.178E-01	4.178E-01
U-238	4.492E+00	2.686E+00	2.686E+00
AM-243	1.519E-01	7.678E-02	7.678E-02
ANH-511	1.120E-01	1.042E-01	1.042E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	4.472E+00	1.606E+01	1.619E+01	NOT IDENT.
NA-22	1.986E-02	5.325E-02	5.400E-02	NOT IDENT.
NA-24	-1.000E+41	9.957E+41	0.000E+00	SHORT HLIF
AL-26	-2.300E-02	5.202E-02	5.304E-02	NOT IDENT.
SC-46	1.296E-01	4.540E-01	4.577E-01	FAIL ABUN
V-48	9.762E+03	1.731E+04	1.787E+04	SHORT HLIF

CR-51	-2.614E+02	4.575E+02	4.725E+02	SHORT HLIF
MN-54	3.464E-02	8.859E-02	8.995E-02	NOT IDENT.
CO-56	-2.422E-01	5.958E-01	6.057E-01	FAIL ABUN
MN-56	-1.000E+41	2.461E+41	0.000E+00	SHORT HLIF
CO-57	2.620E-02	4.981E-02	5.119E-02	NOT IDENT.
CO-58	8.435E-02	8.493E-01	8.502E-01	NOT IDENT.
FE-59	-1.391E+00	1.012E+01	1.014E+01	NOT IDENT.
CO-60	-1.952E-02	6.536E-02	6.595E-02	NOT IDENT.
ZN-65	2.643E-01	1.998E-01	2.327E-01	NOT IDENT.
GE-68	1.726E+00	3.943E+00	4.019E+00	NOT IDENT.
AS-73	-1.626E+00	3.615E+00	3.689E+00	NOT IDENT.
AS-74	5.962E+03	6.864E+03	7.371E+03	SHORT HLIF
SE-75	-1.112E-02	2.482E-01	2.482E-01	NOT IDENT.
BR-77	6.672E+37	5.718E+38	0.000E+00	SHORT HLIF
SR-82	-1.086E+03	9.878E+02	1.102E+03	SHORT HLIF
RB-83	1.149E+00	1.495E+00	1.582E+00	FAIL ABUN
KR-85	1.320E+01	1.339E+01	1.465E+01	NOT IDENT.
SR-85	1.348E+00	1.370E+00	1.499E+00	NOT IDENT.
RB-86	1.194E+04	4.144E+04	4.179E+04	SHORT HLIF
Y-88	-1.357E-01	3.766E-01	3.815E-01	NOT IDENT.
Y-91	3.099E+01	8.319E+02	8.320E+02	NOT IDENT.
NB-94	-2.935E-03	5.579E-02	5.581E-02	NOT IDENT.
NB-95	2.340E-01	1.267E+00	1.271E+00	NOT IDENT.
NB-95M	-1.254E+00	3.166E+00	3.216E+00	NOT IDENT.
ZR-95	7.702E-01	1.988E+00	2.018E+00	NOT IDENT.
NB-97	1.000E+41	5.111E+41	0.000E+00	SHORT HLIF
ZR-97	-1.000E+41	1.889E+42	0.000E+00	SHORT HLIF
MO-99	-9.004E+31	1.178E+32	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	3.359E+41	0.000E+00	SHORT HLIF
RH-101	-4.569E-02	4.248E-02	4.721E-02	NOT IDENT.
RH-102	1.068E-01	1.469E-01	1.546E-01	FAIL ABUN
RU-103	3.633E+00	7.300E+00	7.482E+00	FAIL ABUN
RH-106	3.073E-01	7.158E-01	7.291E-01	NOT IDENT.
RU-106	3.073E-01	7.158E-01	7.291E-01	NOT IDENT.
AG-108M	5.132E-04	3.671E-02	3.671E-02	NOT IDENT.
AG-110M	-3.555E-02	1.357E-01	1.366E-01	NOT IDENT.
SN-113	-2.922E-01	2.724E-01	3.026E-01	NOT IDENT.
CD-115	-1.152E+38	1.599E+39	0.000E+00	SHORT HLIF
SN-117M	1.887E+04	9.776E+04	9.813E+04	SHORT HLIF
TE-123M	9.658E-02	1.496E-01	1.558E-01	NOT IDENT.
SB-124	-8.631E-01	3.515E+00	3.537E+00	NOT IDENT.
SB-125	-4.405E-02	1.232E-01	1.248E-01	FAIL ABUN
TE-125M	8.862E+01	2.626E+02	2.657E+02	NOT IDENT.
I-126	1.288E+06	1.144E+06	1.283E+06	SHORT HLIF
SB-126	2.993E+06	2.243E+06	2.618E+06	SHORT HLIF
SB-127	3.589E+21	2.034E+22	0.000E+00	SHORT HLIF
I-131	1.256E+09	4.617E+09	4.651E+09	SHORT HLIF
I-132	1.000E+41	1.870E+42	0.000E+00	SHORT HLIF
TE-132	2.186E+26	3.120E+26	0.000E+00	SHORT HLIF
BA-133	-6.029E-03	5.625E-02	5.632E-02	FAIL ABUN
I-133	-1.000E+41	1.262E+42	0.000E+00	SHORT HLIF
CS-134	7.486E-02	6.968E-02	7.742E-02	NOT IDENT.
CS-135	-1.805E-01	2.258E-01	2.400E-01	NOT IDENT.
I-135	1.000E+41	7.283E+41	0.000E+00	SHORT HLIF
CS-136	-4.616E+05	3.782E+05	4.317E+05	SHORT HLIF
CE-139	-6.925E-02	1.355E-01	1.391E-01	NOT IDENT.
BA-140	-2.903E+05	1.453E+06	1.459E+06	SHORT HLIF
LA-140	3.038E+05	5.565E+05	5.731E+05	SHORT HLIF
CE-141	3.398E+00	3.001E+01	3.005E+01	NOT IDENT.
CE-143	1.000E+41	2.112E+41	0.000E+00	SHORT HLIF
CE-144	-8.120E-02	4.275E-01	4.291E-01	NOT IDENT.
PM-144	1.596E-02	8.658E-02	8.688E-02	NOT IDENT.
PR-144	3.554E+00	7.149E+00	7.326E+00	NOT IDENT.
PM-146	1.583E-03	5.641E-02	5.641E-02	FAIL ABUN
ND-147	8.682E+06	3.638E+07	3.659E+07	SHORT HLIF
PM-147	5.748E+02	8.389E+02	8.780E+02	NOT IDENT.
PM-149	-3.291E+39	2.236E+40	0.000E+00	SHORT HLIF
EU-150	3.462E-03	3.452E-02	3.456E-02	FAIL ABUN
EU-152	-9.092E-02	1.278E-01	1.342E-01	NOT IDENT.
GD-153	-1.268E-01	1.728E-01	1.821E-01	NOT IDENT.
EU-154	5.290E-02	1.320E-01	1.341E-01	NOT IDENT.
EU-155	6.667E-02	1.077E-01	1.118E-01	FAIL ABUN
TB-160	-1.441E+00	3.013E+00	3.082E+00	FAIL ABUN
HO-166M	-2.656E-02	9.724E-02	9.797E-02	NOT IDENT.
TM-171	-3.650E+00	8.285E+00	8.447E+00	NOT IDENT.
HF-172	1.495E-01	2.651E-01	2.735E-01	FAIL ABUN
LU-172	6.472E-03	1.243E-01	1.244E-01	FAIL ABUN
LU-176	-2.207E-02	2.813E-02	2.984E-02	FAIL ABUN

HF-181	-1.574E-01	6.308E+00	6.308E+00	NOT IDENT.
TA-182	-3.451E-01	1.191E+00	1.201E+00	FAIL ABUN
RE-183	1.749E+00	1.605E+00	1.788E+00	NOT IDENT.
RE-184	-1.444E+01	3.969E+01	4.023E+01	NOT IDENT.
W-188	1.201E+02	1.442E+02	1.541E+02	FAIL ABUN
IR-192	3.002E-01	5.803E-01	5.958E-01	FAIL ABUN
HG-203	-1.136E+00	3.446E+00	3.484E+00	NOT IDENT.
BI-207	-2.036E-02	3.991E-02	4.095E-02	FAIL ABUN
BI-211	2.967E+00	7.342E-01	1.526E+00	FAIL ABUN
PB-211	-3.059E-01	9.183E-01	9.286E-01	NOT IDENT.
BI-212	5.943E-01	7.664E-01	8.119E-01	NOT IDENT.
RN-219	7.448E-01	5.311E-01	6.283E-01	NOT IDENT.
RA-223	2.950E-01	8.192E-01	8.300E-01	FAIL ABUN
RA-224	1.955E+00	1.316E+00	1.584E+00	FAIL ABUN
AC-227	-1.052E-01	2.877E-01	2.916E-01	NOT IDENT.
TH-227	-1.052E-01	2.877E-01	2.916E-01	NOT IDENT.
PA-231	4.789E-01	5.997E-01	6.374E-01	NOT IDENT.
TH-231	2.950E-01	8.192E-01	8.300E-01	FAIL ABUN
PA-233	3.054E-02	8.029E-02	8.146E-02	NOT IDENT.
PA-234	4.288E-01	6.884E-01	7.150E-01	FAIL ABUN
PA-234M	4.103E+00	9.124E+00	9.309E+00	FAIL ABUN
NP-237	3.054E-02	8.029E-02	8.146E-02	NOT IDENT.
NP-238	1.000E+41	2.463E+41	0.000E+00	SHORT HLIF
NP-239	4.019E-01	5.364E-01	5.662E-01	FAIL ABUN
PU-239	9.966E+01	3.697E+02	3.724E+02	NOT IDENT.
AM-241	2.063E-03	8.357E-02	8.357E-02	NOT IDENT.
CM-243	-2.183E-02	1.001E-01	1.006E-01	FAIL ABUN
BK-247	2.102E-02	8.881E-02	8.931E-02	FAIL ABUN
CM-247	2.711E-02	5.056E-02	5.202E-02	FAIL ABUN
CF-249	3.777E-02	4.644E-02	4.946E-02	NOT IDENT.
CF-251	1.857E-01	1.381E-01	1.615E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	89.4408	87.09	59.3402	136.47	49.3451
45.60	101.7740	87.57	59.4031	140.51	0.0000
46.54	102.0990	88.03	59.4632	143.76	57.3511
49.72	0.0000	88.34	59.5039	144.24	57.3940
51.35	127.2471	88.47	59.5204	145.44	46.8521
51.87	130.0749	89.96	59.7139	152.43	45.1973
52.39	127.6637	1093.63	59.8014	153.25	0.0000
52.97	118.2579	91.11	0.0000	323.87	47.4744
53.44	123.6934	92.59	60.0507	156.02	0.0000
54.07	117.7796	93.35	60.1472	158.56	0.0000
57.36	0.0000	94.56	53.1677	159.00	35.8551
57.53	122.5588	94.65	53.1777	162.33	56.7687
57.98	110.2696	94.67	53.1798	162.66	0.0000
59.27	123.7735	94.87	53.2023	163.33	36.0776
59.32	123.7909	97.43	57.3973	165.86	50.4690
59.54	119.1050	98.43	51.9592	176.31	50.0819
60.96	109.4218	98.44	51.9600	176.60	0.0000
61.17	109.4865	99.53	53.0574	177.52	27.8679
62.93	110.0245	100.11	47.2170	181.07	0.0000
63.29	110.1341	102.03	59.2474	181.52	34.3657
63.58	110.2216	103.18	55.4232	184.41	33.7450
64.28	110.4324	103.37	55.4442	143.76	33.8022
66.73	112.9843	105.21	44.7133	193.51	45.5164
67.24	105.8374	105.31	44.7219	197.03	54.8584
125.81	116.9219	106.12	45.7873	198.01	37.7605
67.75	116.9424	106.47	44.8222	201.83	52.8815
69.67	103.7563	109.28	44.0611	203.43	42.6170
70.83	120.3337	111.00	48.2219	205.31	51.9482
72.81	95.0218	111.76	0.0000	210.85	43.3809
72.87	95.0359	114.06	52.5368	215.65	32.7177
74.66	92.9794	116.30	0.0000	222.11	42.3759
74.82	93.0153	116.74	44.6707	227.09	40.2448
74.97	93.0496	119.76	53.0779	227.38	36.7051
77.11	93.5341	121.12	35.8112	228.16	0.0000
78.74	93.8988	121.22	35.8174	228.18	39.1079
79.69	52.7017	121.78	35.8526	116.74	39.1079
80.12	65.9433	122.06	39.9694	235.69	39.8275
80.19	0.0000	122.92	40.0295	235.96	35.0585
80.57	66.0127	123.07	54.4132	238.63	41.5512
81.00	79.2947	265.00	65.7759	238.98	0.0000
81.07	79.3076	125.81	47.4494	240.99	67.2896
81.75	66.1938	127.23	73.4140	242.00	35.2845
83.79	58.9031	127.91	57.9709	244.70	32.1680
84.00	58.9315	129.30	54.9935	252.40	0.0000
85.43	59.1217	131.20	55.1674	252.80	32.8440
86.55	59.2692	133.02	50.1130	254.15	0.0000
86.79	59.3005	133.52	56.4233	256.23	30.5172
86.94	59.3208	136.00	51.4060	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	24.6204	355.39	0.0000	584.27	11.3160
264.80	24.6234	356.01	22.6725	595.83	0.0000
265.00	23.3969	364.49	0.0000	427.87	13.4882
268.22	51.8835	366.42	0.0000	602.52	0.0000
269.46	33.3940	372.51	26.1143	604.72	14.0367
270.03	19.7998	375.05	29.7733	607.14	12.4927
271.23	28.4952	377.52	24.4056	609.32	12.5068
273.65	0.0000	356.01	20.8877	610.33	12.5132
276.40	33.6173	388.16	14.5768	614.28	12.5386
277.37	33.2332	388.63	0.0000	618.01	20.9367
277.60	33.2406	391.69	24.6621	620.36	15.7214
278.00	29.9282	264.66	26.6612	621.93	12.5869
279.20	33.2910	401.81	13.8016	630.19	0.0000
279.54	28.3064	402.40	22.0918	631.29	11.5922
279.70	28.3105	404.85	25.8188	633.25	7.9114
280.46	46.6632	410.95	16.6692	634.78	0.0000
283.69	26.7454	413.71	23.1964	635.95	9.5065
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	31.8112	423.72	0.0000	645.85	20.1674
285.90	0.0000	427.09	17.7924	657.76	9.6083
287.50	36.9057	427.87	17.8021	657.90	0.0000
290.67	21.4513	433.94	18.8159	661.66	11.7654
293.27	0.0000	439.40	10.3866	664.57	0.0000
351.93	21.9629	453.88	17.1584	666.33	0.0000
295.96	21.9777	463.37	22.0590	666.50	0.0000
879.38	30.5024	468.07	21.9326	667.71	0.0000
299.98	28.5045	473.00	0.0000	677.62	19.3982
300.09	28.5072	475.06	15.4590	685.70	0.0000
300.13	28.5086	476.78	18.3773	695.00	0.0000
301.36	27.1810	477.60	14.5157	696.49	16.3074
302.85	39.1241	482.18	22.3210	696.51	13.0459
256.23	24.7015	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	16.3135
306.78	28.1653	497.08	13.7106	697.49	16.3147
308.46	23.0784	505.52	19.1937	702.65	20.7140
311.90	27.4342	507.63	0.0000	706.68	22.9371
316.51	23.2399	511.00	22.7122	711.68	17.5150
319.41	0.0000	514.00	14.8389	720.70	0.0000
320.08	0.0000	514.00	14.8389	721.93	0.0000
321.04	24.1947	520.40	14.8944	722.78	13.2017
323.87	23.3866	520.69	0.0000	722.91	13.2026
325.23	28.6158	522.65	0.0000	723.31	13.2051
328.76	0.0000	527.90	0.0000	724.19	13.2100
333.37	20.9536	528.26	13.9647	727.33	11.9057
333.97	23.5844	529.59	16.9696	733.00	9.9463
334.37	24.9027	529.87	0.0000	735.93	7.7460
338.28	28.0508	531.02	0.0000	333.97	11.0730
338.32	28.0514	537.26	0.0000	739.50	0.0000
311.90	25.0274	546.56	0.0000	747.24	16.6803
340.48	25.0274	552.55	18.2021	748.06	13.3491
340.55	0.0000	563.25	19.3263	752.31	15.6025
344.28	30.6539	569.33	21.4315	753.82	0.0000
345.93	15.8767	946.00	21.4332	756.73	10.0492
351.06	19.4841	569.70	21.4358	756.80	7.8163
351.93	19.4975	583.19	11.3097	884.68	11.7604

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	11.7698	1274.44	8.8081	1620.50	5.4456
766.42	13.4546	1001.03	9.1898	1621.92	3.2684
766.84	13.4570	1002.74	10.2987	1678.03	0.0000
772.60	0.0000	1004.73	7.3611	1690.97	5.5310
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	1.1237
778.90	10.1440	1028.54	0.0000	1063.66	9.0000
783.70	0.0000	1037.84	12.0947	1771.35	3.6010
785.37	18.0827	1038.76	0.0000	1791.20	0.0000
792.07	21.5327	631.29	13.9957	1808.65	5.4431
794.95	10.2118	1048.07	0.0000	1810.72	0.0000
795.86	6.8105	1049.04	12.1391	1836.06	5.4735
810.06	10.2751	1050.41	7.4736		
810.29	13.7012	1063.66	4.6912		
344.28	13.7021	1077.00	0.0000		
810.76	11.4201	1077.34	11.3086		
815.77	0.0000	1085.87	11.3394		
1048.07	0.0000	1093.63	12.3145		
832.01	8.6380	1099.45	12.3367		
834.85	5.1887	1112.07	10.4797		
835.71	6.9207	1112.84	9.5294		
836.80	0.0000	1115.54	1.5260		
846.75	0.0000	1120.29	9.5514		
846.77	10.4260	1120.55	9.5526		
856.80	0.0000	1221.41	9.5544		
860.56	12.8114	1129.67	10.5374		
871.09	11.2262	1131.51	0.0000		
873.19	9.8308	1147.95	0.0000		
875.33	0.0000	1173.23	10.6764		
879.38	14.0767	1177.95	10.6912		
880.51	10.5623	1189.05	8.7764		
883.24	7.9297	1204.77	12.7350		
884.68	11.4603	1221.41	9.8431		
889.28	7.0647	1231.02	13.5368		
894.76	7.9640	1235.36	0.0000		
898.04	7.9739	1238.28	10.1733		
900.72	6.2081	1260.41	0.0000		
903.28	12.4277	1271.87	7.9878		
911.20	14.2446	1274.44	3.9966		
912.08	15.6745	1274.54	3.9968		
923.98	0.0000	1291.59	15.0586		
926.50	7.1624	1298.22	0.0000		
929.11	7.1689	1312.11	0.0000		
937.49	19.7744	1332.49	10.1501		
944.13	0.0000	1362.66	0.0000		
946.00	7.2126	1365.19	10.2380		
949.00	5.7762	1368.63	0.0000		
667.71	0.0000	1384.29	4.1157		
962.31	14.5088	1408.01	5.1758		
964.08	6.0490	1457.56	0.0000		
966.17	10.1698	1460.82	0.0000		
911.20	14.5425	1489.16	7.3935		
968.97	14.5425	1505.03	2.1206		
983.53	0.0000	1584.12	6.4808		
984.45	0.0000	1596.21	0.0000		


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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235069.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM43.CNF;151
Background date : 2-OCT-2016 11:02:23.
Sample date     : 16-DEC-2015 12:45:00 Acquisition date : 3-OCT-2016 06:05:34.
Sample ID      : G405235069 Sample quantity   : 1.56084E+02 GRAM
Detector name   : GAM43 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.70 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1596254 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.50*	20	102	1.18	126.79	124	6	5.49E-03	86.4	
2	4	72.58	41	80	1.32	144.95	143	29	1.14E-02	32.2	3.71E+00
3	4	74.74	95	130	1.11	149.27	143	29	2.64E-02	22.1	
4	4	77.04	164	118	1.14	153.88	143	29	4.56E-02	13.5	
5	4	83.40*	37	112	1.38	166.59	143	29	1.03E-02	56.0	
6	0	86.99	31	123	0.75	173.79	171	7	8.61E-03	61.9	
7	0	92.73*	46	207	1.82	185.27	181	10	1.29E-02	61.7	
8	4	129.16	59	109	1.82	258.15	254	12	1.63E-02	34.0	6.29E+00
9	4	131.74	30	24	1.26	263.32	254	12	8.26E-03	31.7	
10	0	150.51	33	98	1.39	300.86	297	8	9.11E-03	55.1	
11	0	185.71*	64	151	1.28	371.27	366	11	1.78E-02	40.0	
12	4	238.54*	317	73	1.04	476.97	471	29	8.81E-02	7.1	1.14E+00
13	4	241.67	104	75	1.57	483.23	471	29	2.90E-02	19.5	
14	0	273.05	34	113	4.09	546.01	534	16	9.46E-03	72.6	
15	1	294.98*	141	67	1.65	589.88	585	21	3.91E-02	13.5	2.88E+00
16	1	299.95*	55	55	1.66	599.82	585	21	1.53E-02	30.0	
17	0	338.69	63	74	1.11	677.33	672	12	1.74E-02	30.4	
18	0	351.93*	273	60	1.12	703.81	699	12	7.60E-02	8.4	
19	0	395.96	31	79	6.20	791.90	779	24	8.74E-03	76.4	
20	0	465.08	19	54	3.26	930.17	920	15	5.18E-03	90.3	
21	0	504.15	13	15	0.87	1008.32	1005	7	3.47E-03	57.4	
22	0	510.37*	41	38	1.81	1020.77	1012	15	1.15E-02	41.5	
23	0	578.09	21	25	0.93	1156.22	1149	13	5.79E-03	54.9	
24	0	583.14*	110	22	1.81	1166.34	1161	11	3.06E-02	12.8	
25	0	601.94	23	17	3.84	1203.94	1197	14	6.36E-03	43.9	
26	7	609.06*	186	11	1.99	1218.19	1210	31	5.16E-02	8.5	1.73E+00
27	7	615.09	20	31	3.60	1230.25	1210	31	5.61E-03	79.2	
28	0	728.05	28	35	0.70	1456.21	1445	18	7.87E-03	52.9	
29	0	796.10	17	22	1.42	1592.32	1585	13	4.62E-03	63.9	
30	0	808.59	9	21	2.87	1617.31	1606	15	2.38E-03	124.8	
31	0	836.58	11	16	1.34	1673.30	1666	11	3.05E-03	77.6	
32	0	854.30	11	11	1.53	1708.74	1704	8	2.94E-03	64.0	
33	4	910.97	102	7	2.42	1822.10	1816	17	2.85E-02	11.3	2.18E+00
34	4	914.78	11	4	1.43	1829.73	1816	17	3.00E-03	41.6	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	6	964.12*	17	9	2.70	1928.42	1924	18	4.63E-03	41.5	1.72E+00
36	6	968.71	32	13	1.71	1937.59	1924	18	8.77E-03	27.5	
37	0	987.78	18	3	3.72	1975.75	1968	13	4.88E-03	32.0	
38	0	1121.30	35	50	1.06	2242.81	2232	20	9.72E-03	52.3	
39	0	1347.63	11	6	3.92	2695.49	2688	13	3.09E-03	55.5	
40	0	1351.24	7	0	0.58	2702.71	2700	7	1.94E-03	37.8	
41	0	1401.29	6	4	0.87	2802.83	2798	8	1.67E-03	70.7	
42	0	1460.73*	316	8	2.13	2921.71	2913	16	8.78E-02	6.0	
43	0	1589.05	7	6	1.34	3178.36	3168	12	1.94E-03	79.5	
44	0	1620.74	11	0	0.62	3241.73	3235	12	3.06E-03	30.2	
45	0	1764.78*	32	0	2.06	3529.80	3523	13	8.93E-03	18.6	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235069.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 16-DEC-2015 12:45:00 Acquisition date : 3-OCT-2016 06:05:34
Sample ID        : G405235069 Sample quantity  : 156.08 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA43 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.70 0.0%
Energy tolerance : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error  : 0.00 %
Efficiency type  : Linear Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.001E+00	1.378E+01	1.378E+01	12.06	OK
CD-109	88.03	3.70*	4.279E+00	2.403E-01	3.725E-01	637.96	OK
SN-126	64.28	9.60	1.895E+00	6.959E-01	6.959E-01	172.79	OK
	86.94	8.90	4.279E+00	9.991E-02	9.991E-02	637.96	OK
	87.57	37.00*	4.279E+00	2.403E-02	2.403E-02	637.96	OK
TL-208	277.37	6.60	4.205E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.199E+00	3.050E-01	3.050E-01	25.69	OK
	860.56	12.50	1.582E+00	-----	Line Not Found	-----	Absent
BI-211	72.87	1.23	2.909E+00	7.277E+00	7.277E+00	64.49	OK
	351.06	12.92*	3.426E+00	4.410E-01	4.410E-01	220.90	OK
BI-212	727.33	6.67*	1.821E+00	1.177E+00	1.177E+00	105.88	OK
	785.37	1.10	1.708E+00	-----	Line Not Found	-----	Absent
	1620.50	1.47	9.085E-01	3.788E+00	3.788E+00	60.30	OK
PB-212	74.82	10.28	3.139E+00	1.263E+00	1.263E+00	66.43	OK
	77.11	17.10	3.375E+00	1.791E+00	1.791E+00	27.05	OK
	238.63	43.60*	4.740E+00	8.697E-01	8.697E-01	14.13	OK
	300.09	3.30	3.937E+00	2.347E+00	2.347E+00	59.94	OK
BI-214	609.32	45.49*	2.118E+00	9.923E-01	9.927E-01	17.02	OK
	1120.29	14.92	1.265E+00	8.909E-01	8.912E-01	104.59	OK
	1764.49	15.30	8.361E-01	1.144E+00	1.145E+00	37.13	OK
PB-214	74.82	5.80	3.147E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	3.375E+00	3.158E+00	3.159E+00	27.05	OK
	87.09	3.41	4.287E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	4.688E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	3.993E+00	1.062E+00	1.062E+00	27.09	OK
	351.93	35.60*	3.426E+00	-----	Line Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.118E+00	9.923E-01	9.927E-01	17.02	OK
	1120.29	14.92	1.265E+00	8.909E-01	8.912E-01	104.59	OK
	1764.49	15.30	8.361E-01	1.144E+00	1.145E+00	37.13	OK
RA-224	240.99	4.10*	4.693E+00	1.193E+00	1.193E+00	109.08	OK
RA-226	609.32	45.49*	2.118E+00	9.923E-01	9.927E-01	17.02	OK
	1120.29	14.92	1.265E+00	8.909E-01	8.912E-01	104.59	OK
	1764.49	15.30	8.361E-01	1.144E+00	1.145E+00	37.13	OK
AC-228	105.21	1.10	5.396E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.543E+00	8.576E-01	8.576E-01	60.80	OK
	794.95	4.25	1.689E+00	1.157E+00	1.157E+00	127.82	OK
	835.71	1.61	1.620E+00	2.088E+00	2.088E+00	155.20	OK
	911.20	25.80*	1.508E+00	1.295E+00	1.295E+00	22.53	OK
	968.97	15.80	1.432E+00	6.816E-01	6.816E-01	54.95	OK
RA-228	105.21	1.10	5.396E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.543E+00	8.576E-01	8.576E-01	60.80	OK
	794.95	4.25	1.689E+00	1.157E+00	1.157E+00	127.82	OK
	835.71	1.61	1.620E+00	2.088E+00	2.088E+00	155.20	OK
	911.20	25.80*	1.508E+00	1.295E+00	1.295E+00	22.53	OK
	968.97	15.80	1.432E+00	6.816E-01	6.816E-01	54.95	OK
TH-228	74.82	10.28	3.139E+00	1.263E+00	1.263E+00	66.43	OK
	77.11	17.10	3.375E+00	1.791E+00	1.791E+00	27.05	OK
	238.63	43.60*	4.740E+00	8.697E-01	8.697E-01	14.13	OK
	300.09	3.30	3.937E+00	2.347E+00	2.347E+00	59.94	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	609.32	45.49*	2.118E+00	9.923E-01	9.923E-01	17.02	OK
	1120.29	14.92	1.265E+00	8.909E-01	8.909E-01	104.59	OK
	1764.49	15.30	8.361E-01	1.144E+00	1.144E+00	37.13	OK
PA-231	283.69	1.70	4.127E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.937E+00	1.448E+00	1.448E+00	59.94	OK
TH-232	105.21	1.10	5.396E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.543E+00	8.576E-01	8.576E-01	60.80	OK
	835.71	1.61	1.620E+00	2.088E+00	2.088E+00	155.20	OK
	911.20	25.80*	1.508E+00	1.295E+00	1.295E+00	22.53	OK
TH-234	968.97	15.80	1.432E+00	6.816E-01	6.816E-01	54.95	OK
	63.29	3.70*	1.895E+00	1.806E+00	1.806E+00	172.79	OK
	92.59	4.23	4.706E+00	1.441E+00	1.441E+00	123.42	OK
U-234	609.32	45.49*	2.118E+00	9.923E-01	9.923E-01	17.02	OK
	1120.29	14.92	1.265E+00	8.909E-01	8.909E-01	104.59	OK
	1764.49	15.30	8.361E-01	1.144E+00	1.144E+00	37.13	OK
U-238	63.29	3.70*	1.895E+00	1.806E+00	1.806E+00	172.79	OK
	92.59	4.23	4.706E+00	1.441E+00	1.441E+00	123.42	OK
AM-243	43.53	5.90	1.216E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.139E+00	1.931E-01	1.932E-01	66.43	OK
ANH-511	511.00	100.00*	2.468E+00	8.804E-02	8.804E-02	83.01	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235069.CNF;1
* Acquisition date   : 3-OCT-2016 06:05:34 Sensitivity      : 3.000
* Detector ID       : GAM43 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.70 Half life ratio : *****
* Sample date       : 16-DEC-2015 12:45:00 Analyst initials: MXR1
* Sample ID         : G405235069 Sample Quantity : 1.5608E+02 GRAM
* Batch Number      : 1596254 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 6-SEP-2016 07:25:20 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.378E+01	1.629E+00	6.354E-01
CD-109	3.725E-01	2.329E+00	2.725E+00
SN-126	2.403E-02	1.502E-01	1.772E-01
TL-208	3.050E-01	7.678E-02	6.104E-02
BI-211	4.410E-01	9.548E-01	3.603E-01
BI-212	1.177E+00	1.221E+00	8.565E-01
PB-212	8.697E-01	1.204E-01	9.402E-02
BI-214	9.927E-01	1.656E-01	1.230E-01
PB-214	1.222E+00	2.015E-01	3.443E-01
RN-222	9.927E-01	1.656E-01	1.230E-01
RA-224	1.193E+00	1.275E+00	1.008E+00
RA-226	9.927E-01	1.656E-01	1.230E-01
AC-228	1.295E+00	2.859E-01	2.241E-01
RA-228	1.295E+00	2.859E-01	2.241E-01
TH-228	8.697E-01	1.204E-01	9.402E-02
TH-230	9.923E-01	1.655E-01	1.229E-01
PA-231	1.448E+00	8.505E-01	7.827E-01
TH-232	1.295E+00	2.859E-01	2.241E-01
TH-234	1.806E+00	3.058E+00	3.671E+00
U-234	9.923E-01	1.655E-01	1.229E-01
U-238	1.806E+00	3.058E+00	3.671E+00
AM-243	1.932E-01	1.257E-01	1.184E-01
ANH-511	8.804E-02	7.163E-02	4.285E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.182E-01		1.022E+01	1.942E+01	NOT IDENT.
NA-22	5.040E-03		5.459E-02	1.102E-01	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF
AL-26	-3.007E-02		3.264E-02	4.684E-02	NOT IDENT.
SC-46	-4.310E-01		3.735E-01	5.770E-01	FAIL ABUN
V-48	0.000E+00		1.015E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00		3.077E+02	0.000E+00	SHORT HLIF

MN-54	1.263E-02	7.291E-02	1.439E-01	NOT IDENT.
CO-56	3.948E-01	4.723E-01	1.030E+00	NOT IDENT.
MN-56	0.000E+00	1.184E+41	0.000E+00	SHORT HLIF
CO-57	-1.324E-02	4.895E-02	8.752E-02	NOT IDENT.
CO-58	1.931E-01	4.925E-01	9.692E-01	NOT IDENT.
FE-59	1.494E+00	6.201E+00	1.253E+01	NOT IDENT.
CO-60	1.627E-02	3.651E-02	8.274E-02	NOT IDENT.
ZN-65	2.258E-02	2.152E-01	3.669E-01	NOT IDENT.
GE-68	1.245E+00	2.709E+00	5.549E+00	NOT IDENT.
AS-73	1.136E+01	1.621E+01	3.305E+01	NOT IDENT.
AS-74	0.000E+00	4.762E+03	0.000E+00	SHORT HLIF
SE-75	-1.661E-01	2.107E-01	3.278E-01	NOT IDENT.
BR-77	0.000E+00	2.037E+36	0.000E+00	SHORT HLIF
SR-82	0.000E+00	5.735E+02	0.000E+00	SHORT HLIF
RB-83	2.223E-01	6.118E-01	1.279E+00	NOT IDENT.
KR-85	-4.196E+00	7.971E+00	1.186E+01	NOT IDENT.
SR-85	-4.080E-01	7.734E-01	1.150E+00	NOT IDENT.
RB-86	0.000E+00	2.412E+04	0.000E+00	SHORT HLIF
Y-88	5.372E-02	1.884E-01	4.576E-01	NOT IDENT.
Y-91	-1.397E+02	5.780E+02	1.103E+03	NOT IDENT.
NB-94	2.263E-02	3.569E-02	7.447E-02	NOT IDENT.
NB-95	-2.544E-02	8.328E-01	1.614E+00	NOT IDENT.
NB-95M	8.597E-01	2.418E+00	4.330E+00	NOT IDENT.
ZR-95	-1.380E-01	1.183E+00	2.331E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	6.776E+40	0.000E+00	SHORT HLIF
MO-99	0.000E+00	2.565E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.015E+41	0.000E+00	SHORT HLIF
RH-101	-2.695E-02	4.441E-02	6.940E-02	NOT IDENT.
RH-102	1.739E-02	5.970E-02	1.232E-01	NOT IDENT.
RU-103	5.258E+00	4.849E+00	1.051E+01	FAIL ABUN
RH-106	8.447E-02	5.125E-01	9.385E-01	NOT IDENT.
RU-106	8.447E-02	5.125E-01	9.385E-01	NOT IDENT.
AG-108M	-2.233E-03	2.943E-02	5.489E-02	FAIL ABUN
AG-110M	7.245E-02	9.693E-02	2.144E-01	NOT IDENT.
SN-113	-1.002E-01	2.244E-01	4.026E-01	NOT IDENT.
CD-115	0.000E+00	2.363E+38	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	6.205E+04	0.000E+00	SHORT HLIF
TE-123M	-9.444E-02	1.238E-01	2.328E-01	NOT IDENT.
SB-124	-1.440E+00	1.621E+00	2.333E+00	NOT IDENT.
SB-125	3.652E-02	9.672E-02	1.935E-01	FAIL ABUN
TE-125M	1.199E+02	2.548E+02	4.921E+02	NOT IDENT.
I-126	0.000E+00	5.716E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	1.012E+06	0.000E+00	SHORT HLIF
SB-127	0.000E+00	5.229E+21	0.000E+00	SHORT HLIF
I-131	0.000E+00	2.380E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	6.815E+25	0.000E+00	SHORT HLIF
BA-133	3.409E-02	3.625E-02	7.280E-02	NOT IDENT.
I-133	0.000E+00	9.279E+40	0.000E+00	SHORT HLIF
CS-134	7.520E-02	9.420E-02	1.278E-01	FAIL ABUN
CS-135	1.237E-02	1.408E-01	2.473E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.172E+05	0.000E+00	SHORT HLIF
BA-137M	-3.844E-03	3.893E-02	7.517E-02	NOT IDENT.
CS-137	-4.061E-03	4.112E-02	7.941E-02	NOT IDENT.
CE-139	-5.548E-02	1.023E-01	1.950E-01	NOT IDENT.
BA-140	0.000E+00	7.911E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	2.208E+05	0.000E+00	SHORT HLIF
CE-141	-3.590E+00	1.994E+01	3.930E+01	NOT IDENT.
CE-143	0.000E+00	4.571E+40	0.000E+00	SHORT HLIF
CE-144	-3.943E-01	3.251E-01	5.175E-01	NOT IDENT.
PM-144	-4.560E-02	5.301E-02	9.172E-02	NOT IDENT.
PR-144	-3.929E+00	4.588E+00	7.944E+00	NOT IDENT.
PM-146	3.130E-03	4.088E-02	7.977E-02	NOT IDENT.
ND-147	0.000E+00	1.874E+07	0.000E+00	SHORT HLIF
PM-147	-3.148E+02	8.952E+02	1.587E+03	NOT IDENT.
PM-149	0.000E+00	3.697E+39	0.000E+00	SHORT HLIF
EU-150	3.119E-02	2.741E-02	5.373E-02	FAIL ABUN
EU-152	-8.435E-02	1.039E-01	1.550E-01	FAIL ABUN
GD-153	-2.290E-02	2.087E-01	3.548E-01	NOT IDENT.
EU-154	2.002E-02	1.314E-01	2.686E-01	NOT IDENT.
EU-155	8.122E-02	1.140E-01	2.245E-01	FAIL ABUN
TB-160	-4.907E-01	1.890E+00	3.536E+00	FAIL ABUN
HO-166M	4.226E-02	6.155E-02	1.307E-01	FAIL ABUN
TM-171	-2.948E+00	4.409E+01	8.449E+01	NOT IDENT.
HF-172	1.328E-02	2.849E-01	4.778E-01	FAIL ABUN
LU-172	5.397E-02	7.858E-02	1.705E-01	FAIL ABUN

LU-176	-7.496E-03	2.331E-02	4.335E-02	FAIL ABUN
HF-181	7.016E-01	4.094E+00	7.835E+00	FAIL ABUN
TA-182	-2.958E-01	1.087E+00	2.056E+00	FAIL ABUN
RE-183	-1.474E+00	4.416E+00	8.325E+00	NOT IDENT.
RE-184	5.101E-01	2.696E+01	5.292E+01	NOT IDENT.
W-188	-3.071E+01	1.123E+02	1.862E+02	FAIL ABUN
IR-192	-8.633E-02	3.999E-01	7.523E-01	FAIL ABUN
HG-203	-1.001E+00	2.190E+00	4.028E+00	FAIL ABUN
BI-207	1.757E-02	5.006E-02	1.030E-01	FAIL ABUN
PB-210	-7.036E+00	1.050E+01	1.947E+01	NOT IDENT.
PB-211	-7.835E-02	6.945E-01	1.293E+00	NOT IDENT.
RN-219	-1.800E-01	4.582E-01	7.216E-01	NOT IDENT.
RA-223	1.176E-01	5.974E-01	1.162E+00	FAIL ABUN
AC-227	-3.002E-02	2.275E-01	4.345E-01	FAIL ABUN
TH-227	-3.002E-02	2.275E-01	4.345E-01	FAIL ABUN
TH-229	-2.261E-02	4.409E-01	8.622E-01	FAIL ABUN
TH-231	1.176E-01	5.974E-01	1.162E+00	FAIL ABUN
PA-233	-4.434E-02	5.780E-02	1.019E-01	FAIL ABUN
PA-234	-1.343E-01	2.937E-01	5.271E-01	FAIL ABUN
PA-234M	6.350E-01	4.614E+00	9.076E+00	NOT IDENT.
U-235	1.525E-01	1.792E-01	3.744E-01	FAIL ABUN
NP-237	-4.434E-02	5.780E-02	1.019E-01	FAIL ABUN
NP-238	0.000E+00	4.034E+40	0.000E+00	SHORT HLIF
NP-239	1.184E-01	2.617E-01	4.994E-01	NOT IDENT.
PU-239	0.000E+00	6.224E+02	6.849E+02	FAIL ABUN
AM-241	-1.567E-01	2.280E-01	4.146E-01	NOT IDENT.
CM-243	-4.719E-02	1.106E-01	1.974E-01	NOT IDENT.
BK-247	-4.650E-03	7.054E-02	1.221E-01	FAIL ABUN
CM-247	-3.701E-03	4.146E-02	6.864E-02	NOT IDENT.
CF-249	6.166E-03	4.148E-02	7.188E-02	NOT IDENT.
CF-251	-9.060E-02	1.148E-01	2.135E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	306	10.66*	1.001E+00	1.378E+01	1.378E+01	12.06
CD-109	88.03	40	3.70*	4.279E+00	1.219E+00	1.889E+00	123.88
SN-126	64.28	26	9.60	1.895E+00	6.959E-01	6.959E-01	172.79
	86.94	40	8.90	4.279E+00	5.068E-01	5.068E-01	123.88
	87.57	40	37.00*	4.279E+00	1.219E-01	1.219E-01	123.88
TL-208	277.37	-----	6.60	4.205E+00	-----	Line Not Found	-----
	583.19	119	85.00*	2.199E+00	3.050E-01	3.050E-01	25.69
	860.56	-----	12.50	1.582E+00	-----	Line Not Found	-----
BI-211	72.87	54	1.23	2.909E+00	7.277E+00	7.277E+00	64.49
	351.06	310	12.92*	3.426E+00	3.367E+00	3.367E+00	16.82
BI-212	727.33	30	6.67*	1.821E+00	1.177E+00	1.177E+00	105.88
	785.37	-----	1.10	1.708E+00	-----	Line Not Found	-----
	1620.50	11	1.47	9.085E-01	3.788E+00	3.788E+00	60.30
PB-212	74.82	125	10.28	3.139E+00	1.862E+00	1.862E+00	44.20
	77.11	215	17.10	3.375E+00	1.791E+00	1.791E+00	27.05
	238.63	374	43.60*	4.740E+00	8.697E-01	8.697E-01	14.13
	300.09	63	3.30	3.937E+00	2.347E+00	2.347E+00	59.94
BI-214	609.32	199	45.49*	2.118E+00	9.923E-01	9.927E-01	17.02
	1120.29	35	14.92	1.265E+00	8.909E-01	8.912E-01	104.59
	1764.49	30	15.30	8.361E-01	1.144E+00	1.145E+00	37.13
PB-214	74.82	125	5.80	3.139E+00	3.300E+00	3.301E+00	44.20
	77.11	215	9.70	3.375E+00	3.158E+00	3.159E+00	27.05
	87.09	40	3.41	4.279E+00	1.323E+00	1.323E+00	123.88
	242.00	123	7.25	4.693E+00	1.737E+00	1.737E+00	39.01
	295.22	162	18.42	3.993E+00	1.062E+00	1.062E+00	27.09
	351.93	310	35.60*	3.426E+00	1.222E+00	1.222E+00	16.82
RN-222	609.32	199	45.49*	2.118E+00	9.923E-01	9.927E-01	17.02
	1120.29	35	14.92	1.265E+00	8.909E-01	8.912E-01	104.59
	1764.49	30	15.30	8.361E-01	1.144E+00	1.145E+00	37.13
RA-224	240.99	123	4.10*	4.693E+00	3.071E+00	3.071E+00	39.01
RA-226	609.32	199	45.49*	2.118E+00	9.923E-01	9.927E-01	17.02
	1120.29	35	14.92	1.265E+00	8.909E-01	8.912E-01	104.59
	1764.49	30	15.30	8.361E-01	1.144E+00	1.145E+00	37.13
AC-228	105.21	-----	1.10	5.396E+00	-----	Line Not Found	-----
	338.32	71	11.27	3.543E+00	8.576E-01	8.576E-01	60.80
	794.95	17	4.25	1.689E+00	1.157E+00	1.157E+00	127.82
	835.71	11	1.61	1.620E+00	2.088E+00	2.088E+00	155.20
	911.20	105	25.80*	1.508E+00	1.295E+00	1.295E+00	22.53
	968.97	32	15.80	1.432E+00	6.816E-01	6.816E-01	54.95
RA-228	105.21	-----	1.10	5.396E+00	-----	Line Not Found	-----
	338.32	71	11.27	3.543E+00	8.576E-01	8.576E-01	60.80
	794.95	17	4.25	1.689E+00	1.157E+00	1.157E+00	127.82
	835.71	11	1.61	1.620E+00	2.088E+00	2.088E+00	155.20
	911.20	105	25.80*	1.508E+00	1.295E+00	1.295E+00	22.53
	968.97	32	15.80	1.432E+00	6.816E-01	6.816E-01	54.95
TH-228	74.82	125	10.28	3.139E+00	1.862E+00	1.862E+00	44.20
	77.11	215	17.10	3.375E+00	1.791E+00	1.791E+00	27.05

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	238.63	374	43.60*	4.740E+00	8.697E-01	8.697E-01	14.13
	300.09	63	3.30	3.937E+00	2.347E+00	2.347E+00	59.94
TH-230	609.32	199	45.49*	2.118E+00	9.923E-01	9.923E-01	17.02
	1120.29	35	14.92	1.265E+00	8.909E-01	8.909E-01	104.59
	1764.49	30	15.30	8.361E-01	1.144E+00	1.144E+00	37.13
PA-231	283.69	-----	1.70	4.127E+00	-----	Line Not Found	-----
	301.36	63	5.35*	3.937E+00	1.448E+00	1.448E+00	59.94
TH-232	105.21	-----	1.10	5.396E+00	-----	Line Not Found	-----
	338.32	71	11.27	3.543E+00	8.576E-01	8.576E-01	60.80
	835.71	11	1.61	1.620E+00	2.088E+00	2.088E+00	155.20
	911.20	105	25.80*	1.508E+00	1.295E+00	1.295E+00	22.53
	968.97	32	15.80	1.432E+00	6.816E-01	6.816E-01	54.95
TH-234	63.29	26	3.70*	1.895E+00	1.806E+00	1.806E+00	172.79
	92.59	60	4.23	4.706E+00	1.441E+00	1.441E+00	123.42
U-234	609.32	199	45.49*	2.118E+00	9.923E-01	9.923E-01	17.02
	1120.29	35	14.92	1.265E+00	8.909E-01	8.909E-01	104.59
	1764.49	30	15.30	8.361E-01	1.144E+00	1.144E+00	37.13
U-238	63.29	26	3.70*	1.895E+00	1.806E+00	1.806E+00	172.79
	92.59	60	4.23	4.706E+00	1.441E+00	1.441E+00	123.42
AM-243	43.53	-----	5.90	1.216E-01	-----	Line Not Found	-----
	74.66	125	67.20*	3.139E+00	2.848E-01	2.848E-01	44.20
ANH-511	511.00	45	100.00*	2.468E+00	8.804E-02	8.804E-02	83.01

Flag: "*" = Keyline

Total number of lines in spectrum 45
 Number of unidentified lines 11
 Number of lines tentatively identified by NID 34 75.56%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.378E+01	1.378E+01	0.166E+01	12.06	
CD-109	461.40D	1.55	1.219E+00	1.889E+00	2.341E+00	123.88	
SN-126	2.30E+05Y	1.00	1.219E-01	1.219E-01	1.510E-01	123.88	
TL-208	1.41E+10Y	1.00	3.050E-01	3.050E-01	0.783E-01	25.69	
BI-211	7.04E+08Y	1.00	3.367E+00	3.367E+00	0.566E+00	16.82	
BI-212	1.41E+10Y	1.00	1.177E+00	1.177E+00	1.246E+00	105.88	
PB-212	1.41E+10Y	1.00	8.697E-01	8.697E-01	1.229E-01	14.13	
BI-214	1600.00Y	1.00	9.923E-01	9.927E-01	1.690E-01	17.02	
PB-214	1600.00Y	1.00	1.222E+00	1.222E+00	0.206E+00	16.82	
RN-222	1600.00Y	1.00	9.923E-01	9.927E-01	1.690E-01	17.02	
RA-224	1.41E+10Y	1.00	3.071E+00	3.071E+00	1.198E+00	39.01	
RA-226	1600.00Y	1.00	9.923E-01	9.927E-01	1.690E-01	17.02	
AC-228	1.41E+10Y	1.00	1.295E+00	1.295E+00	0.292E+00	22.53	
RA-228	1.41E+10Y	1.00	1.295E+00	1.295E+00	0.292E+00	22.53	
TH-228	1.41E+10Y	1.00	8.697E-01	8.697E-01	1.229E-01	14.13	
TH-230	7.54E+04Y	1.00	9.923E-01	9.923E-01	1.689E-01	17.02	
PA-231	7.04E+08Y	1.00	1.448E+00	1.448E+00	0.868E+00	59.94	
TH-232	1.41E+10Y	1.00	1.295E+00	1.295E+00	0.292E+00	22.53	
TH-234	4.47E+09Y	1.00	1.806E+00	1.806E+00	3.120E+00	172.79	
U-234	2.45E+05Y	1.00	9.923E-01	9.923E-01	1.689E-01	17.02	
U-238	4.47E+09Y	1.00	1.806E+00	1.806E+00	3.120E+00	172.79	
AM-243	7370.00Y	1.00	2.848E-01	2.848E-01	1.259E-01	44.20	
ANH-511	1.00E+09Y	1.00	8.804E-02	8.804E-02	7.309E-02	83.01	
Total Activity :			4.029E+01	4.096E+01			

Grand Total Activity : 4.029E+01 4.096E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
4	83.40	48	145	1.38	166.59	143	29	1.03E-02	****	3.98E+00	T
4	129.16	73	137	1.82	258.15	254	12	1.63E-02	68.1	5.98E+00	T
4	131.74	37	30	1.26	263.32	254	12	8.26E-03	63.5	6.00E+00	T
0	150.51	40	121	1.39	300.86	297	8	9.11E-03	****	5.99E+00	
0	185.71	77	183	1.28	371.27	366	11	1.78E-02	80.1	5.57E+00	T
0	273.05	40	131	4.09	546.01	534	16	9.46E-03	****	4.26E+00	T
0	395.96	35	88	6.20	791.90	779	24	8.74E-03	****	3.09E+00	
0	465.08	21	60	3.26	930.17	920	15	5.18E-03	****	2.68E+00	
0	504.15	14	16	0.87	1008.32	1005	7	3.47E-03	****	2.49E+00	T
0	578.09	22	27	0.93	1156.22	1149	13	5.79E-03	****	2.22E+00	
0	601.94	25	18	3.84	1203.94	1197	14	6.36E-03	87.8	2.14E+00	T
7	615.09	22	33	3.60	1230.25	1210	31	5.61E-03	****	2.10E+00	T
0	808.59	9	22	2.87	1617.31	1606	15	2.38E-03	****	1.67E+00	T
0	854.30	11	12	1.53	1708.74	1704	8	2.94E-03	****	1.59E+00	
4	914.78	11	4	1.43	1829.73	1816	17	3.00E-03	83.1	1.50E+00	
6	964.12	17	9	2.70	1928.42	1924	18	4.63E-03	83.0	1.44E+00	T
0	987.78	18	3	3.72	1975.75	1968	13	4.88E-03	63.9	1.41E+00	
0	1347.63	11	6	3.92	2695.49	2688	13	3.09E-03	****	1.08E+00	
0	1351.24	7	0	0.58	2702.71	2700	7	1.94E-03	75.6	1.07E+00	
0	1401.29	6	4	0.87	2802.83	2798	8	1.67E-03	****	1.04E+00	
0	1589.05	7	6	1.34	3178.36	3168	12	1.94E-03	****	9.26E-01	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*                               *                                               *
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235069.CNF;1  *
* Acquisition date   : 3-OCT-2016 06:05:34 Sensitivity      : 3.000          *
* Detector ID       : GAM43 Energy tolerance: 1.500        *
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000   *
* Elapsed real time : 0 01:00:00.70 Half life ratio : ***** *
* Sample date       : 16-DEC-2015 12:45:00 Nuclide Library : SOLID      *
* Sample ID         : G405235069 Analyst initials: MXR1       *
* Batch Number      : 1596254 Sample Quantity : 1.5608E+02 GRAM *
* Wet wt corr       : 1.00000 Wet Weight : 0.00000          *
*                               Dry Weight : 0.00000          *
*****
*                               CALIBRATION INFORMATION                         *
*                               *                                               *
* Eff. Cal. date    : 6-SEP-2016 07:25:20 Eff. Geometry   : CAN          *
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;7 *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.563E-01
CD-109	1.295E+00
SN-126	8.423E-02
TL-208	2.693E-02
BI-211	1.648E-01
BI-212	3.733E-01
PB-212	4.369E-02
BI-214	5.452E-02
PB-214	1.666E-01
RN-222	5.452E-02
RA-224	4.685E-01
RA-226	5.452E-02
AC-228	9.496E-02
RA-228	9.496E-02
TH-228	4.369E-02
TH-230	5.450E-02
PA-231	3.588E-01
TH-232	9.496E-02
TH-234	1.733E+00
U-234	5.450E-02
U-238	1.733E+00
AM-243	5.583E-02
ANH-511	1.869E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.606E+00	NOT IDENT.
NA-22	4.793E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.540E-02	NOT IDENT.
SC-46	2.403E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	6.411E-02	NOT IDENT.

CO-56	4.581E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.085E-02	NOT IDENT.
CO-58	4.147E-01	NOT IDENT.
FE-59	5.411E+00	NOT IDENT.
CO-60	3.466E-02	NOT IDENT.
ZN-65	1.600E-01	NOT IDENT.
GE-68	2.444E+00	NOT IDENT.
AS-73	1.547E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.495E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	5.749E-01	NOT IDENT.
KR-85	5.262E+00	NOT IDENT.
SR-85	5.104E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.743E-01	NOT IDENT.
Y-91	4.842E+02	NOT IDENT.
NB-94	3.367E-02	NOT IDENT.
NB-95	7.171E-01	NOT IDENT.
NB-95M	2.029E+00	NOT IDENT.
ZR-95	1.002E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.267E-02	NOT IDENT.
RH-102	5.485E-02	NOT IDENT.
RU-103	4.749E+00	FAIL ABUN
RH-106	4.134E-01	NOT IDENT.
RU-106	4.134E-01	NOT IDENT.
AG-108M	2.482E-02	FAIL ABUN
AG-110M	9.392E-02	NOT IDENT.
SN-113	1.819E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.088E-01	NOT IDENT.
SB-124	7.131E-01	NOT IDENT.
SB-125	8.710E-02	FAIL ABUN
TE-125M	2.303E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.300E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.790E-02	FAIL ABUN
CS-135	1.138E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	3.375E-02	NOT IDENT.
CS-137	3.565E-02	NOT IDENT.
CE-139	9.106E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.845E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.375E-01	NOT IDENT.
PM-144	3.965E-02	NOT IDENT.
PR-144	3.435E+00	NOT IDENT.
PM-146	3.568E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.422E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.486E-02	FAIL ABUN
EU-152	6.989E-02	FAIL ABUN
GD-153	1.662E-01	NOT IDENT.
EU-154	1.166E-01	NOT IDENT.
EU-155	1.054E-01	FAIL ABUN
TB-160	1.535E+00	FAIL ABUN
HO-166M	5.872E-02	FAIL ABUN
TM-171	3.941E+01	NOT IDENT.
HF-172	2.250E-01	FAIL ABUN
LU-172	7.436E-02	FAIL ABUN
LU-176	1.979E-02	FAIL ABUN

HF-181	3.536E+00	FAIL ABUN
TA-182	9.065E-01	FAIL ABUN
RE-183	3.872E+00	NOT IDENT.
RE-184	2.299E+01	NOT IDENT.
W-188	8.549E+01	FAIL ABUN
IR-192	3.422E-01	FAIL ABUN
HG-203	1.860E+00	FAIL ABUN
BI-207	4.471E-02	FAIL ABUN
PB-210	9.089E+00	NOT IDENT.
PB-211	5.873E-01	NOT IDENT.
RN-219	3.271E-01	NOT IDENT.
RA-223	5.346E-01	FAIL ABUN
AC-227	2.012E-01	FAIL ABUN
TH-227	2.012E-01	FAIL ABUN
TH-229	4.024E-01	FAIL ABUN
TH-231	5.346E-01	FAIL ABUN
PA-233	4.632E-02	FAIL ABUN
PA-234	2.257E-01	FAIL ABUN
PA-234M	3.972E+00	NOT IDENT.
U-235	1.767E-01	FAIL ABUN
NP-237	4.632E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.345E-01	NOT IDENT.
PU-239	3.240E+02	FAIL ABUN
AM-241	1.937E-01	NOT IDENT.
CM-243	9.226E-02	NOT IDENT.
BK-247	5.584E-02	FAIL ABUN
CM-247	3.123E-02	NOT IDENT.
CF-249	3.266E-02	NOT IDENT.
CF-251	9.972E-02	NOT IDENT.

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235069.CNF;1
* Acquisition date   : 3-OCT-2016 06:05:34 Sensitivity      : 3.000
* Detector ID        : GAM43 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.70 Half life ratio  : *****
* Sample date        : 16-DEC-2015 12:45:00 Nuclide Library : SOLID
* Sample ID          : G405235069 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity : 1.5608E+02 GRAM
*                    : Quantity Err(%) : 1.2814E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                    : Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 6-SEP-2016 07:25:20 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.378E+01	1.781E+00	1.781E+00
CD-109	3.725E-01	2.337E+00	2.337E+00
SN-126	2.403E-02	1.508E-01	1.508E-01
TL-208	3.050E-01	7.788E-02	7.788E-02
BI-211	4.410E-01	9.720E-01	9.720E-01
BI-212	1.177E+00	1.223E+00	1.223E+00
PB-212	8.697E-01	1.291E-01	1.291E-01
BI-214	9.927E-01	1.710E-01	1.710E-01
PB-214	1.222E+00	2.080E-01	2.080E-01
RN-222	9.927E-01	1.710E-01	1.710E-01
RA-224	1.193E+00	1.283E+00	1.283E+00
RA-226	9.927E-01	1.710E-01	1.710E-01
AC-228	1.295E+00	2.935E-01	2.935E-01
RA-228	1.295E+00	2.935E-01	2.935E-01
TH-228	8.697E-01	1.291E-01	1.291E-01
TH-230	9.923E-01	1.710E-01	1.710E-01
PA-231	1.448E+00	9.049E-01	9.049E-01
TH-232	1.295E+00	2.935E-01	2.935E-01
TH-234	1.806E+00	3.084E+00	3.084E+00
U-234	9.923E-01	1.710E-01	1.710E-01
U-238	1.806E+00	3.084E+00	3.084E+00
AM-243	1.932E-01	1.269E-01	1.269E-01
ANH-511	8.804E-02	7.172E-02	7.172E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.182E-01	1.022E+01	1.022E+01	NOT IDENT.
NA-22	5.040E-03	5.459E-02	5.463E-02	NOT IDENT.
NA-24	-1.000E+41	7.518E+41	0.000E+00	SHORT HLIF
AL-26	-3.007E-02	3.270E-02	3.540E-02	NOT IDENT.
SC-46	-4.310E-01	3.740E-01	4.214E-01	FAIL ABUN
V-48	4.458E+01	1.015E+04	1.015E+04	SHORT HLIF
CR-51	-8.230E+01	3.077E+02	3.100E+02	SHORT HLIF

MN-54	1.263E-02	7.292E-02	7.314E-02	NOT IDENT.
CO-56	3.948E-01	4.726E-01	5.050E-01	NOT IDENT.
MN-56	1.000E+41	1.184E+41	0.000E+00	SHORT HLIF
CO-57	-1.324E-02	4.896E-02	4.932E-02	NOT IDENT.
CO-58	1.931E-01	4.925E-01	5.002E-01	NOT IDENT.
FE-59	1.494E+00	6.201E+00	6.238E+00	NOT IDENT.
CO-60	1.627E-02	3.652E-02	3.725E-02	NOT IDENT.
ZN-65	2.258E-02	2.152E-01	2.154E-01	NOT IDENT.
GE-68	1.245E+00	2.710E+00	2.767E+00	NOT IDENT.
AS-73	1.136E+01	1.638E+01	1.716E+01	NOT IDENT.
AS-74	1.251E+00	4.762E+03	4.762E+03	SHORT HLIF
SE-75	-1.661E-01	2.109E-01	2.238E-01	NOT IDENT.
BR-77	1.471E+37	1.239E+38	0.000E+00	SHORT HLIF
SR-82	-1.577E+02	5.735E+02	5.779E+02	SHORT HLIF
RB-83	2.223E-01	6.126E-01	6.207E-01	NOT IDENT.
KR-85	-4.196E+00	7.973E+00	8.194E+00	NOT IDENT.
SR-85	-4.080E-01	7.735E-01	7.951E-01	NOT IDENT.
RB-86	8.346E+03	2.412E+04	2.441E+04	SHORT HLIF
Y-88	5.372E-02	1.884E-01	1.900E-01	NOT IDENT.
Y-91	-1.397E+02	5.780E+02	5.814E+02	NOT IDENT.
NB-94	2.263E-02	3.571E-02	3.713E-02	NOT IDENT.
NB-95	-2.544E-02	8.328E-01	8.329E-01	NOT IDENT.
NB-95M	8.597E-01	2.419E+00	2.450E+00	NOT IDENT.
ZR-95	-1.380E-01	1.183E+00	1.185E+00	NOT IDENT.
NB-97	1.000E+41	4.463E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	6.788E+40	0.000E+00	SHORT HLIF
MO-99	1.685E+30	2.565E+31	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.020E+41	0.000E+00	SHORT HLIF
RH-101	-2.695E-02	4.467E-02	4.630E-02	NOT IDENT.
RH-102	1.739E-02	5.971E-02	6.023E-02	NOT IDENT.
RU-103	5.258E+00	4.855E+00	5.403E+00	FAIL ABUN
RH-106	8.447E-02	5.125E-01	5.140E-01	NOT IDENT.
RU-106	8.447E-02	5.125E-01	5.140E-01	NOT IDENT.
AG-108M	-2.233E-03	2.943E-02	2.945E-02	FAIL ABUN
AG-110M	7.245E-02	9.700E-02	1.024E-01	NOT IDENT.
SN-113	-1.002E-01	2.245E-01	2.290E-01	NOT IDENT.
CD-115	6.576E+37	2.366E+38	0.000E+00	SHORT HLIF
SN-117M	-5.366E+04	6.236E+04	6.689E+04	SHORT HLIF
TE-123M	-9.444E-02	1.239E-01	1.310E-01	NOT IDENT.
SB-124	-1.440E+00	1.623E+00	1.748E+00	NOT IDENT.
SB-125	3.652E-02	9.673E-02	9.812E-02	FAIL ABUN
TE-125M	1.199E+02	2.549E+02	2.605E+02	NOT IDENT.
I-126	5.916E+04	5.717E+05	5.723E+05	SHORT HLIF
SB-126	-4.837E+05	1.016E+06	1.039E+06	SHORT HLIF
SB-127	1.282E+21	5.503E+21	0.000E+00	SHORT HLIF
I-131	5.478E+08	2.380E+09	2.393E+09	SHORT HLIF
I-132	-1.000E+41	1.810E+42	0.000E+00	SHORT HLIF
TE-132	-4.726E+25	7.067E+25	0.000E+00	SHORT HLIF
BA-133	3.409E-02	3.628E-02	3.940E-02	NOT IDENT.
I-133	-1.000E+41	1.990E+41	0.000E+00	SHORT HLIF
CS-134	7.520E-02	9.425E-02	1.002E-01	FAIL ABUN
CS-135	1.237E-02	1.408E-01	1.409E-01	NOT IDENT.
I-135	-1.000E+41	7.222E+41	0.000E+00	SHORT HLIF
CS-136	1.936E+05	2.182E+05	2.350E+05	SHORT HLIF
BA-137M	-3.844E-03	3.893E-02	3.897E-02	NOT IDENT.
CS-137	-4.061E-03	4.112E-02	4.117E-02	NOT IDENT.
CE-139	-5.548E-02	1.029E-01	1.059E-01	NOT IDENT.
BA-140	2.565E+05	7.912E+05	7.996E+05	SHORT HLIF
LA-140	-1.289E+05	2.209E+05	2.284E+05	SHORT HLIF
CE-141	-3.590E+00	1.994E+01	2.001E+01	NOT IDENT.
CE-143	1.000E+41	4.678E+40	0.000E+00	SHORT HLIF
CE-144	-3.943E-01	3.258E-01	3.711E-01	NOT IDENT.
PM-144	-4.560E-02	5.308E-02	5.692E-02	NOT IDENT.
PR-144	-3.929E+00	4.591E+00	4.921E+00	NOT IDENT.
PM-146	3.130E-03	4.088E-02	4.091E-02	NOT IDENT.
ND-147	-4.202E+06	1.875E+07	1.884E+07	SHORT HLIF
PM-147	-3.148E+02	8.953E+02	9.065E+02	NOT IDENT.
PM-149	2.626E+39	3.740E+39	0.000E+00	SHORT HLIF
EU-150	3.119E-02	2.744E-02	3.083E-02	FAIL ABUN
EU-152	-8.435E-02	1.041E-01	1.108E-01	FAIL ABUN
GD-153	-2.290E-02	2.087E-01	2.090E-01	NOT IDENT.
EU-154	2.002E-02	1.314E-01	1.317E-01	NOT IDENT.
EU-155	8.122E-02	1.142E-01	1.199E-01	FAIL ABUN
TB-160	-4.907E-01	1.890E+00	1.903E+00	FAIL ABUN
HO-166M	4.226E-02	6.159E-02	6.447E-02	FAIL ABUN
TM-171	-2.948E+00	4.409E+01	4.411E+01	NOT IDENT.
HF-172	1.328E-02	2.849E-01	2.850E-01	FAIL ABUN
LU-172	5.397E-02	7.877E-02	8.244E-02	FAIL ABUN

LU-176	-7.496E-03	2.331E-02	2.356E-02	FAIL ABUN
HF-181	7.016E-01	4.094E+00	4.106E+00	FAIL ABUN
TA-182	-2.958E-01	1.087E+00	1.096E+00	FAIL ABUN
RE-183	-1.474E+00	4.422E+00	4.472E+00	NOT IDENT.
RE-184	5.101E-01	2.696E+01	2.696E+01	NOT IDENT.
W-188	-3.071E+01	1.123E+02	1.132E+02	FAIL ABUN
IR-192	-8.633E-02	3.999E-01	4.018E-01	FAIL ABUN
HG-203	-1.001E+00	2.190E+00	2.236E+00	FAIL ABUN
BI-207	1.757E-02	5.006E-02	5.069E-02	FAIL ABUN
PB-210	-7.036E+00	1.053E+01	1.100E+01	NOT IDENT.
PB-211	-7.835E-02	6.945E-01	6.954E-01	NOT IDENT.
RN-219	-1.800E-01	4.587E-01	4.659E-01	NOT IDENT.
RA-223	1.176E-01	5.974E-01	5.997E-01	FAIL ABUN
AC-227	-3.002E-02	2.275E-01	2.279E-01	FAIL ABUN
TH-227	-3.002E-02	2.275E-01	2.279E-01	FAIL ABUN
TH-229	-2.261E-02	4.409E-01	4.410E-01	FAIL ABUN
TH-231	1.176E-01	5.974E-01	5.997E-01	FAIL ABUN
PA-233	-4.434E-02	5.784E-02	6.119E-02	FAIL ABUN
PA-234	-1.343E-01	3.315E-01	3.370E-01	FAIL ABUN
PA-234M	6.350E-01	4.614E+00	4.623E+00	NOT IDENT.
U-235	1.525E-01	1.793E-01	1.921E-01	FAIL ABUN
NP-237	-4.434E-02	5.784E-02	6.119E-02	FAIL ABUN
NP-238	-1.640E+40	4.035E+40	0.000E+00	SHORT HLIF
NP-239	1.184E-01	2.619E-01	2.673E-01	NOT IDENT.
PU-239	9.327E+02	6.238E+02	7.522E+02	FAIL ABUN
AM-241	-1.567E-01	2.283E-01	2.389E-01	NOT IDENT.
CM-243	-4.719E-02	1.107E-01	1.127E-01	NOT IDENT.
BK-247	-4.650E-03	7.055E-02	7.058E-02	FAIL ABUN
CM-247	-3.701E-03	4.146E-02	4.150E-02	NOT IDENT.
CF-249	6.166E-03	4.149E-02	4.158E-02	NOT IDENT.
CF-251	-9.060E-02	1.153E-01	1.223E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	72.9704	87.09	122.7173	136.47	68.6578
45.60	82.7768	87.57	122.8402	140.51	0.0000
46.54	81.9877	88.03	122.9582	143.76	69.4136
49.72	0.0000	88.34	96.8917	144.24	68.6157
51.35	83.2067	88.47	96.9174	145.44	83.1620
51.87	72.7863	89.96	97.2147	152.43	88.7168
52.39	63.3895	1093.63	97.3499	153.25	0.0000
52.97	65.6137	91.11	0.0000	323.87	82.4941
53.44	52.9865	92.59	109.3688	156.02	0.0000
54.07	59.4529	93.35	109.5352	158.56	0.0000
57.36	0.0000	94.56	80.9860	159.00	86.5041
57.53	66.4677	94.65	81.0003	162.33	68.6493
57.98	66.5498	94.67	81.0035	162.66	0.0000
59.27	68.9385	94.87	79.4774	163.33	78.3133
59.32	78.6435	97.43	73.6111	165.86	79.4519
59.54	84.0801	98.43	87.0914	176.31	60.1834
60.96	80.7934	98.44	87.0931	176.60	0.0000
61.17	80.8384	99.53	76.6603	177.52	85.9821
62.93	88.4641	100.11	75.5645	181.07	0.0000
63.29	95.8045	102.03	91.2436	181.52	61.4707
63.58	95.8765	103.18	79.5640	184.41	78.6785
64.28	78.5859	103.37	79.5927	143.76	78.8056
66.73	79.0752	105.21	60.7917	193.51	66.8946
67.24	82.4747	105.31	60.8026	197.03	68.0809
125.81	79.2625	106.12	76.4146	198.01	70.8859
67.75	79.2757	106.47	75.2686	201.83	69.3752
69.67	88.5010	109.28	60.0407	203.43	67.6737
70.83	82.8322	111.00	79.4964	205.31	76.9846
72.81	92.1404	111.76	0.0000	210.85	78.3888
72.87	92.1536	114.06	73.8686	215.65	56.5558
74.66	92.5402	116.30	0.0000	222.11	62.5562
74.82	92.5743	116.74	68.1274	227.09	64.7668
74.97	92.6064	119.76	86.8183	227.38	68.5422
77.11	93.0618	121.12	78.4365	228.16	0.0000
78.74	93.4043	121.22	78.4497	228.18	72.3590
79.69	93.6023	121.78	72.3879	116.74	72.3590
80.12	93.6919	122.06	72.4217	235.69	65.3501
80.19	0.0000	122.92	68.8370	235.96	63.9473
80.57	93.7846	123.07	71.3128	238.63	57.9476
81.00	93.8735	265.00	77.5383	238.98	0.0000
81.07	93.8880	125.81	85.6299	240.99	58.0866
81.75	94.0280	127.23	105.6315	242.00	58.1462
83.79	94.4437	127.91	89.2246	244.70	58.3038
84.00	94.4865	129.30	65.8246	252.40	0.0000
85.43	55.0305	131.20	66.0228	252.80	51.0650
86.55	110.3210	133.02	66.6276	254.15	0.0000
86.79	110.3760	133.52	68.7634	256.23	55.1019
86.94	110.4111	136.00	64.4251	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	52.6234	355.39	0.0000	584.27	17.4381
264.80	42.3973	356.01	17.3631	595.83	0.0000
265.00	39.4807	364.49	0.0000	427.87	17.5828
268.22	42.5336	366.42	0.0000	602.52	0.0000
269.46	40.1350	372.51	34.0879	604.72	0.0000
270.03	40.1567	375.05	38.4192	607.14	20.5803
271.23	40.2017	377.52	28.8660	609.32	20.6021
273.65	0.0000	356.01	25.7749	610.33	20.6124
276.40	38.4224	388.16	30.7016	614.28	20.6527
277.37	48.5143	388.63	0.0000	618.01	20.6903
277.60	48.5243	391.69	36.7171	620.36	16.2755
278.00	51.3049	264.66	37.4901	621.93	16.2878
279.20	58.2750	401.81	39.1509	630.19	0.0000
279.54	64.2211	402.40	35.9024	631.29	18.5931
279.70	64.2303	404.85	34.8730	633.25	23.2628
280.46	53.3969	410.95	28.4518	634.78	0.0000
283.69	57.5197	413.71	25.2157	635.95	20.4981
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	46.6825	423.72	0.0000	645.85	18.7219
285.90	0.0000	427.09	17.6976	657.76	18.8269
287.50	35.8228	427.87	22.1334	657.90	0.0000
290.67	47.8984	433.94	31.1092	661.66	27.3486
293.27	0.0000	439.40	31.2186	664.57	0.0000
351.93	50.0926	453.88	20.2537	666.33	0.0000
295.96	50.1251	463.37	23.7686	666.50	0.0000
879.38	50.2380	468.07	25.5396	667.71	0.0000
299.98	50.2991	473.00	0.0000	677.62	14.2497
300.09	50.3042	475.06	22.7979	685.70	0.0000
300.13	50.3052	476.78	30.8090	695.00	0.0000
301.36	40.7900	477.60	20.5496	696.49	23.9510
302.85	42.3546	482.18	26.3298	696.51	23.9510
256.23	40.8996	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	23.0010
306.78	42.4965	497.08	15.0130	697.49	23.0032
308.46	36.4768	505.52	17.4072	702.65	21.1346
311.90	46.7440	507.63	0.0000	706.68	22.1346
316.51	37.7422	511.00	15.7155	711.68	17.3606
319.41	0.0000	514.00	29.7355	720.70	0.0000
320.08	0.0000	514.00	29.7355	721.93	0.0000
321.04	36.8591	520.40	21.9437	722.78	29.4611
323.87	41.0490	520.69	0.0000	722.91	29.4630
325.23	53.4219	522.65	0.0000	723.31	27.9167
328.76	0.0000	527.90	0.0000	724.19	15.5151
333.37	29.4706	528.26	24.6846	727.33	15.5361
333.97	29.4846	529.59	29.1137	733.00	23.3606
334.37	27.9415	529.87	0.0000	735.93	17.5424
338.28	39.4465	531.02	0.0000	333.97	16.5787
338.32	39.4480	537.26	0.0000	739.50	0.0000
311.90	26.5163	546.56	0.0000	747.24	18.6057
340.48	26.5163	552.55	16.0796	748.06	20.5713
340.55	0.0000	563.25	30.5458	752.31	18.6451
344.28	43.8030	569.33	35.1492	753.82	0.0000
345.93	33.4160	946.00	32.4481	756.73	13.7637
351.06	38.7893	569.70	33.3528	756.80	13.7642
351.93	38.8149	583.19	18.8811	884.68	26.6234

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	21.7100	1274.44	12.8895	1620.50	4.0613
766.42	18.7542	1001.03	15.0613	1621.92	3.3854
766.84	15.7959	1002.74	21.5283	1678.03	0.0000
772.60	0.0000	1004.73	15.0797	1690.97	5.1543
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	0.0000
778.90	15.8735	1028.54	0.0000	1063.66	5.2400
783.70	0.0000	1037.84	16.3312	1771.35	8.3859
785.37	14.9203	1038.76	0.0000	1791.20	0.0000
792.07	11.1706	631.29	18.5605	1808.65	6.3369
794.95	10.9839	1048.07	0.0000	1810.72	0.0000
795.86	10.9876	1049.04	9.8339	1836.06	2.1238
810.06	4.8217	1050.41	20.7697		
810.29	6.4295	1063.66	10.9766		
344.28	6.4299	1077.00	0.0000		
810.76	8.0383	1077.34	13.2283		
815.77	0.0000	1085.87	9.9476		
1048.07	0.0000	1093.63	8.8633		
832.01	19.4514	1099.45	11.0992		
834.85	20.2838	1112.07	14.8551		
835.71	20.2905	1112.84	16.0479		
836.80	0.0000	1115.54	14.2758		
846.75	0.0000	1120.29	10.0525		
846.77	12.2260	1120.55	10.0530		
856.80	0.0000	1221.41	10.0552		
860.56	11.2652	1129.67	12.8006		
871.09	13.3658	1131.51	0.0000		
873.19	12.3472	1147.95	0.0000		
875.33	0.0000	1173.23	19.0589		
879.38	17.5318	1177.95	12.7230		
880.51	19.6024	1189.05	22.7930		
883.24	15.4912	1204.77	20.1470		
884.68	9.2994	1221.41	22.0816		
889.28	20.7001	1231.02	15.6827		
894.76	11.4079	1235.36	0.0000		
898.04	13.4979	1238.28	8.3193		
900.72	19.7468	1260.41	0.0000		
903.28	14.5635	1271.87	18.6582		
911.20	10.4321	1274.44	13.0696		
912.08	10.4352	1274.54	14.0032		
923.98	0.0000	1291.59	11.2541		
926.50	12.5863	1298.22	0.0000		
929.11	10.4984	1312.11	0.0000		
937.49	20.0054	1332.49	5.6877		
944.13	0.0000	1362.66	0.0000		
946.00	16.8965	1365.19	6.6917		
949.00	13.7423	1368.63	0.0000		
667.71	0.0000	1384.29	11.5271		
962.31	16.9912	1408.01	1.9326		
964.08	17.0015	1457.56	0.0000		
966.17	17.0132	1460.82	5.8729		
911.20	18.7328	1489.16	3.9418		
968.97	18.7328	1505.03	9.8911		
983.53	0.0000	1584.12	6.7145		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235070.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM11.CNF;517
Background date  : 2-OCT-2016 11:00:34.
Sample date     : 11-DEC-2015 10:10:00 Acquisition date : 3-OCT-2016 06:08:01.
Sample ID      : G405235070 Sample quantity   : 1.45320E+02 GRAM
Detector name   : GAM11 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.53 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity    : 3.00000
Batch ID       : 1596254 Detector SN#    :
Matrix Spike ID : LCS ID           : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.66*	29	106	1.19	93.20	90	8	8.18E-03	65.2	
2	0	63.35*	13	218	0.79	126.60	123	9	3.49E-03	217.5	
3	2	74.90*	100	143	0.88	149.72	146	15	2.79E-02	19.6	2.44E+00
4	2	77.10*	208	112	0.85	154.12	146	15	5.77E-02	10.7	
5	0	87.10	73	134	1.16	174.14	171	7	2.02E-02	28.9	
6	3	89.83	33	42	1.03	179.60	178	12	9.12E-03	27.1	1.26E+00
7	3	92.82*	16	152	1.16	185.58	178	12	4.42E-03	138.0	
8	0	155.71	10	108	1.44	311.46	305	8	2.80E-03	182.1	
9	6	185.88*	100	50	0.92	371.84	366	14	2.77E-02	16.6	2.12E+00
10	6	188.16	24	56	1.57	376.39	366	14	6.56E-03	59.9	
11	0	209.06	35	66	0.95	418.23	415	7	9.85E-03	41.3	
12	9	238.62*	329	57	1.05	477.39	471	19	9.14E-02	6.7	1.94E+00
13	9	241.81	91	88	1.89	483.76	471	19	2.52E-02	27.2	
14	0	270.20	39	57	1.62	540.58	536	9	1.09E-02	38.6	
15	0	291.11	15	46	1.12	582.41	579	7	4.03E-03	81.5	
16	0	295.31*	154	70	1.05	590.82	586	10	4.27E-02	13.1	
17	0	328.14	21	58	0.61	656.53	651	10	5.90E-03	70.2	
18	0	338.55*	42	65	0.82	677.35	675	9	1.18E-02	39.5	
19	0	352.00*	244	45	1.13	704.27	699	12	6.77E-02	8.6	
20	0	424.17	26	33	3.35	848.69	843	12	7.15E-03	48.8	
21	0	467.76	10	60	5.36	935.92	922	16	2.64E-03	184.9	
22	0	511.03*	47	60	2.58	1022.50	1014	20	1.29E-02	47.0	
23	0	564.18	12	17	1.43	1128.85	1122	10	3.38E-03	70.1	
24	0	583.18*	104	25	1.43	1166.86	1159	14	2.90E-02	14.4	
25	0	609.05*	203	30	1.44	1218.62	1211	15	5.63E-02	9.3	
26	0	661.73*	32	33	1.59	1324.04	1317	12	8.82E-03	41.6	
27	0	708.02	8	22	1.11	1416.65	1411	10	2.19E-03	118.1	
28	0	727.64*	37	27	1.58	1455.89	1450	15	1.02E-02	35.1	
29	0	768.99	10	23	1.64	1538.63	1534	9	2.64E-03	95.7	
30	0	803.82*	9	21	2.37	1608.32	1600	12	2.52E-03	110.3	
31	0	832.04	10	10	1.14	1664.77	1661	7	2.82E-03	61.0	
32	0	911.52*	51	32	1.53	1823.77	1816	16	1.42E-02	29.0	
33	0	925.66	13	3	4.39	1852.07	1846	12	3.60E-03	38.6	
34	0	938.05	6	5	0.84	1876.85	1874	6	1.72E-03	68.2	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	954.20	5	11	0.76	1909.16	1902	10	1.41E-03	134.9	
36	0	964.16	27	7	3.99	1929.08	1923	13	7.56E-03	27.3	
37	0	969.01*	35	2	1.43	1938.79	1935	9	9.76E-03	19.7	
38	0	1033.74	15	8	3.09	2068.28	2061	12	4.05E-03	48.5	
39	0	1037.83	11	2	0.57	2076.46	2073	8	2.98E-03	38.4	
40	0	1062.58	6	9	1.60	2125.97	2118	9	1.68E-03	98.4	
41	0	1072.97	14	12	2.24	2146.74	2135	14	3.97E-03	55.4	
42	0	1100.06	8	10	0.72	2200.94	2195	9	2.22E-03	82.3	
43	0	1121.08*	29	21	1.40	2242.98	2235	16	8.00E-03	42.7	
44	0	1238.46	17	26	1.06	2477.77	2471	12	4.71E-03	65.7	
45	0	1307.89	11	0	0.66	2616.64	2611	9	3.06E-03	30.2	
46	0	1333.34*	6	2	1.13	2667.54	2664	7	1.59E-03	63.2	
47	0	1340.33	6	5	1.51	2681.52	2677	7	1.59E-03	78.5	
48	0	1379.10	13	8	1.15	2759.06	2751	11	3.55E-03	51.7	
49	0	1460.97*	310	5	2.03	2922.80	2917	15	8.61E-02	5.9	
50	0	1764.82*	31	10	0.57	3530.44	3524	17	8.51E-03	29.6	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235070.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-DEC-2015 10:10:00 Acquisition date : 3-OCT-2016 06:08:01
Sample ID         : G405235070 Sample quantity   : 145.32 GRAM
Sample type       : SOLID Sample geometry    :
Detector name     : GAMMA11 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.53 0.0%
Energy tolerance  : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error    : 0.00 %
Efficiency type   : Linear Efficiencies at   : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.238E+00	1.167E+01	1.167E+01	11.80	OK
CD-109	88.03	3.70*	6.243E+00	1.014E+00	1.583E+00	117.01	OK
SN-126	64.28	9.60	3.889E+00	2.201E-01	2.201E-01	434.94	OK
	86.94	8.90	6.243E+00	4.215E-01	4.215E-01	117.01	OK
	87.57	37.00*	6.243E+00	1.014E-01	1.014E-01	117.01	OK
BA-137M	661.66	89.90*	2.339E+00	8.096E-02	8.249E-02	83.12	OK
CS-137	661.66	85.10*	2.339E+00	8.553E-02	8.715E-02	83.12	OK
TL-208	277.37	6.60	4.714E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.582E+00	2.579E-01	2.579E-01	28.75	OK
	860.56	12.50	1.907E+00	-----	Line Not Found	-----	Absent
PB-210	46.54	4.25*	1.394E+00	3.323E+00	3.408E+00	130.43	OK
PB-212	74.82	10.28	5.242E+00	5.963E-01	5.963E-01	83.22	OK
	77.11	17.10	5.455E+00	1.434E+00	1.434E+00	21.33	OK
	238.63	43.60*	5.300E+00	8.358E-01	8.358E-01	13.43	OK
	300.09	3.30	4.425E+00	-----	Line Not Found	-----	Absent
BI-214	609.32	45.49*	2.496E+00	9.653E-01	9.657E-01	18.59	OK
	1120.29	14.92	1.547E+00	6.361E-01	6.363E-01	85.47	OK
	1764.49	15.30	1.040E+00	9.388E-01	9.391E-01	59.16	OK
PB-214	74.82	5.80	5.234E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	5.455E+00	2.528E+00	2.529E+00	21.33	OK
	87.09	3.41	6.242E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	5.244E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.483E+00	1.073E+00	1.073E+00	26.29	OK
	351.93	35.60*	3.883E+00	1.001E+00	1.002E+00	17.18	OK
RN-222	609.32	45.49*	2.496E+00	9.653E-01	9.657E-01	18.59	OK
	1120.29	14.92	1.547E+00	6.361E-01	6.363E-01	85.47	OK
	1764.49	15.30	1.040E+00	9.388E-01	9.391E-01	59.16	OK
RA-224	240.99	4.10*	5.247E+00	5.761E-01	5.761E-01	249.15	OK
RA-226	609.32	45.49*	2.496E+00	9.653E-01	9.657E-01	18.59	OK
	1120.29	14.92	1.547E+00	6.361E-01	6.363E-01	85.47	OK
	1764.49	15.30	1.040E+00	9.388E-01	9.391E-01	59.16	OK
AC-228	105.21	1.10	7.023E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.009E+00	5.350E-01	5.350E-01	79.08	OK
	794.95	4.25	2.028E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.951E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.823E+00	5.658E-01	5.658E-01	58.05	OK
	968.97	15.80	1.738E+00	6.622E-01	6.622E-01	39.33	OK
RA-228	105.21	1.10	7.023E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.009E+00	5.350E-01	5.350E-01	79.08	OK
	794.95	4.25	2.028E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.951E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.823E+00	5.658E-01	5.658E-01	58.05	OK
	968.97	15.80	1.738E+00	6.622E-01	6.622E-01	39.33	OK
TH-228	74.82	10.28	5.242E+00	5.963E-01	5.963E-01	83.22	OK
	77.11	17.10	5.455E+00	1.434E+00	1.434E+00	21.33	OK
	238.63	43.60*	5.300E+00	8.358E-01	8.358E-01	13.43	OK
	300.09	3.30	4.425E+00	-----	Line Not Found	-----	Absent
TH-230	609.32	45.49*	2.496E+00	9.653E-01	9.653E-01	18.59	OK
	1120.29	14.92	1.547E+00	6.361E-01	6.361E-01	85.47	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	1764.49	15.30	1.040E+00	9.388E-01	9.388E-01	59.16	OK
TH-232	105.21	1.10	7.023E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.009E+00	5.350E-01	5.350E-01	79.08	OK
	835.71	1.61	1.951E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.823E+00	5.658E-01	5.658E-01	58.05	OK
	968.97	15.80	1.738E+00	6.622E-01	6.622E-01	39.33	OK
TH-234	63.29	3.70*	3.889E+00	5.709E-01	5.709E-01	434.94	OK
	92.59	4.23	6.570E+00	3.632E-01	3.632E-01	276.07	OK
U-234	609.32	45.49*	2.496E+00	9.653E-01	9.653E-01	18.59	OK
	1120.29	14.92	1.547E+00	6.361E-01	6.361E-01	85.47	OK
	1764.49	15.30	1.040E+00	9.388E-01	9.388E-01	59.16	OK
U-235	89.96	3.47	6.410E+00	9.390E-01	9.390E-01	54.30	OK
	93.35	5.60	6.570E+00	2.743E-01	2.743E-01	276.07	OK
	143.76	10.96*	7.059E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	6.731E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.286E+00	1.665E-01	1.665E-01	33.11	OK
	205.31	5.01	5.902E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	3.889E+00	5.709E-01	5.709E-01	434.94	OK
	92.59	4.23	6.570E+00	3.632E-01	3.632E-01	276.07	OK
AM-243	43.53	5.90	9.310E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	5.242E+00	9.122E-02	9.122E-02	83.22	OK
ANH-511	511.00	100.00*	2.868E+00	8.924E-02	8.924E-02	94.03	OK

Flag: "*" = Keyline

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235070.CNF;1
* Acquisition date   : 3-OCT-2016 06:08:01 Sensitivity      : 3.000
* Detector ID       : GAM11 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.53 Half life ratio : *****
* Sample date       : 11-DEC-2015 10:10:00 Analyst initials: MXR1
* Sample ID         : G405235070 Sample Quantity : 1.4532E+02 GRAM
* Batch Number      : 1596254 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 2-AUG-2016 10:31:39 Eff. Geometry : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.167E+01	1.350E+00	5.150E-01
CD-109	1.583E+00	1.816E+00	1.632E+00
SN-126	1.014E-01	1.162E-01	1.050E-01
BA-137M	8.249E-02	6.719E-02	6.223E-02
CS-137	8.715E-02	7.098E-02	6.574E-02
TL-208	2.579E-01	7.266E-02	5.770E-02
PB-210	3.408E+00	4.356E+00	3.737E+00
PB-212	8.358E-01	1.100E-01	7.582E-02
BI-214	9.657E-01	1.759E-01	1.048E-01
PB-214	1.002E+00	1.686E-01	1.004E-01
RN-222	9.657E-01	1.759E-01	1.048E-01
RA-224	5.761E-01	1.407E+00	8.130E-01
RA-226	9.657E-01	1.759E-01	1.048E-01
AC-228	5.658E-01	3.219E-01	2.216E-01
RA-228	5.658E-01	3.219E-01	2.216E-01
TH-228	8.358E-01	1.100E-01	7.582E-02
TH-230	9.653E-01	1.758E-01	1.048E-01
TH-232	5.658E-01	3.219E-01	2.216E-01
TH-234	5.709E-01	2.434E+00	1.789E+00
U-234	9.653E-01	1.758E-01	1.048E-01
U-235	2.754E-02	1.494E-01	2.868E-01
U-238	5.709E-01	2.434E+00	1.789E+00
AM-243	9.122E-02	7.440E-02	7.361E-02
ANH-511	8.924E-02	8.223E-02	4.533E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-3.262E+00	1.117E+01	2.113E+01	NOT IDENT.
NA-22	1.054E-02	3.934E-02	8.378E-02	NOT IDENT.
NA-24	0.000E+00	1.812E+41	0.000E+00	SHORT HLIF
AL-26	-1.122E-03	2.541E-02	5.493E-02	NOT IDENT.
SC-46	4.365E-02	2.870E-01	5.819E-01	FAIL ABUN
V-48	0.000E+00	1.407E+04	0.000E+00	SHORT HLIF

CR-51	0.000E+00	3.008E+02	0.000E+00	SHORT HLIF
MN-54	2.320E-02	6.648E-02	1.209E-01	NOT IDENT.
CO-56	-1.392E-01	3.889E-01	7.029E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.030E-02	3.701E-02	7.277E-02	NOT IDENT.
CO-58	-2.431E-01	4.814E-01	8.474E-01	NOT IDENT.
FE-59	4.693E+00	7.567E+00	1.257E+01	FAIL ABUN
CO-60	2.391E-02	2.964E-02	7.534E-02	FAIL ABUN
ZN-65	3.441E-03	1.700E-01	3.039E-01	NOT IDENT.
GE-68	2.213E-01	2.143E+00	4.279E+00	NOT IDENT.
AS-73	2.370E+00	5.355E+00	1.119E+01	NOT IDENT.
AS-74	0.000E+00	4.364E+03	0.000E+00	SHORT HLIF
SE-75	1.242E-01	1.839E-01	3.612E-01	NOT IDENT.
BR-77	0.000E+00	8.255E+36	0.000E+00	SHORT HLIF
SR-82	0.000E+00	5.995E+02	0.000E+00	SHORT HLIF
RB-83	5.316E-02	5.372E-01	1.076E+00	NOT IDENT.
KR-85	2.996E+00	6.061E+00	1.251E+01	NOT IDENT.
SR-85	3.054E-01	6.203E-01	1.280E+00	NOT IDENT.
RB-86	0.000E+00	2.468E+04	0.000E+00	SHORT HLIF
Y-88	-2.212E-02	2.032E-01	4.180E-01	NOT IDENT.
Y-91	-7.389E+01	4.686E+02	9.109E+02	NOT IDENT.
NB-94	1.224E-02	3.322E-02	6.051E-02	NOT IDENT.
NB-95	1.517E-01	8.418E-01	1.484E+00	NOT IDENT.
NB-95M	-2.286E-01	2.109E+00	3.513E+00	NOT IDENT.
ZR-95	4.511E-02	1.139E+00	2.245E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.255E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	6.357E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.241E+41	0.000E+00	SHORT HLIF
RH-101	-9.025E-03	2.576E-02	4.784E-02	NOT IDENT.
RH-102	-7.239E-03	4.809E-02	9.256E-02	NOT IDENT.
RU-103	-3.861E+00	4.462E+00	7.776E+00	FAIL ABUN
RH-106	2.061E-03	4.354E-01	8.511E-01	NOT IDENT.
RU-106	2.061E-03	4.354E-01	8.511E-01	NOT IDENT.
AG-108M	-1.589E-02	2.096E-02	3.781E-02	NOT IDENT.
AG-110M	-3.045E-02	8.511E-02	1.534E-01	FAIL ABUN
SN-113	-1.898E-01	1.828E-01	3.201E-01	NOT IDENT.
CD-115	0.000E+00	1.252E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	6.644E+04	0.000E+00	SHORT HLIF
TE-123M	4.518E-02	1.029E-01	2.021E-01	NOT IDENT.
SB-124	-1.159E+00	1.580E+00	2.548E+00	NOT IDENT.
SB-125	-1.824E-02	9.016E-02	1.567E-01	NOT IDENT.
TE-125M	1.050E+02	1.958E+02	3.969E+02	NOT IDENT.
I-126	0.000E+00	6.931E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	7.604E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.122E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	3.024E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	8.034E+40	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.761E+26	0.000E+00	SHORT HLIF
BA-133	-1.802E-02	3.626E-02	6.075E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	2.558E-02	4.143E-02	8.824E-02	FAIL ABUN
CS-135	2.486E-02	1.327E-01	2.289E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.353E+05	0.000E+00	SHORT HLIF
CE-139	1.815E-04	9.058E-02	1.701E-01	NOT IDENT.
BA-140	0.000E+00	9.207E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	3.259E+05	0.000E+00	SHORT HLIF
CE-141	-1.480E+01	1.959E+01	3.457E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	-7.716E-02	2.771E-01	5.160E-01	NOT IDENT.
PM-144	5.051E-03	4.876E-02	9.556E-02	NOT IDENT.
PR-144	4.523E-01	4.231E+00	8.296E+00	NOT IDENT.
PM-146	2.999E-02	3.774E-02	8.120E-02	NOT IDENT.
ND-147	0.000E+00	2.493E+07	0.000E+00	SHORT HLIF
PM-147	4.292E+02	6.456E+02	1.310E+03	NOT IDENT.
PM-149	0.000E+00	1.517E+40	0.000E+00	SHORT HLIF
EU-150	1.285E-02	2.188E-02	4.583E-02	FAIL ABUN
EU-152	2.666E-02	7.828E-02	1.560E-01	FAIL ABUN
GD-153	-1.276E-01	1.299E-01	2.318E-01	NOT IDENT.
EU-154	2.362E-02	9.607E-02	2.041E-01	NOT IDENT.
EU-155	6.683E-02	8.250E-02	1.702E-01	FAIL ABUN
TB-160	3.716E-01	1.504E+00	3.064E+00	FAIL ABUN
HO-166M	-6.542E-03	5.000E-02	8.500E-02	FAIL ABUN
TM-171	2.933E+00	1.300E+01	2.678E+01	NOT IDENT.
HF-172	-7.933E-02	1.730E-01	3.184E-01	FAIL ABUN
LU-172	-1.162E-02	6.856E-02	1.257E-01	FAIL ABUN
LU-176	9.543E-03	2.141E-02	4.112E-02	FAIL ABUN

HF-181	-8.376E-01	3.554E+00	6.816E+00	NOT IDENT.
TA-182	6.822E-01	9.614E-01	2.042E+00	FAIL ABUN
RE-183	1.224E+00	2.109E+00	4.370E+00	NOT IDENT.
RE-184	-1.286E+01	2.688E+01	4.680E+01	NOT IDENT.
W-188	8.761E+01	1.399E+02	1.954E+02	FAIL ABUN
IR-192	-2.867E-01	3.905E-01	6.375E-01	FAIL ABUN
HG-203	-1.115E+00	2.170E+00	3.701E+00	NOT IDENT.
BI-207	2.612E-02	5.037E-02	8.917E-02	FAIL ABUN
BI-211	0.000E+00	4.645E-01	7.574E-01	FAIL ABUN
PB-211	2.210E-01	5.519E-01	1.145E+00	FAIL ABUN
BI-212	0.000E+00	9.300E-01	1.280E+00	FAIL ABUN
RN-219	9.000E-02	2.981E-01	6.166E-01	FAIL ABUN
RA-223	8.487E-02	5.232E-01	9.679E-01	FAIL ABUN
AC-227	5.257E-03	2.163E-01	3.951E-01	NOT IDENT.
TH-227	5.257E-03	2.163E-01	3.951E-01	NOT IDENT.
TH-229	-1.258E-01	3.926E-01	7.071E-01	FAIL ABUN
PA-231	-6.136E-02	4.025E-01	7.149E-01	NOT IDENT.
TH-231	8.487E-02	5.232E-01	9.679E-01	FAIL ABUN
PA-233	-2.102E-02	5.476E-02	9.432E-02	NOT IDENT.
PA-234	-2.132E-02	2.438E-01	4.601E-01	FAIL ABUN
PA-234M	3.620E+00	3.540E+00	8.234E+00	NOT IDENT.
NP-237	-2.102E-02	5.476E-02	9.432E-02	NOT IDENT.
NP-238	0.000E+00	9.865E+40	0.000E+00	SHORT HLIF
NP-239	-9.015E-03	1.987E-01	3.800E-01	NOT IDENT.
PU-239	1.468E+02	2.473E+02	4.944E+02	NOT IDENT.
AM-241	6.535E-03	1.112E-01	2.066E-01	NOT IDENT.
CM-243	-7.364E-03	7.517E-02	1.448E-01	NOT IDENT.
BK-247	4.298E-02	6.384E-02	1.257E-01	NOT IDENT.
CM-247	5.901E-04	2.674E-02	5.377E-02	NOT IDENT.
CF-249	2.225E-02	2.870E-02	6.255E-02	NOT IDENT.
CF-251	-9.785E-02	9.424E-02	1.581E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	298	10.66*	1.238E+00	1.167E+01	1.167E+01	11.80
CD-109	88.03	90	3.70*	6.243E+00	2.002E+00	3.128E+00	57.80
SN-126	64.28	16	9.60	3.889E+00	2.201E-01	2.201E-01	434.94
	86.94	90	8.90	6.243E+00	8.325E-01	8.325E-01	57.80
	87.57	90	37.00*	6.243E+00	2.002E-01	2.002E-01	57.80
BA-137M	661.66	33	89.90*	2.339E+00	8.096E-02	8.249E-02	83.12
CS-137	661.66	33	85.10*	2.339E+00	8.553E-02	8.715E-02	83.12
TL-208	277.37	-----	6.60	4.714E+00	-----	Line Not Found	-----
	583.19	110	85.00*	2.582E+00	2.579E-01	2.579E-01	28.75
	860.56	-----	12.50	1.907E+00	-----	Line Not Found	-----
PB-210	46.54	38	4.25*	1.394E+00	3.323E+00	3.408E+00	130.43
BI-211	72.87	-----	1.23	5.033E+00	-----	Line Not Found	-----
	351.06	268	12.92*	3.883E+00	2.759E+00	2.759E+00	17.18
PB-212	74.82	125	10.28	5.242E+00	1.202E+00	1.202E+00	39.12
	77.11	259	17.10	5.455E+00	1.434E+00	1.434E+00	21.33
	238.63	374	43.60*	5.300E+00	8.358E-01	8.358E-01	13.43
	300.09	-----	3.30	4.425E+00	-----	Line Not Found	-----
BI-214	609.32	212	45.49*	2.496E+00	9.653E-01	9.657E-01	18.59
	1120.29	28	14.92	1.547E+00	6.361E-01	6.363E-01	85.47
	1764.49	29	15.30	1.040E+00	9.388E-01	9.391E-01	59.16
PB-214	74.82	125	5.80	5.242E+00	2.130E+00	2.130E+00	39.12
	77.11	259	9.70	5.455E+00	2.528E+00	2.529E+00	21.33
	87.09	90	3.41	6.243E+00	2.173E+00	2.173E+00	57.80
	242.00	103	7.25	5.247E+00	1.398E+00	1.399E+00	54.42
	295.22	171	18.42	4.483E+00	1.073E+00	1.073E+00	26.29
	351.93	268	35.60*	3.883E+00	1.001E+00	1.002E+00	17.18
RN-222	609.32	212	45.49*	2.496E+00	9.653E-01	9.657E-01	18.59
	1120.29	28	14.92	1.547E+00	6.361E-01	6.363E-01	85.47
	1764.49	29	15.30	1.040E+00	9.388E-01	9.391E-01	59.16
RA-224	240.99	103	4.10*	5.247E+00	2.473E+00	2.473E+00	54.42
RA-226	609.32	212	45.49*	2.496E+00	9.653E-01	9.657E-01	18.59
	1120.29	28	14.92	1.547E+00	6.361E-01	6.363E-01	85.47
	1764.49	29	15.30	1.040E+00	9.388E-01	9.391E-01	59.16
AC-228	105.21	-----	1.10	7.023E+00	-----	Line Not Found	-----
	338.32	47	11.27	4.009E+00	5.350E-01	5.350E-01	79.08
	794.95	-----	4.25	2.028E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.951E+00	-----	Line Not Found	-----
	911.20	52	25.80*	1.823E+00	5.658E-01	5.658E-01	58.05
	968.97	35	15.80	1.738E+00	6.622E-01	6.622E-01	39.33
RA-228	105.21	-----	1.10	7.023E+00	-----	Line Not Found	-----
	338.32	47	11.27	4.009E+00	5.350E-01	5.350E-01	79.08
	794.95	-----	4.25	2.028E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.951E+00	-----	Line Not Found	-----
	911.20	52	25.80*	1.823E+00	5.658E-01	5.658E-01	58.05
	968.97	35	15.80	1.738E+00	6.622E-01	6.622E-01	39.33
TH-228	74.82	125	10.28	5.242E+00	1.202E+00	1.202E+00	39.12
	77.11	259	17.10	5.455E+00	1.434E+00	1.434E+00	21.33

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	238.63	374	43.60*	5.300E+00	8.358E-01	8.358E-01	13.43
	300.09	-----	3.30	4.425E+00	-----	Line Not Found	-----
TH-230	609.32	212	45.49*	2.496E+00	9.653E-01	9.653E-01	18.59
	1120.29	28	14.92	1.547E+00	6.361E-01	6.361E-01	85.47
	1764.49	29	15.30	1.040E+00	9.388E-01	9.388E-01	59.16
TH-232	105.21	-----	1.10	7.023E+00	-----	Line Not Found	-----
	338.32	47	11.27	4.009E+00	5.350E-01	5.350E-01	79.08
	835.71	-----	1.61	1.951E+00	-----	Line Not Found	-----
	911.20	52	25.80*	1.823E+00	5.658E-01	5.658E-01	58.05
	968.97	35	15.80	1.738E+00	6.622E-01	6.622E-01	39.33
TH-234	63.29	16	3.70*	3.889E+00	5.709E-01	5.709E-01	434.94
	92.59	20	4.23	6.570E+00	3.632E-01	3.632E-01	276.07
U-234	609.32	212	45.49*	2.496E+00	9.653E-01	9.653E-01	18.59
	1120.29	28	14.92	1.547E+00	6.361E-01	6.361E-01	85.47
	1764.49	29	15.30	1.040E+00	9.388E-01	9.388E-01	59.16
U-235	89.96	40	3.47	6.410E+00	9.390E-01	9.390E-01	54.30
	93.35	20	5.60	6.570E+00	2.743E-01	2.743E-01	276.07
	143.76	-----	10.96*	7.059E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.731E+00	-----	Line Not Found	-----
	185.72	116	57.20	6.286E+00	1.665E-01	1.665E-01	33.11
	205.31	-----	5.01	5.902E+00	-----	Line Not Found	-----
U-238	63.29	16	3.70*	3.889E+00	5.709E-01	5.709E-01	434.94
	92.59	20	4.23	6.570E+00	3.632E-01	3.632E-01	276.07
AM-243	43.53	-----	5.90	9.310E-01	-----	Line Not Found	-----
	74.66	125	67.20*	5.242E+00	1.838E-01	1.838E-01	39.12
ANH-511	511.00	50	100.00*	2.868E+00	8.924E-02	8.924E-02	94.03

Flag: "*" = Keyline

Total number of lines in spectrum 50
 Number of unidentified lines 9
 Number of lines tentatively identified by NID 41 82.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.167E+01	1.167E+01	0.138E+01	11.80	
CD-109	461.40D	1.56	2.002E+00	3.128E+00	1.808E+00	57.80	
SN-126	2.30E+05Y	1.00	2.002E-01	2.002E-01	1.157E-01	57.80	
BA-137M	30.08Y	1.02	8.096E-02	8.249E-02	6.856E-02	83.12	
CS-137	30.08Y	1.02	8.553E-02	8.715E-02	7.243E-02	83.12	
TL-208	1.41E+10Y	1.00	2.579E-01	2.579E-01	0.741E-01	28.75	
PB-210	22.20Y	1.03	3.323E+00	3.408E+00	4.445E+00	130.43	
BI-211	7.04E+08Y	1.00	2.759E+00	2.759E+00	0.474E+00	17.18	
PB-212	1.41E+10Y	1.00	8.358E-01	8.358E-01	1.122E-01	13.43	
BI-214	1600.00Y	1.00	9.653E-01	9.657E-01	1.795E-01	18.59	
PB-214	1600.00Y	1.00	1.001E+00	1.002E+00	0.172E+00	17.18	
RN-222	1600.00Y	1.00	9.653E-01	9.657E-01	1.795E-01	18.59	
RA-224	1.41E+10Y	1.00	2.473E+00	2.473E+00	1.346E+00	54.42	
RA-226	1600.00Y	1.00	9.653E-01	9.657E-01	1.795E-01	18.59	
AC-228	1.41E+10Y	1.00	5.658E-01	5.658E-01	3.284E-01	58.05	
RA-228	1.41E+10Y	1.00	5.658E-01	5.658E-01	3.284E-01	58.05	
TH-228	1.41E+10Y	1.00	8.358E-01	8.358E-01	1.122E-01	13.43	
TH-230	7.54E+04Y	1.00	9.653E-01	9.653E-01	1.794E-01	18.59	
TH-232	1.41E+10Y	1.00	5.658E-01	5.658E-01	3.284E-01	58.05	
TH-234	4.47E+09Y	1.00	5.709E-01	5.709E-01	24.83E-01	434.94	
U-234	2.45E+05Y	1.00	9.653E-01	9.653E-01	1.794E-01	18.59	
U-235	7.04E+08Y	1.00	1.665E-01	1.665E-01	0.551E-01	33.11	K
U-238	4.47E+09Y	1.00	5.709E-01	5.709E-01	24.83E-01	434.94	
AM-243	7370.00Y	1.00	1.838E-01	1.838E-01	0.719E-01	39.12	
ANH-511	1.00E+09Y	1.00	8.924E-02	8.924E-02	8.391E-02	94.03	
Total Activity :			3.363E+01	3.484E+01			

Grand Total Activity : 3.363E+01 3.484E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	155.71	12	127	1.44	311.46	305	8	2.80E-03	****	6.87E+00	T
6	188.16	27	65	1.57	376.39	366	14	6.56E-03	****	6.24E+00	
0	209.06	41	75	0.95	418.23	415	7	9.85E-03	82.6	5.83E+00	
0	270.20	44	64	1.62	540.58	536	9	1.09E-02	77.2	4.81E+00	T
0	291.11	16	51	1.12	582.41	579	7	4.03E-03	****	4.53E+00	T
0	328.14	23	64	0.61	656.53	651	10	5.90E-03	****	4.11E+00	T
0	424.17	28	36	3.35	848.69	843	12	7.15E-03	97.7	3.33E+00	T
0	467.76	10	65	5.36	935.92	922	16	2.64E-03	****	3.08E+00	T
0	564.18	13	18	1.43	1128.85	1122	10	3.38E-03	****	2.65E+00	T
0	708.02	8	23	1.11	1416.65	1411	10	2.19E-03	****	2.22E+00	T
0	727.64	38	28	1.58	1455.89	1450	15	1.02E-02	70.2	2.17E+00	T
0	768.99	10	23	1.64	1538.63	1534	9	2.64E-03	****	2.08E+00	
0	803.82	9	21	2.37	1608.32	1600	12	2.52E-03	****	2.01E+00	
0	832.04	10	10	1.14	1664.77	1661	7	2.82E-03	****	1.96E+00	T
0	925.66	13	3	4.39	1852.07	1846	12	3.60E-03	77.1	1.80E+00	T
0	938.05	6	5	0.84	1876.85	1874	6	1.72E-03	****	1.78E+00	T
0	954.20	5	11	0.76	1909.16	1902	10	1.41E-03	****	1.76E+00	T
0	964.16	27	7	3.99	1929.08	1923	13	7.56E-03	54.6	1.74E+00	T
0	1033.74	15	8	3.09	2068.28	2061	12	4.05E-03	97.0	1.65E+00	
0	1037.83	11	2	0.57	2076.46	2073	8	2.98E-03	76.8	1.65E+00	T
0	1062.58	6	9	1.60	2125.97	2118	9	1.68E-03	****	1.62E+00	T
0	1072.97	14	12	2.24	2146.74	2135	14	3.97E-03	****	1.60E+00	
0	1100.06	8	10	0.72	2200.94	2195	9	2.22E-03	****	1.57E+00	T
0	1238.46	17	25	1.06	2477.77	2471	12	4.71E-03	****	1.43E+00	T
0	1307.89	11	0	0.66	2616.64	2611	9	3.06E-03	60.3	1.36E+00	
0	1333.34	6	2	1.13	2667.54	2664	7	1.59E-03	****	1.34E+00	T
0	1340.33	6	5	1.51	2681.52	2677	7	1.59E-03	****	1.33E+00	
0	1379.10	12	8	1.15	2759.06	2751	11	3.55E-03	****	1.30E+00	

Flags: "T" = Tentatively associated

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235070.CNF;1
* Acquisition date   : 3-OCT-2016 06:08:01 Sensitivity      : 3.000
* Detector ID       : GAM11 Energy tolerance: 1.500
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time: 0 01:00:00.53 Half life ratio : *****
* Sample date       : 11-DEC-2015 10:10:00 Nuclide Library : SOLID
* Sample ID        : G405235070 Analyst initials: MXR1
* Batch Number     : 1596254 Sample Quantity : 1.4532E+02 GRAM
* Wet wt corr      : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 2-AUG-2016 10:31:39 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;14
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.043E-01
CD-109	7.665E-01
SN-126	4.928E-02
BA-137M	2.766E-02
CS-137	2.922E-02
TL-208	2.559E-02
PB-210	1.737E+00
PB-212	3.476E-02
BI-214	4.609E-02
PB-214	4.498E-02
RN-222	4.609E-02
RA-224	3.727E-01
RA-226	4.609E-02
AC-228	9.571E-02
RA-228	9.571E-02
TH-228	3.476E-02
TH-230	4.607E-02
TH-232	9.571E-02
TH-234	8.423E-01
U-234	4.607E-02
U-235	1.339E-01
U-238	8.423E-01
AM-243	3.468E-02
ANH-511	2.016E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	9.479E+00	NOT IDENT.
NA-22	3.561E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.056E-02	NOT IDENT.
SC-46	2.464E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF

MN-54	5.341E-02	NOT IDENT.
CO-56	2.986E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	3.384E-02	NOT IDENT.
CO-58	3.584E-01	NOT IDENT.
FE-59	5.477E+00	FAIL ABUN
CO-60	3.183E-02	FAIL ABUN
ZN-65	1.311E-01	NOT IDENT.
GE-68	1.846E+00	NOT IDENT.
AS-73	5.212E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.665E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.767E-01	NOT IDENT.
KR-85	5.643E+00	NOT IDENT.
SR-85	5.775E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.605E-01	NOT IDENT.
Y-91	3.929E+02	NOT IDENT.
NB-94	2.706E-02	NOT IDENT.
NB-95	6.569E-01	NOT IDENT.
NB-95M	1.620E+00	NOT IDENT.
ZR-95	9.678E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.214E-02	NOT IDENT.
RH-102	4.016E-02	NOT IDENT.
RU-103	3.379E+00	FAIL ABUN
RH-106	3.746E-01	NOT IDENT.
RU-106	3.746E-01	NOT IDENT.
AG-108M	1.647E-02	NOT IDENT.
AG-110M	6.478E-02	FAIL ABUN
SN-113	1.414E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	9.384E-02	NOT IDENT.
SB-124	8.590E-01	NOT IDENT.
SB-125	6.940E-02	NOT IDENT.
TE-125M	1.846E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.718E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.873E-02	FAIL ABUN
CS-135	1.051E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	7.895E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.607E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.389E-01	NOT IDENT.
PM-144	4.216E-02	NOT IDENT.
PR-144	3.660E+00	NOT IDENT.
PM-146	3.672E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	6.104E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.103E-02	FAIL ABUN
EU-152	7.085E-02	FAIL ABUN
GD-153	1.070E-01	NOT IDENT.
EU-154	8.662E-02	NOT IDENT.
EU-155	7.950E-02	FAIL ABUN
TB-160	1.315E+00	FAIL ABUN
HO-166M	3.653E-02	FAIL ABUN
TM-171	1.245E+01	NOT IDENT.
HF-172	1.470E-01	FAIL ABUN
LU-172	5.324E-02	FAIL ABUN
LU-176	1.878E-02	FAIL ABUN
HF-181	3.027E+00	NOT IDENT.

TA-182	9.120E-01	FAIL ABUN
RE-183	2.053E+00	NOT IDENT.
RE-184	2.001E+01	NOT IDENT.
W-188	9.014E+01	FAIL ABUN
IR-192	2.852E-01	FAIL ABUN
HG-203	1.693E+00	NOT IDENT.
BI-207	3.862E-02	FAIL ABUN
BI-211	3.644E-01	FAIL ABUN
PB-211	5.172E-01	FAIL ABUN
BI-212	5.911E-01	FAIL ABUN
RN-219	2.769E-01	FAIL ABUN
RA-223	4.403E-01	FAIL ABUN
AC-227	1.823E-01	NOT IDENT.
TH-227	1.823E-01	NOT IDENT.
TH-229	3.265E-01	FAIL ABUN
PA-231	3.267E-01	NOT IDENT.
TH-231	4.403E-01	FAIL ABUN
PA-233	4.277E-02	NOT IDENT.
PA-234	1.967E-01	FAIL ABUN
PA-234M	3.620E+00	NOT IDENT.
NP-237	4.277E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	1.771E-01	NOT IDENT.
PU-239	2.310E+02	NOT IDENT.
AM-241	9.710E-02	NOT IDENT.
CM-243	6.721E-02	NOT IDENT.
BK-247	5.787E-02	NOT IDENT.
CM-247	2.400E-02	NOT IDENT.
CF-249	2.822E-02	NOT IDENT.
CF-251	7.248E-02	NOT IDENT.

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235070.CNF;1
* Acquisition date   : 3-OCT-2016 06:08:01 Sensitivity      : 3.000
* Detector ID        : GAM11 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.53 Half life ratio  : *****
* Sample date        : 11-DEC-2015 10:10:00 Nuclide Library : SOLID
* Sample ID          : G405235070 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity : 1.4532E+02 GRAM
*                   : Quantity Err(%) : 1.3763E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 2-AUG-2016 10:31:39 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.167E+01	1.481E+00	1.481E+00
CD-109	1.583E+00	1.830E+00	1.830E+00
SN-126	1.014E-01	1.171E-01	1.171E-01
BA-137M	8.249E-02	6.729E-02	6.729E-02
CS-137	8.715E-02	7.108E-02	7.108E-02
TL-208	2.579E-01	7.349E-02	7.349E-02
PB-210	3.408E+00	4.365E+00	4.365E+00
PB-212	8.358E-01	1.185E-01	1.185E-01
BI-214	9.657E-01	1.807E-01	1.807E-01
PB-214	1.002E+00	1.737E-01	1.737E-01
RN-222	9.657E-01	1.807E-01	1.807E-01
RA-224	5.761E-01	1.412E+00	1.412E+00
RA-226	9.657E-01	1.807E-01	1.807E-01
AC-228	5.658E-01	3.232E-01	3.232E-01
RA-228	5.658E-01	3.232E-01	3.232E-01
TH-228	8.358E-01	1.185E-01	1.185E-01
TH-230	9.653E-01	1.807E-01	1.807E-01
TH-232	5.658E-01	3.232E-01	3.232E-01
TH-234	5.709E-01	2.437E+00	2.437E+00
U-234	9.653E-01	1.807E-01	1.807E-01
U-235	2.754E-02	1.494E-01	1.494E-01
U-238	5.709E-01	2.437E+00	2.437E+00
AM-243	9.122E-02	7.553E-02	7.553E-02
ANH-511	8.924E-02	8.231E-02	8.231E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-3.262E+00	1.117E+01	1.127E+01	NOT IDENT.
NA-22	1.054E-02	3.934E-02	3.962E-02	NOT IDENT.
NA-24	1.000E+41	1.862E+41	0.000E+00	SHORT HLIF
AL-26	-1.122E-03	2.541E-02	2.541E-02	NOT IDENT.
SC-46	4.365E-02	2.870E-01	2.877E-01	FAIL ABUN
V-48	-7.055E+03	1.408E+04	1.443E+04	SHORT HLIF

CR-51	7.217E+01	3.008E+02	3.026E+02	SHORT HLIF
MN-54	2.320E-02	6.649E-02	6.731E-02	NOT IDENT.
CO-56	-1.392E-01	3.889E-01	3.939E-01	FAIL ABUN
MN-56	-1.000E+41	2.729E+41	0.000E+00	SHORT HLIF
CO-57	1.030E-02	3.701E-02	3.730E-02	NOT IDENT.
CO-58	-2.431E-01	4.815E-01	4.938E-01	NOT IDENT.
FE-59	4.693E+00	7.574E+00	7.864E+00	FAIL ABUN
CO-60	2.391E-02	2.965E-02	3.155E-02	FAIL ABUN
ZN-65	3.441E-03	1.700E-01	1.700E-01	NOT IDENT.
GE-68	2.213E-01	2.143E+00	2.145E+00	NOT IDENT.
AS-73	2.370E+00	5.377E+00	5.482E+00	NOT IDENT.
AS-74	-4.752E+03	4.382E+03	4.878E+03	SHORT HLIF
SE-75	1.242E-01	1.840E-01	1.923E-01	NOT IDENT.
BR-77	6.274E+37	5.376E+38	0.000E+00	SHORT HLIF
SR-82	6.995E+01	5.995E+02	6.003E+02	SHORT HLIF
RB-83	5.316E-02	5.372E-01	5.378E-01	NOT IDENT.
KR-85	2.996E+00	6.062E+00	6.211E+00	NOT IDENT.
SR-85	3.054E-01	6.205E-01	6.356E-01	NOT IDENT.
RB-86	-5.303E+03	2.468E+04	2.480E+04	SHORT HLIF
Y-88	-2.212E-02	2.032E-01	2.035E-01	NOT IDENT.
Y-91	-7.389E+01	4.686E+02	4.698E+02	NOT IDENT.
NB-94	1.224E-02	3.322E-02	3.368E-02	NOT IDENT.
NB-95	1.517E-01	8.418E-01	8.446E-01	NOT IDENT.
NB-95M	-2.286E-01	2.109E+00	2.112E+00	NOT IDENT.
ZR-95	4.511E-02	1.139E+00	1.139E+00	NOT IDENT.
NB-97	-1.000E+41	2.188E+42	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.256E+41	0.000E+00	SHORT HLIF
MO-99	1.326E+31	6.357E+31	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.244E+41	0.000E+00	SHORT HLIF
RH-101	-9.025E-03	2.582E-02	2.614E-02	NOT IDENT.
RH-102	-7.239E-03	4.810E-02	4.821E-02	NOT IDENT.
RU-103	-3.861E+00	4.466E+00	4.793E+00	FAIL ABUN
RH-106	2.061E-03	4.354E-01	4.354E-01	NOT IDENT.
RU-106	2.061E-03	4.354E-01	4.354E-01	NOT IDENT.
AG-108M	-1.589E-02	2.097E-02	2.216E-02	NOT IDENT.
AG-110M	-3.045E-02	8.513E-02	8.623E-02	FAIL ABUN
SN-113	-1.898E-01	1.829E-01	2.020E-01	NOT IDENT.
CD-115	1.650E+38	1.252E+39	0.000E+00	SHORT HLIF
SN-117M	1.083E+04	6.645E+04	6.663E+04	SHORT HLIF
TE-123M	4.518E-02	1.029E-01	1.049E-01	NOT IDENT.
SB-124	-1.159E+00	1.581E+00	1.665E+00	NOT IDENT.
SB-125	-1.824E-02	9.016E-02	9.054E-02	NOT IDENT.
TE-125M	1.050E+02	1.959E+02	2.016E+02	NOT IDENT.
I-126	3.378E+05	6.946E+05	7.111E+05	SHORT HLIF
SB-126	2.028E+05	7.614E+05	7.669E+05	SHORT HLIF
SB-127	-1.127E+21	1.132E+22	0.000E+00	SHORT HLIF
I-131	-3.540E+08	3.024E+09	3.028E+09	SHORT HLIF
I-132	-1.000E+41	1.831E+42	0.000E+00	SHORT HLIF
TE-132	-2.052E+25	1.763E+26	0.000E+00	SHORT HLIF
BA-133	-1.802E-02	3.627E-02	3.717E-02	NOT IDENT.
I-133	1.000E+41	2.945E+41	0.000E+00	SHORT HLIF
CS-134	2.558E-02	4.144E-02	4.302E-02	FAIL ABUN
CS-135	2.486E-02	1.327E-01	1.332E-01	NOT IDENT.
I-135	1.000E+41	7.219E+41	0.000E+00	SHORT HLIF
CS-136	-2.431E+04	2.353E+05	2.355E+05	SHORT HLIF
CE-139	1.815E-04	9.058E-02	9.058E-02	NOT IDENT.
BA-140	2.953E+05	9.207E+05	9.303E+05	SHORT HLIF
LA-140	-3.335E+05	3.262E+05	3.592E+05	SHORT HLIF
CE-141	-1.480E+01	1.960E+01	2.070E+01	NOT IDENT.
CE-143	1.000E+41	2.702E+41	0.000E+00	SHORT HLIF
CE-144	-7.716E-02	2.772E-01	2.793E-01	NOT IDENT.
PM-144	5.051E-03	4.876E-02	4.881E-02	NOT IDENT.
PR-144	4.523E-01	4.231E+00	4.236E+00	NOT IDENT.
PM-146	2.999E-02	3.781E-02	4.015E-02	NOT IDENT.
ND-147	2.274E+06	2.493E+07	2.495E+07	SHORT HLIF
PM-147	4.292E+02	6.459E+02	6.743E+02	NOT IDENT.
PM-149	-1.717E+39	1.517E+40	0.000E+00	SHORT HLIF
EU-150	1.285E-02	2.189E-02	2.264E-02	FAIL ABUN
EU-152	2.666E-02	7.830E-02	7.921E-02	FAIL ABUN
GD-153	-1.276E-01	1.301E-01	1.423E-01	NOT IDENT.
EU-154	2.362E-02	9.607E-02	9.666E-02	NOT IDENT.
EU-155	6.683E-02	8.264E-02	8.796E-02	FAIL ABUN
TB-160	3.716E-01	1.504E+00	1.513E+00	FAIL ABUN
HO-166M	-6.542E-03	5.000E-02	5.009E-02	FAIL ABUN
TM-171	2.933E+00	1.300E+01	1.307E+01	NOT IDENT.
HF-172	-7.933E-02	1.734E-01	1.771E-01	FAIL ABUN
LU-172	-1.162E-02	6.857E-02	6.877E-02	FAIL ABUN
LU-176	9.543E-03	2.141E-02	2.184E-02	FAIL ABUN

HF-181	-8.376E-01	3.554E+00	3.574E+00	NOT IDENT.
TA-182	6.822E-01	9.618E-01	1.010E+00	FAIL ABUN
RE-183	1.224E+00	2.117E+00	2.188E+00	NOT IDENT.
RE-184	-1.286E+01	2.706E+01	2.767E+01	NOT IDENT.
W-188	8.761E+01	1.403E+02	1.457E+02	FAIL ABUN
IR-192	-2.867E-01	3.907E-01	4.115E-01	FAIL ABUN
HG-203	-1.115E+00	2.171E+00	2.228E+00	NOT IDENT.
BI-207	2.612E-02	5.038E-02	5.174E-02	FAIL ABUN
BI-211	2.759E+00	4.806E-01	1.334E+00	FAIL ABUN
PB-211	2.210E-01	5.520E-01	5.609E-01	FAIL ABUN
BI-212	1.353E+00	9.325E-01	1.114E+00	FAIL ABUN
RN-219	9.000E-02	2.983E-01	3.010E-01	FAIL ABUN
RA-223	8.487E-02	5.232E-01	5.246E-01	FAIL ABUN
AC-227	5.257E-03	2.163E-01	2.163E-01	NOT IDENT.
TH-227	5.257E-03	2.163E-01	2.163E-01	NOT IDENT.
TH-229	-1.258E-01	3.926E-01	3.967E-01	FAIL ABUN
PA-231	-6.136E-02	4.027E-01	4.036E-01	NOT IDENT.
TH-231	8.487E-02	5.232E-01	5.246E-01	FAIL ABUN
PA-233	-2.102E-02	5.476E-02	5.558E-02	NOT IDENT.
PA-234	-2.132E-02	2.450E-01	2.452E-01	FAIL ABUN
PA-234M	3.620E+00	3.544E+00	3.902E+00	NOT IDENT.
NP-237	-2.102E-02	5.476E-02	5.558E-02	NOT IDENT.
NP-238	1.000E+41	9.873E+40	0.000E+00	SHORT HLIF
NP-239	-9.015E-03	1.987E-01	1.988E-01	NOT IDENT.
PU-239	1.468E+02	2.474E+02	2.561E+02	NOT IDENT.
AM-241	6.535E-03	1.112E-01	1.113E-01	NOT IDENT.
CM-243	-7.364E-03	7.518E-02	7.525E-02	NOT IDENT.
BK-247	4.298E-02	6.442E-02	6.728E-02	NOT IDENT.
CM-247	5.901E-04	2.674E-02	2.674E-02	NOT IDENT.
CF-249	2.225E-02	2.876E-02	3.046E-02	NOT IDENT.
CF-251	-9.785E-02	9.487E-02	1.046E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	47.0761	87.09	78.9628	136.47	70.7562
45.60	50.7767	87.57	79.0416	140.51	0.0000
46.54	57.7182	88.03	79.1166	143.76	52.8685
49.72	0.0000	88.34	79.1666	144.24	63.2795
51.35	64.5970	88.47	79.1877	145.44	75.8605
51.87	64.6957	89.96	75.6464	152.43	75.5706
52.39	54.4269	1093.63	75.7501	153.25	0.0000
52.97	49.3262	91.11	0.0000	323.87	51.5578
53.44	51.9926	92.59	76.0468	156.02	0.0000
54.07	61.6353	93.35	76.1609	158.56	0.0000
57.36	0.0000	94.56	72.5256	159.00	47.6621
57.53	71.8754	94.65	72.5384	162.33	57.4525
57.98	67.5750	94.67	72.5413	162.66	0.0000
59.27	87.1854	94.87	61.1113	163.33	59.6598
59.32	87.1972	97.43	69.0919	165.86	55.5848
59.54	79.9044	98.43	47.1106	176.31	46.5890
60.96	74.3085	98.44	47.1117	176.60	0.0000
61.17	74.3495	99.53	52.9900	177.52	61.8515
62.93	87.1388	100.11	54.9770	181.07	0.0000
63.29	87.2196	102.03	53.2389	181.52	53.8003
63.58	87.2842	103.18	63.0526	184.41	50.3434
64.28	87.4403	103.37	58.2230	143.76	50.4241
66.73	73.0171	105.21	49.6564	193.51	55.3230
67.24	70.7119	105.31	49.6654	197.03	58.8850
125.81	82.7868	106.12	57.5407	198.01	58.9521
67.75	81.0008	106.47	60.5048	201.83	58.0945
69.67	84.0932	109.28	48.0590	203.43	61.5586
70.83	92.4873	111.00	54.1079	205.31	56.8299
72.81	103.2444	111.76	0.0000	210.85	54.1736
72.87	103.2591	114.06	67.2534	215.65	39.7109
74.66	88.7447	116.30	0.0000	222.11	51.4140
74.82	88.7773	116.74	63.5874	227.09	51.6859
74.97	88.8084	119.76	61.9134	227.38	55.1484
77.11	89.2406	121.12	49.0419	228.16	0.0000
78.74	89.5662	121.22	49.0497	228.18	47.1454
79.69	66.6216	121.78	53.1027	116.74	47.1454
80.12	76.5640	122.06	53.1274	235.69	49.4440
80.19	0.0000	122.92	64.2441	235.96	46.3666
80.57	76.6397	123.07	64.2598	238.63	40.6813
81.00	65.5761	265.00	58.2934	238.98	0.0000
81.07	65.5858	125.81	57.4858	240.99	40.7780
81.75	69.4007	127.23	58.6270	242.00	40.8191
83.79	74.6838	127.91	57.6788	244.70	42.0991
84.00	69.7357	129.30	54.7630	252.40	0.0000
85.43	79.9388	131.20	71.2016	252.80	31.8260
86.55	78.8743	133.02	56.1028	254.15	0.0000
86.79	78.9134	133.52	58.1872	256.23	47.3059
86.94	78.9384	136.00	62.5079	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	34.5720	355.39	0.0000	584.27	20.7120
264.80	34.5764	356.01	32.1663	595.83	0.0000
265.00	33.3910	364.49	0.0000	427.87	23.8652
268.22	38.2754	366.42	0.0000	602.52	0.0000
269.46	32.3319	372.51	26.0474	604.72	19.4302
270.03	32.3492	375.05	28.7045	607.14	17.9575
271.23	38.3818	377.52	24.3986	609.32	17.9766
273.65	0.0000	356.01	30.6357	610.33	17.9854
276.40	30.1277	388.16	18.4374	614.28	18.0205
277.37	41.0100	388.63	0.0000	618.01	26.0762
277.60	42.2247	391.69	33.4448	620.36	20.0822
278.00	43.4476	264.66	20.3683	621.93	18.0872
279.20	45.9101	401.81	22.1573	630.19	0.0000
279.54	36.2567	402.40	23.0526	631.29	16.1504
279.70	36.2613	404.85	23.9793	633.25	14.1447
280.46	27.8193	410.95	33.8878	634.78	0.0000
283.69	35.1783	413.71	24.1227	635.95	18.2095
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	29.1577	423.72	0.0000	645.85	16.2617
285.90	0.0000	427.09	32.4478	657.76	18.3962
287.50	34.0797	427.87	22.9958	657.90	0.0000
290.67	42.3114	433.94	24.4440	661.66	21.5007
293.27	0.0000	439.40	20.8952	664.57	0.0000
351.93	37.5771	453.88	19.2526	666.33	0.0000
295.96	37.6015	463.37	23.0540	666.50	0.0000
879.38	47.5179	468.07	30.5186	667.71	0.0000
299.98	38.1417	473.00	0.0000	677.62	10.3133
300.09	38.1445	475.06	27.8613	685.70	0.0000
300.13	38.1464	476.78	26.9603	695.00	0.0000
301.36	40.6498	477.60	29.7637	696.49	17.6807
302.85	37.0010	482.18	24.2491	696.51	17.6814
256.23	29.6426	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	19.7685
306.78	29.6990	497.08	25.4020	697.49	22.8916
308.46	33.4583	505.52	25.5251	702.65	18.7720
311.90	38.5258	507.63	0.0000	706.68	13.5813
316.51	36.1765	511.00	21.8112	711.68	14.1345
319.41	0.0000	514.00	21.8479	720.70	0.0000
320.08	0.0000	514.00	21.8479	721.93	0.0000
321.04	35.0590	520.40	19.0666	722.78	15.7800
323.87	31.3736	520.69	0.0000	722.91	17.3594
325.23	30.1516	522.65	0.0000	723.31	15.7837
328.76	0.0000	527.90	0.0000	724.19	9.4739
333.37	32.8761	528.26	19.1496	727.33	13.7030
333.97	32.0486	529.59	20.1224	733.00	14.2641
334.37	33.4085	529.87	0.0000	735.93	9.5211
338.28	34.2724	531.02	0.0000	333.97	11.6445
338.32	34.2732	537.26	0.0000	739.50	0.0000
311.90	35.6024	546.56	0.0000	747.24	10.6295
340.48	35.6024	552.55	22.3131	748.06	5.3166
340.55	0.0000	563.25	20.4882	752.31	12.7822
344.28	27.5451	569.33	23.4893	753.82	0.0000
345.93	29.7933	946.00	18.5980	756.73	12.8057
351.06	24.7826	569.70	19.5784	756.80	12.8062
351.93	24.7992	583.19	20.7001	884.68	11.2383

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	17.6736	1274.44	5.8270	1620.50	4.1279
766.42	24.1068	1001.03	7.8788	1621.92	3.0970
766.84	20.8957	1002.74	15.7665	1678.03	0.0000
772.60	0.0000	1004.73	13.1470	1690.97	5.2386
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	5.3192
778.90	13.9987	1028.54	0.0000	1063.66	5.1123
783.70	0.0000	1037.84	7.0869	1771.35	5.1135
785.37	8.6370	1038.76	0.0000	1791.20	0.0000
792.07	12.9902	631.29	9.7720	1808.65	3.2199
794.95	7.5865	1048.07	0.0000	1810.72	0.0000
795.86	10.8415	1049.04	13.3356	1836.06	4.3167
810.06	13.0825	1050.41	9.7834		
810.29	17.4453	1063.66	7.1450		
344.28	17.4460	1077.00	0.0000		
810.76	15.2675	1077.34	12.3005		
815.77	0.0000	1085.87	10.7915		
1048.07	0.0000	1093.63	12.0190		
832.01	14.2933	1099.45	11.7392		
834.85	14.8596	1112.07	11.7844		
835.71	11.5613	1112.84	14.5068		
836.80	0.0000	1115.54	13.0667		
846.75	0.0000	1120.29	10.9043		
846.77	14.3737	1120.55	10.9050		
856.80	0.0000	1221.41	10.9080		
860.56	15.5597	1129.67	10.0238		
871.09	17.8516	1131.51	0.0000		
873.19	13.3989	1147.95	0.0000		
875.33	0.0000	1173.23	14.7666		
879.38	10.0723	1177.95	10.1655		
880.51	8.9567	1189.05	14.8340		
883.24	10.0862	1204.77	14.8994		
884.68	13.4556	1221.41	14.9688		
889.28	8.9854	1231.02	15.0088		
894.76	13.5044	1235.36	0.0000		
898.04	11.2671	1238.28	18.7988		
900.72	18.0449	1260.41	0.0000		
903.28	16.9324	1271.87	8.5369		
911.20	13.5840	1274.44	8.5430		
912.08	13.5884	1274.54	8.5430		
923.98	0.0000	1291.59	11.4426		
926.50	6.8289	1298.22	0.0000		
929.11	11.9612	1312.11	0.0000		
937.49	13.7100	1332.49	5.7828		
944.13	0.0000	1362.66	0.0000		
946.00	12.6042	1365.19	7.7754		
949.00	13.7642	1368.63	0.0000		
667.71	0.0000	1384.29	1.9531		
962.31	10.3704	1408.01	6.8765		
964.08	12.1060	1457.56	0.0000		
966.17	0.0000	1460.82	4.9753		
911.20	10.3934	1489.16	3.0051		
968.97	10.3934	1505.03	4.0217		
983.53	0.0000	1584.12	9.2137		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235071.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM01.CNF;402
Background date : 2-OCT-2016 10:59:55.
Sample date      : 11-DEC-2015 10:25:00 Acquisition date : 3-OCT-2016 06:45:24.
Sample ID       : G405235071 Sample quantity : 1.49695E+02 GRAM
Detector name   : GAM01 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.34 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596254 Detector SN# :
Matrix Spike ID : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	35.40*	6	43	1.35	71.50	67	9	1.69E-03	223.1	
2	0	63.01*	18	124	0.92	126.71	123	9	4.98E-03	119.5	
3	2	74.91	91	143	1.45	150.50	144	19	2.52E-02	26.9	2.72E+00
4	2	77.18*	142	119	1.12	155.06	144	19	3.94E-02	15.4	
5	0	87.26	58	91	0.99	175.21	173	6	1.62E-02	28.9	
6	0	93.35*	36	204	1.18	187.38	181	11	9.97E-03	83.6	
7	0	109.02	46	109	1.12	218.73	214	11	1.28E-02	46.7	
8	0	127.83	13	116	0.66	256.35	253	10	3.74E-03	151.7	
9	0	144.45*	45	138	4.23	289.57	285	13	1.25E-02	56.5	
10	0	185.91*	44	112	1.19	372.49	368	9	1.23E-02	48.9	
11	0	210.30	31	106	1.02	421.27	415	11	8.60E-03	67.1	
12	3	238.68*	260	60	1.22	478.02	472	18	7.23E-02	8.0	1.39E+00
13	3	241.72*	97	69	1.80	484.11	472	18	2.69E-02	23.3	
14	0	295.31*	99	75	1.19	591.28	586	11	2.75E-02	19.9	
15	0	302.16	28	83	0.75	604.96	597	15	7.83E-03	74.0	
16	0	323.36	13	45	1.01	647.35	643	8	3.65E-03	93.2	
17	0	339.39*	34	88	1.08	679.40	673	13	9.49E-03	60.0	
18	0	351.99*	209	44	1.05	704.61	699	12	5.81E-02	9.6	
19	0	439.77	18	26	3.21	880.13	873	13	4.94E-03	63.8	
20	5	485.75	20	2	2.40	972.09	968	19	5.53E-03	30.2	1.13E+00
21	5	490.62	18	11	2.40	981.82	968	19	5.03E-03	40.1	
22	0	511.30*	15	38	1.20	1023.17	1017	12	4.29E-03	102.5	
23	0	525.23	18	25	0.97	1051.02	1046	11	4.93E-03	61.3	
24	0	565.74*	37	28	1.87	1132.02	1123	16	1.02E-02	37.5	
25	0	583.25*	73	9	1.01	1167.04	1163	9	2.02E-02	14.5	
26	0	604.89	11	10	1.06	1210.31	1207	7	3.16E-03	55.1	
27	0	609.30*	129	25	1.25	1219.12	1214	12	3.59E-02	11.9	
28	0	662.51	31	15	4.18	1325.51	1320	12	8.74E-03	30.3	
29	0	684.91	11	18	1.04	1370.31	1366	10	3.07E-03	77.1	
30	0	727.80	24	27	1.95	1456.08	1451	11	6.78E-03	46.1	
31	0	769.50	27	33	1.24	1539.45	1532	14	7.53E-03	49.8	
32	0	777.65*	5	9	1.83	1555.74	1549	9	1.42E-03	121.9	
33	0	785.41	15	10	3.84	1571.25	1563	13	4.22E-03	49.6	
34	0	840.23	18	5	1.63	1680.86	1676	9	4.86E-03	32.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	873.82	8	11	0.58	1748.02	1744	9	2.27E-03	81.3	
36	0	904.15*	16	10	0.80	1808.67	1804	11	4.42E-03	44.3	
37	2	907.76	13	2	1.65	1815.89	1814	17	3.54E-03	26.1	1.01E+00
38	2	911.34*	63	6	1.88	1823.03	1814	17	1.76E-02	15.4	
39	0	933.57	13	4	0.52	1867.48	1863	8	3.66E-03	37.9	
40	0	969.81	45	11	1.58	1939.93	1932	16	1.26E-02	22.5	
41	0	1120.46*	49	4	1.47	2241.12	2235	14	1.36E-02	16.7	
42	0	1284.19	6	3	1.38	2568.46	2565	6	1.76E-03	58.0	
43	0	1460.65*	264	9	1.86	2921.21	2915	15	7.33E-02	6.6	
44	0	1599.00*	6	3	1.37	3197.77	3191	9	1.60E-03	68.2	
45	0	1660.72	7	0	0.55	3321.14	3318	7	1.94E-03	37.8	
46	0	1764.46*	38	0	1.61	3528.51	3523	10	1.07E-02	16.9	

Flag: "*" = Peak area was modified by background subtraction

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235071.CNF;1
 Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
 Sample title : MXR1
 Sample date : 11-DEC-2015 10:25:00 Acquisition date : 3-OCT-2016 06:45:24
 Sample ID : G405235071 Sample quantity : 149.70 GRAM
 Sample type : SOLID Sample geometry :
 Detector name : GAMMA1 Detector geometry: CAN
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.34 0.0%
 Energy tolerance : 1.50 keV Half life ratio : 10.00
 Errors propagated: No Systematic Error : 0.00 %
 Efficiency type : Linear Efficiencies at : Peak Energy
 Abundance limit : 75.00

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	9.709E-01	1.233E+01	1.233E+01	13.29	OK
CD-109	88.03	3.70*	4.584E+00	1.421E+00	2.220E+00	90.72	OK
TE-125M	109.28	0.27*	5.636E+00	1.879E+01	6.772E+02	93.47	OK
SN-126	64.28	9.60	2.269E+00	5.335E-01	5.335E-01	239.02	OK
	86.94	8.90	4.584E+00	5.909E-01	5.909E-01	90.72	OK
	87.57	37.00*	4.584E+00	1.421E-01	1.421E-01	90.72	OK
BA-137M	661.66	89.90*	1.881E+00	9.767E-02	9.951E-02	60.65	OK
CS-137	661.66	85.10*	1.881E+00	1.032E-01	1.051E-01	60.65	OK
CE-141	145.44	48.29*	5.863E+00	7.637E-02	4.284E+01	144.09	OK
TL-208	277.37	6.60	3.944E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.090E+00	2.173E-01	2.173E-01	29.01	OK
	860.56	12.50	1.520E+00	----- Line	Not Found	-----	Absent
BI-211	72.87	1.23	3.328E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.216E+00	5.613E-01	5.613E-01	186.04	OK
BI-212	727.33	6.67*	1.742E+00	1.092E+00	1.092E+00	92.27	OK
	785.37	1.10	1.637E+00	4.351E+00	4.351E+00	99.20	OK
	1620.50	1.47	8.816E-01	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	3.531E+00	1.134E+00	1.134E+00	77.41	OK
	77.11	17.10	3.749E+00	1.410E+00	1.410E+00	30.81	OK
	238.63	43.60*	4.454E+00	7.749E-01	7.749E-01	15.95	OK
	300.09	3.30	3.690E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.015E+00	7.458E-01	7.460E-01	23.71	OK
	1120.29	14.92	1.223E+00	1.338E+00	1.338E+00	33.36	OK
	1764.49	15.30	8.116E-01	1.466E+00	1.467E+00	33.76	OK
PB-214	74.82	5.80	3.522E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.749E+00	2.486E+00	2.487E+00	30.81	OK
	87.09	3.41	4.572E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.406E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.740E+00	8.162E-01	8.165E-01	39.79	OK
	351.93	35.60*	3.216E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.015E+00	7.458E-01	7.460E-01	23.71	OK
	1120.29	14.92	1.223E+00	1.338E+00	1.338E+00	33.36	OK
	1764.49	15.30	8.116E-01	1.466E+00	1.467E+00	33.76	OK
RA-224	240.99	4.10*	4.410E+00	1.654E+00	1.654E+00	93.84	OK
RA-226	609.32	45.49*	2.015E+00	7.458E-01	7.460E-01	23.71	OK
	1120.29	14.92	1.223E+00	1.338E+00	1.338E+00	33.36	OK
	1764.49	15.30	8.116E-01	1.466E+00	1.467E+00	33.76	OK
AC-228	105.21	1.10	5.519E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.319E+00	5.115E-01	5.115E-01	119.92	OK
	794.95	4.25	1.621E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.557E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.451E+00	8.606E-01	8.606E-01	30.88	OK
	968.97	15.80	1.379E+00	1.052E+00	1.052E+00	44.96	OK
RA-228	105.21	1.10	5.519E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.319E+00	5.115E-01	5.115E-01	119.92	OK
	794.95	4.25	1.621E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.557E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.451E+00	8.606E-01	8.606E-01	30.88	OK
	968.97	15.80	1.379E+00	1.052E+00	1.052E+00	44.96	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	74.82	10.28	3.531E+00	1.134E+00	1.134E+00	77.41	OK
	77.11	17.10	3.749E+00	1.410E+00	1.410E+00	30.81	OK
	238.63	43.60*	4.454E+00	7.749E-01	7.749E-01	15.95	OK
	300.09	3.30	3.690E+00	-----	Line Not Found	-----	Absent
TH-230	609.32	45.49*	2.015E+00	7.458E-01	7.458E-01	23.71	OK
	1120.29	14.92	1.223E+00	1.338E+00	1.338E+00	33.36	OK
	1764.49	15.30	8.116E-01	1.466E+00	1.466E+00	33.76	OK
PA-231	283.69	1.70	3.870E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	3.668E+00	8.130E-01	8.130E-01	147.90	OK
TH-232	105.21	1.10	5.519E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.319E+00	5.115E-01	5.115E-01	119.92	OK
	835.71	1.61	1.557E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.451E+00	8.606E-01	8.606E-01	30.88	OK
TH-234	968.97	15.80	1.379E+00	1.052E+00	1.052E+00	44.96	OK
	63.29	3.70*	2.269E+00	1.384E+00	1.384E+00	239.02	OK
U-234	92.59	4.23	4.978E+00	1.070E+00	1.070E+00	167.26	OK
	609.32	45.49*	2.015E+00	7.458E-01	7.458E-01	23.71	OK
	1120.29	14.92	1.223E+00	1.338E+00	1.338E+00	33.36	OK
U-235	1764.49	15.30	8.116E-01	1.466E+00	1.466E+00	33.76	OK
	89.96	3.47	4.769E+00	-----	Line Not Found	-----	Absent
	93.35	5.60	4.978E+00	8.079E-01	8.079E-01	167.26	OK
	143.76	10.96*	5.868E+00	-----	Line Not Found	-----	<<INT Reject
U-238	163.33	5.08	5.647E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	5.294E+00	8.622E-02	8.622E-02	97.79	OK
	205.31	5.01	4.973E+00	-----	Line Not Found	-----	Absent
	63.29	3.70*	2.269E+00	1.384E+00	1.384E+00	239.02	OK
AM-243	92.59	4.23	4.978E+00	1.070E+00	1.070E+00	167.26	OK
	43.53	5.90	3.822E-01	-----	Line Not Found	-----	Absent
ANH-511	74.66	67.20*	3.531E+00	1.735E-01	1.735E-01	77.41	OK
	511.00	100.00*	2.333E+00	3.569E-02	3.569E-02	205.07	OK

Flag: "*" = Keyline

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235071.CNF;1
* Acquisition date   : 3-OCT-2016 06:45:24 Sensitivity      : 3.000
* Detector ID       : GAM01 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.34 Half life ratio : *****
* Sample date       : 11-DEC-2015 10:25:00 Analyst initials: MXR1
* Sample ID        : G405235071 Sample Quantity : 1.4970E+02 GRAM
* Batch Number     : 1596254 Wet Weight : 0.00000
* Wet wt corr      : 1.00000 Dry Weight : 0.00000
* Nuclide Library  : SOLID.NLB;6
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 20-JUL-2016 07:03:55 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM01_CAN.CNF;9
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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.233E+01	1.605E+00	6.186E-01
CD-109	2.220E+00	1.974E+00	2.628E+00
TE-125M	6.772E+02	6.203E+02	5.226E+02
SN-126	1.421E-01	1.264E-01	1.548E-01
BA-137M	9.951E-02	5.915E-02	5.730E-02
CS-137	1.051E-01	6.249E-02	6.053E-02
CE-141	4.284E+01	6.049E+01	4.372E+01
TL-208	2.173E-01	6.177E-02	5.326E-02
BI-211	5.613E-01	1.023E+00	2.816E-01
BI-212	1.092E+00	9.873E-01	9.940E-01
PB-212	7.749E-01	1.211E-01	9.289E-02
BI-214	7.460E-01	1.733E-01	1.074E-01
PB-214	1.020E+00	1.915E-01	3.343E-01
RN-222	7.460E-01	1.733E-01	1.074E-01
RA-224	1.654E+00	1.521E+00	9.958E-01
RA-226	7.460E-01	1.733E-01	1.074E-01
AC-228	8.606E-01	2.605E-01	2.202E-01
RA-228	8.606E-01	2.605E-01	2.202E-01
TH-228	7.749E-01	1.211E-01	9.289E-02
TH-230	7.458E-01	1.733E-01	1.073E-01
PA-231	8.130E-01	1.178E+00	8.461E-01
TH-232	8.606E-01	2.605E-01	2.202E-01
TH-234	1.384E+00	3.242E+00	2.763E+00
U-234	7.458E-01	1.733E-01	1.073E-01
U-235	4.227E-01	4.679E-01	3.983E-01
U-238	1.384E+00	3.242E+00	2.763E+00
AM-243	1.735E-01	1.316E-01	1.084E-01
ANH-511	3.569E-02	7.172E-02	6.354E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.055E+00	1.101E+01	2.207E+01	NOT IDENT.
NA-22	-3.103E-03	3.451E-02	7.415E-02	NOT IDENT.

NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	-8.500E-03	3.113E-02	6.419E-02	NOT IDENT.
SC-46	-2.686E-01	4.271E-01	7.270E-01	FAIL ABUN
V-48	0.000E+00	1.480E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	4.560E+02	0.000E+00	SHORT HLIF
MN-54	7.563E-03	6.846E-02	1.291E-01	NOT IDENT.
CO-56	4.086E-02	4.253E-01	8.568E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-6.152E-02	4.473E-02	8.063E-02	NOT IDENT.
CO-58	2.084E-01	4.987E-01	1.077E+00	NOT IDENT.
FE-59	8.911E-01	4.766E+00	1.029E+01	NOT IDENT.
CO-60	2.858E-02	3.633E-02	8.904E-02	NOT IDENT.
ZN-65	4.636E-02	1.503E-01	2.966E-01	NOT IDENT.
GE-68	3.024E-01	1.895E+00	3.986E+00	NOT IDENT.
AS-73	-1.825E-01	1.195E+01	2.243E+01	NOT IDENT.
AS-74	0.000E+00	5.320E+03	0.000E+00	SHORT HLIF
SE-75	2.123E-01	1.927E-01	4.184E-01	NOT IDENT.
BR-77	0.000E+00	9.131E+36	0.000E+00	SHORT HLIF
SR-82	0.000E+00	8.478E+02	0.000E+00	SHORT HLIF
RB-83	-3.731E-01	7.278E-01	1.146E+00	NOT IDENT.
KR-85	-2.479E-02	7.976E+00	1.382E+01	NOT IDENT.
SR-85	-2.860E-03	8.167E-01	1.415E+00	NOT IDENT.
RB-86	0.000E+00	2.058E+04	0.000E+00	SHORT HLIF
Y-88	2.731E-03	1.724E-01	4.150E-01	NOT IDENT.
Y-91	9.958E+01	5.534E+02	1.153E+03	NOT IDENT.
NB-94	-8.420E-03	3.496E-02	6.472E-02	NOT IDENT.
NB-95	3.359E-01	1.000E+00	1.823E+00	NOT IDENT.
NB-95M	6.256E-01	2.328E+00	4.241E+00	NOT IDENT.
ZR-95	5.072E-02	1.414E+00	2.764E+00	NOT IDENT.
NB-97	0.000E+00	1.321E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	7.564E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.228E+41	0.000E+00	SHORT HLIF
RH-101	2.427E-02	7.218E-02	6.154E-02	FAIL ABUN
RH-102	-3.131E-03	5.615E-02	1.098E-01	NOT IDENT.
RU-103	3.026E+00	5.038E+00	1.080E+01	FAIL ABUN
RH-106	1.462E-01	5.131E-01	1.043E+00	NOT IDENT.
RU-106	1.462E-01	5.131E-01	1.043E+00	NOT IDENT.
AG-108M	1.838E-02	2.489E-02	5.110E-02	NOT IDENT.
AG-110M	2.525E-02	1.001E-01	2.053E-01	NOT IDENT.
SN-113	-1.442E-01	2.123E-01	3.821E-01	NOT IDENT.
CD-115	0.000E+00	1.197E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	8.069E+04	0.000E+00	SHORT HLIF
TE-123M	7.455E-02	1.267E-01	2.617E-01	NOT IDENT.
SB-124	2.305E+00	2.541E+00	6.327E+00	NOT IDENT.
SB-125	-3.577E-02	1.064E-01	1.993E-01	NOT IDENT.
I-126	0.000E+00	8.379E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	9.834E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	2.116E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	3.505E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.054E+26	0.000E+00	SHORT HLIF
BA-133	-1.183E-04	3.892E-02	6.941E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	4.872E-02	4.956E-02	1.115E-01	FAIL ABUN
CS-135	-3.115E-02	1.465E-01	2.807E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.225E+05	0.000E+00	SHORT HLIF
CE-139	3.413E-02	1.036E-01	2.106E-01	NOT IDENT.
BA-140	0.000E+00	9.357E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.300E+05	0.000E+00	SHORT HLIF
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	-6.014E-03	3.752E-01	7.145E-01	NOT IDENT.
PM-144	8.923E-03	5.285E-02	1.062E-01	NOT IDENT.
PR-144	7.568E-01	4.580E+00	9.200E+00	NOT IDENT.
PM-146	3.942E-02	3.957E-02	8.854E-02	NOT IDENT.
ND-147	0.000E+00	2.287E+07	0.000E+00	SHORT HLIF
PM-147	-1.250E+03	7.655E+02	1.346E+03	NOT IDENT.
PM-149	0.000E+00	1.676E+40	0.000E+00	SHORT HLIF
EU-150	1.220E-02	2.624E-02	4.941E-02	FAIL ABUN
EU-152	-3.946E-03	9.415E-02	1.659E-01	FAIL ABUN
GD-153	9.993E-02	2.253E-01	3.930E-01	NOT IDENT.
EU-154	-1.594E-02	8.942E-02	1.864E-01	FAIL ABUN
EU-155	5.562E-02	1.183E-01	2.102E-01	FAIL ABUN
TB-160	5.274E-01	1.830E+00	3.774E+00	FAIL ABUN
HO-166M	4.663E-03	5.113E-02	1.028E-01	FAIL ABUN
TM-171	-4.573E+00	2.976E+01	5.521E+01	NOT IDENT.
HF-172	-3.366E-02	2.528E-01	4.506E-01	FAIL ABUN

LU-172	3.434E-02	7.336E-02	1.579E-01	FAIL ABUN
LU-176	1.472E-02	2.645E-02	5.005E-02	FAIL ABUN
HF-181	-1.367E+00	3.447E+00	5.671E+00	NOT IDENT.
TA-182	2.346E-01	9.147E-01	1.943E+00	FAIL ABUN
RE-183	9.287E-02	3.552E+00	6.700E+00	NOT IDENT.
RE-184	4.869E+01	4.227E+01	7.180E+01	FAIL ABUN
W-188	1.165E+02	1.062E+02	2.162E+02	FAIL ABUN
IR-192	-9.704E-02	4.092E-01	7.881E-01	FAIL ABUN
HG-203	-1.953E-01	2.315E+00	4.496E+00	NOT IDENT.
BI-207	4.516E-02	5.800E-02	1.241E-01	FAIL ABUN
PB-210	-2.691E+00	4.744E+00	8.679E+00	NOT IDENT.
PB-211	-1.540E-01	5.372E-01	1.032E+00	NOT IDENT.
RN-219	1.894E-02	3.456E-01	6.876E-01	NOT IDENT.
RA-223	5.353E-01	9.780E-01	1.212E+00	FAIL ABUN
AC-227	6.872E-02	2.122E-01	4.315E-01	NOT IDENT.
TH-227	6.872E-02	2.122E-01	4.315E-01	NOT IDENT.
TH-229	1.453E-01	4.659E-01	9.377E-01	FAIL ABUN
TH-231	5.353E-01	9.780E-01	1.212E+00	FAIL ABUN
PA-233	-4.974E-03	5.439E-02	1.064E-01	FAIL ABUN
PA-234	9.748E-02	2.745E-01	5.737E-01	FAIL ABUN
PA-234M	3.856E+00	5.028E+00	1.109E+01	NOT IDENT.
NP-237	-4.974E-03	5.439E-02	1.064E-01	FAIL ABUN
NP-238	0.000E+00	1.657E+41	0.000E+00	SHORT HLIF
NP-239	-5.854E-02	2.836E-01	5.027E-01	NOT IDENT.
PU-239	2.205E+02	6.558E+02	6.224E+02	FAIL ABUN
AM-241	4.229E-02	1.814E-01	3.216E-01	NOT IDENT.
CM-243	-3.215E-02	1.076E-01	1.909E-01	NOT IDENT.
BK-247	5.405E-02	6.806E-02	1.441E-01	NOT IDENT.
CM-247	5.505E-03	3.091E-02	6.265E-02	NOT IDENT.
CF-249	3.092E-02	3.622E-02	7.794E-02	NOT IDENT.
CF-251	1.532E-02	1.182E-01	2.351E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	254	10.66*	9.709E-01	1.233E+01	1.233E+01	13.29
CD-109	88.03	74	3.70*	4.584E+00	2.173E+00	3.395E+00	57.70
TE-125M	109.28	57	0.27*	5.636E+00	1.879E+01	6.772E+02	93.47
SN-126	64.28	23	9.60	2.269E+00	5.335E-01	5.335E-01	239.02
	86.94	74	8.90	4.584E+00	9.036E-01	9.036E-01	57.70
	87.57	74	37.00*	4.584E+00	2.173E-01	2.173E-01	57.70
BA-137M	661.66	33	89.90*	1.881E+00	9.767E-02	9.951E-02	60.65
CS-137	661.66	33	85.10*	1.881E+00	1.032E-01	1.051E-01	60.65
CE-141	145.44	54	48.29*	5.863E+00	9.594E-02	5.381E+01	112.96
TL-208	277.37	-----	6.60	3.944E+00	-----	Line Not Found	-----
	583.19	77	85.00*	2.090E+00	2.173E-01	2.173E-01	29.01
	860.56	-----	12.50	1.520E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	3.328E+00	-----	Line Not Found	-----
	351.06	233	12.92*	3.216E+00	2.810E+00	2.810E+00	19.15
BI-212	727.33	25	6.67*	1.742E+00	1.092E+00	1.092E+00	92.27
	785.37	16	1.10	1.637E+00	4.351E+00	4.351E+00	99.20
	1620.50	-----	1.47	8.816E-01	-----	Line Not Found	-----
PB-212	74.82	115	10.28	3.531E+00	1.594E+00	1.594E+00	53.84
	77.11	180	17.10	3.749E+00	1.410E+00	1.410E+00	30.81
	238.63	300	43.60*	4.454E+00	7.749E-01	7.749E-01	15.95
	300.09	-----	3.30	3.690E+00	-----	Line Not Found	-----
BI-214	609.32	136	45.49*	2.015E+00	7.458E-01	7.460E-01	23.71
	1120.29	49	14.92	1.223E+00	1.338E+00	1.338E+00	33.36
	1764.49	36	15.30	8.116E-01	1.466E+00	1.467E+00	33.76
PB-214	74.82	115	5.80	3.531E+00	2.826E+00	2.827E+00	53.84
	77.11	180	9.70	3.749E+00	2.486E+00	2.487E+00	30.81
	87.09	74	3.41	4.584E+00	2.358E+00	2.359E+00	57.70
	242.00	112	7.25	4.410E+00	1.752E+00	1.752E+00	46.56
	295.22	112	18.42	3.740E+00	8.162E-01	8.165E-01	39.79
	351.93	233	35.60*	3.216E+00	1.020E+00	1.020E+00	19.15
RN-222	609.32	136	45.49*	2.015E+00	7.458E-01	7.460E-01	23.71
	1120.29	49	14.92	1.223E+00	1.338E+00	1.338E+00	33.36
	1764.49	36	15.30	8.116E-01	1.466E+00	1.467E+00	33.76
RA-224	240.99	112	4.10*	4.410E+00	3.097E+00	3.097E+00	46.56
RA-226	609.32	136	45.49*	2.015E+00	7.458E-01	7.460E-01	23.71
	1120.29	49	14.92	1.223E+00	1.338E+00	1.338E+00	33.36
	1764.49	36	15.30	8.116E-01	1.466E+00	1.467E+00	33.76
AC-228	105.21	-----	1.10	5.519E+00	-----	Line Not Found	-----
	338.32	38	11.27	3.319E+00	5.115E-01	5.115E-01	119.92
	794.95	-----	4.25	1.621E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.557E+00	-----	Line Not Found	-----
	911.20	64	25.80*	1.451E+00	8.606E-01	8.606E-01	30.88
	968.97	46	15.80	1.379E+00	1.052E+00	1.052E+00	44.96
RA-228	105.21	-----	1.10	5.519E+00	-----	Line Not Found	-----
	338.32	38	11.27	3.319E+00	5.115E-01	5.115E-01	119.92
	794.95	-----	4.25	1.621E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.557E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	911.20	64	25.80*	1.451E+00	8.606E-01	8.606E-01	30.88
	968.97	46	15.80	1.379E+00	1.052E+00	1.052E+00	44.96
TH-228	74.82	115	10.28	3.531E+00	1.594E+00	1.594E+00	53.84
	77.11	180	17.10	3.749E+00	1.410E+00	1.410E+00	30.81
	238.63	300	43.60*	4.454E+00	7.749E-01	7.749E-01	15.95
	300.09	-----	3.30	3.690E+00	-----	Line Not Found	-----
TH-230	609.32	136	45.49*	2.015E+00	7.458E-01	7.458E-01	23.71
	1120.29	49	14.92	1.223E+00	1.338E+00	1.338E+00	33.36
	1764.49	36	15.30	8.116E-01	1.466E+00	1.466E+00	33.76
PA-231	283.69	-----	1.70	3.870E+00	-----	Line Not Found	-----
	301.36	32	5.35*	3.668E+00	8.130E-01	8.130E-01	147.90
TH-232	105.21	-----	1.10	5.519E+00	-----	Line Not Found	-----
	338.32	38	11.27	3.319E+00	5.115E-01	5.115E-01	119.92
	835.71	-----	1.61	1.557E+00	-----	Line Not Found	-----
	911.20	64	25.80*	1.451E+00	8.606E-01	8.606E-01	30.88
	968.97	46	15.80	1.379E+00	1.052E+00	1.052E+00	44.96
TH-234	63.29	23	3.70*	2.269E+00	1.384E+00	1.384E+00	239.02
	92.59	45	4.23	4.978E+00	1.070E+00	1.070E+00	167.26
U-234	609.32	136	45.49*	2.015E+00	7.458E-01	7.458E-01	23.71
	1120.29	49	14.92	1.223E+00	1.338E+00	1.338E+00	33.36
	1764.49	36	15.30	8.116E-01	1.466E+00	1.466E+00	33.76
U-235	89.96	-----	3.47	4.769E+00	-----	Line Not Found	-----
	93.35	45	5.60	4.978E+00	8.079E-01	8.079E-01	167.26
	143.76	54	10.96*	5.863E+00	4.227E-01	4.227E-01	112.96
	163.33	-----	5.08	5.647E+00	-----	Line Not Found	-----
	185.72	52	57.20	5.294E+00	8.622E-02	8.622E-02	97.79
	205.31	-----	5.01	4.973E+00	-----	Line Not Found	-----
U-238	63.29	23	3.70*	2.269E+00	1.384E+00	1.384E+00	239.02
	92.59	45	4.23	4.978E+00	1.070E+00	1.070E+00	167.26
AM-243	43.53	-----	5.90	3.822E-01	-----	Line Not Found	-----
	74.66	115	67.20*	3.531E+00	2.439E-01	2.439E-01	53.84
ANH-511	511.00	17	100.00*	2.333E+00	3.569E-02	3.569E-02	205.07

Flag: "*" = Keyline

Total number of lines in spectrum 46
 Number of unidentified lines 11
 Number of lines tentatively identified by NID 35 76.09%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.233E+01	1.233E+01	0.164E+01	13.29	
CD-109	461.40D	1.56	2.173E+00	3.395E+00	1.959E+00	57.70	
TE-125M	57.40D	36.0	1.879E+01	6.772E+02	6.330E+02	93.47	
SN-126	2.30E+05Y	1.00	2.173E-01	2.173E-01	1.254E-01	57.70	
BA-137M	30.08Y	1.02	9.767E-02	9.951E-02	6.036E-02	60.65	
CS-137	30.08Y	1.02	1.032E-01	1.051E-01	0.638E-01	60.65	
CE-141	32.51D	561.	9.594E-02	5.381E+01	6.079E+01	112.96	
TL-208	1.41E+10Y	1.00	2.173E-01	2.173E-01	0.630E-01	29.01	
BI-211	7.04E+08Y	1.00	2.810E+00	2.810E+00	0.538E+00	19.15	
BI-212	1.41E+10Y	1.00	1.092E+00	1.092E+00	1.007E+00	92.27	
PB-212	1.41E+10Y	1.00	7.749E-01	7.749E-01	1.236E-01	15.95	
BI-214	1600.00Y	1.00	7.458E-01	7.460E-01	1.769E-01	23.71	
PB-214	1600.00Y	1.00	1.020E+00	1.020E+00	0.195E+00	19.15	
RN-222	1600.00Y	1.00	7.458E-01	7.460E-01	1.769E-01	23.71	
RA-224	1.41E+10Y	1.00	3.097E+00	3.097E+00	1.442E+00	46.56	
RA-226	1600.00Y	1.00	7.458E-01	7.460E-01	1.769E-01	23.71	
AC-228	1.41E+10Y	1.00	8.606E-01	8.606E-01	2.658E-01	30.88	
RA-228	1.41E+10Y	1.00	8.606E-01	8.606E-01	2.658E-01	30.88	
TH-228	1.41E+10Y	1.00	7.749E-01	7.749E-01	1.236E-01	15.95	
TH-230	7.54E+04Y	1.00	7.458E-01	7.458E-01	1.768E-01	23.71	
PA-231	7.04E+08Y	1.00	8.130E-01	8.130E-01	12.03E-01	147.90	
TH-232	1.41E+10Y	1.00	8.606E-01	8.606E-01	2.658E-01	30.88	
TH-234	4.47E+09Y	1.00	1.384E+00	1.384E+00	3.308E+00	239.02	
U-234	2.45E+05Y	1.00	7.458E-01	7.458E-01	1.768E-01	23.71	
U-235	7.04E+08Y	1.00	4.227E-01	4.227E-01	4.775E-01	112.96	
U-238	4.47E+09Y	1.00	1.384E+00	1.384E+00	3.308E+00	239.02	
AM-243	7370.00Y	1.00	2.439E-01	2.439E-01	1.313E-01	53.84	
ANH-511	1.00E+09Y	1.00	3.569E-02	3.569E-02	7.318E-02	205.07	
Total Activity :			5.418E+01	7.676E+02			

Grand Total Activity : 5.418E+01 7.676E+02

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	35.40	8	58	1.35	71.50	67	9	1.69E-03	****	4.12E-02	
0	127.83	16	141	0.66	256.35	253	10	3.74E-03	****	5.91E+00	T
0	210.30	36	124	1.02	421.27	415	11	8.60E-03	****	4.89E+00	T
0	323.36	15	50	1.01	647.35	643	8	3.65E-03	****	3.46E+00	T
0	439.77	19	29	3.21	880.13	873	13	4.94E-03	****	2.65E+00	T
5	485.75	21	3	2.40	972.09	968	19	5.53E-03	60.3	2.44E+00	T
5	490.62	20	12	2.40	981.82	968	19	5.03E-03	80.2	2.42E+00	
0	525.23	19	27	0.97	1051.02	1046	11	4.93E-03	****	2.28E+00	
0	565.74	39	30	1.87	1132.02	1123	16	1.02E-02	75.1	2.14E+00	
0	604.89	12	10	1.06	1210.31	1207	7	3.16E-03	****	2.03E+00	T
0	684.91	12	19	1.04	1370.31	1366	10	3.07E-03	****	1.83E+00	T
0	769.50	28	34	1.24	1539.45	1532	14	7.53E-03	99.7	1.66E+00	
0	777.65	5	9	1.83	1555.74	1549	9	1.42E-03	****	1.65E+00	T
0	840.23	18	5	1.63	1680.86	1676	9	4.86E-03	64.8	1.55E+00	
0	873.82	8	11	0.58	1748.02	1744	9	2.27E-03	****	1.50E+00	T
0	904.15	16	10	0.80	1808.67	1804	11	4.42E-03	88.6	1.46E+00	T
2	907.76	13	2	1.65	1815.89	1814	17	3.54E-03	52.1	1.46E+00	
0	933.57	13	4	0.52	1867.48	1863	8	3.66E-03	75.9	1.42E+00	
0	1284.19	6	3	1.38	2568.46	2565	6	1.76E-03	****	1.09E+00	
0	1599.00	6	3	1.37	3197.77	3191	9	1.60E-03	****	8.93E-01	
0	1660.72	7	0	0.55	3321.14	3318	7	1.94E-03	75.6	8.61E-01	

Flags: "T" = Tentatively associated

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235071.CNF;1
* Acquisition date   : 3-OCT-2016 06:45:24 Sensitivity      : 3.000
* Detector ID        : GAM01 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.34 Half life ratio  : *****
* Sample date        : 11-DEC-2015 10:25:00 Nuclide Library : SOLID
* Sample ID          : G405235071 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity  : 1.4970E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight       : 0.00000
* Dry Weight         : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 20-JUL-2016 07:03:55 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM01_CAN.CNF;9
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.434E-01
CD-109	1.248E+00
TE-125M	2.442E+02
SN-126	7.316E-02
BA-137M	2.446E-02
CS-137	2.584E-02
CE-141	2.044E+01
TL-208	2.270E-02
BI-211	1.238E-01
BI-212	4.374E-01
PB-212	4.279E-02
BI-214	4.609E-02
PB-214	1.611E-01
RN-222	4.609E-02
RA-224	4.587E-01
RA-226	4.609E-02
AC-228	9.165E-02
RA-228	9.165E-02
TH-228	4.279E-02
TH-230	4.607E-02
PA-231	3.871E-01
TH-232	9.165E-02
TH-234	1.296E+00
U-234	4.607E-02
U-235	1.880E-01
U-238	1.296E+00
AM-243	5.111E-02
ANH-511	2.878E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	9.736E+00	NOT IDENT.
NA-22	2.931E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF

AL-26	2.350E-02	NOT IDENT.
SC-46	3.091E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.596E-02	NOT IDENT.
CO-56	3.639E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.725E-02	NOT IDENT.
CO-58	4.591E-01	NOT IDENT.
FE-59	4.149E+00	NOT IDENT.
CO-60	3.730E-02	NOT IDENT.
ZN-65	1.226E-01	NOT IDENT.
GE-68	1.632E+00	NOT IDENT.
AS-73	1.047E+01	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.929E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.996E-01	NOT IDENT.
KR-85	6.181E+00	NOT IDENT.
SR-85	6.328E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.470E-01	NOT IDENT.
Y-91	4.993E+02	NOT IDENT.
NB-94	2.848E-02	NOT IDENT.
NB-95	8.081E-01	NOT IDENT.
NB-95M	1.962E+00	NOT IDENT.
ZR-95	1.194E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.864E-02	FAIL ABUN
RH-102	4.750E-02	NOT IDENT.
RU-103	4.793E+00	FAIL ABUN
RH-106	4.602E-01	NOT IDENT.
RU-106	4.602E-01	NOT IDENT.
AG-108M	2.266E-02	NOT IDENT.
AG-110M	8.810E-02	NOT IDENT.
SN-113	1.690E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.224E-01	NOT IDENT.
SB-124	2.649E+00	NOT IDENT.
SB-125	8.901E-02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.094E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	4.918E-02	FAIL ABUN
CS-135	1.294E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	9.819E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-143	0.000E+00	SHORT HLIF
CE-144	3.347E-01	NOT IDENT.
PM-144	4.629E-02	NOT IDENT.
PR-144	4.009E+00	NOT IDENT.
PM-146	3.964E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	6.195E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.249E-02	FAIL ABUN
EU-152	7.451E-02	FAIL ABUN
GD-153	1.852E-01	NOT IDENT.
EU-154	7.414E-02	FAIL ABUN
EU-155	9.810E-02	FAIL ABUN
TB-160	1.622E+00	FAIL ABUN
HO-166M	4.417E-02	FAIL ABUN
TM-171	2.575E+01	NOT IDENT.
HF-172	2.107E-01	FAIL ABUN
LU-172	6.714E-02	FAIL ABUN

LU-176	2.294E-02	FAIL ABUN
HF-181	2.380E+00	NOT IDENT.
TA-182	8.367E-01	FAIL ABUN
RE-183	3.114E+00	NOT IDENT.
RE-184	3.176E+01	FAIL ABUN
W-188	9.924E+01	FAIL ABUN
IR-192	3.547E-01	FAIL ABUN
HG-203	2.064E+00	NOT IDENT.
BI-207	5.473E-02	FAIL ABUN
PB-210	4.044E+00	NOT IDENT.
PB-211	4.505E-01	NOT IDENT.
RN-219	3.067E-01	NOT IDENT.
RA-223	5.548E-01	FAIL ABUN
AC-227	1.980E-01	NOT IDENT.
TH-227	1.980E-01	NOT IDENT.
TH-229	4.376E-01	FAIL ABUN
TH-231	5.548E-01	FAIL ABUN
PA-233	4.808E-02	FAIL ABUN
PA-234	2.460E-01	FAIL ABUN
PA-234M	4.935E+00	NOT IDENT.
NP-237	4.808E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.357E-01	NOT IDENT.
PU-239	2.919E+02	FAIL ABUN
AM-241	1.500E-01	NOT IDENT.
CM-243	8.897E-02	NOT IDENT.
BK-247	6.629E-02	NOT IDENT.
CM-247	2.791E-02	NOT IDENT.
CF-249	3.536E-02	NOT IDENT.
CF-251	1.099E-01	NOT IDENT.

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
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DETECTOR AND SAMPLE DATA

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*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235071.CNF;1
* Acquisition date   : 3-OCT-2016 06:45:24 Sensitivity      : 3.000
* Detector ID        : GAM01 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.34 Half life ratio  : *****
* Sample date        : 11-DEC-2015 10:25:00 Nuclide Library : SOLID
* Sample ID          : G405235071 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity  : 1.4970E+02 GRAM
*                    : Quantity Err(%) : 1.3360E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                    : Dry Weight       : 0.00000
*****
```

CALIBRATION INFORMATION

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*
* Eff. Cal. date     : 20-JUL-2016 07:03:55 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM01_CAN.CNF;9
*****
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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.233E+01	1.730E+00	1.730E+00
CD-109	2.220E+00	1.987E+00	1.987E+00
TE-125M	6.772E+02	6.216E+02	6.216E+02
SN-126	1.421E-01	1.270E-01	1.270E-01
BA-137M	9.951E-02	5.930E-02	5.930E-02
CS-137	1.051E-01	6.265E-02	6.265E-02
CE-141	4.284E+01	6.052E+01	6.052E+01
TL-208	2.173E-01	6.246E-02	6.246E-02
BI-211	5.613E-01	1.033E+00	1.033E+00
BI-212	1.092E+00	9.889E-01	9.889E-01
PB-212	7.749E-01	1.279E-01	1.279E-01
BI-214	7.460E-01	1.763E-01	1.763E-01
PB-214	1.020E+00	1.962E-01	1.962E-01
RN-222	7.460E-01	1.763E-01	1.763E-01
RA-224	1.654E+00	1.527E+00	1.527E+00
RA-226	7.460E-01	1.763E-01	1.763E-01
AC-228	8.606E-01	2.642E-01	2.642E-01
RA-228	8.606E-01	2.642E-01	2.642E-01
TH-228	7.749E-01	1.279E-01	1.279E-01
TH-230	7.458E-01	1.762E-01	1.762E-01
PA-231	8.130E-01	1.191E+00	1.191E+00
TH-232	8.606E-01	2.642E-01	2.642E-01
TH-234	1.384E+00	3.257E+00	3.257E+00
U-234	7.458E-01	1.762E-01	1.762E-01
U-235	4.227E-01	4.684E-01	4.684E-01
U-238	1.384E+00	3.257E+00	3.257E+00
AM-243	1.735E-01	1.323E-01	1.323E-01
ANH-511	3.569E-02	7.173E-02	7.173E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.055E+00	1.101E+01	1.102E+01	NOT IDENT.
NA-22	-3.103E-03	3.451E-02	3.454E-02	NOT IDENT.

NA-24	-1.000E+41	2.452E+41	0.000E+00	SHORT HLIF
AL-26	-8.500E-03	3.113E-02	3.137E-02	NOT IDENT.
SC-46	-2.686E-01	4.272E-01	4.440E-01	FAIL ABUN
V-48	-5.962E+03	1.480E+04	1.504E+04	SHORT HLIF
CR-51	-2.089E+02	4.561E+02	4.657E+02	SHORT HLIF
MN-54	7.563E-03	6.846E-02	6.854E-02	NOT IDENT.
CO-56	4.086E-02	4.253E-01	4.257E-01	NOT IDENT.
MN-56	1.000E+41	1.090E+42	0.000E+00	SHORT HLIF
CO-57	-6.152E-02	4.482E-02	5.271E-02	NOT IDENT.
CO-58	2.084E-01	4.987E-01	5.075E-01	NOT IDENT.
FE-59	8.911E-01	4.766E+00	4.783E+00	NOT IDENT.
CO-60	2.858E-02	3.634E-02	3.856E-02	NOT IDENT.
ZN-65	4.636E-02	1.503E-01	1.517E-01	NOT IDENT.
GE-68	3.024E-01	1.895E+00	1.900E+00	NOT IDENT.
AS-73	-1.825E-01	1.195E+01	1.195E+01	NOT IDENT.
AS-74	-4.557E+03	5.333E+03	5.715E+03	SHORT HLIF
SE-75	2.123E-01	1.930E-01	2.154E-01	NOT IDENT.
BR-77	5.843E+37	5.007E+38	0.000E+00	SHORT HLIF
SR-82	3.548E+02	8.479E+02	8.629E+02	SHORT HLIF
RB-83	-3.731E-01	7.296E-01	7.488E-01	NOT IDENT.
KR-85	-2.479E-02	7.976E+00	7.976E+00	NOT IDENT.
SR-85	-2.860E-03	8.167E-01	8.167E-01	NOT IDENT.
RB-86	3.283E+03	2.058E+04	2.063E+04	SHORT HLIF
Y-88	2.731E-03	1.724E-01	1.724E-01	NOT IDENT.
Y-91	9.958E+01	5.534E+02	5.552E+02	NOT IDENT.
NB-94	-8.420E-03	3.496E-02	3.517E-02	NOT IDENT.
NB-95	3.359E-01	1.000E+00	1.012E+00	NOT IDENT.
NB-95M	6.256E-01	2.328E+00	2.345E+00	NOT IDENT.
ZR-95	5.072E-02	1.414E+00	1.414E+00	NOT IDENT.
NB-97	1.000E+41	1.321E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	4.513E+41	0.000E+00	SHORT HLIF
MO-99	-1.176E+31	7.564E+31	0.000E+00	SHORT HLIF
TC-99M	1.000E+41	1.232E+41	0.000E+00	SHORT HLIF
RH-101	2.427E-02	7.232E-02	7.314E-02	FAIL ABUN
RH-102	-3.131E-03	5.615E-02	5.617E-02	NOT IDENT.
RU-103	3.026E+00	5.040E+00	5.221E+00	FAIL ABUN
RH-106	1.462E-01	5.132E-01	5.174E-01	NOT IDENT.
RU-106	1.462E-01	5.132E-01	5.174E-01	NOT IDENT.
AG-108M	1.838E-02	2.490E-02	2.625E-02	NOT IDENT.
AG-110M	2.525E-02	1.001E-01	1.007E-01	NOT IDENT.
SN-113	-1.442E-01	2.124E-01	2.221E-01	NOT IDENT.
CD-115	3.212E+38	1.198E+39	0.000E+00	SHORT HLIF
SN-117M	6.853E+04	8.110E+04	8.678E+04	SHORT HLIF
TE-123M	7.455E-02	1.268E-01	1.311E-01	NOT IDENT.
SB-124	2.305E+00	2.544E+00	2.748E+00	NOT IDENT.
SB-125	-3.577E-02	1.064E-01	1.076E-01	NOT IDENT.
I-126	-7.351E+05	8.438E+05	9.065E+05	SHORT HLIF
SB-126	-1.052E+06	1.003E+06	1.109E+06	SHORT HLIF
SB-127	1.401E+22	2.849E+22	0.000E+00	SHORT HLIF
I-131	-1.780E+09	3.506E+09	3.597E+09	SHORT HLIF
I-132	1.000E+41	2.016E+42	0.000E+00	SHORT HLIF
TE-132	4.412E+25	2.061E+26	0.000E+00	SHORT HLIF
BA-133	-1.183E-04	3.892E-02	3.892E-02	FAIL ABUN
I-133	1.000E+41	6.574E+41	0.000E+00	SHORT HLIF
CS-134	4.872E-02	4.960E-02	5.425E-02	FAIL ABUN
CS-135	-3.115E-02	1.465E-01	1.472E-01	NOT IDENT.
I-135	-1.000E+41	1.693E+42	0.000E+00	SHORT HLIF
CS-136	6.413E+04	2.226E+05	2.245E+05	SHORT HLIF
CE-139	3.413E-02	1.038E-01	1.050E-01	NOT IDENT.
BA-140	-4.251E+05	9.359E+05	9.553E+05	SHORT HLIF
LA-140	-9.956E+04	4.301E+05	4.324E+05	SHORT HLIF
CE-143	1.000E+41	4.717E+41	0.000E+00	SHORT HLIF
CE-144	-6.014E-03	3.752E-01	3.752E-01	NOT IDENT.
PM-144	8.923E-03	5.285E-02	5.300E-02	NOT IDENT.
PR-144	7.568E-01	4.581E+00	4.593E+00	NOT IDENT.
PM-146	3.942E-02	3.967E-02	4.347E-02	NOT IDENT.
ND-147	-7.704E+06	2.287E+07	2.313E+07	SHORT HLIF
PM-147	-1.250E+03	7.677E+02	9.524E+02	NOT IDENT.
PM-149	1.320E+40	1.700E+40	0.000E+00	SHORT HLIF
EU-150	1.220E-02	2.625E-02	2.682E-02	FAIL ABUN
EU-152	-3.946E-03	9.415E-02	9.417E-02	FAIL ABUN
GD-153	9.993E-02	2.253E-01	2.298E-01	NOT IDENT.
EU-154	-1.594E-02	8.942E-02	8.971E-02	FAIL ABUN
EU-155	5.562E-02	1.184E-01	1.210E-01	FAIL ABUN
TB-160	5.274E-01	1.830E+00	1.845E+00	FAIL ABUN
HO-166M	4.663E-03	5.113E-02	5.118E-02	FAIL ABUN
TM-171	-4.573E+00	2.977E+01	2.984E+01	NOT IDENT.
HF-172	-3.366E-02	2.529E-01	2.534E-01	FAIL ABUN

LU-172	3.434E-02	7.345E-02	7.506E-02	FAIL ABUN
LU-176	1.472E-02	2.646E-02	2.728E-02	FAIL ABUN
HF-181	-1.367E+00	3.447E+00	3.502E+00	NOT IDENT.
TA-182	2.346E-01	9.148E-01	9.209E-01	FAIL ABUN
RE-183	9.287E-02	3.552E+00	3.552E+00	NOT IDENT.
RE-184	4.869E+01	4.382E+01	4.901E+01	FAIL ABUN
W-188	1.165E+02	1.070E+02	1.192E+02	FAIL ABUN
IR-192	-9.704E-02	4.093E-01	4.116E-01	FAIL ABUN
HG-203	-1.953E-01	2.315E+00	2.317E+00	NOT IDENT.
BI-207	4.516E-02	5.802E-02	6.149E-02	FAIL ABUN
PB-210	-2.691E+00	4.750E+00	4.902E+00	NOT IDENT.
PB-211	-1.540E-01	5.372E-01	5.417E-01	NOT IDENT.
RN-219	1.894E-02	3.456E-01	3.457E-01	NOT IDENT.
RA-223	5.353E-01	9.786E-01	1.008E+00	FAIL ABUN
AC-227	6.872E-02	2.124E-01	2.147E-01	NOT IDENT.
TH-227	6.872E-02	2.124E-01	2.147E-01	NOT IDENT.
TH-229	1.453E-01	4.659E-01	4.705E-01	FAIL ABUN
TH-231	5.353E-01	9.786E-01	1.008E+00	FAIL ABUN
PA-233	-4.974E-03	5.439E-02	5.444E-02	FAIL ABUN
PA-234	9.748E-02	2.963E-01	2.996E-01	FAIL ABUN
PA-234M	3.856E+00	5.031E+00	5.323E+00	NOT IDENT.
NP-237	-4.974E-03	5.439E-02	5.444E-02	FAIL ABUN
NP-238	-1.000E+41	1.657E+41	0.000E+00	SHORT HLIF
NP-239	-5.854E-02	2.836E-01	2.848E-01	NOT IDENT.
PU-239	2.205E+02	6.559E+02	6.634E+02	FAIL ABUN
AM-241	4.229E-02	1.814E-01	1.824E-01	NOT IDENT.
CM-243	-3.215E-02	1.076E-01	1.086E-01	NOT IDENT.
BK-247	5.405E-02	6.892E-02	7.310E-02	NOT IDENT.
CM-247	5.505E-03	3.093E-02	3.103E-02	NOT IDENT.
CF-249	3.092E-02	3.631E-02	3.890E-02	NOT IDENT.
CF-251	1.532E-02	1.183E-01	1.185E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	57.7724	87.09	92.3055	136.47	69.1708
45.60	55.6225	87.57	98.4230	140.51	0.0000
46.54	66.1370	88.03	119.1317	143.76	68.6873
49.72	0.0000	88.34	99.7110	144.24	68.7104
51.35	70.0637	88.47	99.7229	145.44	68.7689
51.87	68.9421	89.96	119.3485	152.43	72.5151
52.39	67.8187	1093.63	119.4240	153.25	0.0000
52.97	72.5493	91.11	0.0000	323.87	58.0826
53.44	65.5675	92.59	94.0030	156.02	0.0000
54.07	56.2452	93.35	94.0682	158.56	0.0000
57.36	0.0000	94.56	73.3809	159.00	58.2701
57.53	70.6071	94.65	73.3868	162.33	60.1164
57.98	57.6937	94.67	73.3882	162.66	0.0000
59.27	58.1759	94.87	78.2949	163.33	61.8750
59.32	58.1795	97.43	73.5709	165.86	56.8121
59.54	58.1947	98.43	79.7727	176.31	69.3237
60.96	66.1695	98.44	79.7737	176.60	0.0000
61.17	70.9133	99.53	78.6221	177.52	66.7742
62.93	75.7954	100.11	77.4330	181.07	0.0000
63.29	75.8268	102.03	70.1759	181.52	83.4580
63.58	75.8519	103.18	70.2459	184.41	61.3978
64.28	82.2385	103.37	70.2576	143.76	66.2402
66.73	77.7075	105.21	54.3195	193.51	58.6693
67.24	87.2724	105.31	54.3242	197.03	63.1780
125.81	90.4901	106.12	52.7142	198.01	54.4348
67.75	77.3983	106.47	60.9688	201.83	55.4352
69.67	85.9142	109.28	68.1332	203.43	59.0094
70.83	87.6149	111.00	67.8170	205.31	43.6433
72.81	90.9928	111.76	0.0000	210.85	65.4493
72.87	90.9986	114.06	72.9618	215.65	51.4356
74.66	91.1696	116.30	0.0000	222.11	53.3978
74.82	91.1847	116.74	81.0139	227.09	51.7566
74.97	91.1989	119.76	61.2190	227.38	56.2273
77.11	91.4004	121.12	73.3745	228.16	0.0000
78.74	91.5523	121.22	78.3835	228.18	50.8938
79.69	91.6399	121.78	78.4180	116.74	50.8938
80.12	91.6793	122.06	78.4352	235.69	45.7176
80.19	0.0000	122.92	61.7882	235.96	51.1037
80.57	94.9387	123.07	61.7954	238.63	45.7881
81.00	107.8581	265.00	43.8622	238.98	0.0000
81.07	107.8656	125.81	72.8053	240.99	45.8442
81.75	120.8267	127.23	75.3976	242.00	45.8680
83.79	74.2554	127.91	75.4367	244.70	43.2295
84.00	74.2708	129.30	75.5164	252.40	0.0000
85.43	95.3925	131.20	79.4056	252.80	42.5029
86.55	110.0621	133.02	73.2027	254.15	0.0000
86.79	92.2788	133.52	73.7352	256.23	36.2345
86.94	92.2922	136.00	64.9312	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	28.1984	355.39	0.0000	584.27	16.8874
264.80	30.9294	356.01	22.7300	595.83	0.0000
265.00	30.9322	364.49	0.0000	427.87	23.1372
268.22	51.0269	366.42	0.0000	602.52	0.0000
269.46	40.1167	372.51	18.1129	604.72	18.5317
270.03	43.7754	375.05	24.8109	607.14	6.1814
271.23	40.1507	377.52	23.8795	609.32	12.3706
273.65	0.0000	356.01	21.0654	610.33	12.3740
276.40	35.6762	388.16	20.1408	614.28	20.1300
277.37	32.9465	388.63	0.0000	618.01	18.6013
277.60	35.6960	391.69	28.8116	620.36	19.6479
278.00	37.5341	264.66	21.1997	621.93	15.5182
279.20	43.9668	401.81	22.1732	630.19	0.0000
279.54	45.8059	402.40	20.2493	631.29	14.5212
279.70	41.2289	404.85	19.3026	633.25	8.3024
280.46	36.6610	410.95	27.0846	634.78	0.0000
283.69	39.4700	413.71	30.0167	635.95	10.3857
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	31.2338	423.72	0.0000	645.85	10.4138
285.90	0.0000	427.09	32.1084	657.76	9.4028
287.50	43.2182	427.87	28.2247	657.90	0.0000
290.67	23.4824	433.94	11.7043	661.66	11.5044
293.27	0.0000	439.40	18.5678	664.57	0.0000
351.93	47.0623	453.88	12.7683	666.33	0.0000
295.96	47.0779	463.37	18.7221	666.50	0.0000
879.38	38.8162	468.07	22.6996	667.71	0.0000
299.98	38.8409	473.00	0.0000	677.62	14.7041
300.09	38.8427	475.06	14.8389	685.70	0.0000
300.13	38.8435	476.78	19.7965	695.00	0.0000
301.36	38.8649	477.60	17.8217	696.49	13.7210
302.85	38.8905	482.18	13.3868	696.51	13.7210
256.23	41.6995	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	10.5570
306.78	30.6105	497.08	13.9504	697.49	12.6689
308.46	40.8445	505.52	26.9775	702.65	21.1426
311.90	30.6797	507.63	0.0000	706.68	14.8152
316.51	30.7415	511.00	31.0287	711.68	11.6557
319.41	0.0000	514.00	24.0449	720.70	0.0000
320.08	0.0000	514.00	24.0449	721.93	0.0000
321.04	30.8019	520.40	22.5879	722.78	11.1571
323.87	33.6431	520.69	0.0000	722.91	11.1575
325.23	43.4802	522.65	0.0000	723.31	7.9703
328.76	0.0000	527.90	0.0000	724.19	17.5386
333.37	29.2748	528.26	6.0383	727.33	18.0846
333.97	26.7483	529.59	10.5714	733.00	15.9796
334.37	33.7932	529.87	0.0000	735.93	13.8590
338.28	33.8481	531.02	0.0000	333.97	9.5984
338.32	33.8489	537.26	0.0000	739.50	0.0000
311.90	33.8789	546.56	0.0000	747.24	13.8982
340.48	33.8789	552.55	20.2783	748.06	13.9008
340.55	0.0000	563.25	13.2232	752.31	10.7039
344.28	26.8631	569.33	24.4561	753.82	0.0000
345.93	21.6940	946.00	22.9285	756.73	11.7873
351.06	17.9586	569.70	22.9303	756.80	11.7873
351.93	17.9648	583.19	11.2547	884.68	16.1017

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	16.1090	1274.44	10.1700	1620.50	2.8242
766.42	12.8892	1001.03	7.9174	1621.92	3.7664
766.84	16.1133	1002.74	16.9720	1678.03	0.0000
772.60	0.0000	1004.73	15.8468	1690.97	2.8522
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	1.9207
778.90	12.9282	1028.54	0.0000	1063.66	3.8442
783.70	0.0000	1037.84	3.4182	1771.35	2.8835
785.37	6.4741	1038.76	0.0000	1791.20	0.0000
792.07	21.6146	631.29	9.1309	1808.65	3.8638
794.95	8.6517	1048.07	0.0000	1810.72	0.0000
795.86	8.6536	1049.04	6.8511	1836.06	1.9388
810.06	4.3411	1050.41	7.9952		
810.29	6.5122	1063.66	10.3059		
344.28	6.5125	1077.00	0.0000		
810.76	7.5984	1077.34	5.7406		
815.77	0.0000	1085.87	3.4500		
1048.07	0.0000	1093.63	6.9102		
832.01	6.5449	1099.45	4.6120		
834.85	13.0981	1112.07	5.7784		
835.71	13.1011	1112.84	8.0909		
836.80	0.0000	1115.54	5.2039		
846.75	0.0000	1120.29	9.2598		
846.77	9.8503	1120.55	9.2604		
856.80	0.0000	1221.41	9.2617		
860.56	8.7832	1129.67	12.7546		
871.09	14.8563	1131.51	0.0000		
873.19	9.9089	1147.95	0.0000		
875.33	0.0000	1173.23	6.1357		
879.38	9.9225	1177.95	13.1598		
880.51	9.9247	1189.05	7.0322		
883.24	15.4481	1204.77	12.3406		
884.68	9.9338	1221.41	10.6091		
889.28	17.6784	1231.02	7.9700		
894.76	17.6992	1235.36	0.0000		
898.04	12.1767	1238.28	12.4132		
900.72	11.6301	1260.41	0.0000		
903.28	9.9741	1271.87	5.3507		
911.20	8.3261	1274.44	6.2451		
912.08	8.3276	1274.54	5.3533		
923.98	0.0000	1291.59	7.1582		
926.50	14.4790	1298.22	0.0000		
929.11	13.3726	1312.11	0.0000		
937.49	3.3491	1332.49	3.6035		
944.13	0.0000	1362.66	0.0000		
946.00	8.9469	1365.19	6.3399		
949.00	8.9525	1368.63	0.0000		
667.71	0.0000	1384.29	6.3591		
962.31	17.9551	1408.01	5.4712		
964.08	11.7873	1457.56	0.0000		
966.17	15.1617	1460.82	4.5972		
911.20	15.7318	1489.16	6.4638		
968.97	15.7318	1505.03	6.4792		
983.53	0.0000	1584.12	4.6826		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235072.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM05.CNF;477
Background date : 2-OCT-2016 11:00:07.
Sample date      : 15-DEC-2015 13:35:00 Acquisition date : 3-OCT-2016 06:45:49.
Sample ID       : G405235072 Sample quantity : 1.66107E+02 GRAM
Detector name   : GAM05 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.62 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596254 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.07*	47	160	0.74	93.97	90	8	1.30E-02	52.0	
2	0	63.10*	76	262	1.05	128.00	124	9	2.11E-02	41.1	
3	1	72.69	26	187	0.93	147.16	144	24	7.33E-03	83.6	1.68E+00
4	1	74.54*	207	183	0.94	150.86	144	24	5.74E-02	12.7	
5	1	76.70*	425	177	0.94	155.17	144	24	1.18E-01	7.1	
6	0	85.98*	217	269	1.14	173.72	167	12	6.02E-02	16.7	
7	0	91.75*	159	266	1.40	185.27	179	12	4.41E-02	22.6	
8	0	143.43*	38	107	1.66	288.55	285	8	1.04E-02	51.1	
9	0	147.00	19	103	1.31	295.69	293	8	5.40E-03	93.4	
10	3	182.34	23	92	1.40	366.31	362	21	6.28E-03	75.1	1.44E+00
11	3	185.52*	94	92	1.40	372.66	362	21	2.60E-02	21.5	
12	0	208.86	75	105	2.00	419.32	414	10	2.09E-02	28.2	
13	5	238.31*	410	61	0.92	478.18	473	21	1.14E-01	5.6	2.29E+00
14	5	241.33	156	92	1.82	484.21	473	21	4.34E-02	16.9	
15	0	251.16	25	131	1.37	503.85	498	14	6.96E-03	98.4	
16	9	268.62	62	65	2.75	538.75	533	32	1.72E-02	31.1	2.20E+00
17	9	271.63	24	52	1.55	544.77	533	32	6.65E-03	64.3	
18	9	276.81	25	58	1.56	555.12	533	32	7.02E-03	59.3	
19	0	294.80*	223	98	1.13	591.08	584	14	6.19E-02	11.6	
20	0	299.62	18	84	1.01	600.70	597	9	4.92E-03	96.0	
21	0	328.23	24	63	0.94	657.89	653	9	6.56E-03	64.8	
22	0	338.26*	94	52	1.37	677.94	673	10	2.62E-02	17.9	
23	0	351.62*	300	38	1.29	704.64	700	9	8.33E-02	7.0	
24	0	356.95	10	52	0.92	715.28	710	11	2.70E-03	150.4	
25	0	409.49	27	49	1.88	820.30	816	11	7.43E-03	53.5	
26	0	464.18	57	57	1.54	929.61	922	17	1.58E-02	33.6	
27	0	510.86*	63	44	1.36	1022.91	1016	15	1.74E-02	30.6	
28	0	565.60	26	20	2.99	1132.32	1128	9	7.11E-03	37.4	
29	0	583.03*	136	18	1.21	1167.14	1163	9	3.78E-02	10.4	
30	0	609.14*	235	22	1.48	1219.34	1214	11	6.52E-02	7.7	
31	0	627.20	22	20	1.91	1255.42	1250	10	6.14E-03	43.4	
32	0	727.24	39	14	0.69	1455.38	1450	11	1.09E-02	24.3	
33	0	768.80*	30	22	1.08	1538.44	1533	11	8.45E-03	35.5	
34	0	798.59	14	47	5.69	1597.99	1584	18	3.85E-03	121.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	876.60	9	5	0.91	1753.91	1751	6	2.62E-03	50.9	
36	1	911.20*	104	14	1.69	1823.05	1816	28	2.88E-02	12.1	1.44E+00
37	1	918.00	16	7	1.90	1836.65	1816	28	4.45E-03	49.9	
38	0	927.77	11	19	1.07	1856.18	1850	12	3.19E-03	79.9	
39	1	964.69	28	23	1.93	1929.97	1925	25	7.90E-03	32.8	1.58E+00
40	1	969.10	50	21	1.90	1938.79	1925	25	1.38E-02	23.6	
41	0	991.00	22	13	0.66	1982.57	1976	17	6.04E-03	43.5	
42	0	1094.78	5	9	0.56	2190.00	2182	9	1.39E-03	117.0	
43	0	1120.05*	51	14	1.87	2240.51	2234	11	1.41E-02	20.3	
44	0	1276.52	6	14	0.56	2553.25	2542	14	1.64E-03	140.8	
45	0	1289.30	15	16	0.54	2578.80	2572	16	4.17E-03	65.0	
46	0	1314.43	9	1	0.95	2629.03	2626	6	2.40E-03	40.5	
47	0	1461.05*	450	8	2.15	2922.09	2914	15	1.25E-01	4.9	
48	0	1728.71	15	3	4.93	3457.09	3450	13	4.14E-03	35.9	
49	0	1764.67	37	0	1.83	3528.97	3523	12	1.03E-02	16.4	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235072.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 15-DEC-2015 13:35:00 Acquisition date : 3-OCT-2016 06:45:49
Sample ID        : G405235072 Sample quantity  : 166.11 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA5 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.62 0.0%
Energy tolerance : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error  : 0.00 %
Efficiency type  : Linear Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.244E+00	1.496E+01	1.496E+01	9.85	OK
CS-135	268.22	16.00*	5.054E+00	4.157E-01	4.157E-01	62.11	OK
TL-208	277.37	6.60	4.931E+00	4.200E-01	4.200E-01	118.59	OK
	583.19	85.00*	2.674E+00	2.973E-01	2.973E-01	20.89	OK
	860.56	12.50	1.959E+00	----- Line	Not Found	-----	Absent
PB-210	46.54	4.25*	9.664E+00	7.421E-01	7.609E-01	104.03	OK
PB-212	74.82	10.28	8.979E+00	5.272E-01	5.272E-01	75.04	OK
	77.11	17.10	8.967E+00	1.716E+00	1.716E+00	14.11	OK
	238.63	43.60*	5.565E+00	9.286E-01	9.286E-01	11.25	OK
	300.09	3.30	4.619E+00	6.232E-01	6.232E-01	191.97	OK
BI-214	609.32	45.49*	2.582E+00	9.853E-01	9.856E-01	15.44	OK
	1120.29	14.92	1.576E+00	9.851E-01	9.854E-01	40.60	OK
	1764.49	15.30	1.032E+00	1.005E+00	1.005E+00	32.88	OK
PB-214	74.82	5.80	8.977E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	8.967E+00	3.026E+00	3.027E+00	14.11	OK
	87.09	3.41	8.919E+00	4.361E+00	4.362E+00	33.31	OK
	242.00	7.25	5.497E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.682E+00	1.387E+00	1.388E+00	23.28	OK
	351.93	35.60*	4.044E+00	1.097E+00	1.097E+00	13.95	OK
RN-222	609.32	45.49*	2.582E+00	9.853E-01	9.856E-01	15.44	OK
	1120.29	14.92	1.576E+00	9.851E-01	9.854E-01	40.60	OK
	1764.49	15.30	1.032E+00	1.005E+00	1.005E+00	32.88	OK
RA-224	240.99	4.10*	5.509E+00	1.101E+00	1.101E+00	127.23	OK
RA-226	609.32	45.49*	2.582E+00	9.853E-01	9.856E-01	15.44	OK
	1120.29	14.92	1.576E+00	9.851E-01	9.854E-01	40.60	OK
	1764.49	15.30	1.032E+00	1.005E+00	1.005E+00	32.88	OK
AC-228	105.21	1.10	8.704E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.176E+00	1.061E+00	1.061E+00	35.82	OK
	794.95	4.25	2.087E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.005E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.870E+00	1.007E+00	1.007E+00	24.25	OK
	968.97	15.80	1.778E+00	8.216E-01	8.216E-01	47.25	OK
RA-228	105.21	1.10	8.704E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.176E+00	1.061E+00	1.061E+00	35.82	OK
	794.95	4.25	2.087E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.005E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.870E+00	1.007E+00	1.007E+00	24.25	OK
	968.97	15.80	1.778E+00	8.216E-01	8.216E-01	47.25	OK
TH-228	74.82	10.28	8.979E+00	5.272E-01	5.272E-01	75.04	OK
	77.11	17.10	8.967E+00	1.716E+00	1.716E+00	14.11	OK
	238.63	43.60*	5.565E+00	9.286E-01	9.286E-01	11.25	OK
	300.09	3.30	4.619E+00	6.232E-01	6.232E-01	191.97	OK
TH-230	609.32	45.49*	2.582E+00	9.853E-01	9.853E-01	15.44	OK
	1120.29	14.92	1.576E+00	9.851E-01	9.851E-01	40.60	OK
	1764.49	15.30	1.032E+00	1.005E+00	1.005E+00	32.88	OK
TH-232	105.21	1.10	8.704E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.176E+00	1.061E+00	1.061E+00	35.82	OK
	835.71	1.61	2.005E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.870E+00	1.007E+00	1.007E+00	24.25	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	968.97	15.80	1.778E+00	8.216E-01	8.216E-01	47.25	OK
TH-234	63.29	3.70*	9.118E+00	1.421E+00	1.421E+00	82.23	OK
	92.59	4.23	8.875E+00	2.571E+00	2.571E+00	45.21	OK
U-234	609.32	45.49*	2.582E+00	9.853E-01	9.853E-01	15.44	OK
	1120.29	14.92	1.576E+00	9.851E-01	9.851E-01	40.60	OK
	1764.49	15.30	1.032E+00	1.005E+00	1.005E+00	32.88	OK
U-235	89.96	3.47	8.890E+00	-----	Line Not Found	-----	Absent
	93.35	5.60	8.860E+00	-----	Line Not Found	-----	Absent
	143.76	10.96*	7.817E+00	2.542E-01	2.542E-01	102.12	OK
	163.33	5.08	7.279E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	6.705E+00	1.380E-01	1.380E-01	42.95	OK
	205.31	5.01	6.238E+00	-----	Line Not Found	-----	Absent
U-238	63.29	3.70*	9.118E+00	1.421E+00	1.421E+00	82.23	OK
	92.59	4.23	8.875E+00	2.571E+00	2.571E+00	45.21	OK
AM-243	43.53	5.90	9.491E+00	-----	Line Not Found	-----	Absent
	74.66	67.20*	8.979E+00	8.065E-02	8.066E-02	75.04	OK
ANH-511	511.00	100.00*	2.974E+00	1.060E-01	1.060E-01	61.27	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235072.CNF;1 *
 * Acquisition date : 3-OCT-2016 06:45:49 Sensitivity : 3.000 *
 * Detector ID : GAM05 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.62 Half life ratio : ***** *
 * Sample date : 15-DEC-2015 13:35:00 Analyst initials: MXR1 *
 * Sample ID : G405235072 Sample Quantity : 1.6611E+02 GRAM *
 * Batch Number : 1596254 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 4-SEP-2016 08:00:28 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;20 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.496E+01	1.444E+00	3.744E-01
CS-135	4.157E-01	2.531E-01	1.877E-01
TL-208	2.973E-01	6.087E-02	5.624E-02
PB-210	7.609E-01	7.758E-01	5.284E-01
PB-212	9.286E-01	1.024E-01	7.575E-02
BI-214	9.856E-01	1.492E-01	9.824E-02
PB-214	1.097E+00	1.501E-01	9.580E-02
RN-222	9.856E-01	1.492E-01	9.824E-02
RA-224	1.101E+00	1.372E+00	8.127E-01
RA-226	9.856E-01	1.492E-01	9.824E-02
AC-228	1.007E+00	2.394E-01	2.055E-01
RA-228	1.007E+00	2.394E-01	2.055E-01
TH-228	9.286E-01	1.024E-01	7.575E-02
TH-230	9.853E-01	1.491E-01	9.821E-02
TH-232	1.007E+00	2.394E-01	2.055E-01
TH-234	1.421E+00	1.145E+00	7.172E-01
U-234	9.853E-01	1.491E-01	9.821E-02
U-235	2.542E-01	2.544E-01	2.041E-01
U-238	1.421E+00	1.145E+00	7.172E-01
AM-243	8.066E-02	5.932E-02	4.205E-02
ANH-511	1.060E-01	6.366E-02	3.644E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.787E+00	8.867E+00	1.807E+01	NOT IDENT.
NA-22	2.279E-03	3.783E-02	7.665E-02	NOT IDENT.
NA-24	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
AL-26	1.227E-02	1.987E-02	5.345E-02	NOT IDENT.
SC-46	8.697E-03	2.843E-01	5.517E-01	FAIL ABUN
V-48	0.000E+00	8.278E+03	0.000E+00	SHORT HLIF
CR-51	0.000E+00	2.745E+02	0.000E+00	SHORT HLIF
MN-54	3.214E-02	5.679E-02	1.160E-01	NOT IDENT.
CO-56	-3.013E-01	3.805E-01	6.530E-01	NOT IDENT.

MN-56	0.000E+00	1.251E+41	0.000E+00	SHORT HLIF
CO-57	-7.065E-03	3.012E-02	5.877E-02	NOT IDENT.
CO-58	-1.845E-02	4.293E-01	8.269E-01	NOT IDENT.
FE-59	5.799E-02	3.309E+00	7.132E+00	NOT IDENT.
CO-60	-3.315E-03	3.259E-02	6.436E-02	NOT IDENT.
ZN-65	-1.151E-02	1.671E-01	2.889E-01	NOT IDENT.
GE-68	-3.516E-01	1.942E+00	3.805E+00	NOT IDENT.
AS-73	-4.905E-01	1.325E+00	2.722E+00	NOT IDENT.
AS-74	0.000E+00	3.861E+03	0.000E+00	SHORT HLIF
SE-75	4.661E-02	1.536E-01	2.788E-01	NOT IDENT.
BR-77	0.000E+00	2.314E+36	0.000E+00	SHORT HLIF
SR-82	0.000E+00	4.614E+02	0.000E+00	SHORT HLIF
RB-83	4.759E-02	4.161E-01	8.550E-01	NOT IDENT.
KR-85	1.969E+00	4.954E+00	9.576E+00	NOT IDENT.
SR-85	1.918E-01	4.856E-01	9.383E-01	NOT IDENT.
RB-86	0.000E+00	1.884E+04	0.000E+00	SHORT HLIF
Y-88	-1.090E-01	2.182E-01	3.822E-01	NOT IDENT.
Y-91	-2.568E+02	4.756E+02	8.592E+02	NOT IDENT.
NB-94	1.808E-02	2.783E-02	5.753E-02	NOT IDENT.
NB-95	2.038E-01	6.381E-01	1.179E+00	NOT IDENT.
NB-95M	-4.897E-01	1.833E+00	3.076E+00	NOT IDENT.
ZR-95	2.356E-01	1.072E+00	2.148E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.325E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	2.200E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	3.333E-03	2.230E-02	4.454E-02	NOT IDENT.
RH-102	-1.997E-02	5.073E-02	8.359E-02	NOT IDENT.
RU-103	-2.317E+00	3.669E+00	6.758E+00	FAIL ABUN
RH-106	1.885E-01	3.463E-01	6.979E-01	NOT IDENT.
RU-106	1.885E-01	3.463E-01	6.979E-01	NOT IDENT.
AG-108M	4.047E-03	2.011E-02	4.154E-02	NOT IDENT.
CD-109	5.695E-01	6.892E-01	1.242E+00	NOT IDENT.
AG-110M	-1.771E-02	8.051E-02	1.488E-01	NOT IDENT.
SN-113	4.927E-02	1.683E-01	3.492E-01	NOT IDENT.
CD-115	0.000E+00	2.977E+38	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	4.893E+04	0.000E+00	SHORT HLIF
TE-123M	-4.039E-02	9.131E-02	1.709E-01	NOT IDENT.
SB-124	1.260E+00	1.345E+00	3.639E+00	NOT IDENT.
SB-125	-9.854E-03	7.258E-02	1.448E-01	FAIL ABUN
TE-125M	1.475E+02	1.606E+02	3.403E+02	NOT IDENT.
I-126	0.000E+00	5.304E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	5.869E+05	0.000E+00	SHORT HLIF
SN-126	0.000E+00	4.877E-02	9.672E-02	FAIL ABUN
SB-127	0.000E+00	4.712E+21	0.000E+00	SHORT HLIF
I-131	0.000E+00	1.961E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	6.030E+25	0.000E+00	SHORT HLIF
BA-133	2.171E-02	6.399E-02	6.253E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	1.934E-02	4.461E-02	8.969E-02	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	1.590E+05	0.000E+00	SHORT HLIF
BA-137M	1.507E-02	2.502E-02	5.338E-02	NOT IDENT.
CS-137	1.592E-02	2.643E-02	5.639E-02	NOT IDENT.
CE-139	2.238E-03	7.297E-02	1.422E-01	NOT IDENT.
BA-140	0.000E+00	6.730E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	2.747E+05	0.000E+00	SHORT HLIF
CE-141	-1.611E+00	1.546E+01	2.454E+01	NOT IDENT.
CE-143	0.000E+00	5.767E+40	0.000E+00	SHORT HLIF
CE-144	5.135E-02	2.338E-01	4.684E-01	NOT IDENT.
PM-144	3.495E-02	3.899E-02	8.651E-02	NOT IDENT.
PR-144	3.001E+00	3.370E+00	7.474E+00	NOT IDENT.
PM-146	5.918E-03	3.232E-02	6.630E-02	NOT IDENT.
ND-147	0.000E+00	1.882E+07	0.000E+00	SHORT HLIF
PM-147	1.777E+02	5.317E+02	1.082E+03	NOT IDENT.
PM-149	0.000E+00	4.109E+39	0.000E+00	SHORT HLIF
EU-150	-1.169E-03	2.218E-02	3.720E-02	FAIL ABUN
EU-152	2.161E-03	6.020E-02	1.245E-01	FAIL ABUN
GD-153	-1.761E-02	1.003E-01	1.988E-01	NOT IDENT.
EU-154	3.650E-03	9.267E-02	1.873E-01	NOT IDENT.
EU-155	3.248E-02	6.840E-02	1.410E-01	FAIL ABUN
TB-160	2.444E-01	1.373E+00	2.508E+00	FAIL ABUN
HO-166M	3.751E-03	4.616E-02	9.113E-02	FAIL ABUN
TM-171	6.665E-01	3.032E+00	6.484E+00	NOT IDENT.
HF-172	-5.775E-02	1.396E-01	2.683E-01	FAIL ABUN
LU-172	3.043E-02	6.982E-02	1.184E-01	FAIL ABUN
LU-176	9.729E-03	1.883E-02	3.712E-02	NOT IDENT.

HF-181	9.718E-01	3.072E+00	6.332E+00	NOT IDENT.
TA-182	1.802E-01	8.172E-01	1.643E+00	FAIL ABUN
RE-183	2.070E-01	6.314E-01	1.345E+00	NOT IDENT.
RE-184	-1.943E+00	2.031E+01	3.855E+01	NOT IDENT.
W-188	5.085E-01	7.919E+01	1.370E+02	FAIL ABUN
IR-192	1.880E-01	3.030E-01	6.133E-01	FAIL ABUN
HG-203	1.047E+00	1.696E+00	3.365E+00	FAIL ABUN
BI-207	-6.739E-04	3.605E-02	7.343E-02	FAIL ABUN
BI-211	0.000E+00	4.133E-01	7.597E-01	FAIL ABUN
PB-211	6.997E-02	5.292E-01	9.827E-01	NOT IDENT.
BI-212	0.000E+00	6.029E-01	1.051E+00	FAIL ABUN
RN-219	5.616E-02	3.177E-01	6.446E-01	FAIL ABUN
RA-223	-2.212E-02	4.977E-01	8.408E-01	FAIL ABUN
AC-227	7.335E-02	1.819E-01	3.327E-01	FAIL ABUN
TH-227	7.335E-02	1.819E-01	3.327E-01	FAIL ABUN
TH-229	1.201E-01	3.342E-01	6.608E-01	FAIL ABUN
PA-231	6.946E-02	4.092E-01	7.075E-01	NOT IDENT.
TH-231	-2.212E-02	4.977E-01	8.408E-01	FAIL ABUN
PA-233	7.768E-03	5.146E-02	9.625E-02	FAIL ABUN
PA-234	-1.275E-01	2.098E-01	3.547E-01	FAIL ABUN
PA-234M	-5.074E-01	3.779E+00	7.502E+00	NOT IDENT.
NP-237	7.768E-03	5.146E-02	9.625E-02	FAIL ABUN
NP-238	0.000E+00	3.830E+40	0.000E+00	SHORT HLIF
NP-239	2.872E-02	1.518E-01	3.070E-01	FAIL ABUN
PU-239	1.050E+02	2.002E+02	4.108E+02	NOT IDENT.
AM-241	3.381E-03	3.674E-02	7.184E-02	NOT IDENT.
CM-243	-2.971E-02	6.136E-02	1.189E-01	FAIL ABUN
BK-247	3.738E-03	5.418E-02	9.547E-02	NOT IDENT.
CM-247	-2.302E-02	2.753E-02	5.057E-02	FAIL ABUN
CF-249	9.972E-03	2.726E-02	5.724E-02	NOT IDENT.
CF-251	1.083E-02	8.530E-02	1.658E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	439	10.66*	1.244E+00	1.496E+01	1.496E+01	9.85
CS-135	268.22	74	16.00*	5.054E+00	4.157E-01	4.157E-01	62.11
TL-208	277.37	30	6.60	4.931E+00	4.200E-01	4.200E-01	118.59
	583.19	149	85.00*	2.674E+00	2.973E-01	2.973E-01	20.89
	860.56	-----	12.50	1.959E+00	-----	Line Not Found	-----
PB-210	46.54	67	4.25*	9.664E+00	7.421E-01	7.609E-01	104.03
BI-211	72.87	36	1.23	8.991E+00	1.484E+00	1.484E+00	167.21
	351.06	349	12.92*	4.044E+00	3.023E+00	3.023E+00	13.95
PB-212	74.82	284	10.28	8.979E+00	1.389E+00	1.389E+00	25.44
	77.11	582	17.10	8.967E+00	1.716E+00	1.716E+00	14.11
	238.63	498	43.60*	5.565E+00	9.286E-01	9.286E-01	11.25
	300.09	21	3.30	4.619E+00	6.232E-01	6.232E-01	191.97
BI-214	609.32	256	45.49*	2.582E+00	9.853E-01	9.856E-01	15.44
	1120.29	51	14.92	1.576E+00	9.851E-01	9.854E-01	40.60
	1764.49	35	15.30	1.032E+00	1.005E+00	1.005E+00	32.88
PB-214	74.82	284	5.80	8.979E+00	2.462E+00	2.463E+00	25.44
	77.11	582	9.70	8.967E+00	3.026E+00	3.027E+00	14.11
	87.09	293	3.41	8.919E+00	4.361E+00	4.362E+00	33.31
	242.00	190	7.25	5.509E+00	2.150E+00	2.151E+00	33.79
	295.22	265	18.42	4.682E+00	1.387E+00	1.388E+00	23.28
	351.93	349	35.60*	4.044E+00	1.097E+00	1.097E+00	13.95
RN-222	609.32	256	45.49*	2.582E+00	9.853E-01	9.856E-01	15.44
	1120.29	51	14.92	1.576E+00	9.851E-01	9.854E-01	40.60
	1764.49	35	15.30	1.032E+00	1.005E+00	1.005E+00	32.88
RA-224	240.99	190	4.10*	5.509E+00	3.801E+00	3.801E+00	33.79
RA-226	609.32	256	45.49*	2.582E+00	9.853E-01	9.856E-01	15.44
	1120.29	51	14.92	1.576E+00	9.851E-01	9.854E-01	40.60
	1764.49	35	15.30	1.032E+00	1.005E+00	1.005E+00	32.88
AC-228	105.21	-----	1.10	8.704E+00	-----	Line Not Found	-----
	338.32	110	11.27	4.176E+00	1.061E+00	1.061E+00	35.82
	794.95	-----	4.25	2.087E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.005E+00	-----	Line Not Found	-----
	911.20	108	25.80*	1.870E+00	1.007E+00	1.007E+00	24.25
	968.97	51	15.80	1.778E+00	8.216E-01	8.216E-01	47.25
RA-228	105.21	-----	1.10	8.704E+00	-----	Line Not Found	-----
	338.32	110	11.27	4.176E+00	1.061E+00	1.061E+00	35.82
	794.95	-----	4.25	2.087E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.005E+00	-----	Line Not Found	-----
	911.20	108	25.80*	1.870E+00	1.007E+00	1.007E+00	24.25
	968.97	51	15.80	1.778E+00	8.216E-01	8.216E-01	47.25
TH-228	74.82	284	10.28	8.979E+00	1.389E+00	1.389E+00	25.44
	77.11	582	17.10	8.967E+00	1.716E+00	1.716E+00	14.11
	238.63	498	43.60*	5.565E+00	9.286E-01	9.286E-01	11.25
	300.09	21	3.30	4.619E+00	6.232E-01	6.232E-01	191.97
TH-230	609.32	256	45.49*	2.582E+00	9.853E-01	9.853E-01	15.44
	1120.29	51	14.92	1.576E+00	9.851E-01	9.851E-01	40.60
	1764.49	35	15.30	1.032E+00	1.005E+00	1.005E+00	32.88

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-232	105.21	-----	1.10	8.704E+00	-----	Line Not Found	-----
	338.32	110	11.27	4.176E+00	1.061E+00	1.061E+00	35.82
	835.71	-----	1.61	2.005E+00	-----	Line Not Found	-----
	911.20	108	25.80*	1.870E+00	1.007E+00	1.007E+00	24.25
	968.97	51	15.80	1.778E+00	8.216E-01	8.216E-01	47.25
TH-234	63.29	106	3.70*	9.118E+00	1.421E+00	1.421E+00	82.23
	92.59	214	4.23	8.875E+00	2.571E+00	2.571E+00	45.21
U-234	609.32	256	45.49*	2.582E+00	9.853E-01	9.853E-01	15.44
	1120.29	51	14.92	1.576E+00	9.851E-01	9.851E-01	40.60
	1764.49	35	15.30	1.032E+00	1.005E+00	1.005E+00	32.88
U-235	89.96	-----	3.47	8.890E+00	-----	Line Not Found	-----
	93.35	-----	5.60	8.860E+00	-----	Line Not Found	-----
	143.76	48	10.96*	7.817E+00	2.542E-01	2.542E-01	102.12
	163.33	-----	5.08	7.279E+00	-----	Line Not Found	-----
	185.72	117	57.20	6.705E+00	1.380E-01	1.380E-01	42.95
U-238	205.31	-----	5.01	6.238E+00	-----	Line Not Found	-----
	63.29	106	3.70*	9.118E+00	1.421E+00	1.421E+00	82.23
	92.59	214	4.23	8.875E+00	2.571E+00	2.571E+00	45.21
AM-243	43.53	-----	5.90	9.491E+00	-----	Line Not Found	-----
	74.66	284	67.20*	8.979E+00	2.125E-01	2.125E-01	25.44
ANH-511	511.00	70	100.00*	2.974E+00	1.060E-01	1.060E-01	61.27

Flag: "*" = Keyline

Total number of lines in spectrum 49
 Number of unidentified lines 12
 Number of lines tentatively identified by NID 37 75.51%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.496E+01	1.496E+01	0.147E+01	9.85	
CS-135	2.30E+06Y	1.00	4.157E-01	4.157E-01	2.582E-01	62.11	
TL-208	1.41E+10Y	1.00	2.973E-01	2.973E-01	0.621E-01	20.89	
PB-210	22.20Y	1.03	7.421E-01	7.609E-01	7.916E-01	104.03	
BI-211	7.04E+08Y	1.00	3.023E+00	3.023E+00	0.422E+00	13.95	
PB-212	1.41E+10Y	1.00	9.286E-01	9.286E-01	1.045E-01	11.25	
BI-214	1600.00Y	1.00	9.853E-01	9.856E-01	1.522E-01	15.44	
PB-214	1600.00Y	1.00	1.097E+00	1.097E+00	0.153E+00	13.95	
RN-222	1600.00Y	1.00	9.853E-01	9.856E-01	1.522E-01	15.44	
RA-224	1.41E+10Y	1.00	3.801E+00	3.801E+00	1.284E+00	33.79	
RA-226	1600.00Y	1.00	9.853E-01	9.856E-01	1.522E-01	15.44	
AC-228	1.41E+10Y	1.00	1.007E+00	1.007E+00	0.244E+00	24.25	
RA-228	1.41E+10Y	1.00	1.007E+00	1.007E+00	0.244E+00	24.25	
TH-228	1.41E+10Y	1.00	9.286E-01	9.286E-01	1.045E-01	11.25	
TH-230	7.54E+04Y	1.00	9.853E-01	9.853E-01	1.522E-01	15.44	
TH-232	1.41E+10Y	1.00	1.007E+00	1.007E+00	0.244E+00	24.25	
TH-234	4.47E+09Y	1.00	1.421E+00	1.421E+00	1.169E+00	82.23	
U-234	2.45E+05Y	1.00	9.853E-01	9.853E-01	1.522E-01	15.44	
U-235	7.04E+08Y	1.00	2.542E-01	2.542E-01	2.596E-01	102.12	
U-238	4.47E+09Y	1.00	1.421E+00	1.421E+00	1.169E+00	82.23	
AM-243	7370.00Y	1.00	2.125E-01	2.125E-01	0.541E-01	25.44	
ANH-511	1.00E+09Y	1.00	1.060E-01	1.060E-01	0.650E-01	61.27	
Total Activity :			3.755E+01	3.757E+01			
Grand Total Activity :			3.755E+01	3.757E+01			

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	147.00	25	131	1.31	295.69	293	8	5.40E-03	****	7.72E+00	
3	182.34	28	115	1.40	366.31	362	21	6.28E-03	****	6.78E+00	T
0	208.86	93	129	2.00	419.32	414	10	2.09E-02	56.4	6.16E+00	
0	251.16	30	158	1.37	503.85	498	14	6.96E-03	****	5.34E+00	T
9	271.63	29	63	1.55	544.77	533	32	6.65E-03	****	5.01E+00	T
0	328.23	28	74	0.94	657.89	653	9	6.56E-03	****	4.28E+00	T
0	356.95	11	61	0.92	715.28	710	11	2.70E-03	****	3.99E+00	T
0	409.49	31	56	1.88	820.30	816	11	7.43E-03	****	3.56E+00	T
0	464.18	64	64	1.54	929.61	922	17	1.58E-02	67.3	3.22E+00	T
0	565.60	28	22	2.99	1132.32	1128	9	7.11E-03	74.8	2.74E+00	
0	627.20	24	22	1.91	1255.42	1250	10	6.14E-03	86.8	2.52E+00	
0	727.24	42	15	0.69	1455.38	1450	11	1.09E-02	48.7	2.24E+00	T
0	768.80	32	23	1.08	1538.44	1533	11	8.45E-03	71.1	2.14E+00	
0	798.59	15	50	5.69	1597.99	1584	18	3.85E-03	****	2.08E+00	
0	876.60	10	5	0.91	1753.91	1751	6	2.62E-03	****	1.93E+00	T
1	918.00	17	7	1.90	1836.65	1816	28	4.45E-03	99.8	1.86E+00	
0	927.77	12	19	1.07	1856.18	1850	12	3.19E-03	****	1.84E+00	T
1	964.69	29	24	1.93	1929.97	1925	25	7.90E-03	65.6	1.79E+00	T
0	991.00	22	14	0.66	1982.57	1976	17	6.04E-03	86.9	1.75E+00	
0	1094.78	5	9	0.56	2190.00	2182	9	1.39E-03	****	1.61E+00	T
0	1276.52	6	14	0.56	2553.25	2542	14	1.64E-03	****	1.41E+00	
0	1289.30	15	16	0.54	2578.80	2572	16	4.17E-03	****	1.39E+00	
0	1314.43	9	1	0.95	2629.03	2626	6	2.40E-03	80.9	1.37E+00	
0	1728.71	14	3	4.93	3457.09	3450	13	4.14E-03	71.8	1.05E+00	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235072.CNF;1
* Acquisition date   : 3-OCT-2016 06:45:49 Sensitivity      : 3.000
* Detector ID       : GAM05 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.62 Half life ratio : *****
* Sample date       : 15-DEC-2015 13:35:00 Nuclide Library : SOLID
* Sample ID        : G405235072 Analyst initials: MXR1
* Batch Number     : 1596254 Sample Quantity : 1.6611E+02 GRAM
* Wet wt corr      : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date    : 4-SEP-2016 08:00:28 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;20
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.406E-01
CS-135	8.585E-02
TL-208	2.533E-02
PB-210	2.472E-01
PB-212	3.519E-02
BI-214	4.372E-02
PB-214	4.342E-02
RN-222	4.372E-02
RA-224	3.776E-01
RA-226	4.372E-02
AC-228	8.976E-02
RA-228	8.976E-02
TH-228	3.519E-02
TH-230	4.370E-02
TH-232	8.976E-02
TH-234	3.386E-01
U-234	4.370E-02
U-235	9.434E-02
U-238	3.386E-01
AM-243	1.991E-02
ANH-511	1.607E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.155E+00	NOT IDENT.
NA-22	3.287E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.061E-02	NOT IDENT.
SC-46	2.388E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	5.198E-02	NOT IDENT.
CO-56	2.826E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF

CO-57	2.743E-02	NOT IDENT.
CO-58	3.595E-01	NOT IDENT.
FE-59	2.907E+00	NOT IDENT.
CO-60	2.710E-02	NOT IDENT.
ZN-65	1.266E-01	NOT IDENT.
GE-68	1.651E+00	NOT IDENT.
AS-73	1.274E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.277E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	3.766E-01	NOT IDENT.
KR-85	4.265E+00	NOT IDENT.
SR-85	4.178E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.492E-01	NOT IDENT.
Y-91	3.779E+02	NOT IDENT.
NB-94	2.602E-02	NOT IDENT.
NB-95	5.198E-01	NOT IDENT.
NB-95M	1.427E+00	NOT IDENT.
ZR-95	9.471E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.087E-02	NOT IDENT.
RH-102	3.656E-02	NOT IDENT.
RU-103	2.974E+00	FAIL ABUN
RH-106	3.055E-01	NOT IDENT.
RU-106	3.055E-01	NOT IDENT.
AG-108M	1.868E-02	NOT IDENT.
CD-109	5.898E-01	NOT IDENT.
AG-110M	6.425E-02	NOT IDENT.
SN-113	1.590E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	7.963E-02	NOT IDENT.
SB-124	1.471E+00	NOT IDENT.
SB-125	6.475E-02	FAIL ABUN
TE-125M	1.604E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SN-126	4.634E-02	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.853E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	4.023E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	2.372E-02	NOT IDENT.
CS-137	2.506E-02	NOT IDENT.
CE-139	6.610E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.136E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.192E-01	NOT IDENT.
PM-144	3.847E-02	NOT IDENT.
PR-144	3.323E+00	NOT IDENT.
PM-146	2.983E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	5.069E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.698E-02	FAIL ABUN
EU-152	5.611E-02	FAIL ABUN
GD-153	9.333E-02	NOT IDENT.
EU-154	8.022E-02	NOT IDENT.
EU-155	6.644E-02	FAIL ABUN
TB-160	1.075E+00	FAIL ABUN
HO-166M	4.044E-02	FAIL ABUN
TM-171	3.039E+00	NOT IDENT.
HF-172	1.246E-01	FAIL ABUN
LU-172	5.093E-02	FAIL ABUN
LU-176	1.703E-02	NOT IDENT.
HF-181	2.861E+00	NOT IDENT.

TA-182	7.289E-01	FAIL ABUN
RE-183	6.338E-01	NOT IDENT.
RE-184	1.658E+01	NOT IDENT.
W-188	6.226E+01	FAIL ABUN
IR-192	2.790E-01	FAIL ABUN
HG-203	1.556E+00	FAIL ABUN
BI-207	3.155E-02	FAIL ABUN
BI-211	3.677E-01	FAIL ABUN
PB-211	4.441E-01	NOT IDENT.
BI-212	4.834E-01	FAIL ABUN
RN-219	2.954E-01	FAIL ABUN
RA-223	3.830E-01	FAIL ABUN
AC-227	1.533E-01	FAIL ABUN
TH-227	1.533E-01	FAIL ABUN
TH-229	3.076E-01	FAIL ABUN
PA-231	3.275E-01	NOT IDENT.
TH-231	3.830E-01	FAIL ABUN
PA-233	4.437E-02	FAIL ABUN
PA-234	1.485E-01	FAIL ABUN
PA-234M	3.322E+00	NOT IDENT.
NP-237	4.437E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.436E-01	FAIL ABUN
PU-239	1.926E+02	NOT IDENT.
AM-241	3.388E-02	NOT IDENT.
CM-243	5.572E-02	FAIL ABUN
BK-247	4.350E-02	NOT IDENT.
CM-247	2.282E-02	FAIL ABUN
CF-249	2.600E-02	NOT IDENT.
CF-251	7.742E-02	NOT IDENT.

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235072.CNF;1
* Acquisition date   : 3-OCT-2016 06:45:49 Sensitivity      : 3.000
* Detector ID       : GAM05 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.62 Half life ratio : *****
* Sample date      : 15-DEC-2015 13:35:00 Nuclide Library : SOLID
* Sample ID       : G405235072 Analyst initials: MXR1
* Batch Number    : 1596254 Sample Quantity : 1.6611E+02 GRAM
*                               Quantity Err(%) : 1.2040E-03 %
* Wet wt corr     : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight     : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 4-SEP-2016 08:00:28 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;20
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.496E+01	1.642E+00	1.642E+00
CS-135	4.157E-01	2.546E-01	2.546E-01
TL-208	2.973E-01	6.217E-02	6.217E-02
PB-210	7.609E-01	7.790E-01	7.790E-01
PB-212	9.286E-01	1.137E-01	1.137E-01
BI-214	9.856E-01	1.551E-01	1.551E-01
PB-214	1.097E+00	1.569E-01	1.569E-01
RN-222	9.856E-01	1.551E-01	1.551E-01
RA-224	1.119E+00	1.384E+00	1.384E+00
RA-226	9.856E-01	1.551E-01	1.551E-01
AC-228	1.007E+00	2.449E-01	2.449E-01
RA-228	1.007E+00	2.449E-01	2.449E-01
TH-228	9.286E-01	1.137E-01	1.137E-01
TH-230	9.853E-01	1.550E-01	1.550E-01
TH-232	1.007E+00	2.449E-01	2.449E-01
TH-234	1.421E+00	1.188E+00	1.188E+00
U-234	9.853E-01	1.550E-01	1.550E-01
U-235	2.542E-01	2.547E-01	2.547E-01
U-238	1.421E+00	1.188E+00	1.188E+00
AM-243	8.156E-02	6.176E-02	6.176E-02
ANH-511	1.060E-01	6.381E-02	6.381E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.787E+00	8.867E+00	8.903E+00	NOT IDENT.
NA-22	2.279E-03	3.783E-02	3.784E-02	NOT IDENT.
NA-24	-1.000E+41	6.140E+41	0.000E+00	SHORT HLIF
AL-26	1.227E-02	1.988E-02	2.064E-02	NOT IDENT.
SC-46	8.697E-03	2.843E-01	2.843E-01	FAIL ABUN
V-48	-3.004E+03	8.279E+03	8.389E+03	SHORT HLIF
CR-51	1.607E+02	2.746E+02	2.840E+02	SHORT HLIF
MN-54	3.214E-02	5.680E-02	5.862E-02	NOT IDENT.
CO-56	-3.013E-01	3.807E-01	4.042E-01	NOT IDENT.

MN-56	-1.000E+41	1.251E+41	0.000E+00	SHORT HLIF
CO-57	-7.065E-03	3.012E-02	3.029E-02	NOT IDENT.
CO-58	-1.845E-02	4.293E-01	4.294E-01	NOT IDENT.
FE-59	5.799E-02	3.309E+00	3.309E+00	NOT IDENT.
CO-60	-3.315E-03	3.259E-02	3.262E-02	NOT IDENT.
ZN-65	-1.151E-02	1.671E-01	1.672E-01	NOT IDENT.
GE-68	-3.516E-01	1.942E+00	1.949E+00	NOT IDENT.
AS-73	-4.905E-01	1.328E+00	1.347E+00	NOT IDENT.
AS-74	-5.819E+02	3.861E+03	3.870E+03	SHORT HLIF
SE-75	4.661E-02	1.536E-01	1.551E-01	NOT IDENT.
BR-77	2.099E+37	1.773E+38	0.000E+00	SHORT HLIF
SR-82	-2.272E+01	4.614E+02	4.616E+02	SHORT HLIF
RB-83	4.759E-02	4.162E-01	4.167E-01	NOT IDENT.
KR-85	1.969E+00	4.955E+00	5.034E+00	NOT IDENT.
SR-85	1.918E-01	4.857E-01	4.933E-01	NOT IDENT.
RB-86	-6.119E+03	1.884E+04	1.904E+04	SHORT HLIF
Y-88	-1.090E-01	2.183E-01	2.238E-01	NOT IDENT.
Y-91	-2.568E+02	4.757E+02	4.896E+02	NOT IDENT.
NB-94	1.808E-02	2.784E-02	2.901E-02	NOT IDENT.
NB-95	2.038E-01	6.382E-01	6.448E-01	NOT IDENT.
NB-95M	-4.897E-01	1.833E+00	1.847E+00	NOT IDENT.
ZR-95	2.356E-01	1.072E+00	1.077E+00	NOT IDENT.
NB-97	-1.000E+41	1.968E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.325E+41	0.000E+00	SHORT HLIF
MO-99	-7.353E+30	2.201E+31	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	3.351E+41	0.000E+00	SHORT HLIF
RH-101	3.333E-03	2.231E-02	2.236E-02	NOT IDENT.
RH-102	-1.997E-02	5.076E-02	5.155E-02	NOT IDENT.
RU-103	-2.317E+00	3.671E+00	3.816E+00	FAIL ABUN
RH-106	1.885E-01	3.465E-01	3.568E-01	NOT IDENT.
RU-106	1.885E-01	3.465E-01	3.568E-01	NOT IDENT.
AG-108M	4.047E-03	2.011E-02	2.019E-02	NOT IDENT.
CD-109	5.695E-01	6.907E-01	7.369E-01	NOT IDENT.
AG-110M	-1.771E-02	8.051E-02	8.091E-02	NOT IDENT.
SN-113	4.927E-02	1.683E-01	1.697E-01	NOT IDENT.
CD-115	-7.590E+37	2.980E+38	0.000E+00	SHORT HLIF
SN-117M	-2.330E+04	4.900E+04	5.012E+04	SHORT HLIF
TE-123M	-4.039E-02	9.132E-02	9.312E-02	NOT IDENT.
SB-124	1.260E+00	1.347E+00	1.462E+00	NOT IDENT.
SB-125	-9.854E-03	7.258E-02	7.271E-02	FAIL ABUN
TE-125M	1.475E+02	1.609E+02	1.741E+02	NOT IDENT.
I-126	3.973E+05	5.330E+05	5.623E+05	SHORT HLIF
SB-126	-3.384E+05	5.902E+05	6.096E+05	SHORT HLIF
SN-126	1.150E-01	4.929E-02	7.154E-02	FAIL ABUN
SB-127	-2.051E+21	5.457E+21	0.000E+00	SHORT HLIF
I-131	-2.296E+09	1.964E+09	2.220E+09	SHORT HLIF
I-132	-1.000E+41	4.913E+42	0.000E+00	SHORT HLIF
TE-132	-3.787E+24	6.032E+25	0.000E+00	SHORT HLIF
BA-133	2.171E-02	6.400E-02	6.474E-02	FAIL ABUN
I-133	-1.000E+41	2.727E+41	0.000E+00	SHORT HLIF
CS-134	1.934E-02	4.462E-02	4.546E-02	NOT IDENT.
I-135	-1.000E+41	1.232E+42	0.000E+00	SHORT HLIF
CS-136	-1.560E+04	1.591E+05	1.592E+05	SHORT HLIF
BA-137M	1.507E-02	2.502E-02	2.593E-02	NOT IDENT.
CS-137	1.592E-02	2.644E-02	2.739E-02	NOT IDENT.
CE-139	2.238E-03	7.297E-02	7.298E-02	NOT IDENT.
BA-140	3.949E+04	6.730E+05	6.733E+05	SHORT HLIF
LA-140	-1.564E+05	2.748E+05	2.837E+05	SHORT HLIF
CE-141	-1.611E+00	1.546E+01	1.547E+01	NOT IDENT.
CE-143	1.000E+41	5.853E+40	0.000E+00	SHORT HLIF
CE-144	5.135E-02	2.338E-01	2.349E-01	NOT IDENT.
PM-144	3.495E-02	3.904E-02	4.210E-02	NOT IDENT.
PR-144	3.001E+00	3.372E+00	3.634E+00	NOT IDENT.
PM-146	5.918E-03	3.232E-02	3.243E-02	NOT IDENT.
ND-147	-5.677E+06	1.882E+07	1.900E+07	SHORT HLIF
PM-147	1.777E+02	5.317E+02	5.377E+02	NOT IDENT.
PM-149	-2.357E+39	4.140E+39	0.000E+00	SHORT HLIF
EU-150	-1.169E-03	2.218E-02	2.218E-02	FAIL ABUN
EU-152	2.161E-03	6.020E-02	6.021E-02	FAIL ABUN
GD-153	-1.761E-02	1.003E-01	1.006E-01	NOT IDENT.
EU-154	3.650E-03	9.267E-02	9.269E-02	NOT IDENT.
EU-155	3.248E-02	6.844E-02	6.999E-02	FAIL ABUN
TB-160	2.444E-01	1.373E+00	1.378E+00	FAIL ABUN
HO-166M	3.751E-03	4.616E-02	4.619E-02	FAIL ABUN
TM-171	6.665E-01	3.033E+00	3.047E+00	NOT IDENT.
HF-172	-5.775E-02	1.399E-01	1.423E-01	FAIL ABUN
LU-172	3.043E-02	6.988E-02	7.122E-02	FAIL ABUN
LU-176	9.729E-03	1.884E-02	1.934E-02	NOT IDENT.

HF-181	9.718E-01	3.072E+00	3.103E+00	NOT IDENT.
TA-182	1.802E-01	8.173E-01	8.213E-01	FAIL ABUN
RE-183	2.070E-01	6.322E-01	6.390E-01	NOT IDENT.
RE-184	-1.943E+00	2.032E+01	2.034E+01	NOT IDENT.
W-188	5.085E-01	7.919E+01	7.919E+01	FAIL ABUN
IR-192	1.880E-01	3.031E-01	3.147E-01	FAIL ABUN
HG-203	1.047E+00	1.697E+00	1.761E+00	FAIL ABUN
BI-207	-6.739E-04	3.605E-02	3.605E-02	FAIL ABUN
BI-211	3.023E+00	4.349E-01	1.430E+00	FAIL ABUN
PB-211	6.997E-02	5.292E-01	5.302E-01	NOT IDENT.
BI-212	1.264E+00	6.063E-01	8.319E-01	FAIL ABUN
RN-219	5.616E-02	3.178E-01	3.188E-01	FAIL ABUN
RA-223	-2.212E-02	4.977E-01	4.978E-01	FAIL ABUN
AC-227	7.335E-02	1.822E-01	1.852E-01	FAIL ABUN
TH-227	7.335E-02	1.822E-01	1.852E-01	FAIL ABUN
TH-229	1.201E-01	3.343E-01	3.386E-01	FAIL ABUN
PA-231	6.946E-02	4.095E-01	4.107E-01	NOT IDENT.
TH-231	-2.212E-02	4.977E-01	4.978E-01	FAIL ABUN
PA-233	7.768E-03	5.146E-02	5.158E-02	FAIL ABUN
PA-234	-1.275E-01	2.555E-01	2.619E-01	FAIL ABUN
PA-234M	-5.074E-01	3.779E+00	3.786E+00	NOT IDENT.
NP-237	7.768E-03	5.146E-02	5.158E-02	FAIL ABUN
NP-238	-5.538E+39	3.830E+40	0.000E+00	SHORT HLIF
NP-239	2.872E-02	1.519E-01	1.524E-01	FAIL ABUN
PU-239	1.050E+02	2.002E+02	2.058E+02	NOT IDENT.
AM-241	3.381E-03	3.674E-02	3.677E-02	NOT IDENT.
CM-243	-2.971E-02	6.142E-02	6.287E-02	FAIL ABUN
BK-247	3.738E-03	5.418E-02	5.421E-02	NOT IDENT.
CM-247	-2.302E-02	2.780E-02	2.968E-02	FAIL ABUN
CF-249	9.972E-03	2.727E-02	2.764E-02	NOT IDENT.
CF-251	1.083E-02	8.531E-02	8.545E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	60.3801	87.09	70.2527	136.47	65.2058
45.60	70.4172	87.57	86.1620	140.51	0.0000
46.54	70.6720	88.03	86.2592	143.76	49.9415
49.72	0.0000	88.34	86.3242	144.24	49.9825
51.35	66.4043	88.47	86.3519	145.44	55.3566
51.87	60.1914	89.96	81.3584	152.43	67.0061
52.39	60.3022	1093.63	81.4918	153.25	0.0000
52.97	59.6297	91.11	0.0000	323.87	70.2094
53.44	70.0804	92.59	81.8708	156.02	0.0000
54.07	71.8296	93.35	82.0175	158.56	0.0000
57.36	0.0000	94.56	69.1376	159.00	72.7734
57.53	79.1330	94.65	69.1523	162.33	60.9631
57.98	81.6761	94.67	69.1553	162.66	0.0000
59.27	98.5324	94.87	69.1871	163.33	76.3229
59.32	98.5486	97.43	78.2955	165.86	58.2333
59.54	88.8650	98.43	85.6890	176.31	65.3811
60.96	100.1561	98.44	85.6908	176.60	0.0000
61.17	98.0438	99.53	81.3805	177.52	63.4173
62.93	95.3001	100.11	77.8647	181.07	0.0000
63.29	95.4065	102.03	71.8318	181.52	59.6032
63.58	95.4919	103.18	97.5369	184.41	59.8493
64.28	95.6970	103.37	86.6337	143.76	59.9606
66.73	108.5971	105.21	74.1620	193.51	53.1693
67.24	101.5478	105.31	76.9254	197.03	55.5610
125.81	96.6794	106.12	77.0594	198.01	57.7738
67.75	105.8685	106.47	97.3144	201.83	55.9181
69.67	117.3634	109.28	67.4177	203.43	51.7258
70.83	103.1752	111.00	88.0507	205.31	51.8540
72.81	106.0101	111.76	0.0000	210.85	55.1283
72.87	106.0283	114.06	74.6143	215.65	58.0197
74.66	106.5561	116.30	0.0000	222.11	56.2801
74.82	106.6030	116.74	66.5788	227.09	61.0643
74.97	106.6469	119.76	57.5440	227.38	52.2001
77.11	107.2694	121.12	65.2639	228.16	0.0000
78.74	107.7380	121.22	65.2766	228.18	47.8042
79.69	108.0086	121.78	64.4001	116.74	47.8042
80.12	108.1300	122.06	71.0684	235.69	61.3190
80.19	0.0000	122.92	60.7456	235.96	61.3390
80.57	108.2572	123.07	56.9655	238.63	57.4030
81.00	108.3786	265.00	61.7845	238.98	0.0000
81.07	108.3987	125.81	65.8530	240.99	57.5602
81.75	108.5890	127.23	70.8133	242.00	57.6279
83.79	69.6753	127.91	65.1549	244.70	57.8061
84.00	69.7125	129.30	63.4017	252.40	0.0000
85.43	69.9640	131.20	76.1564	252.80	44.6099
86.55	70.1593	133.02	58.9997	254.15	0.0000
86.79	70.2008	133.52	65.8293	256.23	38.2731
86.94	70.2271	136.00	56.3999	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	33.9901	355.39	0.0000	584.27	25.1337
264.80	33.9954	356.01	31.5979	595.83	0.0000
265.00	34.0026	364.49	0.0000	427.87	25.8625
268.22	38.3849	366.42	0.0000	602.52	0.0000
269.46	38.4352	372.51	25.6281	604.72	25.4222
270.03	38.4584	375.05	28.2499	607.14	19.4667
271.23	38.5067	377.52	28.3063	609.32	21.9884
273.65	0.0000	356.01	32.7614	610.33	19.5008
276.40	38.7152	388.16	27.6829	614.28	19.2422
277.37	38.7545	388.63	0.0000	618.01	12.0503
277.60	38.7635	391.69	30.3630	620.36	22.1208
278.00	38.7796	264.66	27.9551	621.93	10.5667
279.20	38.8280	401.81	37.5979	630.19	0.0000
279.54	38.8411	402.40	41.9883	631.29	19.7214
279.70	38.8471	404.85	27.6067	633.25	12.1489
280.46	37.6997	410.95	26.4142	634.78	0.0000
283.69	31.9142	413.71	34.4099	635.95	16.2220
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	41.4429	423.72	0.0000	645.85	17.3251
285.90	0.0000	427.09	24.9512	657.76	21.5341
287.50	32.0370	427.87	25.8570	657.90	0.0000
290.67	33.3295	433.94	24.1804	661.66	14.3845
293.27	0.0000	439.40	17.9818	664.57	0.0000
351.93	30.2913	453.88	24.5248	666.33	0.0000
295.96	30.3137	463.37	21.9434	666.50	0.0000
879.38	43.1873	468.07	23.3895	667.71	0.0000
299.98	44.8483	473.00	0.0000	677.62	19.6803
300.09	44.8529	475.06	29.4902	685.70	0.0000
300.13	44.8551	476.78	29.5247	695.00	0.0000
301.36	48.1165	477.60	25.8478	696.49	11.5004
302.85	40.1550	482.18	25.0010	696.51	11.5009
256.23	47.0552	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	18.8269
306.78	32.6483	497.08	26.1811	697.49	17.7823
308.46	46.0226	505.52	18.3324	702.65	20.9733
311.90	43.7432	507.63	0.0000	706.68	17.8619
316.51	24.4067	511.00	18.8680	711.68	17.9048
319.41	0.0000	514.00	17.0134	720.70	0.0000
320.08	0.0000	514.00	17.0134	721.93	0.0000
321.04	30.6366	520.40	17.0815	722.78	15.8820
323.87	36.0409	520.69	0.0000	722.91	6.3533
325.23	34.4454	522.65	0.0000	723.31	6.3545
328.76	0.0000	527.90	0.0000	724.19	6.3572
333.37	36.3516	528.26	30.5156	727.33	15.9161
333.97	38.0245	529.59	26.7228	733.00	15.9589
334.37	36.3838	529.87	0.0000	735.93	11.7193
338.28	31.1172	531.02	0.0000	333.97	14.9257
338.32	31.1180	537.26	0.0000	739.50	0.0000
311.90	36.5816	546.56	0.0000	747.24	20.3483
340.48	36.5816	552.55	14.5154	748.06	17.1419
340.55	0.0000	563.25	14.6069	752.31	16.1023
344.28	27.5275	569.33	17.5906	753.82	0.0000
345.93	28.4025	946.00	17.5928	756.73	16.1346
351.06	31.4651	569.70	19.0604	756.80	16.1353
351.93	31.4888	583.19	27.5819	884.68	19.4253

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	14.5811	1274.44	18.4863	1620.50	6.3875
766.42	17.8260	1001.03	18.6961	1621.92	3.1948
766.84	19.4502	1002.74	19.5984	1678.03	0.0000
772.60	0.0000	1004.73	17.8290	1690.97	1.0821
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	0.0000
778.90	8.6914	1028.54	0.0000	1063.66	4.4053
783.70	0.0000	1037.84	10.8230	1771.35	0.0000
785.37	8.7165	1038.76	0.0000	1791.20	0.0000
792.07	21.3091	631.29	12.6653	1808.65	1.1105
794.95	19.6948	1048.07	0.0000	1810.72	0.0000
795.86	19.7029	1049.04	12.6764	1836.06	7.8190
810.06	15.4190	1050.41	10.8706		
810.29	16.5216	1063.66	12.7396		
344.28	16.5228	1077.00	0.0000		
810.76	15.4236	1077.34	16.4564		
815.77	0.0000	1085.87	12.8362		
1048.07	0.0000	1093.63	4.4124		
832.01	28.9030	1099.45	6.4471		
834.85	17.8079	1112.07	16.6476		
835.71	20.0413	1112.84	14.8008		
836.80	0.0000	1115.54	17.7773		
846.75	0.0000	1120.29	14.8369		
846.77	19.0150	1120.55	14.8389		
856.80	0.0000	1221.41	10.3893		
860.56	7.8744	1129.67	14.8828		
871.09	16.9458	1131.51	0.0000		
873.19	15.2644	1147.95	0.0000		
875.33	0.0000	1173.23	16.0330		
879.38	10.2015	1177.95	18.8904		
880.51	8.5052	1189.05	18.9563		
883.24	18.1641	1204.77	24.7622		
884.68	15.9027	1221.41	18.1871		
889.28	13.6563	1231.02	22.0805		
894.76	12.5451	1235.36	0.0000		
898.04	17.1295	1238.28	17.3177		
900.72	5.7157	1260.41	0.0000		
903.28	13.7314	1271.87	10.8828		
911.20	16.0701	1274.44	11.6689		
912.08	16.0753	1274.54	11.6689		
923.98	0.0000	1291.59	14.6585		
926.50	13.8560	1298.22	0.0000		
929.11	13.8696	1312.11	0.0000		
937.49	16.2331	1332.49	9.8865		
944.13	0.0000	1362.66	0.0000		
946.00	15.1222	1365.19	2.9930		
949.00	8.1519	1368.63	0.0000		
667.71	0.0000	1384.29	4.0115		
962.31	9.8311	1408.01	10.0928		
964.08	16.6888	1457.56	0.0000		
966.17	16.7015	1460.82	3.0701		
911.20	16.7189	1489.16	6.1853		
968.97	16.7189	1505.03	7.2452		
983.53	0.0000	1584.12	13.7197		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235073.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM06.CNF;499
Background date : 2-OCT-2016 11:00:12.
Sample date     : 11-DEC-2015 11:35:00 Acquisition date : 3-OCT-2016 06:46:12.
Sample ID      : G405235073 Sample quantity   : 1.47132E+02 GRAM
Detector name   : GAM06 Detector geometry    : CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.59 0.0%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity    : 3.00000
Batch ID       : 1596254 Detector SN#    :
Matrix Spike ID : LCS ID           : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	51.75	14	123	0.49	103.23	102	8	3.90E-03	140.5	
2	0	74.82*	46	201	0.75	149.34	147	6	1.29E-02	50.4	
3	0	77.25	136	125	0.78	154.19	152	5	3.77E-02	15.2	
4	0	87.33	65	124	0.91	174.34	170	8	1.81E-02	32.3	
5	0	92.75*	52	103	1.11	185.17	182	7	1.44E-02	35.8	
6	0	99.04	25	67	1.33	197.74	196	6	6.86E-03	55.6	
7	0	128.86	33	68	0.70	257.33	255	6	9.25E-03	42.5	
8	0	185.91*	67	121	1.15	371.34	366	11	1.87E-02	34.8	
9	0	209.20	26	64	0.79	417.89	415	7	7.25E-03	54.2	
10	0	238.64*	258	129	1.07	476.72	473	9	7.16E-02	10.2	
11	0	242.05*	45	66	0.88	483.54	481	7	1.25E-02	35.6	
12	0	270.26*	50	34	1.59	539.93	536	9	1.38E-02	26.3	
13	0	295.16*	124	82	0.99	589.69	585	11	3.45E-02	16.9	
14	0	310.56	22	20	1.15	620.48	617	8	6.11E-03	41.2	
15	0	331.22	8	33	1.51	661.76	659	7	2.09E-03	134.2	
16	0	338.20	49	33	1.21	675.72	672	7	1.36E-02	24.2	
17	0	351.84	221	26	1.16	702.98	698	11	6.14E-02	8.1	
18	0	369.32	14	12	1.07	737.93	735	6	3.89E-03	47.4	
19	0	449.15	16	7	1.02	897.49	894	7	4.35E-03	37.9	
20	0	463.46*	27	13	2.26	926.09	922	8	7.38E-03	32.1	
21	0	510.24*	49	37	2.11	1019.62	1009	19	1.35E-02	38.1	
22	0	535.74	47	25	6.71	1070.60	1061	20	1.30E-02	30.0	
23	0	557.39	12	10	0.79	1113.88	1110	10	3.26E-03	58.5	
24	0	583.02*	107	23	1.39	1165.12	1157	16	2.98E-02	14.2	
25	0	609.08*	156	12	1.49	1217.21	1211	12	4.34E-02	9.4	
26	0	633.92	19	6	1.96	1266.87	1262	9	5.21E-03	33.8	
27	0	646.75	16	9	1.01	1292.52	1287	12	4.57E-03	43.8	
28	0	660.92	39	12	0.78	1320.86	1315	10	1.07E-02	23.4	
29	0	688.74	10	5	1.53	1376.48	1374	6	2.86E-03	45.3	
30	0	791.58	6	6	1.43	1582.11	1578	7	1.64E-03	83.2	
31	0	794.51	12	4	2.04	1587.96	1584	8	3.33E-03	40.8	
32	0	852.07	8	14	1.00	1703.05	1696	11	2.33E-03	92.2	
33	0	886.86	19	7	2.47	1772.63	1765	15	5.41E-03	37.8	
34	0	900.11	8	9	0.85	1799.12	1795	8	2.34E-03	68.3	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	911.13*	44	28	1.48	1821.17	1814	14	1.22E-02	29.9	
36	0	992.50	11	2	1.62	1983.90	1979	9	3.00E-03	39.3	
37	0	1070.25	12	6	0.69	2139.39	2132	12	3.33E-03	50.0	
38	0	1119.91*	43	12	2.23	2238.72	2233	15	1.21E-02	22.9	
39	0	1139.80	12	0	1.04	2278.50	2274	8	3.33E-03	28.9	
40	0	1192.44	10	3	0.89	2383.80	2381	6	2.65E-03	46.6	
41	0	1200.72	10	14	0.93	2400.35	2395	9	2.82E-03	72.5	
42	0	1302.42	10	3	1.36	2603.78	2600	9	2.90E-03	40.8	
43	0	1310.46	4	3	1.25	2619.88	2616	6	1.11E-03	84.8	
44	0	1376.95	15	5	2.66	2752.88	2747	10	4.18E-03	37.9	
45	0	1459.92*	256	0	2.14	2918.87	2912	15	7.10E-02	6.3	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235073.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-DEC-2015 11:35:00 Acquisition date : 3-OCT-2016 06:46:12
Sample ID        : G405235073 Sample quantity  : 147.13 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA6 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.59 0.0%
Energy tolerance : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error  : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.005E+00	1.172E+01	1.172E+01	12.65	OK
CD-109	88.03	3.70*	5.207E+00	1.249E+00	1.951E+00	112.90	OK
SN-126	64.28	9.60	2.772E+00	-----	Line Not Found	-----	Absent
	86.94	8.90	5.207E+00	5.194E-01	5.194E-01	112.90	OK
	87.57	37.00*	5.207E+00	1.249E-01	1.249E-01	112.90	OK
BA-137M	661.66	89.90*	2.029E+00	1.127E-01	1.149E-01	46.89	OK
CS-137	661.66	85.10*	2.029E+00	1.191E-01	1.213E-01	46.89	OK
TM-171	51.35	0.27	1.144E+00	3.006E+01	4.031E+01	280.95	OK
	52.39	0.47*	1.144E+00	1.727E+01	2.315E+01	280.95	OK
	66.73	0.14	3.097E+00	-----	Line Not Found	-----	Absent
TL-208	277.37	6.60	3.958E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.244E+00	3.026E-01	3.026E-01	28.44	OK
	860.56	12.50	1.624E+00	-----	Line Not Found	-----	Absent
BI-211	72.87	1.23	3.859E+00	-----	Line Not Found	-----	Absent
	351.06	12.92*	3.304E+00	2.408E-01	2.408E-01	393.74	OK
PB-212	74.82	10.28	4.080E+00	1.643E-01	1.643E-01	448.58	OK
	77.11	17.10	4.339E+00	1.172E+00	1.172E+00	30.49	OK
	238.63	43.60*	4.429E+00	7.792E-01	7.792E-01	20.34	OK
	300.09	3.30	3.729E+00	-----	Line Not Found	-----	Absent
BI-214	609.32	45.49*	2.167E+00	8.485E-01	8.488E-01	18.87	OK
	1120.29	14.92	1.280E+00	1.149E+00	1.149E+00	45.81	OK
	1764.49	15.30	8.592E-01	-----	Line Not Found	-----	Absent
PB-214	74.82	5.80	4.080E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	4.339E+00	2.067E+00	2.067E+00	30.49	OK
	87.09	3.41	5.190E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	4.383E+00	8.248E-01	8.251E-01	71.23	OK
	295.22	18.42	3.776E+00	1.022E+00	1.022E+00	33.83	OK
	351.93	35.60*	3.304E+00	-----	Line Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.167E+00	8.485E-01	8.488E-01	18.87	OK
	1120.29	14.92	1.280E+00	1.149E+00	1.149E+00	45.81	OK
	1764.49	15.30	8.592E-01	-----	Line Not Found	-----	Absent
RA-226	609.32	45.49*	2.167E+00	8.485E-01	8.488E-01	18.87	OK
	1120.29	14.92	1.280E+00	1.149E+00	1.149E+00	45.81	OK
	1764.49	15.30	8.592E-01	-----	Line Not Found	-----	Absent
TH-228	74.82	10.28	4.080E+00	1.643E-01	1.643E-01	448.58	OK
	77.11	17.10	4.339E+00	1.172E+00	1.172E+00	30.49	OK
	238.63	43.60*	4.429E+00	7.792E-01	7.792E-01	20.34	OK
	300.09	3.30	3.729E+00	-----	Line Not Found	-----	Absent
TH-230	609.32	45.49*	2.167E+00	8.485E-01	8.485E-01	18.87	OK
	1120.29	14.92	1.280E+00	1.149E+00	1.149E+00	45.81	OK
	1764.49	15.30	8.592E-01	-----	Line Not Found	-----	Absent
PA-233	300.13	6.63	3.729E+00	-----	Line Not Found	-----	Absent
	311.90	38.50*	3.633E+00	8.967E-02	8.967E-02	82.32	OK
	340.48	4.45	3.388E+00	-----	Line Not Found	-----	Absent
U-234	609.32	45.49*	2.167E+00	8.485E-01	8.485E-01	18.87	OK
	1120.29	14.92	1.280E+00	1.149E+00	1.149E+00	45.81	OK
	1764.49	15.30	8.592E-01	-----	Line Not Found	-----	Absent
AM-243	43.53	5.90	3.924E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	4.080E+00	2.513E-02	2.513E-02	448.58	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
ANH-511	511.00	100.00*	2.490E+00	1.065E-01	1.065E-01	76.26	OK

Flag: "*" = Keyline

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*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235073.CNF;1
* Acquisition date   : 3-OCT-2016 06:46:12 Sensitivity       : 3.000
* Detector ID       : GAM06 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.59 Half life ratio : *****
* Sample date       : 11-DEC-2015 11:35:00 Analyst initials: MXR1
* Sample ID         : G405235073 Sample Quantity : 1.4713E+02 GRAM
* Batch Number      : 1596254 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 8-MAR-2016 07:26:53 Eff. Geometry : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM06_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.172E+01	1.453E+00	3.547E-01
CD-109	1.951E+00	2.159E+00	1.951E+00
SN-126	1.249E-01	1.382E-01	1.228E-01
BA-137M	1.149E-01	5.278E-02	5.898E-02
CS-137	1.213E-01	5.576E-02	6.230E-02
TM-171	2.315E+01	6.375E+01	4.934E+01
TL-208	3.026E-01	8.434E-02	6.034E-02
BI-211	2.408E-01	9.291E-01	3.185E-01
PB-212	7.792E-01	1.553E-01	1.161E-01
BI-214	8.488E-01	1.570E-01	1.143E-01
PB-214	1.059E+00	1.688E-01	3.281E-01
RN-222	8.488E-01	1.570E-01	1.143E-01
RA-226	8.488E-01	1.570E-01	1.143E-01
TH-228	7.792E-01	1.553E-01	1.161E-01
TH-230	8.485E-01	1.569E-01	1.142E-01
PA-233	8.967E-02	7.234E-02	1.018E-01
U-234	8.485E-01	1.569E-01	1.142E-01
AM-243	2.513E-02	1.105E-01	1.141E-01
ANH-511	1.065E-01	7.960E-02	3.925E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	8.696E+00	1.169E+01	2.505E+01	NOT IDENT.
NA-22	-1.775E-02	4.616E-02	8.688E-02	NOT IDENT.
NA-24	0.000E+00	1.635E+41	0.000E+00	SHORT HLIF
AL-26	2.272E-03	2.651E-02	6.166E-02	NOT IDENT.
SC-46	-6.740E-02	3.432E-01	5.695E-01	FAIL ABUN
V-48	0.000E+00	1.291E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	3.847E+02	0.000E+00	SHORT HLIF
MN-54	-3.033E-02	6.419E-02	1.124E-01	NOT IDENT.
CO-56	5.099E-01	4.371E-01	9.806E-01	NOT IDENT.
MN-56	0.000E+00	8.573E+40	0.000E+00	SHORT HLIF
CO-57	1.696E-02	4.361E-02	8.630E-02	NOT IDENT.

CO-58	1.609E-01	4.722E-01	1.002E+00	NOT IDENT.
FE-59	-1.564E+00	6.316E+00	1.234E+01	NOT IDENT.
CO-60	-3.295E-02	3.972E-02	6.599E-02	NOT IDENT.
ZN-65	5.307E-04	1.680E-01	3.065E-01	NOT IDENT.
GE-68	2.602E+00	2.179E+00	5.324E+00	NOT IDENT.
AS-73	-2.331E-01	9.750E+00	1.968E+01	NOT IDENT.
AS-74	0.000E+00	4.774E+03	0.000E+00	SHORT HLIF
SE-75	-7.990E-03	2.025E-01	3.699E-01	NOT IDENT.
BR-77	0.000E+00	1.155E+37	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.647E+02	0.000E+00	SHORT HLIF
RB-83	-1.123E-01	5.074E-01	9.878E-01	NOT IDENT.
KR-85	-3.848E-01	6.623E+00	1.162E+01	NOT IDENT.
SR-85	-4.215E-02	6.774E-01	1.188E+00	NOT IDENT.
RB-86	0.000E+00	2.367E+04	0.000E+00	SHORT HLIF
Y-88	-1.404E-01	1.589E-01	1.151E-01	NOT IDENT.
Y-91	-3.265E+02	6.517E+02	1.005E+03	NOT IDENT.
NB-94	1.304E-02	3.285E-02	6.642E-02	NOT IDENT.
NB-95	1.190E-01	9.777E-01	1.864E+00	NOT IDENT.
NB-95M	-6.651E-01	2.687E+00	4.366E+00	NOT IDENT.
ZR-95	1.326E+00	1.291E+00	2.944E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	8.735E+40	0.000E+00	SHORT HLIF
MO-99	0.000E+00	8.205E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-1.861E-02	3.015E-02	4.965E-02	NOT IDENT.
RH-102	-6.297E-03	5.049E-02	8.819E-02	NOT IDENT.
RU-103	-8.989E-01	4.454E+00	8.685E+00	FAIL ABUN
RH-106	2.001E-02	4.138E-01	8.320E-01	NOT IDENT.
RU-106	2.001E-02	4.138E-01	8.320E-01	NOT IDENT.
AG-108M	4.304E-03	2.572E-02	5.224E-02	NOT IDENT.
AG-110M	1.059E-01	8.914E-02	2.134E-01	NOT IDENT.
SN-113	1.026E-02	2.061E-01	4.143E-01	NOT IDENT.
CD-115	0.000E+00	1.328E+39	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	7.269E+04	0.000E+00	SHORT HLIF
TE-123M	3.409E-03	1.157E-01	2.195E-01	NOT IDENT.
SB-124	-8.150E-01	1.521E+00	2.718E+00	FAIL ABUN
SB-125	-6.022E-02	9.465E-02	1.733E-01	FAIL ABUN
TE-125M	-9.234E+01	2.202E+02	4.110E+02	NOT IDENT.
I-126	0.000E+00	6.546E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	9.454E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	9.494E+21	0.000E+00	SHORT HLIF
I-131	0.000E+00	3.288E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.039E+26	0.000E+00	SHORT HLIF
BA-133	2.086E-02	3.330E-02	6.795E-02	NOT IDENT.
I-133	0.000E+00	1.833E+41	0.000E+00	SHORT HLIF
CS-134	5.532E-02	4.427E-02	8.943E-02	FAIL ABUN
CS-135	-1.763E-03	1.382E-01	2.338E-01	NOT IDENT.
I-135	0.000E+00	1.384E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.440E+05	0.000E+00	SHORT HLIF
CE-139	-5.410E-02	1.057E-01	1.887E-01	NOT IDENT.
BA-140	0.000E+00	1.016E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	3.603E+05	0.000E+00	SHORT HLIF
CE-141	-1.536E+01	1.981E+01	3.480E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	-4.808E-02	3.135E-01	5.906E-01	NOT IDENT.
PM-144	-9.689E-03	5.049E-02	9.524E-02	NOT IDENT.
PR-144	-9.049E-01	4.368E+00	8.218E+00	NOT IDENT.
PM-146	1.883E-02	3.876E-02	8.210E-02	FAIL ABUN
ND-147	0.000E+00	2.894E+07	0.000E+00	SHORT HLIF
PM-147	-4.483E+01	7.763E+02	1.479E+03	NOT IDENT.
PM-149	0.000E+00	1.631E+40	0.000E+00	SHORT HLIF
EU-150	-4.274E-03	3.054E-02	4.291E-02	FAIL ABUN
EU-152	1.744E-02	8.992E-02	1.829E-01	NOT IDENT.
GD-153	-3.497E-02	1.467E-01	2.595E-01	NOT IDENT.
EU-154	-3.811E-02	1.146E-01	2.180E-01	NOT IDENT.
EU-155	-1.597E-02	9.890E-02	1.885E-01	FAIL ABUN
TB-160	8.000E-01	1.756E+00	3.692E+00	FAIL ABUN
HO-166M	2.571E-02	4.849E-02	1.042E-01	FAIL ABUN
HF-172	8.331E-02	2.164E-01	4.002E-01	FAIL ABUN
LU-172	3.106E-03	7.922E-02	1.614E-01	FAIL ABUN
LU-176	6.703E-04	2.094E-02	3.889E-02	FAIL ABUN
HF-181	7.189E-01	3.657E+00	7.486E+00	NOT IDENT.
TA-182	5.694E-01	8.243E-01	1.874E+00	FAIL ABUN
RE-183	-2.721E-01	2.944E+00	5.890E+00	NOT IDENT.
RE-184	-5.328E+00	3.591E+01	5.833E+01	FAIL ABUN
W-188	6.099E+01	1.048E+02	1.943E+02	NOT IDENT.
IR-192	-1.868E-01	4.035E-01	7.746E-01	FAIL ABUN

HG-203	-1.432E+00	2.133E+00	3.553E+00	NOT IDENT.
BI-207	-1.432E-02	5.007E-02	8.504E-02	FAIL ABUN
PB-210	1.023E+00	4.036E+00	8.377E+00	NOT IDENT.
PB-211	-1.584E-01	5.352E-01	1.040E+00	NOT IDENT.
BI-212	6.776E-01	5.129E-01	1.148E+00	NOT IDENT.
RN-219	2.059E-01	3.617E-01	7.623E-01	FAIL ABUN
RA-223	2.992E-01	5.381E-01	1.139E+00	FAIL ABUN
RA-224	0.000E+00	1.018E+00	1.435E+00	FAIL ABUN
AC-227	-8.144E-02	2.328E-01	4.086E-01	NOT IDENT.
TH-227	-8.144E-02	2.328E-01	4.086E-01	NOT IDENT.
AC-228	0.000E+00	3.338E-01	5.196E-01	FAIL ABUN
RA-228	0.000E+00	3.338E-01	5.196E-01	FAIL ABUN
TH-229	-2.064E-01	4.488E-01	7.955E-01	FAIL ABUN
PA-231	-4.488E-02	3.882E-01	7.737E-01	NOT IDENT.
TH-231	2.992E-01	5.381E-01	1.139E+00	FAIL ABUN
TH-232	0.000E+00	3.338E-01	5.196E-01	FAIL ABUN
PA-234	9.156E-02	2.675E-01	5.775E-01	FAIL ABUN
PA-234M	4.321E+00	3.920E+00	9.263E+00	NOT IDENT.
TH-234	4.782E-01	1.285E+00	2.611E+00	FAIL ABUN
U-235	4.420E-02	1.693E-01	3.279E-01	FAIL ABUN
NP-237	8.967E-02	7.234E-02	9.272E-02	FAIL ABUN
NP-238	0.000E+00	1.677E+41	0.000E+00	SHORT HLIF
U-238	4.782E-01	1.285E+00	2.611E+00	FAIL ABUN
NP-239	9.010E-02	1.844E-01	3.766E-01	FAIL ABUN
PU-239	5.275E+02	4.391E+02	6.095E+02	FAIL ABUN
AM-241	-1.982E-02	1.405E-01	2.787E-01	NOT IDENT.
CM-243	-4.651E-02	8.880E-02	1.644E-01	FAIL ABUN
BK-247	2.001E-02	7.155E-02	1.357E-01	NOT IDENT.
CM-247	4.746E-03	3.120E-02	6.345E-02	NOT IDENT.
CF-249	3.557E-02	3.660E-02	7.976E-02	NOT IDENT.
CF-251	1.450E-03	1.043E-01	1.962E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	246	10.66*	1.005E+00	1.172E+01	1.172E+01	12.65
CD-109	88.03	81	3.70*	5.207E+00	2.144E+00	3.349E+00	64.52
SN-126	64.28	-----	9.60	2.772E+00	-----	Line Not Found	-----
	86.94	81	8.90	5.207E+00	8.915E-01	8.915E-01	64.52
	87.57	81	37.00*	5.207E+00	2.144E-01	2.144E-01	64.52
BA-137M	661.66	40	89.90*	2.029E+00	1.127E-01	1.149E-01	46.89
CS-137	661.66	40	85.10*	2.029E+00	1.191E-01	1.213E-01	46.89
TM-171	51.35	18	0.27	1.144E+00	3.006E+01	4.031E+01	280.95
	52.39	18	0.47*	1.144E+00	1.727E+01	2.315E+01	280.95
	66.73	-----	0.14	3.097E+00	-----	Line Not Found	-----
TL-208	277.37	-----	6.60	3.958E+00	-----	Line Not Found	-----
	583.19	113	85.00*	2.244E+00	3.026E-01	3.026E-01	28.44
	860.56	-----	12.50	1.624E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	3.859E+00	-----	Line Not Found	-----
	351.06	244	12.92*	3.304E+00	2.917E+00	2.917E+00	16.26
PB-212	74.82	59	10.28	4.080E+00	7.121E-01	7.121E-01	100.74
	77.11	170	17.10	4.339E+00	1.172E+00	1.172E+00	30.49
	238.63	295	43.60*	4.429E+00	7.792E-01	7.792E-01	20.34
	300.09	-----	3.30	3.729E+00	-----	Line Not Found	-----
BI-214	609.32	164	45.49*	2.167E+00	8.485E-01	8.488E-01	18.87
	1120.29	43	14.92	1.280E+00	1.149E+00	1.149E+00	45.81
	1764.49	-----	15.30	8.592E-01	-----	Line Not Found	-----
PB-214	74.82	59	5.80	4.080E+00	1.262E+00	1.263E+00	100.74
	77.11	170	9.70	4.339E+00	2.067E+00	2.067E+00	30.49
	87.09	81	3.41	5.207E+00	2.327E+00	2.327E+00	64.52
	242.00	51	7.25	4.383E+00	8.248E-01	8.251E-01	71.23
	295.22	139	18.42	3.776E+00	1.022E+00	1.022E+00	33.83
	351.93	244	35.60*	3.304E+00	1.058E+00	1.059E+00	16.26
RN-222	609.32	164	45.49*	2.167E+00	8.485E-01	8.488E-01	18.87
	1120.29	43	14.92	1.280E+00	1.149E+00	1.149E+00	45.81
	1764.49	-----	15.30	8.592E-01	-----	Line Not Found	-----
RA-224	240.99	51	4.10*	4.383E+00	1.458E+00	1.458E+00	71.23
RA-226	609.32	164	45.49*	2.167E+00	8.485E-01	8.488E-01	18.87
	1120.29	43	14.92	1.280E+00	1.149E+00	1.149E+00	45.81
	1764.49	-----	15.30	8.592E-01	-----	Line Not Found	-----
TH-228	74.82	59	10.28	4.080E+00	7.121E-01	7.121E-01	100.74
	77.11	170	17.10	4.339E+00	1.172E+00	1.172E+00	30.49
	238.63	295	43.60*	4.429E+00	7.792E-01	7.792E-01	20.34
	300.09	-----	3.30	3.729E+00	-----	Line Not Found	-----
TH-230	609.32	164	45.49*	2.167E+00	8.485E-01	8.485E-01	18.87
	1120.29	43	14.92	1.280E+00	1.149E+00	1.149E+00	45.81
	1764.49	-----	15.30	8.592E-01	-----	Line Not Found	-----
PA-233	300.13	-----	6.63	3.729E+00	-----	Line Not Found	-----
	311.90	25	38.50*	3.633E+00	8.967E-02	8.967E-02	82.32
	340.48	-----	4.45	3.388E+00	-----	Line Not Found	-----
U-234	609.32	164	45.49*	2.167E+00	8.485E-01	8.485E-01	18.87
	1120.29	43	14.92	1.280E+00	1.149E+00	1.149E+00	45.81

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	1764.49	-----	15.30	8.592E-01	-----	Line Not Found	-----
AM-243	43.53	-----	5.90	3.924E-01	-----	Line Not Found	-----
	74.66	59	67.20*	4.080E+00	1.089E-01	1.089E-01	100.74
ANH-511	511.00	52	100.00*	2.490E+00	1.065E-01	1.065E-01	76.26

Flag: "*" = Keyline

Total number of lines in spectrum 45
 Number of unidentified lines 17
 Number of lines tentatively identified by NID 28 62.22%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.172E+01	1.172E+01	0.148E+01	12.65	
CD-109	461.40D	1.56	2.144E+00	3.349E+00	2.161E+00	64.52	
SN-126	2.30E+05Y	1.00	2.144E-01	2.144E-01	1.384E-01	64.52	
BA-137M	30.08Y	1.02	1.127E-01	1.149E-01	0.539E-01	46.89	
CS-137	30.08Y	1.02	1.191E-01	1.213E-01	0.569E-01	46.89	
TM-171	1.92Y	1.34	1.727E+01	2.315E+01	6.505E+01	280.95	
TL-208	1.41E+10Y	1.00	3.026E-01	3.026E-01	0.861E-01	28.44	
BI-211	7.04E+08Y	1.00	2.917E+00	2.917E+00	0.474E+00	16.26	
PB-212	1.41E+10Y	1.00	7.792E-01	7.792E-01	1.585E-01	20.34	
BI-214	1600.00Y	1.00	8.485E-01	8.488E-01	1.602E-01	18.87	
PB-214	1600.00Y	1.00	1.058E+00	1.059E+00	0.172E+00	16.26	
RN-222	1600.00Y	1.00	8.485E-01	8.488E-01	1.602E-01	18.87	
RA-224	1.41E+10Y	1.00	1.458E+00	1.458E+00	1.039E+00	71.23	
RA-226	1600.00Y	1.00	8.485E-01	8.488E-01	1.602E-01	18.87	
TH-228	1.41E+10Y	1.00	7.792E-01	7.792E-01	1.585E-01	20.34	
TH-230	7.54E+04Y	1.00	8.485E-01	8.485E-01	1.601E-01	18.87	
PA-233	2.14E+06Y	1.00	8.967E-02	8.967E-02	7.382E-02	82.32	
U-234	2.45E+05Y	1.00	8.485E-01	8.485E-01	1.601E-01	18.87	
AM-243	7370.00Y	1.00	1.089E-01	1.089E-01	1.097E-01	100.74	
ANH-511	1.00E+09Y	1.00	1.065E-01	1.065E-01	0.812E-01	76.26	
Total Activity :			4.342E+01	5.052E+01			

Grand Total Activity : 4.342E+01 5.052E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	92.75	64	128	1.11	185.17	182	7	1.44E-02	71.5	5.54E+00	T
0	99.04	30	83	1.33	197.74	196	6	6.86E-03	****	5.82E+00	T
0	128.86	40	82	0.70	257.33	255	6	9.25E-03	84.9	6.15E+00	T
0	185.91	79	141	1.15	371.34	366	11	1.87E-02	69.5	5.26E+00	T
0	209.20	30	74	0.79	417.89	415	7	7.25E-03	****	4.87E+00	
0	270.26	56	39	1.59	539.93	536	9	1.38E-02	52.6	4.04E+00	T
0	331.22	8	37	1.51	661.76	659	7	2.09E-03	****	3.46E+00	
0	338.20	54	37	1.21	675.72	672	7	1.36E-02	48.3	3.41E+00	T
0	369.32	15	13	1.07	737.93	735	6	3.89E-03	94.8	3.18E+00	
0	449.15	17	8	1.02	897.49	894	7	4.35E-03	75.8	2.75E+00	
0	463.46	29	15	2.26	926.09	922	8	7.38E-03	64.3	2.68E+00	T
0	535.74	50	27	6.71	1070.60	1061	20	1.30E-02	59.9	2.40E+00	
0	557.39	12	11	0.79	1113.88	1110	10	3.26E-03	****	2.32E+00	
0	633.92	20	7	1.96	1266.87	1262	9	5.21E-03	67.6	2.10E+00	T
0	646.75	17	9	1.01	1292.52	1287	12	4.57E-03	87.6	2.07E+00	T
0	688.74	11	5	1.53	1376.48	1374	6	2.86E-03	90.6	1.96E+00	
0	791.58	6	6	1.43	1582.11	1578	7	1.64E-03	****	1.75E+00	T
0	794.51	12	4	2.04	1587.96	1584	8	3.33E-03	81.6	1.74E+00	T
0	852.07	9	14	1.00	1703.05	1696	11	2.33E-03	****	1.64E+00	
0	886.86	20	7	2.47	1772.63	1765	15	5.41E-03	75.6	1.58E+00	
0	900.11	9	9	0.85	1799.12	1795	8	2.34E-03	****	1.56E+00	T
0	911.13	44	28	1.48	1821.17	1814	14	1.22E-02	59.9	1.54E+00	T
0	992.50	11	2	1.62	1983.90	1979	9	3.00E-03	78.6	1.43E+00	
0	1070.25	12	6	0.69	2139.39	2132	12	3.33E-03	****	1.33E+00	
0	1139.80	12	0	1.04	2278.50	2274	8	3.33E-03	57.7	1.26E+00	
0	1192.44	9	3	0.89	2383.80	2381	6	2.65E-03	93.2	1.21E+00	
0	1200.72	10	14	0.93	2400.35	2395	9	2.82E-03	****	1.20E+00	
0	1302.42	10	3	1.36	2603.78	2600	9	2.90E-03	81.5	1.11E+00	
0	1310.46	4	3	1.25	2619.88	2616	6	1.11E-03	****	1.11E+00	
0	1376.95	15	5	2.66	2752.88	2747	10	4.18E-03	75.8	1.06E+00	

Flags: "T" = Tentatively associated


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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235073.CNF;1
* Acquisition date   : 3-OCT-2016 06:46:12 Sensitivity      : 3.000
* Detector ID       : GAM06 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.59 Half life ratio : *****
* Sample date       : 11-DEC-2015 11:35:00 Nuclide Library : SOLID
* Sample ID         : G405235073 Analyst initials: MXR1
* Batch Number      : 1596254 Sample Quantity : 1.4713E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 8-MAR-2016 07:26:53 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM06_CAN.CNF;14
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.124E-01
CD-109	9.163E-01
SN-126	5.758E-02
BA-137M	2.554E-02
CS-137	2.698E-02
TM-171	2.292E+01
TL-208	2.646E-02
BI-211	1.425E-01
PB-212	5.433E-02
BI-214	4.995E-02
PB-214	1.580E-01
RN-222	4.995E-02
RA-226	4.995E-02
TH-228	5.433E-02
TH-230	4.994E-02
PA-233	4.578E-02
U-234	4.994E-02
AM-243	5.436E-02
ANH-511	1.677E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.128E+01	NOT IDENT.
NA-22	3.583E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.262E-02	NOT IDENT.
SC-46	2.329E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	4.805E-02	NOT IDENT.
CO-56	4.291E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.020E-02	NOT IDENT.
CO-58	4.254E-01	NOT IDENT.

FE-59	5.202E+00	NOT IDENT.
CO-60	2.590E-02	NOT IDENT.
ZN-65	1.283E-01	NOT IDENT.
GE-68	2.313E+00	NOT IDENT.
AS-73	9.143E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.684E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.238E-01	NOT IDENT.
KR-85	5.114E+00	NOT IDENT.
SR-85	5.227E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	0.000E+00	NOT IDENT.
Y-91	4.269E+02	NOT IDENT.
NB-94	2.955E-02	NOT IDENT.
NB-95	8.348E-01	NOT IDENT.
NB-95M	2.021E+00	NOT IDENT.
ZR-95	1.295E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.276E-02	NOT IDENT.
RH-102	3.712E-02	NOT IDENT.
RU-103	3.762E+00	FAIL ABUN
RH-106	3.579E-01	NOT IDENT.
RU-106	3.579E-01	NOT IDENT.
AG-108M	2.332E-02	NOT IDENT.
AG-110M	9.282E-02	NOT IDENT.
SN-113	1.856E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.013E-01	NOT IDENT.
SB-124	8.591E-01	FAIL ABUN
SB-125	7.633E-02	FAIL ABUN
TE-125M	1.894E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.026E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.850E-02	FAIL ABUN
CS-135	1.058E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	8.714E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.598E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.731E-01	NOT IDENT.
PM-144	4.119E-02	NOT IDENT.
PR-144	3.551E+00	NOT IDENT.
PM-146	3.660E-02	FAIL ABUN
ND-147	0.000E+00	SHORT HLIF
PM-147	6.881E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.925E-02	FAIL ABUN
EU-152	8.308E-02	NOT IDENT.
GD-153	1.194E-01	NOT IDENT.
EU-154	9.030E-02	NOT IDENT.
EU-155	8.775E-02	FAIL ABUN
TB-160	1.594E+00	FAIL ABUN
HO-166M	4.528E-02	FAIL ABUN
HF-172	1.859E-01	FAIL ABUN
LU-172	6.924E-02	FAIL ABUN
LU-176	1.735E-02	FAIL ABUN
HF-181	3.308E+00	NOT IDENT.
TA-182	8.051E-01	FAIL ABUN
RE-183	2.732E+00	NOT IDENT.
RE-184	2.521E+01	FAIL ABUN
W-188	8.824E+01	NOT IDENT.
IR-192	3.480E-01	FAIL ABUN
HG-203	1.591E+00	NOT IDENT.

BI-207	3.542E-02	FAIL ABUN
PB-210	3.898E+00	NOT IDENT.
PB-211	4.562E-01	NOT IDENT.
BI-212	5.177E-01	NOT IDENT.
RN-219	3.450E-01	FAIL ABUN
RA-223	5.186E-01	FAIL ABUN
RA-224	6.779E-01	FAIL ABUN
AC-227	1.863E-01	NOT IDENT.
TH-227	1.863E-01	NOT IDENT.
AC-228	2.423E-01	FAIL ABUN
RA-228	2.423E-01	FAIL ABUN
TH-229	3.657E-01	FAIL ABUN
PA-231	3.507E-01	NOT IDENT.
TH-231	5.186E-01	FAIL ABUN
TH-232	2.423E-01	FAIL ABUN
PA-234	2.497E-01	FAIL ABUN
PA-234M	4.045E+00	NOT IDENT.
TH-234	1.230E+00	FAIL ABUN
U-235	1.528E-01	FAIL ABUN
NP-237	4.121E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.230E+00	FAIL ABUN
NP-239	1.734E-01	FAIL ABUN
PU-239	2.859E+02	FAIL ABUN
AM-241	1.297E-01	NOT IDENT.
CM-243	7.621E-02	FAIL ABUN
BK-247	6.201E-02	NOT IDENT.
CM-247	2.840E-02	NOT IDENT.
CF-249	3.635E-02	NOT IDENT.
CF-251	9.035E-02	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235073.CNF;1
* Acquisition date   : 3-OCT-2016 06:46:12 Sensitivity      : 3.000
* Detector ID       : GAM06 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.59 Half life ratio : *****
* Sample date       : 11-DEC-2015 11:35:00 Nuclide Library : SOLID
* Sample ID        : G405235073 Analyst initials: MXR1
* Batch Number     : 1596254 Sample Quantity : 1.4713E+02 GRAM
*                  : Quantity Err(%) : 1.3593E-03 %
* Wet wt corr      : 1.00000 Wet Weight : 0.00000
*                  : Dry Weight : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date    : 8-MAR-2016 07:26:53 Eff. Geometry : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM06_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.172E+01	1.762E+00	1.762E+00
CD-109	1.955E+00	2.177E+00	2.177E+00
SN-126	1.252E-01	1.392E-01	1.392E-01
BA-137M	1.149E-01	5.363E-02	5.363E-02
CS-137	1.213E-01	5.665E-02	5.665E-02
TM-171	2.315E+01	6.379E+01	6.379E+01
TL-208	3.026E-01	8.825E-02	8.825E-02
BI-211	2.475E-01	9.812E-01	9.812E-01
PB-212	7.792E-01	1.704E-01	1.704E-01
BI-214	8.488E-01	1.728E-01	1.728E-01
PB-214	1.059E+00	1.937E-01	1.937E-01
RN-222	8.488E-01	1.728E-01	1.728E-01
RA-226	8.488E-01	1.728E-01	1.728E-01
TH-228	7.792E-01	1.704E-01	1.704E-01
TH-230	8.485E-01	1.727E-01	1.727E-01
PA-233	8.967E-02	7.285E-02	7.285E-02
U-234	8.485E-01	1.727E-01	1.727E-01
AM-243	2.534E-02	1.112E-01	1.112E-01
ANH-511	1.065E-01	8.013E-02	8.013E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	8.696E+00	1.171E+01	1.235E+01	NOT IDENT.
NA-22	-1.775E-02	4.618E-02	4.687E-02	NOT IDENT.
NA-24	1.000E+41	1.692E+41	0.000E+00	SHORT HLIF
AL-26	2.272E-03	2.651E-02	2.653E-02	NOT IDENT.
SC-46	-6.740E-02	3.433E-01	3.446E-01	FAIL ABUN
V-48	7.679E+02	1.291E+04	1.292E+04	SHORT HLIF
CR-51	2.411E+02	3.853E+02	4.004E+02	SHORT HLIF
MN-54	-3.033E-02	6.428E-02	6.572E-02	NOT IDENT.
CO-56	5.099E-01	4.410E-01	4.973E-01	NOT IDENT.
MN-56	1.000E+41	8.649E+40	0.000E+00	SHORT HLIF
CO-57	1.696E-02	4.363E-02	4.429E-02	NOT IDENT.

CO-58	1.609E-01	4.725E-01	4.780E-01	NOT IDENT.
FE-59	-1.564E+00	6.323E+00	6.362E+00	NOT IDENT.
CO-60	-3.295E-02	3.981E-02	4.249E-02	NOT IDENT.
ZN-65	5.307E-04	1.680E-01	1.680E-01	NOT IDENT.
GE-68	2.602E+00	2.222E+00	2.513E+00	NOT IDENT.
AS-73	-2.331E-01	9.750E+00	9.751E+00	NOT IDENT.
AS-74	-5.684E+03	4.815E+03	5.455E+03	SHORT HLIF
SE-75	-7.990E-03	2.025E-01	2.025E-01	NOT IDENT.
BR-77	5.793E+37	4.965E+38	0.000E+00	SHORT HLIF
SR-82	3.949E+01	6.647E+02	6.650E+02	SHORT HLIF
RB-83	-1.123E-01	5.077E-01	5.103E-01	NOT IDENT.
KR-85	-3.848E-01	6.623E+00	6.625E+00	NOT IDENT.
SR-85	-4.215E-02	6.774E-01	6.777E-01	NOT IDENT.
RB-86	3.816E+04	2.454E+04	2.997E+04	SHORT HLIF
Y-88	-1.404E-01	1.593E-01	1.714E-01	NOT IDENT.
Y-91	-3.265E+02	6.523E+02	6.687E+02	NOT IDENT.
NB-94	1.304E-02	3.287E-02	3.339E-02	NOT IDENT.
NB-95	1.190E-01	9.778E-01	9.792E-01	NOT IDENT.
NB-95M	-6.651E-01	2.688E+00	2.705E+00	NOT IDENT.
ZR-95	1.326E+00	1.297E+00	1.428E+00	NOT IDENT.
NB-97	1.000E+41	1.110E+42	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	8.777E+40	0.000E+00	SHORT HLIF
MO-99	-5.549E+30	8.205E+31	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.005E+42	0.000E+00	SHORT HLIF
RH-101	-1.861E-02	3.036E-02	3.149E-02	NOT IDENT.
RH-102	-6.297E-03	5.049E-02	5.057E-02	NOT IDENT.
RU-103	-8.989E-01	4.455E+00	4.473E+00	FAIL ABUN
RH-106	2.001E-02	4.138E-01	4.139E-01	NOT IDENT.
RU-106	2.001E-02	4.138E-01	4.139E-01	NOT IDENT.
AG-108M	4.304E-03	2.572E-02	2.579E-02	NOT IDENT.
AG-110M	1.059E-01	9.012E-02	1.020E-01	NOT IDENT.
SN-113	1.026E-02	2.061E-01	2.061E-01	NOT IDENT.
CD-115	1.093E+39	1.345E+39	0.000E+00	SHORT HLIF
SN-117M	4.596E+04	7.293E+04	7.582E+04	SHORT HLIF
TE-123M	3.409E-03	1.157E-01	1.157E-01	NOT IDENT.
SB-124	-8.150E-01	1.523E+00	1.566E+00	FAIL ABUN
SB-125	-6.022E-02	9.479E-02	9.860E-02	FAIL ABUN
TE-125M	-9.234E+01	2.203E+02	2.242E+02	NOT IDENT.
I-126	4.003E+04	6.546E+05	6.548E+05	SHORT HLIF
SB-126	5.930E+05	9.531E+05	9.899E+05	SHORT HLIF
SB-127	1.133E+22	1.812E+22	0.000E+00	SHORT HLIF
I-131	2.609E+09	3.296E+09	3.500E+09	SHORT HLIF
I-132	-1.000E+41	2.135E+42	0.000E+00	SHORT HLIF
TE-132	8.092E+25	2.065E+26	0.000E+00	SHORT HLIF
BA-133	2.086E-02	3.335E-02	3.465E-02	NOT IDENT.
I-133	-1.000E+41	2.564E+41	0.000E+00	SHORT HLIF
CS-134	5.532E-02	4.465E-02	5.114E-02	FAIL ABUN
CS-135	-1.763E-03	1.382E-01	1.382E-01	NOT IDENT.
I-135	-1.000E+41	6.848E+41	0.000E+00	SHORT HLIF
CS-136	3.707E+04	2.441E+05	2.447E+05	SHORT HLIF
CE-139	-5.410E-02	1.063E-01	1.091E-01	NOT IDENT.
BA-140	1.287E+06	1.022E+06	1.175E+06	SHORT HLIF
LA-140	-1.775E+05	3.606E+05	3.694E+05	SHORT HLIF
CE-141	-1.536E+01	1.984E+01	2.102E+01	NOT IDENT.
CE-143	1.000E+41	2.508E+41	0.000E+00	SHORT HLIF
CE-144	-4.808E-02	3.135E-01	3.143E-01	NOT IDENT.
PM-144	-9.689E-03	5.050E-02	5.069E-02	NOT IDENT.
PR-144	-9.049E-01	4.368E+00	4.387E+00	NOT IDENT.
PM-146	1.883E-02	3.881E-02	3.973E-02	FAIL ABUN
ND-147	-2.972E+07	2.907E+07	3.201E+07	SHORT HLIF
PM-147	-4.483E+01	7.763E+02	7.766E+02	NOT IDENT.
PM-149	5.622E+39	1.636E+40	0.000E+00	SHORT HLIF
EU-150	-4.274E-03	3.054E-02	3.060E-02	FAIL ABUN
EU-152	1.744E-02	8.994E-02	9.028E-02	NOT IDENT.
GD-153	-3.497E-02	1.467E-01	1.476E-01	NOT IDENT.
EU-154	-3.811E-02	1.146E-01	1.159E-01	NOT IDENT.
EU-155	-1.597E-02	9.891E-02	9.918E-02	FAIL ABUN
TB-160	8.000E-01	1.759E+00	1.796E+00	FAIL ABUN
HO-166M	2.571E-02	4.856E-02	4.992E-02	FAIL ABUN
HF-172	8.331E-02	2.169E-01	2.201E-01	FAIL ABUN
LU-172	3.106E-03	7.922E-02	7.923E-02	FAIL ABUN
LU-176	6.703E-04	2.094E-02	2.094E-02	FAIL ABUN
HF-181	7.189E-01	3.657E+00	3.671E+00	NOT IDENT.
TA-182	5.694E-01	8.259E-01	8.648E-01	FAIL ABUN
RE-183	-2.721E-01	2.945E+00	2.947E+00	NOT IDENT.
RE-184	-5.328E+00	3.594E+01	3.602E+01	FAIL ABUN
W-188	6.099E+01	1.051E+02	1.087E+02	NOT IDENT.
IR-192	-1.868E-01	4.039E-01	4.125E-01	FAIL ABUN

HG-203	-1.432E+00	2.137E+00	2.233E+00	NOT IDENT.
BI-207	-1.432E-02	5.012E-02	5.054E-02	FAIL ABUN
PB-210	1.023E+00	4.037E+00	4.063E+00	NOT IDENT.
PB-211	-1.584E-01	5.354E-01	5.401E-01	NOT IDENT.
BI-212	6.776E-01	5.170E-01	6.005E-01	NOT IDENT.
RN-219	2.059E-01	3.630E-01	3.746E-01	FAIL ABUN
RA-223	2.992E-01	5.390E-01	5.556E-01	FAIL ABUN
RA-224	1.458E+00	1.027E+00	1.219E+00	FAIL ABUN
AC-227	-8.144E-02	2.331E-01	2.360E-01	NOT IDENT.
TH-227	-8.144E-02	2.331E-01	2.360E-01	NOT IDENT.
AC-228	5.687E-01	3.421E-01	4.275E-01	FAIL ABUN
RA-228	5.687E-01	3.421E-01	4.275E-01	FAIL ABUN
TH-229	-2.064E-01	4.490E-01	4.586E-01	FAIL ABUN
PA-231	-4.488E-02	3.883E-01	3.888E-01	NOT IDENT.
TH-231	2.992E-01	5.390E-01	5.556E-01	FAIL ABUN
TH-232	5.687E-01	3.421E-01	4.275E-01	FAIL ABUN
PA-234	9.156E-02	2.875E-01	2.905E-01	FAIL ABUN
PA-234M	4.321E+00	3.973E+00	4.425E+00	NOT IDENT.
TH-234	4.782E-01	1.290E+00	1.307E+00	FAIL ABUN
U-235	4.420E-02	1.694E-01	1.705E-01	FAIL ABUN
NP-237	8.967E-02	7.285E-02	8.332E-02	FAIL ABUN
NP-238	-2.640E+40	1.677E+41	0.000E+00	SHORT HLIF
U-238	4.782E-01	1.290E+00	1.307E+00	FAIL ABUN
NP-239	9.010E-02	1.846E-01	1.891E-01	FAIL ABUN
PU-239	5.275E+02	4.407E+02	5.008E+02	FAIL ABUN
AM-241	-1.982E-02	1.405E-01	1.408E-01	NOT IDENT.
CM-243	-4.651E-02	8.894E-02	9.137E-02	FAIL ABUN
BK-247	2.001E-02	7.168E-02	7.225E-02	NOT IDENT.
CM-247	4.746E-03	3.121E-02	3.128E-02	NOT IDENT.
CF-249	3.557E-02	3.681E-02	4.015E-02	NOT IDENT.
CF-251	1.450E-03	1.043E-01	1.043E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	53.5821	87.09	76.2207	136.47	48.9091
45.60	47.9530	87.57	76.2976	140.51	0.0000
46.54	48.9570	88.03	80.1894	143.76	53.6591
49.72	0.0000	88.34	80.2413	144.24	55.8030
51.35	60.4416	88.47	68.7969	145.44	58.0112
51.87	57.6251	89.96	69.0090	152.43	55.4039
52.39	57.7140	1093.63	53.7488	153.25	0.0000
52.97	57.8124	91.11	0.0000	323.87	66.2250
53.44	57.8920	92.59	64.5617	156.02	0.0000
54.07	50.3821	93.35	64.6604	158.56	0.0000
57.36	0.0000	94.56	61.9146	159.00	47.3133
57.53	53.2455	94.65	61.9258	162.33	57.2514
57.98	56.8657	94.67	61.9282	162.66	0.0000
59.27	51.7173	94.87	61.9526	163.33	54.0840
59.32	61.5339	97.43	49.2932	165.86	59.6955
59.54	62.4631	98.43	46.7893	176.31	28.6081
60.96	57.3281	98.44	46.7904	176.60	0.0000
61.17	75.2855	99.53	48.8422	177.52	45.1822
62.93	65.7316	100.11	65.1957	181.07	0.0000
63.29	67.5960	102.03	54.9644	181.52	39.8732
63.58	66.7451	103.18	64.9194	184.41	50.0214
64.28	64.1552	103.37	64.9426	143.76	50.1025
66.73	69.1035	105.21	64.1773	193.51	52.8262
67.24	77.3860	105.31	64.1892	197.03	37.2464
125.81	77.4709	106.12	54.3949	198.01	45.1990
67.75	77.4846	106.47	51.4608	201.83	43.1310
69.67	66.8619	109.28	54.7079	203.43	50.0338
70.83	87.2578	111.00	51.8834	205.31	44.4439
72.81	82.4428	111.76	0.0000	210.85	44.3414
72.87	89.8383	114.06	52.1638	215.65	34.5872
74.66	134.7088	116.30	0.0000	222.11	52.2482
74.82	134.7587	116.74	36.2813	227.09	52.5277
74.97	134.8063	119.76	51.6634	227.38	53.7118
77.11	113.1011	121.12	60.9196	228.16	0.0000
78.74	69.8587	121.22	60.9297	228.18	40.9024
79.69	60.0063	121.78	62.0029	116.74	40.9024
80.12	63.8180	122.06	53.8965	235.69	58.1076
80.19	0.0000	122.92	64.1574	235.96	54.9823
80.57	66.7001	123.07	62.1360	238.63	70.8856
81.00	63.0027	265.00	63.2185	238.98	0.0000
81.07	63.0124	125.81	49.1144	240.99	90.0053
81.75	67.8159	127.23	53.3296	242.00	39.5162
83.79	63.0722	127.91	62.9711	244.70	26.9447
84.00	54.2666	129.30	46.3046	252.40	0.0000
85.43	84.8146	131.20	56.4217	252.80	28.7600
86.55	76.1340	133.02	46.5779	254.15	0.0000
86.79	76.1719	133.52	53.8654	256.23	42.0824
86.94	76.1963	136.00	50.9537	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	35.1517	355.39	0.0000	584.27	17.0865
264.80	30.3070	356.01	14.4026	595.83	0.0000
265.00	32.7373	364.49	0.0000	427.87	20.2694
268.22	30.8101	366.42	0.0000	602.52	0.0000
269.46	30.4405	372.51	21.2080	604.72	16.7565
270.03	30.4565	375.05	23.9030	607.14	16.7766
271.23	30.4909	377.52	21.2852	609.32	16.2858
273.65	0.0000	356.01	23.1642	610.33	13.7483
276.40	31.8621	388.16	21.4482	614.28	12.2446
277.37	44.1563	388.63	0.0000	618.01	11.2448
277.60	44.1650	391.69	24.1891	620.36	17.3984
278.00	39.2725	264.66	24.3408	621.93	12.2905
279.20	35.6296	401.81	22.5555	630.19	0.0000
279.54	31.9533	402.40	22.5647	631.29	10.8033
279.70	31.9581	404.85	20.7946	633.25	8.2386
280.46	24.6002	410.95	27.2363	634.78	0.0000
283.69	20.9714	413.71	22.7392	635.95	12.3740
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	33.3586	423.72	0.0000	645.85	7.2524
285.90	0.0000	427.09	24.7780	657.76	9.3768
287.50	23.5186	427.87	26.6270	657.90	0.0000
290.67	23.1710	433.94	21.2017	661.66	14.0905
293.27	0.0000	439.40	18.5014	664.57	0.0000
351.93	28.6644	453.88	16.8051	666.33	0.0000
295.96	28.6826	463.37	15.9655	666.50	0.0000
879.38	44.9978	468.07	10.1720	667.71	0.0000
299.98	26.2801	473.00	0.0000	677.62	14.7201
300.09	26.2827	475.06	31.2134	685.70	0.0000
300.13	26.2833	476.78	20.8309	695.00	0.0000
301.36	33.4115	477.60	17.9992	696.49	15.9064
302.85	33.4538	482.18	17.0988	696.51	15.9064
256.23	20.9381	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	16.9727
306.78	22.6571	497.08	16.2913	697.49	14.8525
308.46	18.9079	505.52	2.8890	702.65	17.0130
311.90	26.5480	507.63	0.0000	706.68	14.9132
316.51	32.9951	511.00	11.5925	711.68	9.6079
319.41	0.0000	514.00	18.8700	720.70	0.0000
320.08	0.0000	514.00	18.8700	721.93	0.0000
321.04	35.6656	520.40	14.5679	722.78	22.5270
323.87	26.3858	520.69	0.0000	722.91	19.3103
325.23	31.5274	522.65	0.0000	723.31	21.4591
328.76	0.0000	527.90	0.0000	724.19	24.6874
333.37	25.7306	528.26	17.5591	727.33	11.8231
333.97	28.3171	529.59	19.0358	733.00	6.4646
334.37	20.6011	529.87	0.0000	735.93	7.5514
338.28	27.5527	531.02	0.0000	333.97	9.7156
338.32	32.2899	537.26	0.0000	739.50	0.0000
311.90	27.1690	546.56	0.0000	747.24	14.0918
340.48	27.1690	552.55	14.2348	748.06	11.9279
340.55	0.0000	563.25	11.9297	752.31	21.7253
344.28	30.2775	569.33	16.9550	753.82	0.0000
345.93	25.9857	946.00	16.9564	756.73	7.6181
351.06	24.3490	569.70	16.9578	756.80	7.6181
351.93	24.3650	583.19	17.0775	884.68	22.9226

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	22.9397	1274.44	8.5635	1620.50	4.2180
766.42	17.4824	1001.03	5.3606	1621.92	3.1646
766.84	13.1143	1002.74	8.0456	1678.03	0.0000
772.60	0.0000	1004.73	11.6289	1690.97	3.2122
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	5.4364
778.90	15.3757	1028.54	0.0000	1063.66	4.3540
783.70	0.0000	1037.84	8.1381	1771.35	3.2664
785.37	9.9104	1038.76	0.0000	1791.20	0.0000
792.07	0.0000	631.29	13.6011	1808.65	2.1941
794.95	14.9227	1048.07	0.0000	1810.72	0.0000
795.86	6.6348	1049.04	9.9822	1836.06	3.3091
810.06	10.0082	1050.41	11.8019		
810.29	7.7850	1063.66	10.2108		
344.28	6.6733	1077.00	0.0000		
810.76	7.7864	1077.34	4.5779		
815.77	0.0000	1085.87	10.0977		
1048.07	0.0000	1093.63	11.9622		
832.01	8.9727	1099.45	11.9836		
834.85	16.8420	1112.07	11.1042		
835.71	13.4780	1112.84	12.9584		
836.80	0.0000	1115.54	8.8928		
846.75	0.0000	1120.29	5.5660		
846.77	5.0757	1120.55	5.5664		
856.80	0.0000	1221.41	5.5679		
860.56	15.8736	1129.67	12.0939		
871.09	12.5209	1131.51	0.0000		
873.19	12.5308	1147.95	0.0000		
875.33	0.0000	1173.23	15.0771		
879.38	9.1341	1177.95	6.6052		
880.51	8.5669	1189.05	15.1455		
883.24	15.4358	1204.77	16.7353		
884.68	4.5760	1221.41	6.6873		
889.28	8.5944	1231.02	9.5789		
894.76	9.6448	1235.36	0.0000		
898.04	6.8975	1238.28	10.5576		
900.72	15.5341	1260.41	0.0000		
903.28	15.5484	1271.87	6.7808		
911.20	9.2402	1274.44	10.6630		
912.08	9.2432	1274.54	10.6630		
923.98	0.0000	1291.59	3.8953		
926.50	8.1291	1298.22	0.0000		
929.11	12.7863	1312.11	0.0000		
937.49	10.4923	1332.49	10.8281		
944.13	0.0000	1362.66	0.0000		
946.00	10.5234	1365.19	3.9707		
949.00	7.9008	1368.63	0.0000		
667.71	0.0000	1384.29	2.9925		
962.31	10.5824	1408.01	7.0244		
964.08	27.3549	1457.56	0.0000		
966.17	29.1409	1460.82	1.0165		
911.20	12.3743	1489.16	5.1169		
968.97	12.3743	1505.03	9.2450		
983.53	0.0000	1584.12	9.4142		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235074.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM07.CNF;484
Background date : 2-OCT-2016 11:00:17.
Sample date     : 15-DEC-2015 14:10:00 Acquisition date : 3-OCT-2016 06:46:37.
Sample ID      : G405235074 Sample quantity   : 1.69068E+02 GRAM
Detector name  : GAM07 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.52 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1596254 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.66*	38	153	0.86	93.83	89	10	1.07E-02	63.3	
2	0	63.21*	22	141	1.02	126.92	124	7	6.02E-03	96.8	
3	1	74.83*	128	178	1.13	150.15	146	14	3.55E-02	19.4	1.71E+00
4	1	77.15	233	154	1.13	154.79	146	14	6.48E-02	11.5	
5	0	86.91	58	154	1.19	174.29	171	7	1.61E-02	37.8	
6	0	93.50*	30	214	1.46	187.48	181	9	8.39E-03	93.0	
7	0	118.70	34	84	0.75	237.87	234	7	9.54E-03	47.7	
8	0	129.94	49	136	1.69	260.35	255	10	1.37E-02	46.9	
9	0	186.11*	83	143	1.38	372.64	368	13	2.29E-02	32.8	
10	0	204.67	25	79	1.05	409.76	407	8	6.97E-03	64.2	
11	0	209.40	39	84	0.90	419.23	415	8	1.08E-02	43.7	
12	2	238.59*	391	62	1.25	477.58	474	14	1.09E-01	6.3	2.42E+00
13	2	241.62	94	68	1.54	483.65	474	14	2.61E-02	21.0	
14	0	270.04	39	56	1.63	540.48	536	9	1.10E-02	37.7	
15	1	277.32	25	56	1.45	555.03	552	15	7.01E-03	49.8	2.97E+00
16	1	281.69	25	43	1.45	563.77	552	15	7.05E-03	48.7	
17	0	295.26*	205	87	1.39	590.90	584	15	5.70E-02	12.2	
18	0	302.74	29	70	4.08	605.86	598	12	8.16E-03	61.3	
19	0	338.34*	87	61	1.70	677.05	670	15	2.41E-02	22.5	
20	0	351.94*	282	61	1.43	704.25	696	15	7.84E-02	8.6	
21	0	463.85	38	41	1.85	928.01	922	14	1.06E-02	39.3	
22	0	511.44*	35	69	1.97	1023.17	1016	18	9.79E-03	65.7	
23	0	564.19	34	22	3.16	1128.65	1121	15	9.46E-03	34.8	
24	0	583.08*	112	24	1.43	1166.43	1160	12	3.10E-02	13.2	
25	0	609.27*	184	60	1.29	1218.80	1212	14	5.11E-02	11.7	
26	0	727.17*	29	13	1.43	1454.56	1450	11	7.95E-03	32.2	
27	0	744.83	20	11	2.49	1489.87	1485	9	5.55E-03	39.2	
28	0	768.72	17	12	1.50	1537.64	1533	8	4.77E-03	44.0	
29	0	803.54*	18	3	3.94	1607.28	1601	12	5.05E-03	35.4	
30	0	894.73	14	19	0.61	1789.64	1781	14	3.94E-03	72.8	
31	0	911.72*	53	41	1.87	1823.60	1815	14	1.46E-02	30.1	
32	0	927.72	15	9	2.38	1855.60	1851	11	4.25E-03	44.7	
33	0	934.11	15	6	2.53	1868.38	1865	8	4.29E-03	37.2	
34	0	954.52	8	4	0.97	1909.19	1906	6	2.15E-03	55.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	965.47	7	22	2.09	1931.10	1922	12	1.86E-03	143.0	
36	0	968.79*	62	7	1.61	1937.73	1933	14	1.74E-02	16.0	
37	0	1002.17	19	13	4.53	2004.47	1998	14	5.36E-03	46.7	
38	0	1120.90	31	24	2.18	2241.90	2234	14	8.72E-03	37.8	
39	0	1144.39	17	7	1.71	2288.89	2284	10	4.67E-03	38.9	
40	0	1161.83	15	10	0.86	2323.75	2317	12	4.23E-03	51.2	
41	0	1237.69	19	14	2.49	2475.47	2470	11	5.34E-03	43.8	
42	0	1248.96	14	17	0.69	2498.00	2491	13	3.90E-03	69.2	
43	0	1328.22	5	11	1.45	2656.52	2649	14	1.49E-03	135.1	
44	0	1376.11	11	3	3.18	2752.28	2747	11	3.09E-03	41.8	
45	0	1391.79	11	3	3.33	2783.64	2777	12	3.11E-03	42.9	
46	0	1460.42*	356	3	2.04	2920.89	2914	14	9.90E-02	5.5	
47	0	1764.49*	31	8	2.87	3528.99	3523	13	8.69E-03	28.0	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235074.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 15-DEC-2015 14:10:00 Acquisition date : 3-OCT-2016 06:46:37
Sample ID         : G405235074 Sample quantity   : 169.07 GRAM
Sample type       : SOLID Sample geometry    :
Detector name     : GAMMA7 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.52 0.0%
Energy tolerance  : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error    : 0.00 %
Efficiency type   : Linear Efficiencies at   : Peak Energy
Abundance limit   : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.122E+00	1.291E+01	1.291E+01	10.97	OK
CD-109	88.03	3.70*	5.724E+00	3.499E-01	5.431E-01	371.35	OK
SN-126	64.28	9.60	3.489E+00	4.059E-01	4.059E-01	193.59	OK
	86.94	8.90	5.724E+00	1.455E-01	1.455E-01	371.35	OK
	87.57	37.00*	5.724E+00	3.499E-02	3.499E-02	371.35	OK
TL-208	277.37	6.60	4.378E+00	4.681E-01	4.681E-01	99.58	OK
	583.19	85.00*	2.366E+00	2.719E-01	2.719E-01	26.46	OK
	860.56	12.50	1.736E+00	-----	Line Not Found	-----	Absent
PB-210	46.54	4.25*	1.120E+00	5.209E+00	5.341E+00	126.67	OK
PB-212	74.82	10.28	4.782E+00	8.006E-01	8.006E-01	81.51	OK
	77.11	17.10	4.994E+00	1.679E+00	1.679E+00	23.00	OK
	238.63	43.60*	4.931E+00	9.923E-01	9.923E-01	12.62	OK
	300.09	3.30	4.103E+00	-----	Line Not Found	-----	Absent
BI-214	609.32	45.49*	2.284E+00	8.628E-01	8.631E-01	23.39	OK
	1120.29	14.92	1.405E+00	6.739E-01	6.741E-01	75.57	OK
	1764.49	15.30	9.422E-01	9.156E-01	9.159E-01	55.98	OK
PB-214	74.82	5.80	4.781E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	4.994E+00	2.960E+00	2.961E+00	23.00	OK
	87.09	3.41	5.736E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	4.877E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.159E+00	1.426E+00	1.427E+00	24.36	OK
	351.93	35.60*	3.592E+00	1.151E+00	1.152E+00	17.12	OK
RN-222	609.32	45.49*	2.284E+00	8.628E-01	8.631E-01	23.39	OK
	1120.29	14.92	1.405E+00	6.739E-01	6.741E-01	75.57	OK
	1764.49	15.30	9.422E-01	9.156E-01	9.159E-01	55.98	OK
RA-224	240.99	4.10*	4.883E+00	3.579E-02	3.579E-02	3461.28	OK
RA-226	609.32	45.49*	2.284E+00	8.628E-01	8.631E-01	23.39	OK
	1120.29	14.92	1.405E+00	6.739E-01	6.741E-01	75.57	OK
	1764.49	15.30	9.422E-01	9.156E-01	9.159E-01	55.98	OK
AC-228	105.21	1.10	6.488E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.713E+00	1.088E+00	1.088E+00	45.09	OK
	794.95	4.25	1.849E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.777E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.659E+00	5.680E-01	5.680E-01	60.24	OK
	968.97	15.80	1.580E+00	1.148E+00	1.148E+00	31.90	OK
RA-228	105.21	1.10	6.488E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.713E+00	1.088E+00	1.088E+00	45.09	OK
	794.95	4.25	1.849E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.777E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.659E+00	5.680E-01	5.680E-01	60.24	OK
	968.97	15.80	1.580E+00	1.148E+00	1.148E+00	31.90	OK
TH-228	74.82	10.28	4.782E+00	8.006E-01	8.006E-01	81.51	OK
	77.11	17.10	4.994E+00	1.679E+00	1.679E+00	23.00	OK
	238.63	43.60*	4.931E+00	9.923E-01	9.923E-01	12.62	OK
	300.09	3.30	4.103E+00	-----	Line Not Found	-----	Absent
TH-230	609.32	45.49*	2.284E+00	8.628E-01	8.628E-01	23.39	OK
	1120.29	14.92	1.405E+00	6.739E-01	6.739E-01	75.57	OK
	1764.49	15.30	9.422E-01	9.156E-01	9.156E-01	55.98	OK
PA-231	283.69	1.70	4.298E+00	-----	Line Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	301.36	5.35*	4.074E+00	7.154E-01	7.154E-01	122.52	OK
TH-232	105.21	1.10	6.488E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.713E+00	1.088E+00	1.088E+00	45.09	OK
	835.71	1.61	1.777E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.659E+00	5.680E-01	5.680E-01	60.24	OK
	968.97	15.80	1.580E+00	1.148E+00	1.148E+00	31.90	OK
TH-234	63.29	3.70*	3.489E+00	1.053E+00	1.053E+00	193.59	OK
	92.59	4.23	6.082E+00	7.081E-01	7.081E-01	185.99	OK
U-234	609.32	45.49*	2.284E+00	8.628E-01	8.628E-01	23.39	OK
	1120.29	14.92	1.405E+00	6.739E-01	6.739E-01	75.57	OK
	1764.49	15.30	9.422E-01	9.156E-01	9.156E-01	55.98	OK
U-235	89.96	3.47	5.903E+00	-----	Line Not Found	-----	Absent
	93.35	5.60	6.082E+00	5.348E-01	5.348E-01	185.99	OK
	143.76	10.96*	6.563E+00	-----	Line Not Found	-----	Absent
	163.33	5.08	6.266E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	5.850E+00	1.384E-01	1.384E-01	65.53	OK
	205.31	5.01	5.507E+00	5.048E-01	5.048E-01	128.45	OK
U-238	63.29	3.70*	3.489E+00	1.053E+00	1.053E+00	193.59	OK
	92.59	4.23	6.082E+00	7.081E-01	7.081E-01	185.99	OK
AM-243	43.53	5.90	6.933E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	4.782E+00	1.225E-01	1.225E-01	81.51	OK
ANH-511	511.00	100.00*	2.632E+00	6.672E-02	6.672E-02	131.38	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235074.CNF;1 *
 * Acquisition date : 3-OCT-2016 06:46:37 Sensitivity : 3.000 *
 * Detector ID : GAM07 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.52 Half life ratio : ***** *
 * Sample date : 15-DEC-2015 14:10:00 Analyst initials: MXR1 *
 * Sample ID : G405235074 Sample Quantity : 1.6907E+02 GRAM *
 * Batch Number : 1596254 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 19-AUG-2016 11:09:59 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM07_CAN.CNF;15 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.291E+01	1.388E+00	6.084E-01
CD-109	5.431E-01	1.976E+00	2.046E+00
SN-126	3.499E-02	1.273E-01	1.245E-01
TL-208	2.719E-01	7.050E-02	5.559E-02
PB-210	5.341E+00	6.630E+00	4.223E+00
PB-212	9.923E-01	1.227E-01	7.712E-02
BI-214	8.631E-01	1.979E-01	1.150E-01
PB-214	1.152E+00	1.931E-01	1.118E-01
RN-222	8.631E-01	1.979E-01	1.150E-01
RA-224	3.579E-02	1.214E+00	8.268E-01
RA-226	8.631E-01	1.979E-01	1.150E-01
AC-228	5.680E-01	3.353E-01	2.552E-01
RA-228	5.680E-01	3.353E-01	2.552E-01
TH-228	9.923E-01	1.227E-01	7.712E-02
TH-230	8.628E-01	1.978E-01	1.150E-01
PA-231	7.154E-01	8.590E-01	7.581E-01
TH-232	5.680E-01	3.353E-01	2.552E-01
TH-234	1.053E+00	1.998E+00	1.867E+00
U-234	8.628E-01	1.978E-01	1.150E-01
U-235	1.094E-02	1.439E-01	2.729E-01
U-238	1.053E+00	1.998E+00	1.867E+00
AM-243	1.225E-01	9.783E-02	7.747E-02
ANH-511	6.672E-02	8.590E-02	4.377E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.379E+00		9.796E+00	1.955E+01	NOT IDENT.
NA-22	1.616E-02		3.987E-02	8.558E-02	NOT IDENT.
NA-24	0.000E+00		1.811E+41	0.000E+00	SHORT HLIF
AL-26	-1.698E-02		2.135E-02	3.580E-02	NOT IDENT.
SC-46	3.538E-02		3.648E-01	6.660E-01	FAIL ABUN
V-48	0.000E+00		9.221E+03	0.000E+00	SHORT HLIF
CR-51	0.000E+00		2.936E+02	0.000E+00	SHORT HLIF

MN-54	-1.193E-03	4.952E-02	1.015E-01	NOT IDENT.
CO-56	1.121E-01	4.324E-01	8.956E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.245E-03	4.138E-02	7.333E-02	NOT IDENT.
CO-58	-1.831E-01	4.291E-01	7.633E-01	NOT IDENT.
FE-59	7.519E-01	4.631E+00	9.756E+00	NOT IDENT.
CO-60	1.621E-02	4.335E-02	8.233E-02	NOT IDENT.
ZN-65	1.749E-02	1.862E-01	3.289E-01	NOT IDENT.
GE-68	-6.209E-01	2.298E+00	4.375E+00	NOT IDENT.
AS-73	5.133E+00	5.878E+00	1.266E+01	NOT IDENT.
AS-74	0.000E+00	4.002E+03	0.000E+00	SHORT HLIF
SE-75	1.098E-02	1.604E-01	3.261E-01	NOT IDENT.
BR-77	0.000E+00	2.755E+36	0.000E+00	SHORT HLIF
SR-82	0.000E+00	5.139E+02	0.000E+00	SHORT HLIF
RB-83	-2.077E-01	5.486E-01	1.018E+00	NOT IDENT.
KR-85	5.421E+00	6.179E+00	1.315E+01	NOT IDENT.
SR-85	5.304E-01	6.056E-01	1.289E+00	NOT IDENT.
RB-86	0.000E+00	2.165E+04	0.000E+00	SHORT HLIF
Y-88	-1.139E-01	1.709E-01	3.090E-01	NOT IDENT.
Y-91	-8.441E+01	4.387E+02	8.409E+02	NOT IDENT.
NB-94	1.578E-02	2.870E-02	5.890E-02	NOT IDENT.
NB-95	7.035E-01	6.530E-01	1.388E+00	NOT IDENT.
NB-95M	8.784E-01	1.878E+00	3.588E+00	NOT IDENT.
ZR-95	4.396E-01	1.016E+00	2.142E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	3.026E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.918E+41	0.000E+00	SHORT HLIF
RH-101	-1.570E-02	3.102E-02	5.157E-02	NOT IDENT.
RH-102	-2.730E-02	5.185E-02	9.234E-02	NOT IDENT.
RU-103	-1.949E+00	4.364E+00	8.059E+00	FAIL ABUN
RH-106	3.814E-01	3.336E-01	7.947E-01	NOT IDENT.
RU-106	3.814E-01	3.336E-01	7.947E-01	NOT IDENT.
AG-108M	1.630E-03	2.201E-02	4.419E-02	NOT IDENT.
AG-110M	2.177E-02	7.901E-02	1.695E-01	NOT IDENT.
SN-113	4.530E-02	1.894E-01	3.841E-01	NOT IDENT.
CD-115	0.000E+00	2.811E+38	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	5.789E+04	0.000E+00	SHORT HLIF
TE-123M	-7.530E-02	1.120E-01	1.971E-01	NOT IDENT.
SB-124	-1.410E-01	1.804E+00	3.654E+00	NOT IDENT.
SB-125	2.016E-02	8.248E-02	1.687E-01	FAIL ABUN
TE-125M	-5.511E+01	2.020E+02	3.796E+02	NOT IDENT.
I-126	0.000E+00	5.217E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	6.826E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	5.306E+21	0.000E+00	SHORT HLIF
I-131	0.000E+00	2.372E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	7.666E+25	0.000E+00	SHORT HLIF
BA-133	1.648E-02	2.977E-02	5.936E-02	FAIL ABUN
I-133	0.000E+00	8.338E+40	0.000E+00	SHORT HLIF
CS-134	4.064E-02	5.273E-02	1.083E-01	FAIL ABUN
CS-135	4.233E-02	1.229E-01	2.321E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	1.702E+05	0.000E+00	SHORT HLIF
BA-137M	3.669E-03	2.941E-02	5.778E-02	NOT IDENT.
CS-137	3.876E-03	3.107E-02	6.104E-02	NOT IDENT.
CE-139	-2.574E-03	1.022E-01	1.895E-01	NOT IDENT.
BA-140	0.000E+00	7.914E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	2.330E+05	0.000E+00	SHORT HLIF
CE-141	-4.315E+00	1.672E+01	3.089E+01	NOT IDENT.
CE-143	0.000E+00	5.998E+40	0.000E+00	SHORT HLIF
CE-144	-2.569E-02	3.251E-01	5.638E-01	NOT IDENT.
PM-144	9.287E-03	4.718E-02	9.331E-02	NOT IDENT.
PR-144	7.641E-01	4.077E+00	8.054E+00	NOT IDENT.
PM-146	1.456E-02	3.638E-02	7.524E-02	NOT IDENT.
ND-147	0.000E+00	1.655E+07	0.000E+00	SHORT HLIF
PM-147	3.898E+02	6.729E+02	1.272E+03	NOT IDENT.
PM-149	0.000E+00	3.918E+39	0.000E+00	SHORT HLIF
EU-150	-9.227E-03	2.113E-02	3.573E-02	FAIL ABUN
EU-152	-4.740E-02	8.633E-02	1.427E-01	FAIL ABUN
GD-153	-2.473E-01	1.418E-01	2.336E-01	NOT IDENT.
EU-154	4.404E-02	9.900E-02	2.134E-01	NOT IDENT.
EU-155	5.616E-02	9.474E-02	1.901E-01	FAIL ABUN
TB-160	-1.526E-01	1.334E+00	2.718E+00	FAIL ABUN
HO-166M	4.475E-02	5.012E-02	1.085E-01	FAIL ABUN
TM-171	7.249E+00	1.545E+01	3.228E+01	NOT IDENT.
HF-172	-6.858E-03	2.106E-01	3.688E-01	FAIL ABUN
LU-172	6.000E-02	7.494E-02	1.643E-01	FAIL ABUN

LU-176	2.334E-02	1.980E-02	4.154E-02	FAIL ABUN
HF-181	-1.163E+00	3.168E+00	5.949E+00	NOT IDENT.
TA-182	-2.031E-01	9.016E-01	1.694E+00	FAIL ABUN
RE-183	-1.566E+00	2.066E+00	3.911E+00	NOT IDENT.
RE-184	4.132E+00	2.413E+01	4.986E+01	FAIL ABUN
W-188	-2.021E+01	8.555E+01	1.509E+02	FAIL ABUN
IR-192	-1.709E-01	3.781E-01	7.133E-01	FAIL ABUN
HG-203	-1.304E+00	1.800E+00	3.384E+00	NOT IDENT.
BI-207	-7.806E-03	3.805E-02	7.494E-02	FAIL ABUN
BI-211	0.000E+00	5.320E-01	7.852E-01	FAIL ABUN
PB-211	-1.405E-02	6.006E-01	1.177E+00	NOT IDENT.
BI-212	1.031E+00	6.514E-01	1.099E+00	FAIL ABUN
RN-219	-8.120E-02	3.420E-01	6.557E-01	FAIL ABUN
RA-223	-1.114E-01	4.941E-01	9.646E-01	FAIL ABUN
AC-227	-1.214E-01	1.802E-01	3.433E-01	NOT IDENT.
TH-227	-1.214E-01	1.802E-01	3.433E-01	NOT IDENT.
TH-229	-1.267E-01	4.297E-01	7.703E-01	FAIL ABUN
TH-231	-1.114E-01	4.941E-01	9.646E-01	FAIL ABUN
PA-233	2.157E-02	4.847E-02	1.012E-01	NOT IDENT.
PA-234	-4.405E-02	2.375E-01	4.692E-01	FAIL ABUN
PA-234M	6.816E+00	6.236E+00	7.961E+00	FAIL ABUN
NP-237	2.157E-02	4.847E-02	1.012E-01	FAIL ABUN
NP-238	0.000E+00	4.139E+40	0.000E+00	SHORT HLIF
NP-239	-1.309E-01	2.234E-01	3.710E-01	FAIL ABUN
PU-239	0.000E+00	6.267E+02	5.819E+02	FAIL ABUN
AM-241	-1.059E-02	1.126E-01	2.068E-01	NOT IDENT.
CM-243	-6.749E-02	7.911E-02	1.421E-01	FAIL ABUN
BK-247	-3.673E-03	6.076E-02	1.167E-01	FAIL ABUN
CM-247	-8.305E-03	3.172E-02	6.061E-02	FAIL ABUN
CF-249	-2.462E-02	3.240E-02	5.873E-02	NOT IDENT.
CF-251	-3.022E-02	9.719E-02	1.758E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	348	10.66*	1.122E+00	1.291E+01	1.291E+01	10.97
CD-109	88.03	79	3.70*	5.724E+00	1.664E+00	2.583E+00	75.67
SN-126	64.28	31	9.60	3.489E+00	4.059E-01	4.059E-01	193.59
	86.94	79	8.90	5.724E+00	6.918E-01	6.918E-01	75.67
	87.57	79	37.00*	5.724E+00	1.664E-01	1.664E-01	75.67
TL-208	277.37	30	6.60	4.378E+00	4.681E-01	4.681E-01	99.58
	583.19	123	85.00*	2.366E+00	2.719E-01	2.719E-01	26.46
	860.56	-----	12.50	1.736E+00	-----	Line Not Found	-----
PB-210	46.54	56	4.25*	1.120E+00	5.209E+00	5.341E+00	126.67
BI-211	72.87	-----	1.23	4.591E+00	-----	Line Not Found	-----
	351.06	331	12.92*	3.592E+00	3.172E+00	3.172E+00	17.12
PB-212	74.82	178	10.28	4.782E+00	1.605E+00	1.605E+00	38.77
	77.11	323	17.10	4.994E+00	1.679E+00	1.679E+00	23.00
	238.63	480	43.60*	4.931E+00	9.923E-01	9.923E-01	12.62
	300.09	-----	3.30	4.103E+00	-----	Line Not Found	-----
BI-214	609.32	202	45.49*	2.284E+00	8.628E-01	8.631E-01	23.39
	1120.29	32	14.92	1.405E+00	6.739E-01	6.741E-01	75.57
	1764.49	30	15.30	9.422E-01	9.156E-01	9.159E-01	55.98
PB-214	74.82	178	5.80	4.782E+00	2.845E+00	2.846E+00	38.77
	77.11	323	9.70	4.994E+00	2.960E+00	2.961E+00	23.00
	87.09	79	3.41	5.724E+00	1.806E+00	1.806E+00	75.67
	242.00	115	7.25	4.883E+00	1.446E+00	1.447E+00	42.06
	295.22	246	18.42	4.159E+00	1.426E+00	1.427E+00	24.36
	351.93	331	35.60*	3.592E+00	1.151E+00	1.152E+00	17.12
RN-222	609.32	202	45.49*	2.284E+00	8.628E-01	8.631E-01	23.39
	1120.29	32	14.92	1.405E+00	6.739E-01	6.741E-01	75.57
	1764.49	30	15.30	9.422E-01	9.156E-01	9.159E-01	55.98
RA-224	240.99	115	4.10*	4.883E+00	2.557E+00	2.557E+00	42.06
RA-226	609.32	202	45.49*	2.284E+00	8.628E-01	8.631E-01	23.39
	1120.29	32	14.92	1.405E+00	6.739E-01	6.741E-01	75.57
	1764.49	30	15.30	9.422E-01	9.156E-01	9.159E-01	55.98
AC-228	105.21	-----	1.10	6.488E+00	-----	Line Not Found	-----
	338.32	103	11.27	3.713E+00	1.088E+00	1.088E+00	45.09
	794.95	-----	4.25	1.849E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.777E+00	-----	Line Not Found	-----
	911.20	55	25.80*	1.659E+00	5.680E-01	5.680E-01	60.24
	968.97	65	15.80	1.580E+00	1.148E+00	1.148E+00	31.90
RA-228	105.21	-----	1.10	6.488E+00	-----	Line Not Found	-----
	338.32	103	11.27	3.713E+00	1.088E+00	1.088E+00	45.09
	794.95	-----	4.25	1.849E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.777E+00	-----	Line Not Found	-----
	911.20	55	25.80*	1.659E+00	5.680E-01	5.680E-01	60.24
	968.97	65	15.80	1.580E+00	1.148E+00	1.148E+00	31.90
TH-228	74.82	178	10.28	4.782E+00	1.605E+00	1.605E+00	38.77
	77.11	323	17.10	4.994E+00	1.679E+00	1.679E+00	23.00
	238.63	480	43.60*	4.931E+00	9.923E-01	9.923E-01	12.62
	300.09	-----	3.30	4.103E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-230	609.32	202	45.49*	2.284E+00	8.628E-01	8.628E-01	23.39
	1120.29	32	14.92	1.405E+00	6.739E-01	6.739E-01	75.57
	1764.49	30	15.30	9.422E-01	9.156E-01	9.156E-01	55.98
PA-231	283.69	-----	1.70	4.298E+00	-----	Line Not Found	-----
	301.36	35	5.35*	4.074E+00	7.154E-01	7.154E-01	122.52
TH-232	105.21	-----	1.10	6.488E+00	-----	Line Not Found	-----
	338.32	103	11.27	3.713E+00	1.088E+00	1.088E+00	45.09
	835.71	-----	1.61	1.777E+00	-----	Line Not Found	-----
	911.20	55	25.80*	1.659E+00	5.680E-01	5.680E-01	60.24
TH-234	968.97	65	15.80	1.580E+00	1.148E+00	1.148E+00	31.90
	63.29	31	3.70*	3.489E+00	1.053E+00	1.053E+00	193.59
	92.59	41	4.23	6.082E+00	7.081E-01	7.081E-01	185.99
U-234	609.32	202	45.49*	2.284E+00	8.628E-01	8.628E-01	23.39
	1120.29	32	14.92	1.405E+00	6.739E-01	6.739E-01	75.57
	1764.49	30	15.30	9.422E-01	9.156E-01	9.156E-01	55.98
U-235	89.96	-----	3.47	5.903E+00	-----	Line Not Found	-----
	93.35	41	5.60	6.082E+00	5.348E-01	5.348E-01	185.99
	143.76	-----	10.96*	6.563E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.266E+00	-----	Line Not Found	-----
	185.72	104	57.20	5.850E+00	1.384E-01	1.384E-01	65.53
U-238	205.31	31	5.01	5.507E+00	5.048E-01	5.048E-01	128.45
	63.29	31	3.70*	3.489E+00	1.053E+00	1.053E+00	193.59
	92.59	41	4.23	6.082E+00	7.081E-01	7.081E-01	185.99
AM-243	43.53	-----	5.90	6.933E-01	-----	Line Not Found	-----
	74.66	178	67.20*	4.782E+00	2.455E-01	2.456E-01	38.77
ANH-511	511.00	40	100.00*	2.632E+00	6.672E-02	6.672E-02	131.38

Flag: "*" = Keyline

Total number of lines in spectrum 47
 Number of unidentified lines 10
 Number of lines tentatively identified by NID 37 78.72%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.291E+01	1.291E+01	0.142E+01	10.97	
CD-109	461.40D	1.55	1.664E+00	2.583E+00	1.955E+00	75.67	
SN-126	2.30E+05Y	1.00	1.664E-01	1.664E-01	1.259E-01	75.67	
TL-208	1.41E+10Y	1.00	2.719E-01	2.719E-01	0.719E-01	26.46	
PB-210	22.20Y	1.03	5.209E+00	5.341E+00	6.765E+00	126.67	
BI-211	7.04E+08Y	1.00	3.172E+00	3.172E+00	0.543E+00	17.12	
PB-212	1.41E+10Y	1.00	9.923E-01	9.923E-01	1.253E-01	12.62	
BI-214	1600.00Y	1.00	8.628E-01	8.631E-01	2.019E-01	23.39	
PB-214	1600.00Y	1.00	1.151E+00	1.152E+00	0.197E+00	17.12	
RN-222	1600.00Y	1.00	8.628E-01	8.631E-01	2.019E-01	23.39	
RA-224	1.41E+10Y	1.00	2.557E+00	2.557E+00	1.076E+00	42.06	
RA-226	1600.00Y	1.00	8.628E-01	8.631E-01	2.019E-01	23.39	
AC-228	1.41E+10Y	1.00	5.680E-01	5.680E-01	3.422E-01	60.24	
RA-228	1.41E+10Y	1.00	5.680E-01	5.680E-01	3.422E-01	60.24	
TH-228	1.41E+10Y	1.00	9.923E-01	9.923E-01	1.253E-01	12.62	
TH-230	7.54E+04Y	1.00	8.628E-01	8.628E-01	2.018E-01	23.39	
PA-231	7.04E+08Y	1.00	7.154E-01	7.154E-01	8.765E-01	122.52	
TH-232	1.41E+10Y	1.00	5.680E-01	5.680E-01	3.422E-01	60.24	
TH-234	4.47E+09Y	1.00	1.053E+00	1.053E+00	2.039E+00	193.59	
U-234	2.45E+05Y	1.00	8.628E-01	8.628E-01	2.018E-01	23.39	
U-235	7.04E+08Y	1.00	1.384E-01	1.384E-01	0.907E-01	65.53	K
U-238	4.47E+09Y	1.00	1.053E+00	1.053E+00	2.039E+00	193.59	
AM-243	7370.00Y	1.00	2.455E-01	2.456E-01	0.952E-01	38.77	
ANH-511	1.00E+09Y	1.00	6.672E-02	6.672E-02	8.766E-02	131.38	
Total Activity :			3.838E+01	3.943E+01			

Grand Total Activity : 3.838E+01 3.943E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	118.70	46	111	0.75	237.87	234	7	9.54E-03	95.3	6.68E+00	T
0	129.94	65	178	1.69	260.35	255	10	1.37E-02	93.8	6.68E+00	T
0	209.40	49	105	0.90	419.23	415	8	1.08E-02	87.5	5.42E+00	T
0	270.04	48	67	1.63	540.48	536	9	1.10E-02	75.5	4.47E+00	T
1	281.69	31	52	1.45	563.77	552	15	7.05E-03	97.5	4.32E+00	T
0	463.85	43	46	1.85	928.01	922	14	1.06E-02	78.7	2.85E+00	T
0	564.19	38	24	3.16	1128.65	1121	15	9.46E-03	69.6	2.43E+00	T
0	727.17	31	14	1.43	1454.56	1450	11	7.95E-03	64.5	1.98E+00	T
0	744.83	21	12	2.49	1489.87	1485	9	5.55E-03	78.5	1.95E+00	
0	768.72	18	13	1.50	1537.64	1533	8	4.77E-03	87.9	1.90E+00	
0	803.54	19	3	3.94	1607.28	1601	12	5.05E-03	70.7	1.83E+00	
0	894.73	15	20	0.61	1789.64	1781	14	3.94E-03	****	1.68E+00	T
0	927.72	16	9	2.38	1855.60	1851	11	4.25E-03	89.4	1.64E+00	T
0	934.11	16	6	2.53	1868.38	1865	8	4.29E-03	74.4	1.63E+00	
0	954.52	8	4	0.97	1909.19	1906	6	2.15E-03	****	1.60E+00	T
0	965.47	7	23	2.09	1931.10	1922	12	1.86E-03	****	1.58E+00	T
0	1002.17	20	13	4.53	2004.47	1998	14	5.36E-03	93.4	1.54E+00	T
0	1144.39	17	7	1.71	2288.89	2284	10	4.67E-03	77.8	1.38E+00	
0	1161.83	15	10	0.86	2323.75	2317	12	4.23E-03	****	1.36E+00	
0	1237.69	19	14	2.49	2475.47	2470	11	5.34E-03	87.6	1.29E+00	T
0	1248.96	14	17	0.69	2498.00	2491	13	3.90E-03	****	1.28E+00	
0	1328.22	5	11	1.45	2656.52	2649	14	1.49E-03	****	1.22E+00	
0	1376.11	11	3	3.18	2752.28	2747	11	3.09E-03	83.6	1.18E+00	
0	1391.79	11	3	3.33	2783.64	2777	12	3.11E-03	85.8	1.17E+00	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*                               *                                               *
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235074.CNF;1  *
* Acquisition date   : 3-OCT-2016 06:46:37 Sensitivity      : 3.000          *
* Detector ID       : GAM07 Energy tolerance: 1.500         *
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000    *
* Elapsed real time : 0 01:00:00.52 Half life ratio : ***** *
* Sample date       : 15-DEC-2015 14:10:00 Nuclide Library : SOLID      *
* Sample ID        : G405235074 Analyst initials: MXR1        *
* Batch Number     : 1596254 Sample Quantity : 1.6907E+02 GRAM *
* Wet wt corr      : 1.00000 Wet Weight      : 0.00000        *
*                               Dry Weight     : 0.00000        *
*****
*                               CALIBRATION INFORMATION                         *
*                               *                                               *
* Eff. Cal. date    : 19-AUG-2016 11:09:59 Eff. Geometry   : CAN          *
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM07_CAN.CNF;15 *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.534E-01
CD-109	9.754E-01
SN-126	5.917E-02
TL-208	2.469E-02
PB-210	1.964E+00
PB-212	3.557E-02
BI-214	5.150E-02
PB-214	5.093E-02
RN-222	5.150E-02
RA-224	3.814E-01
RA-226	5.150E-02
AC-228	1.132E-01
RA-228	1.132E-01
TH-228	3.557E-02
TH-230	5.148E-02
PA-231	3.499E-01
TH-232	1.132E-01
TH-234	8.823E-01
U-234	5.148E-02
U-235	1.274E-01
U-238	8.823E-01
AM-243	3.667E-02
ANH-511	1.950E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.797E+00	NOT IDENT.
NA-22	3.681E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.132E-02	NOT IDENT.
SC-46	2.919E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	4.406E-02	NOT IDENT.

CO-56	3.992E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	3.426E-02	NOT IDENT.
CO-58	3.217E-01	NOT IDENT.
FE-59	4.151E+00	NOT IDENT.
CO-60	3.560E-02	NOT IDENT.
ZN-65	1.448E-01	NOT IDENT.
GE-68	1.910E+00	NOT IDENT.
AS-73	5.947E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.501E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.525E-01	NOT IDENT.
KR-85	5.995E+00	NOT IDENT.
SR-85	5.875E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.095E-01	NOT IDENT.
Y-91	3.635E+02	NOT IDENT.
NB-94	2.640E-02	NOT IDENT.
NB-95	6.165E-01	NOT IDENT.
NB-95M	1.670E+00	NOT IDENT.
ZR-95	9.301E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.409E-02	NOT IDENT.
RH-102	4.035E-02	NOT IDENT.
RU-103	3.579E+00	FAIL ABUN
RH-106	3.491E-01	NOT IDENT.
RU-106	3.491E-01	NOT IDENT.
AG-108M	1.978E-02	NOT IDENT.
AG-110M	7.349E-02	NOT IDENT.
SN-113	1.748E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	9.187E-02	NOT IDENT.
SB-124	1.450E+00	NOT IDENT.
SB-125	7.586E-02	FAIL ABUN
TE-125M	1.771E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.665E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	4.903E-02	FAIL ABUN
CS-135	1.072E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	2.559E-02	NOT IDENT.
CS-137	2.703E-02	NOT IDENT.
CE-139	8.905E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.439E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.639E-01	NOT IDENT.
PM-144	4.133E-02	NOT IDENT.
PR-144	3.566E+00	NOT IDENT.
PM-146	3.393E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	5.934E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.607E-02	FAIL ABUN
EU-152	6.453E-02	FAIL ABUN
GD-153	1.084E-01	NOT IDENT.
EU-154	9.197E-02	NOT IDENT.
EU-155	8.968E-02	FAIL ABUN
TB-160	1.160E+00	FAIL ABUN
HO-166M	4.855E-02	FAIL ABUN
TM-171	1.518E+01	NOT IDENT.
HF-172	1.728E-01	FAIL ABUN
LU-172	7.300E-02	FAIL ABUN
LU-176	1.908E-02	FAIL ABUN

HF-181	2.635E+00	NOT IDENT.
TA-182	7.453E-01	FAIL ABUN
RE-183	1.829E+00	NOT IDENT.
RE-184	2.194E+01	FAIL ABUN
W-188	6.854E+01	FAIL ABUN
IR-192	3.260E-01	FAIL ABUN
HG-203	1.552E+00	NOT IDENT.
BI-207	3.176E-02	FAIL ABUN
BI-211	3.791E-01	FAIL ABUN
PB-211	5.363E-01	NOT IDENT.
BI-212	5.025E-01	FAIL ABUN
RN-219	2.981E-01	FAIL ABUN
RA-223	4.409E-01	FAIL ABUN
AC-227	1.572E-01	NOT IDENT.
TH-227	1.572E-01	NOT IDENT.
TH-229	3.596E-01	FAIL ABUN
TH-231	4.409E-01	FAIL ABUN
PA-233	4.644E-02	NOT IDENT.
PA-234	2.027E-01	FAIL ABUN
PA-234M	3.505E+00	FAIL ABUN
NP-237	4.644E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.731E-01	FAIL ABUN
PU-239	2.755E+02	FAIL ABUN
AM-241	9.722E-02	NOT IDENT.
CM-243	6.605E-02	FAIL ABUN
BK-247	5.367E-02	FAIL ABUN
CM-247	2.757E-02	FAIL ABUN
CF-249	2.646E-02	NOT IDENT.
CF-251	8.167E-02	NOT IDENT.


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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235074.CNF;1
* Acquisition date   : 3-OCT-2016 06:46:37 Sensitivity      : 3.000
* Detector ID       : GAM07 Energy tolerance: 1.500
* Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time: 0 01:00:00.52 Half life ratio : *****
* Sample date       : 15-DEC-2015 14:10:00 Nuclide Library : SOLID
* Sample ID         : G405235074 Analyst initials: MXR1
* Batch Number      : 1596254 Sample Quantity : 1.6907E+02 GRAM
*                               Quantity Err(%) : 1.1830E-03 %
* Wet wt corr       : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight      : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date    : 19-AUG-2016 11:09:59 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM07_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.291E+01	1.543E+00	1.543E+00
CD-109	5.431E-01	1.993E+00	1.993E+00
SN-126	3.499E-02	1.284E-01	1.284E-01
TL-208	2.719E-01	7.144E-02	7.144E-02
PB-210	5.341E+00	6.645E+00	6.645E+00
PB-212	9.923E-01	1.336E-01	1.336E-01
BI-214	8.631E-01	2.013E-01	2.013E-01
PB-214	1.152E+00	1.990E-01	1.990E-01
RN-222	8.631E-01	2.013E-01	2.013E-01
RA-224	3.579E-02	1.225E+00	1.225E+00
RA-226	8.631E-01	2.013E-01	2.013E-01
AC-228	5.680E-01	3.366E-01	3.366E-01
RA-228	5.680E-01	3.366E-01	3.366E-01
TH-228	9.923E-01	1.336E-01	1.336E-01
TH-230	8.628E-01	2.012E-01	2.012E-01
PA-231	7.154E-01	8.725E-01	8.725E-01
TH-232	5.680E-01	3.366E-01	3.366E-01
TH-234	1.053E+00	2.012E+00	2.012E+00
U-234	8.628E-01	2.012E-01	2.012E-01
U-235	1.094E-02	1.439E-01	1.439E-01
U-238	1.053E+00	2.012E+00	2.012E+00
AM-243	1.225E-01	9.935E-02	9.935E-02
ANH-511	6.672E-02	8.595E-02	8.595E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.379E+00	9.796E+00	9.816E+00	NOT IDENT.
NA-22	1.616E-02	3.988E-02	4.054E-02	NOT IDENT.
NA-24	1.000E+41	1.861E+41	0.000E+00	SHORT HLIF
AL-26	-1.698E-02	2.138E-02	2.271E-02	NOT IDENT.
SC-46	3.538E-02	3.649E-01	3.652E-01	FAIL ABUN
V-48	-1.384E+03	9.221E+03	9.242E+03	SHORT HLIF
CR-51	4.274E+01	2.936E+02	2.942E+02	SHORT HLIF

MN-54	-1.193E-03	4.952E-02	4.952E-02	NOT IDENT.
CO-56	1.121E-01	4.324E-01	4.354E-01	FAIL ABUN
MN-56	1.000E+41	3.951E+41	0.000E+00	SHORT HLIF
CO-57	1.245E-03	4.138E-02	4.138E-02	NOT IDENT.
CO-58	-1.831E-01	4.291E-01	4.370E-01	NOT IDENT.
FE-59	7.519E-01	4.631E+00	4.644E+00	NOT IDENT.
CO-60	1.621E-02	4.336E-02	4.397E-02	NOT IDENT.
ZN-65	1.749E-02	1.862E-01	1.864E-01	NOT IDENT.
GE-68	-6.209E-01	2.299E+00	2.315E+00	NOT IDENT.
AS-73	5.133E+00	5.972E+00	6.405E+00	NOT IDENT.
AS-74	-7.415E+01	4.002E+03	4.002E+03	SHORT HLIF
SE-75	1.098E-02	1.604E-01	1.605E-01	NOT IDENT.
BR-77	2.227E+37	1.882E+38	0.000E+00	SHORT HLIF
SR-82	1.991E+02	5.139E+02	5.217E+02	SHORT HLIF
RB-83	-2.077E-01	5.494E-01	5.573E-01	NOT IDENT.
KR-85	5.421E+00	6.183E+00	6.649E+00	NOT IDENT.
SR-85	5.304E-01	6.060E-01	6.515E-01	NOT IDENT.
RB-86	-2.099E+03	2.165E+04	2.167E+04	SHORT HLIF
Y-88	-1.139E-01	1.711E-01	1.786E-01	NOT IDENT.
Y-91	-8.441E+01	4.387E+02	4.404E+02	NOT IDENT.
NB-94	1.578E-02	2.871E-02	2.958E-02	NOT IDENT.
NB-95	7.035E-01	6.537E-01	7.266E-01	NOT IDENT.
NB-95M	8.784E-01	1.879E+00	1.921E+00	NOT IDENT.
ZR-95	4.396E-01	1.016E+00	1.035E+00	NOT IDENT.
NB-97	-1.000E+41	2.671E+41	0.000E+00	SHORT HLIF
ZR-97	-1.000E+41	1.242E+42	0.000E+00	SHORT HLIF
MO-99	-2.867E+30	3.026E+31	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.921E+41	0.000E+00	SHORT HLIF
RH-101	-1.570E-02	3.115E-02	3.194E-02	NOT IDENT.
RH-102	-2.730E-02	5.190E-02	5.334E-02	NOT IDENT.
RU-103	-1.949E+00	4.365E+00	4.452E+00	FAIL ABUN
RH-106	3.814E-01	3.344E-01	3.760E-01	NOT IDENT.
RU-106	3.814E-01	3.344E-01	3.760E-01	NOT IDENT.
AG-108M	1.630E-03	2.201E-02	2.202E-02	NOT IDENT.
AG-110M	2.177E-02	7.902E-02	7.962E-02	NOT IDENT.
SN-113	4.530E-02	1.894E-01	1.905E-01	NOT IDENT.
CD-115	-2.862E+38	2.857E+38	0.000E+00	SHORT HLIF
SN-117M	-1.371E+03	5.789E+04	5.789E+04	SHORT HLIF
TE-123M	-7.530E-02	1.121E-01	1.171E-01	NOT IDENT.
SB-124	-1.410E-01	1.804E+00	1.805E+00	NOT IDENT.
SB-125	2.016E-02	8.249E-02	8.299E-02	FAIL ABUN
TE-125M	-5.511E+01	2.021E+02	2.036E+02	NOT IDENT.
I-126	-2.982E+05	5.232E+05	5.402E+05	SHORT HLIF
SB-126	1.339E+05	6.831E+05	6.857E+05	SHORT HLIF
SB-127	1.725E+21	5.789E+21	0.000E+00	SHORT HLIF
I-131	1.107E+08	2.372E+09	2.372E+09	SHORT HLIF
I-132	1.000E+41	1.828E+42	0.000E+00	SHORT HLIF
TE-132	5.041E+25	7.923E+25	0.000E+00	SHORT HLIF
BA-133	1.648E-02	2.978E-02	3.069E-02	FAIL ABUN
I-133	1.000E+41	1.953E+41	0.000E+00	SHORT HLIF
CS-134	4.064E-02	5.276E-02	5.585E-02	FAIL ABUN
CS-135	4.233E-02	1.229E-01	1.244E-01	NOT IDENT.
I-135	1.000E+41	7.434E+41	0.000E+00	SHORT HLIF
CS-136	3.186E+04	1.702E+05	1.709E+05	SHORT HLIF
BA-137M	3.669E-03	2.941E-02	2.946E-02	NOT IDENT.
CS-137	3.876E-03	3.107E-02	3.112E-02	NOT IDENT.
CE-139	-2.574E-03	1.022E-01	1.022E-01	NOT IDENT.
BA-140	-1.893E+05	7.914E+05	7.960E+05	SHORT HLIF
LA-140	-1.903E+05	2.332E+05	2.485E+05	SHORT HLIF
CE-141	-4.315E+00	1.672E+01	1.684E+01	NOT IDENT.
CE-143	1.000E+41	6.081E+40	0.000E+00	SHORT HLIF
CE-144	-2.569E-02	3.251E-01	3.253E-01	NOT IDENT.
PM-144	9.287E-03	4.718E-02	4.737E-02	NOT IDENT.
PR-144	7.641E-01	4.077E+00	4.092E+00	NOT IDENT.
PM-146	1.456E-02	3.640E-02	3.698E-02	NOT IDENT.
ND-147	9.381E+06	1.656E+07	1.709E+07	SHORT HLIF
PM-147	3.898E+02	6.731E+02	6.957E+02	NOT IDENT.
PM-149	-1.804E+39	3.937E+39	0.000E+00	SHORT HLIF
EU-150	-9.227E-03	2.114E-02	2.154E-02	FAIL ABUN
EU-152	-4.740E-02	8.637E-02	8.897E-02	FAIL ABUN
GD-153	-2.473E-01	1.426E-01	1.810E-01	NOT IDENT.
EU-154	4.404E-02	9.902E-02	1.010E-01	NOT IDENT.
EU-155	5.616E-02	9.482E-02	9.814E-02	FAIL ABUN
TB-160	-1.526E-01	1.334E+00	1.336E+00	FAIL ABUN
HO-166M	4.475E-02	5.018E-02	5.409E-02	FAIL ABUN
TM-171	7.249E+00	1.547E+01	1.581E+01	NOT IDENT.
HF-172	-6.858E-03	2.106E-01	2.107E-01	FAIL ABUN
LU-172	6.000E-02	7.518E-02	7.990E-02	FAIL ABUN

LU-176	2.334E-02	1.983E-02	2.245E-02	FAIL ABUN
HF-181	-1.163E+00	3.168E+00	3.211E+00	NOT IDENT.
TA-182	-2.031E-01	9.016E-01	9.063E-01	FAIL ABUN
RE-183	-1.566E+00	2.080E+00	2.196E+00	NOT IDENT.
RE-184	4.132E+00	2.415E+01	2.422E+01	FAIL ABUN
W-188	-2.021E+01	8.558E+01	8.606E+01	FAIL ABUN
IR-192	-1.709E-01	3.782E-01	3.860E-01	FAIL ABUN
HG-203	-1.304E+00	1.801E+00	1.895E+00	NOT IDENT.
BI-207	-7.806E-03	3.805E-02	3.822E-02	FAIL ABUN
BI-211	3.172E+00	5.506E-01	1.532E+00	FAIL ABUN
PB-211	-1.405E-02	6.006E-01	6.006E-01	NOT IDENT.
BI-212	1.031E+00	6.535E-01	8.020E-01	FAIL ABUN
RN-219	-8.120E-02	3.421E-01	3.441E-01	FAIL ABUN
RA-223	-1.114E-01	4.942E-01	4.967E-01	FAIL ABUN
AC-227	-1.214E-01	1.809E-01	1.890E-01	NOT IDENT.
TH-227	-1.214E-01	1.809E-01	1.890E-01	NOT IDENT.
TH-229	-1.267E-01	4.297E-01	4.335E-01	FAIL ABUN
TH-231	-1.114E-01	4.942E-01	4.967E-01	FAIL ABUN
PA-233	2.157E-02	4.849E-02	4.945E-02	NOT IDENT.
PA-234	-4.405E-02	2.428E-01	2.436E-01	FAIL ABUN
PA-234M	6.816E+00	6.243E+00	6.958E+00	FAIL ABUN
NP-237	2.157E-02	4.849E-02	4.945E-02	FAIL ABUN
NP-238	4.525E+39	4.139E+40	0.000E+00	SHORT HLIF
NP-239	-1.309E-01	2.237E-01	2.313E-01	FAIL ABUN
PU-239	6.817E+02	6.274E+02	6.986E+02	FAIL ABUN
AM-241	-1.059E-02	1.126E-01	1.127E-01	NOT IDENT.
CM-243	-6.749E-02	7.936E-02	8.499E-02	FAIL ABUN
BK-247	-3.673E-03	6.076E-02	6.078E-02	FAIL ABUN
CM-247	-8.305E-03	3.175E-02	3.197E-02	FAIL ABUN
CF-249	-2.462E-02	3.247E-02	3.431E-02	NOT IDENT.
CF-251	-3.022E-02	9.725E-02	9.820E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	77.3828	87.09	105.0629	136.47	81.7833
45.60	59.3371	87.57	121.9809	140.51	0.0000
46.54	59.4930	88.03	138.9237	143.76	59.6465
49.72	0.0000	88.34	139.0022	144.24	65.4227
51.35	70.9588	88.47	109.5431	145.44	67.8253
51.87	63.2678	89.96	118.2899	152.43	73.0783
52.39	71.1501	1093.63	122.6650	153.25	0.0000
52.97	63.4471	91.11	0.0000	323.87	65.1046
53.44	60.5911	92.59	103.9934	156.02	0.0000
54.07	86.1376	93.35	104.1332	158.56	0.0000
57.36	0.0000	94.56	55.3722	159.00	79.5277
57.53	87.8647	94.65	55.3809	162.33	79.8514
57.98	87.9597	94.67	55.3829	162.66	0.0000
59.27	86.2490	94.87	55.4023	163.33	101.1106
59.32	86.2592	97.43	87.7531	165.86	82.5504
59.54	84.6510	98.43	67.5359	176.31	54.9142
60.96	80.9530	98.44	67.5369	176.60	0.0000
61.17	98.2530	99.53	54.7739	177.52	64.5535
62.93	97.9864	100.11	70.9533	181.07	0.0000
63.29	98.0669	102.03	80.8891	181.52	59.2420
63.58	98.1318	103.18	78.8819	184.41	61.0395
64.28	89.5952	103.37	78.9070	143.76	63.9427
66.73	73.9510	105.21	76.9770	193.51	73.0042
67.24	89.8501	105.31	76.9894	197.03	78.1631
125.81	101.0529	106.12	78.1771	198.01	47.6800
67.75	101.0681	106.47	80.3938	201.83	42.5520
69.67	103.5183	109.28	67.6616	203.43	52.4590
70.83	94.9569	111.00	72.2227	205.31	54.2031
72.81	102.1629	111.76	0.0000	210.85	54.5099
72.87	102.1759	114.06	70.3691	215.65	51.0373
74.66	104.6046	116.30	0.0000	222.11	54.2850
74.82	104.6389	116.74	80.9631	227.09	61.2596
74.97	104.6716	119.76	63.5875	227.38	53.7220
77.11	105.1252	121.12	54.8255	228.16	0.0000
78.74	89.6124	121.22	51.8698	228.18	63.8436
79.69	96.6865	121.78	51.9129	116.74	63.8436
80.12	89.8557	122.06	66.7726	235.69	50.7611
80.19	0.0000	122.92	78.0002	235.96	48.2349
80.57	76.0989	123.07	78.0173	238.63	47.5063
81.00	84.4707	265.00	73.6246	238.98	0.0000
81.07	81.7126	125.81	74.5992	240.99	47.6095
81.75	106.0887	127.23	80.7317	242.00	47.6533
83.79	94.6697	127.91	65.8458	244.70	62.6990
84.00	97.4933	129.30	61.8523	252.40	0.0000
85.43	111.7212	131.20	61.6426	252.80	38.6664
86.55	104.9576	133.02	67.8287	254.15	0.0000
86.79	105.0041	133.52	73.9097	256.23	51.7114
86.94	105.0339	136.00	80.5954	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	43.4082	355.39	0.0000	584.27	20.6569
264.80	43.7616	356.01	18.1555	595.83	0.0000
265.00	44.8109	364.49	0.0000	427.87	28.8204
268.22	41.7988	366.42	0.0000	602.52	0.0000
269.46	40.0993	372.51	32.0113	604.72	24.0628
270.03	40.1190	375.05	33.9514	607.14	32.1191
271.23	37.9767	377.52	23.6160	609.32	24.6499
273.65	0.0000	356.01	24.6628	610.33	24.6612
276.40	59.1847	388.16	39.9509	614.28	33.8353
277.37	54.4052	388.63	0.0000	618.01	24.7473
277.60	54.4165	391.69	30.5078	620.36	21.5422
278.00	54.4342	264.66	23.0117	621.93	6.4673
279.20	54.4884	401.81	37.4210	630.19	0.0000
279.54	54.5035	402.40	38.3952	631.29	22.7303
279.70	54.5098	404.85	35.5697	633.25	17.3333
280.46	54.5439	410.95	34.7402	634.78	0.0000
283.69	43.6630	413.71	27.0663	635.95	19.5234
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	32.8588	423.72	0.0000	645.85	11.9829
285.90	0.0000	427.09	16.5670	657.76	24.0903
287.50	38.0467	427.87	23.3999	657.90	0.0000
290.67	37.2559	433.94	23.4849	661.66	18.6463
293.27	0.0000	439.40	27.4873	664.57	0.0000
351.93	36.0555	453.88	22.7693	666.33	0.0000
295.96	36.0769	463.37	22.8924	666.50	0.0000
879.38	16.0671	468.07	17.9634	667.71	0.0000
299.98	40.2118	473.00	0.0000	677.62	20.9815
300.09	40.2155	475.06	24.0444	685.70	0.0000
300.13	40.2173	476.78	27.0758	695.00	0.0000
301.36	48.3069	477.60	25.0814	696.49	17.8079
302.85	48.3629	482.18	25.1450	696.51	17.8079
256.23	34.9732	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	15.5871
306.78	22.9076	497.08	27.3763	697.49	16.7017
308.46	43.1748	505.52	24.4438	702.65	17.8529
311.90	34.2705	507.63	0.0000	706.68	18.9998
316.51	43.4395	511.00	22.4713	711.68	13.4390
319.41	0.0000	514.00	22.5067	720.70	0.0000
320.08	0.0000	514.00	22.5067	721.93	0.0000
321.04	37.2305	520.40	26.6877	722.78	18.5612
323.87	41.8588	520.69	0.0000	722.91	18.5625
325.23	40.0782	522.65	0.0000	723.31	16.8774
328.76	0.0000	527.90	0.0000	724.19	16.8835
333.37	26.1146	528.26	23.7038	727.33	21.4121
333.97	34.3765	529.59	8.2503	733.00	16.2650
334.37	34.3864	529.87	0.0000	735.93	15.8315
338.28	28.5056	531.02	0.0000	333.97	12.4466
338.32	28.5069	537.26	0.0000	739.50	0.0000
311.90	28.5504	546.56	0.0000	747.24	17.0374
340.48	28.5504	552.55	22.9507	748.06	8.5214
340.55	0.0000	563.25	16.7793	752.31	23.8993
344.28	40.1706	569.33	12.6216	753.82	0.0000
345.93	31.8966	946.00	12.6226	756.73	10.2601
351.06	35.2593	569.70	6.3118	756.80	10.2605
351.93	35.2802	583.19	21.1751	884.68	13.7183

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	8.5800	1274.44	14.8569	1620.50	5.4312
766.42	17.1643	1001.03	11.1592	1621.92	8.6924
766.84	17.1667	1002.74	11.1650	1678.03	0.0000
772.60	0.0000	1004.73	8.9376	1690.97	5.5096
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	5.5899
778.90	20.6946	1028.54	0.0000	1063.66	5.5960
783.70	0.0000	1037.84	14.1055	1771.35	1.1194
785.37	17.2876	1038.76	0.0000	1791.20	0.0000
792.07	27.7295	631.29	11.3145	1808.65	4.5098
794.95	16.1926	1048.07	0.0000	1810.72	0.0000
795.86	19.6694	1049.04	14.1531	1836.06	5.4398
810.06	12.7939	1050.41	11.3269		
810.29	12.7948	1063.66	12.3192		
344.28	13.9590	1077.00	0.0000		
810.76	13.9604	1077.34	19.0283		
815.77	0.0000	1085.87	13.3523		
1048.07	0.0000	1093.63	12.4263		
832.01	20.2226	1099.45	9.5752		
834.85	14.9622	1112.07	10.5703		
835.71	16.7276	1112.84	8.7874		
836.80	0.0000	1115.54	16.9286		
846.75	0.0000	1120.29	16.3733		
846.77	19.4454	1120.55	16.3754		
856.80	0.0000	1221.41	16.3785		
860.56	12.4341	1129.67	11.5884		
871.09	14.2622	1131.51	0.0000		
873.19	12.4884	1147.95	0.0000		
875.33	0.0000	1173.23	8.7962		
879.38	12.5153	1177.95	17.6144		
880.51	12.5200	1189.05	17.6671		
883.24	12.5316	1204.77	15.7705		
884.68	11.6424	1221.41	20.7898		
889.28	15.7862	1231.02	7.9395		
894.76	15.2766	1235.36	0.0000		
898.04	12.9546	1238.28	17.5001		
900.72	15.4358	1260.41	0.0000		
903.28	16.2213	1271.87	18.0527		
911.20	20.7827	1274.44	9.0324		
912.08	20.7883	1274.54	9.0324		
923.98	0.0000	1291.59	20.1587		
926.50	13.0777	1298.22	0.0000		
929.11	19.3906	1312.11	0.0000		
937.49	7.2915	1332.49	9.7746		
944.13	0.0000	1362.66	0.0000		
946.00	15.5370	1365.19	6.1575		
949.00	14.6372	1368.63	0.0000		
667.71	0.0000	1384.29	9.4258		
962.31	13.2297	1408.01	8.2935		
964.08	19.1204	1457.56	0.0000		
966.17	0.0000	1460.82	8.3945		
911.20	11.7848	1489.16	4.2241		
968.97	11.7848	1505.03	6.3585		
983.53	0.0000	1584.12	14.0140		
984.45	0.0000	1596.21	0.0000		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235075.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM18.CNF;511
Background date  : 2-OCT-2016 11:01:02.
Sample date      : 16-DEC-2015 09:31:00 Acquisition date : 3-OCT-2016 06:47:01.
Sample ID       : G405235075 Sample quantity  : 1.51411E+02 GRAM
Detector name   : GAM18 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.97 0.0%
Energy tolerance: 2.00000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596254 Detector SN# :
Matrix Spike ID : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	3	74.64	121	140	1.25	150.08	144	19	3.36E-02	18.8	1.11E+00
2	3	77.07*	201	166	1.26	154.93	144	19	5.58E-02	13.6	
3	0	86.99	81	158	1.43	174.74	172	7	2.24E-02	28.2	
4	4	89.96	61	122	1.27	180.69	178	13	1.71E-02	30.3	8.94E-01
5	4	92.84*	112	163	1.46	186.44	178	13	3.11E-02	24.2	
6	0	124.62	25	83	1.45	249.95	248	6	6.84E-03	61.5	
7	0	128.95	27	112	0.80	258.60	255	7	7.49E-03	68.2	
8	0	186.41*	92	129	1.62	373.44	368	10	2.57E-02	26.7	
9	0	214.25	35	128	3.86	429.07	424	11	9.82E-03	64.4	
10	4	238.84*	380	102	1.12	478.21	474	19	1.05E-01	6.8	2.06E+00
11	4	241.79	128	114	1.99	484.10	474	19	3.55E-02	25.4	
12	0	259.99	19	64	1.68	520.48	516	8	5.30E-03	76.9	
13	0	270.61	60	107	1.91	541.69	535	12	1.65E-02	37.9	
14	0	285.78	19	76	1.27	572.01	568	10	5.19E-03	90.0	
15	0	295.47*	205	96	1.21	591.38	585	12	5.70E-02	12.0	
16	0	300.86	38	85	1.76	602.16	597	10	1.06E-02	48.2	
17	0	338.67*	90	75	1.54	677.71	673	10	2.50E-02	21.6	
18	0	352.28*	339	91	1.27	704.92	698	13	9.42E-02	8.1	
19	0	425.73	14	45	0.48	851.72	844	9	3.85E-03	94.1	
20	0	431.33	22	41	4.31	862.90	856	12	6.04E-03	63.3	
21	0	438.51	55	60	5.93	877.25	868	20	1.53E-02	37.0	
22	0	463.97	69	30	2.11	928.13	922	15	1.92E-02	21.1	
23	0	476.44	27	39	3.44	953.07	948	11	7.45E-03	48.9	
24	0	485.39	36	61	8.72	970.94	959	22	9.98E-03	59.7	
25	0	511.42*	31	112	1.57	1022.98	1014	18	8.63E-03	91.1	
26	0	583.82*	162	52	1.37	1167.68	1160	16	4.50E-02	13.0	
27	0	609.82*	283	59	1.55	1219.64	1213	15	7.87E-02	8.6	
28	0	697.07	23	102	6.91	1394.04	1363	34	6.39E-03	136.9	
29	0	721.82	28	24	2.42	1443.52	1435	15	7.81E-03	43.6	
30	0	727.32	49	16	2.73	1454.51	1450	9	1.37E-02	20.3	
31	0	795.87*	29	24	1.90	1591.54	1584	14	7.94E-03	42.4	
32	0	862.42	28	38	1.26	1724.57	1713	20	7.85E-03	57.7	
33	0	911.76*	142	30	1.97	1823.19	1816	17	3.95E-02	12.6	
34	0	935.82	25	21	3.41	1871.28	1863	17	7.02E-03	46.2	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	945.53	4	19	0.69	1890.71	1885	10	1.24E-03	221.1	
36	0	950.97	48	5	5.73	1901.58	1894	18	1.33E-02	17.9	
37	0	971.05*	34	67	1.27	1941.71	1931	15	9.42E-03	57.3	
38	0	1077.34	21	8	1.64	2154.20	2150	10	5.90E-03	32.6	
39	0	1121.91*	54	49	2.02	2243.30	2233	17	1.51E-02	33.5	
40	0	1155.68	34	35	0.74	2310.81	2301	23	9.32E-03	48.7	
41	0	1239.87	42	36	1.39	2479.13	2465	23	1.16E-02	42.1	
42	0	1293.60	34	0	6.25	2586.56	2578	19	9.44E-03	17.1	
43	0	1310.05	15	8	1.65	2619.44	2613	11	4.11E-03	45.7	
44	0	1339.54	8	9	0.68	2678.41	2673	10	2.35E-03	82.0	
45	0	1378.25	24	10	3.32	2755.80	2748	14	6.57E-03	35.6	
46	0	1461.62*	577	0	2.82	2922.48	2911	20	1.60E-01	4.2	
47	0	1482.32	9	16	4.43	2963.87	2946	22	2.62E-03	114.2	
48	0	1766.19*	41	4	2.75	3531.49	3522	16	1.13E-02	20.8	

Flag: "*" = Peak area was modified by background subtraction


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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235075.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 16-DEC-2015 09:31:00 Acquisition date : 3-OCT-2016 06:47:01
Sample ID         : G405235075           Sample quantity  : 151.41 GRAM
Sample type       : SOLID                 Sample geometry   :
Detector name     : GAMMA18              Detector geometry: CAN
Elapsed live time : 0 01:00:00.00         Elapsed real time: 0 01:00:00.97   0.0%
Energy tolerance  : 2.00 keV             Half life ratio  : 10.00
Errors propagated: No                    Systematic Error : 0.00 %
Efficiency type   : Linear                Efficiencies at  : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	TH-229	85.43
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	BI-211	72.87
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
BE-7	477.60	10.44*	4.230E+00	3.268E-01	1.463E+01	97.83	OK
K-40	1460.82	10.66*	1.911E+00	1.356E+01	1.356E+01	8.40	OK
GE-68	1077.34	3.22*	2.403E+00	1.357E+00	2.864E+00	65.12	OK
CD-109	88.03	3.70*	6.111E+00	1.254E+00	1.944E+00	102.28	OK
SN-126	64.28	9.60	3.252E+00	-----	Line Not Found	-----	Absent
	86.94	8.90	6.111E+00	5.214E-01	5.214E-01	102.28	OK
	87.57	37.00*	6.111E+00	1.254E-01	1.254E-01	102.28	OK
PR-144	696.51	1.34*	3.253E+00	2.733E+00	5.561E+00	273.88	OK
	1489.16	0.28	1.883E+00	-----	Line Not Found	-----	Absent
TL-208	277.37	6.60	6.127E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	3.674E+00	2.735E-01	2.735E-01	26.03	OK
	860.56	12.50	2.810E+00	4.079E-01	4.079E-01	115.37	OK
PB-212	74.82	10.28	4.729E+00	9.828E-01	9.828E-01	62.52	OK
	77.11	17.10	5.036E+00	1.482E+00	1.482E+00	27.30	OK
	238.63	43.60*	6.719E+00	7.454E-01	7.454E-01	13.59	OK
	300.09	3.30	5.809E+00	1.116E+00	1.116E+00	96.40	OK
BI-214	609.32	45.49*	3.566E+00	9.175E-01	9.178E-01	17.15	OK
	1120.29	14.92	2.334E+00	7.699E-01	7.702E-01	66.96	OK
	1764.49	15.30	1.632E+00	7.609E-01	7.611E-01	41.66	OK
PB-214	74.82	5.80	4.752E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	5.036E+00	2.613E+00	2.614E+00	27.30	OK
	77.09	3.41	6.121E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	6.668E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	5.879E+00	1.069E+00	1.069E+00	24.01	OK
	351.93	35.60*	5.218E+00	1.012E+00	1.012E+00	16.14	OK
RN-222	609.32	45.49*	3.566E+00	9.175E-01	9.178E-01	17.15	OK
	1120.29	14.92	2.334E+00	7.699E-01	7.702E-01	66.96	OK
	1764.49	15.30	1.632E+00	7.609E-01	7.611E-01	41.66	OK
RA-224	240.99	4.10*	6.671E+00	7.942E-01	7.942E-01	180.90	OK
RA-226	609.32	45.49*	3.566E+00	9.175E-01	9.178E-01	17.15	OK
	1120.29	14.92	2.334E+00	7.699E-01	7.702E-01	66.96	OK
	1764.49	15.30	1.632E+00	7.609E-01	7.611E-01	41.66	OK
TH-228	74.82	10.28	4.729E+00	9.828E-01	9.828E-01	62.52	OK
	77.11	17.10	5.036E+00	1.482E+00	1.482E+00	27.30	OK
	238.63	43.60*	6.719E+00	7.454E-01	7.454E-01	13.59	OK
	300.09	3.30	5.809E+00	1.116E+00	1.116E+00	96.40	OK
TH-229	85.43	14.70	6.111E+00	3.157E-01	3.157E-01	102.28	OK
	88.47	24.00	6.111E+00	1.933E-01	1.934E-01	102.28	OK
	193.51	4.41*	7.490E+00	-----	Line Not Found	-----	Absent
	210.85	2.80	7.193E+00	-----	Line Not Found	-----	Absent
TH-230	609.32	45.49*	3.566E+00	9.175E-01	9.175E-01	17.15	OK
	1120.29	14.92	2.334E+00	7.699E-01	7.699E-01	66.96	OK
	1764.49	15.30	1.632E+00	7.609E-01	7.609E-01	41.66	OK
PA-231	283.69	1.70	6.038E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	5.809E+00	6.882E-01	6.882E-01	96.40	OK
U-234	609.32	45.49*	3.566E+00	9.175E-01	9.175E-01	17.15	OK
	1120.29	14.92	2.334E+00	7.699E-01	7.699E-01	66.96	OK
	1764.49	15.30	1.632E+00	7.609E-01	7.609E-01	41.66	OK
U-235	89.96	3.47	6.379E+00	1.742E+00	1.742E+00	60.67	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	93.35	5.60	6.614E+00	1.893E+00	1.893E+00	48.41	OK
	143.76	10.96*	8.086E+00	-----	Line Not Found	-----	Absent
	163.33	5.08	7.938E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	7.607E+00	1.250E-01	1.250E-01	53.45	OK
	205.31	5.01	7.289E+00	-----	Line Not Found	-----	Absent
AM-243	43.53	5.90	3.443E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	4.729E+00	1.503E-01	1.504E-01	62.52	OK
ANH-511	511.00	100.00*	4.027E+00	4.127E-02	4.127E-02	182.29	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235075.CNF;1
* Acquisition date   : 3-OCT-2016 06:47:01 Sensitivity      : 3.000
* Detector ID        : GAM18 Energy tolerance: 2.000
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.97 Half life ratio : *****
* Sample date        : 16-DEC-2015 09:31:00 Analyst initials: MXR1
* Sample ID          : G405235075 Sample Quantity : 1.5141E+02 GRAM
* Batch Number       : 1596254 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 25-JUN-2016 08:25:19 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM18_CAN.CNF;10
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
BE-7	1.463E+01	1.403E+01	1.501E+01
K-40	1.356E+01	1.116E+00	4.038E-01
GE-68	2.864E+00	1.828E+00	3.973E+00
CD-109	1.944E+00	1.949E+00	1.550E+00
SN-126	1.254E-01	1.257E-01	1.152E-01
PR-144	5.561E+00	1.493E+01	6.430E+00
TL-208	2.735E-01	6.975E-02	4.279E-02
PB-212	7.454E-01	9.929E-02	7.166E-02
BI-214	9.178E-01	1.543E-01	9.800E-02
PB-214	1.012E+00	1.601E-01	1.008E-01
RN-222	9.178E-01	1.543E-01	9.800E-02
RA-224	7.942E-01	1.408E+00	7.675E-01
RA-226	9.178E-01	1.543E-01	9.800E-02
TH-228	7.454E-01	9.929E-02	7.166E-02
TH-229	-2.647E-01	3.684E-01	6.931E-01
TH-230	9.175E-01	1.542E-01	9.797E-02
PA-231	6.882E-01	6.502E-01	5.957E-01
U-234	9.175E-01	1.542E-01	9.797E-02
U-235	1.441E-02	1.549E-01	2.877E-01
AM-243	1.504E-01	9.212E-02	7.758E-02
ANH-511	4.127E-02	7.372E-02	3.931E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
NA-22	1.205E-02	3.385E-02	6.818E-02	NOT IDENT.
NA-24	0.000E+00	1.418E+41	0.000E+00	SHORT HLIF
AL-26	-6.523E-03	2.273E-02	4.363E-02	NOT IDENT.
SC-46	2.231E-02	2.676E-01	5.073E-01	FAIL ABUN
V-48	0.000E+00	7.566E+03	0.000E+00	SHORT HLIF
CR-51	0.000E+00	2.526E+02	0.000E+00	SHORT HLIF
MN-54	3.338E-02	5.283E-02	1.049E-01	NOT IDENT.
CO-56	-2.341E-01	3.380E-01	5.712E-01	FAIL ABUN
MN-56	0.000E+00	1.431E+41	0.000E+00	SHORT HLIF

CO-57	3.387E-02	3.683E-02	7.040E-02	NOT IDENT.
CO-58	-2.150E-01	3.637E-01	6.309E-01	NOT IDENT.
FE-59	1.195E+00	4.325E+00	8.679E+00	NOT IDENT.
CO-60	-2.430E-03	3.190E-02	5.471E-02	NOT IDENT.
ZN-65	-1.210E-01	1.907E-01	2.795E-01	NOT IDENT.
AS-73	4.013E+00	8.785E+00	1.837E+01	NOT IDENT.
AS-74	0.000E+00	3.581E+03	0.000E+00	SHORT HLIF
SE-75	-7.183E-02	1.762E-01	2.913E-01	NOT IDENT.
BR-77	0.000E+00	1.761E+36	0.000E+00	SHORT HLIF
SR-82	0.000E+00	4.654E+02	0.000E+00	SHORT HLIF
RB-83	-5.849E-02	4.055E-01	7.901E-01	NOT IDENT.
KR-85	1.123E+01	6.380E+00	1.296E+01	NOT IDENT.
SR-85	1.090E+00	6.200E-01	1.259E+00	NOT IDENT.
RB-86	0.000E+00	1.672E+04	0.000E+00	SHORT HLIF
Y-88	4.812E-02	1.679E-01	3.578E-01	NOT IDENT.
Y-91	-2.872E+01	3.778E+02	7.081E+02	NOT IDENT.
NB-94	-2.436E-03	2.588E-02	4.768E-02	NOT IDENT.
NB-95	-3.067E-01	6.457E-01	1.139E+00	NOT IDENT.
NB-95M	-5.350E-01	1.918E+00	3.249E+00	NOT IDENT.
ZR-95	4.326E-01	1.075E+00	2.116E+00	NOT IDENT.
NB-97	0.000E+00	1.394E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.629E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.855E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	3.551E-02	4.744E-02	5.073E-02	FAIL ABUN
RH-102	-2.539E-02	4.192E-02	7.512E-02	FAIL ABUN
RU-103	-3.951E+00	3.633E+00	6.238E+00	FAIL ABUN
RH-106	-2.152E-01	3.926E-01	7.077E-01	NOT IDENT.
RU-106	-2.152E-01	3.926E-01	7.077E-01	NOT IDENT.
AG-108M	1.594E-02	2.394E-02	3.730E-02	FAIL ABUN
AG-110M	-1.923E-02	8.748E-02	1.567E-01	FAIL ABUN
SN-113	5.205E-03	1.700E-01	3.183E-01	NOT IDENT.
CD-115	0.000E+00	1.831E+38	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	5.213E+04	0.000E+00	SHORT HLIF
TE-123M	-3.510E-02	1.035E-01	1.834E-01	NOT IDENT.
SB-124	2.851E-01	1.346E+00	2.880E+00	FAIL ABUN
SB-125	9.162E-02	9.071E-02	1.500E-01	FAIL ABUN
TE-125M	-6.411E+01	2.069E+02	3.832E+02	NOT IDENT.
I-126	0.000E+00	4.465E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	9.468E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	3.925E+21	0.000E+00	SHORT HLIF
I-131	0.000E+00	1.968E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	5.306E+25	0.000E+00	SHORT HLIF
BA-133	-8.624E-03	3.351E-02	5.451E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	7.524E-02	6.253E-02	8.948E-02	FAIL ABUN
CS-135	6.801E-02	1.226E-01	2.228E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	1.526E+05	0.000E+00	SHORT HLIF
BA-137M	2.403E-03	2.539E-02	4.908E-02	NOT IDENT.
CS-137	2.539E-03	2.683E-02	5.185E-02	NOT IDENT.
CE-139	-2.102E-02	8.839E-02	1.572E-01	NOT IDENT.
BA-140	0.000E+00	6.325E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	1.773E+05	0.000E+00	SHORT HLIF
CE-141	-2.452E+00	1.706E+01	3.117E+01	NOT IDENT.
CE-143	0.000E+00	1.391E+41	0.000E+00	SHORT HLIF
CE-144	-4.473E-02	2.613E-01	4.811E-01	NOT IDENT.
PM-144	6.429E-02	1.725E-01	7.926E-02	FAIL ABUN
PM-146	1.698E-02	3.312E-02	6.473E-02	NOT IDENT.
ND-147	0.000E+00	1.474E+07	0.000E+00	SHORT HLIF
PM-147	8.289E+01	6.407E+02	1.220E+03	NOT IDENT.
PM-149	0.000E+00	5.389E+39	0.000E+00	SHORT HLIF
EU-150	1.250E-02	2.336E-02	4.153E-02	FAIL ABUN
EU-152	-6.710E-02	6.891E-02	1.174E-01	NOT IDENT.
GD-153	-7.773E-02	1.406E-01	2.586E-01	NOT IDENT.
EU-154	2.967E-02	8.333E-02	1.678E-01	FAIL ABUN
EU-155	-1.404E-02	8.521E-02	1.606E-01	FAIL ABUN
TB-160	3.656E-01	1.327E+00	2.577E+00	FAIL ABUN
HO-166M	-1.231E-02	4.318E-02	7.918E-02	NOT IDENT.
TM-171	3.459E+00	2.229E+01	4.588E+01	NOT IDENT.
HF-172	2.242E-01	2.702E-01	3.560E-01	FAIL ABUN
LU-172	-3.125E-02	6.071E-02	1.088E-01	FAIL ABUN
LU-176	-7.025E-03	1.914E-02	3.525E-02	FAIL ABUN
HF-181	3.022E-01	3.199E+00	5.313E+00	NOT IDENT.
TA-182	-3.427E-01	6.963E-01	1.229E+00	FAIL ABUN
RE-183	-1.478E+00	2.659E+00	5.153E+00	NOT IDENT.
RE-184	-1.035E+01	2.363E+01	4.093E+01	NOT IDENT.

W-188	2.423E+01	1.012E+02	1.445E+02	NOT IDENT.
IR-192	2.261E-01	3.295E-01	6.633E-01	FAIL ABUN
HG-203	-5.106E-01	1.632E+00	3.050E+00	FAIL ABUN
BI-207	-3.773E-02	3.947E-02	6.658E-02	FAIL ABUN
PB-210	-6.934E-01	4.293E+00	8.614E+00	NOT IDENT.
BI-211	0.000E+00	4.409E-01	6.582E-01	FAIL ABUN
PB-211	-3.278E-01	5.107E-01	8.842E-01	FAIL ABUN
BI-212	0.000E+00	4.808E-01	9.675E-01	FAIL ABUN
RN-219	3.722E-02	2.798E-01	5.302E-01	FAIL ABUN
RA-223	2.392E-01	4.346E-01	8.668E-01	FAIL ABUN
AC-227	-8.802E-02	1.888E-01	3.116E-01	FAIL ABUN
TH-227	-8.802E-02	1.888E-01	3.116E-01	FAIL ABUN
AC-228	0.000E+00	2.529E-01	4.542E-01	FAIL ABUN
RA-228	0.000E+00	2.529E-01	4.542E-01	FAIL ABUN
TH-231	2.392E-01	4.346E-01	8.668E-01	FAIL ABUN
TH-232	0.000E+00	2.529E-01	4.542E-01	FAIL ABUN
PA-233	-4.997E-03	4.418E-02	8.340E-02	FAIL ABUN
PA-234	7.105E-02	3.078E-01	3.669E-01	FAIL ABUN
PA-234M	2.768E-01	3.170E+00	6.117E+00	NOT IDENT.
TH-234	-6.789E-02	1.118E+00	2.270E+00	FAIL ABUN
NP-237	-4.997E-03	4.418E-02	8.340E-02	FAIL ABUN
NP-238	0.000E+00	2.773E+40	0.000E+00	SHORT HLIF
U-238	-6.789E-02	1.118E+00	2.270E+00	FAIL ABUN
NP-239	-1.441E-01	1.819E-01	3.211E-01	NOT IDENT.
PU-239	3.236E+02	4.323E+02	4.927E+02	FAIL ABUN
AM-241	3.070E-02	1.327E-01	2.704E-01	NOT IDENT.
CM-243	-2.792E-02	7.976E-02	1.483E-01	NOT IDENT.
BK-247	-2.290E-02	6.286E-02	1.044E-01	FAIL ABUN
CM-247	-9.026E-03	2.681E-02	4.812E-02	FAIL ABUN
CF-249	1.310E-02	2.918E-02	5.684E-02	NOT IDENT.
CF-251	4.555E-02	9.384E-02	1.762E-01	FAIL ABUN

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
BE-7	477.60	29	10.44*	4.230E+00	3.268E-01	1.463E+01	97.83
K-40	1460.82	557	10.66*	1.911E+00	1.356E+01	1.356E+01	8.40
GE-68	1077.34	21	3.22*	2.403E+00	1.357E+00	2.864E+00	65.12
CD-109	88.03	102	3.70*	6.111E+00	2.239E+00	3.471E+00	56.31
SN-126	64.28	-----	9.60	3.252E+00	-----	Line Not Found	-----
	86.94	102	8.90	6.111E+00	9.308E-01	9.309E-01	56.31
	87.57	102	37.00*	6.111E+00	2.239E-01	2.239E-01	56.31
PR-144	696.51	24	1.34*	3.253E+00	2.733E+00	5.561E+00	273.88
	1489.16	-----	0.28	1.883E+00	-----	Line Not Found	-----
TL-208	277.37	-----	6.60	6.127E+00	-----	Line Not Found	-----
	583.19	172	85.00*	3.674E+00	2.735E-01	2.735E-01	26.03
	860.56	29	12.50	2.810E+00	4.079E-01	4.079E-01	115.37
BI-211	72.87	155	1.23	4.729E+00	1.325E+01	1.325E+01	37.66
	351.06	379	12.92*	5.218E+00	2.788E+00	2.788E+00	16.14
PB-212	74.82	155	10.28	4.729E+00	1.586E+00	1.586E+00	37.66
	77.11	257	17.10	5.036E+00	1.482E+00	1.482E+00	27.30
	238.63	440	43.60*	6.719E+00	7.454E-01	7.454E-01	13.59
	300.09	43	3.30	5.809E+00	1.116E+00	1.116E+00	96.40
BI-214	609.32	300	45.49*	3.566E+00	9.175E-01	9.178E-01	17.15
	1120.29	54	14.92	2.334E+00	7.699E-01	7.702E-01	66.96
	1764.49	38	15.30	1.632E+00	7.609E-01	7.611E-01	41.66
PB-214	74.82	155	5.80	4.729E+00	2.811E+00	2.812E+00	37.66
	77.11	257	9.70	5.036E+00	2.613E+00	2.614E+00	27.30
	87.09	102	3.41	6.111E+00	2.429E+00	2.430E+00	56.31
	242.00	148	7.25	6.671E+00	1.518E+00	1.518E+00	50.79
	295.22	233	18.42	5.879E+00	1.069E+00	1.069E+00	24.01
	351.93	379	35.60*	5.218E+00	1.012E+00	1.012E+00	16.14
RN-222	609.32	300	45.49*	3.566E+00	9.175E-01	9.178E-01	17.15
	1120.29	54	14.92	2.334E+00	7.699E-01	7.702E-01	66.96
	1764.49	38	15.30	1.632E+00	7.609E-01	7.611E-01	41.66
RA-224	240.99	148	4.10*	6.671E+00	2.684E+00	2.684E+00	50.79
RA-226	609.32	300	45.49*	3.566E+00	9.175E-01	9.178E-01	17.15
	1120.29	54	14.92	2.334E+00	7.699E-01	7.702E-01	66.96
	1764.49	38	15.30	1.632E+00	7.609E-01	7.611E-01	41.66
TH-228	74.82	155	10.28	4.729E+00	1.586E+00	1.586E+00	37.66
	77.11	257	17.10	5.036E+00	1.482E+00	1.482E+00	27.30
	238.63	440	43.60*	6.719E+00	7.454E-01	7.454E-01	13.59
	300.09	43	3.30	5.809E+00	1.116E+00	1.116E+00	96.40
TH-229	85.43	102	14.70	6.111E+00	5.636E-01	5.636E-01	56.31
	88.47	102	24.00	6.111E+00	3.452E-01	3.452E-01	56.31
	193.51	-----	4.41*	7.490E+00	-----	Line Not Found	-----
	210.85	-----	2.80	7.193E+00	-----	Line Not Found	-----
TH-230	609.32	300	45.49*	3.566E+00	9.175E-01	9.175E-01	17.15
	1120.29	54	14.92	2.334E+00	7.699E-01	7.699E-01	66.96
	1764.49	38	15.30	1.632E+00	7.609E-01	7.609E-01	41.66
PA-231	283.69	-----	1.70	6.038E+00	-----	Line Not Found	-----
	301.36	43	5.35*	5.809E+00	6.882E-01	6.882E-01	96.40

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
U-234	609.32	300	45.49*	3.566E+00	9.175E-01	9.175E-01	17.15
	1120.29	54	14.92	2.334E+00	7.699E-01	7.699E-01	66.96
	1764.49	38	15.30	1.632E+00	7.609E-01	7.609E-01	41.66
U-235	89.96	78	3.47	6.379E+00	1.742E+00	1.742E+00	60.67
	93.35	141	5.60	6.614E+00	1.893E+00	1.893E+00	48.41
	143.76	-----	10.96*	8.086E+00	-----	Line Not Found	-----
	163.33	-----	5.08	7.938E+00	-----	Line Not Found	-----
	185.72	110	57.20	7.607E+00	1.250E-01	1.250E-01	53.45
AM-243	205.31	-----	5.01	7.289E+00	-----	Line Not Found	-----
	43.53	-----	5.90	3.443E-01	-----	Line Not Found	-----
ANH-511	74.66	155	67.20*	4.729E+00	2.426E-01	2.426E-01	37.66
	511.00	34	100.00*	4.027E+00	4.127E-02	4.127E-02	182.29

Flag: "*" = Keyline

Total number of lines in spectrum 48
 Number of unidentified lines 8
 Number of lines tentatively identified by NID 40 83.33%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
BE-7	53.22D	44.8	3.268E-01	1.463E+01	1.432E+01	97.83	
K-40	1.25E+09Y	1.00	1.356E+01	1.356E+01	0.114E+01	8.40	
GE-68	270.95D	2.11	1.357E+00	2.864E+00	1.865E+00	65.12	
CD-109	461.40D	1.55	2.239E+00	3.471E+00	1.955E+00	56.31	
SN-126	2.30E+05Y	1.00	2.239E-01	2.239E-01	1.261E-01	56.31	
PR-144	284.91D	2.03	2.733E+00	5.561E+00	15.23E+00	273.88	
TL-208	1.41E+10Y	1.00	2.735E-01	2.735E-01	0.712E-01	26.03	
BI-211	7.04E+08Y	1.00	2.788E+00	2.788E+00	0.450E+00	16.14	
PB-212	1.41E+10Y	1.00	7.454E-01	7.454E-01	1.013E-01	13.59	
BI-214	1600.00Y	1.00	9.175E-01	9.178E-01	1.574E-01	17.15	
PB-214	1600.00Y	1.00	1.012E+00	1.012E+00	0.163E+00	16.14	
RN-222	1600.00Y	1.00	9.175E-01	9.178E-01	1.574E-01	17.15	
RA-224	1.41E+10Y	1.00	2.684E+00	2.684E+00	1.363E+00	50.79	
RA-226	1600.00Y	1.00	9.175E-01	9.178E-01	1.574E-01	17.15	
TH-228	1.41E+10Y	1.00	7.454E-01	7.454E-01	1.013E-01	13.59	
TH-229	7340.00Y	1.00	3.452E-01	3.452E-01	1.944E-01	56.31	K
TH-230	7.54E+04Y	1.00	9.175E-01	9.175E-01	1.573E-01	17.15	
PA-231	7.04E+08Y	1.00	6.882E-01	6.882E-01	6.635E-01	96.40	
U-234	2.45E+05Y	1.00	9.175E-01	9.175E-01	1.573E-01	17.15	
U-235	7.04E+08Y	1.00	1.250E-01	1.250E-01	0.668E-01	53.45	K
AM-243	7370.00Y	1.00	2.426E-01	2.426E-01	0.914E-01	37.66	
ANH-511	1.00E+09Y	1.00	4.127E-02	4.127E-02	7.522E-02	182.29	
Total Activity :			3.472E+01	5.459E+01			

Grand Total Activity : 3.472E+01 5.459E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	124.62	30	103	1.45	249.95	248	6	6.84E-03	****	7.98E+00	T
0	128.95	33	137	0.80	258.60	255	7	7.49E-03	****	8.03E+00	T
0	214.25	41	150	3.86	429.07	424	11	9.82E-03	****	7.13E+00	T
0	259.99	22	74	1.68	520.48	516	8	5.30E-03	****	6.38E+00	T
0	270.61	68	123	1.91	541.69	535	12	1.65E-02	75.8	6.22E+00	T
0	285.78	21	87	1.27	572.01	568	10	5.19E-03	****	6.01E+00	T
0	338.67	101	85	1.54	677.71	673	10	2.50E-02	43.3	5.36E+00	T
0	425.73	15	50	0.48	851.72	844	9	3.85E-03	****	4.57E+00	T
0	431.33	24	45	4.31	862.90	856	12	6.04E-03	****	4.53E+00	
0	438.51	60	66	5.93	877.25	868	20	1.53E-02	74.1	4.48E+00	T
0	463.97	75	33	2.11	928.13	922	15	1.92E-02	42.2	4.31E+00	T
0	485.39	39	66	8.72	970.94	959	22	9.98E-03	****	4.18E+00	T
0	721.82	29	25	2.42	1443.52	1435	15	7.81E-03	87.3	3.18E+00	T
0	727.32	51	16	2.73	1454.51	1450	9	1.37E-02	40.5	3.16E+00	T
0	795.87	29	25	1.90	1591.54	1584	14	7.94E-03	84.8	2.97E+00	T
0	911.76	145	31	1.97	1823.19	1816	17	3.95E-02	25.1	2.70E+00	T
0	935.82	26	21	3.41	1871.28	1863	17	7.02E-03	92.4	2.66E+00	T
0	945.53	5	19	0.69	1890.71	1885	10	1.24E-03	****	2.64E+00	T
0	950.97	48	5	5.73	1901.58	1894	18	1.33E-02	35.7	2.63E+00	T
0	971.05	34	68	1.27	1941.71	1931	15	9.42E-03	****	2.59E+00	
0	1155.68	33	35	0.74	2310.81	2301	23	9.32E-03	97.5	2.28E+00	
0	1239.87	41	36	1.39	2479.13	2465	23	1.16E-02	84.2	2.17E+00	T
0	1293.60	33	0	6.25	2586.56	2578	19	9.44E-03	34.3	2.10E+00	
0	1310.05	14	8	1.65	2619.44	2613	11	4.11E-03	91.3	2.08E+00	
0	1339.54	8	8	0.68	2678.41	2673	10	2.35E-03	****	2.05E+00	
0	1378.25	23	10	3.32	2755.80	2748	14	6.57E-03	71.1	2.00E+00	
0	1482.32	9	15	4.43	2963.87	2946	22	2.62E-03	****	1.89E+00	

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235075.CNF;1
* Acquisition date   : 3-OCT-2016 06:47:01 Sensitivity      : 3.000
* Detector ID       : GAM18 Energy tolerance: 2.000
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.97 Half life ratio : *****
* Sample date       : 16-DEC-2015 09:31:00 Nuclide Library : SOLID
* Sample ID        : G405235075 Analyst initials: MXR1
* Batch Number     : 1596254 Sample Quantity : 1.5141E+02 GRAM
* Wet wt corr      : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 25-JUN-2016 08:25:19 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM18_CAN.CNF;10
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
BE-7	6.804E+00
K-40	1.688E-01
GE-68	1.801E+00
CD-109	7.265E-01
SN-126	5.444E-02
PR-144	2.895E+00
TL-208	1.919E-02
PB-212	3.343E-02
BI-214	4.476E-02
PB-214	4.667E-02
RN-222	4.476E-02
RA-224	3.581E-01
RA-226	4.476E-02
TH-228	3.343E-02
TH-229	3.252E-01
TH-230	4.475E-02
PA-231	2.753E-01
U-234	4.475E-02
U-235	1.358E-01
AM-243	3.652E-02
ANH-511	1.794E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
NA-22	3.015E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.760E-02	NOT IDENT.
SC-46	2.259E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	4.790E-02	NOT IDENT.
CO-56	2.526E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	3.299E-02	NOT IDENT.

CO-58	2.746E-01	NOT IDENT.
FE-59	3.861E+00	NOT IDENT.
CO-60	2.370E-02	NOT IDENT.
ZN-65	1.267E-01	NOT IDENT.
AS-73	8.625E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.354E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	3.547E-01	NOT IDENT.
KR-85	6.061E+00	NOT IDENT.
SR-85	5.889E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.503E-01	NOT IDENT.
Y-91	3.167E+02	NOT IDENT.
NB-94	2.171E-02	NOT IDENT.
NB-95	5.164E-01	NOT IDENT.
NB-95M	1.526E+00	NOT IDENT.
ZR-95	9.617E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.382E-02	FAIL ABUN
RH-102	3.346E-02	FAIL ABUN
RU-103	2.798E+00	FAIL ABUN
RH-106	3.199E-01	NOT IDENT.
RU-106	3.199E-01	NOT IDENT.
AG-108M	1.695E-02	FAIL ABUN
AG-110M	7.072E-02	FAIL ABUN
SN-113	1.464E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	8.592E-02	NOT IDENT.
SB-124	1.200E+00	FAIL ABUN
SB-125	6.874E-02	FAIL ABUN
TE-125M	1.797E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.497E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	4.122E-02	FAIL ABUN
CS-135	1.044E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	2.223E-02	NOT IDENT.
CS-137	2.349E-02	NOT IDENT.
CE-139	7.371E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.467E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.244E-01	NOT IDENT.
PM-144	3.593E-02	FAIL ABUN
PM-146	2.967E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	5.712E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.940E-02	FAIL ABUN
EU-152	5.355E-02	NOT IDENT.
GD-153	1.210E-01	NOT IDENT.
EU-154	7.421E-02	FAIL ABUN
EU-155	7.515E-02	FAIL ABUN
TB-160	1.154E+00	FAIL ABUN
HO-166M	3.564E-02	NOT IDENT.
TM-171	2.147E+01	NOT IDENT.
HF-172	1.674E-01	FAIL ABUN
LU-172	4.830E-02	FAIL ABUN
LU-176	1.632E-02	FAIL ABUN
HF-181	2.414E+00	NOT IDENT.
TA-182	5.478E-01	FAIL ABUN
RE-183	2.408E+00	NOT IDENT.
RE-184	1.847E+01	NOT IDENT.
W-188	6.690E+01	NOT IDENT.

IR-192	3.084E-01	FAIL ABUN
HG-203	1.416E+00	FAIL ABUN
BI-207	2.947E-02	FAIL ABUN
PB-210	4.032E+00	NOT IDENT.
BI-211	3.189E-01	FAIL ABUN
PB-211	4.033E-01	FAIL ABUN
BI-212	4.513E-01	FAIL ABUN
RN-219	2.430E-01	FAIL ABUN
RA-223	4.017E-01	FAIL ABUN
AC-227	1.443E-01	FAIL ABUN
TH-227	1.443E-01	FAIL ABUN
AC-228	2.174E-01	FAIL ABUN
RA-228	2.174E-01	FAIL ABUN
TH-231	4.017E-01	FAIL ABUN
TH-232	2.174E-01	FAIL ABUN
PA-233	3.850E-02	FAIL ABUN
PA-234	1.619E-01	FAIL ABUN
PA-234M	2.739E+00	NOT IDENT.
TH-234	1.072E+00	FAIL ABUN
NP-237	3.850E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.072E+00	FAIL ABUN
NP-239	1.490E-01	NOT IDENT.
PU-239	2.323E+02	FAIL ABUN
AM-241	1.271E-01	NOT IDENT.
CM-243	6.937E-02	NOT IDENT.
BK-247	4.851E-02	FAIL ABUN
CM-247	2.203E-02	FAIL ABUN
CF-249	2.626E-02	NOT IDENT.
CF-251	8.283E-02	FAIL ABUN

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235075.CNF;1 *
 * Acquisition date : 3-OCT-2016 06:47:01 Sensitivity : 3.000 *
 * Detector ID : GAM18 Energy tolerance: 2.000 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:00.97 Half life ratio : ***** *
 * Sample date : 16-DEC-2015 09:31:00 Nuclide Library : SOLID *
 * Sample ID : G405235075 Analyst initials: MXR1 *
 * Batch Number : 1596254 Sample Quantity: 1.5141E+02 GRAM *
 * Quantity Err(%) : 1.3209E-03 % *
 * Wet wt corr : 1.00000 Wet Weight : 0.00000 *
 * Dry Weight : 0.00000 *

CALIBRATION INFORMATION

* Eff. Cal. date : 25-JUN-2016 08:25:19 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM18_CAN.CNF;10 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
BE-7	1.463E+01	1.404E+01	1.404E+01
K-40	1.356E+01	1.321E+00	1.321E+00
GE-68	2.864E+00	1.831E+00	1.831E+00
CD-109	1.944E+00	1.965E+00	1.965E+00
SN-126	1.254E-01	1.265E-01	1.265E-01
PR-144	5.561E+00	1.493E+01	1.493E+01
TL-208	2.735E-01	7.071E-02	7.071E-02
PB-212	7.454E-01	1.068E-01	1.068E-01
BI-214	9.178E-01	1.592E-01	1.592E-01
PB-214	1.012E+00	1.655E-01	1.655E-01
RN-222	9.178E-01	1.592E-01	1.592E-01
RA-224	7.942E-01	1.414E+00	1.414E+00
RA-226	9.178E-01	1.592E-01	1.592E-01
TH-228	7.454E-01	1.068E-01	1.068E-01
TH-229	-2.647E-01	3.686E-01	3.686E-01
TH-230	9.175E-01	1.592E-01	1.592E-01
PA-231	6.882E-01	6.666E-01	6.666E-01
U-234	9.175E-01	1.592E-01	1.592E-01
U-235	1.441E-02	1.549E-01	1.549E-01
AM-243	1.504E-01	9.333E-02	9.333E-02
ANH-511	4.127E-02	7.374E-02	7.374E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
NA-22	1.205E-02	3.386E-02	3.429E-02	NOT IDENT.
NA-24	1.000E+41	1.480E+41	0.000E+00	SHORT HLIF
AL-26	-6.523E-03	2.273E-02	2.292E-02	NOT IDENT.
SC-46	2.231E-02	2.676E-01	2.678E-01	FAIL ABUN
V-48	4.834E+00	7.566E+03	7.566E+03	SHORT HLIF
CR-51	-3.929E+01	2.526E+02	2.532E+02	SHORT HLIF
MN-54	3.338E-02	5.285E-02	5.495E-02	NOT IDENT.
CO-56	-2.341E-01	3.382E-01	3.543E-01	FAIL ABUN
MN-56	-1.000E+41	1.432E+41	0.000E+00	SHORT HLIF

CO-57	3.387E-02	3.686E-02	3.990E-02	NOT IDENT.
CO-58	-2.150E-01	3.638E-01	3.765E-01	NOT IDENT.
FE-59	1.195E+00	4.326E+00	4.359E+00	NOT IDENT.
CO-60	-2.430E-03	3.190E-02	3.192E-02	NOT IDENT.
ZN-65	-1.210E-01	1.907E-01	1.984E-01	NOT IDENT.
AS-73	4.013E+00	8.824E+00	9.007E+00	NOT IDENT.
AS-74	-2.189E+03	3.585E+03	3.719E+03	SHORT HLIF
SE-75	-7.183E-02	1.763E-01	1.792E-01	NOT IDENT.
BR-77	1.322E+37	1.114E+38	0.000E+00	SHORT HLIF
SR-82	-1.618E+02	4.655E+02	4.711E+02	SHORT HLIF
RB-83	-5.849E-02	4.056E-01	4.064E-01	NOT IDENT.
KR-85	1.123E+01	6.397E+00	8.158E+00	NOT IDENT.
SR-85	1.090E+00	6.216E-01	7.924E-01	NOT IDENT.
RB-86	2.619E+04	1.676E+04	2.050E+04	SHORT HLIF
Y-88	4.812E-02	1.679E-01	1.693E-01	NOT IDENT.
Y-91	-2.872E+01	3.778E+02	3.780E+02	NOT IDENT.
NB-94	-2.436E-03	2.588E-02	2.590E-02	NOT IDENT.
NB-95	-3.067E-01	6.458E-01	6.604E-01	NOT IDENT.
NB-95M	-5.350E-01	1.918E+00	1.933E+00	NOT IDENT.
ZR-95	4.326E-01	1.076E+00	1.093E+00	NOT IDENT.
NB-97	-1.000E+41	1.394E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.629E+41	0.000E+00	SHORT HLIF
MO-99	-1.696E+29	1.855E+31	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	6.181E+41	0.000E+00	SHORT HLIF
RH-101	3.551E-02	4.788E-02	5.048E-02	FAIL ABUN
RH-102	-2.539E-02	4.197E-02	4.351E-02	FAIL ABUN
RU-103	-3.951E+00	3.637E+00	4.050E+00	FAIL ABUN
RH-106	-2.152E-01	3.928E-01	4.046E-01	NOT IDENT.
RU-106	-2.152E-01	3.928E-01	4.046E-01	NOT IDENT.
AG-108M	1.594E-02	2.395E-02	2.500E-02	FAIL ABUN
AG-110M	-1.923E-02	8.749E-02	8.792E-02	FAIL ABUN
SN-113	5.205E-03	1.700E-01	1.700E-01	NOT IDENT.
CD-115	-1.217E+38	1.843E+38	0.000E+00	SHORT HLIF
SN-117M	-1.668E+04	5.217E+04	5.271E+04	SHORT HLIF
TE-123M	-3.510E-02	1.035E-01	1.047E-01	NOT IDENT.
SB-124	2.851E-01	1.347E+00	1.353E+00	FAIL ABUN
SB-125	9.162E-02	9.079E-02	9.974E-02	FAIL ABUN
TE-125M	-6.411E+01	2.069E+02	2.089E+02	NOT IDENT.
I-126	5.721E+05	4.529E+05	5.212E+05	SHORT HLIF
SB-126	1.107E+06	9.685E+05	1.089E+06	SHORT HLIF
SB-127	1.510E+21	4.415E+21	0.000E+00	SHORT HLIF
I-131	6.237E+08	1.968E+09	1.988E+09	SHORT HLIF
I-132	-1.000E+41	1.869E+42	0.000E+00	SHORT HLIF
TE-132	-1.153E+24	5.306E+25	0.000E+00	SHORT HLIF
BA-133	-8.624E-03	3.351E-02	3.374E-02	FAIL ABUN
I-133	1.000E+41	1.483E+42	0.000E+00	SHORT HLIF
CS-134	7.524E-02	6.261E-02	7.121E-02	FAIL ABUN
CS-135	6.801E-02	1.227E-01	1.265E-01	NOT IDENT.
I-135	1.000E+41	1.075E+42	0.000E+00	SHORT HLIF
CS-136	1.009E+05	1.530E+05	1.596E+05	SHORT HLIF
BA-137M	2.403E-03	2.539E-02	2.542E-02	NOT IDENT.
CS-137	2.539E-03	2.683E-02	2.685E-02	NOT IDENT.
CE-139	-2.102E-02	8.849E-02	8.899E-02	NOT IDENT.
BA-140	7.162E+04	6.325E+05	6.333E+05	SHORT HLIF
LA-140	1.068E+05	1.774E+05	1.838E+05	SHORT HLIF
CE-141	-2.452E+00	1.706E+01	1.710E+01	NOT IDENT.
CE-143	1.000E+41	1.394E+41	0.000E+00	SHORT HLIF
CE-144	-4.473E-02	2.613E-01	2.621E-01	NOT IDENT.
PM-144	6.429E-02	1.726E-01	1.750E-01	FAIL ABUN
PM-146	1.698E-02	3.315E-02	3.402E-02	NOT IDENT.
ND-147	2.731E+06	1.474E+07	1.479E+07	SHORT HLIF
PM-147	8.289E+01	6.407E+02	6.418E+02	NOT IDENT.
PM-149	3.055E+39	5.430E+39	0.000E+00	SHORT HLIF
EU-150	1.250E-02	2.337E-02	2.404E-02	FAIL ABUN
EU-152	-6.710E-02	6.901E-02	7.535E-02	NOT IDENT.
GD-153	-7.773E-02	1.406E-01	1.449E-01	NOT IDENT.
EU-154	2.967E-02	8.334E-02	8.440E-02	FAIL ABUN
EU-155	-1.404E-02	8.522E-02	8.545E-02	FAIL ABUN
TB-160	3.656E-01	1.327E+00	1.338E+00	FAIL ABUN
HO-166M	-1.231E-02	4.319E-02	4.354E-02	NOT IDENT.
TM-171	3.459E+00	2.229E+01	2.234E+01	NOT IDENT.
HF-172	2.242E-01	2.726E-01	2.907E-01	FAIL ABUN
LU-172	-3.125E-02	6.079E-02	6.240E-02	FAIL ABUN
LU-176	-7.025E-03	1.915E-02	1.941E-02	FAIL ABUN
HF-181	3.022E-01	3.199E+00	3.202E+00	NOT IDENT.
TA-182	-3.427E-01	6.964E-01	7.134E-01	FAIL ABUN
RE-183	-1.478E+00	2.668E+00	2.750E+00	NOT IDENT.
RE-184	-1.035E+01	2.375E+01	2.420E+01	NOT IDENT.

W-188	2.423E+01	1.012E+02	1.018E+02	NOT IDENT.
IR-192	2.261E-01	3.296E-01	3.450E-01	FAIL ABUN
HG-203	-5.106E-01	1.632E+00	1.648E+00	FAIL ABUN
BI-207	-3.773E-02	3.950E-02	4.301E-02	FAIL ABUN
PB-210	-6.934E-01	4.294E+00	4.305E+00	NOT IDENT.
BI-211	2.788E+00	4.581E-01	1.338E+00	FAIL ABUN
PB-211	-3.278E-01	5.110E-01	5.319E-01	FAIL ABUN
BI-212	1.211E+00	4.846E-01	7.299E-01	FAIL ABUN
RN-219	3.722E-02	2.798E-01	2.803E-01	FAIL ABUN
RA-223	2.392E-01	4.349E-01	4.480E-01	FAIL ABUN
AC-227	-8.802E-02	1.891E-01	1.933E-01	FAIL ABUN
TH-227	-8.802E-02	1.891E-01	1.933E-01	FAIL ABUN
AC-228	1.028E+00	2.583E-01	5.304E-01	FAIL ABUN
RA-228	1.028E+00	2.583E-01	5.304E-01	FAIL ABUN
TH-231	2.392E-01	4.349E-01	4.480E-01	FAIL ABUN
TH-232	1.028E+00	2.583E-01	5.304E-01	FAIL ABUN
PA-233	-4.997E-03	4.418E-02	4.424E-02	FAIL ABUN
PA-234	7.105E-02	3.184E-01	3.200E-01	FAIL ABUN
PA-234M	2.768E-01	3.170E+00	3.173E+00	NOT IDENT.
TH-234	-6.789E-02	1.118E+00	1.119E+00	FAIL ABUN
NP-237	-4.997E-03	4.418E-02	4.424E-02	FAIL ABUN
NP-238	-2.365E+40	2.775E+40	0.000E+00	SHORT HLIF
U-238	-6.789E-02	1.118E+00	1.119E+00	FAIL ABUN
NP-239	-1.441E-01	1.823E-01	1.935E-01	NOT IDENT.
PU-239	3.236E+02	4.325E+02	4.565E+02	FAIL ABUN
AM-241	3.070E-02	1.328E-01	1.335E-01	NOT IDENT.
CM-243	-2.792E-02	7.980E-02	8.079E-02	NOT IDENT.
BK-247	-2.290E-02	6.303E-02	6.387E-02	FAIL ABUN
CM-247	-9.026E-03	2.685E-02	2.716E-02	FAIL ABUN
CF-249	1.310E-02	2.920E-02	2.979E-02	NOT IDENT.
CF-251	4.555E-02	9.398E-02	9.620E-02	FAIL ABUN

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
74.66	63.4321	105.31	99.1045	131.20	72.4552
879.38	67.4593	86.79	99.1833	133.02	70.1713
46.54	68.6321	86.94	99.2336	133.52	68.0246
228.16	0.0000	87.09	99.2838	136.00	72.9078
52.39	68.6747	87.57	99.4423	136.47	71.8643
1093.63	82.4539	88.03	74.6948	739.50	0.0000
52.39	68.1787	306.78	74.7713	140.51	0.0000
125.81	63.2454	88.47	74.8032	143.76	83.3391
53.44	68.5303	143.76	88.3560	144.24	74.2854
54.07	63.5842	90.64	88.5509	145.44	79.0664
293.27	0.0000	531.02	0.0000	152.43	97.7197
482.18	78.6024	92.59	89.1050	1048.07	0.0000
57.98	81.3895	93.35	89.3190	154.21	92.2490
59.27	82.7466	94.56	73.6008	158.56	0.0000
59.32	82.7653	311.90	73.6215	159.00	82.5557
59.54	77.5589	946.00	73.6259	162.33	70.0553
60.96	83.3709	94.87	73.6718	537.26	0.0000
61.17	83.4477	97.43	85.0555	163.33	73.7650
62.93	74.2474	98.43	79.2199	165.86	82.5071
63.29	77.9455	98.44	79.2223	427.87	93.9471
290.67	83.4241	103.37	73.3689	176.60	0.0000
87.57	80.0731	116.74	73.3689	177.52	69.7036
66.73	88.1653	100.11	84.7243	181.07	0.0000
67.24	97.4569	102.03	70.8351	181.52	91.9855
67.68	90.3321	103.18	73.1332	184.41	99.0771
1221.41	90.3577	103.37	78.3269	185.72	79.4492
97.43	83.3924	911.20	74.5994	193.51	94.8161
279.20	91.1653	105.31	74.6208	197.03	91.1733
1063.66	85.6604	106.12	61.2894	198.01	88.7892
72.87	85.6801	106.47	74.8680	201.83	89.3649
351.06	85.6801	109.28	83.8458	203.43	76.8036
74.66	86.2640	111.00	80.0327	205.31	76.1883
238.63	86.3160	111.76	0.0000	210.85	85.5202
351.93	86.3160	114.06	60.5255	215.65	76.6052
238.63	86.3160	116.30	0.0000	222.11	54.5218
74.97	86.3644	116.74	73.7921	227.09	59.3706
77.11	87.0516	119.76	75.4533	227.38	68.2617
78.74	87.5689	264.66	68.1459	228.16	0.0000
256.23	87.8679	121.22	68.1632	228.18	70.1199
133.52	95.6551	344.28	46.2295	235.69	87.5163
364.49	0.0000	122.06	52.0452	235.96	98.3266
711.68	83.0340	122.92	73.8915	238.63	64.9065
356.01	78.0427	1274.44	73.9195	238.98	0.0000
323.87	78.0619	123.68	66.7750	240.99	65.1292
81.75	94.9247	125.81	87.5623	242.00	65.2244
83.79	94.3065	127.23	87.8690	244.70	47.7442
265.00	82.7389	127.91	70.4133	685.70	0.0000
193.51	113.0219	129.30	83.8985	388.16	58.8691

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
507.63	0.0000	345.93	53.1191	569.50	43.8230
256.23	63.7698	351.06	51.7507	569.70	43.8287
527.90	0.0000	351.93	51.7985	583.19	25.4097
264.66	68.7089	355.39	0.0000	584.27	25.4279
264.80	68.7208	356.01	45.2559	595.83	0.0000
265.00	65.9331	364.49	0.0000	600.60	35.2238
268.22	60.5803	366.42	0.0000	602.52	0.0000
269.46	60.2096	372.51	44.4327	604.72	36.6539
270.03	60.2539	375.05	45.6053	607.14	36.7125
401.81	60.3490	377.52	45.7164	609.32	37.3385
273.65	0.0000	383.85	48.1393	610.33	37.3623
276.40	55.0594	388.16	40.8203	614.28	39.9547
583.19	46.5735	666.33	0.0000	618.01	34.6586
277.60	53.2428	391.69	43.1136	884.68	36.6385
402.40	57.0752	400.66	42.3928	621.93	38.6047
279.20	63.8307	401.81	38.0854	630.19	0.0000
279.54	68.6250	402.40	45.7273	631.29	31.0664
279.70	61.0117	404.85	48.0140	633.25	26.2444
280.46	61.0716	410.95	47.1861	634.78	0.0000
301.36	54.6134	413.71	37.4040	635.95	26.2881
284.31	0.0000	720.70	0.0000	636.99	0.0000
285.41	47.0500	423.72	0.0000	1690.97	20.5713
285.90	0.0000	427.09	33.4009	657.76	39.4678
287.50	49.0981	427.87	20.0544	657.90	0.0000
290.67	46.3921	433.94	20.1614	661.66	29.6704
293.27	0.0000	439.40	27.0088	664.57	0.0000
295.22	58.3142	453.88	28.4821	666.33	0.0000
316.51	58.3667	463.37	27.5586	666.50	0.0000
298.58	49.7684	468.07	27.6646	667.71	0.0000
299.98	49.8524	473.00	0.0000	677.62	33.0892
300.09	49.8586	631.29	26.0829	685.70	0.0000
300.13	49.8618	696.49	27.8599	695.00	0.0000
311.90	49.8618	477.60	31.3632	696.49	27.4548
301.36	49.9354	482.18	31.4775	696.51	27.4548
302.85	50.0236	487.02	0.0000	697.00	0.0000
304.50	50.1222	492.35	0.0000	697.30	35.5459
304.85	0.0000	497.08	36.2698	697.49	35.5502
306.78	60.1114	505.52	37.0392	702.65	31.4002
308.46	51.3430	507.63	0.0000	706.68	32.4873
311.90	50.5580	511.00	36.6570	711.68	31.5601
316.51	44.8480	514.00	32.9760	720.70	0.0000
319.41	0.0000	514.00	32.9760	721.93	0.0000
320.08	0.0000	520.40	27.9121	722.78	4.0975
321.04	52.0920	520.69	0.0000	722.91	4.0978
323.87	43.2135	667.71	0.0000	723.31	4.0988
325.23	68.4413	527.90	0.0000	756.73	4.1007
1596.21	0.0000	528.26	34.4131	727.33	18.0743
333.37	62.1550	529.59	30.8208	733.00	31.7875
333.97	54.8789	529.87	0.0000	735.93	30.9540
334.37	48.8027	531.02	0.0000	737.46	26.8490
338.28	62.2832	537.26	0.0000	739.50	0.0000
338.32	62.2870	1260.41	0.0000	747.24	23.8767
340.48	52.1974	552.55	28.5668	748.06	28.0415
340.55	0.0000	795.86	26.9238	752.31	38.5153
344.28	54.4643	569.33	39.1571	753.82	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
756.73	27.1283	968.97	43.3763	1505.03	15.7203
756.80	26.0857	983.53	0.0000	1584.12	23.6287
763.94	37.7051	984.45	0.0000	1596.21	0.0000
765.81	39.8392	996.26	23.3374	1620.50	4.7719
1001.03	41.9495	1001.03	20.5772	1621.92	6.6830
766.84	44.0572	1002.74	19.6557	1678.03	0.0000
772.60	0.0000	1004.73	15.9250	1690.97	6.8038
776.52	0.0000	1021.30	0.0000	1750.46	0.0000
777.92	0.0000	1025.87	0.0000	1764.49	6.9294
778.90	33.7783	1028.54	0.0000	1770.23	6.7974
783.70	0.0000	1037.84	19.9367	1771.35	10.1991
785.37	30.7134	1038.76	0.0000	1791.20	0.0000
903.28	27.2055	1046.59	19.0537	1808.65	8.0039
794.95	22.3497	1048.07	0.0000	1810.72	0.0000
795.86	22.3606	1049.04	23.8403	1836.06	7.0493
801.95	34.1777	1050.41	20.9902		
810.06	21.4484	1063.66	33.5679		
810.29	23.5959	1077.00	0.0000		
810.45	23.5972	1077.34	31.8173		
810.76	22.5285	1085.87	34.8240		
815.77	0.0000	1093.63	28.1362		
818.51	0.0000	1099.45	18.4740		
832.01	27.1019	1112.07	20.7603		
834.85	27.1393	1112.84	19.5449		
835.71	27.1507	1115.54	44.0200		
836.80	0.0000	1120.29	28.4180		
846.75	0.0000	1120.55	28.4209		
846.77	29.4793	1121.30	28.4293		
856.80	0.0000	1808.65	25.1300		
860.56	21.9800	1131.51	0.0000		
871.09	17.6714	1147.95	0.0000		
873.19	28.7442	1332.49	20.9790		
875.33	0.0000	1177.95	26.0178		
879.38	21.0659	1189.05	22.1010		
880.51	26.6235	1204.77	25.2539		
883.24	24.4358	1221.41	29.4630		
884.68	32.2321	1231.02	42.4703		
889.28	21.1622	1235.36	0.0000		
894.76	27.9144	1238.28	22.4802		
1836.06	27.9564	1260.41	0.0000		
900.72	31.3496	1271.87	17.5669		
903.28	35.8691	1274.44	15.5134		
911.20	29.2476	1274.54	15.5142		
912.08	33.3108	1291.59	19.0683		
984.45	0.0000	1298.22	0.0000		
926.50	16.3094	1312.11	0.0000		
929.11	19.6545	1332.49	15.0544		
937.49	17.2990	1362.66	0.0000		
983.53	0.0000	1365.19	14.9058		
946.00	0.0000	1368.63	0.0000		
949.00	0.0000	1384.29	16.0642		
954.55	0.0000	1408.01	21.5732		
962.31	29.1425	1457.56	0.0000		
964.08	30.6991	1460.82	8.7652		
966.17	35.3357	1489.16	14.3603		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235076.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM24.CNF;330
Background date : 2-OCT-2016 11:01:18.
Sample date      : 11-DEC-2015 14:19:00 Acquisition date : 3-OCT-2016 06:47:24.
Sample ID       : G405235076 Sample quantity : 1.44470E+02 GRAM
Detector name   : GAM24 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:01.98 0.1%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596254 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.59*	39	178	0.82	127.25	123	9	1.08E-02	65.3	
2	6	74.90*	157	136	1.16	149.86	144	22	4.36E-02	14.8	1.90E+00
3	6	77.12*	251	124	1.18	154.31	144	22	6.98E-02	10.0	
4	6	80.76	39	148	1.86	161.60	144	22	1.09E-02	59.7	
5	0	87.22	56	189	1.27	174.51	172	7	1.55E-02	42.9	
6	0	93.18*	89	223	1.47	186.43	182	12	2.47E-02	36.6	
7	0	105.19	42	68	1.06	210.46	207	7	1.17E-02	36.1	
8	0	129.31	46	94	0.64	258.70	255	8	1.27E-02	39.5	
9	0	144.24*	35	102	1.43	288.58	285	9	9.74E-03	55.3	
10	0	185.91*	82	135	1.58	371.94	366	12	2.29E-02	31.2	
11	0	209.65	29	116	1.48	419.43	415	9	7.95E-03	71.0	
12	4	238.73*	337	63	1.12	477.60	473	16	9.35E-02	6.8	2.14E+00
13	4	241.66	107	70	1.85	483.46	473	16	2.98E-02	23.3	
14	0	270.64	29	80	1.08	541.44	536	10	8.16E-03	59.8	
15	0	295.42	170	63	1.13	591.00	586	12	4.73E-02	12.1	
16	0	300.21	37	38	1.90	600.59	597	7	1.02E-02	32.4	
17	0	328.26	38	51	0.79	656.71	651	11	1.04E-02	40.7	
18	0	338.50	71	60	1.07	677.20	671	10	1.97E-02	23.6	
19	0	352.10*	279	46	1.18	704.40	700	11	7.74E-02	7.8	
20	0	412.07	13	60	3.49	824.38	813	14	3.70E-03	125.8	
21	0	462.53	30	45	3.93	925.33	919	12	8.26E-03	48.7	
22	0	474.56	16	21	1.43	949.40	944	8	4.45E-03	56.2	
23	0	511.31*	11	70	2.72	1022.93	1016	20	3.12E-03	206.4	
24	0	521.35	19	12	2.23	1043.02	1039	9	5.37E-03	38.8	
25	0	538.80	13	54	7.25	1077.92	1066	18	3.61E-03	135.4	
26	0	583.34*	95	38	1.06	1167.04	1162	11	2.65E-02	16.6	
27	0	609.51*	196	39	1.51	1219.39	1214	13	5.44E-02	9.8	
28	0	661.41	26	23	3.21	1323.23	1316	13	7.29E-03	42.2	
29	0	727.70*	22	22	1.43	1455.88	1449	11	6.05E-03	48.4	
30	0	860.52	19	14	3.15	1721.63	1716	11	5.15E-03	45.4	
31	0	872.90	8	3	1.35	1746.40	1743	6	2.25E-03	48.7	
32	0	890.17*	15	2	1.87	1780.95	1776	10	4.18E-03	36.4	
33	0	911.29*	72	21	2.02	1823.21	1817	14	2.00E-02	18.4	
34	0	951.40	12	5	3.95	1903.47	1898	11	3.46E-03	45.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	969.45*	41	15	1.45	1939.59	1935	13	1.15E-02	26.5	
36	0	1051.57	9	13	1.34	2103.92	2096	10	2.61E-03	77.7	
37	0	1063.31	7	15	0.81	2127.40	2118	12	1.96E-03	115.8	
38	0	1121.11*	44	19	0.93	2243.06	2235	17	1.22E-02	28.7	
39	0	1234.43	10	16	1.03	2469.83	2463	10	2.67E-03	87.0	
40	0	1304.20	8	8	0.88	2609.45	2602	11	2.21E-03	78.1	
41	0	1319.96	3	15	0.50	2641.00	2633	10	8.33E-04	248.3	
42	0	1460.88*	331	7	1.59	2923.02	2917	14	9.20E-02	5.8	
43	0	1569.66	7	0	0.50	3140.71	3134	11	1.94E-03	37.8	
44	0	1764.67*	29	7	3.59	3531.03	3524	13	8.12E-03	27.1	
45	0	1982.88	5	3	0.94	3967.79	3960	11	1.46E-03	75.1	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235076.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-DEC-2015 14:19:00 Acquisition date : 3-OCT-2016 06:47:24
Sample ID        : G405235076 Sample quantity   : 144.47 GRAM
Sample type      : SOLID Sample geometry    :
Detector name    : GAMMA24 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:01.98 0.1%
Energy tolerance : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error    : 0.00 %
Efficiency type  : Linear Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.354E+00	1.146E+01	1.146E+01	11.61	OK
SC-46	889.28	99.98*	2.021E+00	3.906E-02	4.546E-01	72.80	OK
	1120.55	99.99	1.688E+00	1.329E-01	1.547E+00	57.46	OK
CD-109	88.03	3.70*	7.495E+00	2.536E-01	3.961E-01	445.54	OK
SN-126	64.28	9.60	5.569E+00	4.768E-01	4.768E-01	130.55	OK
	86.94	8.90	7.495E+00	1.054E-01	1.054E-01	445.54	OK
	87.57	37.00*	7.495E+00	2.536E-02	2.536E-02	445.54	OK
BA-137M	661.66	89.90*	2.534E+00	6.206E-02	6.323E-02	84.46	OK
CS-137	661.66	85.10*	2.534E+00	6.556E-02	6.680E-02	84.46	OK
CE-141	145.44	48.29*	7.611E+00	2.922E-02	1.633E+01	230.51	OK
EU-155	86.55	30.70	7.495E+00	3.057E-02	3.441E-02	445.54	OK
	105.31	21.10*	7.950E+00	1.583E-01	1.782E-01	72.30	OK
TL-208	277.37	6.60	5.023E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.790E+00	2.192E-01	2.192E-01	33.24	OK
	860.56	12.50	2.074E+00	3.760E-01	3.760E-01	90.75	OK
PB-212	74.82	10.28	6.737E+00	8.329E-01	8.329E-01	55.13	OK
	77.11	17.10	6.908E+00	1.371E+00	1.371E+00	20.03	OK
	238.63	43.60*	5.636E+00	8.067E-01	8.067E-01	13.54	OK
	300.09	3.30	4.719E+00	1.365E+00	1.365E+00	64.85	OK
BI-214	609.32	45.49*	2.698E+00	8.666E-01	8.670E-01	19.69	OK
	1120.29	14.92	1.688E+00	8.905E-01	8.909E-01	57.46	OK
	1764.49	15.30	1.138E+00	8.231E-01	8.233E-01	54.25	OK
PB-214	74.82	5.80	6.730E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	6.908E+00	2.417E+00	2.418E+00	20.03	OK
	87.09	3.41	7.489E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	5.579E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.779E+00	1.120E+00	1.120E+00	24.10	OK
	351.93	35.60*	4.154E+00	1.074E+00	1.074E+00	15.50	OK
RN-222	609.32	45.49*	2.698E+00	8.666E-01	8.670E-01	19.69	OK
	1120.29	14.92	1.688E+00	8.905E-01	8.909E-01	57.46	OK
	1764.49	15.30	1.138E+00	8.231E-01	8.233E-01	54.25	OK
RA-224	240.99	4.10*	5.585E+00	7.794E-01	7.794E-01	176.01	OK
RA-226	609.32	45.49*	2.698E+00	8.666E-01	8.670E-01	19.69	OK
	1120.29	14.92	1.688E+00	8.905E-01	8.909E-01	57.46	OK
	1764.49	15.30	1.138E+00	8.231E-01	8.233E-01	54.25	OK
AC-228	105.21	1.10	7.950E+00	3.036E+00	3.036E+00	72.30	OK
	338.32	11.27	4.287E+00	8.401E-01	8.401E-01	47.22	OK
	794.95	4.25	2.203E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	2.121E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.985E+00	7.337E-01	7.337E-01	36.72	OK
	968.97	15.80	1.892E+00	7.190E-01	7.190E-01	52.98	OK
RA-228	105.21	1.10	7.950E+00	3.036E+00	3.036E+00	72.30	OK
	338.32	11.27	4.287E+00	8.401E-01	8.401E-01	47.22	OK
	794.95	4.25	2.203E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	2.121E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.985E+00	7.337E-01	7.337E-01	36.72	OK
	968.97	15.80	1.892E+00	7.190E-01	7.190E-01	52.98	OK
TH-228	74.82	10.28	6.737E+00	8.329E-01	8.329E-01	55.13	OK
	77.11	17.10	6.908E+00	1.371E+00	1.371E+00	20.03	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	238.63	43.60*	5.636E+00	8.067E-01	8.067E-01	13.54	OK
	300.09	3.30	4.719E+00	1.365E+00	1.365E+00	64.85	OK
TH-230	609.32	45.49*	2.698E+00	8.666E-01	8.667E-01	19.69	OK
	1120.29	14.92	1.688E+00	8.905E-01	8.906E-01	57.46	OK
	1764.49	15.30	1.138E+00	8.231E-01	8.231E-01	54.25	OK
PA-231	283.69	1.70	4.935E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.719E+00	8.420E-01	8.420E-01	64.85	OK
TH-232	105.21	1.10	7.950E+00	3.036E+00	3.036E+00	72.30	OK
	338.32	11.27	4.287E+00	8.401E-01	8.401E-01	47.22	OK
	835.71	1.61	2.121E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.985E+00	7.337E-01	7.337E-01	36.72	OK
	968.97	15.80	1.892E+00	7.190E-01	7.190E-01	52.98	OK
TH-234	63.29	3.70*	5.569E+00	1.237E+00	1.237E+00	130.55	OK
	92.59	4.23	7.717E+00	1.734E+00	1.734E+00	73.16	OK
U-234	609.32	45.49*	2.698E+00	8.666E-01	8.667E-01	19.69	OK
	1120.29	14.92	1.688E+00	8.905E-01	8.905E-01	57.46	OK
	1764.49	15.30	1.138E+00	8.231E-01	8.231E-01	54.25	OK
U-235	89.96	3.47	7.607E+00	----- Line	Not Found	-----	Absent
	93.35	5.60	7.717E+00	1.310E+00	1.310E+00	73.16	OK
	143.76	10.96*	7.620E+00	----- Line	Not Found	-----	<<INT Reject
	163.33	5.08	7.206E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.698E+00	1.293E-01	1.293E-01	62.31	OK
	205.31	5.01	6.280E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	5.569E+00	1.237E+00	1.237E+00	130.55	OK
	92.59	4.23	7.717E+00	1.734E+00	1.734E+00	73.16	OK
AM-243	43.53	5.90	1.694E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	6.737E+00	1.274E-01	1.274E-01	55.13	OK
ANH-511	511.00	100.00*	3.090E+00	2.004E-02	2.004E-02	412.83	OK

Flag: "*" = Keyline


```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235076.CNF;1
* Acquisition date   : 3-OCT-2016 06:47:24 Sensitivity      : 3.000
* Detector ID       : GAM24 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:01.98 Half life ratio : *****
* Sample date       : 11-DEC-2015 14:19:00 Analyst initials: MXR1
* Sample ID        : G405235076 Sample Quantity : 1.4447E+02 GRAM
* Batch Number     : 1596254 Wet Weight : 0.00000
* Wet wt corr      : 1.00000 Dry Weight : 0.00000
* Nuclide Library  : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 17-JUN-2016 07:45:20 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM24_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.146E+01	1.305E+00	5.092E-01
SC-46	4.546E-01	3.244E-01	5.106E-01
CD-109	3.961E-01	1.729E+00	1.746E+00
SN-126	2.536E-02	1.107E-01	1.121E-01
BA-137M	6.323E-02	5.234E-02	4.903E-02
CS-137	6.680E-02	5.529E-02	5.180E-02
CE-141	1.633E+01	3.689E+01	3.062E+01
EU-155	1.782E-01	1.262E-01	1.426E-01
TL-208	2.192E-01	7.139E-02	4.973E-02
PB-212	8.067E-01	1.071E-01	8.648E-02
BI-214	8.670E-01	1.673E-01	1.059E-01
PB-214	1.074E+00	1.632E-01	1.056E-01
RN-222	8.670E-01	1.673E-01	1.059E-01
RA-224	7.794E-01	1.344E+00	9.271E-01
RA-226	8.670E-01	1.673E-01	1.059E-01
AC-228	7.337E-01	2.640E-01	1.987E-01
RA-228	7.337E-01	2.640E-01	1.987E-01
TH-228	8.067E-01	1.071E-01	8.648E-02
TH-230	8.667E-01	1.672E-01	1.059E-01
PA-231	8.420E-01	5.351E-01	6.090E-01
TH-232	7.337E-01	2.640E-01	1.987E-01
TH-234	1.237E+00	1.583E+00	1.269E+00
U-234	8.667E-01	1.672E-01	1.059E-01
U-235	2.580E-01	2.799E-01	3.009E-01
U-238	1.237E+00	1.583E+00	1.269E+00
AM-243	1.274E-01	6.884E-02	5.730E-02
ANH-511	2.004E-02	8.107E-02	4.632E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	8.034E+00		1.085E+01	2.117E+01	NOT IDENT.
NA-22	-1.233E-02		4.464E-02	8.424E-02	NOT IDENT.
NA-24	0.000E+00		1.960E+41	0.000E+00	SHORT HLIF

AL-26	1.102E-02	3.065E-02	6.872E-02	NOT IDENT.
V-48	0.000E+00	8.958E+03	0.000E+00	SHORT HLIF
CR-51	0.000E+00	3.388E+02	0.000E+00	SHORT HLIF
MN-54	-6.691E-04	4.960E-02	9.501E-02	NOT IDENT.
CO-56	-1.534E-01	4.212E-01	7.466E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.403E-03	3.525E-02	6.550E-02	NOT IDENT.
CO-58	2.948E-02	3.568E-01	7.266E-01	NOT IDENT.
FE-59	1.537E+00	4.603E+00	1.002E+01	NOT IDENT.
CO-60	2.040E-02	2.964E-02	6.926E-02	NOT IDENT.
ZN-65	7.236E-03	1.498E-01	2.703E-01	NOT IDENT.
GE-68	-8.030E-01	1.743E+00	3.282E+00	NOT IDENT.
AS-73	-8.083E-01	3.874E+00	7.270E+00	NOT IDENT.
AS-74	0.000E+00	4.063E+03	0.000E+00	SHORT HLIF
SE-75	-4.396E-02	1.774E-01	3.423E-01	NOT IDENT.
BR-77	0.000E+00	7.704E+36	0.000E+00	SHORT HLIF
SR-82	0.000E+00	5.857E+02	0.000E+00	SHORT HLIF
RB-83	8.438E-01	6.423E-01	1.079E+00	FAIL ABUN
KR-85	-1.079E+00	5.732E+00	1.080E+01	NOT IDENT.
SR-85	-1.136E-01	5.855E-01	1.103E+00	NOT IDENT.
RB-86	0.000E+00	1.871E+04	0.000E+00	SHORT HLIF
Y-88	5.096E-02	1.576E-01	3.829E-01	NOT IDENT.
Y-91	-3.241E+02	4.137E+02	7.162E+02	NOT IDENT.
NB-94	3.978E-03	2.342E-02	4.663E-02	NOT IDENT.
NB-95	-6.355E-01	7.999E-01	1.323E+00	NOT IDENT.
NB-95M	1.268E+00	1.903E+00	3.642E+00	NOT IDENT.
ZR-95	5.277E-02	1.032E+00	2.032E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.439E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	6.911E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-8.359E-03	2.923E-02	4.833E-02	NOT IDENT.
RH-102	1.135E-02	5.035E-02	1.001E-01	FAIL ABUN
RU-103	-1.052E+00	4.418E+00	8.344E+00	FAIL ABUN
RH-106	-9.982E-03	3.898E-01	7.556E-01	FAIL ABUN
RU-106	-9.982E-03	3.898E-01	7.556E-01	FAIL ABUN
AG-108M	-1.150E-02	2.108E-02	3.856E-02	NOT IDENT.
AG-110M	3.083E-02	8.597E-02	1.681E-01	NOT IDENT.
SN-113	-2.004E-01	1.836E-01	3.132E-01	NOT IDENT.
CD-115	0.000E+00	9.433E+38	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	7.193E+04	0.000E+00	SHORT HLIF
TE-123M	1.810E-02	1.143E-01	2.110E-01	NOT IDENT.
SB-124	5.994E-01	1.135E+00	3.092E+00	NOT IDENT.
SB-125	-3.358E-02	9.077E-02	1.689E-01	FAIL ABUN
TE-125M	-2.011E+01	2.014E+02	3.723E+02	NOT IDENT.
I-126	0.000E+00	6.547E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	7.896E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	1.174E+22	0.000E+00	SHORT HLIF
I-131	0.000E+00	3.000E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.796E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.842E+26	0.000E+00	SHORT HLIF
BA-133	6.873E-03	3.025E-02	5.646E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	1.627E-02	4.345E-02	8.735E-02	NOT IDENT.
CS-135	-1.650E-02	1.255E-01	2.200E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.405E+05	0.000E+00	SHORT HLIF
CE-139	-2.307E-02	8.946E-02	1.594E-01	NOT IDENT.
BA-140	0.000E+00	9.162E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	2.770E+05	0.000E+00	SHORT HLIF
CE-143	0.000E+00	1.411E+41	0.000E+00	SHORT HLIF
CE-144	-5.348E-04	2.688E-01	4.983E-01	FAIL ABUN
PM-144	1.297E-02	4.880E-02	9.610E-02	NOT IDENT.
PR-144	1.125E+00	4.232E+00	8.334E+00	NOT IDENT.
PM-146	-3.708E-03	3.603E-02	6.940E-02	NOT IDENT.
ND-147	0.000E+00	2.481E+07	0.000E+00	SHORT HLIF
PM-147	1.903E+02	5.791E+02	1.119E+03	NOT IDENT.
PM-149	0.000E+00	1.393E+40	0.000E+00	SHORT HLIF
EU-150	6.993E-03	2.014E-02	3.776E-02	FAIL ABUN
EU-152	-2.907E-04	7.430E-02	1.461E-01	NOT IDENT.
GD-153	-2.566E-02	1.392E-01	2.367E-01	NOT IDENT.
EU-154	-3.238E-02	1.092E-01	2.055E-01	FAIL ABUN
TB-160	2.261E-02	1.343E+00	2.624E+00	FAIL ABUN
HO-166M	-4.392E-02	5.217E-02	8.629E-02	FAIL ABUN
TM-171	-6.614E+00	8.566E+00	1.561E+01	NOT IDENT.
HF-172	7.565E-02	1.872E-01	3.352E-01	FAIL ABUN
LU-172	2.317E-02	6.281E-02	1.338E-01	FAIL ABUN
LU-176	-7.537E-03	2.099E-02	3.984E-02	FAIL ABUN

HF-181	4.085E-01	3.175E+00	6.341E+00	NOT IDENT.
TA-182	-5.091E-01	7.371E-01	1.299E+00	FAIL ABUN
RE-183	-2.471E-01	1.419E+00	2.702E+00	NOT IDENT.
RE-184	4.579E+00	2.413E+01	4.748E+01	NOT IDENT.
W-188	-1.064E+02	9.662E+01	1.467E+02	FAIL ABUN
IR-192	8.082E-02	3.923E-01	7.823E-01	FAIL ABUN
HG-203	8.830E-01	1.895E+00	3.877E+00	NOT IDENT.
BI-207	2.821E-02	6.402E-02	9.033E-02	FAIL ABUN
PB-210	-9.385E-03	1.265E+00	2.503E+00	NOT IDENT.
BI-211	0.000E+00	4.494E-01	7.370E-01	FAIL ABUN
PB-211	1.264E-01	5.341E-01	9.856E-01	NOT IDENT.
BI-212	7.403E-01	7.023E-01	1.084E+00	FAIL ABUN
RN-219	-1.396E-01	2.961E-01	5.490E-01	FAIL ABUN
RA-223	5.766E-02	5.249E-01	9.426E-01	FAIL ABUN
AC-227	-1.566E-01	2.002E-01	3.693E-01	FAIL ABUN
TH-227	-1.566E-01	2.002E-01	3.693E-01	FAIL ABUN
TH-229	-7.687E-02	3.976E-01	7.052E-01	FAIL ABUN
TH-231	5.766E-02	5.249E-01	9.426E-01	FAIL ABUN
PA-233	-2.916E-02	4.728E-02	8.758E-02	FAIL ABUN
PA-234	7.290E-02	2.359E-01	4.536E-01	FAIL ABUN
PA-234M	-1.645E+00	3.640E+00	6.858E+00	NOT IDENT.
NP-237	-2.916E-02	4.728E-02	8.758E-02	FAIL ABUN
NP-238	0.000E+00	1.334E+41	0.000E+00	SHORT HLIF
NP-239	-1.001E-01	1.819E-01	3.224E-01	FAIL ABUN
PU-239	0.000E+00	4.431E+02	5.109E+02	FAIL ABUN
AM-241	-2.917E-02	7.466E-02	1.281E-01	NOT IDENT.
CM-243	-5.446E-02	7.939E-02	1.272E-01	NOT IDENT.
BK-247	-1.683E-02	6.494E-02	1.194E-01	FAIL ABUN
CM-247	-1.183E-02	2.779E-02	5.176E-02	NOT IDENT.
CF-249	1.326E-02	3.677E-02	7.312E-02	NOT IDENT.
CF-251	4.753E-02	9.379E-02	1.792E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	318	10.66*	1.354E+00	1.146E+01	1.146E+01	11.61
SC-46	889.28	15	99.98*	2.021E+00	3.906E-02	4.546E-01	72.80
	1120.55	43	99.99	1.688E+00	1.329E-01	1.547E+00	57.46
CD-109	88.03	69	3.70*	7.495E+00	1.286E+00	2.008E+00	85.73
SN-126	64.28	49	9.60	5.569E+00	4.768E-01	4.768E-01	130.55
	86.94	69	8.90	7.495E+00	5.345E-01	5.345E-01	85.73
	87.57	69	37.00*	7.495E+00	1.286E-01	1.286E-01	85.73
BA-137M	661.66	27	89.90*	2.534E+00	6.206E-02	6.323E-02	84.46
CS-137	661.66	27	85.10*	2.534E+00	6.556E-02	6.680E-02	84.46
CE-141	145.44	41	48.29*	7.611E+00	5.857E-02	3.274E+01	110.68
EU-155	86.55	69	30.70	7.495E+00	1.550E-01	1.745E-01	85.73
	105.31	51	21.10*	7.950E+00	1.583E-01	1.782E-01	72.30
TL-208	277.37	-----	6.60	5.023E+00	-----	Line Not Found	-----
	583.19	100	85.00*	2.790E+00	2.192E-01	2.192E-01	33.24
	860.56	19	12.50	2.074E+00	3.760E-01	3.760E-01	90.75
BI-211	72.87	-----	1.23	6.565E+00	-----	Line Not Found	-----
	351.06	306	12.92*	4.154E+00	2.959E+00	2.959E+00	15.50
PB-212	74.82	195	10.28	6.737E+00	1.465E+00	1.465E+00	29.57
	77.11	312	17.10	6.908E+00	1.371E+00	1.371E+00	20.03
	238.63	381	43.60*	5.636E+00	8.067E-01	8.067E-01	13.54
	300.09	41	3.30	4.719E+00	1.365E+00	1.365E+00	64.85
BI-214	609.32	205	45.49*	2.698E+00	8.666E-01	8.670E-01	19.69
	1120.29	43	14.92	1.688E+00	8.905E-01	8.909E-01	57.46
	1764.49	28	15.30	1.138E+00	8.231E-01	8.233E-01	54.25
PB-214	74.82	195	5.80	6.737E+00	2.596E+00	2.597E+00	29.57
	77.11	312	9.70	6.908E+00	2.417E+00	2.418E+00	20.03
	87.09	69	3.41	7.495E+00	1.395E+00	1.396E+00	85.73
	242.00	122	7.25	5.585E+00	1.561E+00	1.561E+00	46.61
	295.22	190	18.42	4.779E+00	1.120E+00	1.120E+00	24.10
	351.93	306	35.60*	4.154E+00	1.074E+00	1.074E+00	15.50
RN-222	609.32	205	45.49*	2.698E+00	8.666E-01	8.670E-01	19.69
	1120.29	43	14.92	1.688E+00	8.905E-01	8.909E-01	57.46
	1764.49	28	15.30	1.138E+00	8.231E-01	8.233E-01	54.25
RA-224	240.99	122	4.10*	5.585E+00	2.760E+00	2.760E+00	46.61
RA-226	609.32	205	45.49*	2.698E+00	8.666E-01	8.670E-01	19.69
	1120.29	43	14.92	1.688E+00	8.905E-01	8.909E-01	57.46
	1764.49	28	15.30	1.138E+00	8.231E-01	8.233E-01	54.25
AC-228	105.21	51	1.10	7.950E+00	3.036E+00	3.036E+00	72.30
	338.32	78	11.27	4.287E+00	8.401E-01	8.401E-01	47.22
	794.95	-----	4.25	2.203E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.121E+00	-----	Line Not Found	-----
	911.20	72	25.80*	1.985E+00	7.337E-01	7.337E-01	36.72
	968.97	41	15.80	1.892E+00	7.190E-01	7.190E-01	52.98
RA-228	105.21	51	1.10	7.950E+00	3.036E+00	3.036E+00	72.30
	338.32	78	11.27	4.287E+00	8.401E-01	8.401E-01	47.22
	794.95	-----	4.25	2.203E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.121E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	911.20	72	25.80*	1.985E+00	7.337E-01	7.337E-01	36.72
	968.97	41	15.80	1.892E+00	7.190E-01	7.190E-01	52.98
	74.82	195	10.28	6.737E+00	1.465E+00	1.465E+00	29.57
	77.11	312	17.10	6.908E+00	1.371E+00	1.371E+00	20.03
TH-230	238.63	381	43.60*	5.636E+00	8.067E-01	8.067E-01	13.54
	300.09	41	3.30	4.719E+00	1.365E+00	1.365E+00	64.85
	609.32	205	45.49*	2.698E+00	8.666E-01	8.667E-01	19.69
	1120.29	43	14.92	1.688E+00	8.905E-01	8.906E-01	57.46
PA-231	1764.49	28	15.30	1.138E+00	8.231E-01	8.231E-01	54.25
	283.69	-----	1.70	4.935E+00	-----	Line Not Found	-----
TH-232	301.36	41	5.35*	4.719E+00	8.420E-01	8.420E-01	64.85
	105.21	51	1.10	7.950E+00	3.036E+00	3.036E+00	72.30
	338.32	78	11.27	4.287E+00	8.401E-01	8.401E-01	47.22
TH-234	835.71	-----	1.61	2.121E+00	-----	Line Not Found	-----
	911.20	72	25.80*	1.985E+00	7.337E-01	7.337E-01	36.72
	968.97	41	15.80	1.892E+00	7.190E-01	7.190E-01	52.98
	63.29	49	3.70*	5.569E+00	1.237E+00	1.237E+00	130.55
U-234	92.59	109	4.23	7.717E+00	1.734E+00	1.734E+00	73.16
	609.32	205	45.49*	2.698E+00	8.666E-01	8.667E-01	19.69
	1120.29	43	14.92	1.688E+00	8.905E-01	8.905E-01	57.46
U-235	1764.49	28	15.30	1.138E+00	8.231E-01	8.231E-01	54.25
	89.96	-----	3.47	7.607E+00	-----	Line Not Found	-----
	93.35	109	5.60	7.717E+00	1.310E+00	1.310E+00	73.16
	143.76	41	10.96*	7.611E+00	2.580E-01	2.580E-01	110.68
	163.33	-----	5.08	7.206E+00	-----	Line Not Found	-----
U-238	185.72	95	57.20	6.698E+00	1.293E-01	1.293E-01	62.31
	205.31	-----	5.01	6.280E+00	-----	Line Not Found	-----
	63.29	49	3.70*	5.569E+00	1.237E+00	1.237E+00	130.55
AM-243	92.59	109	4.23	7.717E+00	1.734E+00	1.734E+00	73.16
	43.53	-----	5.90	1.694E+00	-----	Line Not Found	-----
ANH-511	74.66	195	67.20*	6.737E+00	2.241E-01	2.241E-01	29.57
	511.00	12	100.00*	3.090E+00	2.004E-02	2.004E-02	412.83

Flag: "*" = Keyline

Total number of lines in spectrum 45
 Number of unidentified lines 6
 Number of lines tentatively identified by NID 39 86.67%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.146E+01	1.146E+01	0.133E+01	11.61	
SC-46	83.79D	11.6	3.906E-02	4.546E-01	3.310E-01	72.80	
CD-109	461.40D	1.56	1.286E+00	2.008E+00	1.721E+00	85.73	
SN-126	2.30E+05Y	1.00	1.286E-01	1.286E-01	1.102E-01	85.73	
BA-137M	30.08Y	1.02	6.206E-02	6.323E-02	5.341E-02	84.46	
CS-137	30.08Y	1.02	6.556E-02	6.680E-02	5.642E-02	84.46	
CE-141	32.51D	559.	5.857E-02	3.274E+01	3.623E+01	110.68	
EU-155	4.75Y	1.13	1.583E-01	1.782E-01	1.288E-01	72.30	
TL-208	1.41E+10Y	1.00	2.192E-01	2.192E-01	0.728E-01	33.24	
BI-211	7.04E+08Y	1.00	2.959E+00	2.959E+00	0.459E+00	15.50	
PB-212	1.41E+10Y	1.00	8.067E-01	8.067E-01	1.093E-01	13.54	
BI-214	1600.00Y	1.00	8.666E-01	8.670E-01	1.707E-01	19.69	
PB-214	1600.00Y	1.00	1.074E+00	1.074E+00	0.167E+00	15.50	
RN-222	1600.00Y	1.00	8.666E-01	8.670E-01	1.707E-01	19.69	
RA-224	1.41E+10Y	1.00	2.760E+00	2.760E+00	1.286E+00	46.61	
RA-226	1600.00Y	1.00	8.666E-01	8.670E-01	1.707E-01	19.69	
AC-228	1.41E+10Y	1.00	7.337E-01	7.337E-01	2.694E-01	36.72	
RA-228	1.41E+10Y	1.00	7.337E-01	7.337E-01	2.694E-01	36.72	
TH-228	1.41E+10Y	1.00	8.067E-01	8.067E-01	1.093E-01	13.54	
TH-230	7.54E+04Y	1.00	8.666E-01	8.667E-01	1.706E-01	19.69	
PA-231	7.04E+08Y	1.00	8.420E-01	8.420E-01	5.460E-01	64.85	
TH-232	1.41E+10Y	1.00	7.337E-01	7.337E-01	2.694E-01	36.72	
TH-234	4.47E+09Y	1.00	1.237E+00	1.237E+00	1.615E+00	130.55	
U-234	2.45E+05Y	1.00	8.666E-01	8.667E-01	1.706E-01	19.69	
U-235	7.04E+08Y	1.00	2.580E-01	2.580E-01	2.856E-01	110.68	
U-238	4.47E+09Y	1.00	1.237E+00	1.237E+00	1.615E+00	130.55	
AM-243	7370.00Y	1.00	2.241E-01	2.241E-01	0.663E-01	29.57	
ANH-511	1.00E+09Y	1.00	2.004E-02	2.004E-02	8.273E-02	412.83	
Total Activity :			3.224E+01	6.608E+01			

Grand Total Activity : 3.224E+01 6.608E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
6	80.76	48	183	1.86	161.60	144	22	1.09E-02	****	7.15E+00	T
0	129.31	55	112	0.64	258.70	255	8	1.27E-02	79.1	7.86E+00	T
0	209.65	33	133	1.48	419.43	415	9	7.95E-03	****	6.19E+00	T
0	270.64	33	89	1.08	541.44	536	10	8.16E-03	****	5.12E+00	T
0	328.26	41	57	0.79	656.71	651	11	1.04E-02	81.3	4.39E+00	T
0	412.07	14	65	3.49	824.38	813	14	3.70E-03	****	3.66E+00	T
0	462.53	32	48	3.93	925.33	919	12	8.26E-03	97.4	3.34E+00	T
0	474.56	17	22	1.43	949.40	944	8	4.45E-03	****	3.28E+00	T
0	521.35	20	12	2.23	1043.02	1039	9	5.37E-03	77.7	3.04E+00	T
0	538.80	14	57	7.25	1077.92	1066	18	3.61E-03	****	2.97E+00	
0	727.70	22	23	1.43	1455.88	1449	11	6.05E-03	96.8	2.36E+00	T
0	872.90	8	3	1.35	1746.40	1743	6	2.25E-03	97.3	2.05E+00	T
0	951.40	12	5	3.95	1903.47	1898	11	3.46E-03	90.9	1.92E+00	
0	1051.57	9	13	1.34	2103.92	2096	10	2.61E-03	****	1.78E+00	T
0	1063.31	7	15	0.81	2127.40	2118	12	1.96E-03	****	1.76E+00	T
0	1234.43	9	16	1.03	2469.83	2463	10	2.67E-03	****	1.56E+00	T
0	1304.20	8	8	0.88	2609.45	2602	11	2.21E-03	****	1.49E+00	
0	1319.96	3	15	0.50	2641.00	2633	10	8.33E-04	****	1.48E+00	
0	1569.66	7	0	0.50	3140.71	3134	11	1.94E-03	75.6	1.27E+00	
0	1982.88	5	3	0.94	3967.79	3960	11	1.46E-03	****	1.01E+00	

Flags: "T" = Tentatively associated

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235076.CNF;1
* Acquisition date   : 3-OCT-2016 06:47:24 Sensitivity      : 3.000
* Detector ID        : GAM24 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:01.98 Half life ratio  : *****
* Sample date        : 11-DEC-2015 14:19:00 Nuclide Library : SOLID
* Sample ID          : G405235076 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity : 1.4447E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 17-JUN-2016 07:45:20 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM24_CAN.CNF;7
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.057E-01
SC-46	2.142E-01
CD-109	8.314E-01
SN-126	5.337E-02
BA-137M	2.130E-02
CS-137	2.251E-02
CE-141	1.418E+01
EU-155	6.631E-02
TL-208	2.183E-02
PB-212	4.027E-02
BI-214	4.712E-02
PB-214	4.786E-02
RN-222	4.712E-02
RA-224	4.317E-01
RA-226	4.712E-02
AC-228	8.545E-02
RA-228	8.545E-02
TH-228	4.027E-02
TH-230	4.710E-02
PA-231	2.755E-01
TH-232	8.545E-02
TH-234	5.980E-01
U-234	4.710E-02
U-235	1.416E-01
U-238	5.980E-01
AM-243	2.699E-02
ANH-511	2.083E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	9.573E+00	NOT IDENT.
NA-22	3.634E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.803E-02	NOT IDENT.

V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	4.100E-02	NOT IDENT.
CO-56	3.245E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.043E-02	NOT IDENT.
CO-58	3.029E-01	NOT IDENT.
FE-59	4.265E+00	NOT IDENT.
CO-60	2.926E-02	NOT IDENT.
ZN-65	1.159E-01	NOT IDENT.
GE-68	1.371E+00	NOT IDENT.
AS-73	3.395E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.579E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.826E-01	FAIL ABUN
KR-85	4.832E+00	NOT IDENT.
SR-85	4.932E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.470E-01	NOT IDENT.
Y-91	3.006E+02	NOT IDENT.
NB-94	2.035E-02	NOT IDENT.
NB-95	5.829E-01	NOT IDENT.
NB-95M	1.693E+00	NOT IDENT.
ZR-95	8.729E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.253E-02	NOT IDENT.
RH-102	4.437E-02	FAIL ABUN
RU-103	3.699E+00	FAIL ABUN
RH-106	3.304E-01	FAIL ABUN
RU-106	3.304E-01	FAIL ABUN
AG-108M	1.700E-02	NOT IDENT.
AG-110M	7.306E-02	NOT IDENT.
SN-113	1.391E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	9.875E-02	NOT IDENT.
SB-124	1.166E+00	NOT IDENT.
SB-125	7.609E-02	FAIL ABUN
TE-125M	1.737E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.523E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	3.869E-02	NOT IDENT.
CS-135	1.012E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	7.394E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-143	0.000E+00	SHORT HLIF
CE-144	2.315E-01	FAIL ABUN
PM-144	4.284E-02	NOT IDENT.
PR-144	3.715E+00	NOT IDENT.
PM-146	3.107E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	5.190E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.711E-02	FAIL ABUN
EU-152	6.633E-02	NOT IDENT.
GD-153	1.106E-01	NOT IDENT.
EU-154	8.855E-02	FAIL ABUN
TB-160	1.112E+00	FAIL ABUN
HO-166M	3.762E-02	FAIL ABUN
TM-171	7.232E+00	NOT IDENT.
HF-172	1.564E-01	FAIL ABUN
LU-172	5.808E-02	FAIL ABUN
LU-176	1.824E-02	FAIL ABUN
HF-181	2.816E+00	NOT IDENT.

TA-182	5.488E-01	FAIL ABUN
RE-183	1.264E+00	NOT IDENT.
RE-184	2.062E+01	NOT IDENT.
W-188	6.623E+01	FAIL ABUN
IR-192	3.596E-01	FAIL ABUN
HG-203	1.791E+00	NOT IDENT.
BI-207	3.967E-02	FAIL ABUN
PB-210	1.176E+00	NOT IDENT.
BI-211	3.551E-01	FAIL ABUN
PB-211	4.412E-01	NOT IDENT.
BI-212	4.967E-01	FAIL ABUN
RN-219	2.451E-01	FAIL ABUN
RA-223	4.302E-01	FAIL ABUN
AC-227	1.703E-01	FAIL ABUN
TH-227	1.703E-01	FAIL ABUN
TH-229	3.271E-01	FAIL ABUN
TH-231	4.302E-01	FAIL ABUN
PA-233	3.965E-02	FAIL ABUN
PA-234	1.960E-01	FAIL ABUN
PA-234M	2.970E+00	NOT IDENT.
NP-237	3.965E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.495E-01	FAIL ABUN
PU-239	2.406E+02	FAIL ABUN
AM-241	5.987E-02	NOT IDENT.
CM-243	5.901E-02	NOT IDENT.
BK-247	5.504E-02	FAIL ABUN
CM-247	2.318E-02	NOT IDENT.
CF-249	3.370E-02	NOT IDENT.
CF-251	8.342E-02	NOT IDENT.

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235076.CNF;1
* Acquisition date   : 3-OCT-2016 06:47:24 Sensitivity      : 3.000
* Detector ID       : GAM24 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:01.98 Half life ratio : *****
* Sample date       : 11-DEC-2015 14:19:00 Nuclide Library : SOLID
* Sample ID         : G405235076 Analyst initials: MXR1
* Batch Number      : 1596254 Sample Quantity : 1.4447E+02 GRAM
*                               Quantity Err(%) : 1.3844E-03 %
* Wet wt corr       : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight      : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date    : 17-JUN-2016 07:45:20 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM24_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.146E+01	1.435E+00	1.435E+00
SC-46	4.546E-01	3.249E-01	3.249E-01
CD-109	3.961E-01	1.741E+00	1.741E+00
SN-126	2.536E-02	1.115E-01	1.115E-01
BA-137M	6.323E-02	5.241E-02	5.241E-02
CS-137	6.680E-02	5.537E-02	5.537E-02
CE-141	1.633E+01	3.692E+01	3.692E+01
EU-155	1.782E-01	1.269E-01	1.269E-01
TL-208	2.192E-01	7.199E-02	7.199E-02
PB-212	8.067E-01	1.152E-01	1.152E-01
BI-214	8.670E-01	1.713E-01	1.713E-01
PB-214	1.074E+00	1.691E-01	1.691E-01
RN-222	8.670E-01	1.713E-01	1.713E-01
RA-224	7.794E-01	1.351E+00	1.351E+00
RA-226	8.670E-01	1.713E-01	1.713E-01
AC-228	7.337E-01	2.667E-01	2.667E-01
RA-228	7.337E-01	2.667E-01	2.667E-01
TH-228	8.067E-01	1.152E-01	1.152E-01
TH-230	8.667E-01	1.713E-01	1.713E-01
PA-231	8.420E-01	5.645E-01	5.645E-01
TH-232	7.337E-01	2.667E-01	2.667E-01
TH-234	1.237E+00	1.606E+00	1.606E+00
U-234	8.667E-01	1.713E-01	1.713E-01
U-235	2.580E-01	2.802E-01	2.802E-01
U-238	1.237E+00	1.606E+00	1.606E+00
AM-243	1.274E-01	7.035E-02	7.035E-02
ANH-511	2.004E-02	8.108E-02	8.108E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	8.034E+00	1.086E+01	1.145E+01	NOT IDENT.
NA-22	-1.233E-02	4.465E-02	4.499E-02	NOT IDENT.
NA-24	-1.000E+41	8.509E+41	0.000E+00	SHORT HLIF

AL-26	1.102E-02	3.065E-02	3.105E-02	NOT IDENT.
V-48	-2.543E+03	8.959E+03	9.032E+03	SHORT HLIF
CR-51	-1.599E+02	3.389E+02	3.464E+02	SHORT HLIF
MN-54	-6.691E-04	4.960E-02	4.960E-02	NOT IDENT.
CO-56	-1.534E-01	4.212E-01	4.268E-01	NOT IDENT.
MN-56	-1.000E+41	1.278E+42	0.000E+00	SHORT HLIF
CO-57	-1.403E-03	3.525E-02	3.526E-02	NOT IDENT.
CO-58	2.948E-02	3.568E-01	3.570E-01	NOT IDENT.
FE-59	1.537E+00	4.604E+00	4.656E+00	NOT IDENT.
CO-60	2.040E-02	2.965E-02	3.104E-02	NOT IDENT.
ZN-65	7.236E-03	1.498E-01	1.498E-01	NOT IDENT.
GE-68	-8.030E-01	1.743E+00	1.780E+00	NOT IDENT.
AS-73	-8.083E-01	3.877E+00	3.895E+00	NOT IDENT.
AS-74	1.201E+03	4.064E+03	4.100E+03	SHORT HLIF
SE-75	-4.396E-02	1.774E-01	1.785E-01	NOT IDENT.
BR-77	5.804E+37	4.971E+38	0.000E+00	SHORT HLIF
SR-82	-2.830E+02	5.858E+02	5.996E+02	SHORT HLIF
RB-83	8.438E-01	6.526E-01	7.554E-01	FAIL ABUN
KR-85	-1.079E+00	5.732E+00	5.753E+00	NOT IDENT.
SR-85	-1.136E-01	5.855E-01	5.878E-01	NOT IDENT.
RB-86	-5.422E+03	1.872E+04	1.887E+04	SHORT HLIF
Y-88	5.096E-02	1.577E-01	1.593E-01	NOT IDENT.
Y-91	-3.241E+02	4.139E+02	4.389E+02	NOT IDENT.
NB-94	3.978E-03	2.342E-02	2.349E-02	NOT IDENT.
NB-95	-6.355E-01	8.003E-01	8.501E-01	NOT IDENT.
NB-95M	1.268E+00	1.906E+00	1.990E+00	NOT IDENT.
ZR-95	5.277E-02	1.032E+00	1.033E+00	NOT IDENT.
NB-97	1.000E+41	4.647E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	1.440E+41	0.000E+00	SHORT HLIF
MO-99	3.362E+31	6.915E+31	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	4.028E+41	0.000E+00	SHORT HLIF
RH-101	-8.359E-03	2.927E-02	2.952E-02	NOT IDENT.
RH-102	1.135E-02	5.035E-02	5.061E-02	FAIL ABUN
RU-103	-1.052E+00	4.418E+00	4.444E+00	FAIL ABUN
RH-106	-9.982E-03	3.898E-01	3.899E-01	FAIL ABUN
RU-106	-9.982E-03	3.898E-01	3.899E-01	FAIL ABUN
AG-108M	-1.150E-02	2.108E-02	2.171E-02	NOT IDENT.
AG-110M	3.083E-02	8.599E-02	8.710E-02	NOT IDENT.
SN-113	-2.004E-01	1.838E-01	2.048E-01	NOT IDENT.
CD-115	1.268E+38	9.436E+38	0.000E+00	SHORT HLIF
SN-117M	-2.446E+04	7.199E+04	7.283E+04	SHORT HLIF
TE-123M	1.810E-02	1.143E-01	1.146E-01	NOT IDENT.
SB-124	5.994E-01	1.136E+00	1.168E+00	NOT IDENT.
SB-125	-3.358E-02	9.078E-02	9.203E-02	FAIL ABUN
TE-125M	-2.011E+01	2.014E+02	2.016E+02	NOT IDENT.
I-126	3.228E+05	6.562E+05	6.721E+05	SHORT HLIF
SB-126	1.463E+05	7.901E+05	7.928E+05	SHORT HLIF
SB-127	-8.481E+21	1.646E+22	0.000E+00	SHORT HLIF
I-131	-5.825E+08	3.000E+09	3.012E+09	SHORT HLIF
I-132	-1.000E+41	1.838E+42	0.000E+00	SHORT HLIF
TE-132	3.270E+24	1.842E+26	0.000E+00	SHORT HLIF
BA-133	6.873E-03	3.025E-02	3.041E-02	FAIL ABUN
I-133	1.000E+41	6.233E+41	0.000E+00	SHORT HLIF
CS-134	1.627E-02	4.345E-02	4.407E-02	NOT IDENT.
CS-135	-1.650E-02	1.255E-01	1.257E-01	NOT IDENT.
I-135	1.000E+41	7.685E+41	0.000E+00	SHORT HLIF
CS-136	-1.117E+05	2.408E+05	2.460E+05	SHORT HLIF
CE-139	-2.307E-02	8.958E-02	9.019E-02	NOT IDENT.
BA-140	-3.426E+05	9.163E+05	9.292E+05	SHORT HLIF
LA-140	-9.405E+04	2.770E+05	2.802E+05	SHORT HLIF
CE-143	1.000E+41	1.415E+41	0.000E+00	SHORT HLIF
CE-144	-5.348E-04	2.688E-01	2.688E-01	FAIL ABUN
PM-144	1.297E-02	4.881E-02	4.915E-02	NOT IDENT.
PR-144	1.125E+00	4.232E+00	4.262E+00	NOT IDENT.
PM-146	-3.708E-03	3.603E-02	3.607E-02	NOT IDENT.
ND-147	7.718E+06	2.482E+07	2.506E+07	SHORT HLIF
PM-147	1.903E+02	5.792E+02	5.855E+02	NOT IDENT.
PM-149	-9.092E+39	1.407E+40	0.000E+00	SHORT HLIF
EU-150	6.993E-03	2.014E-02	2.039E-02	FAIL ABUN
EU-152	-2.907E-04	7.430E-02	7.430E-02	NOT IDENT.
GD-153	-2.566E-02	1.392E-01	1.397E-01	NOT IDENT.
EU-154	-3.238E-02	1.092E-01	1.102E-01	FAIL ABUN
TB-160	2.261E-02	1.343E+00	1.343E+00	FAIL ABUN
HO-166M	-4.392E-02	5.222E-02	5.585E-02	FAIL ABUN
TM-171	-6.614E+00	8.586E+00	9.089E+00	NOT IDENT.
HF-172	7.565E-02	1.876E-01	1.907E-01	FAIL ABUN
LU-172	2.317E-02	6.285E-02	6.371E-02	FAIL ABUN
LU-176	-7.537E-03	2.100E-02	2.127E-02	FAIL ABUN

HF-181	4.085E-01	3.175E+00	3.180E+00	NOT IDENT.
TA-182	-5.091E-01	7.373E-01	7.722E-01	FAIL ABUN
RE-183	-2.471E-01	1.420E+00	1.424E+00	NOT IDENT.
RE-184	4.579E+00	2.415E+01	2.424E+01	NOT IDENT.
W-188	-1.064E+02	9.735E+01	1.085E+02	FAIL ABUN
IR-192	8.082E-02	3.924E-01	3.941E-01	FAIL ABUN
HG-203	8.830E-01	1.895E+00	1.937E+00	NOT IDENT.
BI-207	2.821E-02	6.403E-02	6.528E-02	FAIL ABUN
PB-210	-9.385E-03	1.265E+00	1.265E+00	NOT IDENT.
BI-211	2.959E+00	4.683E-01	1.414E+00	FAIL ABUN
PB-211	1.264E-01	5.342E-01	5.372E-01	NOT IDENT.
BI-212	7.403E-01	7.033E-01	7.785E-01	FAIL ABUN
RN-219	-1.396E-01	2.966E-01	3.032E-01	FAIL ABUN
RA-223	5.766E-02	5.249E-01	5.255E-01	FAIL ABUN
AC-227	-1.566E-01	2.013E-01	2.133E-01	FAIL ABUN
TH-227	-1.566E-01	2.013E-01	2.133E-01	FAIL ABUN
TH-229	-7.687E-02	3.976E-01	3.991E-01	FAIL ABUN
TH-231	5.766E-02	5.249E-01	5.255E-01	FAIL ABUN
PA-233	-2.916E-02	4.730E-02	4.909E-02	FAIL ABUN
PA-234	7.290E-02	2.502E-01	2.524E-01	FAIL ABUN
PA-234M	-1.645E+00	3.640E+00	3.715E+00	NOT IDENT.
NP-237	-2.916E-02	4.730E-02	4.909E-02	FAIL ABUN
NP-238	-1.273E+40	1.334E+41	0.000E+00	SHORT HLIF
NP-239	-1.001E-01	1.821E-01	1.876E-01	FAIL ABUN
PU-239	5.716E+02	4.438E+02	5.131E+02	FAIL ABUN
AM-241	-2.917E-02	7.469E-02	7.584E-02	NOT IDENT.
CM-243	-5.446E-02	7.955E-02	8.325E-02	NOT IDENT.
BK-247	-1.683E-02	6.503E-02	6.547E-02	FAIL ABUN
CM-247	-1.183E-02	2.786E-02	2.836E-02	NOT IDENT.
CF-249	1.326E-02	3.679E-02	3.727E-02	NOT IDENT.
CF-251	4.753E-02	9.394E-02	9.635E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	67.1217	87.09	131.5173	136.47	77.2554
45.60	60.6209	87.57	131.6194	140.51	0.0000
46.54	67.6189	88.03	131.7169	143.76	52.7158
49.72	0.0000	88.34	138.8682	144.24	52.7453
51.35	72.3450	88.47	138.8971	145.44	52.8190
51.87	71.4378	89.96	123.6005	152.43	60.1869
52.39	69.5343	1093.63	121.6008	153.25	0.0000
52.97	72.6082	91.11	0.0000	323.87	78.8636
53.44	69.6967	92.59	112.3444	156.02	0.0000
54.07	59.8228	93.35	112.4765	158.56	0.0000
57.36	0.0000	94.56	112.6872	159.00	67.6227
57.53	77.3460	94.65	112.7032	162.33	73.7176
57.98	74.4025	94.67	112.7065	162.66	0.0000
59.27	77.9632	94.87	112.7409	163.33	56.2266
59.32	77.9714	97.43	73.2985	165.86	61.0764
59.54	78.0068	98.43	79.1666	176.31	59.3689
60.96	78.2340	98.44	79.1677	176.60	0.0000
61.17	78.2673	99.53	65.9606	177.52	49.9314
62.93	88.3630	100.11	67.0997	181.07	0.0000
63.29	88.4262	102.03	70.9075	181.52	50.9284
63.58	88.4774	103.18	62.3295	184.41	53.8680
64.28	88.5997	103.37	72.4960	143.76	53.9381
66.73	100.9603	105.21	58.8783	193.51	59.1774
67.24	94.2307	105.31	58.8866	197.03	55.7403
125.81	90.2095	106.12	53.8601	198.01	57.0051
67.75	103.5498	106.47	53.8868	201.83	45.0367
69.67	91.5782	109.28	62.5090	203.43	71.9225
70.83	90.7446	111.00	74.7511	205.31	58.6143
72.81	87.9701	111.76	0.0000	210.85	54.0010
72.87	87.9799	114.06	70.6504	215.65	50.5356
74.66	88.2645	116.30	0.0000	222.11	54.5421
74.82	88.2898	116.74	66.4755	227.09	62.2467
74.97	88.3132	119.76	57.8438	227.38	62.2620
77.11	88.6485	121.12	47.9180	228.16	0.0000
78.74	88.9007	121.22	47.9242	228.18	57.3203
79.69	89.0460	121.78	59.1127	116.74	57.3203
80.12	89.1121	122.06	58.0188	235.69	43.8905
80.19	0.0000	122.92	65.9024	235.96	45.1544
80.57	89.1802	123.07	65.9154	238.63	61.1779
81.00	89.2457	265.00	65.9672	238.98	0.0000
81.07	89.2561	125.81	55.3103	240.99	61.2967
81.75	102.3251	127.23	70.3857	242.00	61.3480
83.79	88.6104	127.91	58.4558	244.70	36.6372
84.00	88.6412	129.30	49.5490	252.40	0.0000
85.43	117.0573	131.20	36.1211	252.80	54.2546
86.55	128.5760	133.02	58.8293	254.15	0.0000
86.79	131.4529	133.52	57.7337	256.23	62.0527
86.94	131.4851	136.00	65.8571	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	52.1935	355.39	0.0000	584.27	17.4233
264.80	52.1985	356.01	20.5046	595.83	0.0000
265.00	51.3513	364.49	0.0000	427.87	29.9299
268.22	46.3304	366.42	0.0000	602.52	0.0000
269.46	42.9382	372.51	27.6172	604.72	18.6094
270.03	42.9576	375.05	24.8934	607.14	23.2855
271.23	42.9962	377.52	24.9302	609.32	21.7537
273.65	0.0000	356.01	37.0728	610.33	21.7622
276.40	44.8906	388.16	39.9538	614.28	23.3551
277.37	42.3307	388.63	0.0000	618.01	22.8719
277.60	44.9308	391.69	37.2428	620.36	15.6097
278.00	43.2149	264.66	30.8845	621.93	16.6608
279.20	40.6584	401.81	29.9688	630.19	0.0000
279.54	43.2648	402.40	30.9153	631.29	17.7706
279.70	43.2699	404.85	21.1079	633.25	16.7383
280.46	45.0260	410.95	26.3582	634.78	0.0000
283.69	28.6420	413.71	29.6992	635.95	13.6147
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	44.3210	423.72	0.0000	645.85	15.7721
285.90	0.0000	427.09	34.1931	657.76	12.6777
287.50	26.9809	427.87	33.2575	657.90	0.0000
290.67	49.7242	433.94	25.7404	661.66	14.8135
293.27	0.0000	439.40	26.7718	664.57	0.0000
351.93	32.8201	453.88	26.0140	666.33	0.0000
295.96	32.8369	463.37	26.1420	666.50	0.0000
879.38	31.5820	468.07	27.1757	667.71	0.0000
299.98	40.8341	473.00	0.0000	677.62	11.7117
300.09	43.4716	475.06	26.2980	685.70	0.0000
300.13	43.4726	476.78	24.8588	695.00	0.0000
301.36	30.3258	477.60	19.0176	696.49	19.3037
302.85	30.3574	482.18	19.5500	696.51	19.3037
256.23	47.5708	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	19.3096
306.78	45.8809	497.08	23.6328	697.49	23.6024
308.46	37.9846	505.52	17.7975	702.65	13.9738
311.90	40.7301	507.63	0.0000	706.68	15.0715
316.51	39.9701	511.00	26.7660	711.68	23.7277
319.41	0.0000	514.00	26.8044	720.70	0.0000
320.08	0.0000	514.00	26.8044	721.93	0.0000
321.04	40.9837	520.40	25.8900	722.78	16.2451
323.87	34.8129	520.69	0.0000	722.91	16.2457
325.23	33.5045	522.65	0.0000	723.31	11.3737
328.76	0.0000	527.90	0.0000	724.19	14.6277
333.37	30.5406	528.26	20.9889	727.33	19.5264
333.97	25.6101	529.59	25.0020	733.00	21.7407
334.37	36.4024	529.87	0.0000	735.93	11.9704
338.28	36.0449	531.02	0.0000	333.97	19.5989
338.32	36.0457	537.26	0.0000	739.50	0.0000
311.90	50.0835	546.56	0.0000	747.24	15.2971
340.48	50.0835	552.55	15.1593	748.06	17.4876
340.55	0.0000	563.25	19.2946	752.31	18.6090
344.28	32.5657	569.33	19.3464	753.82	0.0000
345.93	42.5603	946.00	19.3479	756.73	12.0599
351.06	31.7971	569.70	19.3494	756.80	12.0603
351.93	31.8142	583.19	17.4150	884.68	18.6857

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	29.6971	1274.44	10.6487	1620.50	5.1352
766.42	26.4023	1001.03	15.9950	1621.92	6.1637
766.84	24.2057	1002.74	8.0013	1678.03	0.0000
772.60	0.0000	1004.73	14.2329	1690.97	1.0409
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	4.2205
778.90	19.8889	1028.54	0.0000	1063.66	5.0698
783.70	0.0000	1037.84	10.7747	1771.35	1.2074
785.37	27.6845	1038.76	0.0000	1791.20	0.0000
792.07	21.0889	631.29	18.7205	1808.65	4.2542
794.95	6.6663	1048.07	0.0000	1810.72	0.0000
795.86	13.3369	1049.04	11.5281	1836.06	2.1373
810.06	10.0510	1050.41	13.5150		
810.29	6.7012	1063.66	14.4678		
344.28	7.8183	1077.00	0.0000		
810.76	7.8192	1077.34	12.7072		
815.77	0.0000	1085.87	9.0973		
1048.07	0.0000	1093.63	10.9395		
832.01	10.1246	1099.45	8.2172		
834.85	13.5122	1112.07	12.8251		
835.71	14.6425	1112.84	12.8276		
836.80	0.0000	1115.54	11.7359		
846.75	0.0000	1120.29	7.3442		
846.77	19.2170	1120.55	7.3447		
856.80	0.0000	1221.41	7.3462		
860.56	15.8964	1129.67	6.4420		
871.09	15.3809	1131.51	0.0000		
873.19	11.9706	1147.95	0.0000		
875.33	0.0000	1173.23	7.4448		
879.38	10.2806	1177.95	12.1121		
880.51	14.8551	1189.05	13.0797		
883.24	10.2935	1204.77	16.8827		
884.68	10.9844	1221.41	16.9519		
889.28	9.1670	1231.02	21.1449		
894.76	13.7739	1235.36	0.0000		
898.04	14.9371	1238.28	12.1039		
900.72	14.9498	1260.41	0.0000		
903.28	12.6597	1271.87	11.4390		
911.20	12.6906	1274.44	16.2145		
912.08	12.6941	1274.54	16.2156		
923.98	0.0000	1291.59	9.5764		
926.50	9.2728	1298.22	0.0000		
929.11	6.9602	1312.11	0.0000		
937.49	23.2593	1332.49	4.8337		
944.13	0.0000	1362.66	0.0000		
946.00	6.9956	1365.19	3.8955		
949.00	9.8024	1368.63	0.0000		
667.71	0.0000	1384.29	1.9561		
962.31	20.2099	1408.01	7.8652		
964.08	15.2386	1457.56	0.0000		
966.17	26.7419	1460.82	5.9659		
911.20	18.4884	1489.16	2.0005		
968.97	18.4884	1505.03	8.0283		
983.53	0.0000	1584.12	9.1774		
984.45	0.0000	1596.21	0.0000		


```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235077.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM29.CNF;354
Background date  : 2-OCT-2016 11:01:41.
Sample date      : 17-DEC-2015 13:30:00 Acquisition date : 3-OCT-2016 06:47:53.
Sample ID       : G405235077 Sample quantity   : 1.72799E+02 GRAM
Detector name   : GAM29 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:01.46 0.0%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity    : 3.00000
Batch ID        : 1596254 Detector SN#    :
Matrix Spike ID : LCS ID          : 1556
*****
    
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	3	74.82*	158	219	1.34	149.57	144	14	4.38E-02	18.4	5.99E-01
2	3	77.21*	238	141	1.00	154.35	144	14	6.61E-02	10.8	
3	0	87.20	93	252	1.81	174.29	169	9	2.59E-02	32.7	
4	2	89.96	64	83	1.05	179.81	178	14	1.77E-02	24.1	1.37E+00
5	2	92.75*	95	160	1.25	185.39	178	14	2.64E-02	25.6	
6	8	127.53	19	57	1.34	254.84	253	9	5.34E-03	62.4	2.71E+00
7	8	129.12	55	117	1.39	258.03	253	9	1.52E-02	37.8	
8	5	184.18	34	54	1.04	368.00	366	12	9.48E-03	36.0	1.23E+00
9	5	185.91*	119	117	1.42	371.45	366	12	3.30E-02	19.8	
10	0	209.03	44	99	1.55	417.63	415	8	1.22E-02	41.7	
11	0	218.67	23	84	0.79	436.89	433	7	6.34E-03	70.2	
12	0	223.06	18	70	0.50	445.66	443	6	4.93E-03	78.9	
13	1	238.66*	381	91	1.09	476.82	471	17	1.06E-01	6.7	1.76E+00
14	1	240.87	55	78	1.29	481.24	471	17	1.52E-02	47.4	
15	1	242.13	124	49	1.08	483.76	471	17	3.45E-02	14.4	
16	0	251.09	27	81	0.89	501.65	499	8	7.44E-03	61.1	
17	0	277.71	95	127	1.77	554.83	546	19	2.64E-02	30.4	
18	0	295.23*	173	78	1.14	589.83	585	10	4.81E-02	12.3	
19	0	338.31*	94	54	1.08	675.90	672	8	2.62E-02	17.2	
20	0	351.92*	343	66	1.48	703.08	697	10	9.54E-02	7.1	
21	0	462.94	35	27	1.48	924.93	920	10	9.64E-03	33.0	
22	0	510.90*	32	84	2.07	1020.78	1014	18	8.82E-03	76.5	
23	0	583.19*	133	18	1.59	1165.26	1161	9	3.70E-02	10.7	
24	0	609.50*	221	43	1.58	1217.84	1213	12	6.13E-02	9.4	
25	0	727.37	39	39	0.99	1453.48	1448	12	1.09E-02	35.5	
26	0	737.97	17	15	1.87	1474.68	1470	10	4.72E-03	49.0	
27	0	768.22	36	14	2.12	1535.16	1531	8	1.00E-02	24.4	
28	0	794.89	38	13	3.39	1588.47	1583	13	1.06E-02	25.4	
29	0	911.46*	129	10	1.54	1821.58	1816	15	3.59E-02	10.7	
30	0	925.26	12	12	1.42	1849.18	1843	11	3.30E-03	66.2	
31	0	935.94*	12	21	3.37	1870.53	1861	14	3.47E-03	85.4	
32	0	970.17*	43	63	1.29	1939.00	1929	14	1.18E-02	43.6	
33	0	1120.74*	62	25	1.43	2240.19	2233	14	1.73E-02	21.6	
34	0	1138.49	9	10	1.47	2275.71	2272	8	2.63E-03	65.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1172.64	20	14	3.84	2344.02	2338	11	5.69E-03	41.4	
36	0	1214.03	3	13	2.61	2426.84	2421	7	9.11E-04	186.5	
37	0	1238.08*	45	16	2.19	2474.96	2467	16	1.26E-02	25.3	
38	0	1295.74	12	7	1.68	2590.35	2585	9	3.42E-03	47.5	
39	0	1343.16	11	4	1.69	2685.25	2682	7	3.09E-03	41.3	
40	0	1352.13	15	0	1.24	2703.20	2698	10	4.17E-03	25.8	
41	0	1365.02	6	0	1.44	2729.00	2725	7	1.67E-03	40.8	
42	0	1377.56*	22	6	1.28	2754.08	2747	12	6.08E-03	32.2	
43	0	1460.95*	440	4	1.83	2921.00	2913	15	1.22E-01	4.9	
44	0	1729.40	16	4	1.77	3458.50	3453	9	4.51E-03	33.8	
45	0	1764.87*	33	5	1.29	3529.53	3524	10	9.17E-03	23.1	
46	0	1846.08	11	0	3.50	3692.18	3687	10	3.06E-03	30.2	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235077.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-DEC-2015 13:30:00 Acquisition date : 3-OCT-2016 06:47:53
Sample ID         : G405235077 Sample quantity   : 172.80 GRAM
Sample type       : SOLID Sample geometry    :
Detector name     : GAMMA29 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:01.46 0.0%
Energy tolerance  : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type   : Linear Efficiencies at   : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.347E+00	1.304E+01	1.304E+01	9.81	OK
CD-109	88.03	3.70*	6.265E+00	1.327E+00	2.054E+00	120.88	OK
SN-126	64.28	9.60	3.737E+00	-----	Line Not Found	-----	Absent
	86.94	8.90	6.265E+00	5.517E-01	5.517E-01	120.88	OK
	87.57	37.00*	6.265E+00	1.327E-01	1.327E-01	120.88	OK
HG-203	70.83	3.69	4.623E+00	-----	Line Not Found	-----	Absent
	72.87	6.19	4.875E+00	-----	Line Not Found	-----	Absent
	279.20	81.56*	4.910E+00	1.036E-01	7.831E+00	73.85	OK
TL-208	277.37	6.60	4.914E+00	-----	Line Not Found	-----	<<INT Reject
	583.19	85.00*	2.773E+00	2.734E-01	2.734E-01	21.46	OK
	860.56	12.50	2.069E+00	-----	Line Not Found	-----	Absent
BI-211	72.87	1.23	4.875E+00	-----	Line Not Found	-----	Absent
	351.06	12.92*	4.088E+00	4.913E-02	4.913E-02	1607.86	OK
PB-212	74.82	10.28	5.103E+00	1.169E+00	1.169E+00	59.09	OK
	77.11	17.10	5.367E+00	1.585E+00	1.585E+00	21.55	OK
	238.63	43.60*	5.496E+00	8.586E-01	8.586E-01	13.34	OK
	300.09	3.30	4.626E+00	-----	Line Not Found	-----	Absent
BI-214	609.32	45.49*	2.682E+00	8.688E-01	8.691E-01	18.75	OK
	1120.29	14.92	1.685E+00	1.092E+00	1.092E+00	43.21	OK
	1764.49	15.30	1.129E+00	7.897E-01	7.900E-01	46.20	OK
PB-214	74.82	5.80	5.103E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	5.367E+00	2.795E+00	2.796E+00	21.55	OK
	87.09	3.41	6.257E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	5.438E+00	1.699E+00	1.700E+00	28.71	OK
	295.22	18.42	4.685E+00	1.056E+00	1.056E+00	24.64	OK
	351.93	35.60*	4.087E+00	-----	Line Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.682E+00	8.688E-01	8.691E-01	18.75	OK
	1120.29	14.92	1.685E+00	1.092E+00	1.092E+00	43.21	OK
	1764.49	15.30	1.129E+00	7.897E-01	7.900E-01	46.20	OK
RA-224	240.99	4.10*	5.459E+00	1.320E+00	1.320E+00	94.74	OK
RA-226	609.32	45.49*	2.682E+00	8.688E-01	8.691E-01	18.75	OK
	1120.29	14.92	1.685E+00	1.092E+00	1.092E+00	43.21	OK
	1764.49	15.30	1.129E+00	7.897E-01	7.900E-01	46.20	OK
AC-228	105.21	1.10	7.155E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.215E+00	1.026E+00	1.026E+00	34.50	OK
	794.95	4.25	2.197E+00	1.886E+00	1.886E+00	50.82	OK
	835.71	1.61	2.116E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.981E+00	1.151E+00	1.151E+00	21.32	OK
	968.97	15.80	1.888E+00	6.445E-01	6.445E-01	87.30	OK
RA-228	105.21	1.10	7.155E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.215E+00	1.026E+00	1.026E+00	34.50	OK
	794.95	4.25	2.197E+00	1.886E+00	1.886E+00	50.82	OK
	835.71	1.61	2.116E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.981E+00	1.151E+00	1.151E+00	21.32	OK
	968.97	15.80	1.888E+00	6.445E-01	6.445E-01	87.30	OK
TH-228	74.82	10.28	5.103E+00	1.169E+00	1.169E+00	59.09	OK
	77.11	17.10	5.367E+00	1.585E+00	1.585E+00	21.55	OK
	238.63	43.60*	5.496E+00	8.586E-01	8.586E-01	13.34	OK
	300.09	3.30	4.626E+00	-----	Line Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	609.32	45.49*	2.682E+00	8.688E-01	8.688E-01	18.75	OK
	1120.29	14.92	1.685E+00	1.092E+00	1.092E+00	43.21	OK
	1764.49	15.30	1.129E+00	7.897E-01	7.897E-01	46.20	OK
TH-232	105.21	1.10	7.155E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.215E+00	1.026E+00	1.026E+00	34.50	OK
	835.71	1.61	2.116E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.981E+00	1.151E+00	1.151E+00	21.32	OK
U-234	968.97	15.80	1.888E+00	6.445E-01	6.445E-01	87.30	OK
	609.32	45.49*	2.682E+00	8.688E-01	8.688E-01	18.75	OK
	1120.29	14.92	1.685E+00	1.092E+00	1.092E+00	43.21	OK
U-235	1764.49	15.30	1.129E+00	7.897E-01	7.897E-01	46.20	OK
	89.96	3.47	6.457E+00	1.710E+00	1.710E+00	48.23	OK
	93.35	5.60	6.630E+00	1.533E+00	1.533E+00	51.14	OK
AM-243	143.76	10.96*	7.247E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	6.922E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.477E+00	1.779E-01	1.779E-01	39.57	OK
	205.31	5.01	6.095E+00	----- Line	Not Found	-----	Absent
	43.53	5.90	7.707E-01	----- Line	Not Found	-----	Absent
ANH-511	74.66	67.20*	5.103E+00	1.788E-01	1.788E-01	59.09	OK
	511.00	100.00*	3.065E+00	5.093E-02	5.093E-02	152.97	OK

Flag: "*" = Keyline

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

DETECTOR AND SAMPLE DATA

* Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235077.CNF;1 *
 * Acquisition date : 3-OCT-2016 06:47:53 Sensitivity : 3.000 *
 * Detector ID : GAM29 Energy tolerance: 1.500 *
 * Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000 *
 * Elapsed real time: 0 01:00:01.46 Half life ratio : ***** *
 * Sample date : 17-DEC-2015 13:30:00 Analyst initials: MXR1 *
 * Sample ID : G405235077 Sample Quantity : 1.7280E+02 GRAM *
 * Batch Number : 1596254 Wet Weight : 0.00000 *
 * Wet wt corr : 1.00000 Dry Weight : 0.00000 *
 * Nuclide Library : SOLID.NLB;6 *

CALIBRATION INFORMATION

* Eff. Cal. date : 25-JUN-2016 09:55:57 Eff. Geometry : CAN *
 * Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM29_CAN.CNF;10 *

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
 Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.304E+01	1.253E+00	4.405E-01
CD-109	2.054E+00	2.433E+00	1.431E+00
SN-126	1.327E-01	1.572E-01	1.189E-01
HG-203	7.831E+00	5.668E+00	2.640E+00
TL-208	2.734E-01	5.749E-02	4.798E-02
BI-211	4.913E-02	7.741E-01	2.636E-01
PB-212	8.586E-01	1.123E-01	8.003E-02
BI-214	8.691E-01	1.597E-01	1.012E-01
PB-214	1.216E+00	1.684E-01	2.960E-01
RN-222	8.691E-01	1.597E-01	1.012E-01
RA-224	1.320E+00	1.226E+00	8.576E-01
RA-226	8.691E-01	1.597E-01	1.012E-01
AC-228	1.151E+00	2.404E-01	1.745E-01
RA-228	1.151E+00	2.404E-01	1.745E-01
TH-228	8.586E-01	1.123E-01	8.003E-02
TH-230	8.688E-01	1.596E-01	1.012E-01
TH-232	1.151E+00	2.404E-01	1.745E-01
U-234	8.688E-01	1.596E-01	1.012E-01
U-235	-1.220E-02	1.552E-01	2.903E-01
AM-243	1.788E-01	1.035E-01	7.546E-02
ANH-511	5.093E-02	7.635E-02	3.856E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.707E+00	7.783E+00	1.532E+01	NOT IDENT.
NA-22	-2.923E-02	3.572E-02	5.691E-02	NOT IDENT.
NA-24	0.000E+00	1.839E+41	0.000E+00	SHORT HLIF
AL-26	-2.267E-03	2.294E-02	4.869E-02	NOT IDENT.
SC-46	9.933E-02	2.556E-01	5.348E-01	FAIL ABUN
V-48	0.000E+00	7.409E+03	0.000E+00	SHORT HLIF
CR-51	0.000E+00	2.382E+02	0.000E+00	SHORT HLIF
MN-54	-1.566E-02	5.096E-02	9.450E-02	NOT IDENT.
CO-56	1.349E-01	3.133E-01	6.576E-01	FAIL ABUN

MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	2.531E-02	3.514E-02	7.185E-02	NOT IDENT.
CO-58	-9.627E-02	3.990E-01	7.572E-01	NOT IDENT.
FE-59	2.615E-01	3.991E+00	7.935E+00	NOT IDENT.
CO-60	-1.598E-02	3.102E-02	5.329E-02	FAIL ABUN
ZN-65	-5.625E-02	1.581E-01	2.468E-01	NOT IDENT.
GE-68	8.721E-02	1.630E+00	3.219E+00	NOT IDENT.
AS-73	2.482E+00	6.275E+00	1.306E+01	NOT IDENT.
AS-74	0.000E+00	3.139E+03	0.000E+00	SHORT HLIF
SE-75	-6.033E-02	1.657E-01	2.953E-01	NOT IDENT.
BR-77	0.000E+00	1.418E+36	0.000E+00	SHORT HLIF
SR-82	0.000E+00	4.058E+02	0.000E+00	SHORT HLIF
RB-83	9.791E-02	4.289E-01	8.892E-01	NOT IDENT.
KR-85	2.271E+00	4.990E+00	1.045E+01	NOT IDENT.
SR-85	2.179E-01	4.791E-01	1.004E+00	NOT IDENT.
RB-86	0.000E+00	1.473E+04	0.000E+00	SHORT HLIF
Y-88	2.658E-02	1.142E-01	2.861E-01	NOT IDENT.
Y-91	-6.611E+01	3.781E+02	6.968E+02	NOT IDENT.
NB-94	-1.748E-02	2.433E-02	4.313E-02	NOT IDENT.
NB-95	5.373E-01	6.213E-01	1.252E+00	NOT IDENT.
NB-95M	7.756E-01	2.027E+00	3.577E+00	NOT IDENT.
ZR-95	-2.724E-01	9.177E-01	1.741E+00	NOT IDENT.
NB-97	0.000E+00	1.769E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.423E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	2.621E-02	3.205E-02	5.231E-02	FAIL ABUN
RH-102	-3.247E-02	3.712E-02	6.464E-02	FAIL ABUN
RU-103	5.318E-01	3.859E+00	7.816E+00	FAIL ABUN
RH-106	1.270E-01	3.779E-01	7.801E-01	NOT IDENT.
RU-106	1.270E-01	3.779E-01	7.801E-01	NOT IDENT.
AG-108M	1.316E-02	1.846E-02	4.061E-02	NOT IDENT.
AG-110M	4.264E-02	5.688E-02	1.316E-01	NOT IDENT.
SN-113	-2.062E-02	1.613E-01	3.224E-01	NOT IDENT.
CD-115	0.000E+00	1.366E+38	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	4.918E+04	0.000E+00	SHORT HLIF
TE-123M	-3.585E-02	1.014E-01	1.872E-01	NOT IDENT.
SB-124	-6.113E-01	1.362E+00	2.616E+00	NOT IDENT.
SB-125	6.864E-03	7.459E-02	1.523E-01	FAIL ABUN
TE-125M	-2.256E+02	1.996E+02	3.547E+02	NOT IDENT.
I-126	0.000E+00	4.257E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	4.928E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	3.233E+21	0.000E+00	SHORT HLIF
I-131	0.000E+00	1.864E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	5.099E+25	0.000E+00	SHORT HLIF
BA-133	-2.124E-02	2.828E-02	5.045E-02	FAIL ABUN
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	0.000E+00	6.100E-02	9.289E-02	FAIL ABUN
CS-135	-1.156E-01	1.304E-01	2.192E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	1.625E+05	0.000E+00	SHORT HLIF
BA-137M	-8.577E-03	2.583E-02	4.879E-02	NOT IDENT.
CS-137	-9.061E-03	2.729E-02	5.154E-02	NOT IDENT.
CE-139	4.906E-02	8.374E-02	1.664E-01	NOT IDENT.
BA-140	0.000E+00	5.600E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	2.002E+05	0.000E+00	SHORT HLIF
CE-141	5.457E+00	1.628E+01	3.178E+01	NOT IDENT.
CE-143	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CE-144	-1.102E-01	2.798E-01	5.208E-01	NOT IDENT.
PM-144	-4.159E-02	4.143E-02	7.010E-02	NOT IDENT.
PR-144	-3.519E+00	3.593E+00	6.105E+00	NOT IDENT.
PM-146	9.930E-03	3.111E-02	6.506E-02	NOT IDENT.
ND-147	0.000E+00	1.294E+07	0.000E+00	SHORT HLIF
PM-147	2.496E+02	6.267E+02	1.251E+03	NOT IDENT.
PM-149	0.000E+00	2.086E+39	0.000E+00	SHORT HLIF
EU-150	-1.079E-02	2.302E-02	3.971E-02	FAIL ABUN
EU-152	1.903E-02	6.495E-02	1.362E-01	NOT IDENT.
GD-153	-7.336E-04	1.490E-01	2.688E-01	NOT IDENT.
EU-154	-7.372E-02	8.764E-02	1.387E-01	NOT IDENT.
EU-155	-2.474E-02	8.269E-02	1.576E-01	FAIL ABUN
TB-160	1.150E+00	1.127E+00	2.621E+00	FAIL ABUN
HO-166M	5.292E-03	3.908E-02	7.930E-02	FAIL ABUN
TM-171	5.679E+00	1.584E+01	3.295E+01	NOT IDENT.
HF-172	8.430E-02	1.759E-01	3.302E-01	FAIL ABUN
LU-172	-4.549E-04	5.334E-02	1.042E-01	FAIL ABUN
LU-176	5.432E-03	2.082E-02	3.929E-02	FAIL ABUN
HF-181	-7.485E-01	2.559E+00	5.007E+00	NOT IDENT.

TA-182	3.799E-01	7.649E-01	1.534E+00	FAIL ABUN
RE-183	1.109E-02	2.056E+00	4.151E+00	NOT IDENT.
RE-184	-1.471E+01	1.760E+01	2.939E+01	NOT IDENT.
W-188	-2.102E+00	9.121E+01	1.541E+02	NOT IDENT.
IR-192	-2.234E-01	3.605E-01	6.143E-01	FAIL ABUN
BI-207	-2.686E-02	4.313E-02	7.398E-02	FAIL ABUN
PB-210	-9.434E-01	2.514E+00	5.033E+00	NOT IDENT.
PB-211	2.608E-01	5.103E-01	1.075E+00	NOT IDENT.
BI-212	0.000E+00	8.197E-01	1.026E+00	FAIL ABUN
RN-219	-1.996E-01	2.800E-01	5.250E-01	NOT IDENT.
RA-223	-2.056E-01	3.819E-01	7.443E-01	FAIL ABUN
AC-227	5.558E-02	1.903E-01	3.629E-01	NOT IDENT.
TH-227	5.558E-02	1.903E-01	3.629E-01	NOT IDENT.
TH-229	-6.302E-02	3.898E-01	7.212E-01	FAIL ABUN
PA-231	-4.858E-03	3.891E-01	7.105E-01	NOT IDENT.
TH-231	-2.056E-01	3.819E-01	7.443E-01	FAIL ABUN
PA-233	-5.542E-02	4.916E-02	7.751E-02	NOT IDENT.
PA-234	-5.341E-02	2.094E-01	3.915E-01	FAIL ABUN
PA-234M	1.000E+00	3.804E+00	7.350E+00	NOT IDENT.
TH-234	-1.972E-01	9.622E-01	1.960E+00	FAIL ABUN
NP-237	-5.542E-02	4.916E-02	7.751E-02	NOT IDENT.
NP-238	0.000E+00	1.936E+00	0.000E+00	SHORT HLIF
U-238	-1.972E-01	9.622E-01	1.960E+00	FAIL ABUN
NP-239	1.546E-02	1.791E-01	3.506E-01	FAIL ABUN
PU-239	0.000E+00	5.036E+02	5.483E+02	FAIL ABUN
AM-241	6.447E-03	1.066E-01	2.151E-01	NOT IDENT.
CM-243	-1.466E-02	7.442E-02	1.433E-01	FAIL ABUN
BK-247	1.704E-02	5.566E-02	1.072E-01	NOT IDENT.
CM-247	-8.548E-03	2.591E-02	5.062E-02	FAIL ABUN
CF-249	1.509E-02	2.653E-02	5.683E-02	NOT IDENT.
CF-251	-4.428E-02	9.765E-02	1.772E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	431	10.66*	1.347E+00	1.304E+01	1.304E+01	9.81
CD-109	88.03	130	3.70*	6.265E+00	2.431E+00	3.763E+00	65.41
SN-126	64.28	-----	9.60	3.737E+00	-----	Line Not Found	-----
	86.94	130	8.90	6.265E+00	1.011E+00	1.011E+00	65.41
	87.57	130	37.00*	6.265E+00	2.431E-01	2.431E-01	65.41
HG-203	70.83	-----	3.69	4.623E+00	-----	Line Not Found	-----
	72.87	-----	6.19	4.875E+00	-----	Line Not Found	-----
	279.20	116	81.56*	4.910E+00	1.257E-01	9.504E+00	60.73
TL-208	277.37	116	6.60	4.910E+00	1.553E+00	1.553E+00	60.73
	583.19	148	85.00*	2.773E+00	2.734E-01	2.734E-01	21.46
	860.56	-----	12.50	2.069E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	4.875E+00	-----	Line Not Found	-----
	351.06	407	12.92*	4.088E+00	3.350E+00	3.350E+00	14.13
PB-212	74.82	223	10.28	5.103E+00	1.845E+00	1.845E+00	36.77
	77.11	335	17.10	5.367E+00	1.585E+00	1.585E+00	21.55
	238.63	474	43.60*	5.496E+00	8.586E-01	8.586E-01	13.34
	300.09	-----	3.30	4.626E+00	-----	Line Not Found	-----
BI-214	609.32	244	45.49*	2.682E+00	8.688E-01	8.691E-01	18.75
	1120.29	63	14.92	1.685E+00	1.092E+00	1.092E+00	43.21
	1764.49	31	15.30	1.129E+00	7.897E-01	7.900E-01	46.20
PB-214	74.82	223	5.80	5.103E+00	3.269E+00	3.270E+00	36.77
	77.11	335	9.70	5.367E+00	2.795E+00	2.796E+00	21.55
	87.09	130	3.41	6.265E+00	2.638E+00	2.639E+00	65.41
	242.00	154	7.25	5.438E+00	1.699E+00	1.700E+00	28.71
	295.22	210	18.42	4.685E+00	1.056E+00	1.056E+00	24.64
	351.93	407	35.60*	4.088E+00	1.216E+00	1.216E+00	14.13
RN-222	609.32	244	45.49*	2.682E+00	8.688E-01	8.691E-01	18.75
	1120.29	63	14.92	1.685E+00	1.092E+00	1.092E+00	43.21
	1764.49	31	15.30	1.129E+00	7.897E-01	7.900E-01	46.20
RA-224	240.99	68	4.10*	5.459E+00	1.320E+00	1.320E+00	94.74
RA-226	609.32	244	45.49*	2.682E+00	8.688E-01	8.691E-01	18.75
	1120.29	63	14.92	1.685E+00	1.092E+00	1.092E+00	43.21
	1764.49	31	15.30	1.129E+00	7.897E-01	7.900E-01	46.20
AC-228	105.21	-----	1.10	7.155E+00	-----	Line Not Found	-----
	338.32	112	11.27	4.215E+00	1.026E+00	1.026E+00	34.50
	794.95	41	4.25	2.197E+00	1.886E+00	1.886E+00	50.82
	835.71	-----	1.61	2.116E+00	-----	Line Not Found	-----
	911.20	135	25.80*	1.981E+00	1.151E+00	1.151E+00	21.32
	968.97	44	15.80	1.888E+00	6.445E-01	6.445E-01	87.30
RA-228	105.21	-----	1.10	7.155E+00	-----	Line Not Found	-----
	338.32	112	11.27	4.215E+00	1.026E+00	1.026E+00	34.50
	794.95	41	4.25	2.197E+00	1.886E+00	1.886E+00	50.82
	835.71	-----	1.61	2.116E+00	-----	Line Not Found	-----
	911.20	135	25.80*	1.981E+00	1.151E+00	1.151E+00	21.32
	968.97	44	15.80	1.888E+00	6.445E-01	6.445E-01	87.30
TH-228	74.82	223	10.28	5.103E+00	1.845E+00	1.845E+00	36.77
	77.11	335	17.10	5.367E+00	1.585E+00	1.585E+00	21.55

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	238.63	474	43.60*	5.496E+00	8.586E-01	8.586E-01	13.34
	300.09	-----	3.30	4.626E+00	-----	Line Not Found	-----
TH-230	609.32	244	45.49*	2.682E+00	8.688E-01	8.688E-01	18.75
	1120.29	63	14.92	1.685E+00	1.092E+00	1.092E+00	43.21
	1764.49	31	15.30	1.129E+00	7.897E-01	7.897E-01	46.20
TH-232	105.21	-----	1.10	7.155E+00	-----	Line Not Found	-----
	338.32	112	11.27	4.215E+00	1.026E+00	1.026E+00	34.50
	835.71	-----	1.61	2.116E+00	-----	Line Not Found	-----
	911.20	135	25.80*	1.981E+00	1.151E+00	1.151E+00	21.32
	968.97	44	15.80	1.888E+00	6.445E-01	6.445E-01	87.30
U-234	609.32	244	45.49*	2.682E+00	8.688E-01	8.688E-01	18.75
	1120.29	63	14.92	1.685E+00	1.092E+00	1.092E+00	43.21
	1764.49	31	15.30	1.129E+00	7.897E-01	7.897E-01	46.20
U-235	89.96	88	3.47	6.457E+00	1.710E+00	1.710E+00	48.23
	93.35	131	5.60	6.630E+00	1.533E+00	1.533E+00	51.14
	143.76	-----	10.96*	7.247E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.922E+00	-----	Line Not Found	-----
	185.72	152	57.20	6.477E+00	1.779E-01	1.779E-01	39.57
	205.31	-----	5.01	6.095E+00	-----	Line Not Found	-----
AM-243	43.53	-----	5.90	7.707E-01	-----	Line Not Found	-----
	74.66	223	67.20*	5.103E+00	2.822E-01	2.822E-01	36.77
ANH-511	511.00	36	100.00*	3.065E+00	5.093E-02	5.093E-02	152.97

Flag: "*" = Keyline

Total number of lines in spectrum 46
 Number of unidentified lines 11
 Number of lines tentatively identified by NID 35 76.09%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.304E+01	1.304E+01	0.128E+01	9.81	
CD-109	461.40D	1.55	2.431E+00	3.763E+00	2.461E+00	65.41	
SN-126	2.30E+05Y	1.00	2.431E-01	2.431E-01	1.590E-01	65.41	
HG-203	46.59D	75.6	1.257E-01	9.504E+00	5.772E+00	60.73	
TL-208	1.41E+10Y	1.00	2.734E-01	2.734E-01	0.587E-01	21.46	
BI-211	7.04E+08Y	1.00	3.350E+00	3.350E+00	0.473E+00	14.13	
PB-212	1.41E+10Y	1.00	8.586E-01	8.586E-01	1.145E-01	13.34	
BI-214	1600.00Y	1.00	8.688E-01	8.691E-01	1.629E-01	18.75	
PB-214	1600.00Y	1.00	1.216E+00	1.216E+00	0.172E+00	14.13	
RN-222	1600.00Y	1.00	8.688E-01	8.691E-01	1.629E-01	18.75	
RA-224	1.41E+10Y	1.00	1.320E+00	1.320E+00	1.251E+00	94.74	
RA-226	1600.00Y	1.00	8.688E-01	8.691E-01	1.629E-01	18.75	
AC-228	1.41E+10Y	1.00	1.151E+00	1.151E+00	0.245E+00	21.32	
RA-228	1.41E+10Y	1.00	1.151E+00	1.151E+00	0.245E+00	21.32	
TH-228	1.41E+10Y	1.00	8.586E-01	8.586E-01	1.145E-01	13.34	
TH-230	7.54E+04Y	1.00	8.688E-01	8.688E-01	1.629E-01	18.75	
TH-232	1.41E+10Y	1.00	1.151E+00	1.151E+00	0.245E+00	21.32	
U-234	2.45E+05Y	1.00	8.688E-01	8.688E-01	1.629E-01	18.75	
U-235	7.04E+08Y	1.00	1.779E-01	1.779E-01	0.704E-01	39.57	K
AM-243	7370.00Y	1.00	2.822E-01	2.822E-01	1.038E-01	36.77	
ANH-511	1.00E+09Y	1.00	5.093E-02	5.093E-02	7.791E-02	152.97	
Total Activity :			3.202E+01	4.273E+01			

Grand Total Activity : 3.202E+01 4.273E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
8	127.53	26	76	1.34	254.84	253	9	5.34E-03	****	7.39E+00	T
8	129.12	73	156	1.39	258.03	253	9	1.52E-02	75.6	7.39E+00	T
5	184.18	44	69	1.04	368.00	366	12	9.48E-03	72.0	6.51E+00	T
0	209.03	55	125	1.55	417.63	415	8	1.22E-02	83.4	6.02E+00	
0	218.67	29	106	0.79	436.89	433	7	6.34E-03	****	5.84E+00	
0	223.06	22	88	0.50	445.66	443	6	4.93E-03	****	5.76E+00	T
0	251.09	33	100	0.89	501.65	499	8	7.44E-03	****	5.30E+00	T
0	462.94	40	31	1.48	924.93	920	10	9.64E-03	65.9	3.30E+00	T
0	727.37	43	42	0.99	1453.48	1448	12	1.09E-02	71.0	2.35E+00	T
0	737.97	18	16	1.87	1474.68	1470	10	4.72E-03	98.1	2.32E+00	T
0	768.22	39	15	2.12	1535.16	1531	8	1.00E-02	48.9	2.25E+00	T
0	925.26	12	13	1.42	1849.18	1843	11	3.30E-03	****	1.96E+00	T
0	935.94	13	22	3.37	1870.53	1861	14	3.47E-03	****	1.94E+00	
0	1138.49	10	10	1.47	2275.71	2272	8	2.63E-03	****	1.66E+00	
0	1172.64	21	14	3.84	2344.02	2338	11	5.69E-03	82.8	1.62E+00	T
0	1214.03	3	13	2.61	2426.84	2421	7	9.11E-04	****	1.58E+00	
0	1238.08	45	16	2.19	2474.96	2467	16	1.26E-02	50.5	1.55E+00	T
0	1295.74	12	7	1.68	2590.35	2585	9	3.42E-03	95.0	1.50E+00	
0	1343.16	11	4	1.69	2685.25	2682	7	3.09E-03	82.6	1.45E+00	
0	1352.13	15	0	1.24	2703.20	2698	10	4.17E-03	51.6	1.44E+00	
0	1365.02	6	0	1.44	2729.00	2725	7	1.67E-03	81.6	1.43E+00	T
0	1377.56	22	6	1.28	2754.08	2747	12	6.08E-03	64.3	1.42E+00	
0	1729.40	15	4	1.77	3458.50	3453	9	4.51E-03	67.6	1.15E+00	
0	1846.08	10	0	3.50	3692.18	3687	10	3.06E-03	60.3	1.08E+00	

Flags: "T" = Tentatively associated

```
*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
```

DETECTOR AND SAMPLE DATA

```
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235077.CNF;1
* Acquisition date   : 3-OCT-2016 06:47:53 Sensitivity      : 3.000
* Detector ID       : GAM29 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:01.46 Half life ratio  : *****
* Sample date       : 17-DEC-2015 13:30:00 Nuclide Library : SOLID
* Sample ID         : G405235077 Analyst initials: MXR1
* Batch Number      : 1596254 Sample Quantity  : 1.7280E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight      : 0.00000
* Dry Weight        : 0.00000
*****
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CALIBRATION INFORMATION

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*
* Eff. Cal. date    : 25-JUN-2016 09:55:57 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM29_CAN.CNF;10
*****
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.788E-01
CD-109	6.727E-01
SN-126	5.668E-02
HG-203	1.201E+00
TL-208	2.139E-02
BI-211	1.200E-01
PB-212	3.739E-02
BI-214	4.558E-02
PB-214	1.438E-01
RN-222	4.558E-02
RA-224	4.007E-01
RA-226	4.558E-02
AC-228	7.544E-02
RA-228	7.544E-02
TH-228	3.739E-02
TH-230	4.557E-02
TH-232	7.544E-02
U-234	4.557E-02
U-235	1.371E-01
AM-243	3.583E-02
ANH-511	1.727E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	6.854E+00	NOT IDENT.
NA-22	2.358E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.897E-02	NOT IDENT.
SC-46	2.342E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	4.179E-02	NOT IDENT.
CO-56	2.895E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF

CO-57	3.379E-02	NOT IDENT.
CO-58	3.302E-01	NOT IDENT.
FE-59	3.392E+00	NOT IDENT.
CO-60	2.210E-02	FAIL ABUN
ZN-65	1.074E-01	NOT IDENT.
GE-68	1.384E+00	NOT IDENT.
AS-73	6.157E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.364E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	3.977E-01	NOT IDENT.
KR-85	4.738E+00	NOT IDENT.
SR-85	4.549E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.067E-01	NOT IDENT.
Y-91	3.030E+02	NOT IDENT.
NB-94	1.903E-02	NOT IDENT.
NB-95	5.632E-01	NOT IDENT.
NB-95M	1.682E+00	NOT IDENT.
ZR-95	7.563E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.465E-02	FAIL ABUN
RH-102	2.746E-02	FAIL ABUN
RU-103	3.541E+00	FAIL ABUN
RH-106	3.500E-01	NOT IDENT.
RU-106	3.500E-01	NOT IDENT.
AG-108M	1.834E-02	NOT IDENT.
AG-110M	5.660E-02	NOT IDENT.
SN-113	1.466E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	8.773E-02	NOT IDENT.
SB-124	1.007E+00	NOT IDENT.
SB-125	6.894E-02	FAIL ABUN
TE-125M	1.663E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.261E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	4.223E-02	FAIL ABUN
CS-135	1.018E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	2.165E-02	NOT IDENT.
CS-137	2.287E-02	NOT IDENT.
CE-139	7.820E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.499E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.445E-01	NOT IDENT.
PM-144	3.065E-02	NOT IDENT.
PR-144	2.672E+00	NOT IDENT.
PM-146	2.940E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	5.881E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.831E-02	FAIL ABUN
EU-152	6.222E-02	NOT IDENT.
GD-153	1.269E-01	NOT IDENT.
EU-154	5.732E-02	NOT IDENT.
EU-155	7.402E-02	FAIL ABUN
TB-160	1.150E+00	FAIL ABUN
HO-166M	3.493E-02	FAIL ABUN
TM-171	1.552E+01	NOT IDENT.
HF-172	1.548E-01	FAIL ABUN
LU-172	4.463E-02	FAIL ABUN
LU-176	1.818E-02	FAIL ABUN
HF-181	2.226E+00	NOT IDENT.
TA-182	6.851E-01	FAIL ABUN

RE-183	1.954E+00	NOT IDENT.
RE-184	1.233E+01	NOT IDENT.
W-188	7.115E+01	NOT IDENT.
IR-192	2.811E-01	FAIL ABUN
BI-207	3.233E-02	FAIL ABUN
PB-210	2.376E+00	NOT IDENT.
PB-211	4.929E-01	NOT IDENT.
BI-212	4.741E-01	FAIL ABUN
RN-219	2.370E-01	NOT IDENT.
RA-223	3.362E-01	FAIL ABUN
AC-227	1.688E-01	NOT IDENT.
TH-227	1.688E-01	NOT IDENT.
TH-229	3.379E-01	FAIL ABUN
PA-231	3.299E-01	NOT IDENT.
TH-231	3.362E-01	FAIL ABUN
PA-233	3.514E-02	NOT IDENT.
PA-234	1.696E-01	FAIL ABUN
PA-234M	3.286E+00	NOT IDENT.
TH-234	9.309E-01	FAIL ABUN
NP-237	3.514E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	9.309E-01	FAIL ABUN
NP-239	1.643E-01	FAIL ABUN
PU-239	2.604E+02	FAIL ABUN
AM-241	1.015E-01	NOT IDENT.
CM-243	6.723E-02	FAIL ABUN
BK-247	4.946E-02	NOT IDENT.
CM-247	2.297E-02	FAIL ABUN
CF-249	2.593E-02	NOT IDENT.
CF-251	8.305E-02	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235077.CNF;1
* Acquisition date   : 3-OCT-2016 06:47:53 Sensitivity      : 3.000
* Detector ID        : GAM29 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:01.46 Half life ratio  : *****
* Sample date        : 17-DEC-2015 13:30:00 Nuclide Library : SOLID
* Sample ID          : G405235077 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity : 1.7280E+02 GRAM
*                   : Quantity Err(%) : 1.1574E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight      : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 25-JUN-2016 09:55:57 Eff. Geometry  : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM29_CAN.CNF;10
*****

```

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.304E+01	1.426E+00	1.426E+00
CD-109	2.053E+00	2.448E+00	2.448E+00
SN-126	1.326E-01	1.580E-01	1.580E-01
HG-203	7.831E+00	5.682E+00	5.682E+00
TL-208	2.734E-01	5.866E-02	5.866E-02
BI-211	4.757E-02	7.943E-01	7.943E-01
PB-212	8.586E-01	1.211E-01	1.211E-01
BI-214	8.691E-01	1.640E-01	1.640E-01
PB-214	1.216E+00	1.759E-01	1.759E-01
RN-222	8.691E-01	1.640E-01	1.640E-01
RA-224	1.320E+00	1.228E+00	1.228E+00
RA-226	8.691E-01	1.640E-01	1.640E-01
AC-228	1.151E+00	2.476E-01	2.476E-01
RA-228	1.151E+00	2.476E-01	2.476E-01
TH-228	8.586E-01	1.211E-01	1.211E-01
TH-230	8.688E-01	1.639E-01	1.639E-01
TH-232	1.151E+00	2.476E-01	2.476E-01
U-234	8.688E-01	1.639E-01	1.639E-01
U-235	-1.220E-02	1.552E-01	1.552E-01
AM-243	1.787E-01	1.049E-01	1.049E-01
ANH-511	5.093E-02	7.638E-02	7.638E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.707E+00	7.783E+00	7.821E+00	NOT IDENT.
NA-22	-2.923E-02	3.574E-02	3.809E-02	NOT IDENT.
NA-24	1.000E+41	1.888E+41	0.000E+00	SHORT HLIF
AL-26	-2.267E-03	2.294E-02	2.296E-02	NOT IDENT.
SC-46	9.933E-02	2.556E-01	2.595E-01	FAIL ABUN
V-48	-5.002E+01	7.409E+03	7.409E+03	SHORT HLIF
CR-51	1.677E+02	2.383E+02	2.500E+02	SHORT HLIF
MN-54	-1.566E-02	5.096E-02	5.145E-02	NOT IDENT.
CO-56	1.349E-01	3.133E-01	3.192E-01	FAIL ABUN

MN-56	1.000E+41	2.342E+41	0.000E+00	SHORT HLIF
CO-57	2.531E-02	3.516E-02	3.696E-02	NOT IDENT.
CO-58	-9.627E-02	3.990E-01	4.014E-01	NOT IDENT.
FE-59	2.615E-01	3.992E+00	3.993E+00	NOT IDENT.
CO-60	-1.598E-02	3.103E-02	3.185E-02	FAIL ABUN
ZN-65	-5.625E-02	1.581E-01	1.602E-01	NOT IDENT.
GE-68	8.721E-02	1.630E+00	1.630E+00	NOT IDENT.
AS-73	2.482E+00	6.296E+00	6.394E+00	NOT IDENT.
AS-74	-1.353E+03	3.141E+03	3.199E+03	SHORT HLIF
SE-75	-6.033E-02	1.657E-01	1.679E-01	NOT IDENT.
BR-77	1.084E+37	9.100E+37	0.000E+00	SHORT HLIF
SR-82	-1.647E+02	4.059E+02	4.126E+02	SHORT HLIF
RB-83	9.791E-02	4.291E-01	4.314E-01	NOT IDENT.
KR-85	2.271E+00	4.991E+00	5.095E+00	NOT IDENT.
SR-85	2.179E-01	4.792E-01	4.891E-01	NOT IDENT.
RB-86	-3.269E+02	1.473E+04	1.473E+04	SHORT HLIF
Y-88	2.658E-02	1.142E-01	1.148E-01	NOT IDENT.
Y-91	-6.611E+01	3.781E+02	3.792E+02	NOT IDENT.
NB-94	-1.748E-02	2.434E-02	2.559E-02	NOT IDENT.
NB-95	5.373E-01	6.218E-01	6.673E-01	NOT IDENT.
NB-95M	7.756E-01	2.028E+00	2.058E+00	NOT IDENT.
ZR-95	-2.724E-01	9.178E-01	9.260E-01	NOT IDENT.
NB-97	1.000E+41	1.770E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	5.541E+41	0.000E+00	SHORT HLIF
MO-99	-2.117E+30	1.423E+31	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	4.981E+41	0.000E+00	SHORT HLIF
RH-101	2.621E-02	3.240E-02	3.449E-02	FAIL ABUN
RH-102	-3.247E-02	3.722E-02	3.999E-02	FAIL ABUN
RU-103	5.318E-01	3.859E+00	3.866E+00	FAIL ABUN
RH-106	1.270E-01	3.780E-01	3.823E-01	NOT IDENT.
RU-106	1.270E-01	3.780E-01	3.823E-01	NOT IDENT.
AG-108M	1.316E-02	1.847E-02	1.940E-02	NOT IDENT.
AG-110M	4.264E-02	5.692E-02	6.008E-02	NOT IDENT.
SN-113	-2.062E-02	1.613E-01	1.616E-01	NOT IDENT.
CD-115	4.634E+37	1.369E+38	0.000E+00	SHORT HLIF
SN-117M	-1.691E+04	4.922E+04	4.981E+04	SHORT HLIF
TE-123M	-3.585E-02	1.014E-01	1.027E-01	NOT IDENT.
SB-124	-6.113E-01	1.362E+00	1.390E+00	NOT IDENT.
SB-125	6.864E-03	7.459E-02	7.466E-02	FAIL ABUN
TE-125M	-2.256E+02	2.000E+02	2.244E+02	NOT IDENT.
I-126	3.623E+04	4.257E+05	4.261E+05	SHORT HLIF
SB-126	-1.364E+05	4.934E+05	4.972E+05	SHORT HLIF
SB-127	8.457E+20	3.424E+21	0.000E+00	SHORT HLIF
I-131	5.685E+08	1.864E+09	1.881E+09	SHORT HLIF
I-132	-1.000E+41	1.853E+42	0.000E+00	SHORT HLIF
TE-132	-3.936E+25	5.330E+25	0.000E+00	SHORT HLIF
BA-133	-2.124E-02	2.830E-02	2.987E-02	FAIL ABUN
I-133	1.000E+41	3.583E+41	0.000E+00	SHORT HLIF
CS-134	1.225E-01	6.122E-02	8.244E-02	FAIL ABUN
CS-135	-1.156E-01	1.307E-01	1.407E-01	NOT IDENT.
I-135	1.000E+41	3.375E+42	0.000E+00	SHORT HLIF
CS-136	-9.083E+04	1.627E+05	1.678E+05	SHORT HLIF
BA-137M	-8.577E-03	2.583E-02	2.612E-02	NOT IDENT.
CS-137	-9.061E-03	2.729E-02	2.759E-02	NOT IDENT.
CE-139	4.906E-02	8.432E-02	8.717E-02	NOT IDENT.
BA-140	-2.107E+05	5.601E+05	5.681E+05	SHORT HLIF
LA-140	-2.276E+05	2.005E+05	2.252E+05	SHORT HLIF
CE-141	5.457E+00	1.628E+01	1.646E+01	NOT IDENT.
CE-143	1.000E+41	1.947E+44	0.000E+00	SHORT HLIF
CE-144	-1.102E-01	2.798E-01	2.842E-01	NOT IDENT.
PM-144	-4.159E-02	4.151E-02	4.554E-02	NOT IDENT.
PR-144	-3.519E+00	3.596E+00	3.930E+00	NOT IDENT.
PM-146	9.930E-03	3.112E-02	3.144E-02	NOT IDENT.
ND-147	-6.509E+06	1.295E+07	1.328E+07	SHORT HLIF
PM-147	2.496E+02	6.268E+02	6.369E+02	NOT IDENT.
PM-149	-4.423E+37	2.086E+39	0.000E+00	SHORT HLIF
EU-150	-1.079E-02	2.302E-02	2.353E-02	FAIL ABUN
EU-152	1.903E-02	6.496E-02	6.552E-02	NOT IDENT.
GD-153	-7.336E-04	1.490E-01	1.490E-01	NOT IDENT.
EU-154	-7.372E-02	8.769E-02	9.377E-02	NOT IDENT.
EU-155	-2.474E-02	8.271E-02	8.346E-02	FAIL ABUN
TB-160	1.150E+00	1.129E+00	1.242E+00	FAIL ABUN
HO-166M	5.292E-03	3.908E-02	3.915E-02	FAIL ABUN
TM-171	5.679E+00	1.584E+01	1.605E+01	NOT IDENT.
HF-172	8.430E-02	1.765E-01	1.805E-01	FAIL ABUN
LU-172	-4.549E-04	5.334E-02	5.334E-02	FAIL ABUN
LU-176	5.432E-03	2.082E-02	2.096E-02	FAIL ABUN
HF-181	-7.485E-01	2.560E+00	2.582E+00	NOT IDENT.

TA-182	3.799E-01	7.651E-01	7.840E-01	FAIL ABUN
RE-183	1.109E-02	2.056E+00	2.056E+00	NOT IDENT.
RE-184	-1.471E+01	1.793E+01	1.912E+01	NOT IDENT.
W-188	-2.102E+00	9.121E+01	9.121E+01	NOT IDENT.
IR-192	-2.234E-01	3.606E-01	3.744E-01	FAIL ABUN
BI-207	-2.686E-02	4.315E-02	4.481E-02	FAIL ABUN
PB-210	-9.434E-01	2.515E+00	2.551E+00	NOT IDENT.
PB-211	2.608E-01	5.105E-01	5.239E-01	NOT IDENT.
BI-212	1.179E+00	8.218E-01	9.787E-01	FAIL ABUN
RN-219	-1.996E-01	2.811E-01	2.952E-01	NOT IDENT.
RA-223	-2.056E-01	3.821E-01	3.932E-01	FAIL ABUN
AC-227	5.558E-02	1.905E-01	1.921E-01	NOT IDENT.
TH-227	5.558E-02	1.905E-01	1.921E-01	NOT IDENT.
TH-229	-6.302E-02	3.899E-01	3.909E-01	FAIL ABUN
PA-231	-4.858E-03	3.891E-01	3.892E-01	NOT IDENT.
TH-231	-2.056E-01	3.821E-01	3.932E-01	FAIL ABUN
PA-233	-5.542E-02	4.923E-02	5.520E-02	NOT IDENT.
PA-234	-5.341E-02	2.182E-01	2.195E-01	FAIL ABUN
PA-234M	1.000E+00	3.804E+00	3.831E+00	NOT IDENT.
TH-234	-1.972E-01	9.632E-01	9.673E-01	FAIL ABUN
NP-237	-5.542E-02	4.923E-02	5.520E-02	NOT IDENT.
NP-238	3.421E+39	1.936E+40	0.000E+00	SHORT HLIF
U-238	-1.972E-01	9.632E-01	9.673E-01	FAIL ABUN
NP-239	1.546E-02	1.791E-01	1.792E-01	FAIL ABUN
PU-239	6.795E+02	5.045E+02	5.902E+02	FAIL ABUN
AM-241	6.447E-03	1.066E-01	1.066E-01	NOT IDENT.
CM-243	-1.466E-02	7.443E-02	7.472E-02	FAIL ABUN
BK-247	1.704E-02	5.576E-02	5.629E-02	NOT IDENT.
CM-247	-8.548E-03	2.595E-02	2.624E-02	FAIL ABUN
CF-249	1.509E-02	2.656E-02	2.741E-02	NOT IDENT.
CF-251	-4.428E-02	9.778E-02	9.979E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	85.5244	87.09	137.7993	136.47	91.2226
45.60	101.1675	87.57	137.8918	140.51	0.0000
46.54	88.9319	88.03	81.9684	143.76	90.8192
49.72	0.0000	88.34	82.0038	144.24	87.5793
51.35	96.5439	88.47	82.0184	145.44	83.3013
51.87	101.4724	89.96	86.2962	152.43	107.0603
52.39	79.3240	1093.63	86.3763	153.25	0.0000
52.97	67.7903	91.11	0.0000	323.87	80.7115
53.44	81.4205	92.59	86.6048	156.02	0.0000
54.07	83.4578	93.35	86.6929	158.56	0.0000
57.36	0.0000	94.56	86.8333	159.00	83.3061
57.53	92.7792	94.65	86.8435	162.33	71.3125
57.98	86.0124	94.67	86.8461	162.66	0.0000
59.27	92.0880	94.87	103.4149	163.33	89.2236
59.32	93.0760	97.43	95.4625	165.86	67.0761
59.54	93.1123	98.43	102.8596	176.31	69.9733
60.96	101.2048	98.44	102.8611	176.60	0.0000
61.17	101.2417	99.53	78.0344	177.52	86.9951
62.93	96.6190	100.11	88.5051	181.07	0.0000
63.29	98.6517	102.03	91.8531	181.52	86.1680
63.58	98.7001	103.18	76.3071	184.41	79.5650
64.28	93.8760	103.37	81.5527	143.76	79.6547
66.73	119.0652	105.21	77.5489	193.51	77.8925
67.24	118.1720	105.31	86.9913	197.03	94.2057
125.81	114.2823	106.12	80.7833	198.01	66.6873
67.75	114.2946	106.47	80.8185	201.83	56.5157
69.67	119.6356	109.28	106.3732	203.43	65.8280
70.83	134.5064	111.00	93.9297	205.31	57.0605
72.81	117.2258	111.76	0.0000	210.85	71.2545
72.87	117.2365	114.06	87.9168	215.65	74.6338
74.66	117.5624	116.30	0.0000	222.11	56.2551
74.82	117.5909	116.74	72.2547	227.09	68.2316
74.97	117.6177	119.76	78.9045	227.38	74.1300
77.11	118.0015	121.12	71.5515	228.16	0.0000
78.74	102.4505	121.22	71.5591	228.18	72.9978
79.69	95.8447	121.78	70.5359	116.74	72.9978
80.12	89.1514	122.06	66.2823	235.69	72.6162
80.19	0.0000	122.92	73.8373	235.96	72.6302
80.57	102.7273	123.07	77.0603	238.63	67.6310
81.00	116.6556	265.00	88.8942	238.98	0.0000
81.07	116.6679	125.81	62.9823	240.99	67.7466
81.75	136.0774	127.23	80.2847	242.00	67.7962
83.79	115.4301	127.91	86.0840	244.70	36.5458
84.00	122.2568	129.30	86.2146	252.40	0.0000
85.43	137.4787	131.20	83.5131	252.80	55.9336
86.55	137.6955	133.02	93.0534	254.15	0.0000
86.79	137.7418	133.52	88.7729	256.23	52.8636
86.94	137.7705	136.00	90.0923	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	56.7950	355.39	0.0000	584.27	25.5487
264.80	48.3411	356.01	36.8007	595.83	0.0000
265.00	42.3038	364.49	0.0000	427.87	23.8057
268.22	78.7367	366.42	0.0000	602.52	0.0000
269.46	63.0417	372.51	32.6640	604.72	28.6121
270.03	64.2784	375.05	27.5436	607.14	30.0696
271.23	46.9327	377.52	35.3370	609.32	27.7055
273.65	0.0000	356.01	38.0497	610.33	27.7161
276.40	34.1028	388.16	27.7344	614.28	17.2288
277.37	34.1241	388.63	0.0000	618.01	23.0039
277.60	34.1293	391.69	35.6006	620.36	21.1057
278.00	34.1387	264.66	34.0203	621.93	21.1182
279.20	34.1652	401.81	40.1499	630.19	0.0000
279.54	34.1729	402.40	37.5428	631.29	20.2275
279.70	34.1763	404.85	32.3441	633.25	13.4947
280.46	34.1934	410.95	36.8278	634.78	0.0000
283.69	42.4235	413.71	42.1475	635.95	16.4030
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	40.4292	423.72	0.0000	645.85	25.1769
285.90	0.0000	427.09	35.3548	657.76	21.3949
287.50	50.2978	427.87	29.1791	657.90	0.0000
290.67	49.1699	433.94	19.5096	661.66	25.3197
293.27	0.0000	439.40	28.4525	664.57	0.0000
351.93	46.8459	453.88	25.0662	666.33	0.0000
295.96	46.8680	463.37	19.7817	666.50	0.0000
879.38	52.7109	468.07	23.7891	667.71	0.0000
299.98	48.2227	473.00	0.0000	677.62	27.4212
300.09	48.2263	475.06	20.7913	685.70	0.0000
300.13	48.2275	476.78	26.2358	695.00	0.0000
301.36	56.9272	477.60	27.1503	696.49	29.5728
302.85	70.6046	482.18	25.3927	696.51	29.5728
256.23	49.5984	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	22.6790
306.78	45.9429	497.08	29.2116	697.49	22.6799
308.46	48.4763	505.52	21.9893	702.65	28.6472
311.90	51.0686	507.63	0.0000	706.68	16.8160
316.51	51.2112	511.00	24.7961	711.68	16.8444
319.41	0.0000	514.00	24.8280	720.70	0.0000
320.08	0.0000	514.00	24.8280	721.93	0.0000
321.04	40.9131	520.40	21.2078	722.78	17.9019
323.87	37.6364	520.69	0.0000	722.91	10.4432
325.23	34.3185	522.65	0.0000	723.31	10.4445
328.76	0.0000	527.90	0.0000	724.19	16.4174
333.37	50.4614	528.26	19.4277	727.33	15.9368
333.97	56.7883	529.59	18.5124	733.00	7.9831
334.37	53.0153	529.87	0.0000	735.93	19.4778
338.28	50.6042	531.02	0.0000	333.97	11.9922
338.32	50.6055	537.26	0.0000	739.50	0.0000
311.90	49.4010	546.56	0.0000	747.24	18.0461
340.48	49.4010	552.55	25.2290	748.06	20.0562
340.55	0.0000	563.25	25.3378	752.31	11.0461
344.28	33.0054	569.33	29.1621	753.82	0.0000
345.93	39.6437	946.00	30.1055	756.73	18.1018
351.06	34.8307	569.70	30.1068	756.80	18.1018
351.93	34.8482	583.19	22.7002	884.68	19.6555

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	15.1288	1274.44	14.0114	1620.50	4.6219
766.42	21.1837	1001.03	18.3454	1621.92	8.3216
766.84	21.1871	1002.74	19.4333	1678.03	0.0000
772.60	0.0000	1004.73	12.9624	1690.97	6.5514
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	2.8431
778.90	20.2555	1028.54	0.0000	1063.66	2.5296
783.70	0.0000	1037.84	9.8049	1771.35	2.8464
785.37	22.3258	1038.76	0.0000	1791.20	0.0000
792.07	13.7285	631.29	19.6523	1808.65	4.7736
794.95	18.3215	1048.07	0.0000	1810.72	0.0000
795.86	18.3267	1049.04	24.0339	1836.06	1.9180
810.06	19.4291	1050.41	9.8357		
810.29	19.4306	1063.66	24.1234		
344.28	18.4087	1077.00	0.0000		
810.76	18.4109	1077.34	12.1020		
815.77	0.0000	1085.87	15.4355		
1048.07	0.0000	1093.63	12.1503		
832.01	21.6178	1099.45	11.0620		
834.85	23.6963	1112.07	17.7526		
835.71	22.6723	1112.84	18.8663		
836.80	0.0000	1115.54	19.9878		
846.75	0.0000	1120.29	13.3408		
846.77	13.4412	1120.55	13.3418		
856.80	0.0000	1221.41	13.3438		
860.56	10.3813	1129.67	15.5996		
871.09	20.8268	1131.51	0.0000		
873.19	12.5034	1147.95	0.0000		
875.33	0.0000	1173.23	16.8848		
879.38	7.3068	1177.95	10.8180		
880.51	21.9271	1189.05	7.9080		
883.24	14.6295	1204.77	17.0068		
884.68	6.2725	1221.41	17.0703		
889.28	12.5615	1231.02	12.3170		
894.76	16.7747	1235.36	0.0000		
898.04	15.7410	1238.28	15.9927		
900.72	17.8529	1260.41	0.0000		
903.28	16.8151	1271.87	5.7536		
911.20	13.6930	1274.44	16.1191		
912.08	13.6961	1274.54	16.1203		
923.98	0.0000	1291.59	8.6676		
926.50	7.9333	1298.22	0.0000		
929.11	0.0000	1312.11	0.0000		
937.49	17.5064	1332.49	12.8226		
944.13	0.0000	1362.66	0.0000		
946.00	17.0150	1365.19	9.8588		
949.00	18.0936	1368.63	0.0000		
667.71	0.0000	1384.29	12.3713		
962.31	35.8900	1408.01	7.9909		
964.08	22.4415	1457.56	0.0000		
966.17	30.4738	1460.82	6.2805		
911.20	24.6116	1489.16	5.4126		
968.97	24.6116	1505.03	16.2872		
983.53	0.0000	1584.12	9.1827		
984.45	0.0000	1596.21	0.0000		

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*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235078.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM30.CNF;300
Background date : 2-OCT-2016 11:01:47.
Sample date     : 17-DEC-2015 12:40:00 Acquisition date : 3-OCT-2016 06:48:14.
Sample ID      : G405235078 Sample quantity   : 1.56072E+02 GRAM
Detector name  : GAM30 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:01.31 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1596254 Detector SN# :
Matrix Spike ID : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	38.83	11	82	1.24	77.39	76	7	3.09E-03	138.6	
2	0	47.70*	21	89	0.82	95.12	90	9	5.76E-03	86.8	
3	0	63.18*	44	108	1.16	126.08	123	8	1.23E-02	45.0	
4	4	74.89	146	158	1.45	149.50	145	13	4.04E-02	18.4	1.57E+00
5	4	77.16*	174	114	1.04	154.04	145	13	4.84E-02	12.7	
6	0	83.46*	36	135	0.58	166.65	163	8	9.97E-03	59.0	
7	0	87.95	134	191	4.13	175.62	170	12	3.72E-02	22.4	
8	0	92.85*	61	105	1.81	185.43	182	7	1.71E-02	32.8	
9	0	129.64*	26	49	0.55	259.00	257	6	7.25E-03	48.2	
10	0	186.34*	85	110	1.57	372.42	366	13	2.37E-02	28.3	
11	0	198.63*	19	94	1.43	397.01	393	9	5.27E-03	97.7	
12	0	209.02	22	81	0.93	417.78	415	8	6.09E-03	74.0	
13	3	238.75*	267	74	1.26	477.24	473	20	7.43E-02	8.1	2.95E+00
14	3	241.74	82	57	1.58	483.21	473	20	2.27E-02	24.8	
15	0	270.33	27	54	0.67	540.41	536	9	7.50E-03	52.7	
16	2	292.88	19	23	1.49	585.52	584	12	5.14E-03	35.1	4.11E+00
17	2	295.32*	145	46	1.12	590.39	584	12	4.02E-02	11.6	
18	0	324.56	12	43	0.91	648.87	644	8	3.35E-03	97.9	
19	0	338.50*	46	66	0.98	676.76	671	12	1.28E-02	38.7	
20	0	352.14*	213	57	1.10	704.04	698	12	5.93E-02	9.9	
21	0	463.52	20	20	0.91	926.85	923	9	5.42E-03	47.4	
22	0	511.39*	30	43	2.31	1022.60	1017	13	8.20E-03	62.4	
23	0	583.76*	99	27	1.44	1167.36	1161	14	2.74E-02	15.9	
24	0	609.77*	152	37	1.46	1219.40	1213	13	4.21E-02	11.9	
25	0	624.46	16	10	1.48	1248.79	1245	8	4.55E-03	41.4	
26	0	632.85	6	32	2.71	1265.58	1253	16	1.55E-03	230.9	
27	0	672.50	20	21	6.53	1344.89	1336	17	5.47E-03	58.2	
28	0	728.27	28	26	1.15	1456.45	1449	13	7.85E-03	43.2	
29	0	795.16	22	0	1.68	1590.27	1587	7	6.11E-03	21.3	
30	0	799.55	6	8	1.45	1599.07	1593	8	1.79E-03	85.2	
31	0	817.17	10	6	2.35	1634.31	1629	11	2.85E-03	54.4	
32	0	869.21	11	6	0.59	1738.42	1735	8	3.19E-03	46.9	
33	0	882.67	6	13	1.22	1765.34	1760	10	1.67E-03	118.1	
34	0	911.27	64	5	1.20	1822.57	1817	11	1.77E-02	14.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	968.22*	64	40	5.55	1936.51	1923	33	1.78E-02	33.0	
36	0	1002.42*	5	27	2.36	2004.93	1993	15	1.31E-03	248.1	
37	0	1014.04	7	9	0.87	2028.19	2021	10	1.82E-03	97.6	
38	0	1021.51	3	8	0.92	2043.13	2039	6	8.96E-04	146.2	
39	0	1115.50	13	8	0.53	2231.17	2225	11	3.51E-03	52.3	
40	0	1120.47*	55	5	1.14	2241.13	2236	12	1.54E-02	16.4	
41	0	1156.85	5	9	0.50	2313.93	2308	7	1.33E-03	118.9	
42	0	1171.69	10	7	3.36	2343.61	2338	10	2.74E-03	60.7	
43	0	1199.66	5	15	0.57	2399.58	2393	9	1.33E-03	155.9	
44	0	1212.17	10	9	0.61	2424.60	2419	9	2.78E-03	62.6	
45	0	1220.79	7	8	1.46	2441.86	2438	8	1.94E-03	79.5	
46	0	1239.72	11	8	1.63	2479.73	2475	8	3.06E-03	53.8	
47	0	1286.97	11	10	4.32	2574.27	2567	11	3.16E-03	62.9	
48	0	1293.60	5	5	1.26	2587.54	2583	6	1.33E-03	90.8	
49	0	1378.36	12	8	0.91	2757.14	2751	10	3.19E-03	53.4	
50	0	1408.55	6	2	1.27	2817.55	2813	7	1.70E-03	54.3	
51	0	1442.45	7	2	0.54	2885.40	2881	8	1.99E-03	50.3	
52	0	1461.16*	294	14	2.26	2922.84	2917	11	8.16E-02	6.4	
53	0	1509.73	14	7	1.10	3020.04	3012	13	3.75E-03	47.5	
54	0	1731.04	6	5	1.26	3462.91	3457	7	1.57E-03	79.7	
55	0	1764.92*	28	6	2.00	3530.72	3524	11	7.90E-03	25.9	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235078.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-DEC-2015 12:40:00 Acquisition date : 3-OCT-2016 06:48:14
Sample ID        : G405235078 Sample quantity   : 156.07 GRAM
Sample type      : SOLID Sample geometry    :
Detector name    : GAMMA30 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:01.31 0.0%
Energy tolerance : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type  : Empirical Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.307E+00	9.815E+00	9.815E+00	12.77	OK
ZN-65	1115.54	50.60*	1.651E+00	7.274E-02	1.661E-01	104.56	OK
CD-109	88.03	3.70*	6.598E+00	2.546E+00	3.941E+00	60.62	OK
SN-126	64.28	9.60	3.864E+00	7.620E-01	7.620E-01	89.95	OK
	86.94	8.90	6.598E+00	1.058E+00	1.058E+00	60.62	OK
	87.57	37.00*	6.598E+00	2.546E-01	2.546E-01	60.62	OK
TL-208	277.37	6.60	4.820E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.798E+00	2.144E-01	2.144E-01	31.88	OK
	860.56	12.50	2.059E+00	----- Line	Not Found	-----	Absent
PB-210	46.54	4.25*	1.414E+00	2.264E+00	2.321E+00	173.62	OK
PB-212	74.82	10.28	5.449E+00	1.107E+00	1.107E+00	55.62	OK
	77.11	17.10	5.696E+00	1.127E+00	1.127E+00	25.44	OK
	238.63	43.60*	5.355E+00	6.491E-01	6.491E-01	16.20	OK
	300.09	3.30	4.556E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.706E+00	6.339E-01	6.341E-01	23.85	OK
	1120.29	14.92	1.645E+00	1.085E+00	1.085E+00	32.84	OK
	1764.49	15.30	1.122E+00	7.547E-01	7.549E-01	51.87	OK
PB-214	74.82	5.80	5.442E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.696E+00	1.986E+00	1.987E+00	25.44	OK
	87.09	3.41	6.542E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.305E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.609E+00	9.449E-01	9.452E-01	23.13	OK
	351.93	35.60*	4.059E+00	8.049E-01	8.052E-01	19.87	OK
RN-222	609.32	45.49*	2.706E+00	6.339E-01	6.341E-01	23.85	OK
	1120.29	14.92	1.645E+00	1.085E+00	1.085E+00	32.84	OK
	1764.49	15.30	1.122E+00	7.547E-01	7.549E-01	51.87	OK
RA-224	240.99	4.10*	5.309E+00	4.540E-01	4.540E-01	247.54	OK
RA-226	609.32	45.49*	2.706E+00	6.339E-01	6.341E-01	23.85	OK
	1120.29	14.92	1.645E+00	1.085E+00	1.085E+00	32.84	OK
	1764.49	15.30	1.122E+00	7.547E-01	7.549E-01	51.87	OK
AC-228	105.21	1.10	7.278E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.177E+00	5.374E-01	5.374E-01	77.38	OK
	794.95	4.25	2.196E+00	1.178E+00	1.178E+00	42.64	OK
	835.71	1.61	2.109E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.963E+00	6.178E-01	6.178E-01	28.85	OK
	968.97	15.80	1.865E+00	1.065E+00	1.065E+00	65.95	OK
RA-228	105.21	1.10	7.278E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.177E+00	5.374E-01	5.374E-01	77.38	OK
	794.95	4.25	2.196E+00	1.178E+00	1.178E+00	42.64	OK
	835.71	1.61	2.109E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.963E+00	6.178E-01	6.178E-01	28.85	OK
	968.97	15.80	1.865E+00	1.065E+00	1.065E+00	65.95	OK
TH-228	74.82	10.28	5.449E+00	1.107E+00	1.107E+00	55.62	OK
	77.11	17.10	5.696E+00	1.127E+00	1.127E+00	25.44	OK
	238.63	43.60*	5.355E+00	6.491E-01	6.491E-01	16.20	OK
	300.09	3.30	4.556E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.706E+00	6.339E-01	6.339E-01	23.85	OK
	1120.29	14.92	1.645E+00	1.085E+00	1.085E+00	32.84	OK
	1764.49	15.30	1.122E+00	7.547E-01	7.547E-01	51.87	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-232	105.21	1.10	7.278E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	4.177E+00	5.374E-01	5.374E-01	77.38	OK
	835.71	1.61	2.109E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.963E+00	6.178E-01	6.178E-01	28.85	OK
TH-234	968.97	15.80	1.865E+00	1.065E+00	1.065E+00	65.95	OK
	63.29	3.70*	3.864E+00	1.977E+00	1.977E+00	89.95	OK
	92.59	4.23	6.873E+00	1.308E+00	1.308E+00	65.63	OK
U-234	609.32	45.49*	2.706E+00	6.339E-01	6.339E-01	23.85	OK
	1120.29	14.92	1.645E+00	1.085E+00	1.085E+00	32.84	OK
	1764.49	15.30	1.122E+00	7.547E-01	7.547E-01	51.87	OK
U-238	63.29	3.70*	3.864E+00	1.977E+00	1.977E+00	89.95	OK
	92.59	4.23	6.873E+00	1.308E+00	1.308E+00	65.63	OK
AM-243	43.53	5.90	8.765E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	5.449E+00	1.693E-01	1.694E-01	55.62	OK
ANH-511	511.00	100.00*	3.089E+00	5.009E-02	5.009E-02	124.84	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235078.CNF;1
* Acquisition date   : 3-OCT-2016 06:48:14 Sensitivity      : 3.000
* Detector ID       : GAM30 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:01.31 Half life ratio : *****
* Sample date       : 17-DEC-2015 12:40:00 Analyst initials: MXR1
* Sample ID         : G405235078 Sample Quantity : 1.5607E+02 GRAM
* Batch Number      : 1596254 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 11-MAR-2016 05:58:49 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	9.815E+00	1.228E+00	5.615E-01
ZN-65	1.661E-01	1.702E-01	1.770E-01
CD-109	3.941E+00	2.341E+00	1.287E+00
SN-126	2.546E-01	1.513E-01	8.354E-02
TL-208	2.144E-01	6.699E-02	4.379E-02
PB-210	2.321E+00	3.948E+00	3.356E+00
PB-212	6.491E-01	1.030E-01	7.403E-02
BI-214	6.341E-01	1.482E-01	8.492E-02
PB-214	8.052E-01	1.568E-01	9.700E-02
RN-222	6.341E-01	1.482E-01	8.492E-02
RA-224	4.540E-01	1.101E+00	7.931E-01
RA-226	6.341E-01	1.482E-01	8.492E-02
AC-228	6.178E-01	1.747E-01	2.017E-01
RA-228	6.178E-01	1.747E-01	2.017E-01
TH-228	6.491E-01	1.030E-01	7.403E-02
TH-230	6.339E-01	1.481E-01	8.490E-02
TH-232	6.178E-01	1.747E-01	2.017E-01
TH-234	1.977E+00	1.743E+00	1.452E+00
U-234	6.339E-01	1.481E-01	8.490E-02
U-238	1.977E+00	1.743E+00	1.452E+00
AM-243	1.694E-01	9.231E-02	6.302E-02
ANH-511	5.009E-02	6.129E-02	4.407E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.176E+00	6.480E+00	1.296E+01	NOT IDENT.
NA-22	-2.631E-03	2.835E-02	5.953E-02	NOT IDENT.
NA-24	0.000E+00	1.317E+41	0.000E+00	SHORT HLIF
AL-26	-4.231E-03	1.906E-02	4.077E-02	NOT IDENT.
SC-46	1.863E-01	2.351E-01	5.377E-01	FAIL ABUN
V-48	0.000E+00	6.782E+03	0.000E+00	SHORT HLIF
CR-51	0.000E+00	2.633E+02	0.000E+00	SHORT HLIF
MN-54	-1.007E-03	4.994E-02	9.652E-02	NOT IDENT.

CO-56	2.865E-02	3.062E-01	6.160E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.973E-02	3.802E-02	7.541E-02	NOT IDENT.
CO-58	1.630E-01	3.813E-01	8.096E-01	NOT IDENT.
FE-59	2.014E+00	4.725E+00	9.794E+00	NOT IDENT.
CO-60	6.653E-03	1.943E-02	4.786E-02	NOT IDENT.
GE-68	-1.030E-01	1.378E+00	2.811E+00	NOT IDENT.
AS-73	6.373E+00	5.119E+00	1.133E+01	NOT IDENT.
AS-74	0.000E+00	2.563E+03	0.000E+00	SHORT HLIF
SE-75	-1.196E-02	1.508E-01	2.768E-01	NOT IDENT.
BR-77	0.000E+00	1.315E+36	0.000E+00	SHORT HLIF
SR-82	0.000E+00	3.545E+02	0.000E+00	SHORT HLIF
RB-83	1.385E-01	4.499E-01	9.337E-01	NOT IDENT.
KR-85	1.887E+00	4.406E+00	8.742E+00	NOT IDENT.
SR-85	1.797E-01	4.230E-01	8.388E-01	NOT IDENT.
RB-86	0.000E+00	1.294E+04	0.000E+00	SHORT HLIF
Y-88	-1.435E-01	1.654E-01	2.743E-01	NOT IDENT.
Y-91	1.927E+02	4.056E+02	8.287E+02	NOT IDENT.
NB-94	3.970E-03	2.442E-02	4.859E-02	NOT IDENT.
NB-95	4.956E-02	6.033E-01	1.184E+00	NOT IDENT.
NB-95M	-1.015E+00	1.898E+00	3.038E+00	NOT IDENT.
ZR-95	3.793E-01	9.186E-01	1.945E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.080E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	2.166E-02	2.533E-02	4.908E-02	FAIL ABUN
RH-102	8.932E-03	3.900E-02	7.507E-02	NOT IDENT.
RU-103	-7.143E-01	3.530E+00	6.891E+00	FAIL ABUN
RH-106	4.069E-02	3.362E-01	6.288E-01	NOT IDENT.
RU-106	4.069E-02	3.362E-01	6.288E-01	NOT IDENT.
AG-108M	8.300E-03	1.877E-02	4.009E-02	NOT IDENT.
AG-110M	-7.034E-02	8.199E-02	1.098E-01	NOT IDENT.
SN-113	2.053E-02	1.539E-01	3.156E-01	NOT IDENT.
CD-115	0.000E+00	1.192E+38	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	4.575E+04	0.000E+00	SHORT HLIF
TE-123M	-9.552E-02	9.484E-02	1.614E-01	NOT IDENT.
SB-124	-2.323E-01	8.245E-01	1.834E+00	NOT IDENT.
SB-125	-2.694E-02	7.290E-02	1.405E-01	FAIL ABUN
TE-125M	-9.698E+01	1.854E+02	3.351E+02	NOT IDENT.
I-126	0.000E+00	3.651E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	5.648E+05	0.000E+00	SHORT HLIF
SB-127	0.000E+00	3.099E+21	0.000E+00	SHORT HLIF
I-131	0.000E+00	1.585E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	4.226E+25	0.000E+00	SHORT HLIF
BA-133	-8.116E-03	3.171E-02	5.579E-02	NOT IDENT.
I-133	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-134	7.645E-02	3.195E-02	8.602E-02	FAIL ABUN
CS-135	4.547E-02	1.005E-01	1.859E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	1.388E+05	0.000E+00	SHORT HLIF
BA-137M	1.134E-02	1.929E-02	4.337E-02	NOT IDENT.
CS-137	1.198E-02	2.038E-02	4.582E-02	NOT IDENT.
CE-139	9.951E-02	8.064E-02	1.689E-01	NOT IDENT.
BA-140	0.000E+00	5.668E+05	0.000E+00	SHORT HLIF
LA-140	0.000E+00	2.071E+05	0.000E+00	SHORT HLIF
CE-141	-2.798E+00	1.418E+01	2.649E+01	NOT IDENT.
CE-143	0.000E+00	6.878E+40	0.000E+00	SHORT HLIF
CE-144	2.731E-02	2.591E-01	5.008E-01	NOT IDENT.
PM-144	-8.166E-03	4.169E-02	8.132E-02	NOT IDENT.
PR-144	-6.821E-01	3.608E+00	7.044E+00	NOT IDENT.
PM-146	-1.093E-02	2.745E-02	5.291E-02	FAIL ABUN
ND-147	0.000E+00	1.091E+07	0.000E+00	SHORT HLIF
PM-147	5.975E+02	6.558E+02	1.342E+03	NOT IDENT.
PM-149	0.000E+00	2.112E+39	0.000E+00	SHORT HLIF
EU-150	2.492E-03	1.868E-02	3.499E-02	FAIL ABUN
EU-152	5.074E-02	6.744E-02	1.463E-01	FAIL ABUN
GD-153	-6.355E-02	1.176E-01	2.152E-01	NOT IDENT.
EU-154	-8.478E-03	6.928E-02	1.447E-01	NOT IDENT.
EU-155	6.282E-02	7.776E-02	1.601E-01	FAIL ABUN
TB-160	3.852E-01	1.116E+00	2.229E+00	FAIL ABUN
HO-166M	-4.039E-02	4.343E-02	7.258E-02	NOT IDENT.
TM-171	-1.457E+01	1.341E+01	2.453E+01	NOT IDENT.
HF-172	-5.288E-02	1.701E-01	3.165E-01	FAIL ABUN
LU-172	-4.014E-03	4.828E-02	9.473E-02	FAIL ABUN
LU-176	-1.292E-02	1.840E-02	3.053E-02	FAIL ABUN
HF-181	3.400E-01	2.616E+00	5.355E+00	NOT IDENT.

TA-182	4.702E-01	7.330E-01	1.413E+00	FAIL ABUN
RE-183	-6.013E-01	1.767E+00	3.438E+00	NOT IDENT.
RE-184	-2.243E+00	1.708E+01	3.314E+01	NOT IDENT.
W-188	4.427E+01	9.458E+01	1.688E+02	FAIL ABUN
IR-192	1.420E-01	3.145E-01	6.637E-01	FAIL ABUN
HG-203	1.478E-01	1.741E+00	3.221E+00	NOT IDENT.
BI-207	-2.272E-02	3.368E-02	5.619E-02	FAIL ABUN
BI-211	0.000E+00	4.318E-01	6.439E-01	FAIL ABUN
PB-211	1.003E-01	4.856E-01	9.977E-01	NOT IDENT.
BI-212	9.066E-01	7.679E-01	9.778E-01	FAIL ABUN
RN-219	-1.700E-02	2.515E-01	5.068E-01	FAIL ABUN
RA-223	3.853E-01	7.392E-01	9.522E-01	FAIL ABUN
AC-227	-1.940E-02	1.623E-01	2.982E-01	NOT IDENT.
TH-227	-1.940E-02	1.623E-01	2.982E-01	NOT IDENT.
TH-229	-2.685E-01	3.798E-01	6.580E-01	FAIL ABUN
PA-231	1.333E-02	3.252E-01	6.024E-01	NOT IDENT.
TH-231	3.853E-01	7.392E-01	9.522E-01	FAIL ABUN
PA-233	1.786E-02	4.329E-02	9.122E-02	NOT IDENT.
PA-234	9.735E-02	2.069E-01	4.384E-01	FAIL ABUN
PA-234M	1.506E+00	7.325E+00	7.840E+00	FAIL ABUN
U-235	3.018E-02	1.377E-01	2.657E-01	FAIL ABUN
NP-237	1.786E-02	4.329E-02	9.122E-02	NOT IDENT.
NP-238	0.000E+00	1.757E+40	0.000E+00	SHORT HLIF
NP-239	-1.500E-02	1.751E-01	3.346E-01	NOT IDENT.
PU-239	3.395E+02	3.208E+02	4.538E+02	FAIL ABUN
AM-241	1.034E-01	9.534E-02	1.943E-01	NOT IDENT.
CM-243	-7.011E-02	6.979E-02	1.230E-01	NOT IDENT.
BK-247	-1.690E-02	5.467E-02	9.745E-02	FAIL ABUN
CM-247	-9.582E-03	2.323E-02	4.480E-02	NOT IDENT.
CF-249	-1.732E-03	2.670E-02	5.352E-02	NOT IDENT.
CF-251	-2.684E-02	8.971E-02	1.635E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	284	10.66*	1.307E+00	9.815E+00	9.815E+00	12.77
ZN-65	1115.54	13	50.60*	1.651E+00	7.274E-02	1.661E-01	104.56
CD-109	88.03	173	3.70*	6.598E+00	3.417E+00	5.289E+00	44.78
SN-126	64.28	59	9.60	3.864E+00	7.620E-01	7.620E-01	89.95
	86.94	173	8.90	6.598E+00	1.420E+00	1.421E+00	44.78
	87.57	173	37.00*	6.598E+00	3.417E-01	3.417E-01	44.78
TL-208	277.37	-----	6.60	4.820E+00	-----	Line Not Found	-----
	583.19	106	85.00*	2.798E+00	2.144E-01	2.144E-01	31.88
	860.56	-----	12.50	2.059E+00	-----	Line Not Found	-----
PB-210	46.54	28	4.25*	1.414E+00	2.264E+00	2.321E+00	173.62
BI-211	72.87	-----	1.23	5.213E+00	-----	Line Not Found	-----
	351.06	242	12.92*	4.059E+00	2.218E+00	2.218E+00	19.87
PB-212	74.82	191	10.28	5.449E+00	1.640E+00	1.640E+00	36.78
	77.11	228	17.10	5.696E+00	1.127E+00	1.127E+00	25.44
	238.63	315	43.60*	5.355E+00	6.491E-01	6.491E-01	16.20
	300.09	-----	3.30	4.556E+00	-----	Line Not Found	-----
BI-214	609.32	162	45.49*	2.706E+00	6.339E-01	6.341E-01	23.85
	1120.29	55	14.92	1.645E+00	1.085E+00	1.085E+00	32.84
	1764.49	27	15.30	1.122E+00	7.547E-01	7.549E-01	51.87
PB-214	74.82	191	5.80	5.449E+00	2.907E+00	2.908E+00	36.78
	77.11	228	9.70	5.696E+00	1.986E+00	1.987E+00	25.44
	87.09	173	3.41	6.598E+00	3.707E+00	3.709E+00	44.78
	242.00	96	7.25	5.309E+00	1.202E+00	1.202E+00	49.67
	295.22	167	18.42	4.609E+00	9.449E-01	9.452E-01	23.13
	351.93	242	35.60*	4.059E+00	8.049E-01	8.052E-01	19.87
RN-222	609.32	162	45.49*	2.706E+00	6.339E-01	6.341E-01	23.85
	1120.29	55	14.92	1.645E+00	1.085E+00	1.085E+00	32.84
	1764.49	27	15.30	1.122E+00	7.547E-01	7.549E-01	51.87
RA-224	240.99	96	4.10*	5.309E+00	2.125E+00	2.125E+00	49.67
RA-226	609.32	162	45.49*	2.706E+00	6.339E-01	6.341E-01	23.85
	1120.29	55	14.92	1.645E+00	1.085E+00	1.085E+00	32.84
	1764.49	27	15.30	1.122E+00	7.547E-01	7.549E-01	51.87
AC-228	105.21	-----	1.10	7.278E+00	-----	Line Not Found	-----
	338.32	53	11.27	4.177E+00	5.374E-01	5.374E-01	77.38
	794.95	23	4.25	2.196E+00	1.178E+00	1.178E+00	42.64
	835.71	-----	1.61	2.109E+00	-----	Line Not Found	-----
	911.20	65	25.80*	1.963E+00	6.178E-01	6.178E-01	28.85
	968.97	65	15.80	1.865E+00	1.065E+00	1.065E+00	65.95
RA-228	105.21	-----	1.10	7.278E+00	-----	Line Not Found	-----
	338.32	53	11.27	4.177E+00	5.374E-01	5.374E-01	77.38
	794.95	23	4.25	2.196E+00	1.178E+00	1.178E+00	42.64
	835.71	-----	1.61	2.109E+00	-----	Line Not Found	-----
	911.20	65	25.80*	1.963E+00	6.178E-01	6.178E-01	28.85
	968.97	65	15.80	1.865E+00	1.065E+00	1.065E+00	65.95
TH-228	74.82	191	10.28	5.449E+00	1.640E+00	1.640E+00	36.78
	77.11	228	17.10	5.696E+00	1.127E+00	1.127E+00	25.44
	238.63	315	43.60*	5.355E+00	6.491E-01	6.491E-01	16.20

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	300.09	-----	3.30	4.556E+00	-----	Line Not Found	-----
TH-230	609.32	162	45.49*	2.706E+00	6.339E-01	6.339E-01	23.85
	1120.29	55	14.92	1.645E+00	1.085E+00	1.085E+00	32.84
	1764.49	27	15.30	1.122E+00	7.547E-01	7.547E-01	51.87
TH-232	105.21	-----	1.10	7.278E+00	-----	Line Not Found	-----
	338.32	53	11.27	4.177E+00	5.374E-01	5.374E-01	77.38
	835.71	-----	1.61	2.109E+00	-----	Line Not Found	-----
	911.20	65	25.80*	1.963E+00	6.178E-01	6.178E-01	28.85
	968.97	65	15.80	1.865E+00	1.065E+00	1.065E+00	65.95
TH-234	63.29	59	3.70*	3.864E+00	1.977E+00	1.977E+00	89.95
	92.59	79	4.23	6.873E+00	1.308E+00	1.308E+00	65.63
U-234	609.32	162	45.49*	2.706E+00	6.339E-01	6.339E-01	23.85
	1120.29	55	14.92	1.645E+00	1.085E+00	1.085E+00	32.84
	1764.49	27	15.30	1.122E+00	7.547E-01	7.547E-01	51.87
U-238	63.29	59	3.70*	3.864E+00	1.977E+00	1.977E+00	89.95
	92.59	79	4.23	6.873E+00	1.308E+00	1.308E+00	65.63
AM-243	43.53	-----	5.90	8.765E-01	-----	Line Not Found	-----
	74.66	191	67.20*	5.449E+00	2.509E-01	2.509E-01	36.78
ANH-511	511.00	32	100.00*	3.089E+00	5.009E-02	5.009E-02	124.84

Flag: "*" = Keyline

Total number of lines in spectrum 55
 Number of unidentified lines 17
 Number of lines tentatively identified by NID 38 69.09%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	9.815E+00	9.815E+00	1.253E+00	12.77	
ZN-65	244.06D	2.28	7.274E-02	1.661E-01	1.737E-01	104.56	
CD-109	461.40D	1.55	3.417E+00	5.289E+00	2.368E+00	44.78	
SN-126	2.30E+05Y	1.00	3.417E-01	3.417E-01	1.530E-01	44.78	
TL-208	1.41E+10Y	1.00	2.144E-01	2.144E-01	0.684E-01	31.88	
PB-210	22.20Y	1.03	2.264E+00	2.321E+00	4.029E+00	173.62	
BI-211	7.04E+08Y	1.00	2.218E+00	2.218E+00	0.441E+00	19.87	
PB-212	1.41E+10Y	1.00	6.491E-01	6.491E-01	1.051E-01	16.20	
BI-214	1600.00Y	1.00	6.339E-01	6.341E-01	1.512E-01	23.85	
PB-214	1600.00Y	1.00	8.049E-01	8.052E-01	1.600E-01	19.87	
RN-222	1600.00Y	1.00	6.339E-01	6.341E-01	1.512E-01	23.85	
RA-224	1.41E+10Y	1.00	2.125E+00	2.125E+00	1.055E+00	49.67	
RA-226	1600.00Y	1.00	6.339E-01	6.341E-01	1.512E-01	23.85	
AC-228	1.41E+10Y	1.00	6.178E-01	6.178E-01	1.782E-01	28.85	
RA-228	1.41E+10Y	1.00	6.178E-01	6.178E-01	1.782E-01	28.85	
TH-228	1.41E+10Y	1.00	6.491E-01	6.491E-01	1.051E-01	16.20	
TH-230	7.54E+04Y	1.00	6.339E-01	6.339E-01	1.512E-01	23.85	
TH-232	1.41E+10Y	1.00	6.178E-01	6.178E-01	1.782E-01	28.85	
TH-234	4.47E+09Y	1.00	1.977E+00	1.977E+00	1.778E+00	89.95	
U-234	2.45E+05Y	1.00	6.339E-01	6.339E-01	1.512E-01	23.85	
U-238	4.47E+09Y	1.00	1.977E+00	1.977E+00	1.778E+00	89.95	
AM-243	7370.00Y	1.00	2.509E-01	2.509E-01	0.923E-01	36.78	
ANH-511	1.00E+09Y	1.00	5.009E-02	5.009E-02	6.254E-02	124.84	
Total Activity :			3.185E+01	3.387E+01			

Grand Total Activity : 3.185E+01 3.387E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	38.83	15	114	1.24	77.39	76	7	3.09E-03	****	4.25E-01	
0	83.46	47	175	0.58	166.65	163	8	9.97E-03	****	6.28E+00	T
0	129.64	33	62	0.55	259.00	257	6	7.25E-03	96.4	7.32E+00	T
0	186.34	103	132	1.57	372.42	366	13	2.37E-02	56.5	6.29E+00	T
0	198.63	23	113	1.43	397.01	393	9	5.27E-03	****	6.05E+00	T
0	209.02	26	97	0.93	417.78	415	8	6.09E-03	****	5.85E+00	
0	270.33	31	63	0.67	540.41	536	9	7.50E-03	****	4.91E+00	T
2	292.88	21	27	1.49	585.52	584	12	5.14E-03	70.2	4.64E+00	T
0	324.56	14	49	0.91	648.87	644	8	3.35E-03	****	4.31E+00	T
0	463.52	21	23	0.91	926.85	923	9	5.42E-03	94.8	3.32E+00	T
0	624.46	17	10	1.48	1248.79	1245	8	4.55E-03	82.8	2.66E+00	
0	632.85	6	35	2.71	1265.58	1253	16	1.55E-03	****	2.63E+00	T
0	672.50	21	23	6.53	1344.89	1336	17	5.47E-03	****	2.51E+00	
0	728.27	30	27	1.15	1456.45	1449	13	7.85E-03	86.4	2.36E+00	T
0	799.55	7	8	1.45	1599.07	1593	8	1.79E-03	****	2.19E+00	
0	817.17	11	6	2.35	1634.31	1629	11	2.85E-03	****	2.15E+00	T
0	869.21	12	6	0.59	1738.42	1735	8	3.19E-03	93.9	2.04E+00	
0	882.67	6	13	1.22	1765.34	1760	10	1.67E-03	****	2.02E+00	T
0	1002.42	5	27	2.36	2004.93	1993	15	1.31E-03	****	1.81E+00	T
0	1014.04	7	10	0.87	2028.19	2021	10	1.82E-03	****	1.79E+00	
0	1021.51	3	8	0.92	2043.13	2039	6	8.96E-04	****	1.78E+00	T
0	1156.85	5	9	0.50	2313.93	2308	7	1.33E-03	****	1.60E+00	
0	1171.69	10	7	3.36	2343.61	2338	10	2.74E-03	****	1.58E+00	
0	1199.66	5	15	0.57	2399.58	2393	9	1.33E-03	****	1.55E+00	
0	1212.17	10	9	0.61	2424.60	2419	9	2.78E-03	****	1.54E+00	
0	1220.79	7	8	1.46	2441.86	2438	8	1.94E-03	****	1.53E+00	T
0	1239.72	11	8	1.63	2479.73	2475	8	3.06E-03	****	1.51E+00	T
0	1286.97	11	9	4.32	2574.27	2567	11	3.16E-03	****	1.46E+00	
0	1293.60	5	5	1.26	2587.54	2583	6	1.33E-03	****	1.45E+00	
0	1378.36	11	7	0.91	2757.14	2751	10	3.19E-03	****	1.37E+00	
0	1408.55	6	2	1.27	2817.55	2813	7	1.70E-03	****	1.35E+00	T
0	1442.45	7	2	0.54	2885.40	2881	8	1.99E-03	****	1.32E+00	
0	1509.73	13	6	1.10	3020.04	3012	13	3.75E-03	95.0	1.27E+00	
0	1731.04	5	5	1.26	3462.91	3457	7	1.57E-03	****	1.14E+00	

Flags: "T" = Tentatively associated

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235078.CNF;1
* Acquisition date   : 3-OCT-2016 06:48:14 Sensitivity      : 3.000
* Detector ID        : GAM30 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:01.31 Half life ratio : *****
* Sample date        : 17-DEC-2015 12:40:00 Nuclide Library : SOLID
* Sample ID          : G405235078 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity : 1.5607E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 11-MAR-2016 05:58:49 Eff. Geometry  : CAN
* Eff. File           : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.337E-01
ZN-65	7.043E-02
CD-109	5.992E-01
SN-126	3.888E-02
TL-208	1.907E-02
PB-210	1.540E+00
PB-212	3.408E-02
BI-214	3.701E-02
PB-214	4.380E-02
RN-222	3.701E-02
RA-224	3.651E-01
RA-226	3.701E-02
AC-228	8.774E-02
RA-228	8.774E-02
TH-228	3.408E-02
TH-230	3.700E-02
TH-232	8.774E-02
TH-234	6.767E-01
U-234	3.700E-02
U-238	6.767E-01
AM-243	2.958E-02
ANH-511	1.986E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	5.602E+00	NOT IDENT.
NA-22	2.423E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.444E-02	NOT IDENT.
SC-46	2.321E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	4.225E-02	NOT IDENT.
CO-56	2.646E-01	FAIL ABUN

MN-56	0.000E+00	SHORT HLIF
CO-57	3.539E-02	NOT IDENT.
CO-58	3.516E-01	NOT IDENT.
FE-59	4.249E+00	NOT IDENT.
CO-60	1.877E-02	NOT IDENT.
GE-68	1.152E+00	NOT IDENT.
AS-73	5.294E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.259E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.160E-01	NOT IDENT.
KR-85	3.839E+00	NOT IDENT.
SR-85	3.683E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	9.720E-02	NOT IDENT.
Y-91	3.630E+02	NOT IDENT.
NB-94	2.153E-02	NOT IDENT.
NB-95	5.232E-01	NOT IDENT.
NB-95M	1.400E+00	NOT IDENT.
ZR-95	8.476E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.289E-02	FAIL ABUN
RH-102	3.227E-02	NOT IDENT.
RU-103	3.047E+00	FAIL ABUN
RH-106	2.708E-01	NOT IDENT.
RU-106	2.708E-01	NOT IDENT.
AG-108M	1.790E-02	NOT IDENT.
AG-110M	4.470E-02	NOT IDENT.
SN-113	1.418E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	7.414E-02	NOT IDENT.
SB-124	5.797E-01	NOT IDENT.
SB-125	6.237E-02	FAIL ABUN
TE-125M	1.557E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.503E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.838E-02	FAIL ABUN
CS-135	8.430E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
BA-137M	1.870E-02	NOT IDENT.
CS-137	1.976E-02	NOT IDENT.
CE-139	7.889E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.225E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.329E-01	NOT IDENT.
PM-144	3.587E-02	NOT IDENT.
PR-144	3.108E+00	NOT IDENT.
PM-146	2.305E-02	FAIL ABUN
ND-147	0.000E+00	SHORT HLIF
PM-147	6.301E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.579E-02	FAIL ABUN
EU-152	6.669E-02	FAIL ABUN
GD-153	9.971E-02	NOT IDENT.
EU-154	5.874E-02	NOT IDENT.
EU-155	7.492E-02	FAIL ABUN
TB-160	9.372E-01	FAIL ABUN
HO-166M	3.114E-02	NOT IDENT.
TM-171	1.131E+01	NOT IDENT.
HF-172	1.470E-01	FAIL ABUN
LU-172	3.898E-02	FAIL ABUN
LU-176	1.364E-02	FAIL ABUN
HF-181	2.376E+00	NOT IDENT.
TA-182	6.137E-01	FAIL ABUN

RE-183	1.598E+00	NOT IDENT.
RE-184	1.395E+01	NOT IDENT.
W-188	7.786E+01	FAIL ABUN
IR-192	3.031E-01	FAIL ABUN
HG-203	1.478E+00	NOT IDENT.
BI-207	2.285E-02	FAIL ABUN
BI-211	3.091E-01	FAIL ABUN
PB-211	4.500E-01	NOT IDENT.
BI-212	4.465E-01	FAIL ABUN
RN-219	2.255E-01	FAIL ABUN
RA-223	4.365E-01	FAIL ABUN
AC-227	1.350E-01	NOT IDENT.
TH-227	1.350E-01	NOT IDENT.
TH-229	3.036E-01	FAIL ABUN
PA-231	2.731E-01	NOT IDENT.
TH-231	4.365E-01	FAIL ABUN
PA-233	4.161E-02	NOT IDENT.
PA-234	1.901E-01	FAIL ABUN
PA-234M	3.485E+00	FAIL ABUN
U-235	1.239E-01	FAIL ABUN
NP-237	4.161E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	1.554E-01	NOT IDENT.
PU-239	2.118E+02	FAIL ABUN
AM-241	9.113E-02	NOT IDENT.
CM-243	5.681E-02	NOT IDENT.
BK-247	4.414E-02	FAIL ABUN
CM-247	1.984E-02	NOT IDENT.
CF-249	2.404E-02	NOT IDENT.
CF-251	7.557E-02	NOT IDENT.

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G405235078.CNF;1
* Acquisition date   : 3-OCT-2016 06:48:14 Sensitivity       : 3.000
* Detector ID        : GAM30 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:01.31 Half life ratio  : *****
* Sample date        : 17-DEC-2015 12:40:00 Nuclide Library : SOLID
* Sample ID          : G405235078 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity : 1.5607E+02 GRAM
*                   : Quantity Err(%) : 1.2815E-03 %
* Wet wt corr        : 1.00000 Wet Weight       : 0.00000
*                   : Dry Weight       : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 11-MAR-2016 05:58:49 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7
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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	9.815E+00	1.508E+00	1.508E+00
ZN-65	1.661E-01	1.734E-01	1.734E-01
CD-109	3.941E+00	2.380E+00	2.380E+00
SN-126	2.546E-01	1.532E-01	1.532E-01
TL-208	2.144E-01	6.925E-02	6.925E-02
PB-210	2.321E+00	3.953E+00	3.953E+00
PB-212	6.491E-01	1.159E-01	1.159E-01
BI-214	6.341E-01	1.568E-01	1.568E-01
PB-214	8.052E-01	1.703E-01	1.703E-01
RN-222	6.341E-01	1.568E-01	1.568E-01
RA-224	4.540E-01	1.119E+00	1.119E+00
RA-226	6.341E-01	1.568E-01	1.568E-01
AC-228	6.178E-01	1.948E-01	1.948E-01
RA-228	6.178E-01	1.948E-01	1.948E-01
TH-228	6.491E-01	1.159E-01	1.159E-01
TH-230	6.339E-01	1.568E-01	1.568E-01
TH-232	6.178E-01	1.948E-01	1.948E-01
TH-234	1.977E+00	1.798E+00	1.798E+00
U-234	6.339E-01	1.568E-01	1.568E-01
U-238	1.977E+00	1.798E+00	1.798E+00
AM-243	1.694E-01	9.396E-02	9.396E-02
ANH-511	5.009E-02	6.143E-02	6.143E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.176E+00	6.481E+00	6.503E+00	NOT IDENT.
NA-22	-2.631E-03	2.835E-02	2.838E-02	NOT IDENT.
NA-24	1.000E+41	1.385E+41	0.000E+00	SHORT HLIF
AL-26	-4.231E-03	1.907E-02	1.916E-02	NOT IDENT.
SC-46	1.863E-01	2.363E-01	2.508E-01	FAIL ABUN
V-48	-1.344E+03	6.785E+03	6.812E+03	SHORT HLIF
CR-51	-2.545E+02	2.642E+02	2.880E+02	SHORT HLIF
MN-54	-1.007E-03	4.994E-02	4.994E-02	NOT IDENT.

CO-56	2.865E-02	3.063E-01	3.065E-01	FAIL ABUN
MN-56	1.000E+41	1.117E+42	0.000E+00	SHORT HLIF
CO-57	1.973E-02	3.805E-02	3.907E-02	NOT IDENT.
CO-58	1.630E-01	3.817E-01	3.887E-01	NOT IDENT.
FE-59	2.014E+00	4.743E+00	4.829E+00	NOT IDENT.
CO-60	6.653E-03	1.944E-02	1.967E-02	NOT IDENT.
GE-68	-1.030E-01	1.378E+00	1.379E+00	NOT IDENT.
AS-73	6.373E+00	5.285E+00	6.015E+00	NOT IDENT.
AS-74	-7.197E+02	2.564E+03	2.585E+03	SHORT HLIF
SE-75	-1.196E-02	1.508E-01	1.509E-01	NOT IDENT.
BR-77	8.282E+36	6.952E+37	0.000E+00	SHORT HLIF
SR-82	-3.910E+01	3.545E+02	3.550E+02	SHORT HLIF
RB-83	1.385E-01	4.504E-01	4.547E-01	NOT IDENT.
KR-85	1.887E+00	4.409E+00	4.490E+00	NOT IDENT.
SR-85	1.797E-01	4.232E-01	4.309E-01	NOT IDENT.
RB-86	2.407E+03	1.294E+04	1.299E+04	SHORT HLIF
Y-88	-1.435E-01	1.657E-01	1.779E-01	NOT IDENT.
Y-91	1.927E+02	4.060E+02	4.152E+02	NOT IDENT.
NB-94	3.970E-03	2.442E-02	2.449E-02	NOT IDENT.
NB-95	4.956E-02	6.033E-01	6.037E-01	NOT IDENT.
NB-95M	-1.015E+00	1.901E+00	1.955E+00	NOT IDENT.
ZR-95	3.793E-01	9.194E-01	9.351E-01	NOT IDENT.
NB-97	-1.000E+41	7.238E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	6.405E+41	0.000E+00	SHORT HLIF
MO-99	6.912E+30	1.082E+31	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	4.799E+41	0.000E+00	SHORT HLIF
RH-101	2.166E-02	2.565E-02	2.745E-02	FAIL ABUN
RH-102	8.932E-03	3.901E-02	3.922E-02	NOT IDENT.
RU-103	-7.143E-01	3.530E+00	3.545E+00	FAIL ABUN
RH-106	4.069E-02	3.362E-01	3.367E-01	NOT IDENT.
RU-106	4.069E-02	3.362E-01	3.367E-01	NOT IDENT.
AG-108M	8.300E-03	1.879E-02	1.916E-02	NOT IDENT.
AG-110M	-7.034E-02	8.252E-02	8.840E-02	NOT IDENT.
SN-113	2.053E-02	1.539E-01	1.541E-01	NOT IDENT.
CD-115	-7.301E+37	1.200E+38	0.000E+00	SHORT HLIF
SN-117M	-4.269E+04	4.607E+04	4.993E+04	SHORT HLIF
TE-123M	-9.552E-02	9.507E-02	1.044E-01	NOT IDENT.
SB-124	-2.323E-01	8.247E-01	8.313E-01	NOT IDENT.
SB-125	-2.694E-02	7.294E-02	7.394E-02	FAIL ABUN
TE-125M	-9.698E+01	1.855E+02	1.906E+02	NOT IDENT.
I-126	3.887E+05	3.696E+05	4.090E+05	SHORT HLIF
SB-126	-7.254E+04	5.650E+05	5.659E+05	SHORT HLIF
SB-127	-1.667E+21	3.815E+21	0.000E+00	SHORT HLIF
I-131	5.672E+08	1.586E+09	1.606E+09	SHORT HLIF
I-132	-1.000E+41	1.821E+42	0.000E+00	SHORT HLIF
TE-132	-9.298E+24	4.242E+25	0.000E+00	SHORT HLIF
BA-133	-8.116E-03	3.172E-02	3.193E-02	NOT IDENT.
I-133	1.000E+41	1.217E+42	0.000E+00	SHORT HLIF
CS-134	7.645E-02	3.298E-02	4.770E-02	FAIL ABUN
CS-135	4.547E-02	1.006E-01	1.027E-01	NOT IDENT.
I-135	1.000E+41	9.651E+41	0.000E+00	SHORT HLIF
CS-136	6.714E+04	1.395E+05	1.427E+05	SHORT HLIF
BA-137M	1.134E-02	1.931E-02	1.998E-02	NOT IDENT.
CS-137	1.198E-02	2.040E-02	2.110E-02	NOT IDENT.
CE-139	9.951E-02	8.324E-02	9.456E-02	NOT IDENT.
BA-140	-4.959E+05	5.683E+05	6.107E+05	SHORT HLIF
LA-140	1.408E+05	2.074E+05	2.169E+05	SHORT HLIF
CE-141	-2.798E+00	1.418E+01	1.424E+01	NOT IDENT.
CE-143	1.000E+41	6.985E+40	0.000E+00	SHORT HLIF
CE-144	2.731E-02	2.591E-01	2.594E-01	NOT IDENT.
PM-144	-8.166E-03	4.170E-02	4.186E-02	NOT IDENT.
PR-144	-6.821E-01	3.609E+00	3.622E+00	NOT IDENT.
PM-146	-1.093E-02	2.748E-02	2.791E-02	FAIL ABUN
ND-147	-5.260E+04	1.091E+07	1.091E+07	SHORT HLIF
PM-147	5.975E+02	6.571E+02	7.102E+02	NOT IDENT.
PM-149	1.474E+38	2.113E+39	0.000E+00	SHORT HLIF
EU-150	2.492E-03	1.868E-02	1.872E-02	FAIL ABUN
EU-152	5.074E-02	6.759E-02	7.136E-02	FAIL ABUN
GD-153	-6.355E-02	1.177E-01	1.211E-01	NOT IDENT.
EU-154	-8.478E-03	6.928E-02	6.939E-02	NOT IDENT.
EU-155	6.282E-02	7.794E-02	8.293E-02	FAIL ABUN
TB-160	3.852E-01	1.117E+00	1.130E+00	FAIL ABUN
HO-166M	-4.039E-02	4.359E-02	4.724E-02	NOT IDENT.
TM-171	-1.457E+01	1.348E+01	1.499E+01	NOT IDENT.
HF-172	-5.288E-02	1.703E-01	1.720E-01	FAIL ABUN
LU-172	-4.014E-03	4.829E-02	4.833E-02	FAIL ABUN
LU-176	-1.292E-02	1.843E-02	1.933E-02	FAIL ABUN
HF-181	3.400E-01	2.616E+00	2.620E+00	NOT IDENT.

TA-182	4.702E-01	7.343E-01	7.643E-01	FAIL ABUN
RE-183	-6.013E-01	1.770E+00	1.790E+00	NOT IDENT.
RE-184	-2.243E+00	1.709E+01	1.712E+01	NOT IDENT.
W-188	4.427E+01	9.476E+01	9.684E+01	FAIL ABUN
IR-192	1.420E-01	3.147E-01	3.212E-01	FAIL ABUN
HG-203	1.478E-01	1.741E+00	1.742E+00	NOT IDENT.
BI-207	-2.272E-02	3.394E-02	3.545E-02	FAIL ABUN
BI-211	2.218E+00	4.704E-01	1.105E+00	FAIL ABUN
PB-211	1.003E-01	4.857E-01	4.878E-01	NOT IDENT.
BI-212	9.066E-01	7.728E-01	8.742E-01	FAIL ABUN
RN-219	-1.700E-02	2.515E-01	2.516E-01	FAIL ABUN
RA-223	3.853E-01	7.401E-01	7.602E-01	FAIL ABUN
AC-227	-1.940E-02	1.623E-01	1.625E-01	NOT IDENT.
TH-227	-1.940E-02	1.623E-01	1.625E-01	NOT IDENT.
TH-229	-2.685E-01	3.803E-01	3.991E-01	FAIL ABUN
PA-231	1.333E-02	3.252E-01	3.252E-01	NOT IDENT.
TH-231	3.853E-01	7.401E-01	7.602E-01	FAIL ABUN
PA-233	1.786E-02	4.332E-02	4.406E-02	NOT IDENT.
PA-234	9.735E-02	2.354E-01	2.394E-01	FAIL ABUN
PA-234M	1.506E+00	7.329E+00	7.361E+00	FAIL ABUN
U-235	3.018E-02	1.378E-01	1.384E-01	FAIL ABUN
NP-237	1.786E-02	4.332E-02	4.406E-02	NOT IDENT.
NP-238	-2.272E+39	1.757E+40	0.000E+00	SHORT HLIF
NP-239	-1.500E-02	1.752E-01	1.753E-01	NOT IDENT.
PU-239	3.395E+02	3.216E+02	3.562E+02	FAIL ABUN
AM-241	1.034E-01	9.569E-02	1.064E-01	NOT IDENT.
CM-243	-7.011E-02	7.017E-02	7.696E-02	NOT IDENT.
BK-247	-1.690E-02	5.479E-02	5.532E-02	FAIL ABUN
CM-247	-9.582E-03	2.330E-02	2.370E-02	NOT IDENT.
CF-249	-1.732E-03	2.671E-02	2.672E-02	NOT IDENT.
CF-251	-2.684E-02	8.977E-02	9.058E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	39.5407	87.09	60.4024	136.47	61.2992
45.60	44.7008	87.57	60.4472	140.51	0.0000
46.54	41.9982	88.03	60.4903	143.76	54.2213
49.72	0.0000	88.34	60.5191	144.24	61.8463
51.35	50.9409	88.47	60.5315	145.44	54.3236
51.87	59.4977	89.96	60.6697	152.43	55.8373
52.39	69.9641	1093.63	60.7324	153.25	0.0000
52.97	50.1713	91.11	0.0000	323.87	46.0721
53.44	42.6407	92.59	73.0937	156.02	0.0000
54.07	48.3903	93.35	73.1766	158.56	0.0000
57.36	0.0000	94.56	47.5144	159.00	63.9482
57.53	59.2475	94.65	47.5208	162.33	55.3192
57.98	65.0397	94.67	47.5222	162.66	0.0000
59.27	46.0287	94.87	55.6852	163.33	56.4840
59.32	46.0333	97.43	60.3247	165.86	41.0853
59.54	51.1702	98.43	59.3877	176.31	46.0061
60.96	61.5757	98.44	59.3886	176.60	0.0000
61.17	61.6008	99.53	62.5581	177.52	56.1714
62.93	62.7756	100.11	54.3987	181.07	0.0000
63.29	62.8187	102.03	56.6050	181.52	46.6154
63.58	62.8532	103.18	63.9124	184.41	59.9388
64.28	62.9365	103.37	70.1162	143.76	60.0132
66.73	58.3607	105.21	53.7551	193.51	62.7335
67.24	55.8194	105.31	53.7627	197.03	59.5029
125.81	60.4111	106.12	53.8226	198.01	52.6842
67.75	60.4187	106.47	47.6351	201.83	42.9058
69.67	78.2312	109.28	67.5676	203.43	43.7340
70.83	64.0209	111.00	68.7654	205.31	43.0385
72.81	89.1552	111.76	0.0000	210.85	60.2385
72.87	89.1642	114.06	62.7667	215.65	46.5295
74.66	77.9320	116.30	0.0000	222.11	40.9371
74.82	77.9531	116.74	58.7869	227.09	39.9325
74.97	77.9730	119.76	65.3372	227.38	48.1657
77.11	78.2568	121.12	58.0598	228.16	0.0000
78.74	78.1391	121.22	58.0674	228.18	44.6710
79.69	77.5983	121.78	64.4472	116.74	44.6710
80.12	65.7064	122.06	65.5269	235.69	53.6182
80.19	0.0000	122.92	63.4813	235.96	53.6300
80.57	77.7108	123.07	66.6679	238.63	45.0508
81.00	79.7589	265.00	66.7183	238.98	0.0000
81.07	79.7681	125.81	63.7083	240.99	45.1354
81.75	70.5400	127.23	45.3825	242.00	45.1714
83.79	73.4419	127.91	58.1947	244.70	45.2676
84.00	73.4665	129.30	65.4016	252.40	0.0000
85.43	64.2617	131.20	54.1503	252.80	35.9628
86.55	60.3516	133.02	55.6959	254.15	0.0000
86.79	60.3740	133.52	53.5858	256.23	32.4514
86.94	60.3882	136.00	63.4149	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	35.0774	355.39	0.0000	584.27	15.3672
264.80	36.2906	356.01	29.5684	595.83	0.0000
265.00	36.2961	364.49	0.0000	427.87	16.4390
268.22	24.2548	366.42	0.0000	602.52	0.0000
269.46	37.6289	372.51	29.4263	604.72	18.8882
270.03	37.6450	375.05	29.4698	607.14	29.0881
271.23	40.5141	377.52	25.1720	609.32	15.5273
273.65	0.0000	356.01	22.6506	610.33	15.5339
276.40	43.9200	388.16	27.0727	614.28	10.2103
277.37	34.1831	388.63	0.0000	618.01	16.5559
277.60	40.2943	391.69	24.5011	620.36	13.1594
278.00	47.6348	264.66	23.7448	621.93	11.7051
279.20	40.3406	401.81	22.8801	630.19	0.0000
279.54	40.3507	402.40	25.5284	631.29	10.2800
279.70	44.0233	404.85	25.5626	633.25	10.2881
280.46	39.1533	410.95	24.7638	634.78	0.0000
283.69	39.2432	413.71	24.8008	635.95	10.2988
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	27.0126	423.72	0.0000	645.85	15.7546
285.90	0.0000	427.09	32.1160	657.76	9.8922
287.50	40.5783	427.87	25.8818	657.90	0.0000
290.67	37.7933	433.94	17.9065	661.66	7.9255
293.27	0.0000	439.40	26.9360	664.57	0.0000
351.93	45.7419	453.88	19.9004	666.33	0.0000
295.96	45.7656	463.37	15.4509	666.50	0.0000
879.38	42.9557	468.07	13.6649	667.71	0.0000
299.98	31.4208	473.00	0.0000	677.62	22.4258
300.09	31.4231	475.06	10.9695	685.70	0.0000
300.13	29.7700	476.78	20.1277	695.00	0.0000
301.36	31.0364	477.60	15.5595	696.49	17.0636
302.85	34.7958	482.18	19.2632	696.51	17.0636
256.23	23.6381	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	13.0524
306.78	34.8881	497.08	22.1729	697.49	14.0575
308.46	27.4429	505.52	30.0527	702.65	17.1017
311.90	30.0066	507.63	0.0000	706.68	22.1647
316.51	30.0974	511.00	27.8976	711.68	23.2143
319.41	0.0000	514.00	12.5711	720.70	0.0000
320.08	0.0000	514.00	12.5711	721.93	0.0000
321.04	27.6712	520.40	18.6792	722.78	21.2803
323.87	30.2417	520.69	0.0000	722.91	19.7610
325.23	39.0972	522.65	0.0000	723.31	19.7642
328.76	0.0000	527.90	0.0000	724.19	21.2914
333.37	35.4973	528.26	15.9340	727.33	15.2246
333.97	26.6326	529.59	15.9437	733.00	13.7302
334.37	25.3711	529.87	0.0000	735.93	17.3078
338.28	29.6722	531.02	0.0000	333.97	12.2236
338.32	29.6730	537.26	0.0000	739.50	0.0000
311.90	29.2884	546.56	0.0000	747.24	13.2878
340.48	29.2884	552.55	14.2120	748.06	9.2018
340.55	0.0000	563.25	20.9419	752.31	13.3110
344.28	24.6776	569.33	18.1333	753.82	0.0000
345.93	28.1096	946.00	19.0894	756.73	11.2806
351.06	29.0527	569.70	19.0910	756.80	16.4089
351.93	29.0680	583.19	15.3600	884.68	18.5054

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	18.5171	1274.44	9.9412	1620.50	3.8220
766.42	21.6075	1001.03	9.9543	1621.92	4.7791
766.84	15.4364	1002.74	13.2788	1678.03	0.0000
772.60	0.0000	1004.73	9.9646	1690.97	1.9364
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	2.9434
778.90	8.2666	1028.54	0.0000	1063.66	10.8033
783.70	0.0000	1037.84	11.1727	1771.35	4.9115
785.37	10.3556	1038.76	0.0000	1791.20	0.0000
792.07	7.7841	631.29	6.7197	1808.65	2.9663
794.95	9.3501	1048.07	0.0000	1810.72	0.0000
795.86	0.0000	1049.04	12.3276	1836.06	5.9608
810.06	13.5734	1050.41	6.7266		
810.29	14.6187	1063.66	12.3759		
344.28	12.5308	1077.00	0.0000		
810.76	10.4431	1077.34	5.6458		
815.77	0.0000	1085.87	9.0534		
1048.07	0.0000	1093.63	7.9377		
832.01	18.9280	1099.45	10.2209		
834.85	16.8405	1112.07	3.4180		
835.71	15.7922	1112.84	3.4187		
836.80	0.0000	1115.54	5.1317		
846.75	0.0000	1120.29	1.7126		
846.77	11.6217	1120.55	1.7128		
856.80	0.0000	1221.41	1.7130		
860.56	6.3667	1129.67	6.8667		
871.09	11.1785	1131.51	0.0000		
873.19	4.7939	1147.95	0.0000		
875.33	0.0000	1173.23	12.1483		
879.38	6.4041	1177.95	12.7420		
880.51	9.6094	1189.05	20.9063		
883.24	8.0145	1204.77	11.6593		
884.68	16.0364	1221.41	12.6422		
889.28	6.4236	1231.02	15.8390		
894.76	9.6515	1235.36	0.0000		
898.04	5.3672	1238.28	12.6932		
900.72	9.6687	1260.41	0.0000		
903.28	10.7515	1271.87	7.9953		
911.20	15.0881	1274.44	7.1113		
912.08	15.0920	1274.54	7.1113		
923.98	0.0000	1291.59	9.5189		
926.50	10.8264	1298.22	0.0000		
929.11	10.8346	1312.11	0.0000		
937.49	19.5505	1332.49	2.7019		
944.13	0.0000	1362.66	0.0000		
946.00	9.7994	1365.19	8.1645		
949.00	17.4368	1368.63	0.0000		
667.71	0.0000	1384.29	10.0204		
962.31	13.1279	1408.01	5.4935		
964.08	9.8511	1457.56	0.0000		
966.17	9.8569	1460.82	8.3320		
911.20	9.8646	1489.16	4.6558		
968.97	9.8646	1505.03	4.4839		
983.53	0.0000	1584.12	4.7443		
984.45	0.0000	1596.21	0.0000		

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621364.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM02.CNF;493
Background date : 2-OCT-2016 11:00:01.
Sample date     : 12-SEP-2016 00:00:00 Acquisition date : 3-OCT-2016 06:55:01.
Sample ID      : G1203621364 Sample quantity   : 1.74637E+02 GRAM
Detector name  : GAM02 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.17 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1596254 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	53.79	24	53	1.11	107.10	103	9	6.76E-03	57.2	
2	0	85.37*	24	75	1.88	170.21	165	11	6.57E-03	78.1	
3	0	92.58*	10	73	1.20	184.61	179	12	2.65E-03	217.2	
4	0	126.60	40	50	1.41	252.59	248	13	1.10E-02	39.9	
5	0	185.88*	11	63	1.19	371.05	366	12	3.14E-03	165.0	
6	0	218.78*	18	35	2.42	436.78	429	11	5.02E-03	70.2	
7	0	239.41*	9	39	2.62	478.02	472	10	2.57E-03	139.6	
8	0	244.18	27	23	2.46	487.54	483	10	7.57E-03	38.9	
9	0	482.44	15	9	1.69	963.68	959	10	4.17E-03	46.7	
10	0	555.89	25	5	3.51	1110.45	1103	17	7.05E-03	27.3	
11	0	566.80	20	16	6.77	1132.26	1123	17	5.51E-03	52.5	
12	0	575.39	14	15	0.97	1149.43	1144	10	3.89E-03	58.2	
13	0	611.24	29	26	6.00	1221.07	1209	21	8.04E-03	48.0	
14	4	660.51	17	3	2.58	1319.55	1315	14	4.71E-03	27.1	3.90E-01
15	4	664.00*	4	0	1.53	1326.50	1315	14	1.09E-03	110.8	
16	0	910.83*	15	0	1.99	1819.81	1813	13	4.12E-03	33.4	
17	0	1000.98*	13	6	2.46	1999.99	1994	13	3.50E-03	56.0	
18	0	1382.40	5	3	0.93	2762.36	2755	10	1.25E-03	80.9	
19	0	1460.22*	1	0	0.67	2917.92	2913	9	4.15E-04	259.9	

Flag: "*" = Peak area was modified by background subtraction

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621364.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4
Sample title : MXR1
Sample date : 12-SEP-2016 00:00:00 Acquisition date : 3-OCT-2016 06:55:01
Sample ID : G1203621364 Sample quantity : 174.64 GRAM
Sample type : SOLID Sample geometry :
Detector name : GAMMA2 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.17 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type : Linear Efficiencies at : Peak Energy
Abundance limit : 75.00

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	1	10.66*	1.060E+00	5.571E-02	5.571E-02	519.84
AS-73	53.44	36	10.30*	1.313E+00	1.138E+00	1.367E+00	114.35
BA-137M	661.66	19	89.90*	2.018E+00	4.413E-02	4.419E-02	54.10
CS-137	661.66	19	85.10*	2.018E+00	4.662E-02	4.668E-02	54.10

Flag: "*" = Keyline

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621364.CNF;1
* Acquisition date   : 3-OCT-2016 06:55:01 Sensitivity      : 3.000
* Detector ID        : GAM02 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.17 Half life ratio  : *****
* Sample date        : 12-SEP-2016 00:00:00 Analyst initials: MXR1
* Sample ID          : G1203621364 Sample Quantity : 1.7464E+02 GRAM
* Batch Number       : 1596254 Wet Weight      : 0.00000
* Wet wt corr        : 1.00000 Dry Weight       : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 22-AUG-2016 09:02:05 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.571E-02	2.838E-01	5.964E-01
AS-73	1.367E+00	1.532E+00	1.282E+00
BA-137M	4.419E-02	2.343E-02	4.262E-02
CS-137	4.668E-02	2.475E-02	4.502E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.944E-02		2.159E-01	3.844E-01	NOT IDENT.
NA-22	-4.508E-03		1.684E-02	3.476E-02	NOT IDENT.
NA-24	0.000E+00		5.025E+08	0.000E+00	SHORT HLIF
AL-26	-4.778E-03		9.364E-03	1.347E-02	NOT IDENT.
SC-46	-8.785E-03		2.712E-02	4.877E-02	NOT IDENT.
V-48	1.598E-03		5.024E-02	1.083E-01	NOT IDENT.
CR-51	4.440E-02		2.606E-01	5.402E-01	NOT IDENT.
MN-54	-3.990E-03		1.463E-02	3.087E-02	NOT IDENT.
CO-56	-1.689E-02		2.526E-02	4.591E-02	NOT IDENT.
MN-56	0.000E+00		1.496E+41	0.000E+00	SHORT HLIF
CO-57	1.058E-02		1.374E-02	2.804E-02	NOT IDENT.
CO-58	5.046E-03		2.303E-02	5.153E-02	NOT IDENT.
FE-59	9.143E-03		3.568E-02	8.935E-02	NOT IDENT.
CO-60	-7.938E-03		1.965E-02	3.736E-02	NOT IDENT.
ZN-65	2.152E-02		4.921E-02	1.123E-01	NOT IDENT.
GE-68	-3.180E-01		4.597E-01	7.795E-01	NOT IDENT.
AS-74	2.008E-02		7.774E-02	1.608E-01	NOT IDENT.
SE-75	-1.662E-02		2.789E-02	5.295E-02	NOT IDENT.
BR-77	2.297E+01		6.285E+01	6.937E+01	FAIL ABUN
SR-82	1.660E-02		1.735E-01	3.976E-01	NOT IDENT.
RB-83	1.264E-02		4.998E-02	1.034E-01	NOT IDENT.
KR-85	-9.343E+00		6.934E+00	1.095E+01	NOT IDENT.
SR-85	-5.290E-02		3.921E-02	6.190E-02	NOT IDENT.
RB-86	-2.477E-01		3.582E-01	6.074E-01	NOT IDENT.
Y-88	1.174E-02		2.253E-02	6.267E-02	NOT IDENT.
Y-91	1.026E+00		1.020E+01	2.255E+01	NOT IDENT.

NB-94	-2.243E-03	1.561E-02	3.332E-02	NOT IDENT.
NB-95	-2.880E-02	3.063E-02	5.404E-02	NOT IDENT.
NB-95M	-2.465E-02	7.095E-02	1.247E-01	NOT IDENT.
ZR-95	9.647E-03	4.518E-02	9.951E-02	NOT IDENT.
NB-97	0.000E+00	1.365E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	6.639E+08	0.000E+00	SHORT HLIF
MO-99	-1.288E+01	3.078E+01	6.091E+01	NOT IDENT.
TC-99M	0.000E+00	4.814E+23	0.000E+00	SHORT HLIF
RH-101	0.000E+00	4.315E-02	3.057E-02	FAIL ABUN
RH-102	5.788E-03	3.376E-02	6.982E-02	NOT IDENT.
RU-103	-9.283E-04	2.500E-02	5.063E-02	FAIL ABUN
RH-106	-8.160E-02	2.320E-01	4.232E-01	NOT IDENT.
RU-106	-8.160E-02	2.320E-01	4.232E-01	NOT IDENT.
AG-108M	2.689E-03	1.834E-02	3.780E-02	NOT IDENT.
CD-109	9.285E-02	4.402E-01	7.512E-01	NOT IDENT.
AG-110M	-1.087E-02	3.257E-02	6.360E-02	NOT IDENT.
SN-113	-1.084E-02	2.703E-02	5.139E-02	NOT IDENT.
CD-115	-4.043E+01	4.939E+01	8.276E+01	NOT IDENT.
SN-117M	1.480E-02	4.053E-02	8.772E-02	NOT IDENT.
TE-123M	3.055E-03	1.580E-02	3.373E-02	NOT IDENT.
SB-124	6.791E-04	3.352E-02	9.229E-02	NOT IDENT.
SB-125	-5.414E-02	5.975E-02	1.019E-01	NOT IDENT.
TE-125M	1.756E+00	6.155E+00	1.242E+01	NOT IDENT.
I-126	-1.494E-01	1.936E-01	2.883E-01	NOT IDENT.
SB-126	2.213E-02	1.246E-01	2.701E-01	NOT IDENT.
SN-126	9.987E-04	4.565E-02	7.451E-02	NOT IDENT.
SB-127	-9.483E-01	2.105E+00	4.163E+00	NOT IDENT.
I-131	5.333E-03	1.312E-01	2.645E-01	NOT IDENT.
I-132	0.000E+00	1.745E+41	0.000E+00	SHORT HLIF
TE-132	-6.675E-01	1.553E+00	2.964E+00	NOT IDENT.
BA-133	2.143E-02	2.558E-02	5.727E-02	NOT IDENT.
I-133	0.000E+00	4.615E+05	0.000E+00	SHORT HLIF
CS-134	-5.021E-03	1.741E-02	3.630E-02	NOT IDENT.
CS-135	-1.516E-02	8.665E-02	1.737E-01	NOT IDENT.
I-135	0.000E+00	1.943E+22	0.000E+00	SHORT HLIF
CS-136	7.948E-02	7.613E-02	1.998E-01	NOT IDENT.
CE-139	1.834E-03	1.473E-02	3.155E-02	NOT IDENT.
BA-140	-9.229E-02	2.571E-01	4.764E-01	NOT IDENT.
LA-140	2.136E-03	5.539E-02	1.376E-01	NOT IDENT.
CE-141	-1.843E-02	4.280E-02	7.725E-02	NOT IDENT.
CE-143	0.000E+00	1.625E+03	0.000E+00	SHORT HLIF
CE-144	9.747E-02	1.132E-01	2.405E-01	NOT IDENT.
PM-144	1.822E-02	1.935E-02	4.752E-02	NOT IDENT.
PR-144	1.382E+00	1.456E+00	3.577E+00	NOT IDENT.
PM-146	9.452E-03	2.874E-02	5.992E-02	NOT IDENT.
ND-147	2.564E-01	4.965E-01	1.096E+00	FAIL ABUN
PM-147	-1.001E+01	3.947E+02	7.706E+02	NOT IDENT.
PM-149	1.498E+02	3.454E+02	7.473E+02	NOT IDENT.
EU-150	1.793E-03	1.562E-02	3.223E-02	NOT IDENT.
EU-152	-4.121E-04	5.423E-02	1.107E-01	FAIL ABUN
GD-153	-4.494E-02	5.592E-02	9.311E-02	NOT IDENT.
EU-154	-1.273E-02	4.756E-02	9.819E-02	NOT IDENT.
EU-155	-2.994E-03	6.585E-02	1.279E-01	FAIL ABUN
TB-160	-4.000E-02	7.773E-02	1.472E-01	FAIL ABUN
HO-166M	4.181E-03	3.140E-02	6.974E-02	FAIL ABUN
TM-171	2.546E+01	2.853E+01	2.737E+01	FAIL ABUN
HF-172	0.000E+00	2.621E-01	2.176E-01	FAIL ABUN
LU-172	-1.072E-02	2.064E-02	3.900E-02	FAIL ABUN
LU-176	-1.089E-02	1.551E-02	2.863E-02	NOT IDENT.
HF-181	4.972E-02	4.547E-02	7.250E-02	FAIL ABUN
TA-182	-4.503E-03	9.393E-02	1.967E-01	NOT IDENT.
RE-183	3.777E-02	1.412E-01	2.799E-01	NOT IDENT.
RE-184	3.720E-02	6.880E-02	1.661E-01	NOT IDENT.
W-188	1.050E+00	4.274E+00	9.014E+00	NOT IDENT.
IR-192	-5.557E-03	2.218E-02	4.359E-02	NOT IDENT.
HG-203	-3.079E-03	2.066E-02	4.202E-02	NOT IDENT.
BI-207	-1.719E-02	2.621E-02	4.620E-02	NOT IDENT.
TL-208	6.255E-03	2.809E-02	5.788E-02	NOT IDENT.
PB-210	1.250E+00	3.459E+00	7.256E+00	NOT IDENT.
BI-211	-5.828E-02	1.288E-01	2.483E-01	NOT IDENT.
PB-211	7.507E-02	3.971E-01	8.341E-01	NOT IDENT.
BI-212	-4.815E-03	3.432E-01	7.092E-01	NOT IDENT.
PB-212	2.434E-02	6.659E-02	7.129E-02	FAIL ABUN
BI-214	-1.398E-02	6.002E-02	1.156E-01	NOT IDENT.
PB-214	-3.079E-02	4.849E-02	9.083E-02	NOT IDENT.
RN-219	-1.144E-01	2.448E-01	4.581E-01	NOT IDENT.
RN-222	-1.398E-02	6.002E-02	1.156E-01	NOT IDENT.
RA-223	-2.105E-01	3.769E-01	7.078E-01	NOT IDENT.

RA-224	3.746E-02	4.015E-01	6.127E-01	NOT IDENT.
RA-226	-1.398E-02	6.002E-02	1.156E-01	NOT IDENT.
AC-227	1.090E-01	1.355E-01	3.049E-01	NOT IDENT.
TH-227	1.090E-01	1.355E-01	3.049E-01	NOT IDENT.
AC-228	1.660E-01	1.087E-01	2.516E-01	FAIL ABUN
RA-228	1.660E-01	1.087E-01	2.516E-01	FAIL ABUN
TH-228	2.434E-02	6.659E-02	7.129E-02	FAIL ABUN
TH-229	-1.260E-01	2.962E-01	5.874E-01	FAIL ABUN
TH-230	-1.398E-02	6.001E-02	1.156E-01	NOT IDENT.
PA-231	-1.423E-01	2.615E-01	4.959E-01	NOT IDENT.
TH-231	-2.105E-01	3.769E-01	7.078E-01	NOT IDENT.
TH-232	1.660E-01	1.087E-01	2.516E-01	FAIL ABUN
PA-233	-3.820E-02	3.686E-02	6.412E-02	NOT IDENT.
PA-234	-1.267E-02	1.402E-01	3.026E-01	NOT IDENT.
PA-234M	4.606E+00	5.059E+00	8.723E+00	FAIL ABUN
TH-234	-9.082E-01	9.504E-01	1.996E+00	FAIL ABUN
U-234	-1.398E-02	6.001E-02	1.156E-01	NOT IDENT.
U-235	-6.055E-02	1.285E-01	2.365E-01	FAIL ABUN
NP-237	-3.820E-02	3.686E-02	6.412E-02	NOT IDENT.
NP-238	0.000E+00	8.274E+01	0.000E+00	SHORT HLIF
U-238	-9.082E-01	9.504E-01	1.996E+00	FAIL ABUN
NP-239	1.615E-03	1.228E-01	2.451E-01	NOT IDENT.
PU-239	9.747E+01	1.808E+02	3.746E+02	NOT IDENT.
AM-241	-6.373E-02	9.264E-02	1.745E-01	NOT IDENT.
AM-243	-4.628E-02	3.630E-02	6.950E-02	NOT IDENT.
CM-243	3.671E-02	6.795E-02	1.401E-01	NOT IDENT.
BK-247	-1.837E-02	4.828E-02	9.417E-02	FAIL ABUN
CM-247	-7.784E-03	2.082E-02	3.980E-02	NOT IDENT.
CF-249	1.665E-02	2.173E-02	4.970E-02	NOT IDENT.
CF-251	-7.601E-02	6.884E-02	1.277E-01	NOT IDENT.
ANH-511	-5.082E-02	3.543E-02	7.581E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	1	10.66*	1.060E+00	5.571E-02	5.571E-02	519.84
AS-73	53.44	36	10.30*	1.313E+00	1.138E+00	1.367E+00	114.35
BA-137M	661.66	19	89.90*	2.018E+00	4.413E-02	4.419E-02	54.10
CS-137	661.66	19	85.10*	2.018E+00	4.662E-02	4.668E-02	54.10

Flag: "*" = Keyline

Total number of lines in spectrum 19
 Number of unidentified lines 5
 Number of lines tentatively identified by NID 14 73.68%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.571E-02	5.571E-02	28.96E-02	519.84	
AS-73	80.30D	1.20	1.138E+00	1.367E+00	1.564E+00	114.35	
BA-137M	30.08Y	1.00	4.413E-02	4.419E-02	2.391E-02	54.10	
CS-137	30.08Y	1.00	4.662E-02	4.668E-02	2.526E-02	54.10	
Total Activity :			1.284E+00	1.514E+00			

Grand Total Activity : 1.284E+00 1.514E+00

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	85.37	33	105	1.88	170.21	165	11	6.57E-03	****	4.71E+00	T
0	92.58	13	101	1.20	184.61	179	12	2.65E-03	****	5.20E+00	T
0	126.60	53	68	1.41	252.59	248	13	1.10E-02	79.7	6.16E+00	T
0	185.88	15	80	1.19	371.05	366	12	3.14E-03	****	5.56E+00	T
0	218.78	23	45	2.42	436.78	429	11	5.02E-03	****	5.01E+00	
0	239.41	12	49	2.62	478.02	472	10	2.57E-03	****	4.69E+00	T
0	244.18	34	28	2.46	487.54	483	10	7.57E-03	77.9	4.62E+00	T
0	482.44	17	10	1.69	963.68	959	10	4.17E-03	93.3	2.61E+00	T
0	555.89	28	5	3.51	1110.45	1103	17	7.05E-03	54.7	2.32E+00	
0	566.80	22	18	6.77	1132.26	1123	17	5.51E-03	****	2.29E+00	
0	575.39	16	17	0.97	1149.43	1144	10	3.89E-03	****	2.26E+00	
0	611.24	32	29	6.00	1221.07	1209	21	8.04E-03	96.0	2.15E+00	T
4	664.00	4	0	1.53	1326.50	1315	14	1.09E-03	****	2.01E+00	T
0	910.83	16	0	1.99	1819.81	1813	13	4.12E-03	66.8	1.56E+00	T
0	1000.98	13	7	2.46	1999.99	1994	13	3.50E-03	****	1.45E+00	T
0	1382.40	4	2	0.93	2762.36	2755	10	1.25E-03	****	1.11E+00	

Flags: "T" = Tentatively associated

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621364.CNF;1
* Acquisition date   : 3-OCT-2016 06:55:01 Sensitivity      : 3.000
* Detector ID        : GAM02 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.17 Half life ratio : *****
* Sample date        : 12-SEP-2016 00:00:00 Nuclide Library : SOLID
* Sample ID          : G1203621364 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity : 1.7464E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date     : 22-AUG-2016 09:02:05 Eff. Geometry : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;15
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.460E-01
AS-73	5.810E-01
BA-137M	1.796E-02
CS-137	1.897E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.628E-01	NOT IDENT.
NA-22	1.232E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	0.000E+00	NOT IDENT.
SC-46	1.989E-02	NOT IDENT.
V-48	4.387E-02	NOT IDENT.
CR-51	2.413E-01	NOT IDENT.
MN-54	1.167E-02	NOT IDENT.
CO-56	1.855E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	1.273E-02	NOT IDENT.
CO-58	2.141E-02	NOT IDENT.
FE-59	3.373E-02	NOT IDENT.
CO-60	1.348E-02	NOT IDENT.
ZN-65	4.674E-02	NOT IDENT.
GE-68	2.464E-01	NOT IDENT.
AS-74	6.962E-02	NOT IDENT.
SE-75	2.371E-02	NOT IDENT.
BR-77	3.180E+01	FAIL ABUN
SR-82	1.584E-01	NOT IDENT.
RB-83	4.516E-02	NOT IDENT.
KR-85	4.905E+00	NOT IDENT.
SR-85	2.773E-02	NOT IDENT.
RB-86	1.920E-01	NOT IDENT.
Y-88	2.346E-02	NOT IDENT.
Y-91	8.915E+00	NOT IDENT.
NB-94	1.350E-02	NOT IDENT.

NB-95	2.278E-02	NOT IDENT.
NB-95M	5.565E-02	NOT IDENT.
ZR-95	4.204E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	2.462E+01	NOT IDENT.
TC-99M	0.000E+00	SHORT HLIF
RH-101	1.374E-02	FAIL ABUN
RH-102	2.968E-02	NOT IDENT.
RU-103	2.147E-02	FAIL ABUN
RH-106	1.816E-01	NOT IDENT.
RU-106	1.816E-01	NOT IDENT.
AG-108M	1.653E-02	NOT IDENT.
CD-109	3.389E-01	NOT IDENT.
AG-110M	2.632E-02	NOT IDENT.
SN-113	2.223E-02	NOT IDENT.
CD-115	3.443E+01	NOT IDENT.
SN-117M	4.023E-02	NOT IDENT.
TE-123M	1.543E-02	NOT IDENT.
SB-124	2.917E-02	NOT IDENT.
SB-125	4.371E-02	NOT IDENT.
TE-125M	5.689E+00	NOT IDENT.
I-126	1.153E-01	NOT IDENT.
SB-126	1.153E-01	NOT IDENT.
SN-126	3.367E-02	NOT IDENT.
SB-127	1.692E+00	NOT IDENT.
I-131	1.179E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	1.334E+00	NOT IDENT.
BA-133	2.568E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	1.401E-02	NOT IDENT.
CS-135	7.778E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	8.352E-02	NOT IDENT.
CE-139	1.428E-02	NOT IDENT.
BA-140	2.048E-01	NOT IDENT.
LA-140	4.874E-02	NOT IDENT.
CE-141	3.523E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.105E-01	NOT IDENT.
PM-144	2.049E-02	NOT IDENT.
PR-144	1.543E+00	NOT IDENT.
PM-146	2.651E-02	NOT IDENT.
ND-147	4.738E-01	FAIL ABUN
PM-147	3.481E+02	NOT IDENT.
PM-149	3.344E+02	NOT IDENT.
EU-150	1.431E-02	NOT IDENT.
EU-152	4.864E-02	FAIL ABUN
GD-153	4.223E-02	NOT IDENT.
EU-154	3.479E-02	NOT IDENT.
EU-155	5.862E-02	FAIL ABUN
TB-160	5.837E-02	FAIL ABUN
HO-166M	2.899E-02	FAIL ABUN
TM-171	1.244E+01	FAIL ABUN
HF-172	9.941E-02	FAIL ABUN
LU-172	1.233E-02	FAIL ABUN
LU-176	1.259E-02	NOT IDENT.
HF-181	3.213E-02	FAIL ABUN
TA-182	7.807E-02	NOT IDENT.
RE-183	1.271E-01	NOT IDENT.
RE-184	6.784E-02	NOT IDENT.
W-188	4.031E+00	NOT IDENT.
IR-192	1.935E-02	NOT IDENT.
HG-203	1.848E-02	NOT IDENT.
BI-207	1.729E-02	NOT IDENT.
TL-208	2.574E-02	NOT IDENT.
PB-210	3.336E+00	NOT IDENT.
BI-211	1.102E-01	NOT IDENT.
PB-211	3.633E-01	NOT IDENT.
BI-212	3.061E-01	NOT IDENT.
PB-212	3.259E-02	FAIL ABUN
BI-214	5.161E-02	NOT IDENT.
PB-214	4.033E-02	NOT IDENT.
RN-219	1.984E-01	NOT IDENT.
RN-222	5.161E-02	NOT IDENT.
RA-223	3.115E-01	NOT IDENT.
RA-224	2.736E-01	NOT IDENT.

RA-226	5.161E-02	NOT IDENT.
AC-227	1.377E-01	NOT IDENT.
TH-227	1.377E-01	NOT IDENT.
AC-228	1.109E-01	FAIL ABUN
RA-228	1.109E-01	FAIL ABUN
TH-228	3.259E-02	FAIL ABUN
TH-229	2.674E-01	FAIL ABUN
TH-230	5.161E-02	NOT IDENT.
PA-231	2.181E-01	NOT IDENT.
TH-231	3.115E-01	NOT IDENT.
TH-232	1.109E-01	FAIL ABUN
PA-233	2.780E-02	NOT IDENT.
PA-234	1.184E-01	NOT IDENT.
PA-234M	3.871E+00	FAIL ABUN
TH-234	9.271E-01	FAIL ABUN
U-234	5.161E-02	NOT IDENT.
U-235	1.088E-01	FAIL ABUN
NP-237	2.780E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	9.271E-01	FAIL ABUN
NP-239	1.092E-01	NOT IDENT.
PU-239	1.709E+02	NOT IDENT.
AM-241	7.825E-02	NOT IDENT.
AM-243	3.219E-02	NOT IDENT.
CM-243	6.467E-02	NOT IDENT.
BK-247	4.229E-02	FAIL ABUN
CM-247	1.709E-02	NOT IDENT.
CF-249	2.188E-02	NOT IDENT.
CF-251	5.745E-02	NOT IDENT.
ANH-511	3.546E-02	NOT IDENT.

```

*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621364.CNF;1
* Acquisition date   : 3-OCT-2016 06:55:01 Sensitivity      : 3.000
* Detector ID        : GAM02 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:00.17 Half life ratio  : *****
* Sample date        : 12-SEP-2016 00:00:00 Nuclide Library : SOLID
* Sample ID          : G1203621364 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity : 1.7464E+02 GRAM
*                   : Quantity Err(%) : 1.1452E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                   : Dry Weight       : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 22-AUG-2016 09:02:05 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;15
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.571E-02	2.838E-01	2.838E-01
AS-73	1.367E+00	1.558E+00	1.558E+00
BA-137M	4.419E-02	2.351E-02	2.351E-02
CS-137	4.668E-02	2.483E-02	2.483E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.944E-02	2.159E-01	2.161E-01	NOT IDENT.
NA-22	-4.508E-03	1.684E-02	1.696E-02	NOT IDENT.
NA-24	-4.273E+07	5.025E+08	5.029E+08	SHORT HLIF
AL-26	-4.778E-03	9.369E-03	9.614E-03	NOT IDENT.
SC-46	-8.785E-03	2.713E-02	2.741E-02	NOT IDENT.
V-48	1.598E-03	5.024E-02	5.024E-02	NOT IDENT.
CR-51	4.440E-02	2.606E-01	2.614E-01	NOT IDENT.
MN-54	-3.990E-03	1.463E-02	1.474E-02	NOT IDENT.
CO-56	-1.689E-02	2.527E-02	2.639E-02	NOT IDENT.
MN-56	-1.000E+41	1.496E+41	0.000E+00	SHORT HLIF
CO-57	1.058E-02	1.375E-02	1.455E-02	NOT IDENT.
CO-58	5.046E-03	2.303E-02	2.314E-02	NOT IDENT.
FE-59	9.143E-03	3.569E-02	3.592E-02	NOT IDENT.
CO-60	-7.938E-03	1.965E-02	1.997E-02	NOT IDENT.
ZN-65	2.152E-02	4.922E-02	5.016E-02	NOT IDENT.
GE-68	-3.180E-01	4.599E-01	4.817E-01	NOT IDENT.
AS-74	2.008E-02	7.776E-02	7.828E-02	NOT IDENT.
SE-75	-1.662E-02	2.790E-02	2.889E-02	NOT IDENT.
BR-77	2.297E+01	6.442E+01	6.525E+01	FAIL ABUN
SR-82	1.660E-02	1.735E-01	1.737E-01	NOT IDENT.
RB-83	1.264E-02	5.001E-02	5.033E-02	NOT IDENT.
KR-85	-9.343E+00	6.945E+00	8.122E+00	NOT IDENT.
SR-85	-5.290E-02	3.927E-02	4.594E-02	NOT IDENT.
RB-86	-2.477E-01	3.583E-01	3.753E-01	NOT IDENT.
Y-88	1.174E-02	2.255E-02	2.316E-02	NOT IDENT.
Y-91	1.026E+00	1.020E+01	1.021E+01	NOT IDENT.

NB-94	-2.243E-03	1.561E-02	1.564E-02	NOT IDENT.
NB-95	-2.880E-02	3.065E-02	3.329E-02	NOT IDENT.
NB-95M	-2.465E-02	7.098E-02	7.184E-02	NOT IDENT.
ZR-95	9.647E-03	4.518E-02	4.539E-02	NOT IDENT.
NB-97	-1.000E+41	1.366E+41	0.000E+00	SHORT HLIF
ZR-97	-1.247E+09	6.659E+08	8.715E+08	SHORT HLIF
MO-99	-1.288E+01	3.079E+01	3.133E+01	NOT IDENT.
TC-99M	2.887E+22	4.814E+23	0.000E+00	SHORT HLIF
RH-101	5.523E-02	4.427E-02	5.079E-02	FAIL ABUN
RH-102	5.788E-03	3.377E-02	3.387E-02	NOT IDENT.
RU-103	-9.283E-04	2.500E-02	2.500E-02	FAIL ABUN
RH-106	-8.160E-02	2.320E-01	2.349E-01	NOT IDENT.
RU-106	-8.160E-02	2.320E-01	2.349E-01	NOT IDENT.
AG-108M	2.689E-03	1.834E-02	1.838E-02	NOT IDENT.
CD-109	9.285E-02	4.402E-01	4.422E-01	NOT IDENT.
AG-110M	-1.087E-02	3.257E-02	3.294E-02	NOT IDENT.
SN-113	-1.084E-02	2.704E-02	2.747E-02	NOT IDENT.
CD-115	-4.043E+01	4.945E+01	5.270E+01	NOT IDENT.
SN-117M	1.480E-02	4.053E-02	4.108E-02	NOT IDENT.
TE-123M	3.055E-03	1.580E-02	1.586E-02	NOT IDENT.
SB-124	6.791E-04	3.352E-02	3.352E-02	NOT IDENT.
SB-125	-5.414E-02	5.979E-02	6.457E-02	NOT IDENT.
TE-125M	1.756E+00	6.155E+00	6.206E+00	NOT IDENT.
I-126	-1.494E-01	1.939E-01	2.052E-01	NOT IDENT.
SB-126	2.213E-02	1.246E-01	1.250E-01	NOT IDENT.
SN-126	9.987E-04	4.565E-02	4.566E-02	NOT IDENT.
SB-127	-9.483E-01	2.108E+00	2.151E+00	NOT IDENT.
I-131	5.333E-03	1.312E-01	1.312E-01	NOT IDENT.
I-132	-1.000E+41	2.185E+41	0.000E+00	SHORT HLIF
TE-132	-6.675E-01	1.554E+00	1.583E+00	NOT IDENT.
BA-133	2.143E-02	2.559E-02	2.735E-02	NOT IDENT.
I-133	5.962E+05	4.695E+05	5.409E+05	SHORT HLIF
CS-134	-5.021E-03	1.741E-02	1.756E-02	NOT IDENT.
CS-135	-1.516E-02	8.666E-02	8.693E-02	NOT IDENT.
I-135	-9.856E+21	2.001E+22	0.000E+00	SHORT HLIF
CS-136	7.948E-02	7.641E-02	8.440E-02	NOT IDENT.
CE-139	1.834E-03	1.474E-02	1.476E-02	NOT IDENT.
BA-140	-9.229E-02	2.571E-01	2.604E-01	NOT IDENT.
LA-140	2.136E-03	5.539E-02	5.539E-02	NOT IDENT.
CE-141	-1.843E-02	4.281E-02	4.361E-02	NOT IDENT.
CE-143	1.270E+03	1.626E+03	1.724E+03	SHORT HLIF
CE-144	9.747E-02	1.133E-01	1.216E-01	NOT IDENT.
PM-144	1.822E-02	1.936E-02	2.103E-02	NOT IDENT.
PR-144	1.382E+00	1.457E+00	1.585E+00	NOT IDENT.
PM-146	9.452E-03	2.875E-02	2.907E-02	NOT IDENT.
ND-147	2.564E-01	4.967E-01	5.100E-01	FAIL ABUN
PM-147	-1.001E+01	3.947E+02	3.947E+02	NOT IDENT.
PM-149	1.498E+02	3.460E+02	3.525E+02	NOT IDENT.
EU-150	1.793E-03	1.562E-02	1.564E-02	NOT IDENT.
EU-152	-4.121E-04	5.423E-02	5.423E-02	FAIL ABUN
GD-153	-4.494E-02	5.598E-02	5.953E-02	NOT IDENT.
EU-154	-1.273E-02	4.756E-02	4.790E-02	NOT IDENT.
EU-155	-2.994E-03	6.585E-02	6.587E-02	FAIL ABUN
TB-160	-4.000E-02	7.776E-02	7.983E-02	FAIL ABUN
HO-166M	4.181E-03	3.140E-02	3.145E-02	FAIL ABUN
TM-171	2.546E+01	2.862E+01	3.084E+01	FAIL ABUN
HF-172	3.355E-01	2.677E-01	3.075E-01	FAIL ABUN
LU-172	-1.072E-02	2.067E-02	2.122E-02	FAIL ABUN
LU-176	-1.089E-02	1.551E-02	1.627E-02	NOT IDENT.
HF-181	4.972E-02	4.552E-02	5.074E-02	FAIL ABUN
TA-182	-4.503E-03	9.393E-02	9.395E-02	NOT IDENT.
RE-183	3.777E-02	1.413E-01	1.423E-01	NOT IDENT.
RE-184	3.720E-02	6.885E-02	7.087E-02	NOT IDENT.
W-188	1.050E+00	4.276E+00	4.302E+00	NOT IDENT.
IR-192	-5.557E-03	2.218E-02	2.232E-02	NOT IDENT.
HG-203	-3.079E-03	2.066E-02	2.071E-02	NOT IDENT.
BI-207	-1.719E-02	2.622E-02	2.734E-02	NOT IDENT.
TL-208	6.255E-03	2.809E-02	2.823E-02	NOT IDENT.
PB-210	1.250E+00	3.461E+00	3.506E+00	NOT IDENT.
BI-211	-5.828E-02	1.288E-01	1.315E-01	NOT IDENT.
PB-211	7.507E-02	3.971E-01	3.986E-01	NOT IDENT.
BI-212	-4.815E-03	3.432E-01	3.432E-01	NOT IDENT.
PB-212	2.434E-02	6.660E-02	6.750E-02	FAIL ABUN
BI-214	-1.398E-02	6.002E-02	6.035E-02	NOT IDENT.
PB-214	-3.079E-02	4.851E-02	5.045E-02	NOT IDENT.
RN-219	-1.144E-01	2.452E-01	2.506E-01	NOT IDENT.
RN-222	-1.398E-02	6.002E-02	6.035E-02	NOT IDENT.
RA-223	-2.105E-01	3.772E-01	3.889E-01	NOT IDENT.

RA-224	3.746E-02	4.016E-01	4.019E-01	NOT IDENT.
RA-226	-1.398E-02	6.002E-02	6.035E-02	NOT IDENT.
AC-227	1.090E-01	1.363E-01	1.448E-01	NOT IDENT.
TH-227	1.090E-01	1.363E-01	1.448E-01	NOT IDENT.
AC-228	1.660E-01	1.090E-01	1.323E-01	FAIL ABUN
RA-228	1.660E-01	1.090E-01	1.323E-01	FAIL ABUN
TH-228	2.434E-02	6.660E-02	6.750E-02	FAIL ABUN
TH-229	-1.260E-01	2.963E-01	3.017E-01	FAIL ABUN
TH-230	-1.398E-02	6.002E-02	6.035E-02	NOT IDENT.
PA-231	-1.423E-01	2.632E-01	2.709E-01	NOT IDENT.
TH-231	-2.105E-01	3.772E-01	3.889E-01	NOT IDENT.
TH-232	1.660E-01	1.090E-01	1.323E-01	FAIL ABUN
PA-233	-3.820E-02	3.690E-02	4.072E-02	NOT IDENT.
PA-234	-1.267E-02	1.410E-01	1.411E-01	NOT IDENT.
PA-234M	4.606E+00	5.063E+00	5.472E+00	FAIL ABUN
TH-234	-9.082E-01	9.715E-01	1.054E+00	FAIL ABUN
U-234	-1.398E-02	6.002E-02	6.035E-02	NOT IDENT.
U-235	-6.055E-02	1.285E-01	1.314E-01	FAIL ABUN
NP-237	-3.820E-02	3.690E-02	4.072E-02	NOT IDENT.
NP-238	4.701E+01	8.277E+01	8.544E+01	SHORT HLIF
U-238	-9.082E-01	9.715E-01	1.054E+00	FAIL ABUN
NP-239	1.615E-03	1.228E-01	1.228E-01	NOT IDENT.
PU-239	9.747E+01	1.809E+02	1.861E+02	NOT IDENT.
AM-241	-6.373E-02	9.276E-02	9.711E-02	NOT IDENT.
AM-243	-4.628E-02	3.641E-02	4.196E-02	NOT IDENT.
CM-243	3.671E-02	6.804E-02	7.002E-02	NOT IDENT.
BK-247	-1.837E-02	4.843E-02	4.913E-02	FAIL ABUN
CM-247	-7.784E-03	2.086E-02	2.115E-02	NOT IDENT.
CF-249	1.665E-02	2.177E-02	2.303E-02	NOT IDENT.
CF-251	-7.601E-02	6.937E-02	7.737E-02	NOT IDENT.
ANH-511	-5.082E-02	3.549E-02	4.224E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	36.5939	87.09	26.9562	136.47	42.5201
45.60	29.6539	87.57	29.2288	140.51	25.6527
46.54	31.7827	88.03	24.7530	143.76	39.2598
49.72	28.9574	88.34	24.7673	144.24	39.2847
51.35	29.0826	88.47	29.2774	145.44	44.2656
51.87	20.8015	89.96	29.3573	152.43	28.5377
52.39	22.2183	1093.63	27.1326	153.25	42.2302
52.97	31.2912	91.11	27.1556	323.87	28.6022
53.44	31.3289	92.59	27.2280	156.02	43.6240
54.07	31.3792	93.35	27.2650	158.56	35.0103
57.36	0.0000	94.56	31.8773	159.00	35.8631
57.53	21.1003	94.65	31.8824	162.33	28.4731
57.98	28.1644	94.67	31.8835	162.66	31.8356
59.27	38.1403	94.87	31.8946	163.33	27.6692
59.32	38.1448	97.43	36.6140	165.86	28.5948
59.54	36.0446	98.43	28.6539	176.31	30.6511
60.96	48.9305	98.44	28.6545	176.60	34.0682
61.17	47.8903	99.53	27.5596	177.52	44.3352
62.93	35.2634	100.11	25.2878	181.07	30.8177
63.29	33.1536	102.03	39.2080	181.52	44.9655
63.58	27.8248	103.18	45.0601	184.41	22.3408
64.28	38.5880	103.37	38.1399	143.76	22.3734
66.73	32.3339	105.21	41.7335	193.51	41.6577
67.24	35.6073	105.31	41.7404	197.03	31.3612
125.81	39.9620	106.12	41.7958	198.01	34.8820
67.75	39.9680	106.47	39.4964	201.83	38.5251
69.67	21.6949	109.28	35.0079	203.43	33.3269
70.83	52.1971	111.00	38.6142	205.31	35.1493
72.81	43.6798	111.76	38.6605	210.85	30.9305
72.87	43.6853	114.06	32.9212	215.65	25.3083
74.66	51.5214	116.30	34.2150	222.11	24.1295
74.82	51.5382	116.74	22.4319	227.09	34.1244
74.97	50.4574	119.76	29.6511	227.38	36.8284
77.11	52.8809	121.12	29.7115	228.16	29.6646
78.74	24.3163	121.22	29.7159	228.18	29.6652
79.69	43.1874	121.78	28.5511	116.74	29.6652
80.12	42.1157	122.06	20.6288	235.69	28.5187
80.19	43.2299	122.92	17.4773	235.96	28.5260
80.57	39.9342	123.07	17.4812	238.63	21.7881
81.00	32.5665	265.00	23.8594	238.98	21.7952
81.07	32.5710	125.81	27.5239	240.99	21.8357
81.75	26.6841	127.23	27.5804	242.00	21.8560
83.79	35.7190	127.91	27.6077	244.70	17.8020
84.00	35.7332	129.30	27.6624	252.40	25.7396
85.43	35.8301	131.20	32.1590	252.80	24.8291
86.55	35.9055	133.02	30.2265	254.15	0.0000
86.79	35.9216	133.52	27.8277	256.23	18.4479
86.94	26.9487	136.00	43.7064	260.90	22.2280

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	33.4504	355.39	0.0000	584.27	12.4820
264.80	31.5962	356.01	14.9521	595.83	11.4095
265.00	31.6018	364.49	22.0577	427.87	17.1521
268.22	27.0288	366.42	18.0707	602.52	0.0000
269.46	28.9231	372.51	14.1128	604.72	10.3107
270.03	28.0035	375.05	19.1855	607.14	14.9101
271.23	23.3602	377.52	17.1940	609.32	14.9249
273.65	30.8986	356.01	16.2500	610.33	14.9318
276.40	24.4004	388.16	10.1849	614.28	13.8081
277.37	27.2377	388.63	9.1692	618.01	8.6447
277.60	27.2430	391.69	18.3746	620.36	11.5385
278.00	29.1312	264.66	16.4268	621.93	16.1659
279.20	19.7537	401.81	19.5211	630.19	0.0000
279.54	20.7002	402.40	16.4447	631.29	9.2764
279.70	19.7618	404.85	13.3819	633.25	12.7662
280.46	17.8910	410.95	12.3997	634.78	10.4520
283.69	26.4357	413.71	11.3858	635.95	6.9717
284.31	23.6155	414.70	19.6784	636.99	9.2998
285.41	17.0182	423.72	15.6216	645.85	7.8775
285.90	18.9168	427.09	17.7405	657.76	19.7080
287.50	20.8354	427.87	22.9695	657.90	0.0000
290.67	20.8886	433.94	14.6699	661.66	9.6945
293.27	0.0000	439.40	16.8200	664.57	0.0000
351.93	21.9177	453.88	15.9024	666.33	12.7165
295.96	25.7448	463.37	10.6594	666.50	12.7173
879.38	15.2878	468.07	14.9627	667.71	0.0000
299.98	17.2178	473.00	17.1475	677.62	6.2113
300.09	17.2192	475.06	8.5837	685.70	9.7939
300.13	17.2196	476.78	7.7326	695.00	11.6194
301.36	24.8971	477.60	11.2819	696.49	5.3661
302.85	25.8843	482.18	14.0035	696.51	5.3661
256.23	17.2786	487.02	11.3404	697.00	6.2617
304.85	14.4028	492.35	10.8317	697.30	7.1572
306.78	26.9250	497.08	10.8594	697.49	7.1577
308.46	22.1455	505.52	13.0901	702.65	7.1729
311.90	23.1694	507.63	0.0000	706.68	8.0829
316.51	24.2198	511.00	20.7861	711.68	7.1995
319.41	25.2436	514.00	48.2123	720.70	9.9355
320.08	21.3702	514.00	48.2123	721.93	0.0000
321.04	23.3301	520.40	13.1924	722.78	12.6555
323.87	25.3271	520.69	13.1948	722.91	12.6563
325.23	22.4277	522.65	0.0000	723.31	13.5626
328.76	23.4634	527.90	16.5546	724.19	14.4717
333.37	19.6187	528.26	14.3499	727.33	13.5841
333.97	19.6273	529.59	4.4185	733.00	21.7844
334.37	29.4495	529.87	0.0000	735.93	5.4523
338.28	12.7977	531.02	8.8434	333.97	10.9113
338.32	12.7979	537.26	16.6339	739.50	9.1000
311.90	18.7337	546.56	0.0000	747.24	2.7383
340.48	18.7337	552.55	10.0569	748.06	7.3044
340.55	18.7344	563.25	11.2333	752.31	8.2312
344.28	17.7957	569.33	11.2667	753.82	4.5757
345.93	17.8165	946.00	11.2675	756.73	8.2452
351.06	17.8810	569.70	11.2687	756.80	8.2455
351.93	20.8735	583.19	12.4757	884.68	10.1057

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	14.7100	1274.44	6.3695	1620.50	3.7273
766.42	13.7938	1001.03	7.9736	1621.92	4.6606
766.84	11.9562	1002.74	4.7868	1678.03	0.0000
772.60	0.0000	1004.73	6.3863	1690.97	0.9454
776.52	4.6156	507.63	0.0000	1750.46	0.0000
739.50	8.3125	1025.87	0.0000	1764.49	0.0000
778.90	6.4677	1028.54	0.0000	1063.66	3.8408
783.70	8.3307	1037.84	5.0397	1771.35	2.8812
785.37	5.5573	1038.76	0.0000	1791.20	0.0000
792.07	4.6426	631.29	6.0637	1808.65	0.9673
794.95	7.4363	1048.07	2.0221	1810.72	0.0000
795.86	5.5790	1049.04	5.0568	1836.06	0.9723
810.06	8.4125	1050.41	7.0825		
810.29	10.2830	1063.66	7.1102		
344.28	10.2836	1077.00	4.0789		
810.76	6.5448	1077.34	4.0793		
815.77	7.4934	1085.87	6.1340		
1048.07	8.4386	1093.63	3.0740		
832.01	1.8844	1099.45	2.0527		
834.85	4.7159	1112.07	8.2402		
835.71	6.6042	1112.84	8.2422		
836.80	0.0000	1115.54	5.1553		
846.75	0.0000	1120.29	7.2273		
846.77	11.3661	1120.55	6.1952		
856.80	11.4064	1221.41	4.1309		
860.56	4.7589	1129.67	6.2109		
871.09	7.6421	1131.51	0.0000		
873.19	6.6917	1147.95	0.0000		
875.33	0.0000	1173.23	5.2383		
879.38	8.6221	1177.95	4.1960		
880.51	9.5837	1189.05	2.1044		
883.24	5.7556	1204.77	4.2266		
884.68	10.5572	1221.41	5.3064		
889.28	7.6899	1231.02	8.5117		
894.76	9.6304	1235.36	5.3259		
898.04	2.8923	1238.28	8.5278		
900.72	6.7548	1260.41	0.0000		
903.28	3.3114	1271.87	1.0752		
911.20	4.8419	1274.44	3.2278		
912.08	4.6496	1274.54	3.2278		
923.98	0.0000	1291.59	7.5640		
926.50	6.8131	1298.22	0.0000		
929.11	8.7671	1312.11	4.3445		
937.49	6.8376	1332.49	4.3665		
944.13	3.9156	1362.66	0.0000		
946.00	4.8976	1365.19	3.3008		
949.00	7.8438	1368.63	0.0000		
667.71	0.0000	1384.29	0.0000		
962.31	11.8158	1408.01	5.5576		
964.08	6.8966	1457.56	0.0000		
966.17	8.8728	1460.82	7.5008		
911.20	6.9073	1489.16	5.4352		
968.97	6.9073	1505.03	3.6361		
983.53	5.9478	1584.12	3.6990		
984.45	0.0000	1596.21	1.8542		

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                                 *
*                               Charleston, SC 29407                            *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621365.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM19.CNF;561
Background date : 2-OCT-2016 11:01:07.
Sample date      : 14-DEC-2015 13:47:00 Acquisition date : 3-OCT-2016 06:55:29.
Sample ID       : G1203621365 Sample quantity : 1.44233E+02 GRAM
Detector name   : GAM19 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.73 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1596254 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
    
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	45.95*	19	101	0.65	92.68	90	7	5.28E-03	92.4	
2	0	63.18*	22	136	1.26	127.14	123	8	6.21E-03	96.0	
3	1	74.70*	123	154	1.30	150.19	145	15	3.41E-02	19.7	2.57E+00
4	1	77.06*	224	123	1.20	154.93	145	15	6.24E-02	11.0	
5	4	84.16	45	203	1.76	169.12	162	33	1.26E-02	61.7	2.64E+00
6	4	89.71	66	174	1.66	180.22	162	33	1.83E-02	41.0	
7	4	92.57*	96	151	1.57	185.95	162	33	2.66E-02	26.9	
8	0	185.85*	45	159	0.94	372.59	368	11	1.24E-02	58.3	
9	0	209.01	11	174	0.74	418.93	411	13	3.15E-03	242.0	
10	2	238.58*	342	80	1.15	478.10	472	24	9.49E-02	6.9	2.50E+00
11	2	241.79	88	70	1.72	484.52	472	24	2.44E-02	26.4	
12	0	249.44	31	43	1.53	499.81	496	8	8.71E-03	40.1	
13	0	270.58	22	75	1.41	542.12	538	8	6.18E-03	70.9	
14	0	295.21*	161	84	1.40	591.40	584	14	4.48E-02	14.6	
15	0	300.44	16	72	1.91	601.87	597	8	4.38E-03	96.6	
16	0	338.26	74	76	1.37	677.53	671	11	2.05E-02	25.8	
17	0	351.72*	302	56	1.23	704.46	697	14	8.40E-02	7.9	
18	0	462.11	43	45	2.01	925.34	918	14	1.18E-02	36.9	
19	0	497.26	15	31	1.37	995.67	991	10	4.15E-03	75.5	
20	0	510.51*	22	59	1.94	1022.19	1014	15	6.14E-03	91.3	
21	0	543.22	19	15	0.67	1087.64	1085	7	5.18E-03	42.1	
22	0	569.45*	26	42	1.24	1140.12	1133	14	7.12E-03	73.5	
23	0	583.21*	86	34	1.17	1167.65	1163	11	2.39E-02	17.2	
24	0	586.97	12	8	1.42	1175.17	1173	5	3.19E-03	46.3	
25	0	609.28*	229	17	1.44	1219.80	1213	14	6.35E-02	7.8	
26	0	661.79	54	17	1.88	1324.87	1318	14	1.49E-02	21.4	
27	0	727.31	33	27	1.01	1455.97	1449	11	9.10E-03	35.6	
28	0	768.94	32	25	0.80	1539.27	1532	16	8.88E-03	38.7	
29	0	836.78	14	18	0.92	1675.00	1670	9	3.77E-03	62.8	
30	0	861.57	24	29	0.72	1724.60	1715	17	6.53E-03	57.0	
31	0	911.26*	62	38	1.22	1824.03	1817	14	1.71E-02	25.4	
32	0	933.90	22	9	1.06	1869.33	1865	11	6.16E-03	33.0	
33	1	965.03	21	0	2.13	1931.61	1922	27	5.93E-03	29.6	2.62E+00
34	1	968.91	76	0	2.08	1939.39	1922	27	2.10E-02	10.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1063.56*	30	13	1.86	2128.76	2123	14	8.38E-03	48.3	
36	4	1116.62	13	0	1.81	2234.94	2233	17	3.48E-03	26.5	1.50E+00
37	4	1119.81	30	0	1.49	2241.32	2233	17	8.47E-03	21.5	
38	4	1122.38	12	0	1.51	2246.45	2233	17	3.33E-03	37.3	
39	0	1179.51	15	9	2.65	2360.78	2356	11	4.22E-03	44.9	
40	0	1224.88	10	4	2.01	2451.55	2448	8	2.78E-03	46.9	
41	1	1238.18	24	12	2.28	2478.15	2474	22	6.76E-03	30.5	2.35E+00
42	1	1242.81	18	12	2.29	2487.42	2474	22	5.08E-03	52.2	
43	0	1279.83	19	3	1.04	2561.49	2554	14	5.16E-03	31.5	
44	0	1372.91	9	7	3.78	2747.75	2742	12	2.53E-03	63.9	
45	0	1377.71	13	4	1.98	2757.35	2753	8	3.61E-03	38.5	
46	0	1460.64	294	4	2.14	2923.28	2915	14	8.16E-02	6.0	
47	0	1594.69	8	7	0.57	3191.49	3186	9	2.33E-03	65.4	
48	0	1727.95	15	4	5.08	3458.13	3450	16	4.29E-03	38.3	
49	0	1764.32*	28	0	2.36	3530.91	3524	13	7.73E-03	20.5	
50	0	1769.74*	2	0	1.00	3541.75	3538	8	6.87E-04	146.4	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621365.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 14-DEC-2015 13:47:00 Acquisition date : 3-OCT-2016 06:55:29
Sample ID        : G1203621365           Sample quantity  : 144.23 GRAM
Sample type      : SOLID                  Sample geometry   :
Detector name    : GAMMA19                Detector geometry: CAN
Elapsed live time: 0 01:00:00.00          Elapsed real time: 0 01:00:00.73  0.0%
Energy tolerance : 1.50 keV              Half life ratio  : 10.00
Errors propagated: No                     Systematic Error : 0.00 %
Efficiency type  : Linear                  Efficiencies at  : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	74.82	BI-207	74.97
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.161E+00	1.188E+01	1.188E+01	11.99	OK
ZN-65	1115.54	50.60*	1.441E+00	8.816E-02	2.030E-01	52.99	OK
RU-103	497.08	91.00*	2.722E+00	3.336E-02	5.963E+00	151.06	OK
	610.33	5.76	2.310E+00	9.336E+00	1.669E+03	15.63	OK
BA-137M	661.66	89.90*	2.163E+00	1.491E-01	1.519E-01	42.77	OK
CS-137	661.66	85.10*	2.163E+00	1.575E-01	1.605E-01	42.77	OK
BI-207	72.81	21.40	4.355E+00	-----	Line Not Found	-----	Absent
	74.97	35.70	4.533E+00	2.940E-01	2.991E-01	68.56	OK
	569.70	97.76	2.438E+00	5.876E-02	5.976E-02	147.08	OK
	1063.66	74.60*	1.497E+00	1.394E-01	1.417E-01	96.53	OK
	1770.23	6.87	9.835E-01	1.796E-01	1.827E-01	292.76	OK
TL-208	277.37	6.60	4.415E+00	-----	Line Not Found	-----	Absent
	583.19	85.00*	2.392E+00	2.305E-01	2.305E-01	34.42	OK
	860.56	12.50	1.761E+00	5.621E-01	5.621E-01	113.91	OK
PB-210	46.54	4.25*	8.307E-01	3.608E+00	3.700E+00	184.75	OK
BI-211	72.87	1.23	4.361E+00	-----	Line Not Found	-----	Absent
	351.06	12.92*	3.631E+00	3.461E-01	3.461E-01	327.17	OK
PB-212	74.82	10.28	4.533E+00	1.021E+00	1.021E+00	68.56	OK
	77.11	17.10	4.743E+00	1.785E+00	1.785E+00	21.98	OK
	238.63	43.60*	4.960E+00	9.313E-01	9.313E-01	13.80	OK
	300.09	3.30	4.138E+00	6.672E-01	6.672E-01	193.28	OK
BI-214	609.32	45.49*	2.310E+00	1.182E+00	1.183E+00	15.63	OK
	1120.29	14.92	1.437E+00	7.298E-01	7.301E-01	43.01	OK
	1764.49	15.30	9.862E-01	9.052E-01	9.055E-01	41.00	OK
PB-214	74.82	5.80	4.544E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	4.743E+00	3.147E+00	3.148E+00	21.98	OK
	87.09	3.41	5.478E+00	-----	Line Not Found	-----	Absent
	242.00	7.25	4.908E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.198E+00	1.209E+00	1.209E+00	29.23	OK
	351.93	35.60*	3.629E+00	-----	Line Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.310E+00	1.182E+00	1.183E+00	15.63	OK
	1120.29	14.92	1.437E+00	7.298E-01	7.301E-01	43.01	OK
	1764.49	15.30	9.862E-01	9.052E-01	9.055E-01	41.00	OK
RA-224	240.99	4.10*	4.911E+00	4.352E-01	4.352E-01	343.01	OK
RA-226	609.32	45.49*	2.310E+00	1.182E+00	1.183E+00	15.63	OK
	1120.29	14.92	1.437E+00	7.298E-01	7.301E-01	43.01	OK
	1764.49	15.30	9.862E-01	9.052E-01	9.055E-01	41.00	OK
AC-228	105.21	1.10	6.259E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.751E+00	9.976E-01	9.976E-01	51.61	OK
	794.95	4.25	1.875E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.802E+00	2.467E+00	2.467E+00	125.56	OK
	911.20	25.80*	1.687E+00	7.410E-01	7.410E-01	50.73	OK
	968.97	15.80	1.609E+00	1.548E+00	1.548E+00	21.82	OK
RA-228	105.21	1.10	6.259E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.751E+00	9.976E-01	9.976E-01	51.61	OK
	794.95	4.25	1.875E+00	-----	Line Not Found	-----	Absent
	835.71	1.61	1.802E+00	2.467E+00	2.467E+00	125.56	OK
	911.20	25.80*	1.687E+00	7.410E-01	7.410E-01	50.73	OK
	968.97	15.80	1.609E+00	1.548E+00	1.548E+00	21.82	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	74.82	10.28	4.533E+00	1.021E+00	1.021E+00	68.56	OK
	77.11	17.10	4.743E+00	1.785E+00	1.785E+00	21.98	OK
	238.63	43.60*	4.960E+00	9.313E-01	9.313E-01	13.80	OK
	300.09	3.30	4.138E+00	6.672E-01	6.672E-01	193.28	OK
TH-229	85.43	14.70	5.288E+00	3.734E-01	3.734E-01	123.34	OK
	88.47	24.00	5.631E+00	3.108E-01	3.109E-01	81.93	OK
	193.51	4.41*	5.711E+00	-----	Line Not Found	-----	Absent
	210.85	2.80	5.411E+00	-----	Line Not Found	-----	Absent
TH-230	609.32	45.49*	2.310E+00	1.182E+00	1.182E+00	15.63	OK
	1120.29	14.92	1.437E+00	7.298E-01	7.299E-01	43.01	OK
	1764.49	15.30	9.862E-01	9.052E-01	9.052E-01	41.00	OK
PA-231	283.69	1.70	4.336E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	4.138E+00	4.116E-01	4.116E-01	193.28	OK
TH-232	105.21	1.10	6.259E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.751E+00	9.976E-01	9.976E-01	51.61	OK
	835.71	1.61	1.802E+00	2.467E+00	2.467E+00	125.56	OK
	911.20	25.80*	1.687E+00	7.410E-01	7.410E-01	50.73	OK
	968.97	15.80	1.609E+00	1.548E+00	1.548E+00	21.82	OK
TH-234	63.29	3.70*	3.291E+00	1.202E+00	1.202E+00	191.99	OK
	92.59	4.23	5.782E+00	2.492E+00	2.492E+00	53.70	OK
U-234	609.32	45.49*	2.310E+00	1.182E+00	1.182E+00	15.63	OK
	1120.29	14.92	1.437E+00	7.298E-01	7.298E-01	43.01	OK
	1764.49	15.30	9.862E-01	9.052E-01	9.052E-01	41.00	OK
U-235	89.96	3.47	5.631E+00	2.150E+00	2.150E+00	81.93	OK
	93.35	5.60	5.782E+00	1.883E+00	1.883E+00	53.70	OK
	143.76	10.96*	6.462E+00	-----	Line Not Found	-----	Absent
	163.33	5.08	6.216E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	5.844E+00	8.039E-02	8.039E-02	116.63	OK
U-238	205.31	5.01	5.506E+00	-----	Line Not Found	-----	Absent
	63.29	3.70*	3.291E+00	1.202E+00	1.202E+00	191.99	OK
	92.59	4.23	5.782E+00	2.492E+00	2.492E+00	53.70	OK
AM-243	43.53	5.90	5.190E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	4.533E+00	1.562E-01	1.562E-01	68.56	OK
ANH-511	511.00	100.00*	2.664E+00	4.581E-02	4.581E-02	182.54	OK

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621365.CNF;1
* Acquisition date   : 3-OCT-2016 06:55:29 Sensitivity      : 3.000
* Detector ID       : GAM19 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.73 Half life ratio : *****
* Sample date      : 14-DEC-2015 13:47:00 Analyst initials: MXR1
* Sample ID       : G1203621365 Sample Quantity : 1.4423E+02 GRAM
* Batch Number    : 1596254 Wet Weight : 0.00000
* Wet wt corr     : 1.00000 Dry Weight : 0.00000
* Nuclide Library : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 15-JUN-2016 10:35:16 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM19_CAN.CNF;17
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.188E+01	1.396E+00	5.250E-01
ZN-65	2.030E-01	1.054E-01	3.047E-01
RU-103	5.963E+00	8.828E+00	9.880E+00
BA-137M	1.519E-01	6.366E-02	6.332E-02
CS-137	1.605E-01	6.725E-02	6.689E-02
BI-207	1.417E-01	1.341E-01	9.332E-02
TL-208	2.305E-01	7.774E-02	6.467E-02
PB-210	3.700E+00	6.698E+00	6.093E+00
BI-211	3.461E-01	1.110E+00	3.888E-01
PB-212	9.313E-01	1.259E-01	1.023E-01
BI-214	1.183E+00	1.811E-01	1.015E-01
PB-214	1.335E+00	2.058E-01	3.534E-01
RN-222	1.183E+00	1.811E-01	1.015E-01
RA-224	4.352E-01	1.463E+00	1.097E+00
RA-226	1.183E+00	1.811E-01	1.015E-01
AC-228	7.410E-01	3.684E-01	2.395E-01
RA-228	7.410E-01	3.684E-01	2.395E-01
TH-228	9.313E-01	1.259E-01	1.023E-01
TH-229	4.209E-01	4.488E-01	9.279E-01
TH-230	1.182E+00	1.811E-01	1.015E-01
PA-231	4.116E-01	7.796E-01	8.638E-01
TH-232	7.410E-01	3.684E-01	2.395E-01
TH-234	1.202E+00	2.262E+00	2.127E+00
U-234	1.182E+00	1.811E-01	1.015E-01
U-235	-1.003E-01	1.828E-01	3.362E-01
U-238	1.202E+00	2.262E+00	2.127E+00
AM-243	1.562E-01	1.050E-01	8.959E-02
ANH-511	4.581E-02	8.194E-02	5.930E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.290E+00	1.230E+01	2.279E+01	NOT IDENT.
NA-22	5.037E-02	4.732E-02	1.044E-01	NOT IDENT.

NA-24	0.000E+00	1.159E+41	0.000E+00	SHORT HLIF
AL-26	6.178E-03	2.305E-02	5.824E-02	NOT IDENT.
SC-46	-1.491E-02	3.752E-01	7.388E-01	FAIL ABUN
V-48	0.000E+00	1.120E+04	0.000E+00	SHORT HLIF
CR-51	0.000E+00	3.785E+02	0.000E+00	SHORT HLIF
MN-54	7.263E-02	7.410E-02	1.504E-01	NOT IDENT.
CO-56	1.848E-01	4.232E-01	9.002E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.255E-02	4.427E-02	8.942E-02	NOT IDENT.
CO-58	-3.849E-01	5.201E-01	9.209E-01	NOT IDENT.
FE-59	1.226E+00	5.113E+00	1.082E+01	NOT IDENT.
CO-60	-2.284E-02	3.477E-02	5.908E-02	NOT IDENT.
GE-68	-6.558E-01	2.083E+00	3.927E+00	NOT IDENT.
AS-73	4.108E-01	8.373E+00	1.567E+01	NOT IDENT.
AS-74	0.000E+00	4.998E+03	0.000E+00	SHORT HLIF
SE-75	1.042E-01	2.130E-01	4.232E-01	NOT IDENT.
BR-77	0.000E+00	3.807E+36	0.000E+00	SHORT HLIF
SR-82	0.000E+00	6.993E+02	0.000E+00	SHORT HLIF
RB-83	-3.777E-01	6.506E-01	1.122E+00	NOT IDENT.
KR-85	4.360E+00	9.630E+00	1.675E+01	NOT IDENT.
SR-85	4.339E-01	9.544E-01	1.661E+00	NOT IDENT.
RB-86	0.000E+00	2.062E+04	0.000E+00	SHORT HLIF
Y-88	8.869E-02	1.786E-01	4.576E-01	NOT IDENT.
Y-91	-2.645E+02	4.771E+02	8.392E+02	NOT IDENT.
NB-94	8.232E-03	3.750E-02	7.475E-02	NOT IDENT.
NB-95	6.482E-02	8.103E-01	1.452E+00	NOT IDENT.
NB-95M	8.383E-02	2.635E+00	4.514E+00	NOT IDENT.
ZR-95	-1.057E+00	1.325E+00	2.339E+00	NOT IDENT.
NB-97	0.000E+00	1.919E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
MO-99	0.000E+00	3.813E+31	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.646E+41	0.000E+00	SHORT HLIF
RH-101	-1.055E-02	3.511E-02	6.767E-02	NOT IDENT.
RH-102	1.720E-02	6.221E-02	1.210E-01	NOT IDENT.
RH-106	-4.272E-01	5.475E-01	8.949E-01	NOT IDENT.
RU-106	-4.272E-01	5.475E-01	8.949E-01	NOT IDENT.
AG-108M	2.936E-02	2.909E-02	6.118E-02	NOT IDENT.
CD-109	0.000E+00	1.219E+00	2.549E+00	NOT IDENT.
AG-110M	-4.969E-04	9.653E-02	1.925E-01	NOT IDENT.
SN-113	6.222E-02	2.362E-01	4.585E-01	NOT IDENT.
CD-115	0.000E+00	5.028E+38	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	7.397E+04	0.000E+00	SHORT HLIF
TE-123M	-4.353E-02	1.310E-01	2.493E-01	NOT IDENT.
SB-124	-4.543E-01	1.447E+00	3.024E+00	NOT IDENT.
SB-125	8.192E-02	1.071E-01	2.199E-01	FAIL ABUN
TE-125M	-8.579E+00	2.843E+02	5.078E+02	NOT IDENT.
I-126	0.000E+00	6.055E+05	0.000E+00	SHORT HLIF
SB-126	0.000E+00	9.180E+05	0.000E+00	SHORT HLIF
SN-126	0.000E+00	7.885E-02	1.651E-01	FAIL ABUN
SB-127	0.000E+00	7.499E+21	0.000E+00	SHORT HLIF
I-131	0.000E+00	3.086E+09	0.000E+00	SHORT HLIF
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.056E+26	0.000E+00	SHORT HLIF
BA-133	-1.373E-02	4.701E-02	7.634E-02	NOT IDENT.
I-133	0.000E+00	1.557E+41	0.000E+00	SHORT HLIF
CS-134	7.845E-03	5.772E-02	1.142E-01	FAIL ABUN
CS-135	-1.065E-02	1.766E-01	2.980E-01	NOT IDENT.
I-135	0.000E+00	1.733E+41	0.000E+00	SHORT HLIF
CS-136	0.000E+00	2.282E+05	0.000E+00	SHORT HLIF
CE-139	-1.159E-01	1.041E-01	1.862E-01	NOT IDENT.
BA-140	0.000E+00	1.013E+06	0.000E+00	SHORT HLIF
LA-140	0.000E+00	4.088E+05	0.000E+00	SHORT HLIF
CE-141	-1.785E+00	2.119E+01	4.119E+01	NOT IDENT.
CE-143	0.000E+00	5.717E+40	0.000E+00	SHORT HLIF
CE-144	-2.712E-01	3.314E-01	6.160E-01	NOT IDENT.
PM-144	3.108E-03	6.842E-02	1.343E-01	NOT IDENT.
PR-144	2.386E-01	5.920E+00	1.162E+01	NOT IDENT.
PM-146	-1.276E-02	4.763E-02	8.654E-02	NOT IDENT.
ND-147	0.000E+00	2.428E+07	0.000E+00	SHORT HLIF
PM-147	1.225E+01	7.688E+02	1.527E+03	NOT IDENT.
PM-149	0.000E+00	7.192E+39	0.000E+00	SHORT HLIF
EU-150	-2.268E-02	3.271E-02	5.022E-02	FAIL ABUN
EU-152	-5.343E-02	9.420E-02	1.682E-01	FAIL ABUN
GD-153	-1.167E-01	1.972E-01	3.097E-01	NOT IDENT.
EU-154	1.263E-01	1.169E-01	2.581E-01	NOT IDENT.
EU-155	-3.201E-02	1.162E-01	2.039E-01	NOT IDENT.
TB-160	1.782E-01	1.910E+00	3.811E+00	FAIL ABUN
HO-166M	-1.054E-02	5.059E-02	9.909E-02	FAIL ABUN

TM-171	1.965E+01	2.022E+01	4.081E+01	NOT IDENT.
HF-172	-8.408E-03	2.383E-01	4.673E-01	FAIL ABUN
LU-172	9.034E-02	7.589E-02	1.763E-01	FAIL ABUN
LU-176	2.248E-02	2.388E-02	4.975E-02	FAIL ABUN
HF-181	1.676E+00	4.540E+00	8.831E+00	NOT IDENT.
TA-182	7.037E-02	1.060E+00	1.816E+00	FAIL ABUN
RE-183	4.016E-01	2.786E+00	5.228E+00	NOT IDENT.
RE-184	7.938E+00	2.845E+01	5.824E+01	NOT IDENT.
W-188	-8.179E+01	1.254E+02	1.953E+02	FAIL ABUN
IR-192	-4.372E-01	4.544E-01	7.794E-01	FAIL ABUN
HG-203	-8.527E-01	2.377E+00	4.375E+00	NOT IDENT.
PB-211	4.668E-01	6.831E-01	1.388E+00	NOT IDENT.
BI-212	1.307E+00	9.106E-01	1.376E+00	FAIL ABUN
RN-219	9.379E-02	4.107E-01	7.919E-01	FAIL ABUN
RA-223	-8.290E-02	6.493E-01	1.212E+00	FAIL ABUN
AC-227	-2.973E-02	2.267E-01	4.298E-01	FAIL ABUN
TH-227	-2.973E-02	2.267E-01	4.298E-01	FAIL ABUN
TH-231	-8.290E-02	6.493E-01	1.212E+00	FAIL ABUN
PA-233	-2.888E-03	6.060E-02	1.149E-01	FAIL ABUN
PA-234	-2.859E-03	2.568E-01	5.132E-01	FAIL ABUN
PA-234M	8.409E-01	4.574E+00	9.330E+00	NOT IDENT.
NP-237	-2.888E-03	6.060E-02	1.149E-01	FAIL ABUN
NP-238	0.000E+00	7.002E+40	0.000E+00	SHORT HLIF
NP-239	-3.367E-02	2.162E-01	4.262E-01	NOT IDENT.
PU-239	1.634E+02	3.232E+02	6.525E+02	NOT IDENT.
AM-241	-1.269E-01	1.449E-01	2.250E-01	NOT IDENT.
CM-243	1.427E-02	1.027E-01	1.876E-01	NOT IDENT.
BK-247	2.946E-02	7.782E-02	1.530E-01	FAIL ABUN
CM-247	1.372E-02	3.665E-02	7.196E-02	NOT IDENT.
CF-249	2.316E-02	3.907E-02	7.851E-02	NOT IDENT.
CF-251	-3.052E-02	1.166E-01	2.218E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	282	10.66*	1.161E+00	1.188E+01	1.188E+01	11.99
ZN-65	1115.54	12	50.60*	1.441E+00	8.816E-02	2.030E-01	52.99
RU-103	497.08	16	91.00*	2.722E+00	3.336E-02	5.963E+00	151.06
	610.33	239	5.76	2.310E+00	9.336E+00	1.669E+03	15.63
BA-137M	661.66	56	89.90*	2.163E+00	1.491E-01	1.519E-01	42.77
CS-137	661.66	56	85.10*	2.163E+00	1.575E-01	1.605E-01	42.77
BI-207	72.81	-----	21.40	4.355E+00	-----	Line Not Found	-----
	74.97	152	35.70	4.533E+00	4.904E-01	4.988E-01	39.41
	569.70	27	97.76	2.438E+00	5.876E-02	5.976E-02	147.08
	1063.66	30	74.60*	1.497E+00	1.394E-01	1.417E-01	96.53
	1770.23	2	6.87	9.835E-01	1.796E-01	1.827E-01	292.76
TL-208	277.37	-----	6.60	4.415E+00	-----	Line Not Found	-----
	583.19	90	85.00*	2.392E+00	2.305E-01	2.305E-01	34.42
	860.56	24	12.50	1.761E+00	5.621E-01	5.621E-01	113.91
PB-210	46.54	24	4.25*	8.307E-01	3.608E+00	3.700E+00	184.75
BI-211	72.87	-----	1.23	4.361E+00	-----	Line Not Found	-----
	351.06	331	12.92*	3.631E+00	3.677E+00	3.677E+00	15.74
PB-212	74.82	152	10.28	4.533E+00	1.703E+00	1.703E+00	39.41
	77.11	278	17.10	4.743E+00	1.785E+00	1.785E+00	21.98
	238.63	387	43.60*	4.960E+00	9.313E-01	9.313E-01	13.80
	300.09	18	3.30	4.138E+00	6.672E-01	6.672E-01	193.28
BI-214	609.32	239	45.49*	2.310E+00	1.182E+00	1.183E+00	15.63
	1120.29	30	14.92	1.437E+00	7.298E-01	7.301E-01	43.01
	1764.49	26	15.30	9.862E-01	9.052E-01	9.055E-01	41.00
PB-214	74.82	152	5.80	4.533E+00	3.019E+00	3.020E+00	39.41
	77.11	278	9.70	4.743E+00	3.147E+00	3.148E+00	21.98
	87.09	-----	3.41	5.478E+00	-----	Line Not Found	-----
	242.00	100	7.25	4.911E+00	1.455E+00	1.455E+00	52.70
	295.22	180	18.42	4.198E+00	1.209E+00	1.209E+00	29.23
	351.93	331	35.60*	3.631E+00	1.334E+00	1.335E+00	15.74
RN-222	609.32	239	45.49*	2.310E+00	1.182E+00	1.183E+00	15.63
	1120.29	30	14.92	1.437E+00	7.298E-01	7.301E-01	43.01
	1764.49	26	15.30	9.862E-01	9.052E-01	9.055E-01	41.00
RA-224	240.99	100	4.10*	4.911E+00	2.573E+00	2.573E+00	52.70
RA-226	609.32	239	45.49*	2.310E+00	1.182E+00	1.183E+00	15.63
	1120.29	30	14.92	1.437E+00	7.298E-01	7.301E-01	43.01
	1764.49	26	15.30	9.862E-01	9.052E-01	9.055E-01	41.00
AC-228	105.21	-----	1.10	6.259E+00	-----	Line Not Found	-----
	338.32	81	11.27	3.751E+00	9.976E-01	9.976E-01	51.61
	794.95	-----	4.25	1.875E+00	-----	Line Not Found	-----
	835.71	14	1.61	1.802E+00	2.467E+00	2.467E+00	125.56
	911.20	62	25.80*	1.687E+00	7.410E-01	7.410E-01	50.73
	968.97	76	15.80	1.609E+00	1.548E+00	1.548E+00	21.82
RA-228	105.21	-----	1.10	6.259E+00	-----	Line Not Found	-----
	338.32	81	11.27	3.751E+00	9.976E-01	9.976E-01	51.61
	794.95	-----	4.25	1.875E+00	-----	Line Not Found	-----
	835.71	14	1.61	1.802E+00	2.467E+00	2.467E+00	125.56

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	911.20	62	25.80*	1.687E+00	7.410E-01	7.410E-01	50.73
	968.97	76	15.80	1.609E+00	1.548E+00	1.548E+00	21.82
TH-228	74.82	152	10.28	4.533E+00	1.703E+00	1.703E+00	39.41
	77.11	278	17.10	4.743E+00	1.785E+00	1.785E+00	21.98
	238.63	387	43.60*	4.960E+00	9.313E-01	9.313E-01	13.80
	300.09	18	3.30	4.138E+00	6.672E-01	6.672E-01	193.28
TH-229	85.43	56	14.70	5.288E+00	3.734E-01	3.734E-01	123.34
	88.47	81	24.00	5.631E+00	3.108E-01	3.109E-01	81.93
	193.51	-----	4.41*	5.711E+00	-----	Line Not Found	-----
	210.85	-----	2.80	5.411E+00	-----	Line Not Found	-----
TH-230	609.32	239	45.49*	2.310E+00	1.182E+00	1.182E+00	15.63
	1120.29	30	14.92	1.437E+00	7.298E-01	7.299E-01	43.01
	1764.49	26	15.30	9.862E-01	9.052E-01	9.052E-01	41.00
PA-231	283.69	-----	1.70	4.336E+00	-----	Line Not Found	-----
	301.36	18	5.35*	4.138E+00	4.116E-01	4.116E-01	193.28
TH-232	105.21	-----	1.10	6.259E+00	-----	Line Not Found	-----
	338.32	81	11.27	3.751E+00	9.976E-01	9.976E-01	51.61
	835.71	14	1.61	1.802E+00	2.467E+00	2.467E+00	125.56
	911.20	62	25.80*	1.687E+00	7.410E-01	7.410E-01	50.73
	968.97	76	15.80	1.609E+00	1.548E+00	1.548E+00	21.82
TH-234	63.29	28	3.70*	3.291E+00	1.202E+00	1.202E+00	191.99
	92.59	117	4.23	5.782E+00	2.492E+00	2.492E+00	53.70
U-234	609.32	239	45.49*	2.310E+00	1.182E+00	1.182E+00	15.63
	1120.29	30	14.92	1.437E+00	7.298E-01	7.298E-01	43.01
	1764.49	26	15.30	9.862E-01	9.052E-01	9.052E-01	41.00
U-235	89.96	81	3.47	5.631E+00	2.150E+00	2.150E+00	81.93
	93.35	117	5.60	5.782E+00	1.883E+00	1.883E+00	53.70
	143.76	-----	10.96*	6.462E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.216E+00	-----	Line Not Found	-----
	185.72	52	57.20	5.844E+00	8.039E-02	8.039E-02	116.63
	205.31	-----	5.01	5.506E+00	-----	Line Not Found	-----
U-238	63.29	28	3.70*	3.291E+00	1.202E+00	1.202E+00	191.99
	92.59	117	4.23	5.782E+00	2.492E+00	2.492E+00	53.70
AM-243	43.53	-----	5.90	5.190E-01	-----	Line Not Found	-----
	74.66	152	67.20*	4.533E+00	2.605E-01	2.606E-01	39.41
ANH-511	511.00	23	100.00*	2.664E+00	4.581E-02	4.581E-02	182.54

Flag: "*" = Keyline

Total number of lines in spectrum 50
 Number of unidentified lines 14
 Number of lines tentatively identified by NID 36 72.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.188E+01	1.188E+01	0.142E+01	11.99	
ZN-65	244.06D	2.30	8.816E-02	2.030E-01	1.076E-01	52.99	
RU-103	39.26D	179.	3.336E-02	5.963E+00	9.008E+00	151.06	
BA-137M	30.08Y	1.02	1.491E-01	1.519E-01	0.650E-01	42.77	
CS-137	30.08Y	1.02	1.575E-01	1.605E-01	0.686E-01	42.77	
BI-207	32.90Y	1.02	1.394E-01	1.417E-01	1.368E-01	96.53	
TL-208	1.41E+10Y	1.00	2.305E-01	2.305E-01	0.793E-01	34.42	
PB-210	22.20Y	1.03	3.608E+00	3.700E+00	6.835E+00	184.75	
BI-211	7.04E+08Y	1.00	3.677E+00	3.677E+00	0.579E+00	15.74	
PB-212	1.41E+10Y	1.00	9.313E-01	9.313E-01	1.285E-01	13.80	
BI-214	1600.00Y	1.00	1.182E+00	1.183E+00	0.185E+00	15.63	
PB-214	1600.00Y	1.00	1.334E+00	1.335E+00	0.210E+00	15.74	
RN-222	1600.00Y	1.00	1.182E+00	1.183E+00	0.185E+00	15.63	
RA-224	1.41E+10Y	1.00	2.573E+00	2.573E+00	1.356E+00	52.70	
RA-226	1600.00Y	1.00	1.182E+00	1.183E+00	0.185E+00	15.63	
AC-228	1.41E+10Y	1.00	7.410E-01	7.410E-01	3.759E-01	50.73	
RA-228	1.41E+10Y	1.00	7.410E-01	7.410E-01	3.759E-01	50.73	
TH-228	1.41E+10Y	1.00	9.313E-01	9.313E-01	1.285E-01	13.80	
TH-229	7340.00Y	1.00	3.108E-01	3.109E-01	2.547E-01	81.93	K
TH-230	7.54E+04Y	1.00	1.182E+00	1.182E+00	0.185E+00	15.63	
PA-231	7.04E+08Y	1.00	4.116E-01	4.116E-01	7.955E-01	193.28	
TH-232	1.41E+10Y	1.00	7.410E-01	7.410E-01	3.759E-01	50.73	
TH-234	4.47E+09Y	1.00	1.202E+00	1.202E+00	2.308E+00	191.99	
U-234	2.45E+05Y	1.00	1.182E+00	1.182E+00	0.185E+00	15.63	
U-235	7.04E+08Y	1.00	8.039E-02	8.039E-02	9.376E-02	116.63	K
U-238	4.47E+09Y	1.00	1.202E+00	1.202E+00	2.308E+00	191.99	
AM-243	7370.00Y	1.00	2.605E-01	2.606E-01	1.027E-01	39.41	
ANH-511	1.00E+09Y	1.00	4.581E-02	4.581E-02	8.361E-02	182.54	
Total Activity :			3.738E+01	4.353E+01			

Grand Total Activity : 3.738E+01 4.353E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	209.01	13	199	0.74	418.93	411	13	3.15E-03	****	5.44E+00	
0	249.44	35	48	1.53	499.81	496	8	8.71E-03	80.2	4.80E+00	
0	270.58	25	84	1.41	542.12	538	8	6.18E-03	****	4.50E+00	T
0	462.11	46	49	2.01	925.34	918	14	1.18E-02	73.8	2.89E+00	T
0	543.22	20	16	0.67	1087.64	1085	7	5.18E-03	84.2	2.53E+00	
0	586.97	12	8	1.42	1175.17	1173	5	3.19E-03	92.6	2.38E+00	
0	727.31	34	28	1.01	1455.97	1449	11	9.10E-03	71.1	2.01E+00	T
0	768.94	33	26	0.80	1539.27	1532	16	8.88E-03	77.4	1.92E+00	
0	933.90	22	9	1.06	1869.33	1865	11	6.16E-03	66.0	1.66E+00	
1	965.03	21	0	2.13	1931.61	1922	27	5.93E-03	59.2	1.61E+00	T
4	1122.38	12	0	1.51	2246.45	2233	17	3.33E-03	74.5	1.43E+00	T
0	1179.51	15	9	2.65	2360.78	2356	11	4.22E-03	89.9	1.38E+00	
0	1224.88	10	4	2.01	2451.55	2448	8	2.78E-03	93.8	1.34E+00	
1	1238.18	24	12	2.28	2478.15	2474	22	6.76E-03	60.9	1.33E+00	T
1	1242.81	18	11	2.29	2487.42	2474	22	5.08E-03	****	1.32E+00	
0	1279.83	18	3	1.04	2561.49	2554	14	5.16E-03	63.0	1.29E+00	
0	1372.91	9	7	3.78	2747.75	2742	12	2.53E-03	****	1.22E+00	
0	1377.71	13	4	1.98	2757.35	2753	8	3.61E-03	76.9	1.22E+00	
0	1594.69	8	6	0.57	3191.49	3186	9	2.33E-03	****	1.08E+00	
0	1727.95	15	3	5.08	3458.13	3450	16	4.29E-03	76.6	1.00E+00	

Flags: "T" = Tentatively associated


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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621365.CNF;1
* Acquisition date   : 3-OCT-2016 06:55:29 Sensitivity      : 3.000
* Detector ID       : GAM19 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.73 Half life ratio : *****
* Sample date       : 14-DEC-2015 13:47:00 Nuclide Library : SOLID
* Sample ID         : G1203621365 Analyst initials: MXR1
* Batch Number      : 1596254 Sample Quantity : 1.4423E+02 GRAM
* Wet wt corr       : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 15-JUN-2016 10:35:16 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM19_CAN.CNF;17
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.053E-01
ZN-65	1.299E-01
RU-103	4.419E+00
BA-137M	2.790E-02
CS-137	2.947E-02
BI-207	4.018E-02
TL-208	2.879E-02
PB-210	2.847E+00
BI-211	1.789E-01
PB-212	4.779E-02
BI-214	4.391E-02
PB-214	1.711E-01
RN-222	4.391E-02
RA-224	5.123E-01
RA-226	4.391E-02
AC-228	1.033E-01
RA-228	1.033E-01
TH-228	4.779E-02
TH-229	4.348E-01
TH-230	4.389E-02
PA-231	3.989E-01
TH-232	1.033E-01
TH-234	1.002E+00
U-234	4.389E-02
U-235	1.576E-01
U-238	1.002E+00
AM-243	4.234E-02
ANH-511	2.694E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.027E+01	NOT IDENT.
NA-22	4.541E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF

AL-26	2.180E-02	NOT IDENT.
SC-46	3.222E-01	FAIL ABUN
V-48	0.000E+00	SHORT HLIF
CR-51	0.000E+00	SHORT HLIF
MN-54	6.759E-02	NOT IDENT.
CO-56	3.942E-01	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	4.190E-02	NOT IDENT.
CO-58	3.914E-01	NOT IDENT.
FE-59	4.571E+00	NOT IDENT.
CO-60	2.324E-02	NOT IDENT.
GE-68	1.647E+00	NOT IDENT.
AS-73	7.362E+00	NOT IDENT.
AS-74	0.000E+00	SHORT HLIF
SE-75	1.968E-01	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	0.000E+00	SHORT HLIF
RB-83	4.963E-01	NOT IDENT.
KR-85	7.715E+00	NOT IDENT.
SR-85	7.648E-01	NOT IDENT.
RB-86	0.000E+00	SHORT HLIF
Y-88	1.785E-01	NOT IDENT.
Y-91	3.543E+02	NOT IDENT.
NB-94	3.390E-02	NOT IDENT.
NB-95	6.367E-01	NOT IDENT.
NB-95M	2.115E+00	NOT IDENT.
ZR-95	1.007E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.186E-02	NOT IDENT.
RH-102	5.387E-02	NOT IDENT.
RH-106	3.923E-01	NOT IDENT.
RU-106	3.923E-01	NOT IDENT.
AG-108M	2.796E-02	NOT IDENT.
CD-109	1.218E+00	NOT IDENT.
AG-110M	8.341E-02	NOT IDENT.
SN-113	2.095E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	0.000E+00	SHORT HLIF
TE-123M	1.169E-01	NOT IDENT.
SB-124	1.086E+00	NOT IDENT.
SB-125	1.003E-01	FAIL ABUN
TE-125M	2.388E+02	NOT IDENT.
I-126	0.000E+00	SHORT HLIF
SB-126	0.000E+00	SHORT HLIF
SN-126	7.888E-02	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	0.000E+00	SHORT HLIF
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.473E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.126E-02	FAIL ABUN
CS-135	1.389E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	0.000E+00	SHORT HLIF
CE-139	8.654E-02	NOT IDENT.
BA-140	0.000E+00	SHORT HLIF
LA-140	0.000E+00	SHORT HLIF
CE-141	1.935E+01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.871E-01	NOT IDENT.
PM-144	6.108E-02	NOT IDENT.
PR-144	5.283E+00	NOT IDENT.
PM-146	3.907E-02	NOT IDENT.
ND-147	0.000E+00	SHORT HLIF
PM-147	7.142E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.308E-02	FAIL ABUN
EU-152	7.637E-02	FAIL ABUN
GD-153	1.449E-01	NOT IDENT.
EU-154	1.124E-01	NOT IDENT.
EU-155	9.561E-02	NOT IDENT.
TB-160	1.677E+00	FAIL ABUN
HO-166M	4.305E-02	FAIL ABUN
TM-171	1.920E+01	NOT IDENT.

HF-172	2.201E-01	FAIL ABUN
LU-172	7.780E-02	FAIL ABUN
LU-176	2.296E-02	FAIL ABUN
HF-181	4.023E+00	NOT IDENT.
TA-182	7.922E-01	FAIL ABUN
RE-183	2.459E+00	NOT IDENT.
RE-184	2.565E+01	NOT IDENT.
W-188	8.973E+01	FAIL ABUN
IR-192	3.546E-01	FAIL ABUN
HG-203	2.026E+00	NOT IDENT.
PB-211	6.346E-01	NOT IDENT.
BI-212	6.346E-01	FAIL ABUN
RN-219	3.621E-01	FAIL ABUN
RA-223	5.593E-01	FAIL ABUN
AC-227	1.985E-01	FAIL ABUN
TH-227	1.985E-01	FAIL ABUN
TH-231	5.593E-01	FAIL ABUN
PA-233	5.275E-02	FAIL ABUN
PA-234	2.203E-01	FAIL ABUN
PA-234M	4.125E+00	NOT IDENT.
NP-237	5.275E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.986E-01	NOT IDENT.
PU-239	3.083E+02	NOT IDENT.
AM-241	1.050E-01	NOT IDENT.
CM-243	8.793E-02	NOT IDENT.
BK-247	7.117E-02	FAIL ABUN
CM-247	3.287E-02	NOT IDENT.
CF-249	3.596E-02	NOT IDENT.
CF-251	1.038E-01	NOT IDENT.

```

*****
*
*               GEL Laboratories LLC
*               2040 Savage Road
*               Charleston, SC 29407
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621365.CNF;1
* Acquisition date   : 3-OCT-2016 06:55:29 Sensitivity      : 3.000
* Detector ID       : GAM19 Energy tolerance: 1.500
* Elapsed live time : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time : 0 01:00:00.73 Half life ratio  : *****
* Sample date      : 14-DEC-2015 13:47:00 Nuclide Library : SOLID
* Sample ID       : G1203621365 Analyst initials: MXR1
* Batch Number    : 1596254 Sample Quantity  : 1.4423E+02 GRAM
* Wet wt corr     : 1.00000 Quantity Err(%) : 1.3866E-03 %
* Wet Weight      : 0.00000
* Dry Weight      : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date    : 15-JUN-2016 10:35:16 Eff. Geometry   : CAN
* Eff. File        : DKA100:[CANBERRA.GAMMA]EFF_GAM19_CAN.CNF;17
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.188E+01	1.528E+00	1.528E+00
ZN-65	2.030E-01	1.057E-01	1.057E-01
RU-103	5.963E+00	8.833E+00	8.833E+00
BA-137M	1.519E-01	6.400E-02	6.400E-02
CS-137	1.605E-01	6.761E-02	6.761E-02
BI-207	1.417E-01	1.342E-01	1.342E-01
TL-208	2.305E-01	7.837E-02	7.837E-02
PB-210	3.700E+00	6.709E+00	6.709E+00
BI-211	3.461E-01	1.128E+00	1.128E+00
PB-212	9.313E-01	1.353E-01	1.353E-01
BI-214	1.183E+00	1.882E-01	1.882E-01
PB-214	1.335E+00	2.132E-01	2.132E-01
RN-222	1.183E+00	1.882E-01	1.882E-01
RA-224	4.352E-01	1.470E+00	1.470E+00
RA-226	1.183E+00	1.882E-01	1.882E-01
AC-228	7.410E-01	3.703E-01	3.703E-01
RA-228	7.410E-01	3.703E-01	3.703E-01
TH-228	9.313E-01	1.353E-01	1.353E-01
TH-229	4.209E-01	4.492E-01	4.492E-01
TH-230	1.182E+00	1.881E-01	1.881E-01
PA-231	4.116E-01	7.845E-01	7.845E-01
TH-232	7.410E-01	3.703E-01	3.703E-01
TH-234	1.202E+00	2.278E+00	2.278E+00
U-234	1.182E+00	1.881E-01	1.881E-01
U-235	-1.003E-01	1.829E-01	1.829E-01
U-238	1.202E+00	2.278E+00	2.278E+00
AM-243	1.562E-01	1.062E-01	1.062E-01
ANH-511	4.581E-02	8.196E-02	8.196E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.290E+00	1.230E+01	1.231E+01	NOT IDENT.
NA-22	5.037E-02	4.736E-02	5.252E-02	NOT IDENT.

NA-24	1.000E+41	1.235E+41	0.000E+00	SHORT HLIF
AL-26	6.178E-03	2.306E-02	2.322E-02	NOT IDENT.
SC-46	-1.491E-02	3.752E-01	3.753E-01	FAIL ABUN
V-48	1.166E+04	1.121E+04	1.239E+04	SHORT HLIF
CR-51	1.731E+02	3.785E+02	3.865E+02	SHORT HLIF
MN-54	7.263E-02	7.417E-02	8.107E-02	NOT IDENT.
CO-56	1.848E-01	4.233E-01	4.314E-01	FAIL ABUN
MN-56	1.000E+41	2.309E+41	0.000E+00	SHORT HLIF
CO-57	1.255E-02	4.427E-02	4.463E-02	NOT IDENT.
CO-58	-3.849E-01	5.203E-01	5.485E-01	NOT IDENT.
FE-59	1.226E+00	5.114E+00	5.144E+00	NOT IDENT.
CO-60	-2.284E-02	3.478E-02	3.627E-02	NOT IDENT.
GE-68	-6.558E-01	2.083E+00	2.104E+00	NOT IDENT.
AS-73	4.108E-01	8.373E+00	8.375E+00	NOT IDENT.
AS-74	-1.699E+03	5.000E+03	5.058E+03	SHORT HLIF
SE-75	1.042E-01	2.131E-01	2.182E-01	NOT IDENT.
BR-77	2.816E+37	2.388E+38	0.000E+00	SHORT HLIF
SR-82	-3.318E+02	6.995E+02	7.153E+02	SHORT HLIF
RB-83	-3.777E-01	6.527E-01	6.745E-01	NOT IDENT.
KR-85	4.360E+00	9.632E+00	9.830E+00	NOT IDENT.
SR-85	4.339E-01	9.546E-01	9.744E-01	NOT IDENT.
RB-86	-4.856E+03	2.062E+04	2.073E+04	SHORT HLIF
Y-88	8.869E-02	1.787E-01	1.831E-01	NOT IDENT.
Y-91	-2.645E+02	4.772E+02	4.919E+02	NOT IDENT.
NB-94	8.232E-03	3.750E-02	3.769E-02	NOT IDENT.
NB-95	6.482E-02	8.103E-01	8.108E-01	NOT IDENT.
NB-95M	8.383E-02	2.635E+00	2.635E+00	NOT IDENT.
ZR-95	-1.057E+00	1.326E+00	1.409E+00	NOT IDENT.
NB-97	-1.000E+41	1.920E+41	0.000E+00	SHORT HLIF
ZR-97	1.000E+41	5.169E+41	0.000E+00	SHORT HLIF
MO-99	2.386E+31	3.817E+31	0.000E+00	SHORT HLIF
TC-99M	-1.000E+41	1.649E+41	0.000E+00	SHORT HLIF
RH-101	-1.055E-02	3.516E-02	3.548E-02	NOT IDENT.
RH-102	1.720E-02	6.223E-02	6.271E-02	NOT IDENT.
RH-106	-4.272E-01	5.482E-01	5.810E-01	NOT IDENT.
RU-106	-4.272E-01	5.482E-01	5.810E-01	NOT IDENT.
AG-108M	2.936E-02	2.911E-02	3.198E-02	NOT IDENT.
CD-109	3.009E+00	1.243E+00	1.840E+00	NOT IDENT.
AG-110M	-4.969E-04	9.653E-02	9.653E-02	NOT IDENT.
SN-113	6.222E-02	2.362E-01	2.378E-01	NOT IDENT.
CD-115	-3.132E+38	5.059E+38	0.000E+00	SHORT HLIF
SN-117M	-2.971E+04	7.405E+04	7.525E+04	SHORT HLIF
TE-123M	-4.353E-02	1.311E-01	1.325E-01	NOT IDENT.
SB-124	-4.543E-01	1.447E+00	1.461E+00	NOT IDENT.
SB-125	8.192E-02	1.071E-01	1.133E-01	FAIL ABUN
TE-125M	-8.579E+00	2.843E+02	2.843E+02	NOT IDENT.
I-126	1.595E+05	6.059E+05	6.101E+05	SHORT HLIF
SB-126	-8.258E+05	9.307E+05	1.002E+06	SHORT HLIF
SN-126	1.961E-01	7.980E-02	1.191E-01	FAIL ABUN
SB-127	3.655E+21	8.970E+21	0.000E+00	SHORT HLIF
I-131	1.348E+09	3.086E+09	3.146E+09	SHORT HLIF
I-132	1.000E+41	1.840E+42	0.000E+00	SHORT HLIF
TE-132	-5.000E+25	1.074E+26	0.000E+00	SHORT HLIF
BA-133	-1.373E-02	4.702E-02	4.742E-02	NOT IDENT.
I-133	1.000E+41	2.359E+41	0.000E+00	SHORT HLIF
CS-134	7.845E-03	5.772E-02	5.783E-02	FAIL ABUN
CS-135	-1.065E-02	1.766E-01	1.766E-01	NOT IDENT.
I-135	-1.000E+41	6.859E+41	0.000E+00	SHORT HLIF
CS-136	-1.940E+04	2.283E+05	2.284E+05	SHORT HLIF
CE-139	-1.159E-01	1.067E-01	1.188E-01	NOT IDENT.
BA-140	-2.554E+04	1.013E+06	1.013E+06	SHORT HLIF
LA-140	1.256E+05	4.088E+05	4.127E+05	SHORT HLIF
CE-141	-1.785E+00	2.119E+01	2.120E+01	NOT IDENT.
CE-143	1.000E+41	5.804E+40	0.000E+00	SHORT HLIF
CE-144	-2.712E-01	3.318E-01	3.536E-01	NOT IDENT.
PM-144	3.108E-03	6.842E-02	6.843E-02	NOT IDENT.
PR-144	2.386E-01	5.920E+00	5.921E+00	NOT IDENT.
PM-146	-1.276E-02	4.764E-02	4.799E-02	NOT IDENT.
ND-147	-5.996E+06	2.428E+07	2.443E+07	SHORT HLIF
PM-147	1.225E+01	7.688E+02	7.688E+02	NOT IDENT.
PM-149	4.562E+39	7.260E+39	0.000E+00	SHORT HLIF
EU-150	-2.268E-02	3.272E-02	3.428E-02	FAIL ABUN
EU-152	-5.343E-02	9.425E-02	9.728E-02	FAIL ABUN
GD-153	-1.167E-01	1.974E-01	2.043E-01	NOT IDENT.
EU-154	1.263E-01	1.170E-01	1.301E-01	NOT IDENT.
EU-155	-3.201E-02	1.162E-01	1.171E-01	NOT IDENT.
TB-160	1.782E-01	1.910E+00	1.912E+00	FAIL ABUN
HO-166M	-1.054E-02	5.059E-02	5.082E-02	FAIL ABUN

TM-171	1.965E+01	2.030E+01	2.215E+01	NOT IDENT.
HF-172	-8.408E-03	2.383E-01	2.383E-01	FAIL ABUN
LU-172	9.034E-02	7.644E-02	8.661E-02	FAIL ABUN
LU-176	2.248E-02	2.390E-02	2.596E-02	FAIL ABUN
HF-181	1.676E+00	4.541E+00	4.603E+00	NOT IDENT.
TA-182	7.037E-02	1.060E+00	1.060E+00	FAIL ABUN
RE-183	4.016E-01	2.787E+00	2.793E+00	NOT IDENT.
RE-184	7.938E+00	2.851E+01	2.873E+01	NOT IDENT.
W-188	-8.179E+01	1.257E+02	1.310E+02	FAIL ABUN
IR-192	-4.372E-01	4.548E-01	4.957E-01	FAIL ABUN
HG-203	-8.527E-01	2.378E+00	2.409E+00	NOT IDENT.
PB-211	4.668E-01	6.835E-01	7.151E-01	NOT IDENT.
BI-212	1.307E+00	9.130E-01	1.087E+00	FAIL ABUN
RN-219	9.379E-02	4.109E-01	4.131E-01	FAIL ABUN
RA-223	-8.290E-02	6.493E-01	6.504E-01	FAIL ABUN
AC-227	-2.973E-02	2.267E-01	2.271E-01	FAIL ABUN
TH-227	-2.973E-02	2.267E-01	2.271E-01	FAIL ABUN
TH-231	-8.290E-02	6.493E-01	6.504E-01	FAIL ABUN
PA-233	-2.888E-03	6.060E-02	6.061E-02	FAIL ABUN
PA-234	-2.859E-03	2.568E-01	2.568E-01	FAIL ABUN
PA-234M	8.409E-01	4.574E+00	4.590E+00	NOT IDENT.
NP-237	-2.888E-03	6.060E-02	6.061E-02	FAIL ABUN
NP-238	3.822E+40	7.004E+40	0.000E+00	SHORT HLIF
NP-239	-3.367E-02	2.162E-01	2.167E-01	NOT IDENT.
PU-239	1.634E+02	3.232E+02	3.315E+02	NOT IDENT.
AM-241	-1.269E-01	1.453E-01	1.561E-01	NOT IDENT.
CM-243	1.427E-02	1.027E-01	1.029E-01	NOT IDENT.
BK-247	2.946E-02	7.805E-02	7.917E-02	FAIL ABUN
CM-247	1.372E-02	3.672E-02	3.724E-02	NOT IDENT.
CF-249	2.316E-02	3.912E-02	4.049E-02	NOT IDENT.
CF-251	-3.052E-02	1.166E-01	1.175E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	74.5300	87.09	77.4165	136.47	83.3179
45.60	67.3888	87.57	77.4717	140.51	0.0000
46.54	67.5282	88.03	77.5244	143.76	85.7176
49.72	0.0000	88.34	77.5596	144.24	93.5585
51.35	89.8228	88.47	77.5747	145.44	82.4021
51.87	70.5693	89.96	77.7437	152.43	76.0197
52.39	61.5287	1093.63	77.8208	153.25	0.0000
52.97	68.4455	91.11	0.0000	323.87	84.0381
53.44	78.7868	92.59	78.0391	156.02	0.0000
54.07	74.3132	93.35	78.1235	158.56	0.0000
57.36	0.0000	94.56	78.2578	159.00	84.4492
57.53	71.3651	94.65	78.2676	162.33	62.6660
57.98	80.6427	94.67	78.2700	162.66	0.0000
59.27	83.1502	94.87	78.2920	163.33	69.7960
59.32	83.1580	97.43	80.2087	165.86	83.2550
59.54	90.8953	98.43	86.8760	176.31	69.7806
60.96	64.8769	98.44	86.8776	176.60	0.0000
61.17	71.0835	99.53	57.8679	177.52	77.0250
62.93	88.3663	100.11	82.5580	181.07	0.0000
63.29	88.4241	102.03	77.8310	181.52	87.6502
63.58	88.4705	103.18	71.7641	184.41	82.4751
64.28	80.8115	103.37	71.7823	143.76	84.8299
66.73	87.4066	105.21	83.1233	193.51	53.6170
67.24	89.0468	105.31	83.1340	197.03	69.2801
125.81	91.4604	106.12	80.7387	198.01	66.6026
67.75	91.4711	106.47	80.7754	201.83	69.5685
69.67	111.7768	109.28	84.8122	203.43	67.3728
70.83	89.5977	111.00	92.4989	205.31	64.7261
72.81	115.1289	111.76	0.0000	210.85	91.3170
72.87	115.1407	114.06	68.5969	215.65	78.7165
74.66	98.4751	116.30	0.0000	222.11	74.4759
74.82	98.5004	116.74	66.3075	227.09	56.0797
74.97	98.5245	119.76	69.9223	227.38	57.0280
77.11	98.8665	121.12	69.1933	228.16	0.0000
78.74	85.9861	121.22	69.2017	228.18	66.4188
79.69	86.1152	121.78	67.5594	116.74	66.4188
80.12	86.1735	122.06	67.5822	235.69	73.3972
80.19	0.0000	122.92	78.6452	235.96	76.2358
80.57	81.4431	123.07	78.6589	238.63	66.4896
81.00	81.4976	265.00	87.1802	238.98	0.0000
81.07	86.3009	125.81	89.0968	240.99	66.6101
81.75	76.7930	127.23	94.3442	242.00	66.6610
83.79	77.0332	127.91	102.0752	244.70	66.7973
84.00	77.0581	129.30	85.1990	252.40	0.0000
85.43	77.2246	131.20	87.0928	252.80	44.3250
86.55	77.3545	133.02	83.8509	254.15	0.0000
86.79	77.3818	133.52	81.3304	256.23	51.6039
86.94	77.3994	136.00	85.8500	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	49.0348	355.39	0.0000	584.27	22.1938
264.80	50.0015	356.01	39.7633	595.83	0.0000
265.00	51.9313	364.49	0.0000	427.87	27.4951
268.22	65.0638	366.42	0.0000	602.52	0.0000
269.46	63.6730	372.51	39.1110	604.72	29.2613
270.03	55.9775	375.05	40.1973	607.14	13.7832
271.23	44.9163	377.52	40.2529	609.32	13.7949
273.65	0.0000	356.01	34.1803	610.33	13.8003
276.40	47.5026	388.16	30.1080	614.28	15.5495
277.37	43.6542	388.63	0.0000	618.01	17.3029
277.60	43.6615	391.69	33.2865	620.36	23.0908
278.00	36.8798	264.66	31.3574	621.93	27.7266
279.20	55.3649	401.81	34.5140	630.19	0.0000
279.54	73.8368	402.40	31.3867	631.29	18.5508
279.70	73.8461	404.85	27.2373	633.25	19.7254
280.46	62.2188	410.95	35.7321	634.78	0.0000
283.69	55.5353	413.71	34.7315	635.95	12.7765
284.31	0.0000	414.70	0.0000	636.99	0.0000
285.41	61.4529	423.72	0.0000	645.85	19.8202
285.90	0.0000	427.09	39.2116	657.76	23.8905
287.50	48.8413	427.87	24.3842	657.90	0.0000
290.67	51.3934	433.94	22.3326	661.66	18.4718
293.27	0.0000	439.40	26.6591	664.57	0.0000
351.93	39.7667	453.88	33.2951	666.33	0.0000
295.96	39.7856	463.37	29.1324	666.50	0.0000
879.38	29.5221	468.07	25.9541	667.71	0.0000
299.98	51.7107	473.00	0.0000	677.62	21.2344
300.09	51.7149	475.06	21.7004	685.70	0.0000
300.13	51.7160	476.78	31.4910	695.00	0.0000
301.36	48.8001	477.60	29.3307	696.49	30.2875
302.85	54.7683	482.18	29.3939	696.51	30.2875
256.23	55.7161	487.02	0.0000	697.00	0.0000
304.85	0.0000	492.35	0.0000	697.30	31.1868
306.78	31.6589	497.08	24.1158	697.49	32.0801
308.46	48.5295	505.52	21.4579	702.65	28.5684
311.90	42.6816	507.63	0.0000	706.68	16.9862
316.51	51.7651	511.00	33.0933	711.68	17.0164
319.41	0.0000	514.00	36.4509	720.70	0.0000
320.08	0.0000	514.00	36.4509	721.93	0.0000
321.04	34.9416	520.40	27.6937	722.78	15.8238
323.87	50.0041	520.69	0.0000	722.91	15.8243
325.23	58.0543	522.65	0.0000	723.31	15.8265
328.76	0.0000	527.90	0.0000	724.19	17.2705
333.37	58.8475	528.26	27.7893	727.33	17.2893
333.97	58.8690	529.59	17.7956	733.00	15.3383
334.37	52.8439	529.87	0.0000	735.93	23.4824
338.28	47.4198	531.02	0.0000	333.97	18.9761
338.32	47.4217	537.26	0.0000	739.50	0.0000
311.90	45.4623	546.56	0.0000	747.24	13.5997
340.48	45.4623	552.55	19.0953	748.06	15.4171
340.55	0.0000	563.25	18.6169	752.31	18.1635
344.28	42.5281	569.33	23.7549	753.82	0.0000
345.93	36.4885	946.00	23.7566	756.73	21.8291
351.06	44.7323	569.70	23.7583	756.80	17.2814
351.93	44.7546	583.19	22.1835	884.68	18.9643

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	16.0563	1274.44	14.6626	1620.50	2.2465
766.42	11.6797	1001.03	12.7243	1621.92	1.1235
766.84	11.6813	1002.74	15.6675	1678.03	0.0000
772.60	0.0000	1004.73	20.5751	1690.97	3.6408
776.52	0.0000	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	4.6104
778.90	14.6597	1028.54	0.0000	1063.66	3.0767
783.70	0.0000	1037.84	9.8846	1771.35	1.5386
785.37	14.6909	1038.76	0.0000	1791.20	0.0000
792.07	28.5261	631.29	9.9072	1808.65	1.8581
794.95	17.5000	1048.07	0.0000	1810.72	0.0000
795.86	23.9537	1049.04	16.8527	1836.06	1.8667
810.06	24.0632	1050.41	15.8672		
810.29	24.0648	1063.66	12.9365		
344.28	22.2151	1077.00	0.0000		
810.76	18.5144	1077.34	11.9832		
815.77	0.0000	1085.87	11.0087		
1048.07	0.0000	1093.63	7.0192		
832.01	19.3845	1099.45	8.0342		
834.85	13.4319	1112.07	4.0298		
835.71	14.9282	1112.84	4.8366		
836.80	0.0000	1115.54	11.2930		
846.75	0.0000	1120.29	4.0378		
846.77	12.1704	1120.55	4.0381		
856.80	0.0000	1221.41	4.0391		
860.56	17.8629	1129.67	14.1658		
871.09	10.3746	1131.51	0.0000		
873.19	10.3813	1147.95	0.0000		
875.33	0.0000	1173.23	19.8673		
879.38	17.0189	1177.95	21.2938		
880.51	15.1333	1189.05	11.2907		
883.24	15.1455	1204.77	15.4541		
884.68	14.2049	1221.41	14.8931		
889.28	16.1212	1231.02	17.6215		
894.76	14.2474	1235.36	0.0000		
898.04	7.6060	1238.28	15.5740		
900.72	16.1756	1260.41	0.0000		
903.28	15.2354	1271.87	10.7616		
911.20	13.3617	1274.44	5.0250		
912.08	13.3651	1274.54	5.0250		
923.98	0.0000	1291.59	4.2034		
926.50	13.4211	1298.22	0.0000		
929.11	7.6750	1312.11	0.0000		
937.49	16.9254	1332.49	9.5427		
944.13	0.0000	1362.66	0.0000		
946.00	12.5319	1365.19	10.6781		
949.00	10.6129	1368.63	0.0000		
667.71	0.0000	1384.29	6.4325		
962.31	2.9052	1408.01	3.2324		
964.08	2.9067	1457.56	0.0000		
966.17	2.9084	1460.82	4.3564		
911.20	2.9106	1489.16	5.4764		
968.97	2.9106	1505.03	6.5925		
983.53	0.0000	1584.12	8.9248		
984.45	0.0000	1596.21	0.0000		

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*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621366.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM11.CNF;517
Background date : 2-OCT-2016 11:00:34.
Sample date : 12-SEP-2016 00:00:00 Acquisition date : 3-OCT-2016 05:28:46.
Sample ID : G1203621366 Sample quantity : 1.15000E+02 GRAM
Detector name : GAM11 Detector geometry: CAN
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:06.51 0.7%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID : 1596254 Detector SN# :
Matrix Spike ID : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	10	45.21*	1236	4471	1.98	90.29	87	10	1.37E+00	9.8	6.70E+00
2	10	46.49*	11339	3275	0.84	92.87	87	10	1.26E+01	1.2	
3	0	59.46	23984	4575	0.82	118.83	114	10	2.66E+01	0.8	
4	0	87.98	3343	1556	0.85	175.90	171	10	3.71E+00	2.8	
5	0	122.09	226	845	0.84	244.17	241	7	2.52E-01	22.3	
6	0	157.59	79	652	0.80	315.22	313	7	8.80E-02	54.5	
7	0	281.91*	79	615	1.25	564.01	560	8	8.77E-02	55.7	
8	0	455.52	70	651	1.78	911.43	908	8	7.75E-02	64.4	
9	0	498.20	49	479	1.74	996.82	994	9	5.41E-02	82.1	
10	0	519.40	34	373	1.00	1039.24	1036	8	3.83E-02	98.4	
11	0	619.78	71	231	2.36	1240.11	1237	7	7.84E-02	37.8	
12	0	661.65*	15167	592	1.40	1323.88	1316	16	1.69E+01	0.9	
13	0	690.94	44	205	1.99	1382.48	1380	8	4.93E-02	57.8	
14	0	738.07	55	321	1.80	1476.78	1474	11	6.09E-02	64.6	
15	0	795.59	40	195	0.78	1591.86	1589	6	4.41E-02	58.0	
16	0	920.85	44	271	1.18	1842.45	1840	6	4.85E-02	61.7	
17	0	1173.30	9458	332	1.75	2347.44	2337	20	1.05E+01	1.1	
18	0	1215.76	35	98	0.93	2432.38	2428	12	3.86E-02	59.1	
19	0	1332.61*	8588	77	1.80	2666.09	2658	18	9.54E+00	1.1	
20	0	1356.81	11	44	5.80	2714.48	2702	16	1.25E-02	135.6	
21	0	1400.13	12	39	3.28	2801.13	2790	15	1.36E-02	116.8	
22	0	1508.05	17	40	7.53	3016.96	3003	21	1.83E-02	100.8	
23	0	1861.65	11	7	1.71	3724.04	3718	10	1.19E-02	56.7	
24	0	1865.43	13	2	1.42	3731.61	3728	9	1.48E-02	33.7	
25	0	1943.17	14	4	1.48	3887.05	3883	8	1.60E-02	35.3	
26	0	1961.35	11	5	3.21	3923.40	3917	12	1.23E-02	52.7	
27	0	1996.81	10	13	1.45	3994.30	3987	11	1.11E-02	83.1	
28	0	2032.40	6	5	3.44	4065.45	4058	10	6.97E-03	77.3	

Flag: "*" = Peak area was modified by background subtraction

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621366.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4
Sample title : MXR1
Sample date : 12-SEP-2016 00:00:00 Acquisition date : 3-OCT-2016 05:28:46
Sample ID : G1203621366 Sample quantity : 115.00 GRAM
Sample type : SOLID Sample geometry :
Detector name : GAMMA11 Detector geometry: CAN
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:06.51 0.7%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type : Linear Efficiencies at : Peak Energy
Abundance limit : 75.00

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
CO-57	122.06	237	85.60*	7.219E+00	1.003E+00	1.059E+00	44.65
	136.47	-----	10.68	7.146E+00	-----	Line Not Found	-----
CO-60	1173.23	9009	99.85	1.491E+00	1.581E+02	1.593E+02	2.26
	1332.49	8134	99.98*	1.340E+00	1.585E+02	1.597E+02	2.21
RU-103	497.08	48	91.00*	2.926E+00	4.719E-01	6.865E-01	164.14
	610.33	-----	5.76	2.491E+00	-----	Line Not Found	-----
CD-109	88.03	3550	3.70*	6.299E+00	3.978E+02	4.107E+02	5.62
SN-117M	156.02	-----	2.11	6.864E+00	-----	Line Not Found	-----
	158.56	82	86.40*	6.837E+00	3.631E-01	1.072E+00	109.05
TE-123M	159.00	82	84.00*	6.837E+00	3.735E-01	4.225E-01	109.05
SN-126	64.28	-----	9.60	4.012E+00	-----	Line Not Found	-----
	86.94	3550	8.90	6.299E+00	1.654E+02	1.654E+02	5.62
	87.57	3550	37.00*	6.299E+00	3.978E+01	3.978E+01	5.62
BA-137M	661.66	14813	89.90*	2.339E+00	1.840E+02	1.842E+02	1.78
CS-137	661.66	14813	85.10*	2.339E+00	1.943E+02	1.946E+02	1.78
PM-147	121.22	237	0.00*	7.219E+00	3.013E+04	3.060E+04	44.65
PB-210	46.54	12346	4.25*	1.369E+00	5.541E+03	5.551E+03	2.46
AM-241	59.54	25865	35.90*	3.351E+00	5.614E+02	5.615E+02	1.68

Flag: "*" = Keyline

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                          *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621366.CNF;1
* Acquisition date   : 3-OCT-2016 05:28:46 Sensitivity      : 3.000
* Detector ID       : GAM11 Energy tolerance: 1.500
* Elapsed live time : 0 00:15:00.00 Abundance limit : 75.000
* Elapsed real time : 0 00:15:06.51 Half life ratio : *****
* Sample date       : 12-SEP-2016 00:00:00 Analyst initials: MXR1
* Sample ID         : G1203621366 Sample Quantity : 1.1500E+02 GRAM
* Batch Number      : 1596254 Wet Weight : 0.00000
* Wet wt corr       : 1.00000 Dry Weight : 0.00000
* Nuclide Library   : SOLID.NLB;6
*****
*                               CALIBRATION INFORMATION                         *
*
* Eff. Cal. date    : 2-AUG-2016 10:31:39 Eff. Geometry   : CAN
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
CO-57	1.059E+00	4.633E-01	4.893E-01
CO-60	1.597E+02	3.464E+00	6.389E-01
RU-103	6.865E-01	1.104E+00	1.210E+00
CD-109	4.107E+02	2.262E+01	1.351E+01
SN-117M	1.072E+00	1.145E+00	1.303E+00
TE-123M	4.225E-01	4.516E-01	5.128E-01
SN-126	3.978E+01	2.191E+00	1.314E+00
BA-137M	1.842E+02	3.205E+00	8.989E-01
CS-137	1.946E+02	3.386E+00	9.496E-01
PM-147	3.060E+04	1.339E+04	1.450E+04
PB-210	5.551E+03	1.340E+02	1.039E+02
AM-241	5.615E+02	9.261E+00	4.231E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-8.704E-01	6.073E+00	1.069E+01	NOT IDENT.
NA-22	2.687E-02	3.285E-01	6.130E-01	NOT IDENT.
NA-24	0.000E+00	4.939E+09	0.000E+00	SHORT HLIF
AL-26	2.181E-01	2.590E-01	5.615E-01	NOT IDENT.
K-40	7.487E-01	2.536E+00	5.009E+00	NOT IDENT.
SC-46	-8.330E-01	8.161E-01	1.314E+00	NOT IDENT.
V-48	-6.875E-01	1.864E+00	3.060E+00	NOT IDENT.
CR-51	3.103E-01	5.747E+00	1.048E+01	NOT IDENT.
MN-54	-1.652E-01	6.324E-01	1.062E+00	NOT IDENT.
CO-56	-2.012E-01	7.753E-01	1.299E+00	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-58	1.262E-01	6.897E-01	1.188E+00	NOT IDENT.
FE-59	-9.855E-01	1.725E+00	3.004E+00	NOT IDENT.
ZN-65	1.700E+00	1.597E+00	2.945E+00	NOT IDENT.
GE-68	-5.485E+00	2.256E+01	3.988E+01	NOT IDENT.
AS-73	7.524E+00	1.573E+01	2.859E+01	NOT IDENT.
AS-74	5.140E-01	1.673E+00	2.973E+00	NOT IDENT.
SE-75	-3.644E-01	6.076E-01	9.908E-01	FAIL ABUN

BR-77	-4.754E+02	6.489E+02	1.063E+03	FAIL ABUN
SR-82	-1.819E+00	6.231E+00	1.054E+01	NOT IDENT.
RB-83	8.277E-01	1.596E+00	2.032E+00	FAIL ABUN
KR-85	2.274E+01	9.999E+01	1.782E+02	NOT IDENT.
SR-85	1.282E-01	5.651E-01	1.007E+00	NOT IDENT.
RB-86	-2.647E+00	1.761E+01	3.124E+01	NOT IDENT.
Y-88	-9.316E-02	2.892E-01	5.200E-01	NOT IDENT.
Y-91	-2.211E+01	2.216E+02	3.987E+02	NOT IDENT.
NB-94	2.673E-01	4.533E-01	8.093E-01	NOT IDENT.
NB-95	3.170E-01	6.798E-01	1.191E+00	NOT IDENT.
NB-95M	-7.525E-01	1.560E+00	2.578E+00	NOT IDENT.
ZR-95	8.566E-01	1.131E+00	2.021E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.003E+10	0.000E+00	SHORT HLIF
MO-99	1.132E+03	1.433E+03	1.560E+03	FAIL ABUN
TC-99M	0.000E+00	7.589E+24	0.000E+00	SHORT HLIF
RH-101	9.529E-02	3.257E-01	5.757E-01	NOT IDENT.
RH-102	1.736E-01	8.159E-01	1.437E+00	NOT IDENT.
RH-106	-8.737E-01	5.319E+00	8.227E+00	NOT IDENT.
RU-106	-8.737E-01	5.319E+00	8.227E+00	NOT IDENT.
AG-108M	-8.745E-03	4.956E-01	8.820E-01	NOT IDENT.
AG-110M	-9.137E-01	1.007E+00	1.630E+00	FAIL ABUN
SN-113	3.096E-01	7.181E-01	1.305E+00	NOT IDENT.
CD-115	-2.414E+02	1.166E+03	2.043E+03	NOT IDENT.
SB-124	-3.531E-01	7.538E-01	1.312E+00	NOT IDENT.
SB-125	8.206E-01	1.549E+00	2.802E+00	NOT IDENT.
TE-125M	1.033E+01	1.042E+02	1.847E+02	NOT IDENT.
I-126	2.516E+00	4.724E+00	7.595E+00	NOT IDENT.
SB-126	-1.828E-01	3.044E+00	5.241E+00	NOT IDENT.
SB-127	-5.100E+00	5.494E+01	9.512E+01	NOT IDENT.
I-131	5.600E-01	2.835E+00	5.149E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	3.491E+00	3.443E+01	5.816E+01	NOT IDENT.
BA-133	2.748E-01	5.901E-01	1.082E+00	NOT IDENT.
I-133	0.000E+00	1.181E+07	0.000E+00	SHORT HLIF
CS-134	5.910E-01	6.719E-01	1.187E+00	FAIL ABUN
CS-135	-5.726E-02	2.033E+00	3.383E+00	NOT IDENT.
I-135	0.000E+00	2.535E+23	0.000E+00	SHORT HLIF
CS-136	-1.162E+00	2.612E+00	4.589E+00	NOT IDENT.
CE-139	2.746E-01	3.096E-01	5.506E-01	NOT IDENT.
BA-140	3.139E+00	5.569E+00	1.004E+01	NOT IDENT.
LA-140	-3.882E-01	8.190E-01	1.440E+00	NOT IDENT.
CE-141	4.839E-01	7.159E-01	1.272E+00	NOT IDENT.
CE-143	0.000E+00	3.495E+04	0.000E+00	SHORT HLIF
CE-144	-7.741E-01	2.114E+00	3.648E+00	NOT IDENT.
PM-144	-2.054E-02	5.057E-01	8.339E-01	NOT IDENT.
PR-144	-1.579E+00	3.797E+01	6.260E+01	NOT IDENT.
PM-146	3.605E-01	8.337E-01	1.350E+00	NOT IDENT.
ND-147	3.074E+00	1.246E+01	2.220E+01	NOT IDENT.
PM-149	1.241E+04	8.285E+03	1.453E+04	NOT IDENT.
EU-150	-2.911E-01	3.482E-01	6.168E-01	FAIL ABUN
EU-152	7.043E-01	1.314E+00	2.421E+00	FAIL ABUN
GD-153	6.273E-01	8.571E-01	1.556E+00	NOT IDENT.
EU-154	8.668E-02	9.290E-01	1.735E+00	FAIL ABUN
EU-155	-5.699E-01	1.056E+00	1.839E+00	FAIL ABUN
TB-160	-2.213E+00	2.693E+00	4.381E+00	FAIL ABUN
HO-166M	-1.287E-01	8.484E-01	1.459E+00	FAIL ABUN
TM-171	-2.118E+02	3.080E+02	5.520E+02	NOT IDENT.
HF-172	-1.315E+00	1.962E+00	3.366E+00	FAIL ABUN
LU-172	-4.697E-01	1.182E+00	2.072E+00	FAIL ABUN
LU-176	2.949E-02	3.708E-01	6.141E-01	FAIL ABUN
HF-181	2.570E-02	8.051E-01	1.426E+00	NOT IDENT.
TA-182	8.640E-01	1.939E+00	3.254E+00	NOT IDENT.
RE-183	0.000E+00	1.196E+01	9.352E+00	FAIL ABUN
RE-184	-1.749E-01	2.844E+00	4.768E+00	NOT IDENT.
W-188	-8.503E+01	1.042E+02	1.671E+02	NOT IDENT.
IR-192	1.034E-01	5.315E-01	8.819E-01	NOT IDENT.
HG-203	-2.234E-01	6.052E-01	9.092E-01	NOT IDENT.
BI-207	-5.154E-02	9.071E-01	1.618E+00	NOT IDENT.
TL-208	6.817E-02	4.978E-01	8.808E-01	NOT IDENT.
BI-211	1.243E+00	2.735E+00	5.025E+00	NOT IDENT.
PB-211	3.043E+00	1.040E+01	1.883E+01	NOT IDENT.
BI-212	-1.197E+00	7.372E+00	1.263E+01	NOT IDENT.
PB-212	-7.383E-02	6.855E-01	1.150E+00	NOT IDENT.
BI-214	1.834E-01	9.554E-01	1.689E+00	NOT IDENT.
PB-214	3.724E-01	9.999E-01	1.832E+00	FAIL ABUN
RN-219	-2.611E+00	6.060E+00	1.072E+01	NOT IDENT.
RN-222	1.834E-01	9.554E-01	1.689E+00	NOT IDENT.

RA-223	-4.867E+00	8.255E+00	1.477E+01	NOT IDENT.
RA-224	9.109E-01	7.575E+00	1.276E+01	NOT IDENT.
RA-226	1.834E-01	9.554E-01	1.689E+00	NOT IDENT.
AC-227	-7.211E-01	3.245E+00	5.382E+00	NOT IDENT.
TH-227	-7.211E-01	3.245E+00	5.382E+00	NOT IDENT.
AC-228	-1.644E+00	2.910E+00	4.773E+00	FAIL ABUN
RA-228	-1.644E+00	2.910E+00	4.773E+00	FAIL ABUN
TH-228	-7.383E-02	6.855E-01	1.150E+00	NOT IDENT.
TH-229	1.475E+00	5.860E+00	1.008E+01	FAIL ABUN
TH-230	1.834E-01	9.554E-01	1.689E+00	NOT IDENT.
PA-231	-2.709E+00	6.486E+00	1.054E+01	NOT IDENT.
TH-231	-4.867E+00	8.255E+00	1.477E+01	NOT IDENT.
TH-232	-1.644E+00	2.910E+00	4.773E+00	NOT IDENT.
PA-233	-3.803E-02	9.261E-01	1.524E+00	NOT IDENT.
PA-234	5.891E-01	6.871E+00	1.150E+01	NOT IDENT.
PA-234M	4.607E+01	8.094E+01	1.482E+02	NOT IDENT.
TH-234	-4.166E+00	1.272E+01	2.127E+01	NOT IDENT.
U-234	1.834E-01	9.554E-01	1.689E+00	NOT IDENT.
U-235	-9.682E-01	2.021E+00	3.462E+00	NOT IDENT.
NP-237	-3.803E-02	9.261E-01	1.524E+00	NOT IDENT.
NP-238	0.000E+00	3.092E+03	0.000E+00	SHORT HLIF
U-238	-4.166E+00	1.272E+01	2.127E+01	NOT IDENT.
NP-239	-5.909E-01	2.681E+00	4.690E+00	NOT IDENT.
PU-239	-1.522E+03	3.490E+03	6.021E+03	NOT IDENT.
AM-243	-2.756E-02	5.215E-01	9.356E-01	NOT IDENT.
CM-243	9.497E-01	1.090E+00	1.981E+00	NOT IDENT.
BK-247	-4.077E-01	1.035E+00	1.701E+00	NOT IDENT.
CM-247	-3.028E-01	5.578E-01	9.831E-01	NOT IDENT.
CF-249	-2.765E-01	5.953E-01	1.055E+00	NOT IDENT.
CF-251	-3.808E-01	1.372E+00	2.332E+00	NOT IDENT.
ANH-511	-2.276E-03	4.458E-01	7.983E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
CO-57	122.06	237	85.60*	7.219E+00	1.003E+00	1.059E+00	44.65
	136.47	-----	10.68	7.146E+00	-----	Line Not Found	-----
CO-60	1173.23	9009	99.85	1.491E+00	1.581E+02	1.593E+02	2.26
	1332.49	8134	99.98*	1.340E+00	1.585E+02	1.597E+02	2.21
RU-103	497.08	48	91.00*	2.926E+00	4.719E-01	6.865E-01	164.14
	610.33	-----	5.76	2.491E+00	-----	Line Not Found	-----
CD-109	88.03	3550	3.70*	6.299E+00	3.978E+02	4.107E+02	5.62
SN-117M	156.02	-----	2.11	6.864E+00	-----	Line Not Found	-----
	158.56	82	86.40*	6.837E+00	3.631E-01	1.072E+00	109.05
TE-123M	159.00	82	84.00*	6.837E+00	3.735E-01	4.225E-01	109.05
SN-126	64.28	-----	9.60	4.012E+00	-----	Line Not Found	-----
	86.94	3550	8.90	6.299E+00	1.654E+02	1.654E+02	5.62
	87.57	3550	37.00*	6.299E+00	3.978E+01	3.978E+01	5.62
BA-137M	661.66	14813	89.90*	2.339E+00	1.840E+02	1.842E+02	1.78
CS-137	661.66	14813	85.10*	2.339E+00	1.943E+02	1.946E+02	1.78
PM-147	121.22	237	0.00*	7.219E+00	3.013E+04	3.060E+04	44.65
PB-210	46.54	12346	4.25*	1.369E+00	5.541E+03	5.551E+03	2.46
AM-241	59.54	25865	35.90*	3.351E+00	5.614E+02	5.615E+02	1.68

Flag: "*" = Keyline

Total number of lines in spectrum 28
 Number of unidentified lines 13
 Number of lines tentatively identified by NID 15 53.57%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	271.74D	1.06	1.003E+00	1.059E+00	0.473E+00	44.65	
CO-60	5.27Y	1.01	1.585E+02	1.597E+02	0.035E+02	2.21	
RU-103	39.26D	1.45	4.719E-01	6.865E-01	11.27E-01	164.14	
CD-109	461.40D	1.03	3.978E+02	4.107E+02	0.231E+02	5.62	
SN-117M	13.60D	2.95	3.631E-01	1.072E+00	1.169E+00	109.05	
TE-123M	119.20D	1.13	3.735E-01	4.225E-01	4.608E-01	109.05	
SN-126	2.30E+05Y	1.00	3.978E+01	3.978E+01	0.224E+01	5.62	
BA-137M	30.08Y	1.00	1.840E+02	1.842E+02	0.033E+02	1.78	
CS-137	30.08Y	1.00	1.943E+02	1.946E+02	0.035E+02	1.78	
PM-147	2.62Y	1.02	3.013E+04	3.060E+04	1.366E+04	44.65	
PB-210	22.20Y	1.00	5.541E+03	5.551E+03	0.137E+03	2.46	
AM-241	432.60Y	1.00	5.614E+02	5.615E+02	0.094E+02	1.68	
Total Activity :			3.721E+04	3.770E+04			

Grand Total Activity : 3.721E+04 3.770E+04

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
10	45.21	1348	4874	1.98	90.29	87	10	1.37E+00	19.6	1.17E+00	T
0	281.91	80	623	1.25	564.01	560	8	8.77E-02	****	4.65E+00	T
0	455.52	69	646	1.78	911.43	908	8	7.75E-02	****	3.15E+00	
0	519.40	34	368	1.00	1039.24	1036	8	3.83E-02	****	2.83E+00	T
0	619.78	69	227	2.36	1240.11	1237	7	7.84E-02	75.5	2.46E+00	T
0	690.94	43	200	1.99	1382.48	1380	8	4.93E-02	****	2.26E+00	
0	738.07	53	312	1.80	1476.78	1474	11	6.09E-02	****	2.15E+00	T
0	795.59	38	189	0.78	1591.86	1589	6	4.41E-02	****	2.03E+00	T
0	920.85	42	261	1.18	1842.45	1840	6	4.85E-02	****	1.81E+00	
0	1215.76	33	93	0.93	2432.38	2428	12	3.86E-02	****	1.45E+00	
0	1356.81	11	41	5.80	2714.48	2702	16	1.25E-02	****	1.32E+00	
0	1400.13	12	37	3.28	2801.13	2790	15	1.36E-02	****	1.28E+00	
0	1508.05	16	37	7.53	3016.96	3003	21	1.83E-02	****	1.20E+00	
0	1861.65	10	7	1.71	3724.04	3718	10	1.19E-02	****	9.86E-01	
0	1865.43	12	2	1.42	3731.61	3728	9	1.48E-02	67.4	9.84E-01	
0	1943.17	13	3	1.48	3887.05	3883	8	1.60E-02	70.6	9.45E-01	
0	1961.35	10	5	3.21	3923.40	3917	12	1.23E-02	****	9.36E-01	
0	1996.81	9	12	1.45	3994.30	3987	11	1.11E-02	****	9.19E-01	
0	2032.40	6	4	3.44	4065.45	4058	10	6.97E-03	****	9.02E-01	

Flags: "T" = Tentatively associated

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*****
*
*           GEL Laboratories LLC
*           2040 Savage Road
*           Charleston, SC 29407
*****
*
*           DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621366.CNF;1
* Acquisition date   : 3-OCT-2016 05:28:46 Sensitivity      : 3.000
* Detector ID        : GAM11 Energy tolerance: 1.500
* Elapsed live time  : 0 00:15:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:15:06.51 Half life ratio  : *****
* Sample date        : 12-SEP-2016 00:00:00 Nuclide Library : SOLID
* Sample ID          : G1203621366 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity : 1.1500E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight       : 0.00000
*****
*
*           CALIBRATION INFORMATION
*
* Eff. Cal. date     : 2-AUG-2016 10:31:39 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;14
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
CO-57	2.386E-01
CO-60	2.931E-01
RU-103	5.861E-01
CD-109	6.600E+00
SN-117M	6.338E-01
TE-123M	2.494E-01
SN-126	6.420E-01
BA-137M	4.328E-01
CS-137	4.572E-01
PM-147	7.076E+03
PB-210	5.137E+01
AM-241	2.087E+00

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	5.199E+00	NOT IDENT.
NA-22	2.809E-01	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.462E-01	NOT IDENT.
K-40	2.239E+00	NOT IDENT.
SC-46	6.346E-01	NOT IDENT.
V-48	1.479E+00	NOT IDENT.
CR-51	5.098E+00	NOT IDENT.
MN-54	5.122E-01	NOT IDENT.
CO-56	6.275E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-58	5.722E-01	NOT IDENT.
FE-59	1.447E+00	NOT IDENT.
ZN-65	1.425E+00	NOT IDENT.
GE-68	1.923E+01	NOT IDENT.
AS-73	1.413E+01	NOT IDENT.
AS-74	1.433E+00	NOT IDENT.
SE-75	4.816E-01	FAIL ABUN
BR-77	5.177E+02	FAIL ABUN

SR-82	5.069E+00	NOT IDENT.
RB-83	9.835E-01	FAIL ABUN
KR-85	8.626E+01	NOT IDENT.
SR-85	4.874E-01	NOT IDENT.
RB-86	1.506E+01	NOT IDENT.
Y-88	2.194E-01	NOT IDENT.
Y-91	1.875E+02	NOT IDENT.
NB-94	3.889E-01	NOT IDENT.
NB-95	5.743E-01	NOT IDENT.
NB-95M	1.256E+00	NOT IDENT.
ZR-95	9.721E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	7.515E+02	FAIL ABUN
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.805E-01	NOT IDENT.
RH-102	6.927E-01	NOT IDENT.
RH-106	3.964E+00	NOT IDENT.
RU-106	3.964E+00	NOT IDENT.
AG-108M	4.292E-01	NOT IDENT.
AG-110M	7.880E-01	FAIL ABUN
SN-113	6.352E-01	NOT IDENT.
CD-115	9.875E+02	NOT IDENT.
SB-124	5.693E-01	NOT IDENT.
SB-125	1.365E+00	NOT IDENT.
TE-125M	8.995E+01	NOT IDENT.
I-126	3.655E+00	NOT IDENT.
SB-126	2.523E+00	NOT IDENT.
SB-127	4.565E+01	NOT IDENT.
I-131	2.503E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	2.836E+01	NOT IDENT.
BA-133	5.261E-01	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.727E-01	FAIL ABUN
CS-135	1.646E+00	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	2.213E+00	NOT IDENT.
CE-139	2.680E-01	NOT IDENT.
BA-140	4.854E+00	NOT IDENT.
LA-140	6.179E-01	NOT IDENT.
CE-141	6.195E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.778E+00	NOT IDENT.
PM-144	4.007E-01	NOT IDENT.
PR-144	3.008E+01	NOT IDENT.
PM-146	6.580E-01	NOT IDENT.
ND-147	1.074E+01	NOT IDENT.
PM-149	7.074E+03	NOT IDENT.
EU-150	2.994E-01	FAIL ABUN
EU-152	1.177E+00	FAIL ABUN
GD-153	7.590E-01	NOT IDENT.
EU-154	7.954E-01	FAIL ABUN
EU-155	8.953E-01	FAIL ABUN
TB-160	2.115E+00	FAIL ABUN
HO-166M	7.003E-01	FAIL ABUN
TM-171	2.727E+02	NOT IDENT.
HF-172	1.639E+00	FAIL ABUN
LU-172	1.000E+00	FAIL ABUN
LU-176	2.984E-01	FAIL ABUN
HF-181	6.927E-01	NOT IDENT.
TA-182	1.525E+00	NOT IDENT.
RE-183	4.637E+00	FAIL ABUN
RE-184	2.309E+00	NOT IDENT.
W-188	8.120E+01	NOT IDENT.
IR-192	4.287E-01	NOT IDENT.
HG-203	4.420E-01	NOT IDENT.
BI-207	7.800E-01	NOT IDENT.
TL-208	4.245E-01	NOT IDENT.
BI-211	2.443E+00	NOT IDENT.
PB-211	9.149E+00	NOT IDENT.
BI-212	6.075E+00	NOT IDENT.
PB-212	5.596E-01	NOT IDENT.
BI-214	8.137E-01	NOT IDENT.
PB-214	8.907E-01	FAIL ABUN
RN-219	5.208E+00	NOT IDENT.
RN-222	8.137E-01	NOT IDENT.
RA-223	7.172E+00	NOT IDENT.

RA-224	6.219E+00	NOT IDENT.
RA-226	8.137E-01	NOT IDENT.
AC-227	2.617E+00	NOT IDENT.
TH-227	2.617E+00	NOT IDENT.
AC-228	2.313E+00	FAIL ABUN
RA-228	2.313E+00	FAIL ABUN
TH-228	5.596E-01	NOT IDENT.
TH-229	4.909E+00	FAIL ABUN
TH-230	8.137E-01	NOT IDENT.
PA-231	5.122E+00	NOT IDENT.
TH-231	7.172E+00	NOT IDENT.
TH-232	2.313E+00	NOT IDENT.
PA-233	7.408E-01	NOT IDENT.
PA-234	5.587E+00	NOT IDENT.
PA-234M	7.163E+01	NOT IDENT.
TH-234	1.039E+01	NOT IDENT.
U-234	8.137E-01	NOT IDENT.
U-235	1.685E+00	NOT IDENT.
NP-237	7.408E-01	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	1.039E+01	NOT IDENT.
NP-239	2.283E+00	NOT IDENT.
PU-239	2.933E+03	NOT IDENT.
AM-243	4.577E-01	NOT IDENT.
CM-243	9.662E-01	NOT IDENT.
BK-247	8.267E-01	NOT IDENT.
CM-247	4.776E-01	NOT IDENT.
CF-249	5.125E-01	NOT IDENT.
CF-251	1.135E+00	NOT IDENT.
ANH-511	3.870E-01	NOT IDENT.

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                            *
*****
*                               DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203621366.CNF;1
* Acquisition date   : 3-OCT-2016 05:28:46 Sensitivity      : 3.000
* Detector ID        : GAM11 Energy tolerance: 1.500
* Elapsed live time  : 0 00:15:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:15:06.51 Half life ratio : *****
* Sample date        : 12-SEP-2016 00:00:00 Nuclide Library : SOLID
* Sample ID          : G1203621366 Analyst initials: MXR1
* Batch Number       : 1596254 Sample Quantity : 1.1500E+02 GRAM
*                               Quantity Err(%) : 1.7391E-03 %
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight  : 0.00000
*****
*                               CALIBRATION INFORMATION                          *
*
* Eff. Cal. date     : 2-AUG-2016 10:31:39 Eff. Geometry   : CAN
* Eff. File           : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
CO-57	1.059E+00	4.659E-01	4.659E-01
CO-60	1.597E+02	6.821E+00	6.821E+00
RU-103	6.865E-01	1.105E+00	1.105E+00
CD-109	4.107E+02	4.043E+01	4.043E+01
SN-117M	1.072E+00	1.146E+00	1.146E+00
TE-123M	4.225E-01	4.520E-01	4.520E-01
SN-126	3.978E+01	3.300E+00	3.300E+00
BA-137M	1.842E+02	8.542E+00	8.542E+00
CS-137	1.946E+02	9.005E+00	9.005E+00
PM-147	3.060E+04	1.346E+04	1.346E+04
PB-210	5.551E+03	4.949E+02	4.949E+02
AM-241	5.615E+02	4.237E+01	4.237E+01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-8.704E-01	6.073E+00	6.085E+00	NOT IDENT.
NA-22	2.687E-02	3.285E-01	3.287E-01	NOT IDENT.
NA-24	-4.711E+08	4.939E+09	4.944E+09	SHORT HLIF
AL-26	2.181E-01	2.594E-01	2.774E-01	NOT IDENT.
K-40	7.487E-01	2.536E+00	2.558E+00	NOT IDENT.
SC-46	-8.330E-01	8.169E-01	8.990E-01	NOT IDENT.
V-48	-6.875E-01	1.864E+00	1.889E+00	NOT IDENT.
CR-51	3.103E-01	5.747E+00	5.749E+00	NOT IDENT.
MN-54	-1.652E-01	6.324E-01	6.368E-01	NOT IDENT.
CO-56	-2.012E-01	7.753E-01	7.806E-01	NOT IDENT.
MN-56	-1.000E+41	3.754E+41	0.000E+00	SHORT HLIF
CO-58	1.262E-01	6.897E-01	6.920E-01	NOT IDENT.
FE-59	-9.855E-01	1.727E+00	1.783E+00	NOT IDENT.
ZN-65	1.700E+00	1.598E+00	1.772E+00	NOT IDENT.
GE-68	-5.485E+00	2.256E+01	2.269E+01	NOT IDENT.
AS-73	7.524E+00	1.581E+01	1.617E+01	NOT IDENT.
AS-74	5.140E-01	1.674E+00	1.690E+00	NOT IDENT.
SE-75	-3.644E-01	6.079E-01	6.297E-01	FAIL ABUN

BR-77	-4.754E+02	7.117E+02	7.433E+02	FAIL ABUN
SR-82	-1.819E+00	6.231E+00	6.285E+00	NOT IDENT.
RB-83	8.277E-01	1.600E+00	1.643E+00	FAIL ABUN
KR-85	2.274E+01	1.000E+02	1.005E+02	NOT IDENT.
SR-85	1.282E-01	5.651E-01	5.680E-01	NOT IDENT.
RB-86	-2.647E+00	1.761E+01	1.765E+01	NOT IDENT.
Y-88	-9.316E-02	2.892E-01	2.923E-01	NOT IDENT.
Y-91	-2.211E+01	2.216E+02	2.218E+02	NOT IDENT.
NB-94	2.673E-01	4.534E-01	4.692E-01	NOT IDENT.
NB-95	3.170E-01	6.800E-01	6.948E-01	NOT IDENT.
NB-95M	-7.525E-01	1.561E+00	1.598E+00	NOT IDENT.
ZR-95	8.566E-01	1.132E+00	1.196E+00	NOT IDENT.
NB-97	1.000E+41	2.345E+41	0.000E+00	SHORT HLIF
ZR-97	-1.515E+09	1.003E+10	1.006E+10	SHORT HLIF
MO-99	1.132E+03	1.435E+03	1.523E+03	FAIL ABUN
TC-99M	2.461E+24	7.593E+24	0.000E+00	SHORT HLIF
RH-101	9.529E-02	3.262E-01	3.290E-01	NOT IDENT.
RH-102	1.736E-01	8.161E-01	8.198E-01	NOT IDENT.
RH-106	-8.737E-01	5.320E+00	5.334E+00	NOT IDENT.
RU-106	-8.737E-01	5.320E+00	5.334E+00	NOT IDENT.
AG-108M	-8.745E-03	4.956E-01	4.956E-01	NOT IDENT.
AG-110M	-9.137E-01	1.008E+00	1.089E+00	FAIL ABUN
SN-113	3.096E-01	7.182E-01	7.317E-01	NOT IDENT.
CD-115	-2.414E+02	1.167E+03	1.172E+03	NOT IDENT.
SB-124	-3.531E-01	7.541E-01	7.707E-01	NOT IDENT.
SB-125	8.206E-01	1.550E+00	1.593E+00	NOT IDENT.
TE-125M	1.033E+01	1.042E+02	1.043E+02	NOT IDENT.
I-126	2.516E+00	4.726E+00	4.861E+00	NOT IDENT.
SB-126	-1.828E-01	3.045E+00	3.046E+00	NOT IDENT.
SB-127	-5.100E+00	5.495E+01	5.500E+01	NOT IDENT.
I-131	5.600E-01	2.835E+00	2.846E+00	NOT IDENT.
I-132	1.000E+41	4.850E+41	0.000E+00	SHORT HLIF
TE-132	3.491E+00	3.443E+01	3.447E+01	NOT IDENT.
BA-133	2.748E-01	5.902E-01	6.030E-01	NOT IDENT.
I-133	9.890E+05	1.181E+07	1.182E+07	SHORT HLIF
CS-134	5.910E-01	6.724E-01	7.232E-01	FAIL ABUN
CS-135	-5.726E-02	2.033E+00	2.033E+00	NOT IDENT.
I-135	7.483E+22	2.561E+23	0.000E+00	SHORT HLIF
CS-136	-1.162E+00	2.613E+00	2.665E+00	NOT IDENT.
CE-139	2.746E-01	3.145E-01	3.380E-01	NOT IDENT.
BA-140	3.139E+00	5.571E+00	5.748E+00	NOT IDENT.
LA-140	-3.882E-01	8.192E-01	8.377E-01	NOT IDENT.
CE-141	4.839E-01	7.162E-01	7.487E-01	NOT IDENT.
CE-143	1.937E+03	3.495E+04	3.496E+04	SHORT HLIF
CE-144	-7.741E-01	2.115E+00	2.143E+00	NOT IDENT.
PM-144	-2.054E-02	5.057E-01	5.058E-01	NOT IDENT.
PR-144	-1.579E+00	3.797E+01	3.797E+01	NOT IDENT.
PM-146	3.605E-01	8.341E-01	8.498E-01	NOT IDENT.
ND-147	3.074E+00	1.246E+01	1.254E+01	NOT IDENT.
PM-149	1.241E+04	8.452E+03	1.014E+04	NOT IDENT.
EU-150	-2.911E-01	3.484E-01	3.723E-01	FAIL ABUN
EU-152	7.043E-01	1.315E+00	1.352E+00	FAIL ABUN
GD-153	6.273E-01	8.579E-01	9.033E-01	NOT IDENT.
EU-154	8.668E-02	9.290E-01	9.298E-01	FAIL ABUN
EU-155	-5.699E-01	1.057E+00	1.087E+00	FAIL ABUN
TB-160	-2.213E+00	2.696E+00	2.875E+00	FAIL ABUN
HO-166M	-1.287E-01	8.484E-01	8.504E-01	FAIL ABUN
TM-171	-2.118E+02	3.086E+02	3.230E+02	NOT IDENT.
HF-172	-1.315E+00	1.974E+00	2.061E+00	FAIL ABUN
LU-172	-4.697E-01	1.183E+00	1.202E+00	FAIL ABUN
LU-176	2.949E-02	3.708E-01	3.710E-01	FAIL ABUN
HF-181	2.570E-02	8.051E-01	8.052E-01	NOT IDENT.
TA-182	8.640E-01	1.940E+00	1.978E+00	NOT IDENT.
RE-183	7.251E+02	7.537E+01	3.355E+02	FAIL ABUN
RE-184	-1.749E-01	2.844E+00	2.845E+00	NOT IDENT.
W-188	-8.503E+01	1.046E+02	1.114E+02	NOT IDENT.
IR-192	1.034E-01	5.316E-01	5.336E-01	NOT IDENT.
HG-203	-2.234E-01	6.053E-01	6.136E-01	NOT IDENT.
BI-207	-5.154E-02	9.071E-01	9.074E-01	NOT IDENT.
TL-208	6.817E-02	4.978E-01	4.987E-01	NOT IDENT.
BI-211	1.243E+00	2.736E+00	2.793E+00	NOT IDENT.
PB-211	3.043E+00	1.041E+01	1.050E+01	NOT IDENT.
BI-212	-1.197E+00	7.372E+00	7.392E+00	NOT IDENT.
PB-212	-7.383E-02	6.855E-01	6.863E-01	NOT IDENT.
BI-214	1.834E-01	9.554E-01	9.590E-01	NOT IDENT.
PB-214	3.724E-01	1.000E+00	1.014E+00	FAIL ABUN
RN-219	-2.611E+00	6.069E+00	6.182E+00	NOT IDENT.
RN-222	1.834E-01	9.554E-01	9.590E-01	NOT IDENT.

RA-223	-4.867E+00	8.260E+00	8.546E+00	NOT IDENT.
RA-224	9.109E-01	7.575E+00	7.586E+00	NOT IDENT.
RA-226	1.834E-01	9.554E-01	9.590E-01	NOT IDENT.
AC-227	-7.211E-01	3.246E+00	3.262E+00	NOT IDENT.
TH-227	-7.211E-01	3.246E+00	3.262E+00	NOT IDENT.
AC-228	-1.644E+00	2.911E+00	3.004E+00	FAIL ABUN
RA-228	-1.644E+00	2.911E+00	3.004E+00	FAIL ABUN
TH-228	-7.383E-02	6.855E-01	6.863E-01	NOT IDENT.
TH-229	1.475E+00	5.861E+00	5.898E+00	FAIL ABUN
TH-230	1.834E-01	9.554E-01	9.590E-01	NOT IDENT.
PA-231	-2.709E+00	6.512E+00	6.625E+00	NOT IDENT.
TH-231	-4.867E+00	8.260E+00	8.546E+00	NOT IDENT.
TH-232	-1.644E+00	2.911E+00	3.004E+00	NOT IDENT.
PA-233	-3.803E-02	9.261E-01	9.263E-01	NOT IDENT.
PA-234	5.891E-01	6.904E+00	6.909E+00	NOT IDENT.
PA-234M	4.607E+01	8.096E+01	8.358E+01	NOT IDENT.
TH-234	-4.166E+00	1.276E+01	1.289E+01	NOT IDENT.
U-234	1.834E-01	9.554E-01	9.590E-01	NOT IDENT.
U-235	-9.682E-01	2.021E+00	2.068E+00	NOT IDENT.
NP-237	-3.803E-02	9.261E-01	9.263E-01	NOT IDENT.
NP-238	-5.092E+01	3.092E+03	3.092E+03	SHORT HLIF
U-238	-4.166E+00	1.276E+01	1.289E+01	NOT IDENT.
NP-239	-5.909E-01	2.682E+00	2.695E+00	NOT IDENT.
PU-239	-1.522E+03	3.490E+03	3.557E+03	NOT IDENT.
AM-243	-2.756E-02	5.215E-01	5.217E-01	NOT IDENT.
CM-243	9.497E-01	1.094E+00	1.174E+00	NOT IDENT.
BK-247	-4.077E-01	1.038E+00	1.054E+00	NOT IDENT.
CM-247	-3.028E-01	5.601E-01	5.765E-01	NOT IDENT.
CF-249	-2.765E-01	5.957E-01	6.086E-01	NOT IDENT.
CF-251	-3.808E-01	1.373E+00	1.383E+00	NOT IDENT.
ANH-511	-2.276E-03	4.458E-01	4.458E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	2618.3286	87.09	574.3602	136.47	466.5805
45.60	2295.9553	87.57	574.9335	140.51	458.0647
46.54	2302.7859	88.03	575.4789	143.76	470.6329
49.72	2052.5364	88.34	575.8425	144.24	465.7786
51.35	2087.7761	88.47	575.9963	145.44	428.1440
51.87	2133.2341	89.96	514.3953	152.43	411.4397
52.39	2200.3999	90.64	521.4133	153.25	411.9122
52.97	2213.6208	91.11	509.2720	154.21	436.3124
53.44	2202.7520	92.59	487.6498	156.02	406.4651
54.07	2265.7490	93.35	495.0458	158.56	419.1790
57.36	0.0000	94.56	480.9595	159.00	416.6023
57.53	2527.9116	94.65	481.0441	162.33	401.1032
57.98	1623.5559	94.67	481.0633	162.66	401.2816
59.27	1629.2229	94.87	473.6128	163.33	418.6839
59.32	1629.4417	97.43	466.3705	165.86	383.7492
59.54	1630.4014	98.43	501.8722	176.31	423.6350
60.96	593.2881	98.44	501.8842	176.60	423.7902
61.17	593.6157	99.53	518.3389	177.52	437.3008
62.93	614.1212	100.11	499.6152	181.07	444.6936
63.29	590.9571	102.03	495.6055	181.52	461.3008
63.58	615.1461	103.18	494.7201	184.41	515.4725
64.28	602.2675	103.37	460.9318	185.72	517.3951
66.73	643.6874	105.21	476.1176	193.51	448.1165
67.24	645.3959	105.31	482.0464	197.03	469.9692
67.68	661.3946	106.12	478.8554	198.01	526.1201
67.75	669.6068	106.47	478.1829	201.83	504.9756
69.67	650.1401	109.28	458.0321	203.43	477.9187
70.83	691.8413	111.00	457.4577	205.31	535.0237
72.81	652.2618	111.76	448.2135	210.85	533.8355
72.87	652.3547	114.06	432.2023	215.65	538.9340
74.66	667.8727	116.30	455.7012	222.11	511.8545
74.82	667.2025	116.74	456.0409	227.09	503.0758
74.97	688.4938	119.76	488.6501	227.38	469.9106
77.11	676.2043	121.12	535.1235	228.16	492.1386
78.74	664.8212	121.22	535.2092	228.18	492.1517
79.69	677.3201	121.78	507.9825	235.69	492.5087
80.12	657.5864	122.06	508.2184	235.96	488.0082
80.19	657.6893	122.92	473.8005	238.63	444.0074
80.57	671.2157	123.07	473.9158	238.98	483.6946
81.00	691.3326	123.68	460.9867	240.99	467.1990
81.07	691.4349	125.81	486.1076	242.00	475.8340
81.75	643.1959	127.23	463.9622	244.70	493.4945
83.79	687.0913	127.91	447.2640	252.40	459.5306
84.00	681.1681	129.30	489.8246	252.80	446.7430
85.43	711.9550	131.20	464.8449	254.15	0.0000
86.55	573.7169	133.02	505.9448	256.23	424.5705
86.79	574.0012	133.52	493.0601	260.90	445.4727
86.94	574.1830	136.00	492.8900	264.66	433.9385

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.80	433.9940	364.49	392.7467	600.60	218.7646
265.00	411.4247	366.42	389.8445	602.52	0.0000
268.22	431.7943	372.51	382.8962	604.72	243.1263
269.46	415.5253	375.05	376.6374	607.14	227.4619
270.03	430.1251	1093.63	364.2362	609.32	219.7135
271.23	441.3911	383.85	381.6331	610.33	227.8145
273.65	424.3476	388.16	416.1580	614.28	208.2370
276.40	406.1216	388.63	436.4929	618.01	219.6416
277.37	412.5125	391.69	419.8206	620.36	218.3939
277.60	403.7488	400.66	398.5107	621.93	239.6548
278.00	379.7645	401.81	405.0352	630.19	0.0000
279.20	425.2725	402.40	410.5131	631.29	224.0867
279.54	430.2463	404.85	366.7946	633.25	199.0360
279.70	430.3007	410.95	416.4634	634.78	253.7780
280.46	419.3050	413.71	404.7250	635.95	230.6533
283.69	407.5825	414.70	416.6145	636.99	215.5828
284.31	399.7167	423.72	441.5823	645.85	247.9912
285.41	377.4304	427.09	438.9460	657.76	245.2832
285.90	359.7654	427.87	439.1739	657.90	0.0000
287.50	415.0422	433.94	431.8445	661.66	222.1742
290.67	429.6230	439.40	470.5968	664.57	0.0000
293.27	0.0000	453.88	451.0601	666.33	192.3828
295.22	437.4470	463.37	467.5350	666.50	172.3887
295.96	407.0769	468.07	489.2217	667.71	0.0000
298.58	387.1074	473.00	470.2685	677.62	199.0470
299.98	402.3333	475.06	442.0664	685.70	191.4889
300.09	402.3633	476.78	417.4206	695.00	188.6489
300.13	402.3832	477.60	423.2022	696.49	200.9355
301.36	411.4250	482.18	373.0631	696.51	200.9434
302.85	389.7443	487.02	361.9622	697.00	199.7344
304.50	403.8801	492.35	329.3196	697.30	198.7252
304.85	403.9899	497.08	309.0581	697.49	180.0112
306.78	386.0867	505.52	334.6622	702.65	179.3766
308.46	411.4133	507.63	0.0000	706.68	205.8095
311.90	398.9283	511.00	309.1501	711.68	194.7415
316.51	390.4572	514.00	292.5724	720.70	221.7749
319.41	397.6359	514.00	292.5724	721.93	0.0000
320.08	409.5263	520.40	265.9786	722.78	216.7124
321.04	387.3181	520.69	278.8962	722.91	215.6771
323.87	406.6018	522.65	0.0000	723.31	200.9790
325.23	401.1840	527.90	290.0668	724.19	207.3726
328.76	413.2432	528.26	273.8390	727.33	215.0317
333.37	381.0256	529.59	281.7141	733.00	197.5842
333.97	403.1375	529.87	0.0000	735.93	220.5726
334.37	402.4202	531.02	269.4632	737.46	211.1895
338.28	370.6497	537.26	257.8693	739.50	215.0762
338.32	370.6586	546.56	0.0000	747.24	215.7784
340.48	424.6860	552.55	241.5632	748.06	186.0799
340.55	424.7064	563.25	226.3454	752.31	215.1675
344.28	376.6203	569.33	242.7223	753.82	190.7848
345.93	385.6104	569.50	240.7949	756.73	181.4136
351.06	375.1578	569.70	235.9203	756.80	181.4205
351.93	381.3939	583.19	225.7294	763.94	211.9219
355.39	0.0000	584.27	221.9147	765.81	223.8654
356.01	391.1421	595.83	223.2056	766.42	229.2820

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
766.84	223.9589	1002.74	257.5192	1678.03	0.0000
772.60	0.0000	1004.73	262.9395	1690.97	19.9069
776.52	222.6918	1021.30	0.0000	1750.46	0.0000
777.92	224.9709	1025.87	0.0000	1764.49	14.8938
778.90	227.2096	1028.54	0.0000	1770.23	15.9760
783.70	226.5686	1037.84	248.0420	1771.35	11.7184
785.37	223.4835	1038.76	0.0000	1791.20	0.0000
792.07	256.5571	1046.59	250.5194	1808.65	8.5864
794.95	200.4995	1048.07	261.3054	1810.72	0.0000
795.86	223.3343	1049.04	259.5991	1836.06	12.9500
801.95	235.8250	1050.41	257.0378		
810.06	235.4854	1063.66	241.1444		
810.29	227.8794	1077.00	248.4276		
810.45	227.8879	1077.34	248.4445		
810.76	222.4692	1085.87	273.3848		
815.77	241.4759	1093.63	274.9356		
818.51	248.2997	1099.45	255.5533		
832.01	244.0862	1112.07	281.0132		
834.85	257.5657	1112.84	291.0434		
835.71	256.5503	1115.54	254.0747		
836.80	0.0000	1120.29	233.5337		
846.75	0.0000	1120.55	233.5494		
846.77	283.0521	1121.30	216.3412		
856.80	276.3509	1129.67	157.6471		
860.56	271.1839	1131.51	0.0000		
871.09	281.1621	1147.95	0.0000		
873.19	267.9785	1173.23	131.9765		
875.33	0.0000	1177.95	131.5966		
879.38	295.4531	1189.05	104.7650		
880.51	288.8538	1204.77	85.6716		
883.24	290.2579	1221.41	62.8687		
884.68	319.5697	1231.02	57.2210		
889.28	314.4873	1235.36	51.6565		
894.76	306.0996	1238.28	55.4565		
898.04	281.6772	1260.41	0.0000		
900.72	302.2524	1271.87	40.7875		
903.28	310.4268	1274.44	38.9180		
911.20	348.6556	1274.54	38.9180		
912.08	322.7240	1291.59	35.2814		
923.98	0.0000	1298.22	0.0000		
926.50	357.3769	1312.11	32.5972		
929.11	332.6348	1332.49	41.4437		
937.49	367.8840	1362.66	0.0000		
944.13	359.5617	1365.19	23.3262		
946.00	376.9792	1368.63	0.0000		
949.00	359.0152	1384.29	12.6953		
954.55	0.0000	1408.01	20.6296		
962.31	349.1355	1457.56	0.0000		
964.08	338.9685	1460.82	18.9061		
966.17	316.1324	1489.16	23.0393		
968.97	321.0416	1505.03	19.1032		
983.53	294.7624	1584.12	14.3324		
984.45	0.0000	1596.21	17.4503		
996.26	266.8778	1620.50	13.4158		
1001.03	256.5002	1621.92	10.3235		

Continuing Calibration Data

** Locked out*

Review of Gamma Spectrometer QA results (Daily calibration & background checks)
27-SEP-2016 10:19:49.31

Run Date	Detector	Parameter	Flag
27-SEP-2016	GAM01	All Parameters Passed	
27-SEP-2016	GAM02	All Parameters Passed	
5-JUL-2016	GAM03	Cal Check may not have run since 27-SEP-2016	<i>*</i>
18-SEP-2016	GAM03	Bkg Check may not have run since 27-SEP-2016	<i>*</i>
27-SEP-2016	GAM05	Cal Check PSFWHM-662	Investigate <i>OK</i>
27-SEP-2016	GAM05	Cal Check PSFWHM-59	Action <i>Below, OK</i>
27-SEP-2016	GAM06	All Parameters Passed	
27-SEP-2016	GAM07	Cal Check PSFWHM-59	Investigate <i>OK</i>
27-SEP-2016	GAM08	All Parameters Passed	
27-SEP-2016	GAM09	All Parameters Passed	
25-SEP-2016	GAM10	Cal Check may not have run since 27-SEP-2016	<i>*</i>
24-SEP-2016	GAM10	Bkg Check may not have run since 27-SEP-2016	<i>Not used</i>
27-SEP-2016	GAM11	Cal Check PSFWHM-662	Investigate <i>OK</i>
27-SEP-2016	GAM12	All Parameters Passed	
-----	GAM13	Cal Check may not have run since 27-SEP-2016	<i>*</i>
3-JUL-2016	GAM13	Bkg Check may not have run since 27-SEP-2016	<i>*</i>
27-SEP-2016	GAM14	All Parameters Passed	
27-SEP-2016	GAM16	Cal Check NLACTVTY-662	Investigate <i>OK</i>
27-SEP-2016	GAM16	Cal Check NLACTVTY-59	Investigate <i>OK</i>
10-AUG-2016	GAM17	Cal Check may not have run since 27-SEP-2016	<i>*</i>
25-SEP-2016	GAM17	Bkg Check may not have run since 27-SEP-2016	
27-SEP-2016	GAM18	All Parameters Passed	
27-SEP-2016	GAM19	All Parameters Passed	
27-SEP-2016	GAM20	All Parameters Passed	
-----	GAM21	Cal Check may not have run since 27-SEP-2016	<i>*</i>
25-SEP-2016	GAM21	Bkg Check may not have run since 27-SEP-2016	<i>*</i>
8-JUL-2016	GAM22	Cal Check may not have run since 27-SEP-2016	<i>*</i>
7-AUG-2016	GAM22	Bkg Check may not have run since 27-SEP-2016	
27-SEP-2016	GAM24	All Parameters Passed	

27-SEP-2016	GAM25	All Parameters Passed		
25-SEP-2016	GAM26	Cal Check may not have run since 27-SEP-2016		
24-SEP-2016	GAM26	Bkg Check may not have run since 27-SEP-2016 <i>* not used</i>		
27-SEP-2016	GAM27	All Parameters Passed		
27-SEP-2016	GAM28	Cal Check	NLACTVTY-662	Investigate <i>OK</i>
27-SEP-2016	GAM29	Cal Check	PSFWHM-662	Investigate <i>OK</i>
27-SEP-2016	GAM29	Cal Check	NLACTVTY-59	Investigate <i>OK</i>
27-SEP-2016	GAM30	All Parameters Passed		
27-SEP-2016	GAM31	Bkg Check	BACKRATE	Investigate <i>OK</i>
27-SEP-2016	GAM32	All Parameters Passed		
27-SEP-2016	GAM33	All Parameters Passed		
27-SEP-2016	GAM36	All Parameters Passed		
27-SEP-2016	GAM39	All Parameters Passed		
-----	GAM40	Cal Check may not have run since 27-SEP-2016 <i>*★</i>		
26-JUN-2016	GAM40	Bkg Check may not have run since 27-SEP-2016 <i>*★</i>		
27-SEP-2016	GAM41	All Parameters Passed		
		Weekly Background check completed on 27-SEP-2016.		
		No daily Bkg Check necessary.		
27-SEP-2016	GAM43	All Parameters Passed		
27-SEP-2016	GAM44	All Parameters Passed		
27-SEP-2016	WELL	Cal Check	PSFWHM-1332	Investigate <i>OK</i>
27-SEP-2016	XRAY1	All Parameters Passed		
27-SEP-2016	XRAY2	All Parameters Passed		
27-SEP-2016	XRAY3	Cal Check	PSFWHM-59	Action
27-SEP-2016	XRAY3	Cal Check	PSFWHM-109	Action <i>*★</i>
27-SEP-2016	XRAY3	Cal Check	PSFWHM-210	Action
27-SEP-2016	XRAY3	Bkg Check	BACKRATE	Action
27-SEP-2016	XRAY4	All Parameters Passed		
27-SEP-2016	XRAY5	All Parameters Passed		
27-SEP-2016	XRAY6	All Parameters Passed		

APPROVAL DATE:

9/27/16

APPROVAL TIME: *10:35*

APPROVED BY:

RT

PROCEDURE # GL-RAD-I-001

★ = Locked out

Review of Gamma Spectrometer QA results (Daily calibration & background checks)
28-SEP-2016 09:34:33.92

Run Date	Detector	Parameter	Flag
28-SEP-2016	GAM01	All Parameters Passed	
28-SEP-2016	GAM02	All Parameters Passed	
5-JUL-2016	GAM03	Cal Check may not have run since 28-SEP-2016	★
18-SEP-2016	GAM03	Bkg Check may not have run since 28-SEP-2016	★
28-SEP-2016	GAM05	Cal Check NLACTVTY-662	Investigate OK
28-SEP-2016	GAM05	Cal Check NLACTVTY-59	Investigate OK
28-SEP-2016	GAM05	Cal Check PSFWHM-59	Investigate OK
28-SEP-2016	GAM06	Bkg Check BACKRATE	Investigate OK
28-SEP-2016	GAM07	Cal Check PSFWHM-59	Investigate OK
28-SEP-2016	GAM08	All Parameters Passed	
28-SEP-2016	GAM09	Cal Check PSFWHM-662	Investigate OK
28-SEP-2016	GAM09	Cal Check NLACTVTY-1332	Investigate OK
28-SEP-2016	GAM10	All Parameters Passed	
28-SEP-2016	GAM11	All Parameters Passed	
28-SEP-2016	GAM12	Cal Check PSFWHM-1332	Investigate OK
-----	GAM13	Cal Check may not have run since 28-SEP-2016	★
3-JUL-2016	GAM13	Bkg Check may not have run since 28-SEP-2016	★
28-SEP-2016	GAM14	All Parameters Passed	
28-SEP-2016	GAM16	Cal Check NLACTVTY-59	Investigate OK
10-AUG-2016	GAM17	Cal Check may not have run since 28-SEP-2016	★
25-SEP-2016	GAM17	Bkg Check may not have run since 28-SEP-2016	★
28-SEP-2016	GAM18	All Parameters Passed	
28-SEP-2016	GAM19	Cal Check PSFWHM-662	Investigate OK
28-SEP-2016	GAM20	All Parameters Passed	
-----	GAM21	Cal Check may not have run since 28-SEP-2016	★
25-SEP-2016	GAM21	Bkg Check may not have run since 28-SEP-2016	★
8-JUL-2016	GAM22	Cal Check may not have run since 28-SEP-2016	★
7-AUG-2016	GAM22	Bkg Check may not have run since 28-SEP-2016	★
28-SEP-2016	GAM24	All Parameters Passed	

28-SEP-2016	GAM25	All Parameters Passed	
28-SEP-2016	GAM26	Cal Check	PSFWHM-1332 Investigate ^{OK}
28-SEP-2016	GAM27	Cal Check	PSFWHM-1332 Investigate ^{OK}
28-SEP-2016	GAM28	All Parameters Passed	
28-SEP-2016	GAM29	Cal Check	NLACTVTY-662 Investigate ^{OK}
28-SEP-2016	GAM30	Cal Check	PSFWHM-662 Investigate ^{OK}
28-SEP-2016	GAM30	Cal Check	NLACTVTY-59 Investigate ^{OK}
28-SEP-2016	GAM31	Cal Check	NLACTVTY-662 Investigate ^{OK}
28-SEP-2016	GAM31	Cal Check	NLACTVTY-1332 Investigate ^{OK}
28-SEP-2016	GAM32	All Parameters Passed	
28-SEP-2016	GAM33	All Parameters Passed	
28-SEP-2016	GAM36	All Parameters Passed	
28-SEP-2016	GAM39	All Parameters Passed	
-----	GAM40	Cal Check may not have run since 28-SEP-2016	[☆]
26-JUN-2016	GAM40	Bkg Check may not have run since 28-SEP-2016	
28-SEP-2016	GAM41	All Parameters Passed	
28-SEP-2016	GAM43	All Parameters Passed	
28-SEP-2016	GAM44	Cal Check	NLACTVTY-1332 Investigate ^{OK}
28-SEP-2016	WELL	All Parameters Passed	
28-SEP-2016	XRAY1	Cal Check	NLACTVTY-109 Investigate ^{OK}
28-SEP-2016	XRAY2	All Parameters Passed	
27-SEP-2016	XRAY3	Cal Check may not have run since 28-SEP-2016	[☆]
25-SEP-2016	XRAY3	Bkg Check may not have run since 28-SEP-2016	
28-SEP-2016	XRAY4	All Parameters Passed	
28-SEP-2016	XRAY5	All Parameters Passed	
28-SEP-2016	XRAY6	All Parameters Passed	

APPROVAL DATE: 9/28/16

APPROVAL TIME: 10:30

APPROVED BY: Pt

PROCEDURE # GL-RAD-I-001

Report completed at 28-SEP-2016 09:38:38.88

Review of Gamma Spectrometer QA results (Daily calibration & background checks)
 29-SEP-2016 08:42:59.81

Run Date	Detector	Parameter	Flag
29-SEP-2016	GAM01	Cal Check PSFWHM-1332	Investigate <i>OK</i>
29-SEP-2016	GAM02	Cal Check PSFWHM-662	Investigate <i>OK</i>
5-JUL-2016	GAM03	Cal Check may not have run since 29-SEP-2016	<i>★</i>
18-SEP-2016	GAM03	Bkg Check may not have run since 29-SEP-2016	<i>★</i>
29-SEP-2016	GAM05	Cal Check PSFWHM-59	Action <i>Below, OK</i>
29-SEP-2016	GAM06	All Parameters Passed	
29-SEP-2016	GAM07	All Parameters Passed	
29-SEP-2016	GAM08	Cal Check PSFWHM-662	Investigate <i>OK</i>
29-SEP-2016	GAM08	Cal Check NLACTVTY-59	Investigate <i>OK</i>
29-SEP-2016	GAM08	Cal Check PSFWHM-59	Investigate <i>OK</i>
29-SEP-2016	GAM09	Cal Check PSFWHM-662	Investigate <i>OK</i>
29-SEP-2016	GAM10	Bkg Check BACKRATE	Investigate <i>OK</i>
29-SEP-2016	GAM11	All Parameters Passed	
29-SEP-2016	GAM12	All Parameters Passed	
-----	GAM13	Cal Check may not have run since 29-SEP-2016	<i>★</i>
3-JUL-2016	GAM13	Bkg Check may not have run since 29-SEP-2016	<i>★</i>
29-SEP-2016	GAM14	All Parameters Passed	
29-SEP-2016	GAM16	Cal Check NLACTVTY-1332	Investigate <i>OK</i>
10-AUG-2016	GAM17	Cal Check may not have run since 29-SEP-2016	<i>★</i>
25-SEP-2016	GAM17	Bkg Check may not have run since 29-SEP-2016	<i>★</i>
29-SEP-2016	GAM18	All Parameters Passed	
29-SEP-2016	GAM19	All Parameters Passed	
29-SEP-2016	GAM20	All Parameters Passed	
-----	GAM21	Cal Check may not have run since 29-SEP-2016	<i>★</i>
25-SEP-2016	GAM21	Bkg Check may not have run since 29-SEP-2016	<i>★</i>
8-JUL-2016	GAM22	Cal Check may not have run since 29-SEP-2016	<i>★</i>
7-AUG-2016	GAM22	Bkg Check may not have run since 29-SEP-2016	<i>★</i>
29-SEP-2016	GAM24	All Parameters Passed	
29-SEP-2016	GAM25	All Parameters Passed	

29-SEP-2016	GAM26	All Parameters Passed	
29-SEP-2016	GAM27	All Parameters Passed	
29-SEP-2016	GAM28	All Parameters Passed	
29-SEP-2016	GAM29	Cal Check NLACTVTY-59	Investigate <i>OK</i>
29-SEP-2016	GAM30	All Parameters Passed	
29-SEP-2016	GAM31	All Parameters Passed	
29-SEP-2016	GAM32	All Parameters Passed	
29-SEP-2016	GAM33	All Parameters Passed	
29-SEP-2016	GAM36	All Parameters Passed	
29-SEP-2016	GAM39	All Parameters Passed	
-----	GAM40	Cal Check may not have run since 29-SEP-2016	
26-JUN-2016	GAM40	Bkg Check may not have run since 29-SEP-2016	<i>★</i>
29-SEP-2016	GAM41	All Parameters Passed	
29-SEP-2016	GAM43	All Parameters Passed	
29-SEP-2016	GAM44	All Parameters Passed	
29-SEP-2016	WELL	All Parameters Passed	
29-SEP-2016	XRAY1	All Parameters Passed	
29-SEP-2016	XRAY2	All Parameters Passed	
27-SEP-2016	XRAY3	Cal Check may not have run since 29-SEP-2016	
25-SEP-2016	XRAY3	Bkg Check may not have run since 29-SEP-2016	<i>★</i>
29-SEP-2016	XRAY4	All Parameters Passed	
29-SEP-2016	XRAY5	All Parameters Passed	
29-SEP-2016	XRAY6	Cal Check PSFWHM-210	Investigate <i>OK</i>
29-SEP-2016	XRAY6	Bkg Check BACKRATE	Investigate <i>OK</i>

APPROVAL DATE: *9/29/16*

APPROVAL TIME: *9:17*

APPROVED BY: *Rf*

PROCEDURE # GL-RAD-I-001

Report completed at 29-SEP-2016 08:47:14.82

★ = Locked out

Review of Gamma Spectrometer QA results (Daily calibration & background checks)
 3-OCT-2016 09:29:18.00

Run Date	Detector	Parameter	Flag
3-OCT-2016	GAM01	Cal Check NLACTVTY-662	Investigate OK
3-OCT-2016	GAM02	Cal Check PSFWHM-59	Investigate OK
5-JUL-2016 18-SEP-2016	GAM03 GAM03	Cal Check may not have run since 3-OCT-2016 Bkg Check may not have run since 3-OCT-2016	★
3-OCT-2016	GAM05	Cal Check NLACTVTY-662	Investigate OK
3-OCT-2016	GAM05	Cal Check PSFWHM-59	Action Below, OK
3-OCT-2016	GAM06	Cal Check NLACTVTY-662	Investigate OK
3-OCT-2016	GAM06	Cal Check NLACTVTY-1332	Investigate OK
3-OCT-2016	GAM07	All Parameters Passed Weekly Background check completed on 3-OCT-2016 . No daily Bkg Check necessary.	
3-OCT-2016	GAM08	Cal Check NLACTVTY-662	Investigate OK
3-OCT-2016	GAM09	All Parameters Passed Weekly Background check completed on 3-OCT-2016 . No daily Bkg Check necessary.	
3-OCT-2016	GAM10	Cal Check NLACTVTY-662	Investigate OK
3-OCT-2016	GAM11	All Parameters Passed Weekly Background check completed on 3-OCT-2016 . No daily Bkg Check necessary.	
3-OCT-2016	GAM12	Cal Check PSFWHM-59	Investigate OK
----- 3-JUL-2016	GAM13 GAM13	Cal Check may not have run since 3-OCT-2016 Bkg Check may not have run since 3-OCT-2016	★
3-OCT-2016	GAM14	Cal Check PSFWHM-59	Action Belows were adjusted, OK
3-OCT-2016	GAM16	Cal Check NLACTVTY-1332	Investigate OK
10-AUG-2016	GAM17	Cal Check may not have run since 3-OCT-2016	★
3-OCT-2016	GAM18	Cal Check PSFWHM-1332	Investigate OK
3-OCT-2016	GAM18	Cal Check PSFWHM-59	Investigate OK
3-OCT-2016	GAM19	All Parameters Passed Weekly Background check completed on 3-OCT-2016 . No daily Bkg Check necessary.	
3-OCT-2016	GAM20	All Parameters Passed Weekly Background check completed on 3-OCT-2016 . No daily Bkg Check necessary.	

-----	GAM21	Cal Check may not have run since 3-OCT-2016			
25-SEP-2016	GAM21	Bkg Check may not have run since 3-OCT-2016			
8-JUL-2016	GAM22	Cal Check may not have run since 3-OCT-2016			
7-AUG-2016	GAM22	Bkg Check may not have run since 3-OCT-2016			
3-OCT-2016	GAM24	All Parameters Passed			
		Weekly Background check completed on 3-OCT-2016 .			
		No daily Bkg Check necessary.			
3-OCT-2016	GAM25	Cal Check	PSFWHM-662	Action	Below OK
3-OCT-2016	GAM26	All Parameters Passed			
3-OCT-2016	GAM27	Cal Check	PSFWHM-662	Investigate	OK
3-OCT-2016	GAM28	All Parameters Passed			
		Weekly Background check completed on 3-OCT-2016 .			
		No daily Bkg Check necessary.			
3-OCT-2016	GAM29	Cal Check	NLACTVITY-1332	Investigate	OK
3-OCT-2016	GAM30	Cal Check	NLACTVITY-59	Investigate	OK
3-OCT-2016	GAM31	Cal Check	PSFWHM-662	Investigate	OK
3-OCT-2016	GAM32	All Parameters Passed			
		Weekly Background check completed on 3-OCT-2016 .			
		No daily Bkg Check necessary.			
3-OCT-2016	GAM33	Cal Check	PSFWHM-662	Investigate	OK
3-OCT-2016	GAM36	Cal Check	PSFWHM-662	Investigate	OK
3-OCT-2016	GAM39	All Parameters Passed			
		Weekly Background check completed on 3-OCT-2016 .			
		No daily Bkg Check necessary.			
-----	GAM40	Cal Check may not have run since 3-OCT-2016			
26-JUN-2016	GAM40	Bkg Check may not have run since 3-OCT-2016			
3-OCT-2016	GAM41	All Parameters Passed			
		Weekly Background check completed on 3-OCT-2016 .			
		No daily Bkg Check necessary.			
3-OCT-2016	GAM43	All Parameters Passed			
		Weekly Background check completed on 3-OCT-2016 .			
		No daily Bkg Check necessary.			
3-OCT-2016	GAM44	All Parameters Passed			
		Weekly Background check completed on 3-OCT-2016 .			
		No daily Bkg Check necessary.			
3-OCT-2016	WELL	Cal Check	PSFWHM-1332	Investigate	OK
3-OCT-2016	XRAY1	All Parameters Passed			
		Weekly Background check completed on 3-OCT-2016 .			
		No daily Bkg Check necessary.			

3-OCT-2016 XRAY2 All Parameters Passed
Weekly Background check completed on 3-OCT-2016 .
No daily Bkg Check necessary.

3-OCT-2016 XRAY3 All Parameters Passed
Weekly Background check completed on 3-OCT-2016 .
No daily Bkg Check necessary.

3-OCT-2016 XRAY4 All Parameters Passed
Weekly Background check completed on 3-OCT-2016 .
No daily Bkg Check necessary.

3-OCT-2016 XRAY5 All Parameters Passed
Weekly Background check completed on 3-OCT-2016 .
No daily Bkg Check necessary.

3-OCT-2016 XRAY6 All Parameters Passed
Weekly Background check completed on 3-OCT-2016 .
No daily Bkg Check necessary.

APPROVAL DATE: 10/3/16

APPROVAL TIME: 12:11

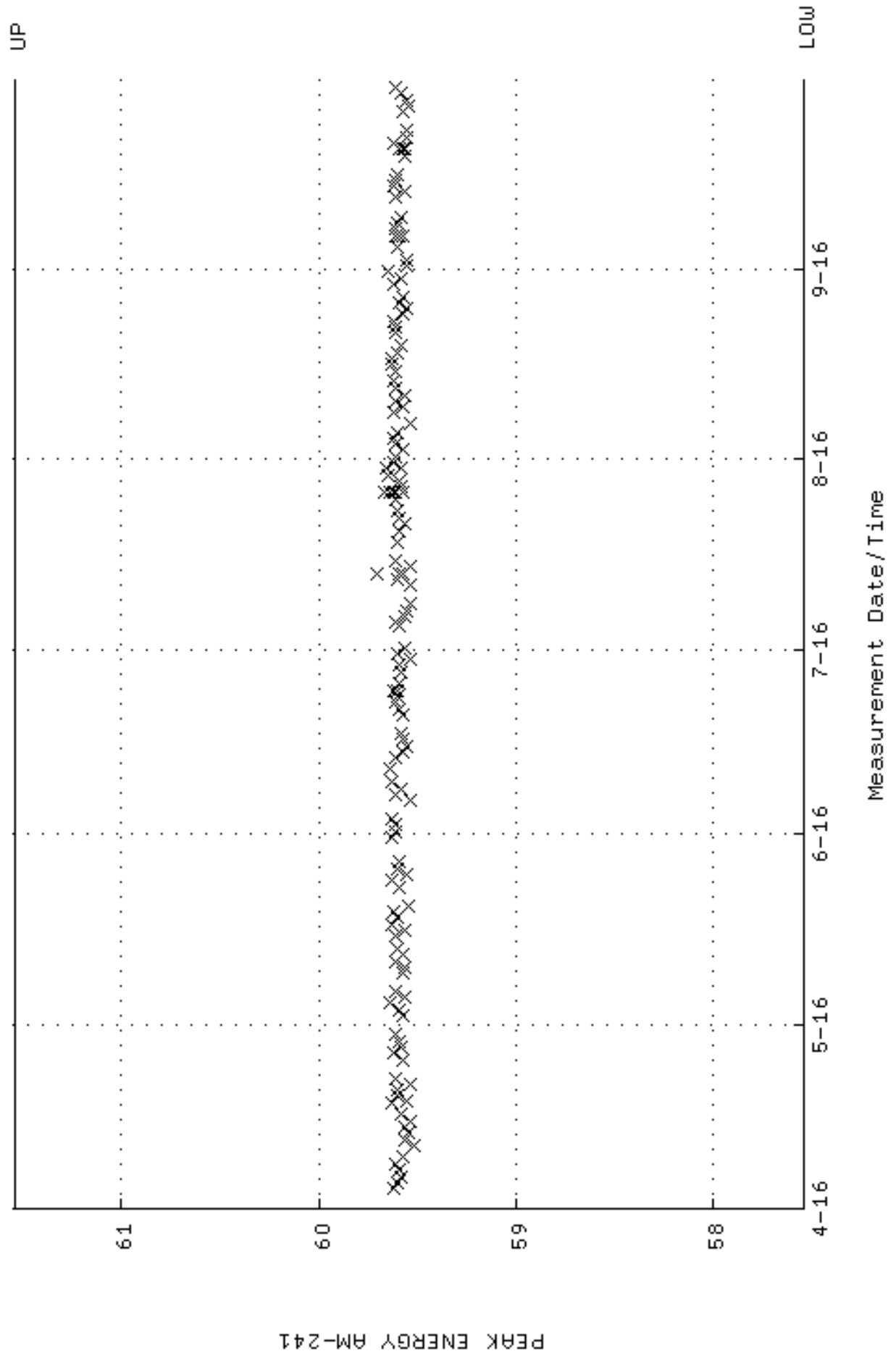
APPROVED BY: RF

PROCEDURE # GL-RAD-I-001

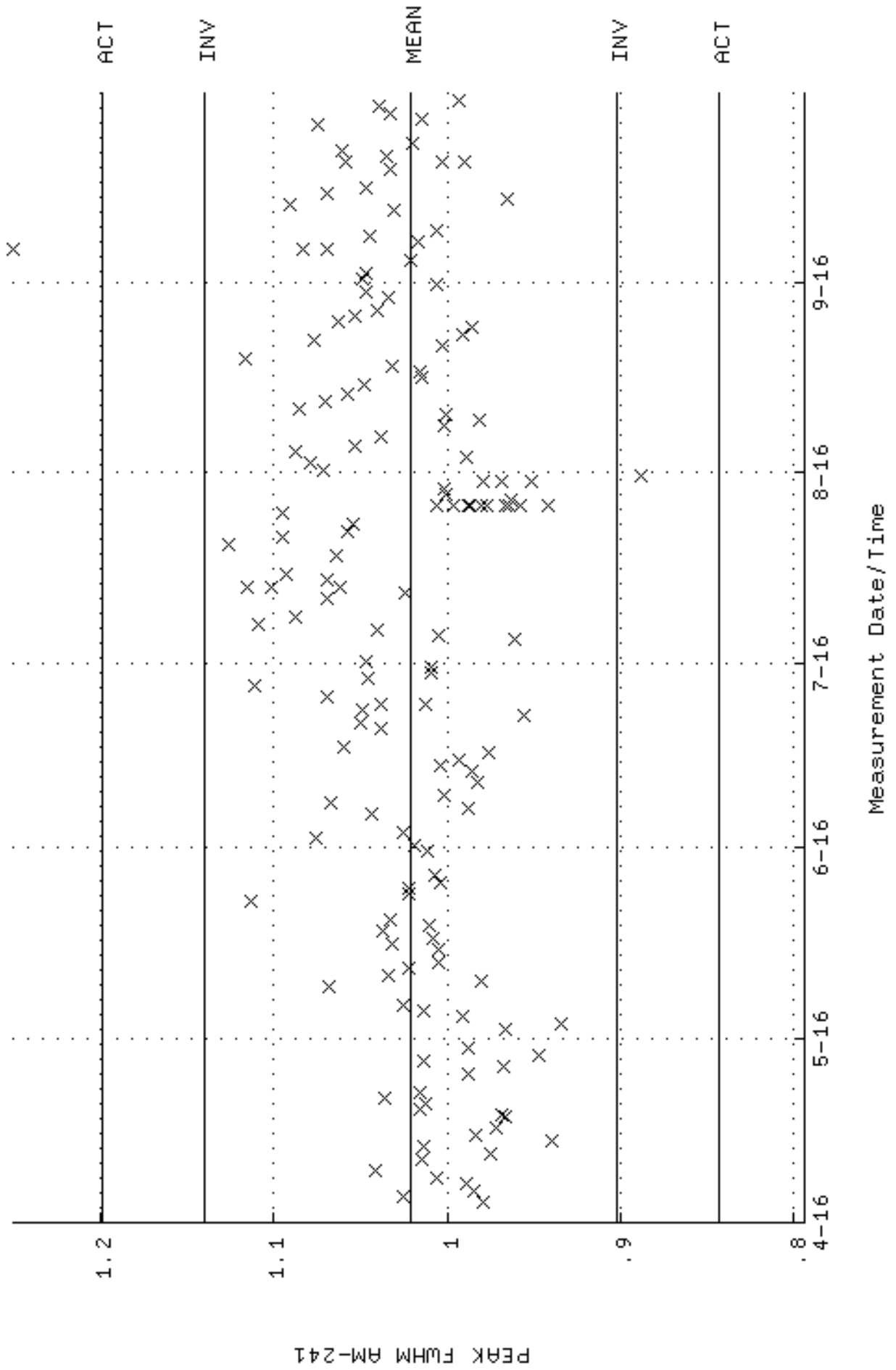
Report completed at 3-OCT-2016 09:33:35.49

Background and Efficiency Data

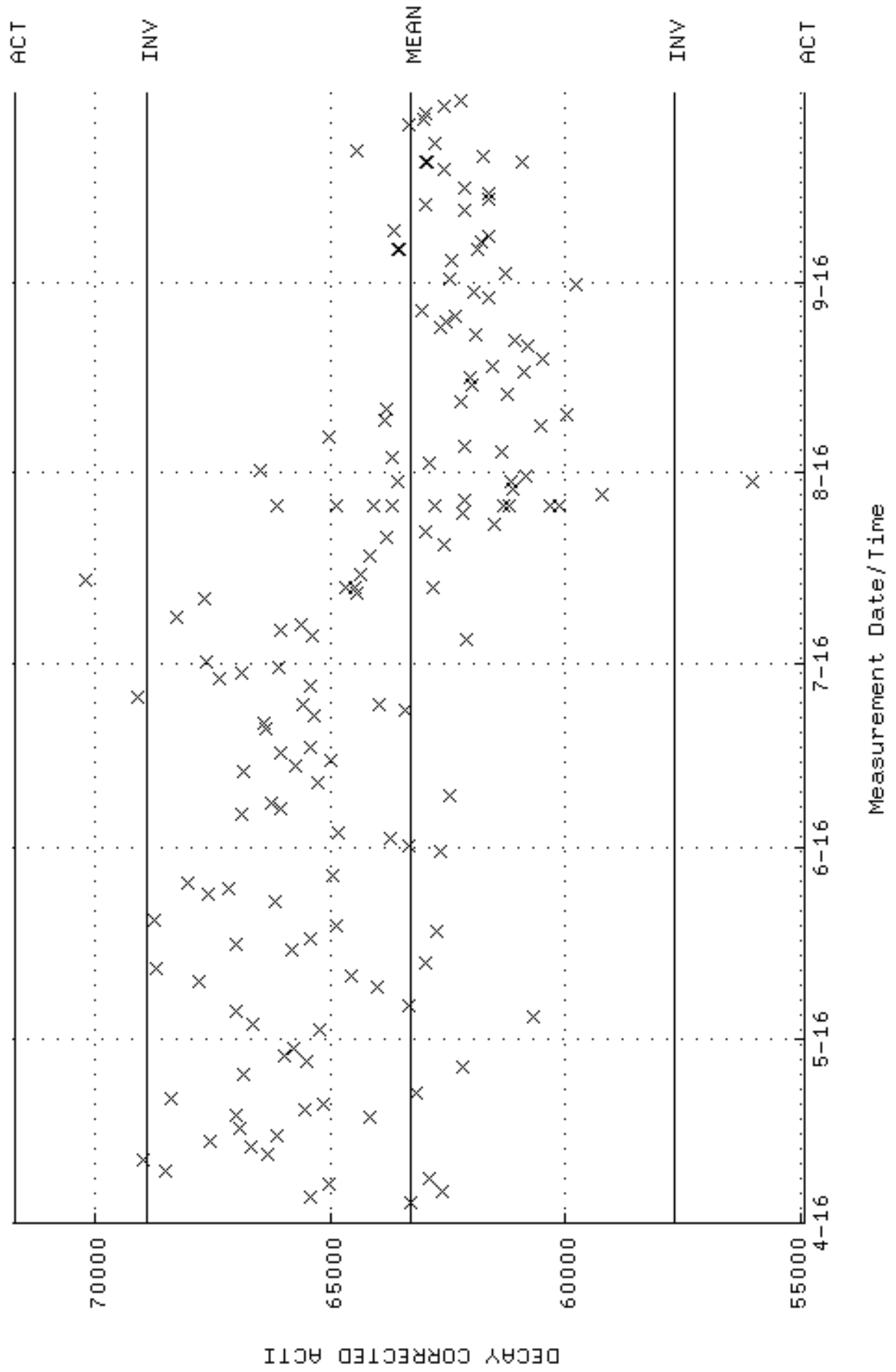
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM01_500MLMB.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:13:18 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



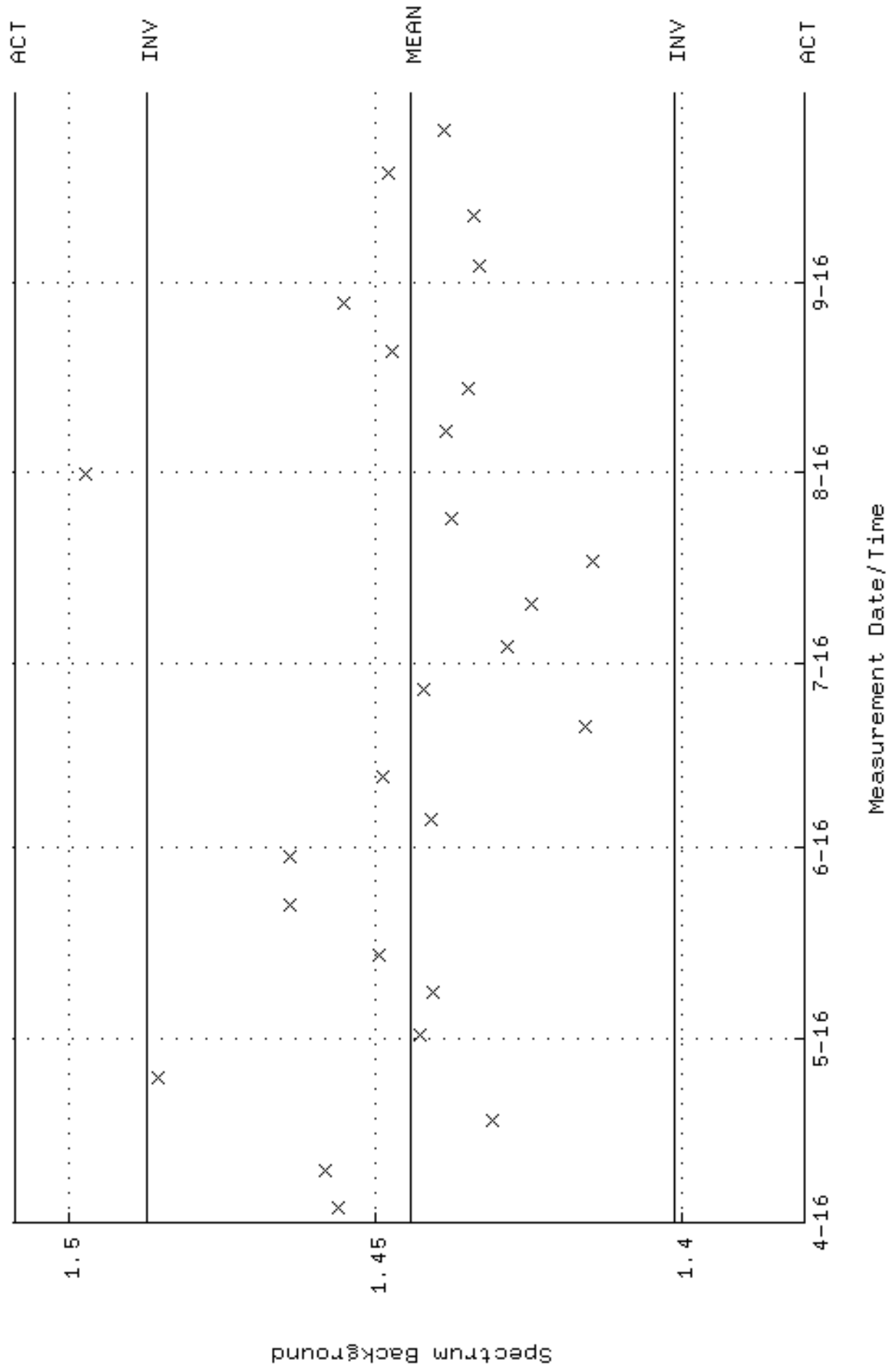
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM01_500MLMB.QAF;1
 Parameter Name : PSFVHM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:13:18 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.02147 +- 5.951646E-02 (5.83 %)



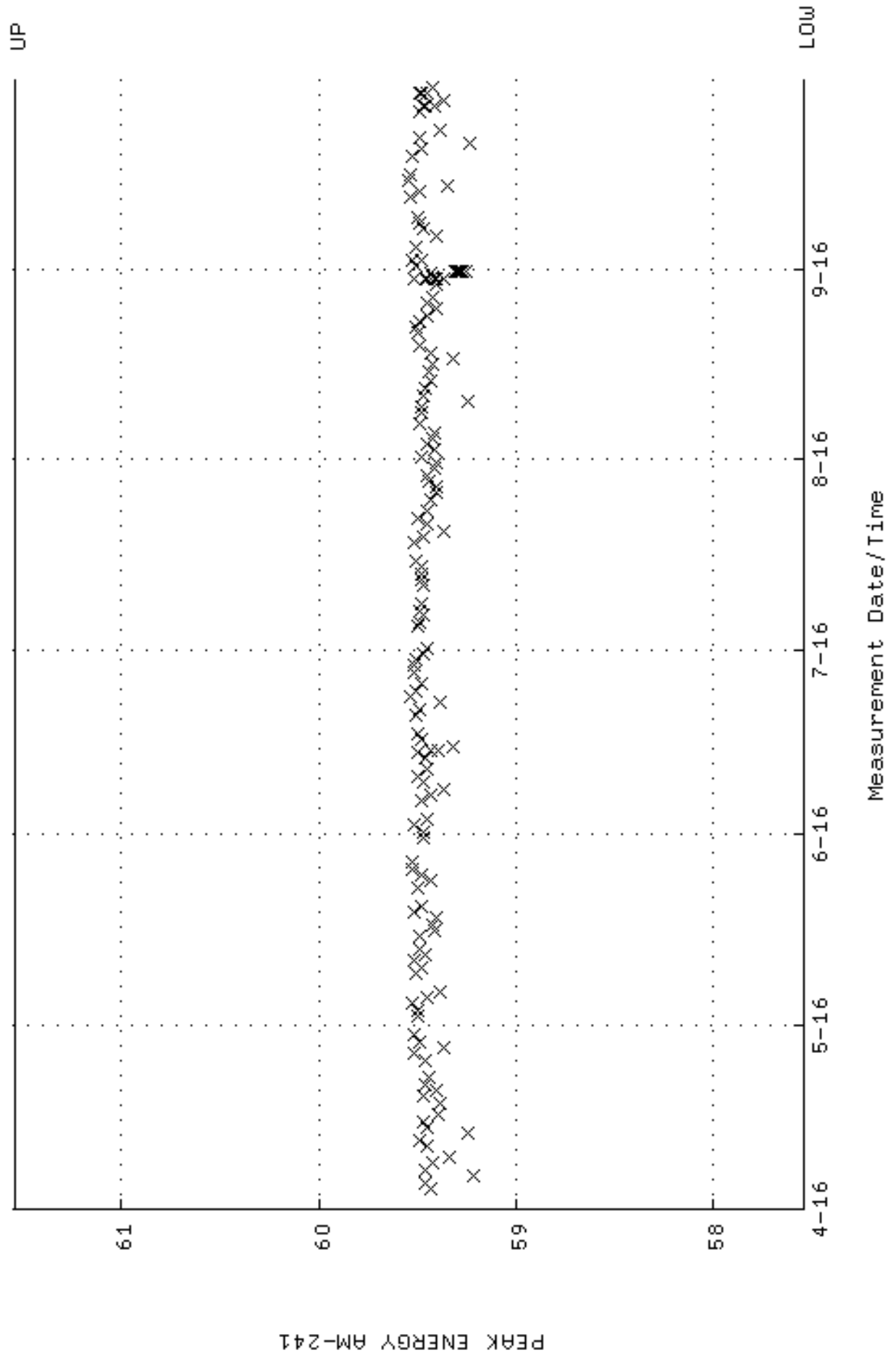
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]QCC_GAM01_500MLMB.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:13:18 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 63306.3 +- 2800.78 (4.42 %)



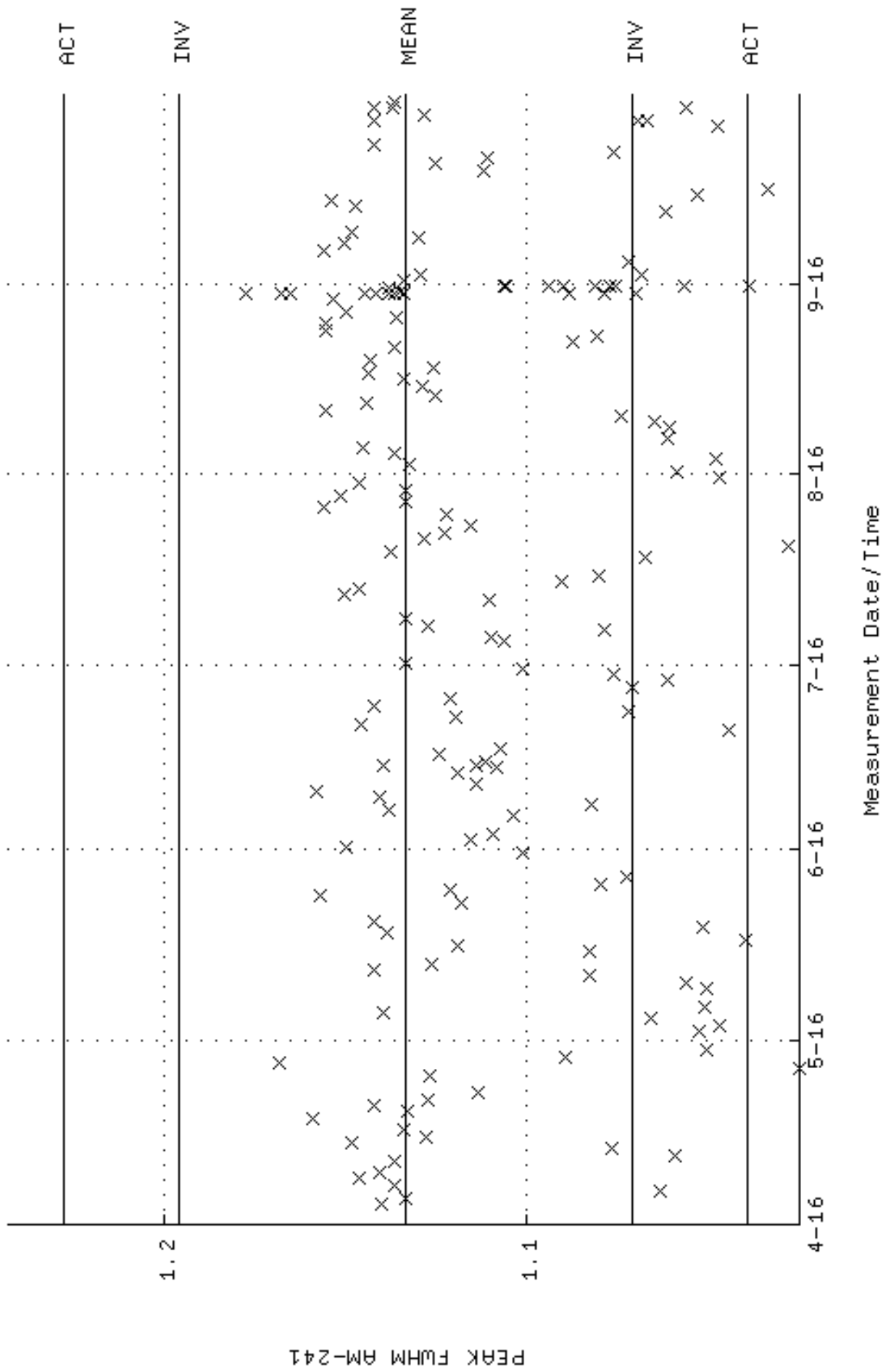
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]LBC_GAM01.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:17:38 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.44447 +- 2.145394E-02 (1.49 %)



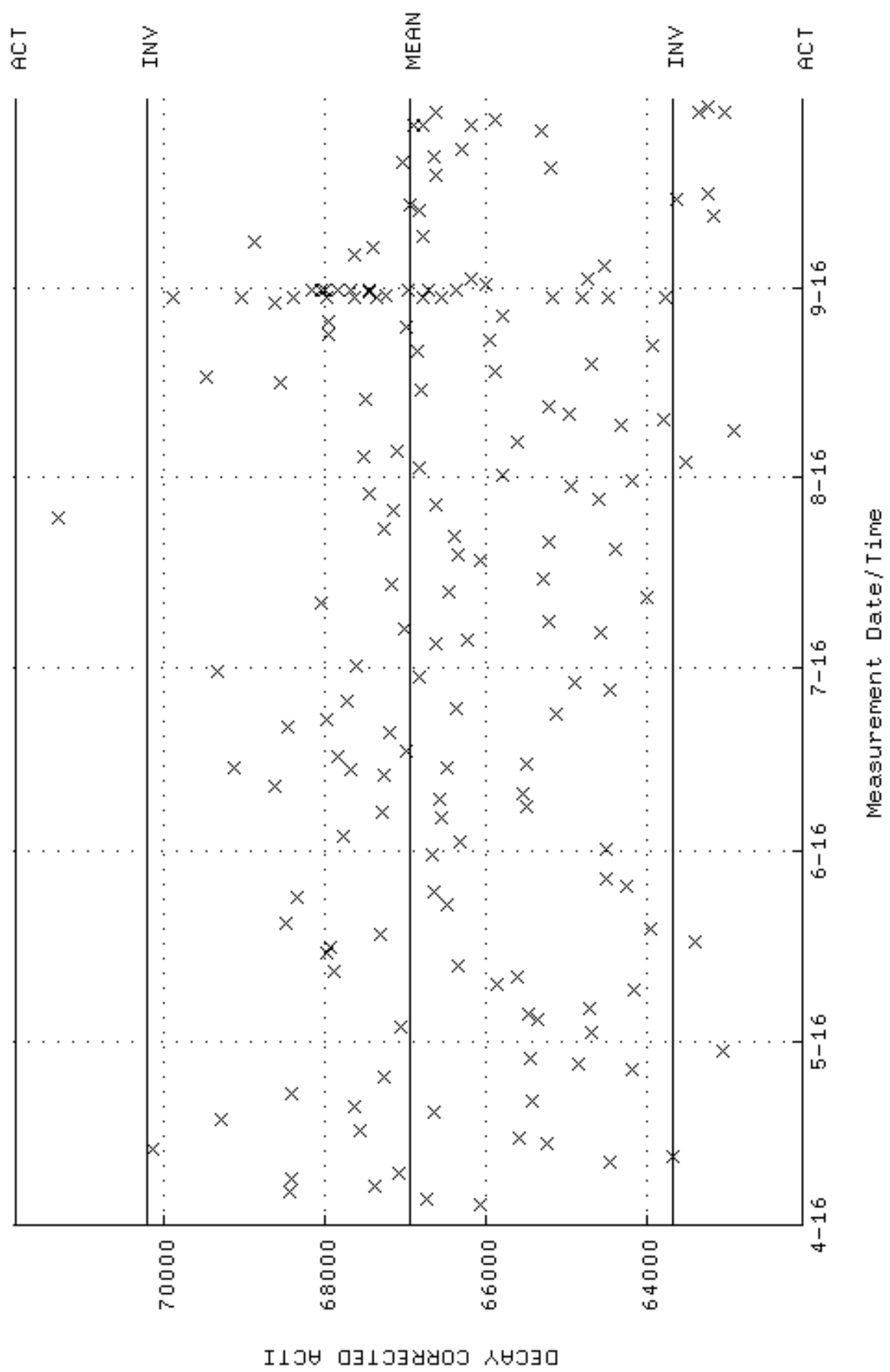
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Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 07:17:47 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



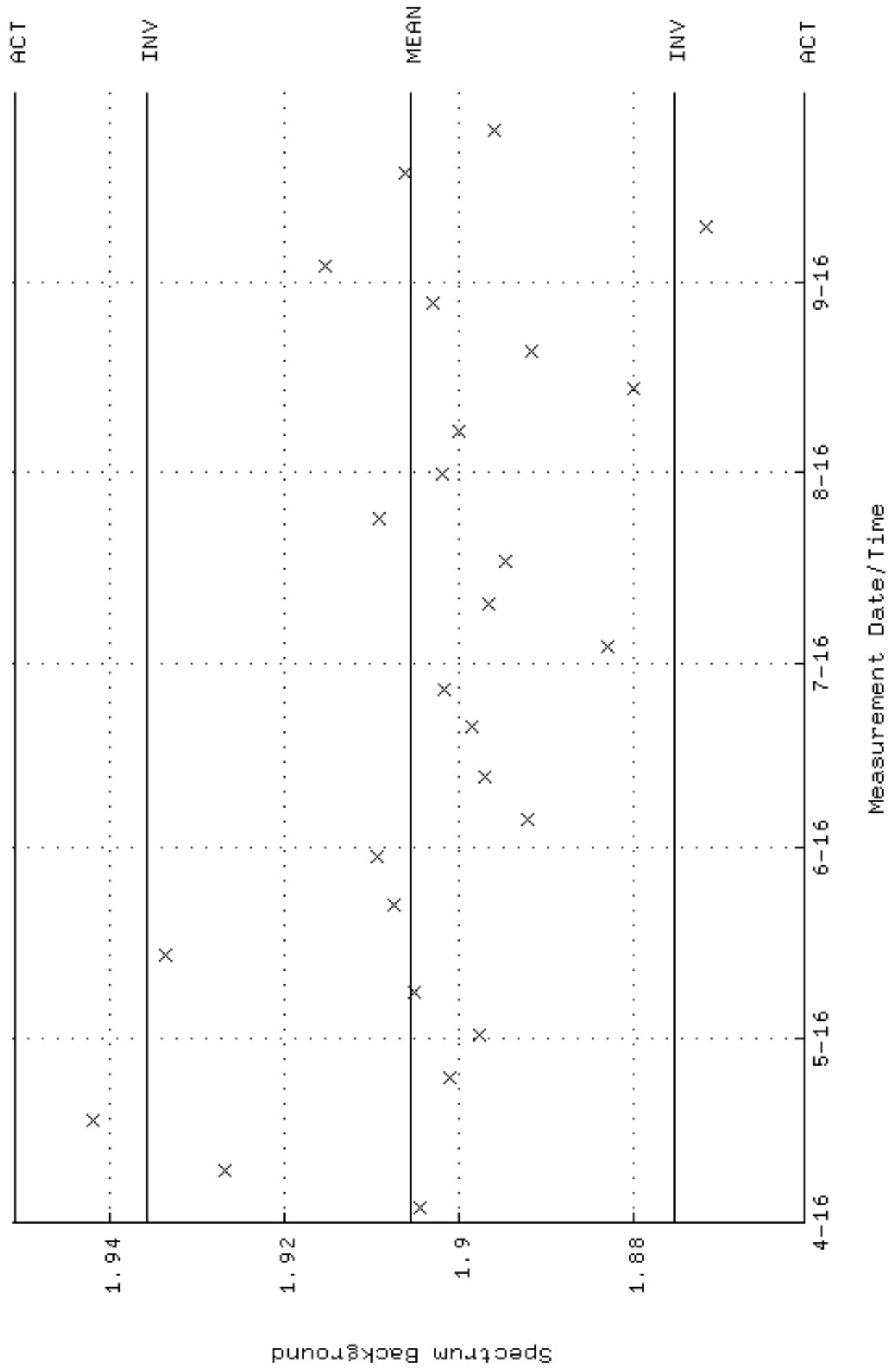
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 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 07:17:47 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.13371 +- 3.136154E-02 (2.77 %)



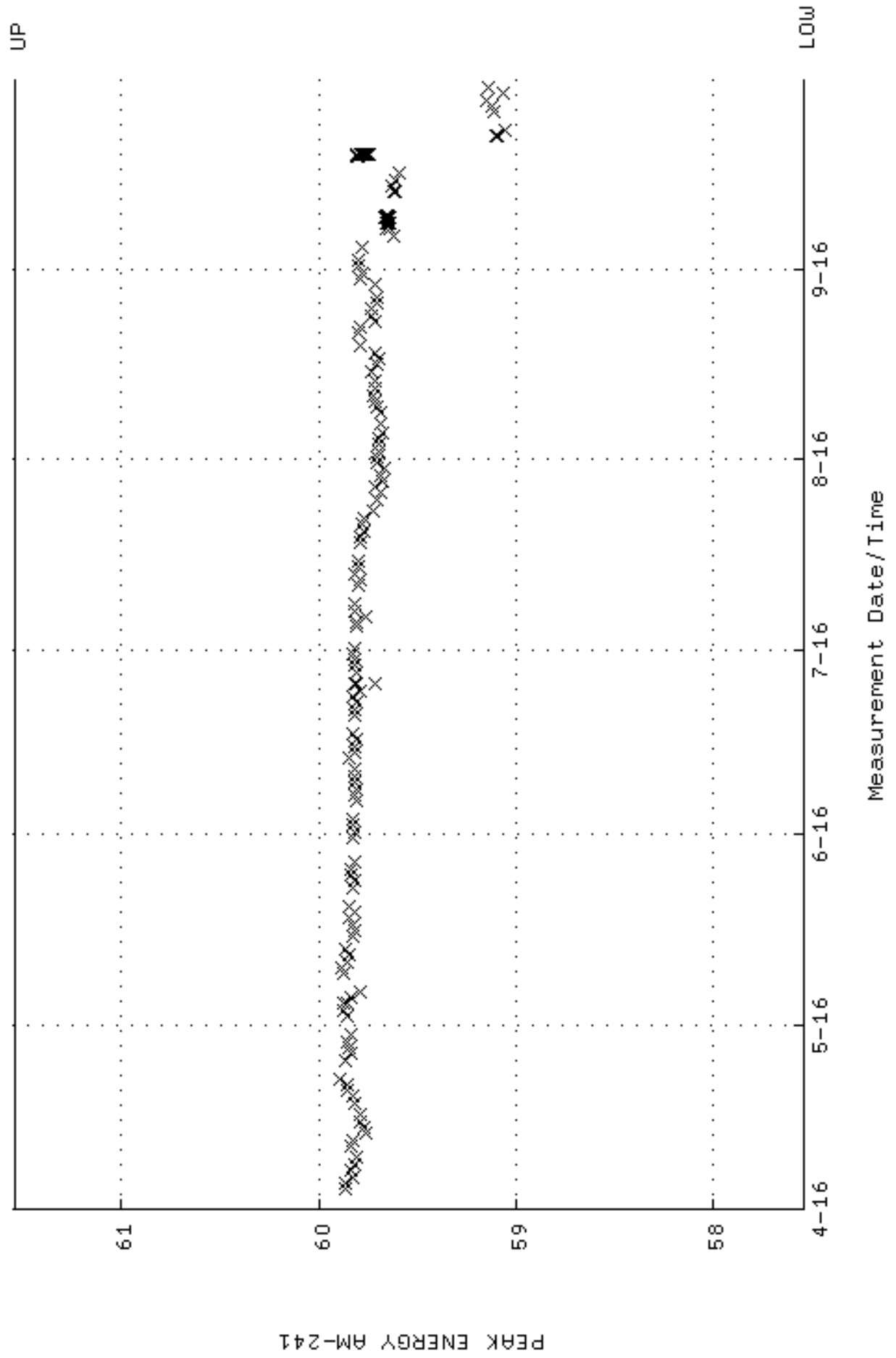
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 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 07:17:47 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 66952.9 +- 1625.05 (2.43 %)



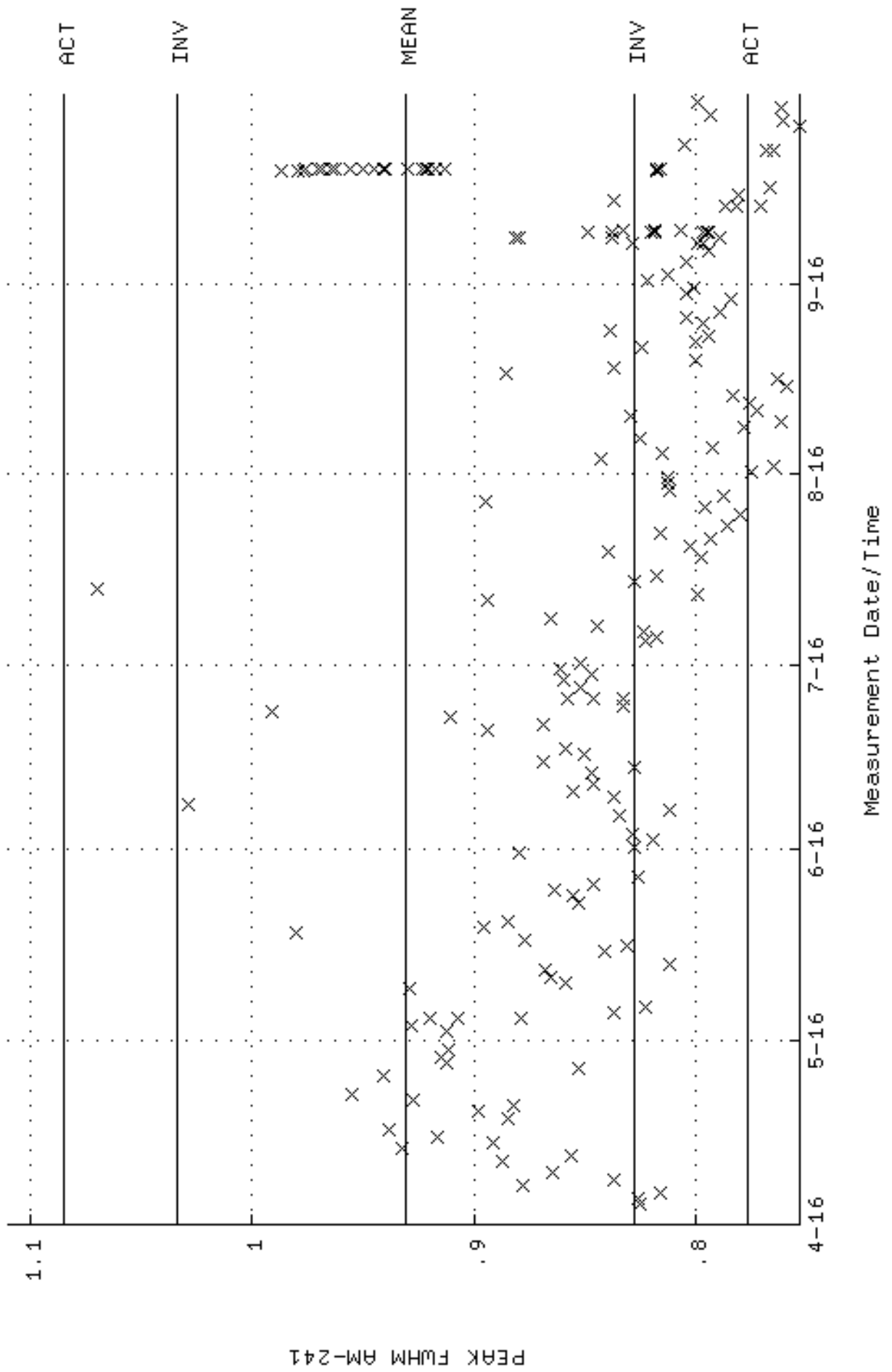
QA filename : DKA100:[CANSBERRA.GAMMA.SCUSR.QA]LBC_GAM02.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:17:44 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.90568 +- 1.505658E-02 (0.79 %)



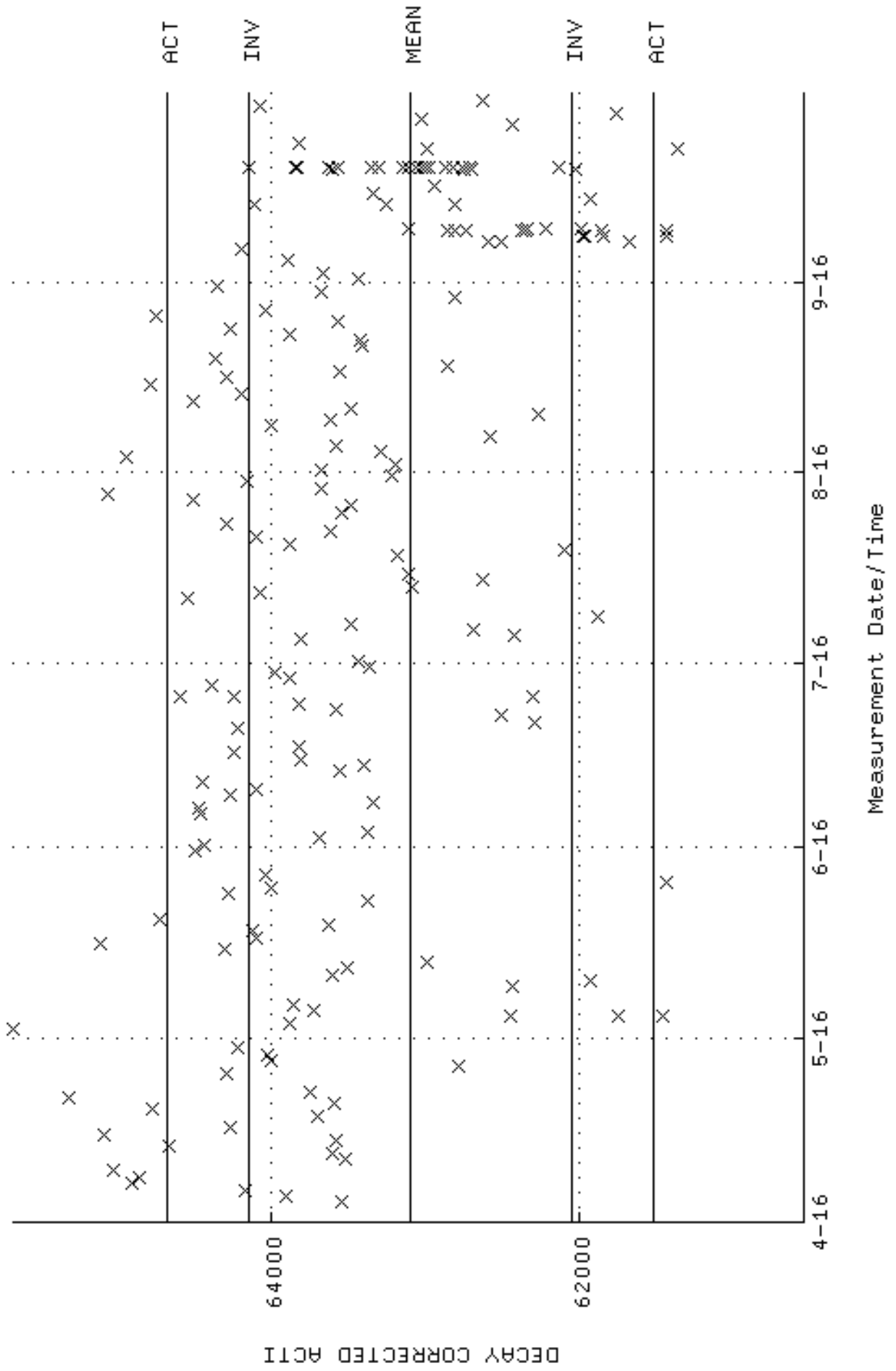
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM05_CAN_QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:24:06 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



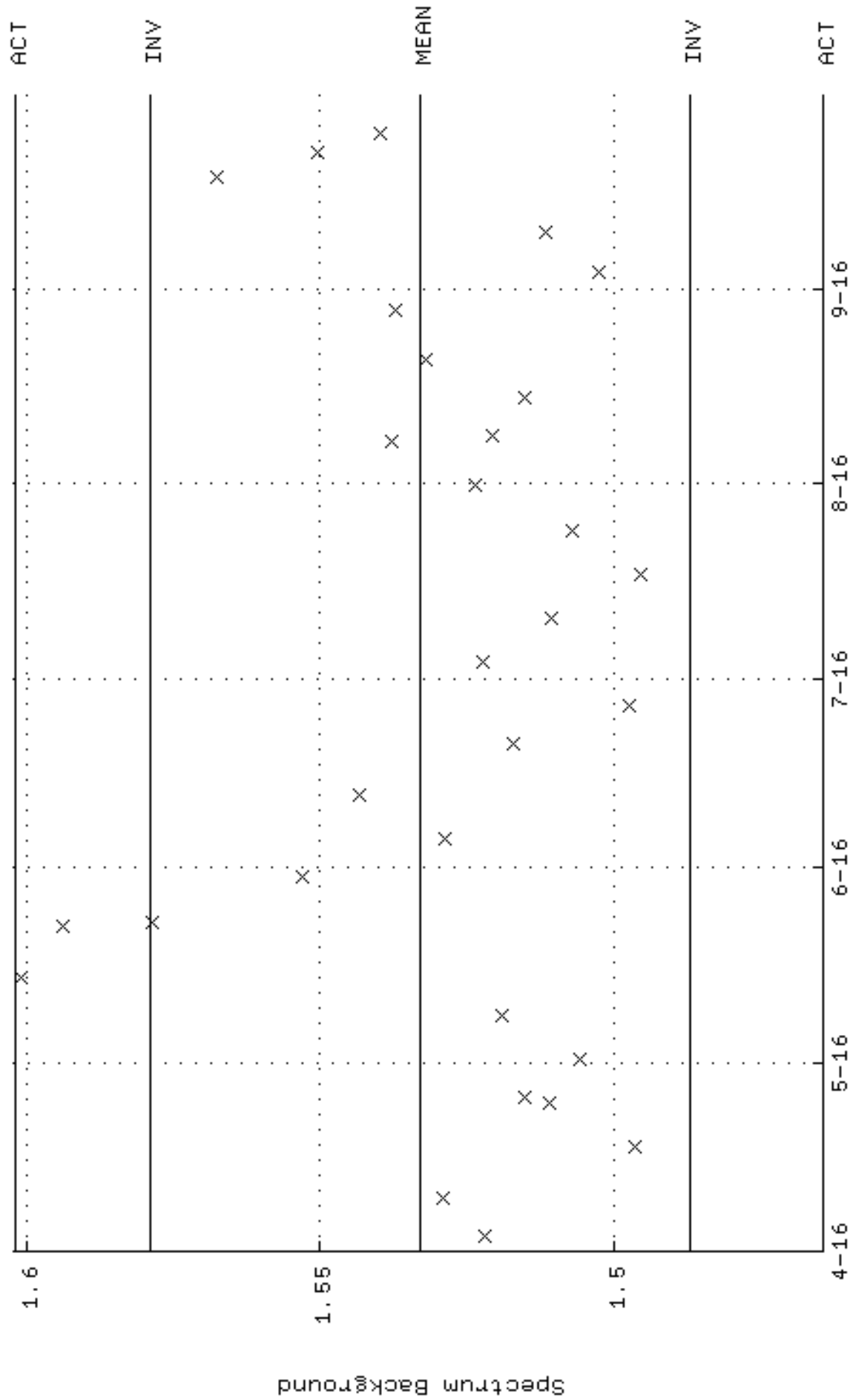
QA filename : DKA100:[CANTERRA,GAMMA,SCUSR,QA]QCC_GAM05_CAN_QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:24:06 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 0.931135 +- 5.131084E-02 (5.51 %)



QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM05_CAN_QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:24:06 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 63104.2 +- 525.196 (0.83 %)

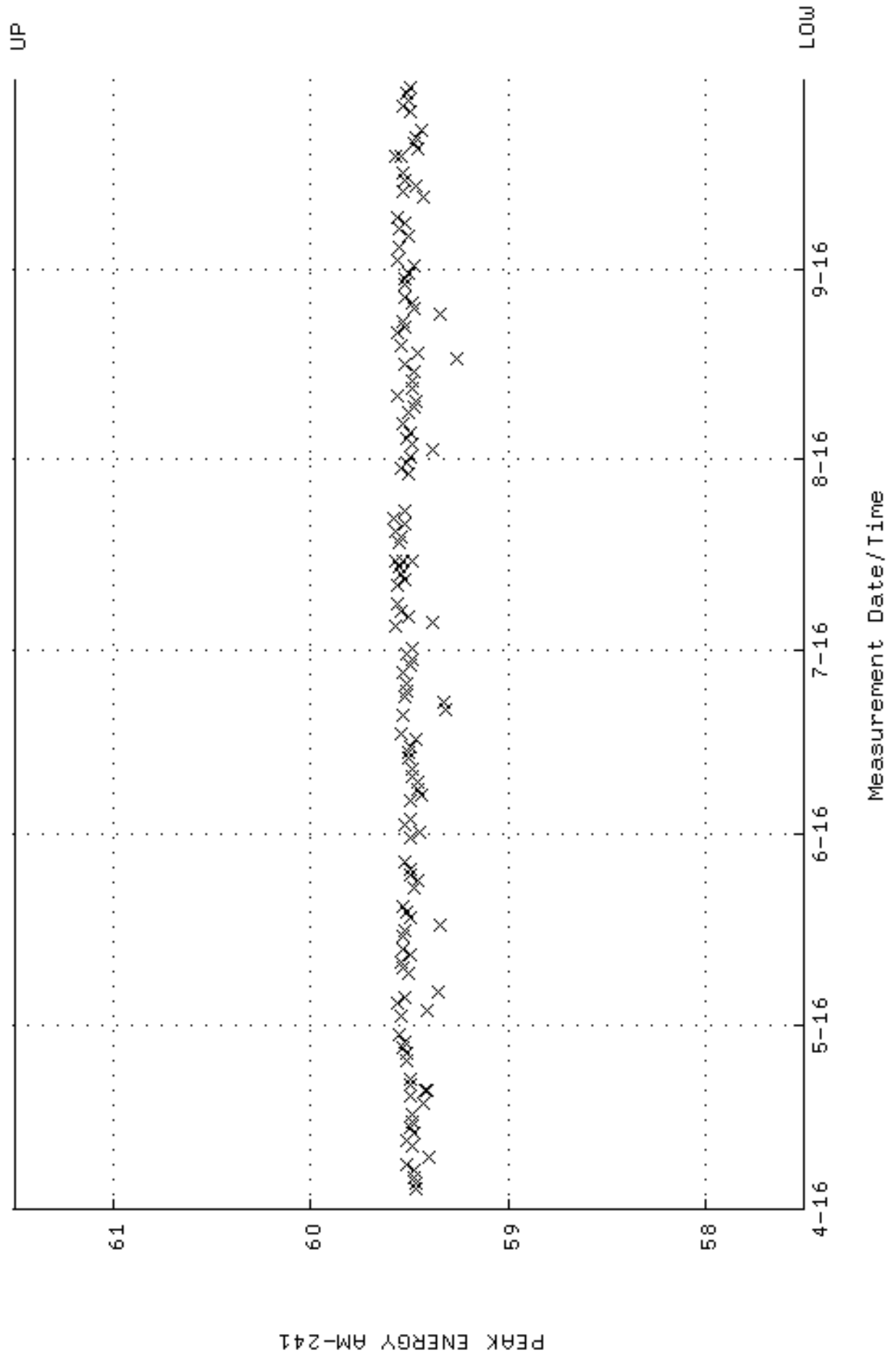


QA filename : DKA100:[CANSBERRA.GAMMA.SCUSR.QA]LBC_GAM05.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:18:01 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.53310 +- 2.296009E-02 (1.50 %)

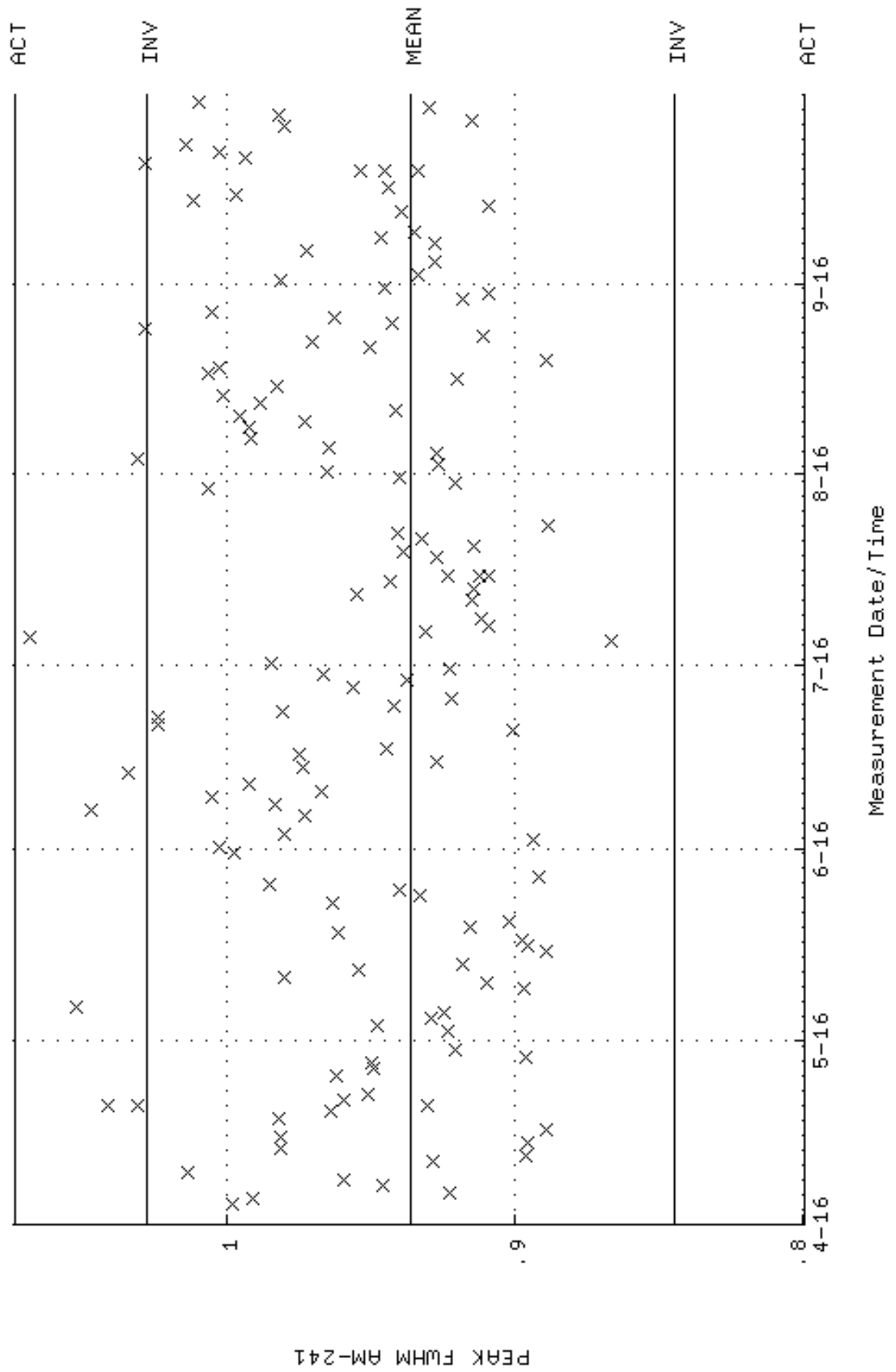


Measurement Date/Time

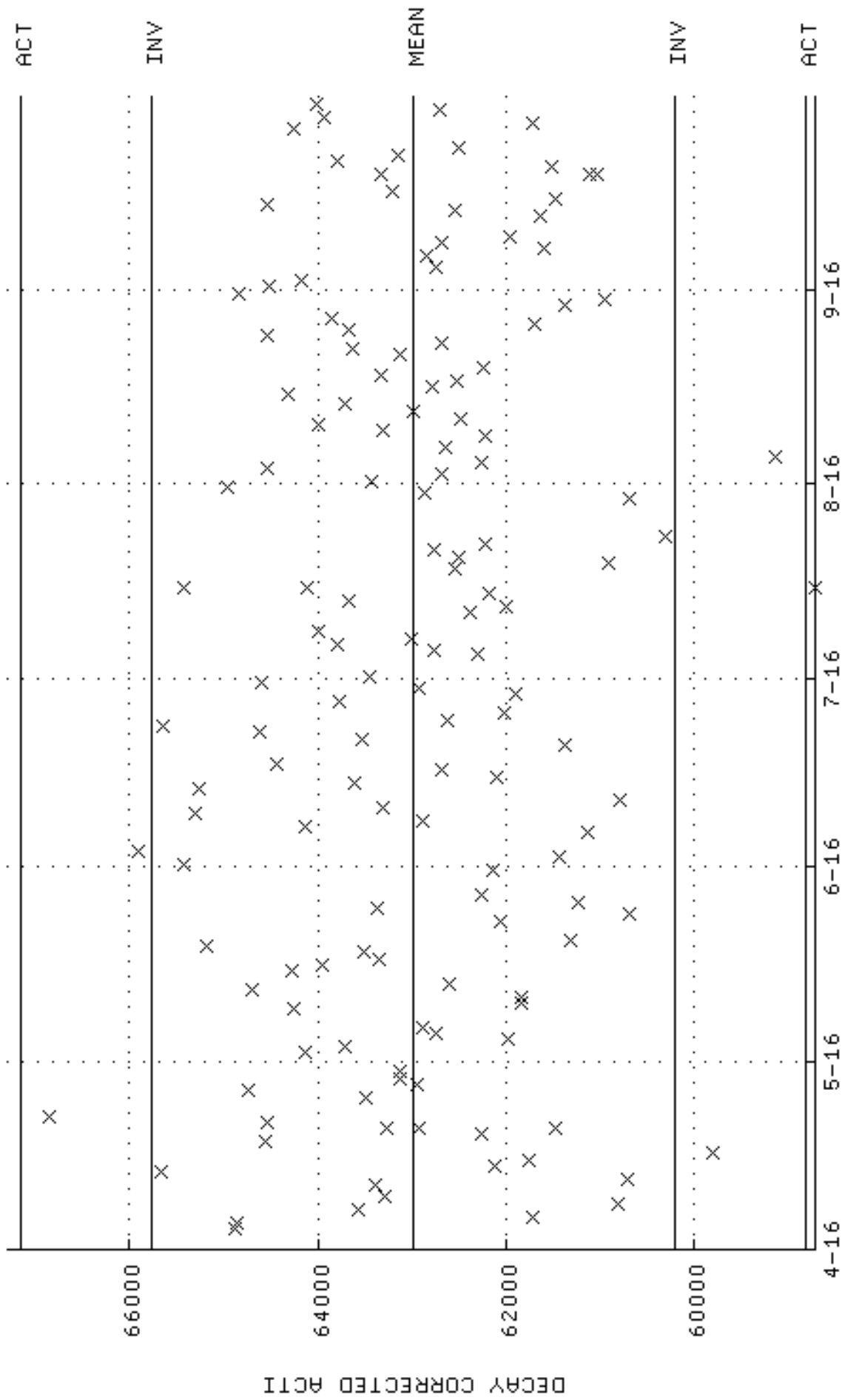
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM06_500MLMB.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:13:24 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5000 through 61.5000



QA filename : DKA100:[CANTERRA,GAMMA,SCUSR,QA]QCC_GAM06_500MLMB.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:13:24 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 0.936438 +- 4.566342E-02 (4.88 %)

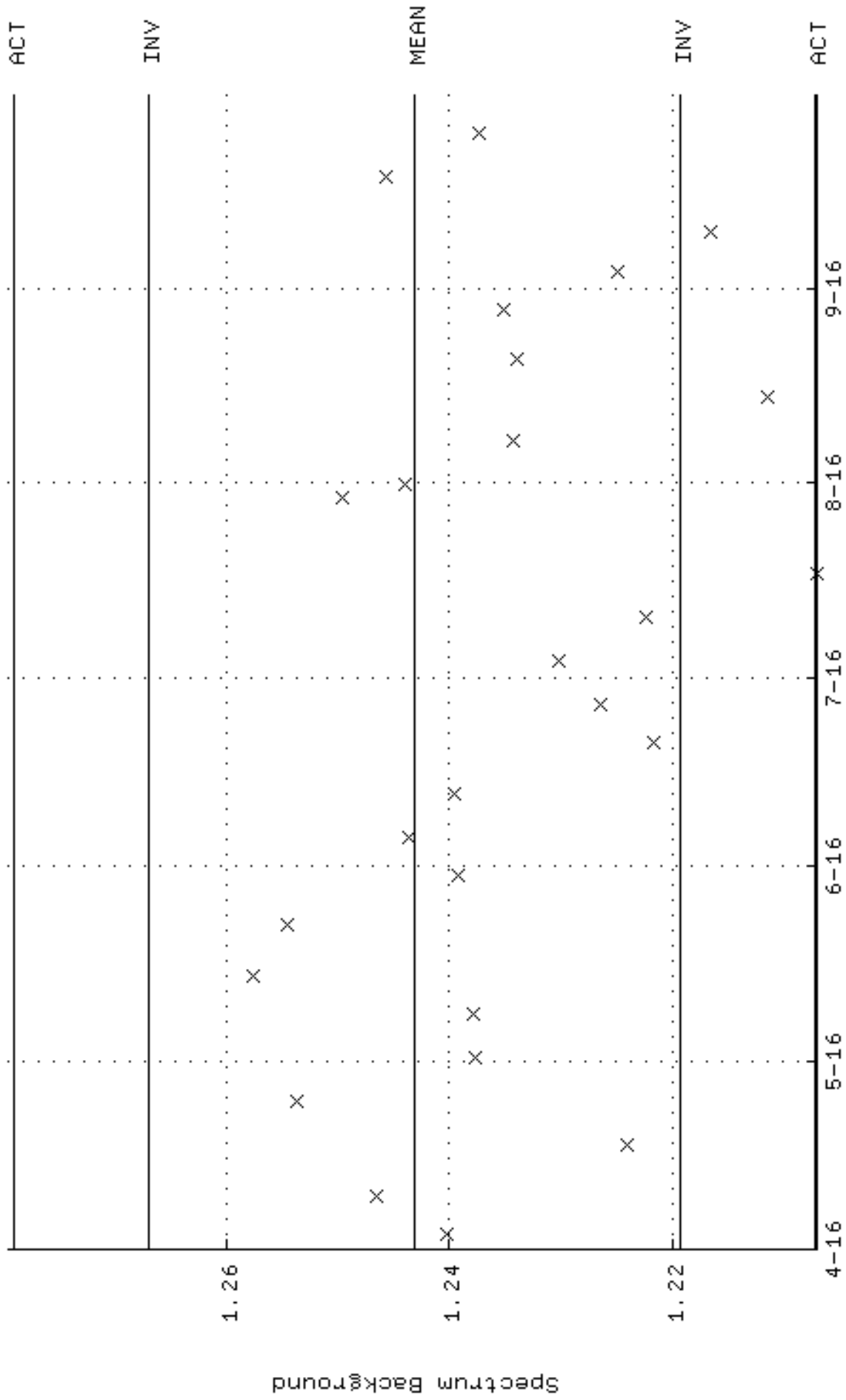


QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM06_500MLMB.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:13:24 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 62995.7 +- 1389.67 (2.21 %)

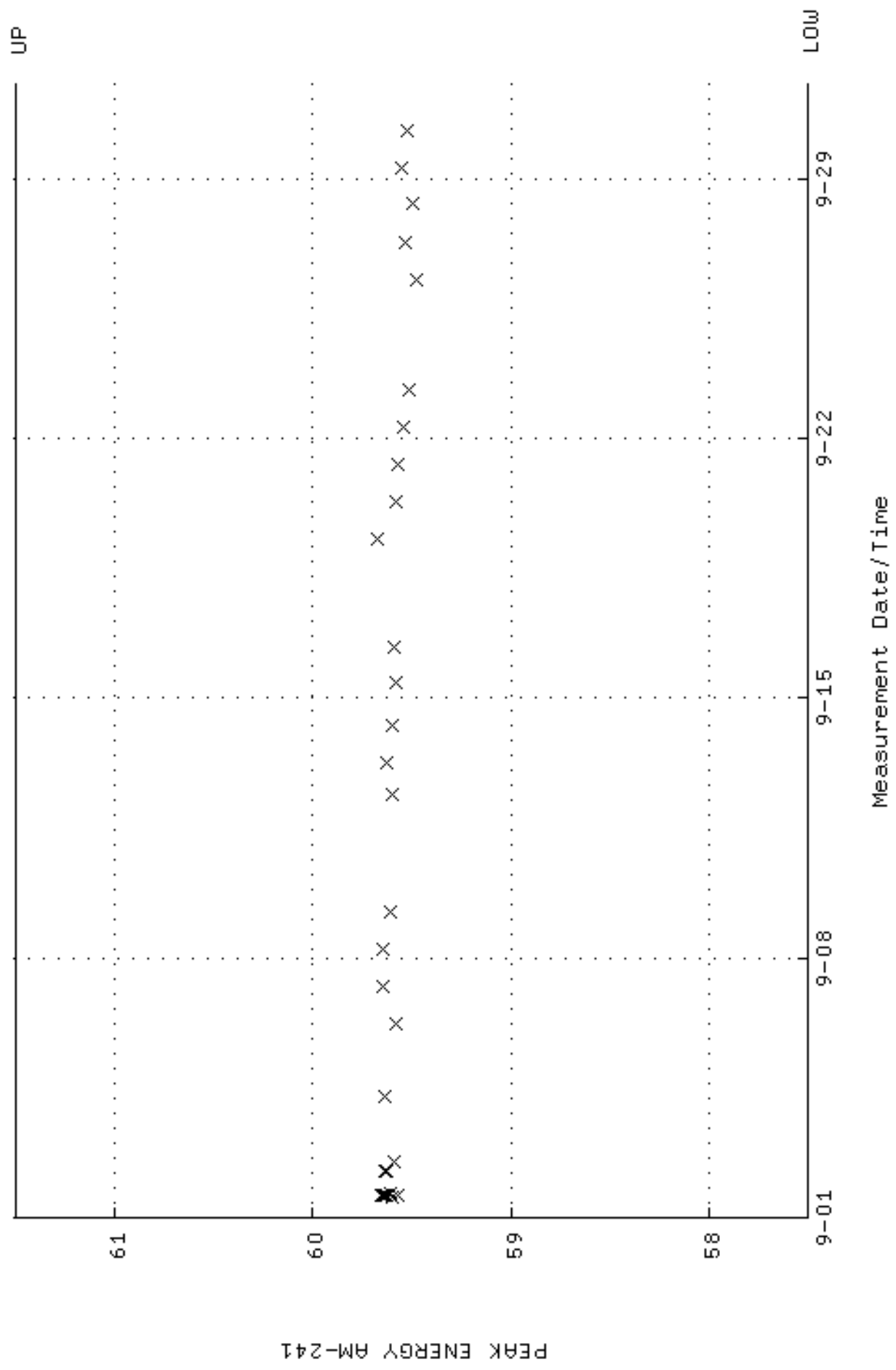


Measurement Date/Time

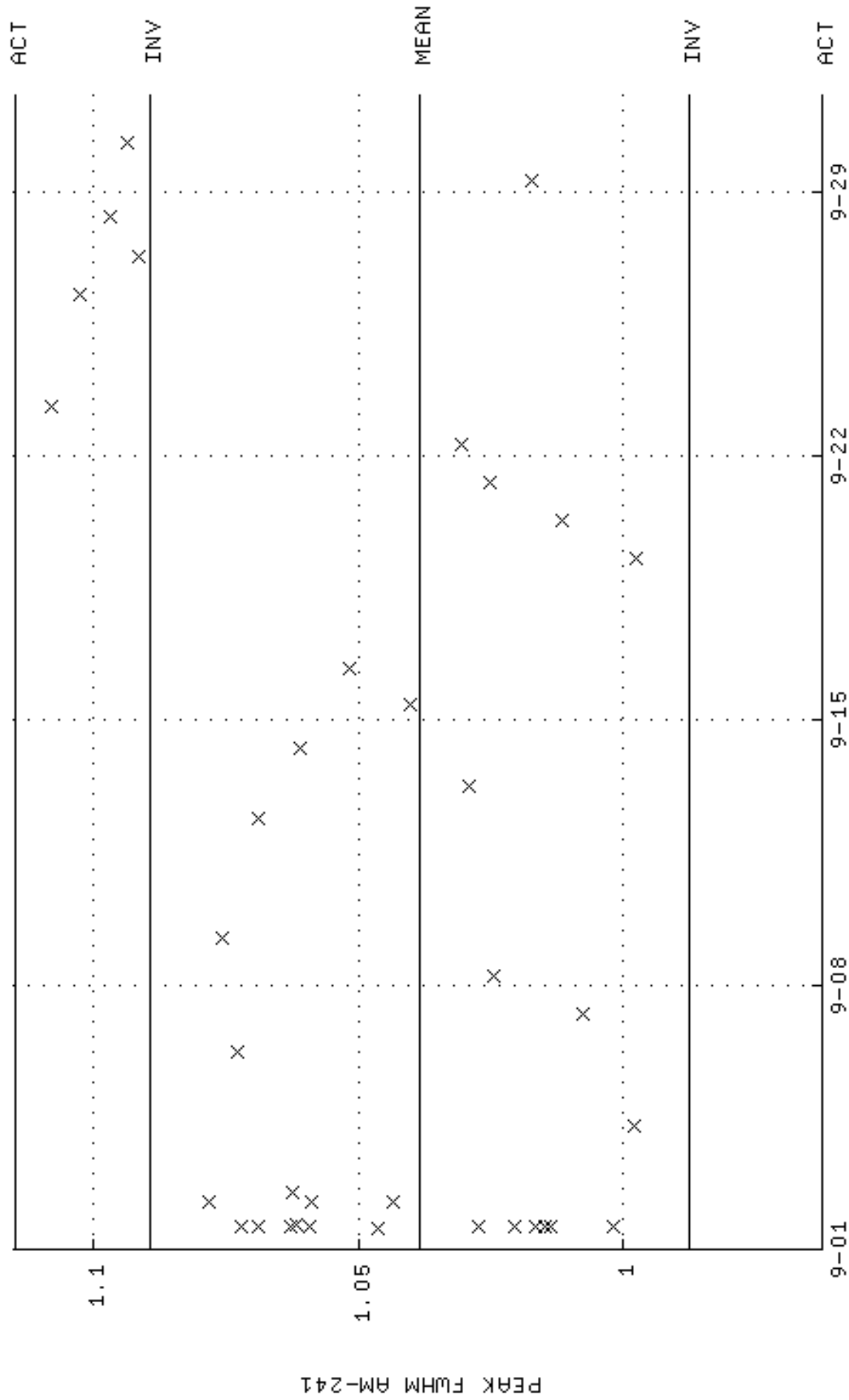
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM06.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:18:07 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.24317 +- 1.196123E-02 (0.96 %)



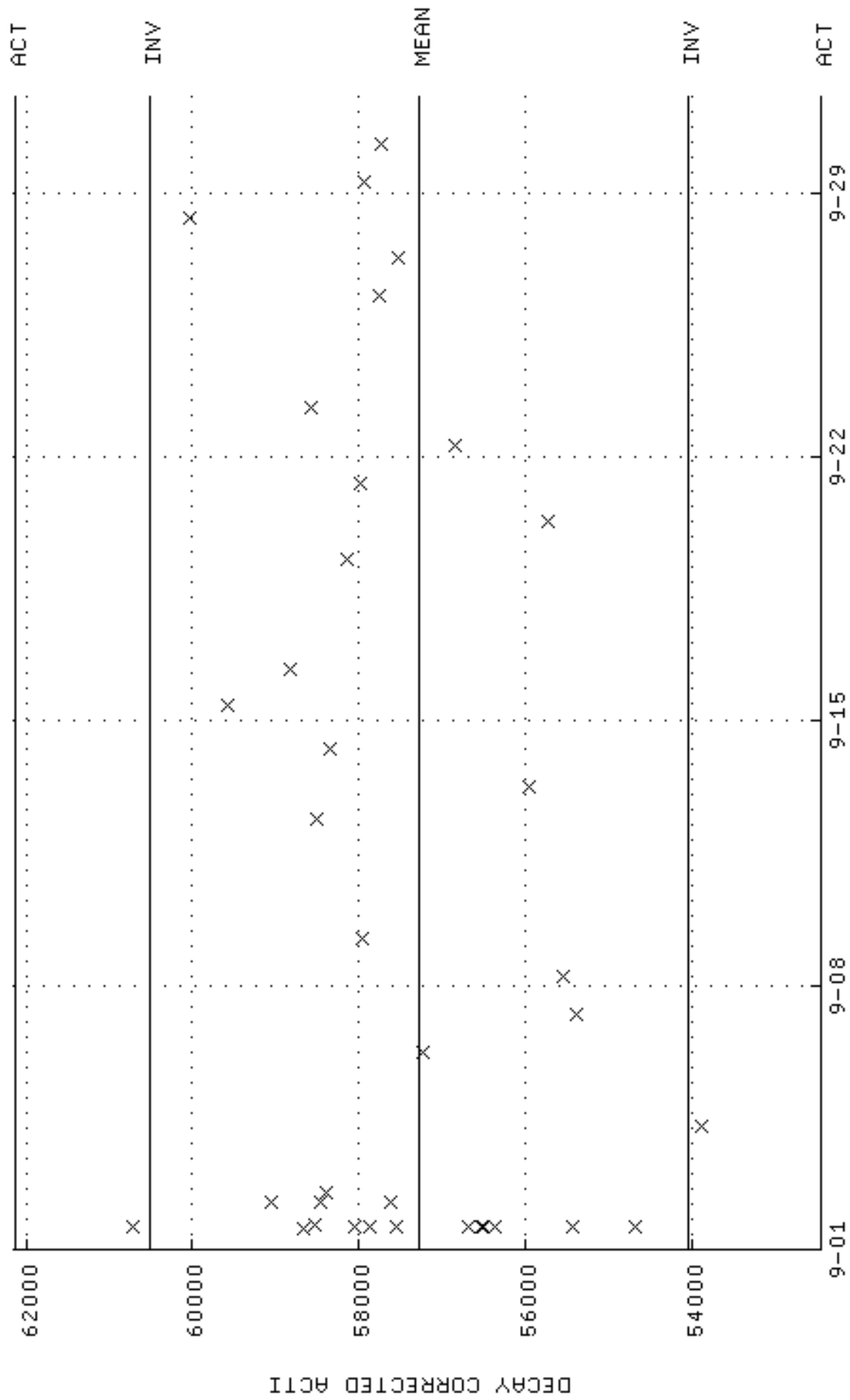
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM07_JAR.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 1-SEP-2016 13:47:02 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 57.5000 through 61.5000



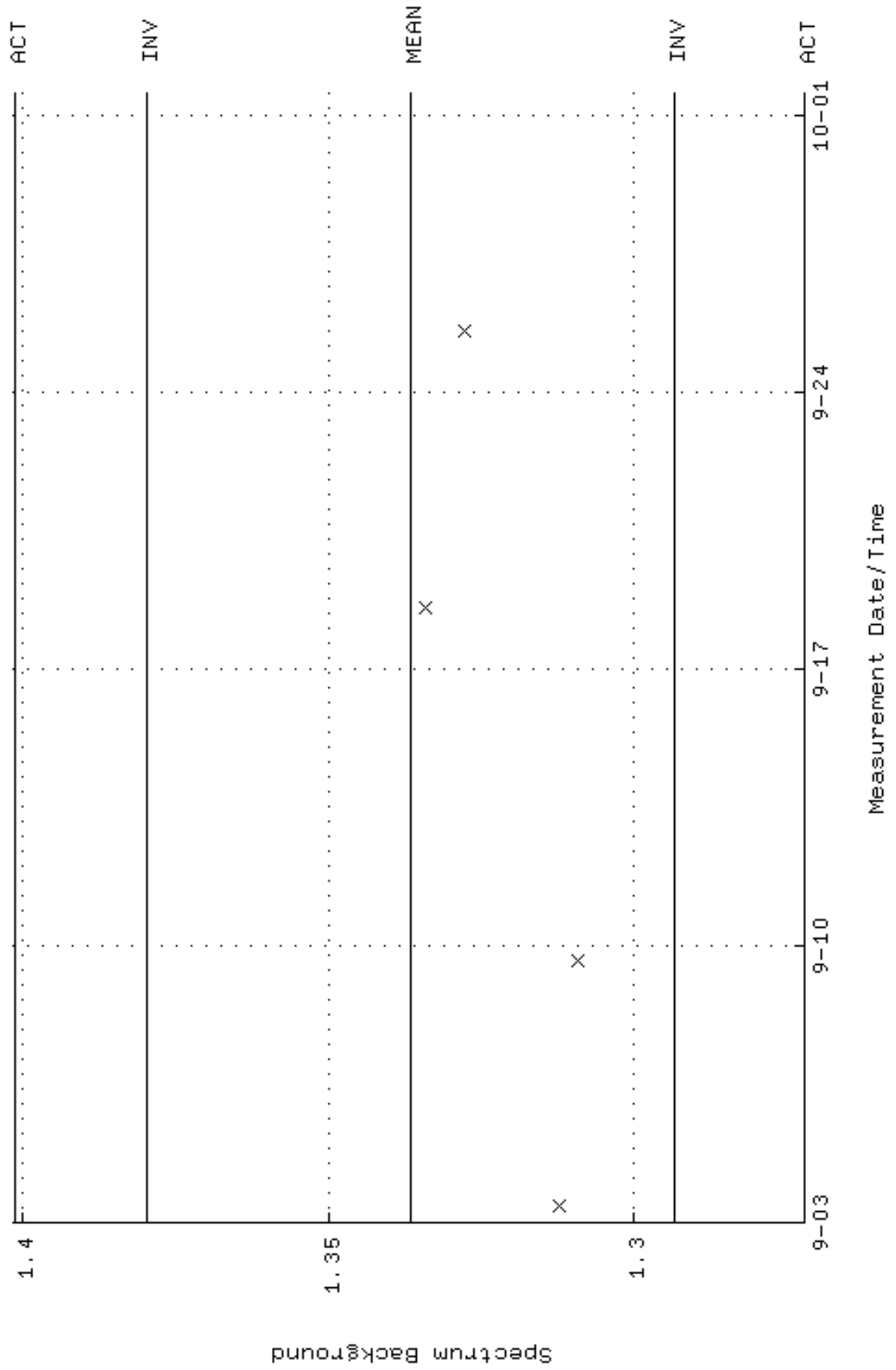
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM07_JAR.QAF;1
 Parameter Name : PSFWHM-59 (PEAK FWHM AM-241)
 Start/End Dates : 1-SEP-2016 13:47:02 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.03858 +- 2.533066E-02 (2.44 %)



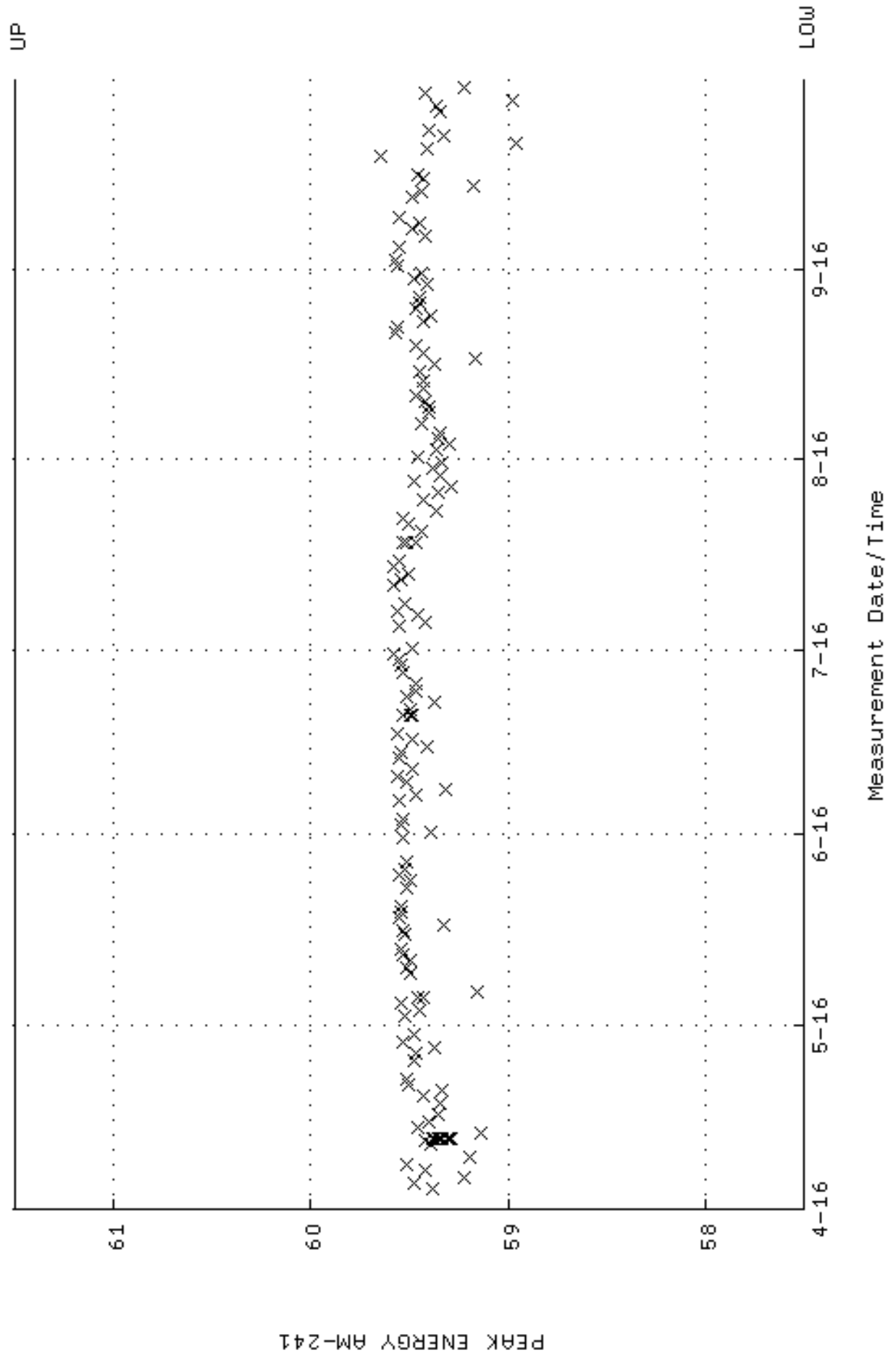
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM07_JAR.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 1-SEP-2016 13:47:02 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 57291.8 +- 1611.56 (2.81 %)



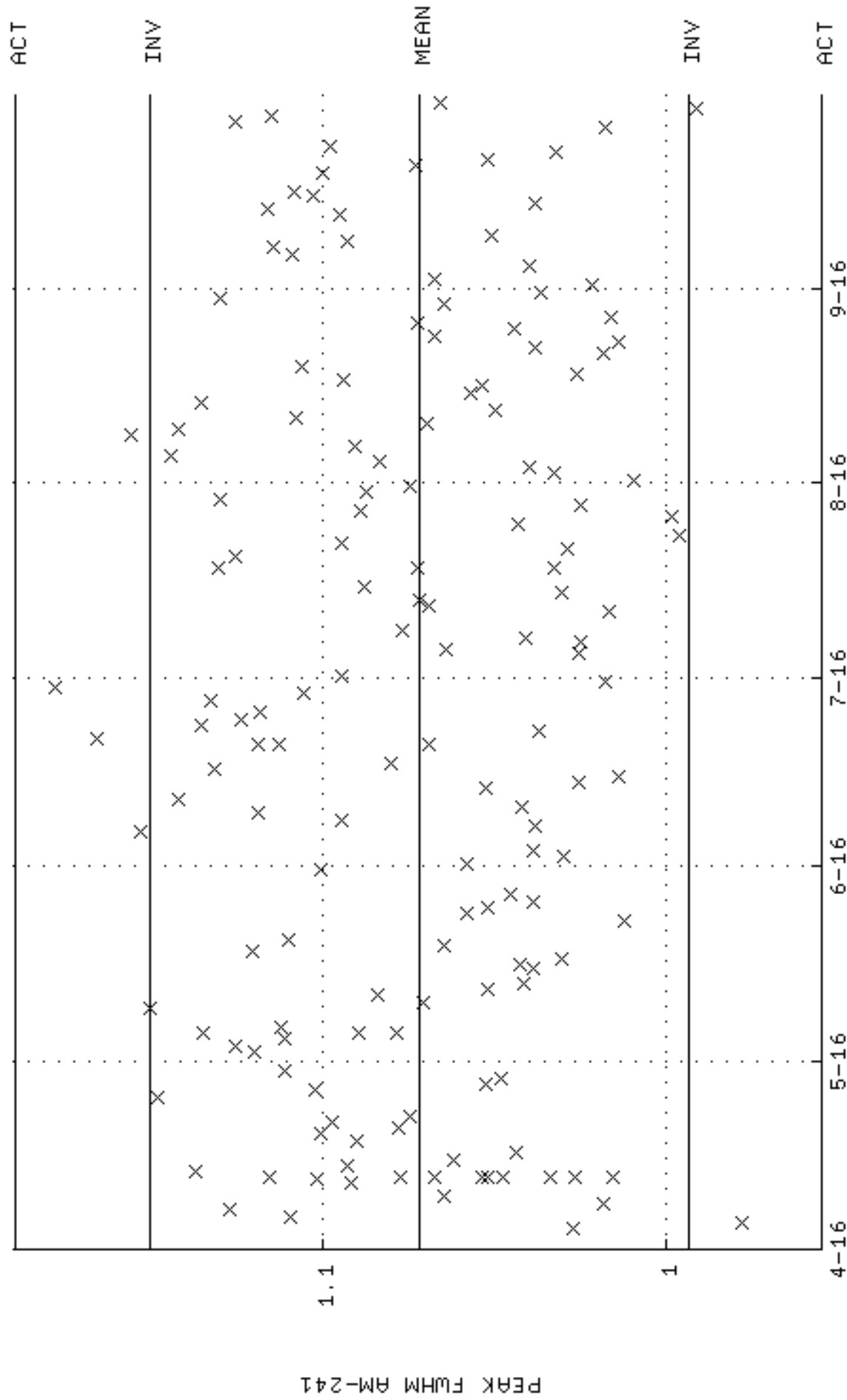
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM07.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-SEP-2016 10:23:03 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.33664 +- 2.151268E-02 (1.61 %)



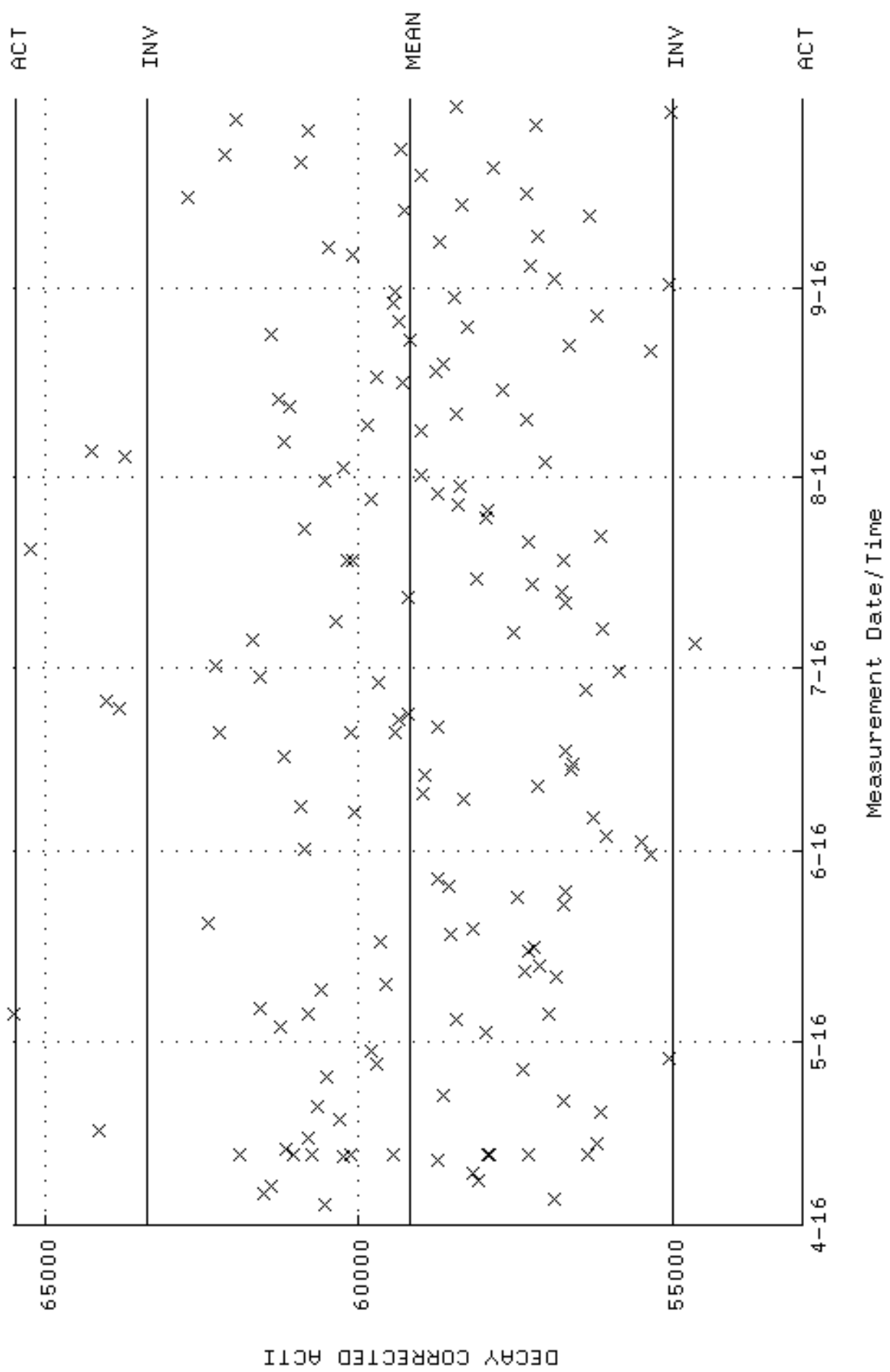
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM08_JAR.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:13:29 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5000 through 61.5000



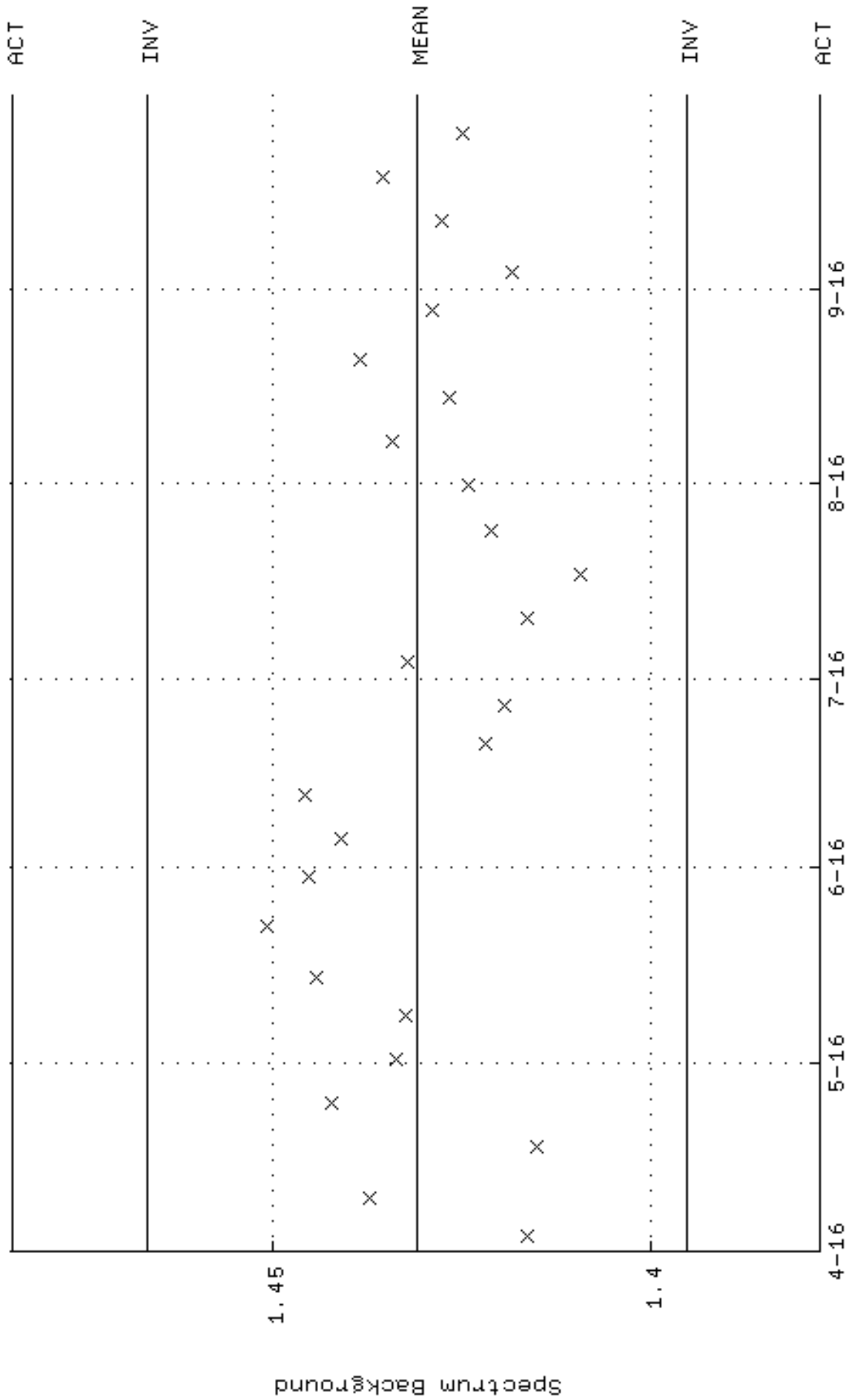
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 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:13:29 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.07206 +- 3.912322E-02 (3.65 %)



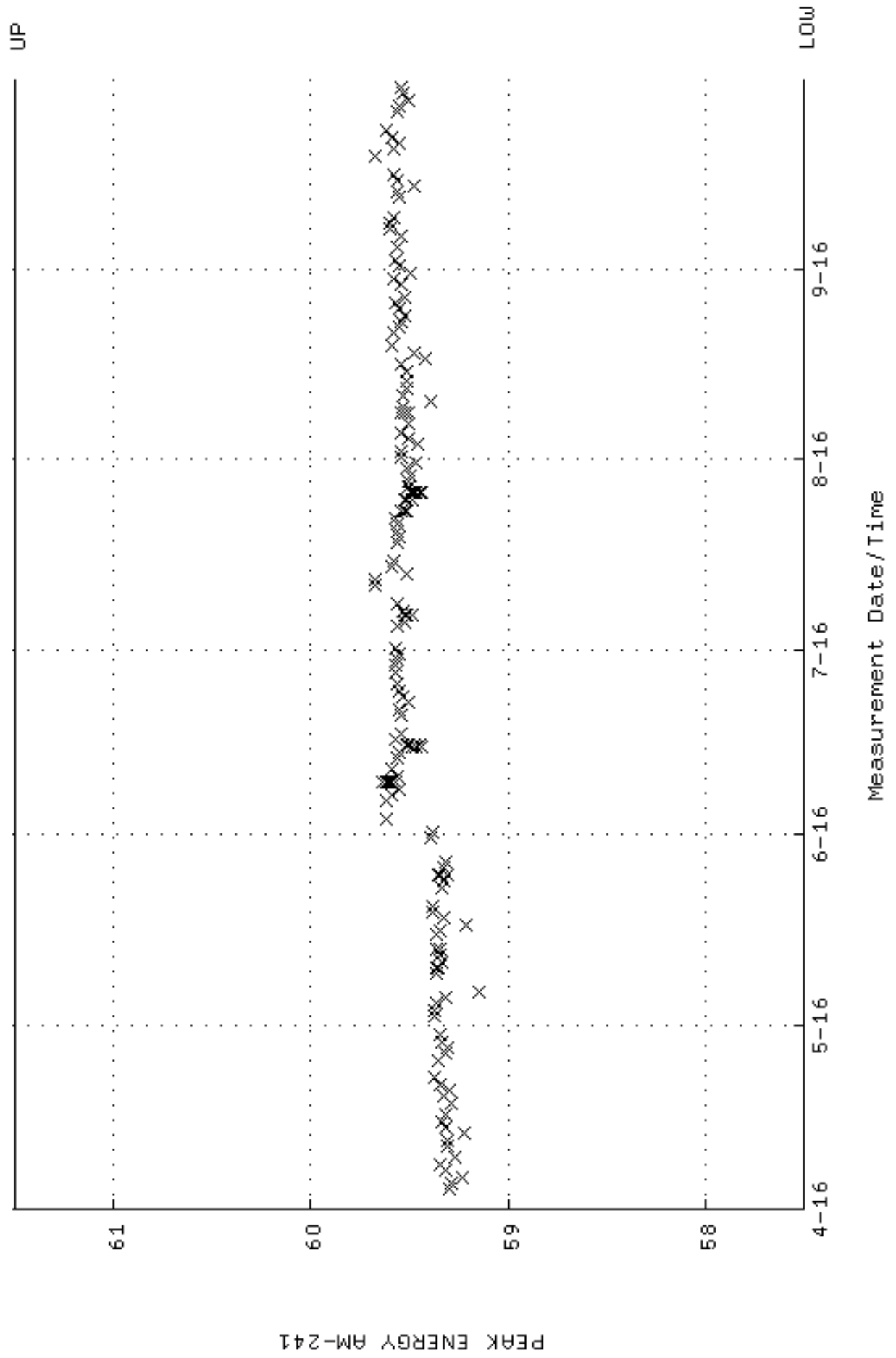
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]QCC_GAM08_JAR.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:13:29 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 59199.1 +- 2092.11 (3.53 %)



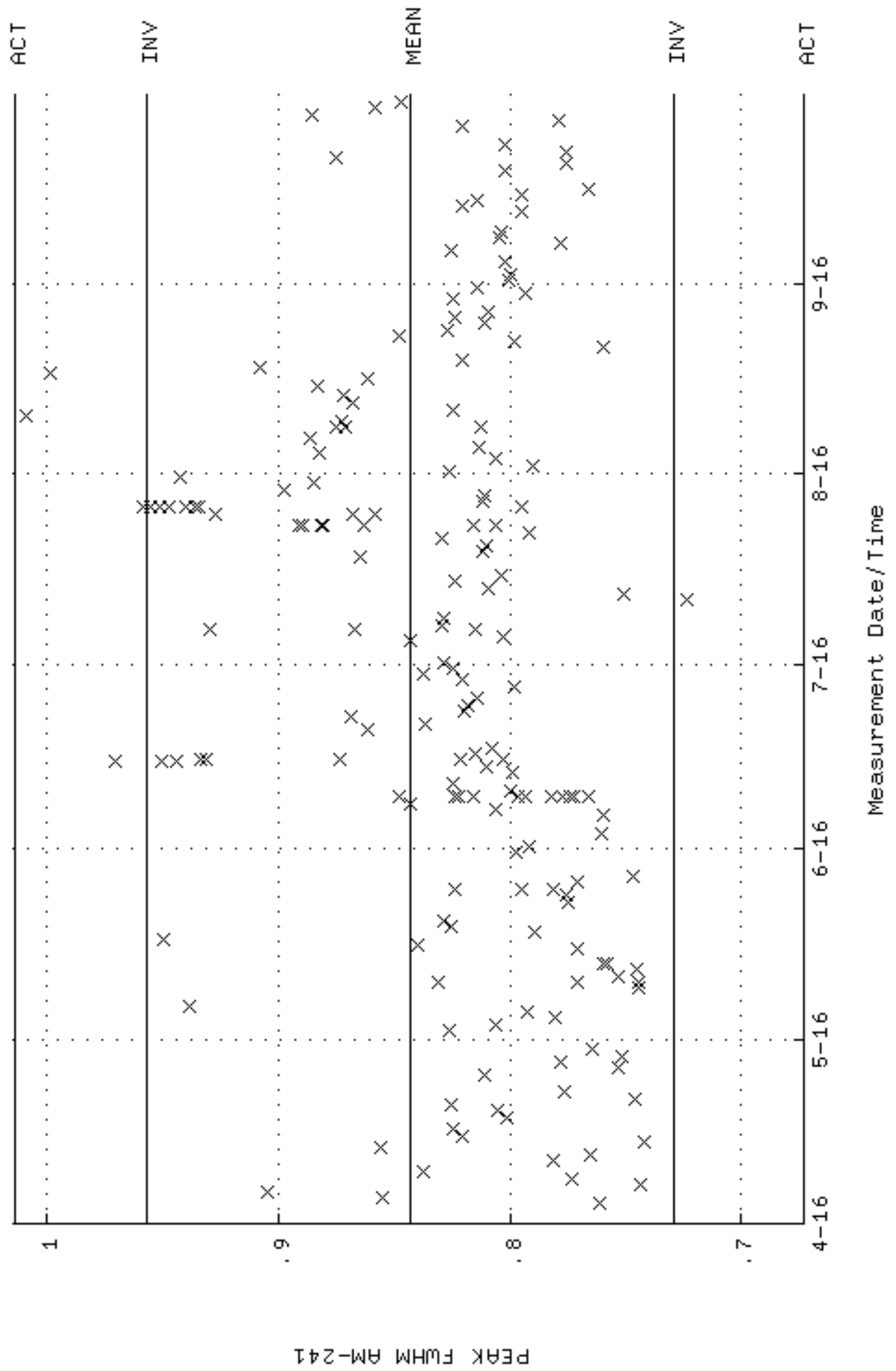
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]LBC_GAM08.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:18:12 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.43104 +- 1.778290E-02 (1.24 %)



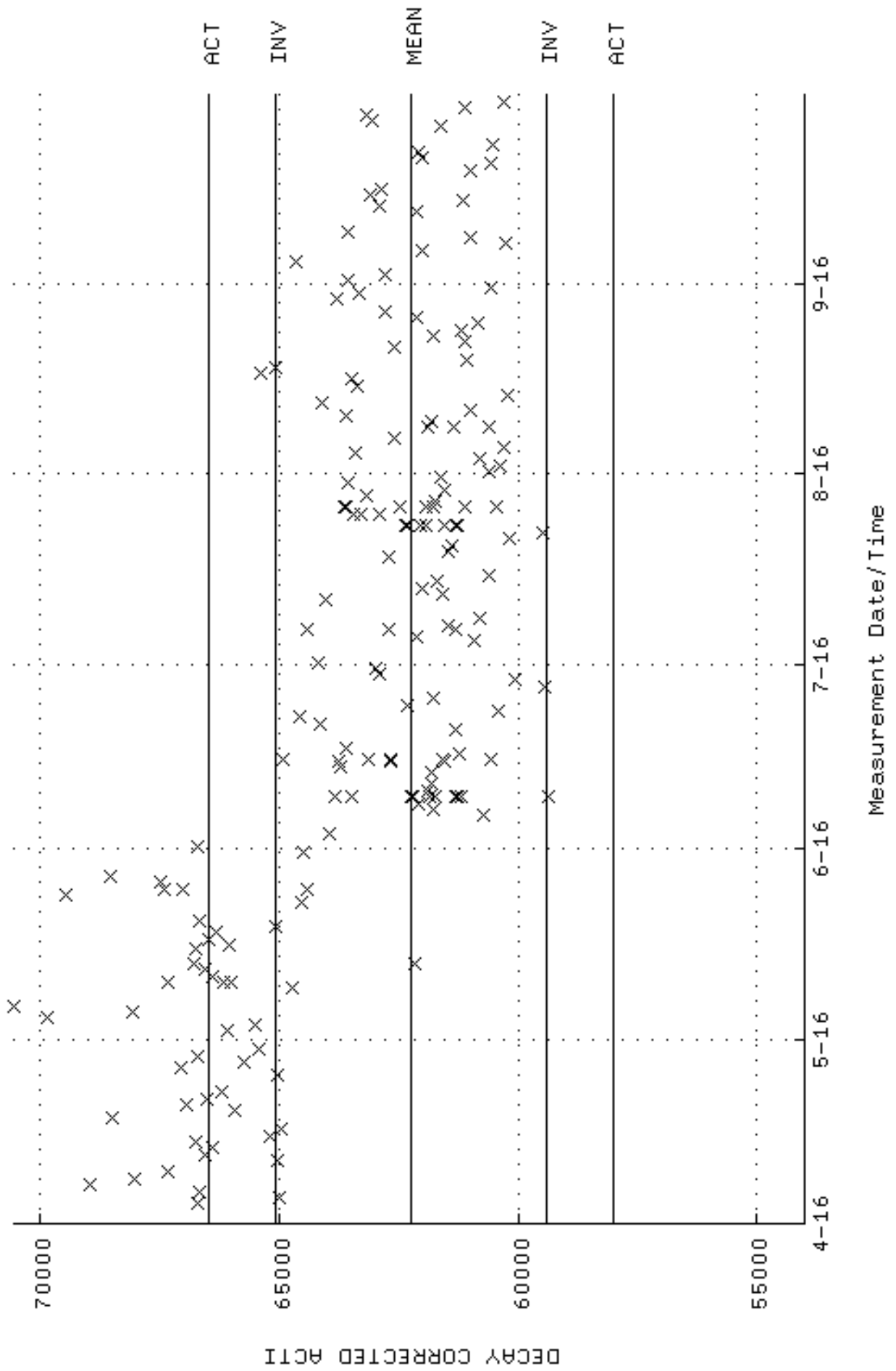
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Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:24:11 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5000 through 61.5000



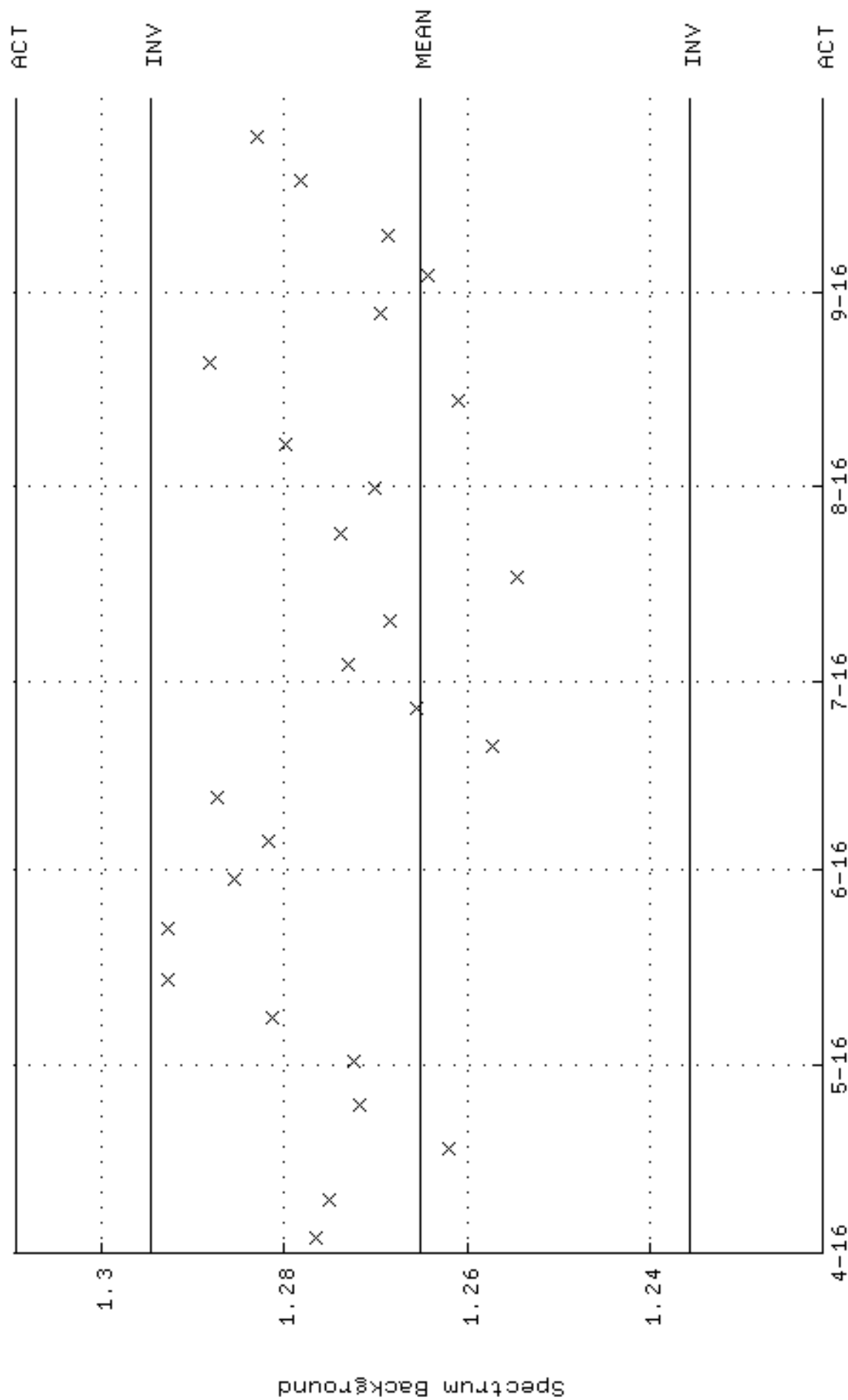
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 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
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 Mean +- Std Dev : 0.843482 +- 5.677858E-02 (6.73 %)



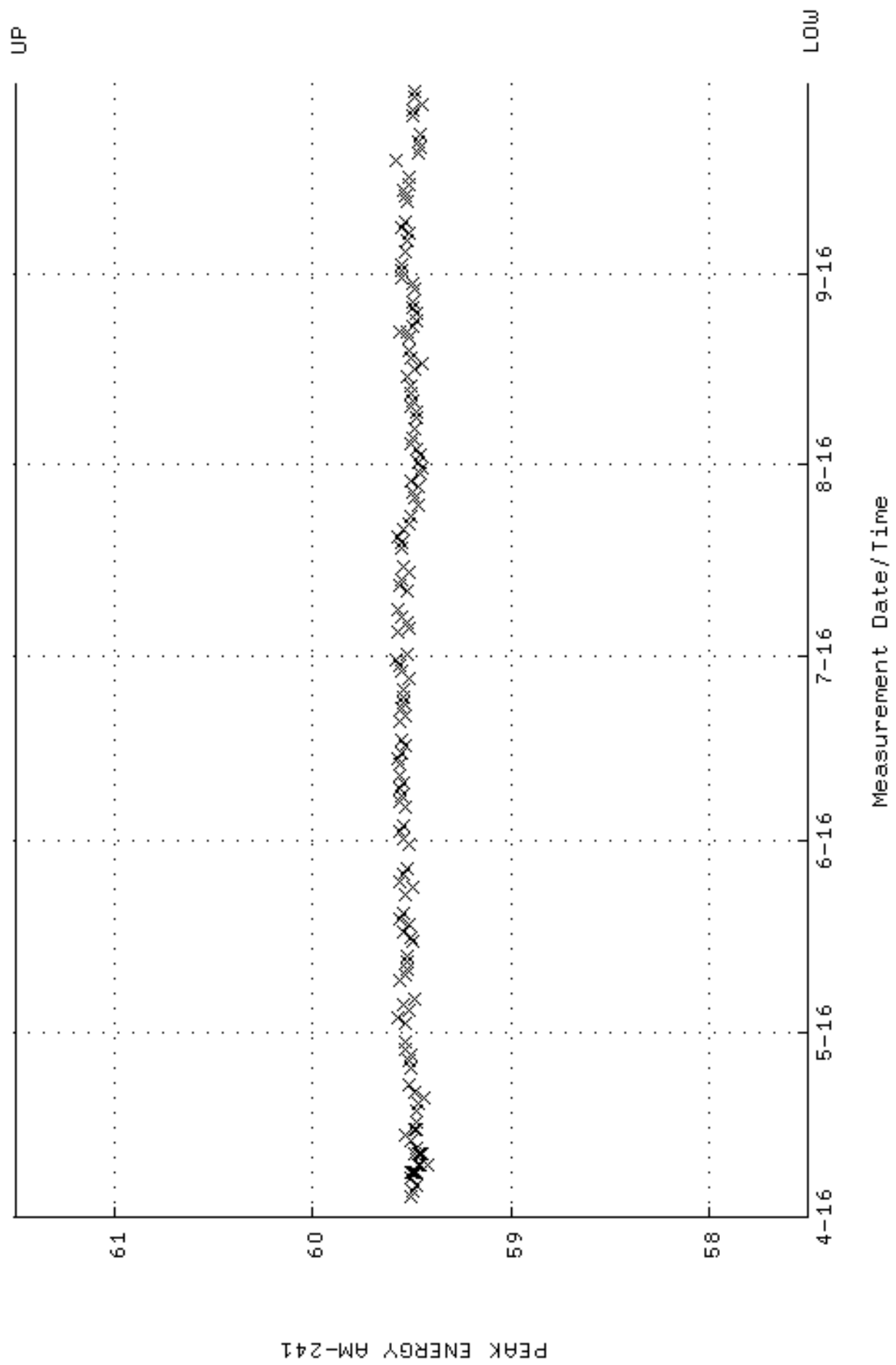
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 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:24:11 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 62249.4 +- 1409.24 (2.26 %)



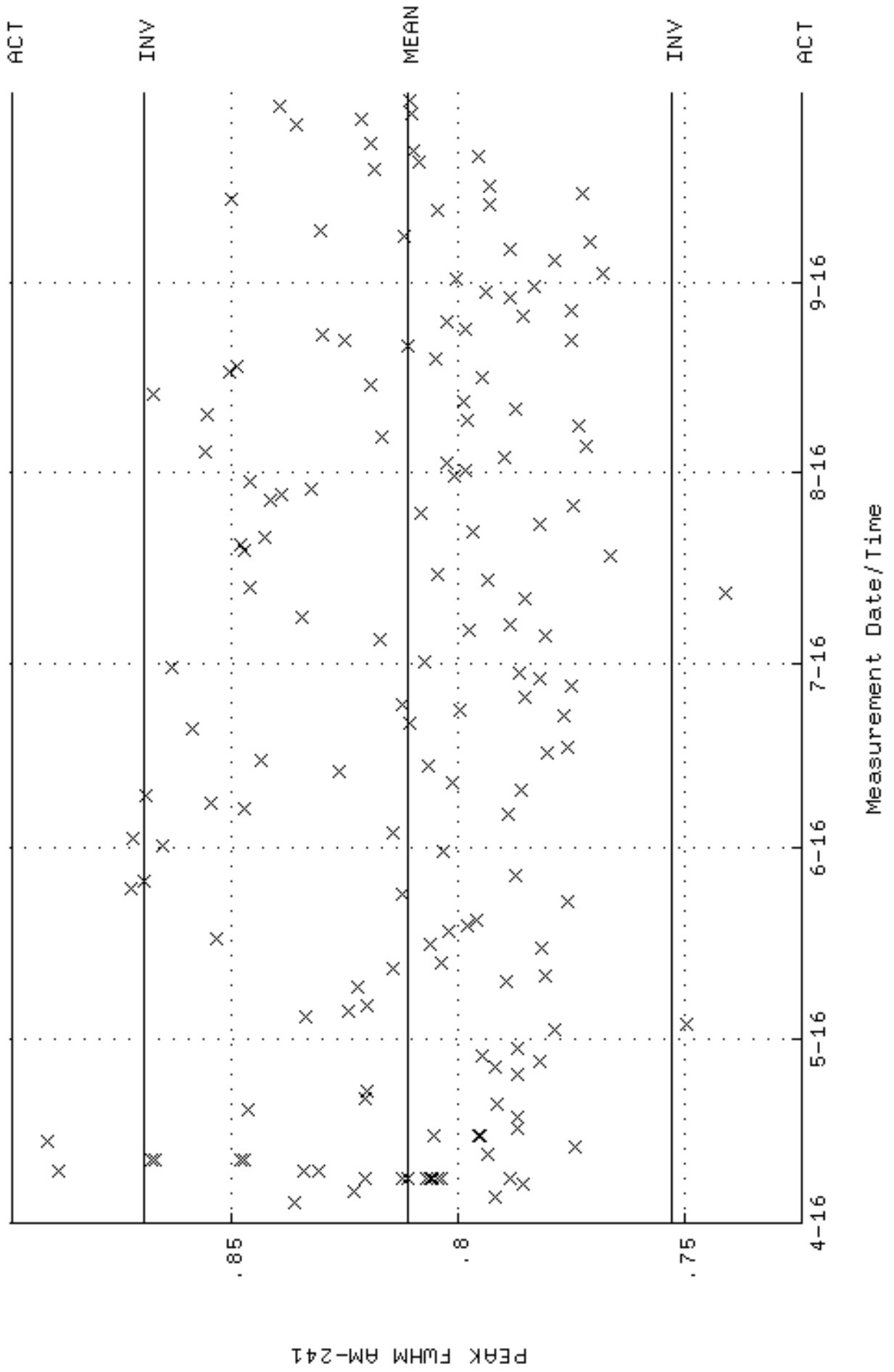
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 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:18:18 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.26523 +- 1.466291E-02 (1.16 %)



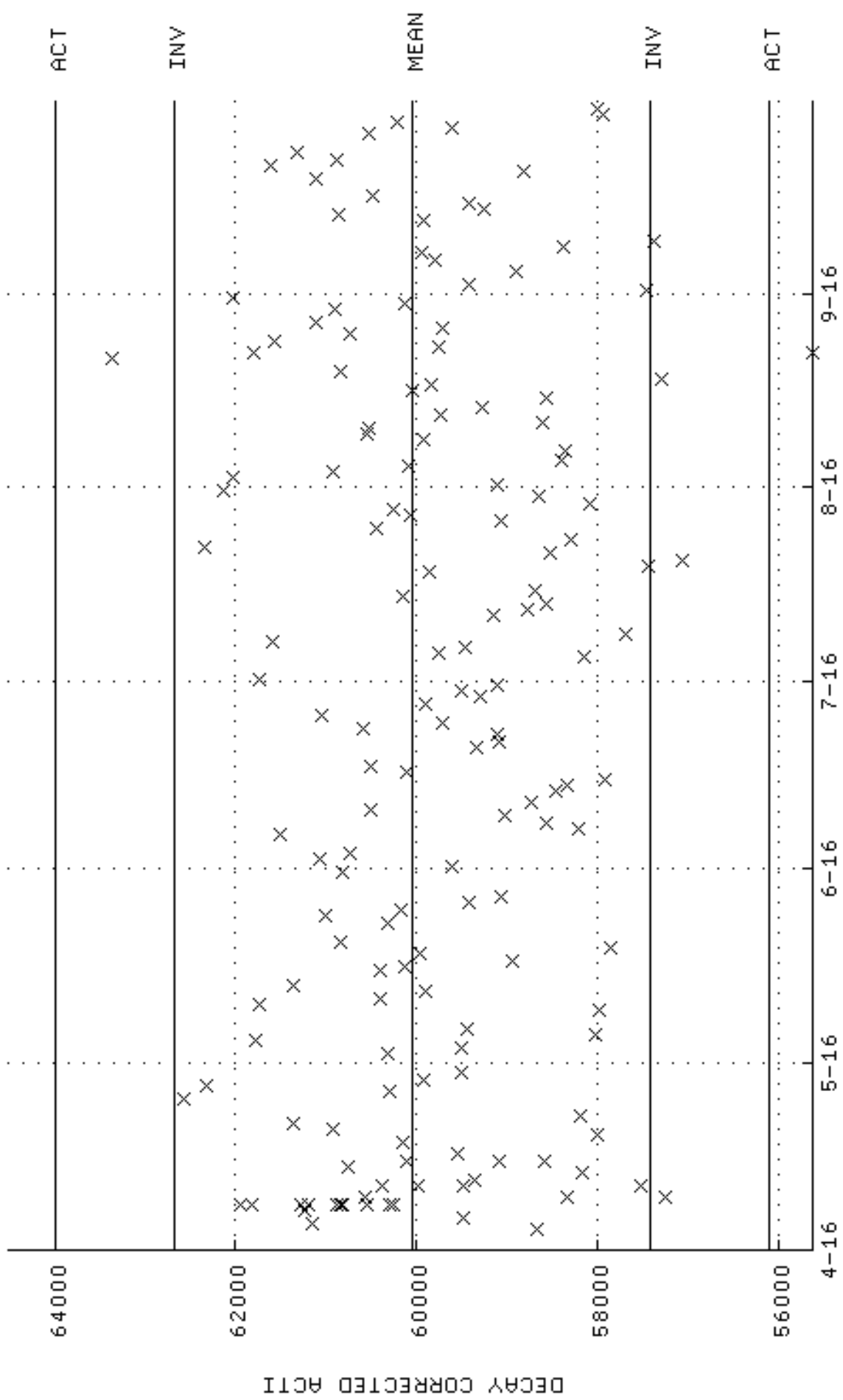
QA filename : DKA100:[CANSBERRA.GAMMA.SCUSR.QA]QCC_GAM11_JAR.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:24:16 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5000 through 61.5000



QA filename : DKA100:[CANTERRA,GAMMA,SCUSR,QA]QCC_GAM11_JAR.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:24:16 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 0.811280 +- 2.896658E-02 (3.57 %)

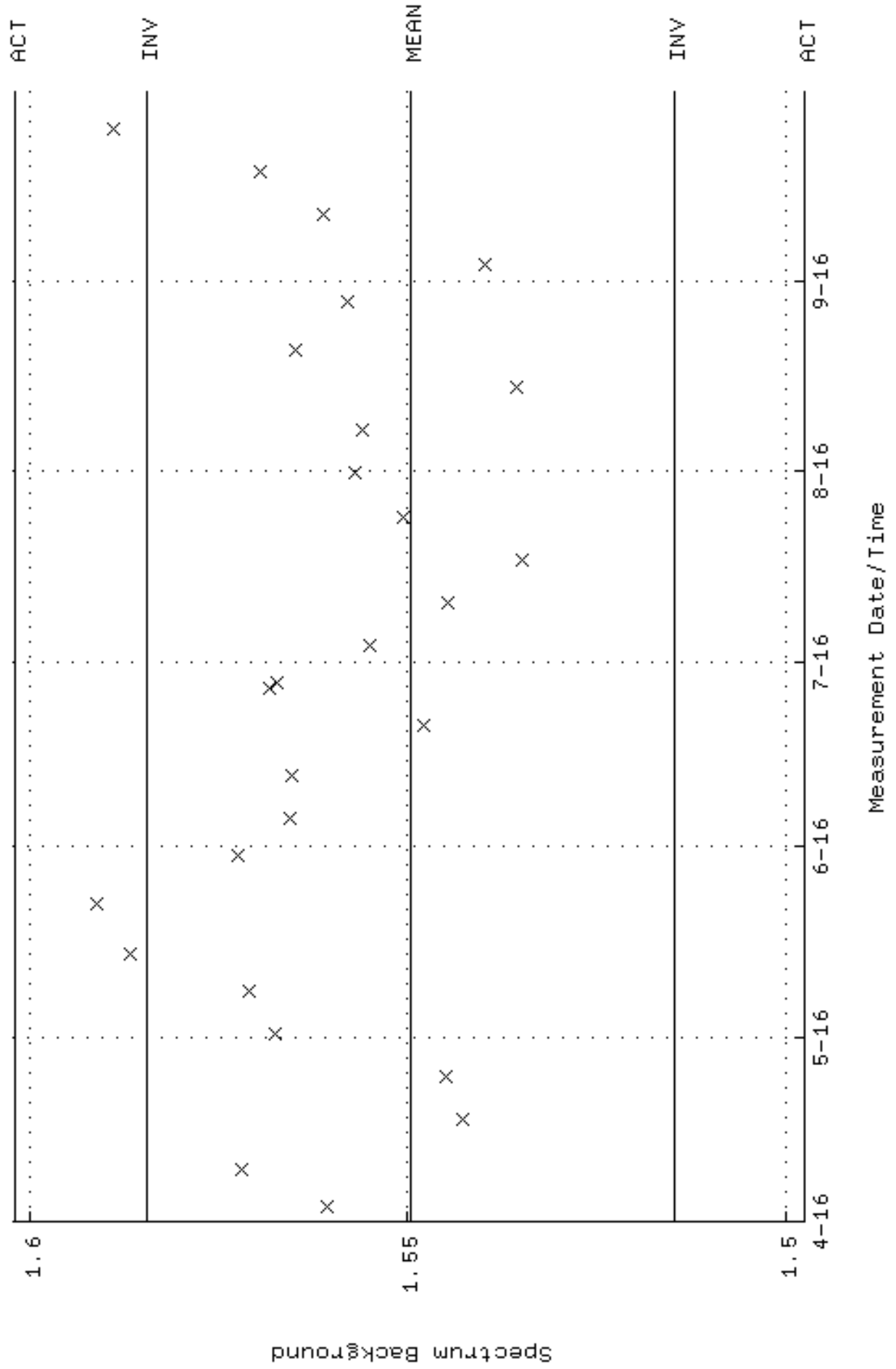


QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM11_JAR.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:24:16 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 60054.4 +- 1312.98 (2.19 %)

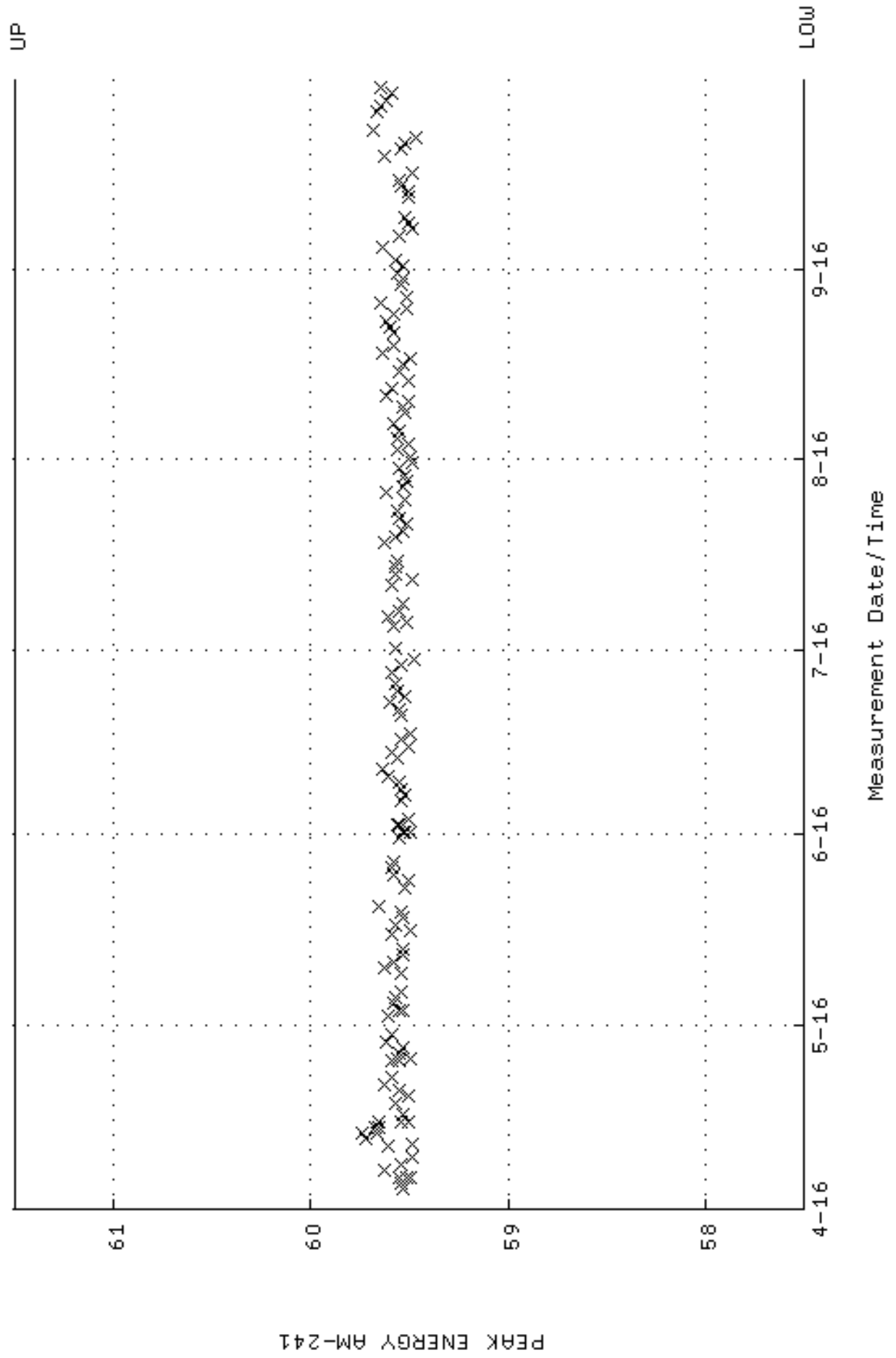


Measurement Date/Time

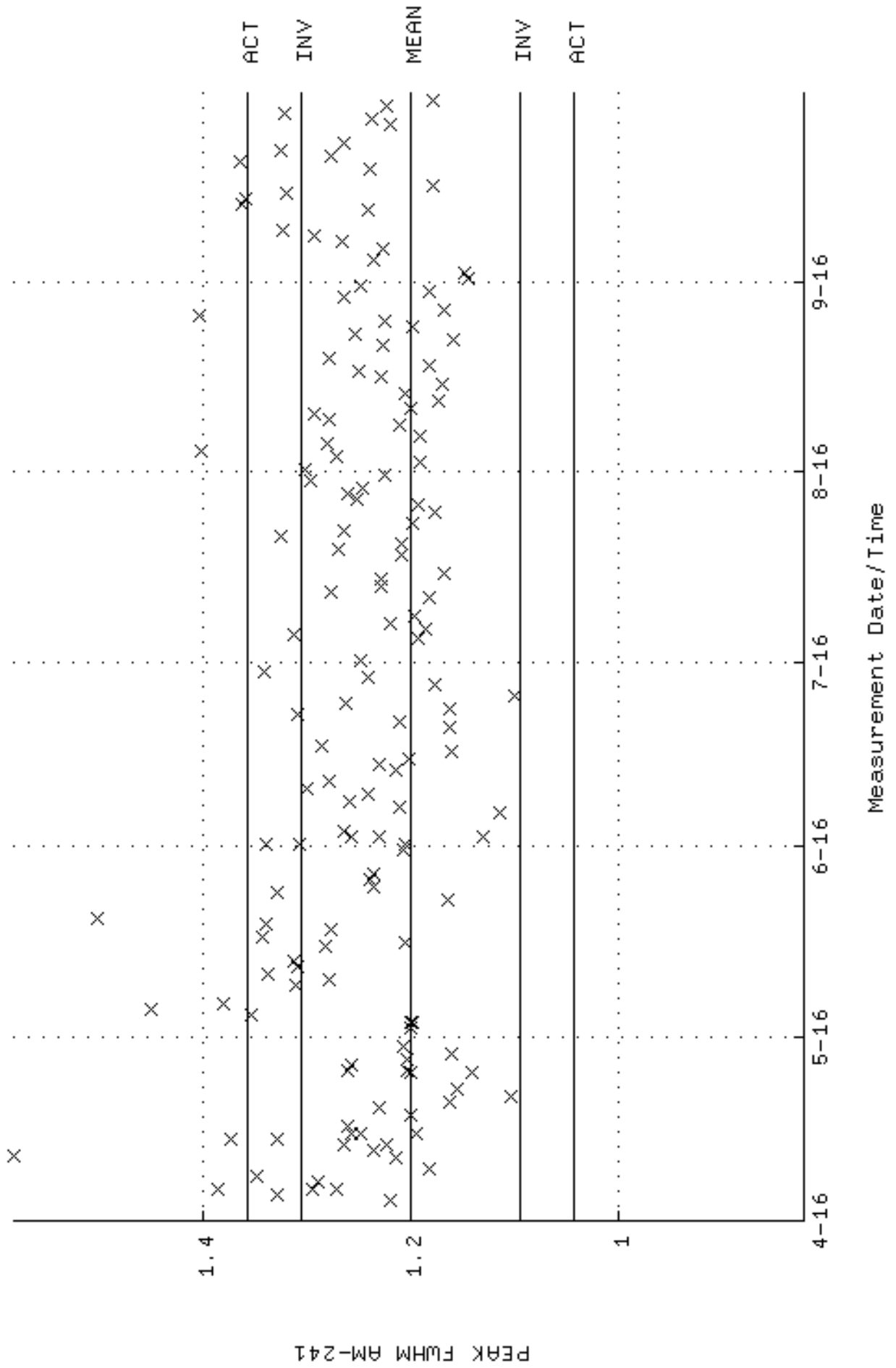
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]LBC_GAM11.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:18:24 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.54973 +- 1.740346E-02 (1.12 %)



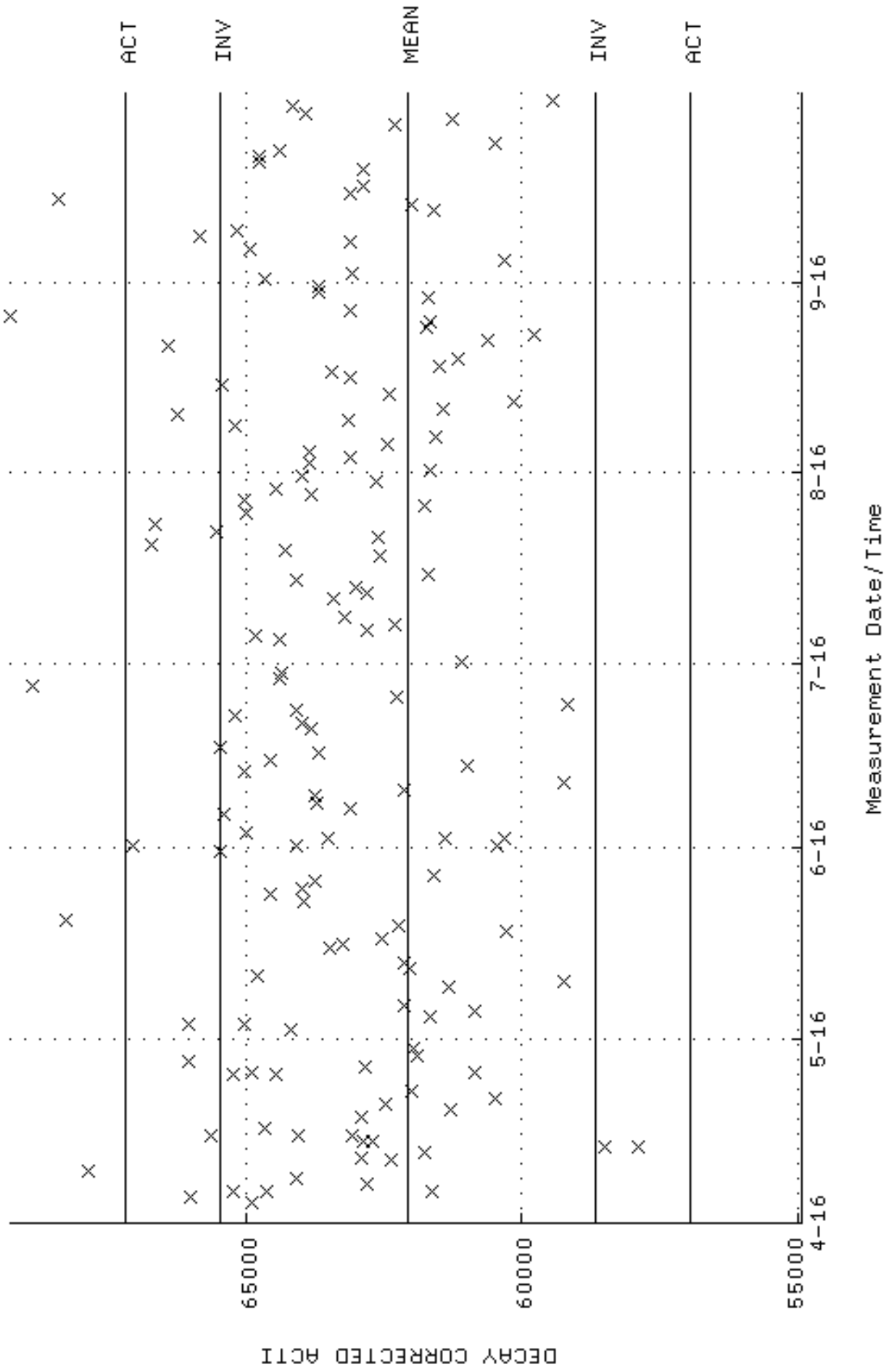
QA filename : DKA100:[CANNBERRA,GAMMA,SCUSR,QA]QCC_GAM12_CAN.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:13:35 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5000 through 61.5000



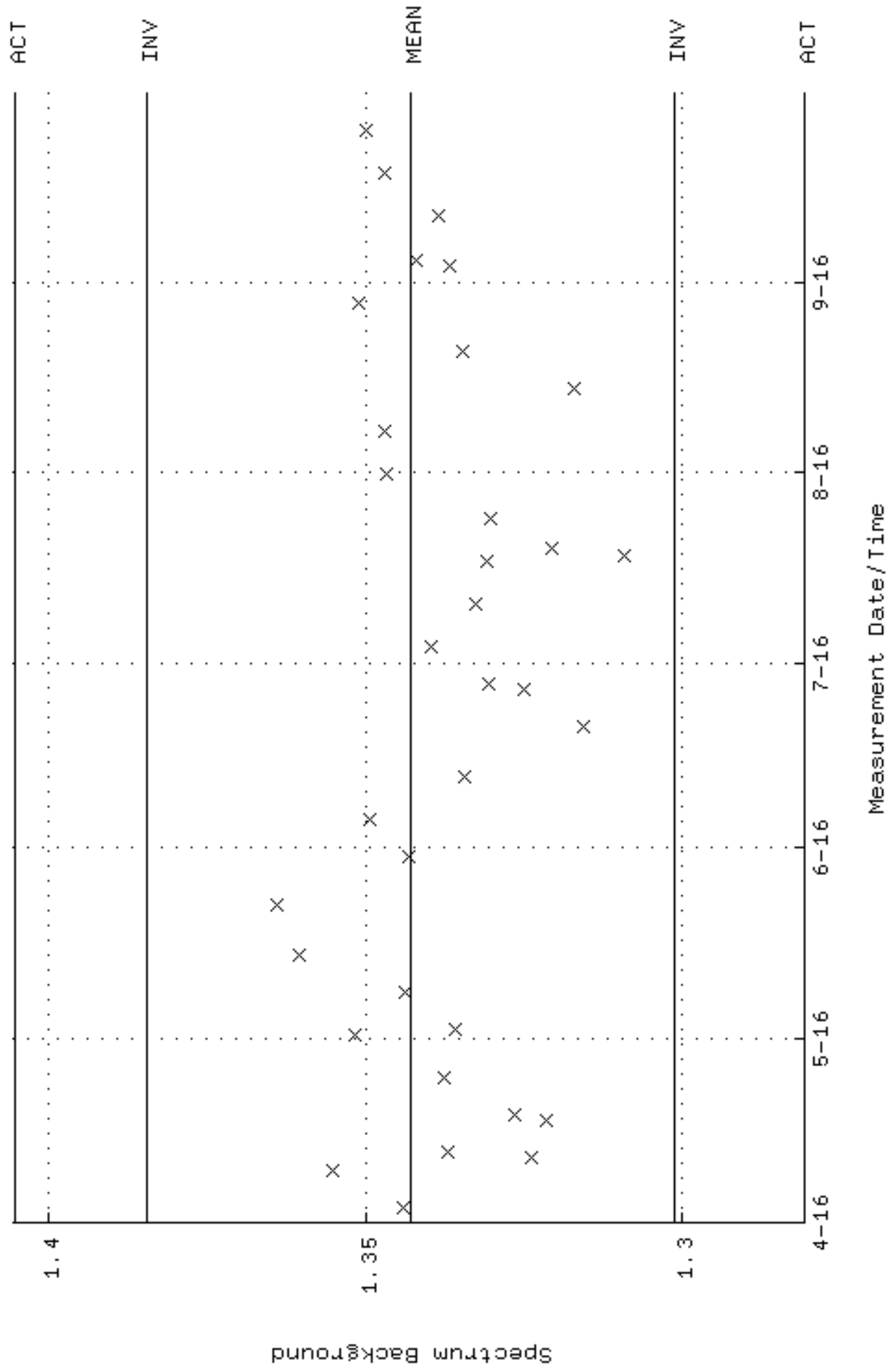
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]QCC_GAM12_CAN.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:13:35 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.20109 +- 5.234504E-02 (4.36 %)



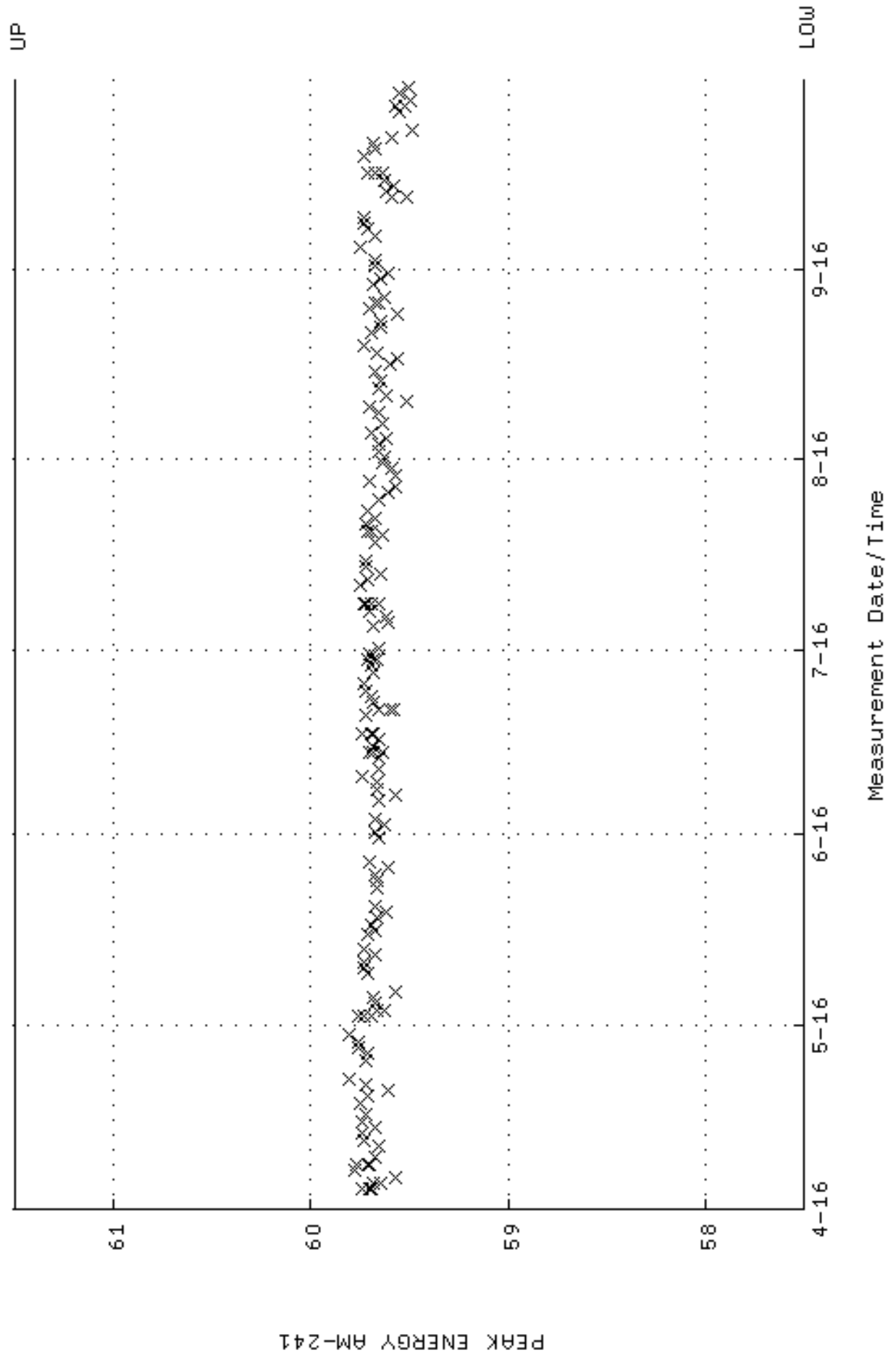
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM12_CAN.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:13:35 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 62074.4 +- 1703.29 (2.74 %)



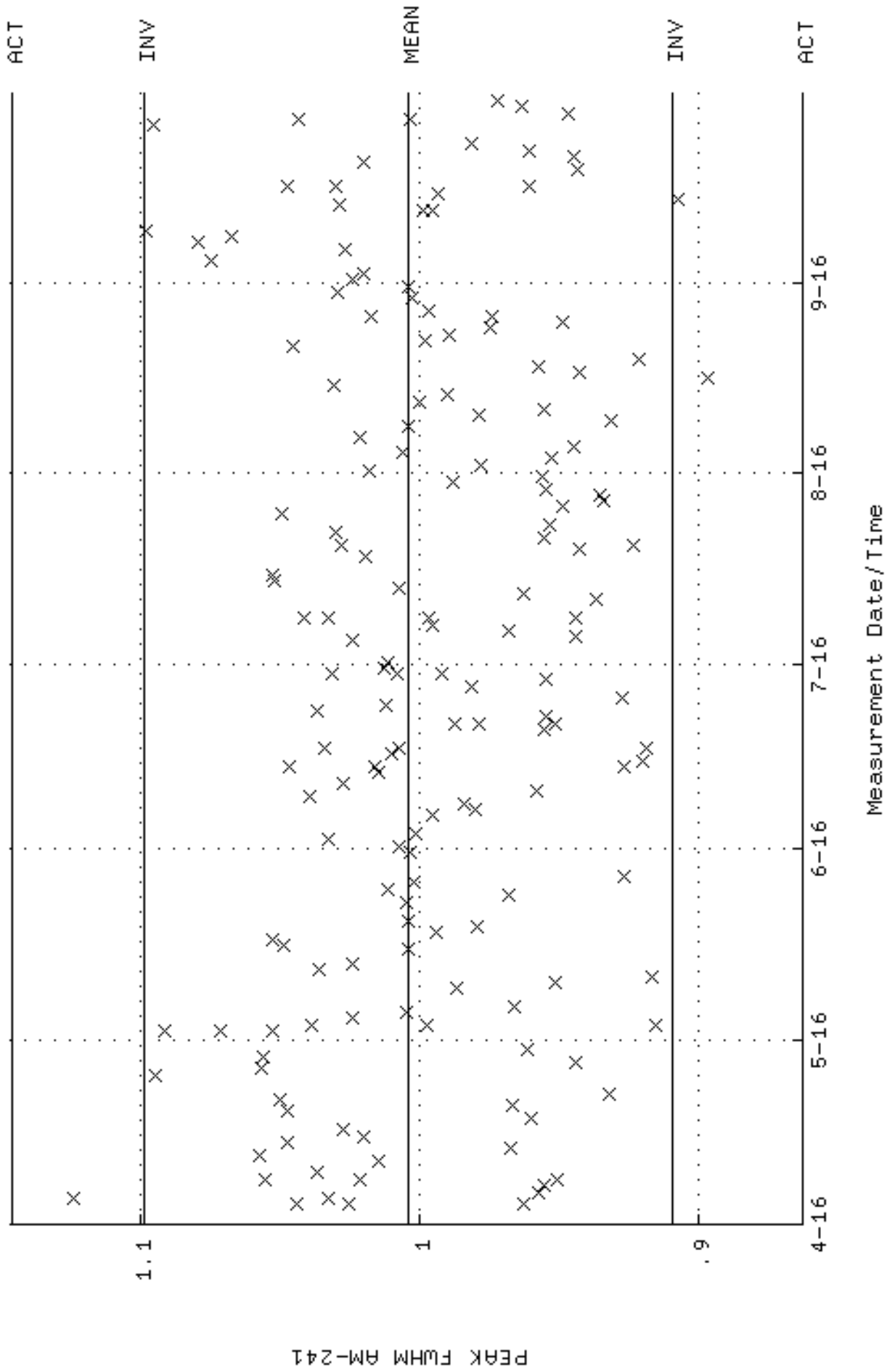
QA filename : DKA100:[CANSBERRA.GAMMA.SCUSR.QA]LBC_GAM12.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:18:29 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.34296 +- 2.081531E-02 (1.55 %)



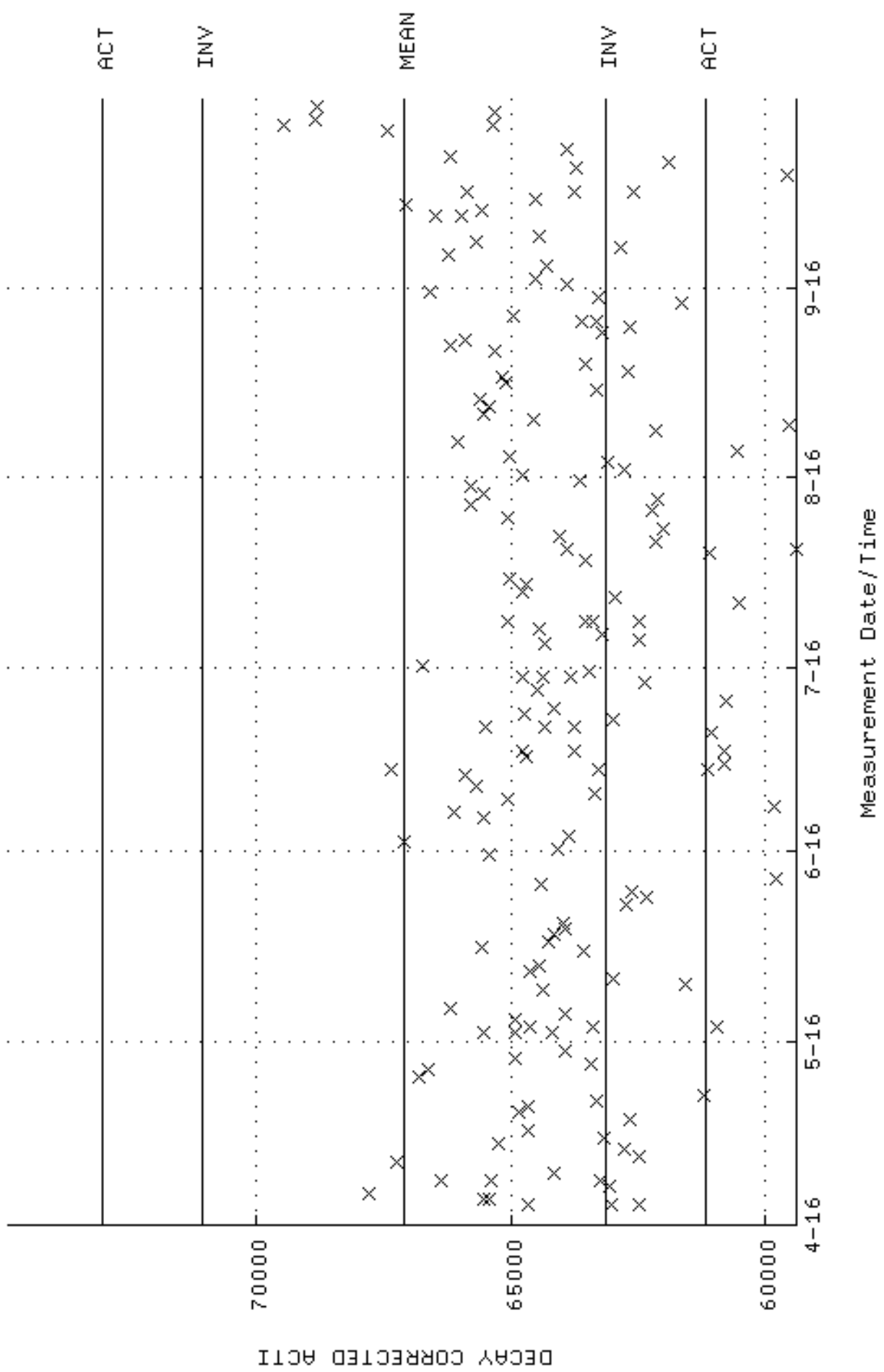
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM16_CAN_QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:24:31 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5000 through 61.5000



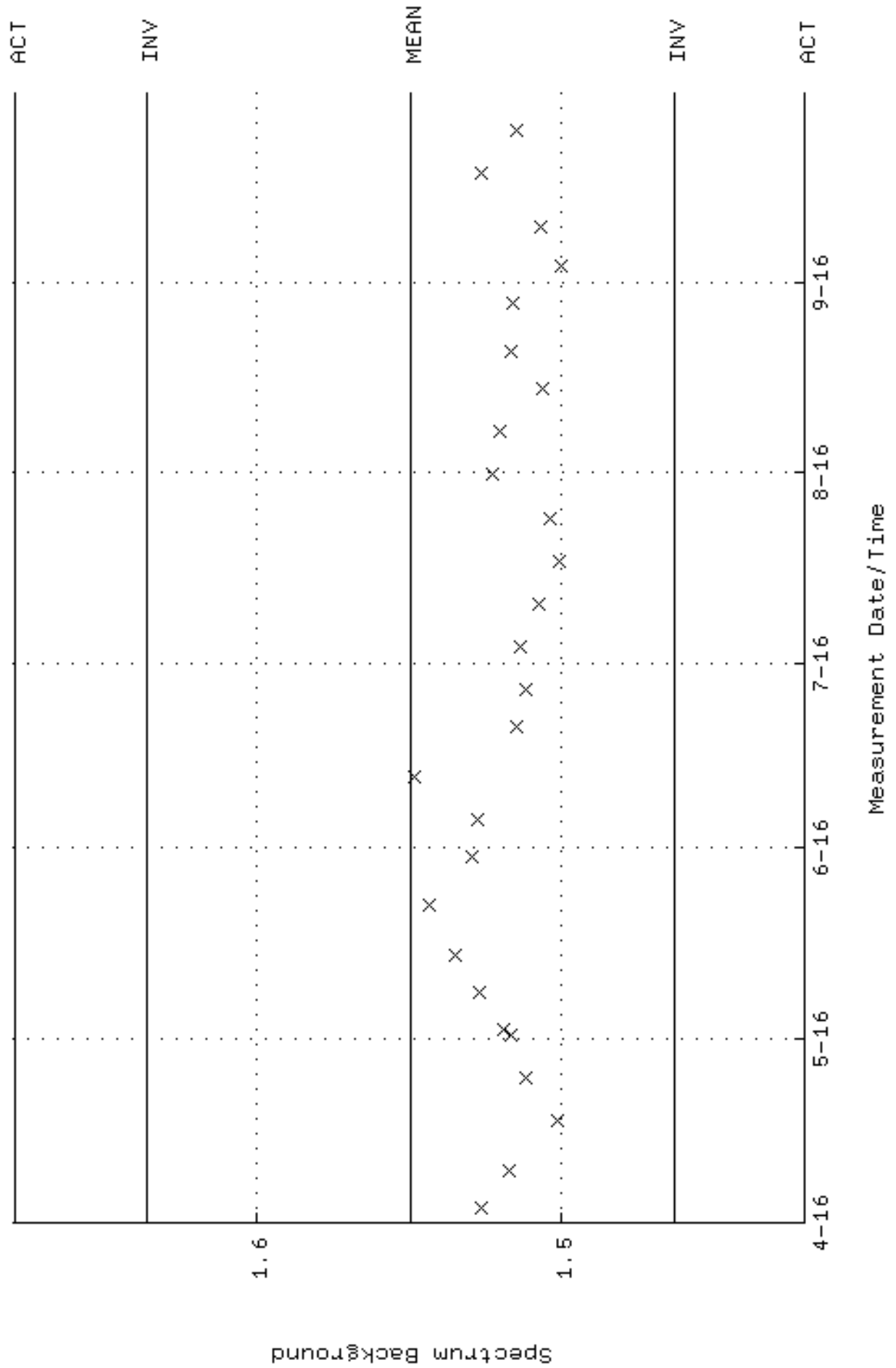
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]QCC_GAM16_CAN.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:24:31 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.00429 +- 4.727185E-02 (4.71 %)



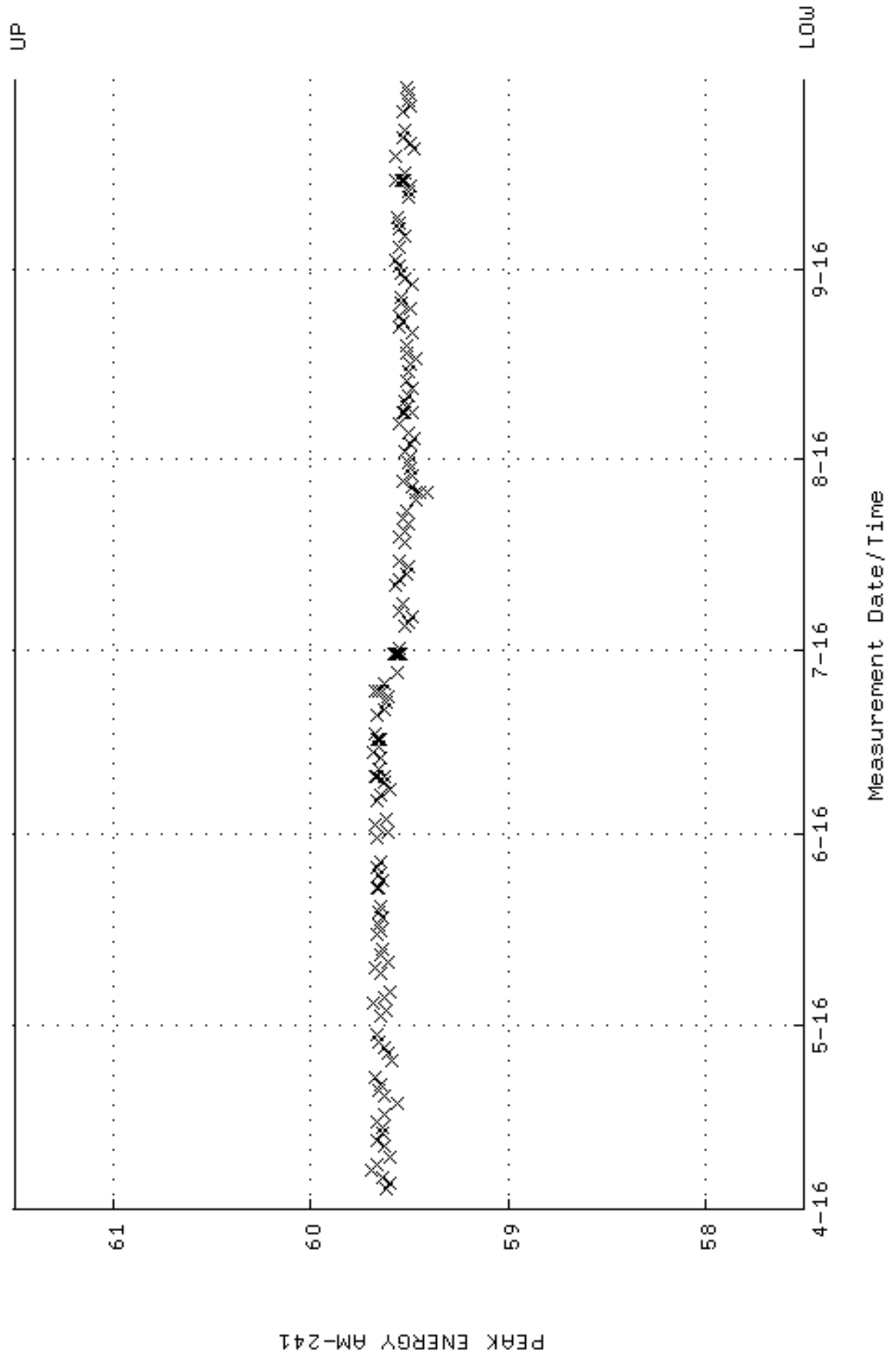
QA filename : DKA100:[CANSBERRA.GAMMA.SCUSR.QA]QCC_GAM16_CAN.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:24:31 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 67102.8 +- 1970.09 (2.94 %)



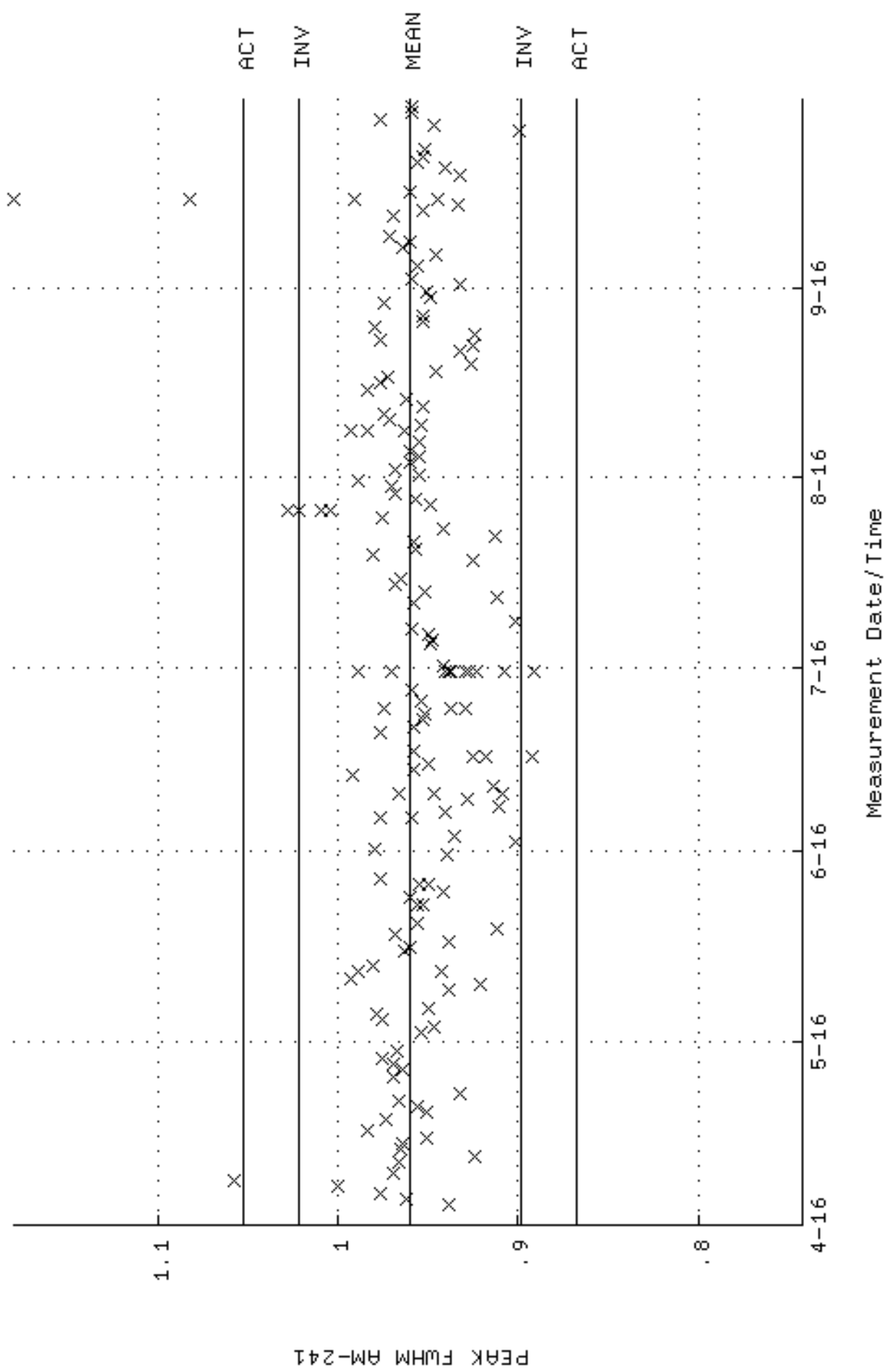
QA filename : DKA100:[CANSBERRA.GAMMA.SCUSR.QA]LBC_GAM16.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:18:45 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.54986 +- 4.312605E-02 (2.78 %)



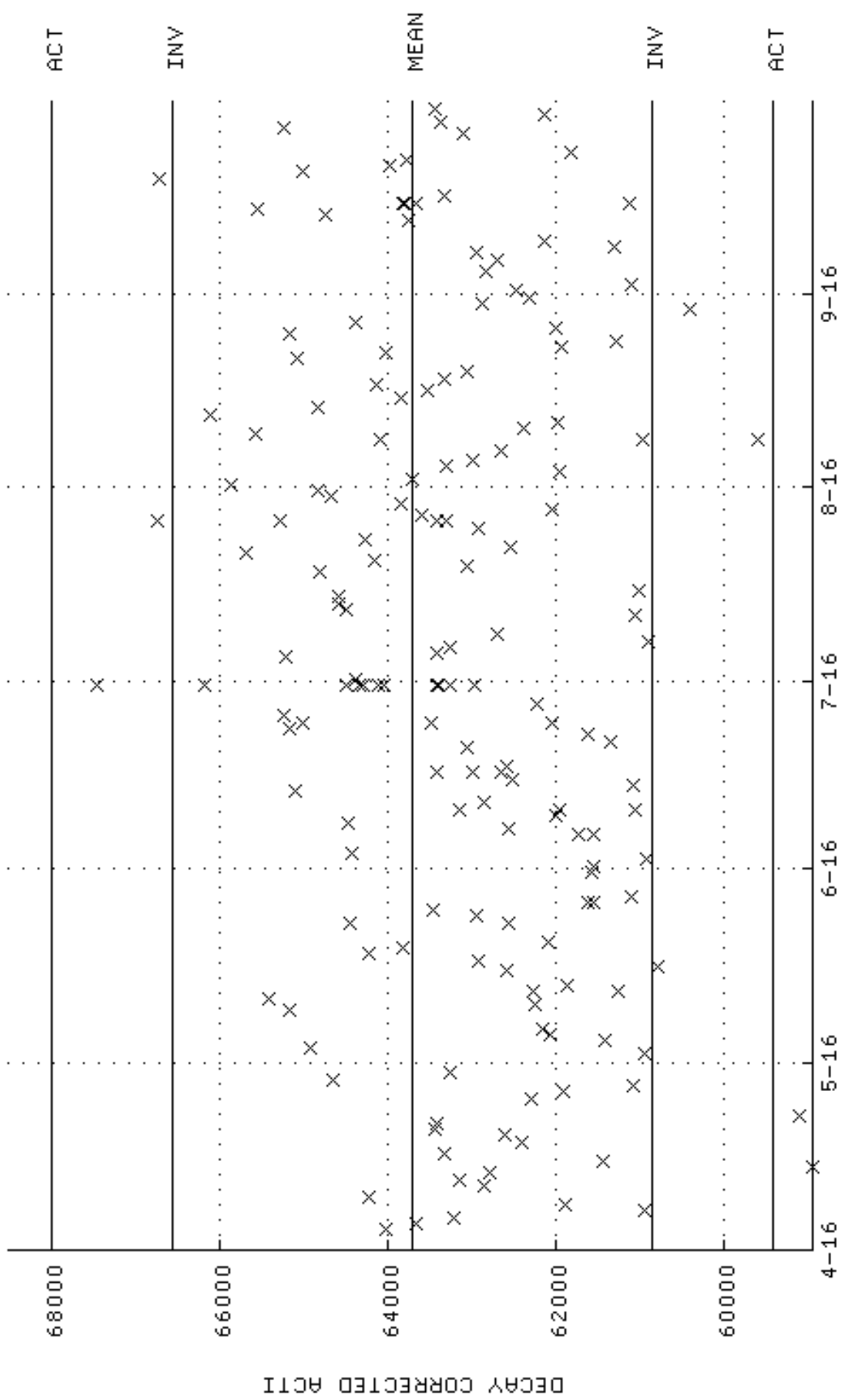
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM18_CAN_QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:13:40 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5000 through 61.5000



QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]QCC_GAM18_CAN_QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:13:40 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 0.960465 +- 3.090899E-02 (3.22 %)

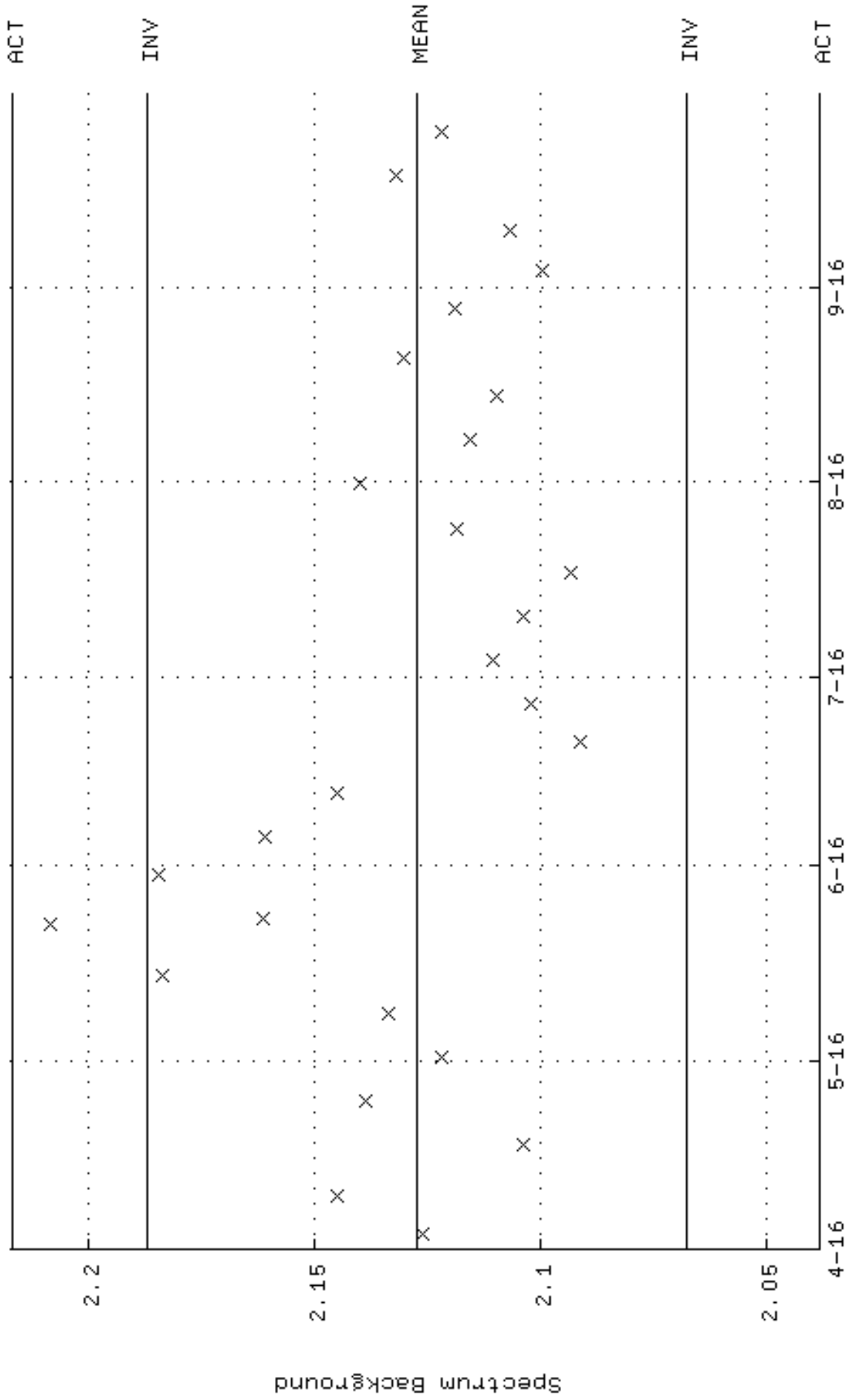


QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM18_CAN_QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:13:40 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 63719.3 +- 1431.59 (2.25 %)

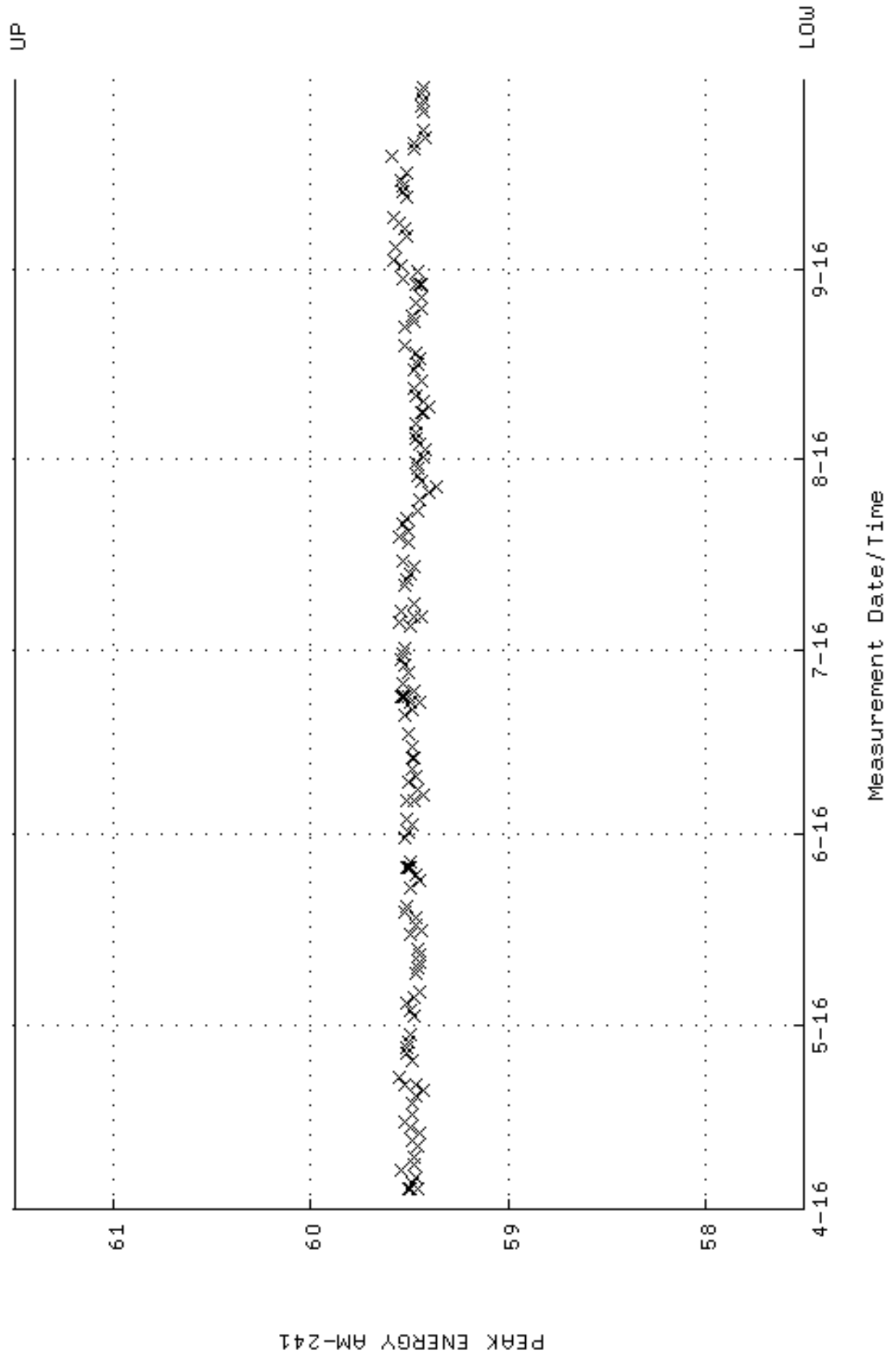


Measurement Date/Time

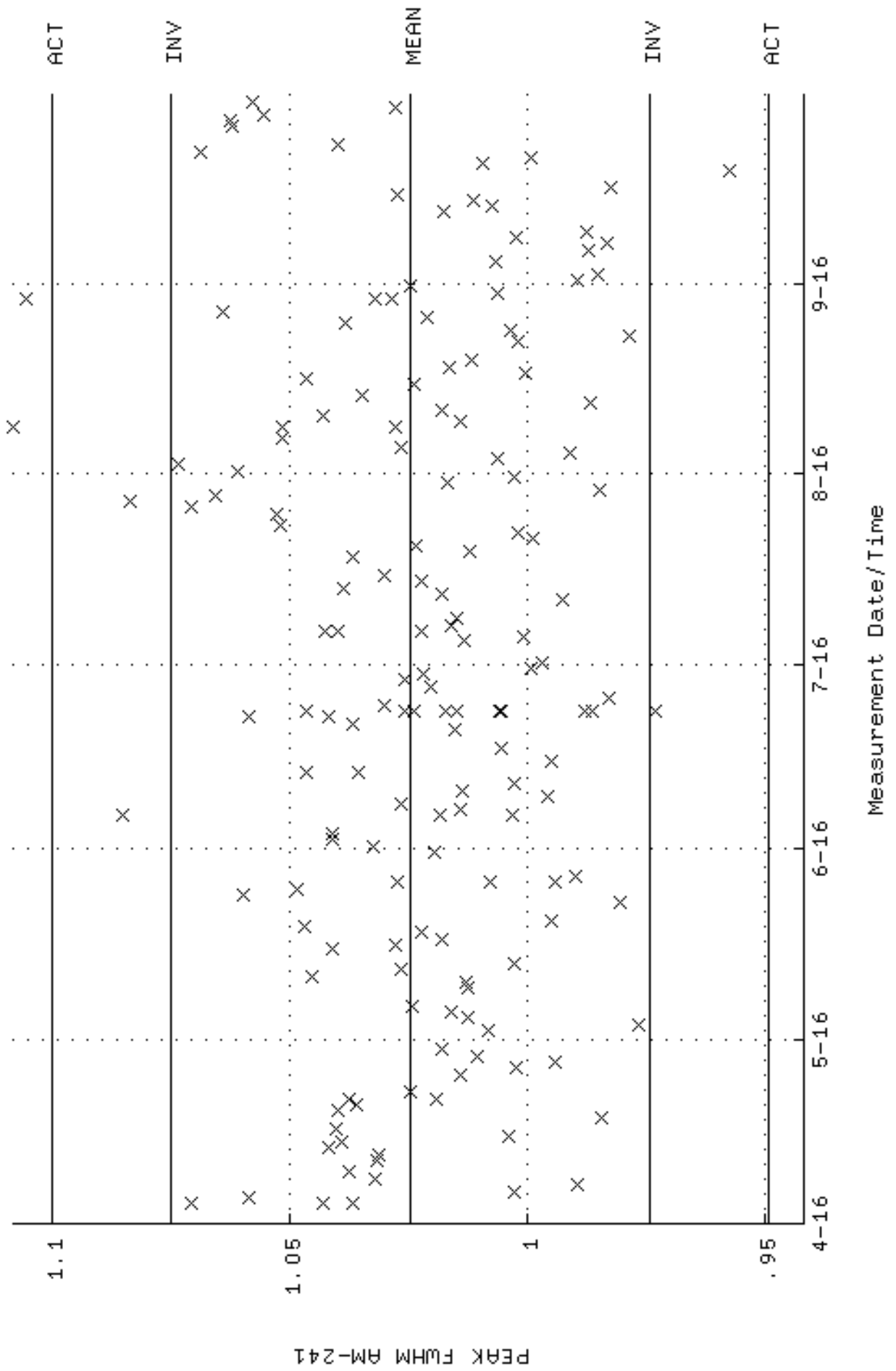
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]LBC_GAM18.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:18:51 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 2.12760 +- 2.980382E-02 (1.40 %)



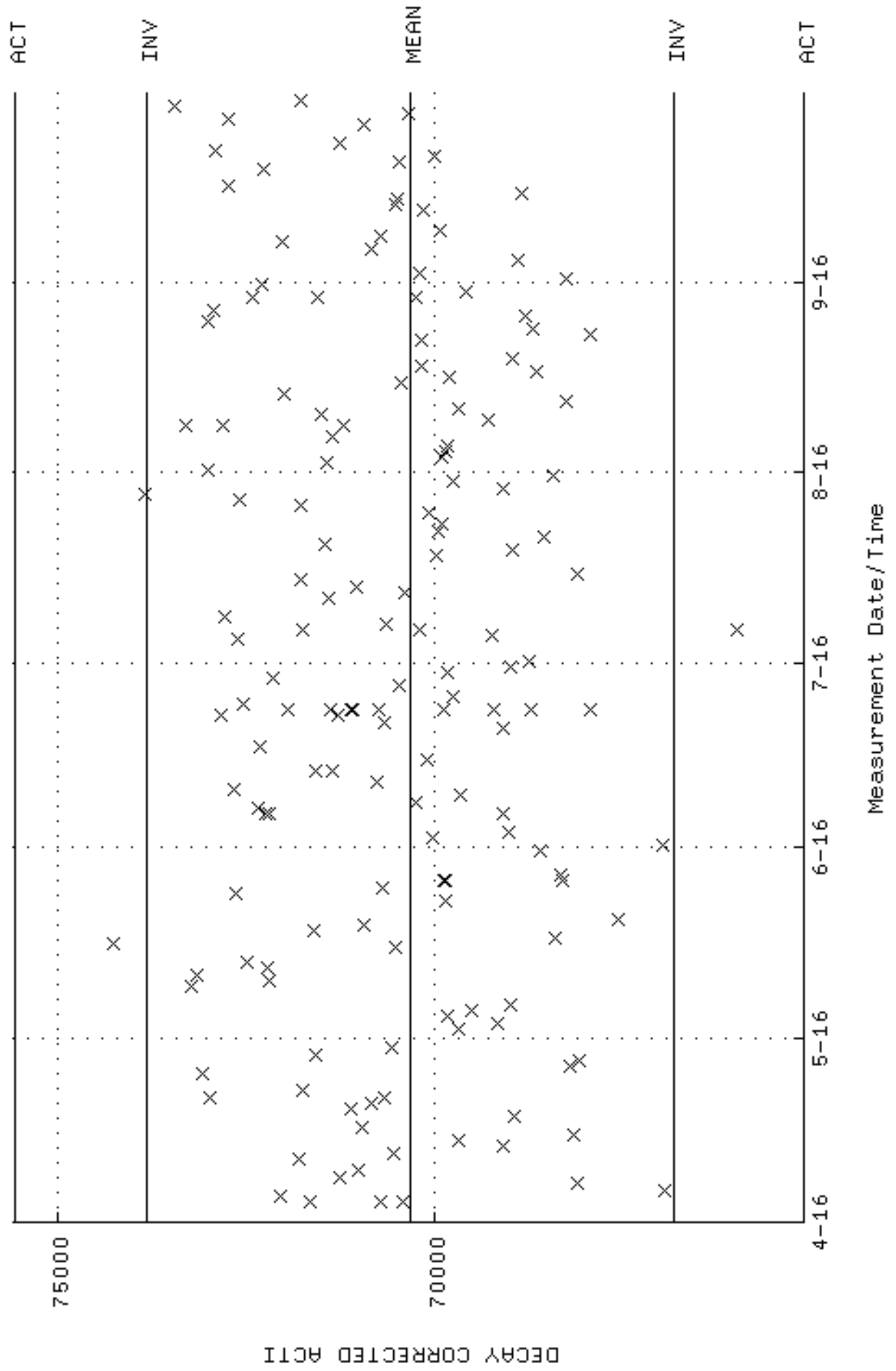
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM19_CAN_QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:54:25 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5000 through 61.5000



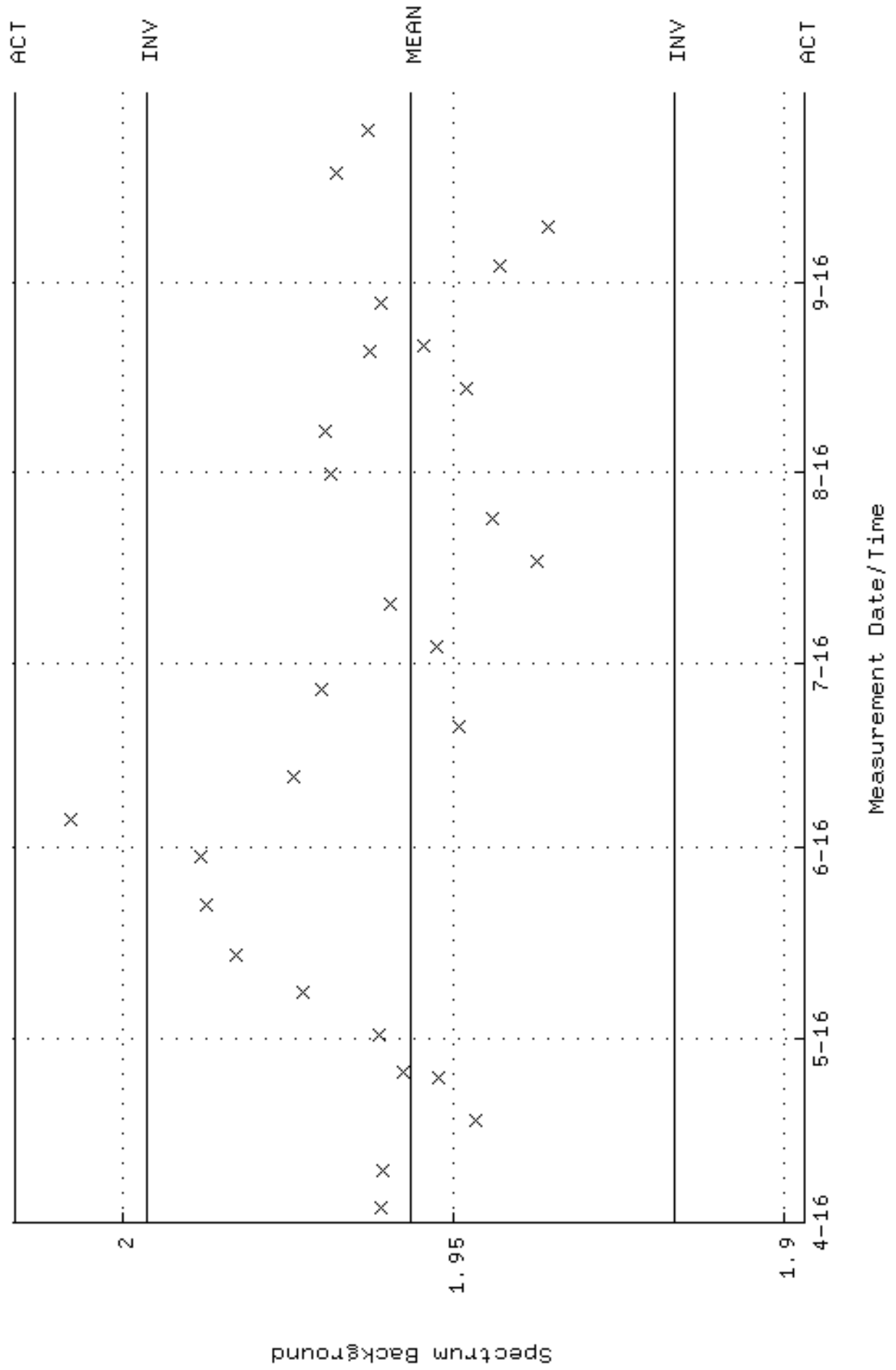
QA filename : DKA100:[CANTERRA,GAMMA,SCUSR,QA]QCC_GAM19_CAN.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:54:25 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.02481 +- 2.522724E-02 (2.46 %)



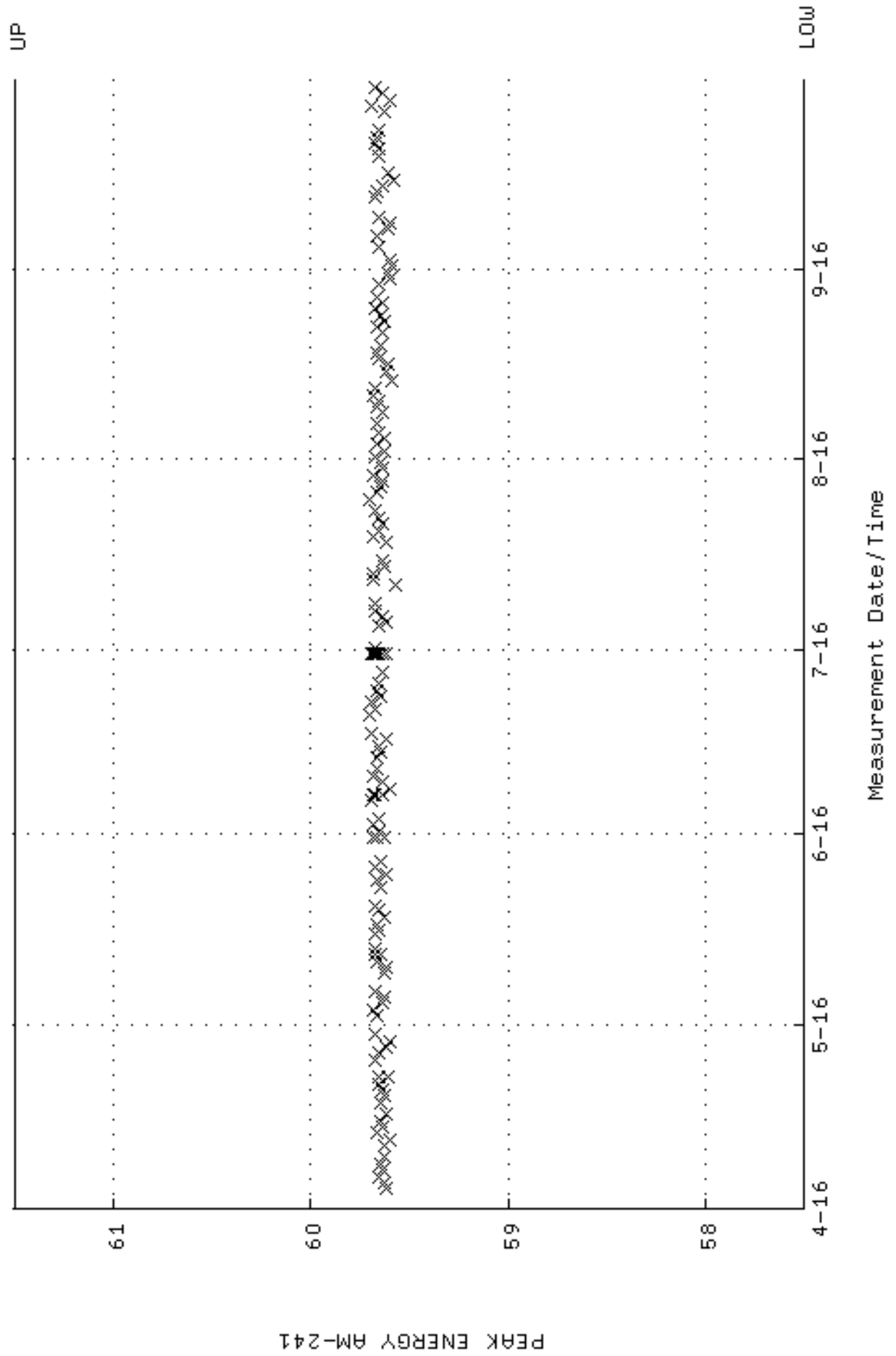
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]QCC_GAM19_CAN.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:54:25 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 70341.0 +- 1743.47 (2.48 %)



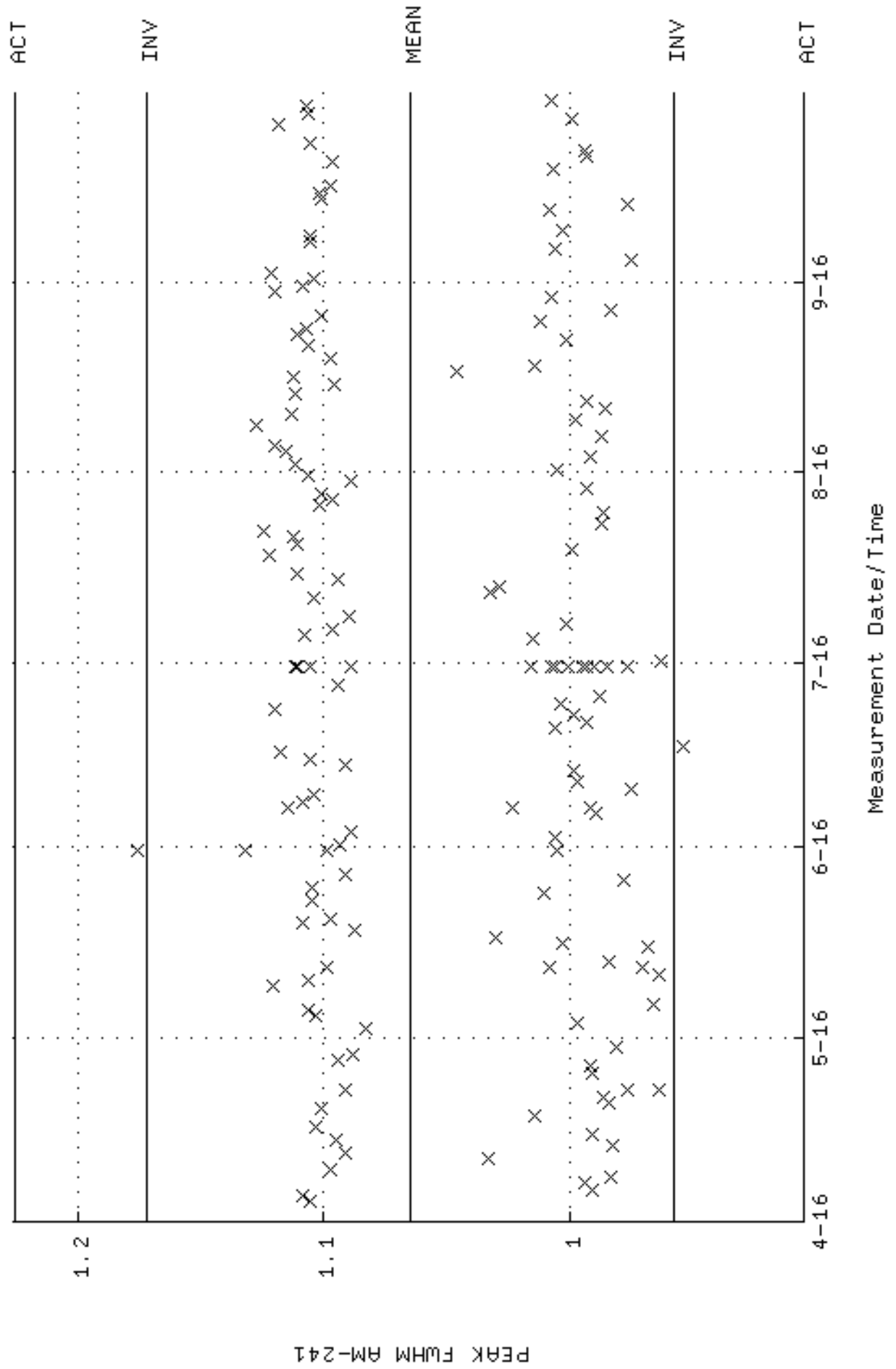
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]LBC_GAM19.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:18:56 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.95658 +- 1.990679E-02 (1.02 %)



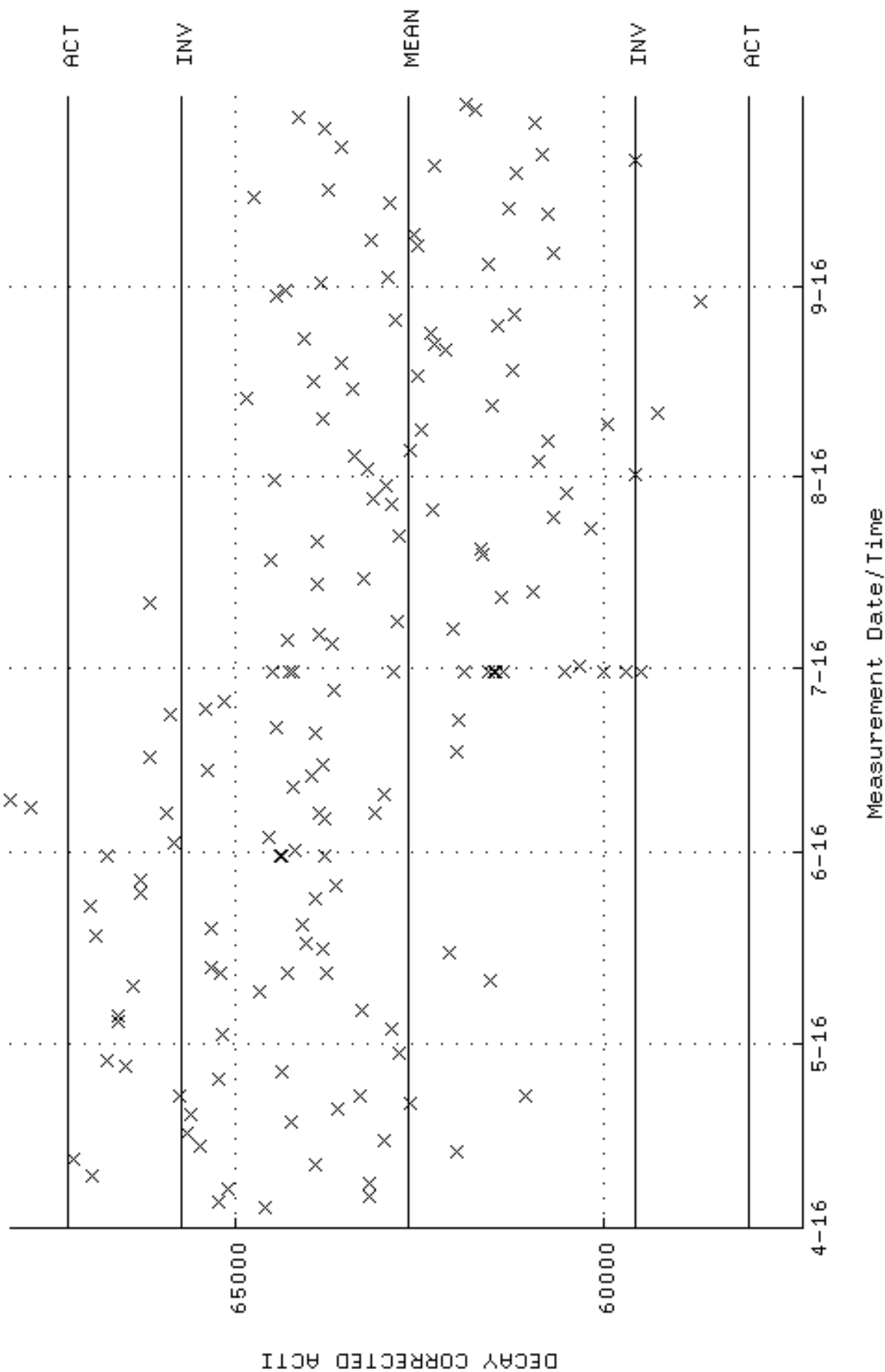
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM20_500MLMB.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:24:37 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5000 through 61.5000



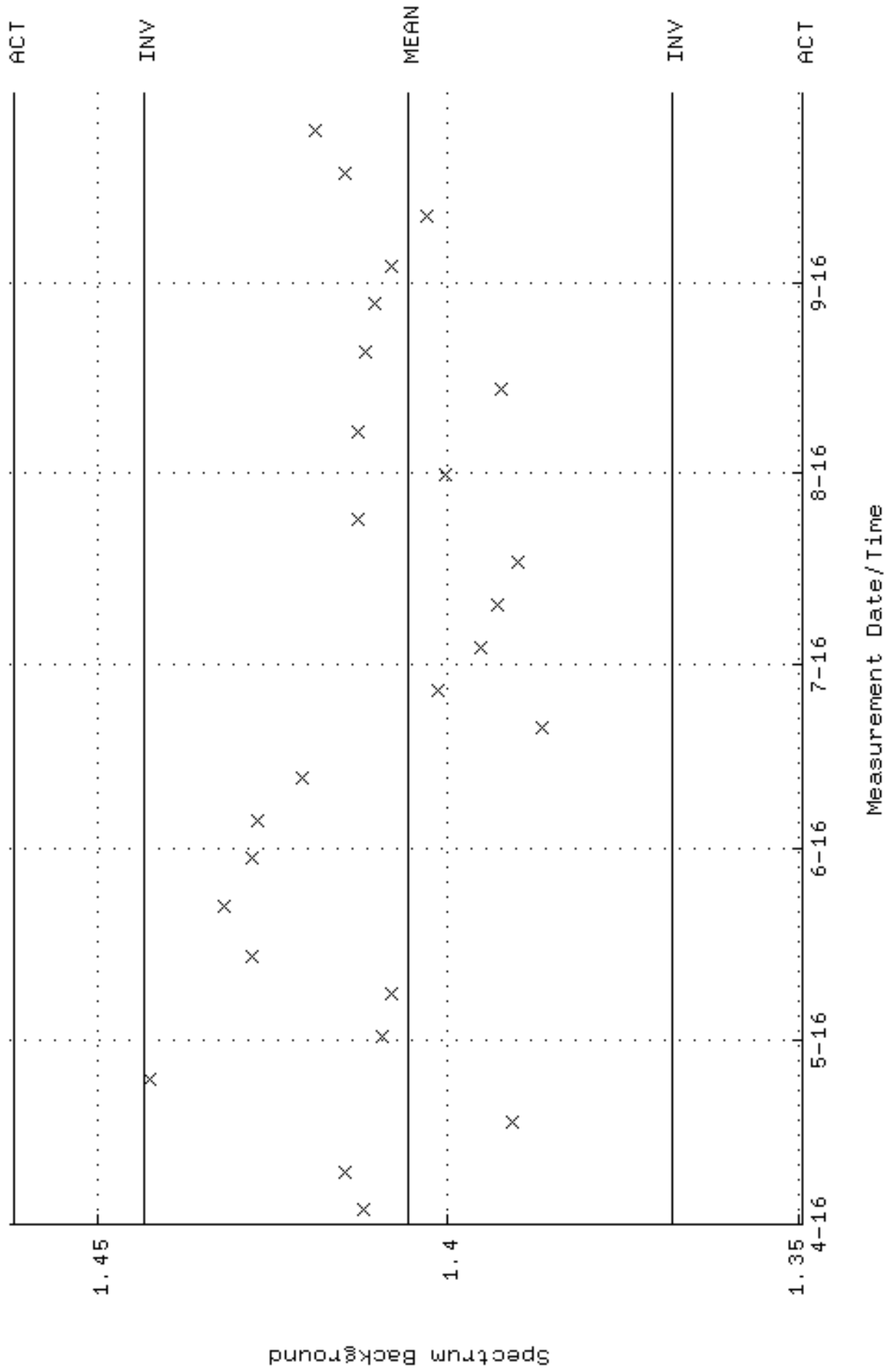
QA filename : DKA100:[CANTERRA,GAMMA,SCUSR,QA]QCC_GAM20_500MLMB.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:24:37 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.06508 +- 5.344863E-02 (5.02 %)



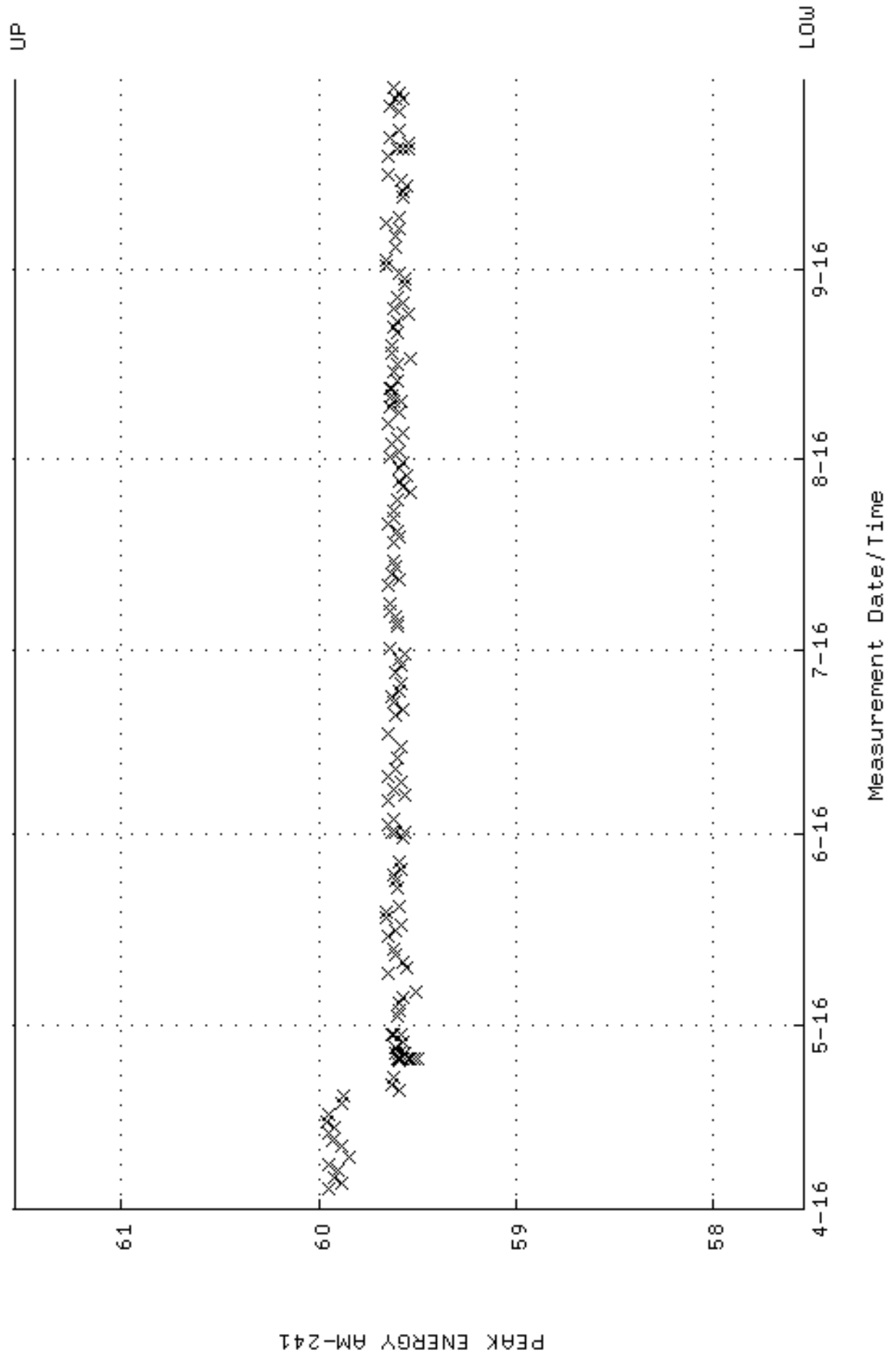
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]QCC_GAM20_500MLMB.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:24:37 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 62671.1 +- 1539.86 (2.46 %)



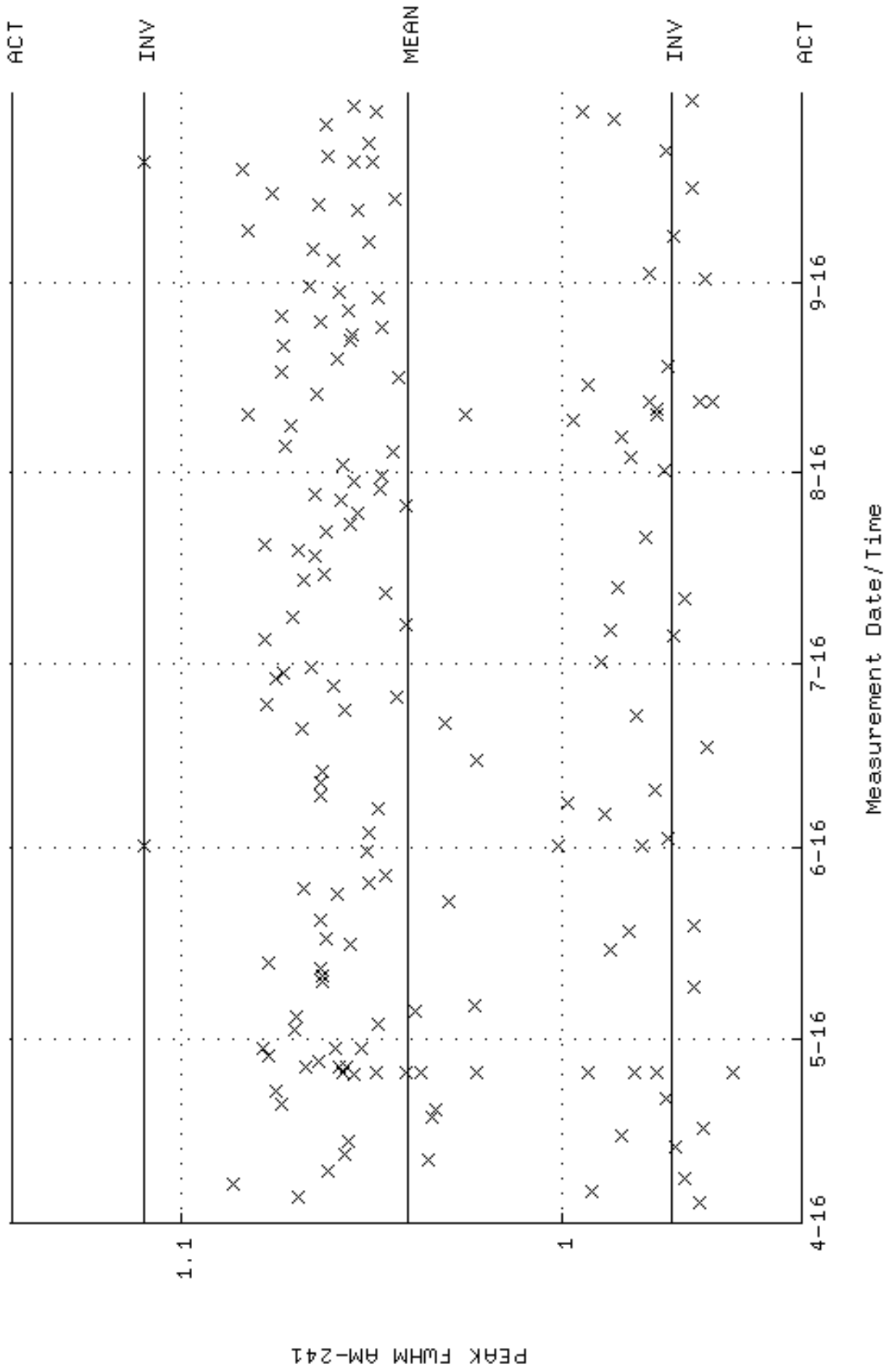
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]LBC_GAM20.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:19:02 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.40579 +- 1.881187E-02 (1.34 %)



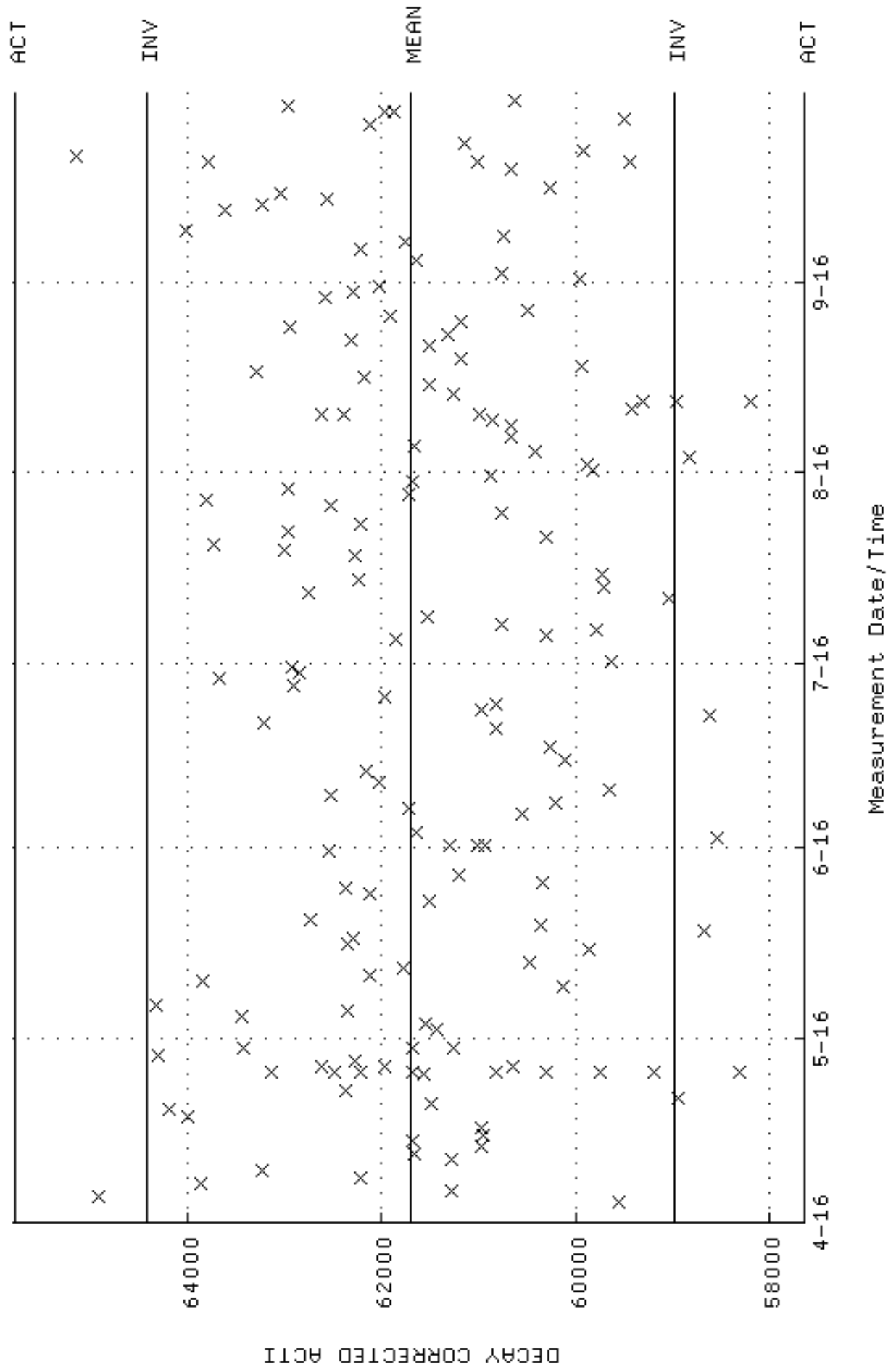
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM24_JAR.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:13:51 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



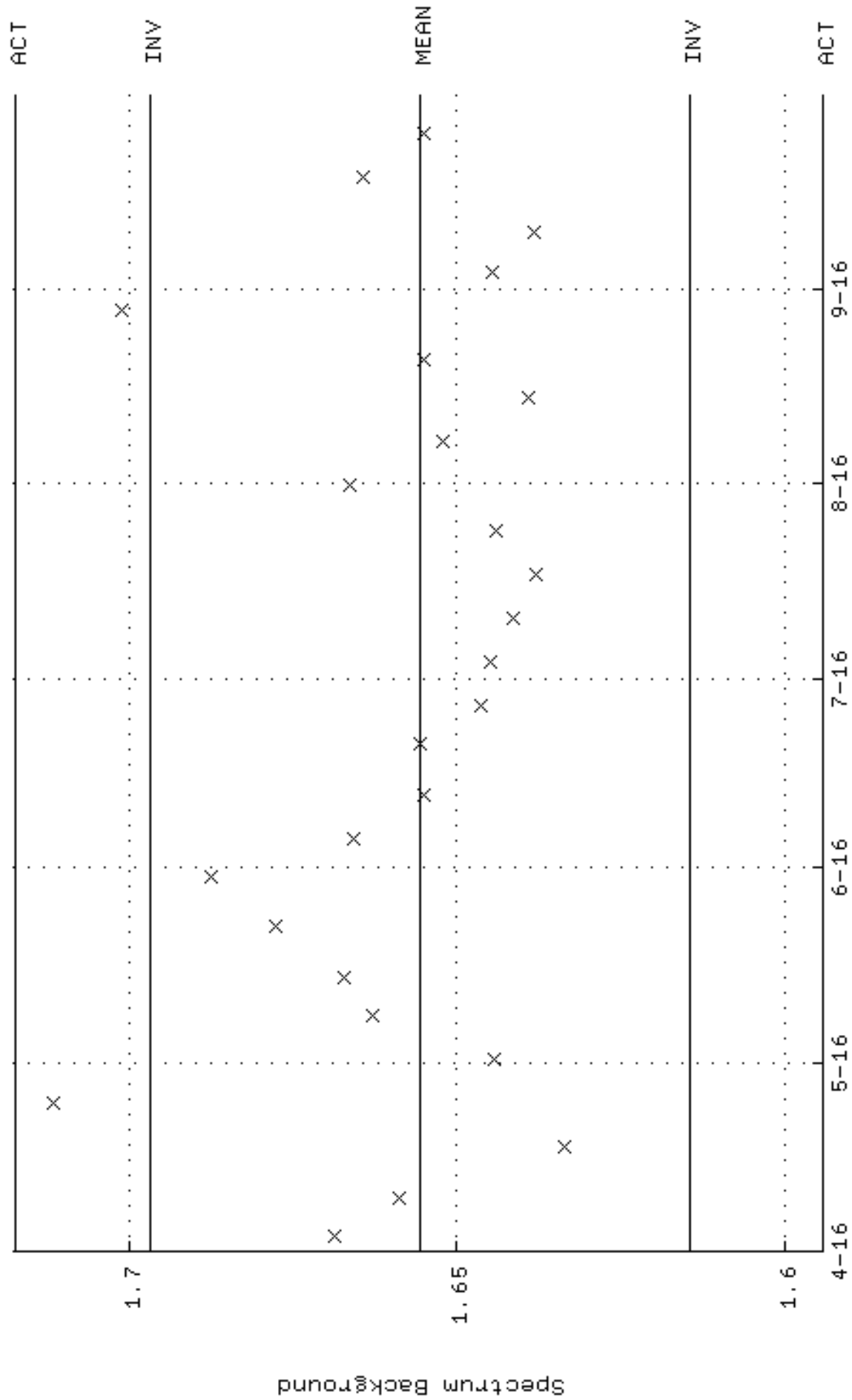
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM24_JAR.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:13:51 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.04071 +- 3.445093E-02 (3.31 %)



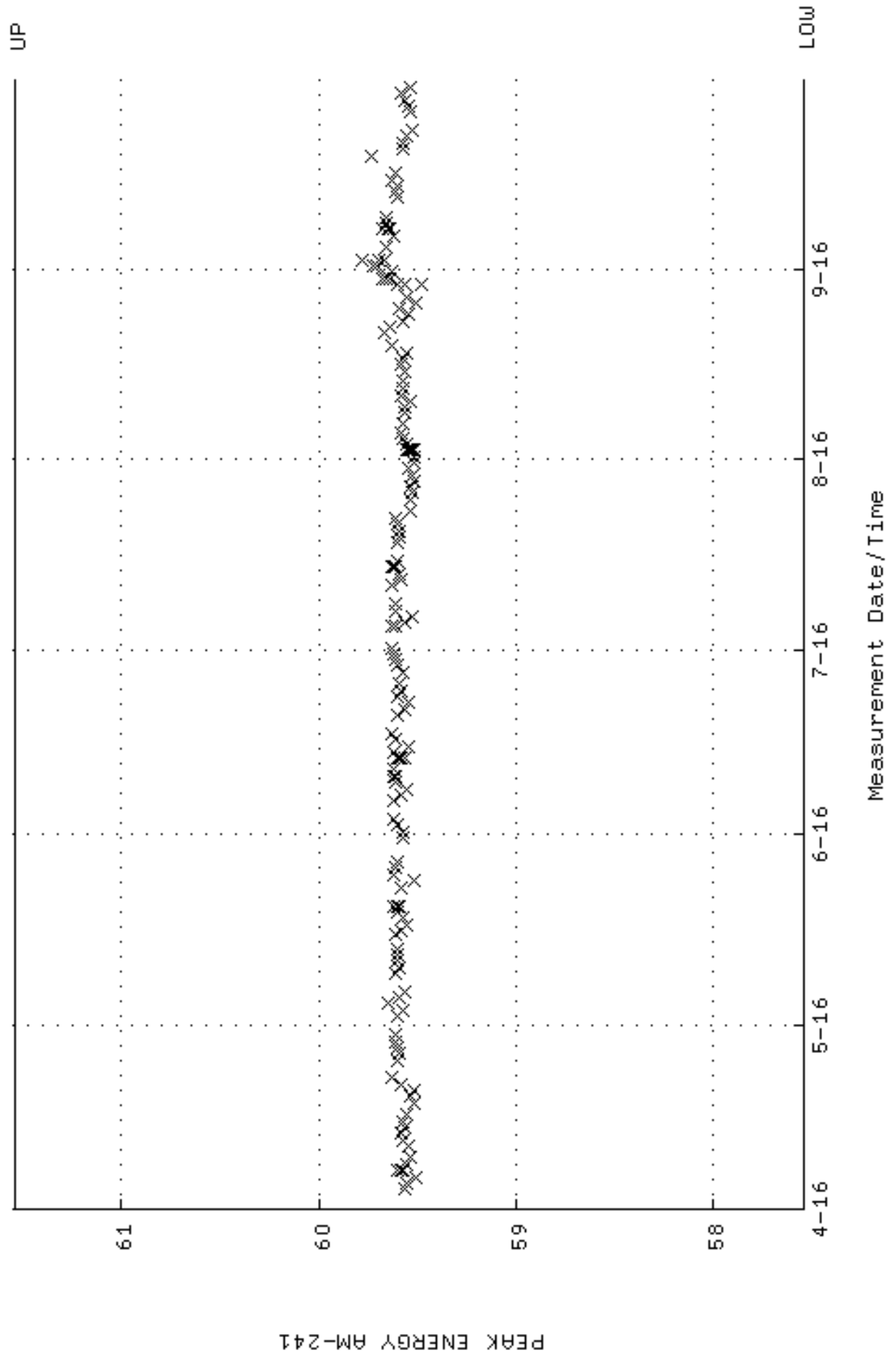
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM24_JAR.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:13:51 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 61710.4 +- 1354.76 (2.20 %)



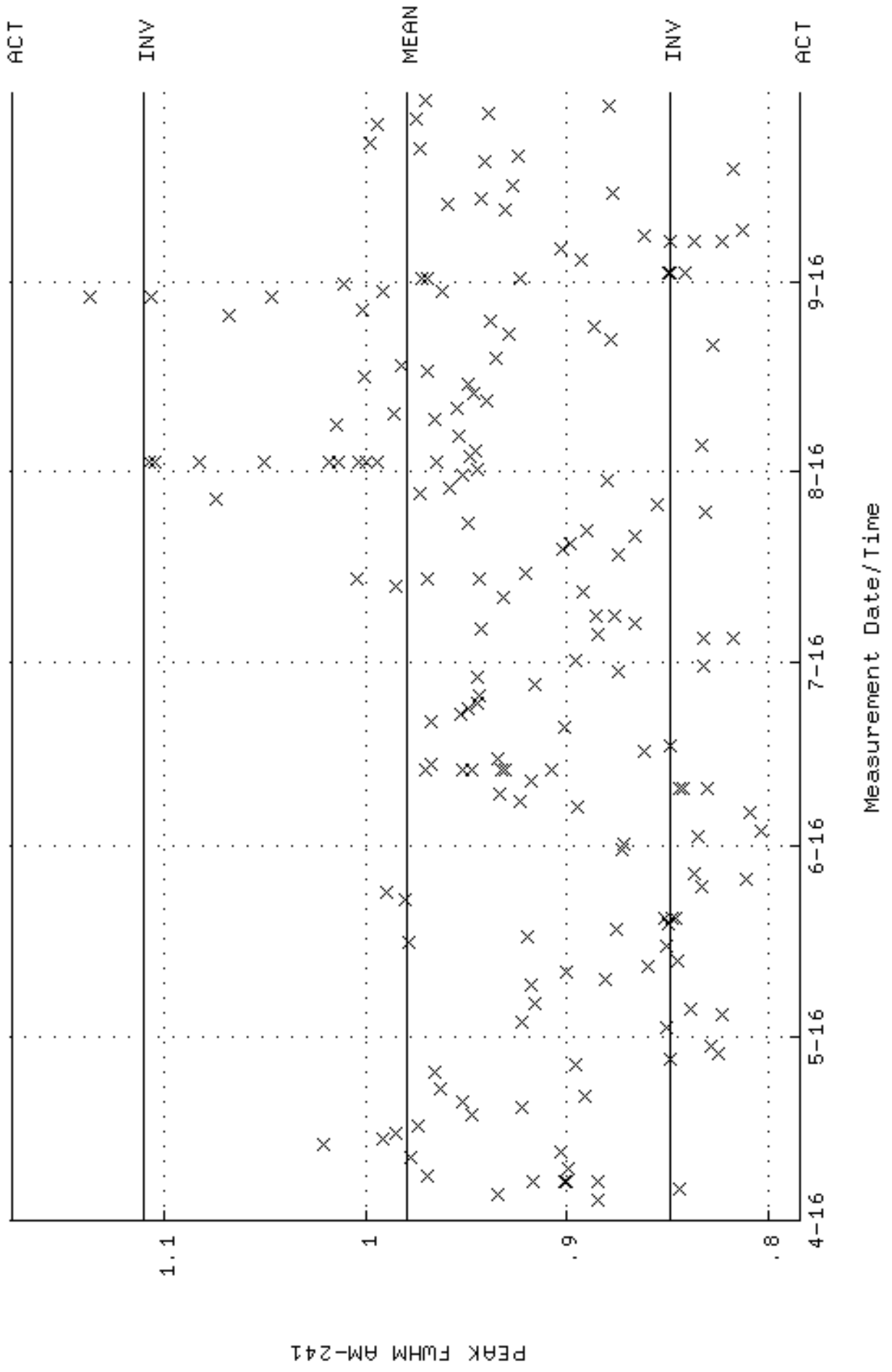
QA filename : DKA100:[CANTERRA.GAMMA.SCUSR.QA]LBC_GAM24.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:19:22 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.65570 +- 2.053930E-02 (1.24 %)



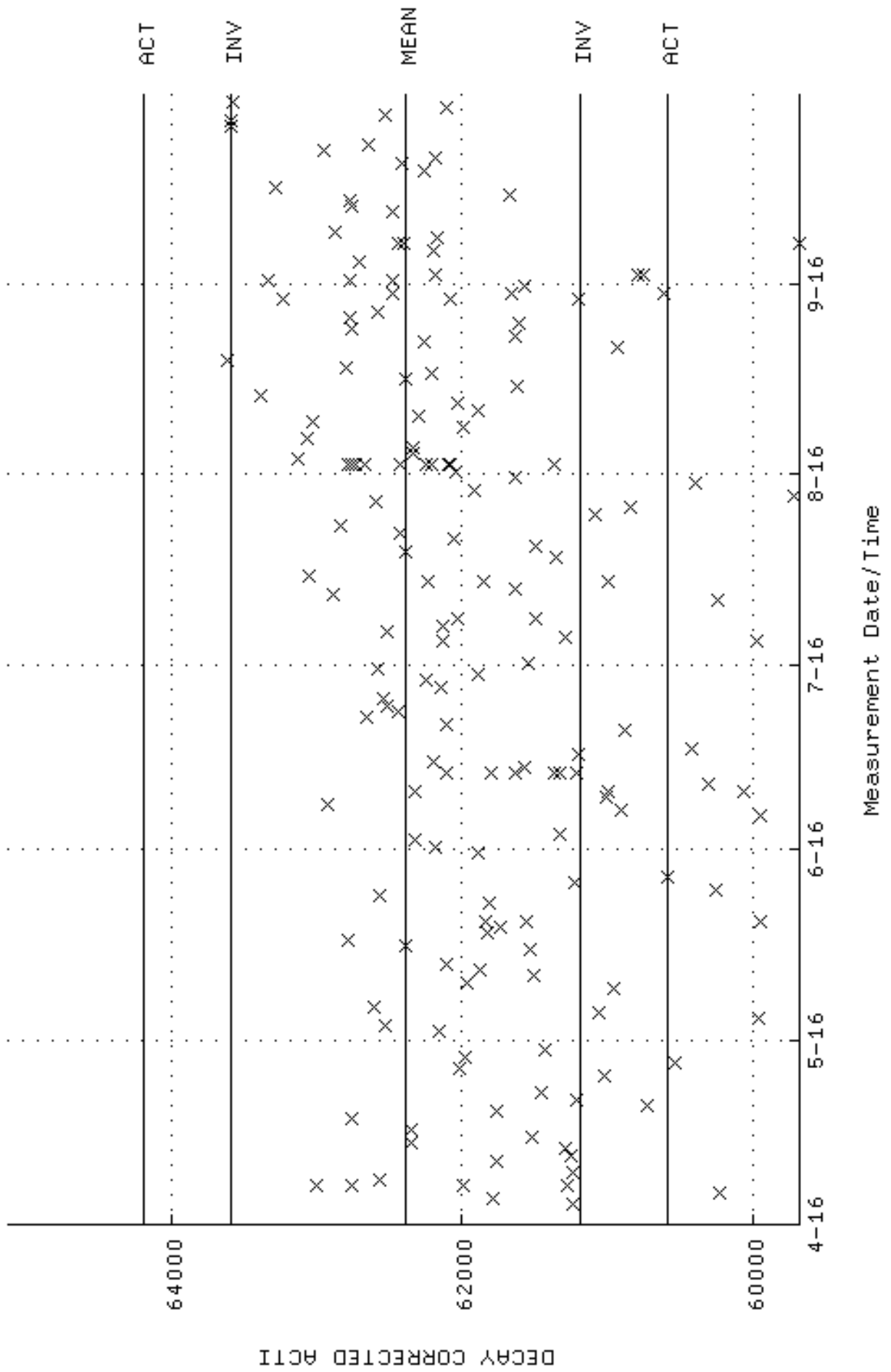
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM25_CAN_QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:39:44 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



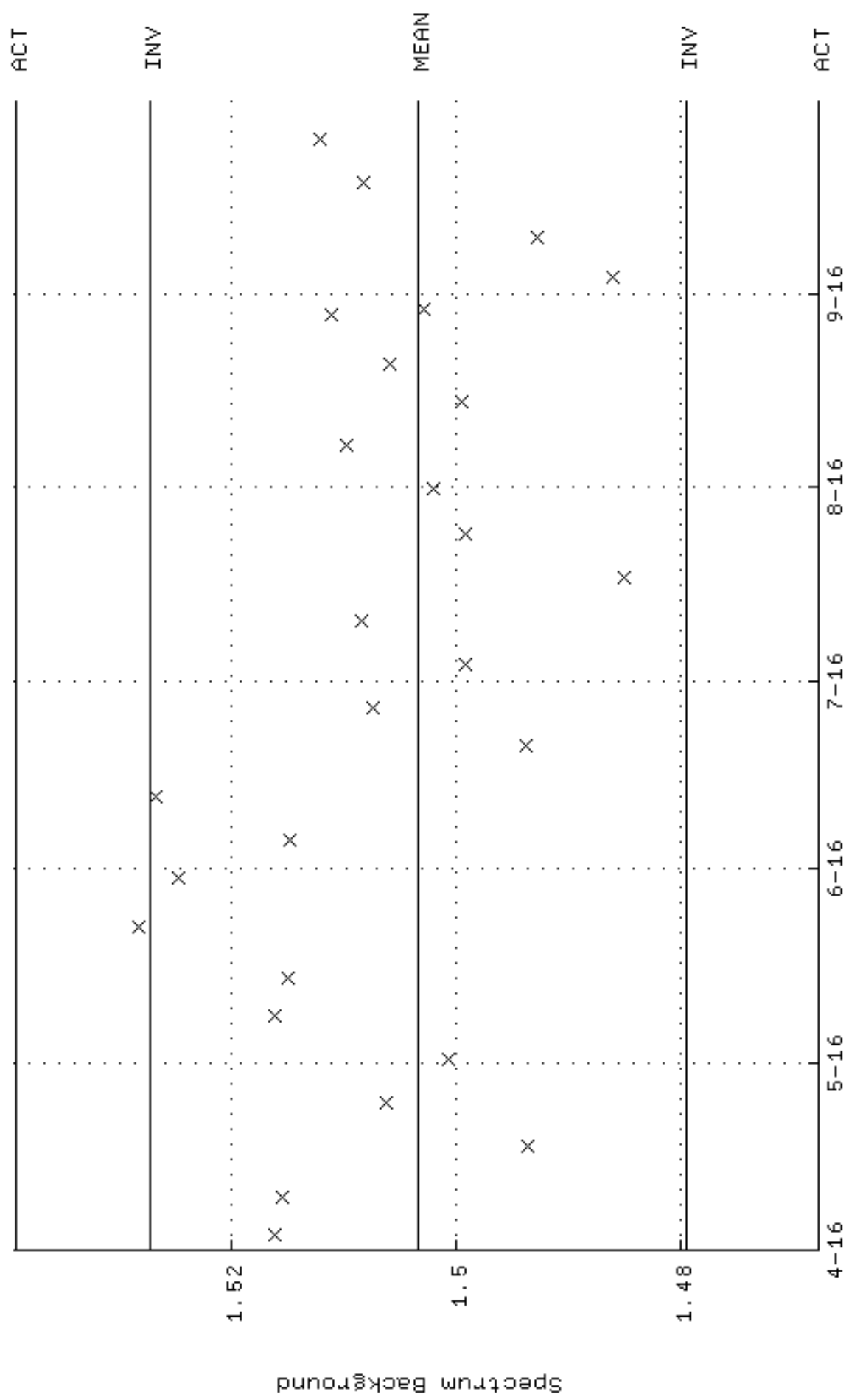
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM25_CAN_QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:39:44 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 0.980027 +- 6.517756E-02 (6.65 %)



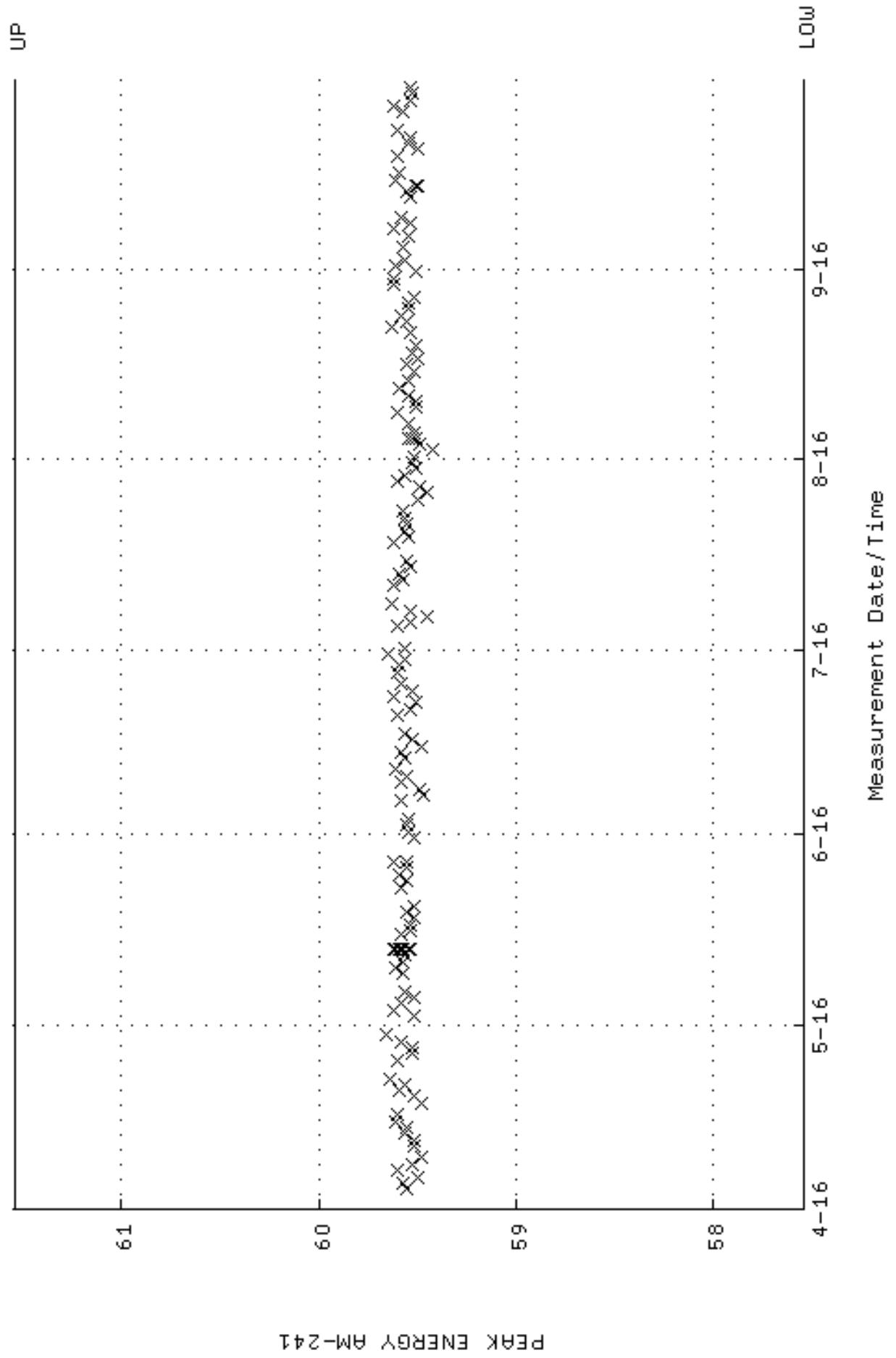
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM25_CAN_QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:39:44 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 62396.6 +- 604.147 (0.97 %)



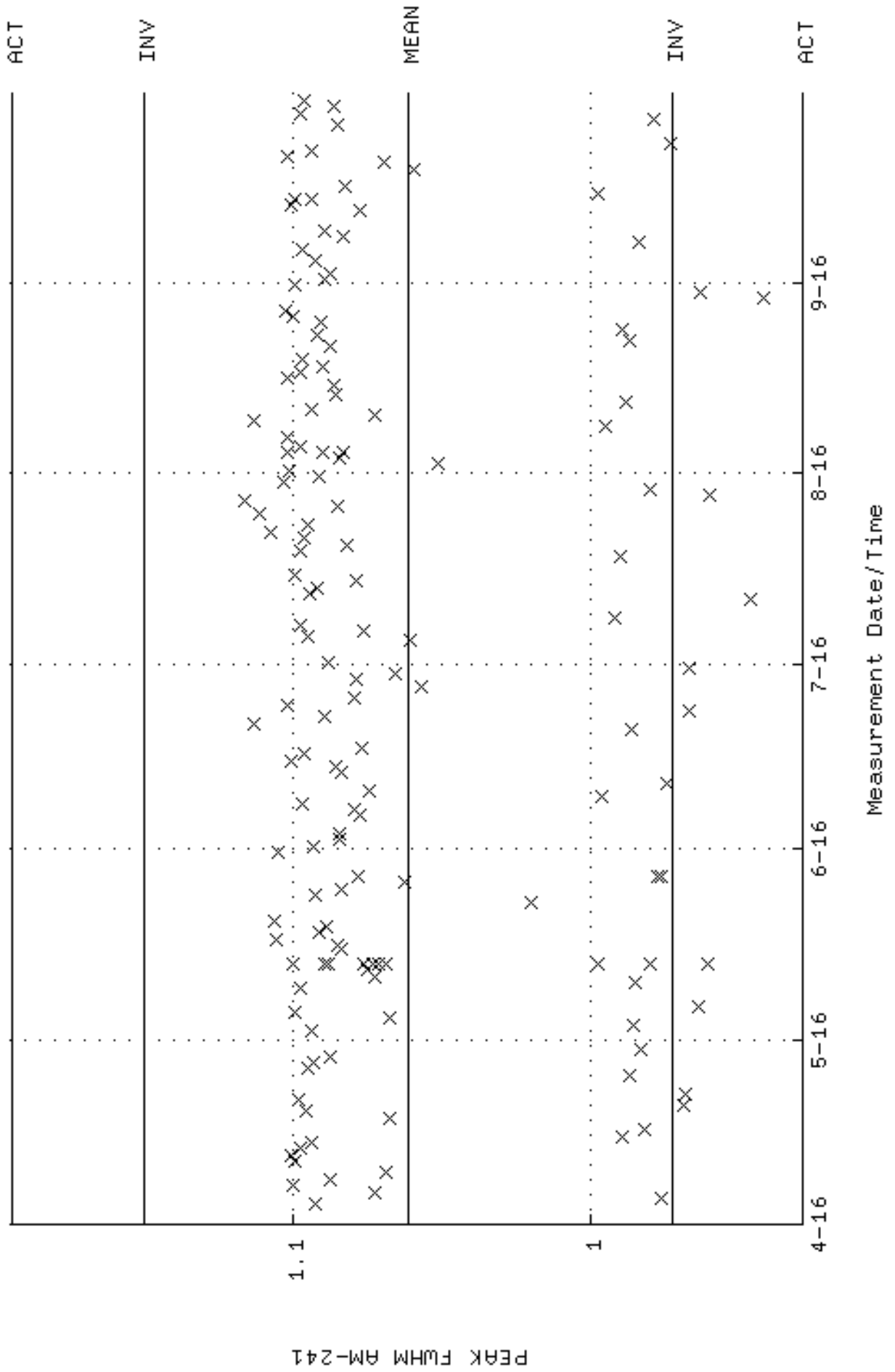
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]LBC_GAM25.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:19:27 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.50341 +- 1.187922E-02 (0.79 %)



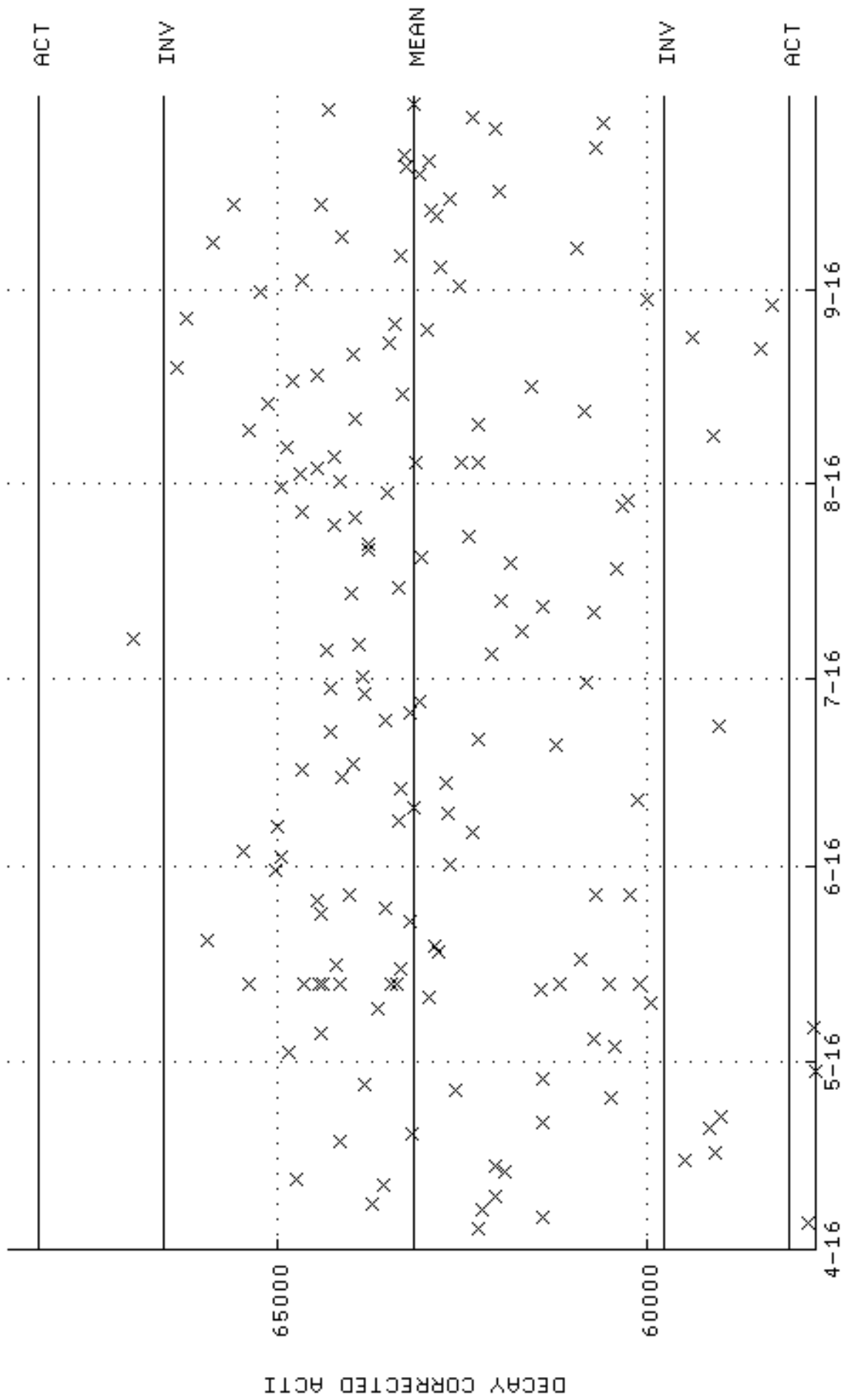
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM27_JAR.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:24:48 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



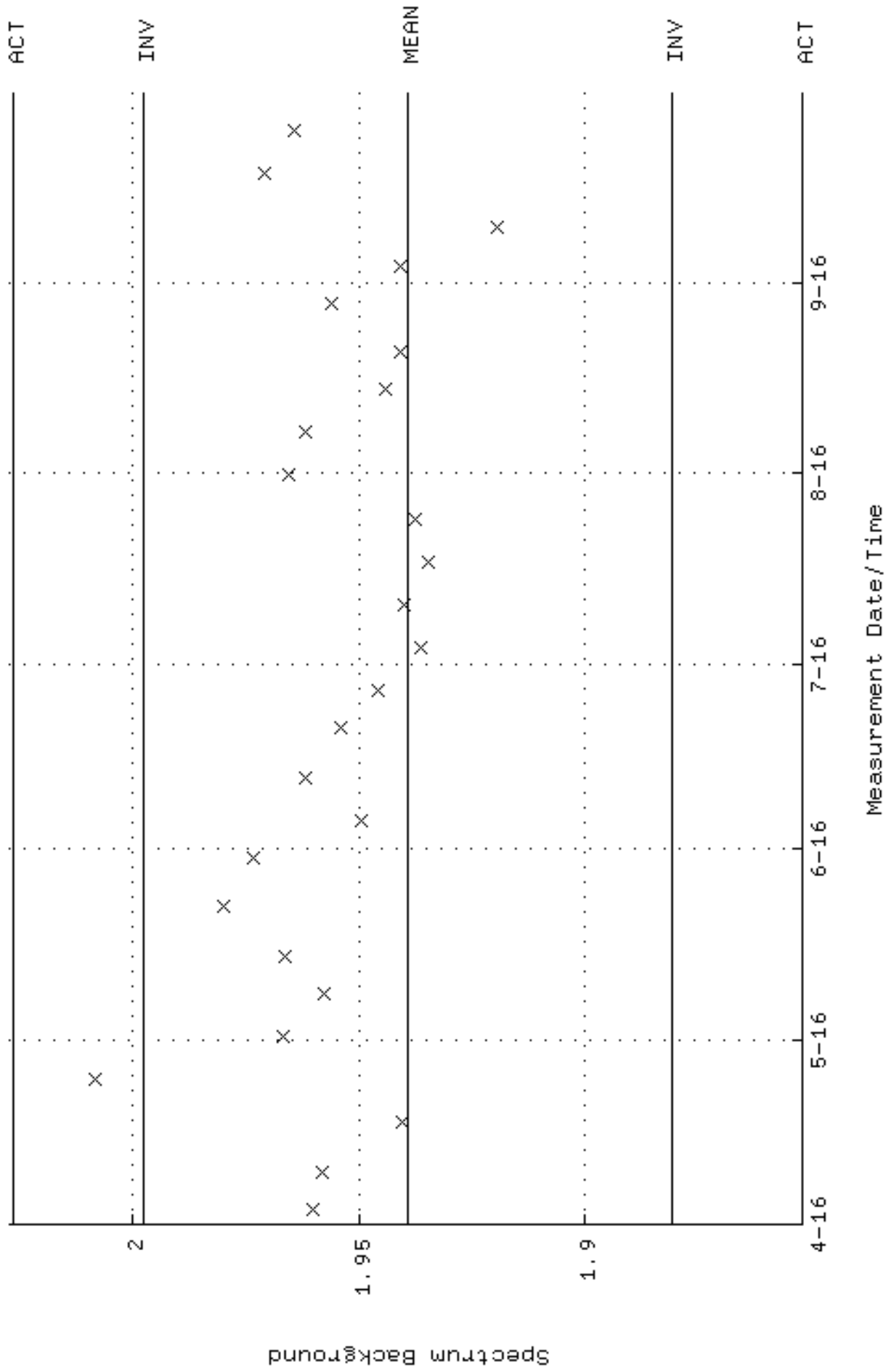
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM27_JAR.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:24:48 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.06135 +- 4.417029E-02 (4.16 %)



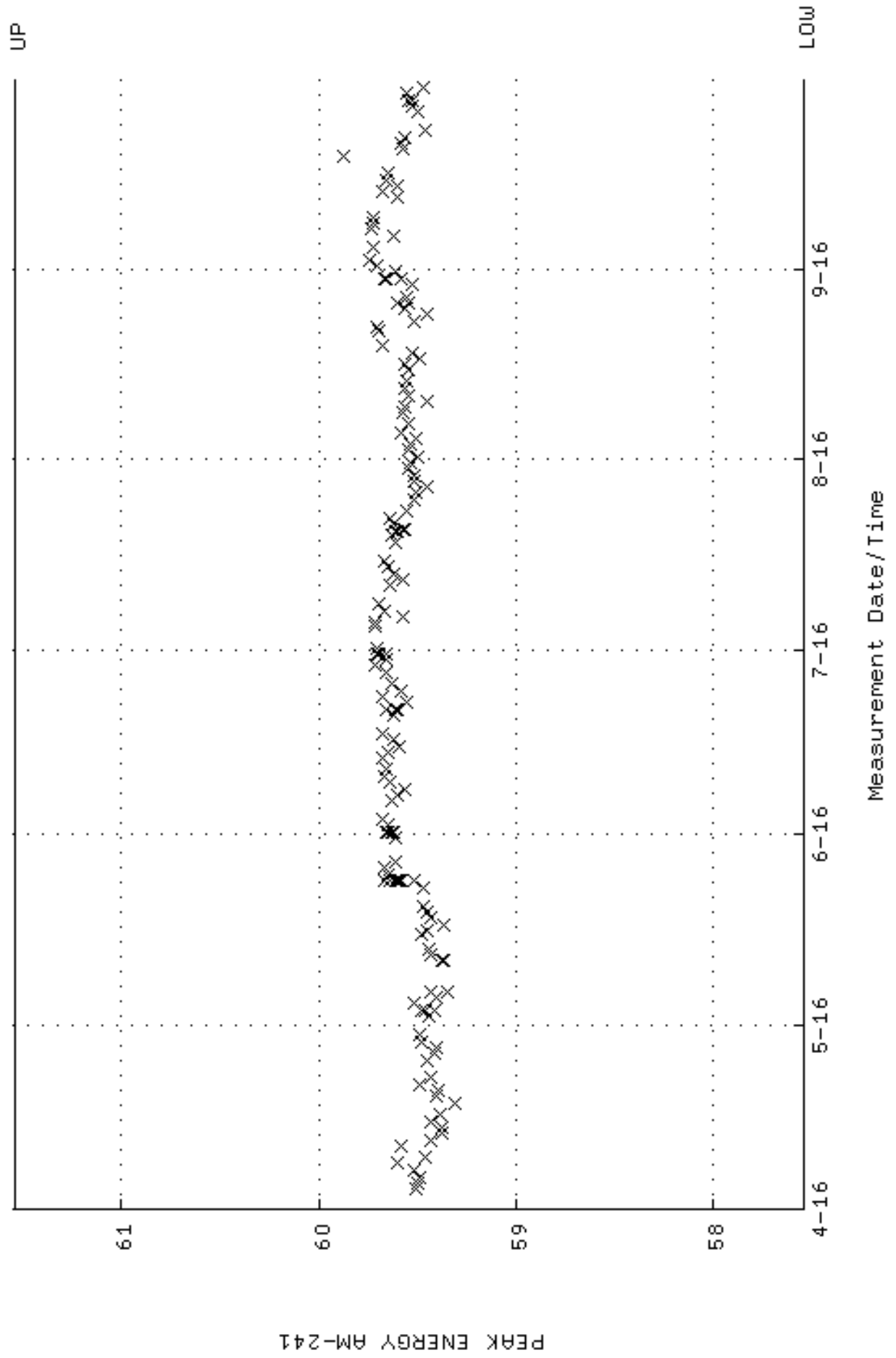
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM27_JAR.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:24:48 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 63166.8 +- 1687.80 (2.67 %)



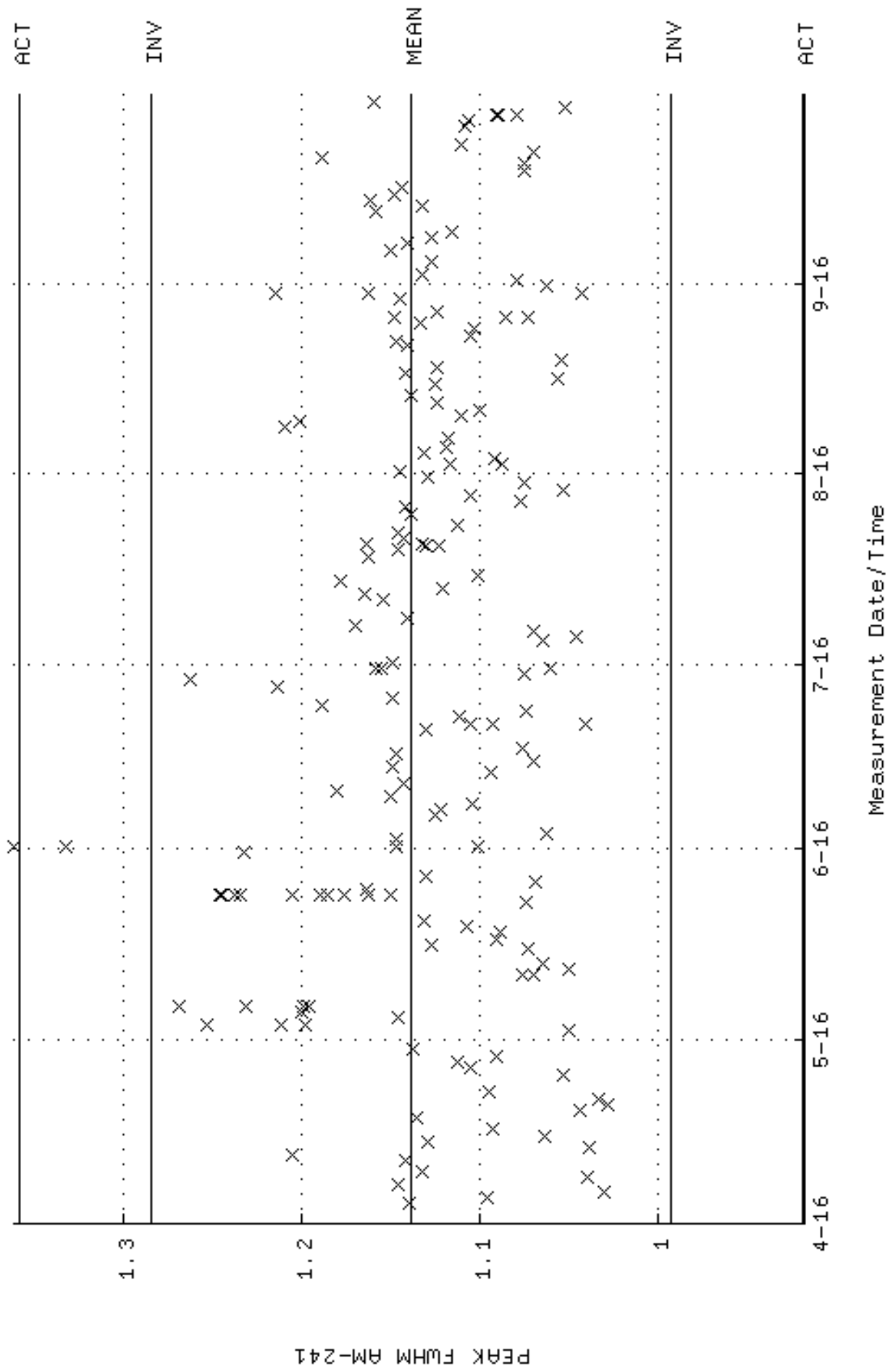
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]LBC_GAM27.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:19:33 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.93943 +- 2.913173E-02 (1.50 %)



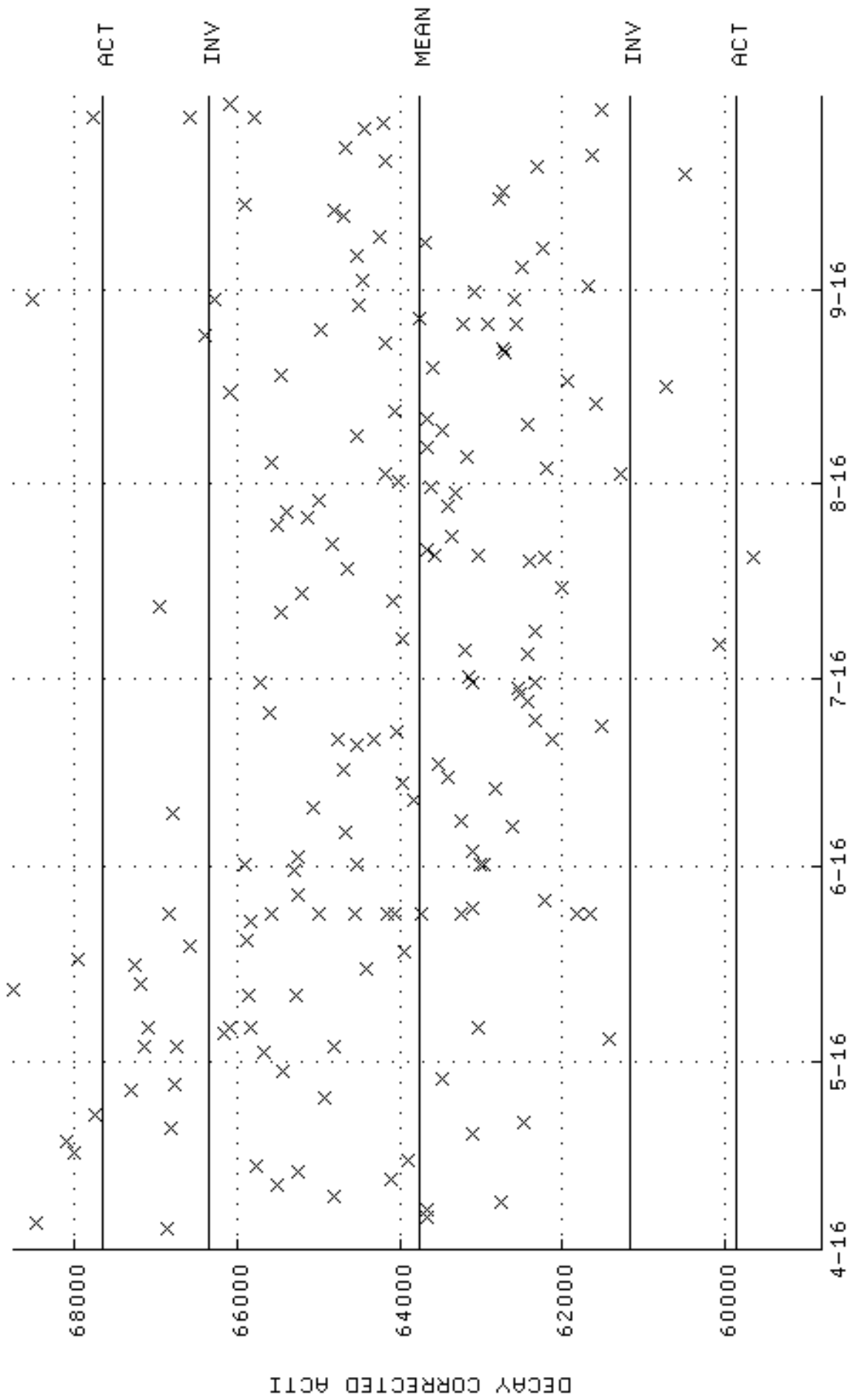
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM28_JAR.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:40:16 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



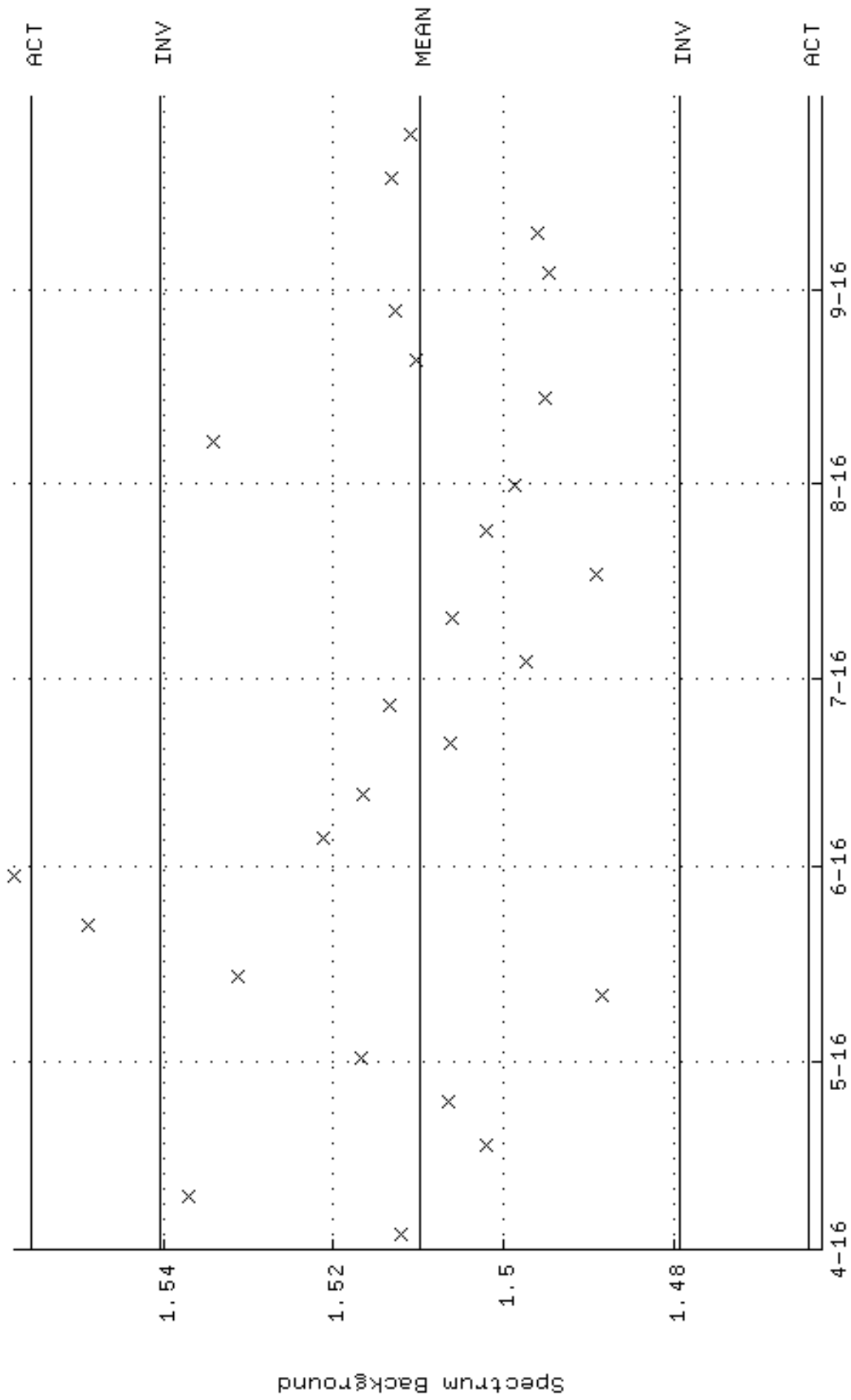
QA filename : DKA100:[CANTERRA,GAMMA,SCUSR,QA]QCC_GAM28_JAR.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:40:16 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.13880 +- 7.316274E-02 (6.42 %)



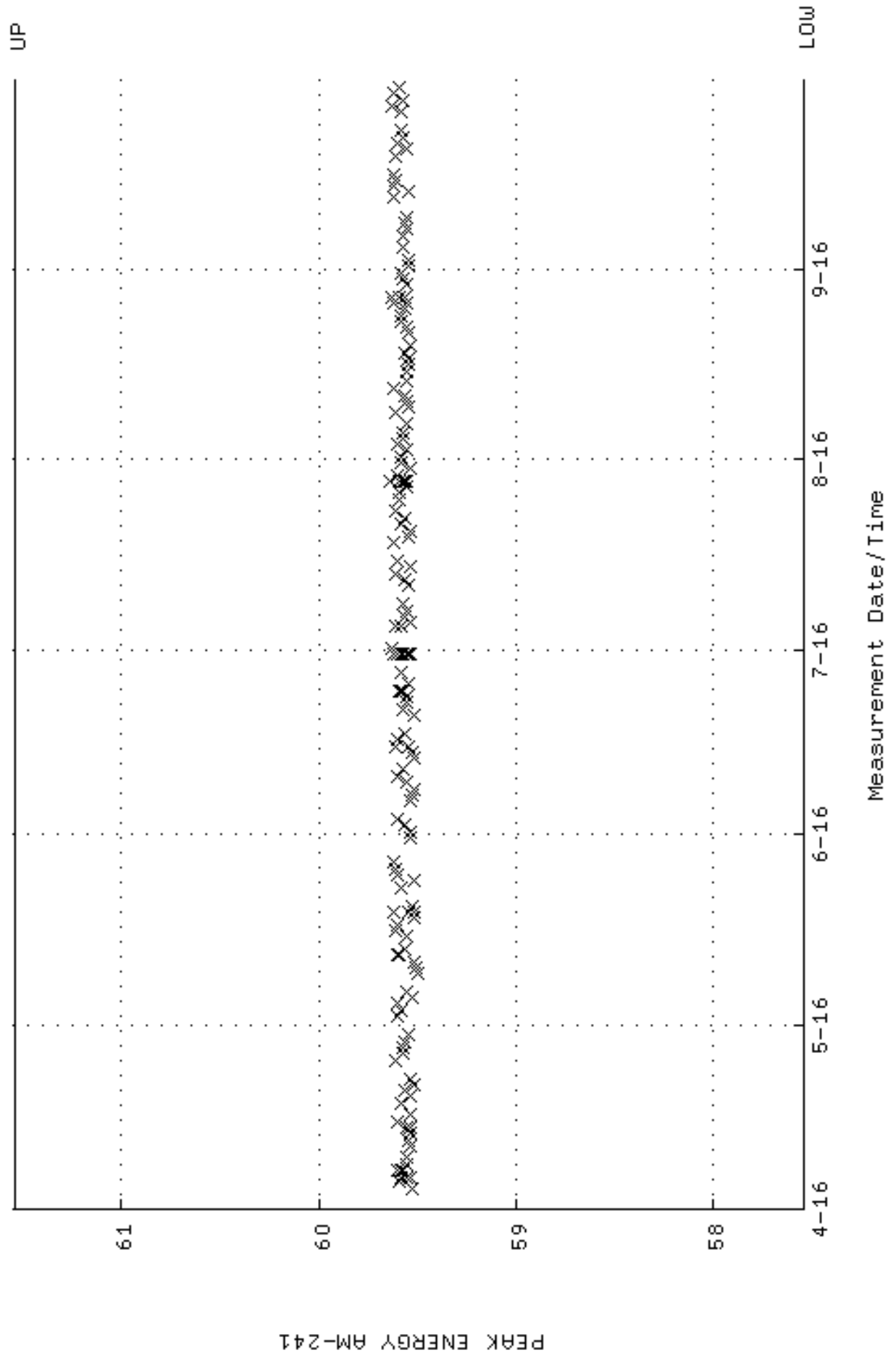
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]QCC_GAM28_JAR.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:40:16 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 63769.8 +- 1297.66 (2.03 %)



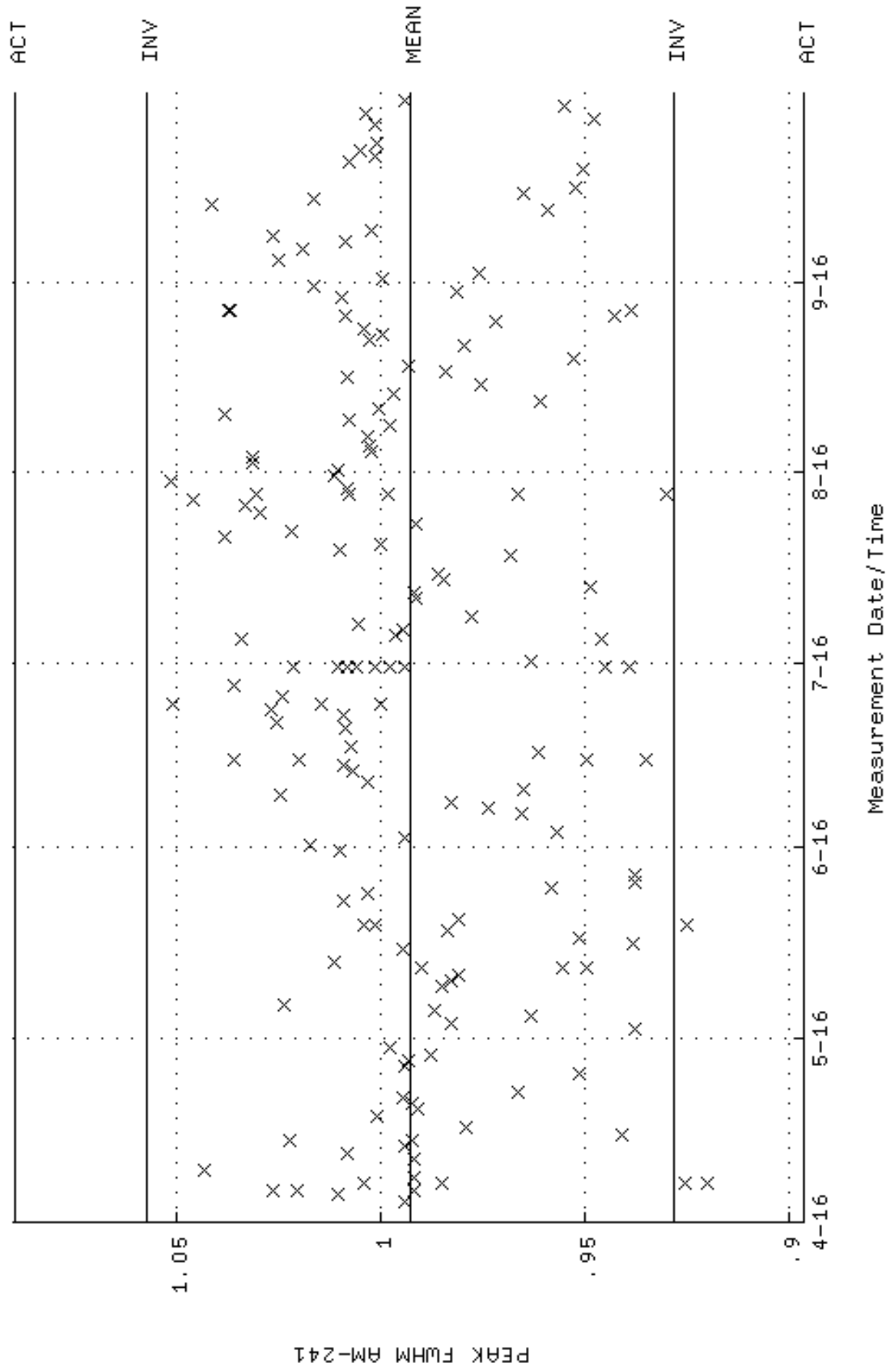
QA filename : DKA100:[CANSBERRA.GAMMA.SCUSR.QA]LBC_GAM28.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:19:38 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.50994 +- 1.525503E-02 (1.01 %)



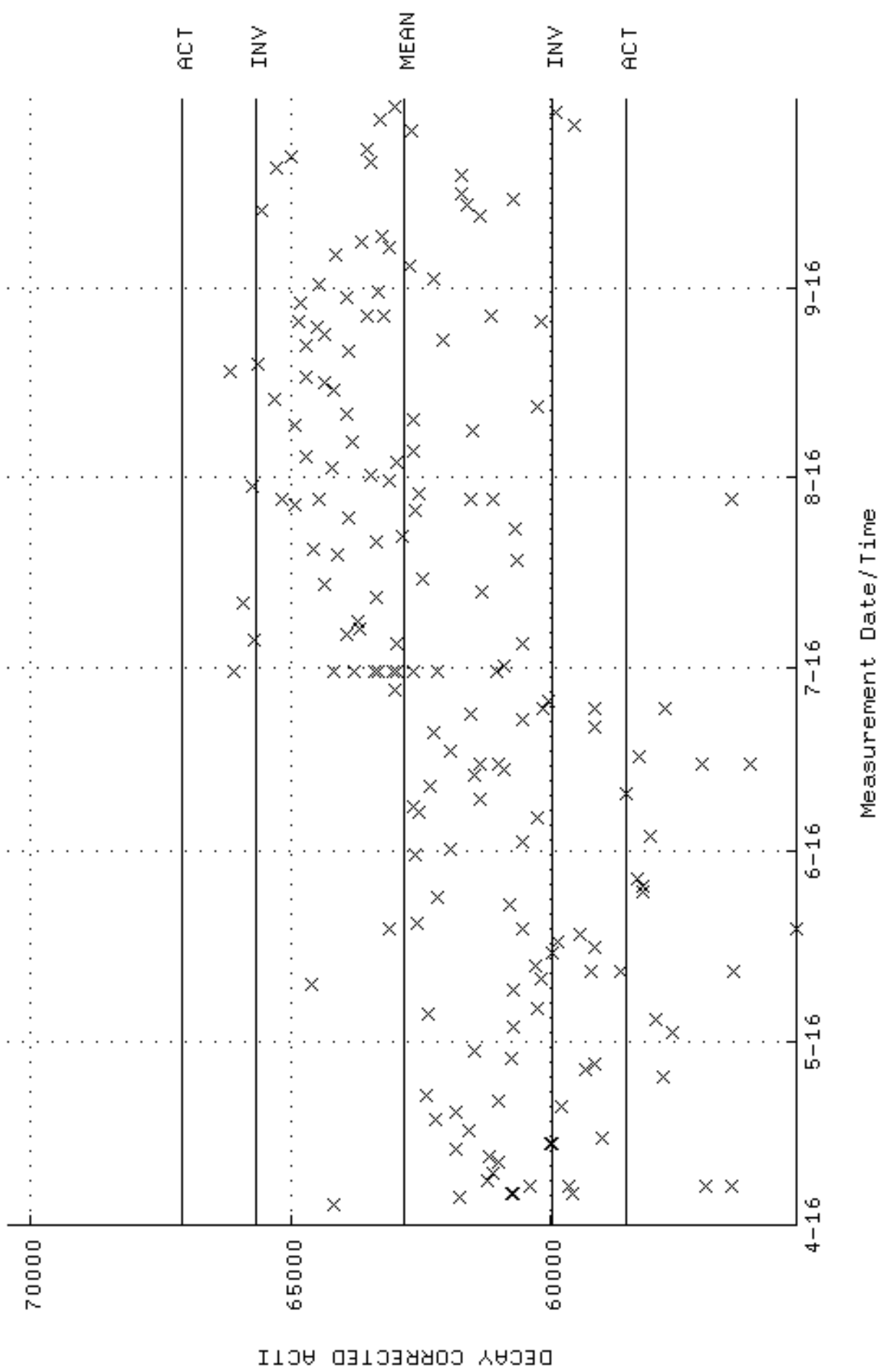
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM29_CAN_QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:13:57 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



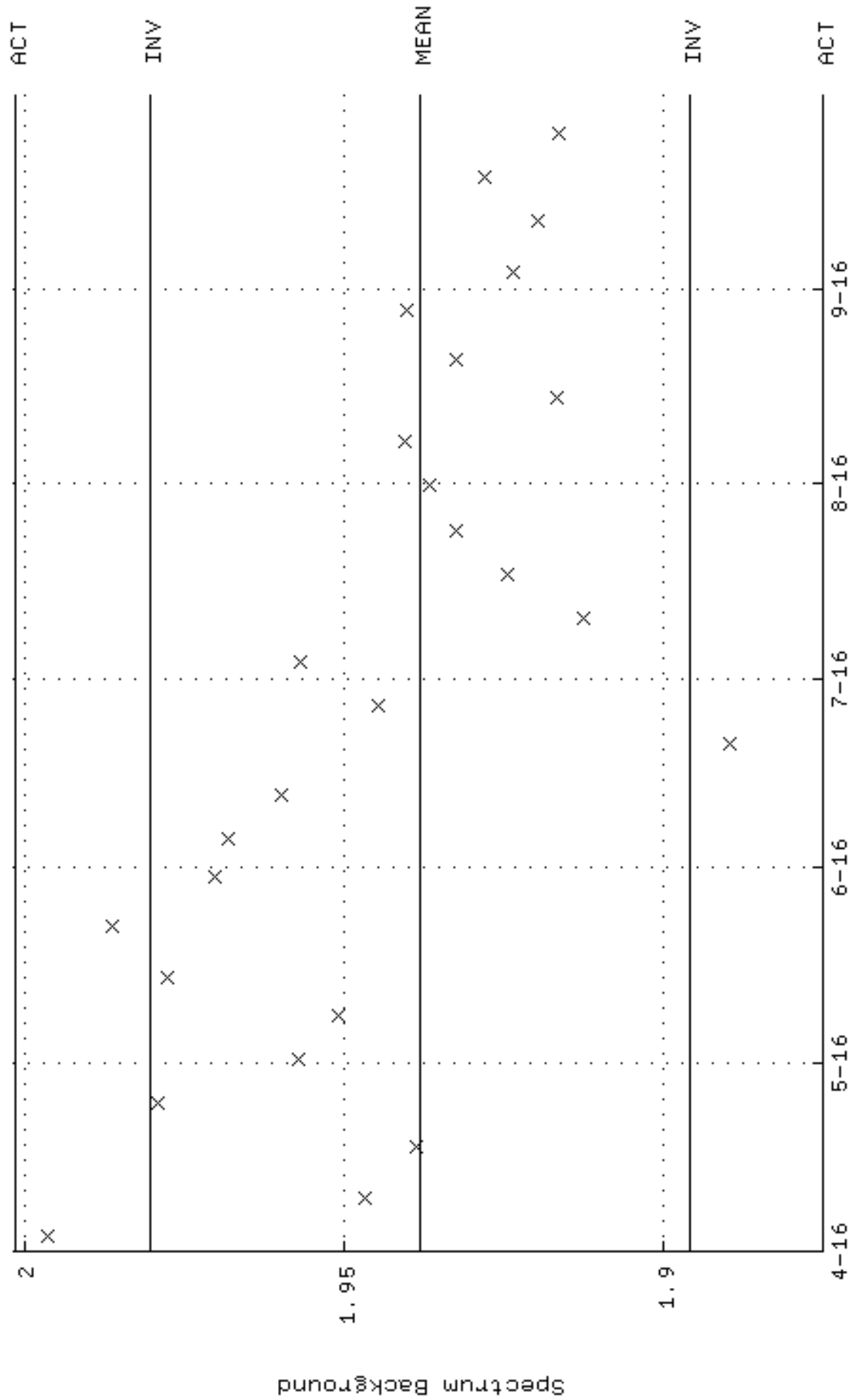
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]QCC_GAM29_CAN.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:13:57 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 0.992983 +- 3.213267E-02 (3.24 %)



QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]QCC_GAM29_CAN.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:13:57 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 62841.9 +- 1422.21 (2.26 %)

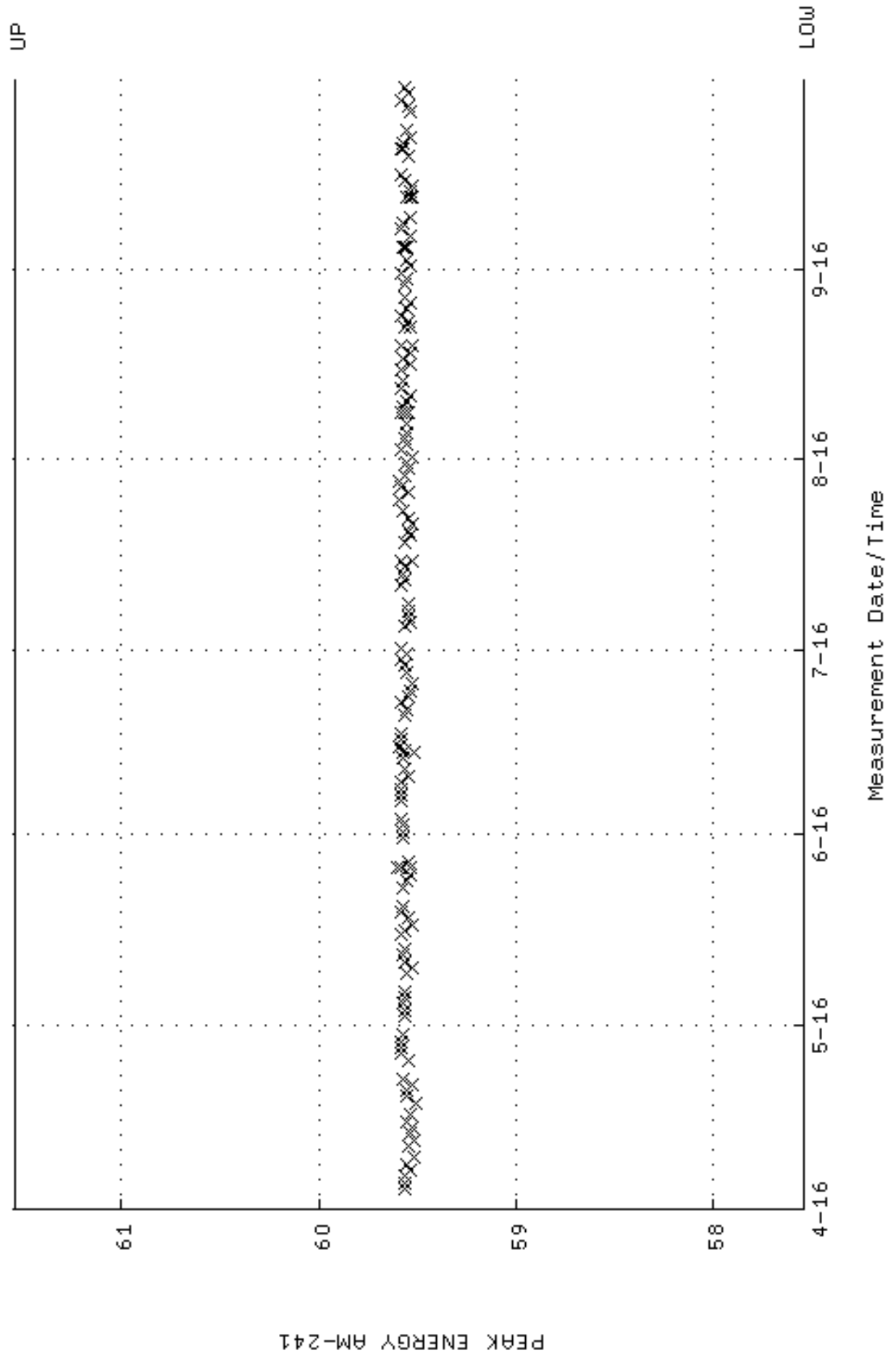


QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]LBC_GAM29.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:19:43 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.93820 +- 2.105615E-02 (1.09 %)

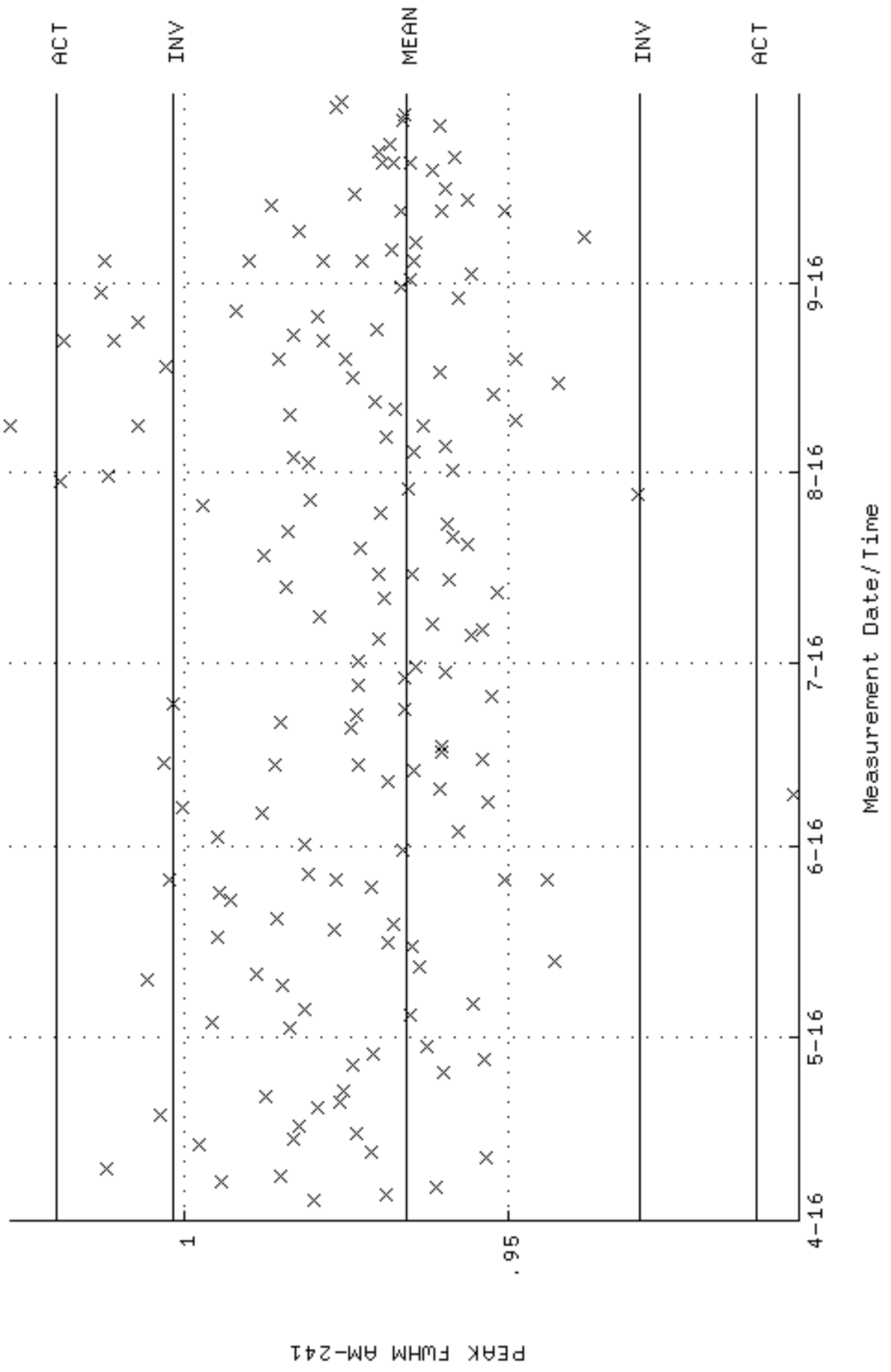


Measurement Date/Time

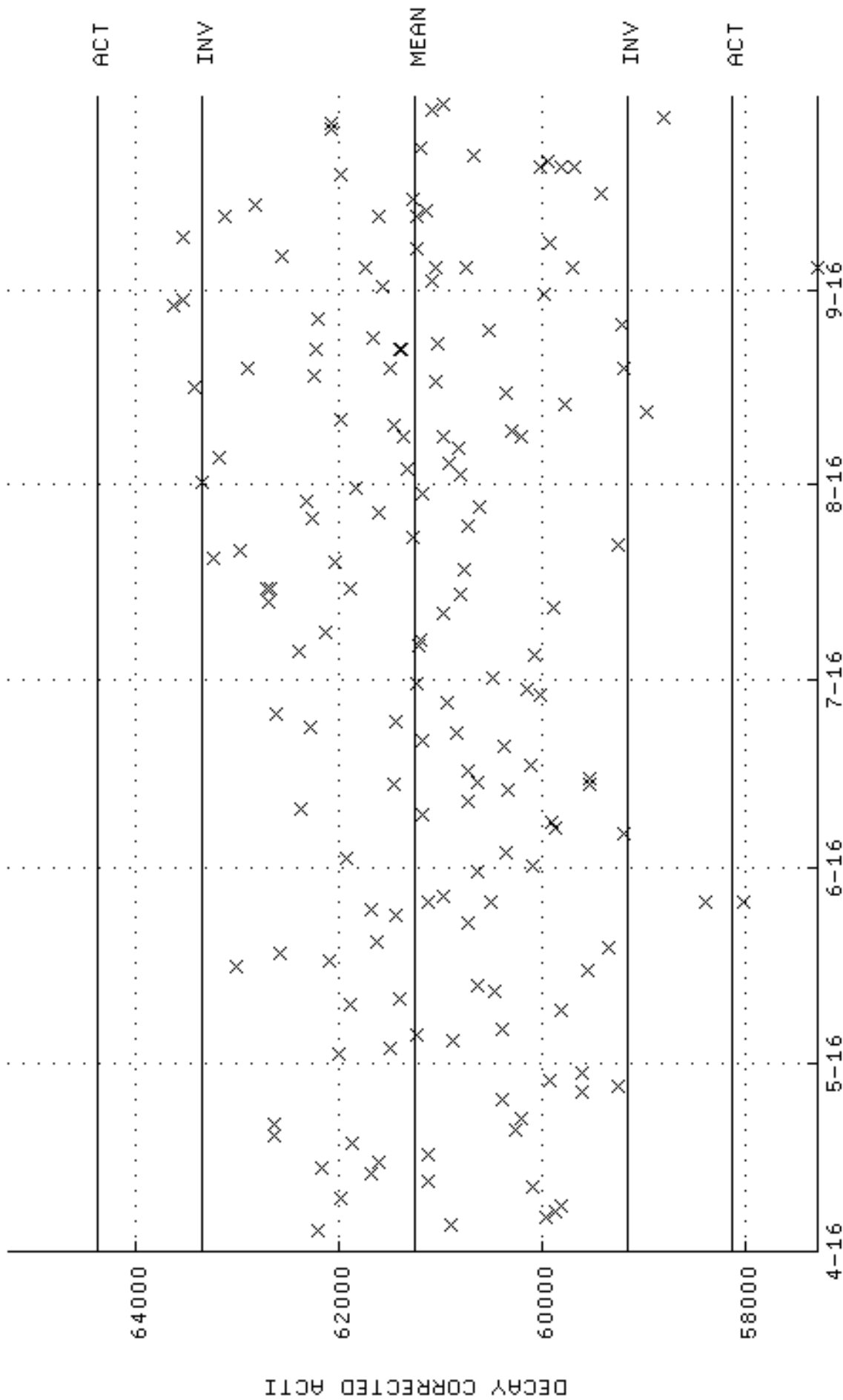
QA filename : DKA100:[CANSBERRA.GAMMA.SCUSR.QA]QCC_GAM30_CAN.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:14:02 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



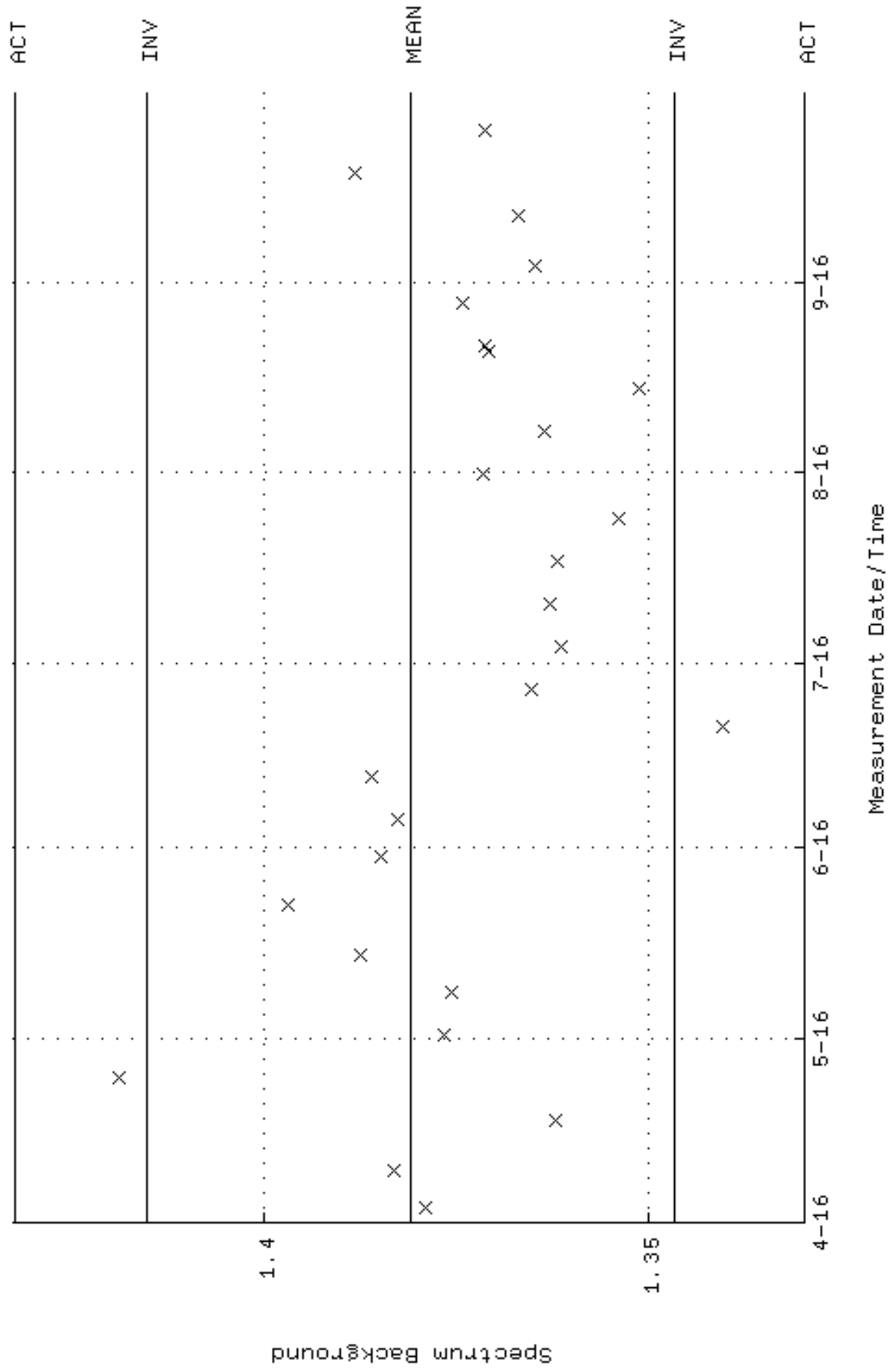
QA filename : DKA100:[CANTERRA,GAMMA,SCUSR,QA]QCC_GAM30_CAN.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:14:02 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 0.965876 +- 1.796214E-02 (1.86 %)



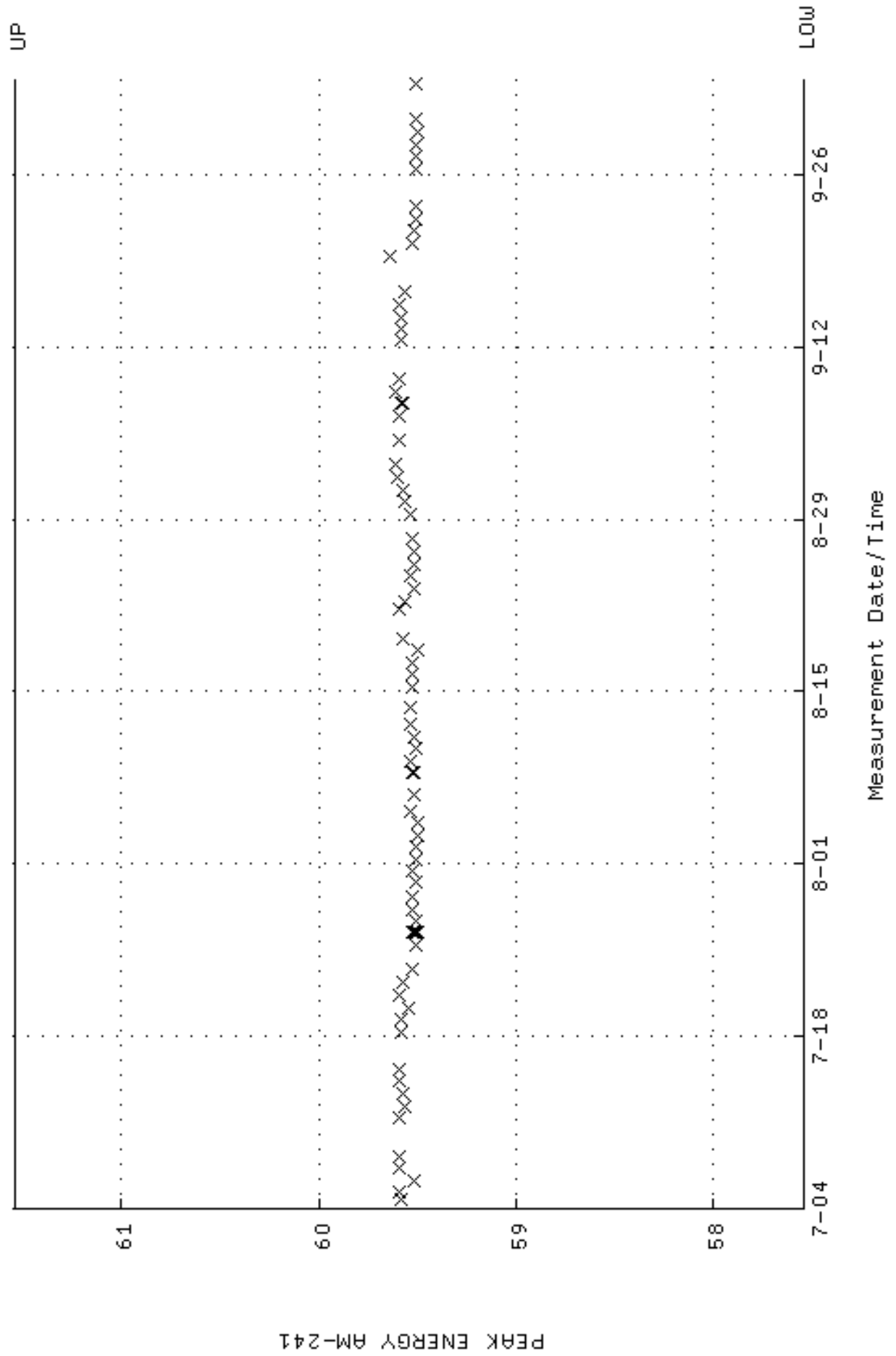
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM30_CAN_QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:14:02 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 61266.4 +- 1042.70 (1.70 %)



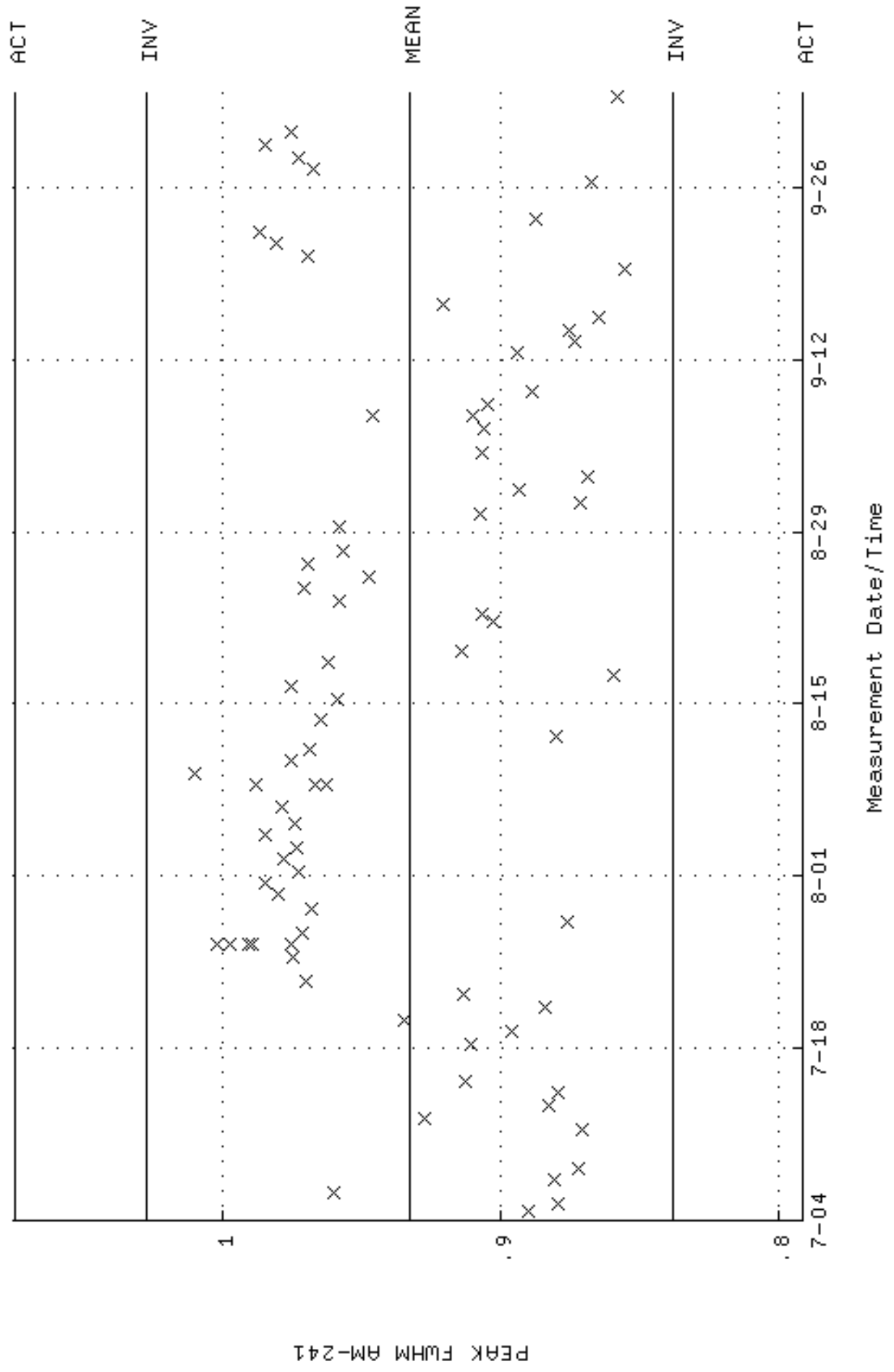
QA filename : DKA100:[CANSBERRA.GAMMA.SCUSR.QA]LBC_GAM30.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:19:48 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.38100 +- 1.713672E-02 (1.24 %)



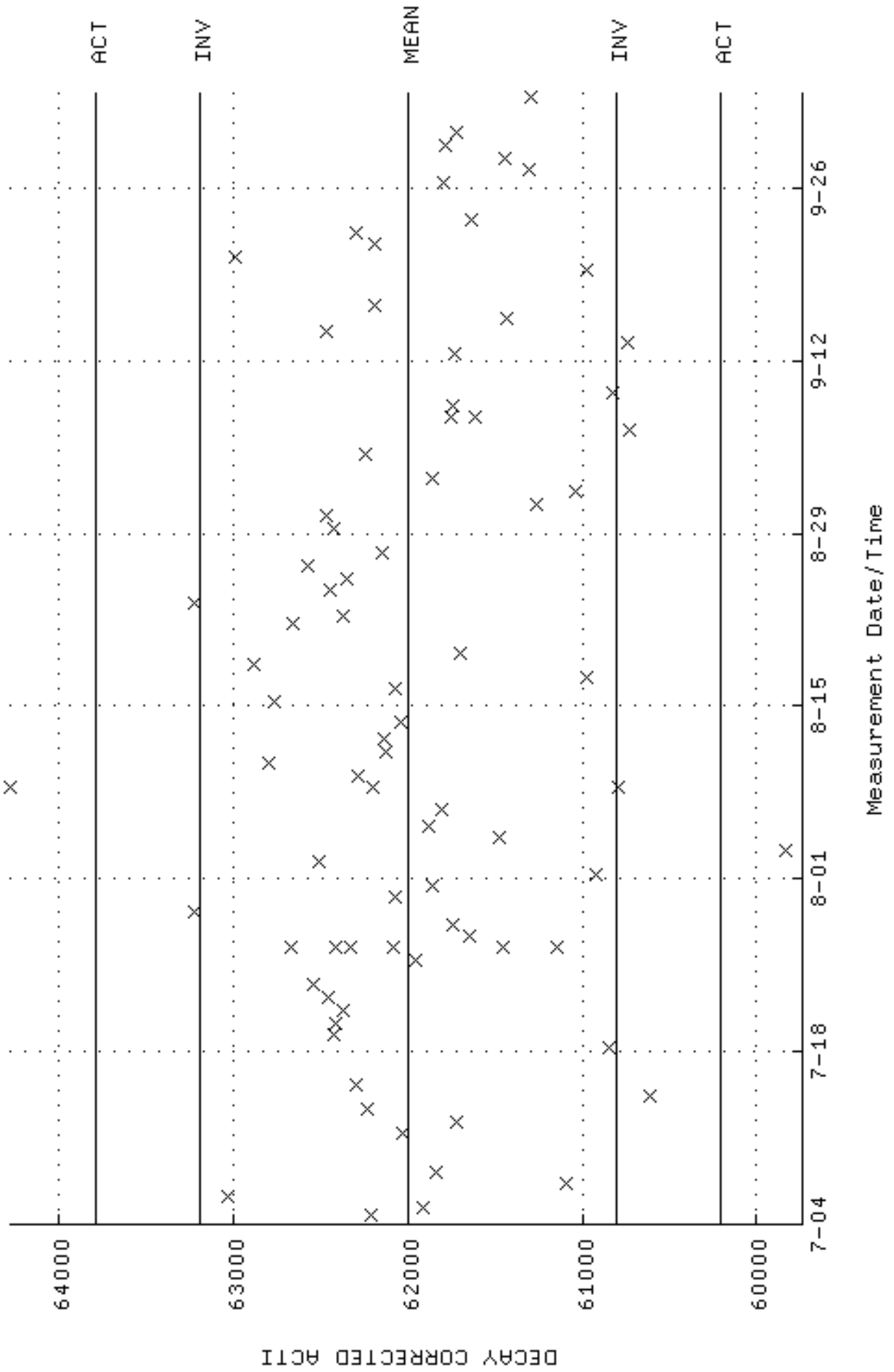
QA filename : DKA100:[CANTERRA.GAMMA.SCUSR.QA]QCC_GAM31_CAN.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 4-JUL-2016 18:05:12 through 3-OCT-2016 12:00:00
 Lower/Upper Lmts: 57.5400 through 61.5400



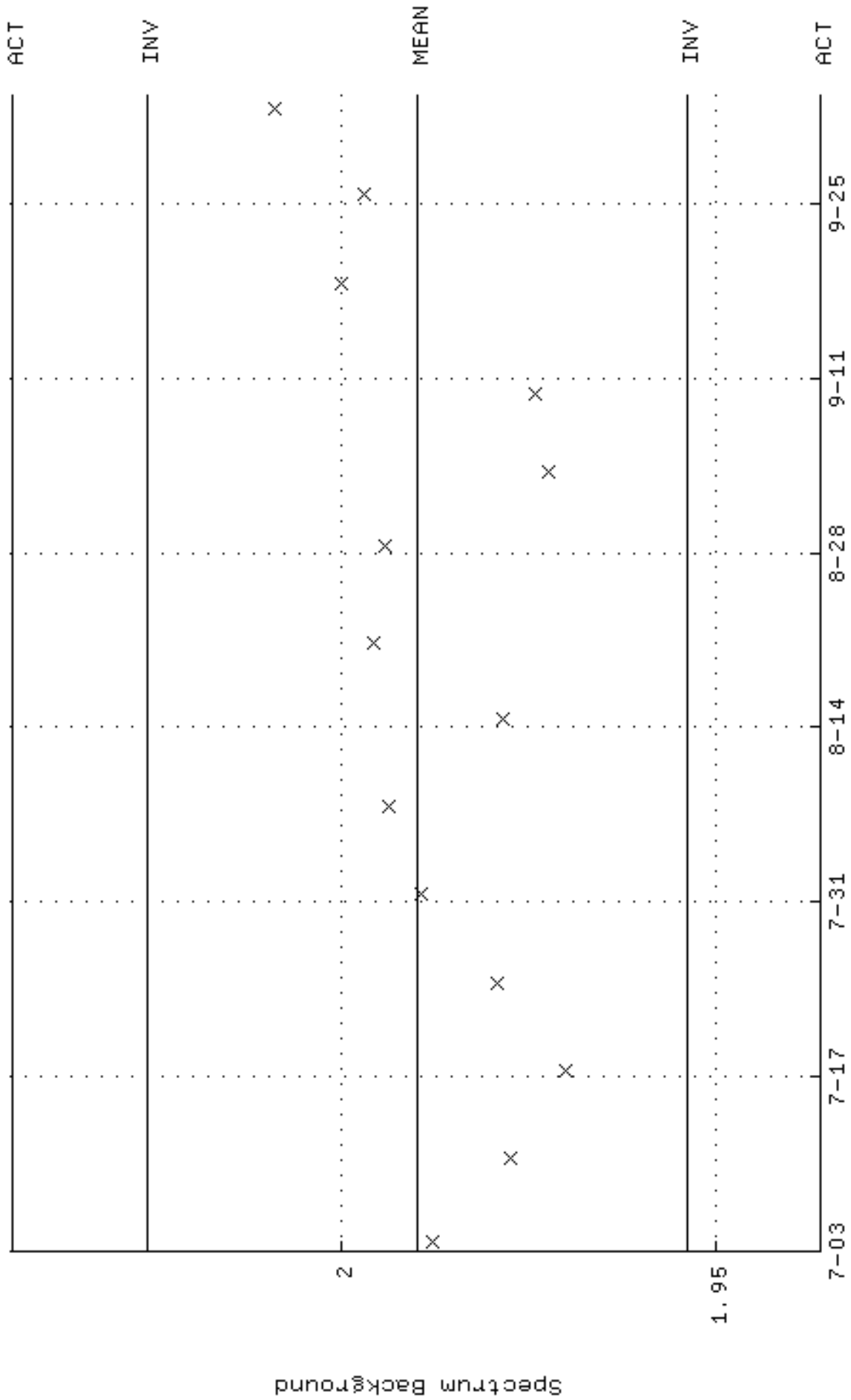
QA filename : DKA100:[CANTERRA,GAMMA,SCUSR,QA]QCC_GAM31_CAN.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-JUL-2016 18:05:12 through 3-OCT-2016 12:00:00
 Mean +- Std Dev : 0.933242 +- 4.723132E-02 (5.06 %)



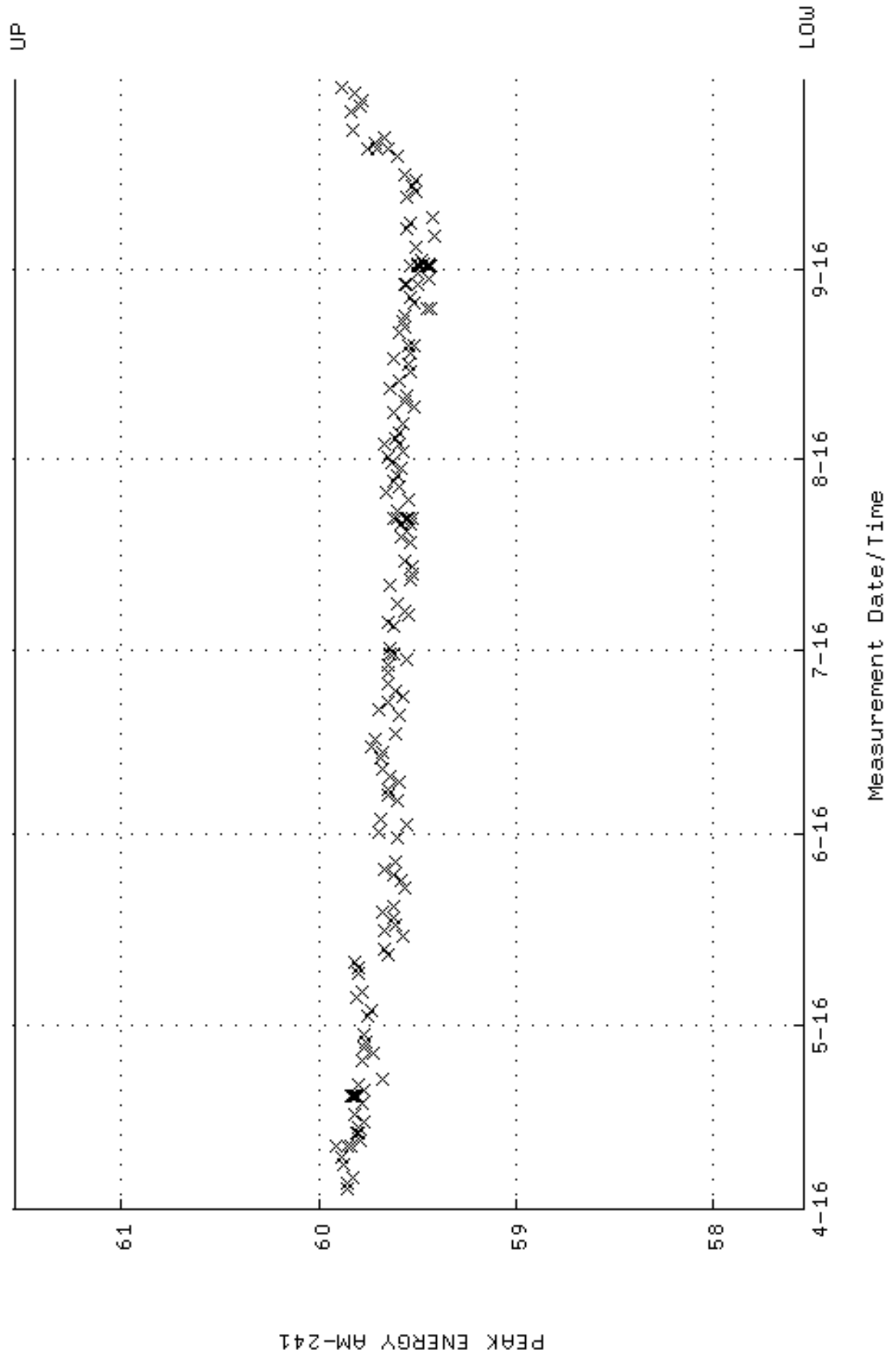
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]QCC_GAM31_CAN_QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-JUL-2016 18:05:12 through 3-OCT-2016 12:00:00
 Mean +- Std Dev : 62002.8 +- 596.550 (0.96 %)



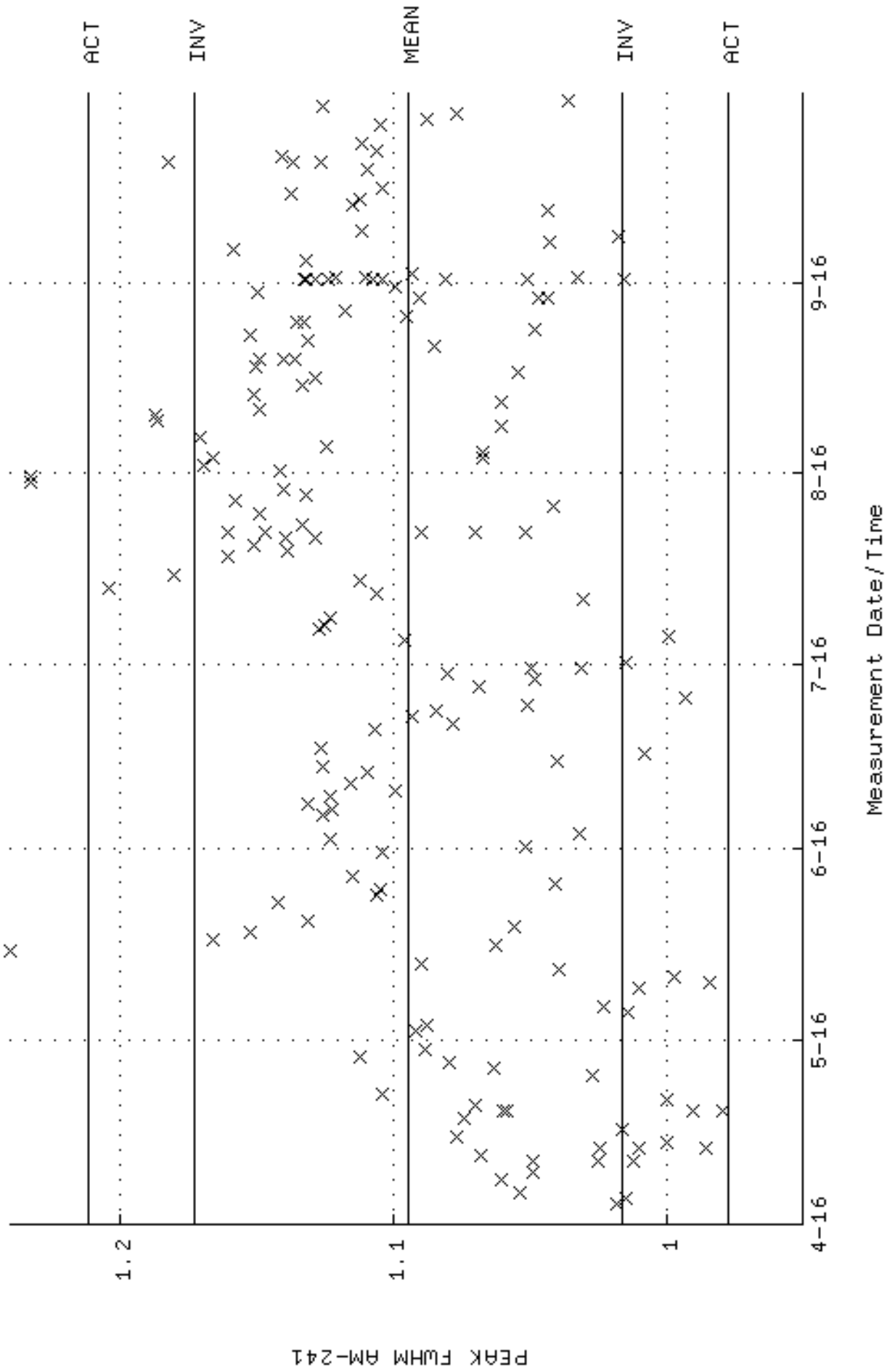
QA filename : DKA100:[CANSBERRA.GAMMA.SCUSR.QA]LBC_GAM31.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-JUL-2016 16:51:20 through 3-OCT-2016 12:00:00
 Mean +- Std Dev : 1.98998 +- 1.794291E-02 (0.90 %)



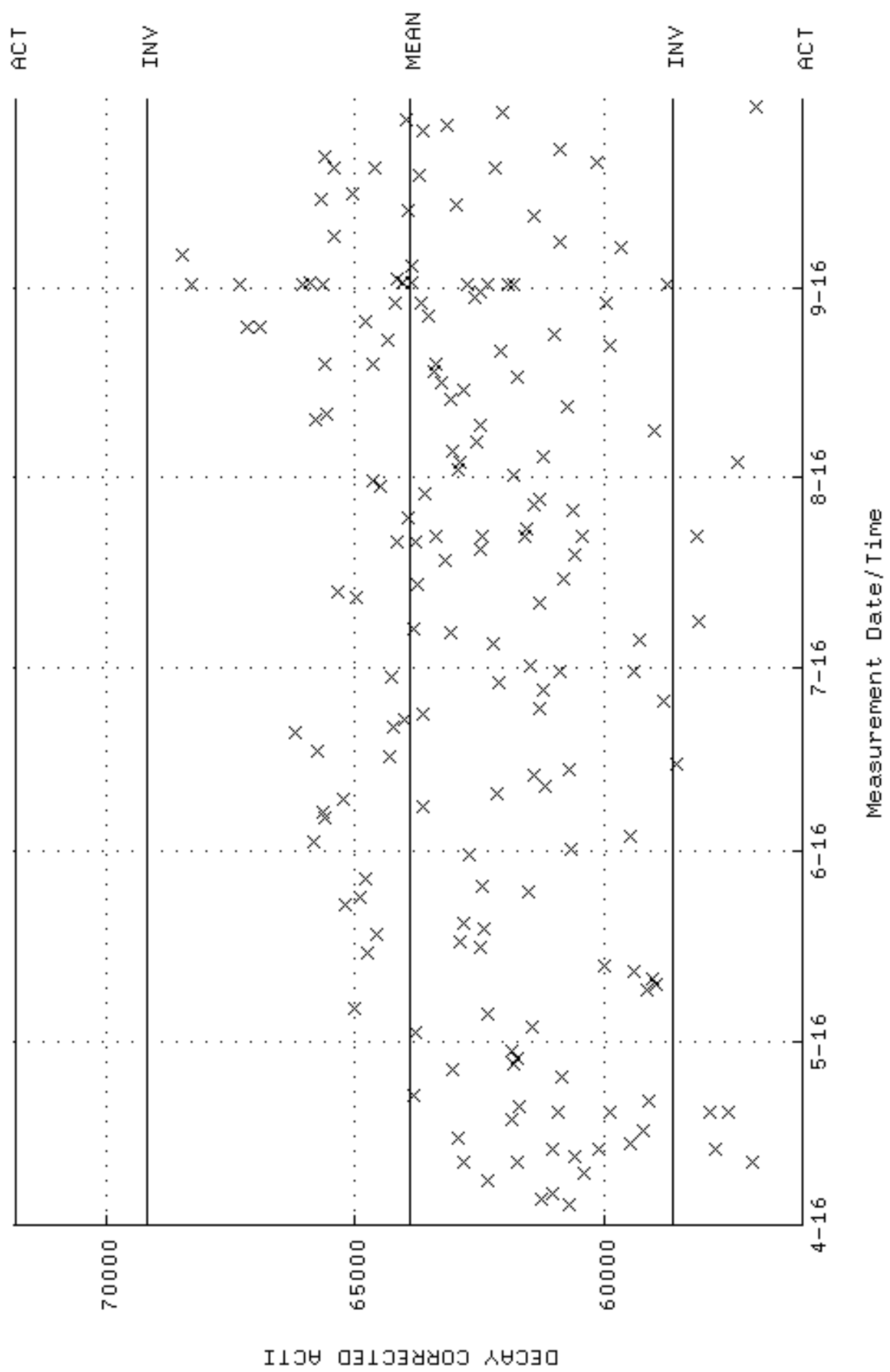
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM32_CAN_QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:14:08 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



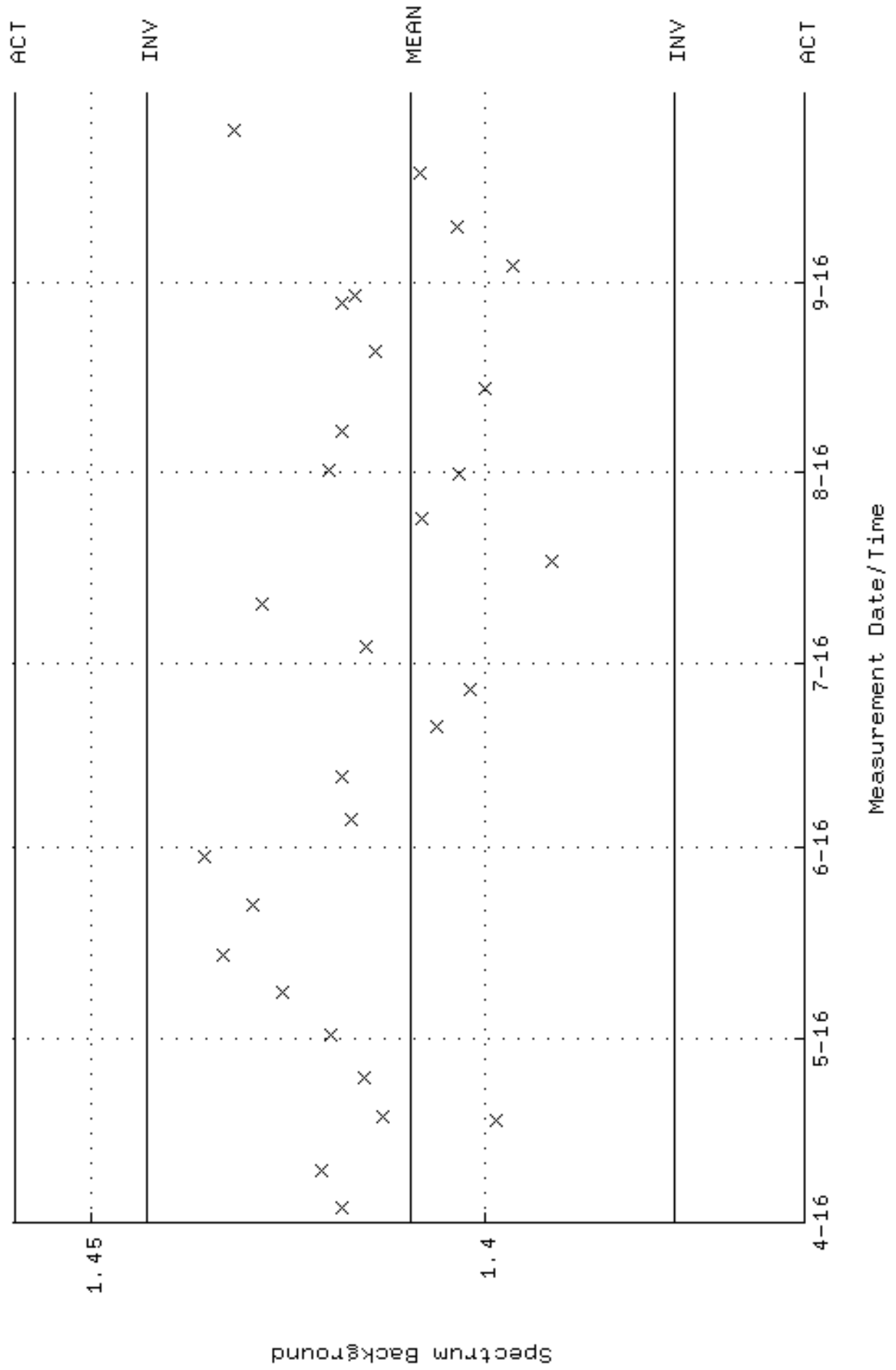
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM32_CAN_QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:14:08 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.09494 +- 3.883722E-02 (3.55 %)



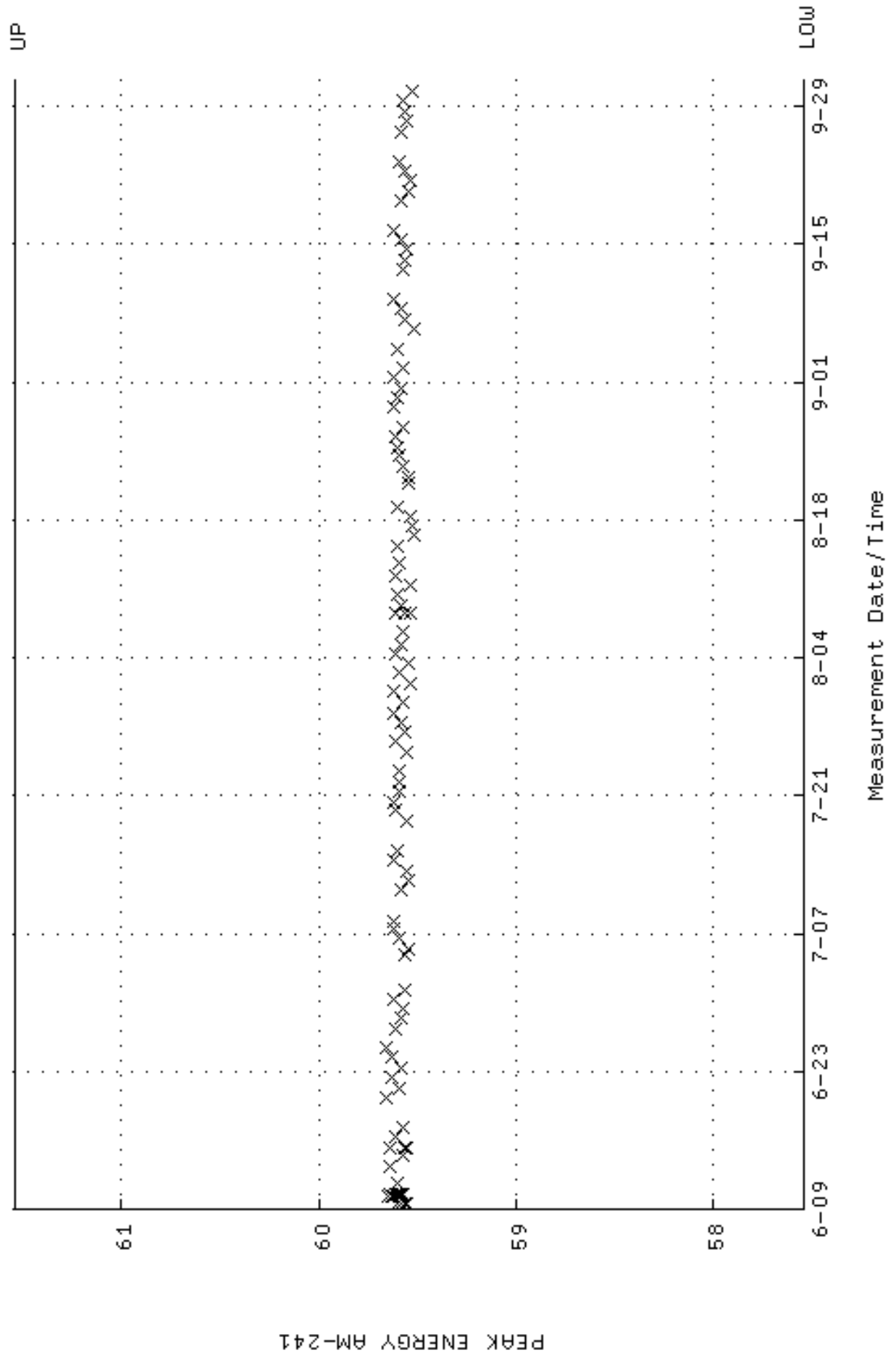
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM32_CAN.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:14:08 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 63906.6 +- 2634.05 (4.12 %)



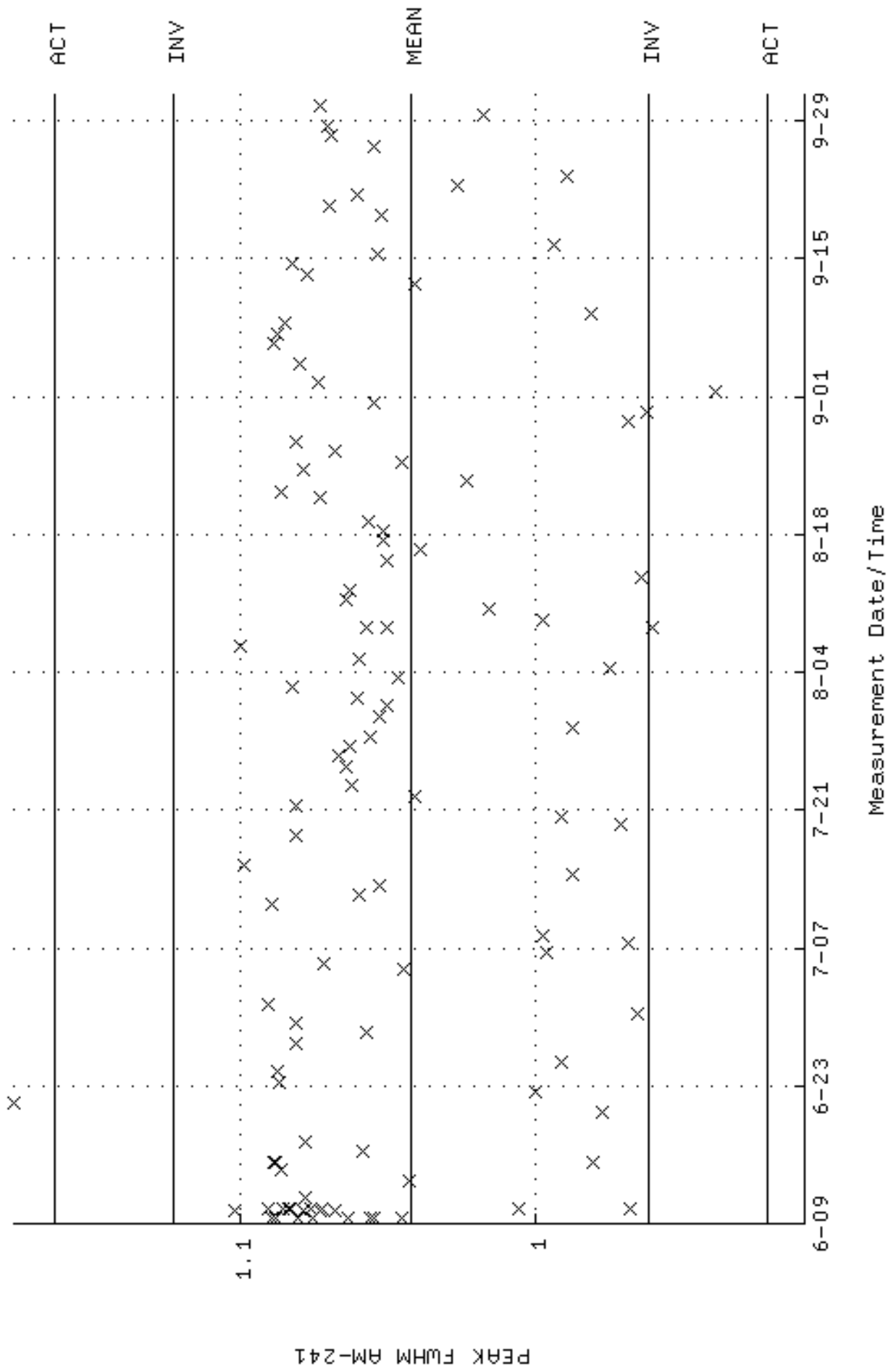
QA filename : DKA100:[CANTERRA.GAMMA.SCUSR.QA]LBC_GAM32.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:19:59 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.40960 +- 1.667514E-02 (1.18 %)



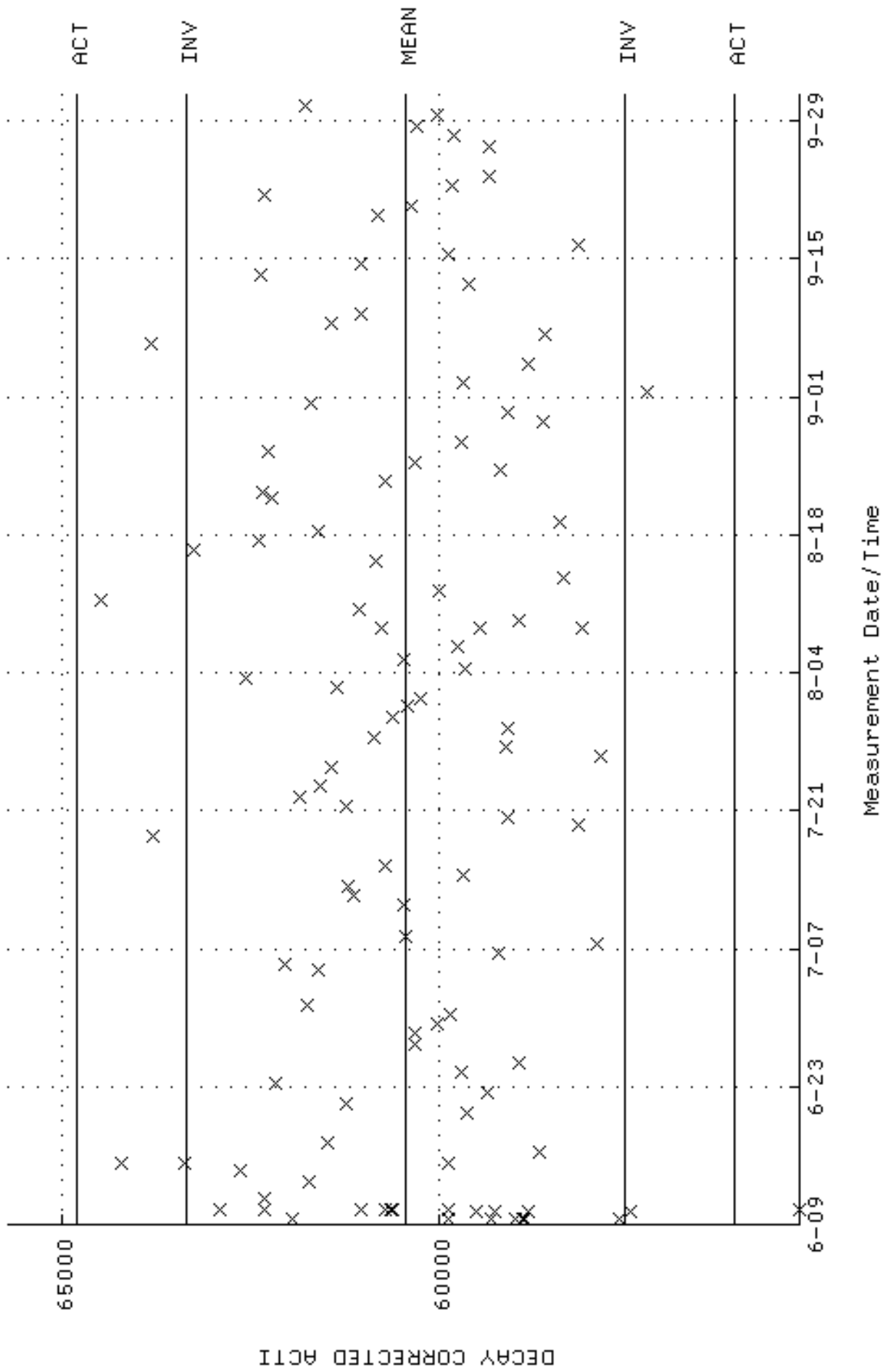
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM33_CAN_QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 9-JUN-2016 11:42:11 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



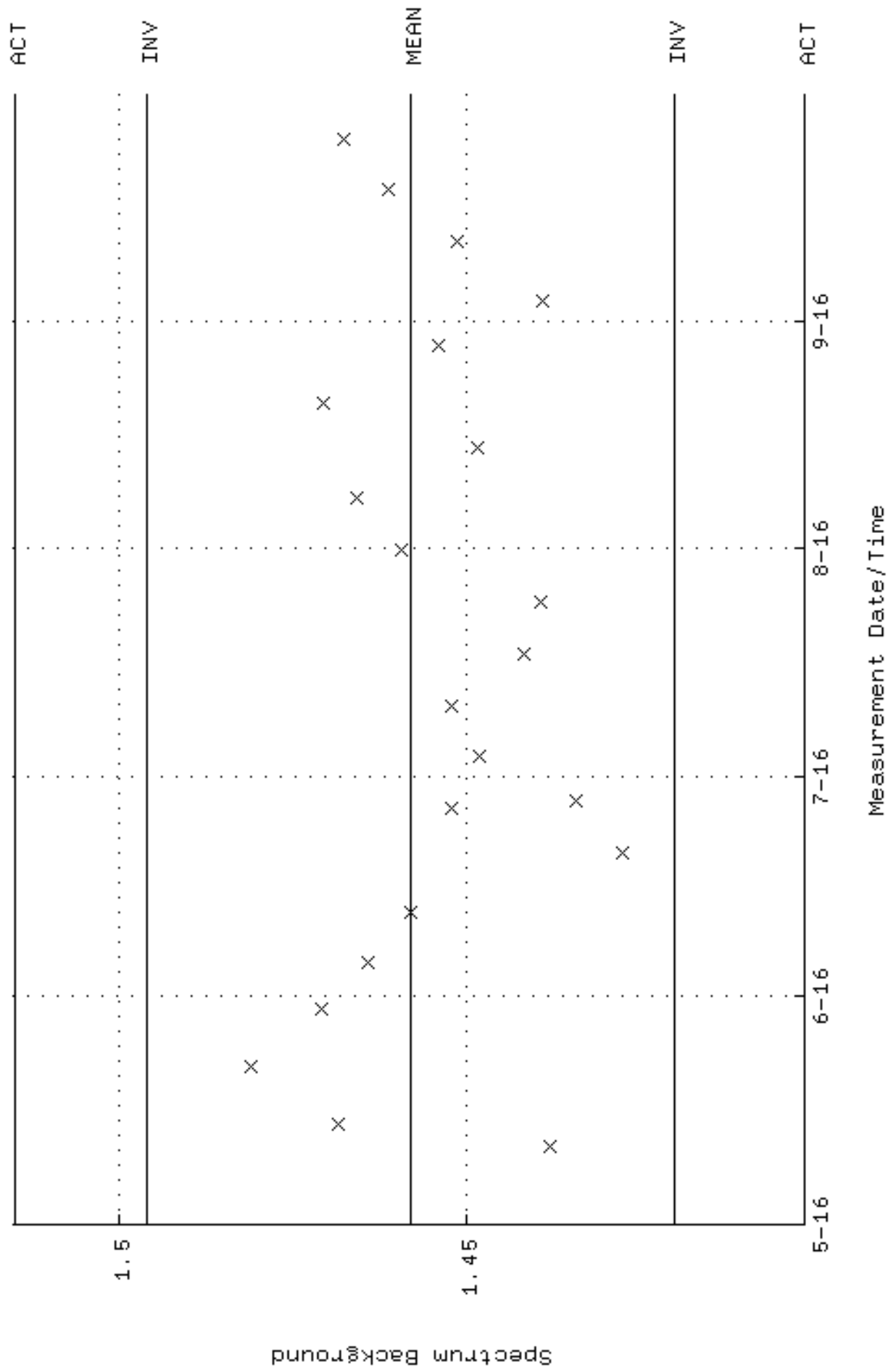
QA filename : DKA100:[CANTERRA,GAMMA,SCUSR,QA]QCC_GAM33_CAN_QAF;1
 Parameter Name : PSFVHM-59 (PEAK FWHM AM-241)
 Start/End Dates : 9-JUN-2016 11:42:11 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.04259 +- 4.028326E-02 (3.86 %)



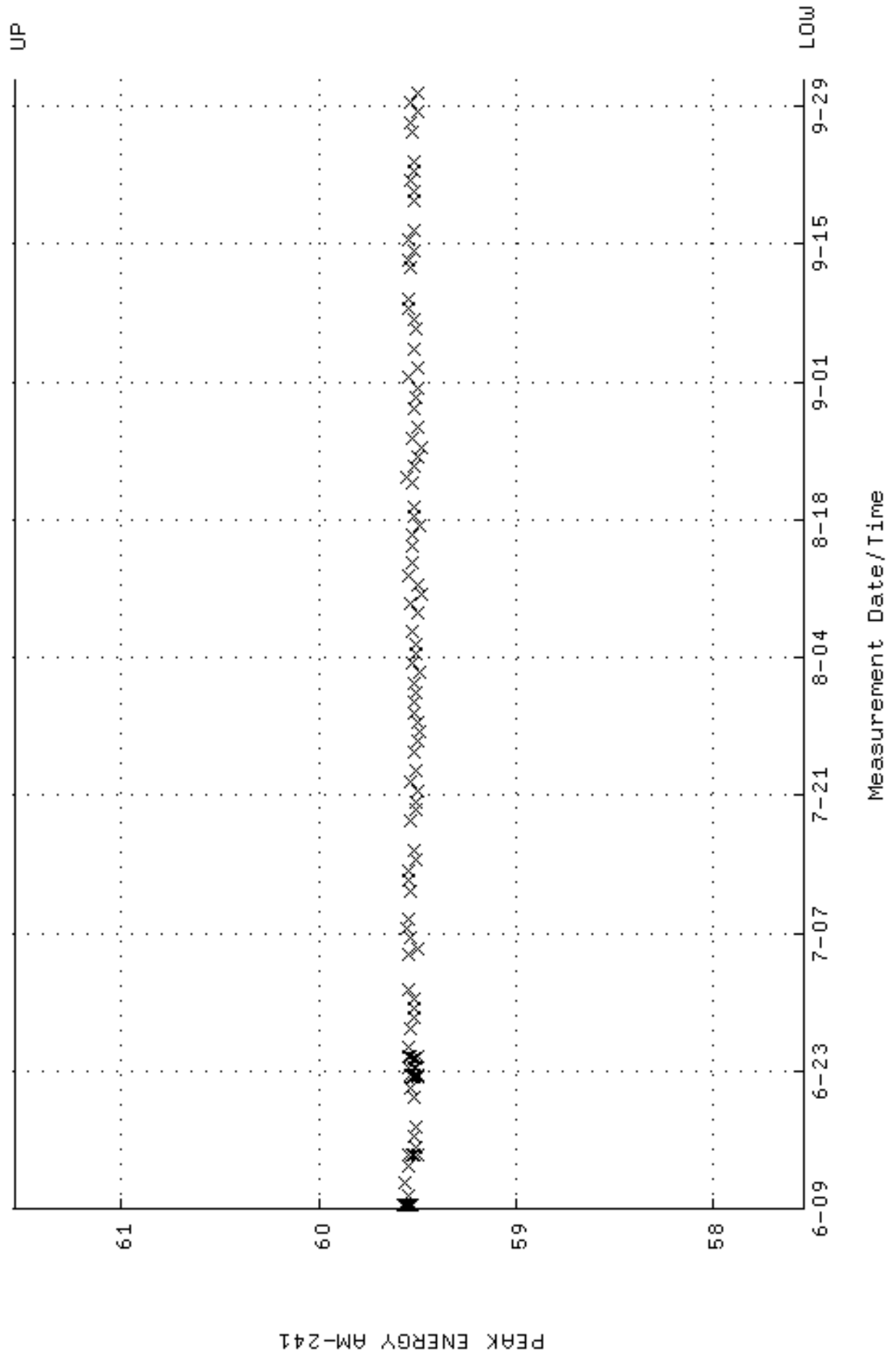
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM33_CAN_QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 9-JUN-2016 11:42:11 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 60458.0 +- 1456.56 (2.41 %)



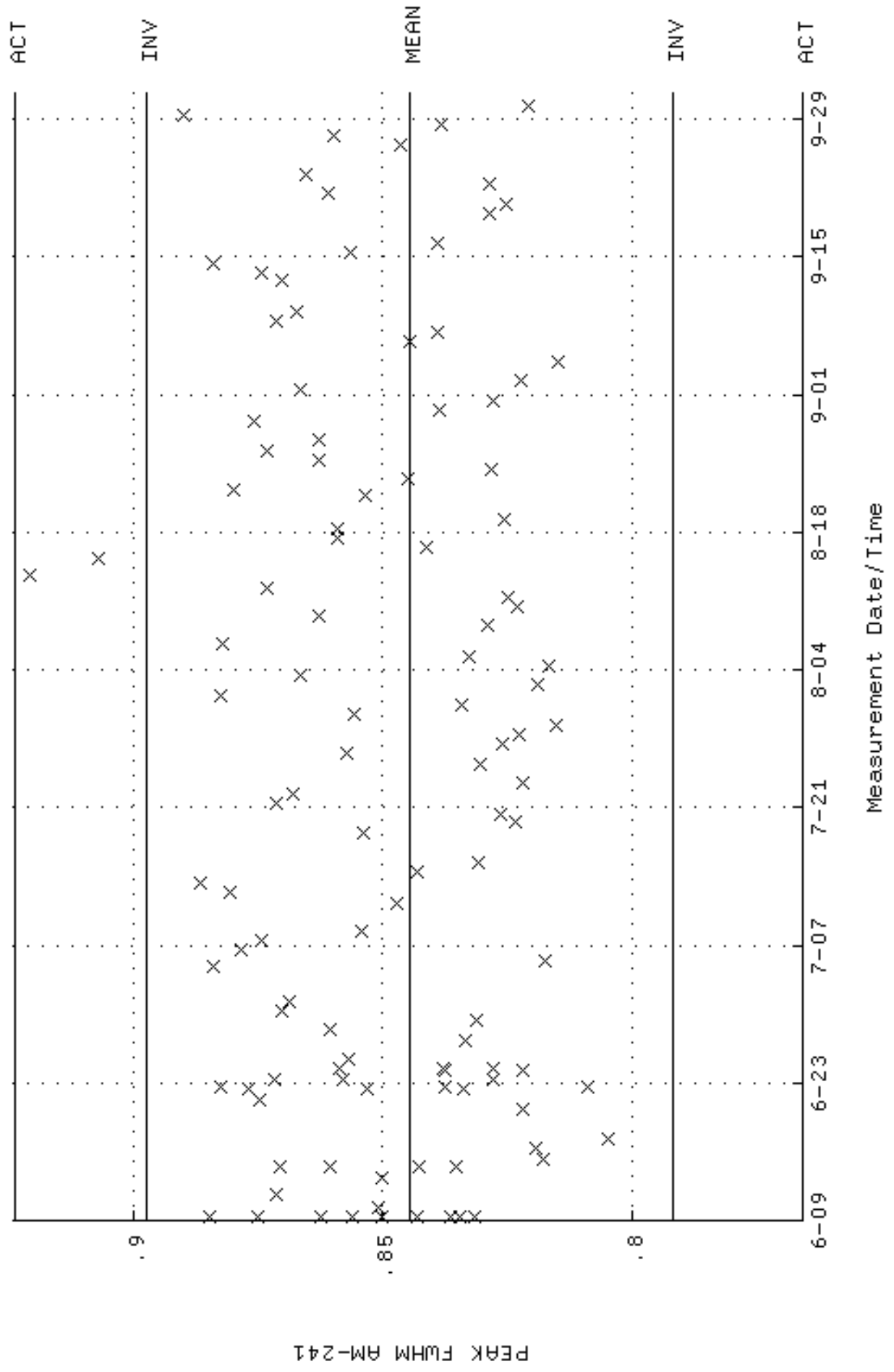
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]LBC_GAM33.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 11-MAY-2016 13:17:48 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.45809 +- 1.896396E-02 (1.30 %)



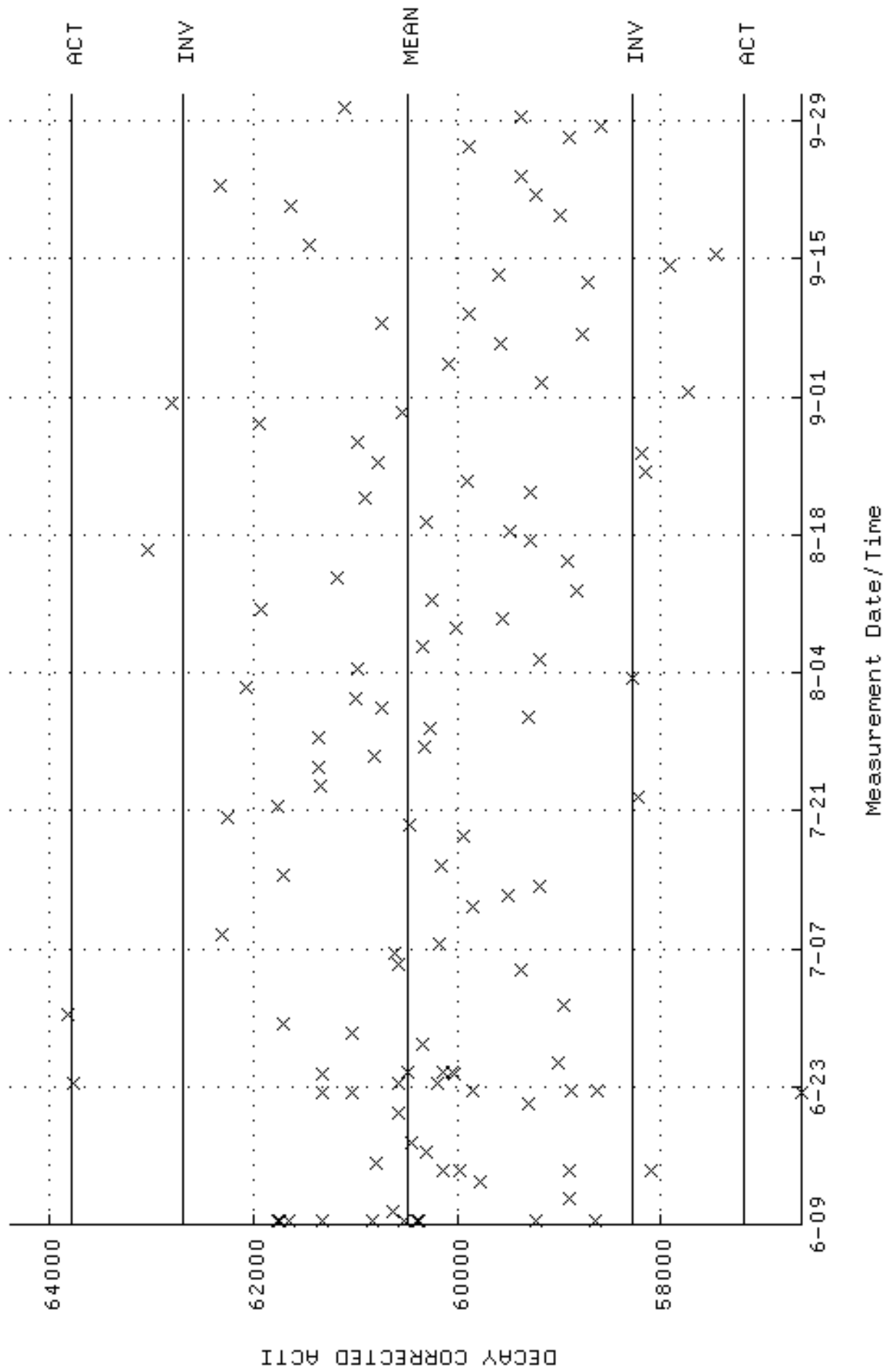
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM36_CAN_QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 9-JUN-2016 07:47:51 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



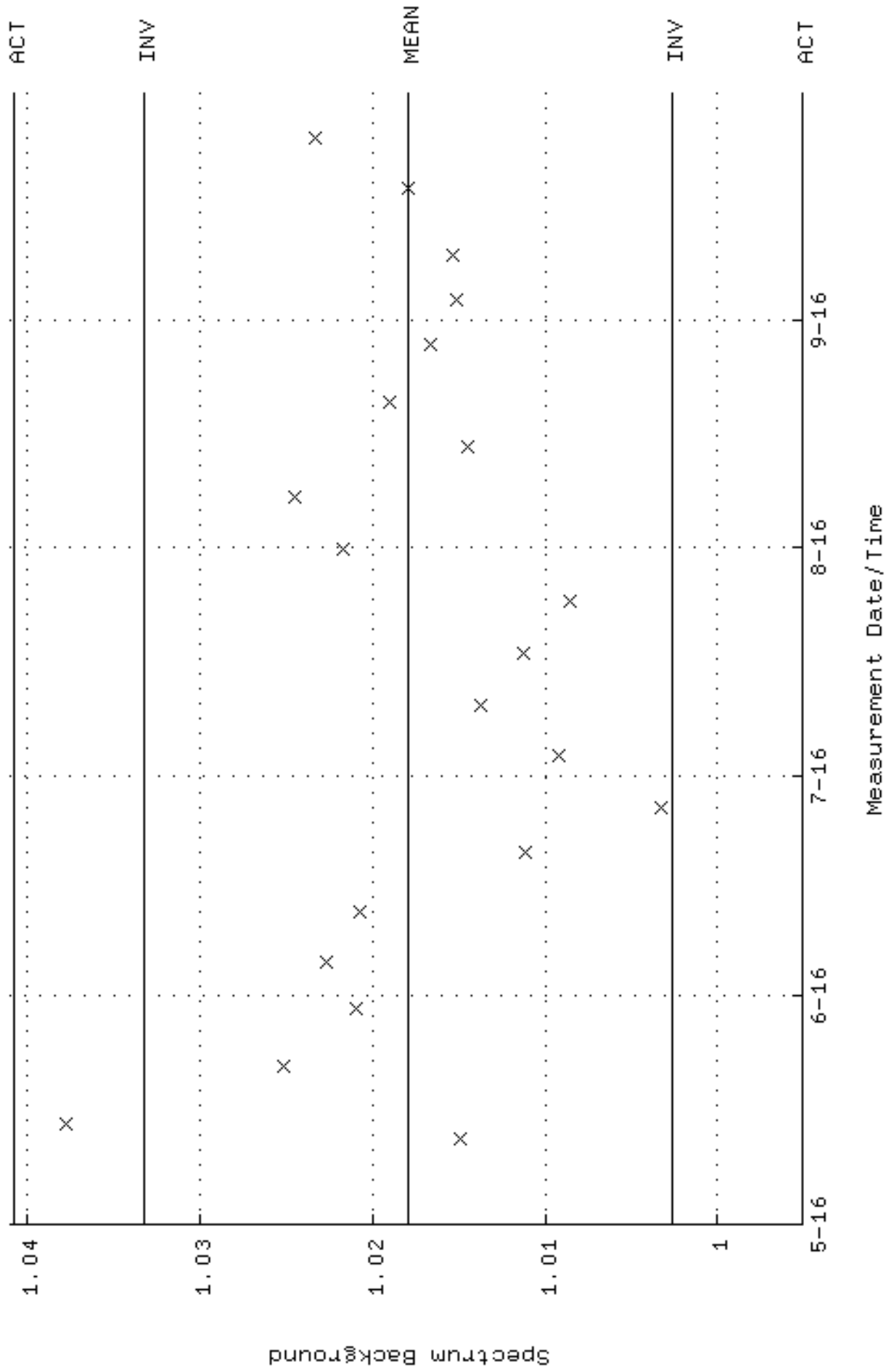
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM36_CAN_QAF;1
 Parameter Name : PSFVHM-59 (PEAK FWHM AM-241)
 Start/End Dates : 9-JUN-2016 07:47:51 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 0.844768 +- 2.631886E-02 (3.12 %)



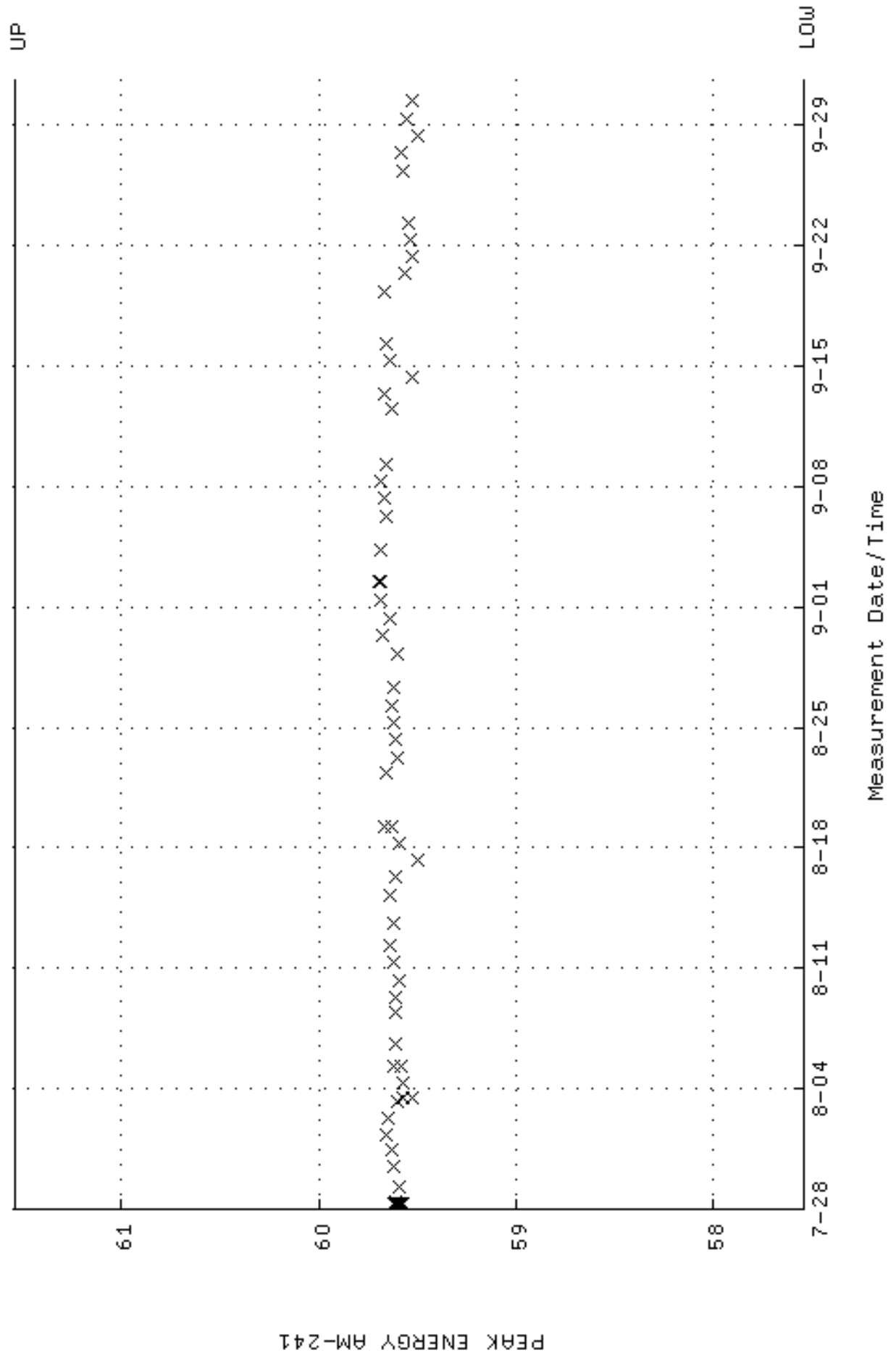
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM36_CAN_QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 9-JUN-2016 07:47:51 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 60493.6 +- 1102.76 (1.82 %)



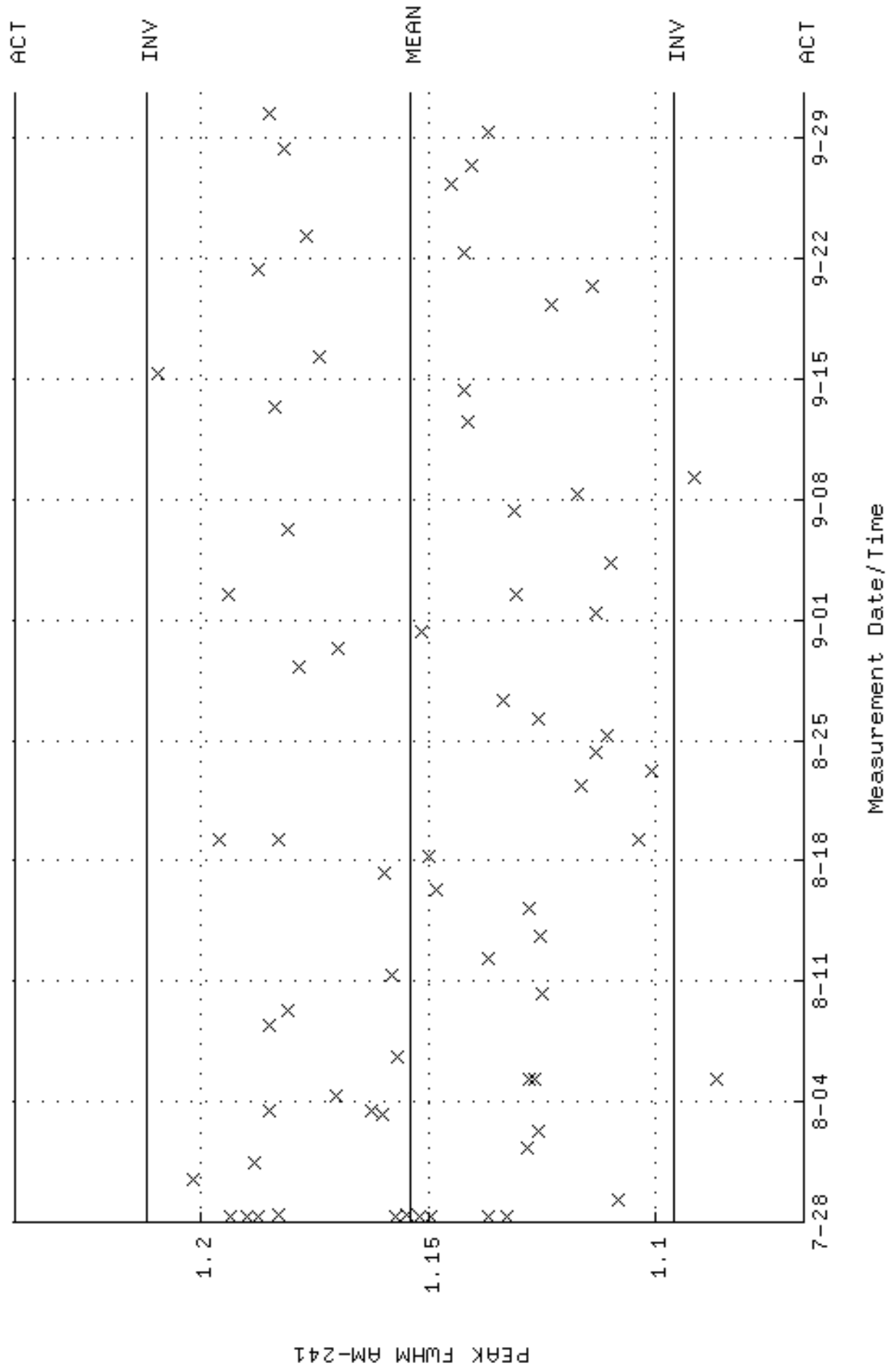
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM36.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 12-MAY-2016 13:49:58 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.01797 +- 7.627347E-03 (0.75 %)



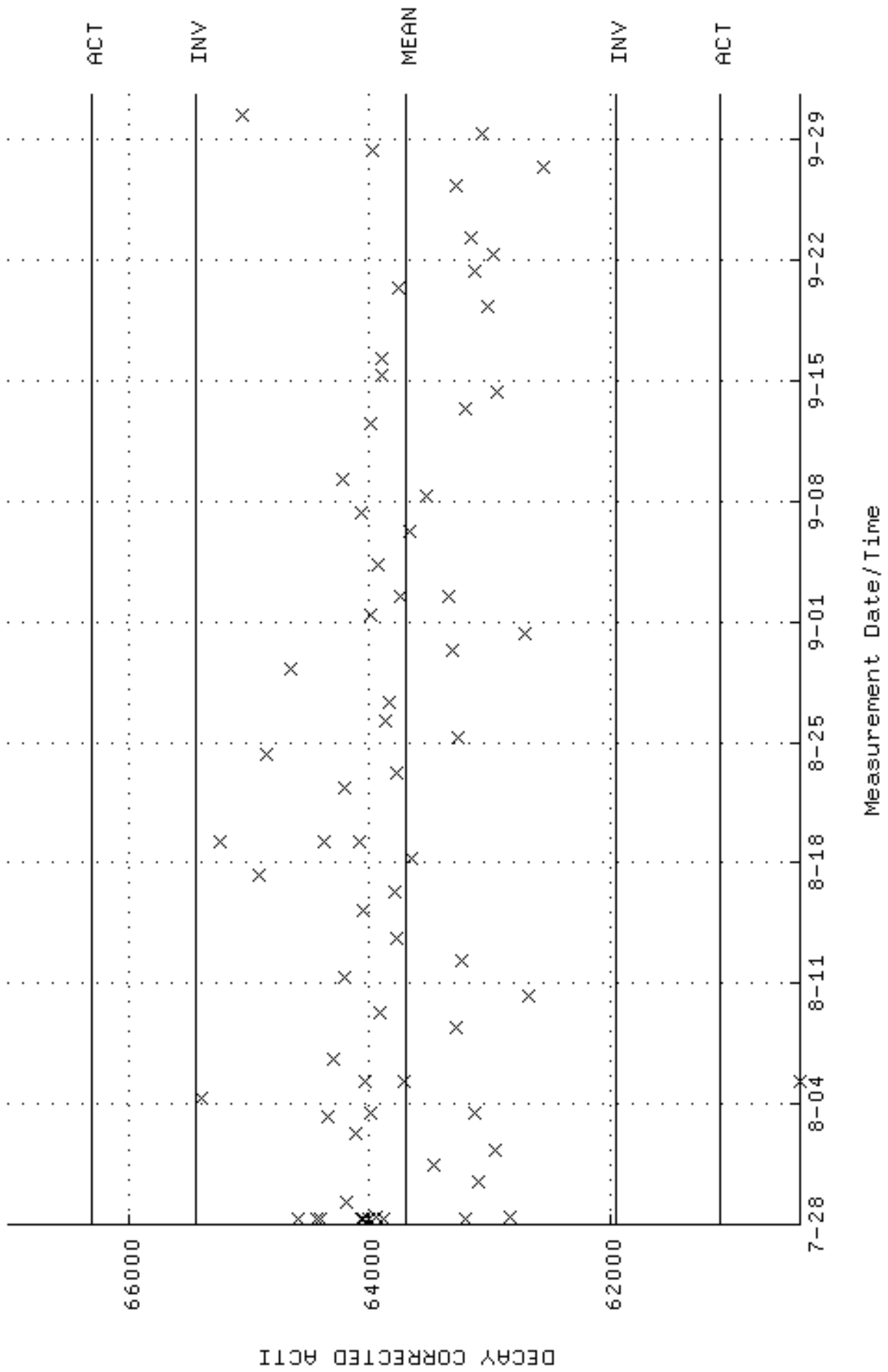
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM39_CAN_QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 28-JUL-2016 07:23:30 through 1-OCT-2016 12:00:00
 Lower/Upper Lmts: 57.5400 through 61.5400



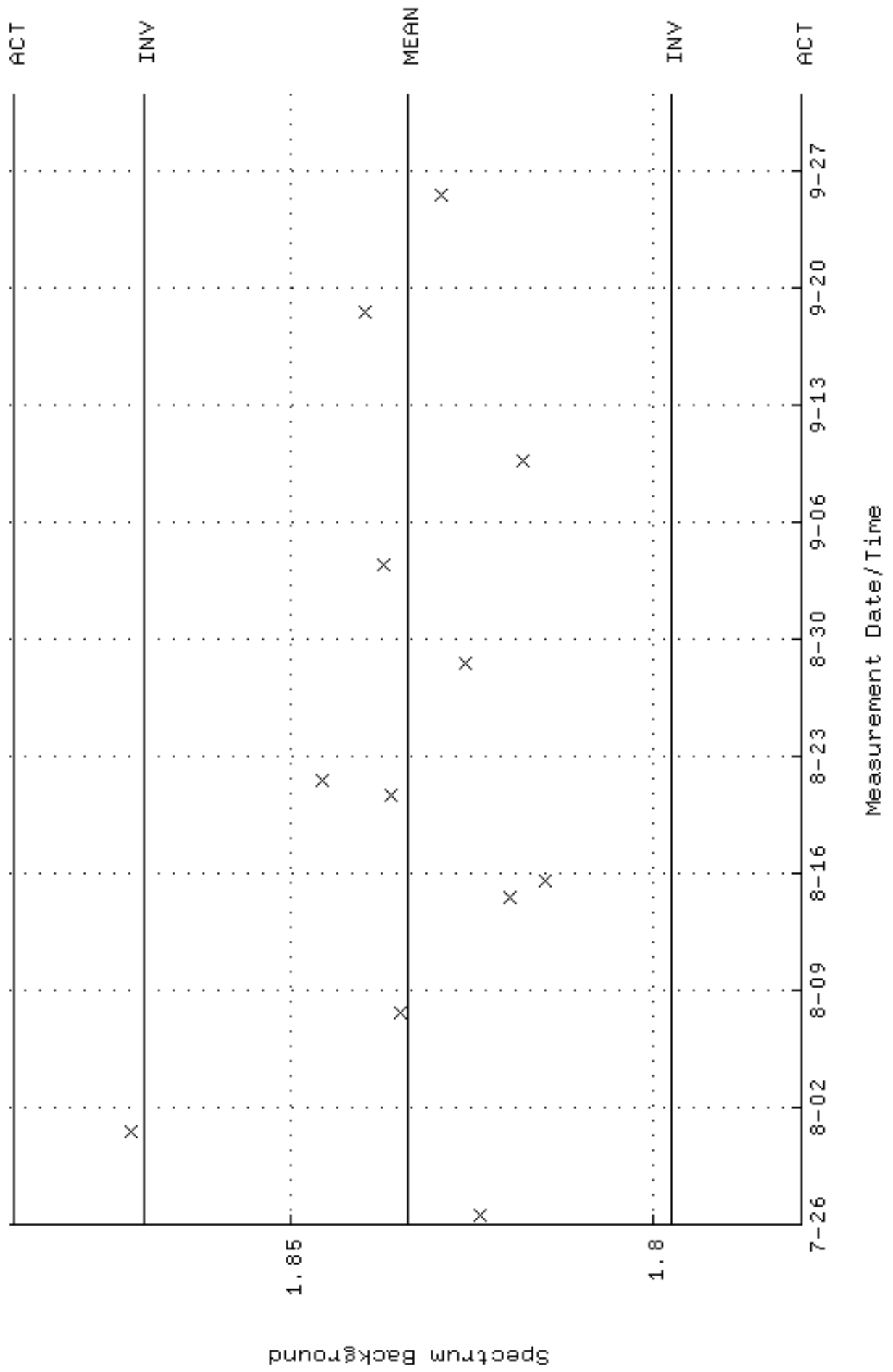
QA filename : DKA100:[CANTERRA,GAMMA,SCUSR,QA]QCC_GAM39_CAN.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 28-JUL-2016 07:23:30 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.15408 +- 2.882958E-02 (2.50 %)



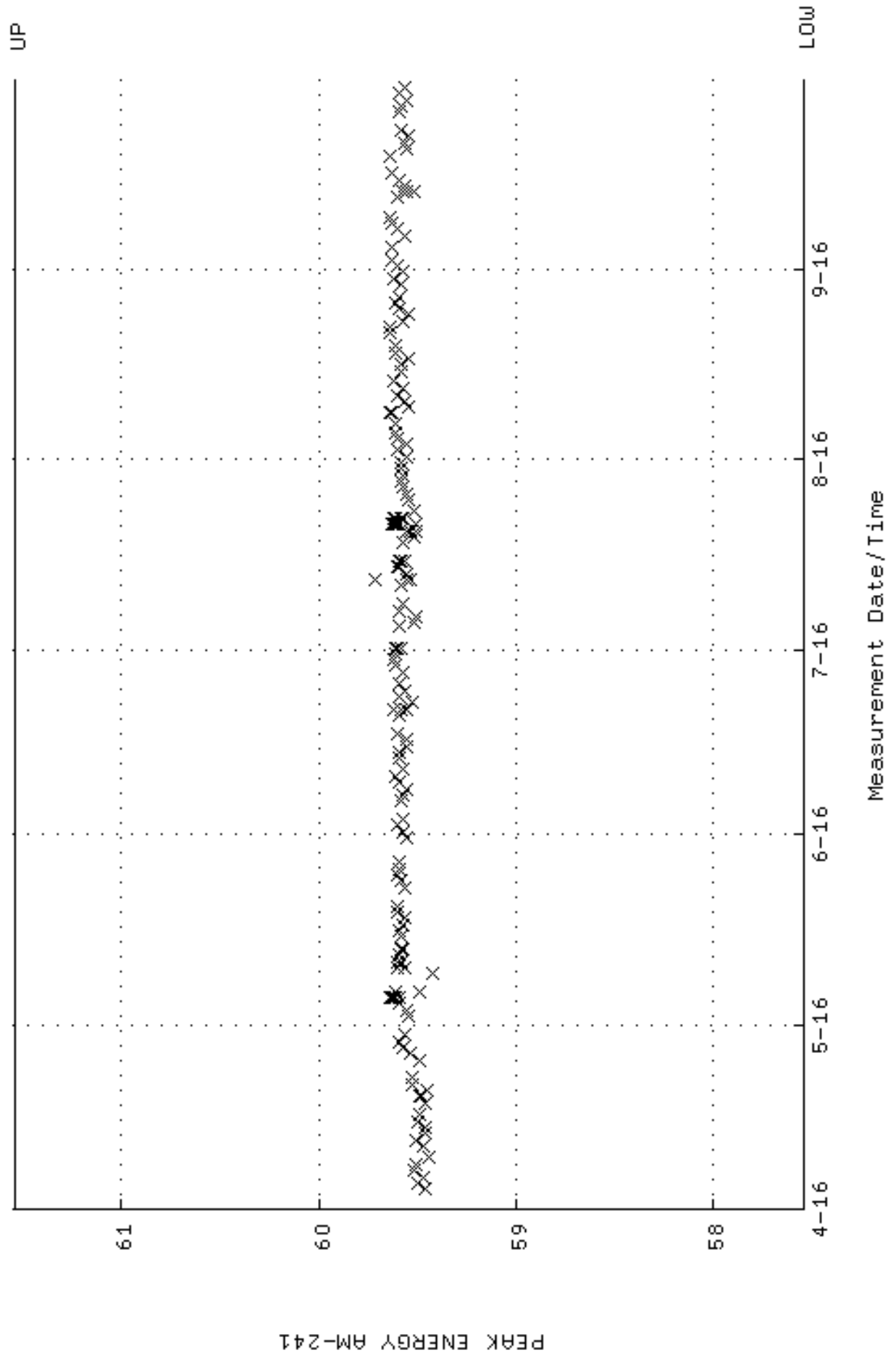
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM39_CAN_QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 28-JUL-2016 07:23:30 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 63705.5 +- 872.341 (1.37 %)



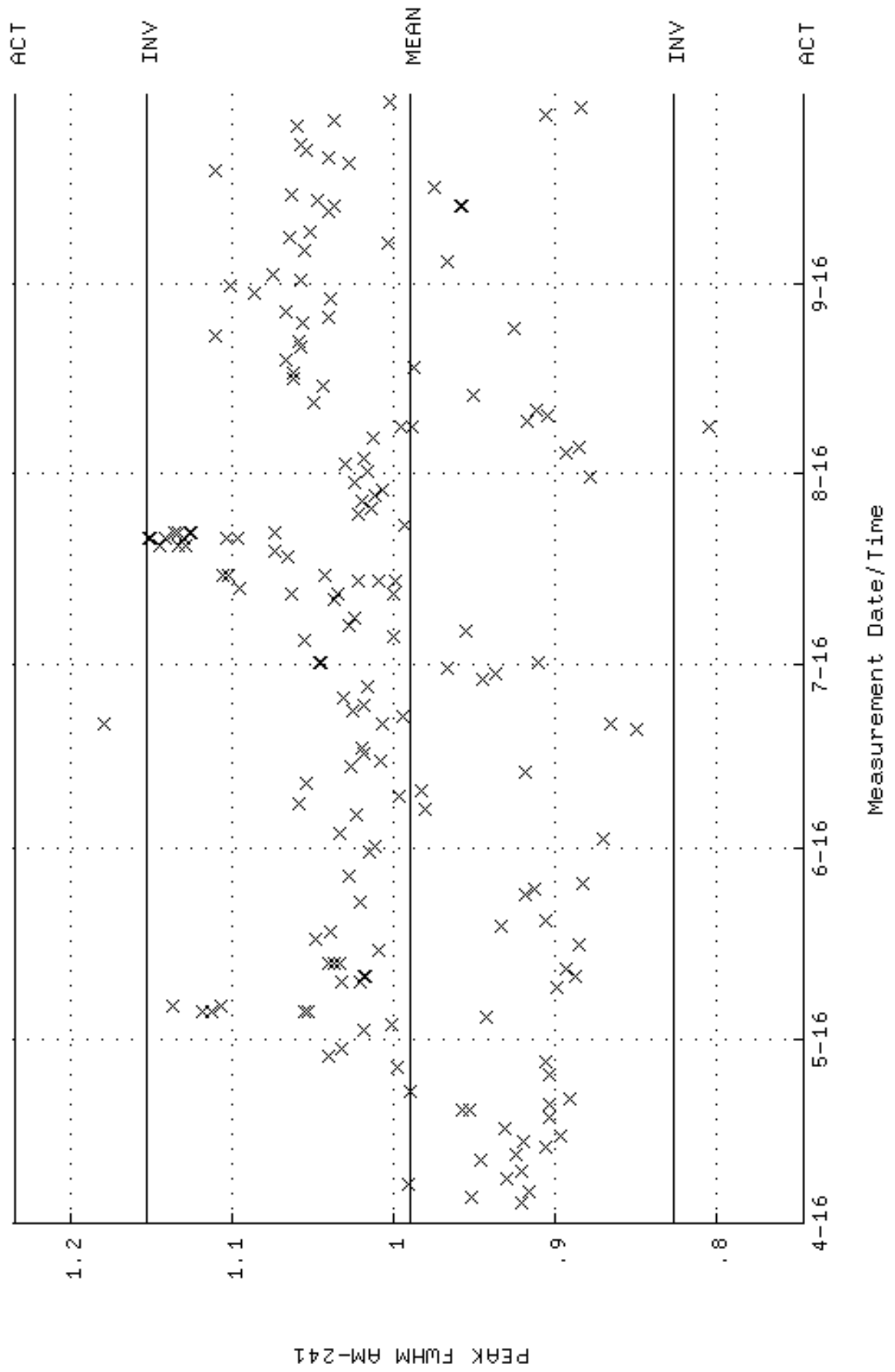
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM39.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 26-JUL-2016 14:23:41 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.83408 +- 1.817269E-02 (0.99 %)



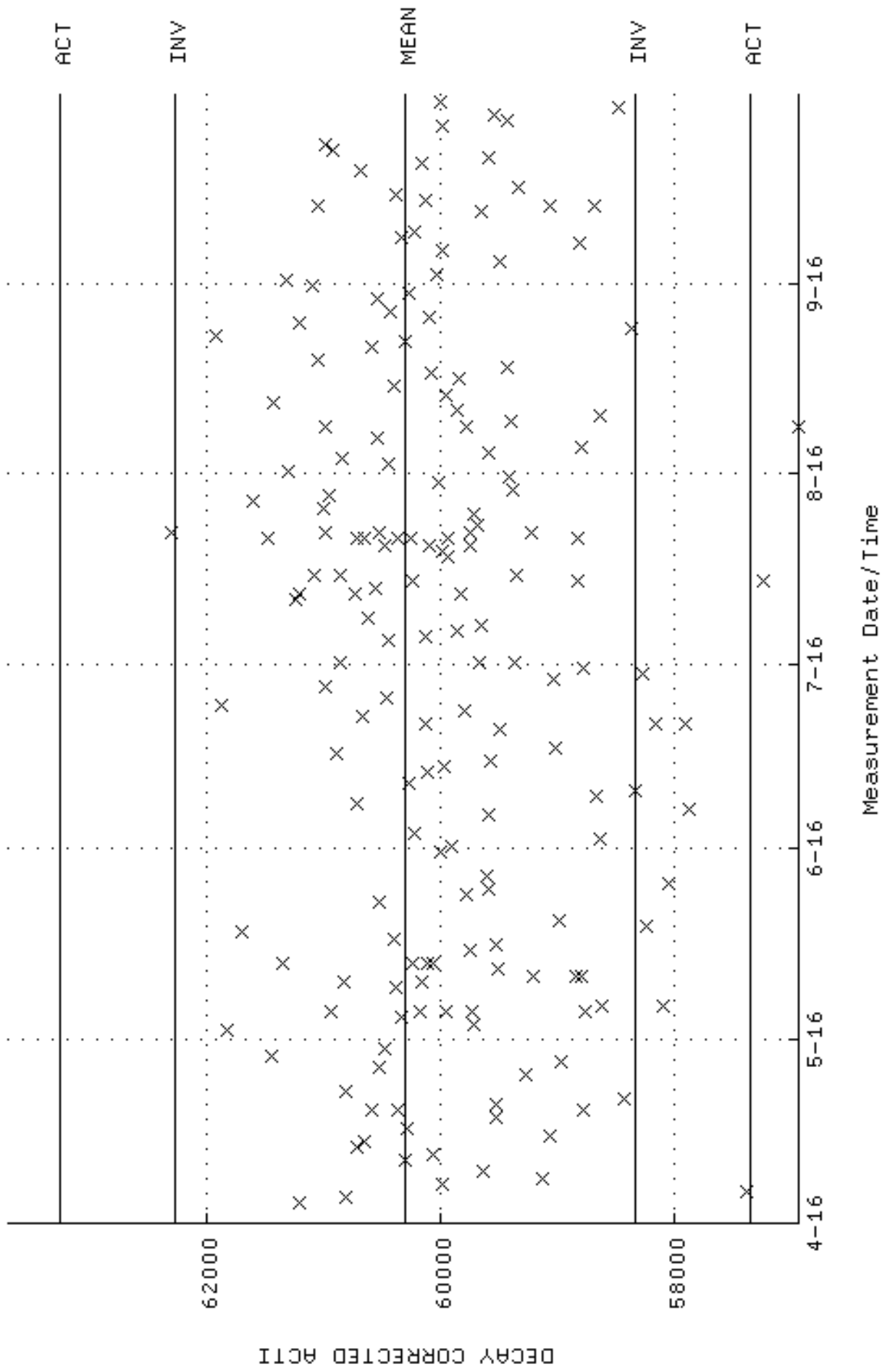
QA filename : DKA100:[CANSBERRA.GAMMA.SCUSR.QA]QCC_GAM41_CAN.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:14:13 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



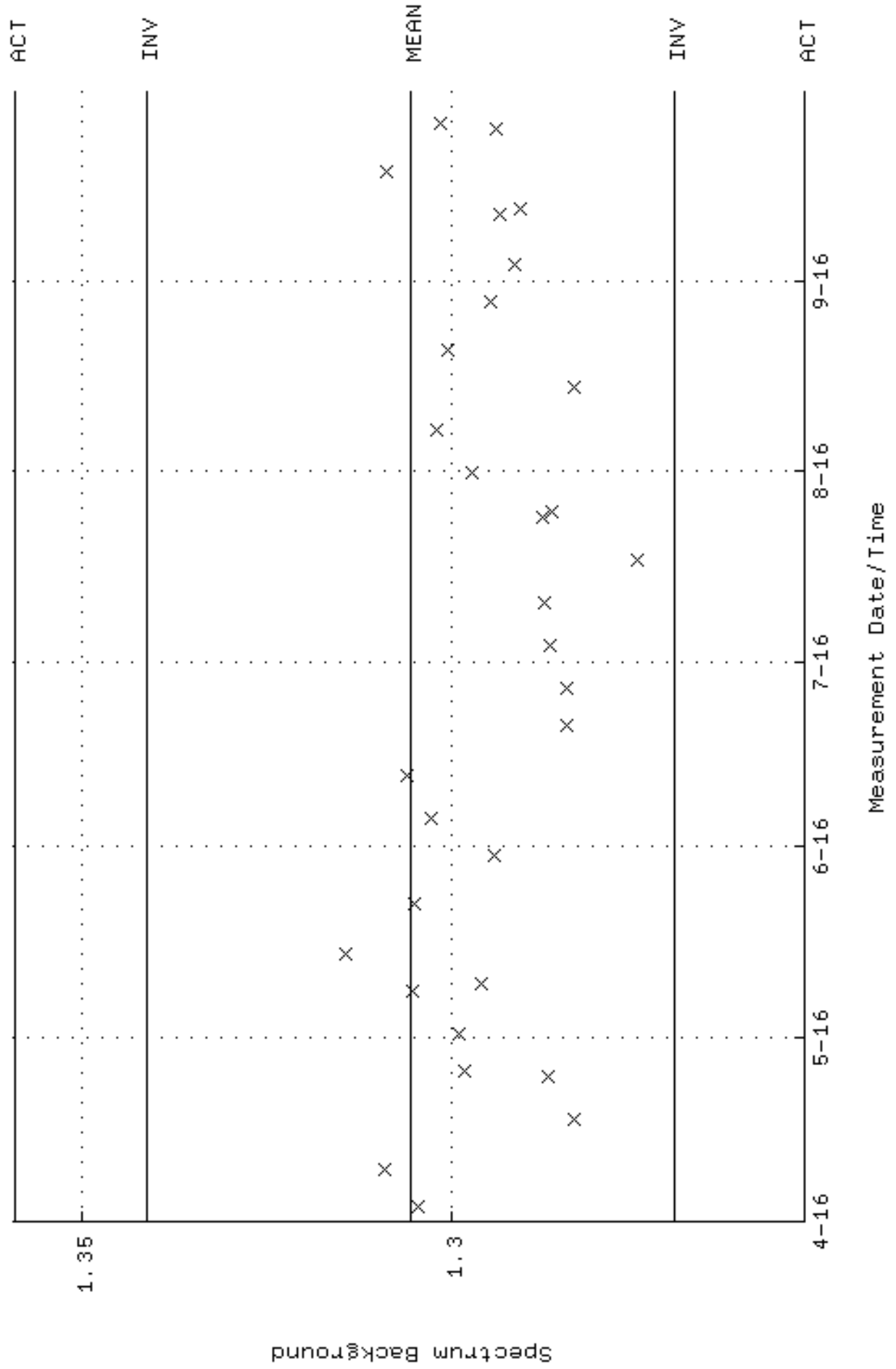
QA filename : DKA100:[CANTERRA,GAMMA,SCUSR,QA]QCC_GAM41_CAN.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:14:13 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 0.990192 +- 8.157611E-02 (8.24 %)



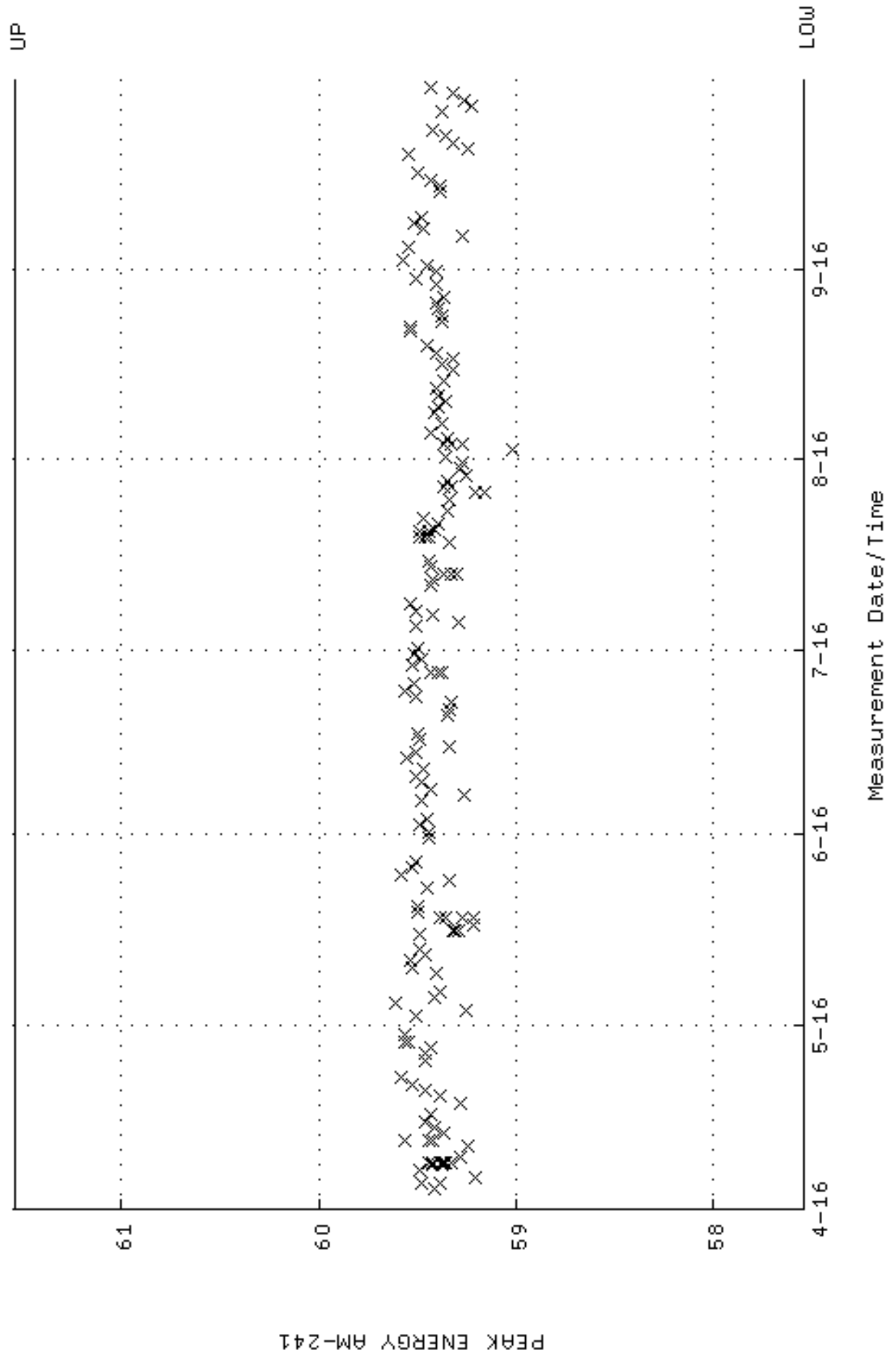
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM41_CAN.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:14:13 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 60310.9 +- 980.348 (1.63 %)



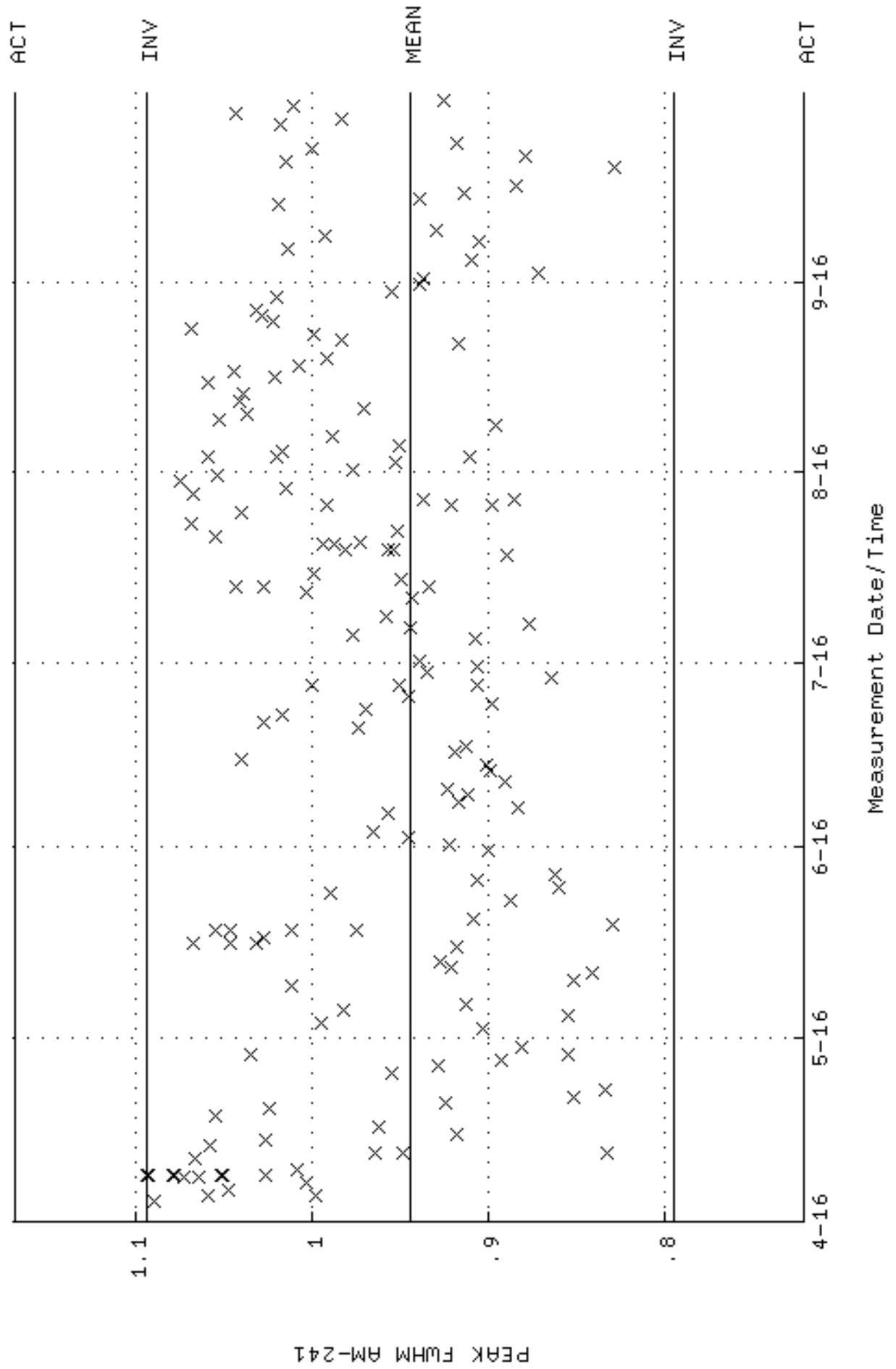
QA filename : DKA100:[CANTERRA.GAMMA.SCUSR.QA]LBC_GAM41.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:20:11 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.30554 +- 1.779819E-02 (1.36 %)



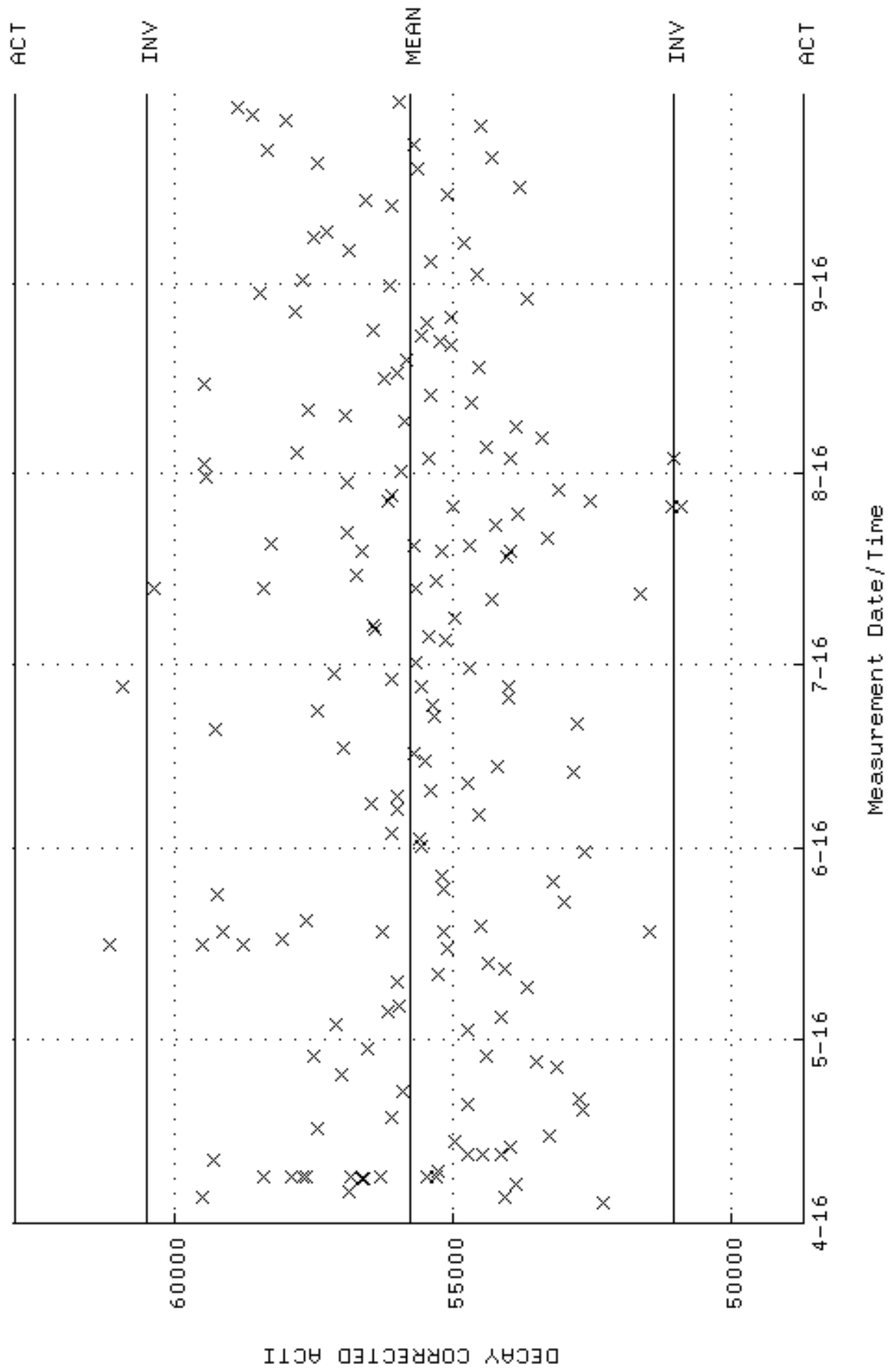
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM43_JAR.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:40:21 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



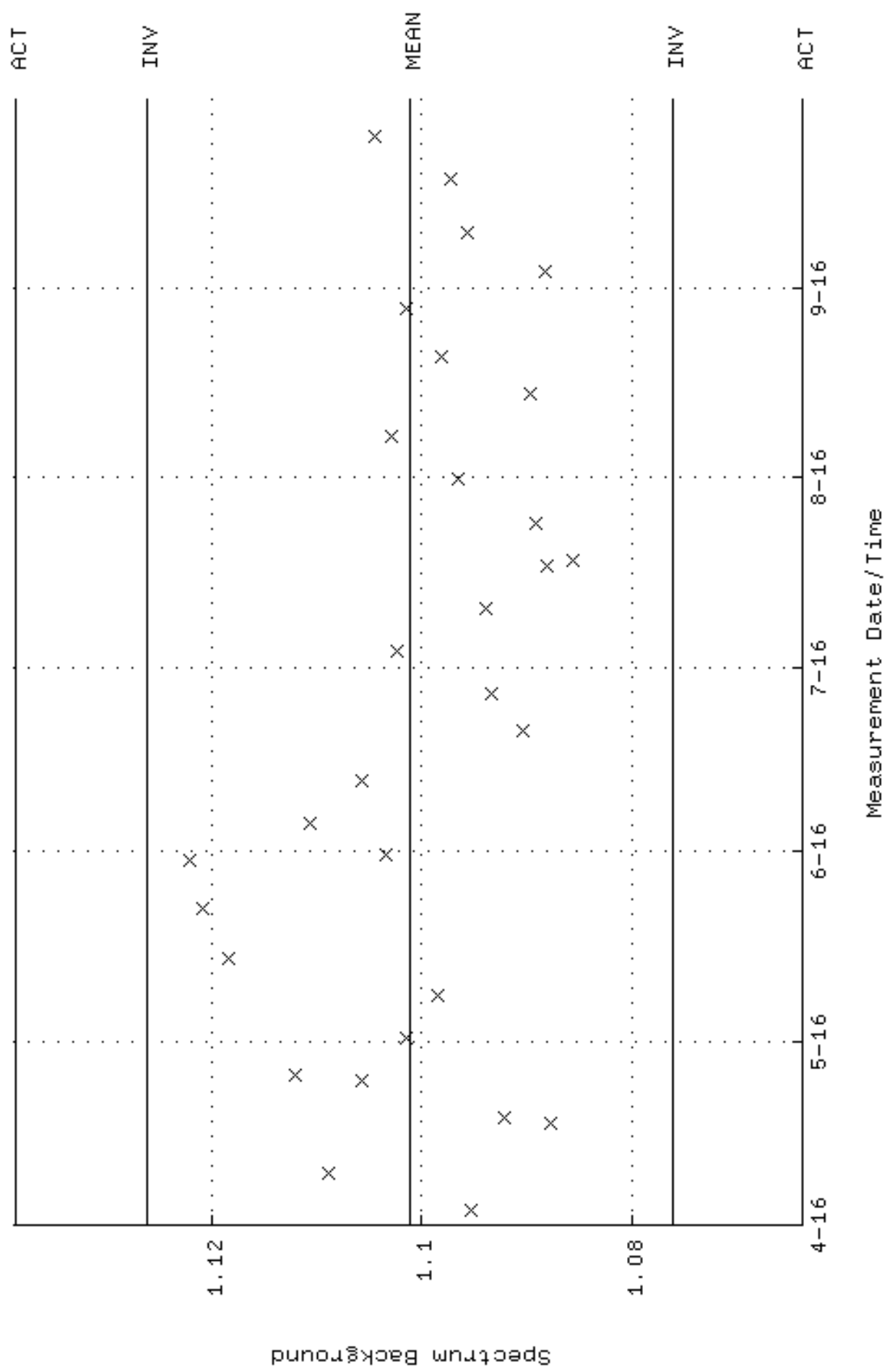
QA filename : DKA100:[CANTBERRA,GAMMA,SCUSR,QA]QCC_GAM43_JAR.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:40:21 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 0.944669 +- 7.461934E-02 (7.90 %)



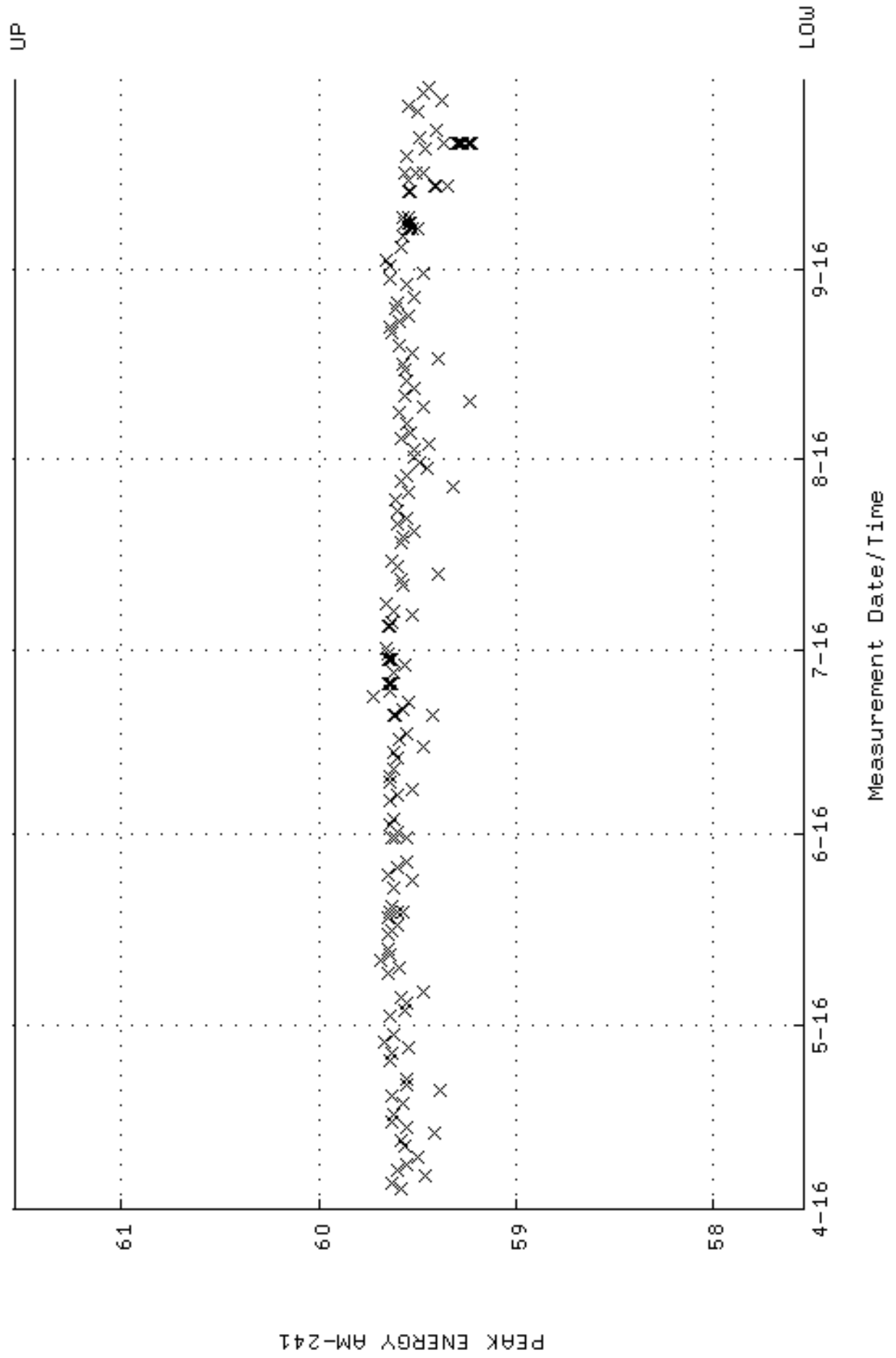
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM43_JAR.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:40:21 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 55780.6 +- 2366.70 (4.24 %)



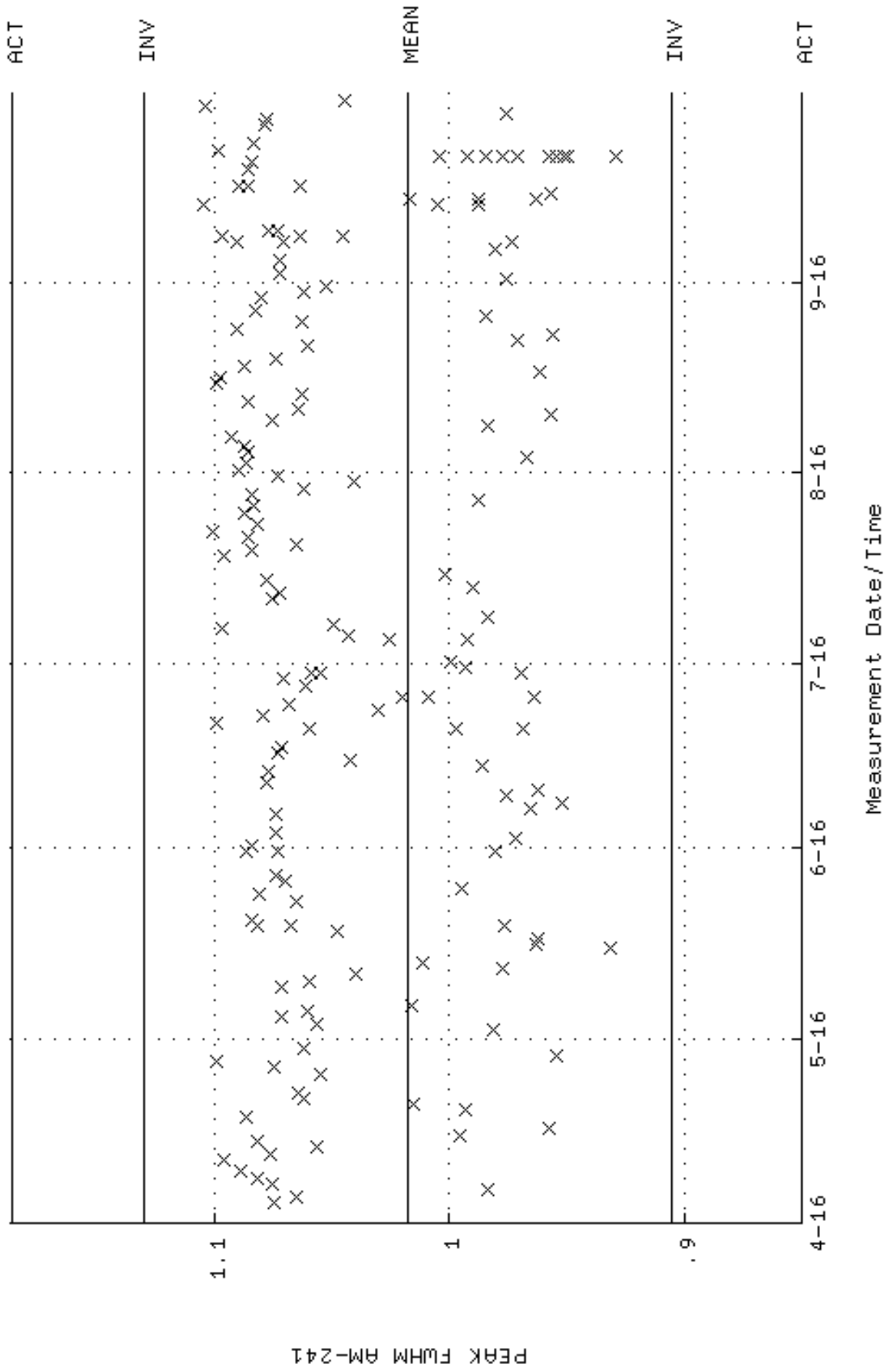
QA filename : DKA100:[CANSERRA.GAMMA.SCUSR.QA]LBC_GAM43.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:20:16 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.10118 +- 1.247801E-02 (1.13 %)



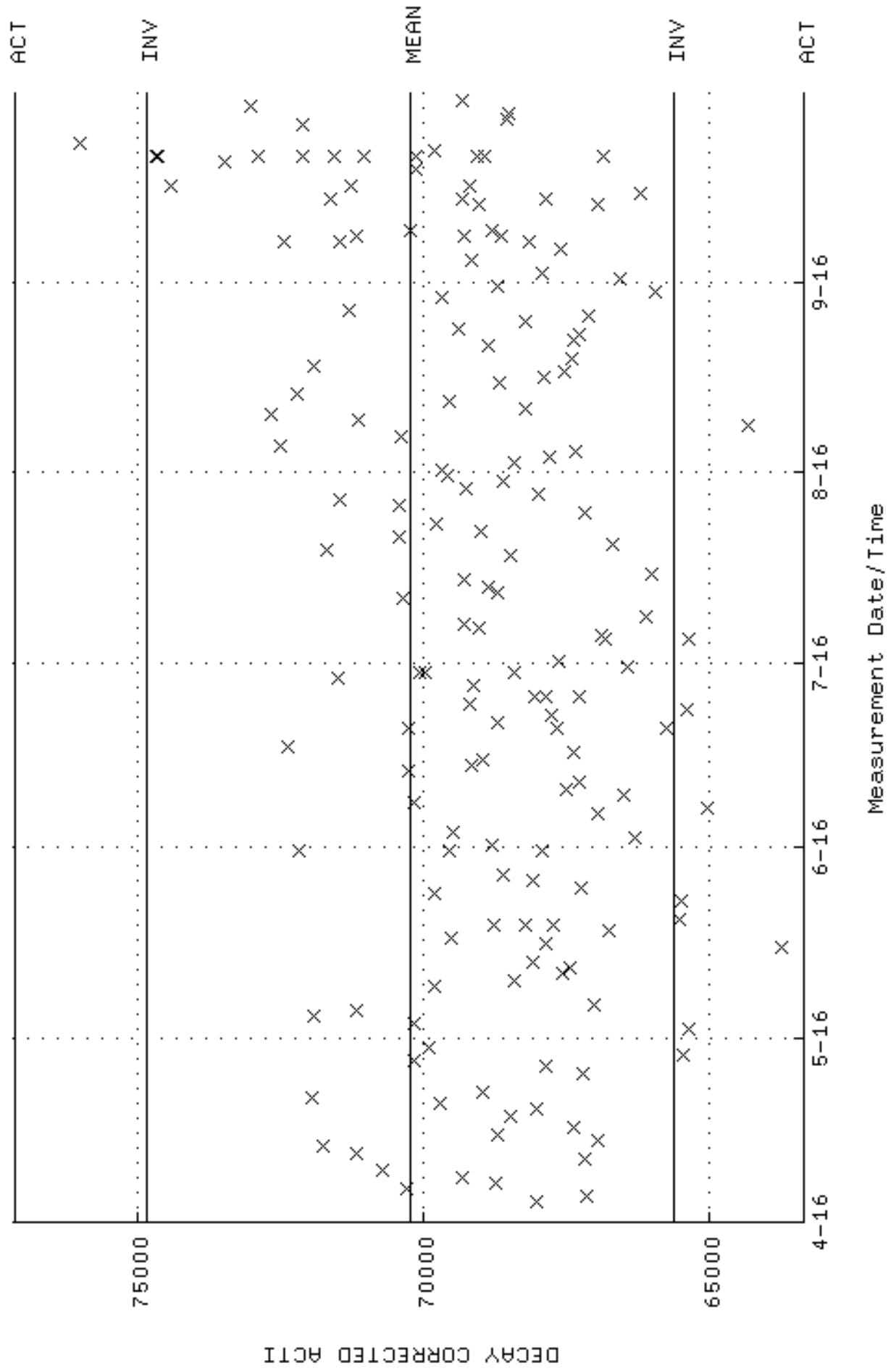
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_GAM44_CAN_QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-APR-2016 06:24:53 through 1-OCT-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



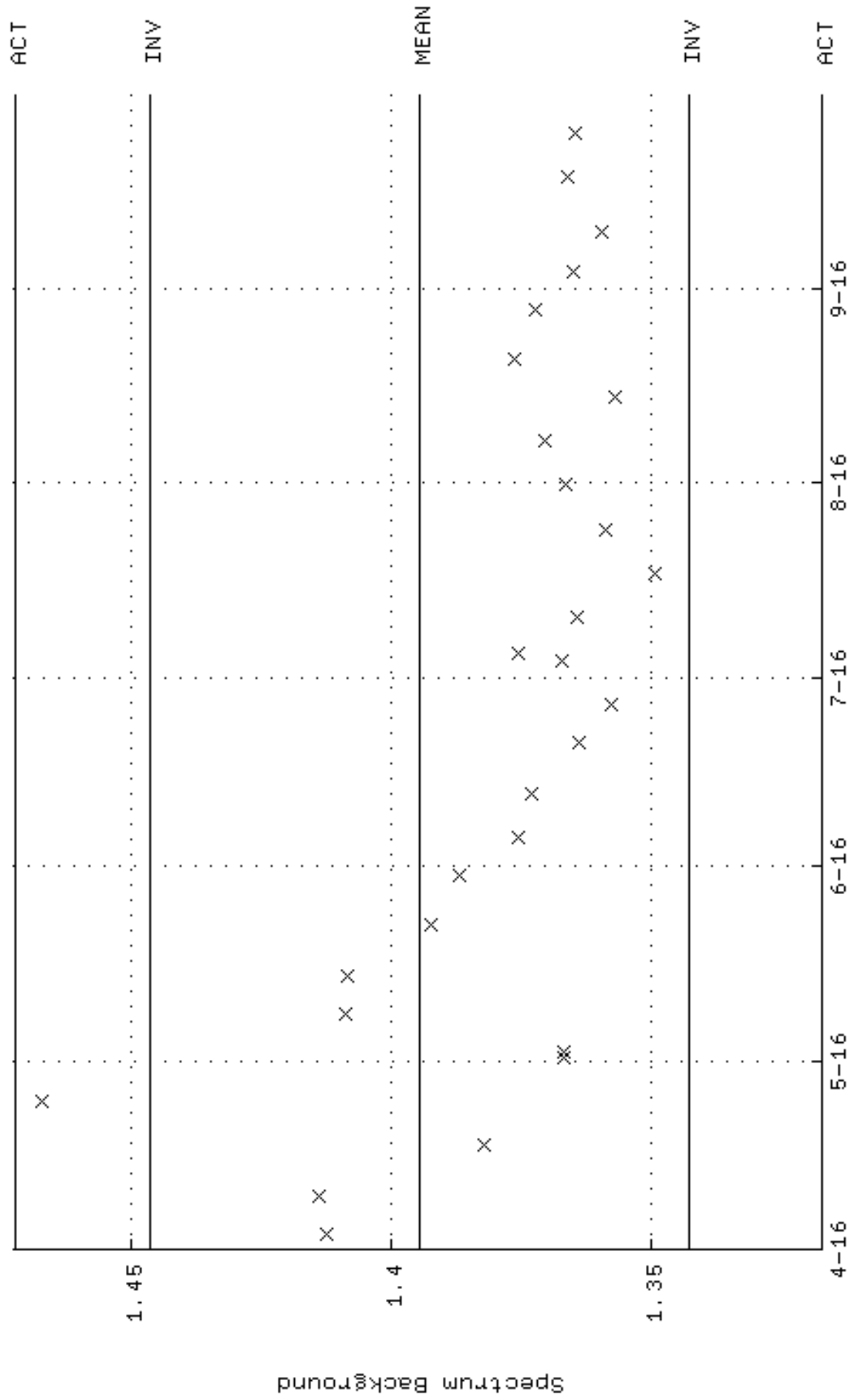
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]QCC_GAM44_CAN.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 4-APR-2016 06:24:53 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.01810 +- 5.609688E-02 (5.51 %)



QA filename : DKA100:[CANSBERRA.GAMMA.SCUSR.QA]QCC_GAM44_CAN.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-APR-2016 06:24:53 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 70239.6 +- 2304.17 (3.28 %)

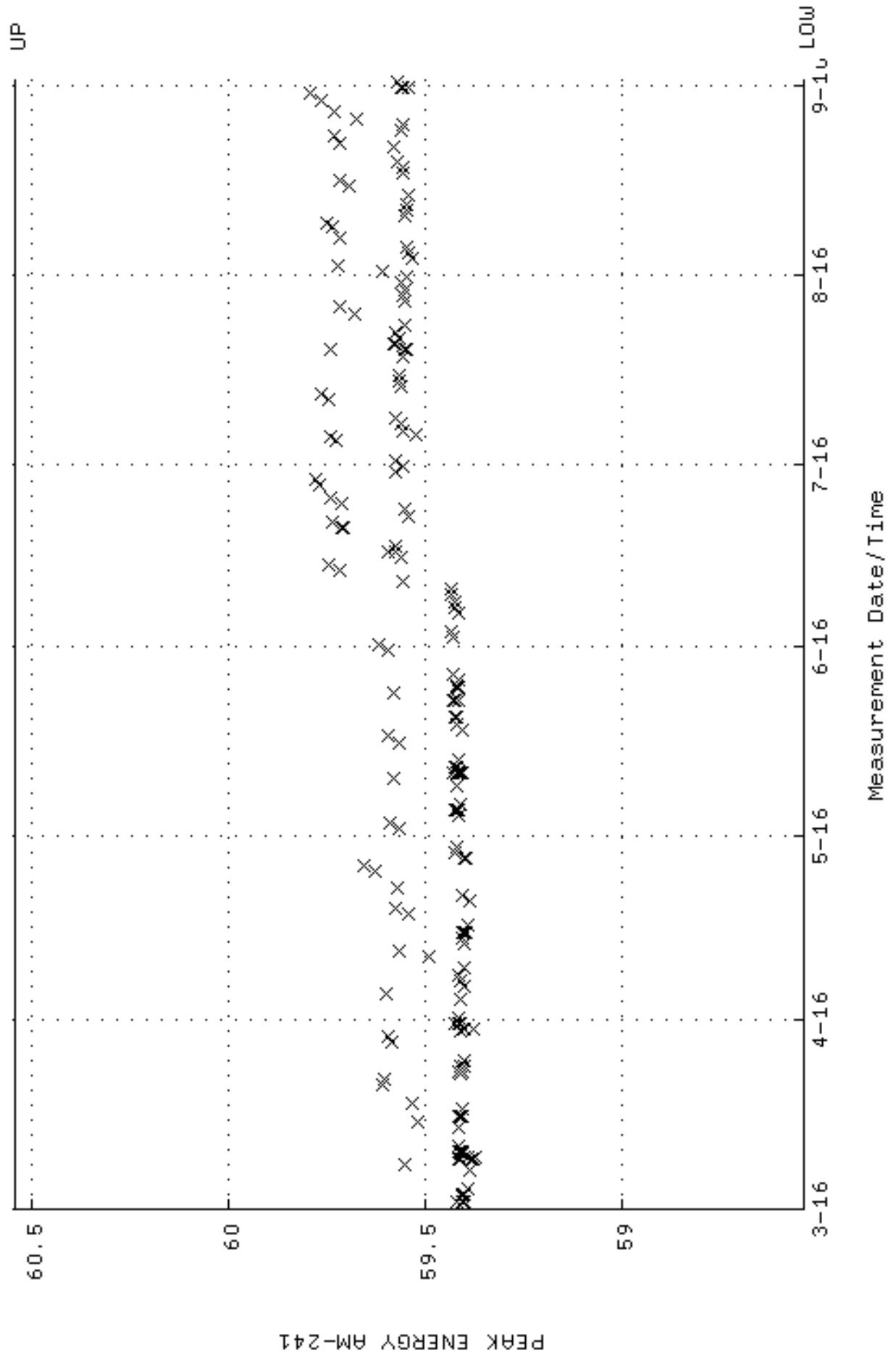


QA filename : DKA100:[CANSBERRA.GAMMA.SCUSR.QA]LBC_GAM44.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-APR-2016 12:20:21 through 1-OCT-2016 12:00:00
 Mean +- Std Dev : 1.39471 +- 2.580503E-02 (1.85 %)

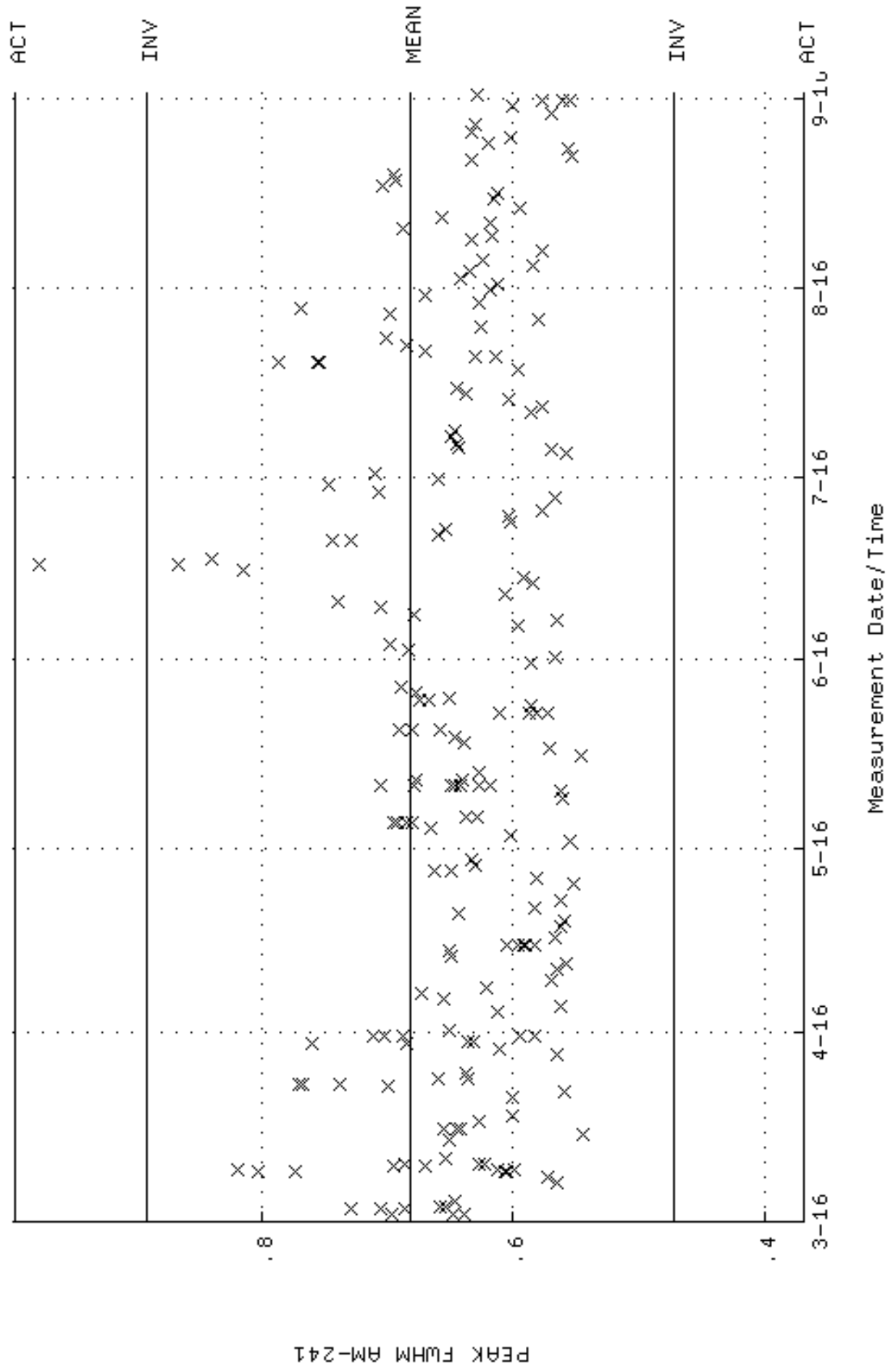


Measurement Date/Time

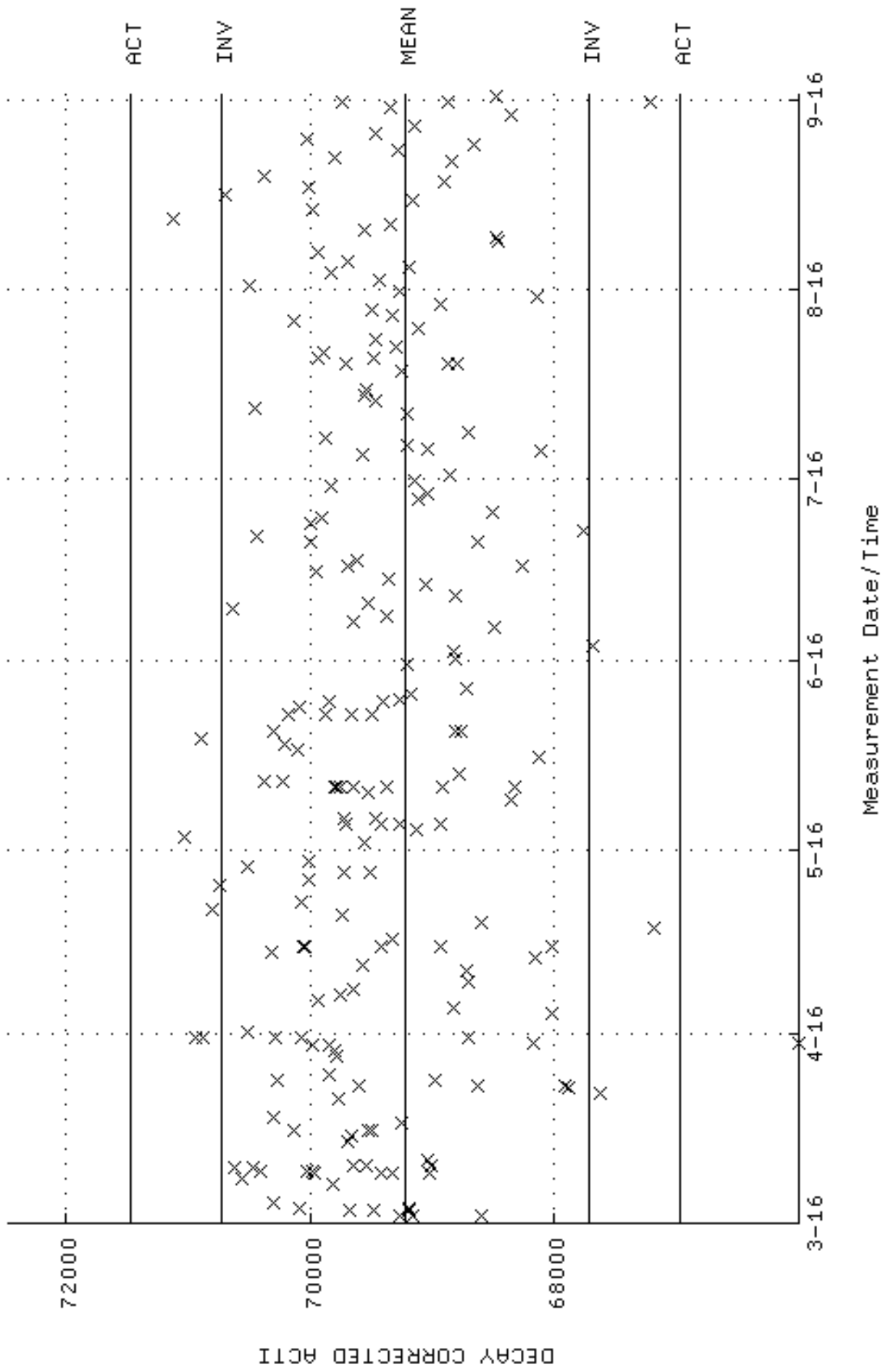
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_XRAY1_CAN.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 2-MAR-2016 05:16:29 through 1-SEP-2016 12:00:00
 Lower/Upper Lmts: 58.5400 through 60.5400



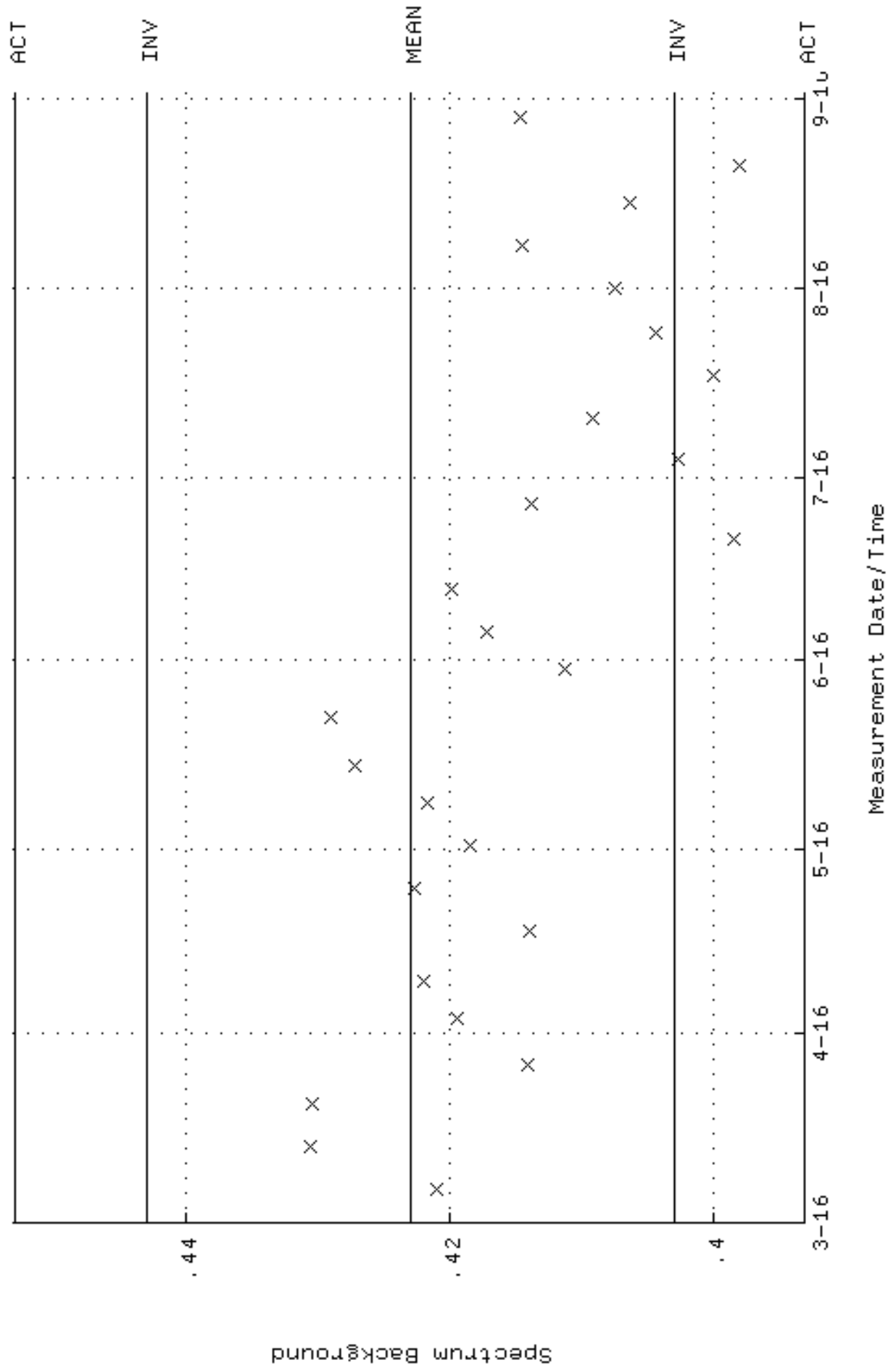
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]QCC_XRAY1_CAN.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 2-MAR-2016 05:16:29 through 1-SEP-2016 12:00:00
 Mean +- Std Dev : 0.682410 +- 0.104470 (15.31 %)



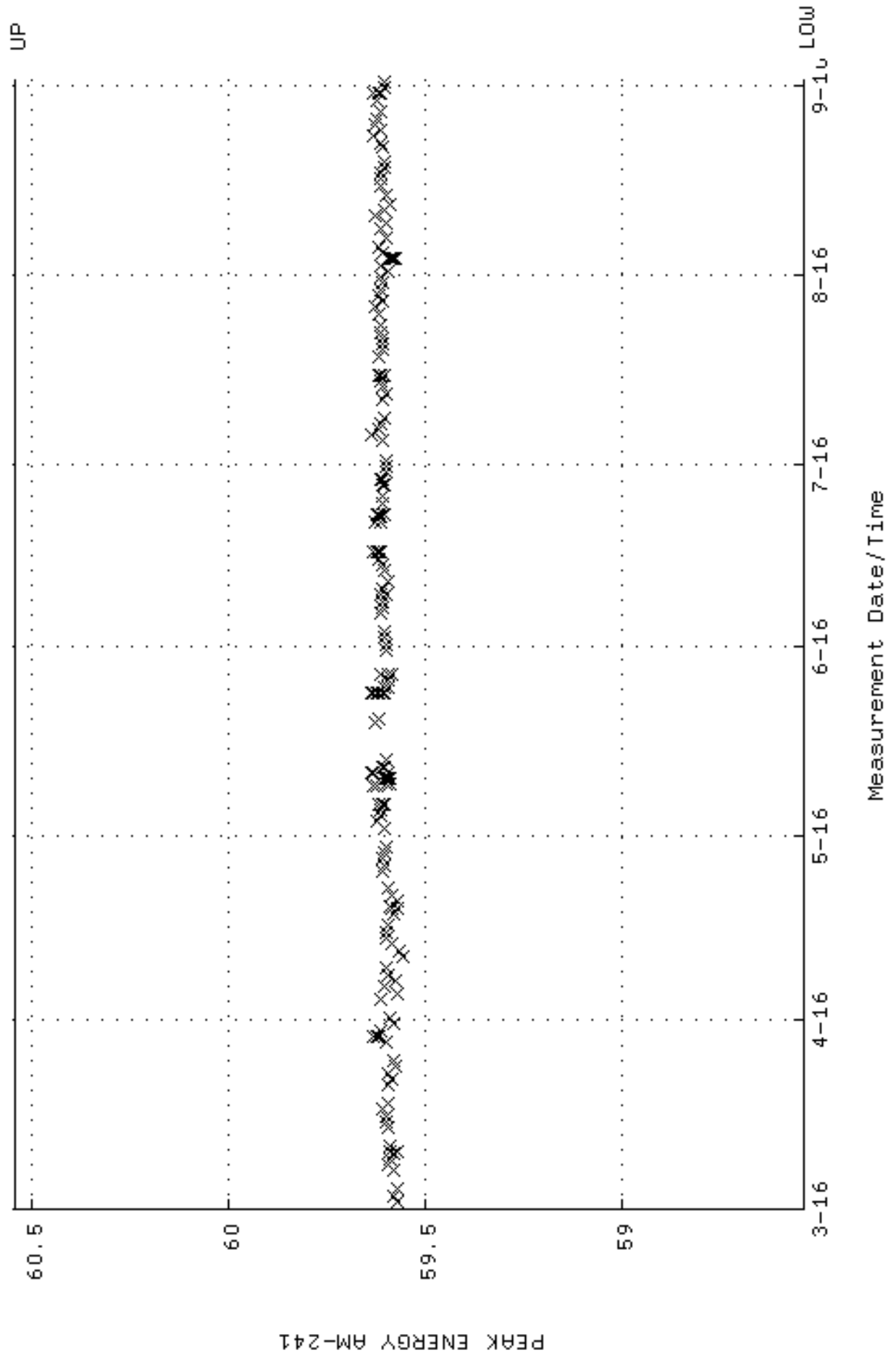
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_XRAY1_CAN.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-MAR-2016 05:16:29 through 1-SEP-2016 12:00:00
 Mean +- Std Dev : 69229.4 +- 750.214 (1.08 %)



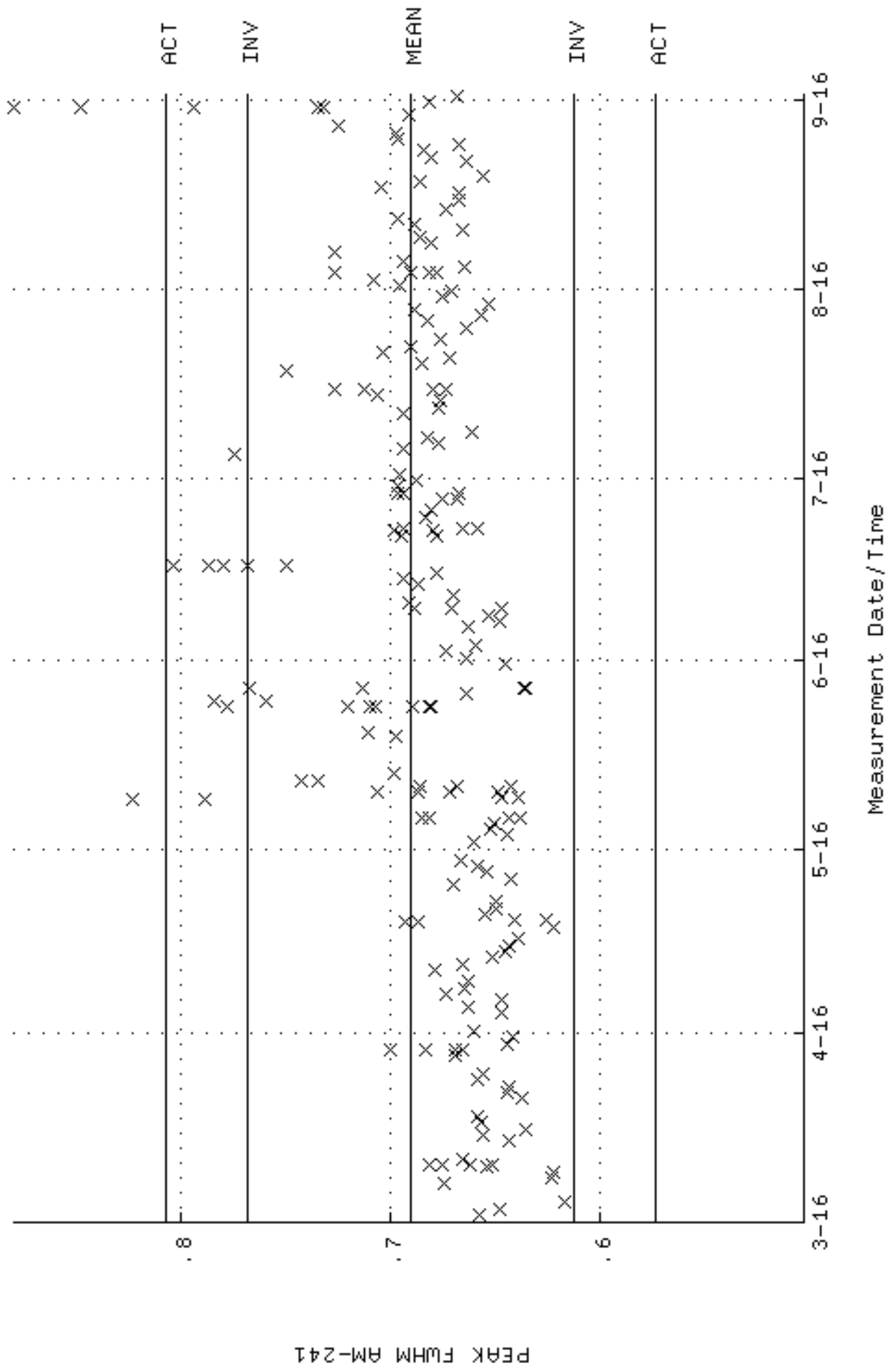
QA filename : DKA100:[CANSBERRA.GAMMA.SCUSR.QA]LBC_XRAY1.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 6-MAR-2016 12:04:56 through 1-SEP-2016 12:00:00
 Mean +- Std Dev : 0.423006 +- 9.957177E-03 (2.35 %)



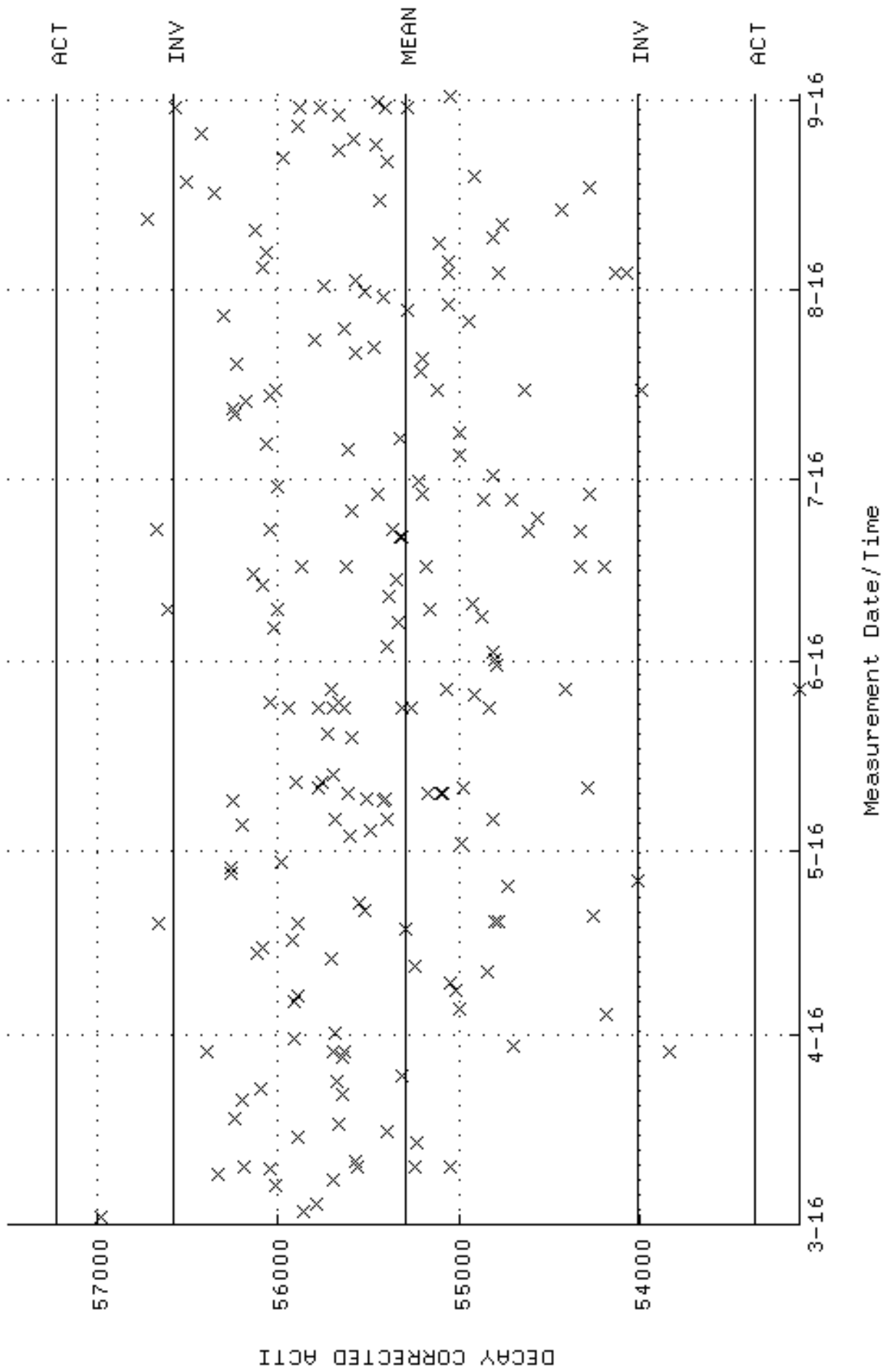
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_XRAY2_CAN.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 2-MAR-2016 05:43:09 through 1-SEP-2016 12:00:00
Lower/Upper Lmts: 58.5400 through 60.5400



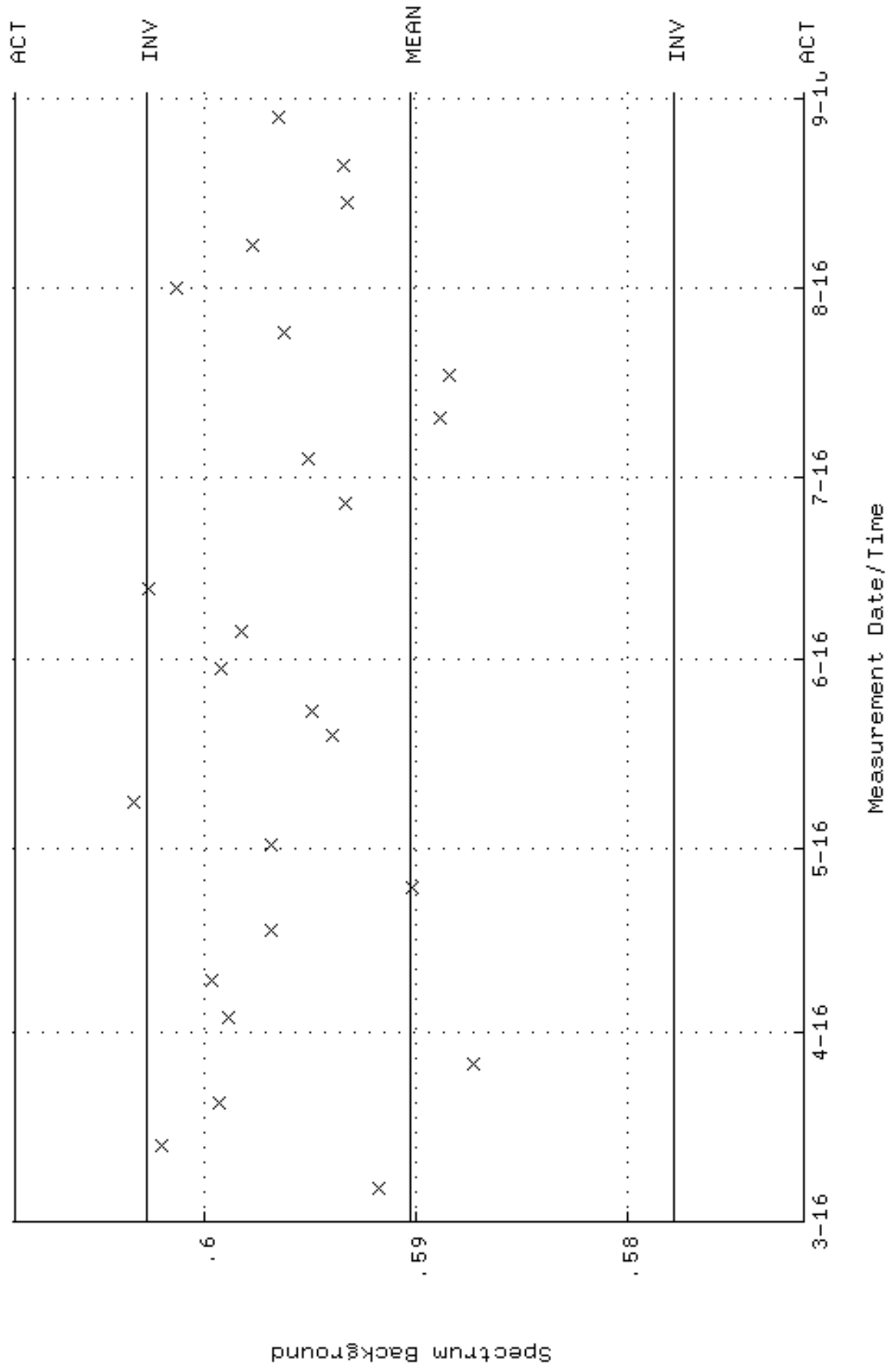
QA filename : DKA100:[CANTERRA,GAMMA,SCUSR,QA]QCC_XRAY2_CAN.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 2-MAR-2016 05:43:09 through 1-SEP-2016 12:00:00
 Mean +- Std Dev : 0.690600 +- 3.901615E-02 (5.65 %)



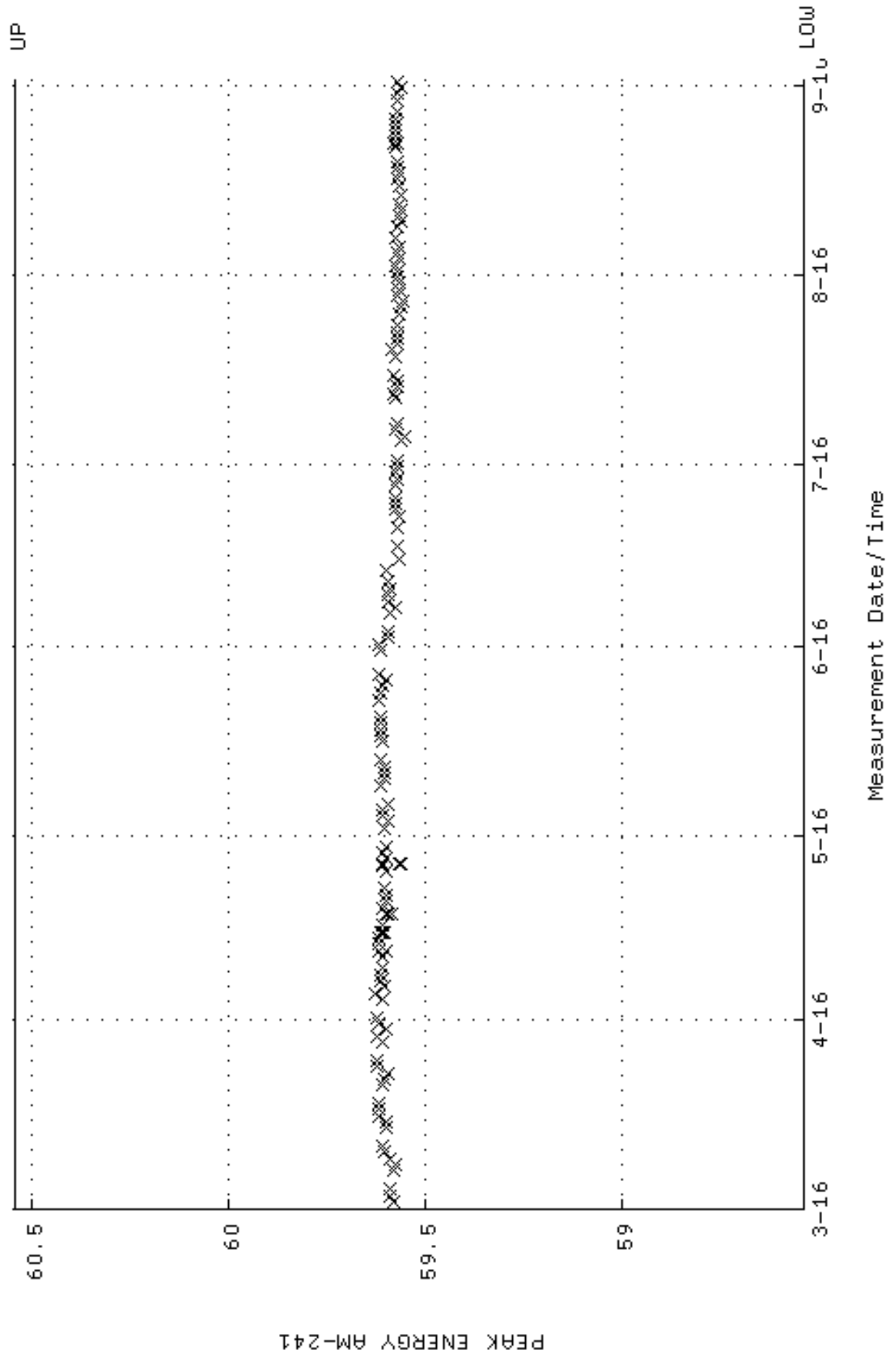
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]QCC_XRAY2_CAN.QAF;1
 Parameter Name : NLAIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-MAR-2016 05:43:09 through 1-SEP-2016 12:00:00
 Mean +- Std Dev : 55300.2 +- 643.502 (1.16 %)



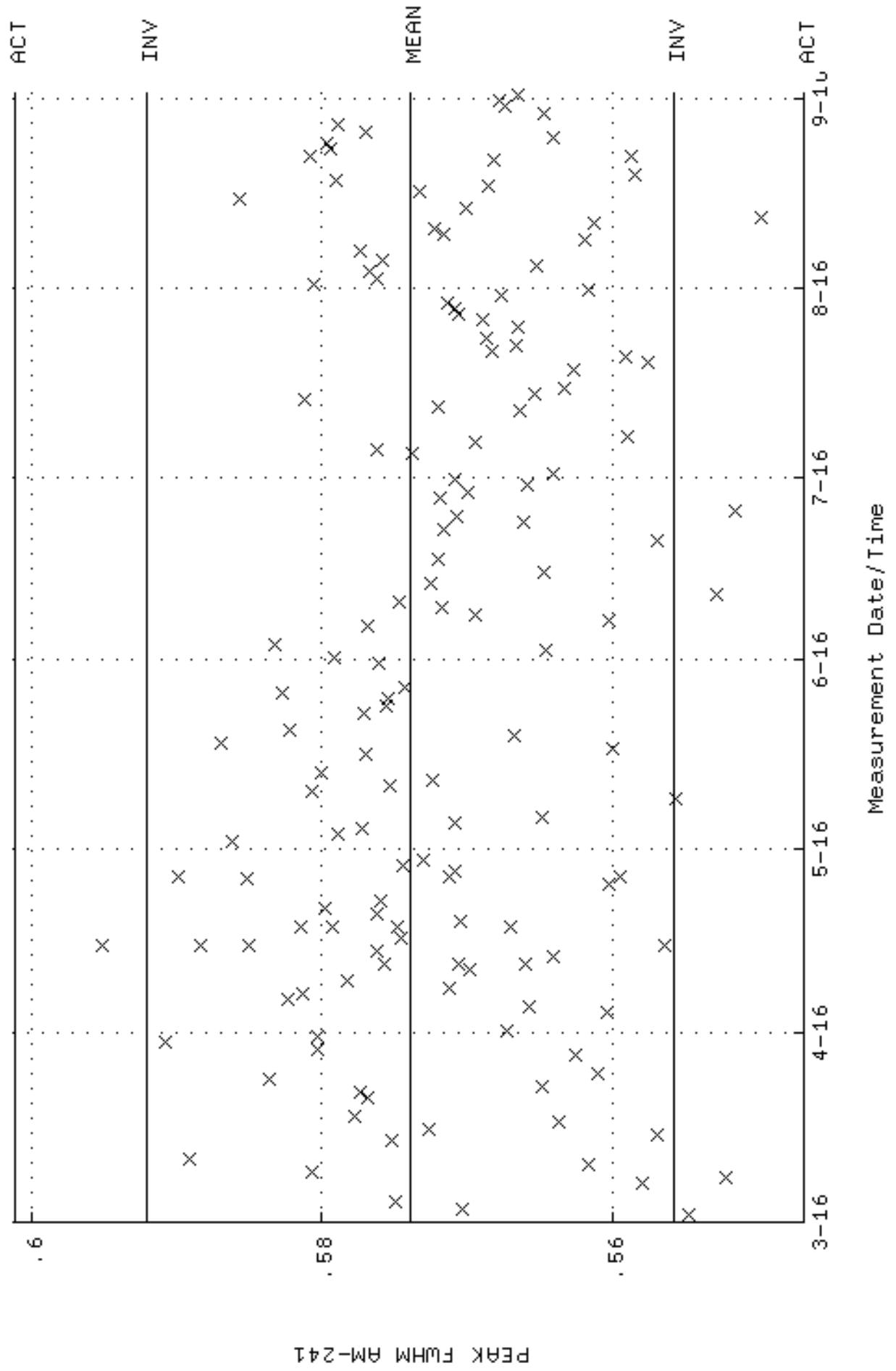
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_XRAY2.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 6-MAR-2016 12:05:02 through 1-SEP-2016 12:00:00
 Mean +- Std Dev : 0.590295 +- 6.231779E-03 (1.06 %)



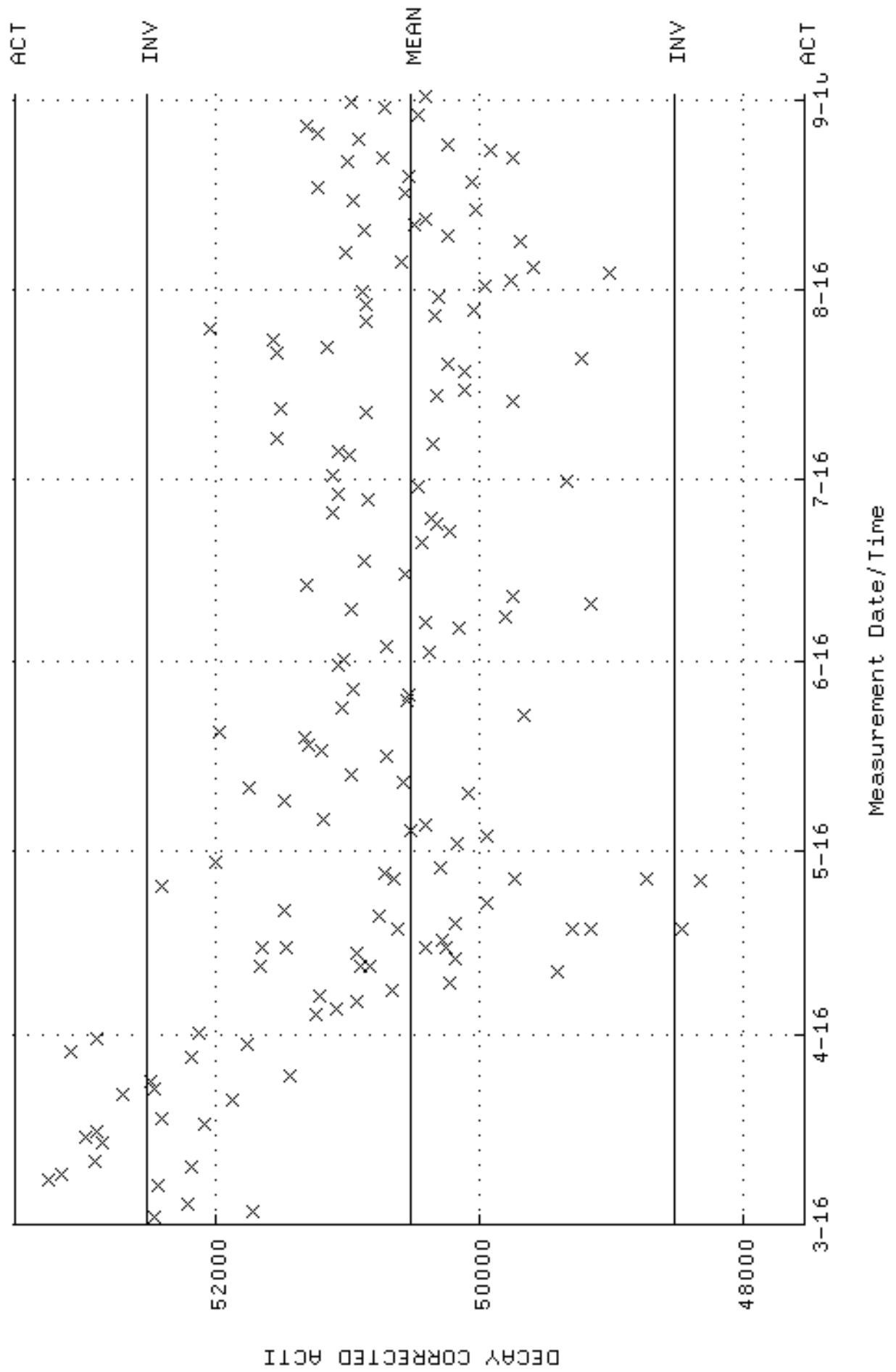
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_XRAY4_CAN.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 2-MAR-2016 06:34:50 through 1-SEP-2016 12:00:00
 Lower/Upper Lmts: 58.5400 through 60.5400



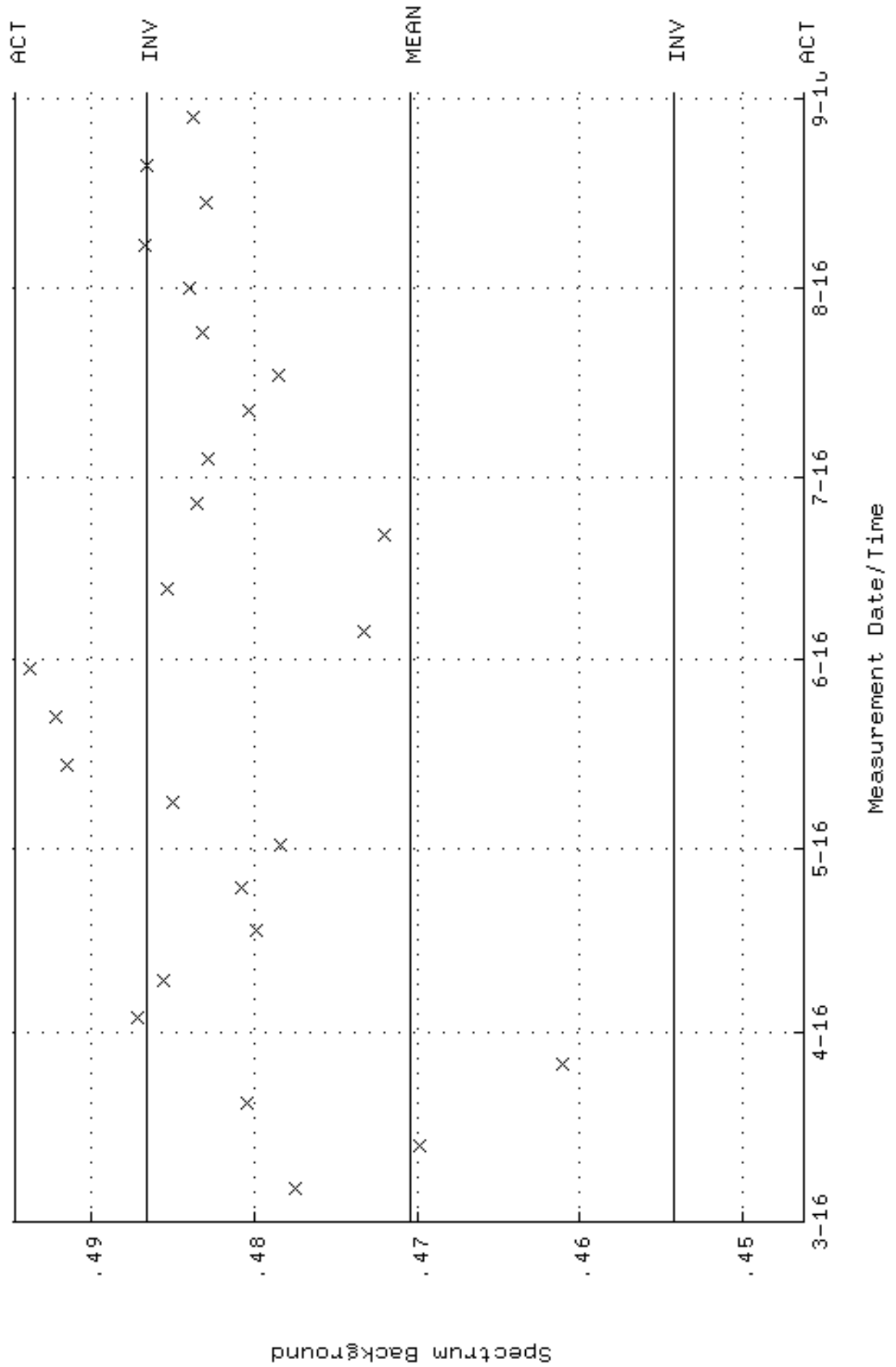
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]QCC_XRAY4_CAN.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 2-MAR-2016 06:34:50 through 1-SEP-2016 12:00:00
 Mean +- Std Dev : 0.573974 +- 9.060334E-03 (1.58 %)



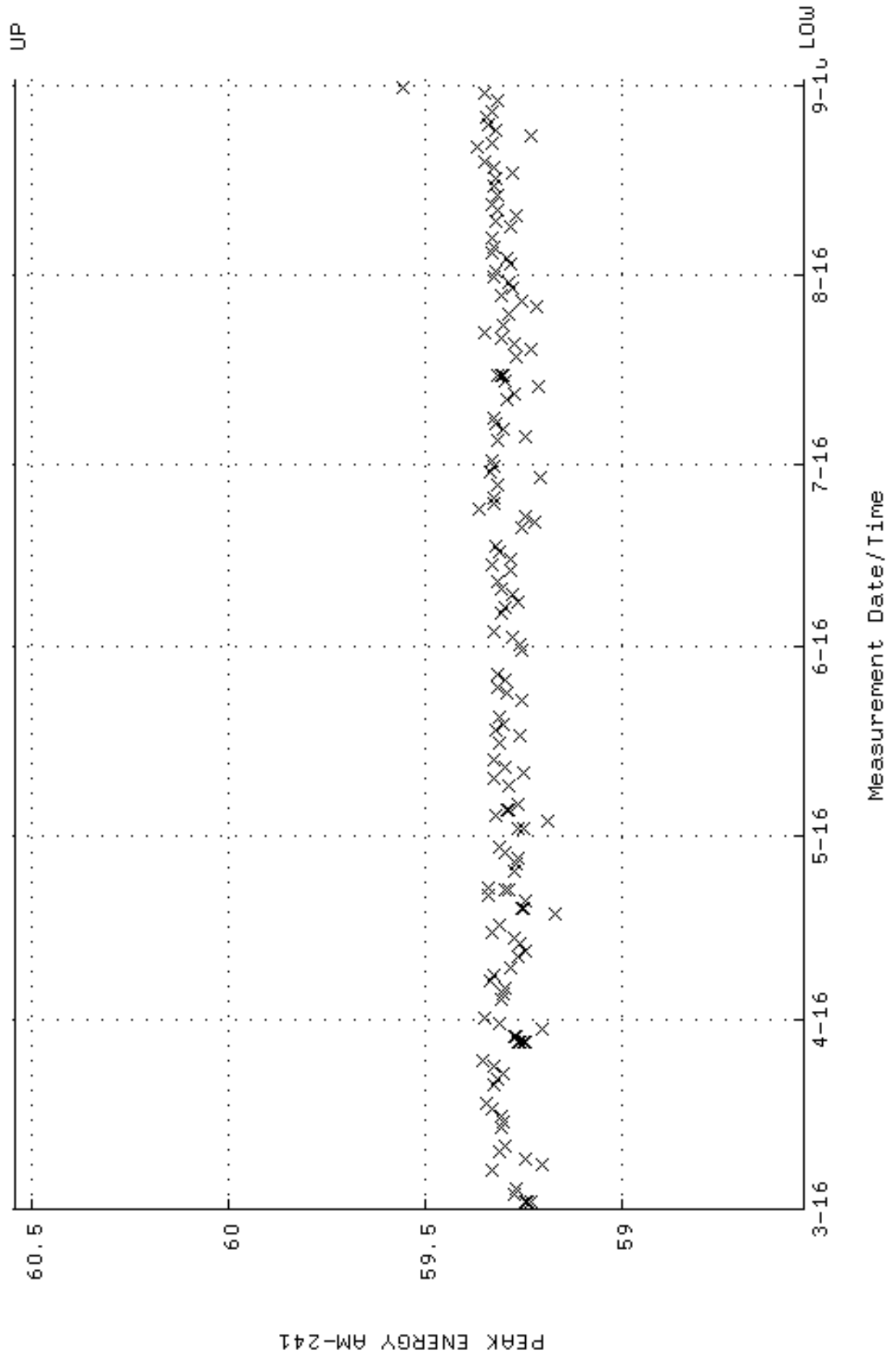
QA filename : DKA100:[CANSBERRA.GAMMA.SCUSR.QA]QCC_XRAY4_CAN.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-MAR-2016 06:34:50 through 1-SEP-2016 12:00:00
 Mean +- Std Dev : 50523.4 +- 997.040 (1.97 %)



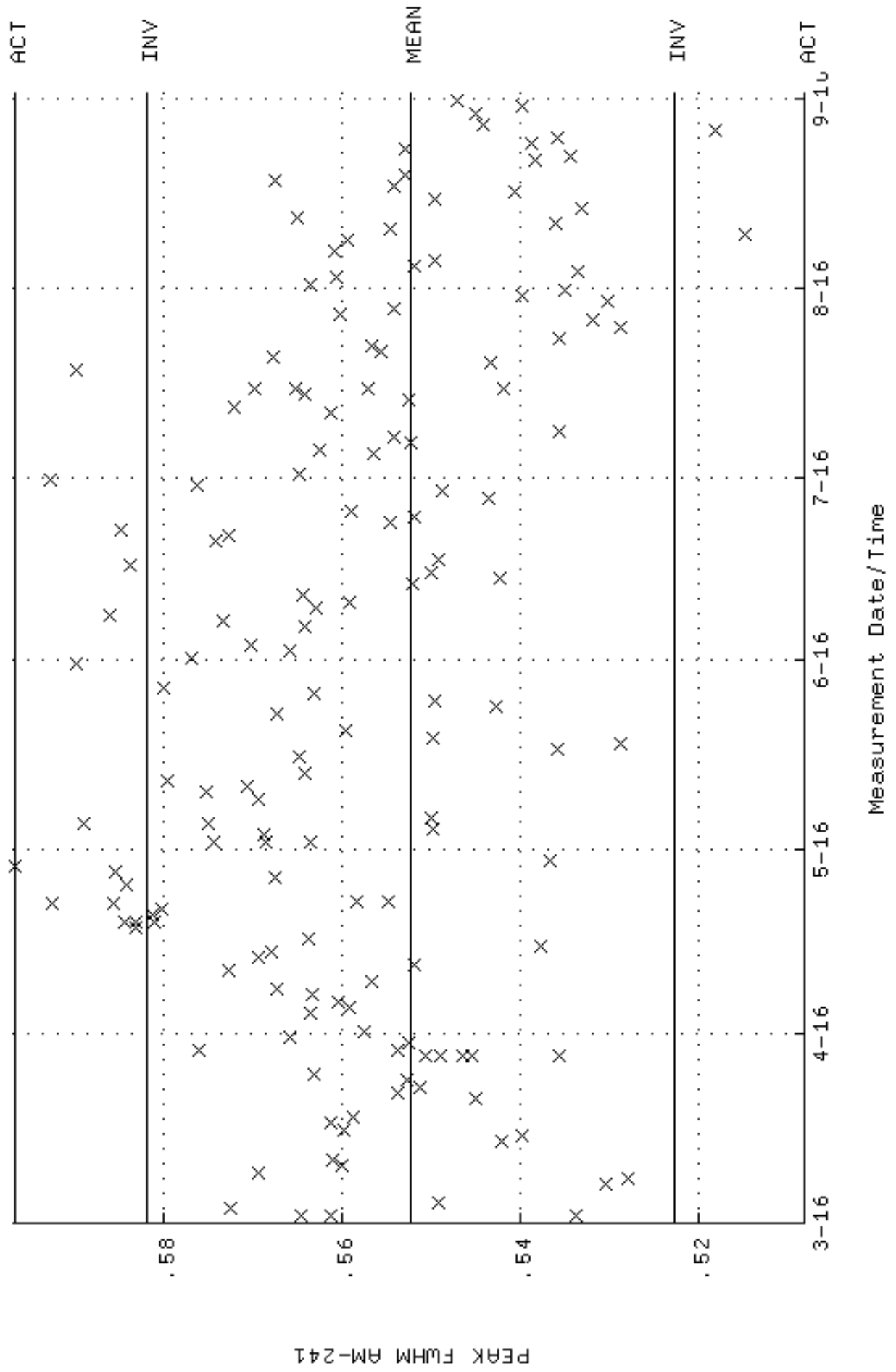
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]LBC_XRAY4.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 6-MAR-2016 12:05:07 through 1-SEP-2016 12:00:00
 Mean +- Std Dev : 0.470476 +- 8.069619E-03 (1.72 %)



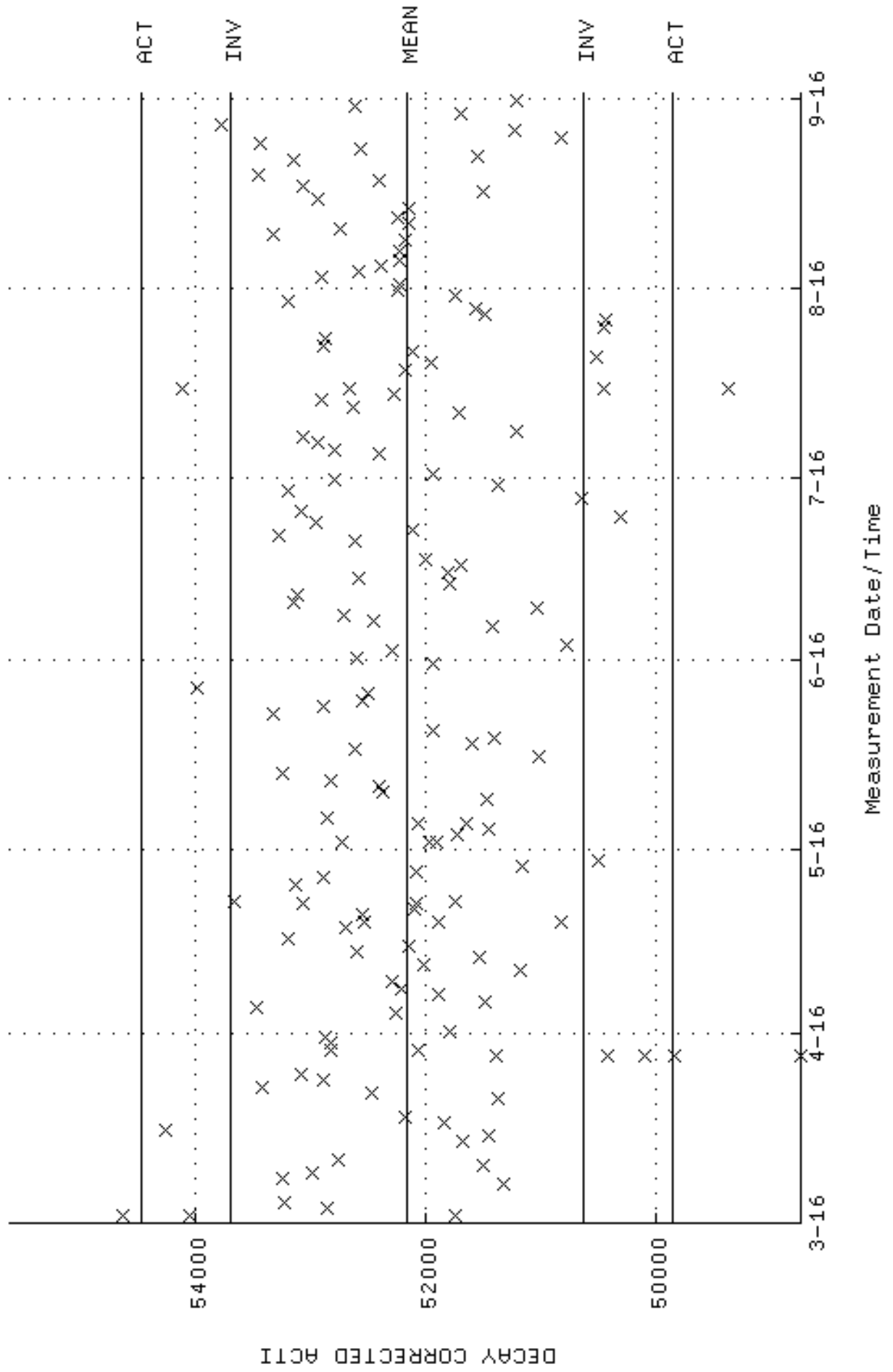
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_XRAY5_CAN_QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 2-MAR-2016 06:42:08 through 1-SEP-2016 12:00:00
Lower/Upper Lmts: 58.5400 through 60.5400



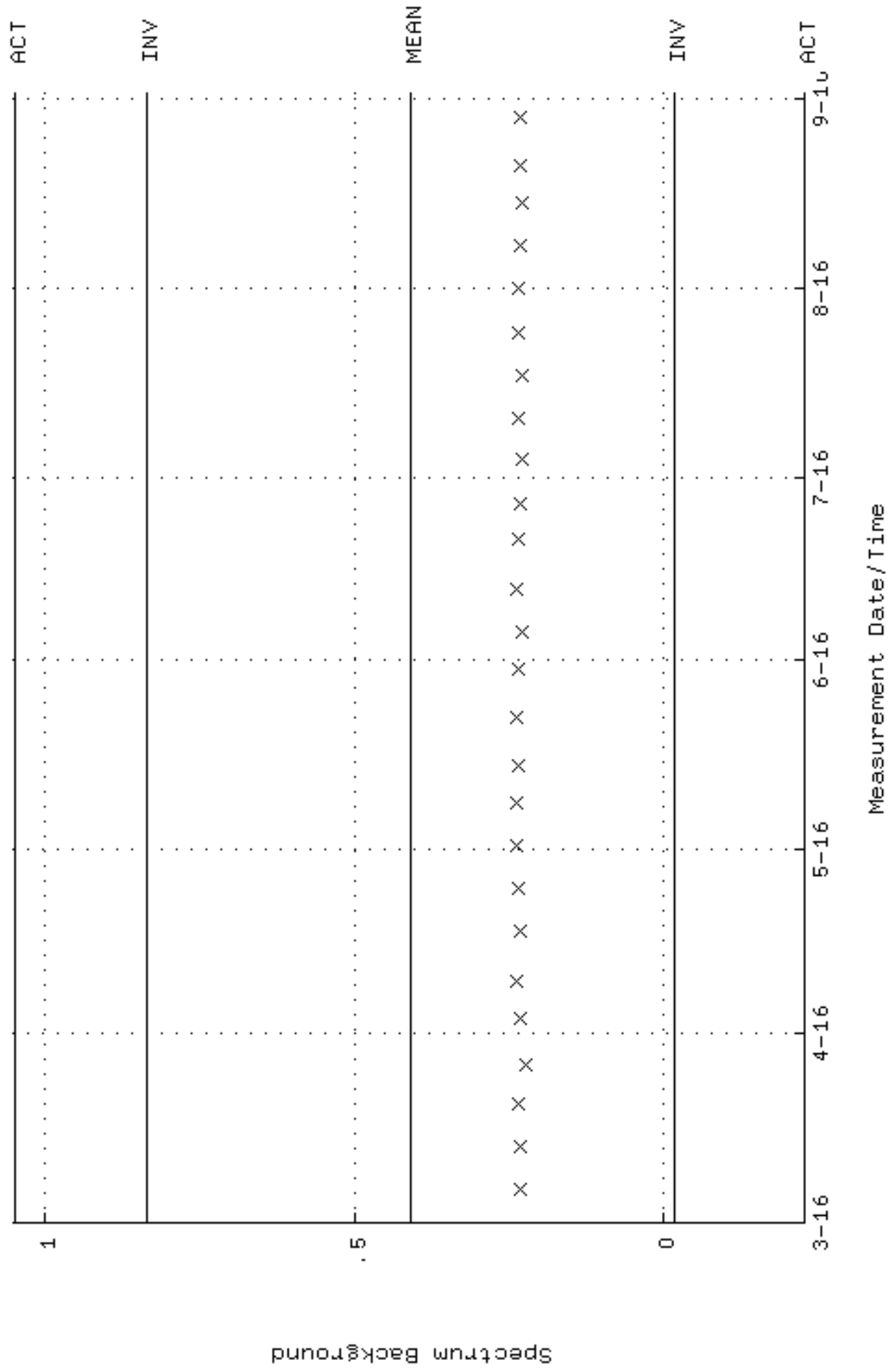
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]QCC_XRAY5_CAN.QAF;1
 Parameter Name : PSFWHM-59 (PEAK FWHM AM-241)
 Start/End Dates : 2-MAR-2016 06:42:08 through 1-SEP-2016 12:00:00
 Mean +- Std Dev : 0.552396 +- 1.478481E-02 (2.68 %)



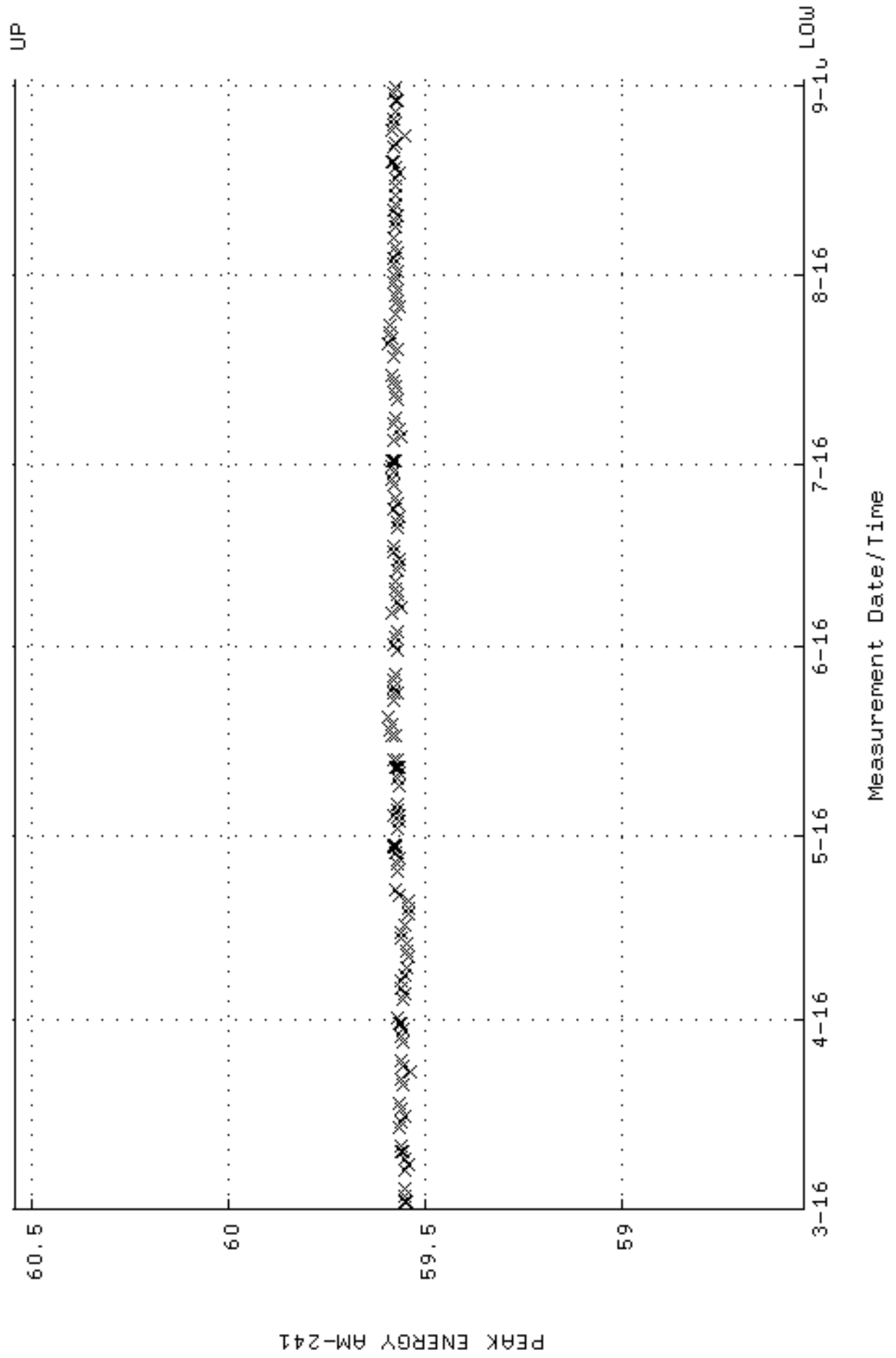
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_XRAY5_CAN_QAF;1
 Parameter Name : NLAIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-MAR-2016 06:42:08 through 1-SEP-2016 12:00:00
 Mean +- Std Dev : 52163.7 +- 766.450 (1.47 %)



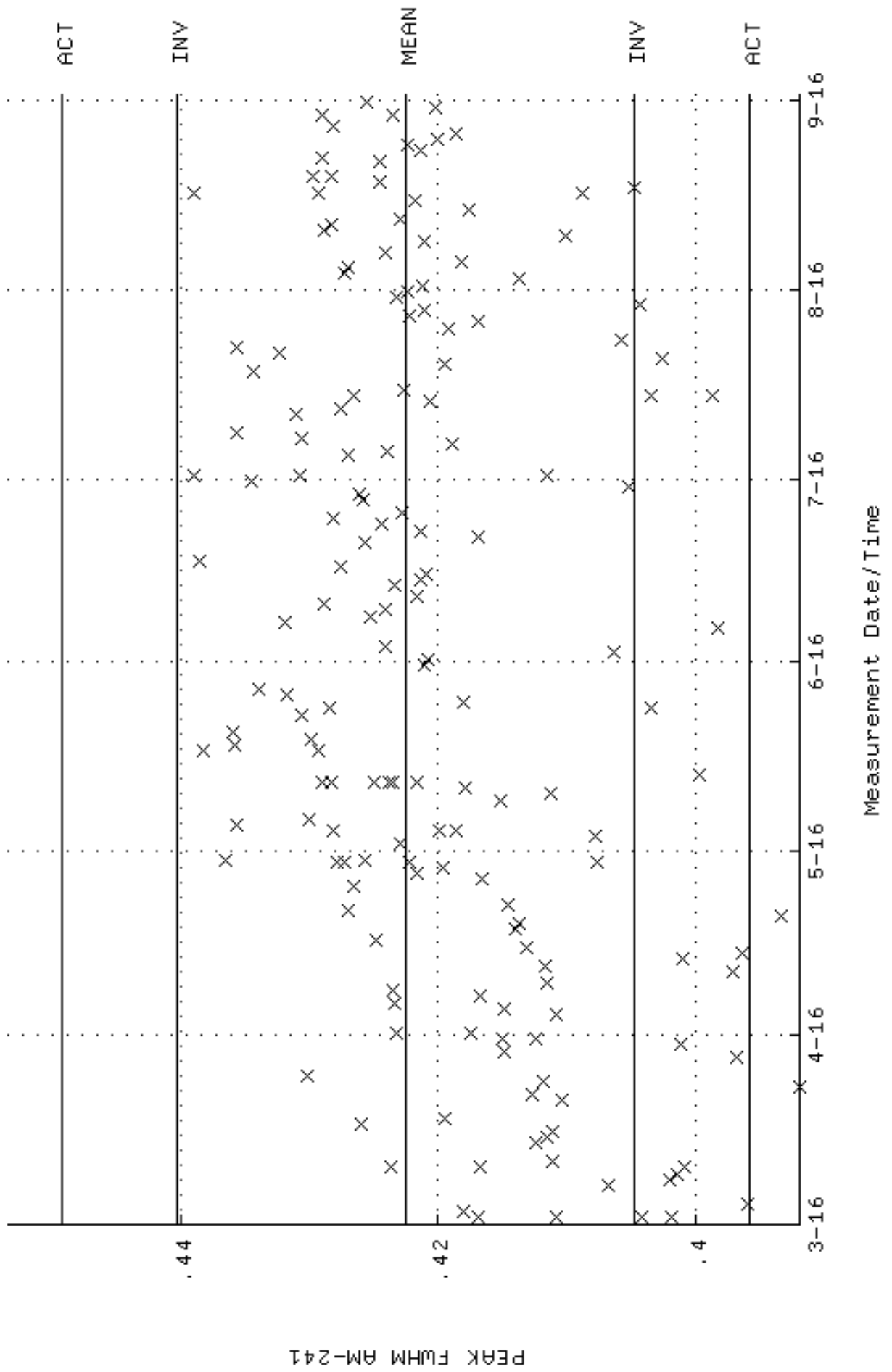
QA filename : DKA100:[CANSBERRA.GAMMA.SCUSR.QA]LBC_XRAY5.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 6-MAR-2016 12:05:12 through 1-SEP-2016 12:00:00
 Mean +- Std Dev : 0.410086 +- 0.213062 (51.96 %)



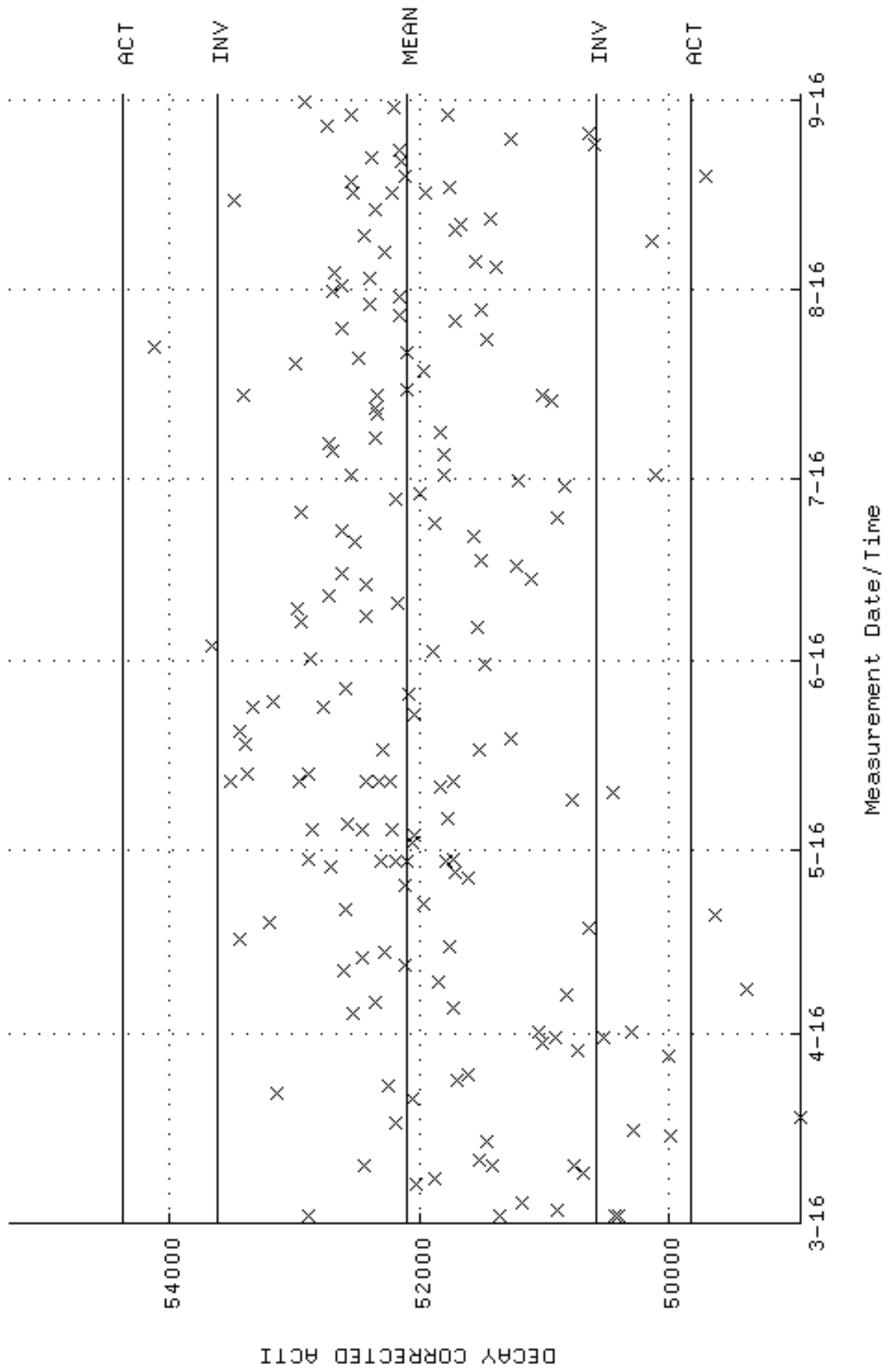
QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_XRAY6_CAN.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 2-MAR-2016 05:59:50 through 1-SEP-2016 12:00:00
Lower/Upper Lmts: 58.5400 through 60.5400



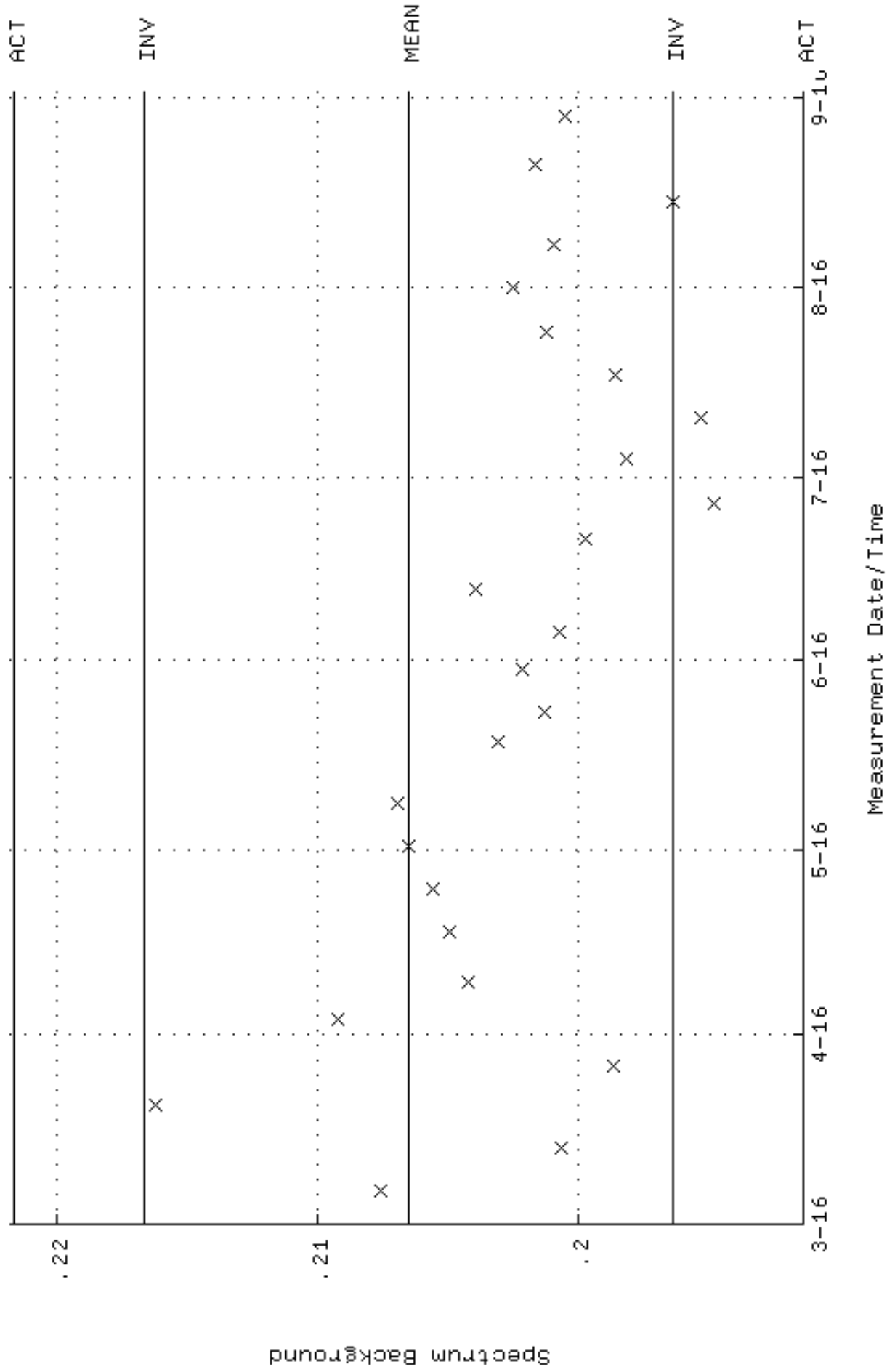
QA filename : DKA100:[CANSBERRA,GAMMA,SCUSR,QA]QCC_XRAY6_CAN.QAF;1
 Parameter Name : PSFVHM-59 (PEAK FWHM AM-241)
 Start/End Dates : 2-MAR-2016 05:59:50 through 1-SEP-2016 12:00:00
 Mean +- Std Dev : 0.422584 +- 8.876291E-03 (2.10 %)



QA filename : DKA100:[CAMBERRA,GAMMA,SCUSR,QA]QCC_XRAY6_CAN_QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-MAR-2016 05:59:50 through 1-SEP-2016 12:00:00
 Mean +- Std Dev : 52108.9 +- 758.036 (1.45 %)



QA filename : DKA100:[CANSBERRA.GAMMA.SCUSR.QA]LBC_XRAY6.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 6-MAR-2016 12:05:17 through 1-SEP-2016 12:00:00
 Mean +- Std Dev : 0.206552 +- 5.056256E-03 (2.45 %)



RAD Standards Traceability



National Institute of Standards & Technology Certificate

Standard Reference Material 4949C Iodine-129 Radioactivity Standard

1470

This Standard Reference Material (SRM) consists of radioactive iodine-129 as sodium iodide, sodium hydroxide, and sodium sulphite dissolved in 5 mL of distilled water. The solution is contained in a flame-sealed NIST borosilicate-glass ampoule. The SRM is intended for the calibration of beta-particle counting instruments and for the monitoring of radiochemical procedures.

Radiological Hazard: The SRM ampoule contains iodine-129 with a total activity of approximately 17 kBq. Iodine-129 decays by beta-particle emission. None of the beta particles escape from the SRM ampoule. During the decay process, X-rays and gamma rays with energies from 4 keV to 40 keV are also emitted. Most of these photons escape from the SRM ampoule but their intensities are so small that they do not represent a significant radiation hazard. Appropriate shielding and/or distance should be used to minimize personnel exposure. The SRM should be used only by persons qualified to handle radioactive material.

Chemical Hazard: The SRM ampoule contains sodium hydroxide (NaOH) with a concentration of 0.01 mole per liter of water. The solution is mildly corrosive and represents a health hazard if it comes in contact with eyes or skin. If the ampoule is to be opened to transfer the solution, the recommended procedure is given on page 2. The ampoule should be opened only by persons qualified to handle both radioactive material and alkaline solution.

Storage and Handling: The SRM should be stored and used at a temperature between 5 and 65 °C. The solution in an unopened ampoule should remain stable and homogeneous for at least five (5) years after receipt. The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material. If the ampoule is transported, it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) because of both the radioactivity and the strong base.

Preparation: This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, J.M.R. Hutchinson, Group Leader. The overall technical direction and physical measurements leading to certification were provided by L.L. Lucas, formerly of the Radioactivity Group. The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program.

Lisa R. Karam, Deputy Chief
Ionizing Radiation Division

Gaithersburg, Maryland 20899
July 1995
Text revised and expiration date extended April 2006

Robert L. Watters, Jr., Chief
Measurement Services Division

Silica in the SRM Ampoule

The solution in the SRM ampoule has a pH of approximately 11 and will slowly etch microgram quantities of silica from the glass ampoule. You may be able to see this silica at times, as it has a density greater than that of the SRM solution and tends to settle. Tests have shown that this silica does not affect the iodine-129 concentration. If desired, the silica may be redispersed in the SRM solution by shaking well. Alternatively, if desired, the silica may be filtered out in the transfer process.

Recommended Procedure for Opening the SRM Ampoule

- 1) If the SRM solution is to be diluted, it is recommended that the diluting solution have a composition comparable to that of the SRM solution.
- 2) Wear eye protection, gloves, and protective clothing and work over a tray with absorbent paper in it. Work in a fume hood. In addition to the radioactive material, the solution contains strong base and is corrosive.
- 3) Shake the ampoule to wet all of the inside surface of the ampoule. Return the ampoule to the upright position.
- 4) Check that all of the liquid has drained out of the neck of the ampoule. If necessary, gently tap the neck to speed the process.
- 5) Holding the ampoule upright, score the narrowest part of the neck around its entire circumference with a scribe or diamond pencil.
- 6) Lightly wet the scored line. This reduces the crack propagation velocity and makes for a cleaner break.
- 7) Hold the ampoule upright with a paper towel, a wiper, or a support jig. Using a paper towel or wiper to avoid contamination, snap off the top of the ampoule by pressing the narrowest part of the neck away from you while pulling the tip of the ampoule towards you.
- 8) Transfer the solution from the ampoule using a pycnometer or a pipet with dispenser handle.
NEVER PIPETTE BY MOUTH.
- 9) Seal any unused SRM solution in a flame-sealed glass ampoule, if possible, to minimize the evaporation loss.

See also reference [4]*.

PROPERTIES OF SRM 4949C

Certified values

Radionuclide	Iodine-129
Reference time	1200 EST, 21 March 1993
Massic activity of the solution [a]*	3451 Bq · g ⁻¹
Relative expanded uncertainty (k=2)	0.64% [b][c]

Uncertified values

Physical Properties:			
Source description	Liquid in flame-sealed NIST borosilicate-glass ampoule		
Ampoule specifications	Body outside diameter	(16.5 ± 0.5) mm	
	Wall thickness	(0.60 ± 0.04) mm	
	Barium content	Less than 2.5%	
	Lead-oxide content	Less than 0.02%	
	Other heavy elements	Trace quantities	
Solution density	(1.003 ± 0.002) g · mL ⁻¹ at 21.2°C [d]		
Solution mass	Approximately 5.0 g		
Chemical Properties:			
Solution composition	Chemical Formula	Concentration (mol·L ⁻¹)	Mass Fraction (g·g ⁻¹)
	H ₂ O	55	1.00
	NaOH	0.01	0.0004
	Na ₂ SO ₃	0.006	0.0008
	Na ¹²⁹ I	0.004	0.0006
Radiological Properties:			
Photon-emitting impurities	None detected [e]		
Half lives used	Iodine-129: (1.57 ± 0.04) × 10 ⁷ a [5][f]		
Calibration method and measuring instrument	NIST 4πβ(LS)-γ-anticoincidence counting system.		

*Notes and references are on pages 5 and 6.

EVALUATION OF THE UNCERTAINTY OF THE MASSIC ACTIVITY [b]*

Input Quantity x_i , the source of uncertainty (and individual uncertainty components where appropriate)	Method Used To Evaluate $u(x_i)$, the standard uncertainty of x_i , (A) denotes evaluation by statistical methods (B) denotes evaluation by other methods	Relative Uncertainty Of Input Quantity, $u(x_i)/x_i$, (%) [g]	Relative Sensitivity Factor, $ \partial y/\partial x_i \cdot$ (x_i/y) [h]	Relative Uncertainty Of Output Quantity, $u(y)/y$, (%) [i]
Massic liquid-scintillation count rate, corrected for background and decay	Standard deviation of the mean for 6 sets of repeated measurements. (A)	0.12	1.0	0.12
Background	Standard deviation of the mean for 6 sets of repeated measurements. (A)	1.0	[j] 0.01	0.01
Mass calibration of the balance	Estimated from manufacturer's data (B)	0.05	1.0	0.05
Decay correction for iodine-129	Standard uncertainty of the half life	2.55 [k]	0.00 [m]	0.00
Decay-scheme data	Standard uncertainty of the probability of beta-particle emission to the excited state (B)	0.10	1.0	0.10
Live time [n]	Estimated (B)	0.10	1.0	0.10
Extrapolation of beta-particle-count-rate versus anticoincidence-gamma-ray-count-rate to zero anticoincidence-gamma-ray-count-rate	Estimated (B)	0.25	1.0	0.25
Photon-emitting impurities	Limit of detection (B) [p]	100	0.00002	0.002
Relative Combined Standard Uncertainty of the Output Quantity, $u_c(y)/y$, (%)				0.32
Coverage Factor, k				<u>x 2</u>
Relative Expanded Uncertainty of the Output Quantity, U/y , (%)				0.64

NOTES

[a] **Massic activity** is the preferred name for the quantity activity divided by the total mass of the sample. See reference [1].

[b] The reported value, y , of massic activity (activity per unit mass) at the reference time was not measured directly but was derived from measurements and calculations of other quantities. This can be expressed as $y = f(x_1, x_2, x_3, \dots, x_n)$, where f is a mathematical function derived from the assumed model of the measurement process. The value, x_i , used for each input quantity i has a **standard uncertainty**, $u(x_i)$, that generates a corresponding uncertainty in y , $u_i(y) \equiv |\partial y / \partial x_i| \cdot u(x_i)$, called a **component of combined standard uncertainty** of y . The **combined standard uncertainty** of y , $u_c(y)$, is the positive square root of the sum of the squares of the components of combined standard uncertainty. The combined standard uncertainty is multiplied by a **coverage factor** of $k = 2$ to obtain U , the **expanded uncertainty** of y .

Since it can be assumed that the possible estimated values of the massic activity are approximately normally distributed with approximate standard deviation $u_c(y)$, the unknown value of the massic activity is believed to lie in the interval $y \pm U$ with a level of confidence of approximately 95 percent.

For further information on the expression of uncertainties, see references [2] and [3].

[c] The value of each component of combined standard uncertainty, and hence the value of the expanded uncertainty itself, is a best estimate based upon all available information, but is only approximately known. That is to say, the "uncertainty of the uncertainty" is large and not well known. This is true for uncertainties evaluated by statistical methods (e.g., the relative standard deviation of the standard deviation of the mean for the massic response is approximately 50%) and for uncertainties evaluated by other methods (which could easily be over estimated or under estimated by substantial amounts). The unknown value of the expanded uncertainty is believed to lie in the interval $U/2$ to $2U$ (i.e., within a factor of 2 of the estimated value).

[d] The stated uncertainty is two times the standard uncertainty.

[e] The estimated limit of detection for photon-emitting impurities, expressed as massic photon emission rates, is:
 $0.07 \text{ s}^{-1} \cdot \text{g}^{-1}$ for energies between 43 keV and 2700 keV.

[f] The stated uncertainty is the standard uncertainty.

[g] Relative standard uncertainty of the input quantity x_i .

[h] The relative change in the output quantity y divided by the relative change in the input quantity x_i . If $|\partial y / \partial x_i| \cdot (x_i / y) = 1.0$, then a 1% change in x_i results in a 1% change in y . If $|\partial y / \partial x_i| \cdot (x_i / y) = 0.05$, then a 1% change in x_i results in a 0.05% change in y .

[i] Relative component of combined standard uncertainty of output quantity y , rounded to two significant figures or less. The relative component of combined standard uncertainty of y is given by $u_i(y) / y \equiv |\partial y / \partial x_i| \cdot u(x_i) / y = |\partial y / \partial x_i| \cdot (x_i / y) \cdot u(x_i) / x_i$. The numerical values of $u(x_i) / x_i$, $|\partial y / \partial x_i| \cdot (x_i / y)$, and $u_i(y) / y$, all dimensionless quantities, are listed in columns 3, 4, and 5, respectively. Thus, the value in column 5 is equal to the value in column 4 multiplied by the value in column 3. The input quantities are independent, or very nearly so. Hence the covariances are zero or negligible.

[j] $|\partial y / \partial x_i| \cdot (x_i / y) = (\text{average background count rate}) / (\text{average net sample count rate})$

- [k] The relative standard uncertainty of $\lambda \cdot t$ is determined by the relative standard uncertainty of λ (i.e., of the half life). The relative standard uncertainty of t is negligible.
- [m] $|\partial y / \partial x_i| \cdot (x_i / y) = |\lambda \cdot t|$
- [n] The live time is determined by counting the pulses from a gated crystal-controlled oscillator.
- [p] The standard uncertainty for each undetected impurity that might reasonably be expected to be present is estimated to be equal to the estimated limit of detection for that impurity, i.e. $u(x_i) / x_i = 100\%$.
 $|\partial y / \partial x_i| \cdot (x_i / y) = \{(\text{response per Bq of impurity}) / (\text{response per Bq of iodine-129})\} \cdot \{(\text{Bq of impurity}) / (\text{Bq of iodine-129})\}$. Thus, $u(y) / y$ is the relative change in y if the impurity were present with a massic activity equal to the estimated limit of detection.

REFERENCES

- [1] International Organization for Standardization (ISO), *ISO Standards Handbook - Quantities and Units*, 1993. Available from Global Engineering Documents, 12 Inverness Way East, Englewood, CO 80112, U.S.A. Telephone 1-800-854-7179.
- [2] International Organization for Standardization (ISO), *Guide to the Expression of Uncertainty in Measurement*, 1993 (corrected and reprinted, 1995). Available from Global Engineering Documents, 12 Inverness Way East, Englewood, CO 80112, U.S.A. Telephone 1-800-854-7179.
- [3] B. N. Taylor and C. E. Kuyatt, *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*, NIST Technical Note 1297, 1994. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20407, U.S.A.
- [4] National Council on Radiation Protection and Measurements Report No. 58, *A Handbook of Radioactivity Measurements Procedures*, Second Edition, 1985. Available from the National Council on Radiation Protection and Measurements, 7910 Woodmont Avenue, Bethesda, MD 20814 U.S.A.
- [5] Evaluated Nuclear Structure Data File (ENSDF), July 1995.



Standard Traceability Log Rad

Source Material Info	
Parent Code:	1470
Prepared By:	Bethany Fiem
Carrier Conc:	Aqueous NaOH
Reference Date:	03/21/1993
Ampoule Mass (g):	4.9632 g
Uncertainty:	+/- .64 %
LogBook No:	RC-S-060-017

A Solution Material Info			
Isotope:	Iodine-129		
Prepared By:	Michael Hilton		
Prep Date:	04/04/2011		
Verification Date:	03/30/2015		
Expiration Date:	03/30/2016		
Primary Code:	1470-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	4.4624 g		
Density(g/mL):	1.0125	Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq/g)}) * (\text{conversion dpm to Bq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq/g)}) * (\text{conversion dpm to Bq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(4.4624 \text{ g}) * (3451 \text{ Bq/g}) * (60 \text{ dpm/Bq}) / (100 \text{ mL}) = 9239.8454 \text{ dpm/mL}$
$(4.4624 \text{ g}) * (3451 \text{ Bq/g}) * (60 \text{ dpm/Bq}) / (1.0125 \text{ g/mL}) / (100 \text{ mL}) = 9125.6201 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
04/11/2011	Michael Hilton	2.9988	100	1470-B	277.8282 dpm/mL	04/11/2011	04/11/2012
04/11/2011	Michael Hilton	1.0002	100	1470-C	92.6066 dpm/mL	04/11/2011	04/11/2012
08/18/2011	Andrew Willis	10.8742	100	1470-D	992.3382 dpm/mL	08/31/2011	08/31/2012
09/16/2011	Michael Hilton	10.112	100	1470-E	923.98454 dpm/mL	09/21/2012	09/21/2013
08/13/2012	Michael Hilton	.9995	100	1470-F	92.1545 dpm/mL	09/15/2011	09/15/2012
08/14/2012	Michael Hilton	10.0979	100	1470-G	936.206 dpm/mL	08/14/2012	08/13/2013
09/11/2012	Michael Hilton	10.0683	100	1470-H	923.98454 dpm/mL	09/08/2014	09/07/2015
05/13/2013	Michael Hilton	10.095	100	1470-I	923.98454 dpm/mL	05/27/2016	05/27/2017

06/10/2014	Michael Hilton	5.0681	1	1470-J	9239.8454 dpm/mL	06/13/2016	06/13/2017
03/27/2015	Michael Hilton	9.9722	100	1470-K	923.98454 dpm/mL	03/30/2016	03/30/2017

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for I-129 Standard 1470-K

v1.1.2
Noah Postell
3/30/2016

Isotope	Result pCi/L
I-129	40
I-129 N1	43
I-129 N2	44
I-129 N3	

Mean Value (Counting) = 42.17 pCi/L 101.327 Pass
 Stdev = 1.771 pCi/L Rule B (Pass/Fail)

Certificate Value = 41.6
 Two sigma = 3.541769802
 10 % of Mean = 4.217333333
 Rule A (Pass/Fail) Pass

*M 91d
3-31-16
M87amp
4/1/16*

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

1556

84680-278

100 mL Solid in Aluminum Can

Customer: GEL Labs
P.O. No.: 489884RD, Item 3
Reference Date: 01-Apr-2011 12:00 PM EST **Grams of Master Source:** 0.0066498

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101. Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* $\mu\text{ps}/\text{gram}$	This Source μps	Uncertainty, %			Calibration Method
					u_A	u_B	U	
Pb-210	46.5	8.120E+03	—	1.129E+03	0.1	2.1	4.1	4 π LS
Am-241	59.5	1.580E+05	—	7.538E+02	0.1	1.7	3.5	4 π LS
Cd-109	88.0	4.626E+02	1.659E+05	1.103E+03	0.6	2.3	4.8	HPGe
Co-57	122.1	2.718E+02	8.949E+04	5.951E+02	0.6	2.0	4.2	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	8.292E+02	0.6	1.9	4.0	HPGe
Hg-203	279.2	4.661E+01	2.899E+05	1.928E+03	0.6	1.9	4.0	HPGe
Sn-113	391.7	1.151E+02	1.739E+05	1.156E+03	0.6	1.9	4.0	HPGe
Cs-137	661.7	1.098E+04	1.107E+05	7.361E+02	0.8	1.9	4.1	HPGe
Y-88	898.0	1.066E+02	4.246E+05	2.824E+03	0.6	1.9	4.0	HPGe
Zn-65	1115.6	2.441E+02	—	1.445E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.118E+05	1.408E+03	0.7	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.118E+05	1.408E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.495E+05	2.989E+03	0.7	1.9	4.0	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



RC-S-060-101

This standard will expire one year after the reference date.

Source Prepared by: M. Williford
M. Williford, Radiochemist

QA Approved: J. D. McCorvey
J. D. McCorvey, QA Manager Alternate

Date: 6/27/11



Standard Logbook

Serial ID: 1556 Open/Reference Date: 01-APR-11 Aliquot : 1 mL
Name: Mixed Gamma LCS CAN Received: 01-APR-11 Density : Hand Calculated
Type: Source Material Expires: 01-APR-37 Lot Number : 84680-278
Employee: Maggie Stamps Verified: 14-JUL-11
Supplier: Eckert & Zeigler Analytics
Description: 84680-278
Comments: None

Analyte	Concentration	Analyte	Concentration
Americium-241	125983.3 dpm/mL	Cesium-137	51898.9 dpm/mL
Cobalt-60	84496.9 dpm/mL		

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope
Pb-210
Mixed Gamma N1
Mixed Gamma N2
Mixed Gamma N3

Result
pCi/L
722900
752300
692100

Isotopic Abundance:
Certificate Value (dps):
0.0425
1129

Mean Value (Counting) = 722433.33
Stdev = 30102.713
100.622
Pass
Rule 3 (Pass/Fail)

Certificate Value = 717965.0
Lower Limit = 662227.9072
Upper Limit = 782638.7594
Rule 1 Pass/Fail Pass
Two sigma = 60205.42611
10 % of Mean = 72243.33333
Rule 2 (Pass/Fail) Pass

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

Handwritten:
11/20/11
11/20/11
H. Stamp

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope
Am-241
Mixed Gamma N1
Mixed Gamma N2
Mixed Gamma N3

Result
pCi/L
58390
60740
57770

Isotopic Abundance:
Certificate Value (dps):
0.359
753.8

Mean Value (Counting) = 58966.67 pCi/L 103.9074 Pass
Sidev = 1566.727 pCi/L Rule 3 (Pass/Fail)

Certificate Value = 56749.2 pCi/L
Lower Limit = 55833.21277 pCi/L
Upper Limit = 62100.12057 pCi/L
Rule 1 Pass/Fail Pass
Two sigma = 3133.453898
10 % of Mean = 5896.666667
Rule 2 (Pass/Fail) Pass

Handwritten:
"12011"
"12011"
"12011"
"12011"

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope
Cd-109
Mixed Gamma N1
Mixed Gamma N2
Mixed Gamma N3

Result
pCi/L
818400
798000
764700

Isotopic Abundance:
Certificate Value (dps):
0.037
1103

Mean Value (Counting) = 793700.00 pCi/L 98.51091 Pass
Sidev = 27107.010 pCi/L Rule 3 (Pass/Fail)

Certificate Value = 805697.6 pCi/L
Lower Limit = 739485.9797 pCi/L
Upper Limit = 847914.0203 pCi/L
Rule 1 Pass/Fail Pass
Two sigma = 54214.02033
10 % of Mean = 79370
Rule 2 (Pass/Fail) Pass

*MSH
7/20/11*
M. Hilton
7/20/11

Verification Rules

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- Rule 3 = The determined mean value shall be within 5% of the certificate value.

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope
Co-57
Mixed Gamma N1
Mixed Gamma N2
Mixed Gamma N3

Result
pCi/L
19090
18820
18830

Isotopic Abundance:
Certificate Value (dps):
0.856
595.1

Mean Value (Counting) = 18913.33
Stdev = 153.080
100.6592
Pass
Rule 3 (Pass/Fail)

Certificate Value = 18789.5
Lower Limit = 18607.17433
Upper Limit = 19219.49233
Rule 1 Pass/Fail Pass
Two sigma = 306.1590001
10 % of Mean = 1891.333333
Rule 2 (Pass/Fail) Pass

Handwritten signature
7/20/11

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

Handwritten signature
7/20/11

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope	Result
Ce-139	pCi/L
Mixed Gamma N1	28740
Mixed Gamma N2	29410
Mixed Gamma N3	27560

Isotopic Abundance:
Certificate Value (dps): 0.8
829.2

Mean Value (Counting) = 101.9865 Pass
Stdev = 936.643 Rule 3 (Pass/Fail)

Certificate Value = 28013.5 pCi/L
Lower Limit = 26696.71412 pCi/L
Upper Limit = 30443.28588 pCi/L
Rule 1 Pass/Fail Pass
Two sigma = 1873.285883
10 % of Mean = 2857
Rule 2 (Pass/Fail) Pass

11/20/11

Stamp
7/20/11

Verification Rules

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- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
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Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope
Hg-203
Mixed Gamma N1
Mixed Gamma N2
Mixed Gamma N3

Result
pCi/L
66300
68180
64480

Isotopic Abundance:
Certificate Value (dps):
0.8156
1928

Mean Value (Counting) = 66320.00 pCi/L 103.8046 Pass
Stdev = 1850.081 pCi/L Rule 3 (Pass/Fail)

Certificate Value = 63889.3 pCi/L
Lower Limit = 62619.83784 pCi/L
Upper Limit = 70020.16216 pCi/L
Rule 1 Pass/Fail Pass
Two sigma = 3700.162159
10 % of Mean = 6632
Rule 2 (Pass/Fail) Pass

*might
1/20/11*
*W. Starnep
7/20/11*

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
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Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope
Sn-113
Mixed Gamma N1
Mixed Gamma N2
Mixed Gamma N3

Result
pCi/L
49560
49620
48300

Isotopic Abundance:
Certificate Value (dps):
0.6497
1156

Mean Value (Counting) = 49160.00 pCi/L 102.2277 Pass
Sidev = 745.386 pCi/L Rule 3 (Pass/Fail)

Certificate Value = 48088.7 pCi/L
Lower Limit = 47669.22839 pCi/L
Upper Limit = 50650.77161 pCi/L
Rule 1 Pass/Fail Pass
Two sigma = 1490.771612
10 % of Mean = 4916
Rule 2 (Pass/Fail) Pass

11/20/11

Woffenberg
7/20/11

Verification Rules

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- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope	Result	Isotopic Abundance:
Cs-137	pCi/L	0.851
Mixed Gamma N1	23710	736.1
Mixed Gamma N2	23950	
Mixed Gamma N3	24040	

Mean Value (Counting) = 23900.00 pCi/L 102.2333 Pass
 Sidev = 170.587 pCi/L Rule 3 (Pass/Fail)

Certificate Value = 23377.9 pCi/L
 Lower Limit = 23558.82556 pCi/L
 Upper Limit = 24241.17444 pCi/L
 Rule 1 Pass/Fail Fail *exception taken due to full recovery of standard
 Two sigma = 341.1744422
 10 % of Mean = 2390
 Rule 2 (Pass/Fail) Pass

msk
7/20/11

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
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- Rule 3 = The determined mean value shall be within 5% of the certificate value.

Postamp
7/20/11

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope
Y-88 (898)
Mixed Gamma N1
Mixed Gamma N2
Mixed Gamma N3

Result
pCi/L
82690
81320
80940

Isotopic Abundance:
Certificate Value (dps):
0.937
2824

Mean Value (Counting) = 81650.00
Sidev = 920.489
pCi/L 100.2381
Pass
Rule 3 (Pass/Fail)

Certificate Value = 81456.1
Lower Limit = 79809.022
Upper Limit = 83490.978
Rule 1 Pass/Fail Pass
Two sigma = 1840.978001
10 % of Mean = 8165
Rule 2 (Pass/Fail) Pass

*mean
7/20/11*

*Hoffman
7/20/11*

Verification Rules

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- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope
Co-60 (1173)
Mixed Gamma N1
Mixed Gamma N2
Mixed Gamma N3

Result
pCi/L
38910
39750
38840

Isotopic Abundance:
Certificate Value (dps):
0.9985
1408

Mean Value (Counting) = 39166.67 pCi/L 102.7694 Pass
Stdev = 506.392 pCi/L Rule 3 (Pass/Fail)

Certificate Value = 38111.2 pCi/L
Lower Limit = 38153.88173 pCi/L
Upper Limit = 40179.45161 pCi/L
Rule 1 Pass/Fail Fail *exception taken due to full recovery of standard
Two sigma = 1012.784939
10 % of Mean = 3916.666667
Rule 2 (Pass/Fail) Pass

*missed
-1/20/11*

*Postamp
-1/20/11*

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope	Result
Co-60 (1332.50)	pCi/L
Mixed Gamma N1	38940
Mixed Gamma N2	40200
Mixed Gamma N3	39150

Isotopic Abundance:
Certificate Value (dps):
0.9998
1408

Mean Value (Counting) = 39430.00 pCi/L 103.595 Pass
Stdev = 675.056 pCi/L Rule 3 (Pass/Fail)

Certificate Value = 38061.7 pCi/L
Lower Limit = 38079.88889 pCi/L
Upper Limit = 40780.11111 pCi/L
Rule 1 Pass/Fail Fall *exception taken due to full recovery of standard
Two sigma = 1350.111107
10 % of Mean = 3943
Rule 2 (Pass/Fail) Pass

msh
7/20/11

Postamp
7/20/11

Verification Rules

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- Rule 3 = The determined mean value shall be within 5% of the certificate value.

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope
Y-88 (1836.1)
Mixed Gamma N1
Mixed Gamma N2
Mixed Gamma N3

Result
pCi/L
82870
83080
84640

Isotopic Abundance:
Certificate Value (dps):
0.992
2989

Mean Value (Counting) = 83530.00 pCi/L 102.5723 Pass
Stdev = 967.006 pCi/L Rule 3 (Pass/Fail)

Certificate Value = 81435.3 pCi/L
Lower Limit = 81595.98862 pCi/L
Upper Limit = 85464.01138 pCi/L
Rule 1 Pass/Fail Fail
Two sigma = 1934.011375
10 % of Mean = 8353
Rule 2 (Pass/Fail) Pass

*exception taken due to full recovery of standard

*mgh
7/20/11*

*Hilton
7/20/11*

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

Runlogs

Instrument Run Log

Instrument Type: **GAMMA SPECTROMETER**

Batch ID: **1596247**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235001	SAMPLE	MXR1	GAM02	OCT-03-16 07:56:53	DONE CAN		22-AUG-16 00:00
405235002	SAMPLE	MXR1	GAM30	OCT-03-16 07:57:26	DONE CAN		11-MAR-16 00:00
405235003	SAMPLE	MXR1	GAM08	OCT-03-16 08:01:06	DONE CAN		21-JUL-16 00:00
405235004	SAMPLE	MXR1	GAM09	OCT-03-16 08:01:44	DONE CAN		03-JUN-16 00:00
405235005	SAMPLE	MXR1	GAM19	OCT-03-16 08:02:09	DONE CAN		15-JUN-16 00:00
405235006	SAMPLE	MXR1	GAM20	OCT-03-16 08:02:32	DONE CAN		30-JUN-16 00:00
405235007	SAMPLE	MXR1	GAM32	OCT-03-16 08:02:54	DONE CAN		23-AUG-16 00:00
405235008	SAMPLE	MXR1	GAM39	OCT-03-16 08:03:23	DONE CAN		27-JUL-16 00:00
405235009	SAMPLE	MXR1	GAM25	OCT-03-16 08:06:24	DONE CAN		01-AUG-16 00:00
405235010	SAMPLE	MXR1	GAM28	OCT-03-16 08:06:48	DONE CAN		01-AUG-16 00:00
405235011	SAMPLE	MXR1	GAM33	OCT-03-16 08:07:11	DONE CAN		10-JUN-16 00:00
405235012	SAMPLE	MXR1	GAM36	OCT-03-16 08:07:40	DONE CAN		01-JUN-16 00:00
405235013	SAMPLE	MXR1	GAM41	OCT-03-16 08:10:29	DONE CAN		26-JAN-16 00:00
405235014	SAMPLE	MXR1	GAM43	OCT-03-16 08:11:15	DONE CAN		06-SEP-16 00:00
405235015	SAMPLE	MXR1	GAM44	OCT-03-16 08:11:39	DONE CAN		06-SEP-16 00:00
405235016	SAMPLE	MXR1	GAM12	OCT-03-16 08:15:34	DONE CAN		22-SEP-16 00:00
405235017	SAMPLE	MXR1	GAM16	OCT-03-16 08:16:00	DONE CAN		23-SEP-16 00:00
405235018	SAMPLE	MXR1	GAM27	OCT-03-16 08:16:22	DONE CAN		03-OCT-16 00:00
405235019	SAMPLE	MXR1	GAM11	OCT-03-16 08:21:03	DONE CAN		02-AUG-16 00:00
1203621350	MB	MXR1	GAM31	OCT-03-16 08:50:58	DONE CAN		15-JUN-16 00:00
405235020	SAMPLE	MXR1	GAM01	OCT-03-16 08:53:24	DONE CAN		20-JUL-16 00:00
1203621351	DUP	MXR1	GAM05	OCT-03-16 08:53:50	DONE CAN		04-SEP-16 00:00
1203621352	LCS	MXR1	GAM06	OCT-03-16 08:54:28	DONE CAN		08-MAR-16 00:00

Instrument Run Log

Instrument Type: **GAMMA SPECTROMETER**

Batch ID: **1596249**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235021	SAMPLE	MXR1	GAM07	OCT-03-16 08:57:41	DONE CAN		19-AUG-16 00:00
405235022	SAMPLE	MXR1	GAM18	OCT-03-16 08:58:12	DONE CAN		25-JUN-16 00:00
405235023	SAMPLE	MXR1	GAM24	OCT-03-16 08:58:40	DONE CAN		17-JUN-16 00:00
405235024	SAMPLE	MXR1	GAM29	OCT-03-16 08:59:12	DONE CAN		25-JUN-16 00:00
405235025	SAMPLE	MXR1	GAM02	OCT-03-16 09:01:15	DONE CAN		22-AUG-16 00:00
405235026	SAMPLE	MXR1	GAM30	OCT-03-16 09:01:37	DONE CAN		11-MAR-16 00:00
405235027	SAMPLE	MXR1	GAM08	OCT-03-16 09:08:01	DONE CAN		21-JUL-16 00:00
405235028	SAMPLE	MXR1	GAM09	OCT-03-16 09:08:29	DONE CAN		03-JUN-16 00:00
405235029	SAMPLE	MXR1	GAM19	OCT-03-16 09:08:53	DONE CAN		15-JUN-16 00:00
405235030	SAMPLE	MXR1	GAM20	OCT-03-16 09:09:22	DONE CAN		30-JUN-16 00:00
405235031	SAMPLE	MXR1	GAM32	OCT-03-16 09:09:51	DONE CAN		23-AUG-16 00:00
405235032	SAMPLE	MXR1	GAM39	OCT-03-16 09:10:21	DONE CAN		27-JUL-16 00:00
1203621356	LCS	MXR1	GAM06	OCT-03-16 09:11:02	DONE CAN		08-MAR-16 00:00
405235033	SAMPLE	MXR1	GAM25	OCT-03-16 09:15:18	DONE CAN		01-AUG-16 00:00
405235034	SAMPLE	MXR1	GAM28	OCT-03-16 09:15:46	DONE CAN		01-AUG-16 00:00
405235035	SAMPLE	MXR1	GAM33	OCT-03-16 09:16:17	DONE CAN		10-JUN-16 00:00
405235036	SAMPLE	MXR1	GAM36	OCT-03-16 09:16:44	DONE CAN		01-JUN-16 00:00
405235037	SAMPLE	MXR1	GAM41	OCT-03-16 09:17:13	DONE CAN		26-JAN-16 00:00
405235038	SAMPLE	MXR1	GAM43	OCT-03-16 09:17:37	DONE CAN		06-SEP-16 00:00
405235039	SAMPLE	MXR1	GAM44	OCT-03-16 09:18:06	DONE CAN		06-SEP-16 00:00
405235040	SAMPLE	MXR1	GAM12	OCT-03-16 09:20:08	DONE CAN		22-SEP-16 00:00
1203621354	MB	MXR1	GAM16	OCT-03-16 09:20:38	DONE CAN		23-SEP-16 00:00
1203621355	DUP	MXR1	GAM27	OCT-03-16 09:21:06	DONE CAN		03-OCT-16 00:00

Instrument Run Log

Instrument Type: **GAMMA SPECTROMETER**

Batch ID: **1596252**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1203621363	LCS	MXR1	GAM11	OCT-03-16 05:45:34	DONE CAN		02-AUG-16 00:00
405235041	SAMPLE	MXR1	GAM28	OCT-03-16 05:54:08	DONE CAN		01-AUG-16 00:00
405235042	SAMPLE	MXR1	GAM08	OCT-03-16 06:55:55	DONE CAN		21-JUL-16 00:00
405235043	SAMPLE	MXR1	GAM09	OCT-03-16 06:56:18	DONE CAN		03-JUN-16 00:00
405235044	SAMPLE	MXR1	GAM32	OCT-03-16 06:56:59	DONE CAN		23-AUG-16 00:00
405235045	SAMPLE	MXR1	GAM39	OCT-03-16 06:57:26	DONE CAN		27-JUL-16 00:00
405235046	SAMPLE	MXR1	GAM20	OCT-03-16 06:57:53	DONE CAN		30-JUN-16 00:00
405235047	SAMPLE	MXR1	GAM25	OCT-03-16 07:00:30	DONE CAN		01-AUG-16 00:00
405235048	SAMPLE	MXR1	GAM28	OCT-03-16 07:00:55	DONE CAN		01-AUG-16 00:00
405235049	SAMPLE	MXR1	GAM33	OCT-03-16 07:01:16	DONE CAN		10-JUN-16 00:00
405235050	SAMPLE	MXR1	GAM36	OCT-03-16 07:01:40	DONE CAN		01-JUN-16 00:00
405235051	SAMPLE	MXR1	GAM41	OCT-03-16 07:04:39	DONE CAN		26-JAN-16 00:00
405235052	SAMPLE	MXR1	GAM44	OCT-03-16 07:04:59	DONE CAN		06-SEP-16 00:00
405235053	SAMPLE	MXR1	GAM31	OCT-03-16 07:06:55	DONE CAN		15-JUN-16 00:00
405235054	SAMPLE	MXR1	GAM43	OCT-03-16 07:07:21	DONE CAN		06-SEP-16 00:00
405235055	SAMPLE	MXR1	GAM11	OCT-03-16 07:18:44	DONE CAN		02-AUG-16 00:00
405235056	SAMPLE	MXR1	GAM01	OCT-03-16 07:50:44	DONE CAN		20-JUL-16 00:00
405235057	SAMPLE	MXR1	GAM05	OCT-03-16 07:51:32	DONE CAN		04-SEP-16 00:00
405235058	SAMPLE	MXR1	GAM06	OCT-03-16 07:51:57	DONE CAN		08-MAR-16 00:00
405235059	SAMPLE	MXR1	GAM07	OCT-03-16 07:52:25	DONE CAN		19-AUG-16 00:00
405235060	SAMPLE	MXR1	GAM18	OCT-03-16 07:52:52	DONE CAN		25-JUN-16 00:00
1203621361	MB	MXR1	GAM24	OCT-03-16 07:53:26	DONE CAN		17-JUN-16 00:00
1203621362	DUP	MXR1	GAM29	OCT-03-16 07:54:00	DONE CAN		25-JUN-16 00:00

Instrument Run Log

Instrument Type: **GAMMA SPECTROMETER**

Batch ID: **1596254**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1203621366	LCS	MXR1	GAM11	OCT-03-16 05:28:46	DONE CAN		02-AUG-16 00:00
405235064	SAMPLE	MXR1	GAM02	OCT-03-16 05:44:14	DONE CAN		22-AUG-16 00:00
405235061	SAMPLE	MXR1	GAM20	OCT-03-16 05:52:51	DONE CAN		30-JUN-16 00:00
405235062	SAMPLE	MXR1	GAM36	OCT-03-16 05:53:13	DONE CAN		01-JUN-16 00:00
405235063	SAMPLE	MXR1	GAM44	OCT-03-16 05:53:40	DONE CAN		06-SEP-16 00:00
405235065	SAMPLE	MXR1	GAM25	OCT-03-16 05:57:14	DONE CAN		01-AUG-16 00:00
405235066	SAMPLE	MXR1	GAM33	OCT-03-16 05:57:37	DONE CAN		10-JUN-16 00:00
405235067	SAMPLE	MXR1	GAM41	OCT-03-16 05:58:05	DONE CAN		26-JAN-16 00:00
405235068	SAMPLE	MXR1	GAM31	OCT-03-16 06:05:07	DONE CAN		15-JUN-16 00:00
405235069	SAMPLE	MXR1	GAM43	OCT-03-16 06:05:34	DONE CAN		06-SEP-16 00:00
405235070	SAMPLE	MXR1	GAM11	OCT-03-16 06:08:01	DONE CAN		02-AUG-16 00:00
405235071	SAMPLE	MXR1	GAM01	OCT-03-16 06:45:24	DONE CAN		20-JUL-16 00:00
405235072	SAMPLE	MXR1	GAM05	OCT-03-16 06:45:49	DONE CAN		04-SEP-16 00:00
405235073	SAMPLE	MXR1	GAM06	OCT-03-16 06:46:12	DONE CAN		08-MAR-16 00:00
405235074	SAMPLE	MXR1	GAM07	OCT-03-16 06:46:37	DONE CAN		19-AUG-16 00:00
405235075	SAMPLE	MXR1	GAM18	OCT-03-16 06:47:01	DONE CAN		25-JUN-16 00:00
405235076	SAMPLE	MXR1	GAM24	OCT-03-16 06:47:24	DONE CAN		17-JUN-16 00:00
405235077	SAMPLE	MXR1	GAM29	OCT-03-16 06:47:53	DONE CAN		25-JUN-16 00:00
405235078	SAMPLE	MXR1	GAM30	OCT-03-16 06:48:14	DONE CAN		11-MAR-16 00:00
1203621364	MB	MXR1	GAM02	OCT-03-16 06:55:01	DONE CAN		22-AUG-16 00:00
1203621365	DUP	MXR1	GAM19	OCT-03-16 06:55:29	DONE CAN		15-JUN-16 00:00

Instrument Run Log

Instrument Type: **GAMMA SPECTROMETER**

Batch ID: **1598618**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235001	SAMPLE	MJH1	XRAY4	SEP-27-16 12:26:55	DONE I129		17-JUN-16 00:00
405235002	SAMPLE	MJH1	XRAY2	SEP-27-16 12:27:18	DONE I129		27-JUL-16 00:00
405235003	SAMPLE	MJH1	XRAY5	SEP-27-16 12:27:38	DONE I129		30-AUG-16 00:00
405235004	SAMPLE	MJH1	XRAY6	SEP-27-16 12:27:59	DONE I129		26-JAN-16 00:00
405235005	SAMPLE	MJH1	XRAY4	SEP-27-16 15:11:29	DONE I129		17-JUN-16 00:00
405235006	SAMPLE	MJH1	XRAY5	SEP-27-16 15:11:52	DONE I129		30-AUG-16 00:00
405235007	SAMPLE	MJH1	XRAY6	SEP-27-16 15:12:14	DONE I129		26-JAN-16 00:00
405235009	SAMPLE	MJH1	XRAY2	SEP-27-16 16:18:41	DONE I129		27-JUL-16 00:00
405235008	SAMPLE	MJH1	XRAY1	SEP-27-16 16:19:05	DONE I129		09-JUN-16 00:00
405235010	SAMPLE	MJH1	XRAY4	SEP-27-16 16:19:26	DONE I129		17-JUN-16 00:00
405235011	SAMPLE	MJH1	XRAY5	SEP-27-16 16:19:47	DONE I129		30-AUG-16 00:00
405235012	SAMPLE	MJH1	XRAY6	SEP-27-16 16:20:09	DONE I129		26-JAN-16 00:00
405235013	SAMPLE	MJH1	XRAY2	SEP-28-16 06:36:49	DONE I129		27-JUL-16 00:00
405235014	SAMPLE	MJH1	XRAY4	SEP-28-16 06:45:16	DONE I129		17-JUN-16 00:00
405235015	SAMPLE	MJH1	XRAY6	SEP-28-16 06:48:23	DONE I129		26-JAN-16 00:00
405235016	SAMPLE	MJH1	XRAY5	SEP-28-16 06:55:30	DONE I129		30-AUG-16 00:00
405235017	SAMPLE	MJH1	XRAY2	SEP-28-16 07:22:16	DONE I129		27-JUL-16 00:00
405235018	SAMPLE	MJH1	XRAY4	SEP-28-16 07:22:56	DONE I129		17-JUN-16 00:00
405235019	SAMPLE	MJH1	XRAY6	SEP-28-16 07:23:18	DONE I129		26-JAN-16 00:00
405235020	SAMPLE	MJH1	XRAY5	SEP-28-16 07:27:31	DONE I129		30-AUG-16 00:00
1203627430	MB	MJH1	XRAY1	SEP-28-16 07:39:35	DONE I129		09-JUN-16 00:00
1203627431	DUP	MJH1	XRAY2	SEP-28-16 08:03:53	DONE I129		27-JUL-16 00:00
1203627432	MS	MJH1	XRAY4	SEP-28-16 08:04:20	DONE I129		17-JUN-16 00:00
1203627433	LCS	MJH1	XRAY1	SEP-28-16 08:11:05	DONE I129		09-JUN-16 00:00

Instrument Run Log

Instrument Type: **GAMMA SPECTROMETER**

Batch ID: **1598620**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235021	SAMPLE	MJH1	XRAY1	SEP-28-16 08:45:02	DONE I129		09-JUN-16 00:00
405235022	SAMPLE	MJH1	XRAY2	SEP-28-16 08:45:25	DONE I129		27-JUL-16 00:00
405235023	SAMPLE	MJH1	XRAY4	SEP-28-16 08:45:52	DONE I129		17-JUN-16 00:00
405235024	SAMPLE	MJH1	XRAY5	SEP-28-16 08:46:16	DONE I129		30-AUG-16 00:00
405235025	SAMPLE	MJH1	XRAY6	SEP-28-16 08:46:38	DONE I129		26-JAN-16 00:00
405235026	SAMPLE	MJH1	XRAY1	SEP-28-16 09:28:33	DONE I129		09-JUN-16 00:00
405235027	SAMPLE	MJH1	XRAY2	SEP-28-16 09:28:55	DONE I129		27-JUL-16 00:00
405235028	SAMPLE	MJH1	XRAY4	SEP-28-16 09:29:20	DONE I129		17-JUN-16 00:00
405235029	SAMPLE	MJH1	XRAY5	SEP-28-16 09:29:56	DONE I129		30-AUG-16 00:00
405235030	SAMPLE	MJH1	XRAY6	SEP-28-16 09:30:21	DONE I129		26-JAN-16 00:00
405235031	SAMPLE	MJH1	XRAY1	SEP-28-16 10:17:59	DONE I129		09-JUN-16 00:00
405235032	SAMPLE	MJH1	XRAY2	SEP-28-16 10:18:25	DONE I129		27-JUL-16 00:00
405235033	SAMPLE	MJH1	XRAY4	SEP-28-16 10:18:47	DONE I129		17-JUN-16 00:00
405235034	SAMPLE	MJH1	XRAY5	SEP-28-16 10:19:14	DONE I129		30-AUG-16 00:00
405235035	SAMPLE	MJH1	XRAY6	SEP-28-16 10:19:45	DONE I129		26-JAN-16 00:00
405235036	SAMPLE	MJH1	XRAY1	SEP-28-16 11:17:38	DONE I129		09-JUN-16 00:00
405235037	SAMPLE	MJH1	XRAY2	SEP-28-16 11:18:01	DONE I129		27-JUL-16 00:00
405235038	SAMPLE	MJH1	XRAY4	SEP-28-16 11:18:47	DONE I129		17-JUN-16 00:00
405235039	SAMPLE	MJH1	XRAY5	SEP-28-16 11:19:10	DONE I129		30-AUG-16 00:00
405235040	SAMPLE	MJH1	XRAY6	SEP-28-16 11:19:53	DONE I129		26-JAN-16 00:00
1203627437	MB	MJH1	XRAY1	SEP-28-16 12:50:58	DONE I129		09-JUN-16 00:00
1203627438	DUP	MJH1	XRAY2	SEP-28-16 12:51:32	DONE I129		27-JUL-16 00:00
1203627439	MS	MJH1	XRAY4	SEP-28-16 12:52:05	DONE I129		17-JUN-16 00:00
1203627440	LCS	MJH1	XRAY5	SEP-28-16 12:52:43	DONE I129		30-AUG-16 00:00

Instrument Run Log

Instrument Type: **GAMMA SPECTROMETER**

Batch ID: **1598647**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235041	SAMPLE	MJH1	XRAY6	SEP-28-16 12:50:10	DONE I129		26-JAN-16 00:00
405235042	SAMPLE	MJH1	XRAY1	SEP-28-16 13:34:32	DONE I129		09-JUN-16 00:00
405235043	SAMPLE	MJH1	XRAY2	SEP-28-16 13:34:57	DONE I129		27-JUL-16 00:00
405235044	SAMPLE	MJH1	XRAY4	SEP-28-16 13:35:27	DONE I129		17-JUN-16 00:00
405235045	SAMPLE	MJH1	XRAY5	SEP-28-16 13:35:51	DONE I129		30-AUG-16 00:00
405235046	SAMPLE	MJH1	XRAY6	SEP-28-16 13:36:13	DONE I129		26-JAN-16 00:00
405235047	SAMPLE	MJH1	XRAY1	SEP-28-16 14:39:43	DONE I129		09-JUN-16 00:00
405235048	SAMPLE	MJH1	XRAY2	SEP-28-16 14:40:07	DONE I129		27-JUL-16 00:00
405235049	SAMPLE	MJH1	XRAY4	SEP-28-16 14:40:29	DONE I129		17-JUN-16 00:00
405235050	SAMPLE	MJH1	XRAY5	SEP-28-16 14:40:52	DONE I129		30-AUG-16 00:00
405235051	SAMPLE	MJH1	XRAY6	SEP-28-16 14:41:12	DONE I129		26-JAN-16 00:00
405235052	SAMPLE	MJH1	XRAY1	SEP-28-16 15:14:01	DONE I129		09-JUN-16 00:00
405235053	SAMPLE	MJH1	XRAY2	SEP-28-16 15:14:23	DONE I129		27-JUL-16 00:00
405235054	SAMPLE	MJH1	XRAY4	SEP-28-16 15:14:44	DONE I129		17-JUN-16 00:00
405235055	SAMPLE	MJH1	XRAY5	SEP-28-16 15:15:08	DONE I129		30-AUG-16 00:00
405235056	SAMPLE	MJH1	XRAY6	SEP-28-16 15:15:30	DONE I129		26-JAN-16 00:00
405235057	SAMPLE	MJH1	XRAY1	SEP-28-16 15:48:44	DONE I129		09-JUN-16 00:00
405235058	SAMPLE	MJH1	XRAY2	SEP-28-16 15:49:08	DONE I129		27-JUL-16 00:00
405235059	SAMPLE	MJH1	XRAY4	SEP-28-16 15:49:42	DONE I129		17-JUN-16 00:00
405235060	SAMPLE	MJH1	XRAY5	SEP-28-16 15:50:06	DONE I129		30-AUG-16 00:00
1203627502	MB	MJH1	XRAY6	SEP-28-16 15:50:32	DONE I129		26-JAN-16 00:00
1203627503	DUP	MJH1	GAM05	SEP-28-16 19:04:24	DONE I129		06-SEP-16 00:00
1203627504	MS	MJH1	XRAY1	SEP-28-16 19:05:16	DONE I129		09-JUN-16 00:00
1203627505	LCS	MJH1	XRAY2	SEP-28-16 19:05:55	DUSE I129		27-JUL-16 00:00
1203627505	LCS	MJH1	XRAY1	SEP-29-16 09:10:18	DONE I129		09-JUN-16 00:00

Instrument Run Log

Instrument Type: **GAMMA SPECTROMETER**

Batch ID: **1598663**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235061	SAMPLE	MJH1	XRAY4	SEP-28-16 19:09:16	DONE I129		17-JUN-16 00:00
405235062	SAMPLE	MJH1	XRAY5	SEP-28-16 19:09:43	DONE I129		30-AUG-16 00:00
405235063	SAMPLE	MJH1	XRAY6	SEP-28-16 19:10:13	DONE I129		26-JAN-16 00:00
405235064	SAMPLE	MJH1	GAM05	SEP-29-16 06:19:44	DONE I129		06-SEP-16 00:00
405235065	SAMPLE	MJH1	XRAY1	SEP-29-16 06:20:10	DONE I129		09-JUN-16 00:00
405235066	SAMPLE	MJH1	XRAY2	SEP-29-16 06:30:34	DONE I129		27-JUL-16 00:00
405235067	SAMPLE	MJH1	XRAY4	SEP-29-16 06:34:44	DONE I129		17-JUN-16 00:00
405235068	SAMPLE	MJH1	XRAY6	SEP-29-16 06:45:27	DONE I129		26-JAN-16 00:00
405235069	SAMPLE	MJH1	XRAY5	SEP-29-16 06:46:52	DONE I129		30-AUG-16 00:00
405235070	SAMPLE	MJH1	XRAY1	SEP-29-16 06:53:16	DONE I129		09-JUN-16 00:00
405235071	SAMPLE	MJH1	XRAY2	SEP-29-16 07:04:23	DONE I129		27-JUL-16 00:00
405235072	SAMPLE	MJH1	XRAY4	SEP-29-16 07:11:09	DONE I129		17-JUN-16 00:00
405235073	SAMPLE	MJH1	XRAY5	SEP-29-16 07:18:28	DONE I129		30-AUG-16 00:00
405235074	SAMPLE	MJH1	XRAY6	SEP-29-16 07:18:54	DONE I129		26-JAN-16 00:00
405235075	SAMPLE	MJH1	XRAY1	SEP-29-16 07:24:37	DONE I129		09-JUN-16 00:00
405235076	SAMPLE	MJH1	GAM05	SEP-29-16 08:01:20	DONE I129		06-SEP-16 00:00
405235077	SAMPLE	MJH1	XRAY1	SEP-29-16 08:02:10	DONE I129		09-JUN-16 00:00
405235078	SAMPLE	MJH1	XRAY2	SEP-29-16 08:02:53	DONE I129		27-JUL-16 00:00
1203627531	MB	MJH1	XRAY4	SEP-29-16 08:03:29	DONE I129		17-JUN-16 00:00
1203627532	DUP	MJH1	XRAY5	SEP-29-16 08:03:56	DONE I129		30-AUG-16 00:00
1203627533	MS	MJH1	XRAY6	SEP-29-16 08:04:21	DONE I129		26-JAN-16 00:00
1203627534	LCS	MJH1	XRAY1	SEP-29-16 08:33:28	DONE I129		09-JUN-16 00:00

Gas Flow Raw Data

Batch# 1597816 Product: GABZ Date: 9/20/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.	/		
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	/		
Instrument source check is within limits.	/		
Instrument bkg check is within limits.	/		
Method RDL/ LLD has been met.	/		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	/		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			NA
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	/		
Sample was run within hold time.	no	✓	DER 1559577
Sample was correctly preserved if required.	/		
Smears Taken for Radioactive batches.	/		
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	/		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	/		
Aux data is correct.			NA
Client Special requirements page has been checked.	/		
Raw Data and/ or spectrum are included and properly stasured.	/		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	/		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	/		NA 9/20/16
Batch Data Exception Reports (DER) completed, if applicable.	✓		NA DER 1559577
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		NA
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	/		

Primary Review Performed By: Walter King III 10/4 MJC

Secondary Review Performed By: Walt 9/21/16

DATA EXCEPTION REPORT

Mo.Day Yr. 20-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GFPC	Test / Method: EPA 900.0/SW846 9310/SM 7110B Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1597816	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, 1203625450, 1203625451, and 1203625452 were received and analyzed out of holding.		1. Reporting results	

Originator's Name:

Nat Long 20-SEP-16

Data Validator/Group Leader:

Kenshalla Oston 21-SEP-16

Logbook

The Determination of Gross Alpha And Gross Non-Volatile Beta in Soil, Filters, Solid Matrices And Direct Count Air Filters

Batch ID: 1597816 Due Dates for Lab: 30-SEP-2016 Hold: 30-MAY-2016 Package: 02-OCT-2016 SDG: 04-OCT-2016
 Analyst: Jasmine Conley Lab SOP: GL-RAD-A-001B REV# 17
 Instrument: BAL-16107662 Method: EPA 900.0/SW846 9310/SM 7110B Modified

Sample ID	Run Date	#	Dry or Wet	Intermediate Aliquot	Unadjusted Aliquot (g)	Aliquot (g)	Initial Weight (g)	Final Weight (g)	Residue Weight (mg)	Detector
405235001	14-SEP-2016 11:00	1	D		0.103	0.103	7.5424	7.5695	27.1	14C
405235002	14-SEP-2016 11:00	2	D		0.099	0.099	7.4936	7.522	28.4	13D
405235003	14-SEP-2016 11:00	3	D		0.103	0.103	7.6016	7.6271	25.5	14D
405235004	14-SEP-2016 11:00	4	D		0.104	0.104	7.4866	7.5139	27.3	13C
405235005	14-SEP-2016 11:00	5	D		0.103	0.103	7.5924	7.6192	26.8	13D
405235006	14-SEP-2016 11:00	6	D		0.101	0.101	7.5087	7.5357	27	14A
405235007	14-SEP-2016 11:00	7	D		0.107	0.107	7.5348	7.561	26.2	C2
405235008	14-SEP-2016 11:00	8	D		0.104	0.104	7.5613	7.5887	27.4	J2
405235009	14-SEP-2016 11:00	9	D		0.102	0.102	7.5388	7.5652	26.4	H1
405235010	14-SEP-2016 11:00	10	D		0.109	0.109	7.5204	7.5474	27	G2
405235011	14-SEP-2016 11:00	11	D		0.102	0.102	7.4561	7.4812	25.1	F3
405235012	14-SEP-2016 11:00	12	D		0.104	0.104	7.6088	7.6346	25.8	G4
405235013	14-SEP-2016 11:00	13	D		0.11	0.11	7.5763	7.6043	28	J2 A
405235014	14-SEP-2016 11:00	14	D		0.103	0.103	7.5802	7.6063	26.1	F4
405235015	14-SEP-2016 11:00	15	D		0.11	0.11	7.5808	7.6083	27.5	F4
405235016	14-SEP-2016 11:00	16	D		0.101	0.101	7.5501	7.5738	23.7	F2
405235017	14-SEP-2016 11:00	17	D		0.103	0.103	7.6397	7.6659	26.2	H3
405235018	14-SEP-2016 11:00	18	D		0.106	0.106	7.6637	7.6892	25.5	J1 A
405235019	14-SEP-2016 11:00	19	D		0.104	0.104	7.6148	7.6394	24.6	J1
405235020	14-SEP-2016 11:00	20	D		0.104	0.104	7.6314	7.6562	24.8	SC
1203625449 MB	14-SEP-2016 11:00	21	D		0.11	0.11	7.6119	7.6128	0.9	B1
1203625450 DUP (405235013)	14-SEP-2016 11:00	22	D		0.109	0.109	7.581	7.6088	27.8	14D A
1203625451 MS (405235013)	14-SEP-2016 11:00	23	D		0.11	0.11	7.6003	7.6269	26.6	B2
1203625452 MSD (405235013)	14-SEP-2016 11:00	24	D		0.109	0.109	7.5958	7.6224	26.6	14
1203625453 LCS	14-SEP-2016 11:00	25	D		0.11	0.11	7.5453	7.5466	1.3	15

ANL 9/20/16

Logbook

The Determination of Gross Alpha And Gross Non-Volatile Beta in Soil, Filters, Solid Matrices And Direct Count Air Filters

Batch ID: 1597816 **Lab SOP:** GL-RAD-A-001B REV# 17
Analyst: Jasmine Conley **Method:** EPA 900.0/SW846 9310/SM 7110B
Instrument: BAL-16107662 **Modified**

Sample ID	Run Date	#	Dry or Wet	Intermediate Aliquot	Unadjusted Aliquot (g)	Aliquot (g)	Initial Weight (g)	Final Weight (g)	Residue Weight (mg)	Detector
Type	Name	Serial Number			Spike Amount	Spike Units				
RGNT	RGF-Hydrofluoric Acid	2429436.1			10	mL				Spike Pipet ID: RAD-GFC-4497063 Planchets Flamed: Yes
RGNT	RGF-1M Nitric Acid	2446509			5	mL				
RGNT	RGF-Hydrochloric Acid	2447606.13			5	mL				
RGNT	RGF-Nitric Acid	2450046.4			25	mL				
SPIKE	Strontium-90 SPIKE	1243-O			.1	mL				
SPIKE	Thorium-230 SPIKE	1493-B			.1	mL				

Gross Alpha/Beta Solid

Filename : GAB.XLS
 File type : Excel
 Version # : 1.3.10

Batch : 1597816
 Analyst : JAS02031
 Prep Date : 9/14/2016
 Alpha Method Uncertainty : 0.0928
 Beta Method Uncertainty : 0.0628

Procedure Code : GFCCANBS
 Parmname1 : Alpha
 Parmname2 : Beta
 Required Alpha MDA : 4 pCi/G
 Required Beta MDA : 10 pCi/G

Geometry : 2 inch Planchett

Sample Characteristics			Count Raw Data					Count		
Pos.	Sample ID	Sample Aliquot G	Sample Residue Wt. (mg)	Sample Aliquot StDev. G	Sample Date/Time	Detector ID	Counting Time (min.)	Gross Counts Alpha	Gross Counts Beta	Count Start Date/Time
1	405235001.1	0.1030	27.1	3.2298E-03	12/10/2015 14:20	14C	160	93	557	9/16/2016 10:57
2	405235002.1	0.0990	28.4	4.3283E-04	12/10/2015 14:30	13D	80	74	200	9/16/2016 10:57
3	405235003.1	0.1030	25.5	3.2298E-03	12/10/2015 14:35	14D	280	167	936	9/16/2016 10:58
4	405235004.1	0.1040	27.3	3.2299E-03	12/9/2015 14:00	12C	280	284	1043	9/16/2016 10:58
5	405235005.1	0.1030	26.8	3.2298E-03	12/10/2015 13:15	12D	230	159	819	9/16/2016 10:58
6	405235006.1	0.1010	27	3.2296E-03	12/10/2015 13:25	14A	90	39	246	9/16/2016 10:58
7	405235007.1	0.1070	26.2	3.2302E-03	12/10/2015 13:55	C2	180	124	584	9/19/2016 12:41
8	405235008.1	0.1040	27.4	3.2299E-03	12/10/2015 14:05	J2	180	111	601	9/19/2016 12:32
9	405235009.1	0.1020	26.4	3.2297E-03	12/10/2015 10:30	H1	180	133	622	9/19/2016 12:32
10	405235010.1	0.1090	27	3.2304E-03	12/10/2015 10:35	G2	180	109	718	9/19/2016 12:32
11	405235011.1	0.1020	25.1	3.2297E-03	12/9/2015 10:13	F3	180	109	648	9/19/2016 12:32
12	405235012.1	0.1040	25.8	3.2299E-03	12/10/2015 11:25	G4	180	88	690	9/19/2016 12:32
13	405235013.1	0.1100	28	3.2305E-03	12/8/2015 11:23	12A	100	70	385	9/20/2016 11:56
14	405235014.1	0.1030	26.1	3.2298E-03	12/8/2015 10:49	B4	180	101	641	9/19/2016 14:16
15	405235015.1	0.1100	27.5	3.2305E-03	12/8/2015 10:56	F4	180	117	693	9/19/2016 12:32
16	405235016.1	0.1010	23.7	3.2296E-03	12/8/2015 11:29	F2	180	105	691	9/19/2016 12:32
17	405235017.1	0.1030	26.2	3.2298E-03	12/22/2015 10:02	H3	180	105	654	9/19/2016 12:32
18	405235018.1	0.1060	25.5	3.2301E-03	12/22/2015 10:19	J1	180	117	573	9/19/2016 12:32
19	405235019.1	0.1040	24.6	3.2299E-03	12/8/2015 14:30	5C	100	81	278	9/19/2016 12:30
20	405235020.1	0.1040	24.8	3.2299E-03	12/8/2015 13:50	B1	180	119	682	9/19/2016 14:16
21	1203625449.1	0.1100	0.9	3.2305E-03	9/14/2016 0:00	14D	70	15	52	9/19/2016 12:20
22	1203625450.1	0.1090	27.8	3.2304E-03	12/8/2015 11:23	12D	140	121	534	9/20/2016 11:56
23	1203625451.1	0.1100	26.6	3.2305E-03	12/8/2015 11:23	14C	60	243	3055	9/20/2016 11:56
24	1203625452.1	0.1090	26.6	3.2304E-03	12/8/2015 11:23	14D	60	239	3163	9/20/2016 11:56
25	1203625453.1	0.1100	1.3	3.2305E-03	9/14/2016 0:00	1D	60	466	3086	9/19/2016 12:37

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-001B
 Instrument SOP: GL-RAD-I-016, GL-RAD-I-006

Pos.	Calibration Data				Alpha				Beta				Weekly Background					
	Counted on	Calibration Date	Calibration Due Date	Calibration Source Used	Calibration Date	Calibration Due Date	Calibration Source Used	Calibration Source Used	Det. Eff. Error (cpm/dpm)	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	Calibration Date	Calibration Due Date	Calibration Source Used	Alpha	CPM	Beta	Count Start Date/Time
1	PIC	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1457	0.02173	0.18747	12/1/2015	11/30/2016	Sr90	0.142	1.268	1.268	9/9/2016 17:55	500
2	PIC	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1257	0.01236	0.26740	12/1/2015	11/30/2016	Sr90	0.032	0.322	0.322	9/9/2016 17:55	500
3	PIC	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1364	0.01512	0.29598	12/1/2015	11/30/2016	Sr90	0.212	0.860	0.860	9/9/2016 17:55	500
4	PIC	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1535	0.02199	0.08779	12/1/2015	11/30/2016	Sr90	0.282	0.748	0.748	9/9/2016 17:58	500
5	PIC	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1520	0.01863	0.12384	12/1/2015	11/30/2016	Sr90	0.222	1.428	1.428	9/9/2016 17:59	500
6	PIC	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1402	0.02505	0.21106	12/1/2015	11/30/2016	Sr90	0.056	0.428	0.428	9/9/2016 17:54	500
7	LB4100	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1547	0.02436	0.21445	12/1/2015	11/30/2016	Sr90	0.190	1.220	1.220	9/16/2016 17:48	500
8	LB4100	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1536	0.00765	0.02390	12/1/2015	11/30/2016	Sr90	0.098	0.726	0.726	9/16/2016 17:29	500
9	LB4100	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1311	0.01393	0.03342	12/1/2015	11/30/2016	Sr90	0.066	0.960	0.960	9/16/2016 17:44	500
10	LB4100	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1247	0.01976	0.02932	12/1/2015	11/30/2016	Sr90	0.126	1.174	1.174	9/16/2016 17:43	500
11	LB4100	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1504	0.02244	0.03271	12/1/2015	11/30/2016	Sr90	0.122	0.942	0.942	9/16/2016 17:44	500
12	LB4100	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1414	0.02077	0.03070	12/1/2015	11/30/2016	Sr90	0.110	0.988	0.988	9/16/2016 17:43	500
13	PIC	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1459	0.01685	0.17032	12/1/2015	11/30/2016	Sr90	0.088	0.888	0.888	9/16/2016 18:00	500
14	LB4100	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1206	0.02055	0.03077	12/1/2015	11/30/2016	Sr90	0.074	1.284	1.284	9/16/2016 17:32	500
15	LB4100	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1164	0.02862	0.04145	12/1/2015	11/30/2016	Sr90	0.110	1.394	1.394	9/16/2016 17:44	500
16	LB4100	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1344	0.03128	0.02996	12/1/2015	11/30/2016	Sr90	0.098	1.138	1.138	9/16/2016 17:44	500
17	LB4100	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1190	0.01513	0.03349	12/1/2015	11/30/2016	Sr90	0.054	1.130	1.130	9/16/2016 17:44	500
18	LB4100	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1481	0.01256	0.02187	12/1/2015	11/30/2016	Sr90	0.184	0.788	0.788	9/16/2016 17:29	500
19	PIC	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1800	0.01161	0.06015	12/1/2015	11/30/2016	Sr90	0.132	0.856	0.856	9/16/2016 17:25	500
20	LB4100	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1579	0.01406	0.01841	12/1/2015	11/30/2016	Sr90	0.188	1.314	1.314	9/16/2016 17:32	500
21	PIC	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.2484	0.01512	0.23521	12/1/2015	11/30/2016	Sr90	0.212	0.793	0.793	9/16/2016 17:23	1000
22	PIC	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1494	0.01863	0.12437	12/1/2015	11/30/2016	Sr90	0.146	1.342	1.342	9/16/2016 18:01	500
23	PIC	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1470	0.02173	0.18712	12/1/2015	11/30/2016	Sr90	0.135	1.297	1.297	9/16/2016 17:23	1000
24	PIC	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.1337	0.01512	0.29676	12/1/2015	11/30/2016	Sr90	0.212	0.793	0.793	9/16/2016 17:23	1000
25	PIC	12/1/2015	11/30/2016	Th230	12/1/2015	11/30/2016	Sr90	0.2796	0.00996	0.03816	12/1/2015	11/30/2016	Sr90	0.190	1.456	1.456	9/16/2016 17:24	500

Notes:

1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

Alpha Spike S/N : 1493-B
 Spike Exp Date : 6/8/2017
 Spike Activity (dpm/ml): 266.08
 Spike Volume Added: 0.10
 Spike Nuclide: Th-230

Alpha LCS S/N : 1493-B
 LCS Exp Date : 6/8/2017
 LCS Activity (dpm/ml): 266.08
 LCS Volume Added: 0.10
 LCS Nuclide: Th-230

Pos.	Decision Level		Critical Level	Required MDA	MDA	Sample Act. Conc.	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA Counting		Total Prop. Uncertainty	Sample OC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
	pCi/G	pCi/G								pCi/G	pCi/G							
1	2.3933	1.6897	4	3.9420	13.1484	14.75%	0.4933	0.0626	0.4933	0.0626	3.6812	4.5024		SAMPLE				
2	1.8164	1.2824	4	3.9219	32.2936	12.15%	0.8930	0.1078	0.8930	0.1078	7.6484	9.6820		SAMPLE				
3	2.5673	1.8125	4	3.9686	12.2892	13.60%	0.3844	0.0505	0.3844	0.0505	3.1757	3.9772		SAMPLE				
4	2.6064	1.8401	4	3.9826	20.6122	9.62%	0.7323	0.0647	0.7323	0.0647	3.5789	5.4142		SAMPLE				
5	2.5170	1.7770	4	3.9293	13.4606	13.04%	0.4693	0.0587	0.4693	0.0587	3.3127	4.2355		SAMPLE				
6	2.0084	1.4180	4	3.8964	11.9765	19.04%	0.3773	0.0702	0.3773	0.0702	4.3765	4.9834		SAMPLE				
7	2.4030	1.6965	4	3.8468	13.5567	13.57%	0.4989	0.0649	0.4989	0.0649	3.4605	4.3752		SAMPLE				
8	1.7879	1.2623	4	2.9945	14.5940	12.04%	0.5187	0.0602	0.5187	0.0602	3.3263	4.3569		SAMPLE				
9	1.7525	1.2373	4	3.0359	22.6230	10.27%	0.6729	0.0651	0.6729	0.0651	4.2971	6.1498		SAMPLE				
10	2.3829	1.6824	4	3.9172	15.8720	13.04%	0.4796	0.0601	0.4796	0.0601	3.9068	4.9854		SAMPLE				
11	2.0767	1.4661	4	3.4216	14.1675	13.01%	0.4836	0.0601	0.4836	0.0601	3.4562	4.4472		SAMPLE				
12	2.0580	1.4529	4	3.4165	11.5824	14.78%	0.3789	0.0542	0.3789	0.0542	3.2538	3.9709		SAMPLE				
13	2.1247	1.5000	4	3.8419	17.1432	14.25%	0.6120	0.0847	0.6120	0.0847	4.6591	5.7239		SAMPLE				
14	1.9977	1.4104	4	3.4251	17.6140	12.32%	0.4871	0.0571	0.4871	0.0571	4.0610	5.3382		SAMPLE				
15	2.3637	1.6688	4	3.9241	18.9622	12.17%	0.5400	0.0619	0.5400	0.0619	4.2690	5.7011		SAMPLE				
16	2.1045	1.4858	4	3.5248	16.0598	12.88%	0.4853	0.0586	0.4853	0.0586	3.8140	5.0127		SAMPLE				
17	1.7290	1.2207	4	3.0537	19.4111	11.47%	0.5293	0.0579	0.5293	0.0579	4.1669	5.6245		SAMPLE				
18	2.4921	1.7595	4	3.9970	13.3302	13.93%	0.4660	0.0631	0.4660	0.0631	3.5467	4.3860		SAMPLE				
19	2.2317	1.5756	4	3.8732	16.0717	13.89%	0.6780	0.0915	0.6780	0.0915	4.3139	5.3425		SAMPLE				
20	2.4081	1.7001	4	3.8573	12.9305	13.87%	0.4731	0.0636	0.4731	0.0636	3.4200	4.2445		SAMPLE				
21	2.1863	1.5435	4	3.7935	0.0336	2503.03%	0.0023	0.0572	0.0023	0.0572	1.8483	1.8489		MB				
22	2.3544	1.6822	4	3.9171	19.8204	11.73%	0.7183	0.0804	0.7183	0.0804	4.3588	5.8235	405235013.1	DUP	14.5%		108.9599	83.9%
23	3.1694	2.2376	4	5.8679	108.5909	7.58%	3.9150	0.2601	3.9150	0.2601	14.1977	25.6114	405235013.1	MS			109.9595	90.0%
24	4.4088	3.1126	4	7.7712	116.0610	7.61%	3.7713	0.2581	3.7713	0.2581	15.6391	27.4266	405235013.1	MSD	6.7%		108.9599	96.5%
25	2.0319	1.4346	4	3.6013	105.1736	5.68%	7.5767	0.3603	7.5767	0.3603	10.3414	23.6571		LCS				

Beta Spike S/N : 1243-O
 Spike Exp Date : 12/18/2016
 Spike Activity (dpm/ml): 483.55
 Spike Volume Added: 0.10
 Spike Nuclide: Sr-90

Beta LCS S/N : 1243-O
 LCS Exp Date : 12/18/2016
 LCS Activity (dpm/ml): 483.55
 LCS Volume Added: 0.10
 LCS Nuclide: Sr-90

Notes:
 1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

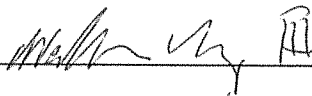
Pos.	Decision Level		Critical pCi/g	Required MDA pCi/g	MDA pCi/g	Sample Act. Conc. pCi/g	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	Counting Uncertainty pCi/g	Total Prop. Uncertainty pCi/g	Sample QC	Sample Type	RPD	RER	Nominal pCi/g	Recovery
	pCi/g	pCi/g															
1	2.2330	1.5765	10	3.3287	19.7175	7.92%	2.2133	0.1559	2.8625	4.1094		SAMPLE					
2	1.6613	1.1729	10	2.7370	20.1455	8.29%	2.1780	0.1786	3.6525	4.6328		SAMPLE					
3	1.5184	1.0720	10	2.2449	21.7133	5.70%	2.4829	0.1169	2.1566	3.8868		SAMPLE					
4	1.3506	0.9536	10	2.0033	25.9321	5.40%	2.9770	0.1217	2.1411	4.3382		SAMPLE					
5	1.9896	1.4047	10	2.9263	18.3613	7.32%	2.1329	0.1354	2.3805	3.6154		SAMPLE					
6	1.6741	1.1820	10	2.6836	21.2347	8.57%	2.3053	0.1767	3.3221	4.6052		SAMPLE					
7	1.8919	1.3357	10	2.8123	15.8718	8.04%	2.0244	0.1431	2.3713	3.4224		SAMPLE					
8	1.5634	1.1038	10	2.3586	23.5391	6.33%	2.6129	0.1414	2.5114	4.1358		SAMPLE					
9	1.8025	1.2726	10	2.6966	22.4444	6.70%	2.4956	0.1453	2.5872	4.0795		SAMPLE					
10	1.8433	1.3014	10	2.7427	23.4952	6.44%	2.8149	0.1566	2.5774	4.1701		SAMPLE					
11	1.7157	1.2113	10	2.5681	23.0273	6.48%	2.6580	0.1479	2.5308	4.1027		SAMPLE					
12	1.7618	1.2439	10	2.6336	24.7704	6.27%	2.8453	0.1526	2.6168	4.3301		SAMPLE					
13	2.0520	1.4487	10	3.1534	24.2533	7.64%	2.9620	0.2007	3.3559	4.8989		SAMPLE					
14	2.1784	1.5379	10	3.2341	21.4504	7.34%	2.2771	0.1495	2.7815	4.0925		SAMPLE					
15	1.9110	1.3492	10	2.8316	19.4127	7.03%	2.4560	0.1555	2.4356	3.6266		SAMPLE					
16	1.8996	1.3411	10	2.8287	23.5927	6.67%	2.7009	0.1536	2.6475	4.2627		SAMPLE					
17	1.8333	1.2943	10	2.7305	21.1502	6.81%	2.5033	0.1498	2.5004	3.8693		SAMPLE					
18	1.5858	1.1196	10	2.3862	21.0033	6.74%	2.3953	0.1388	2.3994	3.8140		SAMPLE					
19	2.0498	1.4472	10	3.1547	16.2775	9.48%	1.9240	0.1718	2.9226	3.7212		SAMPLE					
20	2.0575	1.4526	10	3.0530	21.8259	7.18%	2.4749	0.1539	2.6729	4.1002		SAMPLE					
21	2.2187	1.5664	10	3.5035	-0.8696	213.00%	-0.0501	0.1068	1.8104	1.8104		MB		18.9%			
22	2.1890	1.5455	10	3.2727	20.0573	7.82%	2.4723	0.1730	2.8759	4.1221		DUP				396.0263	102.1%
23	3.0929	2.1836	10	4.8056	428.4758	3.93%	49.6197	0.9219	15.8452	63.1659		MS		5.3%		399.6596	107.0%
24	2.4556	1.7337	10	3.9126	451.8070	3.55%	51.9237	0.9378	16.3659	65.3629		MSD				396.0263	103.6%
25	3.1721	2.2395	10	4.8919	410.2631	3.54%	49.9773	0.9274	15.0111	58.3236		LCS					

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
405235001	14C	160	93	557	9/16/2016 10:57	9/16/2016 13:37	PIC	1597816
405235002	13D	80	74	200	9/16/2016 10:57	9/16/2016 12:17	PIC	1597816
405235003	14D	280	167	936	9/16/2016 10:58	9/16/2016 15:38	PIC	1597816
405235004	12C	280	284	1043	9/16/2016 10:58	9/16/2016 15:38	PIC	1597816
405235005	12D	230	159	819	9/16/2016 10:58	9/16/2016 14:48	PIC	1597816
405235006	14A	90	39	246	9/16/2016 10:58	9/16/2016 12:28	PIC	1597816
405235007	C2	180	124	584	9/19/2016 12:41	9/19/2016 15:41	LB4100	1597816
405235008	J2	180	111	601	9/19/2016 12:32	9/19/2016 15:32	LB4100	1597816
405235009	H1	180	133	622	9/19/2016 12:32	9/19/2016 15:32	LB4100	1597816
405235010	G2	180	109	718	9/19/2016 12:32	9/19/2016 15:32	LB4100	1597816
405235011	F3	180	109	648	9/19/2016 12:32	9/19/2016 15:32	LB4100	1597816
405235012	G4	180	88	690	9/19/2016 12:32	9/19/2016 15:32	LB4100	1597816
405235013	12A	100	70	385	9/20/2016 11:56	9/20/2016 13:36	PIC	1597816
405235014	B4	180	101	641	9/19/2016 14:16	9/19/2016 17:16	LB4100	1597816
405235015	F4	180	117	693	9/19/2016 12:32	9/19/2016 15:32	LB4100	1597816
405235016	F2	180	105	691	9/19/2016 12:32	9/19/2016 15:32	LB4100	1597816
405235017	H3	180	105	654	9/19/2016 12:32	9/19/2016 15:32	LB4100	1597816
405235018	J1	180	117	573	9/19/2016 12:32	9/19/2016 15:32	LB4100	1597816
405235019	5C	100	81	278	9/19/2016 12:30	9/19/2016 14:10	PIC	1597816
405235020	B1	180	119	682	9/19/2016 14:16	9/19/2016 17:16	LB4100	1597816
1203625449	14D	70	15	52	9/19/2016 12:20	9/19/2016 13:30	PIC	1597816
1203625450	12D	140	121	534	9/20/2016 11:56	9/20/2016 14:16	PIC	1597816
1203625451	14C	60	243	3055	9/20/2016 11:56	9/20/2016 12:56	PIC	1597816
1203625452	14D	60	239	3163	9/20/2016 11:56	9/20/2016 12:56	PIC	1597816
1203625453	1D	60	466	3086	9/19/2016 12:37	9/19/2016 13:37	PIC	1597816


21-Sep-2016

Batch# 1597817 Product: GAB Date: 9/26/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.	/		
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	/		
Instrument source check is within limits.	/		
Instrument bkg check is within limits.	/		
Method RDL/ LLD has been met.	/		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	/		see case narrative
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).		NA	
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	/		
Sample was run within hold time.		✓	DER 1561536
Sample was correctly preserved if required.	/		
Smears Taken for Radioactive batches.	/		
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	/		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	/		
Aux data is correct.			NA
Client Special requirements page has been checked.	/		
Raw Data and/ or spectrum are included and properly stasured.	/		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	/		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER 1561536
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	/		

Primary Review Performed By: 

10/27
MJWF

Secondary Review Performed By:  9/27/16

DATA EXCEPTION REPORT

Mo.Day Yr. 26-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GFPC	Test / Method: EPA 900.0/SW846 9310/SM 7110B Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1597817	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample Analyzed out of Holding Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, 1203625460, 1203625461, and 1203625462 were received and analyzed out of holding.		1. Reporting results	

Originator's Name:

Nat Long 26-SEP-16

Data Validator/Group Leader:

Kenshalla Oston 27-SEP-16

Logbook

The Determination of Gross Alpha And Gross Non-Volatile Beta in Soil, Filters, Solid Matrices And Direct Count Air Filters

Batch ID: 1597817 Due Dates for Lab: 01-OCT-2016 Hold: 08-JUN-2016 Package: 02-OCT-2016 SDG: 04-OCT-2016
 Analyst: Jasmine Conley Lab SOP: GL-RAD-A-001B REV# I7
 Instrument: BAL-16107662 Method: EPA 900.0/SW846 9310/SM 7110B Modified

Sample ID	Run Date	#	Dry or Wet	Intermediate Aliquot (g)	Unadjusted Aliquot (g)	Aliquot (g)	Initial Weight (g)	Final Weight (g)	Residue Weight (mg)	Detector
405235061	21-SEP-2016 10:58	1	D		0.1	0.1	7.6046	7.6259	21.3	14A
405235062	21-SEP-2016 10:58	2	D		0.104	0.104	7.646	7.6625	16.5	14D
405235063	21-SEP-2016 10:58	3	D		0.105	0.105	7.5667	7.5861	19.4	12B
405235064	21-SEP-2016 10:58	4	D		0.107	0.107	7.5621	7.5853	23.2	14C
405235065	21-SEP-2016 10:58	5	D		0.099	0.099	7.6409	7.6634	22.5	13A
405235066	21-SEP-2016 10:58	6	D		0.108	0.108	7.6439	7.6685	24.6	13D
405235067	21-SEP-2016 10:58	7	D		0.109	0.109	7.6256	7.6479	22.3	64
405235068	21-SEP-2016 10:58	8	D		0.102	0.102	7.7096	7.7285	18.9	F4
405235069	21-SEP-2016 10:58	9	D		0.106	0.106	7.6165	7.6369	20.4	62
405235070	21-SEP-2016 10:58	10	D		0.104	0.104	7.5127	7.5304	17.7	F3
405235071	21-SEP-2016 10:58	11	D		0.106	0.106	7.5661	7.5869	20.8	F2
405235072	21-SEP-2016 10:58	12	D		0.108	0.108	7.6614	7.686	24.6	H1
405235073	21-SEP-2016 10:58	13	D		0.108	0.108	7.6716	7.6902	18.6	G3
405235074	21-SEP-2016 10:58	14	D		0.111	0.111	7.5205	7.5443	23.8	H3
405235075	21-SEP-2016 10:58	15	D		0.1	0.1	7.6244	7.6452	20.8	13A
405235076	21-SEP-2016 10:58	16	D		0.105	0.105	7.5366	7.5546	18	14A
405235077	21-SEP-2016 10:58	17	D		0.109	0.109	7.5569	7.5781	21.2	13D
405235078	21-SEP-2016 10:58	18	D		0.106	0.106	7.5501	7.5674	17.3	11D
1208625459 MIB	21-SEP-2016 10:58	19	D		0.111	0.111	7.5686	7.5686	0	11C
1208625460 DUP (405235073)	21-SEP-2016 10:58	20	D		0.108	0.108	7.6557	7.6736	17.9	11B
1208625461 MS (405235073)	21-SEP-2016 10:58	21	D		0.103	0.103	7.5288	7.5478	19	2A SD
1208625462 MSD (405235073)	21-SEP-2016 10:58	22	D		0.106	0.106	7.6188	7.638	19.2	2C
1208625463 LCS	21-SEP-2016 10:58	23	D		0.111	0.111	7.5047	7.5047	0	3C

AM 9/26/16

Spike Pipet ID: RAD-GFC-4497063
 Planchets Flamed: Yes

Type	Name	Serial Number	Spike Amount	Spike Units
RGNT	RGF-Hydrofluoric Acid	2429436.1	10	mL

Analytical Logbook version 1 11-04-2004

GEL Laboratories LLC

Logbook

The Determination of Gross Alpha And Gross Non-Volatile Beta in Soil, Filters, Solid Matrices And Direct Count Air Filters

Batch ID: 1597817 Lab SOP: GL-RAD-A-001B REV# 17
 Analyst: Jasmine Conley Method: EPA 900.0/SW846 9310/SM 7110B Modified
 Instrument: BAL-16107662

Sample ID	Run Date	#	Dry or Wet	Intermediate Aliquot	Unadjusted Aliquot (g)	Aliquot (g)	Initial Weight (g)	Final Weight (g)	Residue Weight (mg)	Detector
RGNT	RGF-1M Nitric Acid		2438701		5					Spike Pipet ID: RAD-GFC-4497063
RGNT	RGF-Hydrochloric Acid		2447606.13		5					Planchets Flamed: Yes
RGNT	RGF-Nitric Acid		2454839.7		25					
SPIKE	Strontium-90 SPIKE		1243-O		.1					
SPIKE	Thorium-230 SPIKE		1493-B		.1					

Gross Alpha/Beta Solid

Filename : GAB.XLS
 File type : Excel
 Version # : 1.3.10

Batch : 1597817
 Analyst : JAS02031
 Prep Date : 9/21/2016
 Alpha Method Uncertainty : 0.0928
 Beta Method Uncertainty : 0.0628

Procedure Code : GFCGANBS
 Parmname1 : Alpha
 Parmname2 : Beta
 Required Alpha MDA : 4 pCi/G
 Required Beta MDA : 10 pCi/G

Geometry: 2 inch Plancheit

Sample Characteristics			Count Raw Data			Counting Time (min.)		Gross Counts		Count Start Date/Time	
Pos.	Sample ID	Sample Aliquot G	Sample Residue Wt. (mg)	Sample Aliquot StDev. G	Sample Date/Time	Detector ID	Alpha	Beta	Alpha	Beta	Start Date/Time
1	405235061.1	0.1000	21.3	4.3713E-04	12/14/2015 13:47	14A	73	318	73	318	9/22/2016 12:39
2	405235062.1	0.1040	16.5	3.2299E-03	12/14/2015 13:10	14D	127	661	127	661	9/22/2016 12:39
3	405235063.1	0.1050	19.4	3.2300E-03	12/14/2015 13:15	12B	274	861	274	861	9/22/2016 12:39
4	405235064.1	0.1070	23.2	3.2302E-03	12/14/2015 13:25	14C	104	547	104	547	9/22/2016 12:40
5	405235065.1	0.0990	22.5	4.3283E-04	12/14/2015 13:56	13A	37	142	37	142	9/22/2016 12:40
6	405235066.1	0.1080	24.6	3.2303E-03	12/14/2015 14:00	13D	63	253	63	253	9/22/2016 12:40
7	405235067.1	0.1090	22.3	3.2304E-03	12/11/2015 11:30	G4	142	703	142	703	9/22/2016 13:57
8	405235068.1	0.1020	18.9	3.2297E-03	12/11/2015 10:27	F4	128	681	128	681	9/22/2016 13:57
9	405235069.1	0.1060	20.4	3.2301E-03	12/16/2015 12:45	G2	106	552	106	552	9/22/2016 13:57
10	405235070.1	0.1040	17.7	3.2299E-03	12/11/2015 10:10	F3	112	564	112	564	9/22/2016 13:57
11	405235071.1	0.1060	20.8	3.2301E-03	12/11/2015 10:25	F2	90	514	90	514	9/22/2016 13:57
12	405235072.1	0.1080	24.6	3.2303E-03	12/15/2015 13:35	H1	100	548	100	548	9/22/2016 13:57
13	405235073.1	0.1080	18.6	3.2303E-03	12/11/2015 11:35	G3	158	880	158	880	9/22/2016 13:57
14	405235074.1	0.1110	23.8	3.2306E-03	12/15/2015 14:10	H3	79	527	79	527	9/22/2016 13:57
15	405235075.1	0.1000	20.8	4.3713E-04	12/16/2015 9:31	13A	23	143	23	143	9/22/2016 14:00
16	405235076.1	0.1050	18	3.2300E-03	12/11/2015 14:19	14A	23	138	23	138	9/22/2016 14:00
17	405235077.1	0.1090	21.2	3.2304E-03	12/17/2015 13:30	13D	39	139	39	139	9/22/2016 14:00
18	405235078.1	0.1060	17.3	3.2301E-03	12/17/2015 12:40	11D	93	334	93	334	9/22/2016 14:00
19	1203625459.1	0.1110	0	3.2306E-03	9/21/2016 0:00	11C	4	24	4	24	9/22/2016 14:00
20	1203625460.1	0.1080	17.9	3.2303E-03	12/11/2015 11:35	11B	108	436	108	436	9/22/2016 14:00
21	1203625461.1	0.1030	19	3.2298E-03	12/11/2015 11:35	5D	339	2510	339	2510	9/23/2016 13:24
22	1203625462.1	0.1060	19.2	3.2301E-03	12/11/2015 11:35	2C	344	2411	344	2411	9/22/2016 13:58
23	1203625463.1	0.1110	0	3.2306E-03	9/21/2016 0:00	3C	497	3157	497	3157	9/22/2016 13:58

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-001B
 Instrument SOP: GL-RAD-I-016, GL-RAD-I-006

Pos.	Calibration Data			Alpha			Beta			Weekly Background								
	Counted on	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	X-Talk	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	X-Talk	Alpha	CPM	Beta	Count Start Date/Time	Count Time (min.)
1	PIC	12/1/2015	11/30/2016	Th230	0.1576	0.02505	0.20876	12/1/2015	11/30/2016	Sr90	0.4672	0.02119	0.00031	0.043	0.415	0.415	9/16/2016 17:23	1000
2	PIC	12/1/2015	11/30/2016	Th230	0.1653	0.01512	0.28417	12/1/2015	11/30/2016	Sr90	0.4678	0.00738	0.00033	0.212	0.793	0.793	9/16/2016 17:23	1000
3	PIC	12/1/2015	11/30/2016	Th230	0.1770	0.01035	0.15152	12/1/2015	11/30/2016	Sr90	0.4913	0.01114	0.00040	0.230	0.626	0.626	9/16/2016 18:01	500
4	PIC	12/1/2015	11/30/2016	Th230	0.1567	0.02173	0.18415	12/1/2015	11/30/2016	Sr90	0.4687	0.01828	0.00032	0.135	1.297	1.297	9/16/2016 17:23	1000
5	PIC	12/1/2015	11/30/2016	Th230	0.1622	0.00669	0.16542	12/1/2015	11/30/2016	Sr90	0.4626	0.00714	0.00044	0.031	0.461	0.461	9/16/2016 17:22	1000
6	PIC	12/1/2015	11/30/2016	Th230	0.1352	0.01236	0.26424	12/1/2015	11/30/2016	Sr90	0.4374	0.01144	0.00027	0.040	0.346	0.346	9/16/2016 17:23	1000
7	LB4100	12/1/2015	11/30/2016	Th230	0.1519	0.02077	0.02899	12/1/2015	11/30/2016	Sr90	0.4962	0.00938	0.00022	0.110	0.988	0.988	9/16/2016 17:43	500
8	LB4100	12/1/2015	11/30/2016	Th230	0.1420	0.02862	0.03511	12/1/2015	11/30/2016	Sr90	0.5167	0.00850	0.00029	0.110	1.394	1.394	9/16/2016 17:44	500
9	LB4100	12/1/2015	11/30/2016	Th230	0.1452	0.01976	0.02615	12/1/2015	11/30/2016	Sr90	0.4950	0.01349	0.00018	0.126	1.174	1.174	9/16/2016 17:43	500
10	LB4100	12/1/2015	11/30/2016	Th230	0.1772	0.02244	0.02875	12/1/2015	11/30/2016	Sr90	0.5095	0.00981	0.00026	0.122	0.942	0.942	9/16/2016 17:44	500
11	LB4100	12/1/2015	11/30/2016	Th230	0.1434	0.03128	0.02839	12/1/2015	11/30/2016	Sr90	0.5086	0.01365	0.00039	0.098	1.138	1.138	9/16/2016 17:44	500
12	LB4100	12/1/2015	11/30/2016	Th230	0.1368	0.01393	0.03234	12/1/2015	11/30/2016	Sr90	0.4869	0.00965	0.00035	0.066	0.960	0.960	9/16/2016 17:44	500
13	LB4100	12/1/2015	11/30/2016	Th230	0.1389	0.02238	0.04263	12/1/2015	11/30/2016	Sr90	0.5061	0.01089	0.00025	0.134	1.042	1.042	9/16/2016 17:44	500
14	LB4100	12/1/2015	11/30/2016	Th230	0.1265	0.01513	0.03187	12/1/2015	11/30/2016	Sr90	0.5148	0.00824	0.00027	0.054	1.130	1.130	9/16/2016 17:44	500
15	PIC	12/1/2015	11/30/2016	Th230	0.1675	0.00669	0.16374	12/1/2015	11/30/2016	Sr90	0.4632	0.00714	0.00044	0.031	0.461	0.461	9/16/2016 17:22	1000
16	PIC	12/1/2015	11/30/2016	Th230	0.1701	0.02505	0.20560	12/1/2015	11/30/2016	Sr90	0.4685	0.02119	0.00031	0.043	0.415	0.415	9/16/2016 17:23	1000
17	PIC	12/1/2015	11/30/2016	Th230	0.1453	0.01236	0.26046	12/1/2015	11/30/2016	Sr90	0.4386	0.01144	0.00027	0.040	0.346	0.346	9/16/2016 17:23	1000
18	PIC	12/1/2015	11/30/2016	Th230	0.2011	0.01128	0.08089	12/1/2015	11/30/2016	Sr90	0.5053	0.01068	0.00031	0.092	1.256	1.256	9/16/2016 18:00	500
19	PIC	12/1/2015	11/30/2016	Th230	0.2689	0.01271	0.14397	12/1/2015	11/30/2016	Sr90	0.4900	0.01278	0.00036	0.152	0.444	0.444	9/16/2016 18:00	500
20	PIC	12/1/2015	11/30/2016	Th230	0.1899	0.00743	0.08728	12/1/2015	11/30/2016	Sr90	0.4963	0.00697	0.00028	0.170	0.950	0.950	9/16/2016 18:00	500
21	PIC	12/1/2015	11/30/2016	Th230	0.1980	0.00639	0.06415	12/1/2015	11/30/2016	Sr90	0.4956	0.00925	0.00363	0.174	0.748	0.748	9/16/2016 17:26	500
22	PIC	12/1/2015	11/30/2016	Th230	0.1649	0.01156	0.07922	12/1/2015	11/30/2016	Sr90	0.4283	0.01274	0.00315	0.132	0.506	0.506	9/16/2016 17:24	500
23	PIC	12/1/2015	11/30/2016	Th230	0.2859	0.00568	0.02997	12/1/2015	11/30/2016	Sr90	0.4823	0.00988	0.00835	0.240	0.556	0.556	9/16/2016 17:25	500

Notes:
 1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

Alpha Spike SN : 1493-B
 Spike Exp Date : 6/8/2017
 Spike Activity (dpm/ml): 266.08
 Spike Volume Added: 0.10
 Spike Nuclide: Th-230

Alpha LCS SN : 1493-B
 LCS Exp Date : 6/8/2017
 LCS Activity (dpm/ml): 266.08
 LCS Volume Added: 0.10
 LCS Nuclide: Th-230

Alpha Results		Decision Level	Critical Level	Required MDA	Sample Act. Conc.	Sample Act. Error %	Net Count Rate	Net Count Rate Error	2 SIGMA Counting Uncertainty	2 SIGMA Total Prop. Uncertainty	Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
Pos.	pCi/G	pCi/G	pCi/G	MDA pCi/G	pCi/G	%	CPM	CPM	pCi/G	pCi/G						
1	1.7074	1.2054	4	3.6358	28.5374	12.49%	0.9999	0.1222	6.8476	8.7142		SAMPLE				
2	2.4613	1.7377	4	3.9984	16.5911	12.54%	0.6347	0.0765	3.9301	5.0855		SAMPLE				
3	2.4594	1.7363	4	3.9270	35.8700	7.83%	1.4825	0.1057	5.0179	8.5495		SAMPLE				
4	2.3102	1.6310	4	3.9947	21.7287	12.11%	0.8105	0.0934	4.9195	6.5118		SAMPLE				
5	1.5294	1.0798	4	3.5620	16.3979	17.35%	0.5857	0.1015	5.5818	6.3365		SAMPLE				
6	1.7778	1.2551	4	3.8327	26.5070	13.60%	0.8600	0.1136	6.8684	8.5619		SAMPLE				
7	1.9567	1.3814	4	3.3069	22.7282	10.31%	0.8367	0.0808	4.3082	6.1886		SAMPLE				
8	2.2379	1.5800	4	3.7820	23.0812	11.19%	0.7433	0.0769	4.6867	6.5875		SAMPLE				
9	2.2538	1.5912	4	3.7678	16.9777	12.66%	0.5807	0.0704	4.0418	5.2305		SAMPLE				
10	1.8514	1.3071	4	3.1030	15.2405	12.19%	0.6247	0.0723	3.4610	4.5828		SAMPLE				
11	2.0125	1.4209	4	3.4345	14.8384	13.62%	0.5020	0.0648	3.7629	4.8067		SAMPLE				
12	1.6985	1.1992	4	3.0079	18.2691	11.74%	0.6007	0.0676	4.0414	5.3688		SAMPLE				
13	2.3843	1.6833	4	3.9673	27.5614	10.01%	0.9193	0.0854	5.0252	7.3858		SAMPLE				
14	1.6170	1.1416	4	2.9248	15.1328	13.14%	0.4727	0.0602	3.7825	4.7816		SAMPLE				
15	1.4666	1.0354	4	3.4156	9.4480	22.76%	0.3523	0.0801	4.2238	4.5644		SAMPLE				
16	1.6192	1.1432	4	3.5470	8.5628	23.90%	0.3403	0.0802	3.9633	4.3115		SAMPLE				
17	1.7613	1.2435	4	3.9089	17.3287	17.39%	0.6100	0.1043	5.8119	6.7025		SAMPLE				
18	2.0404	1.4406	4	3.9377	30.7734	11.53%	1.4580	0.1613	6.6807	8.9380		SAMPLE				
19	1.8728	1.3222	4	3.3990	-1.2899	44.20%	-0.0853	0.0376	1.1126	1.1137		MB				
20	2.3119	1.6322	4	3.9235	19.9645	12.00%	0.9100	0.1055	4.5446	5.9442	405235073.1	DUP	32.0%	1.5705	116.3649	77.4%
21	2.9324	2.0703	4	5.2447	117.5699	6.46%	5.4760	0.3074	13.3063	26.8022	405235073.1	MS			113.0715	100.4%
22	2.9806	2.1043	4	5.4972	141.0879	6.42%	5.6013	0.3095	15.6353	31.9193	405235073.1	MSD	18.2%	1.1059	107.9782	100.0%
23	2.2134	1.5627	4	3.8350	107.9247	5.50%	8.0433	0.3722	10.3540	24.1324		LCS				

Notes:
 1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

Beta Spike SN : 1243-O
 Spike Exp Date : 12/18/2016
 Spike Activity (dpm/ml): 483.33
 Spike Volume Added: 0.10
 Spike Nuclide: Sr-90

Beta LCS SN : 1243-O
 LCS Exp Date : 12/18/2016
 LCS Activity (dpm/ml): 483.33
 LCS Volume Added: 0.10
 LCS Nuclide: Sr-90

Pos.	Decision Level		Critical Level	Required MDA	MDA	Sample Act. Conc.	Sample Act. Error %	Net Count Rate	Net Count Rate Error	2 SIGMA Counting		Total Prop. Uncertainty	Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
	pCi/G	pCi/G								pCi/G	pCi/G							
1	1.7893	1.2633	10	2.9397	37.7011	6.56%	4.1279	0.2556	4.8297	7.0834			SAMPLE					
2	1.6821	1.1876	10	2.5603	31.2307	5.77%	3.6137	0.1737	3.1521	5.5927			SAMPLE					
3	1.4622	1.0323	10	2.2283	39.2583	5.11%	4.7553	0.1868	3.1967	6.5904			SAMPLE					
4	2.3942	1.6903	10	3.6255	31.4507	6.85%	3.6757	0.2156	3.7963	6.0117			SAMPLE					
5	2.0683	1.4603	10	3.4124	17.7416	10.52%	1.9057	0.1998	3.8513	4.5001			SAMPLE					
6	1.6159	1.1408	10	2.6903	28.8988	7.68%	3.2683	0.2280	4.2613	6.0582			SAMPLE					
7	1.7956	1.2677	10	2.7020	30.5745	5.83%	3.6987	0.1823	2.9751	5.1720			SAMPLE					
8	2.1890	1.5455	10	3.2619	26.6339	6.64%	3.1460	0.1818	3.0458	4.8185			SAMPLE					
9	2.0178	1.4246	10	3.0209	21.3563	7.34%	2.5060	0.1640	2.7589	4.0743			SAMPLE					
10	1.7896	1.2635	10	2.6970	23.7726	6.67%	2.8180	0.1642	2.7353	4.3028			SAMPLE					
11	1.9333	1.3649	10	2.8969	18.9790	7.69%	2.2887	0.1585	2.5954	3.7204			SAMPLE					
12	1.8204	1.2852	10	2.7418	22.8855	6.79%	2.6933	0.1621	2.7214	4.1820			SAMPLE					
13	1.8246	1.2882	10	2.7412	39.3882	5.28%	4.8247	0.2030	3.2782	6.3913			SAMPLE					
14	1.8175	1.2832	10	2.7240	18.6536	7.37%	2.3833	0.1603	2.4758	3.5661			SAMPLE					
15	2.0449	1.4437	10	3.3737	18.0845	10.46%	1.9223	0.2005	3.8210	4.4709			SAMPLE					
16	1.8270	1.2899	10	3.0377	16.5405	11.09%	1.8950	0.1968	3.5332	4.3123			SAMPLE					
17	1.7166	1.2119	10	2.8950	16.9745	10.51%	1.9707	0.1974	3.6454	4.4554			SAMPLE					
18	3.0006	2.1185	10	4.6575	35.2008	7.86%	4.3107	0.3087	5.0887	7.1466			SAMPLE					
19	1.7566	1.2402	10	2.8944	-0.4439	197.57%	-0.0440	0.0869	1.4108	1.4109			MB					
20	2.0907	1.4760	10	3.2042	27.8648	6.97%	3.4100	0.2133	3.5135	5.2690			DUP	34.3%	2.7267	422.7464	75.7%	
21	2.4294	1.7152	10	3.8716	359.3384	3.85%	41.0853	0.8359	14.4568	52.3449			MS			410.7819	85.1%	
22	2.2466	1.5861	10	3.6683	389.1384	3.89%	39.6773	0.8190	15.9255	57.0145			MSD	8.0%	0.7546	392.2782	111.1%	
23	1.9971	1.4100	10	3.2407	435.9281	3.56%	52.0607	0.9370	15.4525	61.9821			LCS					

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
405235061	14A	70	73	318	9/22/2016 12:39	9/22/2016 13:49	PIC	1597817
405235062	14D	150	127	661	9/22/2016 12:39	9/22/2016 15:09	PIC	1597817
405235063	12B	160	274	861	9/22/2016 12:39	9/22/2016 15:19	PIC	1597817
405235064	14C	110	104	547	9/22/2016 12:40	9/22/2016 14:30	PIC	1597817
405235065	13A	60	37	142	9/22/2016 12:40	9/22/2016 13:40	PIC	1597817
405235066	13D	70	63	253	9/22/2016 12:40	9/22/2016 13:50	PIC	1597817
405235067	G4	150	142	703	9/22/2016 13:57	9/22/2016 16:27	LB4100	1597817
405235068	F4	150	128	681	9/22/2016 13:57	9/22/2016 16:27	LB4100	1597817
405235069	G2	150	106	552	9/22/2016 13:57	9/22/2016 16:27	LB4100	1597817
405235070	F3	150	112	564	9/22/2016 13:57	9/22/2016 16:27	LB4100	1597817
405235071	F2	150	90	514	9/22/2016 13:57	9/22/2016 16:27	LB4100	1597817
405235072	H1	150	100	548	9/22/2016 13:57	9/22/2016 16:27	LB4100	1597817
405235073	G3	150	158	880	9/22/2016 13:57	9/22/2016 16:27	LB4100	1597817
405235074	H3	150	79	527	9/22/2016 13:57	9/22/2016 16:27	LB4100	1597817
405235075	13A	60	23	143	9/22/2016 14:00	9/22/2016 15:00	PIC	1597817
405235076	14A	60	23	138	9/22/2016 14:00	9/22/2016 15:00	PIC	1597817
405235077	13D	60	39	139	9/22/2016 14:00	9/22/2016 15:00	PIC	1597817
405235078	11D	60	93	334	9/22/2016 14:00	9/22/2016 15:00	PIC	1597817
1203625459	11C	60	4	24	9/22/2016 14:00	9/22/2016 15:00	PIC	1597817
1203625460	11B	100	108	436	9/22/2016 14:00	9/22/2016 15:40	PIC	1597817
1203625461	5D	60	339	2510	9/23/2016 13:24	9/23/2016 14:24	PIC	1597817
1203625462	2C	60	344	2411	9/22/2016 13:58	9/22/2016 14:58	PIC	1597817
1203625463	3C	60	497	3157	9/22/2016 13:58	9/22/2016 14:58	PIC	1597817

Batch# 1597795 Product: Sr Date: 9/19/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	/		
Instrument source check is within limits.	/		
Instrument bkg check is within limits.	/		
Method RDL/ LLD has been met.	/		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	/		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	/		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	/		
Sample was run within hold time.	/	✓	DER 1559107
Sample was correctly preserved if required.	/		
Smears Taken for Radioactive batches.	/		
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	/		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	/		
Aux data is correct.			NA
Client Special requirements page has been checked.	/		
Raw Data and/ or spectrum are included and properly stasured.	/		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	/		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	/		NA 9/19/16
Batch Data Exception Reports (DER) completed, if applicable.	✓		NA/ DER 1559107
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		NA
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REM, results above MDC have been verified by historical results, recount or re-analysis.)	/		

Primary Review Performed By: *Walter King*

10/19
MJWC

Secondary Review Performed By: *West 9/20/16*

DATA EXCEPTION REPORT

Mo.Day Yr. 19-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GFPC	Test / Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1597795	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample Analyzed out of Holding Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, and 1203625399 were received and analyzed out of holding.		1. Reporting results	

Originator's Name:

Nat Long 19-SEP-16

Data Validator/Group Leader:

Kenshalla Oston 20-SEP-16

Prep Logbook

The Determination of Strontium 89/90 in Water, Soil, Milk, Filters, Vegetation and Tissues

10/1/16
MORNING

Batch ID: 1597795
 Analyst: Kelli Dorrell
 Method: EPA 905.0 Modified/DOE RP501 Rev. 1
 Lab SOP: GL-RAD-A-004 REV# 17
 Instrument: BAL-16107662

Type: LCS
 Sample Id: 1203625400
 Description: Strontium-90 SPIKE
 Serial Number: 1243-O
 Spike Amount: .1
 Spike Units: mL

Sample ID	Prep Date	Dry or Wet	Unadjusted Aliquot (g)	Aliquot (g)	Initial Wt (g)	Final Wt (g)	Net Wt (mg)	Sr Separation (date)
405235001	16-SEP-2016 10:43	D	0.374	0.374	0.0238	0.0312	7.4	09/16/16 15:08 -16A6C
405235002	16-SEP-2016 10:43	D	0.309	0.309	0.0241	0.0317	7.6	09/16/16 15:08 -16A6C
405235003	16-SEP-2016 10:43	D	0.308	0.308	0.0234	0.0309	7.5	09/16/16 15:08 -12A
405235004	16-SEP-2016 10:43	D	0.323	0.323	0.0243	0.0311	6.8	09/16/16 15:08 -12B
405235005	16-SEP-2016 10:43	D	0.397	0.397	0.0241	0.0307	6.6	09/16/16 15:08 -13C
405235006	16-SEP-2016 10:43	D	0.398	0.398	0.0229	0.0295	6.6	09/16/16 15:08 -13D
405235007	16-SEP-2016 10:43	D	0.84	0.84	0.0235	0.0306	7.1	09/16/16 15:08 -13E
405235008	16-SEP-2016 10:43	D	0.344	0.344	0.024	0.0316	7.6	09/16/16 15:08 -13D
405235009	16-SEP-2016 10:43	D	0.357	0.357	0.0241	0.0304	6.3	09/16/16 15:08 -14C
405235010	16-SEP-2016 10:43	D	0.44	0.44	0.024	0.0309	6.9	09/16/16 15:08 -14D
405235011	16-SEP-2016 10:43	D	0.361	0.361	0.025	0.0311	6.1	09/16/16 15:08 -14
405235012	16-SEP-2016 10:43	D	0.321	0.321	0.0242	0.0307	6.5	09/16/16 15:08 -14
405235013	16-SEP-2016 10:43	D	0.314	0.314	0.0242	0.0312	7	09/16/16 15:08 -1C
405235014	16-SEP-2016 10:43	D	0.31	0.31	0.0226	0.0295	6.9	09/16/16 15:08 -4B
405235015	16-SEP-2016 10:43	D	0.341	0.341	0.0228	0.0299	7.1	09/16/16 15:08 -5A
405235016	16-SEP-2016 10:43	D	0.396	0.396	0.0231	0.0301	7	09/16/16 15:08 -10A
405235017	16-SEP-2016 10:43	D	0.378	0.378	0.0236	0.0306	7	09/16/16 15:08 -14A
405235018	16-SEP-2016 10:43	D	0.331	0.331	0.0235	0.0313	7.8	09/16/16 15:08 -3B
405235019	16-SEP-2016 10:43	D	0.346	0.346	0.0243	0.0313	7	09/16/16 15:08 -5B
405235020	16-SEP-2016 10:43	D	0.334	0.334	0.0244	0.0311	6.7	09/16/16 15:08 -5C
1203625398 MB	16-SEP-2016 10:43	D	0.314	0.314	0.0227	0.0296	6.9	09/16/16 15:08 -5D
1203625399 DUP (405235005)	16-SEP-2016 10:43	D	0.314	0.314	0.0257	0.0316	5.9	09/16/16 15:08 -6A
1203625400 LCS	16-SEP-2016 10:43	D	0.314	0.314	0.0243	0.0308	6.5	09/16/16 15:08 -6B

Comments:

Spike Pipet ID: RAD-GFC-1795419
 Carrier Pipet ID: RAD-GFC-2154115
 Data Entry Date: 16-SEP-2016 15:08 GFC-F30560 Kelli Dorrell

Reagent/Solvent Lot ID	Description	Amount
2064611.2	Phenolphthalein, 1.0% in 50% Alcohol	2 mL
2213530	0.05M HNO3	15 mL
2243751	RGF-6M Sodium Hydroxide	6 mL
2243757	RGF-0.75M Sodium Carbonate	13 mL
2334614	Thymol Blue Indicator	.5 mL
2388714	RGF-80% Ethanol	3 mL
2414995	Sr 0.5mL=7.37, 2.0 mL=29.46 mg	.5 mL
2424020	RGF-3M Nitric/0.05M Oxalic	10 mL
2433863.1	SR SPEC RESIN Cleaned	2 g
2434028	RGF-Sr Filters	1 L
2434079	RGF-8M Nitric Acid	25 mL

Strontium-90 Solid

Filename : SR90.XLS
 File type : Excel
 Version # : 1.3.10

Carrier S/N : 2414995
 Carrier Exp Date : 6/3/2017
 Carrier Volume Added: 0.50
 Carrier Weight (mg/ml): 14.73
 Carrier Weight StDev.: 0.10

Batch : 1597795
 Analyst : KEL01237
 Prep Date : 9/16/2016
 Method Uncertainty : 0.089724205

Procedure Code : GFC90SRS
 Parmname : Strontium-90
 Required MDA : 2 pCi/g
 Sr-90 Abundance : 1.00 years
 Halflife of Sr-90 : 28.90 hours
 Halflife of Y-90 : 64.053 hours

Geometry: Tuffryn Filter

Pos.	Sample Characteristics			Sample Date/Time	Carrier Calculations				Carrier Aliquot (mL)	Carrier Aliquot StDev. (mL)
	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G		Carrier Weight (mg) (Standard)	Net Weight (mg) (Sample)	Net Weight StDev. (mg)	Carrier Aliquot (mL)		
1	405235001.1	0.3740	3.2581E-03	12/10/2015 14:20	14.73	7.40	0.039135	0.5	0.001000	
2	405235002.1	0.3090	3.2513E-03	12/10/2015 14:30	14.73	7.60	0.039995	0.5	0.001000	
3	405235003.1	0.3080	3.2512E-03	12/10/2015 14:35	14.73	7.50	0.039565	0.5	0.001000	
4	405235004.1	0.3230	3.2528E-03	12/9/2015 14:00	14.73	6.80	0.036556	0.5	0.001000	
5	405235005.1	0.3970	3.2605E-03	12/10/2015 13:15	14.73	6.60	0.035697	0.5	0.001000	
6	405235006.1	0.3980	3.2606E-03	12/10/2015 13:25	14.73	6.60	0.035697	0.5	0.001000	
7	405235007.1	0.8400	3.3067E-03	12/10/2015 13:55	14.73	7.10	0.037846	0.5	0.001000	
8	405235008.1	0.3440	3.2550E-03	12/10/2015 14:05	14.73	7.60	0.039995	0.5	0.001000	
9	405235009.1	0.3570	3.2563E-03	12/10/2015 10:30	14.73	6.30	0.034407	0.5	0.001000	
10	405235010.1	0.4400	3.2650E-03	12/10/2015 10:35	14.73	6.90	0.036986	0.5	0.001000	
11	405235011.1	0.3610	3.2567E-03	12/9/2015 10:13	14.73	6.10	0.033548	0.5	0.001000	
12	405235012.1	0.3210	3.2525E-03	12/10/2015 11:25	14.73	6.50	0.035267	0.5	0.001000	
13	405235013.1	0.3140	3.2518E-03	12/8/2015 11:23	14.73	7.00	0.037416	0.5	0.001000	
14	405235014.1	0.3100	3.2514E-03	12/8/2015 10:49	14.73	6.90	0.036986	0.5	0.001000	
15	405235015.1	0.3410	3.2546E-03	12/8/2015 10:56	14.73	7.10	0.037846	0.5	0.001000	
16	405235016.1	0.3960	3.2604E-03	12/8/2015 11:29	14.73	7.00	0.037416	0.5	0.001000	
17	405235017.1	0.3780	3.2585E-03	12/2/2015 10:02	14.73	7.00	0.037416	0.5	0.001000	
18	405235018.1	0.3310	3.2536E-03	12/2/2015 10:19	14.73	7.80	0.040854	0.5	0.001000	
19	405235019.1	0.3460	3.2552E-03	12/8/2015 14:30	14.73	7.00	0.037416	0.5	0.001000	
20	405235020.1	0.3340	3.2539E-03	12/8/2015 13:50	14.73	6.70	0.036127	0.5	0.001000	
21	1203625398.1	0.8400	3.3067E-03	9/16/2016 0:00	14.73	6.90	0.036986	0.5	0.001000	
22	1203625399.1	0.3140	3.2518E-03	12/10/2015 13:15	14.73	5.90	0.032688	0.5	0.001000	
23	1203625400.1	0.8400	3.3067E-03	9/16/2016 0:00	14.73	6.50	0.035267	0.5	0.001000	

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-004
 Instrument SOP: GL-RAD-I-016

Count Raw Data													
Pos.	Detector ID	Counting Time (min.)	Gross Counts		Gross Beta CPM	Count Start Date/Time	Strontium Separation Date/Time	Yttrium Ingrowth	Sr-90 Decay	Calculated Sample Recovery %	Sample Recovery Error %		
			Alpha	Beta									
1	11C	60	2	19	0.311	9/17/2016 15:50	9/16/2016 15:08	0.239	0.982	100%	1.03%		
2	6C	60	3	45	0.748	9/19/2016 11:55	9/16/2016 15:08	0.528	0.982	103%	1.03%		
3	12A	60	7	45	0.733	9/17/2016 15:51	9/16/2016 15:08	0.239	0.982	102%	1.03%		
4	12B	60	25	47	0.726	9/17/2016 15:51	9/16/2016 15:08	0.239	0.982	92.3%	1.04%		
5	12C	60	10	49	0.804	9/17/2016 15:51	9/16/2016 15:08	0.239	0.982	89.6%	1.04%		
6	12D	60	7	84	1.388	9/17/2016 15:51	9/16/2016 15:08	0.239	0.982	89.6%	1.04%		
7	13B	60	19	50	0.792	9/17/2016 15:51	9/16/2016 15:08	0.239	0.982	96.4%	1.03%		
8	13D	60	13	31	0.466	9/17/2016 15:51	9/16/2016 15:08	0.239	0.982	103%	1.03%		
9	14C	60	11	63	1.022	9/17/2016 15:51	9/16/2016 15:08	0.239	0.982	85.5%	1.05%		
10	14D	60	16	60	0.931	9/17/2016 15:51	9/16/2016 15:08	0.239	0.982	93.7%	1.04%		
11	1A	60	6	42	0.692	9/17/2016 16:32	9/16/2016 15:08	0.244	0.982	82.8%	1.05%		
12	1B	60	13	81	1.332	9/17/2016 16:32	9/16/2016 15:08	0.244	0.982	88.3%	1.04%		
13	1C	60	17	52	0.855	9/17/2016 16:32	9/16/2016 15:08	0.244	0.982	95.0%	1.04%		
14	4B	60	10	95	1.561	9/17/2016 16:32	9/16/2016 15:08	0.244	0.982	93.7%	1.04%		
15	5A	60	5	80	1.329	9/17/2016 16:32	9/16/2016 15:08	0.244	0.982	96.4%	1.03%		
16	10A	60	2	24	0.382	9/17/2016 16:31	9/16/2016 15:08	0.244	0.982	95.0%	1.04%		
17	14A	60	5	41	0.668	9/17/2016 16:34	9/16/2016 15:08	0.245	0.981	95.0%	1.04%		
18	3B	60	15	93	1.539	9/17/2016 16:40	9/16/2016 15:08	0.246	0.981	106%	1.02%		
19	5B	60	17	29	0.471	9/17/2016 16:40	9/16/2016 15:08	0.246	0.982	95.0%	1.04%		
20	5C	60	7	45	0.745	9/17/2016 16:40	9/16/2016 15:08	0.246	0.982	91.0%	1.04%		
21	5D	60	2	35	0.582	9/17/2016 16:40	9/16/2016 15:08	0.246	1.000	93.7%	1.04%		
22	6A	60	5	41	0.678	9/17/2016 16:39	9/16/2016 15:08	0.245	0.982	80.1%	1.06%		
23	6B	60	2	1551	25.849	9/17/2016 16:39	9/16/2016 15:08	0.245	1.000	88.3%	1.04%		

Calibration Data		Calibration		Detector Efficiency (cpm/dpm)		Detector Efficiency Error (cpm/dpm)		Alpha X-Talk		Weekly Bkg Count	
Pos.	Counted on	Calibration Date	Due Date	Sr-90	Y-90	Alpha X-Talk	Weekly Bkg CPM	Weekly Bkg Count Start Date/Time	Weekly Bkg Count Time (min.)		
1	PIC	4/1/2016	2/28/2017	0.4167	0.5497	0.01278	0.16693	9/16/2016 18:00	500		
2	PIC	4/1/2016	2/28/2017	0.4218	0.5617	0.01970	0.04606	9/16/2016 17:58	500		
3	PIC	4/1/2016	2/28/2017	0.4039	0.5410	0.01964	0.14272	9/16/2016 18:00	500		
4	PIC	4/1/2016	2/28/2017	0.4173	0.5374	0.01114	0.13789	9/16/2016 18:01	500		
5	PIC	4/1/2016	2/28/2017	0.4200	0.5456	0.01666	0.07332	9/16/2016 18:01	500		
6	PIC	4/1/2016	2/28/2017	0.4215	0.5487	0.01845	0.10267	9/16/2016 18:01	500		
7	PIC	4/1/2016	2/28/2017	0.4193	0.5214	0.00967	0.13169	9/16/2016 17:23	1000		
8	PIC	4/1/2016	2/28/2017	0.3796	0.4297	0.01144	0.23485	9/16/2016 17:23	1000		
9	PIC	4/1/2016	2/28/2017	0.4269	0.5645	0.01828	0.15081	9/16/2016 17:23	1000		
10	PIC	4/1/2016	2/28/2017	0.4231	0.5571	0.00738	0.25894	9/16/2016 17:23	1000		
11	PIC	4/1/2016	2/28/2017	0.4232	0.5477	0.00738	0.07964	9/16/2016 17:24	500		
12	PIC	4/1/2016	2/28/2017	0.4263	0.5497	0.00711	0.08244	9/16/2016 17:24	500		
13	PIC	4/1/2016	2/28/2017	0.4259	0.5634	0.00847	0.04151	9/16/2016 17:24	500		
14	PIC	4/1/2016	2/28/2017	0.4238	0.5578	0.01519	0.13553	9/16/2016 17:25	500		
15	PIC	4/1/2016	2/28/2017	0.4327	0.5685	0.00851	0.05137	9/16/2016 17:25	500		
16	PIC	4/1/2016	2/28/2017	0.3715	0.4608	0.00651	0.52970	9/16/2016 17:59	500		
17	PIC	4/1/2016	2/28/2017	0.4305	0.5582	0.02119	0.18297	9/16/2016 17:23	1000		
18	PIC	4/1/2016	2/28/2017	0.4053	0.5509	0.01614	0.04495	9/16/2016 17:25	500		
19	PIC	4/1/2016	2/28/2017	0.4300	0.5665	0.00426	0.04259	9/16/2016 17:25	500		
20	PIC	4/1/2016	2/28/2017	0.4203	0.5622	0.00657	0.04320	9/16/2016 17:25	500		
21	PIC	4/1/2016	2/28/2017	0.4252	0.5641	0.00925	0.04583	9/16/2016 17:26	500		
22	PIC	4/1/2016	2/28/2017	0.4140	0.5572	0.02228	0.06108	9/16/2016 17:58	500		
23	PIC	4/1/2016	2/28/2017	0.4219	0.5616	0.00851	0.04451	9/16/2016 17:58	500		

Notes:
 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml): N/A
 Spike Volume Added: N/A

LCS S/N : 1243-O
 LCS Exp Date : 12/18/2016
 LCS Activity (dpm/ml): 483.48
 LCS Volume Added: 0.10

* - RPD changed to 0% due to sample & dup activity below MDA

Pos.	Decision Level		Critical Level	Required MDA	MDA	Sample Act. Conc.	Sample Act. Error %	Net Count Rate	Net Count Rate Error	2 SIGMA Counting Uncertainty	2 SIGMA Total Prop. Uncertainty	Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
	pCi/G	pCi/G															
1	0.4727	0.3337	0.3337	2	0.7788	-0.2961	58.67%	-0.1329	0.0779	0.3404	0.3404		SAMPLE				
2	0.6309	0.4455	0.4455	2	0.9911	-0.4616	52.20%	-0.2303	0.1201	0.4717	0.4717		SAMPLE				
3	0.8232	0.5812	0.5812	2	1.2996	-0.4244	76.54%	-0.1547	0.1183	0.6364	0.6364		SAMPLE				
4	0.7104	0.5015	0.5015	2	1.1441	0.2817	115.70%	0.0999	0.1155	0.6387	0.6407		SAMPLE				
5	0.6927	0.4891	0.4891	2	1.0953	-0.1349	213.74%	-0.0576	0.1230	0.5651	0.5651		SAMPLE				
6	0.8587	0.6062	0.6062	2	1.3289	0.1072	349.14%	0.0460	0.1607	0.7333	0.7336		SAMPLE				
7	0.2343	0.1654	0.1654	2	0.3829	0.2757	44.29%	0.2646	0.1171	0.2392	0.2443		SAMPLE				
8	0.4884	0.3448	0.3448	2	0.8236	0.3211	75.20%	0.1198	0.0901	0.4732	0.4767		SAMPLE				
9	0.9434	0.6661	0.6661	2	1.4659	-0.7346	49.36%	-0.2746	0.1354	0.7099	0.7100		SAMPLE				
10	0.5520	0.3897	0.3897	2	0.8795	0.2761	92.59%	0.1380	0.1277	0.5010	0.5034		SAMPLE				
11	0.5828	0.4821	0.4821	2	1.1019	0.2371	131.23%	0.0860	0.1129	0.6097	0.6112		SAMPLE				
12	0.9477	0.6691	0.6691	2	1.4826	0.7803	57.76%	0.2701	0.1560	0.8831	0.8941		SAMPLE				
13	0.8668	0.6120	0.6120	2	1.3604	-0.3850	90.34%	-0.1411	0.1274	0.6815	0.6816		SAMPLE				
14	1.1216	0.7919	0.7919	2	1.7248	2.103E-03	22891.79%	0.0007	0.1707	0.9437	0.9437		SAMPLE				
15	0.9152	0.6462	0.6462	2	1.4144	-0.1391	277.22%	-0.0569	0.1579	0.7557	0.7557		SAMPLE				
16	0.4536	0.3203	0.3203	2	0.7665	0.1570	134.33%	0.0623	0.0837	0.4135	0.4144		SAMPLE				
17	0.4495	0.3174	0.3174	2	0.7474	0.5702	42.54%	0.2531	0.1075	0.4746	0.4865		SAMPLE				
18	0.9126	0.6443	0.6443	2	1.4098	0.3362	121.56%	0.1388	0.1687	0.8009	0.8033		SAMPLE				
19	0.5693	0.4020	0.4020	2	0.9265	-0.1489	155.50%	-0.0607	0.0944	0.4539	0.4539		SAMPLE				
20	0.7967	0.5625	0.5625	2	1.2602	-0.3004	107.05%	-0.1110	0.1189	0.6302	0.6302		SAMPLE				
21	0.2796	0.1974	0.1974	2	0.4456	-0.1688	63.67%	-0.1662	0.1058	0.2106	0.2106		MB				
22	0.9881	0.6976	0.6976	2	1.5608	-0.6617	57.27%	-0.1998	0.1143	0.7420	0.7420	405235005.1	DUP	* 0.0%			
23	0.3808	0.2688	0.2688	2	0.5920	26.7439	3.02%	24.6345	0.6582	1.4006	4.9821		LCS			25.9269	103.2%

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
405235001	11C	60	2	19	9/17/2016 15:50	9/17/2016 16:50	PIC	1597795
405235002	6C	60	3	45	9/19/2016 11:55	9/19/2016 12:55	PIC	1597795
405235003	12A	60	7	45	9/17/2016 15:51	9/17/2016 16:51	PIC	1597795
405235004	12B	60	25	47	9/17/2016 15:51	9/17/2016 16:51	PIC	1597795
405235005	12C	60	10	49	9/17/2016 15:51	9/17/2016 16:51	PIC	1597795
405235006	12D	60	7	84	9/17/2016 15:51	9/17/2016 16:51	PIC	1597795
405235007	13B	60	19	50	9/17/2016 15:51	9/17/2016 16:51	PIC	1597795
405235008	13D	60	13	31	9/17/2016 15:51	9/17/2016 16:51	PIC	1597795
405235009	14C	60	11	63	9/17/2016 15:51	9/17/2016 16:51	PIC	1597795
405235010	14D	60	16	60	9/17/2016 15:51	9/17/2016 16:51	PIC	1597795
405235011	1A	60	6	42	9/17/2016 16:32	9/17/2016 17:32	PIC	1597795
405235012	1B	60	13	81	9/17/2016 16:32	9/17/2016 17:32	PIC	1597795
405235013	1C	60	17	52	9/17/2016 16:32	9/17/2016 17:32	PIC	1597795
405235014	4B	60	10	95	9/17/2016 16:32	9/17/2016 17:32	PIC	1597795
405235015	5A	60	5	80	9/17/2016 16:32	9/17/2016 17:32	PIC	1597795
405235016	10A	60	2	24	9/17/2016 16:31	9/17/2016 17:31	PIC	1597795
405235017	14A	60	5	41	9/17/2016 16:34	9/17/2016 17:34	PIC	1597795
405235018	3B	60	15	93	9/17/2016 16:40	9/17/2016 17:40	PIC	1597795
405235019	5B	60	17	29	9/17/2016 16:40	9/17/2016 17:40	PIC	1597795
405235020	5C	60	7	45	9/17/2016 16:40	9/17/2016 17:40	PIC	1597795
1203625398	5D	60	2	35	9/17/2016 16:40	9/17/2016 17:40	PIC	1597795
1203625399	6A	60	5	41	9/17/2016 16:39	9/17/2016 17:39	PIC	1597795
1203625400	6B	60	2	1551	9/17/2016 16:39	9/17/2016 17:39	PIC	1597795

Batch# 1597811 Product: GAB Date: 9/20/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.	✓		
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits. Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			NA
Method blank is less than the RDL/ LLD. (If rad samples. < 5% of lowest activity)	✓		
Sample was run within hold time.	✓	✓	DER 1559260
Sample was correctly preserved if required.			NA
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		20091014 NA DER 1559260
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.			NA DER 1559260
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: Rest 9/20/16

Secondary Review Performed By: [Signature]
MJC
10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 20-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GFPC	Test / Method: EPA 900.0/SW846 9310/SM 7110B Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1597811	Sample Numbers: See Below		

Potentially affected work order(s)(SDG): 405235

Application Issues:

Sample Analyzed out of Holding
Sample received out of holding

Specification and Requirements Exception Description:	DER Disposition:
<p>1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, 1203625436, 1203625437, and 1203625438 were received and analyzed out of holding.</p>	<p>1. Reporting results</p>

Originator's Name:

Kenshalla Oston 20-SEP-16

Data Validator/Group Leader:

Nat Long 20-SEP-16

The Determination of Gross Alpha And Gross Non-Volatile Beta in Soil, Filters, Solid Matrices And Direct Count Air Filters

Batch ID: 1597811

Due Dates for Lab: 01-OCT-2016 Hold: 21-MAY-2016 Package: 02-OCT-2016 SDG: 04-OCT-2016

Analyst: Bethany Fiem

Lab SOP: GL-RAD-A-001B REV# 17

Instrument: BAL-18550299

Method: EPA 900.0/SW846 9310/SM 7110B Modified

Sample ID	Run Date	#	Dry or Wet	Intermediate Aliquot	Unadjusted Aliquot (g)	Aliquot (g)	Initial Weight (g)	Final Weight (g)	Residue Weight (mg)	Detector
405235021	16-SEP-2016 11:55	1	D		0.109	0.109	7.5388	7.5576	18.8	4B
405235022	16-SEP-2016 11:55	2	D		0.107	0.107	7.6708	7.6918	21	5C
405235023	16-SEP-2016 11:55	3	D		0.117	0.117	7.6451	7.671	25.9	12B
405235024	16-SEP-2016 11:55	4	D		0.111	0.111	7.5531	7.5536	20.5	9A
405235025	16-SEP-2016 11:55	5	D		0.114	0.114	7.5751	7.6017	26.6	3D
405235026	16-SEP-2016 11:55	6	D		0.111	0.111	7.6124	7.6372	24.8	12D
405235027	16-SEP-2016 11:55	7	D		0.106	0.106	7.6586	7.6861	27.5	14A
405235028	16-SEP-2016 11:55	8	D		0.11	0.11	7.6456	7.6667	21.1	8D
405235029	16-SEP-2016 11:55	9	D		0.126	0.126	7.6228	7.6504	27.6	4A
405235030	16-SEP-2016 11:55	10	D		0.114	0.114	7.611	7.6371	26.1	9D
405235031	16-SEP-2016 11:55	11	D		0.108	0.108	7.6608	7.6864	25.6	13D
405235032	16-SEP-2016 11:55	12	D		0.121	0.121	7.5898	7.6198	30	14C
405235033	16-SEP-2016 11:55	13	D		0.113	0.113	7.6784	7.7011	22.7	7D
405235034	16-SEP-2016 11:55	14	D		0.113	0.113	7.6091	7.6358	26.7	5C
405235035	16-SEP-2016 11:55	15	D		0.107	0.107	7.65	7.6715	21.5	3B
405235036	16-SEP-2016 11:55	16	D		0.114	0.114	7.6325	7.6584	25.9	8A
405235037	16-SEP-2016 11:55	17	D		0.125	0.125	7.5723	7.5996	27.3	10B
405235038	16-SEP-2016 11:55	18	D		0.121	0.121	7.6771	7.7062	29.1	7A
405235039	16-SEP-2016 11:55	19	D		0.101	0.101	7.5415	7.563	21.5	12A
405235040	16-SEP-2016 11:55	20	D		0.113	0.113	7.6371	7.6635	26.4	8B
1203625435 MB	16-SEP-2016 11:55	21	D		0.126	0.126	7.5527	7.5527	0	10A
1203625436 DUP (405235033)	16-SEP-2016 11:55	22	D		0.103	0.103	7.6557	7.6752	19.5	4C
1203625437 MS (405235033)	16-SEP-2016 11:55	23	D		0.106	0.106	7.6143	7.6365	22.2	11A
1203625438 MSD (405235033)	16-SEP-2016 11:55	24	D		0.106	0.106	7.573	7.5923	19.3	13D
1203625439 LCS	16-SEP-2016 11:55	25	D		0.126	0.126	7.6158	7.6158	0	14A

The Determination of Gross Alpha And Gross Non-Volatile Beta in Soil, Filters, Solid Matrices And Direct Count Air Filters

Batch ID: 1597811 **Lab SOP:** GL-RAD-A-001B REV# 17
Analyst: Bethany Fiem **Method:** EPA 900.0/SW846 9310/SM 7110B
Instrument: BAL-18550299 **Modified**

Sample ID	Run Date	#	Dry or Wet	Intermediate Aliquot (g)	Unadjusted Aliquot (g)	Aliquot (g)	Initial Weight (g)	Final Weight (g)	Residue Weight (mg)	Detector
Type	Name	Serial Number		Spike Amount		Spike Units				
RGNT	RGF-Hydrofluoric Acid	2429436.1			10					
RGNT	RGF-1M Nitric Acid	2446509			5					
RGNT	RGF-Hydrochloric Acid	2447606.13			5					
RGNT	RGF-Nitric Acid	2454851.13			25					
SPIKE	Strontium-90 SPIKE	1243-O			.1					
SPIKE	Thorium-230 SPIKE	1493-B			.1					

Spike Pipet ID: RAD-GFC-4497063
Planchets Flamed: Yes

Gross Alpha/Beta Solid

Filename : GAB.XLS
 File type : Excel
 Version # : 1.3.10

Batch : 1597811
 Analyst : BET01177
 Prep Date : 9/16/2016
 Alpha Method Uncertainty : 0.0928
 Beta Method Uncertainty : 0.0628

Procedure Code : GFCCANBS
 Parmname1 : Alpha
 Parmname2 : Beta
 Required Alpha MDA : 4 pCi/g
 Required Beta MDA : 10 pCi/g

Geometry: 2 inch Planchett

Sample Characteristics				Count Raw Data				Counting Time (min.)		Gross Counts		Count Start Date/Time	
Pos.	Sample ID	Sample Aliquot G	Sample Residue Wt. (mg)	Sample Aliquot SIDev. G	Sample Date/Time	Detector ID	Alpha	Beta	Time (min.)	Alpha	Beta	Time (min.)	Date/Time
1	405235021.1	0.1090	18.8	3.2304E-03	12/8/2015 14:17	4B	80	525	160	80	525	160	9/19/2016 14:36
2	405235022.1	0.1070	21	3.2302E-03	12/8/2015 13:43	3C	93	416	170	93	416	170	9/19/2016 14:36
3	405235023.1	0.1170	25.9	3.2312E-03	12/2/2015 10:40	12B	124	537	160	124	537	160	9/19/2016 14:41
4	405235024.1	0.1110	20.5	3.2306E-03	12/8/2015 14:13	9A	77	450	140	77	450	140	9/19/2016 14:37
5	405235025.1	0.1140	26.6	3.2309E-03	12/8/2015 13:38	3D	75	395	110	75	395	110	9/19/2016 14:36
6	405235026.1	0.1110	24.8	3.2306E-03	12/8/2015 10:15	12D	89	423	120	89	423	120	9/19/2016 14:41
7	405235027.1	0.1060	27.5	3.2301E-03	12/8/2015 10:19	14A	31	219	70	31	219	70	9/19/2016 14:41
8	405235028.1	0.1100	21.1	3.2305E-03	11/23/2015 14:50	8D	109	862	130	109	862	130	9/19/2016 14:37
9	405235029.1	0.1260	27.6	3.2322E-03	11/23/2015 11:10	4A	74	396	130	74	396	130	9/19/2016 14:36
10	405235030.1	0.1140	26.1	3.2309E-03	11/23/2015 14:44	9D	88	476	120	88	476	120	9/19/2016 14:37
11	405235031.1	0.1080	25.6	3.2303E-03	11/26/2015 14:25	13D	38	156	70	38	156	70	9/19/2016 14:41
12	405235032.1	0.1210	30	3.2317E-03	11/23/2015 11:48	14C	57	411	110	57	411	110	9/19/2016 14:42
13	405235033.1	0.1130	22.7	3.2308E-03	11/23/2015 11:53	7D	62	281	100	62	281	100	9/19/2016 14:37
14	405235034.1	0.1130	26.7	3.2308E-03	11/23/2015 11:20	5C	66	264	90	66	264	90	9/19/2016 14:37
15	405235035.1	0.1070	21.5	3.2302E-03	11/23/2015 11:06	3B	86	598	160	86	598	160	9/19/2016 14:37
16	405235036.1	0.1140	25.9	3.2309E-03	11/23/2015 11:12	8A	76	420	140	76	420	140	9/19/2016 14:37
17	405235037.1	0.1250	27.3	3.2321E-03	11/30/2015 11:19	10B	54	352	130	54	352	130	9/19/2016 14:37
18	405235038.1	0.1210	29.1	3.2317E-03	11/30/2015 10:40	7A	81	374	130	81	374	130	9/19/2016 14:37
19	405235039.1	0.1010	21.5	3.2296E-03	11/30/2015 10:43	12A	42	261	90	42	261	90	9/19/2016 14:42
20	405235040.1	0.1130	26.4	3.2308E-03	11/30/2015 13:23	8B	54	209	100	54	209	100	9/19/2016 14:38
21	1203625435.1	0.1260	0	3.2322E-03	9/16/2016 0:00	10A	6	26	60	6	26	60	9/19/2016 14:36
22	1203625436.1	0.1030	19.5	3.2296E-03	11/23/2015 11:53	4C	124	430	170	124	430	170	9/19/2016 14:36
23	1203625437.1	0.1060	22.2	3.2301E-03	11/23/2015 11:53	11A	314	3099	60	314	3099	60	9/19/2016 16:05
24	1203625438.1	0.1060	19.3	3.2301E-03	11/23/2015 11:53	13D	308	2814	60	308	2814	60	9/19/2016 16:05
25	1203625439.1	0.1260	0	3.2322E-03	9/16/2016 0:00	14A	418	3121	60	418	3121	60	9/19/2016 16:05

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-001B
 Instrument SOP: GL-RAD-I-016

Pos.	Calibration Data			Alpha			Beta			Weekly Background			Count Time (min.)			
	Counted on	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	X-Talk	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)		X-Talk	Alpha	Beta
1	PIC	12/1/2015	11/30/2016	Th230	0.1549	0.00704	0.16170	12/1/2015	11/30/2016	Sr90	0.4877	0.01519	0.00026	0.182	1.560	9/16/2016 17:25
2	PIC	12/1/2015	11/30/2016	Th230	0.1700	0.00568	0.05555	12/1/2015	11/30/2016	Sr90	0.4751	0.00988	0.00635	0.240	0.556	9/16/2016 17:25
3	PIC	12/1/2015	11/30/2016	Th230	0.1572	0.01035	0.15478	12/1/2015	11/30/2016	Sr90	0.4884	0.01114	0.00040	0.230	0.626	9/16/2016 18:01
4	PIC	12/1/2015	11/30/2016	Th230	0.1606	0.00726	0.15338	12/1/2015	11/30/2016	Sr90	0.4930	0.00758	0.00085	0.188	0.846	9/16/2016 17:58
5	PIC	12/1/2015	11/30/2016	Th230	0.1445	0.00657	0.07618	12/1/2015	11/30/2016	Sr90	0.4617	0.02297	0.00259	0.112	0.562	9/16/2016 17:25
6	PIC	12/1/2015	11/30/2016	Th230	0.1575	0.01863	0.12265	12/1/2015	11/30/2016	Sr90	0.4884	0.01845	0.00043	0.146	1.342	9/16/2016 18:01
7	PIC	12/1/2015	11/30/2016	Th230	0.1389	0.02505	0.21109	12/1/2015	11/30/2016	Sr90	0.4648	0.02119	0.00031	0.043	0.415	9/16/2016 17:23
8	PIC	12/1/2015	11/30/2016	Th230	0.1863	0.00794	0.06783	12/1/2015	11/30/2016	Sr90	0.4954	0.00609	0.00243	0.226	0.790	9/16/2016 17:58
9	PIC	12/1/2015	11/30/2016	Th230	0.1423	0.01036	0.07256	12/1/2015	11/30/2016	Sr90	0.4690	0.01123	0.00431	0.176	0.700	9/16/2016 17:25
10	PIC	12/1/2015	11/30/2016	Th230	0.1597	0.02427	0.07788	12/1/2015	11/30/2016	Sr90	0.4849	0.02610	0.00286	0.160	1.276	9/16/2016 18:18
11	PIC	12/1/2015	11/30/2016	Th230	0.1325	0.01236	0.26518	12/1/2015	11/30/2016	Sr90	0.4370	0.01144	0.00027	0.040	0.346	9/16/2016 17:23
12	PIC	12/1/2015	11/30/2016	Th230	0.1389	0.02173	0.18908	12/1/2015	11/30/2016	Sr90	0.4653	0.01828	0.00032	0.135	1.297	9/16/2016 17:23
13	PIC	12/1/2015	11/30/2016	Th230	0.1645	0.00619	0.10658	12/1/2015	11/30/2016	Sr90	0.4725	0.01113	0.00046	0.140	0.676	9/16/2016 17:25
14	PIC	12/1/2015	11/30/2016	Th230	0.1740	0.01161	0.06121	12/1/2015	11/30/2016	Sr90	0.4982	0.00657	0.00367	0.132	0.856	9/16/2016 17:25
15	PIC	12/1/2015	11/30/2016	Th230	0.1633	0.00853	0.06080	12/1/2015	11/30/2016	Sr90	0.4668	0.01614	0.01009	0.198	1.400	9/16/2016 17:25
16	PIC	12/1/2015	11/30/2016	Th230	0.1608	0.01473	0.08664	12/1/2015	11/30/2016	Sr90	0.4869	0.01579	0.00165	0.186	0.818	9/16/2016 17:58
17	PIC	12/1/2015	11/30/2016	Th230	0.1294	0.00844	0.19500	12/1/2015	11/30/2016	Sr90	0.4619	0.00652	0.00072	0.126	0.594	9/16/2016 18:18
18	PIC	12/1/2015	11/30/2016	Th230	0.1481	0.00525	0.10299	12/1/2015	11/30/2016	Sr90	0.4817	0.00594	0.00070	0.166	0.792	9/16/2016 18:18
19	PIC	12/1/2015	11/30/2016	Th230	0.1644	0.01885	0.16665	12/1/2015	11/30/2016	Sr90	0.4827	0.01964	0.00028	0.088	0.888	9/16/2016 18:00
20	PIC	12/1/2015	11/30/2016	Th230	0.1608	0.01664	0.09830	12/1/2015	11/30/2016	Sr90	0.4922	0.02148	0.00053	0.126	0.434	9/16/2016 18:18
21	PIC	12/1/2015	11/30/2016	Th230	0.1864	0.01461	0.48832	12/1/2015	11/30/2016	Sr90	0.4282	0.00651	0.00016	0.090	0.320	9/16/2016 17:59
22	PIC	12/1/2015	11/30/2016	Th230	0.1758	0.01587	0.06433	12/1/2015	11/30/2016	Sr90	0.4810	0.00889	0.00300	0.234	0.738	9/16/2016 17:25
23	PIC	12/1/2015	11/30/2016	Th230	0.1636	0.00693	0.11911	12/1/2015	11/30/2016	Sr90	0.4847	0.01317	0.00028	0.238	0.862	9/16/2016 18:00
24	PIC	12/1/2015	11/30/2016	Th230	0.1518	0.01236	0.25792	12/1/2015	11/30/2016	Sr90	0.4392	0.01144	0.00027	0.040	0.346	9/16/2016 17:23
25	PIC	12/1/2015	11/30/2016	Th230	0.2778	0.02505	0.15685	12/1/2015	11/30/2016	Sr90	0.4754	0.02119	0.00031	0.043	0.415	9/16/2016 17:23

Notes:

1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

Alpha Spike S/N : 1493-B
 Spike Exp Date : 6/8/2017
 Spike Activity (dpm/ml): 286.08
 Spike Volume Added: 0.10
 Spike Nuclide: Th-230

Alpha LCS S/N : 1493-B
 LCS Exp Date : 6/8/2017
 LCS Activity (dpm/ml): 286.08
 LCS Volume Added: 0.10
 LCS Nuclide: Th-230

Alpha Results																	
Pos.	Decision Level		Critical Level	Required MDA	MDA pCi/G	Sample Act. Conc. pCi/G	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA Counting Uncertainty pCi/G	2 SIGMA Total Prop. Uncertainty pCi/G	Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
	Level pCi/G	Level pCi/G															
1	2.4084	1.7003	4	3.9008	8.4599	18.82%	0.3180	0.0591	3.0862	3.4891		SAMPLE					
2	2.5102	1.7722	4	3.9816	7.0999	20.04%	0.3071	0.0608	2.9523	3.2924		SAMPLE					
3	2.4852	1.7546	4	3.9682	13.3115	13.68%	0.5450	0.0728	3.4951	4.3246		SAMPLE					
4	2.4413	1.7236	4	3.9686	9.0795	18.37%	0.3620	0.0656	3.2496	3.6905		SAMPLE					
5	2.2456	1.5854	4	3.9166	15.3271	14.36%	0.5698	0.0801	4.2952	5.2221		SAMPLE					
6	2.3320	1.6464	4	3.9370	15.3096	13.94%	0.5957	0.0805	4.0632	5.0383		SAMPLE					
7	1.8275	1.2902	4	3.8915	12.2028	20.35%	0.3999	0.0798	4.7855	5.3615		SAMPLE					
8	2.3976	1.6927	4	3.8928	13.1119	13.90%	0.6125	0.0831	3.5800	4.4114		SAMPLE					
9	2.4182	1.7073	4	3.9945	9.5514	17.71%	0.3932	0.0688	3.3876	3.8721		SAMPLE					
10	2.3436	1.6546	4	3.9276	13.9020	14.48%	0.5733	0.0802	3.8862	4.7800		SAMPLE					
11	1.8136	1.2805	4	3.9100	15.8108	17.85%	0.5029	0.0883	5.4474	6.2428		SAMPLE					
12	2.3055	1.6277	4	3.9866	10.2405	18.49%	0.3832	0.0696	3.6578	4.1655		SAMPLE					
13	2.3148	1.6342	4	3.9956	11.6049	17.02%	0.4800	0.0805	3.8242	4.4213		SAMPLE					
14	2.2210	1.5680	4	3.8998	13.5319	15.56%	0.6013	0.0917	4.1190	4.8930		SAMPLE					
15	2.4269	1.7134	4	3.9101	7.7779	18.32%	0.3395	0.0613	3.0955	3.5219		SAMPLE					
16	2.3616	1.6673	4	3.8613	8.6492	18.54%	0.3669	0.0652	3.1404	3.5649		SAMPLE					
17	2.2682	1.6013	4	3.8455	8.0068	20.47%	0.2894	0.0587	3.2056	3.5511		SAMPLE					
18	2.3487	1.6582	4	3.8963	11.4361	15.90%	0.4571	0.0716	3.5261	4.1442		SAMPLE					
19	2.1469	1.5158	4	3.9357	10.2501	19.67%	0.3787	0.0732	3.8930	4.3790		SAMPLE					
20	2.2459	1.5856	4	3.9150	10.2352	18.46%	0.4140	0.0752	3.6527	4.1557		SAMPLE					
21	1.8321	1.2935	4	3.5461	0.1905	429.74%	0.0100	0.0430	1.6158	1.6169		MB					
22	2.4898	1.7578	4	3.9547	12.1380	14.36%	0.4954	0.0690	3.3641	4.1310	405235033.1	DUP		4.5%	113.0716	104.1%	
23	4.0335	2.8477	4	6.9840	129.3576	6.70%	4.9953	0.2961	15.0751	29.1081	405235033.1	MS		9.5%	113.0716	115.6%	
24	1.7343	1.2245	4	3.8490	142.2675	6.62%	5.0833	0.2926	16.0566	31.8626	405235033.1	MSD					
25	0.8263	0.5834	4	1.8102	88.8797	6.09%	6.9237	0.3408	8.5953	19.3819		LCS			95.1237	93.4%	

Notes:

1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

Beta Spike SIN : 1243-O
 Spike Exp Date : 12/18/2016
 Spike Activity (dpm/ml): 483.48
 Spike Volume Added: 0.10
 Spike Nuclide: Sr-90

Beta LCS SIN : 1243-O
 LCS Exp Date : 12/18/2016
 LCS Activity (dpm/ml): 483.48
 LCS Volume Added: 0.10
 LCS Nuclide: Sr-90

Beta Results		Critical Level		Required MDA		Sample Act. Conc.		Sample Act. Error		Net Count Rate		Net Count Rate Error		2 SIGMA Counting Uncertainty		2 SIGMA Total Prop. Uncertainty		Sample QC		Sample Type		RPD RER		Nominal pCi/g		Recovery			
Pos.	Level pCi/g	Level pCi/g	MDA pCi/g	MDA pCi/g	MDA pCi/g	Conc. pCi/g	Conc. pCi/g	%	%	CPM	CPM	CPM	CPM	pCi/g	pCi/g	pCi/g	pCi/g	QC	Type	RPD	RER	pCi/g	pCi/g	Recovery	Recovery				
1	2.2400	1.5814	10	3.3217	13.9009	9.53%	1.7213	0.1537	2.5531	3.2631	SAMPLE																		
2	1.3667	0.9649	10	2.0861	16.4859	7.31%	1.8911	0.1245	2.1625	3.1651	SAMPLE																		
3	1.3201	0.9320	10	2.0118	20.5785	6.22%	2.7303	0.1491	2.3038	3.7289	SAMPLE																		
4	1.6870	1.1910	10	2.5584	18.8020	7.28%	2.3683	0.1570	2.5334	3.6739	SAMPLE																		
5	1.6019	1.1310	10	2.4953	25.3036	7.12%	3.0089	0.1839	3.0839	4.7901	SAMPLE																		
6	2.2799	1.6096	10	3.4270	17.3834	8.90%	2.1830	0.1791	2.9161	3.8716	SAMPLE																		
7	1.6967	1.1979	10	2.7877	23.9556	8.66%	2.7136	0.2124	3.8061	5.2029	SAMPLE																		
8	1.6653	1.1898	10	2.5704	47.8097	4.94%	5.8408	0.2283	3.7152	7.5613	SAMPLE																		
9	1.4630	1.0329	10	2.2418	17.5703	7.28%	2.3462	0.1576	2.3545	3.3695	SAMPLE																		
10	2.1804	1.5394	10	3.2825	21.4633	8.00%	2.6907	0.1887	3.0141	4.3716	SAMPLE																		
11	1.6172	1.1417	10	2.6925	16.5928	10.05%	1.8626	0.1794	3.3557	4.1741	SAMPLE																		
12	2.1329	1.5058	10	3.2299	18.7347	8.35%	2.4394	0.1878	2.9451	3.9973	SAMPLE																		
13	1.7705	1.2500	10	2.7531	15.7593	9.10%	1.9340	0.1657	2.7398	3.5360	SAMPLE																		
14	1.9752	1.3945	10	3.0558	16.2638	9.39%	2.0773	0.1852	2.9049	3.6795	SAMPLE																		
15	2.2585	1.5945	10	3.3581	20.7877	7.72%	2.3375	0.1617	2.8592	4.1121	SAMPLE																		
16	1.6351	1.1544	10	2.4826	17.3241	7.68%	2.1920	0.1519	2.4154	3.4426	SAMPLE																		
17	1.3793	0.9738	10	2.1276	15.8584	7.51%	2.1137	0.1484	2.2689	3.1640	SAMPLE																		
18	1.5776	1.1138	10	2.4059	15.8159	7.88%	2.0849	0.1540	2.3325	3.1812	SAMPLE																		
19	2.3228	1.6399	10	3.5879	17.8708	9.90%	2.0120	0.1844	3.3390	4.2725	SAMPLE																		
20	1.3619	0.9615	10	2.1659	12.8822	9.60%	1.6560	0.1475	2.3421	3.0157	SAMPLE																		
21	1.5033	1.0613	10	2.5401	0.5385	78.28%	0.1133	0.0887	1.4508	1.4563	MB																		
22	1.6156	1.1406	10	2.4417	15.8596	7.85%	1.7914	0.1279	2.2788	3.2084	DUP	405235033.1	0.6%																
23	2.5915	1.8296	10	4.0976	439.8466	3.79%	50.7880	0.9287	15.9608	64.0212	MS	405235033.1	0.5%																
24	1.7625	1.2443	10	2.9725	437.6097	3.77%	46.5540	0.8843	16.7696	64.6579	MSD	405235033.1	0.5%																
25	1.5002	1.0592	10	2.4943	379.8067	3.79%	51.6017	0.9313	13.7262	55.7669	LCS																		

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
405235021	4B	160	80	525	9/19/2016 14:36	9/19/2016 17:16	PIC	1597811
405235022	3C	170	93	416	9/19/2016 14:36	9/19/2016 17:26	PIC	1597811
405235023	12B	160	124	537	9/19/2016 14:41	9/19/2016 17:21	PIC	1597811
405235024	9A	140	77	450	9/19/2016 14:37	9/19/2016 16:57	PIC	1597811
405235025	3D	110	75	395	9/19/2016 14:36	9/19/2016 16:26	PIC	1597811
405235026	12D	120	89	423	9/19/2016 14:41	9/19/2016 16:41	PIC	1597811
405235027	14A	70	31	219	9/19/2016 14:41	9/19/2016 15:51	PIC	1597811
405235028	8D	130	109	862	9/19/2016 14:37	9/19/2016 16:47	PIC	1597811
405235029	4A	130	74	396	9/19/2016 14:36	9/19/2016 16:46	PIC	1597811
405235030	9D	120	88	476	9/19/2016 14:37	9/19/2016 16:37	PIC	1597811
405235031	13D	70	38	156	9/19/2016 14:41	9/19/2016 15:51	PIC	1597811
405235032	14C	110	57	411	9/19/2016 14:42	9/19/2016 16:32	PIC	1597811
405235033	7D	100	62	261	9/19/2016 14:37	9/19/2016 16:17	PIC	1597811
405235034	5C	90	66	264	9/19/2016 14:37	9/19/2016 16:07	PIC	1597811
405235035	3B	160	86	598	9/19/2016 14:37	9/19/2016 17:17	PIC	1597811
405235036	8A	140	76	420	9/19/2016 14:37	9/19/2016 16:57	PIC	1597811
405235037	10B	130	54	352	9/19/2016 14:37	9/19/2016 16:47	PIC	1597811
405235038	7A	130	81	374	9/19/2016 14:37	9/19/2016 16:47	PIC	1597811
405235039	12A	90	42	261	9/19/2016 14:42	9/19/2016 16:12	PIC	1597811
405235040	8B	100	54	209	9/19/2016 14:38	9/19/2016 16:18	PIC	1597811
1203625435	10A	60	6	26	9/19/2016 14:36	9/19/2016 15:36	PIC	1597811
1203625436	4C	170	124	430	9/19/2016 14:36	9/19/2016 17:26	PIC	1597811
1203625437	11A	60	314	3099	9/19/2016 16:05	9/19/2016 17:05	PIC	1597811
1203625438	13D	60	308	2814	9/19/2016 16:05	9/19/2016 17:05	PIC	1597811
1203625439	14A	60	418	3121	9/19/2016 16:05	9/19/2016 17:05	PIC	1597811

19-Sep-2016

Batch# 1597796 Product: SR Date: 9/21/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	/		
Instrument source check is within limits.	/		
Instrument bkg check is within limits.	/		
Method RDL/ LLD has been met.	/		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	/		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	/		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	/		
Sample was run within hold time.	/	✓	DERZ 1560005
Sample was correctly preserved if required.	/		
Smears Taken for Radioactive batches.	/		
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	/		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	/		
Aux data is correct.			NA
Client Special requirements page has been checked.	/		
Raw Data and/ or spectrum are included and properly stasured.	/		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	/		
Hit notification complete (if necessary)			M
Batch entered into Case Narrative.	/		9/21/16
Batch Data Exception Reports (DER) completed, if applicable.	/		M DERZ 1560005
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	/		M
Aliquot Correction completed if required.			M
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	/		

Primary Review Performed By: [Signature]

10/9
MJWC

Secondary Review Performed By: [Signature] 9/21/16

DATA EXCEPTION REPORT

Mo.Day Yr. 21-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GFPC	Test / Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1597796	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample Analyzed out of Holding Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, and 12036254402 were received and analyzed out of holding.		1. Reporting results	

Originator's Name:
Nat Long 21-SEP-16

Data Validator/Group Leader:
Kenshalla Oston 21-SEP-16

Prep Logbook

The Determination of Strontium 89/90 in Water, Soil, Milk, Filters, Vegetation and Tissues

Batch ID: 1597796 Serial Number: 1243-O
Analyst: Kelli Dorrell Spike Amount: .1
Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Spike Units: mL

Lab SOP: GL-RAD-A-004 REV# 17
Instrument: BAL-16107662

Type: LCS Description: Strontium-90 SPIKE
Sample Id: 1203625403

Sample ID	Prep Date	Dry or Wet	Unadjusted Aliquot (g)	Aliquot (g)	Initial Wt (g)	Final Wt (g)	Net Wt (mg)	Sr Separation (date)	Strontium Carrier Yield (percent)
405235021	16-SEP-2016 10:48	D	0.321	0.321	0.0236	0.0301	6.5	09/16/16 15:10	88
405235022	16-SEP-2016 10:48	D	0.461	0.461	0.023	0.0298	6.8	09/16/16 15:10	92
405235023	16-SEP-2016 10:48	D	0.397	0.397	0.0231	0.0303	7.2	09/16/16 15:10	98
405235024	16-SEP-2016 10:48	D	0.324	0.324	0.0228	0.0298	7	09/16/16 15:10	95
405235025	16-SEP-2016 10:48	D	0.318	0.318	0.0233	0.0309	7.6	09/16/16 15:10	103
405235026	16-SEP-2016 10:48	D	0.418	0.418	0.0231	0.0303	7.2	09/16/16 15:10	98
405235027	16-SEP-2016 10:48	D	0.321	0.321	0.0242	0.0316	7.4	09/16/16 15:10	100
405235028	16-SEP-2016 10:48	D	0.354	0.354	0.0228	0.0293	6.5	09/16/16 15:10	88
405235029	16-SEP-2016 10:48	D	0.328	0.328	0.0234	0.0303	6.9	09/16/16 15:10	94
405235030	16-SEP-2016 10:48	D	0.332	0.332	0.0227	0.0301	7.4	09/16/16 15:10	100
405235031	16-SEP-2016 10:48	D	0.38	0.38	0.0229	0.0299	7	09/16/16 15:10	95
405235032	16-SEP-2016 10:48	D	0.391	0.391	0.0227	0.0308	8.1	09/16/16 15:10	110
405235033	16-SEP-2016 10:48	D	0.301	0.301	0.0238	0.0308	7	09/16/16 15:10	95
405235034	16-SEP-2016 10:48	D	0.437	0.437	0.0232	0.03	6.8	09/16/16 15:10	92
405235035	16-SEP-2016 10:48	D	0.351	0.351	0.0231	0.0314	8.3	09/16/16 15:10	113
405235036	16-SEP-2016 10:48	D	0.472	0.472	0.0239	0.03	6.1	09/16/16 15:10	83
405235037	16-SEP-2016 10:48	D	0.328	0.328	0.0234	0.0306	7.2	09/16/16 15:10	98
405235038	16-SEP-2016 10:48	D	0.398	0.398	0.0245	0.0313	6.8	09/16/16 15:10	92
405235039	16-SEP-2016 10:48	D	0.332	0.332	0.0239	0.0307	6.8	09/16/16 15:10	92
405235040	16-SEP-2016 10:48	D	0.321	0.321	0.0234	0.0301	6.7	09/16/16 15:10	91
1203625401 MB					0.0242	0.0314	7.2	09/16/16 15:10	98
1203625402 DUP (405235025)			0.31	0.31	0.0228	0.0297	6.9	09/16/16 15:10	94
1203625403 LCS				0.472	0.0226	0.0295	6.9	09/16/16 15:10	94

Comments:

Spike Pipet ID: RAD-GFC-1795419
 Carrier Pipet ID: RAD-GFC-2154115
 Data Entry Date2: 16-SEP-2016 15:10 GFC-F30560 Kelli Dorrell
 Data Entry Date3: 16-SEP-2016 00:00

Reagent/Solvent Lot ID	Description	Amount
20646112	Phenolphthalein, 1.0% in 50% Alcohol	2 mL
2213550	0.05M HNO3	15 mL
2243751	RGF-6M Sodium Hydroxide	6 mL
2243757	RGF-0.75M Sodium Carbonate	13 mL
2334614	Thymol Blue Indicator	5 mL
2388714	RGF-80% Ethanol	3 mL
2413432	Sr-0.5mL=8.35mg/ml=16.7mg	5 mL
2414995	Sr-0.5mL=7.37, 2.0 mL=29.46 mg	5 mL
2424020	RGF-3M Nitric 0.05M Oxalic	10 mL
2433863.1	SR SPEC RESIN Cleaned	2 g
2434028	RGF-Sr Filters	1 L
2434079	RGF-8M Nitric Acid	25 mL

Analytical Logbook version 1 11-04-2002

GEL Laboratories LLC

Prep Logbook

Sample ID	Prep Date	Dry or Wet	Unadjusted Aliquot (g)	Aliquot (g)	Initial Wt (g)	Final Wt (g)	Net Wt (mg)	Sr Separation (date)	Strontium Carrier Yield (percent)
Reagent/Solvent Lot ID	Description	Amount	Comments:						

Strontium-90 Solid

Filename : SR90.XLS
 File type : Excel
 Version # : 1.3.10

Carrier S/N : 2414995
 Carrier Exp Date : 6/3/2017
 Carrier Volume Added: 0.50
 Carrier Weight (mg/ml): 14.73
 Carrier Weight StDev.: 0.10

Batch : 1597796
 Analyst : KEL01237
 Prep Date : 9/16/2016
 Method Uncertainty : 0.089724205

Procedure Code : GFC90SRs
 Parmname : Strontium-90
 Required MDA : 2
 Sr-90 Abundance : 1.00
 Half-life of Sr-90 : 28.90
 Half-life of Y-90 : 64.053

pCi/g
 years
 hours

Geometry: Tuifryn Filler

Sample Characteristics				Carrier Calculations				
Pos.	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G	Carrier Weight (Standard)	Net Weight (Sample)	Net Weight StDev. (mg)	Carrier Aliquot (mL)	Carrier Aliquot StDev. (mL)
1	405235021.1	0.3210	3.2525E-03	14.73	6.50	0.035267	0.5	0.001000
2	405235022.1	0.4610	3.2672E-03	14.73	6.80	0.036556	0.5	0.001000
3	405235023.1	0.3970	3.2605E-03	14.73	7.20	0.038276	0.5	0.001000
4	405235024.1	0.3240	3.2529E-03	14.73	7.00	0.037416	0.5	0.001000
5	405235025.1	0.3180	3.2522E-03	14.73	7.60	0.039995	0.5	0.001000
6	405235026.1	0.4180	3.2627E-03	14.73	7.20	0.038276	0.5	0.001000
7	405235027.1	0.3210	3.2525E-03	14.73	7.40	0.039135	0.5	0.001000
8	405235028.1	0.3540	3.2560E-03	14.73	6.50	0.035267	0.5	0.001000
9	405235029.1	0.3280	3.2533E-03	14.73	6.90	0.036986	0.5	0.001000
10	405235030.1	0.3320	3.2537E-03	14.73	7.40	0.039135	0.5	0.001000
11	405235031.1	0.3800	3.2587E-03	14.73	7.00	0.037416	0.5	0.001000
12	405235032.1	0.3910	3.2599E-03	14.73	8.10	0.042144	0.5	0.001000
13	405235033.1	0.3010	3.2505E-03	14.73	7.00	0.037416	0.5	0.001000
14	405235034.1	0.4370	3.2647E-03	14.73	6.80	0.036556	0.5	0.001000
15	405235035.1	0.3510	3.2557E-03	14.73	8.30	0.043003	0.5	0.001000
16	405235036.1	0.4720	3.2683E-03	14.73	6.10	0.033548	0.5	0.001000
17	405235037.1	0.3280	3.2533E-03	14.73	7.20	0.038276	0.5	0.001000
18	405235038.1	0.3980	3.2606E-03	14.73	6.80	0.036556	0.5	0.001000
19	405235039.1	0.3320	3.2537E-03	14.73	6.80	0.036556	0.5	0.001000
20	405235040.1	0.3210	3.2525E-03	14.73	6.70	0.036127	0.5	0.001000
21	1203625401.1	0.4720	3.2683E-03	14.73	7.20	0.038276	0.5	0.001000
22	1203625402.1	0.3100	3.2514E-03	14.73	6.90	0.036986	0.5	0.001000
23	1203625403.1	0.4720	3.2683E-03	14.73	6.90	0.036986	0.5	0.001000

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-004
 Instrument SOP: GL-RAD-I-016

Count Raw Data												
Pos.	Detector ID	Counting Time (min.)	Gross Counts		Gross Beta CPM	Count Start Date/Time	Strontium Separation Date/Time	Yttrium Ingrowth	Sr-90 Decay	Calculated Sample Recovery %	Sample Recovery Error %	
			Alpha	Beta								
1	5B	60	29	39	0.630	9/17/2016 15:34	9/16/2016 15:10	0.236	0.982	88.3%	1.04%	
2	5C	60	5	42	0.696	9/17/2016 15:34	9/16/2016 15:10	0.236	0.982	92.3%	1.04%	
3	5D	60	11	34	0.558	9/17/2016 15:34	9/16/2016 15:10	0.236	0.981	97.8%	1.03%	
4	2A	60	11	36	0.576	9/21/2016 10:46	9/16/2016 15:10	0.715	0.981	95.0%	1.04%	
5	5A	60	10	87	1.441	9/19/2016 11:54	9/16/2016 15:10	0.527	0.981	103%	1.03%	
6	6C	60	3	41	0.681	9/17/2016 15:33	9/16/2016 15:10	0.236	0.982	97.8%	1.03%	
7	7A	60	4	46	0.761	9/17/2016 15:33	9/16/2016 15:10	0.236	0.982	100%	1.03%	
8	7B	60	8	36	0.593	9/17/2016 15:33	9/16/2016 15:10	0.236	0.981	88.3%	1.04%	
9	7C	60	9	31	0.499	9/17/2016 15:33	9/16/2016 15:10	0.236	0.981	93.7%	1.04%	
10	7D	60	5	35	0.577	9/17/2016 15:33	9/16/2016 15:10	0.236	0.981	100%	1.03%	
11	8A	60	8	50	0.825	9/17/2016 15:33	9/16/2016 15:10	0.236	0.981	95.0%	1.04%	
12	8B	60	4	18	0.295	9/17/2016 15:34	9/16/2016 15:10	0.236	0.981	110%	1.02%	
13	5D	60	0	34	0.567	9/19/2016 15:23	9/16/2016 15:10	0.545	0.980	95.0%	1.04%	
14	8D	60	12	50	0.823	9/17/2016 15:34	9/16/2016 15:10	0.236	0.981	92.3%	1.04%	
15	9A	60	6	38	0.620	9/17/2016 15:36	9/16/2016 15:10	0.237	0.981	113%	1.02%	
16	9B	60	3	21	0.347	9/17/2016 15:36	9/16/2016 15:10	0.237	0.981	82.8%	1.05%	
17	9C	60	5	32	0.528	9/17/2016 15:36	9/16/2016 15:10	0.237	0.981	97.8%	1.03%	
18	9D	60	5	56	0.928	9/17/2016 15:37	9/16/2016 15:10	0.237	0.981	92.3%	1.04%	
19	10B	60	7	43	0.696	9/17/2016 15:37	9/16/2016 15:10	0.237	0.981	92.3%	1.04%	
20	10C	60	1	14	0.229	9/17/2016 15:37	9/16/2016 15:10	0.237	0.981	91.0%	1.04%	
21	10D	60	5	33	0.514	9/17/2016 15:37	9/16/2016 15:10	0.237	1.000	97.8%	1.03%	
22	11A	60	11	54	0.880	9/17/2016 15:45	9/16/2016 15:10	0.238	0.982	93.7%	1.04%	
23	11B	60	4	1582	26.362	9/17/2016 15:45	9/16/2016 15:10	0.238	1.000	93.7%	1.04%	

Calibration Data		Calibration		Detector Efficiency (cpm/dpm)		Detector Efficiency Error (cpm/dpm)		Alpha X-Talk		Weekly Bkg Count		Weekly Bkg Count	
Pos.	Counted on	Calibration Date	Due Date	Sr-90	Y-90	Efficiency	Error	Alpha X-Talk	Weekly Bkg CPM	Count Start Date/Time	Count Start Date/Time	Count Start Date/Time	Count Time (min.)
1	PIC	4/1/2016	2/28/2017	0.4309	0.5665	0.00426	0.04169	0.532	0.532	9/16/2016 17:25	9/16/2016 17:25	500	500
2	PIC	4/1/2016	2/28/2017	0.4203	0.5622	0.00657	0.04334	0.856	0.856	9/16/2016 17:25	9/16/2016 17:25	500	500
3	PIC	4/1/2016	2/28/2017	0.4250	0.5641	0.00925	0.04641	0.748	0.748	9/16/2016 17:26	9/16/2016 17:26	500	500
4	PIC	4/1/2016	2/28/2017	0.4136	0.5406	0.01914	0.13349	0.450	0.450	9/16/2016 17:24	9/16/2016 17:24	500	500
5	PIC	4/1/2016	2/28/2017	0.4320	0.5685	0.00851	0.05241	1.386	1.386	9/16/2016 17:25	9/16/2016 17:25	500	500
6	PIC	4/1/2016	2/28/2017	0.4223	0.5617	0.01970	0.04646	0.978	0.978	9/16/2016 17:58	9/16/2016 17:58	500	500
7	PIC	4/1/2016	2/28/2017	0.4198	0.5546	0.00594	0.07945	0.792	0.792	9/16/2016 18:18	9/16/2016 18:18	500	500
8	PIC	4/1/2016	2/28/2017	0.4308	0.5632	0.00627	0.05267	0.466	0.466	9/16/2016 17:58	9/16/2016 17:58	500	500
9	PIC	4/1/2016	2/28/2017	0.4148	0.5415	0.00790	0.11724	0.398	0.398	9/16/2016 17:58	9/16/2016 17:58	500	500
10	PIC	4/1/2016	2/28/2017	0.4129	0.5455	0.01113	0.08122	0.676	0.676	9/16/2016 17:58	9/16/2016 17:58	500	500
11	PIC	4/1/2016	2/28/2017	0.4121	0.5573	0.01579	0.06471	0.818	0.818	9/16/2016 17:58	9/16/2016 17:58	500	500
12	PIC	4/1/2016	2/28/2017	0.4278	0.5567	0.02148	0.07827	0.434	0.434	9/16/2016 18:18	9/16/2016 18:18	500	500
13	PIC	4/1/2016	2/28/2017	0.4251	0.5641	0.00925	0.04602	0.748	0.748	9/16/2016 17:26	9/16/2016 17:26	500	500
14	PIC	4/1/2016	2/28/2017	0.4258	0.5674	0.00609	0.05209	0.790	0.790	9/16/2016 17:58	9/16/2016 17:58	500	500
15	PIC	4/1/2016	2/28/2017	0.4231	0.5591	0.00758	0.13006	0.846	0.846	9/16/2016 17:58	9/16/2016 17:58	500	500
16	PIC	4/1/2016	2/28/2017	0.4210	0.5570	0.00754	0.05873	0.422	0.422	9/16/2016 17:59	9/16/2016 17:59	500	500
17	PIC	4/1/2016	2/28/2017	0.4142	0.5526	0.00584	0.06923	0.690	0.690	9/16/2016 17:59	9/16/2016 17:59	500	500
18	PIC	4/1/2016	2/28/2017	0.4213	0.5596	0.02610	0.05933	1.276	1.276	9/16/2016 18:18	9/16/2016 18:18	500	500
19	PIC	4/1/2016	2/28/2017	0.4095	0.5325	0.00652	0.17388	0.594	0.594	9/16/2016 18:18	9/16/2016 18:18	500	500
20	PIC	4/1/2016	2/28/2017	0.4082	0.5237	0.00638	0.24092	0.340	0.340	9/16/2016 17:59	9/16/2016 17:59	500	500
21	PIC	4/1/2016	2/28/2017	0.4053	0.5164	0.00557	0.42763	0.524	0.524	9/16/2016 17:59	9/16/2016 17:59	500	500
22	PIC	4/1/2016	2/28/2017	0.4242	0.5473	0.01317	0.10799	0.862	0.862	9/16/2016 18:00	9/16/2016 18:00	500	500
23	PIC	4/1/2016	2/28/2017	0.4317	0.5589	0.00697	0.07187	0.950	0.950	9/16/2016 18:00	9/16/2016 18:00	500	500

Notes:

- 1 - Results are decay corrected to Sample Date/Time
- 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
- 3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml): N/A
 Spike Volume Added: N/A

* - RPD changed to 0% due to sample & dup activity below MDA

LCS S/N : 1243-O
 LCS Exp Date : 12/18/2016
 LCS Activity (dpm/ml): 483.48
 LCS Volume Added: 0.10

Pos.	Decision Level pCi/G	Critical Level pCi/G	Required MDA pCi/G	MDA pCi/G	Sample Act. Conc. pCi/G	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA Counting Uncertainty pCi/G	2 SIGMA Total Prop. Uncertainty pCi/G	Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
1	0.6661	0.4703	2	1.0840	0.2807	109.90%	0.0979	0.1075	0.6046	0.6067		SAMPLE				
2	0.5742	0.4054	2	0.9082	-0.3112	72.32%	-0.1596	0.1154	0.4410	0.4410		SAMPLE				
3	0.5834	0.4119	2	0.9297	-0.4023	54.76%	-0.1898	0.1039	0.4316	0.4316		SAMPLE				
4	0.3978	0.2808	2	0.6548	0.2338	81.64%	0.1255	0.1024	0.3740	0.3765		SAMPLE				
5	0.7163	0.5057	2	1.1070	0.1056	296.19%	0.0553	0.1637	0.6132	0.6135		SAMPLE				
6	0.6372	0.4499	2	1.0009	-0.6011	38.91%	-0.2970	0.1154	0.4576	0.4576		SAMPLE				
7	0.7319	0.5167	2	1.1626	-0.0791	390.05%	-0.0306	0.1195	0.6050	0.6050		SAMPLE				
8	0.5667	0.4001	2	0.9307	0.3312	81.91%	0.1270	0.1040	0.5316	0.5349		SAMPLE				
9	0.5532	0.3906	2	0.9189	0.2784	94.46%	0.1011	0.0955	0.5154	0.5179		SAMPLE				
10	0.6653	0.4697	2	1.0665	-0.2528	105.31%	-0.0994	0.1047	0.5216	0.5217		SAMPLE				
11	0.6734	0.4754	2	1.0678	0.0157	1849.54%	0.0067	0.1240	0.5685	0.5686		SAMPLE				
12	0.4006	0.2828	2	0.6611	-0.2659	54.67%	-0.1392	0.0760	0.2846	0.2847		SAMPLE				
13	0.6037	0.4262	2	0.9621	-0.3976	57.71%	-0.1813	0.1046	0.4495	0.4496		SAMPLE				
14	0.5754	0.4063	2	0.9142	0.0669	375.74%	0.0329	0.1237	0.4930	0.4931		SAMPLE				
15	0.6123	0.4323	2	0.9691	-0.4719	48.63%	-0.2257	0.1097	0.4495	0.4496		SAMPLE				
16	0.4396	0.3104	2	0.7270	-0.1593	108.66%	-0.0749	0.0814	0.3392	0.3393		SAMPLE				
17	0.6949	0.4906	2	1.1126	-0.4269	62.11%	-0.1624	0.1009	0.5195	0.5195		SAMPLE				
18	0.8115	0.5729	2	1.2586	-0.7844	38.73%	-0.3476	0.1343	0.5938	0.5939		SAMPLE				
19	0.6863	0.4845	2	1.1089	0.2864	110.49%	0.1024	0.1131	0.6201	0.6222		SAMPLE				
20	0.5506	0.3887	2	0.9257	-0.3283	60.64%	-0.1107	0.0671	0.3901	0.3902		SAMPLE				
21	0.4265	0.3011	2	0.6948	-0.0178	1017.93%	-0.0096	0.0981	0.3558	0.3559		MB				
22	0.8425	0.5948	2	1.3322	0.0519	703.45%	0.0182	0.1280	0.7154	0.7154	405235025.1	DUP	*	0.0%		
23	0.5599	0.3953	2	0.8807	45.8521	2.96%	25.4119	0.6643	2.3492	8.5194		LCS			46.1411	99.4%

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
405235021	5B	60	29	39	9/17/2016 15:34	9/17/2016 16:34	PIC	1597796
405235022	5C	60	5	42	9/17/2016 15:34	9/17/2016 16:34	PIC	1597796
405235023	5D	60	11	34	9/17/2016 15:34	9/17/2016 16:34	PIC	1597796
405235024	2A	60	11	36	9/21/2016 10:46	9/21/2016 11:46	PIC	1597796
405235025	5A	60	10	87	9/19/2016 11:54	9/19/2016 12:54	PIC	1597796
405235026	6C	60	3	41	9/17/2016 15:33	9/17/2016 16:33	PIC	1597796
405235027	7A	60	4	46	9/17/2016 15:33	9/17/2016 16:33	PIC	1597796
405235028	7B	60	8	36	9/17/2016 15:33	9/17/2016 16:33	PIC	1597796
405235029	7C	60	9	31	9/17/2016 15:33	9/17/2016 16:33	PIC	1597796
405235030	7D	60	5	35	9/17/2016 15:33	9/17/2016 16:33	PIC	1597796
405235031	8A	60	8	50	9/17/2016 15:33	9/17/2016 16:33	PIC	1597796
405235032	8B	60	4	18	9/17/2016 15:34	9/17/2016 16:34	PIC	1597796
405235033	5D	60	0	34	9/19/2016 15:23	9/19/2016 16:23	PIC	1597796
405235034	8D	60	12	50	9/17/2016 15:34	9/17/2016 16:34	PIC	1597796
405235035	9A	60	6	38	9/17/2016 15:36	9/17/2016 16:36	PIC	1597796
405235036	9B	60	3	21	9/17/2016 15:36	9/17/2016 16:36	PIC	1597796
405235037	9C	60	5	32	9/17/2016 15:36	9/17/2016 16:36	PIC	1597796
405235038	9D	60	5	56	9/17/2016 15:37	9/17/2016 16:37	PIC	1597796
405235039	10B	60	7	43	9/17/2016 15:37	9/17/2016 16:37	PIC	1597796
405235040	10C	60	1	14	9/17/2016 15:37	9/17/2016 16:37	PIC	1597796
1203625401	10D	60	5	33	9/17/2016 15:37	9/17/2016 16:37	PIC	1597796
1203625402	11A	60	11	54	9/17/2016 15:45	9/17/2016 16:45	PIC	1597796
1203625403	11B	60	4	1582	9/17/2016 15:45	9/17/2016 16:45	PIC	1597796

Batch# 1602427 Product: GAB Date: 9/29/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.	/		
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	/		
Instrument source check is within limits.	/		
Instrument bkg check is within limits.	/		
Method RDL/ LLD has been met.	/		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	/		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			NA
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	/		
Sample was run within hold time.	/		DER 1562965
Sample was correctly preserved if required.	/		
Smears Taken for Radioactive batches.	/		
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	/		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	/		
Aux data is correct.			NA
Client Special requirements page has been checked.	/		
Raw Data and/ or spectrum are included and properly stasured.	/		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	/		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	/		
Batch Data Exception Reports (DER) completed, if applicable.			DER 1562965
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	/		DER 1562965
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	/		

Primary Review Performed By: *Michael Smyth*

10/4
MJWC

Secondary Review Performed By: *Amanda Tehu*

1602427

DATA EXCEPTION REPORT

Mo.Day Yr. 29-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GFPC	Test / Method: EPA 900.0/SW846 9310/SM 7110B Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1602427	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, and 405235060 were received and analyzed out of holding.</p>		<p>1. Reporting results</p>	

Originator's Name:
Nat Long 29-SEP-16

Data Validator/Group Leader:
Amanda Fehr 30-SEP-16

Logbook

The Determination of Gross Alpha And Gross Non-Volatile Beta in Soil, Filters, Solid Matrices And Direct Count Air Filters

Batch ID: 1602427 Due Dates for Lab: 01-OCT-2016 Hold: 28-MAY-2016 Package: 02-OCT-2016 SDG: 04-OCT-2016
 Analyst: Jasmine Conley Lab SOP: GL-RAD-A-001B REV# 17
 Instrument: BAL-18550299 Method: EPA 900.0/SW846 9310/SM 7110B Modified

Sample ID	Run Date	#	Dry or Wet	Intermediate Aliquot	Unadjusted Aliquot (g)	Aliquot (g)	Initial Weight (g)	Final Weight (g)	Residue Weight (mg)	Detector
405235041 - 2	27-SEP-2016 13:42	1	D		0.1	0.1	7.5877	7.6136	25.9	4A
405235042 - 2	27-SEP-2016 13:42	2	D		0.103	0.103	7.6721	7.697	24.9	4D
405235043 - 2	27-SEP-2016 13:42	3	D		0.103	0.103	7.6615	7.6928	31.3	9B
405235044 - 2	27-SEP-2016 13:42	4	D		0.101	0.101	7.6407	7.666	25.3	5A
405235045 - 2	27-SEP-2016 13:42	5	D		0.1	0.1	7.5693	7.5918	22.5	8A
405235046 - 2	27-SEP-2016 13:42	6	D		0.103	0.103	7.6156	7.6402	24.6	7A
405235047 - 2	27-SEP-2016 13:42	7	D		0.103	0.103	7.6091	7.6314	22.3	4B
405235048 - 2	27-SEP-2016 13:42	8	D		0.1	0.1	7.6918	7.7182	26.4	3C
405235049 - 2	27-SEP-2016 13:42	9	D		0.101	0.101	7.5532	7.5785	25.3	2B
405235050 - 2	27-SEP-2016 13:42	10	D		0.101	0.101	7.6336	7.6592	25.6	1B
405235051 - 2	27-SEP-2016 13:42	11	D		0.101	0.101	7.5806	7.6061	25.5	3D
405235052 - 2	27-SEP-2016 13:42	12	D		0.106	0.106	7.6758	7.7036	27.8	1D
405235053 - 2	27-SEP-2016 13:42	13	D		0.104	0.104	7.5005	7.53	29.5	1B
405235054 - 2	27-SEP-2016 13:42	14	D		0.101	0.101	7.4972	7.5223	25.1	3B
405235055 - 2	27-SEP-2016 13:42	15	D		0.101	0.101	7.6349	7.6627	27.8	1C
405235056 - 2	27-SEP-2016 13:42	16	D		0.105	0.105	7.5495	7.5802	30.7	6A
405235057 - 2	27-SEP-2016 13:42	17	D		0.112	0.112	7.615	7.6464	31.4	7D
405235058 - 2	27-SEP-2016 13:42	18	D		0.103	0.103	7.5762	7.6031	26.9	5C
405235059 - 2	27-SEP-2016 13:42	19	D		0.101	0.101	7.5688	7.5895	20.7	8C
405235060 - 2	27-SEP-2016 13:42	20	D		0.101	0.101	7.6782	7.7022	24	5D
1203636653 MB	27-SEP-2016 13:42	21	D		0.112	0.112	7.6397	7.6405	0.8	6C
1203636654 - 2 DUP (405235045)	27-SEP-2016 13:42	22	D		0.106	0.106	7.6622	7.6881	25.9	5B
1203636655 - 2 MS (405235045)	27-SEP-2016 13:42	23	D		0.104	0.104	7.6065	7.633	26.5	1A 5C
1203636656 - 2 MSD (405235045)	27-SEP-2016 13:42	24	D		0.1	0.1	7.6671	7.6909	23.8	2A 5D
1203636657 LCS	27-SEP-2016 13:42	25	D		0.112	0.112	7.647	7.6474	0.4	10B

ANL 9/29/16

Logbook

The Determination of Gross Alpha And Gross Non-Volatile Beta in Soil, Filters, Solid Matrices And Direct Count Air Filters

Batch ID: 1602427 Lab SOP: GL-RAD-A-001B REV# 17
 Analyst: Jasmine Conley Method: EPA 900.0/SW846 9310/SM 7110B
 Instrument: BAL-18550299 Modified

Sample ID	Run Date	#	Dry or Wet	Intermediate Aliquot	Unadjusted Aliquot	Aliquot	Initial Weight (g)	Final Weight (g)	Residue Weight (mg)	Detector
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Spike Pipet ID: RAD-GFC-4497063
 Planchets Flamed: Yes

Type	Name	Serial Number	Spike Amount	Spike Units
RGNT	RGF-1M Nitric Acid	2438701	5	mL
RGNT	RGF-Hydrofluoric Acid	2445660.8	10	mL
RGNT	RGF-Hydrochloric Acid	2454811.6	5	mL
RGNT	RGF-Nitric Acid	2457375.18	25	mL
SPIKE	Strontium-90 SPIKE	1243-O	.1	mL
SPIKE	Thorium-230 SPIKE	1493-B	.1	mL

Gross Alpha/Beta Solid

Filename : GAB.XLS
 File type : Excel
 Version # : 1.3.10

Batch : 1602427
 Analyst : JAS02031
 Prep Date : 9/27/2016
 Alpha Method Uncertainty : 0.0928
 Beta Method Uncertainty : 0.0628

Procedure Code : GFCCANBS
 Parmname1 : Alpha
 Parmname2 : Beta
 Required Alpha MDA : 4 pCi/g
 Required Beta MDA : 10 pCi/g

Geometry: 2 inch Planchett

Sample Characteristics		Sample			Sample Aliquot		Sample		Counting		Gross Counts		Count	
Pos.	Sample ID	Sample Aliquot G	Sample Residue Wt. (mg)	Sample Aliquot StDev. G	Sample Date/Time	Detector ID	Time (min.)	Alpha	Beta	Start Date/Time	Alpha	Beta	Start Date/Time	
1	405235041.2	0.1000	25.9	4.3713E-04	11/30/2015 13:27	4A	130	91	374	9/28/2016 14:48	91	374	9/28/2016 14:48	
2	405235042.2	0.1030	24.9	3.2298E-03	11/30/2015 13:53	4D	170	145	528	9/28/2016 14:48	145	528	9/28/2016 14:48	
3	405235043.2	0.1030	31.3	3.2298E-03	11/30/2015 13:59	9B	130	64	364	9/28/2016 14:48	64	364	9/28/2016 14:48	
4	405235044.2	0.1010	25.3	3.2296E-03	11/30/2015 13:50	5A	150	109	602	9/28/2016 14:48	109	602	9/28/2016 14:48	
5	405235045.2	0.1000	22.5	4.3713E-04	11/30/2015 14:15	8A	190	157	640	9/28/2016 14:48	157	640	9/28/2016 14:48	
6	405235046.2	0.1030	24.6	3.2298E-03	12/7/2015 10:02	7A	180	136	578	9/28/2016 14:48	136	578	9/28/2016 14:48	
7	405235047.2	0.1030	22.3	3.2298E-03	12/7/2015 10:10	4B	180	122	628	9/28/2016 14:48	122	628	9/28/2016 14:48	
8	405235048.2	0.1000	26.4	4.3713E-04	12/7/2015 13:28	3C	130	125	441	9/28/2016 14:48	125	441	9/28/2016 14:48	
9	405235049.2	0.1010	25.3	3.2296E-03	12/7/2015 13:33	2B	160	127	472	9/28/2016 14:48	127	472	9/28/2016 14:48	
10	405235050.2	0.1010	25.6	3.2296E-03	12/7/2015 13:42	1B	140	91	415	9/28/2016 14:48	91	415	9/28/2016 14:48	
11	405235051.2	0.1010	25.5	3.2296E-03	12/7/2015 13:02	3D	140	96	401	9/28/2016 14:48	96	401	9/28/2016 14:48	
12	405235052.2	0.1060	27.8	3.2301E-03	12/7/2015 13:11	1D	170	133	639	9/28/2016 14:48	133	639	9/28/2016 14:48	
13	405235053.2	0.1040	29.5	3.2299E-03	12/1/2015 14:24	7B	130	98	473	9/28/2016 14:48	98	473	9/28/2016 14:48	
14	405235054.2	0.1010	25.1	3.2296E-03	12/2/2015 14:51	3B	170	128	630	9/28/2016 14:48	128	630	9/28/2016 14:48	
15	405235055.2	0.1010	27.8	3.2296E-03	12/2/2015 14:59	1C	130	111	431	9/28/2016 14:48	111	431	9/28/2016 14:48	
16	405235056.2	0.1050	30.7	3.2300E-03	12/2/2015 14:50	6A	130	104	505	9/28/2016 14:48	104	505	9/28/2016 14:48	
17	405235057.2	0.1120	31.4	3.2307E-03	12/2/2015 14:55	7D	130	119	480	9/28/2016 14:48	119	480	9/28/2016 14:48	
18	405235058.2	0.1030	26.9	3.2298E-03	12/2/2015 15:00	5C	140	121	457	9/28/2016 14:48	121	457	9/28/2016 14:48	
19	405235059.2	0.1010	20.7	3.2296E-03	12/16/2015 12:26	8C	180	171	782	9/28/2016 14:48	171	782	9/28/2016 14:48	
20	405235060.2	0.1010	24	3.2296E-03	12/16/2015 12:33	5D	180	174	602	9/28/2016 14:48	174	602	9/28/2016 14:48	
21	1203636653.1	0.1120	0.8	3.2307E-03	9/27/2015 0:00	6C	60	7	46	9/28/2016 14:47	7	46	9/28/2016 14:47	
22	1203636654.2	0.1060	25.9	3.2301E-03	11/30/2015 14:15	5B	180	195	616	9/28/2016 14:47	195	616	9/28/2016 14:47	
23	1203636655.2	0.1040	26.5	3.2299E-03	11/30/2015 14:15	5C	60	398	3130	9/29/2016 13:04	398	3130	9/29/2016 13:04	
24	1203636656.2	0.1000	23.8	4.3713E-04	11/30/2015 14:15	5D	60	416	3288	9/29/2016 13:04	416	3288	9/29/2016 13:04	
25	1203636657.1	0.1120	0.4	3.2307E-03	9/27/2015 0:00	10B	60	442	3199	9/28/2016 14:47	442	3199	9/28/2016 14:47	

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-001B
 Instrument SOP: GL-RAD-I-016

Pos.	Calibration Data		Alpha					Beta					Weekly Background					
	Counted on	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	X-Talk	Calibration Date	Calibration Due Date	Calibration Source Used	Detector Efficiency (cpm/dpm)	Det. Eff. Error (cpm/dpm)	X-Talk	Alpha	Beta	CPM	Count Start Date/Time	Count Time (min.)
1	PIC	12/1/2015	11/30/2016	Th230	0.1469	0.01036	0.07169	12/1/2015	11/30/2016	Sr90	0.4694	0.01123	0.00431	0.104	0.770		9/23/2016 18:18	500
2	PIC	12/1/2015	11/30/2016	Th230	0.1559	0.00613	0.06469	12/1/2015	11/30/2016	Sr90	0.4877	0.00773	0.01310	0.182	0.716		9/23/2016 18:18	500
3	PIC	12/1/2015	11/30/2016	Th230	0.1370	0.00633	0.08644	12/1/2015	11/30/2016	Sr90	0.4877	0.00754	0.00186	0.122	0.456		9/23/2016 18:14	500
4	PIC	12/1/2015	11/30/2016	Th230	0.1723	0.00491	0.07351	12/1/2015	11/30/2016	Sr90	0.4935	0.00851	0.00290	0.188	1.382		9/23/2016 18:18	500
5	PIC	12/1/2015	11/30/2016	Th230	0.1713	0.01473	0.08472	12/1/2015	11/30/2016	Sr90	0.4881	0.01579	0.00165	0.228	1.076		9/23/2016 18:14	500
6	PIC	12/1/2015	11/30/2016	Th230	0.1599	0.00525	0.10057	12/1/2015	11/30/2016	Sr90	0.4832	0.00594	0.00070	0.200	0.824		9/23/2016 18:13	500
7	PIC	12/1/2015	11/30/2016	Th230	0.1427	0.00704	0.16609	12/1/2015	11/30/2016	Sr90	0.4865	0.01519	0.00026	0.152	1.540		9/23/2016 18:18	500
8	PIC	12/1/2015	11/30/2016	Th230	0.1526	0.00568	0.05769	12/1/2015	11/30/2016	Sr90	0.4733	0.00988	0.00835	0.116	0.478		9/23/2016 18:17	500
9	PIC	12/1/2015	11/30/2016	Th230	0.1149	0.02011	0.32798	12/1/2015	11/30/2016	Sr90	0.4536	0.02111	0.00019	0.076	0.464		9/23/2016 18:17	500
10	PIC	12/1/2015	11/30/2016	Th230	0.1425	0.01356	0.10708	12/1/2015	11/30/2016	Sr90	0.4861	0.00711	0.00168	0.114	1.118		9/23/2016 18:17	500
11	PIC	12/1/2015	11/30/2016	Th230	0.1476	0.00657	0.07566	12/1/2015	11/30/2016	Sr90	0.4621	0.02297	0.00259	0.124	0.630		9/23/2016 18:17	500
12	PIC	12/1/2015	11/30/2016	Th230	0.1440	0.00996	0.06778	12/1/2015	11/30/2016	Sr90	0.4832	0.00692	0.00767	0.158	1.392		9/23/2016 18:17	500
13	PIC	12/1/2015	11/30/2016	Th230	0.1560	0.00479	0.07603	12/1/2015	11/30/2016	Sr90	0.4983	0.00627	0.00155	0.132	0.556		9/23/2016 18:17	500
14	PIC	12/1/2015	11/30/2016	Th230	0.1517	0.00853	0.06297	12/1/2015	11/30/2016	Sr90	0.4656	0.01614	0.01009	0.162	1.378		9/23/2016 18:17	500
15	PIC	12/1/2015	11/30/2016	Th230	0.1485	0.00967	0.06210	12/1/2015	11/30/2016	Sr90	0.4856	0.00847	0.01123	0.114	0.722		9/23/2016 18:17	500
16	PIC	12/1/2015	11/30/2016	Th230	0.1518	0.02108	0.09170	12/1/2015	11/30/2016	Sr90	0.4109	0.02228	0.00287	0.130	0.782		9/23/2016 18:14	500
17	PIC	12/1/2015	11/30/2016	Th230	0.1422	0.00619	0.11008	12/1/2015	11/30/2016	Sr90	0.4703	0.01113	0.00046	0.132	0.802		9/23/2016 18:14	500
18	PIC	12/1/2015	11/30/2016	Th230	0.1734	0.01161	0.06130	12/1/2015	11/30/2016	Sr90	0.4981	0.00657	0.00367	0.182	0.794		9/23/2016 18:18	500
19	PIC	12/1/2015	11/30/2016	Th230	0.1653	0.01321	0.19135	12/1/2015	11/30/2016	Sr90	0.4763	0.01955	0.00046	0.210	1.510		9/23/2016 18:14	500
20	PIC	12/1/2015	11/30/2016	Th230	0.1811	0.00639	0.06885	12/1/2015	11/30/2016	Sr90	0.4938	0.00925	0.00363	0.248	0.770		9/23/2016 18:18	500
21	PIC	12/1/2015	11/30/2016	Th230	0.2906	0.01553	0.05431	12/1/2015	11/30/2016	Sr90	0.4670	0.01970	0.00732	0.106	1.100		9/23/2016 18:13	500
22	PIC	12/1/2015	11/30/2016	Th230	0.1767	0.01152	0.05976	12/1/2015	11/30/2016	Sr90	0.4970	0.00426	0.00379	0.272	0.506		9/23/2016 18:18	500
23	PIC	12/1/2015	11/30/2016	Th230	0.1745	0.01161	0.06111	12/1/2015	11/30/2016	Sr90	0.4982	0.00657	0.00367	0.182	0.794		9/23/2016 18:18	500
24	PIC	12/1/2015	11/30/2016	Th230	0.1817	0.00639	0.06869	12/1/2015	11/30/2016	Sr90	0.4939	0.00925	0.00363	0.248	0.770		9/23/2016 18:18	500
25	PIC	12/1/2015	11/30/2016	Th230	0.2564	0.00844	0.16281	12/1/2015	11/30/2016	Sr90	0.4707	0.00652	0.00072	0.120	0.560		9/23/2016 18:15	500

Notes:

1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

Alpha Spike S/N : 1493-B
 Spike Exp Date : 6/8/2017
 Spike Activity (dpm/ml): 266.08
 Spike Volume Added: 0.10
 Spike Nuclide: Th-230

Alpha LCS S/N : 1493-B
 LCS Exp Date : 6/8/2017
 LCS Activity (dpm/ml): 266.08
 LCS Volume Added: 0.10
 LCS Nuclide: Th-230

Alpha Results																		
Pos.	Decision Level pCi/G	Critical Level pCi/G	Required MDA pCi/G	MDA pCi/G	Sample Act. Conc. pCi/G	Sample Act. Error %	Net Count		Net Count Rate CPM	Rate Error CPM	2 SIGMA Counting Uncertainty pCi/G		Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
							Rate CPM	%			Counting pCi/G	Total Prop. Uncertainty pCi/G						
1	2.2678	1.6011	4	3.9097	17.8912	12.60%	0.5960	0.0748	4.4935	5.6035	SAMPLE							
2	2.4762	1.7482	4	3.9917	17.6844	11.39%	0.6709	0.0734	4.0344	5.4214	SAMPLE							
3	2.5569	1.8052	4	4.3468	11.6516	17.44%	0.3703	0.0635	3.9712	4.5760	SAMPLE							
4	2.4347	1.7190	4	3.9557	13.6440	13.80%	0.5387	0.0723	3.6661	4.5448	SAMPLE							
5	2.4935	1.7604	4	3.9361	15.5881	11.69%	0.5983	0.0693	3.5729	4.6023	SAMPLE							
6	2.4774	1.7491	4	3.9540	15.1344	12.61%	0.5556	0.0678	3.6351	4.6636	SAMPLE							
7	2.4203	1.7088	4	3.9284	16.0885	12.55%	0.5258	0.0638	3.8325	4.9307	SAMPLE							
8	2.3067	1.6286	4	3.9385	24.1288	10.35%	0.8455	0.0873	5.0544	6.8036	SAMPLE							
9	2.2645	1.5988	4	3.9253	27.8370	10.65%	0.7178	0.0715	5.4398	7.7151	SAMPLE							
10	2.3550	1.6626	4	3.9961	16.6246	13.48%	0.5360	0.0698	4.2825	5.3815	SAMPLE							
11	2.3706	1.6737	4	3.9949	16.7490	13.18%	0.5617	0.0717	4.2486	5.3630	SAMPLE							
12	2.4267	1.7133	4	3.9474	17.5757	11.68%	0.6244	0.0701	4.0566	5.3879	SAMPLE							
13	2.3137	1.6335	4	3.9076	17.1069	12.91%	0.6218	0.0779	4.2368	5.3796	SAMPLE							
14	2.4470	1.7276	4	3.9739	16.2691	12.13%	0.5909	0.0689	3.9714	5.1981	SAMPLE							
15	2.3260	1.6422	4	3.9775	21.1015	11.63%	0.7398	0.0824	4.8526	6.4806	SAMPLE							
16	2.3380	1.6507	4	3.9537	18.6252	12.52%	0.6700	0.0801	4.4373	5.7857	SAMPLE							
17	2.3569	1.6640	4	3.9807	22.1061	11.30%	0.7834	0.0855	4.7377	6.3502	SAMPLE							
18	2.3967	1.6921	4	3.9245	16.9028	12.31%	0.6823	0.0809	3.9961	5.1993	SAMPLE							
19	2.5034	1.7674	4	3.9844	19.9064	10.77%	0.7400	0.0755	3.9906	5.5622	SAMPLE							
20	2.4833	1.7532	4	3.9168	17.3954	11.15%	0.7187	0.0766	3.6962	5.0298	SAMPLE							
21	1.4345	1.0127	4	2.7175	0.7000	435.36%	0.0107	0.0464	1.2597	1.2605	MB							
22	2.5402	1.7934	4	3.9877	19.2001	10.50%	0.8113	0.0810	3.8185	5.3599	DUP	405235045.2	20.8%			115.2460	121.3%	
23	3.3704	2.3796	4	6.0000	155.3618	6.14%	6.4513	0.3330	16.2003	34.9109	MS	405235045.2				119.8558	121.1%	
24	3.9291	2.7740	4	6.7871	160.7577	5.15%	6.6853	0.3407	16.5484	34.4734	MSD	405235045.2	3.4%			107.0141	105.7%	
25	1.7300	1.2214	4	3.2272	113.0825	5.70%	7.2467	0.3507	10.7846	24.2637	LCS							

Notes:
1 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date

Beta Spike S/N : 1243-O
Spike Exp Date : 12/18/2016
Spike Activity (dpm/ml): 483.14
Spike Volume Added: 0.10
Spike Nuclide: Sr-90

Beta LCS S/N : 1243-O
LCS Exp Date : 12/18/2016
LCS Activity (dpm/ml): 483.14
LCS Volume Added: 0.10
LCS Nuclide: Sr-90

Pos.	Decision Level		Critical Level pCi/G	Required MDA pCi/G	MDA pCi/G	Sample Act. Conc. pCi/G	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA Counting Uncertainty pCi/G	2 SIGMA Total Prop. Uncertainty pCi/G	Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
	pCi/G	pCi/G															
1	1.9314	1.3636	10	2.9486	19.7350	19.7350	7.40%	2.1059	0.1539	2.8934	3.8461		SAMPLE				
2	1.6332	1.1531	10	2.4708	21.7841	21.7841	6.70%	2.3899	0.1404	2.5670	4.0144		SAMPLE				
3	1.3889	0.9806	10	2.1680	20.6355	20.6355	7.16%	2.3440	0.1498	2.6332	3.9231		SAMPLE				
4	2.3045	1.6270	10	3.4347	23.2974	23.2974	7.32%	2.6313	0.1718	3.0433	4.4953		SAMPLE				
5	1.9009	1.3420	10	2.8298	20.5096	20.5096	6.37%	2.2924	0.1410	2.5504	3.7077		SAMPLE				
6	1.6639	1.1748	10	2.5004	20.9175	20.9175	6.66%	2.3871	0.1396	2.4764	3.8770		SAMPLE				
7	2.2595	1.5953	10	3.3403	16.5089	16.5089	8.44%	1.9489	0.1499	2.6409	3.6135		SAMPLE				
8	1.5094	1.0656	10	2.3509	27.2088	27.2088	5.75%	2.9143	0.1645	3.0681	4.6275		SAMPLE				
9	1.4173	1.0006	10	2.1856	21.8821	21.8821	6.78%	2.4860	0.1392	2.6616	4.4284		SAMPLE				
10	2.1613	1.5259	10	3.2484	16.3007	16.3007	8.91%	1.8463	0.1530	2.7514	3.6194		SAMPLE				
11	1.7068	1.2050	10	2.6169	21.0650	21.0650	7.68%	2.2343	0.1474	2.7881	4.1940		SAMPLE				
12	2.1464	1.5154	10	3.1859	20.3483	20.3483	7.36%	2.3668	0.1578	2.7197	3.9479		SAMPLE				
13	1.4868	1.0497	10	2.3001	26.2970	26.2970	6.38%	3.0825	0.1706	2.9065	4.7005		SAMPLE				
14	2.3259	1.6421	10	3.4532	21.8427	21.8427	7.63%	2.3279	0.1567	2.9418	4.3170		SAMPLE				
15	1.7901	1.2638	10	2.7396	23.3315	23.3315	7.14%	2.5934	0.1642	2.9550	4.4398		SAMPLE				
16	2.1177	1.4951	10	3.2311	31.6247	31.6247	6.86%	3.1026	0.1773	3.6285	5.9055		SAMPLE				
17	1.7568	1.2403	10	2.6779	23.8556	23.8556	6.74%	2.8903	0.1732	2.9035	4.4643		SAMPLE				
18	1.7431	1.2306	10	2.6494	21.2248	21.2248	7.15%	2.4703	0.1578	2.7159	4.0446		SAMPLE				
19	2.3303	1.6452	10	3.4455	24.8378	24.8378	6.92%	2.8344	0.1648	3.0243	4.8599		SAMPLE				
20	1.6050	1.1332	10	2.4168	22.6493	22.6493	6.44%	2.5744	0.1418	2.5108	4.0982		SAMPLE				
21	2.8754	2.0300	10	4.4907	-2.9253	-2.9253	36.88%	-0.3333	0.1224	2.0658	2.0659		MB				
22	1.2318	0.8697	10	1.8818	24.3804	24.3804	5.75%	2.9182	0.1415	2.3714	4.1598	405235045.2	DUP	17.2%		418.5166	101.0%
23	2.4659	1.7410	10	3.9166	443.0673	443.0673	3.66%	51.3727	0.9333	15.9020	63.6134	405235045.2	MS			435.2572	107.5%
24	2.5476	1.7987	10	4.0533	488.4210	488.4210	2.04%	54.0300	0.9565	17.0978	63.7877	405235045.2	MSD	9.7%		388.6225	113.4%
25	2.0355	1.4371	10	3.3014	440.5397	440.5397	3.46%	52.7567	0.9433	15.7972	63.3332		LCS				

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
405235041	4A	130	91	374	9/28/2016 14:48	9/28/2016 16:58	PIC	1602427
405235042	4D	170	145	528	9/28/2016 14:48	9/28/2016 17:38	PIC	1602427
405235043	9B	130	64	364	9/28/2016 14:48	9/28/2016 16:58	PIC	1602427
405235044	5A	150	109	602	9/28/2016 14:48	9/28/2016 17:18	PIC	1602427
405235045	8A	190	157	640	9/28/2016 14:48	9/28/2016 17:58	PIC	1602427
405235046	7A	180	136	578	9/28/2016 14:48	9/28/2016 17:48	PIC	1602427
405235047	4B	180	122	628	9/28/2016 14:48	9/28/2016 17:48	PIC	1602427
405235048	3C	130	125	441	9/28/2016 14:48	9/28/2016 16:58	PIC	1602427
405235049	2B	160	127	472	9/28/2016 14:48	9/28/2016 17:28	PIC	1602427
405235050	1B	140	91	415	9/28/2016 14:48	9/28/2016 17:08	PIC	1602427
405235051	3D	140	96	401	9/28/2016 14:48	9/28/2016 17:08	PIC	1602427
405235052	1D	170	133	639	9/28/2016 14:48	9/28/2016 17:38	PIC	1602427
405235053	7B	130	98	473	9/28/2016 14:48	9/28/2016 16:58	PIC	1602427
405235054	3B	170	128	630	9/28/2016 14:48	9/28/2016 17:38	PIC	1602427
405235055	1C	130	111	431	9/28/2016 14:48	9/28/2016 16:58	PIC	1602427
405235056	6A	130	104	505	9/28/2016 14:48	9/28/2016 16:58	PIC	1602427
405235057	7D	130	119	480	9/28/2016 14:48	9/28/2016 16:58	PIC	1602427
405235058	5C	140	121	457	9/28/2016 14:48	9/28/2016 17:08	PIC	1602427
405235059	8C	180	171	782	9/28/2016 14:48	9/28/2016 17:48	PIC	1602427
405235060	5D	180	174	602	9/28/2016 14:49	9/28/2016 17:49	PIC	1602427
1203636653	6C	60	7	46	9/28/2016 14:47	9/28/2016 15:47	PIC	1602427
1203636654	5B	180	195	616	9/28/2016 14:47	9/28/2016 17:47	PIC	1602427
1203636655	5C	60	398	3130	9/29/2016 13:04	9/29/2016 14:04	PIC	1602427
1203636656	5D	60	416	3288	9/29/2016 13:04	9/29/2016 14:04	PIC	1602427
1203636657	10B	60	442	3199	9/28/2016 14:47	9/28/2016 15:47	PIC	1602427

29-Sep-2016

Batch# 1597804 Product: Sr Date: 9/29/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	/		
Instrument source check is within limits.	/		
Instrument bkg check is within limits.	/		
Method RDL/ LLD has been met.	/		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	/		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	/		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	/		
Sample was run within hold time.			DER 1562747
Sample was correctly preserved if required.	/		
Smears Taken for Radioactive batches.	/		
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	/		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	/		
Aux data is correct.			NA
Client Special requirements page has been checked.	/		
Raw Data and/ or spectrum are included and properly stated.	/		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	/		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	/		
Batch Data Exception Reports (DER) completed, if applicable.			DER 1562747
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER 1562747
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	/		

Primary Review Performed By: *[Signature]*

10/4
MWC

Secondary Review Performed By: *Amanda Lehu*

1597804

DATA EXCEPTION REPORT

Mo.Day Yr. 29-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GFPC	Test / Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1597804	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample Analyzed out of Holding Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, and 405235078 were received and analyzed out of holding.		1. Reporting results	

Originator's Name:

Nat Long 29-SEP-16

Data Validator/Group Leader:

Amanda Fehr 30-SEP-16

Prep Logbook

The Determination of Strontium 89/90 in Water, Soil, Milk, Filters, Vegetation and Tissues

Batch ID: 1597804

Analyst: Bethany Fiem

Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified

Lab SOP: GL-RAD-A-004 REV# 17

Instrument: BAL-18550299

Sample ID	Prep Date	Dry or Wet	Unadjusted Aliquot (g)	Aliquot (g)	Initial Wt (g)	Final Wt (g)	Net Wt (mg)	Sr Separation (date)	Strontium Carrier Yield (percent)
405233061	23-SEP-2016 12:57	D	0.352	0.352	0.0226	0.0296	7	09/27/16 11:44	95
405233062	23-SEP-2016 12:57	D	0.341	0.341	0.0231	0.0295	6.4	09/27/16 11:44	87
405233063	23-SEP-2016 12:57	D	0.318	0.318	0.0236	0.03	6.4	09/27/16 11:44	87
405233064	23-SEP-2016 12:57	D	0.323	0.323	0.0237	0.0296	5.9	09/27/16 11:44	80
405233065	23-SEP-2016 12:57	D	0.304	0.304	0.0226	0.0288	6.2	09/27/16 11:44	84
405233066	23-SEP-2016 12:57	D	0.368	0.368	0.0231	0.0293	6.2	09/27/16 11:44	84
405233067	23-SEP-2016 12:57	D	0.307	0.307	0.0228	0.029	6.2	09/27/16 11:44	84
405233068	23-SEP-2016 12:57	D	0.333	0.333	0.0229	0.0295	6.6	09/27/16 11:44	90
405233069	23-SEP-2016 12:57	D	0.315	0.315	0.0235	0.0295	6	09/27/16 11:44	81
405233070	23-SEP-2016 12:57	D	0.304	0.304	0.0233	0.0297	6.4	09/27/16 11:44	87
405233071	23-SEP-2016 12:57	D	0.308	0.308	0.0224	0.0288	6.4	09/27/16 11:44	87
405233072	23-SEP-2016 12:57	D	0.315	0.315	0.0231	0.0295	6.4	09/27/16 11:44	87
405233073	23-SEP-2016 12:57	D	0.359	0.359	0.0232	0.0298	6.6	09/27/16 11:44	90
405233074	23-SEP-2016 12:57	D	0.304	0.304	0.0237	0.0302	6.5	09/27/16 11:44	88
405233075	23-SEP-2016 12:57	D	0.314	0.314	0.0227	0.0292	6.5	09/27/16 11:44	88
405233076	23-SEP-2016 12:57	D	0.374	0.374	0.0233	0.0295	6.2	09/27/16 11:44	84
405233077	23-SEP-2016 12:57	D	0.342	0.342	0.0226	0.0287	6.1	09/27/16 11:44	83
405233078	23-SEP-2016 12:57	D	0.318	0.318	0.023	0.0292	6.2	09/27/16 11:44	84
1203625412 MB	23-SEP-2016 12:57	D	0.374	0.374	0.0237	0.0299	6.2	09/27/16 11:44	84
1203625413 DUP (405233065)	23-SEP-2016 12:57	D	0.354	0.354	0.0235	0.0297	6.2	09/27/16 11:44	84
1203625414 LCS	23-SEP-2016 12:57	D	0.374	0.374	0.0226	0.0293	6.7	09/27/16 11:44	91

Comments:

Spike Pipet ID: RAD-GFC-1795419
 Carrier Pipet ID: RAD-GFC-2154115
 Data Entry Date2: 23-SEP-2016 14:35 GFC-F30560 Bethany Fiem
 Data Entry Date3: 27-SEP-2016 14:19 GFC-F30560 Bethany Fiem
 Data Entry Date4: 23-SEP-2016 00:00

Reagent/Solvent Lot ID	Description	Amount
2213330	0.05M HNO3	15 mL
2243751	RGF-6M Sodium Hydroxide	6 mL
2243757	RGF-0.75M Sodium Carbonate	13 mL
2280154.26	R-Hydrogen Peroxide	10 mL
2334614	Thymol Blue Indicator	.5 mL
2388714	RGF-80% Ethanol	3 mL
2414995	Sr 0.5mL = 7.37, 2.0 mL = 29.46 mg	5 mL
2424020	RGF-3M Nitric/0.05M Oxalic	10 mL
2433863.1	SR SPEC RESIN Cleaned	2 g
2434028	RGF-Sr Filters	1 L
2434079	RGF-8M Nitric Acid	25 mL

Strontium-90 Solid

Filename : SR90.XLS
 File type : Excel
 Version # : 1.3.10

Carrier S/N : 2414995
 Carrier Exp Date : 6/3/2017
 Carrier Volume Added: 0.50
 Carrier Weight (mg/ml): 14.73
 Carrier Weight StDev.: 0.10

Batch : 1597804
 Analyst : BET01177
 Prep Date : 9/23/2016
 Method Uncertainty : 0.089724205

Procedure Code : GFC90SRS
 Parmname : Strontium-90
 Required MDA : 2 pCi/G
 Sr-90 Abundance : 1.00 years
 Half-life of Sr-90 : 28.90 hours
 Half-life of Y-90 : 64.053 hours

Geometry: Tuffryn Filter

Pos.	Sample Characteristics			Carrier Calculations				Carrier Aliquot (mL)	Carrier Aliquot StDev. (mL)	Net Weight (mg)	Net Weight StDev. (mg)	Carrier Aliquot (mL)	Carrier Aliquot StDev. (mL)
	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G	Sample Date/Time	Carrier Weight (Standard)	Net Weight (Sample)	Carrier Weight (mg)						
1	405235061.1	0.3520	3.2558E-03	12/14/2015 13:47	14.73	7.00	14.73	0.037416	0.5	0.037416	0.001000	0.5	0.001000
2	405235062.1	0.3410	3.2546E-03	12/14/2015 13:10	14.73	6.40	14.73	0.034837	0.5	0.034837	0.001000	0.5	0.001000
3	405235063.1	0.3180	3.2522E-03	12/14/2015 13:15	14.73	6.40	14.73	0.034837	0.5	0.034837	0.001000	0.5	0.001000
4	405235064.1	0.3230	3.2528E-03	12/14/2015 13:25	14.73	5.90	14.73	0.032688	0.5	0.032688	0.001000	0.5	0.001000
5	405235065.1	0.3040	3.2508E-03	12/14/2015 13:56	14.73	6.20	14.73	0.033978	0.5	0.033978	0.001000	0.5	0.001000
6	405235066.1	0.3680	3.2575E-03	12/14/2015 14:00	14.73	6.20	14.73	0.033978	0.5	0.033978	0.001000	0.5	0.001000
7	405235067.1	0.3070	3.2511E-03	12/11/2015 11:30	14.73	6.20	14.73	0.033978	0.5	0.033978	0.001000	0.5	0.001000
8	405235068.1	0.3330	3.2538E-03	12/11/2015 10:27	14.73	6.60	14.73	0.035697	0.5	0.035697	0.001000	0.5	0.001000
9	405235069.1	0.3150	3.2519E-03	12/16/2015 12:45	14.73	6.00	14.73	0.033118	0.5	0.033118	0.001000	0.5	0.001000
10	405235070.1	0.3040	3.2508E-03	12/11/2015 10:10	14.73	6.40	14.73	0.034837	0.5	0.034837	0.001000	0.5	0.001000
11	405235071.1	0.3080	3.2512E-03	12/11/2015 10:25	14.73	6.40	14.73	0.034837	0.5	0.034837	0.001000	0.5	0.001000
12	405235072.1	0.3150	3.2519E-03	12/15/2015 13:35	14.73	6.40	14.73	0.034837	0.5	0.034837	0.001000	0.5	0.001000
13	405235073.1	0.3590	3.2565E-03	12/11/2015 11:35	14.73	6.60	14.73	0.035267	0.5	0.035267	0.001000	0.5	0.001000
14	405235074.1	0.3040	3.2508E-03	12/15/2015 14:10	14.73	6.50	14.73	0.035267	0.5	0.035267	0.001000	0.5	0.001000
15	405235075.1	0.3140	3.2518E-03	12/16/2015 9:31	14.73	6.50	14.73	0.035267	0.5	0.035267	0.001000	0.5	0.001000
16	405235076.1	0.3740	3.2581E-03	12/11/2015 14:19	14.73	6.20	14.73	0.033978	0.5	0.033978	0.001000	0.5	0.001000
17	405235077.1	0.3420	3.2547E-03	12/17/2015 13:30	14.73	6.10	14.73	0.033548	0.5	0.033548	0.001000	0.5	0.001000
18	405235078.1	0.3180	3.2522E-03	12/17/2015 12:40	14.73	6.20	14.73	0.033978	0.5	0.033978	0.001000	0.5	0.001000
19	1203625412.1	0.3740	3.2581E-03	9/23/2016 0:00	14.73	6.20	14.73	0.033978	0.5	0.033978	0.001000	0.5	0.001000
20	1203625413.1	0.3540	3.2560E-03	12/14/2015 13:56	14.73	6.20	14.73	0.033978	0.5	0.033978	0.001000	0.5	0.001000
21	1203625414.1	0.3740	3.2581E-03	9/23/2016 0:00	14.73	6.70	14.73	0.036127	0.5	0.036127	0.001000	0.5	0.001000

Pipet, 0.1 ml Stdev : +/- 0.0002000 ml
 Pipet, 0.5 ml Stdev : +/- 0.0010000 ml
 Pipet, 1 ml Stdev : +/- 0.0020000 ml

Analytical SOP: GL-RAD-A-004
 Instrument SOP: GL-RAD-I-016

Count Raw Data													
Pos.	Detector ID	Counting Time (min.)	Gross Counts		Gross Beta CPM	Count Start Date/Time	Strontium Separation Date/Time	Yttrium Ingrowth	Sr-90 Decay	Calculated Sample Recovery %	Sample Recovery Error %		
			Alpha	Beta									
1	1A	60	3	35	0.579	9/27/2016 15:39	9/27/2016 11:44	0.047	0.981	95.0%	1.04%		
2	1B	60	13	68	1.116	9/27/2016 15:39	9/27/2016 11:44	0.047	0.981	86.9%	1.05%		
3	1B	60	14	78	1.281	9/28/2016 8:51	9/27/2016 11:44	0.209	0.981	86.9%	1.05%		
4	3D	60	26	41	0.658	9/28/2016 8:51	9/27/2016 11:44	0.209	0.981	80.1%	1.06%		
5	2A	60	14	45	0.719	9/27/2016 15:39	9/27/2016 11:44	0.047	0.981	84.2%	1.05%		
6	5C	60	5	38	0.630	9/28/2016 8:51	9/27/2016 11:44	0.209	0.981	84.2%	1.05%		
7	7D	60	2	40	0.664	9/28/2016 8:50	9/27/2016 11:44	0.209	0.981	84.2%	1.05%		
8	3B	80	20	109	1.352	9/27/2016 15:39	9/27/2016 11:44	0.049	0.981	89.6%	1.04%		
9	3C	60	12	37	0.609	9/27/2016 15:39	9/27/2016 11:44	0.047	0.981	81.5%	1.05%		
10	10C	60	3	14	0.221	9/28/2016 8:50	9/27/2016 11:44	0.209	0.981	86.9%	1.05%		
11	4C	60	6	40	0.662	9/27/2016 15:39	9/27/2016 11:44	0.047	0.981	86.9%	1.05%		
12	4D	60	5	39	0.647	9/27/2016 15:40	9/27/2016 11:44	0.047	0.981	86.9%	1.05%		
13	5A	70	7	91	1.295	9/27/2016 15:40	9/27/2016 11:44	0.048	0.981	89.6%	1.04%		
14	11A	60	14	60	0.975	9/28/2016 8:54	9/27/2016 11:44	0.209	0.981	88.3%	1.04%		
15	6A	60	5	53	0.878	9/27/2016 15:38	9/27/2016 11:44	0.046	0.981	88.3%	1.04%		
16	11B	60	3	61	1.013	9/28/2016 8:54	9/27/2016 11:44	0.209	0.981	84.2%	1.05%		
17	7A	60	7	34	0.558	9/27/2016 15:38	9/27/2016 11:44	0.047	0.981	82.8%	1.05%		
18	7B	60	4	26	0.430	9/27/2016 15:38	9/27/2016 11:44	0.047	0.981	84.2%	1.05%		
19	7C	60	6	22	0.355	9/27/2016 15:37	9/27/2016 11:44	0.046	1.000	84.2%	1.05%		
20	11C	60	7	35	0.564	9/28/2016 8:54	9/27/2016 11:44	0.209	0.981	84.2%	1.05%		
21	12A	60	6	1512	25.186	9/28/2016 8:54	9/27/2016 11:44	0.209	1.000	91.0%	1.04%		

Calibration Data										
Pos.	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency Sr-90	Detector Efficiency Y-90	Detector Efficiency Error (cpm/dpm)	Alpha X-Talk	Weekly Bkg Count CPM	Weekly Bkg Count Start Date/Time	Weekly Bkg Count Time (min.)
1	PIC	4/1/2016	2/28/2017	0.4224	0.5477	0.00738	0.08172	0.848	9/23/2016 18:17	500
2	PIC	4/1/2016	2/28/2017	0.4265	0.5497	0.00711	0.08223	1.118	9/23/2016 18:17	500
3	PIC	4/1/2016	2/28/2017	0.4265	0.5497	0.00711	0.08223	1.118	9/23/2016 18:17	500
4	PIC	4/1/2016	2/28/2017	0.4033	0.5395	0.02297	0.05829	0.630	9/23/2016 18:17	500
5	PIC	4/1/2016	2/28/2017	0.4143	0.5406	0.01914	0.13103	0.470	9/23/2016 18:17	500
6	PIC	4/1/2016	2/28/2017	0.4205	0.5622	0.00657	0.04249	0.794	9/23/2016 18:18	500
7	PIC	4/1/2016	2/28/2017	0.4140	0.5455	0.01113	0.07795	0.802	9/23/2016 18:14	500
8	PIC	4/1/2016	2/28/2017	0.4069	0.5509	0.01614	0.04289	1.378	9/23/2016 18:17	500
9	PIC	4/1/2016	2/28/2017	0.4182	0.5563	0.00988	0.04066	0.478	9/23/2016 18:17	500
10	PIC	4/1/2016	2/28/2017	0.4065	0.5237	0.00638	0.24020	0.396	9/23/2016 18:15	500
11	PIC	4/1/2016	2/28/2017	0.4263	0.5613	0.00889	0.04452	0.748	9/23/2016 18:18	500
12	PIC	4/1/2016	2/28/2017	0.4138	0.5536	0.00773	0.03940	0.716	9/23/2016 18:18	500
13	PIC	4/1/2016	2/28/2017	0.4333	0.5685	0.00851	0.05031	1.382	9/23/2016 18:18	500
14	PIC	4/1/2016	2/28/2017	0.4246	0.5473	0.01317	0.10757	0.906	9/23/2016 17:07	500
15	PIC	4/1/2016	2/28/2017	0.4135	0.5572	0.02228	0.06252	0.782	9/23/2016 18:13	500
16	PIC	4/1/2016	2/28/2017	0.4329	0.5589	0.00697	0.07046	0.776	9/23/2016 17:07	500
17	PIC	4/1/2016	2/28/2017	0.4206	0.5546	0.00594	0.07695	0.824	9/23/2016 18:13	500
18	PIC	4/1/2016	2/28/2017	0.4312	0.5632	0.00627	0.05210	0.556	9/23/2016 18:14	500
19	PIC	4/1/2016	2/28/2017	0.4151	0.5415	0.00790	0.11574	0.444	9/23/2016 18:14	500
20	PIC	4/1/2016	2/28/2017	0.4174	0.5497	0.01278	0.16385	0.468	9/23/2016 17:08	500
21	PIC	4/1/2016	2/28/2017	0.4050	0.5410	0.01964	0.14055	1.074	9/23/2016 17:08	500

Notes:

- 1 - Results are decay corrected to Sample Date/Time
- 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
- 3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml): N/A
 Spike Volume Added: N/A

* - RPD changed to 0% due to sample & dup activity below MDA

LCS SN : 1243-O
 LCS Exp Date : 12/18/2016
 LCS Activity (dpm/ml): 483.26
 LCS Volume Added: 0.10

Pos.	Decision Level		Critical Level pCi/G	Required MDA pCi/G	MDA pCi/G	Sample Act. Conc. pCi/G	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	Net Count CPM	2 SIGMA		2 SIGMA		Sample Type	Sample QC	RPD	RER	Nominal pCi/G	Recovery	
	pCi/G	pCi/G									Counting Uncertainty pCi/G	Total Prop. Uncertainty pCi/G									
1	0.8978	0.6338	2	1.4208	-0.8231	39.67%	-0.2688	0.1065	0.6395	0.6396	SAMPLE										
2	1.1531	0.8141	2	1.7995	-8.505E-03	5813.23%	-0.0025	0.1443	0.9690	0.9691	SAMPLE										
3	1.0332	0.7295	2	1.6124	0.4998	94.33%	0.1628	0.1536	0.9239	0.9283	SAMPLE										
4	0.8690	0.6135	2	1.3990	0.0966	393.88%	0.0281	0.1106	0.7454	0.7456	SAMPLE										
5	0.8905	0.6287	2	1.4615	1.0178	45.65%	0.2494	0.1137	0.9094	0.9289	SAMPLE										
6	0.7816	0.5518	2	1.2414	-0.4525	66.96%	-0.1642	0.1099	0.5937	0.5937	SAMPLE										
7	0.9597	0.6775	2	1.5234	-0.4643	81.63%	-0.1379	0.1126	0.7427	0.7428	SAMPLE										
8	1.1686	0.8250	2	1.7831	-0.0930	534.63%	-0.0262	0.1402	0.9749	0.9750	SAMPLE										
9	0.8862	0.6257	2	1.4526	0.5256	80.72%	0.1305	0.1053	0.8314	0.8368	SAMPLE										
10	0.6752	0.4767	2	1.1219	-0.5888	38.36%	-0.1747	0.0689	0.4422	0.4423	SAMPLE										
11	1.0437	0.7368	2	1.6632	-0.3252	130.51%	-0.0858	0.1120	0.8318	0.8319	SAMPLE										
12	1.0271	0.7252	2	1.6410	-0.2642	159.50%	-0.0693	0.1105	0.8259	0.8260	SAMPLE										
13	1.0834	0.7649	2	1.6626	-0.2697	167.56%	-0.0870	0.1458	0.8858	0.8859	SAMPLE										
14	0.9619	0.6791	2	1.5169	0.2187	195.06%	0.0689	0.1344	0.8361	0.8371	SAMPLE										
15	1.0612	0.7492	2	1.6870	0.3624	132.44%	0.0961	0.1273	0.9404	0.9429	SAMPLE										
16	0.7439	0.5252	2	1.1830	0.6291	57.28%	0.2371	0.1358	0.7060	0.7149	SAMPLE										
17	1.0490	0.7406	2	1.6627	-0.9667	39.31%	-0.2663	0.1046	0.7443	0.7444	SAMPLE										
18	0.8897	0.6282	2	1.4438	-0.4728	72.14%	-0.1261	0.0910	0.6684	0.6685	SAMPLE										
19	0.6895	0.4868	2	1.1362	-0.2890	92.81%	-0.0889	0.0825	0.5256	0.5257	MB										
20	0.6302	0.4449	2	1.0346	0.2784	105.70%	0.0962	0.1017	0.5767	0.5789	DUP	405235065.1								0.0%	
21	0.8433	0.5954	2	1.3186	61.6345	3.60%	24.1119	0.6495	3.2543	11.9172	LCS									58.2048	105.9%

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
405235061	1A	60	3	35	9/27/2016 15:39	9/27/2016 16:39	PIC	1597804
405235062	1B	60	13	68	9/27/2016 15:39	9/27/2016 16:39	PIC	1597804
405235063	1B	60	14	78	9/28/2016 8:51	9/28/2016 9:51	PIC	1597804
405235064	3D	60	26	41	9/28/2016 8:51	9/28/2016 9:51	PIC	1597804
405235065	2A	60	14	45	9/27/2016 15:39	9/27/2016 16:39	PIC	1597804
405235066	5C	60	5	38	9/28/2016 8:51	9/28/2016 9:51	PIC	1597804
405235067	7D	60	2	40	9/28/2016 8:50	9/28/2016 9:50	PIC	1597804
405235068	3B	80	20	109	9/27/2016 15:39	9/27/2016 16:59	PIC	1597804
405235069	3C	60	12	37	9/27/2016 15:39	9/27/2016 16:39	PIC	1597804
405235070	10C	60	3	14	9/28/2016 8:50	9/28/2016 9:50	PIC	1597804
405235071	4C	60	6	40	9/27/2016 15:39	9/27/2016 16:39	PIC	1597804
405235072	4D	60	5	39	9/27/2016 15:40	9/27/2016 16:40	PIC	1597804
405235073	5A	70	7	91	9/27/2016 15:40	9/27/2016 16:50	PIC	1597804
405235074	11A	60	14	60	9/28/2016 8:54	9/28/2016 9:54	PIC	1597804
405235075	6A	60	5	53	9/27/2016 15:38	9/27/2016 16:38	PIC	1597804
405235076	11B	60	3	61	9/28/2016 8:54	9/28/2016 9:54	PIC	1597804
405235077	7A	60	7	34	9/27/2016 15:38	9/27/2016 16:38	PIC	1597804
405235078	7B	60	4	26	9/27/2016 15:38	9/27/2016 16:38	PIC	1597804
1203625412	7C	60	6	22	9/27/2016 15:37	9/27/2016 16:37	PIC	1597804
1203625413	11C	60	7	35	9/28/2016 8:54	9/28/2016 9:54	PIC	1597804
1203625414	12A	60	6	1512	9/28/2016 8:54	9/28/2016 9:54	PIC	1597804

Batch# 1597803 Product: Sr Date: 9/26/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	/		
Instrument source check is within limits.	/		
Instrument bkg check is within limits.	/		
Method RDL/ LLD has been met.	/		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	/		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	/		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	/		
Sample was run within hold time.		✓	DETZ 1561542
Sample was correctly preserved if required.	/		
Smears Taken for Radioactive batches.	/		
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	/		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	/		
Aux data is correct.			NA
Client Special requirements page has been checked.	/		
Raw Data and/ or spectrum are included and properly stasured.	/		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	/		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	/		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DETZ 1561542
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMM, results above MDC have been verified by historical results, recount or re-analysis.)	/		

Primary Review Performed By: *M. J. W. C.* ¹⁰⁷⁴ *MJWC*

Secondary Review Performed By: *W. O. St.* 9/27/16

DATA EXCEPTION REPORT

Mo.Day Yr. 26-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GFPC	Test / Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1597803	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample Analyzed out of Holding Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060, and 1203625409 were received and analyzed out of holding.		1. Reporting results	

Originator's Name:

Nat Long 26-SEP-16

Data Validator/Group Leader:

Kenshalla Oston 27-SEP-16

1/21

Prep Logbook

The Determination of Strontium 89/90 in Water, Soil, Milk, Filters, Vegetation and Tissues

Batch ID: 1597803 **Type:** LCS **Sample Id:** 1203625410 **Description:** Strontium-90 SPIKE **Serial Number:** 1243-O **Spike Amount:** .1 **Spike Units:** mL
Analyst: Kelli Dorrell
Method: EPA 905.0 Modified/DOE RP501 Rev. 1

Lab SOP: GL-RAD-A-004 REV# 17
Instrument: BAL-16107662

Sample ID	Prep Date	Dry or Wet	Unadjusted Aliquot (g)	Aliquot (g)	Initial Wt (g)	Final Wt (g)	Net Wt (mg)	Sr Separation (date)
405235041	21-SEP-2016 16:39	D	0.382	0.382	0.0233	0.0301	6.8	09/22/16 13:28 <i>1A</i>
405235042	21-SEP-2016 16:39	D	0.574	0.574	0.0229	0.0289	6	09/22/16 13:28 <i>1B</i>
405235043	21-SEP-2016 16:39	D	0.316	0.316	0.0231	0.0302	7.1	09/22/16 13:28 <i>1D 1C</i>
405235044	21-SEP-2016 16:39	D	0.319	0.319	0.023	0.0298	6.8	09/22/16 13:28 <i>2B</i>
405235045	21-SEP-2016 16:39	D	0.324	0.324	0.0236	0.0303	6.7	09/22/16 13:28 <i>2C</i>
405235046	21-SEP-2016 16:39	D	0.361	0.361	0.0231	0.03	6.9	09/22/16 13:28 <i>3B</i>
405235047	21-SEP-2016 16:39	D	0.331	0.331	0.023	0.0297	6.7	09/22/16 13:28 <i>3C</i>
405235048	21-SEP-2016 16:39	D	0.382	0.382	0.0235	0.0303	6.8	09/22/16 13:28 <i>3D</i>
405235049	21-SEP-2016 16:39	D	0.356	0.356	0.0235	0.0304	6.9	09/22/16 13:28 <i>4A</i>
405235050	21-SEP-2016 16:39	D	0.317	0.317	0.0234	0.0304	7	09/22/16 13:28 <i>4C</i>
405235051	21-SEP-2016 16:39	D	0.352	0.352	0.0232	0.03	6.8	09/22/16 13:28 <i>4D</i>
405235052	21-SEP-2016 16:39	D	0.421	0.421	0.0233	0.0294	6.1	09/22/16 13:28 <i>5A</i>
405235053	21-SEP-2016 16:39	D	0.323	0.323	0.0225	0.0286	6.1	09/22/16 13:28 <i>5B</i>
405235054	21-SEP-2016 16:39	D	0.424	0.424	0.0225	0.0293	6.8	09/22/16 13:28 <i>5C</i>
405235055	21-SEP-2016 16:39	D	0.329	0.329	0.0229	0.0295	6.6	09/22/16 13:28 <i>5D</i>
405235056	21-SEP-2016 16:39	D	0.312	0.312	0.0226	0.0284	5.8	09/22/16 13:28 <i>6A 4C</i>
405235057	21-SEP-2016 16:39	D	0.301	0.301	0.0231	0.0298	6.7	09/22/16 13:28 <i>6B 4C</i>
405235058	21-SEP-2016 16:39	D	0.387	0.387	0.0232	0.0297	6.5	09/22/16 13:28 <i>6C 4C</i>
405235059	21-SEP-2016 16:39	D	0.432	0.432	0.023	0.0298	6.8	09/22/16 13:28 <i>7A</i>
405235060	21-SEP-2016 16:39	D	0.426	0.426	0.023	0.0295	6.5	09/22/16 13:28 <i>7B</i>
1203625408 MB	21-SEP-2016 16:39	D	0.297	0.297	0.0235	0.0302	6.7	09/22/16 13:28 <i>7C</i>
1203625409 DUP (405235045)	21-SEP-2016 16:39	D	0.297	0.297	0.0235	0.0299	6.4	09/22/16 13:28 <i>7D</i>
1203625410 LCS	21-SEP-2016 16:39	D	0.297	0.297	0.0233	0.0299	6.6	09/22/16 13:28 <i>7A</i>

ANL 9/26/16

Comments:
 Spike Pipet ID: RAD-GFC-1795419
 Carrier Pipet ID: RAD-GFC-2154115
 Data Entry Date: 22-SEP-2016 13:28 GFC-F30560 Kelli Dorrell

Reagent/Solvent Lot ID	Description	Amount
2064611.2	Phenolphthalein, 1.0% in 50% Alcohol	2 mL
2213530	0.05M HNO3	15 mL
2243751	RGF-6M Sodium Hydroxide	6 mL
2243757	RGF-0.75M Sodium Carbonate	13 mL
2334614	Thymol Blue Indicator	.5 mL
2388714	RGF-80% Ethanol	3 mL
2414995	St-0.5 mL=7.37, 2.0 mL=29.46 mg	.5 mL
2424020	RGF-3M Nitric/0.05M Oxalic	10 mL
2433863.1	SR SPEC RESIN Cleaned	2 g
2434028	RGF-Sr Filters	1 L
2434079	RGF-8M Nitric Acid	25 mL

Strontium-90 Solid

Filename : SR90.XLS
 File type : Excel
 Version # : 1.3.10

Carrier SN : 2414995
 Carrier Exp Date : 6/3/2017
 Carrier Volume Added: 0.50
 Carrier Weight (mg/ml): 14.73
 Carrier Weight StDev.: 0.10

Batch : 1597803
 Analyst : KEL01237
 Prep Date : 9/21/2016
 Method Uncertainty : 0.089724205

Procedure Code : GFC90SRS
 Parname : Strontium-90
 Required MDA : 2
 Sr-90 Abundance : 1.00
 Half-life of Sr-90 : 28.90
 Half-life of Y-90 : 64.053

pCi/G
 years
 hours

Geometry: Tuffryn Filter

Pos.	Sample Characteristics			Sample Date/Time	Carrier Calculations				
	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G		Carrier Weight (Standard)	Net Weight (Sample)	Net Weight StDev. (mg)	Carrier Aliquot (mL)	Carrier Aliquot StDev. (mL)
1	405235041.1	0.3820	3.2589E-03	11/30/2015 13:27	14.73	6.80	0.036556	0.5	0.001000
2	405235042.1	0.5740	3.2790E-03	11/30/2015 13:53	14.73	6.00	0.033118	0.5	0.001000
3	405235043.1	0.3160	3.2520E-03	11/30/2015 13:59	14.73	7.10	0.037846	0.5	0.001000
4	405235044.1	0.3190	3.2523E-03	11/30/2015 13:50	14.73	6.80	0.036556	0.5	0.001000
5	405235045.1	0.3240	3.2529E-03	11/30/2015 14:15	14.73	6.70	0.036127	0.5	0.001000
6	405235046.1	0.3610	3.2567E-03	12/7/2015 10:02	14.73	6.90	0.036986	0.5	0.001000
7	405235047.1	0.3310	3.2536E-03	12/7/2015 10:10	14.73	6.70	0.036127	0.5	0.001000
8	405235048.1	0.3820	3.2589E-03	12/7/2015 13:28	14.73	6.80	0.036556	0.5	0.001000
9	405235049.1	0.3560	3.2562E-03	12/7/2015 13:33	14.73	6.90	0.036986	0.5	0.001000
10	405235050.1	0.3170	3.2521E-03	12/7/2015 13:42	14.73	7.00	0.037416	0.5	0.001000
11	405235051.1	0.3520	3.2558E-03	12/7/2015 13:02	14.73	6.80	0.036556	0.5	0.001000
12	405235052.1	0.4210	3.2630E-03	12/7/2015 13:11	14.73	6.10	0.033548	0.5	0.001000
13	405235053.1	0.3230	3.2528E-03	12/1/2015 14:24	14.73	6.10	0.033548	0.5	0.001000
14	405235054.1	0.4240	3.2633E-03	12/2/2015 14:51	14.73	6.80	0.036556	0.5	0.001000
15	405235055.1	0.3290	3.2534E-03	12/2/2015 14:59	14.73	6.60	0.035697	0.5	0.001000
16	405235056.1	0.3120	3.2516E-03	12/2/2015 14:50	14.73	5.80	0.032258	0.5	0.001000
17	405235057.1	0.3010	3.2505E-03	12/2/2015 14:55	14.73	6.70	0.036127	0.5	0.001000
18	405235058.1	0.3870	3.2594E-03	12/2/2015 15:00	14.73	6.50	0.035267	0.5	0.001000
19	405235059.1	0.4320	3.2641E-03	12/16/2015 12:26	14.73	6.80	0.036556	0.5	0.001000
20	405235060.1	0.4260	3.2635E-03	12/16/2015 12:33	14.73	6.50	0.035267	0.5	0.001000
21	1203625408.1	0.5740	3.2790E-03	9/21/2016 0:00	14.73	6.70	0.036127	0.5	0.001000
22	1203625409.1	0.2970	3.2500E-03	11/30/2015 14:15	14.73	6.40	0.034837	0.5	0.001000
23	1203625410.1	0.5740	3.2790E-03	9/21/2016 0:00	14.73	6.60	0.035697	0.5	0.001000

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-004
 Instrument SOP: GL-RAD-I-016

Pos.	Detector ID	Counting Time (min.)	Gross Counts		Gross Beta CPM	Count Start Date/Time	Strontium Separation Date/Time	Yttrium Ingrowth	Sr-90 Decay	Calculated Sample Recovery %	Sample Recovery Error %
			Alpha	Beta							
1	1A	60	2	50	0.831	9/22/2016 17:20	9/22/2016 13:28	0.046	0.981	92.3%	1.04%
2	1B	70	6	83	1.179	9/22/2016 17:20	9/22/2016 13:28	0.047	0.981	81.5%	1.05%
3	1D	70	12	79	1.120	9/22/2016 17:21	9/22/2016 13:28	0.047	0.981	96.4%	1.03%
4	1B	60	8	66	1.089	9/23/2016 13:27	9/22/2016 13:28	0.233	0.981	92.3%	1.04%
5	2B	60	1	34	0.562	9/22/2016 17:20	9/22/2016 13:28	0.046	0.981	91.0%	1.04%
6	2C	60	5	38	0.628	9/22/2016 17:20	9/22/2016 13:28	0.046	0.981	93.7%	1.04%
7	3B	80	21	96	1.189	9/22/2016 17:21	9/22/2016 13:28	0.048	0.981	91.0%	1.04%
8	3C	60	16	38	0.622	9/22/2016 17:20	9/22/2016 13:28	0.046	0.981	92.3%	1.04%
9	3D	60	9	33	0.541	9/22/2016 17:20	9/22/2016 13:28	0.046	0.981	93.7%	1.04%
10	4A	60	11	33	0.541	9/22/2016 17:20	9/22/2016 13:28	0.046	0.981	95.0%	1.04%
11	4C	60	2	37	0.615	9/22/2016 17:20	9/22/2016 13:28	0.046	0.981	92.3%	1.04%
12	4D	60	3	62	1.031	9/22/2016 17:20	9/22/2016 13:28	0.046	0.981	82.8%	1.05%
13	3D	60	14	28	0.453	9/23/2016 11:36	9/22/2016 13:28	0.217	0.981	82.8%	1.05%
14	5C	60	7	38	0.628	9/22/2016 17:20	9/22/2016 13:28	0.046	0.981	92.3%	1.04%
15	5D	90	12	47	0.516	9/22/2016 17:21	9/22/2016 13:28	0.049	0.981	89.6%	1.04%
16	6A	70	9	46	0.649	9/22/2016 17:19	9/22/2016 13:28	0.047	0.981	78.8%	1.06%
17	4C	60	8	30	0.494	9/23/2016 11:21	9/22/2016 13:28	0.215	0.981	91.0%	1.04%
18	5A	60	5	81	1.346	9/23/2016 11:21	9/22/2016 13:28	0.215	0.981	88.3%	1.04%
19	7A	60	9	55	0.905	9/22/2016 17:18	9/22/2016 13:28	0.046	0.982	92.3%	1.04%
20	7B	60	10	31	0.508	9/22/2016 17:18	9/22/2016 13:28	0.046	0.982	88.3%	1.04%
21	7C	60	4	26	0.426	9/22/2016 17:18	9/22/2016 13:28	0.046	1.000	91.0%	1.04%
22	7D	60	6	26	0.425	9/22/2016 17:18	9/22/2016 13:28	0.046	0.981	86.9%	1.05%
23	8A	60	12	1360	22.654	9/22/2016 17:18	9/22/2016 13:28	0.046	1.000	89.6%	1.04%

Calibration Data											
Pos.	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)		Detector Efficiency Error (cpm/dpm)		Alpha X-Talk	Weekly Bkg Count CPM	Weekly Bkg Count Start Date/Time	Weekly Bkg Count Time (min.)
				Sr-90	Y-90						
1	PIC	4/1/2016	2/28/2017	0.4226	0.5477	0.00738	0.08126	0.606	9/16/2016 17:24	500	
2	PIC	4/1/2016	2/28/2017	0.4272	0.5497	0.00711	0.08136	1.062	9/16/2016 17:24	500	
3	PIC	4/1/2016	2/28/2017	0.4194	0.5546	0.00692	0.04952	1.456	9/16/2016 17:24	500	
4	PIC	4/1/2016	2/28/2017	0.4258	0.5497	0.00711	0.08308	1.062	9/16/2016 17:24	500	
5	PIC	4/1/2016	2/28/2017	0.4006	0.5091	0.02111	0.27533	0.360	9/16/2016 17:24	500	
6	PIC	4/1/2016	2/28/2017	0.4094	0.5381	0.01274	0.06390	0.506	9/16/2016 17:24	500	
7	PIC	4/1/2016	2/28/2017	0.4068	0.5509	0.01614	0.04306	1.400	9/16/2016 17:25	500	
8	PIC	4/1/2016	2/28/2017	0.4176	0.5563	0.00988	0.04185	0.556	9/16/2016 17:25	500	
9	PIC	4/1/2016	2/28/2017	0.4030	0.5395	0.02297	0.05962	0.582	9/16/2016 17:25	500	
10	PIC	4/1/2016	2/28/2017	0.4185	0.5503	0.01123	0.04798	0.700	9/16/2016 17:25	500	
11	PIC	4/1/2016	2/28/2017	0.4259	0.5613	0.00889	0.04535	0.738	9/16/2016 17:25	500	
12	PIC	4/1/2016	2/28/2017	0.4141	0.5536	0.00773	0.03878	0.732	9/16/2016 17:25	500	
13	PIC	4/1/2016	2/28/2017	0.4033	0.5395	0.02297	0.05856	0.582	9/16/2016 17:25	500	
14	PIC	4/1/2016	2/28/2017	0.4203	0.5622	0.00657	0.04334	0.856	9/16/2016 17:25	500	
15	PIC	4/1/2016	2/28/2017	0.4253	0.5641	0.00925	0.04523	0.748	9/16/2016 17:26	500	
16	PIC	4/1/2016	2/28/2017	0.4140	0.5572	0.02228	0.06083	0.878	9/16/2016 17:58	500	
17	PIC	4/1/2016	2/28/2017	0.4260	0.5613	0.00889	0.04515	0.738	9/16/2016 17:25	500	
18	PIC	4/1/2016	2/28/2017	0.4335	0.5685	0.00851	0.05009	1.386	9/16/2016 17:25	500	
19	PIC	4/1/2016	2/28/2017	0.4202	0.5546	0.00594	0.07831	0.792	9/16/2016 18:18	500	
20	PIC	4/1/2016	2/28/2017	0.4308	0.5632	0.00627	0.05267	0.466	9/16/2016 17:58	500	
21	PIC	4/1/2016	2/28/2017	0.4149	0.5415	0.00790	0.11682	0.398	9/16/2016 17:58	500	
22	PIC	4/1/2016	2/28/2017	0.4138	0.5455	0.01113	0.07851	0.676	9/16/2016 17:58	500	
23	PIC	4/1/2016	2/28/2017	0.4127	0.5573	0.01579	0.06390	0.818	9/16/2016 17:58	500	

Notes:

- 1 - Results are decay corrected to Sample Date/Time
- 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
- 3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml): N/A
 Spike Volume Added: N/A

LCS S/N : 1243-O
 LCS Exp Date : 12/18/2016
 LCS Activity (dpm/ml): 483.33
 LCS Volume Added: 0.10

* - RPD changed to 0% due to sample & dup activity below MDA

Pos.	Decision Level		Critical Level pCi/G	Required MDA pCi/G	MDA pCi/G	Sample Act. Conc. pCi/G	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA		2 SIGMA		Sample Type	Sample QC	RPD	RER	Nominal pCi/G	Recovery	
	pCi/G	pCi/G								Counting Uncertainty pCi/G	Total Prop. Uncertainty pCi/G									
1	0.7206	0.5087	2	1.1628	0.6531	54.65%	0.2246	0.1227	0.6993	0.7090	SAMPLE									
2	0.6642	0.4689	2	1.0308	0.2531	117.97%	0.1167	0.1377	0.5851	0.5868	SAMPLE									
3	1.2141	0.8572	2	1.8594	-1.1367	40.97%	-0.3359	0.1375	0.9121	0.9122	SAMPLE									
4	0.9238	0.6522	2	1.4453	0.0758	528.86%	0.0269	0.1424	0.7859	0.7860	SAMPLE									
5	0.7018	0.4955	2	1.1746	0.7425	49.77%	0.2021	0.1004	0.7233	0.7366	SAMPLE									
6	0.7082	0.5000	2	1.1564	0.3816	87.83%	0.1220	0.1071	0.6567	0.6604	SAMPLE									
7	1.1683	0.8248	2	1.7816	-0.7436	62.93%	-0.2113	0.1329	0.9166	0.9166	SAMPLE									
8	0.6970	0.4921	2	1.1310	0.1943	161.94%	0.0662	0.1072	0.6167	0.6177	SAMPLE									
9	0.7812	0.5515	2	1.2639	-0.1317	246.46%	-0.0409	0.1009	0.6362	0.6363	SAMPLE									
10	0.9142	0.6454	2	1.4624	-0.5450	64.31%	-0.1588	0.1021	0.6867	0.6868	SAMPLE									
11	0.8550	0.6037	2	1.3636	-0.3841	88.17%	-0.1228	0.1083	0.6636	0.6637	SAMPLE									
12	0.8155	0.5757	2	1.3012	0.8964	45.64%	0.2994	0.1366	0.8015	0.8174	SAMPLE									
13	0.8011	0.5656	2	1.2962	-0.4255	72.42%	-0.1290	0.0933	0.6036	0.6037	SAMPLE									
14	0.7742	0.5466	2	1.2246	-0.7972	48.49%	-0.2277	0.1104	0.5687	0.5687	SAMPLE									
15	0.7935	0.5602	2	1.2351	-0.7972	36.72%	-0.2318	0.0850	0.5732	0.5732	SAMPLE									
16	1.1830	0.8352	2	1.8524	-0.9710	46.01%	-0.2287	0.1050	0.8741	0.8742	SAMPLE									
17	0.8389	0.5923	2	1.3379	-0.7486	40.42%	-0.2440	0.0985	0.5924	0.5925	SAMPLE									
18	0.9067	0.6401	2	1.4012	-0.0972	395.16%	-0.0402	0.1588	0.7528	0.7528	SAMPLE									
19	0.7314	0.5164	2	1.1618	0.2915	114.34%	0.1129	0.1291	0.6532	0.6553	SAMPLE									
20	0.5908	0.4100	2	0.9537	0.1119	231.42%	0.0419	0.0969	0.5078	0.5082	SAMPLE									
21	0.3940	0.2782	2	0.6545	0.0540	322.44%	0.0275	0.0888	0.3415	0.3417	SAMPLE									
22	1.0515	0.7494	2	1.7016	-1.0160	36.73%	-0.2505	0.0919	0.7304	0.7305	MB	405235045.1								
23	0.5754	0.4062	2	0.9124	43.6387	3.44%	21.8359	0.6158	2.4121	8.3304	DUP									
											LCS								37.9293	115.1%

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
405235041	1A	60	2	50	9/22/2016 17:20	9/22/2016 18:20	PIC	1597803
405235042	1B	70	6	83	9/22/2016 17:20	9/22/2016 18:30	PIC	1597803
405235043	1D	70	12	79	9/22/2016 17:21	9/22/2016 18:31	PIC	1597803
405235044	1B	60	8	66	9/23/2016 13:27	9/23/2016 14:27	PIC	1597803
405235045	2B	60	1	34	9/22/2016 17:20	9/22/2016 18:20	PIC	1597803
405235046	2C	60	5	38	9/22/2016 17:20	9/22/2016 18:20	PIC	1597803
405235047	3B	80	21	96	9/22/2016 17:21	9/22/2016 18:41	PIC	1597803
405235048	3C	60	16	38	9/22/2016 17:20	9/22/2016 18:20	PIC	1597803
405235049	3D	60	9	33	9/22/2016 17:20	9/22/2016 18:20	PIC	1597803
405235050	4A	60	11	33	9/22/2016 17:20	9/22/2016 18:20	PIC	1597803
405235051	4C	60	2	37	9/22/2016 17:20	9/22/2016 18:20	PIC	1597803
405235052	4D	60	3	62	9/22/2016 17:20	9/22/2016 18:20	PIC	1597803
405235053	3D	60	14	28	9/23/2016 11:36	9/23/2016 12:36	PIC	1597803
405235054	5C	60	7	38	9/22/2016 17:20	9/22/2016 18:20	PIC	1597803
405235055	5D	90	12	47	9/22/2016 17:21	9/22/2016 18:51	PIC	1597803
405235056	6A	70	9	46	9/22/2016 17:19	9/22/2016 18:29	PIC	1597803
405235057	4C	60	8	30	9/23/2016 11:21	9/23/2016 12:21	PIC	1597803
405235058	5A	60	5	81	9/23/2016 11:21	9/23/2016 12:21	PIC	1597803
405235059	7A	60	9	55	9/22/2016 17:18	9/22/2016 18:18	PIC	1597803
405235060	7B	60	10	31	9/22/2016 17:18	9/22/2016 18:18	PIC	1597803
1203625408	7C	60	4	26	9/22/2016 17:18	9/22/2016 18:18	PIC	1597803
1203625409	7D	60	6	26	9/22/2016 17:18	9/22/2016 18:18	PIC	1597803
1203625410	8A	60	12	1360	9/22/2016 17:18	9/22/2016 18:18	PIC	1597803

Continuing Calibration Data

Gas Flow Proportional Counter Checks for 16-Sep-2016

Detectors LB4100 A1 through J4 and PIC 1A through 14D

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100B2	need 2nd	Alpha bkg	16-Sep 06:37	60	0.150	0.096	0.359	-1.77
LB4100B2	Above	Beta bkg	16-Sep 06:37	60	2.167	0.992	2.051	+3.66
LB4100B3	Above	Beta bkg	16-Sep 05:15	60	3.083	0.965	1.943	+10.00
LB4100C1	need 2nd	Alpha bkg	16-Sep 05:17	60	0.267	0.149	0.367	+0.24
LB4100C4	Above	Alpha bkg	16-Sep 05:17	60	0.333	4.08E-6	0.304	+3.58
LB4100C4	Above	Beta bkg	16-Sep 05:17	60	2.100	0.686	2.113	+2.95
LB4100E2	Above	Beta bkg	16-Sep 05:15	60	2.433	1.061	2.316	+3.56
LB4100E4	Above	Beta bkg	16-Sep 05:15	60	2.333	0.650	2.302	+3.11
LB4100F1	Below	Alpha eff	16-Sep 06:40	5	10495	10840	11730	-5.33
LB4100F1	Above	Alpha XTalk	16-Sep 06:40	5	0.268	0.224	0.265	+3.44
LB4100F2	Below	Beta eff	16-Sep 07:01	5	18234	18400	19480	-3.92
LB4100F3	need 2nd	Beta bkg	16-Sep 05:15	60	1.150	0.797	2.216	-1.51
LB4100H4	Below	Alpha eff	16-Sep 06:33	5	10341	11490	13890	-5.87
LB4100H4	Above	Alpha XTalk	16-Sep 06:33	5	0.423	0.307	0.379	+6.68
LB4100H4	Below	Beta eff	16-Sep 06:40	5	34210	35210	36600	-7.32
LB4100I3	Above	Alpha XTalk	16-Sep 06:19	5	0.198	0.143	0.193	+3.53
LB4100I4	Below	Alpha eff	16-Sep 06:19	5	11497	12310	13620	-6.72
LB4100I4	Below	Beta bkg	16-Sep 05:15	60	0.883	0.958	1.734	-3.58
LB4100I4	Below	Beta eff	16-Sep 06:26	5	20099	20380	21610	-4.37
PIC2D	Above	Alpha bkg	16-Sep 07:40	60	0.333	0.006	0.407	+1.90
PIC3A	need 2nd	Alpha XTalk	16-Sep 05:26	5	0.265	0.240	0.267	+2.67
PIC3A	Below	Beta XTalk	16-Sep 05:18	5	0.001	0.011	0.029	-6.51
PIC5B	Above	Alpha bkg	16-Sep 06:49	60	0.367	0.107	0.374	+2.84
PIC8D	Above	Alpha bkg	16-Sep 06:47	60	0.333	0.004	0.401	+1.98
PIC10A	Below	Alpha eff	16-Sep 05:44	5	8831	8854	10610	-3.08
PIC10A	need 2nd	Beta eff	16-Sep 05:52	5	45029	44740	53240	-2.80
PIC11D	Above	Alpha bkg	16-Sep 07:17	60	0.333	0.001	0.361	+2.54

PIC13A	Above	Alpha bkg	16-Sep 07:18	60	0.467	-5.13E-2	0.389	+4.06
PIC13B	Above	Alpha bkg	16-Sep 07:18	60	0.317	-5.02E-2	0.412	+1.76
PIC14B	need 2nd	Alpha bkg	16-Sep 06:13	60	0.217	-8.43E-2	0.377	+0.92

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

LB4100D1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC7C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC8B	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC9B	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by *B. Birch-Hansen*

Date *9-16-16*

GEL Laboratories LLC

Gas Flow Proportional Counter Checks for 17-Sep-2016

Detectors LB4100 A1 through J4 and PIC 1A through 14D

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100B2	Above	Alpha bkg	17-Sep 16:06	60	0.333	0.096	0.359	+2.41
LB4100B3	Above	Beta bkg	16-Sep 17:32	500	3.220	0.965	1.943	+10.84
LB4100C4	need 2nd	Alpha bkg	16-Sep 17:48	500	0.246	4.08E-6	0.304	+1.86
LB4100C4	Above	Beta bkg	16-Sep 17:48	500	2.172	0.686	2.113	+3.25
LB4100E2	Above	Beta bkg	16-Sep 17:44	500	2.598	1.061	2.316	+4.35
LB4100E4	Above	Beta bkg	16-Sep 17:44	500	2.254	0.650	2.302	+2.83
LB4100F1	Below	Alpha eff	17-Sep 16:06	5	10608	10840	11730	-4.56
LB4100F1	need 2nd	Alpha XTalk	17-Sep 16:06	5	0.262	0.224	0.265	+2.56
LB4100H4	Below	Alpha eff	17-Sep 15:59	5	10188	11490	13890	-6.25
LB4100H4	Above	Alpha XTalk	17-Sep 15:59	5	0.425	0.307	0.379	+6.82
LB4100H4	Below	Beta eff	17-Sep 16:06	5	34259	35210	36600	-7.11
LB4100I4	Below	Alpha eff	17-Sep 15:44	5	11444	12310	13620	-6.97
LB4100I4	Below	Beta bkg	16-Sep 17:28	500	0.762	0.958	1.734	-4.51
LB4100I4	Below	Beta eff	17-Sep 15:51	5	20148	20380	21610	-4.13
PIC2D	Above	Alpha bkg	17-Sep 15:08	60	0.367	0.006	0.407	+2.40
PIC3A	Above	Alpha XTalk	17-Sep 14:59	5	0.271	0.240	0.267	+3.95
PIC3A	Below	Beta XTalk	17-Sep 14:52	5	0.001	0.011	0.029	-6.38
PIC13A	Above	Alpha bkg	17-Sep 15:43	60	0.333	-5.13E-2	0.389	+2.24
PIC14B	Above	Beta bkg	16-Sep 17:23	1000	1.728	-1.34E-1	1.713	+3.05

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

LB4100D1 Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
 LB4100D2 Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
 LB4100D3 Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
 LB4100D4 Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
 PIC6D Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
 PIC13C Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by *KD St*

Date 9/19/16

GEL Laboratories LLC

Gas Flow Proportional Counter Checks for 19-Sep-2016

Detectors LB4100 A1 through J4 and PIC 1A through 14D

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100B3	Above	Alpha bkg	19-Sep 08:10	60	0.350	0.121	0.383	+2.24
LB4100B3	Above	Beta bkg	19-Sep 08:10	60	3.200	0.965	1.943	+10.71
LB4100C1	Above	Alpha bkg	19-Sep 08:15	60	0.433	0.149	0.367	+4.81
LB4100C4	Above	Alpha bkg	19-Sep 08:15	60	0.367	4.08E-6	0.304	+4.24
LB4100C4	Above	Beta bkg	19-Sep 08:15	60	2.183	0.686	2.113	+3.30
LB4100E2	Above	Beta bkg	19-Sep 06:29	60	2.667	1.061	2.316	+4.68
LB4100E3	Above	Beta bkg	19-Sep 07:55	60	2.283	0.463	2.359	+2.76
LB4100E4	Above	Beta bkg	19-Sep 06:29	60	2.400	0.650	2.302	+3.36
LB4100F1	Below	Alpha eff	19-Sep 09:55	5	10542	10840	11730	-5.01
LB4100G3	Above	Beta bkg	19-Sep 07:54	60	9.033	0.611	1.889	+36.54
LB4100H4	Below	Alpha eff	19-Sep 07:41	5	10613	11490	13890	-5.19
LB4100H4	Above	Alpha XTalk	19-Sep 07:41	5	0.409	0.307	0.379	+5.50
LB4100H4	Below	Beta eff	19-Sep 07:34	5	34216	35210	36600	-7.29
LB4100I3	Above	Beta bkg	19-Sep 06:29	60	2.183	0.091	2.093	+3.27
LB4100I4	Below	Alpha eff	19-Sep 08:09	5	11549	12310	13620	-6.49
LB4100I4	Below	Alpha XTalk	19-Sep 08:09	5	0.188	0.189	0.219	-3.09
LB4100I4	Below	Beta bkg	19-Sep 06:29	60	0.933	0.958	1.734	-3.19
LB4100I4	Below	Beta eff	19-Sep 08:19	5	20182	20380	21610	-3.97
PIC3A	Below	Beta XTalk	19-Sep 11:18	5	0.002	0.011	0.029	-6.20
PIC5B	Above	Alpha bkg	19-Sep 09:38	60	0.317	0.107	0.374	+1.72
PIC6D	Missing	Beta eff	19-Sep 06:44	5	1.523	43700	47280	-76.24
PIC6D	Missing	Beta XTalk	19-Sep 06:44	5	0.500	-1.81E-3	0.004	+483.09
PIC8C	Above	Beta XTalk	19-Sep 11:14	5	0.001	5.46E-5	5.49E-4	+8.69
PIC12C	Above	Alpha bkg	19-Sep 08:38	60	0.433	0.010	0.413	+3.31
PIC13B	Above	Alpha bkg	19-Sep 07:22	60	134	-5.02E-2	0.412	+1,741.68
PIC13B	Above	Beta bkg	19-Sep 07:22	60	356	-1.78E-2	2.229	+947.11

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

LB4100D1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by Kilster

Date 9/19/16

GEL Laboratories LLC

Gas Flow Proportional Counter Checks for 20-Sep-2016

Detectors LB4100 A1 through J4 and PIC 1A through 14D

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100B3	need 2nd	Alpha bkg	20-Sep 05:02	60	0.233	0.121	0.383	-0.43
LB4100B3	Above	Beta bkg	20-Sep 05:02	60	3.150	0.965	1.943	+10.41
LB4100C2	Above	Alpha bkg	20-Sep 06:54	60	0.467	-4.14E-2	0.367	+4.47
LB4100C2	Above	Beta bkg	20-Sep 06:54	60	2.350	0.561	1.662	+6.75
LB4100C4	Above	Alpha bkg	20-Sep 05:03	60	0.350	4.08E-6	0.304	+3.91
LB4100C4	Above	Beta bkg	20-Sep 05:03	60	2.117	0.686	2.113	+3.02
LB4100E2	Above	Beta bkg	20-Sep 05:02	60	2.783	1.061	2.316	+5.23
LB4100E3	need 2nd	Alpha bkg	20-Sep 06:45	60	0.100	-8.16E-2	0.346	-0.45
LB4100E3	Above	Beta bkg	20-Sep 06:45	60	2.100	0.463	2.359	+2.18
LB4100E4	Above	Beta bkg	20-Sep 05:02	60	2.417	0.650	2.302	+3.42
LB4100F1	Below	Alpha eff	20-Sep 06:59	5	10662	10840	11730	-4.20
LB4100H4	Below	Alpha eff	20-Sep 06:18	5	10792	11490	13890	-4.75
LB4100H4	Above	Alpha XTalk	20-Sep 06:18	5	0.405	0.307	0.379	+5.17
LB4100H4	Below	Beta eff	20-Sep 06:28	5	34316	35210	36600	-6.86
LB4100I3	Above	Beta bkg	20-Sep 06:29	60	2.533	0.091	2.093	+4.32
LB4100I4	Below	Alpha eff	20-Sep 06:05	5	11564	12310	13620	-6.42
LB4100I4	Below	Alpha XTalk	20-Sep 06:05	5	0.187	0.189	0.219	-3.24
LB4100I4	Below	Beta bkg	20-Sep 05:02	60	0.733	0.958	1.734	-4.74
LB4100I4	Below	Beta eff	20-Sep 06:12	5	20093	20380	21610	-4.40
PIC2D	Above	Alpha bkg	20-Sep 13:16	60	0.383	0.006	0.407	+2.65
PIC3A	Above	Alpha XTalk	20-Sep 05:14	5	0.272	0.240	0.267	+4.17
PIC3A	Below	Beta XTalk	20-Sep 13:55	5	0.002	0.011	0.029	-6.23
PIC7D	Above	Beta XTalk	20-Sep 13:53	5	7.94E-4	1.40E-4	7.07E-4	+3.92
PIC8C	need 2nd	Beta XTalk	20-Sep 05:20	5	4.34E-4	5.46E-5	5.49E-4	+1.60
PIC10D	Above	Alpha bkg	20-Sep 12:53	60	0.333	-6.34E-2	0.362	+2.60
PIC10D	Below	Alpha eff	20-Sep 05:40	5	11941	15350	16570	-19.76
PIC10D	Above	Alpha XTalk	20-Sep 05:40	5	0.754	0.303	0.427	+18.80
PIC10D	Above	Beta bkg	20-Sep 12:53	60	1.417	-1.50E-1	1.265	+3.64
PIC10D	Below	Beta eff	20-Sep 05:52	5	31566	40190	43320	-19.53
PIC11D	Above	Alpha bkg	20-Sep 13:17	60	0.667	0.001	0.361	+8.10

PIC12C	Above	Alpha bkg	20-Sep 13:17	60	0.317	0.010	0.413	+1.57
PIC12C	Above	Beta eff	20-Sep 05:36	5	27959	25610	26990	+7.21
PIC13B	Above	Alpha bkg	20-Sep 13:17	60	0.533	-5.02E-2	0.412	+4.57
PIC13B	need 2nd	Beta bkg	20-Sep 13:17	60	1.817	-1.78E-2	2.229	+1.90
PIC14B	Above	Beta bkg	20-Sep 13:17	60	3.233	-1.34E-1	1.713	+7.94

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

LB4100D1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by _____



Date _____

9/20/16

GEL Laboratories LLC

Gas Flow Proportional Counter Checks for 21-Sep-2016

Detectors LB4100 A1 through J4 and PIC 1A through 14D

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100B3	Above	Beta bkg	21-Sep 06:32	60	3.300	0.965	1.943	+11.33
LB4100C2	Above	Alpha bkg	21-Sep 08:05	60	0.550	-4.14E-2	0.367	+5.69
LB4100C2	Above	Beta bkg	21-Sep 08:05	60	1.733	0.561	1.662	+3.39
LB4100C4	Above	Alpha bkg	21-Sep 06:29	60	0.367	4.08E-6	0.304	+4.24
LB4100C4	Above	Beta bkg	21-Sep 06:29	60	2.500	0.686	2.113	+4.63
LB4100E2	Above	Beta bkg	21-Sep 06:27	60	2.733	1.061	2.316	+5.00
LB4100E3	Above	Beta bkg	21-Sep 07:49	60	2.083	0.463	2.359	+2.13
LB4100E4	Above	Beta bkg	21-Sep 06:27	60	2.500	0.650	2.302	+3.72
LB4100F1	Below	Alpha eff	21-Sep 09:37	5	10529	10840	11730	-5.09
LB4100H4	Below	Alpha eff	21-Sep 07:39	5	10799	11490	13890	-4.73
LB4100H4	Above	Alpha XTalk	21-Sep 07:39	5	0.405	0.307	0.379	+5.15
LB4100H4	Below	Beta eff	21-Sep 07:31	5	34200	35210	36600	-7.36
LB4100I3	Above	Beta bkg	21-Sep 08:18	60	2.283	0.091	2.093	+3.57
LB4100I4	Below	Alpha eff	21-Sep 08:02	5	11663	12310	13620	-5.96
LB4100I4	need 2nd	Alpha XTalk	21-Sep 08:02	5	0.189	0.189	0.219	-2.97
LB4100I4	Below	Beta bkg	21-Sep 06:27	60	0.883	0.958	1.734	-3.58
LB4100I4	Below	Beta eff	21-Sep 08:12	5	20027	20380	21610	-4.72
PIC1C	Below	Beta eff	21-Sep 11:26	5	20723	21130	22410	-4.91
PIC3A	Below	Beta XTalk	21-Sep 09:42	5	0.002	0.011	0.029	-6.29
PIC8C	Above	Alpha bkg	21-Sep 09:00	60	0.317	0.105	0.367	+1.85
PIC10D	Below	Alpha eff	21-Sep 11:08	5	11758	15350	16570	-20.66
PIC10D	Above	Alpha XTalk	21-Sep 11:08	5	0.773	0.303	0.427	+19.72
PIC10D	Below	Beta eff	21-Sep 06:53	5	32197	40190	43320	-18.32
PIC12D	Above	Alpha bkg	21-Sep 09:12	60	0.317	-3.91E-2	0.386	+2.02
PIC14B	need 2nd	Alpha bkg	21-Sep 08:20	60	0.150	-8.43E-2	0.377	+0.05
PIC14B	Above	Beta bkg	21-Sep 08:20	60	3.700	-1.34E-1	1.713	+9.46

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

LB4100D1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by *K Ost*

Date 9/21/16

GEL Laboratories LLC

Gas Flow Proportional Counter Checks for 22-Sep-2016

Detectors LB4100 A1 through J4 and PIC 1A through 14D

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stddev
LB4100B3	Above	Beta bkg	22-Sep 05:50	60	2.967	0.965	1.943	+9.28
LB4100C1	Above	Alpha bkg	22-Sep 07:45	60	0.333	0.149	0.367	+2.07
LB4100C4	Above	Alpha bkg	22-Sep 05:52	60	0.400	4.08E-6	0.304	+4.89
LB4100C4	need 2nd	Beta bkg	22-Sep 05:52	60	1.983	0.686	2.113	+2.45
LB4100E2	Above	Beta bkg	22-Sep 05:50	60	2.783	1.061	2.316	+5.23
LB4100E3	Above	Beta bkg	22-Sep 07:29	60	3.383	0.463	2.359	+6.24
LB4100E4	Above	Beta bkg	22-Sep 05:50	60	2.467	0.650	2.302	+3.60
LB4100F1	Below	Alpha eff	22-Sep 07:20	5	10642	10840	11730	-4.34
LB4100F1	Below	Beta eff	22-Sep 07:37	5	45648	45650	49940	-3.00
LB4100H4	Below	Alpha eff	22-Sep 07:10	5	10733	11490	13890	-4.89
LB4100H4	Above	Alpha XTalk	22-Sep 07:10	5	0.407	0.307	0.379	+5.34
LB4100H4	Below	Beta eff	22-Sep 07:20	5	34292	35210	36600	-6.96
LB4100I3	Above	Beta bkg	22-Sep 05:51	60	2.383	0.091	2.093	+3.87
LB4100I4	Below	Alpha eff	22-Sep 06:56	5	11526	12310	13620	-6.59
LB4100I4	Below	Alpha XTalk	22-Sep 06:56	5	0.186	0.189	0.219	-3.43
LB4100I4	Below	Beta bkg	22-Sep 05:51	60	0.683	0.958	1.734	-5.12
LB4100I4	Below	Beta eff	22-Sep 07:03	5	20177	20380	21610	-3.99
PIC1C	Below	Beta eff	22-Sep 06:05	5	20866	21130	22410	-4.24
PIC2D	Above	Alpha bkg	22-Sep 07:17	60	0.367	0.006	0.407	+2.40
PIC2D	Above	Beta bkg	22-Sep 07:17	60	2.150	1.126	2.275	+2.35
PIC3A	Above	Alpha bkg	22-Sep 06:14	60	0.417	-5.23E-2	0.356	+3.88
PIC3A	Below	Beta XTalk	22-Sep 05:56	5	0.002	0.011	0.029	-6.30
PIC5B	Above	Alpha bkg	22-Sep 07:35	60	0.400	0.107	0.374	+3.60
PIC8C	Above	Alpha bkg	22-Sep 07:33	60	0.350	0.105	0.367	+2.62
PIC9C	Above	Alpha bkg	22-Sep 07:42	60	0.317	-2.53E-2	0.365	+2.26
PIC10D	Below	Alpha eff	22-Sep 06:24	5	11811	15350	16570	-20.41
PIC10D	Above	Alpha XTalk	22-Sep 06:24	5	0.768	0.303	0.427	+19.46
PIC10D	Below	Beta eff	22-Sep 06:31	5	31926	40190	43320	-18.84

PIC11A	Above	Alpha bkg	22-Sep 08:13	60	0.350	0.029	0.365	+2.74
PIC12A	Above	Alpha bkg	22-Sep 08:14	60	0.550	0.067	0.379	+6.29
PIC12A	need 2nd	Beta bkg	22-Sep 08:14	60	1.367	0.288	1.844	+1.16
PIC12C	Above	Alpha bkg	22-Sep 08:14	60	0.417	0.010	0.413	+3.06
PIC12D	Above	Alpha bkg	22-Sep 08:14	60	0.367	-3.91E-2	0.386	+2.73
PIC13B	Above	Alpha bkg	22-Sep 08:14	60	0.317	-5.02E-2	0.412	+1.76
PIC14B	need 2nd	Beta bkg	22-Sep 06:51	60	1.100	-1.34E-1	1.713	+1.01

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

LB4100D1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by *R. Siub-Hansen*

Date *9-22-16*

GEL Laboratories LLC

Gas Flow Proportional Counter Checks for 23-Sep-2016

Detectors LB4100 A1 through J4 and PIC 1A through 14D


Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100A3	Below	Alpha eff	23-Sep 11:36	5	8874	9142	11120	-3.81
LB4100B2	Below	Alpha eff	23-Sep 07:02	5	7531	9043	10550	-9.02
LB4100B2	Above	Beta bkg	23-Sep 11:44	60	7.650	0.992	2.051	+34.73
LB4100B3	Below	Alpha bkg	23-Sep 05:49	60	0.117	0.121	0.383	-3.10
LB4100B3	Below	Alpha eff	23-Sep 07:02	5	9981	13770	17610	-8.92
LB4100B3	Above	Alpha XTalk	23-Sep 07:02	5	0.567	0.308	0.393	+15.15
LB4100B3	Above	Beta bkg	23-Sep 05:49	60	71.683	0.965	1.943	+430.94
LB4100B4	Below	Alpha eff	23-Sep 07:02	5	11712	12260	14720	-4.34
LB4100B4	Above	Alpha XTalk	23-Sep 07:02	5	0.361	0.273	0.337	+5.27
LB4100C1	Above	Alpha bkg	23-Sep 05:53	60	0.350	0.149	0.367	+2.52
LB4100C3	Below	Alpha eff	23-Sep 11:18	5	5257	6624	9128	-6.28
LB4100C3	Above	Alpha XTalk	23-Sep 11:18	5	0.464	0.248	0.368	+7.79
LB4100C4	need 2nd	Alpha bkg	23-Sep 05:53	60	0.250	4.08E-6	0.304	+1.93
LB4100C4	Above	Beta bkg	23-Sep 05:53	60	128	0.686	2.113	+533.03
LB4100E1	Above	Beta bkg	23-Sep 10:56	60	15.517	0.637	2.392	+47.87
LB4100E2	Above	Beta bkg	23-Sep 10:56	60	3.933	1.061	2.316	+10.73
LB4100E3	need 2nd	Beta bkg	23-Sep 10:56	60	1.833	0.463	2.359	+1.34
LB4100E4	Above	Alpha bkg	23-Sep 10:56	60	0.367	-6.65E-2	0.309	+3.92
LB4100E4	Above	Beta bkg	23-Sep 10:56	60	4.750	0.650	2.302	+11.89
LB4100F1	Below	Alpha eff	23-Sep 10:45	5	10371	10840	11730	-6.16
LB4100F1	Above	Alpha XTalk	23-Sep 10:45	5	0.269	0.224	0.265	+3.54
LB4100F1	need 2nd	Beta eff	23-Sep 10:37	5	45920	45650	49940	-2.62
LB4100F2	Above	Beta bkg	23-Sep 10:57	60	2.133	0.575	1.803	+4.61
LB4100H4	Below	Alpha eff	23-Sep 10:37	5	10800	11490	13890	-4.73
LB4100H4	Above	Alpha XTalk	23-Sep 10:37	5	0.400	0.307	0.379	+4.75
LB4100H4	Below	Beta eff	23-Sep 10:45	5	34315	35210	36600	-6.86
LB4100I3	Above	Beta bkg	23-Sep 11:09	60	2.183	0.091	2.093	+3.27
LB4100I4	Below	Alpha eff	23-Sep 12:12	5	11515	12310	13620	-6.64
LB4100I4	Below	Alpha XTalk	23-Sep 12:12	5	0.188	0.189	0.219	-3.05
LB4100I4	need 2nd	Beta bkg	23-Sep 05:49	60	1.083	0.958	1.734	-2.03

LB4100I4	Below	Beta eff	23-Sep 07:02	5	20276	20380	21610	-3.51
PIC2D	Above	Alpha bkg	23-Sep 10:36	60	0.583	0.006	0.407	+5.64
PIC2D	Below	Alpha eff	23-Sep 05:53	5	14713	16200	17080	-13.14
PIC2D	Above	Alpha XTalk	23-Sep 05:53	5	0.426	0.242	0.304	+14.87
PIC2D	Below	Beta eff	23-Sep 06:00	5	33508	39480	42300	-15.71
PIC3A	Above	Alpha XTalk	23-Sep 06:00	5	0.286	0.240	0.267	+7.29
PIC3A	Below	Beta XTalk	23-Sep 05:53	5	7.60E-4	0.011	0.029	-6.62
PIC5B	Above	Alpha bkg	23-Sep 10:34	60	0.317	0.107	0.374	+1.72
PIC10D	Below	Alpha eff	23-Sep 11:51	5	11968	15350	16570	-19.63
PIC10D	Above	Alpha XTalk	23-Sep 11:51	5	0.756	0.303	0.427	+18.85
PIC10D	Below	Beta eff	23-Sep 10:58	5	30970	40190	43320	-20.67
PIC12C	need 2nd	Alpha bkg	23-Sep 12:08	60	0.267	0.010	0.413	+0.83
PIC14D	Above	Beta eff	23-Sep 12:41	5	42592	40480	42120	+4.73

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

LB4100D1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by 

Date 9/23/16

GEL Laboratories LLC

Gas Flow Proportional Counter Checks for 27-Sep-2016

Detectors LB4100 A1 through J4 and PIC 1A through 14D

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100A3	Below	Alpha eff	27-Sep 06:17	5	8876	9142	11120	-3.81
LB4100B2	need 2nd	Beta bkg	27-Sep 05:03	60	1.917	0.992	2.051	+2.24
LB4100B3	Above	Alpha bkg	27-Sep 05:03	60	0.383	0.121	0.383	+3.00
LB4100C3	Below	Alpha eff	27-Sep 06:46	5	5995	6624	9128	-4.51
LB4100C3	Above	Alpha XTalk	27-Sep 06:46	5	0.416	0.248	0.368	+5.36
LB4100C4	Above	Beta bkg	27-Sep 05:06	60	13.633	0.686	2.113	+51.42
LB4100E1	Above	Beta bkg	27-Sep 05:03	60	8.733	0.637	2.392	+24.68
LB4100E2	Above	Beta bkg	27-Sep 05:03	60	3.217	1.061	2.316	+7.31
LB4100E3	Above	Alpha bkg	27-Sep 05:03	60	0.350	-8.16E-2	0.346	+3.05
LB4100E3	Above	Beta bkg	27-Sep 05:03	60	3.983	0.463	2.359	+8.14
LB4100E4	Above	Beta bkg	27-Sep 05:03	60	2.417	0.650	2.302	+3.42
LB4100F1	Below	Alpha eff	27-Sep 06:59	5	10464	10840	11730	-5.53
LB4100F1	Above	Alpha XTalk	27-Sep 06:59	5	0.268	0.224	0.265	+3.42
LB4100H4	Below	Alpha eff	27-Sep 06:24	5	10622	11490	13890	-5.17
LB4100H4	Above	Alpha XTalk	27-Sep 06:24	5	0.418	0.307	0.379	+6.23
LB4100H4	Below	Beta eff	27-Sep 06:31	5	34394	35210	36600	-6.52
LB4100I3	Above	Beta bkg	27-Sep 05:03	60	2.450	0.091	2.093	+4.07
LB4100I3	Below	Beta eff	27-Sep 06:17	5	17122	17160	17920	-3.30
LB4100I4	Below	Alpha eff	27-Sep 06:10	5	11565	12310	13620	-6.41
LB4100I4	need 2nd	Alpha XTalk	27-Sep 06:10	5	0.191	0.189	0.219	-2.52
LB4100I4	Below	Beta bkg	27-Sep 05:03	60	0.767	0.958	1.734	-4.48
LB4100I4	Below	Beta eff	27-Sep 06:17	5	20345	20380	21610	-3.17
PIC3A	need 2nd	Alpha XTalk	27-Sep 05:09	5	0.265	0.240	0.267	+2.75
PIC3A	Below	Beta XTalk	27-Sep 05:03	5	0.001	0.011	0.029	-6.40
PIC3D	Above	Alpha bkg	27-Sep 06:30	60	0.317	-6.75E-2	0.338	+2.69
PIC5B	Above	Alpha bkg	27-Sep 06:38	60	0.383	0.107	0.374	+3.22
PIC5C	Above	Alpha bkg	27-Sep 06:39	60	0.350	-1.81E-2	0.382	+2.52
PIC7D	Above	Alpha bkg	27-Sep 07:40	60	0.383	-1.11E-2	0.349	+3.58

PIC10A	need 2nd	Alpha eff	27-Sep 05:27	5	8986	8854	10610	-2.55
PIC10A	Below	Beta eff	27-Sep 05:34	5	44152	44740	53240	-3.42
PIC10D	Below	Alpha eff	27-Sep 05:27	5	11828	15350	16570	-20.32
PIC10D	Above	Alpha XTalk	27-Sep 05:27	5	0.771	0.303	0.427	+19.62
PIC10D	Below	Beta eff	27-Sep 05:34	5	31335	40190	43320	-19.97
PIC11A	Above	Alpha bkg	27-Sep 07:01	60	0.383	0.029	0.365	+3.34
PIC12A	Above	Alpha bkg	27-Sep 07:02	60	0.333	0.067	0.379	+2.12
PIC12C	need 2nd	Alpha bkg	27-Sep 05:51	60	0.283	0.010	0.413	+1.07
PIC12C	need 2nd	Beta bkg	27-Sep 05:51	60	0.917	-3.86E-2	2.074	-0.29

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

LB4100D1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by R. David Harman

Date 9-27-16

GEL Laboratories LLC

Gas Flow Proportional Counter Checks for 28-Sep-2016

Detectors LB4100 A1 through J4 and PIC 1A through 14D

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100A3	Below	Alpha eff	28-Sep 05:51	5	8875	9142	11120	-3.81
LB4100B3	need 2nd	Alpha bkg	28-Sep 04:42	60	0.283	0.121	0.383	+0.71
LB4100C1	Above	Alpha bkg	28-Sep 04:44	60	0.500	0.149	0.367	+6.64
LB4100C3	Below	Alpha eff	28-Sep 06:22	5	6093	6624	9128	-4.27
LB4100C3	Above	Alpha XTalk	28-Sep 06:22	5	0.409	0.248	0.368	+5.03
LB4100C4	Above	Alpha bkg	28-Sep 04:44	60	0.483	4.08E-6	0.304	+6.54
LB4100C4	Above	Beta bkg	28-Sep 04:44	60	10.667	0.686	2.113	+38.95
LB4100E1	Above	Beta bkg	28-Sep 04:42	60	6.400	0.637	2.392	+16.70
LB4100E2	Above	Beta bkg	28-Sep 04:42	60	2.667	1.061	2.316	+4.68
LB4100E3	need 2nd	Alpha bkg	28-Sep 04:42	60	0.067	-8.16E-2	0.346	-0.92
LB4100E3	Above	Beta bkg	28-Sep 04:42	60	2.167	0.463	2.359	+2.39
LB4100E4	Above	Beta bkg	28-Sep 04:42	60	2.433	0.650	2.302	+3.48
LB4100F1	Below	Alpha bkg	28-Sep 04:42	60	0.033	0.059	0.384	-3.47
LB4100F1	Below	Alpha eff	28-Sep 06:06	5	10556	10840	11730	-4.92
LB4100F1	Above	Alpha XTalk	28-Sep 06:06	5	0.267	0.224	0.265	+3.21
LB4100F1	Below	Beta eff	28-Sep 05:58	5	45647	45650	49940	-3.00
LB4100F2	Below	Beta eff	28-Sep 06:40	5	18321	18400	19480	-3.44
LB4100H4	Below	Alpha eff	28-Sep 05:58	5	10597	11490	13890	-5.23
LB4100H4	Above	Alpha XTalk	28-Sep 05:58	5	0.416	0.307	0.379	+6.05
LB4100H4	Below	Beta eff	28-Sep 06:06	5	34282	35210	36600	-7.00
LB4100I3	Below	Beta eff	28-Sep 07:38	5	17015	17160	17920	-4.14
LB4100I4	Below	Alpha eff	28-Sep 05:45	5	11386	12310	13620	-7.23
LB4100I4	Below	Beta bkg	28-Sep 04:42	60	0.867	0.958	1.734	-3.70
LB4100I4	Below	Beta eff	28-Sep 05:51	5	20161	20380	21610	-4.07
PIC2D	Above	Alpha bkg	28-Sep 04:57	60	0.350	0.006	0.407	+2.15
PIC3A	Above	Alpha XTalk	28-Sep 04:50	5	0.269	0.240	0.267	+3.61
PIC3A	Below	Beta XTalk	28-Sep 04:43	5	0.001	0.011	0.029	-6.43
PIC6B	Above	Beta bkg	28-Sep 07:34	60	2.083	0.657	2.252	+2.37

PIC8D	Above	Alpha bkg	28-Sep 06:20	60	0.317	0.004	0.401	+1.72
PIC9C	Above	Alpha bkg	28-Sep 06:44	60	0.333	-2.53E-2	0.365	+2.52
PIC9C	Below	Alpha eff	28-Sep 05:08	5	9732	9741	10420	-3.08
PIC10A	Below	Beta eff	28-Sep 05:16	5	44641	44740	53240	-3.07
PIC10D	Below	Alpha eff	28-Sep 05:08	5	12062	15350	16570	-19.17
PIC10D	Above	Alpha XTalk	28-Sep 05:08	5	0.737	0.303	0.427	+17.97
PIC10D	Below	Beta eff	28-Sep 05:16	5	32143	40190	43320	-18.42
PIC12C	Above	Alpha bkg	28-Sep 05:33	60	0.317	0.010	0.413	+1.57

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

LB4100D1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by *R. Birch-Hannon*

Date 9-28-16

GEL Laboratories LLC

Gas Flow Proportional Counter Checks for 29-Sep-2016

Detectors LB4100 A1 through J4 and PIC 1A through 14D

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100A3	Below	Alpha eff	29-Sep 06:35	5	8809	9142	11120	-4.01
LB4100B1	need 2nd	Alpha bkg	29-Sep 06:49	60	0.233	-7.77E-2	0.363	+1.23
LB4100B1	Above	Beta bkg	29-Sep 06:49	60	1.700	0.703	1.635	+3.42
LB4100B2	Above	Alpha bkg	29-Sep 05:20	60	0.317	0.096	0.359	+2.03
LB4100B3	Above	Alpha bkg	29-Sep 05:20	60	0.383	0.121	0.383	+3.00
LB4100B3	Above	Beta bkg	29-Sep 05:20	60	2.083	0.965	1.943	+3.86
LB4100C1	Above	Alpha bkg	29-Sep 05:22	60	0.533	0.149	0.367	+7.55
LB4100C3	Below	Alpha eff	29-Sep 07:05	5	5838	6624	9128	-4.88
LB4100C3	Above	Alpha XTalk	29-Sep 07:05	5	0.421	0.248	0.368	+5.65
LB4100C4	need 2nd	Alpha bkg	29-Sep 05:22	60	0.283	4.08E-6	0.304	+2.59
LB4100C4	Above	Beta bkg	29-Sep 05:22	60	7.850	0.686	2.113	+27.11
LB4100E1	Above	Beta bkg	29-Sep 05:20	60	5.400	0.637	2.392	+13.28
LB4100E2	Above	Beta bkg	29-Sep 05:20	60	2.517	1.061	2.316	+3.96
LB4100E3	need 2nd	Beta bkg	29-Sep 05:20	60	1.817	0.463	2.359	+1.28
LB4100E4	Above	Beta bkg	29-Sep 05:20	60	2.333	0.650	2.302	+3.11
LB4100F1	need 2nd	Alpha bkg	29-Sep 05:20	60	0.150	0.059	0.384	-1.32
LB4100F1	Below	Alpha eff	29-Sep 06:52	5	10585	10840	11730	-4.72
LB4100F1	need 2nd	Alpha XTalk	29-Sep 06:52	5	0.265	0.224	0.265	+2.97
LB4100F1	Below	Beta eff	29-Sep 06:44	5	45465	45650	49940	-3.26
LB4100F2	Below	Beta eff	29-Sep 06:44	5	18323	18400	19480	-3.43
LB4100H4	Below	Alpha eff	29-Sep 06:44	5	10469	11490	13890	-5.55
LB4100H4	Above	Alpha XTalk	29-Sep 06:44	5	0.413	0.307	0.379	+5.83
LB4100H4	Below	Beta eff	29-Sep 06:52	5	34209	35210	36600	-7.32
LB4100I3	Below	Beta eff	29-Sep 07:14	5	17033	17160	17920	-4.00
LB4100I4	Below	Alpha eff	29-Sep 06:26	5	11442	12310	13620	-6.98
LB4100I4	Below	Beta bkg	29-Sep 05:20	60	0.700	0.958	1.734	-4.99
LB4100I4	Below	Beta eff	29-Sep 06:35	5	20152	20380	21610	-4.11
PIC1C	Below	Beta eff	29-Sep 07:00	5	21059	21130	22410	-3.33

PIC2D	Above	Alpha bkg	29-Sep 05:35	60	0.350	0.006	0.407	+2.15
PIC3A	need 2nd	Alpha XTalk	29-Sep 05:28	5	0.266	0.240	0.267	+2.90
PIC3A	Below	Beta XTalk	29-Sep 05:20	5	0.001	0.011	0.029	-6.40
PIC5B	Above	Alpha bkg	29-Sep 06:57	60	0.350	0.107	0.374	+2.47
PIC6B	Below	Alpha eff	29-Sep 05:33	5	9422	9451	9758	-3.57
PIC6B	Above	Beta bkg	29-Sep 08:31	60	2.150	0.657	2.252	+2.62
PIC9C	Above	Alpha bkg	29-Sep 07:16	60	0.400	-2.53E-2	0.365	+3.55
PIC9C	need 2nd	Alpha eff	29-Sep 05:47	5	9861	9741	10420	-1.94
PIC10D	Below	Alpha eff	29-Sep 05:47	5	12052	15350	16570	-19.22
PIC10D	Above	Alpha XTalk	29-Sep 05:47	5	0.747	0.303	0.427	+18.43
PIC10D	Below	Beta eff	29-Sep 05:55	5	32414	40190	43320	-17.91
PIC11D	Above	Alpha bkg	29-Sep 07:19	60	0.367	0.001	0.361	+3.10
PIC11D	need 2nd	Beta bkg	29-Sep 07:19	60	1.200	-2.33E-1	2.356	+0.32
PIC12C	Above	Alpha bkg	29-Sep 06:13	60	0.417	0.010	0.413	+3.06
PIC14B	Above	Alpha bkg	29-Sep 06:13	60	0.350	-8.43E-2	0.377	+2.65
PIC14D	Above	Alpha bkg	29-Sep 08:34	60	0.317	0.120	0.376	+1.61

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

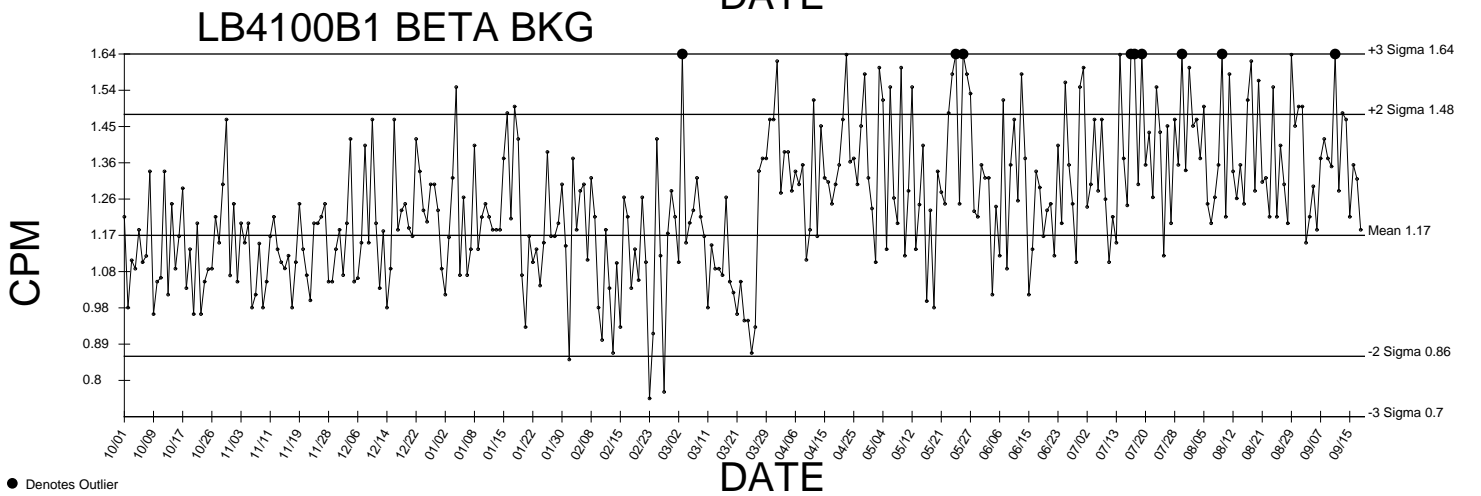
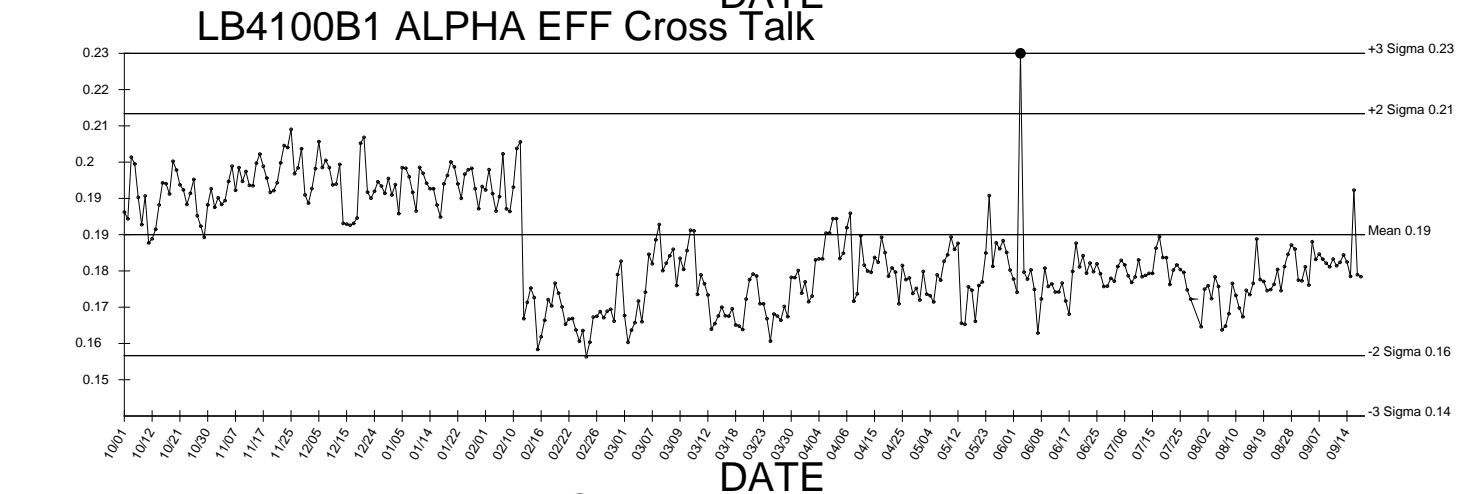
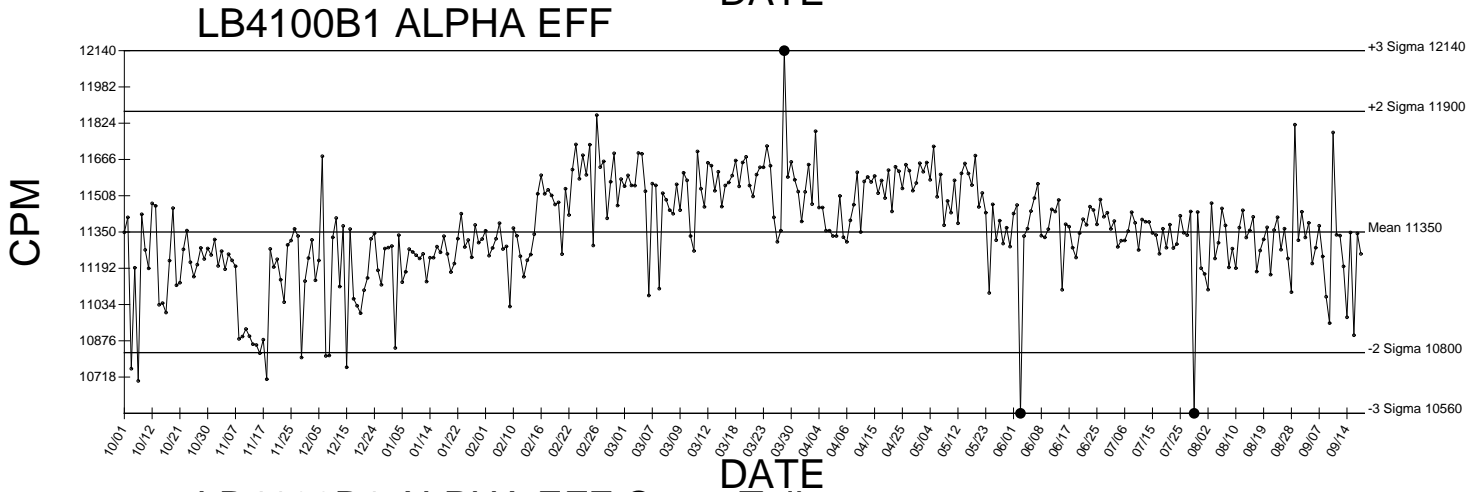
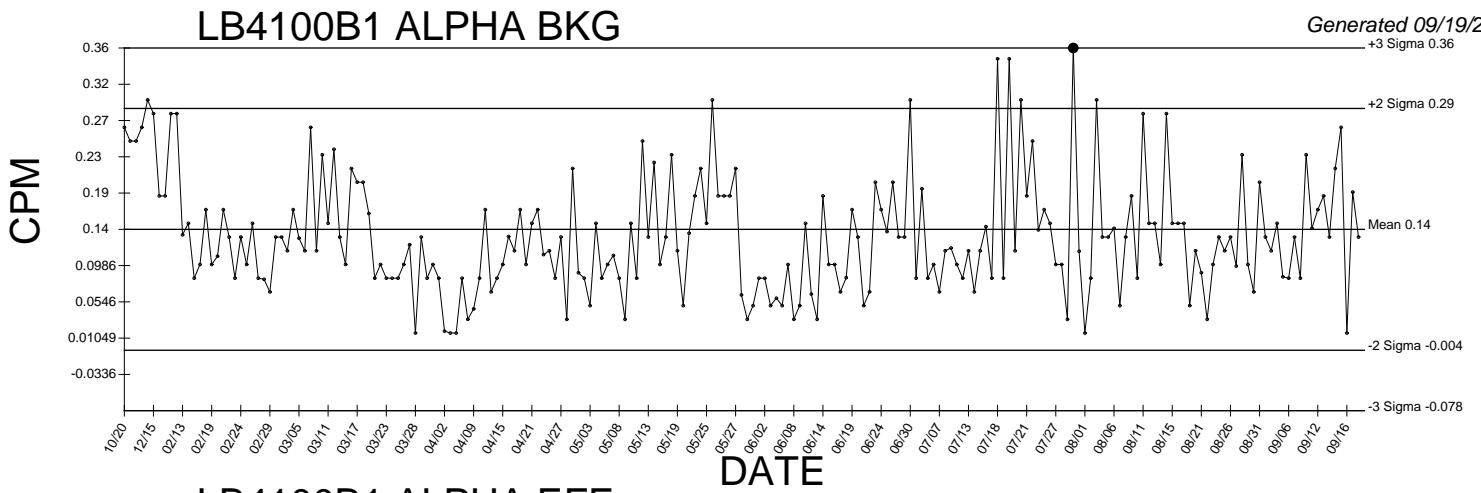
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LB4100D2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by R. Birch-Harman

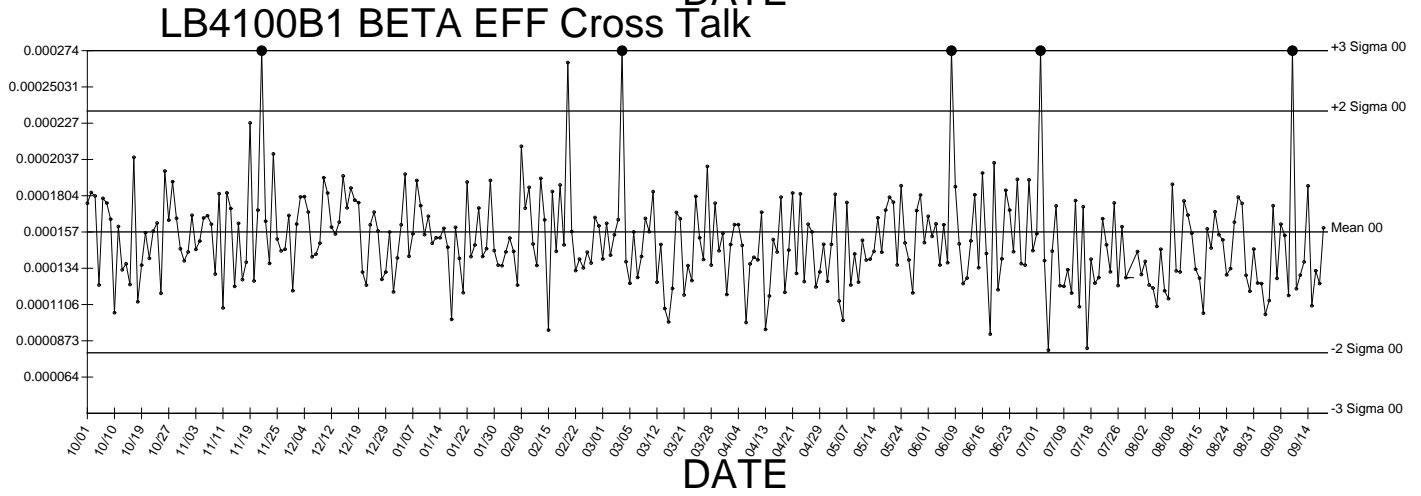
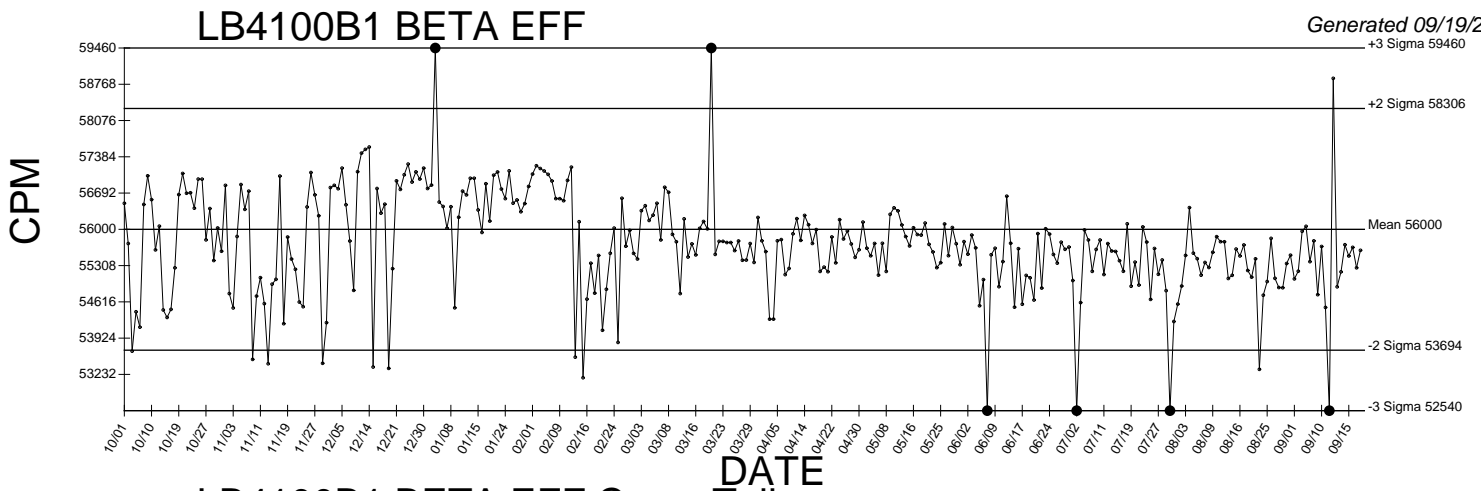
Date 9-29-16

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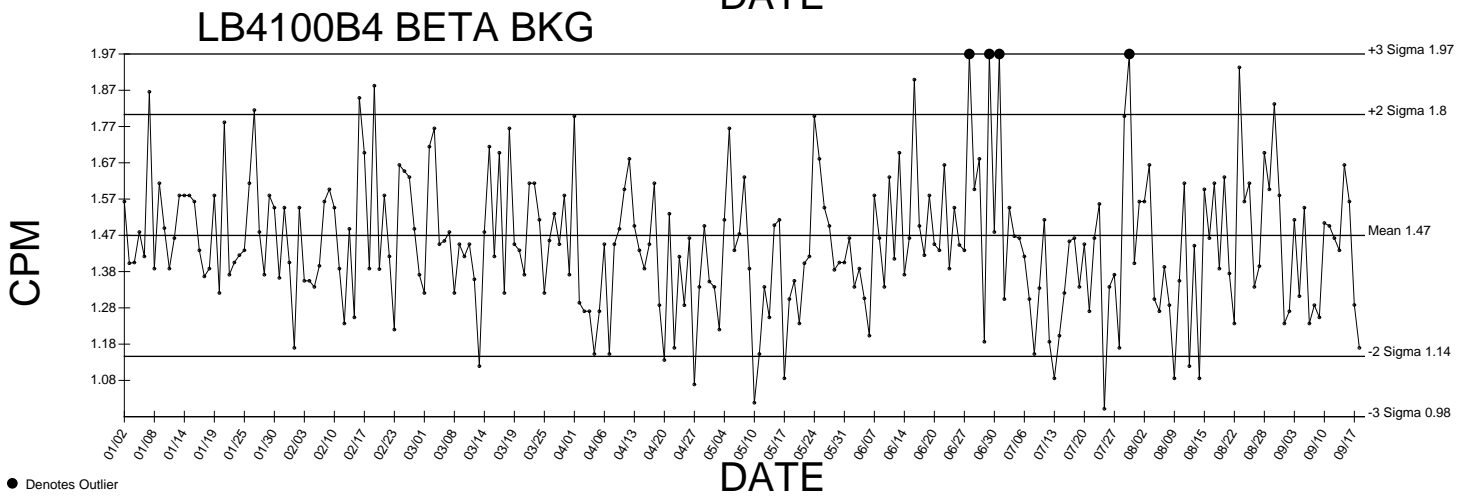
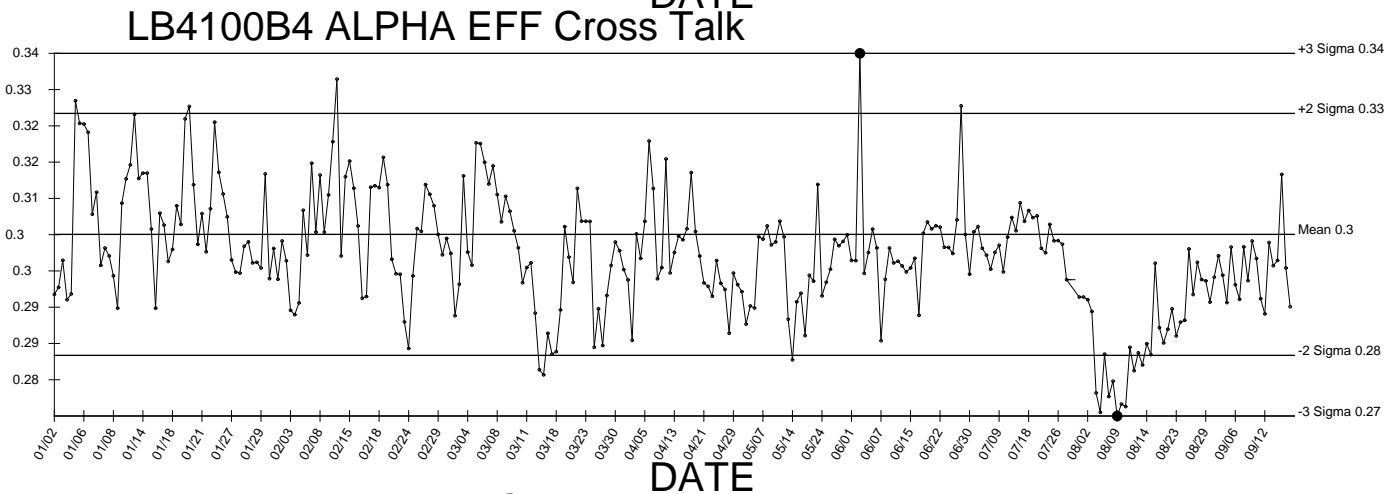
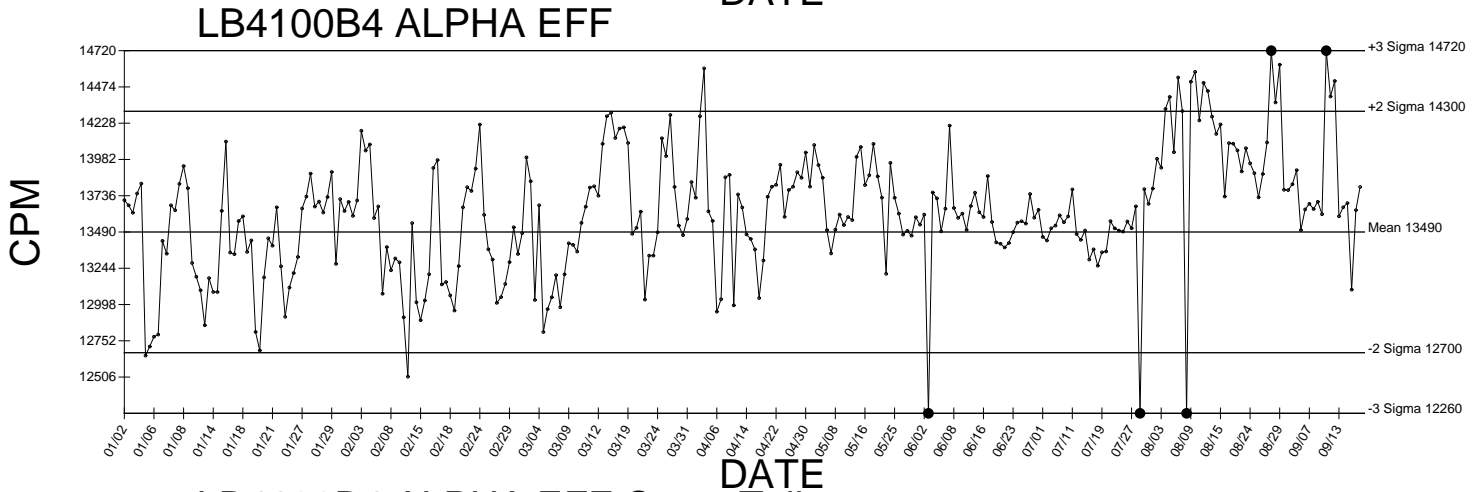
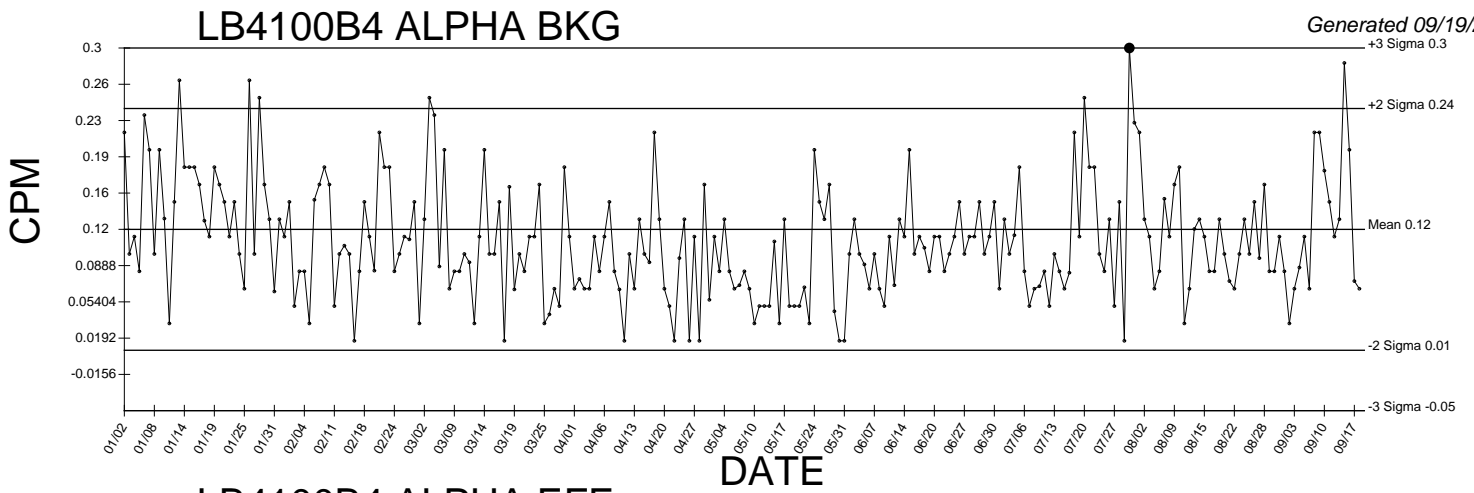
Background and Efficiency Data



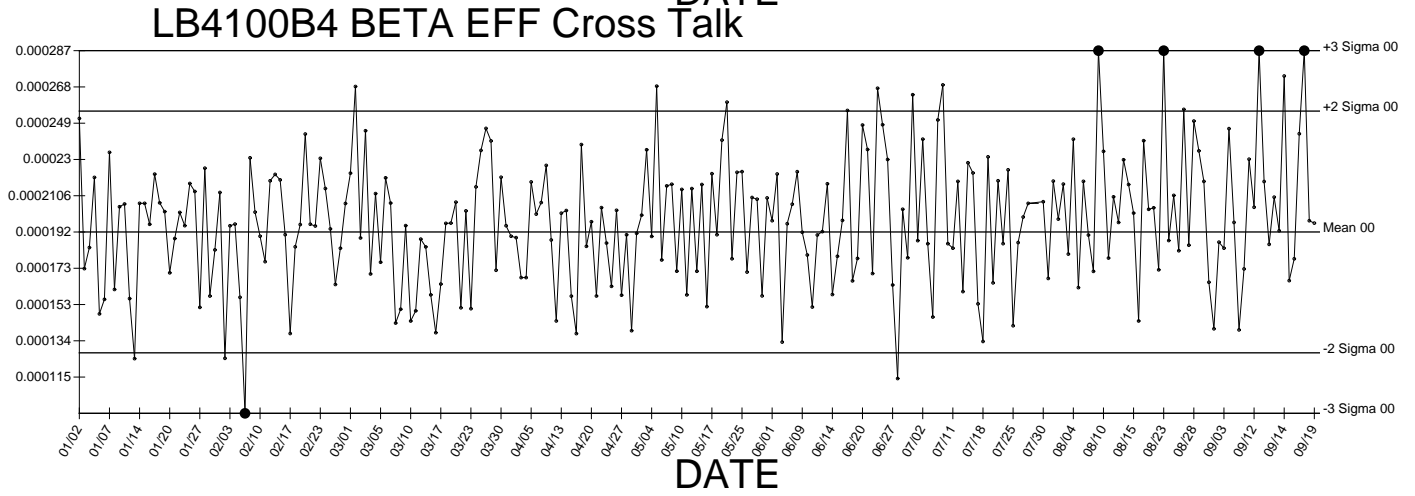
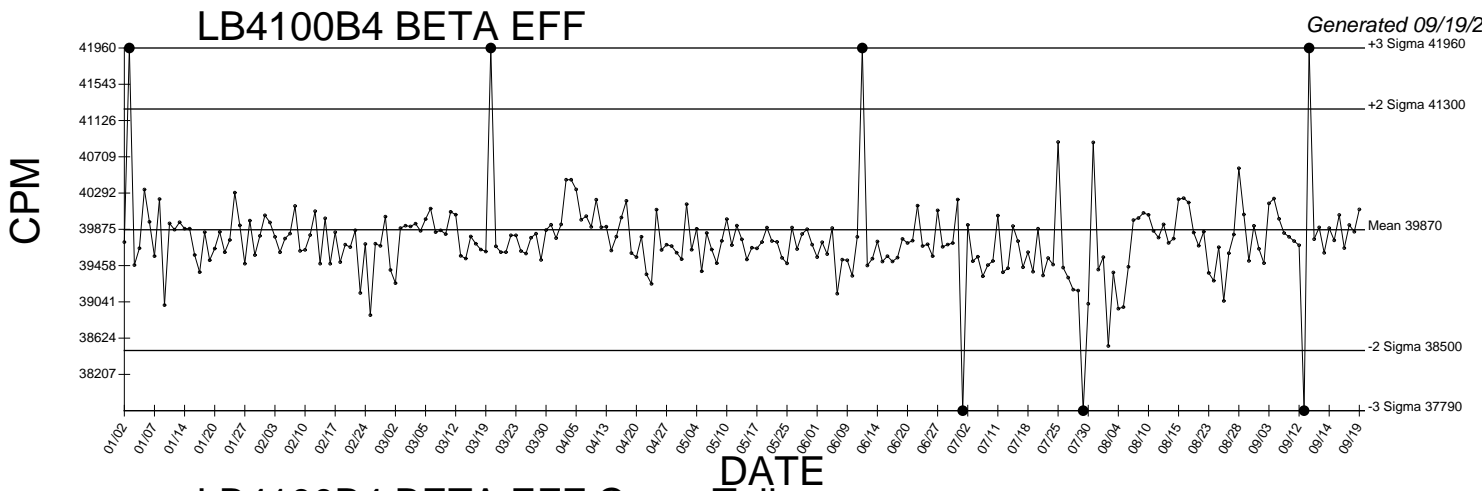
● Denotes Outlier



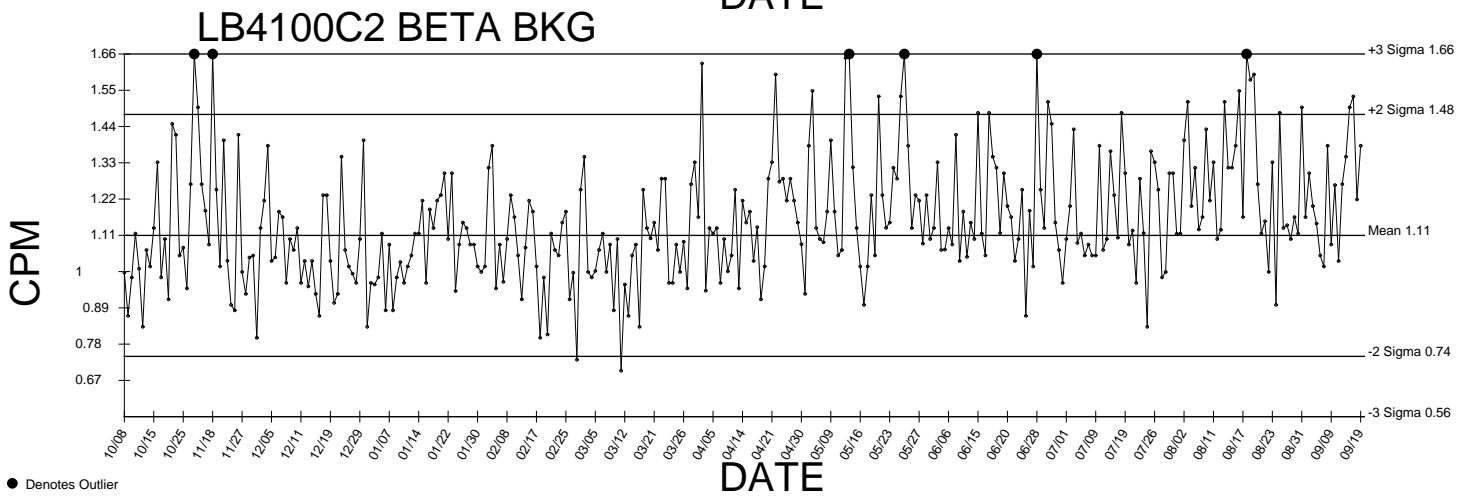
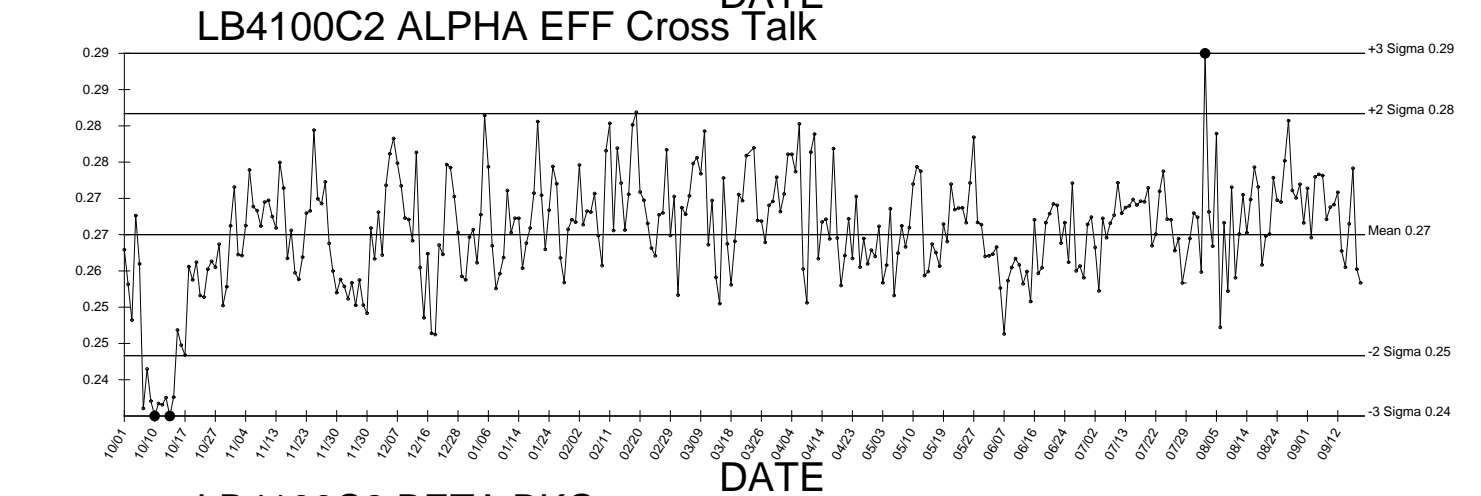
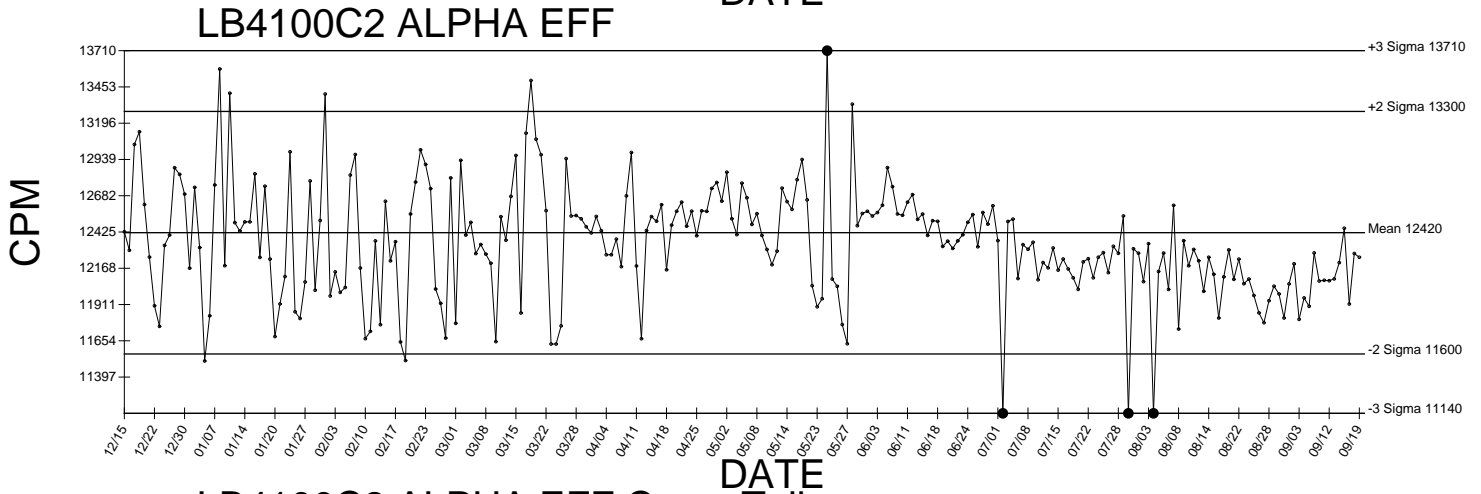
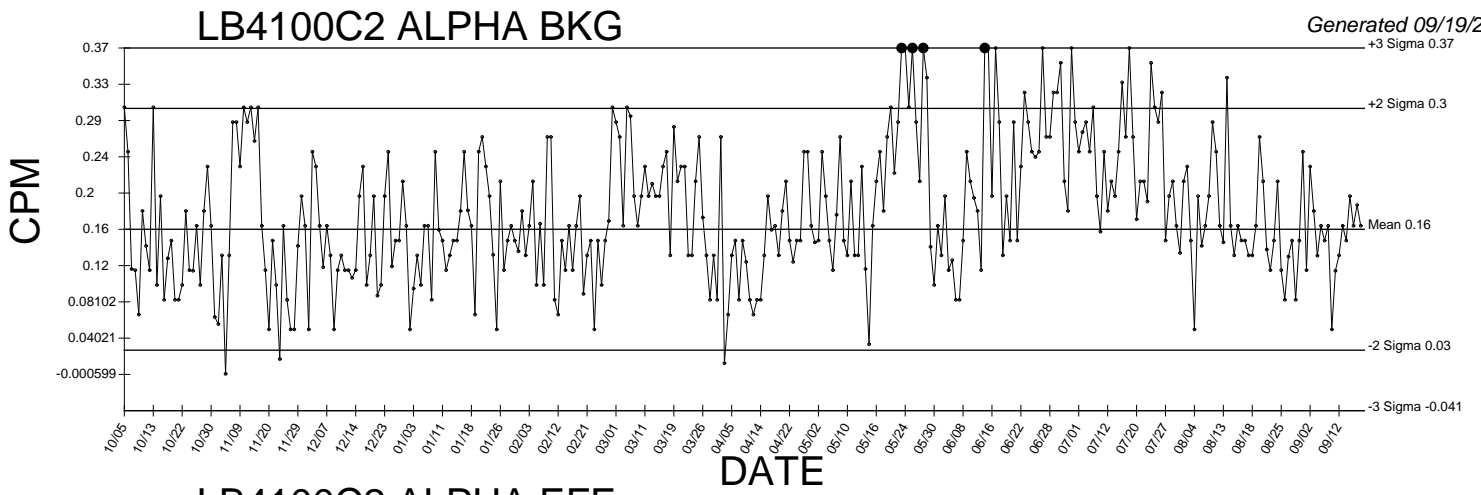
● Denotes Outlier



● Denotes Outlier



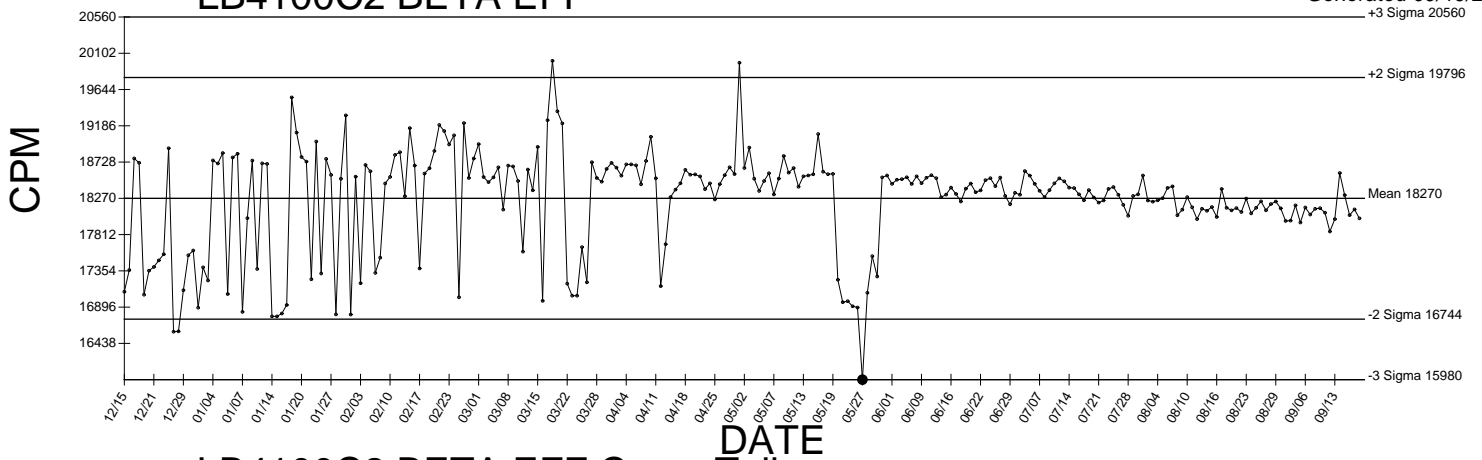
● Denotes Outlier



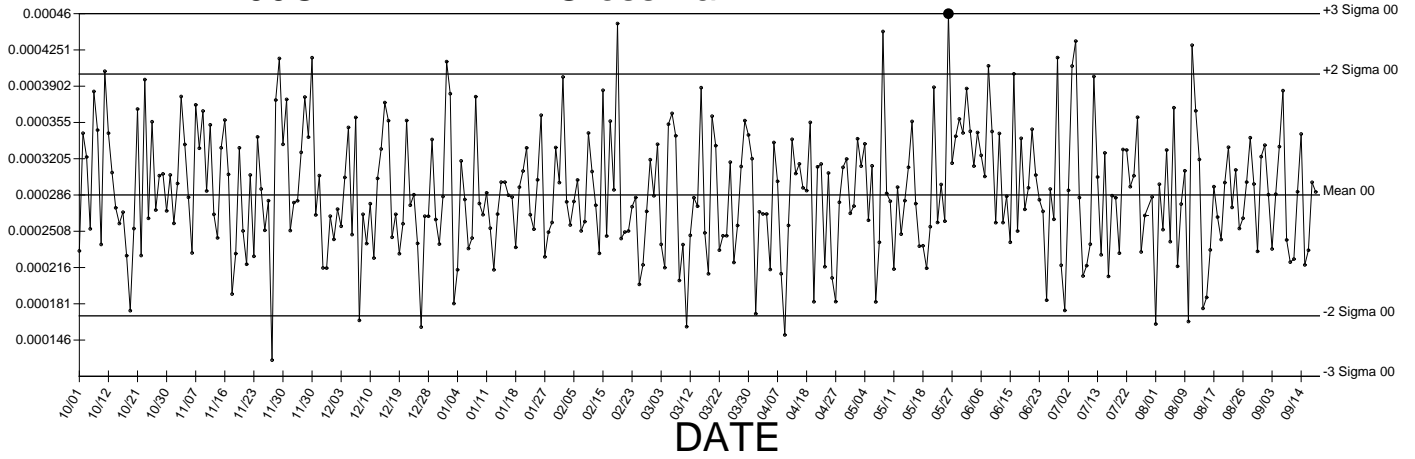
● Denotes Outlier

LB4100C2 BETA EFF

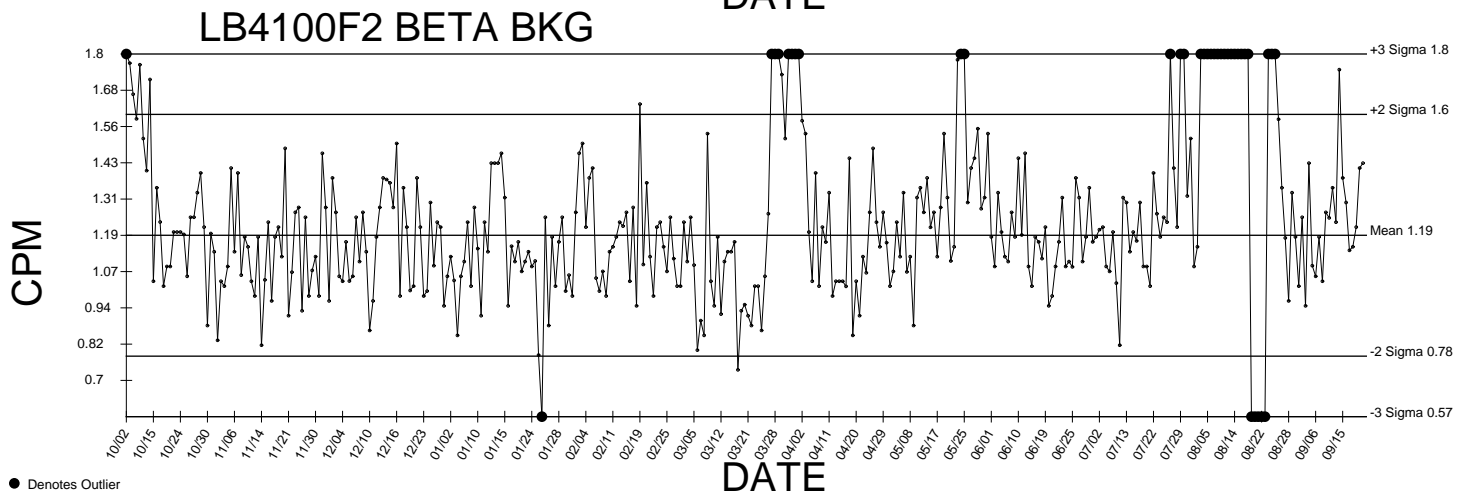
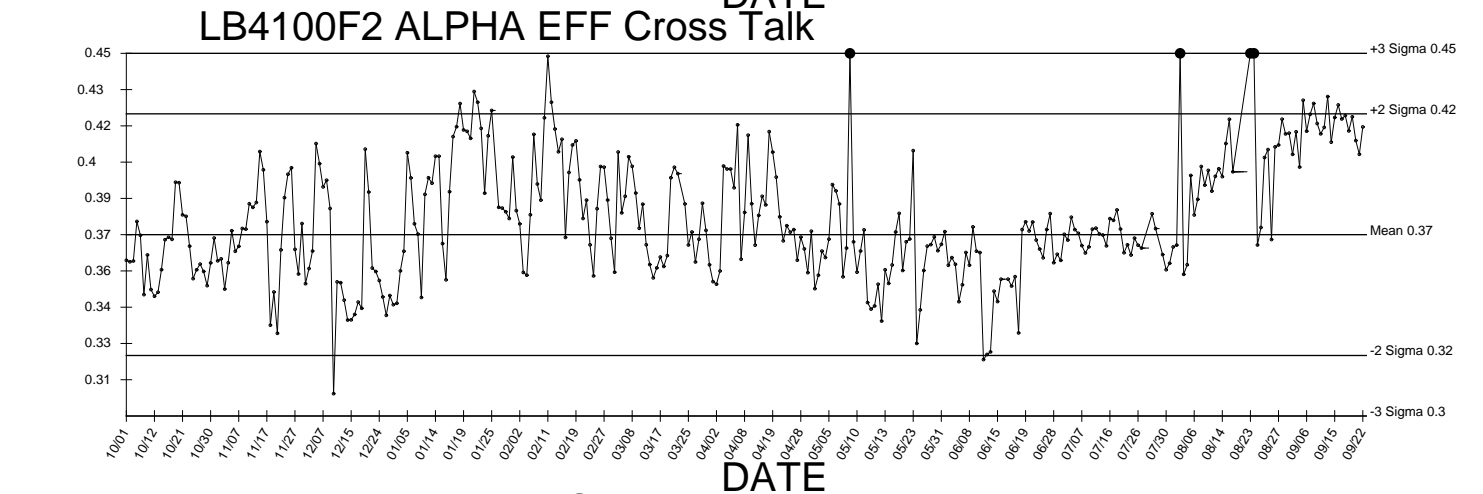
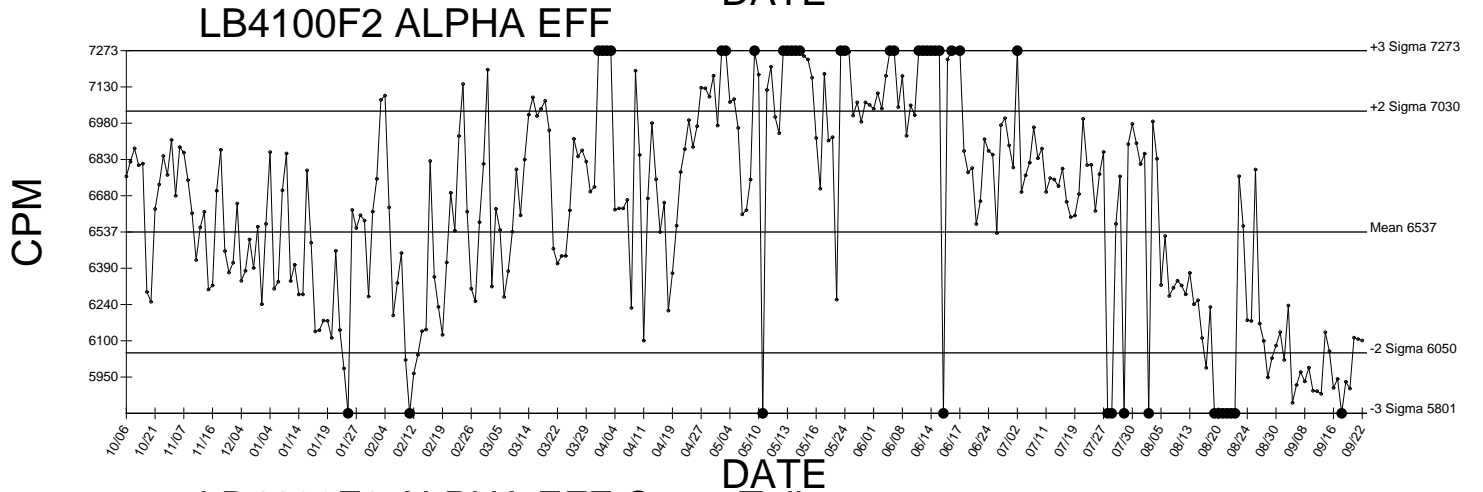
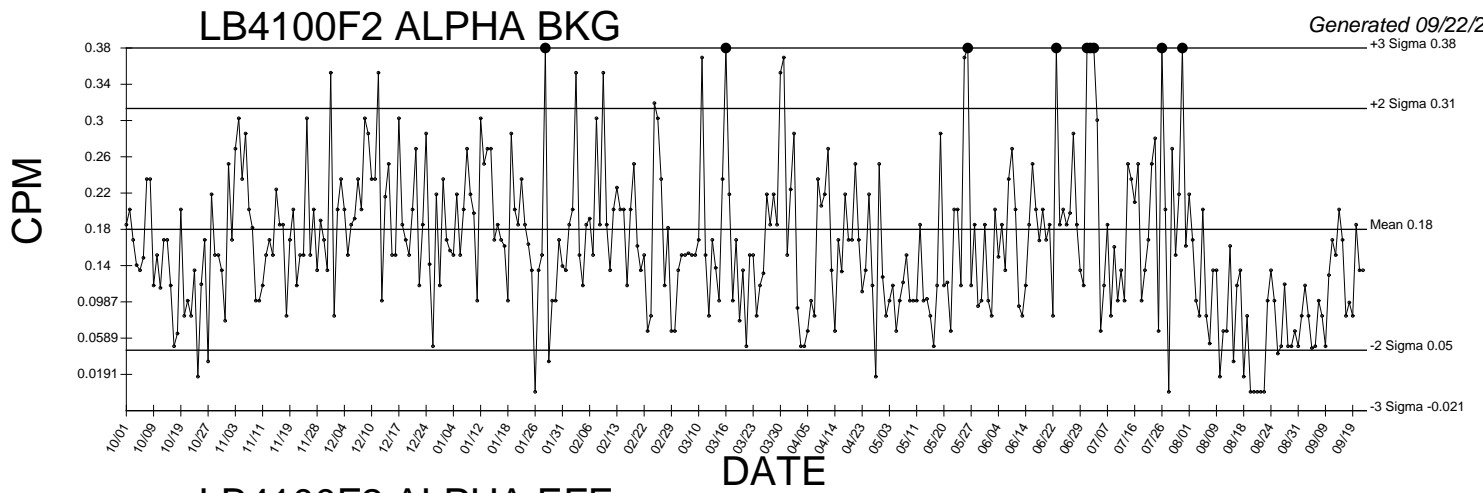
Generated 09/19/2016



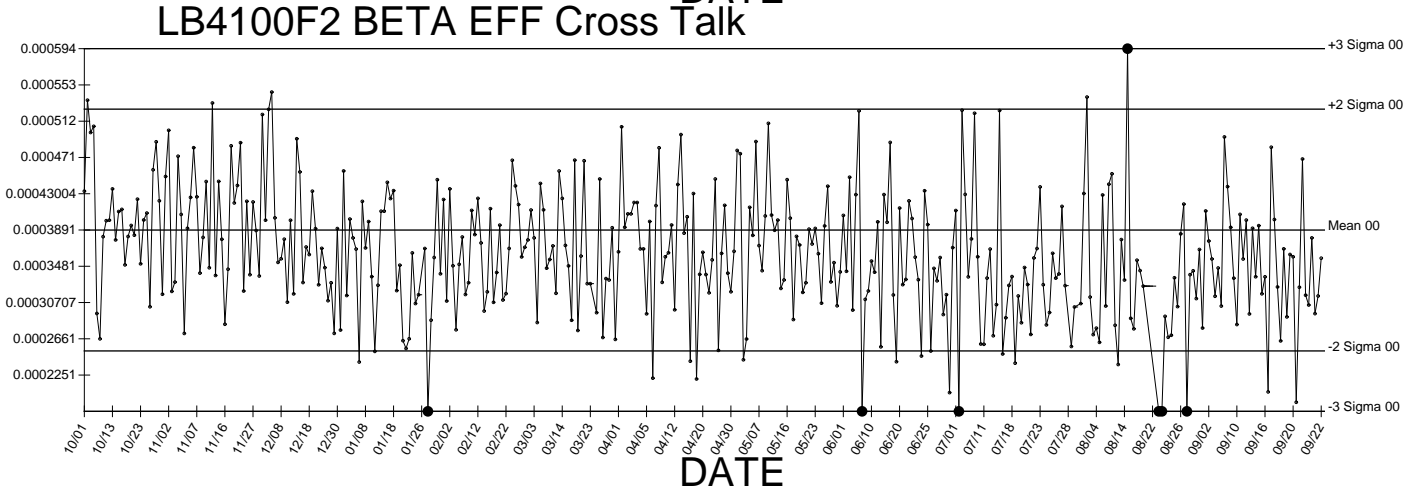
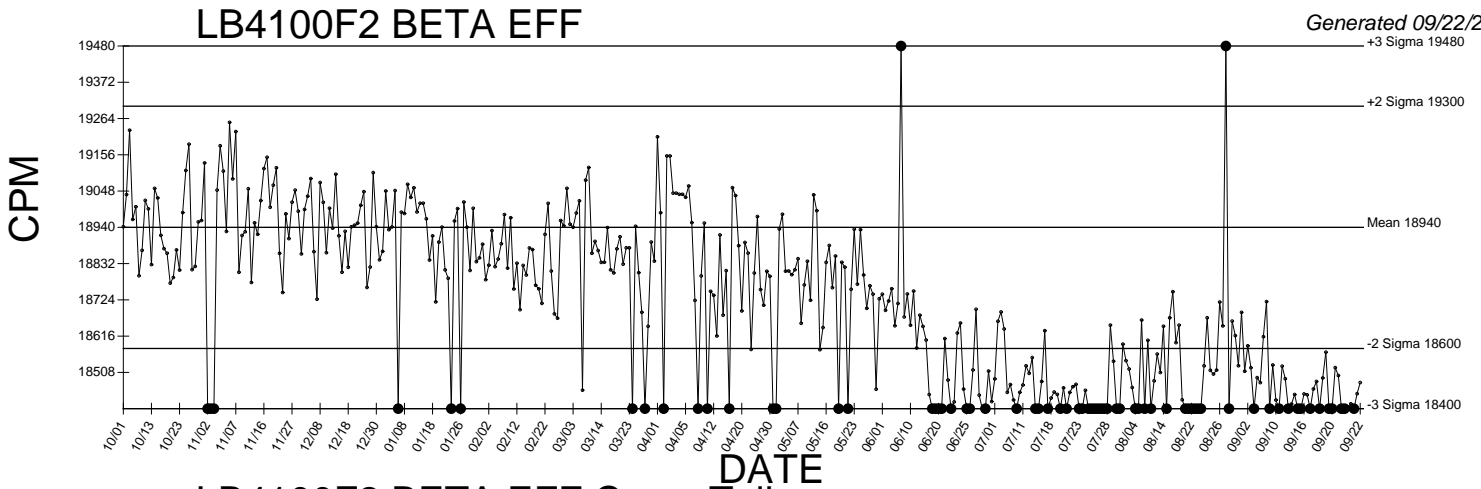
LB4100C2 BETA EFF Cross Talk



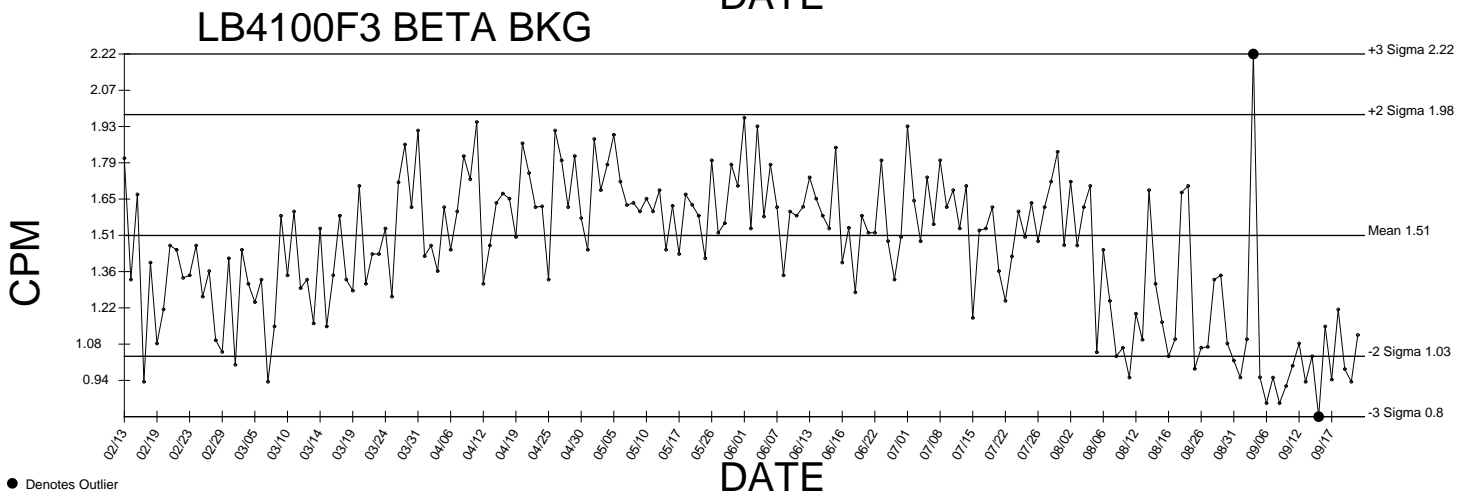
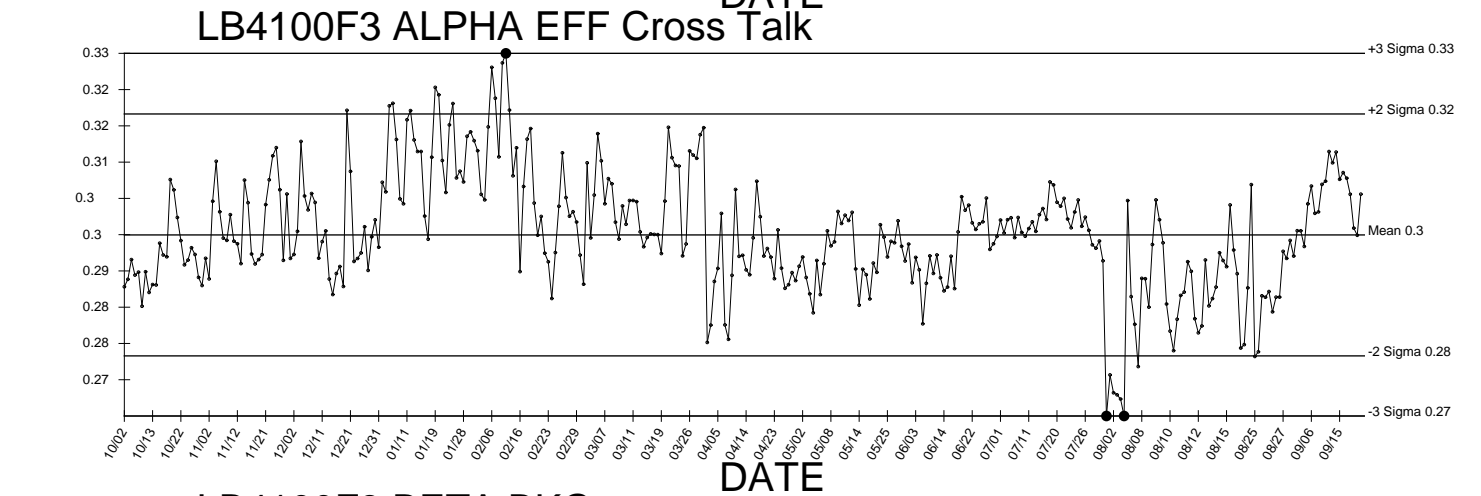
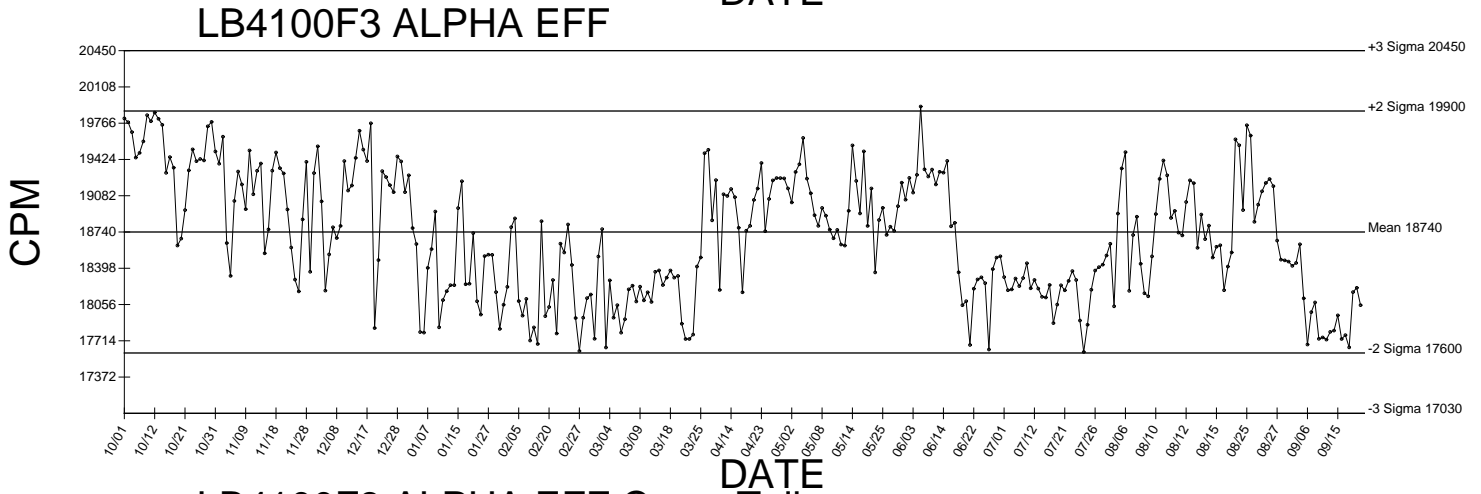
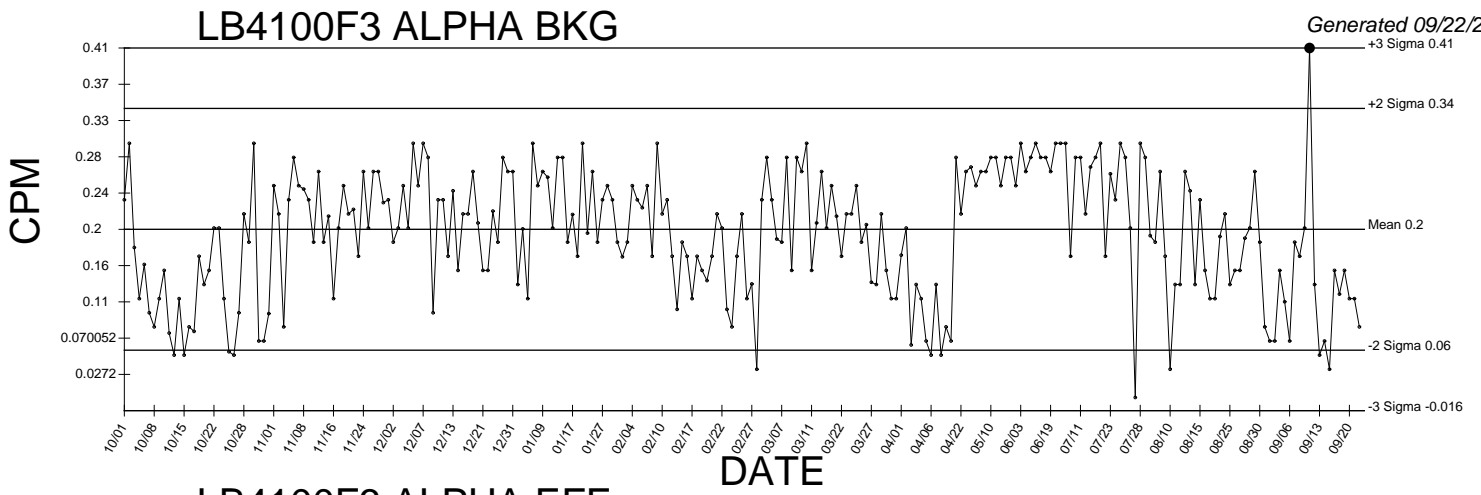
● Denotes Outlier



● Denotes Outlier



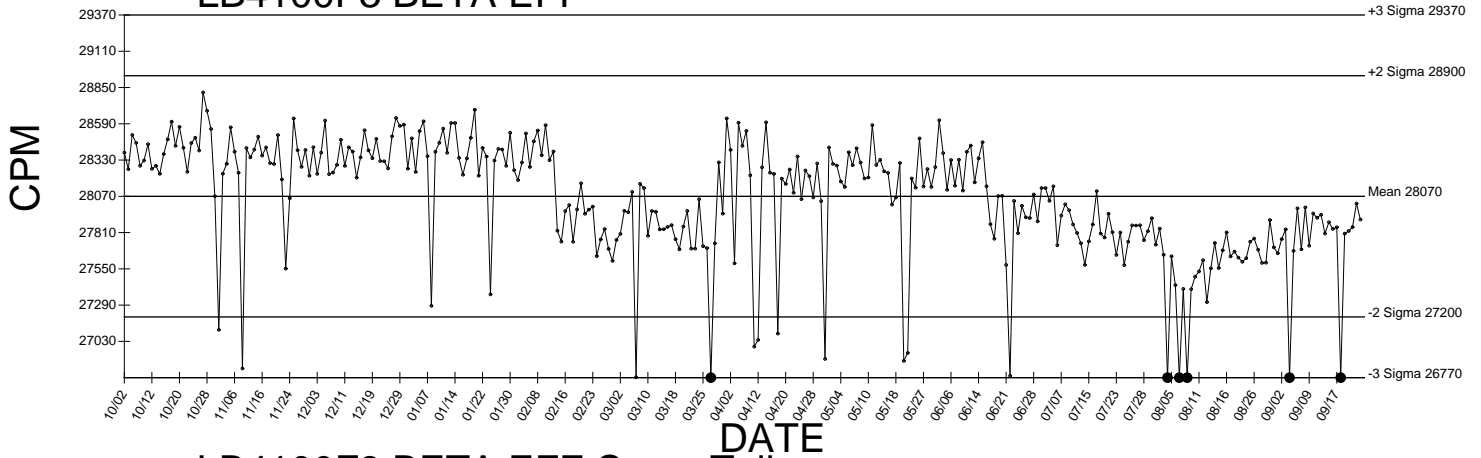
● Denotes Outlier



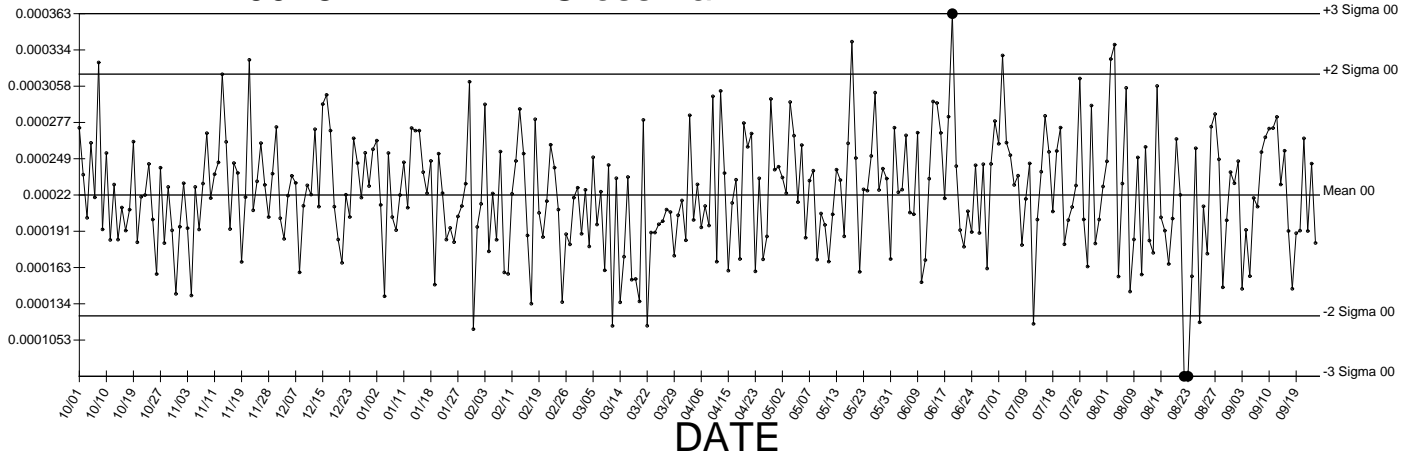
● Denotes Outlier

LB4100F3 BETA EFF

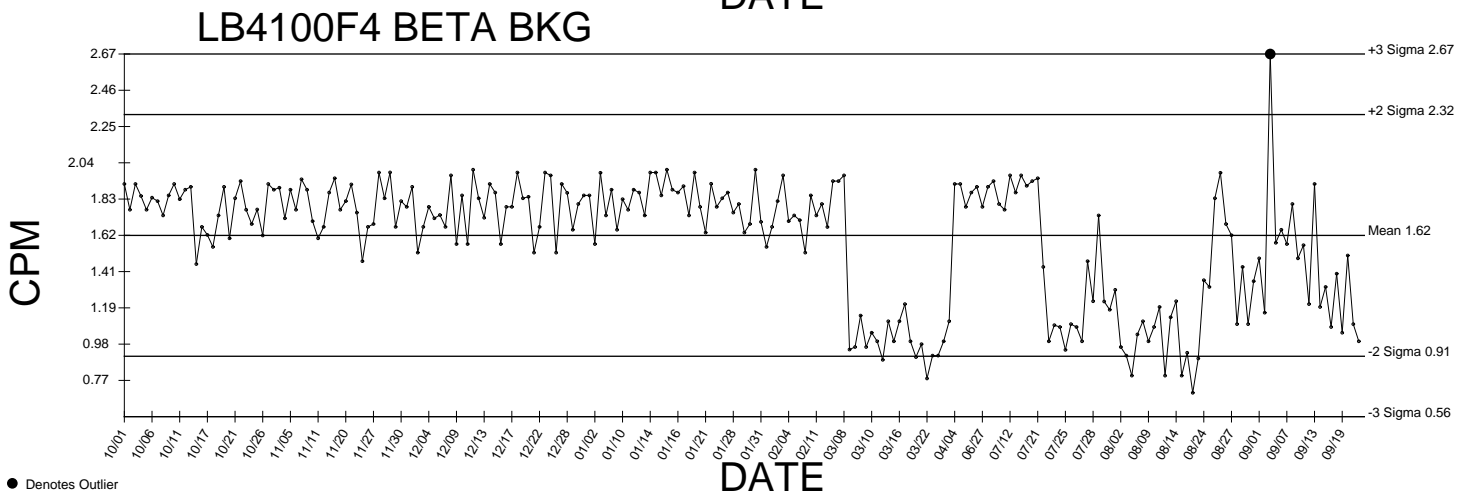
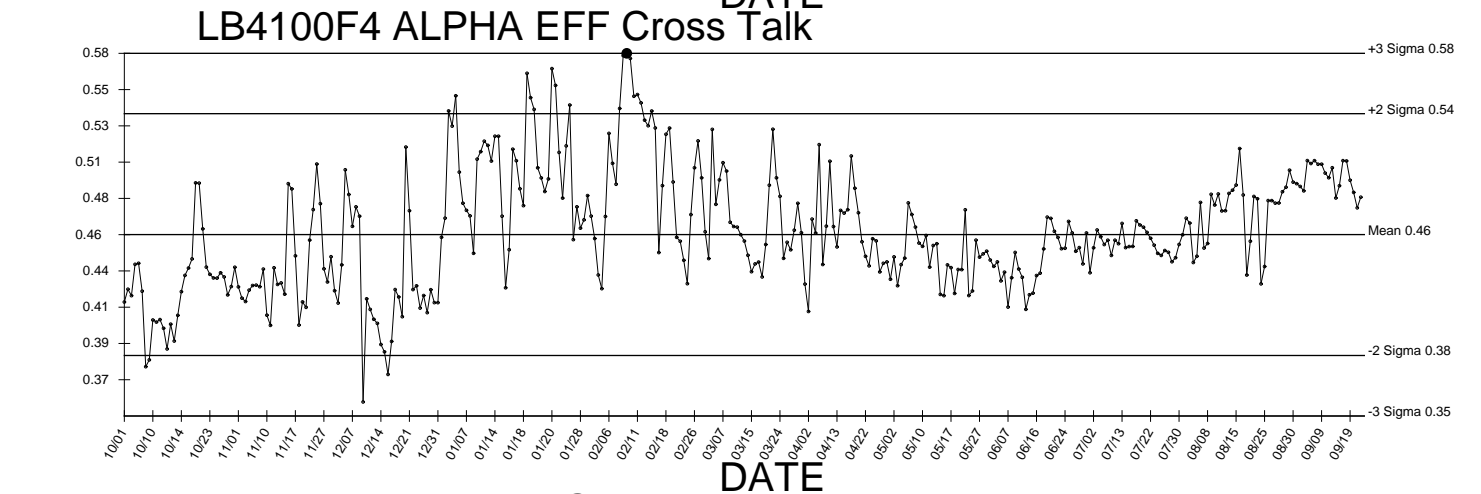
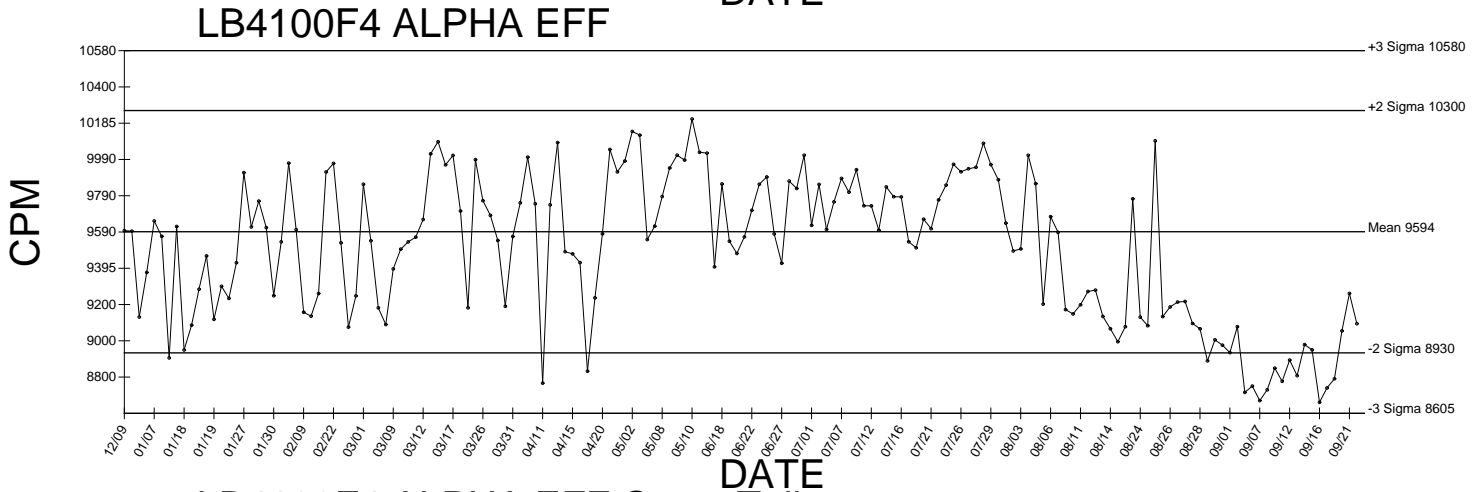
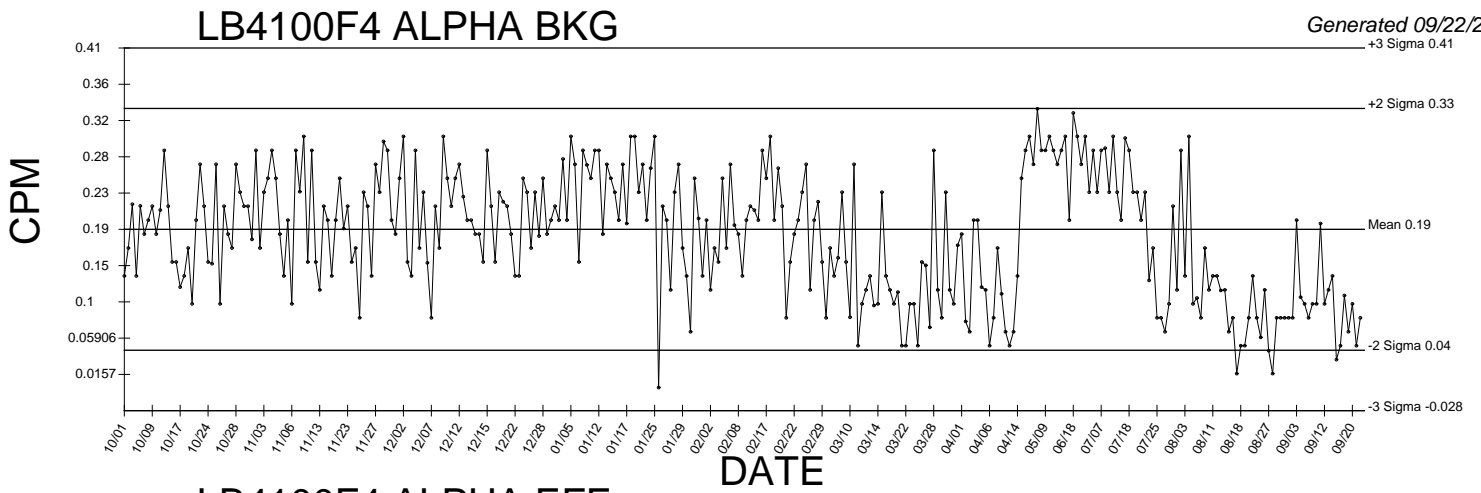
Generated 09/22/2016



LB4100F3 BETA EFF Cross Talk



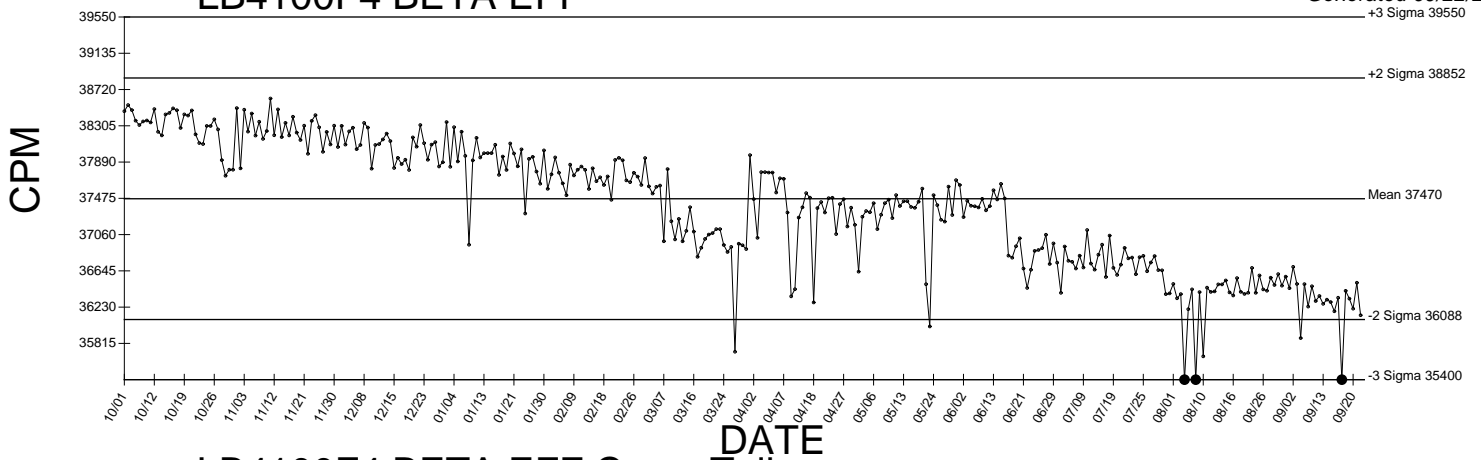
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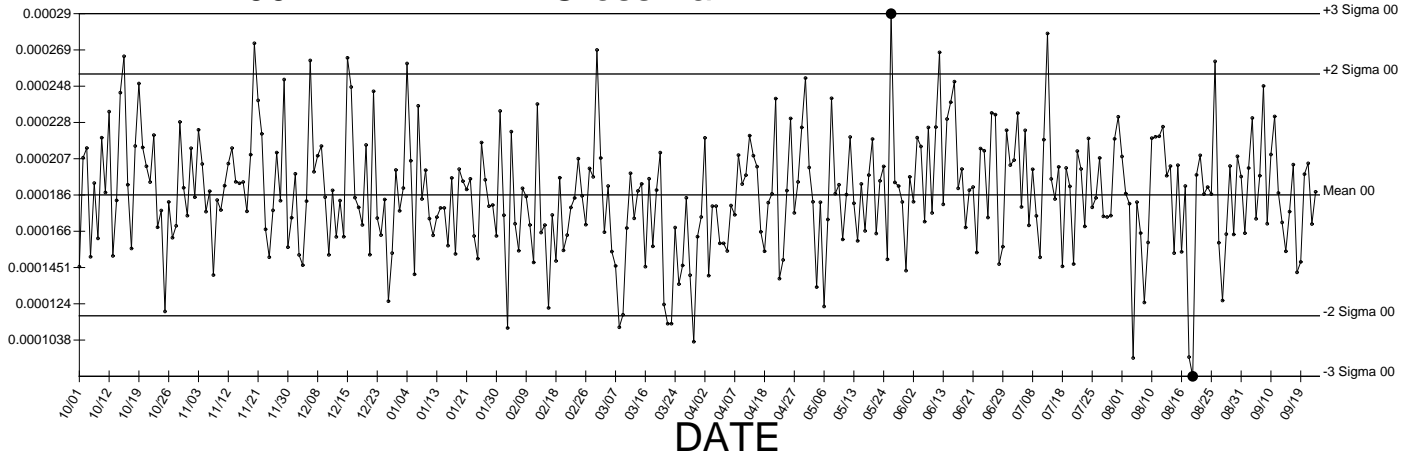
● Denotes Outlier

LB4100F4 BETA EFF

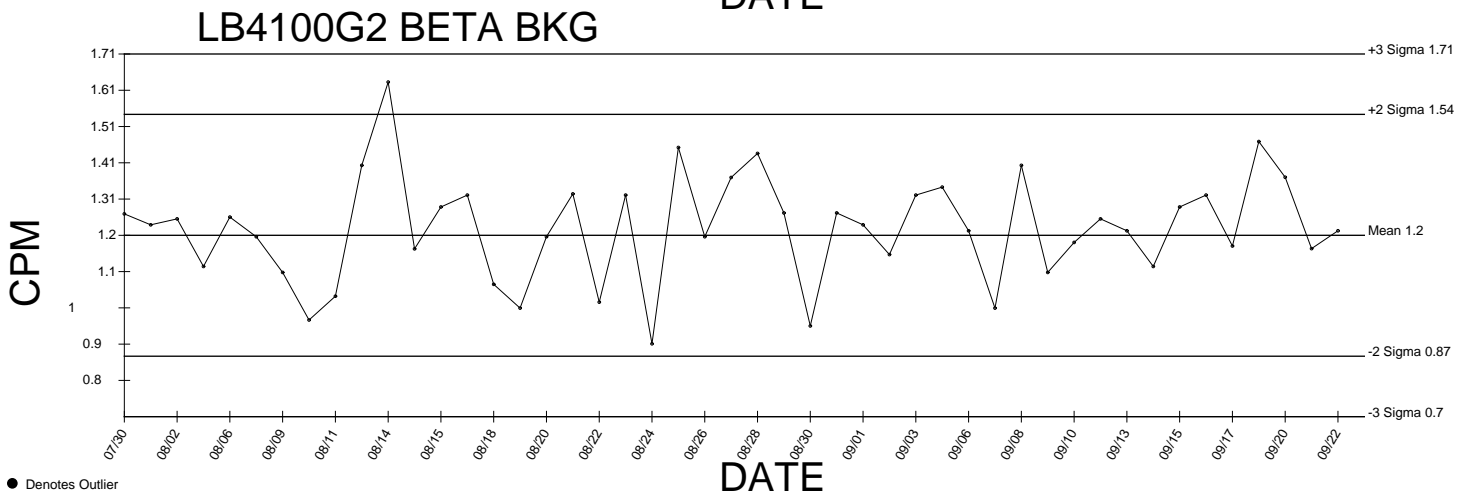
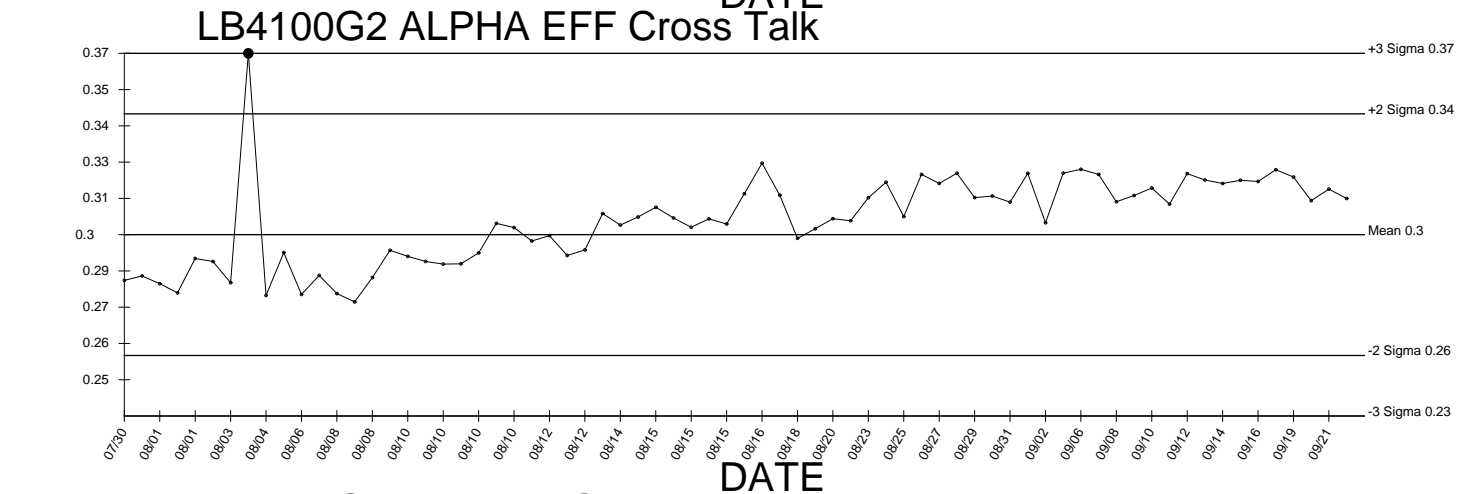
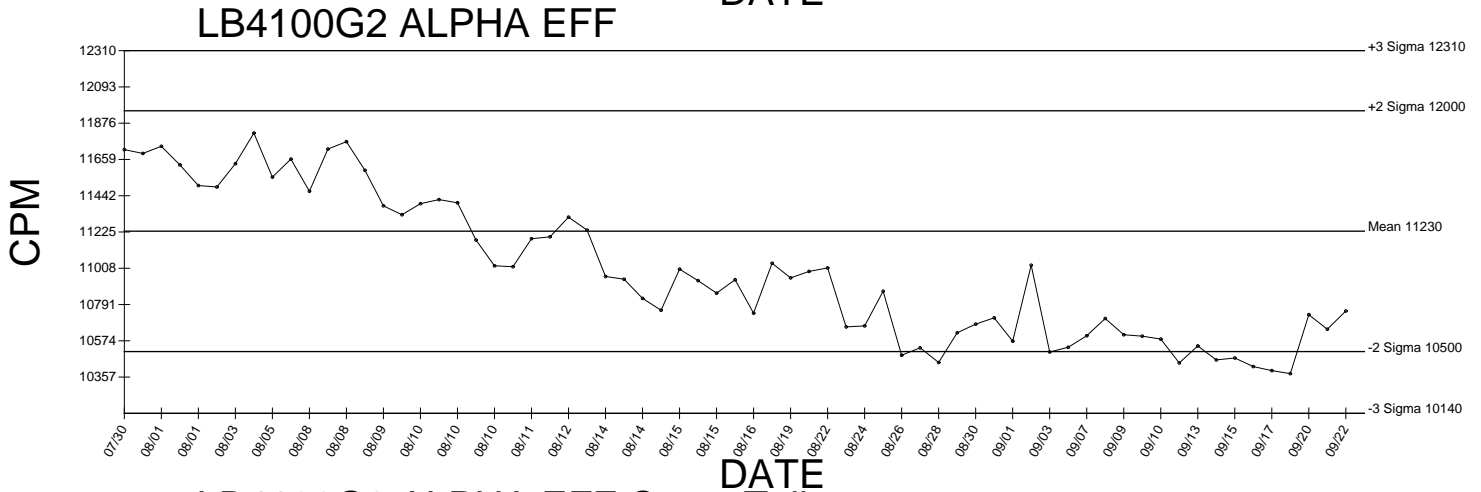
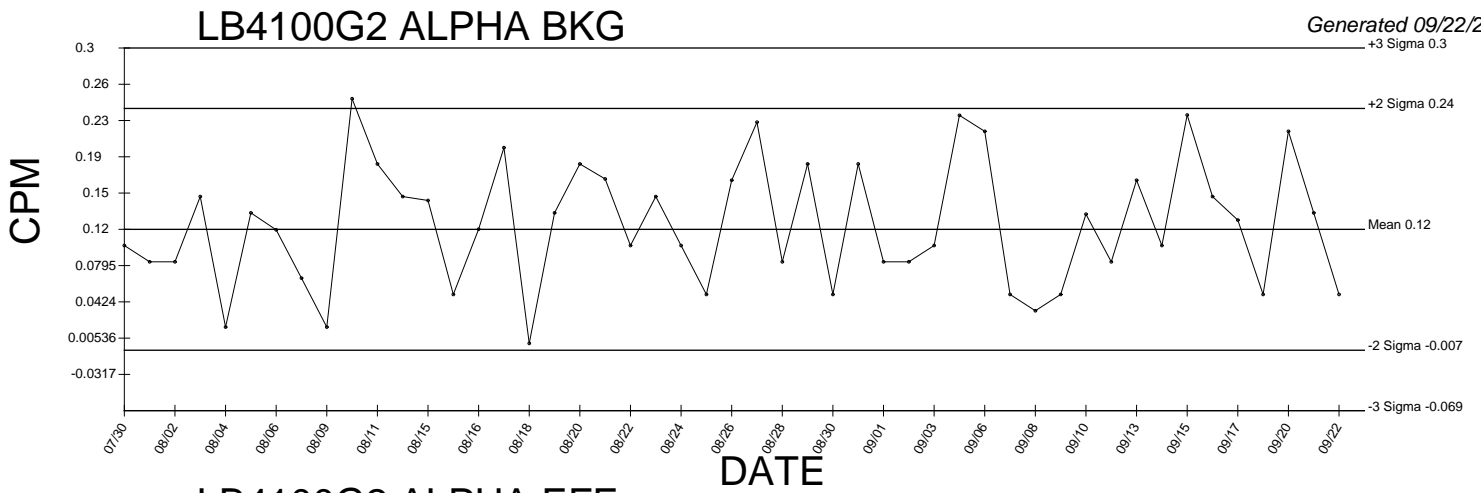
Generated 09/22/2016



LB4100F4 BETA EFF Cross Talk



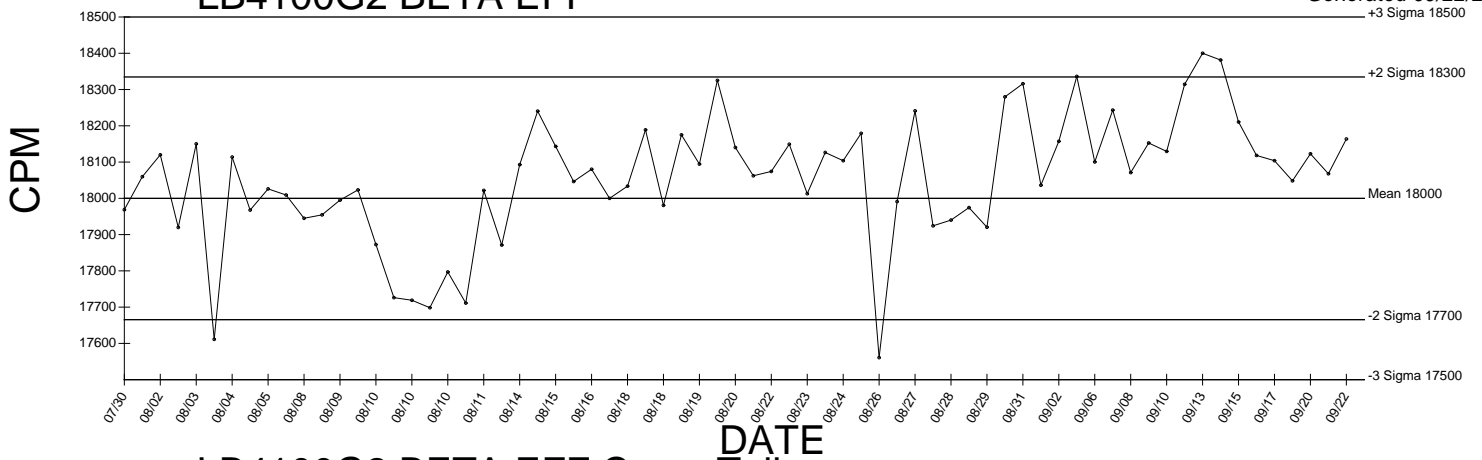
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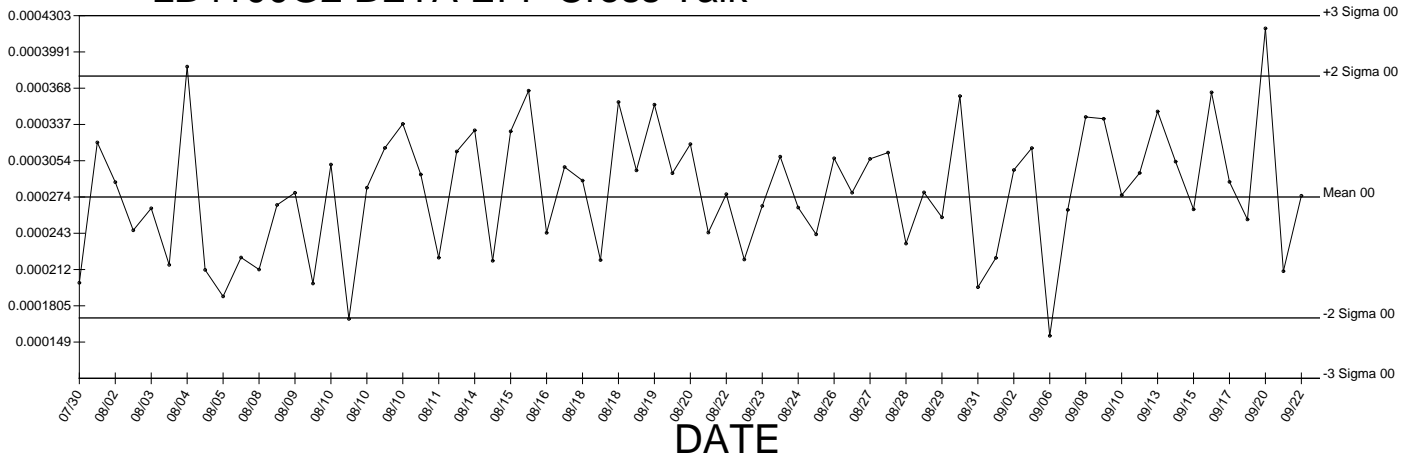
● Denotes Outlier

LB4100G2 BETA EFF

Generated 09/22/2016

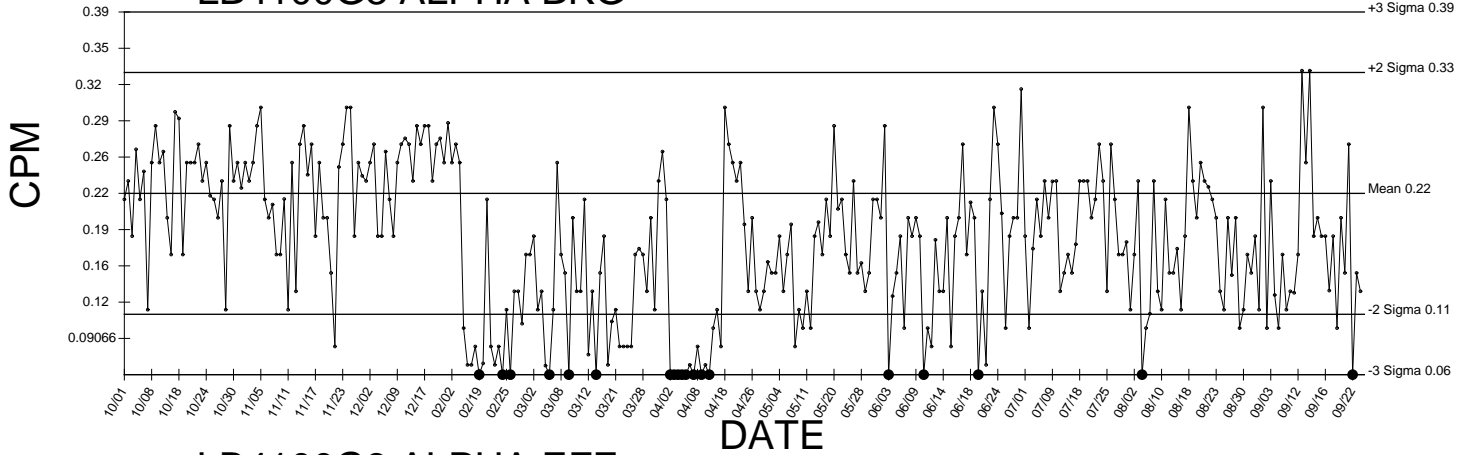


LB4100G2 BETA EFF Cross Talk

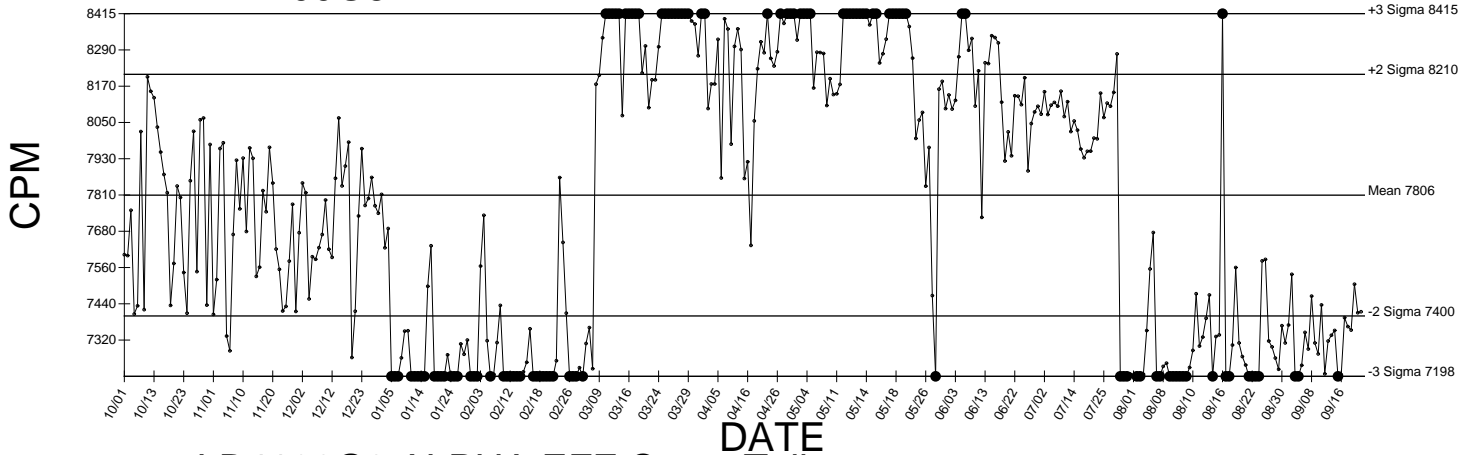


● Denotes Outlier

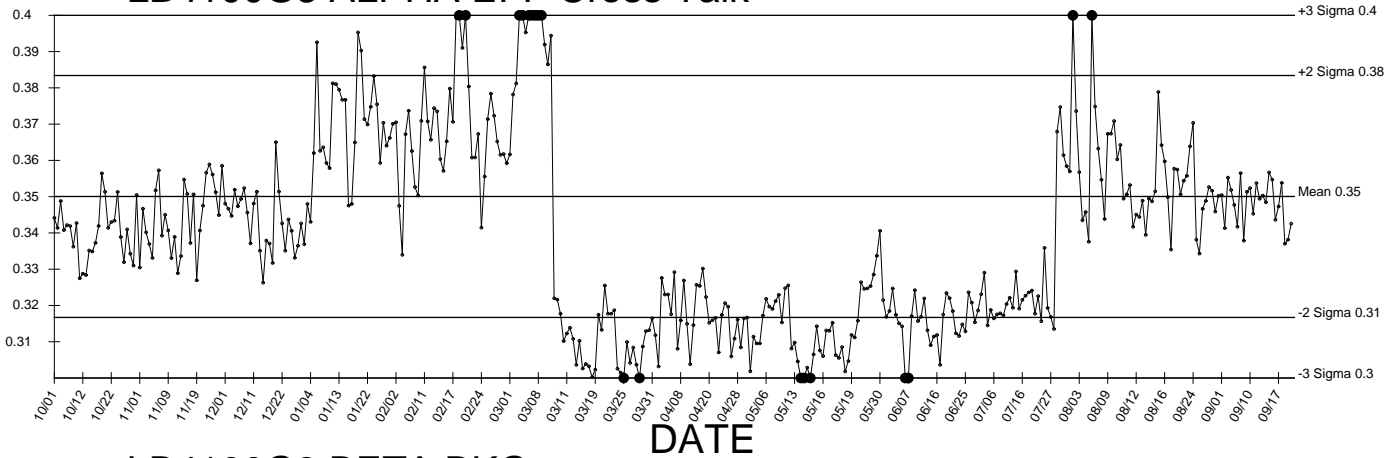
LB4100G3 ALPHA BKG



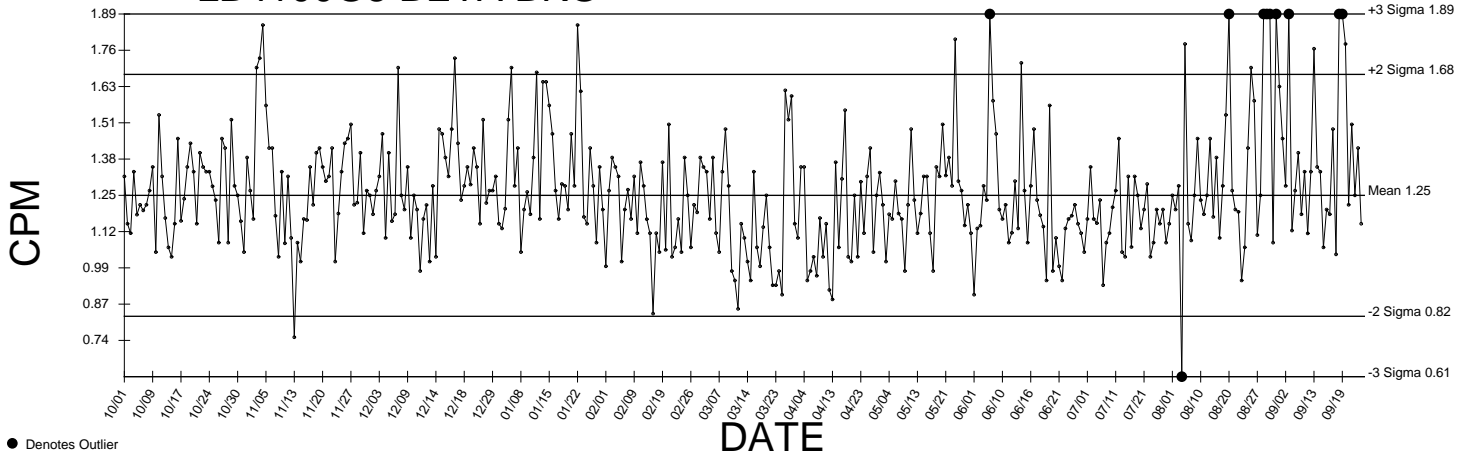
LB4100G3 ALPHA EFF



LB4100G3 ALPHA EFF Cross Talk



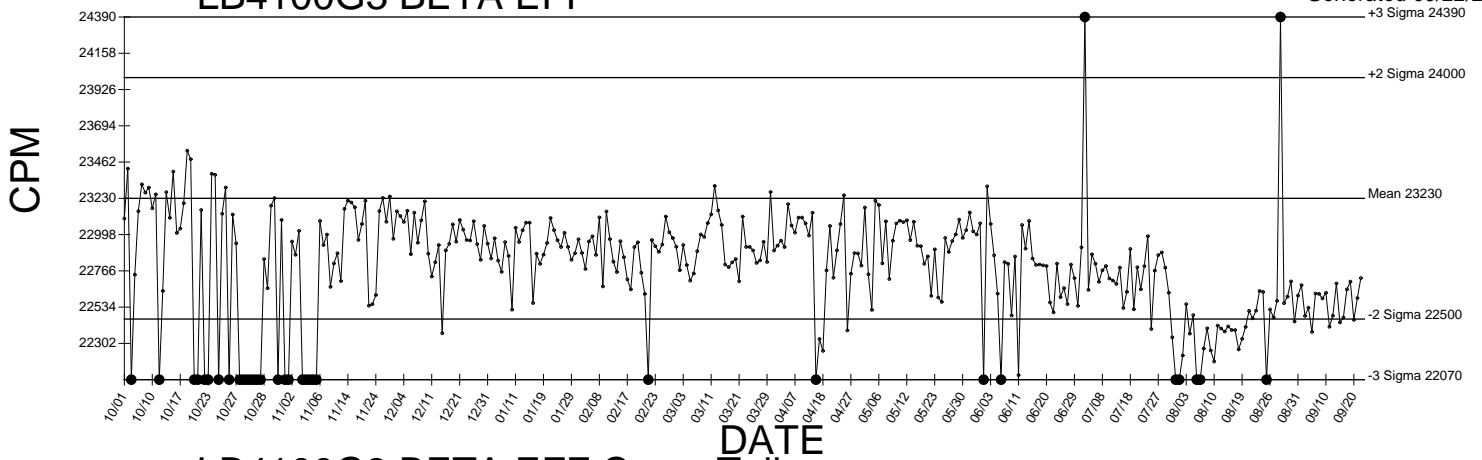
LB4100G3 BETA BKG



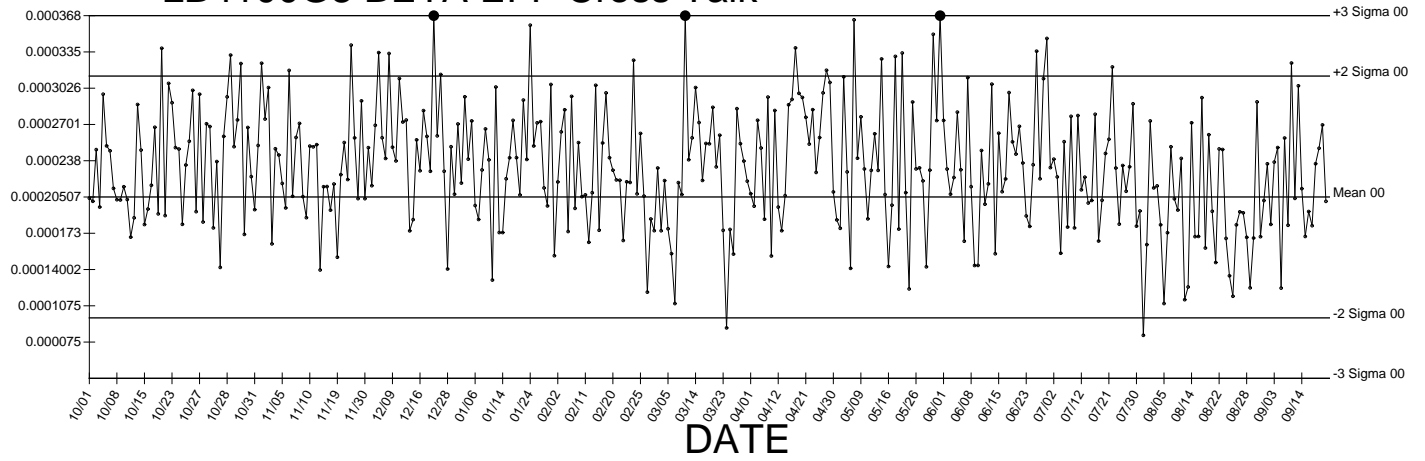
● Denotes Outlier

LB4100G3 BETA EFF

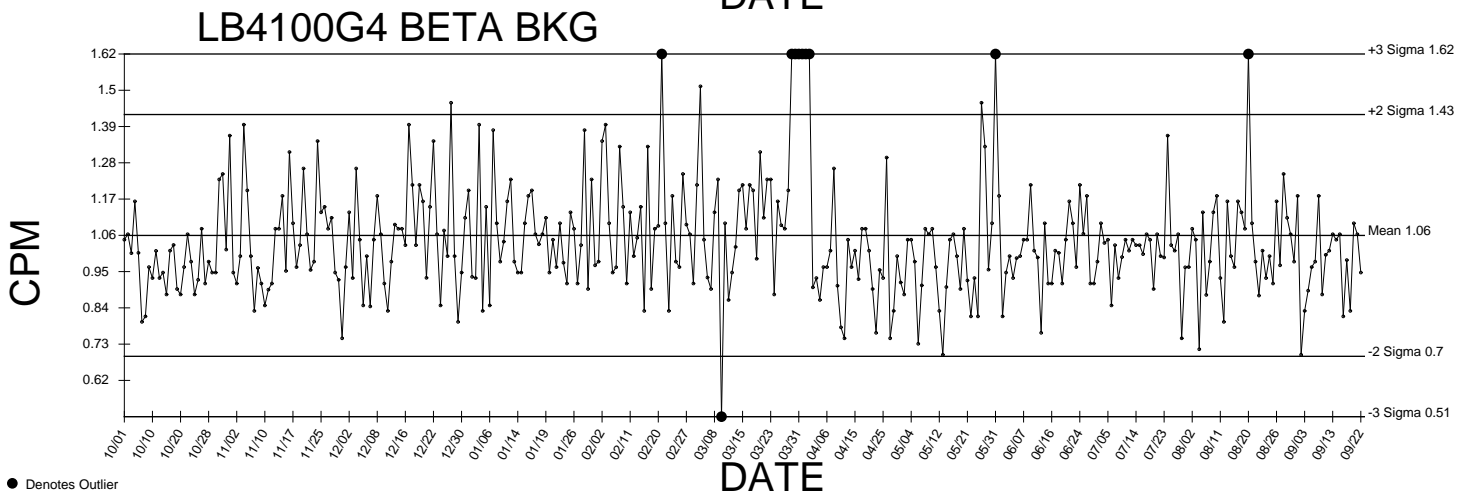
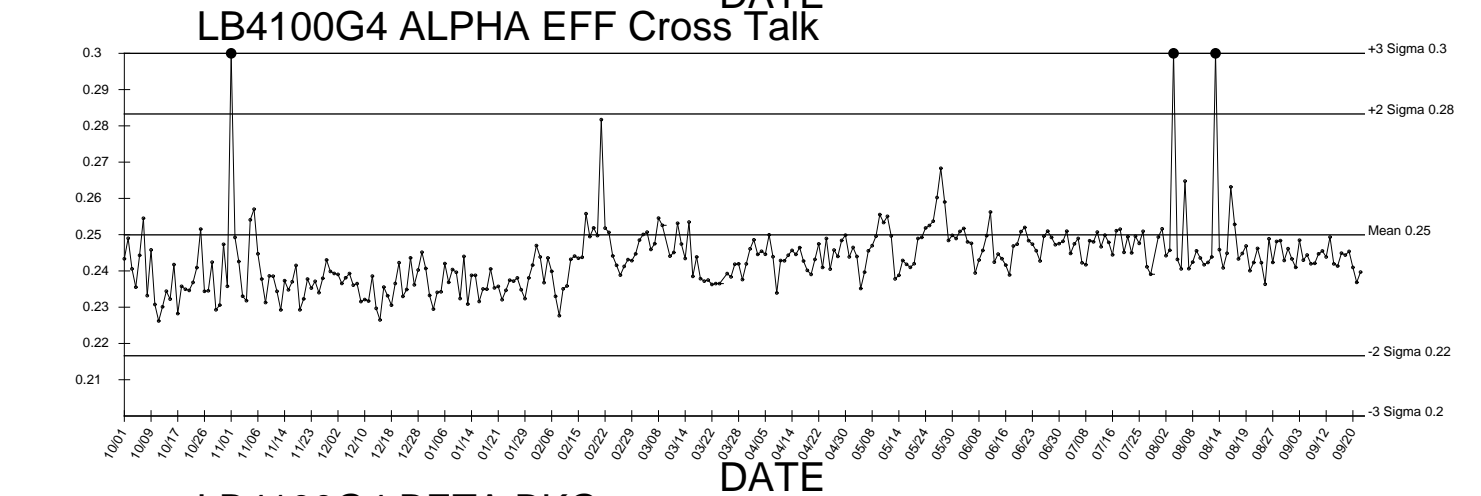
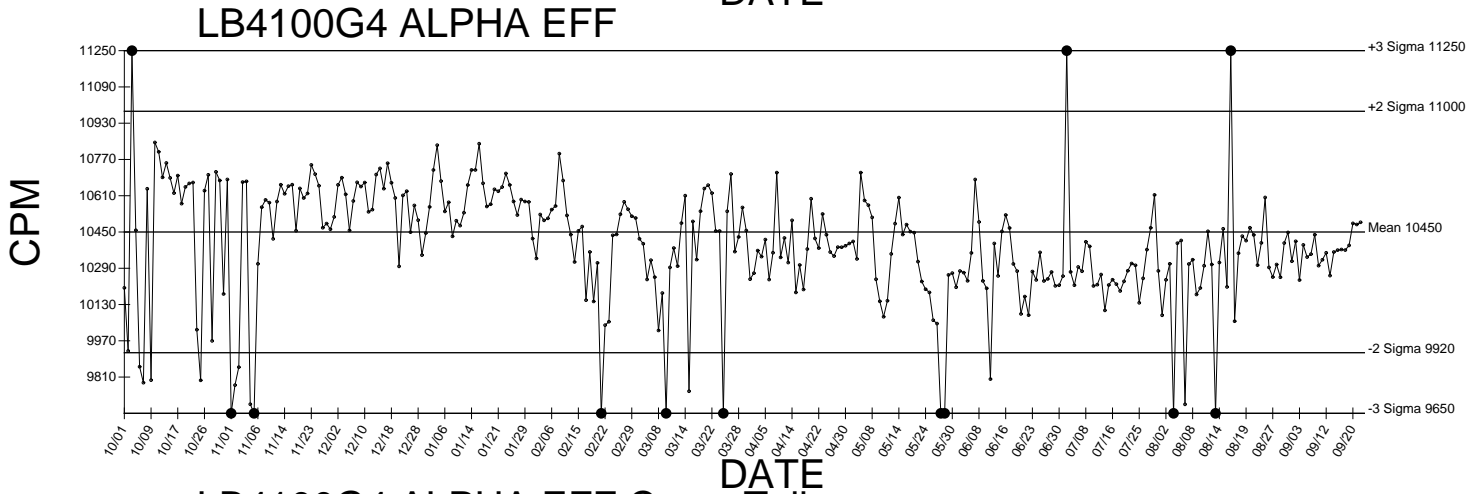
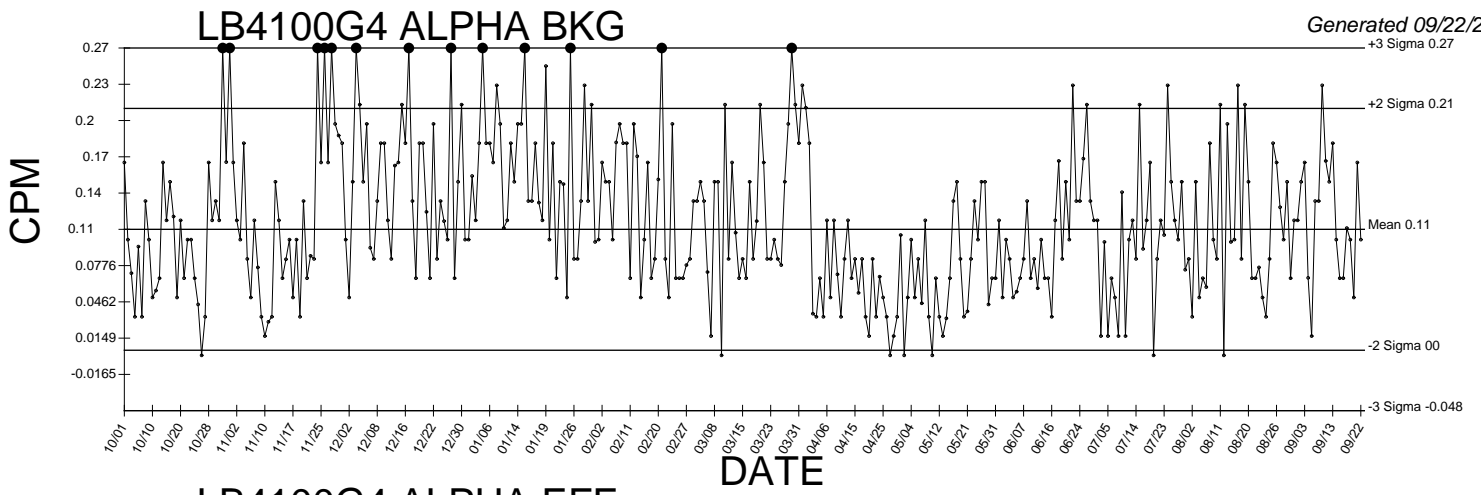
Generated 09/22/2016



LB4100G3 BETA EFF Cross Talk



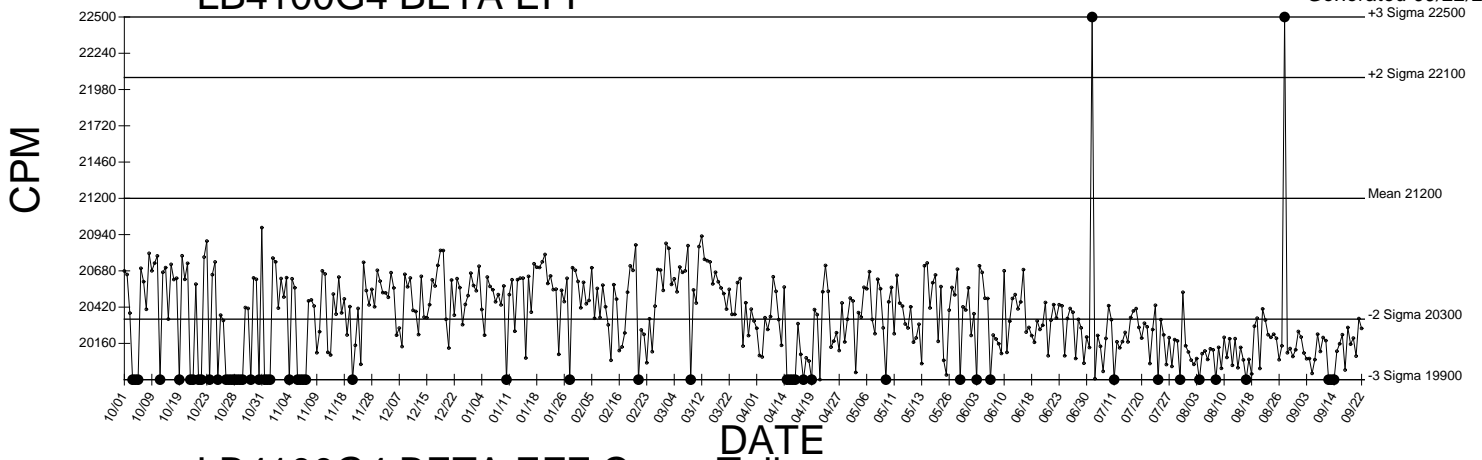
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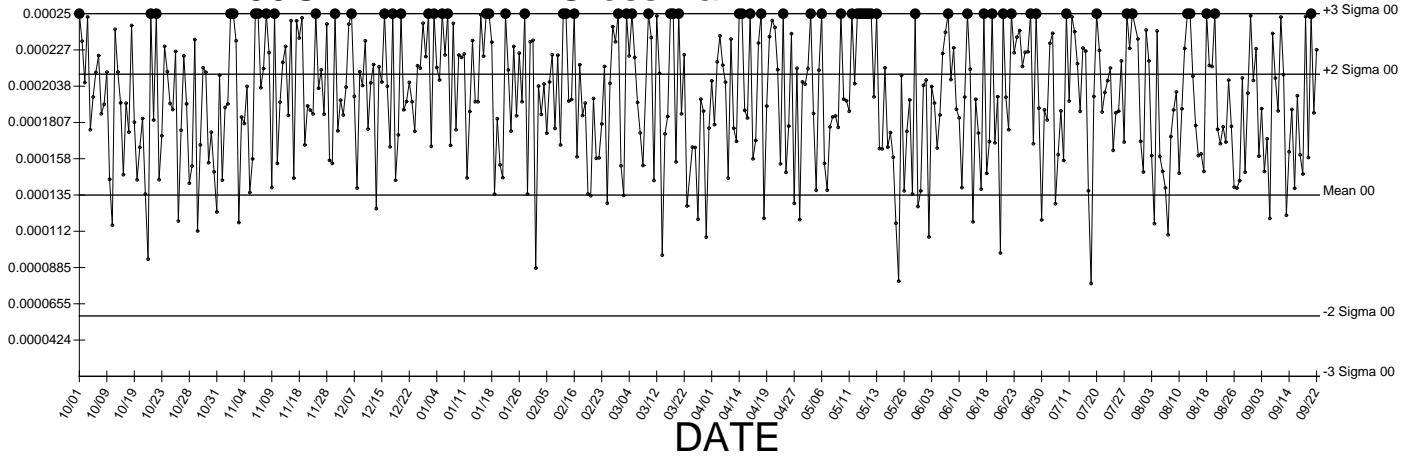
● Denotes Outlier

LB4100G4 BETA EFF

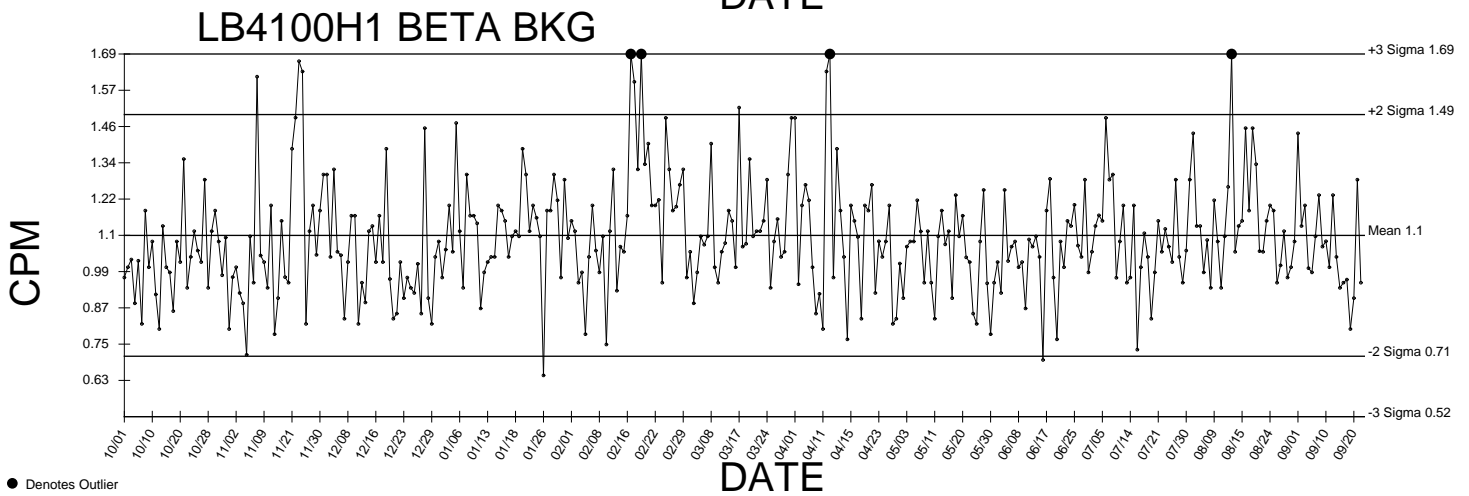
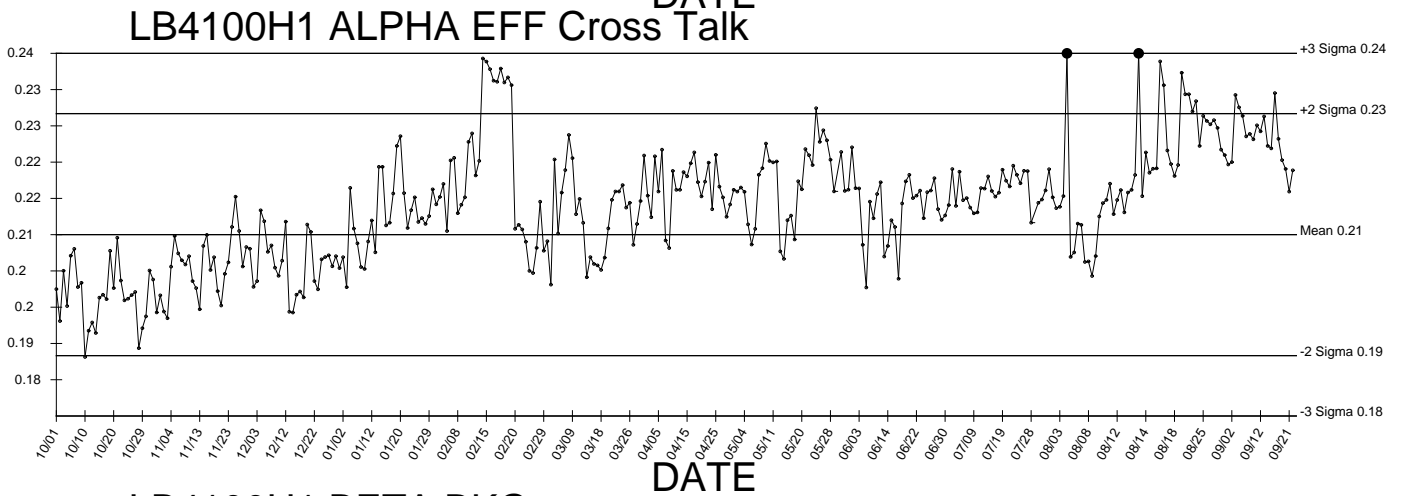
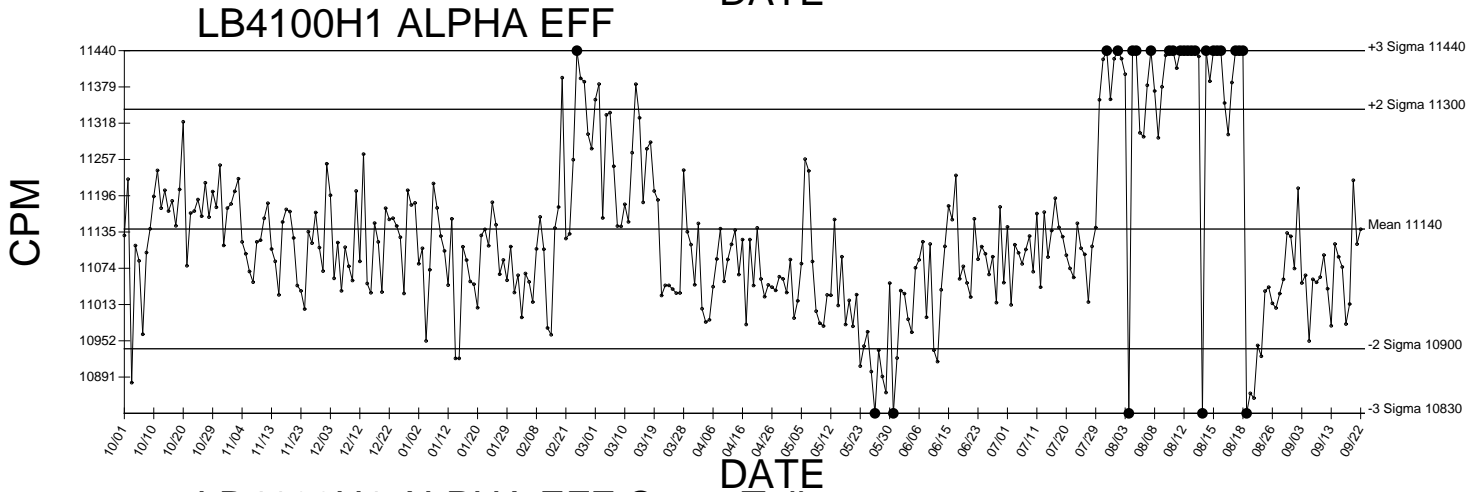
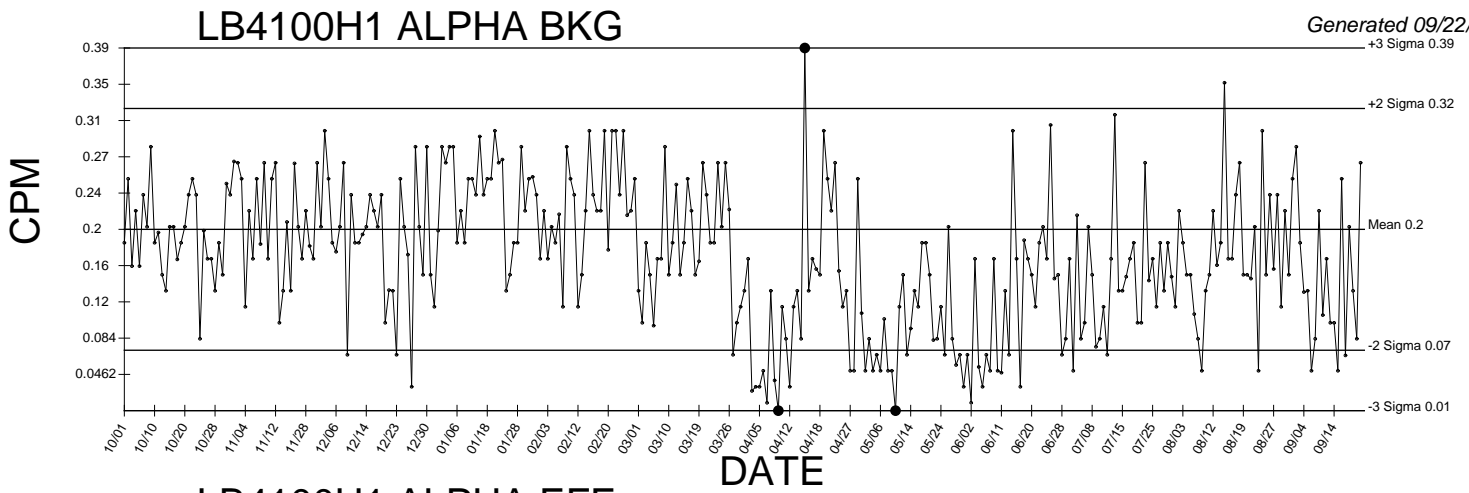
Generated 09/22/2016



LB4100G4 BETA EFF Cross Talk



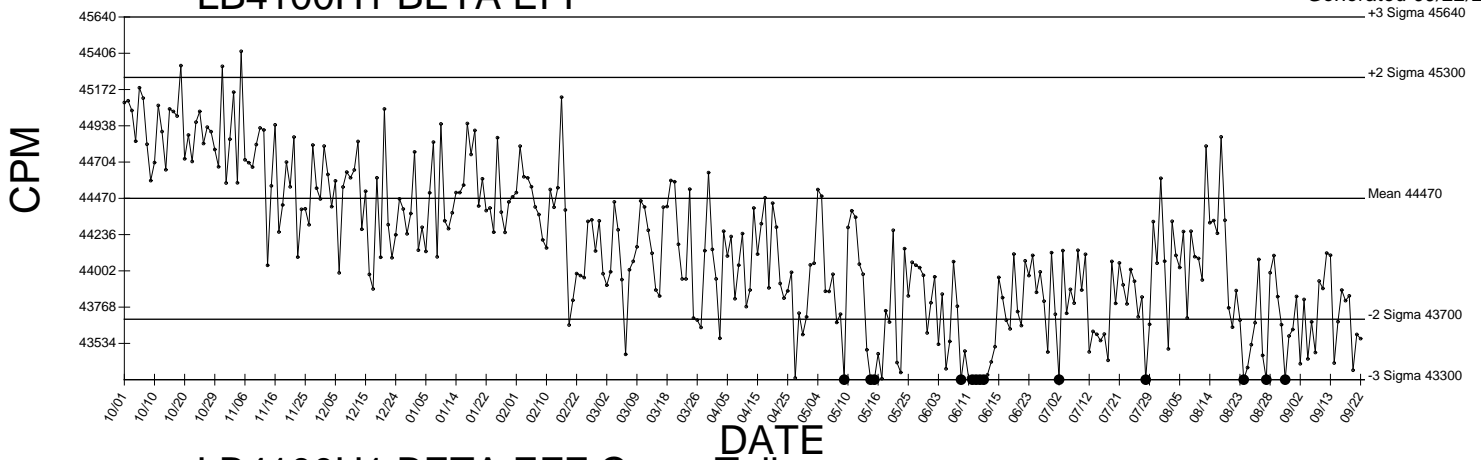
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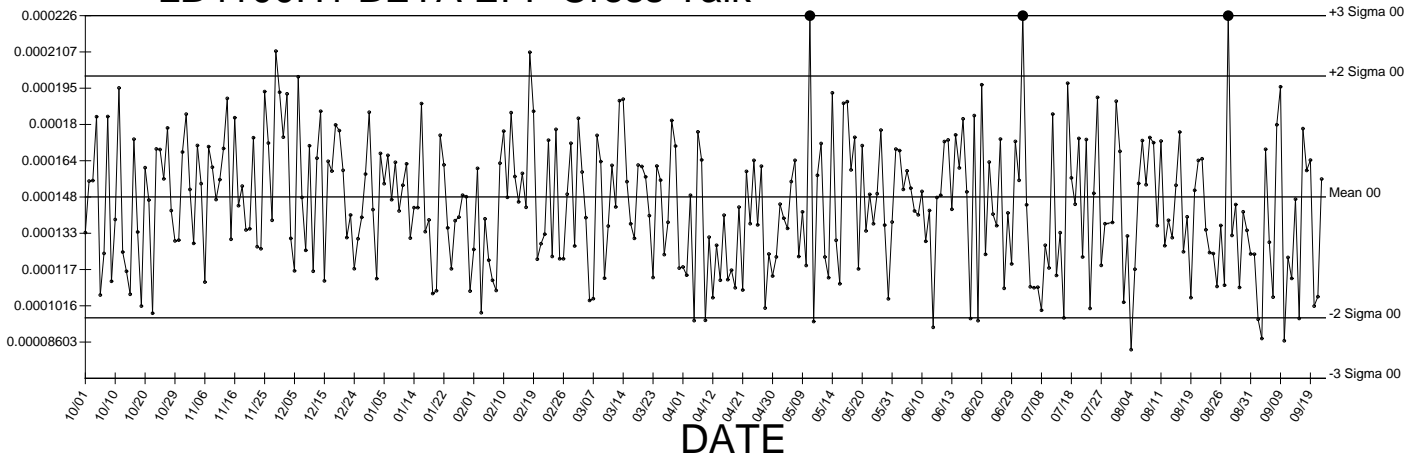
● Denotes Outlier

LB4100H1 BETA EFF

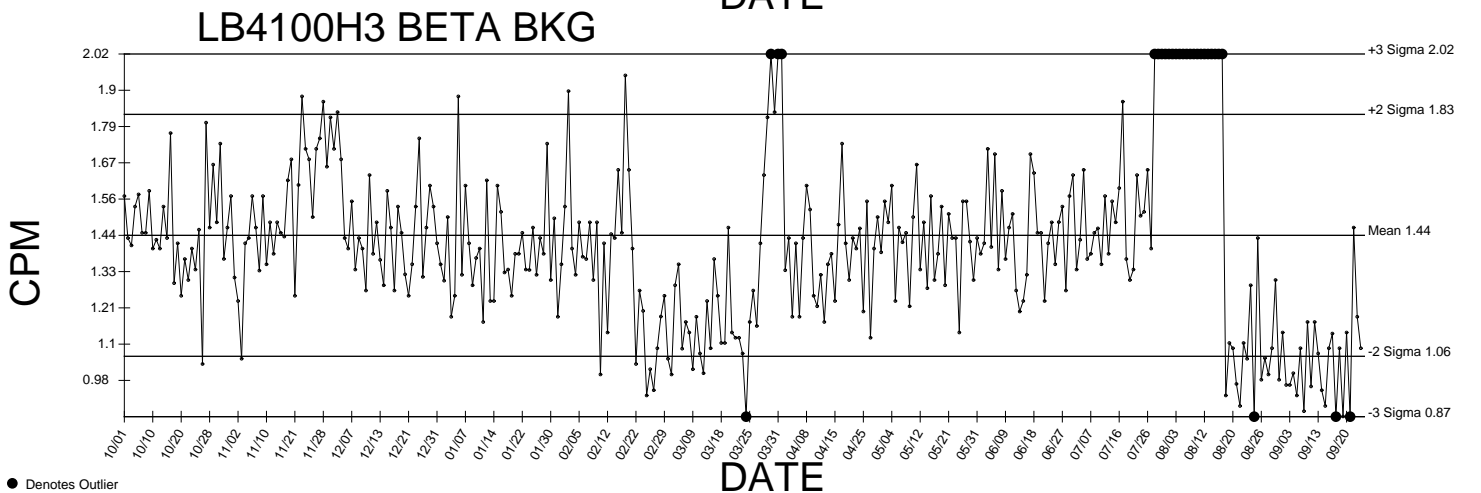
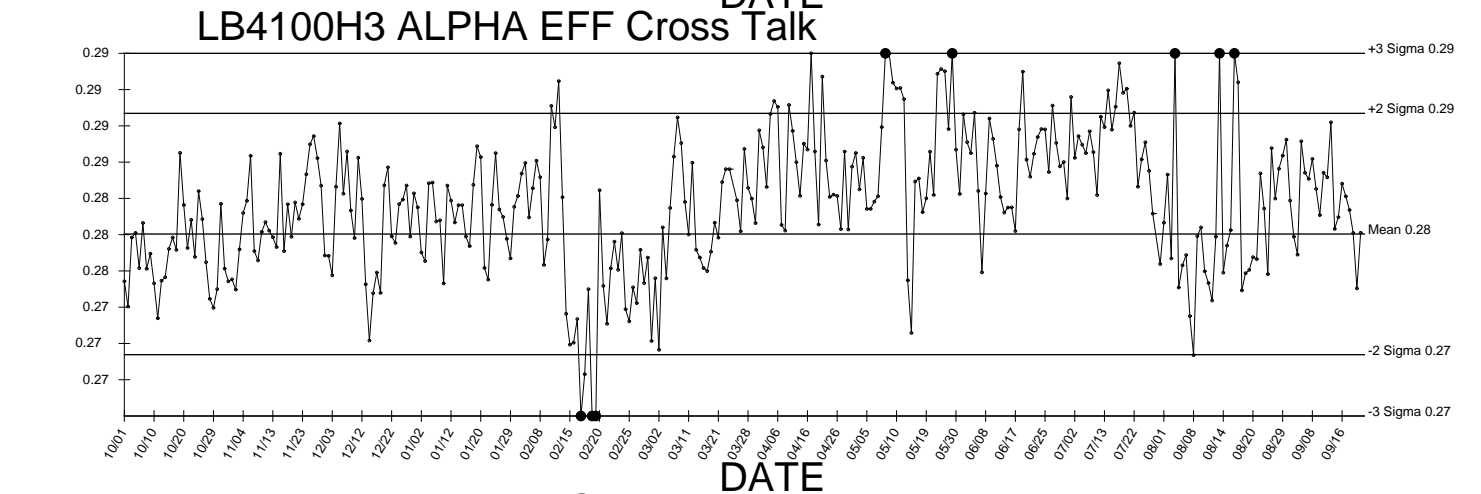
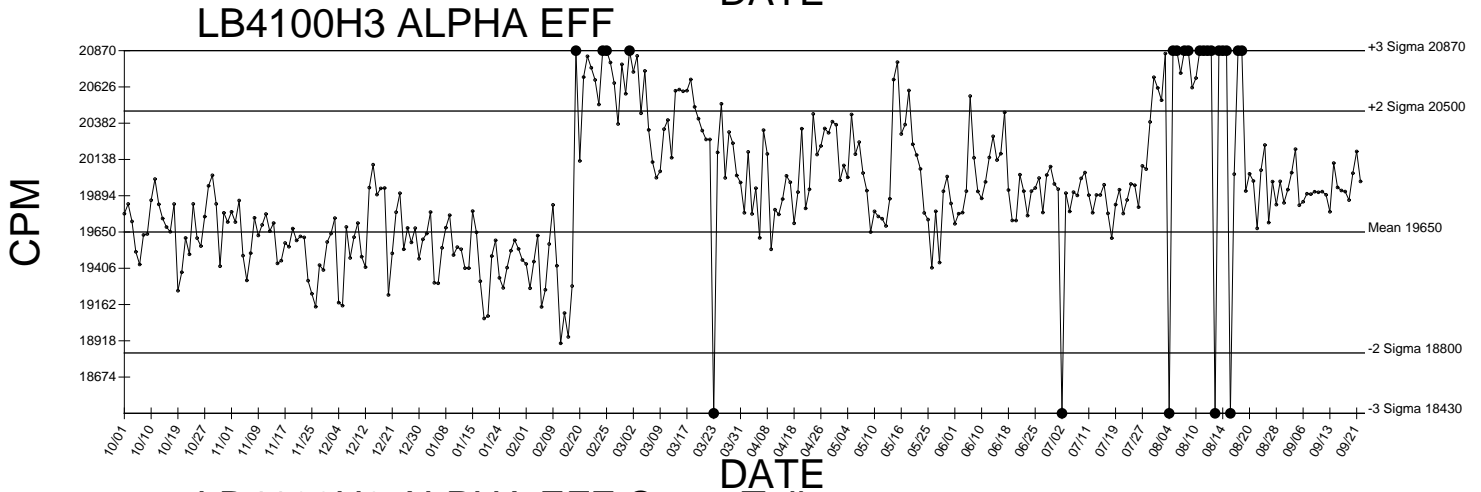
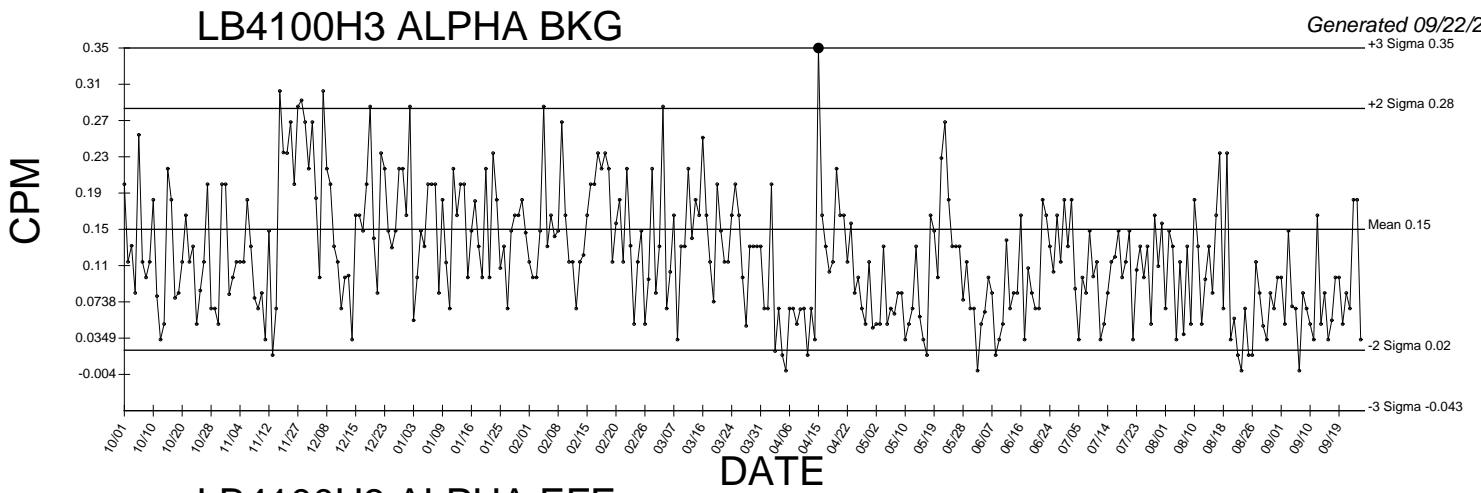
Generated 09/22/2016



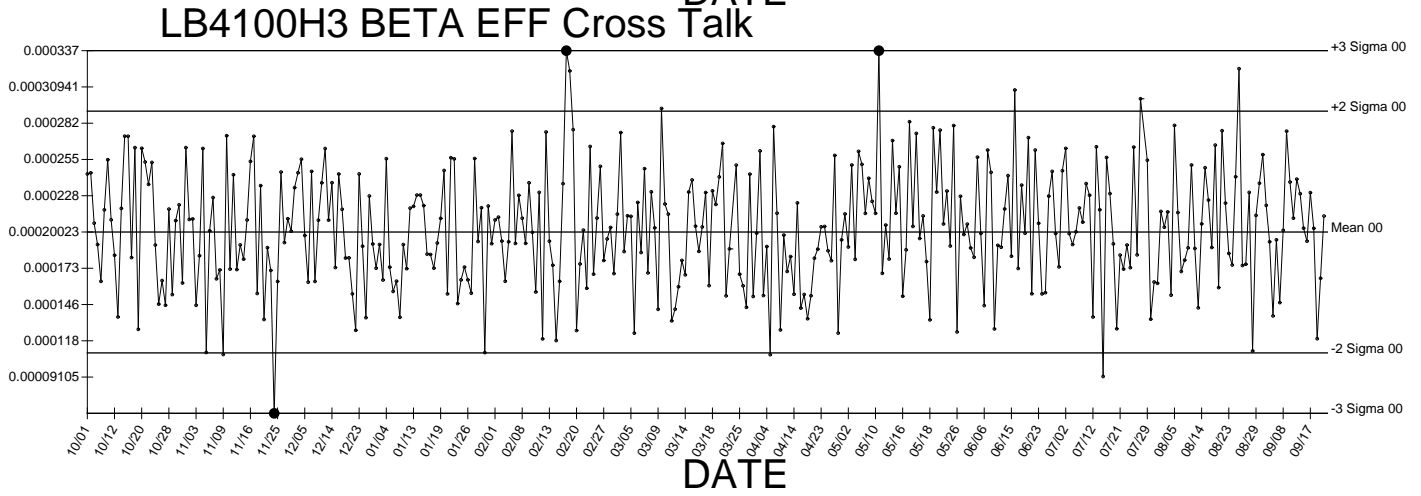
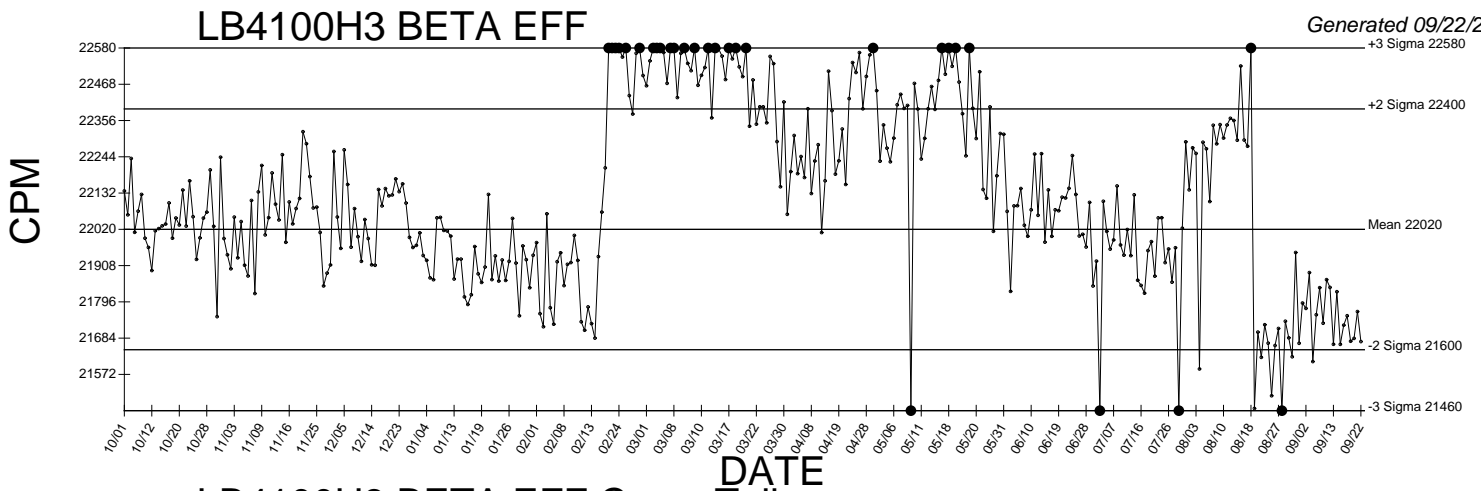
LB4100H1 BETA EFF Cross Talk



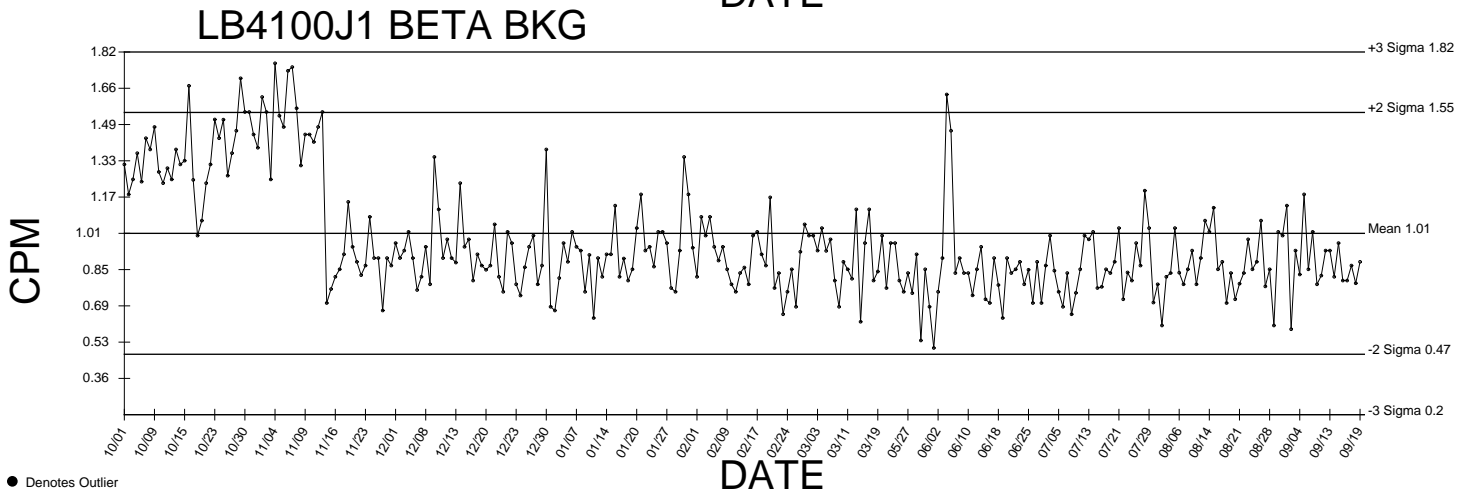
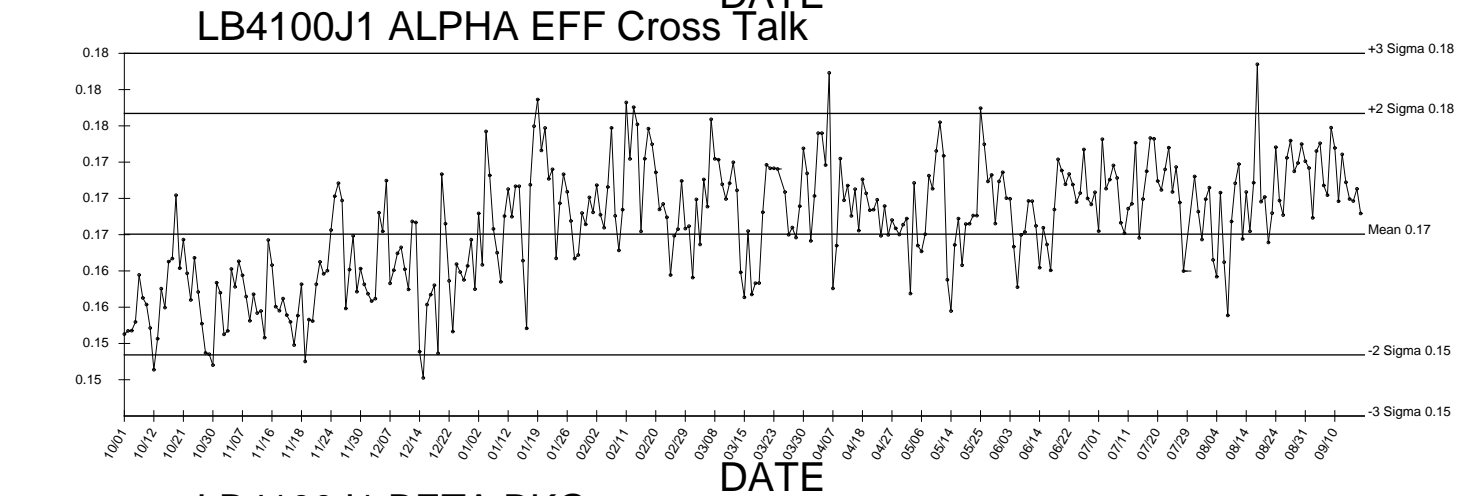
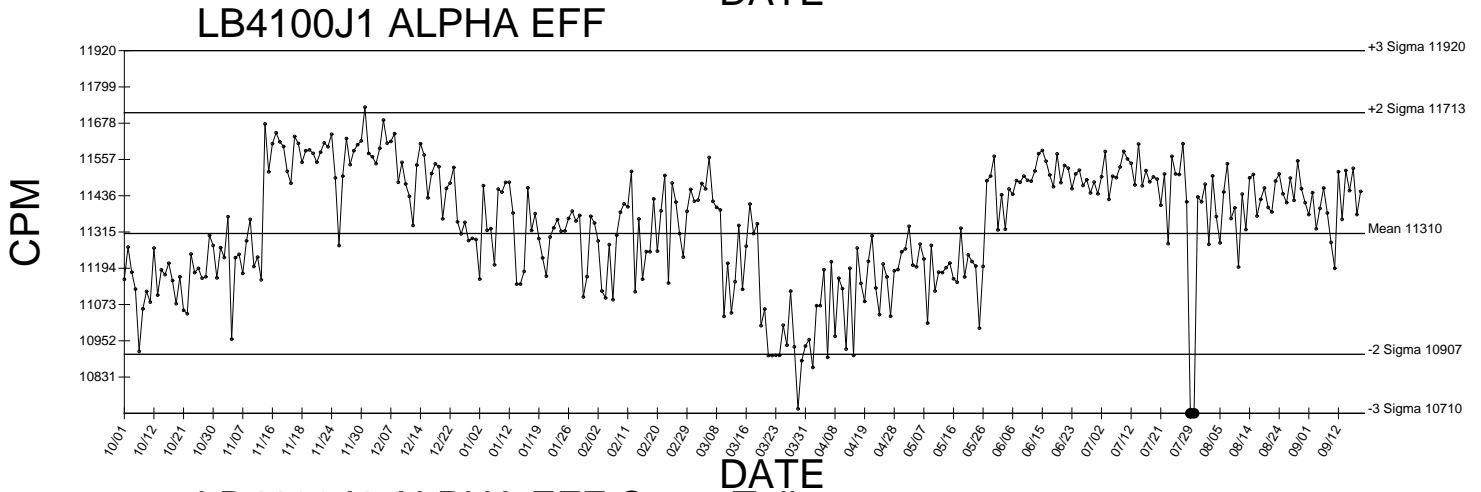
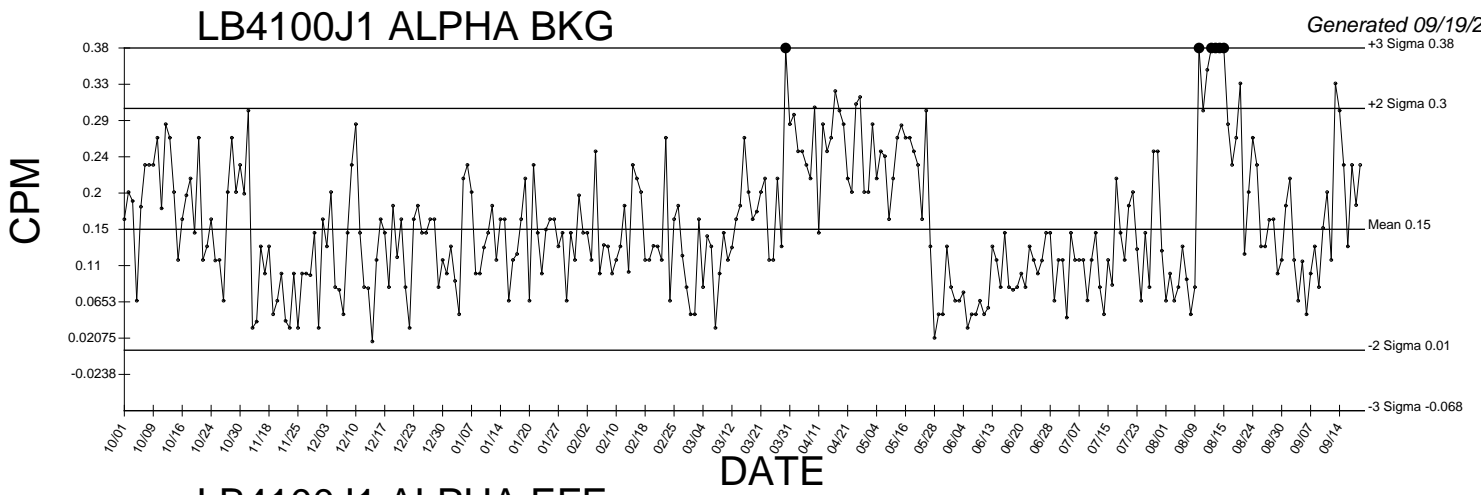
● Denotes Outlier



● Denotes Outlier



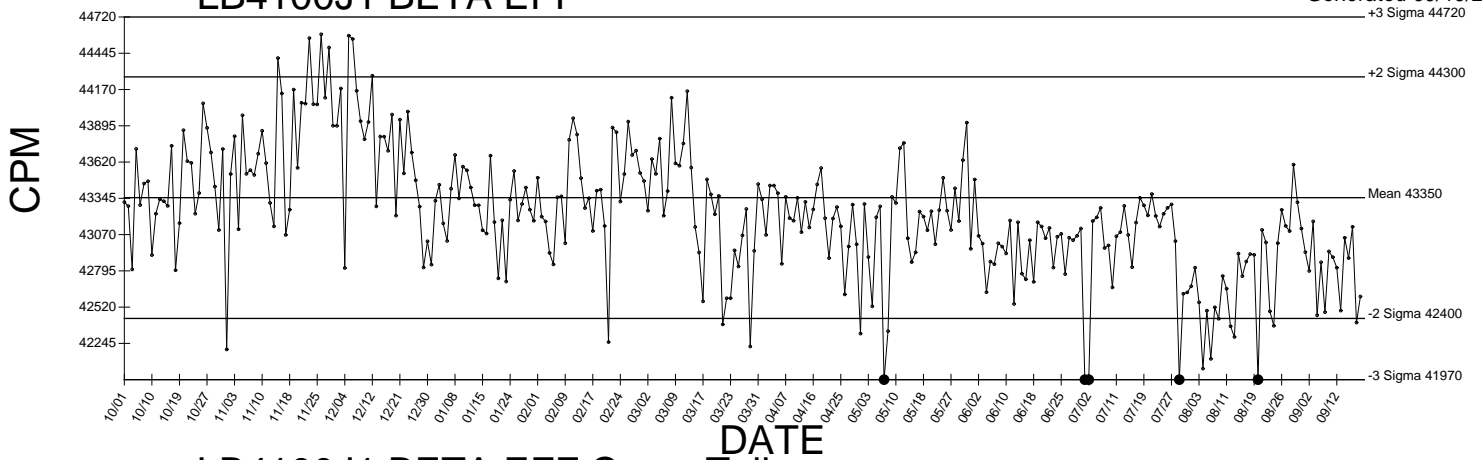
● Denotes Outlier



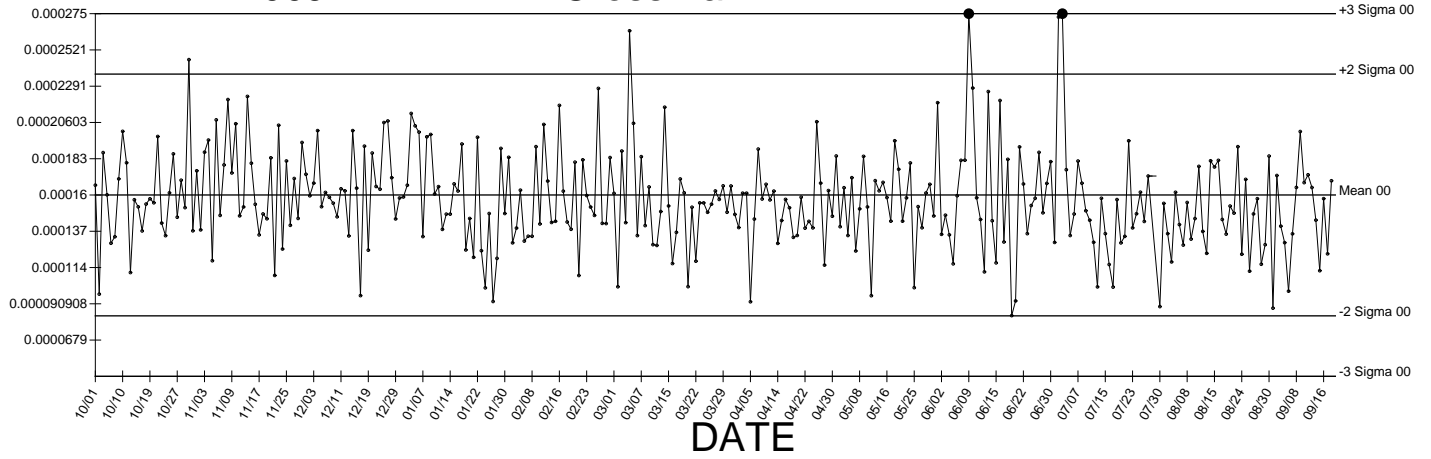
● Denotes Outlier

LB4100J1 BETA EFF

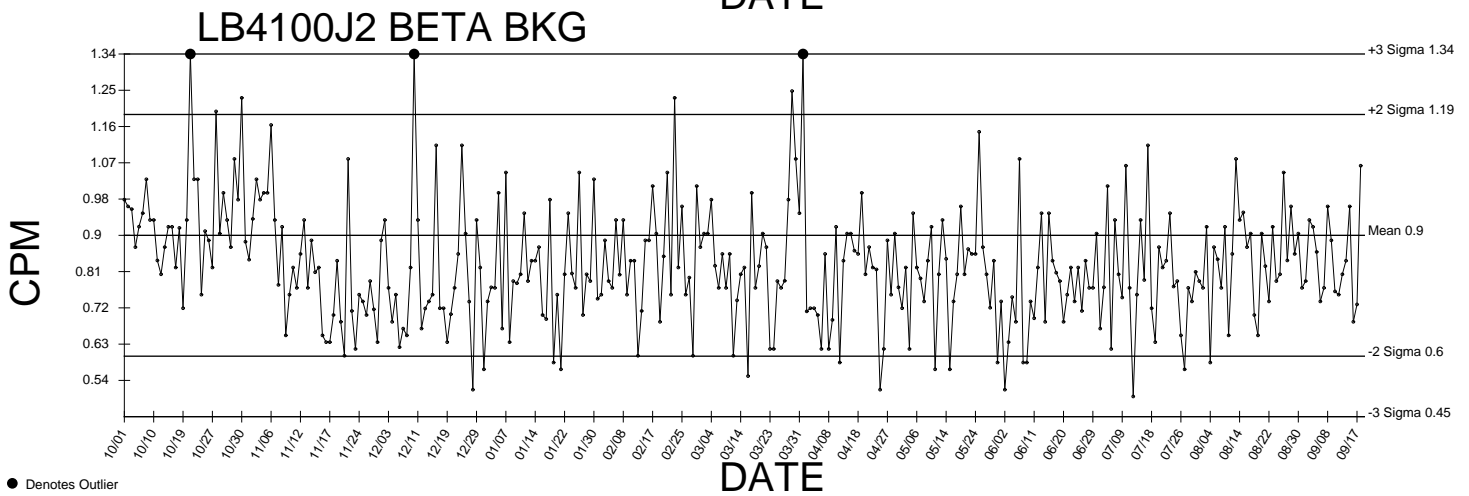
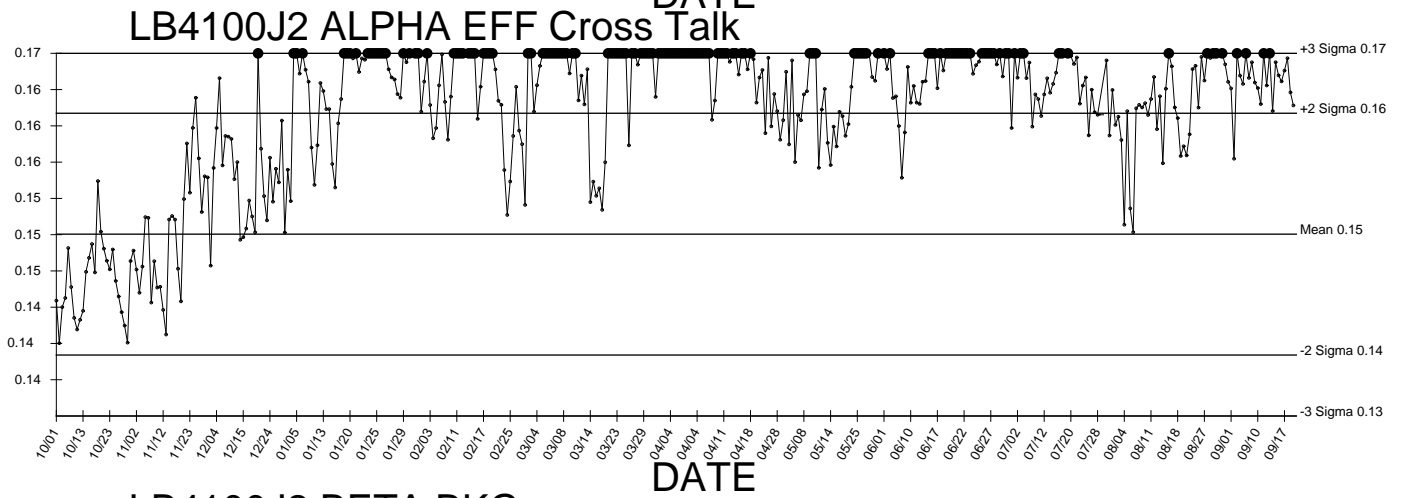
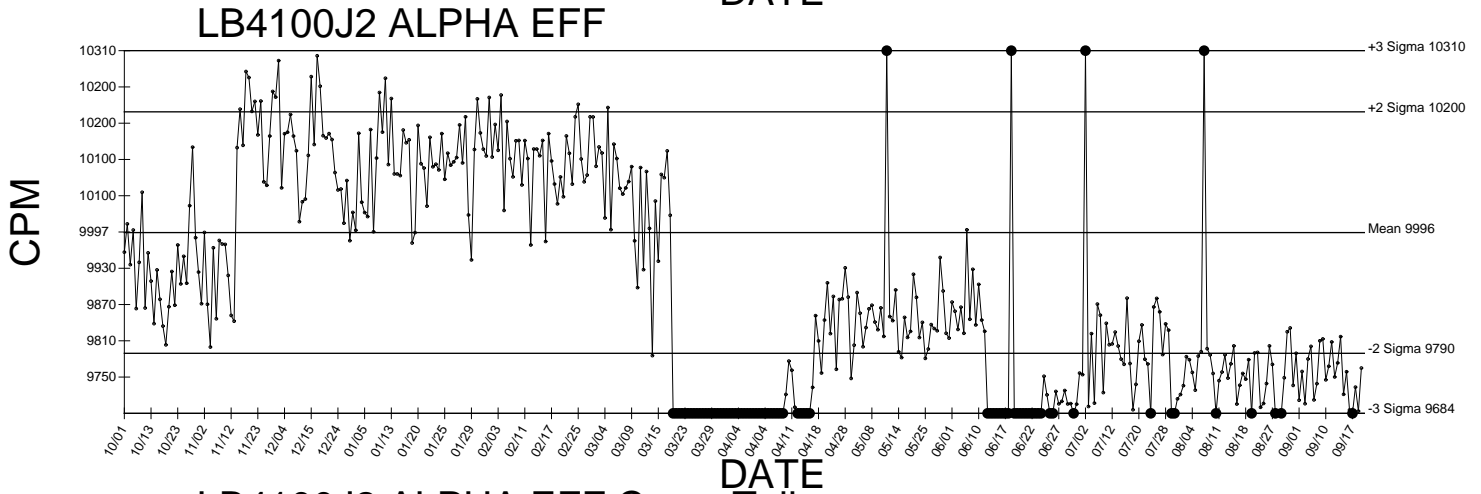
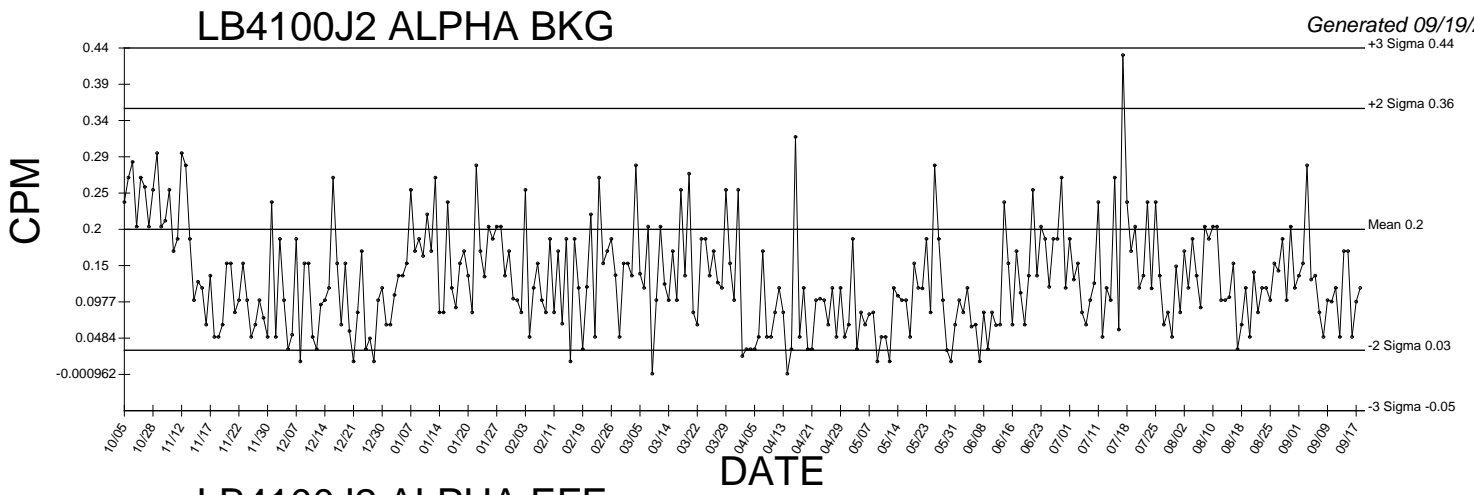
Generated 09/19/2016



LB4100J1 BETA EFF Cross Talk



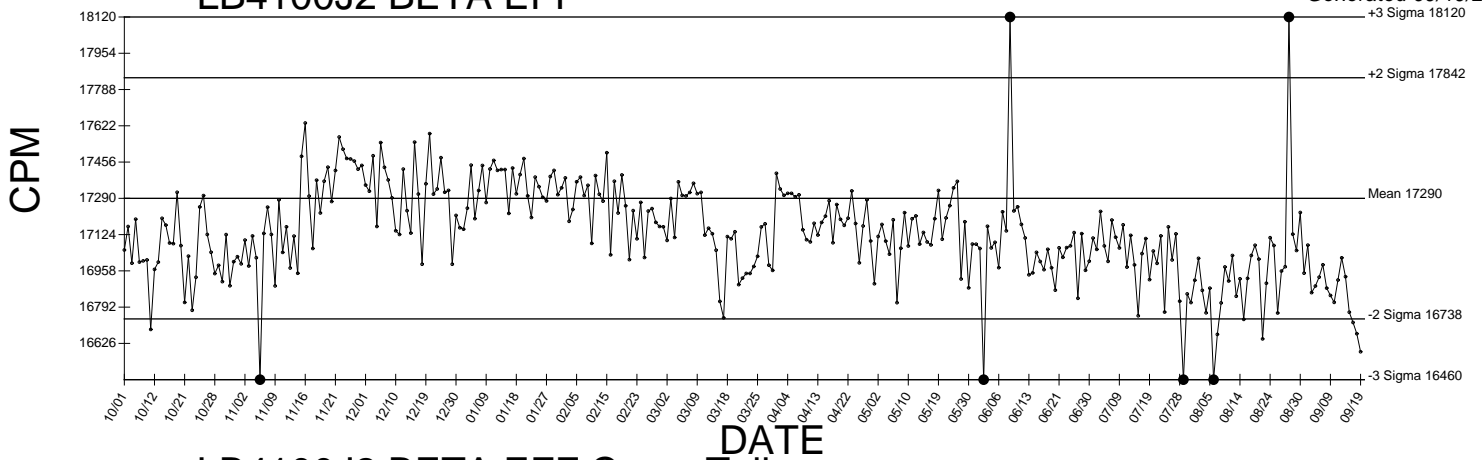
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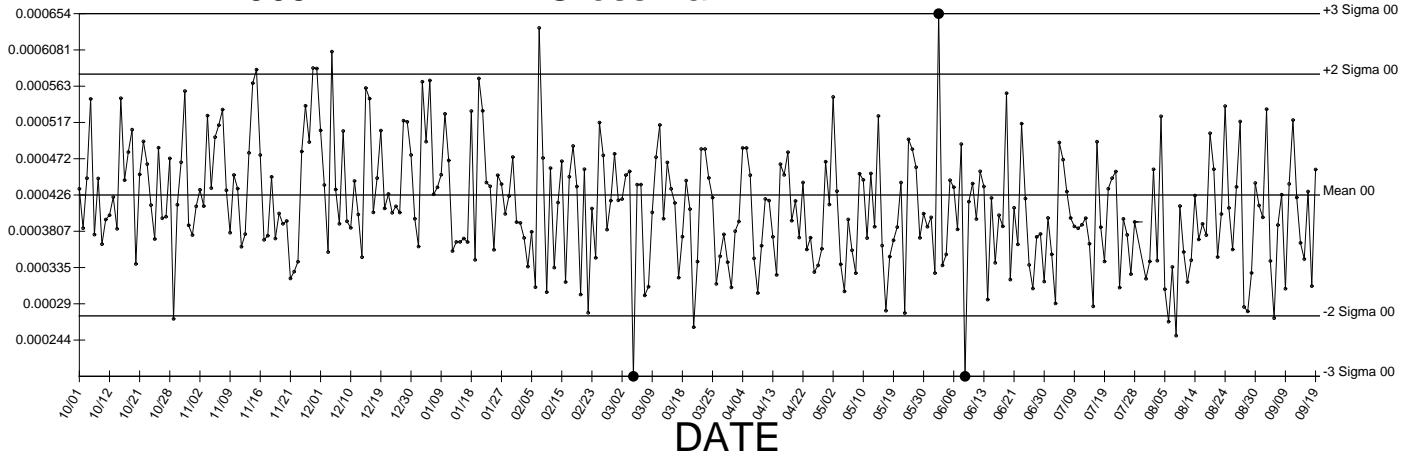
● Denotes Outlier

LB4100J2 BETA EFF

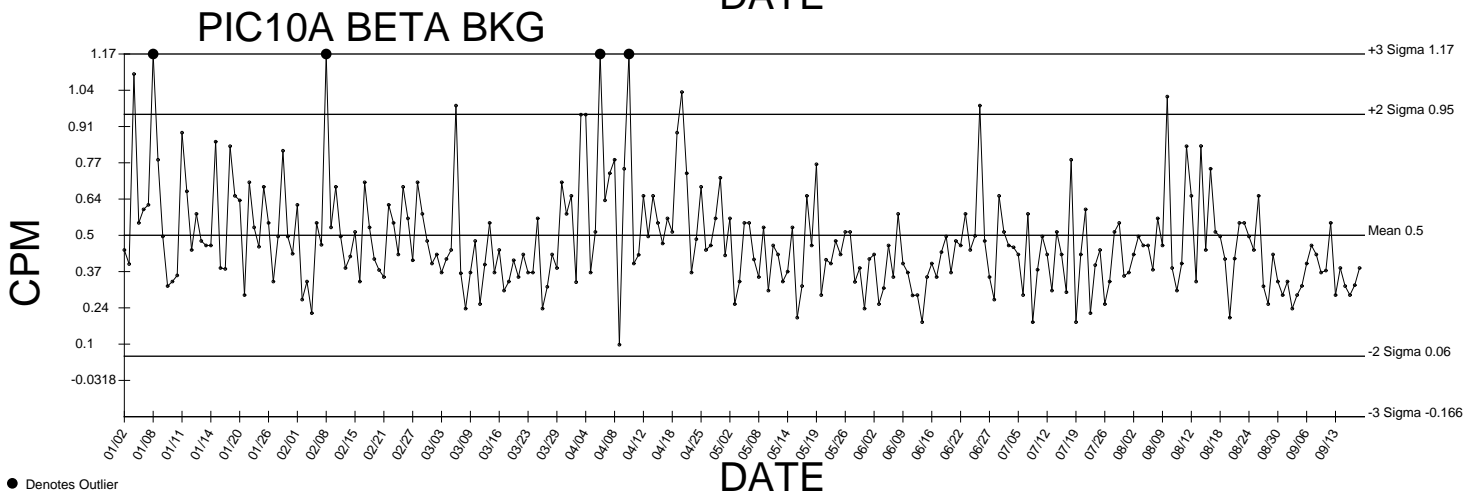
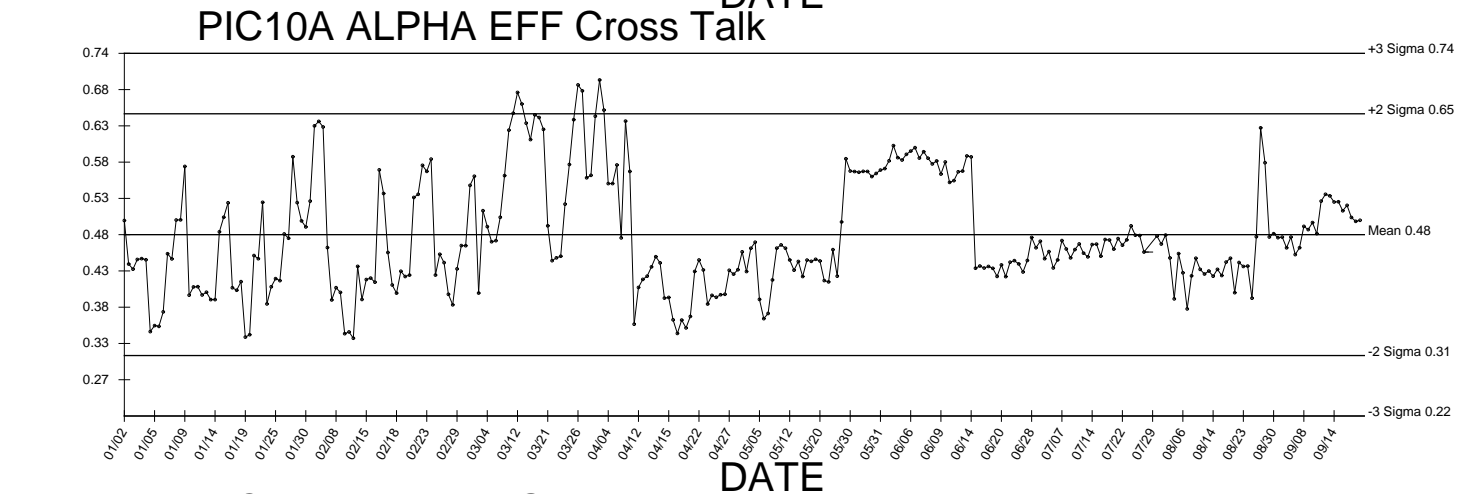
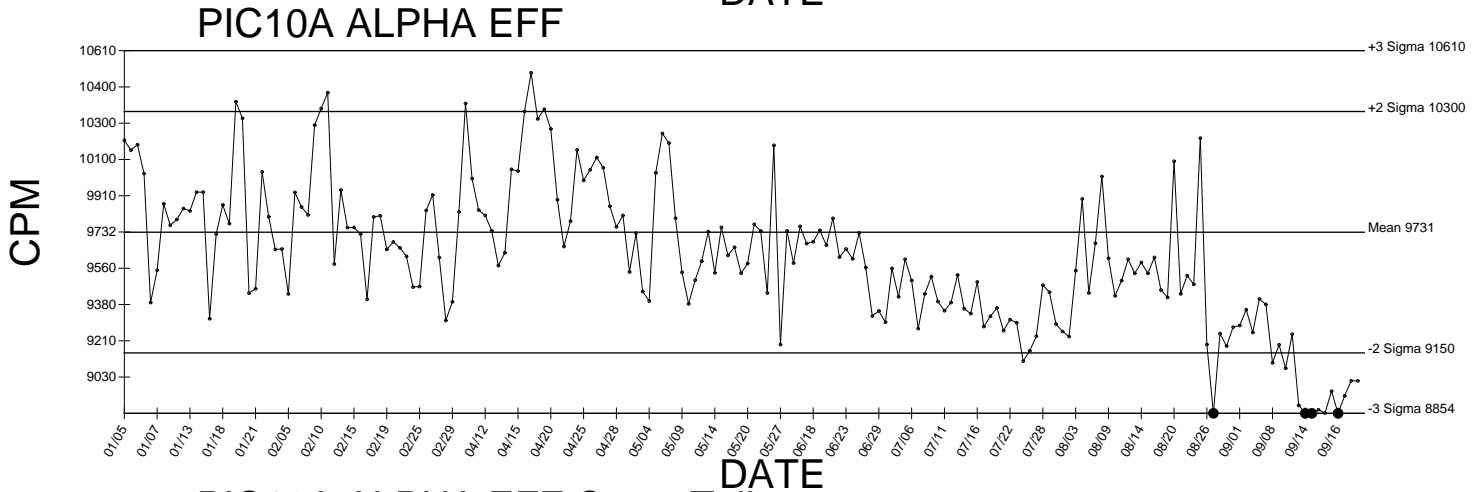
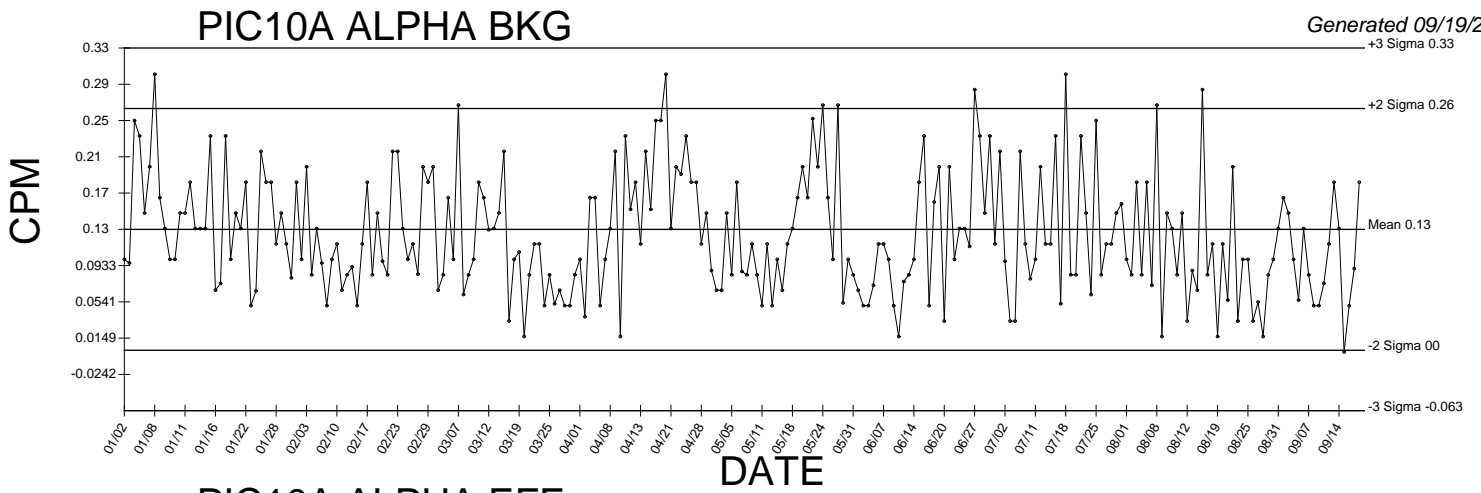
Generated 09/19/2016



LB4100J2 BETA EFF Cross Talk



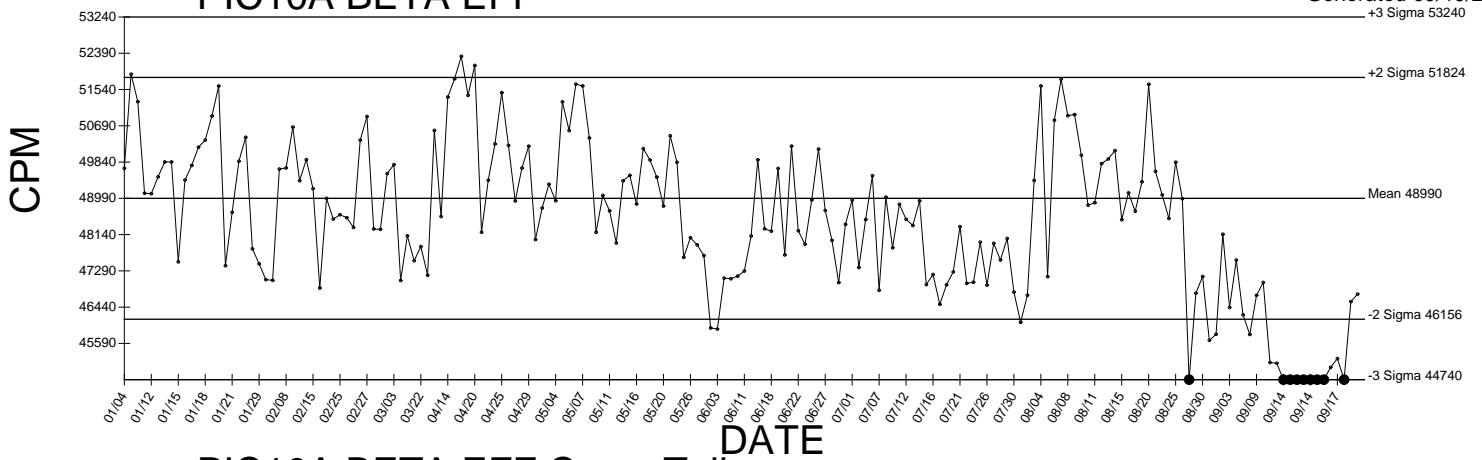
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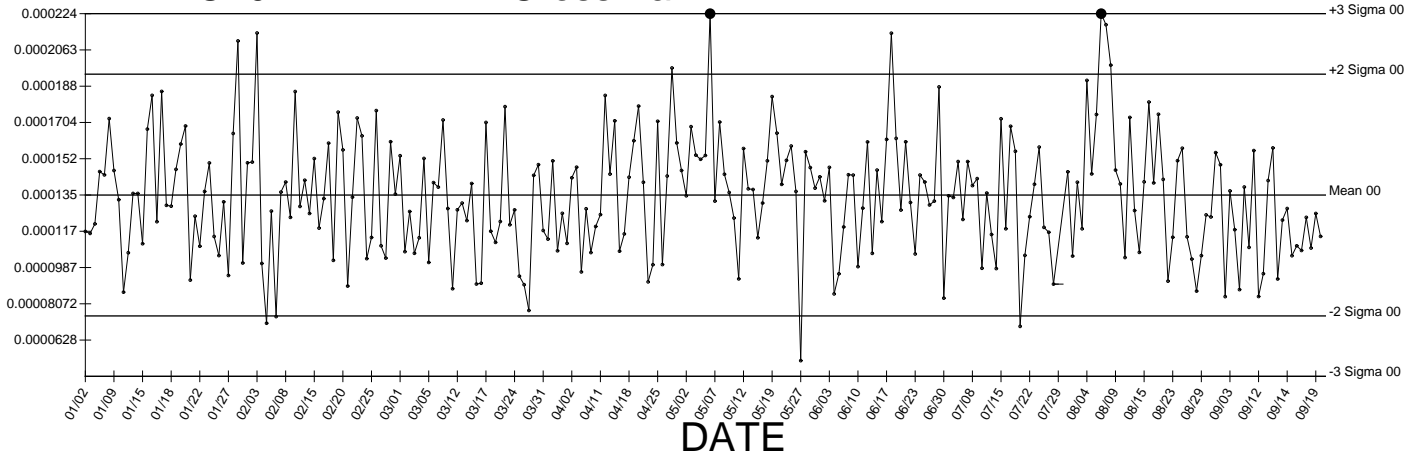
● Denotes Outlier

PIC10A BETA EFF

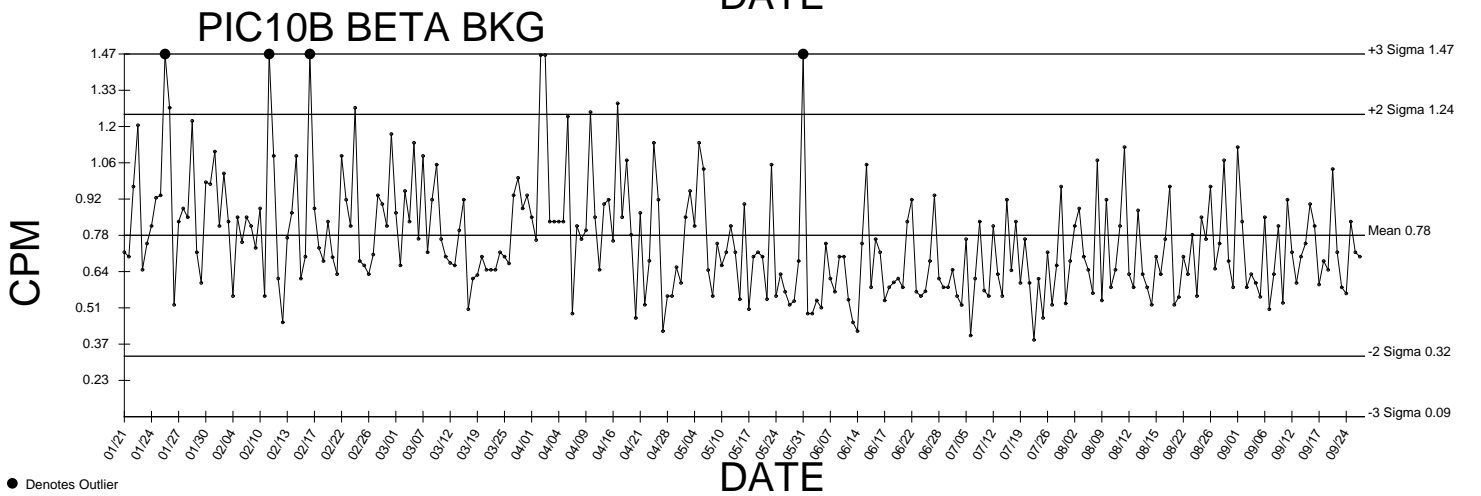
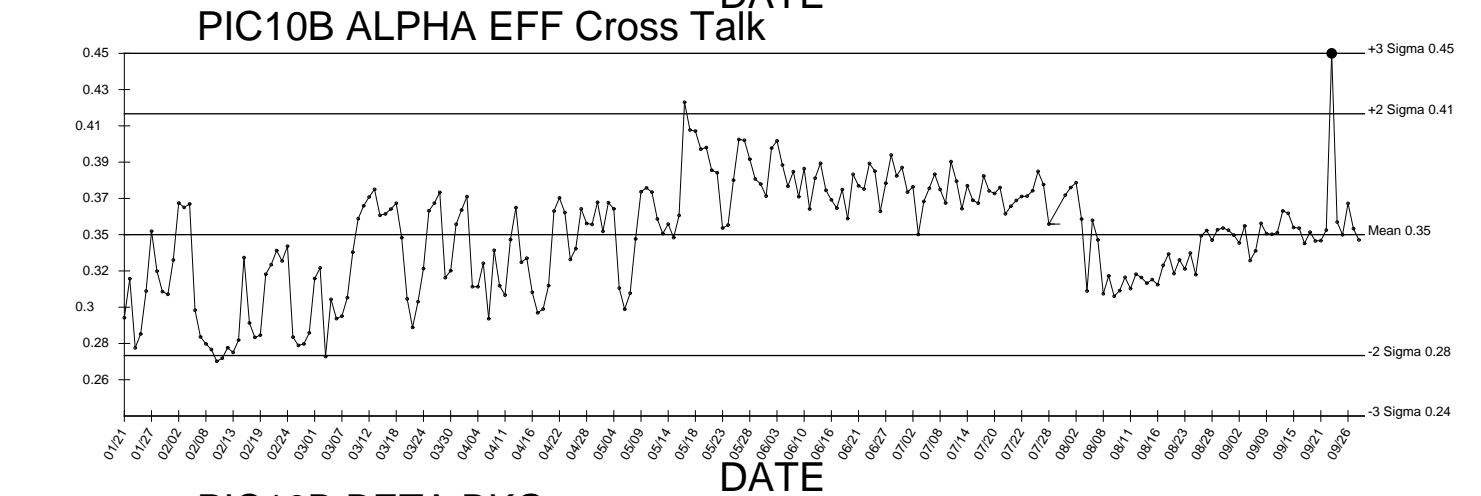
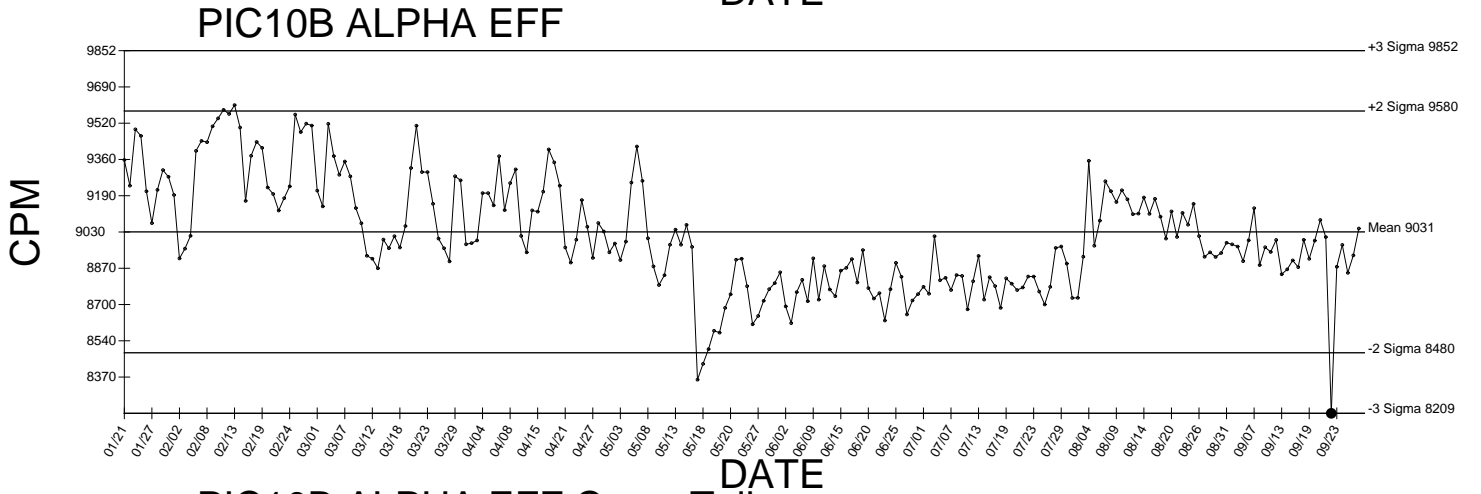
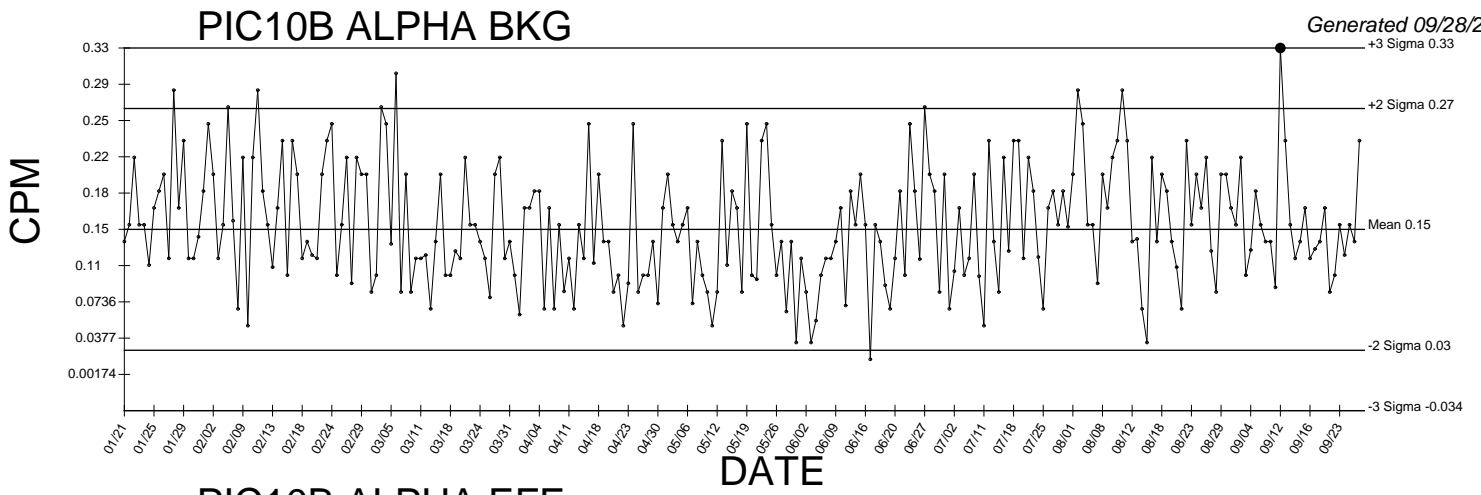
Generated 09/19/2016



PIC10A BETA EFF Cross Talk



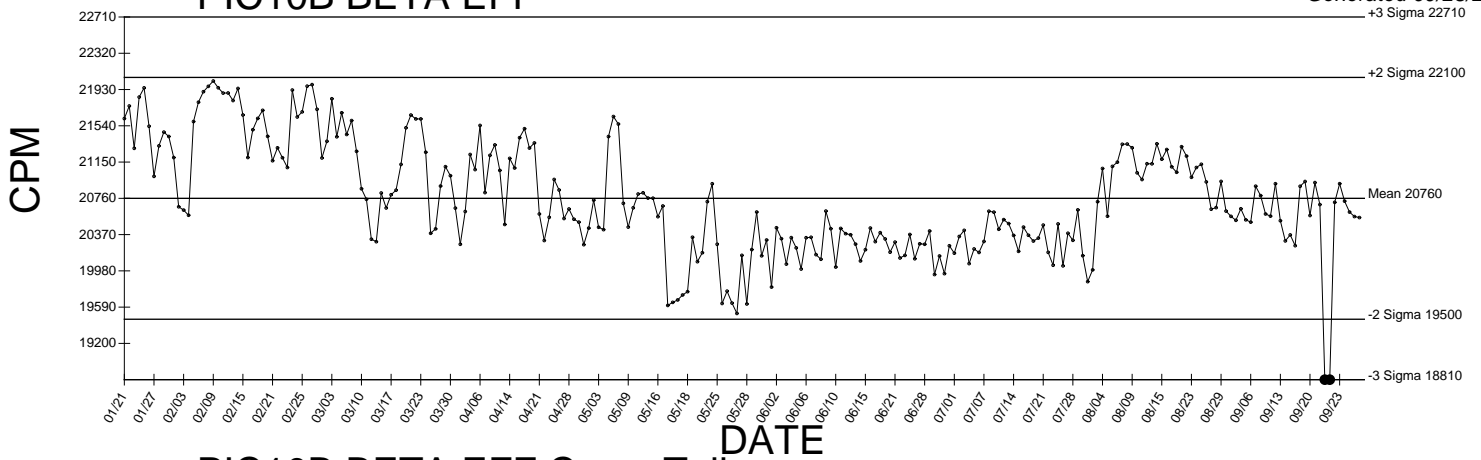
● Denotes Outlier



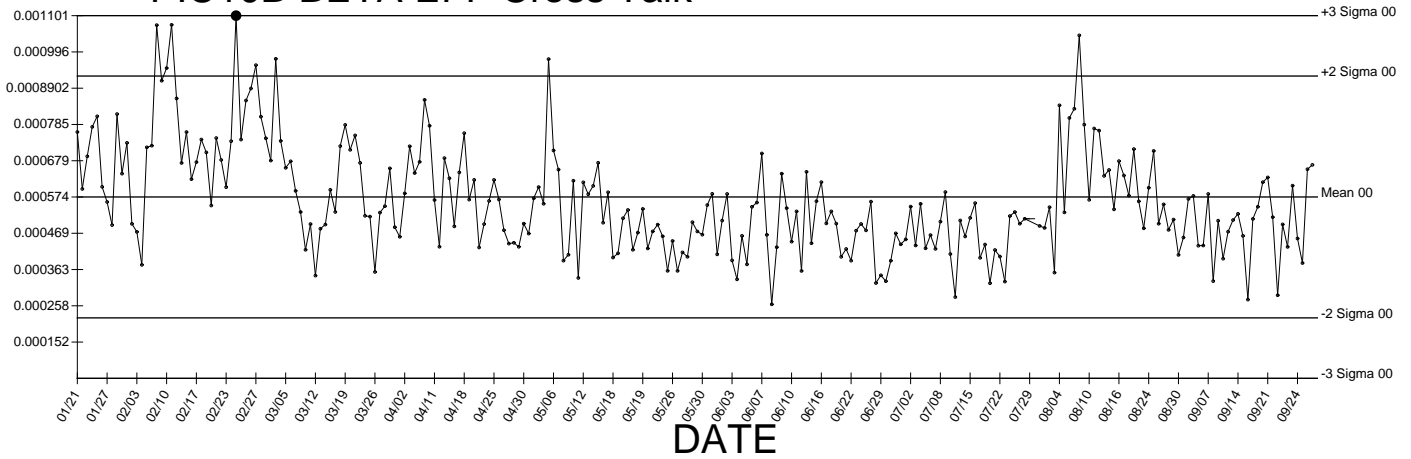
● Denotes Outlier

PIC10B BETA EFF

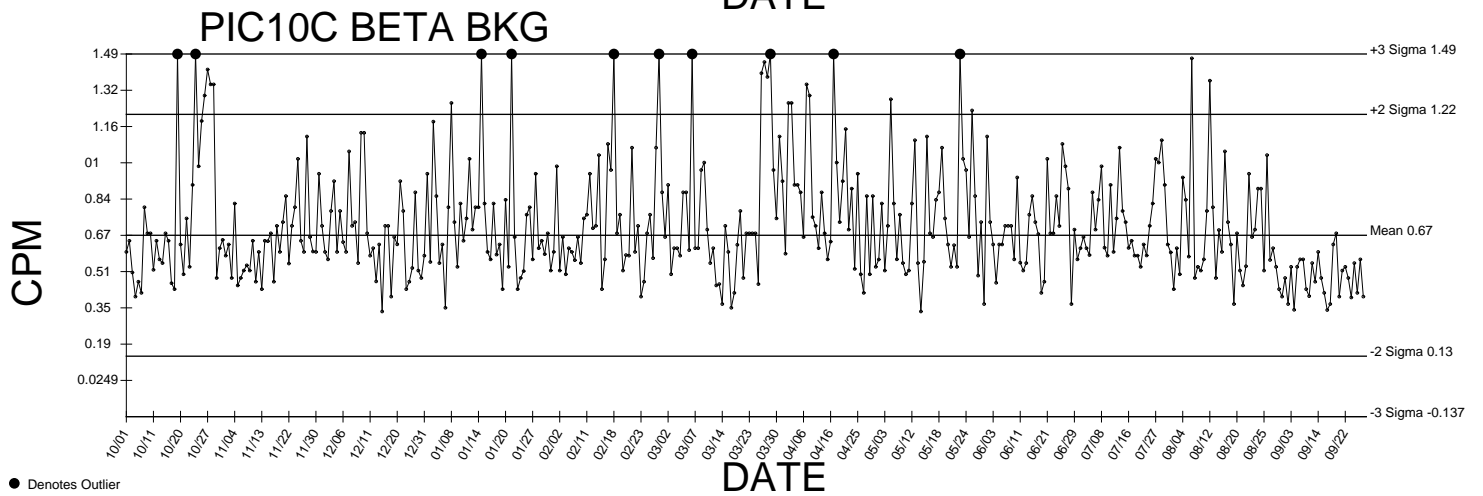
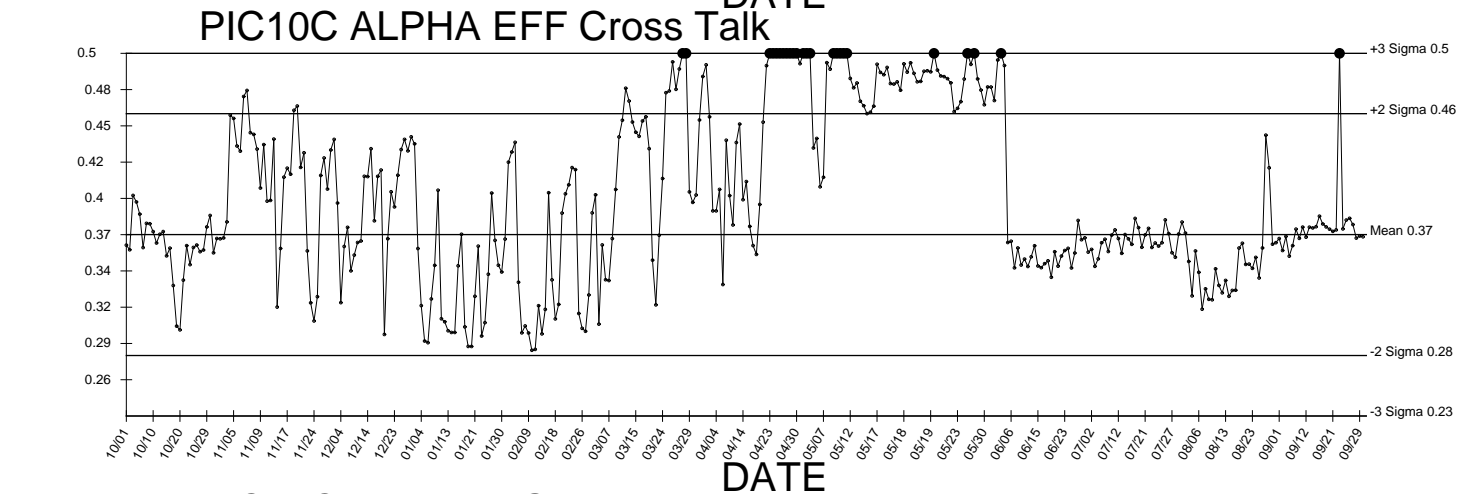
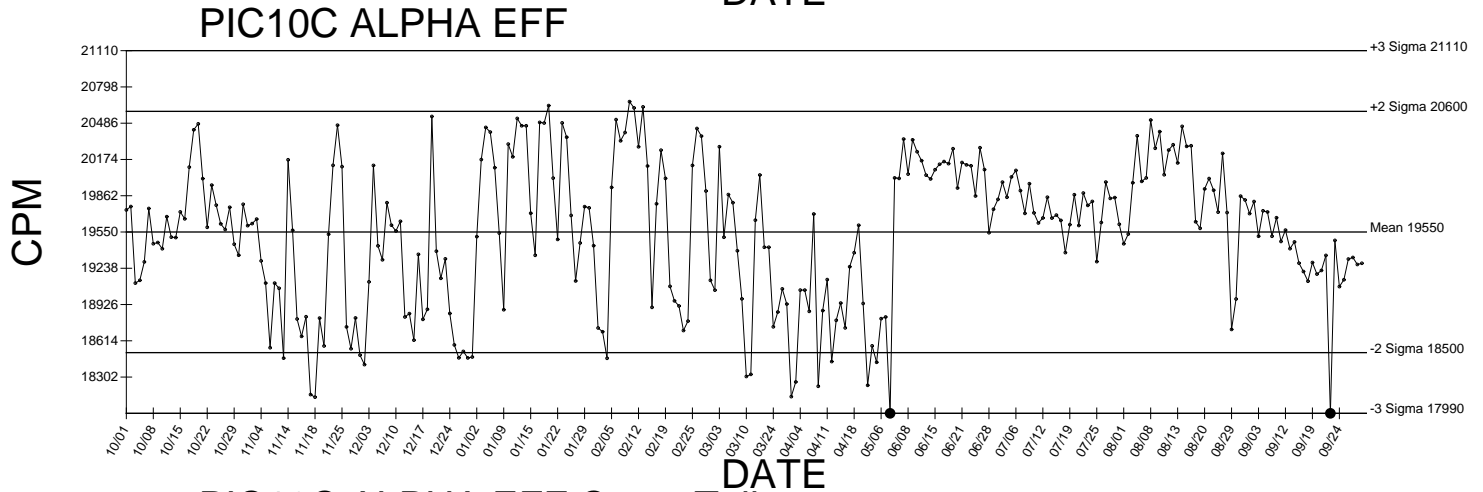
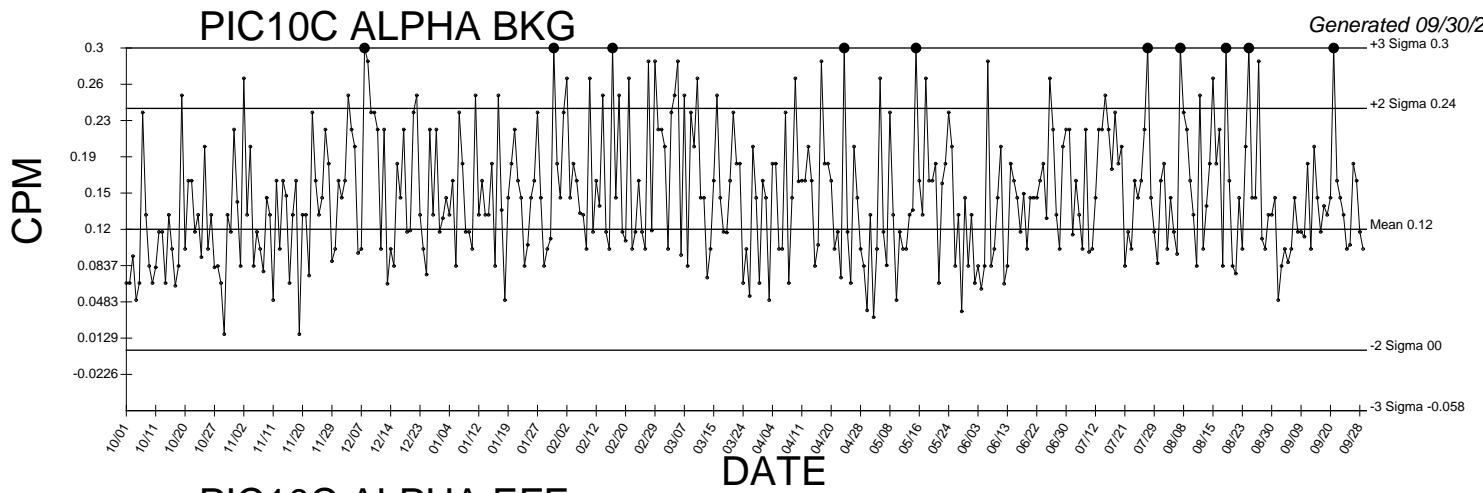
Generated 09/28/2016



PIC10B BETA EFF Cross Talk



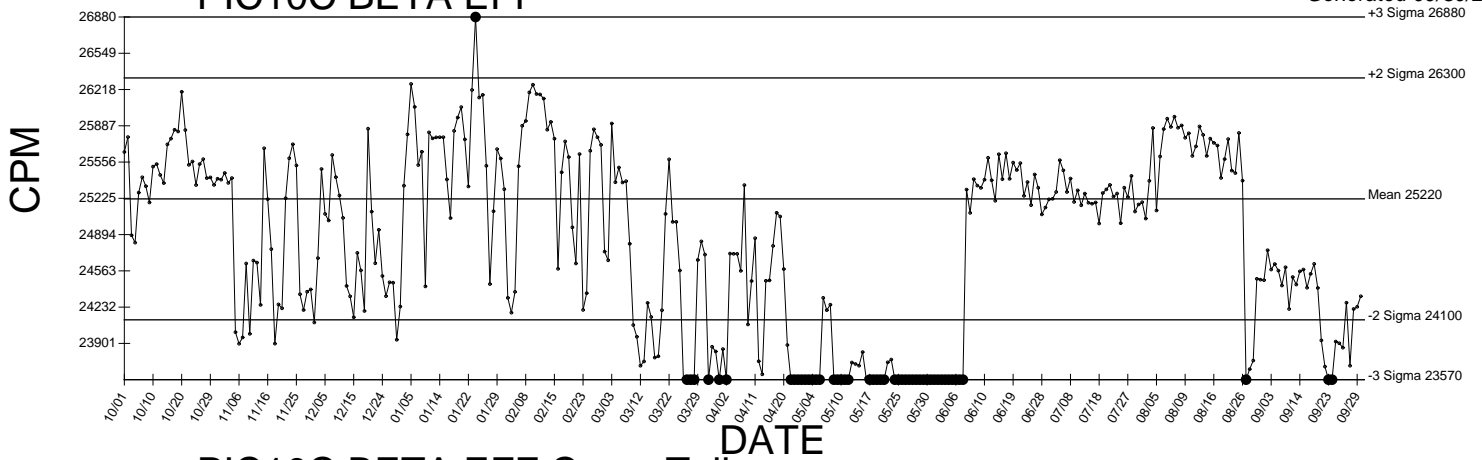
● Denotes Outlier



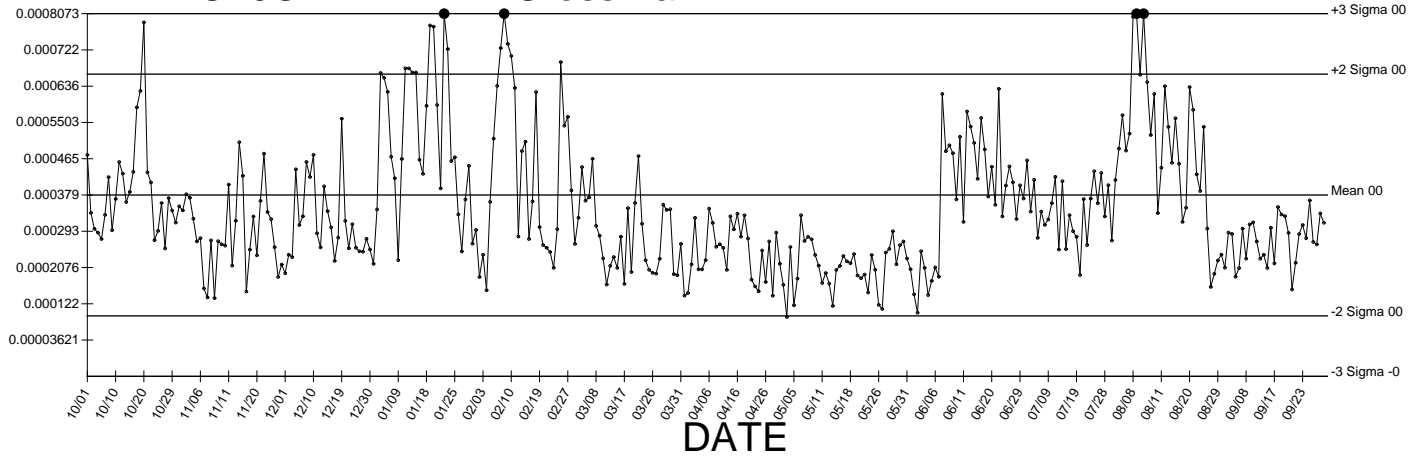
● Denotes Outlier

PIC10C BETA EFF

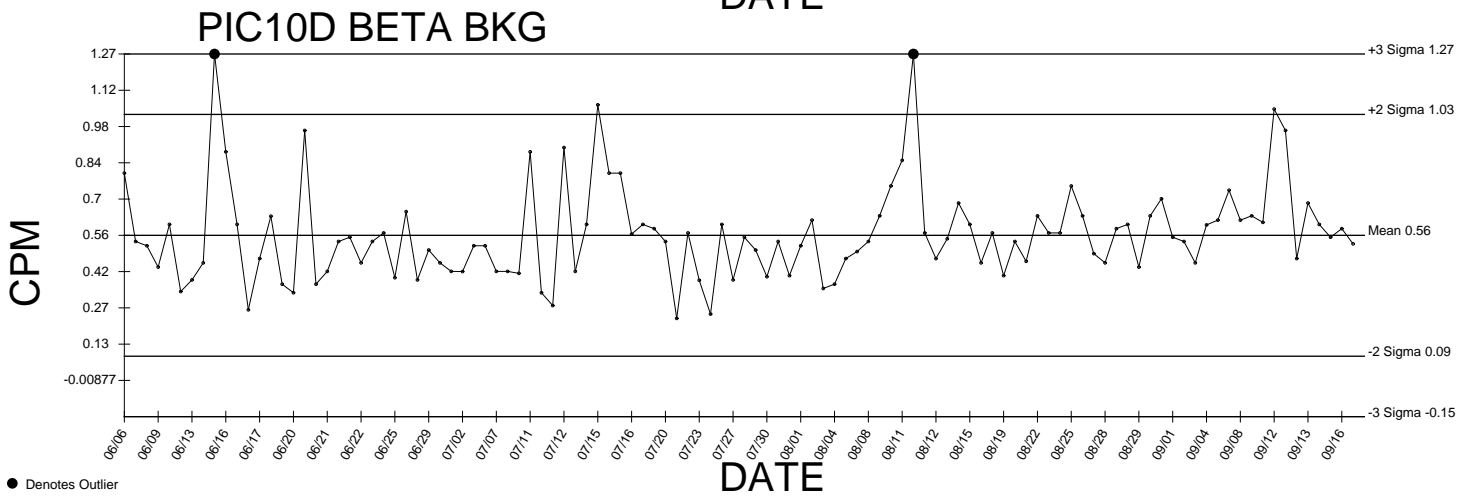
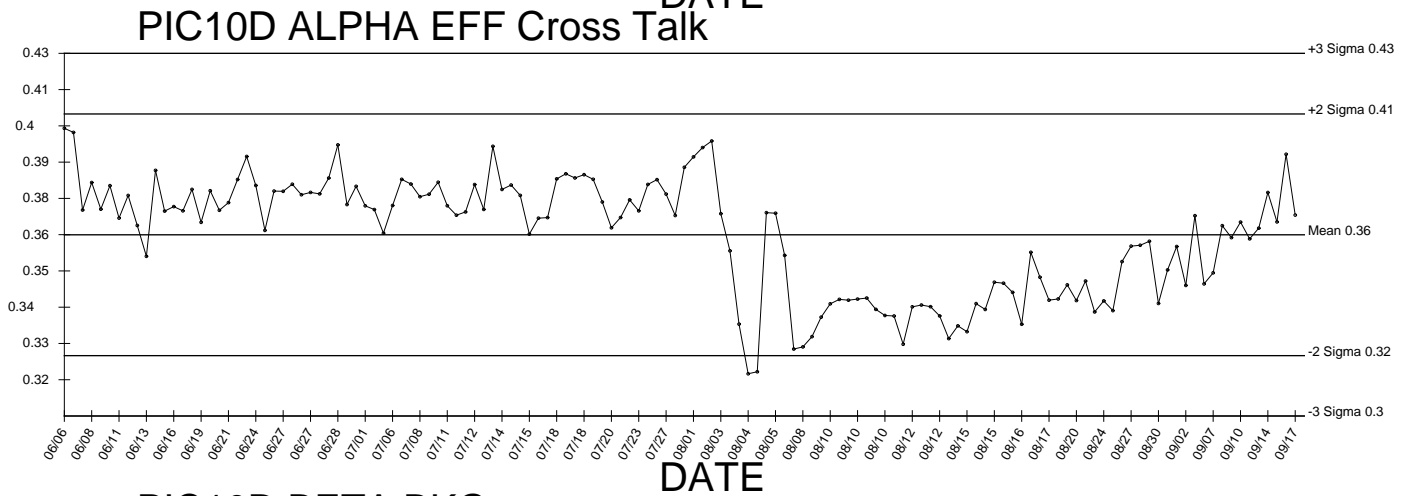
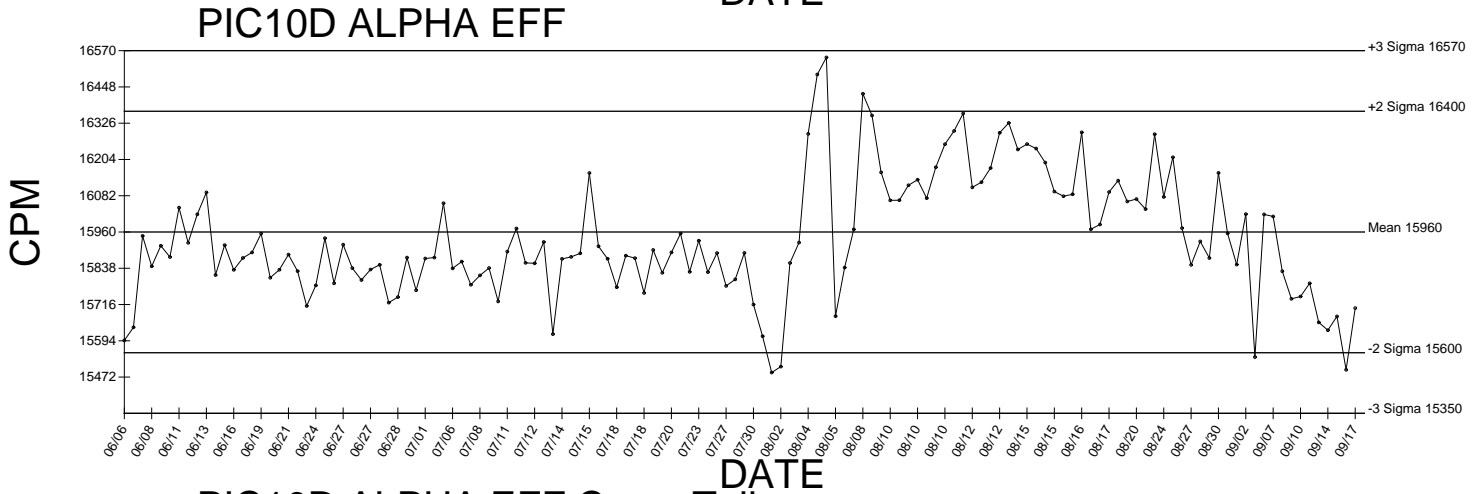
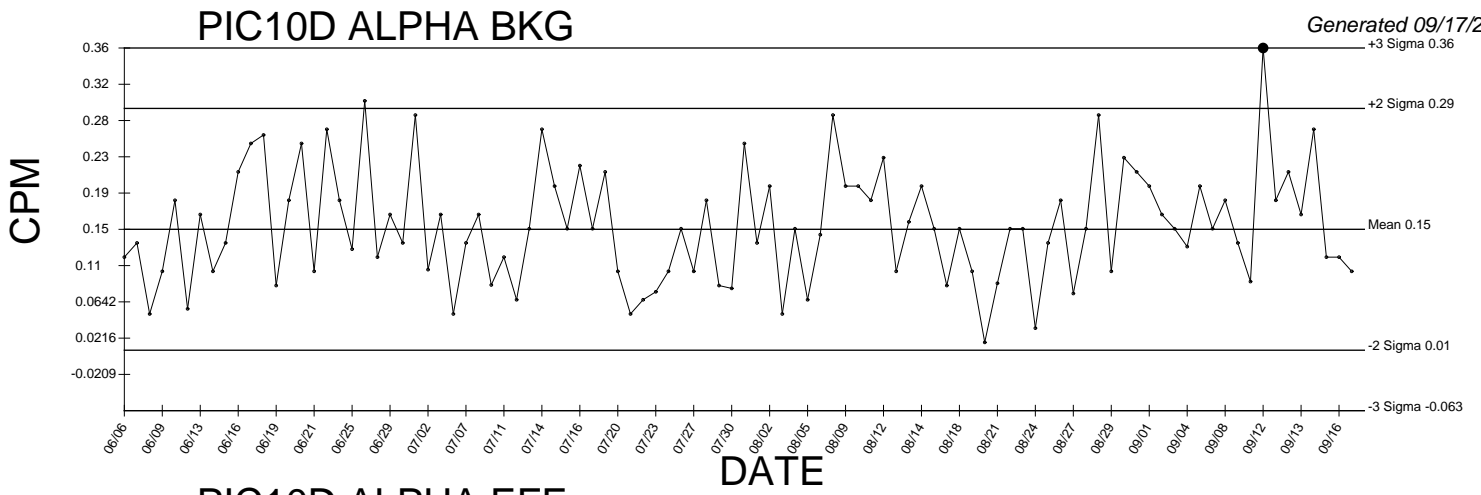
Generated 09/30/2016



PIC10C BETA EFF Cross Talk



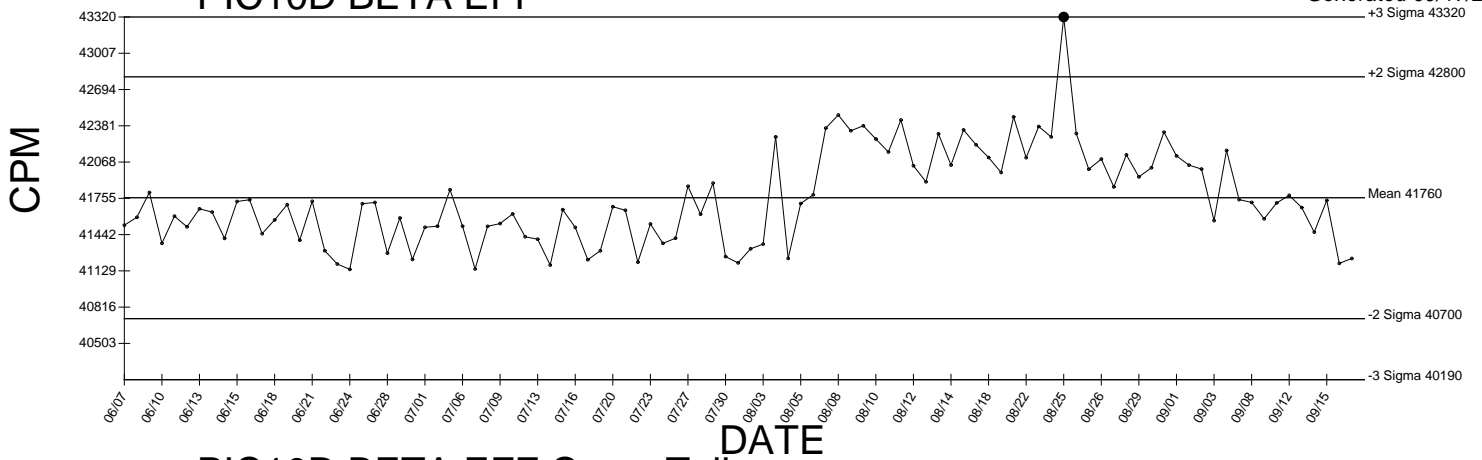
● Denotes Outlier



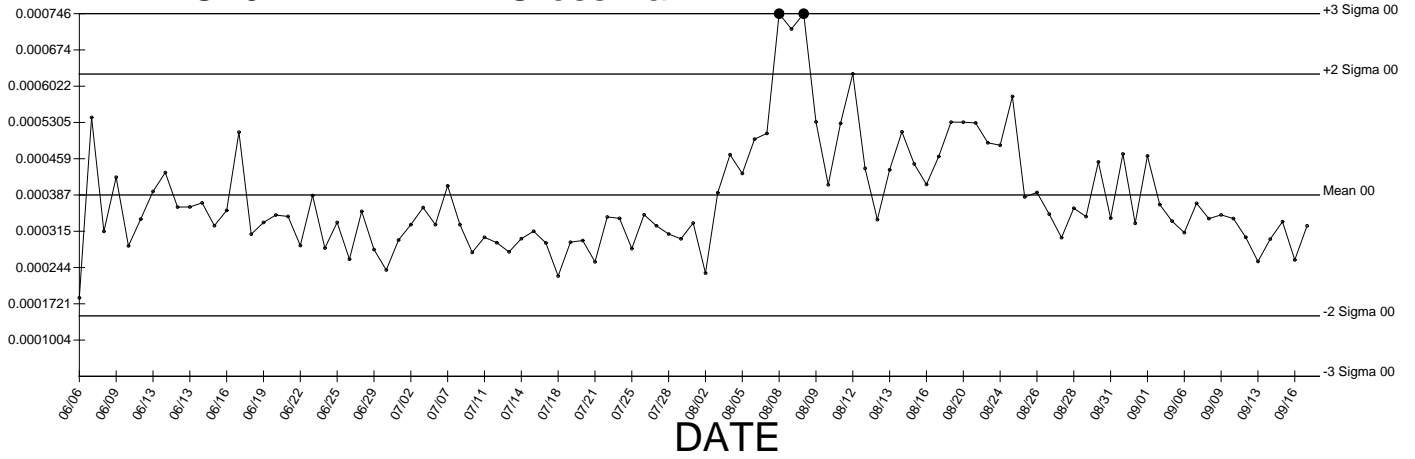
● Denotes Outlier

PIC10D BETA EFF

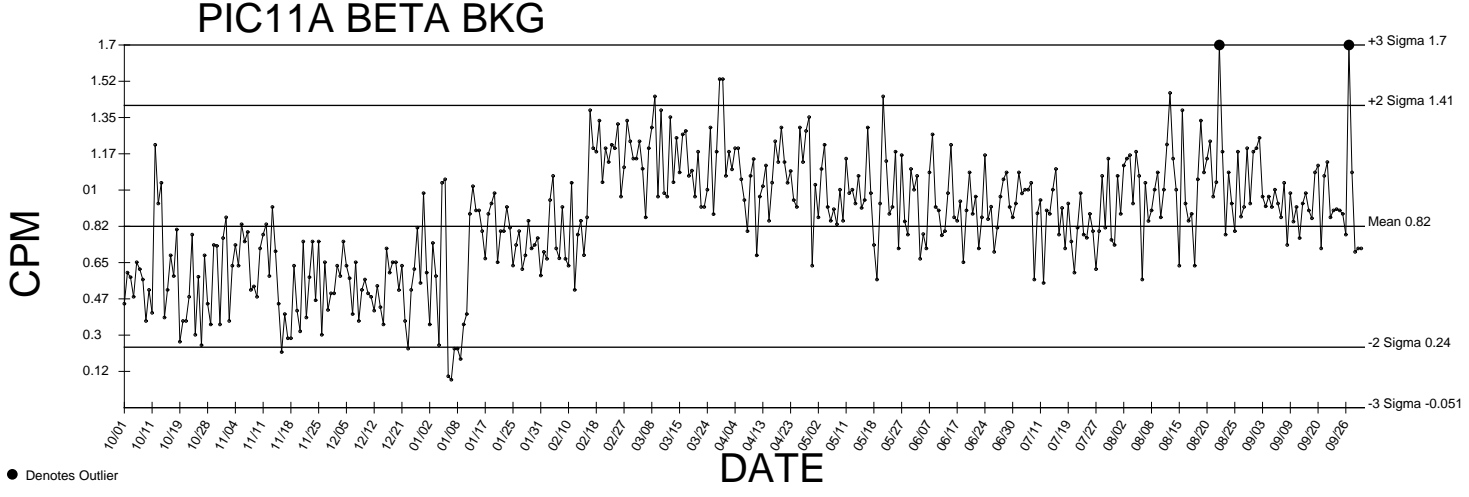
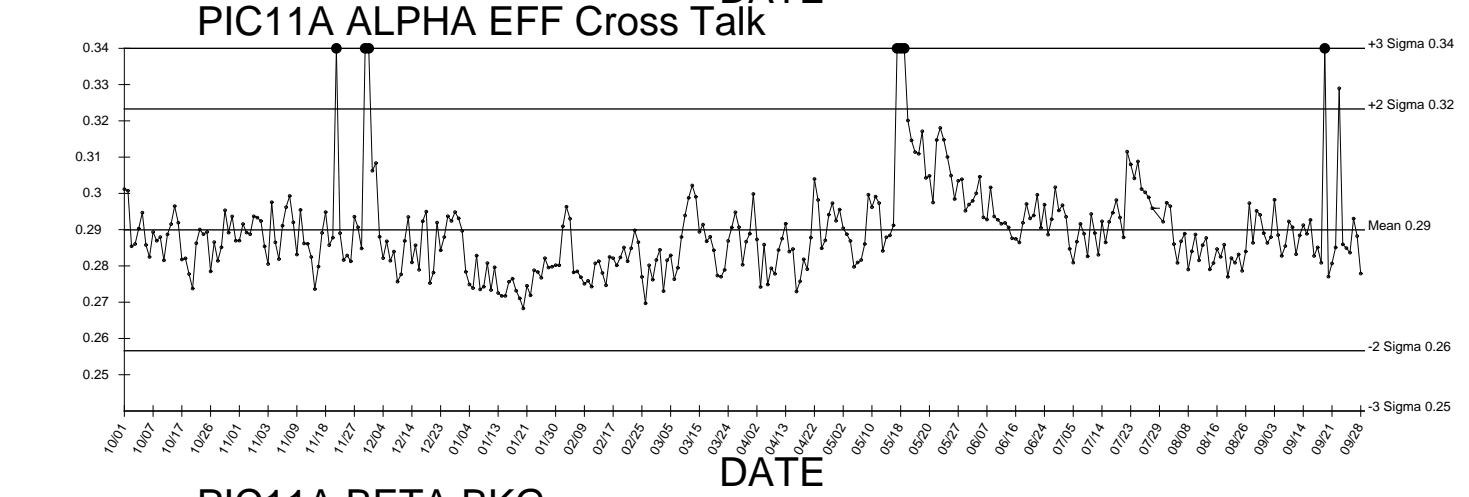
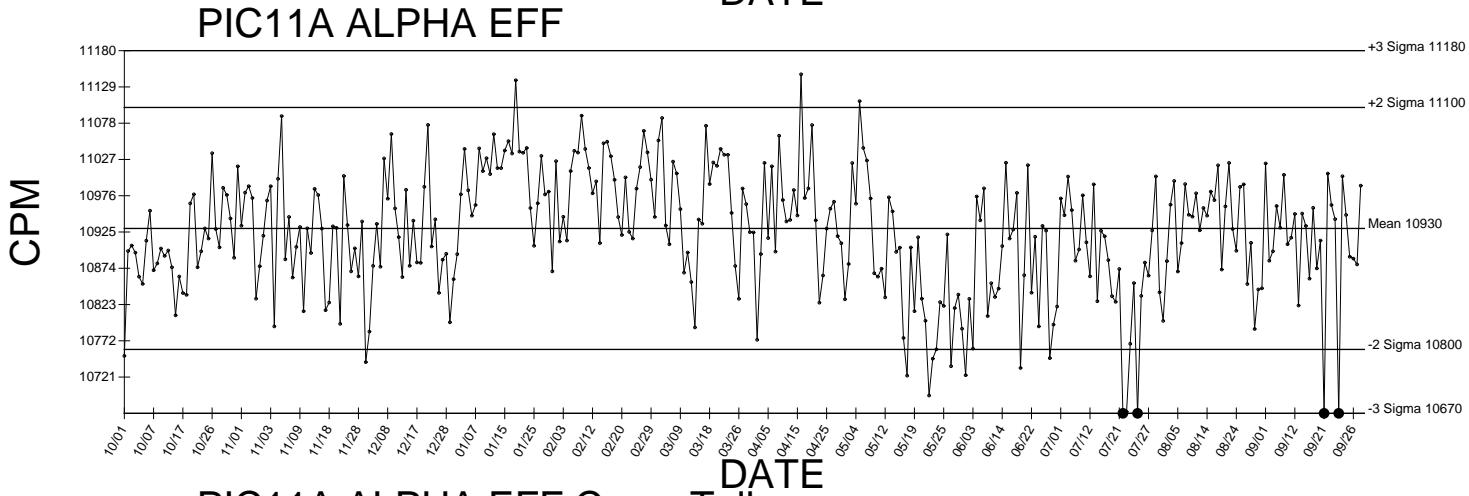
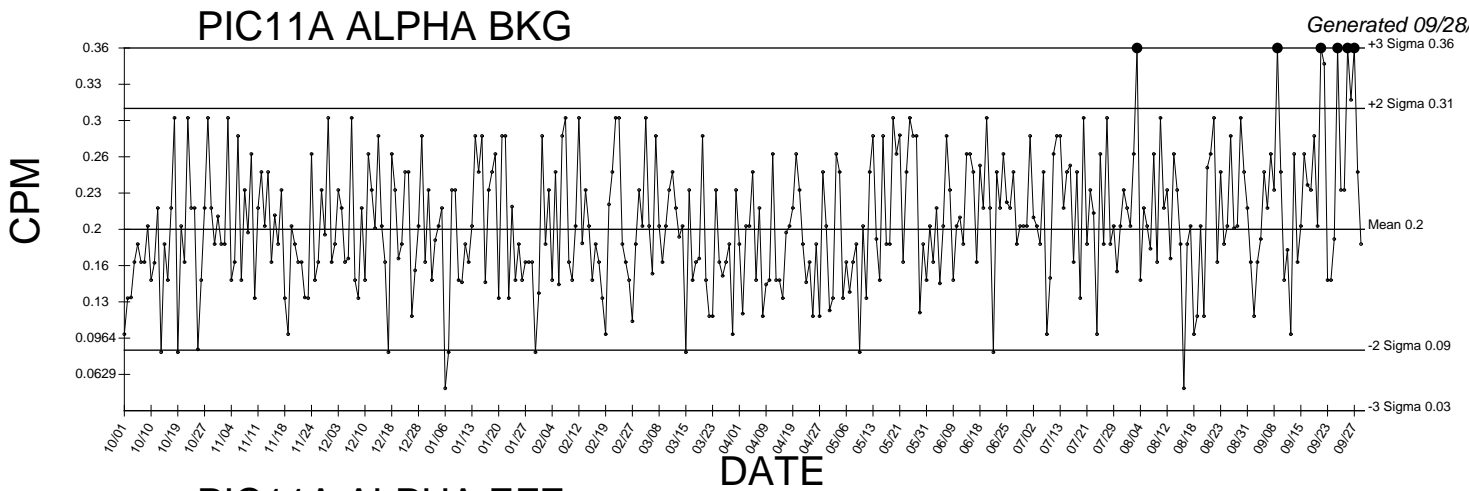
Generated 09/17/2016



PIC10D BETA EFF Cross Talk



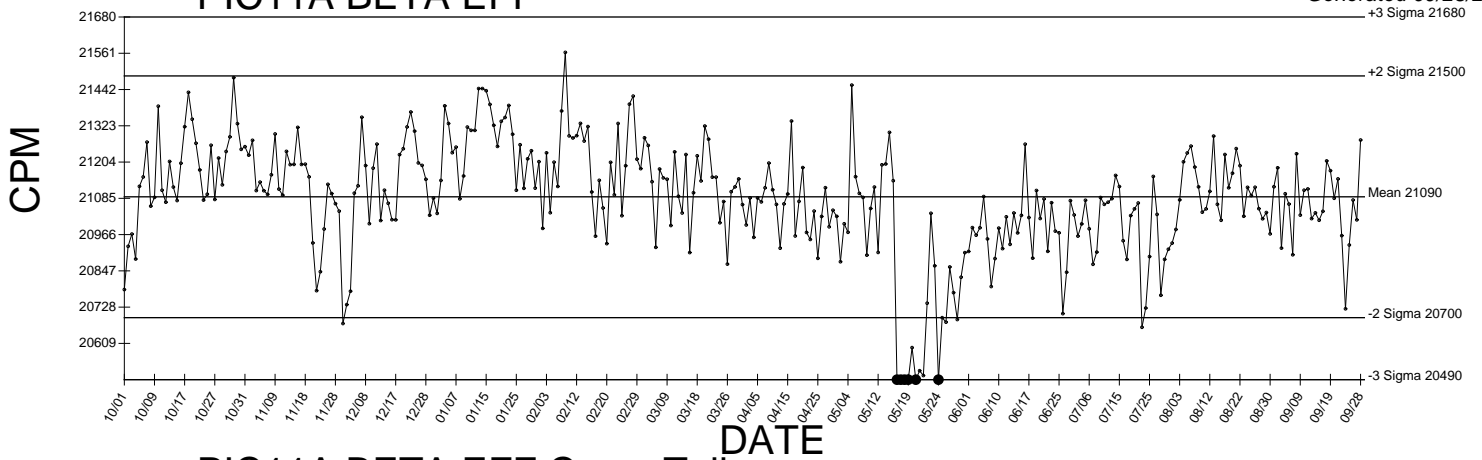
● Denotes Outlier



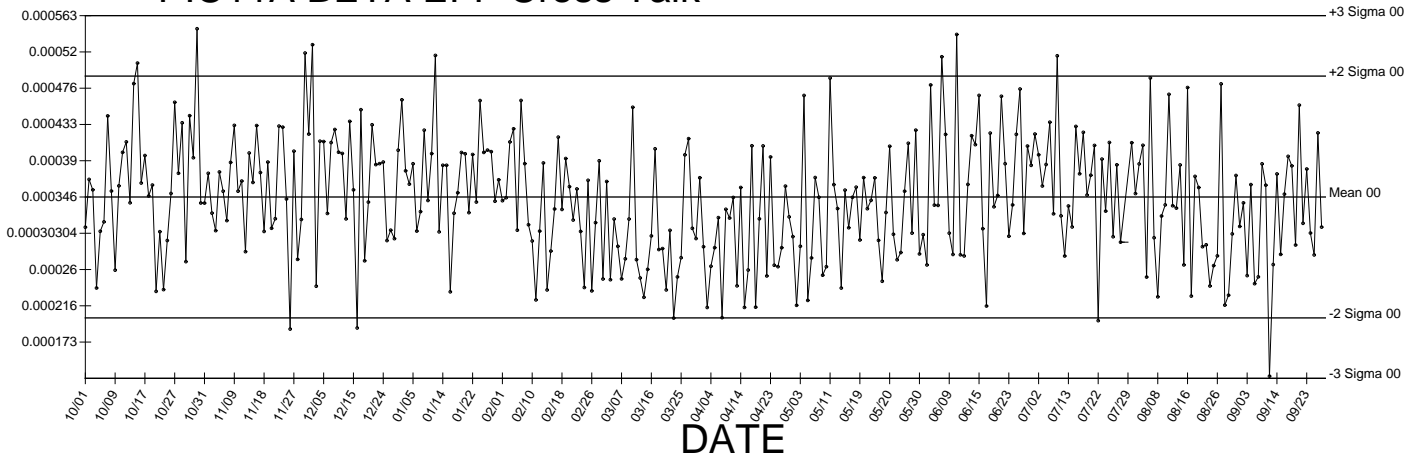
● Denotes Outlier

PIC11A BETA EFF

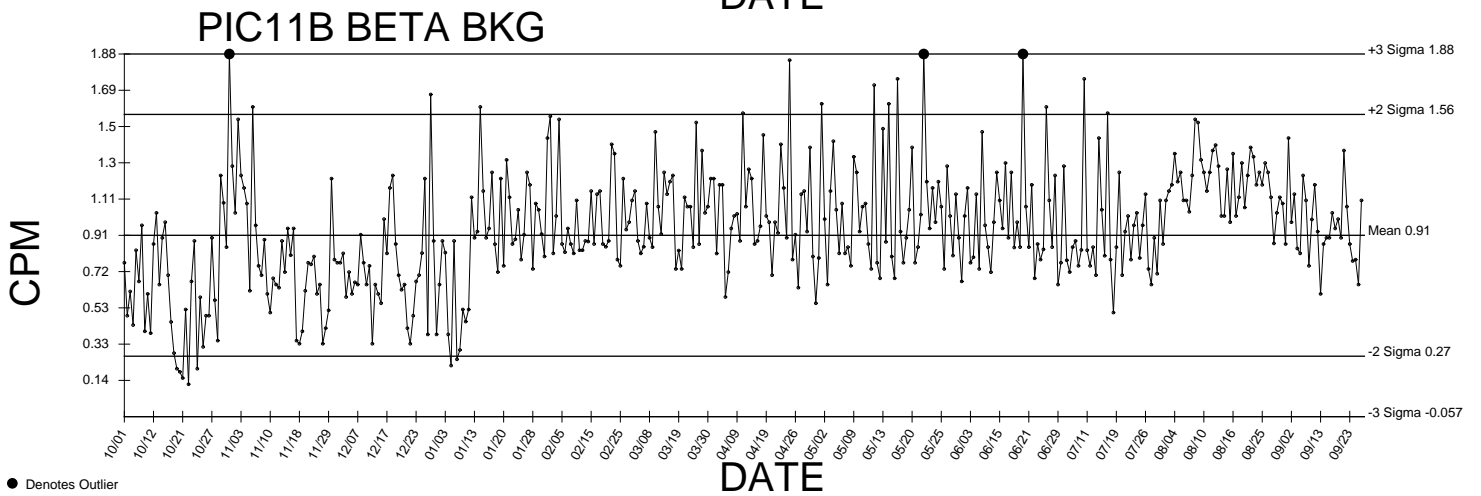
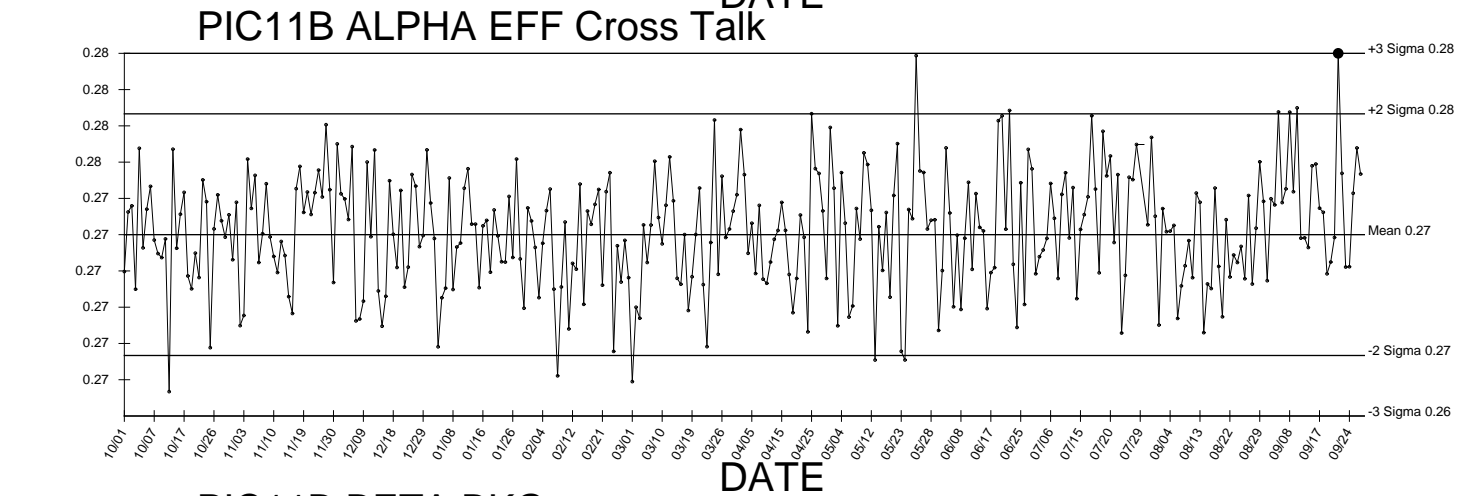
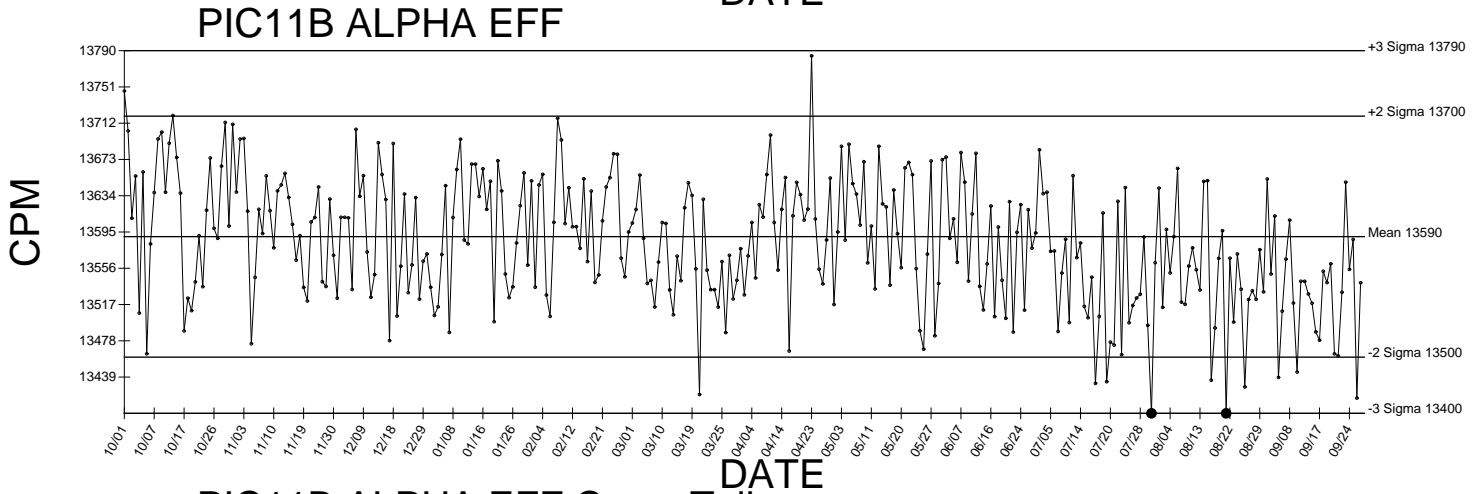
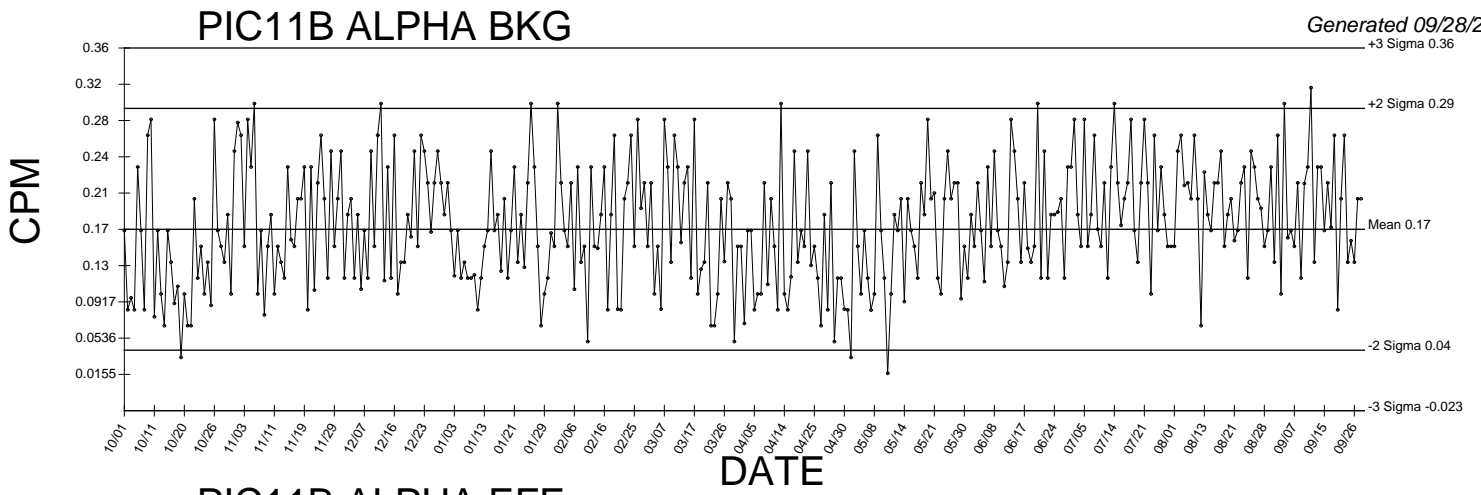
Generated 09/28/2016



PIC11A BETA EFF Cross Talk



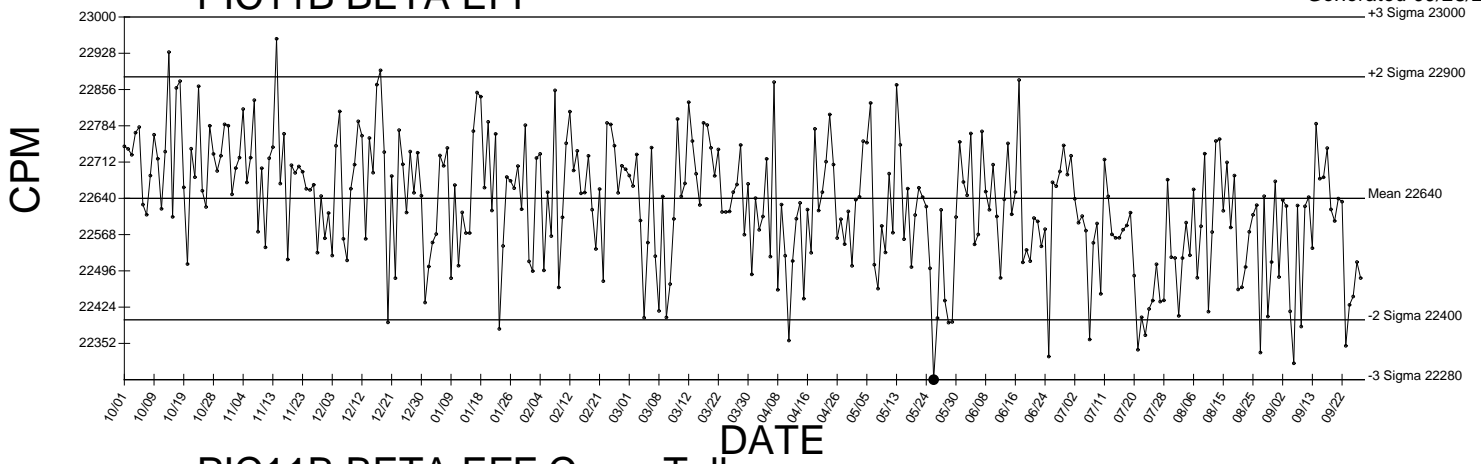
● Denotes Outlier



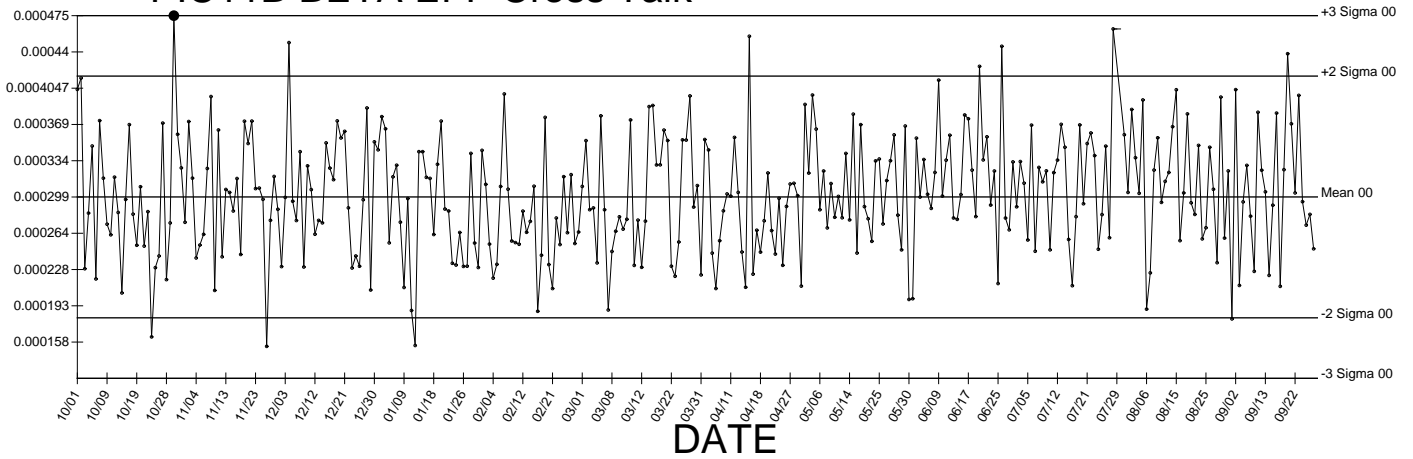
● Denotes Outlier

PIC11B BETA EFF

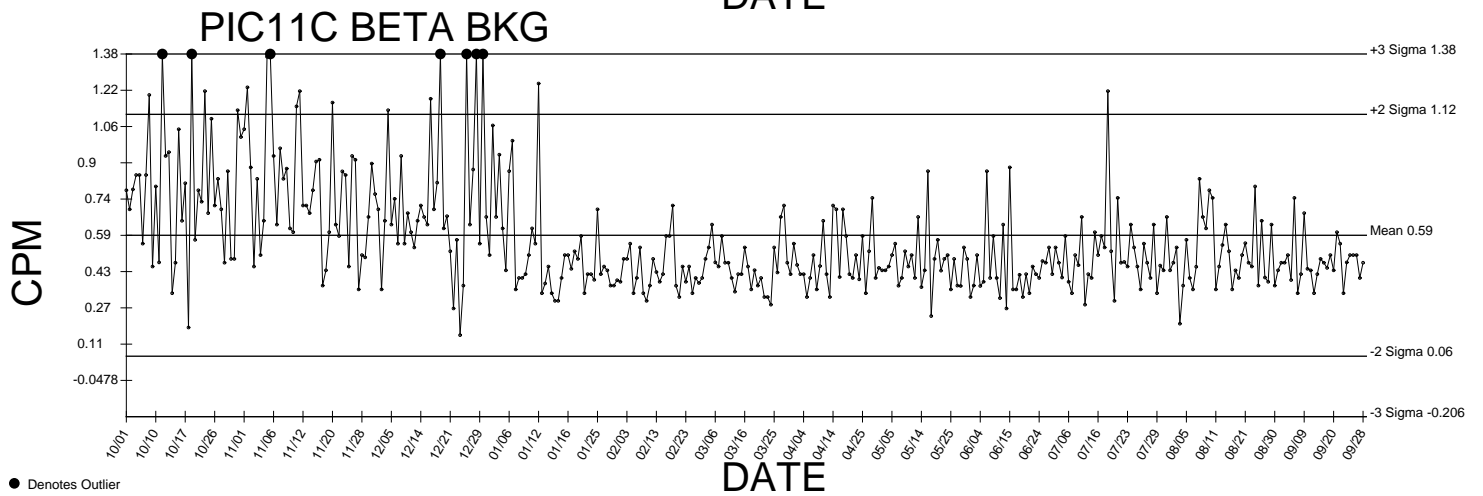
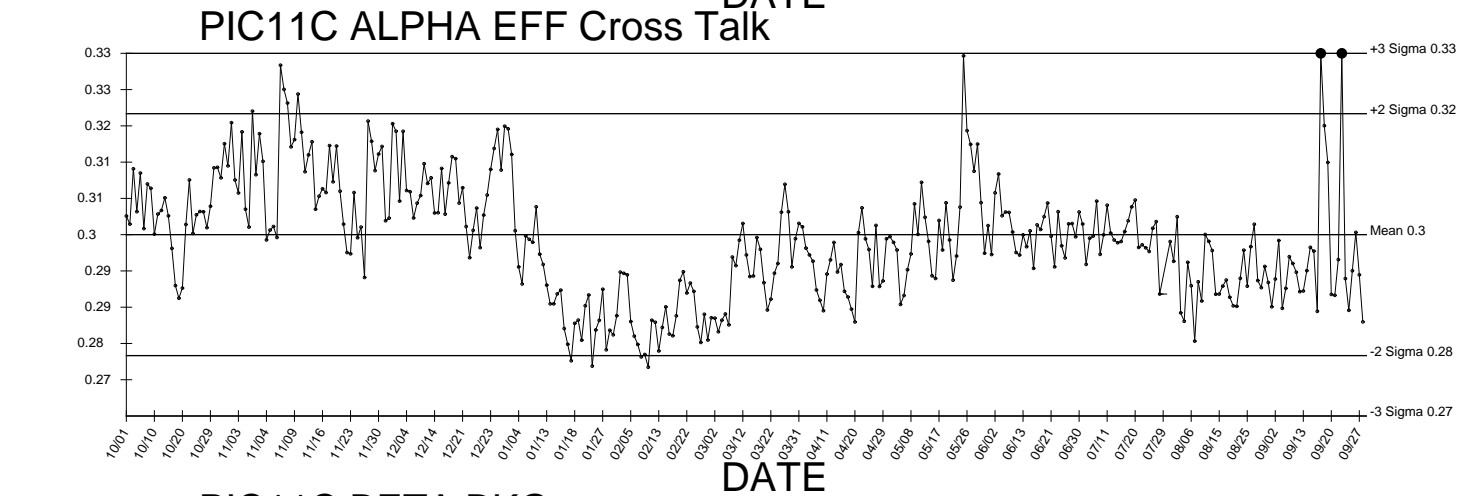
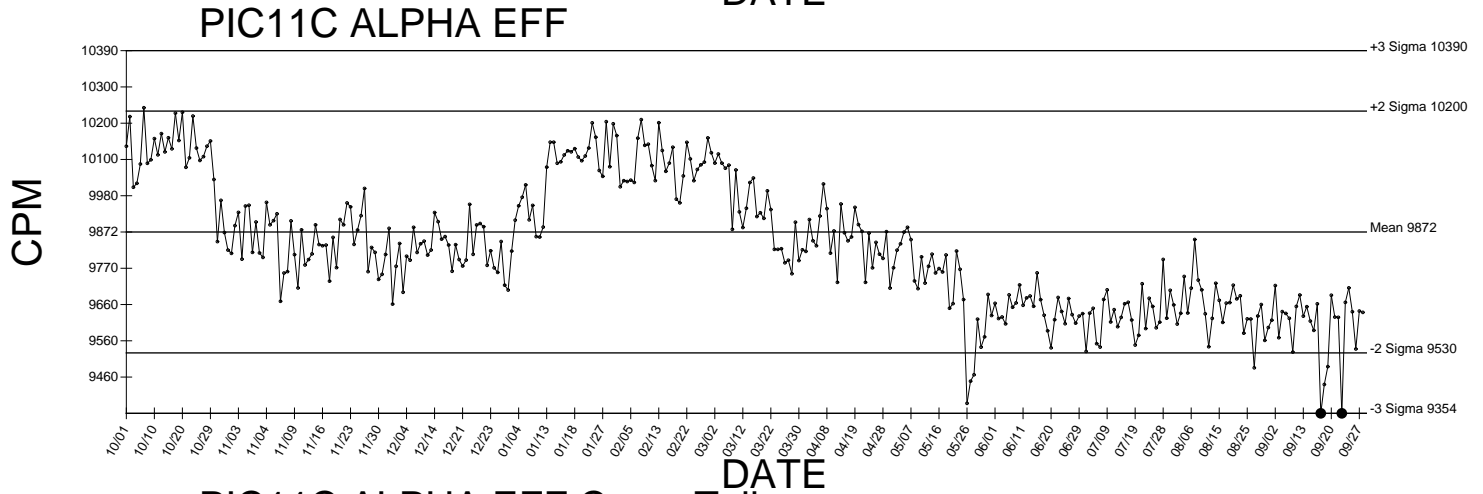
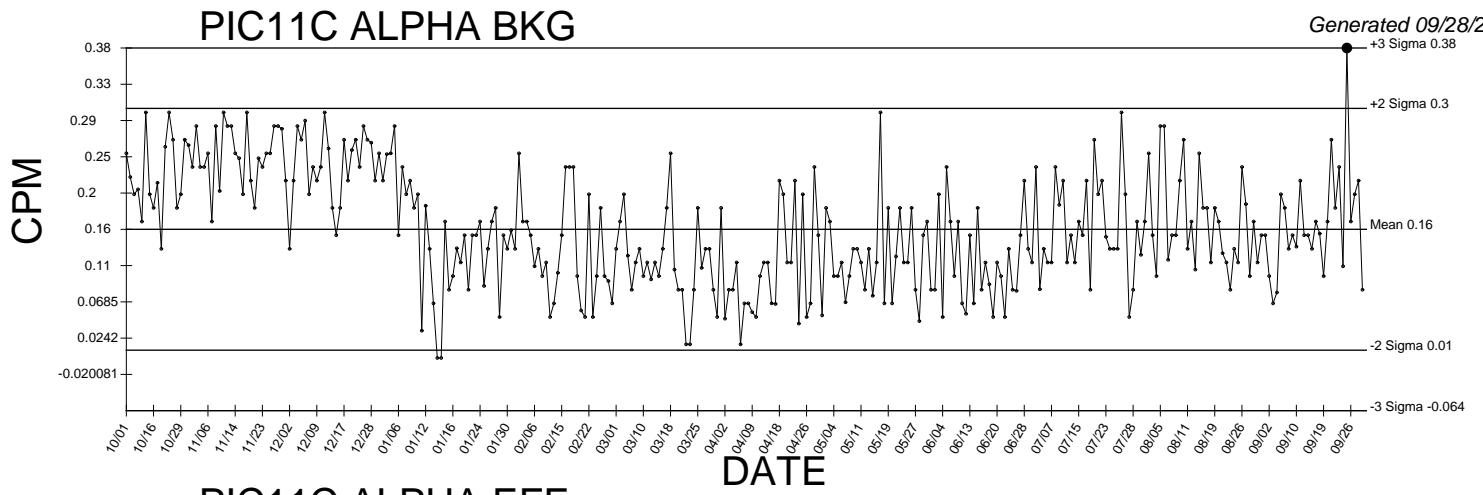
Generated 09/28/2016



PIC11B BETA EFF Cross Talk



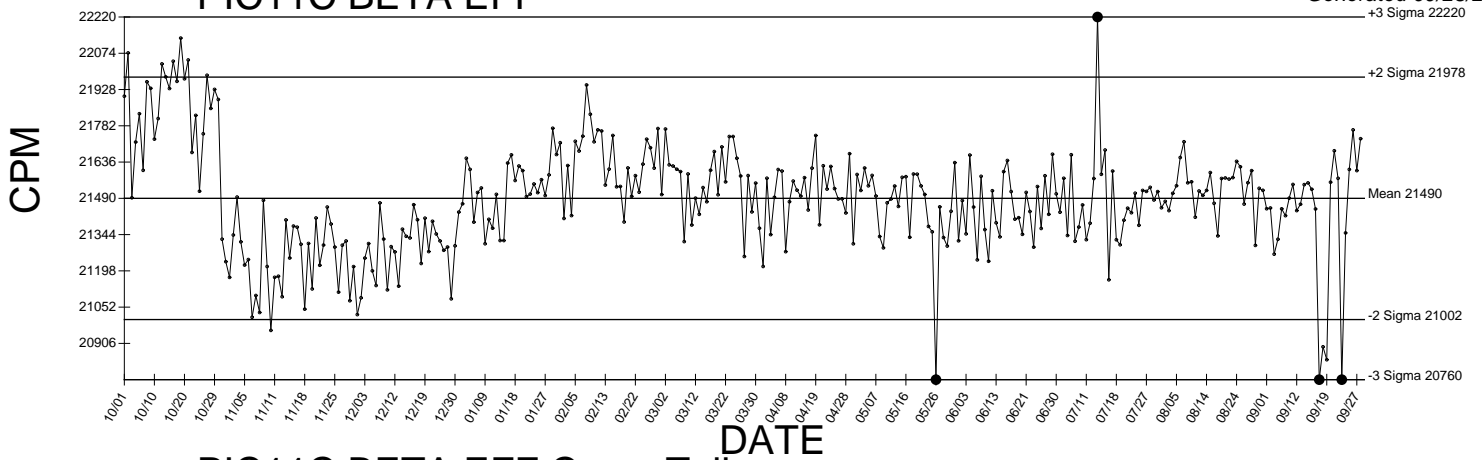
● Denotes Outlier



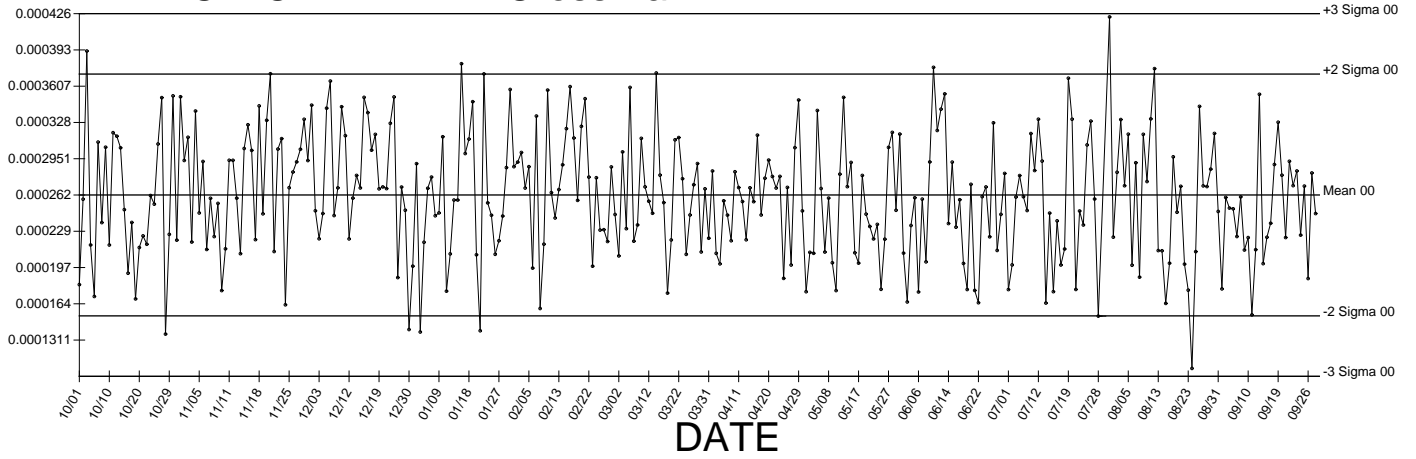
● Denotes Outlier

PIC11C BETA EFF

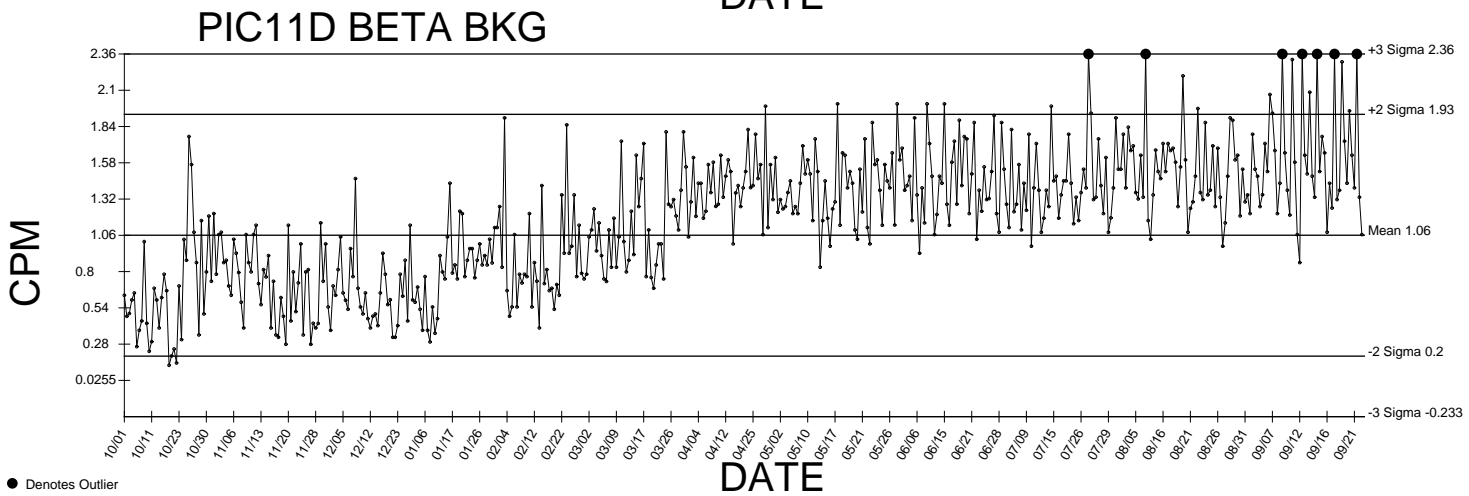
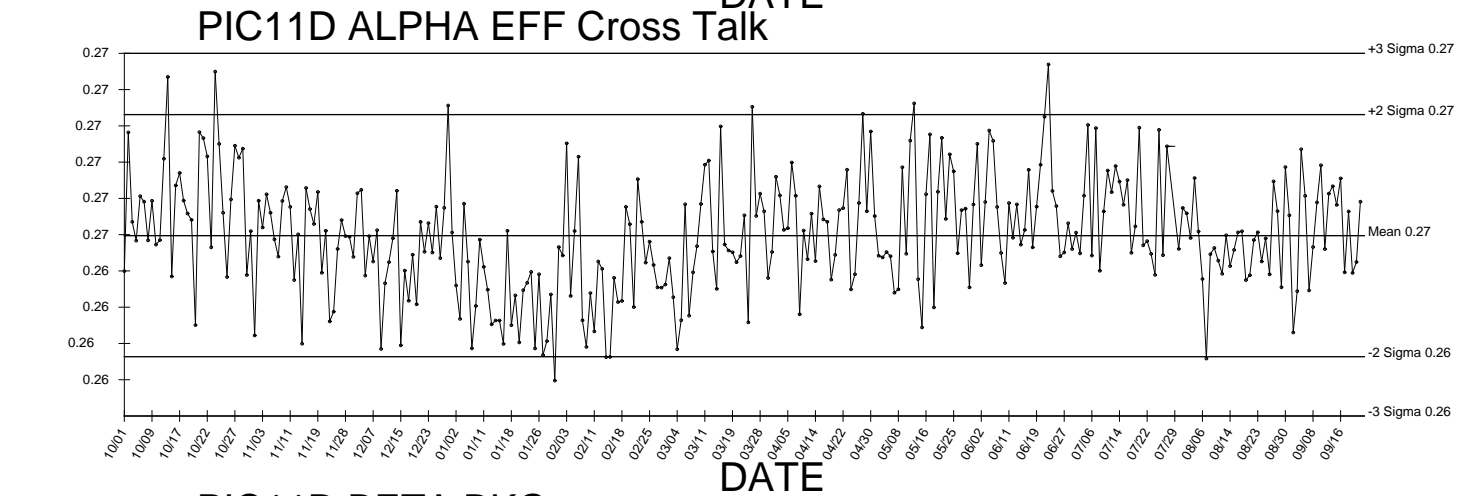
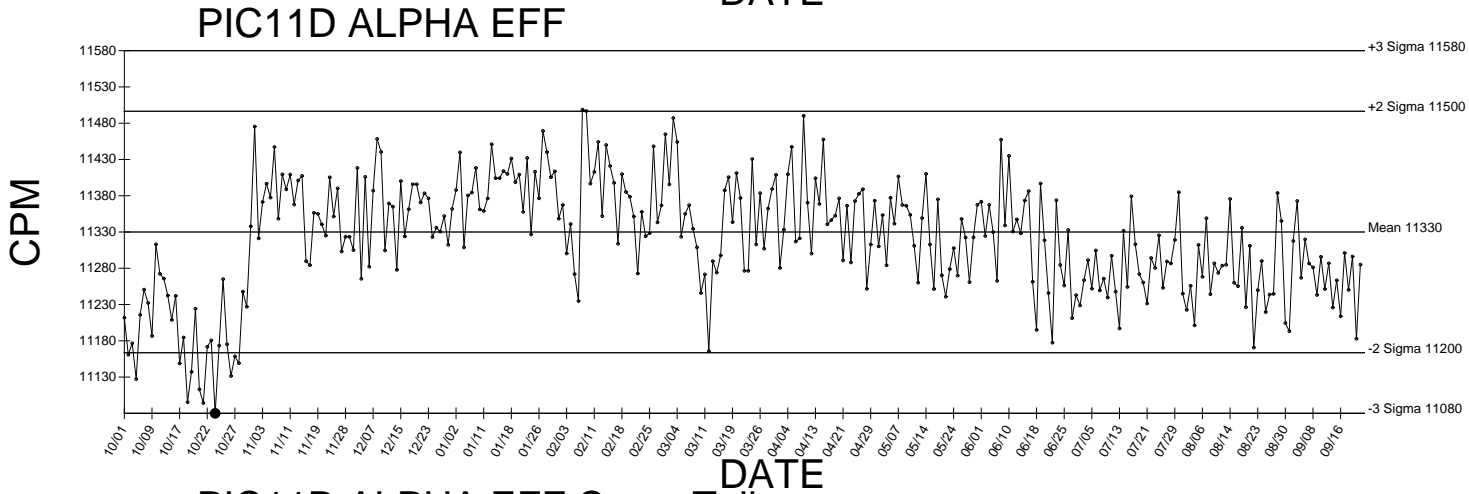
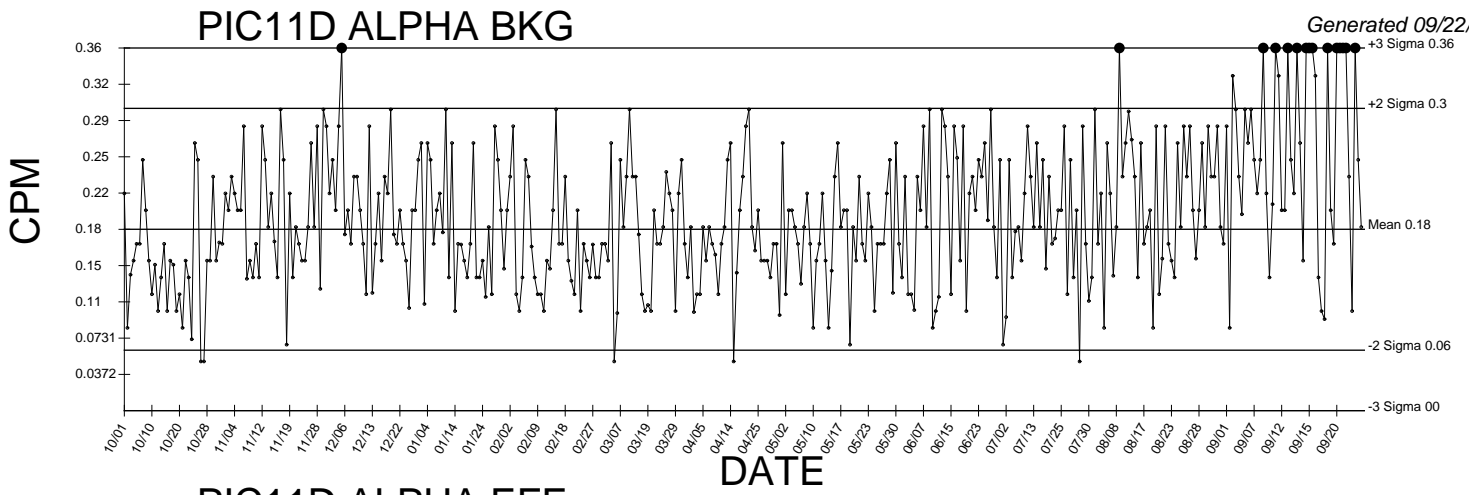
Generated 09/28/2016



PIC11C BETA EFF Cross Talk



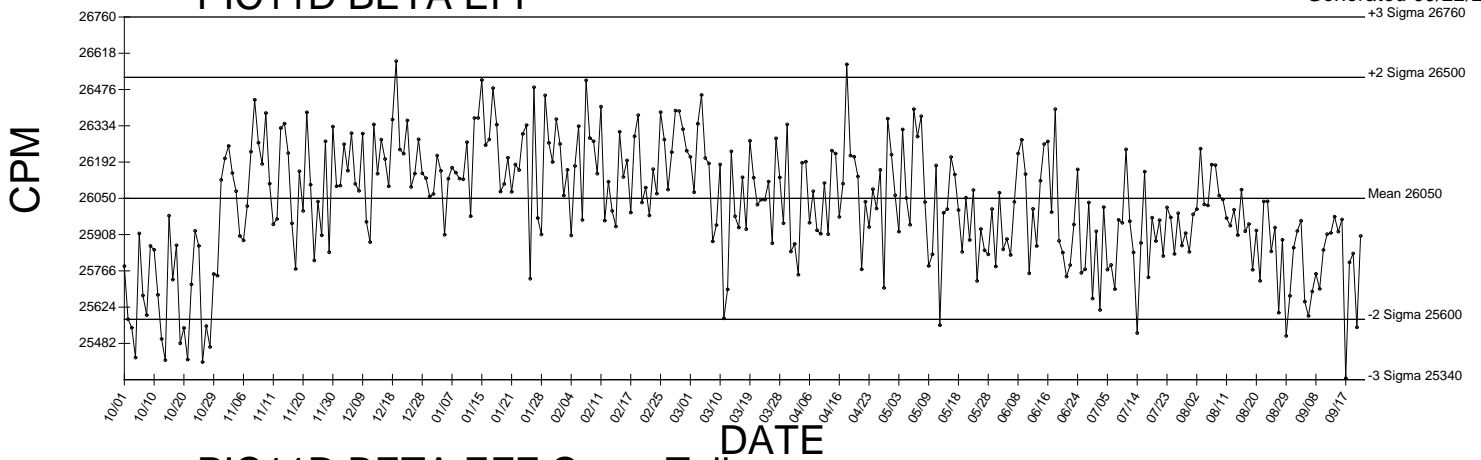
● Denotes Outlier



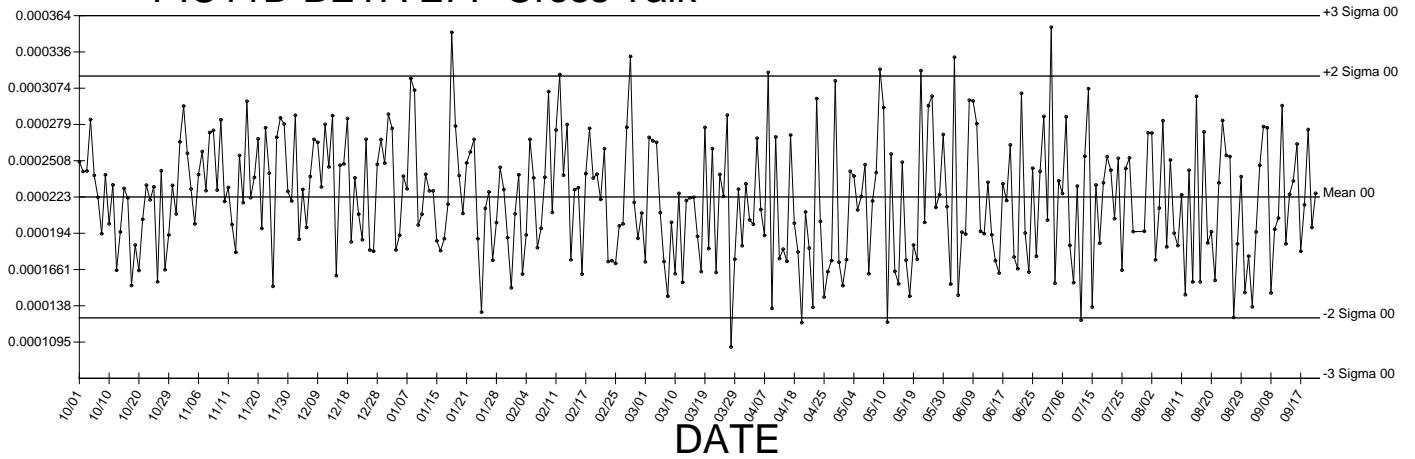
● Denotes Outlier

PIC11D BETA EFF

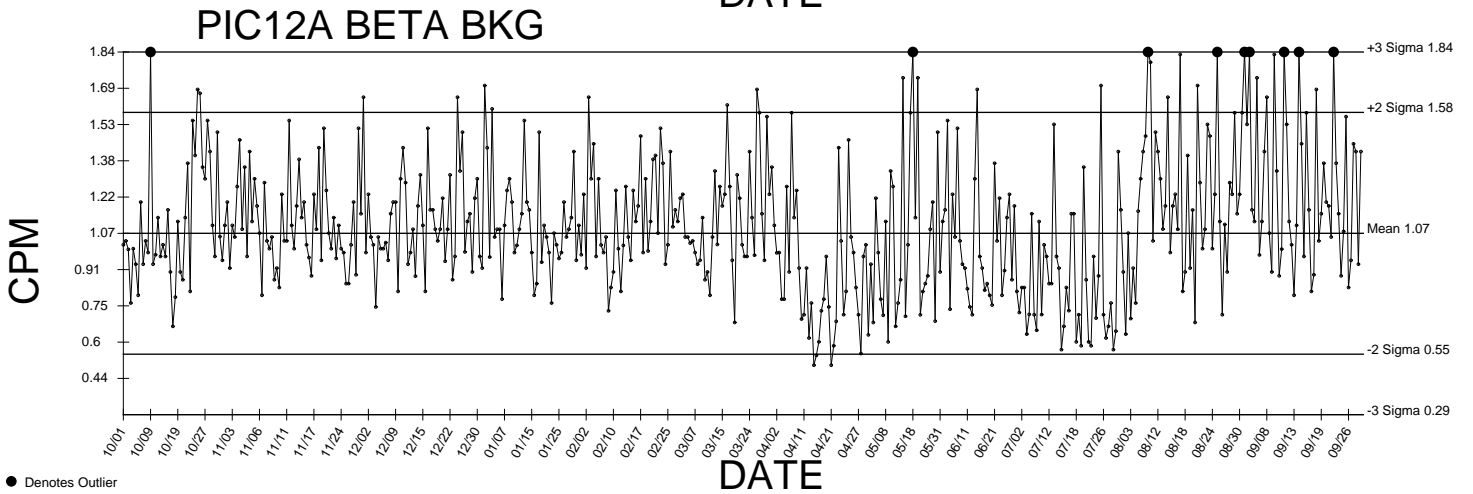
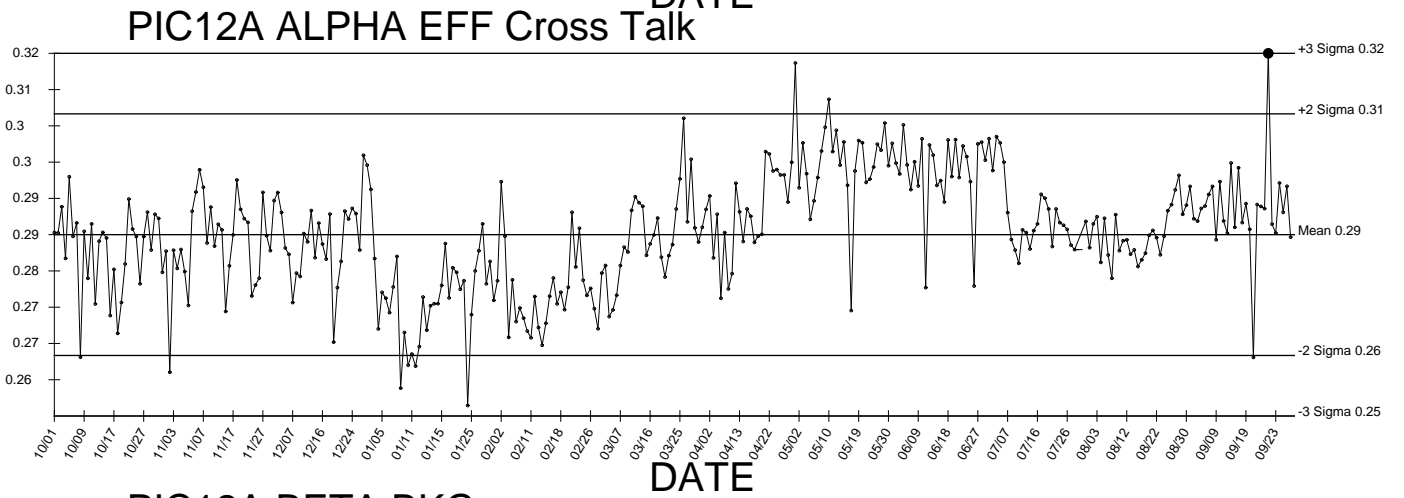
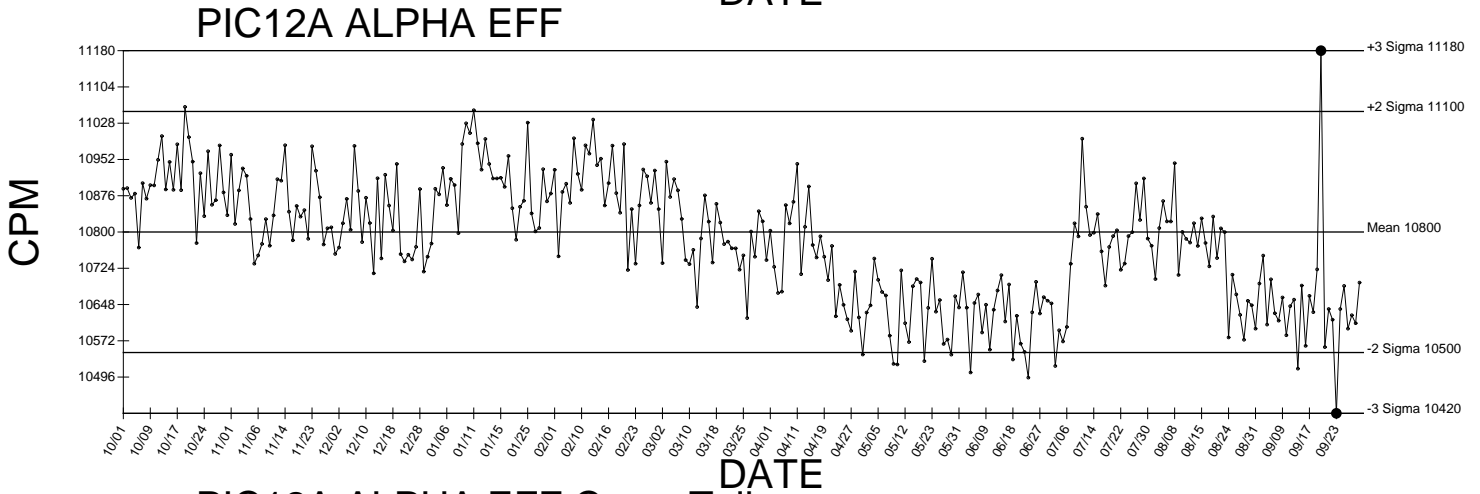
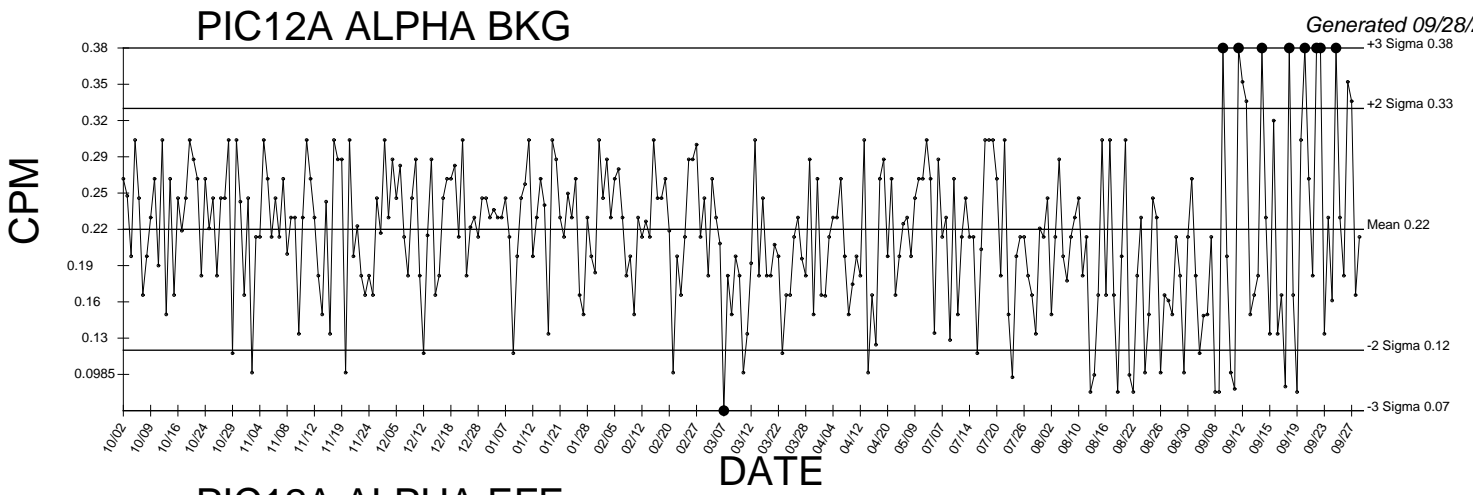
Generated 09/22/2016



PIC11D BETA EFF Cross Talk



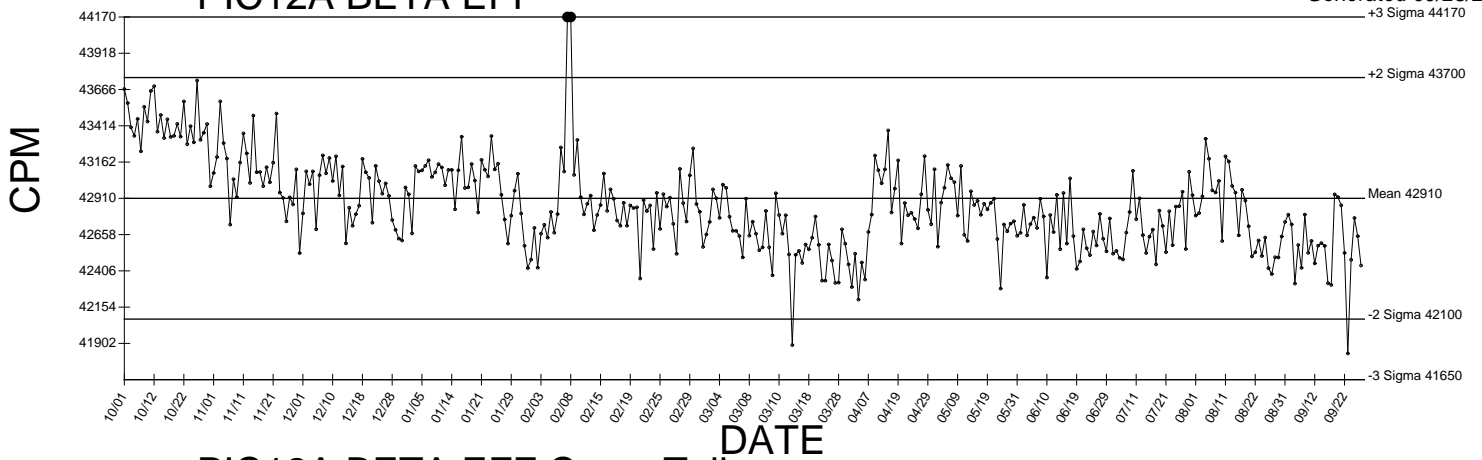
● Denotes Outlier



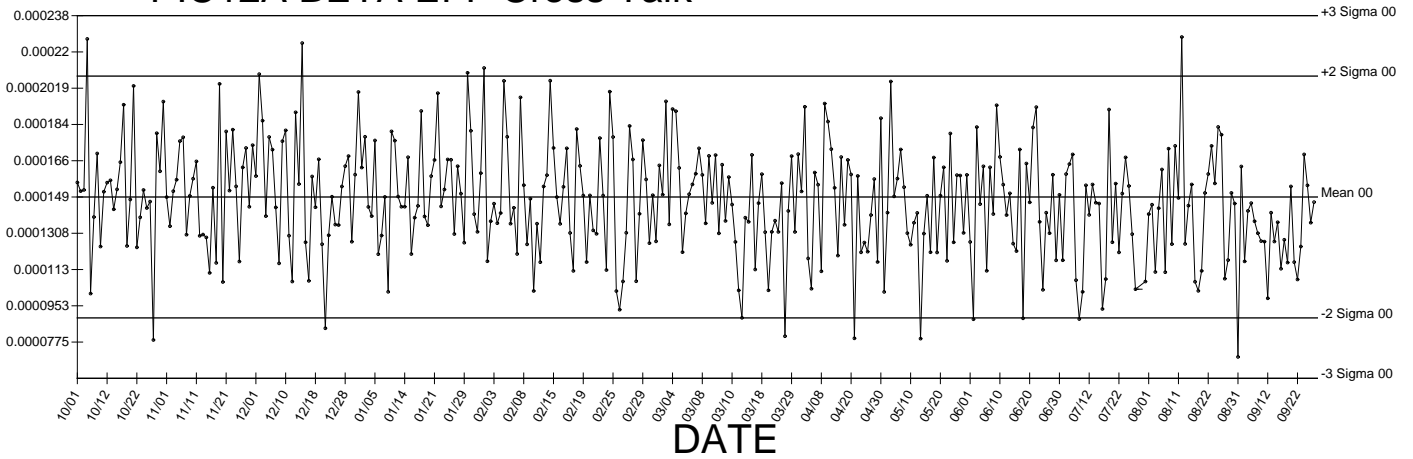
● Denotes Outlier

PIC12A BETA EFF

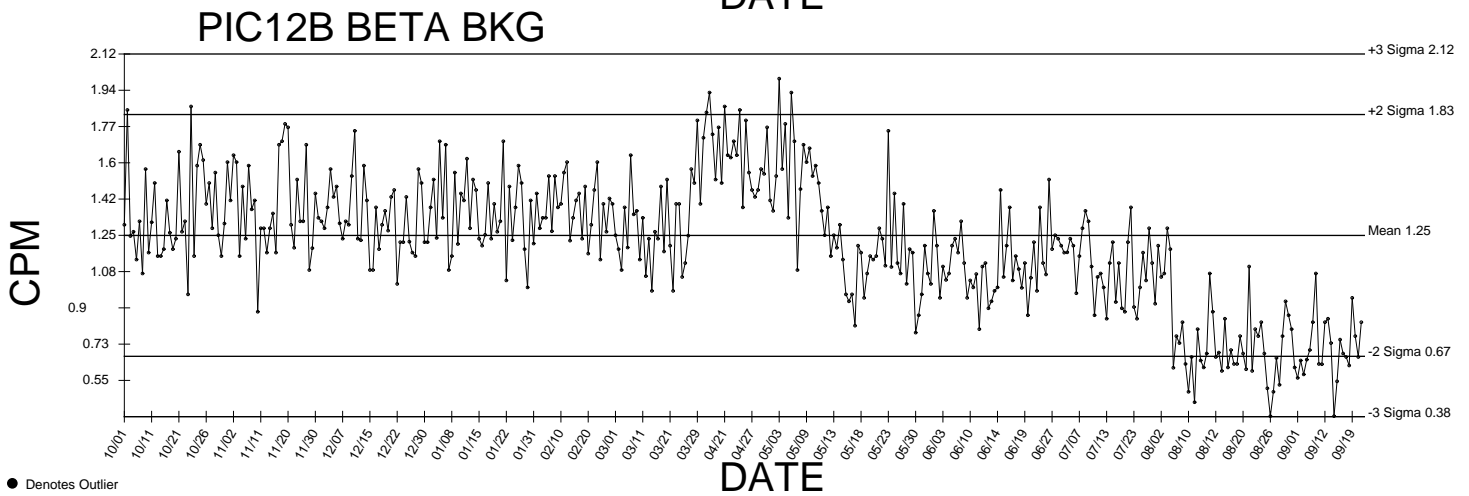
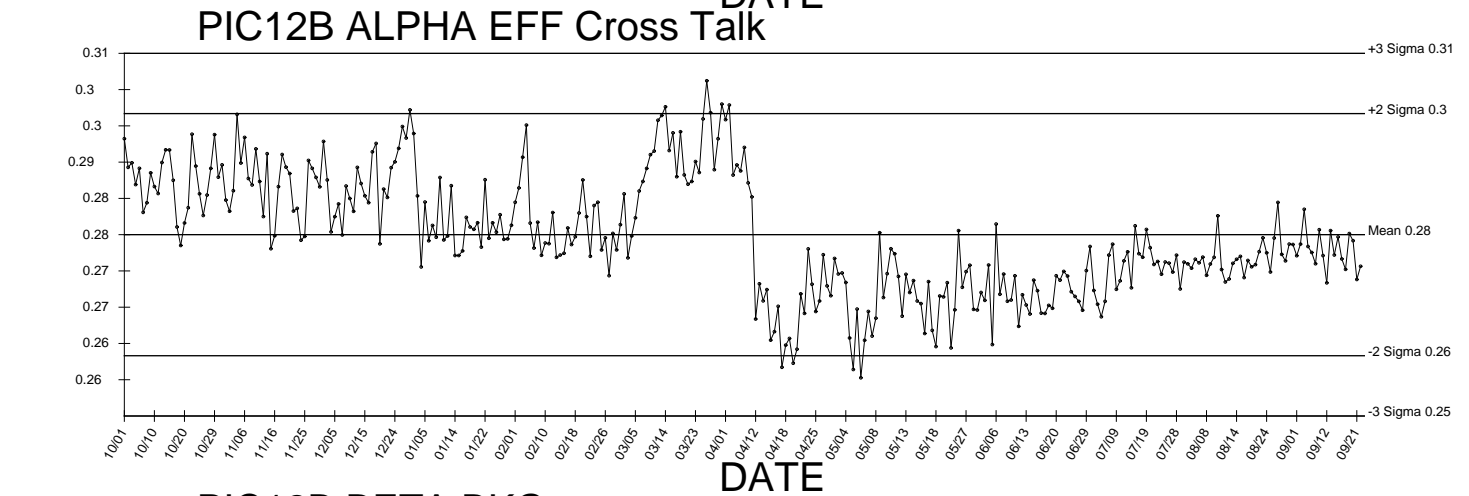
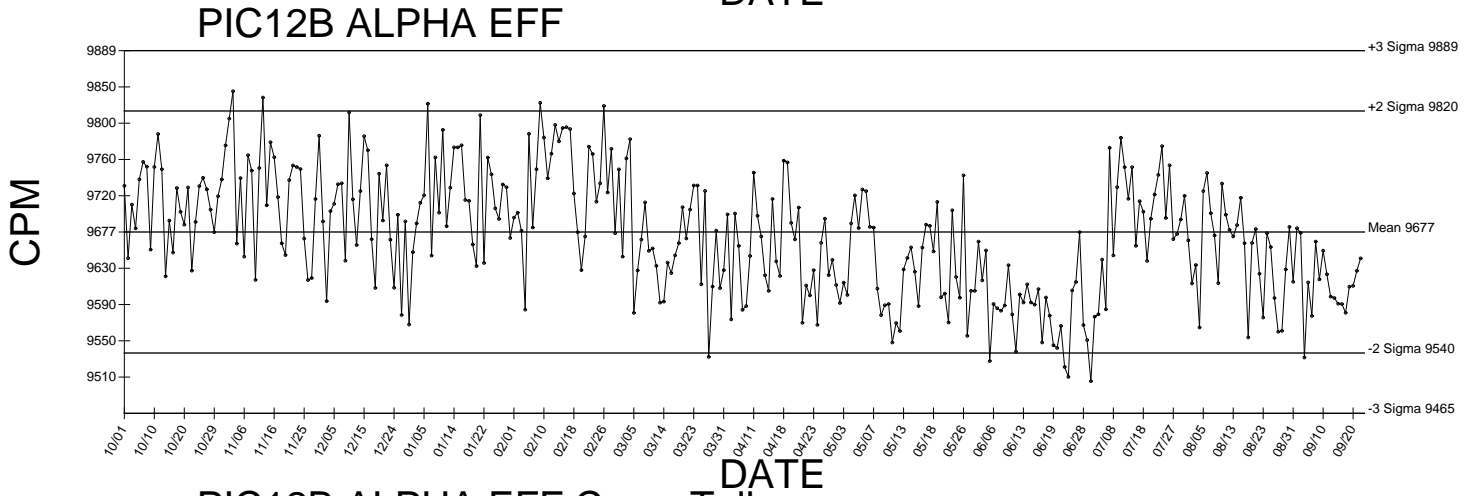
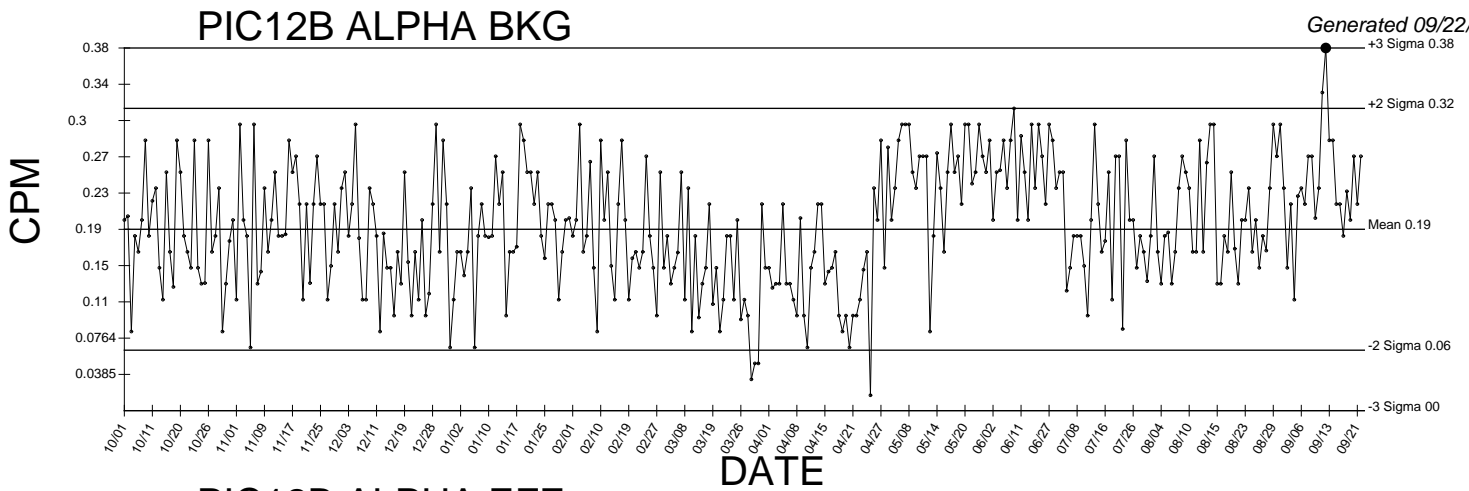
Generated 09/28/2016



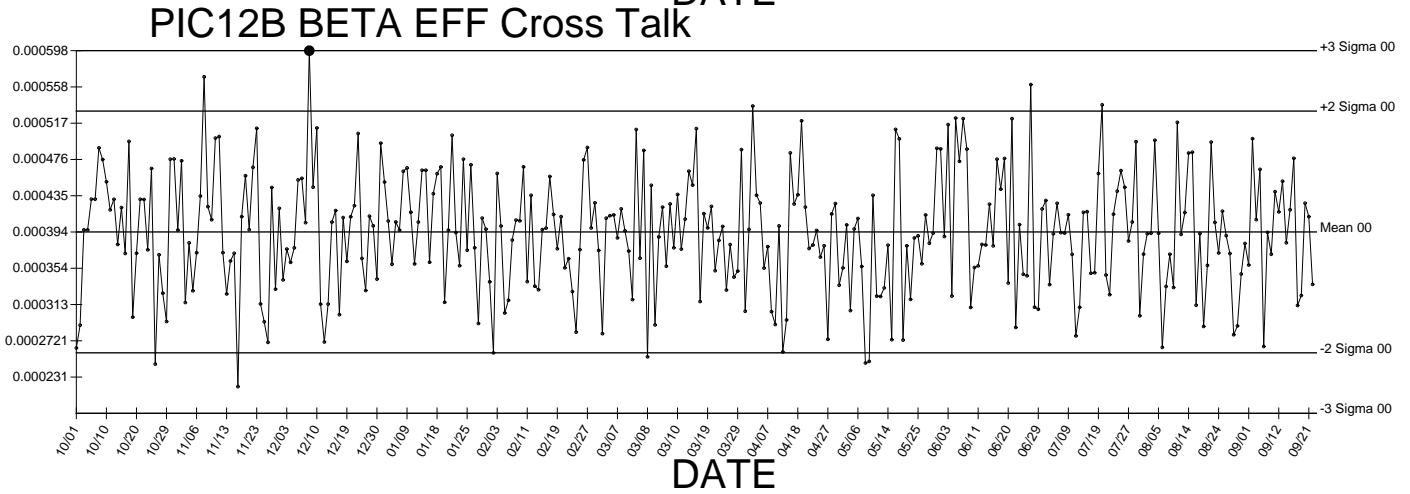
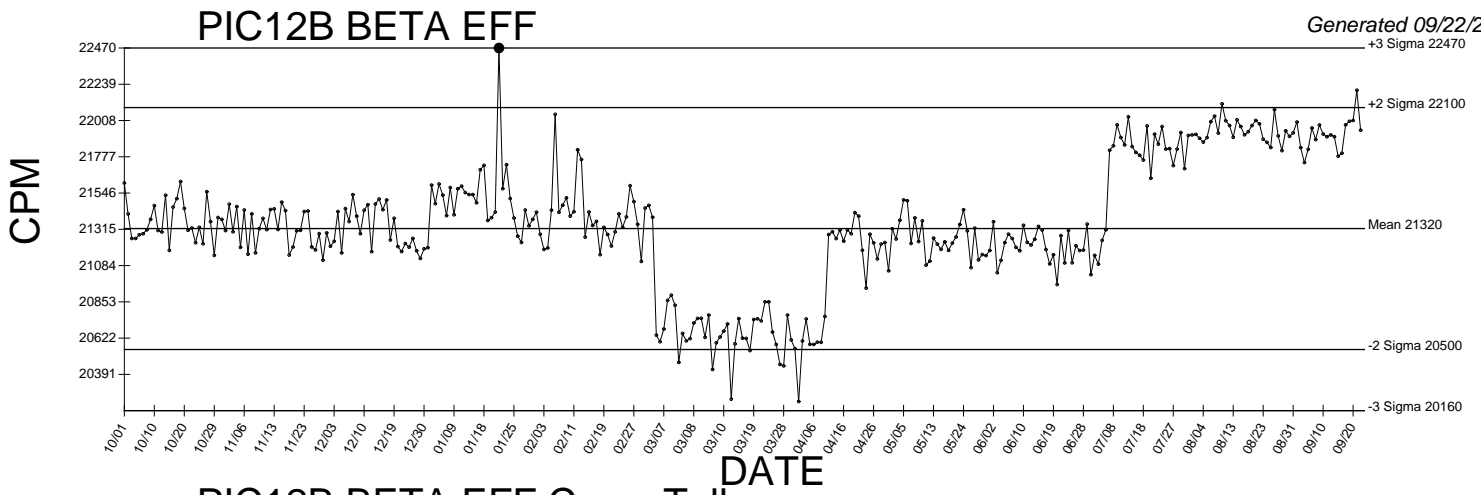
PIC12A BETA EFF Cross Talk



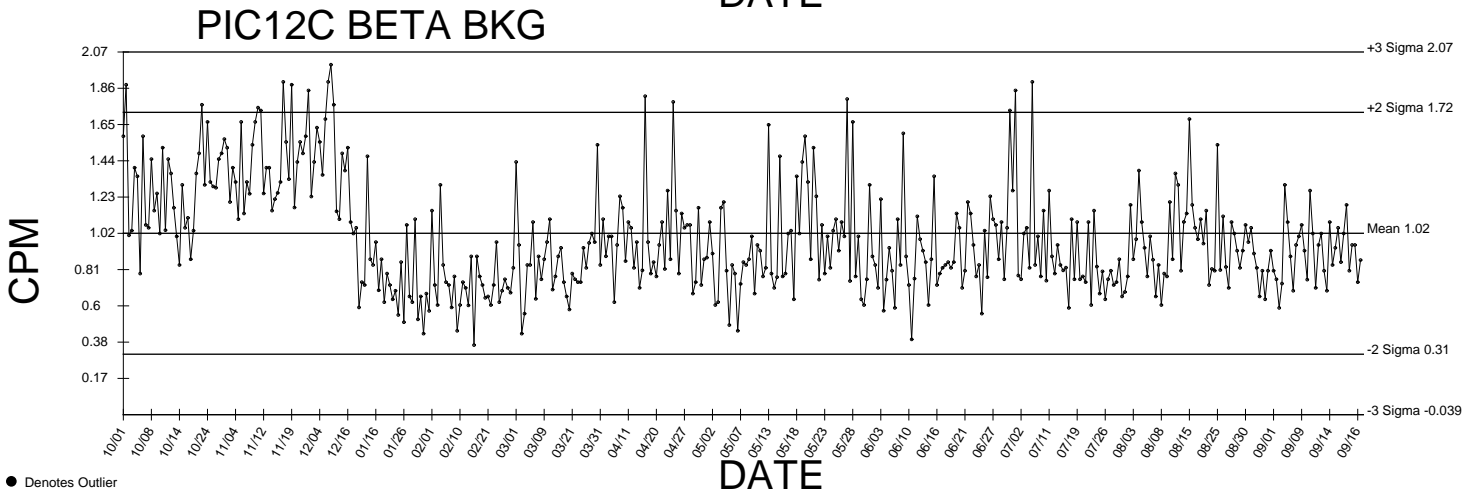
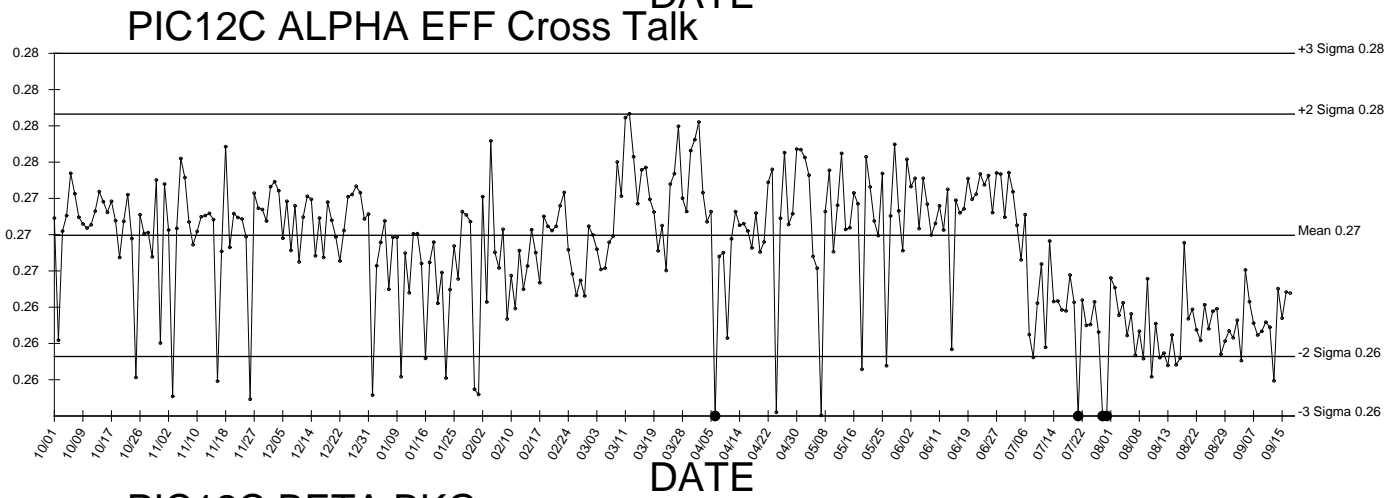
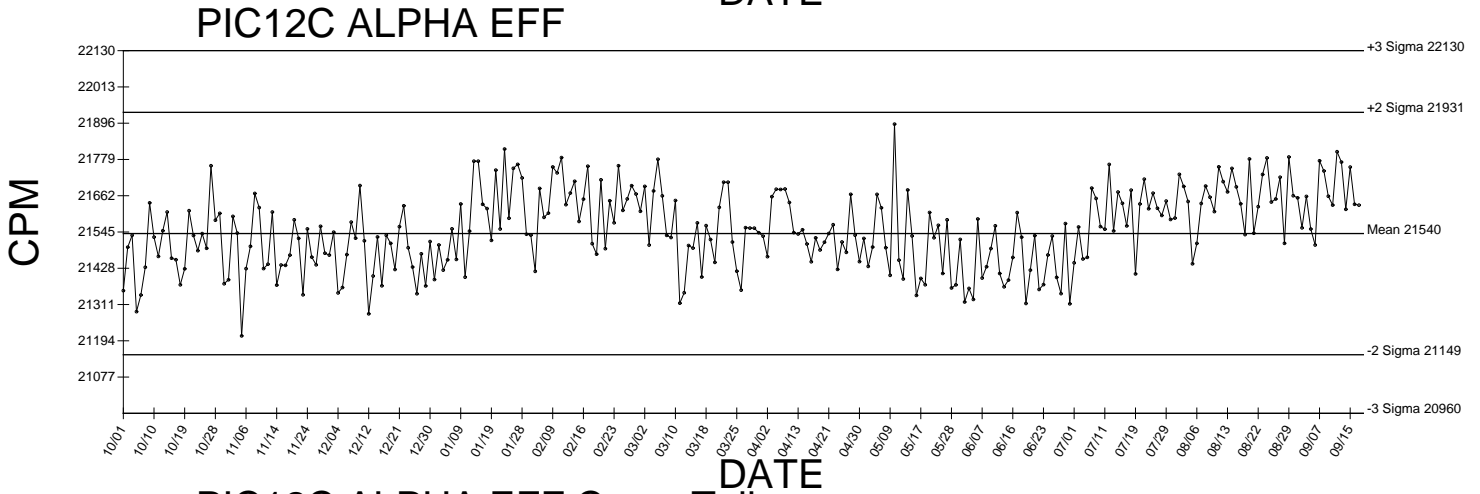
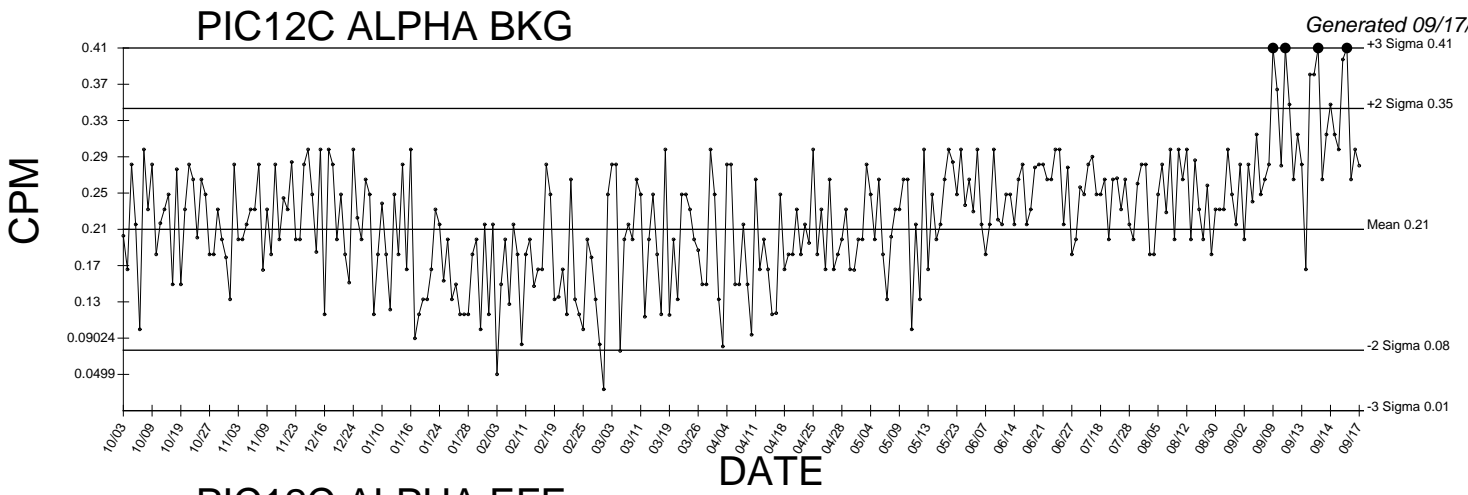
● Denotes Outlier



● Denotes Outlier



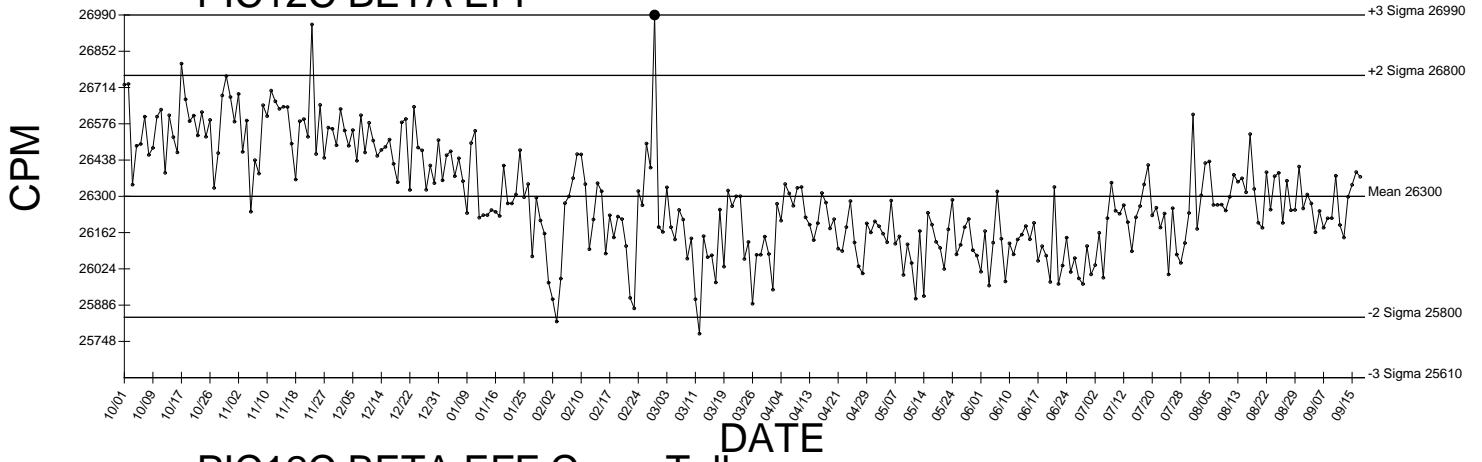
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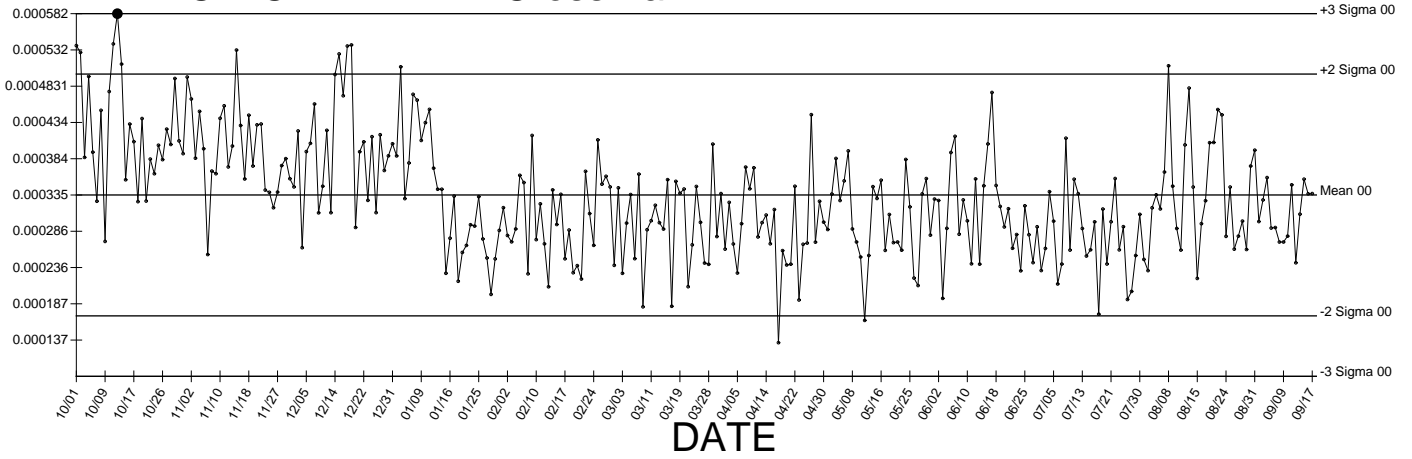
● Denotes Outlier

PIC12C BETA EFF

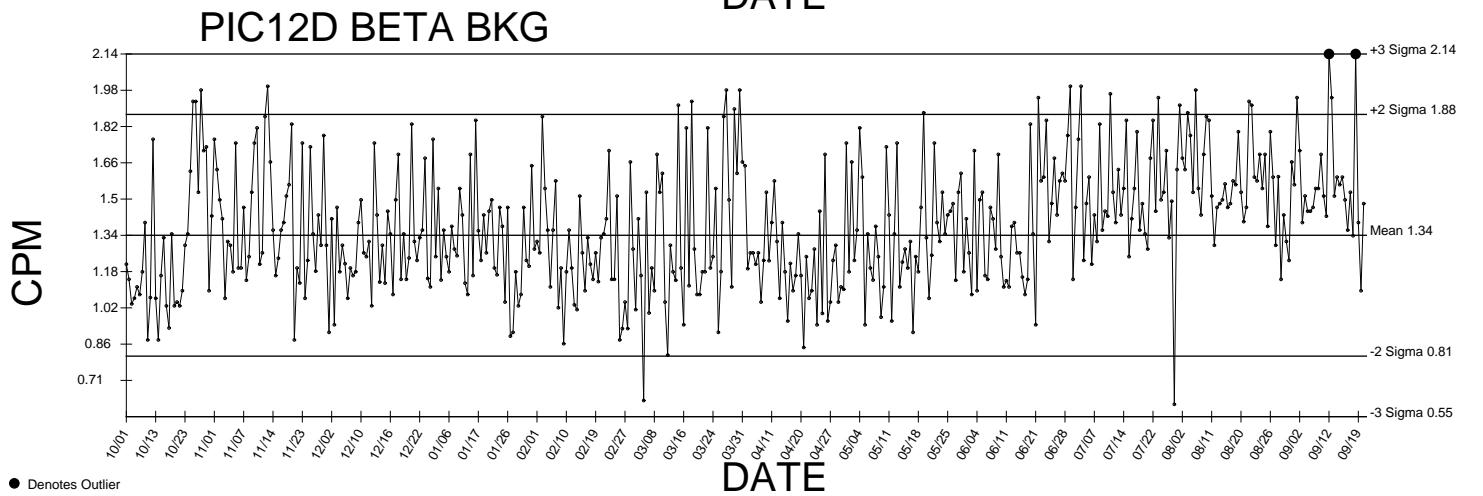
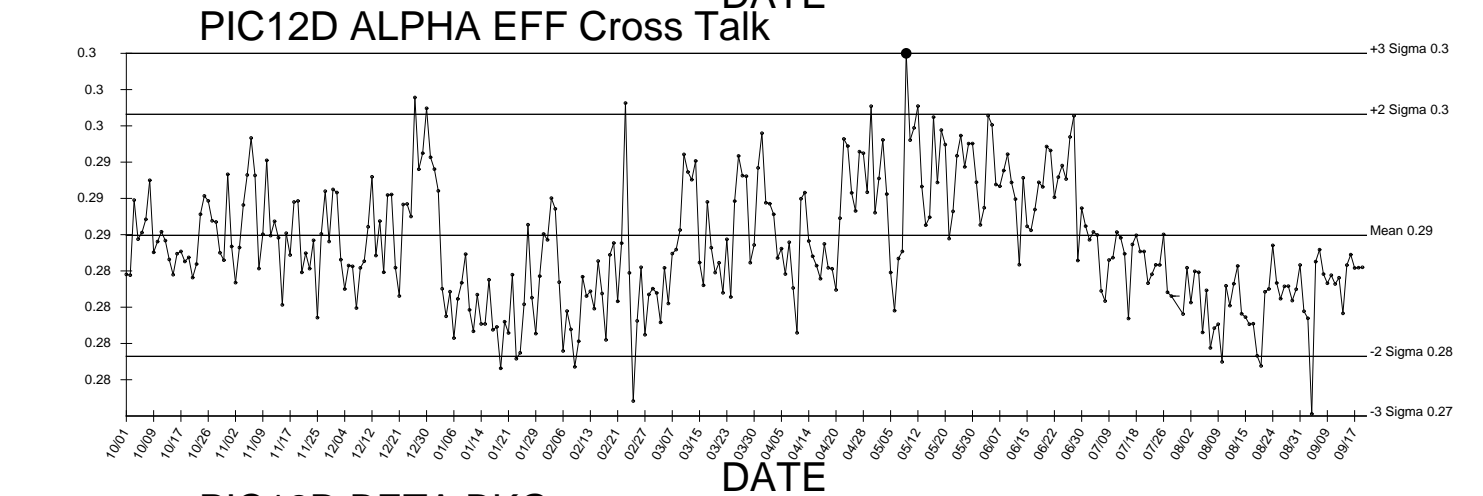
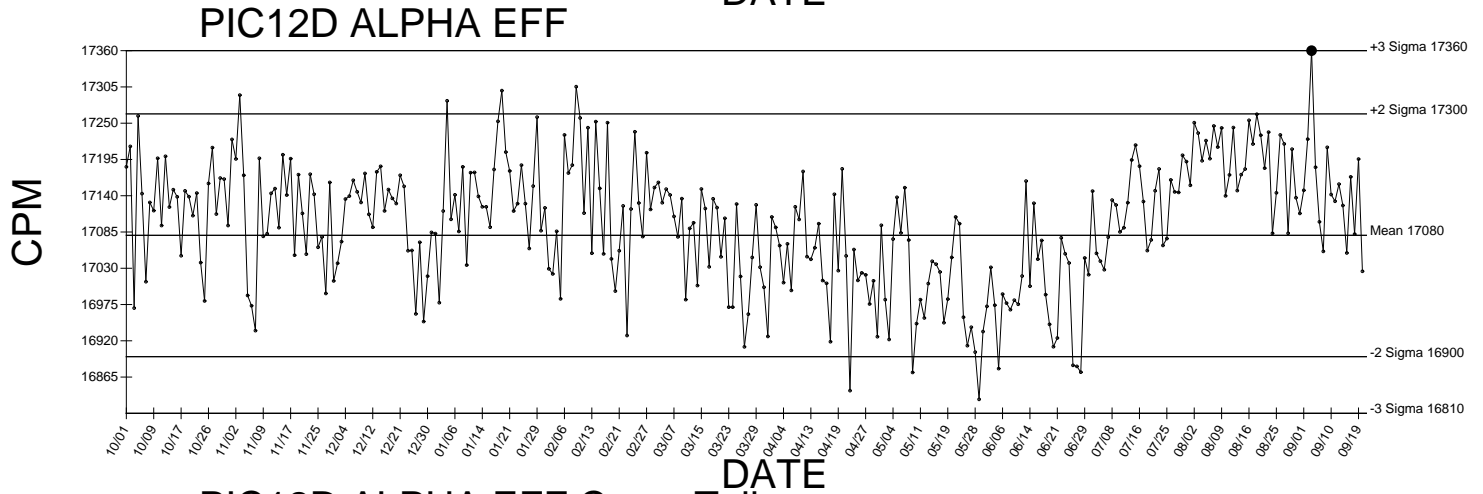
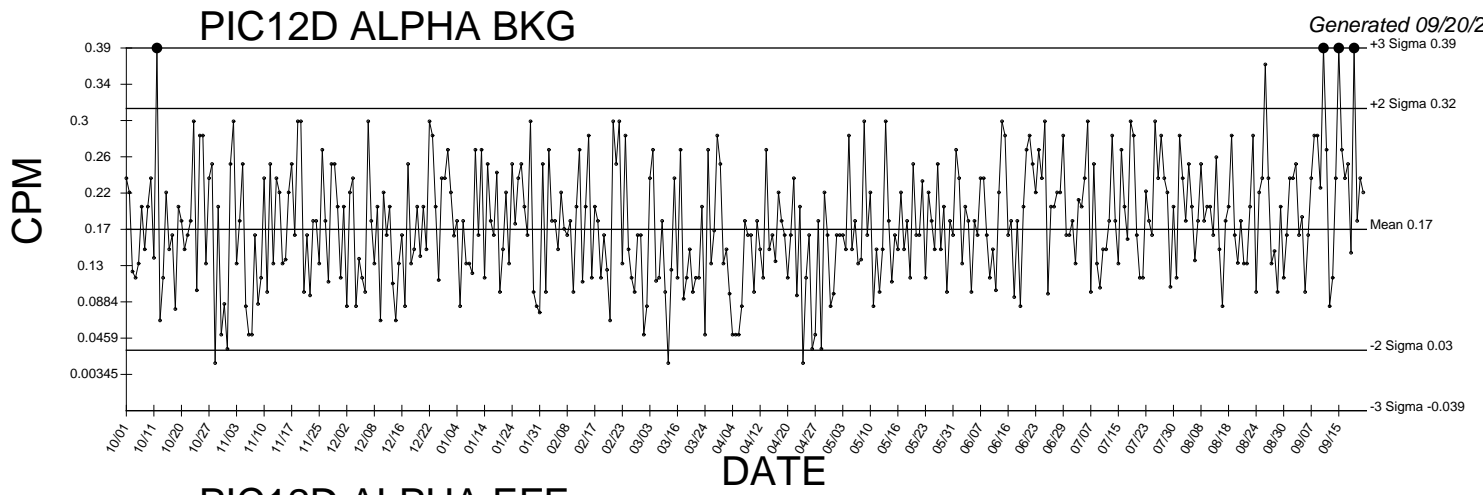
Generated 09/17/2016



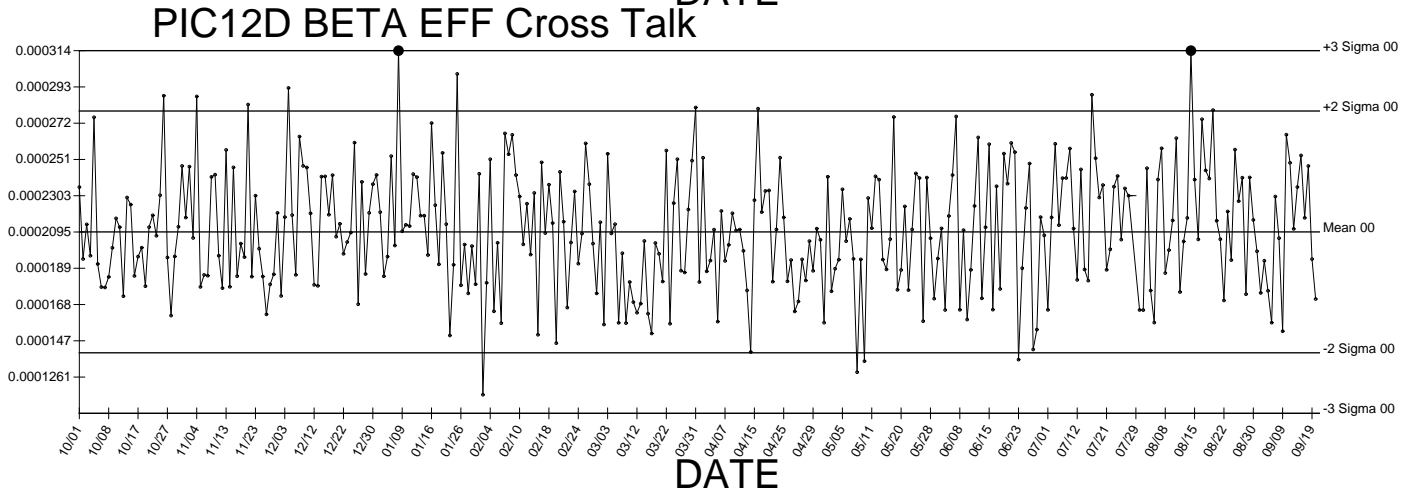
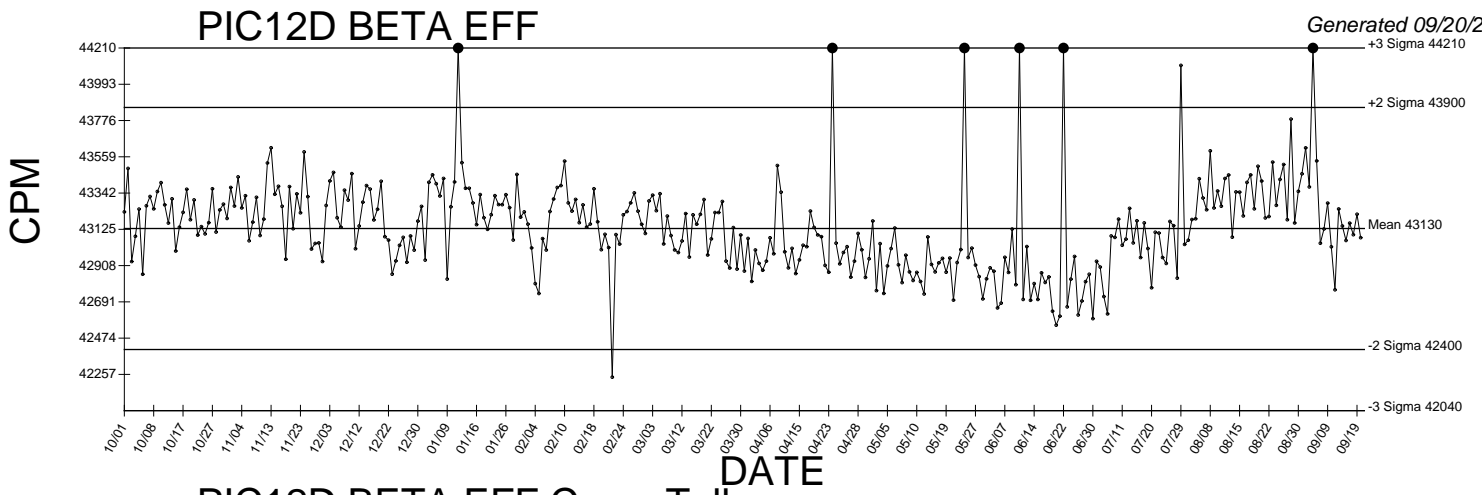
PIC12C BETA EFF Cross Talk



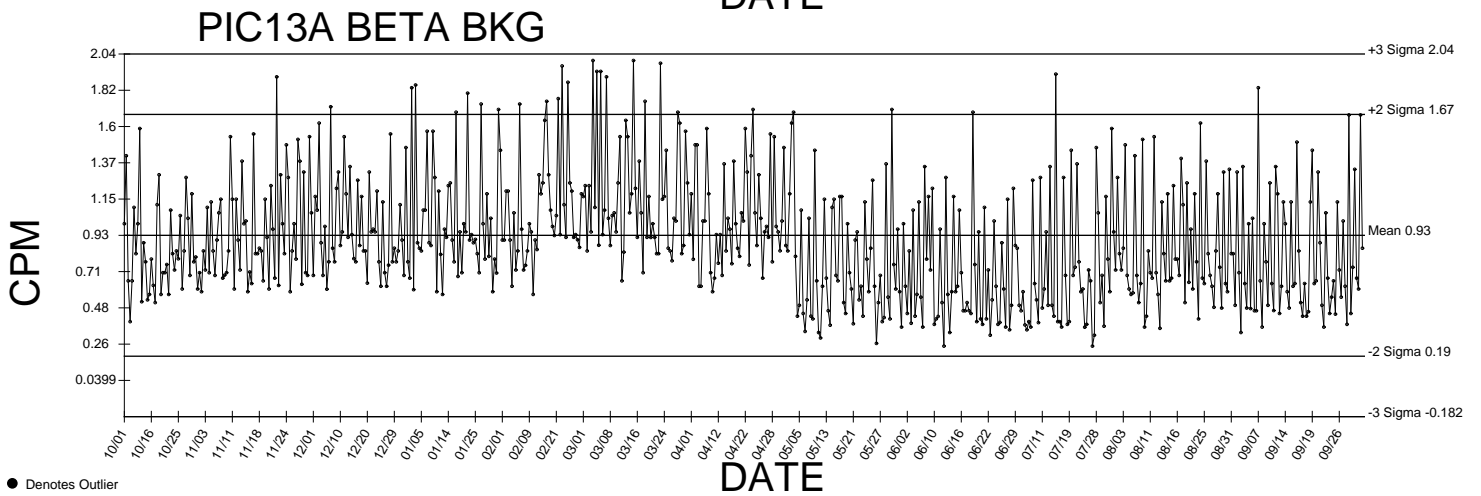
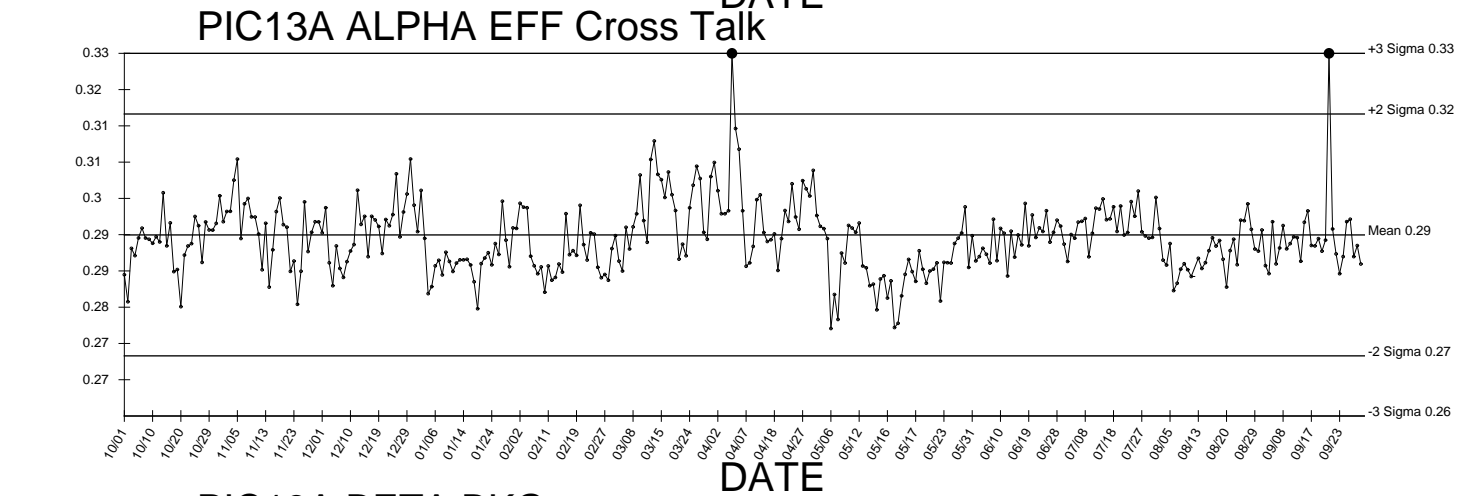
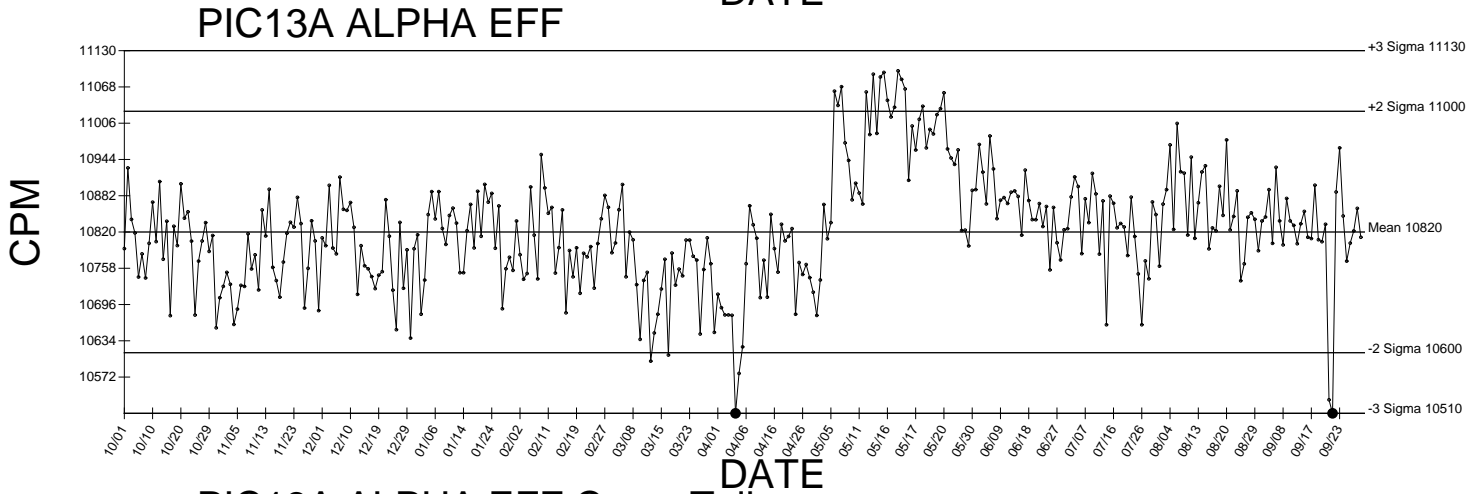
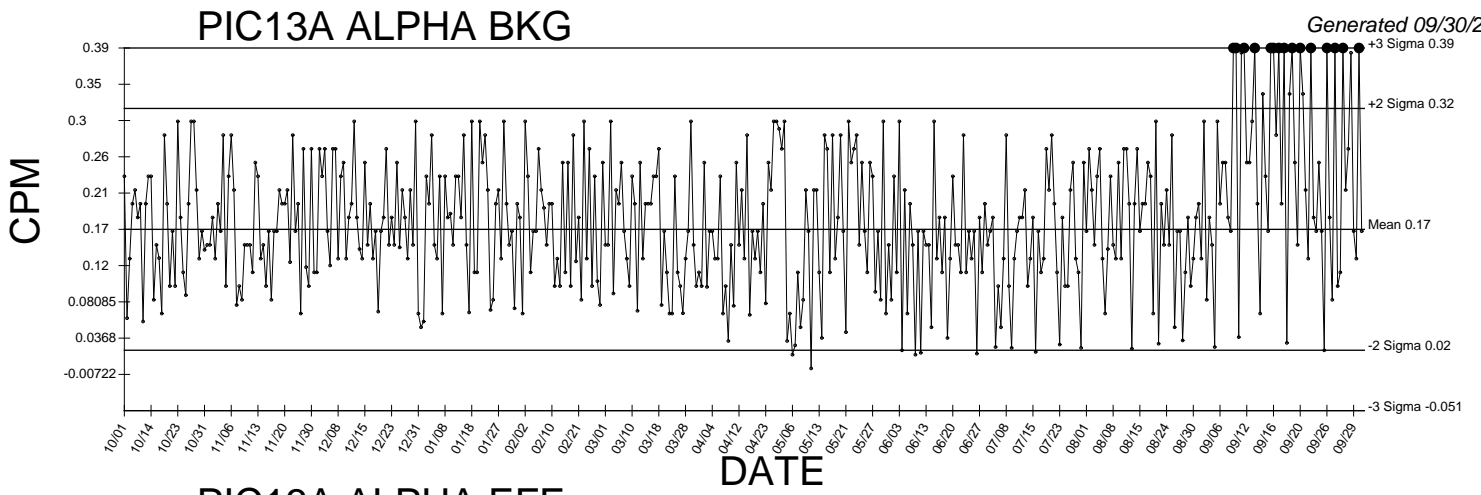
● Denotes Outlier



● Denotes Outlier



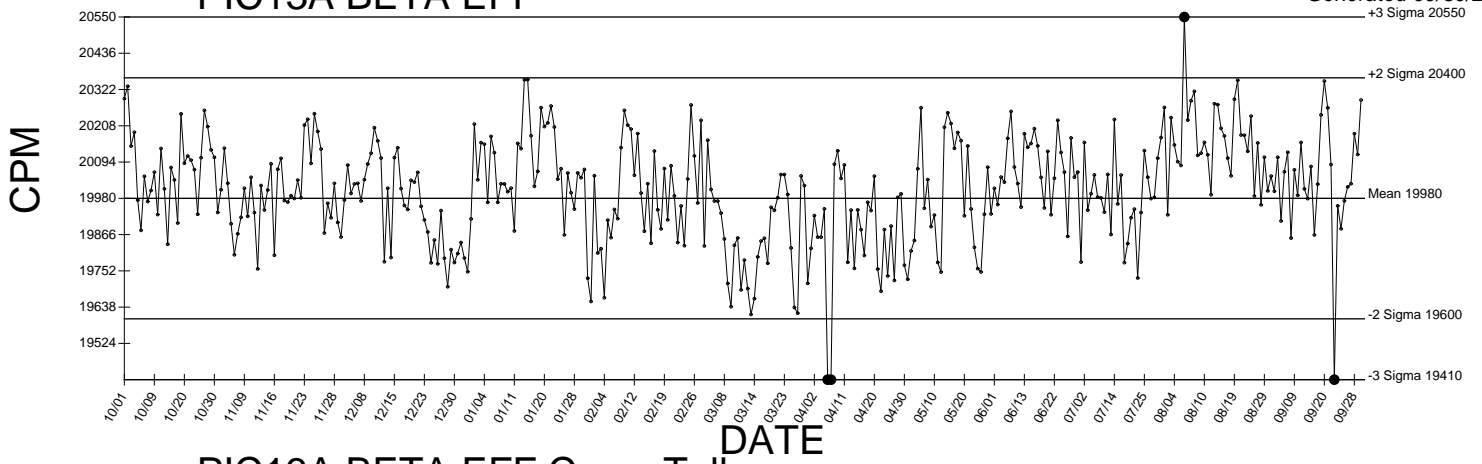
● Denotes Outlier



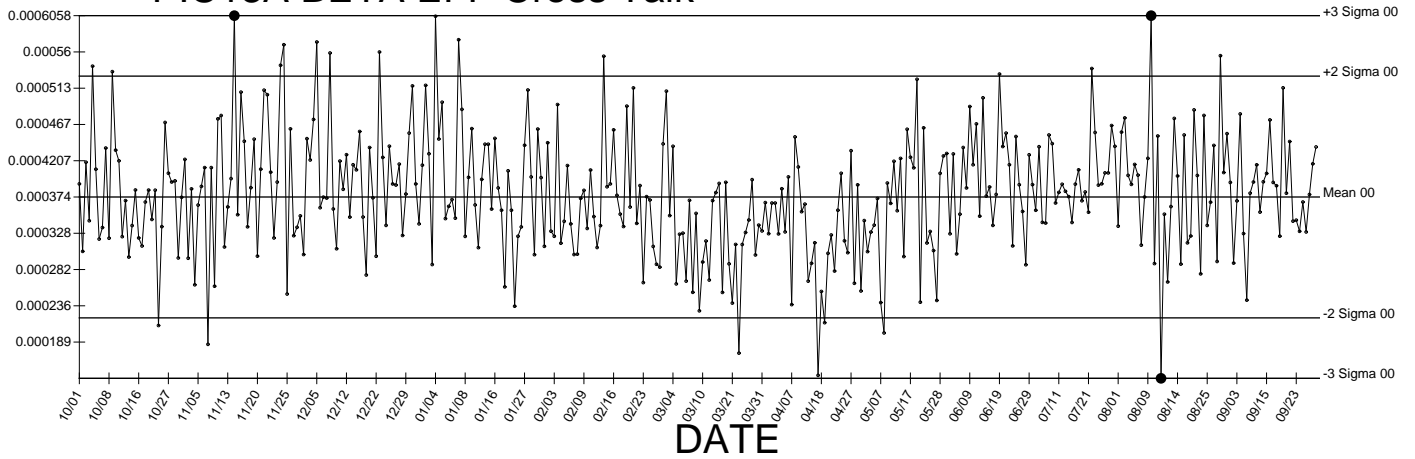
● Denotes Outlier

PIC13A BETA EFF

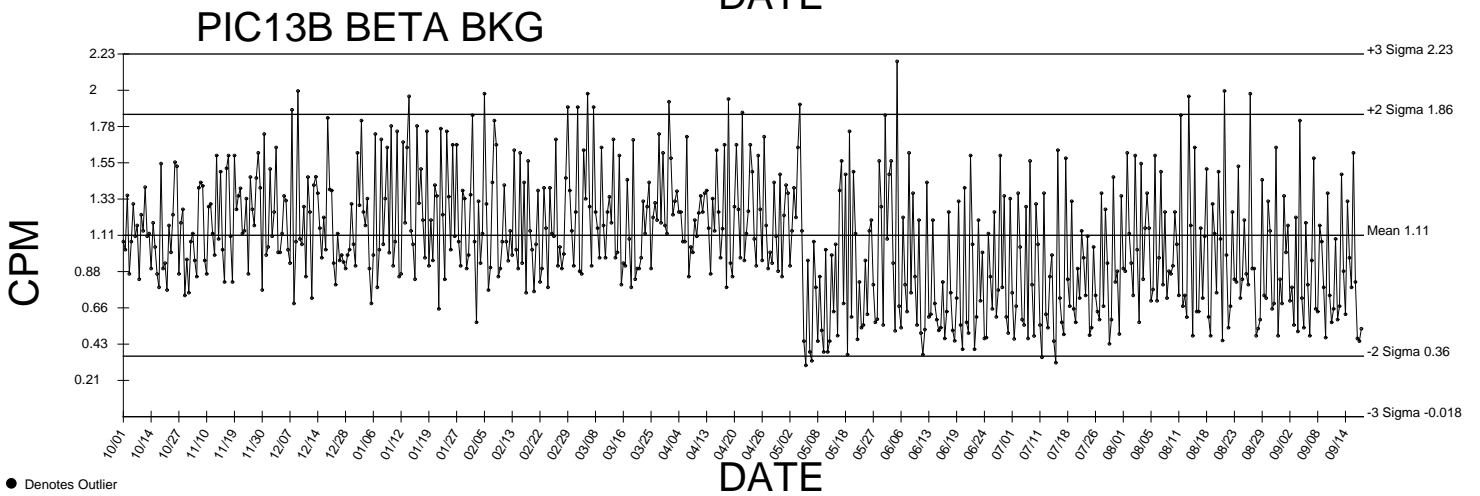
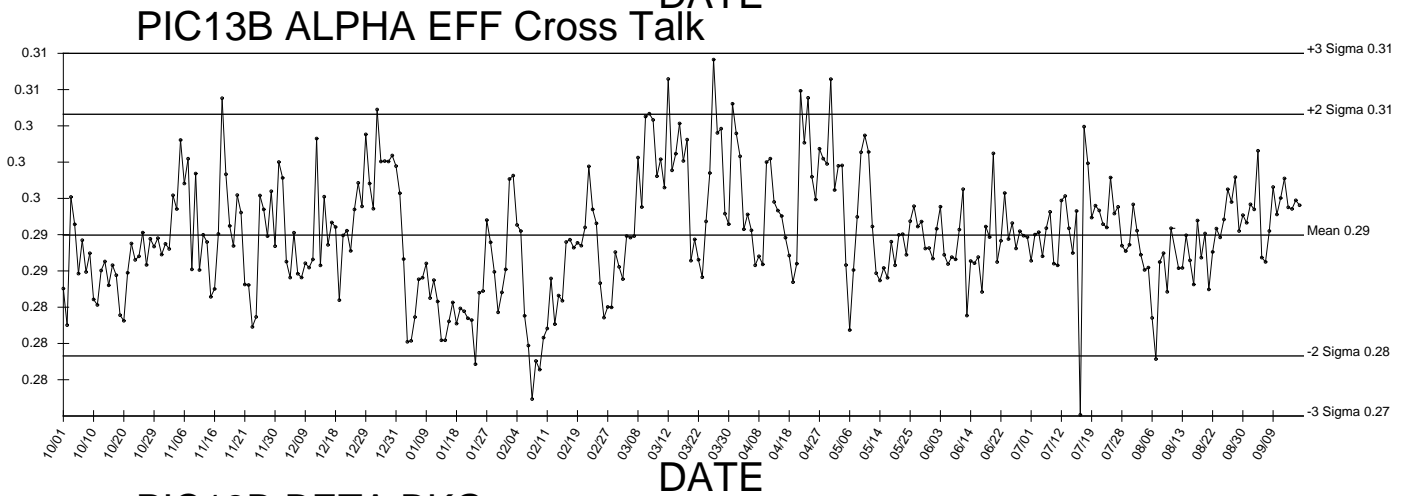
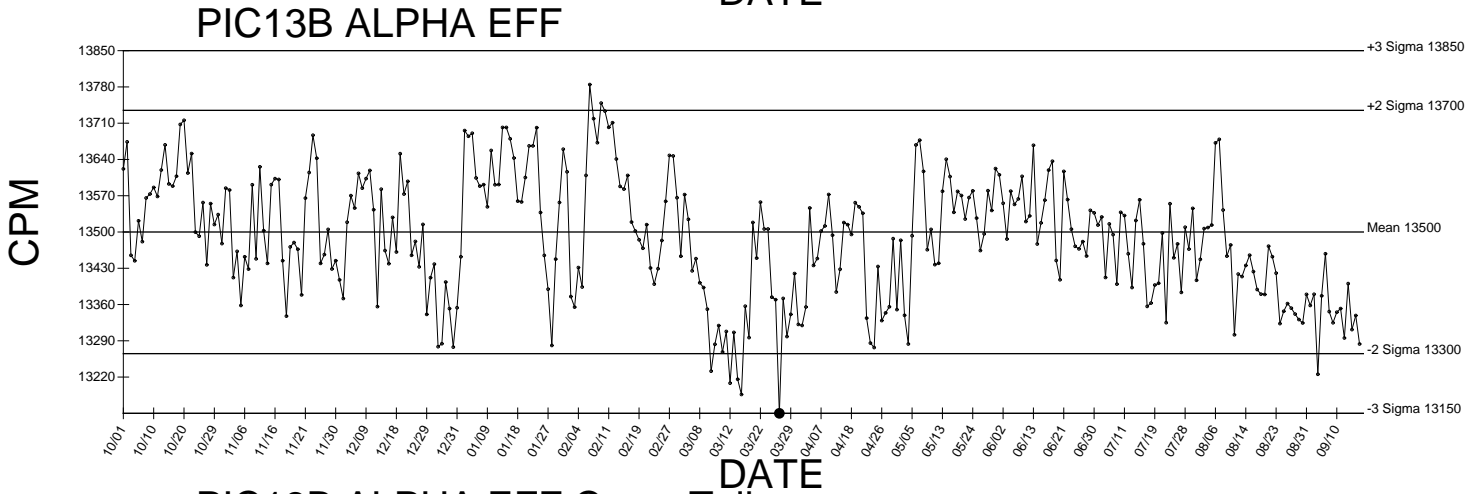
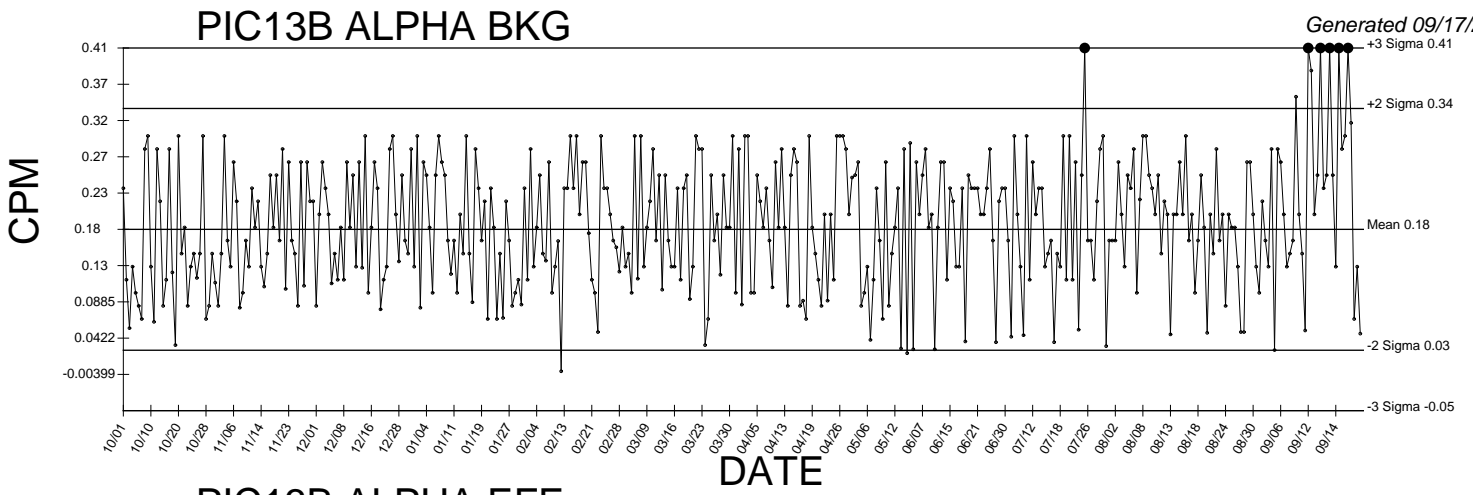
Generated 09/30/2016



PIC13A BETA EFF Cross Talk



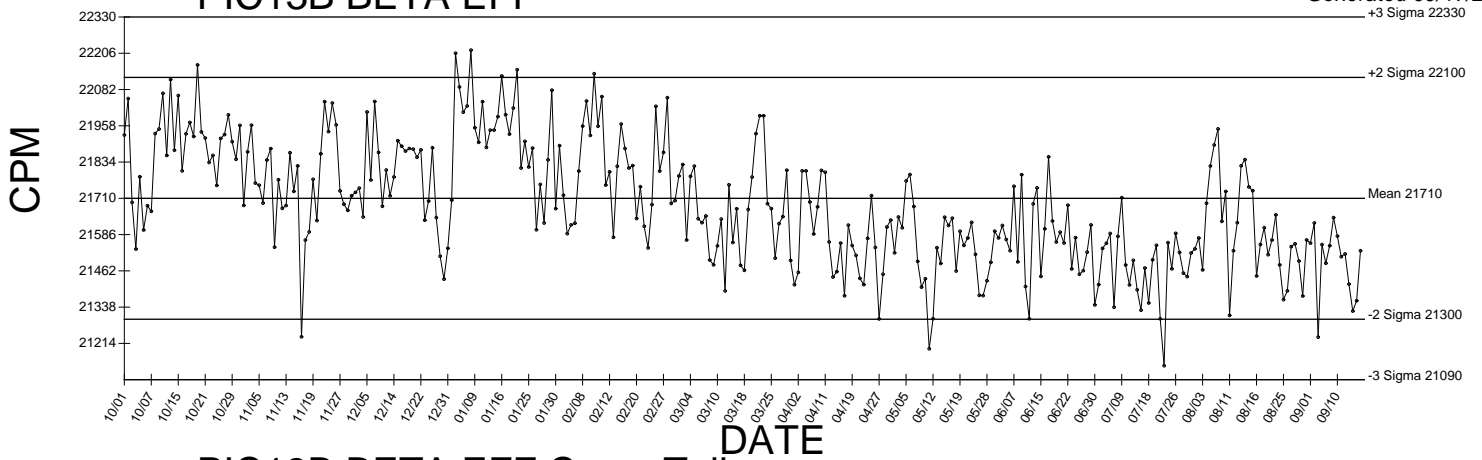
● Denotes Outlier



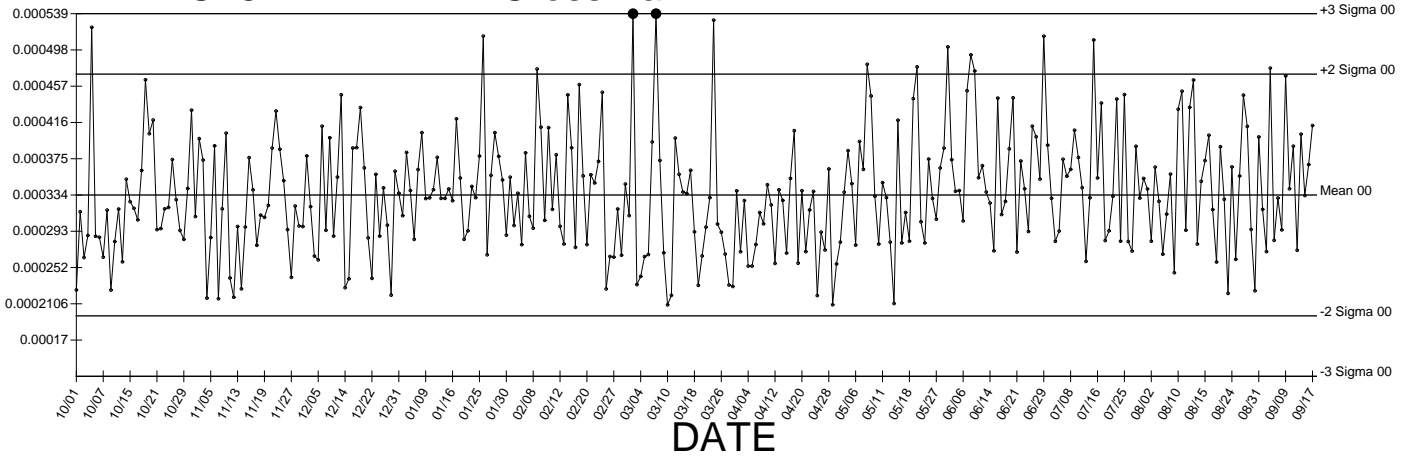
● Denotes Outlier

PIC13B BETA EFF

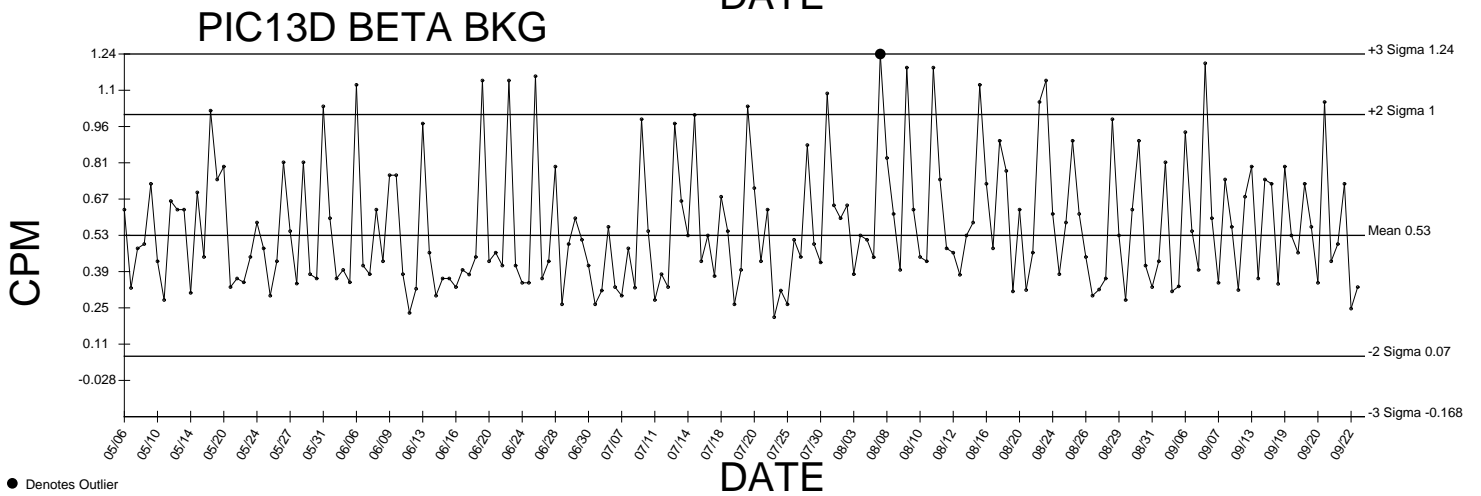
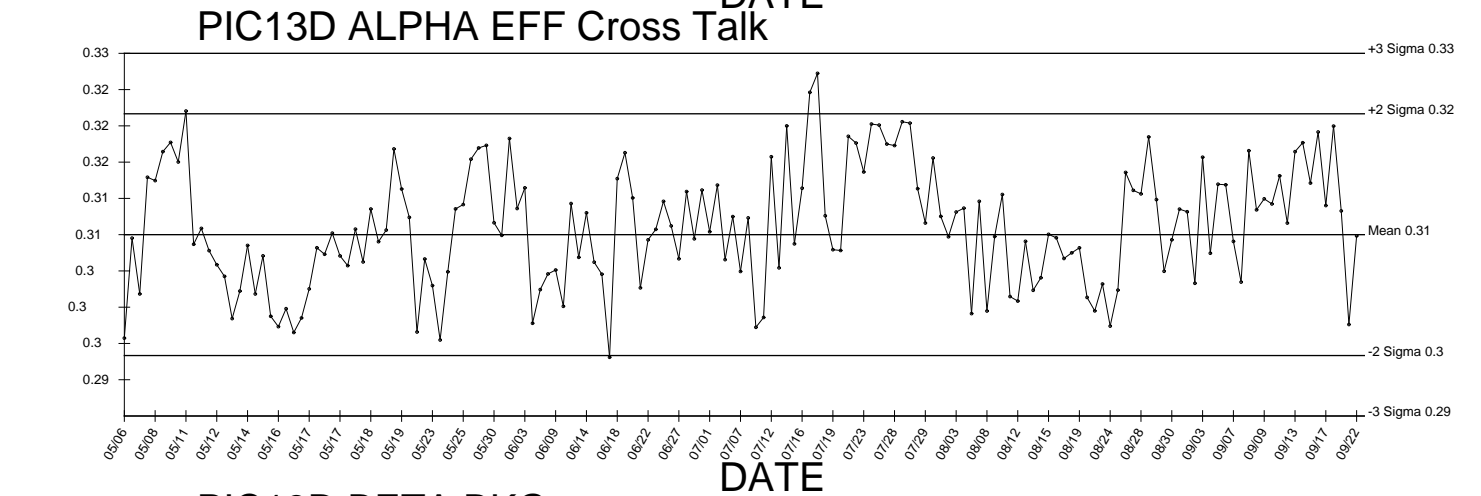
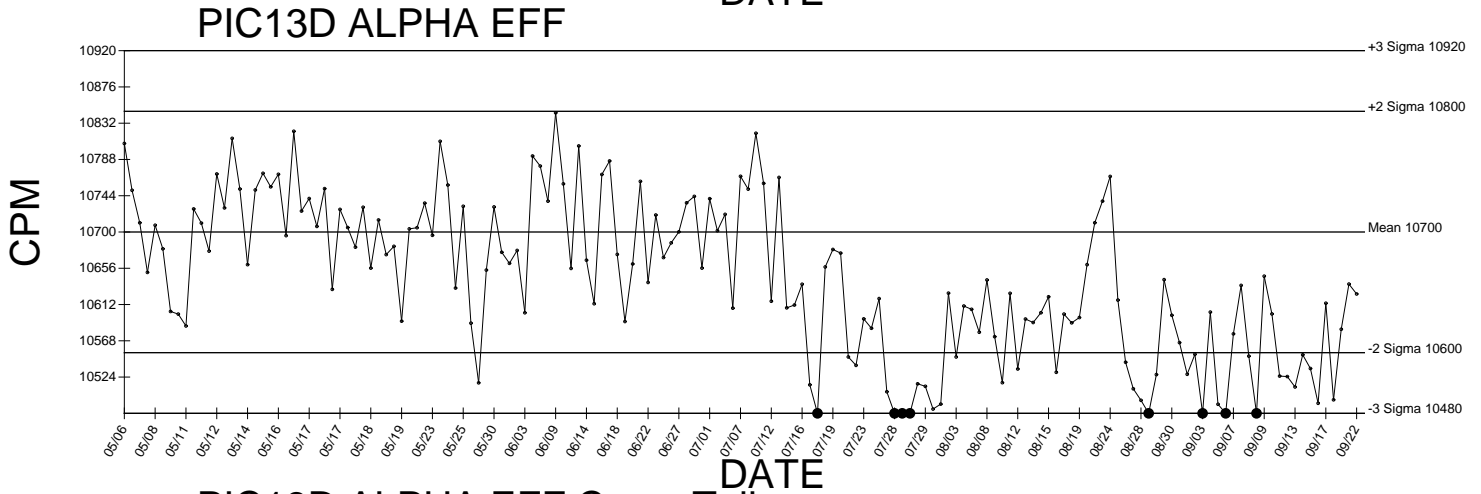
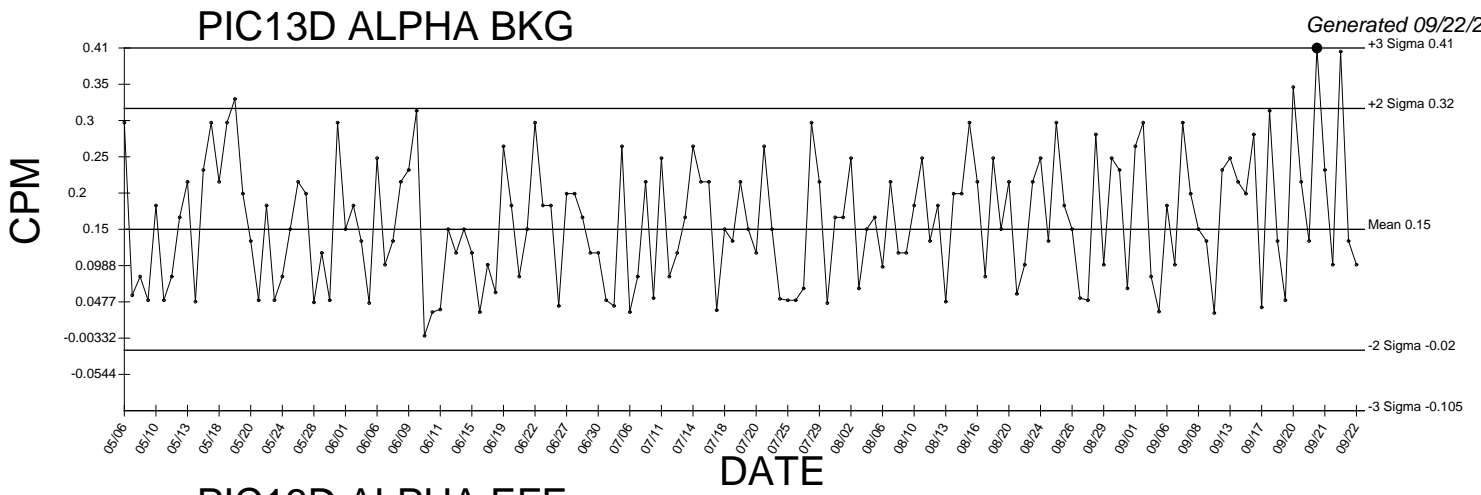
Generated 09/17/2016



PIC13B BETA EFF Cross Talk



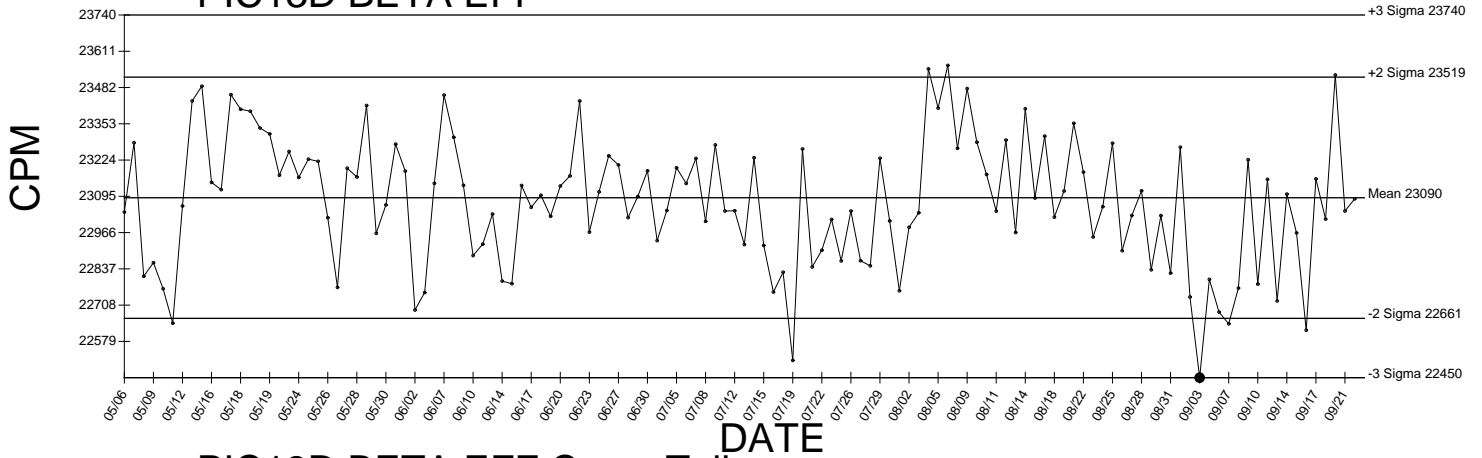
● Denotes Outlier



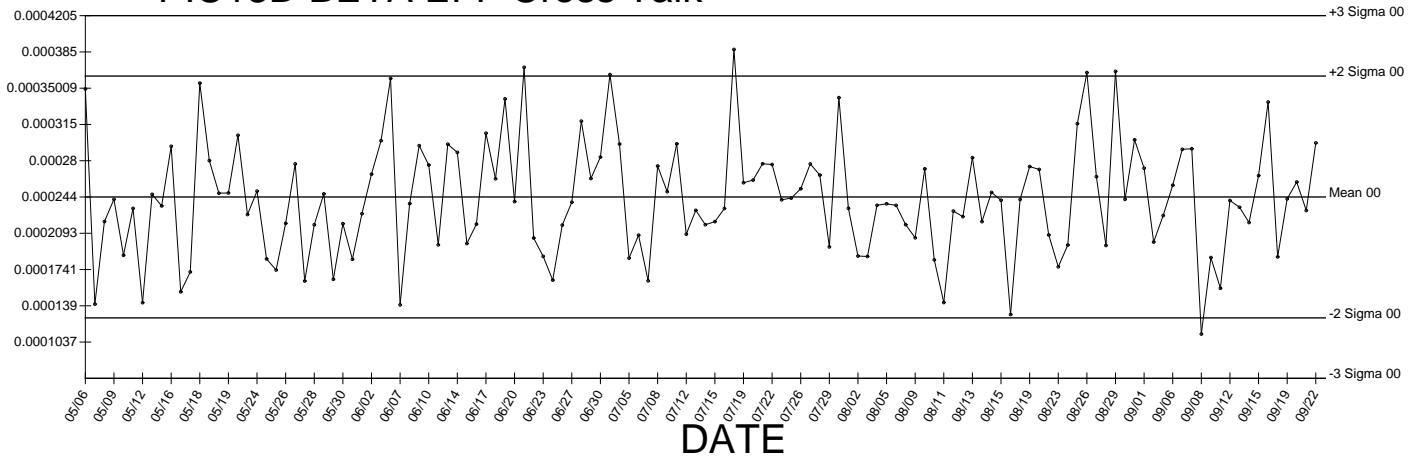
● Denotes Outlier

PIC13D BETA EFF

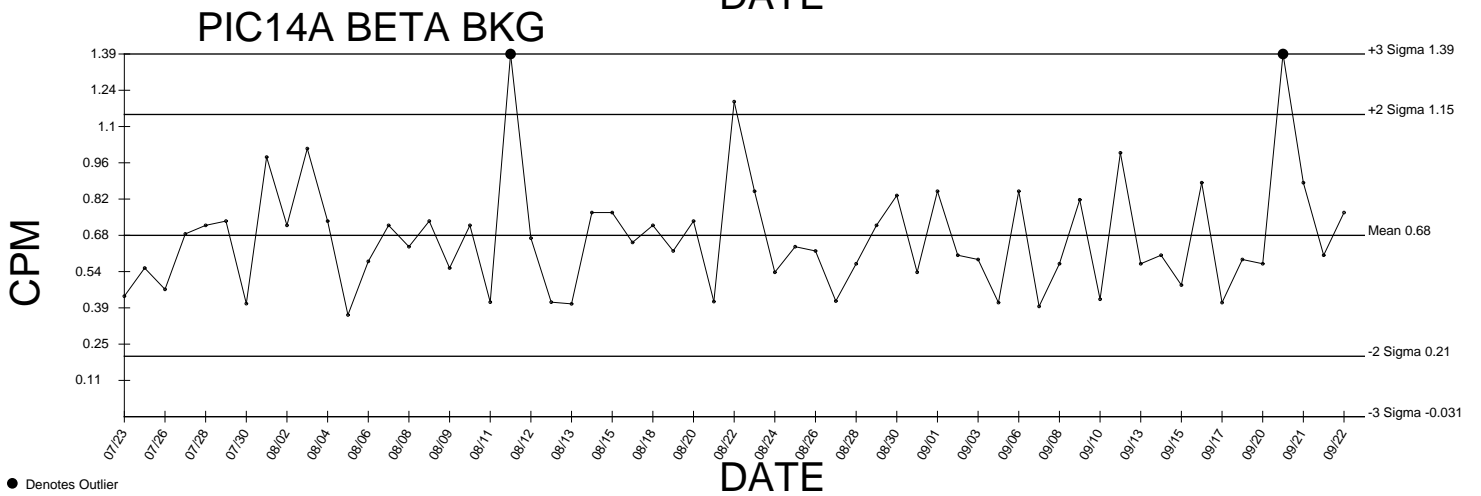
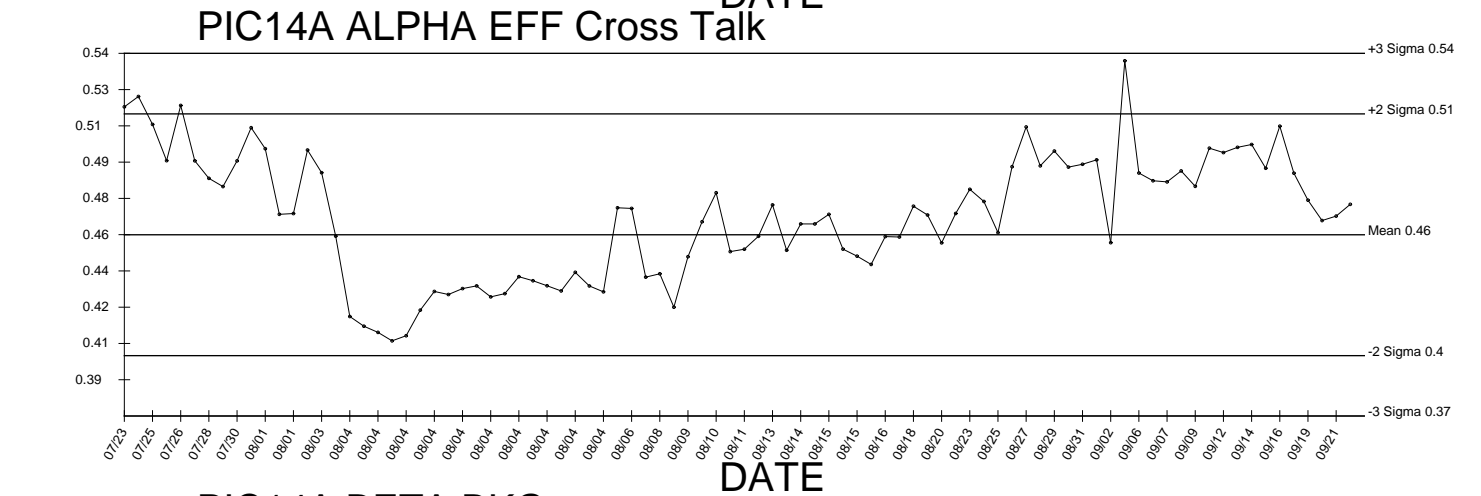
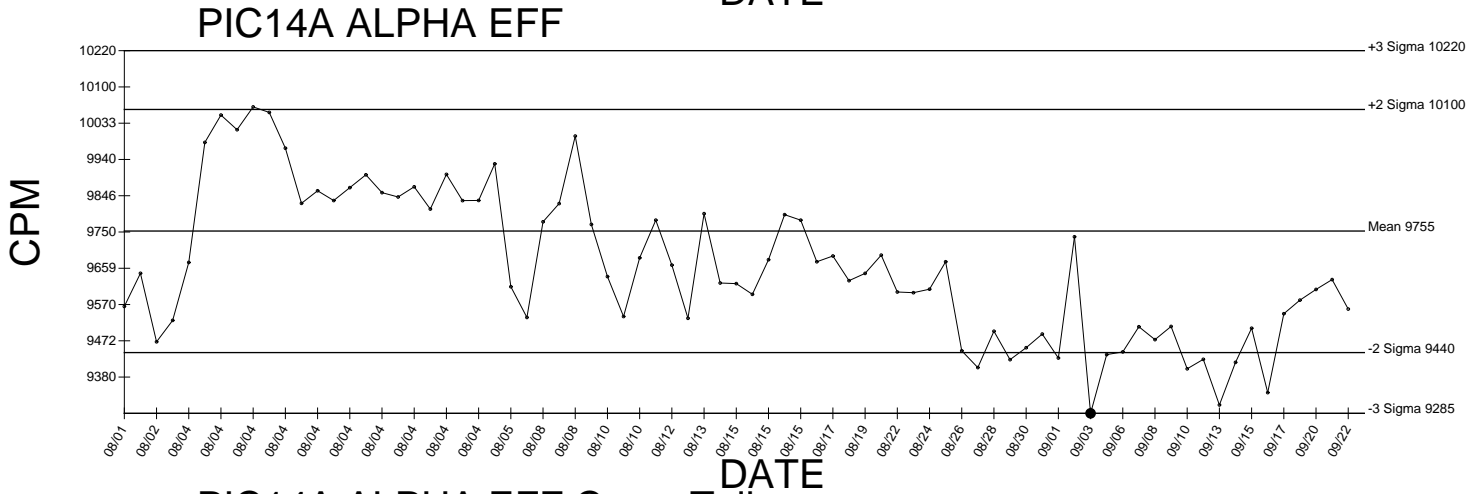
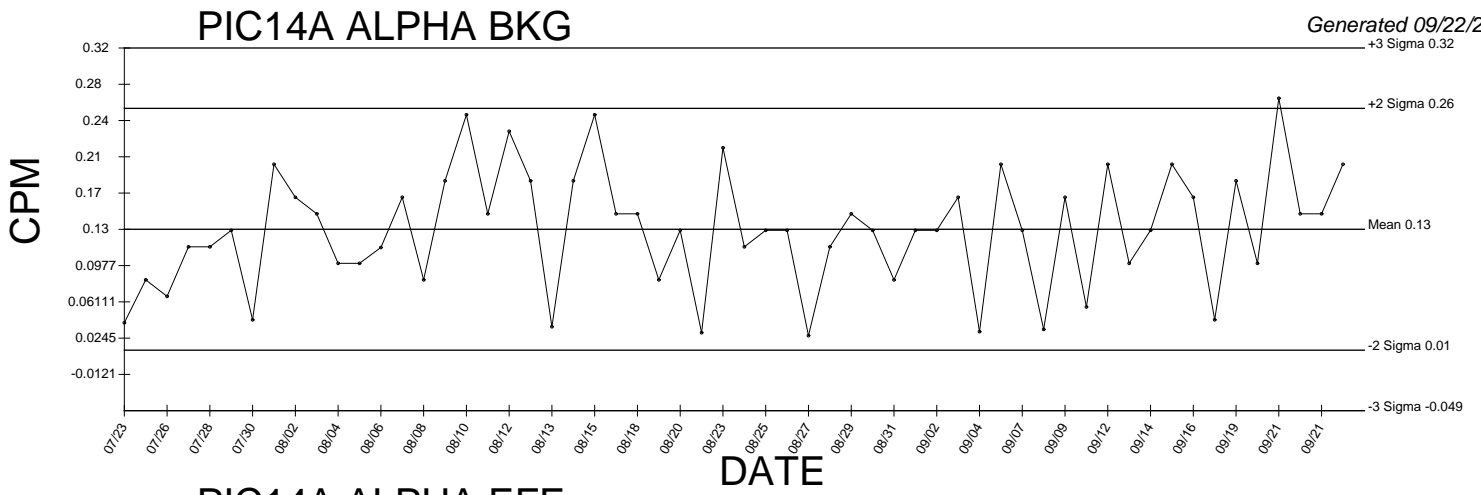
Generated 09/22/2016



PIC13D BETA EFF Cross Talk



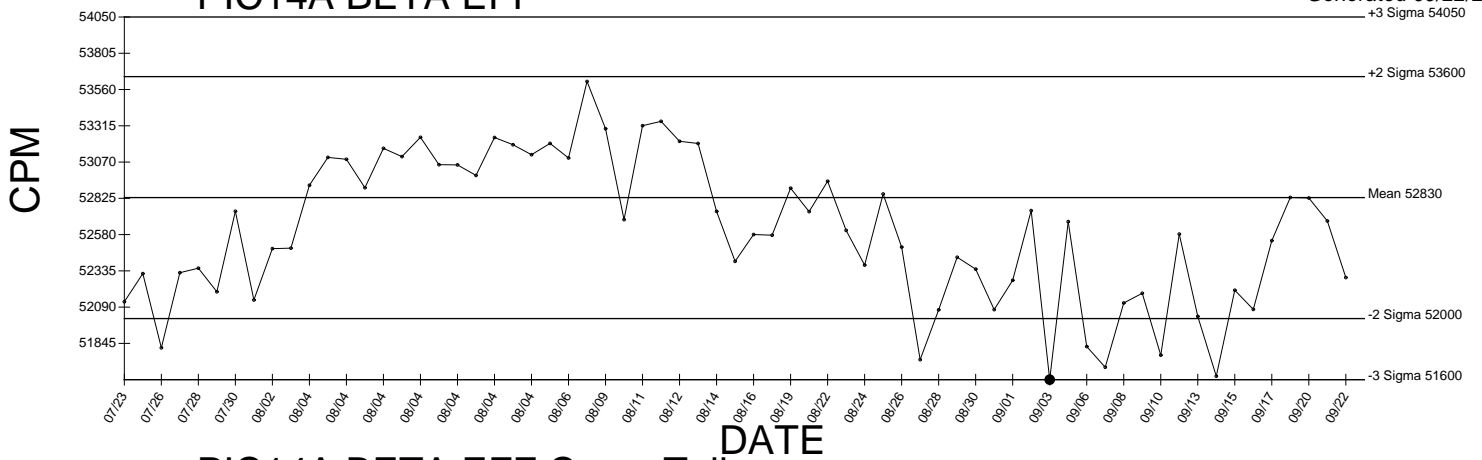
● Denotes Outlier



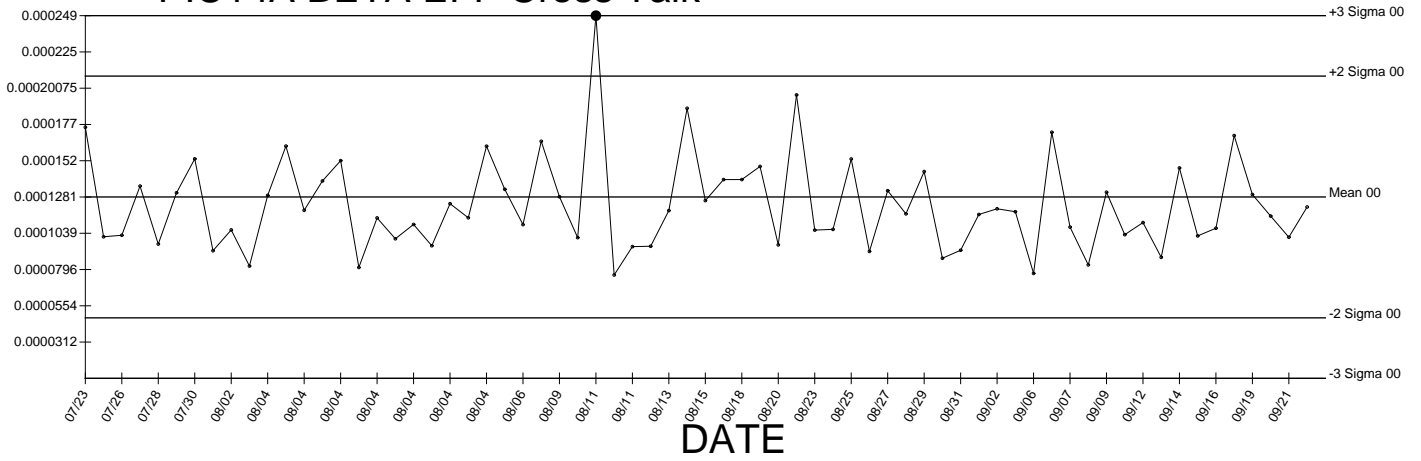
● Denotes Outlier

PIC14A BETA EFF

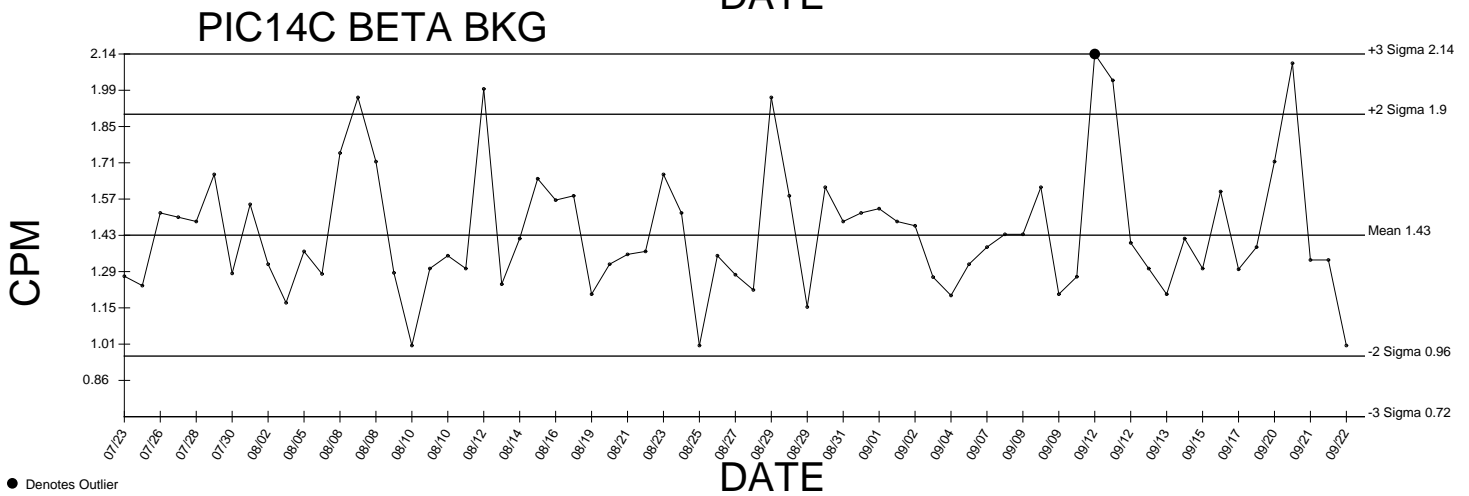
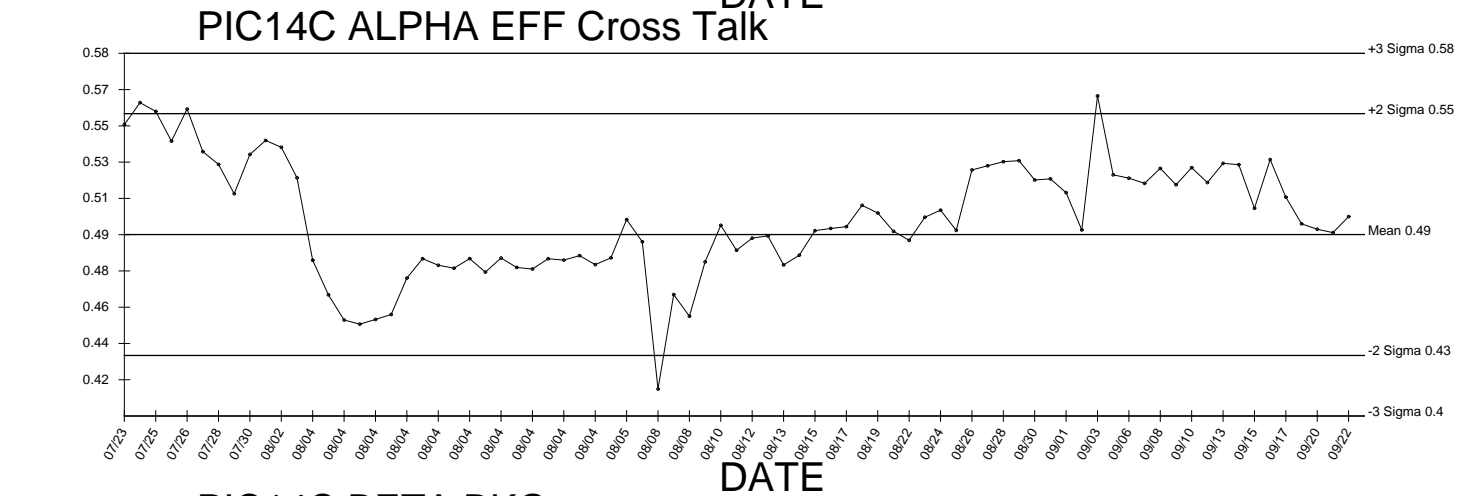
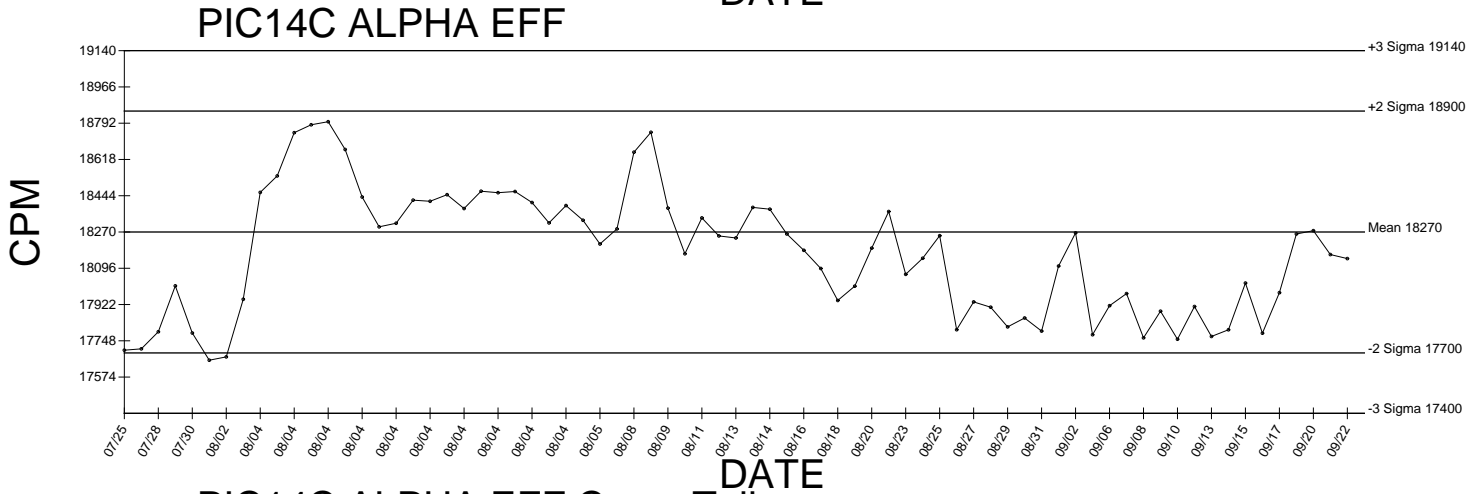
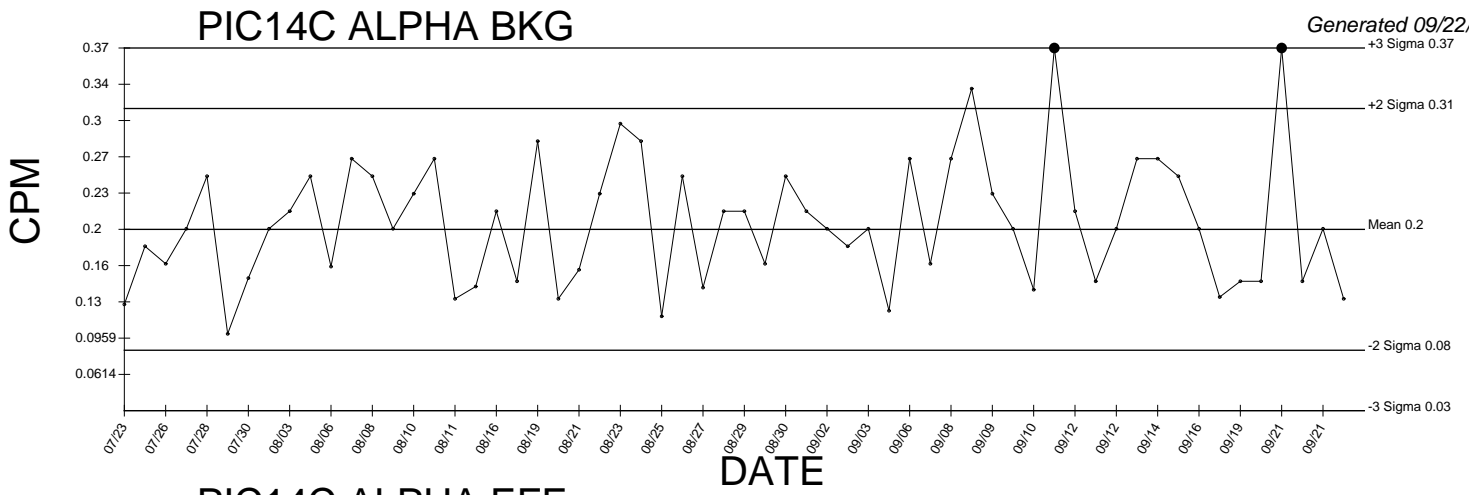
Generated 09/22/2016



PIC14A BETA EFF Cross Talk



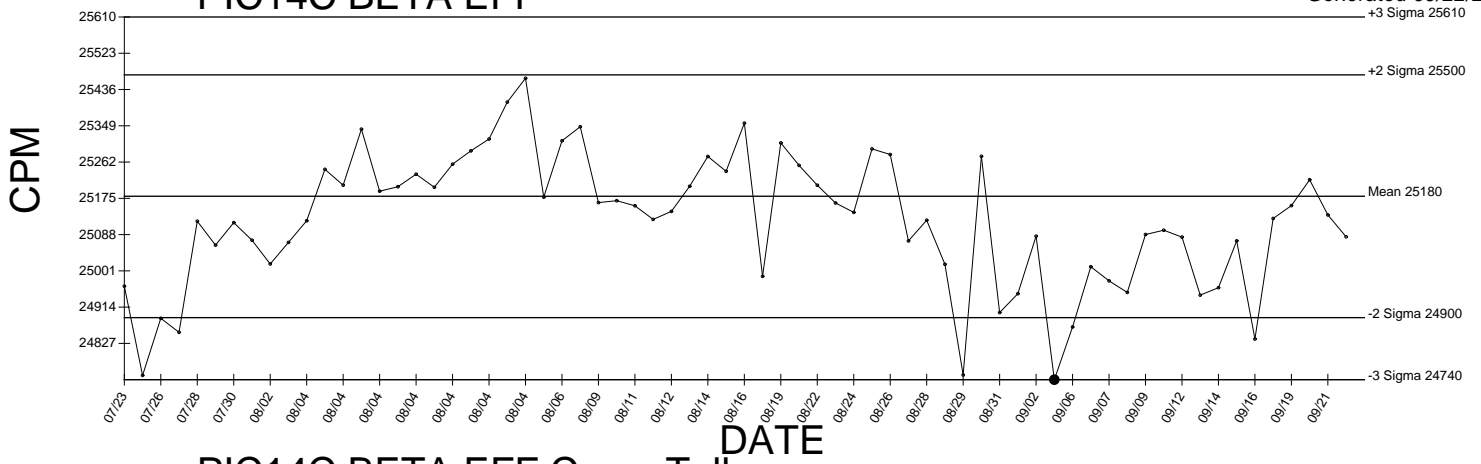
● Denotes Outlier



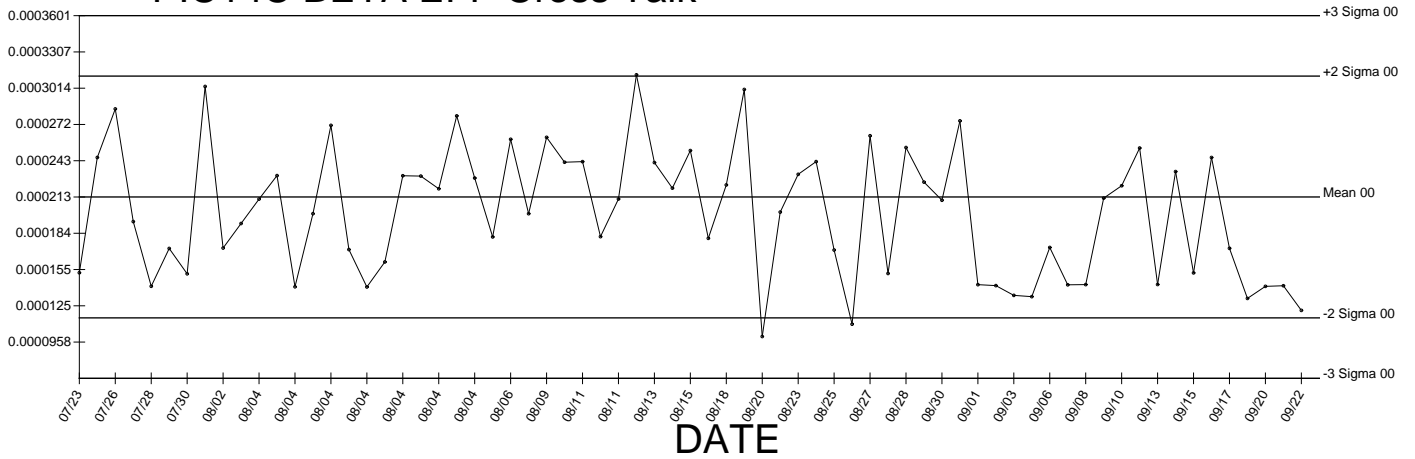
● Denotes Outlier

PIC14C BETA EFF

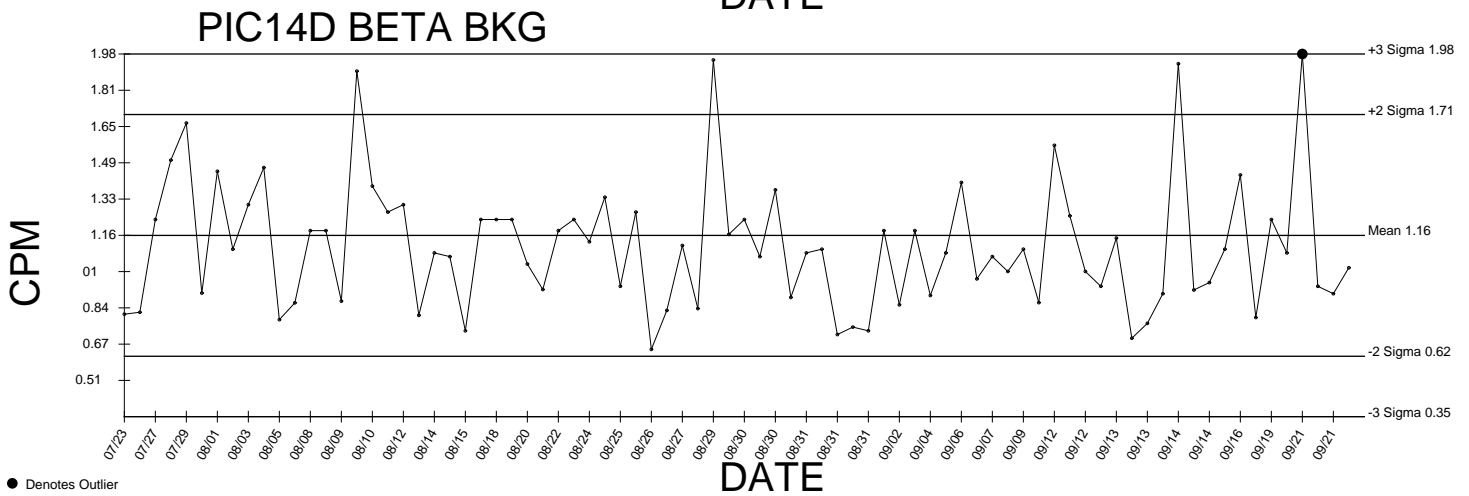
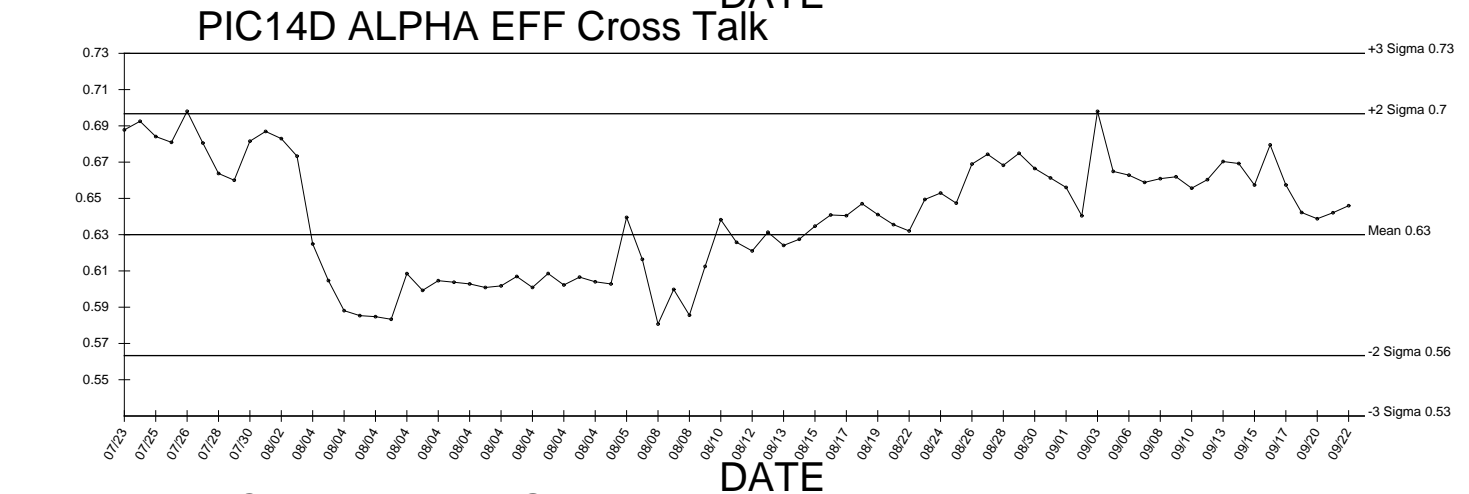
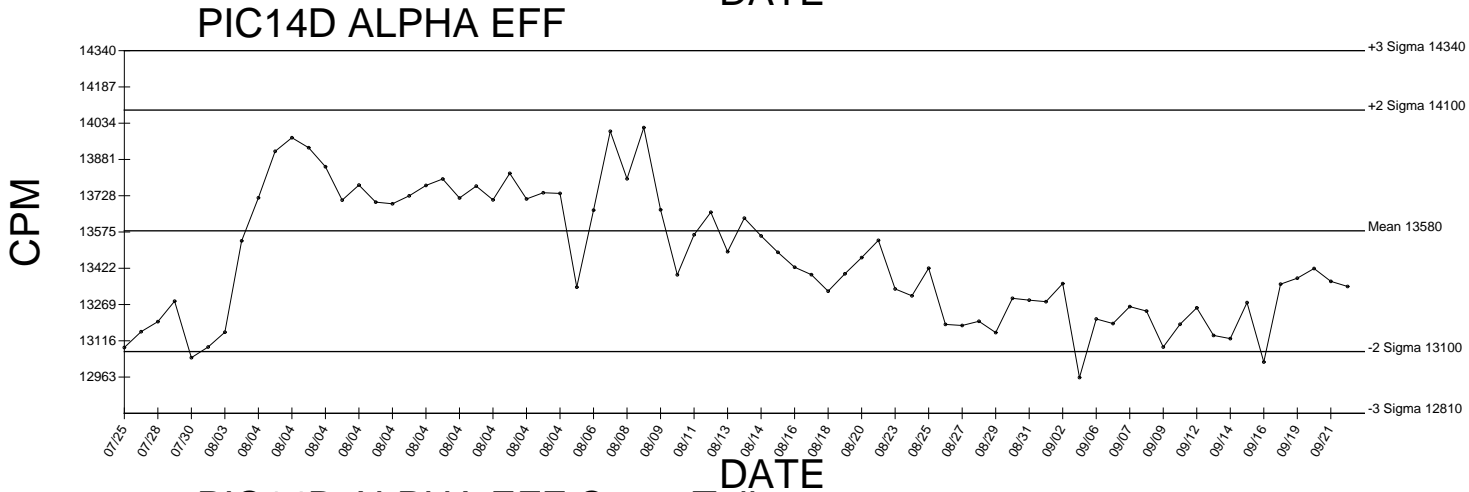
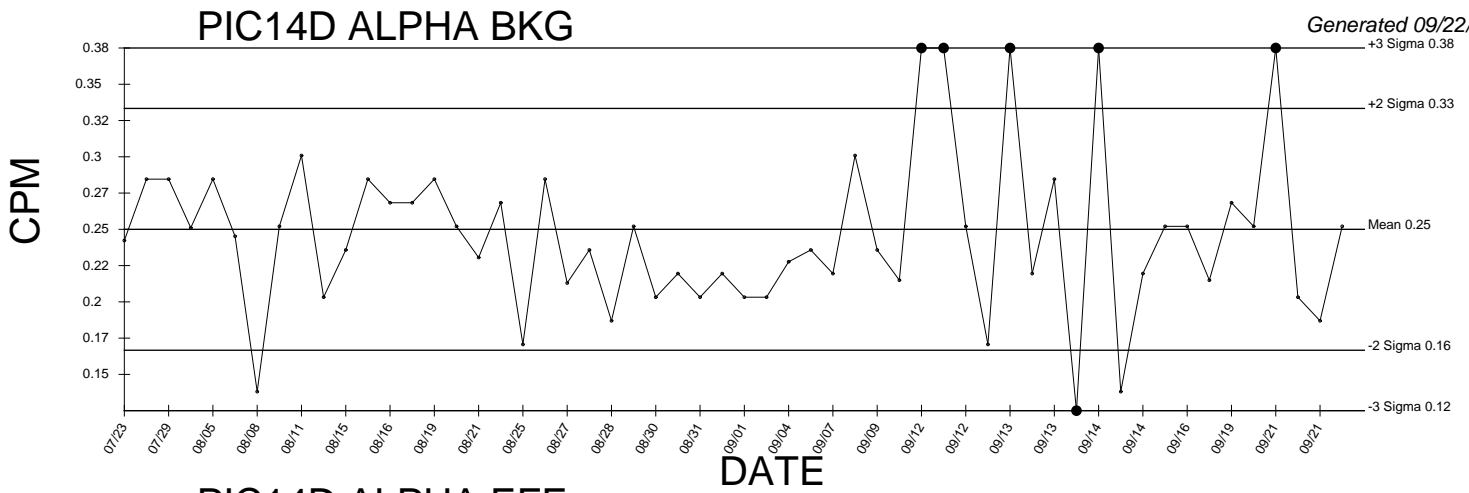
Generated 09/22/2016



PIC14C BETA EFF Cross Talk



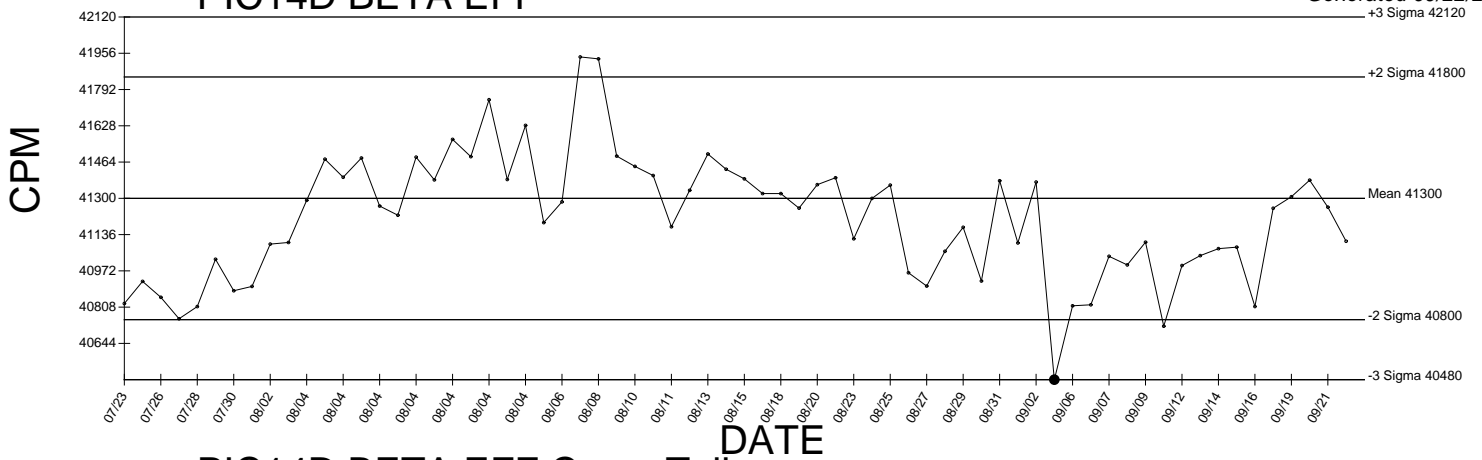
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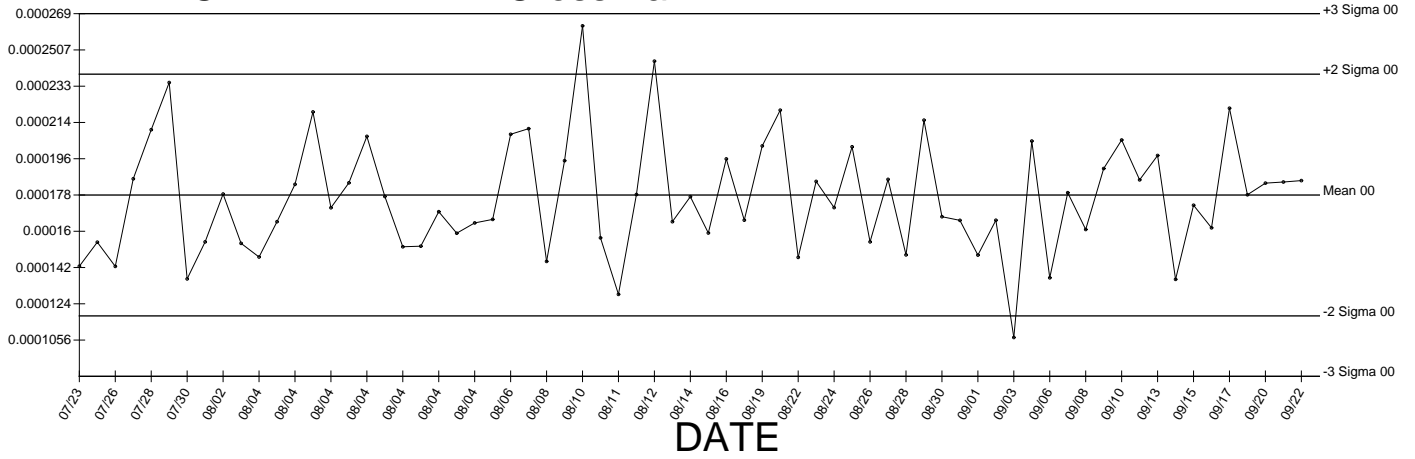
● Denotes Outlier

PIC14D BETA EFF

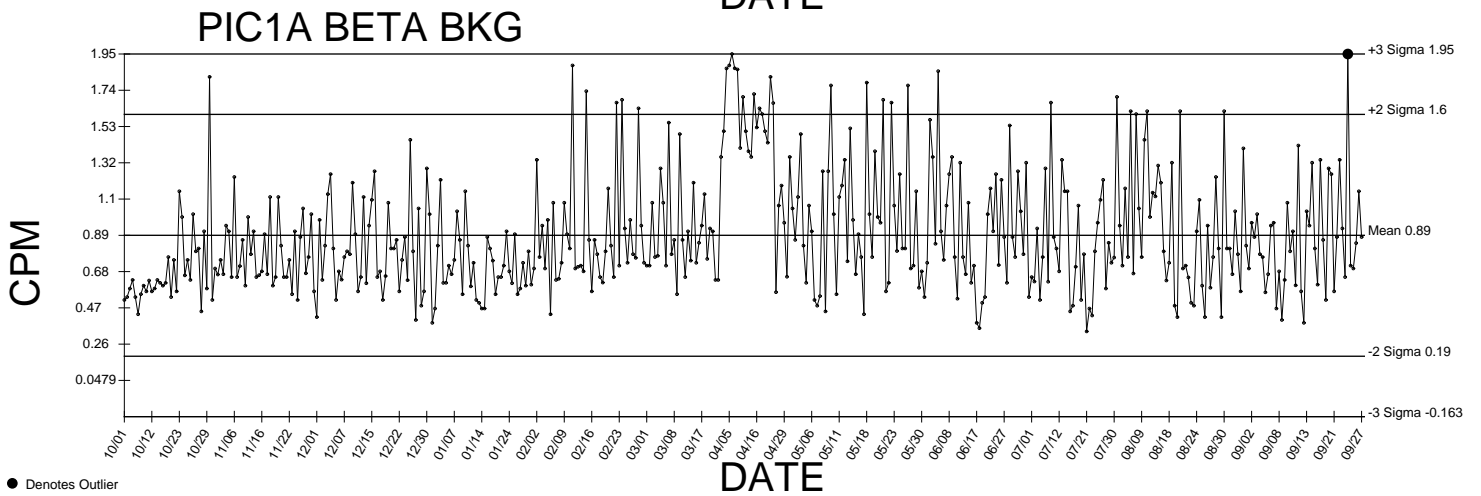
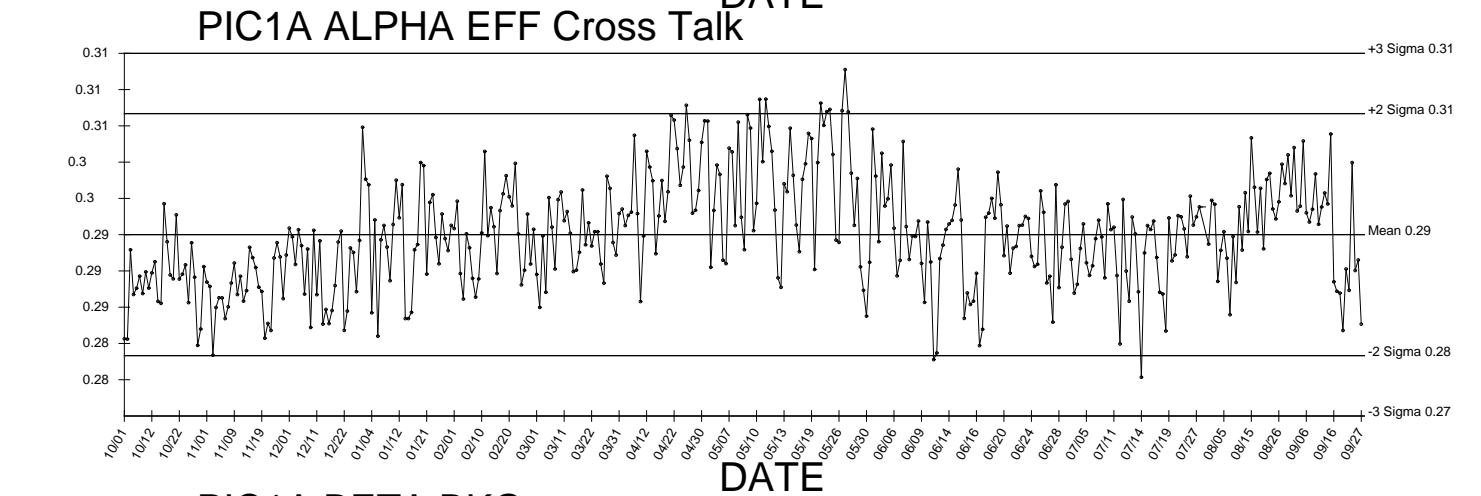
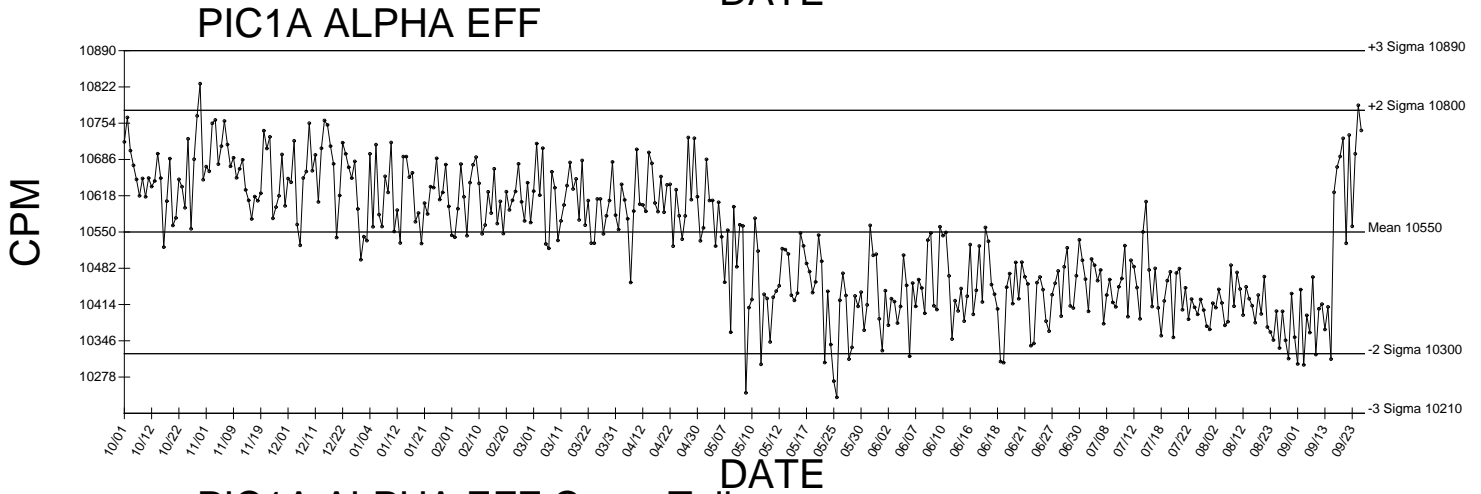
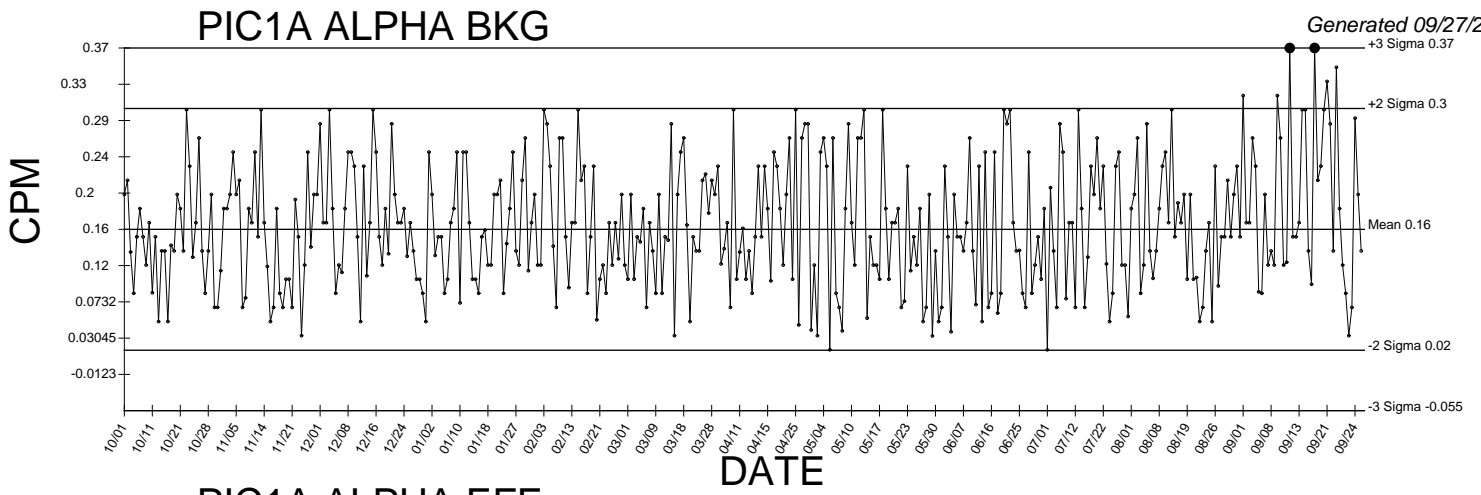
Generated 09/22/2016



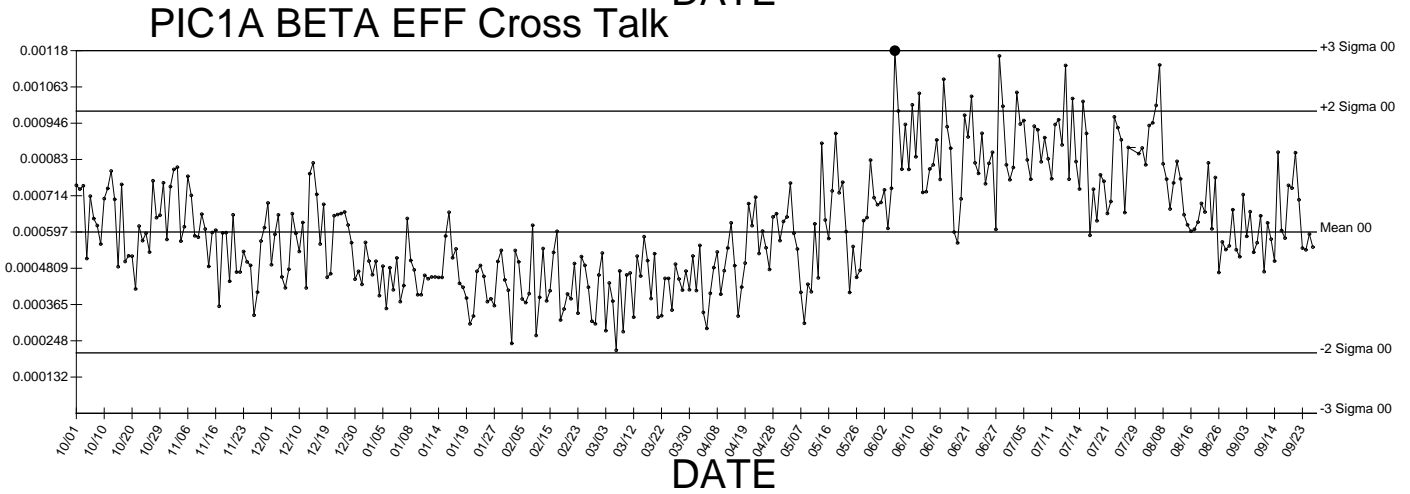
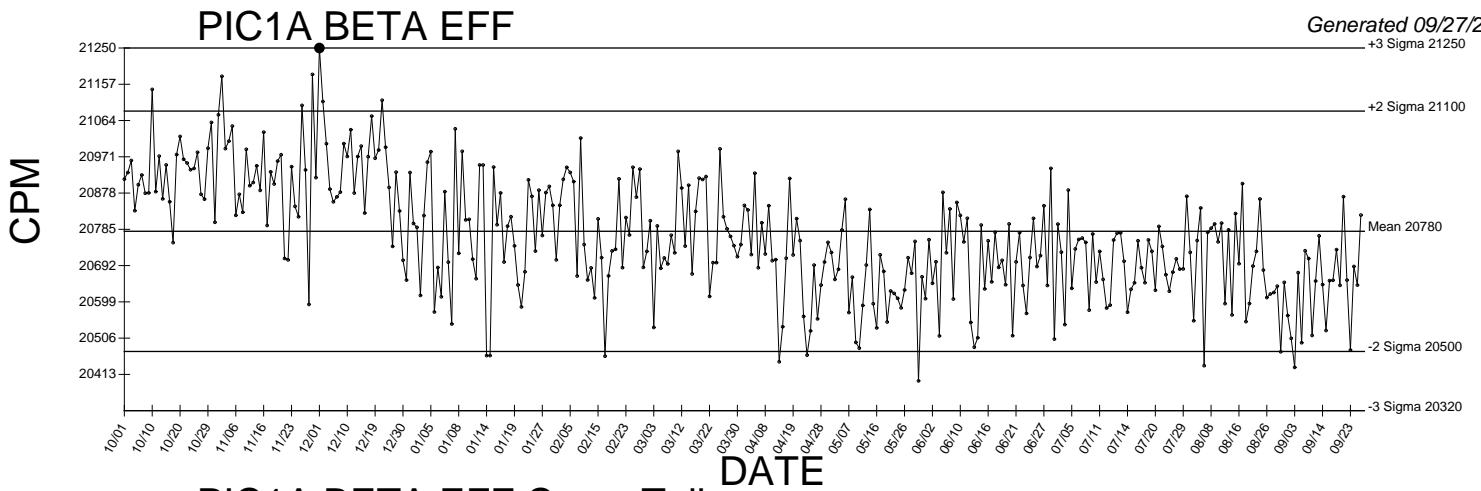
PIC14D BETA EFF Cross Talk



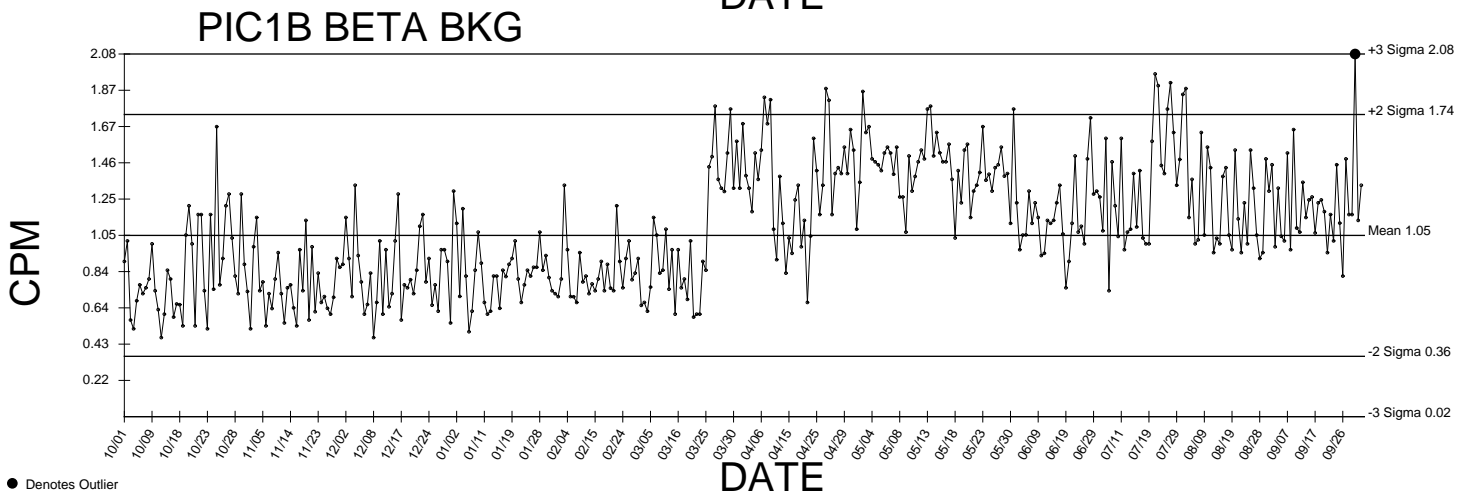
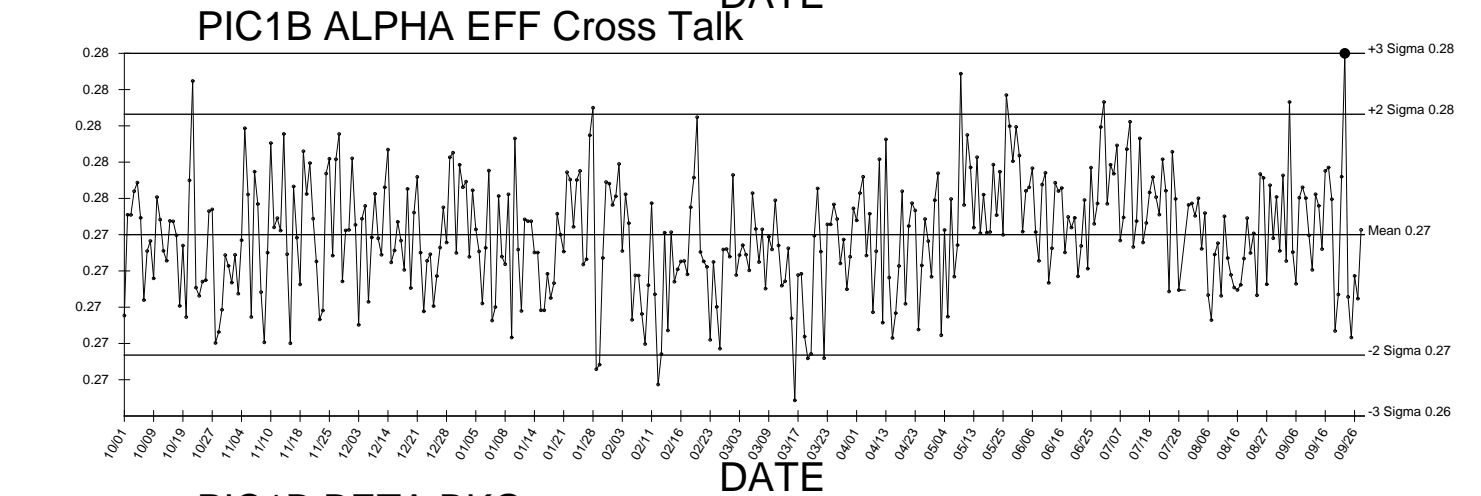
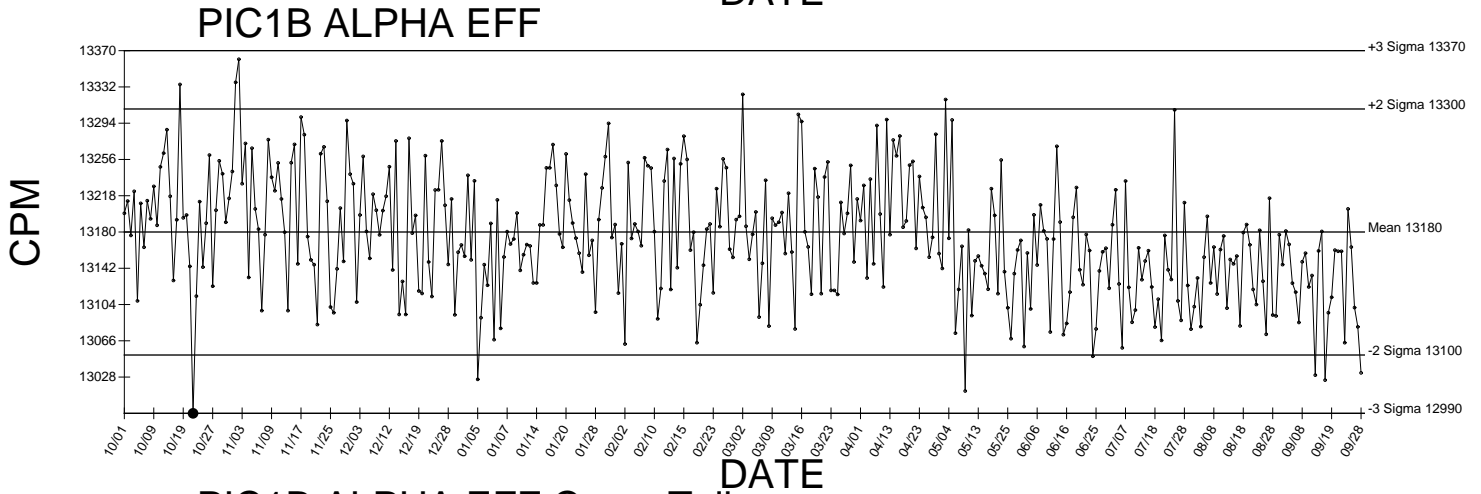
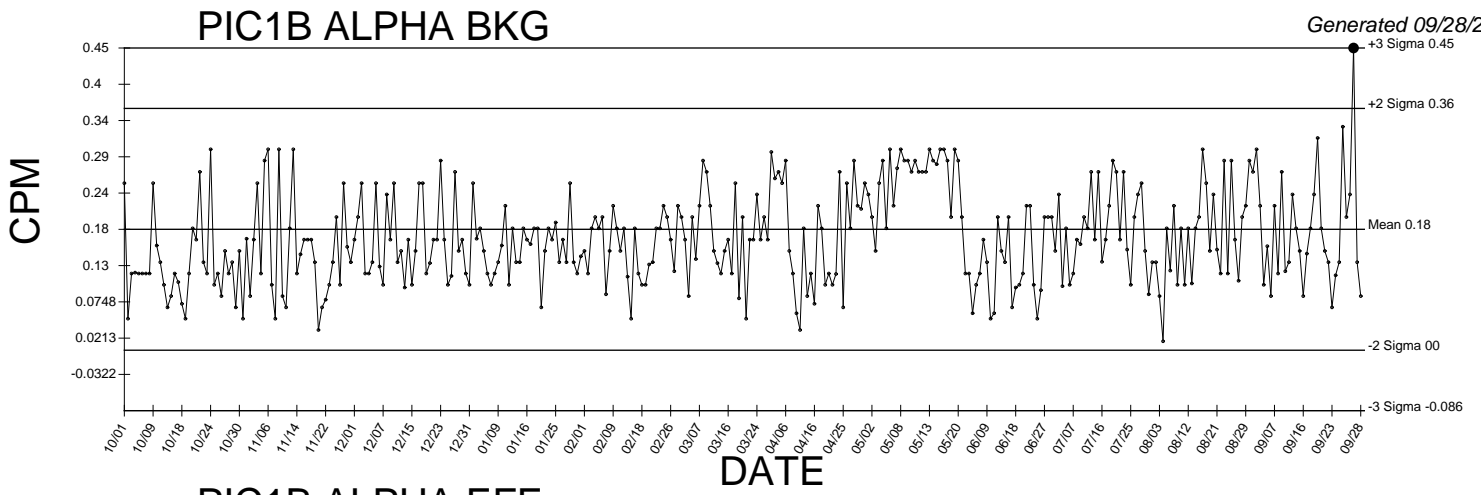
● Denotes Outlier



● Denotes Outlier



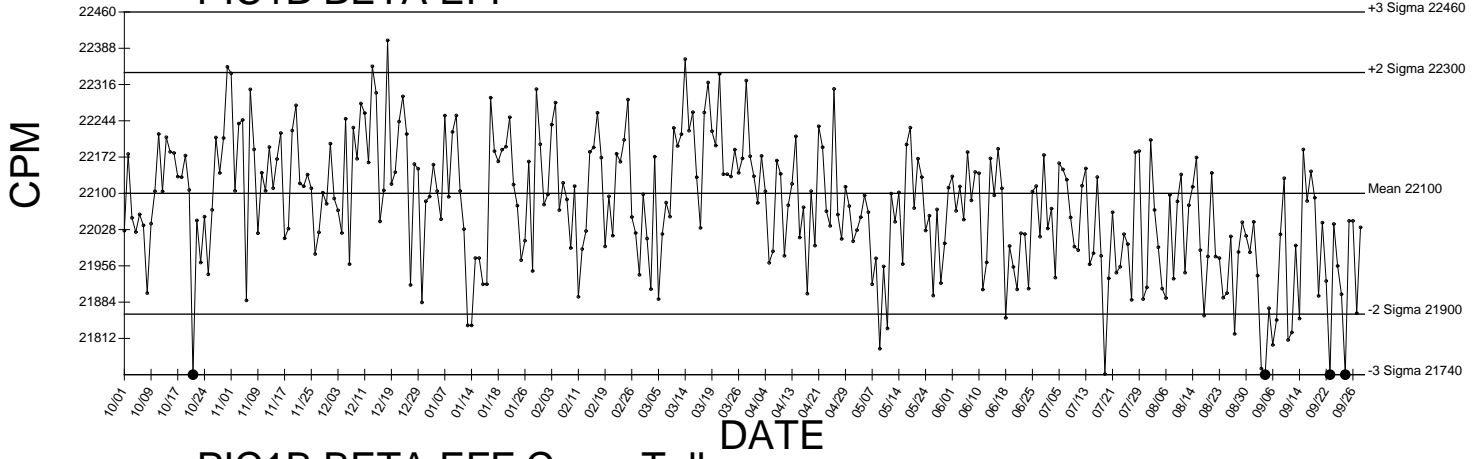
● Denotes Outlier



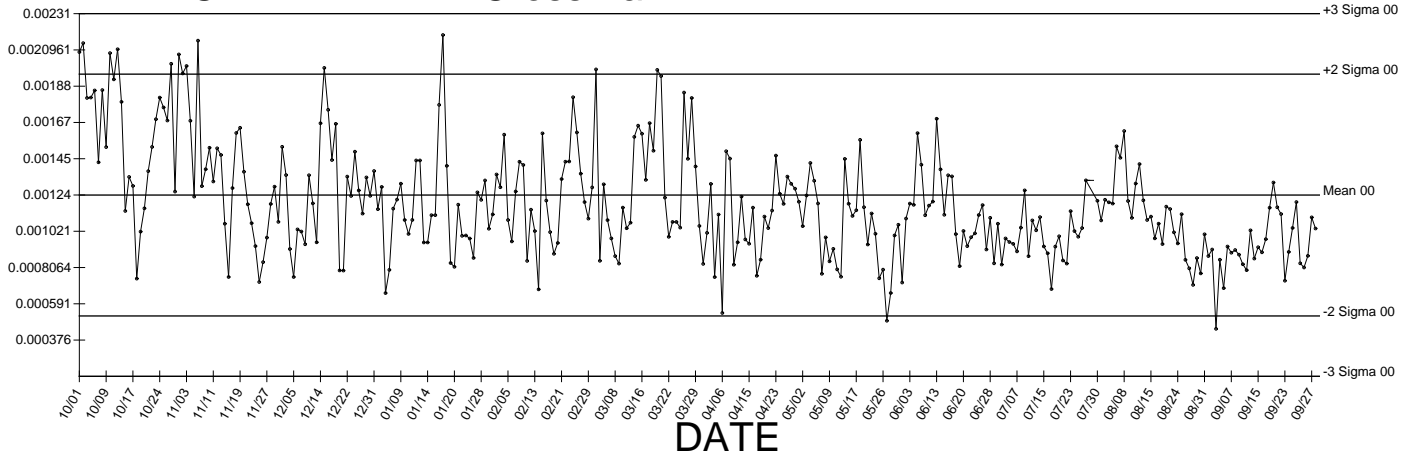
● Denotes Outlier

PIC1B BETA EFF

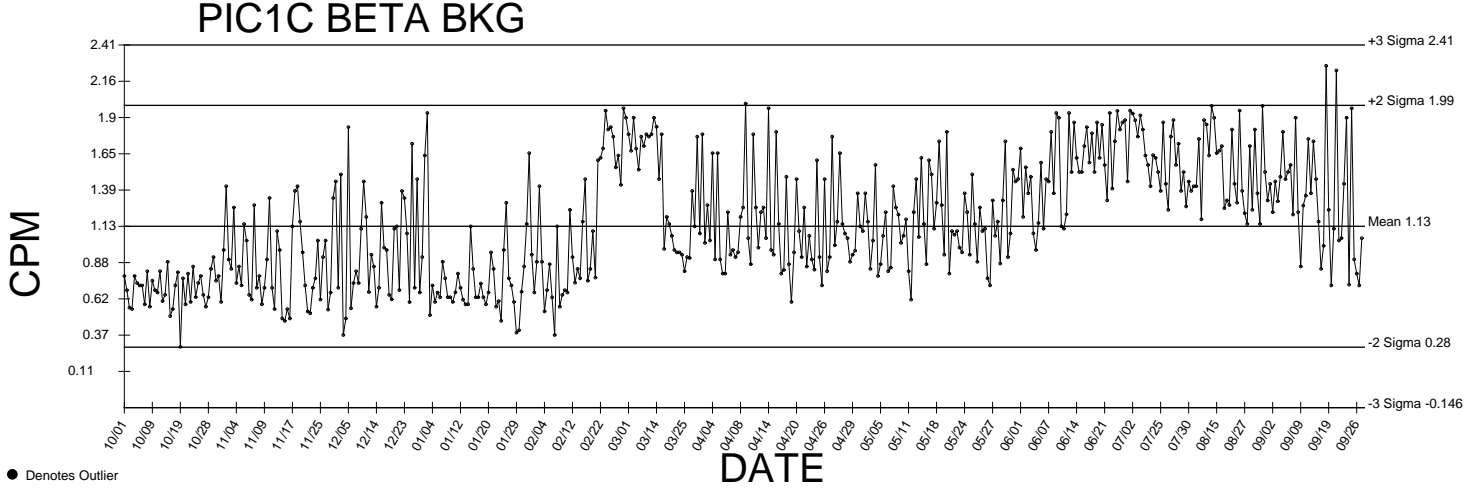
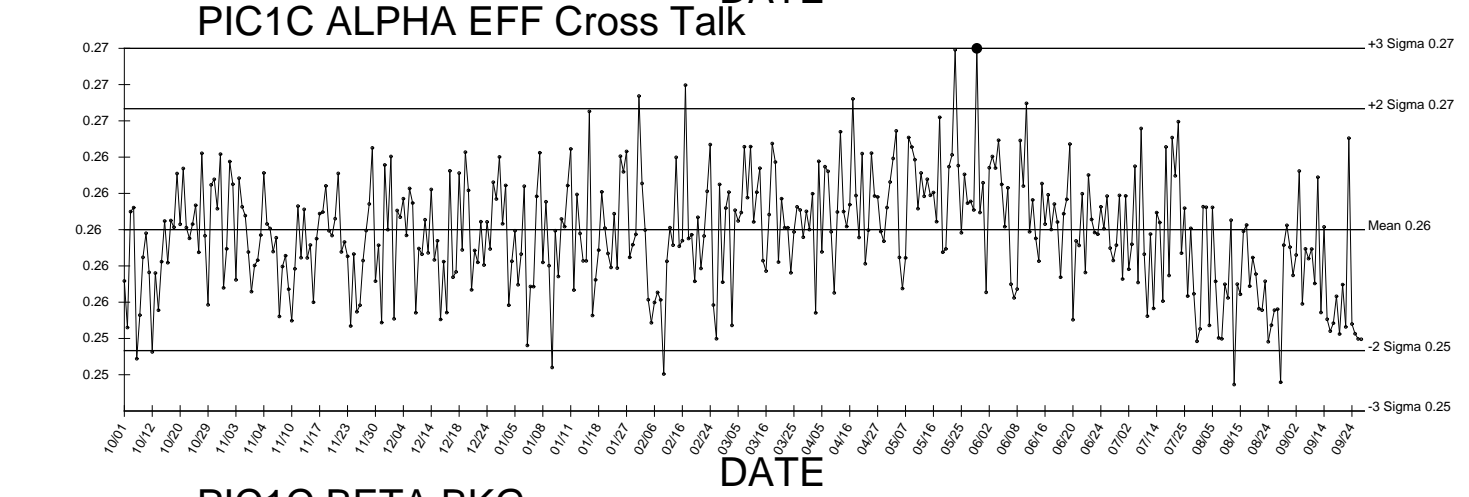
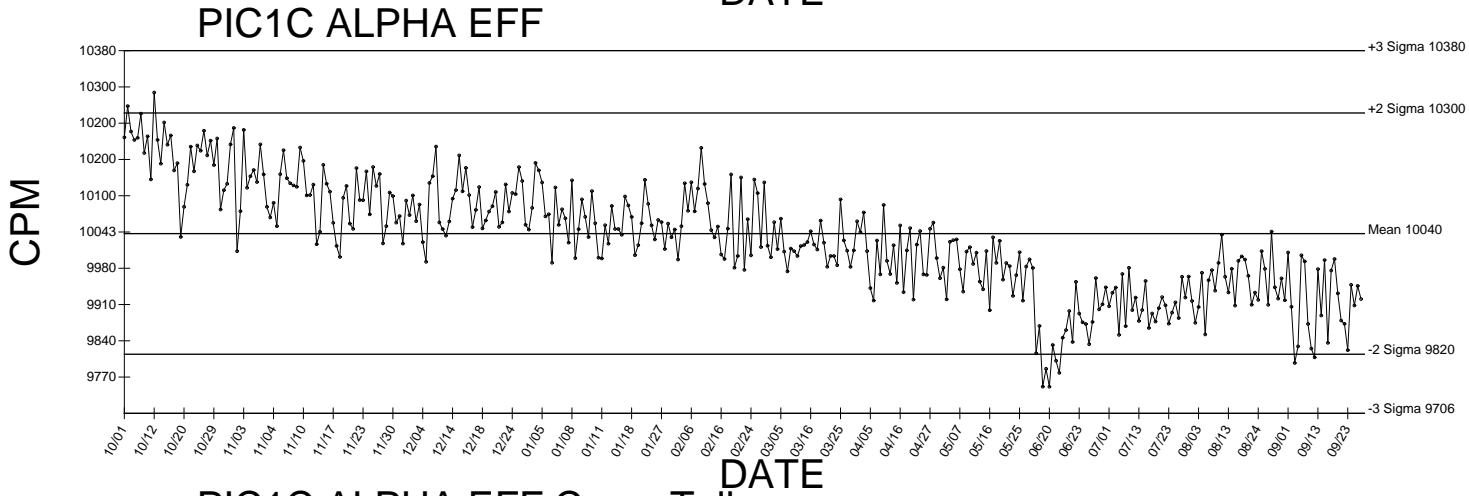
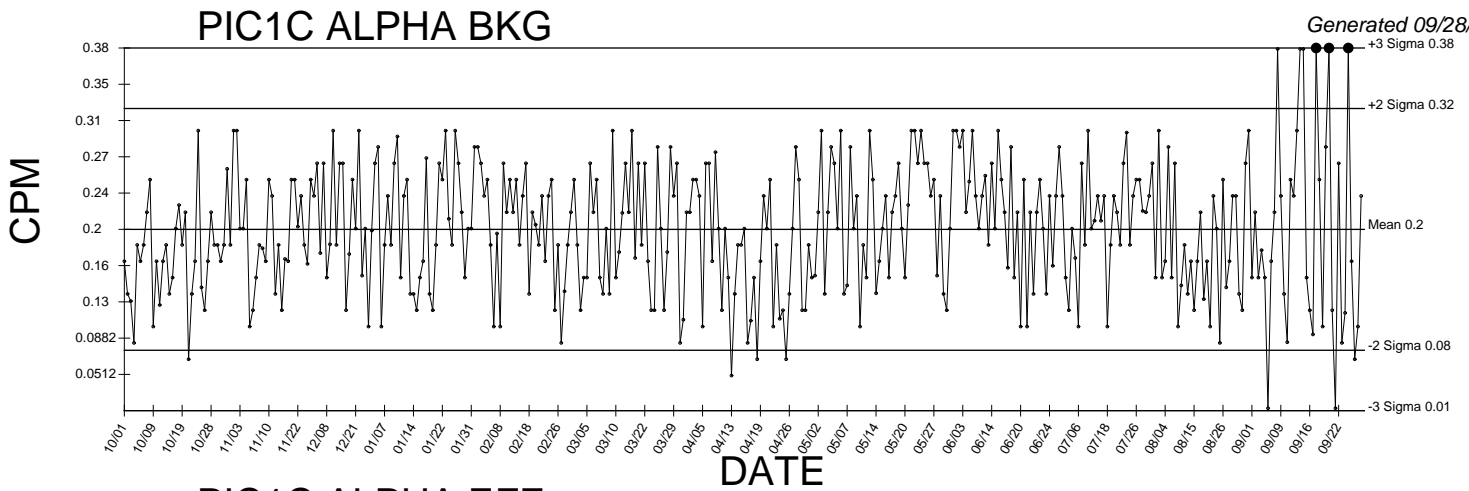
Generated 09/28/2016



PIC1B BETA EFF Cross Talk



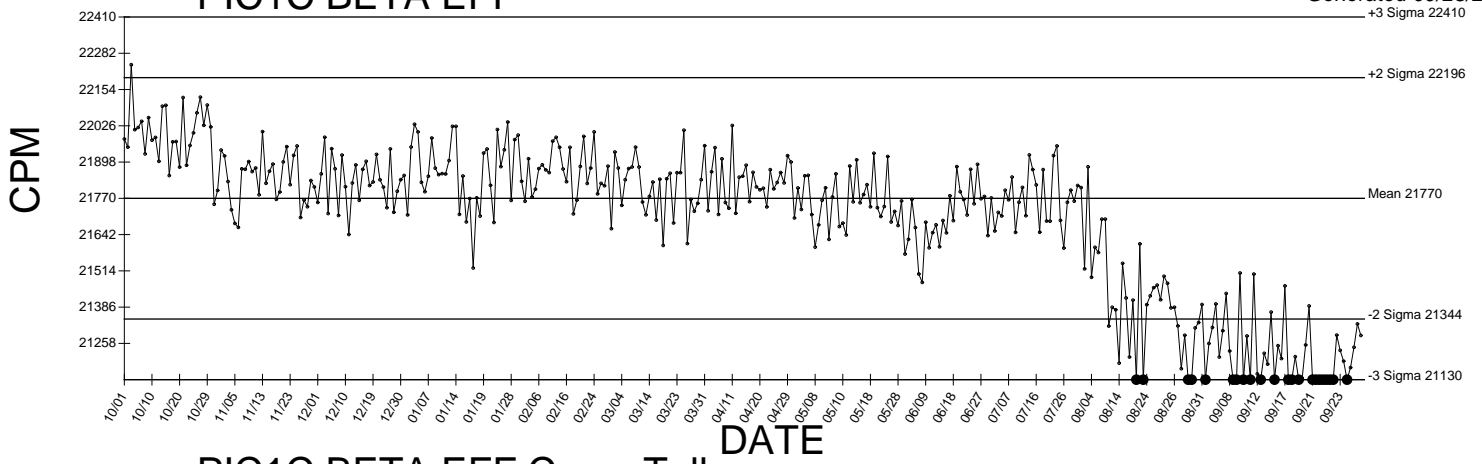
● Denotes Outlier



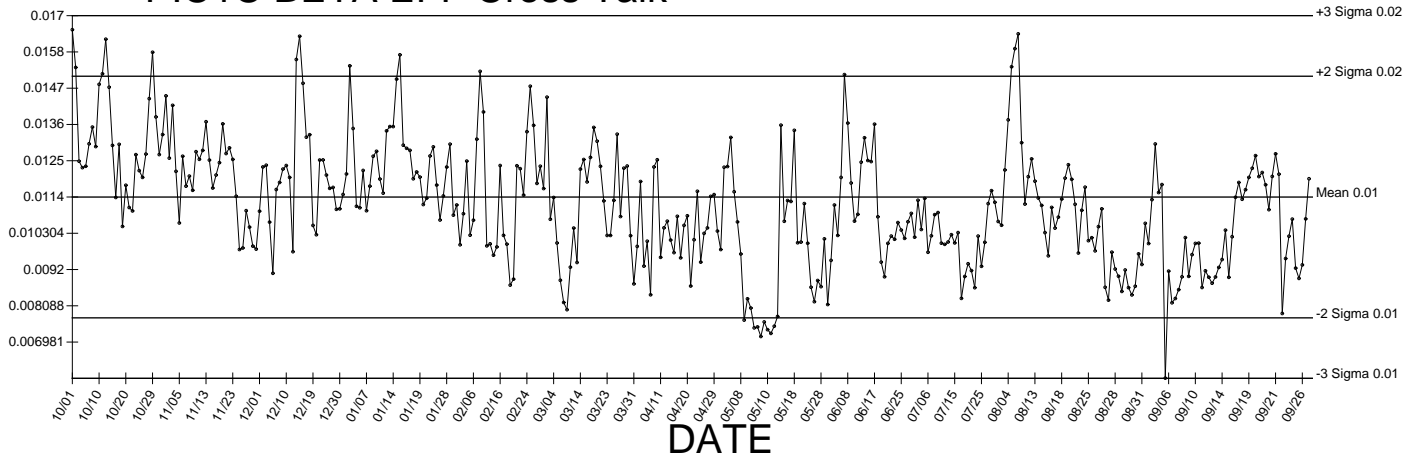
● Denotes Outlier

PIC1C BETA EFF

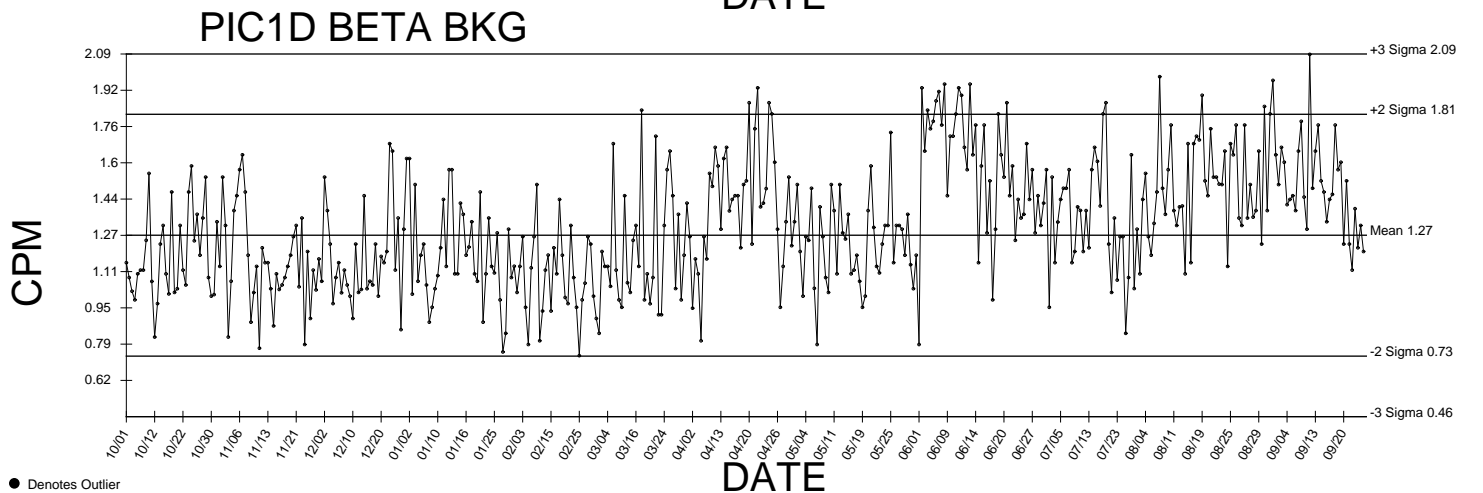
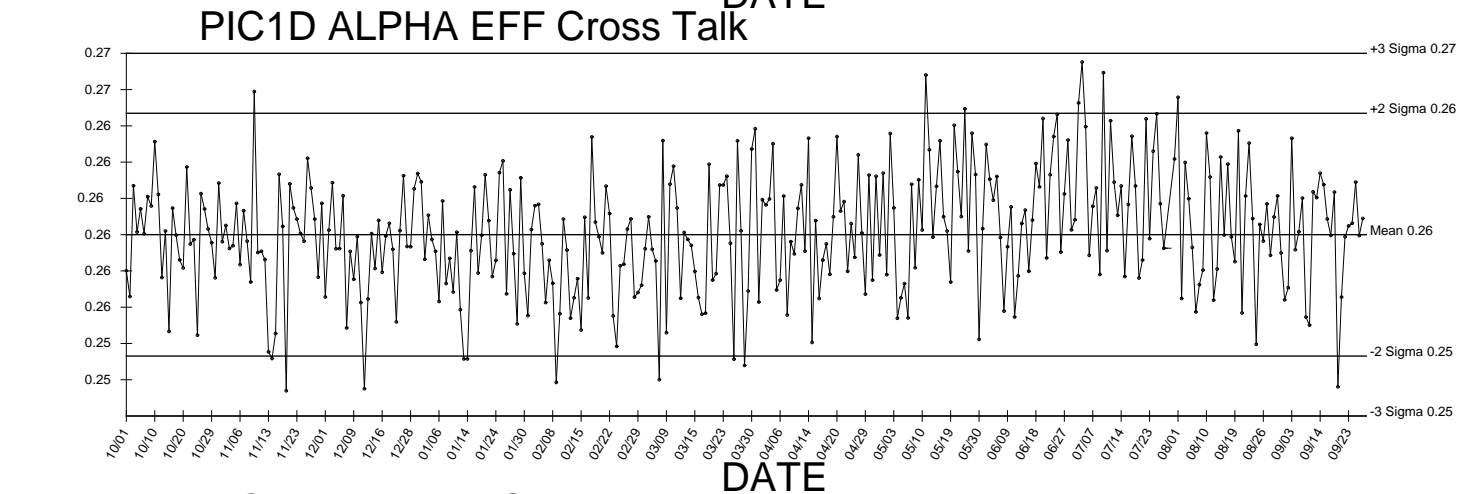
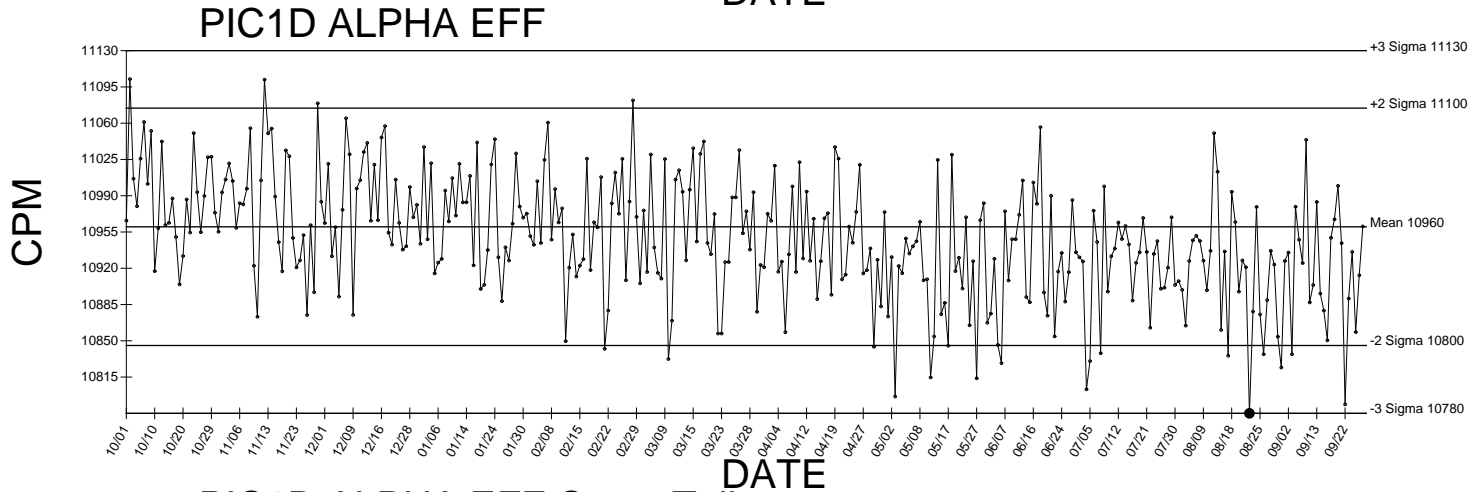
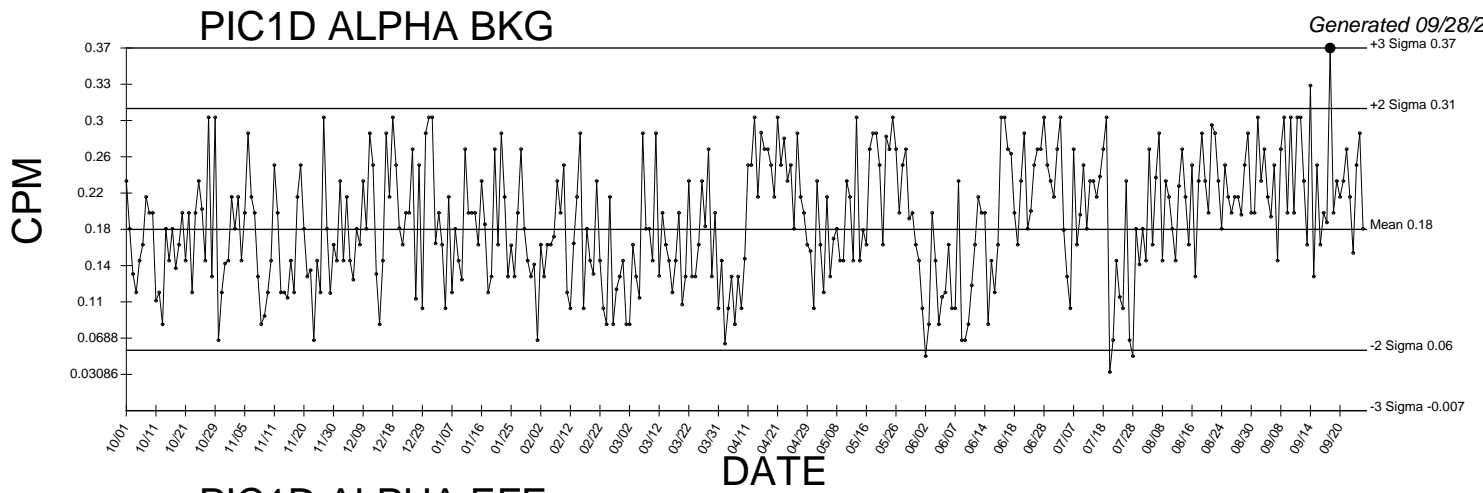
Generated 09/28/2016



PIC1C BETA EFF Cross Talk



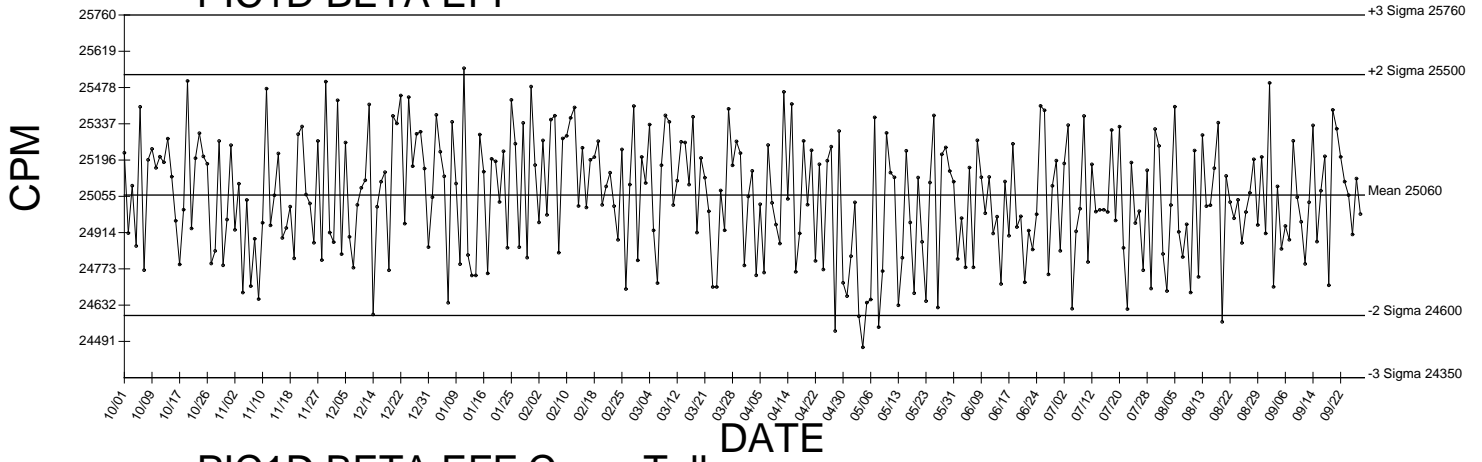
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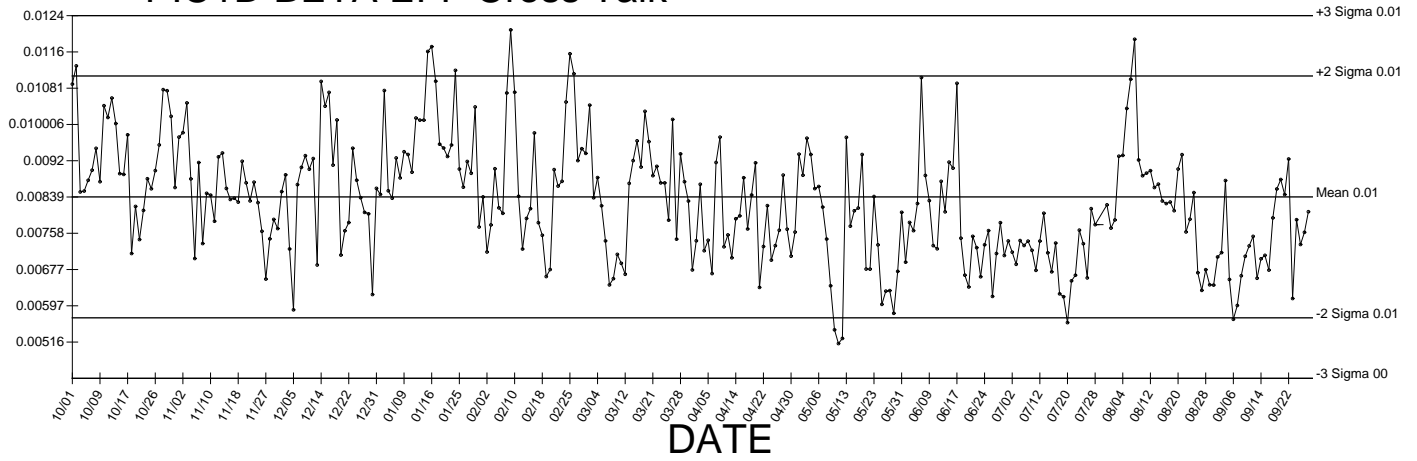
● Denotes Outlier

PIC1D BETA EFF

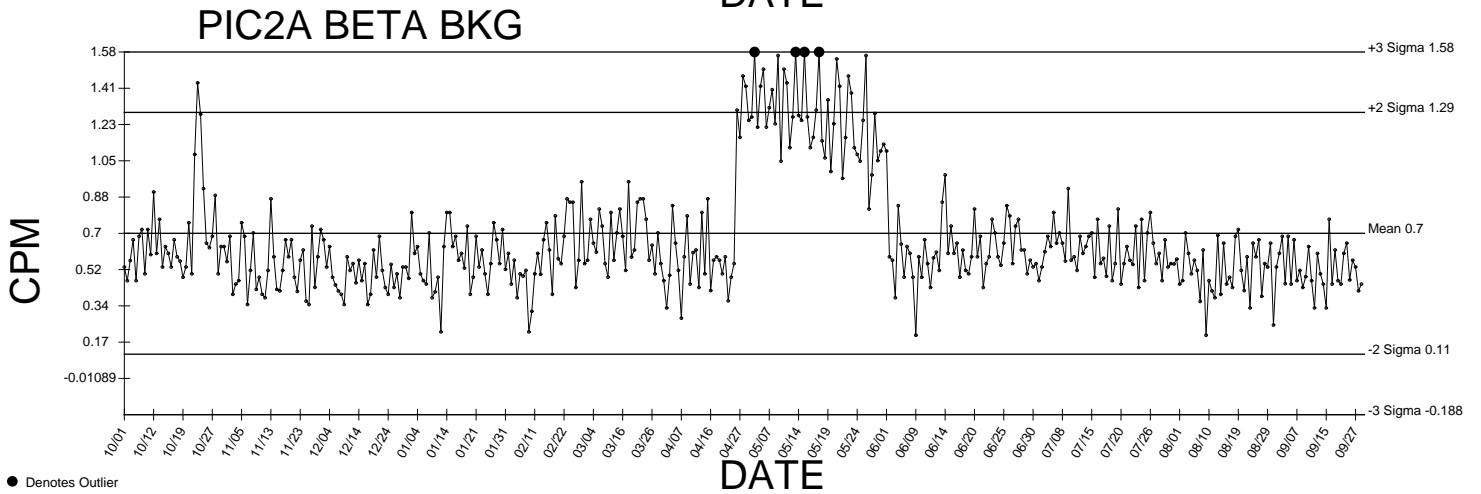
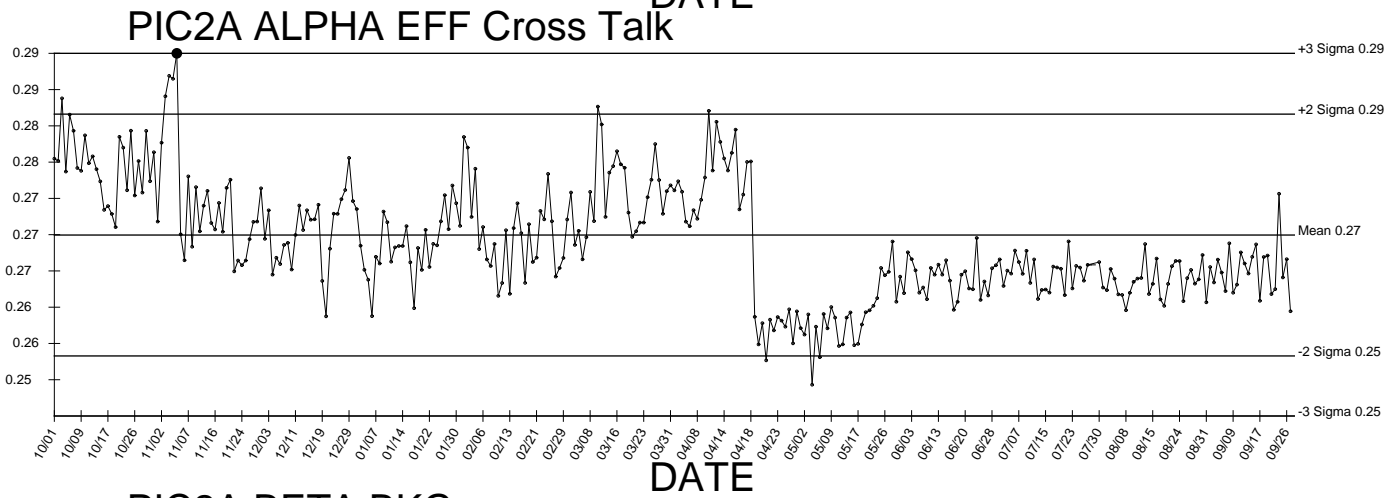
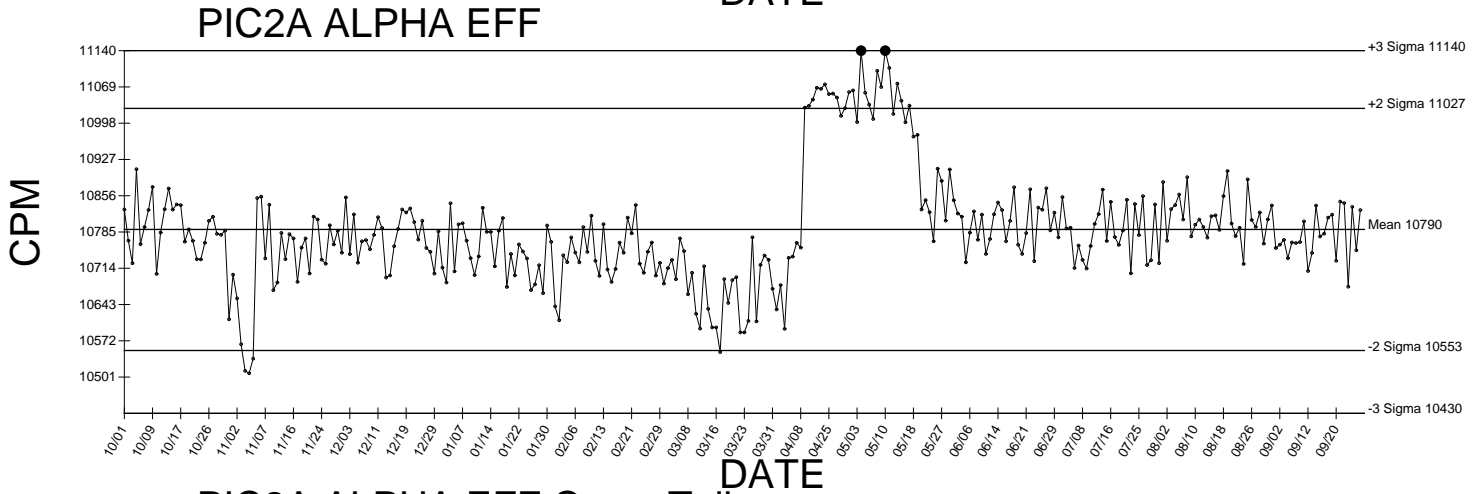
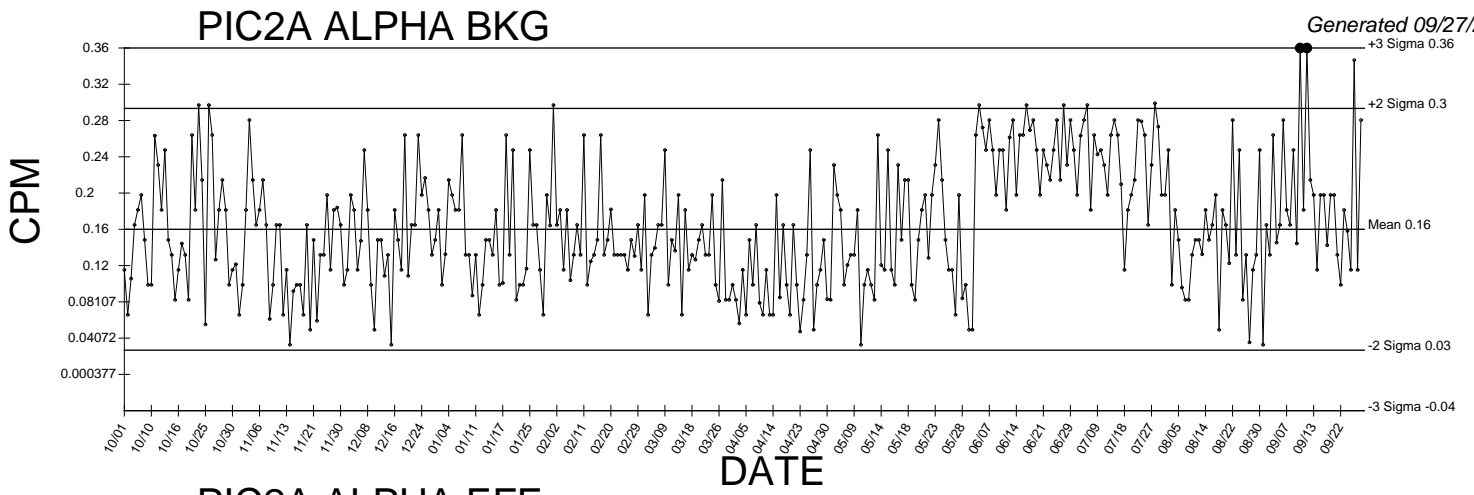
Generated 09/28/2016



PIC1D BETA EFF Cross Talk



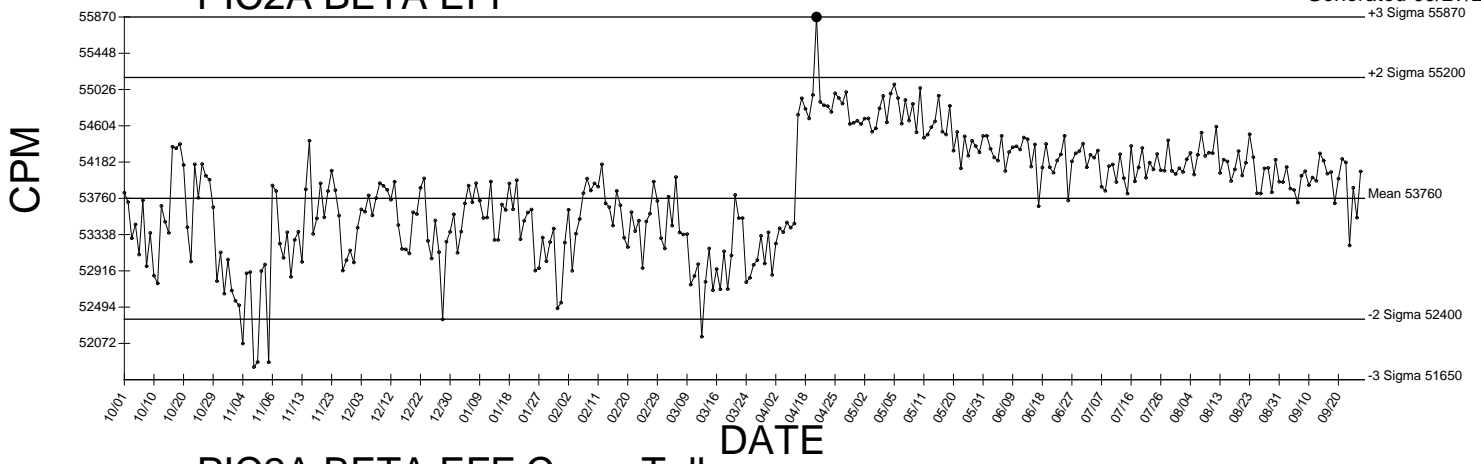
● Denotes Outlier



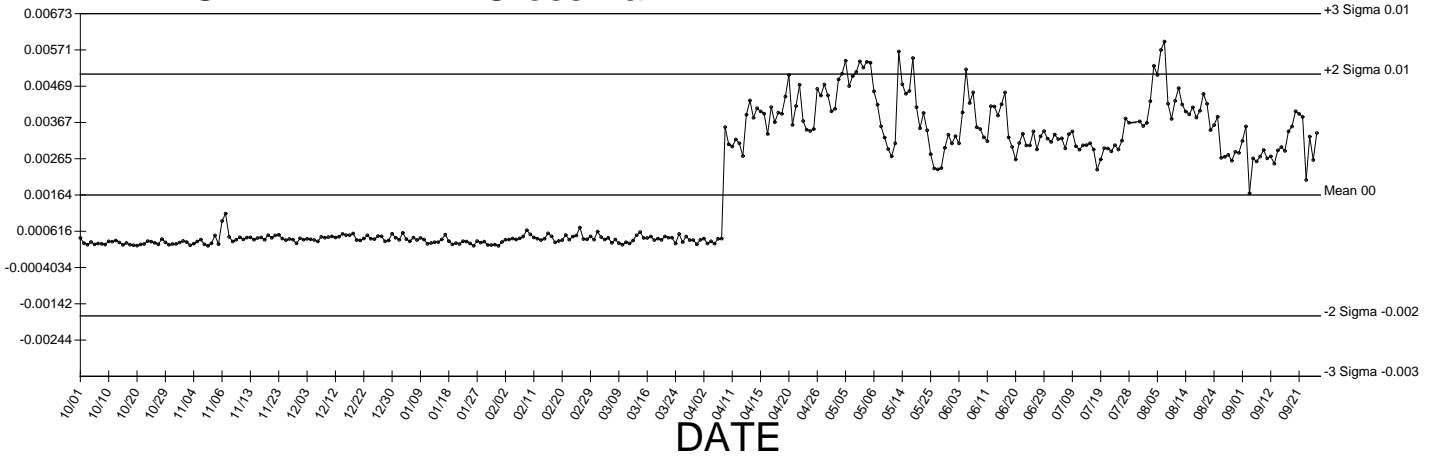
● Denotes Outlier

PIC2A BETA EFF

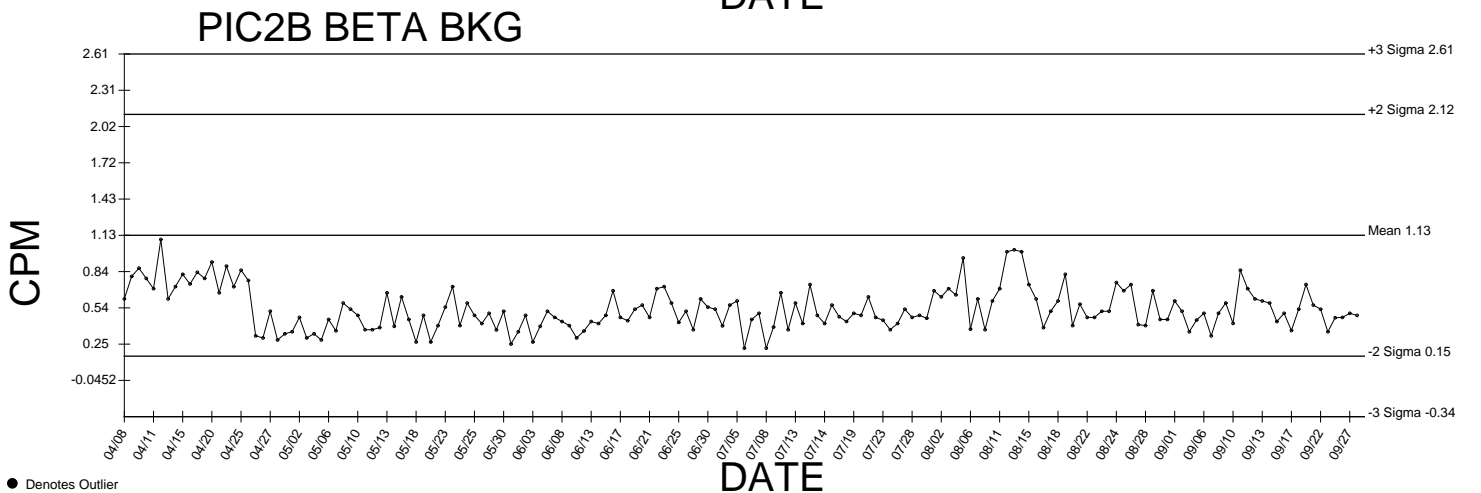
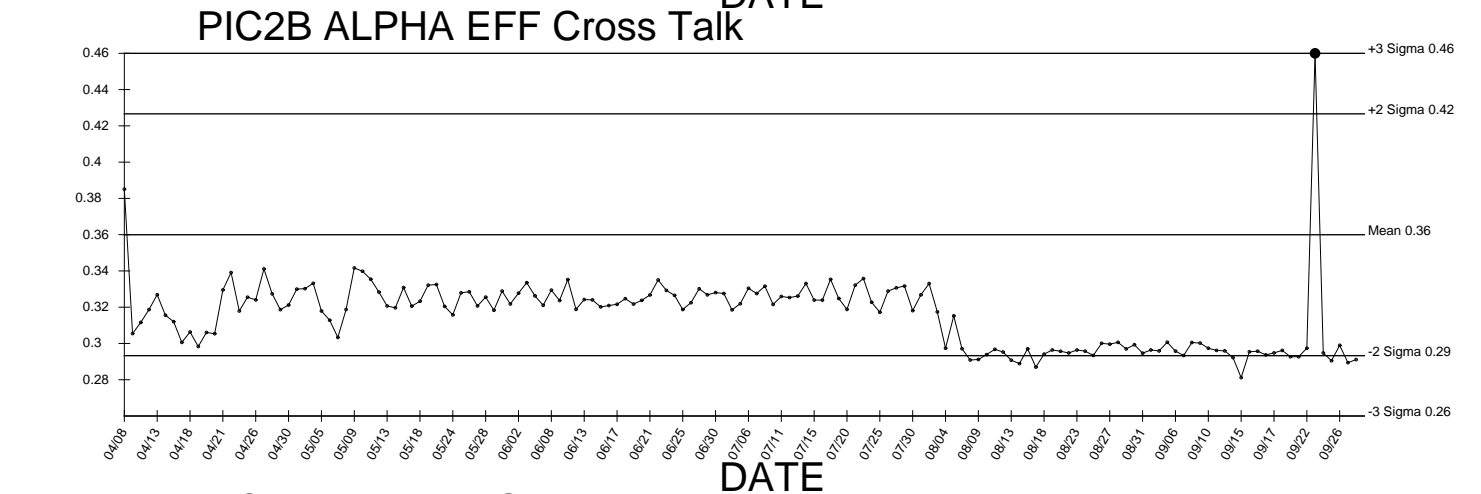
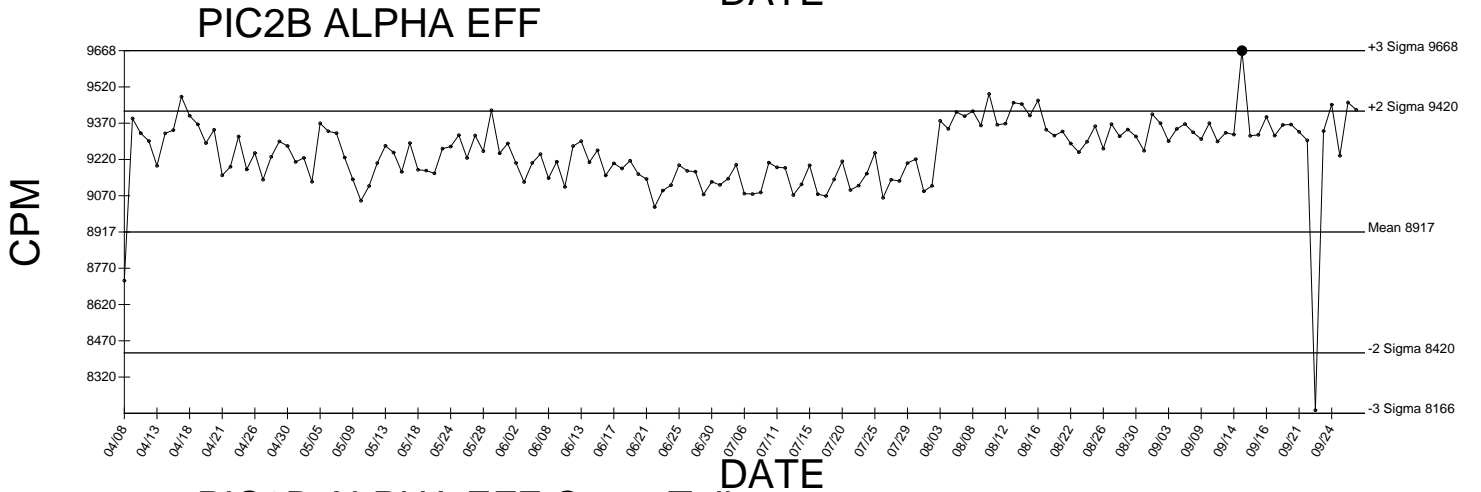
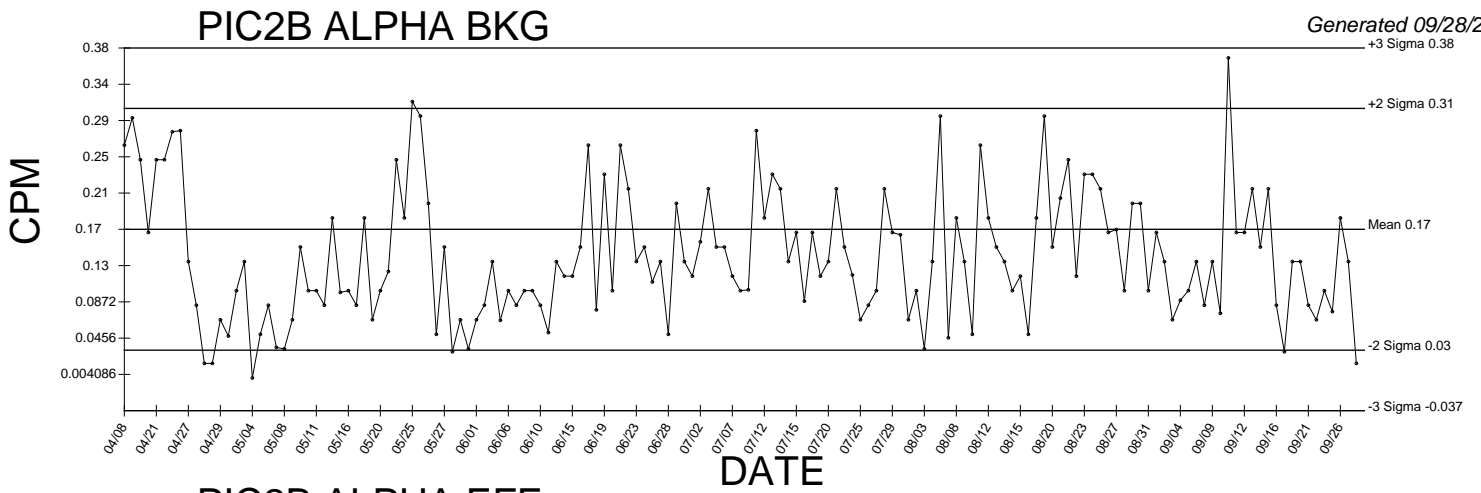
Generated 09/27/2016



PIC2A BETA EFF Cross Talk



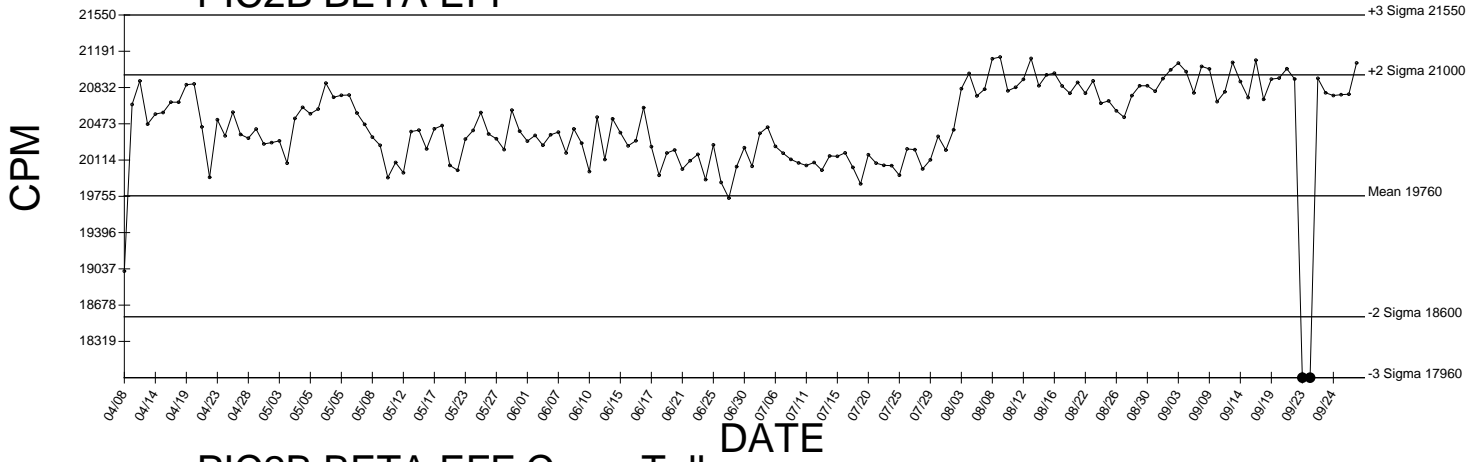
● Denotes Outlier



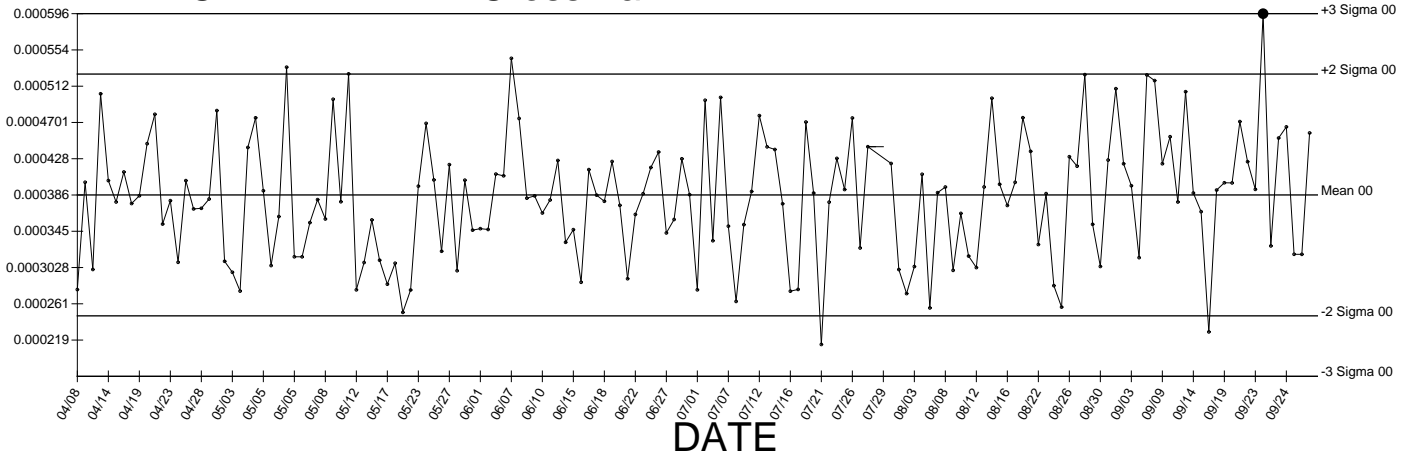
● Denotes Outlier

PIC2B BETA EFF

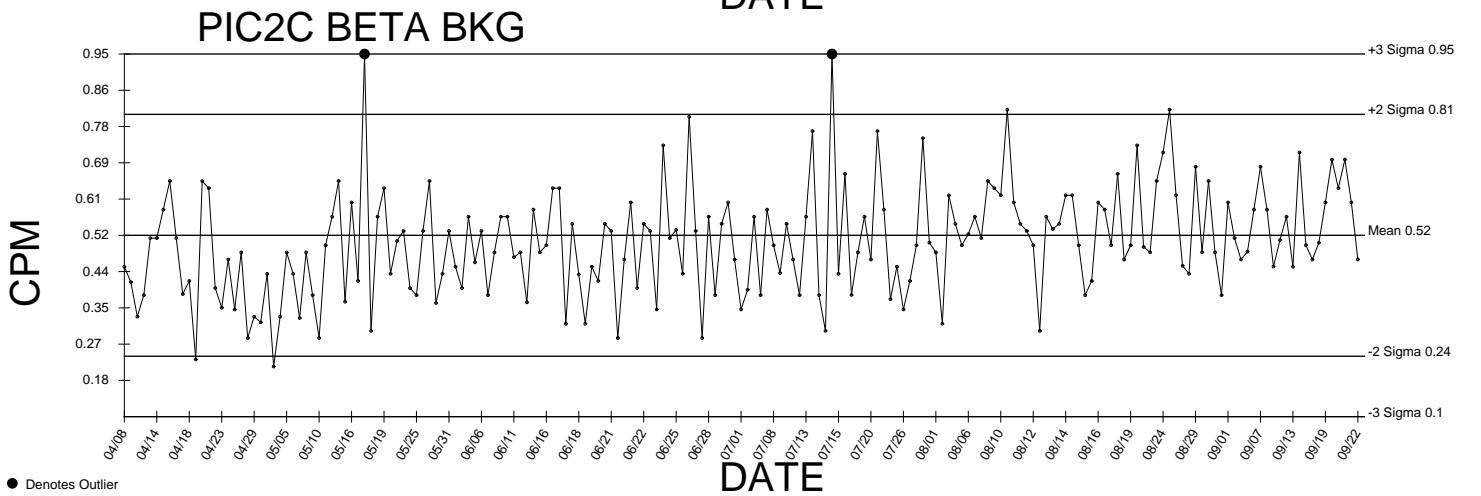
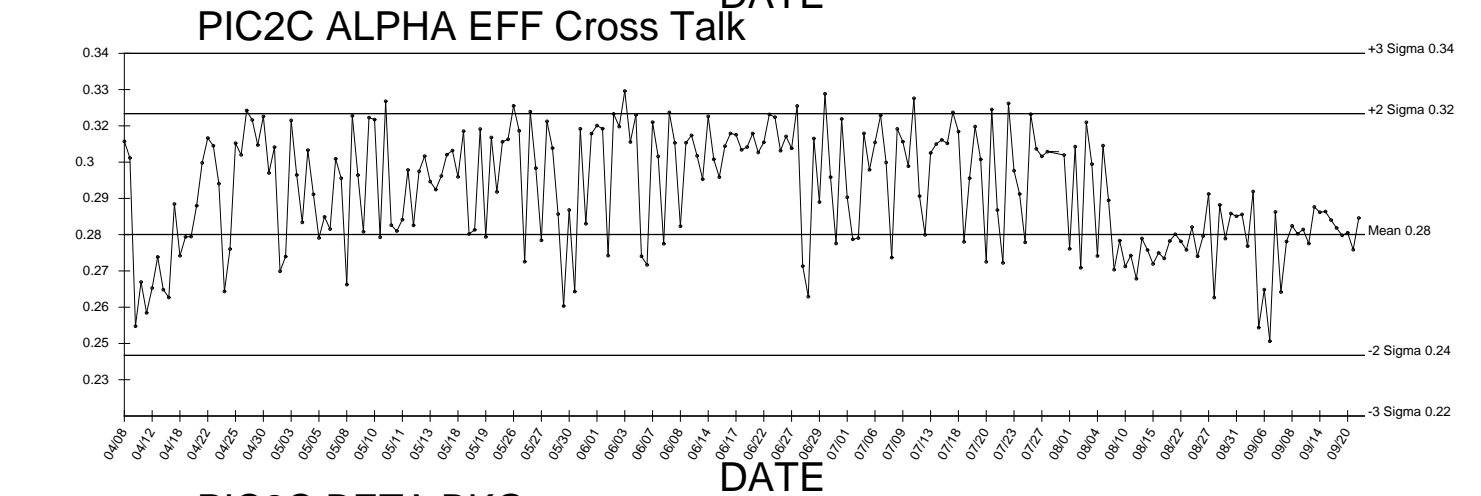
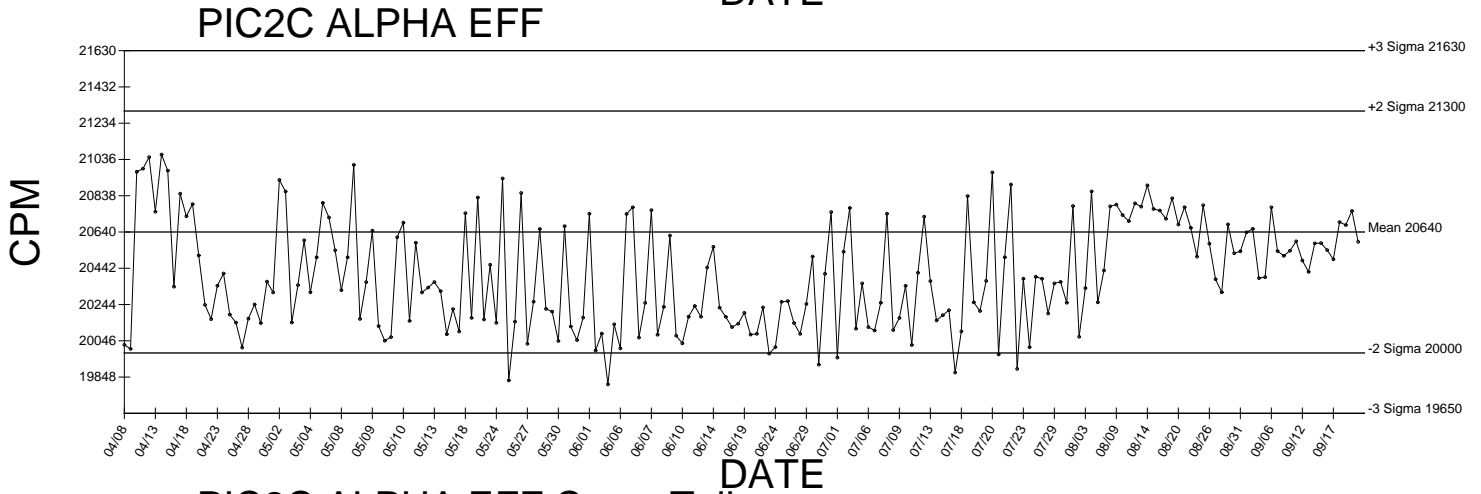
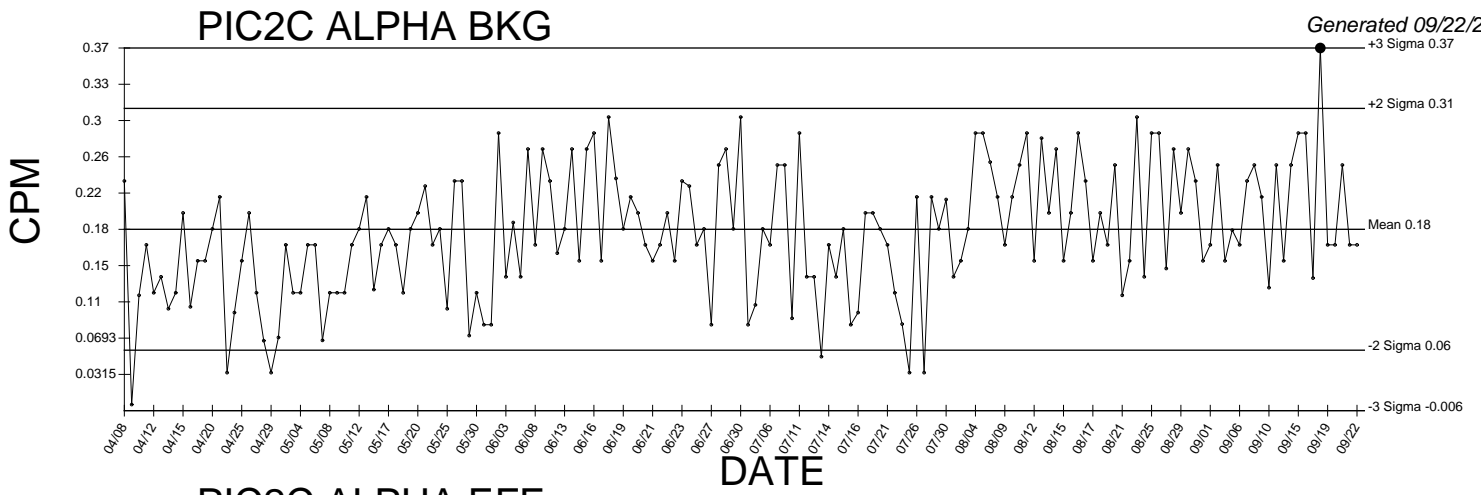
Generated 09/28/2016



PIC2B BETA EFF Cross Talk



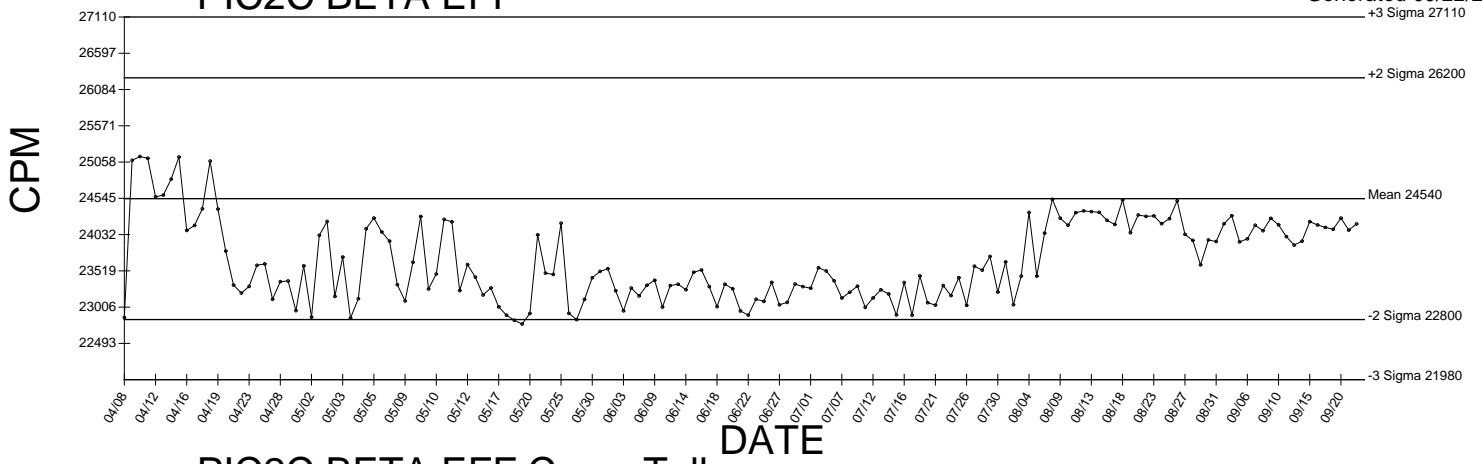
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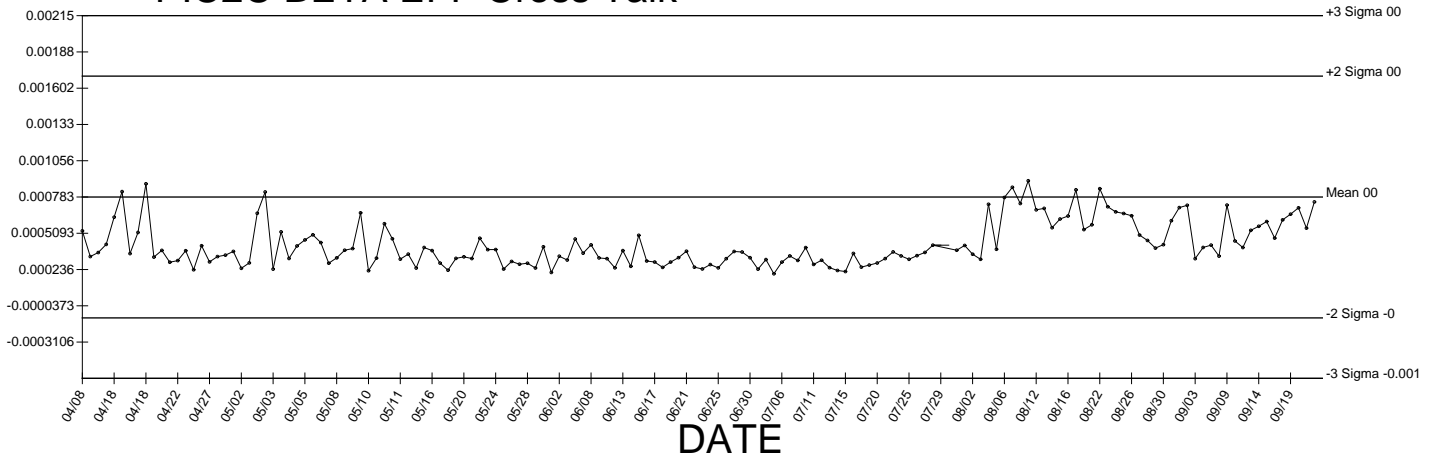
● Denotes Outlier

PIC2C BETA EFF

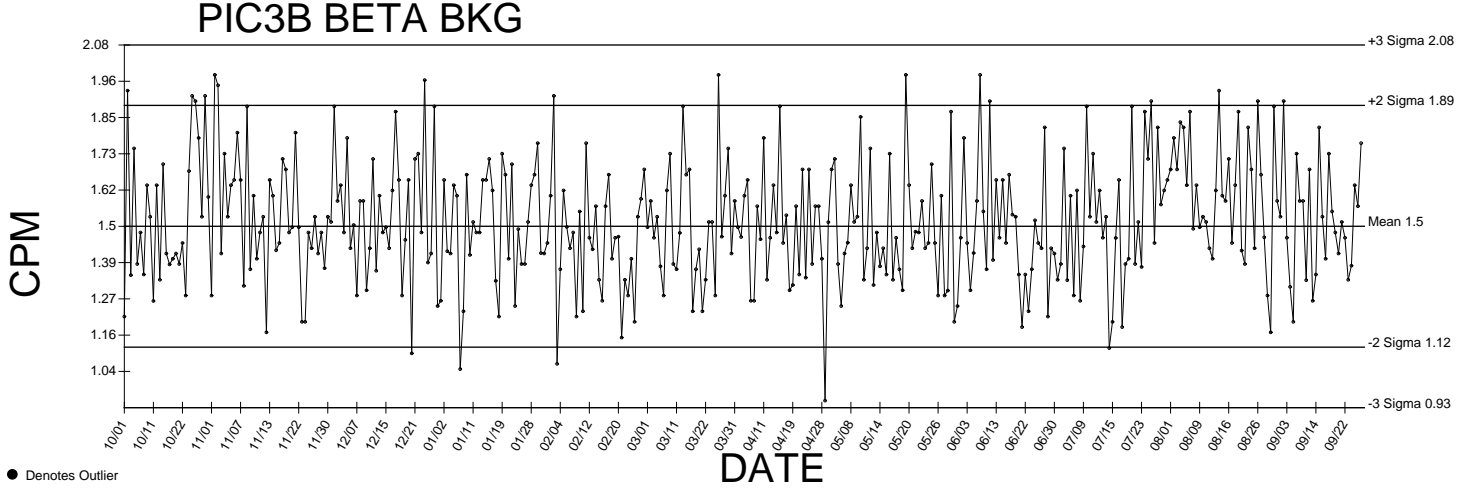
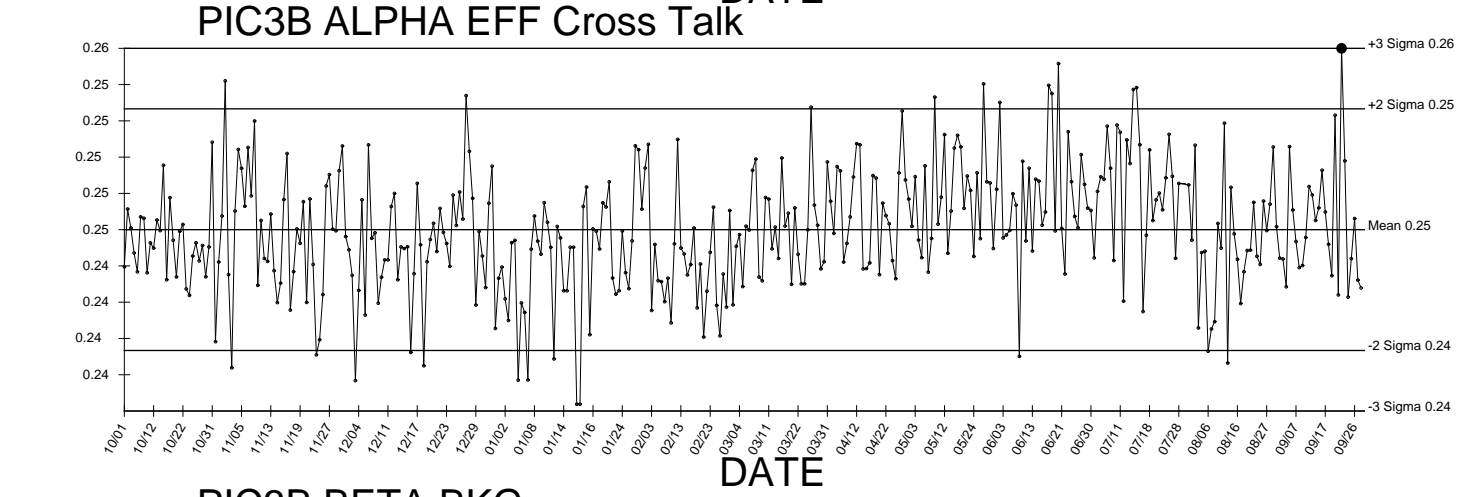
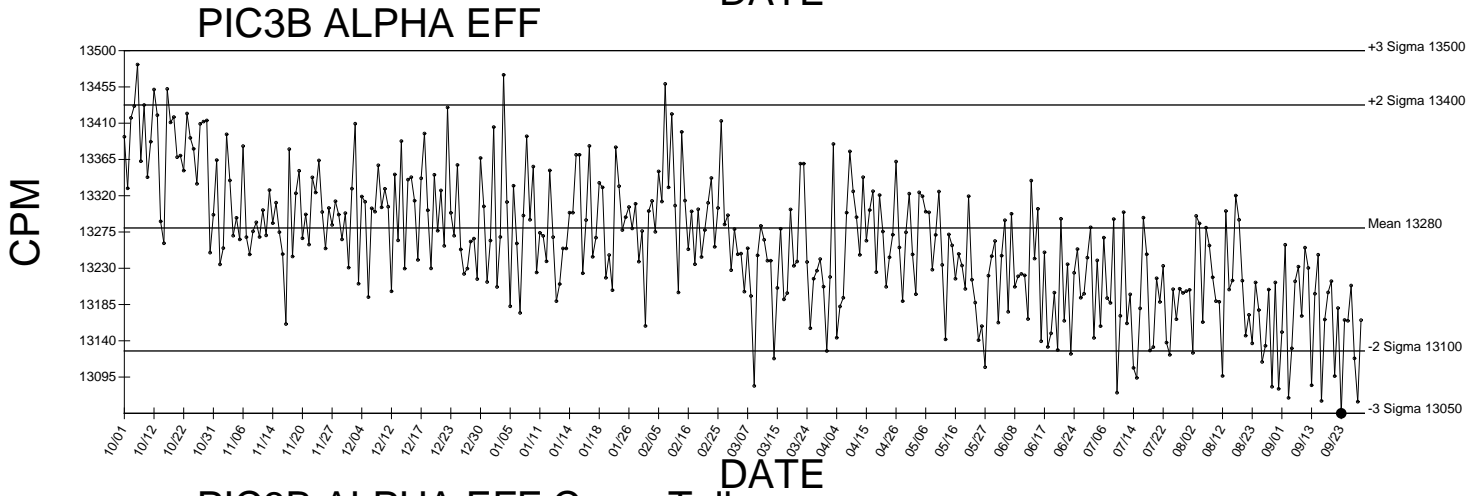
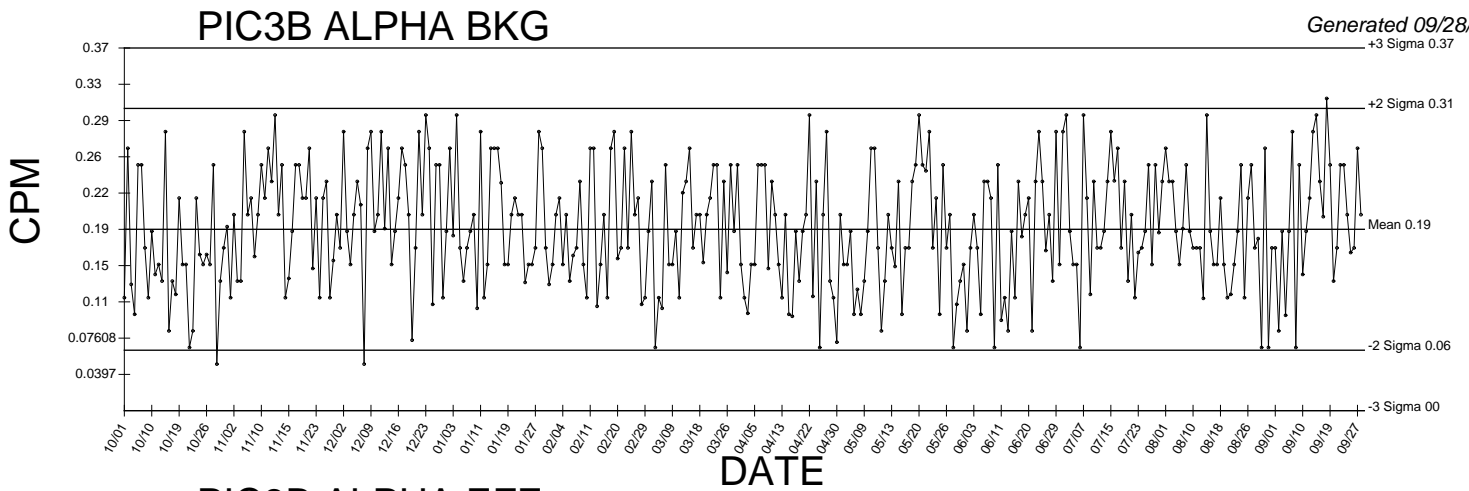
Generated 09/22/2016



PIC2C BETA EFF Cross Talk



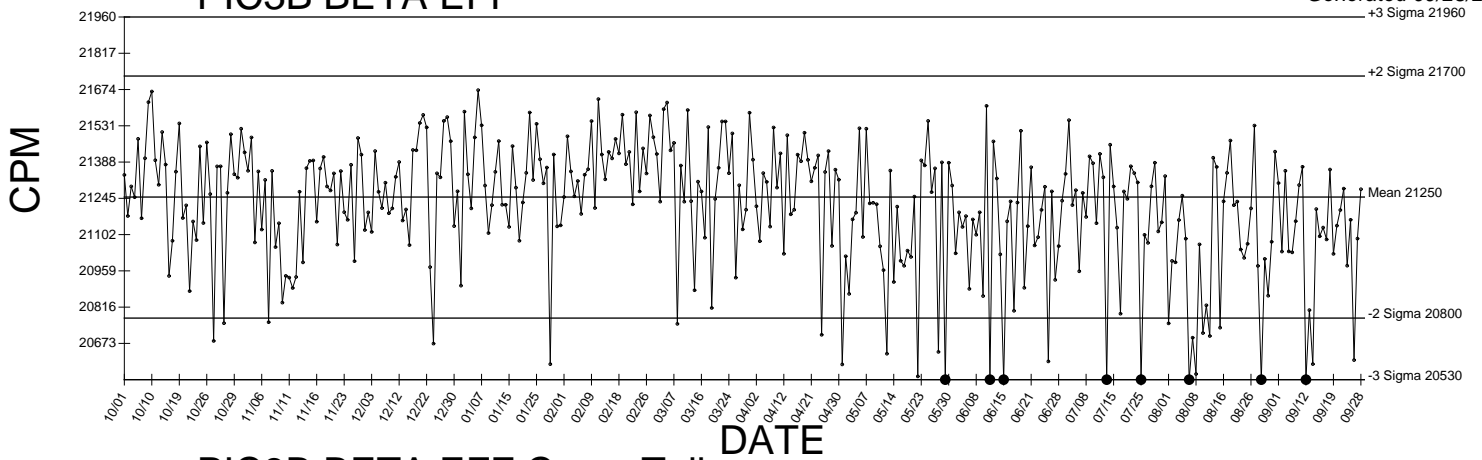
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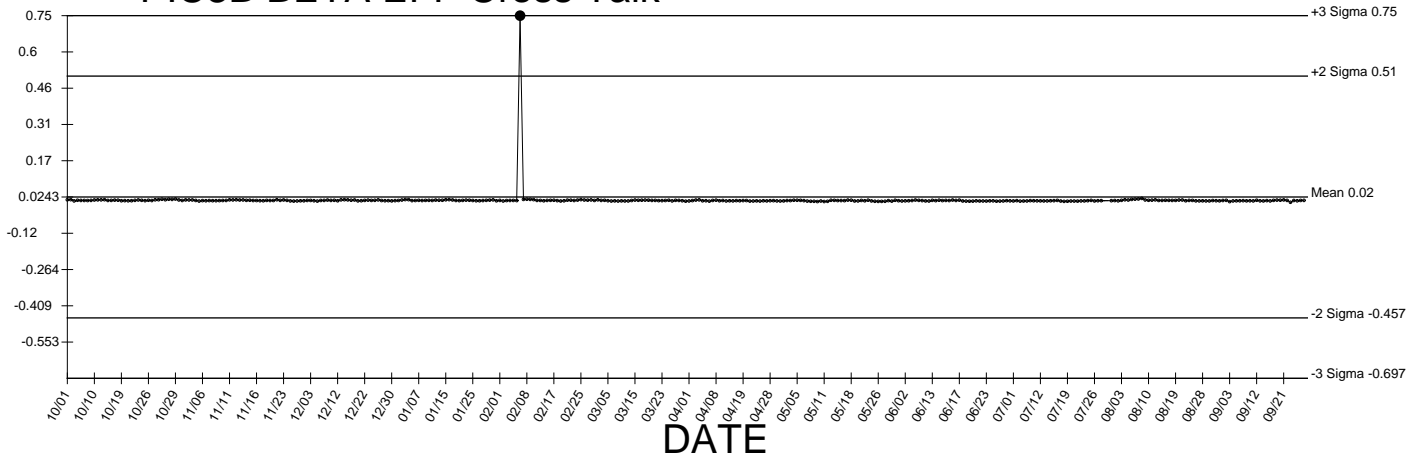
● Denotes Outlier

PIC3B BETA EFF

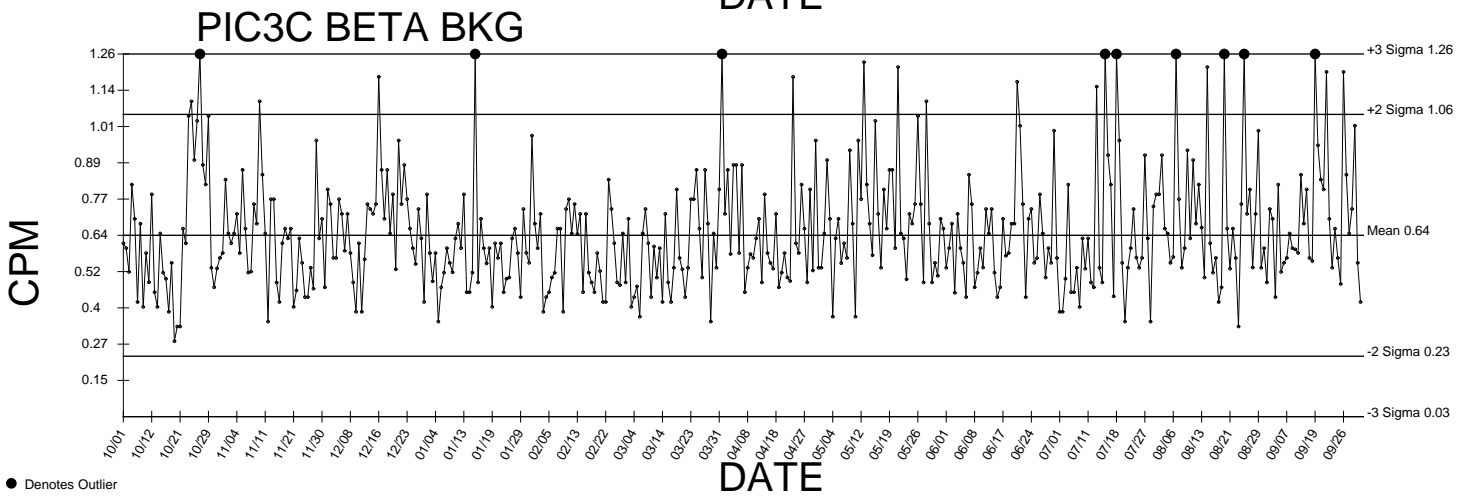
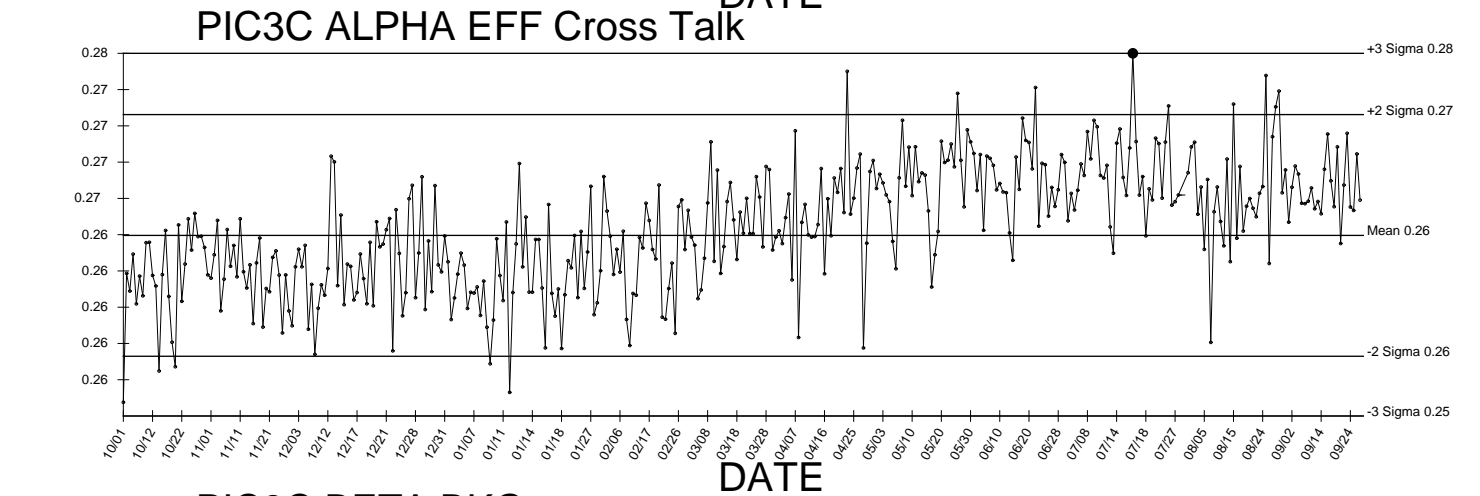
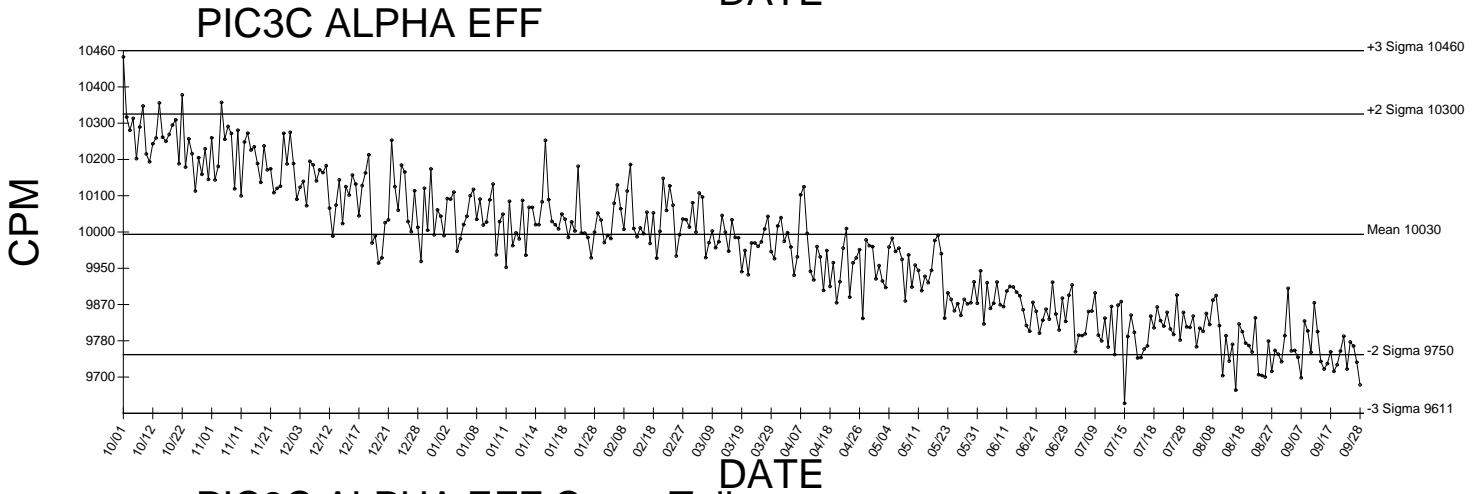
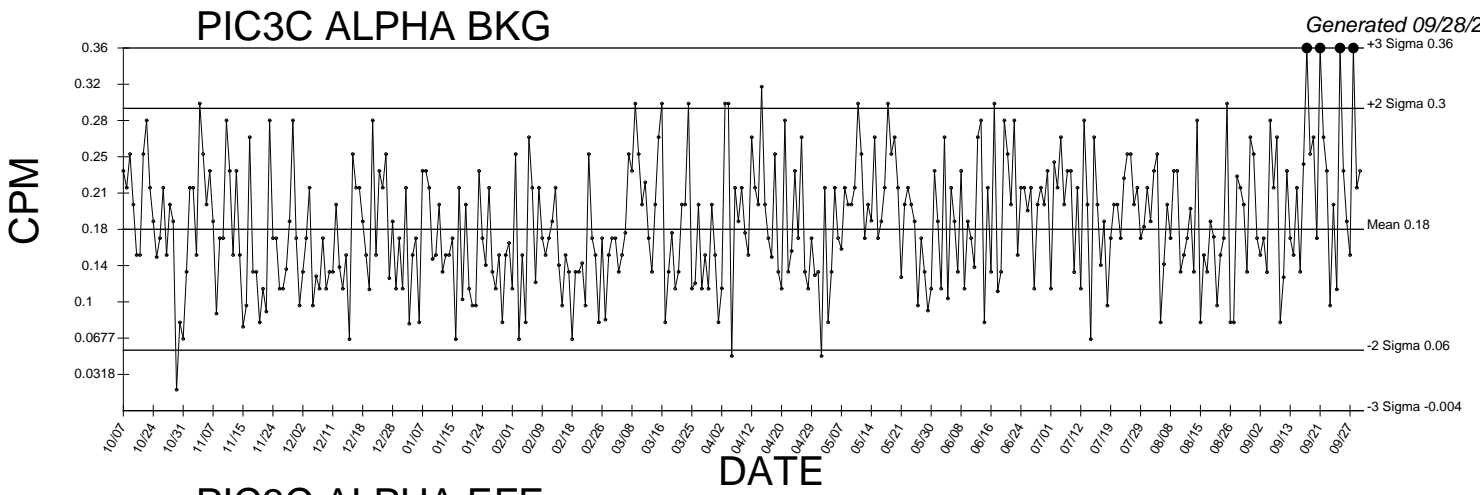
Generated 09/28/2016



PIC3B BETA EFF Cross Talk



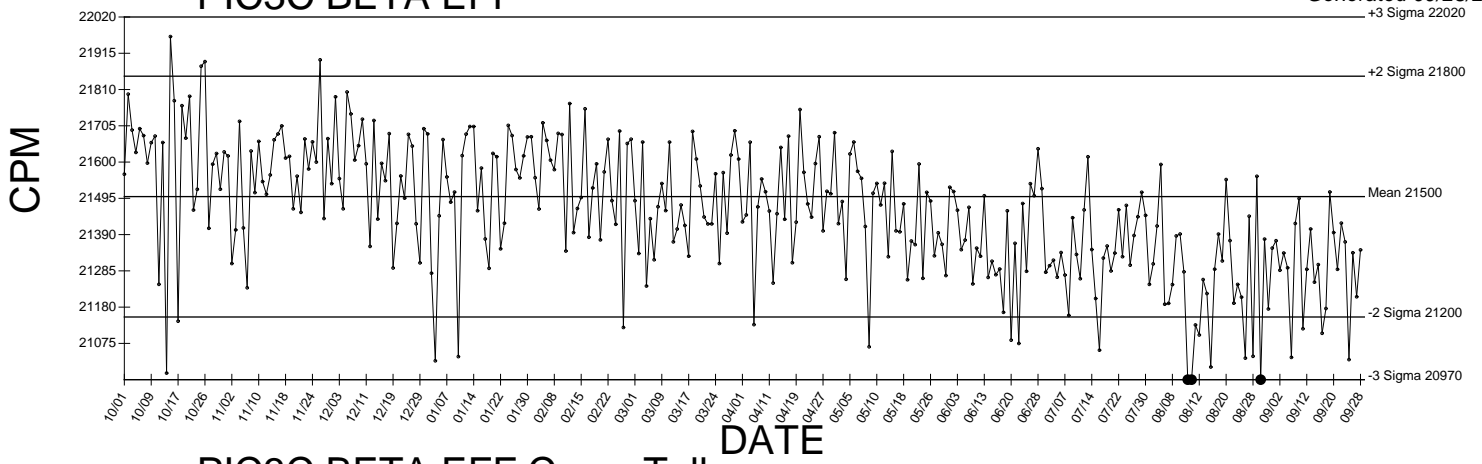
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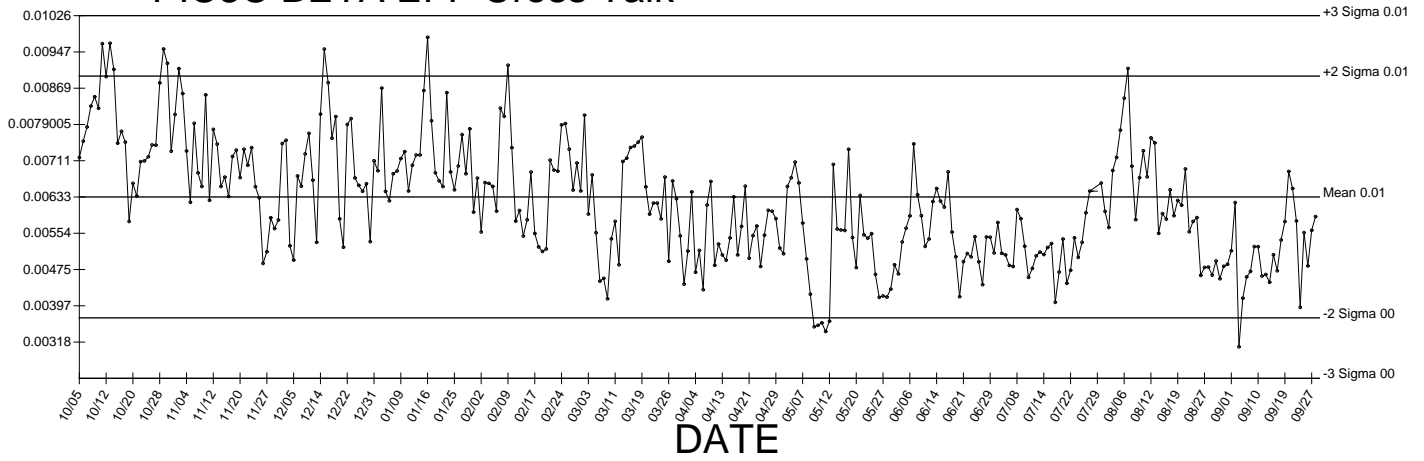
● Denotes Outlier

PIC3C BETA EFF

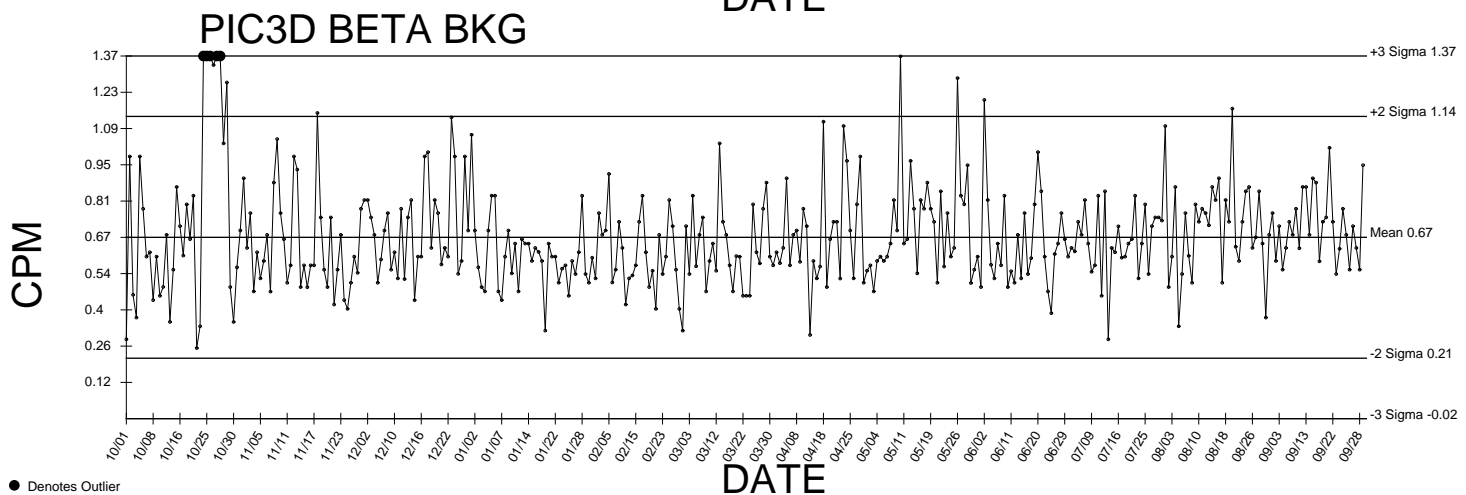
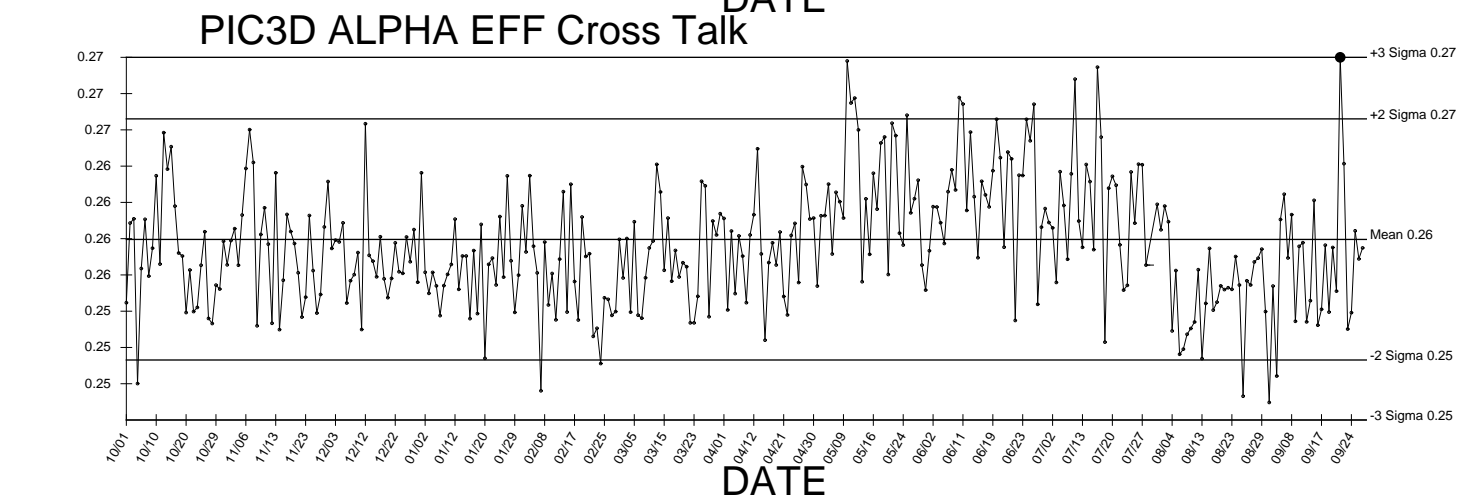
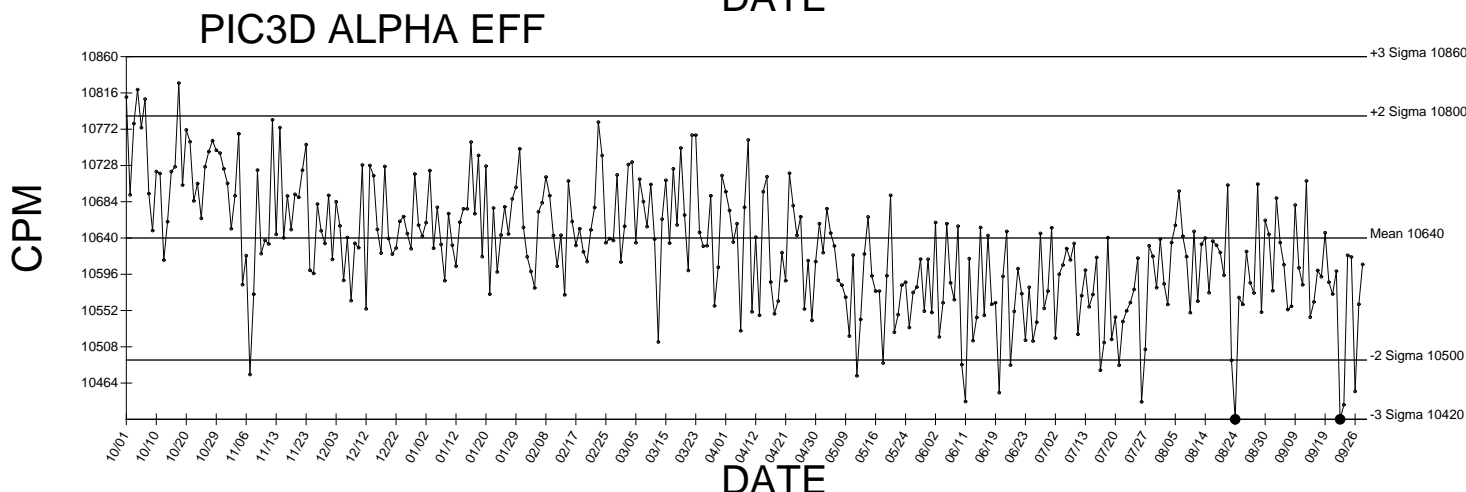
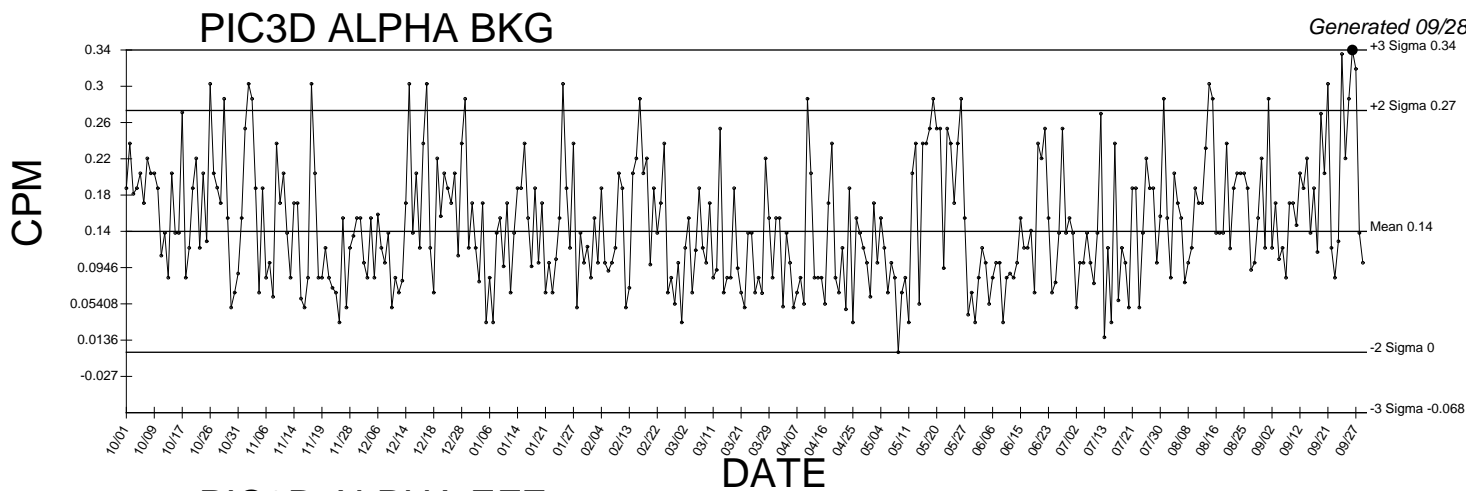
Generated 09/28/2016



PIC3C BETA EFF Cross Talk



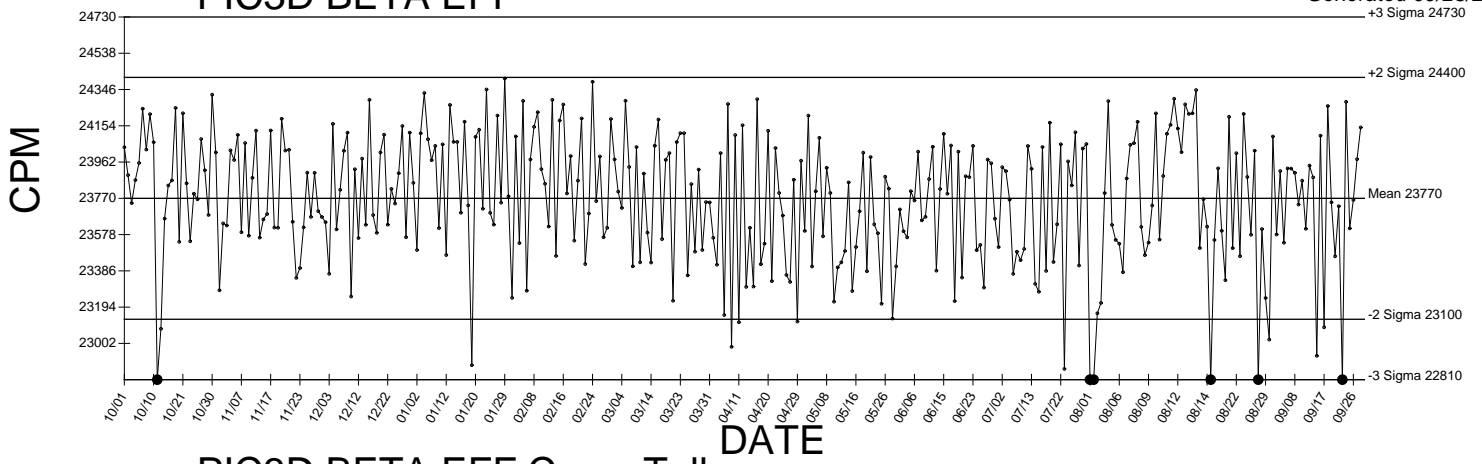
● Denotes Outlier



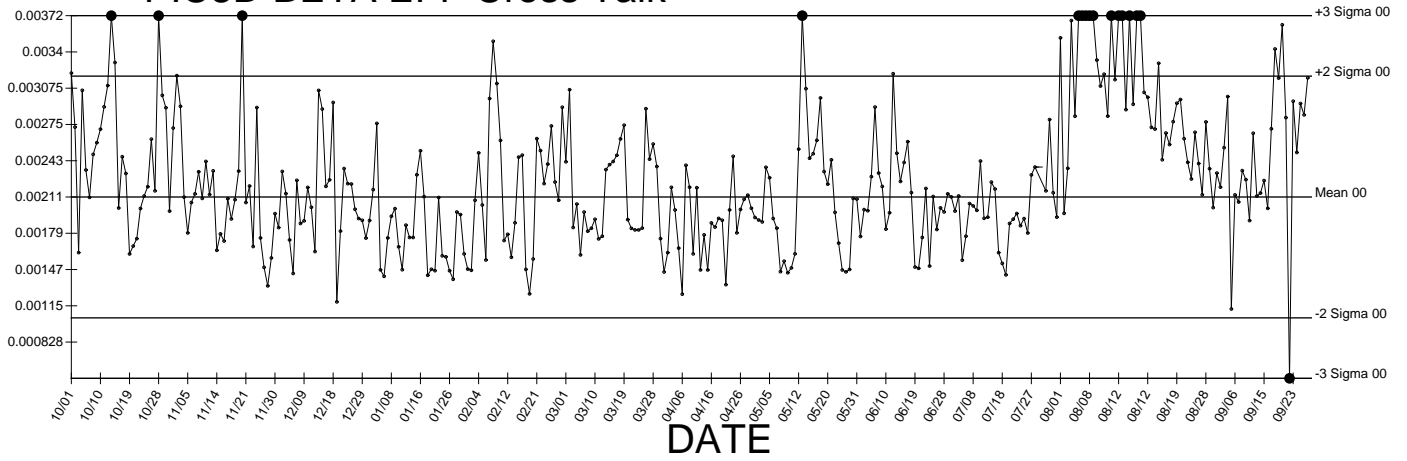
● Denotes Outlier

PIC3D BETA EFF

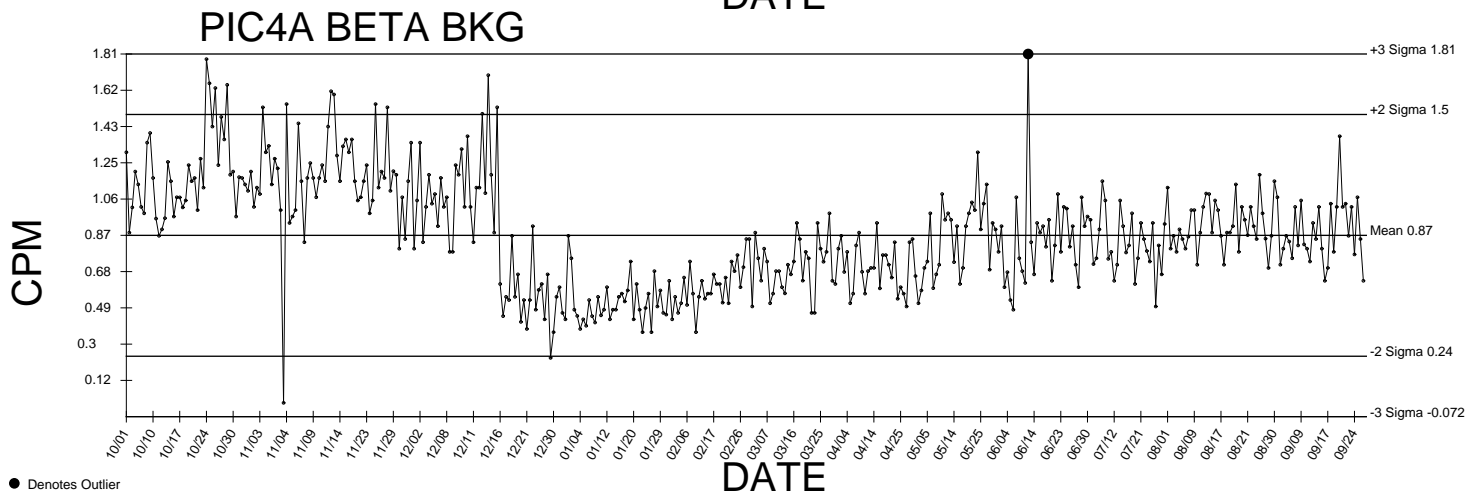
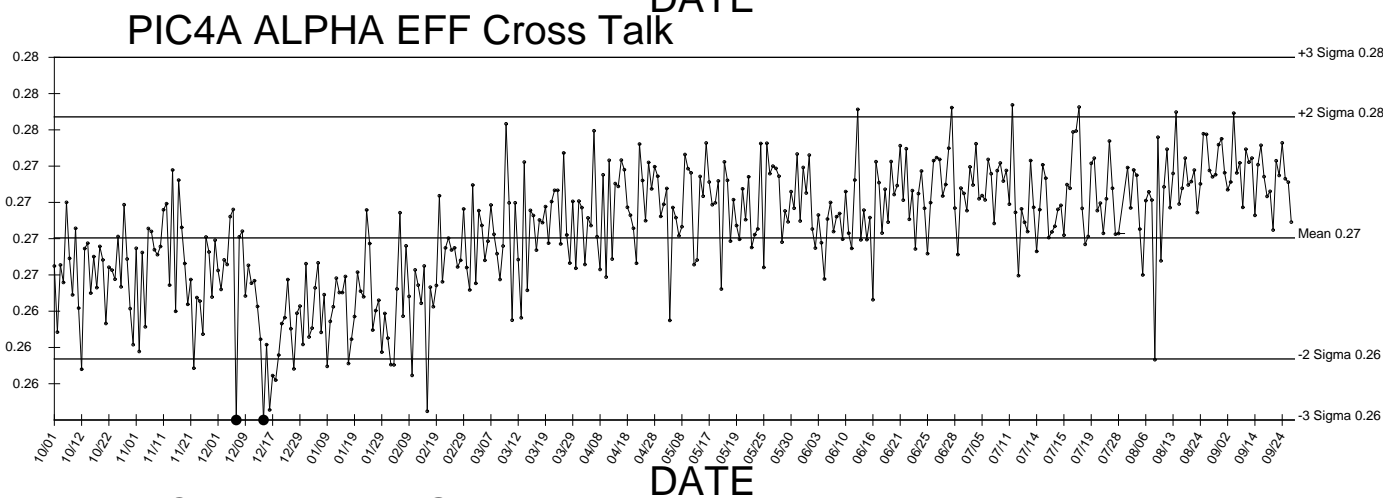
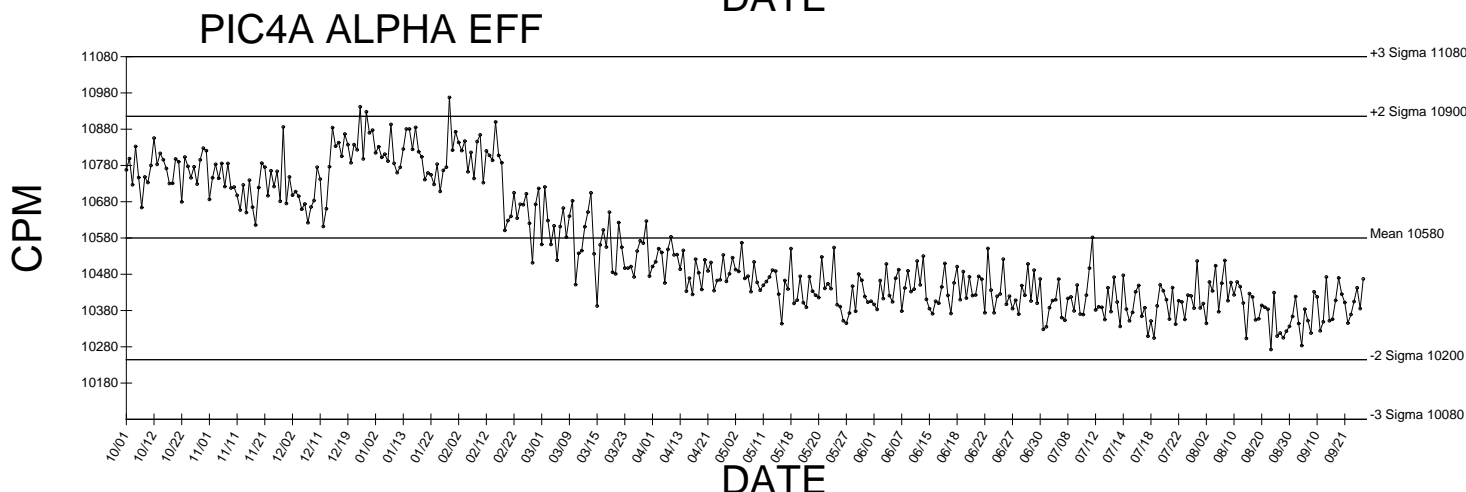
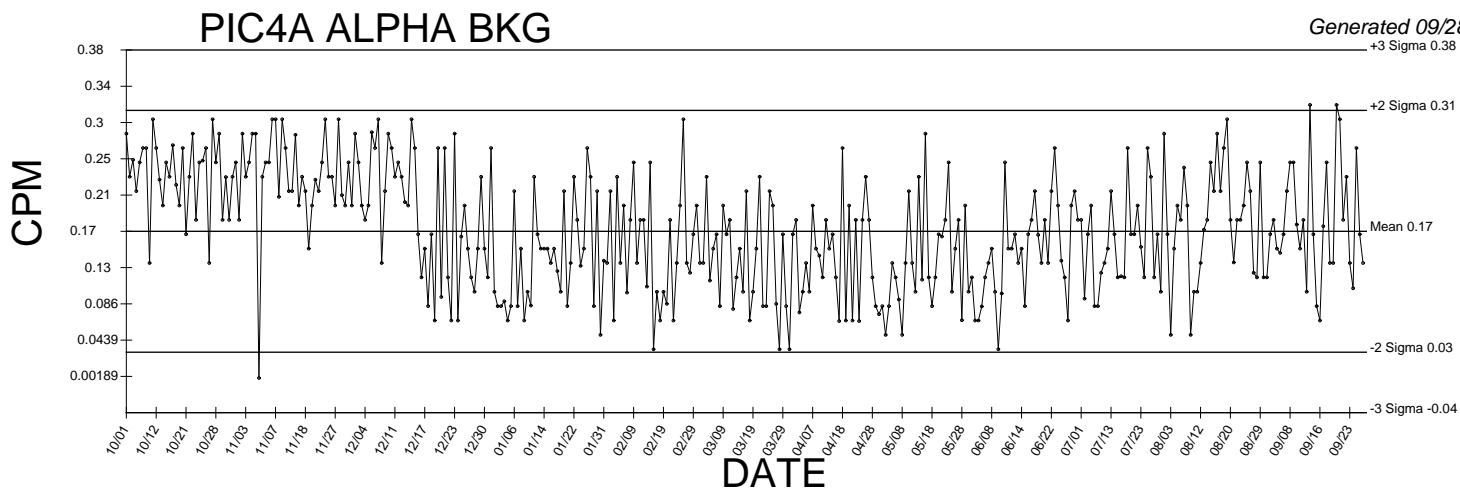
Generated 09/28/2016



PIC3D BETA EFF Cross Talk



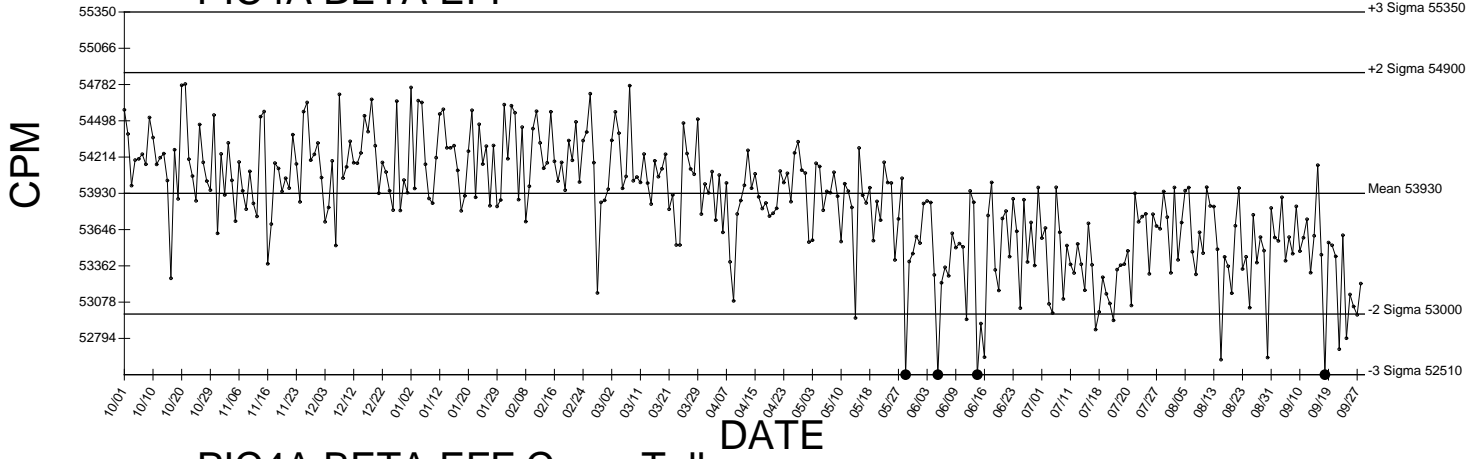
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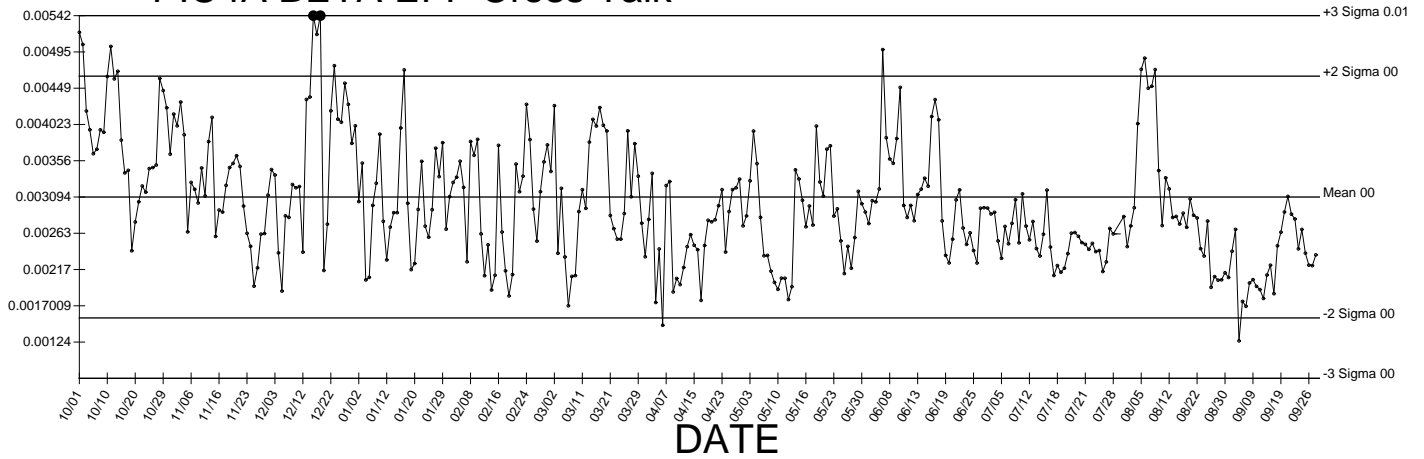
● Denotes Outlier

PIC4A BETA EFF

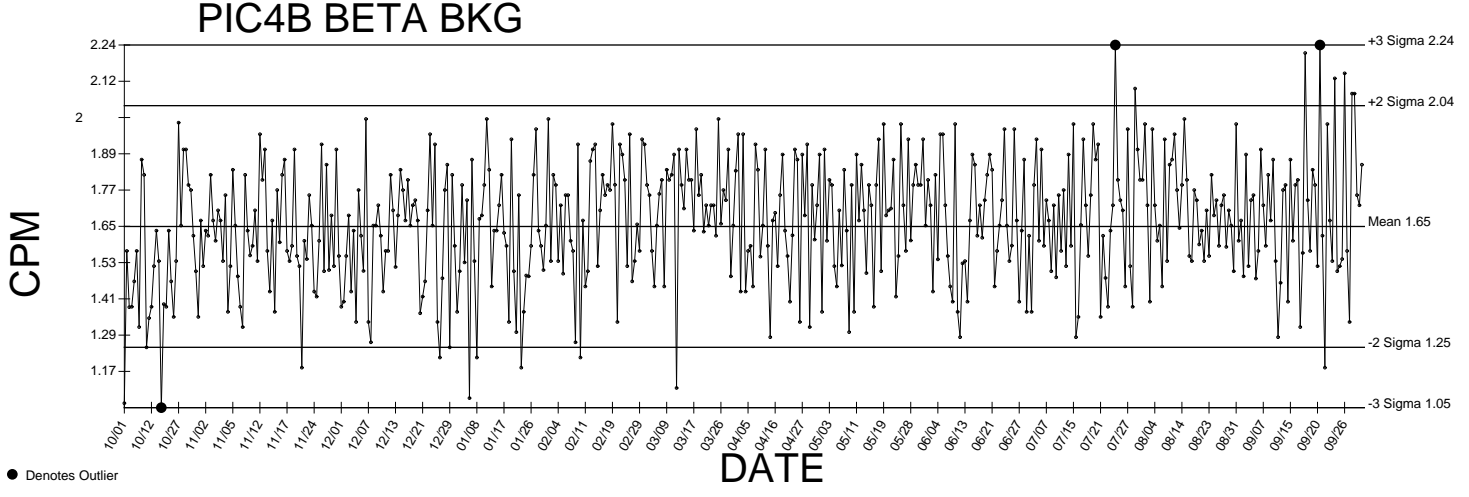
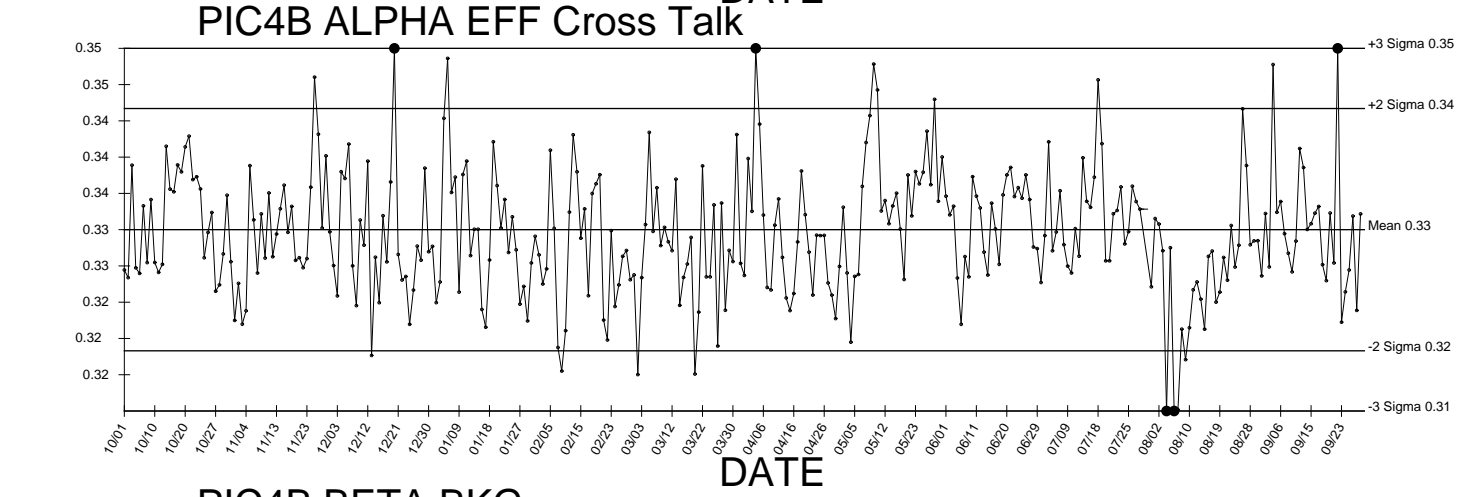
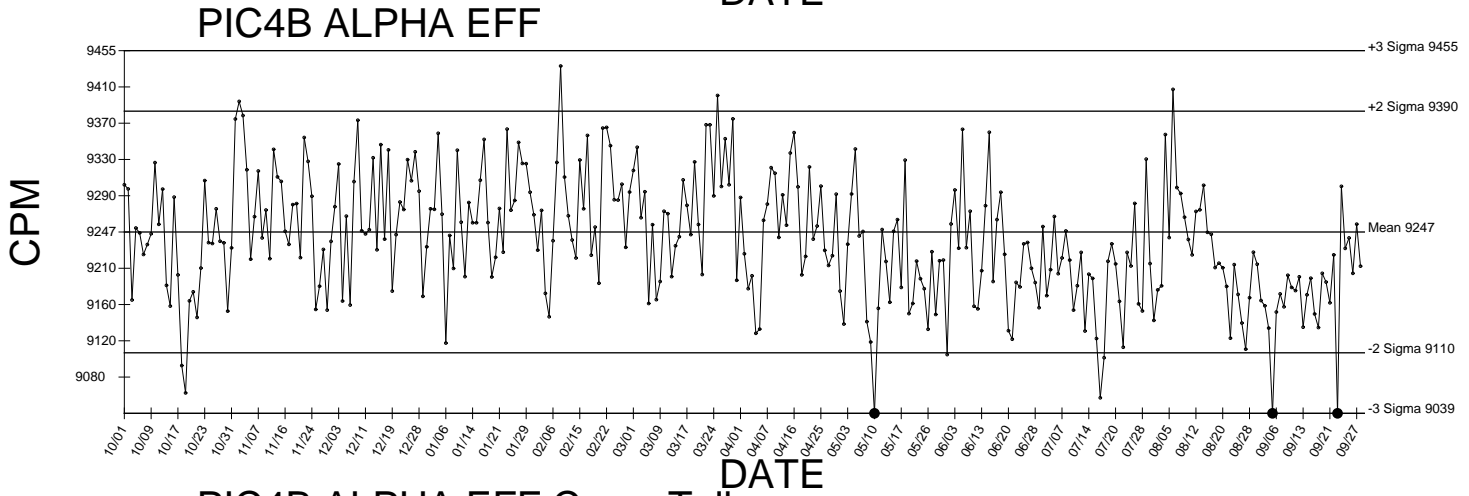
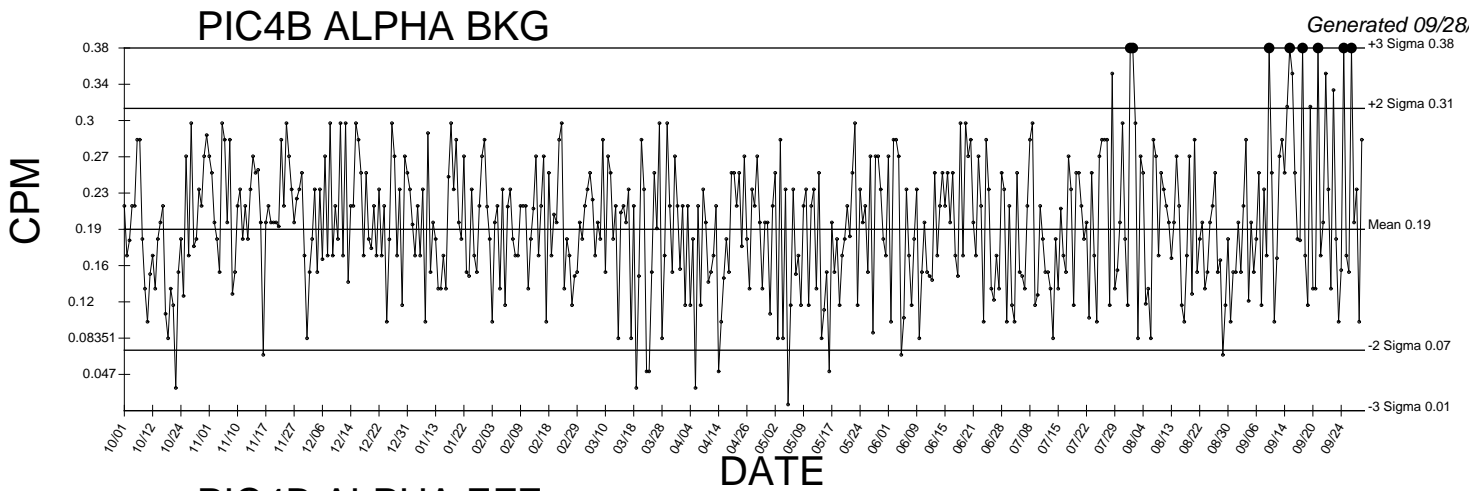
Generated 09/28/2016



PIC4A BETA EFF Cross Talk



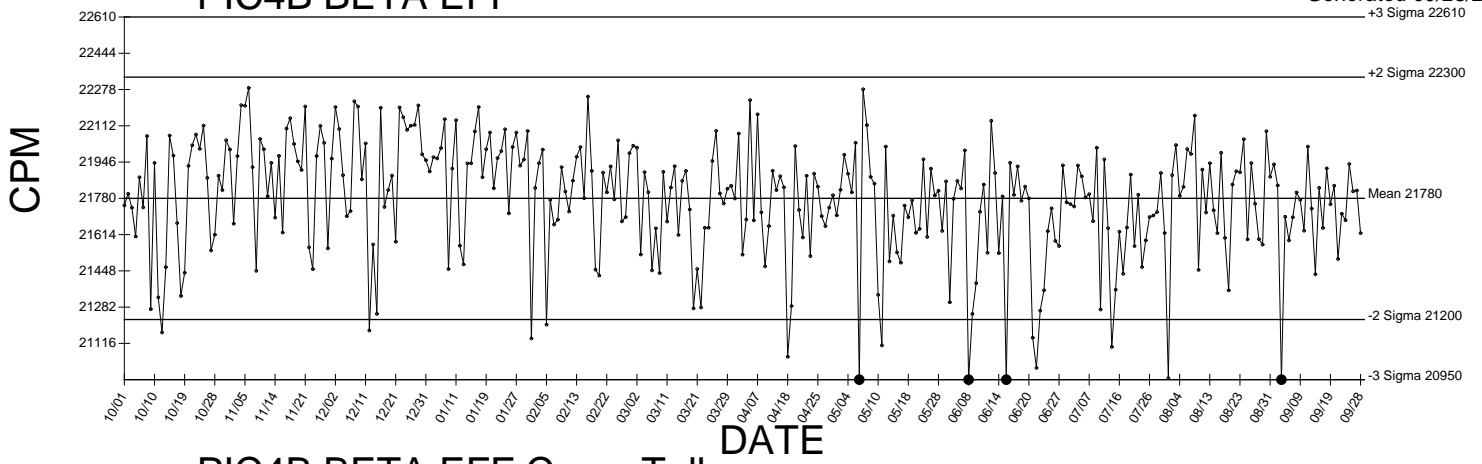
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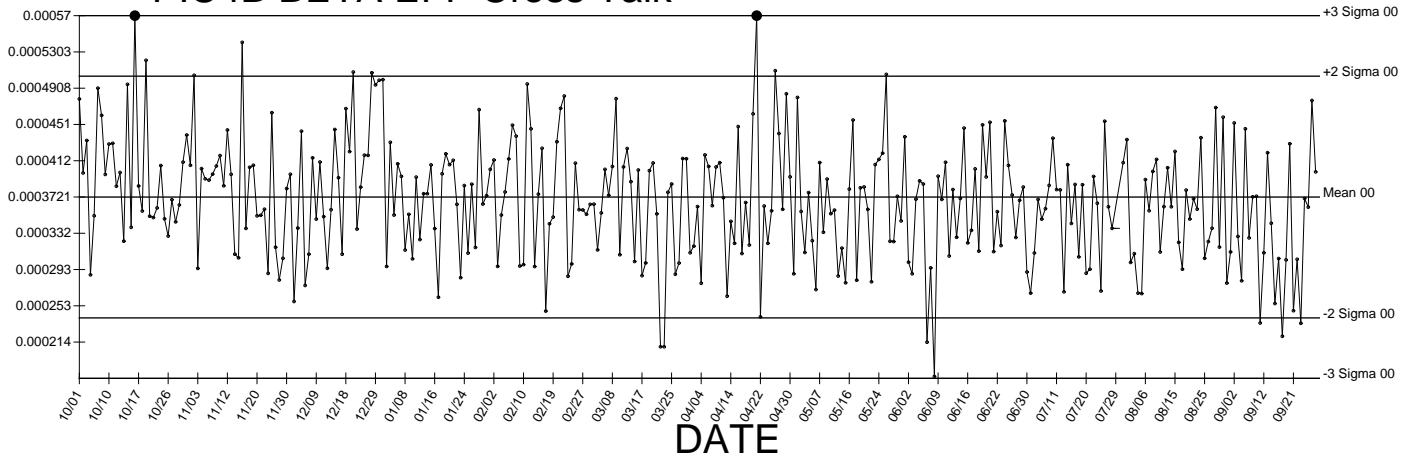
● Denotes Outlier

PIC4B BETA EFF

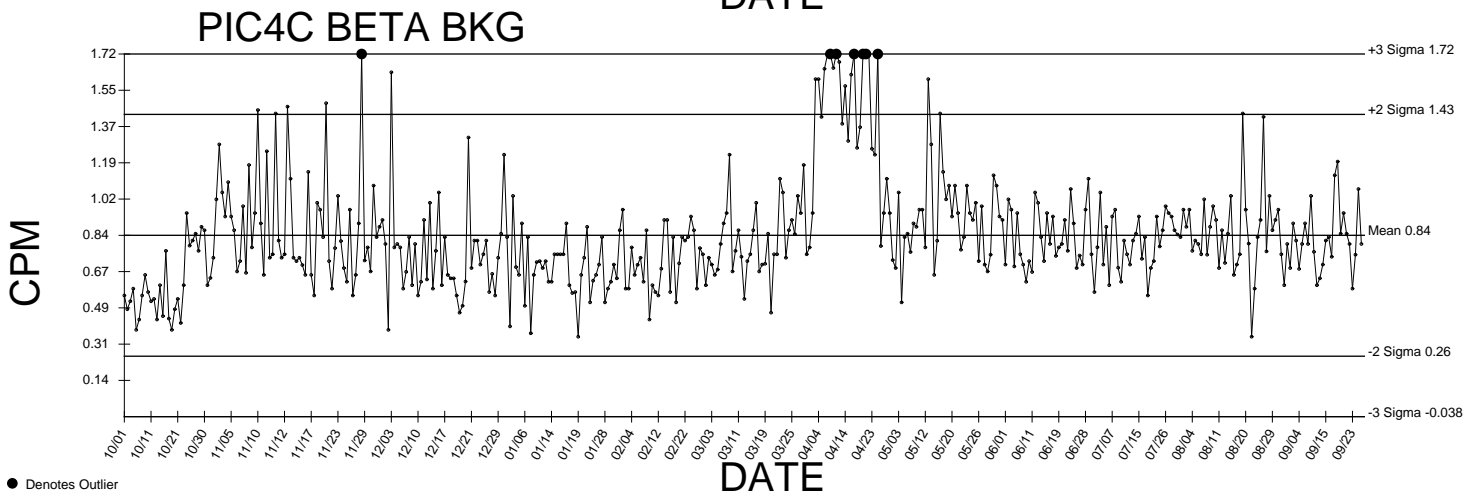
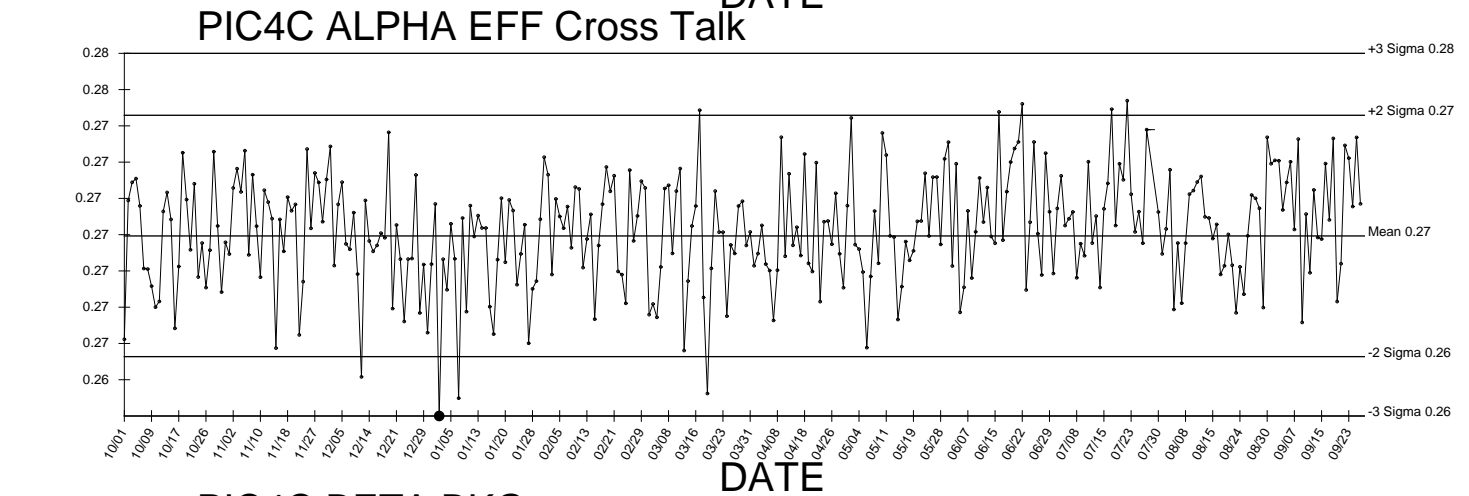
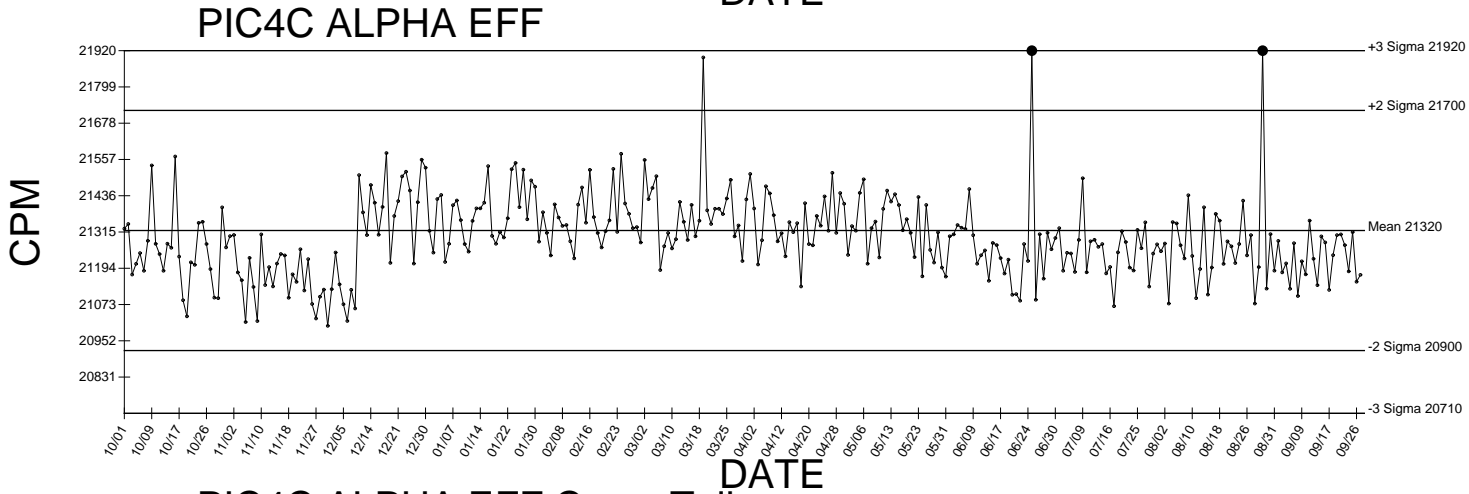
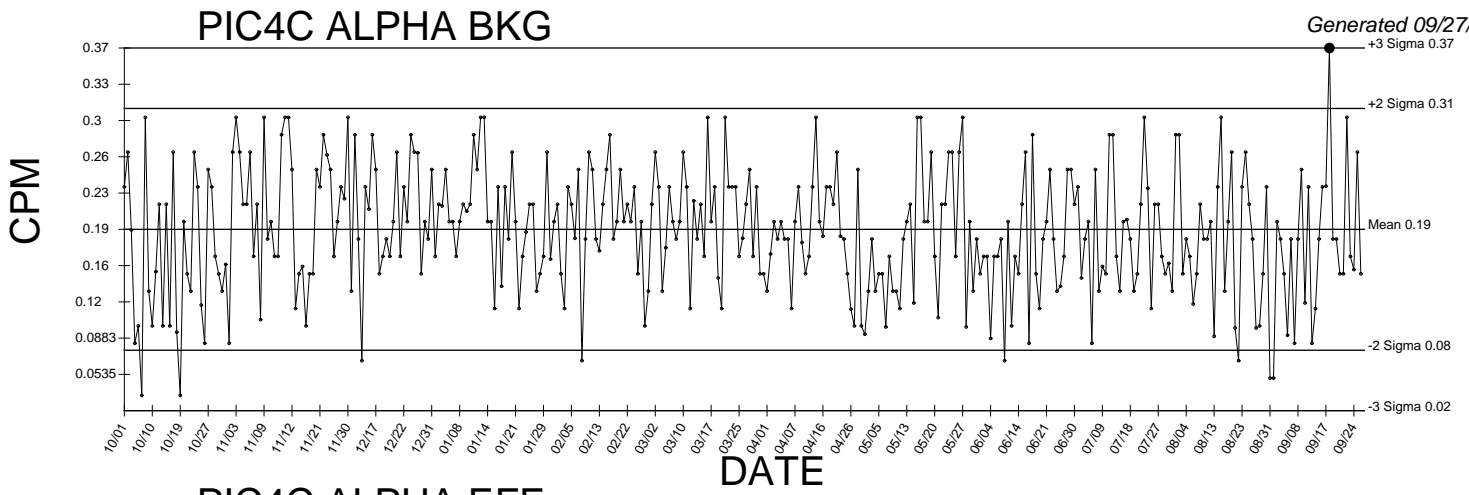
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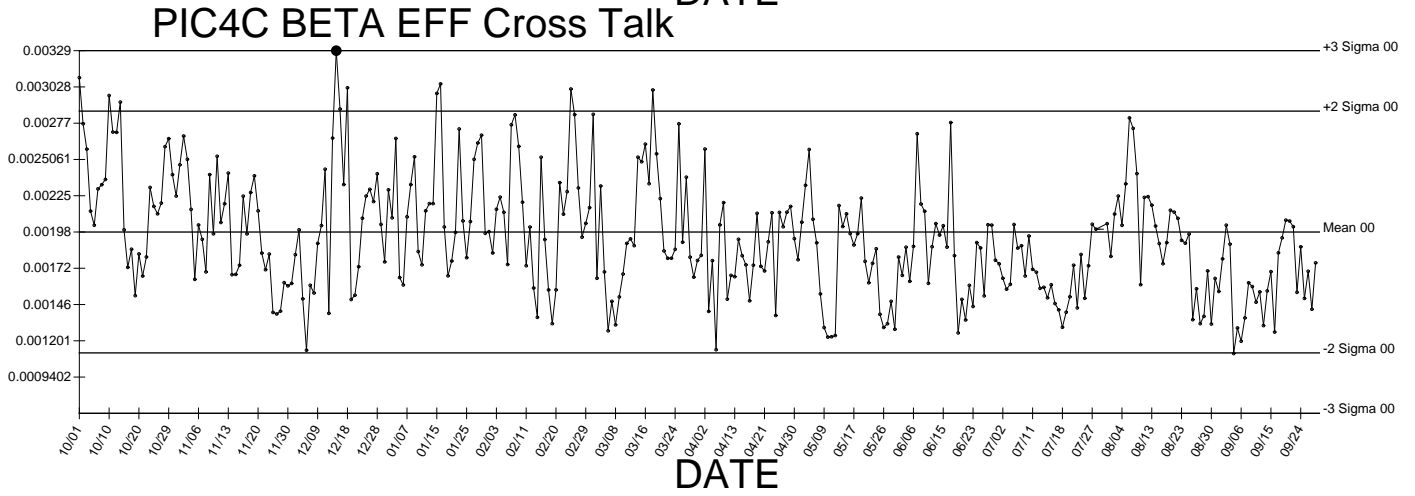
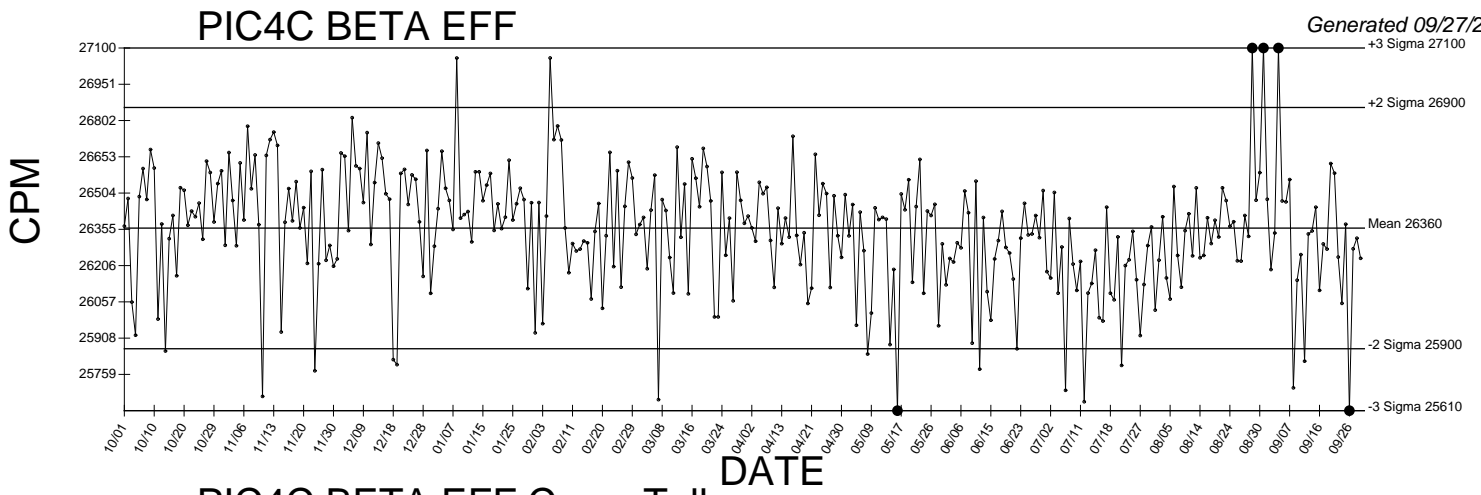
PIC4B BETA EFF Cross Talk



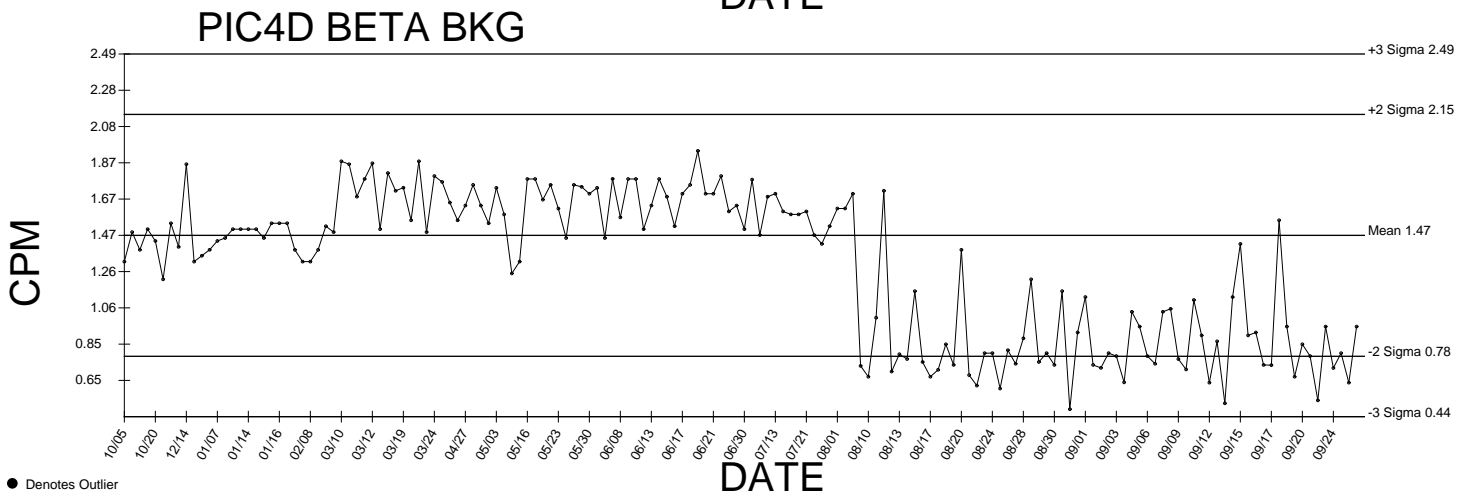
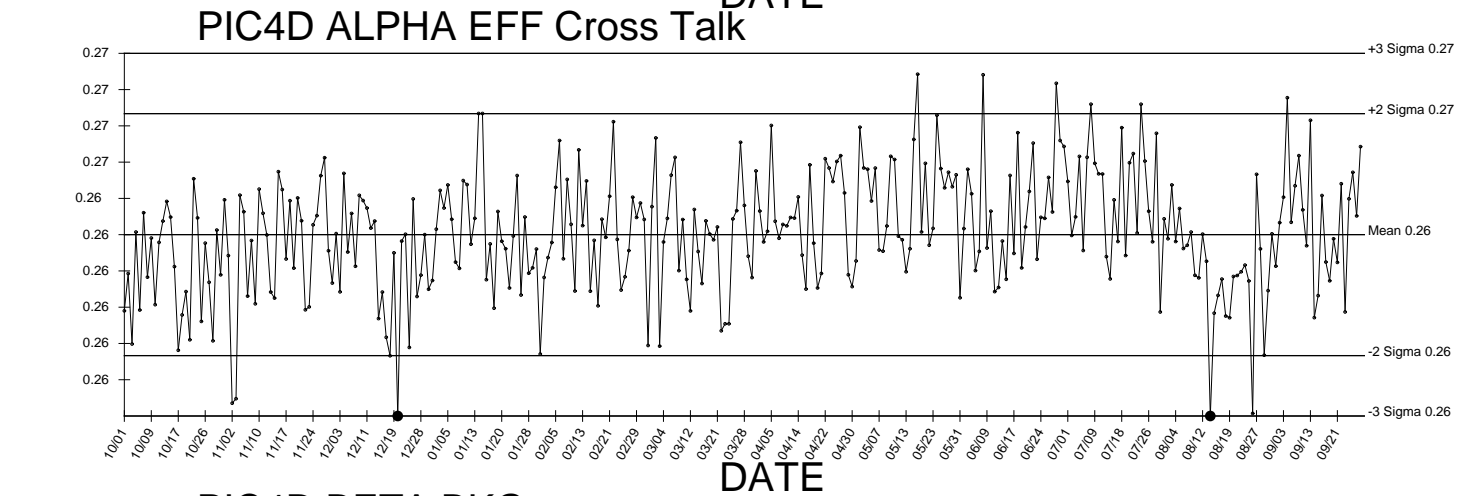
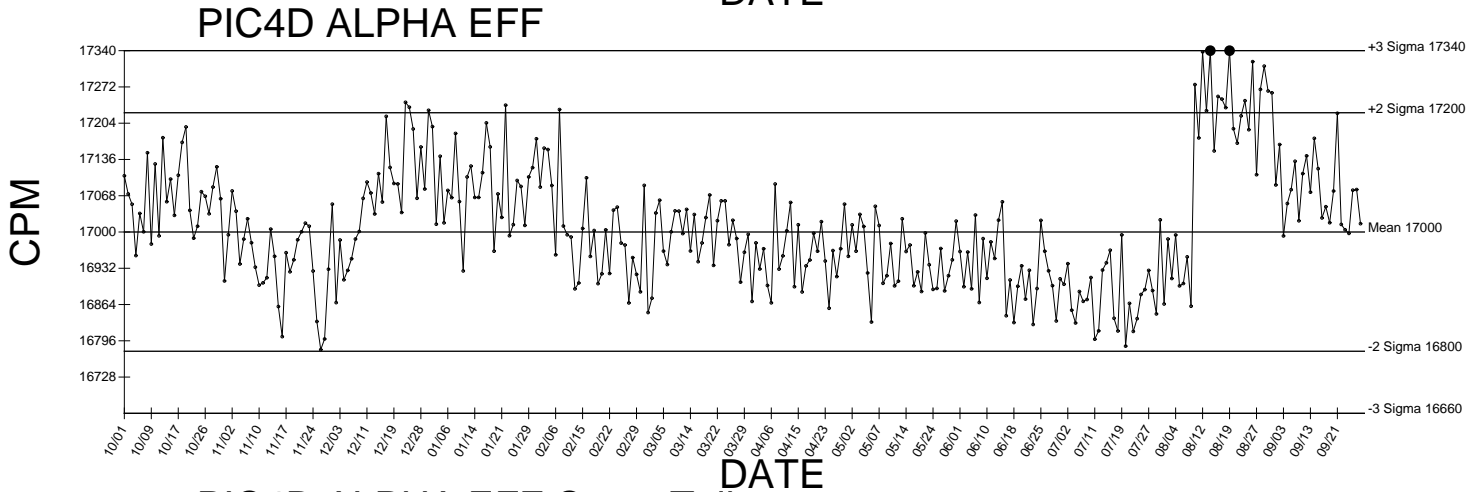
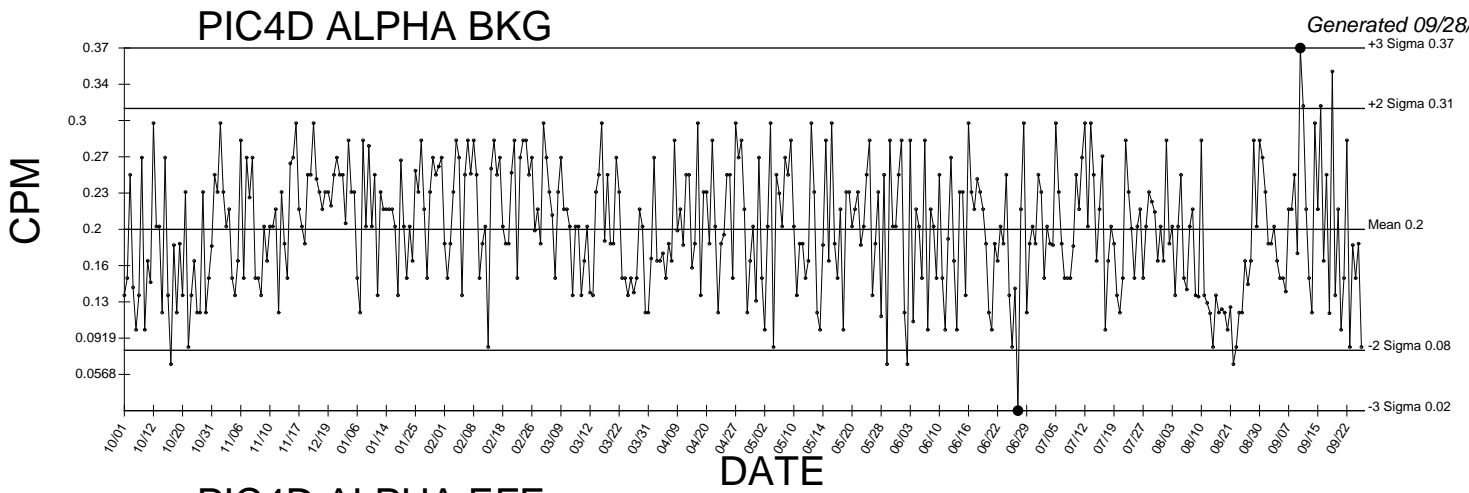
● Denotes Outlier



● Denotes Outlier



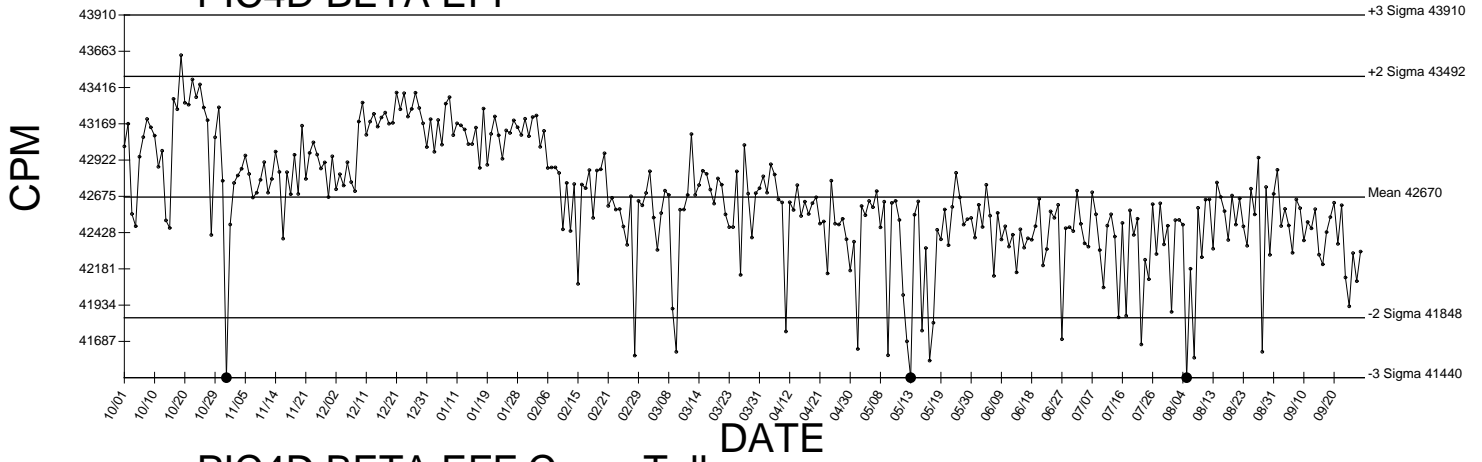
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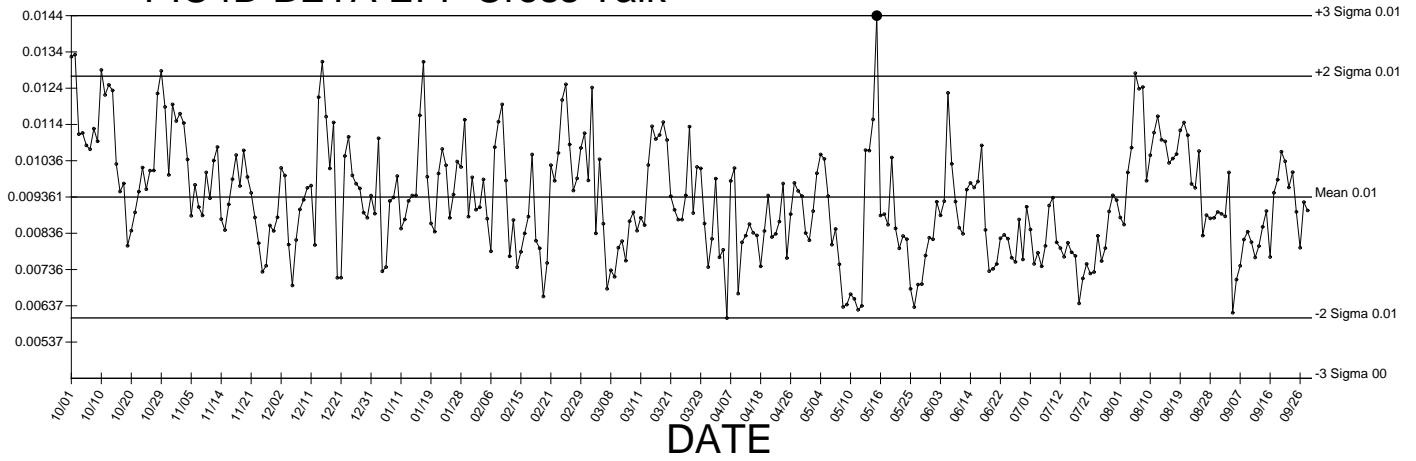
● Denotes Outlier

PIC4D BETA EFF

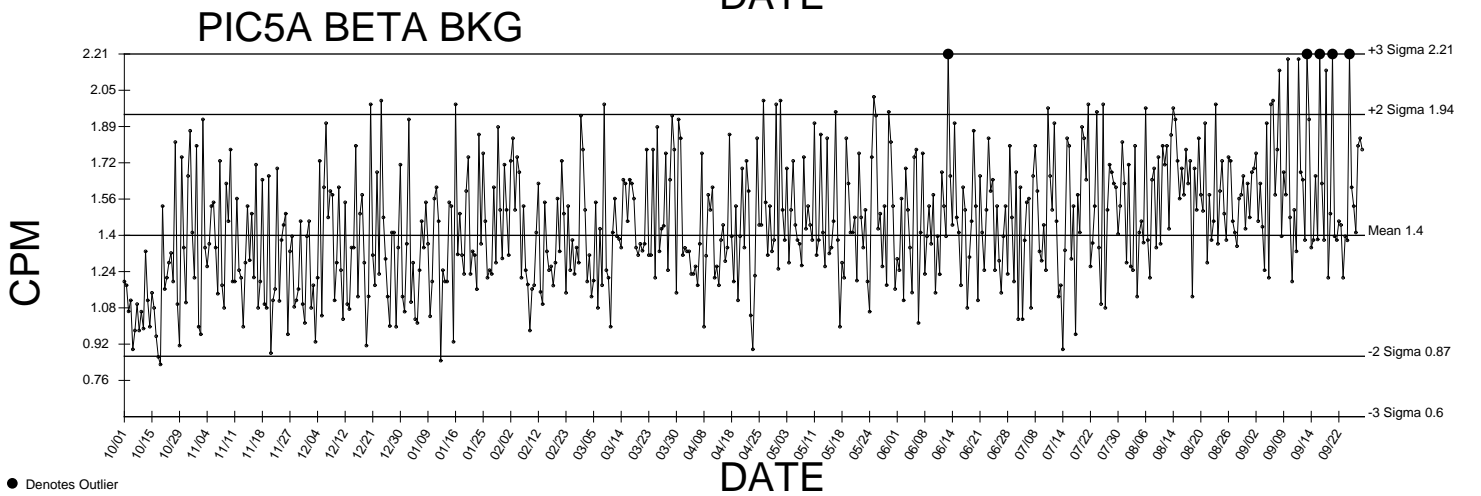
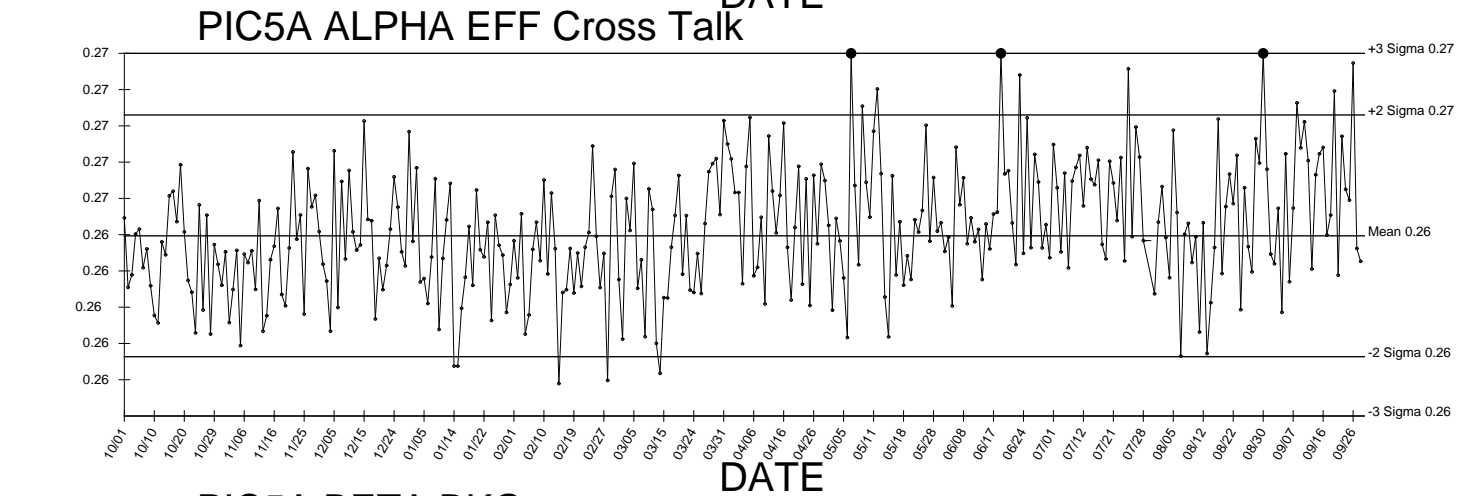
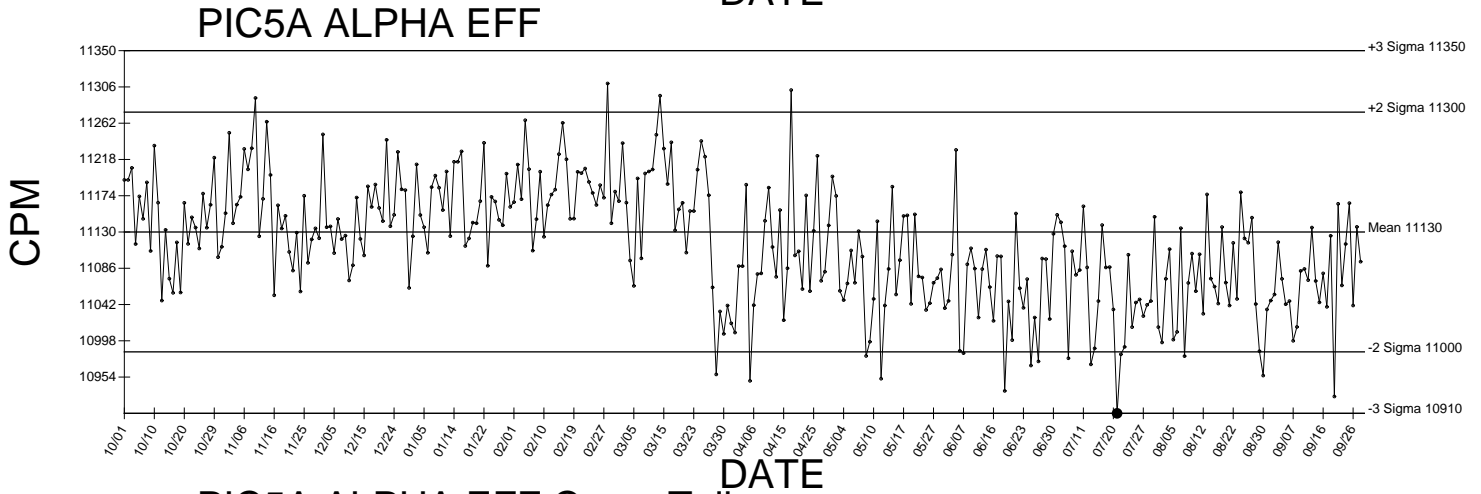
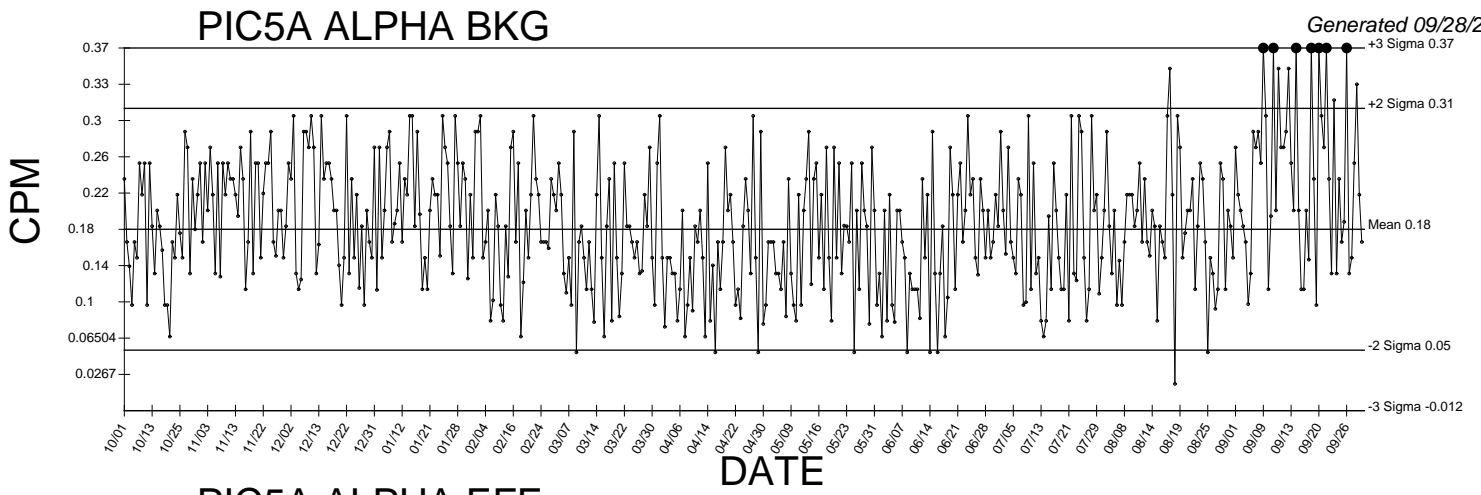
Generated 09/28/2016



PIC4D BETA EFF Cross Talk



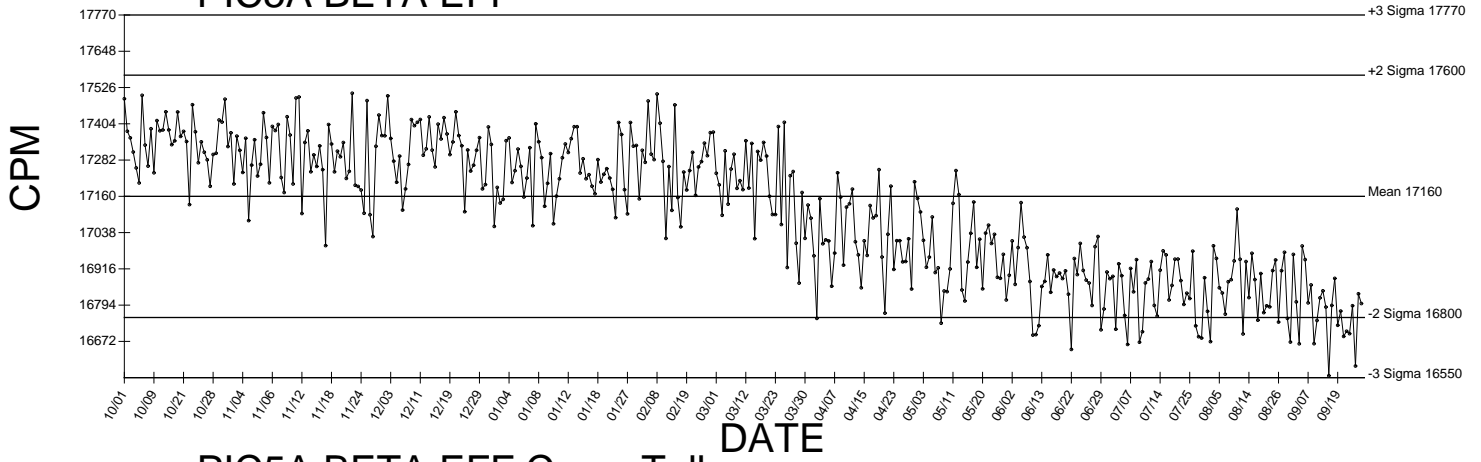
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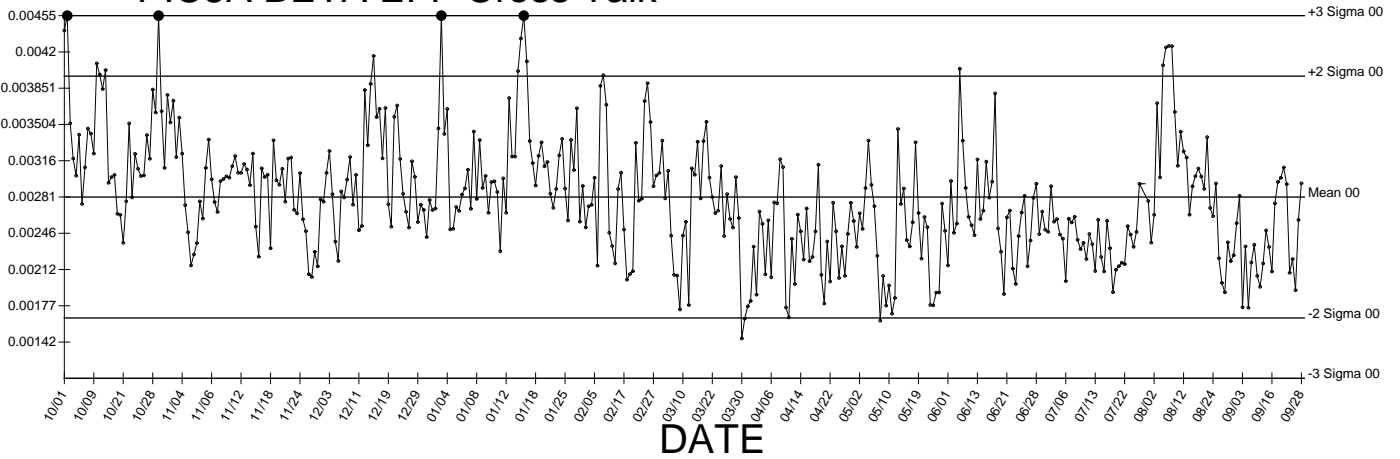
● Denotes Outlier

PIC5A BETA EFF

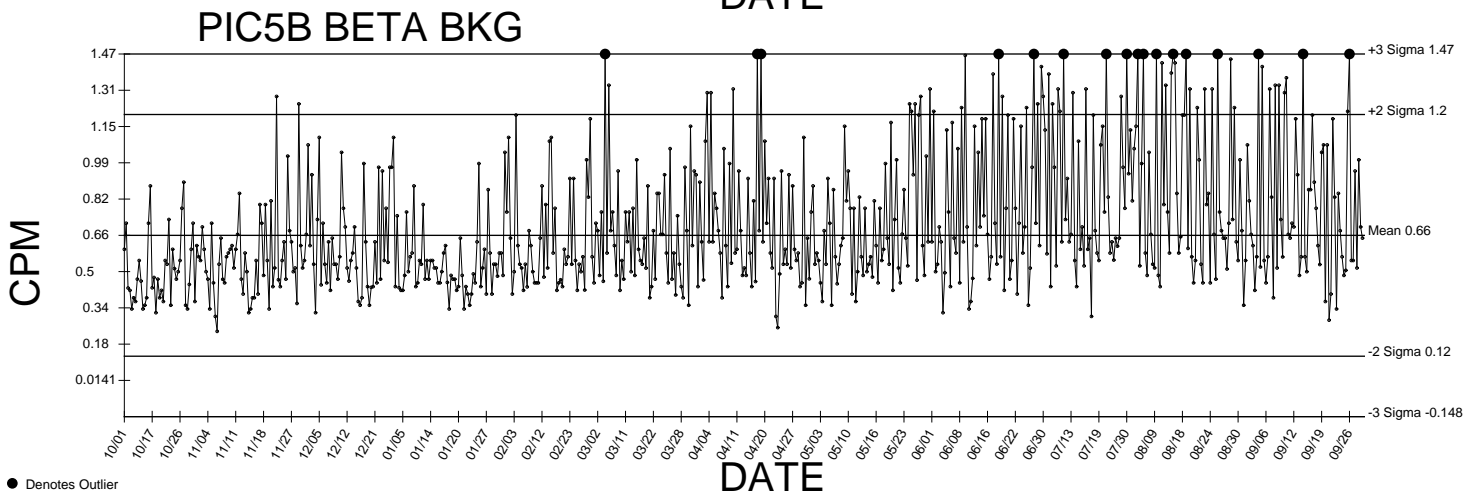
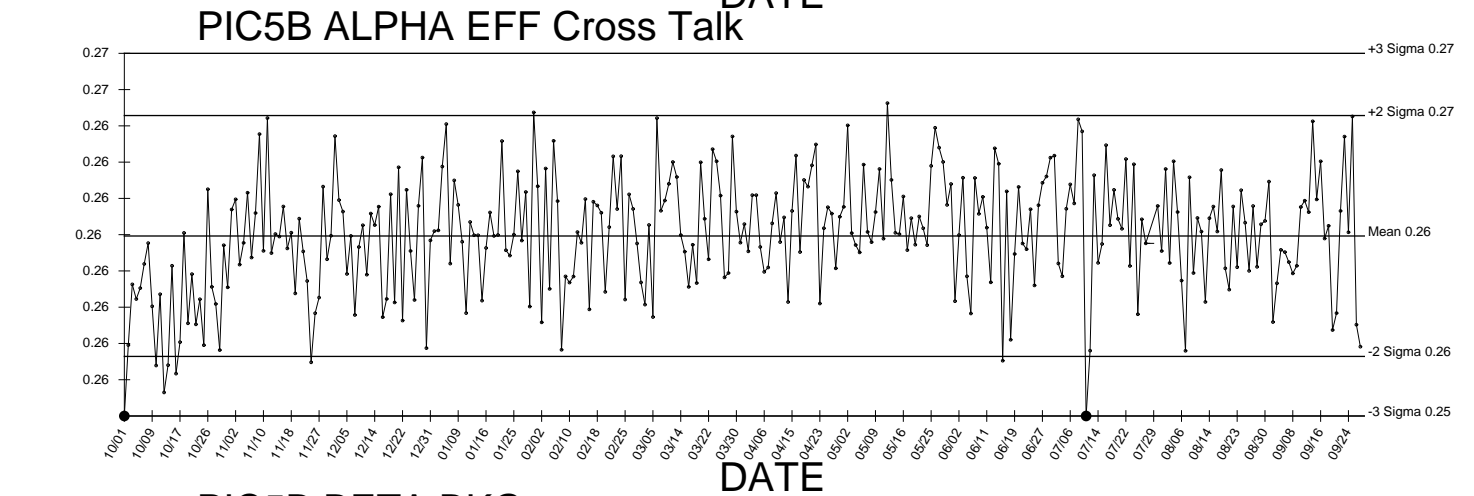
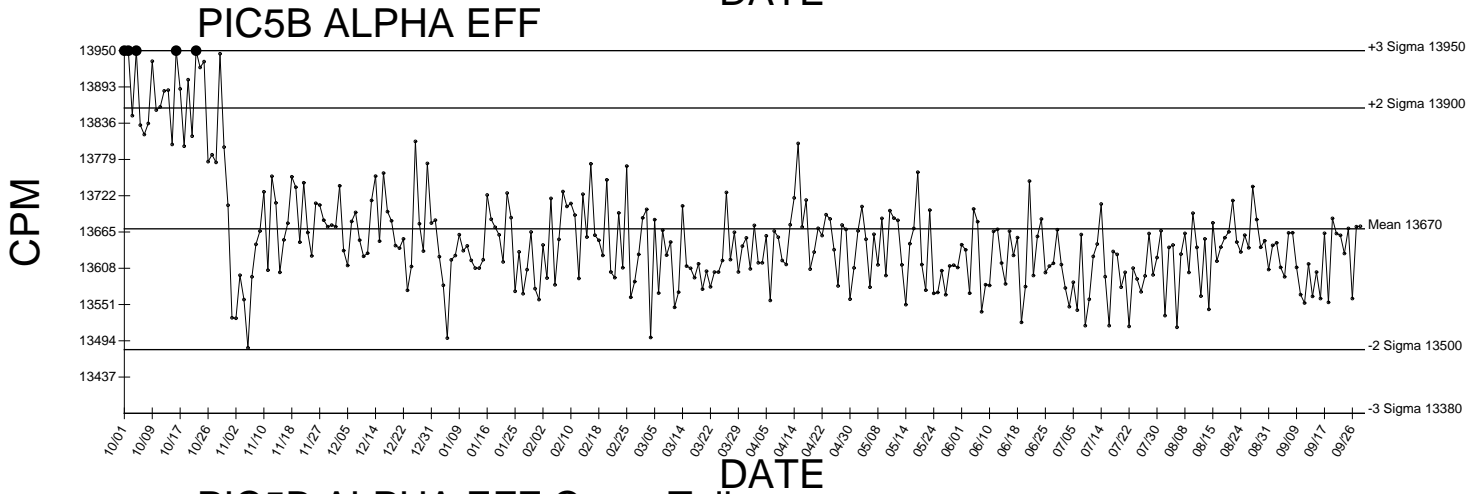
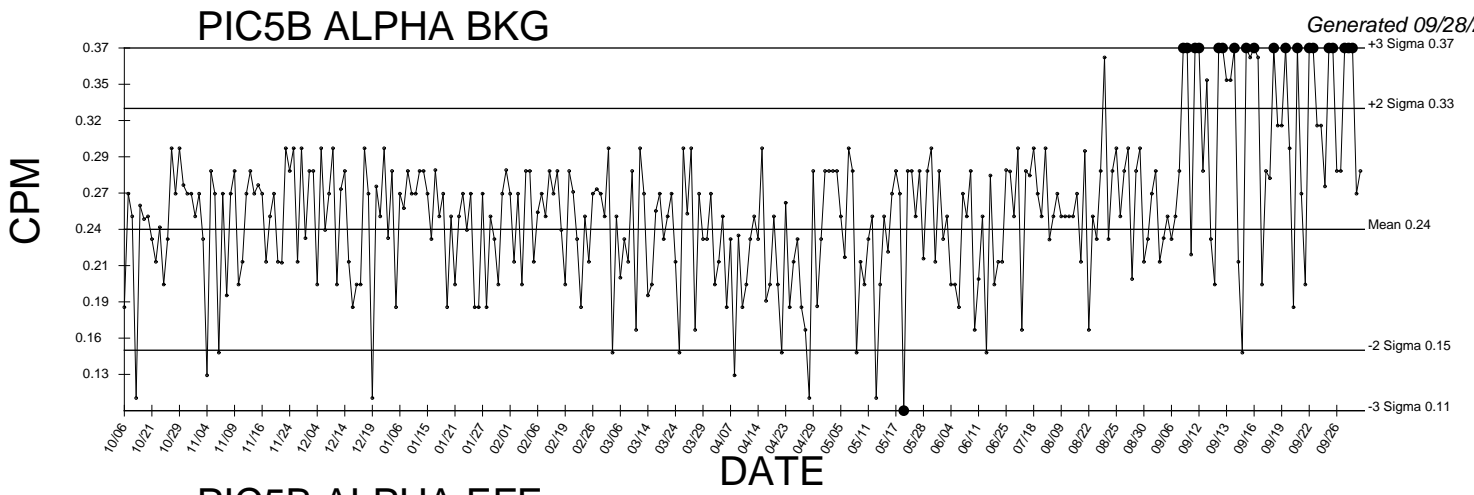
Generated 09/28/2016



PIC5A BETA EFF Cross Talk



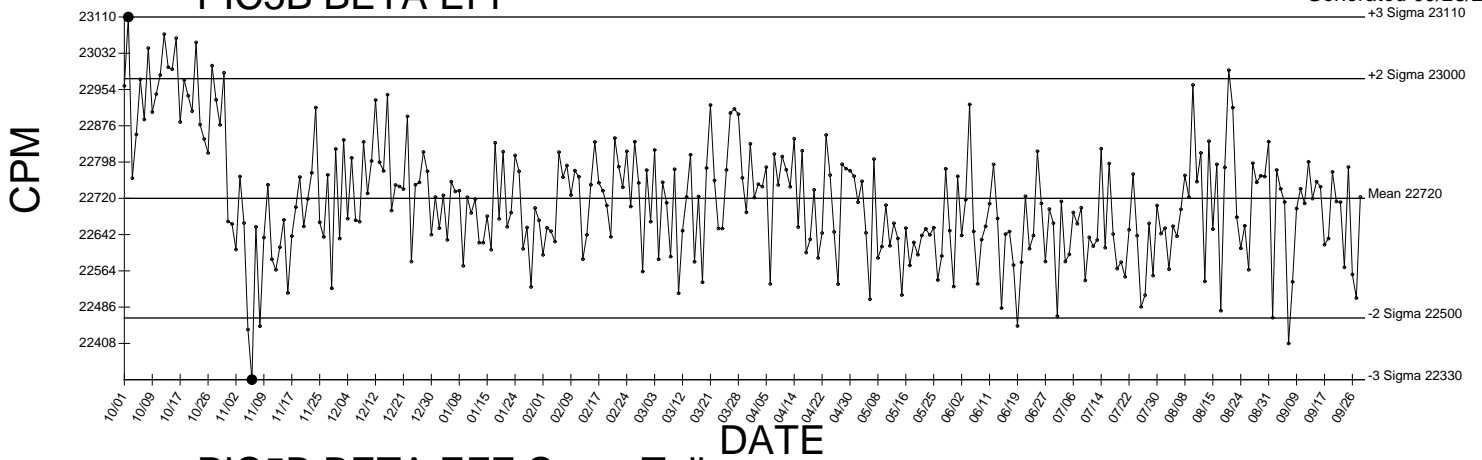
● Denotes Outlier



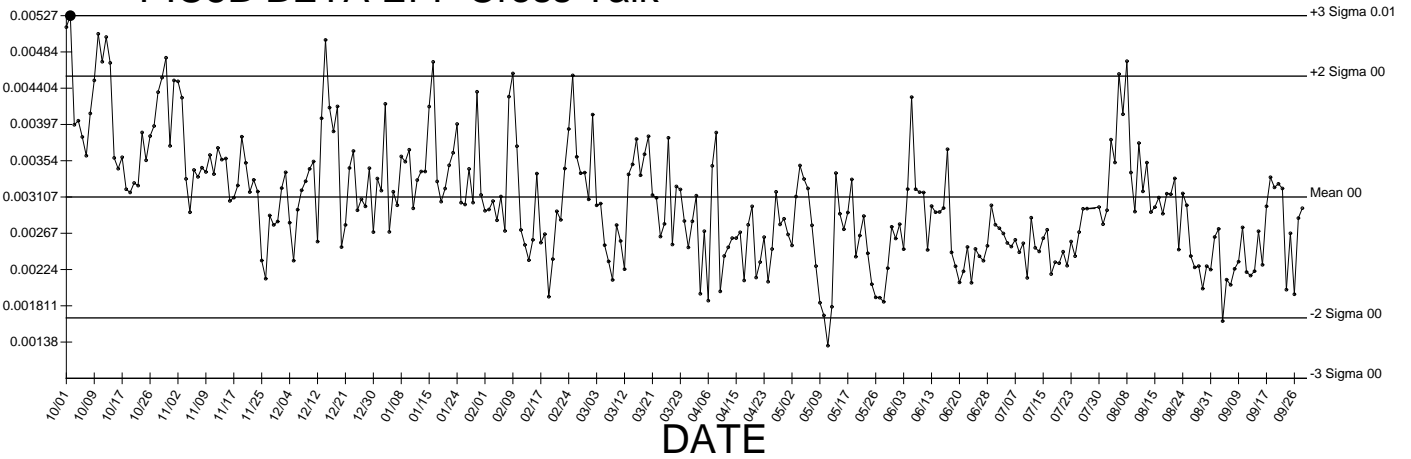
● Denotes Outlier

PIC5B BETA EFF

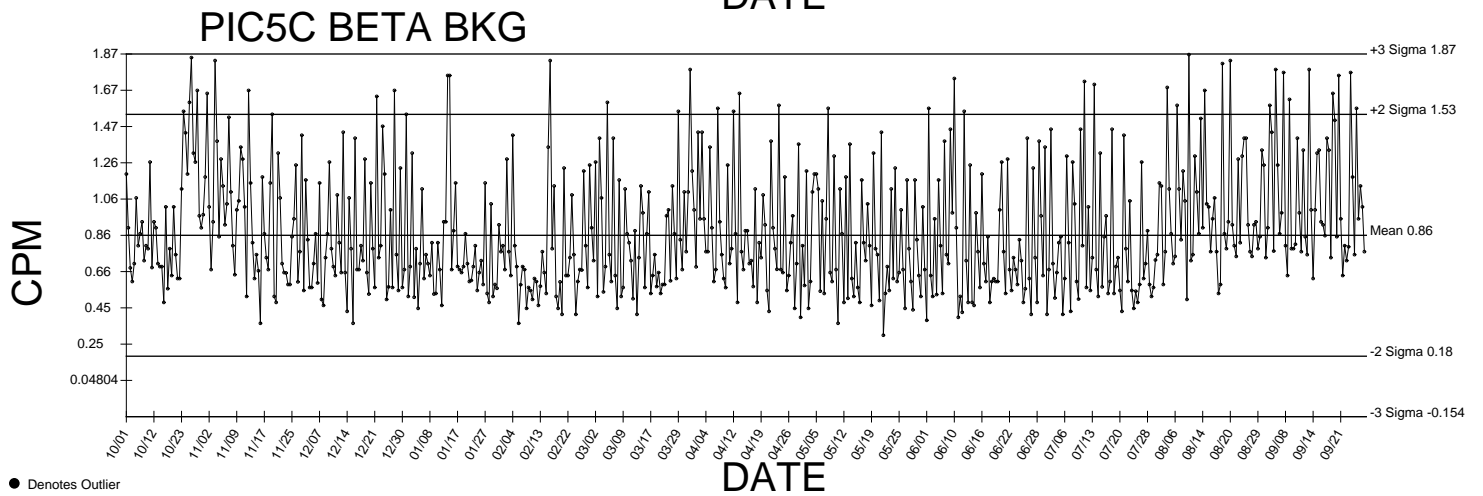
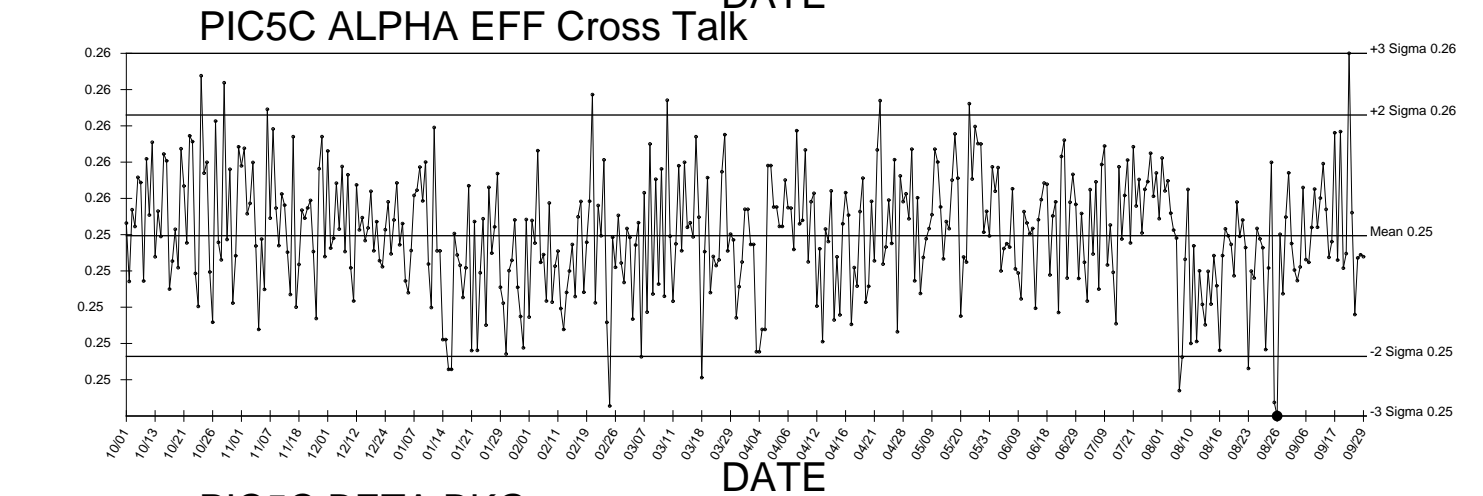
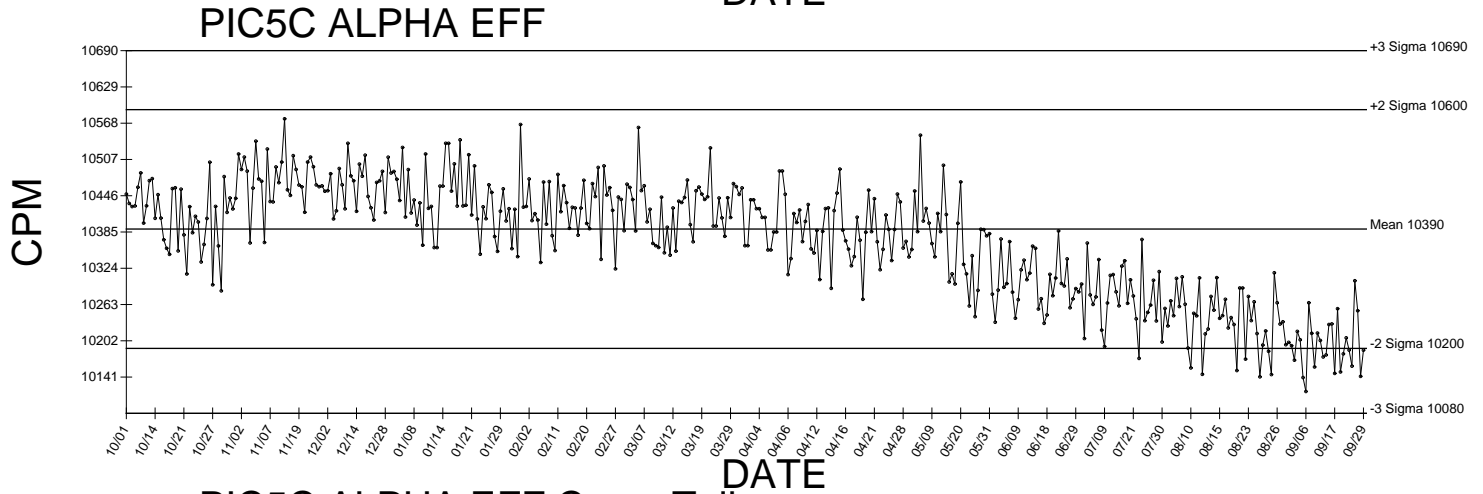
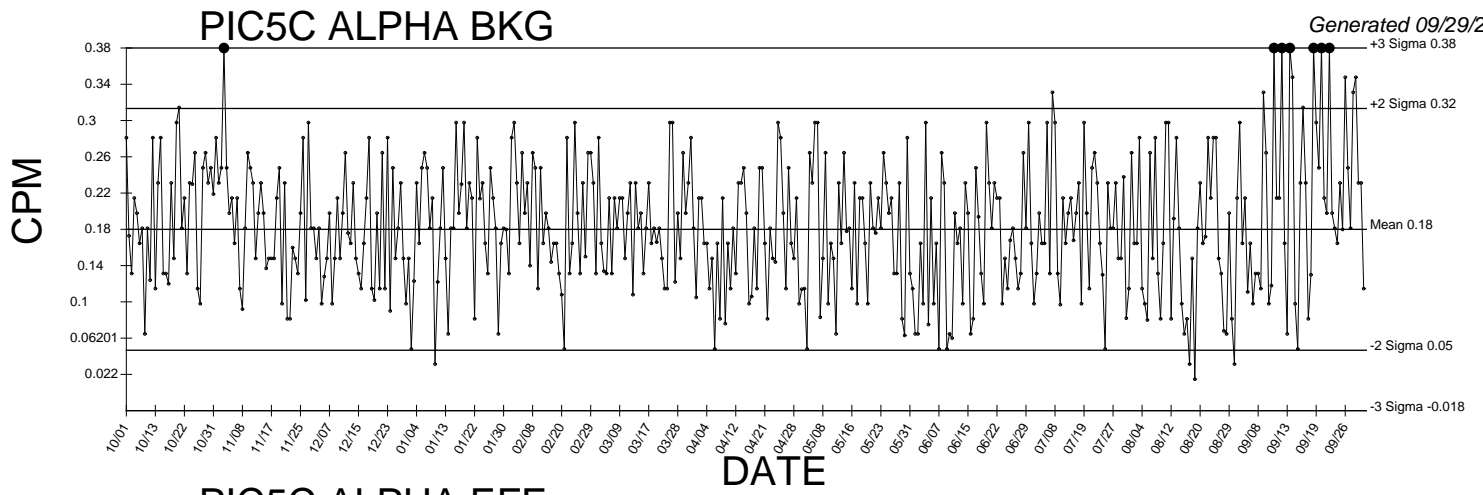
Generated 09/28/2016



PIC5B BETA EFF Cross Talk



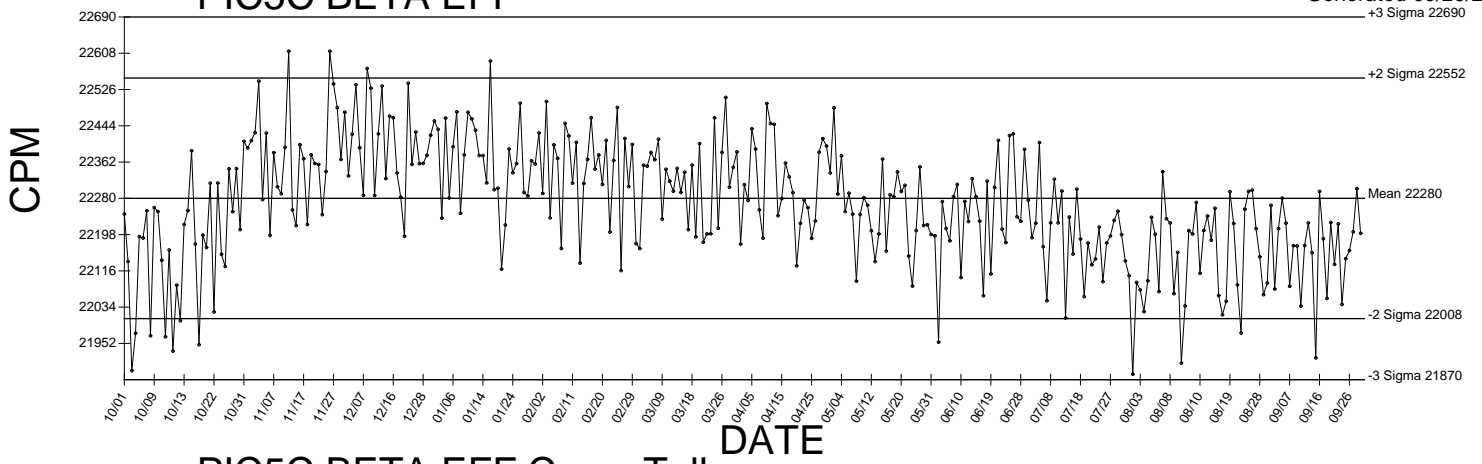
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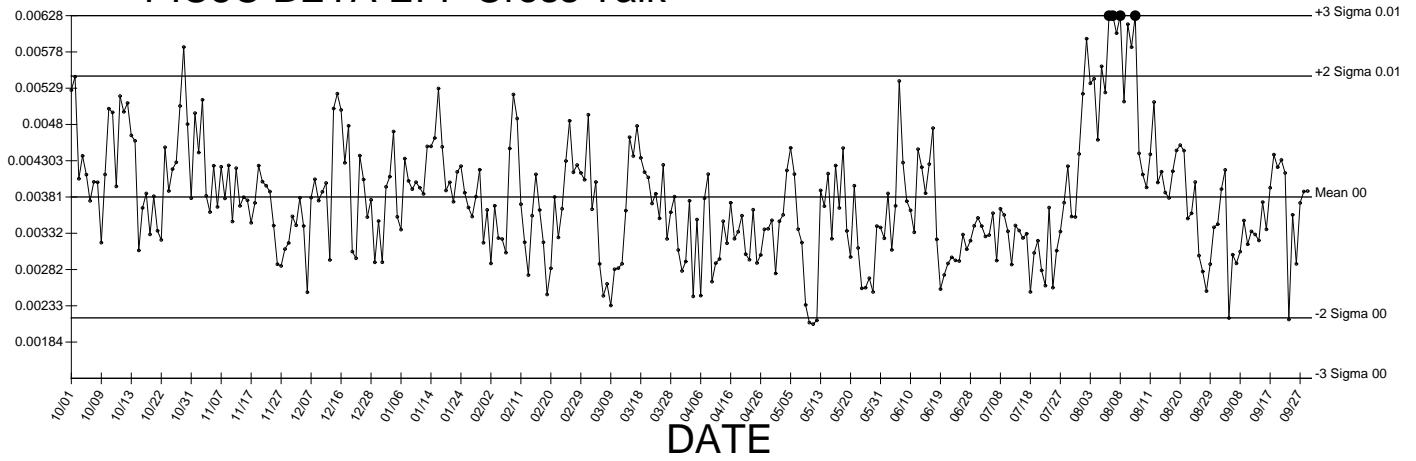
● Denotes Outlier

PIC5C BETA EFF

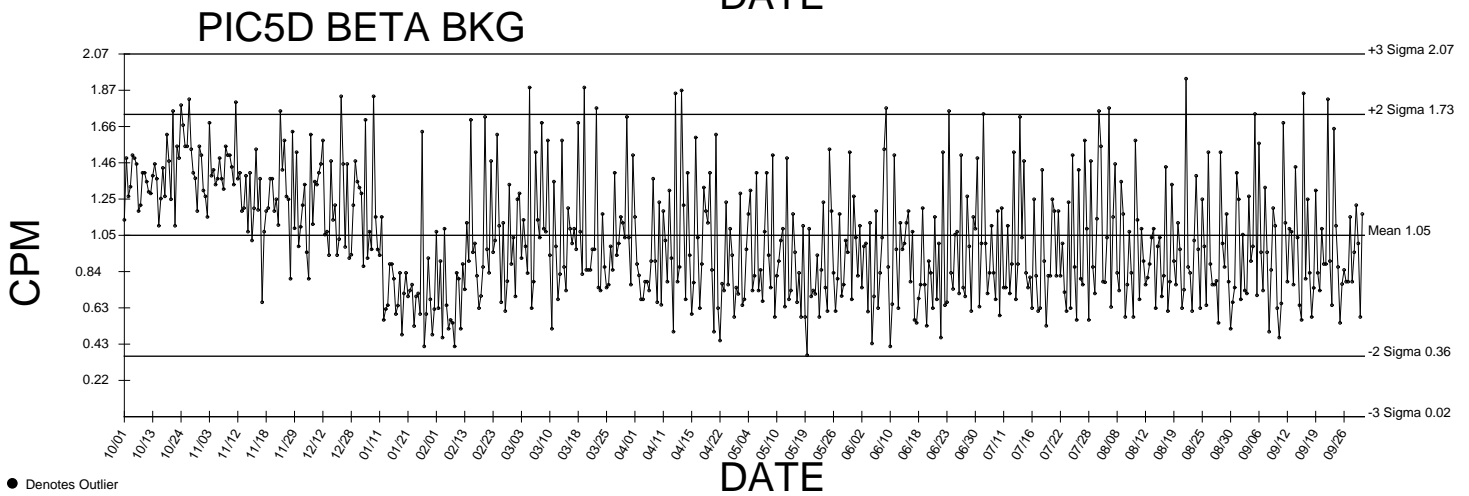
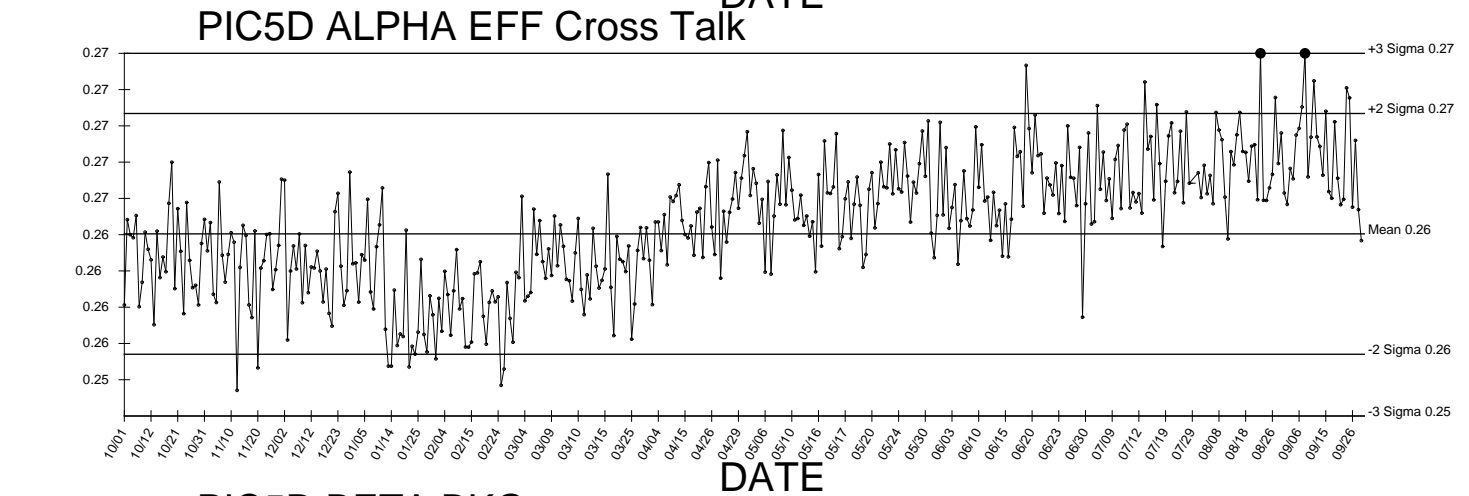
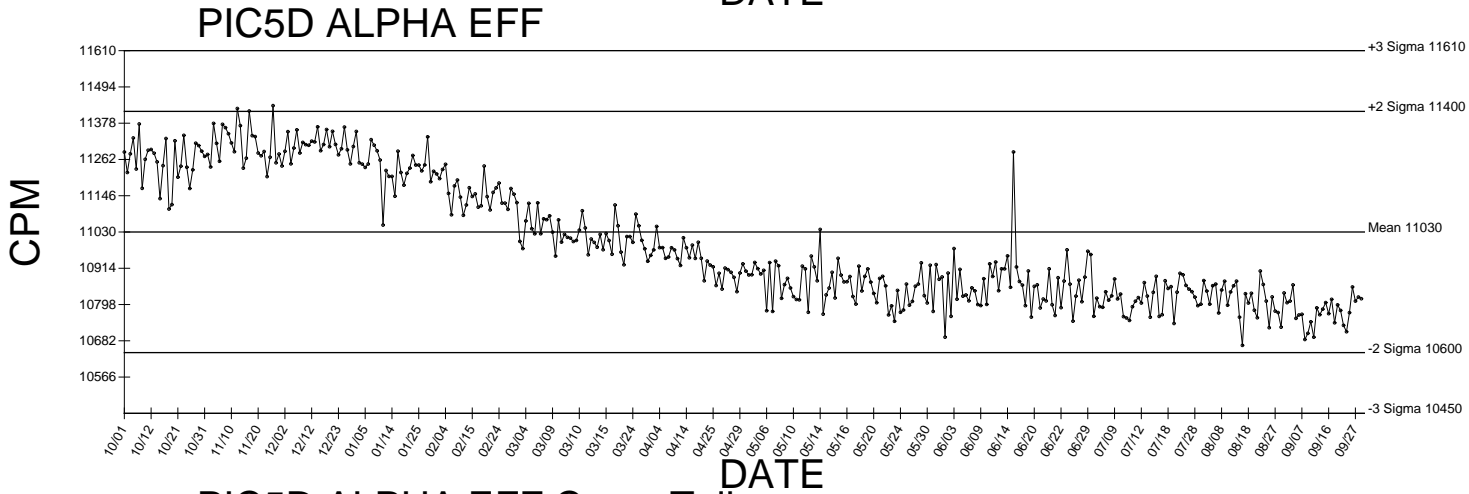
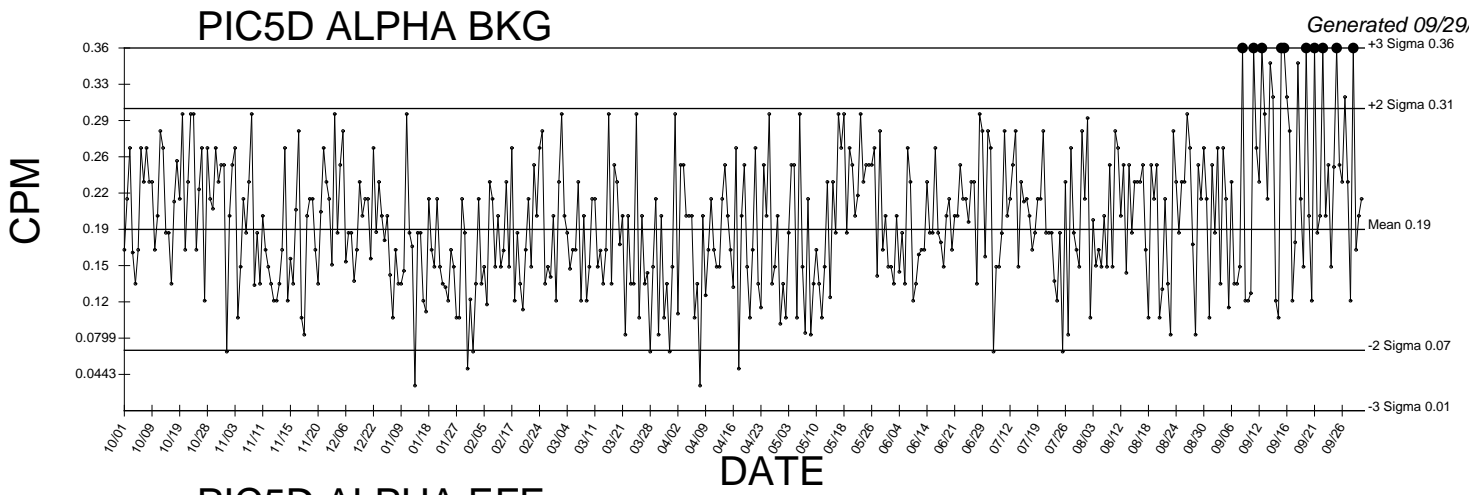
Generated 09/29/2016



PIC5C BETA EFF Cross Talk



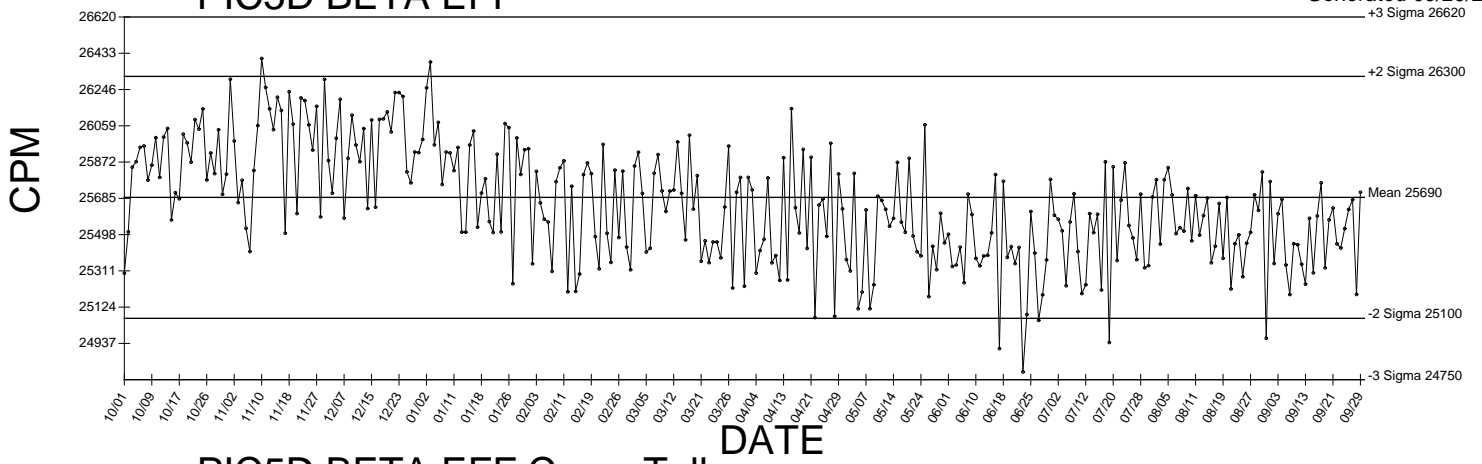
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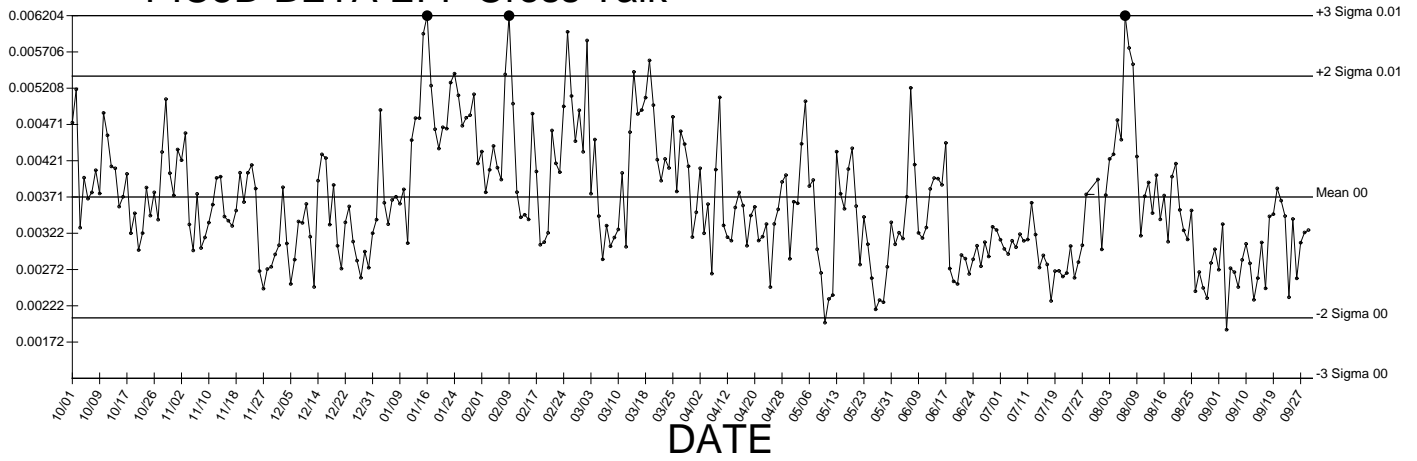
● Denotes Outlier

PIC5D BETA EFF

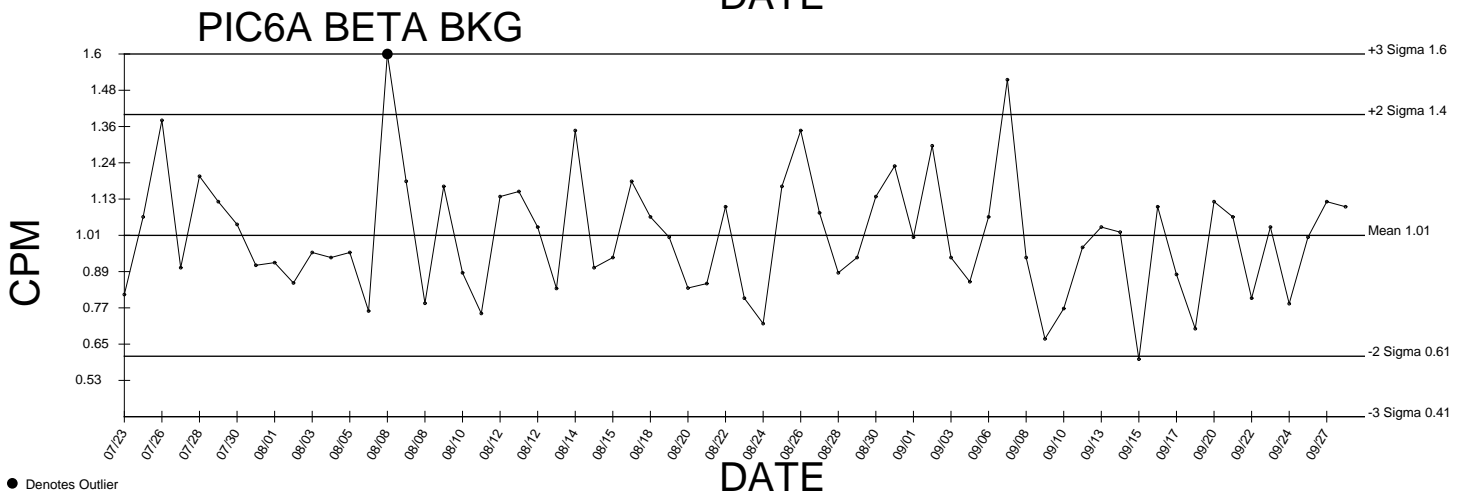
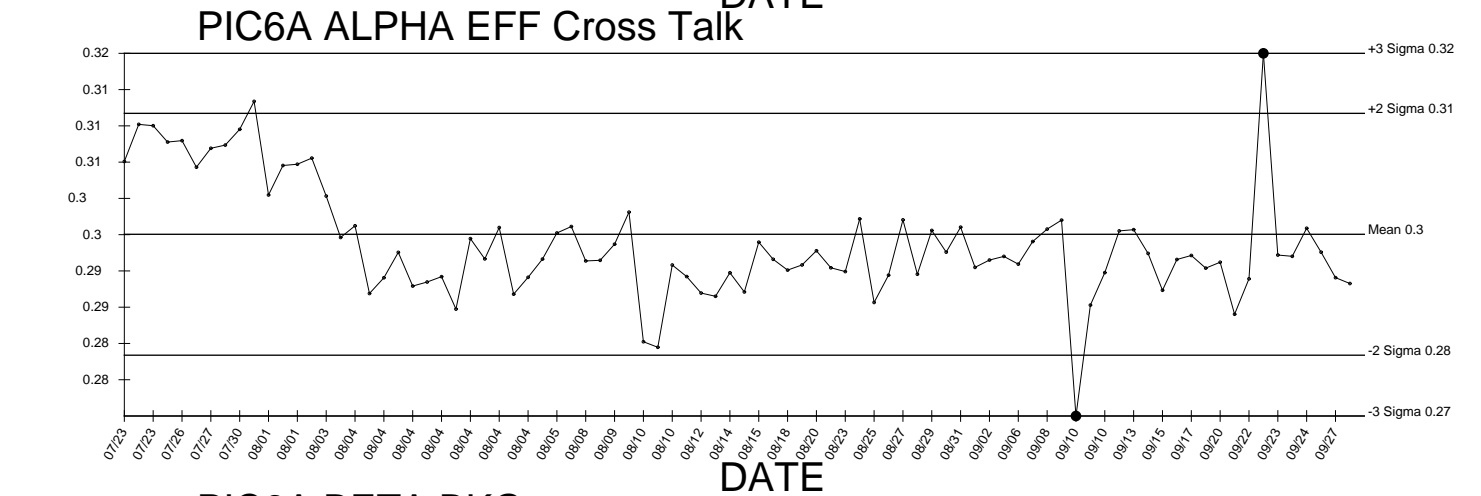
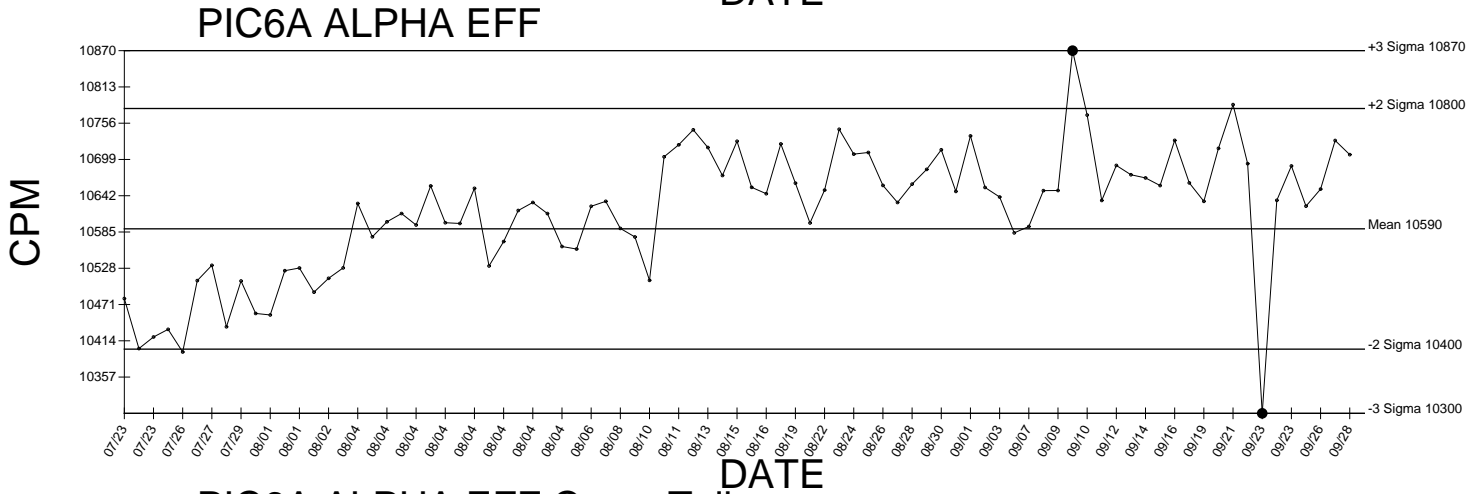
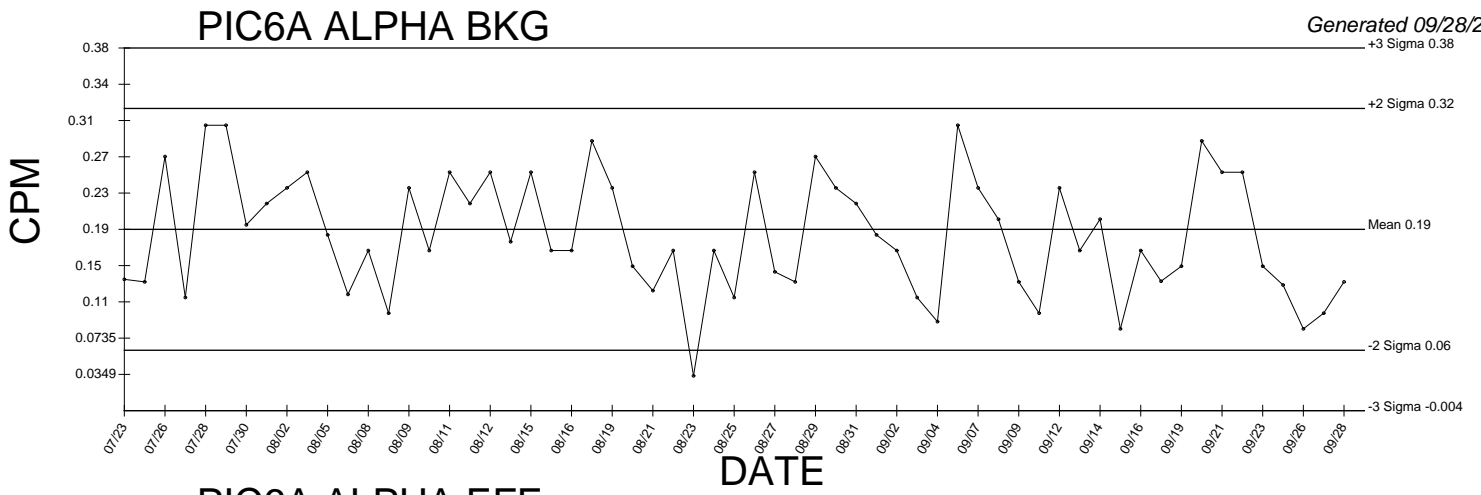
Generated 09/29/2016



PIC5D BETA EFF Cross Talk



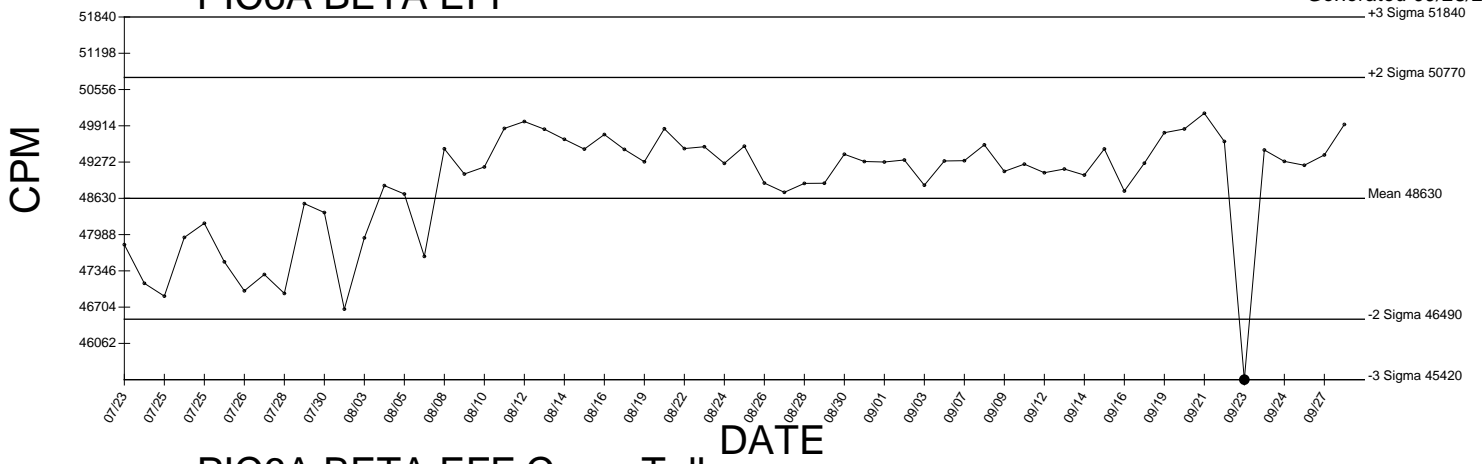
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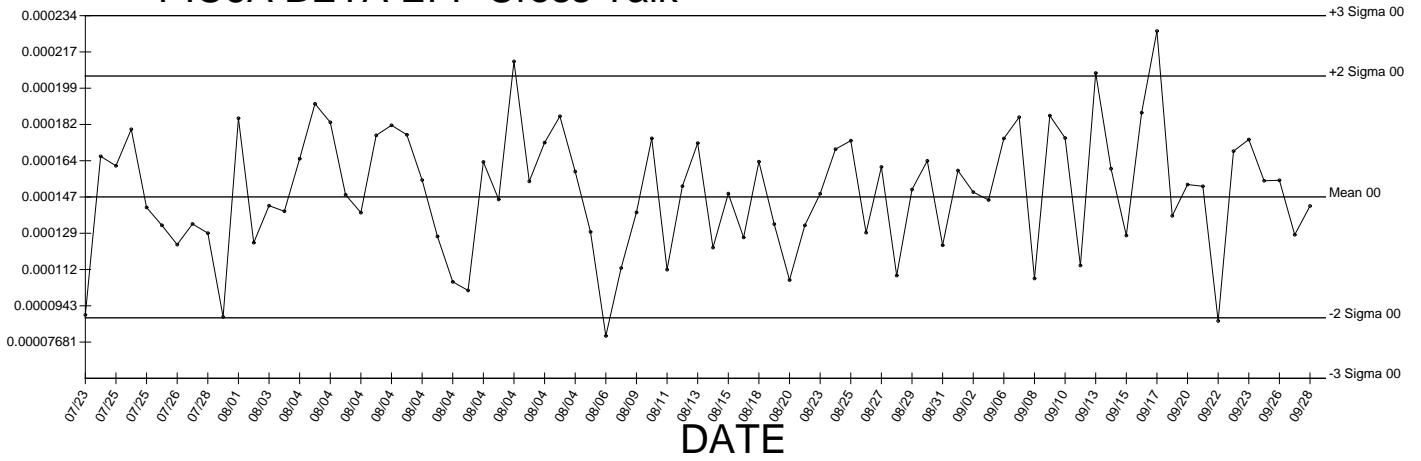
● Denotes Outlier

PIC6A BETA EFF

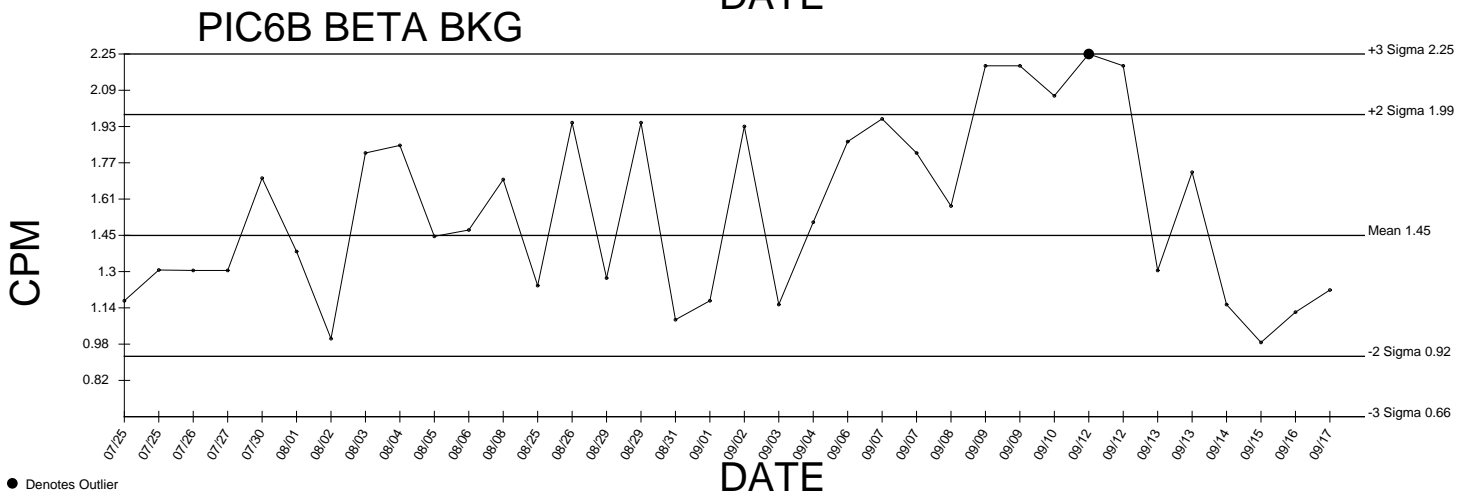
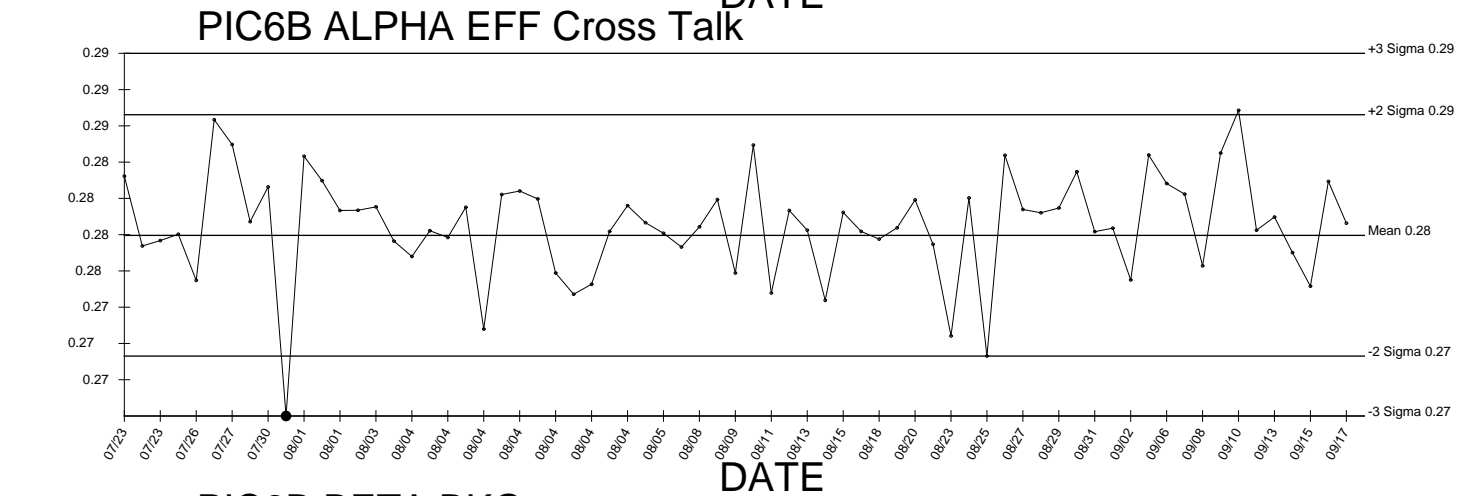
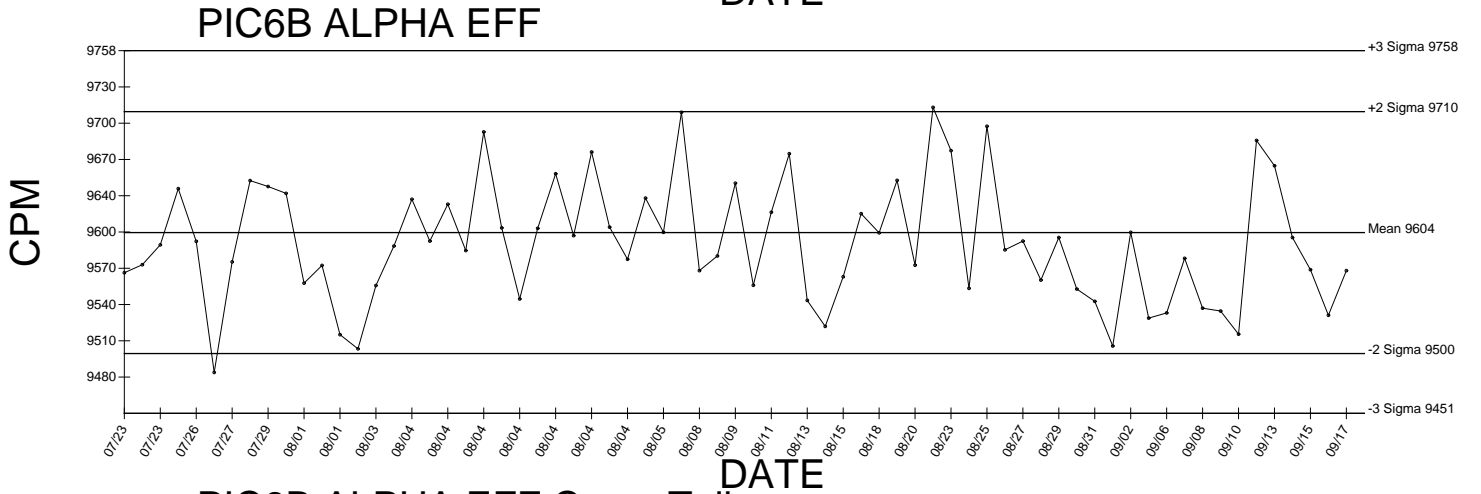
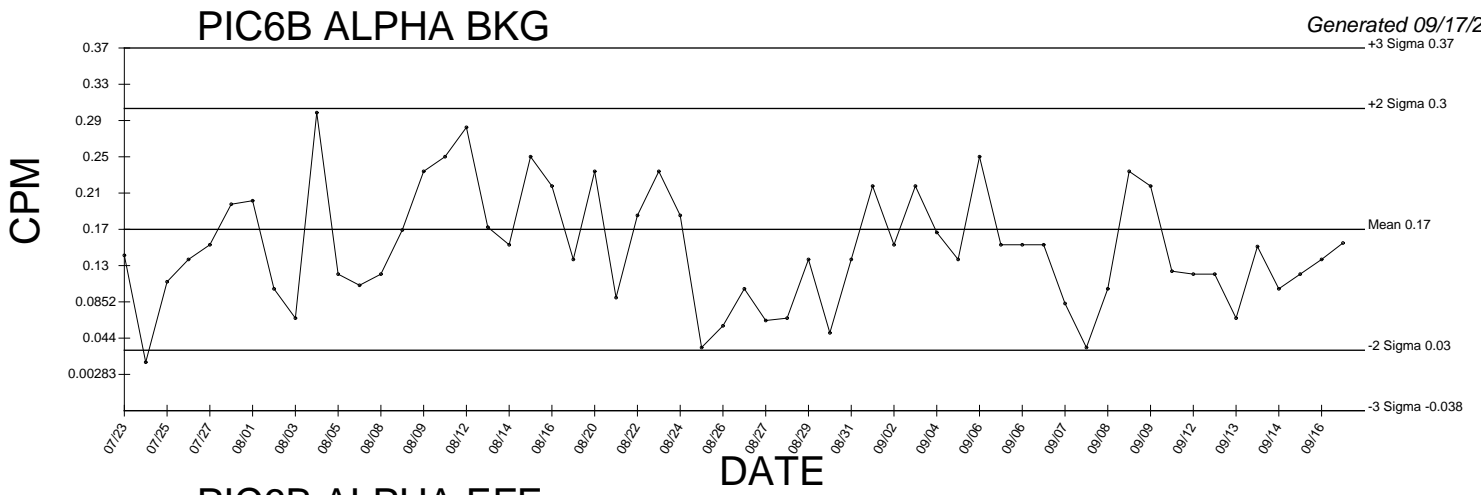
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PIC6A BETA EFF Cross Talk



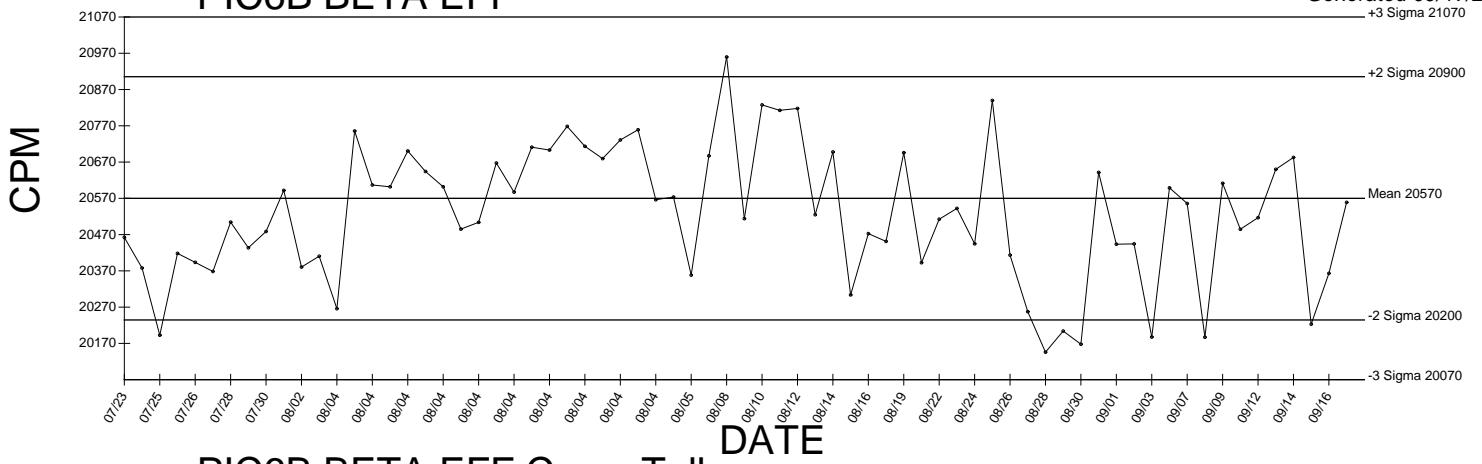
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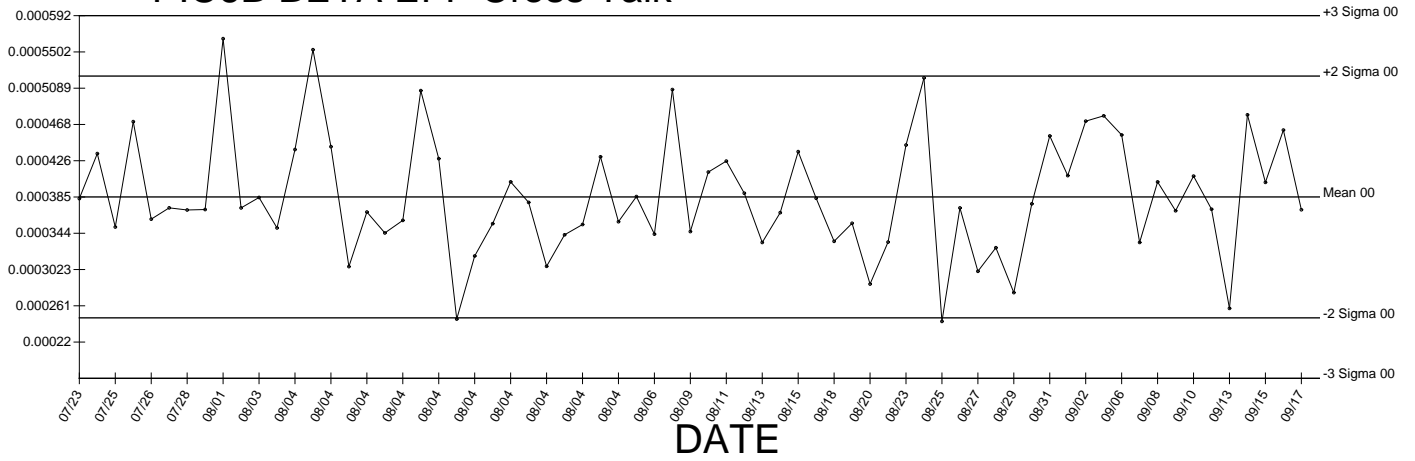
● Denotes Outlier

PIC6B BETA EFF

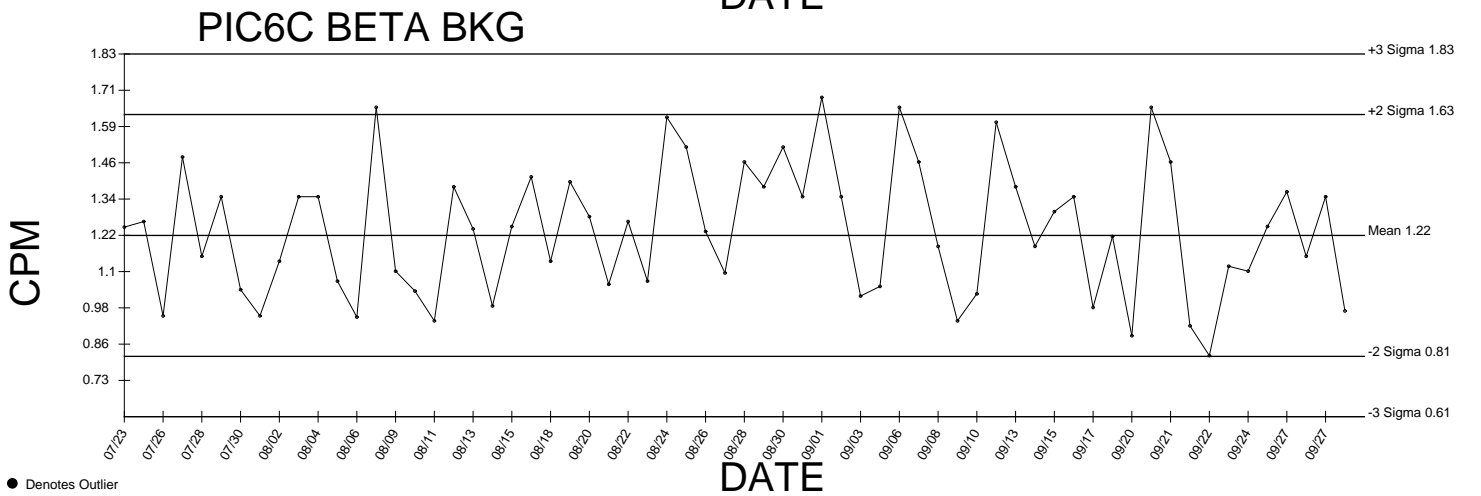
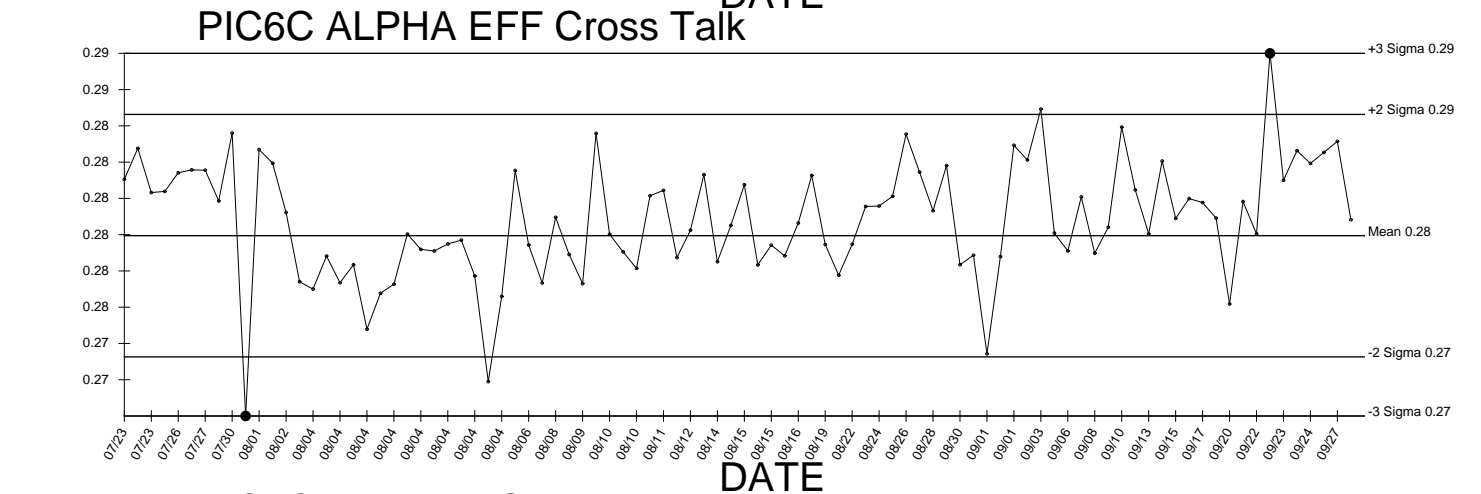
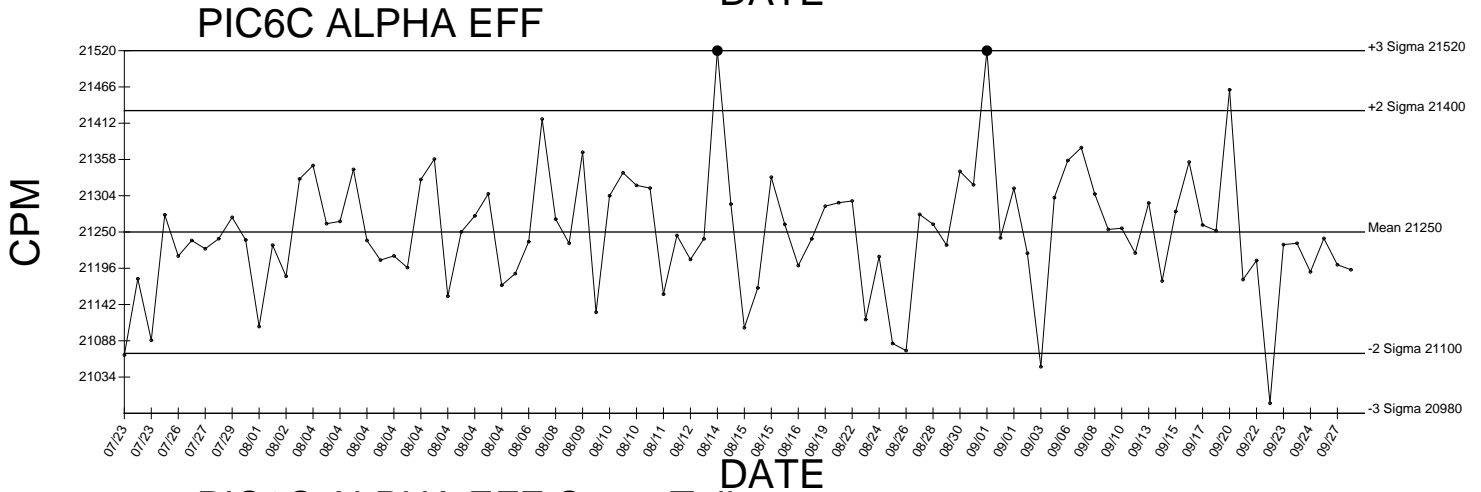
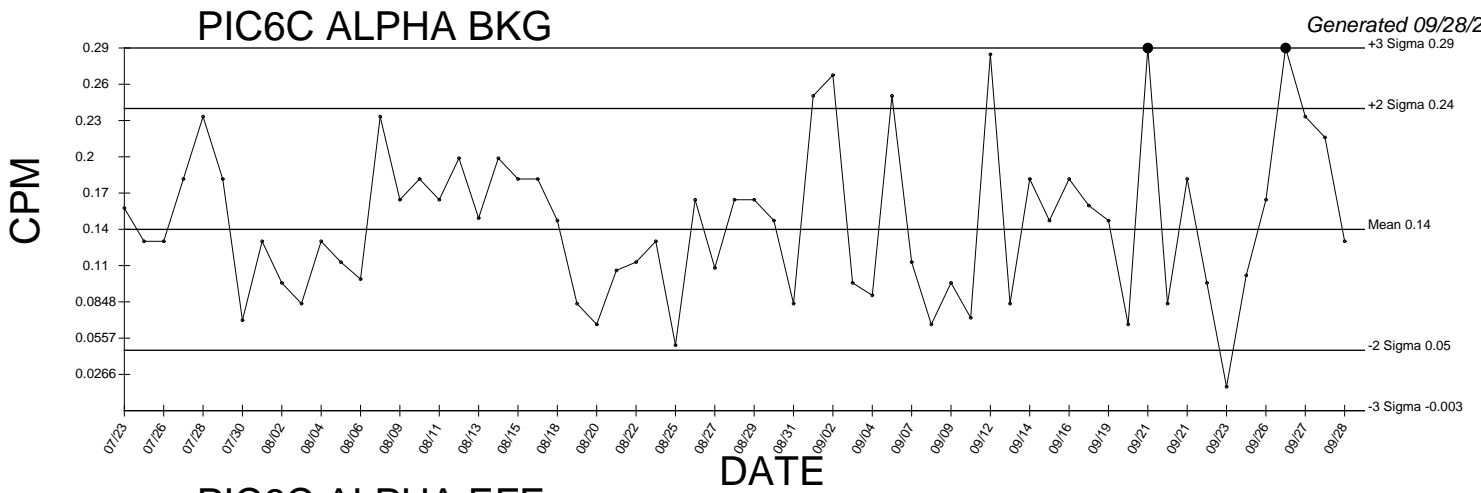
Generated 09/17/2016



PIC6B BETA EFF Cross Talk



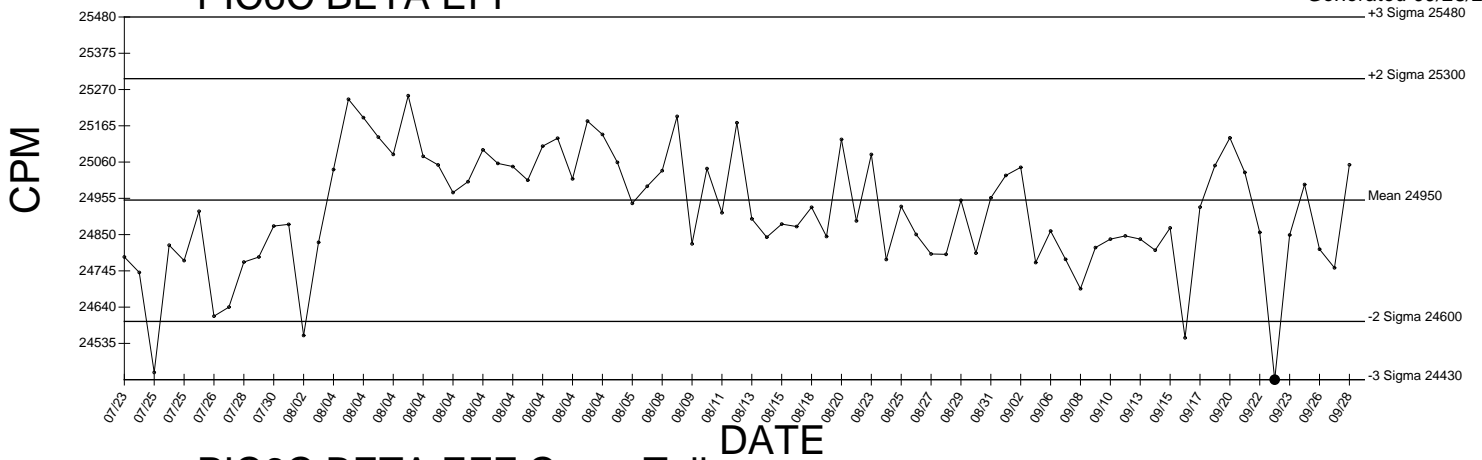
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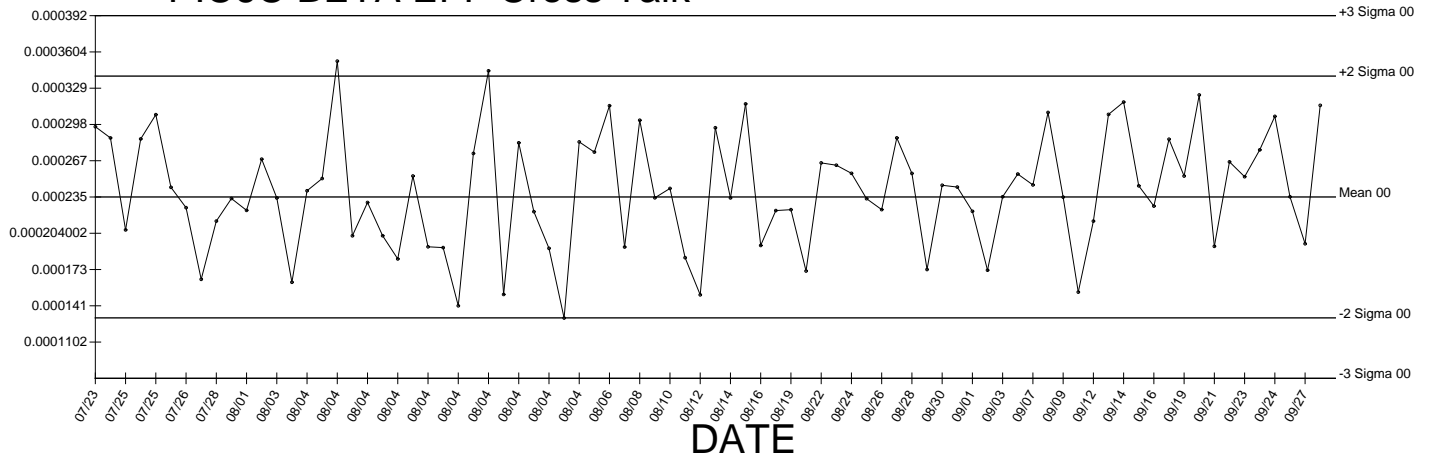
● Denotes Outlier

PIC6C BETA EFF

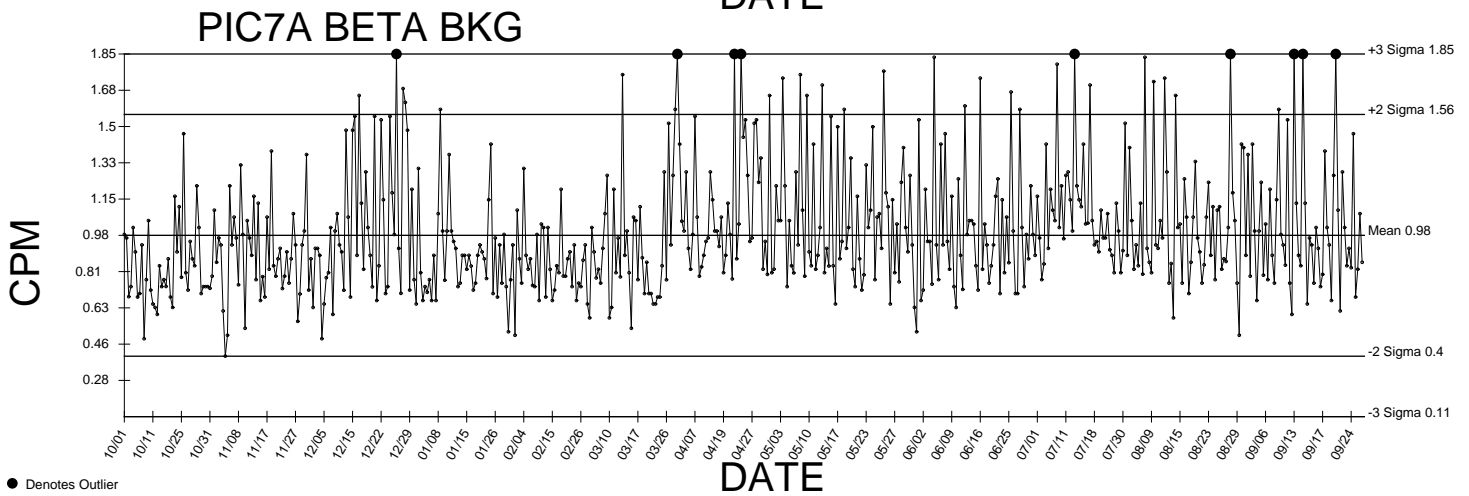
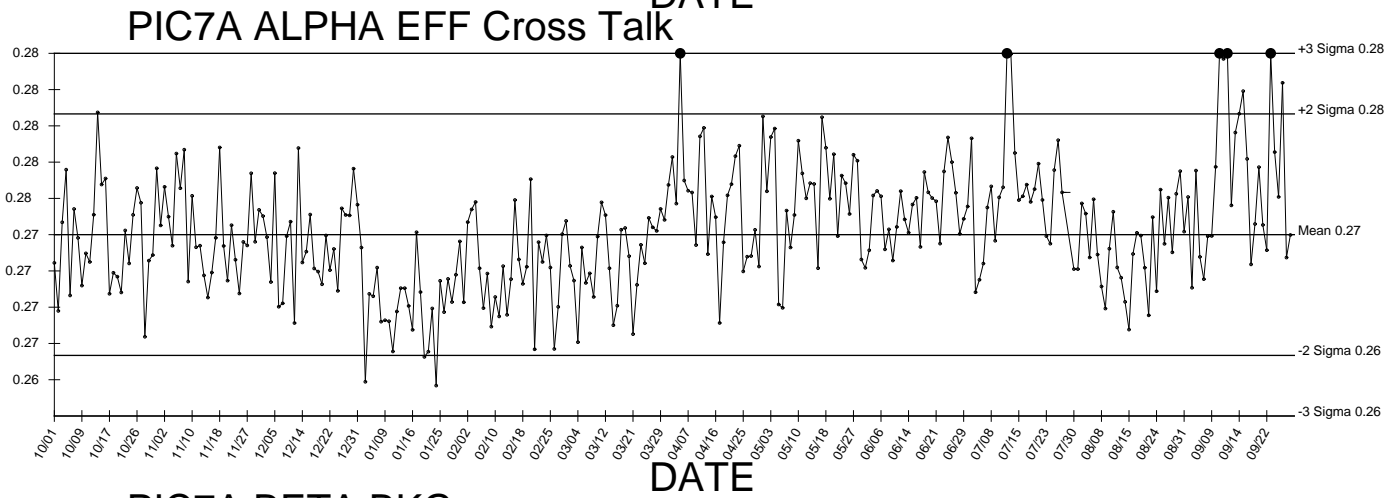
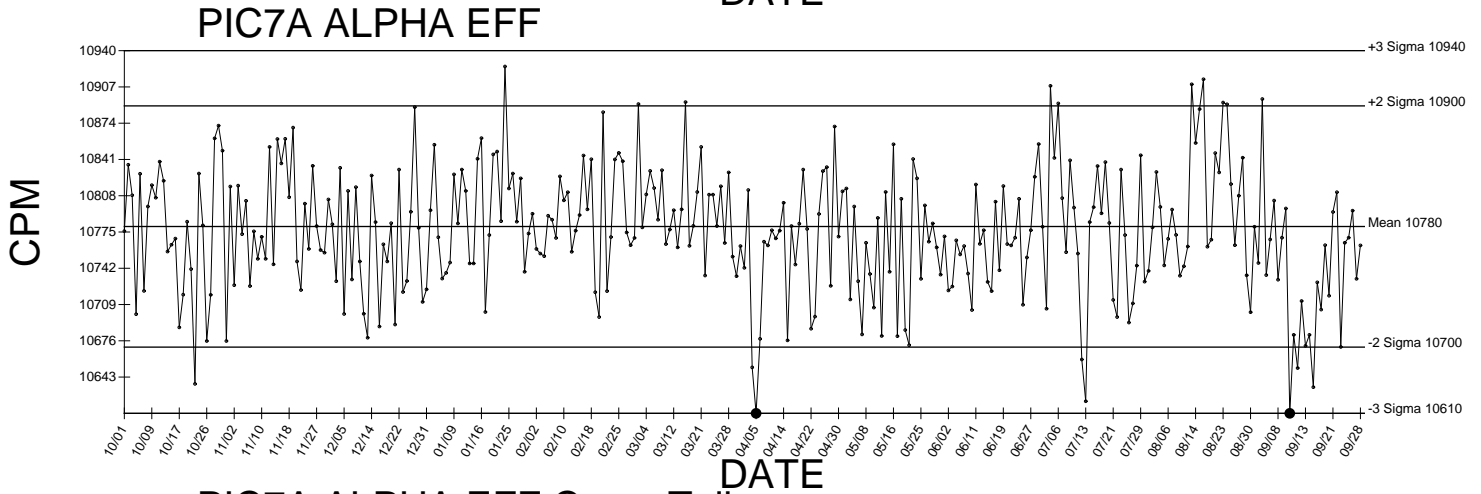
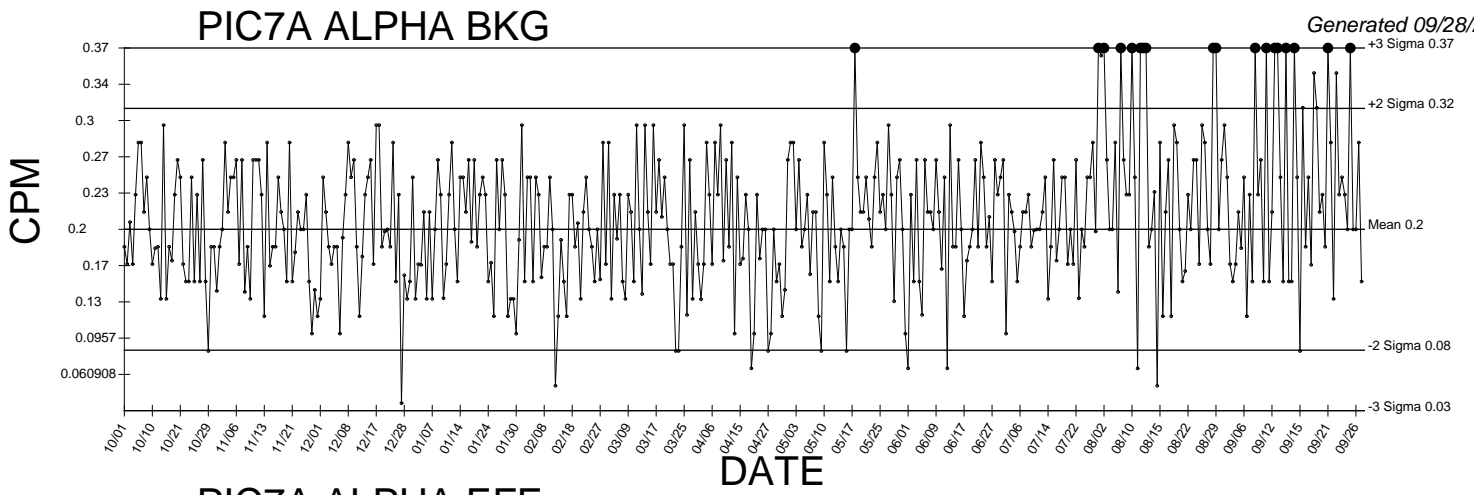
Generated 09/28/2016



PIC6C BETA EFF Cross Talk



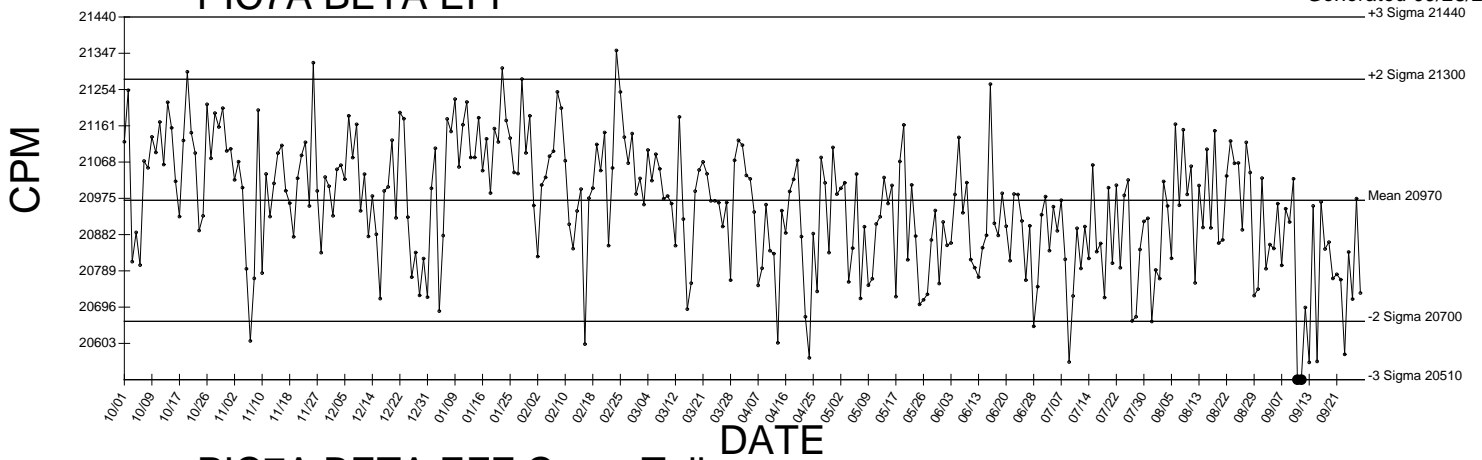
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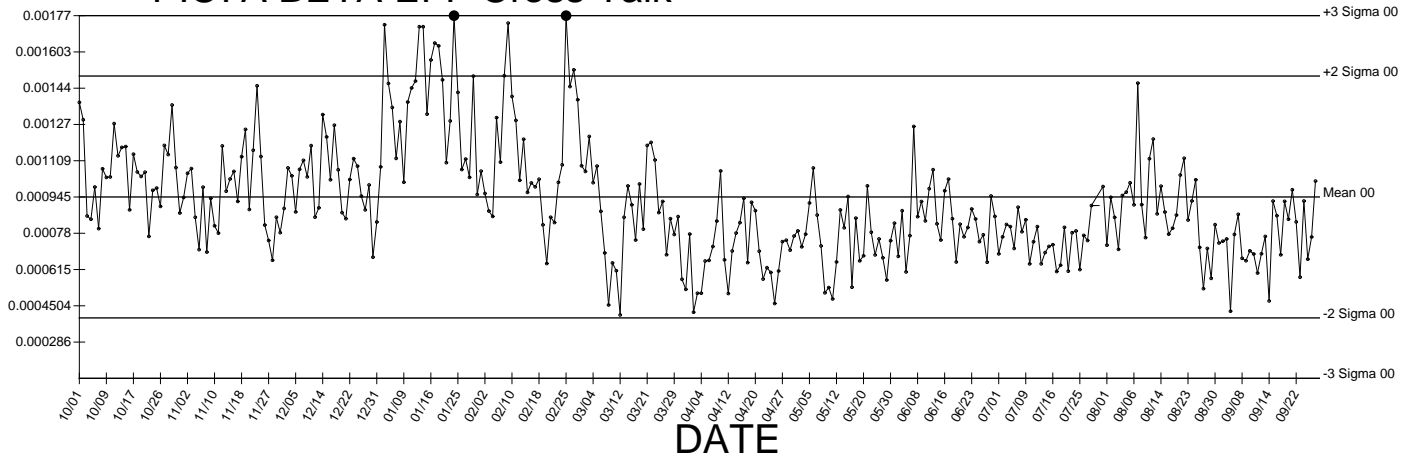
● Denotes Outlier

PIC7A BETA EFF

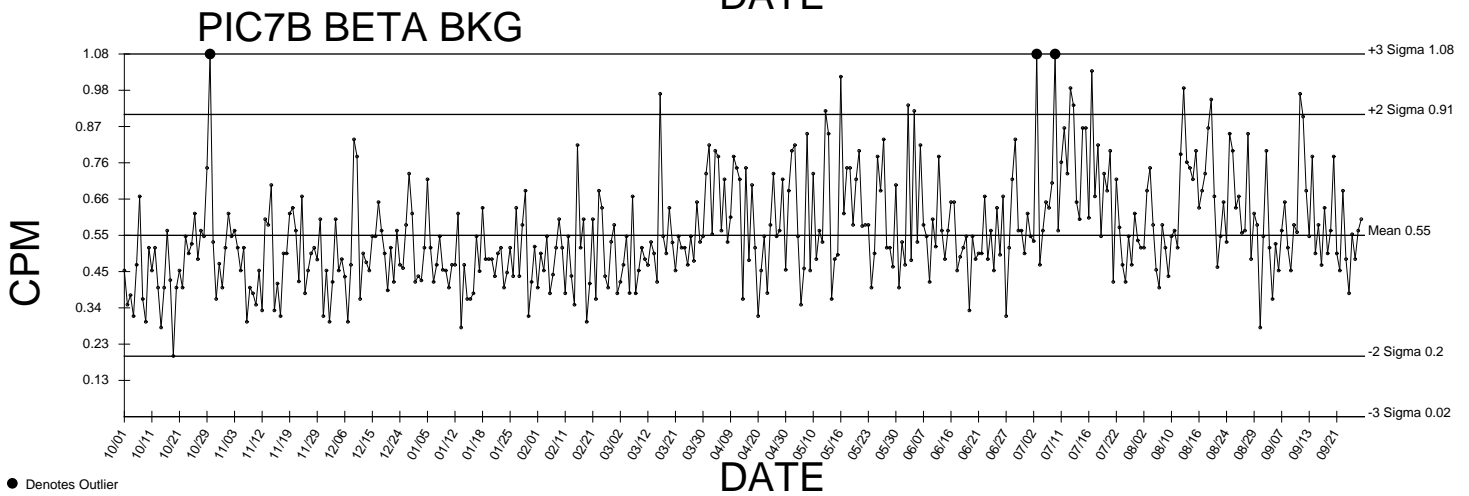
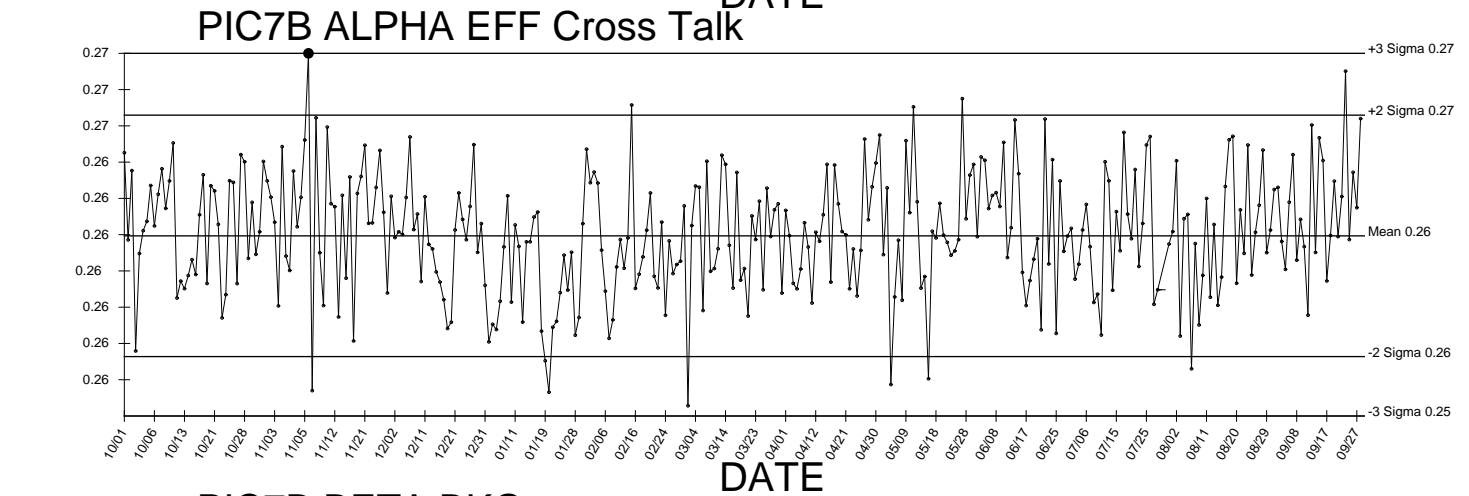
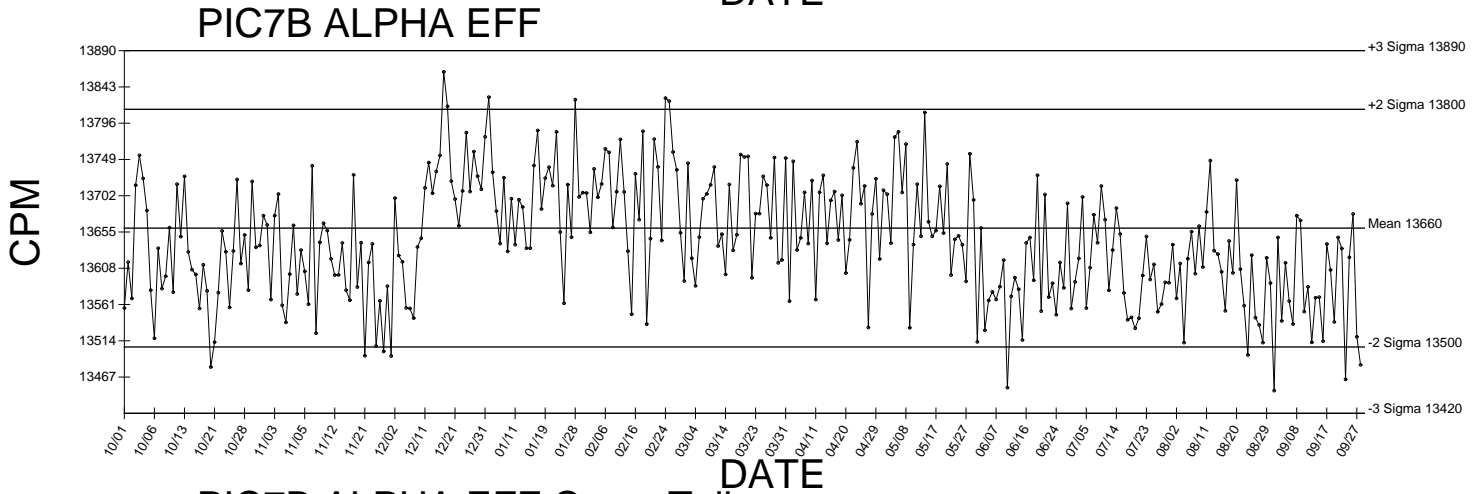
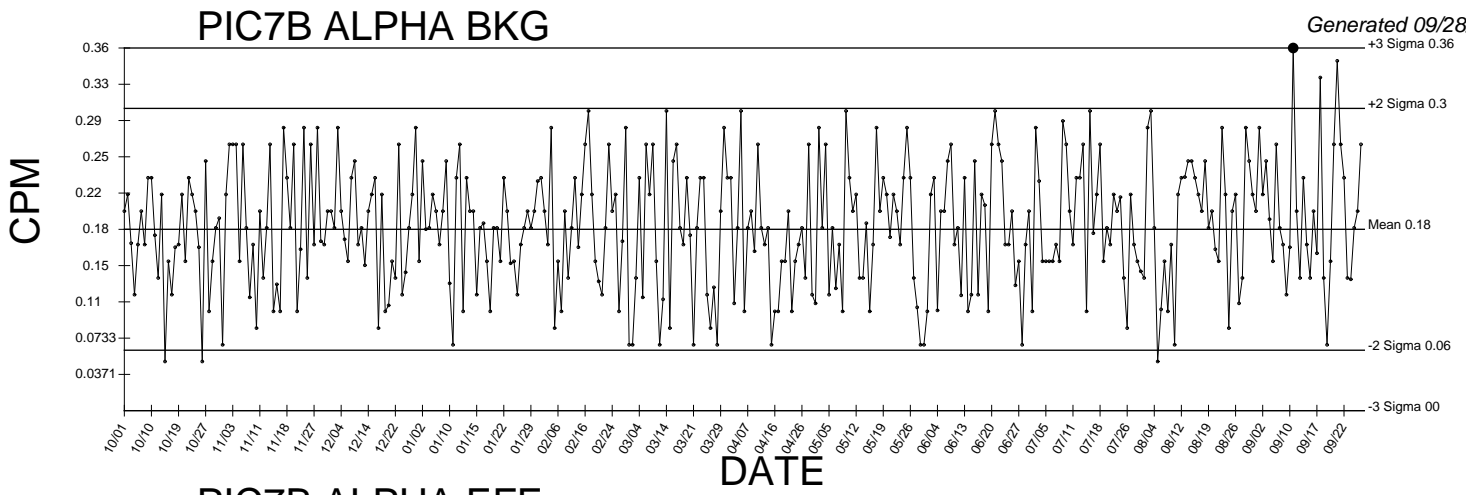
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PIC7A BETA EFF Cross Talk



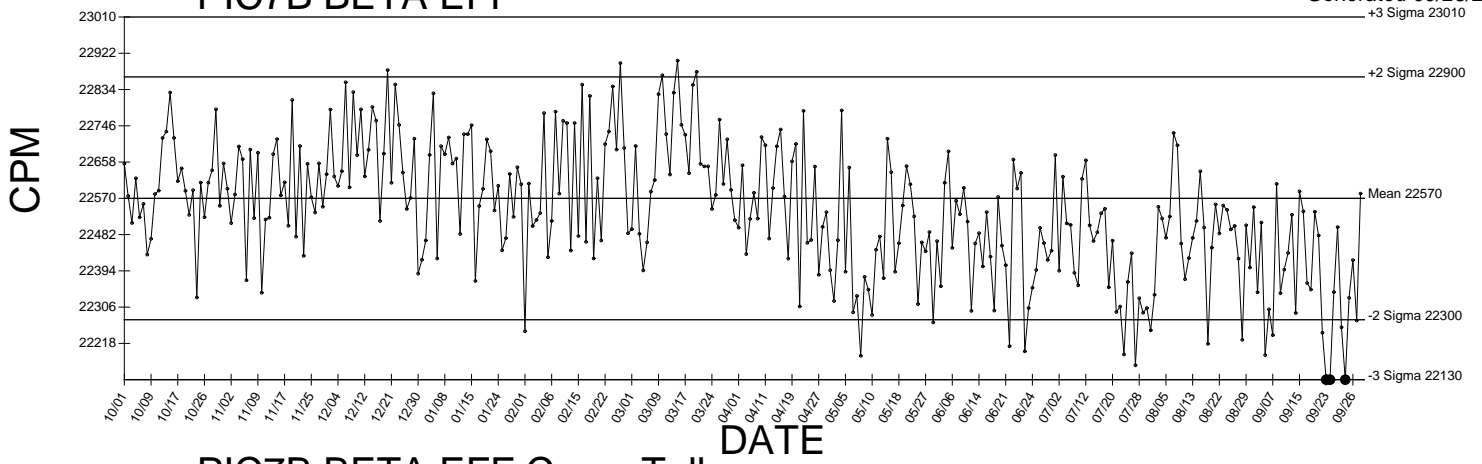
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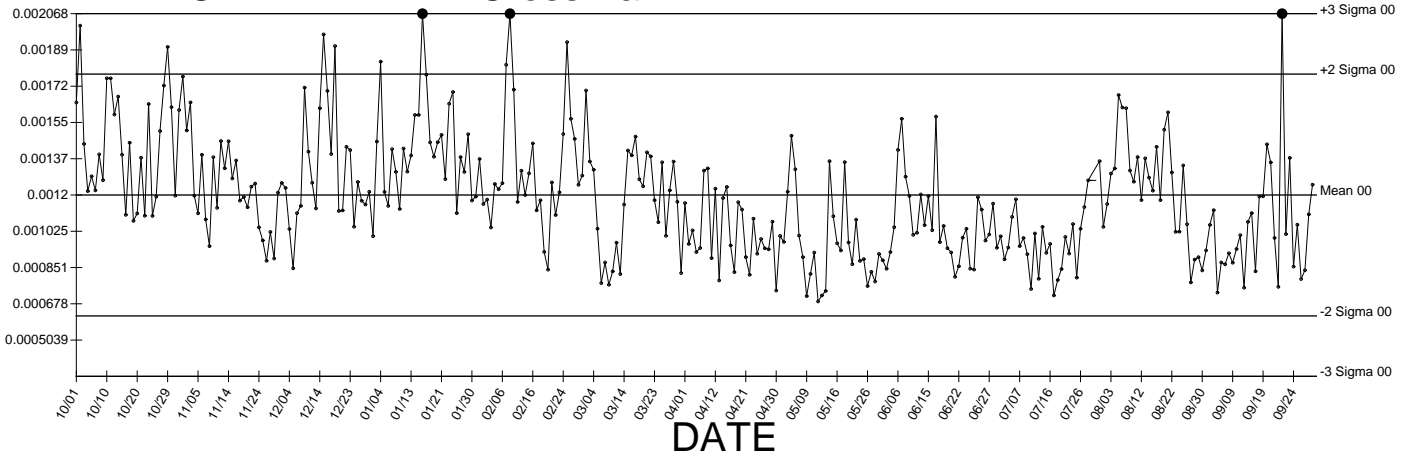
● Denotes Outlier

PIC7B BETA EFF

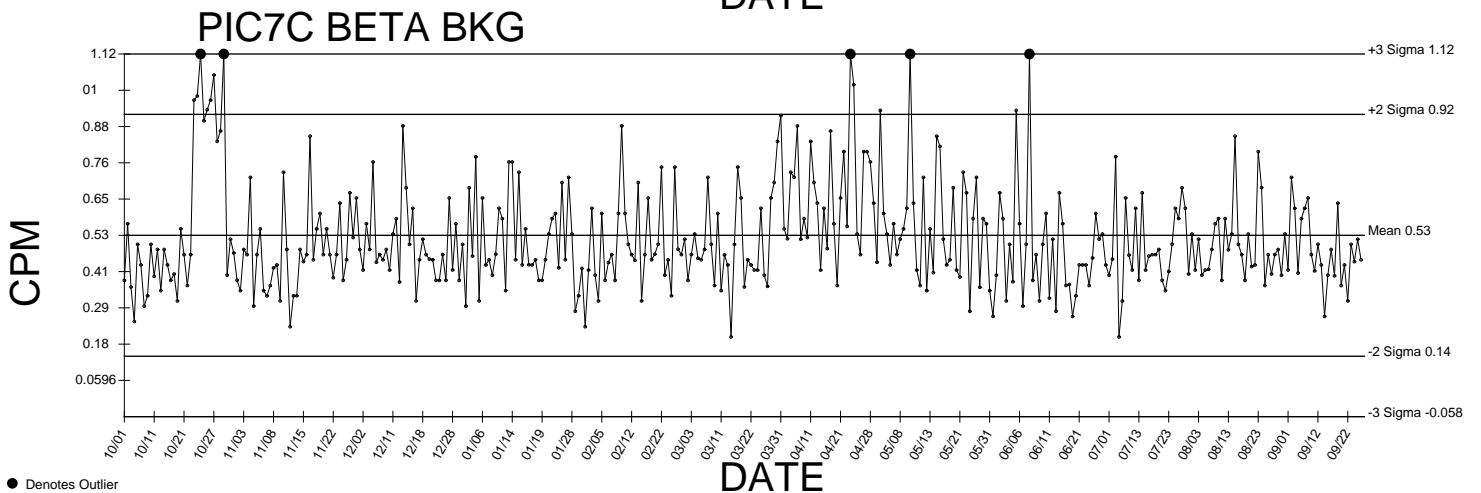
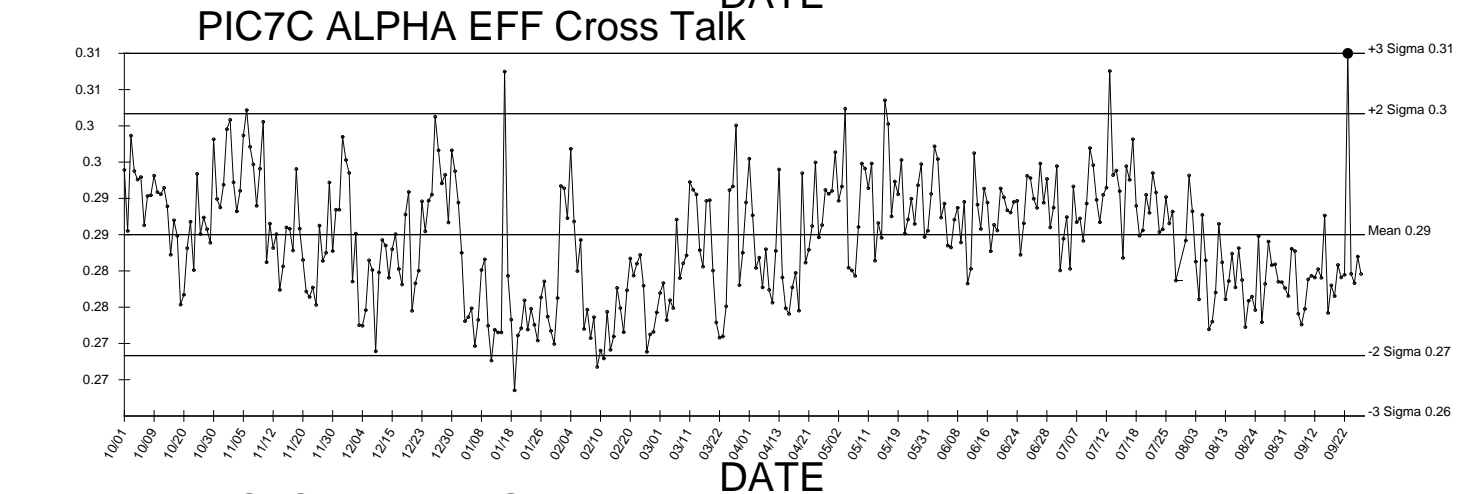
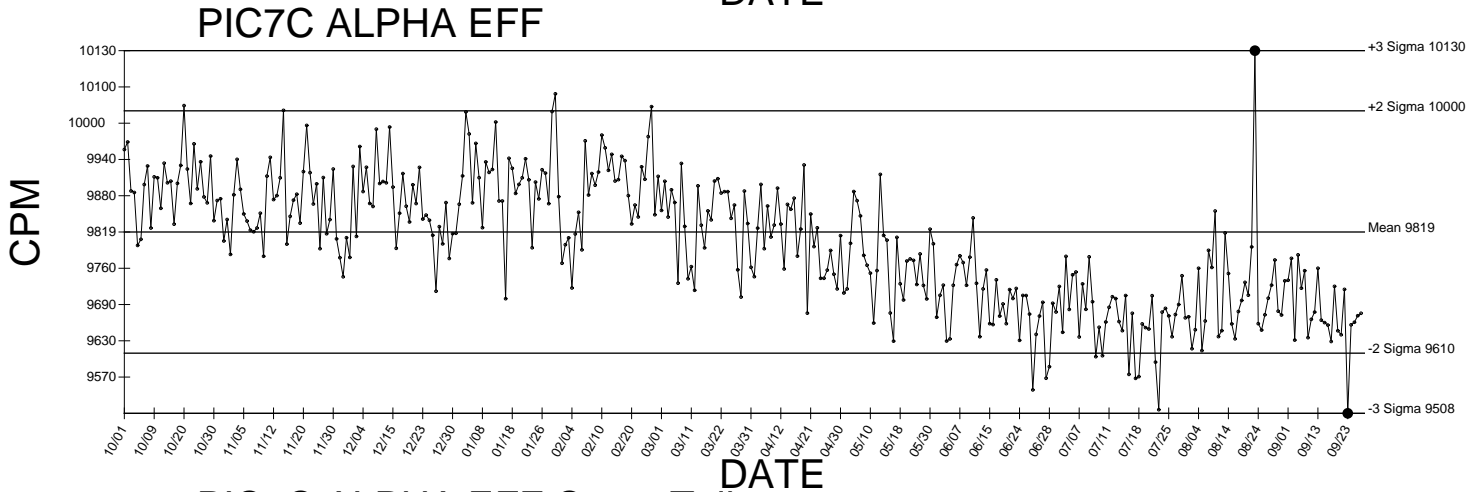
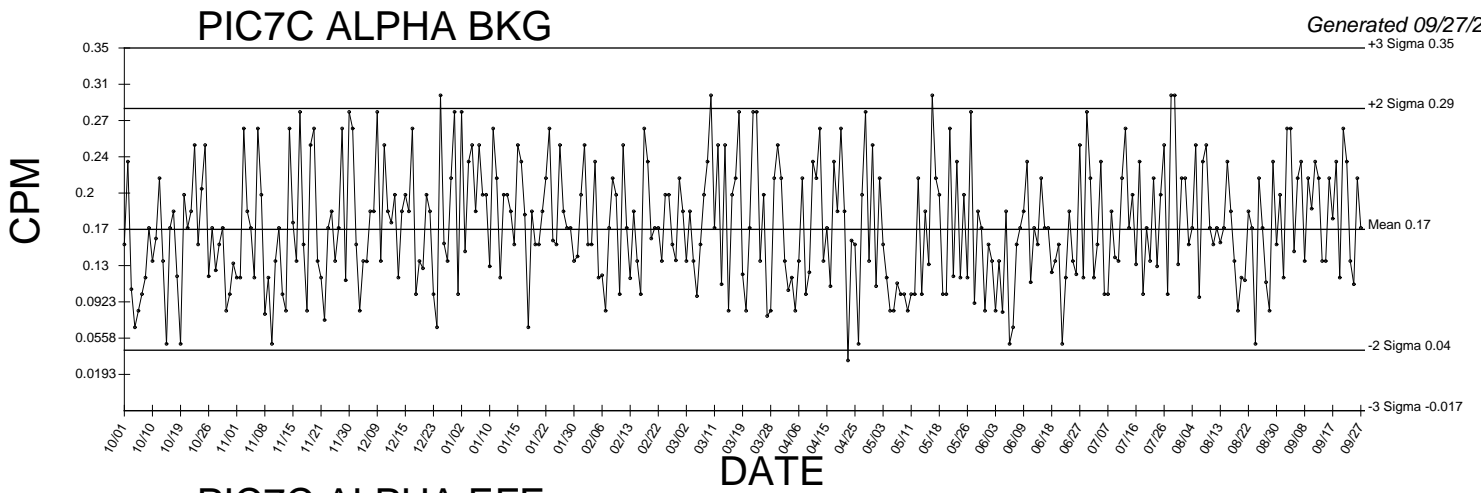
Generated 09/28/2016



PIC7B BETA EFF Cross Talk



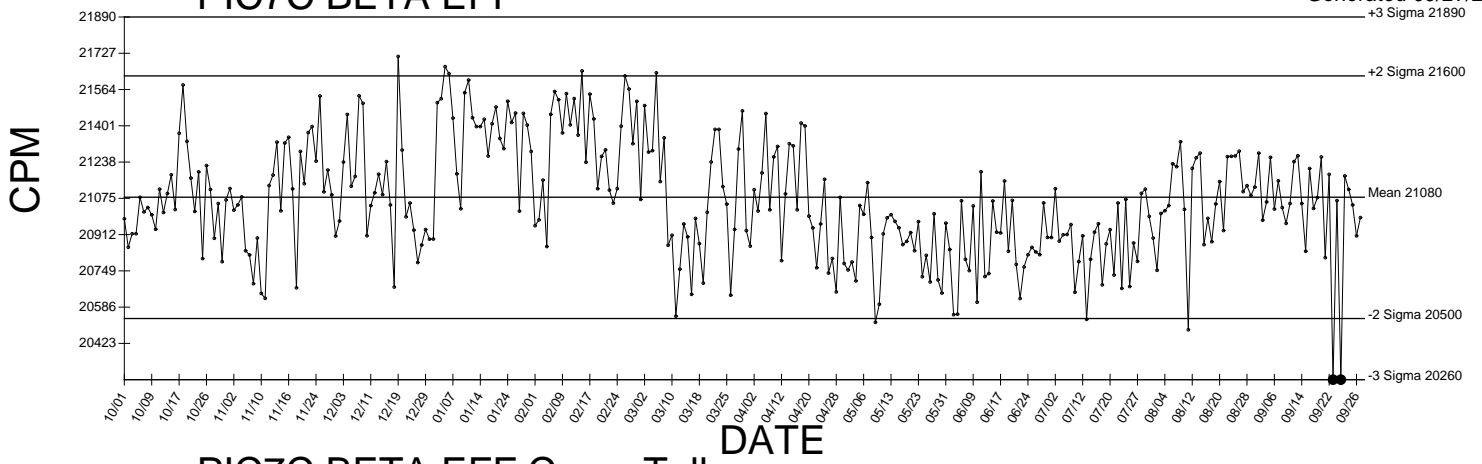
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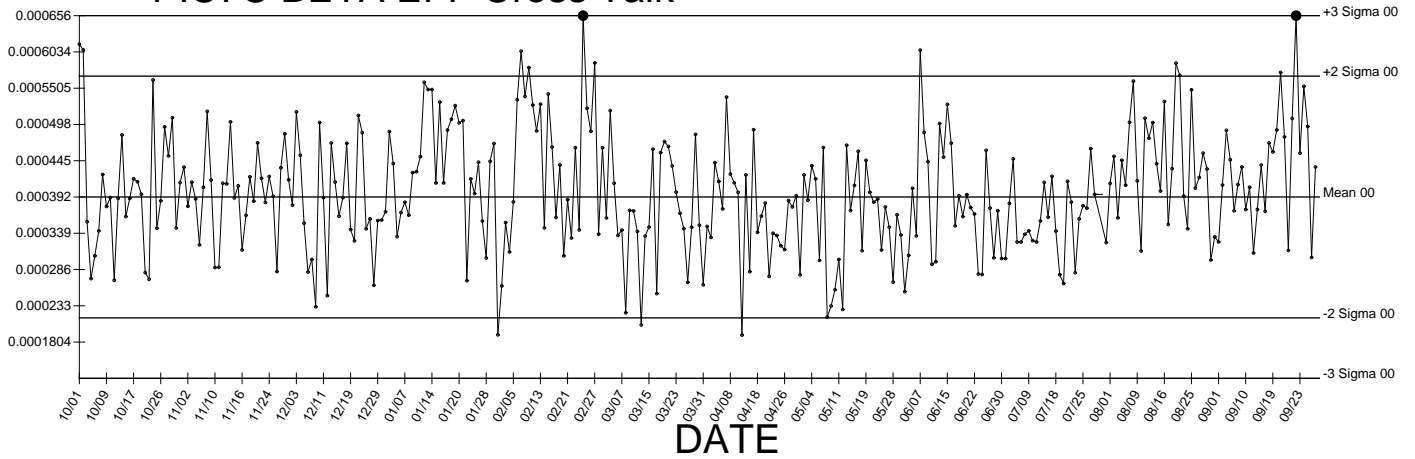
● Denotes Outlier

PIC7C BETA EFF

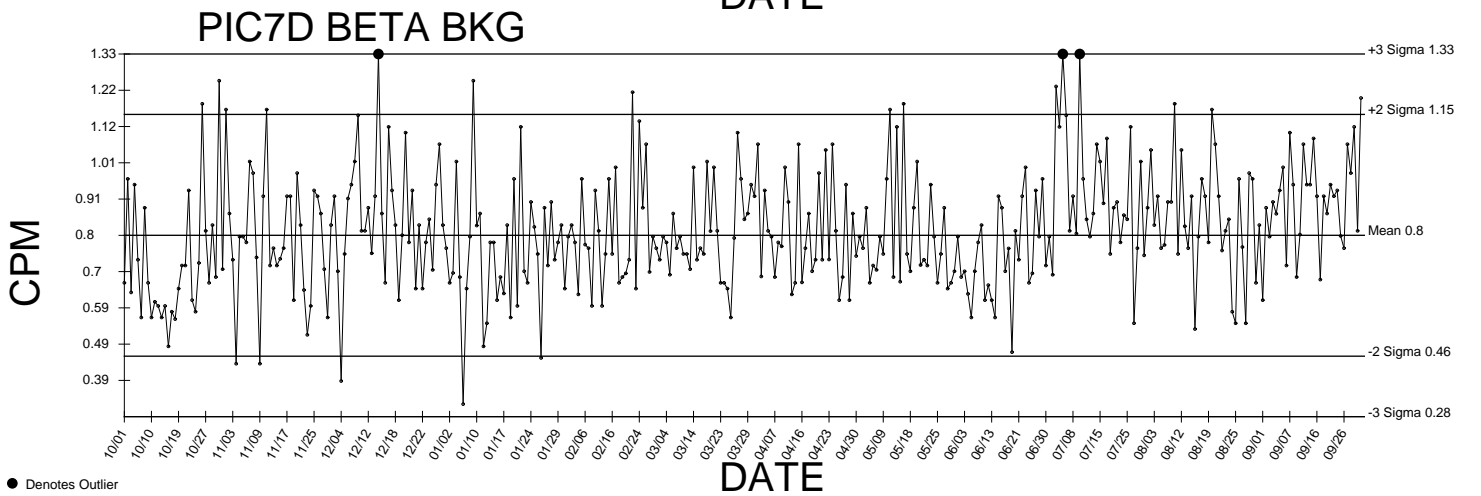
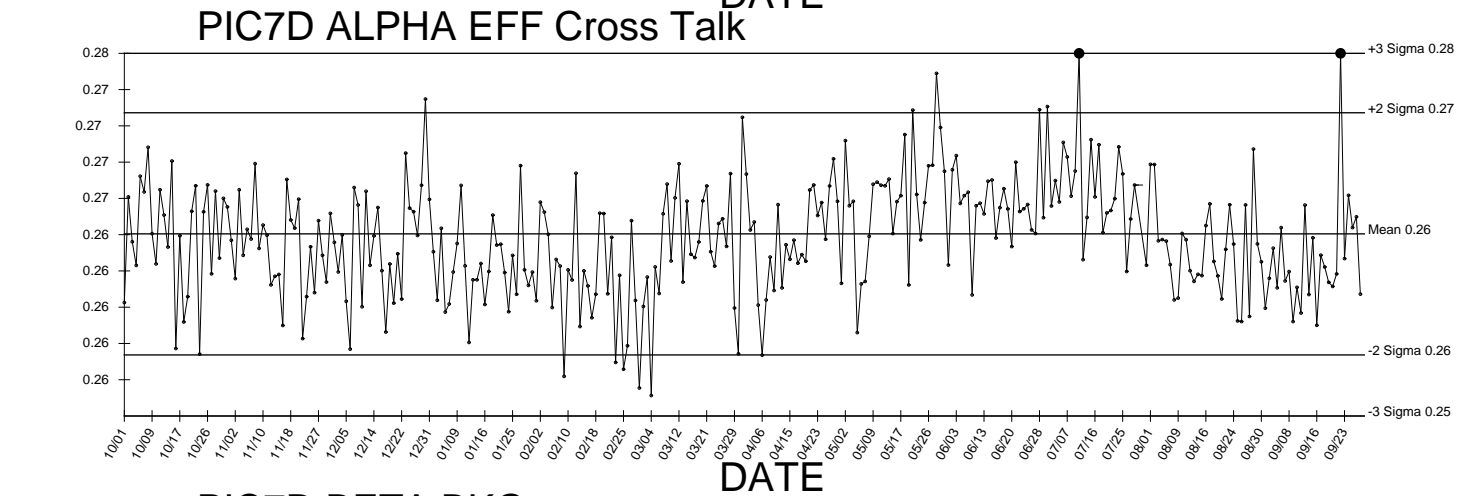
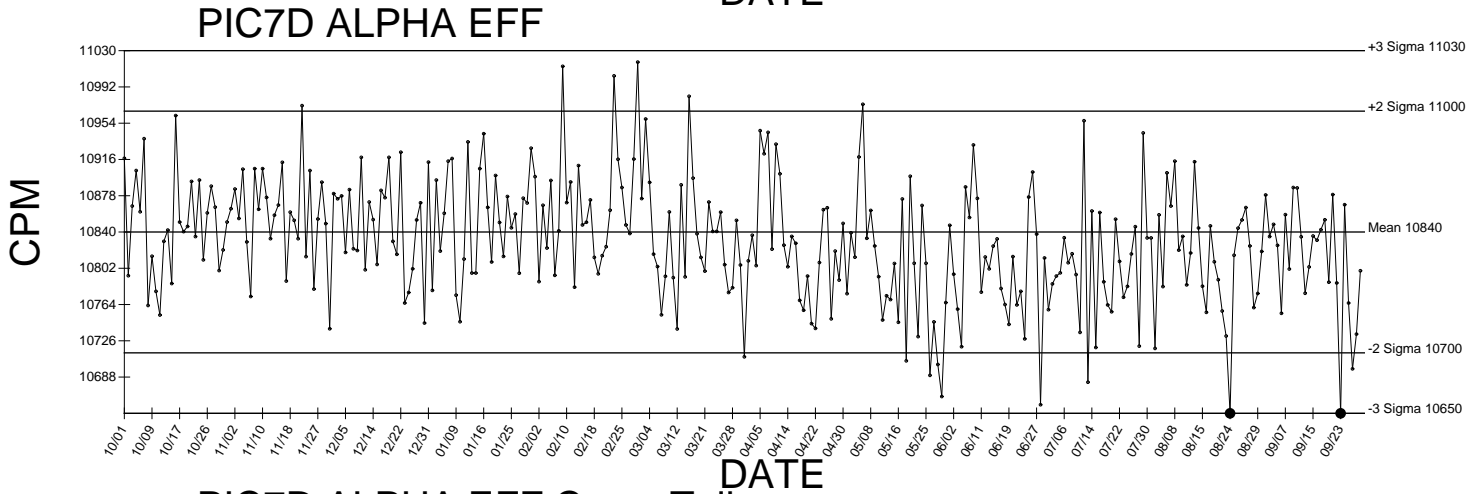
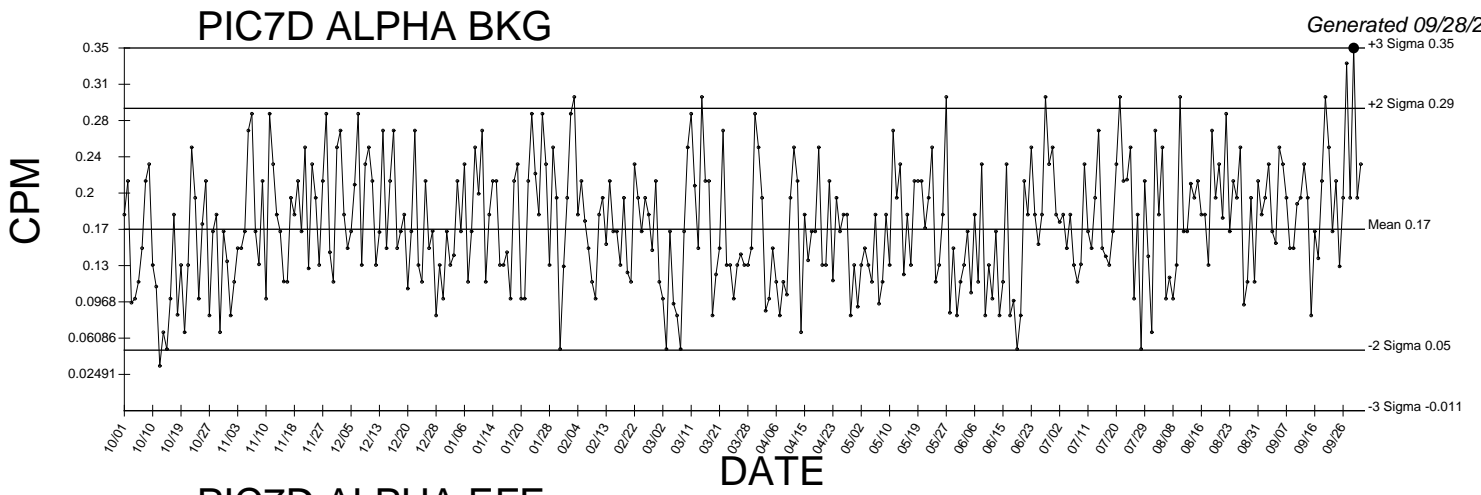
Generated 09/27/2016



PIC7C BETA EFF Cross Talk



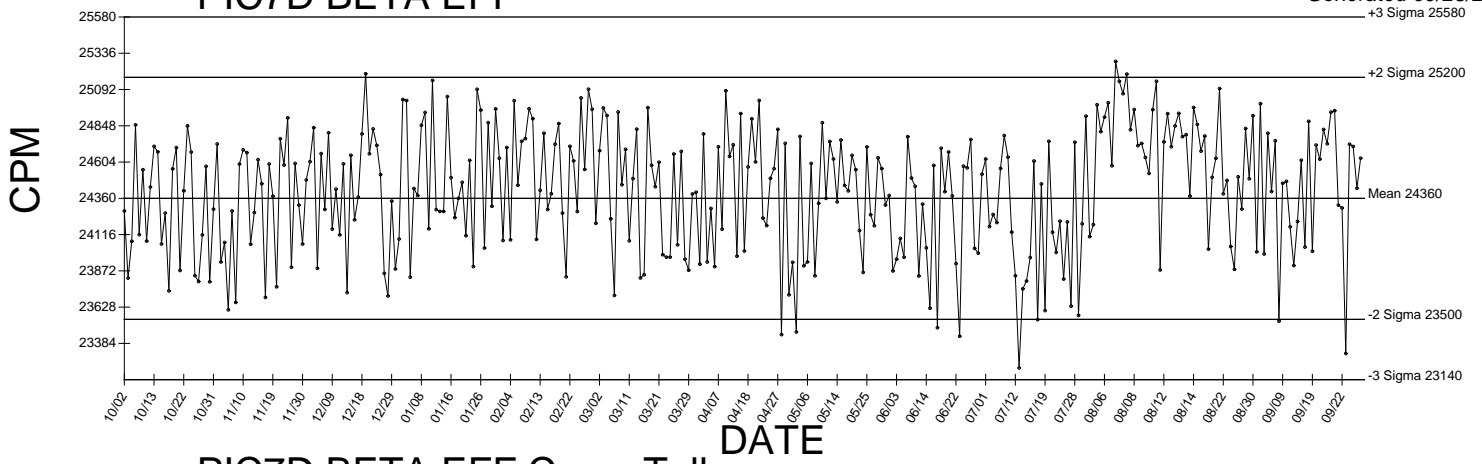
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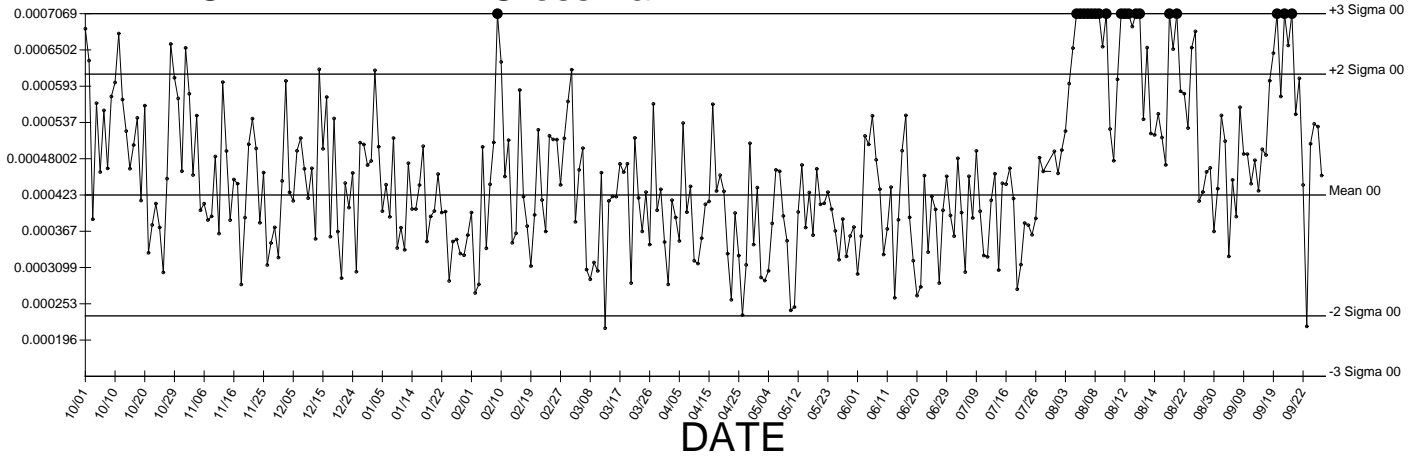
● Denotes Outlier

PIC7D BETA EFF

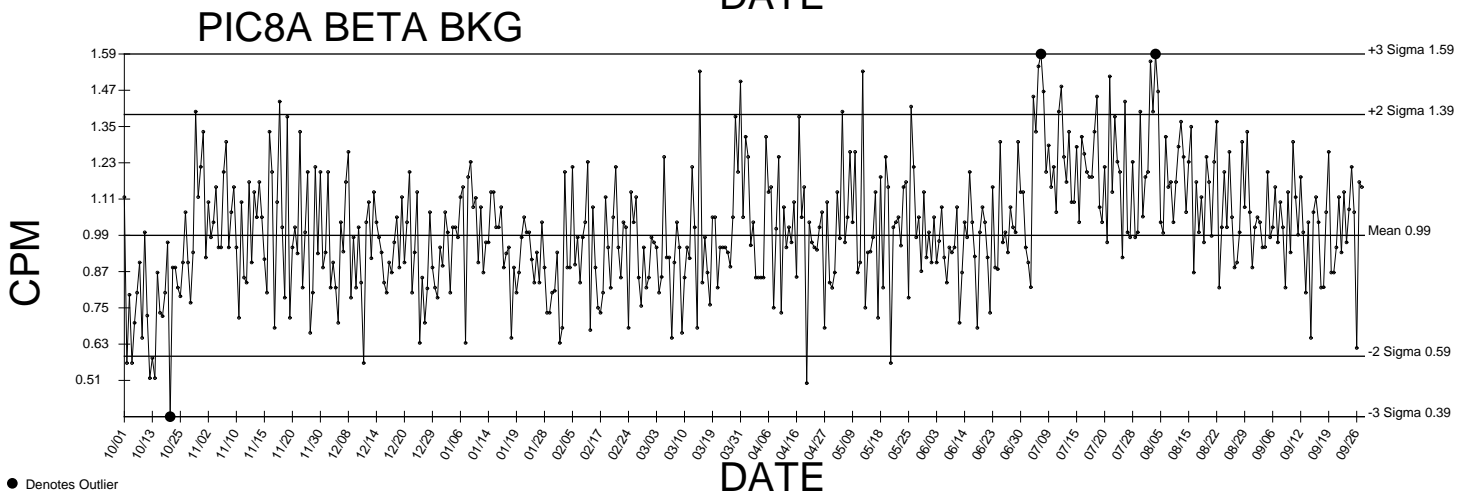
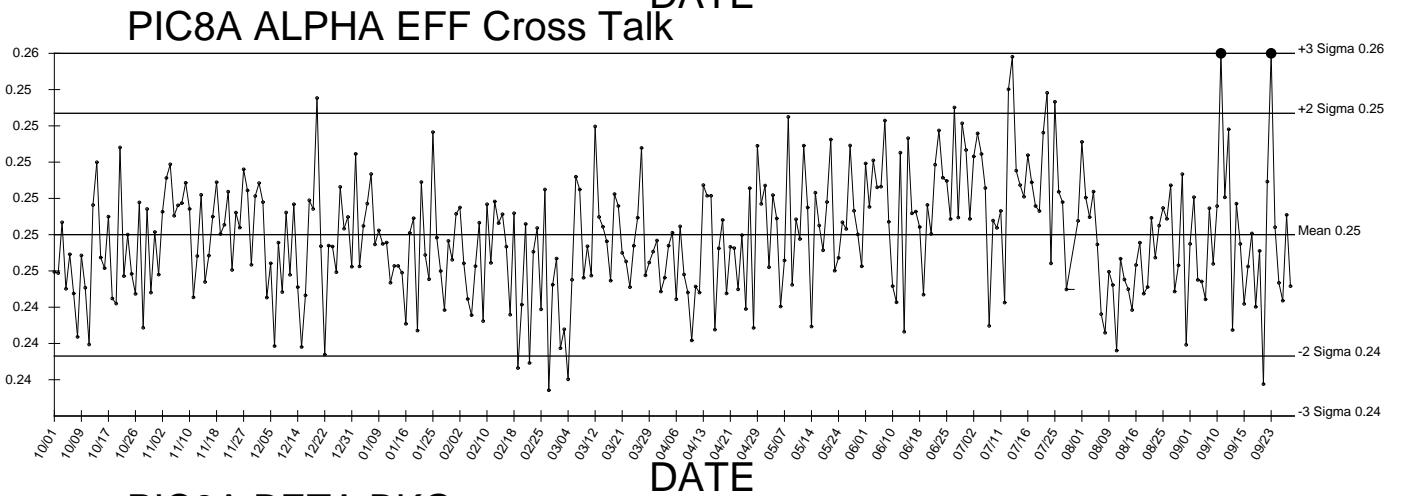
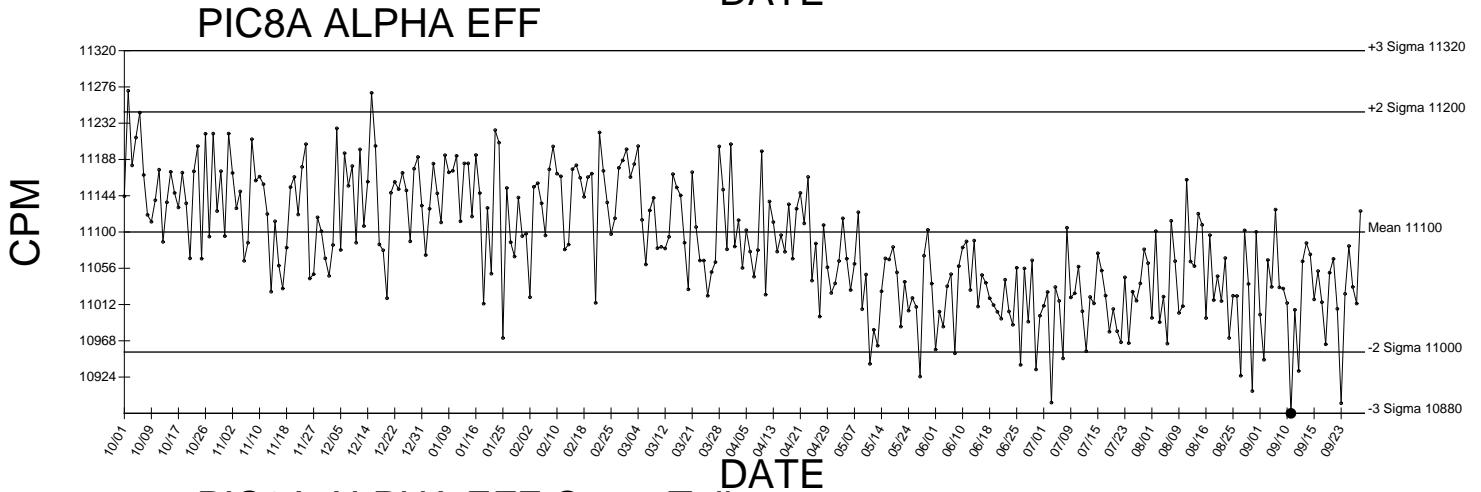
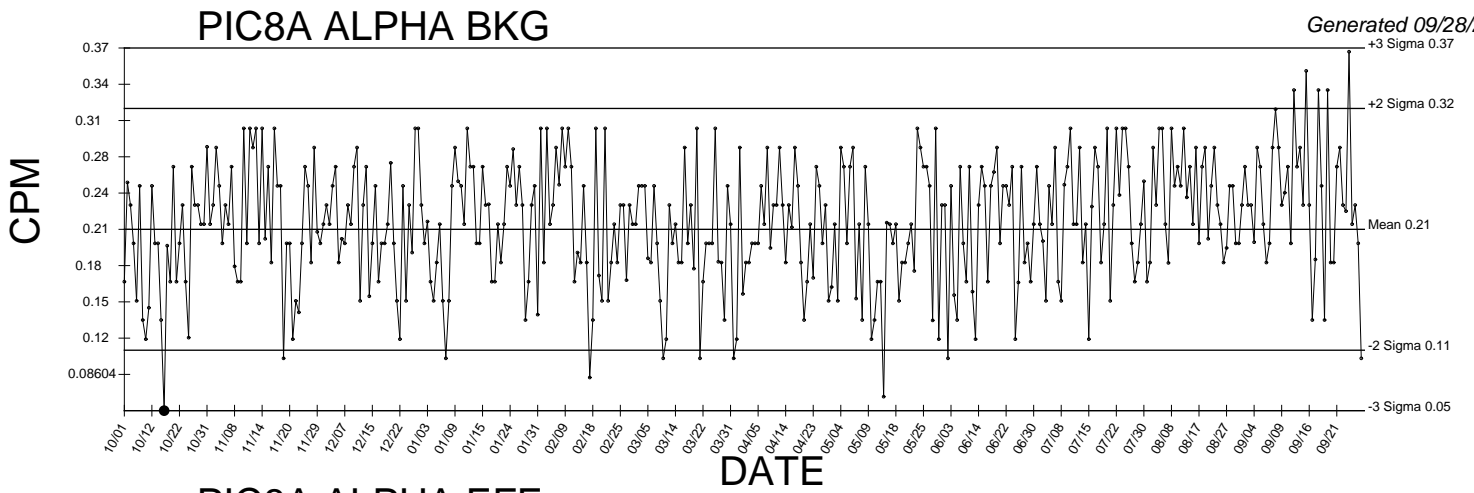
Generated 09/28/2016



PIC7D BETA EFF Cross Talk



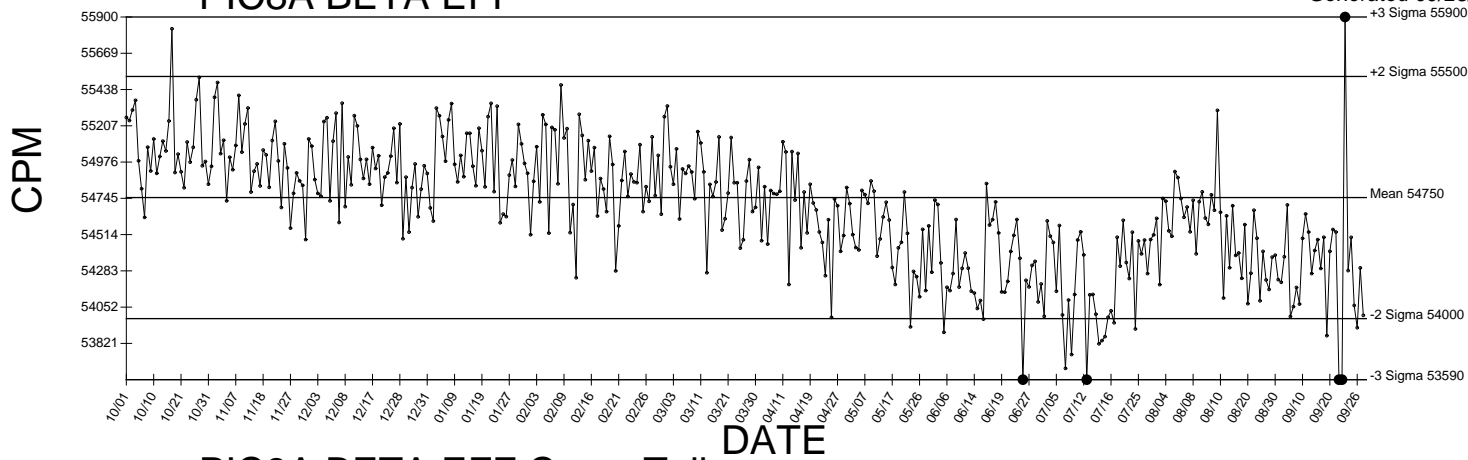
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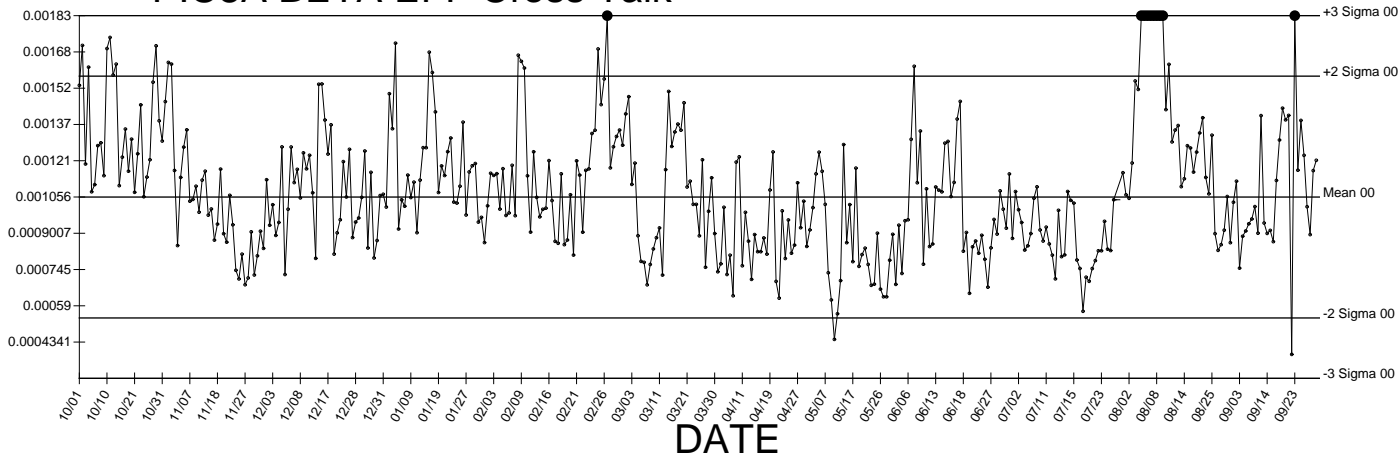
● Denotes Outlier

PIC8A BETA EFF

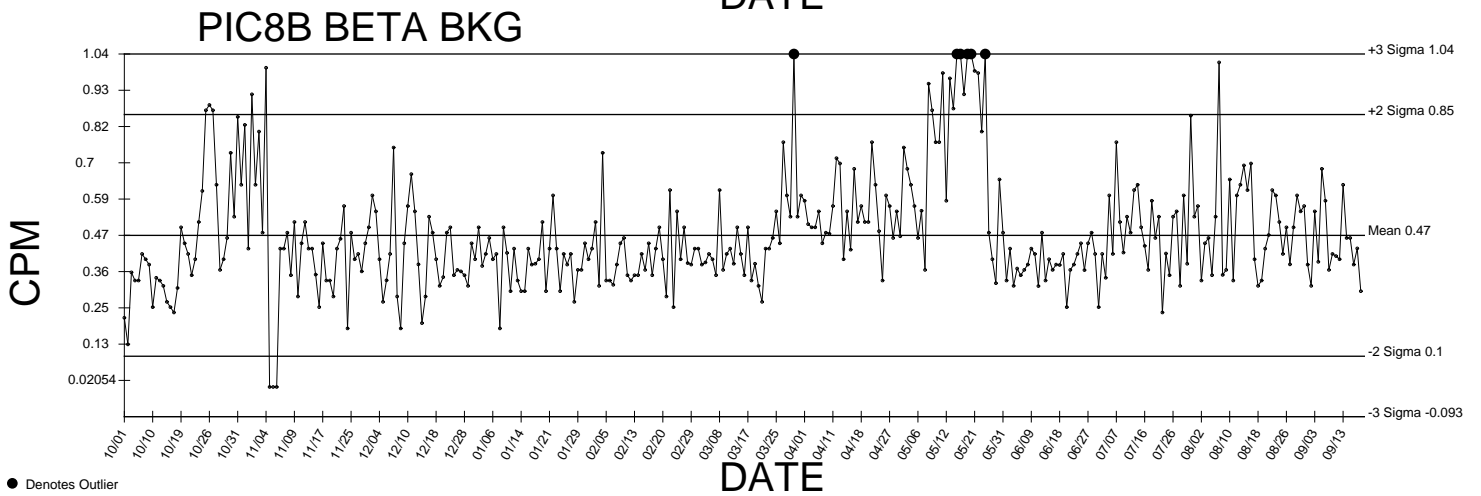
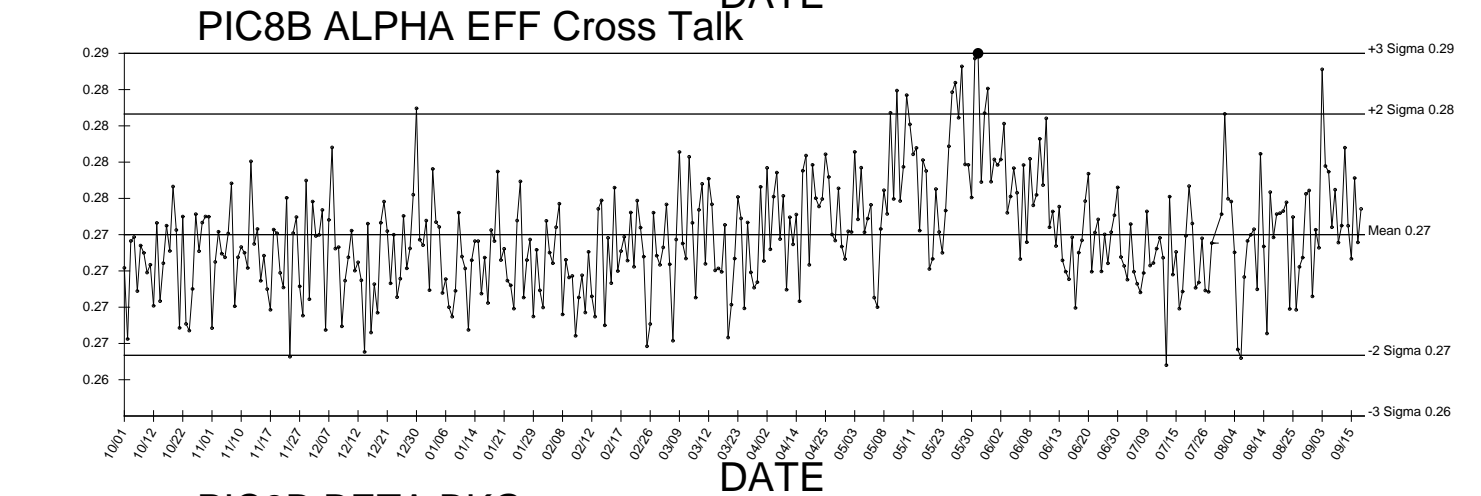
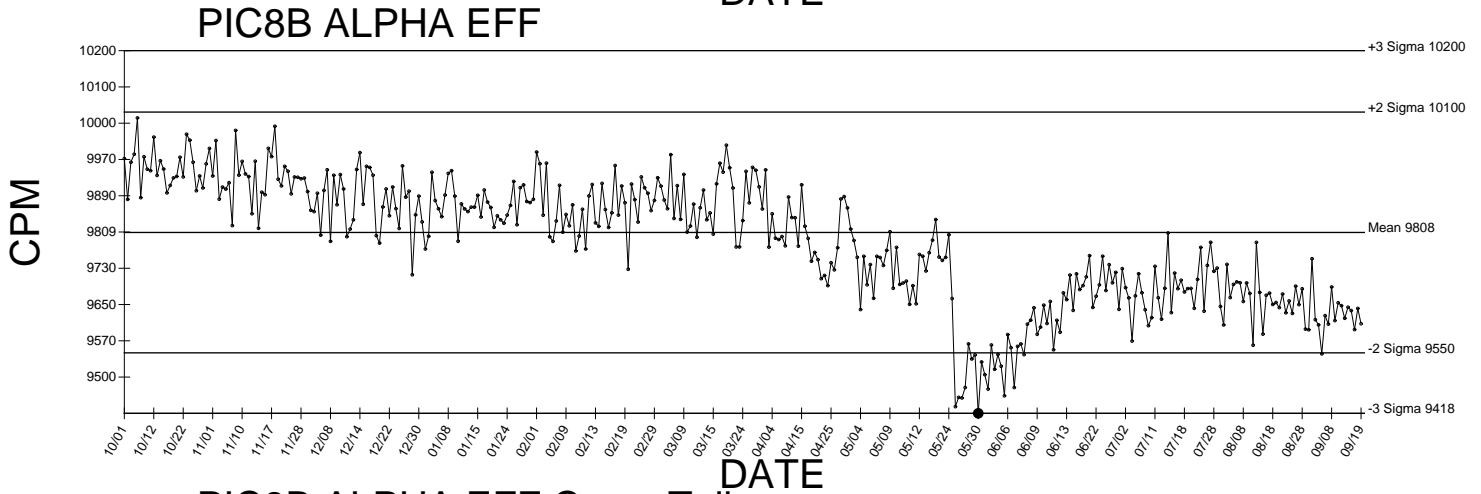
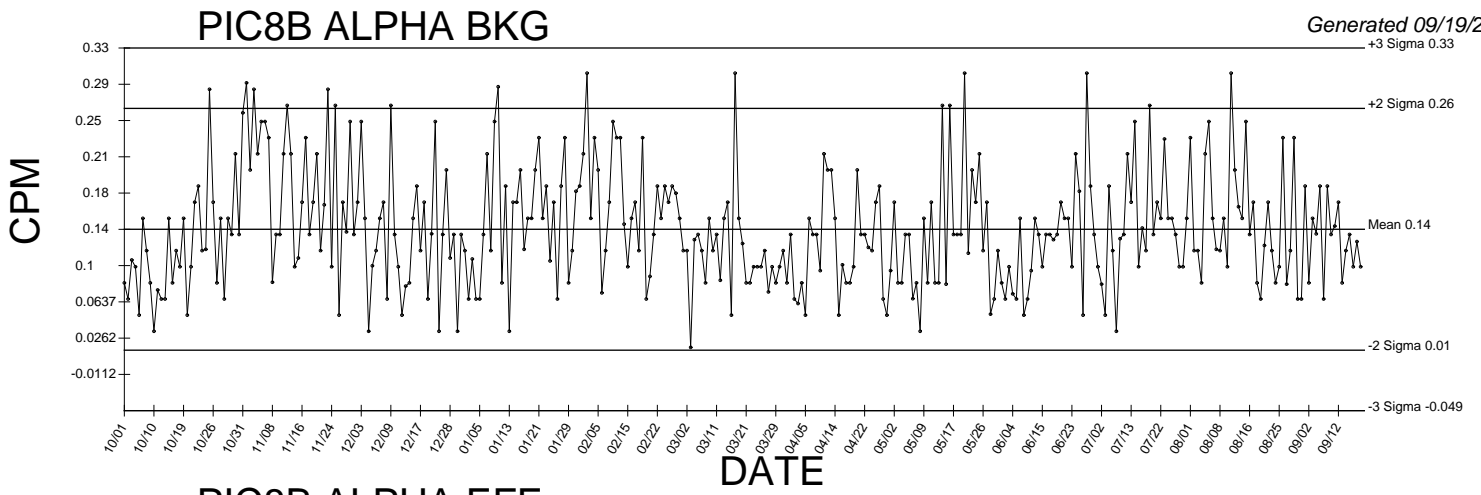
Generated 09/28/2016



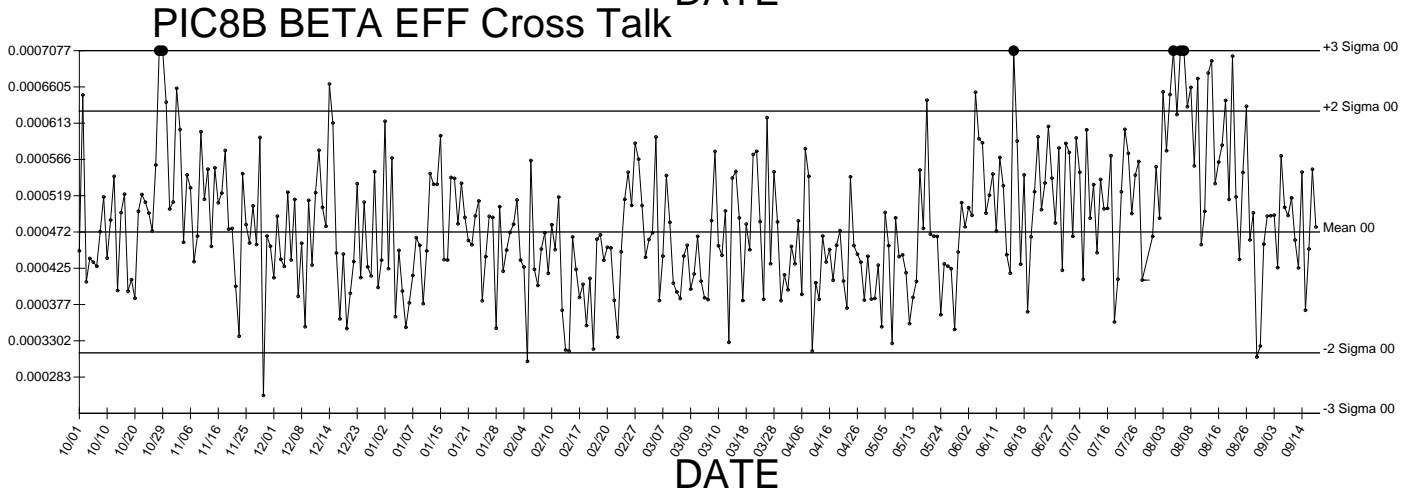
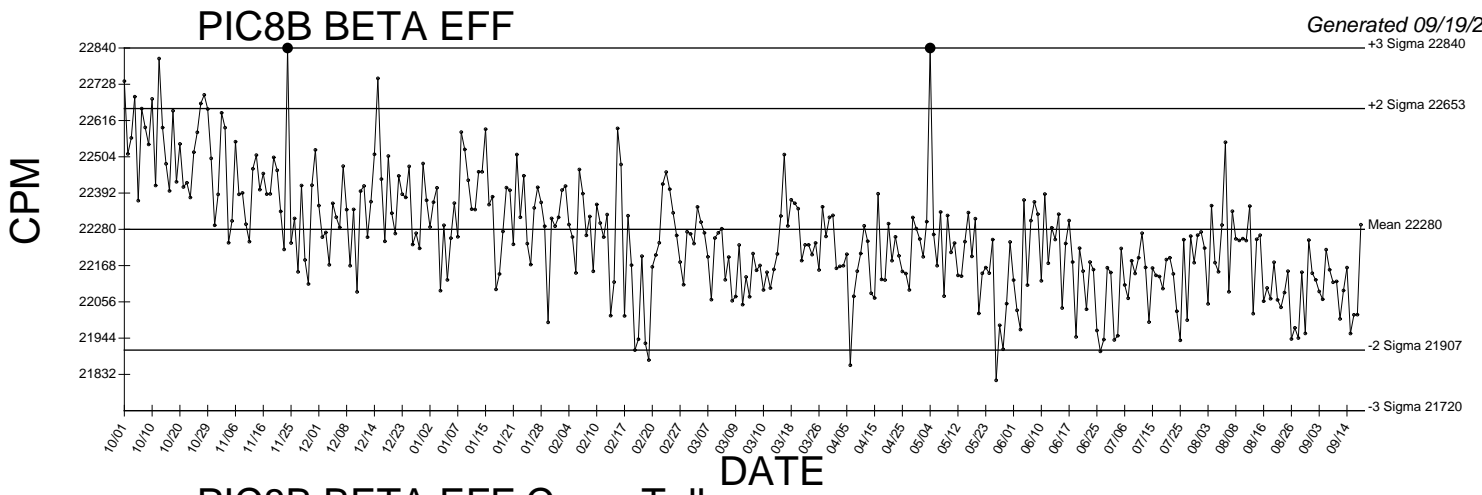
PIC8A BETA EFF Cross Talk



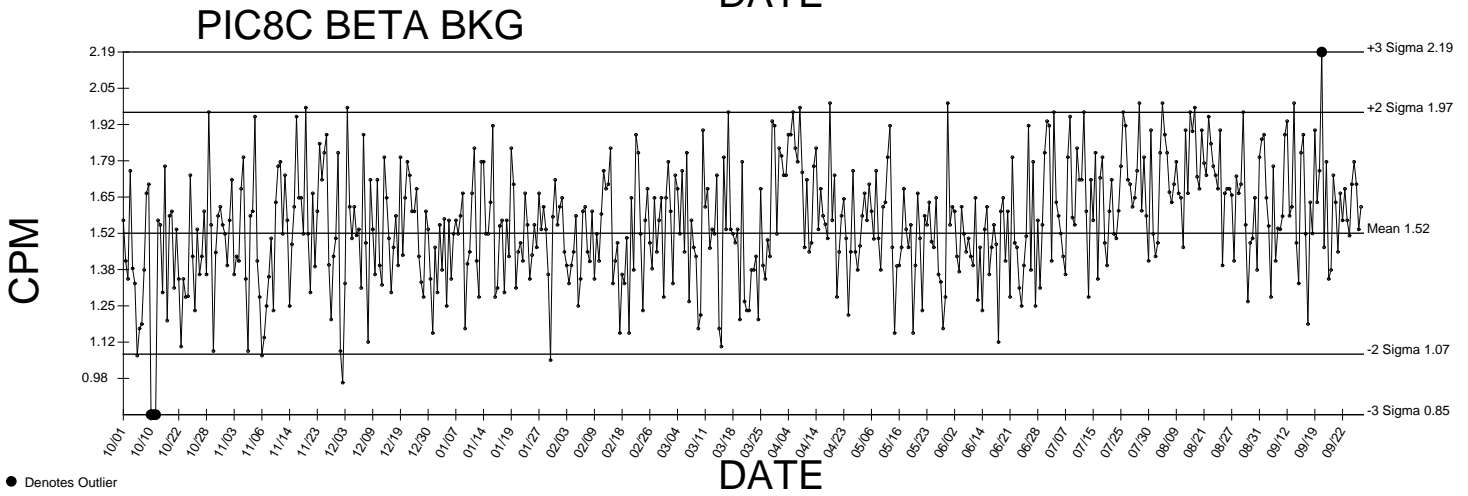
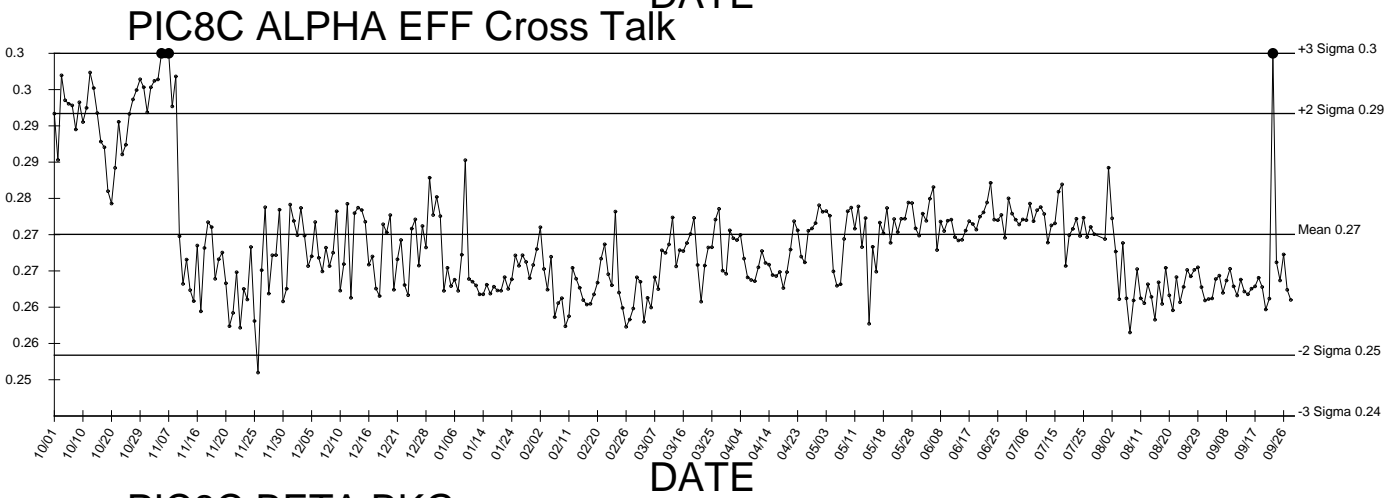
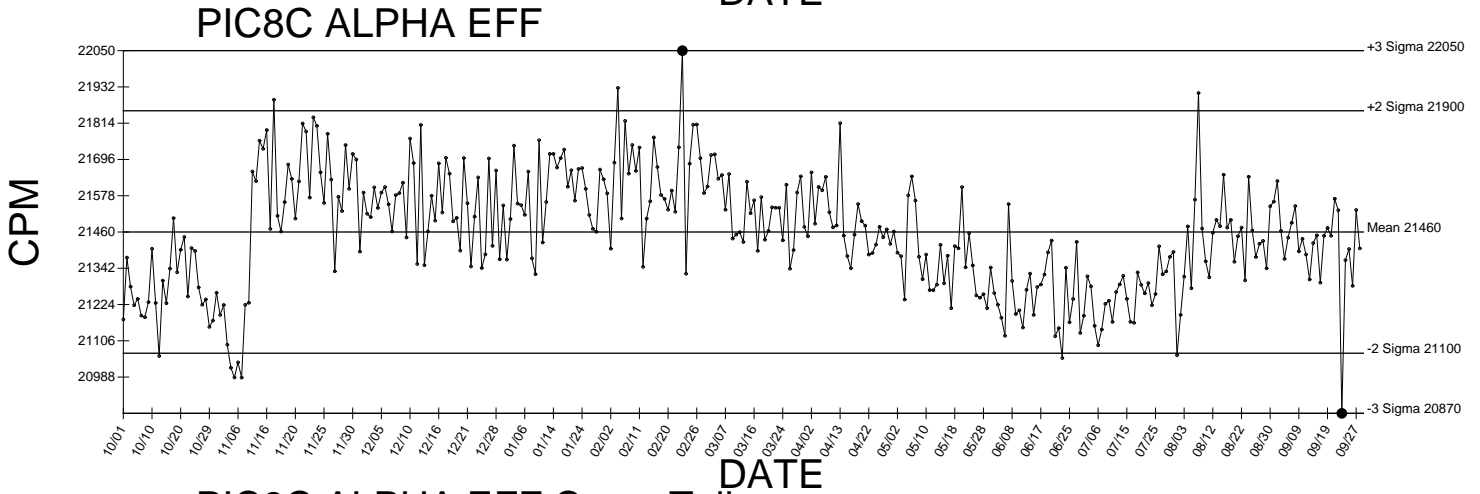
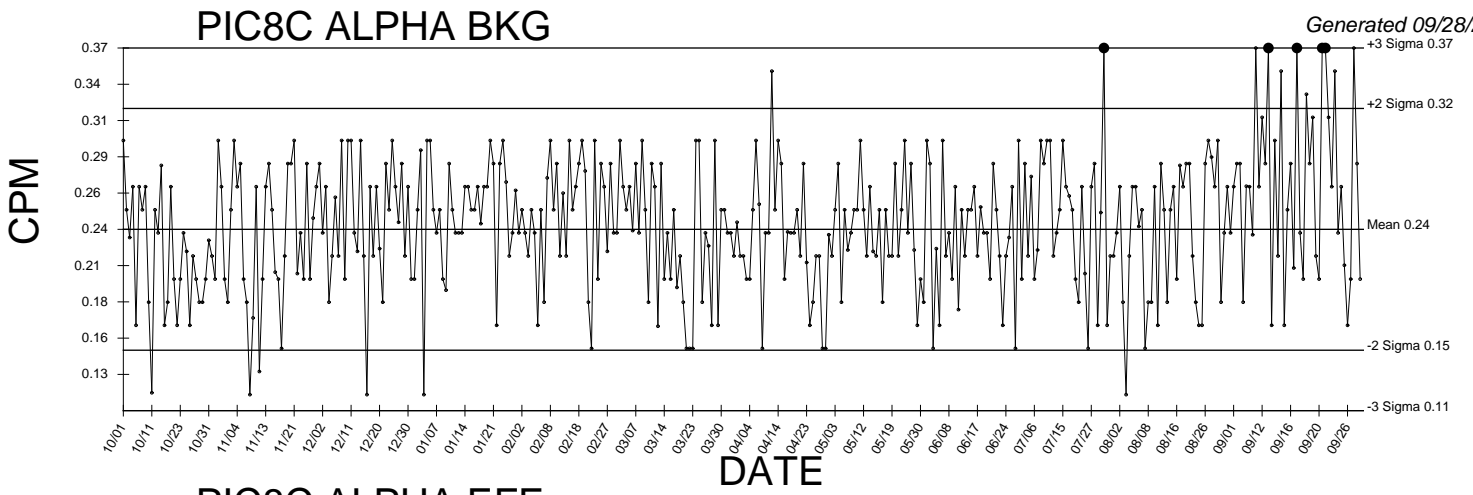
● Denotes Outlier



● Denotes Outlier



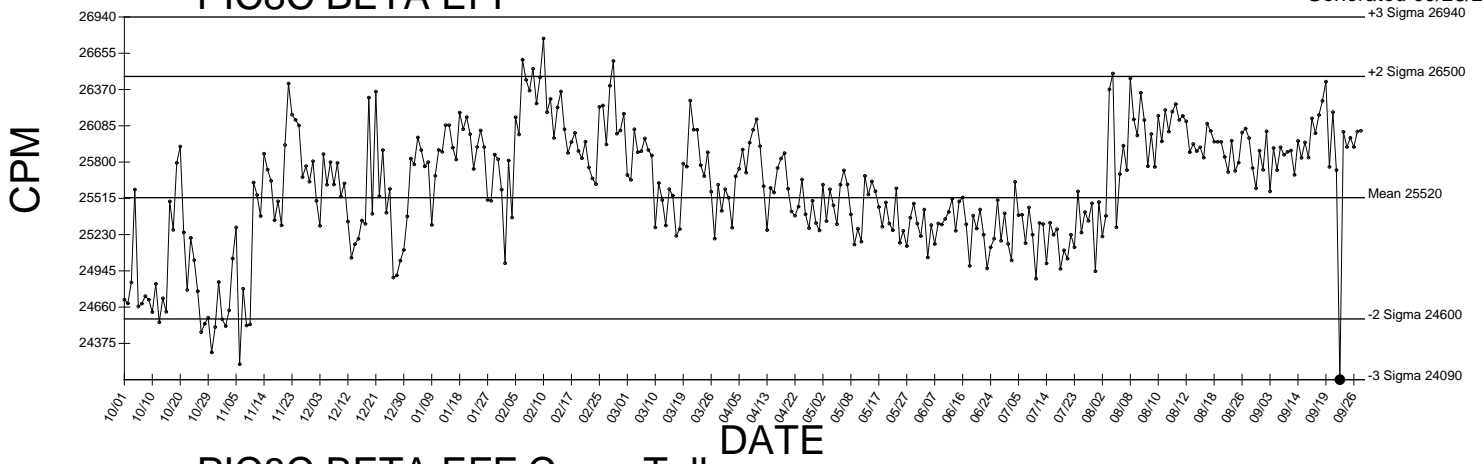
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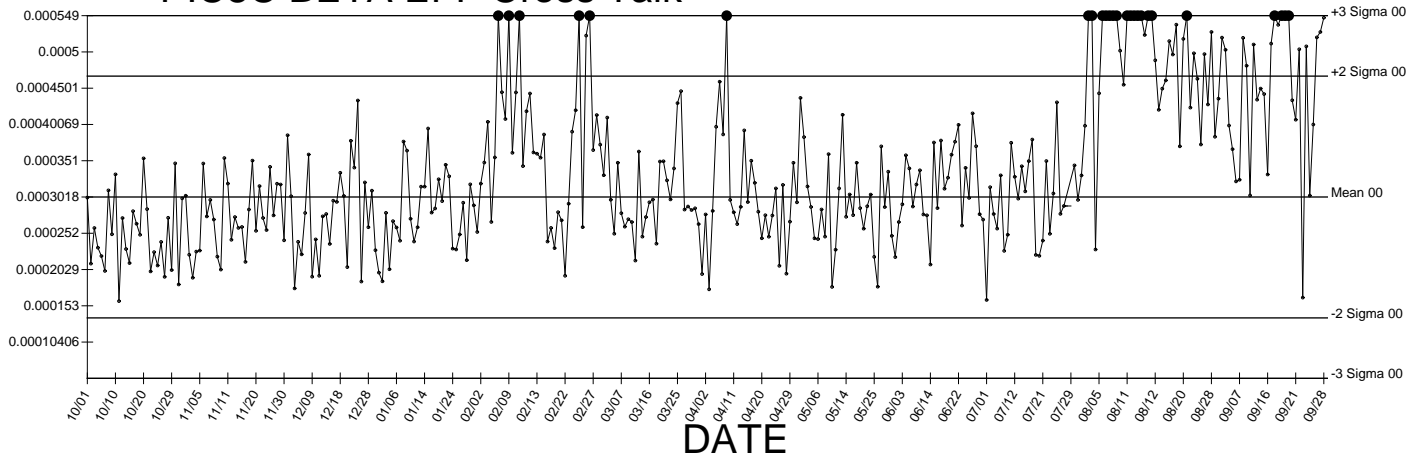
● Denotes Outlier

PIC8C BETA EFF

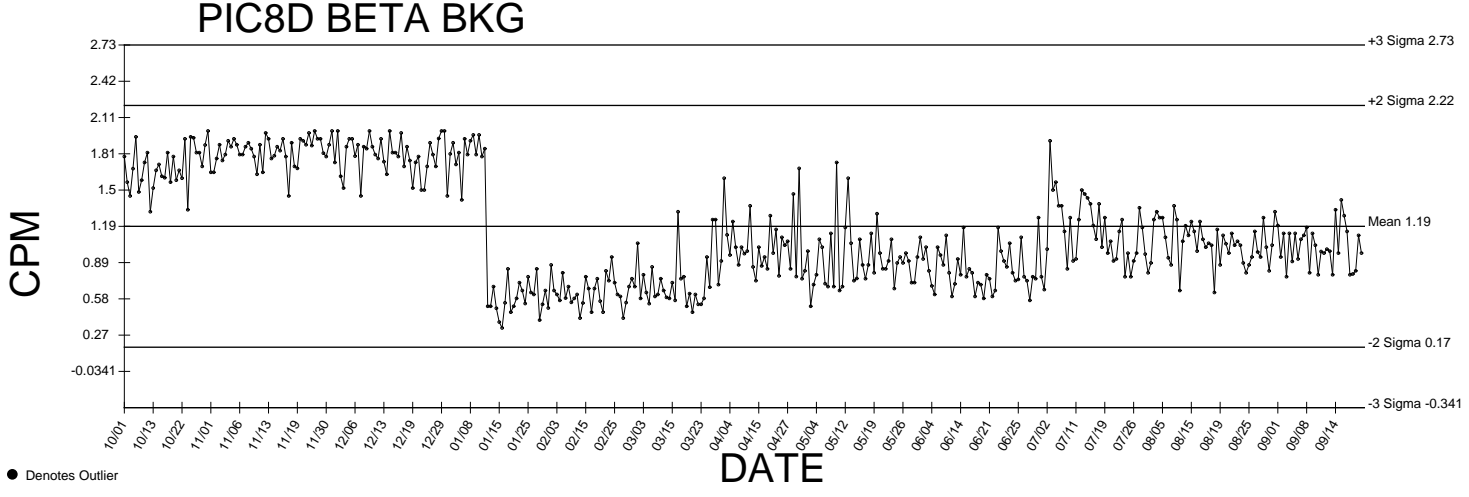
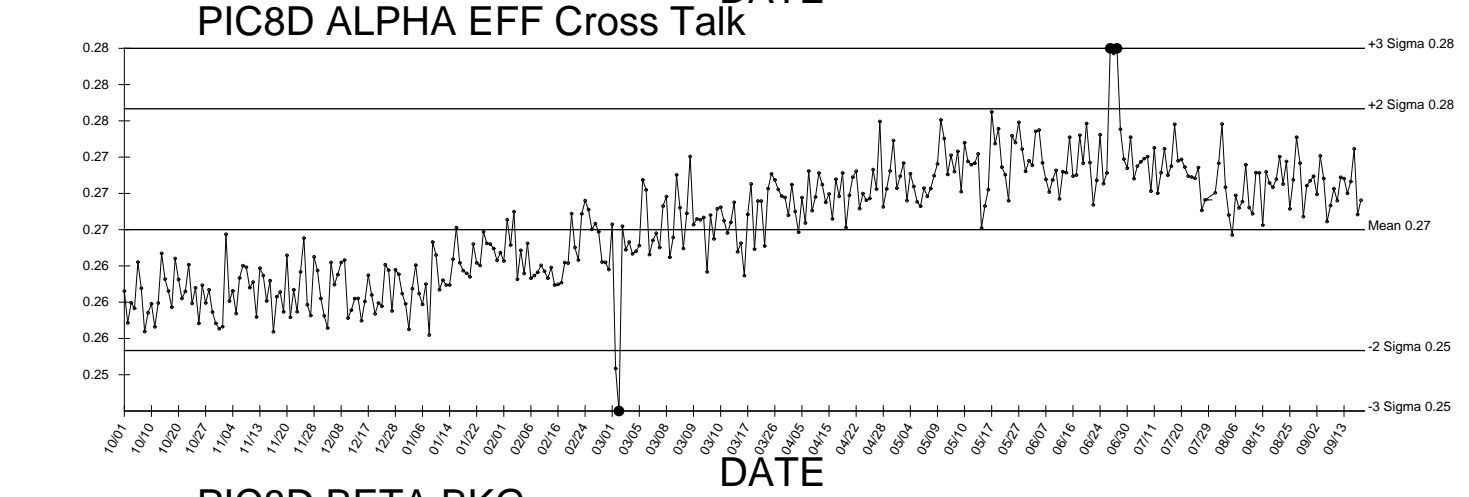
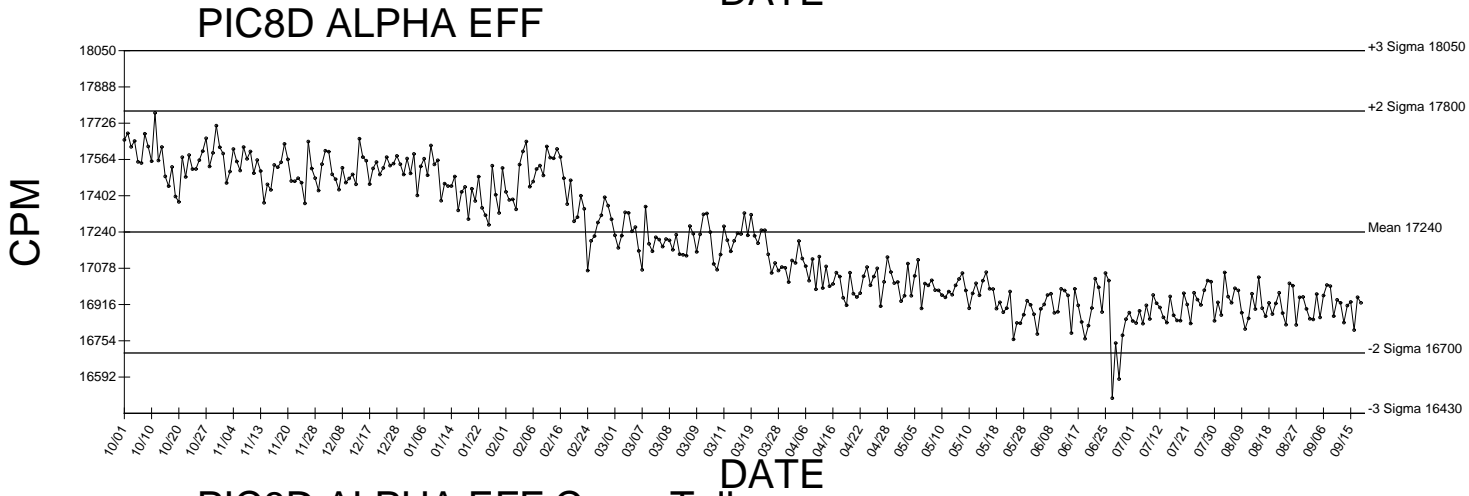
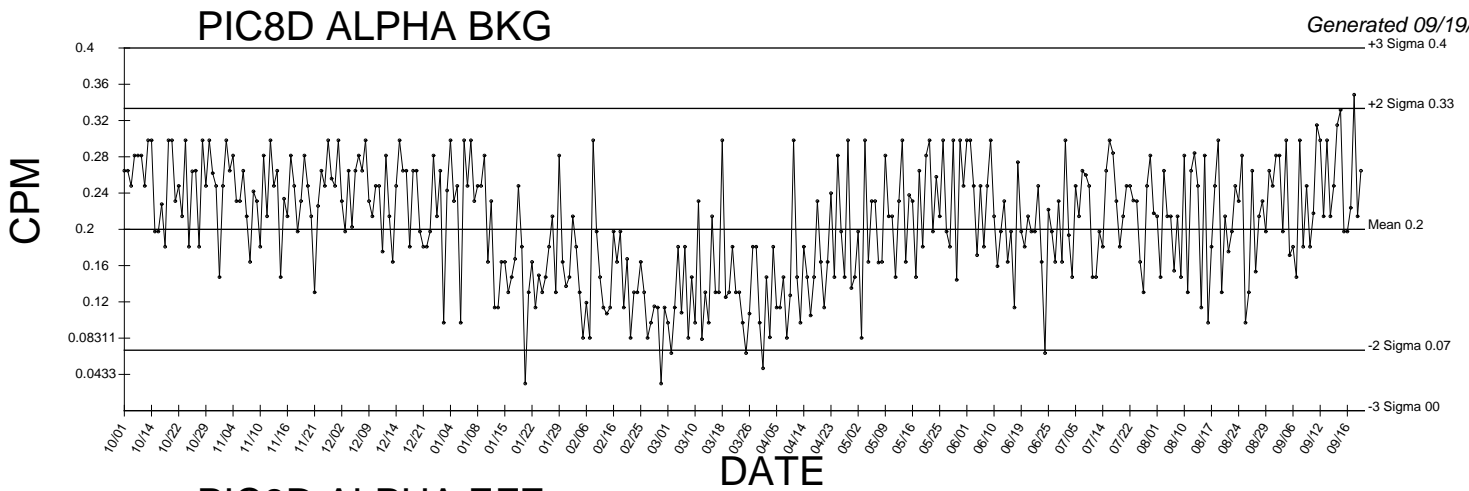
Generated 09/28/2016



PIC8C BETA EFF Cross Talk



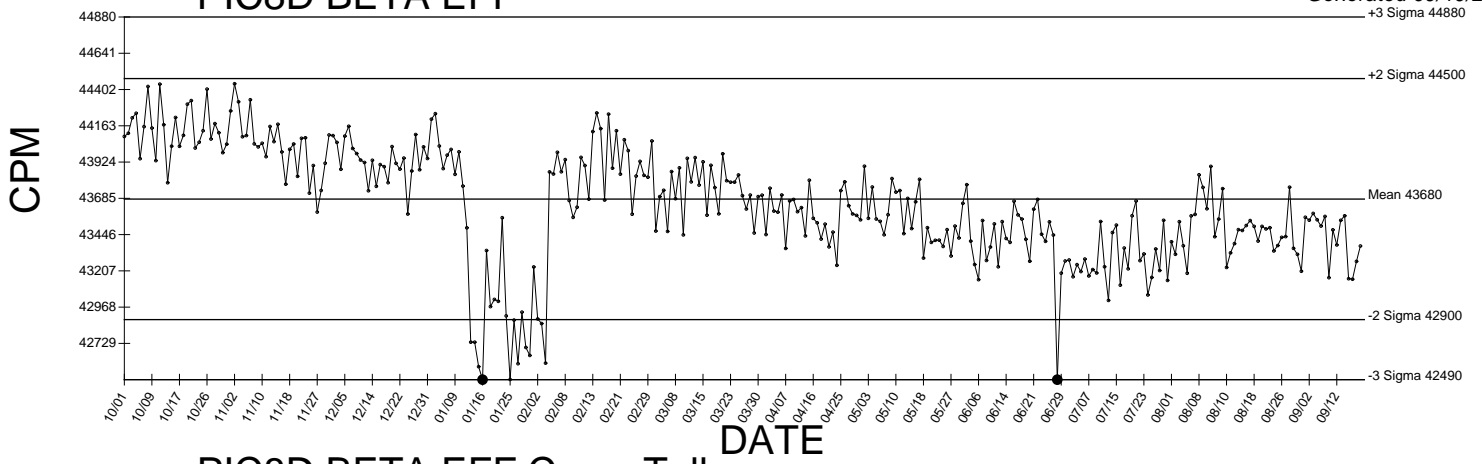
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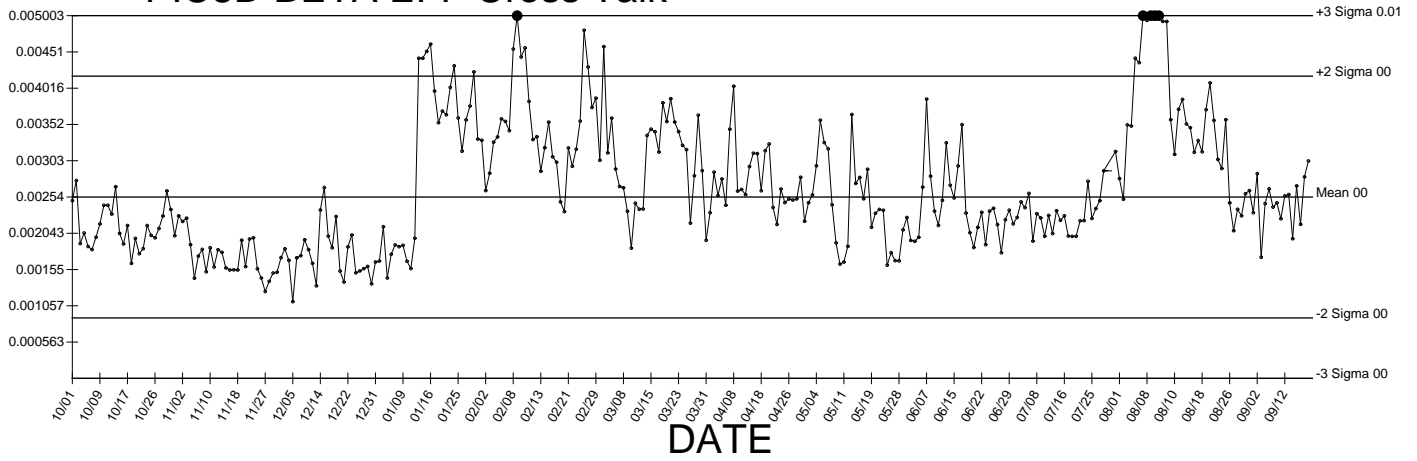
● Denotes Outlier

PIC8D BETA EFF

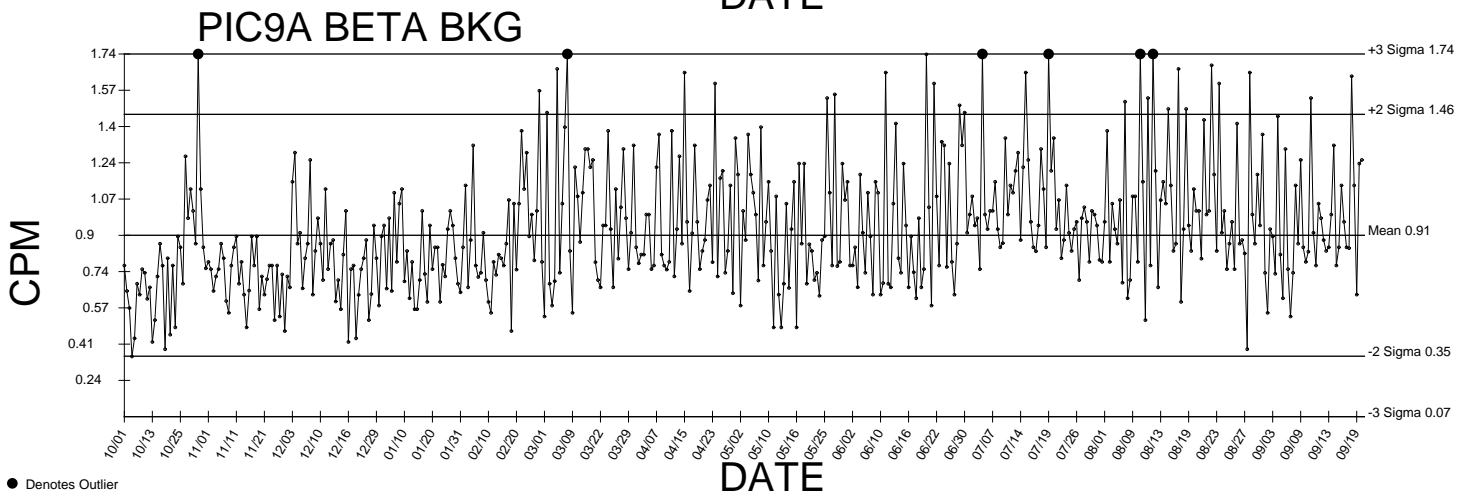
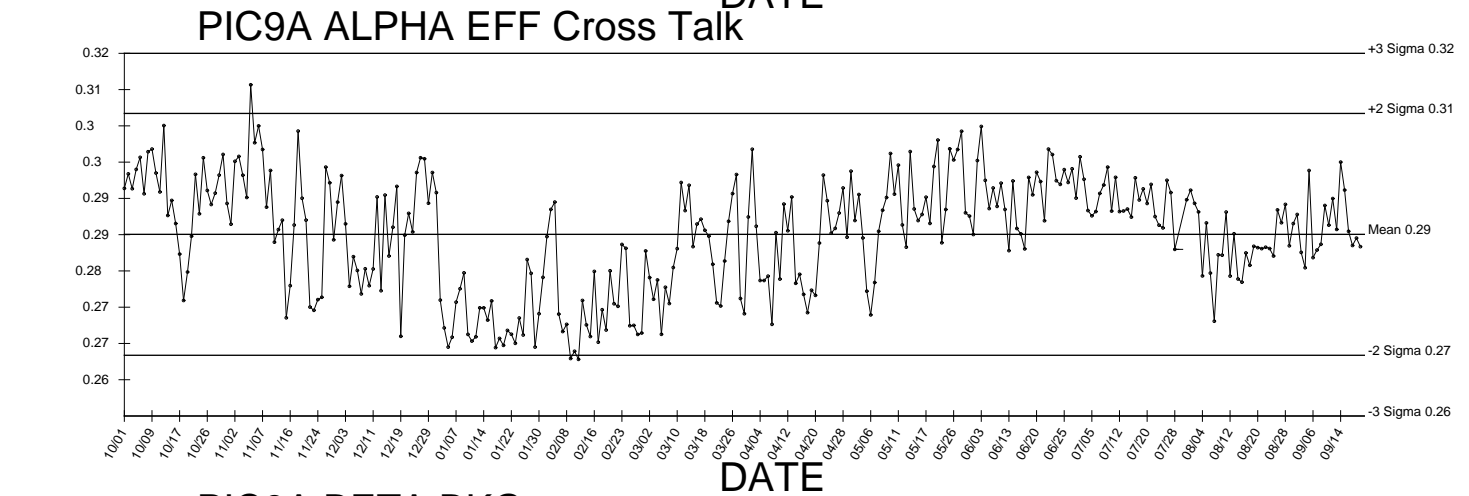
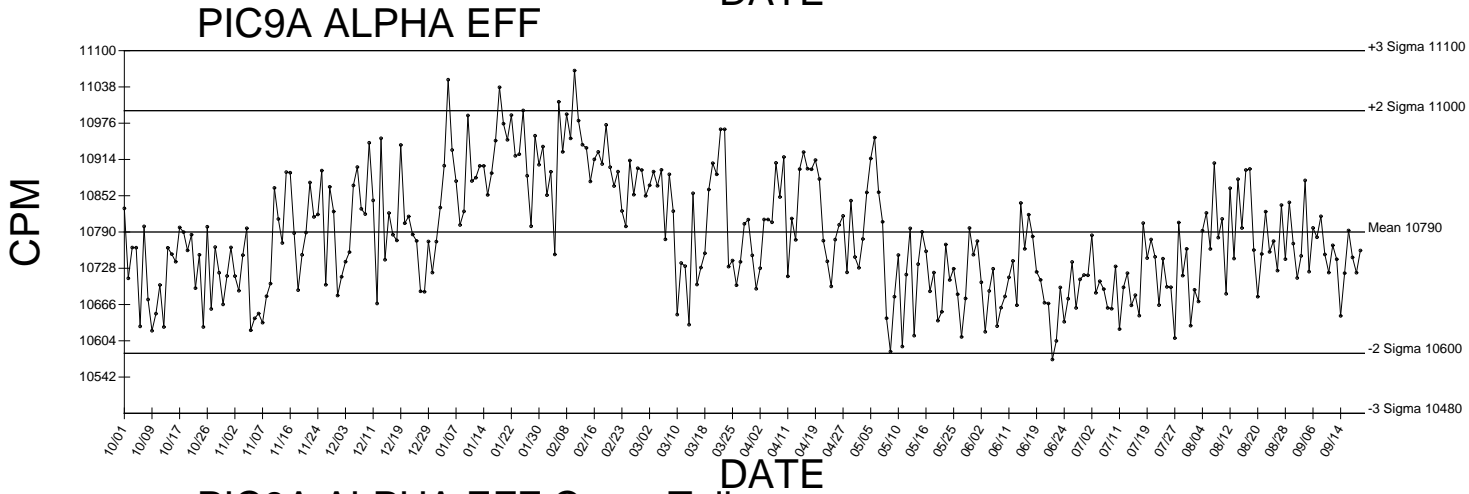
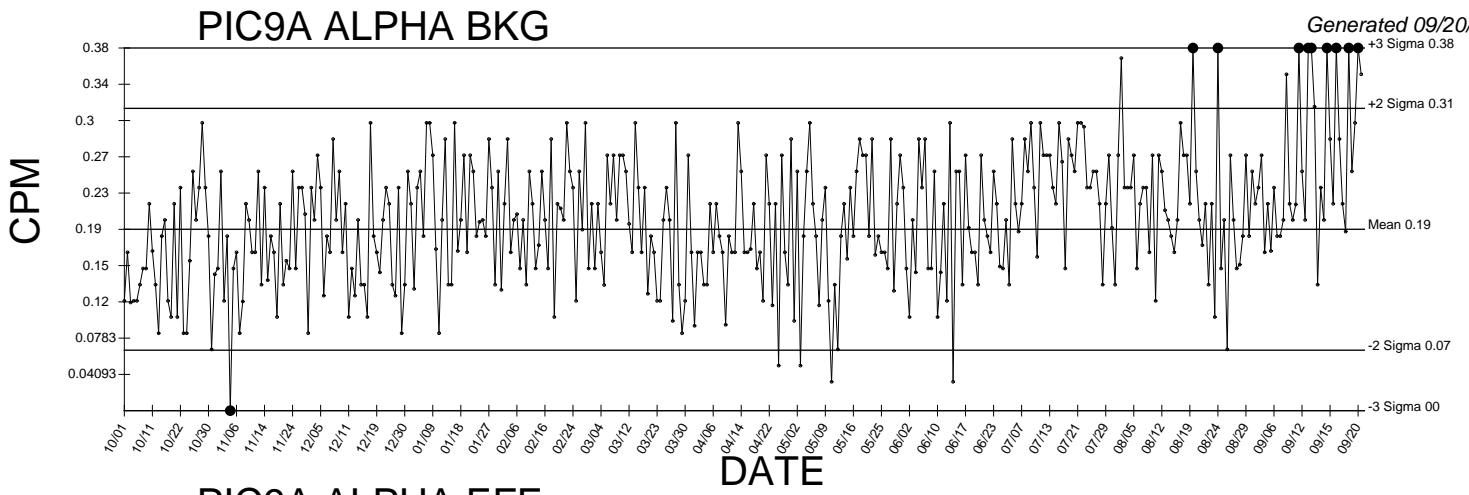
Generated 09/19/2016



PIC8D BETA EFF Cross Talk

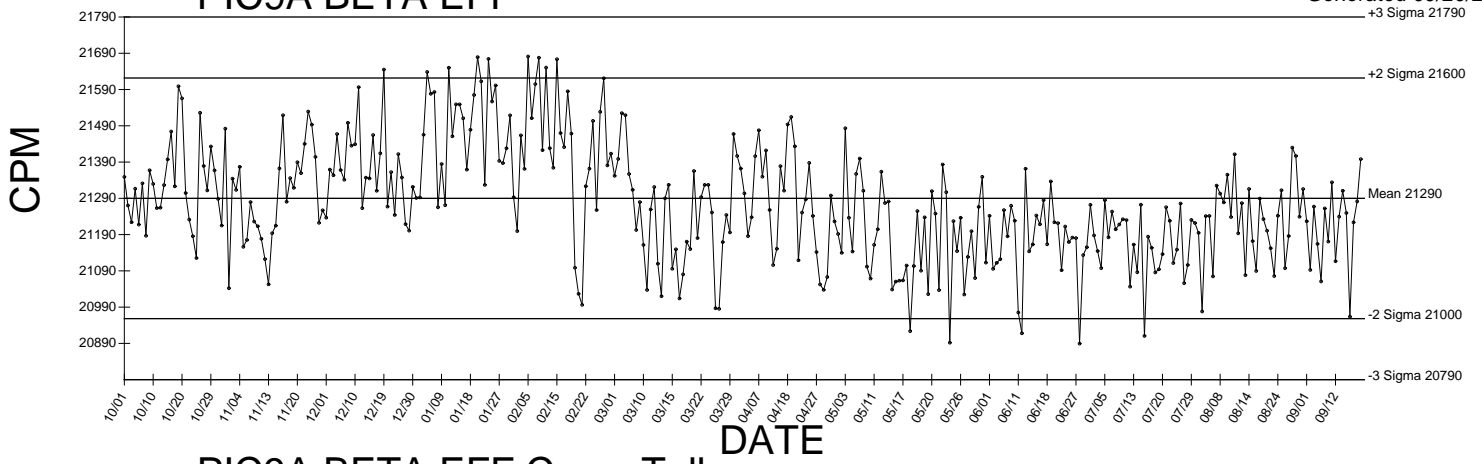


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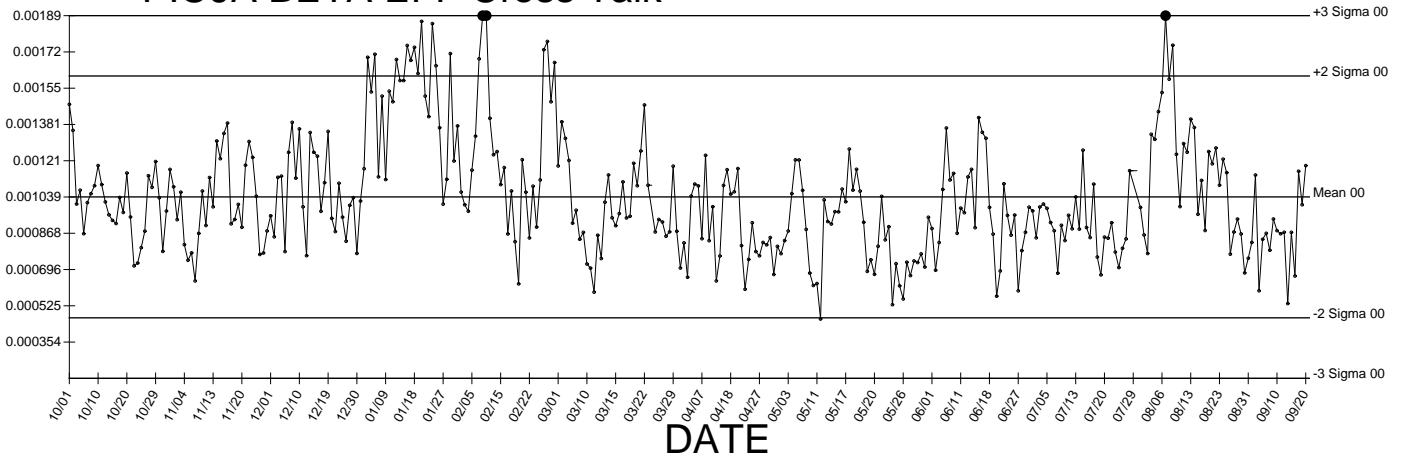


PIC9A BETA EFF

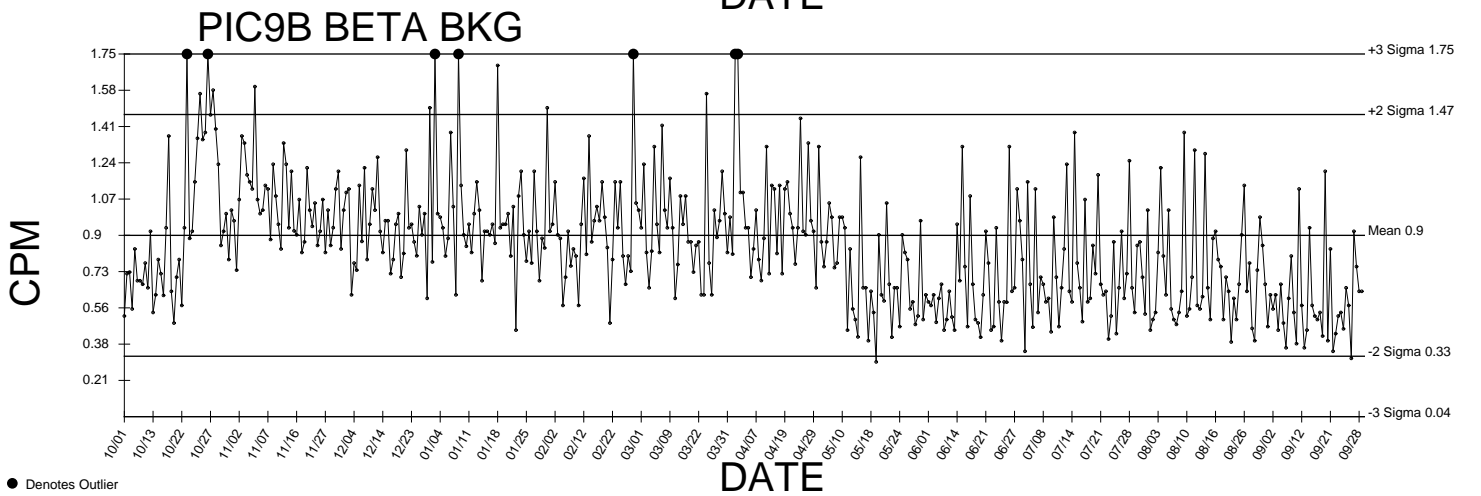
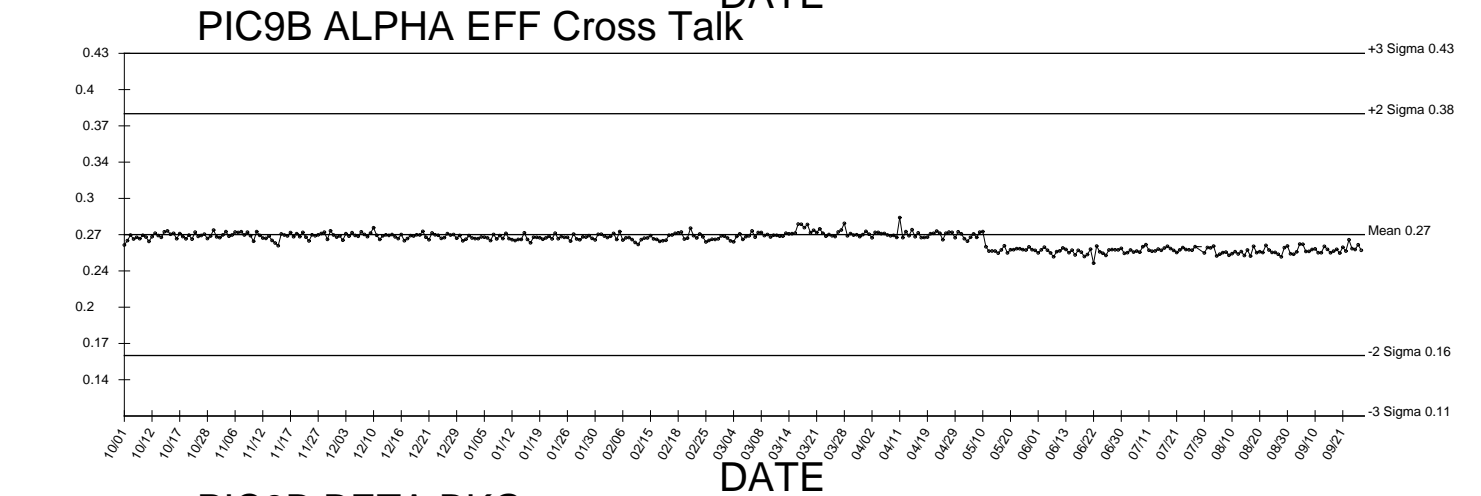
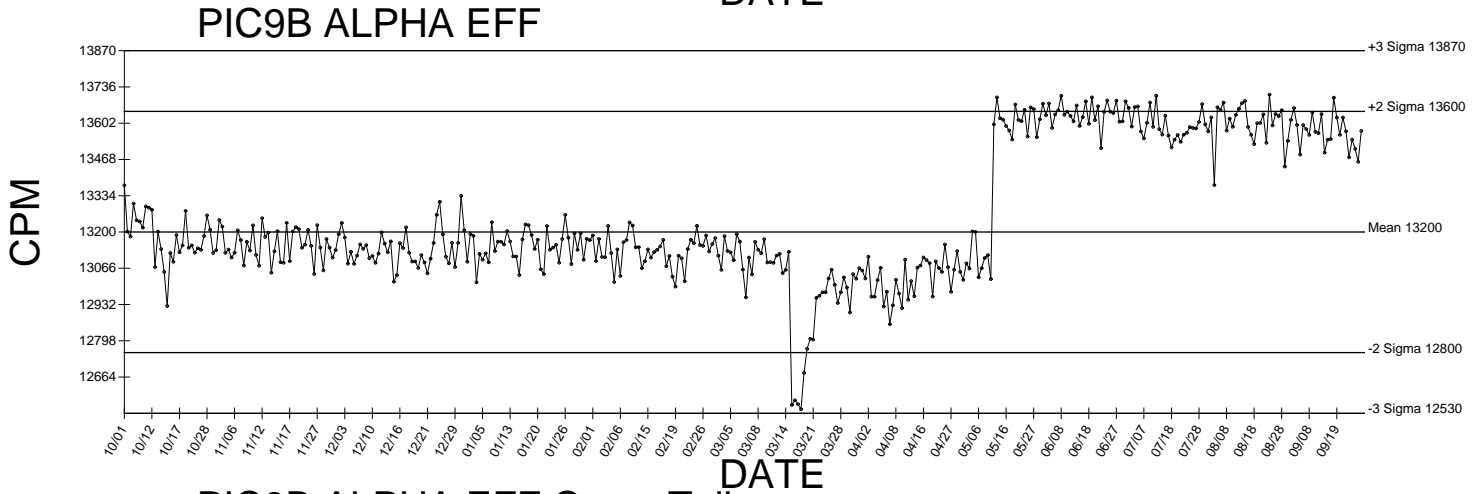
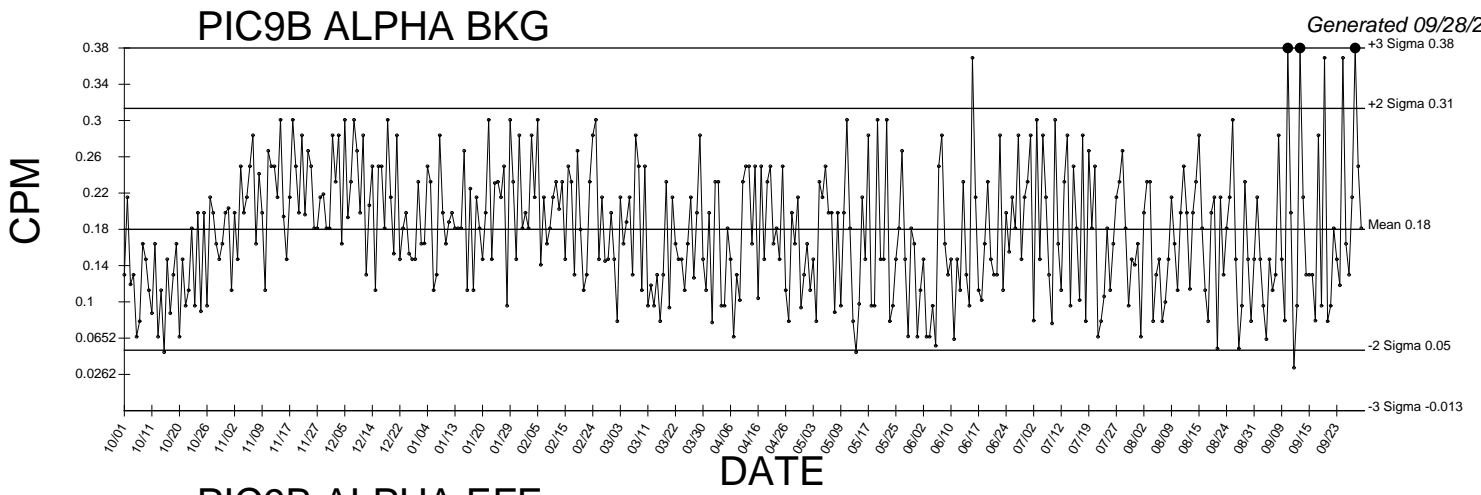
Generated 09/20/2016



PIC9A BETA EFF Cross Talk



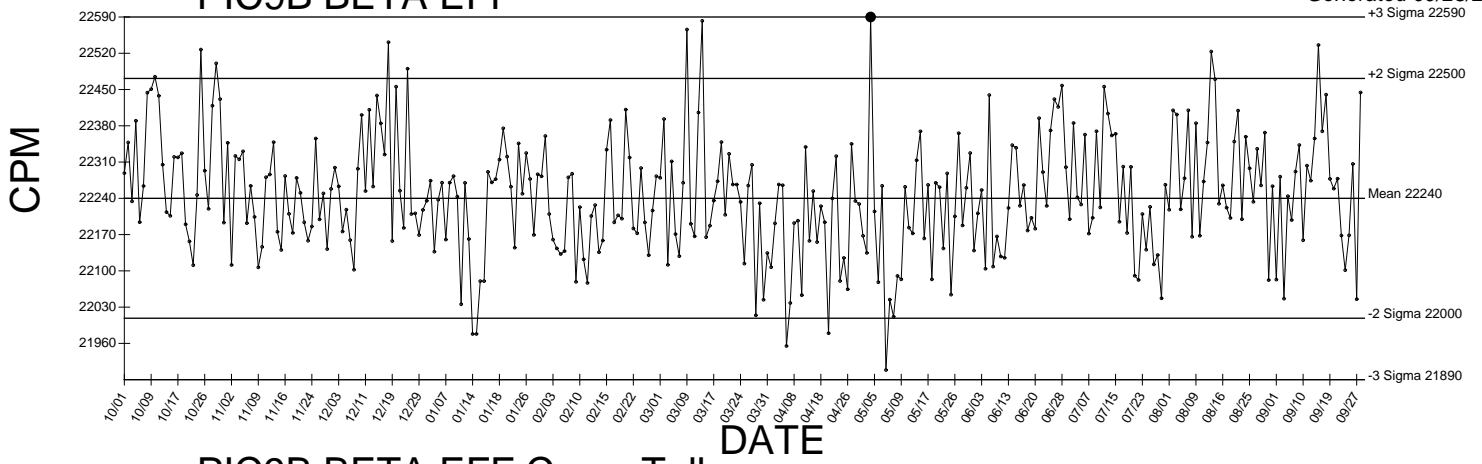
● Denotes Outlier



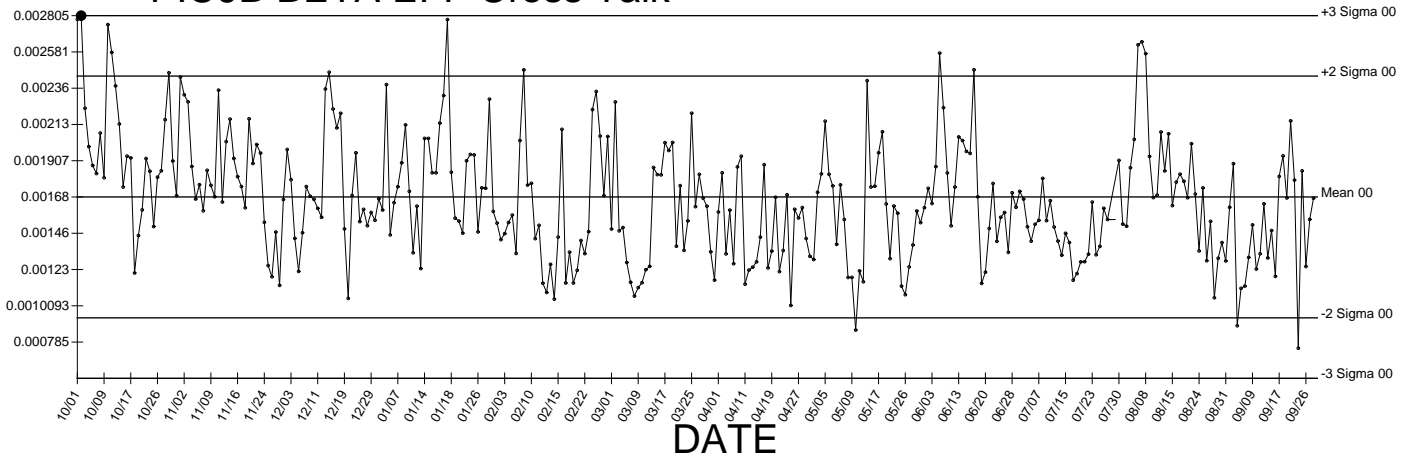
● Denotes Outlier

PIC9B BETA EFF

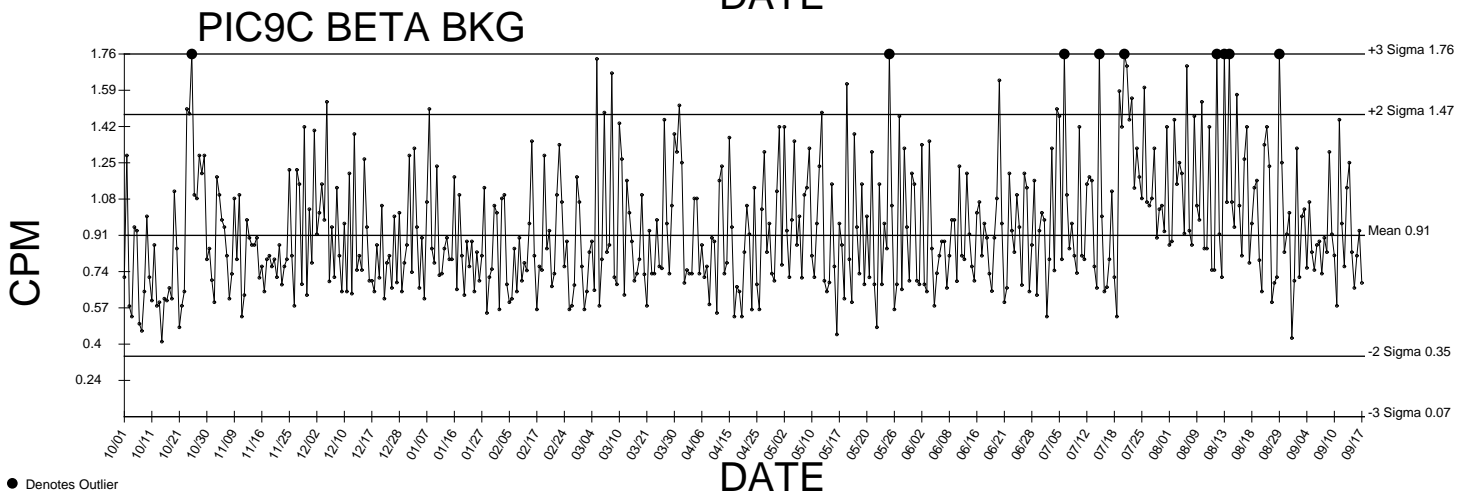
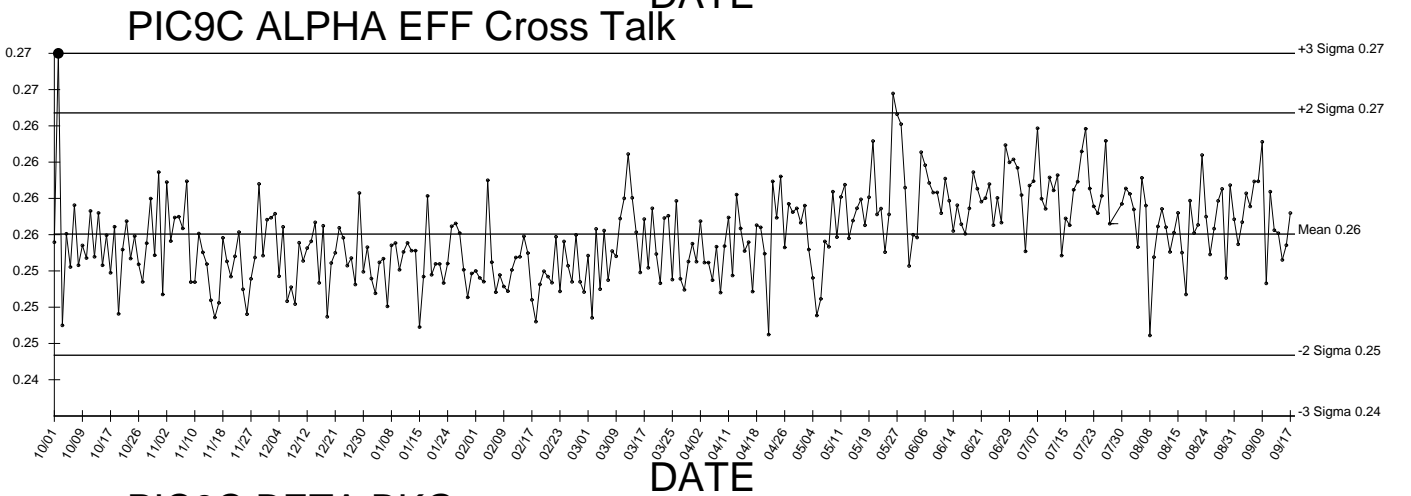
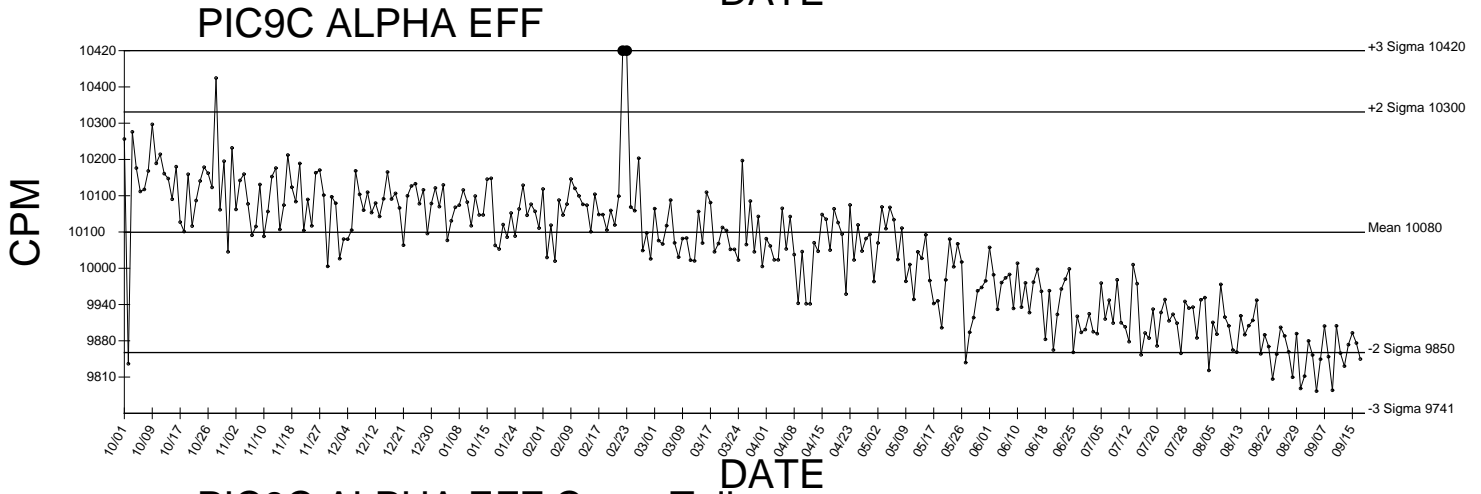
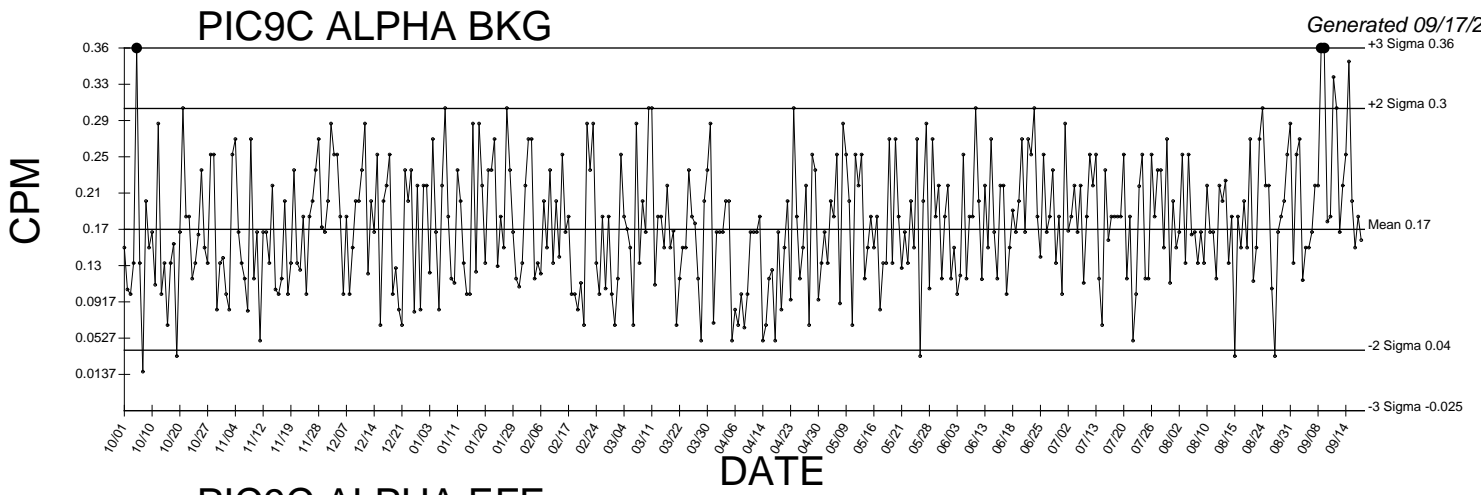
Generated 09/28/2016



PIC9B BETA EFF Cross Talk



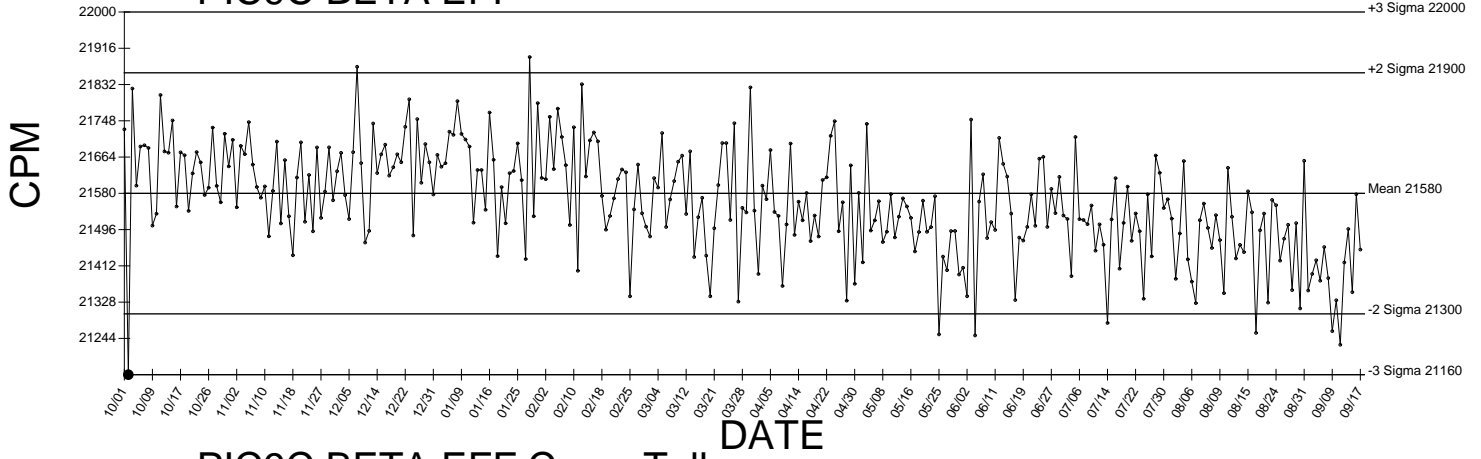
● Denotes Outlier



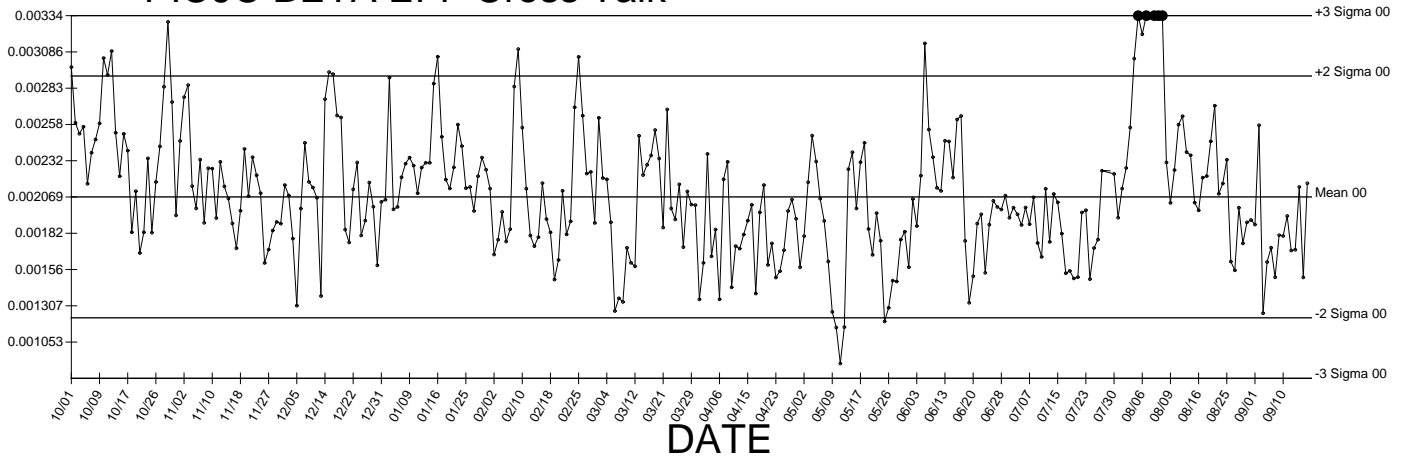
● Denotes Outlier

PIC9C BETA EFF

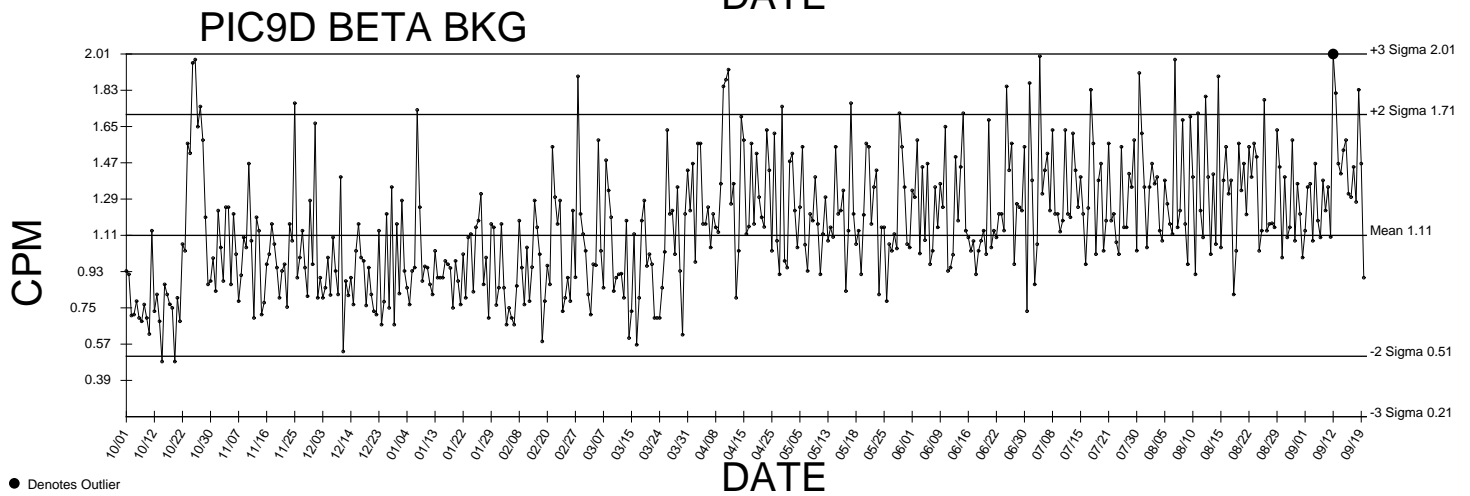
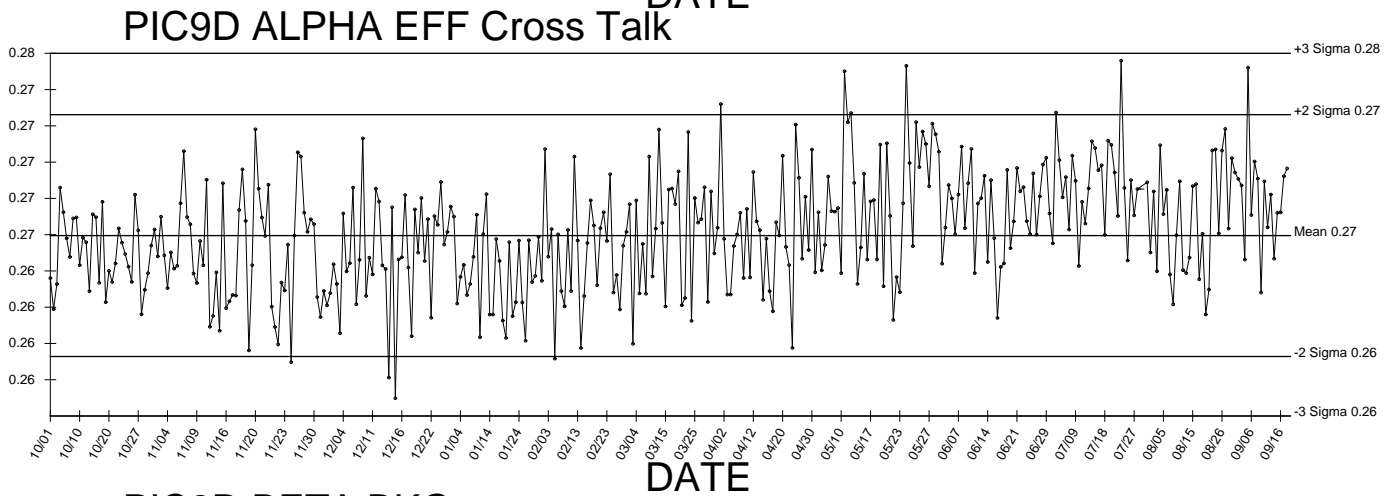
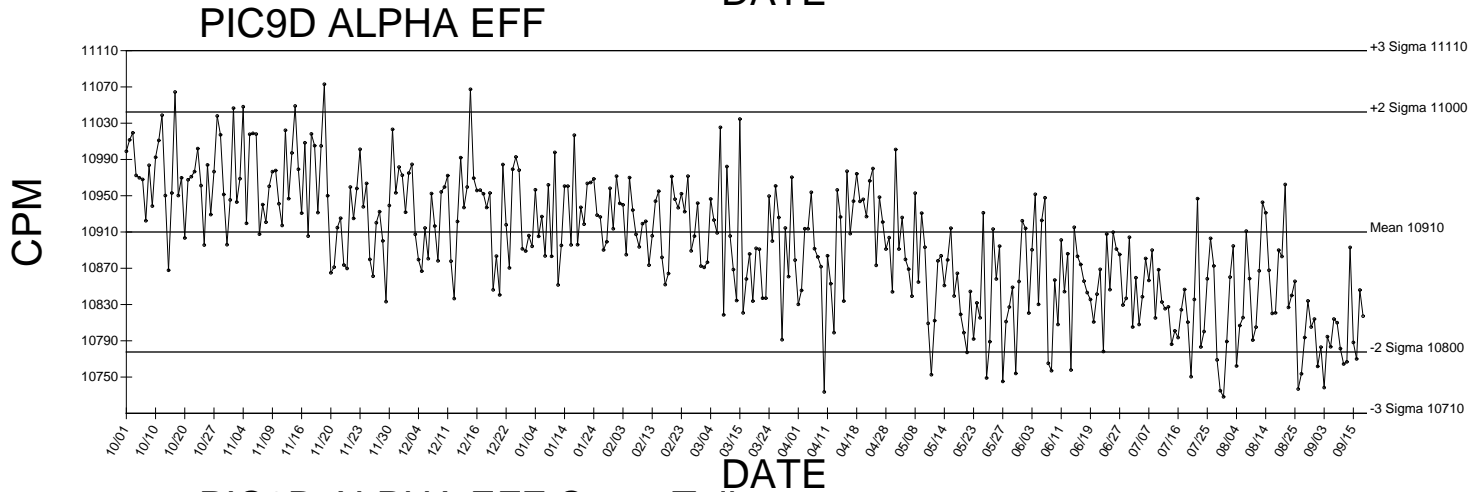
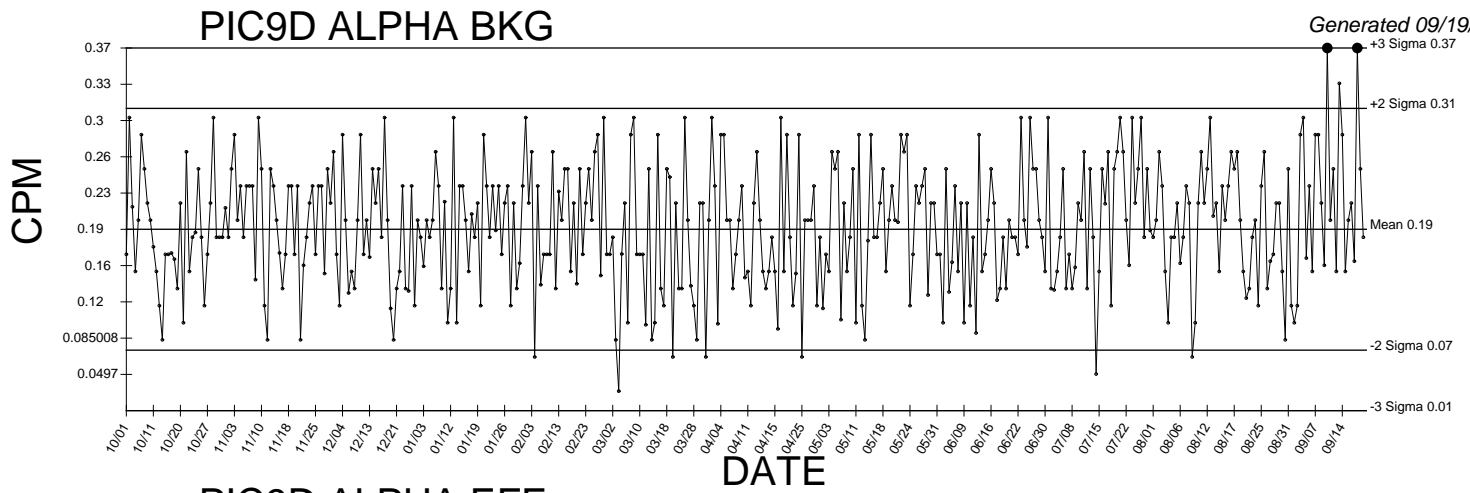
Generated 09/17/2016



PIC9C BETA EFF Cross Talk



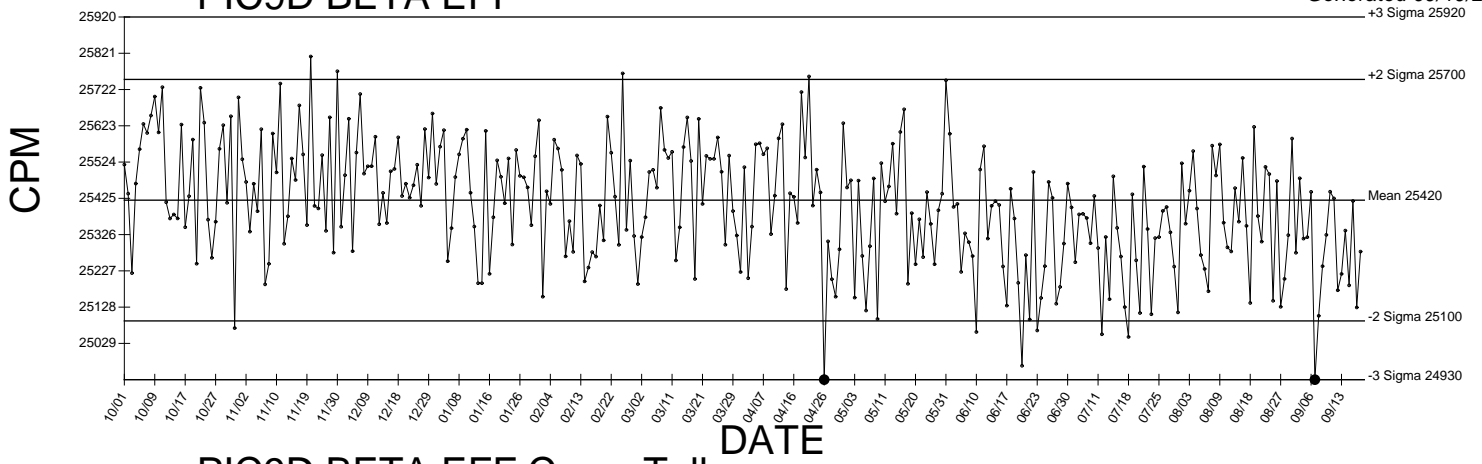
● Denotes Outlier



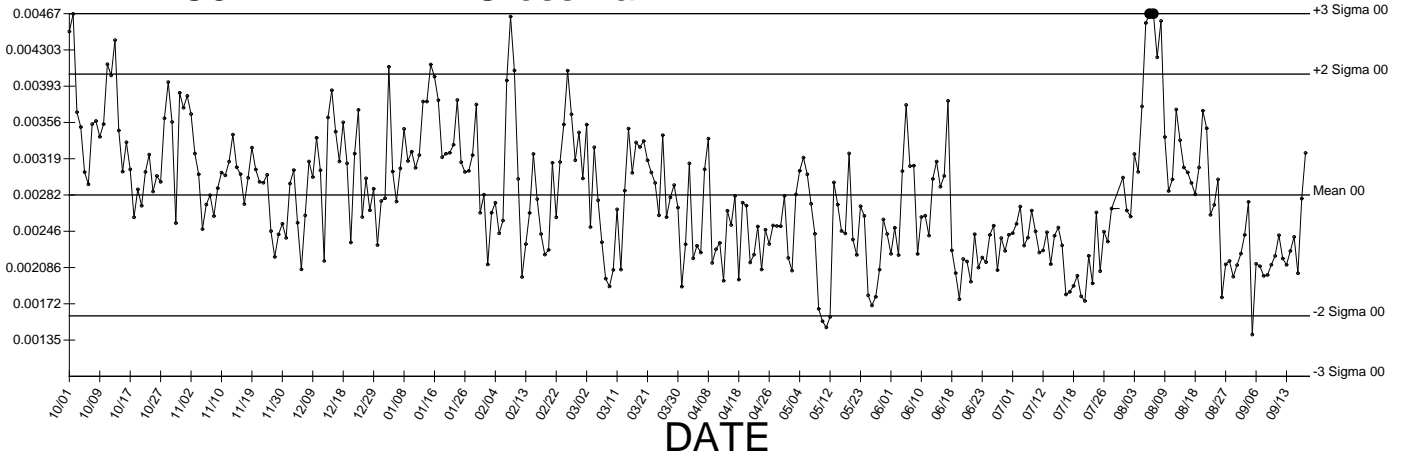
● Denotes Outlier

PIC9D BETA EFF

Generated 09/19/2016



PIC9D BETA EFF Cross Talk



● Denotes Outlier

RAD Standards Traceability

Standardization of Strontium Carrier 2414995

v1.2.1

Analyst	KSD1
---------	------

Standard Information	
Isotope	Strontium
Serial Number	2414995
Amount of Std. (mL)	1.0
Standard Prepared	6/3/2016

Parent Information	
Parent Serial #	2130147.5
Parent Exp. Date	6/3/2018

Std #	Weight of carrier added (g)	Weight of crucible or filter (g)	Weight of crucible or filter + ppt. (g)	Weight of ppt. (g)	mg Strontium/mL	mg Strontium/g
1	1.0104	0.0242	0.0388	0.0146	14.60	14.45
2	1.0136	0.0244	0.0392	0.0148	14.80	14.60
3	1.0191	0.0242	0.0390	0.0148	14.80	14.52
4	1.0214	0.0244	0.0391	0.0147	14.70	14.39

Mean Value (mg/mL) = 14.73
 Stdev (mg/mL) = ± 0.10
 1.0% of Mean Value = 0.147250

Pass

Expiration Date 6/3/2017

Mean Value (mg/1.0mL) = 14.73

Standardization Rule

A satisfactory standardization is obtained when results give a standard deviation of less than 1.0% of the mean value.

Handwritten notes:
 2/4/16
 126
 9/17/16



Eckert & Ziegler
Analytcs

1380 Seaboard Industrial Blvd.
 Atlanta, Georgia 30318
 Tel 404-352-8677
 Fax 404-352-2837
 www.analytcsinc.com

CERTIFICATE OF CALIBRATION
 Standard Radionuclide Source

1243

78352-278

Sr-90 10 mL Liquid in Flame Sealed Vial

Customer: General Engineering Labs/Charleston, SC
P.O. No.: 7312 RD, Item 3

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

Isotope:	Sr-90
Activity (Bq):	3.856 E5
Half-Life:	28.79 years
Calibration Date:	October 1, 2008 12:00 EST
Relative Expanded Uncertainty (k=2):	1.7%

Comments:

Impurities: γ -impurities <0.1%
 10.41484 grams 0.1M HCl solution with 30 μ g/g Sr carrier.

NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

Source Prepared By: W. Mao
 W. Mao, Radiochemist

QA Approved: D. M. Montgomery
 D. M. Montgomery, QA Manager

Date: 10/3/08





Standard Traceability Log Rad

Source Material Info	
Parent Code:	1243
Prepared By:	Daniel Roy
Carrier Conc:	0.1M HCL
Reference Date:	10/01/2008
Ampoule Mass (g):	10.41484 g
Uncertainty:	+/- .85 %
LogBook No:	RC-S-048-124

A Solution Material Info			
Isotope:	Strontium-90		
Prepared By:	Daniel Roy		
Prep Date:	12/19/2008		
Verification Date:	09/27/2016		
Expiration Date:	09/27/2017		
Primary Code:	1243-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	10.2164 g		
Density(g/mL):	0.9991	Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parent Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parent Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(10.2164 \text{ g}) * (385600 \text{ Bq}) * (60 \text{ dpm/Bq}) / (10.41484 \text{ g} * 100 \text{ mL}) = 226951.7634 \text{ dpm/mL}$
$(10.2164 \text{ g}) * (385600 \text{ Bq}) * (60 \text{ dpm/Bq}) / (0.9991 \text{ g/mL}) / (10.41484 \text{ g} * 100 \text{ mL}) = 227146.2010 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
01/21/2010	Bethany Fiem	2.2467	1000	1243-B	510.329369 dpm/mL	01/21/2010	01/21/2011
08/03/2010	Bethany Fiem	2.5604	1000	1243-C	581.5851 dpm/mL	08/03/2010	08/03/2011
01/12/2011	Bethany Fiem	2.4946	1000	1243-D	566.6389 dpm/mL	01/12/2011	01/12/2012
08/12/2011	Tim Chandler	3.3115	100	1243-G	18.7877 dpm/mL	03/26/2014	03/25/2015
08/17/2011	Tim Chandler	2.5541	100	1243-H	14.49064 dpm/mL	03/26/2014	03/25/2015
06/21/2011	Tim Chandler	.0235	100	1243-E	53.37936 dpm/mL	03/19/2014	06/20/2014
07/05/2011	Bethany Fiem	2.6072	1000	1243-F	592.2156 dpm/mL	07/05/2011	07/05/2012
01/31/2012	Gregory Ramsay	2.6792	1000	1243-I	608.5701 dpm/ml	01/31/2012	01/31/2013

08/29/2012	Bethany Fiem	2.6799	1000	1243-J	608.729104 dpm/mL	09/14/2012	09/11/2013
02/12/2013	Gregory Ramsay	2.6526	1000	1243-K	602.528 dpm/ml	01/15/2014	01/15/2015
12/04/2013	Gregory Ramsay	2.5347	1000	1243-L	575.747476 dpm/ml	12/04/2013	12/04/2014
08/11/2014	Gregory Ramsay	2.7006	1000	1243-M	613.431 dpm/mL	08/12/2014	08/12/2015
05/06/2015	Gregory Ramsay	2.5102	1000	1243-N	570.1824 dpm/mL	05/06/2015	05/06/2016
12/18/2015	Gregory Ramsay	2.5762	1000	1243-O	585.174 dpm/mL	12/18/2015	12/18/2016
08/30/2016	Christina Kimball	.068	250	1243-P	61.7838 dpm/mL	09/07/2016	09/07/2017
09/27/2016	Bethany Fiem	2.6337	1000	1243-Q	598.235 dpm/mL	09/27/2016	09/27/2017

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Sr-90 Standard 1243-O

v1.0.2

Instrument	BLUE
Analyst	BXF1
Verification Prep Date	12/18/2015

Standard Information	
Isotope	Sr-90
Serial Number	1243-O
Isotope Half-life	28.9000 Y
Reference Date	10/1/2008
Ref. Act. (DPM/mL)	585.174
Amount of Std. (mL)	1.0
Standard Prep Date	12/18/2015

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	12/30/2015	88.50	1073.20	39.80
2	12/30/2015	90.20	1062.80	39.80
3	12/30/2015	89.60	1064.60	39.80

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	1033.40	2.017144	512.31	512.31
2	1023.00	2.017144	507.15	507.15
3	1024.80	2.017144	508.04	508.04

dpm/mL
509.17
2.755468033

Mean Value =
Stdev =

Certificate Value* = 491.8
Two sigma = 5.511
10 % of Mean = 50.917
Rule A (Pass/Fail) Pass
% Recovery 103.52%
Rule B (Pass/Fail) Pass
Expiration Date 12/18/2016

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for Sr-90 source 1243-O by transferring 1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecocint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 10 mL of Ecocint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCBLUE for Sr-90 source standard verification. The Sr-90 efficiency calibration which was used for verification calculations was performed on 12/18/2015 using Sr-90 source 1244-A.

Standard results for each verification source was calculated as follows:

$$\text{Source dpm/mL} = (A - B)/(C/D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency (cpm/dpm), and
- D = volume used for standard verification.

RAD-M-001

Handwritten signature and date 12/30/15

Amanda Teh

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

1493

82898-278
5 mL Liquid in Flame Sealed Vial

Customer: GEL Labs, LLC
P.O. No.: 7344 RD, Item 1

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty* , %			Reference Date (12:00 PM EST)
			u_A	u_B	U	
Th-230	2.753E+07	3.942E+04	0.1	0.9	1.8	07/29/2010

***Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

Impurities: γ -impurities < 0.1 %, α -impurities < 0.04 %. 5.10422 grams 0.5M HNO₃ solution.

Source Prepared by: W. Mao
W. Mao, Radiochemist

QA Approved: D. M. Montgomery
D. M. Montgomery, QA Manager Alternate

Date: 7-29-10

RECEIVED
8/3/10





Standard Traceability Log Rad

Source Material Info	
Parent Code:	1493
Prepared By:	Gregory Ramsay
Carrier Conc:	0.5M HNO3
Reference Date:	07/29/2010
Ampoule Mass (g):	5.10422 g
Uncertainty:	+/- 1.8 %
LogBook No:	RC-S-060-040

A Solution Material Info			
Isotope:	Thorium-230		
Prepared By:	Bethany Fiem		
Prep Date:	06/24/2015		
Verification Date:	09/27/2016		
Expiration Date:	09/27/2017		
Primary Code:	1493-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	5.0802 g		
Density(g/mL):	1.0011	Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(5.0802 \text{ g}) * (39420 \text{ Bq}) * (60 \text{ dpm/Bq}) / (5.10422 \text{ g} * 100 \text{ mL}) = 23540.6958 \text{ dpm/mL}$
$(5.0802 \text{ g}) * (39420 \text{ Bq}) * (60 \text{ dpm/Bq}) / (1.0011 \text{ g/mL}) / (5.10422 \text{ g} * 100 \text{ mL}) = 23515.7691 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
06/24/2015	Bethany Fiem	11.3156	1000	1493-B	266.095 dpm/mL	06/08/2016	06/08/2017
09/27/2016	Bethany Fiem	11.4091	1000	1493-C	268.294 dpm/mL	09/27/2016	09/27/2017

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Th-230 Standard 1493-B

v1.0.2

Instrument	BLUE
Analyst	TC1
Verification Prep Date	6/8/2016

Standard Information	
Isotope	Th-230
Serial Number	1493-B
Isotope Half-life	7.5380E+04 Y
Reference Date	7/29/2010
Ref. Act. (DPM/mL)	266.095
Amount of Std. (mL)	1.0
Standard Prep Date	6/24/2015

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	6/8/2016	95.10	312.60	38.67
2	6/8/2016	95.30	306.40	38.67
3	6/8/2016	95.20	312.20	38.67

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	273.93	1.007294	271.95	271.95
2	267.73	1.007294	265.79	265.79
3	273.53	1.007294	271.55	271.55

dpm/mL
 Mean Value = 269.76
 Stdev = 3.444745088
 Certificate Value* = 266.1
 Two sigma = 6.889
 10 % of Mean = 26.976
 Rule A (Pass/Fail) Pass
 % Recovery 101.38%
 Rule B (Pass/Fail) Pass
 Expiration Date 6/8/2017

Verification Rules

- Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for Th-230 source 1493-B by transferring 1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecocint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 10 mL of Ecocint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCBLUE for Th-230 source standard verification. The Th-230 efficiency calibration which was used for verification calculations was performed on 6/8/2016 using Th-230 source 1759-A.

Standard results for each verification source was calculated as follows:

$$\text{Source dpm/mL} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency (cpm/dpm), and
- D = volume used for standard verification.

RAD-M-001

TC1
6-8-16

Runlogs

Instrument Run Log

Instrument Type: GFPC

Batch ID: 1597795

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235001	SAMPLE	KSD1	PIC11C	SEP-17-16 15:50:52	DONE	Tuffryn Filter	01-APR-16 00:00
405235003	SAMPLE	KSD1	PIC12A	SEP-17-16 15:51:00	DONE	Tuffryn Filter	01-APR-16 00:00
405235004	SAMPLE	KSD1	PIC12B	SEP-17-16 15:51:04	DONE	Tuffryn Filter	01-APR-16 00:00
405235005	SAMPLE	KSD1	PIC12C	SEP-17-16 15:51:07	DONE	Tuffryn Filter	01-APR-16 00:00
405235006	SAMPLE	KSD1	PIC12D	SEP-17-16 15:51:13	DONE	Tuffryn Filter	01-APR-16 00:00
405235007	SAMPLE	KSD1	PIC13B	SEP-17-16 15:51:17	DONE	Tuffryn Filter	01-APR-16 00:00
405235008	SAMPLE	KSD1	PIC13D	SEP-17-16 15:51:20	DONE	Tuffryn Filter	01-APR-16 00:00
405235009	SAMPLE	KSD1	PIC14C	SEP-17-16 15:51:24	DONE	Tuffryn Filter	01-APR-16 00:00
405235010	SAMPLE	KSD1	PIC14D	SEP-17-16 15:51:27	DONE	Tuffryn Filter	01-APR-16 00:00
405235016	SAMPLE	KSD1	PIC10A	SEP-17-16 16:31:16	DONE	Tuffryn Filter	01-APR-16 00:00
405235011	SAMPLE	KSD1	PIC1A	SEP-17-16 16:32:09	DONE	Tuffryn Filter	01-APR-16 00:00
405235012	SAMPLE	KSD1	PIC1B	SEP-17-16 16:32:14	DONE	Tuffryn Filter	01-APR-16 00:00
405235013	SAMPLE	KSD1	PIC1C	SEP-17-16 16:32:17	DONE	Tuffryn Filter	01-APR-16 00:00
405235014	SAMPLE	KSD1	PIC4B	SEP-17-16 16:32:22	DONE	Tuffryn Filter	01-APR-16 00:00
405235015	SAMPLE	KSD1	PIC5A	SEP-17-16 16:32:25	DONE	Tuffryn Filter	01-APR-16 00:00
405235017	SAMPLE	KSD1	PIC14A	SEP-17-16 16:34:48	DONE	Tuffryn Filter	01-APR-16 00:00
1203625399	DUP	KSD1	PIC6A	SEP-17-16 16:39:23	DONE	Tuffryn Filter	01-APR-16 00:00
1203625400	LCS	KSD1	PIC6B	SEP-17-16 16:39:25	DONE	Tuffryn Filter	01-APR-16 00:00
405235018	SAMPLE	KSD1	PIC3B	SEP-17-16 16:40:28	DONE	Tuffryn Filter	01-APR-16 00:00
405235019	SAMPLE	KSD1	PIC5B	SEP-17-16 16:40:32	DONE	Tuffryn Filter	01-APR-16 00:00
405235020	SAMPLE	KSD1	PIC5C	SEP-17-16 16:40:38	DONE	Tuffryn Filter	01-APR-16 00:00
1203625398	MB	KSD1	PIC5D	SEP-17-16 16:40:43	DONE	Tuffryn Filter	01-APR-16 00:00
405235002	SAMPLE	KSD1	PIC6C	SEP-19-16 11:55:11	DONE	Tuffryn Filter	01-APR-16 00:00

Instrument Run Log

Instrument Type: GFPC

Batch ID: 1597796

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235026	SAMPLE	KSD1	PIC6C	SEP-17-16 15:33:38	DONE	Tuffryn Filter	01-APR-16 00:00
405235027	SAMPLE	KSD1	PIC7A	SEP-17-16 15:33:41	DONE	Tuffryn Filter	01-APR-16 00:00
405235028	SAMPLE	KSD1	PIC7B	SEP-17-16 15:33:45	DONE	Tuffryn Filter	01-APR-16 00:00
405235029	SAMPLE	KSD1	PIC7C	SEP-17-16 15:33:47	DONE	Tuffryn Filter	01-APR-16 00:00
405235030	SAMPLE	KSD1	PIC7D	SEP-17-16 15:33:51	DONE	Tuffryn Filter	01-APR-16 00:00
405235031	SAMPLE	KSD1	PIC8A	SEP-17-16 15:33:56	DONE	Tuffryn Filter	01-APR-16 00:00
405235032	SAMPLE	KSD1	PIC8B	SEP-17-16 15:34:00	DONE	Tuffryn Filter	01-APR-16 00:00
405235034	SAMPLE	KSD1	PIC8D	SEP-17-16 15:34:08	DONE	Tuffryn Filter	01-APR-16 00:00
405235021	SAMPLE	KSD1	PIC5B	SEP-17-16 15:34:17	DONE	Tuffryn Filter	01-APR-16 00:00
405235022	SAMPLE	KSD1	PIC5C	SEP-17-16 15:34:20	DONE	Tuffryn Filter	01-APR-16 00:00
405235023	SAMPLE	KSD1	PIC5D	SEP-17-16 15:34:22	DONE	Tuffryn Filter	01-APR-16 00:00
405235035	SAMPLE	KSD1	PIC9A	SEP-17-16 15:36:47	DONE	Tuffryn Filter	01-APR-16 00:00
405235036	SAMPLE	KSD1	PIC9B	SEP-17-16 15:36:51	DONE	Tuffryn Filter	01-APR-16 00:00
405235037	SAMPLE	KSD1	PIC9C	SEP-17-16 15:36:56	DONE	Tuffryn Filter	01-APR-16 00:00
405235038	SAMPLE	KSD1	PIC9D	SEP-17-16 15:37:00	DONE	Tuffryn Filter	01-APR-16 00:00
405235039	SAMPLE	KSD1	PIC10B	SEP-17-16 15:37:05	DONE	Tuffryn Filter	01-APR-16 00:00
405235040	SAMPLE	KSD1	PIC10C	SEP-17-16 15:37:10	DONE	Tuffryn Filter	01-APR-16 00:00
1203625401	MB	KSD1	PIC10D	SEP-17-16 15:37:15	DONE	Tuffryn Filter	01-APR-16 00:00
1203625402	DUP	KSD1	PIC11A	SEP-17-16 15:45:43	DONE	Tuffryn Filter	01-APR-16 00:00
1203625403	LCS	KSD1	PIC11B	SEP-17-16 15:45:47	DONE	Tuffryn Filter	01-APR-16 00:00
405235025	SAMPLE	KSD1	PIC5A	SEP-19-16 11:54:29	DONE	Tuffryn Filter	01-APR-16 00:00
405235033	SAMPLE	KSD1	PIC5D	SEP-19-16 15:23:45	DONE	Tuffryn Filter	01-APR-16 00:00
405235024	SAMPLE	KSD1	PIC2A	SEP-21-16 10:46:02	DONE	Tuffryn Filter	01-APR-16 00:00

Instrument Run Log

Instrument Type: GFPC

Batch ID: 1597803

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1203625408	MB	KSD1	PIC7C	SEP-22-16 17:18:15	DONE	Tuffryn Filter	01-APR-16 00:00
1203625409	DUP	KSD1	PIC7D	SEP-22-16 17:18:17	DONE	Tuffryn Filter	01-APR-16 00:00
1203625410	LCS	KSD1	PIC8A	SEP-22-16 17:18:20	DONE	Tuffryn Filter	01-APR-16 00:00
405235059	SAMPLE	KSD1	PIC7A	SEP-22-16 17:18:30	DONE	Tuffryn Filter	01-APR-16 00:00
405235060	SAMPLE	KSD1	PIC7B	SEP-22-16 17:18:34	DONE	Tuffryn Filter	01-APR-16 00:00
405235056	SAMPLE	KSD1	PIC6A	SEP-22-16 17:19:50	DONE	Tuffryn Filter	01-APR-16 00:00
405235041	SAMPLE	KSD1	PIC1A	SEP-22-16 17:20:11	DONE	Tuffryn Filter	01-APR-16 00:00
405235045	SAMPLE	KSD1	PIC2B	SEP-22-16 17:20:21	DONE	Tuffryn Filter	01-APR-16 00:00
405235046	SAMPLE	KSD1	PIC2C	SEP-22-16 17:20:23	DONE	Tuffryn Filter	01-APR-16 00:00
405235048	SAMPLE	KSD1	PIC3C	SEP-22-16 17:20:28	DONE	Tuffryn Filter	01-APR-16 00:00
405235049	SAMPLE	KSD1	PIC3D	SEP-22-16 17:20:33	DONE	Tuffryn Filter	01-APR-16 00:00
405235050	SAMPLE	KSD1	PIC4A	SEP-22-16 17:20:34	DONE	Tuffryn Filter	01-APR-16 00:00
405235051	SAMPLE	KSD1	PIC4C	SEP-22-16 17:20:36	DONE	Tuffryn Filter	01-APR-16 00:00
405235052	SAMPLE	KSD1	PIC4D	SEP-22-16 17:20:39	DONE	Tuffryn Filter	01-APR-16 00:00
405235054	SAMPLE	KSD1	PIC5C	SEP-22-16 17:20:45	DONE	Tuffryn Filter	01-APR-16 00:00
405235042	SAMPLE	KSD1	PIC1B	SEP-22-16 17:20:59	DONE	Tuffryn Filter	01-APR-16 00:00
405235043	SAMPLE	KSD1	PIC1D	SEP-22-16 17:21:04	DONE	Tuffryn Filter	01-APR-16 00:00
405235047	SAMPLE	KSD1	PIC3B	SEP-22-16 17:21:09	DONE	Tuffryn Filter	01-APR-16 00:00
405235055	SAMPLE	KSD1	PIC5D	SEP-22-16 17:21:16	DONE	Tuffryn Filter	01-APR-16 00:00
405235057	SAMPLE	KSD1	PIC4C	SEP-23-16 11:21:51	DONE	Tuffryn Filter	01-APR-16 00:00
405235058	SAMPLE	KSD1	PIC5A	SEP-23-16 11:21:54	DONE	Tuffryn Filter	01-APR-16 00:00
405235053	SAMPLE	KSD1	PIC3D	SEP-23-16 11:36:16	DONE	Tuffryn Filter	01-APR-16 00:00
405235044	SAMPLE	KSD1	PIC1B	SEP-23-16 13:27:51	DONE	Tuffryn Filter	01-APR-16 00:00

Instrument Run Log

Instrument Type: GFPC

Batch ID: 1597804

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1203625412	MB	BXF1	PIC7C	SEP-27-16 15:37:52	DONE	Tuffryn Filter	01-APR-16 00:00
405235075	SAMPLE	BXF1	PIC6A	SEP-27-16 15:38:00	DONE	Tuffryn Filter	01-APR-16 00:00
405235077	SAMPLE	BXF1	PIC7A	SEP-27-16 15:38:07	DONE	Tuffryn Filter	01-APR-16 00:00
405235078	SAMPLE	BXF1	PIC7B	SEP-27-16 15:38:10	DONE	Tuffryn Filter	01-APR-16 00:00
405235061	SAMPLE	BXF1	PIC1A	SEP-27-16 15:39:30	DONE	Tuffryn Filter	01-APR-16 00:00
405235062	SAMPLE	BXF1	PIC1B	SEP-27-16 15:39:32	DONE	Tuffryn Filter	01-APR-16 00:00
405235065	SAMPLE	BXF1	PIC2A	SEP-27-16 15:39:41	DONE	Tuffryn Filter	01-APR-16 00:00
405235068	SAMPLE	BXF1	PIC3B	SEP-27-16 15:39:51	DONE	Tuffryn Filter	01-APR-16 00:00
405235069	SAMPLE	BXF1	PIC3C	SEP-27-16 15:39:52	DONE	Tuffryn Filter	01-APR-16 00:00
405235071	SAMPLE	BXF1	PIC4C	SEP-27-16 15:39:59	DONE	Tuffryn Filter	01-APR-16 00:00
405235072	SAMPLE	BXF1	PIC4D	SEP-27-16 15:40:01	DONE	Tuffryn Filter	01-APR-16 00:00
405235073	SAMPLE	BXF1	PIC5A	SEP-27-16 15:40:07	DONE	Tuffryn Filter	01-APR-16 00:00
405235067	SAMPLE	BXF1	PIC7D	SEP-28-16 08:50:51	DONE	Tuffryn Filter	01-APR-16 00:00
405235070	SAMPLE	BXF1	PIC10C	SEP-28-16 08:50:55	DONE	Tuffryn Filter	01-APR-16 00:00
405235063	SAMPLE	BXF1	PIC1B	SEP-28-16 08:51:21	DONE	Tuffryn Filter	01-APR-16 00:00
405235064	SAMPLE	BXF1	PIC3D	SEP-28-16 08:51:25	DONE	Tuffryn Filter	01-APR-16 00:00
405235066	SAMPLE	BXF1	PIC5C	SEP-28-16 08:51:29	DONE	Tuffryn Filter	01-APR-16 00:00
405235074	SAMPLE	BXF1	PIC11A	SEP-28-16 08:54:32	DONE	Tuffryn Filter	01-APR-16 00:00
405235076	SAMPLE	BXF1	PIC11B	SEP-28-16 08:54:41	DONE	Tuffryn Filter	01-APR-16 00:00
1203625413	DUP	BXF1	PIC11C	SEP-28-16 08:54:48	DONE	Tuffryn Filter	01-APR-16 00:00
1203625414	LCS	BXF1	PIC12A	SEP-28-16 08:54:54	DONE	Tuffryn Filter	01-APR-16 00:00

Instrument Run Log

Instrument Type: GFPC

Batch ID: 1597811

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1203625436	DUP	BXF1	PIC4C	SEP-19-16 14:36:23	DONE	2 inch Planchett	01-DEC-15 00:01
405235021	SAMPLE	BXF1	PIC4B	SEP-19-16 14:36:28	DONE	2 inch Planchett	01-DEC-15 00:01
405235022	SAMPLE	BXF1	PIC3C	SEP-19-16 14:36:32	DONE	2 inch Planchett	01-DEC-15 00:01
405235025	SAMPLE	BXF1	PIC3D	SEP-19-16 14:36:49	DONE	2 inch Planchett	01-DEC-15 00:01
405235029	SAMPLE	BXF1	PIC4A	SEP-19-16 14:36:57	DONE	2 inch Planchett	01-DEC-15 00:01
1203625435	MB	BXF1	PIC10A	SEP-19-16 14:36:58	DONE	2 inch Planchett	01-DEC-15 00:01
405235034	SAMPLE	BXF1	PIC5C	SEP-19-16 14:37:09	DONE	2 inch Planchett	01-DEC-15 00:01
405235024	SAMPLE	BXF1	PIC9A	SEP-19-16 14:37:10	DONE	2 inch Planchett	01-DEC-15 00:01
405235028	SAMPLE	BXF1	PIC8D	SEP-19-16 14:37:17	DONE	2 inch Planchett	01-DEC-15 00:01
405235035	SAMPLE	BXF1	PIC3B	SEP-19-16 14:37:17	DONE	2 inch Planchett	01-DEC-15 00:01
405235030	SAMPLE	BXF1	PIC9D	SEP-19-16 14:37:22	DONE	2 inch Planchett	01-DEC-15 00:01
405235033	SAMPLE	BXF1	PIC7D	SEP-19-16 14:37:27	DONE	2 inch Planchett	01-DEC-15 00:01
405235036	SAMPLE	BXF1	PIC8A	SEP-19-16 14:37:43	DONE	2 inch Planchett	01-DEC-15 00:01
405235037	SAMPLE	BXF1	PIC10B	SEP-19-16 14:37:45	DONE	2 inch Planchett	01-DEC-15 00:01
405235038	SAMPLE	BXF1	PIC7A	SEP-19-16 14:37:50	DONE	2 inch Planchett	01-DEC-15 00:01
405235040	SAMPLE	BXF1	PIC8B	SEP-19-16 14:38:04	DONE	2 inch Planchett	01-DEC-15 00:01
405235023	SAMPLE	BXF1	PIC12B	SEP-19-16 14:41:30	DONE	2 inch Planchett	01-DEC-15 00:01
405235026	SAMPLE	BXF1	PIC12D	SEP-19-16 14:41:44	DONE	2 inch Planchett	01-DEC-15 00:01
405235027	SAMPLE	BXF1	PIC14A	SEP-19-16 14:41:49	DONE	2 inch Planchett	01-DEC-15 00:01
405235031	SAMPLE	BXF1	PIC13D	SEP-19-16 14:41:58	DONE	2 inch Planchett	01-DEC-15 00:01
405235032	SAMPLE	BXF1	PIC14C	SEP-19-16 14:42:08	DONE	2 inch Planchett	01-DEC-15 00:01
405235039	SAMPLE	BXF1	PIC12A	SEP-19-16 14:42:14	DONE	2 inch Planchett	01-DEC-15 00:01
1203625437	MS	BXF1	PIC11A	SEP-19-16 16:05:11	DONE	2 inch Planchett	01-DEC-15 00:01
1203625438	MSD	BXF1	PIC13D	SEP-19-16 16:05:14	DONE	2 inch Planchett	01-DEC-15 00:01
1203625439	LCS	BXF1	PIC14A	SEP-19-16 16:05:18	DONE	2 inch Planchett	01-DEC-15 00:01

Instrument Run Log

Instrument Type: GFPC

Batch ID: 1597816

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235001	SAMPLE	JXC9	PIC14C	SEP-16-16 10:57:49	DONE	2 inch Planchett	01-DEC-15 00:01
405235002	SAMPLE	JXC9	PIC13D	SEP-16-16 10:57:58	DONE	2 inch Planchett	01-DEC-15 00:01
405235003	SAMPLE	JXC9	PIC14D	SEP-16-16 10:58:18	DONE	2 inch Planchett	01-DEC-15 00:01
405235004	SAMPLE	JXC9	PIC12C	SEP-16-16 10:58:29	DONE	2 inch Planchett	01-DEC-15 00:01
405235005	SAMPLE	JXC9	PIC12D	SEP-16-16 10:58:36	DONE	2 inch Planchett	01-DEC-15 00:01
405235006	SAMPLE	JXC9	PIC14A	SEP-16-16 10:58:41	DONE	2 inch Planchett	01-DEC-15 00:01
1203625449	MB	JXC9	PIC14D	SEP-19-16 12:20:11	DONE	2 inch Planchett	01-DEC-15 00:01
405235019	SAMPLE	JXC9	PIC5C	SEP-19-16 12:30:35	DONE	2 inch Planchett	01-DEC-15 00:01
405235010	SAMPLE	JXC9	LB4100G2	SEP-19-16 12:32:07	DONE	2 inch Planchett	01-DEC-15 00:01
405235012	SAMPLE	JXC9	LB4100G4	SEP-19-16 12:32:08	DONE	2 inch Planchett	01-DEC-15 00:01
405235009	SAMPLE	JXC9	LB4100H1	SEP-19-16 12:32:15	DONE	2 inch Planchett	01-DEC-15 00:01
405235017	SAMPLE	JXC9	LB4100H3	SEP-19-16 12:32:15	DONE	2 inch Planchett	01-DEC-15 00:01
405235011	SAMPLE	JXC9	LB4100F3	SEP-19-16 12:32:19	DONE	2 inch Planchett	01-DEC-15 00:01
405235016	SAMPLE	JXC9	LB4100F2	SEP-19-16 12:32:19	DONE	2 inch Planchett	01-DEC-15 00:01
405235015	SAMPLE	JXC9	LB4100F4	SEP-19-16 12:32:20	DONE	2 inch Planchett	01-DEC-15 00:01
405235008	SAMPLE	JXC9	LB4100J2	SEP-19-16 12:32:52	DONE	2 inch Planchett	01-DEC-15 00:01
405235018	SAMPLE	JXC9	LB4100J1	SEP-19-16 12:32:52	DONE	2 inch Planchett	01-DEC-15 00:01
1203625453	LCS	JXC9	PIC1D	SEP-19-16 12:37:49	DONE	2 inch Planchett	01-DEC-15 00:01
405235007	SAMPLE	JXC9	LB4100C2	SEP-19-16 12:41:54	DONE	2 inch Planchett	01-DEC-15 00:01
405235014	SAMPLE	JXC9	LB4100B4	SEP-19-16 14:16:35	DONE	2 inch Planchett	01-DEC-15 00:01
405235020	SAMPLE	JXC9	LB4100B1	SEP-19-16 14:16:35	DONE	2 inch Planchett	01-DEC-15 00:01
1203625450	DUP	JXC9	PIC12D	SEP-20-16 11:56:34	DONE	2 inch Planchett	01-DEC-15 00:01
1203625451	MS	JXC9	PIC14C	SEP-20-16 11:56:34	DONE	2 inch Planchett	01-DEC-15 00:01
1203625452	MSD	JXC9	PIC14D	SEP-20-16 11:56:38	DONE	2 inch Planchett	01-DEC-15 00:01
405235013	SAMPLE	JXC9	PIC12A	SEP-20-16 11:56:48	DONE	2 inch Planchett	01-DEC-15 00:01

Instrument Run Log

Instrument Type: GFPC

Batch ID: 1597817

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235061	SAMPLE	JXC9	PIC14A	SEP-22-16 12:39:44	DONE	2 inch Planchett	01-DEC-15 00:01
405235062	SAMPLE	JXC9	PIC14D	SEP-22-16 12:39:54	DONE	2 inch Planchett	01-DEC-15 00:01
405235063	SAMPLE	JXC9	PIC12B	SEP-22-16 12:39:58	DONE	2 inch Planchett	01-DEC-15 00:01
405235064	SAMPLE	JXC9	PIC14C	SEP-22-16 12:40:02	DONE	2 inch Planchett	01-DEC-15 00:01
405235065	SAMPLE	JXC9	PIC13A	SEP-22-16 12:40:04	DONE	2 inch Planchett	01-DEC-15 00:01
405235066	SAMPLE	JXC9	PIC13D	SEP-22-16 12:40:11	DONE	2 inch Planchett	01-DEC-15 00:01
405235069	SAMPLE	JXC9	LB4100G2	SEP-22-16 13:57:34	DONE	2 inch Planchett	01-DEC-15 00:01
405235073	SAMPLE	JXC9	LB4100G3	SEP-22-16 13:57:34	DONE	2 inch Planchett	01-DEC-15 00:01
405235067	SAMPLE	JXC9	LB4100G4	SEP-22-16 13:57:35	DONE	2 inch Planchett	01-DEC-15 00:01
405235070	SAMPLE	JXC9	LB4100F3	SEP-22-16 13:57:41	DONE	2 inch Planchett	01-DEC-15 00:01
405235071	SAMPLE	JXC9	LB4100F2	SEP-22-16 13:57:41	DONE	2 inch Planchett	01-DEC-15 00:01
405235072	SAMPLE	JXC9	LB4100H1	SEP-22-16 13:57:41	DONE	2 inch Planchett	01-DEC-15 00:01
405235068	SAMPLE	JXC9	LB4100F4	SEP-22-16 13:57:42	DONE	2 inch Planchett	01-DEC-15 00:01
405235074	SAMPLE	JXC9	LB4100H3	SEP-22-16 13:57:42	DONE	2 inch Planchett	01-DEC-15 00:01
1203625462	MSD	JXC9	PIC2C	SEP-22-16 13:58:31	DONE	2 inch Planchett	01-DEC-15 00:01
1203625463	LCS	JXC9	PIC3C	SEP-22-16 13:58:35	DONE	2 inch Planchett	01-DEC-15 00:01
1203625459	MB	JXC9	PIC11C	SEP-22-16 14:00:17	DONE	2 inch Planchett	01-DEC-15 00:01
1203625460	DUP	JXC9	PIC11B	SEP-22-16 14:00:25	DONE	2 inch Planchett	01-DEC-15 00:01
405235075	SAMPLE	JXC9	PIC13A	SEP-22-16 14:00:28	DONE	2 inch Planchett	01-DEC-15 00:01
405235076	SAMPLE	JXC9	PIC14A	SEP-22-16 14:00:32	DONE	2 inch Planchett	01-DEC-15 00:01
405235077	SAMPLE	JXC9	PIC13D	SEP-22-16 14:00:36	DONE	2 inch Planchett	01-DEC-15 00:01
405235078	SAMPLE	JXC9	PIC11D	SEP-22-16 14:00:38	DONE	2 inch Planchett	01-DEC-15 00:01
1203625461	MS	JXC9	PIC5D	SEP-23-16 13:24:24	DONE	2 inch Planchett	01-DEC-15 00:01

Instrument Run Log

Instrument Type: GFPC

Batch ID: 1602427

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1203636654	DUP	JXC9	PIC5B	SEP-28-16 14:47:43	DONE	2 inch Planchett	01-DEC-15 00:01
1203636653	MB	JXC9	PIC6C	SEP-28-16 14:47:50	DONE	2 inch Planchett	01-DEC-15 00:01
1203636657	LCS	JXC9	PIC10B	SEP-28-16 14:47:54	DONE	2 inch Planchett	01-DEC-15 00:01
405235041	SAMPLE	JXC9	PIC4A	SEP-28-16 14:48:00	DONE	2 inch Planchett	01-DEC-15 00:01
405235043	SAMPLE	JXC9	PIC9B	SEP-28-16 14:48:05	DONE	2 inch Planchett	01-DEC-15 00:01
405235042	SAMPLE	JXC9	PIC4D	SEP-28-16 14:48:06	DONE	2 inch Planchett	01-DEC-15 00:01
405235044	SAMPLE	JXC9	PIC5A	SEP-28-16 14:48:11	DONE	2 inch Planchett	01-DEC-15 00:01
405235045	SAMPLE	JXC9	PIC8A	SEP-28-16 14:48:11	DONE	2 inch Planchett	01-DEC-15 00:01
405235046	SAMPLE	JXC9	PIC7A	SEP-28-16 14:48:17	DONE	2 inch Planchett	01-DEC-15 00:01
405235047	SAMPLE	JXC9	PIC4B	SEP-28-16 14:48:17	DONE	2 inch Planchett	01-DEC-15 00:01
405235048	SAMPLE	JXC9	PIC3C	SEP-28-16 14:48:19	DONE	2 inch Planchett	01-DEC-15 00:01
405235053	SAMPLE	JXC9	PIC7B	SEP-28-16 14:48:22	DONE	2 inch Planchett	01-DEC-15 00:01
405235049	SAMPLE	JXC9	PIC2B	SEP-28-16 14:48:24	DONE	2 inch Planchett	01-DEC-15 00:01
405235056	SAMPLE	JXC9	PIC6A	SEP-28-16 14:48:26	DONE	2 inch Planchett	01-DEC-15 00:01
405235050	SAMPLE	JXC9	PIC1B	SEP-28-16 14:48:29	DONE	2 inch Planchett	01-DEC-15 00:01
405235057	SAMPLE	JXC9	PIC7D	SEP-28-16 14:48:30	DONE	2 inch Planchett	01-DEC-15 00:01
405235051	SAMPLE	JXC9	PIC3D	SEP-28-16 14:48:32	DONE	2 inch Planchett	01-DEC-15 00:01
405235059	SAMPLE	JXC9	PIC8C	SEP-28-16 14:48:40	DONE	2 inch Planchett	01-DEC-15 00:01
405235052	SAMPLE	JXC9	PIC1D	SEP-28-16 14:48:41	DONE	2 inch Planchett	01-DEC-15 00:01
405235054	SAMPLE	JXC9	PIC3B	SEP-28-16 14:48:47	DONE	2 inch Planchett	01-DEC-15 00:01
405235055	SAMPLE	JXC9	PIC1C	SEP-28-16 14:48:50	DONE	2 inch Planchett	01-DEC-15 00:01
405235058	SAMPLE	JXC9	PIC5C	SEP-28-16 14:48:57	DONE	2 inch Planchett	01-DEC-15 00:01
405235060	SAMPLE	JXC9	PIC5D	SEP-28-16 14:49:04	DONE	2 inch Planchett	01-DEC-15 00:01
1203636655	MS	JXC9	PIC5C	SEP-29-16 13:04:36	DONE	2 inch Planchett	01-DEC-15 00:01
1203636656	MSD	JXC9	PIC5D	SEP-29-16 13:04:40	DONE	2 inch Planchett	01-DEC-15 00:01

Liquid Scintillation Raw Data

Batch# 1596402 Product: Pu239 Date: 9/30/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	DATA 1563227
Sample was correctly preserved if required.			NA
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DATA 1563227
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DATA 1563227
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMPA, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: Melanie Ayuk 9/30/16

Secondary Review Performed By: Jessie Davis 10/02/16

10/4
MLWC

DATA EXCEPTION REPORT

Mo.Day Yr. 30-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LSC	Test / Method: DOE EML HASL-300, Pu-11-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596402	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, and 1203621726 were received and analyzed out of holding.</p>		<p>1. Reporting results.</p>	

Originator's Name:

Melanie Aycock 30-SEP-16

Data Validator/Group Leader:

Jessica Davis 30-SEP-16

Pu-241 Queue Sheet

07-SEP-16

Batch #: 1596402 Analyst: MXS2 First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16
 Tracer Isotope: Pu-241 Tracer Code: 1770 A Expiration Date: 8-3-17 Vol: 0.1
 LCS Isotope: Pu-241 LCS Code: 160-B Expiration Date: 10-28-16 Vol: 0.1
 Spike Isotope: Pu-241 Spike Code: Expiration Date: Vol:
 Prep Date: 9-2-16 Initials: MSD Pipet ID: 1840022 Balance ID: 16107602 Witness: N/A

Solid Sample Dissolution by: LEACH of DIGESTION
 Cocktail Used: Ultima gold LLT or Ecocoint Ultra
 Circle One

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	LSC Rack#	Alpha Spec Det #
405235021-1	4.2B.R.2.3	SAMPLE		15 pCi/g	SOIL	MJWC001	08-DEC-15	1	1	0.514	3-2	89
405235022-1	4.2B.R.1.3	SAMPLE		15 pCi/g	SOIL	MJWC001	08-DEC-15	2	2	0.505	3-3	90
405235023-1	4.2B.R.11.2	SAMPLE		15 pCi/g	SOIL	MJWC001	02-DEC-15	3	3	0.504	60-2	91
405235024-1	4.2B.R.2.2	SAMPLE		15 pCi/g	SOIL	MJWC001	08-DEC-15	4	4	0.505	60-3	92
405235025-1	4.2B.R.1.2	SAMPLE		15 pCi/g	SOIL	MJWC001	08-DEC-15	5	5	0.506	60-4	93
405235026-1	4.2C.R.1.3	SAMPLE		15 pCi/g	SOIL	MJWC001	08-DEC-15	6	6	0.502	3-7	95
405235027-1	4.2C.R.1.4	SAMPLE		15 pCi/g	SOIL	MJWC001	08-DEC-15	7	7	0.510	3-8	96
405235028-1	4.3.A.R.1.3	SAMPLE		15 pCi/g	SOIL	MJWC001	23-NOV-15	8	8	0.507	3-9	99
405235029-1	4.3.B.R.1.3	SAMPLE		15 pCi/g	SOIL	MJWC001	23-NOV-15	9	9	0.504	3-10	99
405235030-1	4.3A.R.2.3	SAMPLE		15 pCi/g	SOIL	MJWC001	23-NOV-15	10	10	0.514	3-11	253
405235031-1	4.3.B.R.19.2	SAMPLE		15 pCi/g	SOIL	MJWC001	26-NOV-15	11	11	0.517	3-12	254
405235032-1	4.3B.R.3.3	SAMPLE		15 pCi/g	SOIL	MJWC001	23-NOV-15	12	12	0.508	49-1	255
405235033-1	4.3B.R.3.4	SAMPLE		15 pCi/g	SOIL	MJWC001	23-NOV-15	13	13	0.506	49-2	256
405235034-1	4.3B.R.1.4	SAMPLE		15 pCi/g	SOIL	MJWC001	23-NOV-15	14	14	0.509	49-3	233
405235035-1	4.3B.R.2.3	SAMPLE		15 pCi/g	SOIL	MJWC001	23-NOV-15	15	15	0.516	49-4	234
405235036-1	4.3B.R.2.4	SAMPLE		15 pCi/g	SOIL	MJWC001	23-NOV-15	16	16	0.518	49-5	235
405235037-1	4.4C.R.2.4	SAMPLE		15 pCi/g	SOIL	MJWC001	30-NOV-15	17	17	0.506	49-6	255
405235038-1	4.4C.R.1.3	SAMPLE		15 pCi/g	SOIL	MJWC001	30-NOV-15	18	18	0.501	49-7	238
405235039-1	4.4C.R.1.4	SAMPLE		15 pCi/g	SOIL	MJWC001	30-NOV-15	19	19	0.512	60-5	256
405235040-1	4.4D.R.1.3	SAMPLE		15 pCi/g	SOIL	MJWC001	30-NOV-15	20	20	0.515	49-9	241
1203621725-1	MB for batch 1596402	MB		15 pCi/g	SOIL	QC ACCOUNT		21	21	0.518	52-10	243
1203621726-1	4.2B.R.2.3(405235021DUP)	DUP		15 pCi/g	SOIL	QC ACCOUNT	08-DEC-15	22	22	0.508	60-6	244
1203621727-1	LCS for batch 1596402	LCS		15 pCi/g	SOIL	QC ACCOUNT		23	24	0.518	52-12	227

Bkg Rack #: 3-160-1
 16/9-20-16

Instrument Used: LS6000 (Red) 7065155, LS6500 (Blue) 7067083, LS6500 (Green) 7067404, Wallace (Yellow) 7067056, Wallace (Purple) 7069123, Silver 7060656, 4140127, LS6000 (Brown) 7060655, LS6500 (Gold) 7070506, Purple 7069123, Silver 7060656, (White) 4140299, Wallace (Teal) 4140421, Wallace (Gray) 4150033, 7069693 (Mocha)
 Data Reviewed By: M. Anderson 9/30/16
 GEL Laboratories LLC, Radiochemistry Division

Plutonium-241 Solid

Filename : PU241.XLS
 File type : Excel
 Version # : 1.3.4

Tracer S/N : 1770-A
 Tracer Exp Date : 8/3/2017
 Tracer Volume Added : 0.10
 Tracer Error : 0.44%

Batch : 1596402
 Analyst : MXS2
 Prep Date : 9/21/2016
 Method Uncertainty : 0.0839

Procedure Code : LSC41PUS
 Parmname : Plutonium-241
 Required MDA : 15 pCi/G
 Halflife of Pu-241 : 14.290 years
 Pu-241 Abundance : 1.00
 Tracer Abundance : 1.00
 Halflife of Tracer : 373500.000 years

Geometry: 2mL DI/1 drop HNO3/13mL Ecoscint Ultra

Sample Characteristics			Tracer Calculations				Tracer			Tracer		Tracer		Detector	
Pos.	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G	Tracer DPM	Tracer Counts	Tracer Bkg Counts	Tracer Net CPM	Tracer Count Date/Time	Tracer Count Time (sec.)	Tracer Decay	Detector Serial #	Detector Efficiency (cpm/dpm)	Detector Efficiency StDev. (cpm/dpm)	Detector Efficiency StDev. (cpm/dpm)	
1	405235021.1	0.5140	3.2727E-03	4.3831	229	6.960	0.925	9/24/2016 20:54	14400	1.000	79988	0.292461	0.005651	0.005651	
2	405235022.1	0.5050	3.2718E-03	4.3831	246	0.240	1.024	9/24/2016 20:54	14400	1.000	78263	0.334344	0.006443	0.006443	
3	405235023.1	0.5040	3.2717E-03	4.3831	253	1.440	1.048	9/24/2016 20:54	14400	1.000	78259	0.347245	0.006687	0.006687	
4	405235024.1	0.5050	3.2718E-03	4.3831	216	1.680	0.893	9/24/2016 20:54	14400	1.000	80063	0.303421	0.005858	0.005858	
5	405235025.1	0.5060	3.2719E-03	4.3831	284	1.680	1.093	9/24/2016 20:54	14400	1.000	33206	0.330892	0.006377	0.006377	
6	405235026.1	0.5020	3.2714E-03	4.3831	269	1.440	1.115	9/24/2016 20:54	14400	1.000	38626	0.304247	0.005873	0.005873	
7	405235027.1	0.5100	3.2723E-03	4.3831	271	1.440	1.123	9/24/2016 20:54	14400	1.000	80016	0.325188	0.006269	0.006269	
8	405235028.1	0.5070	3.2720E-03	4.3831	306	1.200	1.270	9/24/2016 20:54	14400	1.000	83288	0.353557	0.006805	0.006805	
9	405235029.1	0.5040	3.2717E-03	4.3831	293	0.720	1.218	9/24/2016 20:54	14400	1.000	80059	0.356284	0.006858	0.006858	
10	405235030.1	0.5140	3.2727E-03	4.3831	219	0.720	0.910	9/24/2016 20:51	14400	1.000	87941	0.256727	0.004975	0.004975	
11	405235031.1	0.5170	3.2730E-03	4.3831	223	0.480	0.927	9/24/2016 20:51	14400	1.000	87942	0.251642	0.004879	0.004879	
12	405235032.1	0.5080	3.2721E-03	4.3831	209	0.960	0.867	9/24/2016 20:51	14400	1.000	87943	0.249747	0.004844	0.004844	
13	405235033.1	0.5060	3.2719E-03	4.3831	192	1.920	0.792	9/24/2016 20:51	14400	1.000	87944	0.257507	0.004991	0.004991	
14	405235034.1	0.5090	3.2722E-03	4.3831	258	0.960	1.071	9/24/2016 20:54	14400	1.000	87921	0.252931	0.004905	0.004905	
15	405235035.1	0.5160	3.2729E-03	4.3831	195	0.240	0.812	9/24/2016 20:54	14400	1.000	87922	0.248037	0.004811	0.004811	
16	405235036.1	0.5180	3.2731E-03	4.3831	222	1.200	0.920	9/24/2016 20:54	14400	1.000	87923	0.247991	0.004811	0.004811	
17	405235037.1	0.5060	3.2719E-03	4.3831	178	0.960	0.738	9/26/2016 13:55	14400	1.000	87943	0.249747	0.004844	0.004844	
18	405235038.1	0.5010	3.2713E-03	4.3831	211	0.960	0.875	9/24/2016 20:54	14400	1.000	87926	0.261325	0.005062	0.005062	
19	405235039.1	0.5120	3.2725E-03	4.3831	233	1.920	0.963	9/26/2016 13:55	14400	1.000	87944	0.257507	0.004991	0.004991	
20	405235040.1	0.5150	3.2728E-03	4.3831	183	0.720	0.760	9/24/2016 20:54	14400	1.000	87963	0.259137	0.005022	0.005022	
21	1203621725.1	0.5180	3.2731E-03	4.3831	220	2.160	0.908	9/24/2016 20:54	14400	1.000	87931	0.248977	0.004829	0.004829	
22	1203621726.1	0.5080	3.2721E-03	4.3831	235	1.680	0.972	9/24/2016 20:54	14400	1.000	87932	0.237184	0.004607	0.004607	
23	1203621727.1	0.5180	3.2731E-03	4.3831	228	1.440	0.944	9/24/2016 20:54	14400	1.000	87915	0.263665	0.005107	0.005107	

Pipet, 0.1 ml Stdev : +/- 0.0002000 ml
 Pipet, 0.5 ml Stdev : +/- 0.0010000 ml
 Pipet, 1 ml Stdev : +/- 0.0020000 ml

Analytical SOP: GL-RAD-A-035
 Instrument SOP: GL-RAD-I-004

Count raw Data		Calibration Data										Calculated			Background				
Pos.	Rack Position #	Counting Time (min.)	Quench#	Gross cpm	Bkg cpm	Bkg Count Time (min.)	Bkg Quench#	Corrected Bkg cpm	Count Start Date/Time	Sample Decay	Sample Recovery %	Sample Recovery Error %	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Background Rack Position #	Background Count Start Date/Time
1	3-2	45	133.6	11.33	9.67	45	132.5	9.6767	9/28/2016 5:20	0.962	72.2%	7.14%	LSCBROWN	2/1/2016	1/31/2017	0.2207	0.00792	3-1	9/28/2016 4:33
2	3-3	45	132.7	11.76	9.67	45	132.5	9.6712	9/28/2016 6:07	0.962	69.9%	6.69%	LSCBROWN	2/1/2016	1/31/2017	0.2222	0.00792	3-1	9/28/2016 4:33
3	60-2	45	135.1	7.38	7.56	45	134.8	7.5620	9/29/2016 10:42	0.961	68.9%	6.64%	LSCBROWN	2/1/2016	1/31/2017	0.2182	0.00792	60-1	9/29/2016 9:55
4	60-3	45	134.7	8.18	7.56	45	134.8	7.5594	9/29/2016 11:28	0.961	67.1%	7.16%	LSCBROWN	2/1/2016	1/31/2017	0.2189	0.00792	60-1	9/29/2016 9:55
5	60-4	45	136.4	7.62	7.56	45	134.8	7.5707	9/29/2016 12:15	0.961	75.4%	6.52%	LSCBROWN	2/1/2016	1/31/2017	0.2160	0.00792	60-1	9/29/2016 9:55
6	3-7	45	133.1	11.36	9.67	45	132.5	9.6736	9/28/2016 9:15	0.962	83.6%	6.46%	LSCBROWN	2/1/2016	1/31/2017	0.2216	0.00792	3-1	9/28/2016 4:33
7	3-8	45	133.8	10.58	9.67	45	132.5	9.6779	9/28/2016 10:02	0.962	78.8%	6.43%	LSCBROWN	2/1/2016	1/31/2017	0.2204	0.00792	3-1	9/28/2016 4:33
8	3-9	45	132.6	11.87	9.67	45	132.5	9.6706	9/28/2016 10:49	0.960	82.0%	6.08%	LSCBROWN	2/1/2016	1/31/2017	0.2224	0.00792	3-1	9/28/2016 4:33
9	3-10	45	135.8	10.42	9.67	45	132.5	9.6909	9/28/2016 11:35	0.960	78.0%	6.19%	LSCBROWN	2/1/2016	1/31/2017	0.2170	0.00792	3-1	9/28/2016 4:33
10	3-11	45	136.4	9.89	9.67	45	132.5	9.6950	9/28/2016 12:22	0.960	80.8%	7.08%	LSCBROWN	2/1/2016	1/31/2017	0.2160	0.00792	3-1	9/28/2016 4:33
11	3-12	45	132.6	10.49	9.67	45	132.5	9.6706	9/28/2016 13:09	0.960	84.1%	7.02%	LSCBROWN	2/1/2016	1/31/2017	0.2224	0.00792	3-1	9/28/2016 4:33
12	49-1	45	134.9	10.82	9.67	45	132.5	9.6850	9/28/2016 13:56	0.960	79.2%	7.25%	LSCBROWN	2/1/2016	1/31/2017	0.2185	0.00792	3-1	9/28/2016 4:33
13	49-2	45	134.6	10	9.67	45	132.5	9.6830	9/28/2016 14:43	0.960	70.2%	7.58%	LSCBROWN	2/1/2016	1/31/2017	0.2190	0.00792	3-1	9/28/2016 4:33
14	49-3	45	134.3	10.49	9.67	45	132.5	9.6811	9/28/2016 15:30	0.960	96.6%	6.57%	LSCBROWN	2/1/2016	1/31/2017	0.2195	0.00792	3-1	9/28/2016 4:33
15	49-4	45	136.5	10.07	9.67	45	132.5	9.6956	9/28/2016 16:16	0.960	74.6%	7.46%	LSCBROWN	2/1/2016	1/31/2017	0.2158	0.00792	3-1	9/28/2016 4:33
16	49-5	45	135.2	9.73	9.67	45	132.5	9.6869	9/28/2016 17:03	0.960	84.6%	7.05%	LSCBROWN	2/1/2016	1/31/2017	0.2180	0.00792	3-1	9/28/2016 4:33
17	49-6	45	135.2	10.29	9.67	45	132.5	9.6869	9/28/2016 17:50	0.961	67.4%	7.82%	LSCBROWN	2/1/2016	1/31/2017	0.2180	0.00792	3-1	9/28/2016 4:33
18	49-7	45	145.8	8.82	7.56	45	134.8	7.5207	9/28/2016 18:37	0.961	76.4%	7.22%	LSCBROWN	2/1/2016	1/31/2017	0.1999	0.00792	3-1	9/28/2016 4:33
19	60-5	45	127.6	7.69	7.56	45	134.8	7.5207	9/29/2016 13:01	0.960	85.3%	6.92%	LSCBROWN	2/1/2016	1/31/2017	0.2308	0.00792	60-1	9/29/2016 9:55
20	49-9	45	136.5	8.71	9.67	45	132.5	9.6956	9/28/2016 20:10	0.961	66.9%	7.71%	LSCBROWN	2/1/2016	1/31/2017	0.2158	0.00792	3-1	9/28/2016 4:33
21	52-10	45	133.8	8.6	9.67	45	132.5	9.6779	9/28/2016 22:08	0.999	83.2%	7.12%	LSCBROWN	2/1/2016	1/31/2017	0.2204	0.00792	3-1	9/28/2016 4:33
22	60-6	45	134.4	8.29	7.56	45	134.8	7.5574	9/29/2016 13:48	0.961	93.5%	6.88%	LSCBROWN	2/1/2016	1/31/2017	0.2194	0.00792	60-1	9/29/2016 9:55
23	52-12	45	134	39.87	9.67	45	132.5	9.6792	9/28/2016 23:41	0.999	81.7%	6.97%	LSCBROWN	2/1/2016	1/31/2017	0.2200	0.00792	3-1	9/28/2016 4:33

Notes:

- 1 - Results are decay corrected to Sample Date/Time
- 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
- 3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml): N/A
 Spike Volume Added: N/A

* - RPD changed to 0% due to sample & dup activity below MDA

LCS S/N : 1610-B
 LCS Exp Date : 10/28/2016
 LCS Activity (dpm/ml): 1692.28
 LCS Volume Added: 0.10

Pos.	Decision Level		Critical Level pCi/G	Required MDA pCi/G	MDA pCi/G	Sample Act. Conc. pCi/G	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA Counting Uncertainty pCi/G	2 SIGMA Total Prop. Uncertainty pCi/G	Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery	
	pCi/G	pCi/G																
1	8.7417	6.1717	15	12.7249	9.4586	11.7112	41.95%	1.6533	0.6832	7.6612	7.9309		SAMPLE					
2	9.1245	6.4420	15	13.2822	12.4768	11.1712	33.73%	2.0888	0.6901	8.0794	8.4988		SAMPLE					
3	8.3637	5.9048	15	12.2225	-1.1267	11.1712	316.75%	-0.1820	0.5762	6.9931	6.9932		SAMPLE					
4	8.5261	6.0195	15	12.4599	3.9182	11.1712	95.56%	0.6206	0.5914	7.3179	7.3672		SAMPLE					
5	7.6888	5.4283	15	11.2359	0.2807	11.1712	1177.49%	0.0493	0.5810	6.4783	6.4786		SAMPLE					
6	7.6969	5.4340	15	11.2040	8.4960	11.1712	41.06%	1.6864	0.6837	6.7509	6.9794		SAMPLE					
7	8.0825	5.7063	15	11.7653	4.7713	11.1712	74.66%	0.9021	0.6710	6.9557	7.0263		SAMPLE					
8	7.7586	5.4777	15	11.2939	11.1712	11.1712	32.06%	2.1994	0.6919	6.8877	7.2552		SAMPLE					
9	8.4159	5.9417	15	12.2503	4.0127	11.1712	91.91%	0.7291	0.6685	7.2114	7.2583		SAMPLE					
10	8.0013	5.6490	15	11.6467	1.0203	11.1712	338.33%	0.1950	0.6597	6.7644	6.7680		SAMPLE					
11	7.4149	5.2350	15	10.7936	3.9775	11.1712	81.99%	0.8194	0.6693	6.3682	6.4255		SAMPLE					
12	8.1629	5.7631	15	11.8822	6.0610	11.1712	59.92%	1.1350	0.6750	7.0650	7.1878		SAMPLE					
13	9.2259	6.5135	15	13.4295	1.9133	11.1712	208.78%	0.3170	0.6614	7.8241	7.8367		SAMPLE					
14	6.6457	4.6919	15	9.6737	3.5173	11.1712	83.03%	0.8089	0.6695	5.7060	5.7535		SAMPLE					
15	8.6379	6.0984	15	12.5733	2.1141	11.1712	177.20%	0.3744	0.6627	7.3360	7.3508		SAMPLE					
16	7.5081	5.3008	15	10.9290	0.2115	11.1712	1525.09%	0.0431	0.6569	6.3229	6.3230		SAMPLE					
17	9.6449	6.8094	15	14.0394	3.8046	11.1712	110.76%	0.6031	0.6663	8.2386	8.2633		SAMPLE					
18	9.4041	6.6394	15	13.6873	-5.7754	11.1712	68.57%	-0.9426	0.6426	7.7175	7.7175		SAMPLE					
19	6.2673	4.4248	15	9.1598	0.7879	11.1712	343.39%	0.1693	0.5814	5.3017	5.3044		SAMPLE					
20	9.6521	6.8145	15	14.0497	-6.2200	11.1712	65.35%	-0.9856	0.6395	7.9103	7.9104		SAMPLE					
21	7.2573	5.1237	15	10.5640	-5.1193	11.1712	59.56%	-1.0779	0.6373	5.9324	5.9325		SAMPLE					
22	6.0711	4.2863	15	8.8723	3.2936	11.1712	81.30%	0.7326	0.5984	5.2293	5.2765	405235021.1	MB		0.0%			
23	7.4015	5.2255	15	10.7740	146.2220	11.1712	7.86%	30.1908	1.0493	9.9611	32.9438		DUP			147.1595	99.4%	
													LCS					

1596402

ID: PU-241

28 SEP 2016 05:03

USER: 7

COMMENT: BROWN

PRESET TIME : 45.00
 DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD
 COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT
 TWO PHASE : NO AGC : NO CYCLE REPEATS : 1 DISK : OFF
 SCINTILLATOR: LIQUID LUMEX: NO LOW SAMPLE REJ: 0
 LOW LEVEL : YES HALF LIFE CORRECTION DATE: none

CHAN: 0.0 - 300.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0
 CHAN: 0.0 - 900.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

SAM NO	POS	TIME MIN	H#	WIND 1		LUMEX %	ELAPSED TIME
				CPM	%ERROR		
1	3-1	45.00	132.5	9.67	9.59	11.59	46.35
2	3-2	45.00	133.6	11.33	8.86	16.33	93.26
3	3-3	45.00	132.7	11.76	8.70	17.04	140.20
4	3-4	45.00	134.4	12.07	8.58	18.10	187.13
5	3-5	45.00	133.8	12.38	8.47	17.11	234.04
6	3-6	45.00	134.2	12.38	8.47	15.22	280.94
7	3-7	45.00	133.1	11.36	8.85	15.53	327.82
8	3-8	45.00	133.8	10.58	9.17	15.16	374.70
9	3-9	45.00	132.6	11.87	8.65	14.28	421.57
10	3-10	45.00	135.8	10.42	9.24	13.52	468.41
11	3-11	45.00	136.4	9.89	9.48	13.09	515.25
12	3-12	45.00	132.6	10.49	9.21	13.36	562.09
13	49-1	45.00	134.9	10.82	9.06	11.54	609.00
14	49-2	45.00	134.6	10.00	9.43	11.98	655.83
15	49-3	45.00	134.3	10.49	9.21	11.82	702.64
16	49-4	45.00	136.5	10.07	9.40	10.54	749.41
17	49-5	45.00	135.2	9.73	9.56	10.86	796.19
18	49-6	45.00	135.2	10.29	9.29	10.84	842.96
19	49-7	45.00	145.8	8.82	10.04	9.66	889.72
20	49-8	45.00	128.3	11.96	8.62	7.93	936.48
21	49-9	45.00	136.5	8.71	10.10	7.86	983.17

x ma 9/30/14

1586402

ID: PU-241

28 SEP 2016 22:38

USER: 7

COMMENT: BROWN

PRESET TIME : 45.00
 DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD
 COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT
 TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF
 SCINTILLATOR: LIQUID LUMEX: NO LOW SAMPLE REJ: 0
 LOW LEVEL : YES HALF LIFE CORRECTION DATE: none

CHAN: 0.0 - 300.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0
 CHAN: 0.0 - 900.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

SAM NO	POS	TIME MIN	H#	WIND 1		LUMEX %	ELAPSED TIME
				CPM	%ERROR		

MISSING SAMPLE

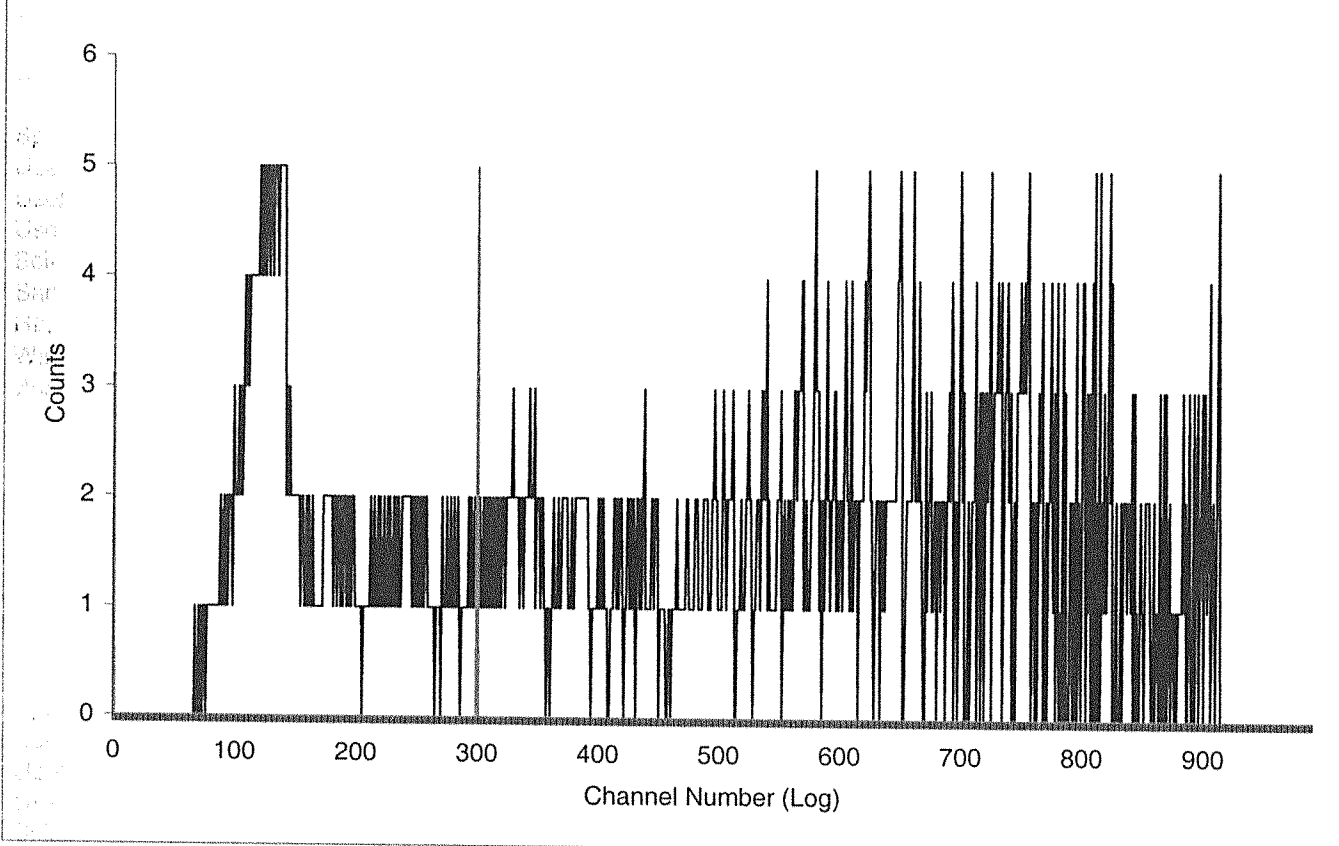
U	10	52-10	45.00	133.8	8.60	10.17	7.88	46.33
22	11	52-11	45.00	134.6	7.51	10.88	7.23	93.00
U	12	52-12	45.00	134.0	39.87	4.72	3.86	139.69

* MA9/5016

Sample Count Start Time: 28 Sep 2016 04:33:55
Data Capture Date: 28 Sep 2016 05:19:18
User Filename: S07092803-1A.XLS
U07092803-1A.XLS
Spectrum Type: Log Counts
User Number: 07
User Id: PU-241
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 1 3-1 45.00
H#, Total Counts: 132.5 1464
Win1: Pu-241 - Start, End: 0 300
Win2: - Start, End: 0 990

SPECTRUM PLOT

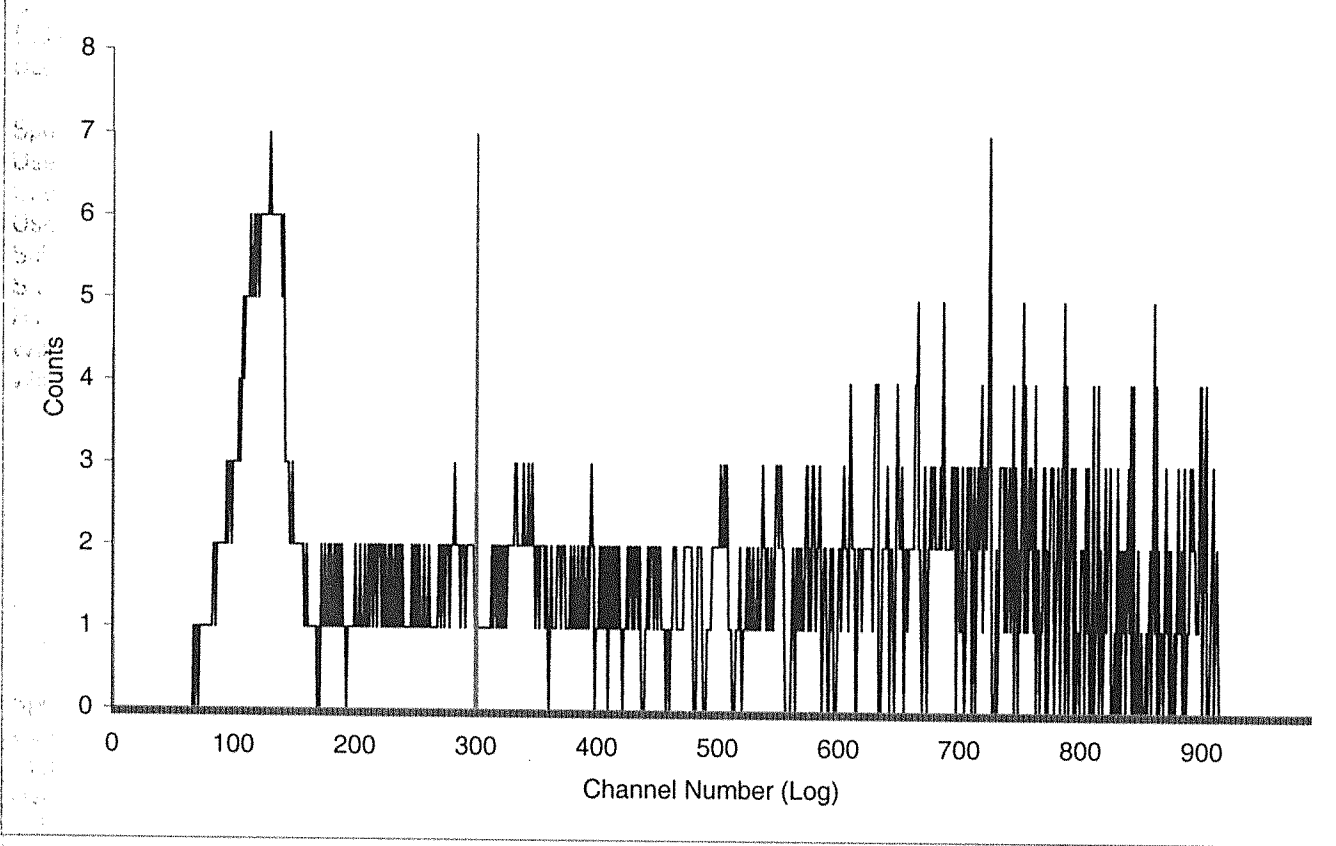
USER 07 - PU-241



Sample Count Start Time: 28 Sep 2016 05:20:50
Data Capture Date: 28 Sep 2016 06:06:13
User Filename: S07092803-2A.XLS
U07092803-1A.XLS
Spectrum Type: Log Counts
User Number: 07
User Id: PU-241
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 2 3-2 45.00
H#, Total Counts: 133.6 1492
Win1: Pu-241 - Start, End: 0 300
Win2: - Start, End: 0 990

SPECTRUM PLOT

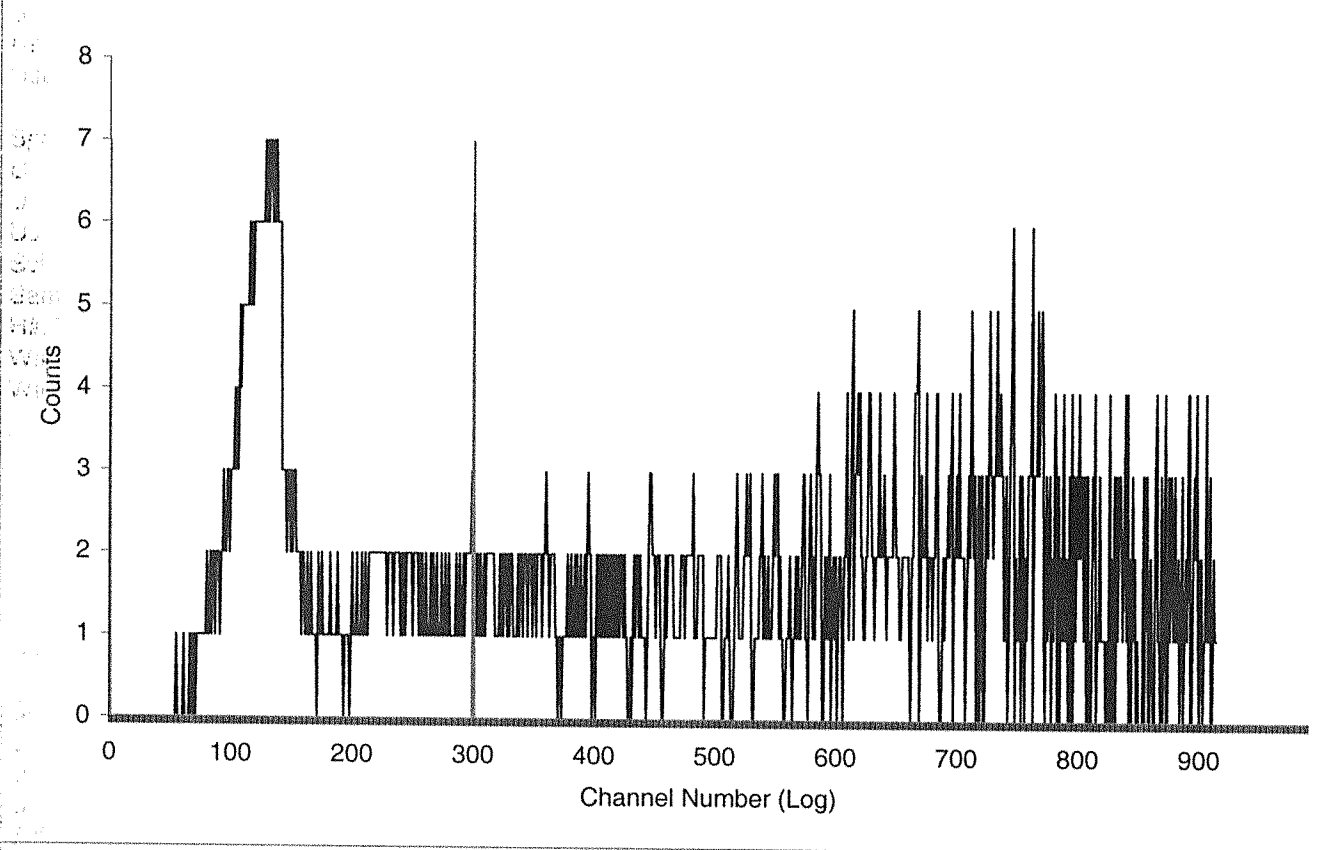
USER 07 - PU-241



Sample Count Start Time:	28 Sep 2016 06:07:46		
Data Capture Date	28 Sep 2016 06:53:09		
User Filename	S07092803-3A.XLS		
	U07092803-1A.XLS		
Spectrum Type	Log Counts		
User Number	07		
User Id	PU-241		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	3	3-3	45.00
H#, Total Counts:	132.7	1582	
Win1: Pu-241 - Start, End:	0	300	
Win2: - Start, End:	0	990	

SPECTRUM PLOT

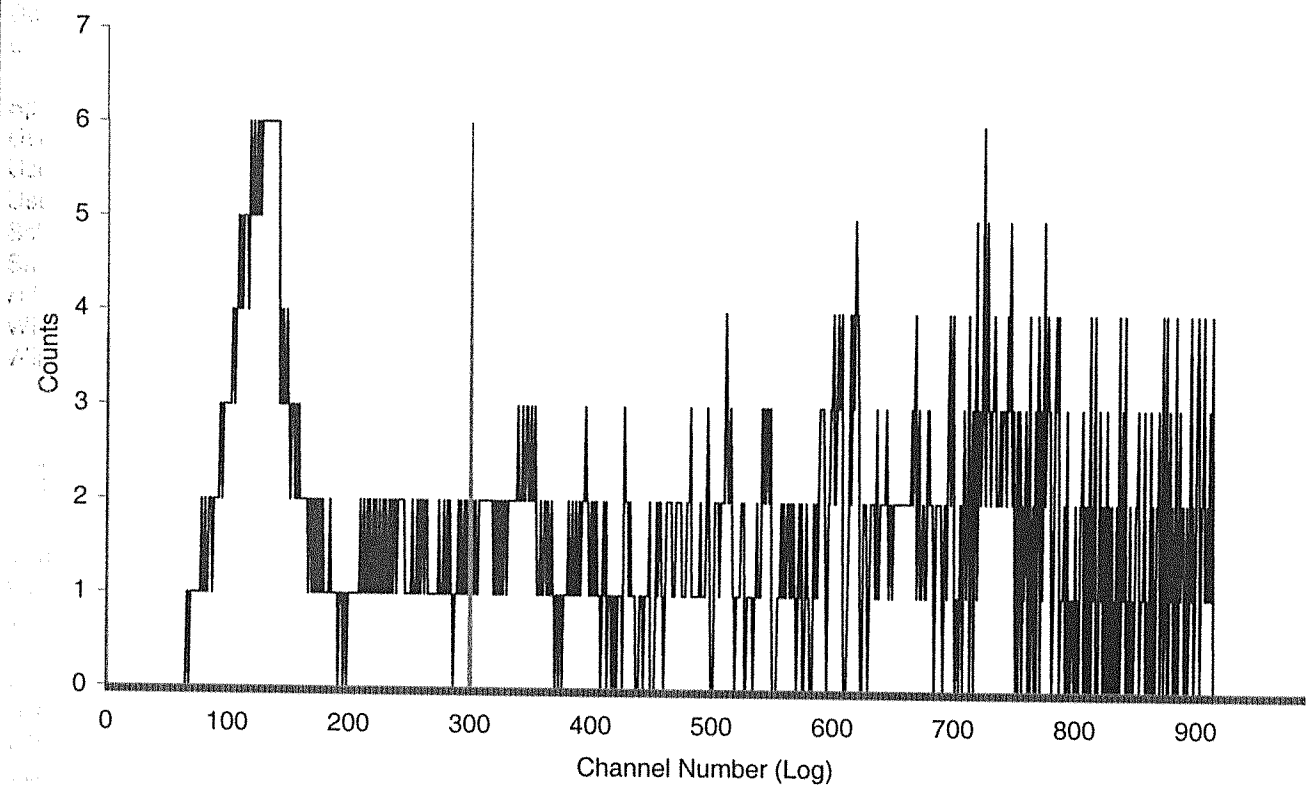
USER 07 - PU-241



Sample Count Start Time: 28 Sep 2016 09:15:23
Data Capture Date: 28 Sep 2016 10:00:46
User Filename: S07092803-7A.XLS
U07092803-1A.XLS
Spectrum Type: Log Counts
User Number: 07
User Id: PU-241
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 7 3-7 45.00
H#, Total Counts: 133.1 1504
Win1: Pu-241 - Start, End: 0 300
Win2: - Start, End: 0 990

SPECTRUM PLOT

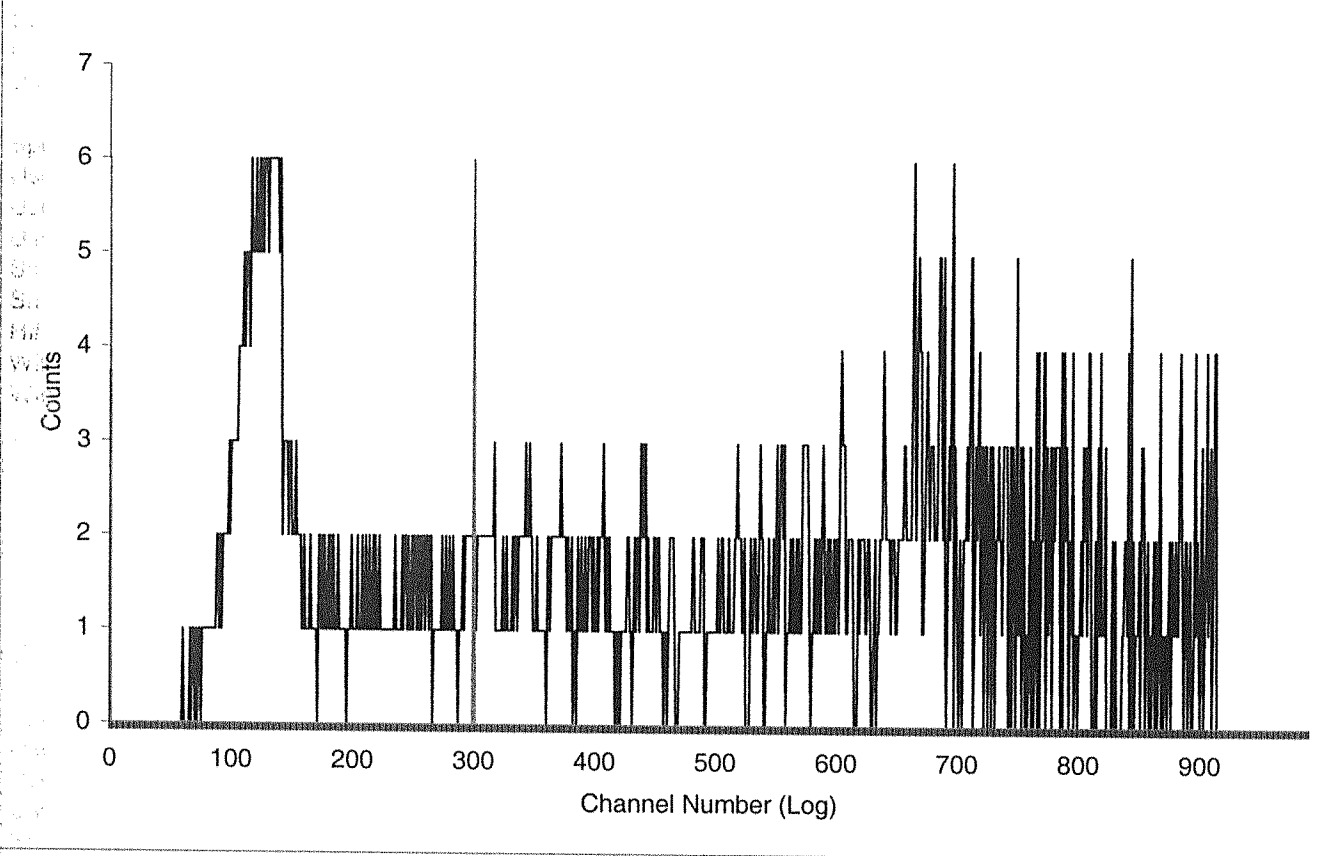
USER 07 - PU-241



Sample Count Start Time:	28 Sep 2016 10:02:16		
Data Capture Date	28 Sep 2016 10:47:39		
User Filename	S07092803-8A.XLS		
	U07092803-1A.XLS		
Spectrum Type	Log Counts		
User Number	07		
User Id	PU-241		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	8	3-8	45.00
H#, Total Counts:	133.8	1474	
Win1: Pu-241 - Start, End:	0	300	
Win2: - Start, End:	0	990	

SPECTRUM PLOT

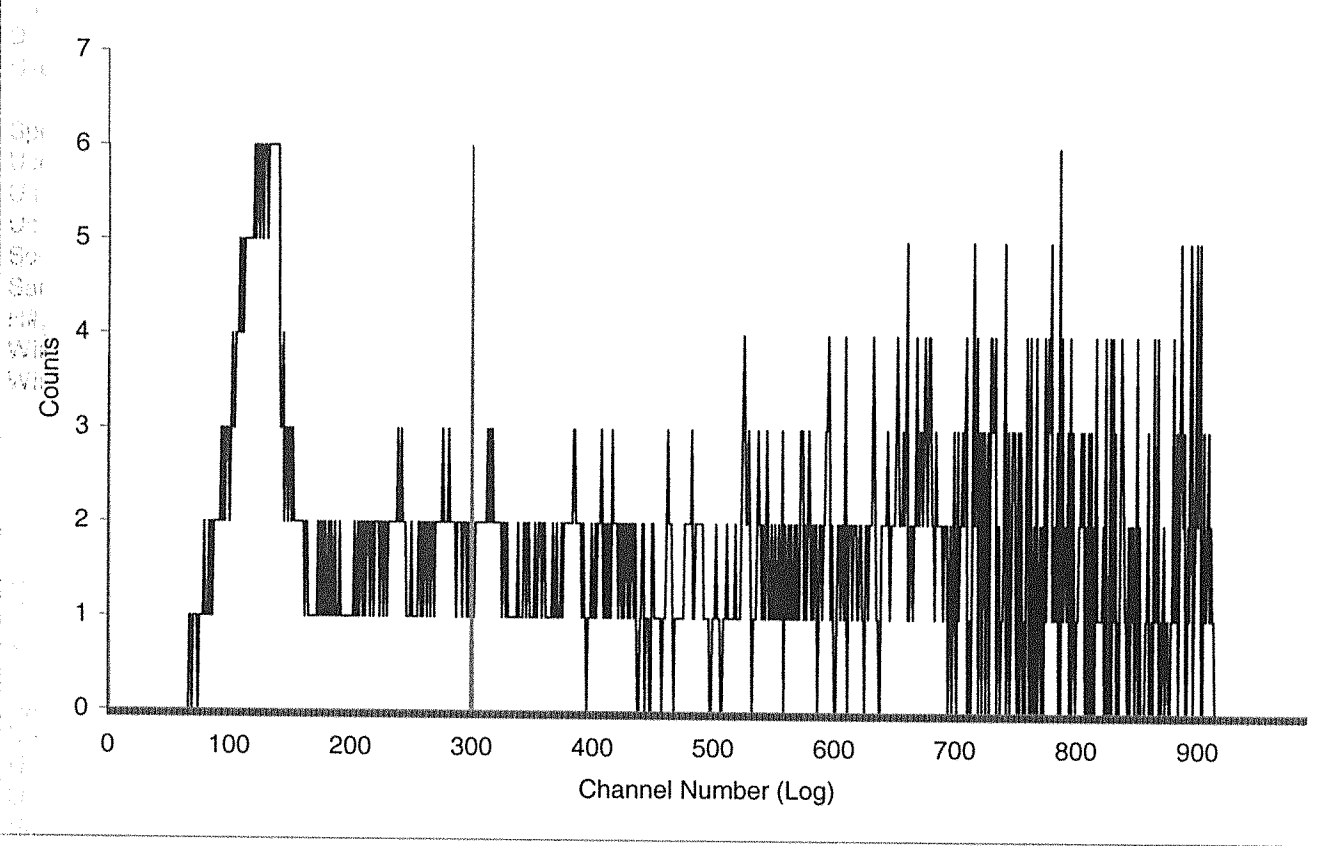
USER 07 - PU-241



Sample Count Start Time:	28 Sep 2016 10:49:08		
Data Capture Date	28 Sep 2016 11:34:31		
User Filename	S07092803-9A.XLS		
	U07092803-1A.XLS		
Spectrum Type	Log Counts		
User Number	07		
User Id	PU-241		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	9	3-9	45.00
H#, Total Counts:	132.6	1544	
Win1: Pu-241 - Start, End:	0	300	
Win2: - Start, End:	0	990	

SPECTRUM PLOT

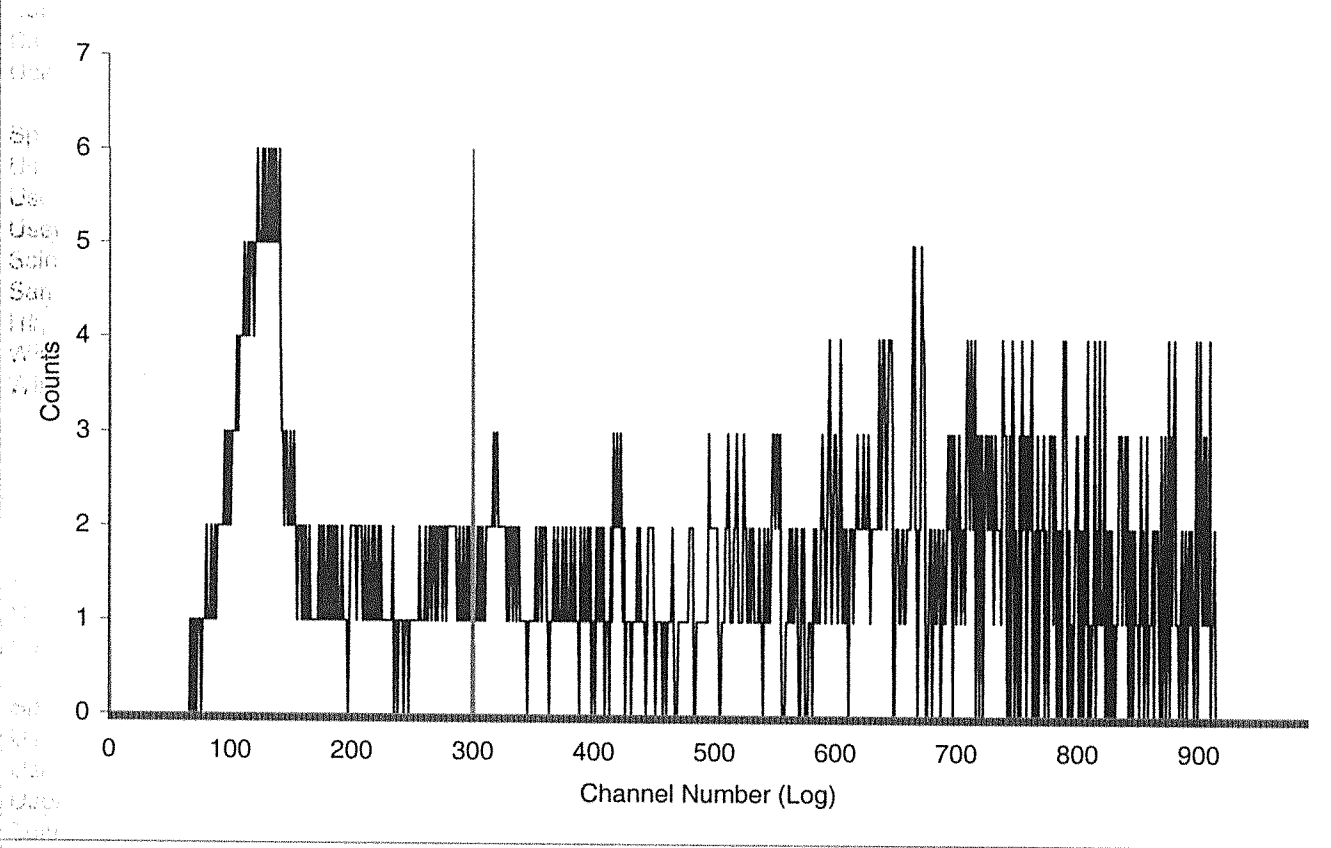
USER 07 - PU-241



Sample Count Start Time: 28 Sep 2016 11:35:59
Data Capture Date: 28 Sep 2016 12:21:21
User Filename: S07092803-10A.XLS
U07092803-1A.XLS
Spectrum Type: Log Counts
User Number: 07
User Id: PU-241
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 10 3-10 45.00
H#, Total Counts: 135.8 1442
Win1: Pu-241 - Start, End: 0 300
Win2: - Start, End: 0 990

SPECTRUM PLOT

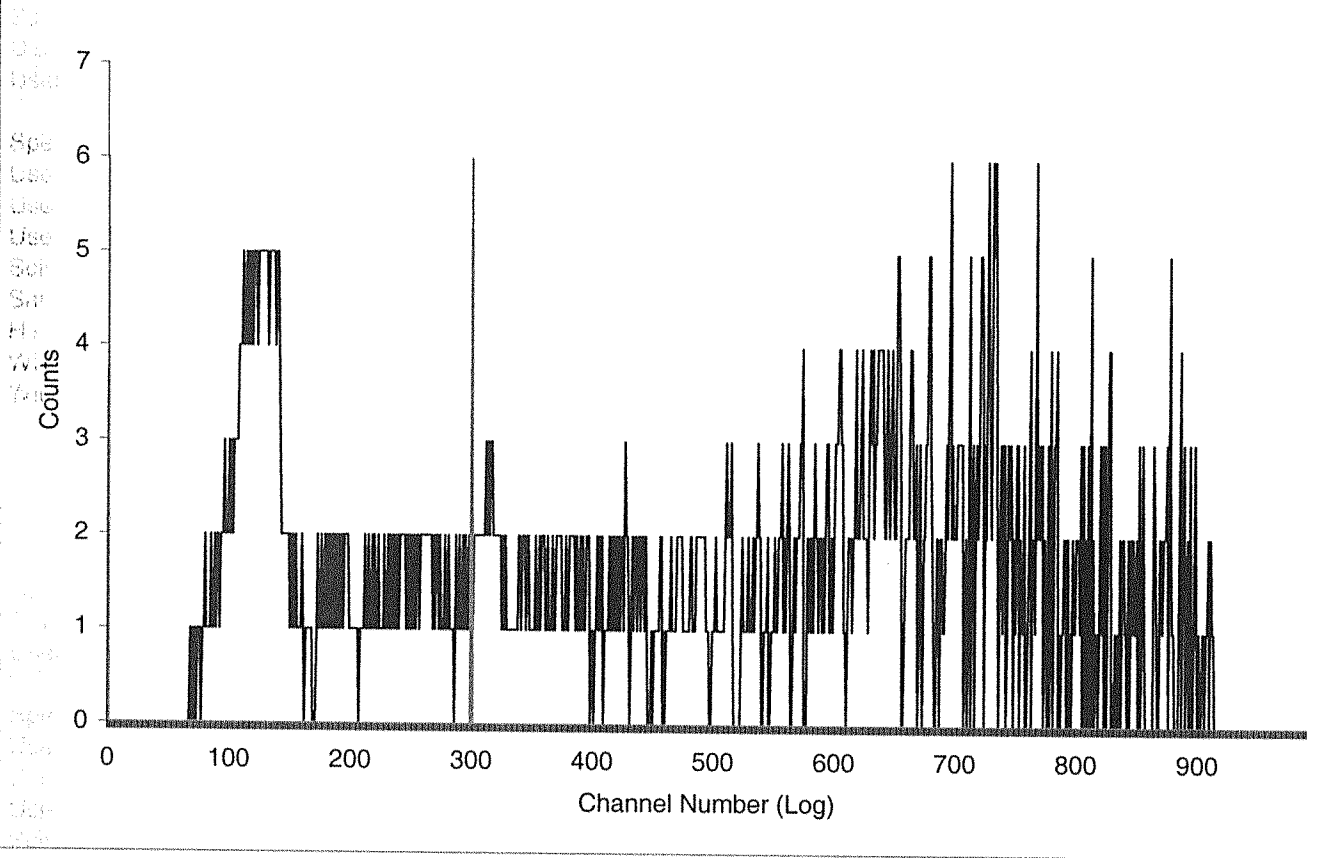
USER 07 - PU-241



Sample Count Start Time:	28 Sep 2016 12:22:49		
Data Capture Date	28 Sep 2016 13:08:11		
User Filename	S07092803-11A.XLS		
	U07092803-1A.XLS		
Spectrum Type	Log Counts		
User Number	07		
User Id	PU-241		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	11	3-11	45.00
M#, Total Counts:	136.4	1464	
Win1: Pu-241 - Start, End:	0	300	
Win2: - Start, End:	0	990	

SPECTRUM PLOT

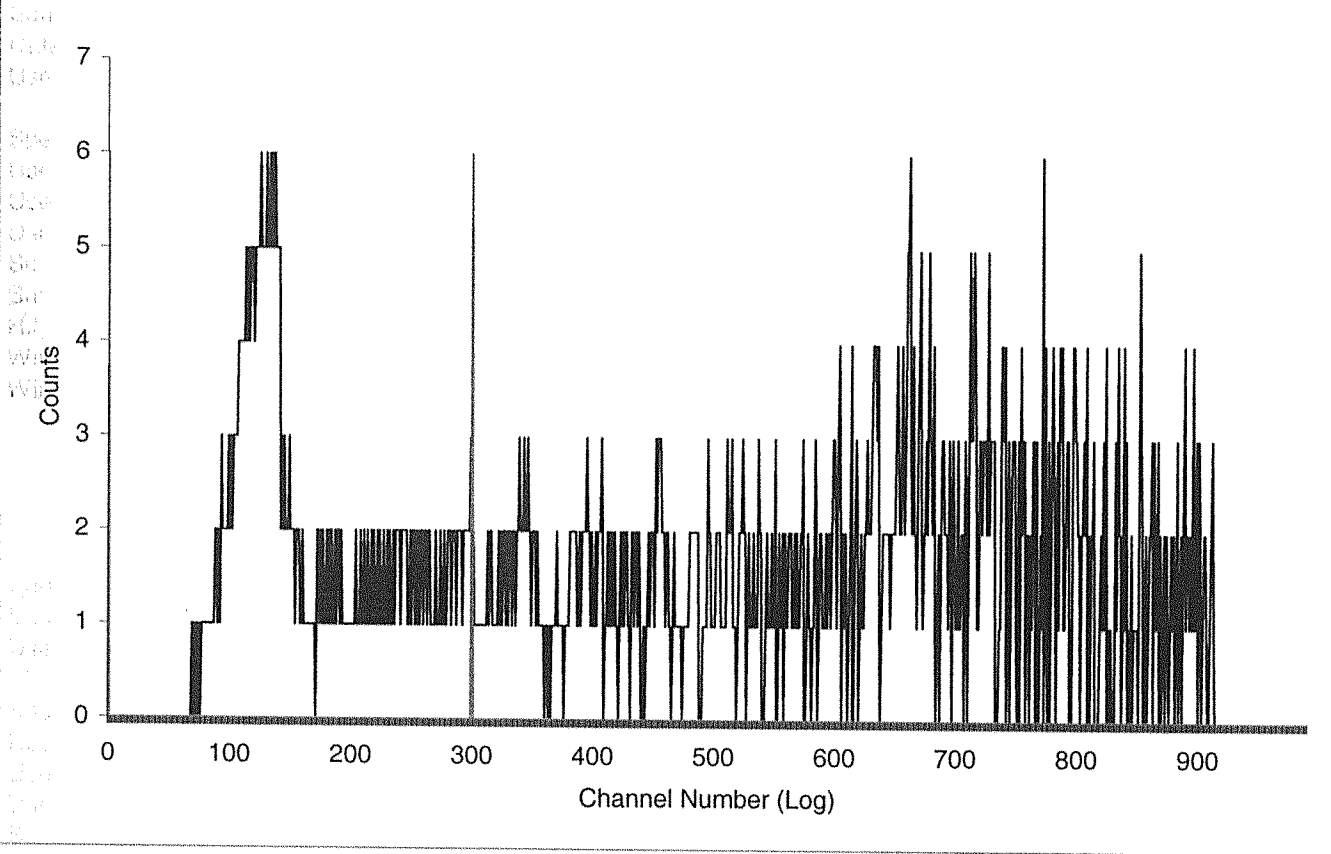
USER 07 - PU-241



Sample Count Start Time:	28 Sep 2016 13:09:39		
Data Capture Date	28 Sep 2016 13:55:01		
User Filename	S07092803-12A.XLS		
	U07092803-1A.XLS		
Spectrum Type	Log Counts		
User Number	07		
User Id	PU-241		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	12	3-12	45.00
H#, Total Counts:	132.6	1493	
Win1: Pu-241 - Start, End:	0	300	
Win2: - Start, End:	0	990	

SPECTRUM PLOT

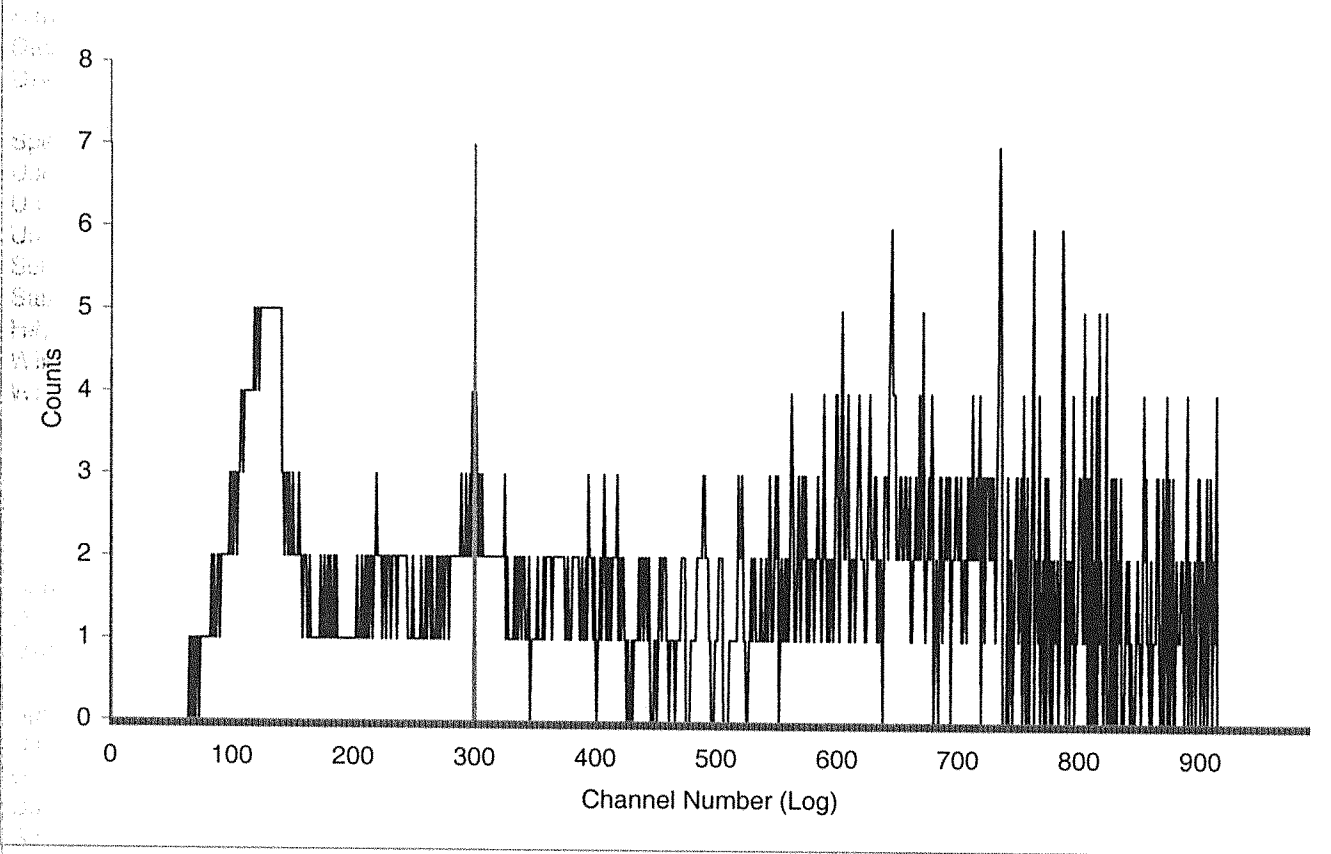
USER 07 - PU-241



Sample Count Start Time: 28 Sep 2016 13:56:34
Data Capture Date: 28 Sep 2016 14:41:57
User Filename: S07092849-1A.XLS
U07092803-1A.XLS
Spectrum Type: Log Counts
User Number: 07
User Id: PU-241
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 13 49-1 45.00
H#, Total Counts: 134.9 1540
Win1: Pu-241 - Start, End: 0 300
Win2: - Start, End: 0 990

SPECTRUM PLOT

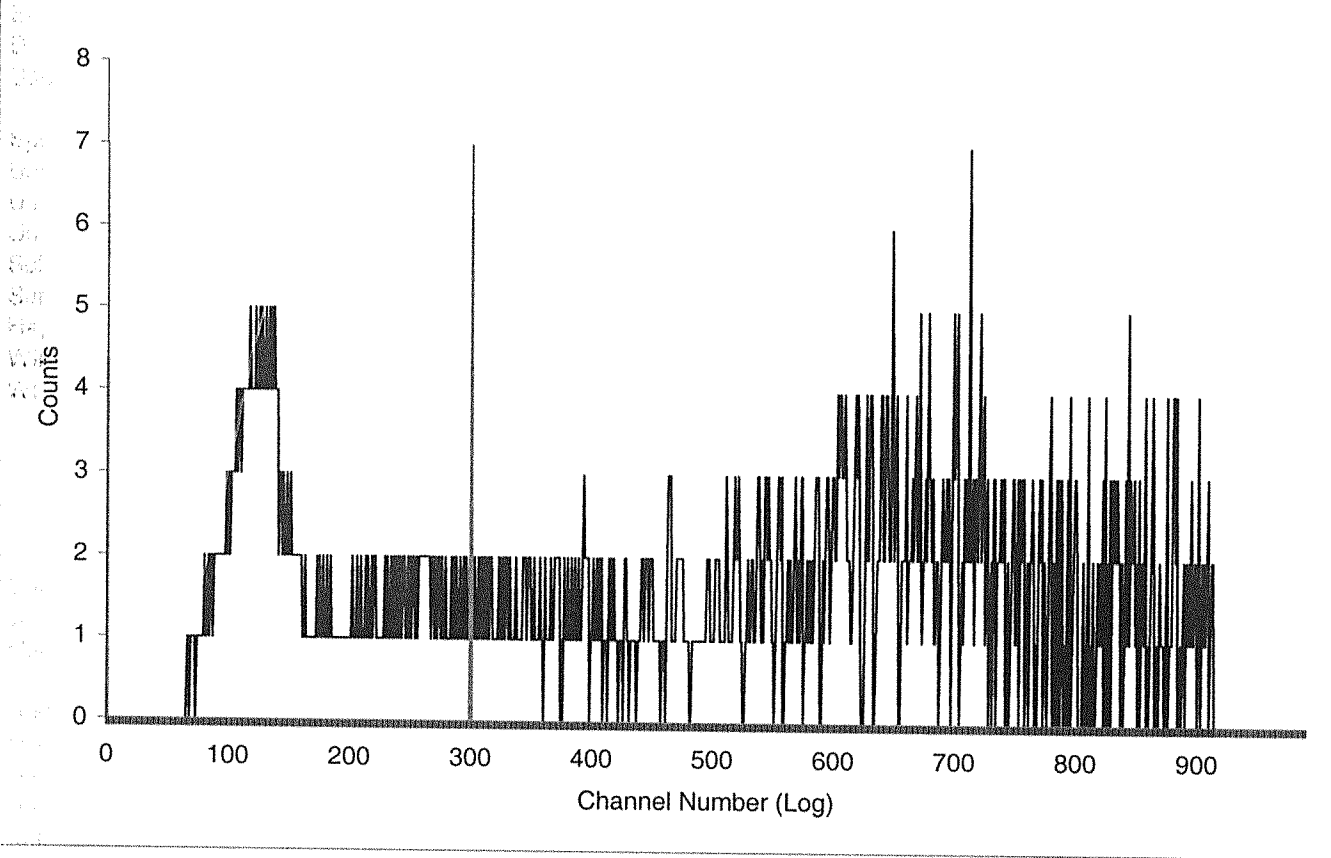
USER 07 - PU-241



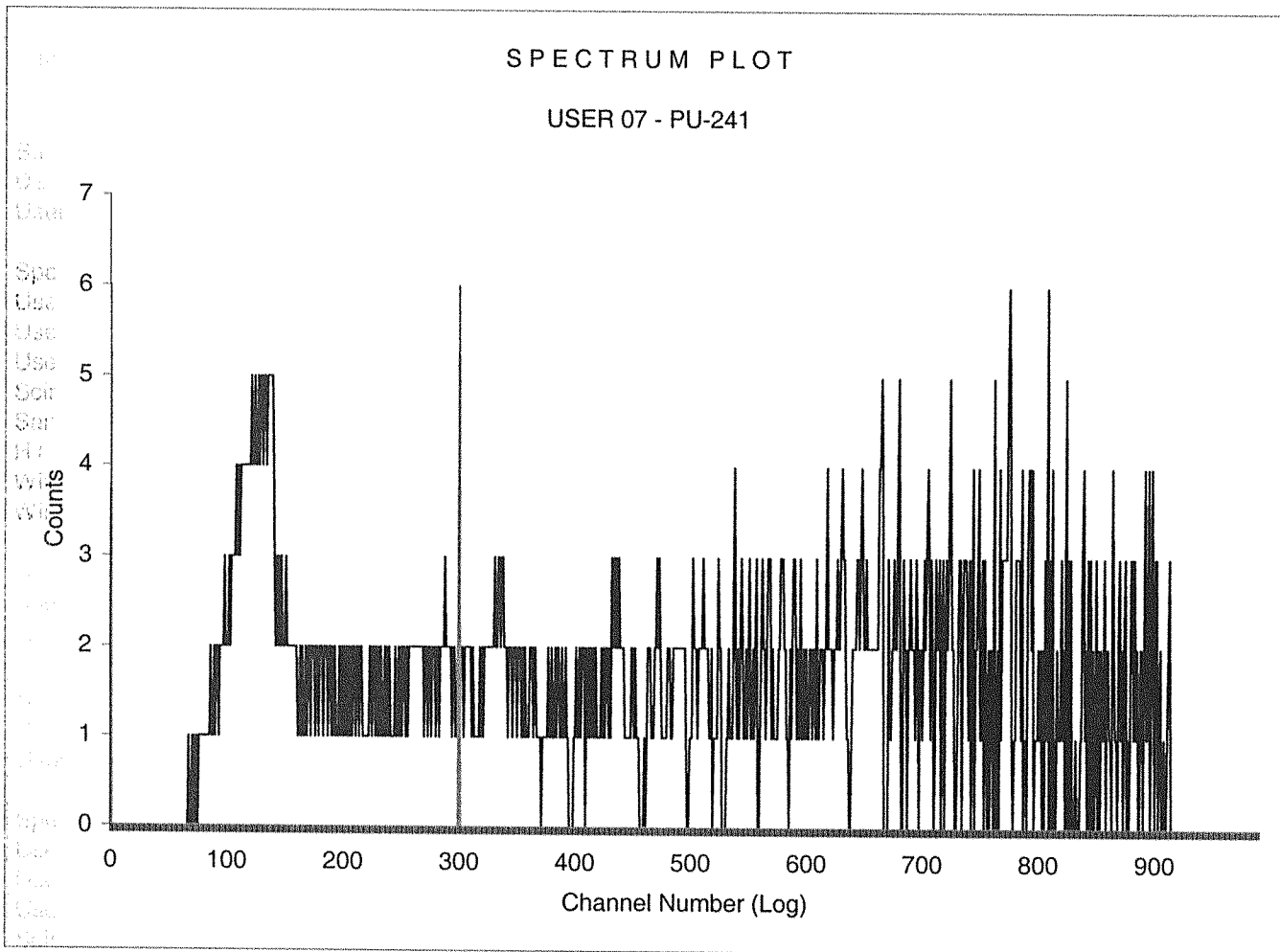
Sample Count Start Time: 28 Sep 2016 14:43:24
Data Capture Date: 28 Sep 2016 15:28:46
User Filename: S07092849-2A.XLS
U07092803-1A.XLS
Spectrum Type: Log Counts
User Number: 07
User Id: PU-241
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 14 49-2 45.00
H#, Total Counts: 134.6 1473
Win1: Pu-241 - Start, End: 0 300
Win2: - Start, End: 0 990

SPECTRUM PLOT

USER 07 - PU-241



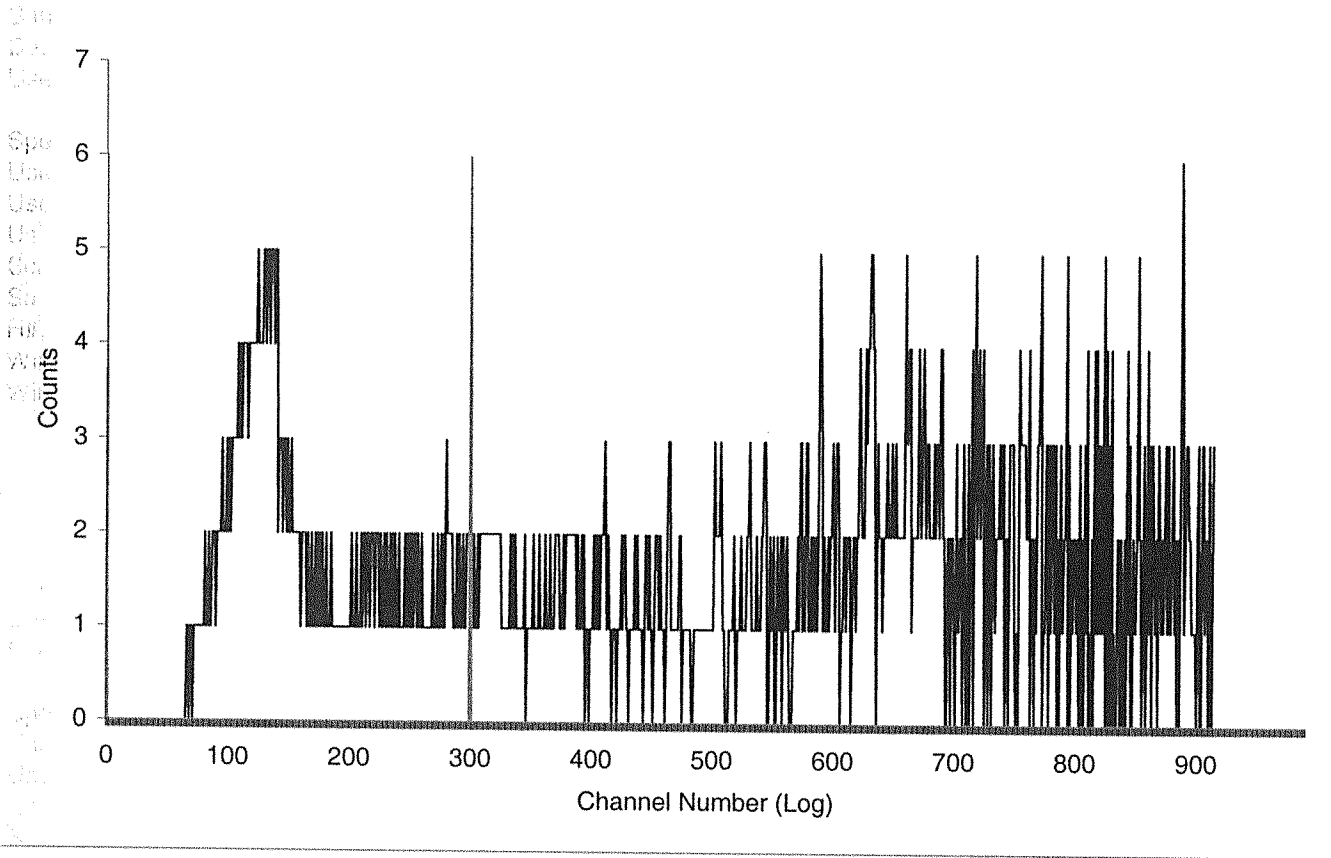
Sample Count Start Time:	28 Sep 2016 15:30:12		
Data Capture Date	28 Sep 2016 16:15:34		
User Filename	S07092849-3A.XLS		
	U07092803-1A.XLS		
Spectrum Type	Log Counts		
User Number	07		
User Id	PU-241		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	15	49-3	45.00
H#, Total Counts:	134.3	1508	
Win1: Pu-241 - Start, End:	0	300	
Win2: - Start, End:	0	990	



Sample Count Start Time: 28 Sep 2016 16:16:59
Data Capture Date: 28 Sep 2016 17:02:21
User Filename: S07092849-4A.XLS
U07092803-1A.XLS
Spectrum Type: Log Counts
User Number: 07
User Id: PU-241
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 16 49-4 45.00
H#, Total Counts: 136.5 1476
Win1: Pu-241 - Start, End: 0 300
Win2: - Start, End: 0 990

SPECTRUM PLOT

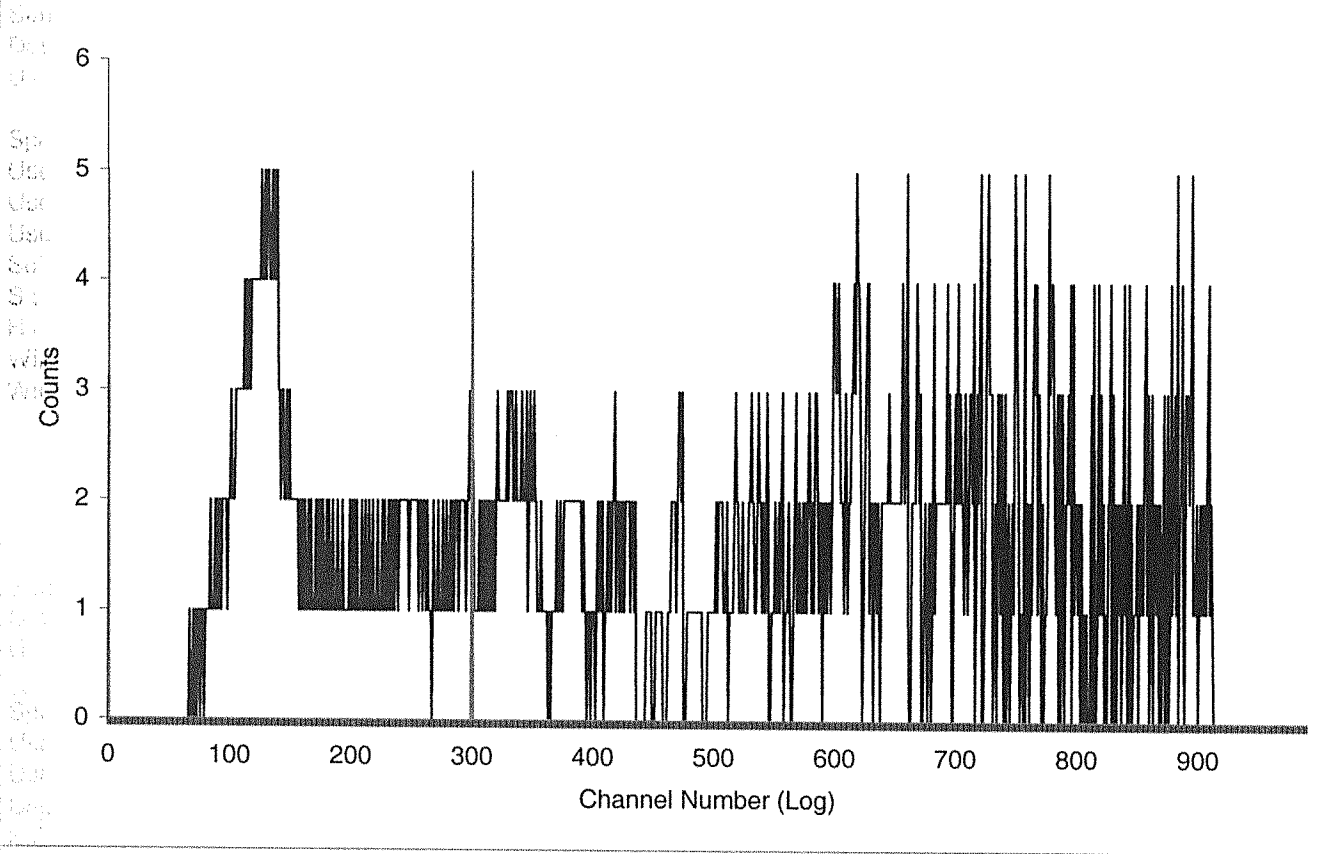
USER 07 - PU-241



Sample Count Start Time:	28 Sep 2016 17:03:45		
Data Capture Date	28 Sep 2016 17:49:07		
User Filename	S07092849-5A.XLS		
	U07092803-1A.XLS		
Spectrum Type	Log Counts		
User Number	07		
User Id	PU-241		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	17	49-5	45.00
H#, Total Counts:	135.2	1453	
Win1: Pu-241 - Start, End:	0	300	
Win2: - Start, End:	0	990	

SPECTRUM PLOT

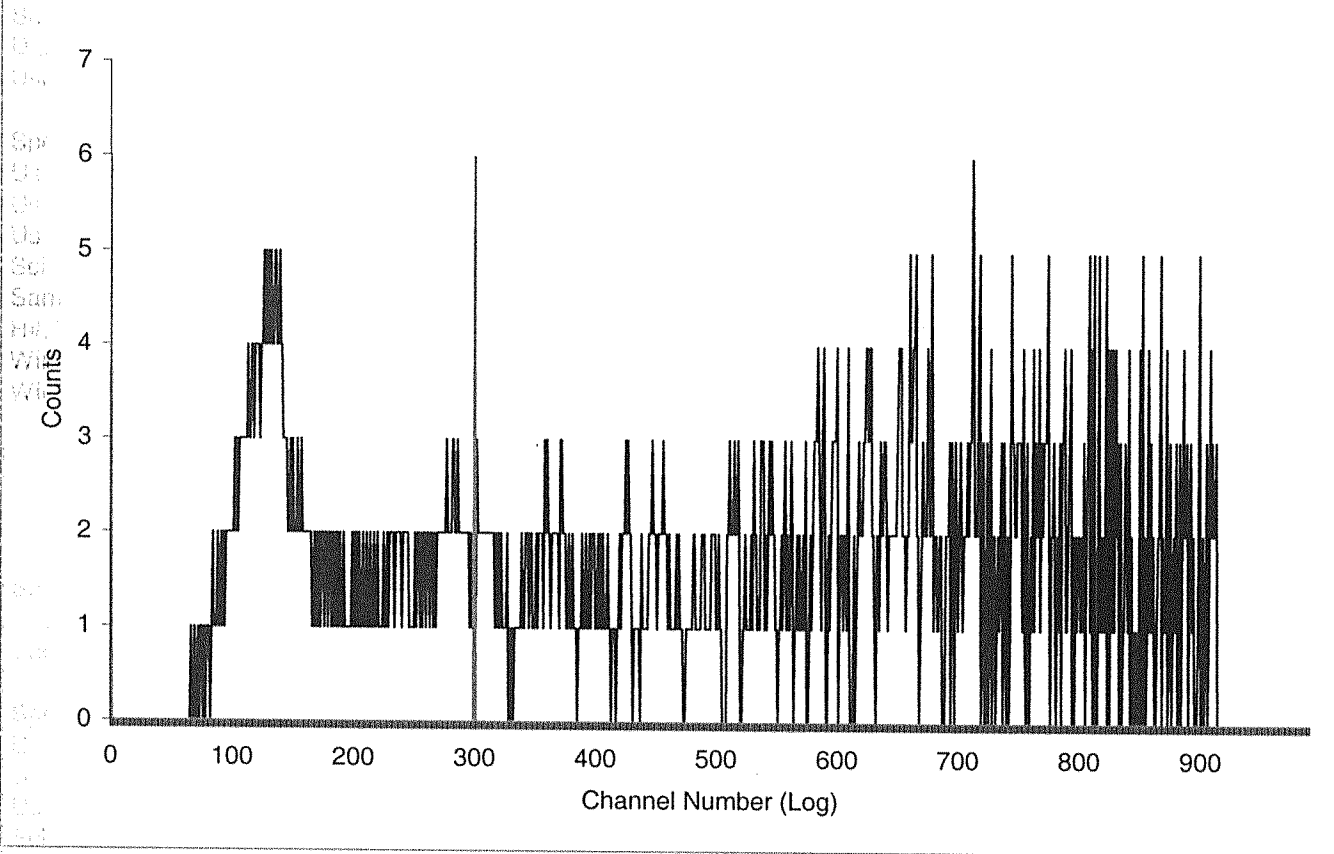
USER 07 - PU-241



Sample Count Start Time:	28 Sep 2016 17:50:32		
Data Capture Date	28 Sep 2016 18:35:54		
User Filename	S07092849-6A.XLS		
	U07092803-1A.XLS		
Spectrum Type	Log Counts		
User Number	07		
User Id	PU-241		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	18	49-6	45.00
H#, Total Counts:	135.2	1531	
Win1: Pu-241 - Start, End:	0	300	
Win2: - Start, End:	0	990	

SPECTRUM PLOT

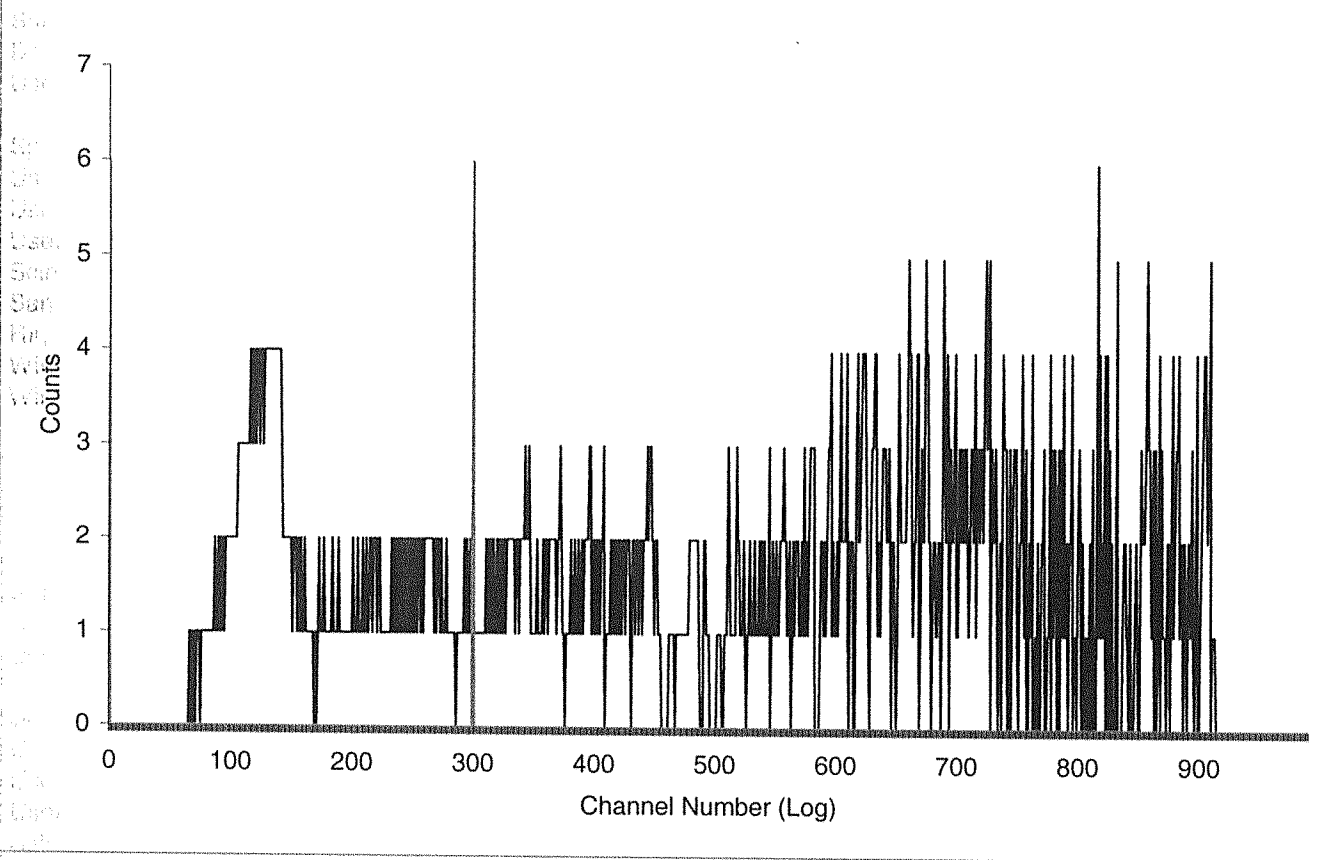
USER 07 - PU-241



Sample Count Start Time:	28 Sep 2016 18:37:17		
Data Capture Date	28 Sep 2016 19:22:39		
User Filename	S07092849-7A.XLS		
	U07092803-1A.XLS		
Spectrum Type	Log Counts		
User Number	07		
User Id	PU-241		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	19	49-7	45.00
H#, Total Counts:	145.8	1420	
Win1: Pu-241 - Start, End:	0	300	
Win2: - Start, End:	0	990	

SPECTRUM PLOT

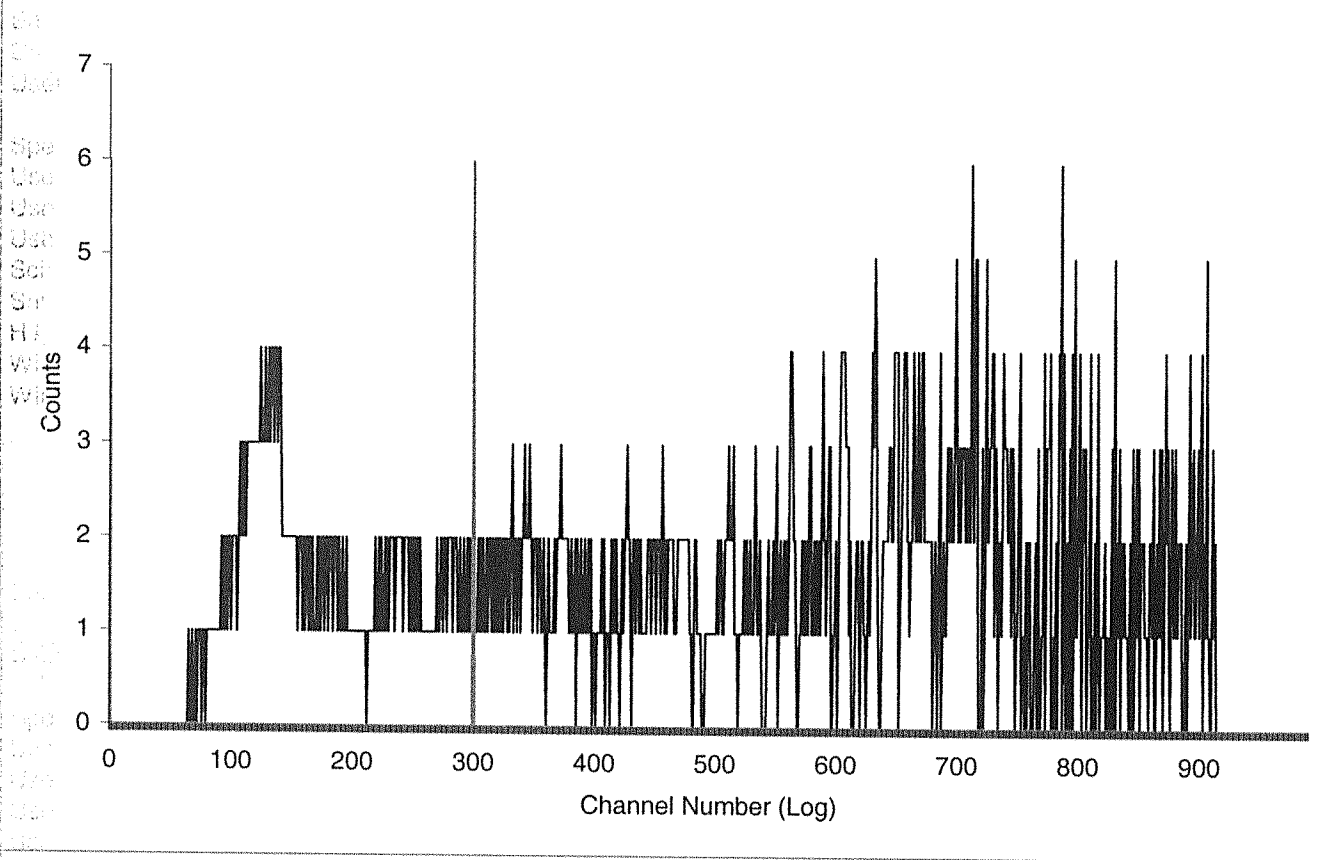
USER 07 - PU-241



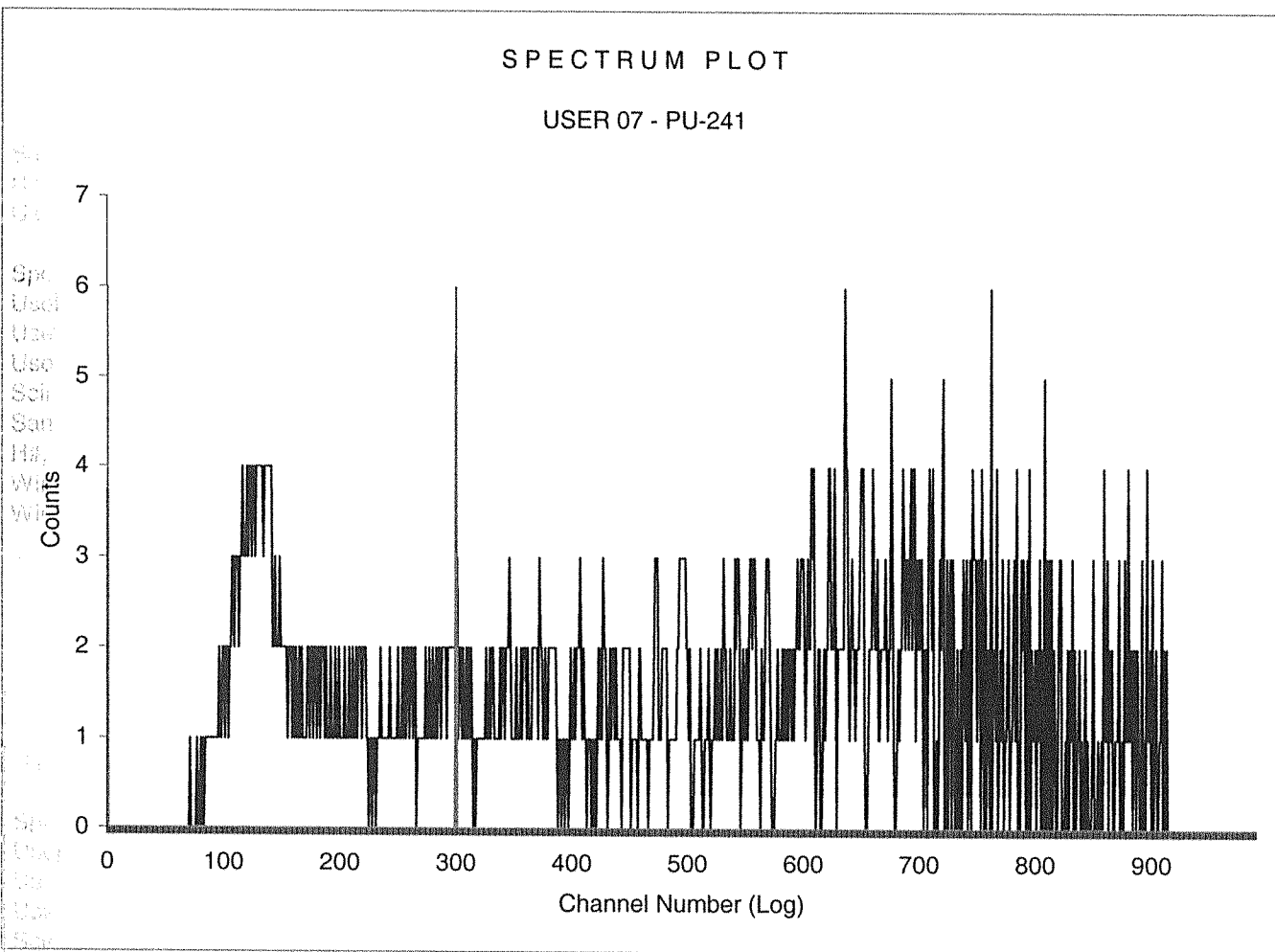
Sample Count Start Time:	28 Sep 2016 20:10:44		
Data Capture Date	28 Sep 2016 20:56:07		
User Filename	S07092849-9A.XLS		
	U07092803-1A.XLS		
Spectrum Type	Log Counts		
User Number	07		
User Id	PU-241		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	21	49-9	45.00
H#, Total Counts:	136.5	1416	
Win1: Pu-241 - Start, End:	0	300	
Win2: - Start, End:	0	990	

SPECTRUM PLOT

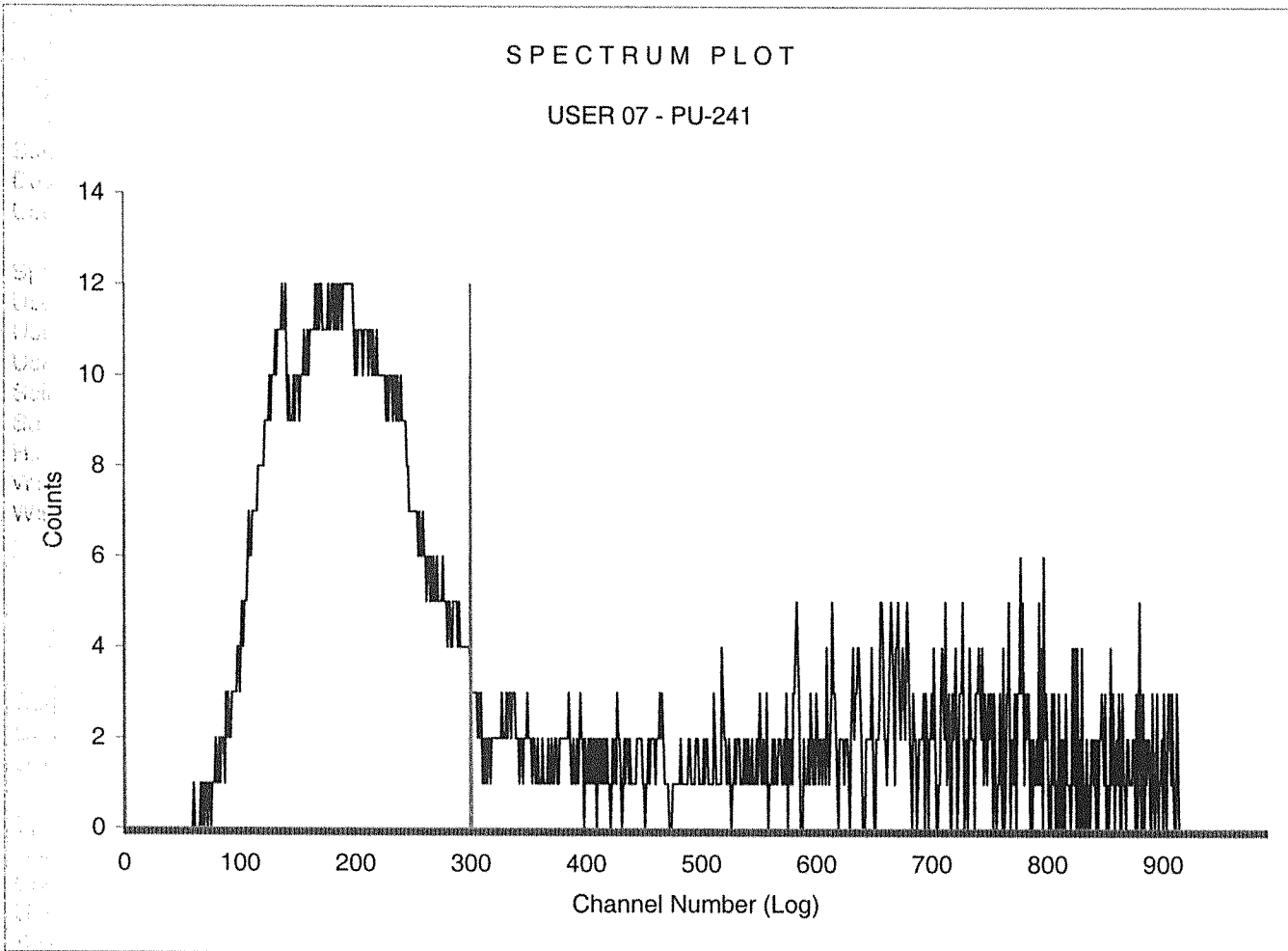
USER 07 - PU-241



Sample Count Start Time:	28 Sep 2016 22:08:37		
Data Capture Date	28 Sep 2016 22:54:00		
User Filename	S07092852-10A.XLS		
	U07092802-10A.XLS		
Spectrum Type	Log Counts		
User Number	07		
User Id	PU-241		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	10	52-10	45.00
H#, Total Counts:	133.8	1336	
Win1: Pu-241 - Start, End:	0	300	
Win2: - Start, End:	0	990	



Sample Count Start Time: 28 Sep 2016 23:41:58
Data Capture Date 29 Sep 2016 00:27:22
User Filename S07092952-12A.XLS
U07092802-10A.XLS
Spectrum Type Log Counts
User Number 07
User Id PU-241
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 12 52-12 45.00
H#, Total Counts: 134.0 2875
Win1: Pu-241 - Start, End: 0 300
Win2: - Start, End: 0 990



1596402

ID: PU-241

29 SEP 2016 10:25

USER: 7

COMMENT: BROWN

PRESET TIME : 45.00
 DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD
 COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT
 TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF
 SCINTILLATOR: LIQUID LUMEX: NO LOW SAMPLE REJ: 0
 LOW LEVEL : YES HALF LIFE CORRECTION DATE: none

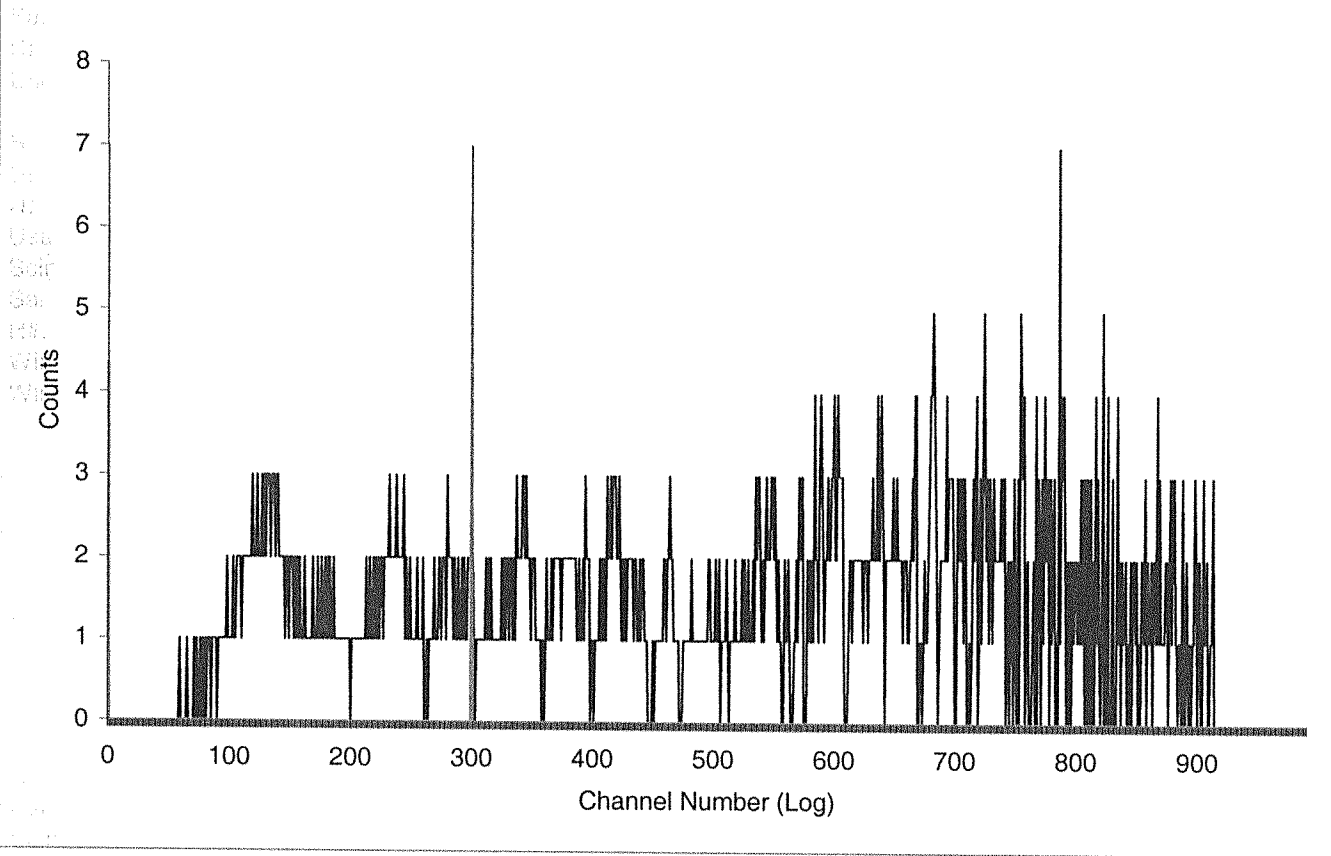
CHAN: 0.0 - 300.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0
 CHAN: 0.0 - 900.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

SAM NO	POS	TIME MIN	H#	WIND 1		LUMEX %	ELAPSED TIME
				CPM	%ERROR		
1	60-1	45.00	134.8	7.56	10.85	4.94	46.11
3	60-2	45.00	135.1	7.38	10.98	5.80	92.75
4	60-3	45.00	134.7	8.18	10.43	6.09	139.37
5	60-4	45.00	136.4	7.62	10.80	6.02	186.01
19	60-5	45.00	127.6	7.69	10.75	5.81	232.64
22	60-6	45.00	134.4	8.29	10.36	5.05	279.23

Sample Count Start Time:	29 Sep 2016 09:55:26		
Data Capture Date	29 Sep 2016 10:40:50		
User Filename	S07092960-1A.XLS		
	U07092960-1A.XLS		
Spectrum Type	Log Counts		
User Number	07		
User Id	PU-241		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	1	60-1	45.00
H#, Total Counts:	134.8	1332	
Win1: Pu-241 - Start, End:	0	300	
Win2: - Start, End:	0	990	

SPECTRUM PLOT

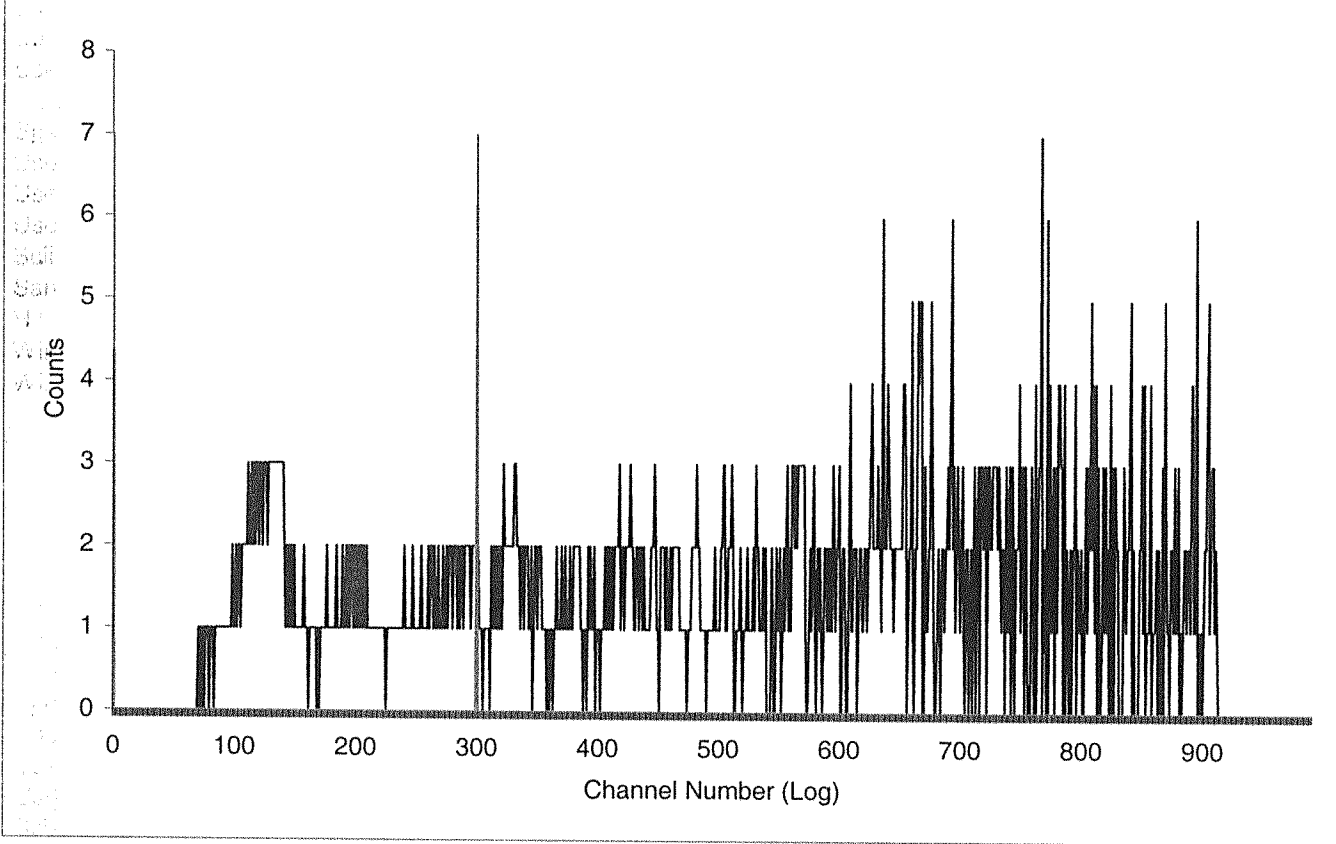
USER 07 - PU-241



Sample Count Start Time: 29 Sep 2016 10:42:04
Data Capture Date: 29 Sep 2016 11:27:27
User Filename: S07092960-2A.XLS
U07092960-1A.XLS
Spectrum Type: Log Counts
User Number: 07
User Id: PU-241
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 2 60-2 45.00
H#, Total Counts: 135.1 1347
Win1: Pu-241 - Start, End: 0 300
Win2: - Start, End: 0 990

SPECTRUM PLOT

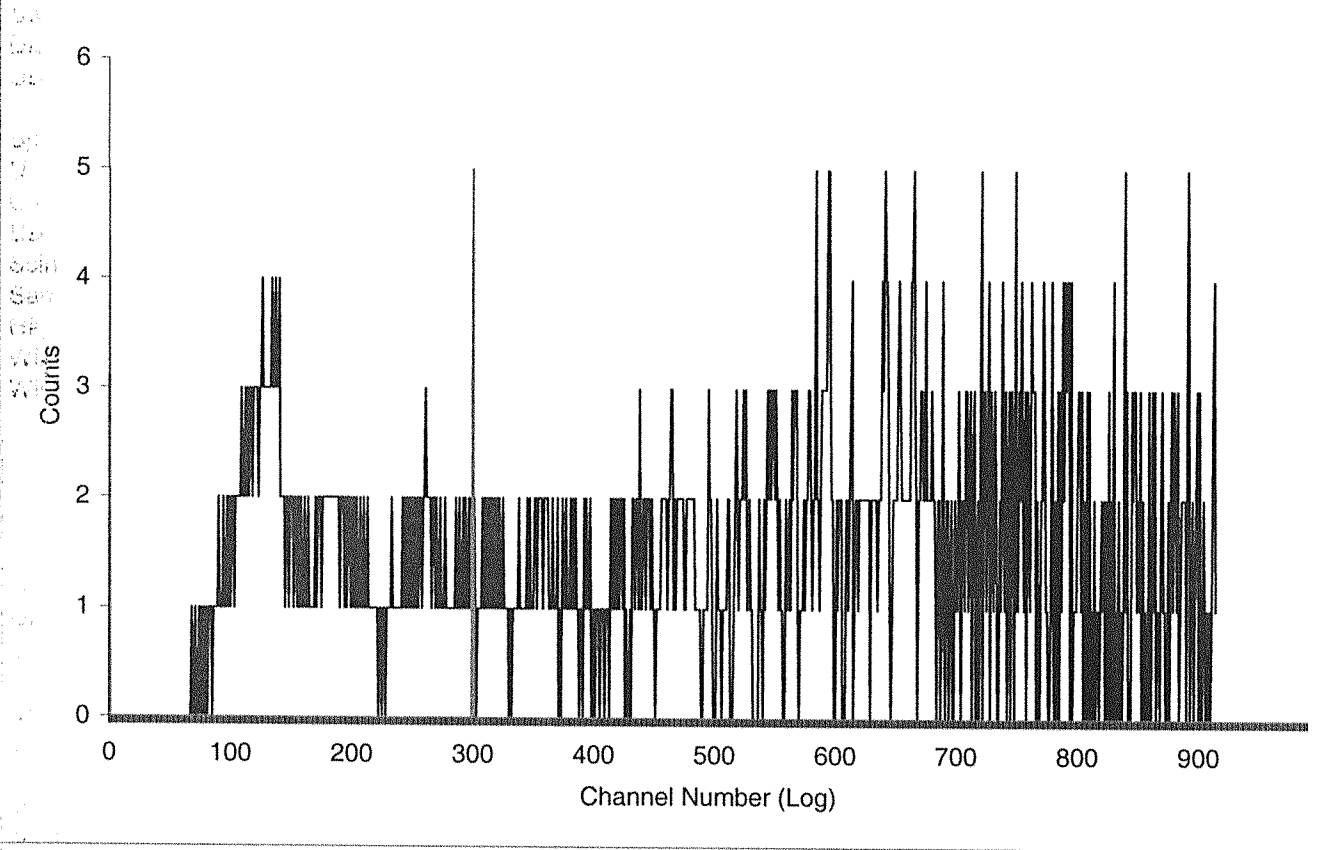
USER 07 - PU-241



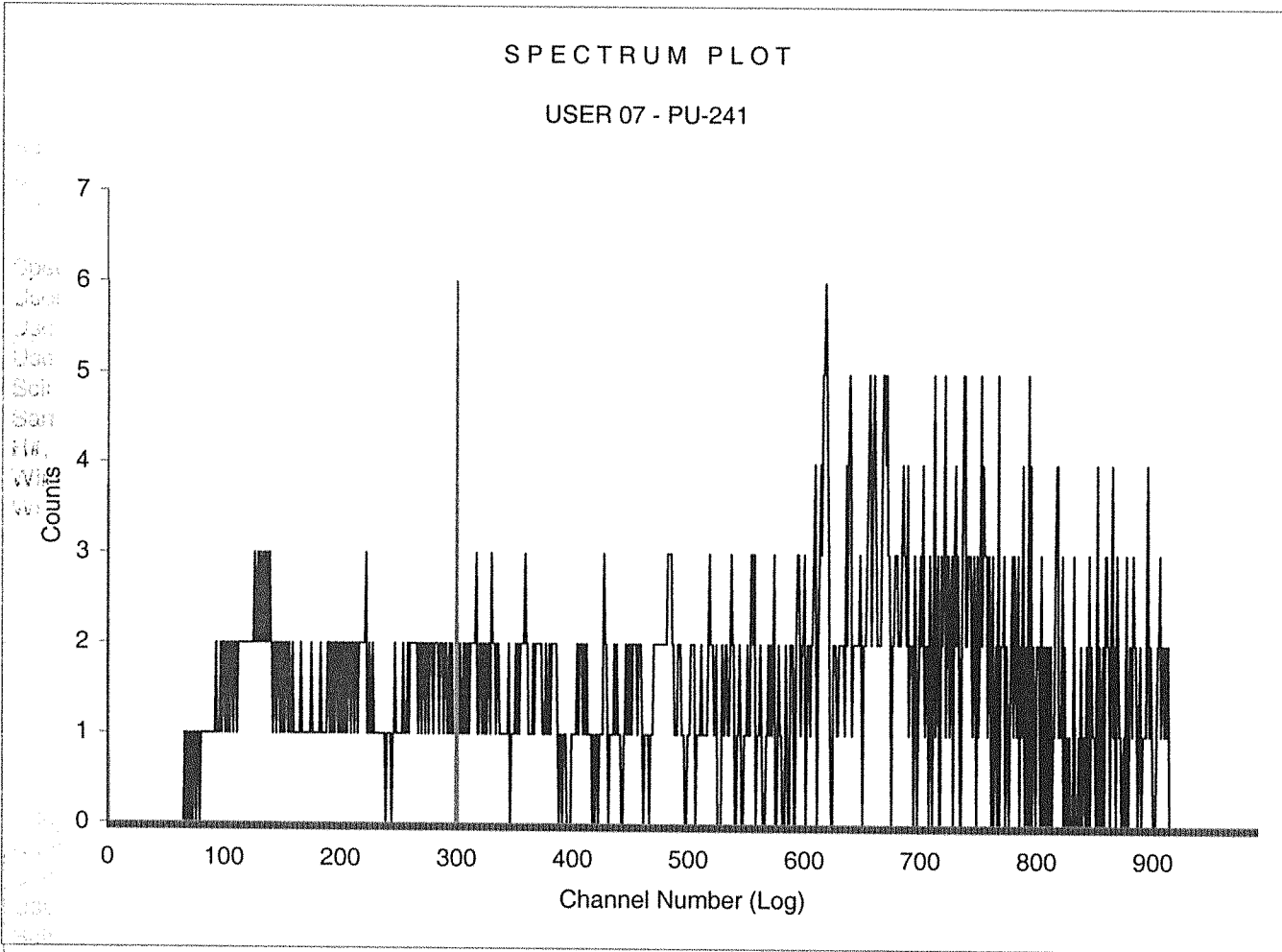
Sample Count Start Time: 29 Sep 2016 11:28:41
Data Capture Date: 29 Sep 2016 12:14:05
User Filename: S07092960-3A.XLS
U07092960-1A.XLS
Spectrum Type: Log Counts
User Number: 07
User Id: PU-241
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 3 60-3 45.00
H#, Total Counts: 134.7 1331
Win1: Pu-241 - Start, End: 0 300
Win2: - Start, End: 0 990

SPECTRUM PLOT

USER 07 - PU-241



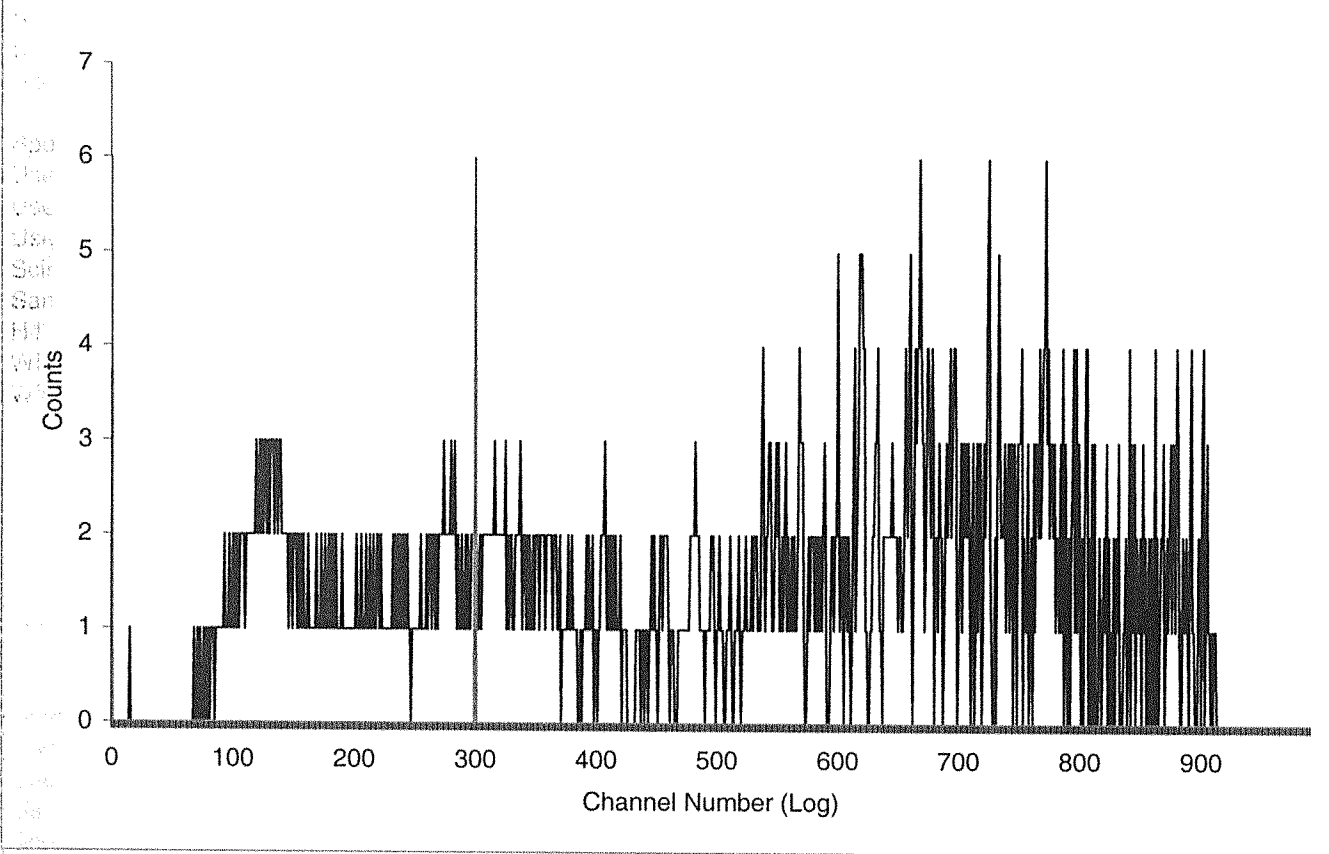
Sample Count Start Time:	29 Sep 2016 12:15:20		
Data Capture Date	29 Sep 2016 13:00:43		
User Filename	S07092960-4A.XLS		
	U07092960-1A.XLS		
Spectrum Type	Log Counts		
User Number	07		
User Id	PU-241		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	4	60-4	45.00
H#, Total Counts:	136.4	1344	
Win1: Pu-241 - Start, End:	0	300	
Win2: - Start, End:	0	990	



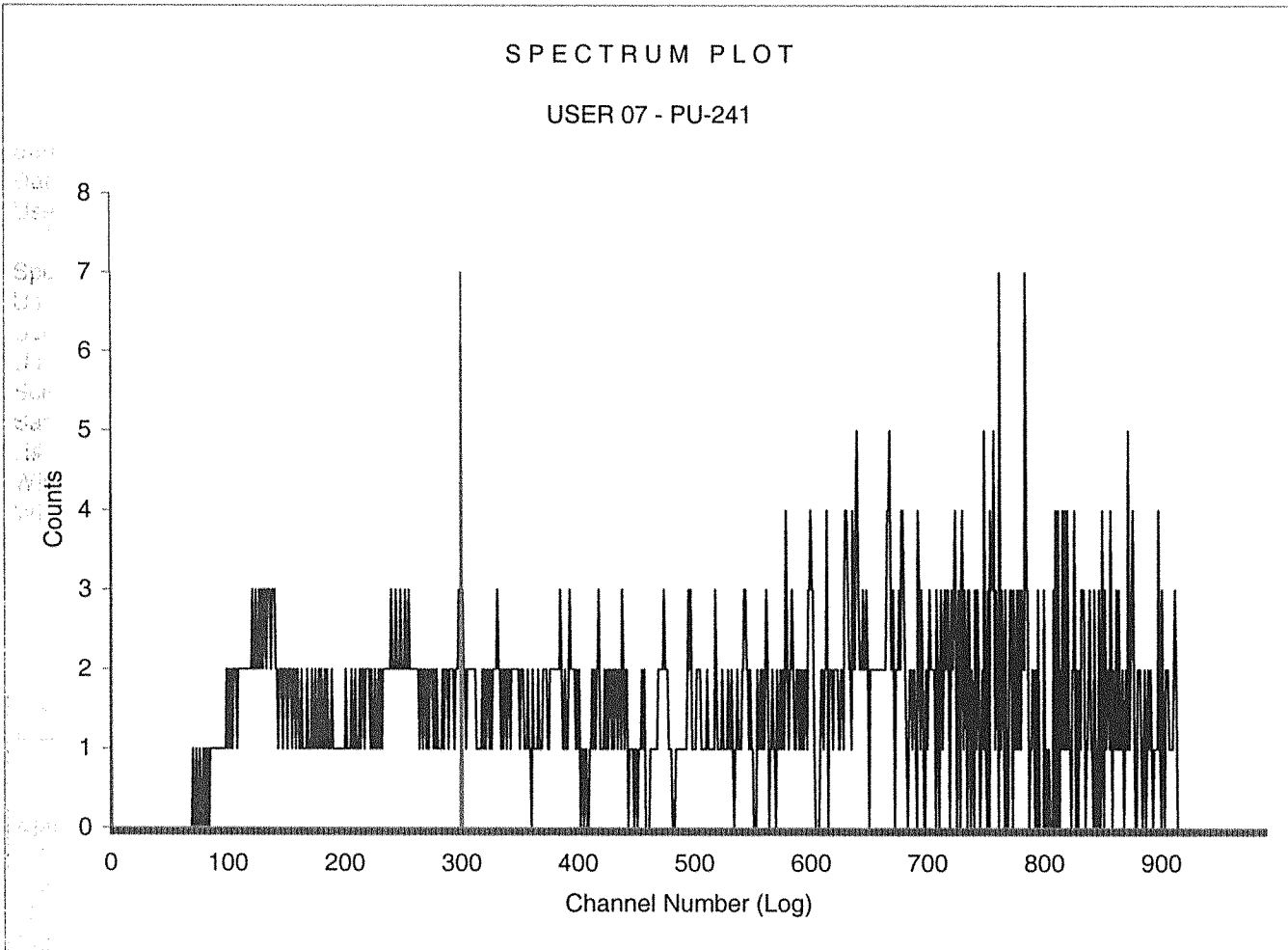
Sample Count Start Time: 29 Sep 2016 13:01:57
Data Capture Date: 29 Sep 2016 13:47:21
User Filename: S07092960-5A.XLS
U07092960-1A.XLS
Spectrum Type: Log Counts
User Number: 07
User Id: PU-241
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 5 60-5 45.00
H#, Total Counts: 127.6 1360
Win1: Pu-241 - Start, End: 0 300
Win2: - Start, End: 0 990

SPECTRUM PLOT

USER 07 - PU-241



Sample Count Start Time: 29 Sep 2016 13:48:33
Data Capture Date 29 Sep 2016 14:33:57
User Filename S07092960-6A.XLS
U07092960-1A.XLS
Spectrum Type Log Counts
User Number 07
User Id PU-241
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 6 60-6 45.00
H#, Total Counts: 134.4 1379
Win1: Pu-241 - Start, End: 0 300
Win2: - Start, End: 0 990



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
SAMPLE ID : R0405235021_PU
SAMPLE QTY : 0.514 G +/-0.195 %
SAMPLE DATE : 08-Dec-2015 00:00:00
ANALYST : MXS2
% YIELD : 72.2 +/-7.136 %

CHAMBER : 089
DETECTOR S/N : 79988
AVERAGE %EFFICIENCY : 29.2461
AVERAGE %EFF ERROR : 0.5651
COUNT DATE : 24-Sep-2016 20:54:51
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B089.CNF;1435
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 59999.99
EFF FILE : W089.CNF;384
CAL DATE : 06-Sep-2016

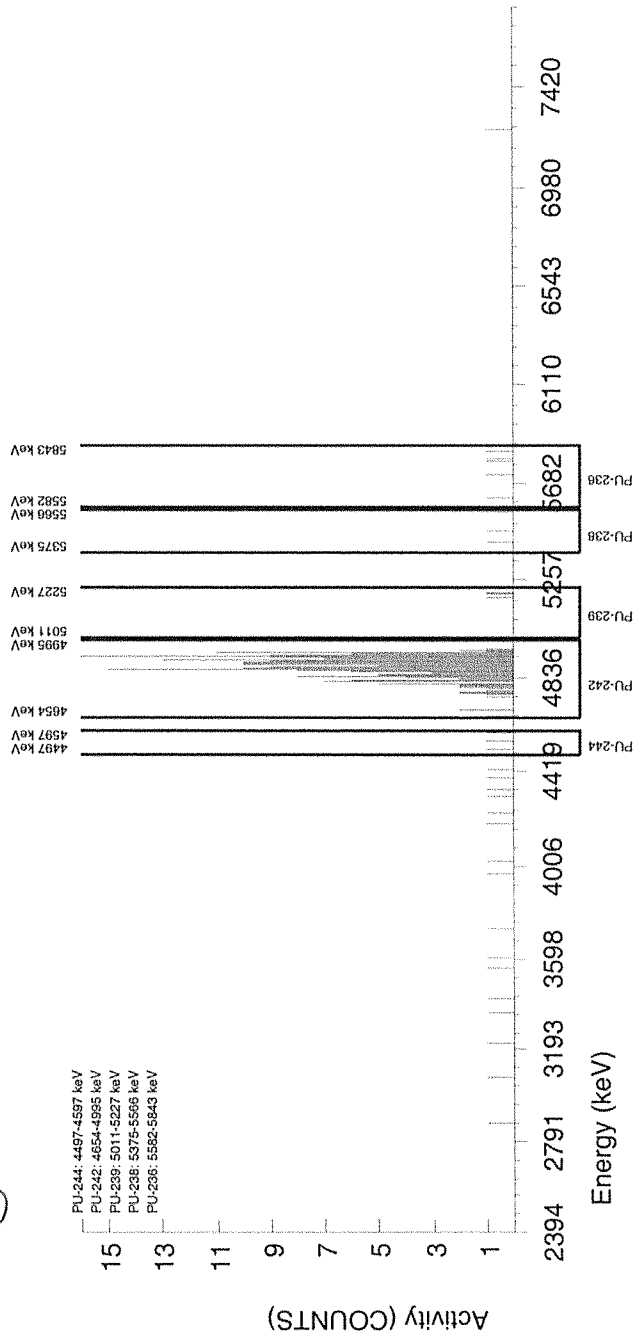
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.1634E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG S/Dev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5744.73	192.598	5.000	-1.240	6.240	2.4980	100.000	-2.60E-02	1.13E-01	2.55E-01	9.61E-02	1.13E-01
PU-238	5486.00	5484.82	123.460	3.000	1.080	1.920	1.3856	99.900	1.88E-02	7.27E-02	1.41E-01	4.42E-02	7.26E-02
PU-239	5155.00	5195.39	24.692	3.000	-0.120	3.120	1.7664	99.900	-2.08E-03	7.45E-02	1.64E-01	5.60E-02	7.44E-02
PU-242	4890.00	4876.70	75.558	229.000	222.040	6.960	2.6382	100.000	3.84E+00	7.59E-01	2.19E-01	8.36E-02	5.16E-01
PU-244	4589.00	4554.41	74.076	3.000	1.320	1.680	1.2961	99.900	2.29E-02	7.18E-02	1.34E-01	4.11E-02	7.17E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
 SAMPLE ID : R0405235022_PU
 SAMPLE QTY : 0.505 G +/-0.198 %
 SAMPLE DATE : 08-Dec-2015 00:00:00
 ANALYST : MXS2
 % YIELD : 69.9 +/-6.695 %

CHAMBER : 090
 DETECTOR S/N : 78263
 AVERAGE %EFFICIENCY : 33.4344
 AVERAGE %EFF ERROR : 0.6443
 COUNT DATE : 24-Sep-2016 20:54:51
 ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
 BKG FILE : B090.CNF;1440
 BKG DATE : 23-Sep-2016
 BKG LIVE TIME(SEC) : 59999.99
 EFF FILE : W090.CNF;374
 CAL DATE : 06-Sep-2016

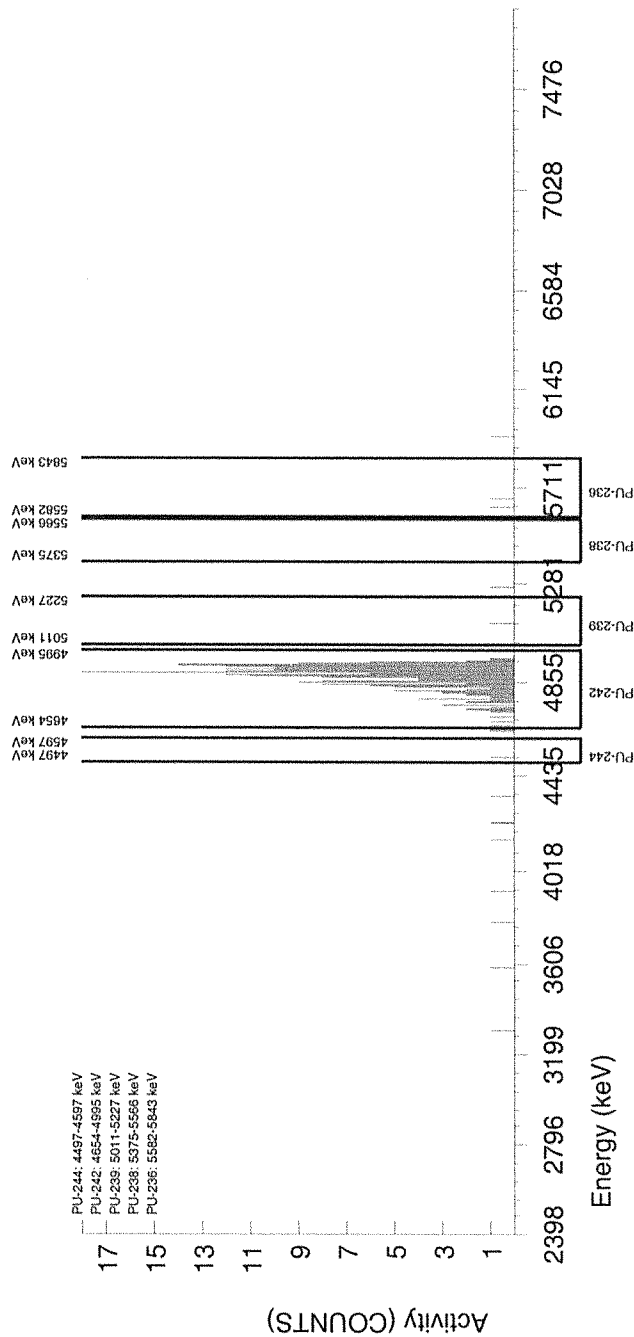
TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.0627E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5643.27	39.587	2.000	1.520	0.480	0.6928	100.000	2.94E-02	6.75E-02	1.07E-01	2.45E-02	6.74E-02
PU-238	5486.00	5470.34	0.000	0.000	-0.960	0.960	0.9798	99.900	-1.54E-02	3.57E-02	1.06E-01	2.88E-02	3.56E-02
PU-239	5155.00	5110.12	4.948	1.000	0.040	0.960	0.9798	99.900	6.37E-04	4.73E-02	1.05E-01	2.86E-02	4.72E-02
PU-242	4890.00	4872.46	57.731	246.000	245.760	0.240	0.4899	100.000	3.91E+00	7.25E-01	7.63E-02	1.43E-02	4.90E-01
PU-244	4589.00	4518.38	4.948	1.000	0.520	0.480	0.6928	99.900	8.28E-03	4.61E-02	8.82E-02	2.02E-02	4.60E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
SAMPLE ID : R0405235023_PU
SAMPLE QTY : 0.504 G +/-0.198 %
SAMPLE DATE : 02-Dec-2015 00:00:00
ANALYST : MXS2
% YIELD : 68.9 +/-6.641 %

CHAMBER : 091
DETECTOR S/N : 78259
AVERAGE %EFFICIENCY : 34.7245
AVERAGE %EFF ERROR : 0.6687
COUNT DATE : 24-Sep-2016 20:54:51
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B091.CNF;1438
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 59999.99
EFF FILE : W091.CNF;363
CAL DATE : 06-Sep-2016

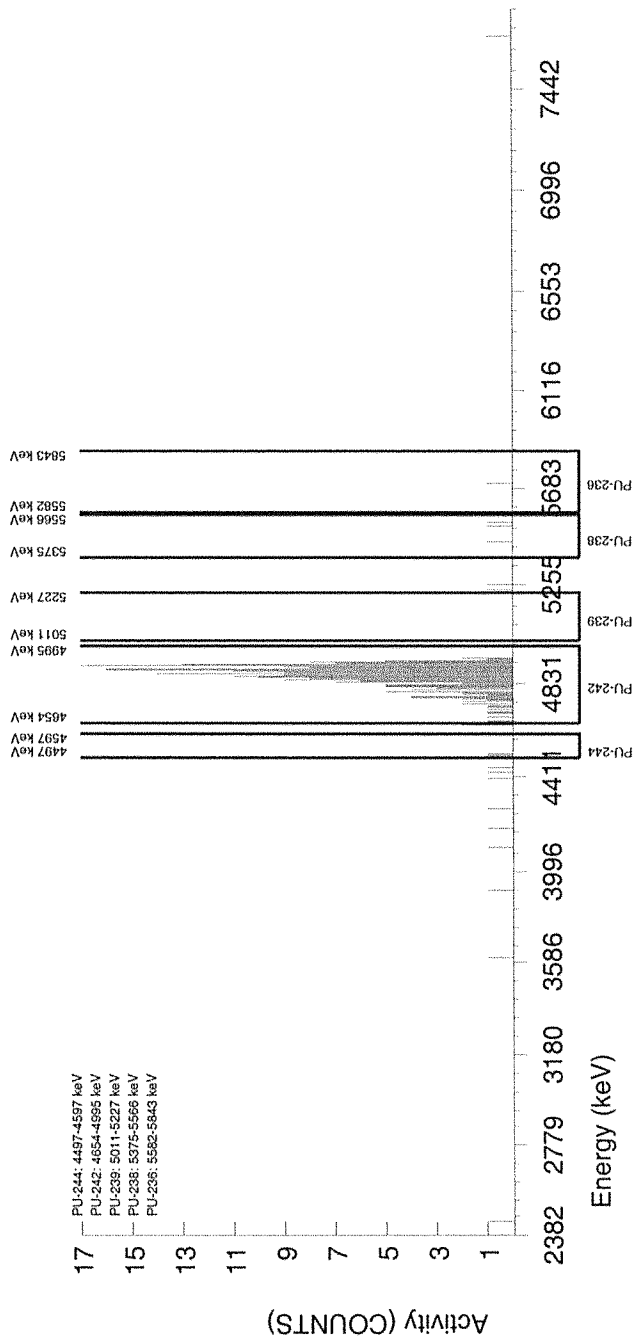
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.0185E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5704.53	4.930	1.000	0.280	0.720	0.8485	100.000	5.31E-03	5.56E-02	1.16E-01	2.95E-02	5.56E-02
PU-238	5486.00	5498.56	83.811	3.000	2.040	0.960	0.9798	99.900	3.20E-02	6.38E-02	1.03E-01	2.82E-02	6.37E-02
PU-239	5155.00	5118.68	0.000	0.000	-0.480	0.480	0.6928	99.900	-7.48E-03	3.32E-02	8.63E-02	1.98E-02	3.31E-02
PU-242	4890.00	4856.68	68.610	253.000	251.560	1.440	1.2000	100.000	3.92E+00	7.20E-01	1.15E-01	3.42E-02	4.87E-01
PU-244	4589.00	4510.45	14.790	3.000	2.760	0.240	0.4899	99.900	4.30E-02	6.23E-02	7.47E-02	1.40E-02	6.20E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
SAMPLE ID : R0405235024_PU
SAMPLE QTY : 0.505 G +/-0.198 %
SAMPLE DATE : 08-Dec-2015 00:00:00
ANALYST : MXS2
% YIELD : 67.1 +/-7.160 %

CHAMBER : 092
DETECTOR S/N : 80063
AVERAGE %EFFICIENCY : 30.3421
AVERAGE %EFF ERROR : 0.5858
COUNT DATE : 24-Sep-2016 20:54:51
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B092.CNF:1442
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 59999.99
EFF FILE : W092.CNF:414
CAL DATE : 06-Sep-2016

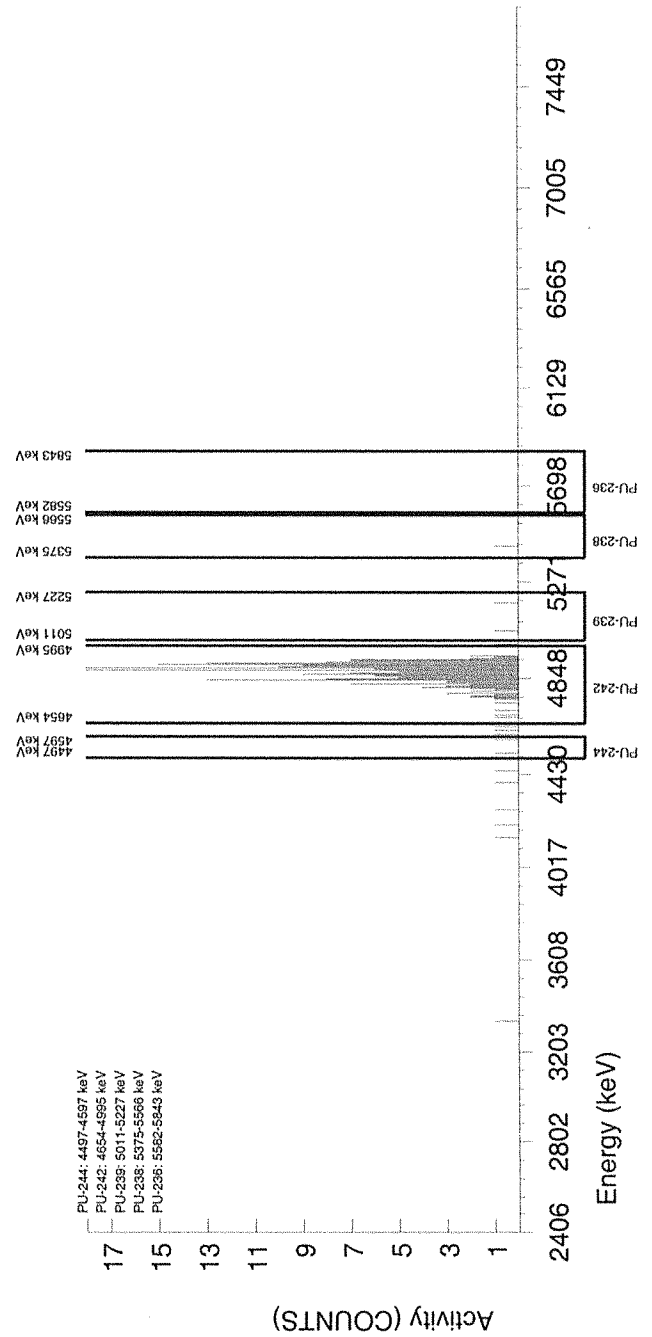
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 2.9431E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.25	0.000	0.000	-0.480	0.480	0.6928	100.000	-1.06E-02	4.71E-02	1.23E-01	2.81E-02	4.70E-02
PU-238	5486.00	5430.46	4.922	1.000	0.040	0.960	0.9798	99.900	7.35E-04	5.45E-02	1.21E-01	3.30E-02	5.45E-02
PU-239	5155.00	5119.91	118.128	2.000	0.080	1.920	1.3856	99.900	1.46E-03	6.72E-02	1.47E-01	4.63E-02	6.71E-02
PU-242	4890.00	4873.62	74.814	216.000	214.320	1.680	1.2961	100.000	3.91E+00	7.75E-01	1.41E-01	4.33E-02	5.27E-01
PU-244	4589.00	4552.77	59.064	2.000	1.520	0.480	0.6928	99.900	2.78E-02	6.39E-02	1.01E-01	2.32E-02	6.38E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
 SAMPLE ID : R0405235025_PU
 SAMPLE QTY : 0.506 G +/-0.198 %
 SAMPLE DATE : 08-Dec-2015 00:00:00
 ANALYST : MXS2
 % YIELD : 75.4 +/-6.518 %

CHAMBER : 093
 DETECTOR S/N : 33206
 AVERAGE %EFFICIENCY : 33.0892
 AVERAGE %EFF ERROR : 0.6377
 COUNT DATE : 24-Sep-2016 20:54:51
 ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
 BKG FILE : B093.CNF;1431
 BKG DATE : 23-Sep-2016
 BKG LIVE TIME(SEC) : 59999.99
 EFF FILE : W093.CNF;379
 CAL DATE : 06-Sep-2016

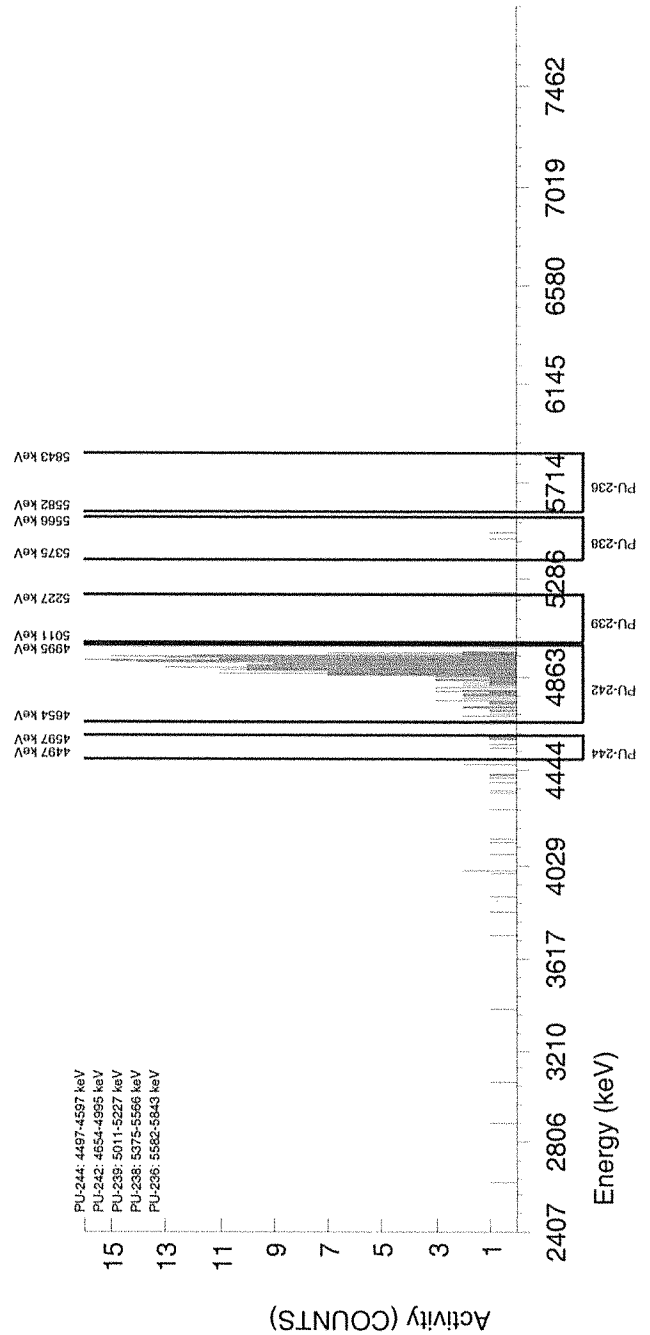
TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.3032E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG S/Dev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Umc pCi/G
PU-236	5749.00	5712.27	0.000	0.000	-1.200	1.200	1.0954	100.000	-2.17E-02	4.11E-02	1.27E-01	3.62E-02	4.11E-02
PU-238	5486.00	5446.19	0.000	3.000	1.320	1.680	1.2961	99.900	1.98E-02	6.21E-02	1.16E-01	3.56E-02	6.20E-02
PU-239	5155.00	5118.70	0.000	0.000	-1.680	1.680	1.2961	99.900	-2.50E-02	3.53E-02	1.15E-01	3.54E-02	3.53E-02
PU-242	4890.00	4889.29	80.246	264.000	262.320	1.680	1.2961	100.000	3.90E+00	7.04E-01	1.15E-01	3.53E-02	4.75E-01
PU-244	4589.00	4558.92	0.000	6.000	6.000	0.000	0.0000	99.900	8.93E-02	7.84E-02	4.47E-02	0.00E+00	7.75E-02

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GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
 SAMPLE ID : R0405235026_PU
 SAMPLE QTY : 0.502 G +/-0.199 %
 SAMPLE DATE : 08-Dec-2015 00:00:00
 ANALYST : MXS2
 % YIELD : 83.6 +/-6.457 %

CHAMBER : 095
 DETECTOR S/N : 38626
 AVERAGE %EFFICIENCY : 30.4247
 AVERAGE %EFF ERROR : 0.5873
 COUNT DATE : 24-Sep-2016 20:54:52
 ELAPSED LIVE TIME(SEC) : 14399.99

LIB FILE : PU
 BKG FILE : B095.CNF:1407
 BKG DATE : 23-Sep-2016
 BKG LIVE TIME(SEC) : 59999.99
 EFF FILE : W095.CNF:408
 CAL DATE : 06-Sep-2016

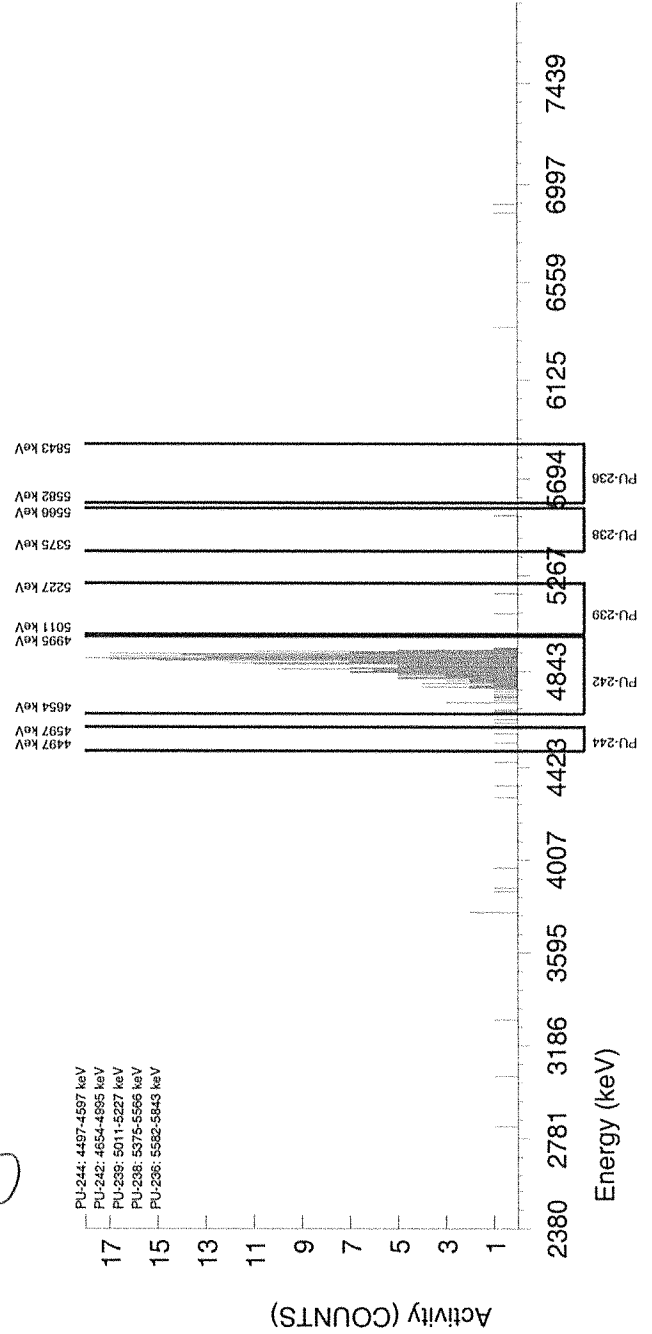
TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.6642E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Umc pCi/G
PU-236	5749.00	5712.28	0.000	0.000	-0.960	0.960	0.9798	100.000	-1.71E-02	3.98E-02	1.18E-01	3.20E-02	3.97E-02
PU-238	5486.00	5527.73	4.993	1.000	0.040	0.960	0.9798	99.900	5.92E-04	4.39E-02	9.76E-02	2.66E-02	4.39E-02
PU-239	5155.00	5141.73	89.878	2.000	1.520	0.480	0.6928	99.900	2.24E-02	5.15E-02	8.15E-02	1.87E-02	5.14E-02
PU-242	4890.00	4870.78	77.811	269.000	267.560	1.440	1.2000	100.000	3.93E+00	7.03E-01	1.09E-01	3.23E-02	4.74E-01
PU-244	4589.00	4548.76	44.939	2.000	2.000	0.000	0.0000	99.900	2.94E-02	5.06E-02	4.41E-02	0.00E+00	5.04E-02

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GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
 SAMPLE ID : R0405235027_PU
 SAMPLE QTY : 0.510 G +/-0.196 %
 SAMPLE DATE : 08-Dec-2015 00:00:00
 ANALYST : MXS2
 % YIELD : 78.8 +/-6.434 %

CHAMBER : 096
 DETECTOR S/N : 80016
 AVERAGE %EFFICIENCY : 32.5188
 AVERAGE %EFF ERROR : 0.6269
 COUNT DATE : 24-Sep-2016 20:54:52
 ELAPSED LIVE TIME(SEC) : 14399.99

LIB FILE : PU
 BKG FILE : B096.CNF;1399
 BKG DATE : 23-Sep-2016
 BKG LIVE TIME(SEC) : 59999.99
 EFF FILE : W096.CNF;357
 CAL DATE : 06-Sep-2016

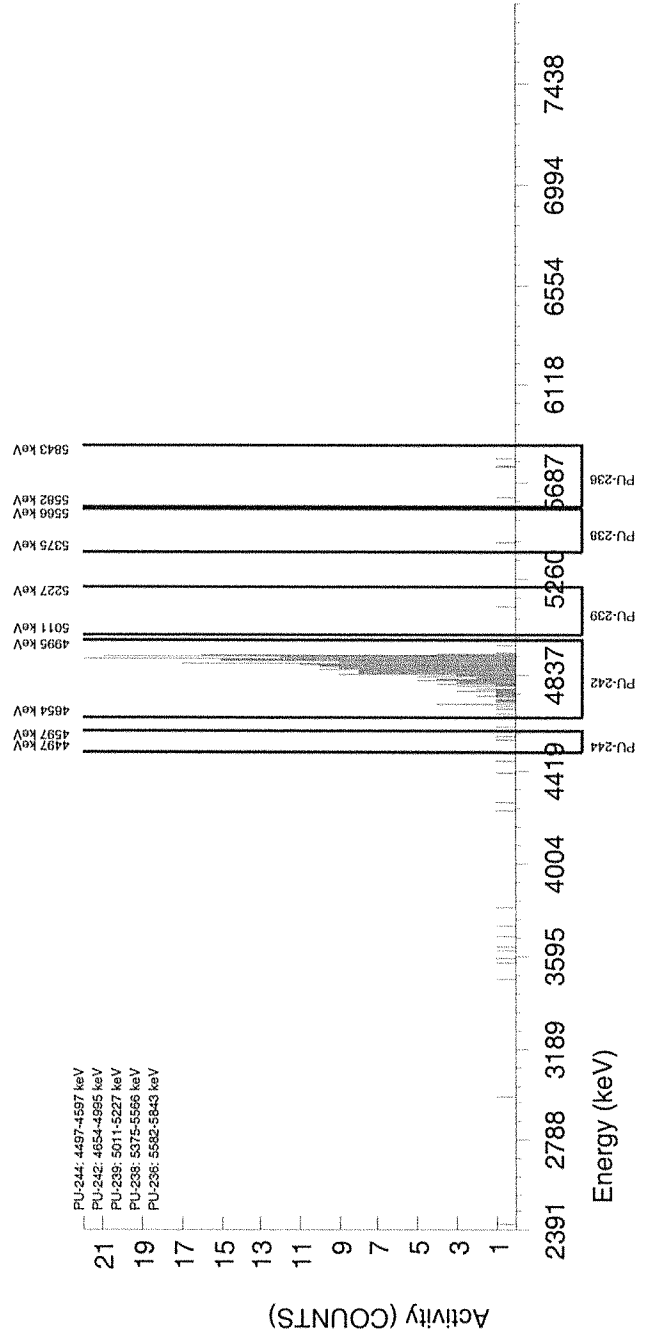
TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.4539E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5728.41	162.816	4.000	2.560	1.440	1.2000	100.000	4.46E-02	7.96E-02	1.29E-01	3.83E-02	7.94E-02
PU-238	5486.00	5419.38	4.934	1.000	-0.680	1.680	1.2961	99.900	-9.84E-03	4.45E-02	1.12E-01	3.49E-02	4.45E-02
PU-239	5155.00	5137.74	4.934	1.000	0.280	0.720	0.8485	99.900	4.03E-03	4.21E-02	8.78E-02	2.23E-02	4.21E-02
PU-242	4890.00	4870.70	41.526	271.000	269.560	1.440	1.2000	100.000	3.87E+00	6.90E-01	1.06E-01	3.16E-02	4.65E-01
PU-244	4589.00	4561.87	19.735	2.000	1.040	0.960	0.9798	99.900	1.50E-02	5.11E-02	9.47E-02	2.58E-02	5.11E-02

Signature



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
SAMPLE ID : R0405235028_PU
SAMPLE QTY : 0.507 G +/-0.197 %
SAMPLE DATE : 23-Nov-2015 00:00:00
ANALYST : MXS2
% YIELD : 82.0 +/-6.081 %

CHAMBER : 097
DETECTOR S/N : 83288
AVERAGE %EFFICIENCY : 35.3557
AVERAGE %EFF ERROR : 0.6805
COUNT DATE : 24-Sep-2016 20:54:52
ELAPSED LIVE TIME(SEC) : 14399.99

LIB FILE : PU
BKG FILE : B097.CNF;1396
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 59999.99
EFF FILE : W097.CNF;381
CAL DATE : 06-Sep-2016

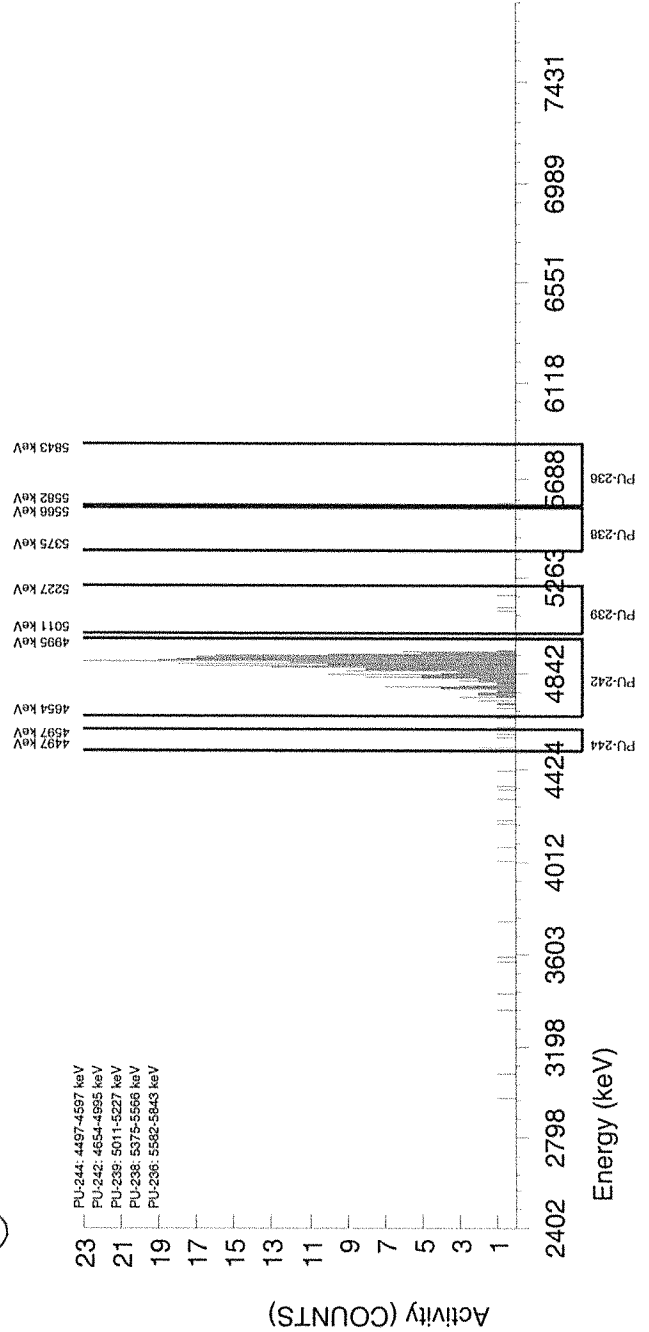
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.5921E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.14	236.442	2.000	0.560	1.440	1.2000	100.000	8.77E-03	5.67E-02	1.16E-01	3.44E-02	5.66E-02
PU-238	5486.00	5470.35	0.000	0.000	-0.480	0.480	0.6928	99.900	-6.18E-03	2.74E-02	7.13E-02	1.63E-02	2.73E-02
PU-239	5155.00	5142.96	68.962	3.000	2.280	0.720	0.8485	99.900	2.92E-02	5.17E-02	7.81E-02	1.99E-02	5.16E-02
PU-242	4890.00	4869.37	54.431	306.000	304.800	1.200	1.0954	100.000	3.89E+00	6.56E-01	8.96E-02	2.56E-02	4.39E-01
PU-244	4589.00	4542.65	4.926	4.000	4.000	0.000	0.0000	99.900	5.12E-02	5.67E-02	3.84E-02	0.00E+00	5.64E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
SAMPLE ID : R0405235029_PU
SAMPLE QTY : 0.504 G +/-0.198 %
SAMPLE DATE : 23-Nov-2015 00:00:00
ANALYST : MXS2
% YIELD : 78.0 +/-6.192 %

CHAMBER : 099
DETECTOR SN : 80059
AVERAGE %EFFICIENCY : 35.6284
AVERAGE %EFF ERROR : 0.6858
COUNT DATE : 24-Sep-2016 20:54:52
ELAPSED LIVE TIME(SEC) : 14399.99

LIB FILE : PU
BKG FILE : B099.CNF;1399
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 59999.99
EFF FILE : W099.CNF;383
CAL DATE : 06-Sep-2016

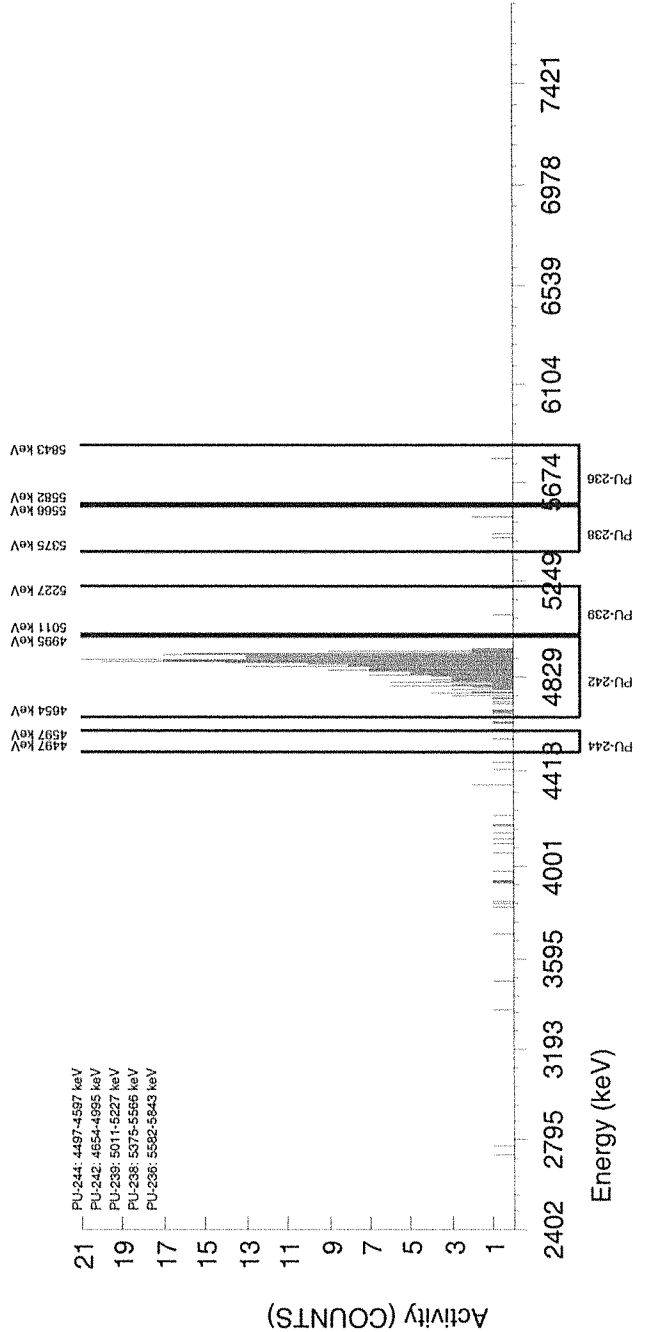
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.4182E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5781.43	4.881	1.000	0.040	0.960	0.9798	100.000	6.57E-04	4.88E-02	1.08E-01	2.95E-02	4.87E-02
PU-238	5486.00	5483.83	4.881	4.000	3.520	0.480	0.6928	99.900	4.75E-02	6.05E-02	7.48E-02	1.71E-02	6.02E-02
PU-239	5155.00	5154.17	112.262	2.000	1.520	0.480	0.6928	99.900	2.04E-02	4.69E-02	7.43E-02	1.70E-02	4.68E-02
PU-242	4890.00	4871.59	57.642	293.000	292.280	0.720	0.8485	100.000	3.92E+00	6.72E-01	8.19E-02	2.08E-02	4.51E-01
PU-244	4589.00	4578.50	0.000	2.000	1.280	0.720	0.8485	99.900	1.72E-02	4.73E-02	8.20E-02	2.09E-02	4.73E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
 SAMPLE ID : R0405235030_PU
 SAMPLE QTY : 0.514 G +/-0.195 %
 SAMPLE DATE : 23-Nov-2015 00:00:00
 ANALYST : MXS2
 % YIELD : 80.8 +/-7.083 %

CHAMBER : 253
 DETECTOR S/N : 87941
 AVERAGE %EFFICIENCY : 25.6727
 AVERAGE %EFF ERROR : 0.4975
 COUNT DATE : 24-Sep-2016 20:51:04
 ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
 BKG FILE : B253.CNF;459
 BKG DATE : 23-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W253.CNF;112
 CAL DATE : 19-Sep-2016

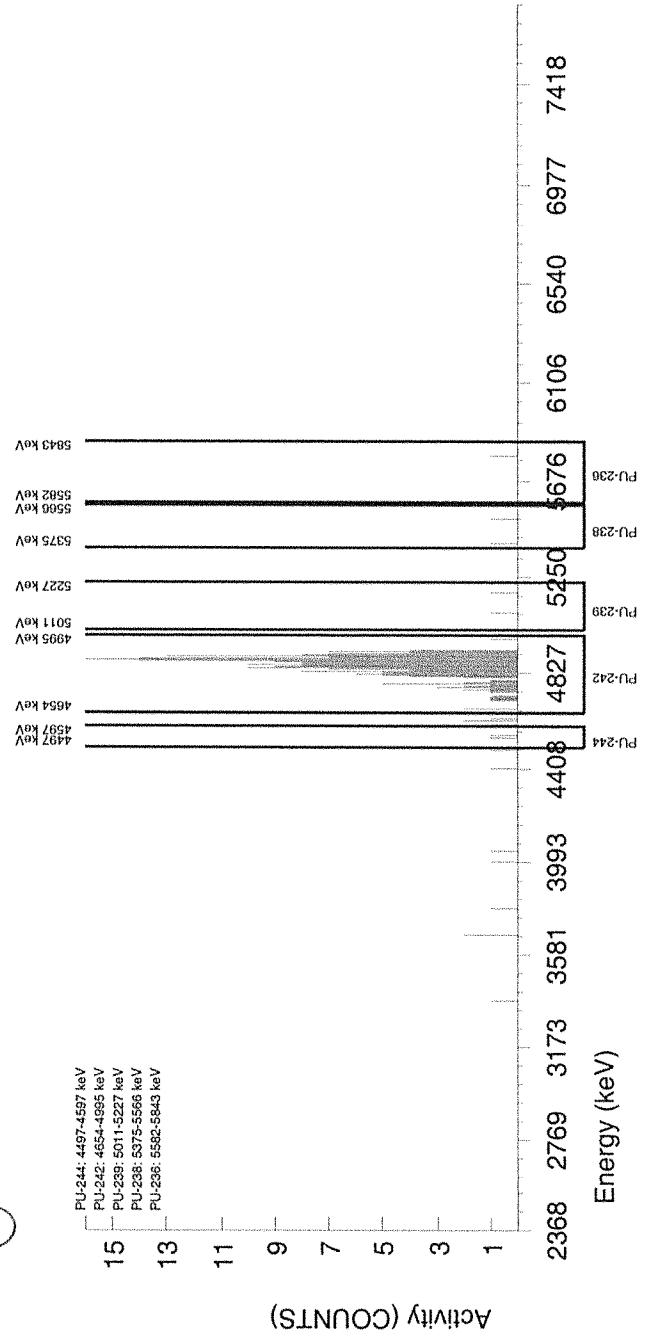
TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.5427E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5783.09	4.985	1.000	0.520	0.480	0.6928	100.000	1.12E-02	6.24E-02	1.19E-01	2.74E-02	6.23E-02
PU-238	5486.00	5451.69	104.681	2.000	1.280	0.720	0.8485	99.900	2.27E-02	6.26E-02	1.08E-01	2.76E-02	6.25E-02
PU-239	5155.00	5135.71	89.727	2.000	1.040	0.960	0.9798	99.900	1.83E-02	6.27E-02	1.16E-01	3.16E-02	6.26E-02
PU-242	4890.00	4855.64	58.156	219.000	218.280	0.720	0.8485	100.000	3.84E+00	7.54E-01	1.07E-01	2.74E-02	5.12E-01
PU-244	4589.00	4533.36	54.833	3.000	2.520	0.480	0.6928	99.900	4.44E-02	7.08E-02	9.76E-02	2.24E-02	7.05E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
 SAMPLE ID : R0405235031_PU
 SAMPLE QTY : 0.517 G +/-0.193 %
 SAMPLE DATE : 26-Nov-2015 00:00:00
 ANALYST : MXS2
 % YIELD : 84.1 +/-7.016 %

CHAMBER : 254
 DETECTOR S/N : 87942
 AVERAGE %EFFICIENCY : 25.1642
 AVERAGE %EFF ERROR : 0.4879
 COUNT DATE : 24-Sep-2016 20:51:06
 ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
 BKG FILE : B254.CNF;458
 BKG DATE : 23-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W254.CNF;116
 CAL DATE : 19-Sep-2016

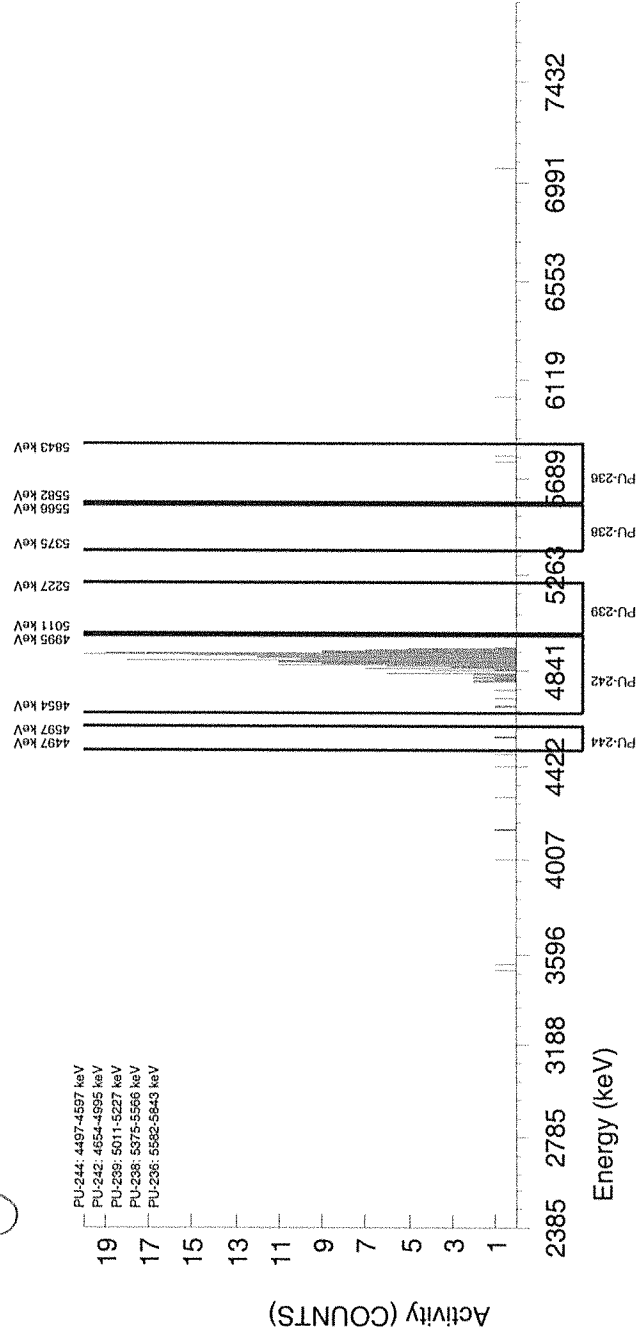
TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.6845E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5772.49	29.851	2.000	1.280	0.720	0.8485	100.000	2.69E-02	7.41E-02	1.28E-01	3.26E-02	7.40E-02
PU-238	5486.00	5470.36	0.000	0.000	-0.480	0.480	0.6928	99.900	-8.30E-03	3.68E-02	9.58E-02	2.19E-02	3.67E-02
PU-239	5155.00	5118.70	0.000	0.000	-0.480	0.480	0.6928	99.900	-8.25E-03	3.65E-02	9.51E-02	2.18E-02	3.65E-02
PU-242	4890.00	4886.46	55.224	223.000	222.520	0.480	0.6928	100.000	3.82E+00	7.42E-01	9.50E-02	2.18E-02	5.04E-01
PU-244	4589.00	4549.83	9.950	2.000	1.760	0.240	0.4899	99.900	3.02E-02	5.96E-02	8.24E-02	1.54E-02	5.94E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
 SAMPLE ID : R0405235032_PU
 SAMPLE QTY : 0.508 G +/-0.197 %
 SAMPLE DATE : 23-Nov-2015 00:00:00
 ANALYST : MXS2
 % YIELD : 79.2 +/-7.248 %

CHAMBER : 255
 DETECTOR S/N : 87943
 AVERAGE %EFFICIENCY : 24.9747
 AVERAGE %EFF ERROR : 0.4844
 COUNT DATE : 24-Sep-2016 20:51:08
 ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
 BKG FILE : B255.CNF;460
 BKG DATE : 23-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W255.CNF;120
 CAL DATE : 19-Sep-2016

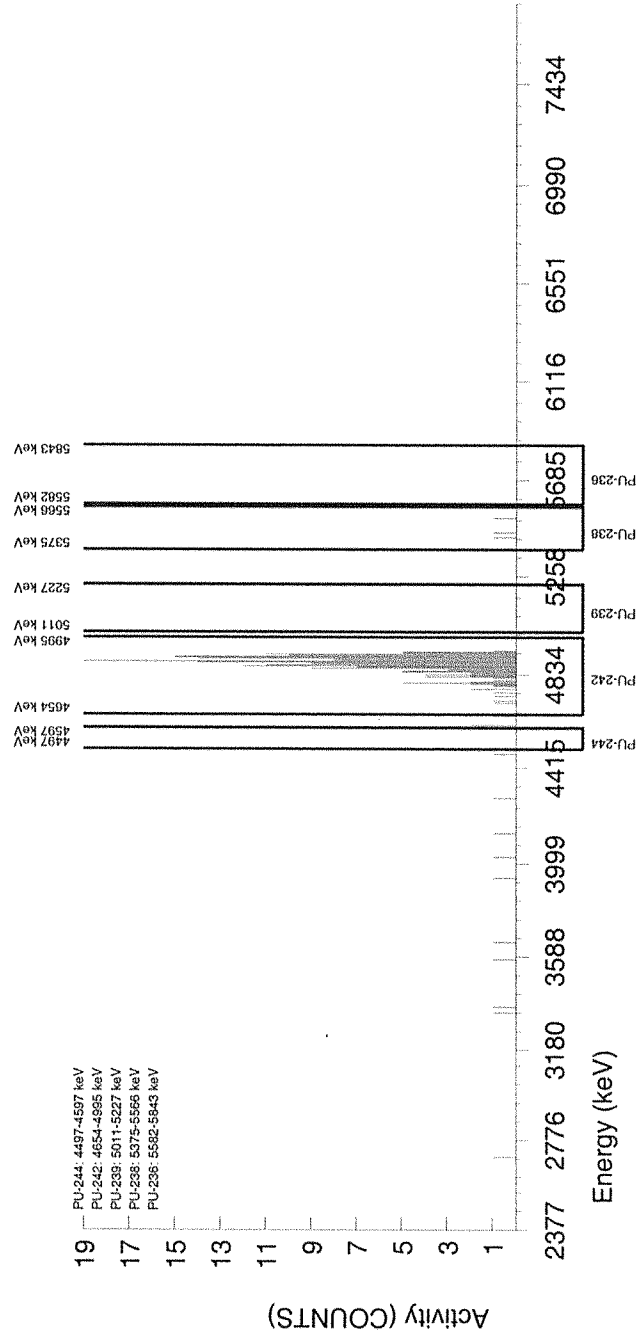
TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.4709E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.27	0.000	0.000	-0.480	0.480	0.6928	100.000	-1.10E-02	4.87E-02	1.27E-01	2.91E-02	4.86E-02
PU-238	5486.00	5468.93	84.520	3.000	2.280	0.720	0.8485	99.900	4.29E-02	7.62E-02	1.15E-01	2.93E-02	7.59E-02
PU-239	5155.00	5118.70	0.000	0.000	-1.680	1.680	1.2961	99.900	-3.14E-02	4.44E-02	1.45E-01	4.44E-02	4.43E-02
PU-242	4890.00	4874.01	53.447	209.000	208.040	0.960	0.9798	100.000	3.89E+00	7.80E-01	1.23E-01	3.35E-02	5.31E-01
PU-244	4589.00	4498.27	0.000	1.000	0.040	0.960	0.9798	99.900	7.48E-04	5.55E-02	1.23E-01	3.36E-02	5.54E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
SAMPLE ID : R0405235033_PU
SAMPLE QTY : 0.506 G +/-0.198 %
SAMPLE DATE : 23-Nov-2015 00:00:00
ANALYST : MXS2
% YIELD : 70.2 +/-7.583 %

CHAMBER : 256
DETECTOR S/N : 87944
AVERAGE %EFFICIENCY : 25.7507
AVERAGE %EFF ERROR : 0.4991
COUNT DATE : 24-Sep-2016 20:51:11
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B256.CNF;460
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W256.CNF;114
CAL DATE : 19-Sep-2016

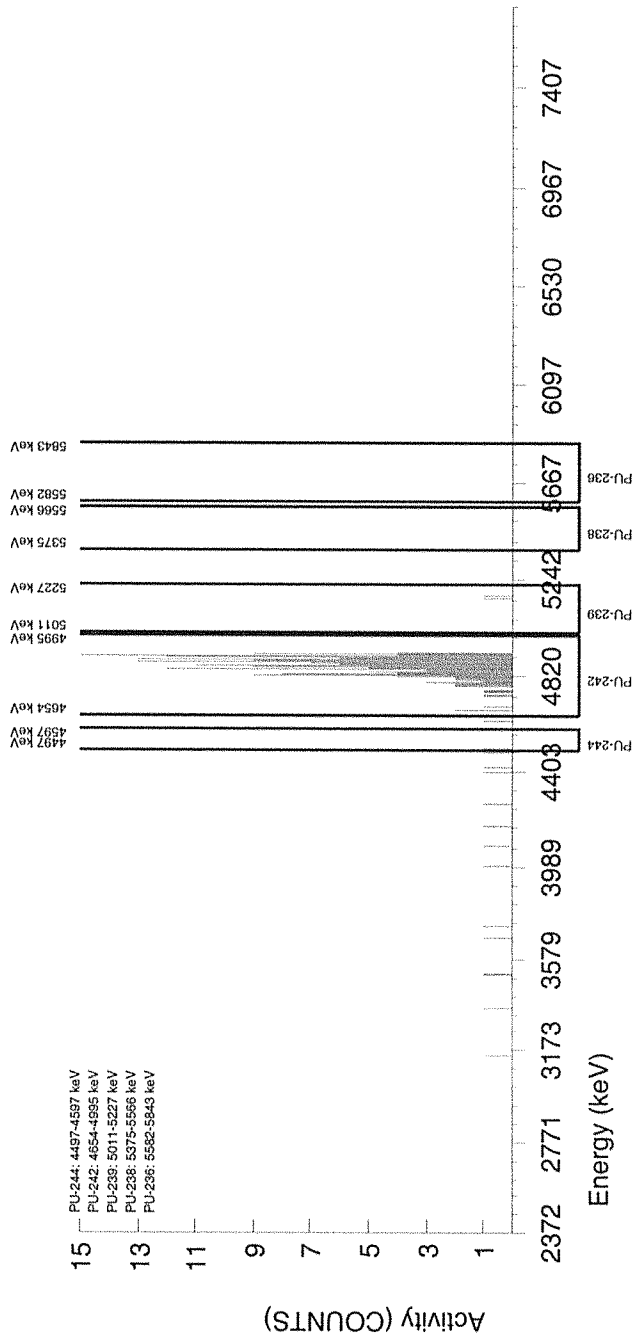
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.0757E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.27	0.000	0.000	-0.480	0.480	0.6928	100.000	-1.21E-02	5.36E-02	1.39E-01	3.19E-02	5.34E-02
PU-238	5486.00	5470.36	0.000	0.000	-0.720	0.720	0.8485	99.900	-1.49E-02	4.51E-02	1.26E-01	3.22E-02	4.50E-02
PU-239	5155.00	5167.96	14.866	2.000	1.040	0.960	0.9798	99.900	2.14E-02	7.31E-02	1.35E-01	3.69E-02	7.30E-02
PU-242	4890.00	4863.70	92.169	192.000	190.080	1.920	1.3856	100.000	3.90E+00	8.20E-01	1.66E-01	5.21E-02	5.60E-01
PU-244	4589.00	4506.88	4.955	1.000	0.520	0.480	0.6928	99.900	1.07E-02	5.95E-02	1.14E-01	2.61E-02	5.94E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
 SAMPLE ID : R0405235034_PU
 SAMPLE QTY : 0.509 G +/-0.196 %
 SAMPLE DATE : 23-Nov-2015 00:00:00
 ANALYST : MXS2
 % YIELD : 96.6 +/-6.572 %

CHAMBER : 233
 DETECTOR S/N : 87921
 AVERAGE %EFFICIENCY : 25.2931
 AVERAGE %EFF ERROR : 0.4905
 COUNT DATE : 24-Sep-2016 20:54:08
 ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
 BKG FILE : B233.CNF;454
 BKG DATE : 23-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W233.CNF;117
 CAL DATE : 19-Sep-2016

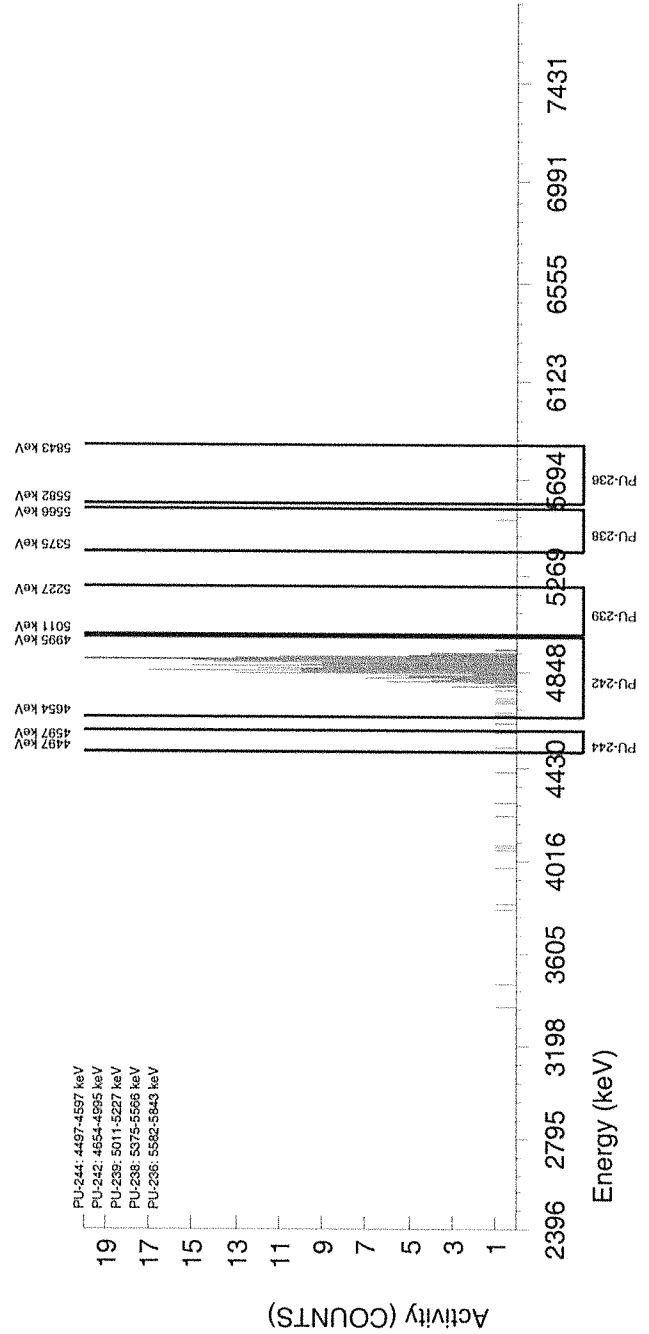
TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 4.2344E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.28	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	3.74E-02	5.55E-02	0.00E+00	3.73E-02
PU-238	5486.00	5512.84	4.971	1.000	0.760	0.240	0.4899	99.900	1.16E-02	4.34E-02	7.29E-02	1.36E-02	4.33E-02
PU-239	5155.00	5118.71	0.000	0.000	-0.480	0.480	0.6928	99.900	-7.25E-03	3.21E-02	8.37E-02	1.92E-02	3.21E-02
PU-242	4890.00	4869.83	71.772	258.000	257.040	0.960	0.9798	100.000	3.88E+00	7.06E-01	9.94E-02	2.71E-02	4.76E-01
PU-244	4589.00	4532.12	0.000	3.000	3.000	0.000	0.0000	99.900	4.53E-02	5.99E-02	4.53E-02	0.00E+00	5.96E-02

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GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
 SAMPLE ID : R0405235035_PU
 SAMPLE QTY : 0.516 G +/-0.194 %
 SAMPLE DATE : 23-Nov-2015 00:00:00
 ANALYST : MXS2
 % YIELD : 74.6 +/-7.460 %

CHAMBER : 234
 DETECTOR S/N : 87922
 AVERAGE %EFFICIENCY : 24.8037
 AVERAGE %EFF ERROR : 0.4811
 COUNT DATE : 24-Sep-2016 20:54:11
 ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
 BKG FILE : B234.CNF;454
 BKG DATE : 23-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W234.CNF;117
 CAL DATE : 19-Sep-2016

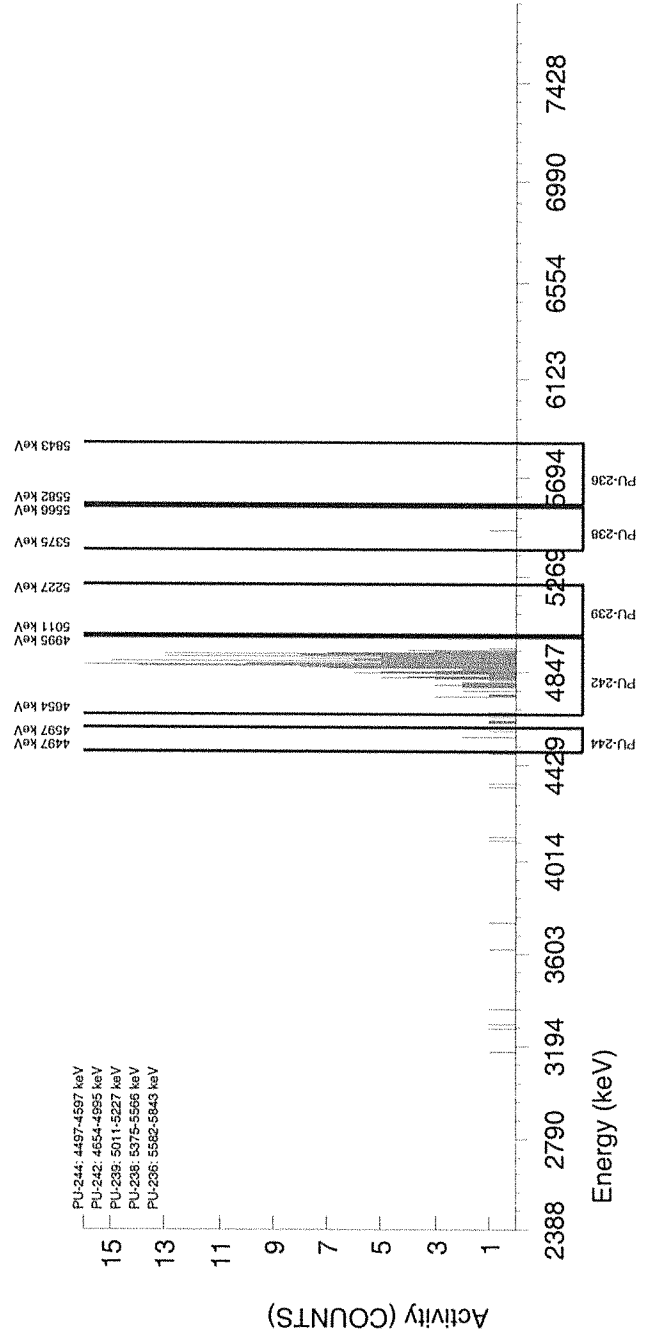
TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.2717E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.30	0.000	0.000	-0.480	0.480	0.6928	100.000	-1.16E-02	5.13E-02	1.33E-01	3.06E-02	5.11E-02
PU-238	5486.00	5465.26	4.996	1.000	-0.440	1.440	1.2000	99.900	-8.71E-03	6.02E-02	1.46E-01	4.35E-02	6.02E-02
PU-239	5155.00	5226.77	0.000	1.000	-0.920	1.920	1.3856	99.900	-1.81E-02	6.12E-02	1.59E-01	4.99E-02	6.12E-02
PU-242	4890.00	4870.16	59.123	195.000	194.760	0.240	0.4899	100.000	3.83E+00	7.91E-01	9.42E-02	1.76E-02	5.39E-01
PU-244	4589.00	4562.94	4.996	3.000	3.000	0.000	0.0000	99.900	5.90E-02	7.82E-02	5.90E-02	0.00E+00	7.76E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
SAMPLE ID : R0405235036_PU
SAMPLE QTY : 0.518 G +/-0.193 %
SAMPLE DATE : 23-Nov-2015 00:00:00
ANALYST : MXS2
% YIELD : 84.6 +/-7.054 %

CHAMBER : 235
DETECTOR S/N : 87923
AVERAGE %EFFICIENCY : 24.7991
AVERAGE %EFF ERROR : 0.4811
COUNT DATE : 24-Sep-2016 20:54:13
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B235.CNF;455
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W235.CNF;118
CAL DATE : 19-Sep-2016

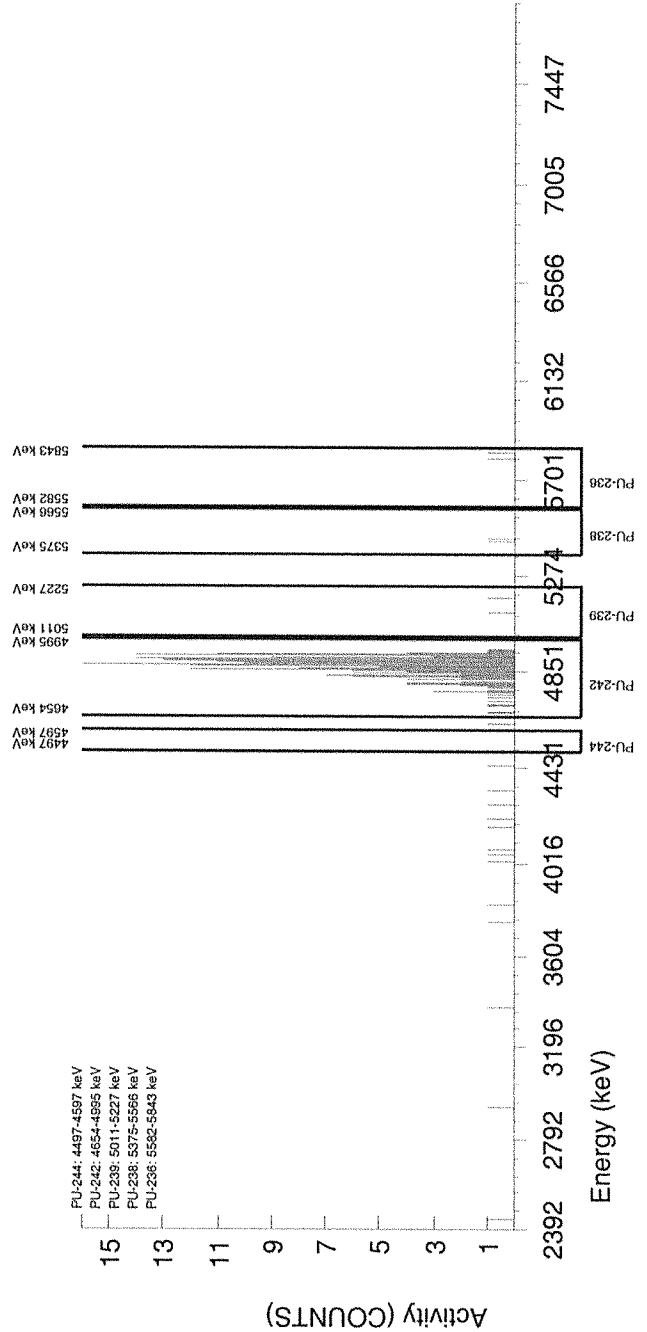
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.7098E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5805.53	29.867	2.000	0.800	1.200	1.0954	100.000	1.69E-02	7.59E-02	1.48E-01	4.25E-02	7.59E-02
PU-238	5486.00	5433.55	14.933	2.000	1.280	0.720	0.8485	99.900	2.23E-02	6.14E-02	1.06E-01	2.70E-02	6.13E-02
PU-239	5155.00	5146.52	64.712	2.000	1.040	0.960	0.9798	99.900	1.80E-02	6.15E-02	1.14E-01	3.10E-02	6.14E-02
PU-242	4890.00	4871.68	70.163	222.000	220.800	1.200	1.0954	100.000	3.81E+00	7.45E-01	1.21E-01	3.46E-02	5.06E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.240	0.240	0.4899	99.900	-4.15E-03	3.59E-02	8.29E-02	1.55E-02	3.58E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
SAMPLE ID : R0405235037_PU
SAMPLE QTY : 0.506 G +/-0.198 %
SAMPLE DATE : 30-Nov-2015 00:00:00
ANALYST : MXS2
% YIELD : 67.4 +/-7.820 %

CHAMBER : 255
DETECTOR S/N : 87943
AVERAGE %EFFICIENCY : 24.9747
AVERAGE %EFF ERROR : 0.4844
COUNT DATE : 26-Sep-2016 13:55:05
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B255.CNF,460
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W255.CNF,120
CAL DATE : 19-Sep-2016

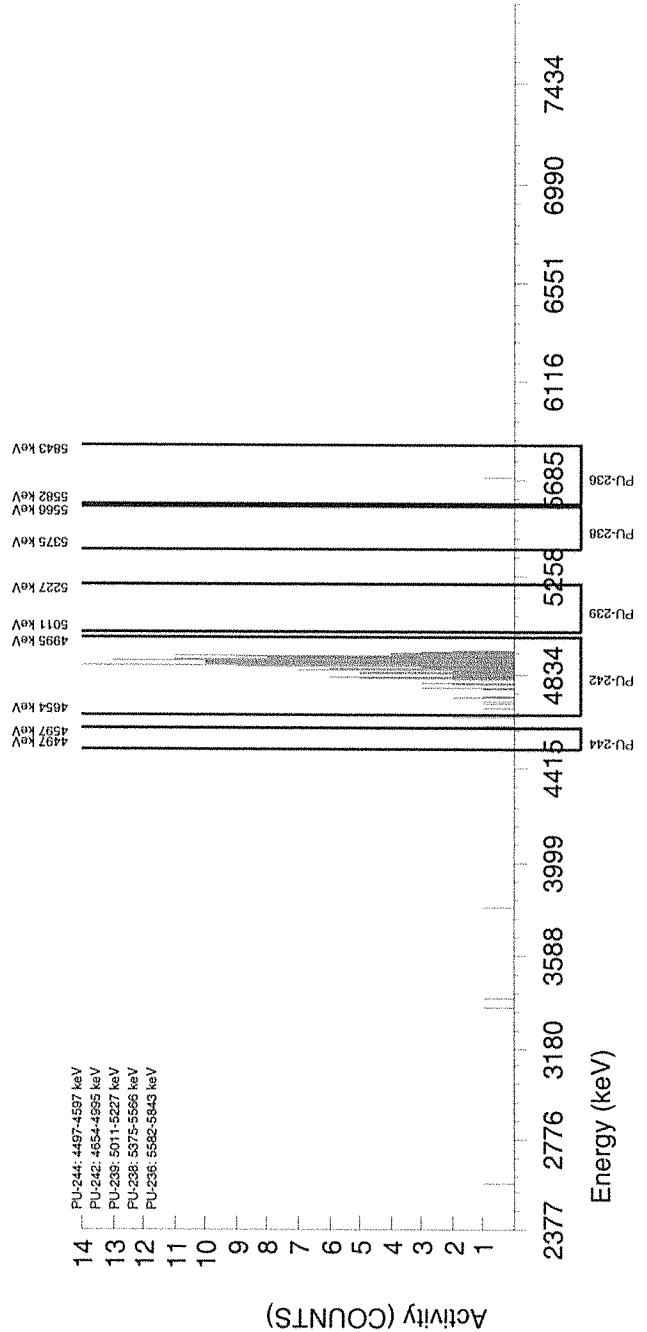
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 2.9537E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5695.60	4.972	1.000	0.520	0.480	0.6928	100.000	1.40E-02	7.79E-02	1.49E-01	3.42E-02	7.78E-02
PU-238	5486.00	5470.35	0.000	0.000	-0.720	0.720	0.8485	99.900	-1.60E-02	4.84E-02	1.36E-01	3.45E-02	4.83E-02
PU-239	5155.00	5118.70	0.000	0.000	-1.680	1.680	1.2961	99.900	-3.71E-02	5.24E-02	1.71E-01	5.24E-02	5.23E-02
PU-242	4890.00	4866.83	49.244	178.000	177.040	0.960	0.9798	100.000	3.90E+00	8.45E-01	1.45E-01	3.96E-02	5.78E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.960	0.960	0.9798	99.900	-2.12E-02	4.92E-02	1.45E-01	3.96E-02	4.91E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
 SAMPLE ID : R0405235038_PU
 SAMPLE QTY : 0.501 G +/-0.200 %
 SAMPLE DATE : 30-Nov-2015 00:00:00
 ANALYST : MXS2
 % YIELD : 76.4 +/-7.215 %

CHAMBER : 238
 DETECTOR S/N : 87926
 AVERAGE %EFFICIENCY : 26.1325
 AVERAGE %EFF ERROR : 0.5062
 COUNT DATE : 24-Sep-2016 20:54:18
 ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
 BKG FILE : B238.CNF,455
 BKG DATE : 23-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W238.CNF,125
 CAL DATE : 19-Sep-2016

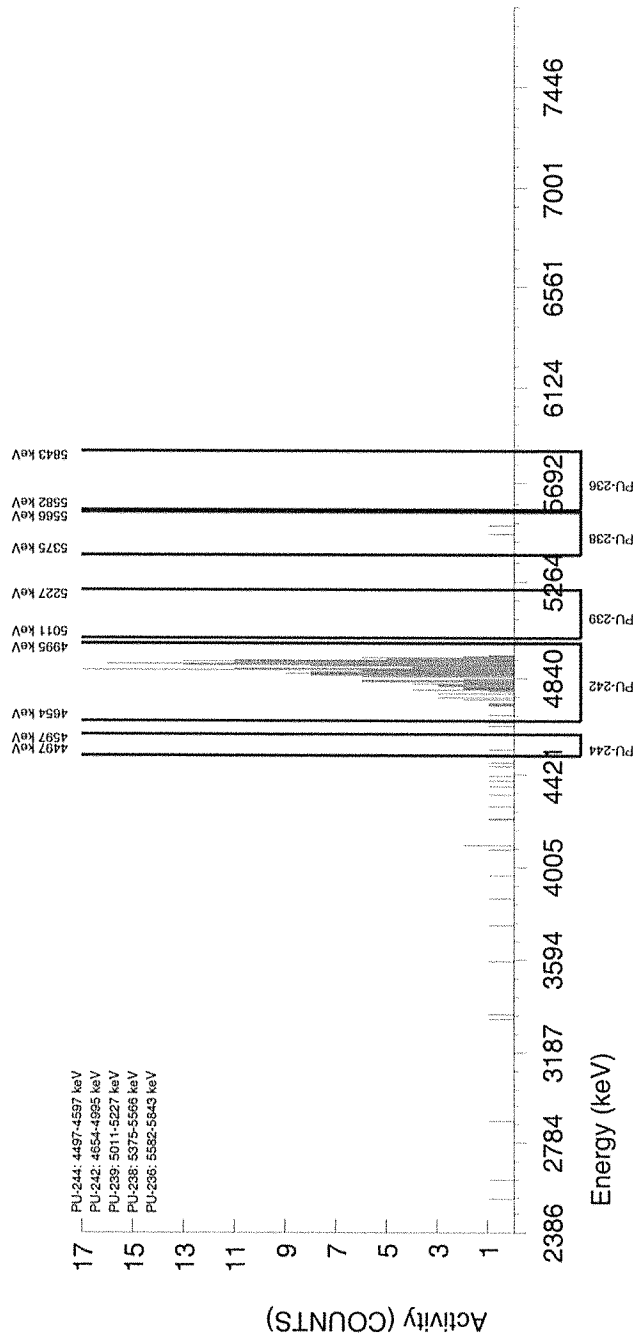
TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.3490E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	-0.240	0.240	100.000	-5.50E-03	4.75E-02	1.10E-01	2.05E-02	4.74E-02
PU-238	5486.00	5490.86	39.647	2.000	1.520	0.480	99.900	2.87E-02	6.61E-02	1.05E-01	2.40E-02	6.60E-02
PU-239	5155.00	5118.69	0.000	0.000	-0.480	0.480	99.900	-9.02E-03	4.00E-02	1.04E-01	2.38E-02	3.99E-02
PU-242	4890.00	4867.80	59.058	211.000	210.040	0.960	100.000	3.94E+00	7.88E-01	1.24E-01	3.37E-02	5.36E-01
PU-244	4589.00	4525.12	4.956	1.000	1.000	0.000	99.900	1.88E-02	5.29E-02	5.63E-02	0.00E+00	5.28E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
 SAMPLE ID : R0405235039_PU
 SAMPLE QTY : 0.512 G +/-0.195 %
 SAMPLE DATE : 30-Nov-2015 00:00:00
 ANALYST : MXS2
 % YIELD : 85.3 +/-6.918 %

CHAMBER : 256
 DETECTOR S/N : 87944
 AVERAGE %EFFICIENCY : 25.7507
 AVERAGE %EFF ERROR : 0.4991
 COUNT DATE : 26-Sep-2016 13:55:07
 ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
 BKG FILE : B256.CNF,460
 BKG DATE : 23-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W256.CNF,114
 CAL DATE : 19-Sep-2016

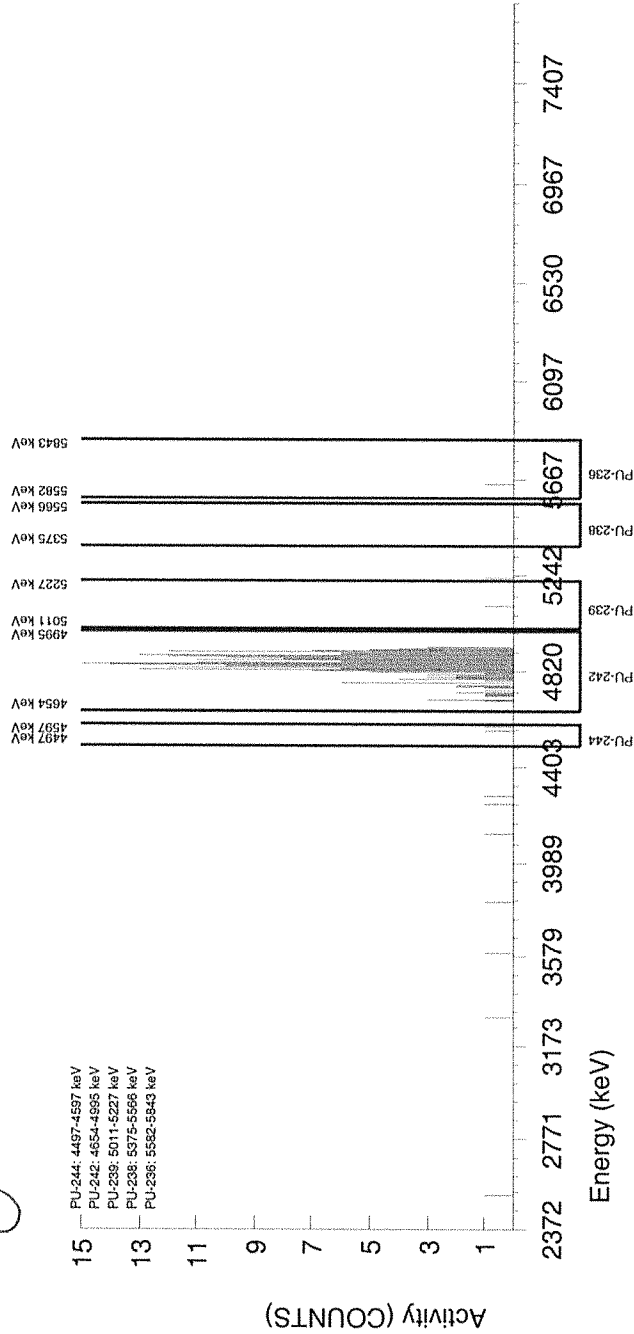
TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.7391E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5646.01	4.955	1.000	0.520	0.480	0.6928	100.000	1.06E-02	5.90E-02	1.13E-01	2.59E-02	5.89E-02
PU-238	5486.00	5470.36	0.000	0.000	-0.720	0.720	0.8485	99.900	-1.21E-02	3.66E-02	1.03E-01	2.61E-02	3.66E-02
PU-239	5155.00	5109.87	4.955	1.000	0.040	0.960	0.9798	99.900	6.68E-04	4.96E-02	1.10E-01	3.00E-02	4.95E-02
PU-242	4890.00	4854.54	83.332	233.000	231.080	1.920	1.3856	100.000	3.86E+00	7.39E-01	1.35E-01	4.24E-02	5.01E-01
PU-244	4589.00	4572.03	19.821	2.000	1.520	0.480	0.6928	99.900	2.54E-02	5.84E-02	9.25E-02	2.12E-02	5.83E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
SAMPLE ID : R0405235040_PU
SAMPLE QTY : 0.515 G +/-0.194 %
SAMPLE DATE : 30-Nov-2015 00:00:00
ANALYST : MXS2
% YIELD : 66.9 +/-7.707 %

CHAMBER : 241
DETECTOR S/N : 87963
AVERAGE %EFFICIENCY : 25.9137
AVERAGE %EFF ERROR : 0.5022
COUNT DATE : 24-Sep-2016 20:54:22
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B241.CNF;455
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W241.CNF;131
CAL DATE : 19-Sep-2016

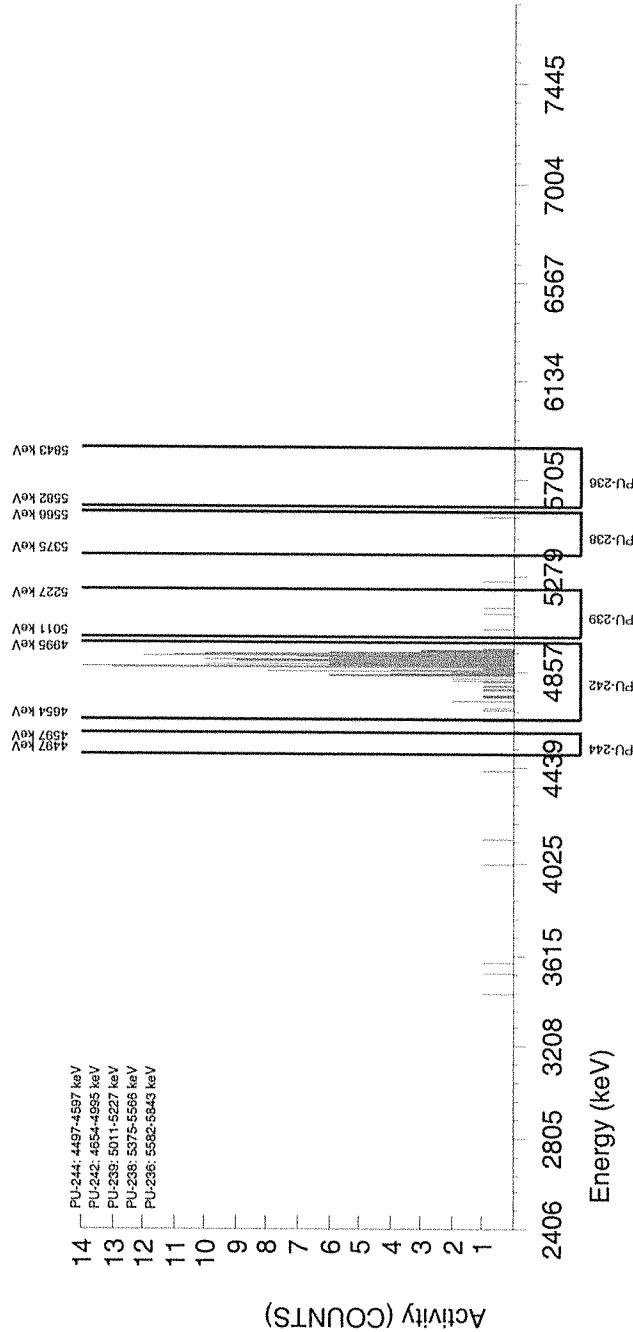
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 2.9309E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG S/Dev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.28	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	5.19E-02	7.70E-02	0.00E+00	5.17E-02
PU-238	5486.00	5539.52	4.964	1.000	-0.200	1.200	1.0954	99.900	-4.24E-03	6.37E-02	1.49E-01	4.25E-02	6.36E-02
PU-239	5155.00	5101.30	94.325	3.000	2.760	0.240	0.4899	99.900	5.81E-02	8.42E-02	1.01E-01	1.89E-02	8.37E-02
PU-242	4890.00	4891.22	79.018	183.000	182.280	0.720	0.8485	100.000	3.83E+00	8.18E-01	1.28E-01	3.27E-02	5.60E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.240	0.240	0.4899	99.900	-5.05E-03	4.37E-02	1.01E-01	1.89E-02	4.36E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
SAMPLE ID : R1203621725_PU
SAMPLE QTY : 0.518 G +/-0.193 %
SAMPLE DATE : 21-Sep-2016 00:00:00
ANALYST : MXS2
% YIELD : 83.2 +/-7.117 %

CHAMBER : 243
DETECTOR S/N : 87931
AVERAGE %EFFICIENCY : 24.8977
AVERAGE %EFF ERROR : 0.4829
COUNT DATE : 24-Sep-2016 20:54:24
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B243.CNF;455
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W243.CNF;118
CAL DATE : 19-Sep-2016

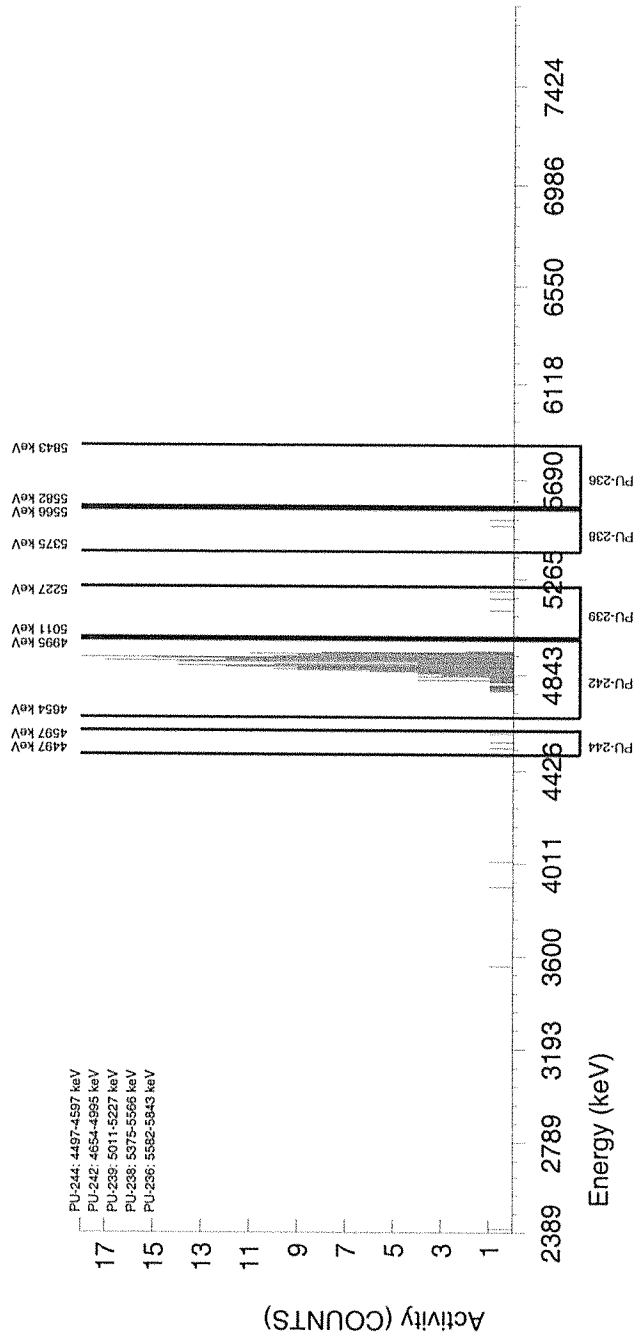
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.6456E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.29	0.000	0.000	-0.960	0.960	0.9798	100.000	-1.68E-02	3.91E-02	1.16E-01	3.15E-02	3.90E-02
PU-238	5486.00	5526.42	0.000	3.000	-2.760	5.760	2.4000	99.900	-4.83E-02	8.01E-02	2.07E-01	7.70E-02	8.01E-02
PU-239	5155.00	5167.95	84.671	3.000	2.520	0.480	0.6928	99.900	4.41E-02	7.04E-02	9.70E-02	2.22E-02	7.01E-02
PU-242	4890.00	4887.31	73.049	220.000	217.840	2.160	1.4697	100.000	3.81E+00	7.51E-01	1.47E-01	4.71E-02	5.10E-01
PU-244	4589.00	4548.84	64.748	3.000	2.760	0.240	0.4899	99.900	4.83E-02	7.00E-02	8.40E-02	1.57E-02	6.96E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
SAMPLE ID : R1203621726_PU
SAMPLE QTY : 0.508 G +/-0.197 %
SAMPLE DATE : 08-Dec-2015 00:00:00
ANALYST : MXS2
% YIELD : 93.5 +/-6.885 %

CHAMBER : 244
DETECTOR S/N : 87932
AVERAGE %EFFICIENCY : 23.7184
AVERAGE %EFF ERROR : 0.4607
COUNT DATE : 24-Sep-2016 20:54:26
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B244.CNF;455
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W244.CNF;112
CAL DATE : 19-Sep-2016

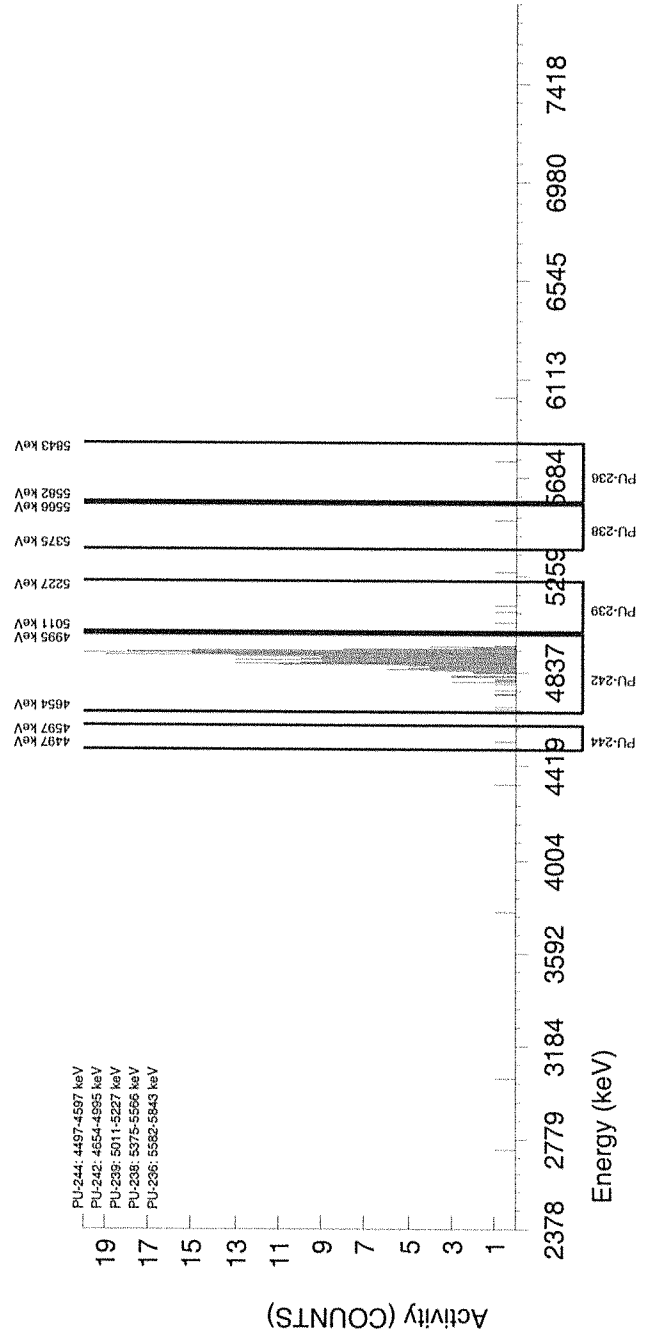
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 4.0988E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5759.03	4.999	1.000	-0.200	1.200	1.0954	100.000	-4.04E-03	6.08E-02	1.42E-01	4.06E-02	6.07E-02
PU-238	5486.00	5497.91	4.999	1.000	0.280	0.720	0.8485	99.900	4.70E-03	4.92E-02	1.03E-01	2.61E-02	4.91E-02
PU-239	5155.00	5088.35	74.978	3.000	1.560	1.440	1.2000	99.900	2.60E-02	6.87E-02	1.23E-01	3.67E-02	6.86E-02
PU-242	4890.00	4886.10	64.386	235.000	233.320	1.680	1.2961	100.000	3.89E+00	7.41E-01	1.29E-01	3.95E-02	5.02E-01
PU-244	4589.00	4528.60	4.999	1.000	1.000	0.000	0.0000	99.900	1.67E-02	4.69E-02	5.00E-02	0.00E+00	4.69E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596402
SAMPLE ID : R1203621727_PU
SAMPLE QTY : 0.518 G +/-0.193 %
SAMPLE DATE : 21-Sep-2016 00:00:00
ANALYST : MXS2
% YIELD : 81.7 +/-6.974 %

CHAMBER : 227
DETECTOR S/N : 87915
AVERAGE %EFFICIENCY : 26.3665
AVERAGE %EFF ERROR : 0.5107
COUNT DATE : 24-Sep-2016 20:54:06
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B227.CNF;459
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W227.CNF;120
CAL DATE : 16-Sep-2016

TRACER

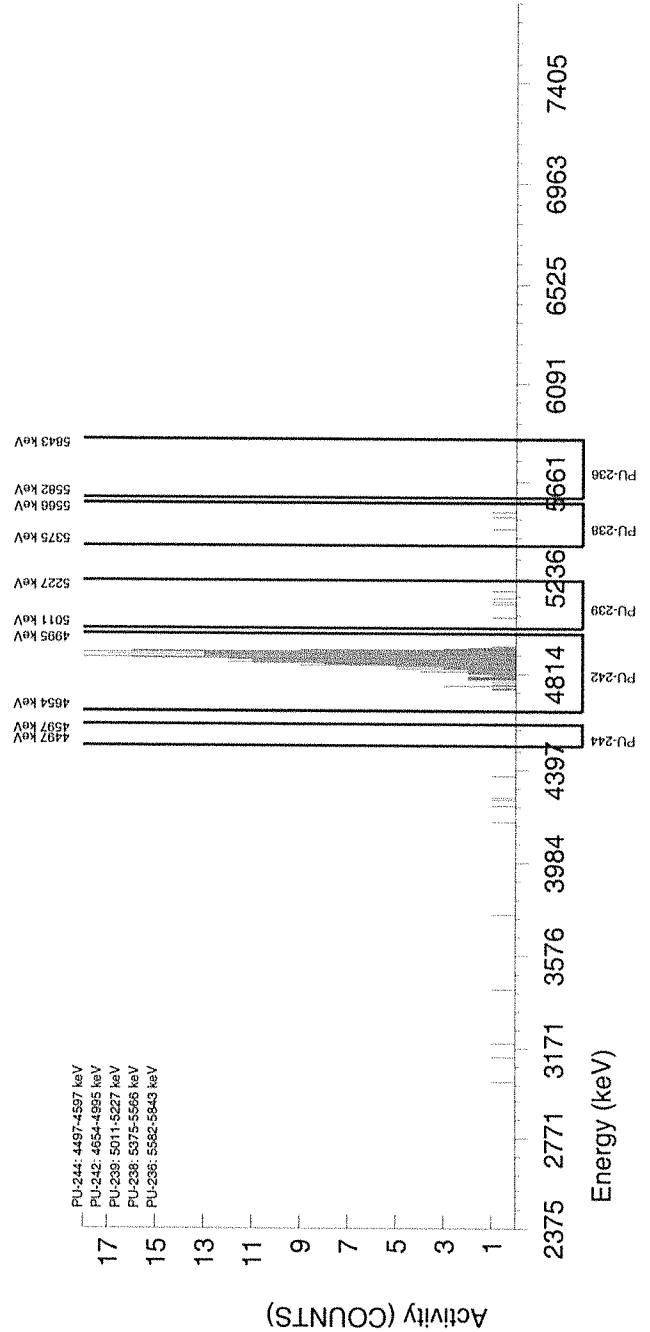
ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.5803E+00 dpm

LCS
NUCLIDE
NOMINAL (pCi/G)
% RECOVERY

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	0.000	0.000	0.000	100.000	0.00E+00	3.41E-02	5.06E-02	0.00E+00	3.40E-02
PU-238	5486.00	5490.39	73.837	1.800	1.800	1.0954	1.0954	99.900	3.03E-02	6.89E-02	1.18E-01	3.38E-02	6.88E-02
PU-239	5155.00	5126.71	113.217	5.000	2.840	2.160	1.4697	99.900	4.78E-02	8.49E-02	1.41E-01	4.53E-02	8.46E-02
PU-242	4890.00	4875.90	57.429	228.000	226.560	1.440	1.2000	100.000	3.81E+00	7.36E-01	1.24E-01	3.70E-02	4.99E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.240	0.240	0.4899	99.900	-4.04E-03	3.49E-02	8.07E-02	1.51E-02	3.49E-02

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Batch# 1596394 Product: Pu-241 Date: 10/4/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	DER# 1564186
Sample was correctly preserved if required.			NA
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER# 1564186
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER# 1564186
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: ML [Signature] 10/4/16

Secondary Review Performed By: J [Signature] 10/04/16

10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 04-OCT-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LSC	Test / Method: DOE EML HASL-300, Pu-11-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596394	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Other Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, and 1203621704 were received and analyzed out of holding.</p> <p>2.. Sample 1203621704 does not meet the resolution requirement of having a full width half maximum of 100 keV or less for the Pu-242 tracer.</p>		<p>1. Reporting results.</p> <p>2. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.</p>	

Originator's Name:
Melanie Aycock 04-OCT-16

Data Validator/Group Leader:
Jessica Davis 04-OCT-16

RV

07-SEP-16

Pu-241 Queue Sheet

Batch #: 1596394 Analyst: JXH2 First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16

Tracer Isotope: Pu-242/Pu-236 Tracer Code: 1770-A Expiration Date: 8-3-17 Vol: 0.1 mL

LCS Isotope: Pu-241 LCS Code: 1610-B Expiration Date: 10-28-16 Vol: 0.1 mL

Spike Isotope: Pu-241 Spike Code: Expiration Date: Vol:

Prep Date: 9-26-16 Initials: JEH Pipet ID: 84002Z Balance ID: 1610766Z Cocktail Used: Ultima gold LLT or Ecoscint Ultra

Witness: KB 9-26-16

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/l/f)	LSC Rack#	Alpha Spec Det #
405235001-1	4.1.B.R.1.2	SAMPLE		15 pCi/g	SOIL	MJWC001	10-DEC-15	1	1	0.501	91-2	103
405235002-1	4.1.B.R.1.3	SAMPLE		15 pCi/g	SOIL	MJWC001	10-DEC-15	2	2	0.505	91-3	104
405235003-1	4.1.B.R.1.4	SAMPLE		15 pCi/g	SOIL	MJWC001	10-DEC-15	3	3	0.501	91-2	105
405235004-1	4.1.B.R.7.2	SAMPLE		15 pCi/g	SOIL	MJWC001	09-DEC-15	4	4	0.502	91-3	106
405235005-1	4.1.C.R.1.3	SAMPLE		15 pCi/g	SOIL	MJWC001	10-DEC-15	5	5	0.503	91-4	107
405235006-1	4.1.C.R.1.4	SAMPLE		15 pCi/g	SOIL	MJWC001	10-DEC-15	6	6	0.501	91-4	108
405235007-1	4.1.C.R.2.3	SAMPLE		15 pCi/g	SOIL	MJWC001	10-DEC-15	7	7	0.501	91-8	109
405235008-1	4.1.C.R.2.4	SAMPLE		15 pCi/g	SOIL	MJWC001	10-DEC-15	8	8	0.503	91-9	110
405235009-1	4.1.D.R.1.3	SAMPLE		15 pCi/g	SOIL	MJWC001	10-DEC-15	9	9	0.504	91-10	112
405235010-1	4.1.D.R.1.4	SAMPLE		15 pCi/g	SOIL	MJWC001	10-DEC-15	10	10	0.501	91-11	210
405235011-1	4.1.D.R.3.2	SAMPLE		15 pCi/g	SOIL	MJWC001	09-DEC-15	11	11	0.500	91-5	212
405235012-1	4.1.D.R.2.4	SAMPLE		15 pCi/g	SOIL	MJWC001	10-DEC-15	12	12	0.506	0-1	213
405235013-1	4.2.A.R.2.3	SAMPLE		15 pCi/g	SOIL	MJWC001	08-DEC-15	13	13	0.500	0-2	214
405235014-1	4.2.A.R.1.3	SAMPLE		15 pCi/g	SOIL	MJWC001	08-DEC-15	14	14	0.507	0-3	218
405235015-1	4.2.A.R.1.4	SAMPLE		15 pCi/g	SOIL	MJWC001	08-DEC-15	15	15	0.569	0-4	235
405235016-1	4.2.A.R.2.4	SAMPLE		15 pCi/g	SOIL	MJWC001	08-DEC-15	16	16	0.501	0-5	220
405235017-1	4.2.A.R.3.2	SAMPLE		15 pCi/g	SOIL	MJWC001	02-DEC-15	17	17	0.501	0-6	221
405235018-1	4.2.A.R.4.2	SAMPLE		15 pCi/g	SOIL	MJWC001	02-DEC-15	18	18	0.500	91-6	223
405235019-1	4.2.B.R.2.4	SAMPLE		15 pCi/g	SOIL	MJWC001	08-DEC-15	19	19	0.506	0-8	224
405235020-1	4.2.B.R.1.4	SAMPLE		15 pCi/g	SOIL	MJWC001	08-DEC-15	20	20	0.502	0-9	226
1203621703-1	MB for batch 1596394	MB		15 pCi/g	SOIL	QC ACCOUNT		21	21	0.504	0-10	227
1203621704-1	4.1.B.R.1.2(405235001DUP)	DUP		15 pCi/g	SOIL	QC ACCOUNT	10-DEC-15	22	22	0.500	91-7	228
1203621705-1	LCS for batch 1596394	LCS		15 pCi/g	SOIL	QC ACCOUNT		24	24	0.509	0-12	234

Bkg Rack #: 91-1

Data Reviewed By: M. Monahan 10/4/14

Instrument Used: LS6000 (Red) 7065155, LS6500 (Blue) 7067083, LS6500 (Green) 7067404, Waitac (Yellow) 7066056, 4140127, LS6000 (Brown) 7060655, LS6500 (Gold) 7070506, Purple 7069123, Silver 7060656, (White) 4140299, Waitac (Teal) 4140421, Waitac (Gray) 4150033, 7069693 (Mocha)

PU1596394R

Plutonium-241 Solid

Filename : PU241.XLS
File type : Excel
Version # : 1.3.4

Tracer S/N : 1770-A
Tracer Exp Date : 8/3/2017
Tracer Volume Added: 0.10
Tracer Error: 0.44%

Procedure Code : LSC41PUS
Parmname : Plutonium-241
Required MDA : 15 pCi/g
Half-life of Pu-241 : 14.290 years
Pu-241 Abundance : 1.00
Tracer Abundance : 1.00
Half-life of Tracer : 373500.000 years

Batch : 1596394
Analyst : JXH2
Prep Date : 9/26/2016
Method Uncertainty : 0.0839

Geometry: 2mL DI/1 drop HNO3/13mL Ecoscint Ultra

Pos.	Sample Characteristics				Tracer Calculations										Tracer		Detector	
	Sample ID	Sample Aliquot G	Sample Aliquot SIDev. G	Sample Date/Time	Tracer Concentration DPM	Tracer Counts	Tracer Bkg Counts	Tracer Net CPM	Tracer Start Date/Time	Tracer Count Time (sec.)	Tracer Decay	Detector Serial #	Detector Efficiency (cpm/dpm)	Detector Efficiency StdDev. (cpm/dpm)	Detector Serial #	Detector Efficiency (cpm/dpm)	Detector Efficiency StdDev. (cpm/dpm)	
1	405235001.1	0.5010	3.2713E-03	12/10/2015 14:20	4.3831	280	0.480	1.165	9/29/2016 9:18	14400	1.000	79461	0.338848	0.006527	79461	0.338848	0.006527	
2	405235002.1	0.5050	3.2718E-03	12/10/2015 14:30	4.3831	262	1.680	1.085	9/29/2016 9:18	14400	1.000	80011	0.324069	0.006248	80011	0.324069	0.006248	
3	405235003.1	0.5010	3.2713E-03	12/10/2015 14:35	4.3831	213	2.160	0.879	9/29/2016 9:18	14400	1.000	78777	0.336886	0.006490	78777	0.336886	0.006490	
4	405235004.1	0.5020	3.2714E-03	12/9/2015 14:00	4.3831	195	1.440	0.807	9/29/2016 9:18	14400	1.000	80012	0.326615	0.006296	80012	0.326615	0.006296	
5	405235005.1	0.5030	3.2715E-03	12/10/2015 13:15	4.3831	302	0.960	1.254	9/29/2016 9:18	14400	1.000	67578	0.307195	0.005929	67578	0.307195	0.005929	
6	405235006.1	0.5010	3.2713E-03	12/10/2015 13:25	4.3831	355	1.200	1.474	9/29/2016 9:18	14400	1.000	78778	0.345578	0.006655	78778	0.345578	0.006655	
7	405235007.1	0.5010	3.2713E-03	12/10/2015 13:55	4.3831	317	1.680	1.314	9/29/2016 9:18	14400	1.000	79463	0.361703	0.006959	79463	0.361703	0.006959	
8	405235008.1	0.5030	3.2715E-03	12/10/2015 14:05	4.3831	308	1.200	1.278	9/29/2016 9:18	14400	1.000	83292	0.323669	0.006241	83292	0.323669	0.006241	
9	405235009.1	0.5040	3.2717E-03	12/10/2015 10:30	4.3831	314	2.160	1.299	9/29/2016 9:18	14400	1.000	78261	0.340722	0.006563	78261	0.340722	0.006563	
10	405235010.1	0.5010	3.2713E-03	12/10/2015 10:35	4.3831	250	1.440	1.036	9/29/2016 9:23	14400	1.000	87898	0.253042	0.004906	87898	0.253042	0.004906	
11	405235011.1	0.5000	3.2712E-03	12/9/2015 10:13	4.3831	187	1.200	0.774	9/29/2016 9:23	14400	1.000	87900	0.260378	0.005045	87900	0.260378	0.005045	
12	405235012.1	0.5060	3.2719E-03	12/10/2015 11:25	4.3831	238	0.960	0.988	9/29/2016 9:23	14400	1.000	87901	0.248786	0.004826	87901	0.248786	0.004826	
13	405235013.1	0.5000	3.2712E-03	12/8/2015 11:23	4.3831	210	1.920	0.867	9/29/2016 9:23	14400	1.000	87902	0.262230	0.005080	87902	0.262230	0.005080	
14	405235014.1	0.5020	3.2714E-03	12/8/2015 10:49	4.3831	228	0.720	0.947	9/29/2016 9:23	14400	1.000	87906	0.251171	0.004871	87906	0.251171	0.004871	
15	405235015.1	0.5090	3.2722E-03	12/8/2015 10:56	4.3831	255	1.200	1.058	9/29/2016 9:44	14400	1.000	87923	0.247991	0.004811	87923	0.247991	0.004811	
16	405235016.1	0.5010	3.2713E-03	12/8/2015 11:29	4.3831	249	1.200	1.033	9/29/2016 9:23	14400	1.000	87908	0.240361	0.004668	87908	0.240361	0.004668	
17	405235017.1	0.5010	3.2713E-03	12/2/2015 10:02	4.3831	204	0.480	0.848	9/29/2016 9:23	14400	1.000	87909	0.255264	0.004948	87909	0.255264	0.004948	
18	405235018.1	0.5000	3.2712E-03	12/2/2015 10:19	4.3831	218	0.480	0.906	9/29/2016 9:23	14400	1.000	87911	0.256333	0.004968	87911	0.256333	0.004968	
19	405235019.1	0.5060	3.2719E-03	12/8/2015 14:30	4.3831	246	1.680	1.018	9/29/2016 9:23	14400	1.000	87912	0.257363	0.004987	87912	0.257363	0.004987	
20	405235020.1	0.5020	3.2714E-03	12/8/2015 13:50	4.3831	210	1.200	0.870	9/29/2016 9:23	14400	1.000	87914	0.266847	0.005195	87914	0.266847	0.005195	
21	1203621703.1	0.5090	3.2722E-03	9/26/2016 0:00	4.3831	256	1.440	1.061	9/29/2016 9:24	14400	1.000	87915	0.263665	0.005107	87915	0.263665	0.005107	
22	1203621704.1	0.5000	3.2712E-03	12/10/2015 14:20	4.3831	154	3.360	0.628	9/29/2016 9:23	14400	1.000	87916	0.255769	0.004958	87916	0.255769	0.004958	
23	1203621705.1	0.5090	3.2722E-03	9/26/2016 0:00	4.3831	145	0.240	0.603	9/29/2016 9:24	14400	1.000	87922	0.248037	0.004811	87922	0.248037	0.004811	

PU1596394R

Pipet, 0.1 ml Sidev : +/- 0.000200 ml
 Pipet, 0.5 ml Sidev : +/- 0.001000 ml
 Pipet, 1 ml Sidev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-035
 Instrument SOP: GL-RAD-I-014

Count raw Data												Calculated				Calibration Data				Detector				Background	
Pos.	Rack	Position #	Counting Time (min.)	Quench#	Gross cpm	Bkg cpm	Bkg Time (min.)	Count	Bkg Quench#	Corrected Bkg cpm	Count Start Date/Time	Sample Decay	Sample Recovery %	Sample Recovery Error %	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)	Detector Error (cpm/dpm)	Background Rack	Background Position #	Background Count Start Date/Time			
1	91-2		60	694.43	8.28	8.99	60	701.52	8.8418	8.8571	9/30/2016 5:39	0.962	78.4%	6.32%	LSCTEAL	2/1/2016	1/31/2017	0.1620	0.00792	91-1		9/30/2016 4:38			
2	91-3		60	695.27	7.62	8.99	60	701.52	8.8571	8.8571	9/30/2016 6:41	0.962	76.4%	6.54%	LSCTEAL	2/1/2016	1/31/2017	0.1634	0.00792	91-1		9/30/2016 4:38			
3	91-2		120	693.74	7.96	8.08	120	700.9	7.9345	7.9345	10/1/2016 17:08	0.961	59.5%	7.22%	LSCTEAL	2/1/2016	1/31/2017	0.1608	0.00792	91-1		10/1/2016 15:07			
4	91-3		120	692.62	7.34	8.08	120	700.9	7.9154	7.9154	10/1/2016 19:09	0.961	56.3%	7.51%	LSCTEAL	2/1/2016	1/31/2017	0.1590	0.00792	91-1		10/1/2016 15:07			
5	91-6		60	695.01	8.24	8.99	60	701.52	8.8523	8.8523	9/30/2016 9:44	0.962	93.2%	6.11%	LSCTEAL	2/1/2016	1/31/2017	0.1629	0.00792	91-1		9/30/2016 4:38			
6	91-4		120	694.53	7.74	8.08	120	700.9	7.9485	7.9485	10/1/2016 21:10	0.961	97.3%	5.69%	LSCTEAL	2/1/2016	1/31/2017	0.1622	0.00792	91-1		10/1/2016 15:07			
7	91-8		60	694.53	7.6	8.99	60	701.52	8.8436	8.8436	9/30/2016 11:46	0.962	82.9%	5.99%	LSCTEAL	2/1/2016	1/31/2017	0.1622	0.00792	91-1		9/30/2016 4:38			
8	91-9		60	693.21	7.55	8.99	60	701.52	8.8204	8.8204	9/30/2016 12:47	0.962	90.1%	6.06%	LSCTEAL	2/1/2016	1/31/2017	0.1600	0.00792	91-1		9/30/2016 4:38			
9	91-10		60	692.78	7.86	8.99	60	701.52	8.8131	8.8131	9/30/2016 13:49	0.962	87.0%	6.03%	LSCTEAL	2/1/2016	1/31/2017	0.1593	0.00792	91-1		9/30/2016 4:38			
10	91-11		60	693.53	8.57	8.99	60	701.52	8.8260	8.8260	9/30/2016 14:50	0.962	93.4%	6.68%	LSCTEAL	2/1/2016	1/31/2017	0.1605	0.00792	91-1		9/30/2016 4:38			
11	91-5		120	695.96	7.41	8.08	120	700.9	7.9750	7.9750	10/3/2016 8:28	0.961	67.8%	7.65%	LSCTEAL	2/1/2016	1/31/2017	0.1645	0.00792	91-1		10/1/2016 15:07			
12	0-1		60	690.81	8.15	8.99	60	701.52	8.7810	8.7810	9/30/2016 16:52	0.962	90.6%	6.82%	LSCTEAL	2/1/2016	1/31/2017	0.1561	0.00792	91-1		9/30/2016 4:38			
13	0-2		60	691.29	8	8.99	60	701.52	8.7886	8.7886	9/30/2016 17:53	0.961	75.4%	7.27%	LSCTEAL	2/1/2016	1/31/2017	0.1569	0.00792	91-1		9/30/2016 4:38			
14	0-3		60	690.38	7.59	8.99	60	701.52	8.7742	8.7742	9/30/2016 18:54	0.961	86.0%	6.95%	LSCTEAL	2/1/2016	1/31/2017	0.1555	0.00792	91-1		9/30/2016 4:38			
15	0-4		60	692.04	7.53	8.99	60	701.52	8.8008	8.8008	9/30/2016 19:55	0.961	97.3%	6.61%	LSCTEAL	2/1/2016	1/31/2017	0.1581	0.00792	91-1		9/30/2016 4:38			
16	0-5		60	694.16	7.33	8.99	60	701.52	8.8370	8.8370	9/30/2016 20:57	0.961	98.0%	6.69%	LSCTEAL	2/1/2016	1/31/2017	0.1615	0.00792	91-1		9/30/2016 4:38			
17	0-6		60	691.08	7.52	8.99	60	701.52	8.7853	8.7853	9/30/2016 21:58	0.960	75.8%	7.31%	LSCTEAL	2/1/2016	1/31/2017	0.1566	0.00792	91-1		9/30/2016 4:38			
18	91-6		120	691.77	7.88	8.08	120	700.9	7.9013	7.9013	10/3/2016 10:29	0.960	80.7%	7.09%	LSCTEAL	2/1/2016	1/31/2017	0.1577	0.00792	91-1		10/1/2016 15:07			
19	0-8		60	690.97	7.33	8.99	60	701.52	8.7835	8.7835	10/1/2016 0:00	0.961	90.2%	6.74%	LSCTEAL	2/1/2016	1/31/2017	0.1564	0.00792	91-1		9/30/2016 4:38			
20	0-9		60	694.8	7.9	8.99	60	701.52	8.8485	8.8485	10/1/2016 1:01	0.961	74.0%	7.24%	LSCTEAL	2/1/2016	1/31/2017	0.1626	0.00792	91-1		9/30/2016 4:38			
21	0-10		60	691.77	8.48	8.99	60	701.52	8.7964	8.7964	10/1/2016 2:02	0.999	91.8%	6.61%	LSCTEAL	2/1/2016	1/31/2017	0.1577	0.00792	91-1		9/30/2016 4:38			
22	91-7		120	692.04	7.52	8.08	120	700.9	7.9058	7.9058	10/3/2016 12:30	0.961	56.0%	8.52%	LSCTEAL	2/1/2016	1/31/2017	0.1581	0.00792	91-1		10/1/2016 15:07			
23	0-12		60	691.66	24.03	8.99	60	701.52	8.7946	8.7946	10/1/2016 4:05	0.999	55.5%	8.58%	LSCTEAL	2/1/2016	1/31/2017	0.1575	0.00792	91-1		9/30/2016 4:38			

Notes:

- 1 - Results are decay corrected to Sample Date/Time
- 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
- 3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml): N/A
 Spike Volume Added: N/A

LCS S/N : 1610-B
 LCS Exp Date : 10/28/2016
 LCS Activity (dpm/ml): 1691.15
 LCS Volume Added: 0.10

* - RPD changed to 0% due to sample & dup activity below MDA

Pos.	Decision		Critical		Required		MDA		Sample Act.		Sample Act.		Net Count		Net Count		2 SIGMA		2 SIGMA		Sample		Nominal		Recovery	
	pCi/G	Level	pCi/G	Level	MDA	MDA	pCi/G	Conc.	Conc.	Conc.	Rate	Rate	Rate	Rate	Rate Error	Rate Error	Counting	Total Prop.	Uncertainty	Uncertainty	OC	Type	RPD	RER	pCi/G	pCi/G
1	9.3106	6.5733	15	13.5147	-4.1351	95.30%	-0.5618	0.5342	7.7066	7.7067	SAMPLE															
2	9.4134	6.6460	15	13.6637	-9.1983	42.88%	-1.2371	0.5240	7.6371	7.6371	SAMPLE															
3	8.2796	5.8455	15	11.9353	0.2487	1429.91%	0.0255	0.3639	6.9704	6.9706	SAMPLE															
4	8.8167	6.2247	15	12.7098	-5.9945	62.43%	-0.5754	0.3566	7.2806	7.2806	SAMPLE															
5	7.7654	5.4825	15	11.2717	-3.7567	87.39%	-0.6123	0.5337	6.4183	6.4184	SAMPLE															
6	5.0256	3.5481	15	7.2444	-1.2358	173.48%	-0.2085	0.3616	4.1997	4.1998	SAMPLE															
7	8.8025	6.2146	15	12.7772	-8.6531	42.53%	-1.2436	0.5235	7.1396	7.1396	SAMPLE															
8	8.1613	5.7619	15	11.8469	-8.2068	41.57%	-1.2704	0.5223	6.6135	6.6135	SAMPLE															
9	8.4692	5.9793	15	12.2940	-6.3920	55.64%	-0.9531	0.5271	6.9290	6.9291	SAMPLE															
10	7.8840	5.5662	15	11.4442	-1.5967	210.48%	-0.2560	0.5385	6.5838	6.5838	SAMPLE															
11	7.1354	5.0377	15	10.2854	-4.7458	63.84%	-0.5650	0.3581	5.8951	5.8951	SAMPLE															
12	8.2520	5.8260	15	11.9793	-4.1304	84.47%	-0.6310	0.5312	6.8158	6.8158	SAMPLE															
13	9.9856	7.0499	15	14.4958	-6.2444	67.48%	-0.7886	0.5290	8.2093	8.2094	SAMPLE															
14	8.7955	6.2097	15	12.7685	-8.2657	44.66%	-1.1842	0.5222	7.1448	7.1449	SAMPLE															
15	7.5530	5.3325	15	10.9642	-7.6058	41.60%	-1.2708	0.5217	6.1199	6.1200	SAMPLE															
16	7.4709	5.2745	15	10.8445	-8.9030	35.10%	-1.5070	0.5191	6.0107	6.0107	SAMPLE															
17	9.9458	7.0219	15	14.4381	-9.9804	41.86%	-1.2653	0.5213	8.0596	8.0597	SAMPLE															
18	6.2372	4.4035	15	8.9915	-0.1574	1699.52%	-0.0213	0.3626	5.2432	5.2432	SAMPLE															
19	8.2723	5.8403	15	12.0086	-9.5370	36.30%	-1.4535	0.5182	6.6646	6.6646	SAMPLE															
20	9.8217	6.9342	15	14.2565	-7.3617	56.18%	-0.9485	0.5283	8.0376	8.0376	SAMPLE															
21	7.7208	5.4509	15	11.2078	-1.9361	169.73%	-0.3164	0.5366	6.4361	6.4361	MB															
22	8.9548	6.3222	15	12.9091	-4.0844	93.34%	-0.3858	0.3585	7.4404	7.4404	DUP	0.0%														
23	12.7853	9.0265	15	18.5598	154.4052	9.91%	15.2354	0.7396	14.6922	39.3053	LCS															

PROTOCOL : 5 Pu-241 60 min
DATE : 2016/09/30
TIME : 04:38
ID : P05AS290

Pu-241

Wallac 1414 WinSpectral v3.0 S/N4140421

Counting mode : CPM
Isotope(s) : H3
H3 = 5- 350,12.43 y
Protocol name : Pu-241 60 min
Counting time : 3600
Repeats : 1
Cycles : 1
Replicates : 1
2 sigma % : 2.00
Minimum cpm : 0.00 Checking time: 10
Advanced modes : Chemilum
Output to Display :
 POS,DPM1,CPMw2,CLMM,FNCT2,
 RACK,RACKPOS,FNCT1,SQPE,DATE,
 TIME,CPMw1,CPM,CPM1,CTIME
Additions to Display : Spectrum,Header,Listing
Header : Pu-241
Spectrum : Rnd.Cos,Beta
Window 1 : 25- 220 /Beta
Window 2 : 25- 220 /Rnd.Cos
Window 3 : 1-1024 /Beta
Window 4 : 1-1024 /Beta
Window 5 : 1-1024 /Beta
Window 6 : 1-1024 /Beta
FNCT1 = FNCT1 : CTIME/60
FNCT2 = FNCT2 : CPMW1-CPMW2
FNCT3 = FNCT3 :
FNCT4 = FNCT4 :

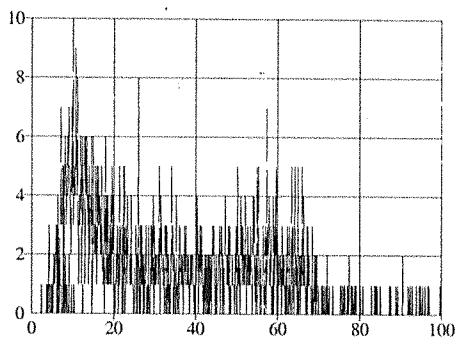
Total count rate:

H3 289.0 CPM

Pu-241 TEAL

Rack_position 91 Count_Time(min) 60.00 Quench_number 701.52 Pu241_cpm 8.99 Run_Date 9/30/2016 4:38 AM

JK



Counts Chem

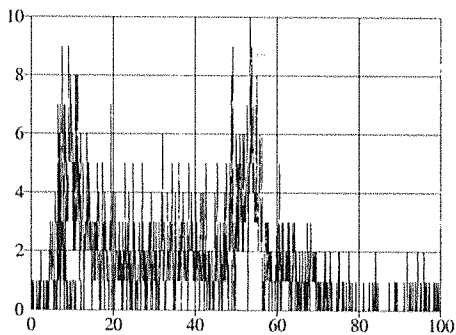
Counts Beta

Gross_B_CPM 9.50 LUMEX 0.00

Lumex_CPM 0.50 DPM 0.00

Rack_position 91 Count_Time(min) 60.00 Quench_number 694.43 Pu241_cpm 8.28 Run_Date 9/30/2016 5:39 AM

1



Counts Chem

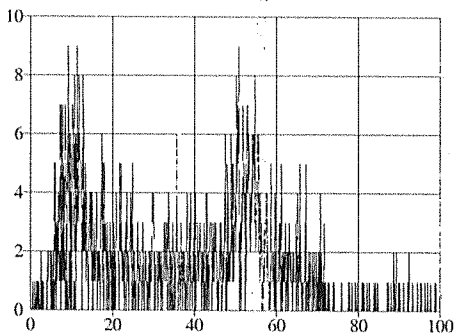
Counts Beta

Gross_B_CPM 9.40 LUMEX 0.00

Lumex_CPM 1.10 DPM 0.00

Rack_position 91 Count_Time(min) 60.00 Quench_number 695.27 Pu241_cpm 7.62 Run_Date 9/30/2016 6:41 AM

2



Counts Chem

Counts Beta

Gross_B_CPM 8.80 LUMEX 0.00

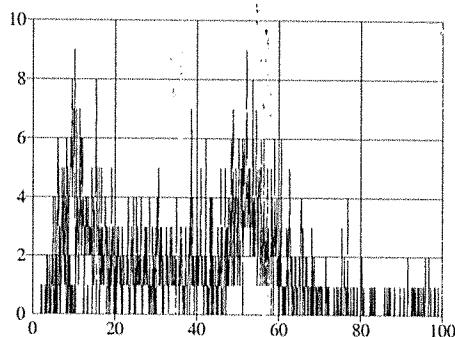
Lumex_CPM 1.20 DPM 0.00

Pu-241 TEAL

Wallo/ut

Rack_position 91 Count_Time(min) 60.00 Quench_number 694.48 Pu241_cpm 7.76 Run_Date 9/30/2016 7:42 AM

3



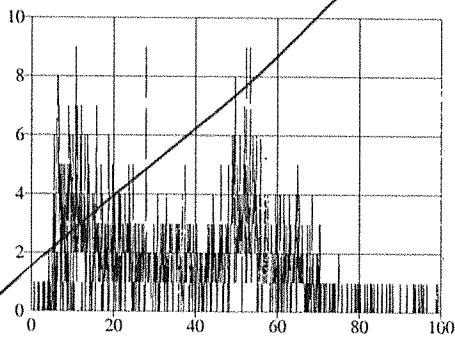
Counts Chem

Counts Beta

Gross_B_CPM 8.80 LUMEX 0.00
Lumex_CPM 1.00 DPM 0.00

Rack_position 91 Count_Time(min) 60.00 Quench_number 693.79 Pu241_cpm 7.57 Run_Date 9/30/2016 8:43 AM

4



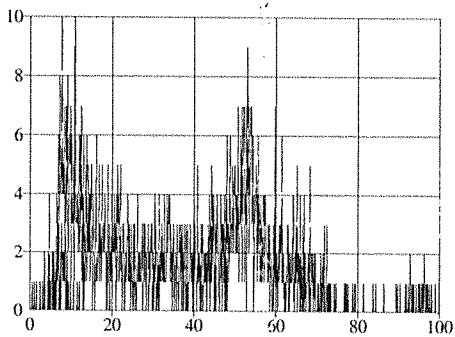
Counts Chem

Counts Beta

Gross_B_CPM 8.70 LUMEX 0.00
Lumex_CPM 1.10 DPM 0.00

Rack_position 91 Count_Time(min) 60.00 Quench_number 695.01 Pu241_cpm 8.24 Run_Date 9/30/2016 9:44 AM

5



Counts Chem

Counts Beta

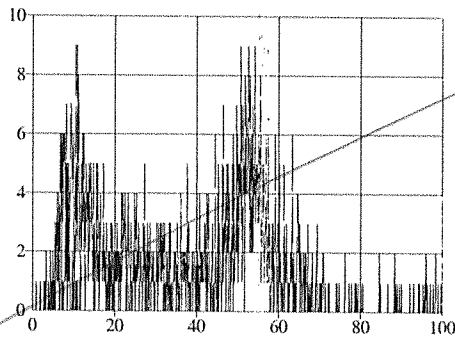
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Lumex_CPM 1.00 DPM 0.00

Pu-241 TEAL

M. M. 10/1/16

Rack_position 91 Count_Time(min) 60.00 Quench_number 694.32 Pu241_cpm 7.08 Run_Date 9/30/2016 10:45 AM

6

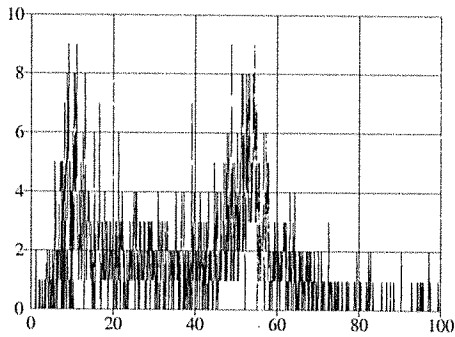


Gross_B_CPM 8.40 LUMEX 0.00

Lumex_CPM 1.30 DPM 0.00

Rack_position 91 Count_Time(min) 60.00 Quench_number 694.53 Pu241_cpm 7.60 Run_Date 9/30/2016 11:46 AM

7

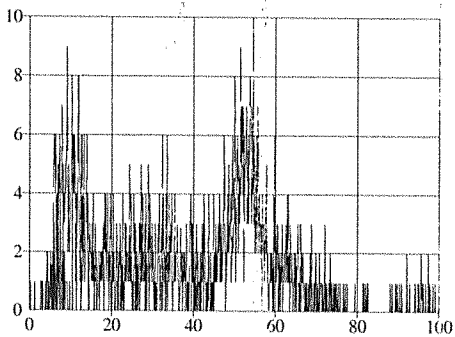


Gross_B_CPM 8.50 LUMEX 0.00

Lumex_CPM 0.90 DPM 0.00

Rack_position 91 Count_Time(min) 60.00 Quench_number 693.21 Pu241_cpm 7.55 Run_Date 9/30/2016 12:47 PM

8

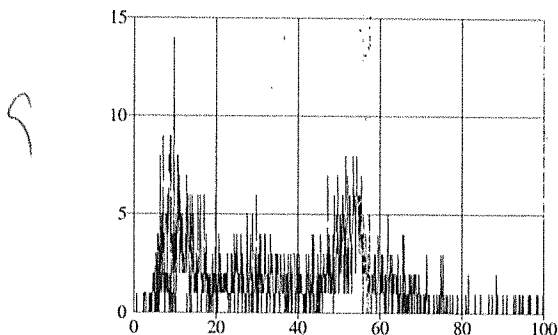


Gross_B_CPM 8.50 LUMEX 0.00

Lumex_CPM 0.90 DPM 0.00

Pu-241 TEAL

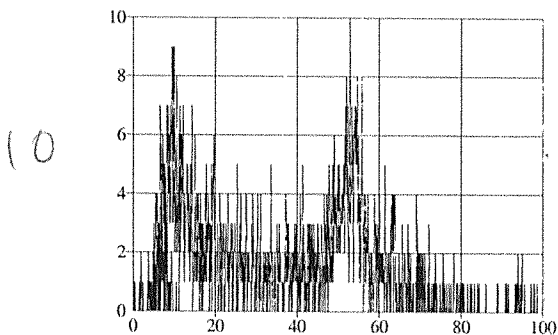
Rack_position 91 10 Count_Time(min) 60.00 Quench_number 692.78 Pu241_cpm 7.86 Run_Date 9/30/2016 1:49 PM



Counts Chem
Counts Beta

Gross_B_CPM 9.00 LUMEX 0.00
Lumex_CPM 1.20 DPM 0.00

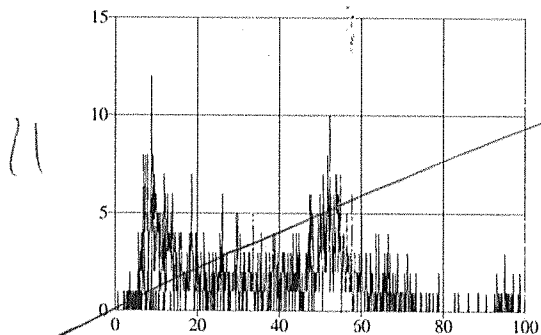
Rack_position 91 11 Count_Time(min) 60.00 Quench_number 693.53 Pu241_cpm 8.57 Run_Date 9/30/2016 2:50 PM



Counts Chem
Counts Beta

Gross_B_CPM 9.70 LUMEX 0.00
Lumex_CPM 1.10 DPM 0.00

Rack_position 91 12 Count_Time(min) 60.00 Quench_number 694.43 Pu241_cpm 7.98 Run_Date 9/30/2016 3:51 PM



Counts Chem
Counts Beta

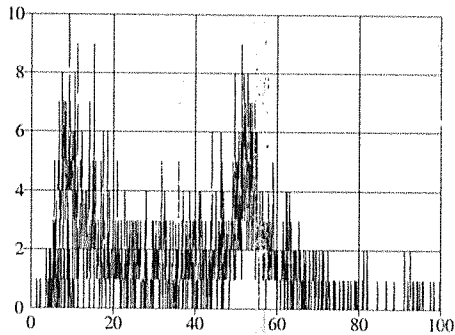
Gross_B_CPM 8.90 LUMEX 0.00
Lumex_CPM 0.90 DPM 0.00

9/30/2016

Pu-241 TEAL

Rack_position 0 1 Count_Time(min) 60.00 Quench_number 690.81 Pu241_cpm 8.15 Run_Date 9/30/2016 4:52 PM

12



Counts Chem

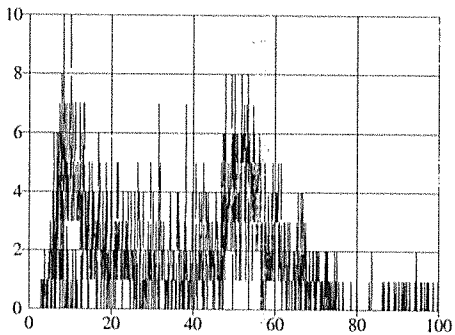
Counts Beta

Gross_B_CPM 9.10 LUMEX 0.00

Lumex_CPM 1.00 DPM 0.00

Rack_position 0 2 Count_Time(min) 60.00 Quench_number 691.29 Pu241_cpm 8.00 Run_Date 9/30/2016 5:53 PM

13



Counts Chem

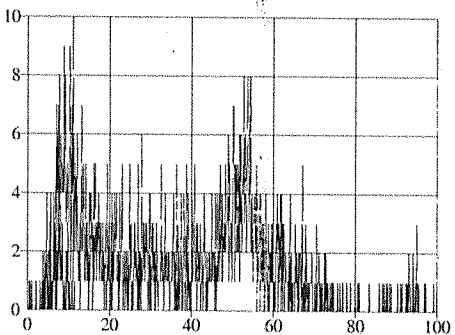
Counts Beta

Gross_B_CPM 9.30 LUMEX 0.00

Lumex_CPM 1.30 DPM 0.00

Rack_position 0 3 Count_Time(min) 60.00 Quench_number 690.38 Pu241_cpm 7.59 Run_Date 9/30/2016 6:54 PM

14



Counts Chem

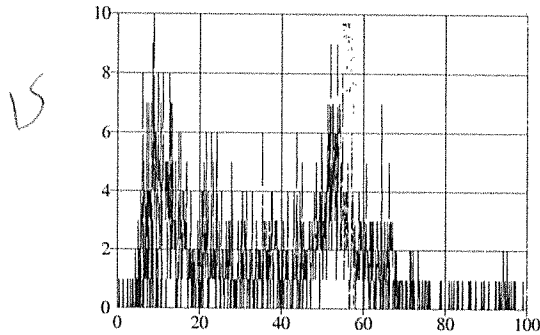
Counts Beta

Gross_B_CPM 8.80 LUMEX 0.00

Lumex_CPM 1.20 DPM 0.00

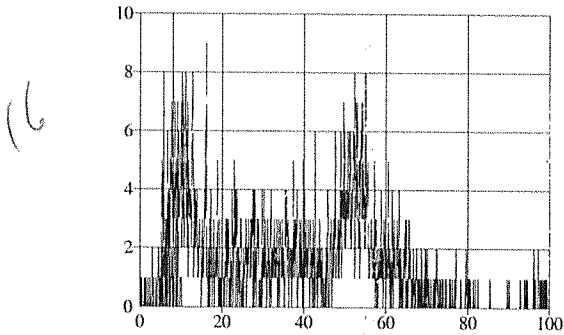
Pu-241 TEAL

Rack_position 0 4 Count_Time(min) 60.00 Quench_number 692.04 Pu241_cpm 7.53 Run_Date 9/30/2016 7:55 PM



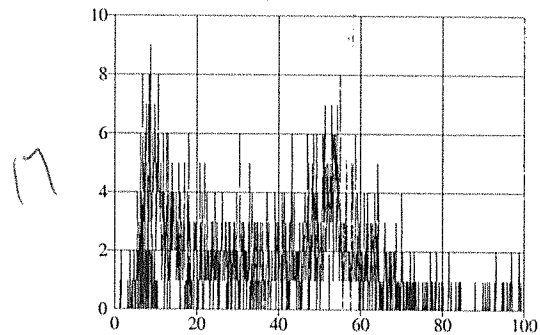
Gross_B_CPM 8.40 LUMEX 0.00
Lumex_CPM 0.90 DPM 0.00

Rack_position 0 5 Count_Time(min) 60.00 Quench_number 694.16 Pu241_cpm 7.33 Run_Date 9/30/2016 8:57 PM



Gross_B_CPM 8.30 LUMEX 0.00
Lumex_CPM 1.00 DPM 0.00

Rack_position 0 6 Count_Time(min) 60.00 Quench_number 691.08 Pu241_cpm 7.52 Run_Date 9/30/2016 9:58 PM



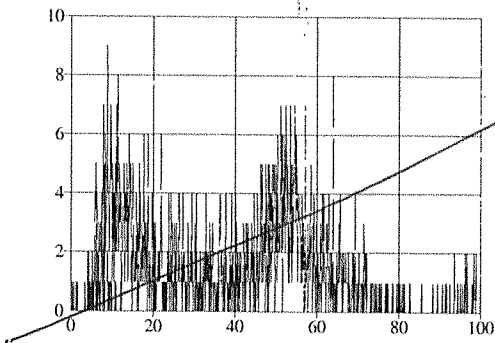
Gross_B_CPM 8.40 LUMEX 0.00
Lumex_CPM 0.90 DPM 0.00

Pu-241 TEAL

MM 10/4/16

Rack_position 0 7 Count_Time(min) 60.00 Quench_number 692.46 Pu241_cpm 6.91 Run_Date 9/30/2016 10:59 PM

19

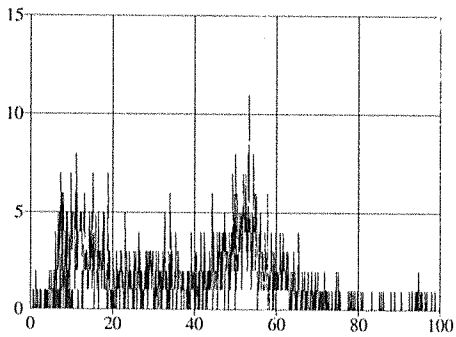


Gross_B_CPM 7.90 LUMEX 0.00

Lumex_CPM 1.00 DPM 0.00

Rack_position 0 8 Count_Time(min) 60.00 Quench_number 690.97 Pu241_cpm 7.33 Run_Date 10/1/2016 0:00 AM

18

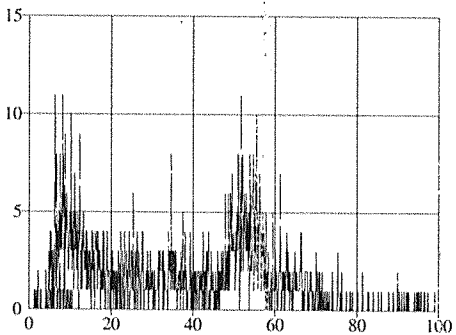


Gross_B_CPM 8.20 LUMEX 0.00

Lumex_CPM 0.90 DPM 0.00

Rack_position 0 9 Count_Time(min) 60.00 Quench_number 694.80 Pu241_cpm 7.90 Run_Date 10/1/2016 1:01 AM

20



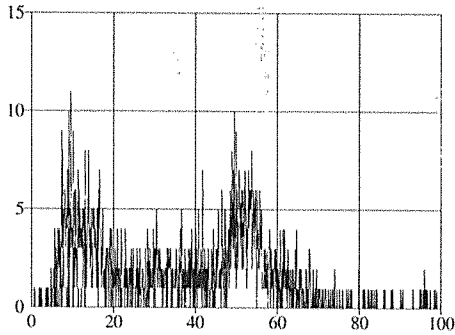
Gross_B_CPM 8.90 LUMEX 0.00

Lumex_CPM 1.00 DPM 0.00

Pu-241 TEAL

Rack_position 0 10 Count_Time(min) 60.00 Quench_number 691.77 Pu241_cpm 8.48 Run_Date 10/1/2016 2:02 AM

21



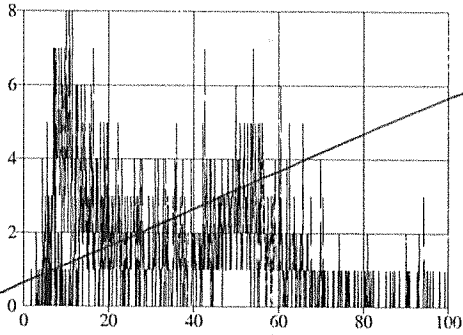
Gross_B_CPM 9.20 LUMEX 0.00

Lumex_CPM 0.70 DPM 0.00

Rack_position 0 11 Count_Time(min) 60.00 Quench_number 691.08 Pu241_cpm 8.40 Run_Date 10/1/2016 3:04 AM

via 10/1/16

22

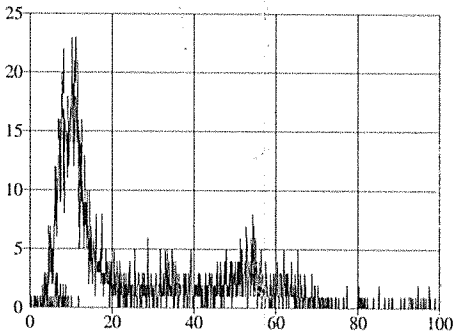


Gross_B_CPM 9.20 LUMEX 0.00

Lumex_CPM 0.80 DPM 0.00

Rack_position 0 12 Count_Time(min) 60.00 Quench_number 691.66 Pu241_cpm 24.03 Run_Date 10/1/2016 4:05 AM

24



Gross_B_CPM 24.70 LUMEX 0.00

Lumex_CPM 0.70 DPM 0.00

PROTOCOL : 5 Pu-241 120 min
DATE : 2016/10/01
TIME : 15:06
ID : P05AS291

Pu-241

Wallac 1414 WinSpectral v3.0 S/N4140421

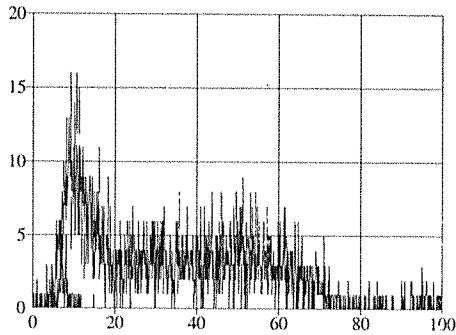
Counting mode : CPM
Isotope(s) : H3
H3 = 5- 350,12.43 y
Protocol name : Pu-241 120 min
Counting time : 7200
Repeats : 1
Cycles : 1
Replicates : 1
2 sigma % : 2.00
Minimum cpm : 0.00 **Checking time:** 10
Advanced modes : Chemilum
Output to Display :
 POS,DPM1,CPMw2,CLMM,FNCT2,
 RACK,RACKPOS,FNCT1,SQPE,DATE,
 TIME,CPMw1,CPM,CPM1,CTIME
Additions to Display : Spectrum,Header,Listing
Header : Pu-241
Spectrum : Rnd.Cos,Beta
Window 1 : 25- 220 /Beta
Window 2 : 25- 220 /Rnd.Cos
Window 3 : 1-1024 /Beta
Window 4 : 1-1024 /Beta
Window 5 : 1-1024 /Beta
Window 6 : 1-1024 /Beta
FNCT1 = FNCT1 : CTIME/60
FNCT2 = FNCT2 : CPMW1-CPMW2
FNCT3 = FNCT3 :
FNCT4 = FNCT4 :

Total count rate:

H3	78.3 CPM
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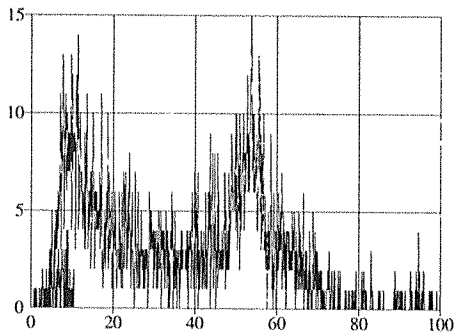
Pu-241 TEAL

13 Rack_position 91 1 Count_Time(min) 120.00 Quench_number 700.90 Pu241_cpm 8.08 Run_Date 10/1/2016 3:07 PM



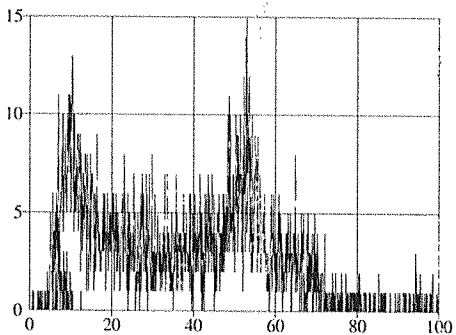
Gross_B_CPM 8.70 LUMEX 0.00
Lumex_CPM 0.60 DPM 0.00

3 Rack_position 91 2 Count_Time(min) 120.00 Quench_number 693.74 Pu241_cpm 7.96 Run_Date 10/1/2016 5:08 PM



Gross_B_CPM 8.50 LUMEX 0.00
Lumex_CPM 0.60 DPM 0.00

4 Rack_position 91 3 Count_Time(min) 120.00 Quench_number 692.62 Pu241_cpm 7.34 Run_Date 10/1/2016 7:09 PM

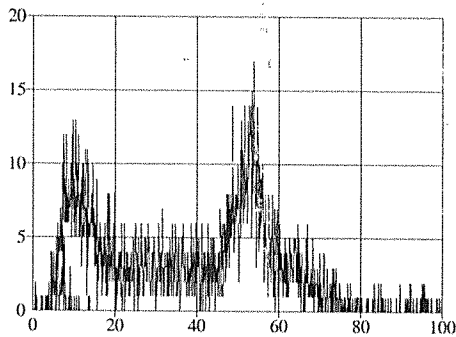


Gross_B_CPM 7.80 LUMEX 0.00
Lumex_CPM 0.50 DPM 0.00

Pu-241 TEAL

6

Rack_position 91 Count_Time(min) 120.00 Quench_number 694.53 Pu241_cpm 7.74 Run_Date 10/1/2016 9:10 PM



Counts Chem

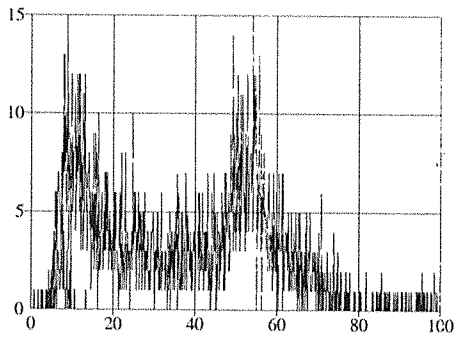
Counts Beta

Gross_B_CPM 8.20 LUMEX 0.00

Lumex_CPM 0.50 DPM 0.00

11

Rack_position 91 Count_Time(min) 120.00 Quench_number 693.84 Pu241_cpm 7.60 Run_Date 10/1/2016 11:11 PM



Counts Chem

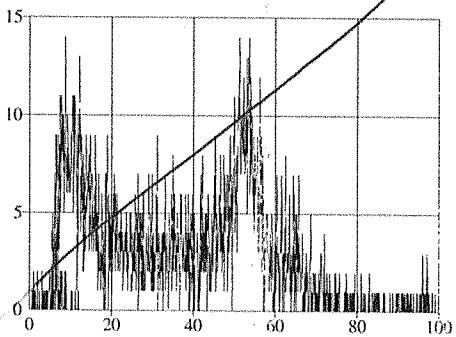
Counts Beta

Gross_B_CPM 8.20 LUMEX 0.00

Lumex_CPM 0.60 DPM 0.00

18

Rack_position 91 Count_Time(min) 120.00 Quench_number 691.61 Pu241_cpm 7.85 Run_Date 10/2/2016 1:13 AM



Counts Chem

Counts Beta

Gross_B_CPM 8.20 LUMEX 0.00

Lumex_CPM 0.30 DPM 0.00

MA 10/1/16

PROTOCOL : 5 Pu-241 120 min
DATE : 2016/10/03
TIME : 08:27
ID : P05AS294

Pu-241

Wallac 1414 WinSpectral v3.0 S/N4140421

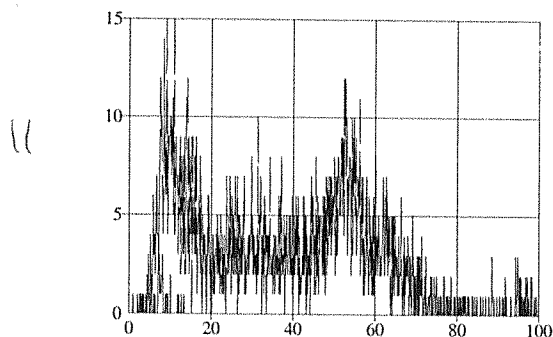
Counting mode : CPM
Isotope(s) : H3
H3 = 5- 350,12.43 y
Protocol name : Pu-241 120 min
Counting time : 7200
Repeats : 1
Cycles : 1
Replicates : 1
2 sigma % : 2.00
Minimum cpm : 0.00 Checking time: 10
Advanced modes : Chemilum
Output to Display :
POS,DPM1,CPMw2,CLMM,FNCT2,
RACK,RACKPOS,FNCT1,SQPE,DATE,
TIME,CPMw1,CPM,CPM1,CTIME
Additions to Display : Spectrum,Header,Listing
Header : Pu-241
Spectrum : Rnd.Cos,Beta
Window 1 : 25- 220 /Beta
Window 2 : 25- 220 /Rnd.Cos
Window 3 : 1-1024 /Beta
Window 4 : 1-1024 /Beta
Window 5 : 1-1024 /Beta
Window 6 : 1-1024 /Beta
FNCT1 = FNCT1 : CTIME/60
FNCT2 = FNCT2 : CPMW1-CPMW2
FNCT3 = FNCT3 :
FNCT4 = FNCT4 :

Total count rate:

H3 33.6 CPM

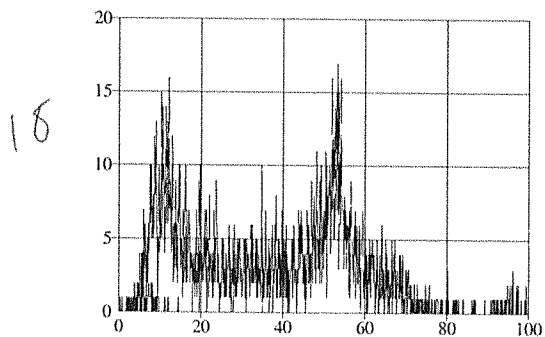
Pu-241 TEAL

Rack_position	Count_Time(min)	Quench_number	Pu241_cpm	Run_Date
91	5	120.00	695.96	10/3/2016 8:28 AM



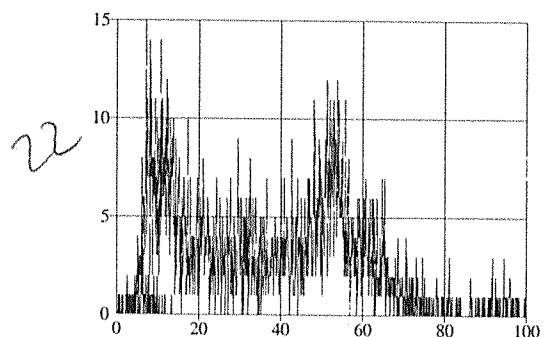
Counts Chem	Gross_B_CPM	LUMEX
Counts Beta	Lumex_CPM	DPM
	7.80	0.00
	0.40	0.00

Rack_position	Count_Time(min)	Quench_number	Pu241_cpm	Run_Date
91	6	120.00	691.77	10/3/2016 10:29 AM



Counts Chem	Gross_B_CPM	LUMEX
Counts Beta	Lumex_CPM	DPM
	8.30	0.00
	0.40	0.00

Rack_position	Count_Time(min)	Quench_number	Pu241_cpm	Run_Date
91	7	120.00	692.04	10/3/2016 12:30 PM



Counts Chem	Gross_B_CPM	LUMEX
Counts Beta	Lumex_CPM	DPM
	8.00	0.00
	0.40	0.00

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
SAMPLE ID : R0405235001_PU
SAMPLE QTY : 0.501 G +/-0.200 %
SAMPLE DATE : 10-Dec-2015 00:00:00
ANALYST : JXH2
% YIELD : 78.4 +/-6.316 %

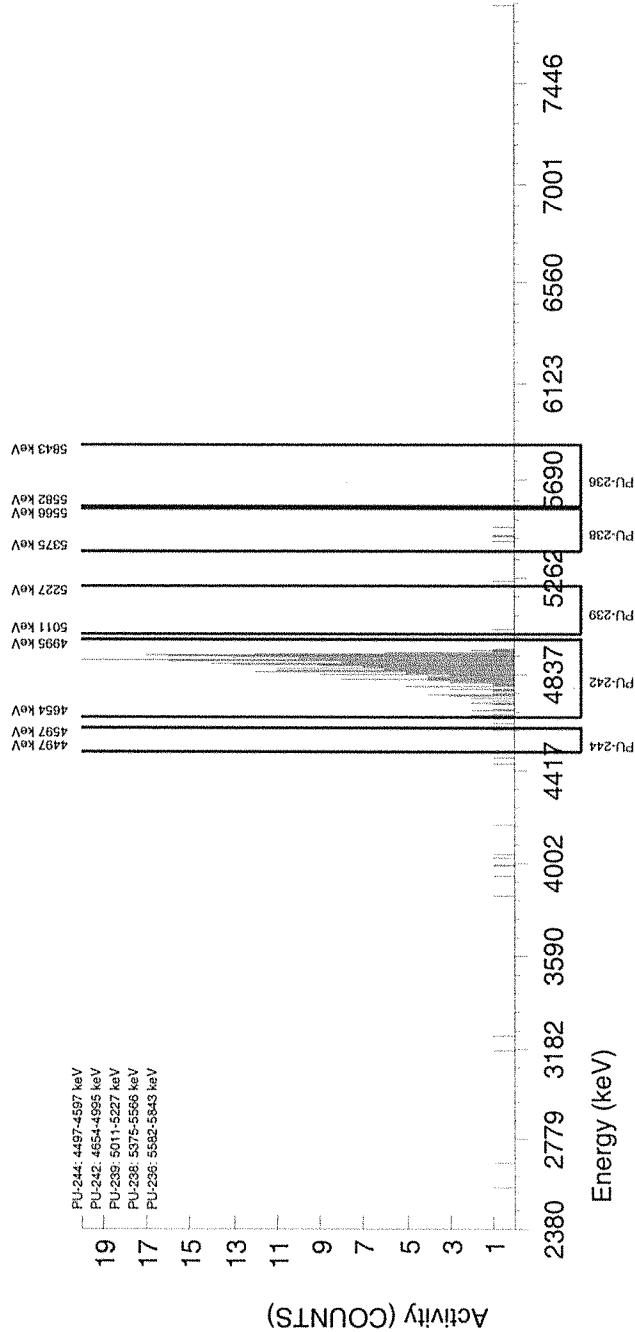
CHAMBER : 103
DETECTOR S/N : 79461
AVERAGE %EFFICIENCY : 33.8848
AVERAGE %EFF ERROR : 0.6527
COUNT DATE : 29-Sep-2016 09:18:29
ELAPSED LIVE TIME(SEC) : 14399.99

LIB FILE : PU
BKG FILE : B103.CNF;1414
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W103.CNF;395
CAL DATE : 06-Sep-2016

TRACER ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.4371E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	-0.960	0.960	0.9798	100.000	-1.65E-02	3.82E-02	1.13E-01	3.08E-02	3.81E-02
PU-238	5486.00	5450.04	64.506	4.000	2.560	1.440	1.2000	99.900	3.64E-02	6.49E-02	1.05E-01	3.12E-02	6.47E-02
PU-239	5155.00	5033.19	4.962	1.000	-0.440	1.440	1.2000	99.900	-6.21E-03	4.29E-02	1.04E-01	3.10E-02	4.29E-02
PU-242	4890.00	4865.40	77.502	280.000	279.520	0.480	0.6928	100.000	3.94E+00	6.89E-01	7.81E-02	1.79E-02	4.63E-01
PU-244	4589.00	4590.17	4.962	1.000	1.000	0.000	0.0000	99.900	1.41E-02	3.97E-02	4.23E-02	0.00E+00	3.97E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
SAMPLE ID : R0405235002_PU
SAMPLE QTY : 0.505 G +/-0.198 %
SAMPLE DATE : 10-Dec-2015 00:00:00
ANALYST : JXH2
% YIELD : 76.4 +/-6.541 %

CHAMBER : 104
DETECTOR S/N : 80011
AVERAGE %EFFICIENCY : 32.4069
AVERAGE %EFF ERROR : 0.6248
COUNT DATE : 29-Sep-2016 09:18:29
ELAPSED LIVE TIME(SEC) : 14399.99

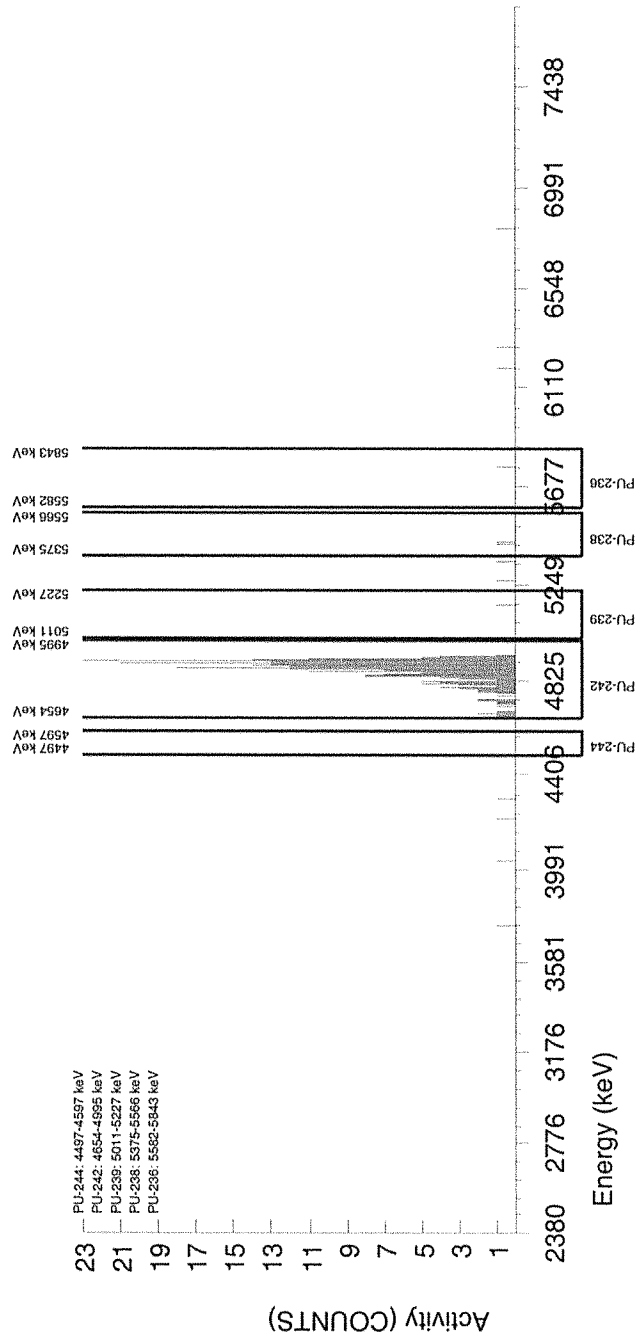
LIB FILE : PU
BKG FILE : B104.CNF;1399
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W104.CNF;386
CAL DATE : 06-Sep-2016

TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.3470E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma cnt Unc
										TPU pCi/G	Lc pCi/G	
PU-236	5749.00	5763.53	4.919	1.000	0.280	0.720	0.8485	100.000	5.11E-03	1.12E-01	2.84E-02	5.35E-02
PU-238	5486.00	5430.31	14.757	2.000	1.280	0.720	0.8485	99.900	1.94E-02	9.24E-02	2.35E-02	5.33E-02
PU-239	5155.00	5158.31	4.919	1.000	-0.440	1.440	1.2000	99.900	-6.61E-03	1.11E-01	3.30E-02	4.57E-02
PU-242	4890.00	4865.77	43.943	262.000	260.320	1.680	1.2961	100.000	3.91E+00	1.16E-01	3.57E-02	4.78E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.720	0.720	0.8485	99.900	-1.08E-02	9.18E-02	2.34E-02	3.27E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
SAMPLE ID : R0405235003_PU
SAMPLE QTY : 0.501 G +/-0.200 %
SAMPLE DATE : 10-Dec-2015 00:00:00
ANALYST : JXH2
% YIELD : 59.5 +/-7.223 %

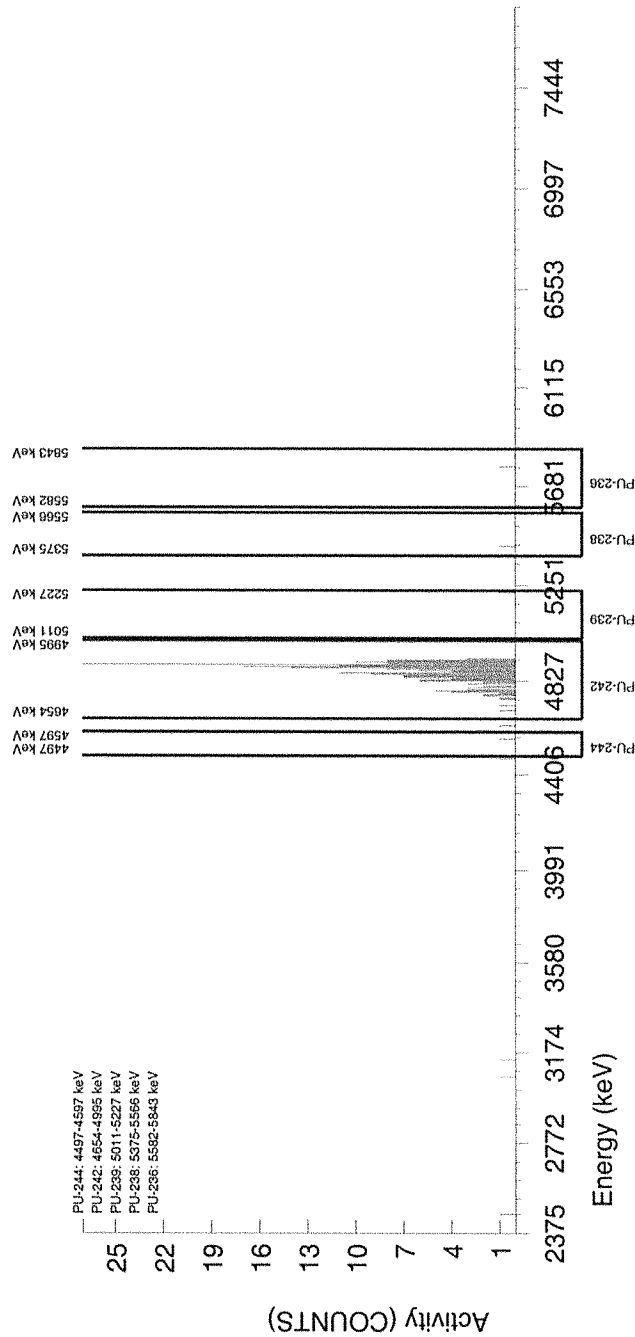
CHAMBER : 105
DETECTOR S/N : 78777
AVERAGE %EFFICIENCY : 33.6886
AVERAGE %EFF ERROR : 0.6490
COUNT DATE : 29-Sep-2016 09:18:29
ELAPSED LIVE TIME(SEC) : 14399.99

LIB FILE : PU
BKG FILE : B105.CNF;1398
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W105.CNF;364
CAL DATE : 06-Sep-2016

TRACER
ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 2.6077E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma cnt Unc
										TPU pCi/G	Lc pCi/G	
PU-236	5749.00	5767.11	4.933	1.000	-0.680	1.680	1.2961	100.000	-1.55E-02	7.00E-02	1.76E-01	6.99E-02
PU-238	5486.00	5417.13	4.933	1.000	0.040	0.960	0.9798	99.900	7.53E-04	5.59E-02	1.24E-01	5.58E-02
PU-239	5155.00	5213.95	4.933	1.000	0.040	0.960	0.9798	99.900	7.48E-04	5.55E-02	1.23E-01	5.55E-02
PU-242	4890.00	4861.02	18.714	213.000	210.840	2.160	1.4697	100.000	3.94E+00	7.88E-01	1.57E-01	5.37E-01
PU-244	4589.00	4568.67	4.933	1.000	0.040	0.960	0.9798	99.900	7.48E-04	5.55E-02	1.23E-01	5.55E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
SAMPLE ID : R0405235004_PU
SAMPLE QTY : 0.502 G +/-0.199 %
SAMPLE DATE : 09-Dec-2015 00:00:00
ANALYST : JXH2
% YIELD : 56.3 +/-7.505 %

CHAMBER : 106
DETECTOR S/N : 80012
AVERAGE %EFFICIENCY : 32.6615
AVERAGE %EFF ERROR : 0.6296
COUNT DATE : 29-Sep-2016 09:18:29
ELAPSED LIVE TIME(SEC) : 14399.99

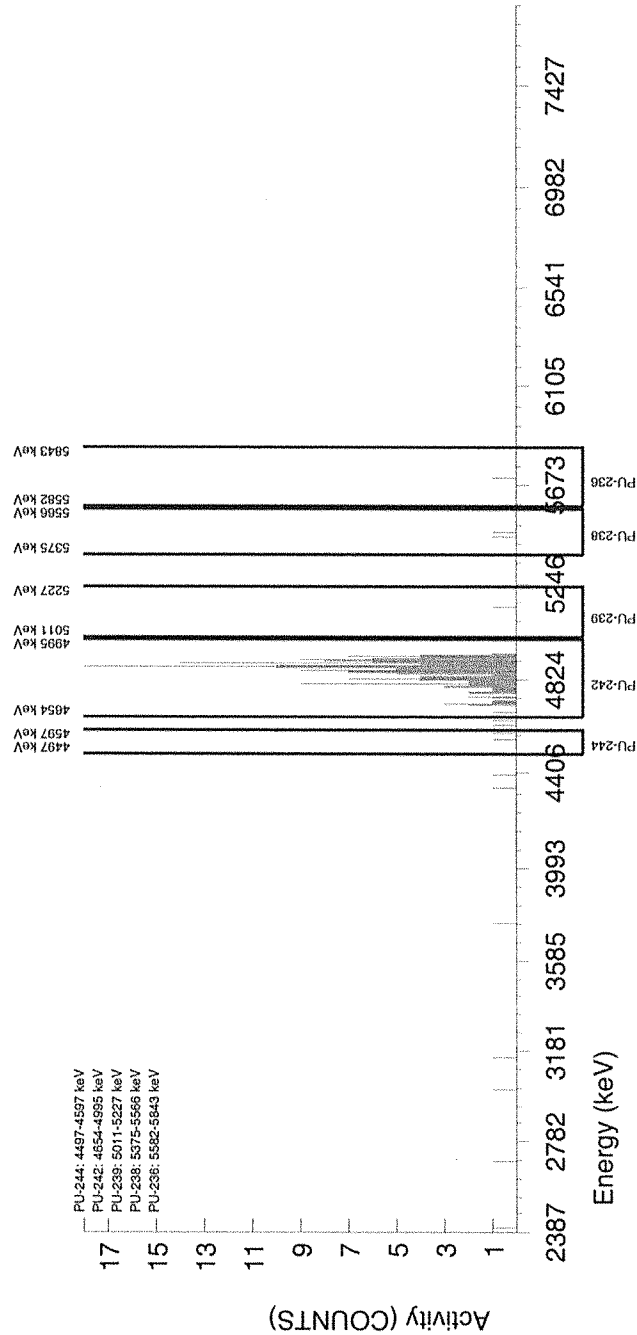
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CAL DATE : 06-Sep-2016

TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 2.4693E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5705.53	4.904	1.000	0.760	0.240	0.4899	100.000	1.88E-02	7.06E-02	1.19E-01	2.22E-02	7.05E-02
PU-238	5486.00	5459.31	24.521	2.000	-1.120	3.120	1.7664	99.900	-2.29E-02	7.83E-02	1.94E-01	6.62E-02	7.83E-02
PU-239	5155.00	5140.44	4.904	1.000	0.520	0.480	0.6928	99.900	1.06E-02	5.88E-02	1.13E-01	2.58E-02	5.88E-02
PU-242	4890.00	4854.84	23.663	195.000	193.560	1.440	1.2000	100.000	3.93E+00	8.18E-01	1.50E-01	4.47E-02	5.58E-01
PU-244	4589.00	4570.39	29.425	2.000	1.760	0.240	0.4899	99.900	3.58E-02	7.06E-02	9.75E-02	1.83E-02	7.04E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
SAMPLE ID : R0405235005_PU
SAMPLE QTY : 0.503 G +/-0.199 %
SAMPLE DATE : 10-Dec-2015 00:00:00
ANALYST : JXH2
% YIELD : 93.2 +/-6.114 %

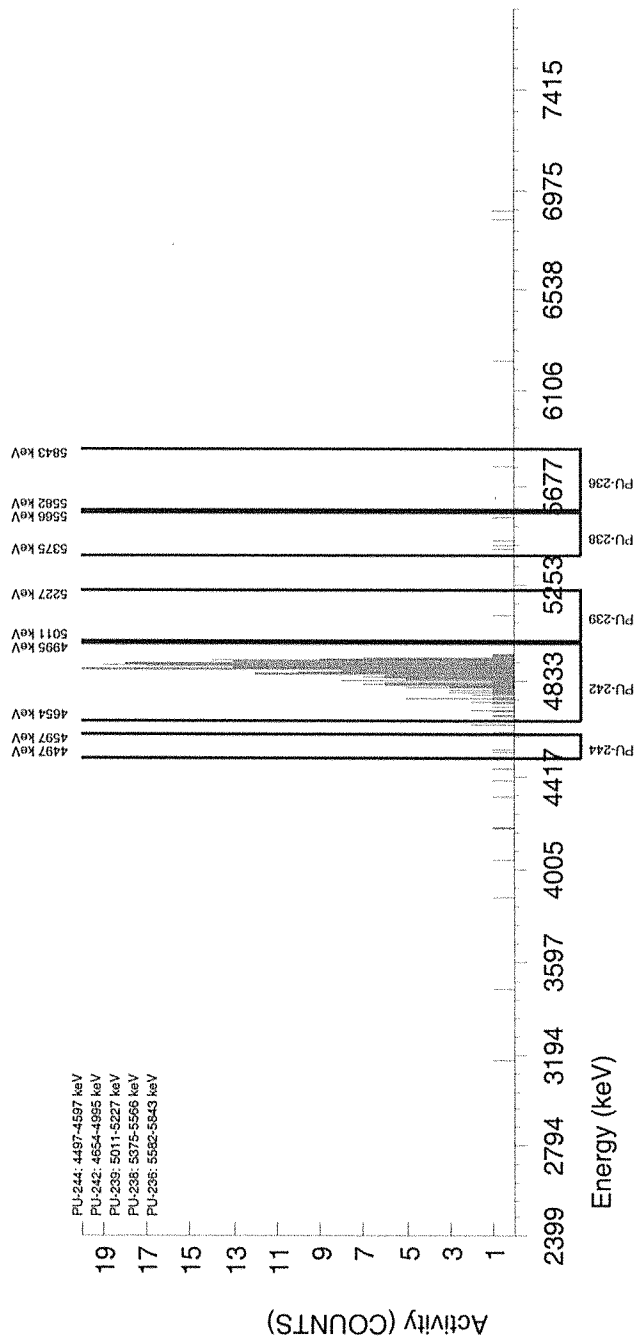
CHAMBER : 107
DETECTOR S/N : 67578
AVERAGE %EFFICIENCY : 30.7195
AVERAGE %EFF ERROR : 0.5929
COUNT DATE : 29-Sep-2016 09:18:30
ELAPSED LIVE TIME(SEC) : 14399.99

LIB FILE : PU
BKG FILE : B107.CNF;1439
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W107.CNF;426
CAL DATE : 06-Sep-2016

TRACER
ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 4.0832E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	Lc pCi/G	MDA pCi/G	cnt Unc pCi/G
PU-236	5749.00	5767.98	4.917	1.000	-0.200	1.200	1.0954	100.000	-3.17E-03	4.76E-02	1.11E-01	3.18E-02	4.76E-02
PU-238	5486.00	5439.25	157.348	5.000	3.560	1.440	1.2000	99.900	4.68E-02	6.54E-02	9.72E-02	2.89E-02	6.51E-02
PU-239	5155.00	5116.13	4.917	1.000	0.520	0.480	0.6928	99.900	6.79E-03	3.77E-02	7.23E-02	1.66E-02	3.77E-02
PU-242	4890.00	4868.26	64.578	302.000	301.040	0.960	0.9798	100.000	3.93E+00	6.65E-01	8.59E-02	2.34E-02	4.45E-01
PU-244	4589.00	4515.46	0.000	3.000	2.760	0.240	0.4899	99.900	3.60E-02	5.21E-02	6.26E-02	1.17E-02	5.19E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
SAMPLE ID : R0405235006_PU
SAMPLE QTY : 0.501 G +/-0.200 %
SAMPLE DATE : 10-Dec-2015 00:00:00
ANALYST : JXH2
% YIELD : 97.3 +/-5.689 %

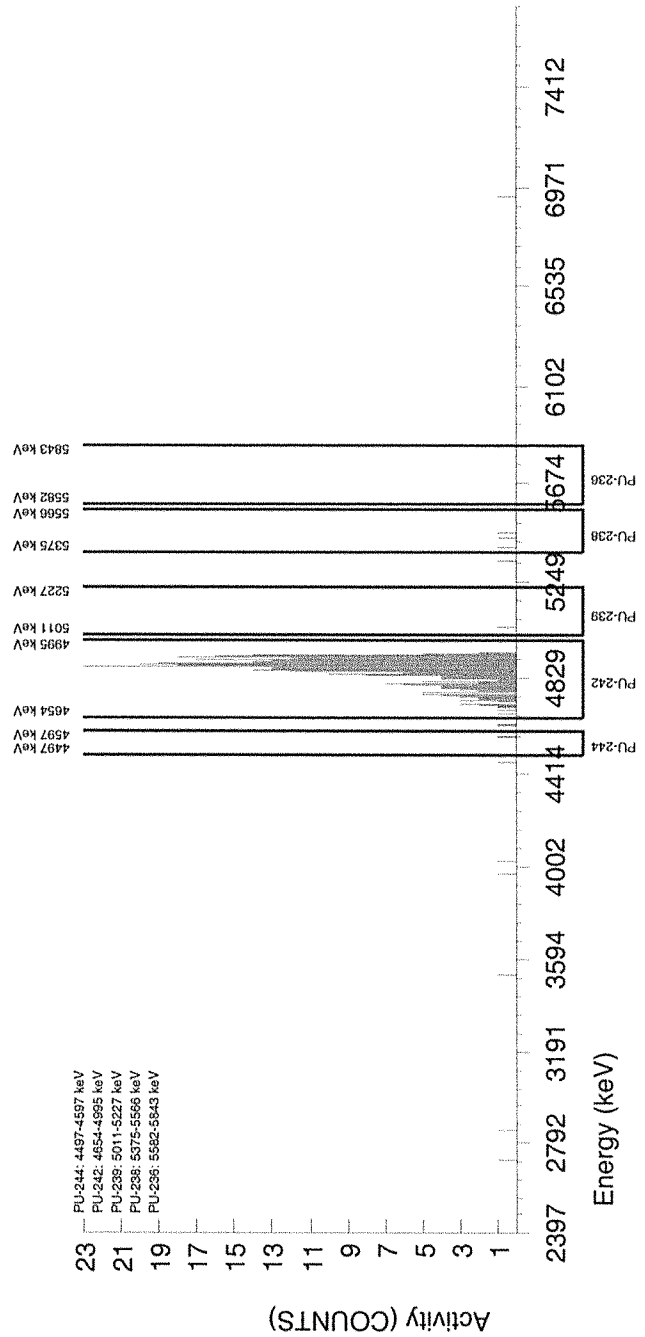
CHAMBER : 108
DETECTOR S/N : 78778
AVERAGE %EFFICIENCY : 34.5578
AVERAGE %EFF ERROR : 0.6655
COUNT DATE : 29-Sep-2016 09:18:30
ELAPSED LIVE TIME(SEC) : 14399.99

LIB FILE : PU
BKG FILE : B108.CNF;1433
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W108.CNF;430
CAL DATE : 06-Sep-2016

TRACER ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 4.2658E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	-0.480	0.480	0.6928	100.000	-6.50E-03	2.88E-02	7.50E-02	1.72E-02	2.87E-02
PU-238	5486.00	5432.77	63.844	3.000	2.520	0.480	0.6928	99.900	2.83E-02	4.51E-02	6.21E-02	1.42E-02	4.49E-02
PU-239	5155.00	5049.43	4.911	1.000	0.760	0.240	0.4899	99.900	8.47E-03	3.18E-02	5.35E-02	1.00E-02	3.18E-02
PU-242	4890.00	4860.01	70.528	355.000	353.800	1.200	1.0954	100.000	3.94E+00	6.21E-01	7.81E-02	2.24E-02	4.12E-01
PU-244	4589.00	4571.63	9.822	2.000	2.000	0.000	0.0000	99.900	2.23E-02	3.83E-02	3.34E-02	0.00E+00	3.82E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
SAMPLE ID : R0405235007_PU
SAMPLE QTY : 0.501 G +/-0.200 %
SAMPLE DATE : 10-Dec-2015 00:00:00
ANALYST : JXH2
% YIELD : 82.9 +/-5.993 %

CHAMBER : 109
DETECTOR S/N : 79463
AVERAGE %EFFICIENCY : 36.1703
AVERAGE %EFF ERROR : 0.6959
COUNT DATE : 29-Sep-2016 09:18:30
ELAPSED LIVE TIME(SEC) : 14399.99

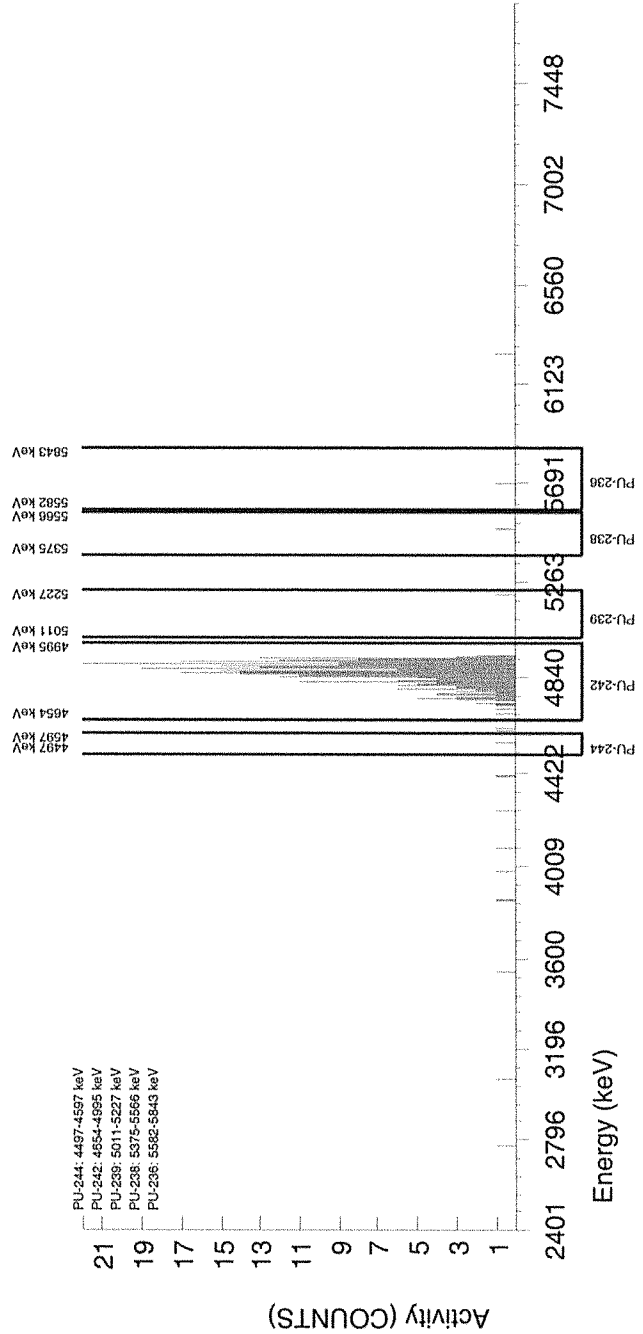
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BKG LIVE TIME(SEC) : 60000.00
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CAL DATE : 06-Sep-2016

TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.6324E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5690.95	4.905	1.000	0.520	0.480	0.6928	100.000	7.90E-03	4.39E-02	8.42E-02	1.93E-02	4.39E-02
PU-238	5486.00	5492.60	4.905	1.000	0.040	0.960	0.9798	99.900	5.04E-04	3.74E-02	8.30E-02	2.26E-02	3.73E-02
PU-239	5155.00	5204.92	4.905	1.000	0.040	0.960	0.9798	99.900	5.00E-04	3.71E-02	8.24E-02	2.25E-02	3.71E-02
PU-242	4890.00	4857.44	80.162	317.000	315.320	1.680	1.2961	100.000	3.94E+00	6.54E-01	9.68E-02	2.97E-02	4.37E-01
PU-244	4589.00	4552.40	4.905	1.000	0.520	0.480	0.6928	99.900	6.51E-03	3.62E-02	6.93E-02	1.59E-02	3.61E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
SAMPLE ID : R0405235008_PU
SAMPLE QTY : 0.503 G +/-0.199 %
SAMPLE DATE : 10-Dec-2015 00:00:00
ANALYST : JXH2
% YIELD : 90.1 +/-6.064 %

CHAMBER : 110
DETECTOR S/N : 83292
AVERAGE %EFFICIENCY : 32.3669
AVERAGE %EFF ERROR : 0.6241
COUNT DATE : 29-Sep-2016 09:18:30
ELAPSED LIVE TIME(SEC) : 14399.99

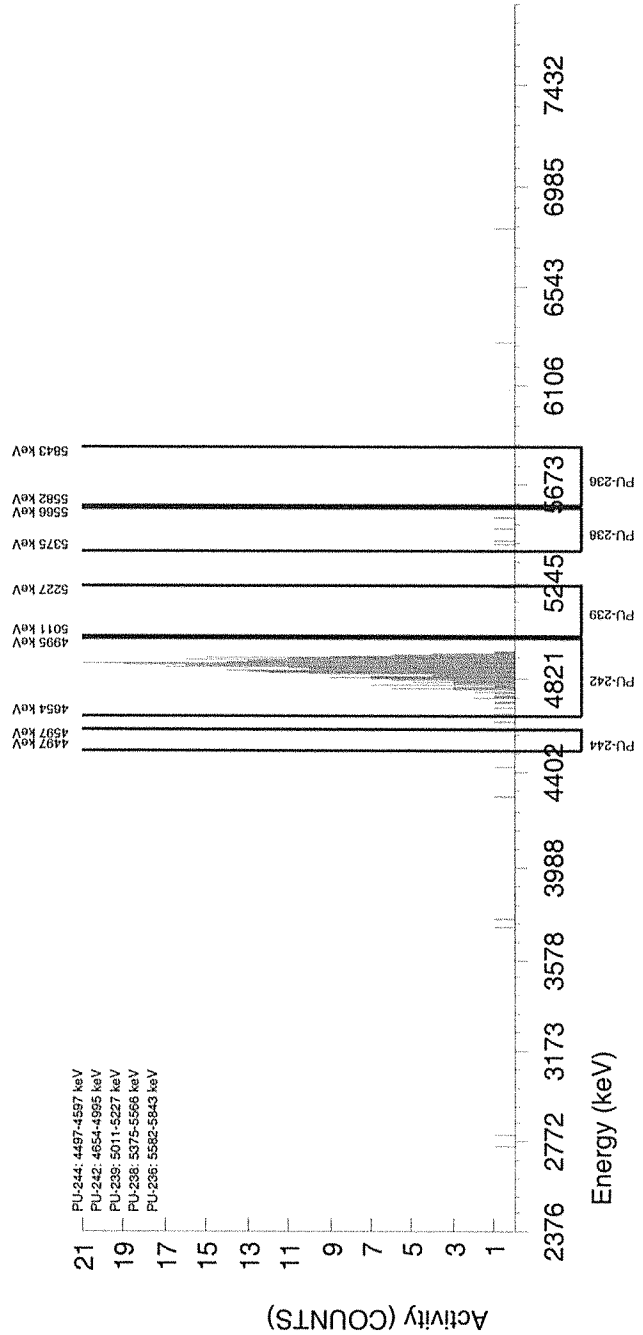
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BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W110.CNF;441
CAL DATE : 06-Sep-2016

TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.9495E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.24	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	3.14E-02	4.67E-02	0.00E+00	3.14E-02
PU-238	5486.00	5461.18	113.212	3.520	0.480	0.6928	0.6928	99.900	4.54E-02	5.77E-02	7.14E-02	1.64E-02	5.75E-02
PU-239	5155.00	5218.37	4.922	1.000	0.520	0.6928	0.6928	99.900	6.66E-03	3.70E-02	7.09E-02	1.63E-02	3.70E-02
PU-242	4890.00	4858.84	71.373	308.800	0.000	1.200	1.0954	100.000	3.93E+00	6.59E-01	8.97E-02	2.57E-02	4.41E-01
PU-244	4589.00	4546.97	0.000	0.000	0.000	0.0000	0.0000	99.900	0.00E+00	2.59E-02	3.84E-02	0.00E+00	2.58E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
SAMPLE ID : R0405235009_PU
SAMPLE QTY : 0.504 G +/-0.198 %
SAMPLE DATE : 10-Dec-2015 00:00:00
ANALYST : JXH2
% YIELD : 87.0 +/-6.029 %

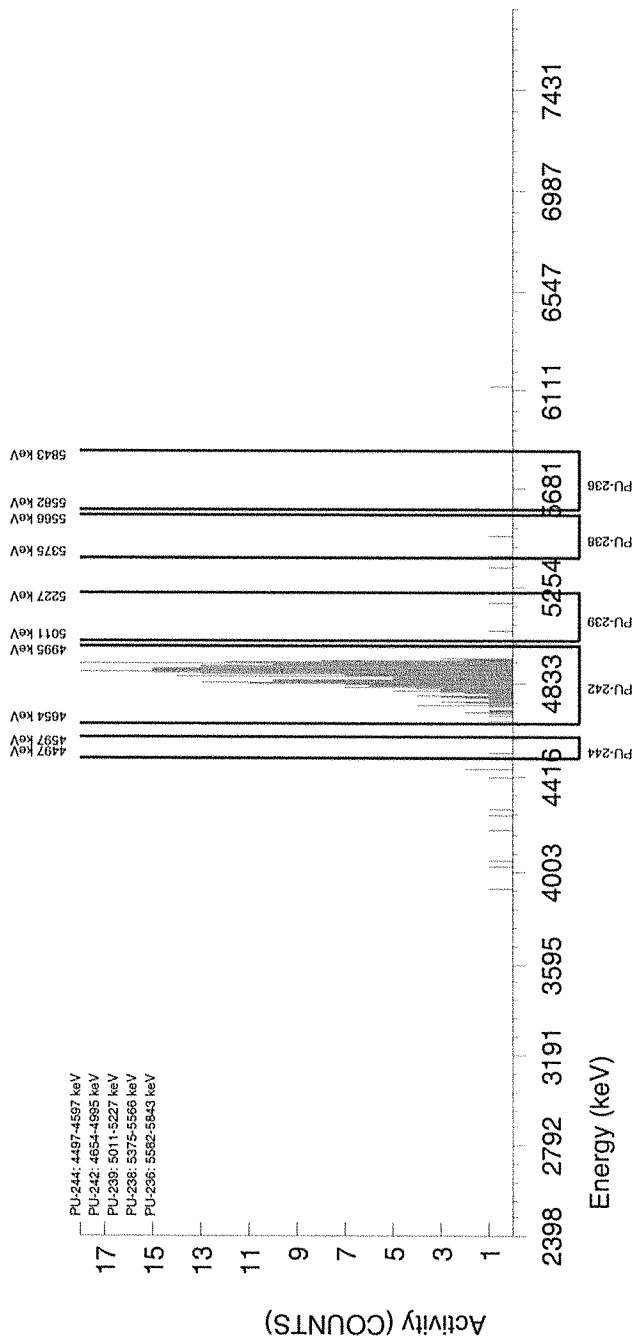
CHAMBER : 112
DETECTOR S/N : 78261
AVERAGE %EFFICIENCY : 34.0722
AVERAGE %EFF ERROR : 0.6563
COUNT DATE : 29-Sep-2016 09:18:30
ELAPSED LIVE TIME(SEC) : 14399.99

LIB FILE : PU
BKG FILE : B112.CNF;1443
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W112.CNF;451
CAL DATE : 06-Sep-2016

TRACER ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.8135E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma cnt Unc
										TPU pCi/G	Lc pCi/G	
PU-236	5749.00	5712.24	0.000	0.000	-0.480	0.480	0.6928	100.000	-7.33E-03	8.46E-02	1.94E-02	3.24E-02
PU-238	5486.00	5429.74	83.327	0.560	0.560	1.440	1.2000	99.900	7.09E-03	9.36E-02	2.78E-02	4.58E-02
PU-239	5155.00	5119.56	117.638	1.520	1.520	0.480	0.6928	99.900	1.91E-02	6.96E-02	1.60E-02	4.39E-02
PU-242	4890.00	4857.86	94.356	311.840	0.760	2.160	1.4697	100.000	3.92E+00	1.05E-01	3.38E-02	4.37E-01
PU-244	4589.00	4524.68	4.902	1.000	0.240	0.240	0.4899	99.900	9.56E-03	6.03E-02	1.13E-02	3.58E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
SAMPLE ID : R0405235010_PU
SAMPLE QTY : 0.501 G +/-0.200 %
SAMPLE DATE : 10-Dec-2015 00:00:00
ANALYST : JXH2
% YIELD : 93.4 +/-6.681 %

CHAMBER : 210
DETECTOR S/N : 87898
AVERAGE %EFFICIENCY : 25.3042
AVERAGE %EFF ERROR : 0.4906
COUNT DATE : 29-Sep-2016 09:23:32
ELAPSED LIVE TIME(SEC) : 14400.00

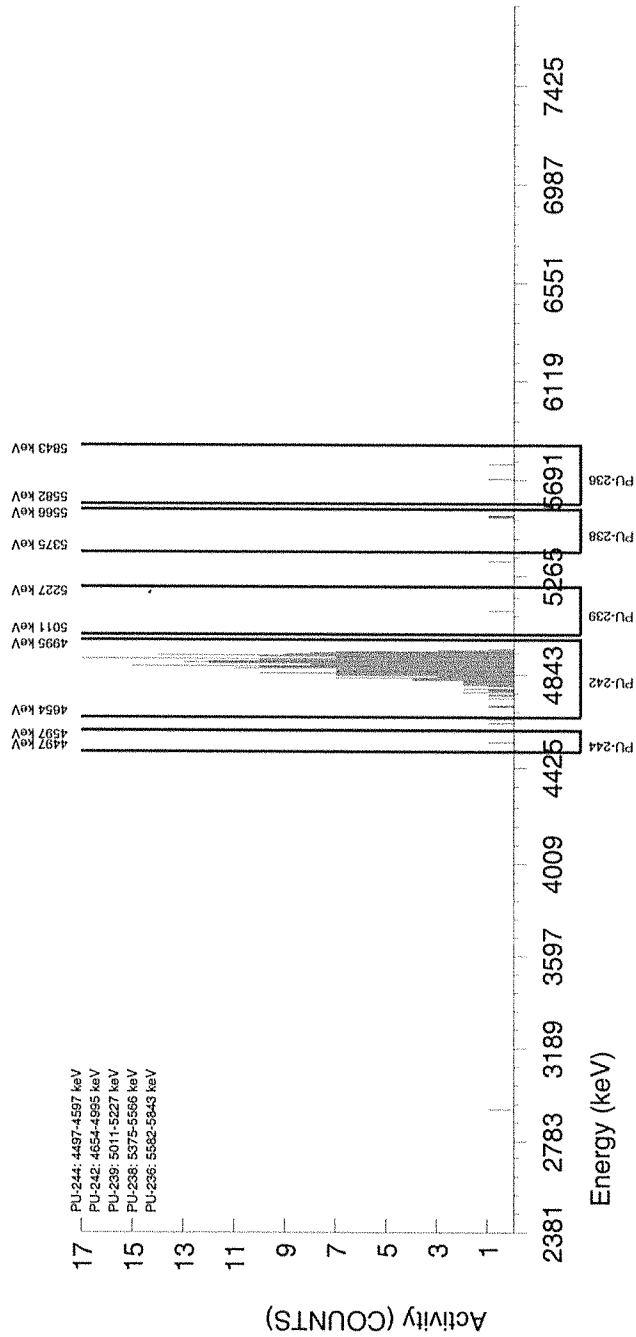
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BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W210.CNF;126
CAL DATE : 16-Sep-2016

TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 4.0929E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5728.05	65.062	2.000	1.760	0.240	0.4899	100.000	3.39E-02	6.69E-02	9.24E-02	1.73E-02	6.67E-02
PU-238	5486.00	5530.79	15.014	3.000	-1.320	4.320	2.0785	99.900	-2.11E-02	7.07E-02	1.70E-01	6.08E-02	7.07E-02
PU-239	5155.00	5117.29	5.005	1.000	0.280	0.720	0.8485	99.900	4.44E-03	4.65E-02	9.70E-02	2.47E-02	4.65E-02
PU-242	4890.00	4874.31	85.080	250.000	248.560	1.440	1.2000	100.000	3.94E+00	7.29E-01	1.17E-01	3.49E-02	4.93E-01
PU-244	4589.00	4518.61	0.000	2.000	2.000	0.000	0.0000	99.900	3.17E-02	5.46E-02	4.76E-02	0.00E+00	5.44E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
SAMPLE ID : R0405235011_PU
SAMPLE QTY : 0.500 G +/-0.200 %
SAMPLE DATE : 09-Dec-2015 00:00:00
ANALYST : JXH2
% YIELD : 67.8 +/-7.649 %

CHAMBER : 212
DETECTOR S/N : 87900
AVERAGE %EFFICIENCY : 26.0378
AVERAGE %EFF ERROR : 0.5045
COUNT DATE : 29-Sep-2016 09:23:34
ELAPSED LIVE TIME(SEC) : 14400.00

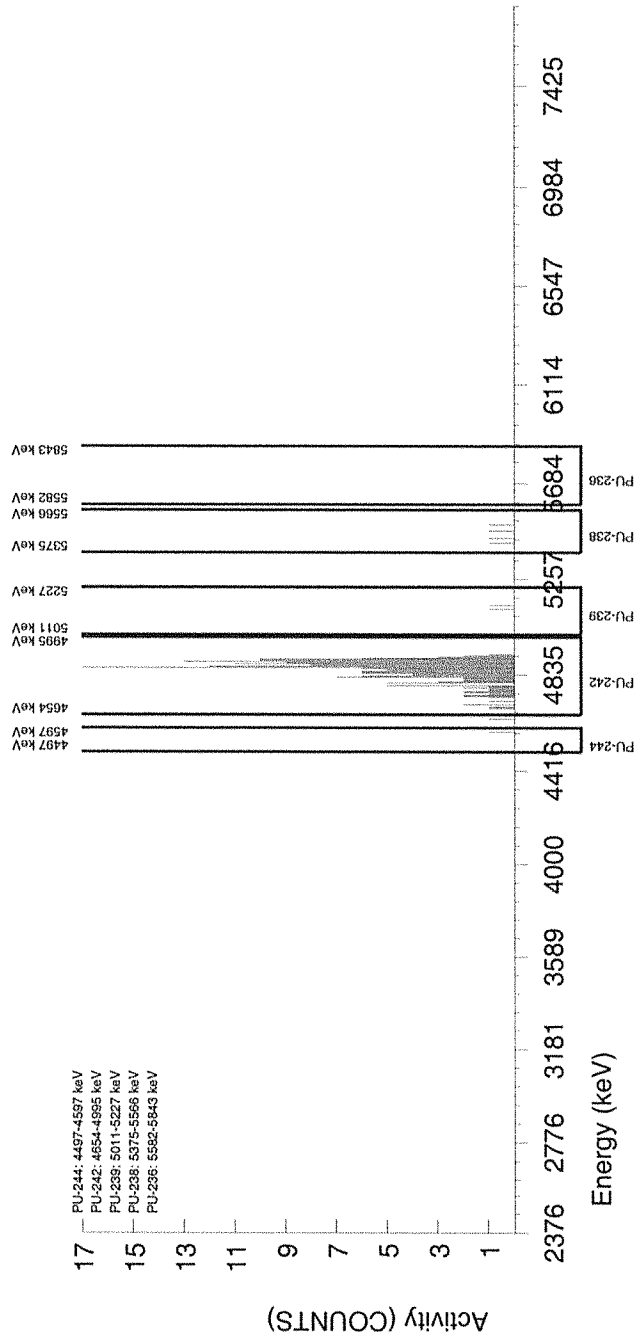
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BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W212.CNF;119
CAL DATE : 16-Sep-2016

TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 2.9732E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc
PU-236	5749.00	5712.28	0.000	0.000	-0.720	0.720	0.8485	100.000	-1.86E-02	5.64E-02	1.58E-01	4.02E-02	5.62E-02
PU-238	5486.00	5439.10	0.000	5.000	3.800	1.200	1.0954	99.900	8.14E-02	1.06E-01	1.50E-01	4.30E-02	1.06E-01
PU-239	5155.00	5132.78	19.941	2.000	1.280	0.720	0.8485	99.900	2.72E-02	7.51E-02	1.30E-01	3.31E-02	7.49E-02
PU-242	4890.00	4851.76	40.619	187.000	185.800	1.200	1.0954	100.000	3.95E+00	8.37E-01	1.49E-01	4.26E-02	5.72E-01
PU-244	4589.00	4590.71	0.000	2.000	1.520	0.480	0.6928	99.900	3.23E-02	7.44E-02	1.18E-01	2.70E-02	7.49E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
SAMPLE ID : R0405235012_PU
SAMPLE QTY : 0.506 G +/-0.198 %
SAMPLE DATE : 10-Dec-2015 00:00:00
ANALYST : JXH2
% YIELD : 90.6 +/-6.822 %

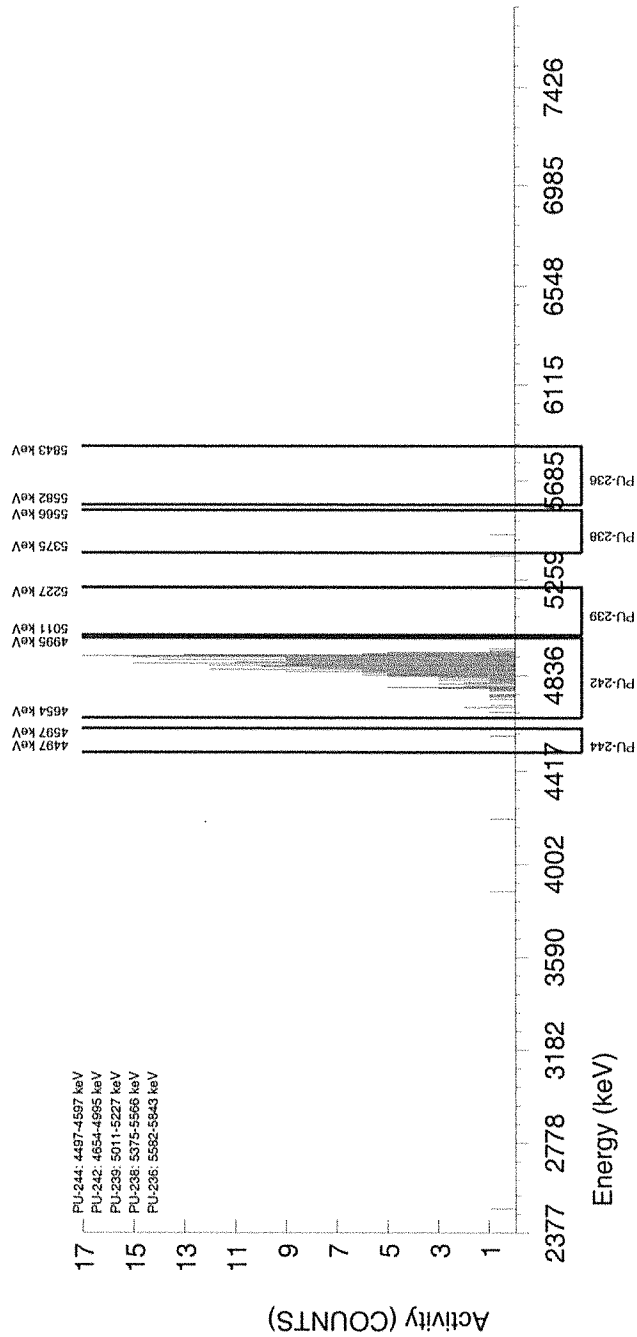
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DETECTOR S/N : 87901
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ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B213.CNF;469
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W213.CNF;152
CAL DATE : 16-Sep-2016

TRACER ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.9699E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.28	0.000	0.000	-0.480	0.480	0.6928	100.000	-9.61E-03	4.26E-02	1.11E-01	2.54E-02	4.25E-02
PU-238	5486.00	5455.35	4.987	1.000	0.280	0.720	0.8485	99.900	4.64E-03	4.86E-02	1.01E-01	2.58E-02	4.85E-02
PU-239	5155.00	5118.71	0.000	0.000	-1.200	1.200	1.0954	99.900	-1.98E-02	3.75E-02	1.16E-01	3.31E-02	3.75E-02
PU-242	4890.00	4873.06	73.853	238.000	237.040	0.960	0.9798	100.000	3.90E+00	7.37E-01	1.08E-01	2.95E-02	4.99E-01
PU-244	4589.00	4568.76	4.987	1.000	0.520	0.480	0.6928	99.900	8.57E-03	4.77E-02	9.13E-02	2.09E-02	4.76E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
SAMPLE ID : R0405235013_PU
SAMPLE QTY : 0.500 G +/-0.200 %
SAMPLE DATE : 08-Dec-2015 00:00:00
ANALYST : JXH2
% YIELD : 75.4 +/-7.266 %

CHAMBER : 214
DETECTOR S/N : 87902
AVERAGE %EFFICIENCY : 26.2230
AVERAGE %EFF ERROR : 0.5080
COUNT DATE : 29-Sep-2016 09:23:39
ELAPSED LIVE TIME(SEC) : 14400.00

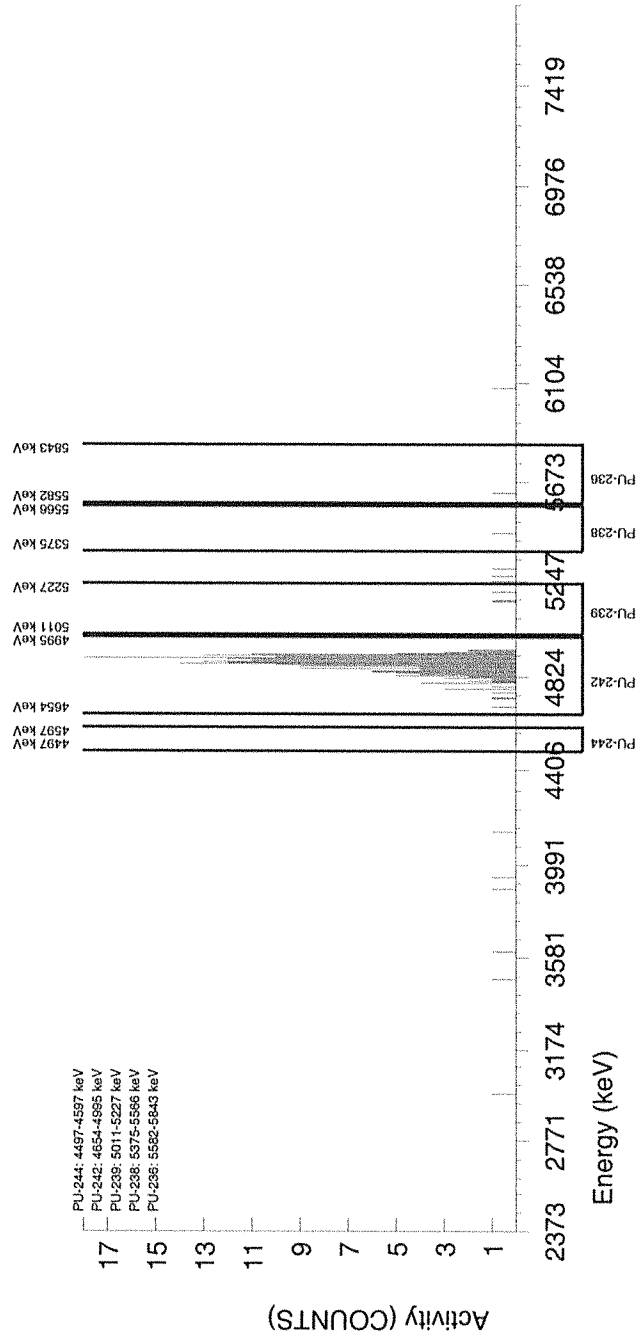
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BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W214.CNF,119
CAL DATE : 16-Sep-2016

TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.3063E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5624.99	4.958	1.000	0.520	0.480	0.6928	100.000	1.20E-02	6.68E-02	1.28E-01	2.93E-02	6.68E-02
PU-238	5486.00	5448.78	4.958	1.000	0.040	0.960	0.9798	99.900	7.65E-04	5.68E-02	1.26E-01	3.43E-02	5.67E-02
PU-239	5155.00	5167.19	44.618	3.000	2.040	0.960	0.9798	99.900	3.88E-02	7.73E-02	1.25E-01	3.41E-02	7.71E-02
PU-242	4890.00	4873.06	51.228	210.000	208.080	1.920	1.3856	100.000	3.95E+00	7.95E-01	1.53E-01	4.82E-02	5.41E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.480	0.480	0.6928	99.900	-9.12E-03	4.04E-02	1.05E-01	2.41E-02	4.03E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
SAMPLE ID : R0405235014_PU
SAMPLE QTY : 0.502 G +/-0.199 %
SAMPLE DATE : 08-Dec-2015 00:00:00
ANALYST : JXH2
% YIELD : 86.0 +/-6.952 %

CHAMBER : 218
DETECTOR S/N : 87906
AVERAGE %EFFICIENCY : 25.1171
AVERAGE %EFF ERROR : 0.4871
COUNT DATE : 29-Sep-2016 09:23:41
ELAPSED LIVE TIME(SEC) : 14400.00

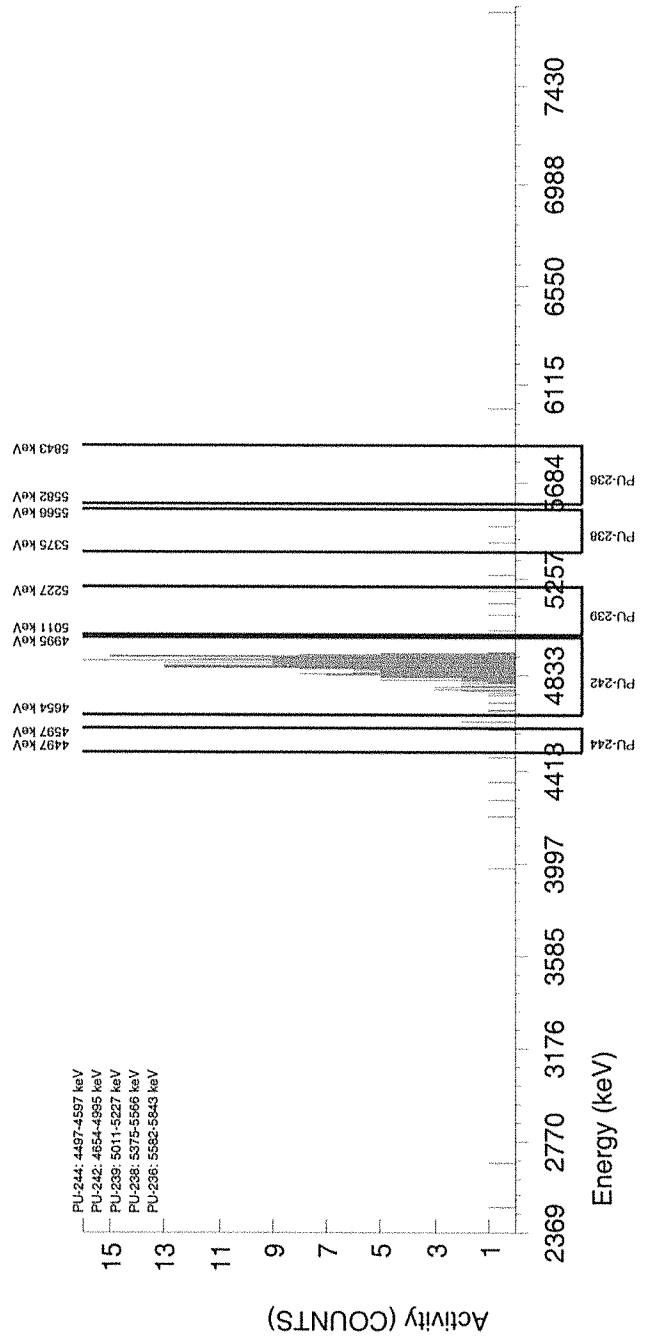
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BKG FILE : B218.CNF;459
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W218.CNF;126
CAL DATE : 16-Sep-2016

TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.7703E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.28	0.000	0.000	-0.480	0.480	0.6928	100.000	-1.01E-02	4.48E-02	1.17E-01	2.67E-02	4.47E-02
PU-238	5486.00	5451.35	69.949	2.000	1.520	0.480	0.6928	99.900	2.65E-02	6.10E-02	9.66E-02	2.21E-02	6.09E-02
PU-239	5155.00	5120.15	169.875	4.000	2.320	1.680	1.2961	99.900	4.02E-02	7.95E-02	1.34E-01	4.11E-02	7.93E-02
PU-242	4890.00	4869.65	59.956	228.000	227.280	0.720	0.8485	100.000	3.93E+00	7.57E-01	1.06E-01	2.69E-02	5.14E-01
PU-244	4589.00	4591.42	4.996	1.000	0.520	0.480	0.6928	99.900	9.01E-03	5.01E-02	9.59E-02	2.20E-02	5.00E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
SAMPLE ID : R0405235015_PU
SAMPLE QTY : 0.509 G +/-0.196 %
SAMPLE DATE : 08-Dec-2015 00:00:00
ANALYST : JXH2
% YIELD : 97.3 +/-6.614 %

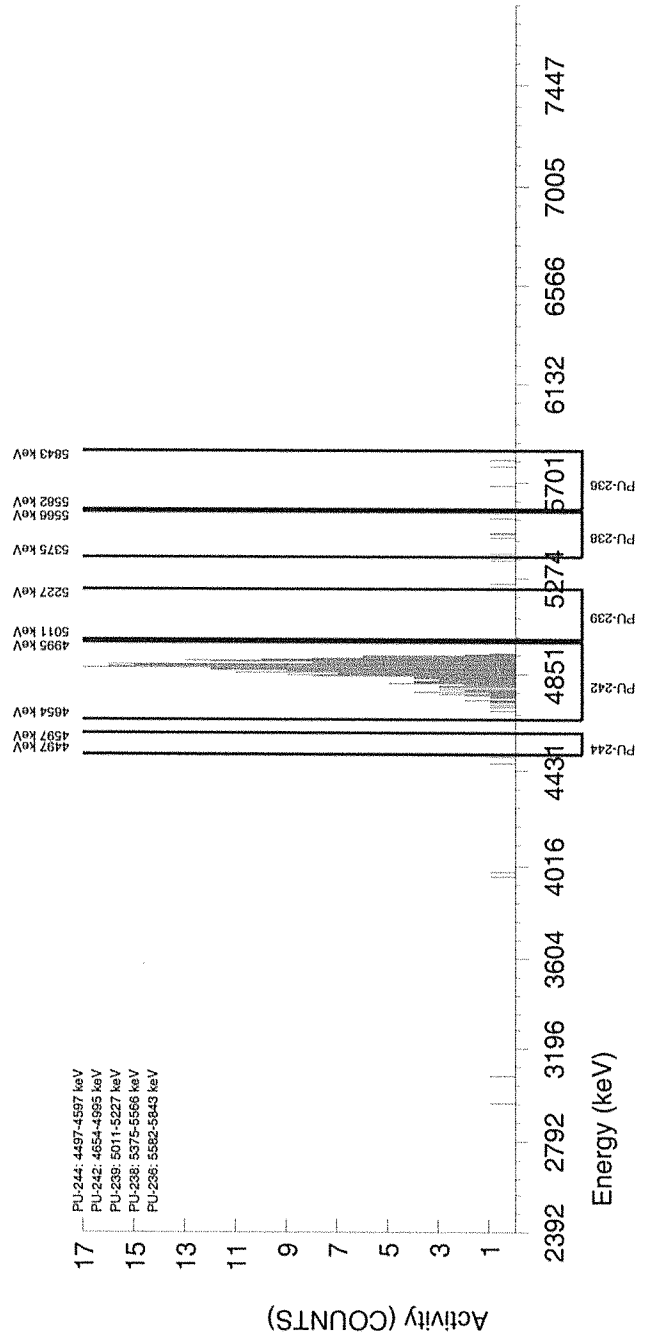
CHAMBER : 235
DETECTOR S/N : 87923
AVERAGE %EFFICIENCY : 24.7991
AVERAGE %EFF ERROR : 0.4811
COUNT DATE : 29-Sep-2016 09:44:15
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B235.CNF;455
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W235.CNF;118
CAL DATE : 19-Sep-2016

TRACER
ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 4.2643E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5750.94	109.512	3.000	1.800	1.200	1.0954	100.000	3.35E-02	7.62E-02	1.31E-01	3.73E-02	7.60E-02
PU-238	5486.00	5465.55	149.334	5.000	4.280	0.720	0.8485	99.900	6.59E-02	7.59E-02	9.41E-02	2.39E-02	7.53E-02
PU-239	5155.00	5118.70	0.000	0.000	-0.960	0.960	0.9788	99.900	-1.47E-02	3.41E-02	1.01E-01	2.75E-02	3.40E-02
PU-242	4890.00	4868.08	70.934	255.800	253.800	1.200	1.0954	100.000	3.88E+00	7.11E-01	1.07E-01	3.07E-02	4.80E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.240	0.240	0.4899	99.900	-3.67E-03	3.17E-02	7.34E-02	1.37E-02	3.17E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
 SAMPLE ID : R0405235016_PU
 SAMPLE QTY : 0.501 G +/-0.200 %
 SAMPLE DATE : 08-Dec-2015 00:00:00
 ANALYST : JXH2
 % YIELD : 98.0 +/-6.688 %

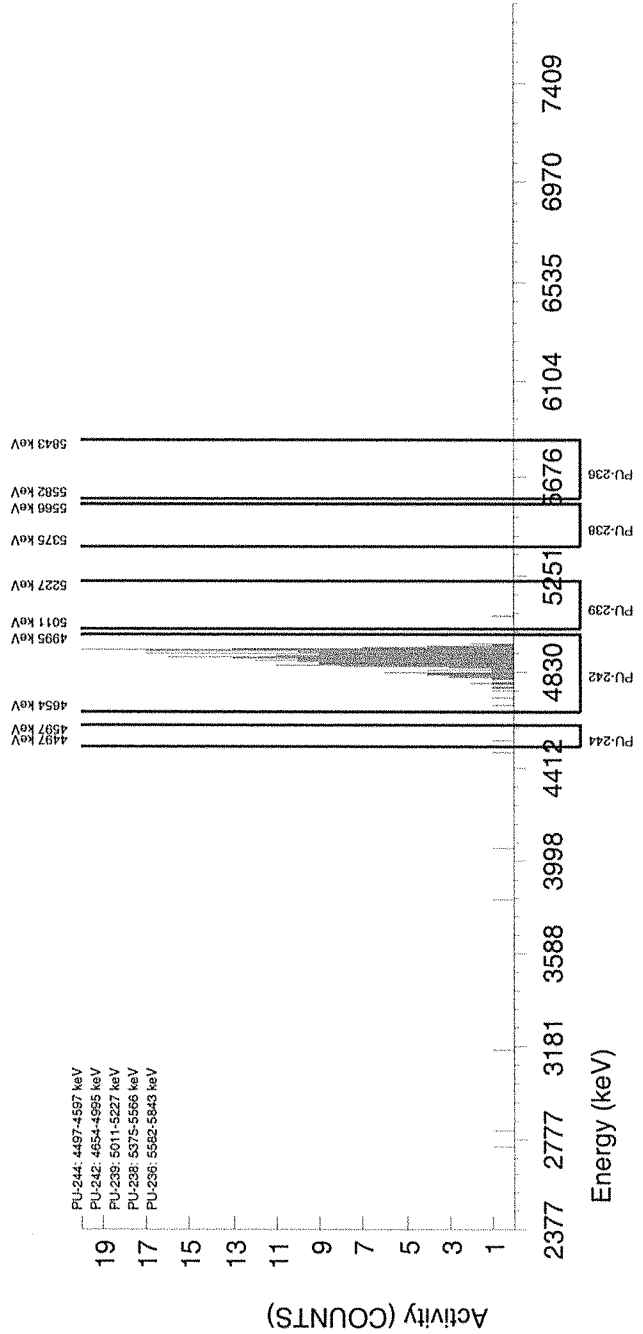
CHAMBER : 220
 DETECTOR S/N : 87908
 AVERAGE %EFFICIENCY : 24.0361
 AVERAGE %EFF ERROR : 0.4668
 COUNT DATE : 29-Sep-2016 09:23:45
 ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
 BKG FILE : B220.CNF;458
 BKG DATE : 23-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W220.CNF;142
 CAL DATE : 16-Sep-2016

TRACER ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 4.2956E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG S/DDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
PU-236	5749.00	5712.29	0.000	0.000	-0.720	0.720	0.8485	100.000	-1.39E-02	1.18E-01	3.01E-02	4.21E-02	4.21E-02
PU-238	5486.00	5470.36	0.000	0.000	-0.720	0.720	0.8485	99.900	-1.15E-02	9.79E-02	2.49E-02	3.48E-02	3.48E-02
PU-239	5155.00	5071.69	4.978	1.000	0.760	0.240	0.4899	99.900	1.21E-02	7.63E-02	1.43E-02	4.54E-02	4.54E-02
PU-242	4890.00	4882.99	73.840	249.000	247.800	1.200	1.0954	100.000	3.94E+00	1.12E-01	3.19E-02	4.93E-01	4.93E-01
PU-244	4589.00	4526.96	4.978	1.000	0.760	0.240	0.4899	99.900	1.21E-02	7.63E-02	1.43E-02	4.54E-02	4.54E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
 SAMPLE ID : R0405235017_PU
 SAMPLE QTY : 0.501 G +/-0.200 %
 SAMPLE DATE : 02-Dec-2015 00:00:00
 ANALYST : JXH2
 % YIELD : 75.8 +/-7.313 %

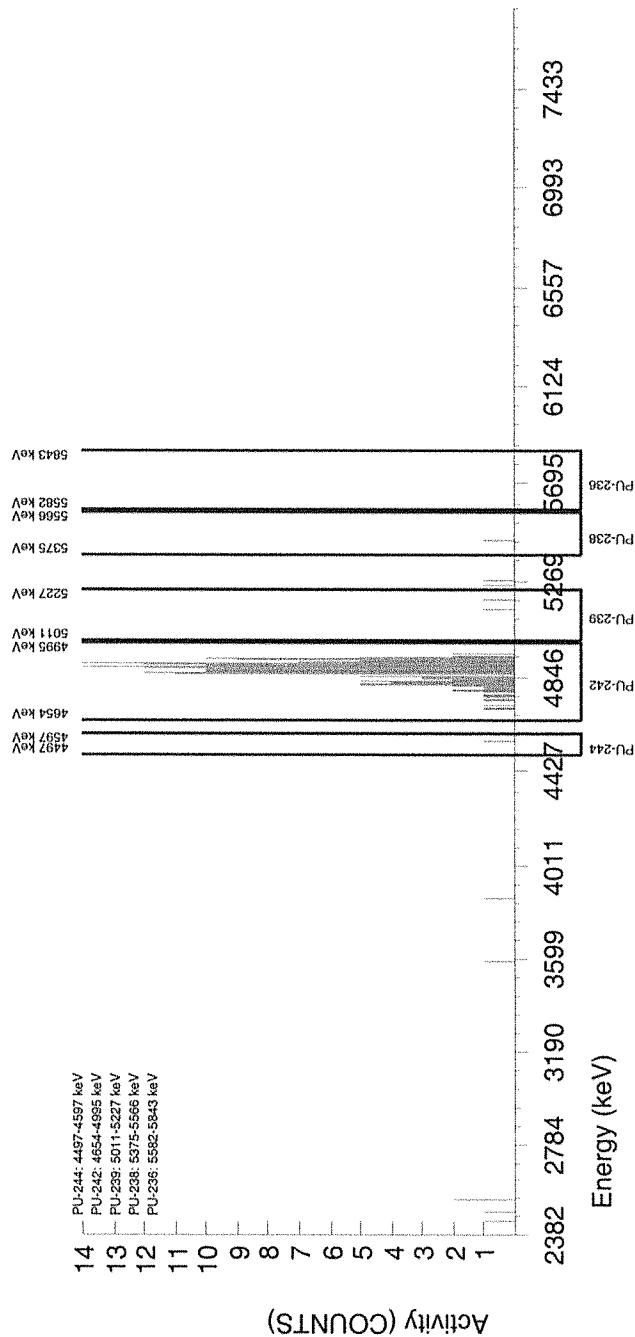
CHAMBER : 221
 DETECTOR S/N : 87909
 AVERAGE %EFFICIENCY : 25.5264
 AVERAGE %EFF ERROR : 0.4948
 COUNT DATE : 29-Sep-2016 09:23:48
 ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
 BKG FILE : B221.CNF;467
 BKG DATE : 23-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W221.CNF;128
 CAL DATE : 16-Sep-2016

TRACER
 ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.3221E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
PU-236	5749.00	5712.29	0.000	0.000	-0.720	0.720	0.8485	100.000	-1.70E-02	5.16E-02	1.45E-01	3.68E-02	5.15E-02
PU-238	5486.00	5444.18	5.006	1.000	0.520	0.480	0.6928	99.900	1.01E-02	5.64E-02	1.08E-01	2.48E-02	5.64E-02
PU-239	5155.00	5162.88	45.052	2.000	1.280	0.720	0.8485	99.900	2.48E-02	6.84E-02	1.18E-01	3.01E-02	6.89E-02
PU-242	4890.00	4871.18	69.899	204.000	203.520	0.480	0.6928	100.000	3.94E+00	7.98E-01	1.07E-01	2.46E-02	5.44E-01
PU-244	4589.00	4581.20	0.000	2.000	1.760	0.240	0.4899	99.900	3.41E-02	6.72E-02	9.29E-02	1.74E-02	6.71E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
SAMPLE ID : R0405235018_PU
SAMPLE QTY : 0.500 G +/-0.200 %
SAMPLE DATE : 02-Dec-2015 00:00:00
ANALYST : JXH2
% YIELD : 80.7 +/-7.090 %

CHAMBER : 223
DETECTOR S/N : 87911
AVERAGE %EFFICIENCY : 25.6333
AVERAGE %EFF ERROR : 0.4968
COUNT DATE : 29-Sep-2016 09:23:51
ELAPSED LIVE TIME(SEC) : 14400.00

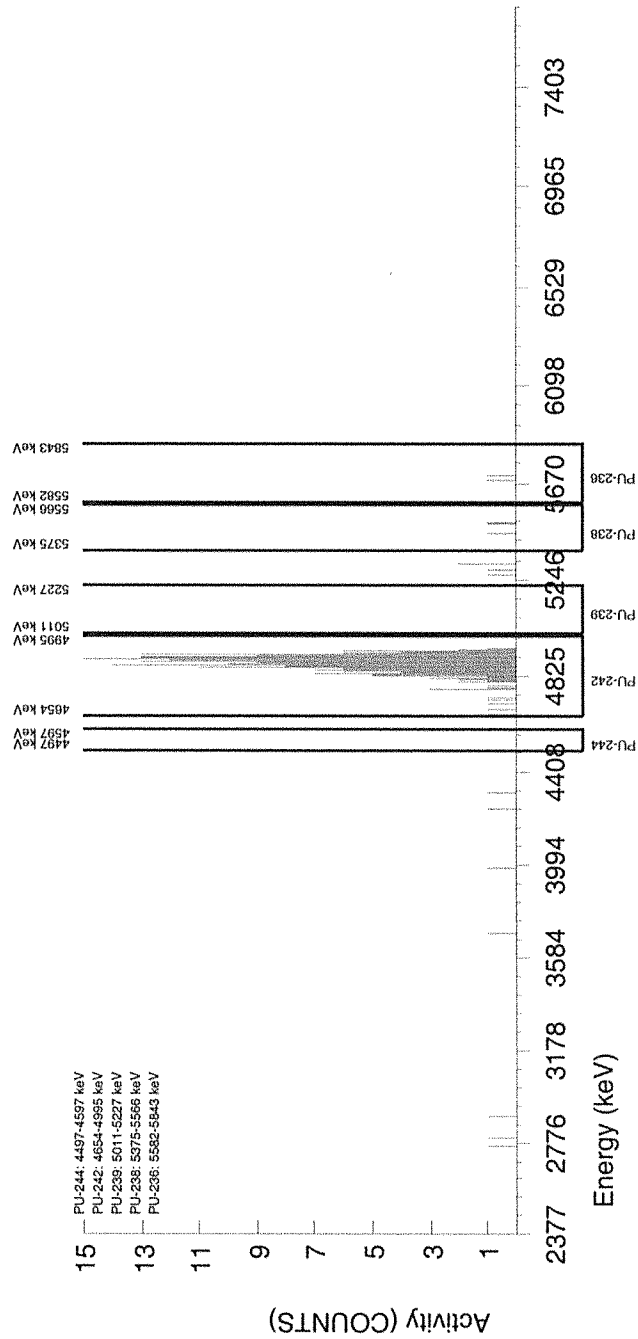
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BKG FILE : B223.CNF;460
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W223.CNF;114
CAL DATE : 16-Sep-2016

TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.5358E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SiDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5691.16	24.821	2.000	1.520	0.480	0.6928	100.000	3.37E-02	7.76E-02	1.23E-01	2.82E-02	7.75E-02
PU-238	5486.00	5476.68	49.642	3.000	1.560	1.440	1.2000	99.900	2.85E-02	7.53E-02	1.35E-01	4.02E-02	7.52E-02
PU-239	5155.00	5118.71	0.000	0.000	-0.240	0.240	0.4899	99.900	-4.36E-03	3.77E-02	8.71E-02	1.63E-02	3.76E-02
PU-242	4890.00	4875.08	61.981	218.000	217.520	0.480	0.6928	100.000	3.95E+00	7.75E-01	1.01E-01	2.30E-02	5.27E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.240	0.240	0.4899	99.900	-4.36E-03	3.77E-02	8.71E-02	1.63E-02	3.76E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
 SAMPLE ID : R0405235019_PU
 SAMPLE QTY : 0.506 G +/-0.198 %
 SAMPLE DATE : 08-Dec-2015 00:00:00
 ANALYST : JXH2
 % YIELD : 90.2 +/-6.738 %

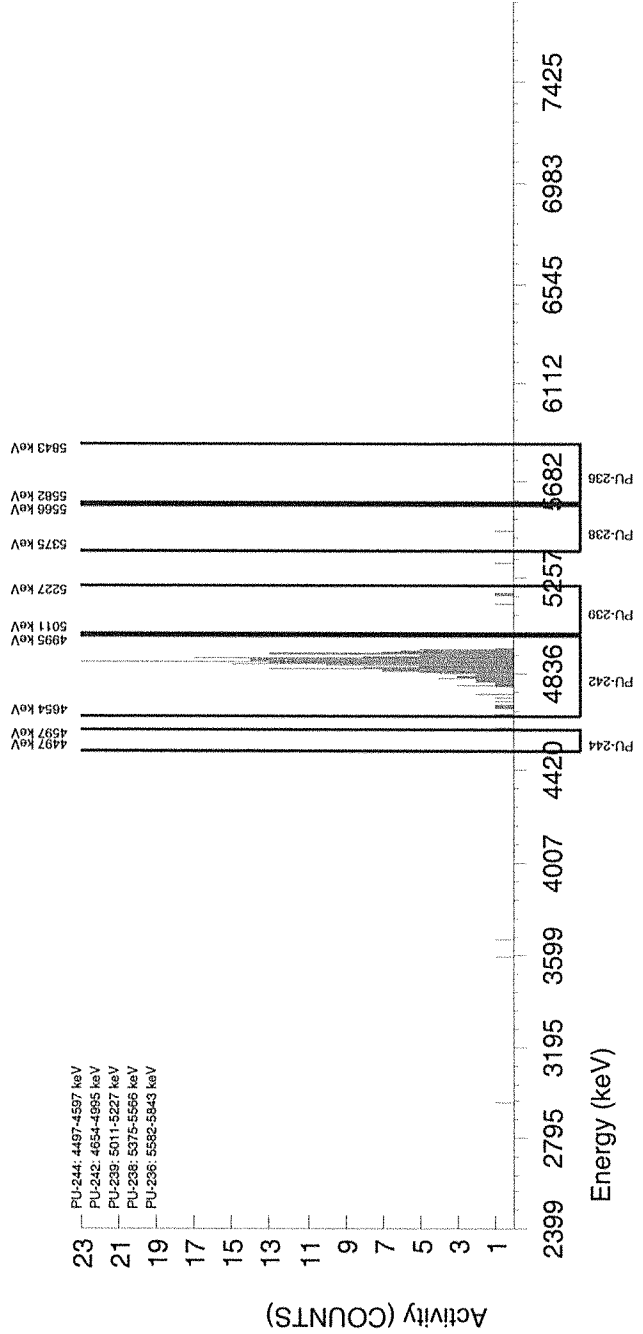
CHAMBER : 224
 DETECTOR S/N : 87912
 AVERAGE %EFFICIENCY : 25.7363
 AVERAGE %EFF ERROR : 0.4987
 COUNT DATE : 29-Sep-2016 09:23:52
 ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
 BKG FILE : B224.CNF;471
 BKG DATE : 23-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W224.CNF;150
 CAL DATE : 16-Sep-2016

TRACER ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.9555E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc
PU-236	5749.00	5712.26	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	3.93E-02	5.83E-02	0.00E+00	3.92E-02
PU-238	5486.00	5458.69	4.920	1.000	-0.440	1.440	1.2000	99.900	-7.08E-03	4.89E-02	1.19E-01	3.54E-02	4.89E-02
PU-239	5155.00	5183.32	0.000	5.000	4.280	0.720	0.8485	99.900	6.84E-02	7.88E-02	9.77E-02	2.48E-02	7.82E-02
PU-242	4890.00	4876.19	66.419	246.000	244.320	1.680	1.2961	100.000	3.90E+00	7.28E-01	1.24E-01	3.79E-02	4.92E-01
PU-244	4589.00	4546.97	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	3.23E-02	4.80E-02	0.00E+00	3.22E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
SAMPLE ID : R0405235020_PU
SAMPLE QTY : 0.502 G +/-0.199 %
SAMPLE DATE : 08-Dec-2015 00:00:00
ANALYST : JXH2
% YIELD : 74.0 +/-7.240 %

CHAMBER : 226
DETECTOR S/N : 87914
AVERAGE %EFFICIENCY : 26.8347
AVERAGE %EFF ERROR : 0.5195
COUNT DATE : 29-Sep-2016 09:23:54
ELAPSED LIVE TIME(SEC) : 14400.00

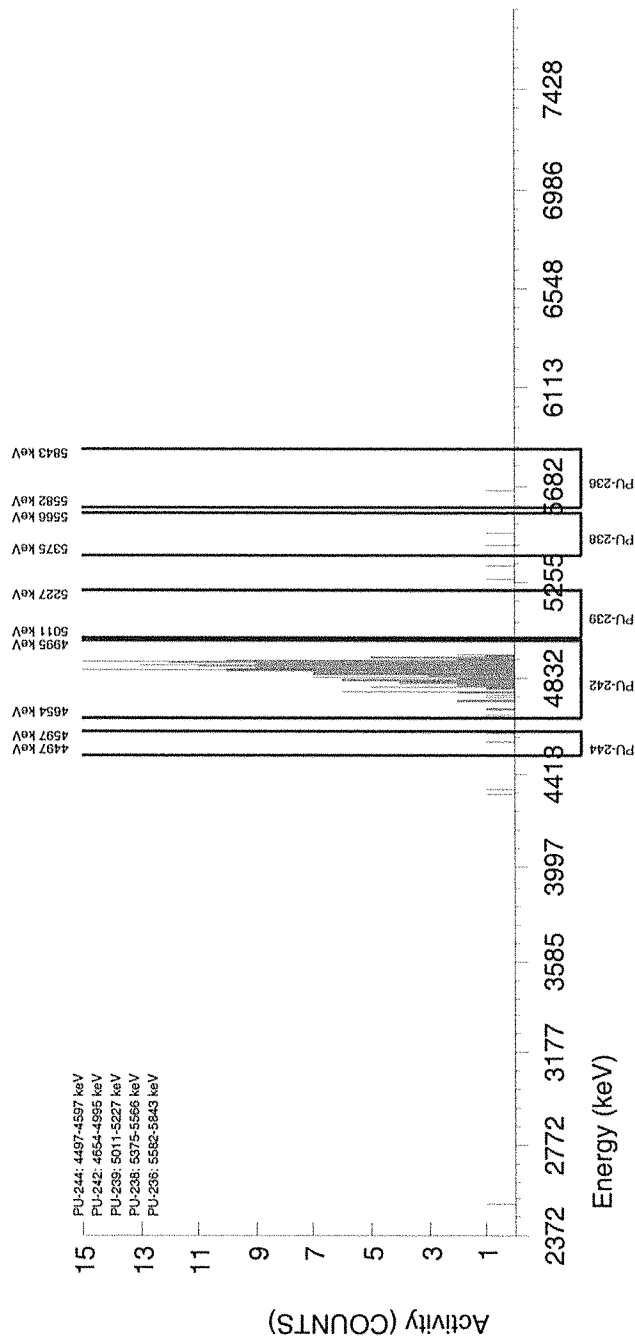
LIB FILE : PU
BKG FILE : B226.CNF;460
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W226.CNF;122
CAL DATE : 16-Sep-2016

TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.2421E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	Lc pCi/G	MDA pCi/G	cnt Unc pCi/G
PU-236	5749.00	5661.00	4.984	1.000	1.000	0.000	0.0000	100.000	2.29E-02	6.46E-02	6.88E-02	0.00E+00	6.45E-02
PU-238	5486.00	5447.11	54.821	1.280	1.280	0.8485	0.8485	99.900	2.43E-02	6.69E-02	1.16E-01	2.95E-02	6.68E-02
PU-239	5155.00	5118.70	0.000	-1.440	1.440	1.2000	1.2000	99.900	-2.72E-02	4.39E-02	1.39E-01	4.14E-02	4.38E-02
PU-242	4890.00	4861.53	50.564	208.800	208.800	1.200	1.0954	100.000	3.93E+00	7.89E-01	1.32E-01	3.78E-02	5.37E-01
PU-244	4589.00	4535.50	0.000	3.760	3.760	0.240	0.4899	99.900	7.09E-02	8.42E-02	9.04E-02	1.69E-02	8.36E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
SAMPLE ID : R1203621703_PU
SAMPLE QTY : 0.509 G +/-0.196 %
SAMPLE DATE : 26-Sep-2016 00:00:00
ANALYST : JXH2
% YIELD : 91.8 +/-6.608 %

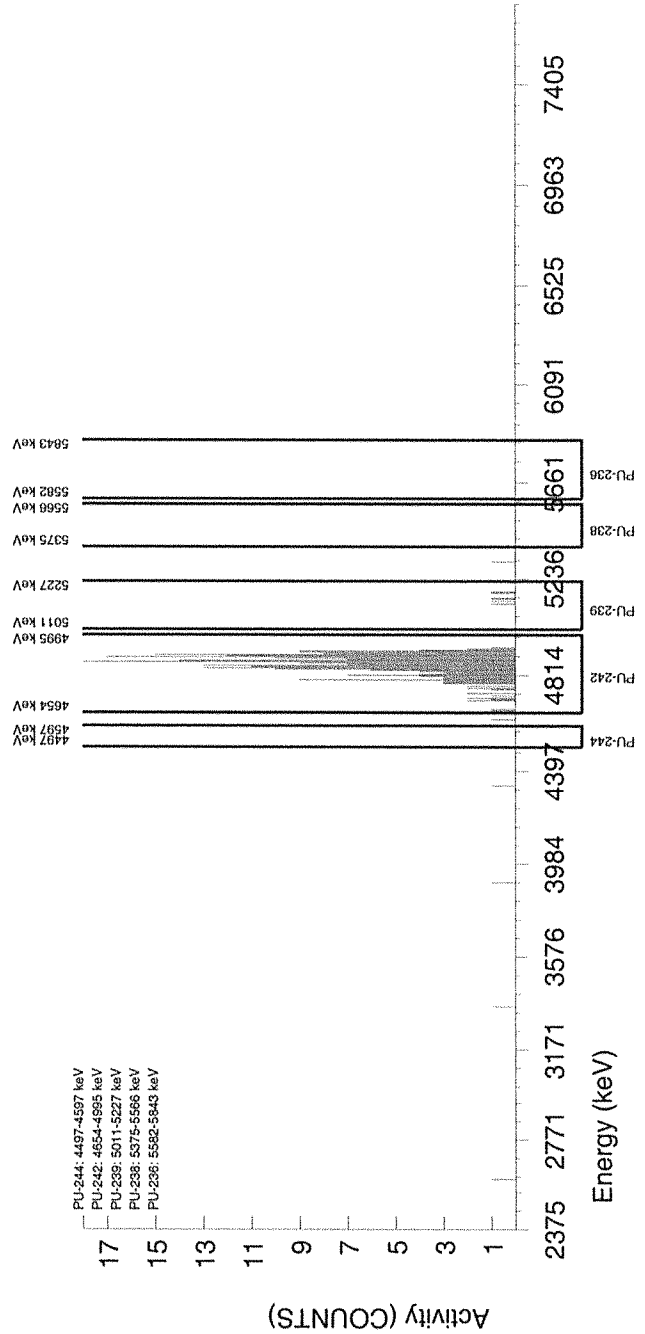
CHAMBER : 227
DETECTOR S/N : 87915
AVERAGE %EFFICIENCY : 26.3665
AVERAGE %EFF ERROR : 0.5107
COUNT DATE : 29-Sep-2016 09:24:00
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B227.CNF;459
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W227.CNF;120
CAL DATE : 16-Sep-2016

TRACER
ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 4.0228E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	4.58E-02	0.00E+00	3.09E-02	3.08E-02
PU-238	5486.00	5470.35	0.000	-1.200	1.200	1.0954	99.900	99.900	-1.83E-02	1.07E-01	3.06E-02	3.47E-02	3.47E-02
PU-239	5155.00	5151.00	54.147	3.840	2.160	1.4697	99.900	99.900	5.86E-02	1.28E-01	4.11E-02	8.27E-02	8.23E-02
PU-242	4890.00	4857.07	64.520	254.560	1.440	1.2000	100.000	100.000	3.88E+00	1.15E-01	3.35E-02	7.10E-01	4.79E-01
PU-244	4589.00	4546.97	0.000	-0.240	0.240	0.4899	99.900	99.900	-3.66E-03	7.31E-02	1.37E-02	3.16E-02	3.16E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
SAMPLE ID : R1203621704_PU
SAMPLE QTY : 0.500 G +/-0.200 %
SAMPLE DATE : 10-Dec-2015 00:00:00
ANALYST : JXH2
% YIELD : 56.0 +/-8.523 %

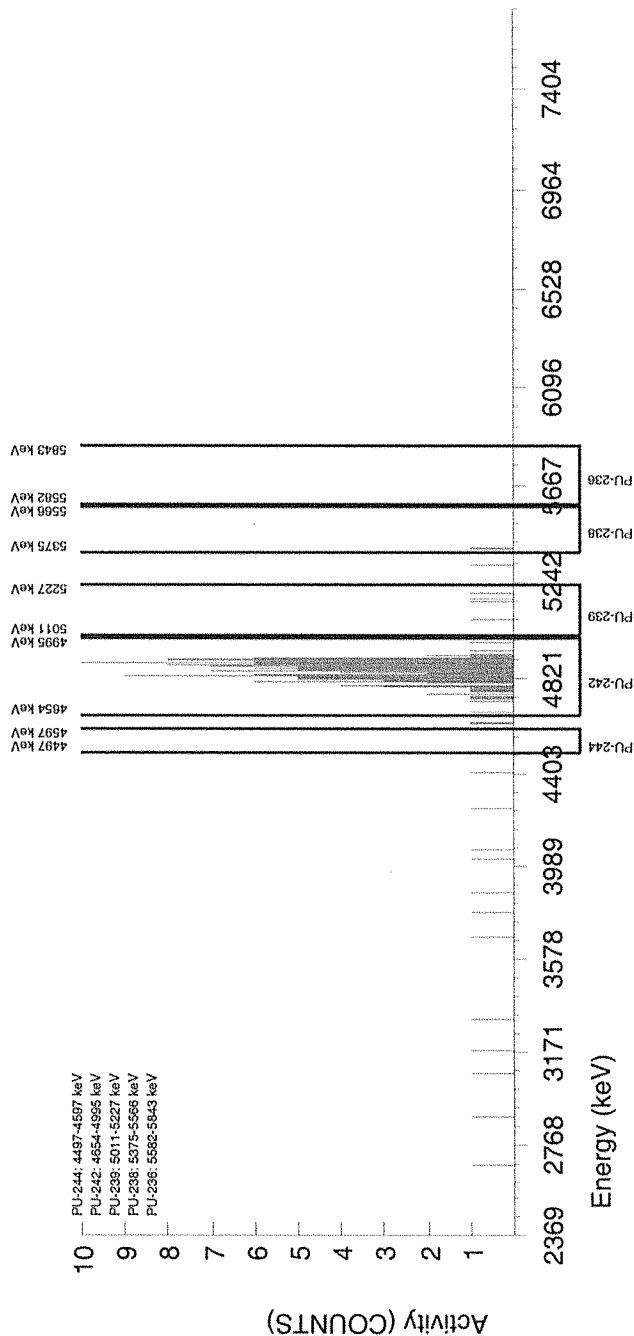
CHAMBER : 228
DETECTOR S/N : 87916
AVERAGE %EFFICIENCY : 25.5769
AVERAGE %EFF ERROR : 0.4958
COUNT DATE : 29-Sep-2016 09:23:57
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B228.CNF;457
BKG DATE : 23-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W228.CNF;117
CAL DATE : 16-Sep-2016

TRACER
ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 2.4540E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG S/D	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
PU-236	5749.00	5712.28	0.000	0.000	-1.200	1.200	1.0954	100.000	-3.82E-02	2.24E-01	6.40E-02	7.27E-02	7.25E-02
PU-238	5486.00	5387.67	9.940	2.000	1.280	0.720	0.8485	99.900	3.38E-02	1.61E-01	4.10E-02	9.32E-02	9.30E-02
PU-239	5155.00	5149.45	114.305	4.000	1.840	2.160	1.4697	99.900	4.83E-02	2.20E-01	7.06E-02	1.22E-01	1.21E-01
PU-242	4890.00	4853.01	101.632	154.000	150.640	3.360	1.8330	100.000	3.95E+00	9.32E-01	8.80E-02	9.32E-01	6.41E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.720	0.720	0.8485	99.900	-1.89E-02	1.60E-01	4.08E-02	5.72E-02	5.70E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596394
 SAMPLE ID : R1203621705_PU
 SAMPLE QTY : 0.509 G +/-0.196 %
 SAMPLE DATE : 26-Sep-2016 00:00:00
 ANALYST : JXH2
 % YIELD : 55.5 +/-8.584 %

CHAMBER : 234
 DETECTOR S/N : 87922
 AVERAGE %EFFICIENCY : 24.8037
 AVERAGE %EFF ERROR : 0.4811
 COUNT DATE : 29-Sep-2016 09:24:05
 ELAPSED LIVE TIME(SEC) : 14400.00

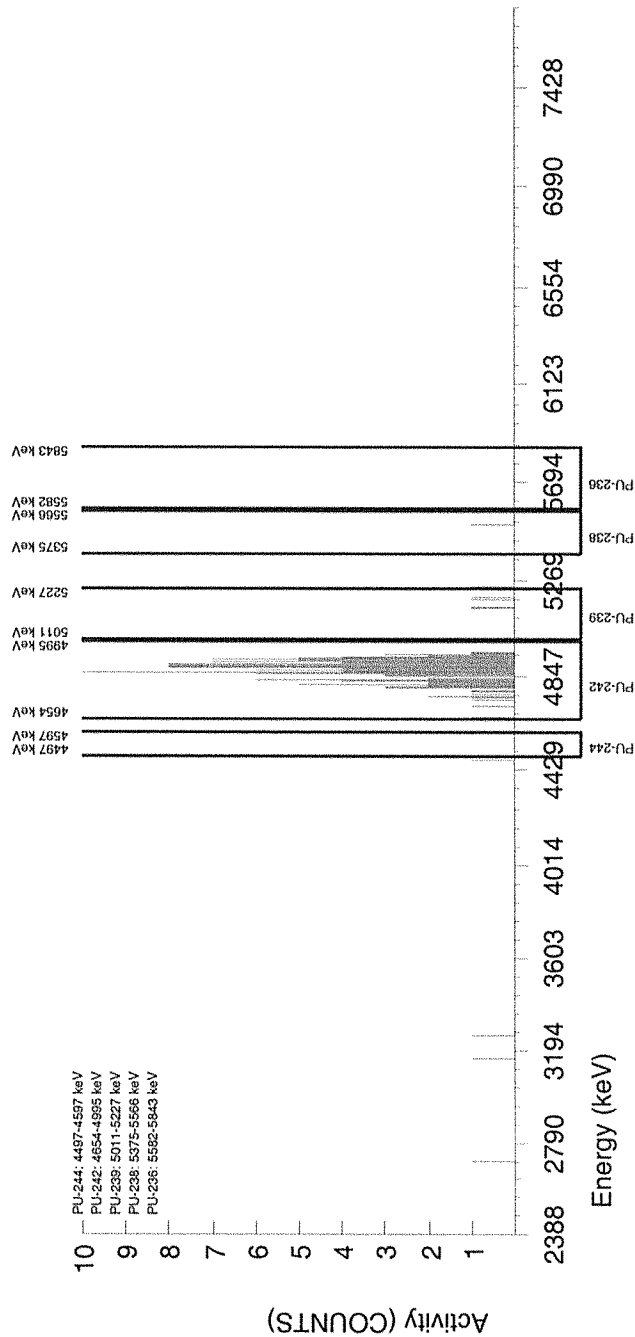
LIB FILE : PU
 BKG FILE : B234.CNF;454
 BKG DATE : 23-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W234.CNF;117
 CAL DATE : 19-Sep-2016

TRACER ID : 1770-A
 NUCLEIDE ID : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 2.4318E+00 dpm

NUCLEIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc
PU-236	5749.00	5712.30	0.000	0.000	-0.480	0.480	0.6928	100.000	-1.29E-02	5.72E-02	1.49E-01	3.41E-02	5.70E-02
PU-238	5486.00	5507.77	4.996	1.000	-0.440	1.440	1.2000	99.900	-1.18E-02	8.16E-02	1.98E-01	5.90E-02	8.15E-02
PU-239	5155.00	5164.67	49.963	4.000	2.080	1.920	1.3856	99.900	5.58E-02	1.24E-01	2.17E-01	6.81E-02	1.23E-01
PU-242	4890.00	4864.06	92.432	145.000	144.760	0.240	0.4899	100.000	3.88E+00	9.22E-01	1.28E-01	2.40E-02	6.35E-01
PU-244	4589.00	4546.98	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	5.49E-02	8.05E-02	0.00E+00	5.41E-02

NUCLEIDE ACTIVITY SUMMARY

NUCLEIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc
PU-236	5749.00	5712.30	0.000	0.000	-0.480	0.480	0.6928	100.000	-1.29E-02	5.72E-02	1.49E-01	3.41E-02	5.70E-02
PU-238	5486.00	5507.77	4.996	1.000	-0.440	1.440	1.2000	99.900	-1.18E-02	8.16E-02	1.98E-01	5.90E-02	8.15E-02
PU-239	5155.00	5164.67	49.963	4.000	2.080	1.920	1.3856	99.900	5.58E-02	1.24E-01	2.17E-01	6.81E-02	1.23E-01
PU-242	4890.00	4864.06	92.432	145.000	144.760	0.240	0.4899	100.000	3.88E+00	9.22E-01	1.28E-01	2.40E-02	6.35E-01
PU-244	4589.00	4546.98	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	5.49E-02	8.05E-02	0.00E+00	5.41E-02



27-Sep-2016

Batch# 1598092 Product: H3 Date: 9/27/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			NA
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	see DER 1561594
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER 1561594
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER 1561594
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By:

[Signature]
9/27/16

MSK
10/4

Secondary Review Performed By:

DATA EXCEPTION REPORT

Mo.Day Yr. 27-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LSC	Test / Method: EPA 906.0 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1598092	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060, 1203626145, and 1203626146 were received and analyzed out of the method specified hold time.</p>		<p>1. Reporting results.</p>	

Originator's Name:

Elizabeth Krouse 27-SEP-16

Data Validator/Group Leader:

Lyndsey Pace 27-SEP-16

MJWC 10/4/16 6090

Prep Logbook

The Determination of Tritium

Batch ID: 1598092
Analyst: Terry Phillips
Method: EPA 906.0 Modified
Lab SOP: GL-RAD-A-002 REV# 21
Instrument: LSC-J93763

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
LCS	1203626147	Tritium SPIKE	1753-B	.1	mL
MS	1203626146	Tritium SPIKE	1753-B	.1	mL

Sample ID	Prep Date	Matrix	Dry or Wet	Unadjusted Aliquot (g)	Aliquot (g)	Rig #	Volume Added (mL)	Aliquot in vial (mL)
405235041	23-SEP-2016 10:44:31	Soil	W	3.36	2.958	15	50	10
405235042	23-SEP-2016 10:44:31	Soil	W	3.42	3.045	20	50	10
405235043	23-SEP-2016 10:44:31	Soil	W	3.43	2.931	24	50	10
405235044	23-SEP-2016 10:44:31	Soil	W	3.35	2.52	27	50	10
405235045	23-SEP-2016 10:44:31	Soil	W	3.34	2.593	29	50	10
405235046	23-SEP-2016 10:44:31	Soil	W	3.47	2.823	33	50	10
405235047	23-SEP-2016 10:44:31	Soil	W	3.27	2.593	36	50	10
405235048	23-SEP-2016 10:44:31	Soil	W	3.31	2.553	37	50	10
405235049	23-SEP-2016 10:44:31	Soil	W	3.3	2.68	38	50	10
405235050	23-SEP-2016 10:44:31	Soil	W	3.38	3.007	40	50	10
405235051	23-SEP-2016 10:44:31	Soil	W	3.41	2.808	43	50	10
405235052	23-SEP-2016 10:44:31	Soil	W	3.4	2.874	44	50	10
405235053	23-SEP-2016 10:44:31	Soil	W	3.3	2.298	46	50	10
405235054	23-SEP-2016 10:44:31	Soil	W	3.39	2.773	49	50	10
405235055	23-SEP-2016 10:44:31	Soil	W	3.3	2.663	51	50	10
405235056	23-SEP-2016 10:44:31	Soil	W	3.37	2.297	57	50	10
405235057	23-SEP-2016 10:44:31	Soil	W	3.38	2.463	60	50	10
405235058	23-SEP-2016 10:44:31	Soil	W	3.3	2.646	65	50	10
405235059	23-SEP-2016 10:44:31	Soil	W	3.28	2.886	66	50	10
405235060	23-SEP-2016 10:44:31	Soil	W	3.3	2.982	67	50	10
1203626144 MB					3.045	69	50	10
1203626145 DUP (405235041)					2.958	70	50	10
1203626146 MS (405235041)					2.905	71	50	10
1203626147 LCS					3.045	82	50	10

Comments:
 Spike Pipet ID: RAD-LSC-2970968
 Vial Pipet ID: RAD-LSC-8036326
 Bkg prepared with dead water: Yes

Reagent/Solvent Lot ID	Description	Amount
2352257.5	Eoscient Ultra Scintillation Solution	13 mL
2373671	Sodium Hydroxide, Pellet.ACS	2 g
2418926	Quenching Agent	20 uL
2447042.3	Eoscient Ultra Scintillation Solution	13 mL
2457153	RL-Potassium Permanganate	2 mL

Tritium Solid

Filename : H3DST.XLS
 File type : Excel
 Version # : 1.2.13

Batch : 1598092
 Analyst : TER02081
 Prep Date : 9/23/2016
 Method Uncertainty : 0

Procedure Code : LSCDSH3DS
 Parmname : Tritium
 Required MDA : 6 pCi/G
 H-3 Abundance : 1.00
 Half-life of Tritium : 12.32 years

Geometry: 10mL DW/13mL Ecoscint Ultra

Pos.	Sample ID	Total Sample Volume (L)	Sample Aliquot G	Sample Aliquot StDev. G	Distilled Sample Counted L	Sample Counted StDev. L	Rig number	Sample Date/Time
1	405235041.1	0.0500	2.9580	3.5261E-03	0.0100	1.0000E-05	15	11/30/2015 13:27
2	405235042.1	0.0500	3.0450	3.5351E-03	0.0100	1.0000E-05	20	11/30/2015 13:53
3	405235043.1	0.0500	2.9310	3.5233E-03	0.0100	1.0000E-05	24	11/30/2015 13:59
4	405235044.1	0.0500	2.5200	3.4809E-03	0.0100	1.0000E-05	27	11/30/2015 13:50
5	405235045.1	0.0500	2.5930	3.4885E-03	0.0100	1.0000E-05	29	11/30/2015 14:15
6	405235046.1	0.0500	2.8230	3.5122E-03	0.0100	1.0000E-05	33	12/7/2015 10:02
7	405235047.1	0.0500	2.5930	3.4885E-03	0.0100	1.0000E-05	36	12/7/2015 10:10
8	405235048.1	0.0500	2.5530	3.4843E-03	0.0100	1.0000E-05	37	12/7/2015 13:28
9	405235049.1	0.0500	2.6800	3.4974E-03	0.0100	1.0000E-05	38	12/7/2015 13:33
10	405235050.1	0.0500	3.0070	3.5312E-03	0.0100	1.0000E-05	40	12/7/2015 13:42
11	405235051.1	0.0500	2.8080	3.5107E-03	0.0100	1.0000E-05	43	12/7/2015 13:02
12	405235052.1	0.0500	2.8740	3.5175E-03	0.0100	1.0000E-05	44	12/7/2015 13:11
13	405235053.1	0.0500	2.2980	3.4580E-03	0.0100	1.0000E-05	46	12/1/2015 14:24
14	405235054.1	0.0500	2.7730	3.5070E-03	0.0100	1.0000E-05	49	12/2/2015 14:51
15	405235055.1	0.0500	2.6630	3.4957E-03	0.0100	1.0000E-05	51	12/2/2015 14:59
16	405235056.1	0.0500	2.2970	3.4579E-03	0.0100	1.0000E-05	57	12/2/2015 14:50
17	405235057.1	0.0500	2.4630	3.4750E-03	0.0100	1.0000E-05	60	12/2/2015 14:55
18	405235058.1	0.0500	2.6460	3.4939E-03	0.0100	1.0000E-05	65	12/2/2015 15:00
19	405235059.1	0.0500	2.8660	3.5187E-03	0.0100	1.0000E-05	66	12/16/2015 12:26
20	405235060.1	0.0500	2.9820	3.5286E-03	0.0100	1.0000E-05	67	12/16/2015 12:33
21	1203626144.1	0.0500	3.0450	3.5351E-03	0.0100	1.0000E-05	69	9/23/2016 0:00
22	1203626145.1	0.0500	2.9580	3.5261E-03	0.0100	1.0000E-05	70	11/30/2015 13:27
23	1203626146.1	0.0500	2.9050	3.5207E-03	0.0100	1.0000E-05	71	11/30/2015 13:27
24	1203626147.1	0.0500	3.0450	3.5351E-03	0.0100	1.0000E-05	82	9/23/2016 0:00

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1.0 ml Stdev : +/- 0.002000 ml
 Pipet, 5.0 ml Stdev : +/- 0.010000 ml

Analytical SOP: GL-RAD-A-002
 Instrument SOP: GL-RAD-I-004

Pos.	Counting				Gross cpm	Bkg cpm	Bkg Count Time (min.)	Bkg Quench#	Corrected Bkg cpm	Count Start Date/Time	Sample Decay	Calibration Data				Detector Efficiency (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Background Count Start Date/Time
	Rack Position #	Time (min.)	Quench#	Count (min.)								Counted on	Calibration Date	Due Date	Background Rack Position #			
1	32-2	100	162.9	100	4.28	3.95	100	163	3.9469	9/23/2016 21:31	0.955	LSCBROWN	7/1/2016	6/30/2017	0.1902	0.00792	9/23/2016 19:47	
2	32-3	100	160.4	100	3.85	3.95	100	163	3.8665	9/23/2016 23:14	0.955	LSCBROWN	7/1/2016	6/30/2017	0.1953	0.00792	9/23/2016 19:47	
3	44-1	100	162.3	100	4.06	3.95	100	163	3.9281	9/24/2016 2:09	0.955	LSCBROWN	7/1/2016	6/30/2017	0.1914	0.00792	9/23/2016 19:47	
4	44-2	100	163.6	100	4.02	3.95	100	163	3.9684	9/24/2016 3:52	0.955	LSCBROWN	7/1/2016	6/30/2017	0.1888	0.00792	9/23/2016 19:47	
5	44-3	100	161.3	100	3.69	3.95	100	163	3.8961	9/24/2016 5:36	0.955	LSCBROWN	7/1/2016	6/30/2017	0.1935	0.00792	9/23/2016 19:47	
6	44-4	100	162.5	100	4.23	3.95	100	163	3.9344	9/24/2016 7:19	0.956	LSCBROWN	7/1/2016	6/30/2017	0.1910	0.00792	9/23/2016 19:47	
7	44-5	100	162.3	100	3.84	3.95	100	163	3.9281	9/24/2016 9:03	0.956	LSCBROWN	7/1/2016	6/30/2017	0.1914	0.00792	9/23/2016 19:47	
8	44-6	100	161.3	100	3.81	3.95	100	163	3.8961	9/24/2016 10:46	0.956	LSCBROWN	7/1/2016	6/30/2017	0.1935	0.00792	9/23/2016 19:47	
9	44-7	100	163.6	100	3.85	3.95	100	163	3.9684	9/24/2016 12:30	0.956	LSCBROWN	7/1/2016	6/30/2017	0.1888	0.00792	9/23/2016 19:47	
10	44-8	100	161.2	100	3.46	3.95	100	163	3.8928	9/24/2016 14:14	0.956	LSCBROWN	7/1/2016	6/30/2017	0.1937	0.00792	9/23/2016 19:47	
11	44-9	100	163.9	100	3.87	3.95	100	163	3.9775	9/24/2016 15:57	0.956	LSCBROWN	7/1/2016	6/30/2017	0.1882	0.00792	9/23/2016 19:47	
12	44-10	100	162.7	100	4.2	3.95	100	163	3.9407	9/24/2016 17:41	0.956	LSCBROWN	7/1/2016	6/30/2017	0.1906	0.00792	9/23/2016 19:47	
13	44-11	100	170.7	100	3.99	3.95	100	163	4.1639	9/24/2016 19:24	0.955	LSCBROWN	7/1/2016	6/30/2017	0.1749	0.00792	9/23/2016 19:47	
14	44-12	100	163.6	100	4.12	3.95	100	163	3.9684	9/24/2016 21:08	0.955	LSCBROWN	7/1/2016	6/30/2017	0.1888	0.00792	9/23/2016 19:47	
15	44-1	100	162.4	100	4.05	3.95	100	163	3.9313	9/24/2016 22:52	0.955	LSCBROWN	7/1/2016	6/30/2017	0.1912	0.00792	9/23/2016 19:47	
16	44-2	100	162.8	100	3.45	3.95	100	163	3.9438	9/25/2016 0:35	0.955	LSCBROWN	7/1/2016	6/30/2017	0.1904	0.00792	9/23/2016 19:47	
17	44-3	100	163.2	100	3.92	3.95	100	163	3.9562	9/25/2016 2:19	0.955	LSCBROWN	7/1/2016	6/30/2017	0.1896	0.00792	9/23/2016 19:47	
18	44-4	100	167.6	100	4.26	3.95	100	163	4.0836	9/25/2016 6:47	0.955	LSCBROWN	7/1/2016	6/30/2017	0.1809	0.00792	9/23/2016 19:47	
19	44-2	180	205	180	3.77	3.46	180	165.8	4.0257	9/26/2016 9:50	0.957	LSCBROWN	7/1/2016	6/30/2017	0.1174	0.00792	9/26/2016 6:40	
20	44-6	100	162.5	100	3.43	3.95	100	163	3.9344	9/25/2016 10:17	0.957	LSCBROWN	7/1/2016	6/30/2017	0.1910	0.00792	9/23/2016 19:47	
21	44-7	100	163.1	100	4.04	3.95	100	163	3.9531	9/25/2016 12:01	1.000	LSCBROWN	7/1/2016	6/30/2017	0.1888	0.00792	9/23/2016 19:47	
22	44-8	100	162.7	100	4.03	3.95	100	163	3.9407	9/25/2016 13:44	0.955	LSCBROWN	7/1/2016	6/30/2017	0.1906	0.00792	9/23/2016 19:47	
23	44-9	100	162.9	100	12.23	3.95	100	163	3.9469	9/25/2016 15:28	0.955	LSCBROWN	7/1/2016	6/30/2017	0.1902	0.00792	9/23/2016 19:47	
24	44-10	100	161.1	100	12.49	3.95	100	163	3.8896	9/25/2016 17:12	1.000	LSCBROWN	7/1/2016	6/30/2017	0.1939	0.00792	9/23/2016 19:47	

T1598092R

Notes:

- 1 - Results are decay corrected to Sample Date/Time
- 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
- 3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : 1753-B
 Spike Exp Date : 11/2/2016
 Spike Activity (dpm/ml): 2548.86
 Spike Volume Added: 0.10

* - RPD changed to 0% due to sample & dup activity below MDA

LCS S/N : 1753-B
 LCS Exp Date : 11/2/2016
 LCS Activity (dpm/ml): 2548.86
 LCS Volume Added: 0.10

Pos.	Decision Level		Critical Level	Required MDA	Sample Act. Conc.	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA Counting		2 SIGMA Total Prop.		Sample Type	Sample QC	RPD	RER	Nominal pCi/G	Recovery
	pCi/G	pCi/G							pCi/G	Uncertainty pCi/G	Uncertainty pCi/G							
1	2.7434	1.9368	6	3.9994	1.3959	86.11%	0.3331	0.2868	2.3559	2.3560	SAMPLE							
2	2.5690	1.8137	6	3.7464	-0.0656	1679.89%	-0.0165	0.2778	2.1587	2.1587	SAMPLE							
3	2.7446	1.9377	6	4.0015	0.5543	214.28%	0.1319	0.2826	2.3281	2.3281	SAMPLE							
4	3.2532	2.2968	6	4.7422	0.2555	548.14%	0.0516	0.2826	2.7455	2.7455	SAMPLE							
5	3.0573	2.1585	6	4.4580	-0.9687	133.65%	-0.2061	0.2754	2.5376	2.5376	SAMPLE							
6	2.8550	2.0157	6	4.1624	1.2912	96.67%	0.2956	0.2857	2.4464	2.4464	SAMPLE							
7	3.0992	2.1881	6	4.5186	-0.4181	316.35%	-0.0881	0.2787	2.5924	2.5924	SAMPLE							
8	3.1020	2.1900	6	4.5231	-0.4106	322.46%	-0.0861	0.2776	2.5949	2.5949	SAMPLE							
9	3.0559	2.1575	6	4.4546	-0.5514	236.09%	-0.1184	0.2796	2.5513	2.5513	SAMPLE							
10	2.6298	1.8567	6	3.8347	-1.7508	62.65%	-0.4328	0.2712	2.1498	2.1498	SAMPLE							
11	2.9293	2.0681	6	4.2700	-0.4794	260.49%	-0.1075	0.2801	2.4474	2.4474	SAMPLE							
12	2.8127	1.9858	6	4.1006	1.1151	110.02%	0.2593	0.2853	2.4046	2.4046	SAMPLE							
13	3.9444	2.7848	6	5.7456	-1.0201	164.21%	-0.1739	0.2856	3.2832	3.2832	SAMPLE							
14	2.9558	2.0868	6	4.3087	0.6825	187.65%	0.1516	0.2844	2.5100	2.5100	SAMPLE							
15	3.0247	2.1355	6	4.4098	0.5497	237.92%	0.1187	0.2825	2.5635	2.5635	SAMPLE							
16	3.5272	2.4902	6	5.1422	-2.6616	55.07%	-0.4938	0.2719	2.8727	2.8727	SAMPLE							
17	3.3087	2.3360	6	4.8234	-0.1826	775.70%	-0.0362	0.2806	2.7769	2.7769	SAMPLE							
18	3.2800	2.3157	6	4.7792	0.8688	163.78%	0.1764	0.2889	2.7888	2.7888	SAMPLE							
19	3.4235	2.4170	6	4.9498	-1.7761	81.41%	-0.2557	0.2081	2.8338	2.8338	SAMPLE							
20	2.6995	1.9059	6	3.9356	-2.0833	53.81%	-0.5044	0.2714	2.1968	2.1968	SAMPLE							
21	2.5537	1.8029	6	3.7228	0.3387	325.32%	0.0869	0.2827	2.1599	2.1599	SAMPLE							
22	2.7361	1.9317	6	3.9889	0.3737	316.03%	0.0893	0.2823	2.3146	2.3146	405235041.1	405235041.1	MB		0.0%	41.3756	85.4%	
23	2.7942	1.9727	6	4.0735	35.3548	4.92%	8.2831	0.4022	3.3648	3.4117	DUP						37.7056	87.0%
24	2.4801	1.7510	6	3.6165	32.8227	4.78%	8.6004	0.4047	3.0273	3.0722	MS							
											LCS							

1598092

ID: TRITIUM

23 SEP 2016 20:15

USER: 6

COMMENT: BROWN

PRESET TIME : 100.00

DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD

COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT

TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF

SCINTILLATOR: LIQUID LUMEX: YES LOW SAMPLE REJ: 0

LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

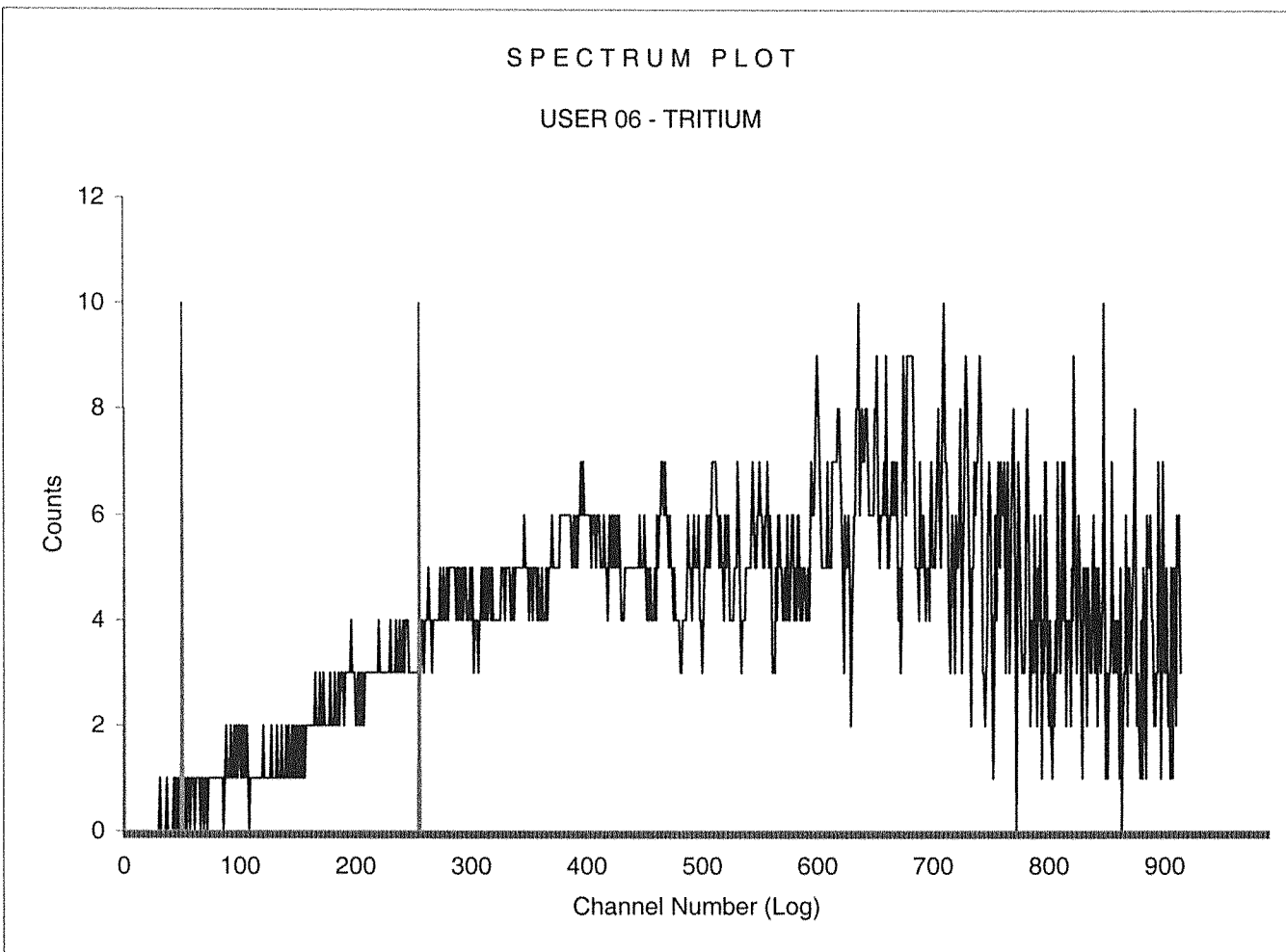
CHAN: 50.0 - 255.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

CHAN: 0.0 - 900.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

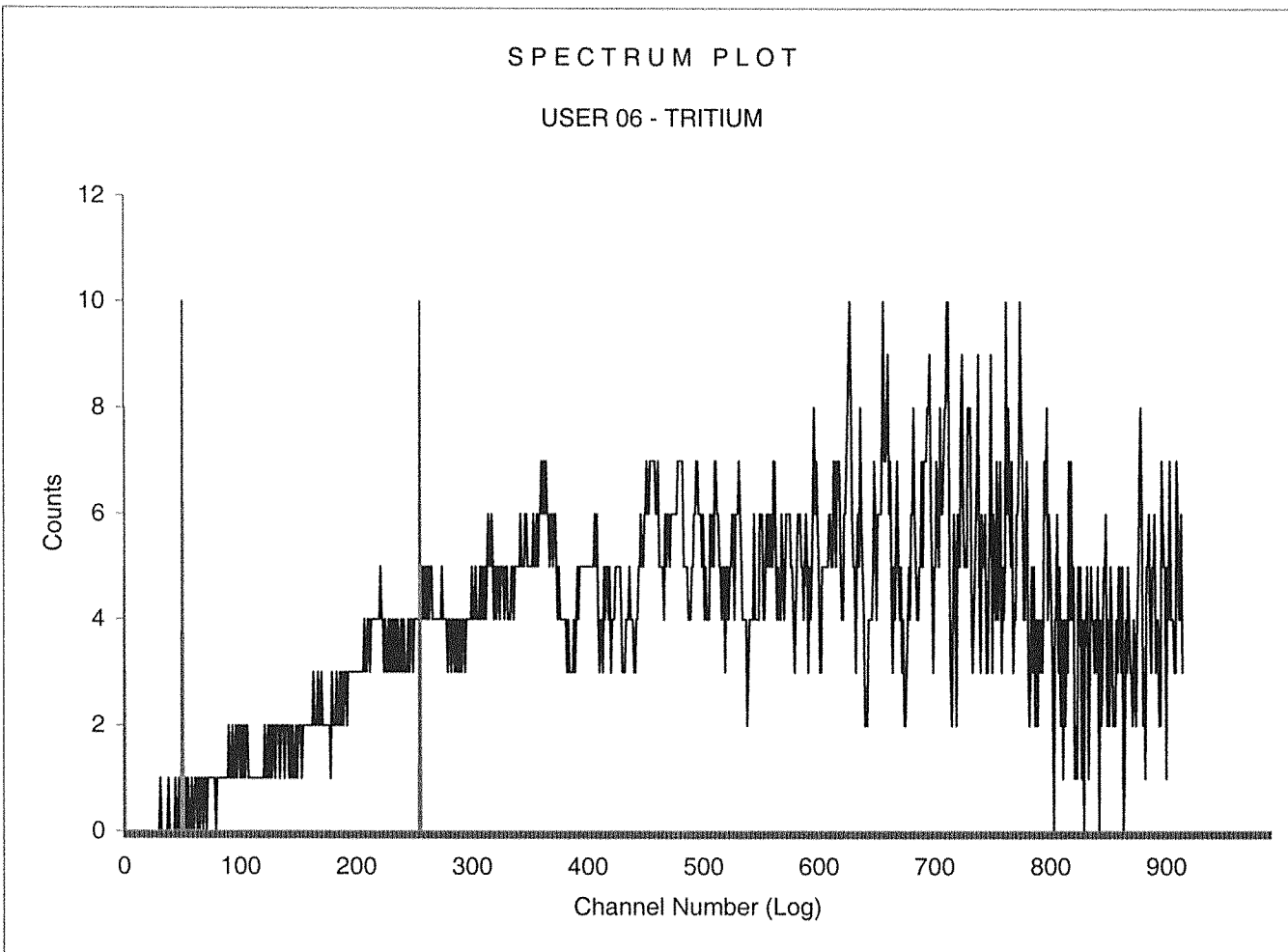
SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		
1	32-1	100.00	163.0	3.95	11.21	36.52	3.35	2.18	103.13
2	32-2	100.00	162.9	4.28	10.42	35.73	3.38	1.68	206.66
3	32-3	100.00	160.4	3.85	11.08	34.98	3.42	1.69	310.17

Bl

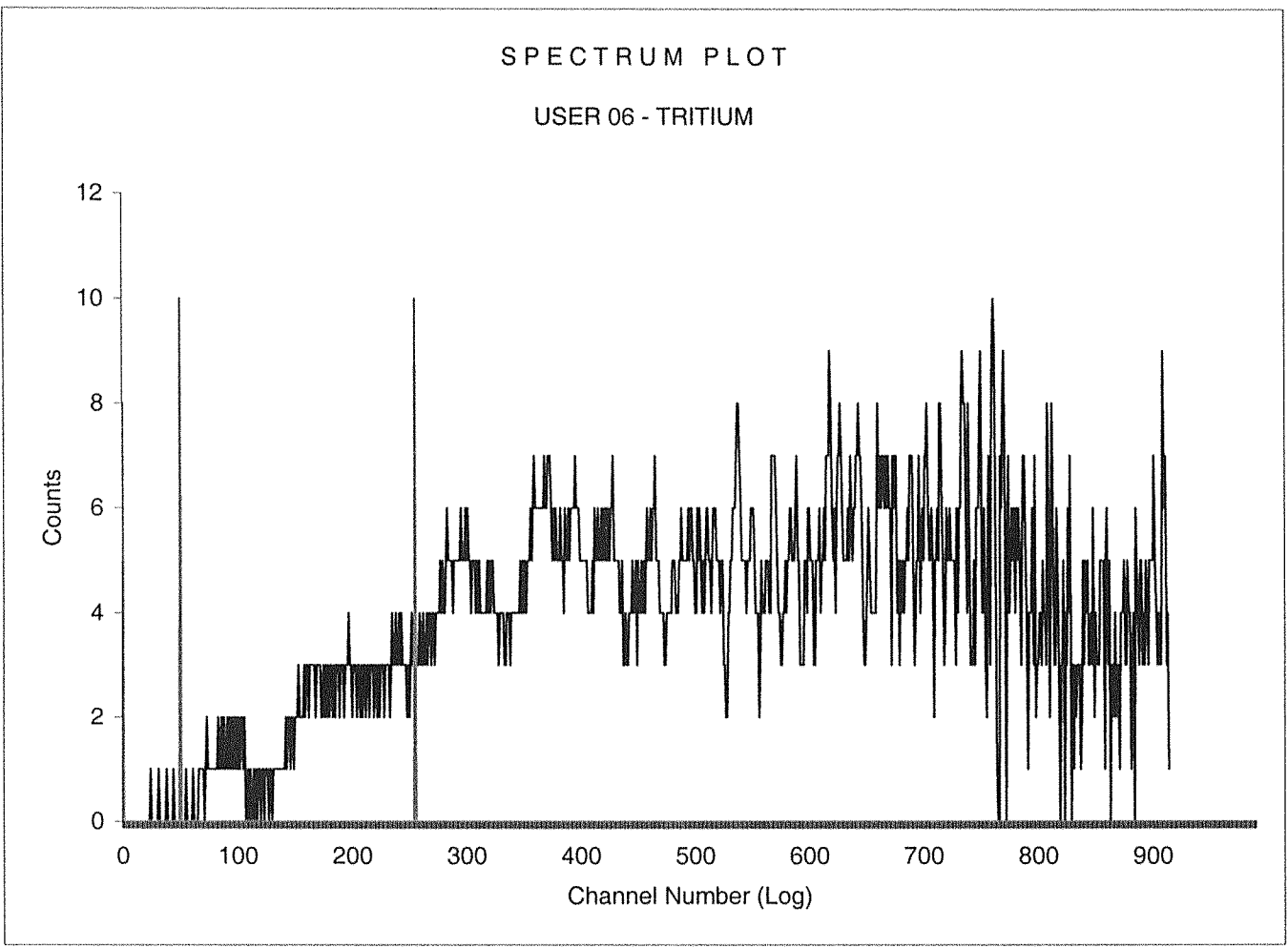
Sample Count Start Time:	23 Sep 2016 19:47:35		
Data Capture Date	23 Sep 2016 21:28:00		
User Filename	S06092332-1A.XLS		
	U06092332-1A.XLS		
Spectrum Type	Log Counts		
User Number	06		
User Id	TRITIUM		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	1	32-1	100.00
H#, Total Counts:	163.0	3704	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	



Sample Count Start Time:	23 Sep 2016 21:31:07		
Data Capture Date	23 Sep 2016 23:11:31		
User Filename	S06092332-2A.XLS		
	U06092332-1A.XLS		
Spectrum Type	Log Counts		
User Number	06		
User Id	TRITIUM		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	2	32-2	100.00
H#, Total Counts:	162.9	3637	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	



Sample Count Start Time: 23 Sep 2016 23:14:37
Data Capture Date: 24 Sep 2016 00:55:02
User Filename: S06092432-3A.XLS
U06092332-1A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TRITIUM
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 3 32-3 100.00
H#, Total Counts: 160.4 3563
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



1598092

ID: TRITIUM

24 SEP 2016 02:37

USER: 6

COMMENT: BROWN

PRESET TIME : 100.00

DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD

COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT

TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF

SCINTILLATOR: LIQUID LUMEX: YES LOW SAMPLE REJ: 0

LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 50.0 - 255.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

CHAN: 0.0 - 900.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		

3 1 44-1 100.00 162.3 4.06 10.71 35.16 3.41 1.63 103.03

4 2 44-2 100.00 163.6 4.02 10.86 34.39 3.45 1.85 206.55

5 3 44-3 100.00 161.3 3.69 11.25 34.20 3.45 1.59 310.04

6 4 44-4 100.00 162.5 4.23 10.49 34.01 3.46 1.74 413.56

7 5 44-5 100.00 162.3 3.84 11.15 33.90 3.47 1.91 517.10

8 6 44-6 100.00 161.3 3.81 11.16 33.49 3.49 1.88 620.65

9 7 44-7 100.00 163.6 3.85 11.17 33.39 3.50 1.95 724.22

10 8 44-8 100.00 161.2 3.46 11.93 34.07 3.47 2.05 827.82

11 9 44-9 100.00 163.9 3.87 11.14 34.44 3.45 1.96 931.39

12 10 44-10 100.00 162.7 4.20 10.67 33.41 3.50 2.12 1034.98

13 11 44-11 100.00 170.7 3.99 11.44 34.70 3.45 2.93 1138.70

14 12 44-12 100.00 163.6 4.12 10.74 35.07 3.42 1.93 1242.28

15 13 44-1 100.00 162.4 4.05 10.89 35.47 3.40 2.04 1345.99

16 14 44-2 100.00 162.8 3.45 12.05 34.18 3.47 2.15 1449.58

17 15 44-3 100.00 163.2 3.92 11.16 35.15 3.41 2.06 1553.19

~~16 44-4 89.21 167.6 4.05 11.86 34.28 3.67 2.68 1645.81~~

17 44-5 SAMPLE TERMINATED:

18 44-6 SAMPLE TERMINATED:

19 44-7 SAMPLE TERMINATED:

20 44-8 SAMPLE TERMINATED:

21 44-9 SAMPLE TERMINATED:

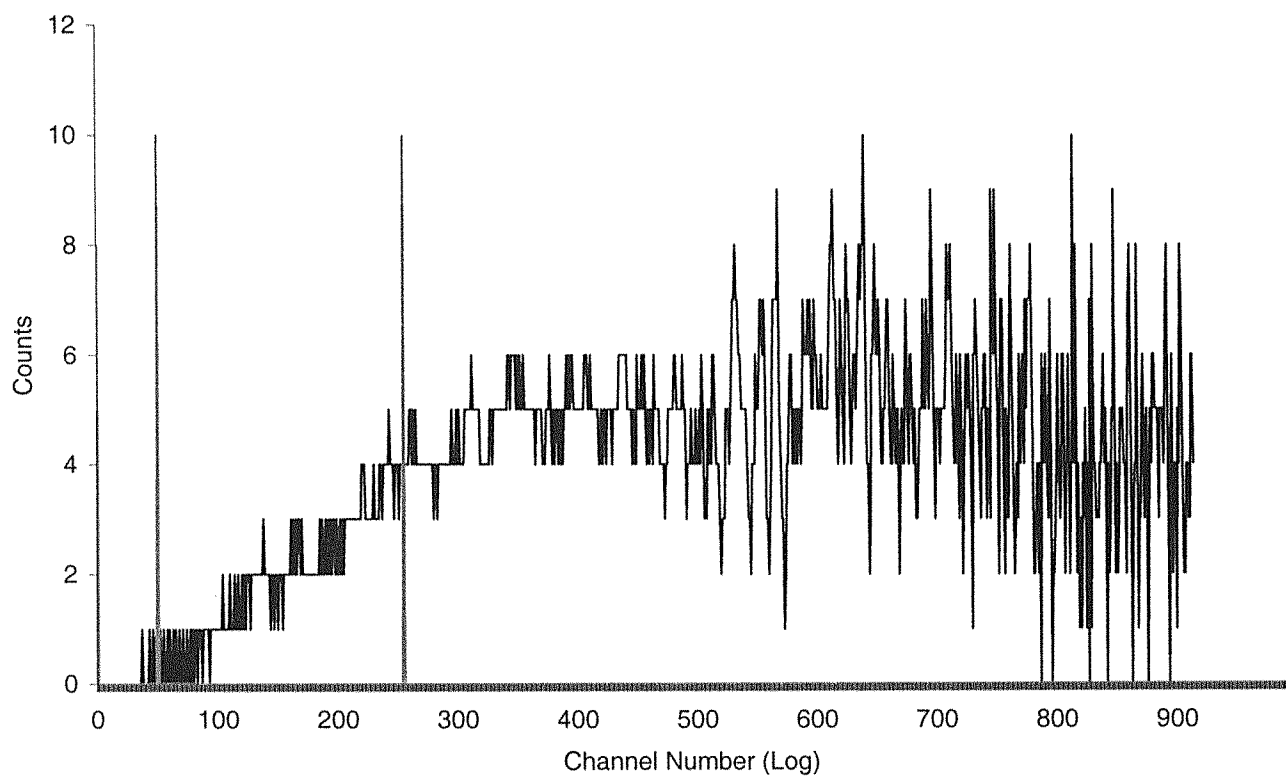
22 44-10 SAMPLE TERMINATED:

ypq/25/16

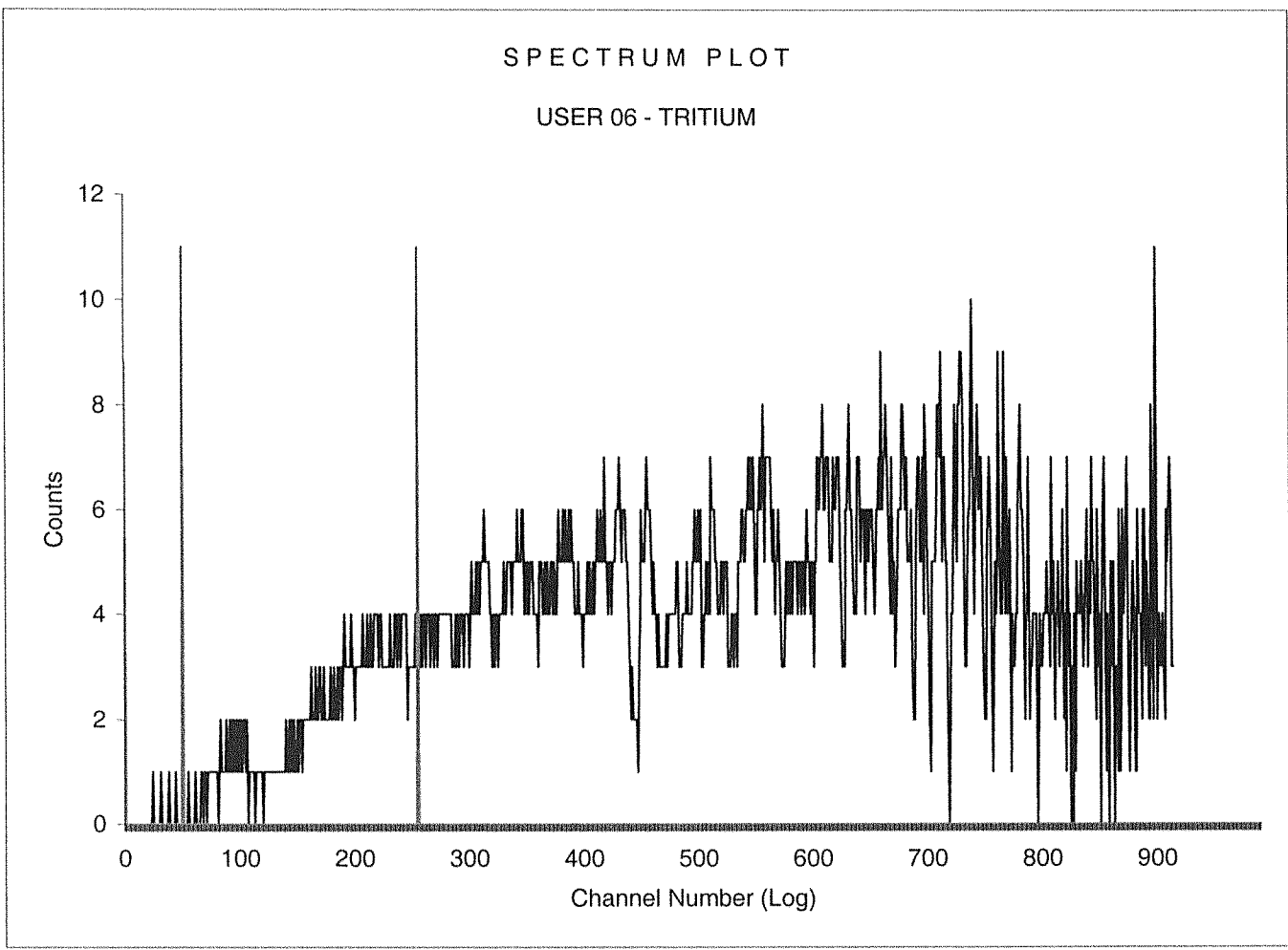
Sample Count Start Time: 24 Sep 2016 02:09:19
Data Capture Date 24 Sep 2016 03:49:43
User Filename S06092444-1A.XLS
U06092444-1A.XLS
Spectrum Type Log Counts
User Number 06
User Id TRITIUM
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 1 44-1 100.00
H#, Total Counts: 162.3 3578
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990

SPECTRUM PLOT

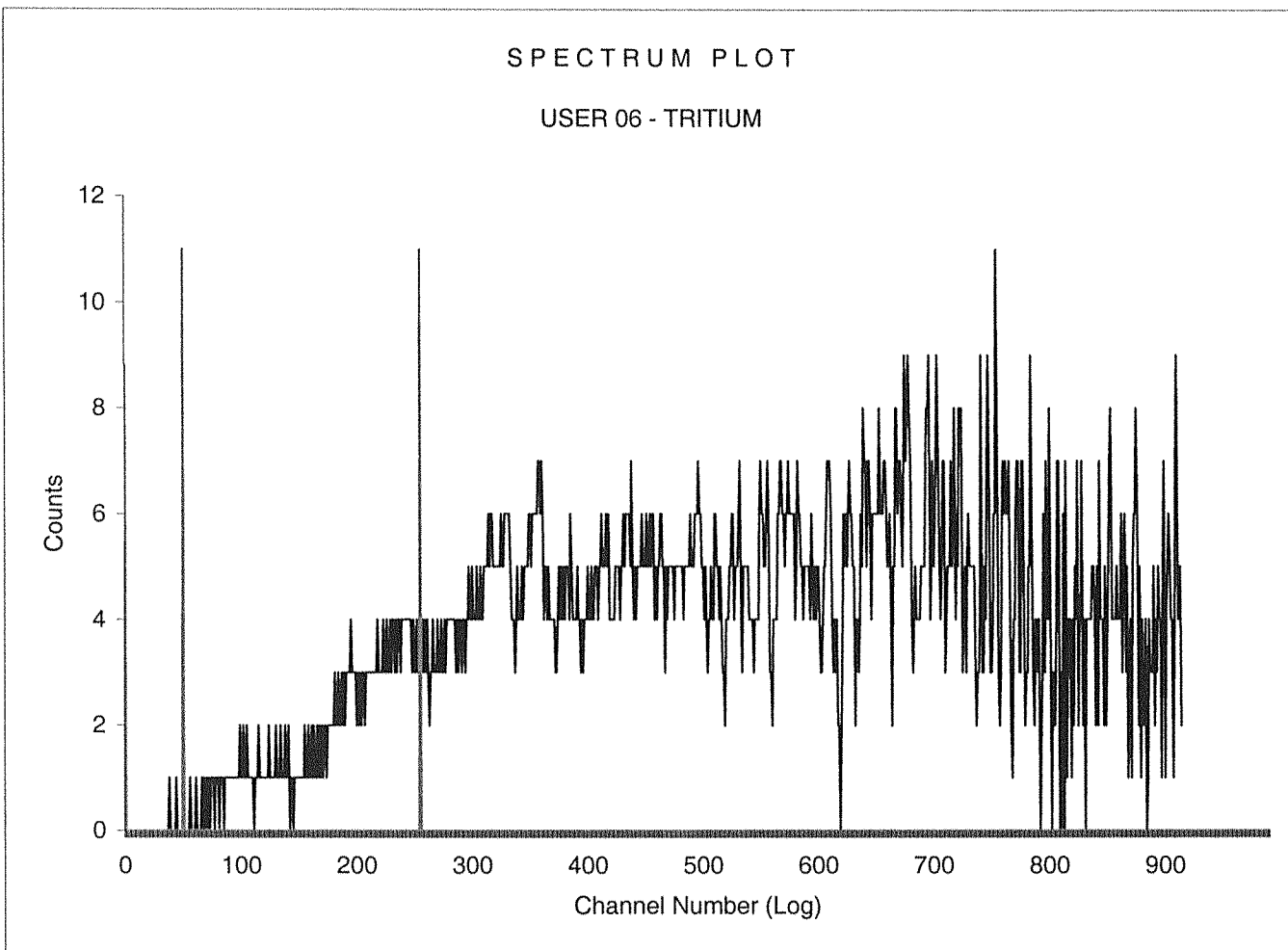
USER 06 - TRITIUM



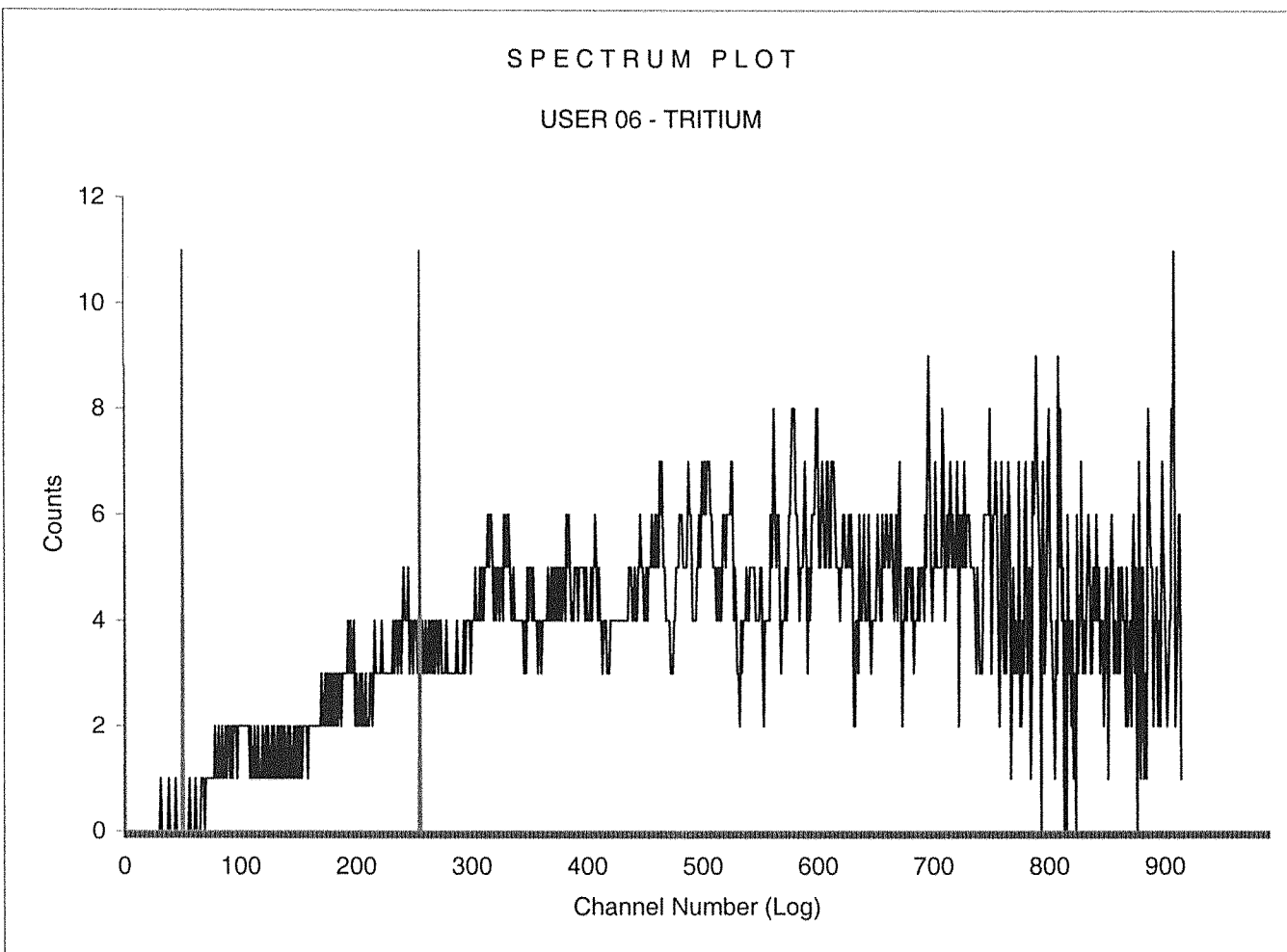
Sample Count Start Time:	24 Sep 2016 03:52:50		
Data Capture Date	24 Sep 2016 05:33:14		
User Filename	S06092444-2A.XLS		
	U06092444-1A.XLS		
Spectrum Type	Log Counts		
User Number	06		
User Id	TRITIUM		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	2	44-2	100.00
H#, Total Counts:	163.6	3497	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	



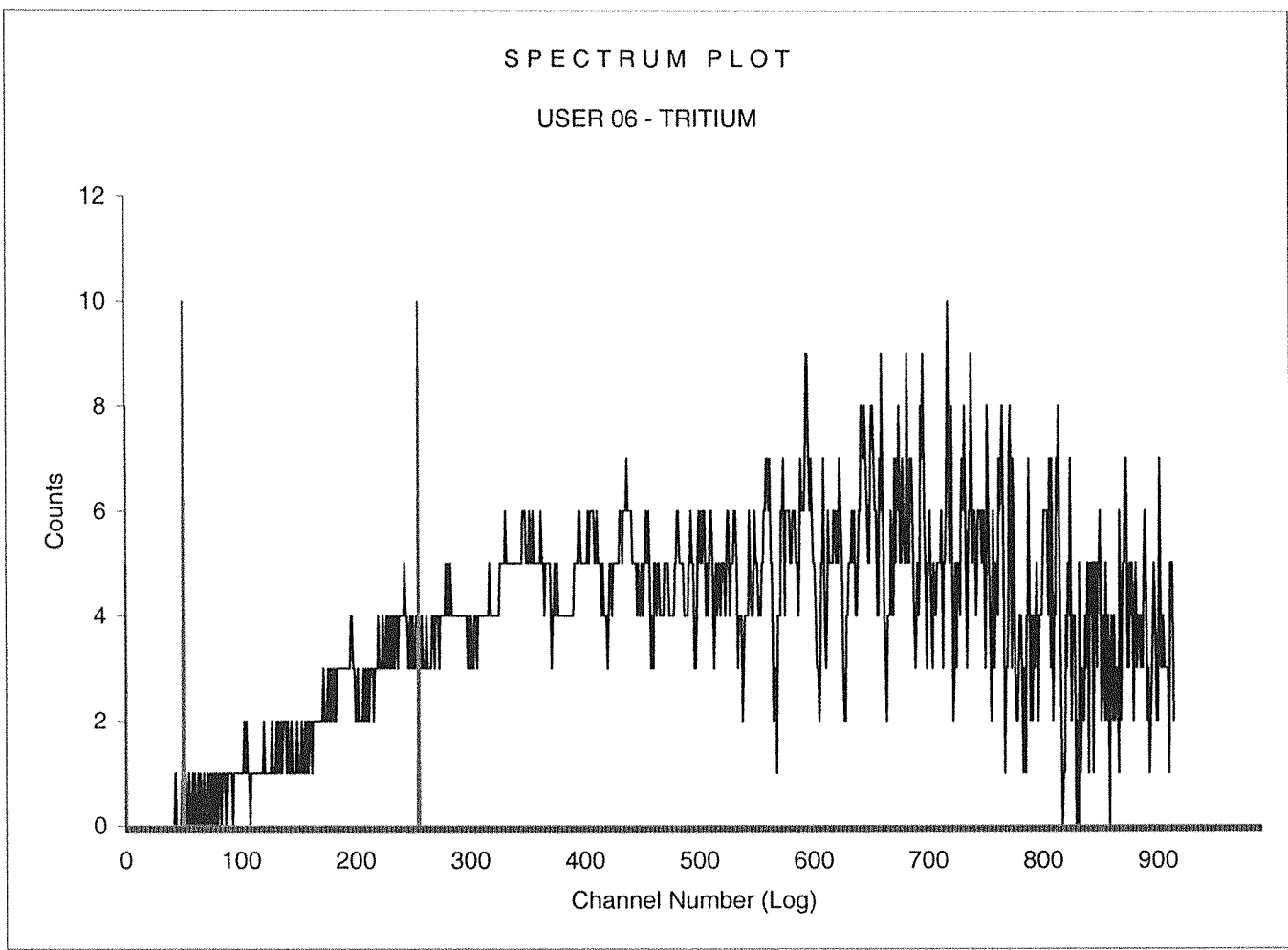
Sample Count Start Time: 24 Sep 2016 05:36:19
Data Capture Date: 24 Sep 2016 07:16:43
User Filename: S06092444-3A.XLS
U06092444-1A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TRITIUM
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 3 44-3 100.00
H#, Total Counts: 161.3 3484
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



Sample Count Start Time: 24 Sep 2016 07:19:51
Data Capture Date: 24 Sep 2016 09:00:14
User Filename: S06092444-4A.XLS
U06092444-1A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TRITIUM
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 4 44-4 100.00
H#, Total Counts: 162.5 3465
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



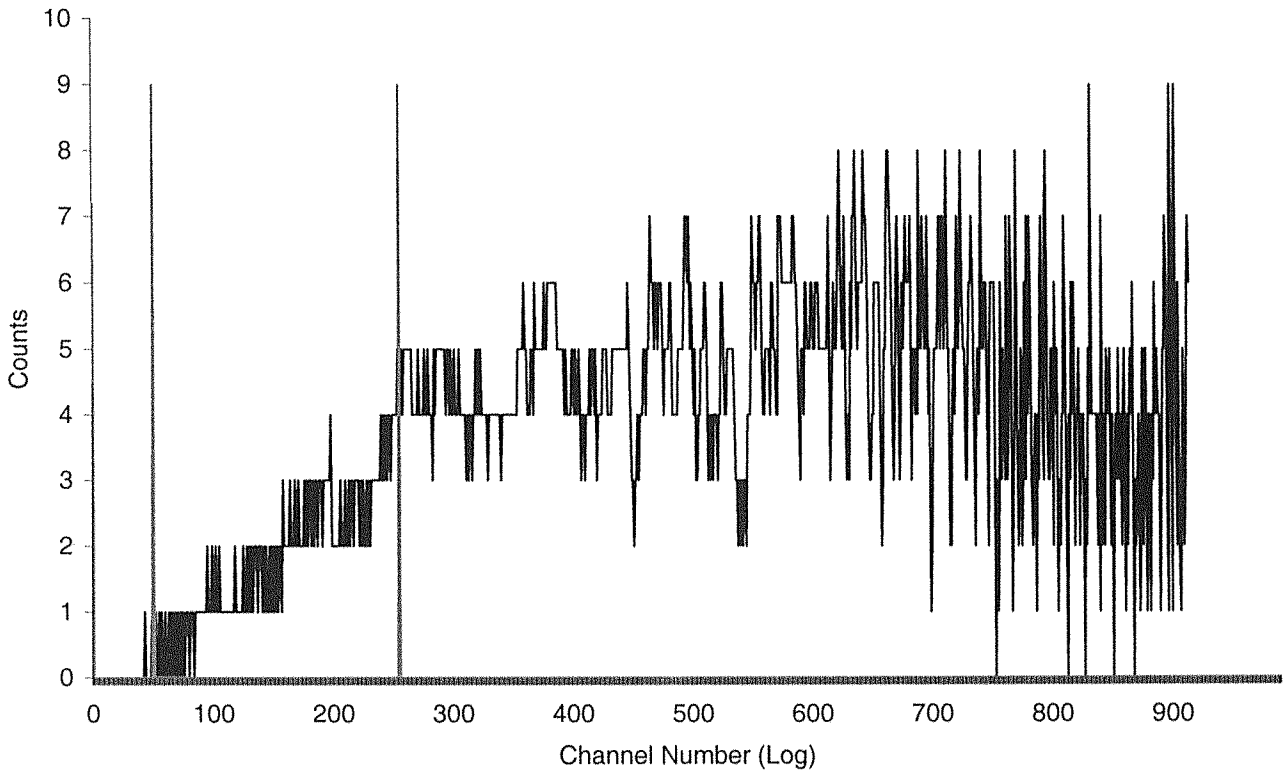
Sample Count Start Time: 24 Sep 2016 09:03:23
Data Capture Date: 24 Sep 2016 10:43:46
User Filename: S06092444-5A.XLS
U06092444-1A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TRITIUM
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 5 44-5 100.00
H#, Total Counts: 162.3 3441
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



Sample Count Start Time: 24 Sep 2016 10:46:56
Data Capture Date 24 Sep 2016 12:27:19
User Filename S06092444-6A.XLS
U06092444-1A.XLS
Spectrum Type Log Counts
User Number 06
User Id TRITIUM
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 6 44-6 100.00
H#, Total Counts: 161.3 3411
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990

SPECTRUM PLOT

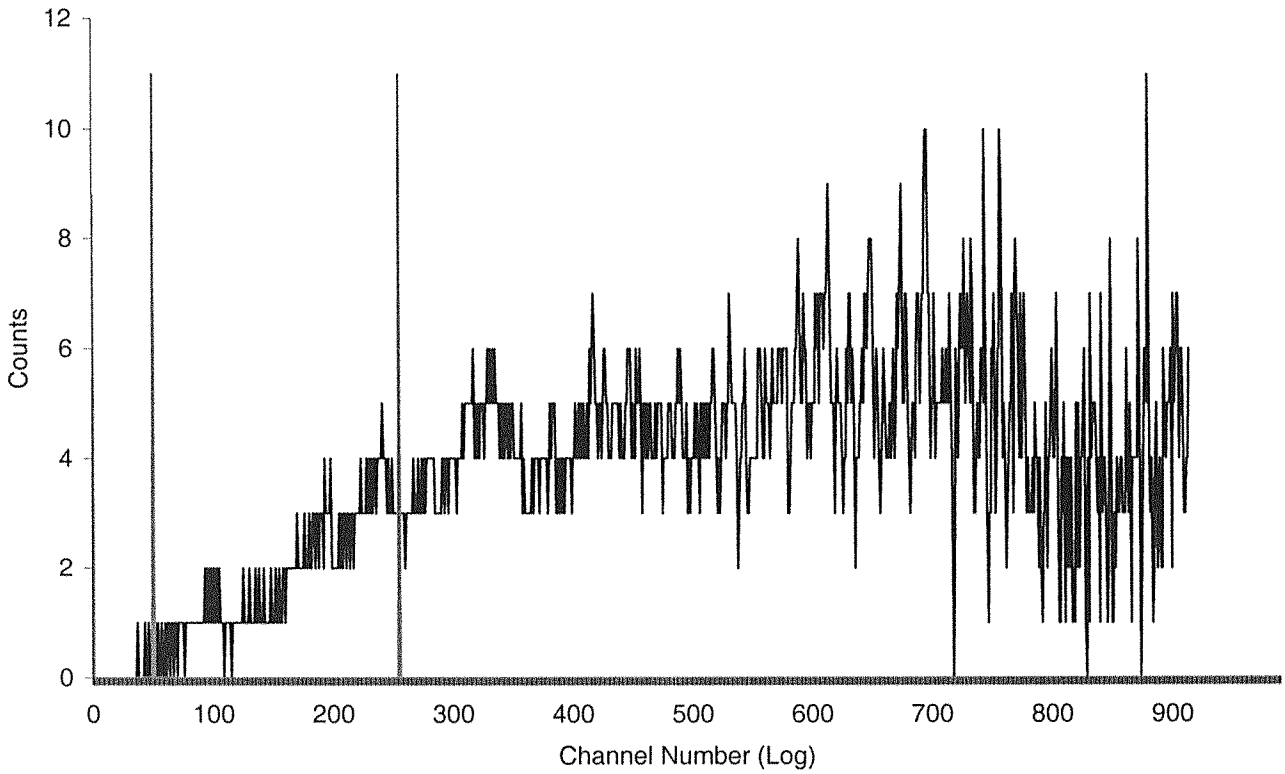
USER 06 - TRITIUM



Sample Count Start Time: 24 Sep 2016 12:30:30
Data Capture Date 24 Sep 2016 14:10:54
User Filename S06092444-7A.XLS
U06092444-1A.XLS
Spectrum Type Log Counts
User Number 06
User Id TRITIUM
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 7 44-7 100.00
H#, Total Counts: 163.6 3412
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990

SPECTRUM PLOT

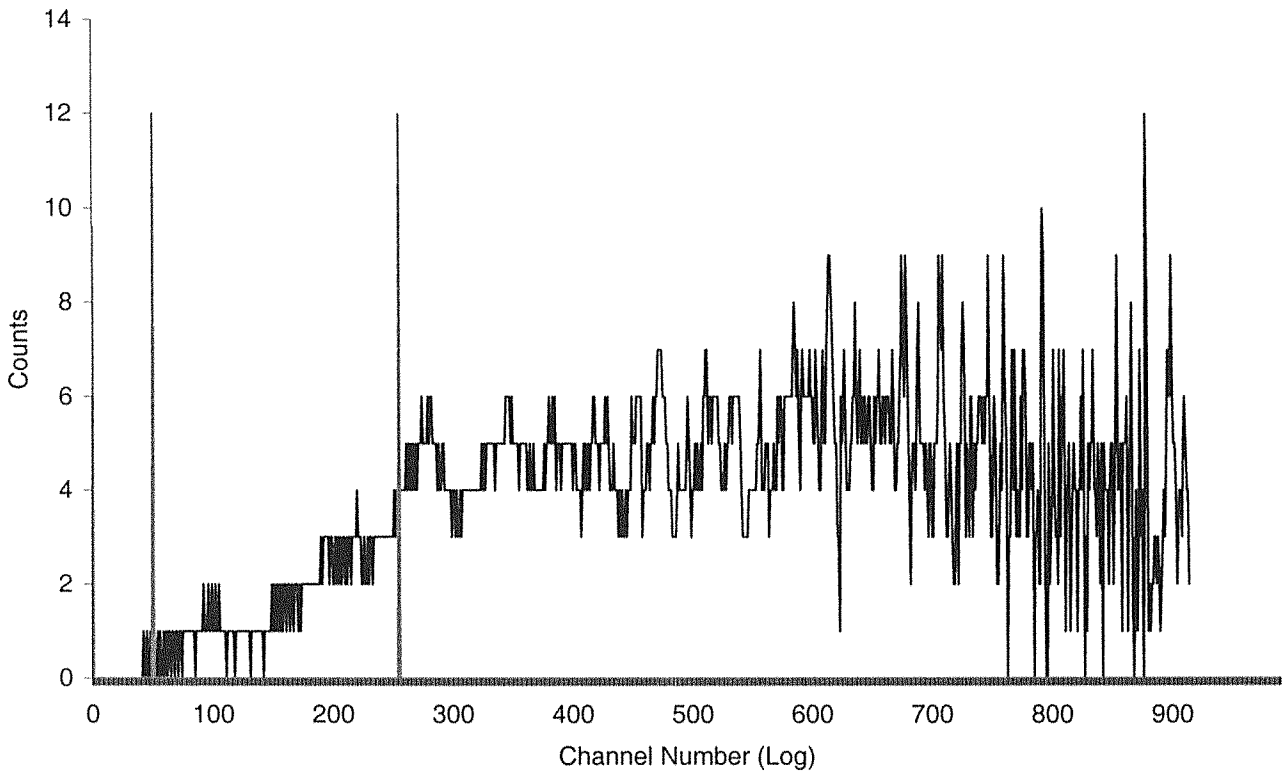
USER 06 - TRITIUM



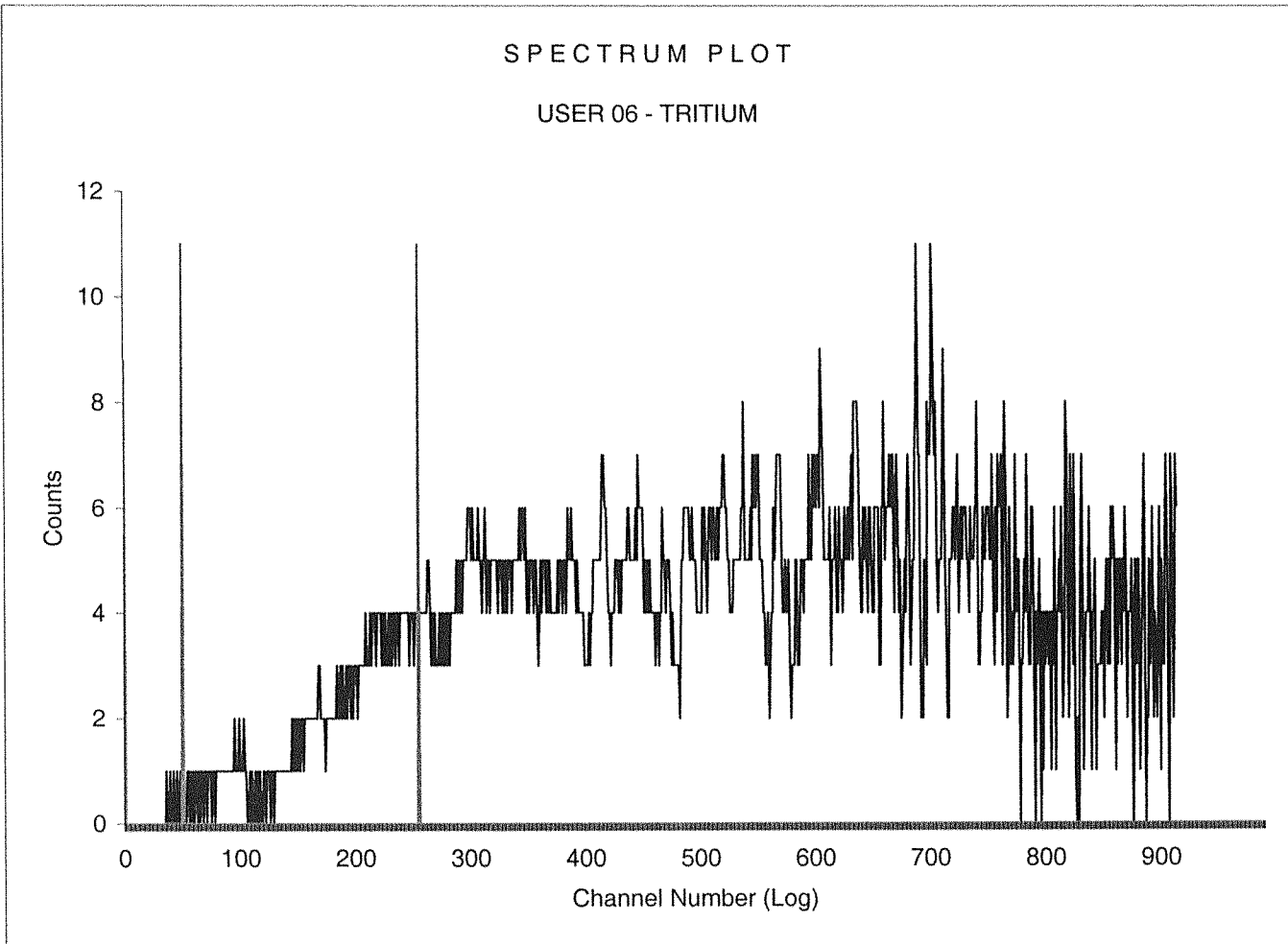
Sample Count Start Time: 24 Sep 2016 14:14:06
Data Capture Date 24 Sep 2016 15:54:29
User Filename S06092444-8A.XLS
U06092444-1A.XLS
Spectrum Type Log Counts
User Number 06
User Id TRITIUM
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 8 44-8 100.00
H#, Total Counts: 161.2 3463
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990

SPECTRUM PLOT

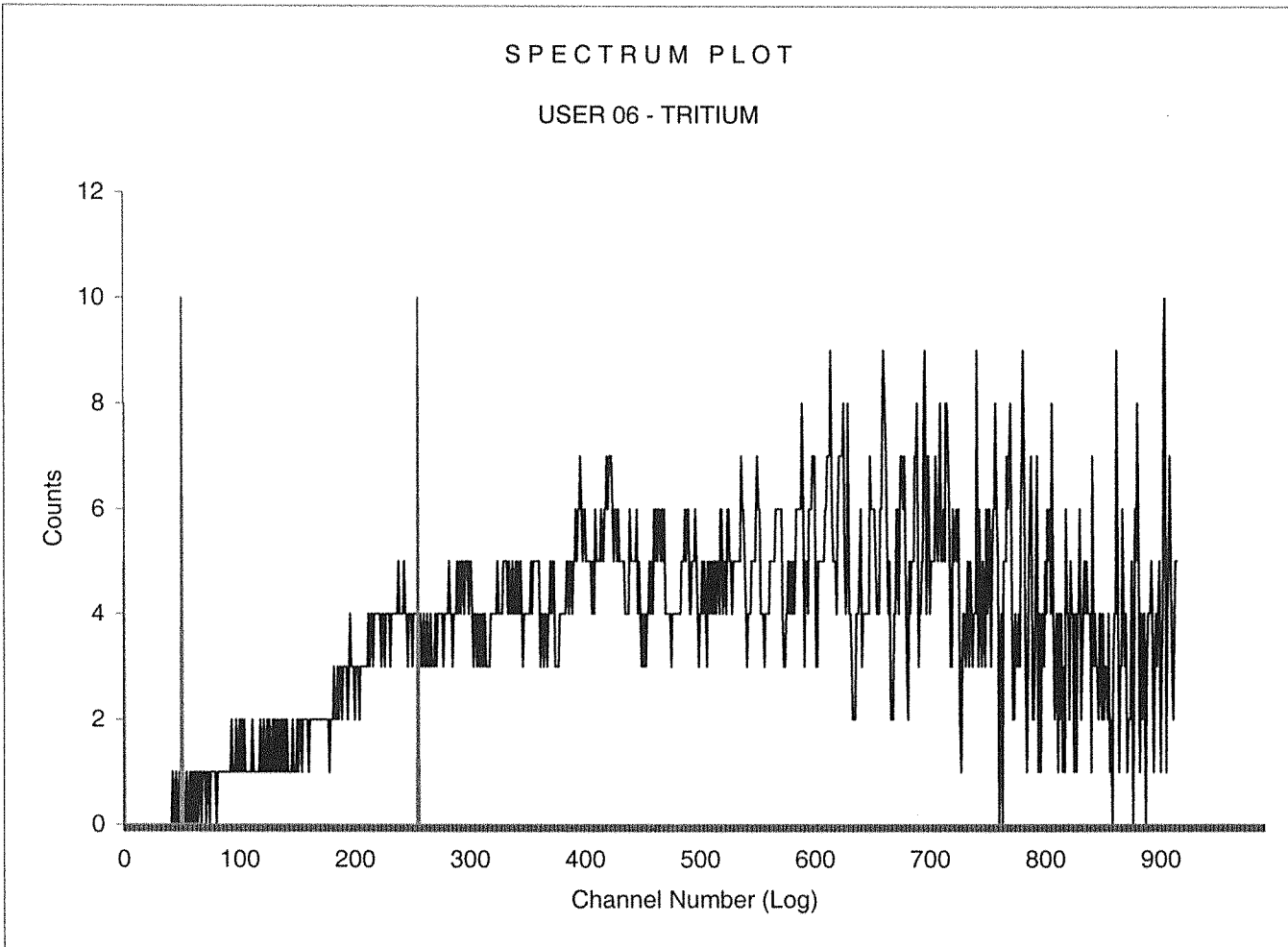
USER 06 - TRITIUM



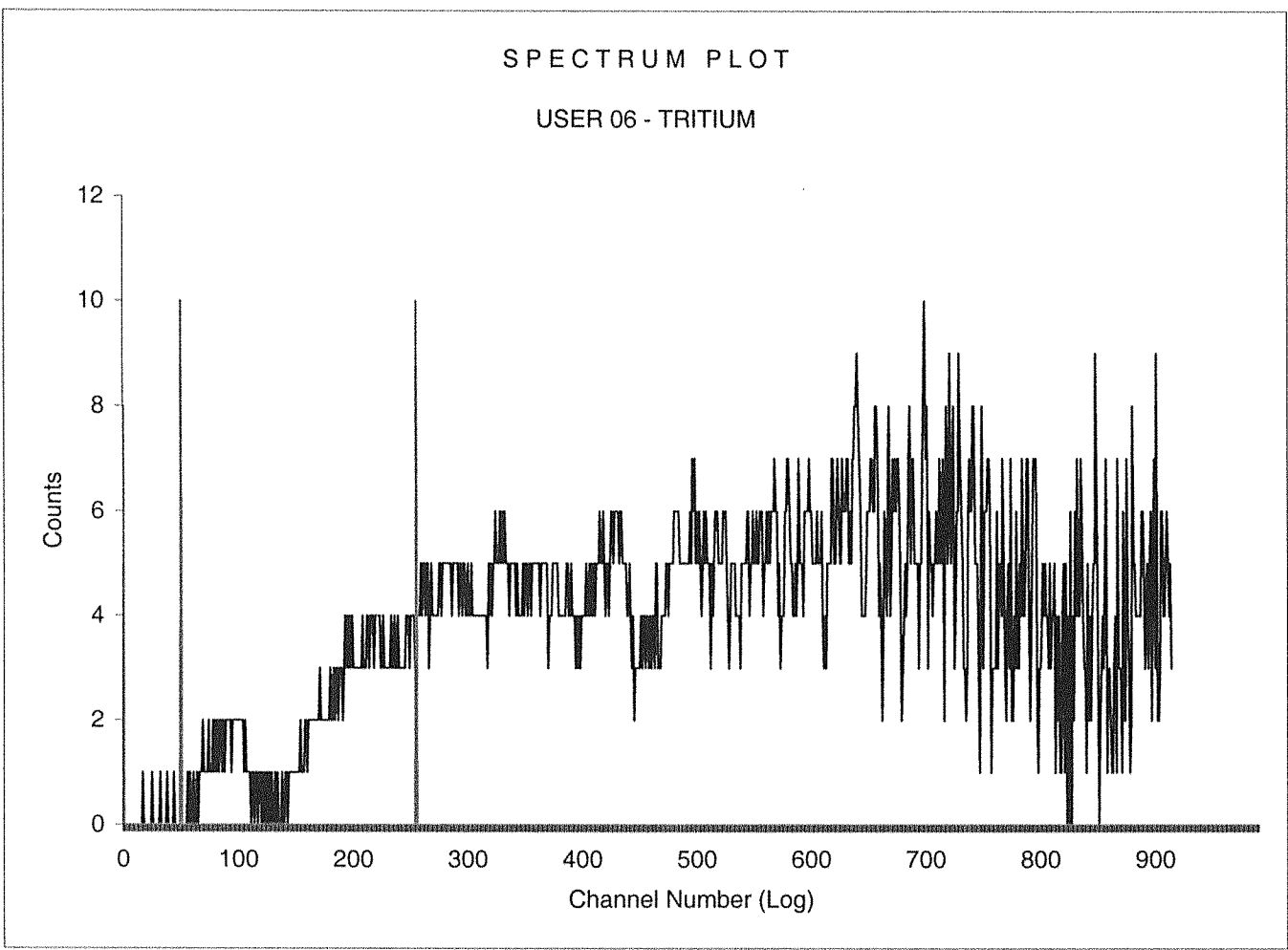
Sample Count Start Time: 24 Sep 2016 15:57:40
Data Capture Date 24 Sep 2016 17:38:03
User Filename S06092444-9A.XLS
U06092444-1A.XLS
Spectrum Type Log Counts
User Number 06
User Id TRITIUM
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 9 44-9 100.00
H#, Total Counts: 163.9 3508
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



Sample Count Start Time: 24 Sep 2016 17:41:16
Data Capture Date 24 Sep 2016 19:21:39
User Filename S06092444-10A.XLS
U06092444-1A.XLS
Spectrum Type Log Counts
User Number 06
User Id TRITIUM
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 10 44-10 100.00
H#, Total Counts: 162.7 3408
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



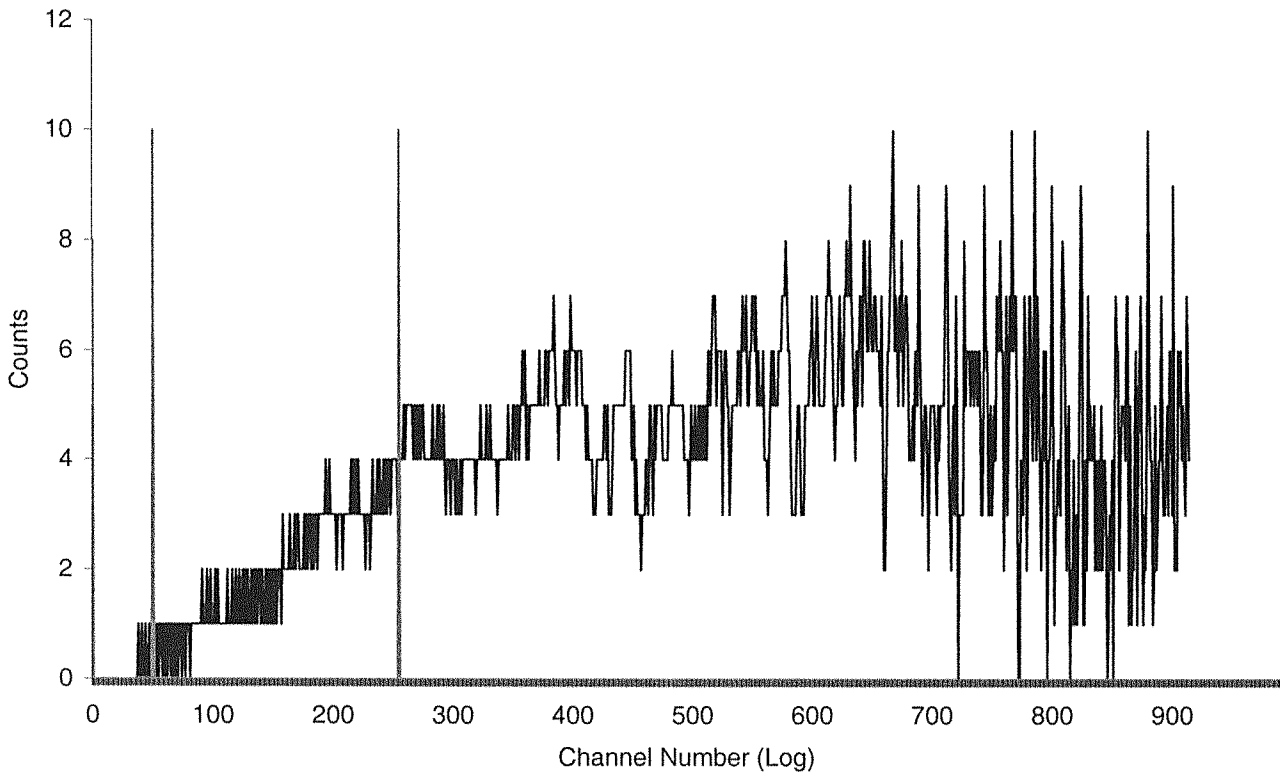
Sample Count Start Time: 24 Sep 2016 19:24:59
Data Capture Date 24 Sep 2016 21:05:23
User Filename S06092444-11A.XLS
U06092444-1A.XLS
Spectrum Type Log Counts
User Number 06
User Id TRITIUM
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 11 44-11 100.00
H#, Total Counts: 170.7 3534
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



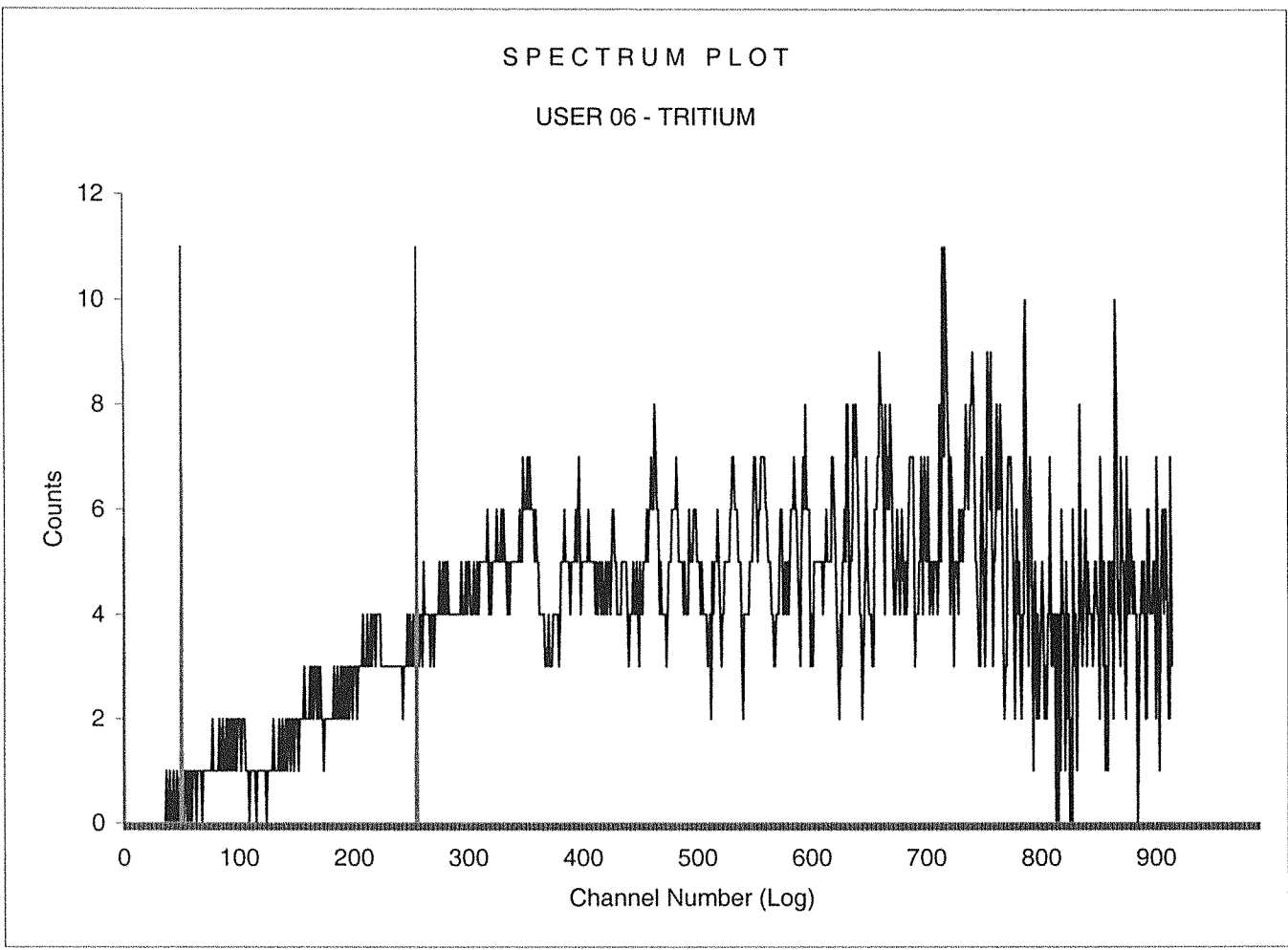
Sample Count Start Time: 24 Sep 2016 21:08:34
Data Capture Date: 24 Sep 2016 22:48:56
User Filename: S06092444-12A.XLS
U06092444-1A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TRITIUM
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 12 44-12 100.00
H#, Total Counts: 163.6 3572
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990

SPECTRUM PLOT

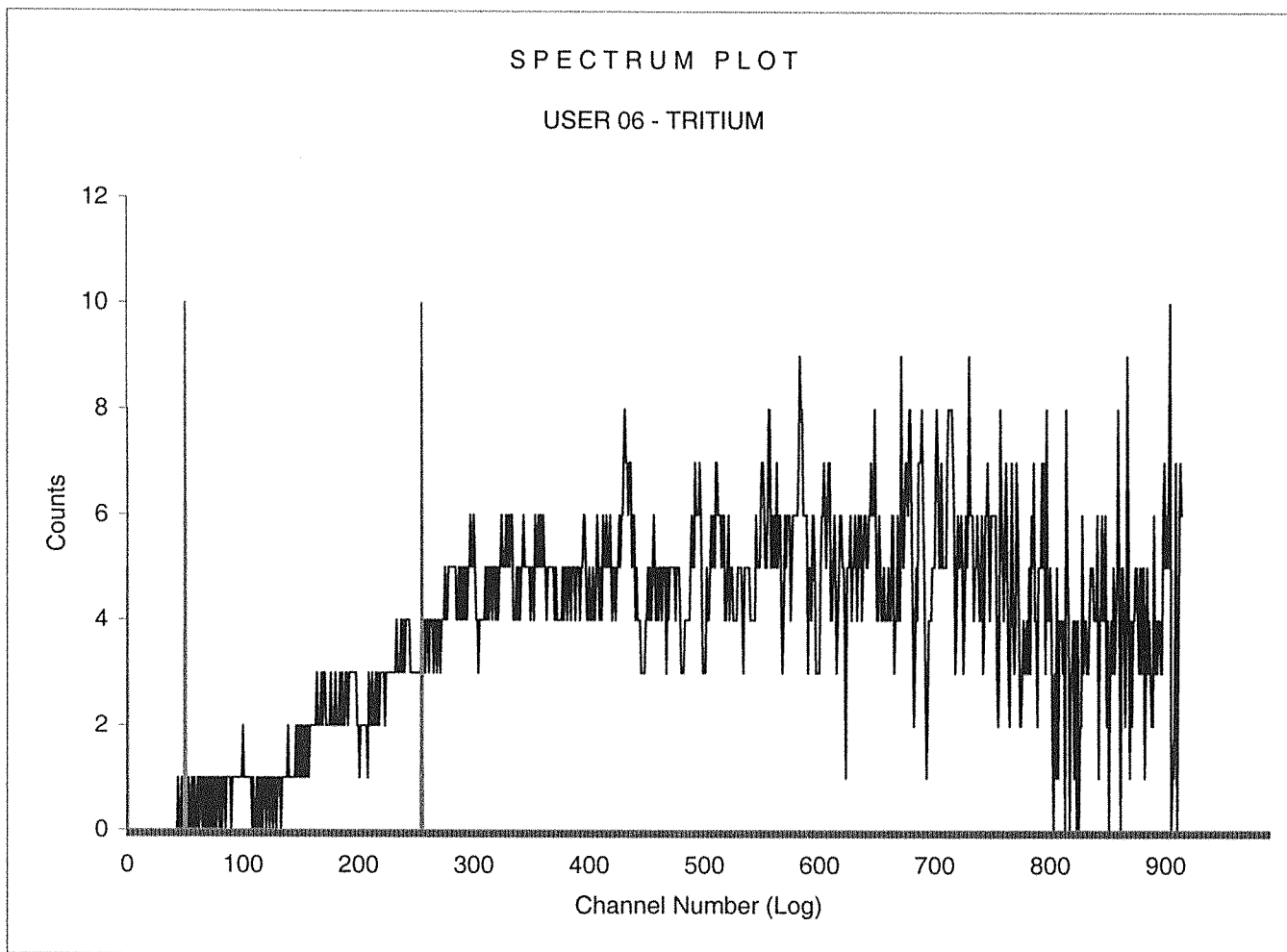
USER 06 - TRITIUM



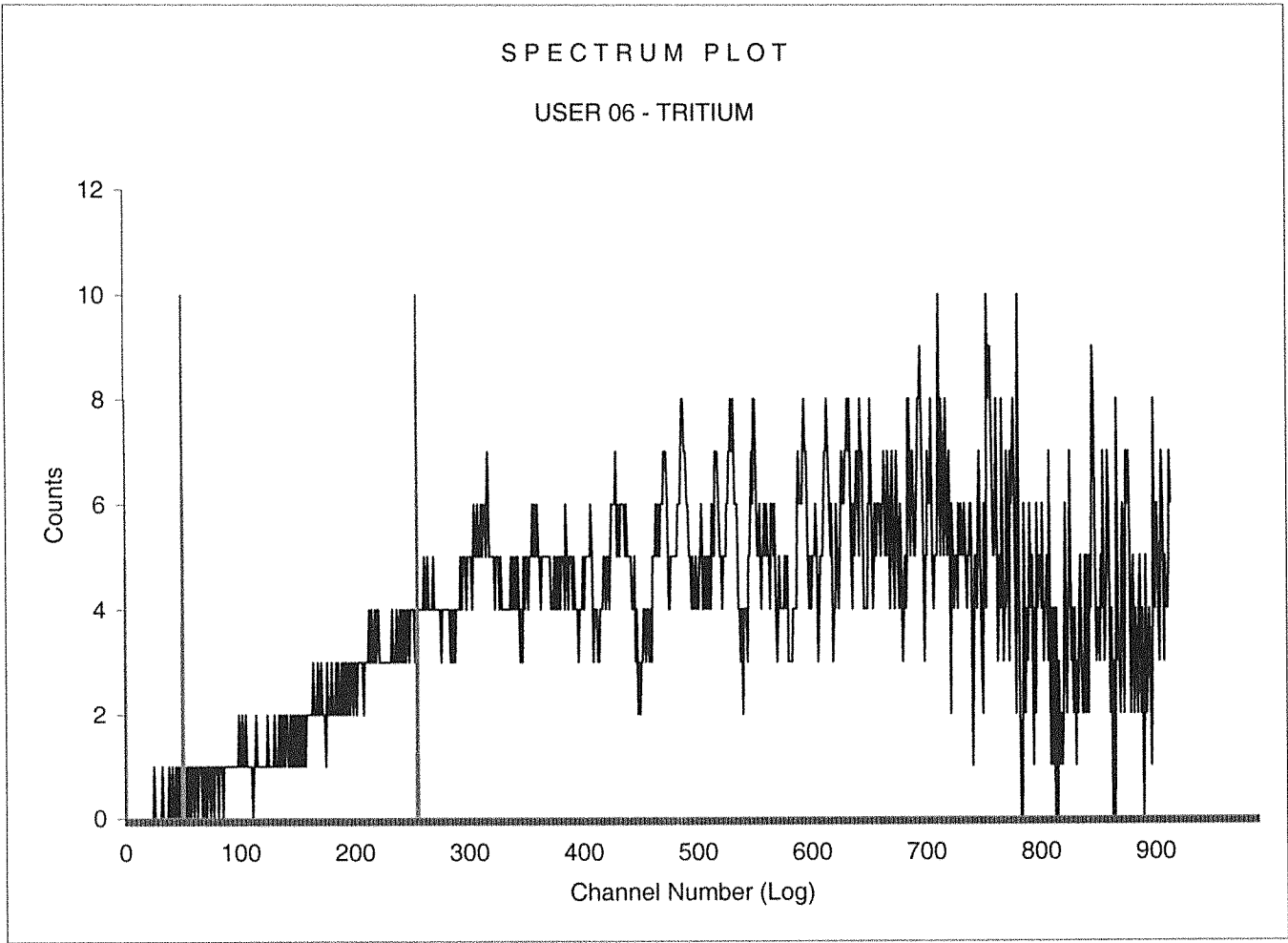
Sample Count Start Time: 24 Sep 2016 22:52:16
Data Capture Date: 25 Sep 2016 00:32:39
User Filename: S06092544-1A.XLS
U06092444-1A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TRITIUM
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 13 44-1 100.00
H#, Total Counts: 162.4 3609
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



Sample Count Start Time:	25 Sep 2016 00:35:52		
Data Capture Date	25 Sep 2016 02:16:15		
User Filename	S06092544-2A.XLS		
	U06092444-1A.XLS		
Spectrum Type	Log Counts		
User Number	06		
User Id	TRITIUM		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	14	44-2	100.00
H#, Total Counts:	162.8	3480	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	



Sample Count Start Time: 25 Sep 2016 02:19:28
Data Capture Date 25 Sep 2016 03:59:51
User Filename S06092544-3A.XLS
U06092444-1A.XLS
Spectrum Type Log Counts
User Number 06
User Id TRITIUM
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 15 44-3 100.00
H#, Total Counts: 163.2 3594
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



1598092

PAGE: 1

ID: TRITIUM

25 SEP 2016 07:15

USER: 6

COMMENT: BROWN

PRESET TIME : 100.00

DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD

COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT

TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF

SCINTILLATOR: LIQUID LUMEX: YES LOW SAMPLE REJ: 0

LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 50.0 - 255.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

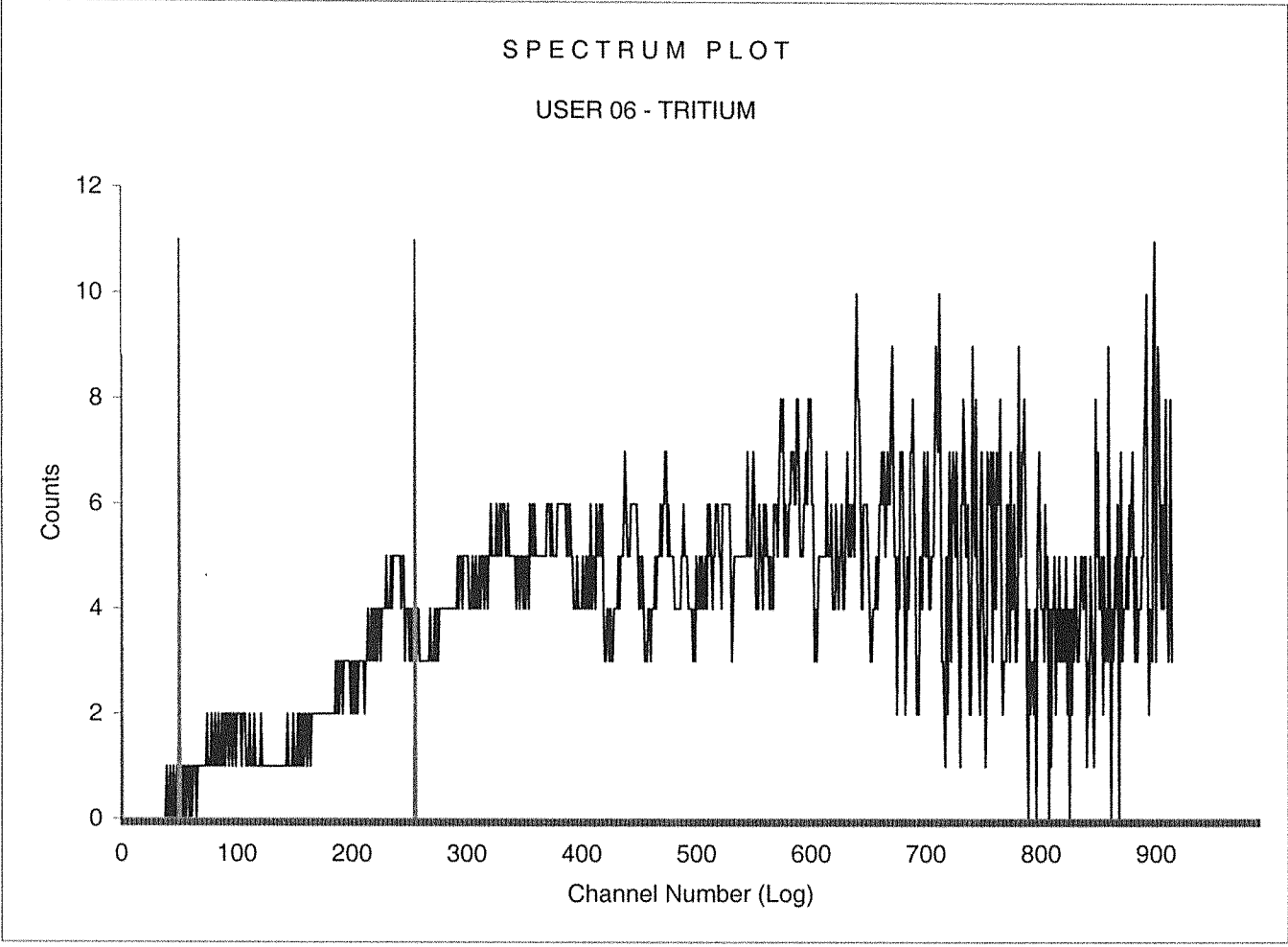
CHAN: 0.0 - 900.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		
18		MISSING SAMPLE							
4	44-4	100.00	167.6	4.26	10.82	35.51	3.41	2.59	103.24
19	5 44-5	100.00	205.7	3.81	27.27	35.36	4.40	30.10	210.02
20	6 44-6	100.00	162.5	3.43	12.13	32.91	3.53	2.32	313.60
21	7 44-7	100.00	163.1	4.04	11.00	33.65	3.49	2.19	417.18
22	8 44-8	100.00	162.7	4.03	11.13	33.98	3.48	2.45	520.84
23	9 44-9	100.00	162.9	12.23	5.91	42.14	3.11	1.72	624.41
24	10 44-10	100.00	161.1	12.49	5.84	43.49	3.06	1.65	728.01

pp/9/11/16

INSTRUMENT CALIBRATION: Maxi 26 SEP 2016 04:07
Calibration successful

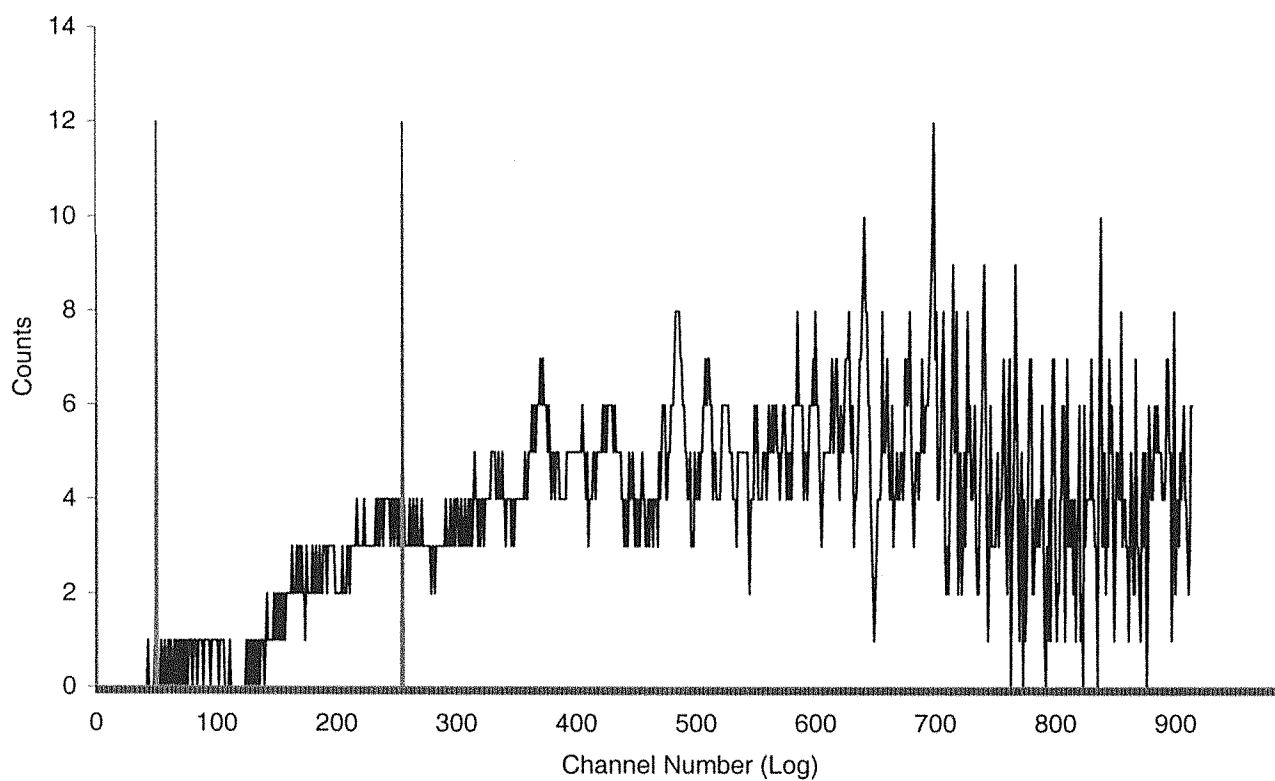
Sample Count Start Time: 25 Sep 2016 06:47:23
Data Capture Date: 25 Sep 2016 08:27:47
User Filename: S06092544-4B.XLS
U06092544-4A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TRITIUM
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 4 44-4 100.00
H#, Total Counts: 167.6 3629
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



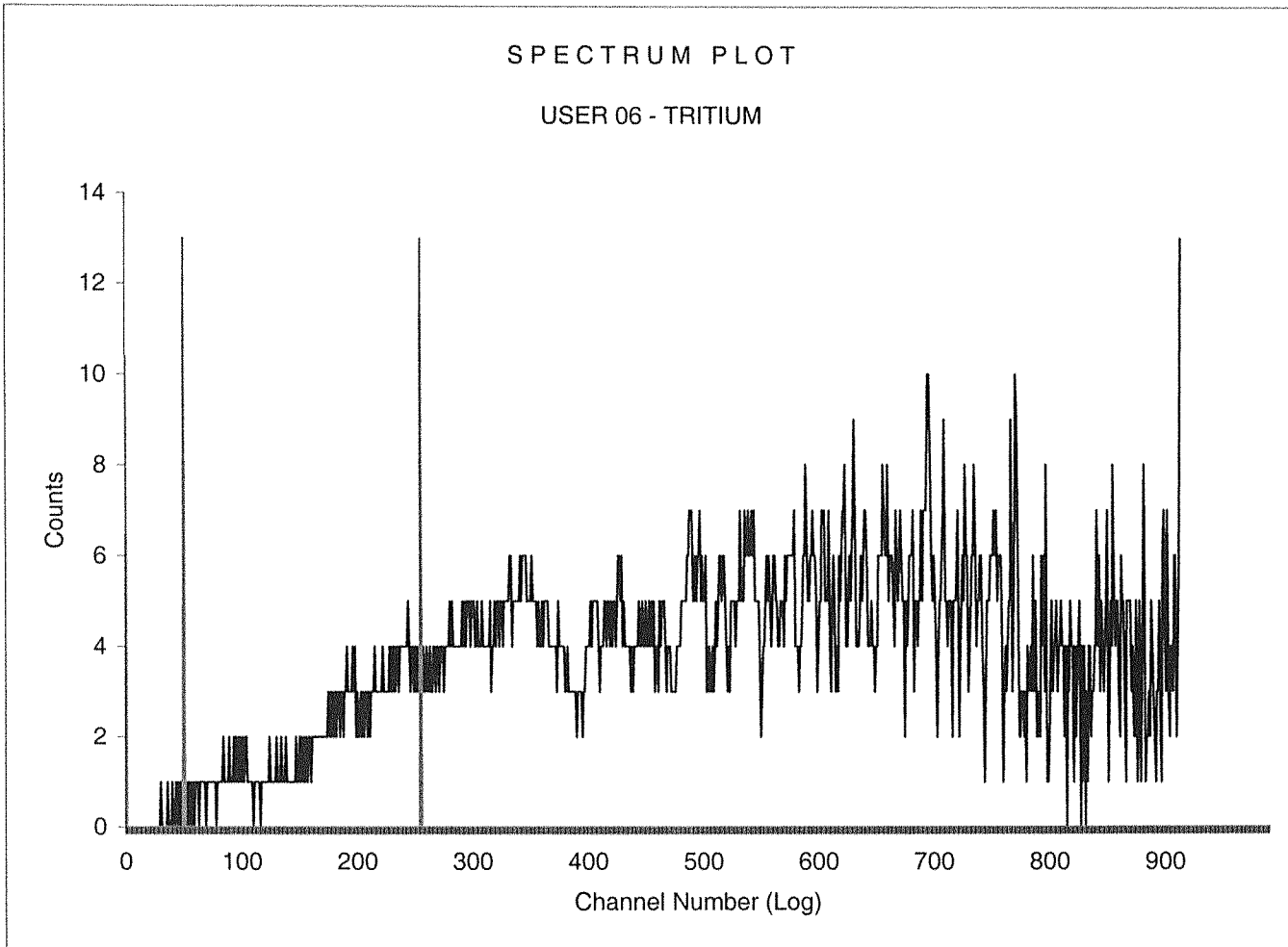
Sample Count Start Time:	25 Sep 2016 10:17:45		
Data Capture Date	25 Sep 2016 11:58:09		
User Filename	S06092544-6A.XLS		
	U06092544-4A.XLS		
Spectrum Type	Log Counts		
User Number	06		
User Id	TRITIUM		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	6	44-6	100.00
H#, Total Counts:	162.5	3349	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	

SPECTRUM PLOT

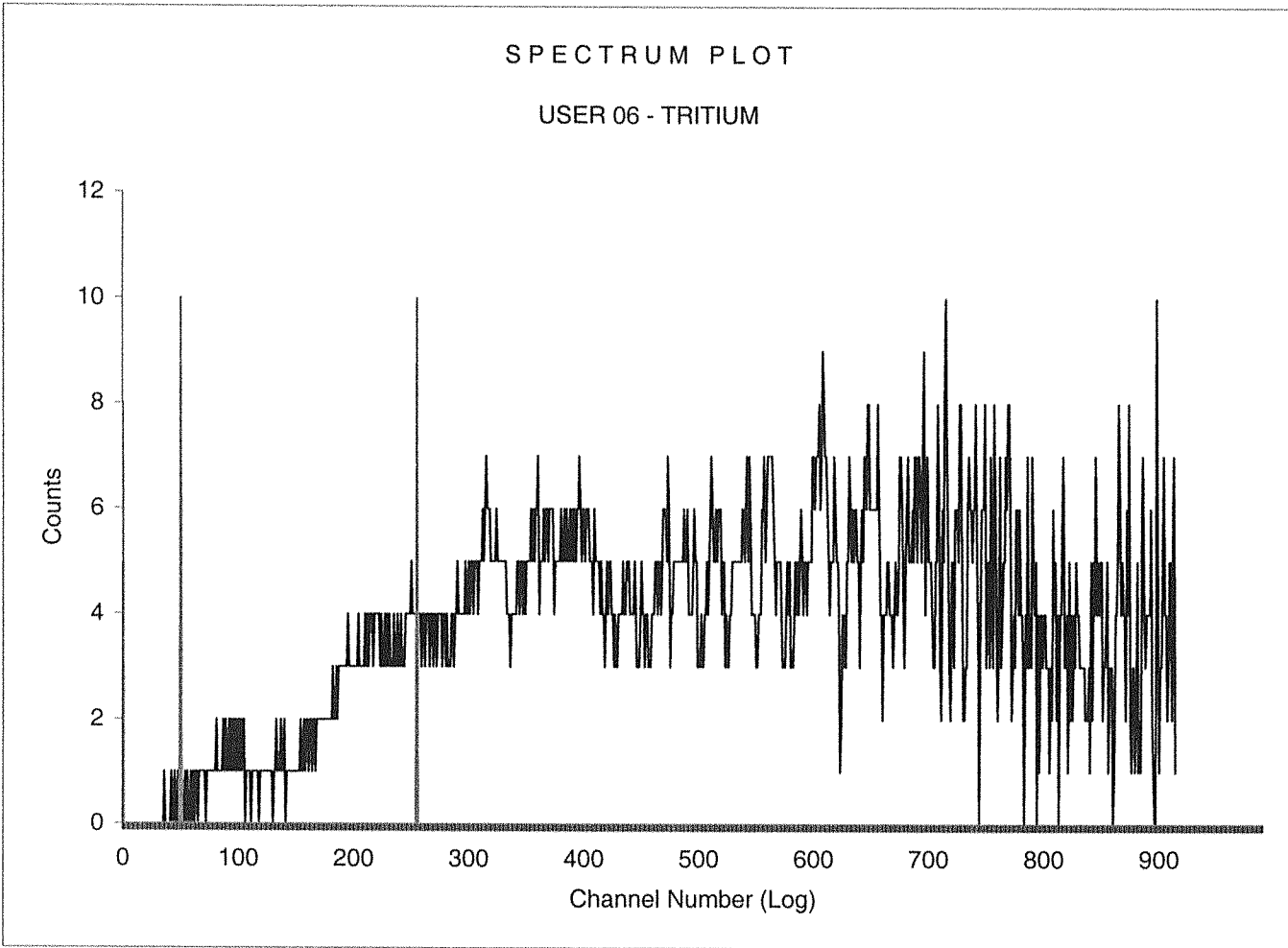
USER 06 - TRITIUM



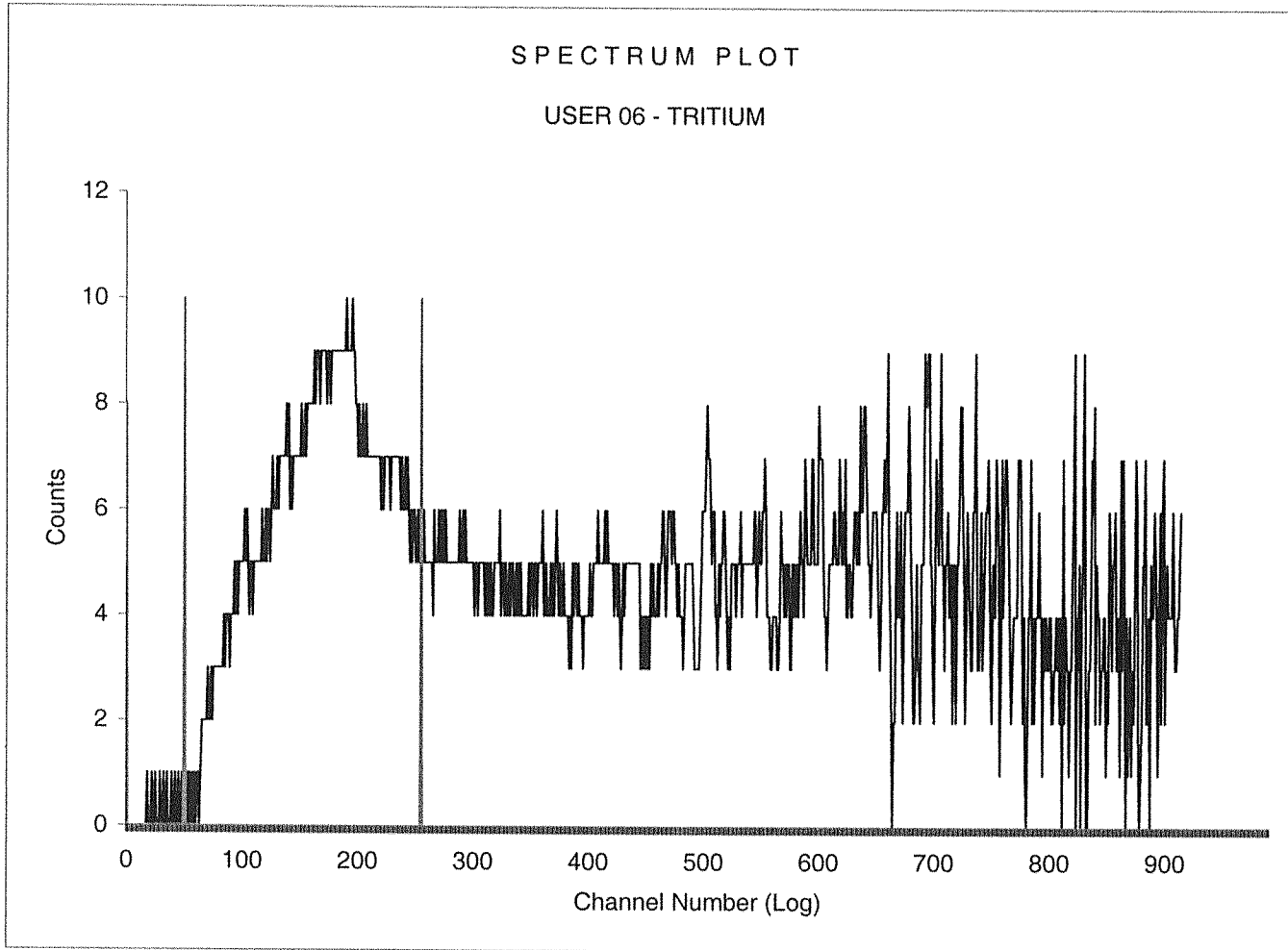
Sample Count Start Time: 25 Sep 2016 12:01:20
Data Capture Date: 25 Sep 2016 13:41:45
User Filename: S06092544-7A.XLS
U06092544-4A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TRITIUM
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 7 44-7 100.00
H#, Total Counts: 163.1 3437
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



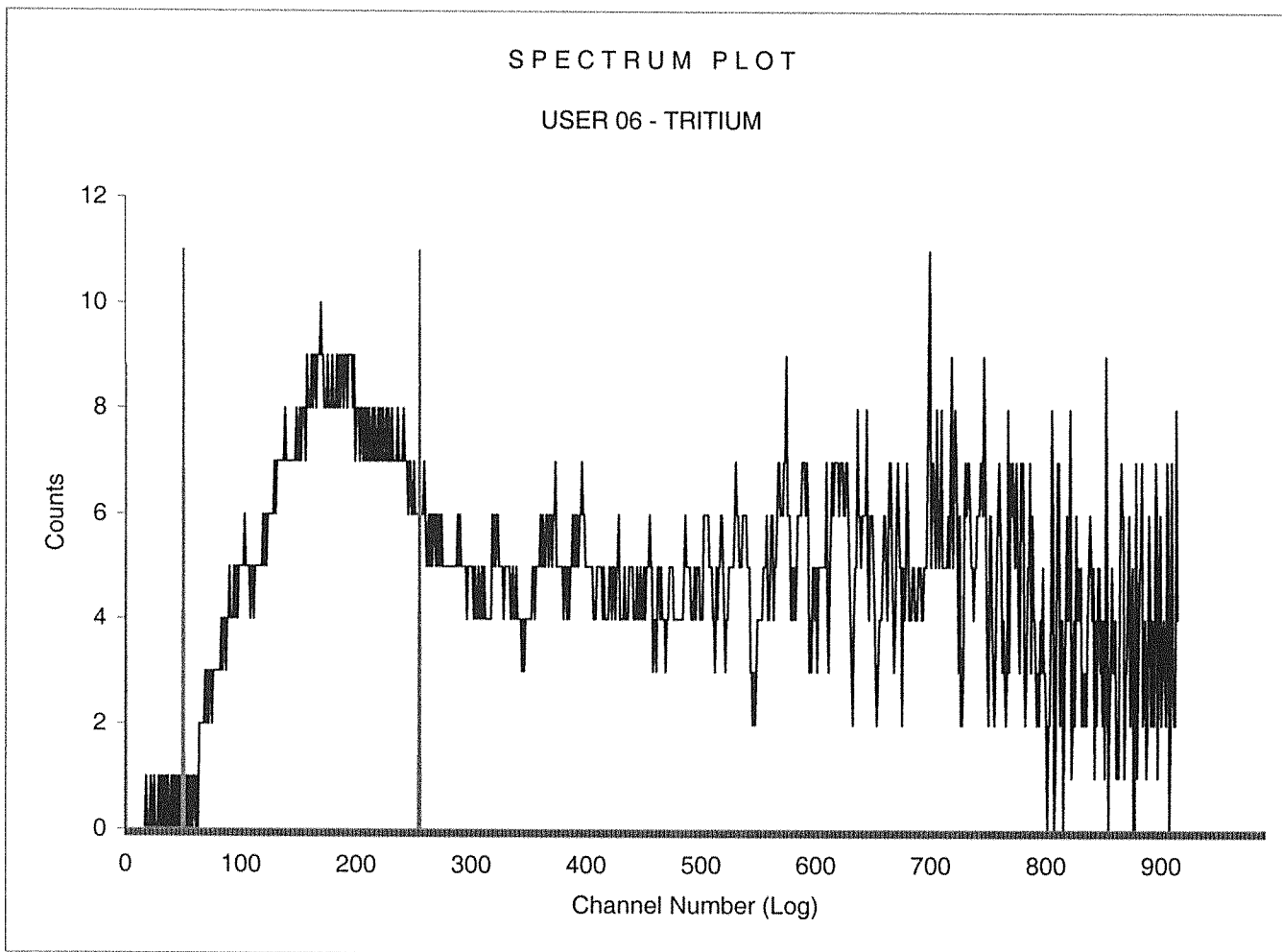
Sample Count Start Time: 25 Sep 2016 13:44:59
Data Capture Date: 25 Sep 2016 15:25:23
User Filename: S06092544-8A.XLS
U06092544-4A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TRITIUM
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 8 44-8 100.00
H#, Total Counts: 162.7 3455
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



Sample Count Start Time:	25 Sep 2016 15:28:34		
Data Capture Date	25 Sep 2016 17:08:58		
User Filename	S06092544-9A.XLS		
	U06092544-4A.XLS		
Spectrum Type	Log Counts		
User Number	06		
User Id	TRITIUM		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	9	44-9	100.00
H#, Total Counts:	162.9	4274	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	



Sample Count Start Time:	25 Sep 2016 17:12:10		
Data Capture Date	25 Sep 2016 18:52:33		
User Filename	S06092544-10A.XLS		
	U06092544-4A.XLS		
Spectrum Type	Log Counts		
User Number	06		
User Id	TRITIUM		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	10	44-10	100.00
H#, Total Counts:	161.1	4402	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	



1598092

ID: TRITIUM

26 SEP 2016 07:05

USER: 6

COMMENT: BROWN

PRESET TIME : 180.00

DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD

COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT

TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF

SCINTILLATOR: LIQUID LUMEX: YES LOW SAMPLE REJ: 0

LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

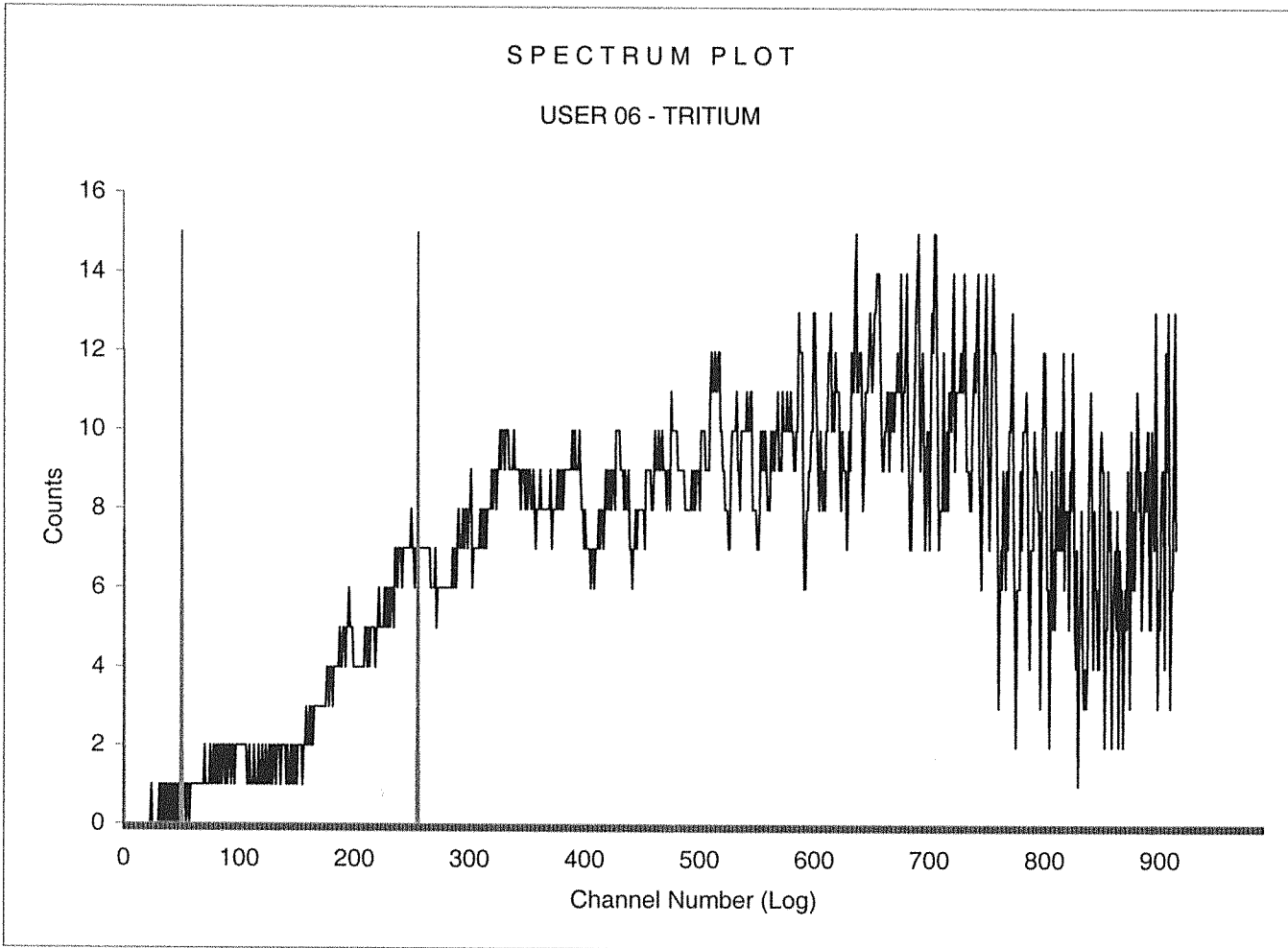
CHAN: 50.0 - 255.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

CHAN: 0.0 - 900.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		
1	44-1	180.00	165.8	3.46	9.51	34.86	2.58	3.28	185.60
2	44-2	180.00	205.0	3.77	17.30	34.18	3.09	28.72	375.64

AKK
19

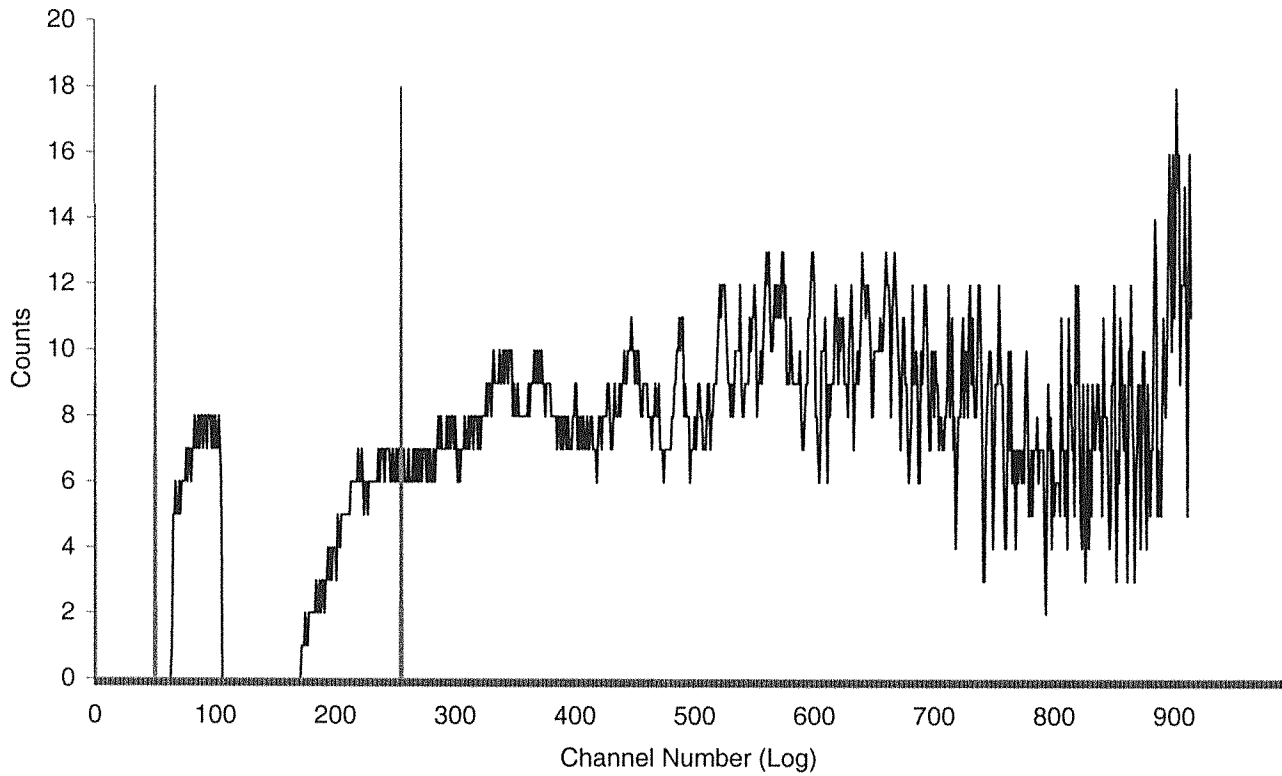
Sample Count Start Time: 26 Sep 2016 06:40:18
Data Capture Date: 26 Sep 2016 09:40:42
User Filename: S06092644-1A.XLS
U06092644-1A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TRITIUM
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 1 44-1 180.00
H#, Total Counts: 165.8 6393
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



Sample Count Start Time: 26 Sep 2016 09:50:20
Data Capture Date: 26 Sep 2016 12:50:43
User Filename: S06092644-2A.XLS
U06092644-1A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TRITIUM
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 2 44-2 180.00
H#, Total Counts: 205.0 6329
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990

SPECTRUM PLOT

USER 06 - TRITIUM



23-Sep-2016

Batch# 1598081

Product: Cl4

Date: 9/28/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			NA
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	see DSR 1562017
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER 1562017
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER 1562017
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: _____

[Signature]
Secondary Review Performed By: *[Signature]* 9/28/16

MTWC
10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 28-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LSC	Test / Method: EPA EERF C-01 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1598081	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060, 1203626110, and 1203626111 were received and analyzed out of the method specified hold time.</p>		<p>1. Reporting results.</p>	

Originator's Name:

Elizabeth Krouse 28-SEP-16

Data Validator/Group Leader:

Lyndsey Pace 28-SEP-16

MSJL
10/4
70 10/4

Prep Logbook

The Determination of Carbon-14 in Water, Soil, Vegetation and Other Solid Matrices

Batch ID: 1598081

Analyst: Tiffany Jordan

Method: EPA EERF C-01 Modified

Lab SOP: GL-RAD-A-003 REV# 15

Instrument: BAL-16107662

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
LCS	1203626112	Carbon-14 SPIKE	1646-B	.1	mL
MS	1203626111	Carbon-14 SPIKE	1646-B	.1	mL

Sample ID	Prep Date	Matrix	Dry or Wet	Unadjusted Aliquot (g)	Aliquot (g)	Flask #
405235041	19-SEP-2016 11:46:47	Soil	W	1.273	1.121	1
405235042	19-SEP-2016 11:46:47	Soil	W	1.252	1.115	2
405235043	19-SEP-2016 11:46:47	Soil	W	1.313	1.122	3
405235044	19-SEP-2016 11:46:47	Soil	W	1.361	1.024	4
405235045	19-SEP-2016 11:46:47	Soil	W	1.308	1.015	5
405235046	19-SEP-2016 11:46:47	Soil	W	1.356	1.103	6
405235047	19-SEP-2016 11:46:47	Soil	W	1.305	1.035	8
405235048	19-SEP-2016 11:46:47	Soil	W	1.268	0.978	83
405235049	19-SEP-2016 11:46:47	Soil	W	1.274	1.035	84
405235050	19-SEP-2016 11:46:47	Soil	W	1.358	1.208	86
405235051	19-SEP-2016 11:46:47	Soil	W	1.275	1.05	400
405235052	19-SEP-2016 11:46:47	Soil	W	1.401	1.184	402
405235053	19-SEP-2016 11:46:47	Soil	W	1.277	0.889	404
405235054	19-SEP-2016 11:46:47	Soil	W	1.27	1.039	405
405235055	19-SEP-2016 11:46:47	Soil	W	1.364	1.101	406
405235056	19-SEP-2016 11:46:47	Soil	W	1.33	0.907	506
405235057	19-SEP-2016 11:46:47	Soil	W	1.313	0.957	507
405235058	19-SEP-2016 11:46:47	Soil	W	1.315	1.055	514
405235059	19-SEP-2016 11:46:47	Soil	W	1.259	1.108	519
405235060	19-SEP-2016 11:46:47	Soil	W	1.4	1.265	530
1203626109 MB	19-SEP-2016 11:46:47	Soil	W	1.289	1.265	706
1203626110 DUP (405235041)	19-SEP-2016 11:46:47	Soil	W	1.289	1.135	708
1203626111 MS (405235041)	19-SEP-2016 11:46:47	Soil	W	1.393	1.226	729
1203626112 LCS	19-SEP-2016 11:46:47	Soil	W	1.265	1.265	733

Reagent/Solvent Lot ID	Description	Amount	Comments:
2242305.2	Eoscient A Scintillation Solution	10 mL	Spike Pipet ID: RAD-LSC-2970968 Data Entry Date: 26-SEP-2016 14:31 BAL-16107662 Tiffany Jordan
2431394.13	16M Nitric Acid Poly Coated Bottle	25 mL	
2440076.3	Potassium Persulfate 99+%	5 g	
2440953	RL-0.4M Hydrochloric Acid	50 mL	
2444293.4	Methanol 4L Plastic Bottle	9 mL	
2455949	RL-1M Silver Nitrate	2 mL	

Carbon-14 Solid

Filename : C14.XLS
 File type : Excel
 Version # : 1.3.10

Batch : 1598081
 Analyst : TIF02034
 Prep Date : 9/19/2016
 Method Uncertainty : 0.0363

Procedure Code : LSC_14CS
 Parrrname : Carbon-14
 Required MDA : 2 pCi/G
 C-14 Abundance : 1.00
 Halfife of Carbon-14 : 5700.00 years

Geometry: 3mL Ethanolamine/9mL Methanol/10mL EcoScint A

Pos.	Sample Characteristics			Counting			Count raw Data			Corrected			Count Start Date/Time	C-14 Normalization Factor	Sample Decay
	Sample ID	Sample Aliquot G	Sample Aliquot G	Sample Aliquot G	SiDev.	Sample Date/Time	Rack Position #	Counting Time (min.)	Quench#	Gross cpm	Bkg cpm	Bkg Count Time (min.)			
1	405235041.1	1.1210	3.3359E-03	11/30/2015 13:27	3-2	70	233.9	15.19	14.64	70	240.8	15.2382	9/26/2016 16:33	1.00000	1.000
2	405235042.1	1.1150	3.3353E-03	11/30/2015 13:53	3-3	70	233.6	15.57	14.64	70	240.8	15.2663	9/26/2016 17:45	1.00000	1.000
3	405235043.1	1.1220	3.3360E-03	11/30/2015 13:59	3-4	70	236.7	14.6	14.64	70	240.8	14.9846	9/26/2016 18:57	1.00000	1.000
4	405235044.1	1.0240	3.3258E-03	11/30/2015 13:50	3-5	70	233	15.11	14.64	70	240.8	15.3231	9/26/2016 20:09	1.00000	1.000
5	405235045.1	1.0150	3.3249E-03	11/30/2015 14:15	3-6	70	232.4	15.2	14.64	70	240.8	15.3805	9/26/2016 21:20	1.00000	1.000
6	405235046.1	1.1030	3.3341E-03	12/7/2015 10:02	3-7	70	235.1	15.47	14.64	70	240.8	15.1277	9/26/2016 22:32	1.00000	1.000
7	405235047.1	1.0350	3.3270E-03	12/7/2015 10:10	3-8	70	232.9	14.74	14.64	70	240.8	15.3326	9/26/2016 23:44	1.00000	1.000
8	405235048.1	0.9780	3.3210E-03	12/7/2015 13:28	16-1	70	233.9	14.89	14.64	70	240.8	15.2382	9/27/2016 2:07	1.00000	1.000
9	405235049.1	1.0350	3.3270E-03	12/7/2015 13:33	16-2	70	230.6	14.5	14.64	70	240.8	15.5572	9/27/2016 3:19	1.00000	1.000
10	405235050.1	1.2080	3.3450E-03	12/7/2015 13:42	16-3	70	231.4	14.93	14.64	70	240.8	15.4778	9/27/2016 4:30	1.00000	1.000
11	405235051.1	1.0500	3.3285E-03	12/7/2015 13:02	16-4	70	232.5	14.83	14.64	70	240.8	15.3709	9/27/2016 5:42	1.00000	1.000
12	405235052.1	1.1840	3.3425E-03	12/7/2015 13:11	16-5	70	232.1	14.83	14.64	70	240.8	15.4095	9/27/2016 6:54	1.00000	1.000
13	405235053.1	0.8890	3.3118E-03	12/1/2015 14:24	16-6	70	232.3	15.9	14.64	70	240.8	15.3901	9/27/2016 8:06	1.00000	1.000
14	405235054.1	1.0390	3.3274E-03	12/2/2015 14:51	16-7	70	232.9	14.44	14.64	70	240.8	15.3326	9/27/2016 9:17	1.00000	1.000
15	405235055.1	1.1010	3.3338E-03	12/2/2015 14:59	16-8	70	235.1	14.41	14.64	70	240.8	15.1277	9/27/2016 10:29	1.00000	1.000
16	405235056.1	0.9070	3.3137E-03	12/2/2015 14:50	16-9	70	231.4	14.47	14.64	70	240.8	15.4778	9/27/2016 11:41	1.00000	1.000
17	405235057.1	0.9570	3.3189E-03	12/2/2015 14:55	16-10	70	232.8	15.81	14.64	70	240.8	15.3421	9/27/2016 12:53	1.00000	1.000
18	405235058.1	1.0550	3.3291E-03	12/2/2015 15:00	16-11	70	234.8	15	14.64	70	240.8	15.1551	9/27/2016 14:04	1.00000	1.000
19	405235059.1	1.1080	3.3346E-03	12/16/2015 12:26	16-12	70	234.6	15.63	14.64	70	240.8	15.1734	9/27/2016 15:16	1.00000	1.000
20	405235060.1	1.2650	3.3509E-03	12/16/2015 12:33	53-1	70	237.4	14.89	14.64	70	240.8	14.9235	9/27/2016 16:28	1.00000	1.000
21	1203626109.1	1.2650	3.3509E-03	9/19/2016 0:00	53-2	70	233.2	14.8	14.64	70	240.8	15.3041	9/27/2016 17:40	1.00000	1.000
22	1203626110.1	1.1350	3.3374E-03	11/30/2015 13:27	53-3	70	233	15.7	14.64	70	240.8	15.3231	9/27/2016 18:52	1.00000	1.000
23	1203626111.1	1.2260	3.3468E-03	11/30/2015 13:27	53-4	70	232	141.11	14.64	70	240.8	15.4192	9/27/2016 20:03	1.00000	1.000
24	1203626112.1	1.2650	3.3509E-03	9/19/2016 0:00	53-5	70	232.4	143.73	14.64	70	240.8	15.3805	9/27/2016 21:15	1.00000	1.000

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml

Analytical SOP: GL-RAD-A-003
 Instrument SOP: GL-RAD-I-004

Pos.	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Background Rack Position #	Background Count Start Date/Time
1	LSCBROWN	6/1/2016	5/31/2017	0.7692	0.00792	3-1	9/26/2016 15:21
2	LSCBROWN	6/1/2016	5/31/2017	0.7698	0.00792	3-1	9/26/2016 15:21
3	LSCBROWN	6/1/2016	5/31/2017	0.7696	0.00792	3-1	9/26/2016 15:21
4	LSCBROWN	6/1/2016	5/31/2017	0.7710	0.00792	3-1	9/26/2016 15:21
5	LSCBROWN	6/1/2016	5/31/2017	0.7722	0.00792	3-1	9/26/2016 15:21
6	LSCBROWN	6/1/2016	5/31/2017	0.7668	0.00792	3-1	9/26/2016 15:21
7	LSCBROWN	6/1/2016	5/31/2017	0.7712	0.00792	3-1	9/26/2016 15:21
8	LSCBROWN	6/1/2016	5/31/2017	0.7692	0.00792	3-1	9/26/2016 15:21
9	LSCBROWN	6/1/2016	5/31/2017	0.7757	0.00792	3-1	9/26/2016 15:21
10	LSCBROWN	6/1/2016	5/31/2017	0.7741	0.00792	3-1	9/26/2016 15:21
11	LSCBROWN	6/1/2016	5/31/2017	0.7728	0.00792	3-1	9/26/2016 15:21
12	LSCBROWN	6/1/2016	5/31/2017	0.7720	0.00792	3-1	9/26/2016 15:21
13	LSCBROWN	6/1/2016	5/31/2017	0.7724	0.00792	3-1	9/26/2016 15:21
14	LSCBROWN	6/1/2016	5/31/2017	0.7712	0.00792	3-1	9/26/2016 15:21
15	LSCBROWN	6/1/2016	5/31/2017	0.7688	0.00792	3-1	9/26/2016 15:21
16	LSCBROWN	6/1/2016	5/31/2017	0.7741	0.00792	3-1	9/26/2016 15:21
17	LSCBROWN	6/1/2016	5/31/2017	0.7714	0.00792	3-1	9/26/2016 15:21
18	LSCBROWN	6/1/2016	5/31/2017	0.7674	0.00792	3-1	9/26/2016 15:21
19	LSCBROWN	6/1/2016	5/31/2017	0.7678	0.00792	3-1	9/26/2016 15:21
20	LSCBROWN	6/1/2016	5/31/2017	0.7622	0.00792	3-1	9/26/2016 15:21
21	LSCBROWN	6/1/2016	5/31/2017	0.7706	0.00792	3-1	9/26/2016 15:21
22	LSCBROWN	6/1/2016	5/31/2017	0.7710	0.00792	3-1	9/26/2016 15:21
23	LSCBROWN	6/1/2016	5/31/2017	0.7730	0.00792	3-1	9/26/2016 15:21
24	LSCBROWN	6/1/2016	5/31/2017	0.7722	0.00792	3-1	9/26/2016 15:21

Spike S/N : 1646-B
 Spike Exp Date : 1/5/2017
 Spike Activity (dpm/ml): 1681.40
 Spike Volume Added: 0.10

LCS S/N : 1646-B
 LCS Exp Date : 1/5/2017
 LCS Activity (dpm/ml): 1681.40
 LCS Volume Added: 0.10

Notes:
 * - Results are decay corrected to Sample Date/Time
 * - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 * - Spike Nominals are decay corrected to Sample Date/Time
 * - RPD changed to 0% due to sample & dup activity below MDA

Pos.	Decision Level	Critical Level	Required MDA	Sample Act. Conc.	Sample Act. Error	Net Count Rate	Net Count Rate Error	2 SIGMA Counting Uncertainty	2 SIGMA Total Prop. Uncertainty	Sample QC	Sample Type	RPD	RER	Nominal pCi/g	Recovery
1	0.8032	0.5671	2	1.1565	-0.0252	1366.51%	-0.0482	0.6593	0.6751		SAMPLE				
2	0.8076	0.5702	2	1.1629	0.1594	218.57%	0.3037	0.6637	0.6828		SAMPLE				
3	0.8016	0.5659	2	1.1544	-0.2022	169.04%	-0.3846	0.6501	0.6700		SAMPLE				
4	0.8797	0.6211	2	1.2666	-0.1216	309.49%	-0.2131	0.6594	0.7374		SAMPLE				
5	0.8878	0.6268	2	1.2782	-0.1037	366.21%	-0.1805	0.6610	0.7446		SAMPLE				
6	0.8159	0.5760	2	1.1748	0.1823	193.13%	0.3423	0.6611	0.6902		SAMPLE				
7	0.8704	0.6145	2	1.2532	-0.3344	110.61%	-0.5926	0.6554	0.7251		SAMPLE				
8	0.9206	0.6500	2	1.3256	-0.2085	188.39%	-0.3482	0.6561	0.7700		SAMPLE				
9	0.8717	0.6154	2	1.2549	-0.5932	61.99%	-1.0572	0.6553	0.7207		SAMPLE				
10	0.7464	0.5270	2	1.0746	-0.2639	120.31%	-0.5478	0.6591	0.6223		SAMPLE				
11	0.8584	0.6060	2	1.2358	-0.3217	113.43%	-0.5795	0.6573	0.7152		SAMPLE				
12	0.7610	0.5373	2	1.0957	-0.2666	121.45%	-0.5409	0.6568	0.6345		SAMPLE				
13	1.0137	0.7157	2	1.4595	0.3345	131.13%	0.5099	0.6686	0.8601		SAMPLE				
14	0.8670	0.6121	2	1.2484	-0.5018	73.07%	-0.8926	0.6522	0.7187		SAMPLE				
15	0.8173	0.5771	2	1.1770	-0.3829	90.52%	-0.7177	0.6496	0.6793		SAMPLE				
16	0.9941	0.7019	2	1.4312	-0.6466	64.91%	-1.0078	0.6541	0.8225		SAMPLE				
17	0.9414	0.6646	2	1.3554	0.2855	142.58%	0.4679	0.6671	0.7979		SAMPLE				
18	0.8531	0.6023	2	1.2284	-0.0863	423.31%	-0.1551	0.6563	0.7158		SAMPLE				
19	0.8123	0.5735	2	1.1697	0.2418	145.29%	0.4566	0.6634	0.6885		SAMPLE				
20	0.7109	0.5019	2	1.0238	-0.0157	1945.26%	-0.0335	0.6526	0.5976		SAMPLE				
21	0.7119	0.5026	2	1.0251	-0.2329	130.10%	-0.5041	0.6558	0.5939		MB				
22	0.7937	0.5603	2	1.1427	0.1941	176.61%	0.3769	0.6657	0.6719	405235041.1	DUP	* 0.0%		61.7831	96.7%
23	0.7352	0.5190	2	1.0585	59.7508	1.46%	125.6908	1.4954	1.3933	405235041.1	MS			59.8725	98.9%
24	0.7123	0.5029	2	1.0255	59.1877	1.44%	128.3495	1.5076	1.3627		LCS				

1598081

PAGE: 1

ID: C-14

26 SEP 2016 15:51

USER: B

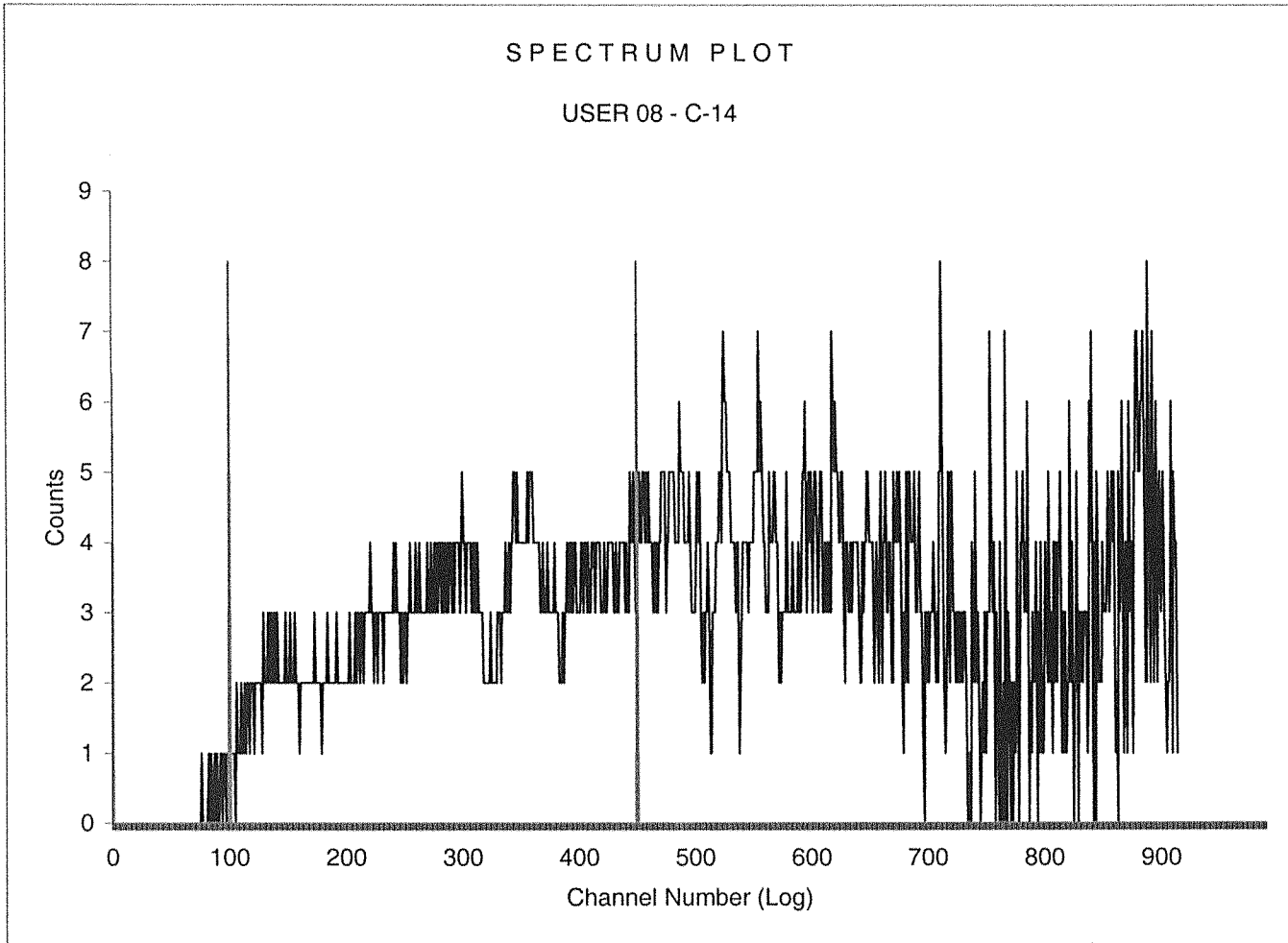
COMMENT: BROWN

PRESET TIME : 70.00
 DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : EDIT
 COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT
 TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF
 SCINTILLATOR: LIQUID LUMEX: NO LOW SAMPLE REJ: 0
 LOW LEVEL : YES HALF LIFE CORRECTION DATE: none

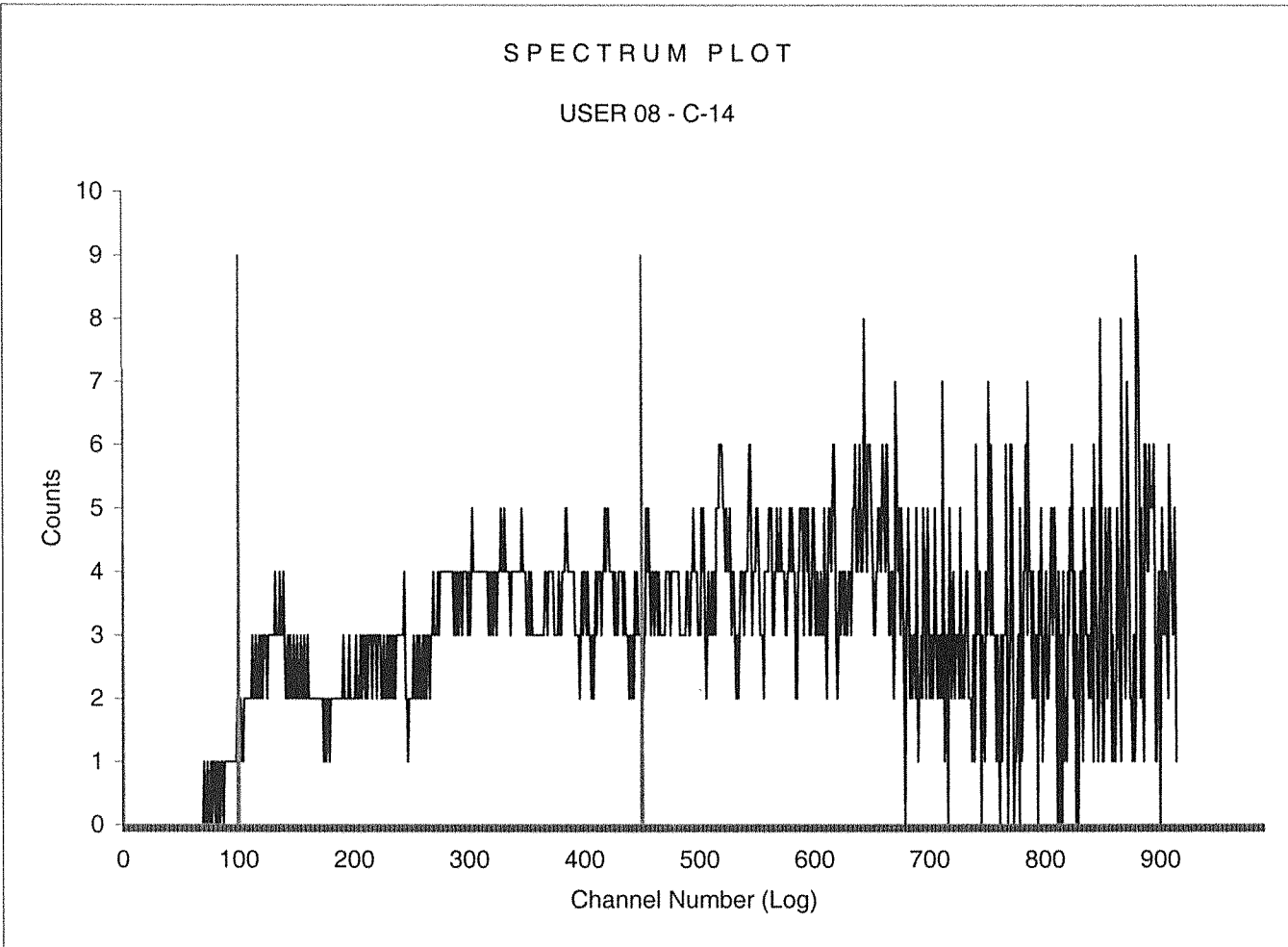
CHAN: 100.0 - 450.0 %ERROR: 0.00 FACTOR: 1.0000000 BKG. SUB: 0
 CHAN: 0.0 - 900.0 %ERROR: 0.00 FACTOR: 1.0000000 BKG. SUB: 0

SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		
<i>BV</i> 1	3-1	70.00	240.8	14.64	6.25	37.14	3.92	0.87	71.24
1 2	3-2	70.00	233.9	15.19	6.13	38.30	3.86	1.43	143.01
2 3	3-3	70.00	233.6	15.57	6.06	37.51	3.90	1.19	214.76
3 4	3-4	70.00	236.7	14.60	6.26	37.66	3.90	1.36	286.53
4 5	3-5	70.00	233.0	15.11	6.15	36.44	3.96	2.07	358.35
5 6	3-6	70.00	232.4	15.20	6.13	36.69	3.95	2.11	430.17
6 7	3-7	70.00	235.1	15.47	6.08	36.76	3.94	1.11	501.93
7 8	3-8	70.00	232.9	14.74	6.23	37.19	3.92	1.22	573.70

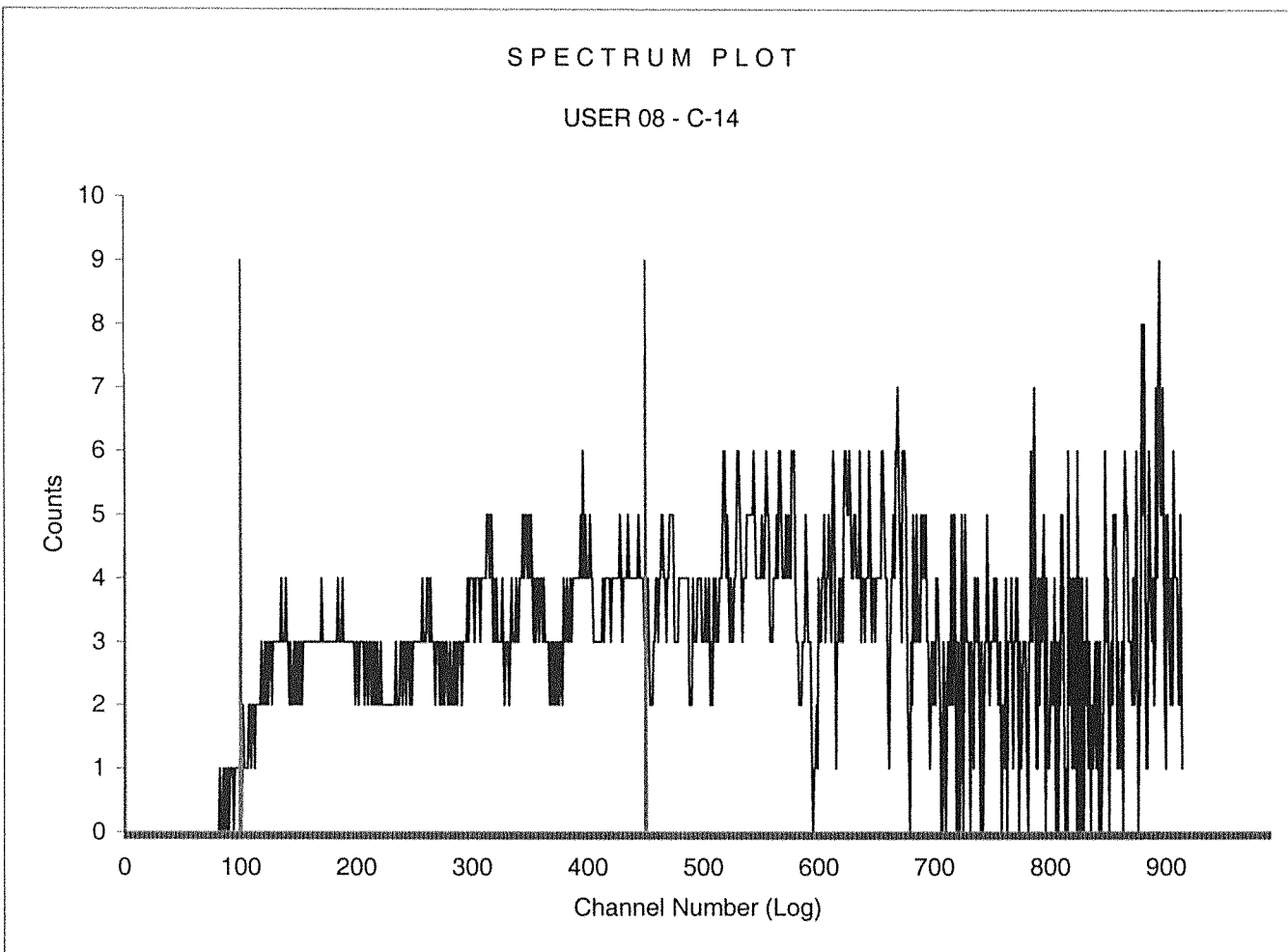
Sample Count Start Time: 26 Sep 2016 15:21:57
Data Capture Date: 26 Sep 2016 16:32:20
User Filename: S08092603-1A.XLS
U08092603-1A.XLS
Spectrum Type: Log Counts
User Number: 08
User Id: C-14
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 1 3-1 70.00
H#, Total Counts: 240.8 2643
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



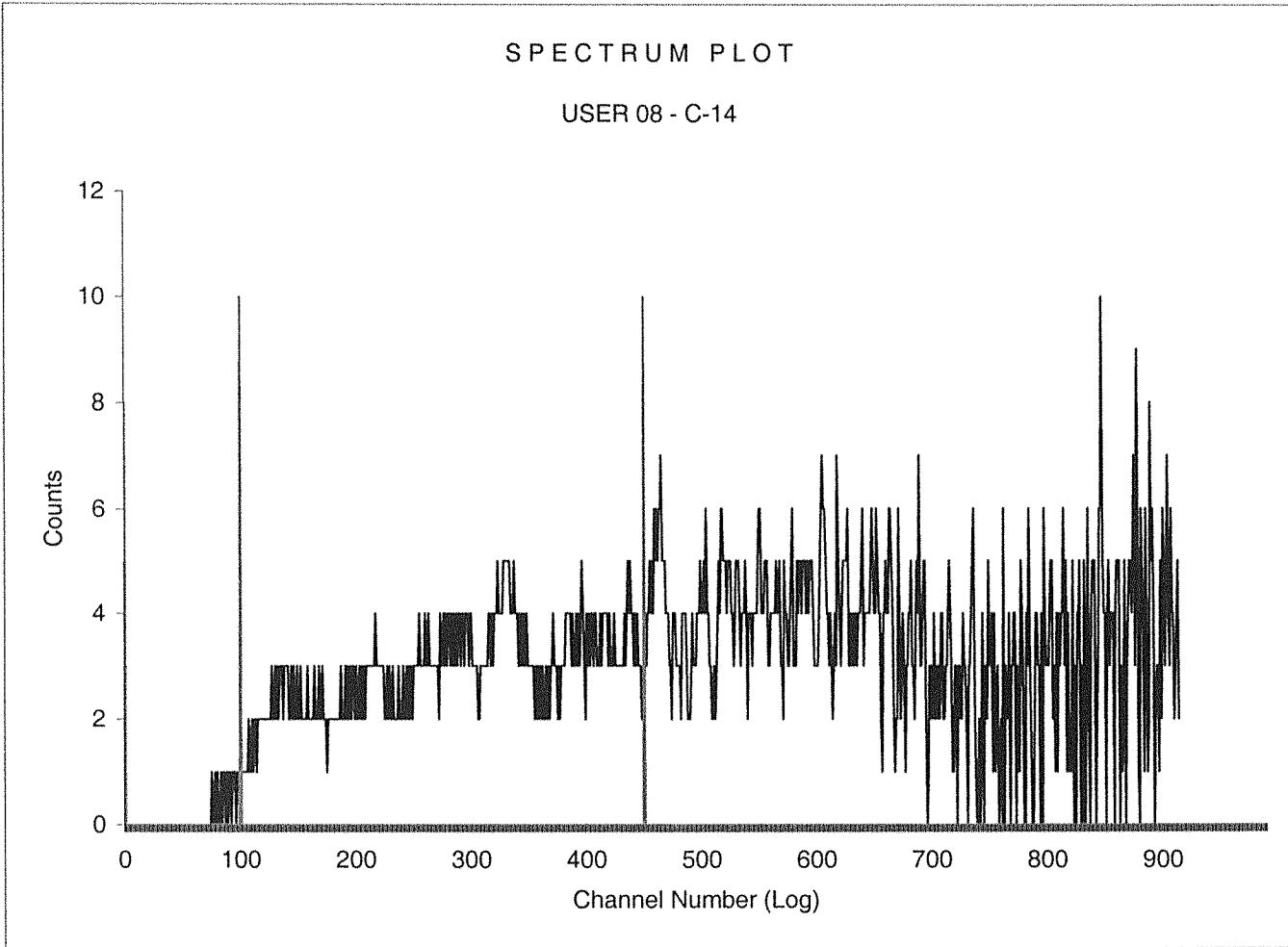
Sample Count Start Time: 26 Sep 2016 16:33:44
Data Capture Date: 26 Sep 2016 17:44:07
User Filename: S08092603-2A.XLS
U08092603-1A.XLS
Spectrum Type: Log Counts
User Number: 08
User Id: C-14
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 2 3-2 70.00
H#, Total Counts: 233.9 2732
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



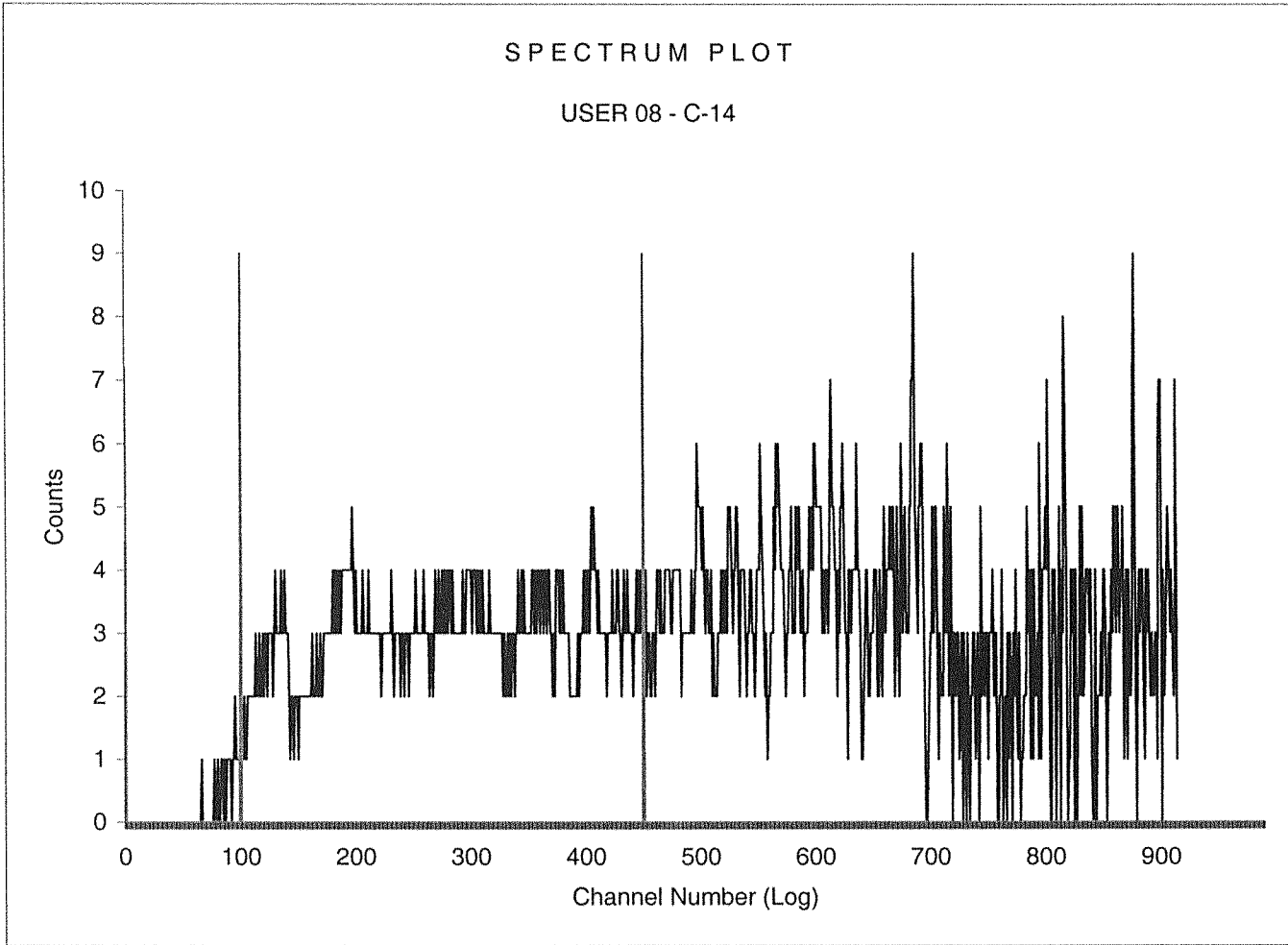
Sample Count Start Time: 26 Sep 2016 17:45:29
Data Capture Date 26 Sep 2016 18:55:52
User Filename S08092603-3A.XLS
U08092603-1A.XLS
Spectrum Type Log Counts
User Number 08
User Id C-14
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 3 3-3 70.00
H#, Total Counts: 233.6 2675
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



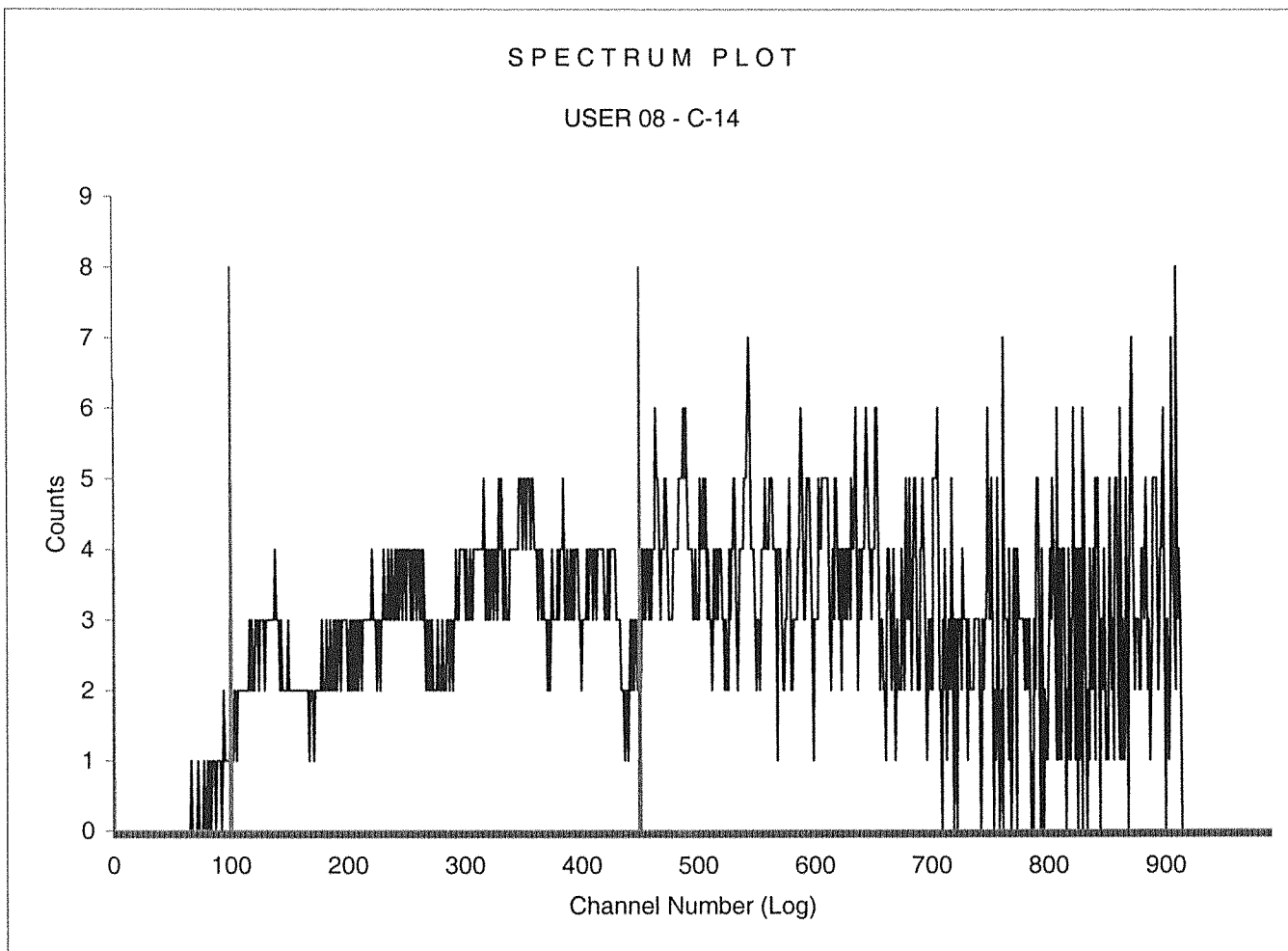
Sample Count Start Time: 26 Sep 2016 18:57:15
Data Capture Date: 26 Sep 2016 20:07:37
User Filename: S08092603-4A.XLS
U08092603-1A.XLS
Spectrum Type: Log Counts
User Number: 08
User Id: C-14
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 4 3-4 70.00
H#, Total Counts: 236.7 2693
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



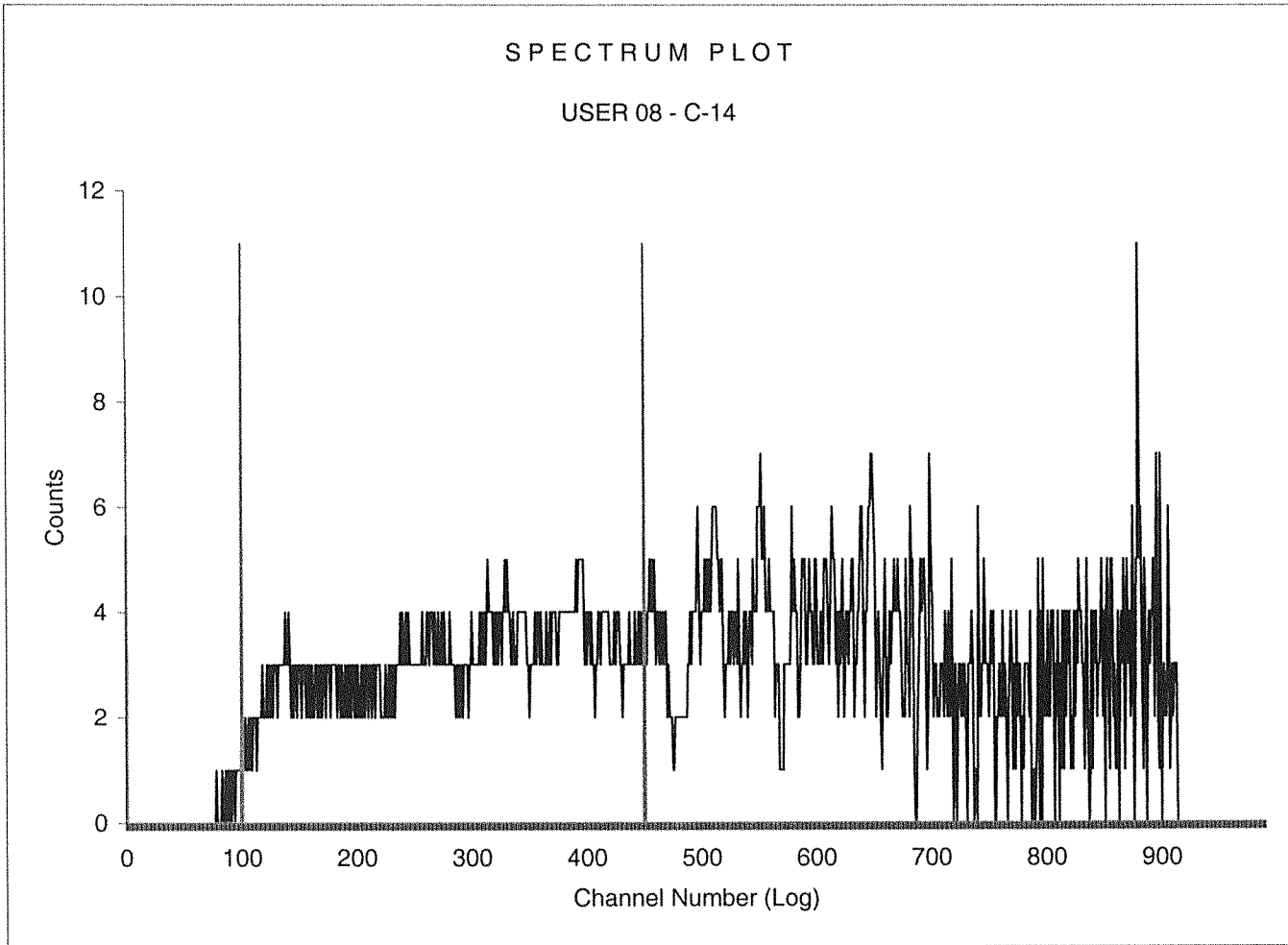
Sample Count Start Time: 26 Sep 2016 20:09:04
Data Capture Date 26 Sep 2016 21:19:27
User Filename S08092603-5A.XLS
U08092603-1A.XLS
Spectrum Type Log Counts
User Number 08
User Id C-14
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 5 3-5 70.00
H#, Total Counts: 233.0 2596
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



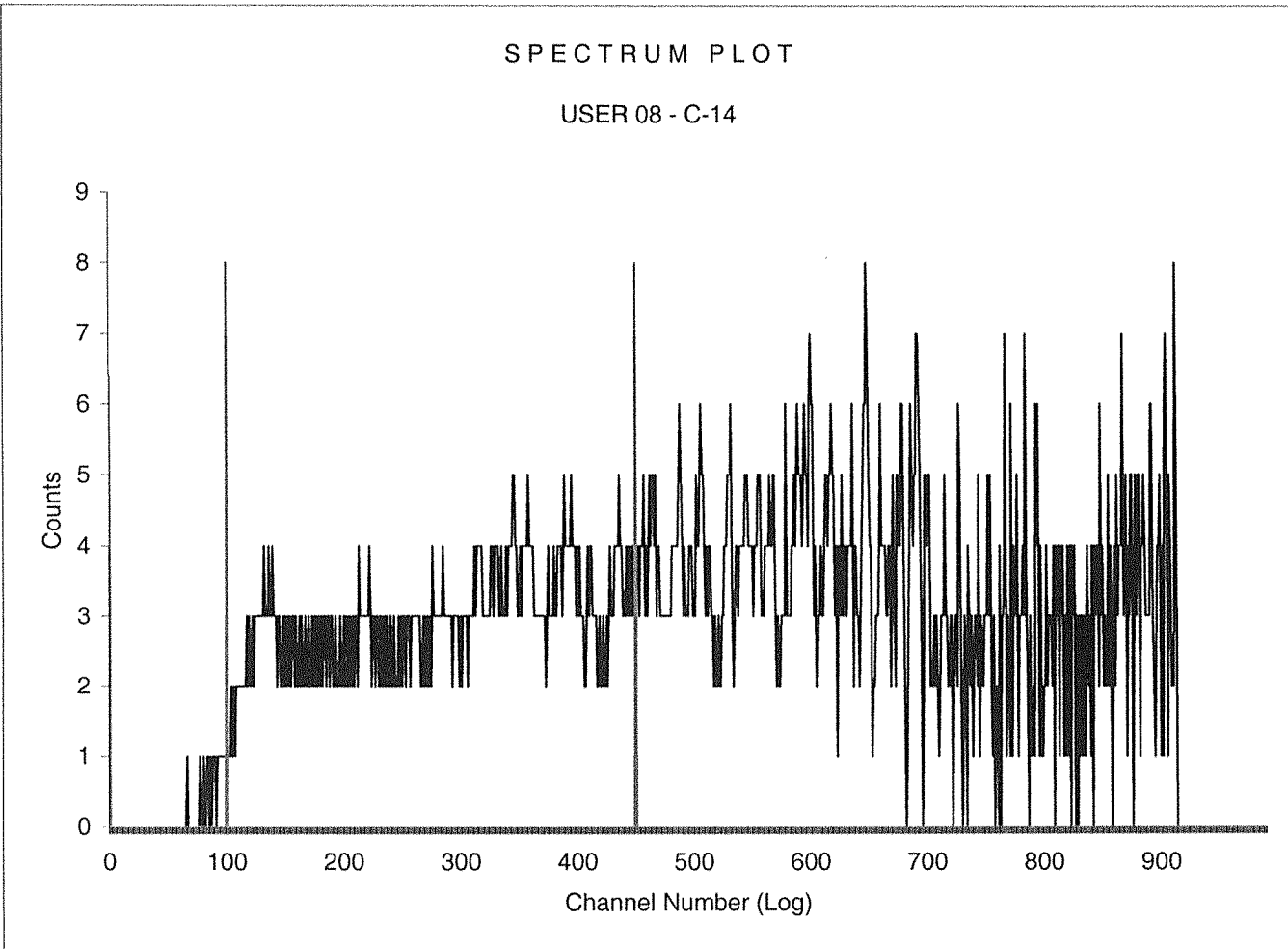
Sample Count Start Time: 26 Sep 2016 21:20:53
Data Capture Date 26 Sep 2016 22:31:16
User Filename S08092603-6A.XLS
U08092603-1A.XLS
Spectrum Type Log Counts
User Number 08
User Id C-14
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 6 3-6 70.00
H#, Total Counts: 232.4 2614
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



Sample Count Start Time: 26 Sep 2016 22:32:39
Data Capture Date: 26 Sep 2016 23:43:02
User Filename: S08092603-7A.XLS
U08092603-1A.XLS
Spectrum Type: Log Counts
User Number: 08
User Id: C-14
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 7 3-7 70.00
H#, Total Counts: 235.1 2608
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



Sample Count Start Time: 26 Sep 2016 23:44:25
Data Capture Date: 27 Sep 2016 00:54:48
User Filename: S08092703-8A.XLS
U08092603-1A.XLS
Spectrum Type: Log Counts
User Number: 08
User Id: C-14
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 8 3-8 70.00
H#, Total Counts: 232.9 2654
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



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ID: C-14

27 SEP 2016 02:37

USER: 8 COMMENT: BROWN

PRESET TIME : 70.00

DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : EDIT

COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT

TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF

SCINTILLATOR: LIQUID LUMEX: NO LOW SAMPLE REJ: 0

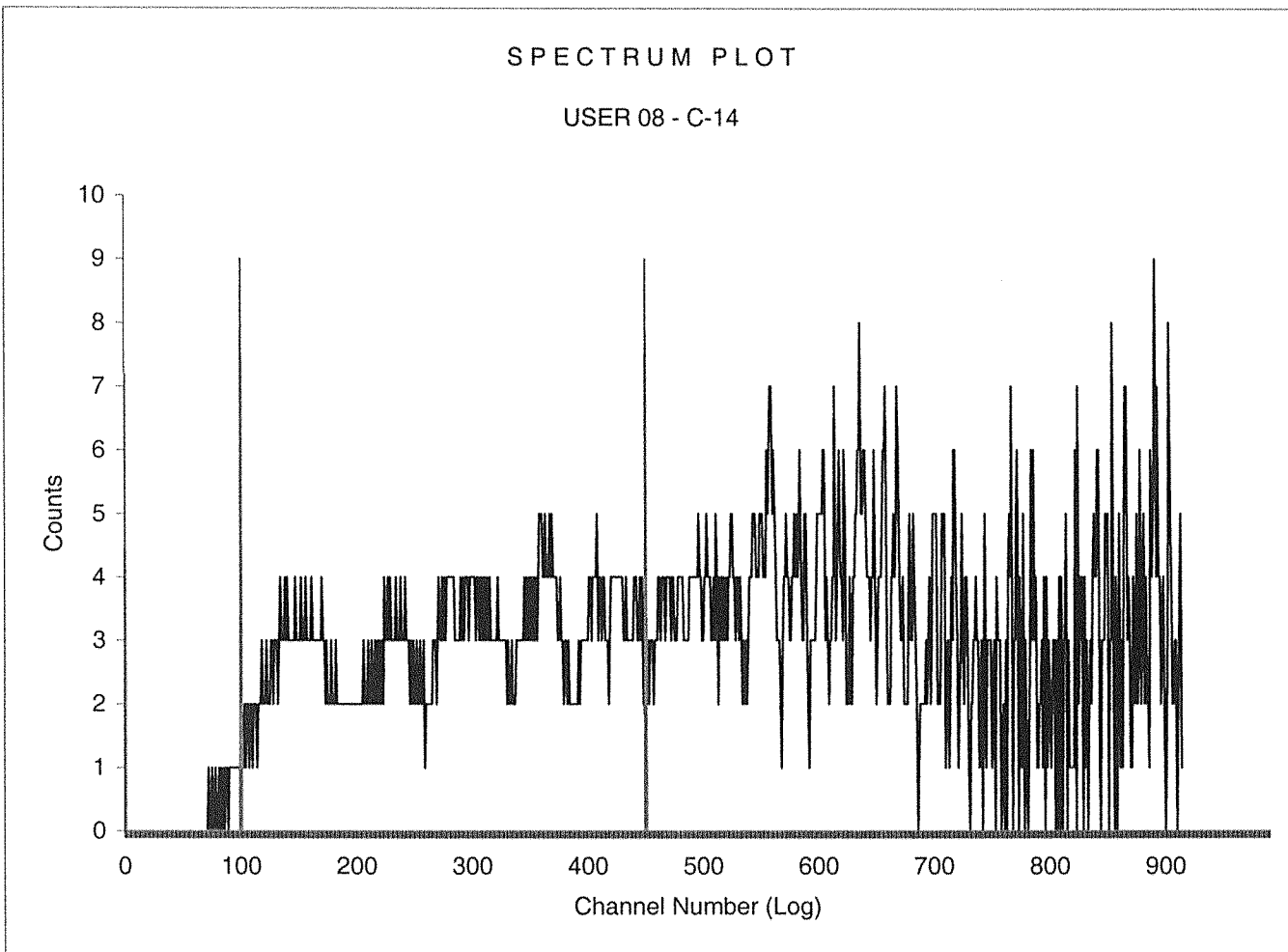
LOW LEVEL : YES HALF LIFE CORRECTION DATE: none

CHAN: 100.0 - 450.0 %ERROR: 0.00 FACTOR: 1.000000 BKG. SUB: 0

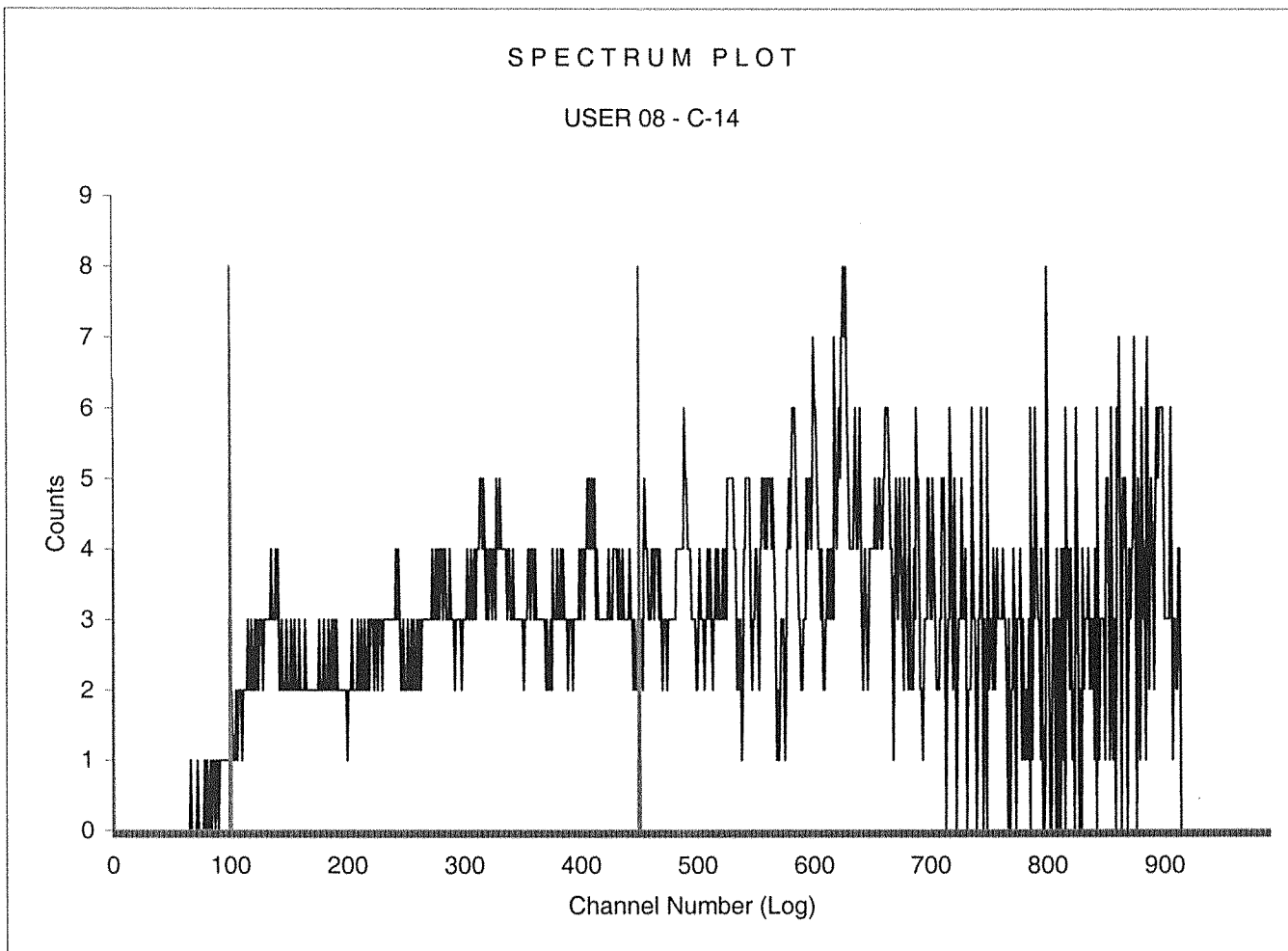
CHAN: 0.0 - 900.0 %ERROR: 0.00 FACTOR: 1.000000 BKG. SUB: 0

SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME	
				CPM	%ERROR	CPM	%ERROR			
8	1	16-1	70.00	233.9	14.89	6.20	36.96	3.93	1.21	71.28
9	2	16-2	70.00	230.6	14.50	6.28	36.84	3.94	1.33	143.05
10	3	16-3	70.00	231.4	14.93	6.19	36.61	3.95	1.04	214.79
11	4	16-4	70.00	232.1	14.83	6.21	36.44	3.96	1.10	286.51
12	5	16-5	70.00	232.5	14.83	6.21	36.26	3.97	1.25	358.27
13	6	16-6	70.00	232.3	15.90	5.99	38.01	3.88	1.81	430.08
14	7	16-7	70.00	232.9	14.44	6.29	37.01	3.93	1.43	501.86
15	8	16-8	70.00	235.1	14.41	6.30	35.61	4.01	1.29	573.62
16	9	16-9	70.00	231.4	14.47	6.28	36.27	3.97	1.71	645.42
17	10	16-10	70.00	232.8	15.81	6.01	37.36	3.91	1.48	717.20
18	11	16-11	70.00	234.8	15.00	6.17	36.77	3.94	1.72	788.99
19	12	16-12	70.00	234.6	15.63	6.05	37.76	3.89	1.42	860.79
20	13	53-1	70.00	237.4	14.89	6.20	35.70	4.00	1.02	932.64
21	14	53-2	70.00	233.2	14.80	6.21	36.21	3.97	0.66	1004.34
22	15	53-3	70.00	233.0	15.70	6.03	37.44	3.91	1.13	1076.10
23	16	53-4	70.00	232.0	141.11	2.01	164.09	1.87	0.25	1147.85
24	17	53-5	70.00	232.4	143.73	1.99	166.49	1.85	0.13	1219.55

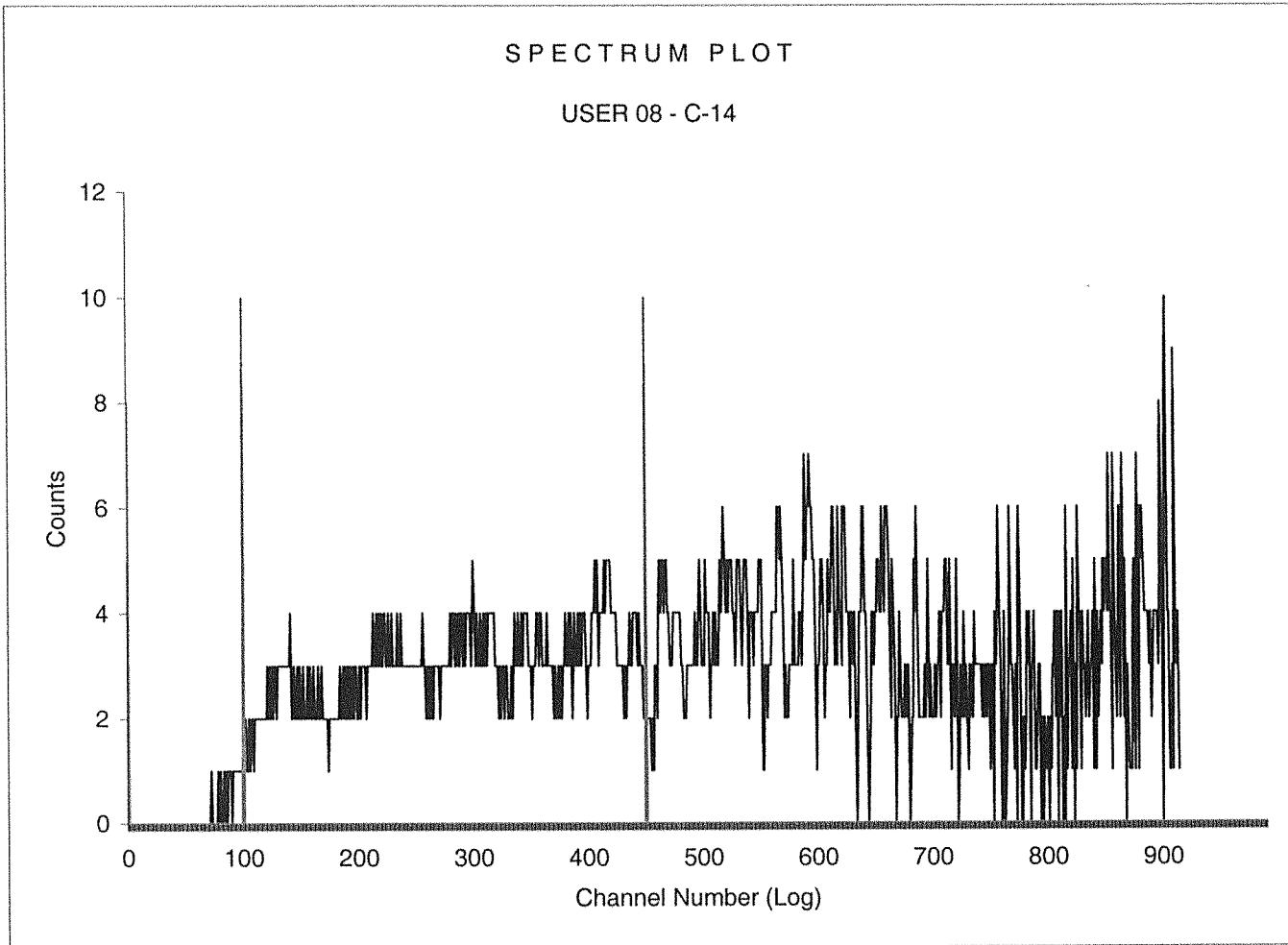
Sample Count Start Time: 27 Sep 2016 02:07:16
Data Capture Date 27 Sep 2016 03:17:39
User Filename S08092716-1A.XLS
U08092716-1A.XLS
Spectrum Type Log Counts
User Number 08
User Id C-14
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 1 16-1 70.00
H#, Total Counts: 233.9 2631
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



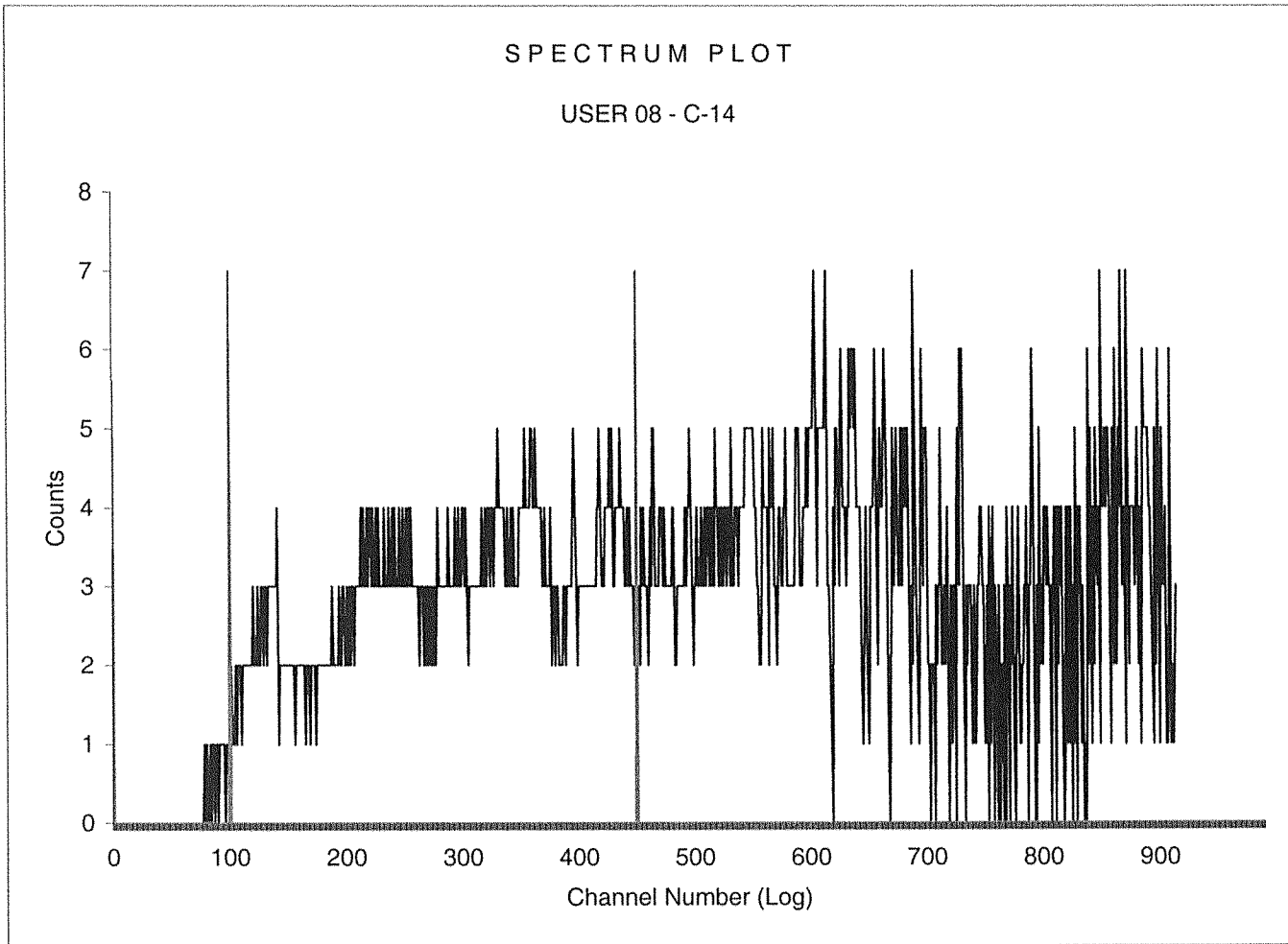
Sample Count Start Time: 27 Sep 2016 03:19:02
Data Capture Date: 27 Sep 2016 04:29:25
User Filename: S08092716-2A.XLS
U08092716-1A.XLS
Spectrum Type: Log Counts
User Number: 08
User Id: C-14
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 2 16-2 70.00
H#, Total Counts: 230.6 2621
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



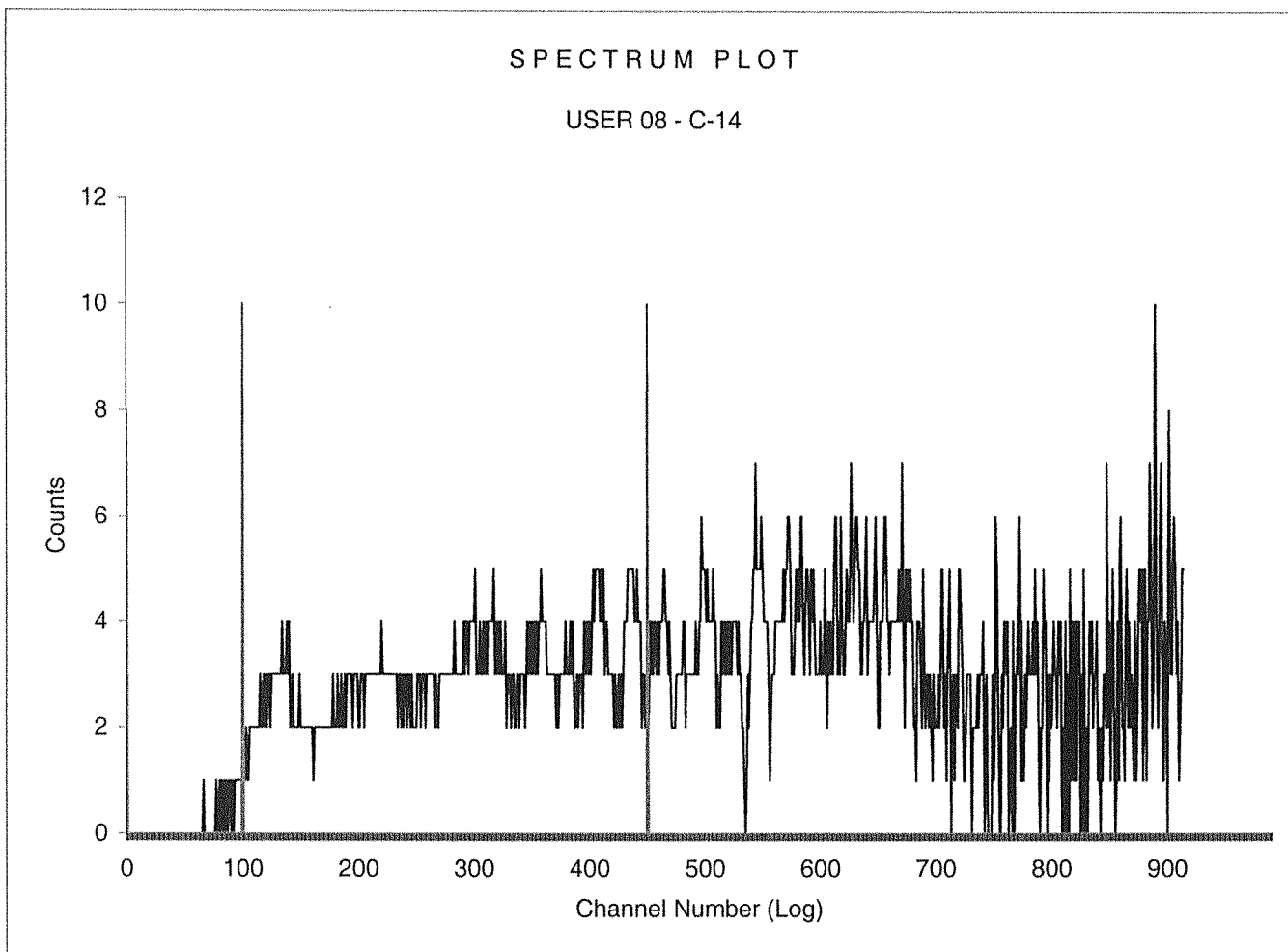
Sample Count Start Time: 27 Sep 2016 04:30:46
Data Capture Date 27 Sep 2016 05:41:09
User Filename S08092716-3A.XLS
U08092716-1A.XLS
Spectrum Type Log Counts
User Number 08
User Id C-14
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 3 16-3 70.00
H#, Total Counts: 231.4 2618
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



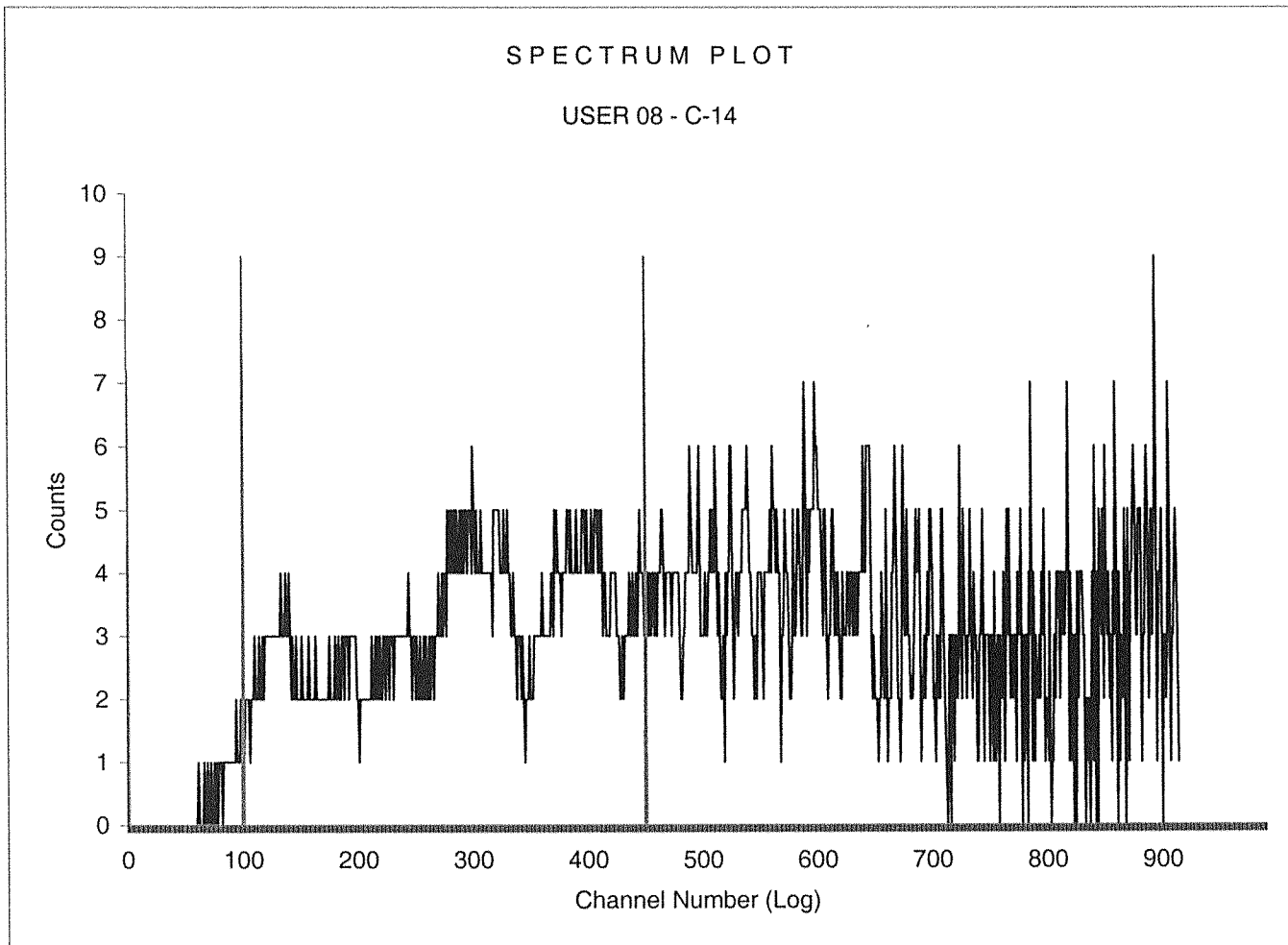
Sample Count Start Time: 27 Sep 2016 05:42:30
Data Capture Date 27 Sep 2016 06:52:53
User Filename S08092716-4A.XLS
U08092716-1A.XLS
Spectrum Type Log Counts
User Number 08
User Id C-14
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 4 16-4 70.00
H#, Total Counts: 232.1 2588
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



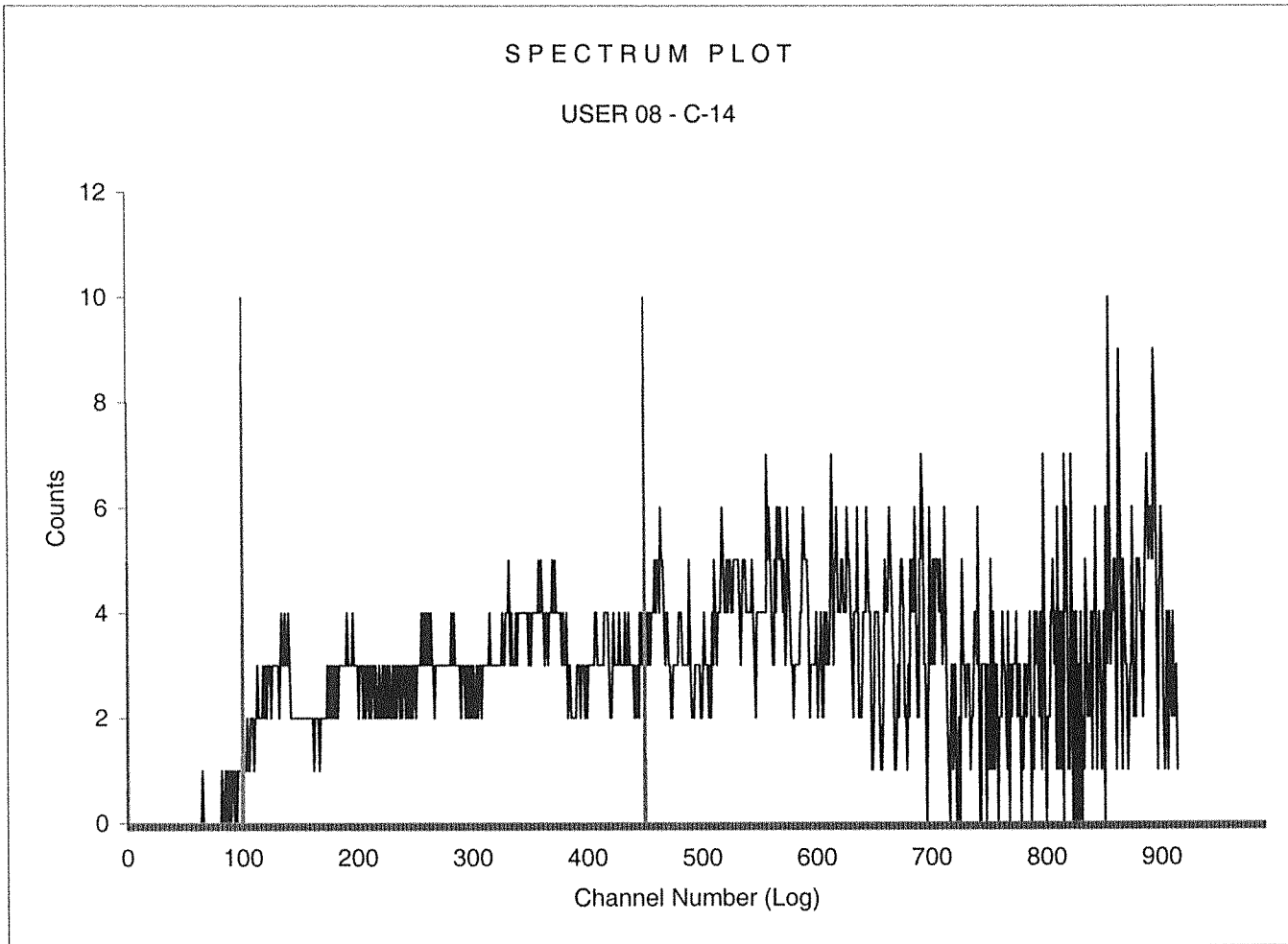
Sample Count Start Time: 27 Sep 2016 06:54:15
Data Capture Date: 27 Sep 2016 08:04:38
User Filename: S08092716-5A.XLS
U08092716-1A.XLS
Spectrum Type: Log Counts
User Number: 08
User Id: C-14
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 5 16-5 70.00
H#, Total Counts: 232.5 2596
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



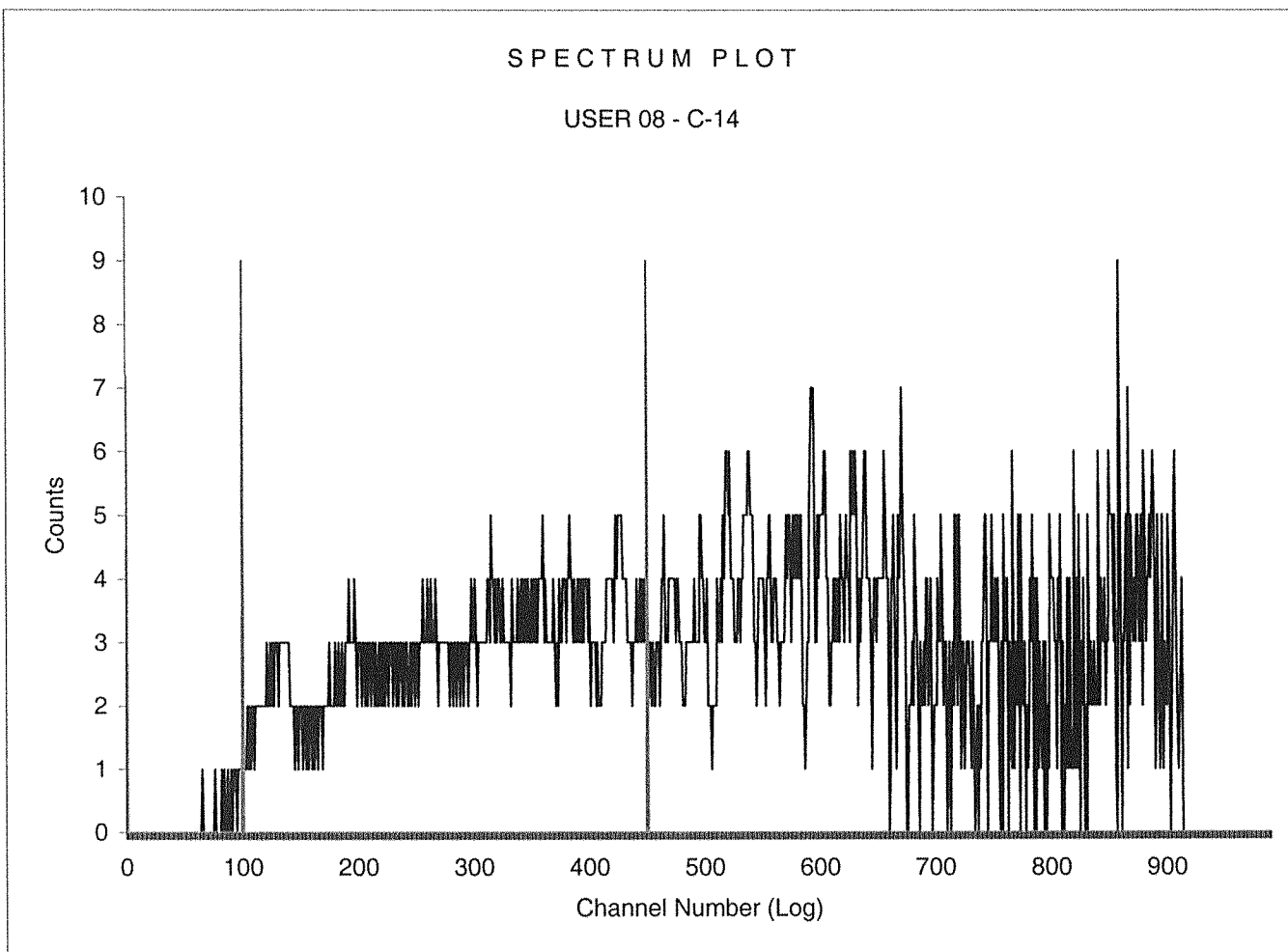
Sample Count Start Time: 27 Sep 2016 08:06:04
Data Capture Date: 27 Sep 2016 09:16:27
User Filename: S08092716-6A.XLS
U08092716-1A.XLS
Spectrum Type: Log Counts
User Number: 08
User Id: C-14
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 6 16-6 70.00
H#, Total Counts: 232.3 2708
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



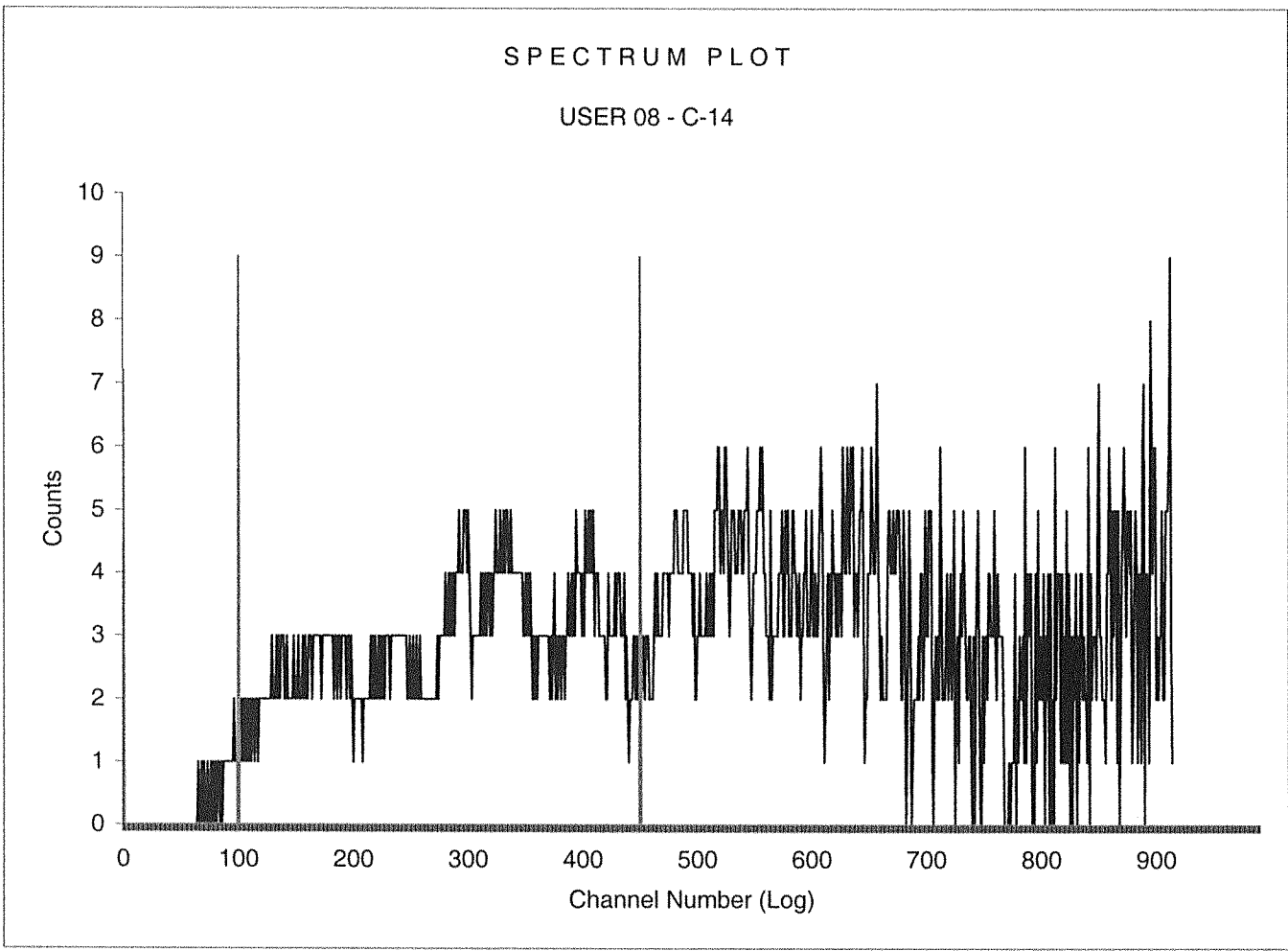
Sample Count Start Time: 27 Sep 2016 09:17:51
Data Capture Date: 27 Sep 2016 10:28:14
User Filename: S08092716-7A.XLS
U08092716-1A.XLS
Spectrum Type: Log Counts
User Number: 08
User Id: C-14
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 7 16-7 70.00
H#, Total Counts: 232.9 2627
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



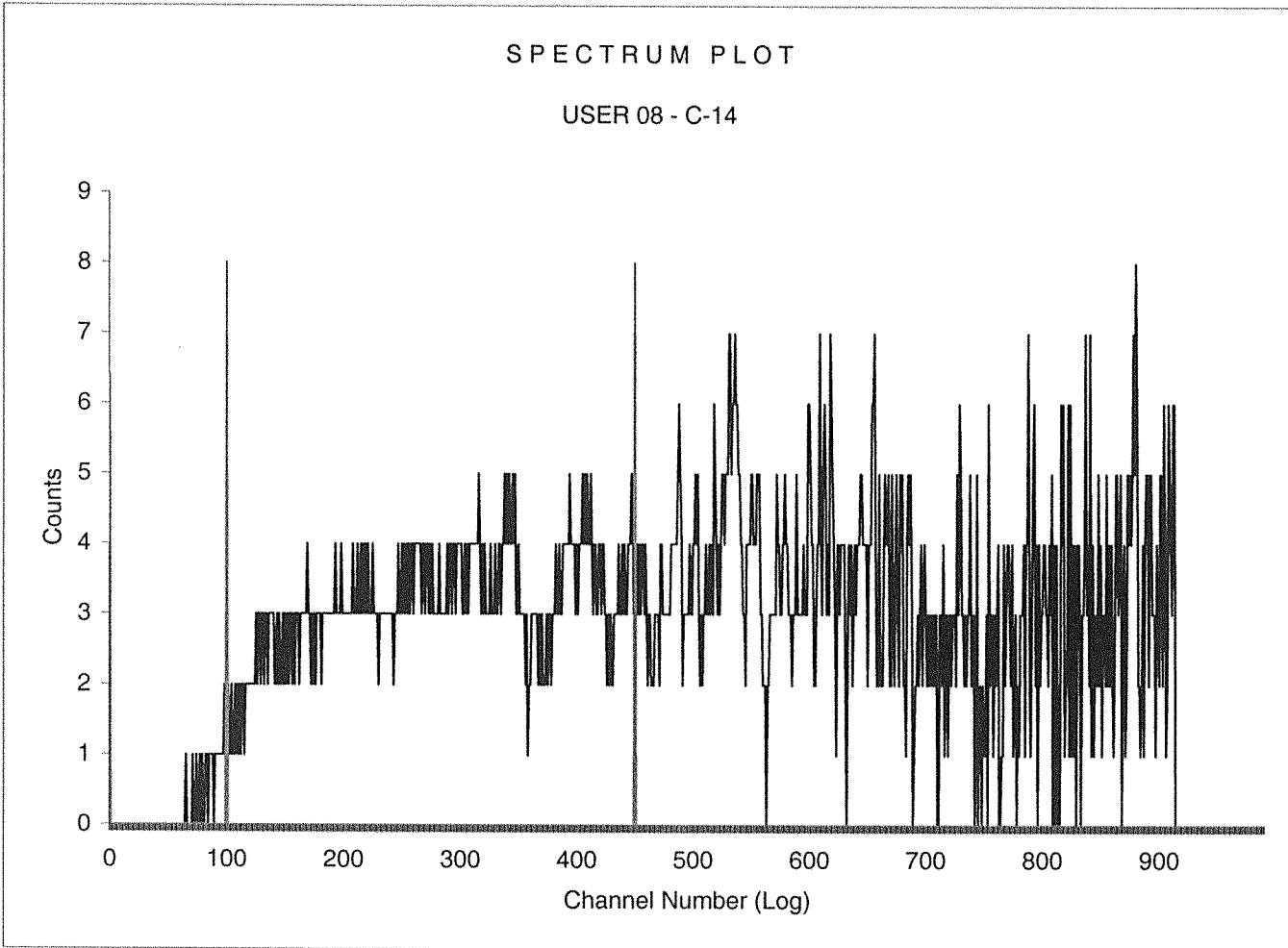
Sample Count Start Time: 27 Sep 2016 10:29:36
Data Capture Date 27 Sep 2016 11:39:59
User Filename S08092716-8A.XLS
U08092716-1A.XLS
Spectrum Type Log Counts
User Number 08
User Id C-14
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 8 16-8 70.00
H#, Total Counts: 235.1 2533
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



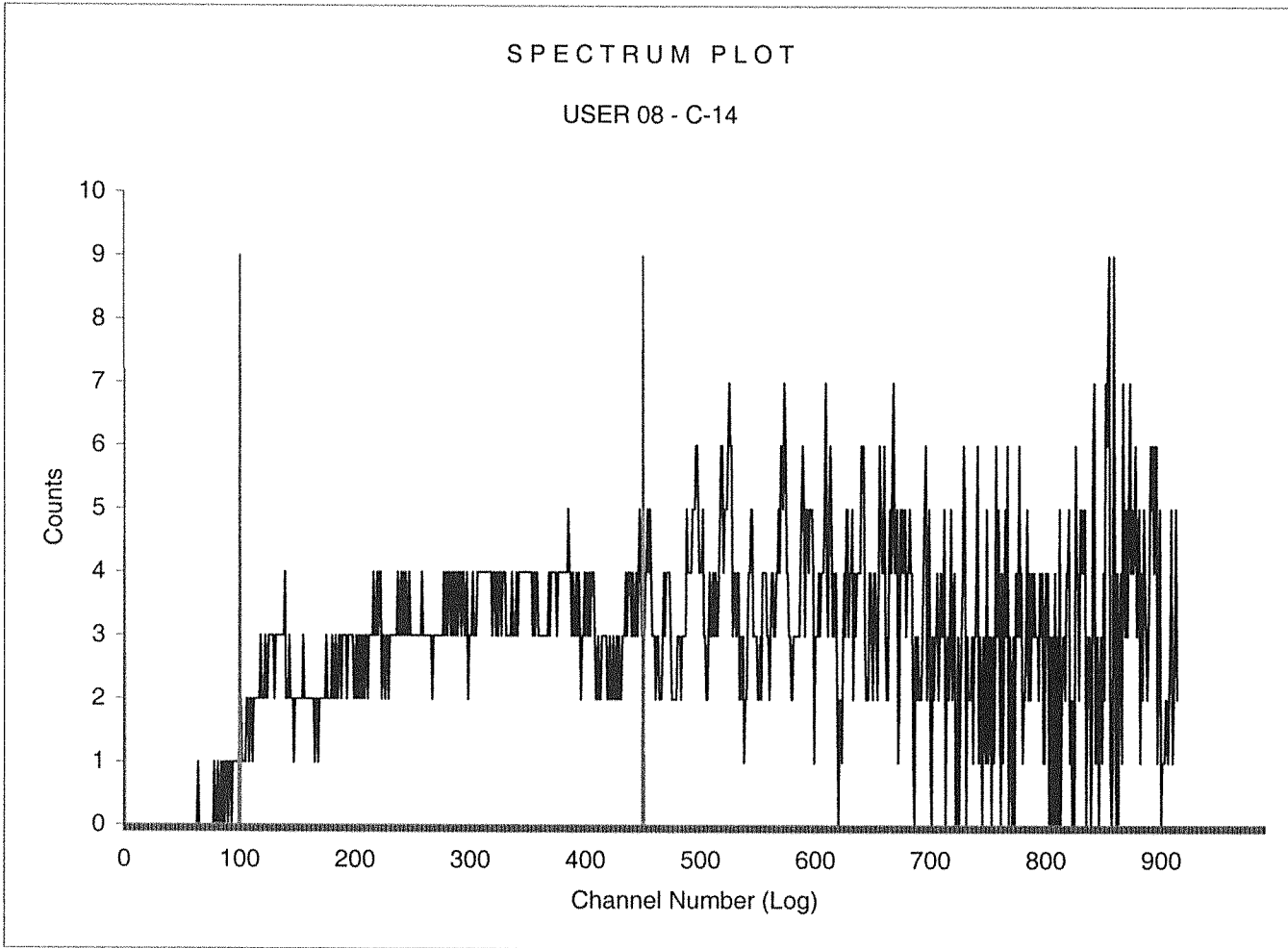
Sample Count Start Time: 27 Sep 2016 11:41:24
Data Capture Date: 27 Sep 2016 12:51:47
User Filename: S08092716-9A.XLS
U08092716-1A.XLS
Spectrum Type: Log Counts
User Number: 08
User Id: C-14
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 9 16-9 70.00
H#, Total Counts: 231.4 2593
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



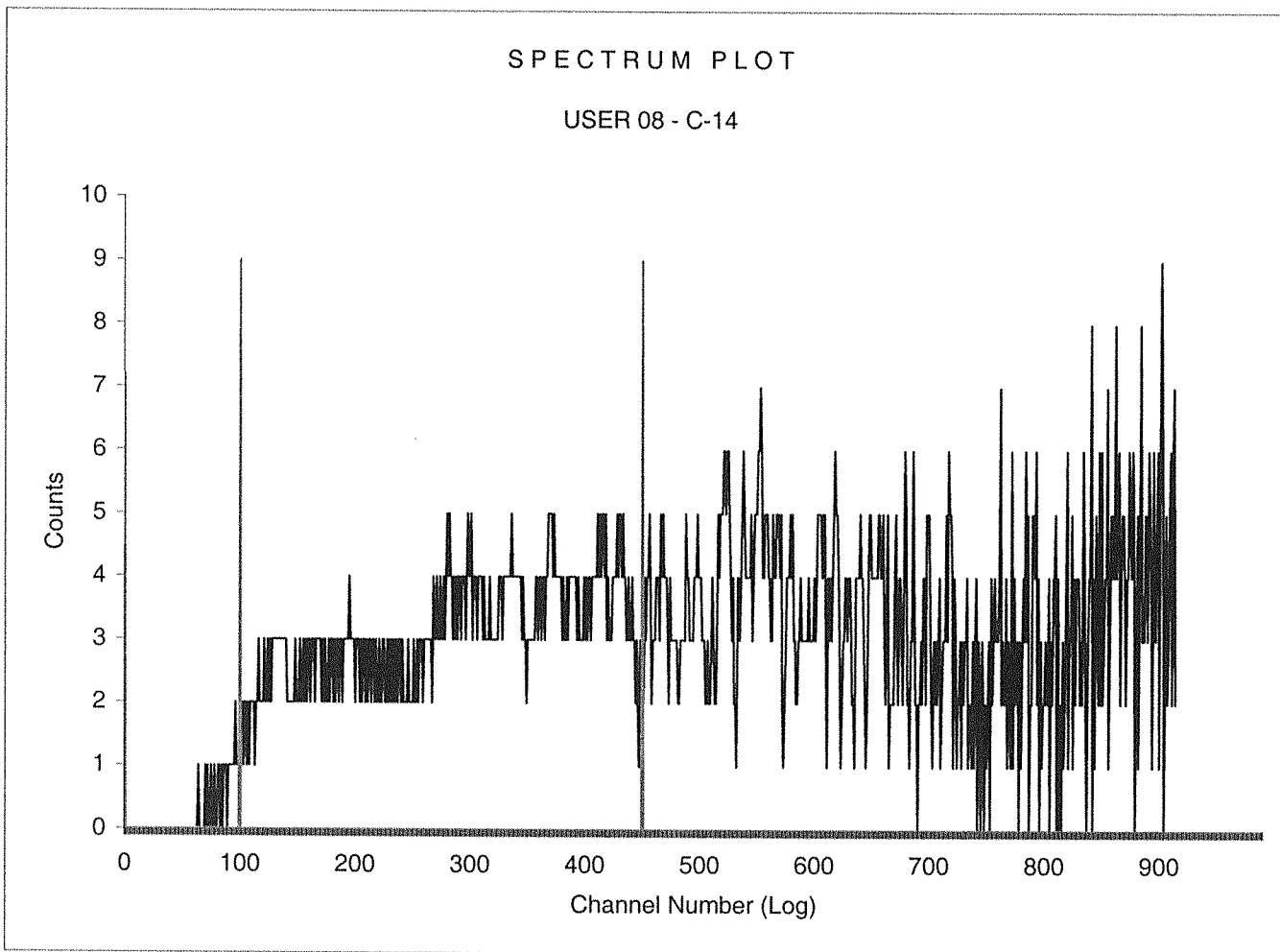
Sample Count Start Time: 27 Sep 2016 12:53:11
Data Capture Date 27 Sep 2016 14:03:34
User Filename S08092716-10A.XLS
U08092716-1A.XLS
Spectrum Type Log Counts
User Number 08
User Id C-14
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 10 16-10 70.00
H#, Total Counts: 232.8 2670
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



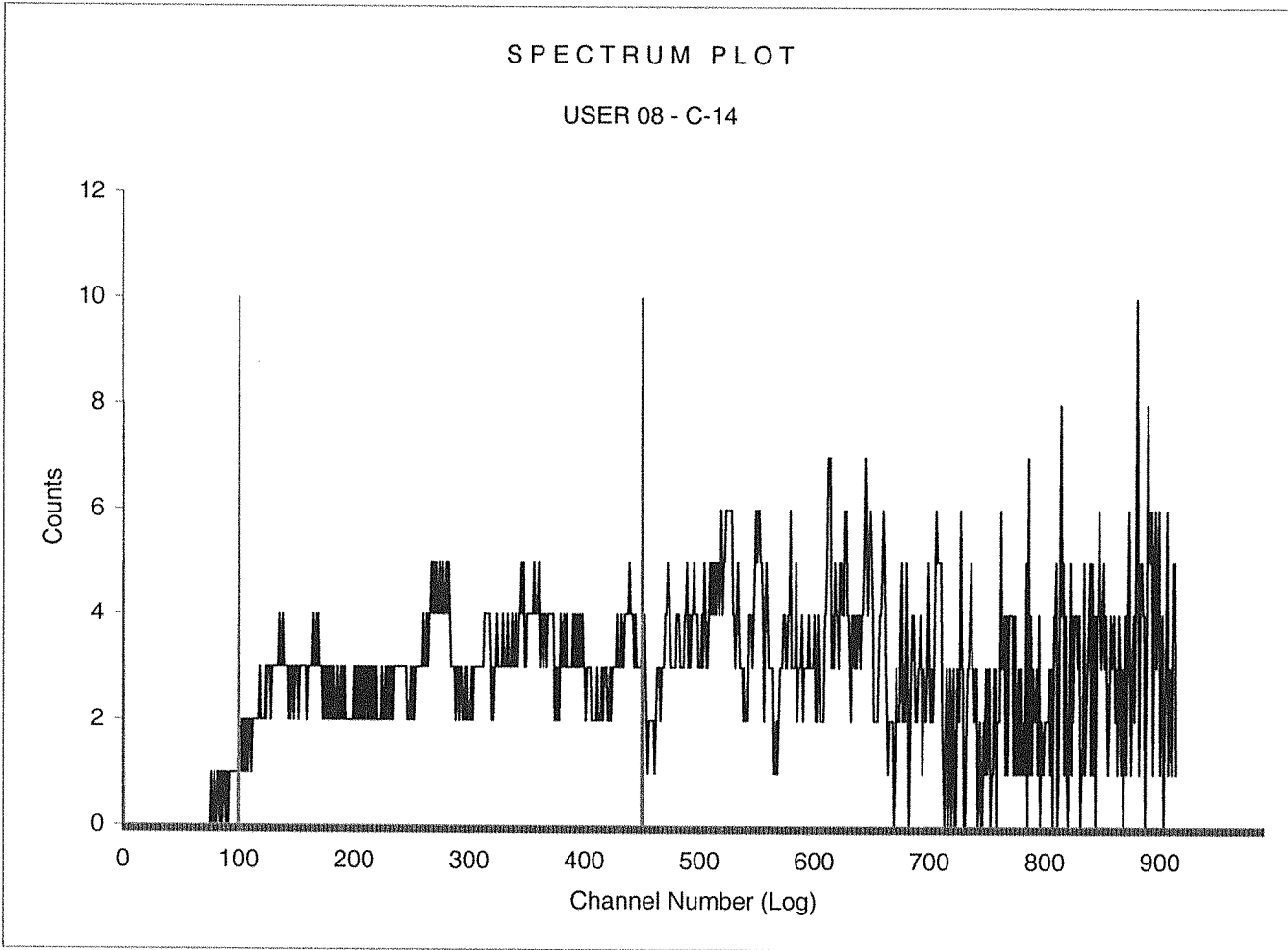
Sample Count Start Time: 27 Sep 2016 14:04:58
Data Capture Date: 27 Sep 2016 15:15:21
User Filename: S08092716-11A.XLS
U08092716-1A.XLS
Spectrum Type: Log Counts
User Number: 08
User Id: C-14
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 11 16-11 70.00
H#, Total Counts: 234.8 2613
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



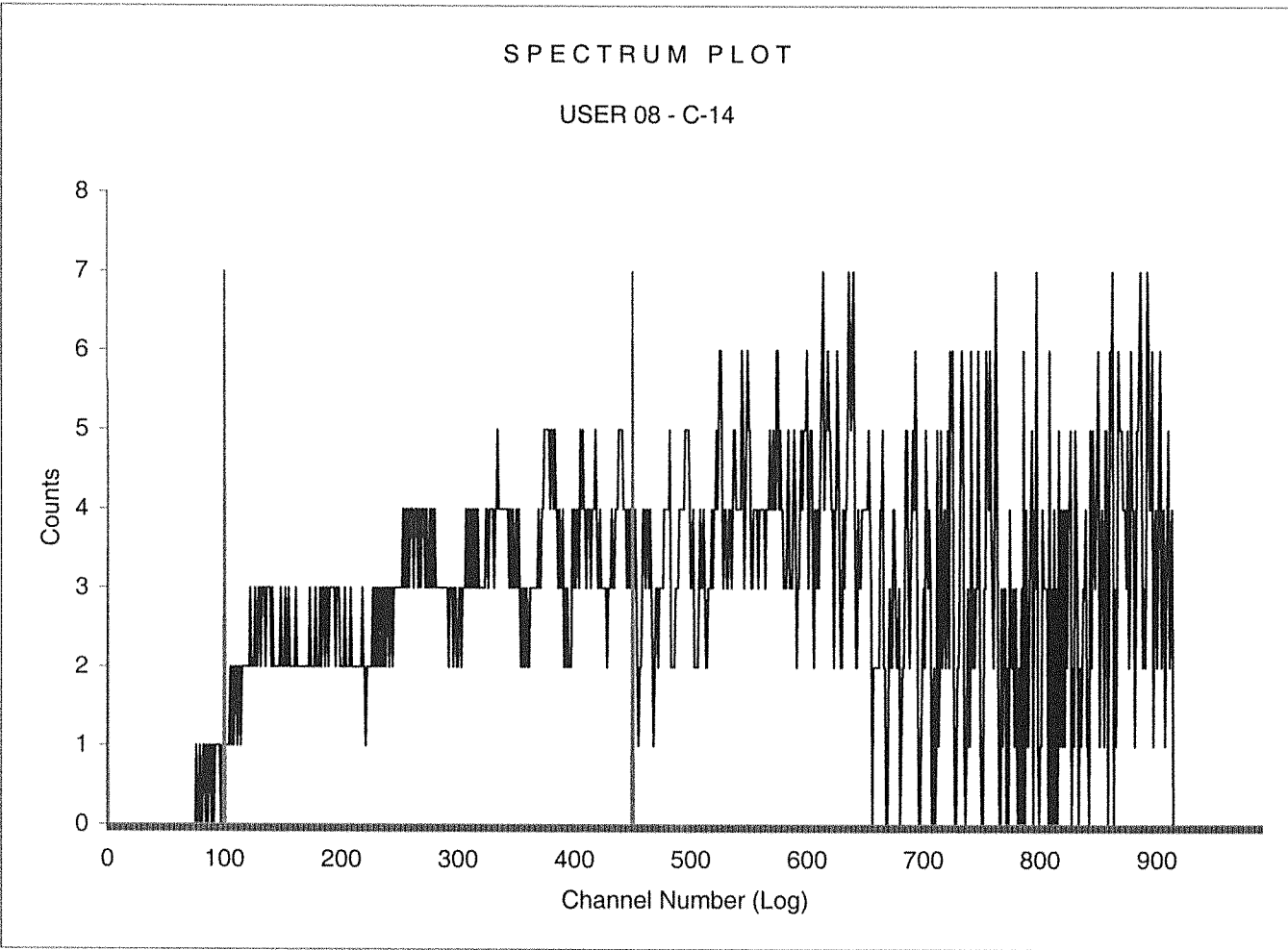
Sample Count Start Time: 27 Sep 2016 15:16:46
Data Capture Date 27 Sep 2016 16:27:09
User Filename S08092716-12A.XLS
U08092716-1A.XLS
Spectrum Type Log Counts
User Number 08
User Id C-14
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 12 16-12 70.00
H#, Total Counts: 234.6 2704
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



Sample Count Start Time: 27 Sep 2016 16:28:37
Data Capture Date 27 Sep 2016 17:38:59
User Filename S08092753-1A.XLS
U08092716-1A.XLS
Spectrum Type Log Counts
User Number 08
User Id C-14
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 13 53-1 70.00
H#, Total Counts: 237.4 2540
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



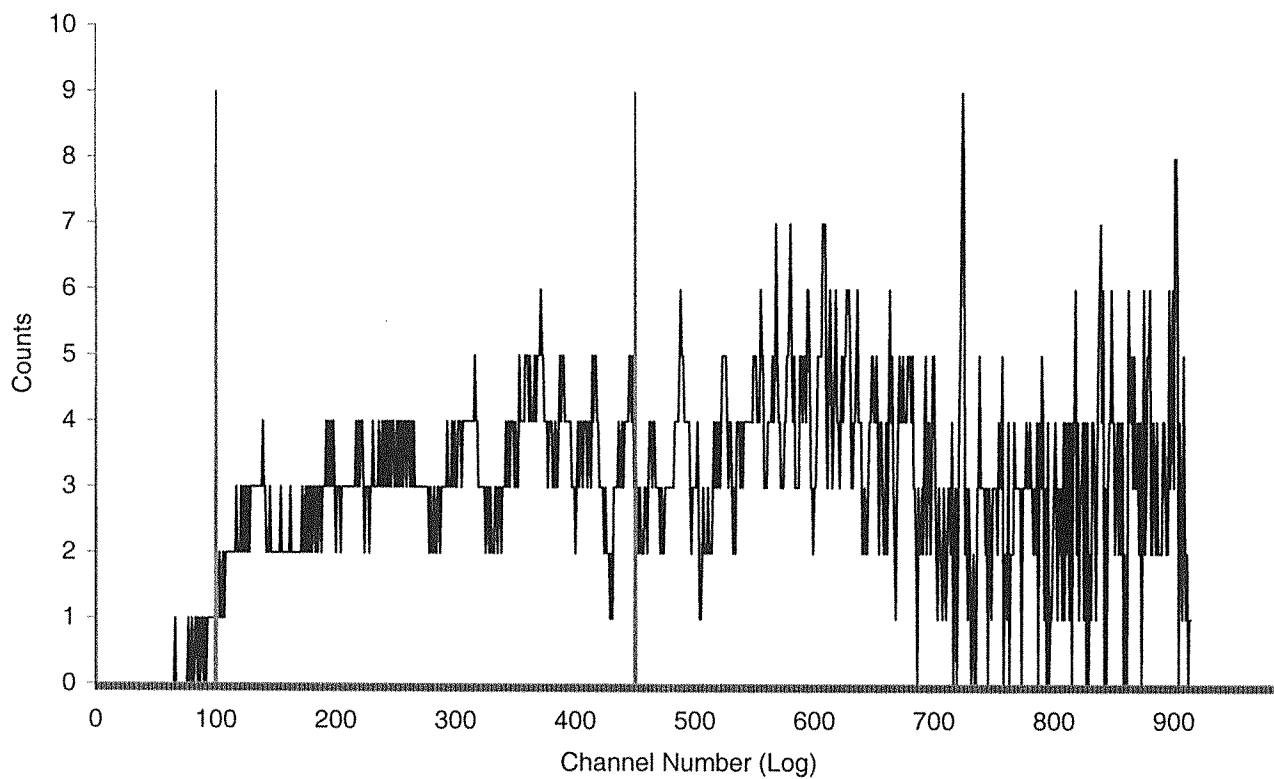
Sample Count Start Time: 27 Sep 2016 17:40:19
Data Capture Date 27 Sep 2016 18:50:41
User Filename S08092753-2A.XLS
U08092716-1A.XLS
Spectrum Type Log Counts
User Number 08
User Id C-14
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 14 53-2 70.00
H#, Total Counts: 233.2 2581
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990



Sample Count Start Time: 27 Sep 2016 18:52:05
Data Capture Date: 27 Sep 2016 20:02:27
User Filename: S08092753-3A.XLS
U08092716-1A.XLS
Spectrum Type: Log Counts
User Number: 08
User Id: C-14
User Comment: BROWN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 15 53-3 70.00
H#, Total Counts: 233.0 2663
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990

SPECTRUM PLOT

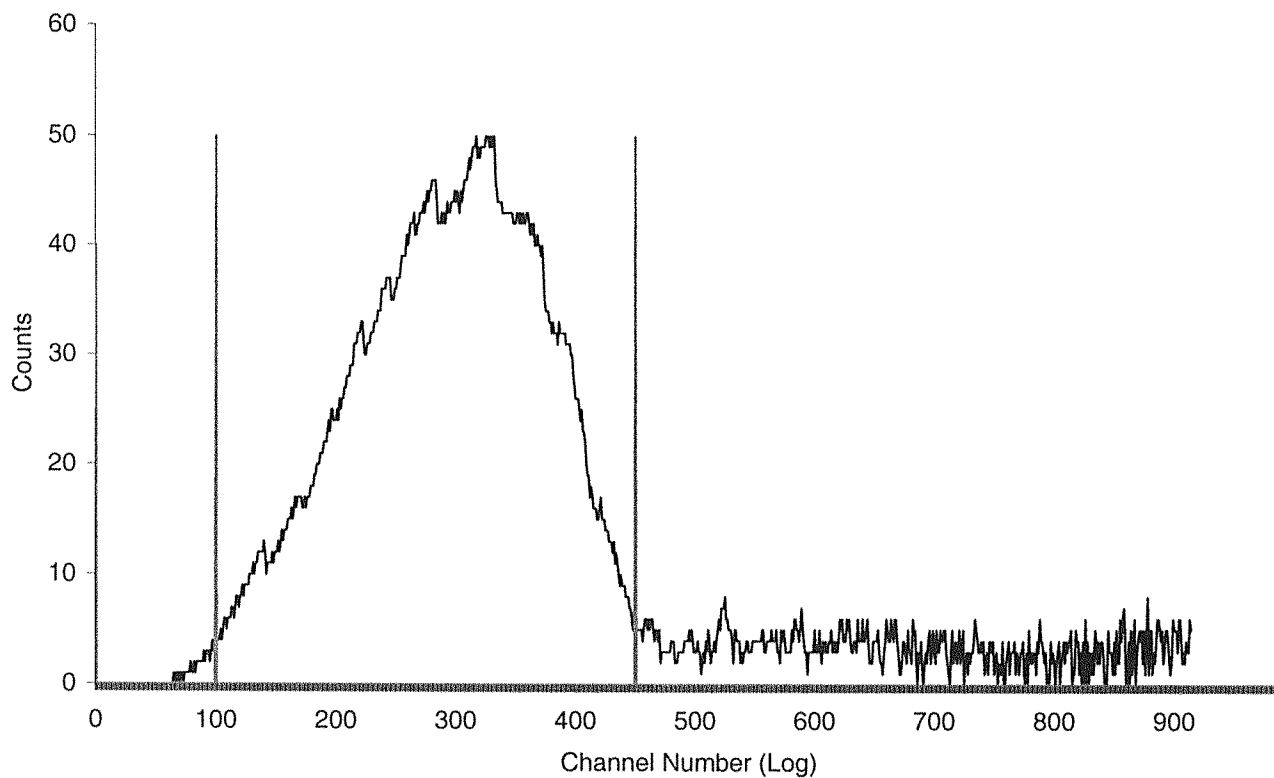
USER 08 - C-14



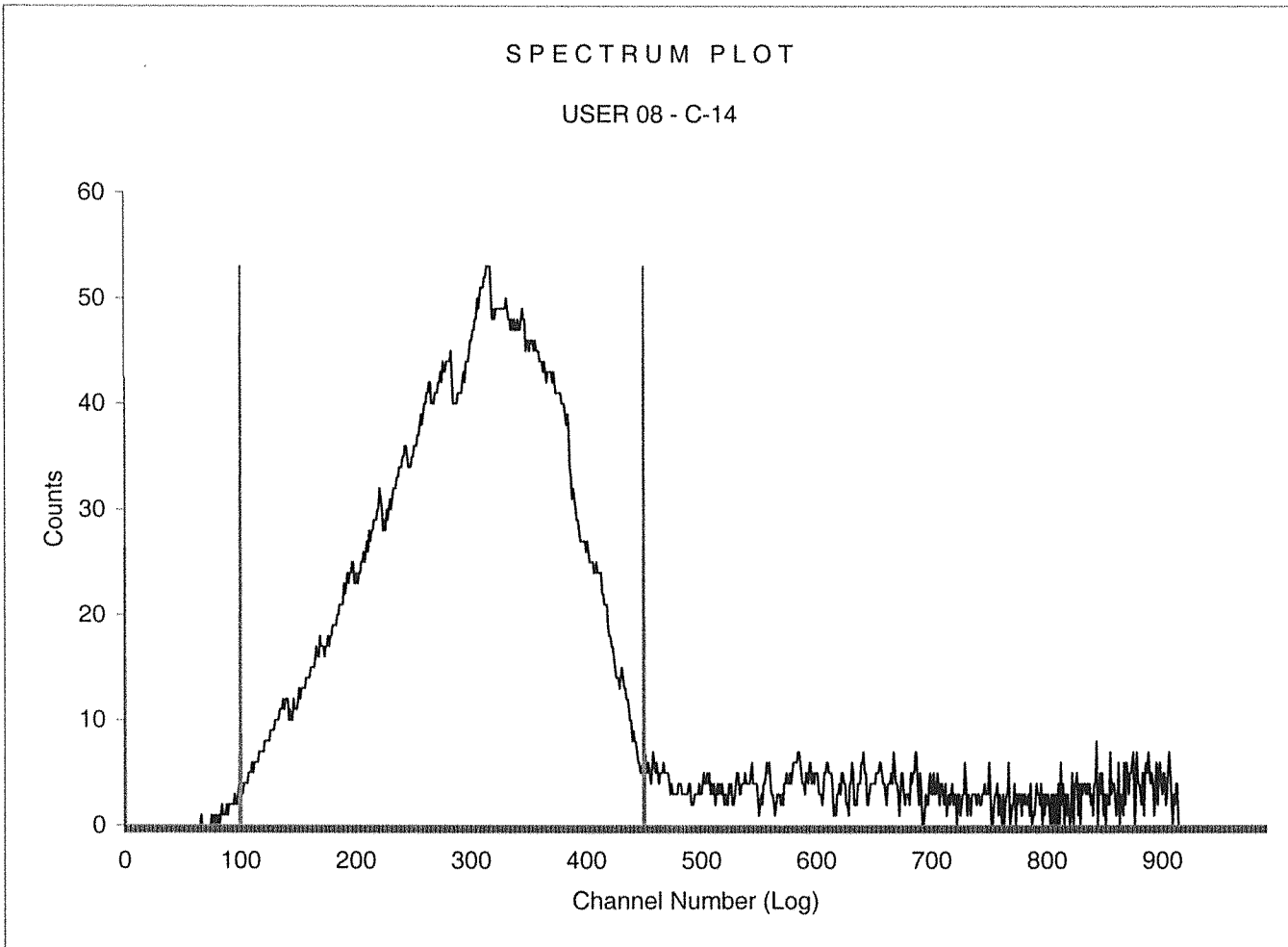
Sample Count Start Time: 27 Sep 2016 20:03:50
Data Capture Date 27 Sep 2016 21:14:12
User Filename S08092753-4A.XLS
U08092716-1A.XLS
Spectrum Type Log Counts
User Number 08
User Id C-14
User Comment BROWN
Scintillator LIQUID
Sample, Rack-Pos, Time: 16 53-4 70.00
H#, Total Counts: 232.0 11543
Win1: C-14 - Start, End: 100 450
Win2: - Start, End: 0 990

SPECTRUM PLOT

USER 08 - C-14



Sample Count Start Time:	27 Sep 2016 21:15:32		
Data Capture Date	27 Sep 2016 22:25:54		
User Filename	S08092753-5A.XLS		
	U08092716-1A.XLS		
Spectrum Type	Log Counts		
User Number	08		
User Id	C-14		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	17	53-5	70.00
H#, Total Counts:	232.4	11701	
Win1: C-14 - Start, End:	100	450	
Win2: - Start, End:	0	990	



21-Sep-2016

Batch# 1597412 Product: TSS Date: 9/24/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	See DER 1559833
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.	✓		
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER 1559833
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER 1559833
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By:

[Handwritten Signature]

MJWC
10/4

Secondary Review Performed By:

DATA EXCEPTION REPORT

Mo.Day Yr. 21-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LSC	Test / Method: DOE EML HASL-300, Tc-02-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1597412	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040 and 1203624302 were received and analyzed out of the method specified hold time.</p>		<p>1. Reporting results.</p>	

Originator's Name:
Elizabeth Krouse 21-SEP-16

Data Validator/Group Leader:
Lyndsey Pace 21-SEP-16

Prep Logbook

MJWC 10/11/10

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The Determination of Technetium-99 Using Analytical Grade IX8 Resin

Batch ID: 1597412
 Analyst: Christina Sanchez
 Method: DOE EML HASL-300, Tc-02-RC Modified
 Lab SOP: GL-RAD-A-059 REV# 4
 Instrument: BAL-16107662

Type: LCS
 Sample Id: 1203624303
 Description: Technetium-99 SPIKE
 Serial Number: 1621-B
 Spike Amount: .1
 Spike Units: mL

Sample ID	Prep Date	Matrix	Dry or Wet	Unadjusted Aliquot (g)	Aliquot (g)
405233021	15-SEP-2016 12:36:17	Soil	W	1.237	1.032
405233022	15-SEP-2016 12:36:17	Soil	W	1.273	1.026
405233023	15-SEP-2016 12:36:17	Soil	W	1.239	0.96
405233024	15-SEP-2016 12:36:17	Soil	W	1.203	0.97
405233025	15-SEP-2016 12:36:17	Soil	W	1.23	0.967
405233026	15-SEP-2016 12:36:17	Soil	W	1.257	1.048
405233027	15-SEP-2016 12:36:17	Soil	W	1.22	0.998
405233028	15-SEP-2016 12:36:17	Soil	W	1.313	1.015
405233029	15-SEP-2016 12:36:17	Soil	W	1.223	0.987
405233030	15-SEP-2016 12:36:17	Soil	W	1.214	0.924
405233031	15-SEP-2016 12:36:17	Soil	W	1.271	0.984
405233032	15-SEP-2016 12:36:17	Soil	W	1.248	0.994
405233033	15-SEP-2016 12:36:17	Soil	W	1.237	1.019
405233034	15-SEP-2016 12:36:17	Soil	W	1.242	0.999
405233035	15-SEP-2016 12:36:17	Soil	W	1.249	1.046
405233036	15-SEP-2016 12:36:17	Soil	W	1.252	1.03
405233037	15-SEP-2016 12:36:17	Soil	W	1.36	1.275
405233038	15-SEP-2016 12:36:17	Soil	W	1.232	1.031
405233039	15-SEP-2016 12:36:17	Soil	W	1.222	1.116
405233040	15-SEP-2016 12:36:17	Soil	W	1.211	1.032
1203624301 MB	15-SEP-2016 12:36:17	Soil	W	1.275	1.275
1203624302 DUP (405235021)	15-SEP-2016 12:36:17	Soil	W	1.228	1.025
1203624303 LCS	15-SEP-2016 12:36:17	Soil	W		1.275

Reagent/Solvent Lot ID	Description	Amount	Comments:
2280154.26	Hydrogen Peroxide 30% ACS Reagent 120LBS 30 Gallons	10 mL	Spike Pipet ID: RAD-LSC-2272418 Tracer Pipet ID: RAD-LSC-4099802
2402130.4	Eosin GL Scintillation Solution	15 mL	
2418926	Quenching Agent	.1 uL	
2429641	RL-0.1M Hydrochloric Acid	100 mL	
2441205	RL-0.01M Nitric Acid	20 mL	
2451825	RL-0.1M Nitric Acid	25 mL	
TC2074-A	tracer	1 mL	

Technetium-99 Solid

Filename : TC99.XLS
 File type : Excel
 Version # : 1.2.16

Tracer S/N : TC2074-A
 Tracer Exp Date : 9/16/2016
 Tracer Volume Added : 1.00

Batch : 1597412
 Analyst : CHR02061
 Prep Date : 9/15/2016
 Tc-99 Method Uncertainty : 0.0576

Procedure Code : LSC99TCS
 Parname : Technetium-99
 Required MDA : 5 pCi/G
 Tc-99 Abundance : 1.00
 Half-life of Tc-99 : 211100 years

Geometry: 15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin

Pos.	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G	Sample Date/Time	Tracer Calculations Tracer Ref. Activity (CPM)	Tracer Ref. Count Uncertainty (%)	Tracer Samp. Activity (CPM)	Tracer Samp. Count Uncertainty (%)	Tracer Aliquot (mL)	Tracer Aliquot StDev. (mL)
1	405235021.1	1.0320	3.3267E-03	12/8/2015 14:17	35053	0.93%	32410	0.94%	1.0	0.002000
2	405235022.1	1.0260	3.3260E-03	12/8/2015 13:43	35053	0.93%	30279	0.95%	1.0	0.002000
3	405235023.1	0.9600	3.3192E-03	12/2/2015 10:40	35053	0.93%	32762	0.94%	1.0	0.002000
4	405235024.1	0.9700	3.3202E-03	12/8/2015 14:13	35053	0.93%	32104	0.95%	1.0	0.002000
5	405235025.1	0.9670	3.3199E-03	12/8/2015 13:38	35053	0.93%	30278	0.95%	1.0	0.002000
6	405235026.1	1.0480	3.3283E-03	12/8/2015 10:15	35053	0.93%	31023	0.94%	1.0	0.002000
7	405235027.1	0.9980	3.3231E-03	12/8/2015 10:19	35053	0.93%	30387	0.93%	1.0	0.002000
8	405235028.1	1.0150	3.3249E-03	11/23/2015 14:50	35053	0.93%	30862	0.95%	1.0	0.002000
9	405235029.1	0.9870	3.3220E-03	11/23/2015 11:10	35053	0.93%	30989	0.95%	1.0	0.002000
10	405235030.1	0.9240	3.3154E-03	11/23/2015 14:44	35053	0.93%	30616	0.95%	1.0	0.002000
11	405235031.1	0.9840	3.3217E-03	11/26/2015 14:25	35053	0.93%	30727	0.95%	1.0	0.002000
12	405235032.1	0.9940	3.3227E-03	11/23/2015 11:48	35053	0.93%	32089	0.93%	1.0	0.002000
13	405235033.1	1.0190	3.3253E-03	11/23/2015 11:53	35053	0.93%	29362	0.95%	1.0	0.002000
14	405235034.1	0.9990	3.3232E-03	11/23/2015 11:20	35053	0.93%	29577	0.95%	1.0	0.002000
15	405235035.1	1.0460	3.3281E-03	11/23/2015 11:06	35053	0.93%	30348	0.94%	1.0	0.002000
16	405235036.1	1.0300	3.3265E-03	11/23/2015 11:12	35053	0.93%	32013	0.93%	1.0	0.002000
17	405235037.1	1.2750	3.3519E-03	11/30/2015 11:19	35053	0.93%	30537	0.94%	1.0	0.002000
18	405235038.1	1.0310	3.3266E-03	11/30/2015 10:40	35053	0.93%	31276	0.95%	1.0	0.002000
19	405235039.1	1.1160	3.3354E-03	11/30/2015 10:43	35053	0.93%	28425	0.95%	1.0	0.002000
20	405235040.1	1.0320	3.3267E-03	11/30/2015 13:23	35053	0.93%	30164	0.94%	1.0	0.002000
21	1203624301.1	1.2750	3.3519E-03	9/15/2016 0:00	35053	0.93%	32123	0.94%	1.0	0.002000
22	1203624302.1	1.0250	3.3259E-03	12/8/2015 14:17	35053	0.93%	31072	0.95%	1.0	0.002000
23	1203624303.1	1.2750	3.3519E-03	9/15/2016 0:00	35053	0.93%	31945	0.94%	1.0	0.002000

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-059
 Instrument SOP: GL-RAD-I-004

Count raw Data										Calibration Data									
Pos.	Rack Position #	Counting Time (min.)	Quench#	Gross cpm	Bkg cpm	Bkg Count Time (min.)	Bkg Quench#	Corrected Bkg cpm	Count Start Date/Time	Sample Decay	Calculated Sample Recovery %	Sample Recovery Error %	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Background Count Start Date/Time	Background Position #
1	17-2	30	185.6	17.77	16.87	30	179.4	16.5602	9/20/2016 10:44	1.000	92.5%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5572	0.00792	9/20/2016 10:12	17-1
2	17-3	30	184.4	15.9	16.87	30	179.4	16.5765	9/20/2016 11:16	1.000	86.4%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5578	0.00792	9/20/2016 10:12	17-1
3	17-4	30	192.1	17.2	16.87	30	179.4	16.5092	9/20/2016 11:48	1.000	93.5%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5530	0.00792	9/20/2016 10:12	17-1
4	17-5	30	180.1	15.97	16.87	30	179.4	16.6543	9/20/2016 12:20	1.000	91.6%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5594	0.00792	9/20/2016 10:12	17-1
5	17-7	30	190.5	14.87	16.87	30	179.4	16.5161	9/20/2016 13:24	1.000	86.4%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5542	0.00792	9/20/2016 10:12	17-1
6	17-6	30	177.3	16.27	16.87	30	179.4	16.7222	9/20/2016 12:52	1.000	88.5%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5600	0.00792	9/20/2016 10:12	17-1
7	17-9	30	189.8	16.67	16.87	30	179.4	16.5203	9/20/2016 14:28	1.000	86.7%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5547	0.00792	9/20/2016 10:12	17-1
8	17-8	30	192.7	17.17	16.87	30	179.4	16.5075	9/20/2016 13:56	1.000	88.0%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5526	0.00792	9/20/2016 10:12	17-1
9	17-11	30	183.1	17	16.87	30	179.4	16.5968	9/20/2016 15:32	1.000	88.4%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5584	0.00792	9/20/2016 10:12	17-1
10	17-10	30	194.2	16.8	16.87	30	179.4	16.5053	9/20/2016 15:00	1.000	87.3%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5513	0.00792	9/20/2016 10:12	17-1
11	17-12	30	211.8	17.03	16.87	30	179.4	16.6631	9/20/2016 16:04	1.000	87.7%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5303	0.00792	9/20/2016 10:12	17-1
12	8-1	30	181	16.43	16.87	30	179.4	16.6355	9/20/2016 16:36	1.000	91.5%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5591	0.00792	9/20/2016 10:12	17-1
13	8-2	30	171	15.47	16.87	30	179.4	16.9285	9/20/2016 17:08	1.000	83.8%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5801	0.00792	9/20/2016 10:12	17-1
14	8-3	30	177.9	15.37	16.87	30	179.4	16.7065	9/20/2016 17:40	1.000	84.4%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5599	0.00792	9/20/2016 10:12	17-1
15	8-4	30	173.1	15.33	16.87	30	179.4	16.8511	9/20/2016 18:12	1.000	86.6%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5603	0.00792	9/20/2016 10:12	17-1
16	8-5	30	180.1	16.67	16.87	30	179.4	16.6543	9/20/2016 18:44	1.000	91.3%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5594	0.00792	9/20/2016 10:12	17-1
17	8-6	30	167	15.53	16.87	30	179.4	17.1011	9/20/2016 19:15	1.000	87.1%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5592	0.00792	9/20/2016 10:12	17-1
18	8-7	30	171.1	17.77	16.87	30	179.4	16.9246	9/20/2016 19:47	1.000	89.2%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5601	0.00792	9/20/2016 10:12	17-1
19	8-8	30	185.7	15.8	16.87	30	179.4	16.5589	9/20/2016 20:19	1.000	81.1%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5572	0.00792	9/20/2016 10:12	17-1
20	8-9	30	188.1	16.7	16.87	30	179.4	16.5333	9/20/2016 20:51	1.000	86.1%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5558	0.00792	9/20/2016 10:12	17-1
21	8-10	30	175.5	14.8	16.87	30	179.4	16.7733	9/20/2016 21:23	1.000	91.6%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5602	0.00792	9/20/2016 10:12	17-1
22	8-11	30	185.7	18.43	16.87	30	179.4	16.5589	9/20/2016 21:55	1.000	88.6%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5572	0.00792	9/20/2016 10:12	17-1
23	8-12	30	175.2	128.77	16.87	30	179.4	16.7825	9/20/2016 22:27	1.000	91.1%	0.72%	LSCGOLD	7/4/2016	6/30/2017	0.5602	0.00792	9/20/2016 10:12	17-1

Notes:
 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

* - RPD changed to 0% due to sample & dup activity below MDA

Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml): N/A
 Spike Volume Added: N/A
 LCS S/N : 1621-B
 LCS Exp Date : 1/5/2017
 LCS Activity (dpm/ml): 1911.38
 LCS Volume Added (ml): 0.10

Pos.	Decision Level		Critical Level		Required MDA		Sample Act. Conc.		Sample Act. Error %		Net Count Rate		2 SIGMA Counting Uncertainty		2 SIGMA Total Prop. Uncertainty		Sample QC		Sample Type		Nominal	
	pCi/G	pCi/G	pCi/G	MDA	MDA	pCi/G	MDA	pCi/G	%	CPM	CPM	Rate Error	CPM	pCi/G	pCi/G	RPD	RER	RPD	RER	pCi/G	Recovery	
1	2.0740	1.4643	5	3.0133	1.0250	88.43%	1.2098	1.0697	1.7763	1.7802	SAMPLE											
2	2.2318	1.5757	5	3.2425	-0.6164	153.80%	-0.6765	1.0405	1.8581	1.8581	SAMPLE											
3	2.2190	1.5666	5	3.2240	0.6271	153.45%	0.6908	1.0600	1.8860	1.8874	SAMPLE											
4	2.2253	1.5711	5	3.2328	-0.6203	152.39%	-0.6843	1.0428	1.8526	1.8526	SAMPLE											
5	2.2790	1.6796	5	3.4565	-1.6018	62.15%	-1.6461	1.0228	1.9507	1.9507	SAMPLE											
6	2.1335	1.5062	5	3.0992	-0.3921	231.92%	-0.4522	1.0487	1.7825	1.7825	SAMPLE											
7	2.2951	1.6203	5	3.3345	0.1405	702.49%	0.1497	1.0518	1.9350	1.9350	SAMPLE											
8	2.2297	1.5742	5	3.2397	0.6044	159.93%	0.6625	1.0595	1.8944	1.8957	SAMPLE											
9	2.2659	1.5997	5	3.2919	0.3728	262.47%	0.4032	1.0583	1.9176	1.9181	SAMPLE											
10	2.4744	1.7469	5	3.5951	0.2984	357.49%	0.2947	1.0536	2.0907	2.0910	SAMPLE											
11	2.4183	1.7073	5	3.5131	0.3613	288.81%	0.3669	1.0598	2.0454	2.0458	SAMPLE											
12	2.1724	1.5337	5	3.1560	-0.1819	510.93%	-0.2055	1.0498	1.8218	1.8218	SAMPLE											
13	2.3322	1.6466	5	3.3874	-1.3742	71.26%	-1.4585	1.0392	1.9192	1.9192	SAMPLE											
14	2.3469	1.6569	5	3.4093	-1.2755	77.38%	-1.3365	1.0340	1.9343	1.9343	SAMPLE											
15	2.1925	1.5479	5	3.1846	-1.3504	68.10%	-1.5211	1.0357	1.8022	1.8022	SAMPLE											
16	2.1016	1.4838	5	3.0531	0.0134	6734.43%	0.0157	1.0540	1.7683	1.7683	SAMPLE											
17	1.8041	1.2737	5	2.6200	-1.1393	66.39%	-1.5711	1.0429	1.4824	1.4824	SAMPLE											
18	2.1637	1.5276	5	3.1426	0.7390	127.21%	0.8454	1.0754	1.8427	1.8446	SAMPLE											
19	2.1870	1.5440	5	3.1774	-0.6780	136.86%	-0.7589	1.0386	1.8185	1.8185	SAMPLE											
20	2.2323	1.5761	5	3.2434	0.1522	631.25%	0.1667	1.0525	1.8826	1.8827	SAMPLE											
21	1.6955	1.1971	5	2.4629	-1.3580	52.00%	-1.9733	1.0259	1.3837	1.3837	MB											
22	2.1783	1.5379	5	3.1648	1.6649	57.73%	1.8711	1.0600	1.8834	1.8831	DUP	405235021.1										
23	1.7054	1.2040	5	2.4772	77.4913	2.25%	111.9875	2.2027	2.9874	9.3946	LCS											67.5279 114.8%

ASSAY 16-Sep-16 12:07:35

Protocol id 12 TC99_REC
Time limit 500
Count limit 10000
Isotope Tc-99m
Protocol date 23-Sep-13 14:21:59
Run id. 18

POS	RACK	BATCH	TIME	COUNTS	CPM	ERROR	% RECOVERY	COUNT TIME
1	69	1	20	11635	35053.2	0.93		12:07:42
2	69	2	21	11288	32410.1	0.94	92.46	12:08:14
3	69	3	22	11039	30278.6	0.95	86.38	12:08:47
4	69	4	21	11385	32761.6	0.94	93.46	12:09:21
5	69	5	21	11146	32104.2	0.95	91.59	12:09:54
6	81	6	22	10998	30277.5	0.95	86.38	12:10:40
7	81	7	22	11256	31023.1	0.94	88.50	12:11:14
8	81	8	23	11515	30387.3	0.93	86.69	12:11:48
9	81	9	22	11173	30861.5	0.95	88.04	12:12:23
10	81	10	22	11207	30989.3	0.95	88.41	12:12:57
11	74	11	22	11057	30616.1	0.95	87.34	12:13:41
12	74	12	22	11085	30727.3	0.95	87.66	12:14:15
13	74	13	22	11562	32088.8	0.93	91.54	12:14:49
14	74	14	23	11052	29361.5	0.95	83.76	12:15:23
15	74	15	23	11120	29577	0.95	84.38	12:15:58
16	70	16	23	11391	30348.3	0.94	86.58	12:16:47
17	70	17	22	11478	32013.1	0.93	91.33	12:17:22
18	70	18	23	11436	30537.3	0.94	87.12	12:17:56
19	70	19	22	11191	31276.4	0.95	89.23	12:18:31
20	70	20	24	11086	28424.6	0.95	81.09	12:19:05
21	72	21	23	11254	30163.7	0.94	86.05	12:19:55
22	72	22	22	11449	32123.2	0.94	91.64	12:20:29
23	72	23	22	11064	31071.6	0.95	88.64	12:21:03
24	72	24	22	11361	31945.2	0.94	91.13	12:21:37

END OF ASSAY

* Samples are switched

1597412

PAGE: 1

ID: TC-99

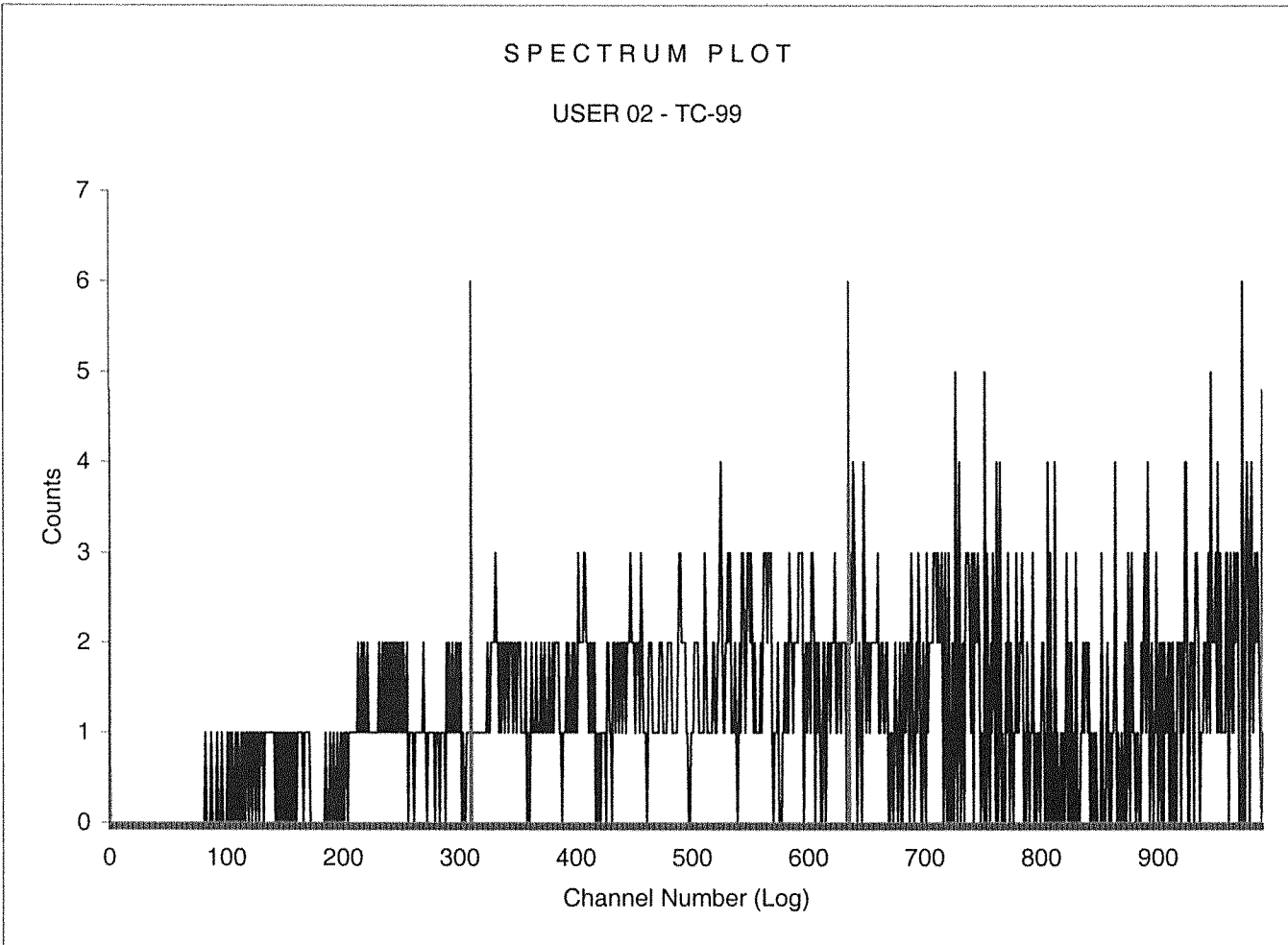
20 SEP 2016 10:52

USER: 2 COMMENT: GOLD
PRESET TIME : 30.00
DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD
COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT
TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF
SCINTILLATOR: LIQUID LUMEX: YES LOW SAMPLE REJ: 0
LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

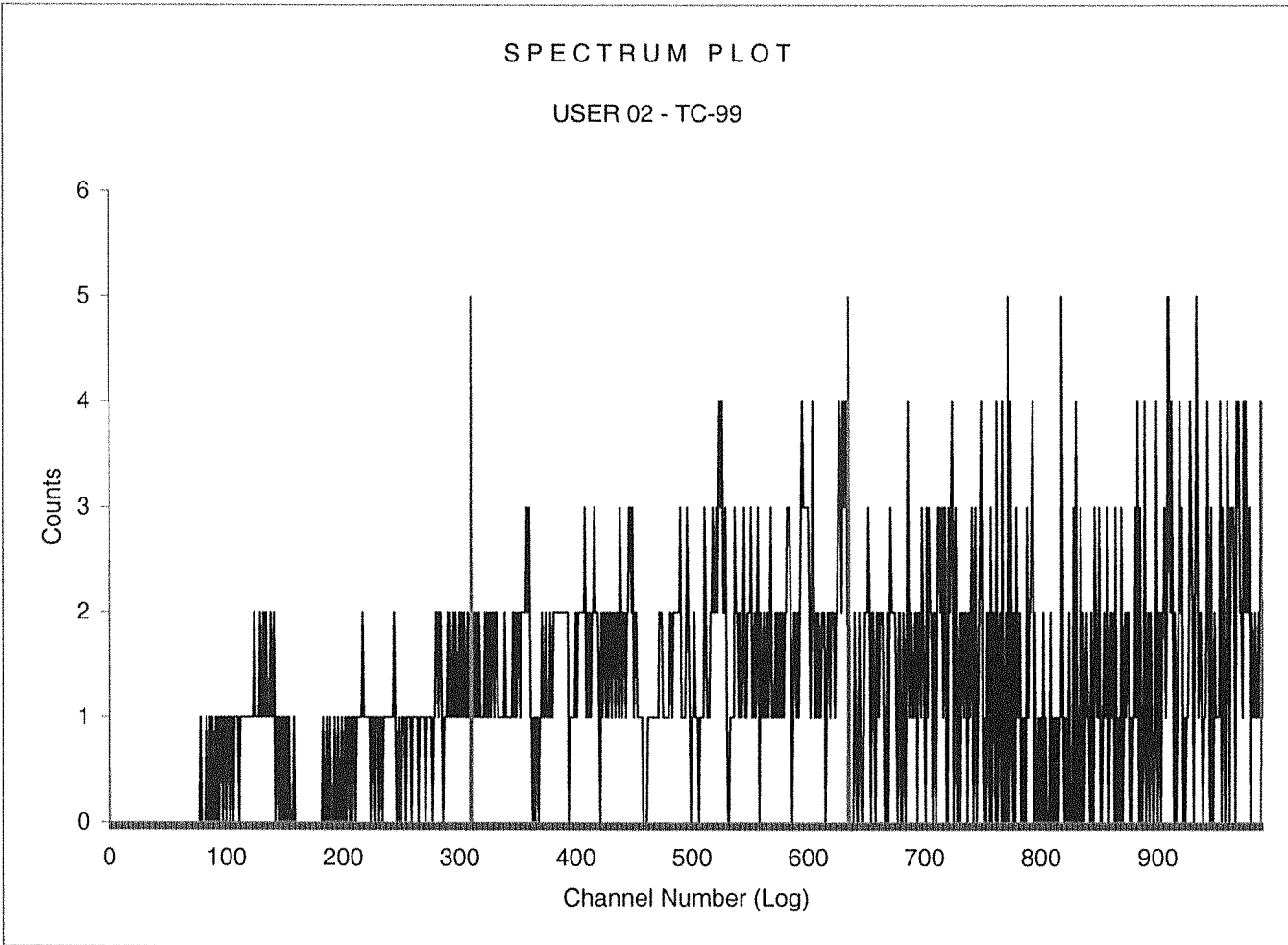
CHAN: 310.0 - 635.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0
CHAN: 0.0 - 1000.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		
lit 1	17-1	30.00	179.4	16.67	8.94	40.70	5.87	4.90	31.36
2	17-2	30.00	185.6	17.77	8.66	41.83	5.88	7.97	63.34
3	17-3	30.00	184.4	15.90	9.16	39.60	6.00	6.70	95.25
4	17-4	30.00	192.1	17.20	8.80	39.63	6.01	7.15	127.19
5	17-5	30.00	180.1	15.97	9.14	38.97	6.07	7.34	159.13
6	17-6	30.00	177.3	16.27	9.05	39.40	6.06	8.03	191.11
7	17-7	30.00	190.5	14.87	9.47	41.03	5.91	7.29	223.08
8	17-8	30.00	192.7	17.17	8.81	40.70	5.97	8.24	255.05
9	17-9	30.00	189.8	16.67	8.94	41.00	5.84	4.93	286.93
10	17-10	30.00	194.2	16.80	8.91	41.20	5.94	8.50	318.93
11	17-11	30.00	183.1	17.00	8.86	42.43	5.82	7.45	350.90
12	17-12	30.00	211.8	17.03	8.85	39.07	6.07	7.74	382.88
13	8-1	30.00	181.0	16.43	9.01	41.13	5.87	6.10	414.91
14	8-2	30.00	171.0	15.47	9.28	40.37	5.87	4.50	446.79
15	8-3	30.00	177.9	15.37	9.31	39.30	6.01	6.42	478.73
16	8-4	30.00	173.1	15.33	9.33	40.43	5.91	5.70	510.64
17	8-5	30.00	180.1	16.67	8.94	41.43	5.85	6.28	542.58
18	8-6	30.00	167.0	15.53	9.26	39.50	5.99	6.10	574.49
19	8-7	30.00	171.1	17.77	8.66	43.43	5.70	5.59	606.41
20	8-8	30.00	185.7	15.80	9.19	39.70	5.97	5.99	638.33
21	8-9	30.00	188.1	16.70	8.94	41.07	5.81	4.18	670.18
22	8-10	30.00	175.5	14.80	9.49	40.63	5.87	5.04	702.07
23	8-11	30.00	185.7	18.43	8.50	43.37	5.74	6.86	734.04
24	8-12	30.00	175.2	120.77	3.22	160.17	2.83	1.19	765.94

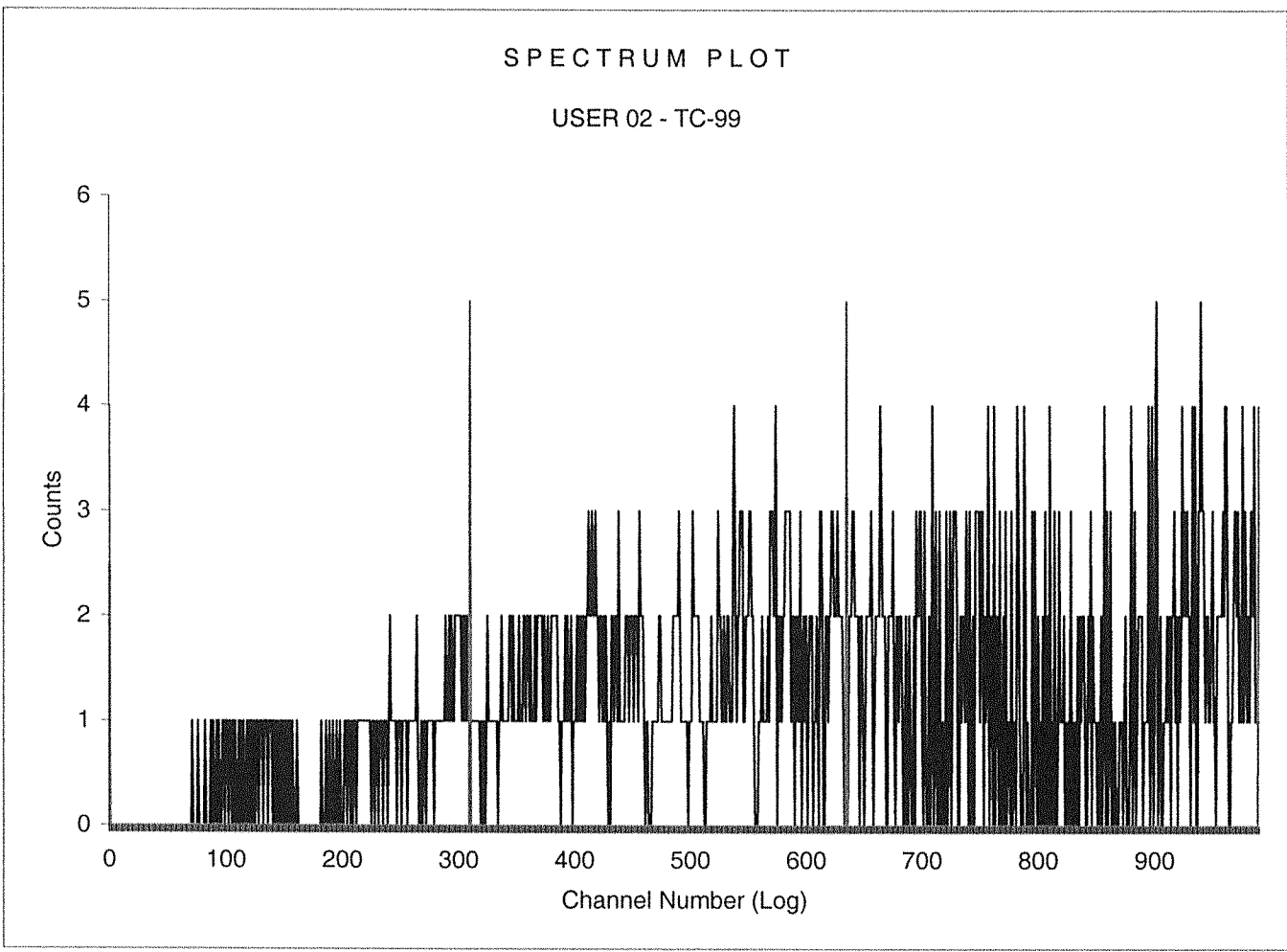
Sample Count Start Time: 20 Sep 2016 10:12:50
Data Capture Date: 20 Sep 2016 10:43:15
User Filename: S02092017-1A.XLS
U02092017-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TC-99
User Comment: GOLD
Scintillator: LIQUID
Sample, Rack-Pos, Time: 1 17-1 30.00
H#, Total Counts: 179.4 1229
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990



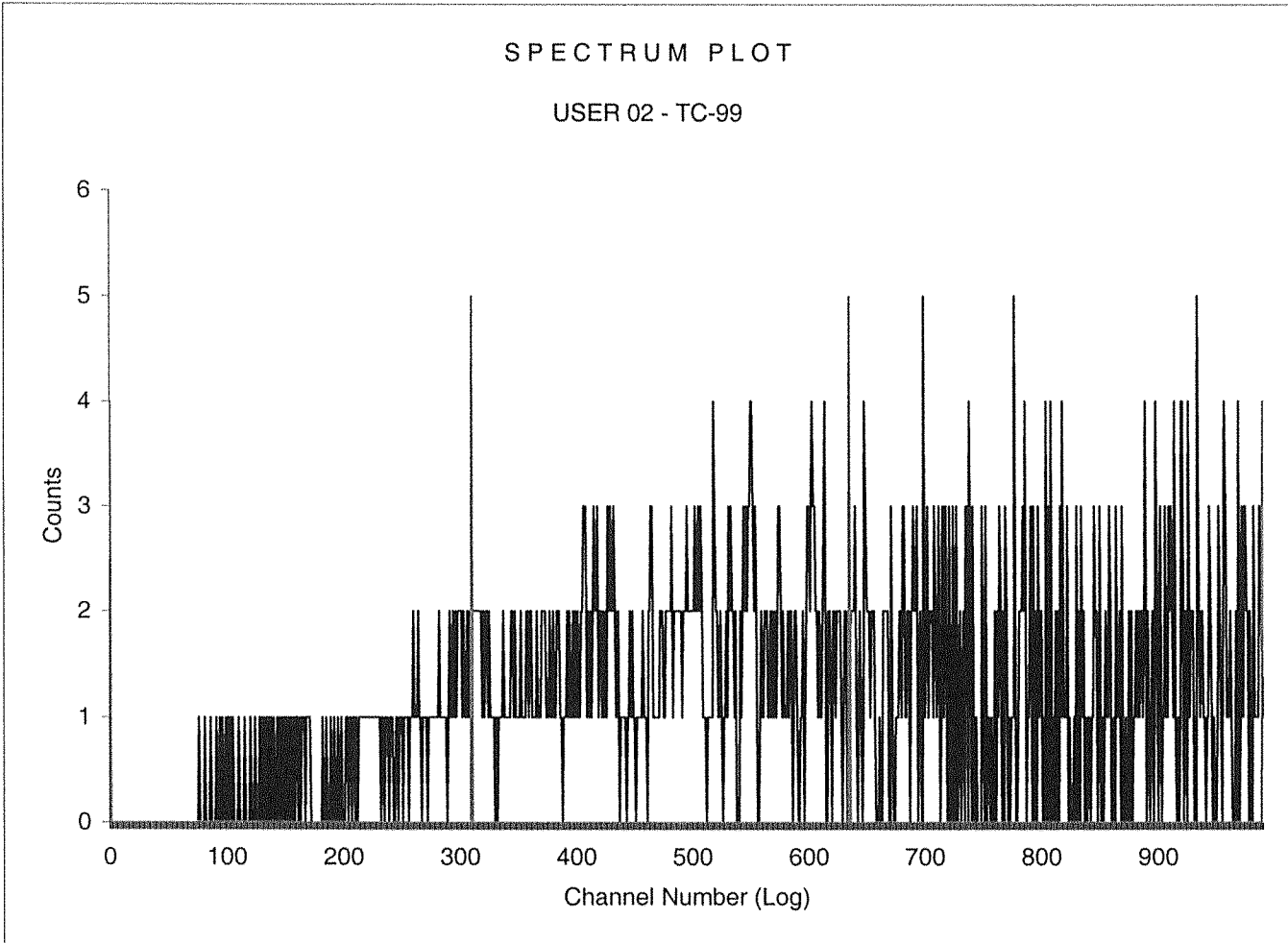
Sample Count Start Time: 20 Sep 2016 10:44:48
Data Capture Date: 20 Sep 2016 11:15:14
User Filename: S02092017-2A.XLS
U02092017-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TC-99
User Comment: GOLD
Scintillator: LIQUID
Sample, Rack-Pos, Time: 2 17-2 30.00
H#, Total Counts: 185.6 1263
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990



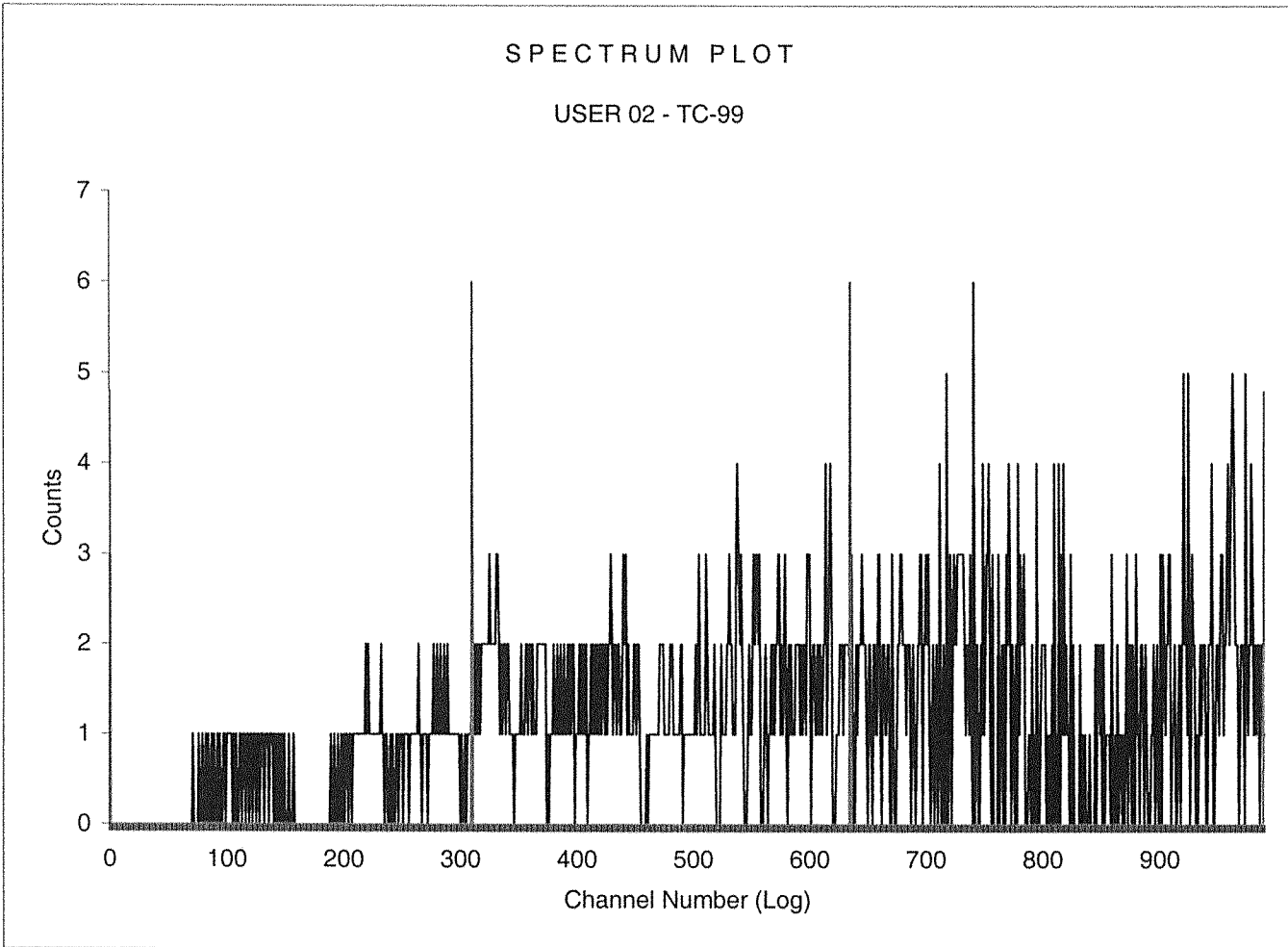
Sample Count Start Time:	20 Sep 2016 11:16:43		
Data Capture Date	20 Sep 2016 11:47:09		
User Filename	S02092017-3A.XLS		
	U02092017-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TC-99		
User Comment	GOLD		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	3	17-3	30.00
H#, Total Counts:	184.4	1204	
Win1: Tc-99 - Start, End:	310	635	
Win2: - Start, End:	0	990	



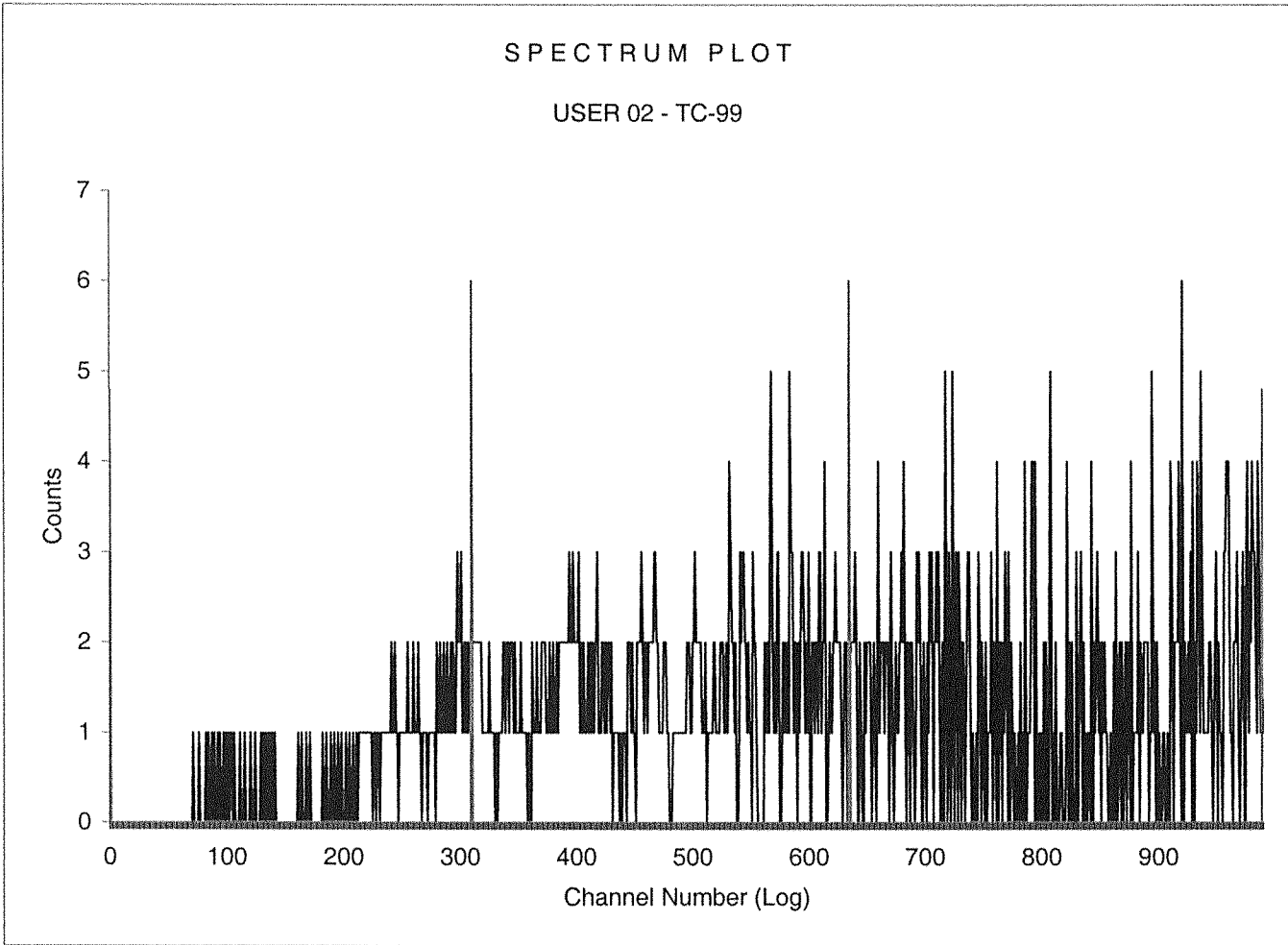
Sample Count Start Time: 20 Sep 2016 11:48:39
Data Capture Date: 20 Sep 2016 12:19:05
User Filename: S02092017-4A.XLS
U02092017-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TC-99
User Comment: GOLD
Scintillator: LIQUID
Sample, Rack-Pos, Time: 4 17-4 30.00
H#, Total Counts: 192.1 1189
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990



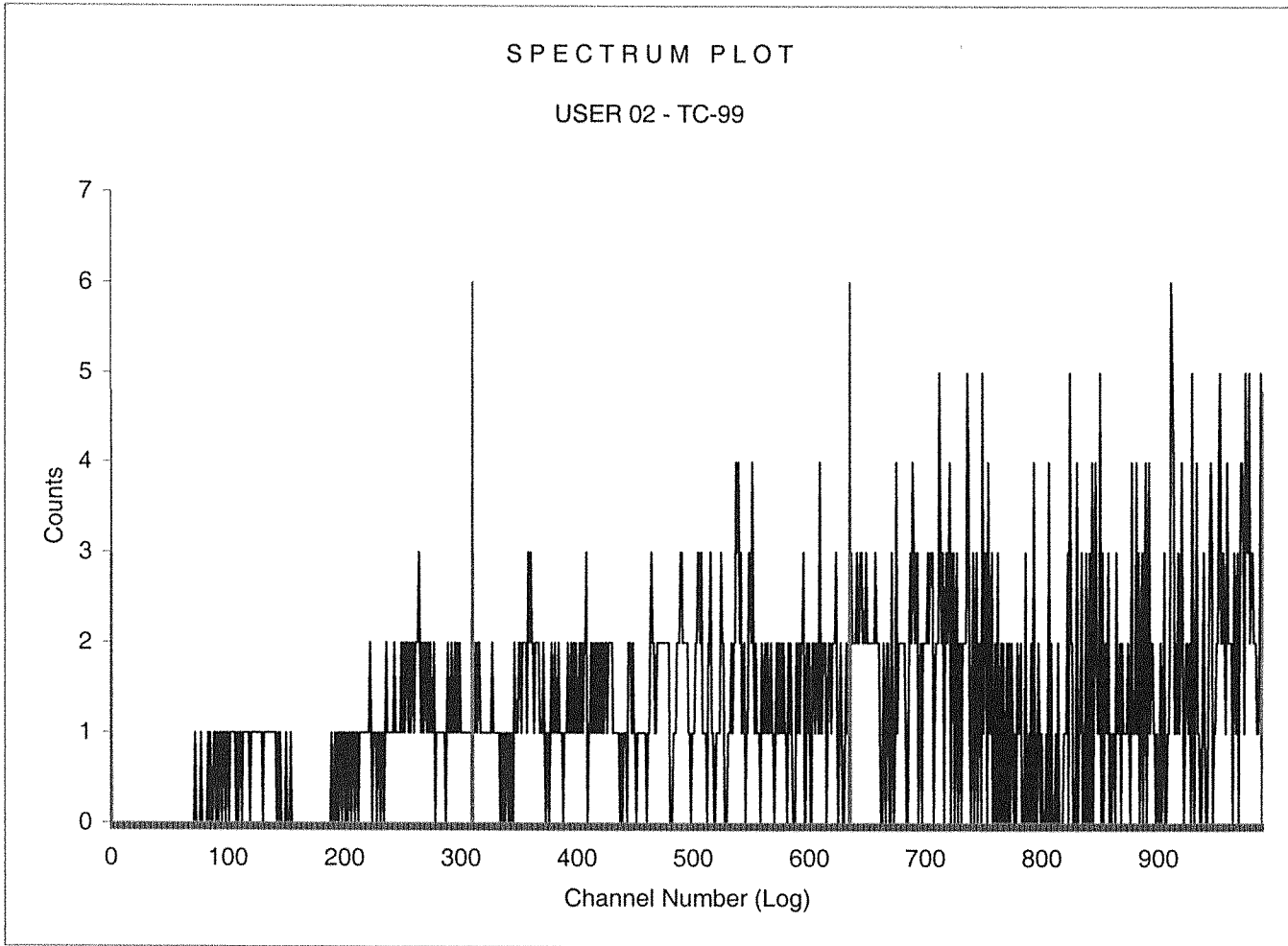
Sample Count Start Time:	20 Sep 2016 12:20:36		
Data Capture Date	20 Sep 2016 12:51:02		
User Filename	S02092017-5A.XLS		
	U02092017-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TC-99		
User Comment	GOLD		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	5	17-5	30.00
H#, Total Counts:	180.1	1169	
Win1: Tc-99 - Start, End:	310	635	
Win2: - Start, End:	0	990	



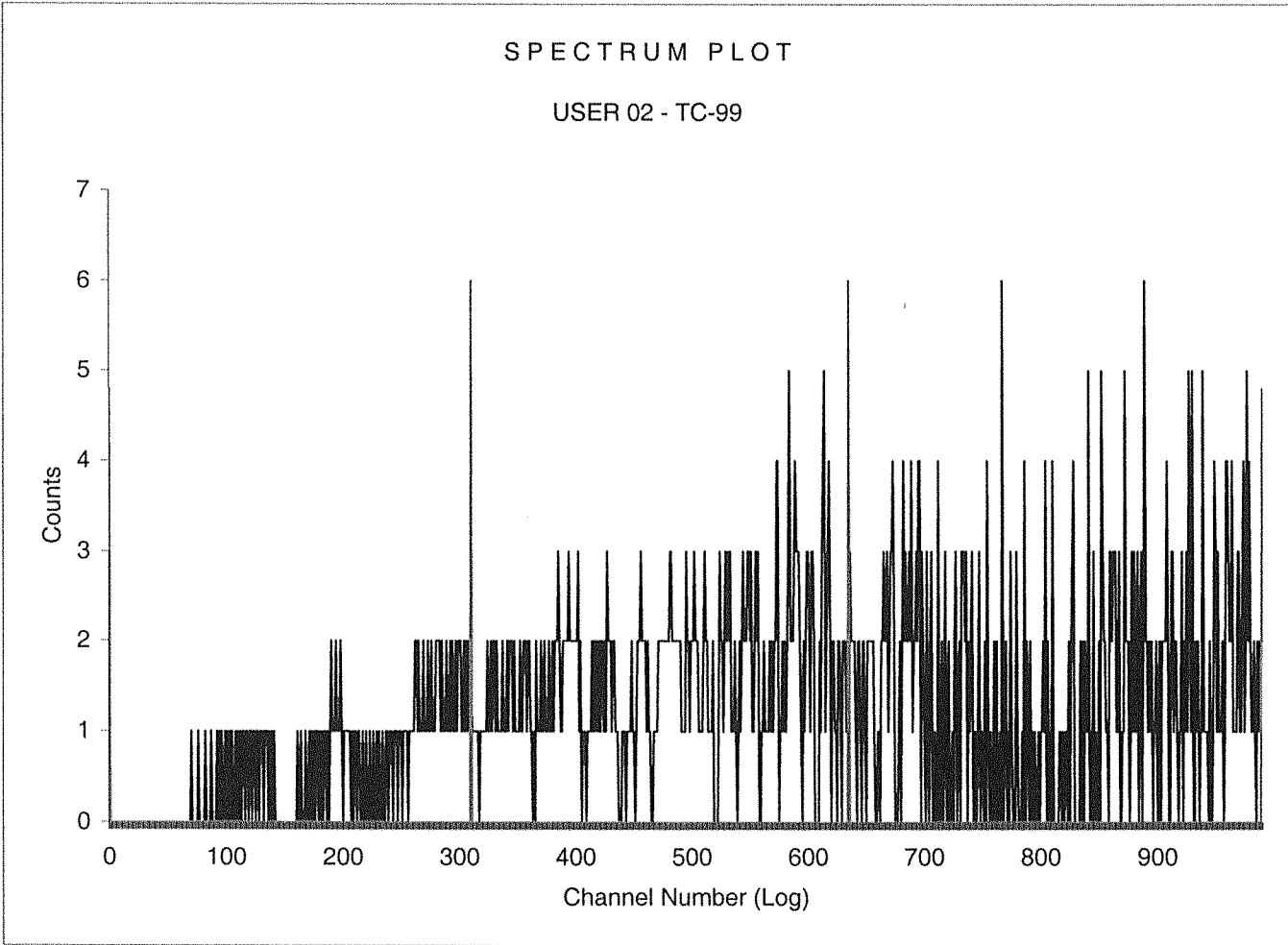
Sample Count Start Time: 20 Sep 2016 12:52:35
Data Capture Date: 20 Sep 2016 13:23:00
User Filename: S02092017-6A.XLS
U02092017-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TC-99
User Comment: GOLD
Scintillator: LIQUID
Sample, Rack-Pos, Time: 6 17-6 30.00
H#, Total Counts: 177.3 1190
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990



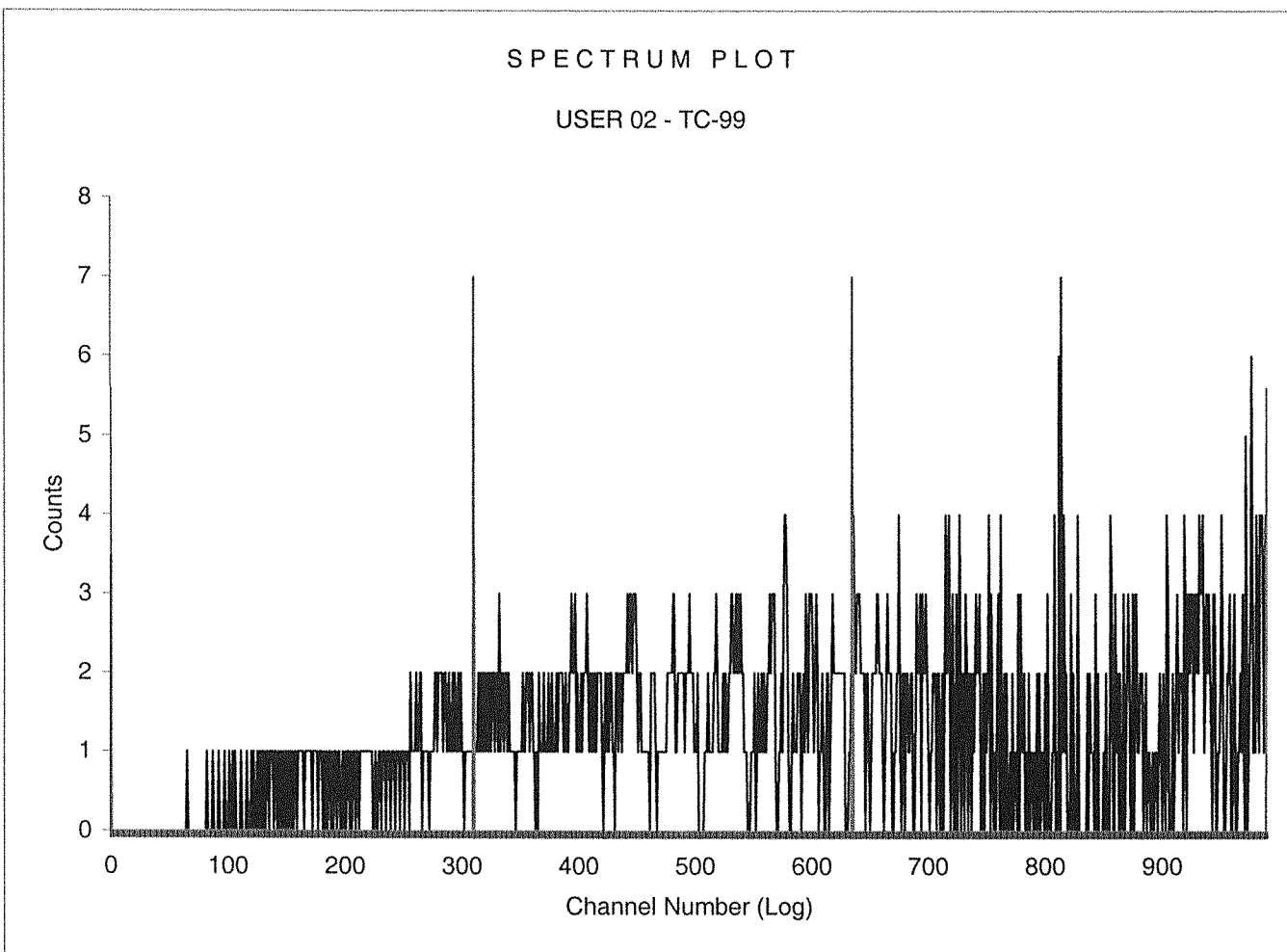
Sample Count Start Time: 20 Sep 2016 13:24:33
Data Capture Date: 20 Sep 2016 13:54:58
User Filename: S02092017-7A.XLS
U02092017-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TC-99
User Comment: GOLD
Scintillator: LIQUID
Sample, Rack-Pos, Time: 7 17-7 30.00
H#, Total Counts: 190.5 1239
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990



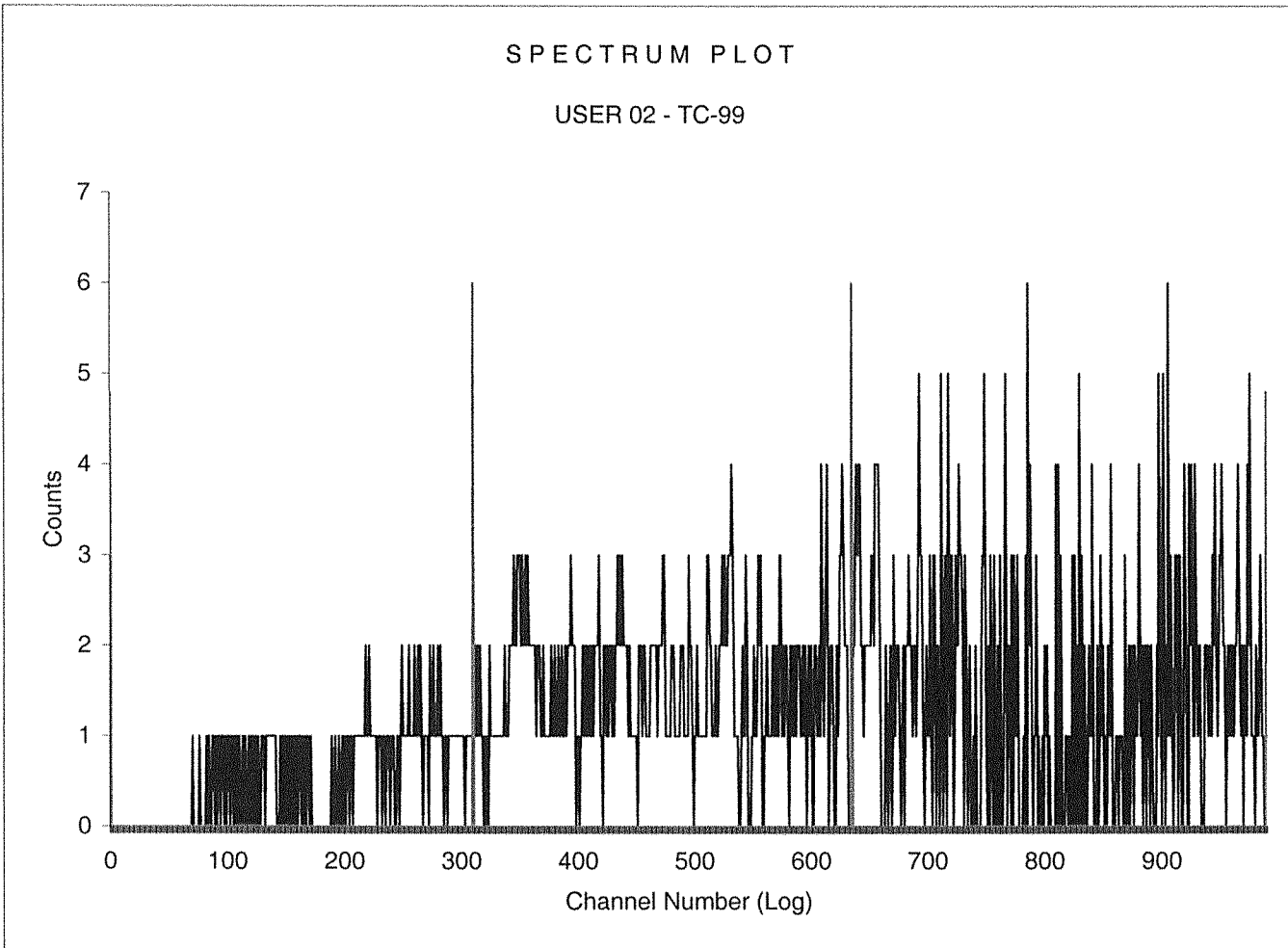
Sample Count Start Time: 20 Sep 2016 13:56:31
Data Capture Date: 20 Sep 2016 14:26:57
User Filename: S02092017-8A.XLS
U02092017-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TC-99
User Comment: GOLD
Scintillator: LIQUID
Sample, Rack-Pos, Time: 8 17-8 30.00
H#, Total Counts: 192.7 1221
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990



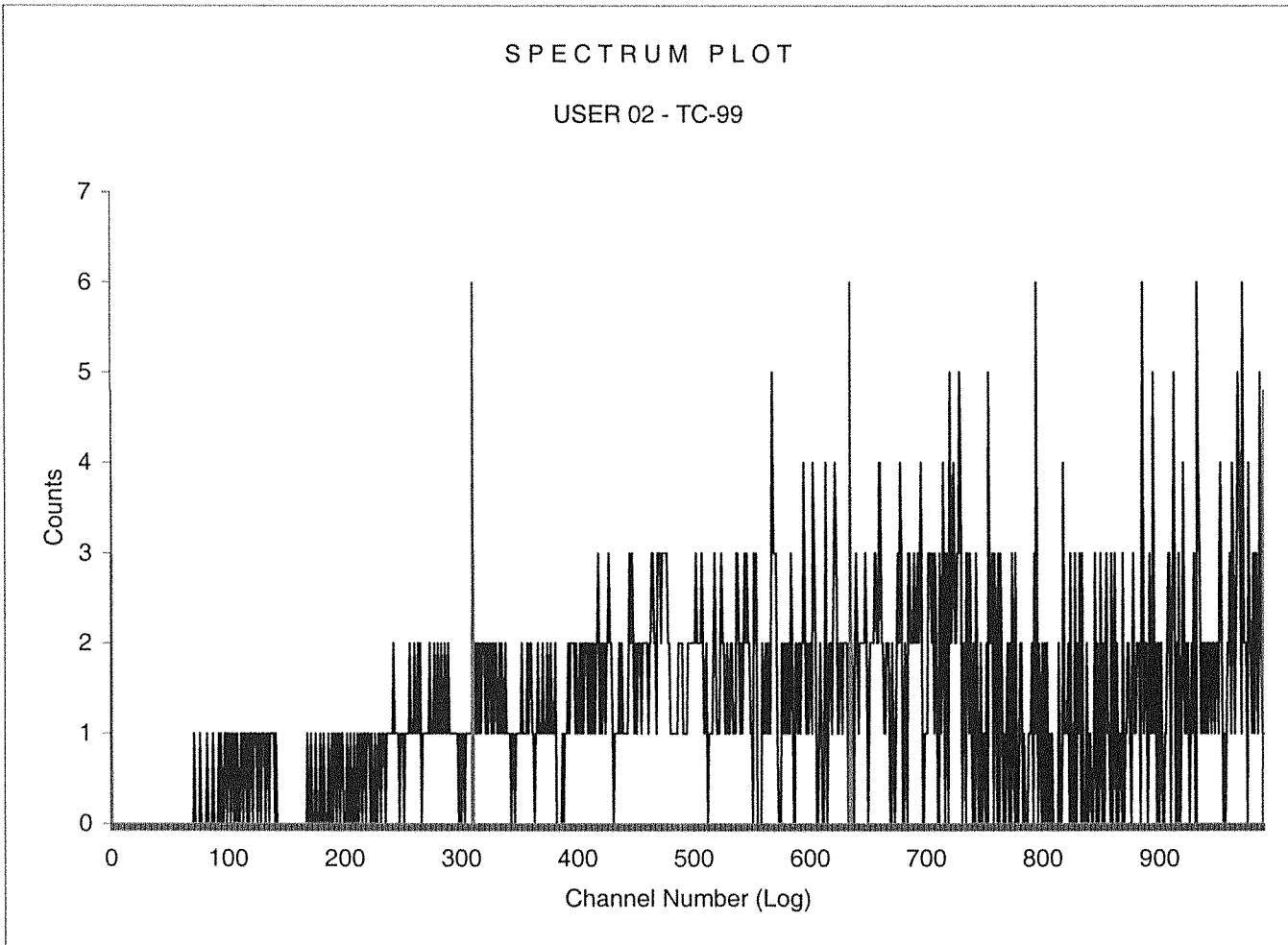
Sample Count Start Time:	20 Sep 2016 14:28:24		
Data Capture Date	20 Sep 2016 14:58:49		
User Filename	S02092017-9A.XLS		
	U02092017-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TC-99		
User Comment	GOLD		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	9	17-9	30.00
H#, Total Counts:	189.8	1230	
Win1: Tc-99 - Start, End:	310	635	
Win2: - Start, End:	0	990	



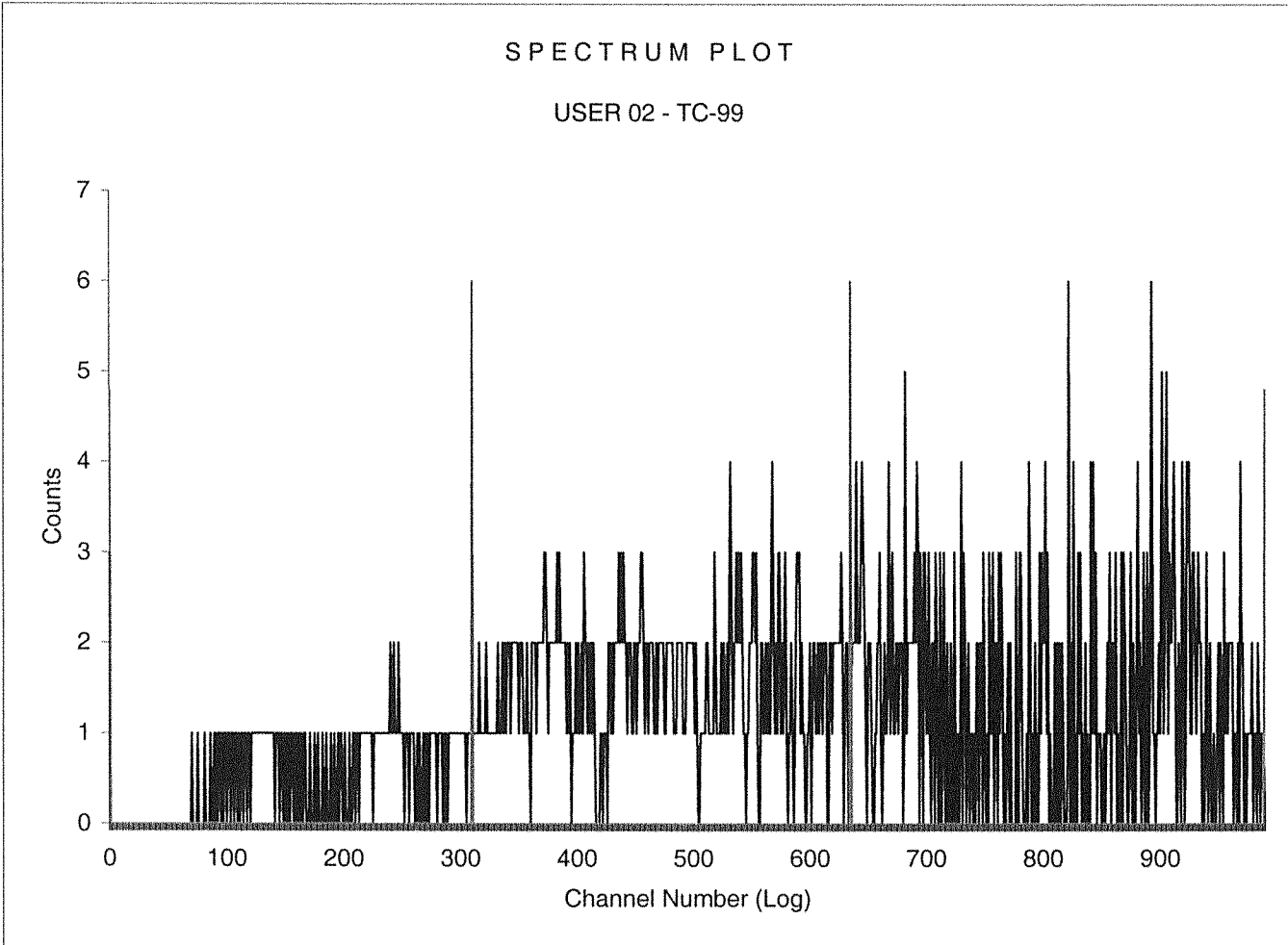
Sample Count Start Time: 20 Sep 2016 15:00:24
Data Capture Date 20 Sep 2016 15:30:49
User Filename S02092017-10A.XLS
U02092017-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TC-99
User Comment GOLD
Scintillator LIQUID
Sample, Rack-Pos, Time: 10 17-10 30.00
H#, Total Counts: 194.2 1236
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990



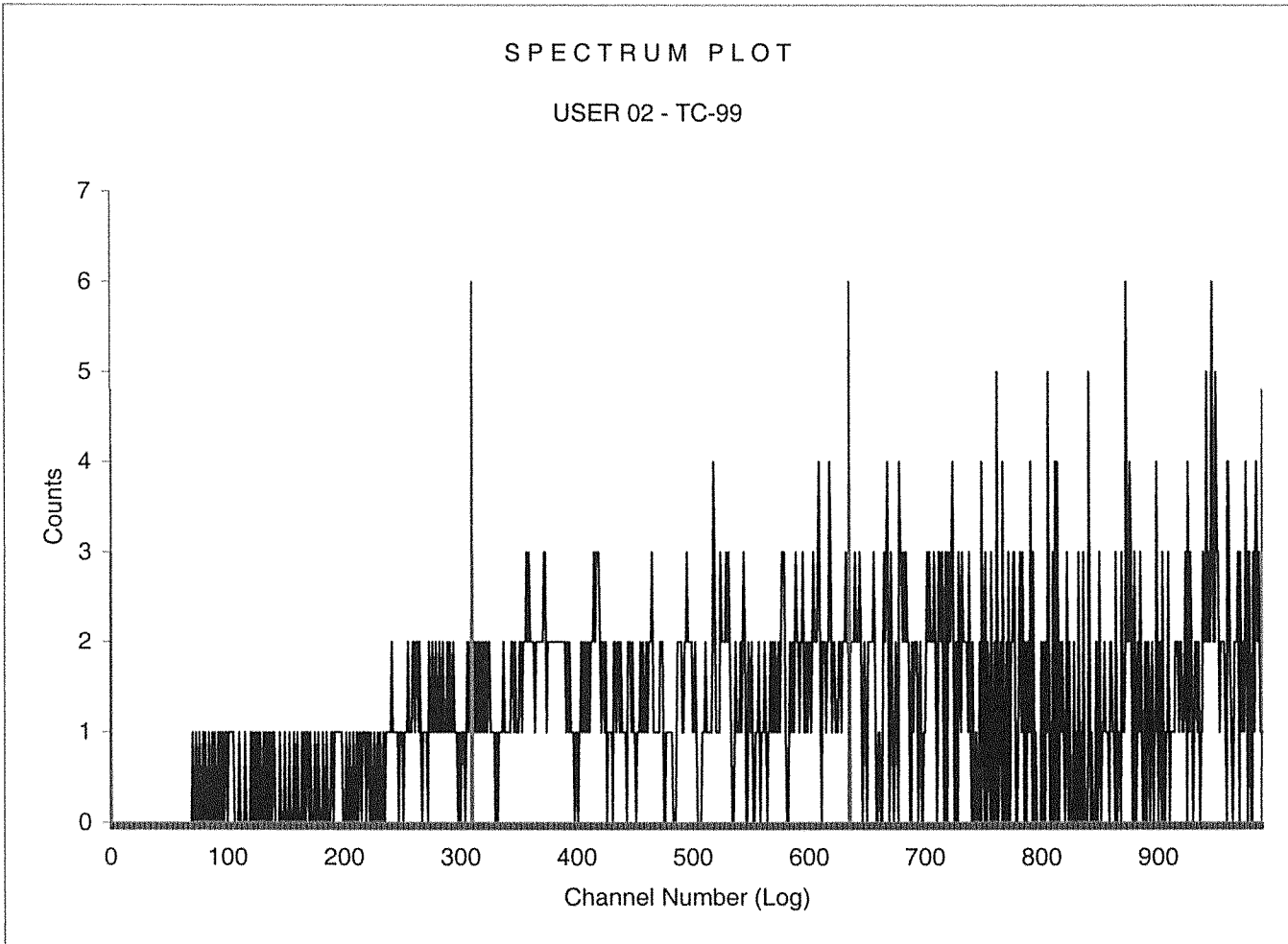
Sample Count Start Time: 20 Sep 2016 15:32:22
Data Capture Date: 20 Sep 2016 16:02:48
User Filename: S02092017-11A.XLS
U02092017-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TC-99
User Comment: GOLD
Scintillator: LIQUID
Sample, Rack-Pos, Time: 11 17-11 30.00
H#, Total Counts: 183.1 1241
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990



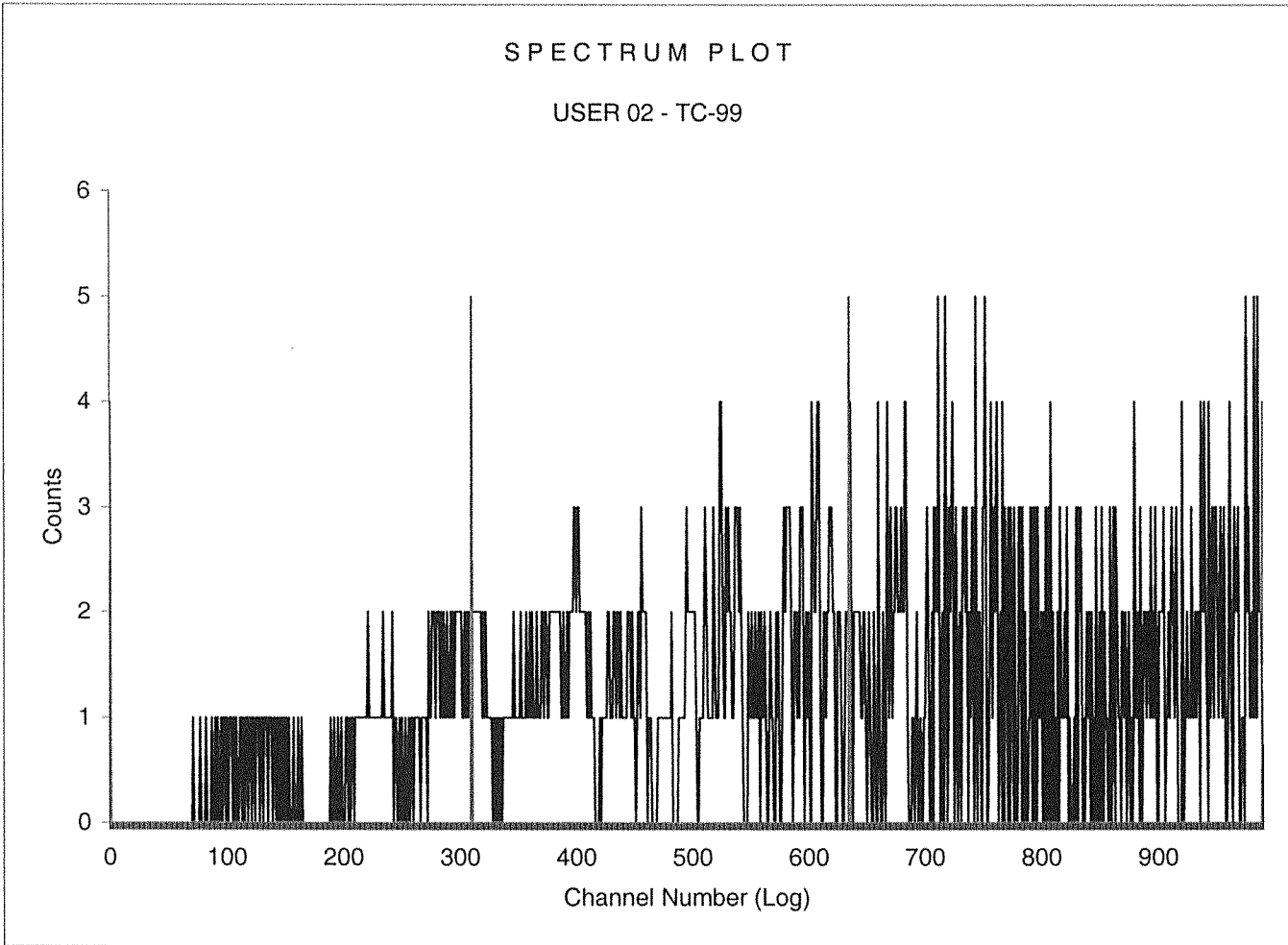
Sample Count Start Time: 20 Sep 2016 16:04:21
Data Capture Date: 20 Sep 2016 16:34:46
User Filename: S02092017-12A.XLS
U02092017-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TC-99
User Comment: GOLD
Scintillator: LIQUID
Sample, Rack-Pos, Time: 12 17-12 30.00
H#, Total Counts: 211.8 1180
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990



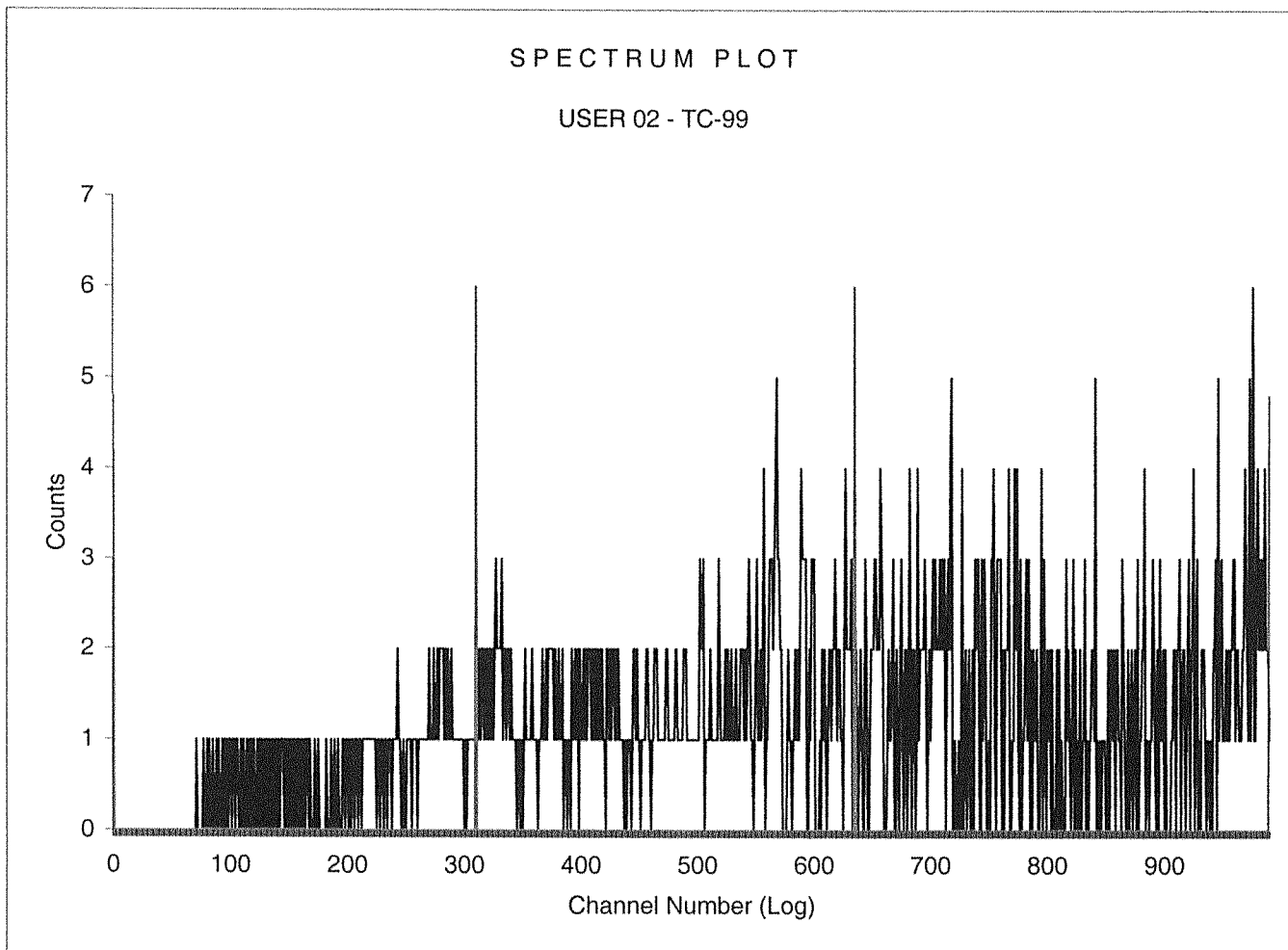
Sample Count Start Time: 20 Sep 2016 16:36:23
Data Capture Date: 20 Sep 2016 17:06:49
User Filename: S02092008-1A.XLS
U02092017-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TC-99
User Comment: GOLD
Scintillator: LIQUID
Sample, Rack-Pos, Time: 13 8-1 30.00
H#, Total Counts: 181.0 1242
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990



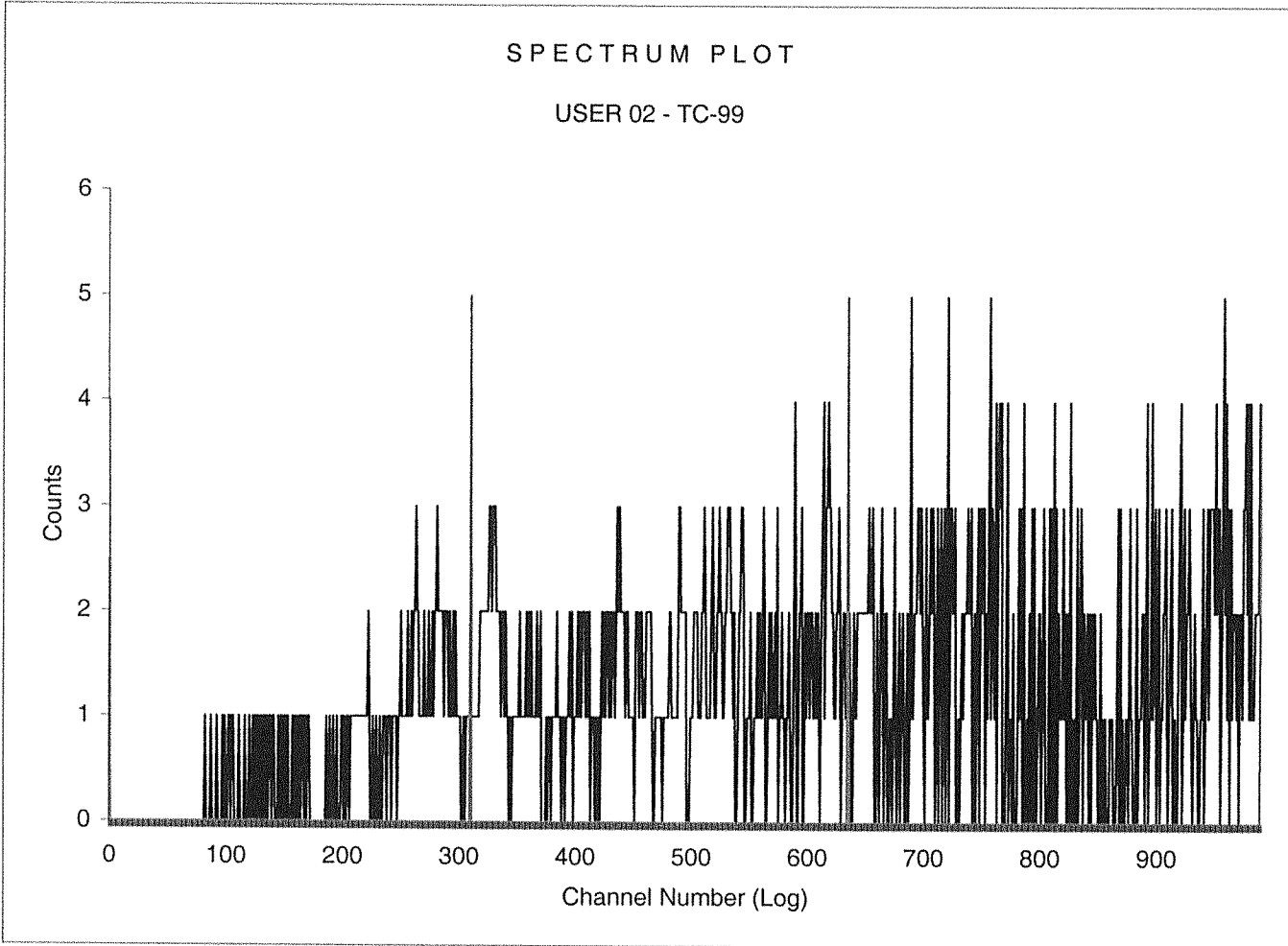
Sample Count Start Time: 20 Sep 2016 17:08:15
Data Capture Date: 20 Sep 2016 17:38:40
User Filename: S02092008-2A.XLS
U02092017-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TC-99
User Comment: GOLD
Scintillator: LIQUID
Sample, Rack-Pos, Time: 14 8-2 30.00
H#, Total Counts: 171.0 1219
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990



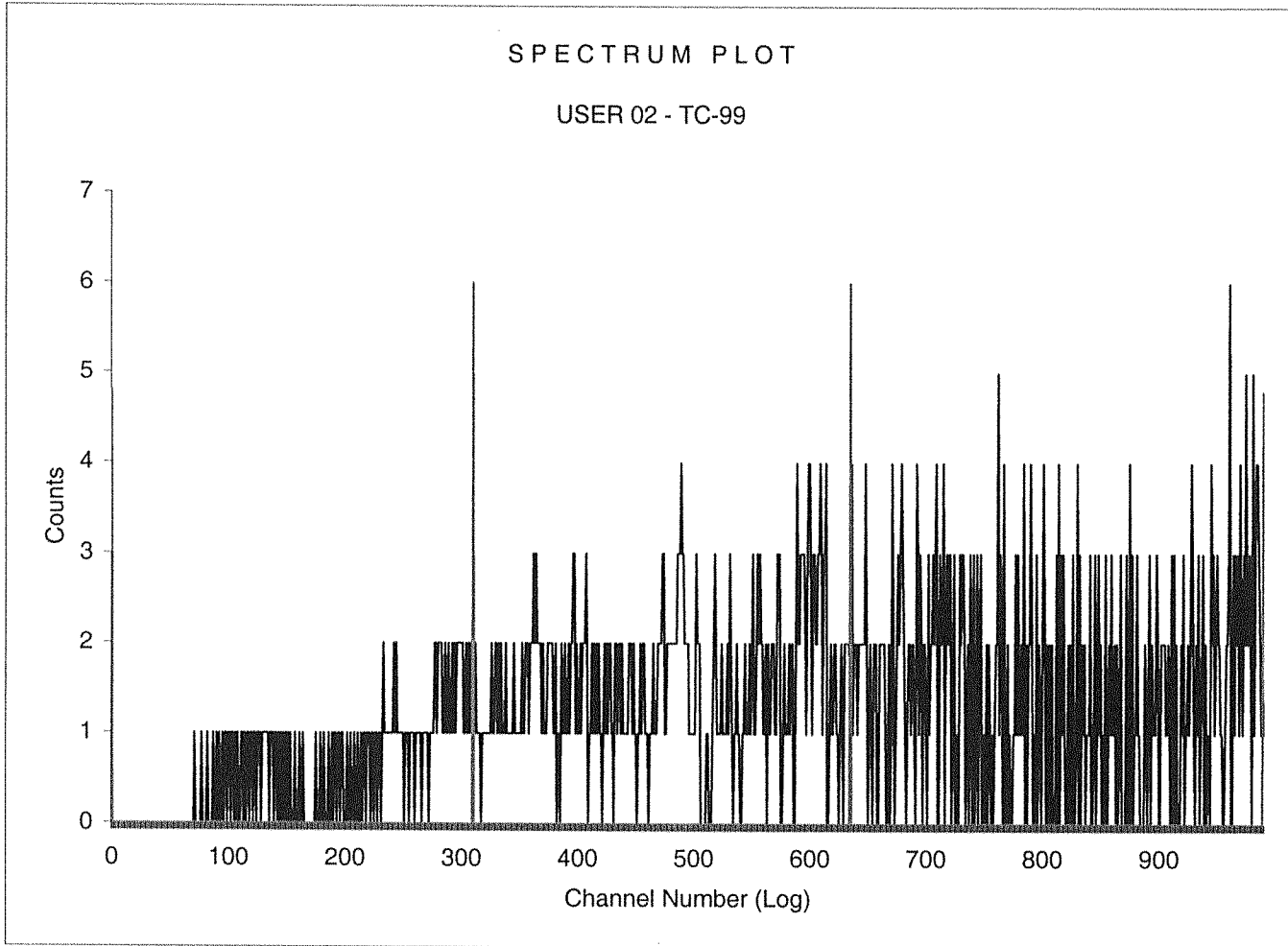
Sample Count Start Time:	20 Sep 2016 17:40:12		
Data Capture Date	20 Sep 2016 18:10:37		
User Filename	S02092008-3A.XLS		
	U02092017-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TC-99		
User Comment	GOLD		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	15	8-3	30.00
H#, Total Counts:	177.9	1179	
Win1: Tc-99 - Start, End:	310	635	
Win2: - Start, End:	0	990	



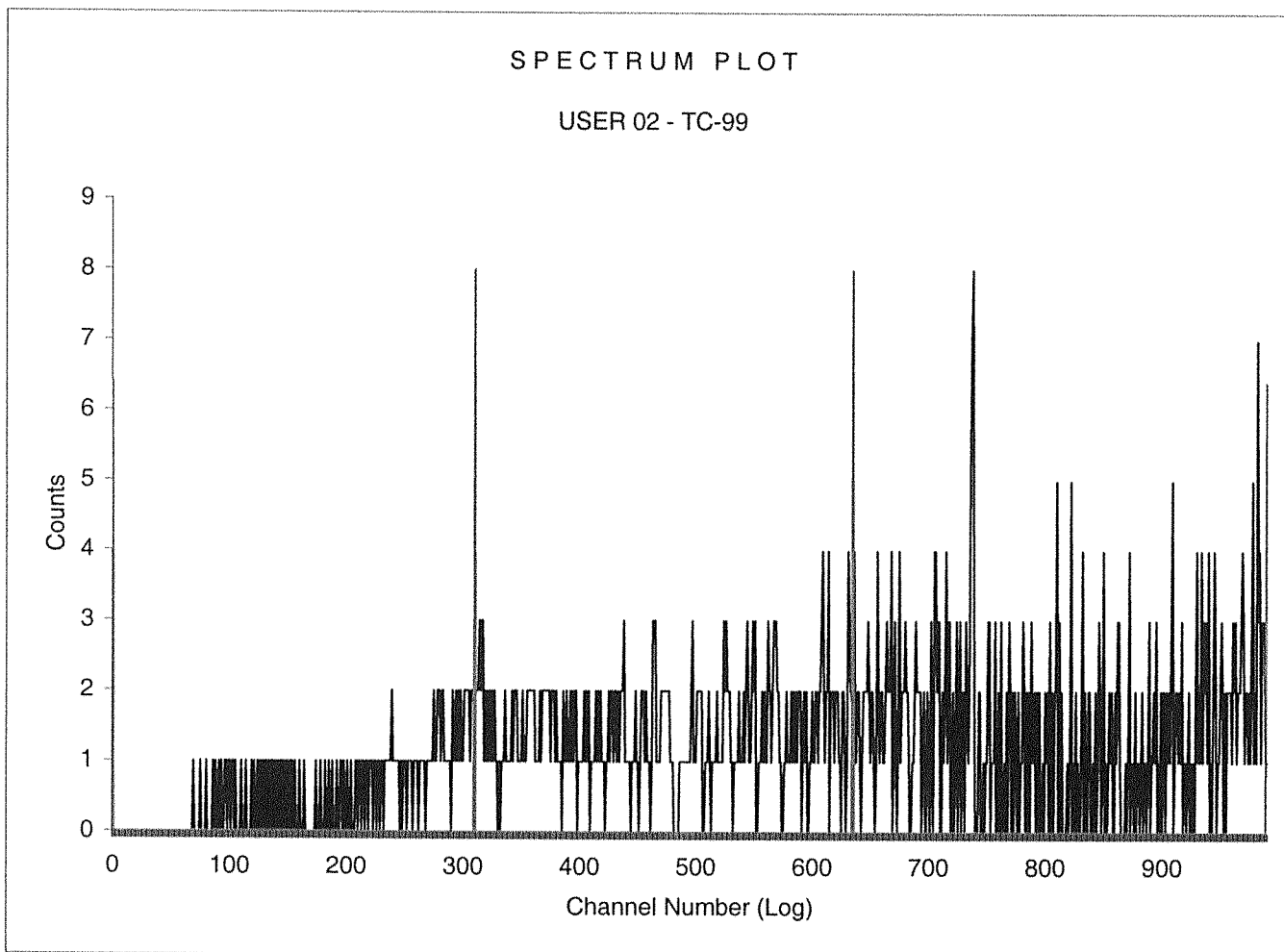
Sample Count Start Time: 20 Sep 2016 18:12:06
Data Capture Date: 20 Sep 2016 18:42:31
User Filename: S02092008-4A.XLS
U02092017-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TC-99
User Comment: GOLD
Scintillator: LIQUID
Sample, Rack-Pos, Time: 16 8-4 30.00
H#, Total Counts: 173.1 1253
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990



Sample Count Start Time: 20 Sep 2016 18:44:03
Data Capture Date: 20 Sep 2016 19:14:27
User Filename: S02092008-5A.XLS
U02092017-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TC-99
User Comment: GOLD
Scintillator: LIQUID
Sample, Rack-Pos, Time: 17 8-5 30.00
H#, Total Counts: 180.1 1251
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990



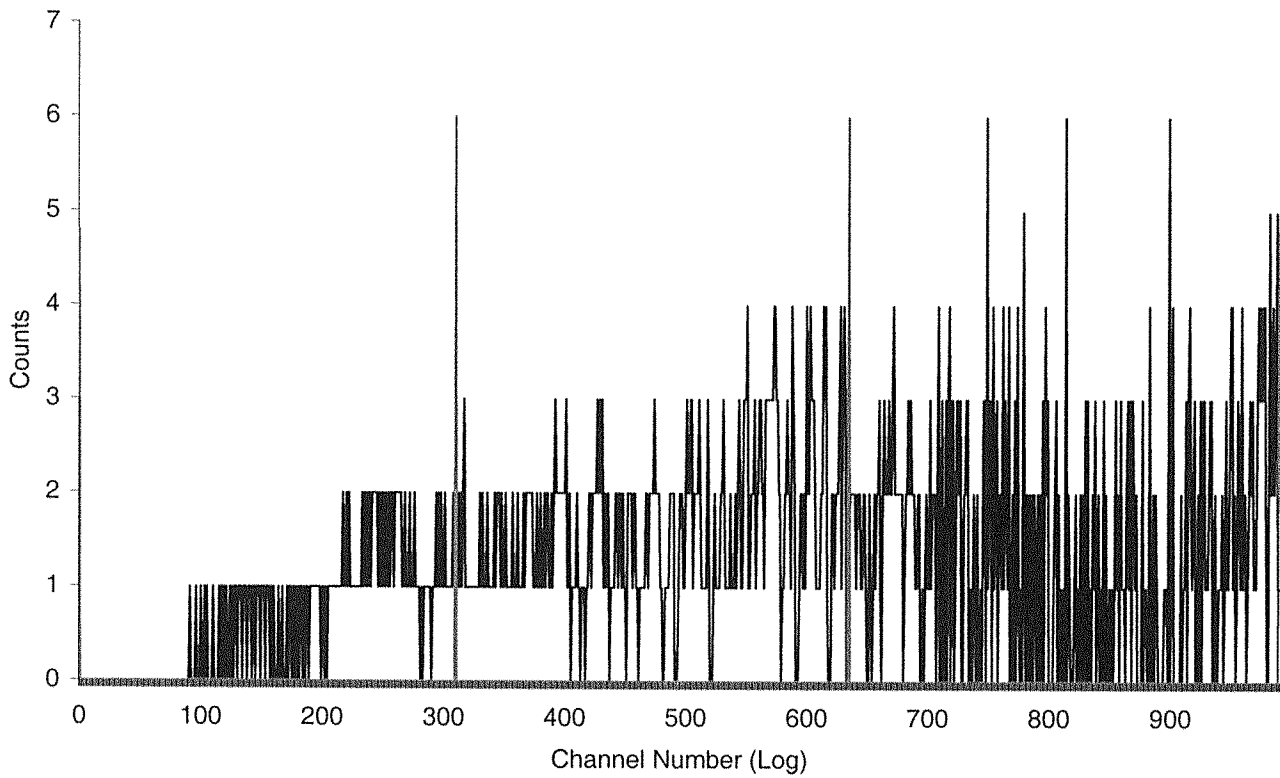
Sample Count Start Time: 20 Sep 2016 19:15:57
Data Capture Date: 20 Sep 2016 19:46:23
User Filename: S02092008-6A.XLS
U02092017-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TC-99
User Comment: GOLD
Scintillator: LIQUID
Sample, Rack-Pos, Time: 18 8-6 30.00
H#, Total Counts: 167.0 1233
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990



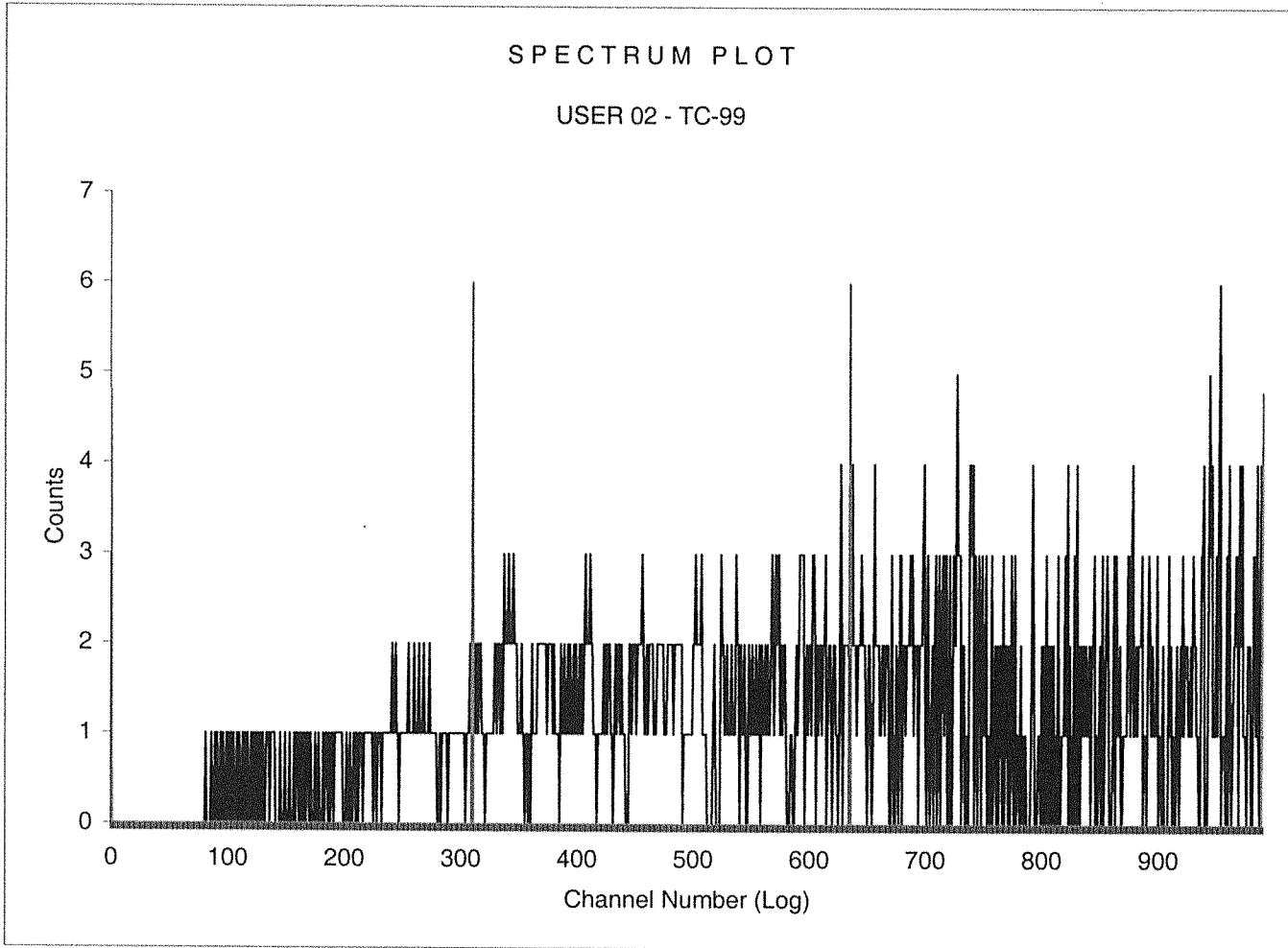
Sample Count Start Time: 20 Sep 2016 19:47:53
Data Capture Date 20 Sep 2016 20:18:17
User Filename S02092008-7A.XLS
U02092017-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TC-99
User Comment GOLD
Scintillator LIQUID
Sample, Rack-Pos, Time: 19 8-7 30.00
H#, Total Counts: 171.1 1327
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990

SPECTRUM PLOT

USER 02 - TC-99



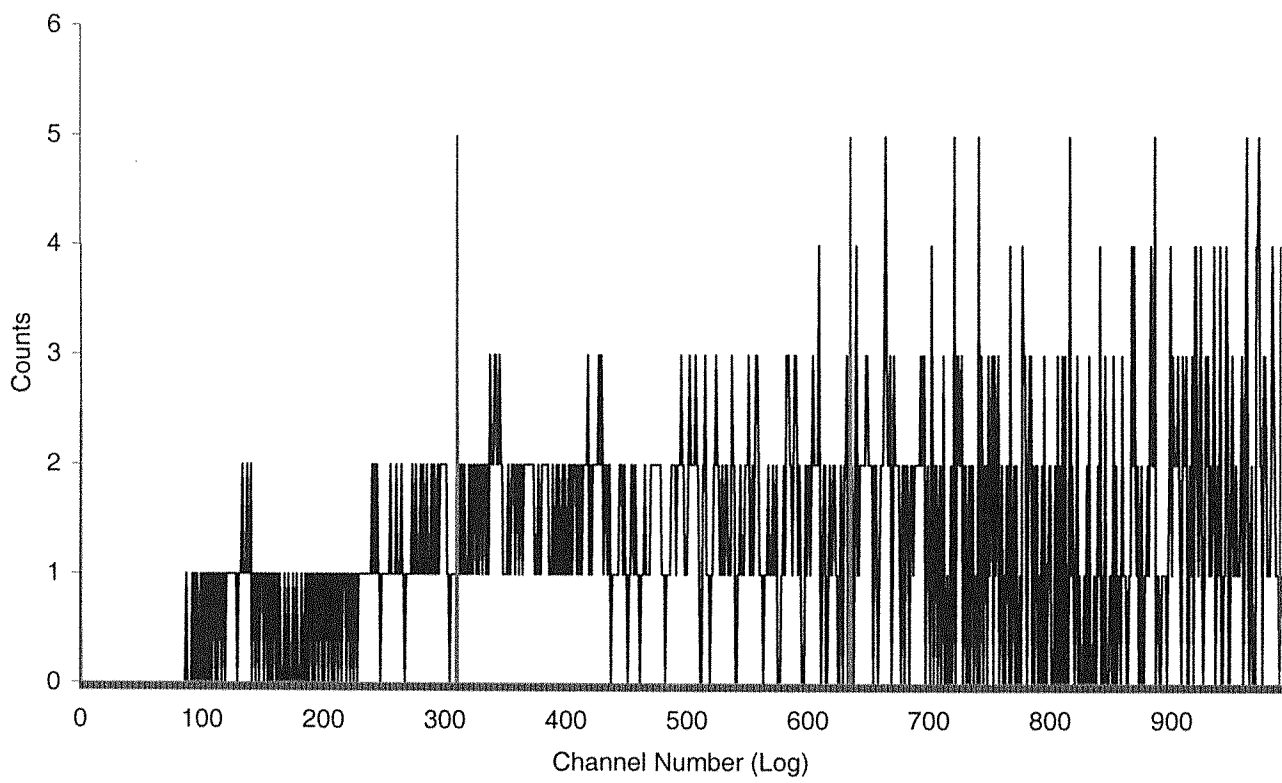
Sample Count Start Time: 20 Sep 2016 20:19:48
Data Capture Date: 20 Sep 2016 20:50:12
User Filename: S02092008-8A.XLS
U02092017-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TC-99
User Comment: GOLD
Scintillator: LIQUID
Sample, Rack-Pos, Time: 20 8-8 30.00
H#, Total Counts: 185.7 1199
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990



Sample Count Start Time: 20 Sep 2016 20:51:39
Data Capture Date: 20 Sep 2016 21:22:04
User Filename: S02092008-9A.XLS
U02092017-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TC-99
User Comment: GOLD
Scintillator: LIQUID
Sample, Rack-Pos, Time: 21 8-9 30.00
H#, Total Counts: 188.1 1240
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990

SPECTRUM PLOT

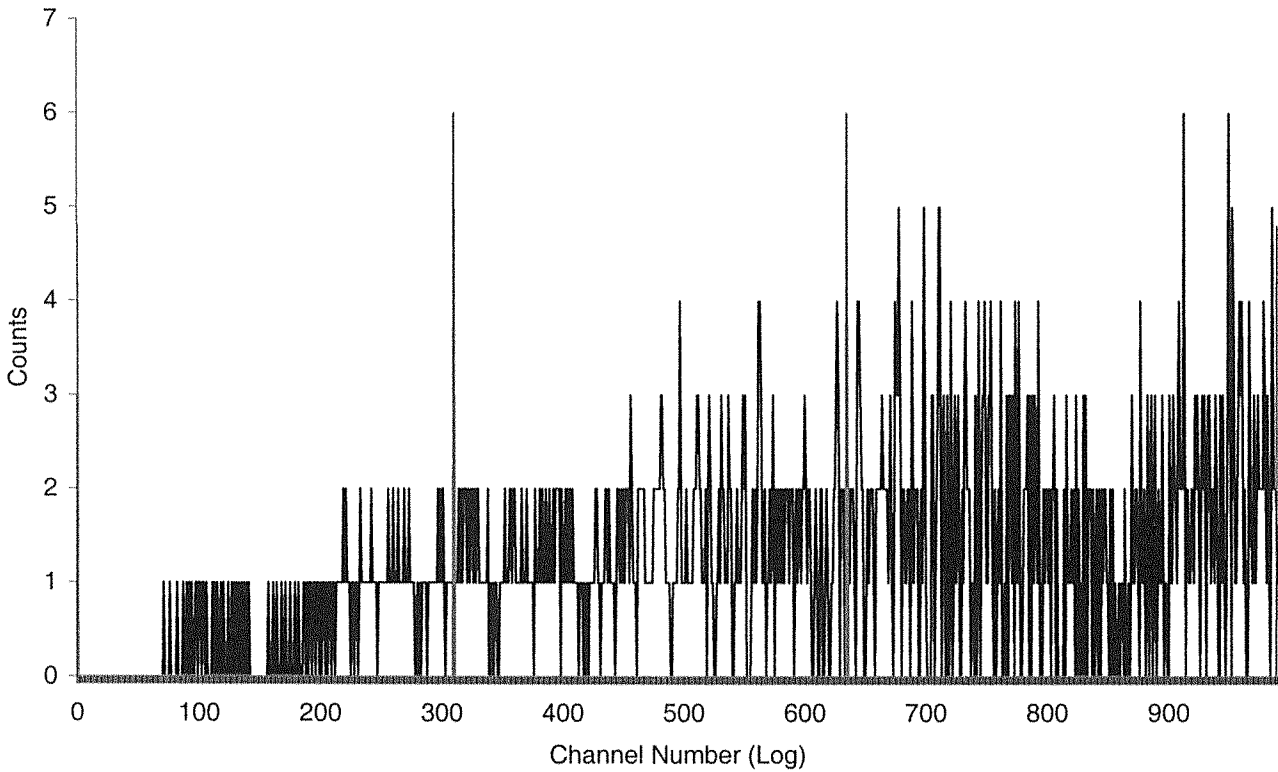
USER 02 - TC-99



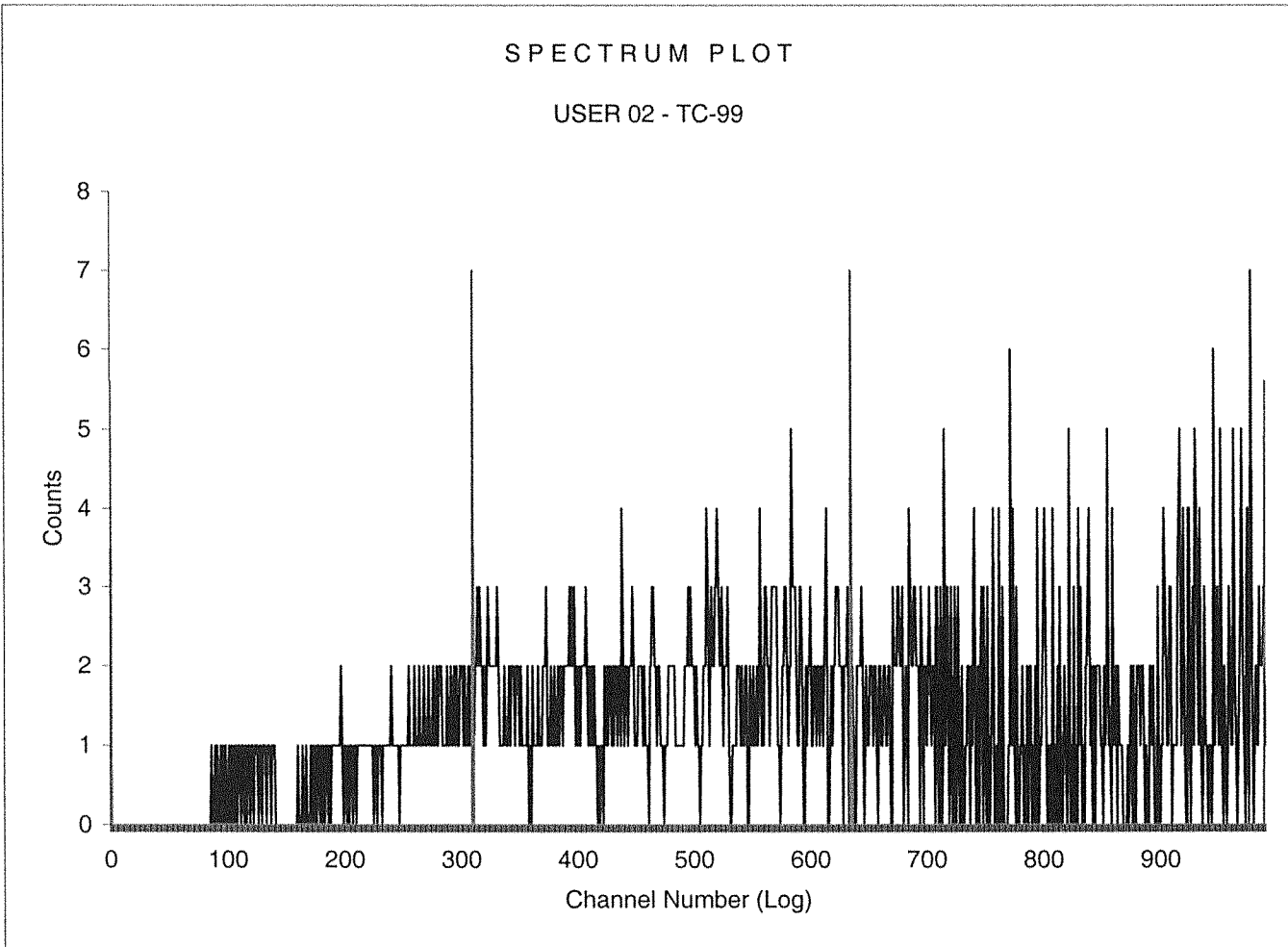
Sample Count Start Time: 20 Sep 2016 21:23:32
Data Capture Date 20 Sep 2016 21:53:58
User Filename S02092008-10A.XLS
U02092017-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TC-99
User Comment GOLD
Scintillator LIQUID
Sample, Rack-Pos, Time: 22 8-10 30.00
H#, Total Counts: 175.5 1227
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990

SPECTRUM PLOT

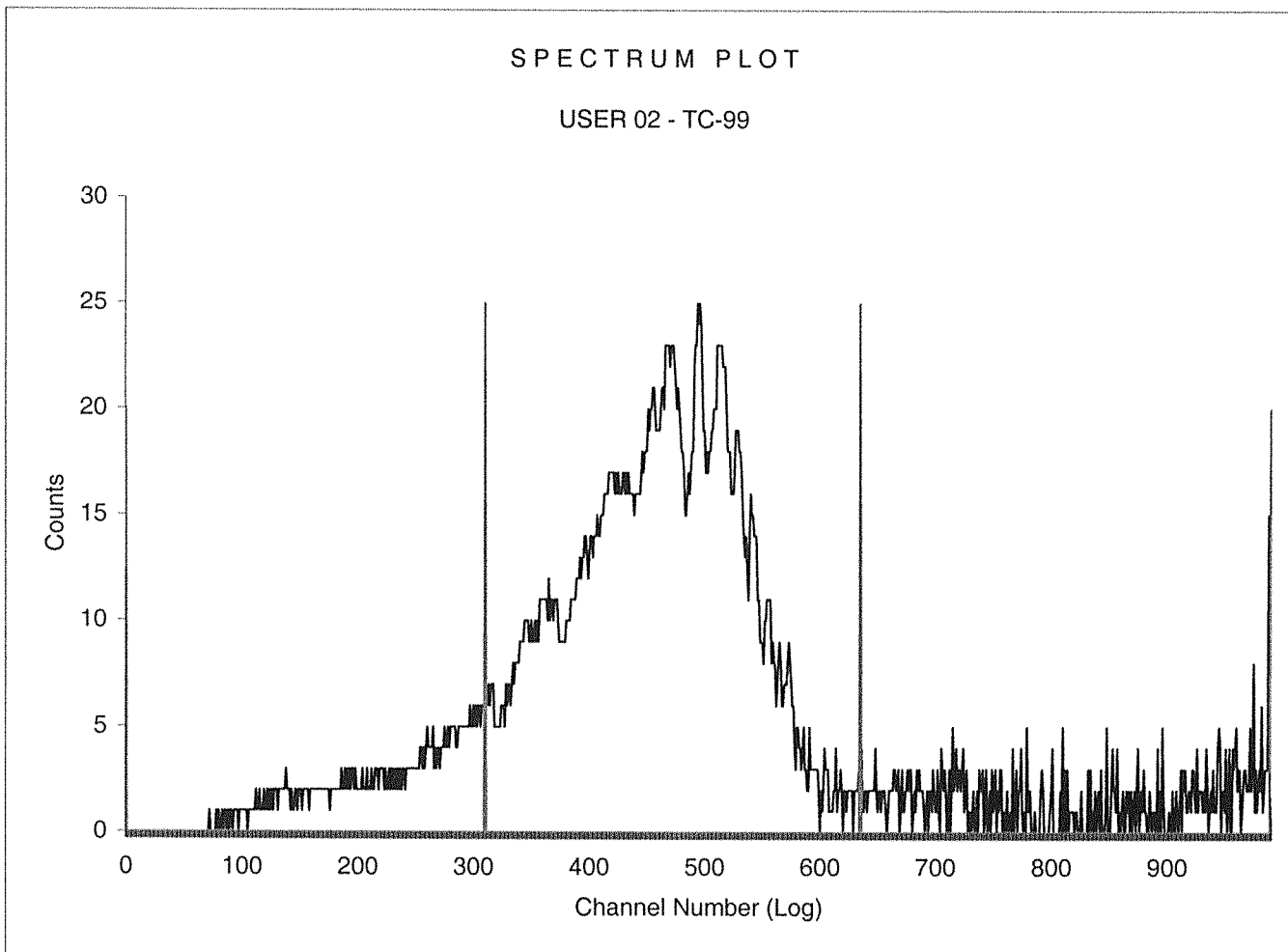
USER 02 - TC-99



Sample Count Start Time: 20 Sep 2016 21:55:30
Data Capture Date: 20 Sep 2016 22:25:56
User Filename: S02092008-11A.XLS
U02092017-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TC-99
User Comment: GOLD
Scintillator: LIQUID
Sample, Rack-Pos, Time: 23 8-11 30.00
H#, Total Counts: 185.7 1301
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990



Sample Count Start Time: 20 Sep 2016 22:27:24
Data Capture Date 20 Sep 2016 22:57:49
User Filename S02092008-12A.XLS
U02092017-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TC-99
User Comment GOLD
Scintillator LIQUID
Sample, Rack-Pos, Time: 24 8-12 30.00
H#, Total Counts: 175.2 5061
Win1: Tc-99 - Start, End: 310 635
Win2: - Start, End: 0 990



Batch# 1598072 Product: H3 Date: 9/21/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			NA
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	see DER 1559816
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER 1559816
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER 1559816
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REM, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: [Signature]

Secondary Review Performed By: [Signature] 9/21/16

MJWE
COM

DATA EXCEPTION REPORT

Mo.Day Yr. 21-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LSC	Test / Method: EPA 906.0 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1598072	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, 1203626095 and 1203626096 were received and analyzed out of the method specified hold time.</p>		<p>1. Reporting results.</p>	

Originator's Name:
Elizabeth Krouse 21-SEP-16

Data Validator/Group Leader:
Lyndsey Pace 21-SEP-16

Prep Logbook

The Determination of Tritium

MSWC 10/4/16 90

Batch ID: 1598072
Analyst: Angela Johnson
Method: EPA 906.0 Modified
Lab SOP: GL-RAD-A-002 REV# 21
Instrument: BAL-18550299

Sample ID	Prep Date	Matrix	Dry or Wet	Unadjusted Aliquot (g)	Aliquot (g)	Rig #	Volume Added (mL)	Aliquot in vial (mL)	Serial Number	Spike Amount	Spike Units
405235001	14-SEP-2016 11:11:07	Soil	W	3.928	3.165	1	50	10	1753-B	.1	mL
405235002	14-SEP-2016 11:11:07	Soil	W	4.033	3.131	2	50	10	1753-B	.1	mL
405235003	14-SEP-2016 11:11:07	Soil	W	3.851	3.182	5	50	10			
405235004	14-SEP-2016 11:11:07	Soil	W	3.943	3.179	8	50	10			
405235005	14-SEP-2016 11:11:07	Soil	W	4.247	3.381	9	50	10			
405235006	14-SEP-2016 11:11:07	Soil	W	3.788	3.049	11	50	10			
405235007	14-SEP-2016 11:11:07	Soil	W	3.805	2.997	13	50	10			
405235008	14-SEP-2016 11:11:07	Soil	W	3.777	2.994	15	50	10			
405235009	14-SEP-2016 11:11:07	Soil	W	3.957	3.022	16	50	10			
405235010	14-SEP-2016 11:11:07	Soil	W	3.833	3.062	17	50	10			
405235011	14-SEP-2016 11:11:07	Soil	W	4.103	3.434	18	50	10			
405235012	14-SEP-2016 11:11:07	Soil	W	3.979	3.304	20	50	10			
405235013	14-SEP-2016 11:11:07	Soil	W	3.704	2.904	21	50	10			
405235014	14-SEP-2016 11:11:07	Soil	W	3.881	3.292	23	50	10			
405235015	14-SEP-2016 11:11:07	Soil	W	3.748	3.48	24	50	10			
405235016	14-SEP-2016 11:11:07	Soil	W	3.635	2.892	25	50	10			
405235017	14-SEP-2016 11:11:07	Soil	W	3.692	2.861	26	50	10			
405235018	14-SEP-2016 11:11:07	Soil	W	3.647	2.856	27	50	10			
405235019	14-SEP-2016 11:11:07	Soil	W	3.893	3.211	28	50	10			
405235020	14-SEP-2016 11:11:07	Soil	W	3.764	3.227	29	50	10			
1203626094 MB	14-SEP-2016 11:11:07	Soil	W	3.478	3.478	30	50	10			
1203626095 DUP (405235001)	14-SEP-2016 11:11:07	Soil	W	3.137	2.528	31	50	10			
1203626096 MS (405235001)	14-SEP-2016 11:11:07	Soil	W	3.847	3.1	32	50	10			
1203626097 LCS	14-SEP-2016 11:11:07	Soil	W	3.48	3.48	33	50	10			

Reagent/Solvent Lot ID	Description	Amount
2352257.5	Eoscient Ultra Scintillation Solution	13 mL
2373671	Sodium Hydroxide, Pellet ACS	2 g
2418926	Quenching Agent	20 mL
2447042.3	Eoscient Ultra Scintillation Solution	13 mL
2452415	RL-Potassium Permanganate	2 mL

Comments:
 Spike Pipet ID: RAD-LSC-2970968
 Vial Pipet ID: RAD-LSC-8036326
 Bkg prepared with dead water: Yes
 Data Entry Date2: 19-SEP-2016 05:15 BAL-18550299 Angela Johnson

Tritium Solid

Filename : H3DST.XLS
 File type : Excel
 Version # : 1.2.13

Batch : 1598072
 Analyst : ANGELA095
 Prep Date : 9/14/2016
 Method Uncertainty : 0

Procedure Code : LSCDSH9DS
 Parmname : Tritium
 Required MDA : 6 pCi/g
 H-3 Abundance : 1.00
 Half-life of Tritium : 12.32 years

Geometry: 10mL DW/13mL Ecoscint Ultra

Pos.	Sample ID	Total Sample Volume (L)	Sample Aliquot G	Sample Aliquot StDev. G	Distilled Sample Counted L	Sample Counted StDev. L	Rig number	Sample Date/Time
1	405235001.1	0.0500	3.1650	3.5474E-03	0.0100	1.0000E-05	1	12/10/2015 14:20
2	405235002.1	0.0500	3.1310	3.5439E-03	0.0100	1.0000E-05	2	12/10/2015 14:30
3	405235003.1	0.0500	3.1820	3.5492E-03	0.0100	1.0000E-05	5	12/10/2015 14:35
4	405235004.1	0.0500	3.1790	3.5489E-03	0.0100	1.0000E-05	8	12/9/2015 14:00
5	405235005.1	0.0500	3.3810	3.5697E-03	0.0100	1.0000E-05	9	12/10/2015 13:15
6	405235006.1	0.0500	3.0490	3.5355E-03	0.0100	1.0000E-05	11	12/10/2015 13:25
7	405235007.1	0.0500	2.9970	3.5301E-03	0.0100	1.0000E-05	13	12/10/2015 13:55
8	405235008.1	0.0500	2.9940	3.5298E-03	0.0100	1.0000E-05	15	12/10/2015 14:05
9	405235009.1	0.0500	3.0220	3.5327E-03	0.0100	1.0000E-05	16	12/10/2015 10:30
10	405235010.1	0.0500	3.0620	3.5368E-03	0.0100	1.0000E-05	17	12/10/2015 10:35
11	405235011.1	0.0500	3.4340	3.5751E-03	0.0100	1.0000E-05	18	12/9/2015 10:13
12	405235012.1	0.0500	3.3040	3.5617E-03	0.0100	1.0000E-05	20	12/10/2015 11:25
13	405235013.1	0.0500	2.9040	3.5206E-03	0.0100	1.0000E-05	21	12/8/2015 11:23
14	405235014.1	0.0500	3.2920	3.5605E-03	0.0100	1.0000E-05	23	12/8/2015 10:49
15	405235015.1	0.0500	3.4800	3.5798E-03	0.0100	1.0000E-05	24	12/8/2015 10:56
16	405235016.1	0.0500	2.8920	3.5193E-03	0.0100	1.0000E-05	25	12/8/2015 11:29
17	405235017.1	0.0500	2.8610	3.5161E-03	0.0100	1.0000E-05	26	12/2/2015 10:02
18	405235018.1	0.0500	2.8560	3.5156E-03	0.0100	1.0000E-05	27	12/2/2015 10:19
19	405235019.1	0.0500	3.2110	3.5522E-03	0.0100	1.0000E-05	28	12/8/2015 14:30
20	405235020.1	0.0500	3.2270	3.5538E-03	0.0100	1.0000E-05	29	12/8/2015 13:50
21	1203626094.1	0.0500	3.4800	3.5798E-03	0.0100	1.0000E-05	30	9/14/2016 0:00
22	1203626095.1	0.0500	2.5280	3.4818E-03	0.0100	1.0000E-05	31	12/10/2015 14:20
23	1203626096.1	0.0500	3.1000	3.5407E-03	0.0100	1.0000E-05	32	12/10/2015 14:20
24	1203626097.1	0.0500	3.4800	3.5798E-03	0.0100	1.0000E-05	33	9/14/2016 0:00

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1.0 ml Stdev : +/- 0.002000 ml
 Pipet, 5.0 ml Stdev : +/- 0.010000 ml

Analytical SOP: GL-RAD-A-002
 Instrument SOP: GL-RAD-I-004

Count raw Data										Calibration Data				Detector Efficiency				Background	
Pos.	Rack Position #	Counting Time (min.)	Quench#	Gross cpm	Bkg cpm	Bkg Count Time (min.)	Bkg Quench#	Corrected Bkg cpm	Count Date/Time	Sample Decay	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)	Detector Error (cpm/dpm)	Background Rack Position #	Background Count Start Date/Time		
1	53-2	90	152.6	3.71	3.70	90	161.5	3.6844	9/19/2016 13:26	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2197	0.00792	53-1	9/19/2016 11:53		
2	53-3	90	153.3	4.01	3.70	90	161.5	3.6858	9/19/2016 14:59	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2184	0.00792	53-1	9/19/2016 11:53		
3	53-4	90	153.9	3.53	3.70	90	161.5	3.6869	9/19/2016 16:32	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2172	0.00792	53-1	9/19/2016 11:53		
4	53-5	90	152	4.2	3.70	90	161.5	3.6832	9/19/2016 18:05	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2209	0.00792	53-1	9/19/2016 11:53		
5	53-6	90	154.5	4.01	3.70	90	161.5	3.6881	9/19/2016 19:38	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2160	0.00792	53-1	9/19/2016 11:53		
6	53-7	90	149.8	3.86	3.70	90	161.5	3.6787	9/19/2016 21:11	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2253	0.00792	53-1	9/19/2016 11:53		
7	53-8	90	155.6	3.62	3.70	90	161.5	3.6901	9/19/2016 22:44	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2139	0.00792	53-1	9/19/2016 11:53		
8	53-9	90	153.8	4.08	3.70	90	161.5	3.6867	9/20/2016 0:17	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2174	0.00792	53-1	9/19/2016 11:53		
9	53-10	90	156.7	3.8	3.70	90	161.5	3.6921	9/20/2016 1:50	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2118	0.00792	53-1	9/19/2016 11:53		
10	53-11	90	155.2	3.77	3.70	90	161.5	3.6903	9/20/2016 3:23	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2137	0.00792	53-1	9/19/2016 11:53		
11	31-1	90	155.2	3.89	3.70	90	161.5	3.6894	9/20/2016 6:07	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2147	0.00792	53-1	9/19/2016 11:53		
12	31-2	90	153.7	3.91	3.70	90	161.5	3.6865	9/20/2016 7:40	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2176	0.00792	53-1	9/19/2016 11:53		
13	31-3	90	155	3.86	3.70	90	161.5	3.6890	9/20/2016 10:46	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2151	0.00792	53-1	9/19/2016 11:53		
14	31-4	90	155.1	3.89	3.70	90	161.5	3.6892	9/20/2016 12:19	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2149	0.00792	53-1	9/19/2016 11:53		
15	31-5	90	154.2	3.33	3.70	90	161.5	3.6875	9/20/2016 13:52	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2166	0.00792	53-1	9/19/2016 11:53		
16	31-6	90	156.1	3.56	3.70	90	161.5	3.6910	9/20/2016 15:25	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2129	0.00792	53-1	9/19/2016 11:53		
17	31-7	90	152.7	3.93	3.70	90	161.5	3.6846	9/20/2016 16:58	0.956	LSCGREEN	7/1/2016	6/30/2017	0.2195	0.00792	53-1	9/19/2016 11:53		
18	31-8	90	156.5	3.7	3.70	90	161.5	3.6917	9/20/2016 18:31	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2122	0.00792	53-1	9/19/2016 11:53		
19	31-9	90	156.5	3.77	3.70	90	161.5	3.6917	9/20/2016 20:04	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2154	0.00792	53-1	9/19/2016 11:53		
20	31-10	90	154.8	3.61	3.70	90	161.5	3.6886	9/20/2016 21:37	0.999	LSCGREEN	7/1/2016	6/30/2017	0.2162	0.00792	53-1	9/19/2016 11:53		
21	31-11	90	154.4	3.37	3.70	90	161.5	3.6879	9/20/2016 23:10	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2114	0.00792	53-1	9/19/2016 11:53		
22	31-12	90	156.9	3.74	3.70	90	161.5	3.6924	9/21/2016 0:42	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2129	0.00792	53-1	9/19/2016 11:53		
23	18-1	15	156.1	14.07	3.70	90	161.5	3.6910	9/21/2016 0:58	0.999	LSCGREEN	7/1/2016	6/30/2017	0.2168	0.00792	53-1	9/19/2016 11:53		
24	18-2	15	154.1	15	3.70	90	161.5	3.6873			LSCGREEN	7/1/2016	6/30/2017			53-1			

Notes:

- 1 - Results are decay corrected to Sample Date/Time
- 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
- 3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : 1753-B
 Spike Exp Date : 11/2/2016
 Spike Activity (dpm/ml): 2552.40
 Spike Volume Added: 0.10

* - RPD changed to 0% due to sample & dup activity below MDA

LCS S/N : 1753-B
 LCS Exp Date : 11/2/2016
 LCS Activity (dpm/ml): 2552.40
 LCS Volume Added: 0.10

Pos.	Decision Level		Critical Level		Required MDA		Sample Act.		Sample Act. Error		Net Count Rate		Net Count Rate Error		2 SIGMA Counting Uncertainty		2 SIGMA Total Prop. Uncertainty		Sample QC		Sample Type		Nominal Recovery	
	pCi/G	pCi/G	pCi/G	pCi/G	MDA	pCi/G	Conc.	pCi/G	%	Rate	CPM	Rate	CPM	pCi/G	pCi/G	pCi/G	pCi/G	QC	Type	RPD	RER	pCi/G	Recovery	
1	2.2557	1.5925	1.5925	6	3.2979	0.0866	1120.14%	0.0256	0.2866	1.9008	1.9008	1.9008	1.9008	SAMPLE										
2	2.2949	1.6202	1.6202	6	3.3552	1.1158	90.19%	0.3242	0.2924	1.9725	1.9725	1.9726	1.9726	SAMPLE										
3	2.2707	1.6031	1.6031	6	3.3198	-0.5343	180.45%	-0.1569	0.2832	1.8897	1.8897	1.8897	1.8897	SAMPLE										
4	2.2338	1.5771	1.5771	6	3.2659	1.7318	57.28%	0.5168	0.2960	1.9439	1.9439	1.9441	1.9441	SAMPLE										
5	2.1490	1.5172	1.5172	6	3.1418	1.0372	90.85%	0.3219	0.2925	1.8468	1.8468	1.8468	1.8468	SAMPLE										
6	2.2824	1.6114	1.6114	6	3.3370	0.6212	159.64%	0.1813	0.2894	1.9435	1.9435	1.9435	1.9435	SAMPLE										
7	2.4492	1.7292	1.7292	6	3.5807	-0.2573	406.56%	-0.0701	0.2850	2.0505	2.0505	2.0505	2.0505	SAMPLE										
8	2.4112	1.7023	1.7023	6	3.5252	1.4218	74.70%	0.3933	0.2938	2.0817	2.0817	2.0818	2.0818	SAMPLE										
9	2.4540	1.7326	1.7326	6	3.5877	0.3988	267.33%	0.1079	0.2885	2.0794	2.0794	2.0794	2.0794	SAMPLE										
10	2.3996	1.6941	1.6941	6	3.5081	0.2867	361.16%	0.0797	0.2879	2.0294	2.0294	2.0294	2.0294	SAMPLE										
11	2.1301	1.5039	1.5039	6	3.1142	0.6406	144.64%	0.2006	0.2902	1.8160	1.8160	1.8161	1.8161	SAMPLE										
12	2.1831	1.5413	1.5413	6	3.1917	0.7315	130.02%	0.2235	0.2905	1.8640	1.8640	1.8641	1.8641	SAMPLE										
13	2.5146	1.7753	1.7753	6	3.6763	0.6446	169.37%	0.1710	0.2896	2.1397	2.1397	2.1397	2.1397	SAMPLE										
14	2.2203	1.5676	1.5676	6	3.2461	0.6684	144.51%	0.2008	0.2902	1.8930	1.8930	1.8930	1.8930	SAMPLE										
15	2.0830	1.4706	1.4706	6	3.0453	-1.1165	78.11%	-0.3575	0.2792	1.7092	1.7092	1.7092	1.7092	SAMPLE										
16	2.5510	1.8011	1.8011	6	3.7295	-0.5008	216.67%	-0.1310	0.2838	2.1268	2.1268	2.1268	2.1268	SAMPLE										
17	2.5012	1.7659	1.7659	6	3.6568	0.9206	118.54%	0.2454	0.2909	2.1388	2.1388	2.1388	2.1388	SAMPLE										
18	2.5953	1.8323	1.8323	6	3.7942	0.0322	3460.87%	0.0083	0.2866	2.1844	2.1844	2.1844	2.1844	SAMPLE										
19	2.3062	1.6282	1.6282	6	3.3716	0.2705	367.83%	0.0783	0.2879	1.9502	1.9502	1.9502	1.9502	SAMPLE										
20	2.2589	1.5948	1.5948	6	3.3024	-0.2662	362.19%	-0.0786	0.2848	1.8900	1.8900	1.8900	1.8900	SAMPLE										
21	1.9987	1.4111	1.4111	6	2.9221	-0.9525	88.10%	-0.3179	0.2800	1.6447	1.6447	1.6447	1.6447	MB										
22	2.9394	2.0752	2.0752	6	4.2973	0.2095	604.06%	0.0476	0.2874	2.4806	2.4806	2.4806	2.4806	DUP										
23	4.4512	3.1426	3.1426	6	6.9982	37.0061	9.57%	10.3790	0.9894	6.9146	6.9146	6.9397	6.9397	MS										
24	3.7289	2.6326	2.6326	6	5.8630	33.8073	9.06%	11.3127	1.0203	5.9761	5.9761	6.0002	6.0002	LCS										

1598072

PAGE: 1

ID: TRITIUM

19 SEP 2016 12:13

USER: 2

COMMENT: GREEN

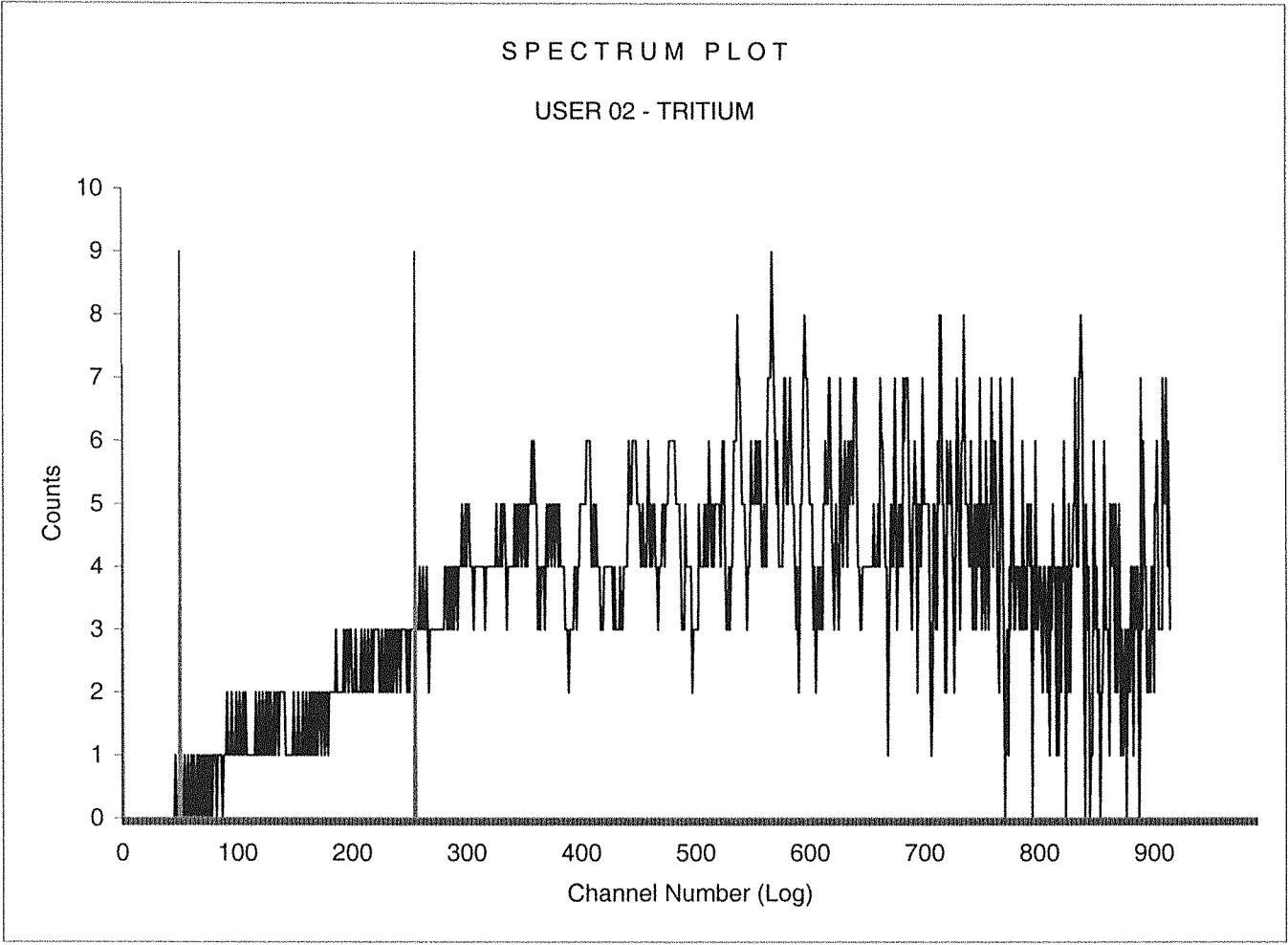
PRESET TIME : 90.00
DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD
COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT
TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF
SCINTILLATOR: LIQUID LUMEX: YES LOW SAMPLE REJ: 0 RWM LIST : OFF
LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 50.0 - 255.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0
CHAN: 0.0 - 900.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

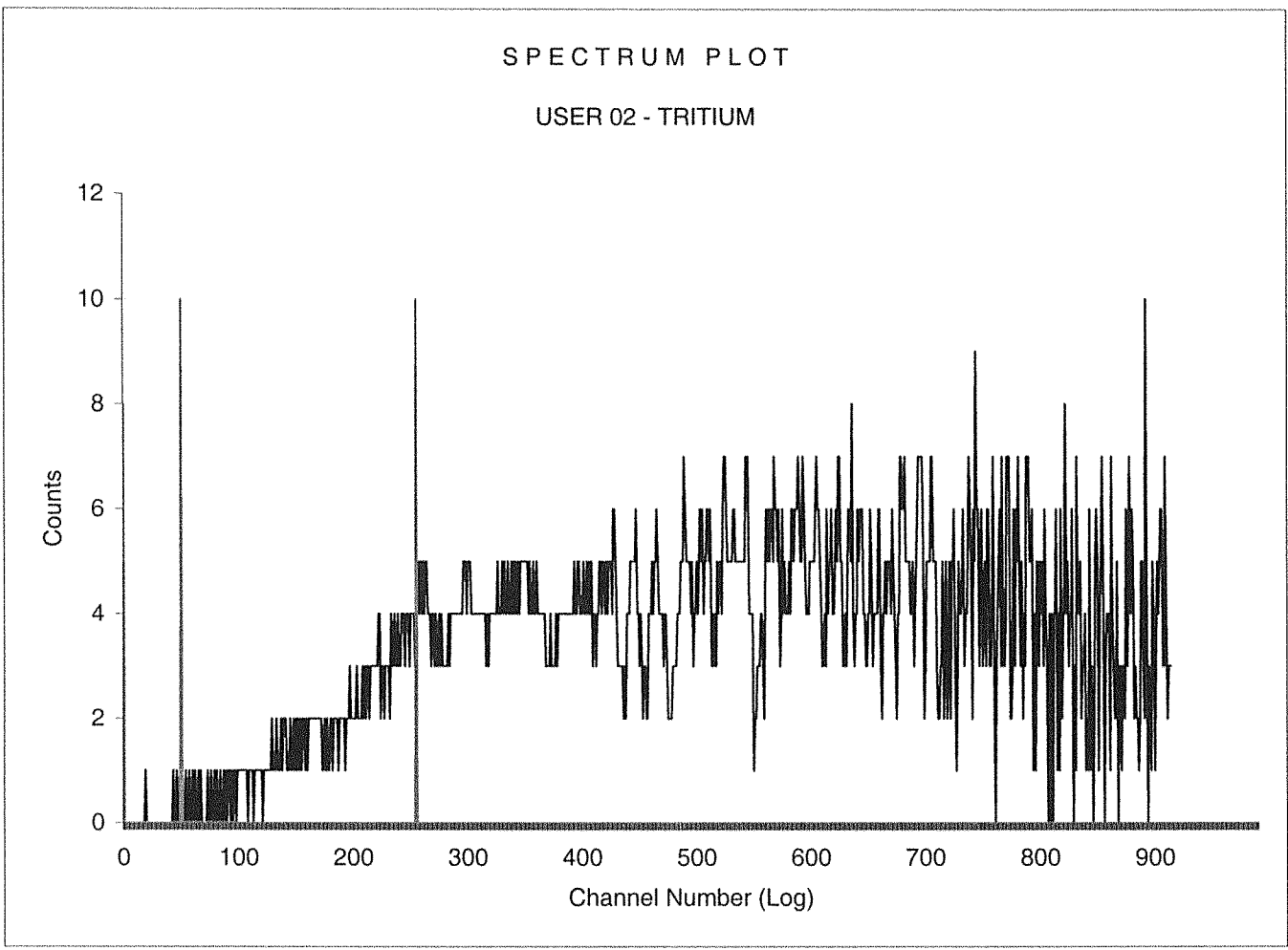
ALPHA-BETA DISCRIMINATION: NO

SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		
1	53-1	90.00	161.5	3.70	11.46	34.29	3.62	0.95	92.56
2	53-2	90.00	152.6	3.71	11.39	34.28	3.62	0.91	185.58
3	53-3	90.00	153.3	4.01	10.88	34.30	3.61	0.72	278.57
4	53-4	90.00	153.9	3.53	11.75	33.77	3.65	0.84	371.57
5	53-5	90.00	152.0	4.20	10.74	33.98	3.64	0.99	464.63
6	53-6	90.00	154.5	4.01	10.98	34.83	3.59	0.88	557.65
7	53-7	90.00	149.8	3.86	11.21	33.57	3.66	0.88	650.68
8	53-8	90.00	155.6	3.62	11.61	34.44	3.61	0.85	743.69
9	53-9	90.00	153.8	4.08	10.83	33.31	3.67	0.81	836.69
10	53-10	90.00	156.7	3.80	11.26	33.54	3.66	0.85	929.71
11	53-11	90.00	155.7	3.77	11.35	34.14	3.63	0.86	1022.76

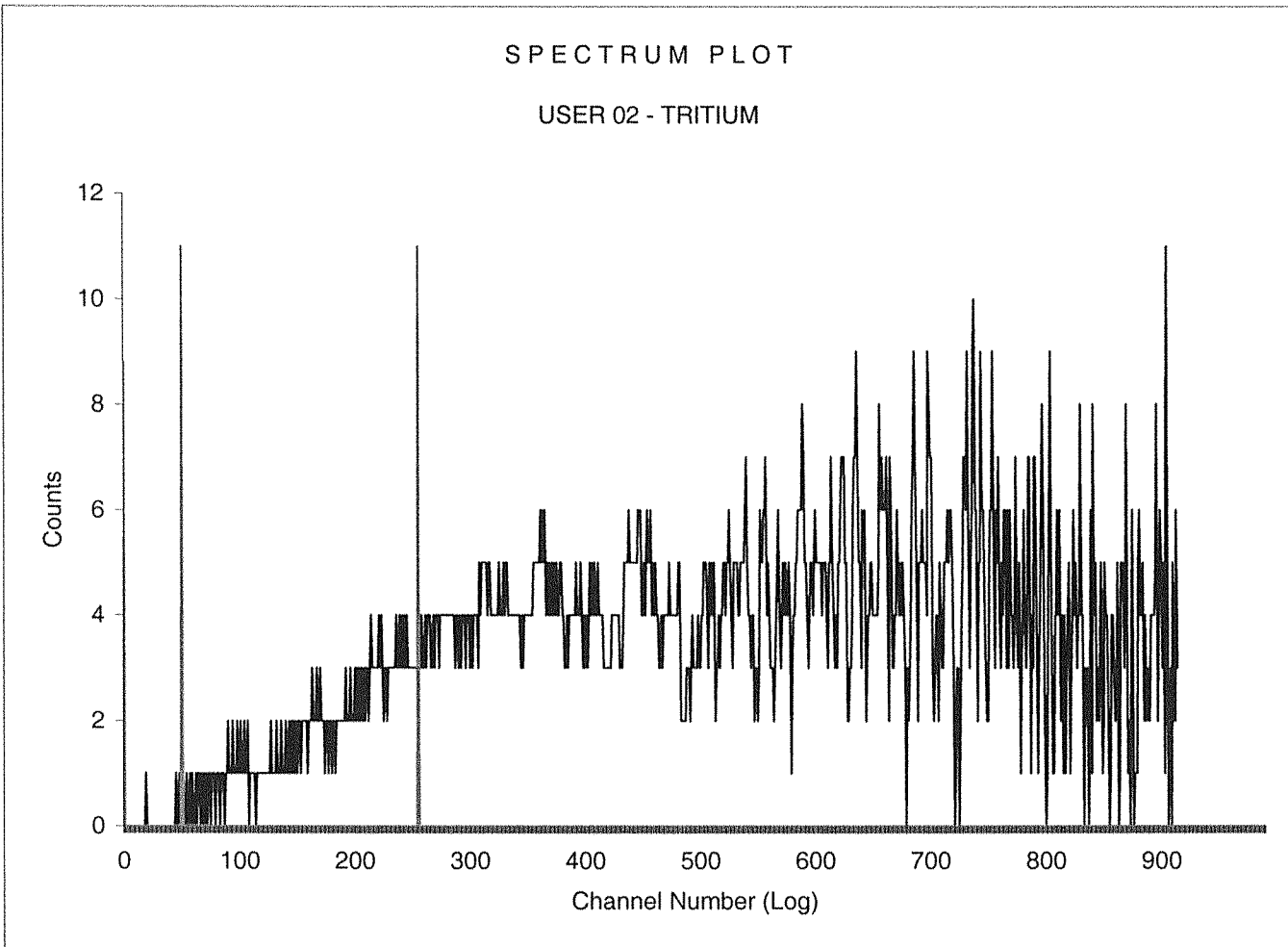
Sample Count Start Time: 19 Sep 2016 11:53:08
Data Capture Date 19 Sep 2016 13:23:31
User Filename S02091953-1A.XLS
U02091953-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 1 53-1 90.00
H#, Total Counts: 161.5 3151
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



Sample Count Start Time: 19 Sep 2016 13:26:09
Data Capture Date 19 Sep 2016 14:56:32
User Filename S02091953-2A.XLS
U02091953-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 2 53-2 90.00
H#, Total Counts: 152.6 3142
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



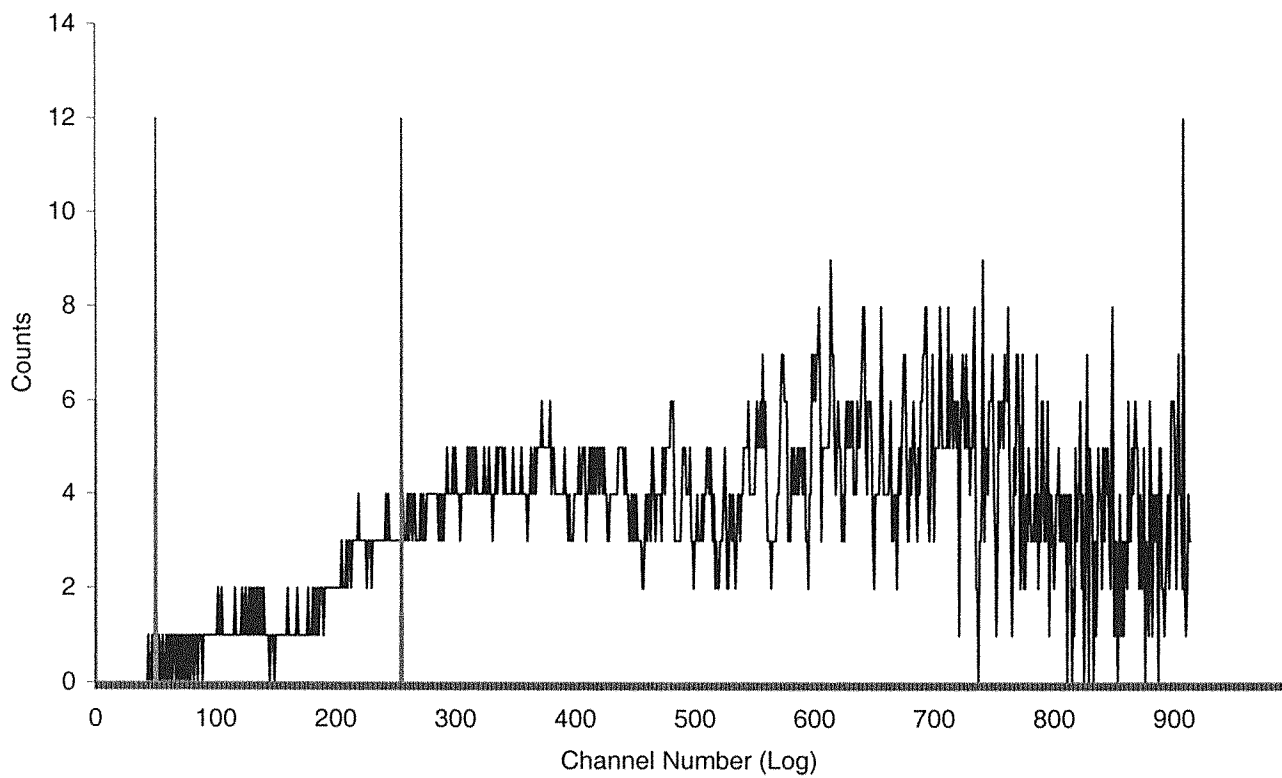
Sample Count Start Time: 19 Sep 2016 14:59:08
Data Capture Date: 19 Sep 2016 16:29:32
User Filename: S02091953-3A.XLS
U02091953-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TRITIUM
User Comment: GREEN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 3 53-3 90.00
H#, Total Counts: 153.3 3137
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



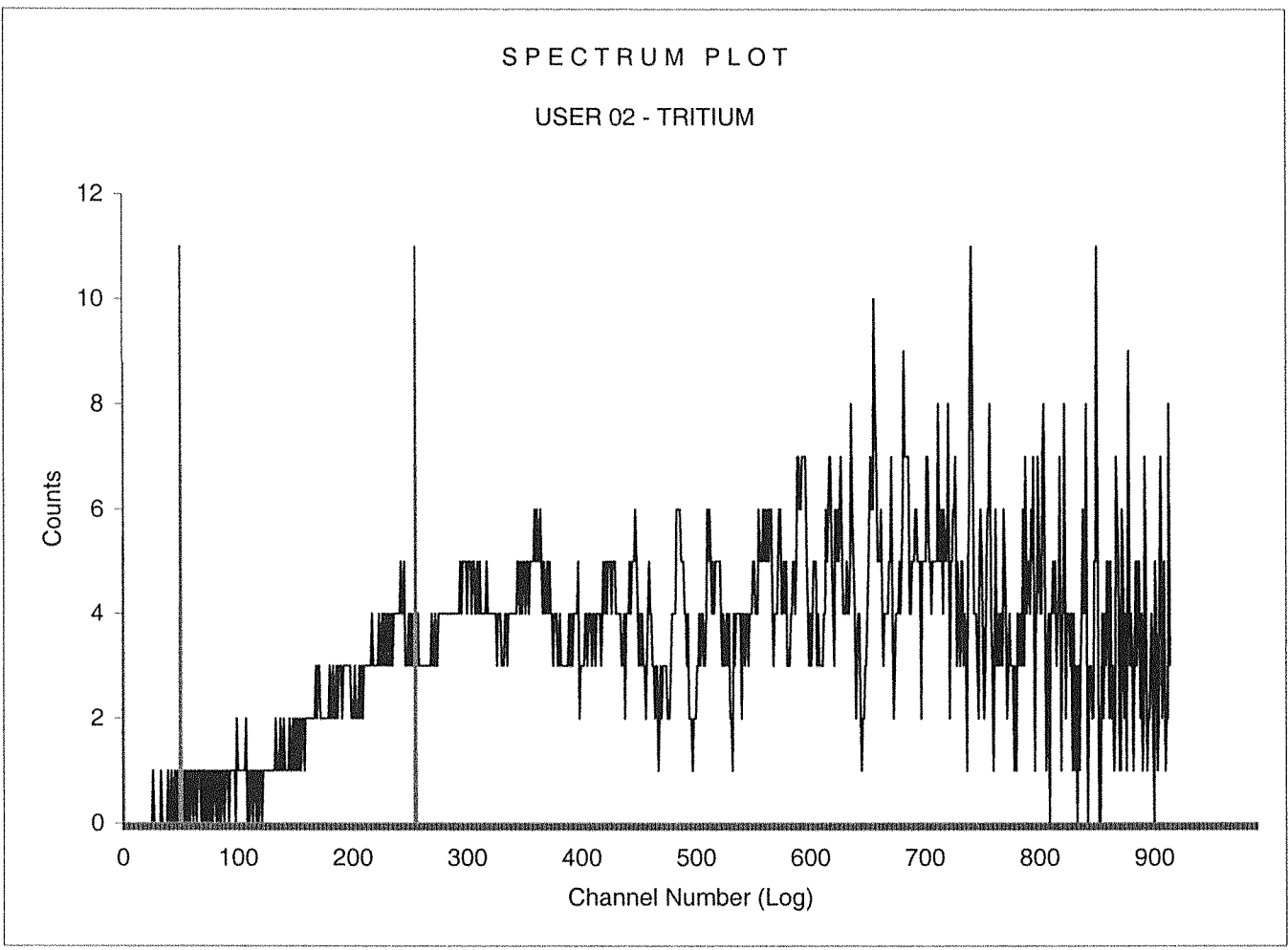
Sample Count Start Time: 19 Sep 2016 16:32:08
Data Capture Date 19 Sep 2016 18:02:32
User Filename S02091953-4A.XLS
U02091953-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 4 53-4 90.00
H#, Total Counts: 153.9 3095
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990

SPECTRUM PLOT

USER 02 - TRITIUM



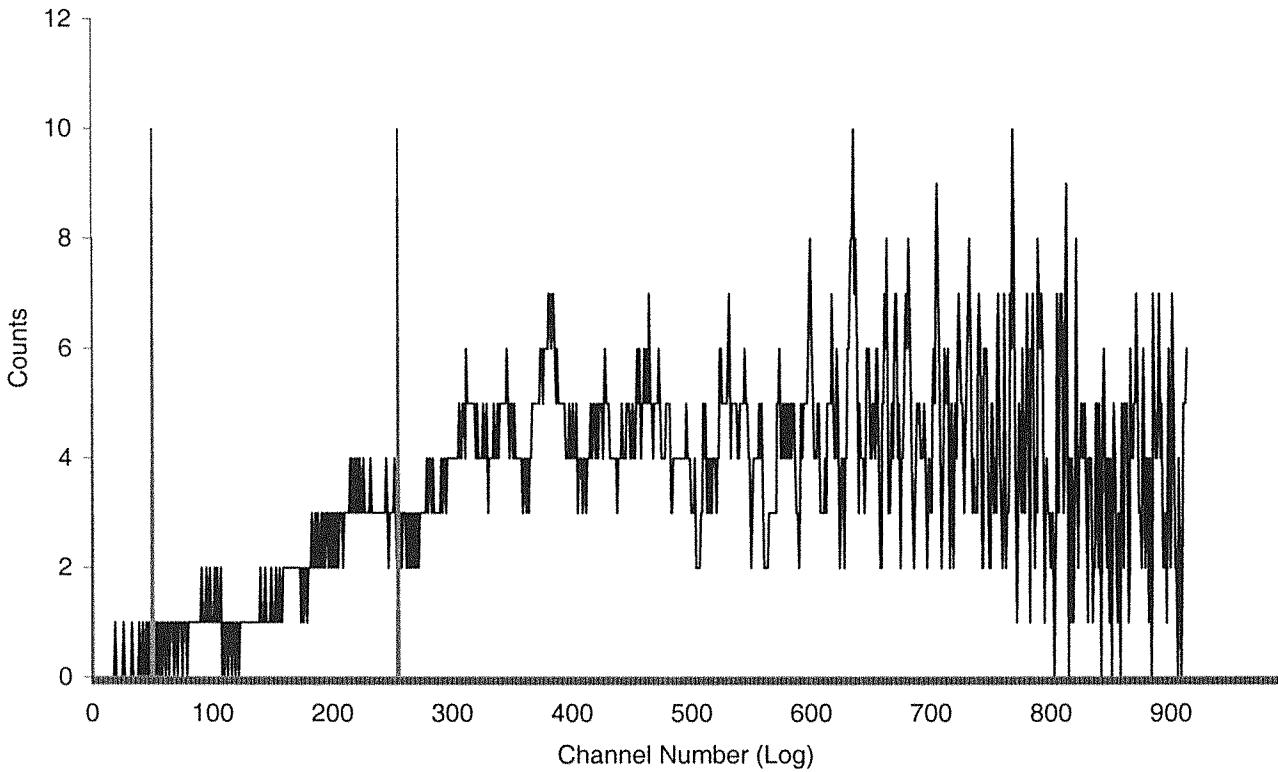
Sample Count Start Time: 19 Sep 2016 18:05:12
Data Capture Date: 19 Sep 2016 19:35:35
User Filename: S02091953-5A.XLS
U02091953-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TRITIUM
User Comment: GREEN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 5 53-5 90.00
H#, Total Counts: 152.0 3108
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



Sample Count Start Time: 19 Sep 2016 19:38:13
Data Capture Date: 19 Sep 2016 21:08:37
User Filename: S02091953-6A.XLS
U02091953-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TRITIUM
User Comment: GREEN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 6 53-6 90.00
H#, Total Counts: 154.5 3183
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990

SPECTRUM PLOT

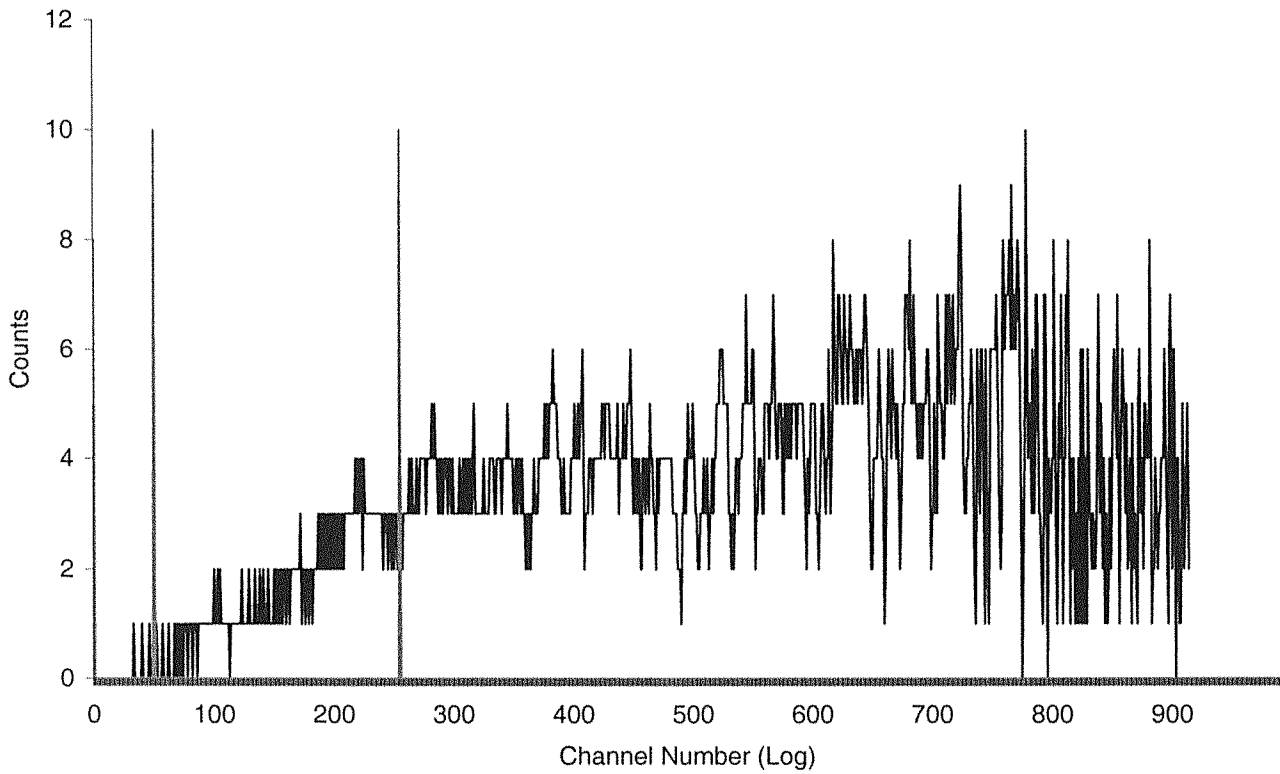
USER 02 - TRITIUM



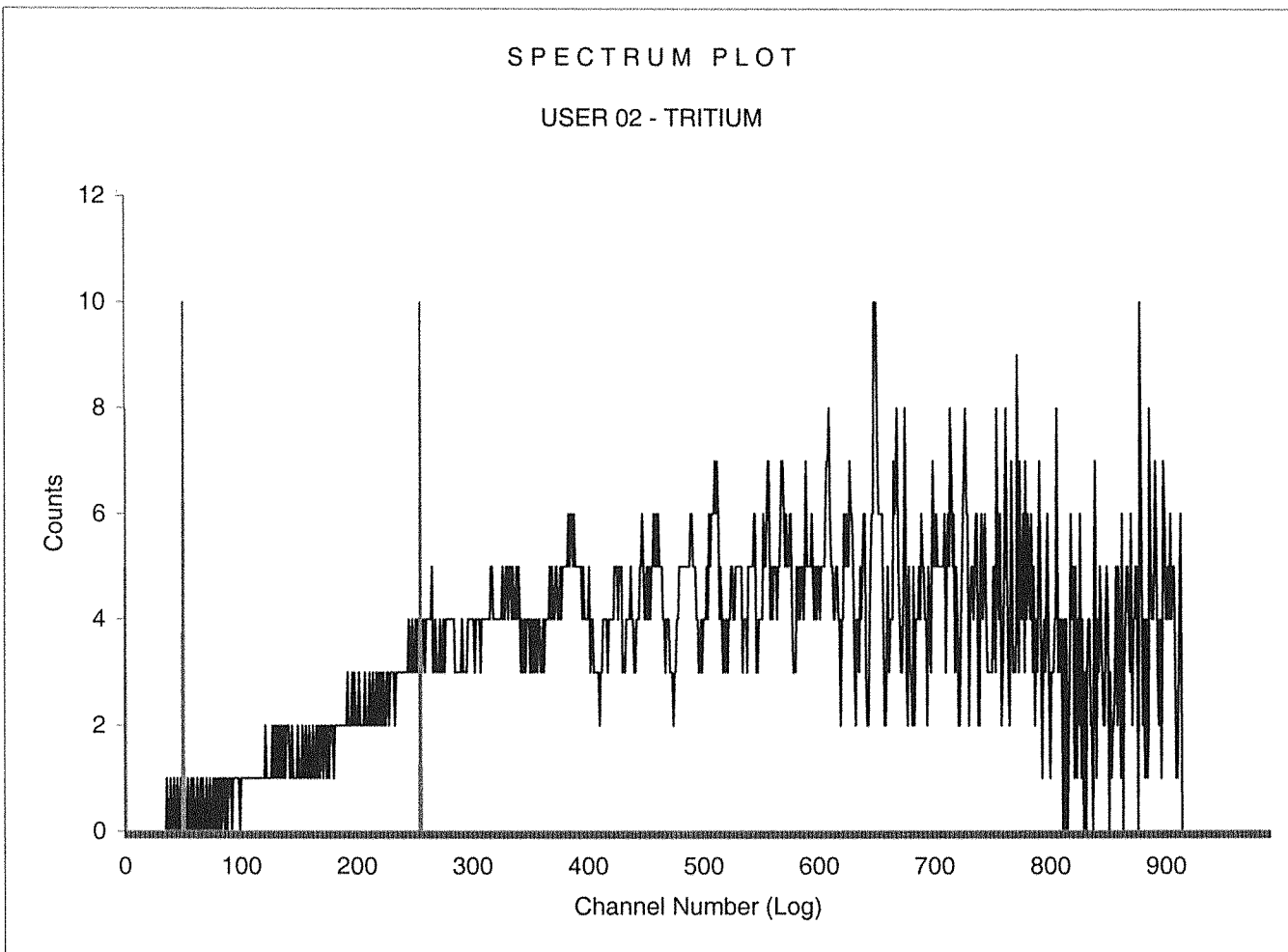
Sample Count Start Time: 19 Sep 2016 21:11:15
Data Capture Date: 19 Sep 2016 22:41:38
User Filename: S02091953-7A.XLS
U02091953-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TRITIUM
User Comment: GREEN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 7 53-7 90.00
H#, Total Counts: 149.8 3067
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990

SPECTRUM PLOT

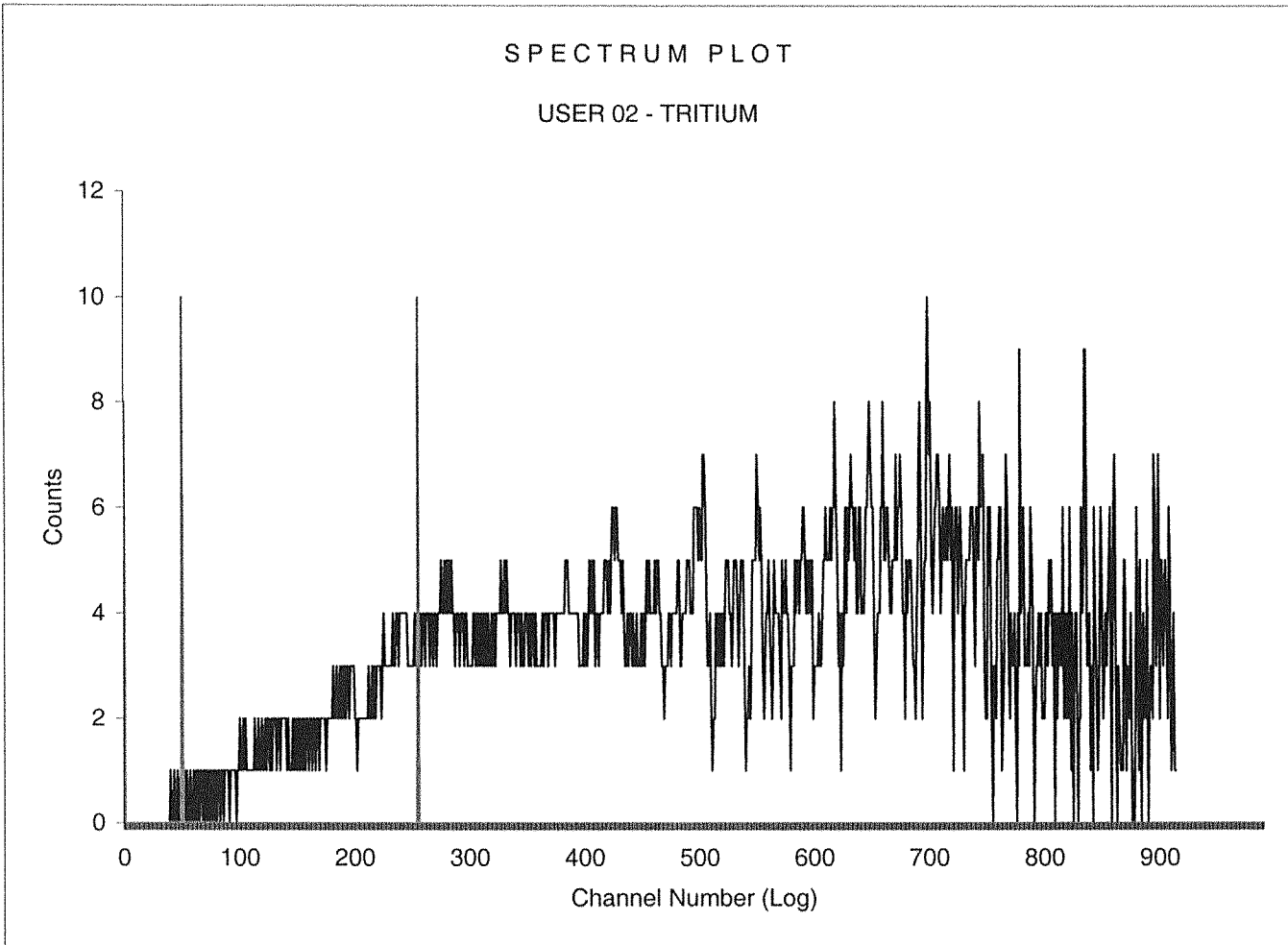
USER 02 - TRITIUM



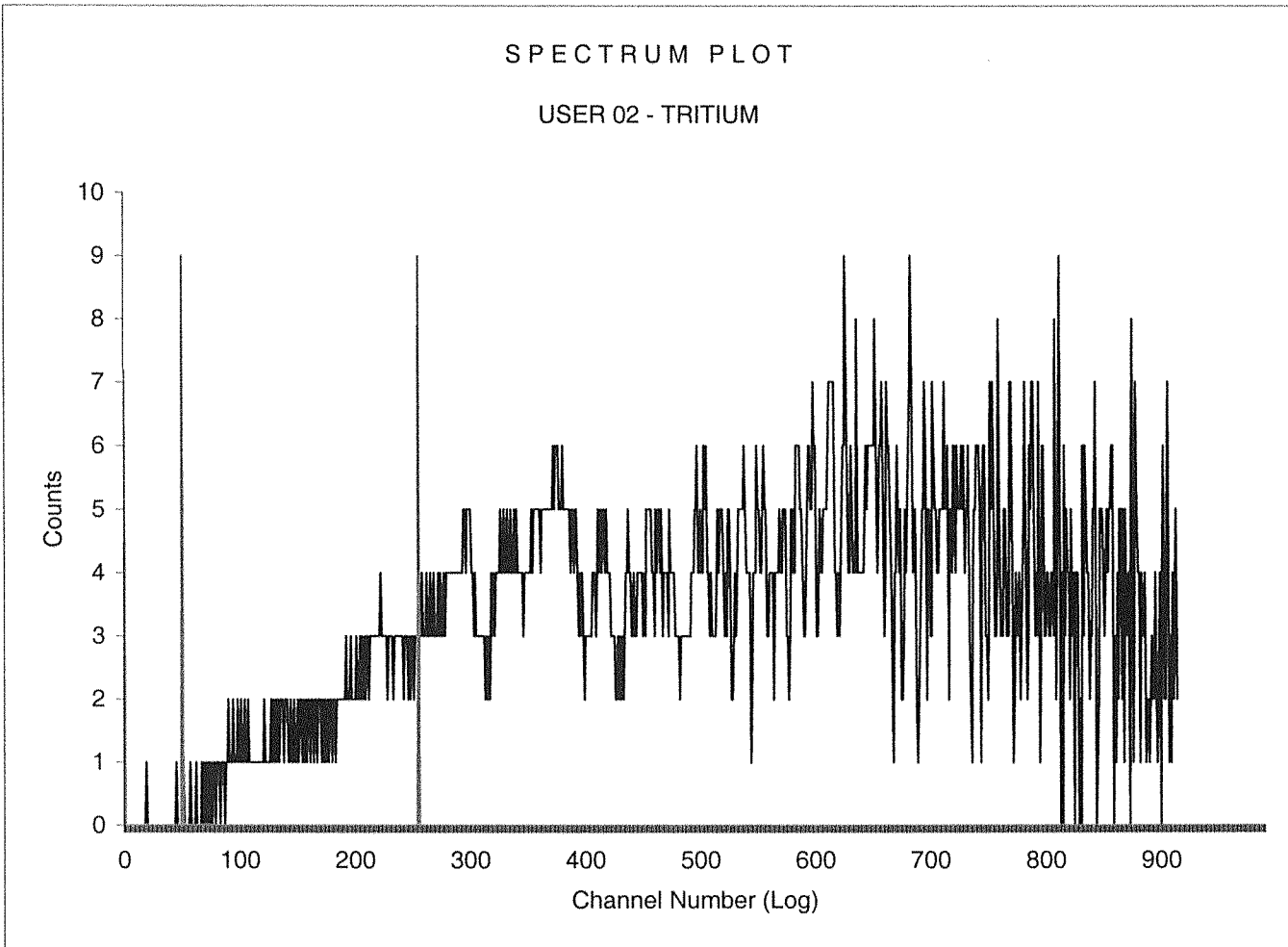
Sample Count Start Time:	19 Sep 2016 22:44:15		
Data Capture Date	20 Sep 2016 00:14:38		
User Filename	S02092053-8A.XLS		
	U02091953-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	8	53-8	90.00
H#, Total Counts:	155.6	3152	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	



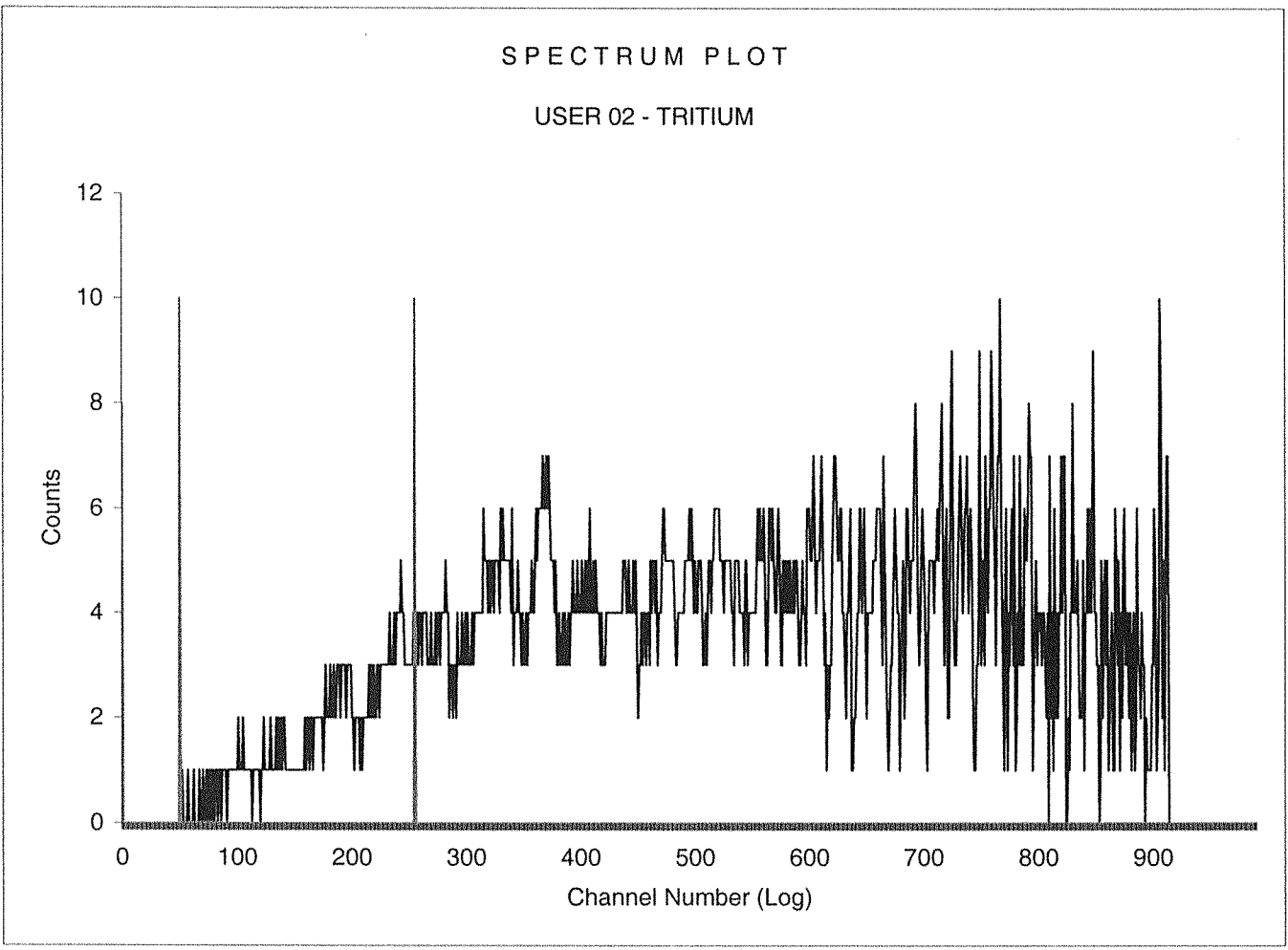
Sample Count Start Time:	20 Sep 2016 00:17:15		
Data Capture Date	20 Sep 2016 01:47:39		
User Filename	S02092053-9A.XLS		
	U02091953-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	9	53-9	90.00
H#, Total Counts:	153.8	3046	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	



Sample Count Start Time: 20 Sep 2016 01:50:17
Data Capture Date: 20 Sep 2016 03:20:40
User Filename: S02092053-10A.XLS
U02091953-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TRITIUM
User Comment: GREEN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 10 53-10 90.00
H#, Total Counts: 156.7 3067
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



Sample Count Start Time: 20 Sep 2016 03:23:20
Data Capture Date 20 Sep 2016 04:53:43
User Filename S02092053-11A.XLS
U02091953-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 11 53-11 90.00
H#, Total Counts: 155.7 3135
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



1598672

PAGE: 1

ID: TRITIUM

20 SEP 2016 06:27

USER: 2

COMMENT: GREEN

PRESET TIME : 90.00
DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD
COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT
TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF
SCINTILLATOR: LIQUID LUMEX: YES LOW SAMPLE REJ: 0 RWM LIST : OFF
LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 50.0 - 255.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0
CHAN: 0.0 - 900.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

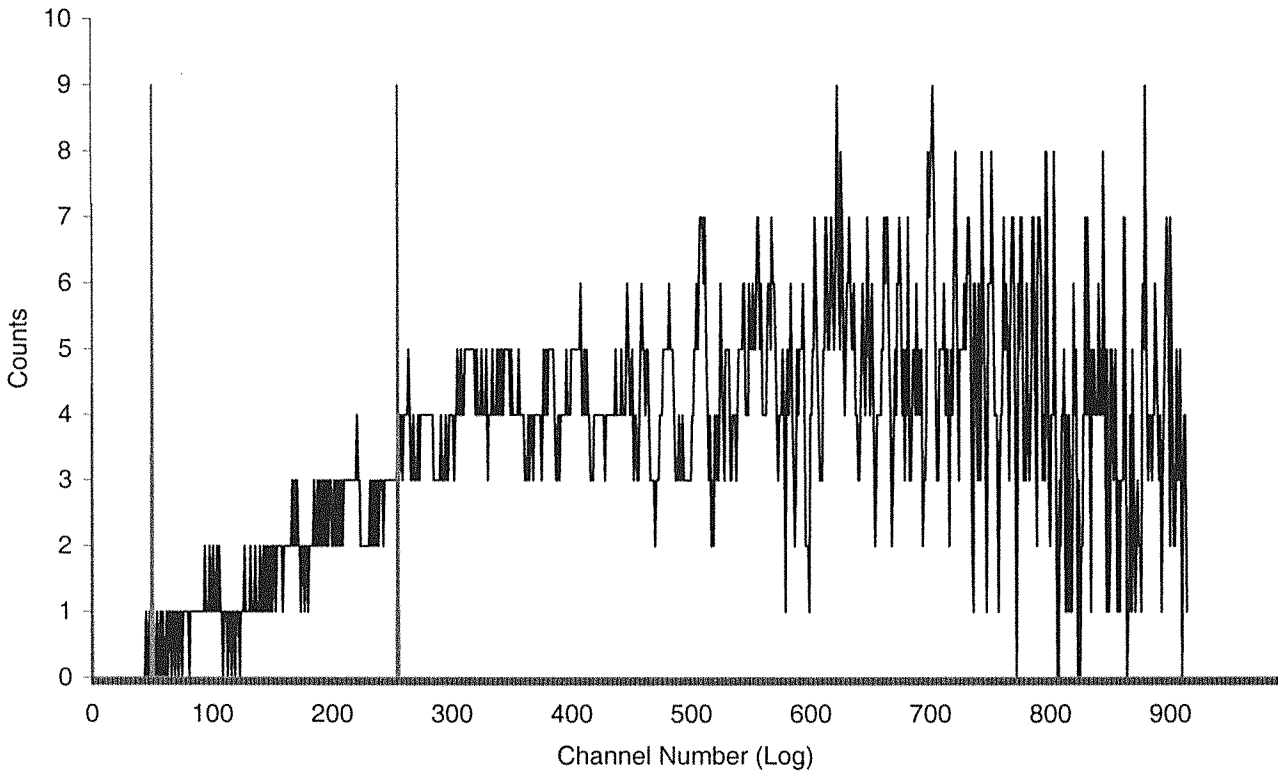
ALPHA-BETA DISCRIMINATION: NO

SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME	
				CPM	%ERROR	CPM	%ERROR			
11	1	31-1	90.00	155.2	3.89	11.14	35.01	3.58	0.90	92.57
12	2	31-2	90.00	153.7	3.91	11.22	35.06	3.58	1.00	185.63
13	3	31-3	90.00	155.0	3.86	11.27	33.44	3.67	1.00	278.69
14	4	31-4	90.00	155.1	3.89	11.17	33.62	3.66	0.99	371.74
15	5	31-5	90.00	154.2	3.33	12.28	33.61	3.66	1.06	464.80
16	6	31-6	90.00	156.1	3.56	11.76	33.38	3.67	0.96	557.85
17	7	31-7	90.00	152.7	3.93	10.81	33.84	3.63	0.37	650.72
18	8	31-8	90.00	156.5	3.70	11.60	33.34	3.68	1.19	743.82
19	9	31-9	90.00	156.5	3.77	11.52	33.84	3.65	1.20	836.93
20	10	31-10	90.00	154.8	3.61	11.71	34.44	3.61	1.05	930.00
21	11	31-11	90.00	154.4	3.37	12.21	33.39	3.67	1.12	1023.05
22	12	31-12	90.00	156.9	3.74	11.42	34.30	3.62	0.94	1116.11

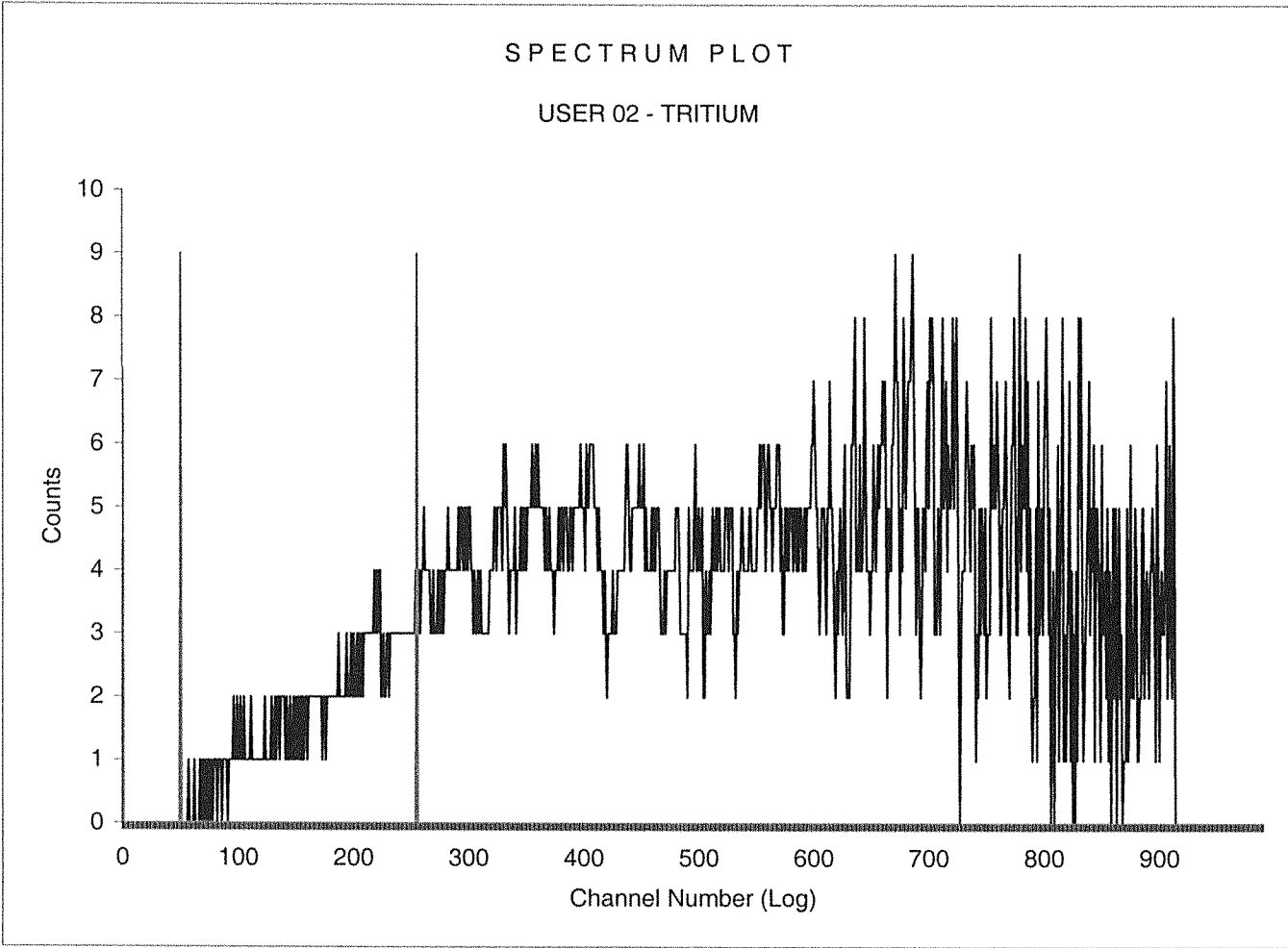
Sample Count Start Time: 20 Sep 2016 06:07:20
Data Capture Date 20 Sep 2016 07:37:43
User Filename S02092031-1A.XLS
U02092031-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 1 31-1 90.00
H#, Total Counts: 155.2 3198
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990

SPECTRUM PLOT

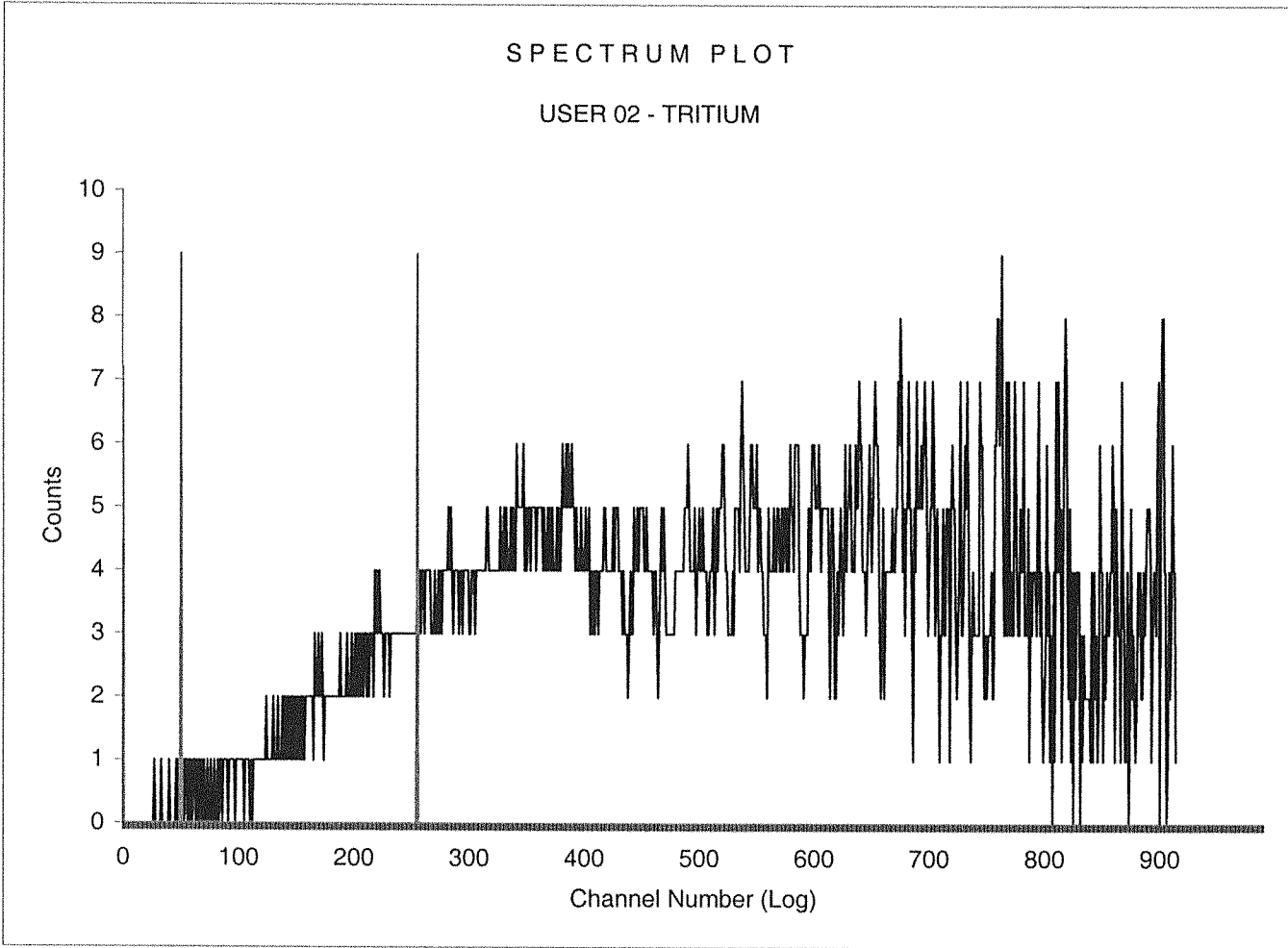
USER 02 - TRITIUM



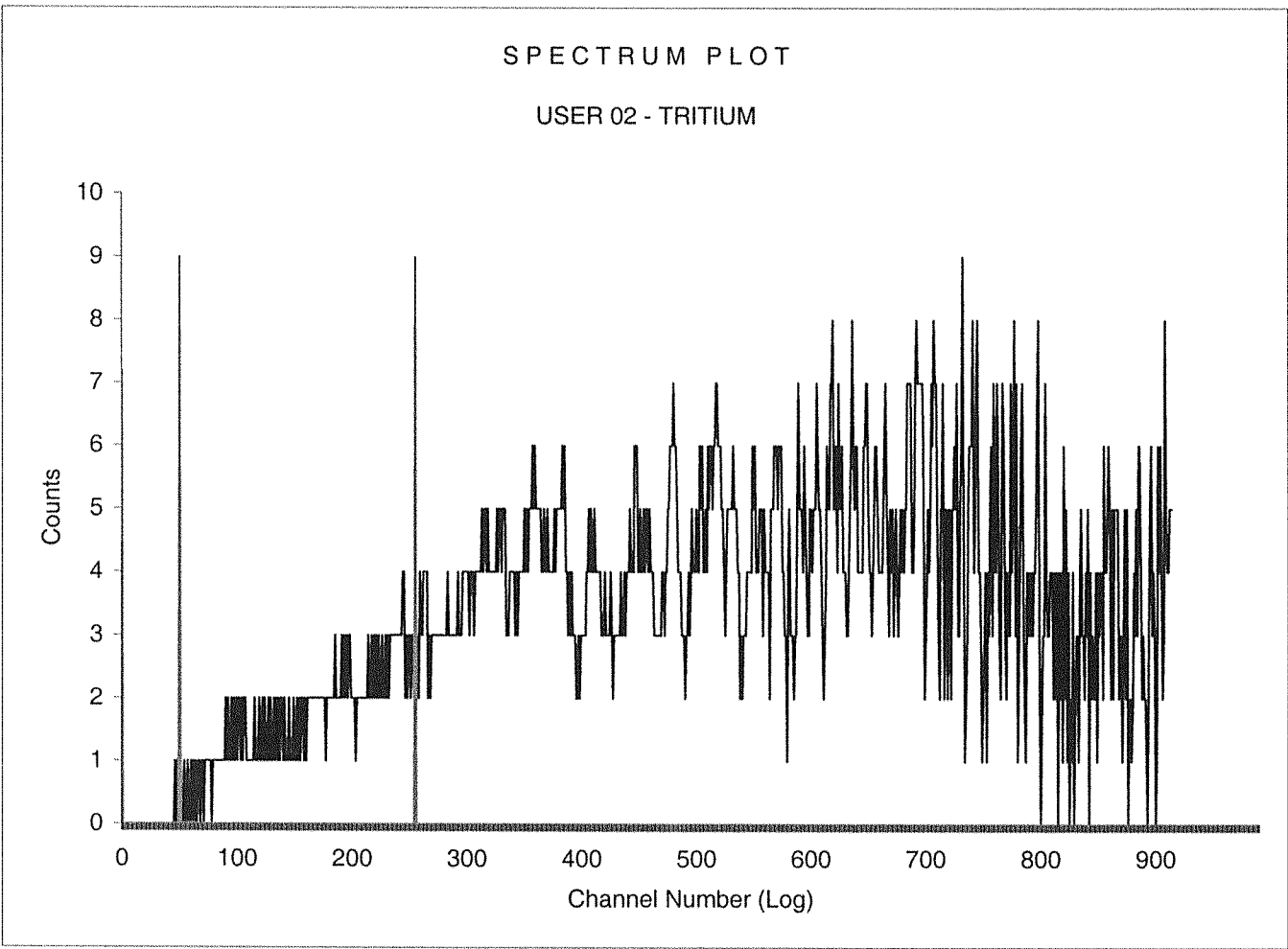
Sample Count Start Time: 20 Sep 2016 07:40:24
Data Capture Date: 20 Sep 2016 09:10:46
User Filename: S02092031-2A.XLS
U02092031-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TRITIUM
User Comment: GREEN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 2 31-2 90.00
H#, Total Counts: 153.7 3209
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



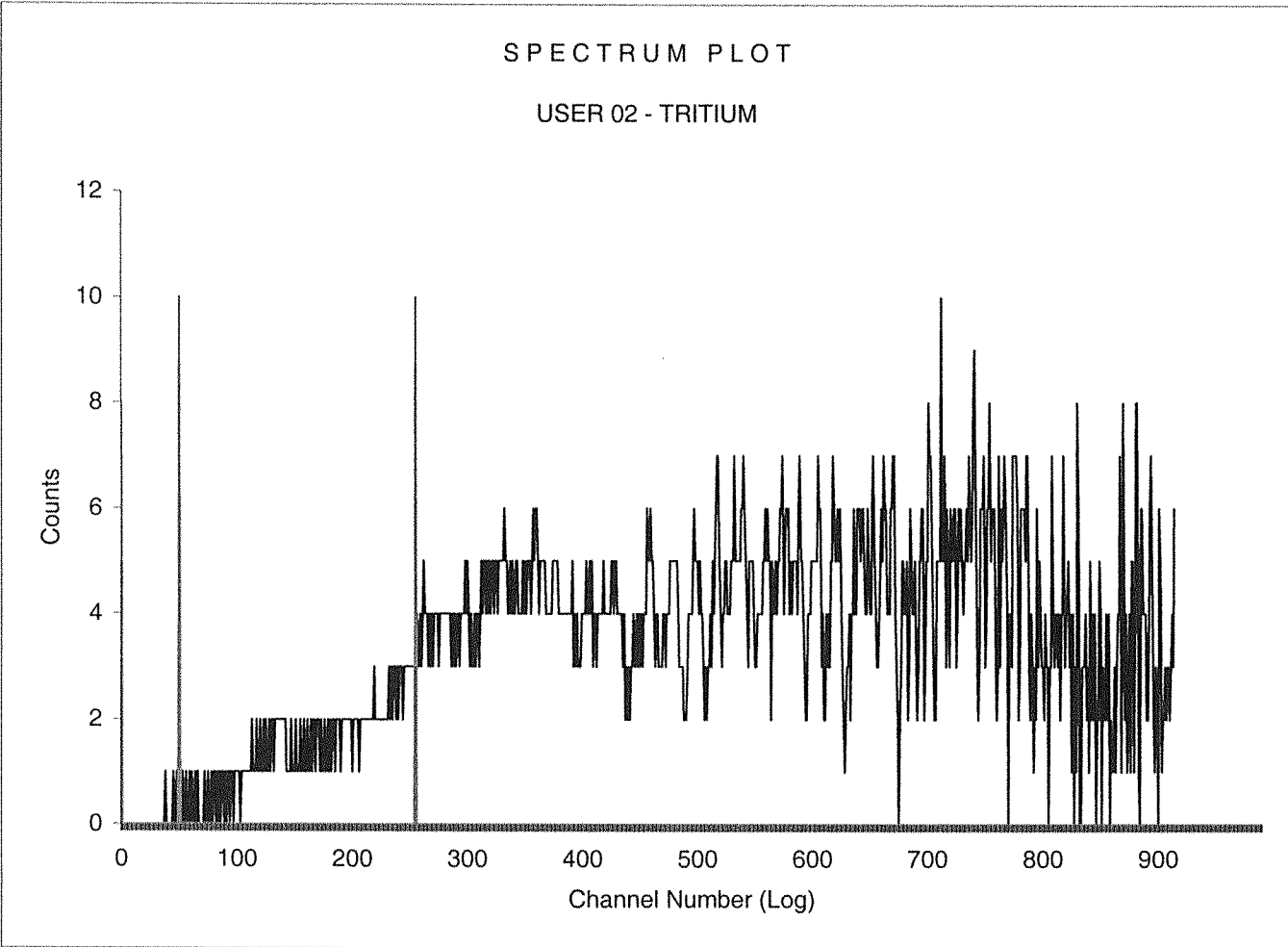
Sample Count Start Time: 20 Sep 2016 09:13:27
Data Capture Date 20 Sep 2016 10:43:50
User Filename S02092031-3A.XLS
U02092031-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 3 31-3 90.00
H#, Total Counts: 155.0 3064
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



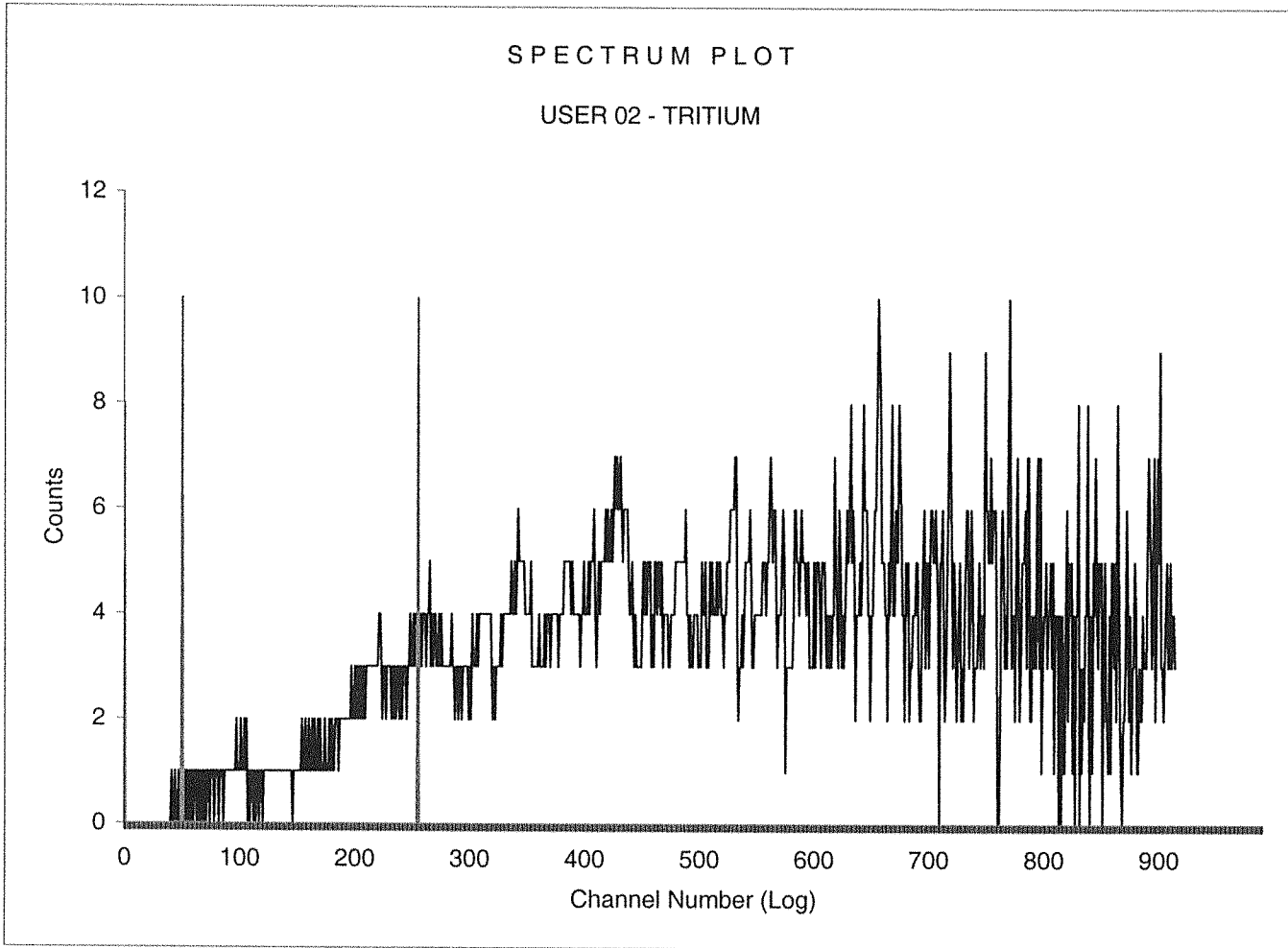
Sample Count Start Time: 20 Sep 2016 10:46:30
Data Capture Date 20 Sep 2016 12:16:53
User Filename S02092031-4A.XLS
U02092031-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 4 31-4 90.00
H#, Total Counts: 155.1 3088
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



Sample Count Start Time: 20 Sep 2016 12:19:34
Data Capture Date 20 Sep 2016 13:49:57
User Filename S02092031-5A.XLS
U02092031-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 5 31-5 90.00
H#, Total Counts: 154.2 3070
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



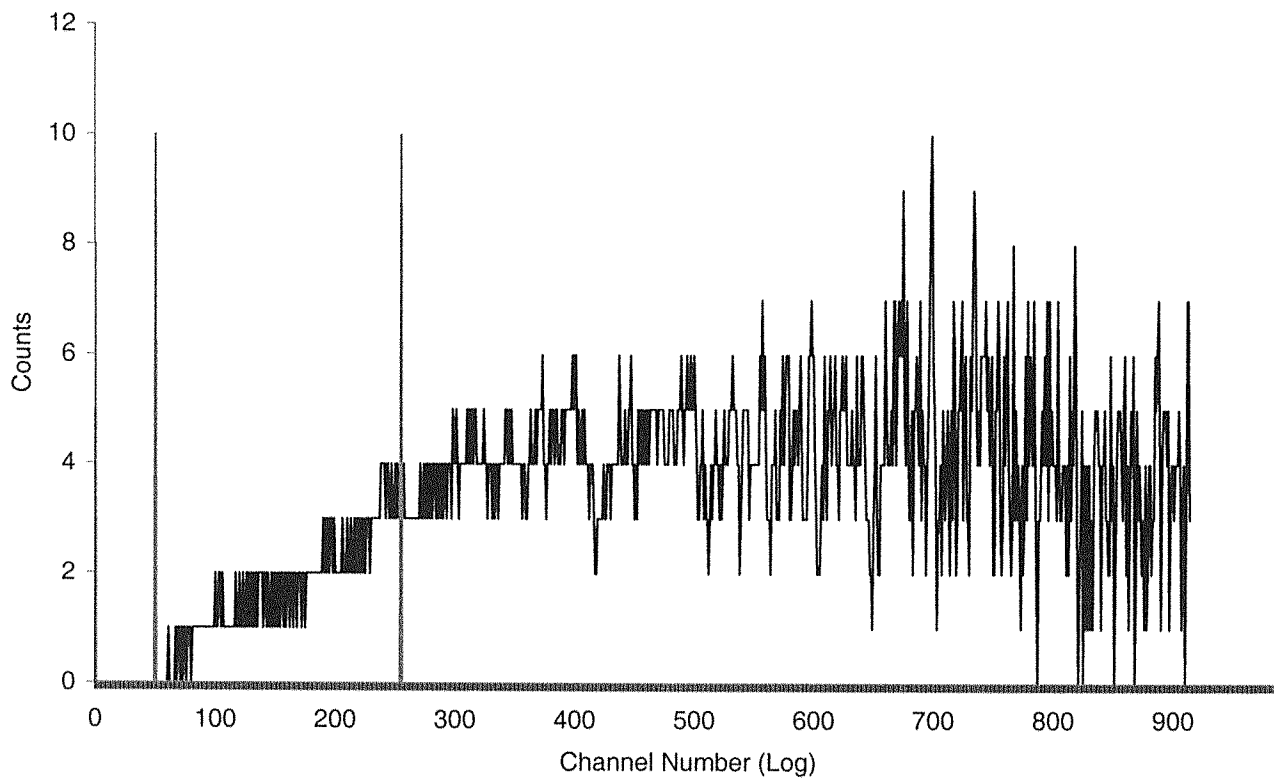
Sample Count Start Time: 20 Sep 2016 13:52:37
Data Capture Date 20 Sep 2016 15:23:00
User Filename S02092031-6A.XLS
U02092031-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 6 31-6 90.00
H#, Total Counts: 156.1 3058
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



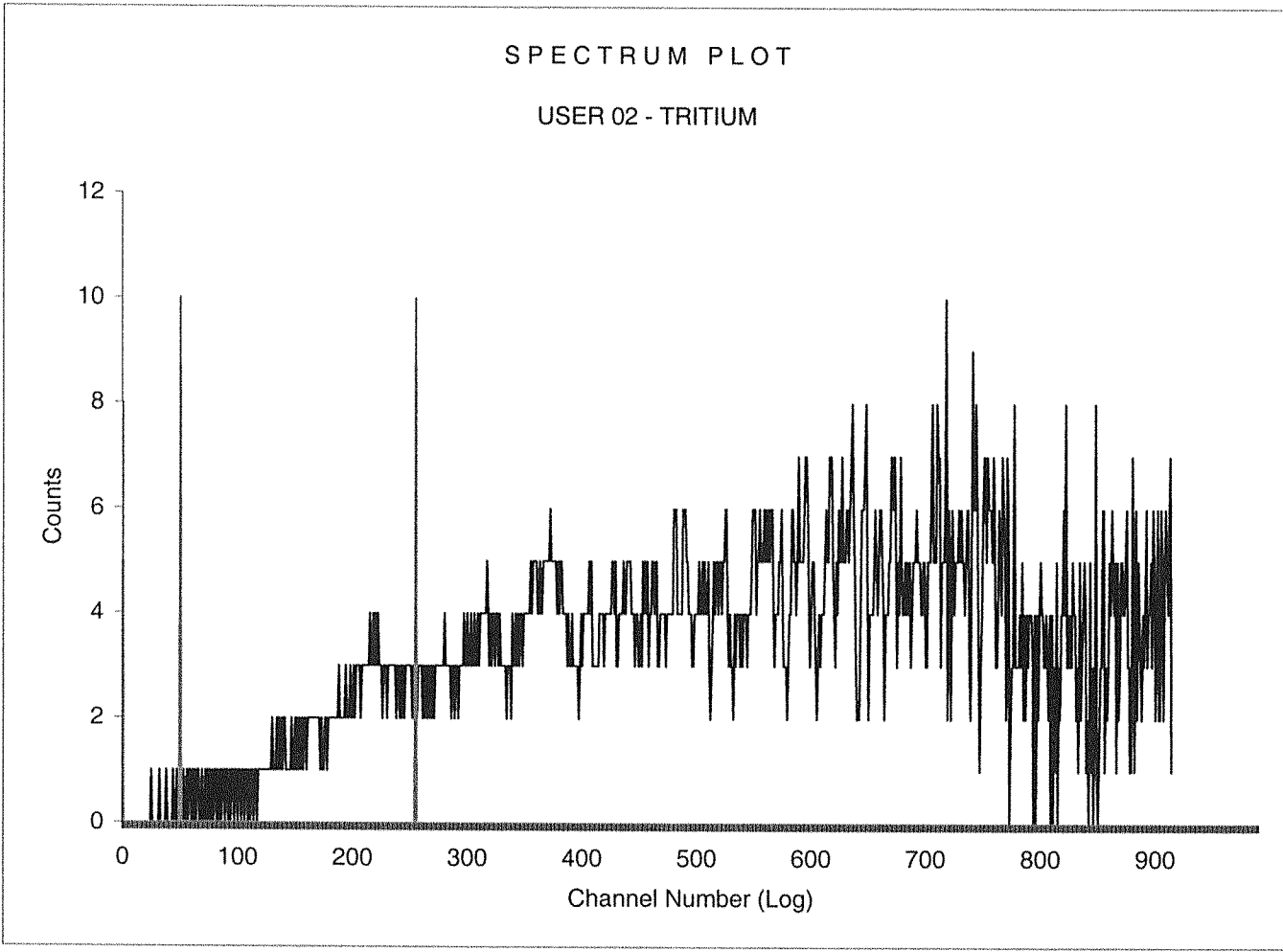
Sample Count Start Time:	20 Sep 2016 15:25:29		
Data Capture Date	20 Sep 2016 16:55:52		
User Filename	S02092031-7A.XLS		
	U02092031-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	7	31-7	90.00
H#, Total Counts:	152.7	3098	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	

SPECTRUM PLOT

USER 02 - TRITIUM



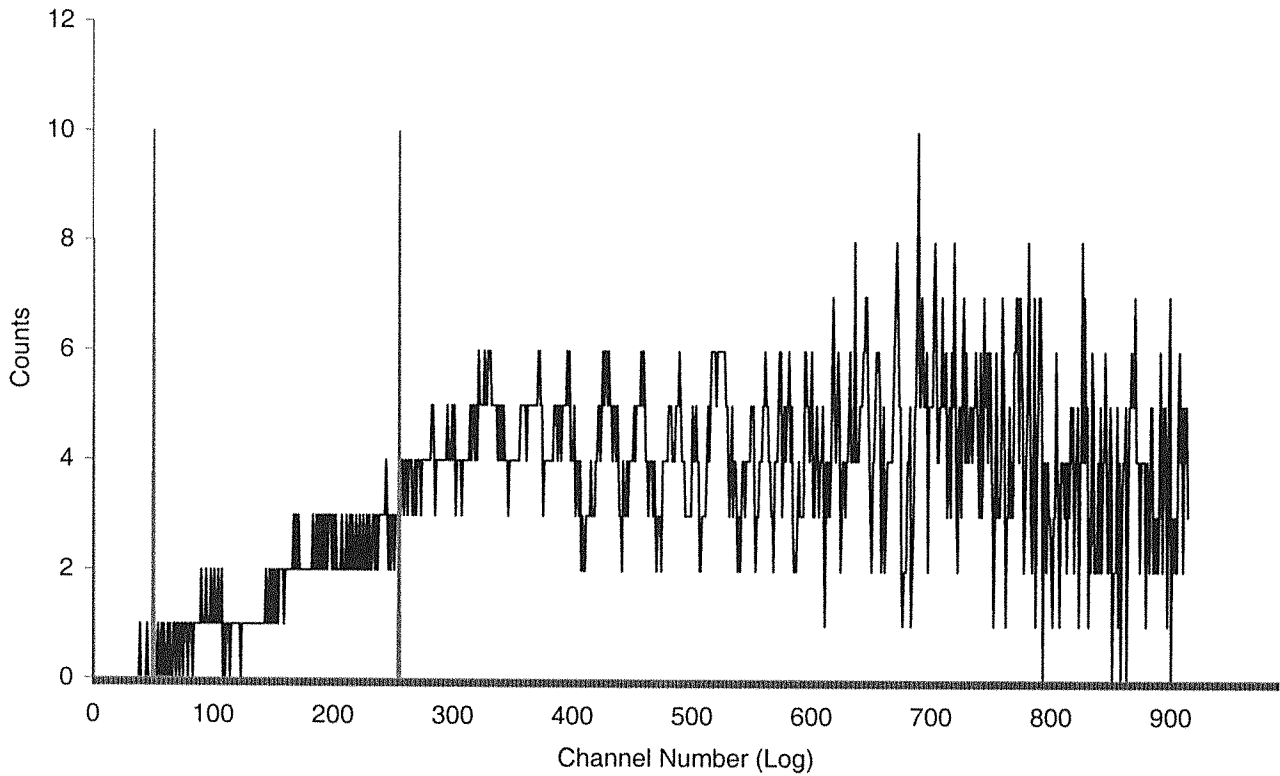
Sample Count Start Time: 20 Sep 2016 16:58:35
Data Capture Date: 20 Sep 2016 18:28:57
User Filename: S02092031-8A.XLS
U02092031-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TRITIUM
User Comment: GREEN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 8 31-8 90.00
H#, Total Counts: 156.5 3061
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



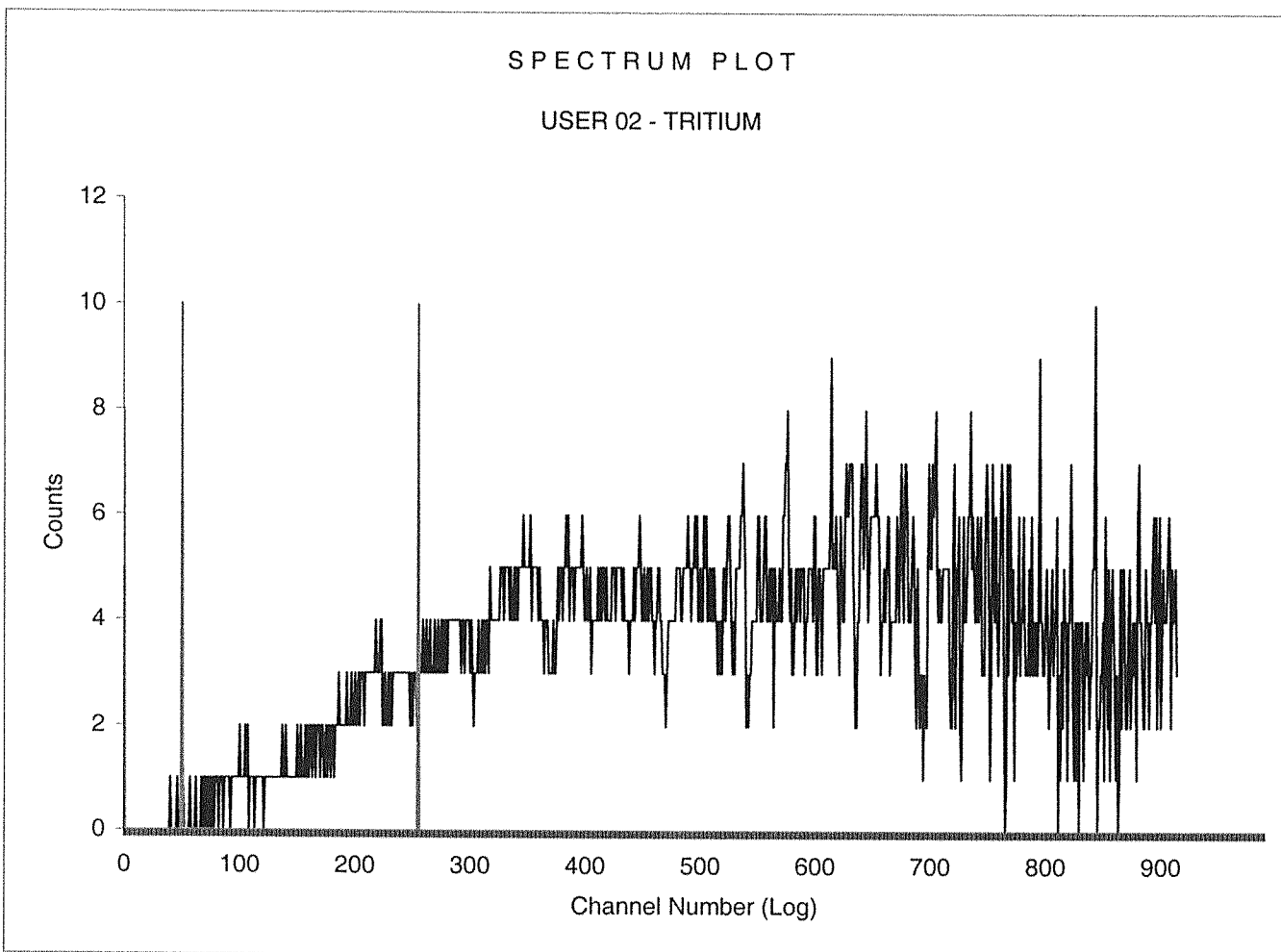
Sample Count Start Time: 20 Sep 2016 18:31:42
Data Capture Date 20 Sep 2016 20:02:04
User Filename S02092031-9A.XLS
U02092031-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 9 31-9 90.00
H#, Total Counts: 156.5 3097
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990

SPECTRUM PLOT

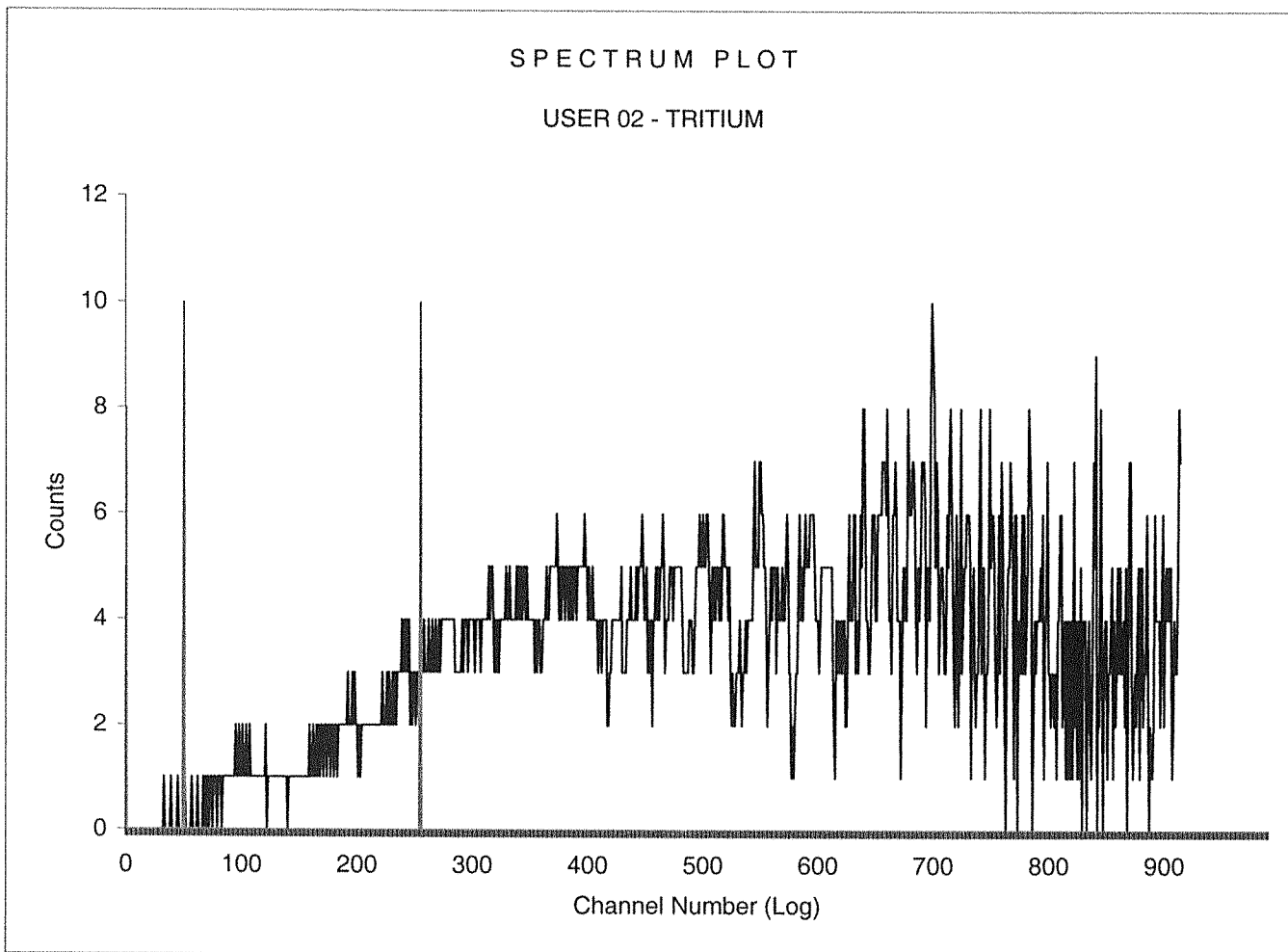
USER 02 - TRITIUM



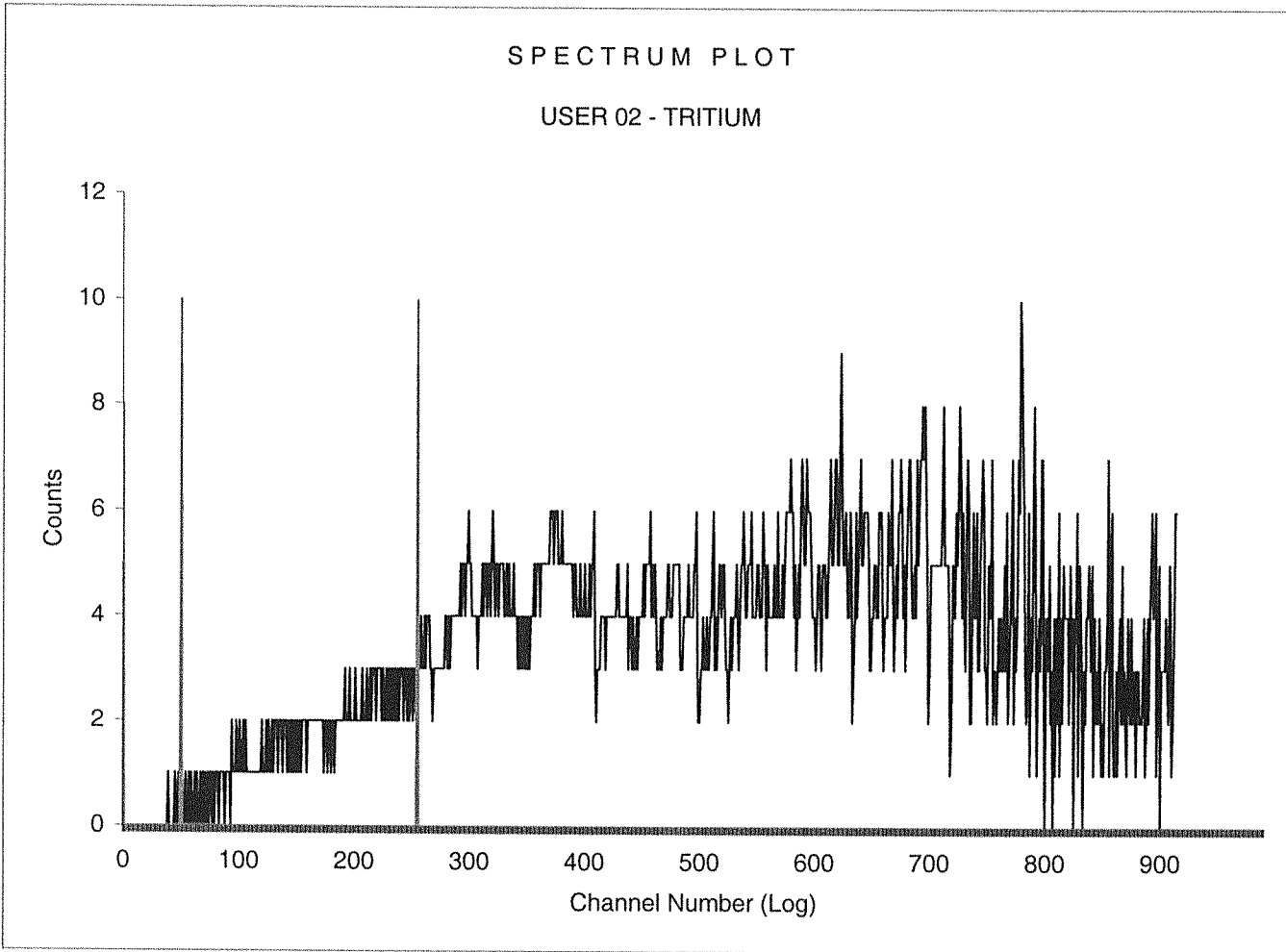
Sample Count Start Time: 20 Sep 2016 20:04:46
Data Capture Date 20 Sep 2016 21:35:08
User Filename S02092031-10A.XLS
U02092031-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 10 31-10 90.00
H#, Total Counts: 154.8 3159
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



Sample Count Start Time: 20 Sep 2016 21:37:49
Data Capture Date: 20 Sep 2016 23:08:12
User Filename: S02092031-11A.XLS
U02092031-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TRITIUM
User Comment: GREEN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 11 31-11 90.00
H#, Total Counts: 154.4 3065
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



Sample Count Start Time: 20 Sep 2016 23:10:53
Data Capture Date: 21 Sep 2016 00:41:15
User Filename: S02092131-12A.XLS
U02092031-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TRITIUM
User Comment: GREEN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 12 31-12 90.00
H#, Total Counts: 156.9 3136
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



1598672

PAGE: 1

ID: TRITIUM

21 SEP 2016 01:04

USER: 4 COMMENT: GREEN

PRESET TIME : 15.00
 DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD
 COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT
 TWO PHASE : NO AGC : NO CYCLE REPEATS : 1 DISK : OFF
 SCINTILLATOR: LIQUID LUMEX: YES LOW SAMPLE REJ: 0 RWM LIST : OFF
 LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 50.0 - 255.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0
 CHAN: 0.0 - 900.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

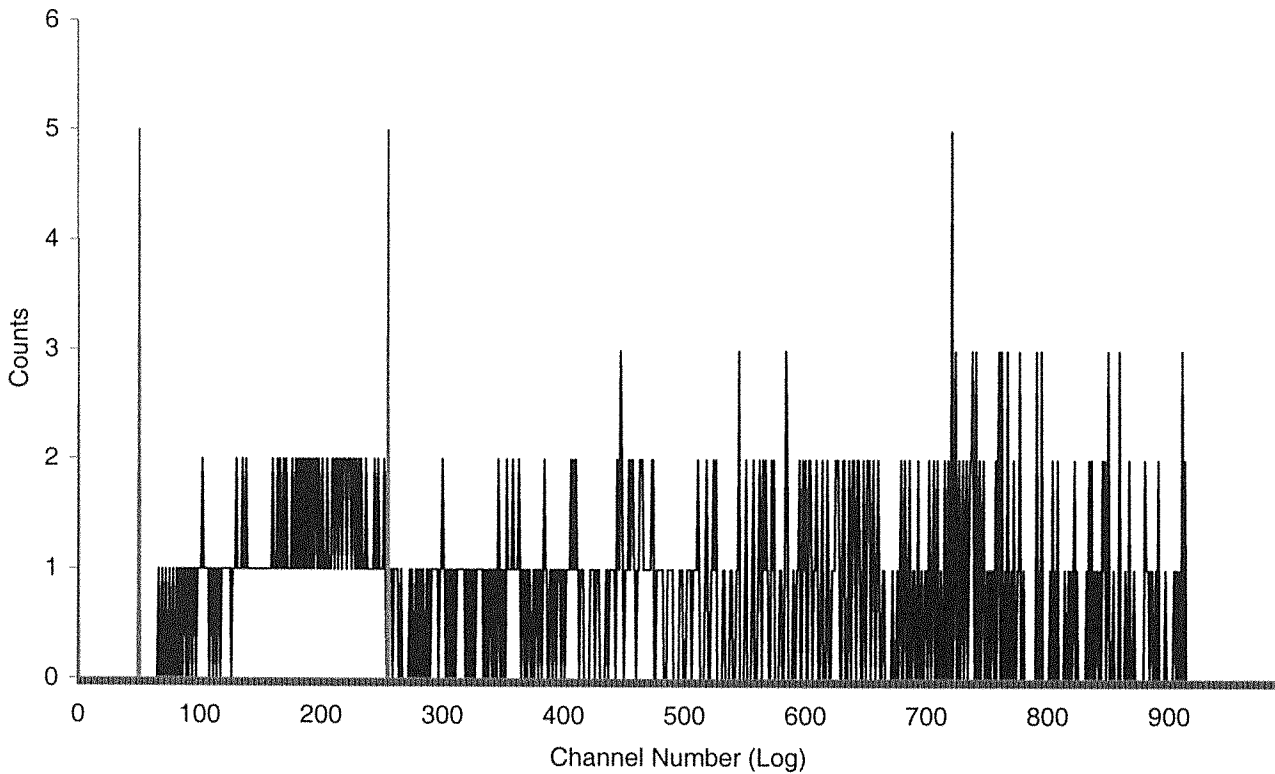
ALPHA-BETA DISCRIMINATION: NO

SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		
23 1	18-1	15.00	156.1	14.07	13.93	45.20	7.71	0.85	15.83
24 2	18-2	15.00	154.1	15.00	13.51	46.73	7.59	0.92	32.11

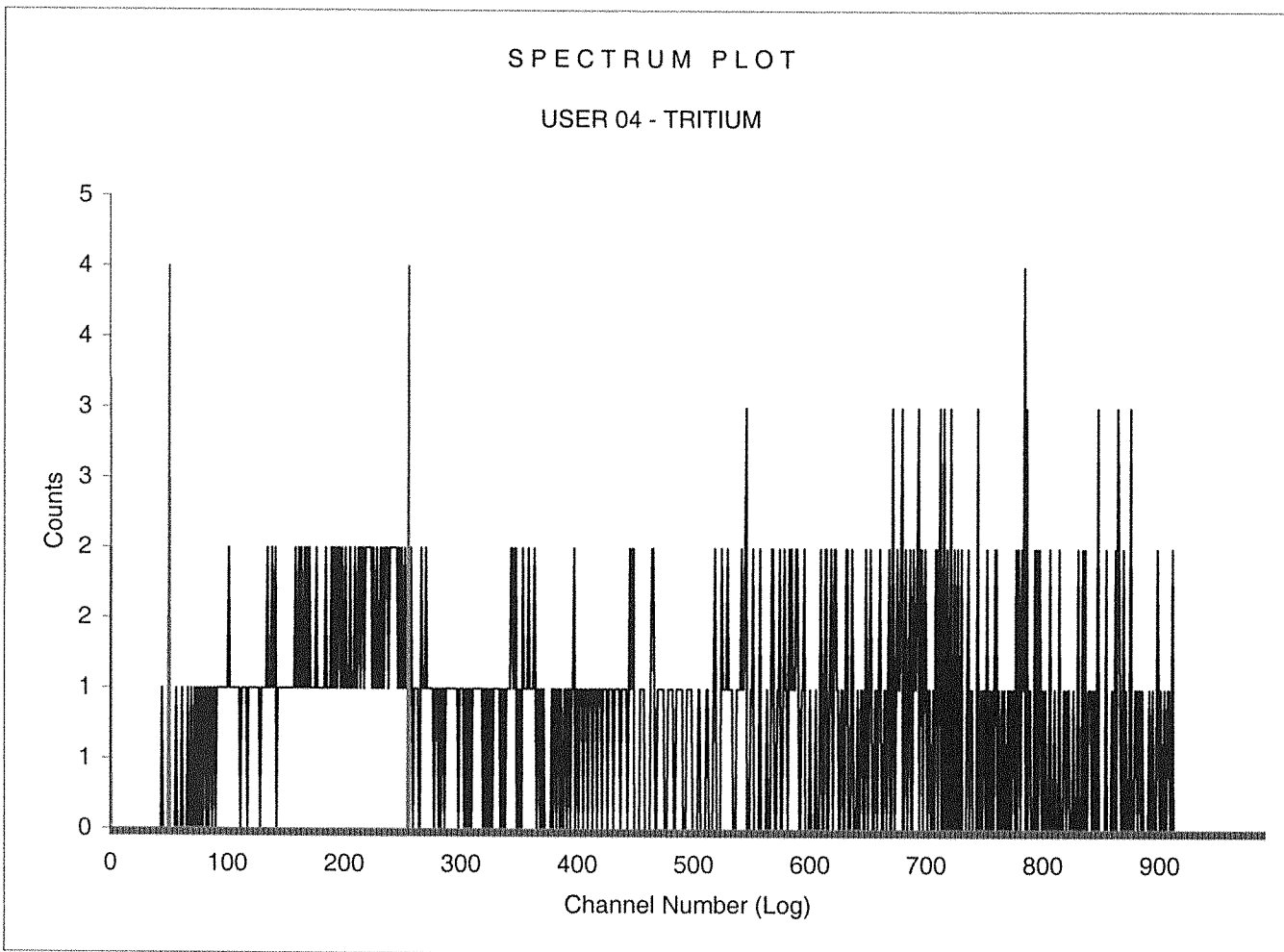
Sample Count Start Time: 21 Sep 2016 00:42:20
Data Capture Date 21 Sep 2016 00:57:42
User Filename S04092118-1A.XLS
U04092118-1A.XLS
Spectrum Type Log Counts
User Number 04
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 1 18-1 15.00
H#, Total Counts: 156.1 687
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990

SPECTRUM PLOT

USER 04 - TRITIUM



Sample Count Start Time: 21 Sep 2016 00:58:37
Data Capture Date: 21 Sep 2016 01:13:59
User Filename: S04092118-2A.XLS
U04092118-1A.XLS
Spectrum Type: Log Counts
User Number: 04
User Id: TRITIUM
User Comment: GREEN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 2 18-2 15.00
H#, Total Counts: 154.1 707
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



Batch# 1SP805C Product: H3 Date: 9/30/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			NA
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	See DER 1563148
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER 1563148
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DET 1563148
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By:

[Signature]
9/30/16

MS MC
10/4

Secondary Review Performed By:

DATA EXCEPTION REPORT

Mo.Day Yr. 30-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LSC	Test / Method: EPA 906.0 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1598096	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, 1203626153, and 1203626154 were received and analyzed out of the method specified hold time.</p>		<p>1. Reporting results.</p>	

Originator's Name:

Elizabeth Krouse 30-SEP-16

Data Validator/Group Leader:

Lyndsey Pace 30-SEP-16

MSWC 10/4/16 90

Prep Logbook

The Determination of Tritium

Batch ID: 1598096

Analyst: Terry Phillips

Method: EPA 906.0 Modified

Lab SOP: GL-RAD-A-002 REV# 21

Instrument: LSC-J93763

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
LCS	1203626155	Tritium SPIKE	1753-B	.1	mL
MS	1203626154	Tritium SPIKE	1753-B	.1	mL

Sample ID	Prep Date	Matrix	Dry or Wet	Unadjusted Aliquot (g)	Aliquot (g)	Rig #	Volume Added (mL)	Aliquot in vial (mL)
405235061	26-SEP-2016 06:30:12	Soil	W	3.35	2.761	33	50	10
405235062	26-SEP-2016 06:30:12	Soil	W	3.32	2.677	37	50	10
405235063	26-SEP-2016 06:30:12	Soil	W	3.39	3.034	38	50	10
405235064	26-SEP-2016 06:30:12	Soil	W	3.35	3.077	40	50	10
405235065	26-SEP-2016 06:30:12	Soil	W	3.37	3.031	43	50	10
405235066	26-SEP-2016 06:30:12	Soil	W	3.43	3.111	44	50	10
405235067	26-SEP-2016 06:30:12	Soil	W	3.44	2.963	45	50	10
405235068	26-SEP-2016 06:30:12	Soil	W	3.43	2.954	46	50	10
405235069	26-SEP-2016 06:30:12	Soil	W	3.37	3.012	48	50	10
405235070	26-SEP-2016 06:30:12	Soil	W	3.33	2.702	49	50	10
405235071	26-SEP-2016 06:30:12	Soil	W	3.3	2.754	51	50	10
405235072	26-SEP-2016 06:30:12	Soil	W	3.38	3.104	52	50	10
405235073	26-SEP-2016 06:30:12	Soil	W	3.46	2.806	56	50	10
405235074	26-SEP-2016 06:30:12	Soil	W	3.34	2.983	57	50	10
405235075	26-SEP-2016 06:30:12	Soil	W	3.39	3.026	60	50	10
405235076	26-SEP-2016 06:30:12	Soil	W	3.31	2.63	65	50	10
405235077	26-SEP-2016 06:30:12	Soil	W	3.4	3.063	66	50	10
405235078	26-SEP-2016 06:30:12	Soil	W	3.33	2.793	67	50	10
1203626152 MB	26-SEP-2016 06:30:12	Soil	W	3.111	3.111	69	50	10
1203626153 DUP (405235061)	26-SEP-2016 06:30:12	Soil	W	3.4	2.802	70	50	10
1203626154 MS (405235061)	26-SEP-2016 06:30:12	Soil	W	3.43	2.827	71	50	10
1203626155 LCS	26-SEP-2016 06:30:12	Soil	W		3.111	82	50	10

Comments:

Spike Pipet ID: RAD-LSC-2970968
 Vial Pipet ID: RAD-LSC-8036326
 Bkg prepared with dead water: Yes

Reagent/Solvent Lot ID	Description	Amount
2352257.5	Eoscient Ultra Scintillation Solution	13 mL
2373671	Sodium Hydroxide, Pellet ACS	2 g
2418926	Quenching Agent	20 uL
2447042.3	Eoscient Ultra Scintillation Solution	13 mL
2457153	RL-Potassium Permanganate	2 mL

Tritium Solid

Filename : H3DST.XLS
 File type : Excel
 Version # : 1.2.13

Batch : 1598096
 Analyst : TER02081
 Prep Date : 9/26/2016
 Method Uncertainty : 0

Procedure Code : LSCDSH3DS
 Parmname : Tritium
 Required MDA : 6 pCi/g
 H-3 Abundance : 1.00
 Halflife of Tritium : 12.32 years

Geometry: 10mL DW/13mL Ecoscint Ultra

Pos.	Sample ID	Total Sample Volume (L)	Sample Aliquot (G)	Sample Aliquot StDev. (G)	Distilled Sample Counted (L)	Sample Counted (L)	Rig number	Sample Date/Time
1	405235061.1	0.0500	2.7610	3.5058E-03	0.0100	1.0000E-05	33	12/14/2015 13:47
2	405235062.1	0.0500	2.6770	3.4971E-03	0.0100	1.0000E-05	37	12/14/2015 13:10
3	405235063.1	0.0500	3.0340	3.5340E-03	0.0100	1.0000E-05	38	12/14/2015 13:15
4	405235064.1	0.0500	3.0770	3.5384E-03	0.0100	1.0000E-05	40	12/14/2015 13:25
5	405235065.1	0.0500	3.0310	3.5366E-03	0.0100	1.0000E-05	43	12/14/2015 13:56
6	405235066.1	0.0500	3.1110	3.5419E-03	0.0100	1.0000E-05	44	12/14/2015 14:00
7	405235067.1	0.0500	2.9630	3.5266E-03	0.0100	1.0000E-05	45	12/11/2015 11:30
8	405235068.1	0.0500	2.9540	3.5257E-03	0.0100	1.0000E-05	46	12/11/2015 10:27
9	405235069.1	0.0500	3.0120	3.5317E-03	0.0100	1.0000E-05	48	12/16/2015 12:45
10	405235070.1	0.0500	2.7020	3.4997E-03	0.0100	1.0000E-05	49	12/11/2015 10:10
11	405235071.1	0.0500	2.7540	3.5051E-03	0.0100	1.0000E-05	51	12/11/2015 10:25
12	405235072.1	0.0500	3.1040	3.5412E-03	0.0100	1.0000E-05	52	12/15/2015 13:35
13	405235073.1	0.0500	2.8060	3.5104E-03	0.0100	1.0000E-05	56	12/11/2015 11:35
14	405235074.1	0.0500	2.9830	3.5287E-03	0.0100	1.0000E-05	57	12/15/2015 14:10
15	405235075.1	0.0500	3.0260	3.5331E-03	0.0100	1.0000E-05	60	12/16/2015 9:31
16	405235076.1	0.0500	2.6300	3.4923E-03	0.0100	1.0000E-05	65	12/11/2015 14:19
17	405235077.1	0.0500	3.0630	3.5369E-03	0.0100	1.0000E-05	66	12/17/2015 13:30
18	405235078.1	0.0500	2.7930	3.5091E-03	0.0100	1.0000E-05	67	12/17/2015 12:40
19	1203626152.1	0.0500	3.1110	3.5419E-03	0.0100	1.0000E-05	69	9/26/2016 0:00
20	1203626153.1	0.0500	2.8020	3.5100E-03	0.0100	1.0000E-05	70	12/14/2015 13:47
21	1203626154.1	0.0500	2.8270	3.5126E-03	0.0100	1.0000E-05	71	12/14/2015 13:47
22	1203626155.1	0.0500	3.1110	3.5419E-03	0.0100	1.0000E-05	82	9/26/2016 0:00

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1.0 ml Stdev : +/- 0.002000 ml
 Pipet, 5.0 ml Stdev : +/- 0.010000 ml

Analytical SOP: GL-RAD-A-002
 Instrument SOP: GL-RAD-I-004

Count raw Data		Calibration Data										Sample Decay					
Pos.	Rack Position #	Counting Time (min.)	Quench#	Gross cpm	Bkg cpm	Bkg Count Time (min.)	Bkg Quench#	Corrected Bkg cpm	Count Start Date/Time	Sample Decay	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)	Detector Error (cpm/dpm)	Background Rack Position #	Background Count Start Date/Time
1	17-2	90	152.8	3.54	3.39	90	160.3	3.3767	9/26/2016 13:35	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2193	0.00792	17-1	9/26/2016 12:02
2	17-3	90	155.4	3.66	3.39	90	160.3	3.3816	9/26/2016 15:10	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2143	0.00792	17-1	9/26/2016 12:02
3	17-4	90	154.8	3.89	3.39	90	160.3	3.3805	9/26/2016 16:43	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2154	0.00792	17-1	9/26/2016 12:02
4	17-5	90	154.7	3.38	3.39	90	160.3	3.3803	9/26/2016 18:17	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2156	0.00792	17-1	9/26/2016 12:02
5	17-6	90	155.6	3.72	3.39	90	160.3	3.3820	9/26/2016 19:50	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2139	0.00792	17-1	9/26/2016 12:02
6	17-7	90	153.6	3.8	3.39	90	160.3	3.3782	9/26/2016 21:23	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2178	0.00792	17-1	9/26/2016 12:02
7	17-8	90	179.3	3.71	3.39	90	160.3	3.4116	9/26/2016 22:58	0.956	LSCGREEN	7/1/2016	6/30/2017	0.1707	0.00792	17-1	9/26/2016 12:02
8	17-9	90	154.5	3.91	3.39	90	160.3	3.3799	9/27/2016 0:32	0.956	LSCGREEN	7/1/2016	6/30/2017	0.2160	0.00792	17-1	9/26/2016 12:02
9	14-1	90	152.9	4.01	3.39	90	160.3	3.3789	9/27/2016 3:16	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2191	0.00792	17-1	9/26/2016 12:02
10	14-2	90	158	3.76	3.39	90	160.3	3.3852	9/27/2016 4:50	0.956	LSCGREEN	7/1/2016	6/30/2017	0.2093	0.00792	17-1	9/26/2016 12:02
11	14-3	90	174.9	3.36	3.39	90	160.3	3.4081	9/27/2016 6:25	0.956	LSCGREEN	7/1/2016	6/30/2017	0.1783	0.00792	17-1	9/26/2016 12:02
12	14-4	90	153.7	3.6	3.39	90	160.3	3.3784	9/27/2016 7:58	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2176	0.00792	17-1	9/26/2016 12:02
13	14-5	90	154.1	3.88	3.39	90	160.3	3.3801	9/27/2016 9:32	0.956	LSCGREEN	7/1/2016	6/30/2017	0.2158	0.00792	17-1	9/26/2016 12:02
14	14-6	90	154.6	3.68	3.39	90	160.3	3.3792	9/27/2016 11:06	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2168	0.00792	17-1	9/26/2016 12:02
15	14-7	90	156.1	3.37	3.39	90	160.3	3.3829	9/27/2016 12:39	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2129	0.00792	17-1	9/26/2016 12:02
16	14-8	90	156.7	4.1	3.39	90	160.3	3.3840	9/27/2016 14:13	0.956	LSCGREEN	7/1/2016	6/30/2017	0.2118	0.00792	17-1	9/26/2016 12:02
17	14-9	90	154.6	3.61	3.39	90	160.3	3.3801	9/27/2016 15:47	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2158	0.00792	17-1	9/26/2016 12:02
18	14-10	90	157.4	3.66	3.39	90	160.3	3.3852	9/27/2016 17:21	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2104	0.00792	17-1	9/26/2016 12:02
19	14-11	90	154.7	3.5	3.39	90	160.3	3.3803	9/27/2016 18:54	1.000	LSCGREEN	7/1/2016	6/30/2017	0.2156	0.00792	17-1	9/26/2016 12:02
20	14-12	90	154.1	3.78	3.39	90	160.3	3.3792	9/27/2016 20:28	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2168	0.00792	17-1	9/26/2016 12:02
21	21-1	15	153.6	12.53	3.39	90	160.3	3.3782	9/27/2016 21:59	0.957	LSCGREEN	7/1/2016	6/30/2017	0.2178	0.00792	17-1	9/26/2016 12:02
22	53-1	15	153.9	13.53	2.67	15	156.6	2.6650	9/29/2016 8:14	0.999	LSCGREEN	7/1/2016	6/30/2017	0.2172	0.00792	53-3	9/29/2016 8:30

Notes:
 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : 1753-B
 Spike Exp Date : 11/2/2016
 Spike Activity (dpm/ml): 2547.68
 Spike Volume Added: 0.10

LCS S/N : 1753-B
 LCS Exp Date : 11/2/2016
 LCS Activity (dpm/ml): 2547.68
 LCS Volume Added: 0.10

* - RPD changed to 0% due to sample & dup activity below MDA

Pos.	Decision Level pCi/G	Critical Level pCi/G	Required MDA pCi/G	MDA pCi/G	Sample Act. Conc. pCi/G	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA		Total Prop. Uncertainty pCi/G	Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
									Counting Uncertainty pCi/G	Uncertainty pCi/G							
1	2.4810	1.7516	6	3.6328	0.6349	169.74%	0.1633	0.2772	2.1121	2.1121	2.1121		SAMPLE				
2	2.6212	1.8506	6	3.8380	1.1425	100.48%	0.2784	0.2797	2.2499	2.2500	2.2500		SAMPLE				
3	2.3000	1.6238	6	3.3676	1.8350	55.79%	0.5095	0.2842	2.0063	2.0065	2.0065		SAMPLE				
4	2.2657	1.5996	6	3.3175	-1.119E-03	86905.89%	-0.0003	0.2741	1.9059	1.9059	1.9059		SAMPLE				
5	2.3195	1.6376	6	3.3962	1.2274	83.11%	0.3380	0.2809	1.9993	1.9994	1.9994		SAMPLE				
6	2.2183	1.5661	6	3.2481	1.4655	66.96%	0.4218	0.2824	1.9234	1.9235	1.9235		SAMPLE				
7	2.9874	2.1091	6	4.3735	1.3895	94.27%	0.2984	0.2813	2.5674	2.5675	2.5675		SAMPLE				
8	2.3569	1.6640	6	3.4511	1.9565	53.70%	0.5301	0.2846	2.0589	2.0592	2.0592		SAMPLE				
9	2.2759	1.6068	6	3.3324	2.2575	45.26%	0.6331	0.2865	2.0022	2.0025	2.0025		SAMPLE				
10	2.6623	1.8796	6	3.8981	1.5570	75.39%	0.3738	0.2818	2.3005	2.3007	2.3007		SAMPLE				
11	3.0754	2.1712	6	4.5023	-0.2308	569.82%	-0.0481	0.2742	2.5779	2.5779	2.5779		SAMPLE				
12	2.2252	1.5710	6	3.2582	0.7723	125.67%	0.2216	0.2785	1.9023	1.9023	1.9023		SAMPLE				
13	2.4837	1.7535	6	3.6367	1.1663	93.40%	0.2999	0.2801	2.1351	2.1352	2.1352		SAMPLE				
14	2.3241	1.6408	6	3.4030	1.8229	56.71%	0.5008	0.2840	2.0261	2.0264	2.0264		SAMPLE				
15	2.3337	1.6476	6	3.4170	-0.0471	2126.64%	-0.0129	0.2739	1.9613	1.9613	1.9613		SAMPLE				
16	2.7022	1.9078	6	3.9566	3.0283	40.28%	0.7160	0.2884	2.3903	2.3908	2.3908		SAMPLE				
17	2.2733	1.6049	6	3.3285	0.8183	121.24%	0.2299	0.2787	1.9445	1.9445	1.9445		SAMPLE				
18	2.5589	1.8066	6	3.7467	1.1005	101.81%	0.2748	0.2798	2.1958	2.1958	2.1958		SAMPLE				
19	2.1446	1.5141	6	3.1401	0.4019	231.02%	0.1197	0.2765	1.8199	1.8199	1.8199		MB				
20	2.4747	1.7472	6	3.6236	1.5535	70.37%	0.4008	0.2820	2.1426	2.1427	2.1427	405235061.1	DUP	0.0%		42.4256	82.5%
21	4.5677	3.2248	6	7.2146	35.0005	10.24%	9.1518	0.9343	7.0032	7.0255	7.0255	405235061.1	MS			36.8886	98.2%
22	4.6321	3.2703	6	7.2075	36.2347	9.60%	10.8650	1.0391	6.7920	6.8165	6.8165		LCS				

159 8096

Instrument Type LS 6000
 Data Capture Date 26 Sep 2016 11:58:54
 User Filename C:\LSCCAPTURE\BROWN\USER02\UN092601.BSF

User Number 2
 User Id TRITIUM
 User Comments GREEN

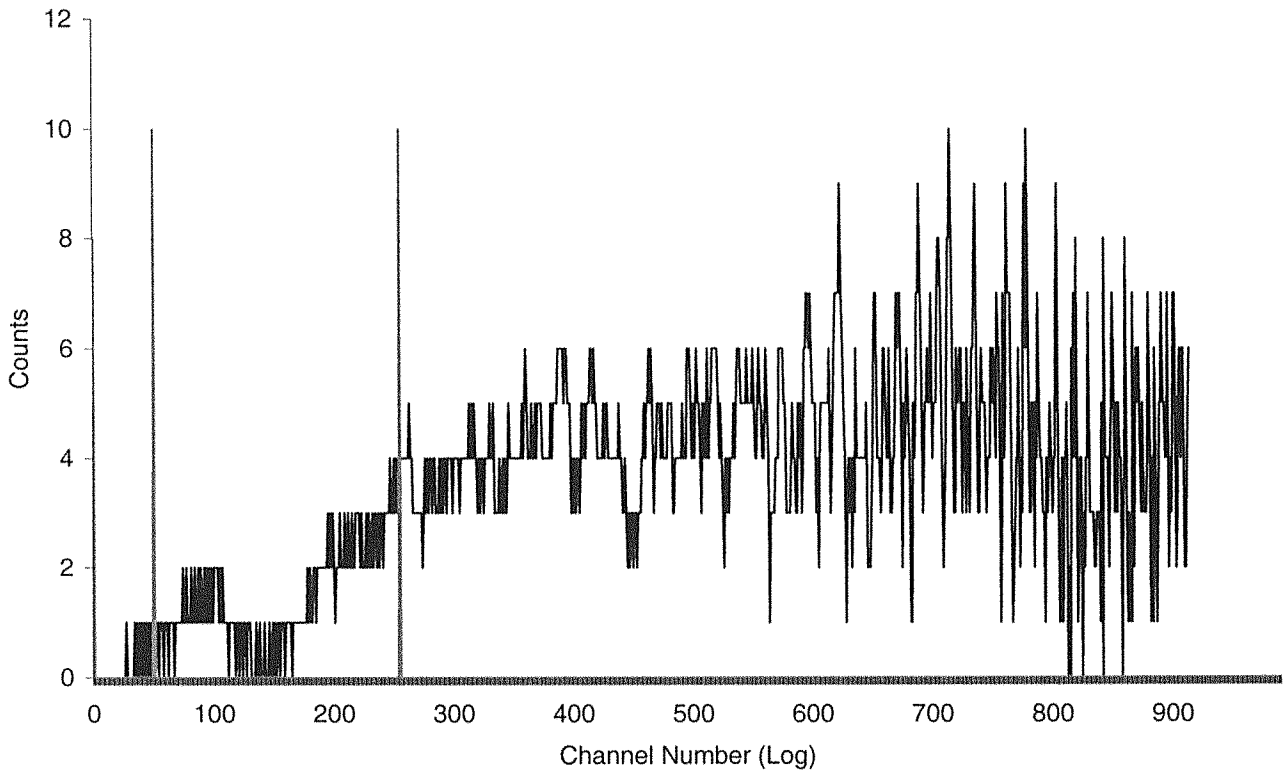
Scintillator Choice: LIQUID

Sam	Rack	Time	H#	Raw	Raw CPM2	CPM Iso1	%Err1	CPM Iso2	%Err2	LumEx	EITime
DK 1	17-1	90.00	160.3	5.54	36.87	3.39	14.65	34.74	3.68	4.77	93.17
2	17-2	90.00	152.8	5.18	35.72	3.54	13.54	34.03	3.70	3.89	186.67
3	17-3	90.00	155.4	10.56	41.40	3.66	18.75	34.36	3.95	14.36	281.18
4	17-4	90.00	154.8	7.08	36.97	3.89	14.43	33.68	3.81	7.41	375.07
5	17-5	90.00	154.7	4.26	35.46	3.38	12.88	34.58	3.63	2.07	468.34
6	17-6	90.00	155.6	4.62	35.06	3.72	12.18	34.16	3.65	2.17	561.63
7	17-7	90.00	153.6	4.47	34.98	3.80	11.73	34.30	3.64	1.65	654.82
8	17-8	90.00	179.3	15.61	47.49	3.71	22.47	34.87	4.17	23.39	749.97
8	17-9	90.00	154.5	6.91	37.40	3.91	14.18	34.39	3.75	6.73	843.81

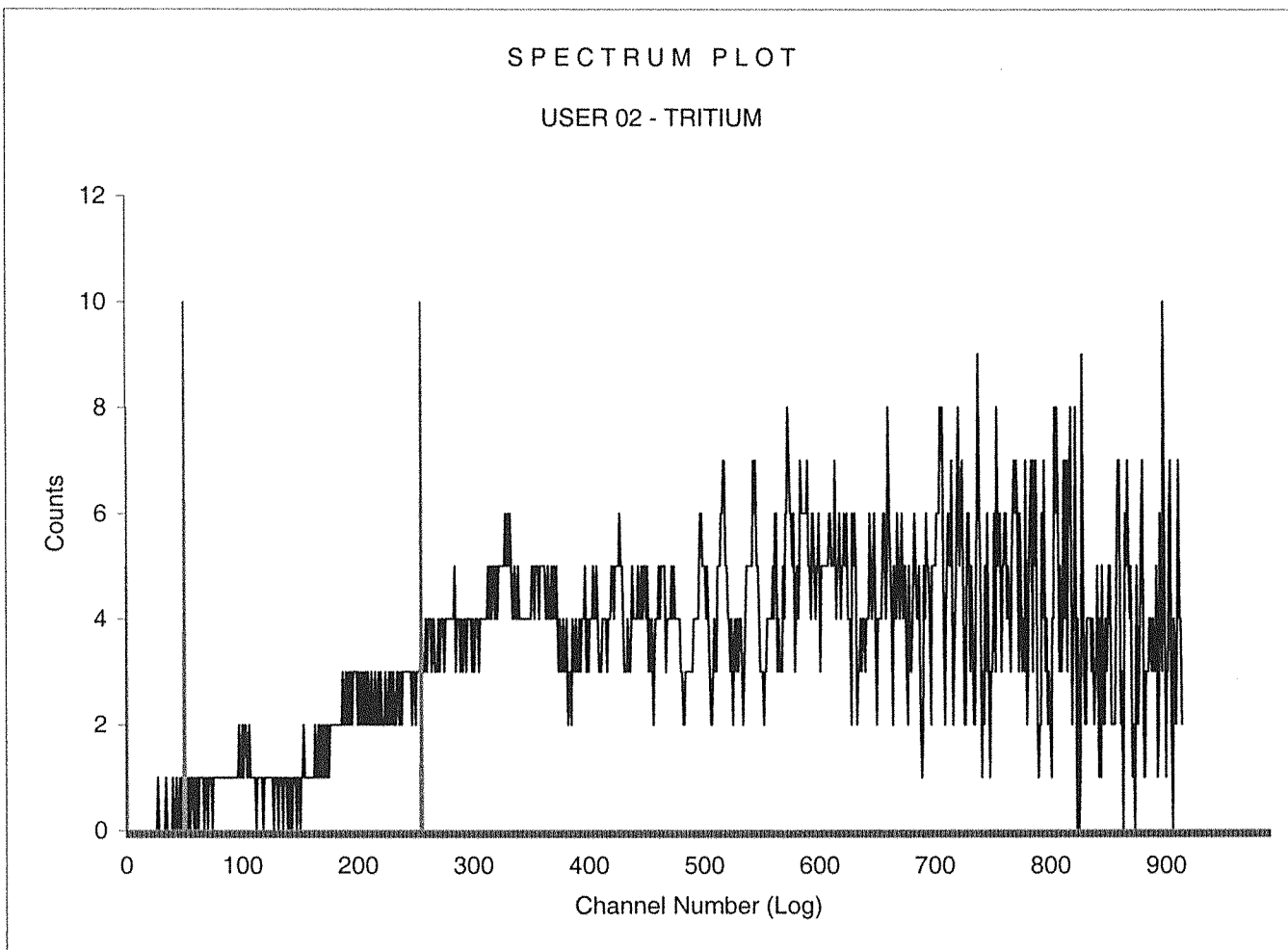
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Data Capture Date: 26 Sep 2016 13:32:27
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U02092617-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TRITIUM
User Comment: GREEN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 1 17-1 90.00
H#, Total Counts: 160.3 3192
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990

SPECTRUM PLOT

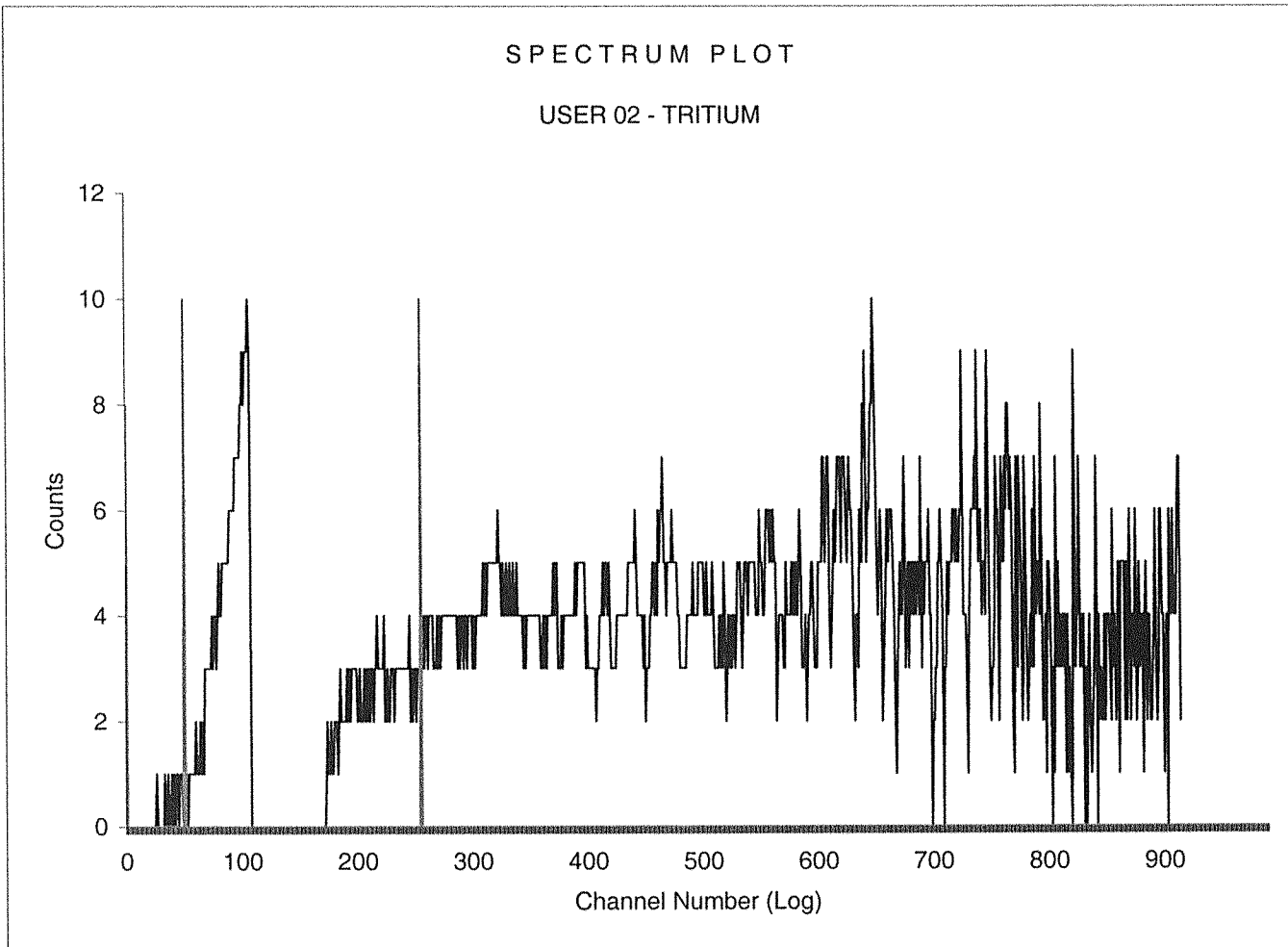
USER 02 - TRITIUM



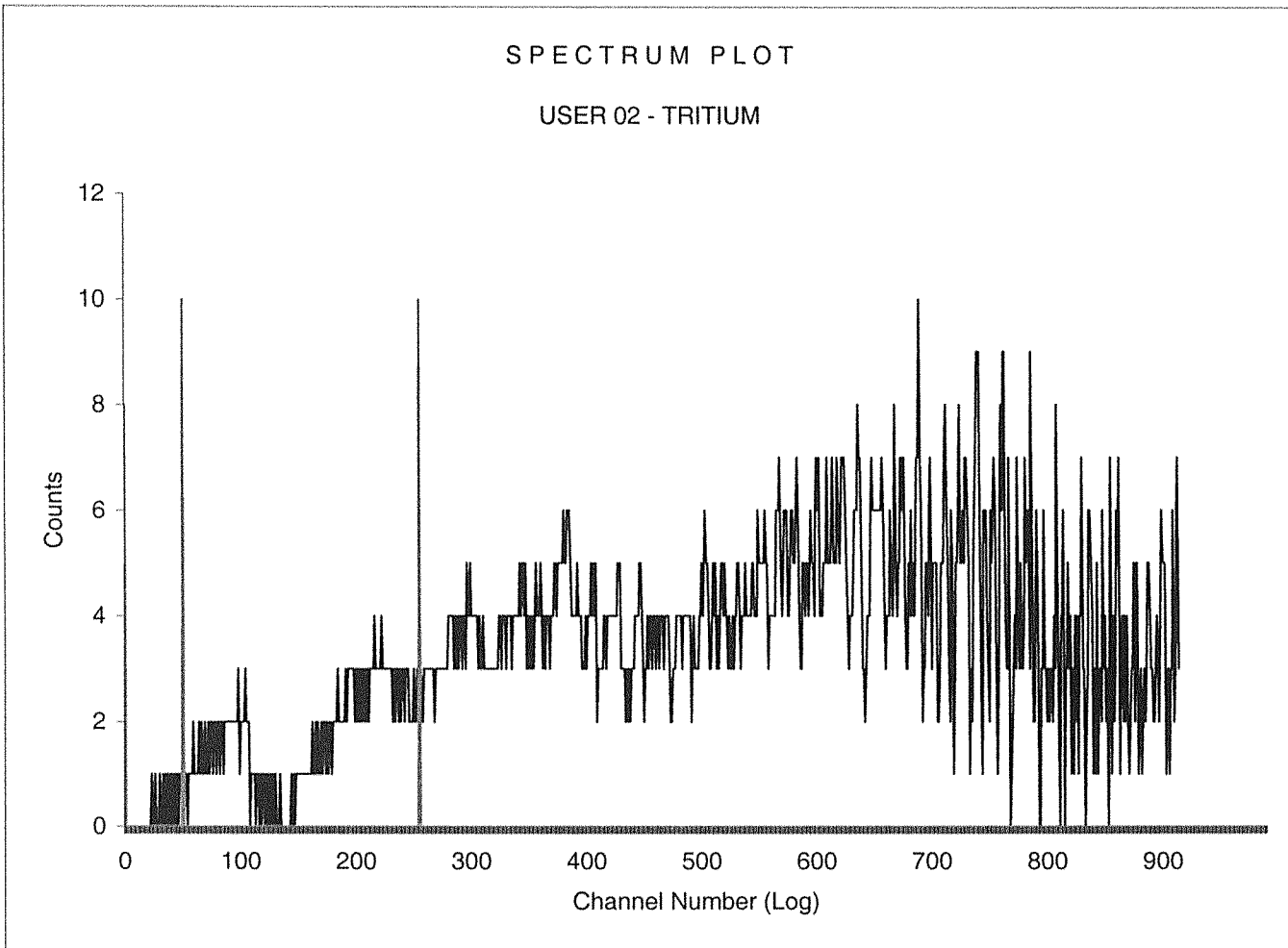
Sample Count Start Time: 26 Sep 2016 13:35:34
Data Capture Date 26 Sep 2016 15:05:57
User Filename S02092617-2A.XLS
U02092617-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 2 17-2 90.00
H#, Total Counts: 152.8 3114
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



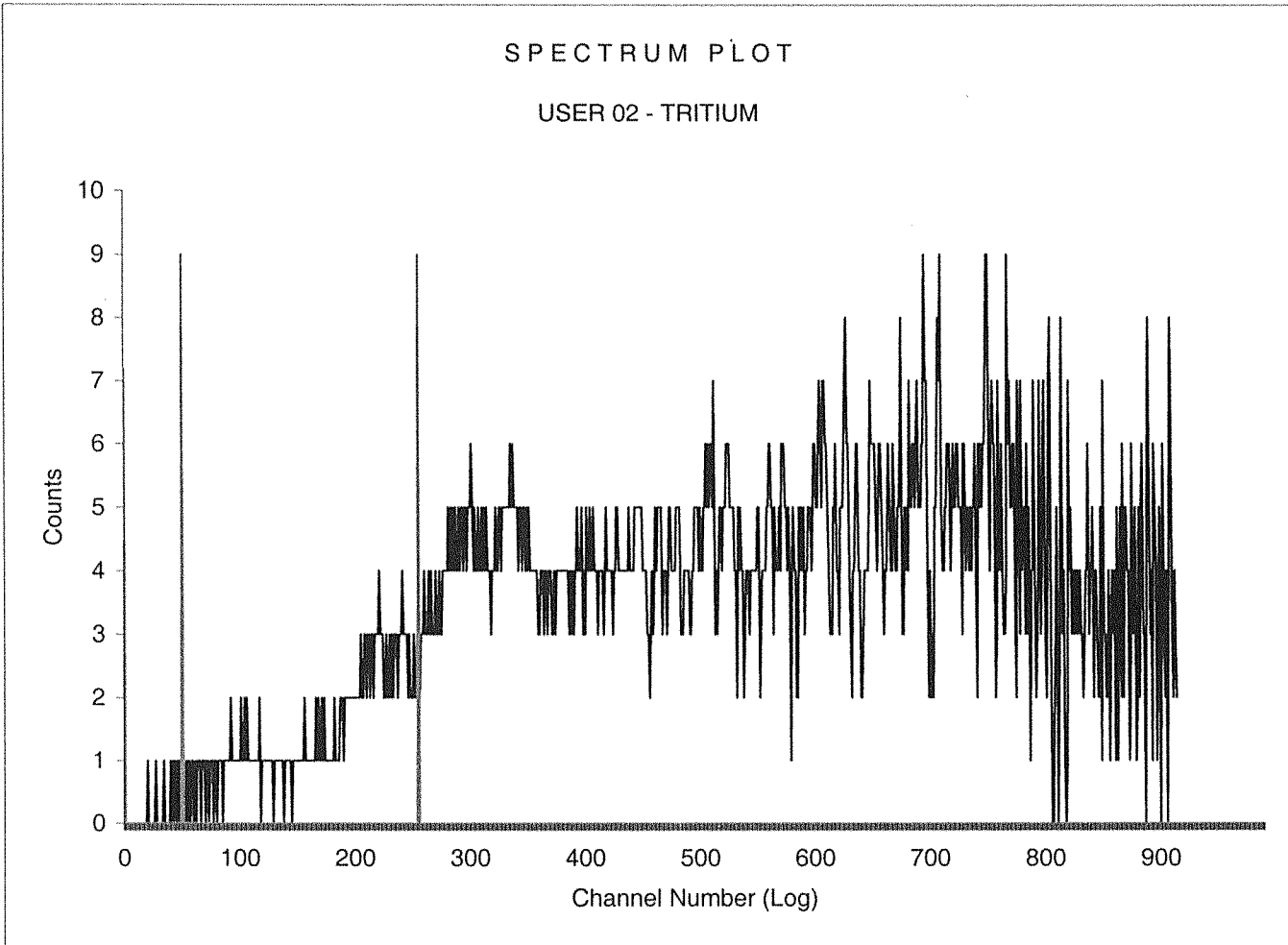
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Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	3	17-3	90.00
H#, Total Counts:	155.4	3282	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	



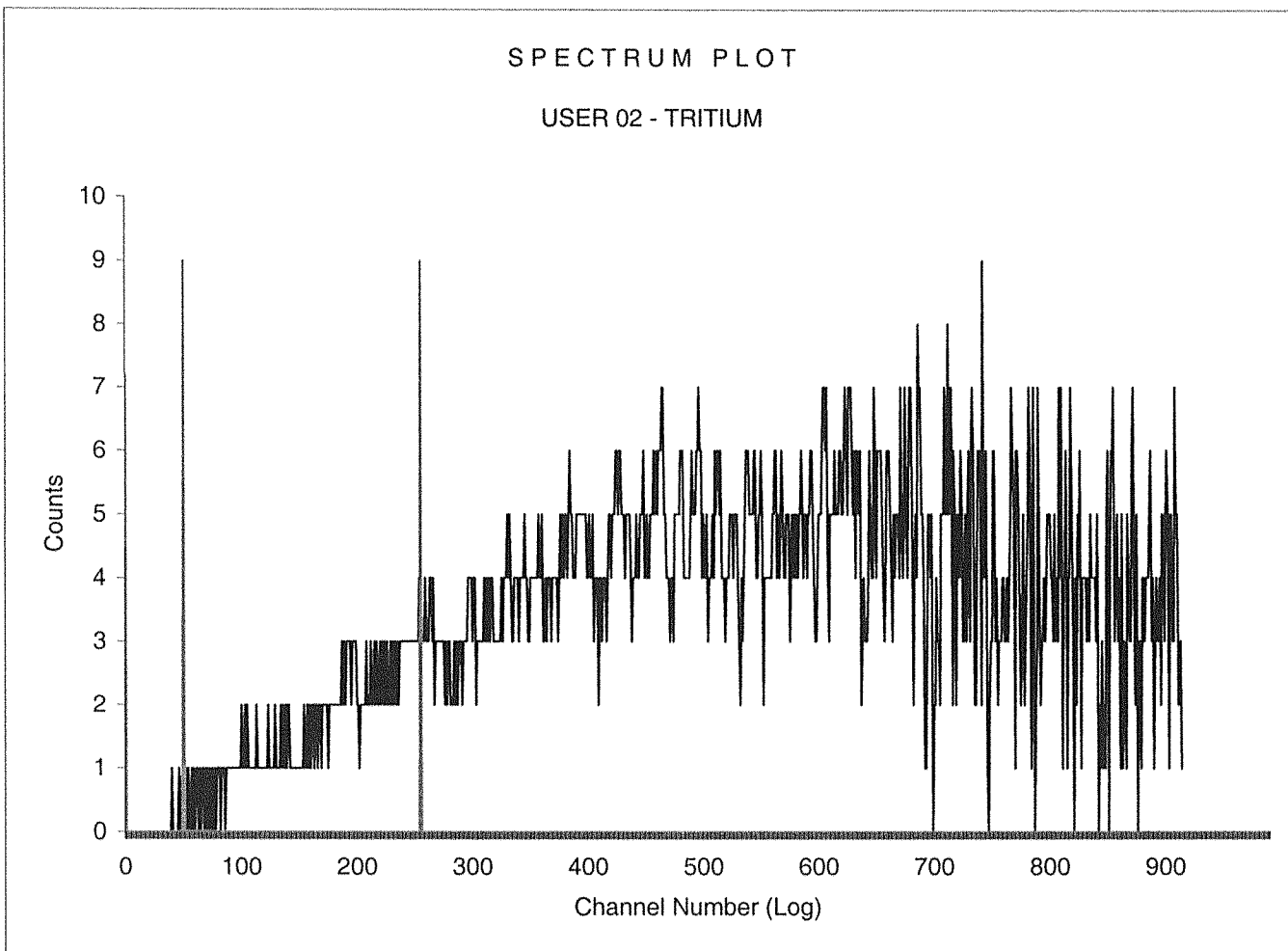
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	U02092617-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	4	17-4	90.00
H#, Total Counts:	154.8	3081	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	



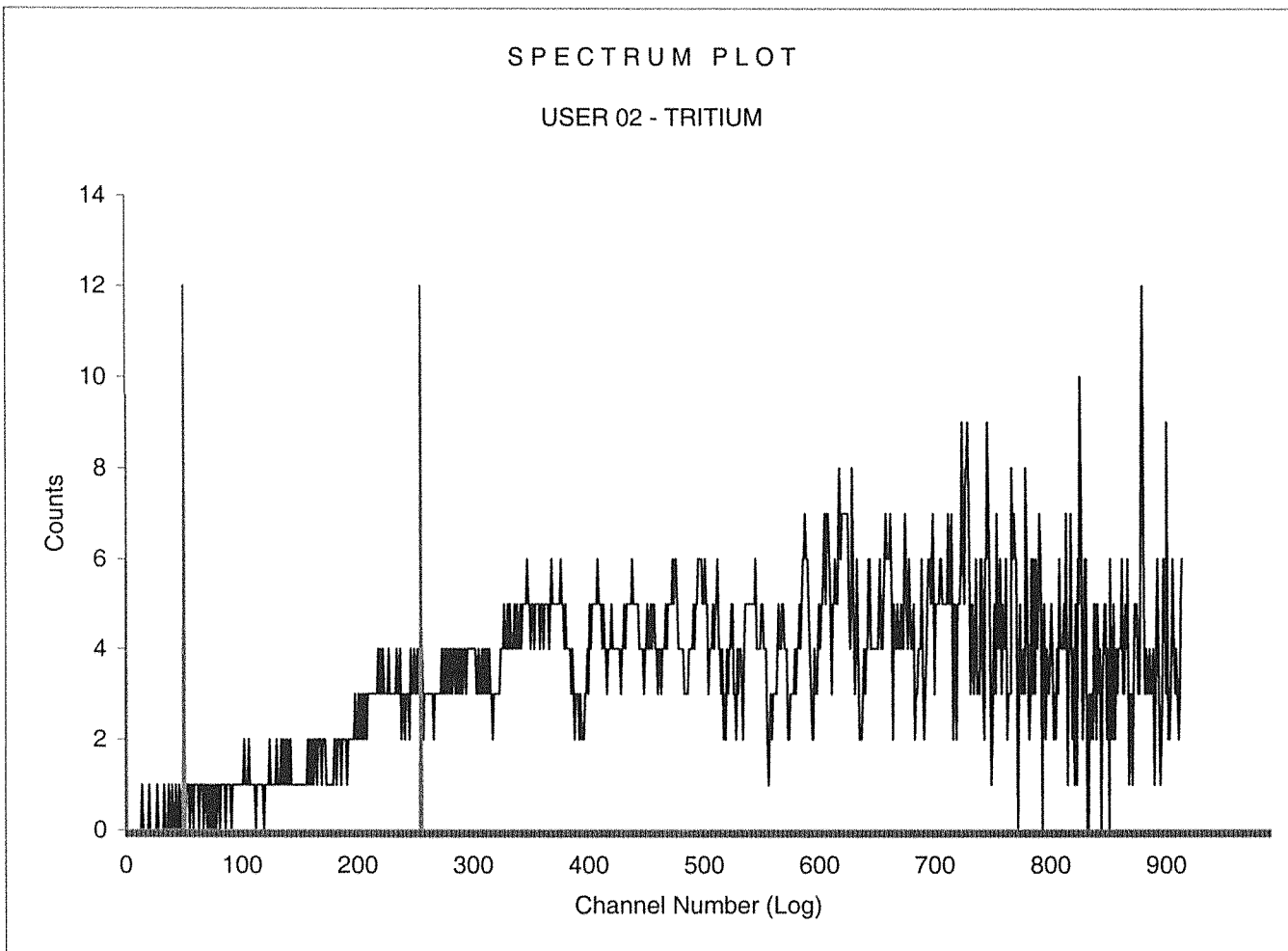
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U02092617-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TRITIUM
User Comment: GREEN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 5 17-5 90.00
H#, Total Counts: 154.7 3163
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



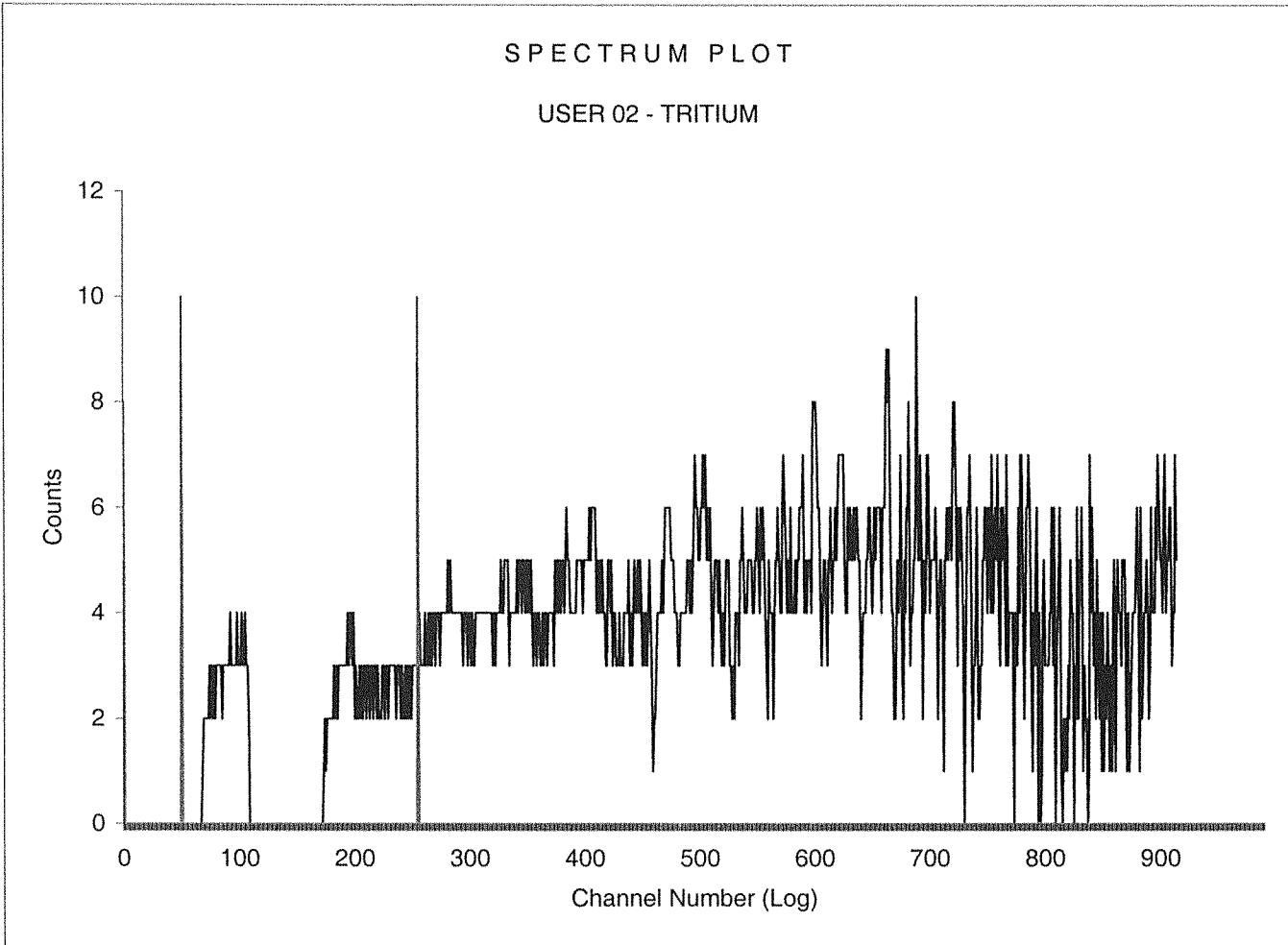
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User Filename: S02092617-6A.XLS
U02092617-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TRITIUM
User Comment: GREEN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 6 17-6 90.00
H#, Total Counts: 155.6 3127
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



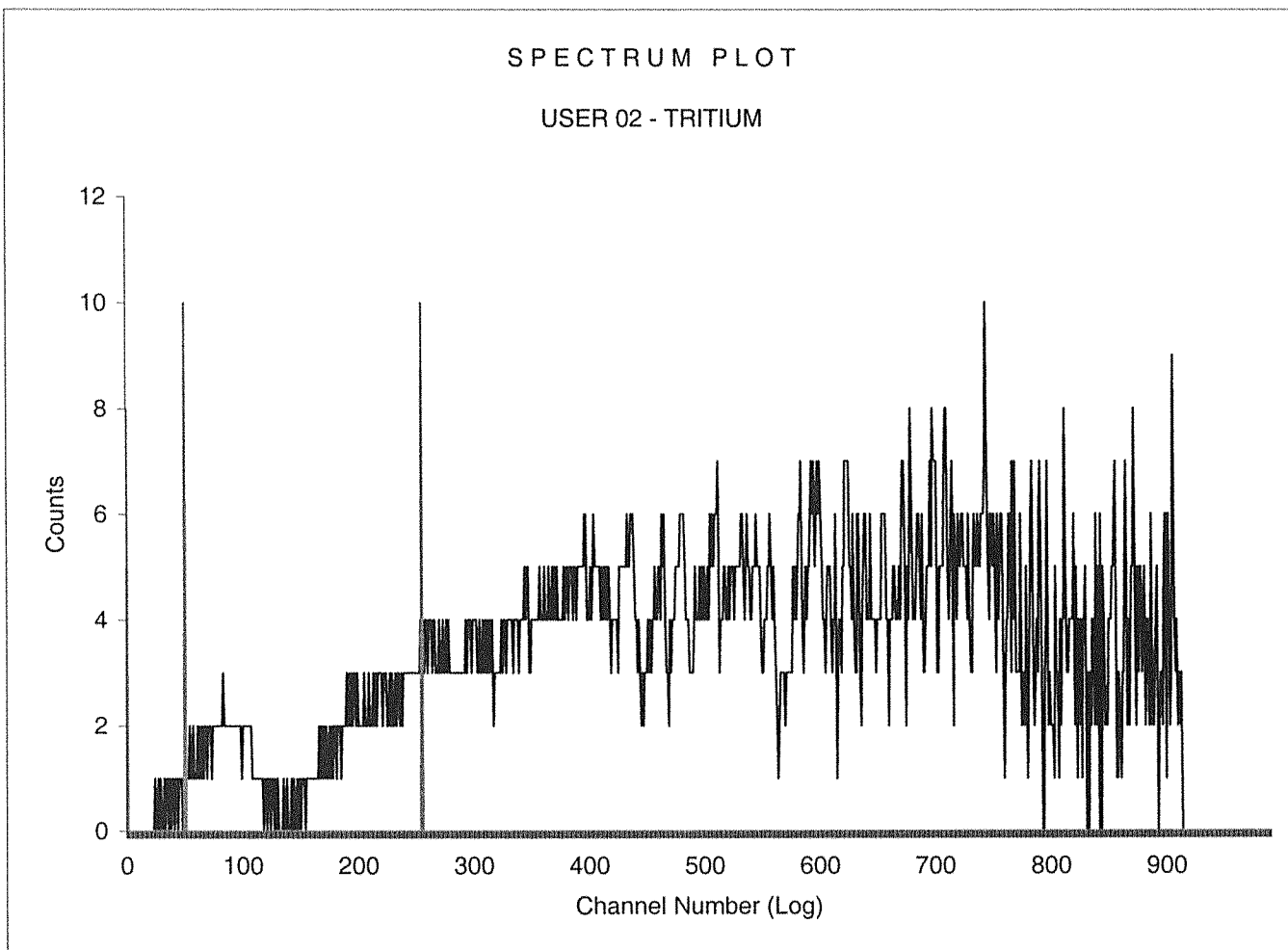
Sample Count Start Time:	26 Sep 2016 21:23:43		
Data Capture Date	26 Sep 2016 22:54:06		
User Filename	S02092617-7A.XLS		
	U02092617-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	7	17-7	90.00
H#, Total Counts:	153.6	3143	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	



Sample Count Start Time: 26 Sep 2016 22:58:52
Data Capture Date: 27 Sep 2016 00:29:14
User Filename: S02092717-8A.XLS
U02092617-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TRITIUM
User Comment: GREEN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 8 17-8 90.00
H#, Total Counts: 179.3 3209
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



Sample Count Start Time: 27 Sep 2016 00:32:43
Data Capture Date 27 Sep 2016 02:03:04
User Filename S02092717-9A.XLS
U02092617-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 9 17-9 90.00
H#, Total Counts: 154.5 3147
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



1598096

ID: TRITIUM

27 SEP 2016 03:36

USER: 2 COMMENT: GREEN

PRESET TIME : 90.00

DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD

COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT

TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF

SCINTILLATOR: LIQUID LUMEX: YES LOW SAMPLE REJ: 0 RWM LIST : OFF

LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 50.0 - 255.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

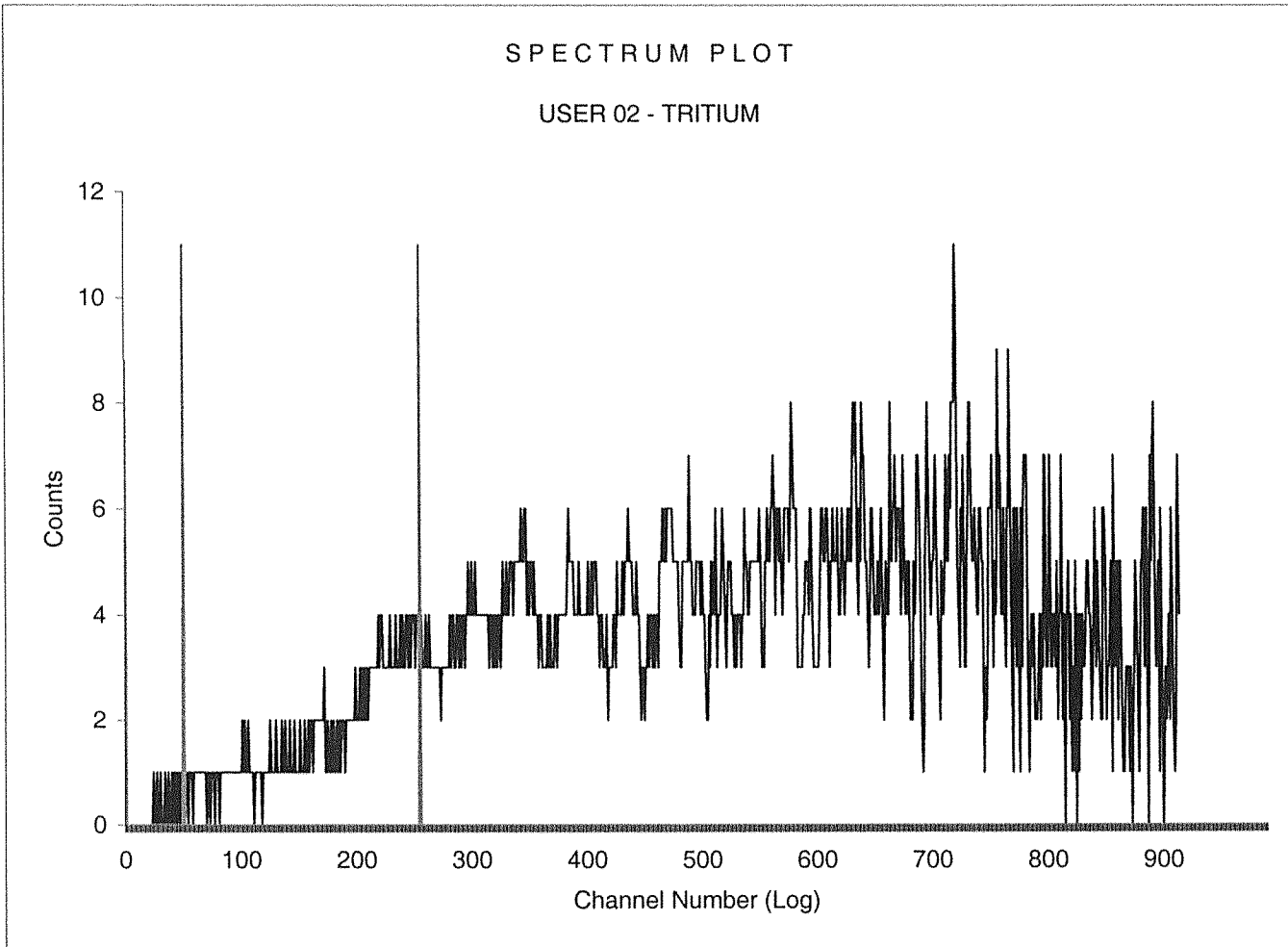
CHAN: 0.0 - 900.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

ALPHA-BETA DISCRIMINATION: NO

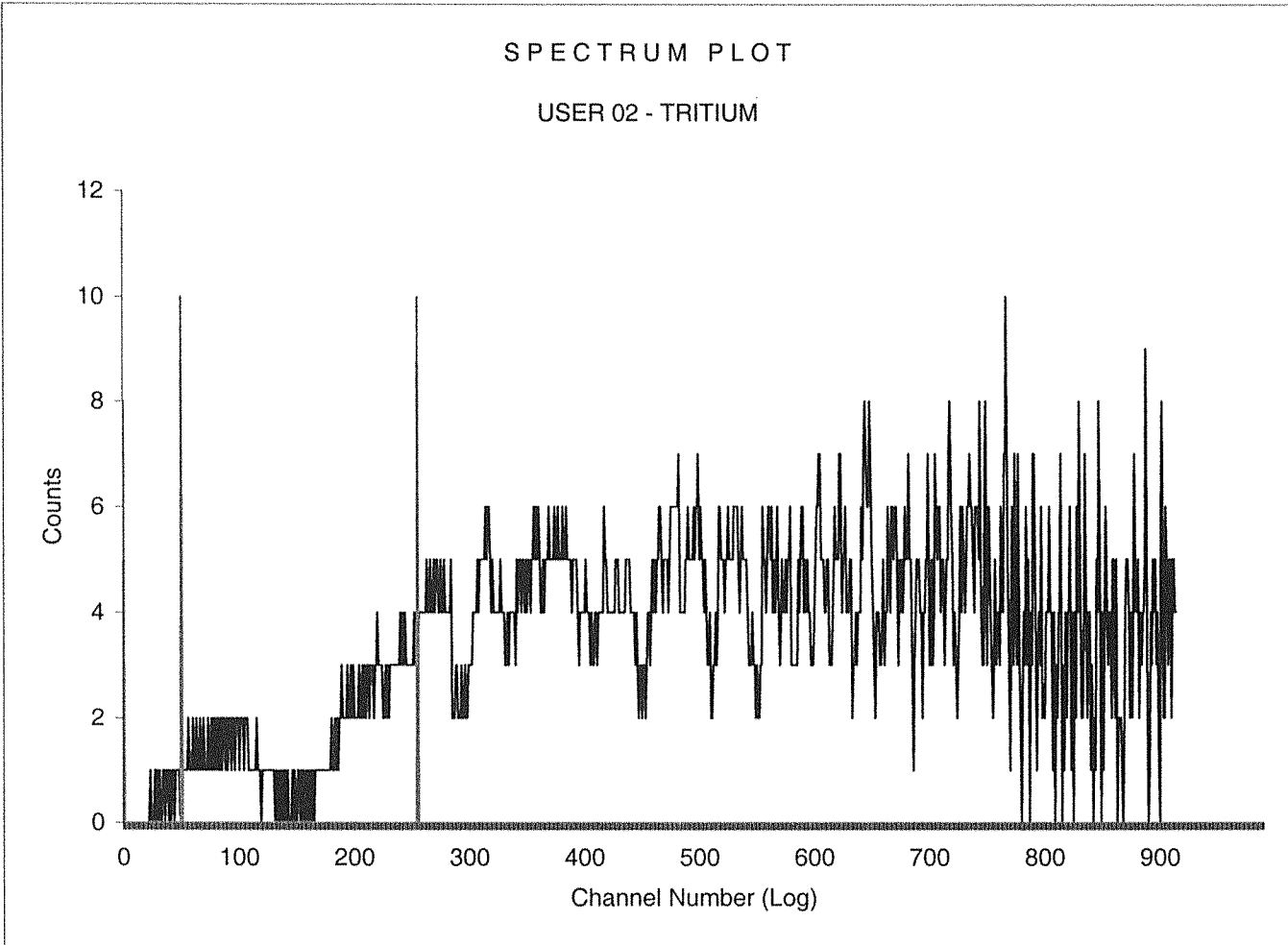
SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		

9	1	14-1	90.00	152.9	4.01	11.64	35.34	3.59	2.08	92.91
10	2	14-2	90.00	158.0	3.76	15.24	34.57	3.77	7.89	186.75
11	3	14-3	90.00	174.9	3.36	18.43	35.10	3.83	11.52	281.02
12	4	14-4	90.00	153.7	3.60	13.93	33.83	3.74	4.94	374.66
13	5	14-5	90.00	154.6	3.68	14.10	34.59	3.70	5.31	468.36
14	6	14-6	90.00	154.1	3.88	13.25	33.77	3.74	4.95	562.02
15	7	14-7	90.00	156.1	3.37	14.70	33.79	3.74	4.88	655.65
16	8	14-8	90.00	156.7	4.10	13.63	35.16	3.70	6.38	749.46
17	9	14-9	90.00	154.6	3.61	14.44	33.76	3.76	5.67	843.19
18	10	14-10	90.00	157.4	3.66	14.92	33.28	3.82	6.90	937.04
19	11	14-11	90.00	154.7	3.50	14.50	33.69	3.75	5.21	1030.73
20	12	14-12	90.00	154.1	3.78	13.30	33.90	3.72	4.38	1124.32

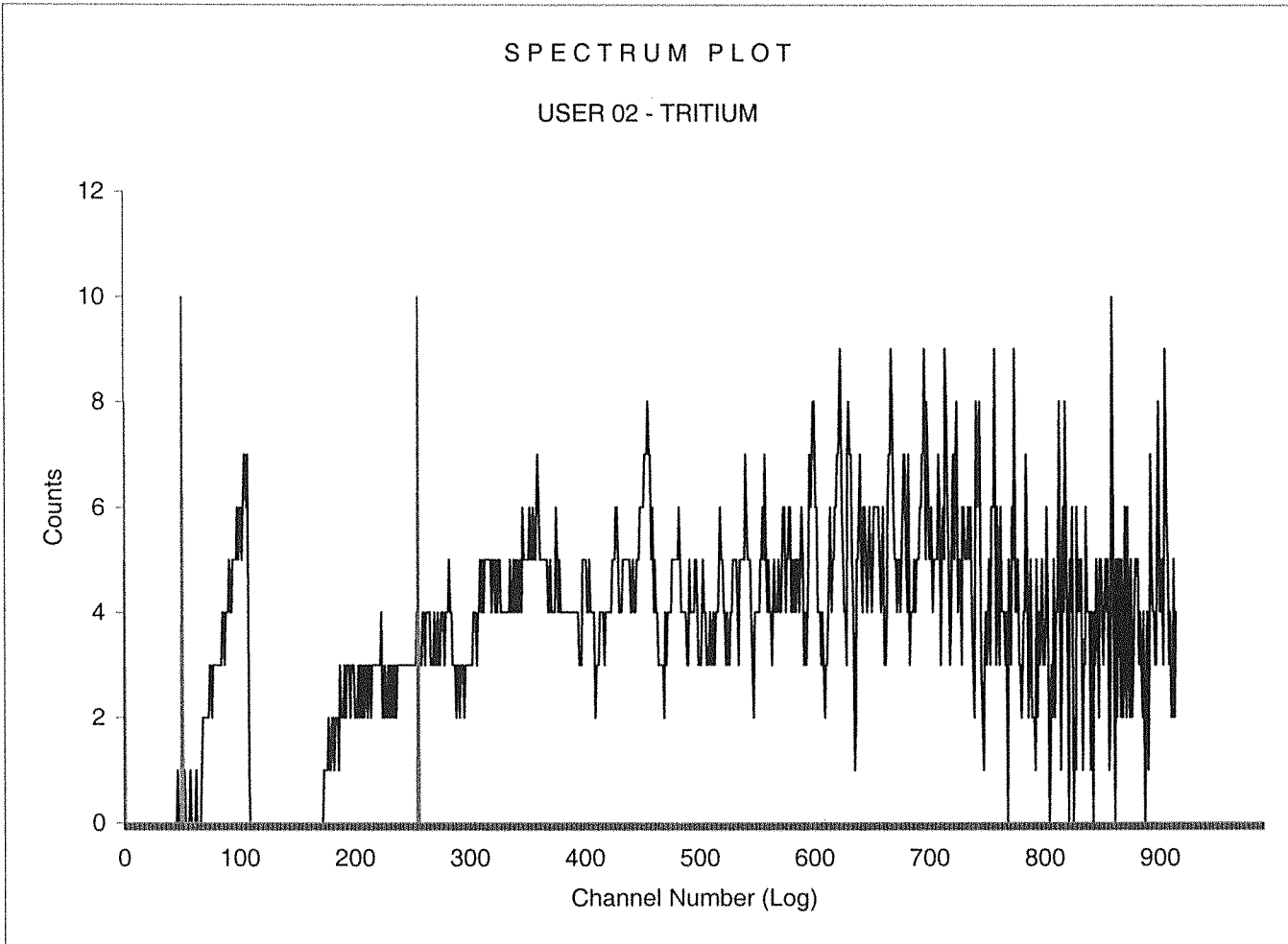
Sample Count Start Time:	27 Sep 2016 03:16:51		
Data Capture Date	27 Sep 2016 04:47:15		
User Filename	S02092714-1A.XLS		
	U02092714-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	1	14-1	90.00
H#, Total Counts:	152.9	3228	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	



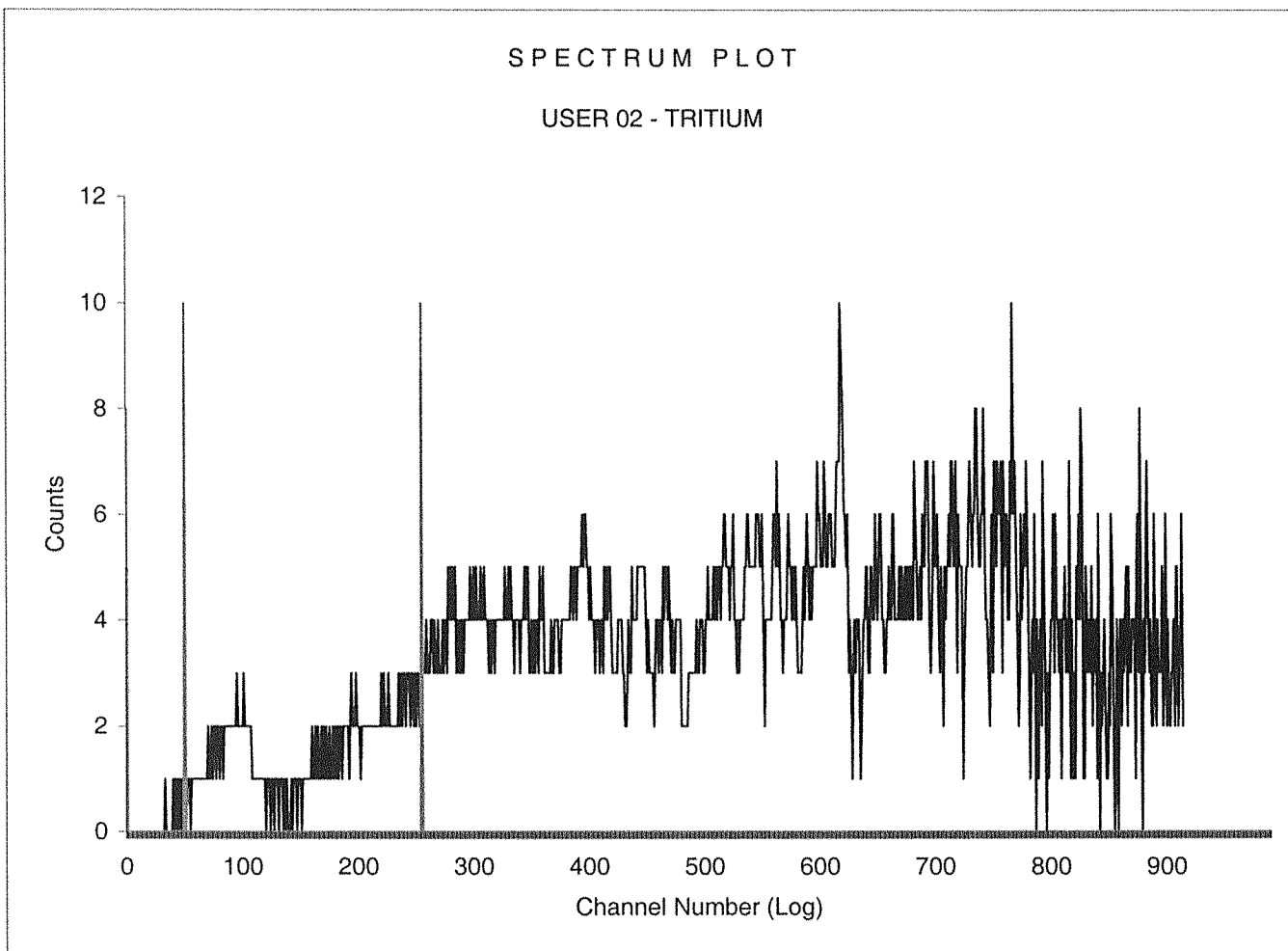
Sample Count Start Time: 27 Sep 2016 04:50:47
Data Capture Date 27 Sep 2016 06:21:11
User Filename S02092714-2A.XLS
U02092714-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 2 14-2 90.00
H#, Total Counts: 158.0 3173
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



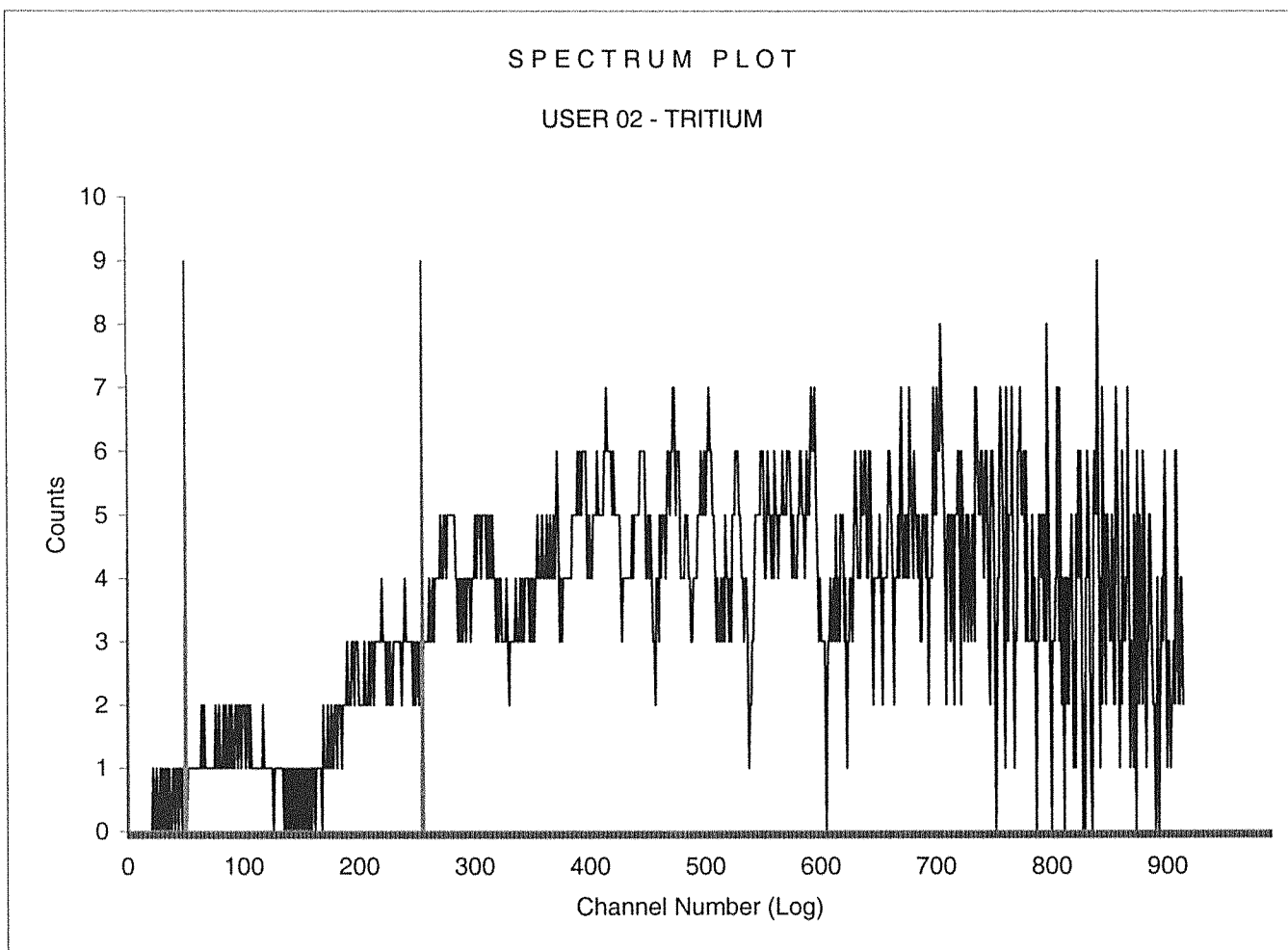
Sample Count Start Time: 27 Sep 2016 06:25:03
Data Capture Date: 27 Sep 2016 07:55:27
User Filename: S02092714-3A.XLS
U02092714-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TRITIUM
User Comment: GREEN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 3 14-3 90.00
H#, Total Counts: 174.9 3291
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



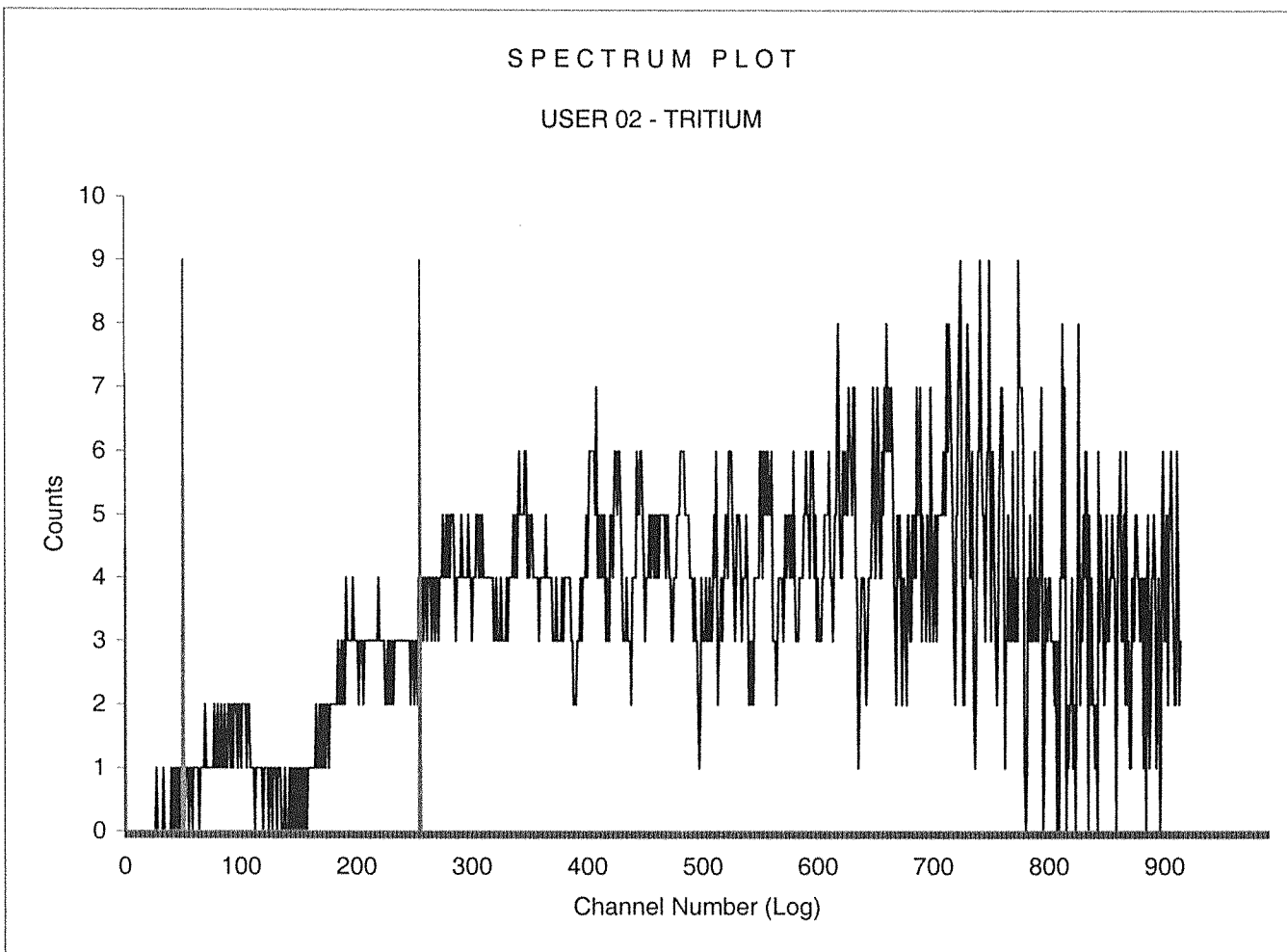
Sample Count Start Time:	27 Sep 2016 07:58:42
Data Capture Date	27 Sep 2016 09:29:06
User Filename	S02092714-4A.XLS
	U02092714-1A.XLS
Spectrum Type	Log Counts
User Number	02
User Id	TRITIUM
User Comment	GREEN
Scintillator	LIQUID
Sample, Rack-Pos, Time:	4 14-4 90.00
H#, Total Counts:	153.7 3092
Win1: Tritium - Start, End:	50 255
Win2: - Start, End:	0 990



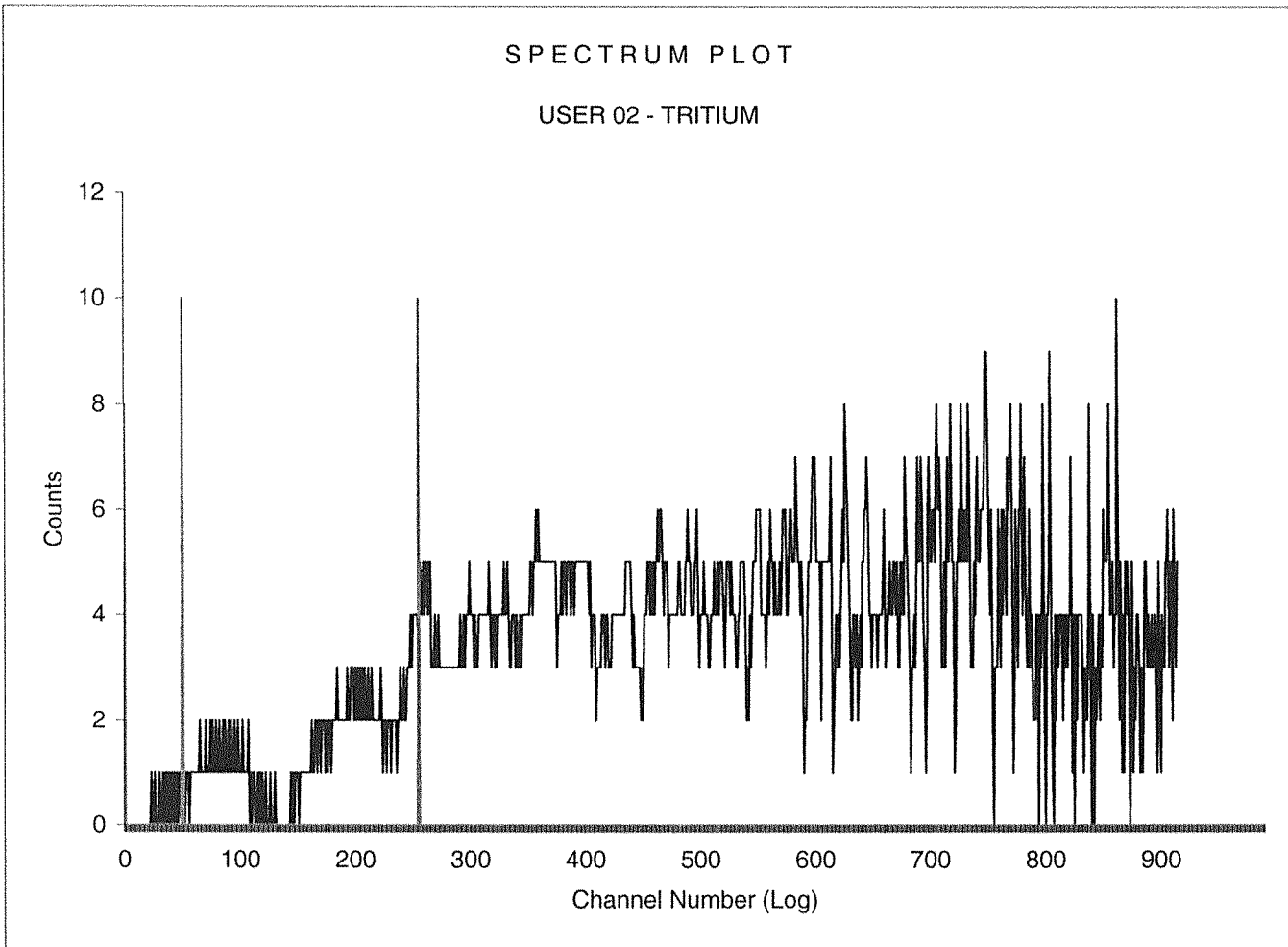
Sample Count Start Time: 27 Sep 2016 09:32:24
Data Capture Date 27 Sep 2016 11:02:47
User Filename S02092714-5A.XLS
U02092714-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 5 14-5 90.00
H#, Total Counts: 154.6 3155
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



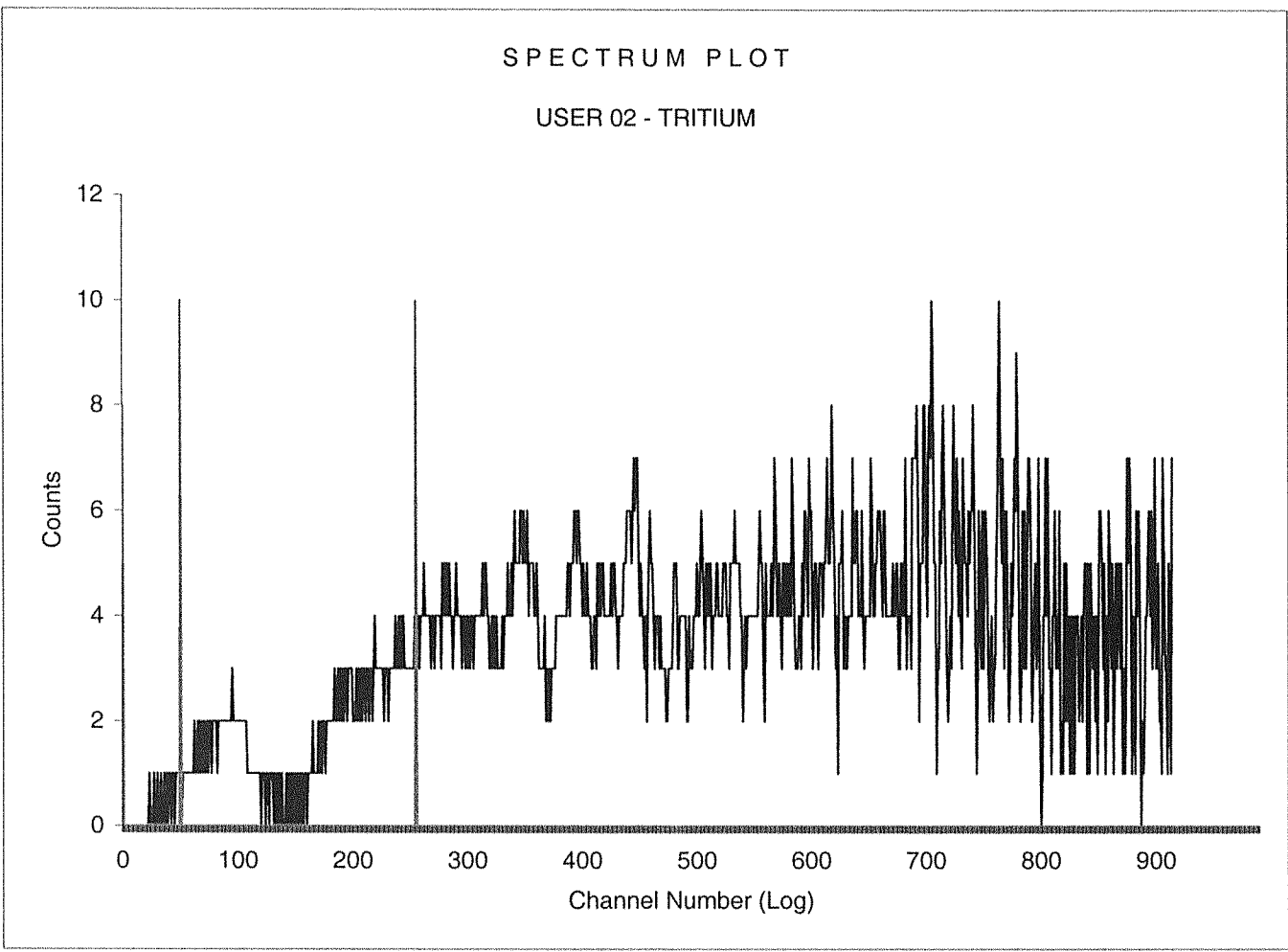
Sample Count Start Time: 27 Sep 2016 11:06:03
Data Capture Date 27 Sep 2016 12:36:27
User Filename S02092714-6A.XLS
U02092714-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 6 14-6 90.00
H#, Total Counts: 154.1 3091
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



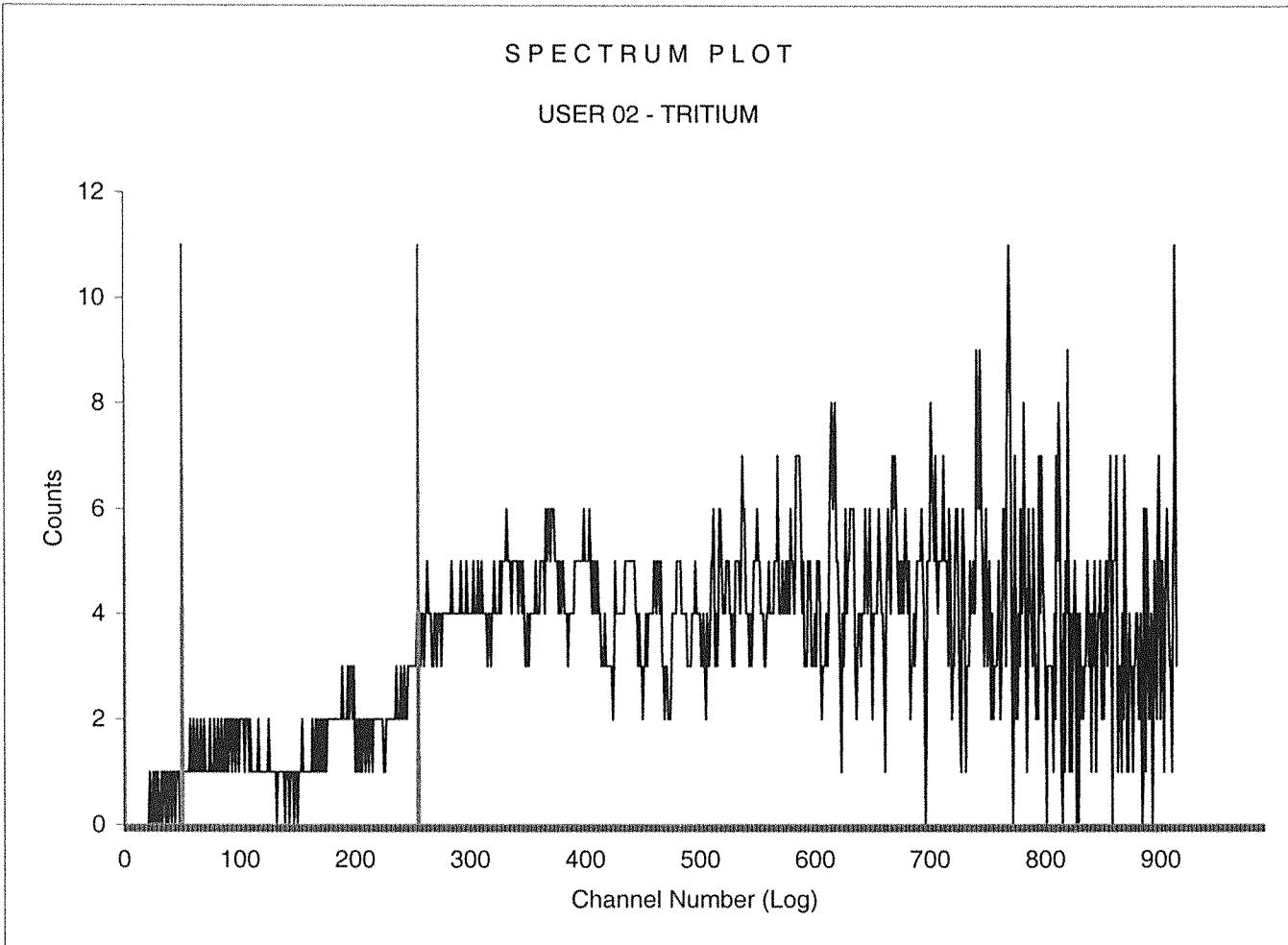
Sample Count Start Time: 27 Sep 2016 12:39:41
Data Capture Date: 27 Sep 2016 14:10:05
User Filename: S02092714-7A.XLS
U02092714-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TRITIUM
User Comment: GREEN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 7 14-7 90.00
H#, Total Counts: 156.1 3100
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



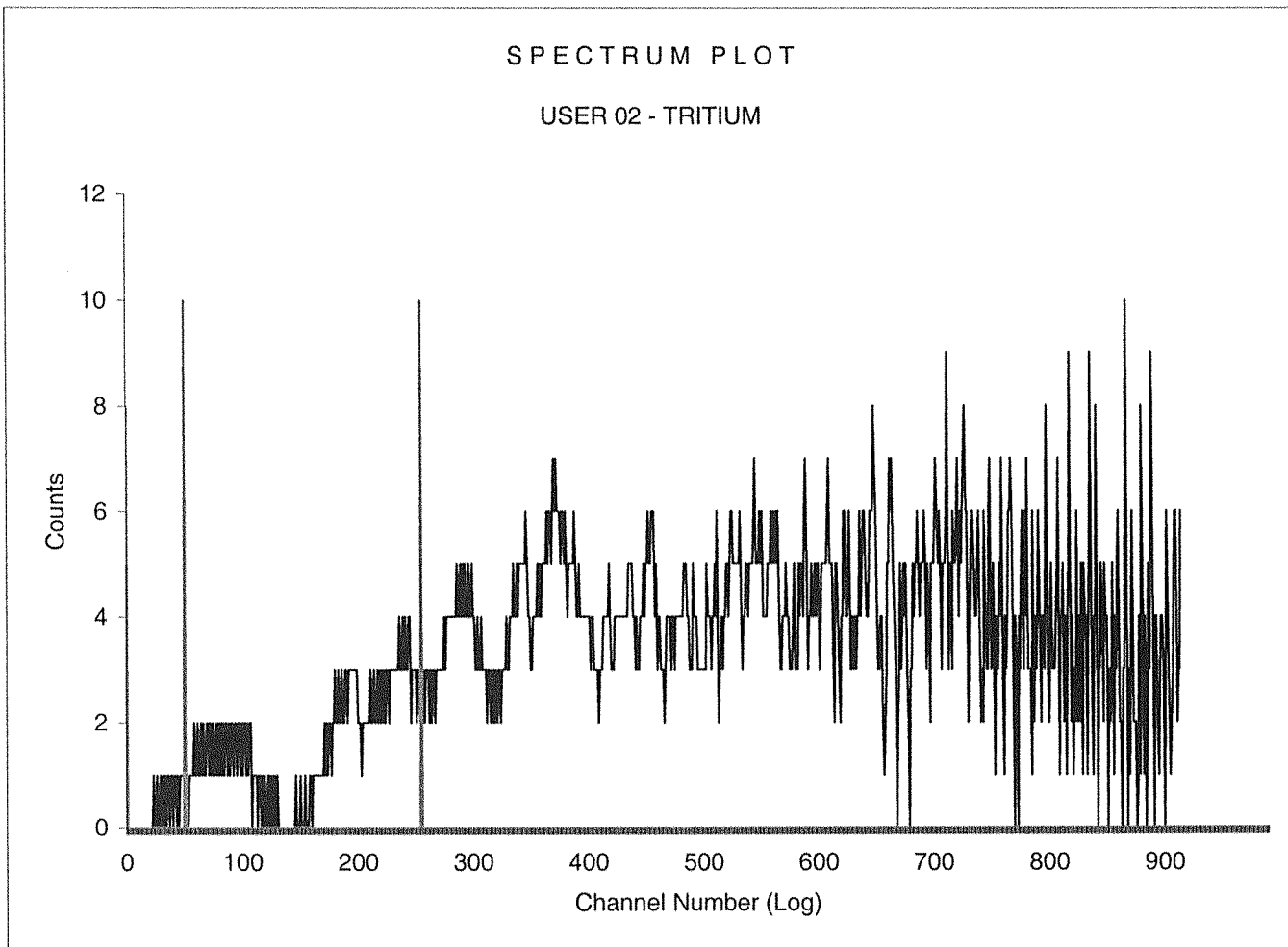
Sample Count Start Time: 27 Sep 2016 14:13:30
Data Capture Date 27 Sep 2016 15:43:54
User Filename S02092714-8A.XLS
U02092714-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 8 14-8 90.00
H#, Total Counts: 156.7 3213
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



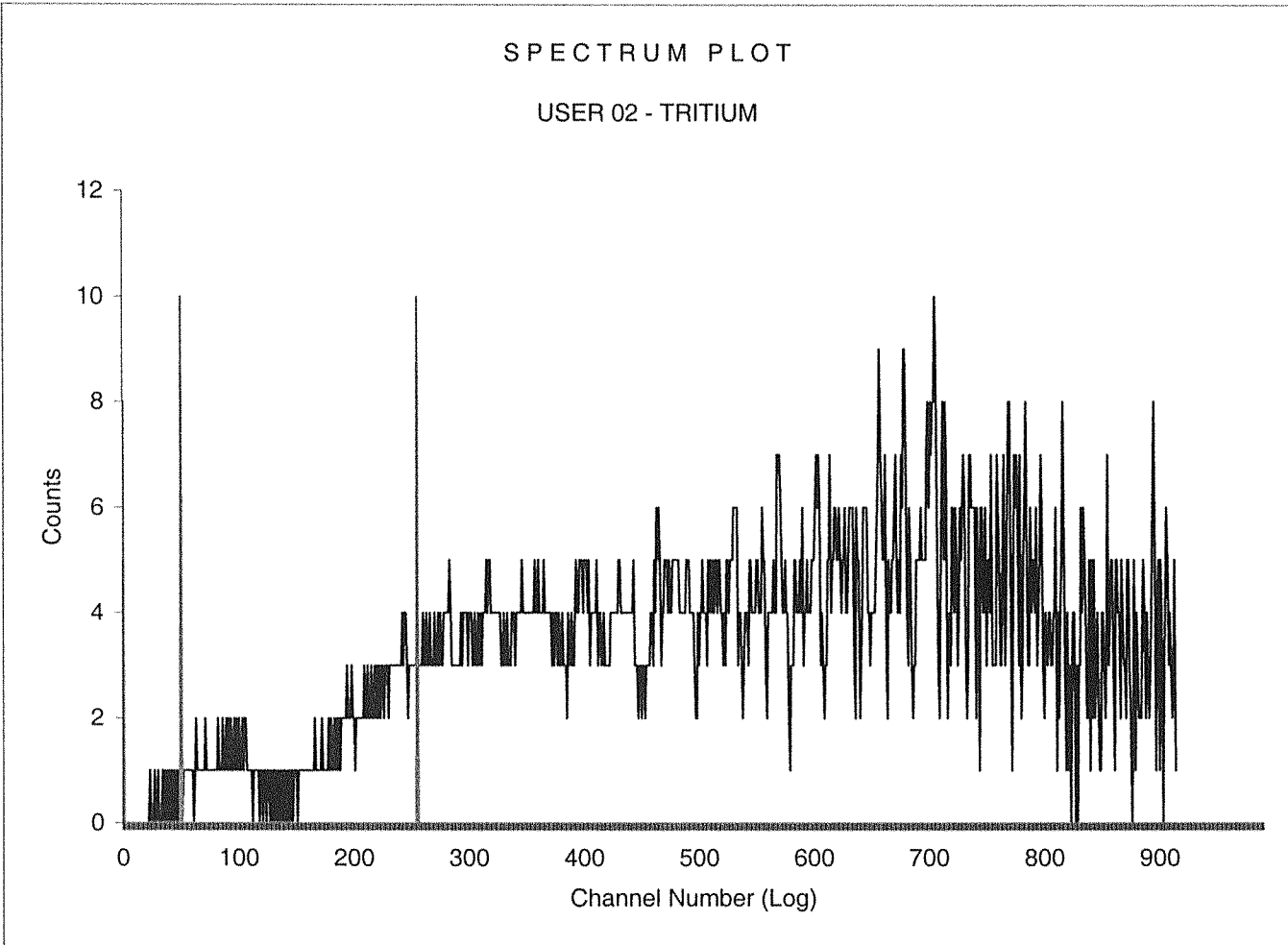
Sample Count Start Time: 27 Sep 2016 15:47:13
Data Capture Date: 27 Sep 2016 17:17:38
User Filename: S02092714-9A.XLS
U02092714-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TRITIUM
User Comment: GREEN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 9 14-9 90.00
H#, Total Counts: 154.6 3100
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



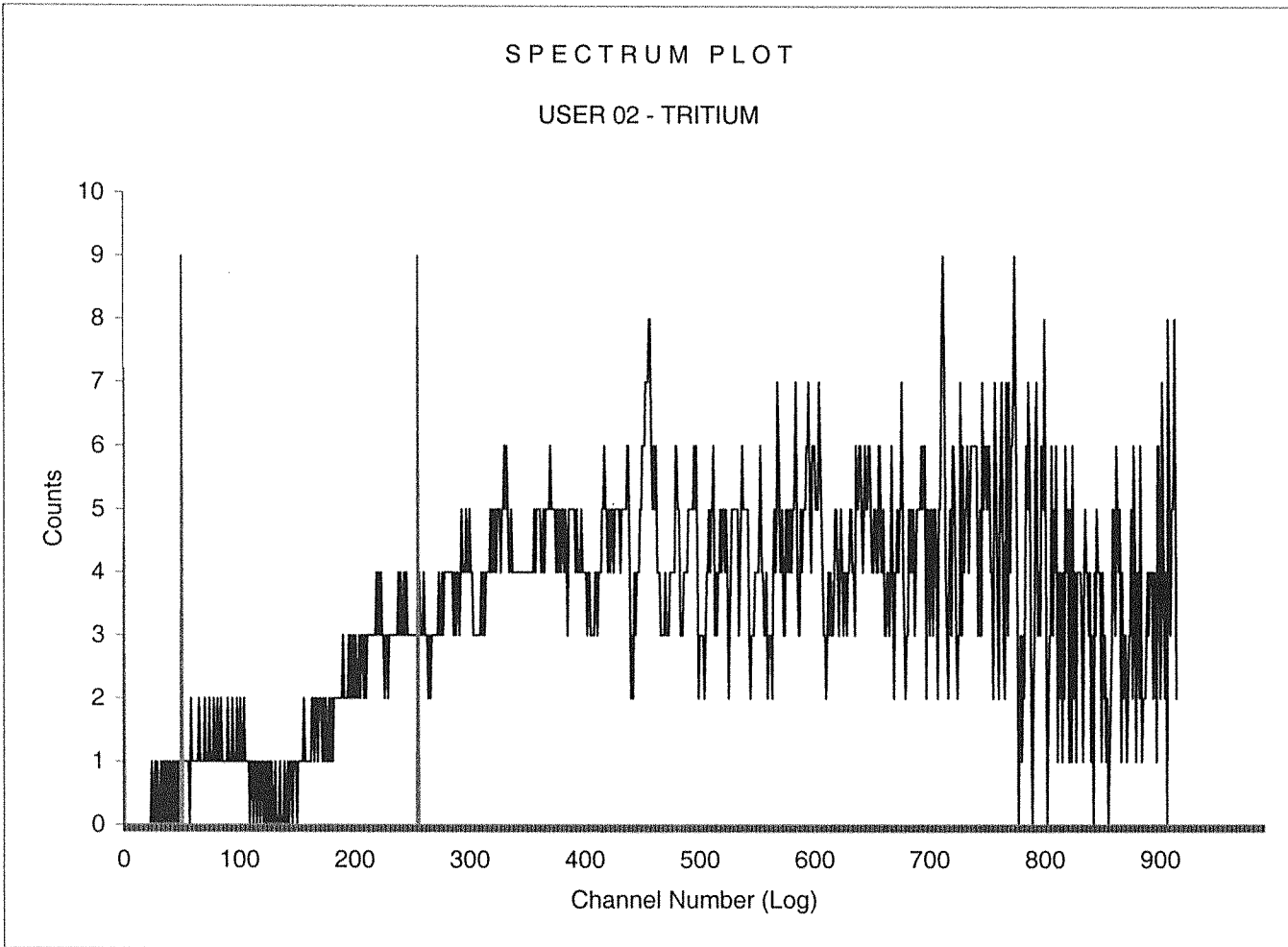
Sample Count Start Time: 27 Sep 2016 17:21:04
Data Capture Date 27 Sep 2016 18:51:29
User Filename S02092714-10A.XLS
U02092714-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 10 14-10 90.00
H#, Total Counts: 157.4 3047
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



Sample Count Start Time: 27 Sep 2016 18:54:46
Data Capture Date: 27 Sep 2016 20:25:10
User Filename: S02092714-11A.XLS
U02092714-1A.XLS
Spectrum Type: Log Counts
User Number: 02
User Id: TRITIUM
User Comment: GREEN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 11 14-11 90.00
H#, Total Counts: 154.7 3080
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



Sample Count Start Time: 27 Sep 2016 20:28:21
Data Capture Date 27 Sep 2016 21:58:44
User Filename S02092714-12A.XLS
U02092714-1A.XLS
Spectrum Type Log Counts
User Number 02
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 12 14-12 90.00
H#, Total Counts: 154.1 3114
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



1588096

ID: TRITIUM

27 SEP 2016 22:21

USER: 4

COMMENT: GREEN

PRESET TIME : 15.00
 DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD
 COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT
 TWO PHASE : NO AGC : NO CYCLE REPEATS : 1 DISK : OFF
 SCINTILLATOR: LIQUID LUMEX: YES LOW SAMPLE REJ: 0 RWM LIST : OFF
 LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 50.0 - 255.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0
 CHAN: 0.0 - 900.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

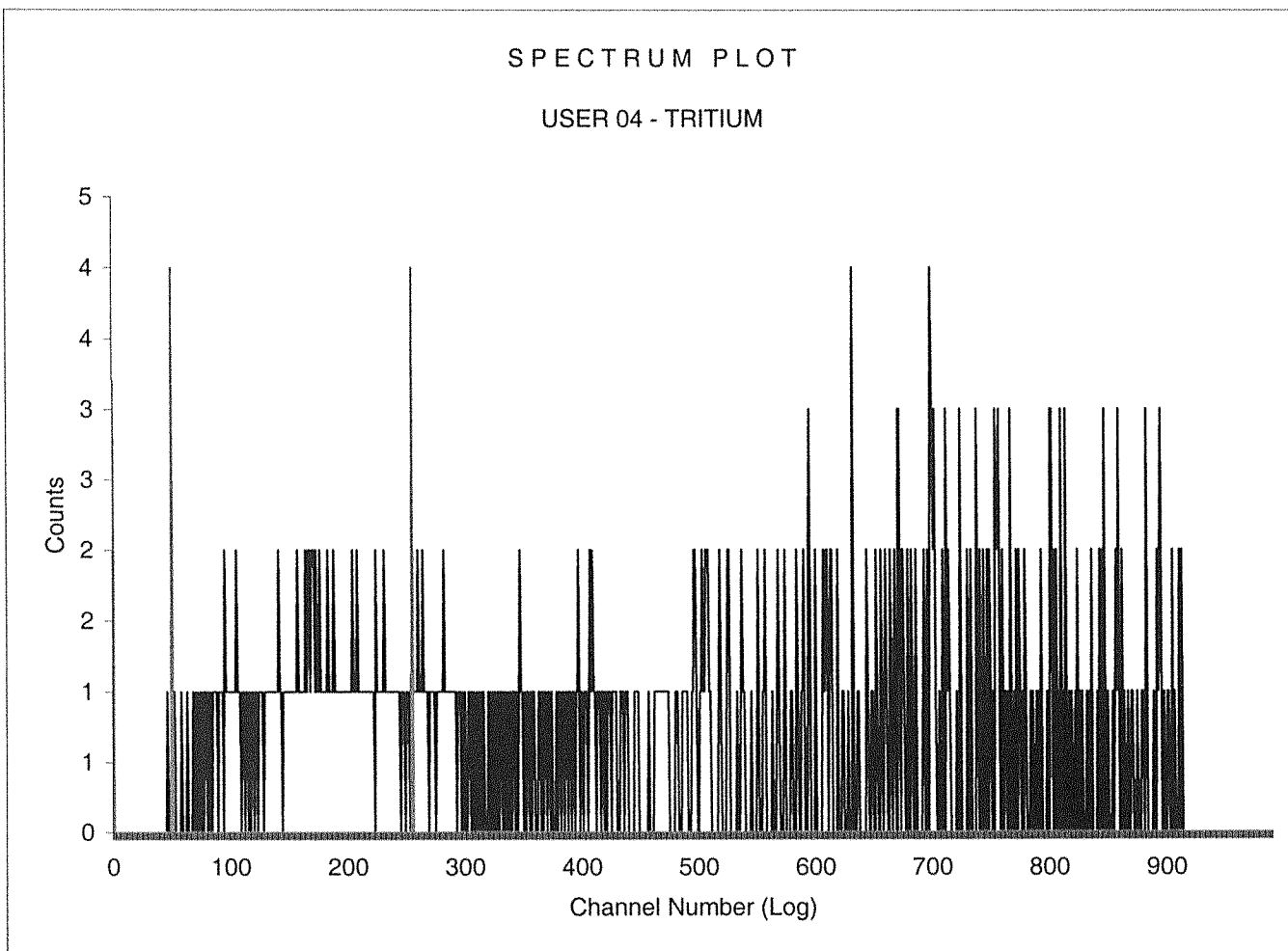
ALPHA-BETA DISCRIMINATION: NO

SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		

21	1	21-1	15.00	153.6	12.53	15.31	42.20	8.07	2.80	15.89
22	2	21-2	15.00	154.4	11.47	16.40	43.20	8.02	3.64	32.26

JP
9/30/16

Sample Count Start Time: 27 Sep 2016 21:59:52
Data Capture Date 27 Sep 2016 22:15:15
User Filename S04092721-1A.XLS
U04092721-1A.XLS
Spectrum Type Log Counts
User Number 04
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 1 21-1 15.00
H#, Total Counts: 153.6 642
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990



1598096

ID: TRITIUM

29 SEP 2016 08:36

USER: 4 COMMENT: GREEN

PRESET TIME : 15.00

DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD

COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT

TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF

SCINTILLATOR: LIQUID LUMEX: YES LOW SAMPLE REJ: 0 RWM LIST : OFF

LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 50.0 - 255.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

CHAN: 0.0 - 900.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

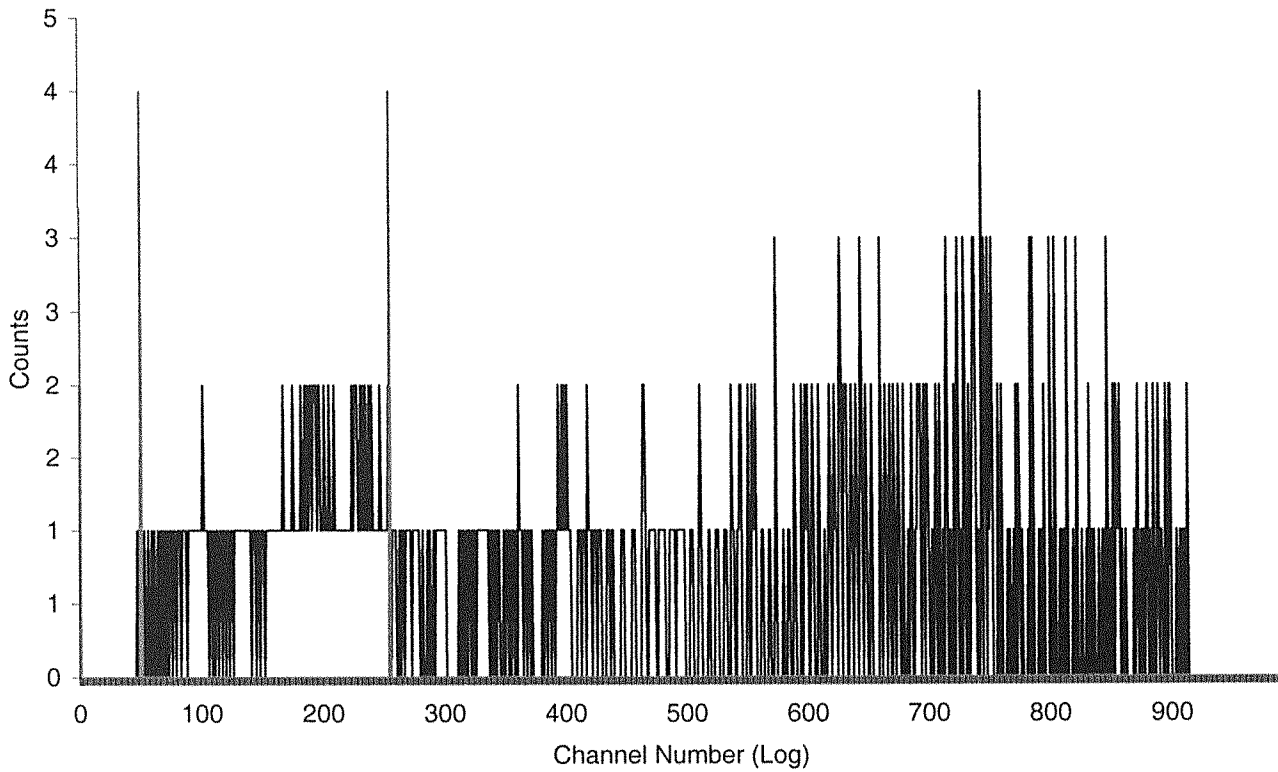
ALPHA-BETA DISCRIMINATION: NO

SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		
77 1	53-1	15.00	153.9	13.53	14.48	43.27	7.95	2.36	15.87
	MISSING SAMPLE								
88 3	53-3	15.00	156.6	2.67	39.06	35.53	8.83	3.32	32.24

Sample Count Start Time: 29 Sep 2016 08:14:13
Data Capture Date 29 Sep 2016 08:29:36
User Filename S04092953-1A.XLS
U04092953-1A.XLS
Spectrum Type Log Counts
User Number 04
User Id TRITIUM
User Comment GREEN
Scintillator LIQUID
Sample, Rack-Pos, Time: 1 53-1 15.00
H#, Total Counts: 153.9 655
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990

SPECTRUM PLOT

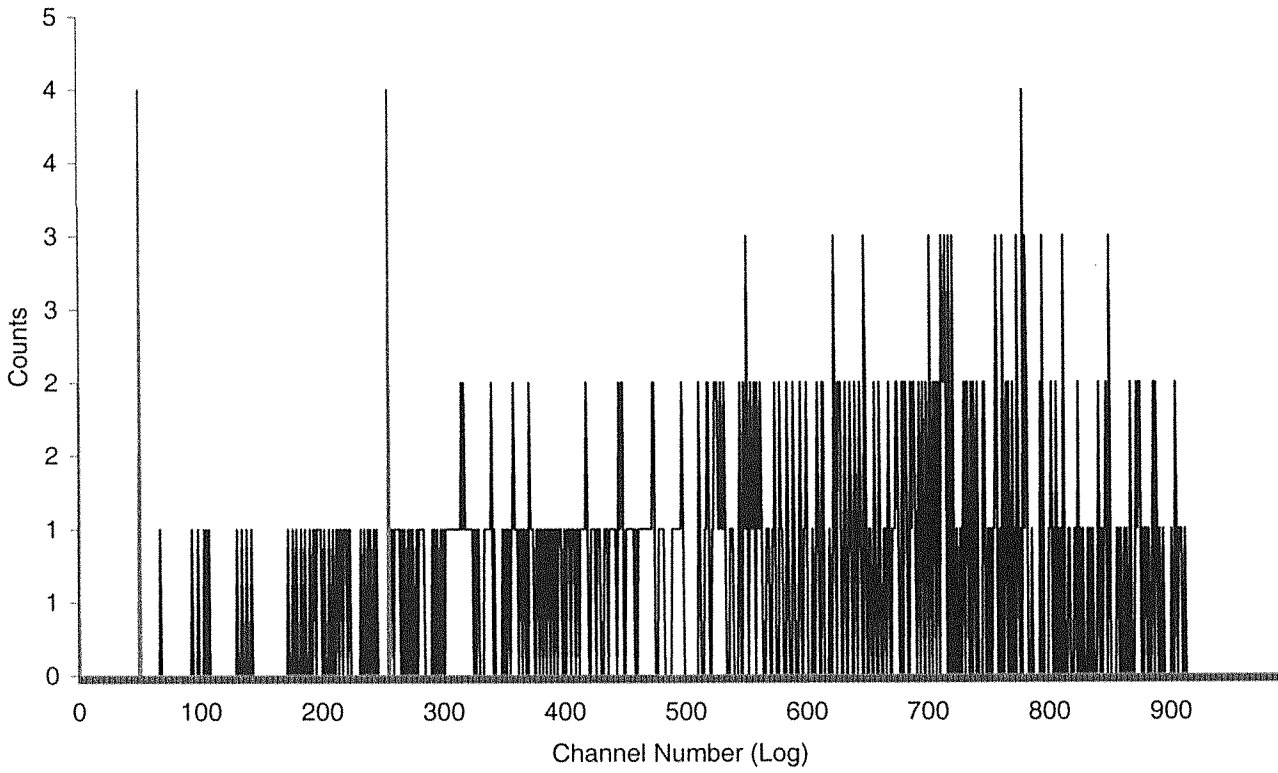
USER 04 - TRITIUM



Sample Count Start Time: 29 Sep 2016 08:30:35
Data Capture Date: 29 Sep 2016 08:45:59
User Filename: S04092953-3A.XLS
U04092953-1A.XLS
Spectrum Type: Log Counts
User Number: 04
User Id: TRITIUM
User Comment: GREEN
Scintillator: LIQUID
Sample, Rack-Pos, Time: 3 53-3 15.00
H#, Total Counts: 156.6 541
Win1: Tritium - Start, End: 50 255
Win2: - Start, End: 0 990

SPECTRUM PLOT

USER 04 - TRITIUM



Batch# 1598075 Product: HB Date: 9/23/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			NA
Method blank is less than the RDL/ LLD. (If rad samples. < 5% of lowest activity)	✓		
Sample was run within hold time.	✓	✓	See DSR1560877
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		DER 1560877 #9/22/16
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER 1560877
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.		✓	DER 1560877
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: [Signature]

Secondary Review Performed By: [Signature] 9/23/16

MSWC
10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 23-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LSC	Test / Method: EPA 906.0 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1598075	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, 1203626099, and 1203626100 were received and analyzed out of the method specified hold time.</p>		<p>1. Reporting results.</p>	

Originator's Name:

Elizabeth Krouse 23-SEP-16

Data Validator/Group Leader:

Lyndsey Pace 23-SEP-16

70
or 30910

MJWC 10/4/10

Prep Logbook

The Determination of Tritium

Batch ID: 1598075
Analyst: Terry Phillips
Method: EPA 906.0 Modified
Lab SOP: GL-RAD-A-002 REV# 21
Instrument: No instrument-manual method

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
LCS	1203626101	Tritium SPIKE	1753-B	.1	mL
MS	1203626100	Tritium SPIKE	1753-B	.1	mL

Sample ID	Prep Date	Matrix	Dry or Wet	Unadjusted Aliquot (g)	Aliquot (g)	Rig #	Volume Added (mL)	Aliquot in vial (mL)
405235021	22-SEP-2016 05:47:33	Soil	W	3.3	2.7541	5	50	10
405235022	22-SEP-2016 05:47:33	Soil	W	3.32	2.6768	11	50	10
405235023	22-SEP-2016 05:47:33	Soil	W	3.43	2.6565	15	50	10
405235024	22-SEP-2016 05:47:33	Soil	W	3.31	2.6679	20	50	10
405235025	22-SEP-2016 05:47:33	Soil	W	3.41	2.6807	21	50	10
405235026	22-SEP-2016 05:47:33	Soil	W	3.27	2.7257	39	50	10
405235027	22-SEP-2016 05:47:33	Soil	W	3.41	2.7907	30	50	10
405235028	22-SEP-2016 05:47:33	Soil	W	3.38	2.6136	33	50	10
405235029	22-SEP-2016 05:47:33	Soil	W	3.42	2.7592	36	50	10
405235030	22-SEP-2016 05:47:33	Soil	W	3.44	2.6181	35	50	10
405235031	22-SEP-2016 05:47:33	Soil	W	3.41	2.64	38	50	10
405235032	22-SEP-2016 05:47:33	Soil	W	3.3	2.6278	40	50	10
405235033	22-SEP-2016 05:47:33	Soil	W	3.5	2.883	43	50	10
405235034	22-SEP-2016 05:47:33	Soil	W	3.4	2.7348	44	50	10
405235035	22-SEP-2016 05:47:33	Soil	W	3.42	2.8636	45	50	10
405235036	22-SEP-2016 05:47:33	Soil	W	3.41	2.8065	46	50	10
405235037	22-SEP-2016 05:47:33	Soil	W	3.44	3.2257	47	50	10
405235038	22-SEP-2016 05:47:33	Soil	W	3.43	2.8693	51	50	10
405235039	22-SEP-2016 05:47:33	Soil	W	3.37	3.0769	57	50	10
405235040	22-SEP-2016 05:47:33	Soil	W	3.42	2.9143	60	50	10
1203626098 MB	22-SEP-2016 05:47:33	Soil	W		3.2257	65	50	10
1203626099 DJP (405235021)	22-SEP-2016 05:47:33	Soil	W	3.31	2.7624	66	50	10
1203626100 MS(405235021)	22-SEP-2016 05:47:33	Soil	W	3.31	2.7624	67	50	10
1203626101 LCS	22-SEP-2016 05:47:33	Soil	W		3.2257	71	50	10

Reagent/Solvent Lot ID	Description	Amount	Comments:
2352257.5	Ecosint Ultra Scintillation Solution	13 mL	Spike Pipet ID: RAD-LSC-2970968
2373671	Sodium Hydroxide, Pellet ACS	2 g	Vial Pipet ID: RAD-LSC-8036326
2418926	Quenching Agent	20 uL	Bkg prepared with dead water: Yes
2447042.3	Ecosint Ultra Scintillation Solution	13 mL	
2452415	RL-Potassium Permanganate	2 mL	

Tritium Solid

Filename : H3DST.XLS
 File type : Excel
 Version # : 1.2.13

Batch : 1598075
 Analyst : TER02081
 Prep Date : 9/22/2016
 Method Uncertainty : 0

Procedure Code : LSCDSH3DS
 Parmname : Tritium
 Required MDA : 6 pCi/G
 H-3 Abundance : 1.00
 Half-life of Tritium : 12.32 years

Geometry: 10mL DW/13mL Ecoscint Ultra

Pos.	Sample ID	Total Sample Volume (L)	Sample Aliquot G	Sample Aliquot StDev. G	Distilled Sample Counted L	Sample Counted StDev. L	Rig number	Sample Date/Time
1	405235021.1	0.0500	2.7541	3.5051E-03	0.0100	1.0000E-05	5	12/8/2015 14:17
2	405235022.1	0.0500	2.6768	3.4971E-03	0.0100	1.0000E-05	11	12/8/2015 13:43
3	405235023.1	0.0500	2.6565	3.4950E-03	0.0100	1.0000E-05	15	12/2/2015 10:40
4	405235024.1	0.0500	2.6679	3.4962E-03	0.0100	1.0000E-05	20	12/8/2015 14:13
5	405235025.1	0.0500	2.6807	3.4975E-03	0.0100	1.0000E-05	21	12/8/2015 13:38
6	405235026.1	0.0500	2.7257	3.5022E-03	0.0100	1.0000E-05	39	12/8/2015 10:15
7	405235027.1	0.0500	2.7907	3.5089E-03	0.0100	1.0000E-05	30	12/8/2015 10:19
8	405235028.1	0.0500	2.6136	3.4906E-03	0.0100	1.0000E-05	33	11/23/2015 14:50
9	405235029.1	0.0500	2.7592	3.5056E-03	0.0100	1.0000E-05	36	11/23/2015 11:10
10	405235030.1	0.0500	2.6181	3.4911E-03	0.0100	1.0000E-05	35	11/23/2015 14:44
11	405235031.1	0.0500	2.6400	3.4933E-03	0.0100	1.0000E-05	38	11/26/2015 14:25
12	405235032.1	0.0500	2.6278	3.4921E-03	0.0100	1.0000E-05	40	11/23/2015 11:48
13	405235033.1	0.0500	2.8830	3.5184E-03	0.0100	1.0000E-05	43	11/23/2015 11:53
14	405235034.1	0.0500	2.7348	3.5031E-03	0.0100	1.0000E-05	44	11/23/2015 11:20
15	405235035.1	0.0500	2.8636	3.5164E-03	0.0100	1.0000E-05	45	11/23/2015 11:06
16	405235036.1	0.0500	2.8065	3.5105E-03	0.0100	1.0000E-05	46	11/23/2015 11:12
17	405235037.1	0.0500	3.2257	3.5537E-03	0.0100	1.0000E-05	47	11/30/2015 11:19
18	405235038.1	0.0500	2.8693	3.5170E-03	0.0100	1.0000E-05	51	11/30/2015 10:40
19	405235039.1	0.0500	3.0769	3.5384E-03	0.0100	1.0000E-05	57	11/30/2015 10:43
20	405235040.1	0.0500	2.9143	3.5216E-03	0.0100	1.0000E-05	60	11/30/2015 13:23
21	1203626098.1	0.0500	3.2257	3.5537E-03	0.0100	1.0000E-05	65	9/22/2016 0:00
22	1203626099.1	0.0500	2.7624	3.5060E-03	0.0100	1.0000E-05	66	12/8/2015 14:17
23	1203626100.1	0.0500	2.7624	3.5060E-03	0.0100	1.0000E-05	67	12/8/2015 14:17
24	1203626101.1	0.0500	3.2257	3.5537E-03	0.0100	1.0000E-05	71	9/22/2016 0:00

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1.0 ml Stdev : +/- 0.002000 ml
 Pipet, 5.0 ml Stdev : +/- 0.010000 ml

Analytical SOP: GL-RAD-A-002
 Instrument SOP: GL-RAD-I-017

Count raw Data		Calibration Data										Sample Decay				
Pos.	Rack Position #	Counting Time (min.)	Quench#	Gross cpm	Bkg cpm	Bkg Count Time (min.)	Bkg Quench#	Corrected Bkg cpm	Count Start Date/Time	Sample Decay	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)	Detector Error (cpm/dpm)	Background Count Start Date/Time
1	5	30.0296	670.85	1.67	0.95	30	667.23	0.9528	9/22/2016 15:03	0.956	LSCORANGE	6/15/2016	6/30/2017	0.2387	0.00792	9/22/2016 14:30
2	6	30.0297	683.81	1.29	0.95	30	667.23	0.9442	9/22/2016 15:35	0.956	LSCORANGE	6/15/2016	6/30/2017	0.2667	0.00792	9/22/2016 14:30
3	7	30.0296	672.21	1.56	0.95	30	667.23	0.9533	9/22/2016 16:08	0.956	LSCORANGE	6/15/2016	6/30/2017	0.2416	0.00792	9/22/2016 14:30
4	8	30.0296	670.5	1.15	0.95	30	667.23	0.9526	9/22/2016 16:40	0.956	LSCORANGE	6/15/2016	6/30/2017	0.2380	0.00792	9/22/2016 14:30
5	9	30.0297	671.66	0.98	0.95	30	667.23	0.9531	9/22/2016 17:13	0.956	LSCORANGE	6/15/2016	6/30/2017	0.2405	0.00792	9/22/2016 14:30
6	10	30.0297	671.61	1.12	0.95	30	667.23	0.9531	9/22/2016 17:45	0.956	LSCORANGE	6/15/2016	6/30/2017	0.2404	0.00792	9/22/2016 14:30
7	11	30.0297	670.66	1.29	0.95	30	667.23	0.9527	9/22/2016 18:18	0.956	LSCORANGE	6/15/2016	6/30/2017	0.2383	0.00792	9/22/2016 14:30
8	12	30.0297	670.78	0.81	0.95	30	667.23	0.9527	9/22/2016 18:51	0.954	LSCORANGE	6/15/2016	6/30/2017	0.2386	0.00792	9/22/2016 14:30
9	13	30.0297	669.33	1.29	0.95	30	667.23	0.9519	9/22/2016 19:23	0.954	LSCORANGE	6/15/2016	6/30/2017	0.2356	0.00792	9/22/2016 14:30
10	14	30.0297	668.97	1.02	0.95	30	667.23	0.9516	9/22/2016 19:56	0.954	LSCORANGE	6/15/2016	6/30/2017	0.2348	0.00792	9/22/2016 14:30
11	15	30.0296	666.81	1.49	0.95	30	667.23	0.9485	9/22/2016 20:28	0.955	LSCORANGE	6/15/2016	6/30/2017	0.2284	0.00792	9/22/2016 14:30
12	16	30.0296	666.61	1.29	0.95	30	667.23	0.9493	9/22/2016 21:01	0.954	LSCORANGE	6/15/2016	6/30/2017	0.2299	0.00792	9/22/2016 14:30
13	17	30.0296	666.81	1.12	0.95	30	667.23	0.9495	9/22/2016 21:33	0.954	LSCORANGE	6/15/2016	6/30/2017	0.2303	0.00792	9/22/2016 14:30
14	18	30.013	668.92	1.19	0.95	30	667.23	0.9516	9/22/2016 22:06	0.954	LSCORANGE	6/15/2016	6/30/2017	0.2347	0.00792	9/22/2016 14:30
15	19	30.0296	666.66	1.22	0.95	30	667.23	0.9494	9/22/2016 22:38	0.954	LSCORANGE	6/15/2016	6/30/2017	0.2300	0.00792	9/22/2016 14:30
16	20	30.0296	665.28	1.43	0.95	30	667.23	0.9477	9/22/2016 23:11	0.954	LSCORANGE	6/15/2016	6/30/2017	0.2271	0.00792	9/22/2016 14:30
17	53	30.0296	665.57	1.32	0.95	30	667.23	0.9480	9/22/2016 23:44	0.955	LSCORANGE	6/15/2016	6/30/2017	0.2277	0.00792	9/22/2016 14:30
18	54	30.0296	664.97	1.32	0.95	30	667.23	0.9472	9/23/2016 0:17	0.955	LSCORANGE	6/15/2016	6/30/2017	0.2265	0.00792	9/22/2016 14:30
19	55	30.0296	666.93	1.29	0.95	30	667.23	0.9497	9/23/2016 0:49	0.955	LSCORANGE	6/15/2016	6/30/2017	0.2305	0.00792	9/22/2016 14:30
20	56	30.0297	664.41	1.43	0.95	30	667.23	0.9464	9/23/2016 2:37	0.955	LSCORANGE	6/15/2016	6/30/2017	0.2253	0.00792	9/22/2016 14:30
21	57	30.0296	670.89	1.43	0.95	30	667.23	0.9528	9/23/2016 3:10	1.000	LSCORANGE	6/15/2016	6/30/2017	0.2388	0.00792	9/22/2016 14:30
22	58	30.0296	663.96	1.53	0.95	30	667.23	0.9458	9/23/2016 3:42	0.956	LSCORANGE	6/15/2016	6/30/2017	0.2244	0.00792	9/22/2016 14:30
23	59	15.0297	667.7	11.78	0.95	30	667.23	0.9505	9/23/2016 4:15	0.956	LSCORANGE	6/15/2016	6/30/2017	0.2322	0.00792	9/22/2016 14:30
24	60	15.0297	667.91	11.64	0.95	30	667.23	0.9507	9/23/2016 4:32	1.000	LSCORANGE	6/15/2016	6/30/2017	0.2326	0.00792	9/22/2016 14:30

Notes:
 1 - Results are decay corrected to Sample Date/Time
 2 - Reference Date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : 1753-B
 Spike Exp Date : 11/2/2016
 Spike Activity (dpm/ml): 2549.25
 Spike Volume Added: 0.10

LCS S/N : 1753-B
 LCS Exp Date : 11/2/2016
 LCS Activity (dpm/ml): 2549.25
 LCS Volume Added: 0.10

* - RPD changed to 0% due to sample & dup activity below MDA

Results		2 SIGMA										2 SIGMA		2 SIGMA		Nominal	
Pos.	Decision Level pCi/G	Critical Level pCi/G	Required MDA pCi/G	MDA pCi/G	Sample Conc. pCi/G	Sample Act. Error %	Net Count CPM	Rate Error CPM	Net Count CPM	Counting Uncertainty pCi/G	Total Prop. Uncertainty pCi/G	Sample QC	Sample Type	RPD	RER	Recovery	
1	2.1019	1.4840	6	3.3257	2.5686	41.21%	0.7172	0.2955	2.0744	2.0748			SAMPLE				
2	1.9276	1.3609	6	3.0514	1.1408	78.88%	0.3458	0.2728	1.7637	1.7638			SAMPLE				
3	2.1559	1.5221	6	3.4110	2.2281	47.69%	0.6067	0.2893	2.0822	2.0825			SAMPLE				
4	2.1764	1.5366	6	3.4436	0.7321	134.04%	0.1974	0.2646	1.9233	1.9233			SAMPLE				
5	2.1446	1.5141	6	3.3931	0.0983	943.05%	0.0269	0.2537	1.8167	1.8167			SAMPLE				
6	2.1101	1.4898	6	3.3386	0.6000	157.41%	0.1669	0.2627	1.8511	1.8511			SAMPLE				
7	2.0779	1.4670	6	3.2876	1.1943	81.02%	0.3373	0.2733	1.8963	1.8964			SAMPLE				
8	2.2214	1.5684	6	3.5148	-0.5402	169.75%	-0.1427	0.2423	1.7973	1.7973			SAMPLE				
9	2.1305	1.5042	6	3.3711	1.2280	80.81%	0.3381	0.2732	1.9448	1.9449			SAMPLE				
10	2.2522	1.5901	6	3.5637	0.2627	374.56%	0.0684	0.2562	1.9283	1.9283			SAMPLE				
11	2.2910	1.6174	6	3.6257	2.1185	52.63%	0.5415	0.2850	2.1850	2.1852			SAMPLE				
12	2.2892	1.6162	6	3.6227	1.3312	80.16%	0.3407	0.2731	2.0913	2.0914			SAMPLE				
13	2.0830	1.4706	6	3.2964	0.6060	154.01%	0.1705	0.2625	1.8292	1.8292			SAMPLE				
14	2.1574	1.5231	6	3.4138	0.8769	112.01%	0.2384	0.2671	1.9251	1.9252			SAMPLE				
15	2.0998	1.4825	6	3.3231	0.9699	99.32%	0.2706	0.2688	1.8881	1.8881			SAMPLE				
16	2.1676	1.5303	6	3.4306	1.7861	58.34%	0.4823	0.2814	2.0422	2.0424			SAMPLE				
17	1.8793	1.3268	6	2.9742	1.1939	73.89%	0.3720	0.2748	1.7290	1.7291			SAMPLE				
18	2.1234	1.4991	6	3.3607	1.3525	73.72%	0.3728	0.2748	1.9540	1.9541			SAMPLE				
19	1.9478	1.3751	6	3.0823	1.1312	80.25%	0.3403	0.2731	1.7792	1.7793			SAMPLE				
20	2.1004	1.4829	6	3.3245	1.7363	58.18%	0.4836	0.2813	1.9797	1.9799			SAMPLE				
21	1.7162	1.2117	6	2.7154	1.3954	59.03%	0.4772	0.2817	1.6143	1.6145			MB				
22	2.2215	1.5684	6	3.5163	2.2195	49.15%	0.5842	0.2871	2.1379	2.1382	405235021.1	DUP		0.0%		43.4577	
23	2.6357	1.8609	6	4.4547	39.7689	8.38%	10.8295	0.9030	6.4996	6.5305	405235021.1	MS				91.5%	
24	2.1553	1.5216	6	3.6426	32.0949	8.44%	10.6893	0.8978	5.2838	5.3084		LCS				35.5988	
																	90.2%

REGISTRY

THU 22 SEP 2016 14:28

*** DIRECTORY PATH :M:\LSC\O\DA\598075A0 ***

PARAMETER GROUP: 8
ID: H-3 (3)

00A PROGRAM MODE 6 ->

ORDER	POS	ID	CTIME	COUNTS	CUCNTS	MCW	REP	STD	STMS	STIME
1	4	BKG	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
2	5	405235021	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
3	6	405235022	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
4	7	405235023	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
5	8	405235024	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
6	9	405235025	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
7	10	405235026	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
8	11	405235027	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
9	12	405235028	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
10	13	405235029	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
11	14	405235030	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
12	15	405235031	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
13	16	405235032	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
14	17	405235033	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
15	18	405235034	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
16	19	405235035	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
17	20	405235036	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
18	53	405235037	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
19	54	405235038	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
20	55	405235039	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
NUMBER OF CYCLES			1							
COINCIDENCE BIAS (L/H)			L							

MCA INPUT	TRIGG.	INHIBIT	MEMORY SPLIT
1 LRSUM	DCOS	G	L*R
2 GSUM	G		L*R

WINDOW	CHANNELS	MCA	HALF
1	50- 175	1	2
2	5- 320	1	2
3	1- 1024	1	2
4	50- 320	1	1
5	50- 270	1	1
6	60- 220	1	1
7	1- 1024	2	1
8	1- 1024	2	2

SELECTED PRINTOUT FOR TERMINAL 1 (A)

SELECTED PRINTOUT FOR TERMINAL 2 (B)

1. POS	2. ID	3. CTIME	4. SQP	5. CPM1	6. CPM2	7. CPM3
SEND SPECTRA		12				
RESOLUTION OF SPECTRA		1024				
LISTING		Y				
INSTRUMENT NUMBER		1				

REGISTRY

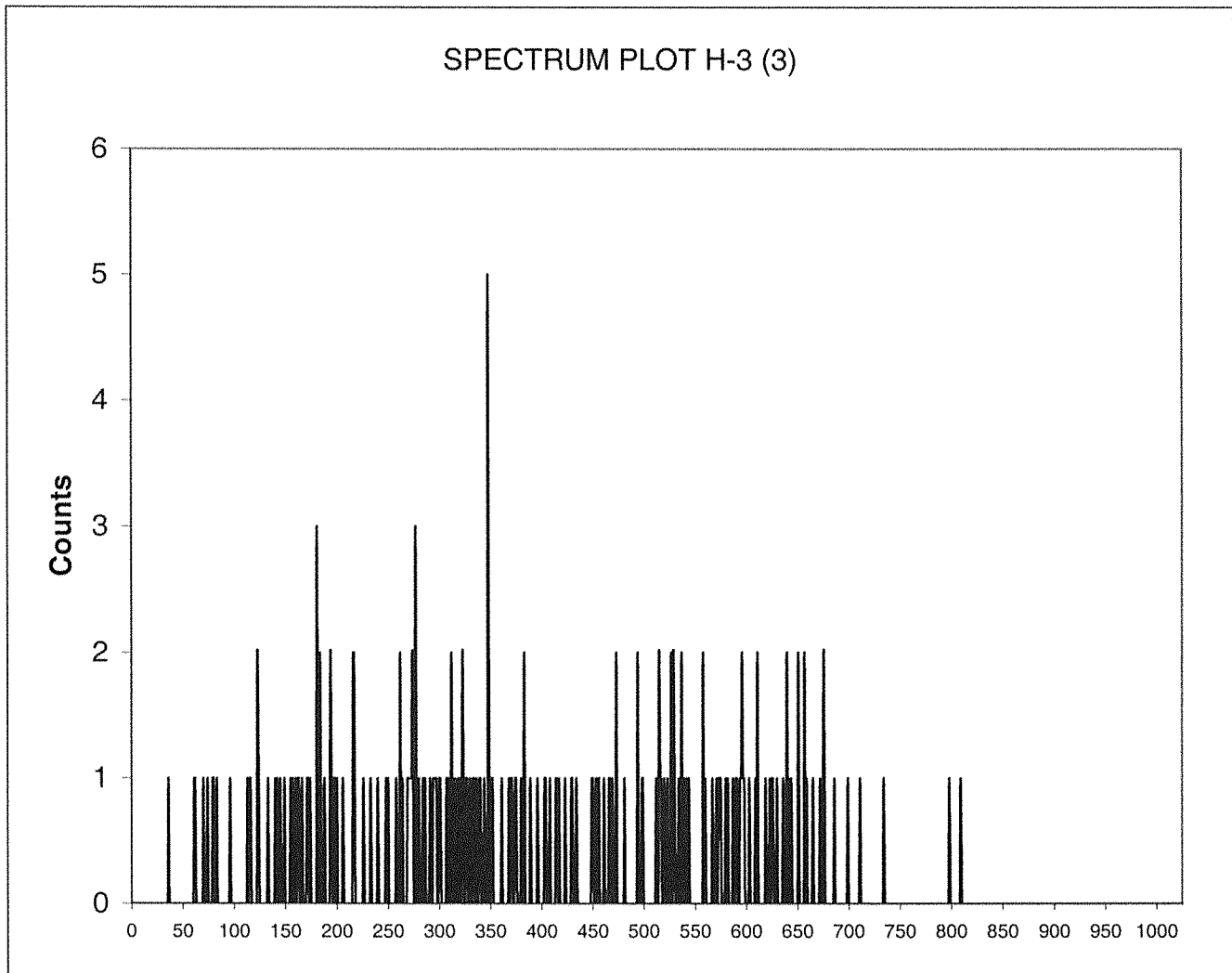
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Q010401N.001	22 SEP 2016	15:01				
4	BKG	30:01.780	667.23	.95	2.82	7.02
Q020501N.001	22 SEP 2016	15:34				
5	405235021	30:01.773	670.85	1.67	3.23	6.37
Q030601N.001	22 SEP 2016	16:06				
6	405235022	30:01.780	683.81	1.29	2.52	5.86
Q040701N.001	22 SEP 2016	16:39				
7	405235023	30:01.773	672.21	1.56	2.82	6.85
Q050801N.001	22 SEP 2016	17:11				
8	405235024	30:01.773	670.50	1.15	2.38	5.69
Q060901N.001	22 SEP 2016	17:44				
9	405235025	30:01.780	671.66	.98	2.31	5.48
Q071001N.001	22 SEP 2016	18:16				
10	405235026	30:01.780	671.61	1.12	2.59	6.47
Q081101N.001	22 SEP 2016	18:49				
11	405235027	30:01.779	670.66	1.29	2.62	5.69
Q091201N.001	22 SEP 2016	19:22				
12	405235028	30:01.779	670.78	.81	2.04	5.72
Q101301N.001	22 SEP 2016	19:54				
13	405235029	30:01.779	669.33	1.29	2.86	6.54
Q111401N.001	22 SEP 2016	20:27				
14	405235030	30:01.779	668.97	1.02	2.52	6.23
Q121501N.001	22 SEP 2016	20:59				
15	405235031	30:01.779	665.91	1.49	2.76	6.57
Q131601N.001	22 SEP 2016	21:32				
16	405235032	30:01.778	666.61	1.29	2.62	6.13
Q141701N.001	22 SEP 2016	22:04				
17	405235033	30:01.778	666.81	1.12	2.38	5.99
Q151801N.001	22 SEP 2016	22:37				
18	405235034	30:00.778	668.92	1.19	2.86	6.37
Q161901N.001	22 SEP 2016	23:09				
19	405235035	30:01.778	666.66	1.22	2.69	5.99
Q172001N.001	22 SEP 2016	23:42				
20	405235036	30:01.778	665.28	1.43	2.48	5.82
Q185301N.001	23 SEP 2016	0:15				
53	405235037	30:01.777	665.57	1.32	2.52	5.35
Q195401N.001	23 SEP 2016	0:48				
54	405235038	30:01.777	664.97	1.32	2.52	5.45
Q205501N.001	23 SEP 2016	1:20				
55	405235039	30:01.777	666.93	1.29	2.93	5.82

Instrument Type: Quantulus
Data Capture Date: THU 22 SEP 2016 14:28
FileName: M:\LSC\FILES\orange\598075A0\SQ010401N.001.xls
File Info: M:\LSC\FILES\orange\598075A0\U598075A0.xls

ID: H-3 (3)
Comments: ORANGE

Sample, Rack-Pos, Time: 1, BKG, 30.02967:
Quench: 667.23
Start, End, X-Axis 50-175

Channel Counts



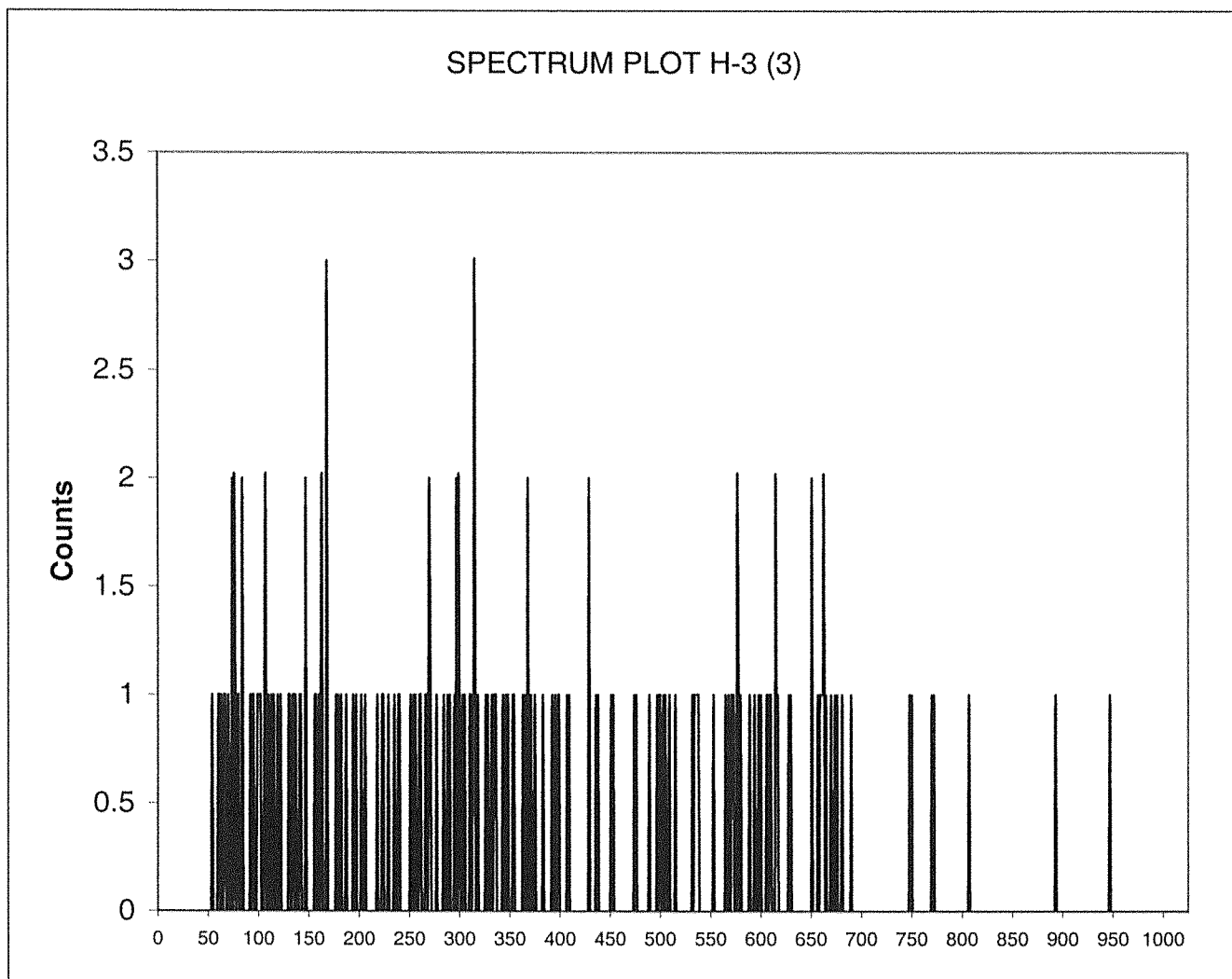
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ID: H-3 (3)
Comments: ORANGE

Sample, Rack-Pos, Time: 2, 405235021, 30.02955:
Quench: 670.85
Start, End, X-Axis 50-175

Channel Counts



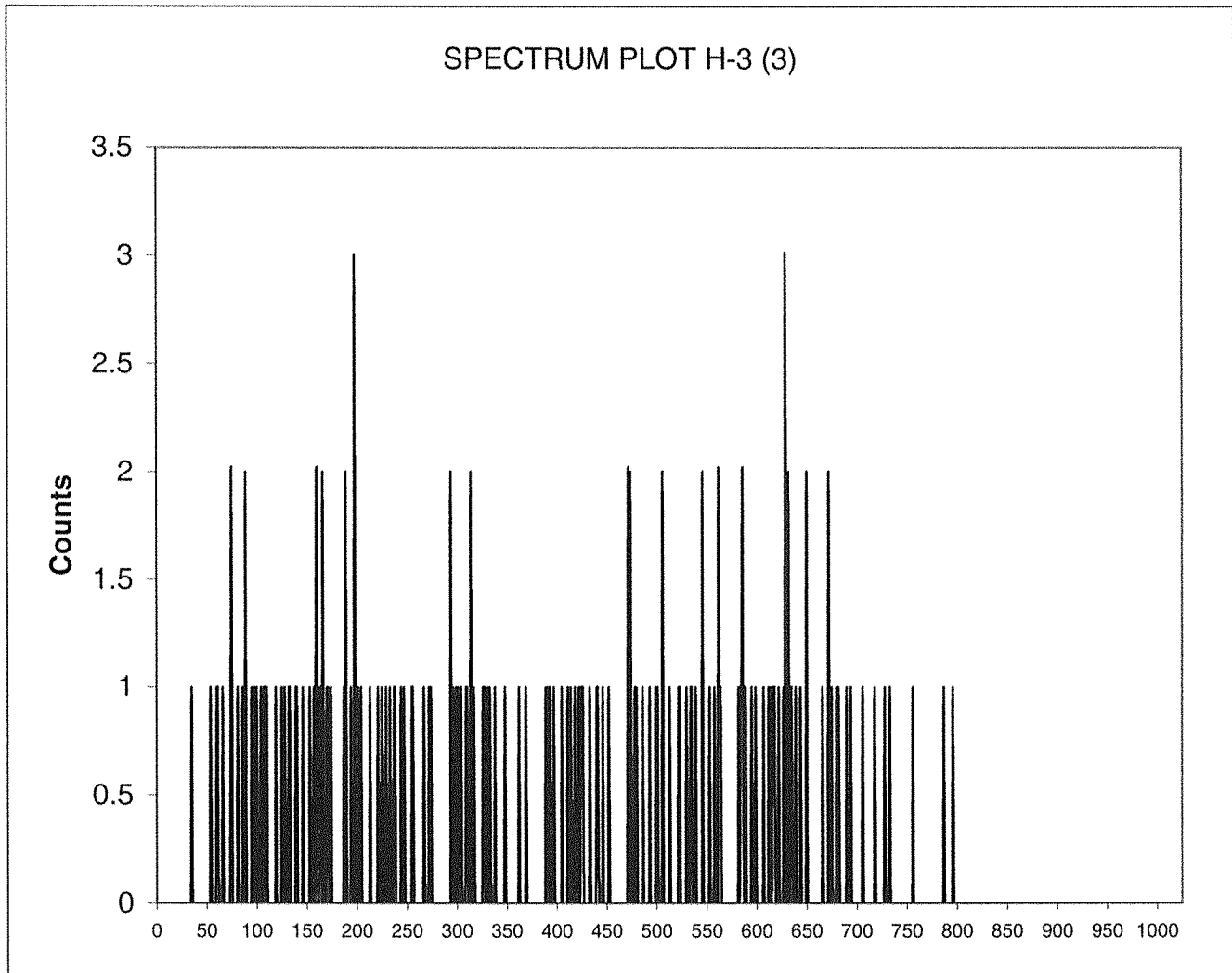
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ID: H-3 (3)
Comments: ORANGE

Sample, Rack-Pos, Time: 3, 405235022, 30.02967:
Quench: 683.81
Start, End, X-Axis 50-175

Channel Counts



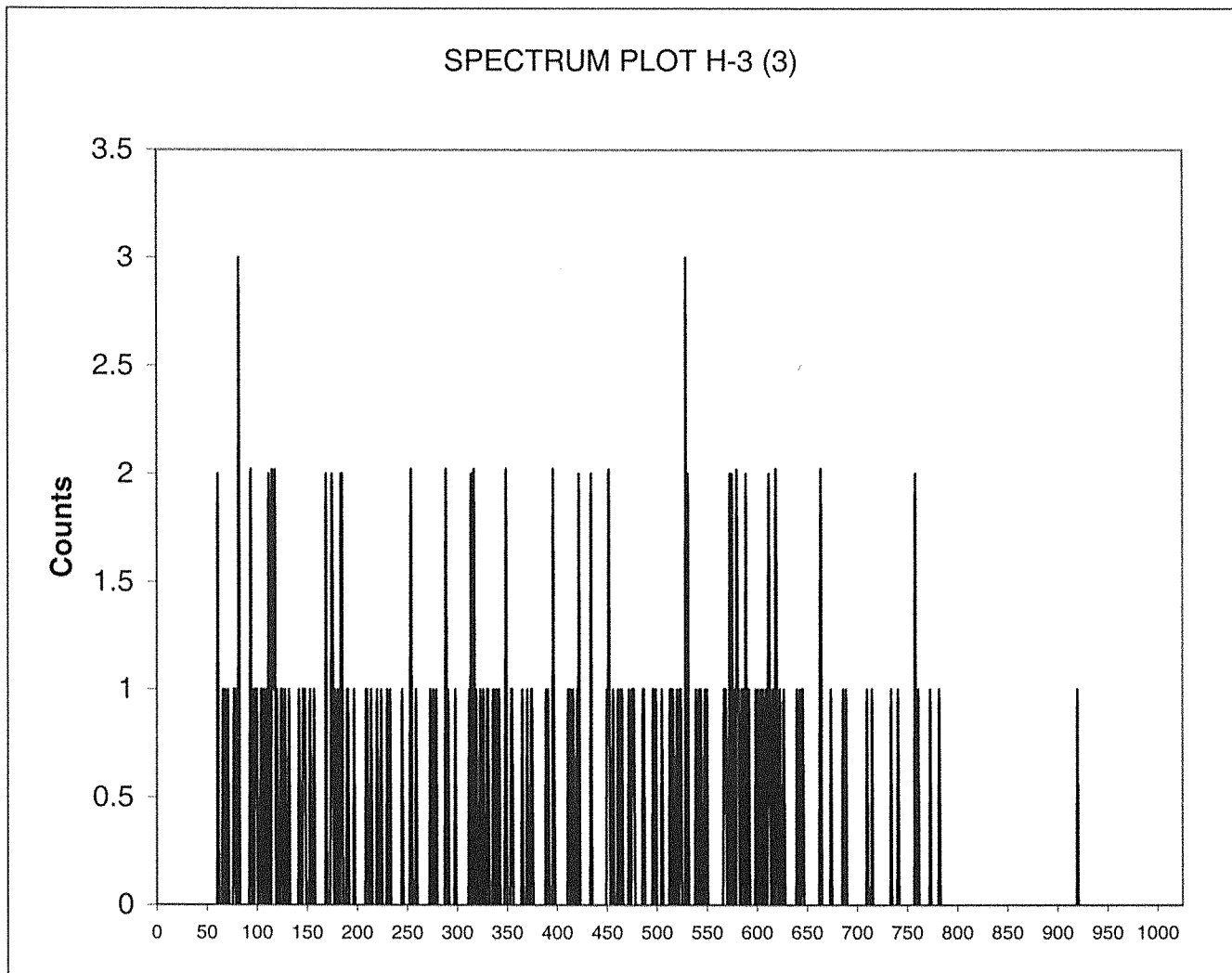
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Instrument Type: Quantulus
Data Capture Date: THU 22 SEP 2016 14:28
FileName: M:\LSC\FILES\orange\598075A0\SQ040701N.001.xls
File Info: M:\LSC\FILES\orange\598075A0\U598075A0.xls

ID: H-3 (3)
Comments: ORANGE

Sample, Rack-Pos, Time: 4, 405235023, 30.02955:
Quench: 672.21
Start, End, X-Axis: 50-175

Channel Counts



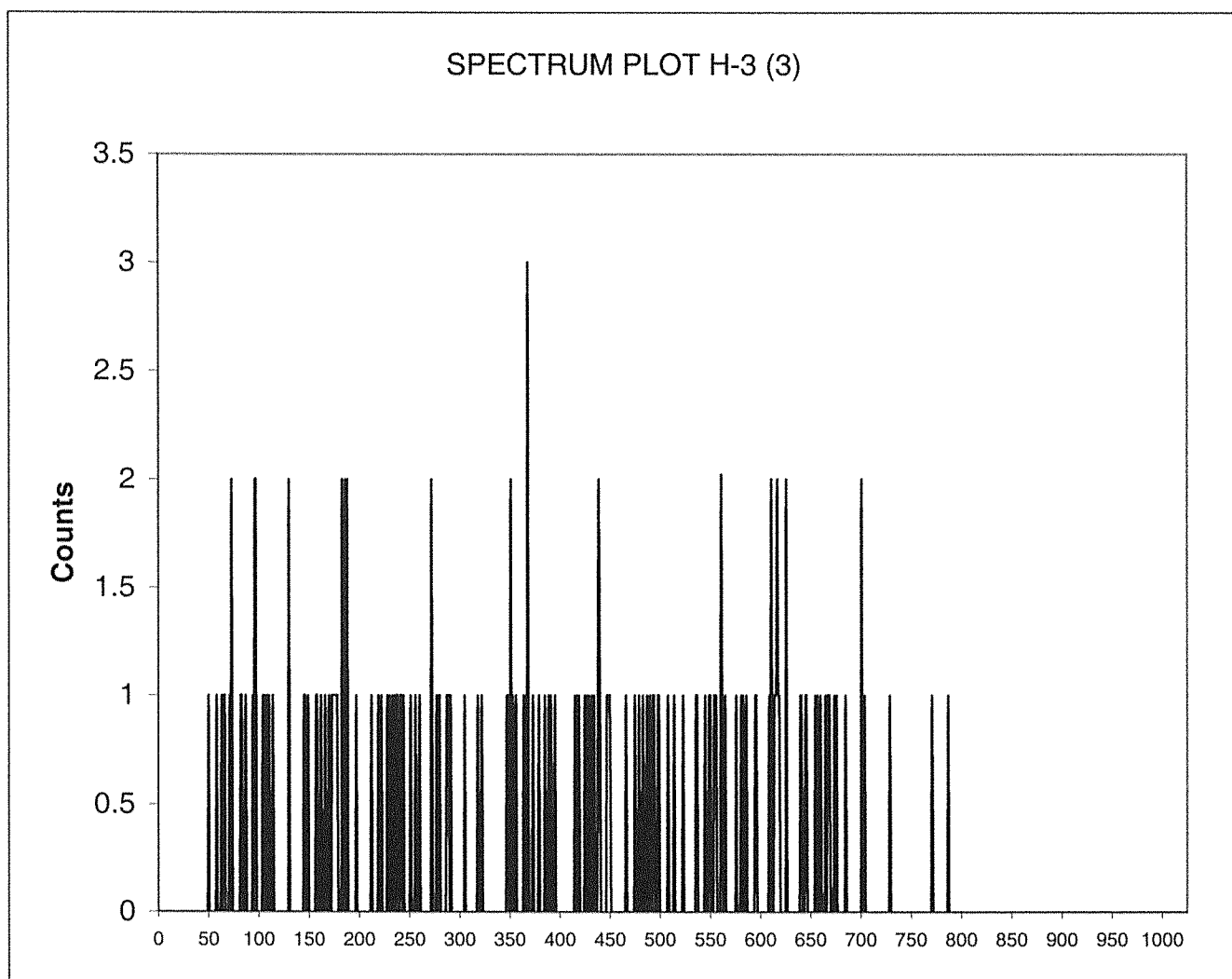
31	0
32	0
33	0
34	0
35	0

Instrument Type: Quantulus
Data Capture Date: THU 22 SEP 2016 14:28
FileName: M:\LSC\FILES\orange\598075A0\SQ050801N.001.xls
File Info: M:\LSC\FILES\orange\598075A0\U598075A0.xls

ID: H-3 (3)
Comments: ORANGE

Sample, Rack-Pos, Time: 5, 405235024, 30.02955:
Quench: 670.5
Start, End, X-Axis 50-175

Channel Counts



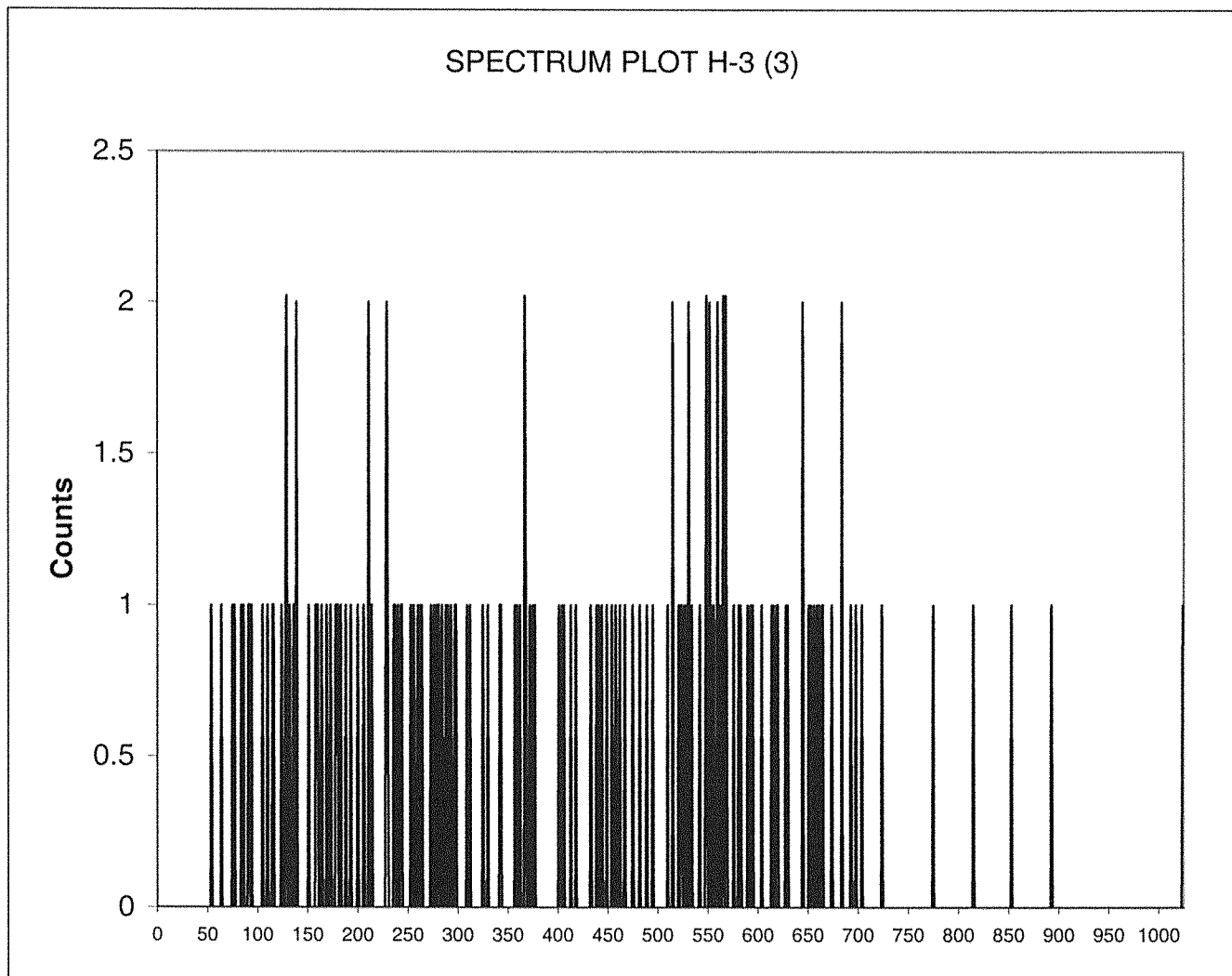
31 0
32 0
33 0
34 0
35 0

Instrument Type: Quantulus
Data Capture Date: THU 22 SEP 2016 14:28
FileName: M:\LSC\FILES\orange\598075A0\SQ060901N.001.xls
File Info: M:\LSC\FILES\orange\598075A0\U598075A0.xls

ID: H-3 (3)
Comments: ORANGE

Sample, Rack-Pos, Time: 6, 405235025, 30.02967:
Quench: 671.66
Start, End, X-Axis 50-175

Channel Counts



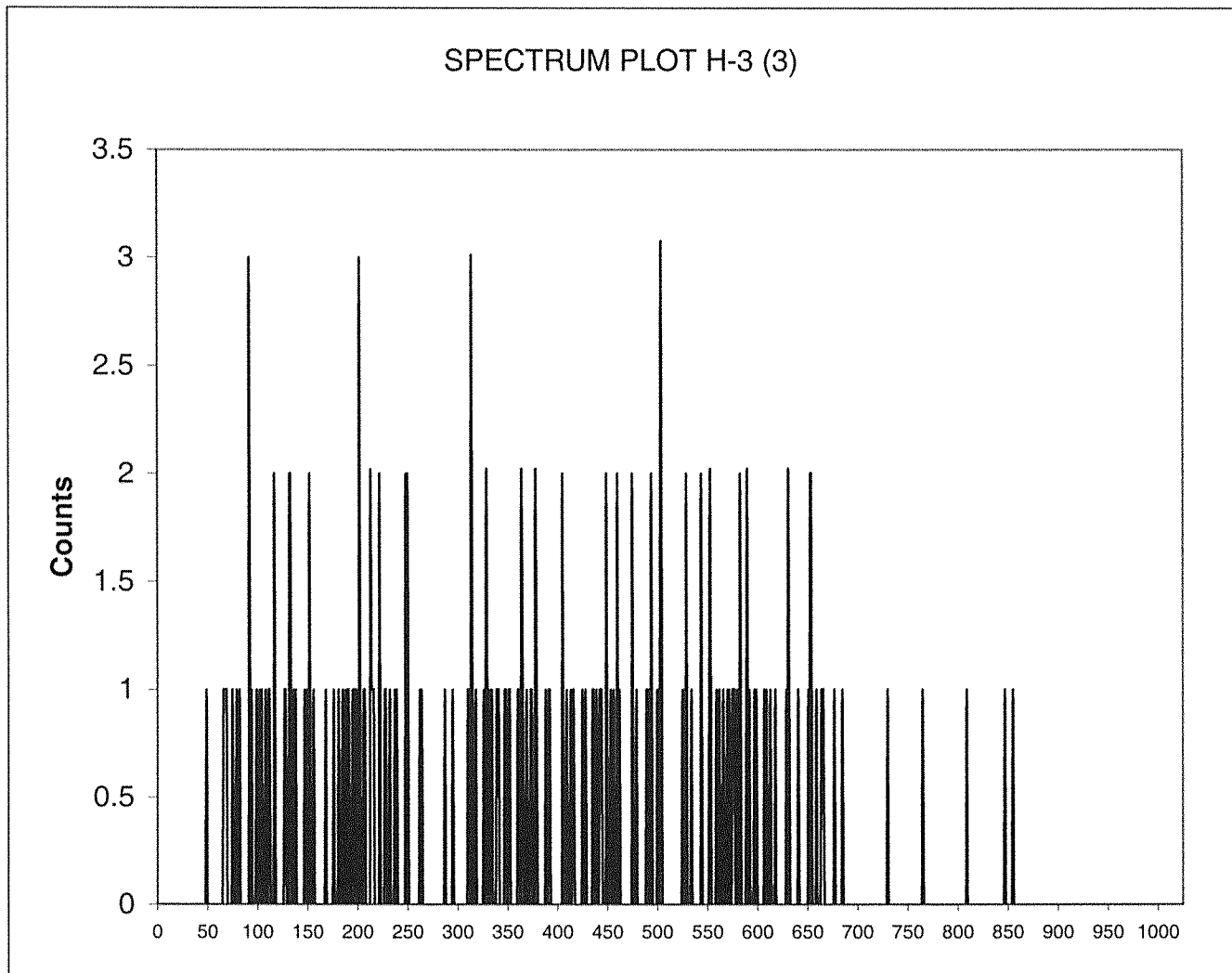
31	0
32	0
33	0
34	0
35	0

Instrument Type: Quantulus
Data Capture Date: THU 22 SEP 2016 14:28
FileName: M:\LSC\FILES\orange\598075A0\SQ071001N.001.xls
File Info: M:\LSC\FILES\orange\598075A0\U598075A0.xls

ID: H-3 (3)
Comments: ORANGE

Sample, Rack-Pos, Time: 7, 405235026, 30.02967:
Quench: 671.61
Start, End, X-Axis: 50-175

Channel Counts



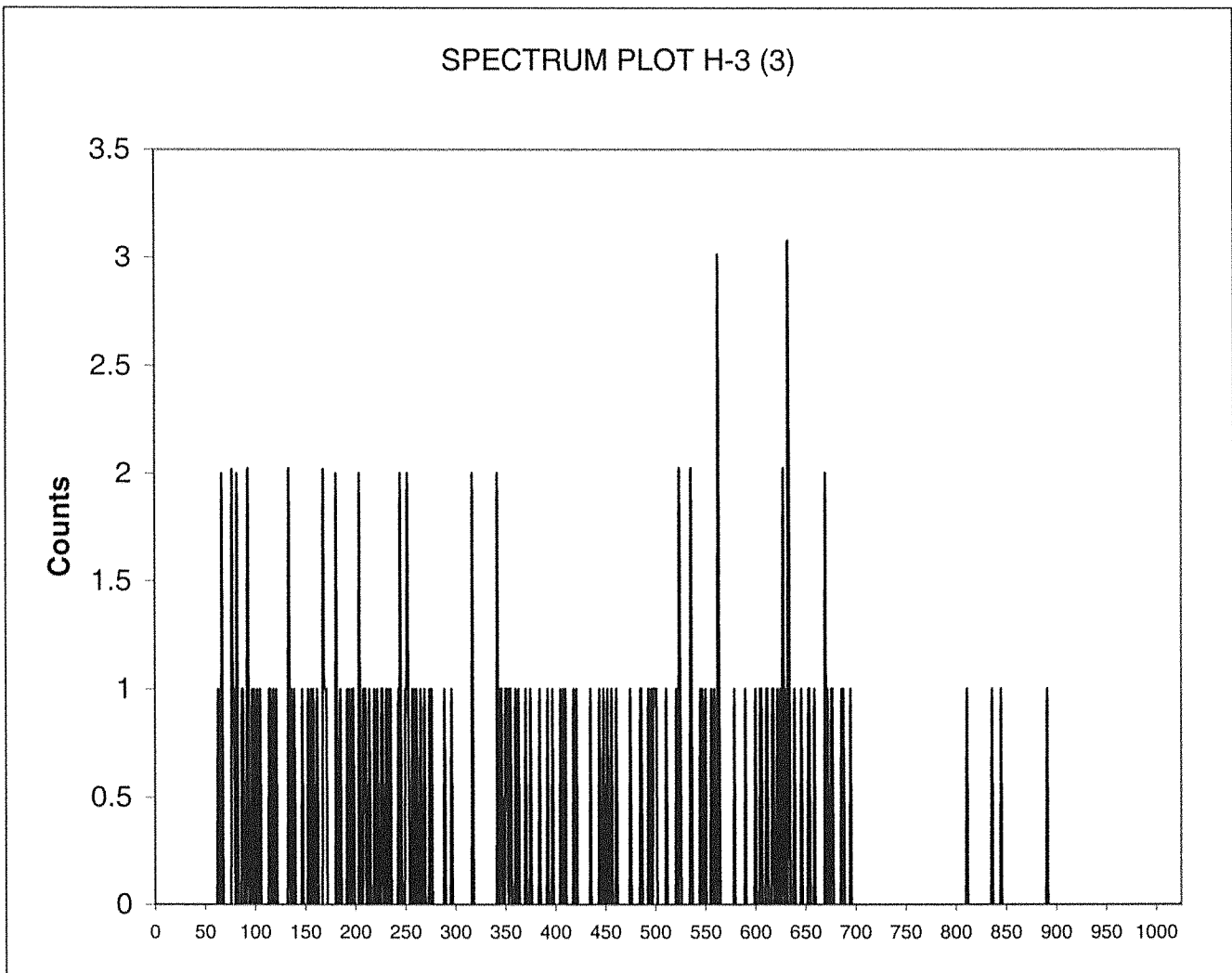
31 0
32 0
33 0
34 0
35 0

Instrument Type: Quantulus
Data Capture Date: THU 22 SEP 2016 14:28
FileName: M:\LSC\FILES\orange\598075A0\SQ081101N.001.xls
File Info: M:\LSC\FILES\orange\598075A0\U598075A0.xls

ID: H-3 (3)
Comments: ORANGE

Sample, Rack-Pos, Time: 8, 405235027, 30.02965:
Quench: 670.66
Start, End, X-Axis 50-175

Channel Counts



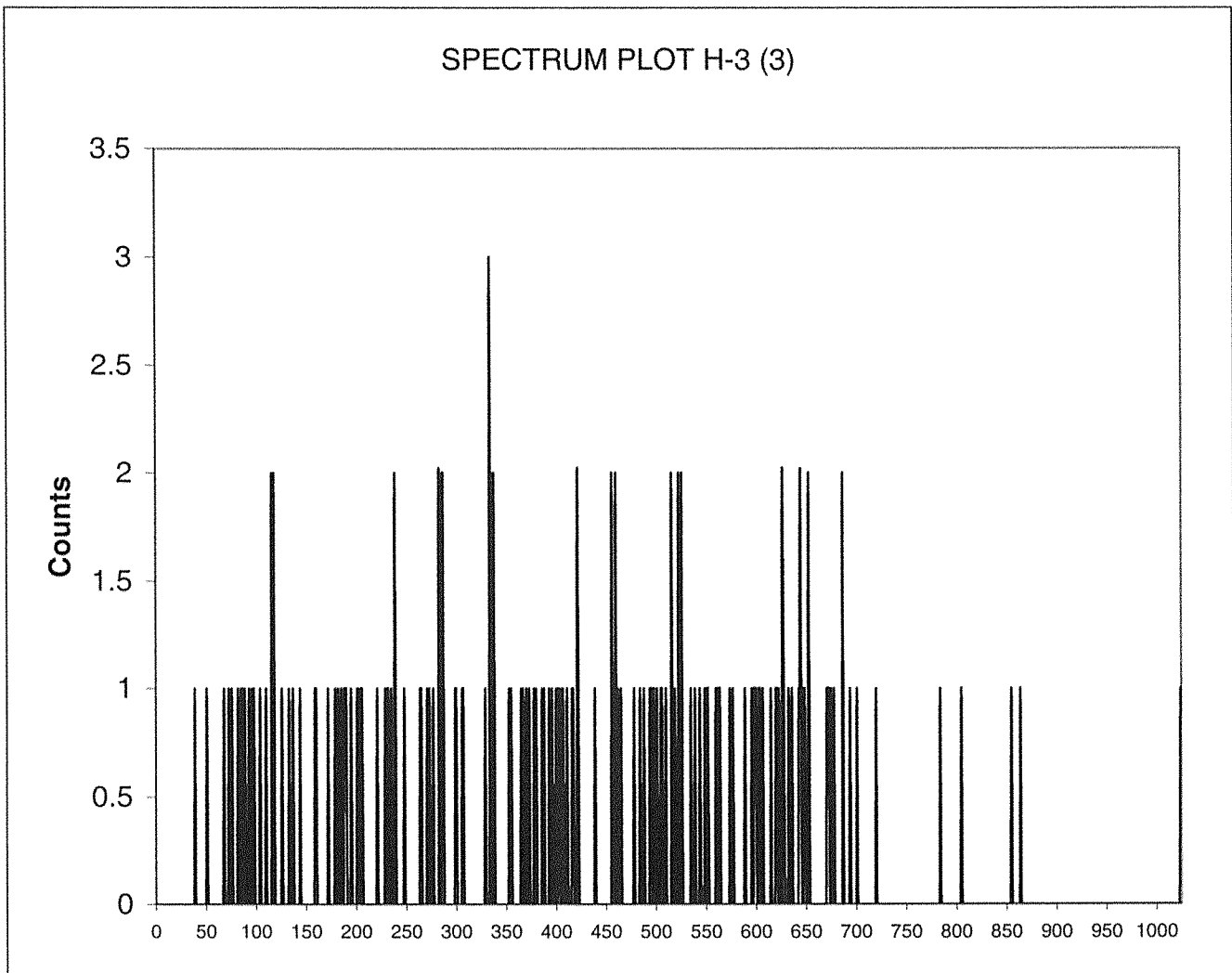
31	0
32	0
33	0
34	0
35	0

Instrument Type: Quantulus
Data Capture Date: THU 22 SEP 2016 14:28
FileName: M:\LSC\FILES\orange\598075A0\SQ091201N.001.xls
File Info: M:\LSC\FILES\orange\598075A0\U598075A0.xls

ID: H-3 (3)
Comments: ORANGE

Sample, Rack-Pos, Time: 9, 405235028, 30.02965:
Quench: 670.78
Start, End, X-Axis 50-175

Channel Counts



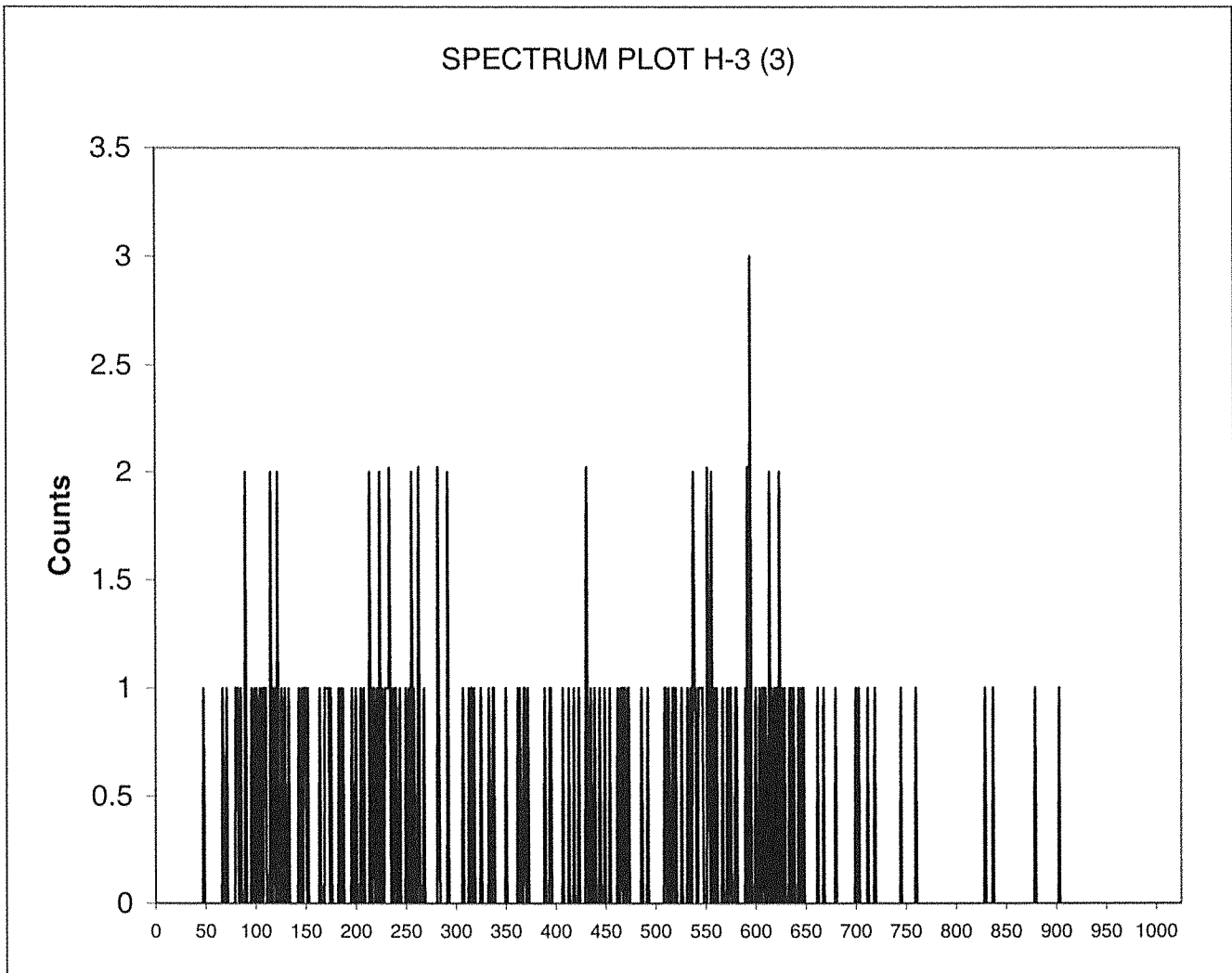
31	0
32	0
33	0
34	0
35	0

Instrument Type: Quantulus
Data Capture Date: THU 22 SEP 2016 14:28
FileName: M:\LSC\FILES\orange\598075A0\SQ101301N.001.xls
File Info: M:\LSC\FILES\orange\598075A0\U598075A0.xls

ID: H-3 (3)
Comments: ORANGE

Sample, Rack-Pos, Time: 10, 405235029, 30.02965:
Quench: 669.33
Start, End, X-Axis 50-175

Channel Counts



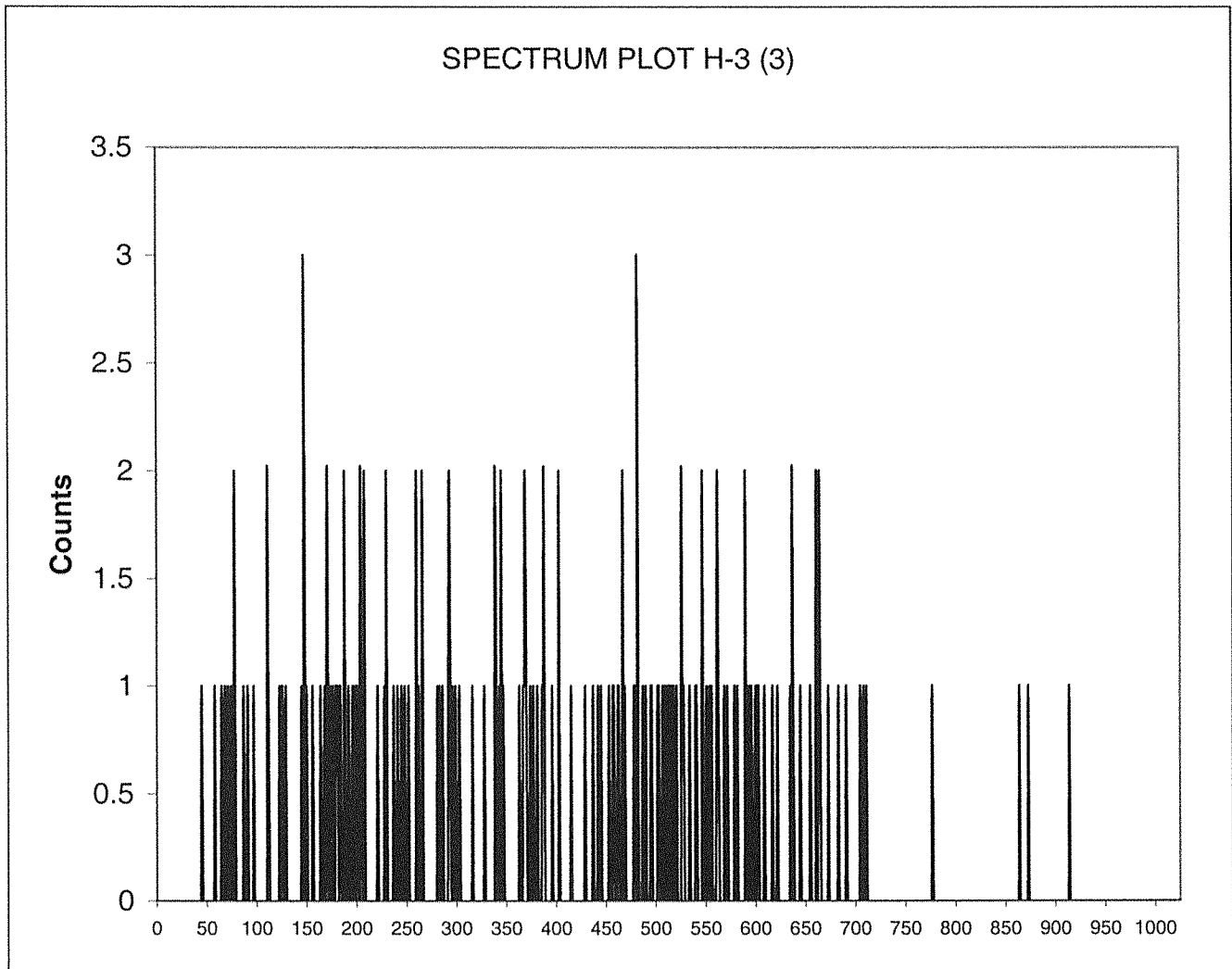
31 0
32 0
33 0
34 0
35 0

Instrument Type: Quantulus
Data Capture Date: THU 22 SEP 2016 14:28
FileName: M:\LSC\FILES\orange\598075A0\SQ111401N.001.xls
File Info: M:\LSC\FILES\orange\598075A0\U598075A0.xls

ID: H-3 (3)
Comments: ORANGE

Sample, Rack-Pos, Time: 11, 405235030, 30.02965:
Quench: 668.97
Start, End, X-Axis: 50-175

Channel Counts



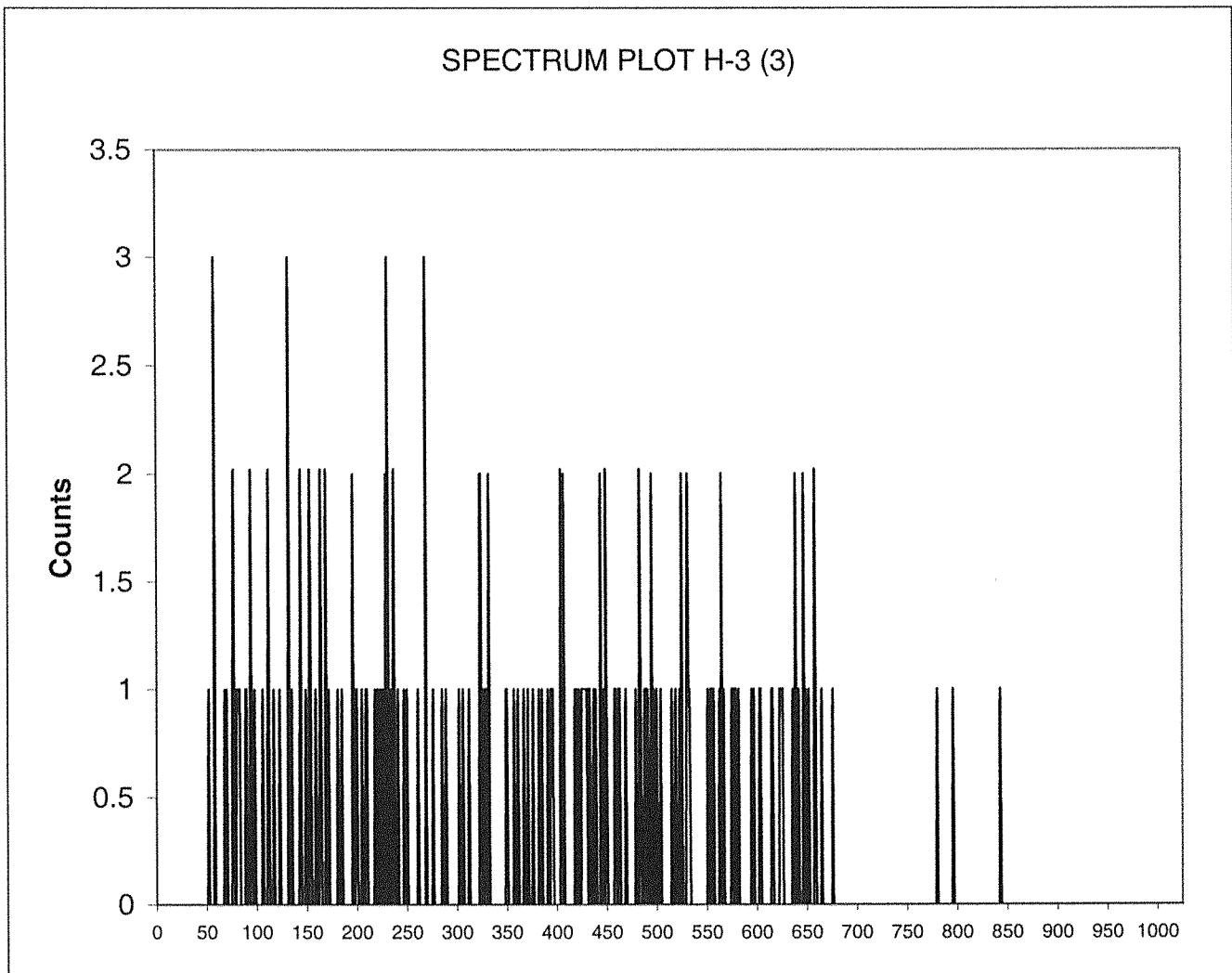
31 0
32 0
33 0
34 0
35 0

Instrument Type: Quantulus
Data Capture Date: THU 22 SEP 2016 14:28
FileName: M:\LSC\FILES\orange\598075A0\SQ121501N.001.xls
File Info: M:\LSC\FILES\orange\598075A0\U598075A0.xls

ID: H-3 (3)
Comments: ORANGE

Sample, Rack-Pos, Time: 12, 405235031, 30.02965:
Quench: 665.91
Start, End, X-Axis 50-175

Channel Counts



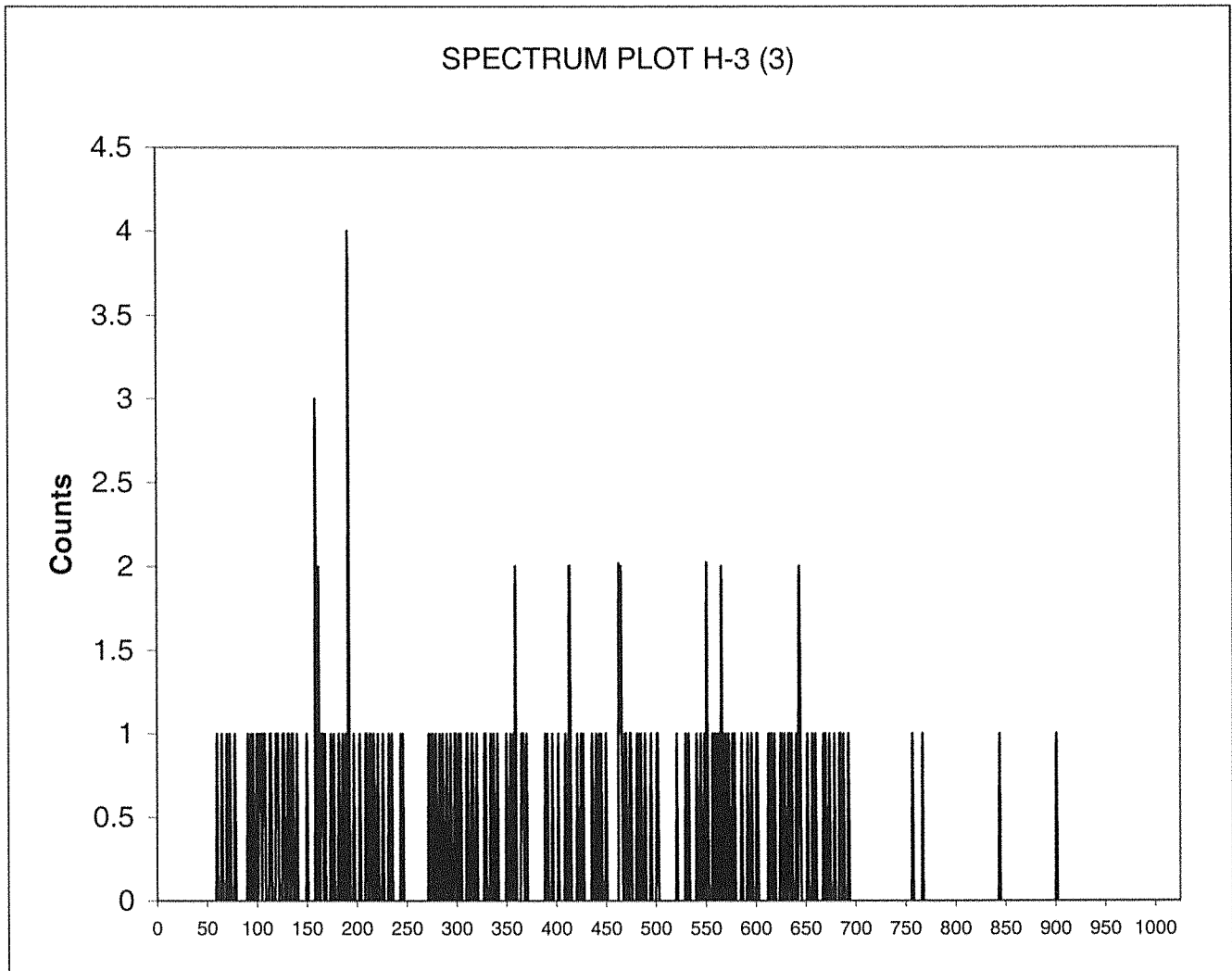
31	0
32	0
33	0
34	0
35	0

Instrument Type: Quantulus
Data Capture Date: THU 22 SEP 2016 14:28
FileName: M:\LSC\FILES\orange\598075A0\SQ131601N.001.xls
File Info: M:\LSC\FILES\orange\598075A0\U598075A0.xls

ID: H-3 (3)
Comments: ORANGE

Sample, Rack-Pos, Time: 13, 405235032, 30.02963:
Quench: 666.61
Start, End, X-Axis: 50-175

Channel Counts



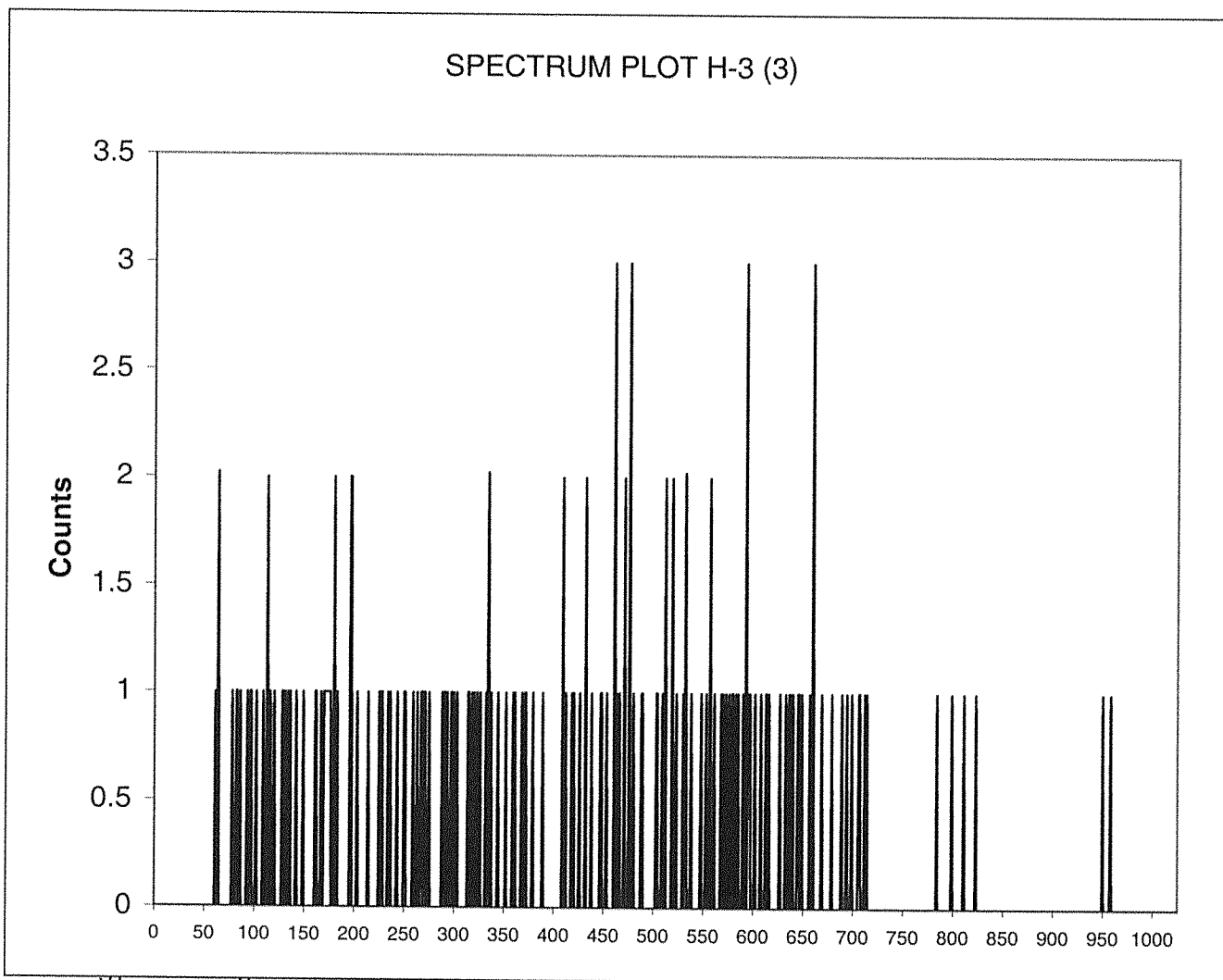
31	0
32	0
33	0
34	0
35	0

Instrument Type: Quantulus
Data Capture Date: THU 22 SEP 2016 14:28
FileName: M:\LSC\FILES\orange\598075A0\SQ141701N.001.xls
File Info: M:\LSC\FILES\orange\598075A0\U598075A0.xls

ID: H-3 (3)
Comments: ORANGE

Sample, Rack-Pos, Time: 14, 405235033, 30.02963:
Quench: 666.81
Start, End, X-Axis 50-175

Channel Counts



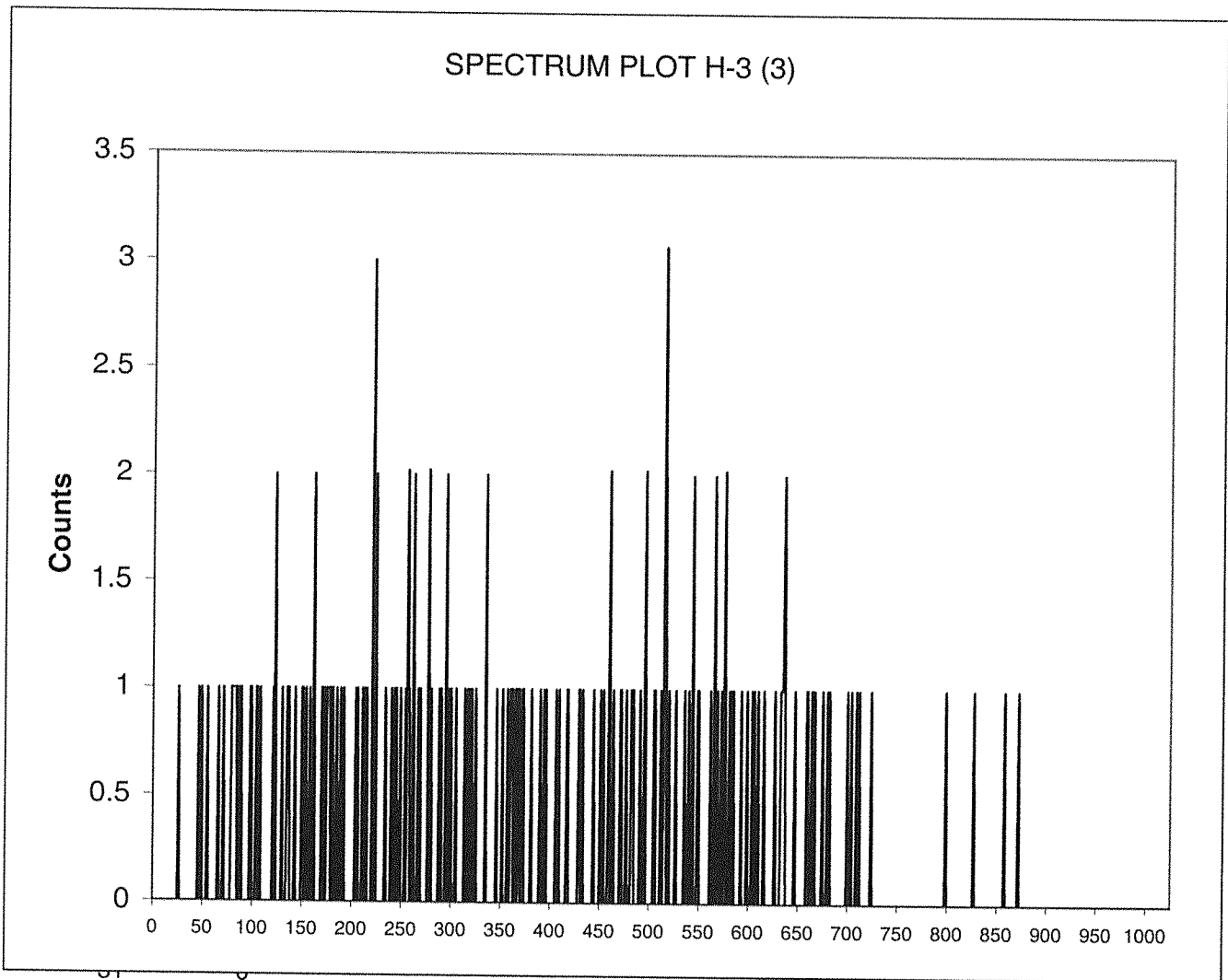
31	0
32	0
33	0
34	0
35	0

Instrument Type: Quantulus
Data Capture Date: THU 22 SEP 2016 14:28
FileName: M:\LSC\FILES\orange\598075A0\SQ151801N.001.xls
File Info: M:\LSC\FILES\orange\598075A0\U598075A0.xls

ID: H-3 (3)
Comments: ORANGE

Sample, Rack-Pos, Time: 15, 405235034, 30.01297:
Quench: 668.92
Start, End, X-Axis 50-175

Channel Counts



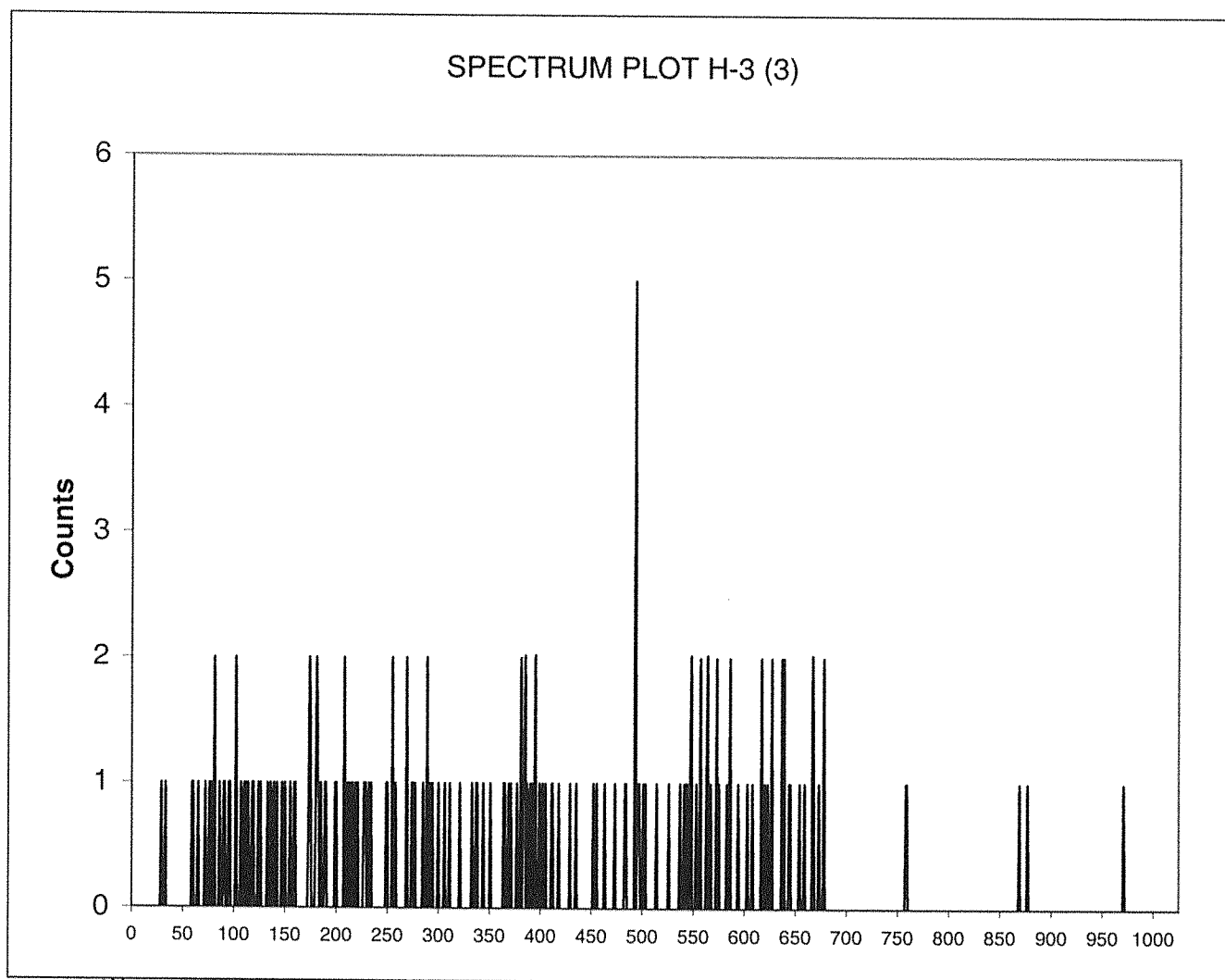
31 0
32 0
33 0
34 0
35 0

Instrument Type: Quantulus
Data Capture Date: THU 22 SEP 2016 14:28
FileName: M:\LSC\FILES\orange\598075A0\SQ161901N.001.xls
File Info: M:\LSC\FILES\orange\598075A0\U598075A0.xls

ID: H-3 (3)
Comments: ORANGE

Sample, Rack-Pos, Time: 16, 405235035, 30.02963:
Quench: 666.66
Start, End, X-Axis 50-175

Channel Counts



31	0
32	0
33	1
34	0
35	0

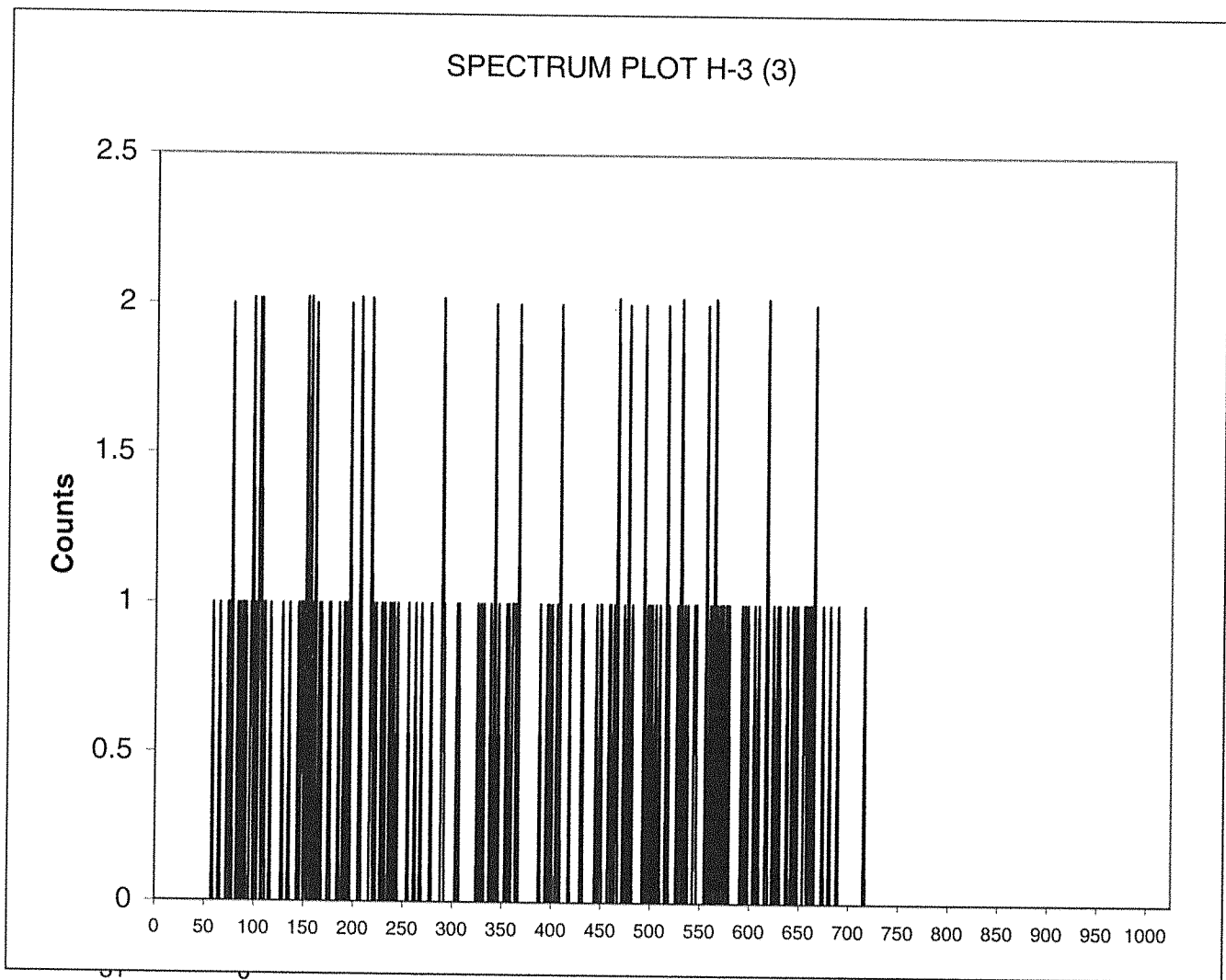
Instrument Type:
Data Capture Date:
FileName:
File Info:

Quantulus
THU 22 SEP 2016 14:28
M:\LSC\FILES\orange\598075A0\SQ172001N.001.xls
M:\LSC\FILES\orange\598075A0\U598075A0.xls

ID: H-3 (3)
Comments: ORANGE

Sample, Rack-Pos, Time: 17, 405235036, 30.02963:
Quench: 665.28
Start, End, X-Axis 50-175

Channel Counts



31	0
32	0
33	0
34	0
35	0

Instrument Type:
Data Capture Date:
FileName:
File Info:

Quantulus
THU 22 SEP 2016 14:28
M:\LSC\FILES\orange\598075A0\SQ185301N.001.xls
M:\LSC\FILES\orange\598075A0\U598075A0.xls

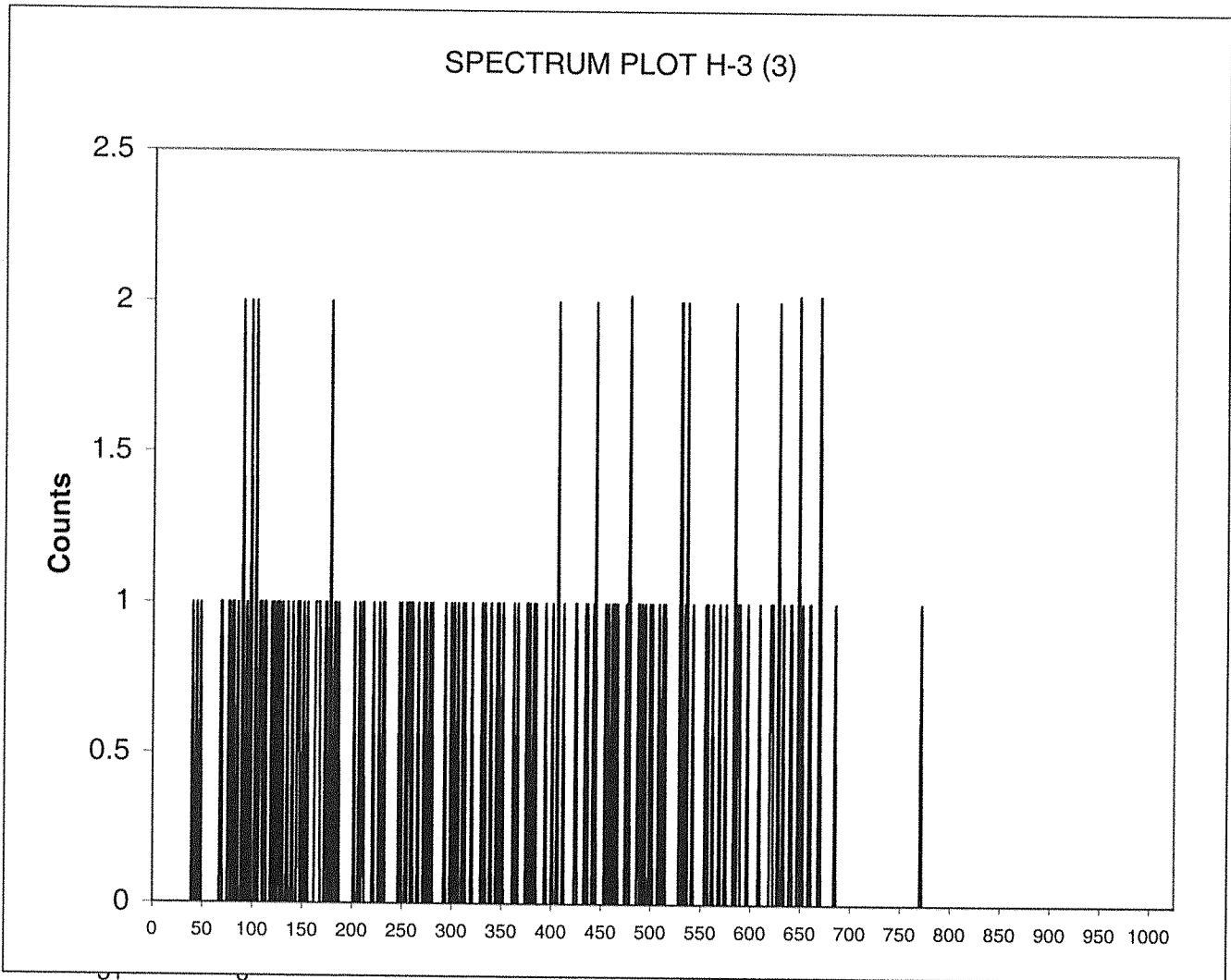
ID:
Comments:

H-3 (3)
ORANGE

Sample, Rack-Pos, Time:
Quench:
Start, End, X-Axis

18, 405235037, 30.02962:
665.57
50-175

Channel Counts



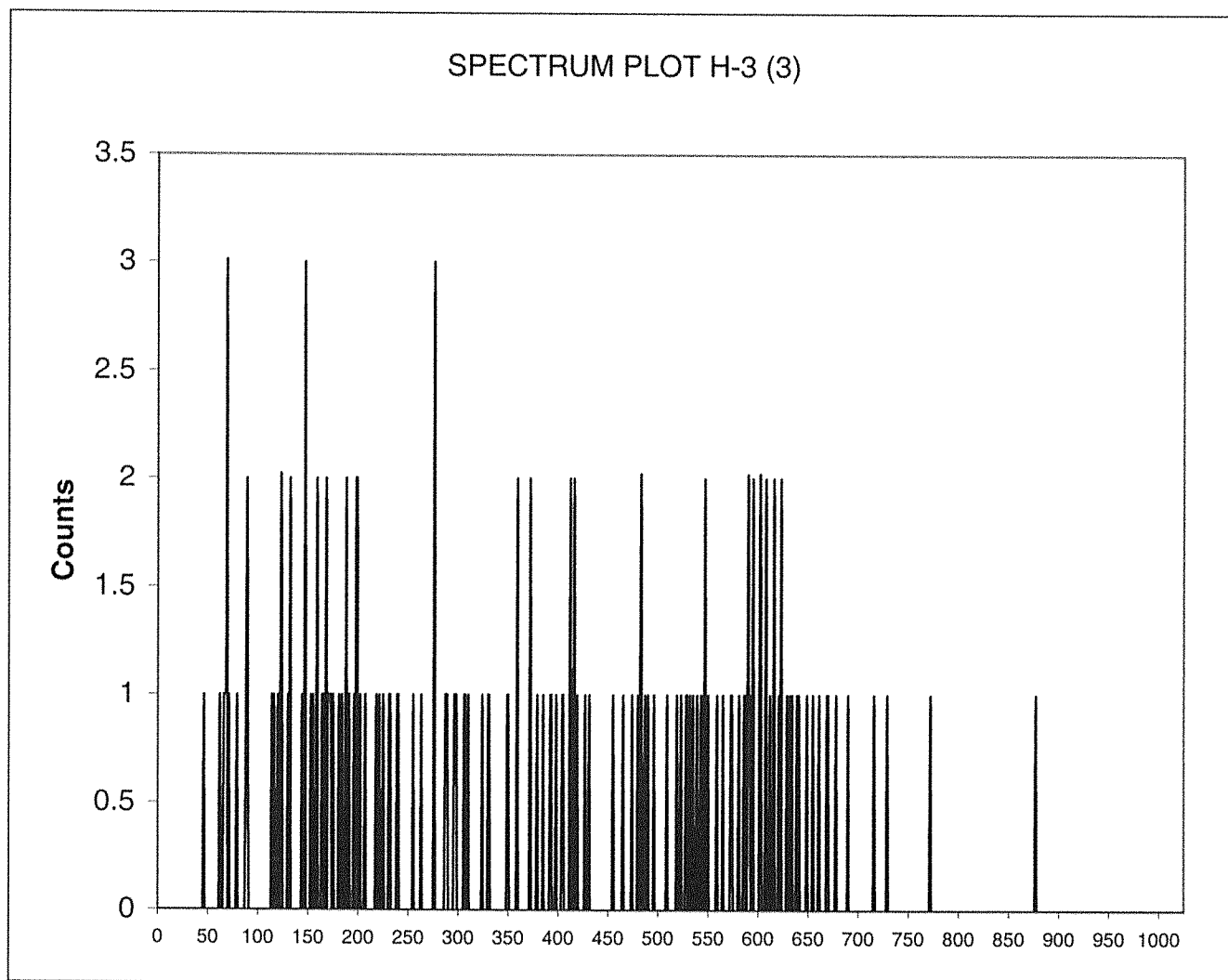
32	0
33	0
34	0
35	0

Instrument Type: Quantulus
Data Capture Date: THU 22 SEP 2016 14:28
FileName: M:\LSC\FILES\orange\598075A0\SQ195401N.001.xls
File Info: M:\LSC\FILES\orange\598075A0\U598075A0.xls

ID: H-3 (3)
Comments: ORANGE

Sample, Rack-Pos, Time: 19, 405235038, 30.02962:
Quench: 664.97
Start, End, X-Axis 50-175

Channel Counts



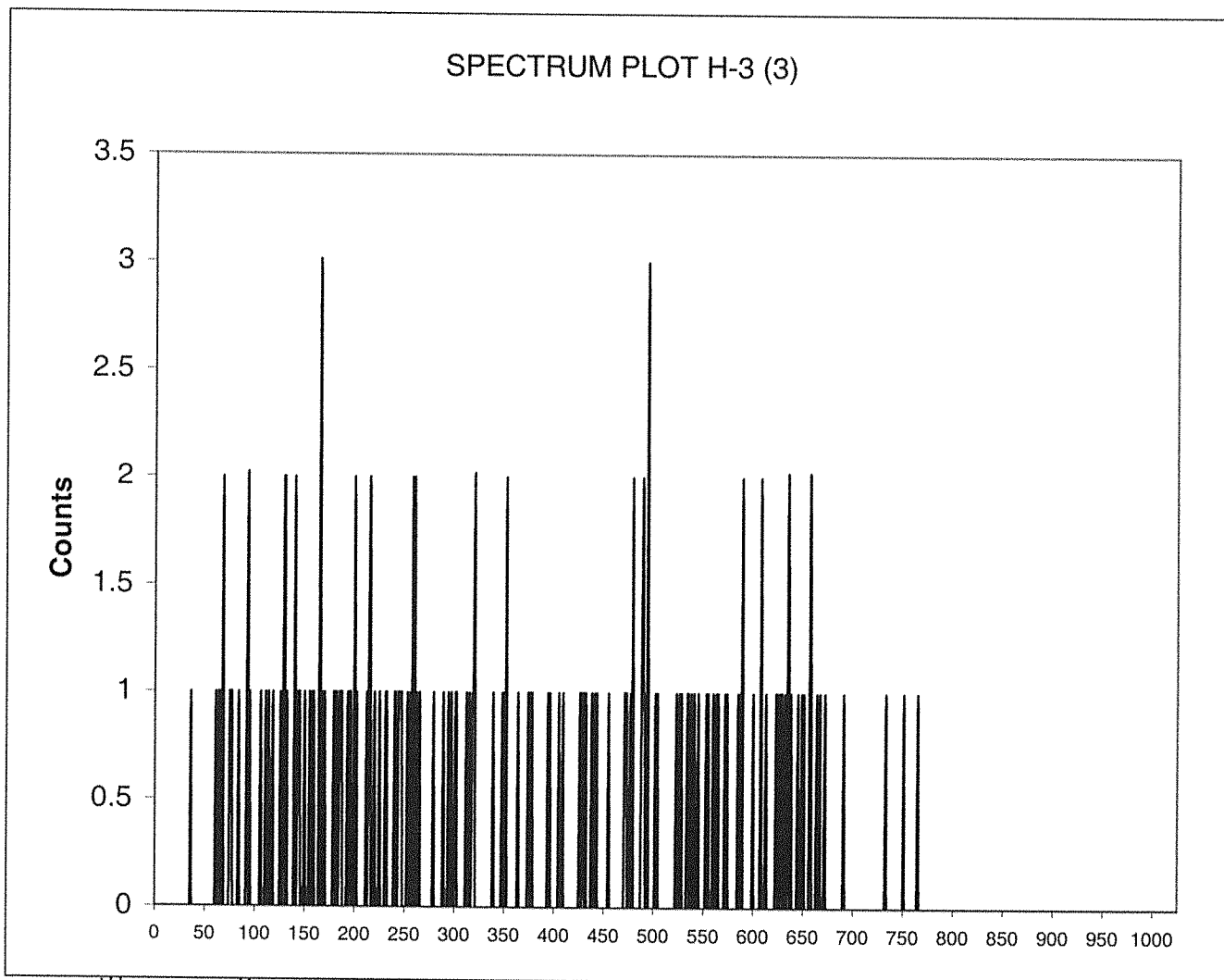
31 0
32 0
33 0
34 0
35 0

Instrument Type: Quantulus
Data Capture Date: THU 22 SEP 2016 14:28
FileName: M:\LSC\FILES\orange\598075A0\SQ205501N.001.xls
File Info: M:\LSC\FILES\orange\598075A0\U598075A0.xls

ID: H-3 (3)
Comments: ORANGE

Sample, Rack-Pos, Time: 20, 405235039, 30.02962:
Quench: 666.93
Start, End, X-Axis: 50-175

Channel Counts



31	0
32	0
33	0
34	0
35	0

REGISTRY

FRI 23 SEP 2016 2:35

*** DIRECTORY PATH :M:\LSC\O\DA\598075A1 ***

PARAMETER GROUP: 8
ID: H-3 (4)

00A PROGRAM MODE 6 ->

ORDER	POS	ID	CTIME	COUNTS	CUCNTS	MCW	REP	STD	STMS	STIME
1	56	405235040	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
2	57	1203626098	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
3	58	1203626099	30:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
4	59	1203626100	15:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
5	60	1203626101	15:00	1.0E04	NO LIM	1	1	Y	1/10	1:00

NUMBER OF CYCLES 1
COINCIDENCE BIAS (L/H) L

MCA INPUT	TRIGG.	INHIBIT	MEMORY SPLIT
1	LRSUM	DCOS G	L*R
2	GSUM	G	L*R

WINDOW	CHANNELS	MCA	HALF
1	50- 175	1	2
2	5- 320	1	2
3	1- 1024	1	2
4	50- 320	1	1
5	50- 270	1	1
6	60- 220	1	1
7	1- 1024	2	1
8	1- 1024	2	2

SELECTED PRINTOUT FOR TERMINAL 1 (A)

SELECTED PRINTOUT FOR TERMINAL 2 (B)

1.	2.	3.	4.	5.	6.	7.
POS	ID	CTIME	SQP	CPM1	CPM2	CPM3
SEND SPECTRA		12				
RESOLUTION OF SPECTRA	1024					
LISTING		Y				
INSTRUMENT NUMBER		1				

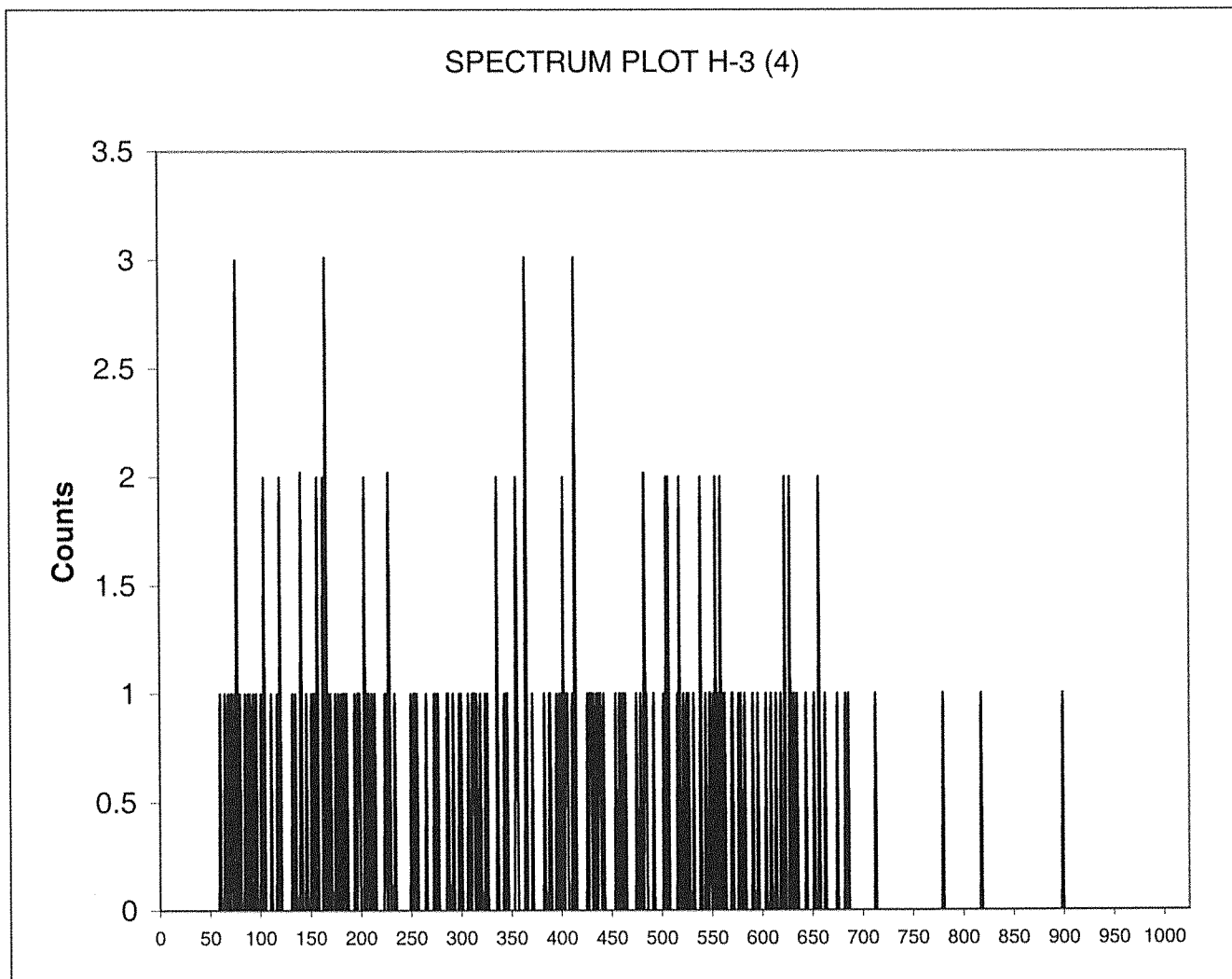
POS	ID	CTIME	SQP	CPM1	CPM2	CPM3
Q015601N.001	23 SEP 2016	3:08				
56	405235040	30:01.780	664.41	1.43	2.79	6.51
Q025701N.001	23 SEP 2016	3:41				
57	1203626098	30:01.773	670.89	1.43	3.30	6.54
Q035801N.001	23 SEP 2016	4:13				
58	1203626099	30:01.773	663.96	1.53	2.96	6.51
Q045901N.001	23 SEP 2016	4:31				
59	1203626100	15:01.780	667.70	11.78	13.27	16.27
Q056001N.001	23 SEP 2016	4:48				
60	1203626101	15:01.780	667.91	11.64	13.07	15.86

Instrument Type: Quantulus
Data Capture Date: FRI 23 SEP 2016 2:35
FileName: M:\LSC\FILES\orange\598075A1\SQ015601N.001.xls
File Info: M:\LSC\FILES\orange\598075A1\U598075A1.xls

ID: H-3 (4)
Comments: ORANGE

Sample, Rack-Pos, Time: 1, 405235040, 30.02967:
Quench: 664.41
Start, End, X-Axis 50-175

Channel Counts



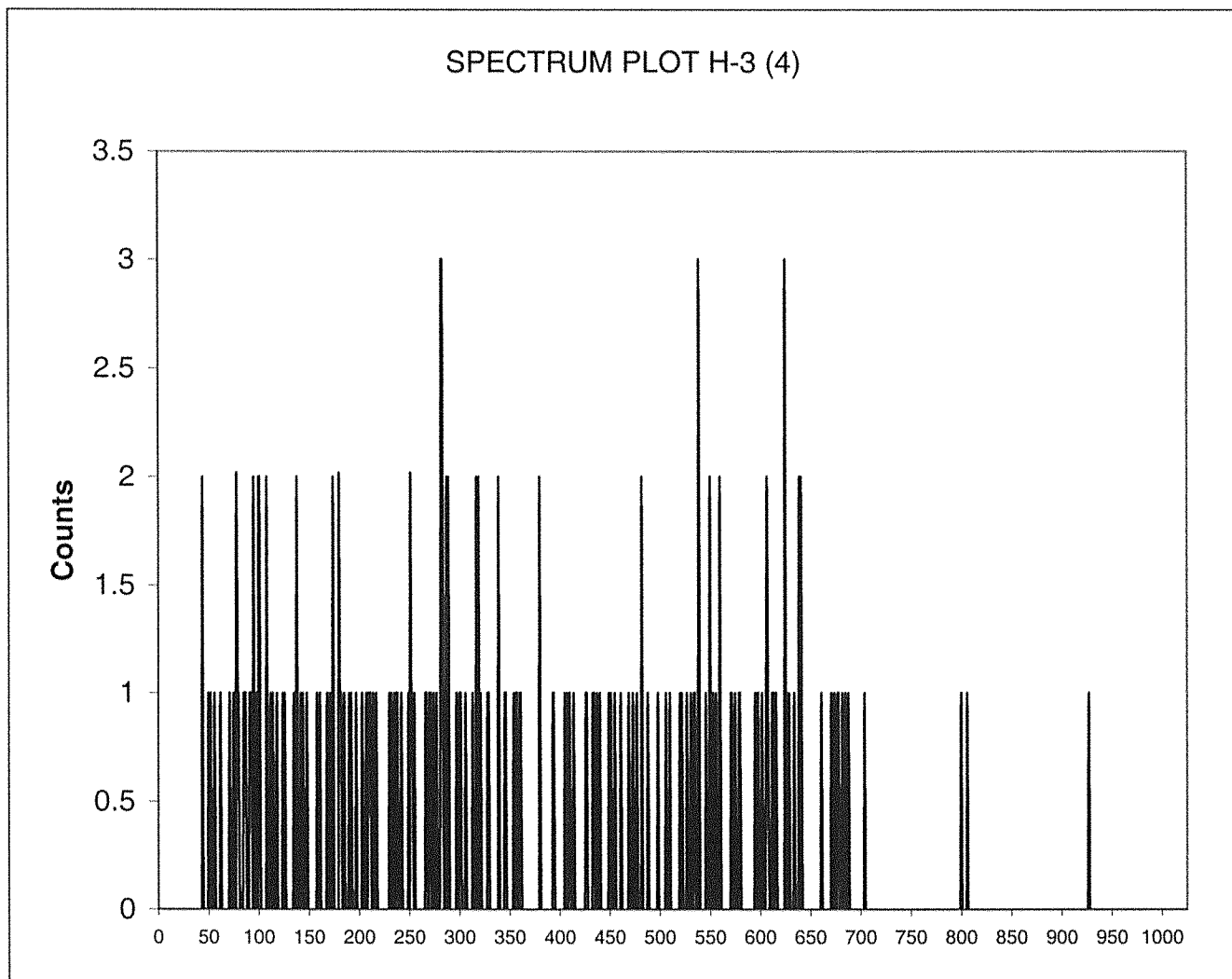
31	0
32	0
33	0
34	0
35	0

Instrument Type: Quantulus
Data Capture Date: FRI 23 SEP 2016 2:35
FileName: M:\LSC\FILES\orange\598075A1\SQ025701N.001.xls
File Info: M:\LSC\FILES\orange\598075A1\U598075A1.xls

ID: H-3 (4)
Comments: ORANGE

Sample, Rack-Pos, Time: 2, 1203626098, 30.02955:
Quench: 670.89
Start, End, X-Axis 50-175

Channel Counts



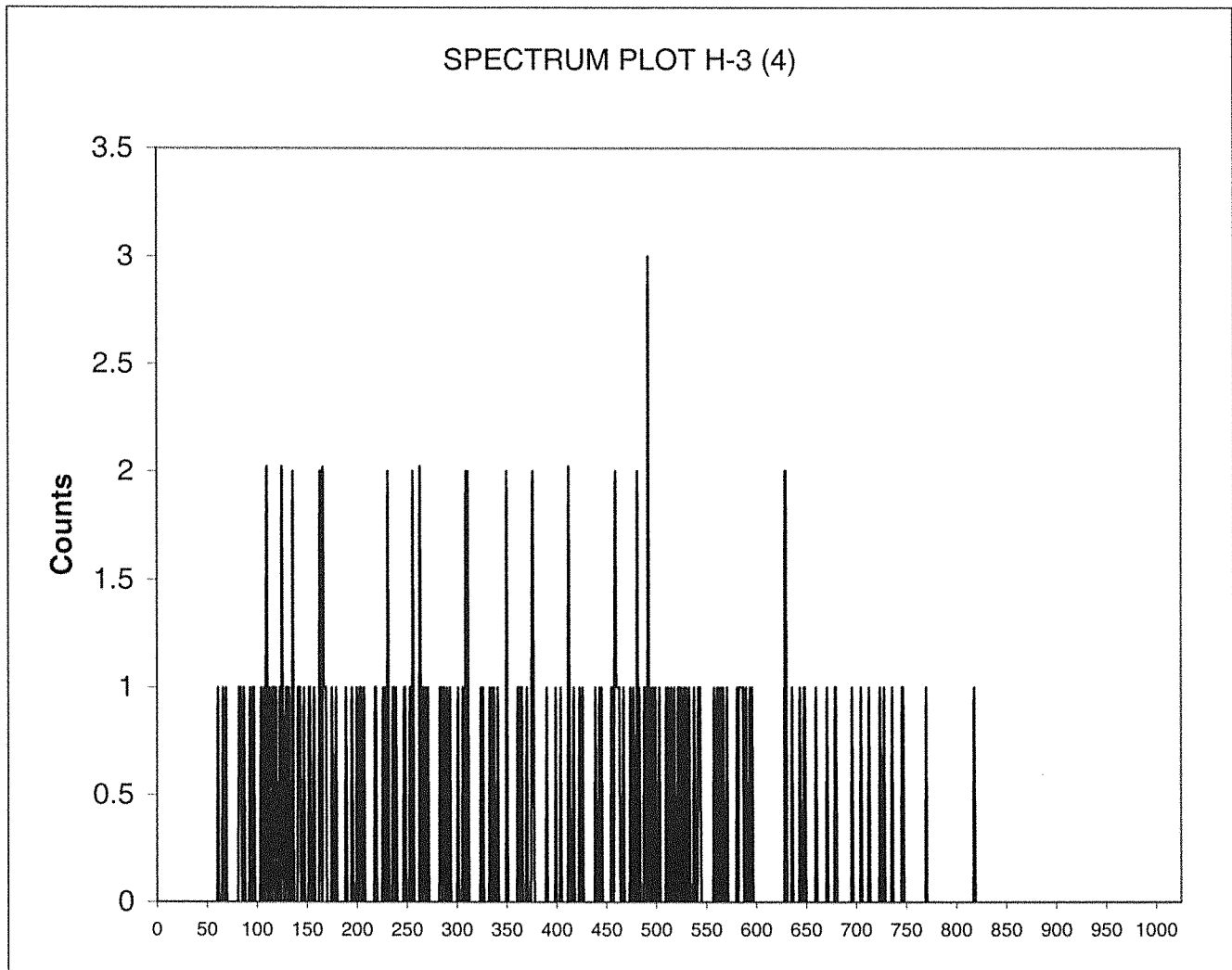
31 0
32 0
33 0
34 0
35 0

Instrument Type: Quantulus
 Data Capture Date: FRI 23 SEP 2016 2:35
 FileName: M:\LSC\FILES\orange\598075A1\SQ035801N.001.xls
 File Info: M:\LSC\FILES\orange\598075A1\U598075A1.xls

ID: H-3 (4)
 Comments: ORANGE

Sample, Rack-Pos, Time: 3, 1203626099, 30.02955:
 Quench: 663.96
 Start, End, X-Axis 50-175

Channel Counts



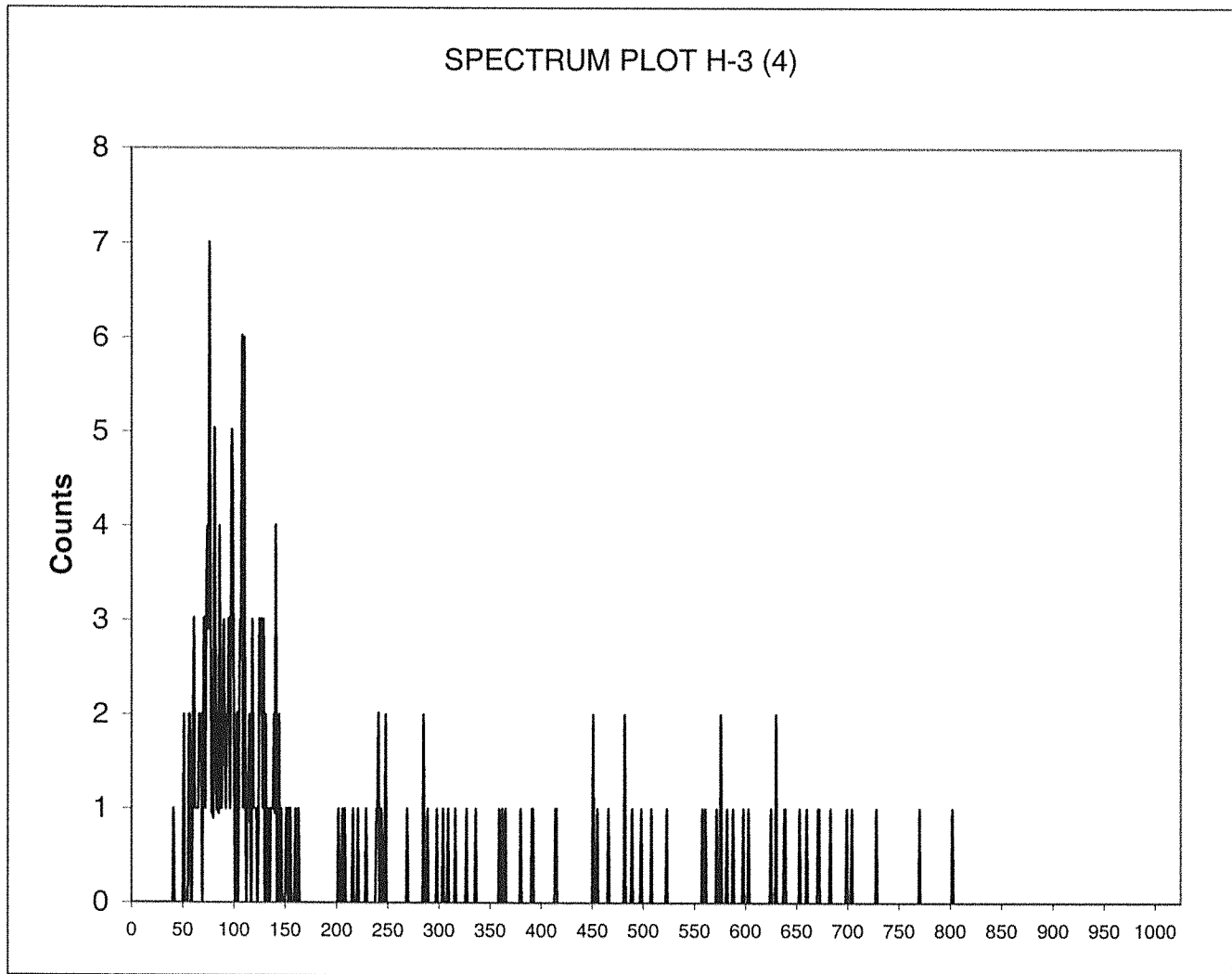
31	0
32	0
33	0
34	0
35	0

Instrument Type: Quantulus
Data Capture Date: FRI 23 SEP 2016 2:35
FileName: M:\LSC\FILES\orange\598075A1\SQ045901N.001.xls
File Info: M:\LSC\FILES\orange\598075A1\U598075A1.xls

ID: H-3 (4)
Comments: ORANGE

Sample, Rack-Pos, Time: 4, 1203626100, 15.02967:
Quench: 667.7
Start, End, X-Axis 50-175

Channel Counts



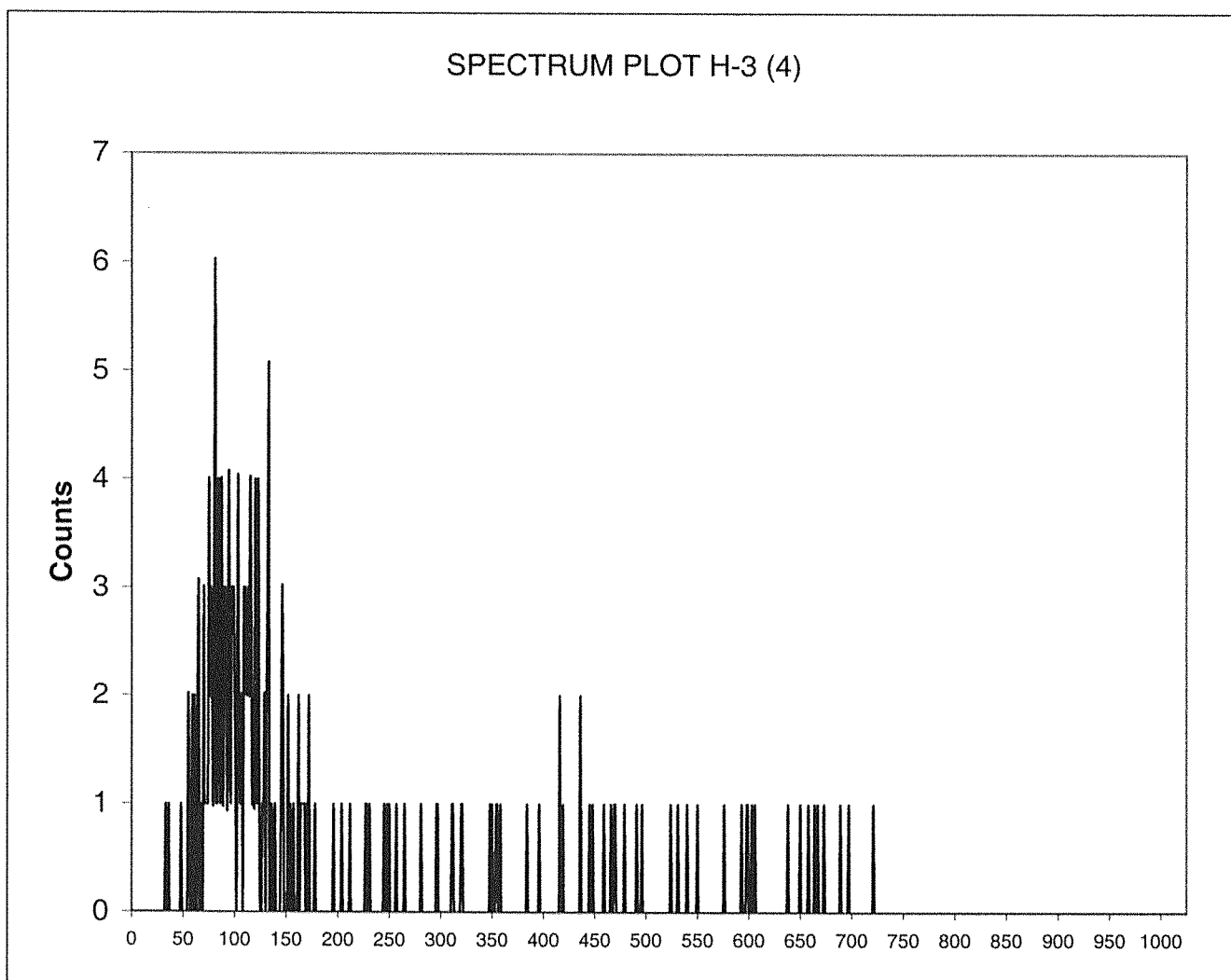
31 0
32 0
33 0
34 0
35 0

Instrument Type: Quantulus
Data Capture Date: FRI 23 SEP 2016 2:35
FileName: M:\LSC\FILES\orange\598075A1\SQ056001N.001.xls
File Info: M:\LSC\FILES\orange\598075A1\U598075A1.xls

ID: H-3 (4)
Comments: ORANGE

Sample, Rack-Pos, Time: 5, 1203626101, 15.02967:
Quench: 667.91
Start, End, X-Axis 50-175

Channel Counts



31 0
32 0
33 1
34 0
35 0

21-Sep-2016

Batch# 1597417 Product: T-99 Date: 9/21/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓	✓	see DER 1559774
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		NA DER 1559774
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER 1559774
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

OK
9/21/16

OK
9/21/16

Primary Review Performed By: [Signature]

MSWC

Secondary Review Performed By: [Signature] 9/21/16

10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 21-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LSC	Test / Method: DOE EML HASL-300, Tc-02-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1597417	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, and 1203624312 were received and analyzed out of method specified hold time.</p>		<p>1. Reporting results.</p>	

Originator's Name:
Elizabeth Krouse 21-SEP-16

Data Validator/Group Leader:
Lyndsey Pace 21-SEP-16

Prep Logbook

M5WC 10/4/10

25

The Determination of Technetium-99 Using Analytical Grade IX8 Resin

Batch ID: 1597417

Analyst: Christina Sanchez

Method: DOE EML HASL-300, Tc-02-RC Modified

Lab SOP: GL-RAD-A-059 REV# 4

Instrument: BAL-16107662

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
LCS	1203624313	Technetium-99 SPIKE	1621-B	.1	mL

Sample ID	Prep Date	Matrix	Dry or Wet	Unadjusted Aliquot (g)	Aliquot (g)
405235061	15-SEP-2016 12:12:06	Soil	W	1.205	0.993
405235062	15-SEP-2016 12:12:06	Soil	W	1.273	1.027
405235063	15-SEP-2016 12:12:06	Soil	W	1.256	1.124
405235064	15-SEP-2016 12:12:06	Soil	W	1.258	1.155
405235065	15-SEP-2016 12:12:06	Soil	W	1.238	1.114
405235066	15-SEP-2016 12:12:06	Soil	W	1.225	1.111
405235067	15-SEP-2016 12:12:06	Soil	W	1.251	1.078
405235068	15-SEP-2016 12:12:06	Soil	W	1.217	1.048
405235069	15-SEP-2016 12:12:06	Soil	W	1.29	1.153
405235070	15-SEP-2016 12:12:06	Soil	W	1.278	1.037
405235071	15-SEP-2016 12:12:06	Soil	W	1.239	1.034
405235072	15-SEP-2016 12:12:06	Soil	W	1.243	1.141
405235073	15-SEP-2016 12:12:06	Soil	W	1.272	1.031
405235074	15-SEP-2016 12:12:06	Soil	W	1.355	1.21
405235075	15-SEP-2016 12:12:06	Soil	W	1.232	1.1
405235076	15-SEP-2016 12:12:06	Soil	W	1.259	1
405235077	15-SEP-2016 12:12:06	Soil	W	1.226	1.104
405235078	15-SEP-2016 12:12:06	Soil	W	1.252	1.05
1203624311 MB	15-SEP-2016 12:12:06	Soil	W	1.21	1.21
1203624312 DUP (405235061)	15-SEP-2016 12:12:06	Soil	W	1.269	1.046
1203624313 LCS	15-SEP-2016 12:12:06	Soil	W	1.21	1.21

Comments:
Spike Pipet ID: RAD-LSC-2272418
Tracer Pipet ID: RAD-LSC-4099802

Reagent/Solvent Lot ID	Description	Amount
2280154.26	Hydrogen Peroxide 30% ACS Reagent	10 mL
	1200LBS 30 Gallons	
2402130.4	Eosin GL Scintillation Solution	15 mL
2418926	Quenching Agent	.1 uL
2429641	RL-0.1M Hydrochloric Acid	100 mL
2441205	RL-0.01M Nitric Acid	20 mL
2451825	RL-0.1M Nitric Acid	25 mL
TC2074-A	tracer	1 mL

Technetium-99 Solid

Filename : TC99.XLS
 File type : Excel
 Version # : 1.2.16

Tracer S/N : TC2074-A
 Tracer Exp Date : 9/16/2016
 Tracer Volume Added : 1.00

Batch : 1597417
 Analyst : CHR02061
 Prep Date : 9/15/2016
 Tc-99 Method Uncertainty : 0.0576

Procedure Code : LSC99TCS
 Paramname : Technetium-99
 Required MDA : 5 pCi/g
 Tc-99 Abundance : 1.00
 Half-life of Tc-99 : 211100 years

Geometry: 15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin

Pos.	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G	Sample Date/Time	Tracer Calculations Tracer Ref. Activity (CPM)	Tracer Ref. Count Uncertainty (%)	Tracer Samp. Activity (CPM)	Tracer Samp. Count Uncertainty (%)	Tracer Aliquot (mL)	Tracer Aliquot StDev. (mL)
1	405235061.1	0.9930	3.3226E-03	12/14/2015 13:47	32522	0.94%	30685	0.95%	1.0	0.002000
2	405235062.1	1.0270	3.3261E-03	12/14/2015 13:10	32522	0.94%	29949	0.94%	1.0	0.002000
3	405235063.1	1.1240	3.3362E-03	12/14/2015 13:15	32522	0.94%	30221	0.95%	1.0	0.002000
4	405235064.1	1.1550	3.3395E-03	12/14/2015 13:25	32522	0.94%	29728	0.94%	1.0	0.002000
5	405235065.1	1.1140	3.3352E-03	12/14/2015 13:56	32522	0.94%	28982	0.95%	1.0	0.002000
6	405235066.1	1.1110	3.3349E-03	12/14/2015 14:00	32522	0.94%	30594	0.95%	1.0	0.002000
7	405235067.1	1.0780	3.3315E-03	12/11/2015 11:30	32522	0.94%	30895	0.95%	1.0	0.002000
8	405235068.1	1.0480	3.3283E-03	12/11/2015 10:27	32522	0.94%	29108	0.95%	1.0	0.002000
9	405235069.1	1.1530	3.3593E-03	12/16/2015 12:45	32522	0.94%	29056	0.95%	1.0	0.002000
10	405235070.1	1.0370	3.3272E-03	12/11/2015 10:10	32522	0.94%	30362	0.93%	1.0	0.002000
11	405235071.1	1.0340	3.3269E-03	12/11/2015 10:25	32522	0.94%	28574	0.95%	1.0	0.002000
12	405235072.1	1.1410	3.3880E-03	12/15/2015 13:35	32522	0.94%	29642	0.95%	1.0	0.002000
13	405235073.1	1.0310	3.3266E-03	12/11/2015 11:35	32522	0.94%	29132	0.96%	1.0	0.002000
14	405235074.1	1.2100	3.3452E-03	12/15/2015 14:10	32522	0.94%	28908	0.94%	1.0	0.002000
15	405235075.1	1.1000	3.3337E-03	12/16/2015 9:31	32522	0.94%	31032	0.95%	1.0	0.002000
16	405235076.1	1.0000	3.3233E-03	12/11/2015 14:19	32522	0.94%	30752	0.95%	1.0	0.002000
17	405235077.1	1.1040	3.3342E-03	12/17/2015 13:30	32522	0.94%	28562	0.95%	1.0	0.002000
18	405235078.1	1.0500	3.3285E-03	12/17/2015 12:40	32522	0.94%	28037	0.96%	1.0	0.002000
19	1203624311.1	1.2100	3.3452E-03	9/15/2016 0:00	32522	0.94%	31216	0.95%	1.0	0.002000
20	1203624312.1	1.0460	3.3281E-03	12/14/2015 13:47	32522	0.94%	30154	0.94%	1.0	0.002000
21	1203624313.1	1.2100	3.3452E-03	9/15/2016 0:00	32522	0.94%	30937	0.95%	1.0	0.002000

Pipet, 0.1 ml Sidev : +/- 0.000200 ml
 Pipet, 0.5 ml Sidev : +/- 0.001000 ml
 Pipet, 1 ml Sidev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-059
 Instrument SOP: GL-RAD-I-017

Count raw Data										Calibration Data				Sample Recovery		Calculated Sample Recovery		Detector Efficiency		Background Count	
Pos.	Rack Position #	Counting Time (min.)	Quench#	Gross cpm	Bkg cpm	Bkg Count Time (min.)	Bkg Quench#	Corrected Bkg cpm	Count Start Date/Time	Sample Decay	Sample Recovery %	Calculated Sample Recovery %	Sample Recovery Error %	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)	Detector Error (cpm/dpm)	Background Position #	Background Count Start Date/Time	
1	22	25.0124	738.8	4	3.76	25	755.15	3.8344	9/20/2016 5:58	1.000	94.4%	94.4%	0.73%	LSCPINK	7/4/2016	6/30/2017	0.5418	0.00792	21	9/20/2016 5:31	
2	23	25.0124	708.3	3.92	3.76	25	755.15	3.8594	9/20/2016 6:26	1.000	92.1%	92.1%	0.72%	LSCPINK	7/4/2016	6/30/2017	0.5008	0.00792	21	9/20/2016 5:31	
3	24	25.0124	744.19	4.25	3.76	25	755.15	3.8159	9/20/2016 6:53	1.000	92.9%	92.9%	0.73%	LSCPINK	7/4/2016	6/30/2017	0.5458	0.00792	21	9/20/2016 5:31	
4	25	25.0124	743.23	3.84	3.76	25	755.15	3.8196	9/20/2016 7:21	1.000	91.4%	91.4%	0.72%	LSCPINK	7/4/2016	6/30/2017	0.5451	0.00792	21	9/20/2016 5:31	
5	26	25.0124	738.75	3.4	3.76	25	755.15	3.8345	9/20/2016 7:48	1.000	89.1%	89.1%	0.73%	LSCPINK	7/4/2016	6/30/2017	0.5418	0.00792	21	9/20/2016 5:31	
6	27	25.0124	736.91	3.84	3.76	25	755.15	3.8396	9/20/2016 8:16	1.000	94.1%	94.1%	0.73%	LSCPINK	7/4/2016	6/30/2017	0.5402	0.00792	21	9/20/2016 5:31	
7	28	25.0124	740.76	3.64	3.76	25	755.15	3.8283	9/20/2016 8:43	1.000	95.0%	95.0%	0.73%	LSCPINK	7/4/2016	6/30/2017	0.5434	0.00792	21	9/20/2016 5:31	
8	29	25.0124	724.32	3.48	3.76	25	755.15	3.8602	9/20/2016 9:11	1.000	89.5%	89.5%	0.73%	LSCPINK	7/4/2016	6/30/2017	0.5262	0.00792	21	9/20/2016 5:31	
9	30	25.0124	745.26	4.04	3.76	25	755.15	3.8116	9/20/2016 9:38	1.000	89.3%	89.3%	0.72%	LSCPINK	7/4/2016	6/30/2017	0.5464	0.00792	21	9/20/2016 5:31	
10	31	25.0124	712.84	3.92	3.76	25	755.15	3.8619	9/20/2016 10:06	1.000	93.4%	93.4%	0.72%	LSCPINK	7/4/2016	6/30/2017	0.5088	0.00792	21	9/20/2016 5:31	
11	32	25.0124	696.37	4.29	3.76	25	755.15	3.8477	9/20/2016 10:33	1.000	90.9%	90.9%	0.73%	LSCPINK	7/4/2016	6/30/2017	0.4767	0.00792	21	9/20/2016 5:31	
12	33	25.0124	747.39	3.72	3.76	25	755.15	3.8023	9/20/2016 11:01	1.000	91.1%	91.1%	0.73%	LSCPINK	7/4/2016	6/30/2017	0.5476	0.00792	21	9/20/2016 5:31	
13	34	25.0123	729.05	3.44	3.76	25	755.15	3.8551	9/20/2016 11:28	1.000	89.6%	89.6%	0.72%	LSCPINK	7/4/2016	6/30/2017	0.5320	0.00792	21	9/20/2016 5:31	
14	35	25.0123	744.62	3.72	3.76	25	755.15	3.8142	9/20/2016 11:56	1.000	88.9%	88.9%	0.73%	LSCPINK	7/4/2016	6/30/2017	0.5460	0.00792	21	9/20/2016 5:31	
15	36	25.0123	749.76	3.72	3.76	25	755.15	3.7908	9/20/2016 12:23	1.000	95.4%	95.4%	0.73%	LSCPINK	7/4/2016	6/30/2017	0.5488	0.00792	21	9/20/2016 5:31	
16	37	25.0123	718.12	3.92	3.76	25	755.15	3.8627	9/20/2016 12:51	1.000	94.6%	94.6%	0.73%	LSCPINK	7/4/2016	6/30/2017	0.5173	0.00792	21	9/20/2016 5:31	
17	38	25.0123	759.17	3.92	3.76	25	755.15	3.7326	9/20/2016 13:18	1.000	90.9%	90.9%	0.73%	LSCPINK	7/4/2016	6/30/2017	0.5512	0.00792	21	9/20/2016 5:31	
18	39	25.0123	720.72	4.73	3.76	25	755.15	3.8622	9/20/2016 13:46	1.000	86.2%	86.2%	0.73%	LSCPINK	7/4/2016	6/30/2017	0.5212	0.00792	21	9/20/2016 5:31	
19	40	25.0123	748.33	3.36	3.76	25	755.15	3.7978	9/20/2016 14:13	1.000	96.0%	96.0%	0.73%	LSCPINK	7/4/2016	6/30/2017	0.5481	0.00792	21	9/20/2016 5:31	
20	41	25.0123	716.05	3.76	3.76	25	755.15	3.8627	9/20/2016 14:41	1.000	92.7%	92.7%	0.72%	LSCPINK	7/4/2016	6/30/2017	0.5141	0.00792	21	9/20/2016 5:31	
21	42	25.0123	753.4	106.32	3.76	25	755.15	3.7707	9/20/2016 15:09	1.000	95.1%	95.1%	0.73%	LSCPINK	7/4/2016	6/30/2017	0.5501	0.00792	21	9/20/2016 5:31	

Notes:

- 1 - Results are decay corrected to Sample Date/Time
- 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
- 3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml) : N/A
 Spike Volume Added : N/A

* - RPD changed to 0% due to sample & dup activity below MDA

LCS S/N : 1621-B
 LCS Exp Date : 1/5/2017
 LCS Activity (dpm/ml) : 1911.38
 LCS Volume Added (ml) : 0.10

Pos.	Decision Level pCi/G	Critical Level pCi/G	Required MDA pCi/G	MDA pCi/G	Sample Act. Conc. pCi/G	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA		Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
									Counting Uncertainty pCi/G	Total Prop. Uncertainty pCi/G						
1	1.1449	0.8083	5	1.7230	0.1470	337.91%	0.1656	0.5597	0.9734	0.9735		SAMPLE				
2	1.2311	0.8691	5	1.8524	0.0577	919.59%	0.0606	0.5577	1.0396	1.0397		SAMPLE				
3	1.0170	0.7180	5	1.5308	0.3430	130.82%	0.4341	0.5679	0.8795	0.8804		SAMPLE				
4	1.0078	0.7115	5	1.5169	0.0160	2712.08%	0.0204	0.5534	0.8489	0.8489		SAMPLE				
5	1.0806	0.7629	5	1.6263	-0.3639	123.78%	-0.4345	0.5378	0.8629	0.8629		SAMPLE				
6	1.0301	0.7273	5	1.5502	3.191E-04	138572.83%	0.0004	0.5541	0.8665	0.8666		SAMPLE				
7	1.0436	0.7368	5	1.5706	-0.1524	280.22%	-0.1883	0.5464	0.8670	0.8670		SAMPLE				
8	1.1815	0.8341	5	1.7778	-0.3470	142.50%	-0.3802	0.5417	0.9691	0.9691		SAMPLE				
9	1.0294	0.7267	5	1.5494	0.1828	245.28%	0.2284	0.5603	0.8788	0.8790		SAMPLE				
10	1.1840	0.8359	5	1.7816	0.0532	959.30%	0.0581	0.5578	0.9998	0.9998		SAMPLE				
11	1.2988	0.9169	5	1.9544	0.4445	128.97%	0.4423	0.5704	1.1235	1.1247		SAMPLE				
12	1.0161	0.7174	5	1.5297	-0.0651	666.68%	-0.0823	0.5484	0.8501	0.8502		SAMPLE				
13	1.1859	0.8373	5	1.7845	-0.3806	130.10%	-0.4151	0.5401	0.9704	0.9704		SAMPLE				
14	0.9870	0.6968	5	1.4856	-0.0722	582.69%	-0.0942	0.5488	0.8251	0.8251		SAMPLE				
15	1.0032	0.7083	5	1.5104	-0.0553	774.26%	-0.0708	0.5480	0.8400	0.8400		SAMPLE				
16	1.1925	0.8419	5	1.7942	0.0528	973.63%	0.0573	0.5578	1.0068	1.0068		SAMPLE				
17	1.0365	0.7318	5	1.5612	0.1526	295.09%	0.1874	0.5531	0.8628	0.8630		SAMPLE				
18	1.2363	0.8728	5	1.8602	0.8286	67.54%	0.8678	0.5861	1.0969	1.1010		SAMPLE				
19	0.9086	0.6415	5	1.3678	-0.3098	122.18%	-0.4378	0.5350	0.7419	0.7419		SAMPLE				
20	1.1699	0.8260	5	1.7603	-0.0928	537.69%	-0.1027	0.5520	0.9776	0.9776		MB				
21	0.9101	0.6426	5	1.3705	72.9522	2.33%	102.5493	2.0980	2.9522	8.8828	405235061.1	DUP	0.0%	71.1554	102.5%	

ASSAY 16-Sep-16 12:29:07

Protocol id 12 TC99_REC
Time limit 500
Count limit 10000
Isotope Tc-99m
Protocol date 23-Sep-13 14:21:59
Run id. 19

POS	RACK	BATCH	TIME	COUNTS	CPM	ERROR	% RECOVERY	COUNT TIME
1	63	1	21	11337	32521.9	0.94		12:29:15
2	63	2	22	11197	30685.1	0.95	94.35	12:29:48
3	63	3	23	11414	29948.9	0.94	92.09	12:30:22
4	63	4	22	11004	30221.2	0.95	92.93	12:30:57
5	63	5	23	11305	29728.2	0.94	91.41	12:31:31
6	88	6	23	11005	28981.9	0.95	89.12	12:32:20
7	88	7	22	11098	30594.2	0.95	94.07	12:32:54
8	88	8	22	11195	30895.3	0.95	95.00	12:33:28
9	88	9	23	11017	29108.3	0.95	89.50	12:34:02
10	88	10	23	10985	29056.4	0.95	89.34	12:34:37
11	96	11	23	11457	30361.7	0.93	93.36	12:35:31
12	96	12	23	11149	29574.4	0.95	90.94	12:36:06
13	96	13	23	11162	29642.3	0.95	91.15	12:36:41
14	96	14	23	10958	29131.9	0.96	89.58	12:37:16
15	96	15	24	11334	28907.6	0.94	88.89	12:37:51
16	51	16	22	11135	31031.8	0.95	95.42	12:38:35
17	51	17	22	11023	30751.6	0.95	94.56	12:39:09
18	51	18	23	11067	29562.1	0.95	90.90	12:39:43
19	51	19	24	10943	28037.3	0.96	86.21	12:40:18
20	51	20	22	11151	31216.2	0.95	95.99	12:40:54
21	73	21	23	11246	30154.3	0.94	92.72	12:41:41
22	73	22	22	11023	30936.8	0.95	95.13	12:42:16

END OF ASSAY

REGISTRY

TUE 20 SEP 2016 5:29

*** DIRECTORY PATH :M:\LSC\Q\DA\597417A0 ***

PARAMETER GROUP: 8
ID: TC99 (1)

00A PROGRAM MODE 6 ->

ORDER	POS	ID	CTIME	COUNTS	CUCNTS	MCW	REP	STD	STMS	STIME
1	21	REF	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
2	22	405235061	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
3	23	405235062	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
4	24	405235063	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
5	25	405235064	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
6	26	405235065	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
7	27	405235066	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
8	28	405235067	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
9	29	405235068	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
10	30	405235069	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
11	31	405235070	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
12	32	405235071	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
13	33	405235072	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
14	34	405235073	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
15	35	405235074	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
16	36	405235075	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
17	37	405235076	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
18	38	405235077	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
19	39	405235078	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
20	40	1203624311	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
21	41	1203624312	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00
22	42	1203624313	25:00	1.0E04	NO LIM	1	1	Y	1/10	1:00

NUMBER OF CYCLES 1
COINCIDENCE BIAS (L/H) H

MCA INPUT TRIGG. INHIBIT MEMORY SPLIT
1 LRSUM L*R PAC+G
2 GSUM G L*R
PULSE COMPARATOR LEVEL 1

WINDOW	CHANNELS	MCA	HALF
1	200- 600	1	1
2	1- 1024	1	1
3	300- 640	1	1
4	50- 650	1	2
5	70- 500	1	2
6	300- 640	1	2
7	1- 1024	2	1
8	1- 1024	2	2

SELECTED PRINTOUT FOR TERMINAL 1 (A)

SELECTED PRINTOUT FOR TERMINAL 2 (B)

1. POS 2. ID 3. CTIME 4. SQP 5. CPM1 6. CPM2 7. CPM3
SEND SPECTRA 11
RESOLUTION OF SPECTRA 1024

LISTING
INSTRUMENT NUMBER

Y
1

REGISTRY

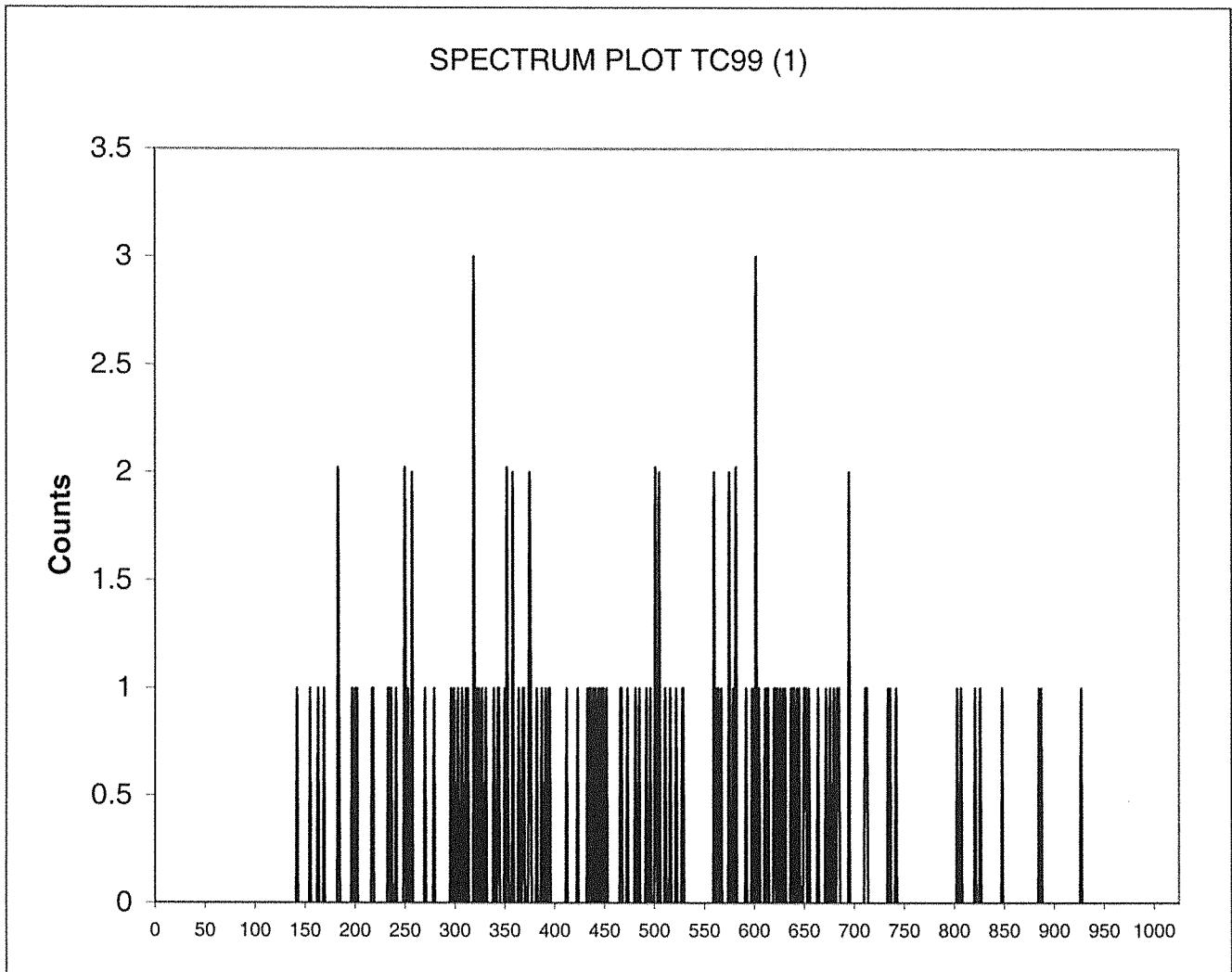
POS	ID	CTIME	SQP	CPM1	CPM2	CPM3
Q012101N.001	20 SEP 2016	5:57				
21	REF	25:00.742	755.15	3.76	5.95	3.72
Q022201N.001	20 SEP 2016	6:24				
22	405235061	25:00.742	738.80	4.00	5.83	3.72
Q032301N.001	20 SEP 2016	6:52				
23	405235062	25:00.742	708.30	3.92	5.58	3.92
Q042401N.001	20 SEP 2016	7:19				
24	405235063	25:00.742	744.19	4.25	6.47	4.17
Q052501N.001	20 SEP 2016	7:47				
25	405235064	25:00.742	743.23	3.84	5.78	3.23
Q062601N.001	20 SEP 2016	8:14				
26	405235065	25:00.742	738.75	3.40	4.85	3.15
Q072701N.001	20 SEP 2016	8:42				
27	405235066	25:00.742	736.91	3.84	5.54	3.44
Q082801N.001	20 SEP 2016	9:09				
28	405235067	25:00.741	740.76	3.64	5.66	3.48
Q092901N.001	20 SEP 2016	9:37				
29	405235068	25:00.741	724.32	3.48	5.06	3.07
Q103001N.001	20 SEP 2016	10:04				
30	405235069	25:00.741	745.26	4.04	5.99	3.80
Q113101N.001	20 SEP 2016	10:32				
31	405235070	25:00.741	712.84	3.92	5.66	3.76
Q123201N.001	20 SEP 2016	10:59				
32	405235071	25:00.741	696.37	4.29	5.22	3.92
Q133301N.001	20 SEP 2016	11:27				
33	405235072	25:00.741	747.39	3.72	5.78	3.76
Q143401N.001	20 SEP 2016	11:54				
34	405235073	25:00.740	729.05	3.44	5.22	3.03
Q153501N.001	20 SEP 2016	12:22				
35	405235074	25:00.740	744.62	3.72	5.62	3.52
Q163601N.001	20 SEP 2016	12:49				
36	405235075	25:00.740	749.76	3.72	5.78	3.84
Q173701N.001	20 SEP 2016	13:17				
37	405235076	25:00.740	718.12	3.92	5.46	3.19
Q183801N.001	20 SEP 2016	13:44				
38	405235077	25:00.740	759.17	3.92	5.50	2.99
Q193901N.001	20 SEP 2016	14:12				
39	405235078	25:00.739	720.72	4.73	6.23	4.25
Q204001N.001	20 SEP 2016	14:39				
40	1203624311	25:00.739	748.33	3.36	5.02	3.11
Q214101N.001	20 SEP 2016	15:07				
41	1203624312	25:00.739	716.05	3.76	5.66	3.80
Q224201N.001	20 SEP 2016	15:35				
42	1203624313	25:00.739	753.40	106.32	112.80	83.93

Instrument Type: Quantulus
Data Capture Date: TUE 20 SEP 2016 5:29
FileName: M:\LSC\FILES\pink\597417A0\SQ012101N.001.xls
File Info: M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 1, REF, 25.01237:
Quench: 755.15
Start, End, X-Axis: 200-600

Channel Counts



31 0
32 0
33 0
34 0
35 0

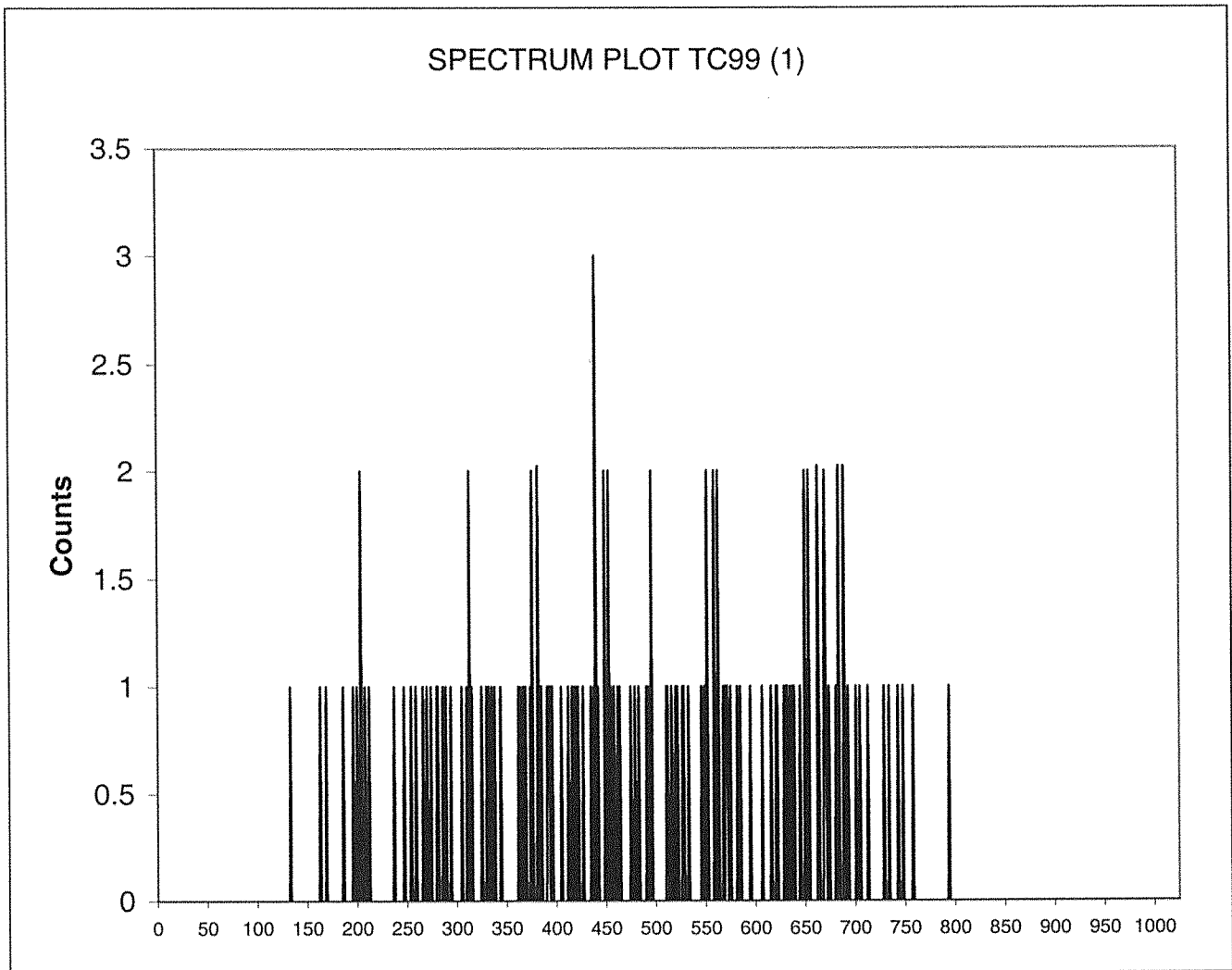
Instrument Type:
Data Capture Date:
FileName:
File Info:

Quantulus
TUE 20 SEP 2016 5:29
M:\LSC\FILES\pink\597417A0\SQ022201N.001.xls
M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 2, 405235061, 25.01237:
Quench: 738.8
Start, End, X-Axis 200-600

Channel Counts



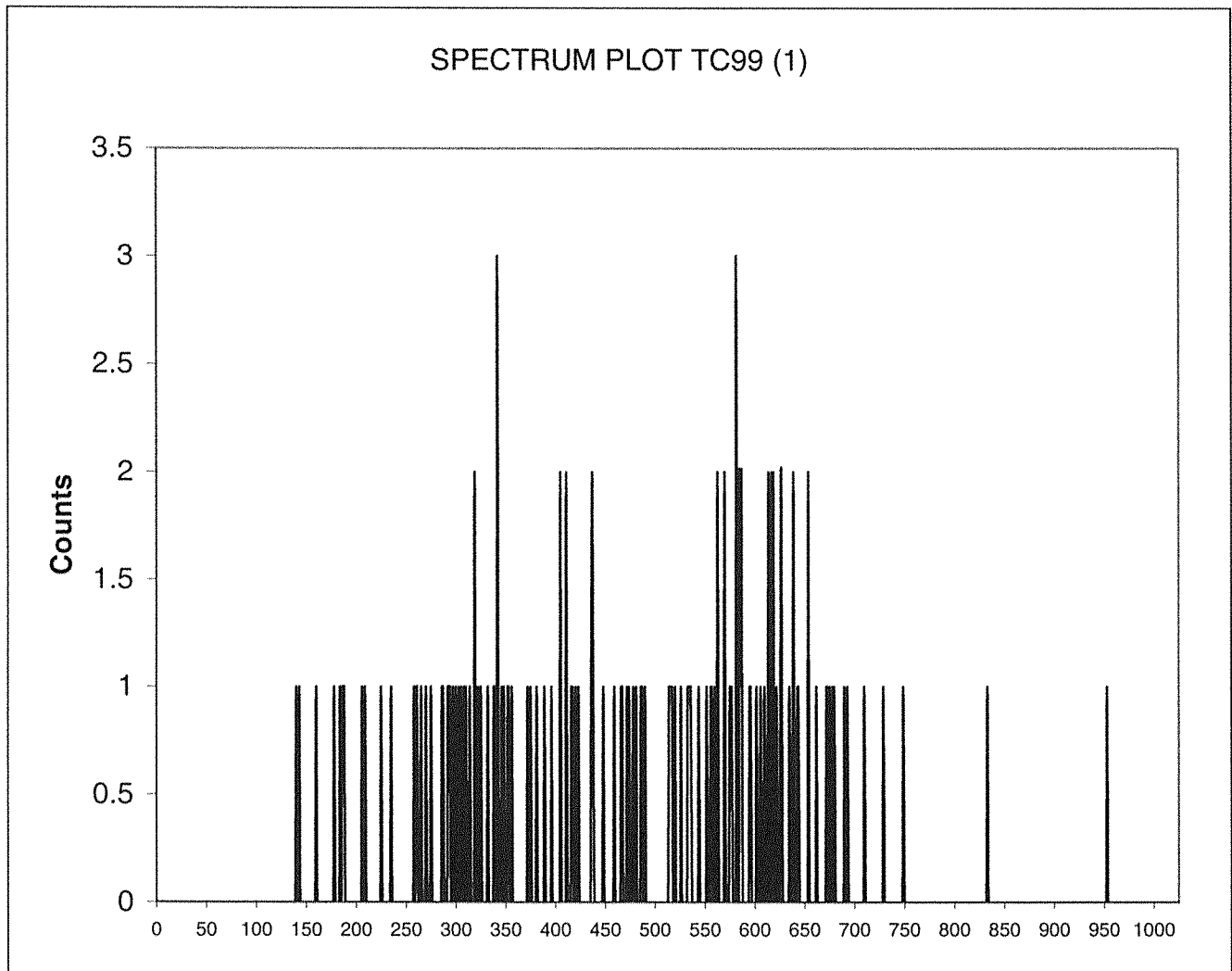
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35	0

Instrument Type: Quantulus
Data Capture Date: TUE 20 SEP 2016 5:29
FileName: M:\LSC\FILES\pink\597417A0\SQ032301N.001.xls
File Info: M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 3, 405235062, 25.01237:
Quench: 708.3
Start, End, X-Axis: 200-600

Channel Counts



31 0
32 0
33 0
34 0
35 0

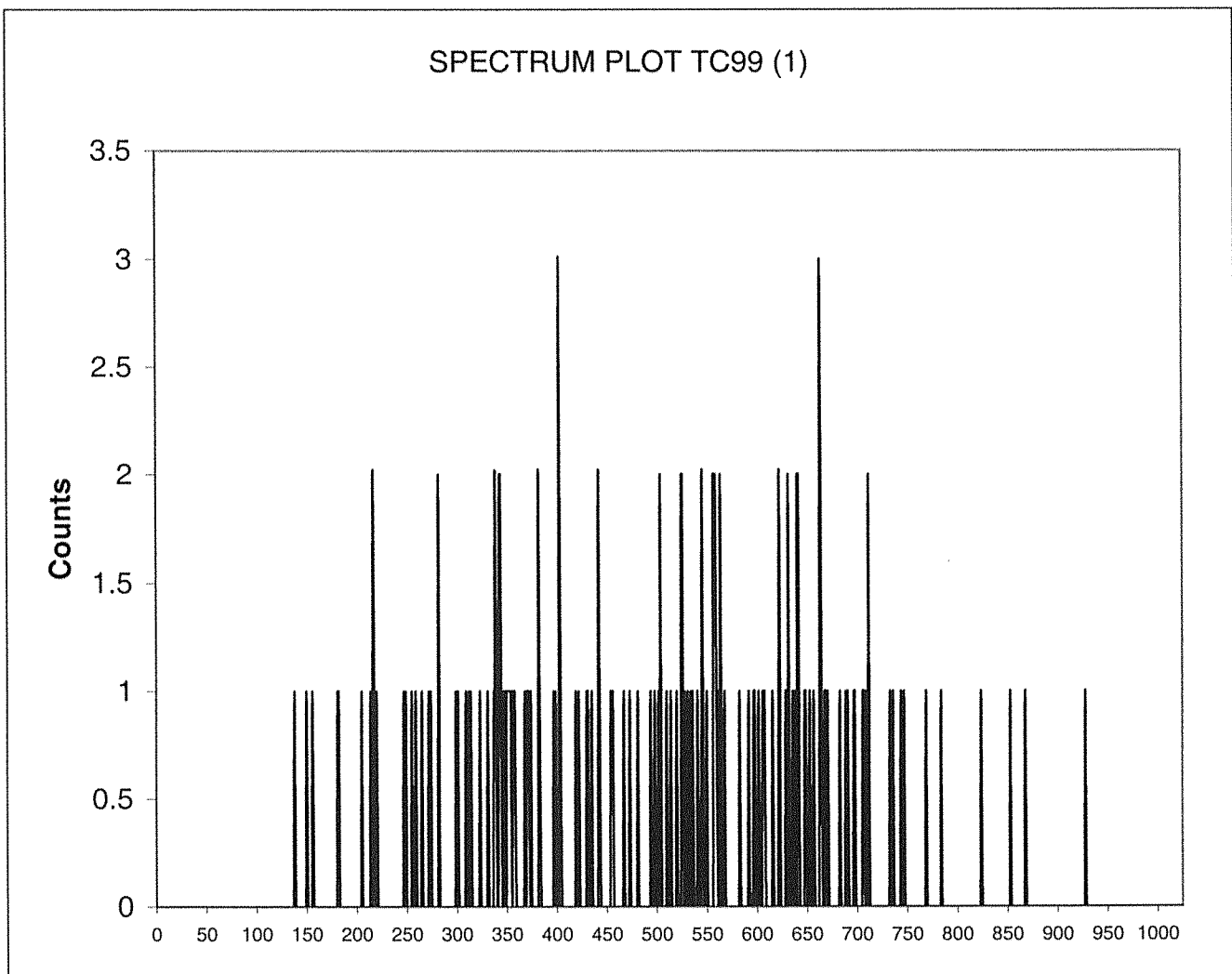
Instrument Type:
Data Capture Date:
FileName:
File Info:

Quantulus
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M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 4, 405235063, 25.01237:
Quench: 744.19
Start, End, X-Axis 200-600

Channel Counts



31 0
32 0
33 0
34 0
35 0

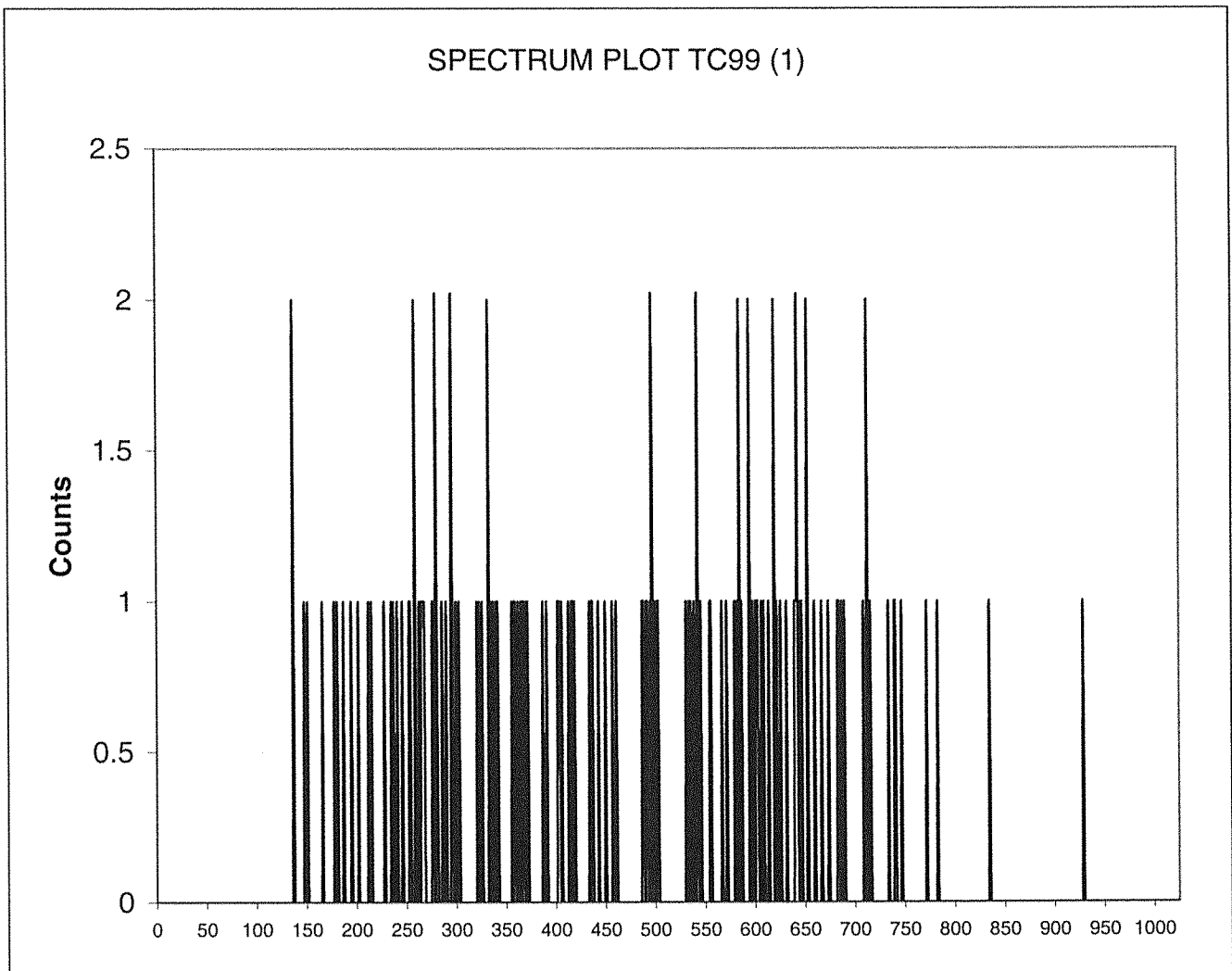
Instrument Type:
Data Capture Date:
FileName:
File Info:

Quantulus
TUE 20 SEP 2016 5:29
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M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 5, 405235064, 25.01237:
Quench: 743.23
Start, End, X-Axis 200-600

Channel Counts



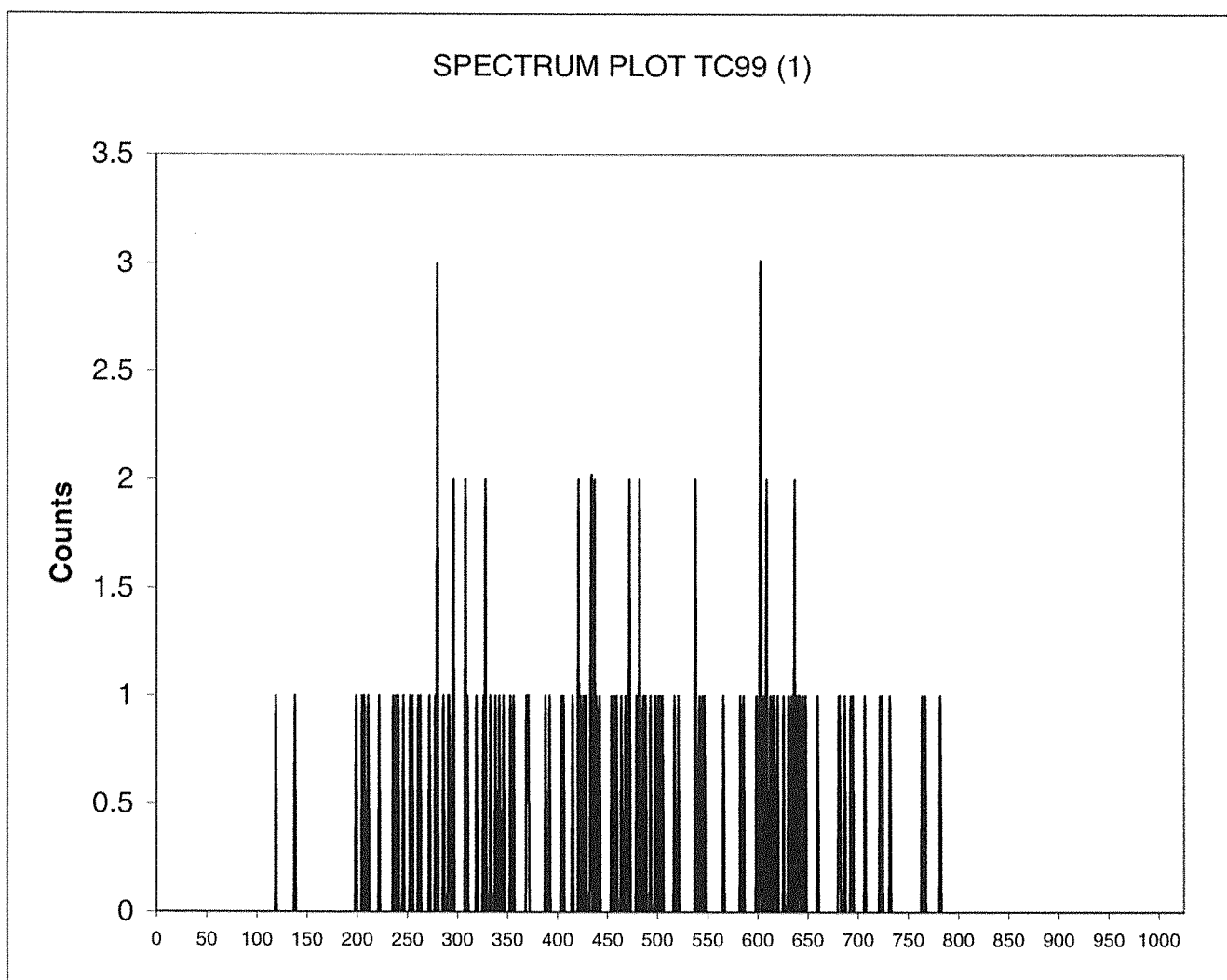
31 0
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33 0
34 0
35 0

Instrument Type: Quantulus
Data Capture Date: TUE 20 SEP 2016 5:29
FileName: M:\LSC\FILES\pink\597417A0\SQ062601N.001.xls
File Info: M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 6, 405235065, 25.01237:
Quench: 738.75
Start, End, X-Axis: 200-600

Channel Counts



31 0
32 0
33 0
34 0
35 0

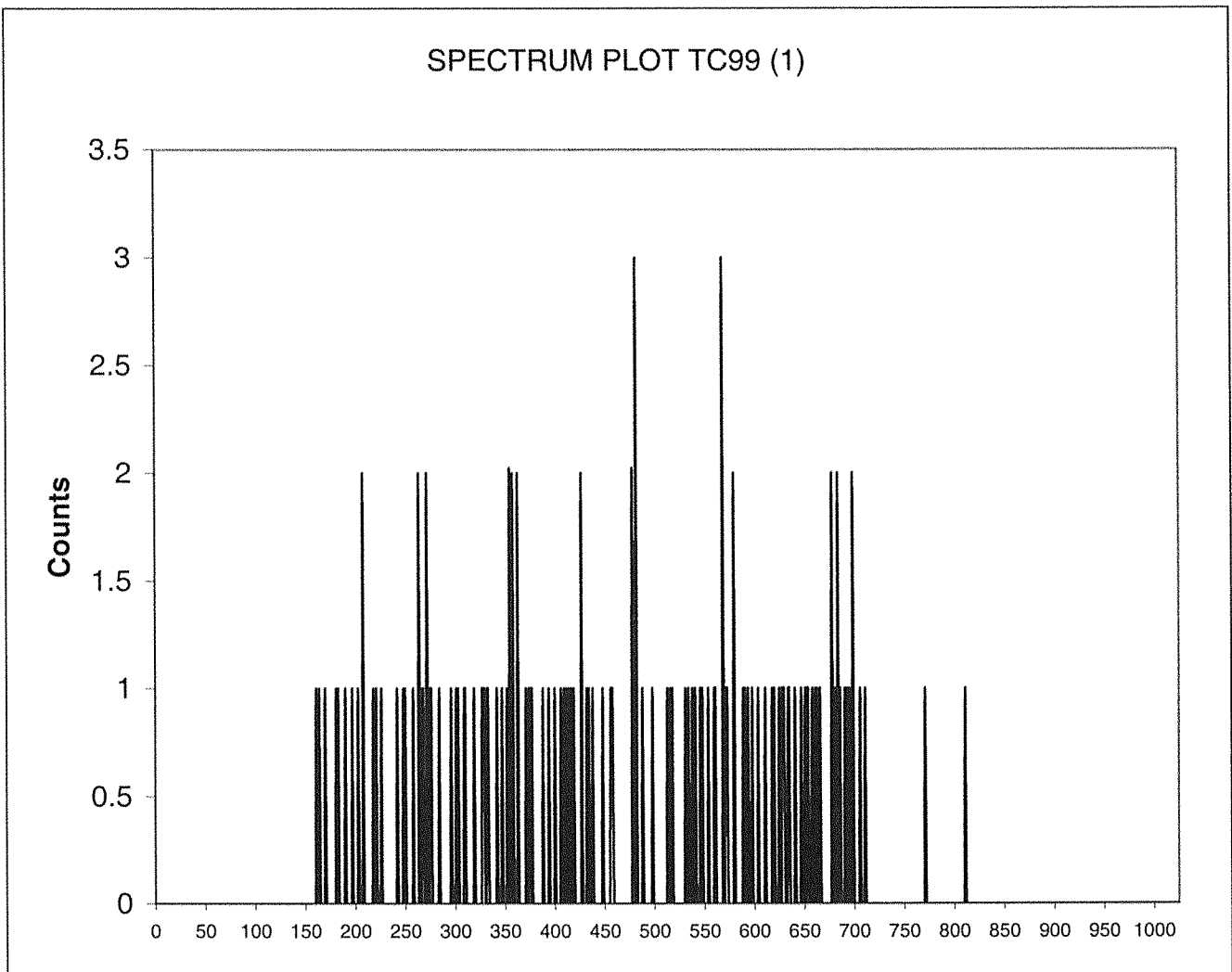
Instrument Type:
Data Capture Date:
FileName:
File Info:

Quantulus
TUE 20 SEP 2016 5:29
M:\LSC\FILES\pink\597417A0\SQ072701N.001.xls
M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 7, 405235066, 25.01237:
Quench: 736.91
Start, End, X-Axis 200-600

Channel Counts



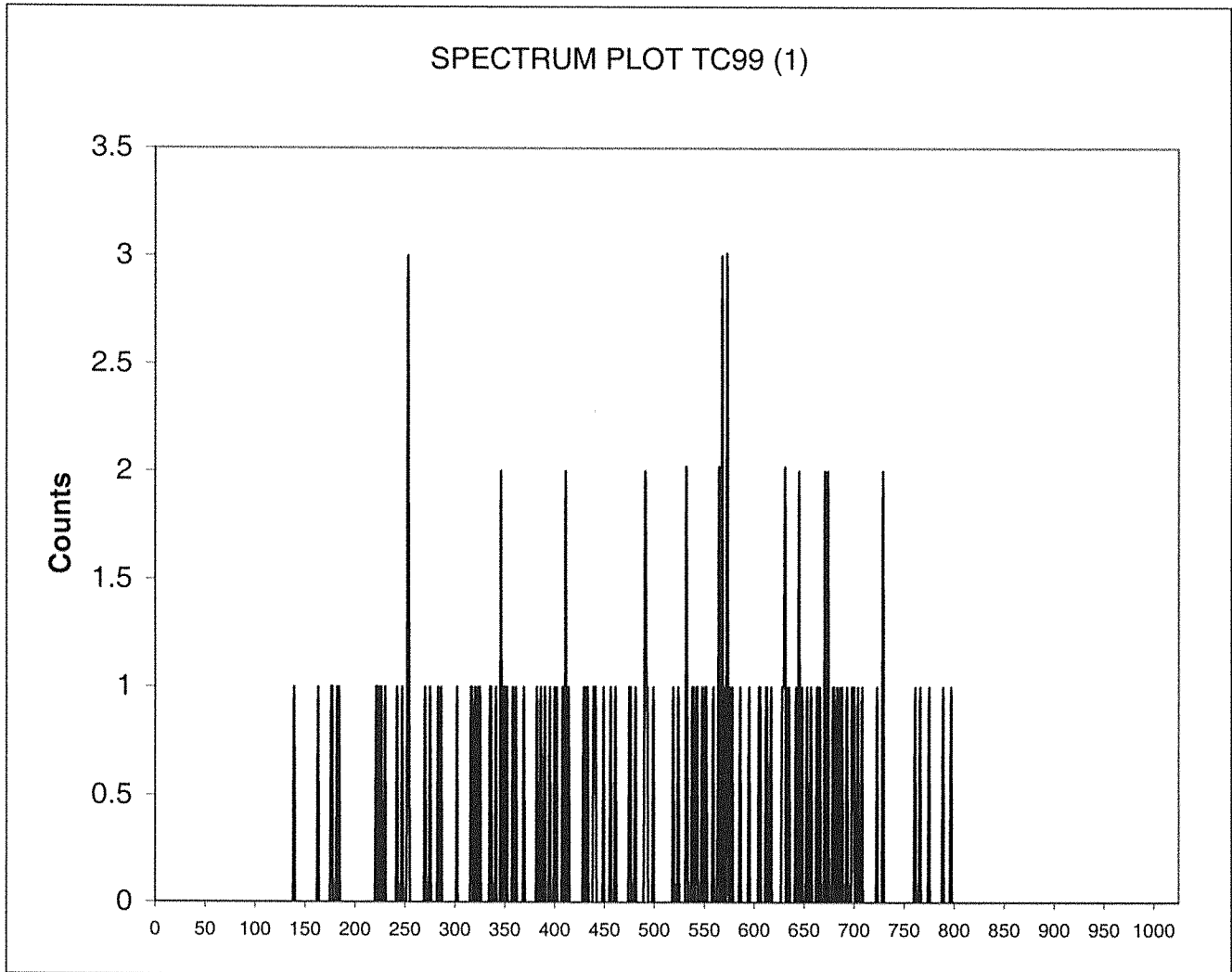
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32	0
33	0
34	0
35	0

Instrument Type: Quantulus
Data Capture Date: TUE 20 SEP 2016 5:29
FileName: M:\LSC\FILES\pink\597417A0\SQ082801N.001.xls
File Info: M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 8, 405235067, 25.01235:
Quench: 740.76
Start, End, X-Axis: 200-600

Channel Counts



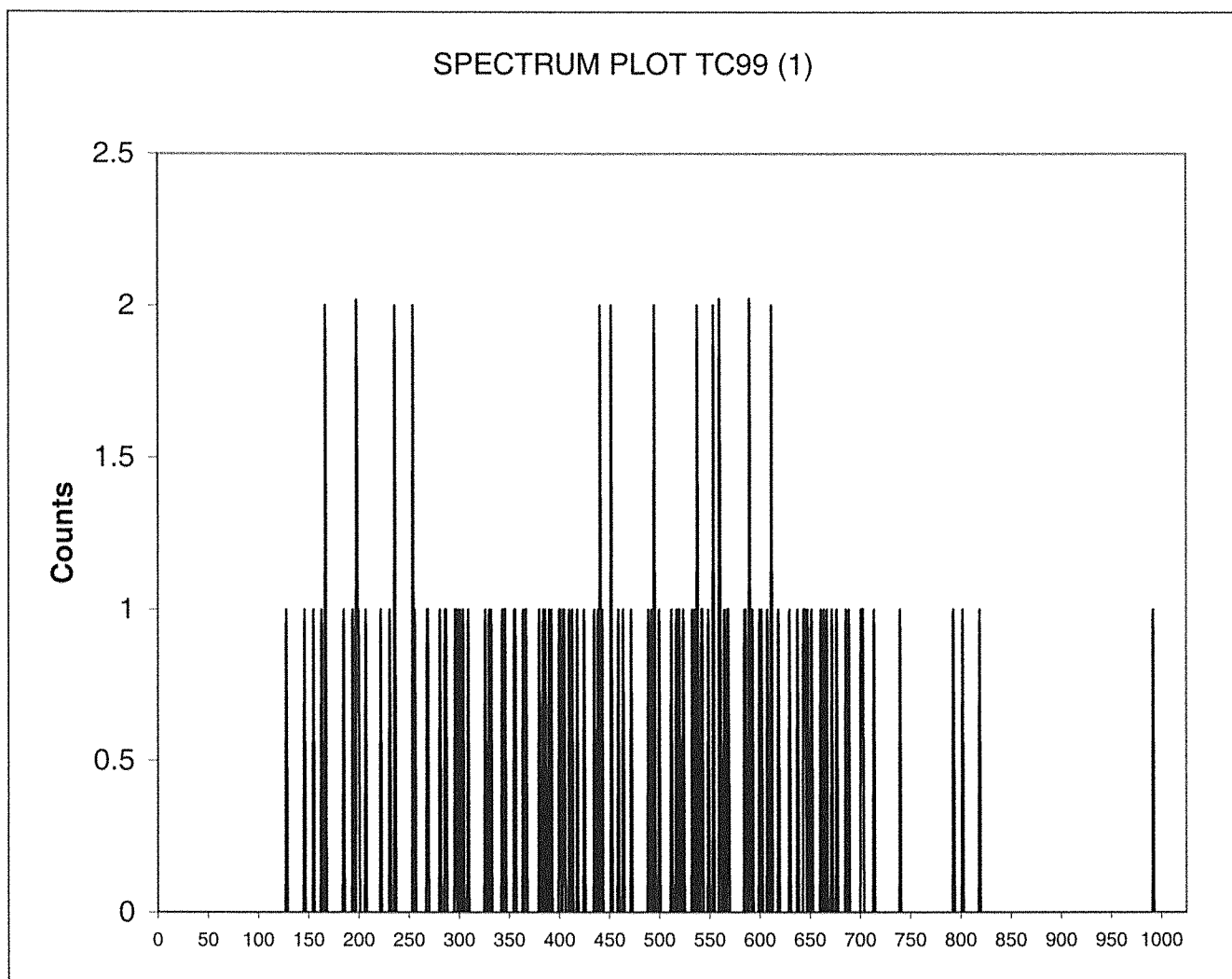
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32 0
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35 0

Instrument Type: Quantulus
Data Capture Date: TUE 20 SEP 2016 5:29
FileName: M:\LSC\FILES\pink\597417A0\SQ092901N.001.xls
File Info: M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 9, 405235068, 25.01235:
Quench: 724.32
Start, End, X-Axis: 200-600

Channel Counts



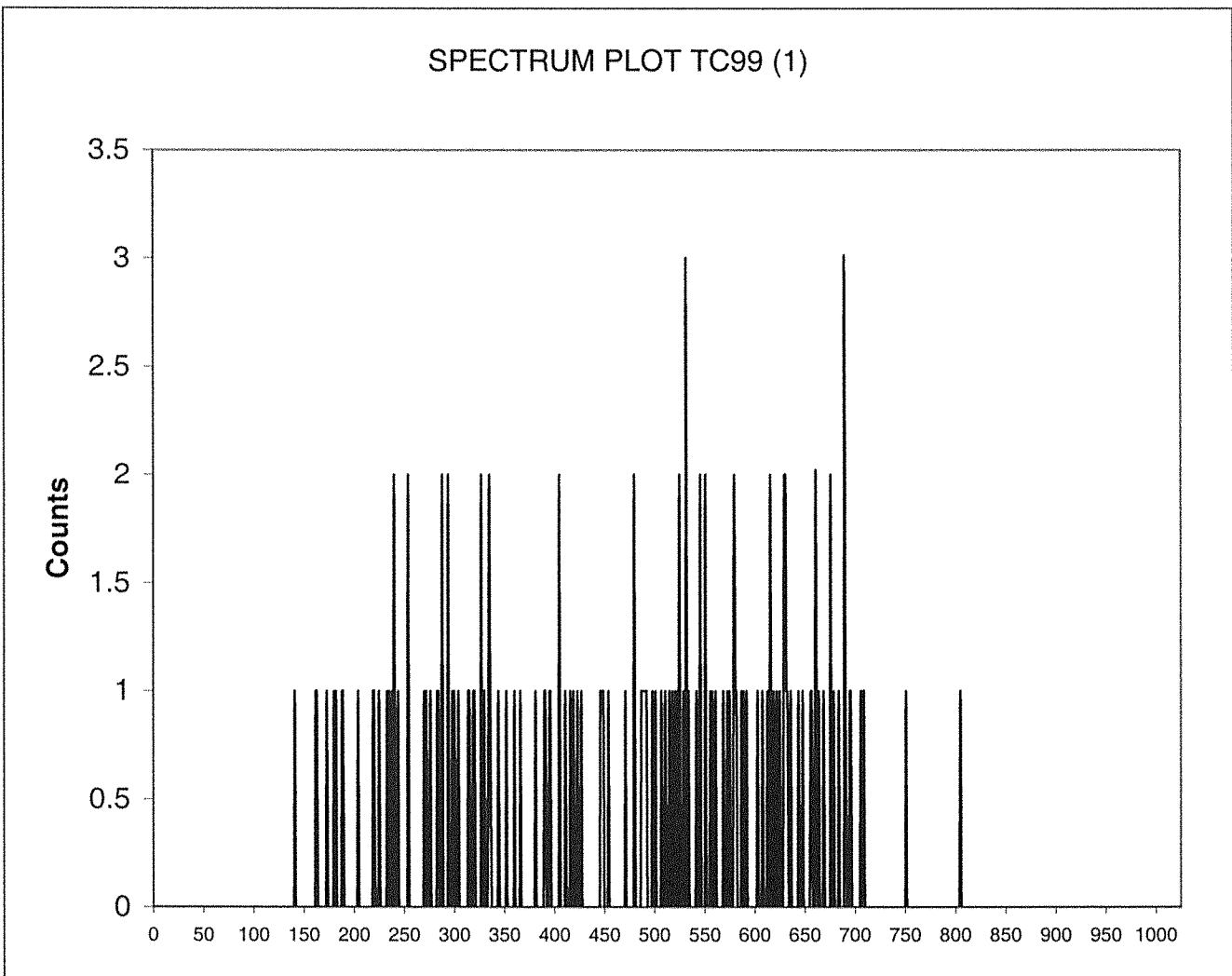
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32	0
33	0
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35	0

Instrument Type: Quantulus
Data Capture Date: TUE 20 SEP 2016 5:29
FileName: M:\LSC\FILES\pink\597417A0\SQ103001N.001.xls
File Info: M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 10, 405235069, 25.01235:
Quench: 745.26
Start, End, X-Axis: 200-600

Channel Counts



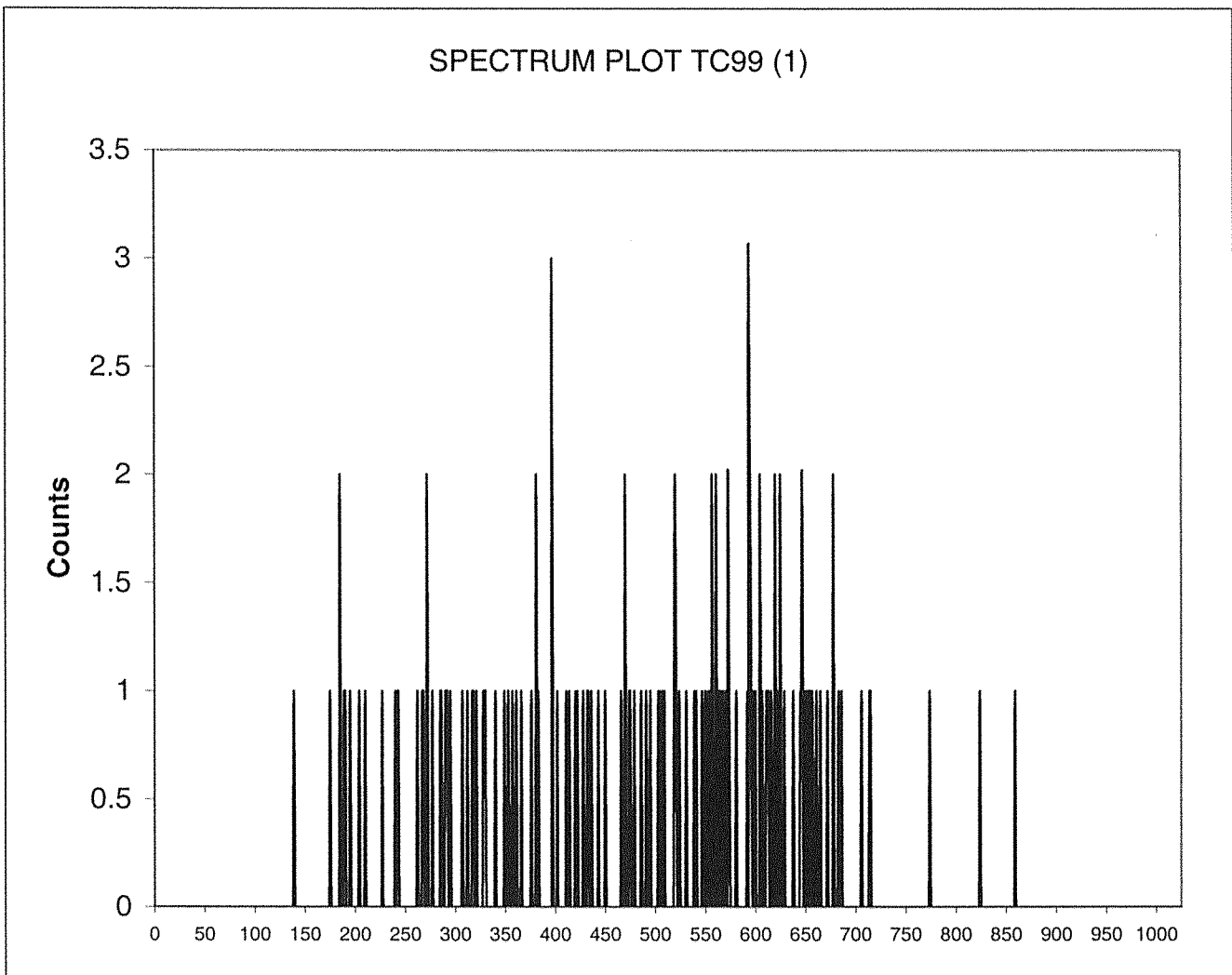
31 0
32 0
33 0
34 0
35 0

Instrument Type: Quantulus
Data Capture Date: TUE 20 SEP 2016 5:29
FileName: M:\LSC\FILES\pink\597417A0\SQ113101N.001.xls
File Info: M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 11, 405235070, 25.01235:
Quench: 712.84
Start, End, X-Axis: 200-600

Channel Counts



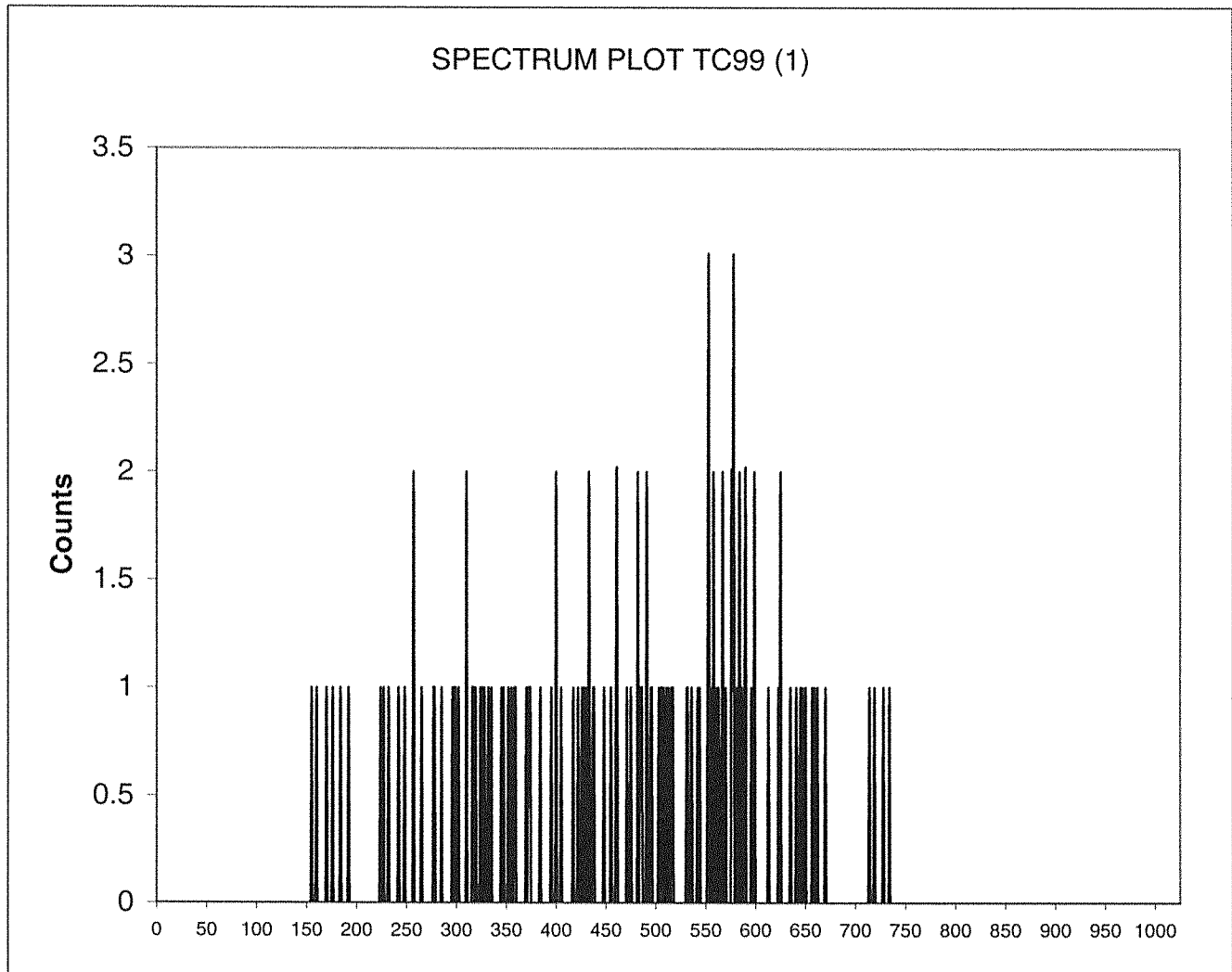
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32	0
33	0
34	0
35	0

Instrument Type: Quantulus
Data Capture Date: TUE 20 SEP 2016 5:29
FileName: M:\LSC\FILES\pink\597417A0\SQ123201N.001.xls
File Info: M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 12, 405235071, 25.01235:
Quench: 696.37
Start, End, X-Axis 200-600

Channel Counts



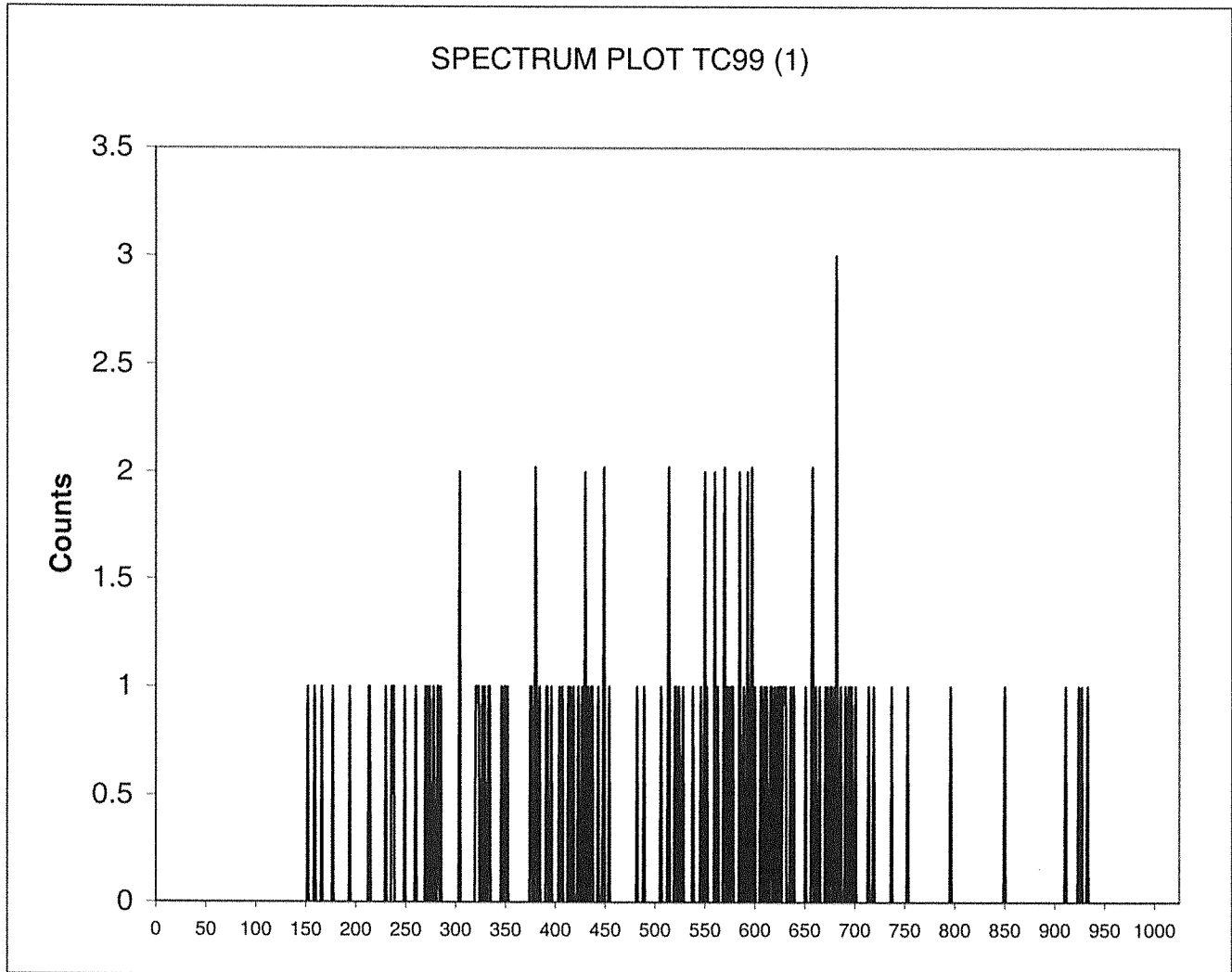
31 0
32 0
33 0
34 0
35 0

Instrument Type: Quantulus
Data Capture Date: TUE 20 SEP 2016 5:29
FileName: M:\LSC\FILES\pink\597417A0\SQ133301N.001.xls
File Info: M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 13, 405235072, 25.01235:
Quench: 747.39
Start, End, X-Axis: 200-600

Channel Counts



31 0
32 0
33 0
34 0
35 0

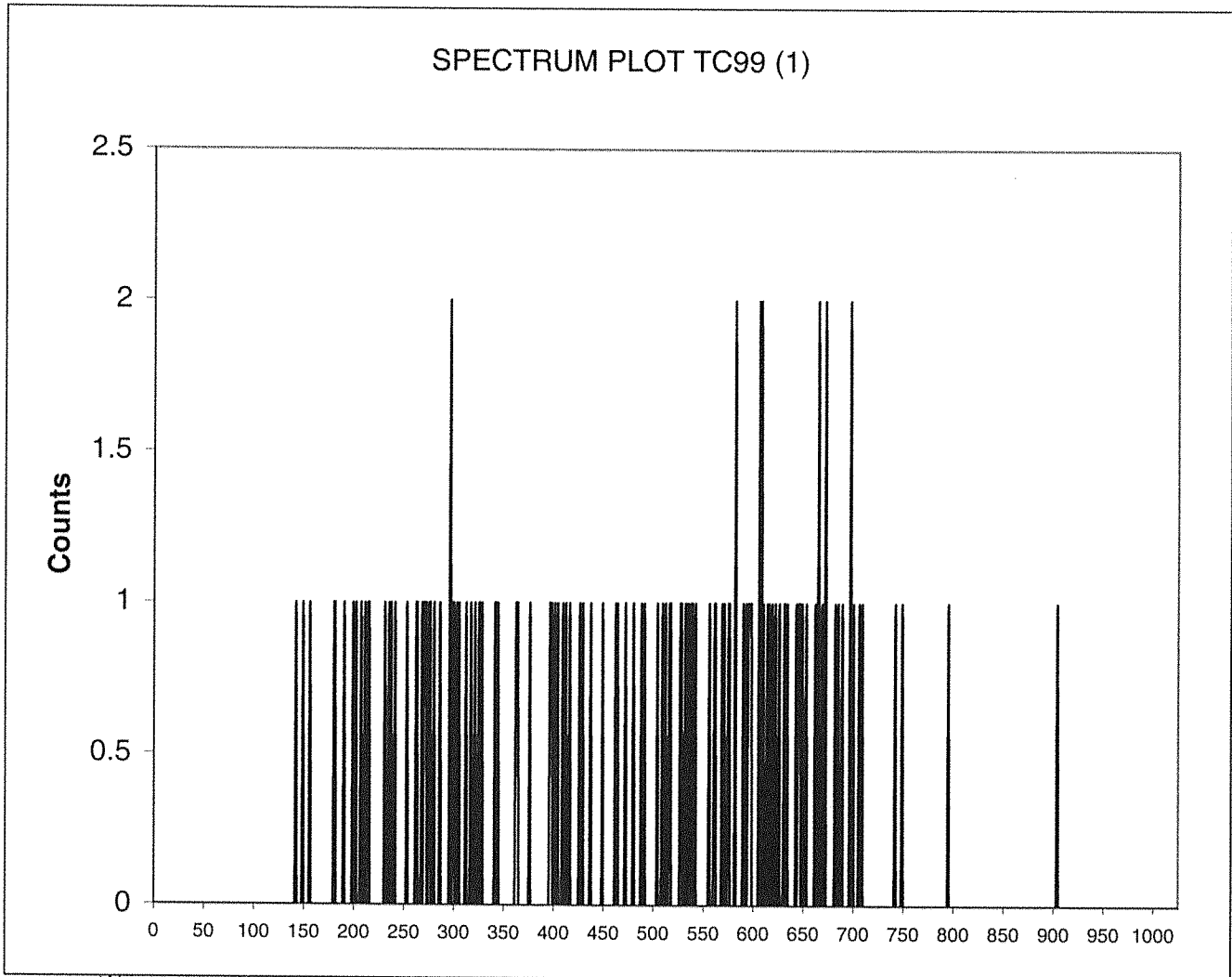
Instrument Type:
Data Capture Date:
FileName:
File Info:

Quantulus
TUE 20 SEP 2016 5:29
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M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 14, 405235073, 25.01233:
Quench: 729.05
Start, End, X-Axis 200-600

Channel Counts



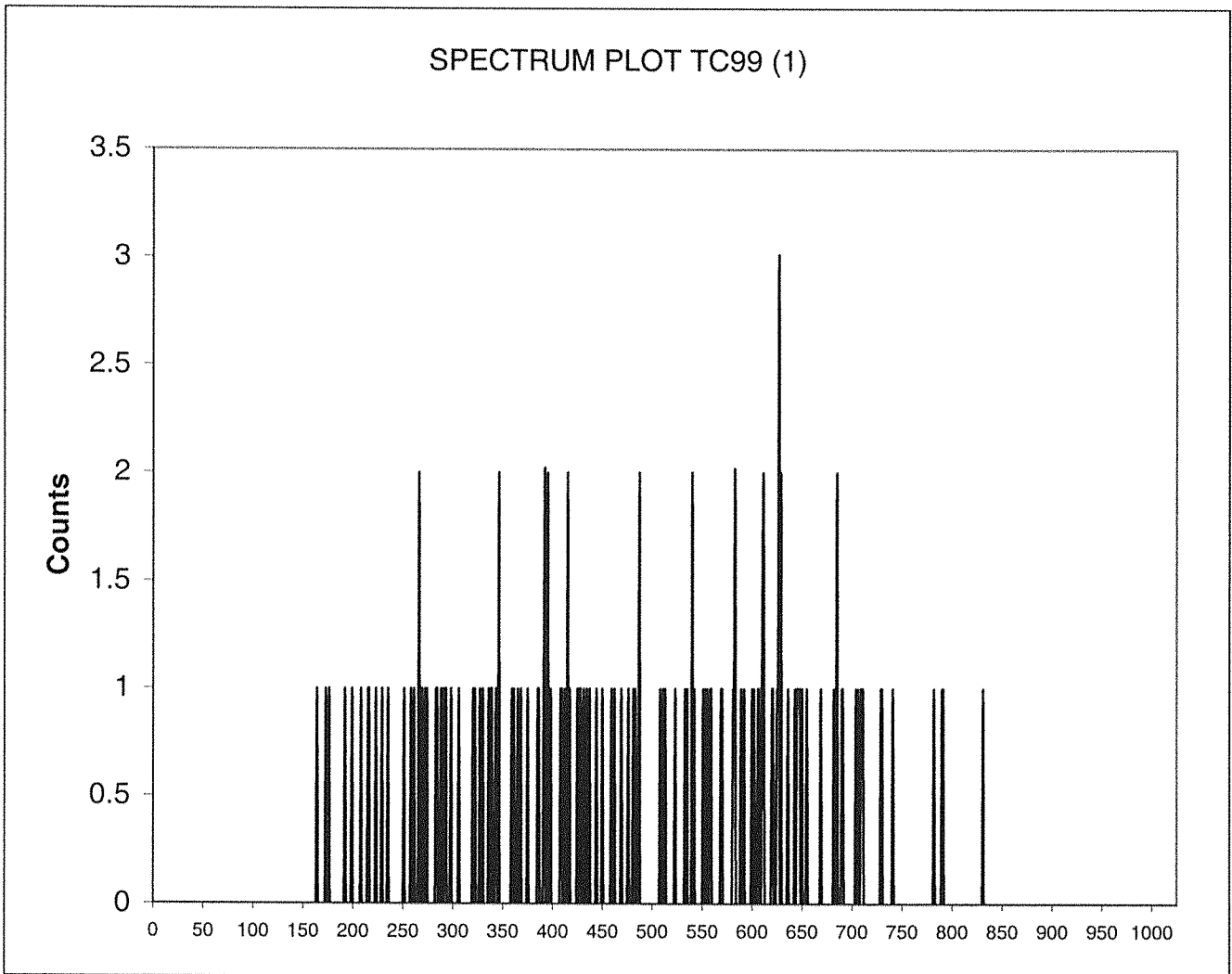
31 0
32 0
33 0
34 0
35 0

Instrument Type: Quantulus
Data Capture Date: TUE 20 SEP 2016 5:29
FileName: M:\LSC\FILES\pink\597417A0\SQ153501N.001.xls
File Info: M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 15, 405235074, 25.01233:
Quench: 744.62
Start, End, X-Axis: 200-600

Channel Counts



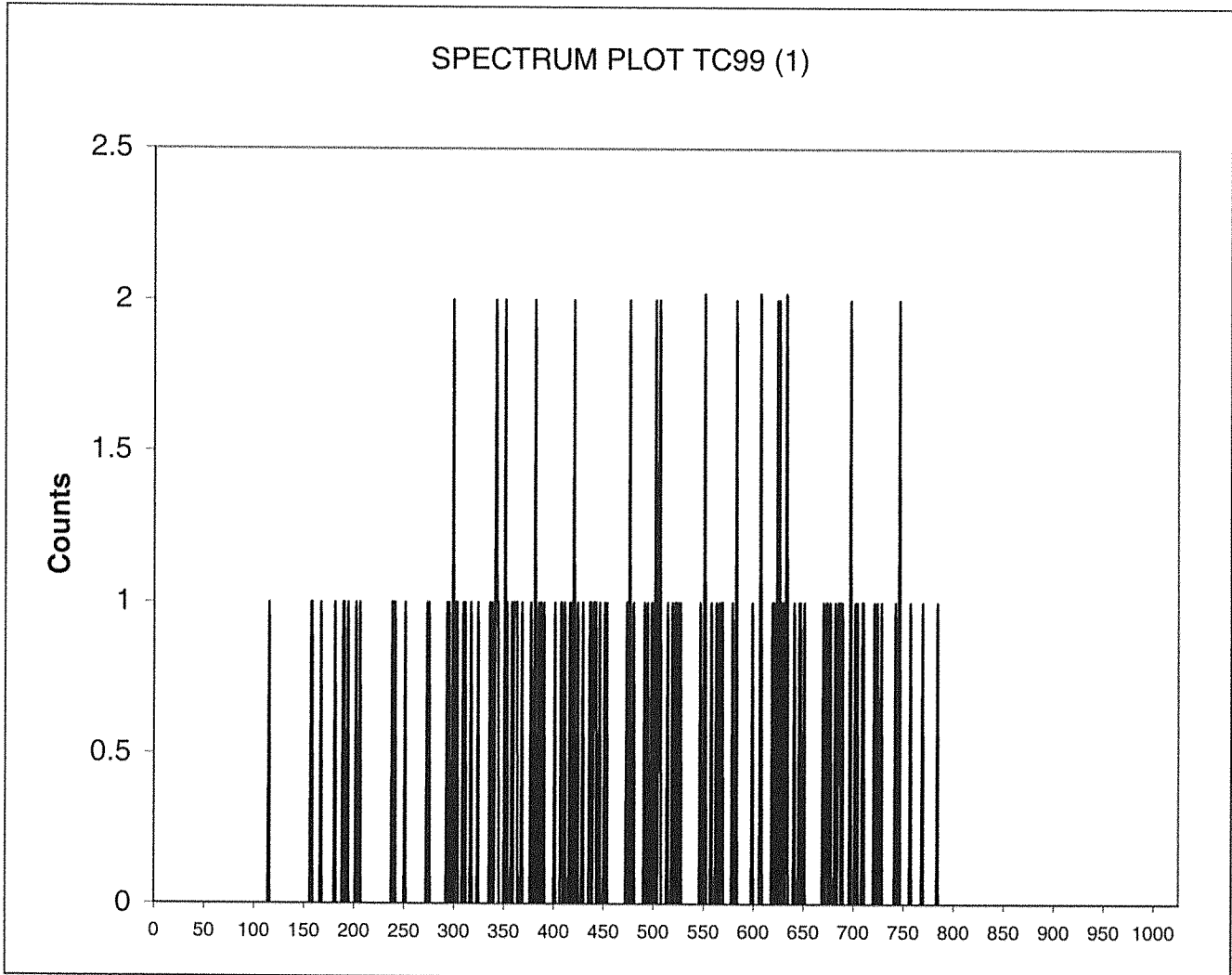
31 0
32 0
33 0
34 0
35 0

Instrument Type: Quantulus
Data Capture Date: TUE 20 SEP 2016 5:29
FileName: M:\LSC\FILES\pink\597417A0\SQ163601N.001.xls
File Info: M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 16, 405235075, 25.01233:
Quench: 749.76
Start, End, X-Axis 200-600

Channel Counts



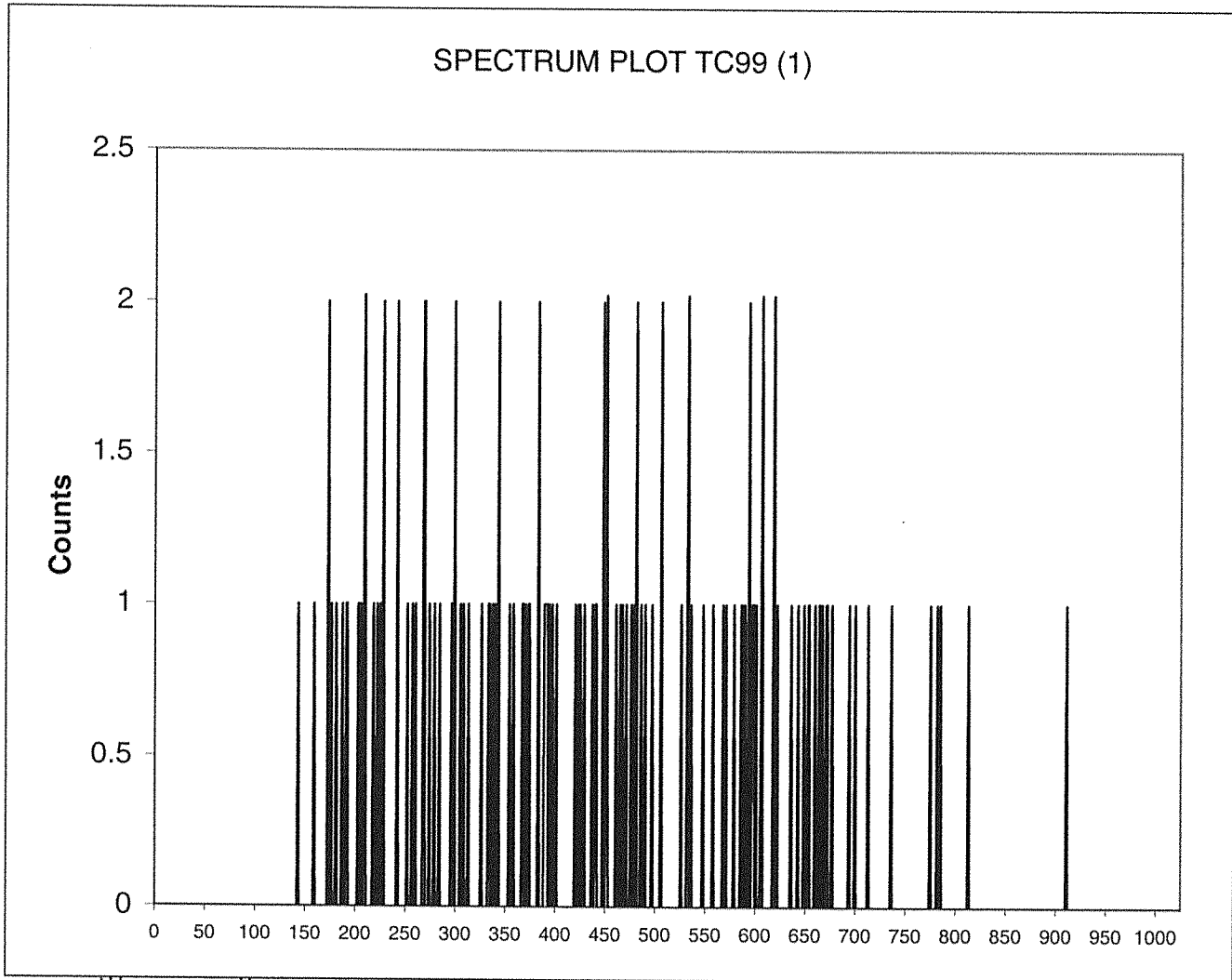
31	0
32	0
33	0
34	0
35	0

Instrument Type: Quantulus
Data Capture Date: TUE 20 SEP 2016 5:29
FileName: M:\LSC\FILES\pink\597417A0\SQ173701N.001.xls
File Info: M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 17, 405235076, 25.01233:
Quench: 718.12
Start, End, X-Axis 200-600

Channel Counts



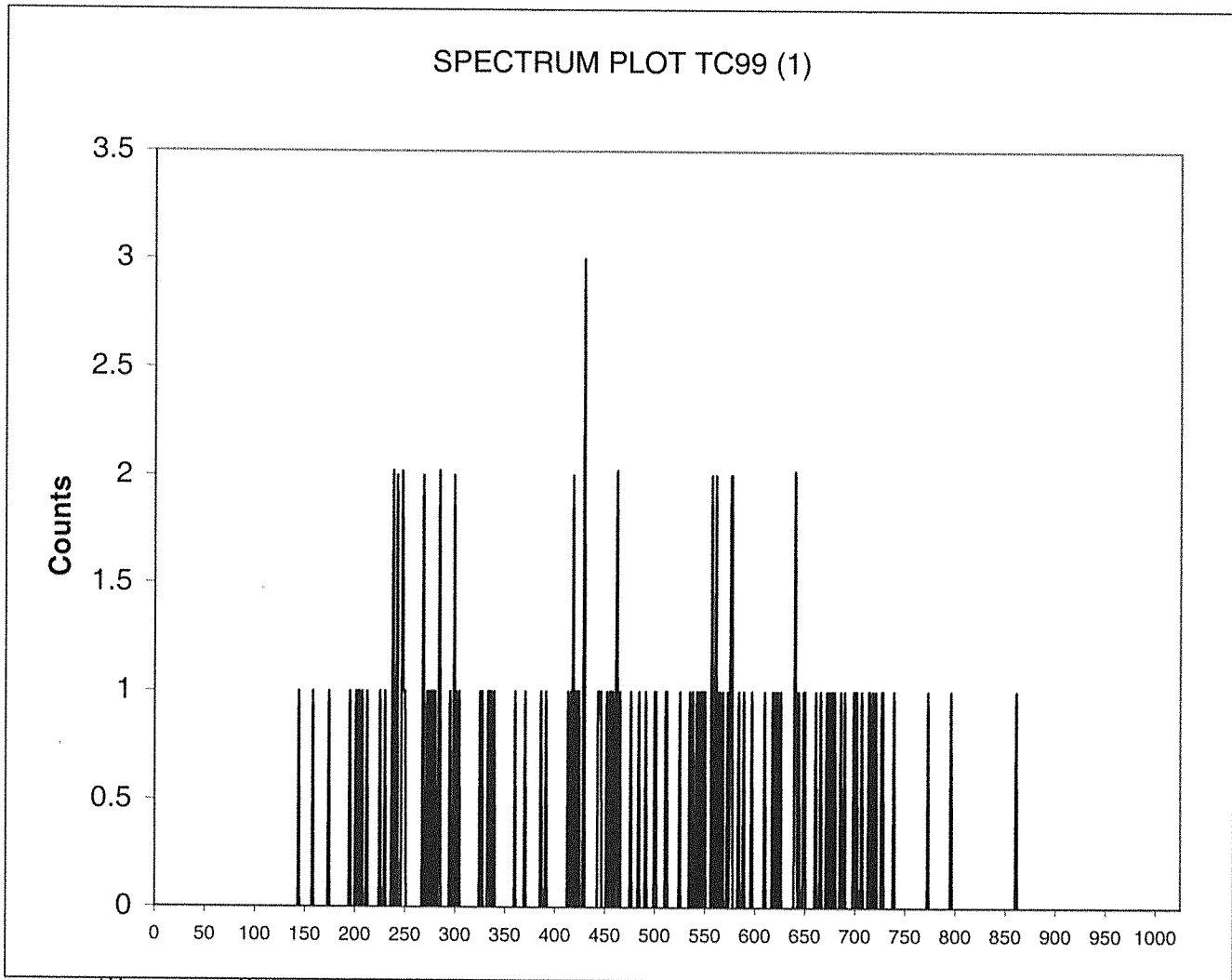
31 0
32 0
33 0
34 0
35 0

Instrument Type: Quantulus
Data Capture Date: TUE 20 SEP 2016 5:29
FileName: M:\LSC\FILES\pink\597417A0\SQ183801N.001.xls
File Info: M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 18, 405235077, 25.01233:
Quench: 759.17
Start, End, X-Axis 200-600

Channel Counts



31 0
32 0
33 0
34 0
35 0

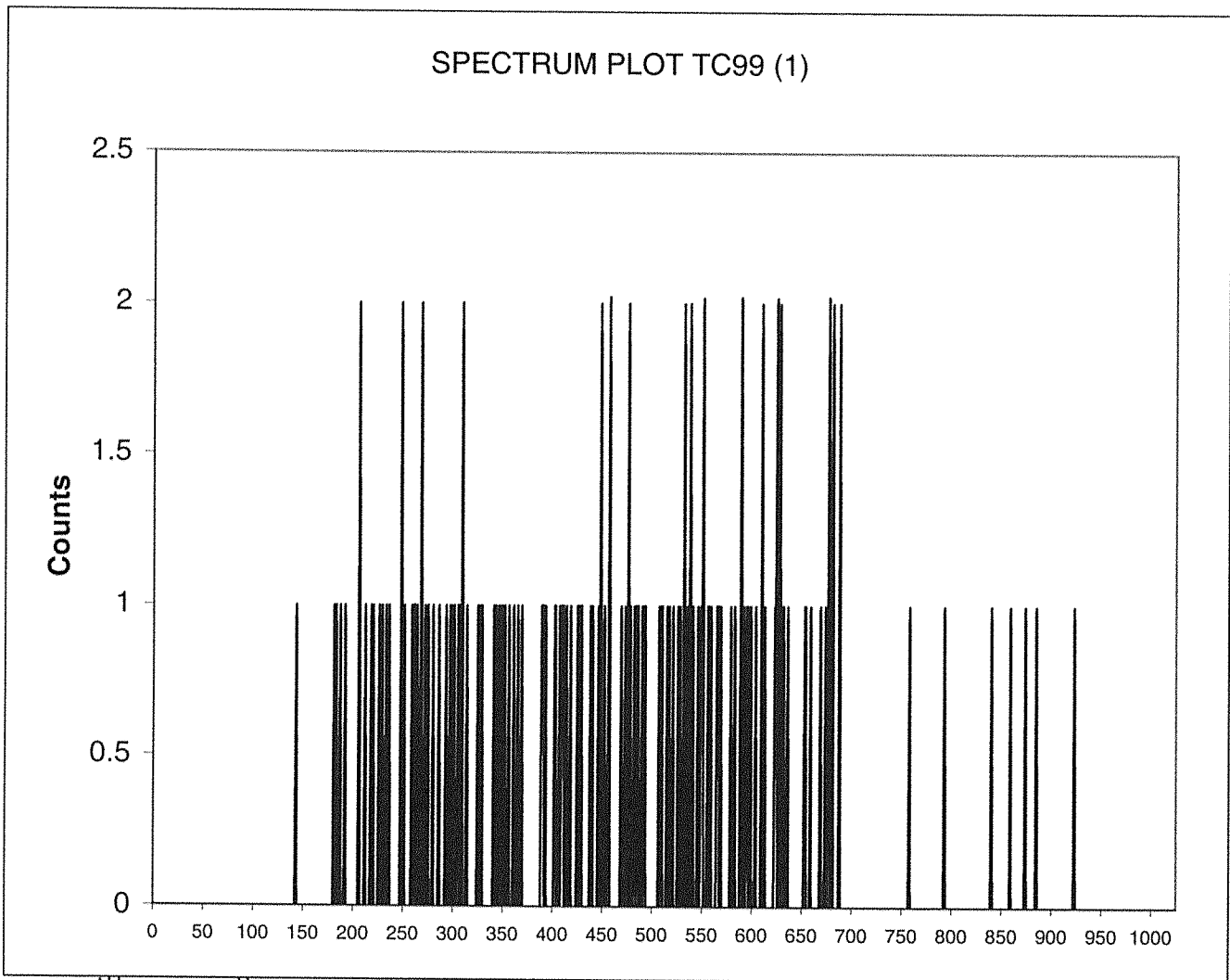
Instrument Type:
Data Capture Date:
FileName:
File Info:

Quantulus
TUE 20 SEP 2016 5:29
M:\LSC\FILES\pink\597417A0\SQ193901N.001.xls
M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 19, 405235078, 25.01232:
Quench: 720.72
Start, End, X-Axis 200-600

Channel Counts



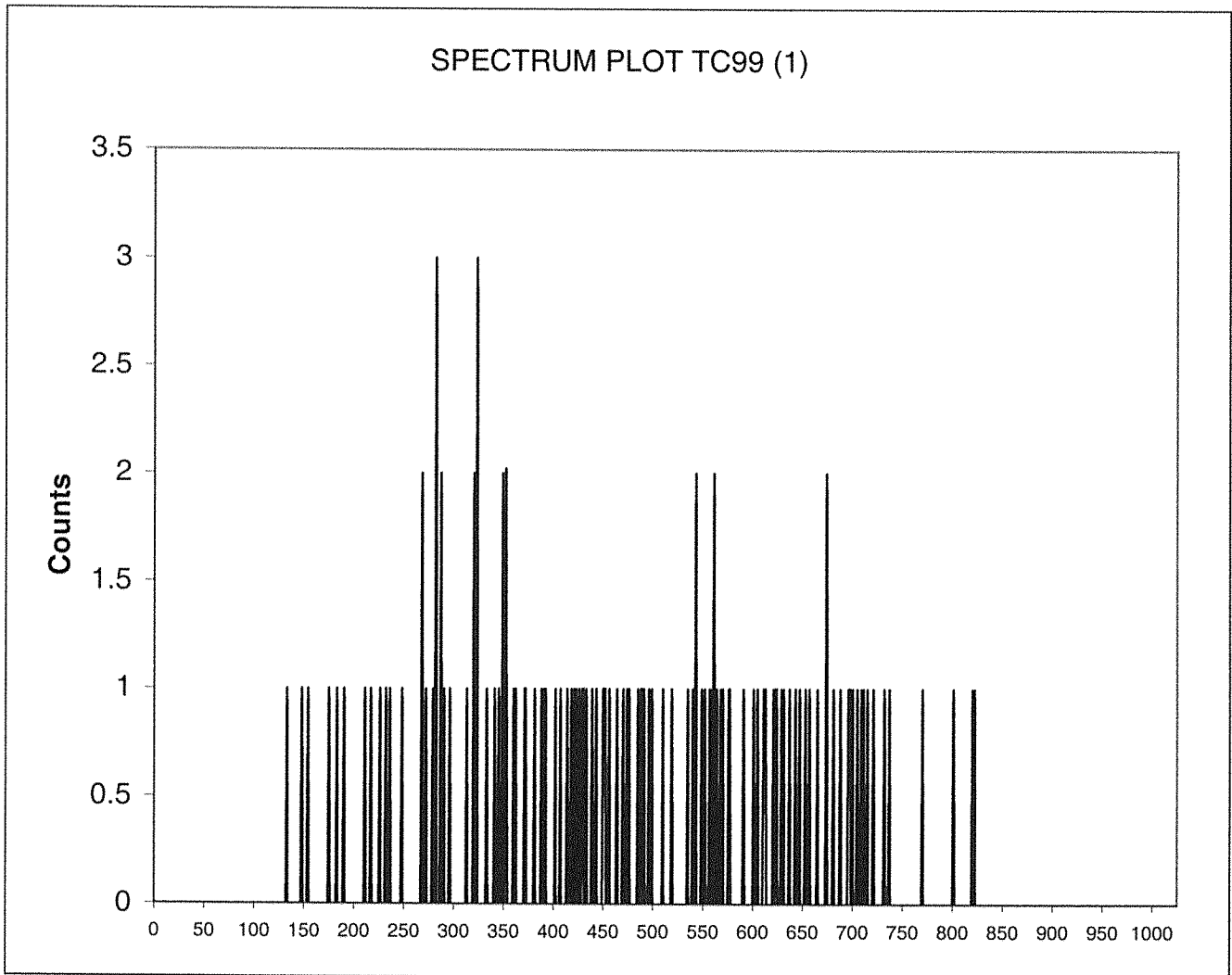
31 0
32 0
33 0
34 0
35 0

Instrument Type: Quantulus
Data Capture Date: TUE 20 SEP 2016 5:29
FileName: M:\LSC\FILES\pink\597417A0\SQ204001N.001.xls
File Info: M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 20, 1203624311, 25.01232:
Quench: 748.33
Start, End, X-Axis 200-600

Channel Counts



31	0
32	0
33	0
34	0
35	0

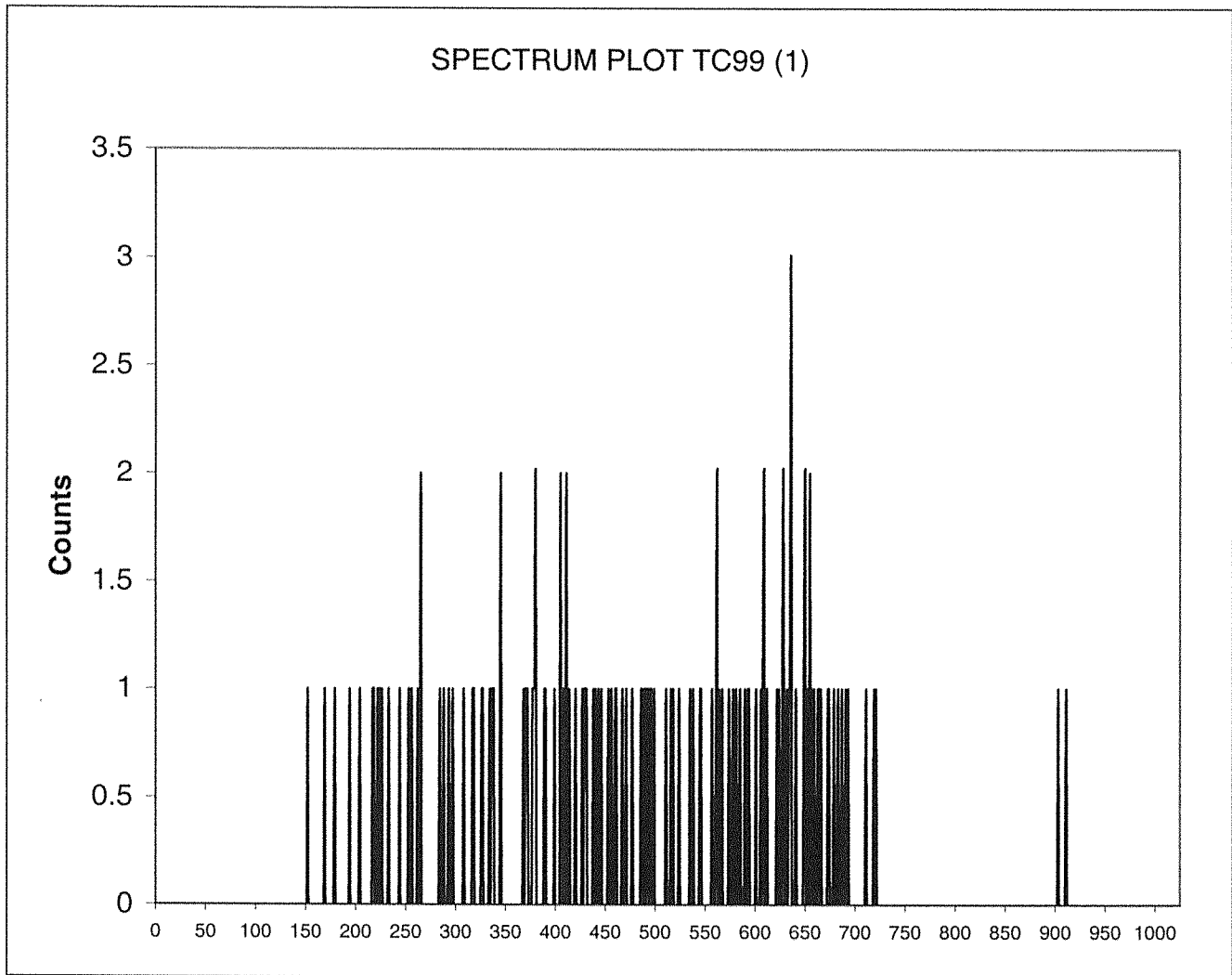
Instrument Type:
Data Capture Date:
FileName:
File Info:

Quantulus
TUE 20 SEP 2016 5:29
M:\LSC\FILES\pink\597417A0\SQ214101N.001.xls
M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 21, 1203624312, 25.01232:
Quench: 716.05
Start, End, X-Axis 200-600

Channel Counts



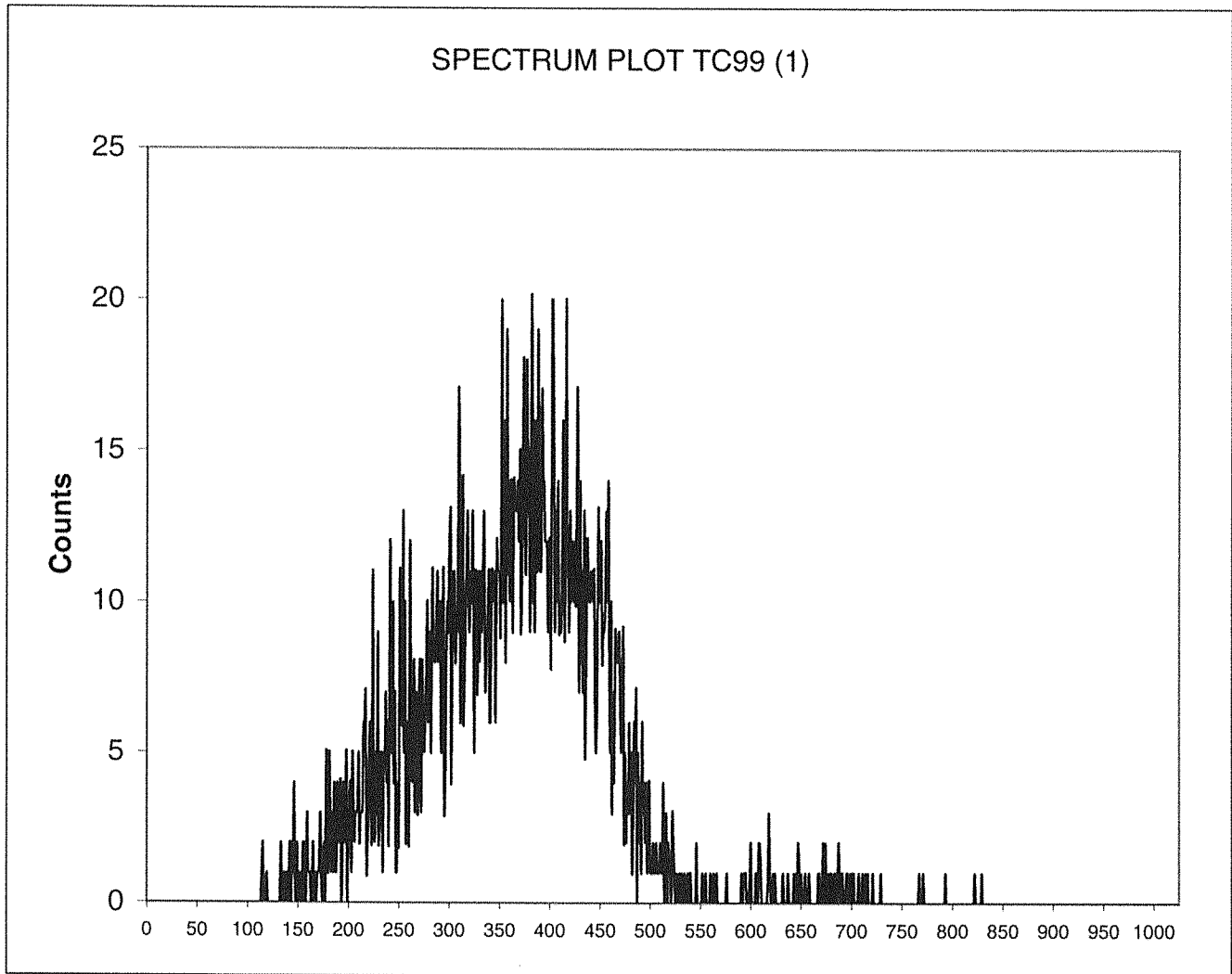
31 0
32 0
33 0
34 0
35 0

Instrument Type: Quantulus
Data Capture Date: TUE 20 SEP 2016 5:29
FileName: M:\LSC\FILES\pink\597417A0\SQ224201N.001.xls
File Info: M:\LSC\FILES\pink\597417A0\U597417A0.xls

ID: TC99 (1)
Comments: PINK

Sample, Rack-Pos, Time: 22, 1203624313, 25.01232:
Quench: 753.4
Start, End, X-Axis 200-600

Channel Counts



Batch# 1597414 Product: TSS Date: 9/21/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	see DER 1559848
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER 1559848
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER 1559848
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: 

Secondary Review Performed By: 

MSWC
10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 21-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LSC	Test / Method: DOE EML HASL-300, Tc-02-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1597414	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060 and 1203624305 were received and analyzed out of the method specified hold time.</p>		<p>1. Reporting results.</p>	

Originator's Name:
Elizabeth Krouse 21-SEP-16

Data Validator/Group Leader:
Lyndsey Pace 21-SEP-16

MSWC 10/4/14

Prep Logbook

*90, 15

The Determination of Technetium-99 Using Analytical Grade 1X8 Resin

Batch ID: 1597414

Analyst: Christina Sanchez

Method: DOE ML HASL-300, Tc-02-RC Modified

Lab SOP: GL-RAD-A-059 REV# 4

Instrument: BAL-16107662

Type: LCS Sample ID: 1203624306 Description: Technetium-99 SPIKE Serial Number: 1621-B Spike Amount: .1 Spike Units: mL

Sample ID	Prep Date	Matrix	Dry or Wet	Unadjusted Aliquot (g)	Aliquot (g)
405235041	15-SEP-2016 12:28:40	Soil	W	1.209	1.064
405235042	15-SEP-2016 12:28:40	Soil	W	1.257	1.119
405235043	15-SEP-2016 12:28:40	Soil	W	1.28	1.094
405235044	15-SEP-2016 12:28:40	Soil	W	1.244	0.936
405235045	15-SEP-2016 12:28:40	Soil	W	1.298	1.008
405235046	15-SEP-2016 12:28:40	Soil	W	1.224	0.996
405235047	15-SEP-2016 12:28:40	Soil	W	1.301	1.032
405235048	15-SEP-2016 12:28:40	Soil	W	1.222	0.942
405235049	15-SEP-2016 12:28:40	Soil	W	1.212	0.984
405235050	15-SEP-2016 12:28:40	Soil	W	1.282	1.14
405235051	15-SEP-2016 12:28:40	Soil	W	1.23	1.013
405235052	15-SEP-2016 12:28:40	Soil	W	1.215	1.027
405235053	15-SEP-2016 12:28:40	Soil	W	1.211	0.843
405235054	15-SEP-2016 12:28:40	Soil	W	1.205	0.986
405235055	15-SEP-2016 12:28:40	Soil	W	1.254	1.012
405235056	15-SEP-2016 12:28:40	Soil	W	1.218	0.83
405235057	15-SEP-2016 12:28:40	Soil	W	1.229	0.895
405235058	15-SEP-2016 12:28:40	Soil	W	1.296	1.039
405235059	15-SEP-2016 12:28:40	Soil	W	1.265	1.113
405235060	15-SEP-2016 12:28:40	Soil	W	1.278	1.155
1203624304 MB	15-SEP-2016 12:28:40	Soil	W	1.155	1.155
1203624305 DUP (405235041)	15-SEP-2016 12:28:40	Soil	W	1.077	1.077
1203624306 LCS	15-SEP-2016 12:28:40	Soil	W	1.223	1.155

*

Comments:
Spike Pipet ID: RAD-LSC-2272418
Tracer Pipet ID: RAD-LSC-4099802

Reagent/Solvent Lot ID	Description	Amount
2280154.26	Hydrogen Peroxide 30% ACS Reagent	10 mL
2402130.4	120LBS 30 Gallons	15 mL
2418926	Ecoscint GL Scintillation Solution	.1 uL
2429641	Quenching Agent	100 mL
2441205	RL-0.1M Hydrochloric Acid	20 mL
2451825	RL-0.01M Nitric Acid	25 mL
TC2074-A	RL-0.1M Nitric Acid tracer	1 mL

Technetium-99 Solid

Tracer SN: TC2074-A
 Tracer Exp Date: 9/16/2016
 Tracer Volume Added: 1.00

Filename: TC99.XLS
 File type: Excel
 Version #: 1.2.16

Batch: 1597414
 Analyst: CHR02061
 Prep Date: 9/15/2016
 Tc-99 Method Uncertainty: 0.0576

Procedure Code: LSC99TCS
 Parname: Technetium-99
 Required MDA: 5 pCi/g
 Tc-99 Abundance: 1.00
 Half-life of Tc-99: 211100 years

Geometry: 15mL Ecosoint GL5mL DI H2O/AG 1x8 Resin

Pos.	Sampl Sample Characteristics			Tracer Calculations			Tracer Samp.			Tracer Aliquot		
	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G	Tracer Ref. Activity (CPM)	Tracer Ref. Uncertainty (%)	Tracer Samp. Activity (CPM)	Tracer Samp. Uncertainty (%)	Tracer Aliquot (mL)	Tracer Aliquot (mL)	Tracer Aliquot StDev. (mL)		
1	405235041.1	1.0640	3.3300E-03	30227	0.95%	29715	0.94%	1.0	0.002000			
2	405235042.1	1.1190	3.3357E-03	30227	0.95%	29324	0.95%	1.0	0.002000			
3	405235043.1	1.0940	3.3331E-03	30227	0.95%	28808	0.96%	1.0	0.002000			
4	405235044.1	0.9360	3.3167E-03	30227	0.95%	29111	0.95%	1.0	0.002000			
5	405235045.1	1.0080	3.3242E-03	30227	0.95%	29715	0.94%	1.0	0.002000			
6	405235046.1	0.9960	3.3229E-03	30227	0.95%	28745	0.96%	1.0	0.002000			
7	405235047.1	1.0320	3.3267E-03	30227	0.95%	27982	0.95%	1.0	0.002000			
8	405235048.1	0.9420	3.3179E-03	30227	0.95%	27907	0.95%	1.0	0.002000			
9	405235049.1	0.9840	3.3217E-03	30227	0.95%	28777	0.96%	1.0	0.002000			
10	405235050.1	1.1400	3.3379E-03	30227	0.95%	28810	0.94%	1.0	0.002000			
11	405235051.1	1.0130	3.3247E-03	30227	0.95%	28703	0.94%	1.0	0.002000			
12	405235052.1	1.0270	3.3261E-03	30227	0.95%	12790	0.98%	1.0	0.002000			
13	405235053.1	0.8430	3.3070E-03	30227	0.95%	29193	0.96%	1.0	0.002000			
14	405235054.1	0.9860	3.3219E-03	30227	0.95%	27995	0.96%	1.0	0.002000			
15	405235055.1	1.0120	3.3246E-03	30227	0.95%	27206	0.95%	1.0	0.002000			
16	405235056.1	0.8300	3.3056E-03	30227	0.95%	27262	0.94%	1.0	0.002000			
17	405235057.1	0.8950	3.3124E-03	30227	0.95%	28229	0.94%	1.0	0.002000			
18	405235058.1	1.0390	3.3274E-03	30227	0.95%	27987	0.96%	1.0	0.002000			
19	405235059.1	1.1130	3.3351E-03	30227	0.95%	28995	0.94%	1.0	0.002000			
20	405235060.1	1.1550	3.3395E-03	30227	0.95%	29103	0.94%	1.0	0.002000			
21	1203624304.1	1.1550	3.3395E-03	30227	0.95%	29543	0.95%	1.0	0.002000			
22	1203624305.1	1.0770	3.3314E-03	30227	0.95%	28833	0.95%	1.0	0.002000			
23	1203624306.1	1.1550	3.3395E-03	30227	0.95%	28270	0.96%	1.0	0.002000			

Pipet, 0.1 ml Stdev : +/- 0.0002000 ml
 Pipet, 0.5 ml Stdev : +/- 0.0010000 ml
 Pipet, 1 ml Stdev : +/- 0.0020000 ml

Analytical SOP: GL-RAD-A-059
 Instrument SOP: GL-RAD-I-004

Count raw Data										Calibration Data				Sample		Calculated		Background	
Pos.	Rack Position #	Counting Time (min.)	Quench#	Gross cpm	Bkg cpm	Bkg Count Time (min.)	Bkg Quench#	Corrected Bkg cpm	Count Start Date/Time	Sample Decay	Sample Recovery %	Sample Recovery Error %	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Background Count Start Date/Time	
1	19-2	15	167.9	14.73	14.29	90	170.6	14.3093	9/20/2016 13:38	1.000	98.3%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5575	0.00792	9/20/2016 10:33	
2	19-3	15	171.3	16.2	14.29	90	170.6	14.2848	9/20/2016 13:55	1.000	97.0%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5576	0.00792	9/20/2016 10:33	
3	19-4	15	176.8	16.27	14.29	90	170.6	14.2404	9/20/2016 14:11	1.000	95.3%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5570	0.00792	9/20/2016 10:33	
4	19-5	15	216.6	14.2	14.29	90	170.6	13.8653	9/20/2016 14:28	1.000	96.3%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5249	0.00792	9/20/2016 10:33	
5	19-6	15	199.6	14.27	14.29	90	170.6	14.0229	9/20/2016 14:44	1.000	98.3%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5445	0.00792	9/20/2016 10:33	
6	19-7	15	183.1	16.87	14.29	90	170.6	14.1842	9/20/2016 15:01	1.000	95.1%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5552	0.00792	9/20/2016 10:33	
7	19-8	15	174.1	14.8	14.29	90	170.6	14.2628	9/20/2016 15:17	1.000	92.6%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5574	0.00792	9/20/2016 10:33	
8	19-9	15	175	12.4	14.29	90	170.6	14.2555	9/20/2016 15:34	1.000	92.3%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5573	0.00792	9/20/2016 10:33	
9	19-10	15	166.7	14.27	14.29	90	170.6	14.3174	9/20/2016 15:50	1.000	95.2%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5574	0.00792	9/20/2016 10:33	
10	19-11	15	166.5	13.73	14.29	90	170.6	14.3187	9/20/2016 16:06	1.000	95.3%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5574	0.00792	9/20/2016 10:33	
11	19-12	15	169.9	14.13	14.29	90	170.6	14.2951	9/20/2016 16:23	1.000	95.0%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5576	0.00792	9/20/2016 10:33	
12	20-3	90	166.1	14.48	14.29	90	170.6	14.3213	9/20/2016 12:07	1.000	42.3%	0.74%	LSCSILVER	7/7/2016	6/30/2017	0.5573	0.00792	9/20/2016 10:33	
13	18-2	15	205.5	15	14.29	90	170.6	13.9653	9/20/2016 16:39	1.000	96.6%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5367	0.00792	9/20/2016 10:33	
14	18-3	15	168.5	13.8	14.29	90	170.6	14.3051	9/20/2016 16:56	1.000	92.6%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5575	0.00792	9/20/2016 10:33	
15	18-6	15	163.7	14.6	14.29	90	170.6	14.3361	9/20/2016 17:45	1.000	90.0%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5569	0.00792	9/20/2016 10:33	
16	18-5	15	215.8	14.53	14.29	90	170.6	13.8719	9/20/2016 17:29	1.000	91.8%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5260	0.00792	9/20/2016 10:33	
17	18-4	15	198.4	13.93	14.29	90	170.6	14.0348	9/20/2016 17:12	1.000	96.7%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5456	0.00792	9/20/2016 10:33	
18	18-9	15	184.9	14.27	14.29	90	170.6	14.1673	9/20/2016 18:35	1.000	92.6%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5544	0.00792	9/20/2016 10:33	
19	18-8	15	178.5	15	14.29	90	170.6	14.2258	9/20/2016 18:18	1.000	95.9%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5566	0.00792	9/20/2016 10:33	
20	18-7	15	174.4	12.4	14.29	90	170.6	14.2604	9/20/2016 18:02	1.000	96.3%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5574	0.00792	9/20/2016 10:33	
21	18-10	15	168	14.93	14.29	90	170.6	14.3086	9/20/2016 18:51	1.000	97.7%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5575	0.00792	9/20/2016 10:33	
22	18-11	15	176.3	15	14.29	90	170.6	14.2447	9/20/2016 19:08	1.000	95.4%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5571	0.00792	9/20/2016 10:33	
23	18-12	15	172.5	122.67	14.29	90	170.6	14.2755	9/20/2016 19:24	1.000	93.5%	0.73%	LSCSILVER	7/7/2016	6/30/2017	0.5576	0.00792	9/20/2016 10:33	

Notes:
 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Spike SN : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml): N/A
 Spike Volume Added: N/A

LCS SIN : 1621-B
 LCS Exp Date : 1/5/2017
 LCS Activity (dpm/ml): 1911.38
 LCS Volume Added (ml): 0.10

* - RPD changed to 0% due to sample & dup activity below MDA

Pos.	Decision Level		Critical Level	Required MDA	MDA	Sample Act. Conc.	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA Counting Uncertainty		Total Prop. Uncertainty	Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
	pCi/G	pCi/G								pCi/G	pCi/G							
1	1.8988	1.3406	5	2.8356	1.4250	253.91%	0.4207	1.0682	1.6173	1.6177	1.6177	SAMPLE						
2	1.8276	1.2903	5	2.7294	1.4252	58.12%	1.9152	1.1130	1.6233	1.6315	1.6315	SAMPLE						
3	1.9019	1.3428	5	2.8406	1.5741	54.94%	2.0286	1.1149	1.8948	1.7044	1.7044	SAMPLE						
4	2.3036	1.6264	5	3.4431	0.3187	313.42%	0.3347	1.0492	1.9577	1.9581	1.9581	SAMPLE						
5	2.0314	1.4342	5	3.0353	0.2063	425.75%	0.2471	1.0522	1.7216	1.7218	1.7218	SAMPLE						
6	2.0964	1.4801	5	3.1315	2.3007	42.18%	2.6858	1.1324	1.9012	1.9196	1.9196	SAMPLE						
7	2.0757	1.4655	5	3.1002	0.4543	199.22%	0.5372	1.0701	1.7741	1.7749	1.7749	SAMPLE						
8	2.2801	1.6097	5	3.4054	-1.7244	53.50%	-1.8555	0.9925	1.8078	1.8079	1.8079	SAMPLE						
9	2.1211	1.4975	5	3.1676	-0.4049	2224.29%	-0.0474	1.0538	1.7818	1.7818	1.7818	SAMPLE						
10	1.8289	1.2912	5	2.7313	-0.4379	176.08%	-0.5887	1.0365	1.5112	1.5112	1.5112	SAMPLE						
11	2.0633	1.4567	5	3.0813	-0.1387	635.31%	-0.1651	1.0492	1.7270	1.7270	1.7270	SAMPLE						
12	2.4448	1.7260	5	3.5140	0.2952	356.43%	0.1587	0.5657	2.0622	2.0625	2.0625	SAMPLE						
13	2.4940	1.7608	5	3.7270	1.0627	103.88%	1.0347	1.0748	2.1636	2.1670	2.1670	SAMPLE						
14	2.1744	1.5351	5	3.2472	-0.4469	205.63%	-0.5051	1.0387	1.8012	1.8012	1.8012	SAMPLE						
15	2.1849	1.5426	5	3.2628	0.2344	403.25%	0.2639	1.0642	1.8524	1.8526	1.8526	SAMPLE						
16	2.7189	1.9195	5	4.0638	0.7393	161.02%	0.6581	1.0596	2.3331	2.3347	2.3347	SAMPLE						
17	2.3224	1.6396	5	3.4700	-0.0999	994.22%	-0.1048	1.0414	1.9473	1.9473	1.9473	SAMPLE						
18	2.0657	1.4594	5	3.0856	0.0868	1024.98%	0.1027	1.0530	1.7430	1.7431	1.7431	SAMPLE						
19	1.8576	1.3115	5	2.7746	0.5868	139.00%	0.7742	1.0761	1.5987	1.6001	1.6001	SAMPLE						
20	1.7832	1.2590	5	2.6633	-1.3520	53.36%	-1.8604	0.9925	1.4137	1.4137	1.4137	SAMPLE						
21	1.7593	1.2421	5	2.6273	0.4447	172.91%	0.6214	1.0744	1.5072	1.5081	1.5081	SAMPLE						
22	1.9302	1.3627	5	2.8829	0.5945	142.49%	0.7553	1.0762	1.6602	1.6616	1.6616	MB						
23	1.8362	1.2964	5	2.7423	81.0669	2.89%	108.3945	2.8873	4.2324	10.2383	10.2383	DUP	405235041.1		0.0%	74.5437	108.8%	

ASSAY 16-Sep-16 12:58:20

Protocol id 12 TC99_REC
Time limit 500
Count limit 10000
Isotope Tc-99m
Protocol date 23-Sep-13 14:21:59
Run id. 21

POS	RACK	BATCH	TIME	COUNTS	CPM	ERROR	% RECOVERY	COUNT TIME
1	69	1	22	11042	30226.7	0.95		12:58:26
2	69	2	23	11337	29714.5	0.94	98.31	12:59:00
3	69	3	23	11176	29324.3	0.95	97.01	12:59:35
4	69	4	23	10968	28808.1	0.96	95.31	13:00:10
5	69	5	23	11071	29110.9	0.95	96.31	13:00:45
6	37	6	23	11282	29714.9	0.94	98.31	13:01:34
7	37	7	23	10903	28745.2	0.96	95.10	13:02:09
8	37	8	24	11064	27982.4	0.95	92.58	13:02:44
9	37	9	24	11022	27907.2	0.95	92.33	13:03:19
10	37	10	23	10878	28776.9	0.96	95.20	13:03:56
11	74	11	24	11346	28809.8	0.94	95.31	13:04:44
12	74	12	24	11291	28702.8	0.94	94.96	13:05:20
13	74	13	50	10492	12790.4	0.98	42.31	13:05:56
14	74	14	23	10971	29192.5	0.96	96.58	13:06:58
15	74	15	24	10967	27994.9	0.96	92.62	13:07:33
16	70	16	25	11086	27206.3	0.95	90.01	13:08:22
17	70	17	25	11298	27762	0.94	91.85	13:08:59
18	70	18	24	11404	29228.8	0.94	96.70	13:09:36
19	70	19	24	10908	27986.9	0.96	92.59	13:10:12
20	70	20	24	11287	28995.3	0.94	95.93	13:10:48
21	72	21	24	11311	29103	0.94	96.28	13:11:38
22	72	22	23	10990	29542.8	0.95	97.74	13:12:13
23	72	23	24	11182	28833.2	0.95	95.39	13:12:48
24	72	24	24	10951	28270.1	0.96	93.53	13:13:24

END OF ASSAY

1597414

ID:TC-99

20 SEP 2016 11:09

USER: 7 COMMENT:SILVER

PRESET TIME : 90.00

DATA CALC : CPM H# :YES SAMPLE REPEATS: 1 PRINTER : STD

COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 :EDIT

TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF

SCINTILLATOR: LIQUID LUMEX:YES LOW SAMPLE REJ: 0

LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

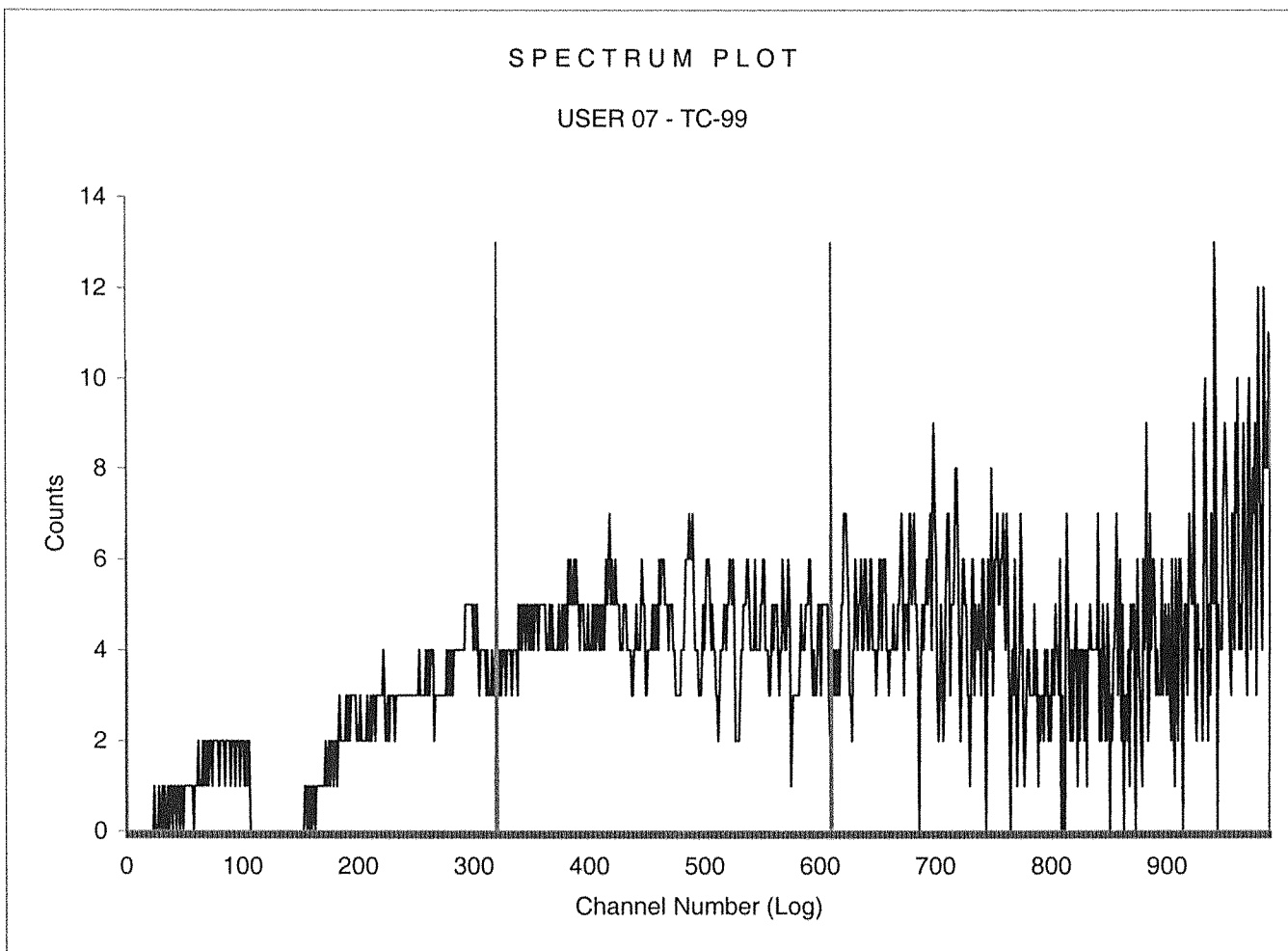
CHAN: 320.0 - 610.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

CHAN: 0.0 - 1000.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

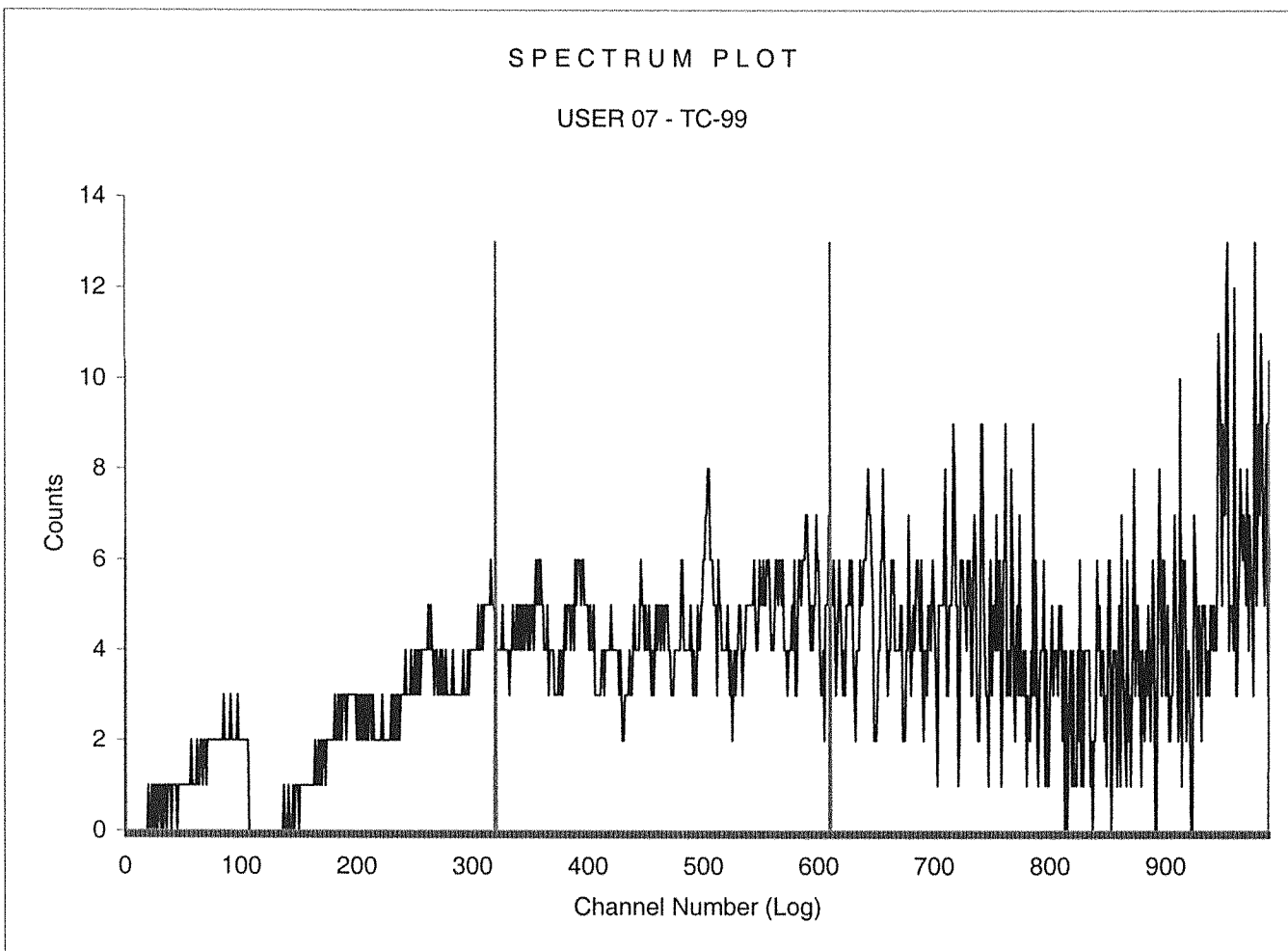
SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		
<i>Raf</i> 1	20-1	90.00	170.6	14.29	5.58	41.00	3.41	6.80	93.34
MISSING SAMPLE									
<i>12</i> 3	20-3	90.00	166.1	14.48	5.54	41.37	3.40	7.03	187.26

QPOP

Sample Count Start Time: 20 Sep 2016 10:33:10
Data Capture Date: 20 Sep 2016 12:03:36
User Filename: S07092020-1A.XLS
U07092020-1A.XLS
Spectrum Type: Log Counts
User Number: 07
User Id: TC-99
User Comment: SILVER
Scintillator: LIQUID
Sample, Rack-Pos, Time: 1 20-1 90.00
H#, Total Counts: 170.6 3690
Win1: Tc-99 - Start, End: 320 610
Win2: - Start, End: 0 990



Sample Count Start Time: 20 Sep 2016 12:07:06
Data Capture Date: 20 Sep 2016 13:37:31
User Filename: S07092020-3A.XLS
U07092020-1A.XLS
Spectrum Type: Log Counts
User Number: 07
User Id: TC-99
User Comment: SILVER
Scintillator: LIQUID
Sample, Rack-Pos, Time: 3 20-3 90.00
H#, Total Counts: 166.1 3723
Win1: Tc-99 - Start, End: 320 610
Win2: - Start, End: 0 990



1597414

ID:TC-99

20 SEP 2016 14:17

USER: 6

COMMENT:SILVER

PRESET TIME : 15.00

DATA CALC : CPM H# :YES SAMPLE REPEATS: 1 PRINTER : STD
 COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 :EDIT
 TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF
 SCINTILLATOR: LIQUID LUMEX:YES LOW SAMPLE REJ: 0
 LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 320.0 - 610.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0
 CHAN: 0.0 - 1000.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

SAM	POS	TIME	H#	WIND1		WIND2		LUMEX	ELAPSED
				CPM	%ERROR	CPM	%ERROR		

MISSING SAMPLE

1	2	19-2	15.00	167.9	14.73	13.45	45.47	7.86	5.41	15.95
2	3	19-3	15.00	171.3	16.20	12.83	46.07	7.81	5.37	32.39
3	4	19-4	15.00	176.8	16.27	12.80	43.13	8.11	6.21	48.84
4	5	19-5	15.00	216.6	14.20	13.70	39.67	8.44	6.03	65.27
5	6	19-6	15.00	199.6	14.27	13.67	38.47	8.60	6.48	81.73
6	7	19-7	15.00	183.1	16.87	12.57	42.93	8.18	7.64	98.21
7	8	19-8	15.00	174.1	14.80	13.42	43.73	8.03	5.70	114.67
8	9	19-9	15.00	175.0	12.40	14.66	38.27	8.65	7.11	131.11
9	10	19-10	15.00	166.7	14.27	13.67	44.27	8.01	6.27	147.57
10	11	19-11	15.00	166.5	13.73	13.93	42.20	8.20	7.59	164.03
11	12	19-12	15.00	169.9	14.13	13.74	39.53	8.53	7.53	180.48

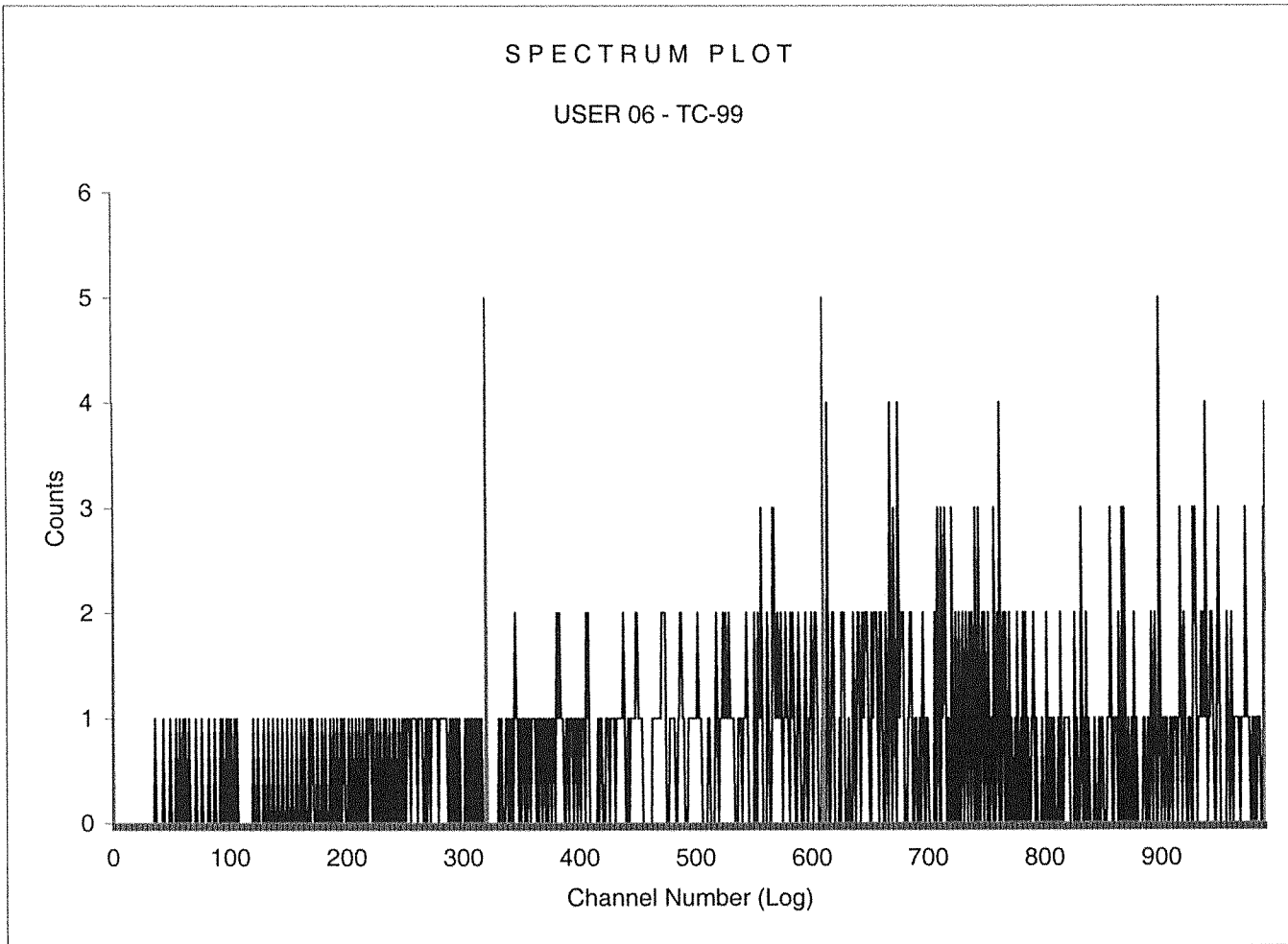
MISSING SAMPLE

13	14	18-2	15.00	205.5	15.00	13.33	39.80	8.44	6.33	197.02
14	15	18-3	15.00	168.5	13.80	13.90	39.53	8.47	6.14	213.45
15	16	18-4	15.00	198.4	13.93	13.83	40.13	8.50	8.40	229.91
16	17	18-5	15.00	215.8	14.53	13.55	41.07	8.39	8.10	246.38
17	18	18-6	15.00	163.7	14.60	13.51	41.27	8.30	6.37	262.84
18	19	18-7	15.00	174.4	12.40	14.66	36.53	8.93	8.68	279.31
19	20	18-8	15.00	178.5	15.00	13.33	42.33	8.24	7.66	295.78
20	21	18-9	15.00	184.9	14.27	13.67	41.13	8.36	7.47	312.25
21	22	18-10	15.00	168.0	14.93	13.36	43.07	8.13	6.48	328.71
22	23	18-11	15.00	176.3	15.00	13.33	40.93	8.37	7.28	345.17
23	24	18-12	15.00	172.5	122.67	4.66	164.80	4.06	1.94	361.64

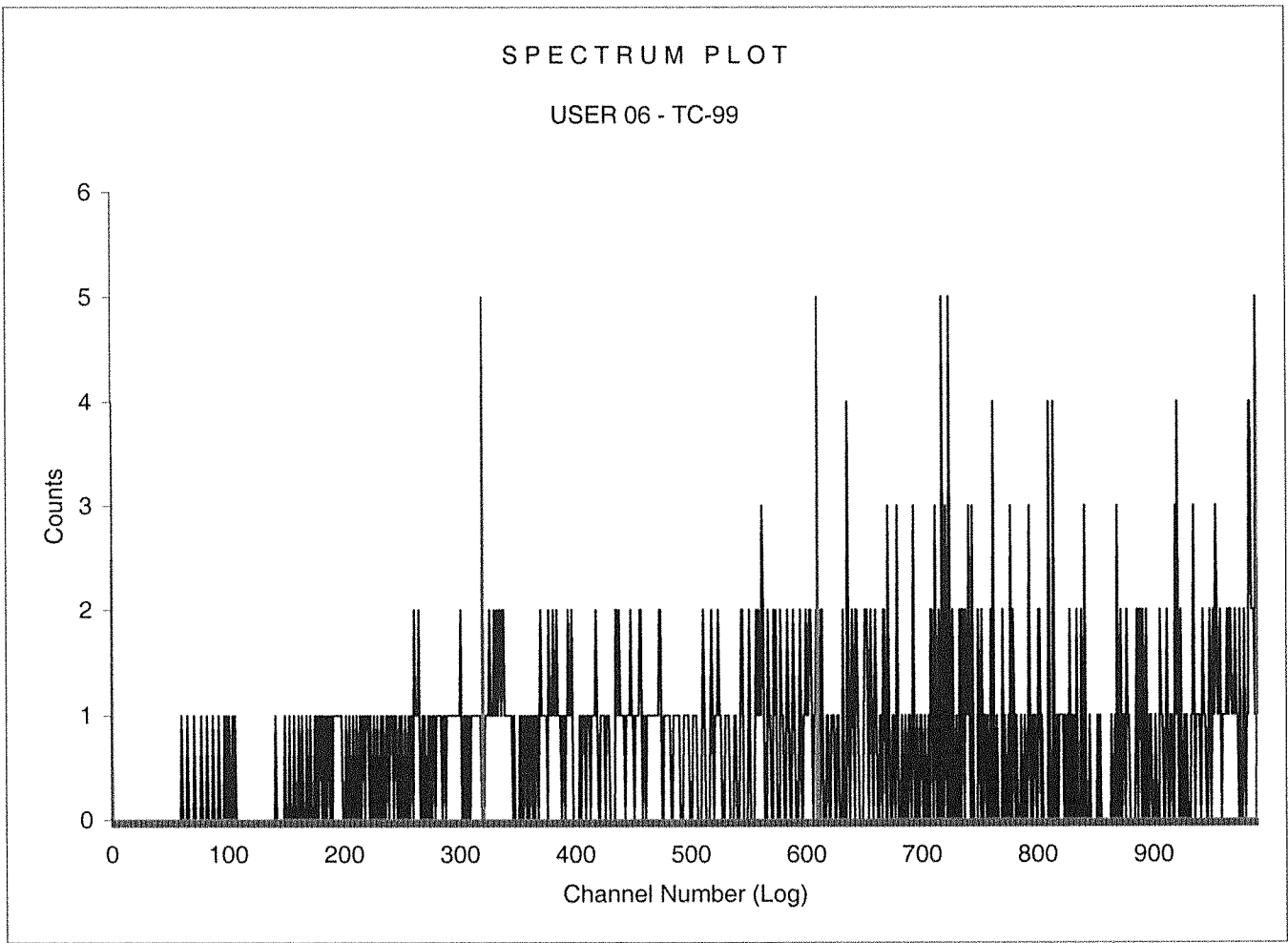
OPQP

samples are switched

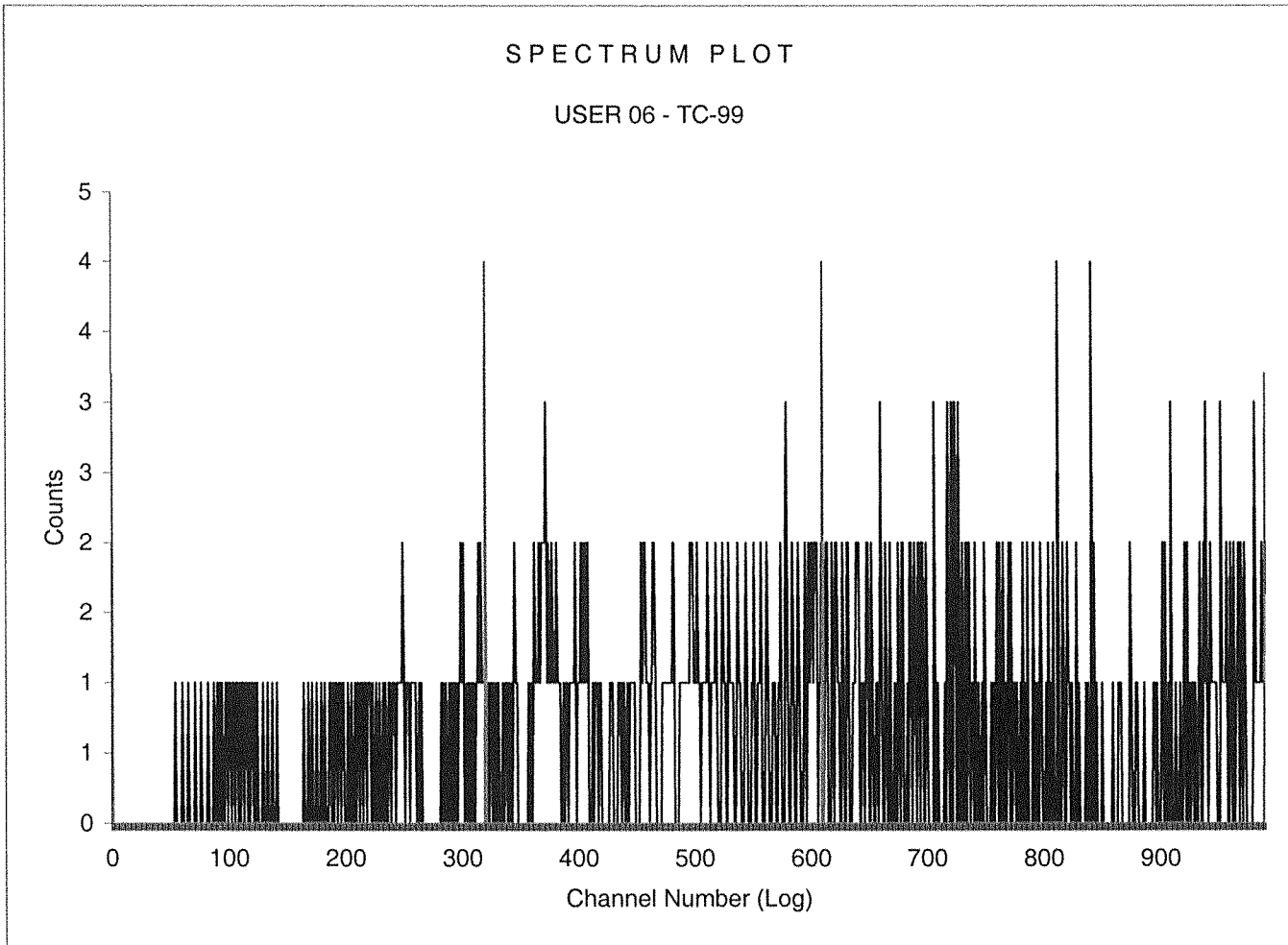
Sample Count Start Time: 20 Sep 2016 13:38:50
Data Capture Date 20 Sep 2016 13:54:15
User Filename S06092019-2A.XLS
U06092019-2A.XLS
Spectrum Type Log Counts
User Number 06
User Id TC-99
User Comment SILVER
Scintillator LIQUID
Sample, Rack-Pos, Time: 2 19-2 15.00
H#, Total Counts: 167.9 682
Win1: Tc-99 - Start, End: 320 610
Win2: - Start, End: 0 990



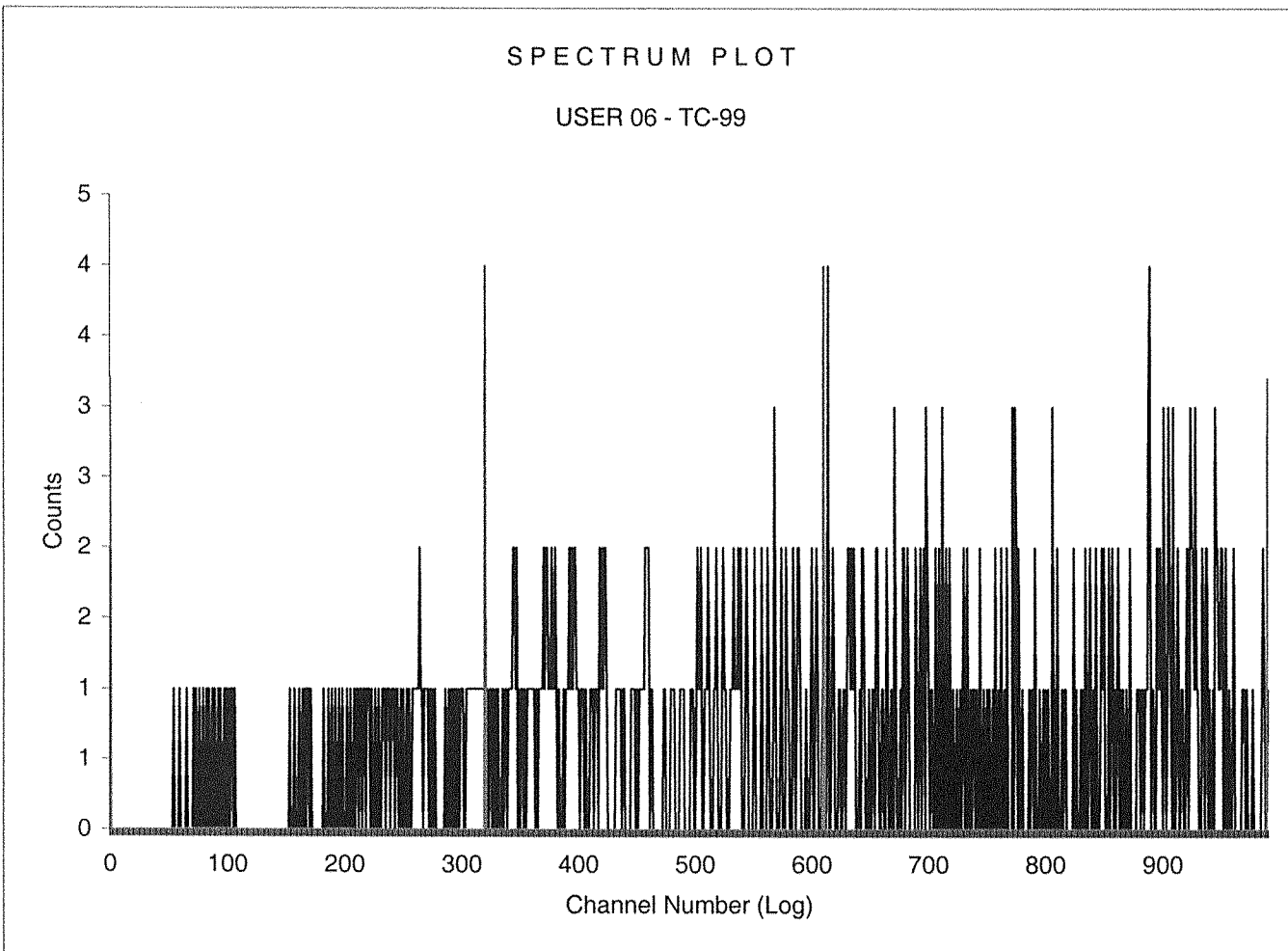
Sample Count Start Time: 20 Sep 2016 13:55:16
Data Capture Date 20 Sep 2016 14:10:40
User Filename S06092019-3A.XLS
U06092019-2A.XLS
Spectrum Type Log Counts
User Number 06
User Id TC-99
User Comment SILVER
Scintillator LIQUID
Sample, Rack-Pos, Time: 3 19-3 15.00
H#, Total Counts: 171.3 691
Win1: Tc-99 - Start, End: 320 610
Win2: - Start, End: 0 990



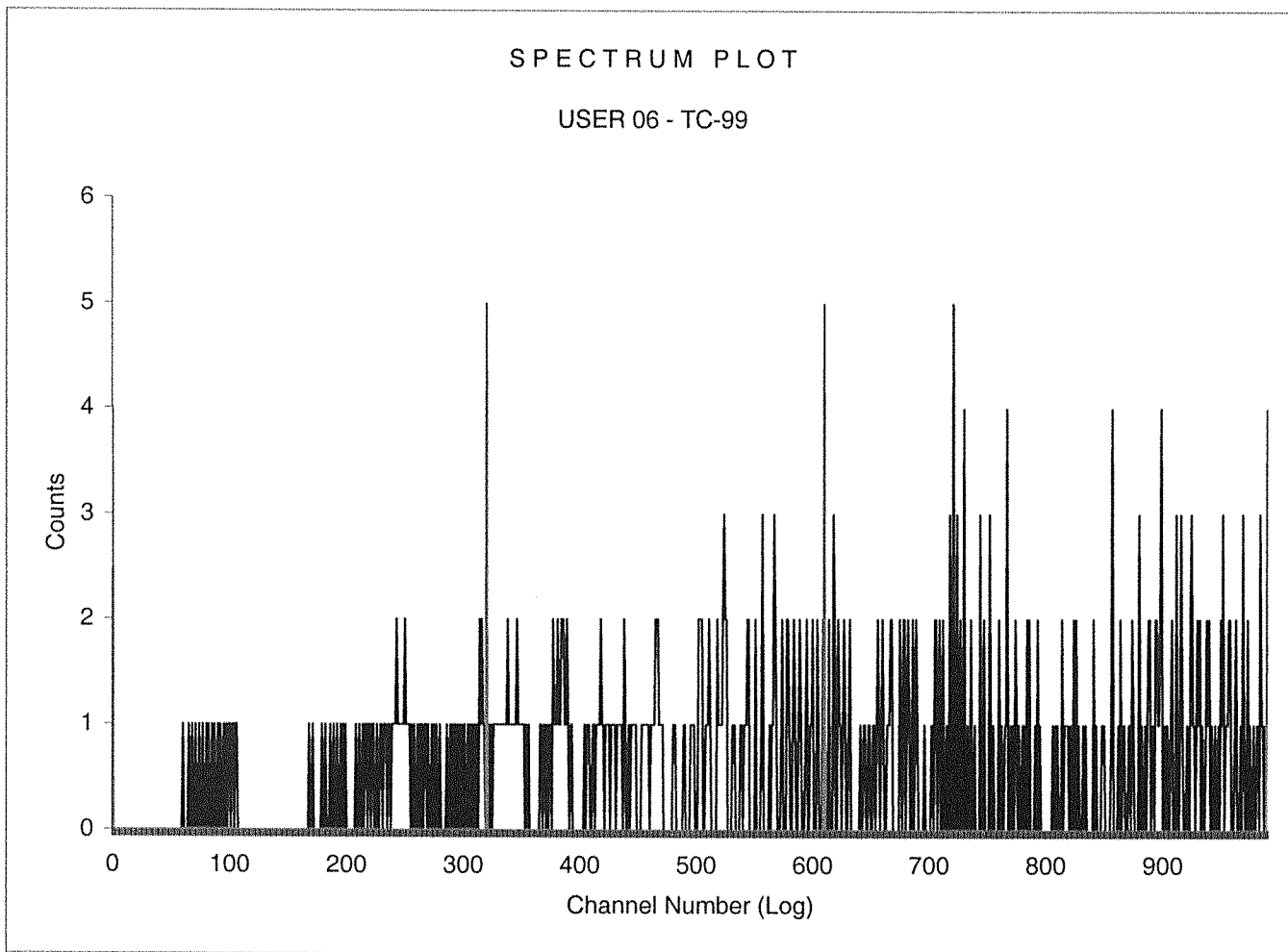
Sample Count Start Time: 20 Sep 2016 14:11:43
Data Capture Date: 20 Sep 2016 14:27:07
User Filename: S06092019-4A.XLS
U06092019-2A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TC-99
User Comment: SILVER
Scintillator: LIQUID
Sample, Rack-Pos, Time: 4 19-4 15.00
H#, Total Counts: 176.8 647
Win1: Tc-99 - Start, End: 320 610
Win2: - Start, End: 0 990



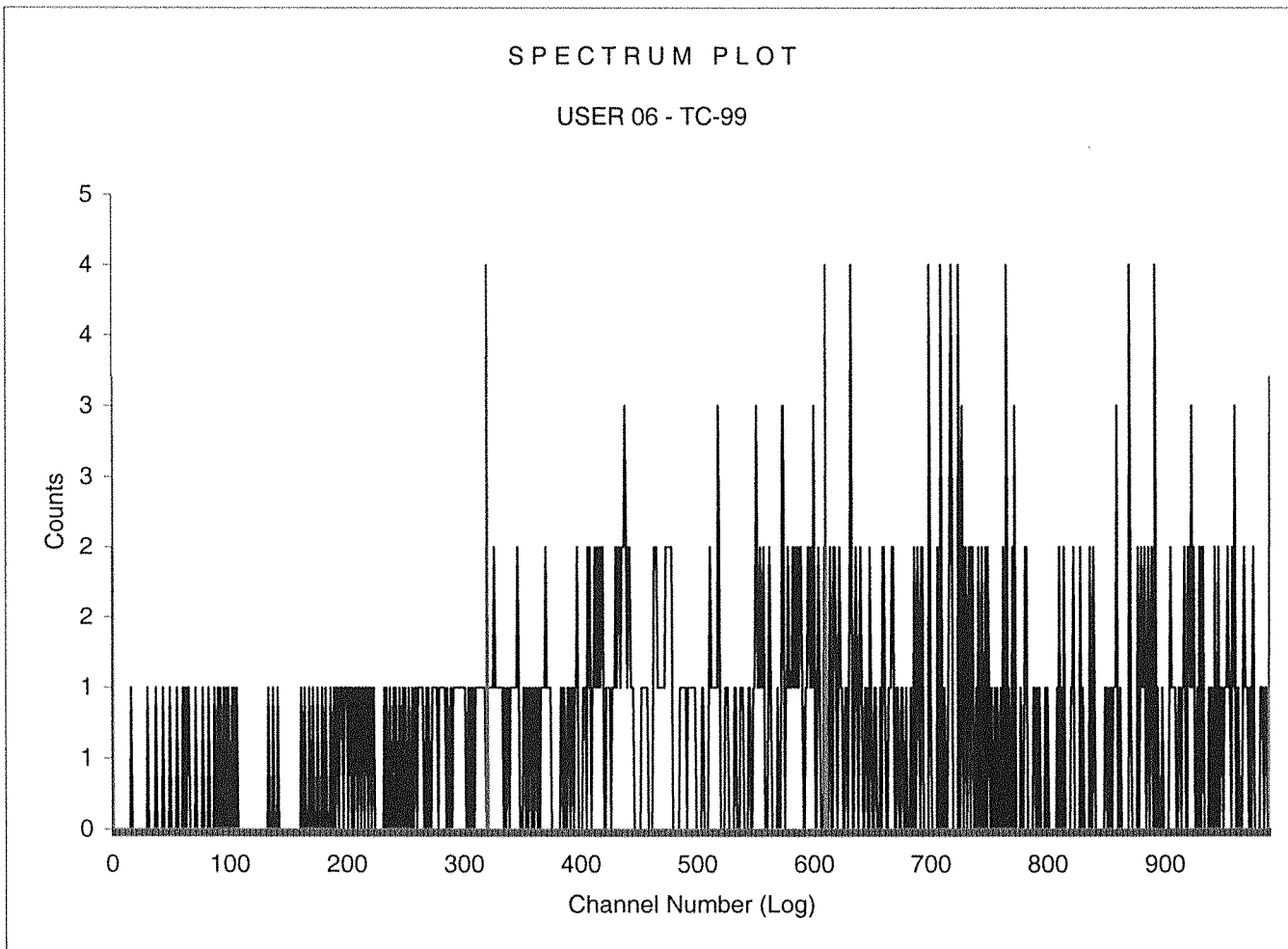
Sample Count Start Time: 20 Sep 2016 14:28:09
Data Capture Date: 20 Sep 2016 14:43:33
User Filename: S06092019-5A.XLS
U06092019-2A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TC-99
User Comment: SILVER
Scintillator: LIQUID
Sample, Rack-Pos, Time: 5 19-5 15.00
H#, Total Counts: 216.6 595
Win1: Tc-99 - Start, End: 320 610
Win2: - Start, End: 0 990



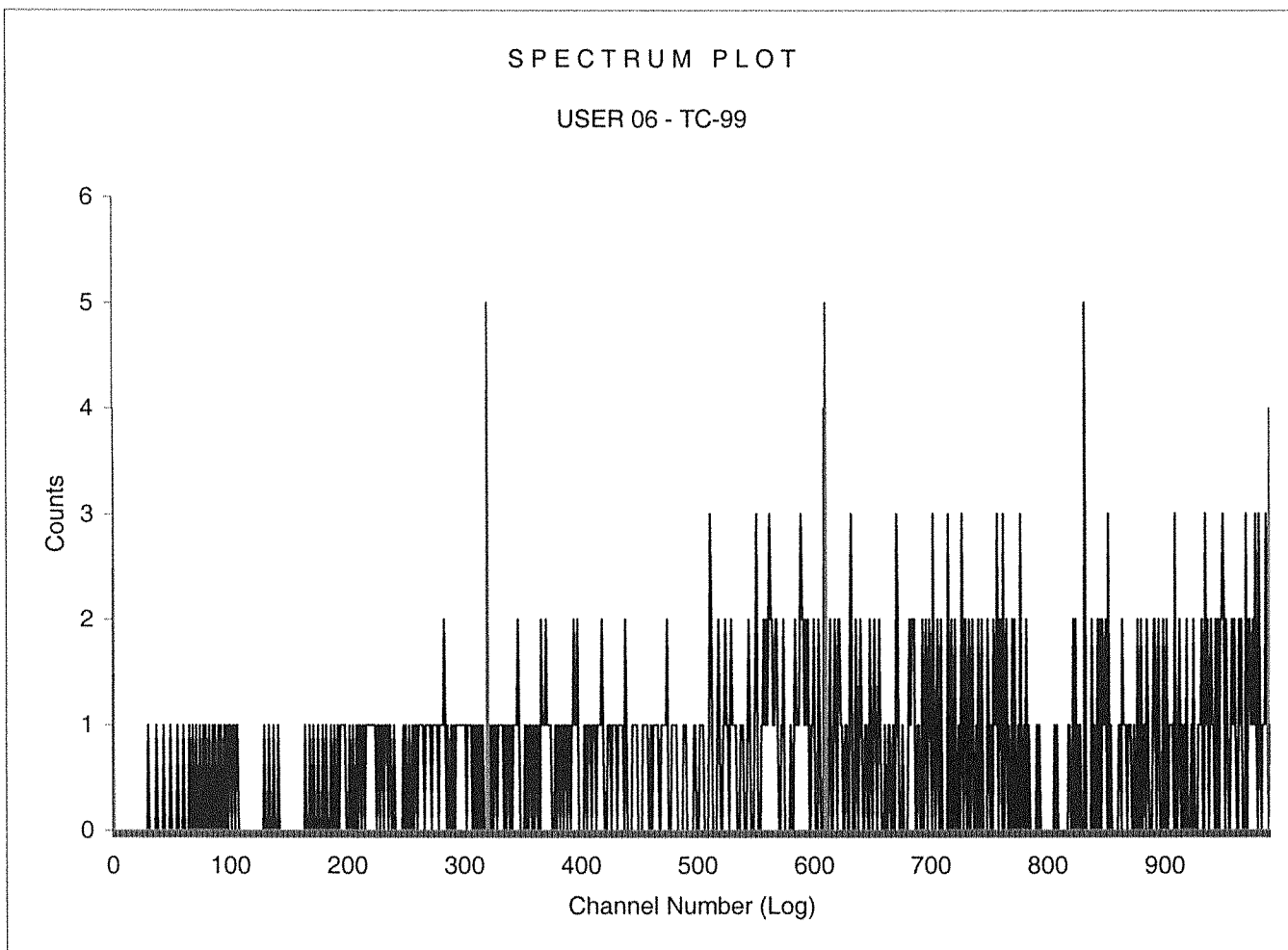
Sample Count Start Time: 20 Sep 2016 14:44:37
Data Capture Date: 20 Sep 2016 15:00:00
User Filename: S06092019-6A.XLS
U06092019-2A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TC-99
User Comment: SILVER
Scintillator: LIQUID
Sample, Rack-Pos, Time: 6 19-6 15.00
H#, Total Counts: 199.6 577
Win1: Tc-99 - Start, End: 320 610
Win2: - Start, End: 0 990



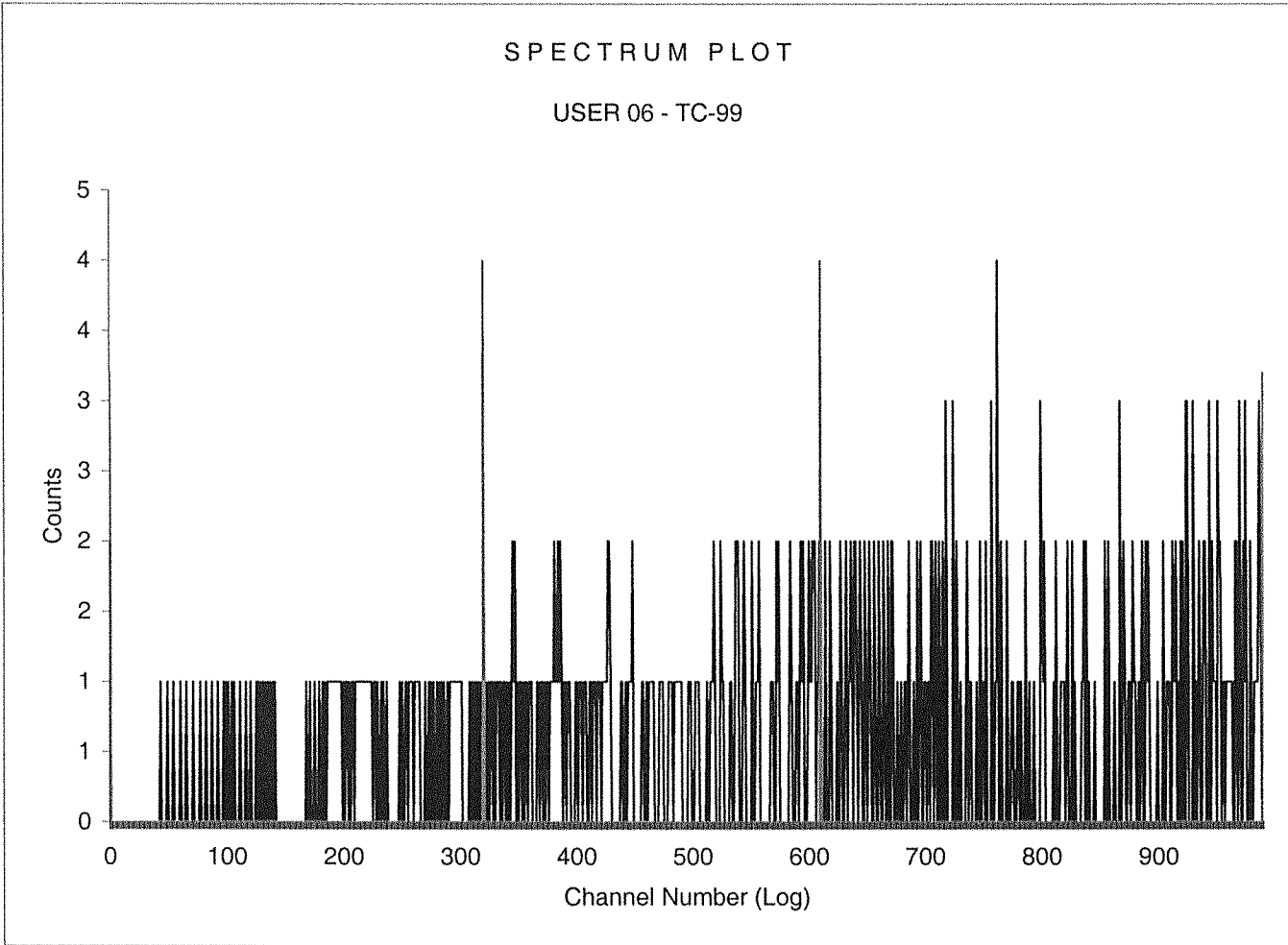
Sample Count Start Time: 20 Sep 2016 15:01:06
Data Capture Date: 20 Sep 2016 15:16:29
User Filename: S06092019-7A.XLS
U06092019-2A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TC-99
User Comment: SILVER
Scintillator: LIQUID
Sample, Rack-Pos, Time: 7 19-7 15.00
H#, Total Counts: 183.1 644
Win1: Tc-99 - Start, End: 320 610
Win2: - Start, End: 0 990



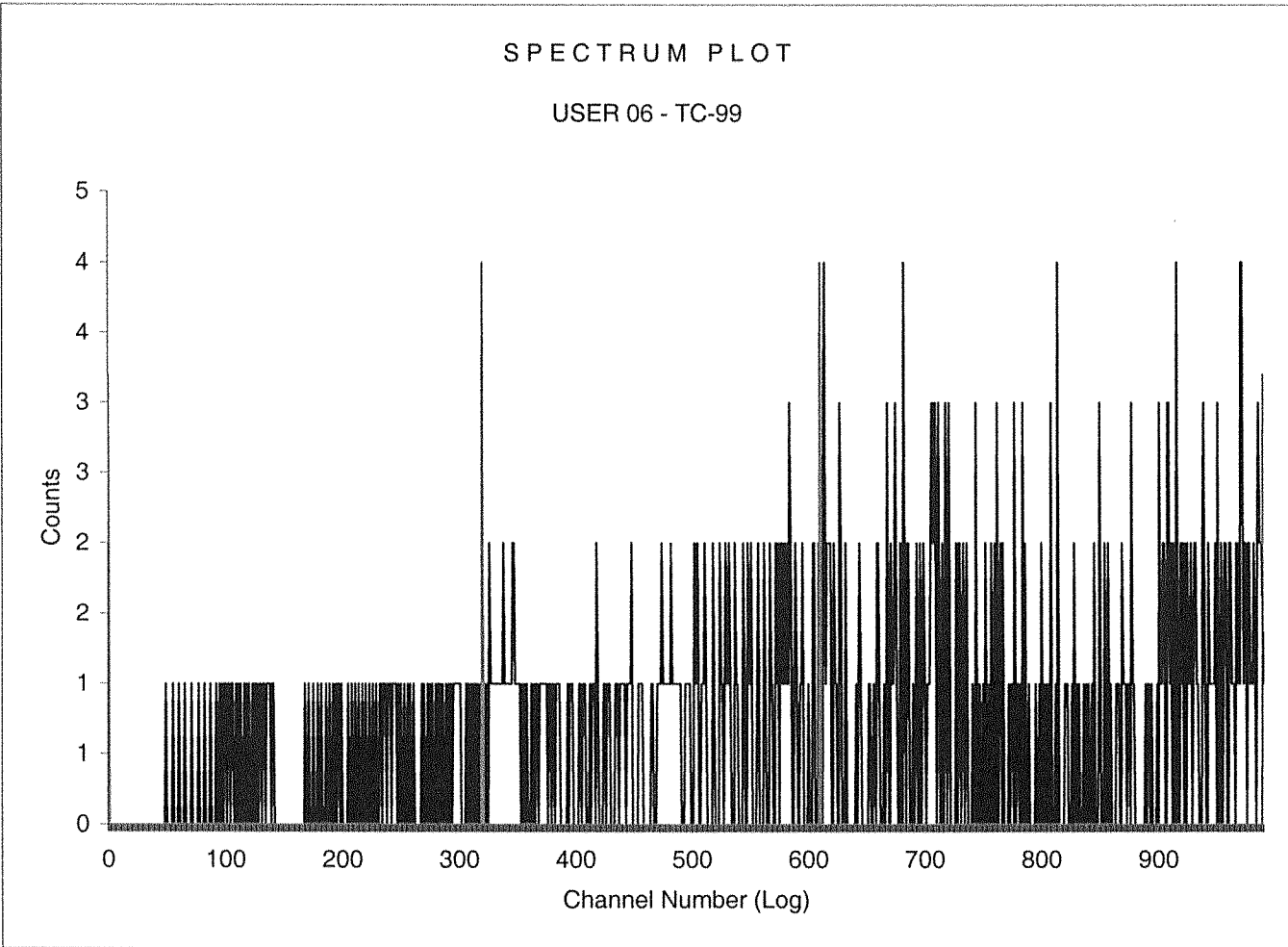
Sample Count Start Time: 20 Sep 2016 15:17:33
Data Capture Date: 20 Sep 2016 15:32:57
User Filename: S06092019-8A.XLS
U06092019-2A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TC-99
User Comment: SILVER
Scintillator: LIQUID
Sample, Rack-Pos, Time: 8 19-8 15.00
H#, Total Counts: 174.1 656
Win1: Tc-99 - Start, End: 320 610
Win2: - Start, End: 0 990



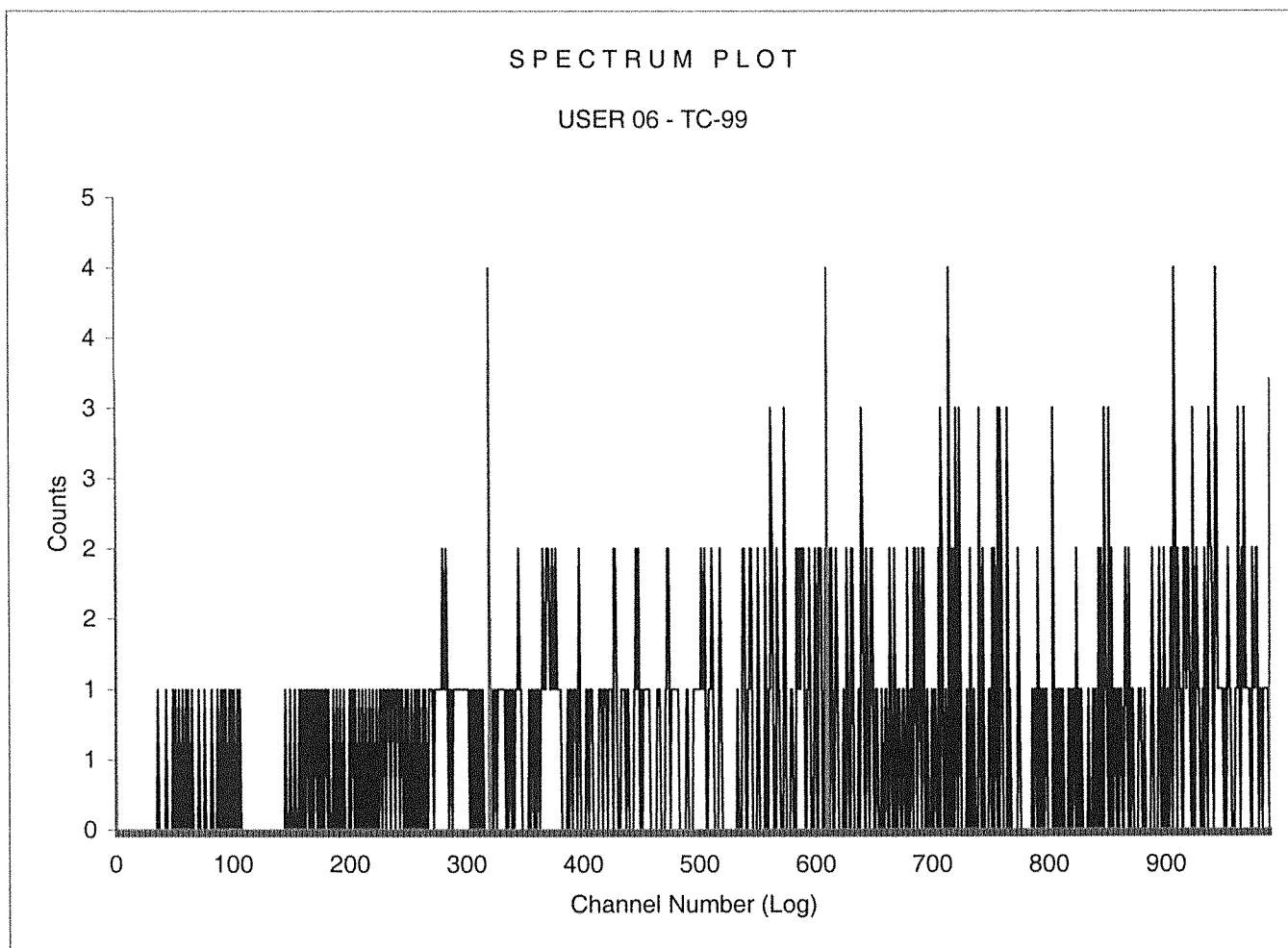
Sample Count Start Time: 20 Sep 2016 15:34:00
Data Capture Date: 20 Sep 2016 15:49:23
User Filename: S06092019-9A.XLS
U06092019-2A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TC-99
User Comment: SILVER
Scintillator: LIQUID
Sample, Rack-Pos, Time: 9 19-9 15.00
H#, Total Counts: 175.0 574
Win1: Tc-99 - Start, End: 320 610
Win2: - Start, End: 0 990



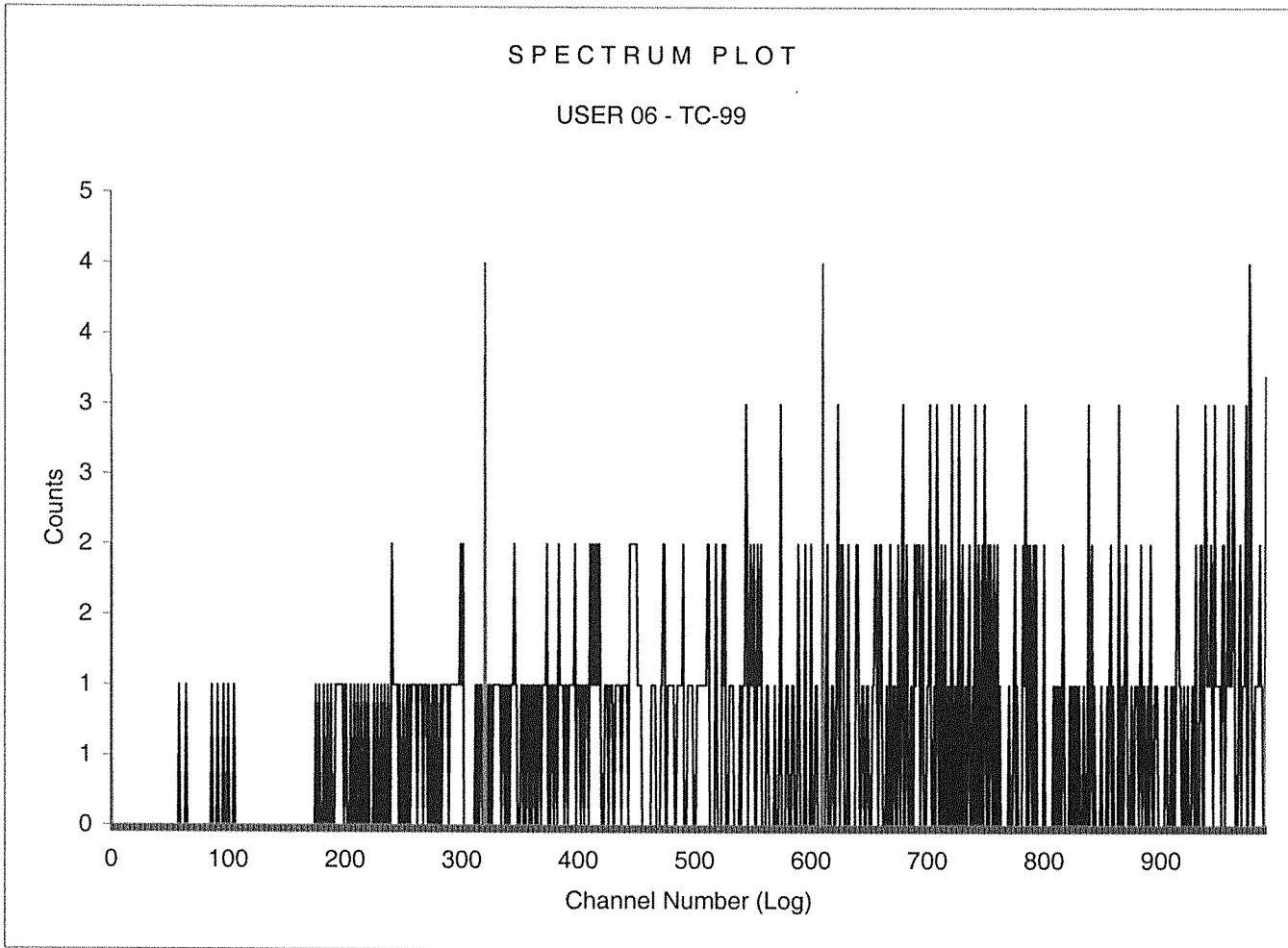
Sample Count Start Time: 20 Sep 2016 15:50:27
Data Capture Date: 20 Sep 2016 16:05:51
User Filename: S06092019-10A.XLS
U06092019-2A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TC-99
User Comment: SILVER
Scintillator: LIQUID
Sample, Rack-Pos, Time: 10 19-10 15.00
H#, Total Counts: 166.7 664
Win1: Tc-99 - Start, End: 320 610
Win2: - Start, End: 0 990



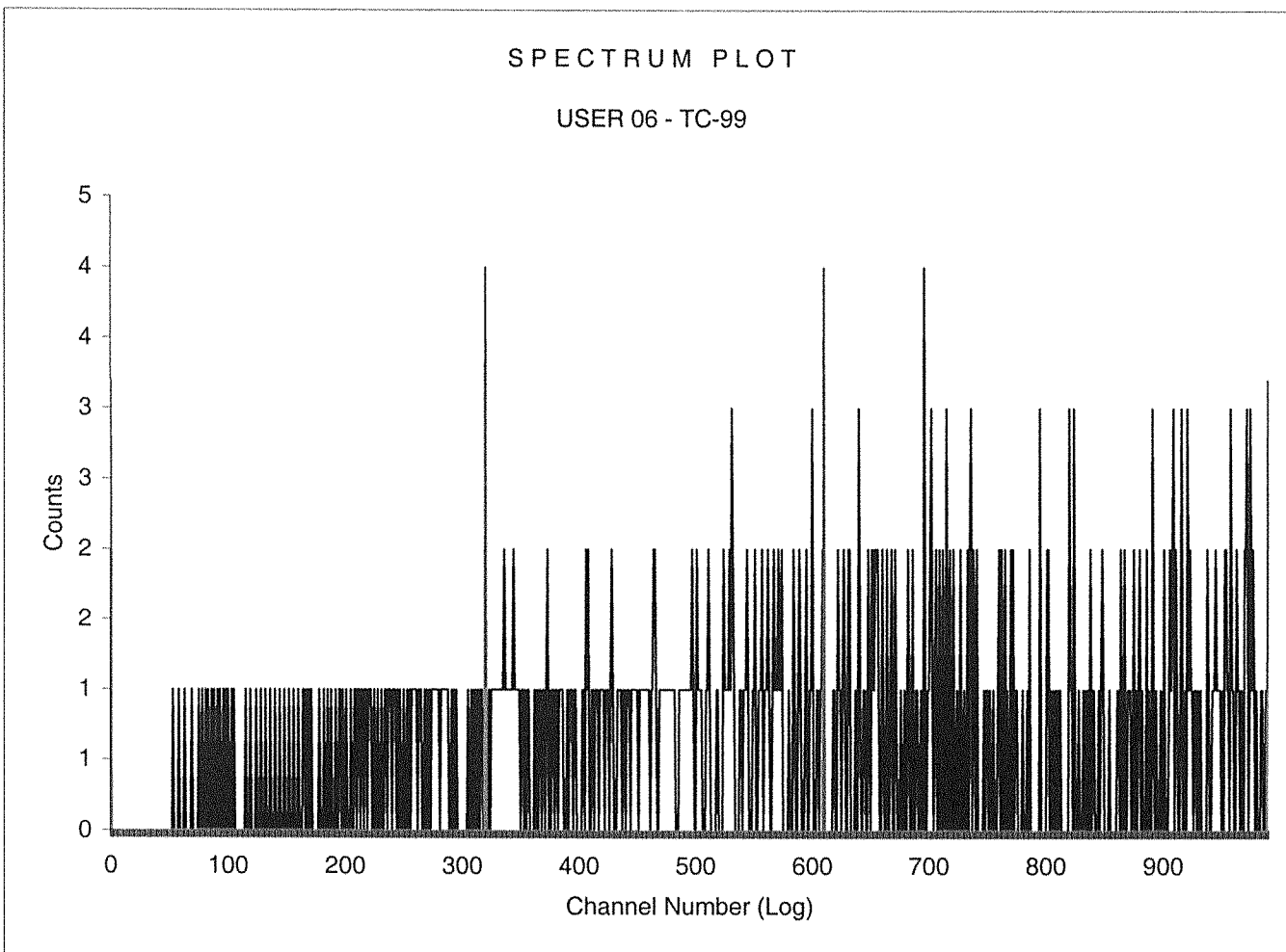
Sample Count Start Time: 20 Sep 2016 16:06:55
Data Capture Date 20 Sep 2016 16:22:19
User Filename S06092019-11A.XLS
U06092019-2A.XLS
Spectrum Type Log Counts
User Number 06
User Id TC-99
User Comment SILVER
Scintillator LIQUID
Sample, Rack-Pos, Time: 11 19-11 15.00
H#, Total Counts: 166.5 633
Win1: Tc-99 - Start, End: 320 610
Win2: - Start, End: 0 990



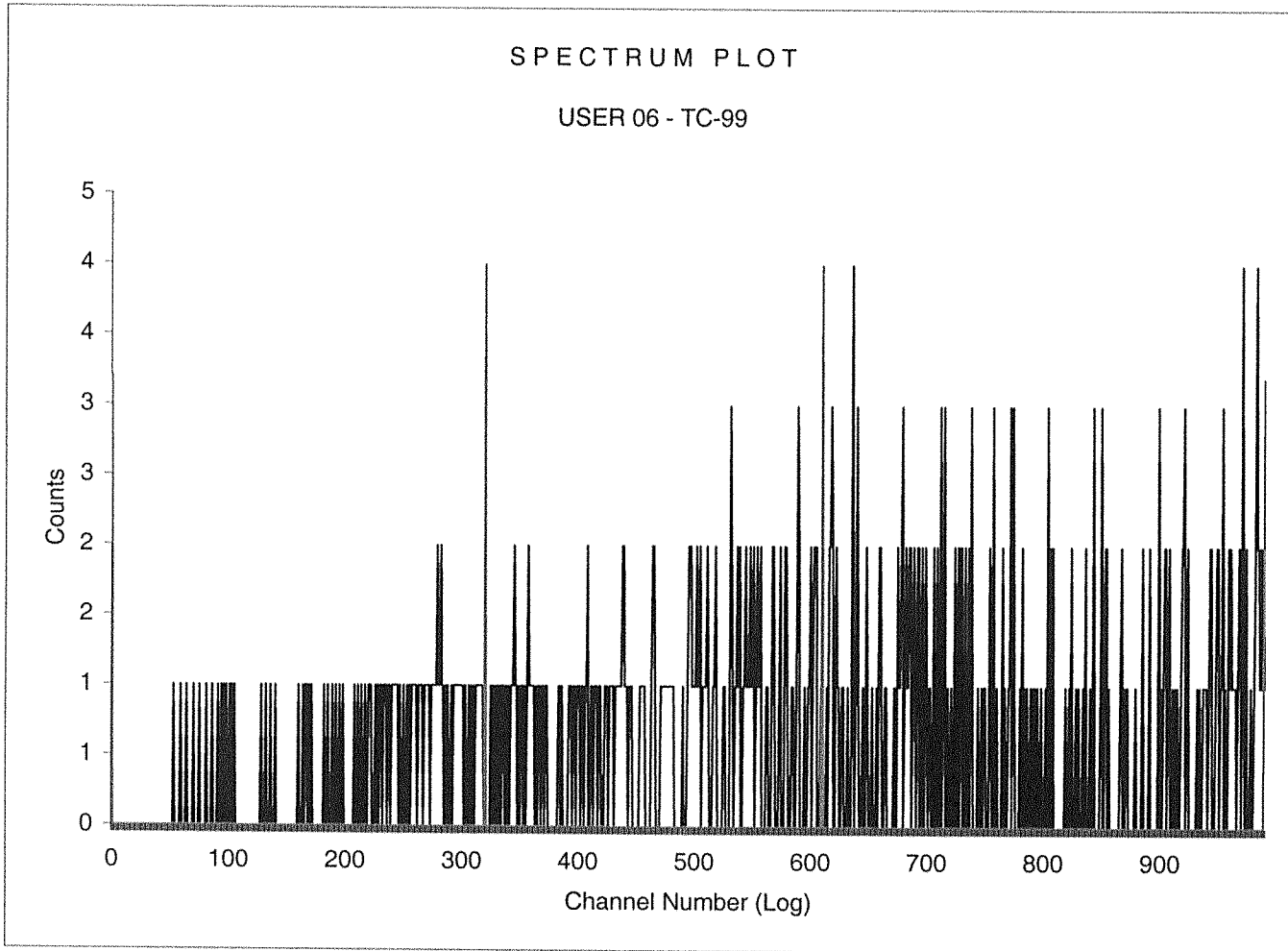
Sample Count Start Time: 20 Sep 2016 16:23:22
Data Capture Date: 20 Sep 2016 16:38:45
User Filename: S06092019-12A.XLS
U06092019-2A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TC-99
User Comment: SILVER
Scintillator: LIQUID
Sample, Rack-Pos, Time: 12 19-12 15.00
H#, Total Counts: 169.9 593
Win1: Tc-99 - Start, End: 320 610
Win2: - Start, End: 0 990



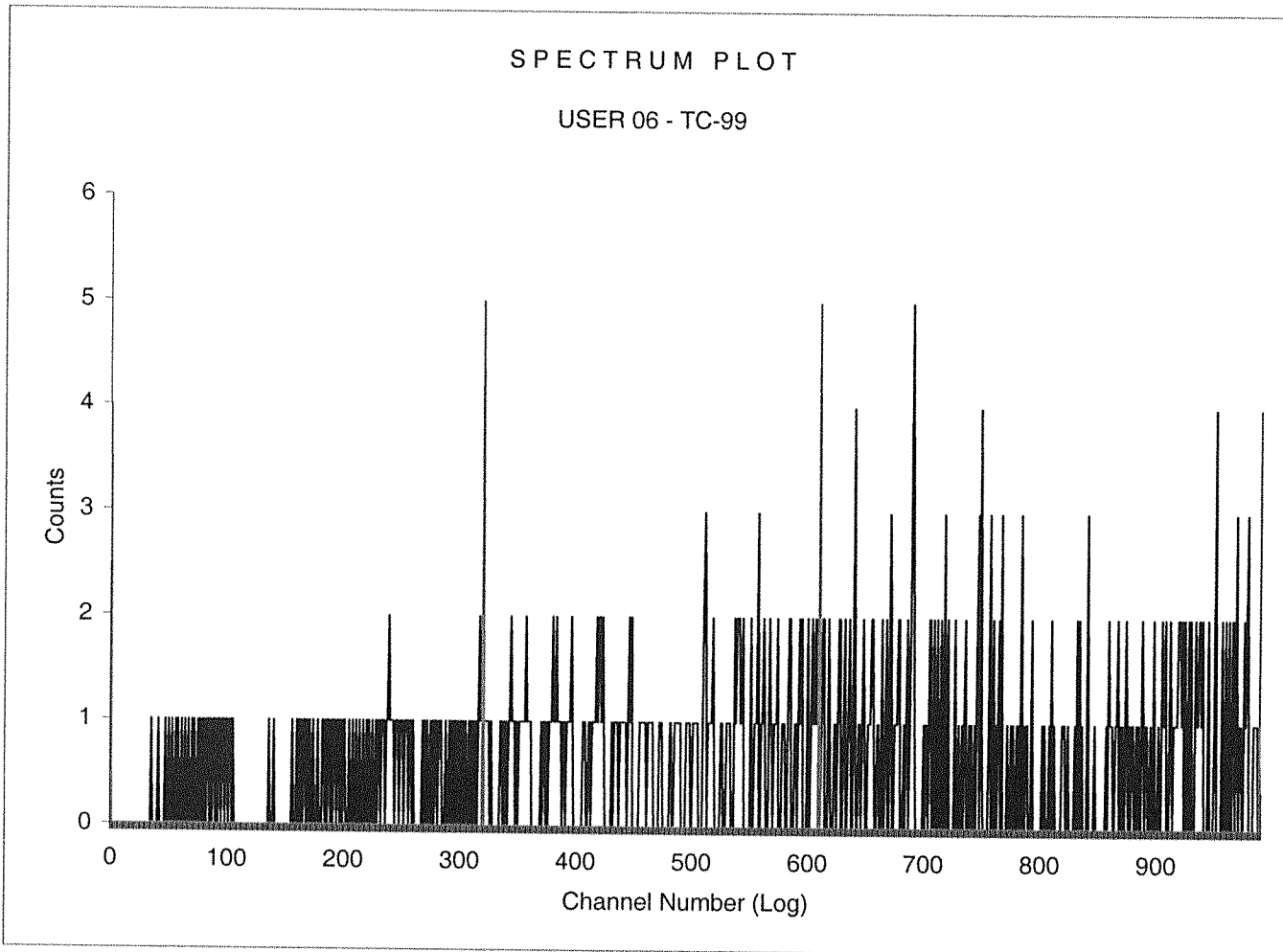
Sample Count Start Time:	20 Sep 2016 16:39:54		
Data Capture Date	20 Sep 2016 16:55:19		
User Filename	S06092018-2A.XLS		
	U06092019-2A.XLS		
Spectrum Type	Log Counts		
User Number	06		
User Id	TC-99		
User Comment	SILVER		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	14	18-2	15.00
H#, Total Counts:	205.5	597	
Win1: Tc-99 - Start, End:	320	610	
Win2: - Start, End:	0	990	



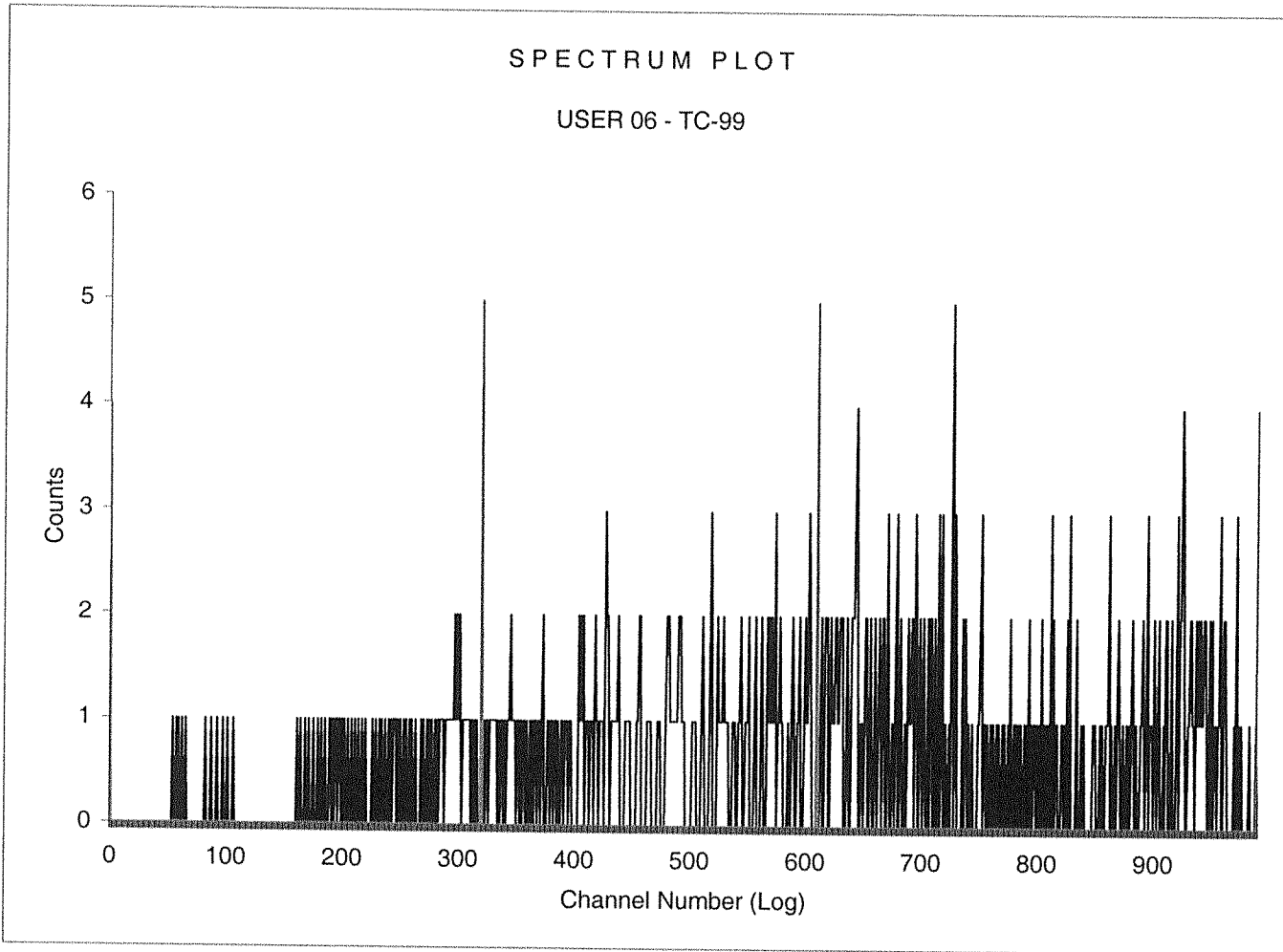
Sample Count Start Time:	20 Sep 2016 16:56:20
Data Capture Date	20 Sep 2016 17:11:44
User Filename	S06092018-3A.XLS
	U06092019-2A.XLS
Spectrum Type	Log Counts
User Number	06
User Id	TC-99
User Comment	SILVER
Scintillator	LIQUID
Sample, Rack-Pos, Time:	15 18-3 15.00
H#, Total Counts:	168.5 593
Win1: Tc-99 - Start, End:	320 610
Win2: - Start, End:	0 990



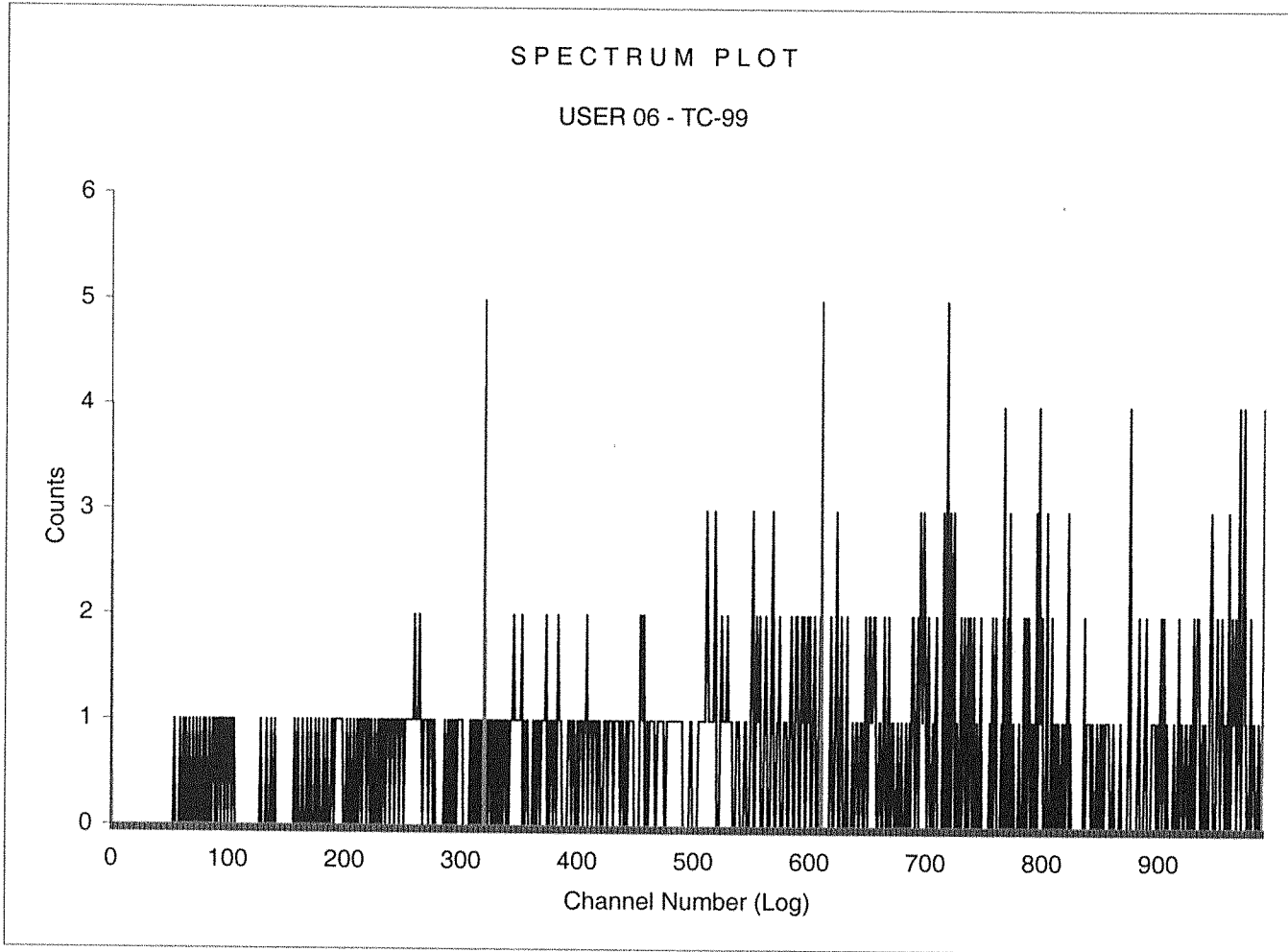
Sample Count Start Time: 20 Sep 2016 17:12:48
Data Capture Date: 20 Sep 2016 17:28:12
User Filename: S06092018-4A.XLS
U06092019-2A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TC-99
User Comment: SILVER
Scintillator: LIQUID
Sample, Rack-Pos, Time: 16 18-4 15.00
H#, Total Counts: 198.4 602
Win1: Tc-99 - Start, End: 320 610
Win2: - Start, End: 0 990



Sample Count Start Time:	20 Sep 2016 17:29:16
Data Capture Date	20 Sep 2016 17:44:40
User Filename	S06092018-5A.XLS
	U06092019-2A.XLS
Spectrum Type	Log Counts
User Number	06
User Id	TC-99
User Comment	SILVER
Scintillator	LIQUID
Sample, Rack-Pos, Time:	17 18-5 15.00
H#, Total Counts:	215.8 616
Win1: Tc-99 - Start, End:	320 610
Win2: - Start, End:	0 990



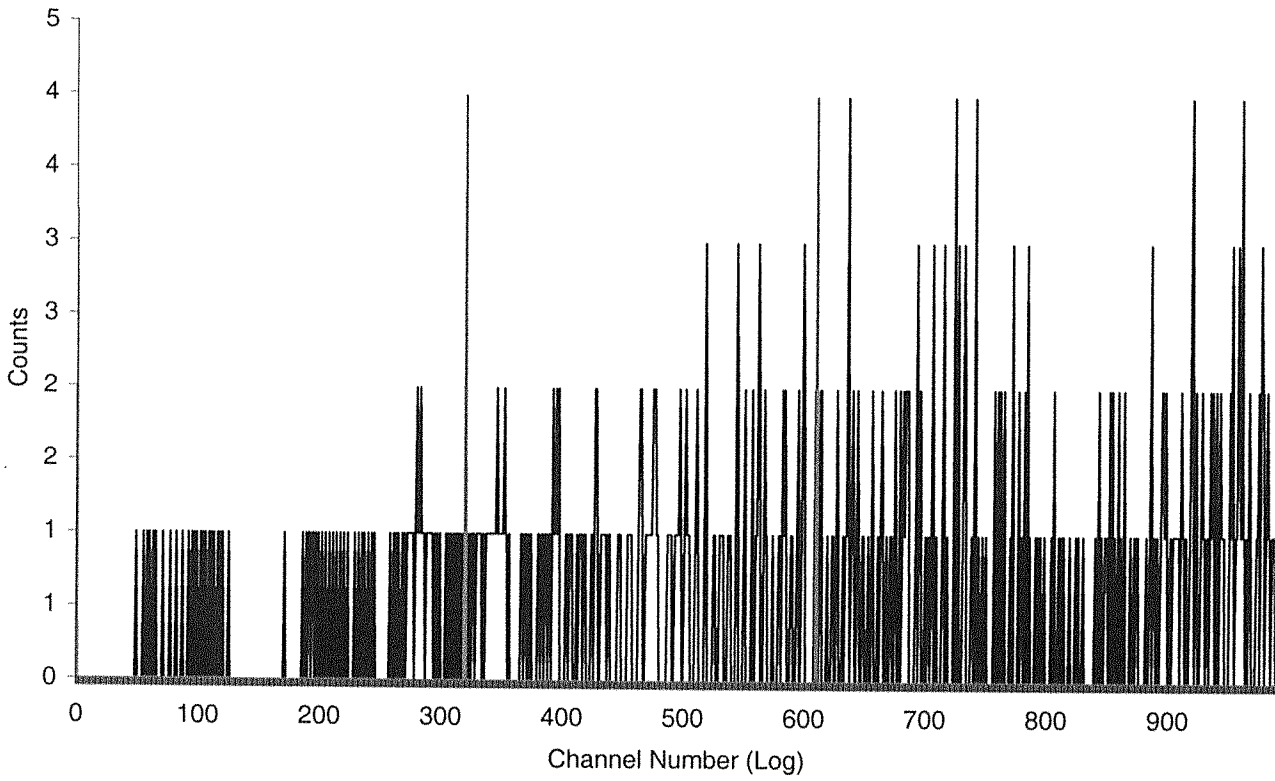
Sample Count Start Time: 20 Sep 2016 17:45:43
Data Capture Date: 20 Sep 2016 18:01:07
User Filename: S06092018-6A.XLS
U06092019-2A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TC-99
User Comment: SILVER
Scintillator: LIQUID
Sample, Rack-Pos, Time: 18 18-6 15.00
H#, Total Counts: 163.7 619
Win1: Tc-99 - Start, End: 320 610
Win2: - Start, End: 0 990



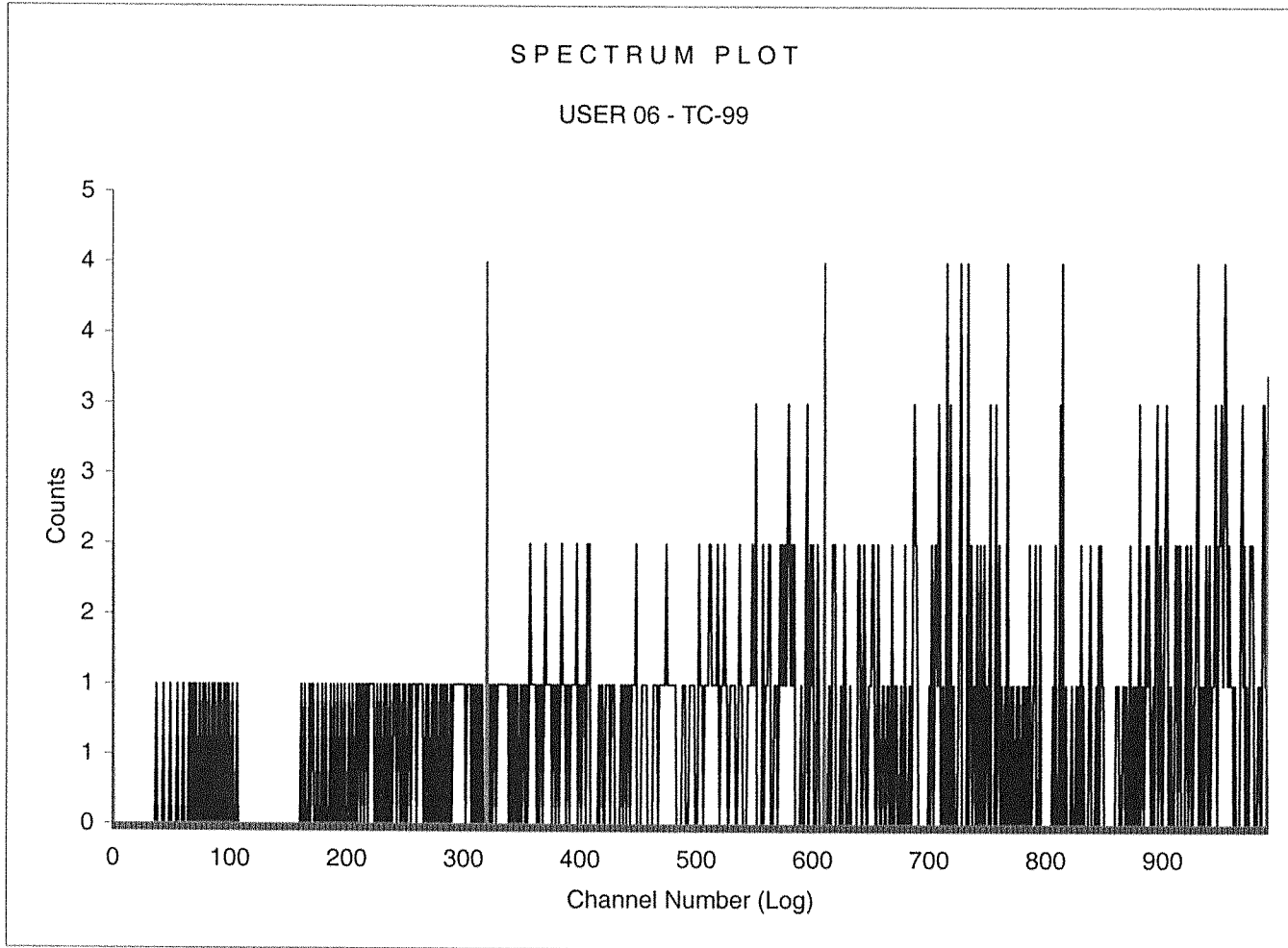
Sample Count Start Time:	20 Sep 2016 18:02:12
Data Capture Date	20 Sep 2016 18:17:36
User Filename	S06092018-7A.XLS
	U06092019-2A.XLS
Spectrum Type	Log Counts
User Number	06
User Id	TC-99
User Comment	SILVER
Scintillator	LIQUID
Sample, Rack-Pos, Time:	19 18-7 15.00
H#, Total Counts:	174.4 548
Win1: Tc-99 - Start, End:	320 610
Win2: - Start, End:	0 990

SPECTRUM PLOT

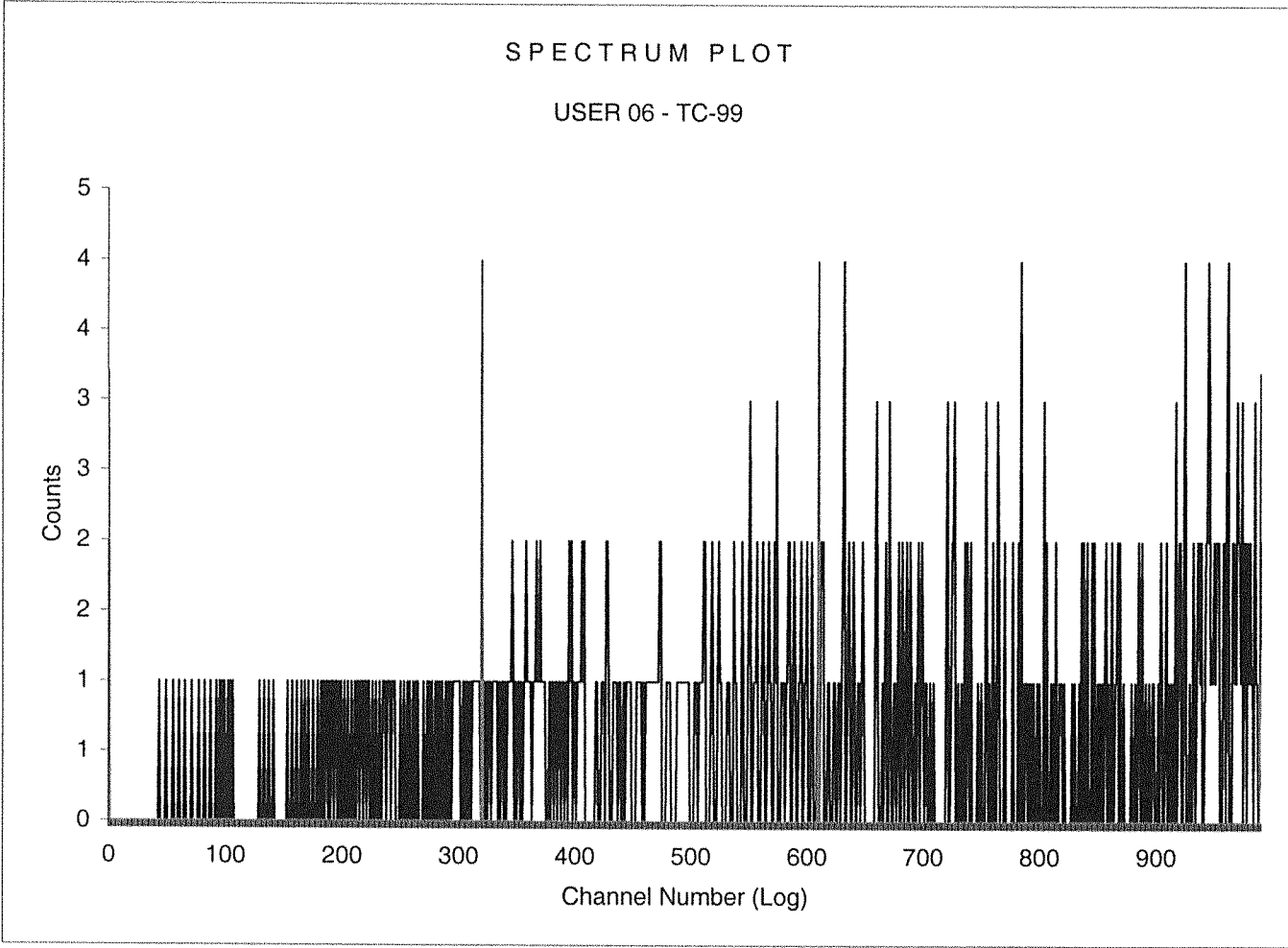
USER 06 - TC-99



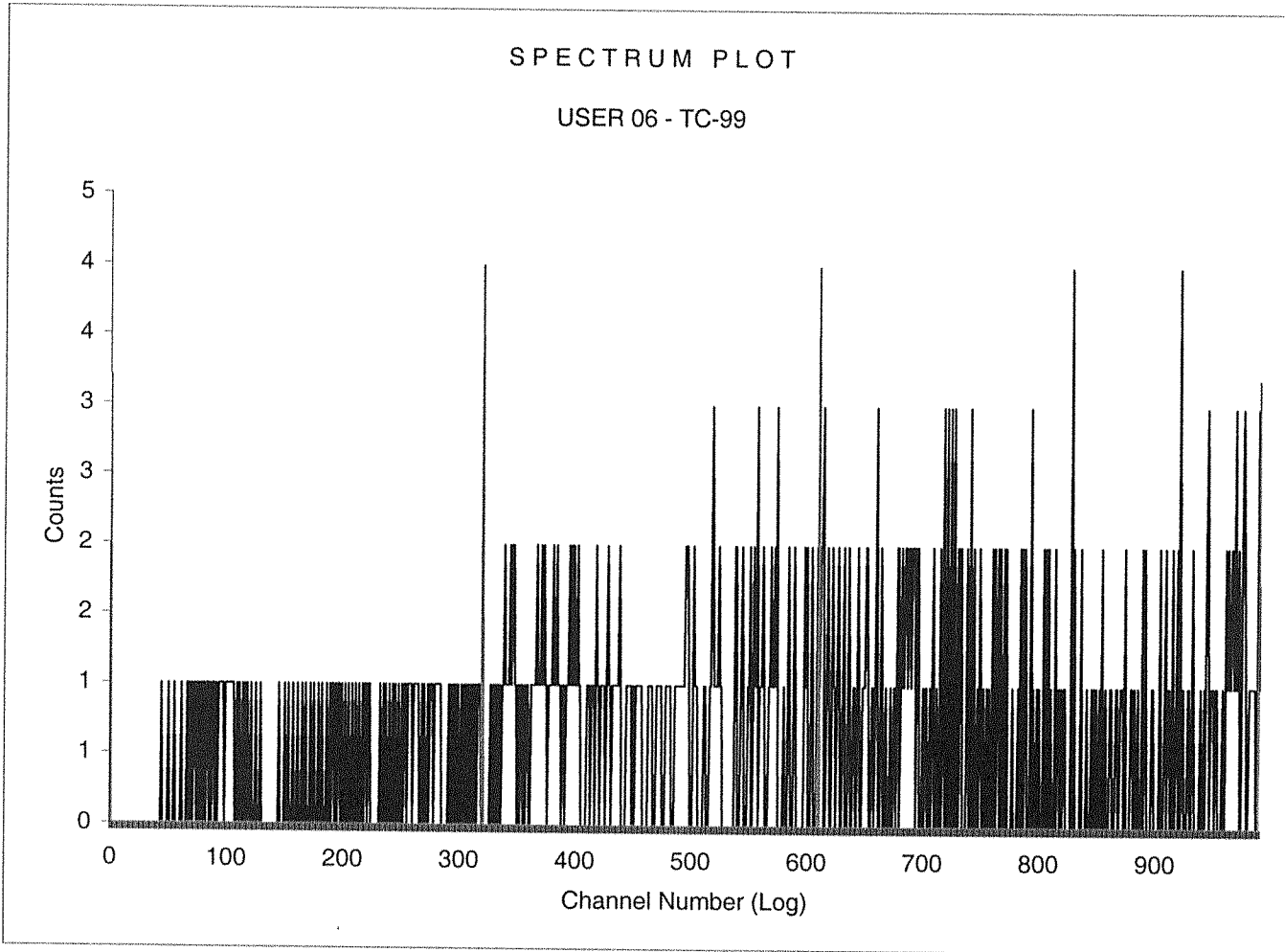
Sample Count Start Time: 20 Sep 2016 18:18:40
Data Capture Date: 20 Sep 2016 18:34:04
User Filename: S06092018-8A.XLS
U06092019-2A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TC-99
User Comment: SILVER
Scintillator: LIQUID
Sample, Rack-Pos, Time: 20 18-8 15.00
H#, Total Counts: 178.5 635
Win1: Tc-99 - Start, End: 320 610
Win2: - Start, End: 0 990



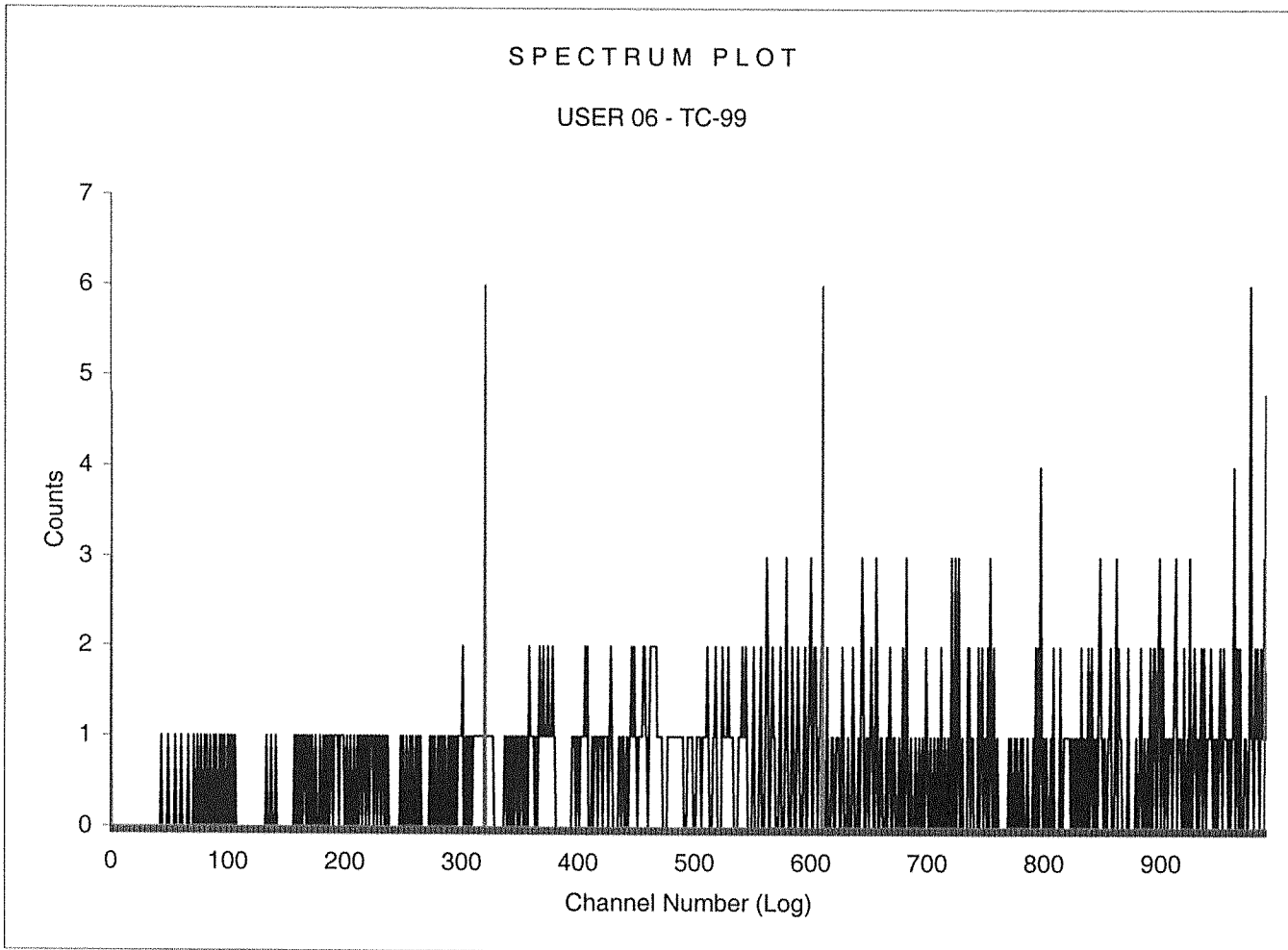
Sample Count Start Time:	20 Sep 2016 18:35:08		
Data Capture Date	20 Sep 2016 18:50:33		
User Filename	S06092018-9A.XLS		
	U06092019-2A.XLS		
Spectrum Type	Log Counts		
User Number	06		
User Id	TC-99		
User Comment	SILVER		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	21	18-9	15.00
H#, Total Counts:	184.9	617	
Win1: Tc-99 - Start, End:	320	610	
Win2: - Start, End:	0	990	



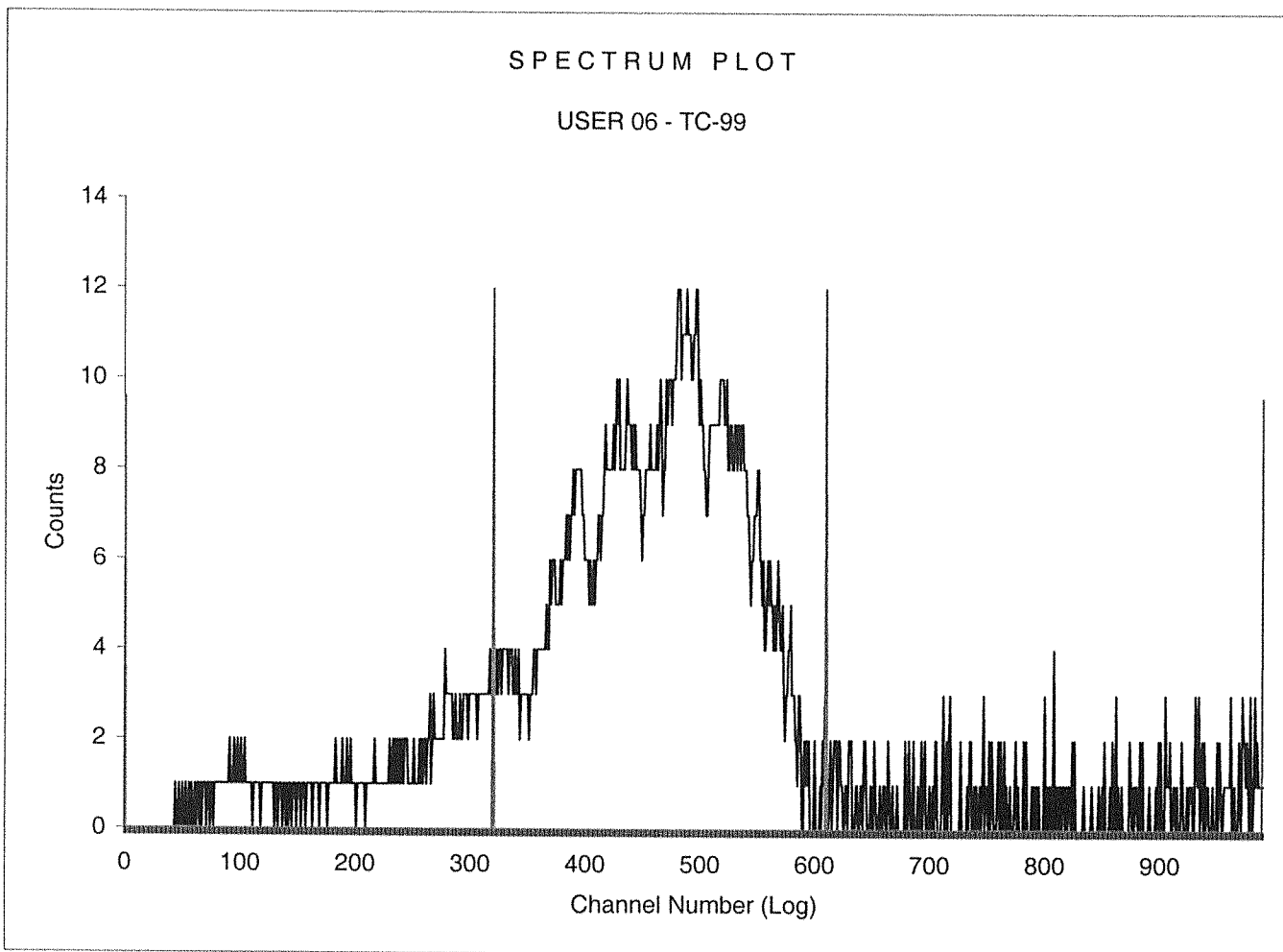
Sample Count Start Time: 20 Sep 2016 18:51:36
Data Capture Date: 20 Sep 2016 19:07:00
User Filename: S06092018-10A.XLS
U06092019-2A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TC-99
User Comment: SILVER
Scintillator: LIQUID
Sample, Rack-Pos, Time: 22 18-10 15.00
H#, Total Counts: 168.0 646
Win1: Tc-99 - Start, End: 320 610
Win2: - Start, End: 0 990



Sample Count Start Time: 20 Sep 2016 19:08:03
Data Capture Date: 20 Sep 2016 19:23:27
User Filename: S06092018-11A.XLS
U06092019-2A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TC-99
User Comment: SILVER
Scintillator: LIQUID
Sample, Rack-Pos, Time: 23 18-11 15.00
H#, Total Counts: 176.3 614
Win1: Tc-99 - Start, End: 320 610
Win2: - Start, End: 0 990



Sample Count Start Time: 20 Sep 2016 19:24:31
Data Capture Date: 20 Sep 2016 19:39:55
User Filename: S06092018-12A.XLS
U06092019-2A.XLS
Spectrum Type: Log Counts
User Number: 06
User Id: TC-99
User Comment: SILVER
Scintillator: LIQUID
Sample, Rack-Pos, Time: 24 18-12 15.00
H#, Total Counts: 172.5 2472
Win1: Tc-99 - Start, End: 320 610
Win2: - Start, End: 0 990



Batch# 1596422 Product: Pu 241 Date: 9/25/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NB
Samples have been blank corrected (if required). Blank correction reported included (if required).			NB
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	Der# 1561184
Sample was correctly preserved if required.			NB
Smears Taken for Radioactive batches.			NB
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.	✓		
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NB
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		Der# 1561184
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		Der# 1561184
Aliquot Correction completed if required.			NB
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: MLandry 9/25/16

Secondary Review Performed By: Jessie Davis 09/30/16

10/4
MJWC

DATA EXCEPTION REPORT

Mo.Day Yr. 25-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LSC	Test / Method: DOE EML HASL-300, Pu-11-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596422	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Other Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, and 1203621773 were received and analyzed out of holding.</p> <p>2. Sample 1203621774 does not meet the resolution requirement of having a full width half maximum of 100 keV or less for the Pu-242 tracer.</p>		<p>1. Reporting results.</p> <p>2. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.</p>	

Originator's Name:
Melanie Aycock 25-SEP-16

Data Validator/Group Leader:
Jessica Davis 30-SEP-16

Pu-241 Queue Sheet

07-SEP-16

90

Batch #: 1596422 Analyst: KXB2 First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16
 Tracer Isotope: Pu-242 (Pu-242) Pu-236 Tracer Code: 1710-A Expiration Date: 8-3-17 Vol: 0.1
 LCS Isotope: Pu-241 LCS Code: 1110-B Expiration Date: 10-28-16 Vol: 0.1
 Spike Isotope: Pu-241 Spike Code: Expiration Date: Vol: -
 Prep Date: 9-15-16 Initials: KB Pipet ID: 1840027 Balance ID: 16107602

Solid Sample Dissolution by: LEACH or DIGESTION
 Circle One
 Cocktail Used: Ultima gold LLT or Ecoscint Ultra
 Witness: AKA 9/15/16

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g) (1/f)	LSC Rack#	Alpha Spec Det #
405235061-1	5.1B.R.2.2	SAMPLE	15 pCi/g	SOIL	MJWC001	14-DEC-15	1	1	0.514	91-2	65	
405235062-1	5.2A.R.1.2	SAMPLE	15 pCi/g	SOIL	MJWC001	14-DEC-15	2	2	0.515	91-3	66	
405235063-1	5.2A.R.1.3	SAMPLE	15 pCi/g	SOIL	MJWC001	14-DEC-15	3	3	0.518	91-4	67	
405235064-1	5.2A.R.1.4	SAMPLE	15 pCi/g	SOIL	MJWC001	14-DEC-15	4	4	0.517	91-5	68	
405235065-1	5.2A.R.2.3	SAMPLE	15 pCi/g	SOIL	MJWC001	14-DEC-15	5	5	0.507	91-6	69	
405235066-1	5.2A.R.2.4	SAMPLE	15 pCi/g	SOIL	MJWC001	14-DEC-15	6	6	0.509	91-7	70	
405235067-1	5.2A.R.6.2	SAMPLE	15 pCi/g	SOIL	MJWC001	11-DEC-15	7	7	0.508	91-8	71	
405235068-1	5.2A.R.4.2	SAMPLE	15 pCi/g	SOIL	MJWC001	11-DEC-15	8	8	0.509	91-1	72	
405235069-1	5.2B.R.1.4	SAMPLE	15 pCi/g	SOIL	MJWC001	16-DEC-15	9	9	0.505	91-2	73	
405235070-1	5.2B.R.3.2	SAMPLE	15 pCi/g	SOIL	MJWC001	11-DEC-15	10	10	0.509	91-3	74	
405235071-1	5.2B.R.4.2	SAMPLE	15 pCi/g	SOIL	MJWC001	11-DEC-15	11	11	0.515	91-4	75	
405235072-1	5.2B.R.2.4	SAMPLE	15 pCi/g	SOIL	MJWC001	15-DEC-15	12	12	0.513	91-5	78	
405235073-1	5.2B.R.8.2	SAMPLE	15 pCi/g	SOIL	MJWC001	11-DEC-15	13	13	0.505	91-6	80	
405235074-1	5.3A.R.1.3	SAMPLE	15 pCi/g	SOIL	MJWC001	15-DEC-15	14	14	0.501	91-7	81	
405235075-1	5.4A.R.1.3	SAMPLE	15 pCi/g	SOIL	MJWC001	16-DEC-15	15	15	0.508	91-8	82	
405235076-1	5.4A.R.4.2	SAMPLE	15 pCi/g	SOIL	MJWC001	11-DEC-15	16	16	0.512	91-9	83	
405235077-1	5.5A.R.1.3	SAMPLE	15 pCi/g	SOIL	MJWC001	17-DEC-15	17	17	0.510	91-10	84	
405235078-1	5.6A.R.1.3	SAMPLE	15 pCi/g	SOIL	MJWC001	17-DEC-15	18	18	0.505	91-11	85	
1203621772-1	MB for batch 1596422	MB	15 pCi/g	SOIL	QC ACCOUNT	14-DEC-15	19	19	0.518	91-12	86	
1203621773-1	5.1B.R.2.2(405235061DUP)	DUP	15 pCi/g	SOIL	QC ACCOUNT		20	20	0.507	0-1	88	
1203621774-1	LCS for batch 1596422	LCS	15 pCi/g	SOIL	QC ACCOUNT		21	21	0.518	0-2	170	

AN 9-14-16 Bkg Rack #: 91-1

Instrument Used: LS6000 (Red) 7065155, LS6500 (Blue) 7067083, LS6500 (Green) 7067404, Wallac (Yellow) 7066056, LS6000 (Brown) 7060655, LS6500 (Gold) 7070506, Purple 7069123, Silver 7060656, (White) 4140299, Wallac (Teal) 4140421, Wallac (Gray) 4150033, 7069693 (Mocha)
 Data Reviewed By: M. [Signature] 9/25/16
 GEL Laboratories LLC, Radiochemistry Division
 Page 1 of 1

Plutonium-241 Solid

Filename : PU241.XLS
 File type : Excel
 Version # : 1.3.4

Batch : 1596422
 Analyst : KXB2
 Prep Date : 9/15/2016
 Method Uncertainty : 0.0839

Tracer S/N : 1770-A
 Tracer Exp Date : 8/3/2017
 Tracer Volume Added: 0.10
 Tracer Error: 0.44%

Procedure Code : LSC41PUS
 Parmname : Plutonium-241
 Required MDA : 15 pCi/G
 Half-life of Pu-241 : 14.290 years
 Pu-241 Abundance : 1.00
 Tracer Abundance : 1.00
 Half-life of Tracer : 373500.000 years

Geometry: 2mL D/1 drop HNO3/13mL Ecoscint-Ultra

Pos.	Sample Characteristics		Sample		Sample Date/Time	Tracer Calculations			Tracer Net CPM	Tracer Count Start Date/Time	Tracer Count Time (sec.)	Tracer Decay	Detector Serial #	Detector Efficiency (cpm/dpm)	Detector Efficiency StDev. (cpm/dpm)
	Sample ID	Sample Aliquot	Sample Aliquot	Sample StDev.		Tracer Concentration DPM	Tracer Counts	Bkg Counts							
1	405235066.1	3.2727E-03	0.5140	G	12/14/2015 13:47	4.3831	264	0.480	1.098	9/17/2016 11:42	14400	1.000	72194	0.284758	0.005506
2	405235062.1	3.2728E-03	0.5150	G	12/14/2015 13:10	4.3831	226	0.480	0.940	9/17/2016 11:42	14400	1.000	46-089C1	0.256702	0.004975
3	405235063.1	3.2731E-03	0.5180	G	12/14/2015 13:15	4.3831	242	0.960	1.004	9/17/2016 11:42	14400	1.000	78780	0.291959	0.005641
4	405235064.1	3.2730E-03	0.5170	G	12/14/2015 13:25	4.3831	267	1.200	1.108	9/17/2016 11:42	14400	1.000	78794	0.277658	0.005371
5	405235065.1	3.2720E-03	0.5070	G	12/14/2015 13:56	4.3831	317	0.960	1.317	9/17/2016 11:42	14400	1.000	78795	0.329662	0.006355
6	405235066.1	3.2722E-03	0.5090	G	12/14/2015 14:00	4.3831	298	0.720	1.239	9/17/2016 11:42	14400	1.000	78262	0.312964	0.006038
7	405235067.1	3.2721E-03	0.5080	G	12/11/2015 11:30	4.3831	312	0.960	1.296	9/17/2016 11:42	14400	1.000	80020	0.321394	0.006198
8	405235068.1	3.2722E-03	0.5090	G	12/11/2015 10:27	4.3831	161	1.200	0.666	9/17/2016 11:42	14400	1.000	67584	0.318335	0.006139
9	405235069.1	3.2718E-03	0.5050	G	12/16/2015 12:45	4.3831	286	2.160	1.183	9/17/2016 11:42	14400	1.000	78775	0.335965	0.006474
10	405235070.1	3.2722E-03	0.5090	G	12/11/2015 10:10	4.3831	254	2.160	1.049	9/17/2016 11:42	14400	1.000	83296	0.303767	0.005964
11	405235071.1	3.2728E-03	0.5150	G	12/11/2015 10:25	4.3831	286	1.680	1.185	9/17/2016 11:42	14400	1.000	80010	0.323452	0.006238
12	405235072.1	3.2726E-03	0.5130	G	12/15/2015 13:35	4.3831	260	0.720	1.080	9/17/2016 11:42	14400	1.000	38633	0.334433	0.006444
13	405235073.1	3.2718E-03	0.5050	G	12/11/2015 11:35	4.3831	312	0.480	1.298	9/17/2016 11:42	14400	1.000	78197	0.344422	0.006633
14	405235074.1	3.2719E-03	0.5010	G	12/15/2015 14:10	4.3831	162	1.920	0.667	9/17/2016 11:42	14400	1.000	79996	0.330506	0.006369
15	405235075.1	3.2721E-03	0.5080	G	12/16/2015 9:31	4.3831	261	2.880	1.075	9/17/2016 11:42	14400	1.000	79997	0.319848	0.006168
16	405235076.1	3.2725E-03	0.5120	G	12/11/2015 14:19	4.3831	399	2.160	1.612	9/17/2016 11:42	14400	1.000	78785	0.353477	0.006805
17	405235077.1	3.2723E-03	0.5100	G	12/17/2015 13:30	4.3831	242	1.440	1.002	9/17/2016 11:42	14400	1.000	78265	0.347248	0.006686
18	405235078.1	3.2718E-03	0.5050	G	12/17/2015 12:40	4.3831	288	0.720	1.197	9/17/2016 11:42	14400	1.000	78776	0.329780	0.006356
19	1203621773.1	3.2731E-03	0.5180	G	9/15/2016 0:00	4.3831	275	2.640	1.135	9/17/2016 11:42	14400	1.000	78198	0.311951	0.006019
20	1203621773.1	3.2720E-03	0.5070	G	12/14/2015 13:47	4.3831	306	2.640	1.264	9/17/2016 11:42	14400	1.000	83291	0.312191	0.006024
21	1203621774.1	3.2731E-03	0.5180	G	9/15/2016 0:00	4.3831	179	0.960	0.742	9/17/2016 11:44	14400	1.000	72549	0.257306	0.004988

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-035
 Instrument SOP: GL-RAD-I-014

Pos.	Counting			Gross cpm	Bkg cpm	Bkg Count Time (min.)	Bkg Quench#	Corrected Bkg cpm	Count Start Date/Time	Sample Decay	Calculated Sample Recovery %	Sample Recovery Error %	Calibration Data			Detector Efficiency Error (cpm/dpm)	Background Rack Position #	Background Count Start Date/Time
	Rack Position #	Counting Time (min.)	Quench#										Count	Calibration Date	Calibration Due Date			
1	91-2	90	713.45	8.79	9.09	90	714.56	9.0410	9/21/2016 14:35	0.963	86.0%	6.49%	LSCTEAL	2/1/2016	1/31/2017	0.1958	91-1	9/21/2016 13:03
2	91-3	90	713.4	7.98	9.09	90	714.56	9.0388	9/21/2016 16:06	0.963	83.5%	6.97%	LSCTEAL	2/1/2016	1/31/2017	0.1957	91-1	9/21/2016 13:03
3	91-4	90	714.16	8.35	9.09	90	714.56	9.0720	9/21/2016 17:37	0.963	78.5%	6.77%	LSCTEAL	2/1/2016	1/31/2017	0.1972	91-1	9/21/2016 13:03
4	91-5	90	713.35	8.39	9.09	90	714.56	9.0367	9/21/2016 19:08	0.963	91.0%	6.47%	LSCTEAL	2/1/2016	1/31/2017	0.1956	91-1	9/21/2016 13:03
5	91-6	90	711.62	8.56	9.09	90	714.56	8.9653	9/21/2016 20:39	0.963	91.1%	5.98%	LSCTEAL	2/1/2016	1/31/2017	0.1923	91-1	9/21/2016 13:03
6	91-7	90	714.97	8.44	9.09	90	714.56	9.1087	9/21/2016 22:10	0.963	90.3%	6.15%	LSCTEAL	2/1/2016	1/31/2017	0.1987	91-1	9/21/2016 13:03
7	91-8	90	713.05	8.85	9.09	90	714.56	9.0239	9/21/2016 23:41	0.963	92.0%	6.02%	LSCTEAL	2/1/2016	1/31/2017	0.1950	91-1	9/21/2016 13:03
8	91-1	90	712.49	8.23	9.09	90	714.56	9.0005	9/22/2016 2:25	0.963	47.7%	8.21%	LSCTEAL	2/1/2016	1/31/2017	0.1940	91-1	9/21/2016 13:03
9	91-2	90	715.98	8.18	9.09	90	714.56	9.1564	9/22/2016 3:56	0.963	80.3%	6.29%	LSCTEAL	2/1/2016	1/31/2017	0.2007	91-1	9/21/2016 13:03
10	91-3	90	710.14	8.33	9.09	90	714.56	8.9087	9/22/2016 5:27	0.963	78.8%	6.65%	LSCTEAL	2/1/2016	1/31/2017	0.1895	91-1	9/21/2016 13:03
11	91-4	90	712.44	8.85	9.09	90	714.56	8.9984	9/22/2016 6:58	0.963	83.6%	6.28%	LSCTEAL	2/1/2016	1/31/2017	0.1939	91-1	9/21/2016 13:03
12	91-5	90	711.37	8.91	9.09	90	714.56	8.9555	9/22/2016 8:29	0.963	73.7%	6.54%	LSCTEAL	2/1/2016	1/31/2017	0.1918	91-1	9/21/2016 13:03
13	91-6	90	714.01	8.1	9.09	90	714.56	9.0654	9/22/2016 10:00	0.963	86.0%	6.01%	LSCTEAL	2/1/2016	1/31/2017	0.1969	91-1	9/21/2016 13:03
14	91-7	90	714.97	8.38	9.09	90	714.56	9.1087	9/22/2016 11:32	0.963	46.0%	8.23%	LSCTEAL	2/1/2016	1/31/2017	0.1987	91-1	9/21/2016 13:03
15	91-8	90	705	8.37	9.09	90	714.56	8.7401	9/22/2016 13:03	0.963	76.7%	5.88%	LSCTEAL	2/1/2016	1/31/2017	0.1801	91-1	9/21/2016 13:03
16	91-9	90	710.5	8.68	9.09	90	714.56	8.9221	9/22/2016 14:34	0.963	104%	5.48%	LSCTEAL	2/1/2016	1/31/2017	0.1902	91-1	9/21/2016 13:03
17	91-10	90	711.16	8.74	9.09	90	714.56	8.9473	9/22/2016 16:05	0.963	65.9%	6.78%	LSCTEAL	2/1/2016	1/31/2017	0.1914	91-1	9/21/2016 13:03
18	91-11	90	715.12	8.9	9.09	90	714.56	9.1157	9/22/2016 17:36	0.963	82.8%	6.24%	LSCTEAL	2/1/2016	1/31/2017	0.1990	91-1	9/21/2016 13:03
19	91-12	90	711.78	8.55	9.09	90	714.56	8.9717	9/22/2016 19:07	0.999	93.0%	6.42%	LSCTEAL	2/1/2016	1/31/2017	0.1926	91-1	9/21/2016 13:03
20	0-1	90	712.13	8.71	9.09	90	714.56	8.9858	9/22/2016 20:39	0.963	92.4%	6.11%	LSCTEAL	2/1/2016	1/31/2017	0.1933	91-1	9/21/2016 13:03
21	0-2	90	710.04	34.2	9.09	90	714.56	8.9050	9/22/2016 22:10	0.999	65.8%	7.80%	LSCTEAL	2/1/2016	1/31/2017	0.1893	91-1	9/21/2016 13:03

PROTOCOL : 5 Pu-241 90 min
DATE : 2016/09/21
TIME : 13:03
ID : P05AS287

Pu-241

Wallac 1414 WinSpectral v3.0 S/N4140421

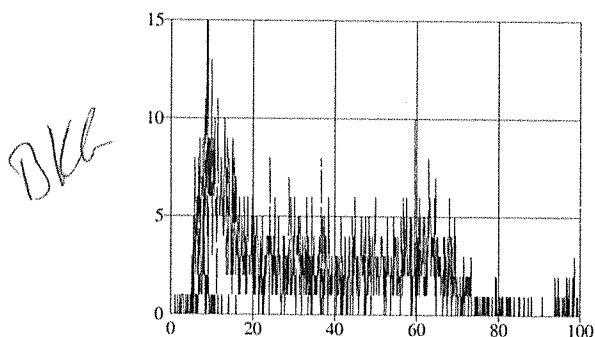
Counting mode : CPM
Isotope(s) : H3
H3 = 5- 350,12.43 y
Protocol name : Pu-241 90 min
Counting time : 5400
Repeats : 1
Cycles : 1
Replicates : 1
2 sigma % : 2.00
Minimum cpm : 0.00 Checking time: 10
Advanced modes : Chemilum
Output to Display :
 POS,DPM1,CPMw2,CLMM,FNCT2,
 RACK,RACKPOS,FNCT1,SQPE,DATE,
 TIME,CPMw1,CPM,CPM1,CTIME
Additions to Display : Spectrum,Header,Listing
Header : Pu-241
Spectrum : Rnd.Cos,Beta
Window 1 : 25- 220 /Beta
Window 2 : 25- 220 /Rnd.Cos
Window 3 : 1-1024 /Beta
Window 4 : 1-1024 /Beta
Window 5 : 1-1024 /Beta
Window 6 : 1-1024 /Beta
FNCT1 = FNCT1 : CTIME/60
FNCT2 = FNCT2 : CPMW1-CPMW2
FNCT3 = FNCT3 :
FNCT4 = FNCT4 :

Total count rate:

H3 96.9 CPM

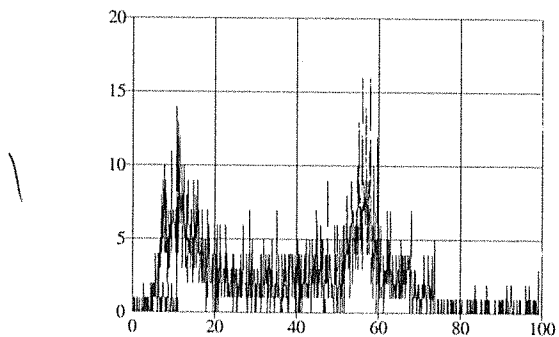
Pu-241 TEAL

Rack_position	Count_Time(min)	Quench_number	Pu241_cpm	Run_Date
91	1	90.00	714.56	9/21/2016 1:03 PM



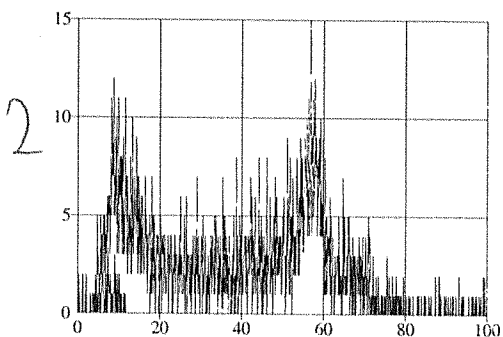
Gross_B_CPM	LUMEX
10.00	0.00
Lumex_CPM	DPM
0.90	0.00

Rack_position	Count_Time(min)	Quench_number	Pu241_cpm	Run_Date
91	2	90.00	713.45	9/21/2016 2:35 PM



Gross_B_CPM	LUMEX
9.20	0.00
Lumex_CPM	DPM
0.40	0.00

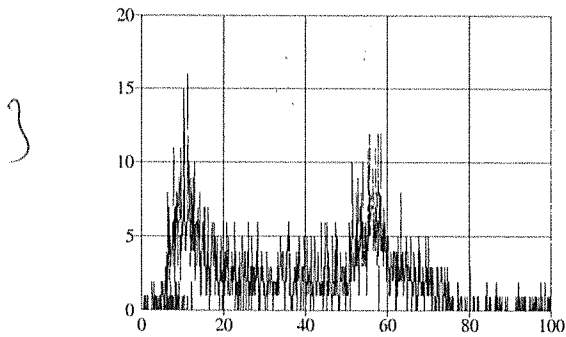
Rack_position	Count_Time(min)	Quench_number	Pu241_cpm	Run_Date
91	3	90.00	713.40	9/21/2016 4:06 PM



Gross_B_CPM	LUMEX
8.70	0.00
Lumex_CPM	DPM
0.70	0.00

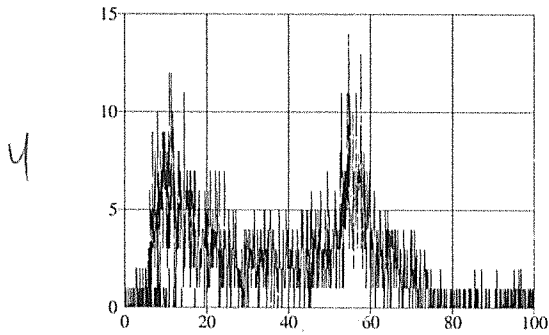
Pu-241 TEAL

Rack_position Count_Time(min) Quench_number Pu241_cpm Run_Date
91 4 90.00 714.16 8.35 9/21/2016 5:37 PM



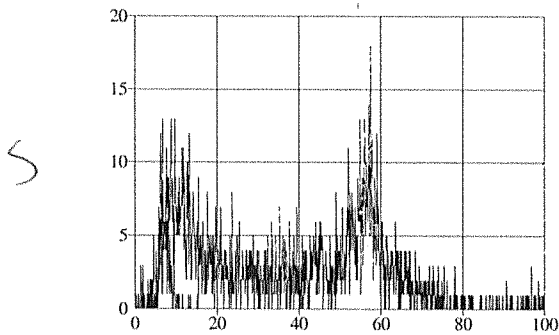
Gross_B_CPM LUMEX
8.70 0.00
Lumex_CPM DPM
0.40 0.00

Rack_position Count_Time(min) Quench_number Pu241_cpm Run_Date
91 5 90.00 713.35 8.39 9/21/2016 7:08 PM



Gross_B_CPM LUMEX
8.80 0.00
Lumex_CPM DPM
0.50 0.00

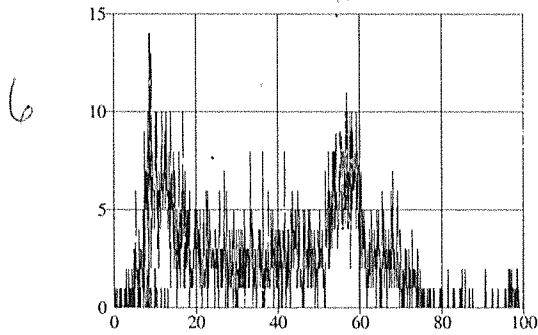
Rack_position Count_Time(min) Quench_number Pu241_cpm Run_Date
91 6 90.00 711.62 8.56 9/21/2016 8:39 PM



Gross_B_CPM LUMEX
10.30 0.00
Lumex_CPM DPM
1.80 0.00

Pu-241 TEAL

Rack_position Count_Time(min) Quench_number Pu241_cpm Run_Date
91 7 90.00 714.97 8.44 9/21/2016 10:10 PM

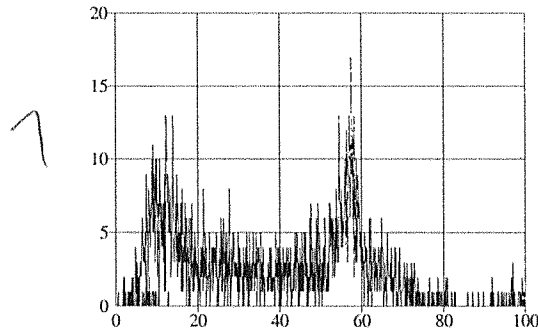


Counts Chem

Counts Beta

Gross_B_CPM LUMEX
8.90 0.00
Lumex_CPM DPM
0.50 0.00

Rack_position Count_Time(min) Quench_number Pu241_cpm Run_Date
91 8 90.00 713.05 8.85 9/21/2016 11:41 PM



Counts Chem

Counts Beta

Gross_B_CPM LUMEX
9.10 0.00
Lumex_CPM DPM
0.30 0.00

PROTOCOL : 5 Pu-241 90 min
DATE : 2016/09/22
TIME : 02:24
ID : P05AS288

Pu-241

Wallac 1414 WinSpectral v3.0 S/N4140421

Counting mode : CPM
Isotope(s) : H3
H3 = 5- 350,12.43 y
Protocol name : Pu-241 90 min
Counting time : 5400
Repeats : 1
Cycles : 1
Replicates : 1
2 sigma % : 2.00
Minimum cpm : 0.00 Checking time: 10
Advanced modes : Chemilum
Output to Display :
 POS,DPM1,CPMw2,CLMM,FNCT2,
 RACK,RACKPOS,FNCT1,SQPE,DATE,
 TIME,CPMw1,CPM,CPM1,CTIME
Additions to Display : Spectrum,Header,Listing
Header : Pu-241
Spectrum : Rnd.Cos,Beta
Window 1 : 25- 220 /Beta
Window 2 : 25- 220 /Rnd.Cos
Window 3 : 1-1024 /Beta
Window 4 : 1-1024 /Beta
Window 5 : 1-1024 /Beta
Window 6 : 1-1024 /Beta
FNCT1 = FNCT1 : CTIME/60
FNCT2 = FNCT2 : CPMW1-CPMW2
FNCT3 = FNCT3 :
FNCT4 = FNCT4 :

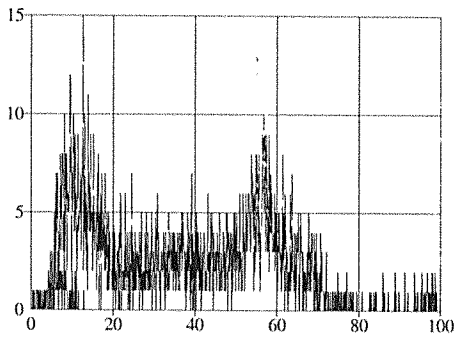
Total count rate:

H3 192.2 CPM

Pu-241 TEAL

Rack_position 91 Count_Time(min) 90.00 Quench_number 712.49 Pu241_cpm 8.23 Run_Date 9/22/2016 2:25 AM

8



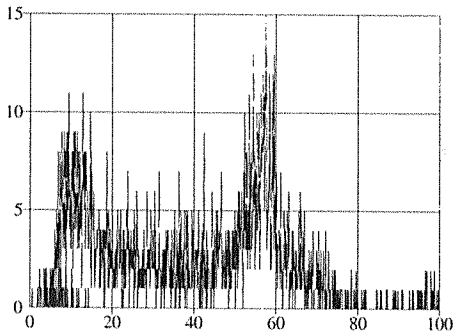
Counts Chem

Counts Beta

Gross_B_CPM 8.90 LUMEX 0.00
Lumex_CPM 0.70 DPM 0.00

Rack_position 91 Count_Time(min) 90.00 Quench_number 715.98 Pu241_cpm 8.18 Run_Date 9/22/2016 3:56 AM

9



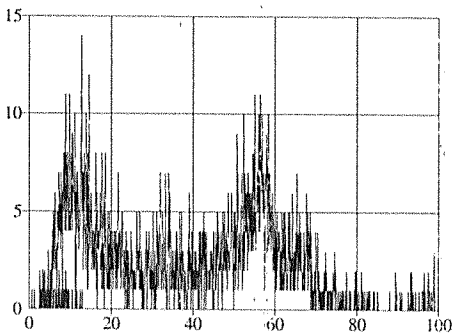
Counts Chem

Counts Beta

Gross_B_CPM 8.60 LUMEX 0.00
Lumex_CPM 0.40 DPM 0.00

Rack_position 91 Count_Time(min) 90.00 Quench_number 710.14 Pu241_cpm 8.33 Run_Date 9/22/2016 5:27 AM

10



Counts Chem

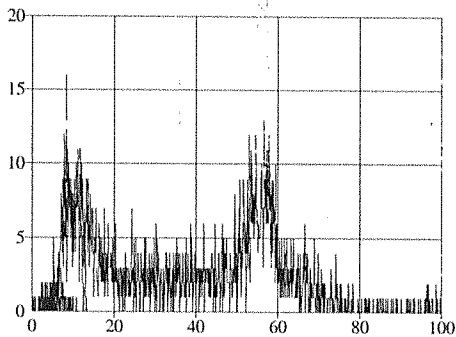
Counts Beta

Gross_B_CPM 8.70 LUMEX 0.00
Lumex_CPM 0.40 DPM 0.00

Pu-241 TEAL

Rack_position 91 Count_Time(min) 90.00 Quench_number 712.44 Pu241_cpm 8.85 Run_Date 9/22/2016 6:58 AM

11



Counts Chem

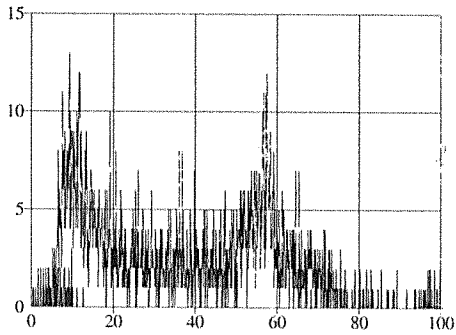
Counts Beta

Gross_B_CPM 9.30 LUMEX 0.00

Lumex_CPM 0.50 DPM 0.00

Rack_position 91 Count_Time(min) 90.00 Quench_number 711.37 Pu241_cpm 8.91 Run_Date 9/22/2016 8:29 AM

12



Counts Chem

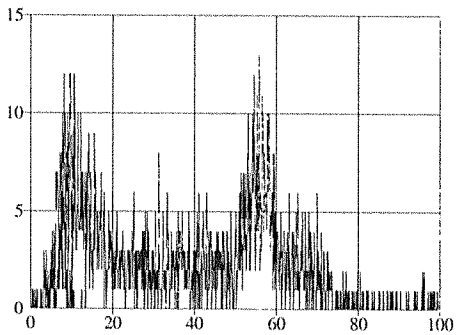
Counts Beta

Gross_B_CPM 9.40 LUMEX 0.00

Lumex_CPM 0.40 DPM 0.00

Rack_position 91 Count_Time(min) 90.00 Quench_number 714.01 Pu241_cpm 8.10 Run_Date 9/22/2016 10:00 AM

13



Counts Chem

Counts Beta

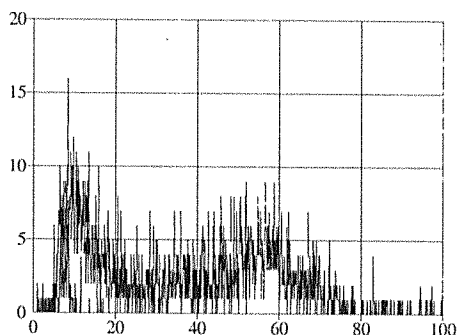
Gross_B_CPM 9.10 LUMEX 0.00

Lumex_CPM 1.00 DPM 0.00

Pu-241 TEAL

Rack_position	Count_Time(min)	Quench_number	Pu241_cpm	Run_Date
91	7	90.00	8.38	9/22/2016 11:32 AM

14

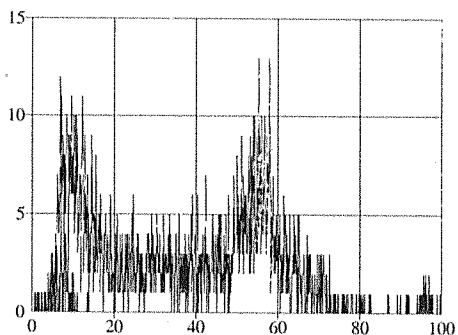


Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
9.60	0.00
Lumex_CPM	DPM
1.30	0.00

Rack_position	Count_Time(min)	Quench_number	Pu241_cpm	Run_Date
91	8	90.00	8.37	9/22/2016 1:03 PM

15

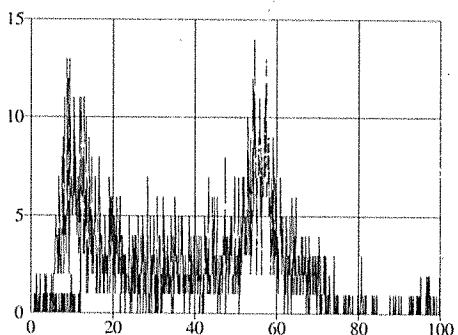


Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
9.30	0.00
Lumex_CPM	DPM
0.90	0.00

Rack_position	Count_Time(min)	Quench_number	Pu241_cpm	Run_Date
91	9	90.00	8.68	9/22/2016 2:34 PM

16



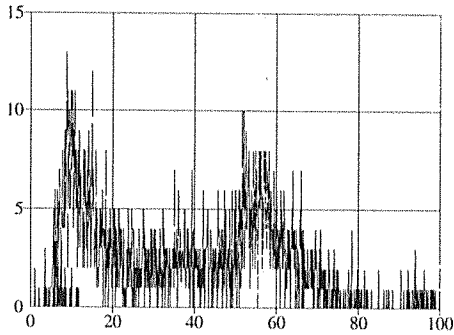
Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
9.00	0.00
Lumex_CPM	DPM
0.30	0.00

Pu-241 TEAL

Rack_position Count_Time(min) Quench_number Pu241_cpm Run_Date
91 10 90.00 711.16 8.74 9/22/2016 4:05 PM

17



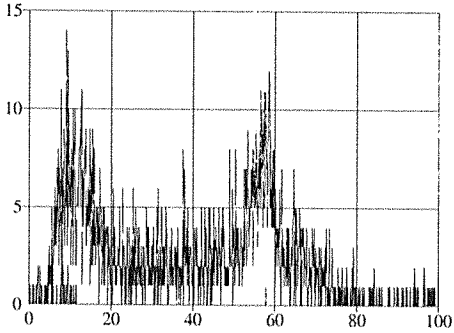
Counts Chem

Counts Beta

Gross_B_CPM LUMEX
9.10 0.00
Lumex_CPM DPM
0.30 0.00

Rack_position Count_Time(min) Quench_number Pu241_cpm Run_Date
91 11 90.00 715.12 8.90 9/22/2016 5:36 PM

18



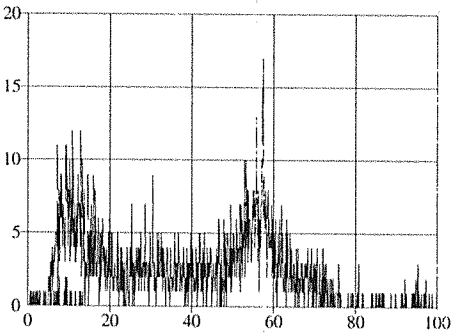
Counts Chem

Counts Beta

Gross_B_CPM LUMEX
9.20 0.00
Lumex_CPM DPM
0.30 0.00

Rack_position Count_Time(min) Quench_number Pu241_cpm Run_Date
91 12 90.00 711.78 8.55 9/22/2016 7:07 PM

19



Counts Chem

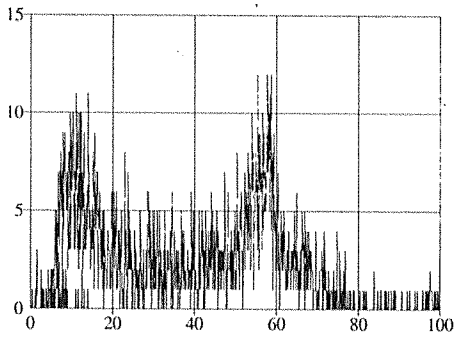
Counts Beta

Gross_B_CPM LUMEX
8.80 0.00
Lumex_CPM DPM
0.30 0.00

Pu-241 TEAL

Rack_position Count_Time(min) Quench_number Pu241_cpm Run_Date
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20



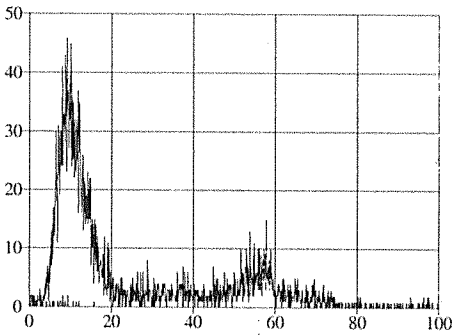
Counts Chem

Counts Beta

Gross_B_CPM LUMEX
9.10 0.00
Lumex_CPM DPM
0.40 0.00

Rack_position Count_Time(min) Quench_number Pu241_cpm Run_Date
0 2 90.00 710.04 34.20 9/22/2016 10:10 PM

22



Counts Chem

Counts Beta

Gross_B_CPM LUMEX
34.40 0.00
Lumex_CPM DPM
0.20 0.00

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
 SAMPLE ID : R0405235061_PU
 SAMPLE QTY : 0.514 G +/-0.195 %
 SAMPLE DATE : 14-Dec-2015 00:00:00
 ANALYST : KXB2
 % YIELD : 88.0 +/-6.490 %

CHAMBER : 065
 DETECTOR S/N : 72194
 AVERAGE %EFFICIENCY : 28.4758
 AVERAGE %EFF ERROR : 0.5506
 COUNT DATE : 17-Sep-2016 11:42:34
 ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
 BKG FILE : B065.CNF;2658
 BKG DATE : 16-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W065.CNF;489
 CAL DATE : 03-Sep-2016

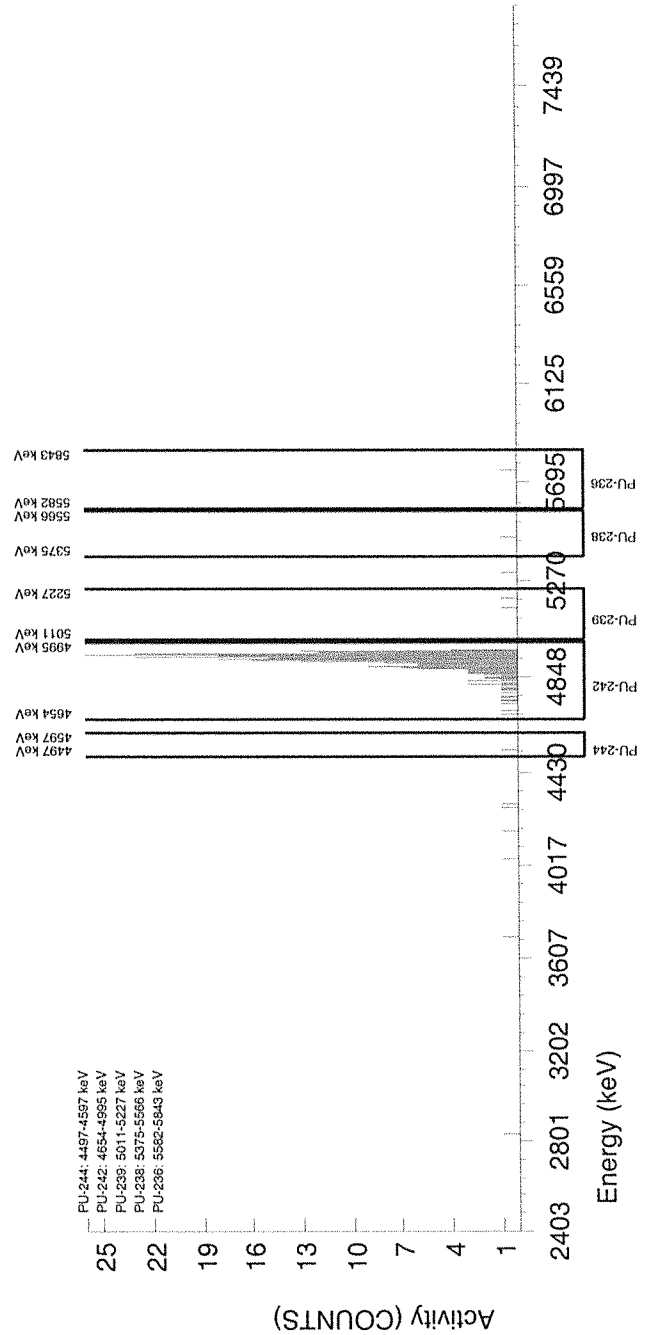
TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.8559E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5748.94	4.939	1.000	0.520	0.480	0.6928	100.000	9.12E-03	5.07E-02	9.71E-02	2.23E-02	5.07E-02
PU-238	5486.00	5415.55	0.000	2.000	1.760	0.240	0.4899	99.900	2.58E-02	5.09E-02	7.04E-02	1.32E-02	5.08E-02
PU-239	5155.00	5169.13	44.452	2.000	1.760	0.240	0.4899	99.900	2.57E-02	5.06E-02	7.00E-02	1.31E-02	5.05E-02
PU-242	4890.00	4909.38	39.064	264.000	263.520	0.480	0.6928	100.000	3.84E+00	6.90E-01	8.07E-02	1.85E-02	4.65E-01
PU-244	4589.00	4523.95	4.939	1.000	1.000	0.000	0.0000	99.900	1.46E-02	4.11E-02	4.38E-02	0.00E+00	4.10E-02

Handwritten signature and date: 9/19/14



GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
 SAMPLE ID : R0405235062_PU
 SAMPLE QTY : 0.515 G +/-0.194 %
 SAMPLE DATE : 14-Dec-2015 00:00:00
 ANALYST : KXB2
 % YIELD : 83.5 +/-6.972 %

CHAMBER : 066
 DETECTOR S/N : 46-089C1
 AVERAGE %EFFICIENCY : 25.6702
 AVERAGE %EFF ERROR : 0.4975
 COUNT DATE : 17-Sep-2016 11:42:34
 ELAPSED LIVE TIME(SEC) : 14400.00

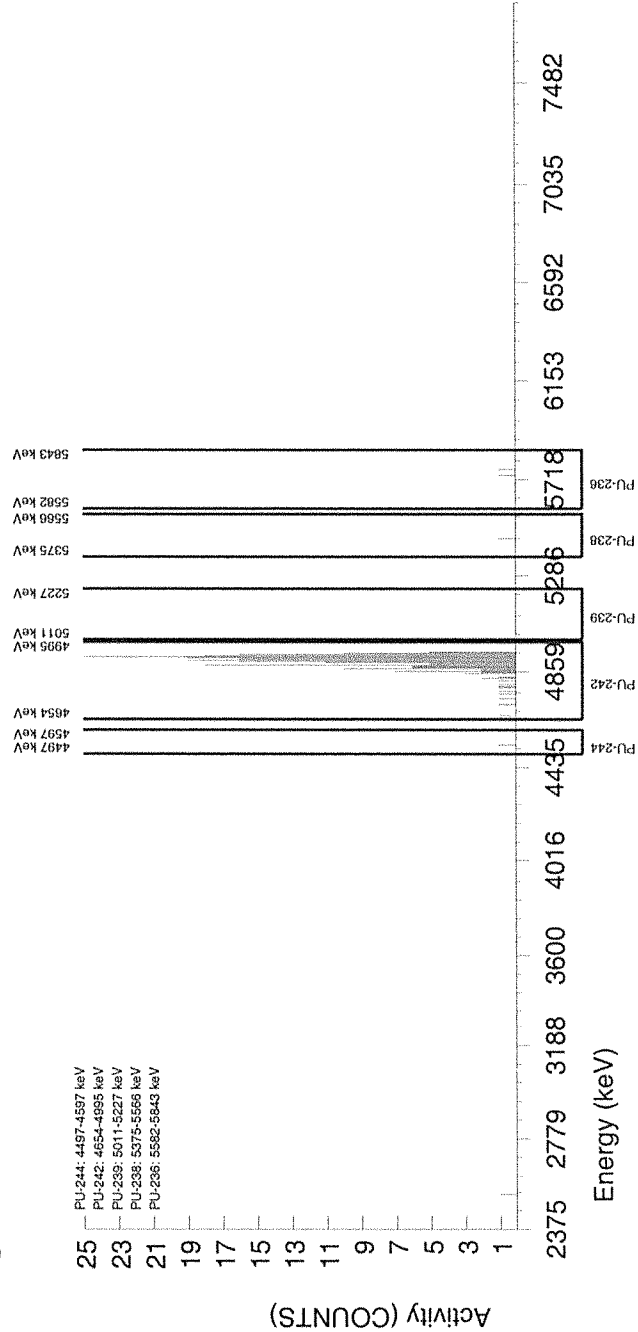
LIB FILE : PU
 BKG FILE : B066.CNF;1813
 BKG DATE : 16-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W066.CNF;487
 CAL DATE : 03-Sep-2016

TRACER
 ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.6605E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG S/D	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5747.65	30.175	2.000	1.760	0.240	0.4899	100.000	3.60E-02	7.09E-02	9.81E-02	1.84E-02	7.08E-02
PU-238	5486.00	5453.18	5.029	1.000	0.280	0.720	0.8485	99.900	4.79E-03	5.02E-02	1.05E-01	2.66E-02	5.01E-02
PU-239	5155.00	5118.70	0.000	0.000	-1.200	1.200	1.0954	99.900	-2.04E-02	3.88E-02	1.19E-01	3.41E-02	3.87E-02
PU-242	4890.00	4904.86	50.501	226.000	225.520	0.480	0.6928	100.000	3.83E+00	7.40E-01	9.41E-02	2.16E-02	5.02E-01
PU-244	4589.00	4535.62	5.029	1.000	0.760	0.240	0.4899	99.900	1.29E-02	4.86E-02	8.16E-02	1.53E-02	4.85E-02

9/29/16



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
SAMPLE ID : R0405235063_PU
SAMPLE QTY : 0.518 G +/-0.193 %
SAMPLE DATE : 14-Dec-2015 00:00:00
ANALYST : KXB2
% YIELD : 78.5 +/-6.767 %

CHAMBER : 067
DETECTOR S/N : 78780
AVERAGE %EFFICIENCY : 29.1959
AVERAGE %EFF ERROR : 0.5641
COUNT DATE : 17-Sep-2016 11:42:34
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B067.CNF;1813
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W067.CNF;476
CAL DATE : 03-Sep-2016

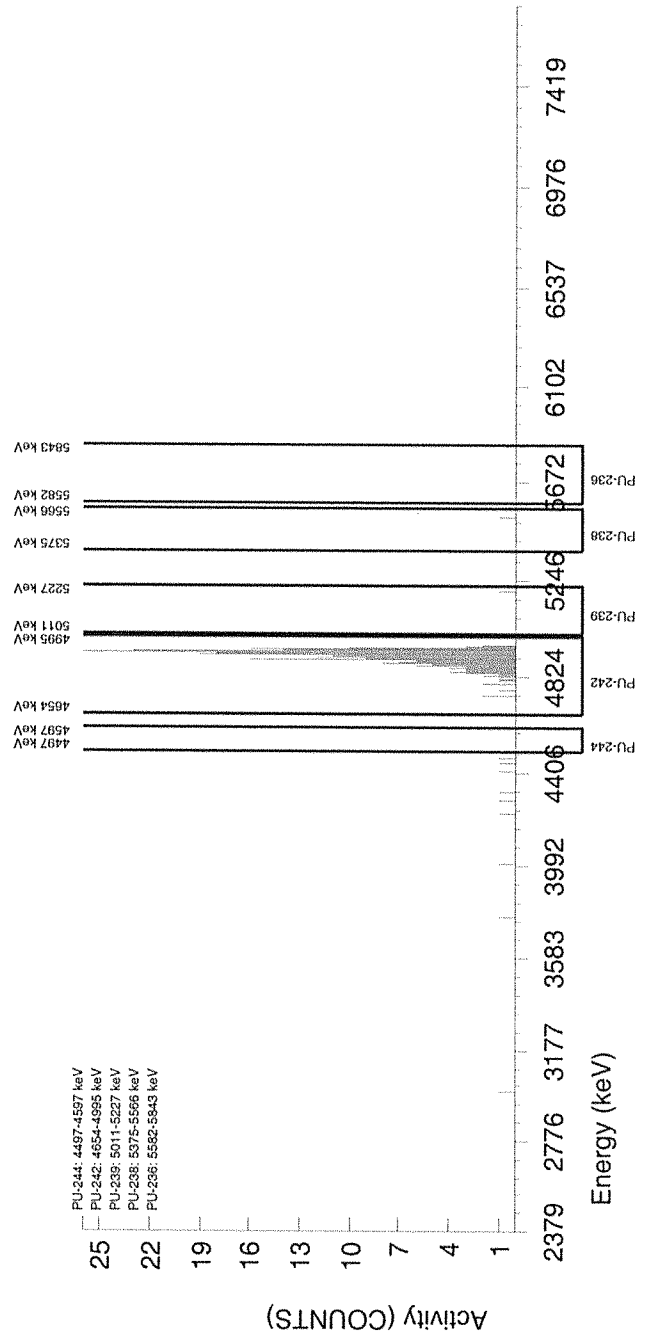
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.4400E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	-1.200	1.200	1.0954	100.000	-2.28E-02	1.33E-01	3.82E-02	4.33E-02
PU-238	5486.00	5522.37	4.935	1.000	1.000	0.000	0.0000	99.900	1.59E-02	4.78E-02	0.00E+00	4.48E-02
PU-239	5155.00	5198.11	4.935	1.000	0.520	0.480	0.6928	99.900	8.23E-03	8.77E-02	2.01E-02	4.57E-02
PU-242	4890.00	4907.93	48.359	242.000	241.040	0.960	0.9798	100.000	3.81E+00	1.04E-01	2.84E-02	4.83E-01
PU-244	4589.00	4598.66	0.000	1.000	1.000	0.000	0.0000	99.900	1.58E-02	4.75E-02	0.00E+00	4.45E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
SAMPLE ID : R0405235064_PU
SAMPLE QTY : 0.517 G +/-0.193 %
SAMPLE DATE : 14-Dec-2015 00:00:00
ANALYST : KXB2
% YIELD : 91.0 +/-6.474 %

CHAMBER : 068
DETECTOR S/N : 78794
AVERAGE %EFFICIENCY : 27.7658
AVERAGE %EFF ERROR : 0.5371
COUNT DATE : 17-Sep-2016 11:42:34
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B068.CNF:1804
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W068.CNF:453
CAL DATE : 03-Sep-2016

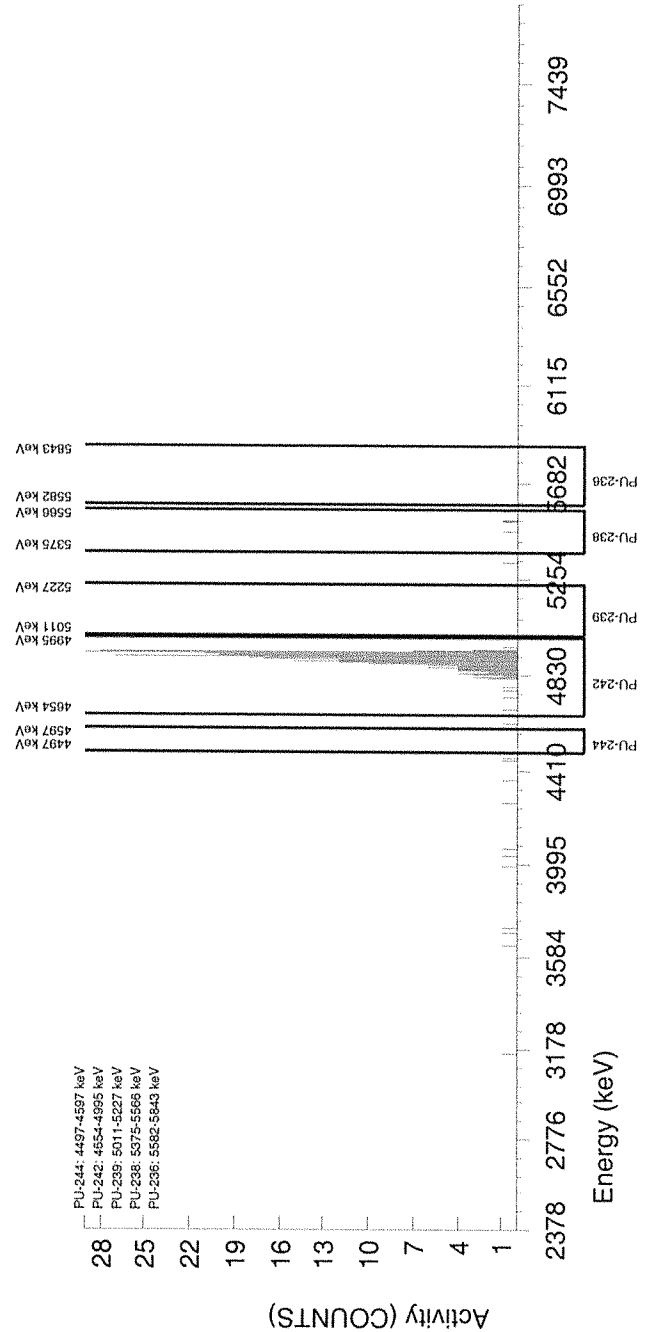
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.9887E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.25	0.000	0.000	-0.960	0.960	0.9798	100.000	-1.66E-02	3.85E-02	3.10E-02	3.85E-02
PU-238	5486.00	5497.56	49.420	3.000	2.040	0.960	0.9798	99.900	2.95E-02	5.89E-02	2.60E-02	5.87E-02
PU-239	5155.00	5118.68	0.000	0.000	-1.200	1.200	1.0954	99.900	-1.73E-02	3.28E-02	2.89E-02	3.27E-02
PU-242	4890.00	4902.87	43.536	267.000	265.800	1.200	1.0954	100.000	3.82E+00	6.85E-01	2.88E-02	4.61E-01
PU-244	4589.00	4546.97	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	2.91E-02	0.00E+00	2.90E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
 SAMPLE ID : R0405235065_PU
 SAMPLE QTY : 0.507 G +/-0.197 %
 SAMPLE DATE : 14-Dec-2015 00:00:00
 ANALYST : KXB2
 % YIELD : 91.1 +/-5.981 %

CHAMBER : 069
 DETECTOR S/N : 78795
 AVERAGE %EFFICIENCY : 32.9662
 AVERAGE %EFF ERROR : 0.6355
 COUNT DATE : 17-Sep-2016 11:42:34
 ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
 BKG FILE : B069.CNF:1819
 BKG DATE : 16-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W069.CNF:495
 CAL DATE : 03-Sep-2016

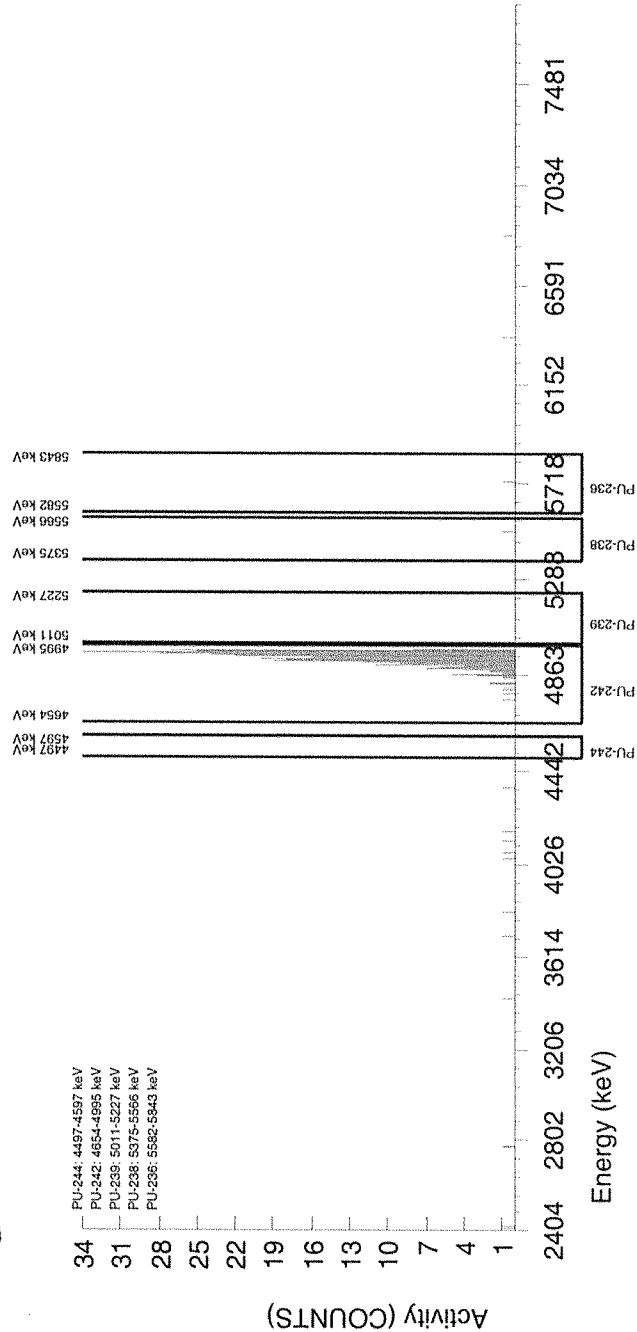
TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.9945E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma	
										TPU pCi/G	Lc pCi/G
PU-236	5749.00	5723.58	4.959	1.000	0.520	0.480	0.6928	100.000	7.71E-03	4.29E-02	8.21E-02
PU-238	5486.00	5502.78	4.959	1.000	1.000	0.000	0.0000	99.900	1.24E-02	3.49E-02	3.72E-02
PU-239	5155.00	5118.68	0.000	0.000	-0.720	0.720	0.8485	99.900	-8.88E-03	2.69E-02	7.53E-02
PU-242	4890.00	4938.75	48.654	317.000	316.040	0.960	0.9798	100.000	3.89E+00	6.45E-01	8.12E-02
PU-244	4589.00	4546.97	0.000	0.000	-0.240	0.240	0.4899	99.900	-2.96E-03	2.56E-02	5.91E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER : 1596422
 SAMPLE ID : R0405235066_PU
 SAMPLE QTY : 0.509 G +/-0.196 %
 SAMPLE DATE : 14-Dec-2015 00:00:00
 ANALYST : KXB2
 % YIELD : 90.3 +/-6.146 %

LIB FILE : PU
 BKG FILE : B070.CNF;1821
 BKG DATE : 16-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W070.CNF;500
 CAL DATE : 03-Sep-2016

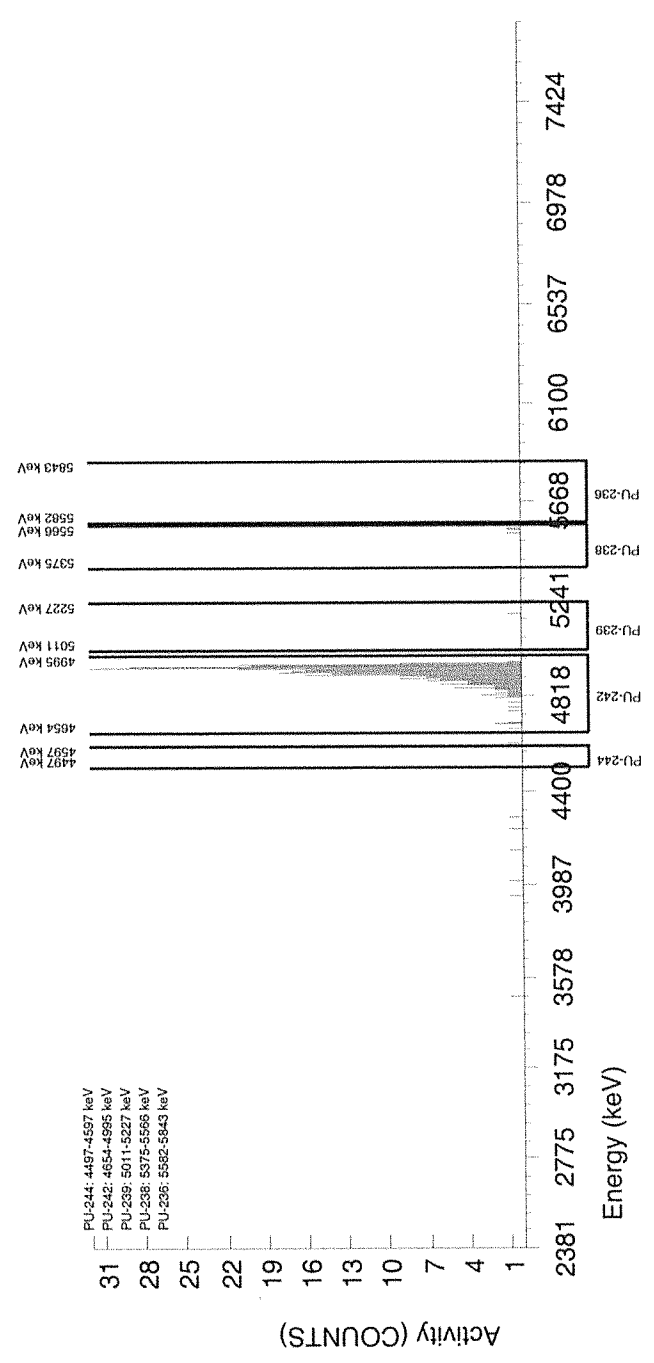
CHAMBER : 070
 DETECTOR S/N : 78262
 AVERAGE %EFFICIENCY : 31.2964
 AVERAGE %EFF ERROR : 0.6038
 COUNT DATE : 17-Sep-2016 11:42:34
 ELAPSED LIVE TIME(SEC) : 14400.00

TRACER ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.9579E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.24	0.000	0.000	-1.440	1.440	1.2000	100.000	-2.26E-02	3.65E-02	1.16E-01	3.45E-02	3.64E-02
PU-238	5486.00	5541.00	24.500	3.000	2.280	0.720	0.8485	99.900	3.00E-02	5.31E-02	8.03E-02	2.04E-02	5.30E-02
PU-239	5155.00	5176.90	4.900	1.000	-0.200	1.200	1.0954	99.900	-2.61E-03	3.92E-02	9.16E-02	2.62E-02	3.92E-02
PU-242	4890.00	4913.24	38.792	298.000	297.280	0.720	0.8485	100.000	3.88E+00	6.60E-01	7.97E-02	2.03E-02	4.42E-01
PU-244	4589.00	4546.97	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	2.64E-02	3.92E-02	0.00E+00	2.63E-02

Signature



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
SAMPLE ID : R0405235067_PU
SAMPLE QTY : 0.508 G +/-0.197 %
SAMPLE DATE : 11-Dec-2015 00:00:00
ANALYST : KXB2
% YIELD : 92.0 +/-6.024 %

CHAMBER : 071
DETECTOR S/N : 80020
AVERAGE %EFFICIENCY : 32.1394
AVERAGE %EFF ERROR : 0.6198
COUNT DATE : 17-Sep-2016 11:42:35
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B071.CNF:1814
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W071.CNF:464
CAL DATE : 03-Sep-2016

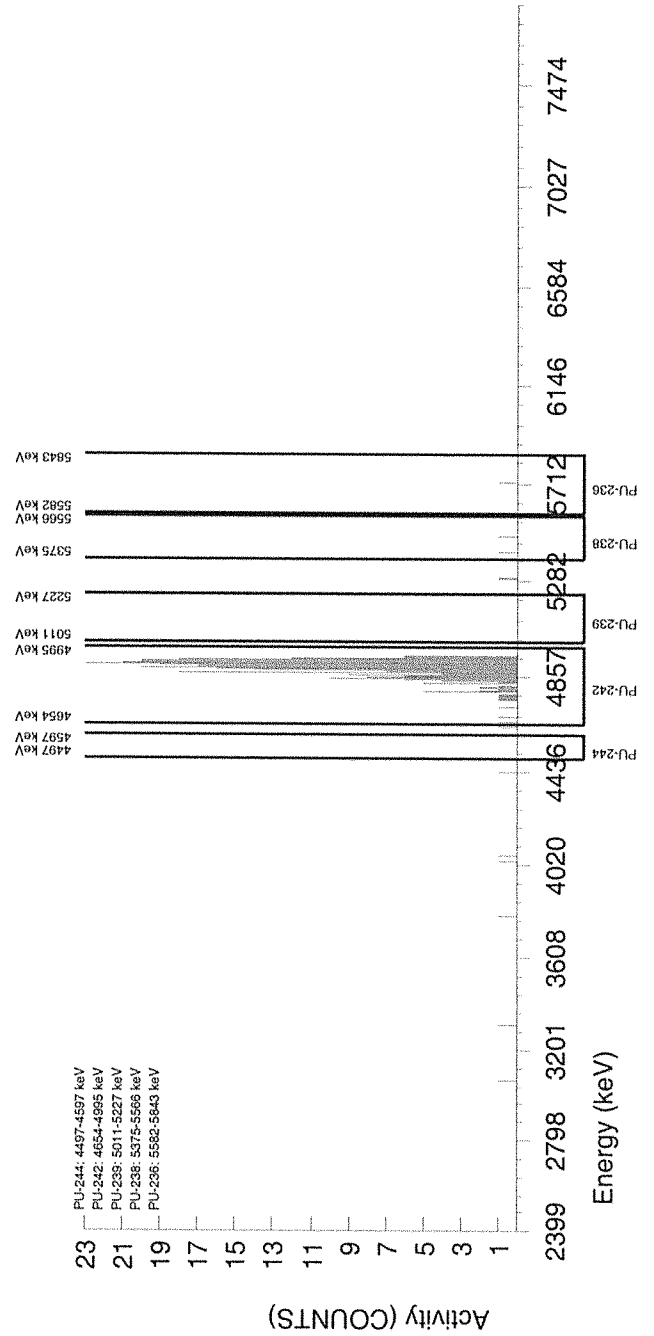
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 4.0324E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5717.08	4.953	1.000	0.520	0.480	0.6928	100.000	7.83E-03	4.36E-02	8.34E-02	1.91E-02	4.35E-02
PU-238	5486.00	5445.38	69.348	2.000	1.760	0.240	0.4899	99.900	2.21E-02	4.36E-02	6.03E-02	1.13E-02	4.35E-02
PU-239	5155.00	5118.68	0.000	0.000	-0.480	0.480	0.6928	99.900	-6.00E-03	2.66E-02	6.93E-02	1.59E-02	2.65E-02
PU-242	4890.00	4893.79	62.153	312.000	311.040	0.960	0.9798	100.000	3.89E+00	6.48E-01	8.23E-02	2.24E-02	4.33E-01
PU-244	4589.00	4546.97	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	2.53E-02	3.75E-02	0.00E+00	2.52E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
SAMPLE ID : R0405235068_PU
SAMPLE QTY : 0.509 G +/-0.196 %
SAMPLE DATE : 11-Dec-2015 00:00:00
ANALYST : KXB2
% YIELD : 47.7 +/-8.215 %

CHAMBER : 072
DETECTOR S/N : 67584
AVERAGE %EFFICIENCY : 31.8335
AVERAGE %EFF ERROR : 0.6139
COUNT DATE : 17-Sep-2016 11:42:35
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B072.CNF:1821
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W072.CNF:475
CAL DATE : 03-Sep-2016

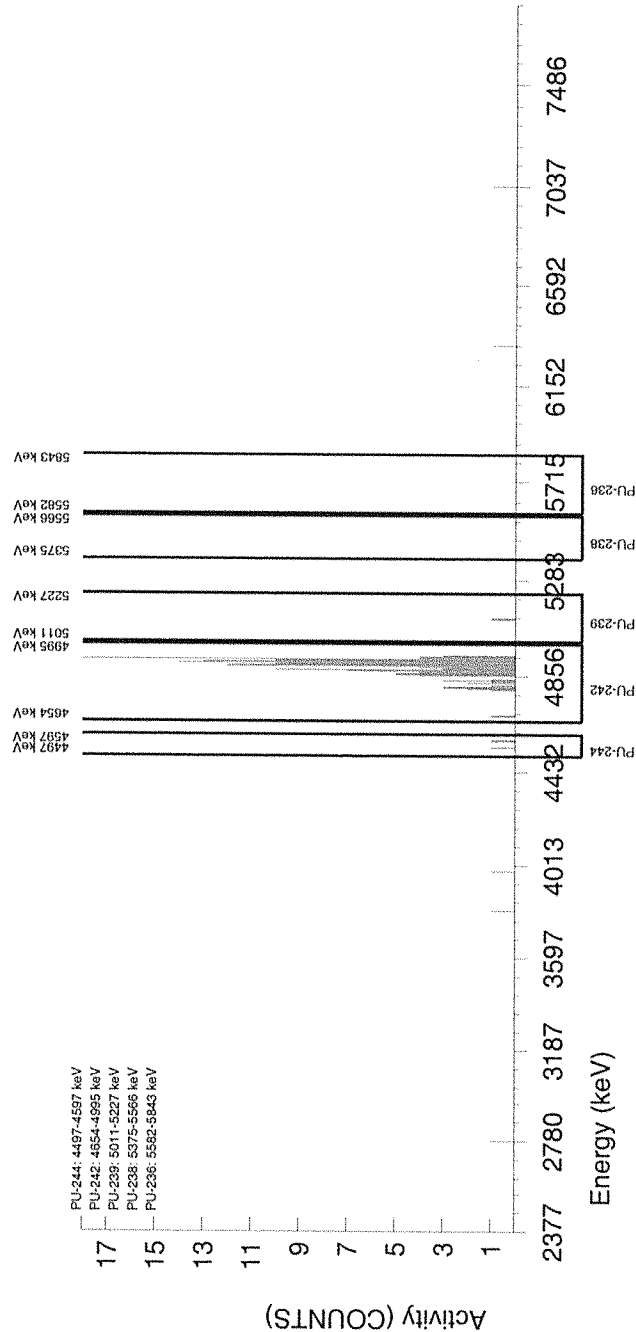
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 2.0916E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma cnt Unc	
										TPU pCi/G	MDA pCi/G	Lc pCi/G	pCi/G
PU-236	5749.00	5712.26	0.000	0.000	0.000	0.0000	0.0000	100.000	0.00E+00	8.78E-02	0.00E+00	5.90E-02	5.90E-02
PU-238	5486.00	5470.35	0.000	-0.240	0.240	0.4899	99.900	99.900	-5.87E-03	1.17E-01	2.19E-02	5.06E-02	5.06E-02
PU-239	5155.00	5109.06	10.008	0.320	1.680	1.2961	99.900	99.900	7.78E-03	1.88E-01	5.77E-02	8.86E-02	8.86E-02
PU-242	4890.00	4892.73	49.920	159.800	1.200	1.0954	100.000	100.000	3.88E+00	1.70E-01	4.87E-02	6.06E-01	6.06E-01
PU-244	4589.00	4556.86	35.028	3.000	0.000	0.0000	99.900	99.900	7.29E-02	7.29E-02	0.00E+00	9.59E-02	9.59E-02

Signature



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
SAMPLE ID : R0405235069_PU
SAMPLE QTY : 0.505 G +/-0.198 %
SAMPLE DATE : 16-Dec-2015 00:00:00
ANALYST : KXB2
% YIELD : 80.3 +/-6.293 %

CHAMBER : 073
DETECTOR S/N : 78775
AVERAGE %EFFICIENCY : 33.5965
AVERAGE %EFF ERROR : 0.6474
COUNT DATE : 17-Sep-2016 11:42:35
ELAPSED LIVE TIME(SEC) : 14400.00

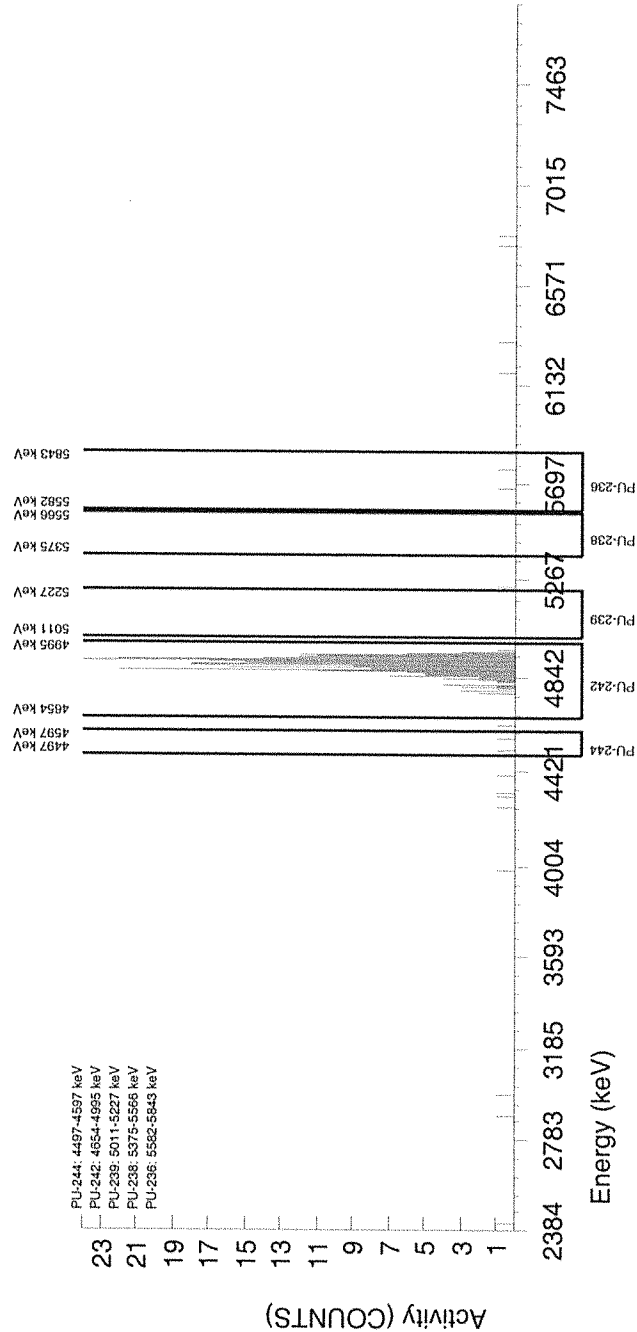
LIB FILE : PU
BKG FILE : B073.CNF:1820
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W073.CNF:495
CAL DATE : 03-Sep-2016

TRACER
ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.5202E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma cnt Unc
										TPU pCi/G	Lc pCi/G	
PU-236	5749.00	5718.81	84.102	2.000	0.320	1.680	1.2961	100.000	5.30E-03	6.04E-02	1.28E-01	6.03E-02
PU-238	5486.00	5470.34	0.000	0.000	-0.720	0.720	0.8485	99.900	-9.99E-03	3.02E-02	8.47E-02	3.02E-02
PU-239	5155.00	5118.68	0.000	0.000	-1.200	1.200	1.0954	99.900	-1.65E-02	3.14E-02	9.67E-02	3.13E-02
PU-242	4890.00	4889.55	58.916	286.000	283.840	2.160	1.4697	100.000	3.91E+00	6.81E-01	1.15E-01	4.58E-01
PU-244	4589.00	4541.25	54.419	2.000	1.520	0.480	0.6928	99.900	2.10E-02	4.82E-02	7.64E-02	4.81E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
SAMPLE ID : R0405235070_PU
SAMPLE QTY : 0.509 G +/-0.196 %
SAMPLE DATE : 11-Dec-2015 00:00:00
ANALYST : KXB2
% YIELD : 78.8 +/-6.649 %

CHAMBER : 074
DETECTOR S/N : 83296
AVERAGE %EFFICIENCY : 30.3767
AVERAGE %EFF ERROR : 0.5864
COUNT DATE : 17-Sep-2016 11:42:35
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B074.CNF;1838
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W074.CNF;511
CAL DATE : 03-Sep-2016

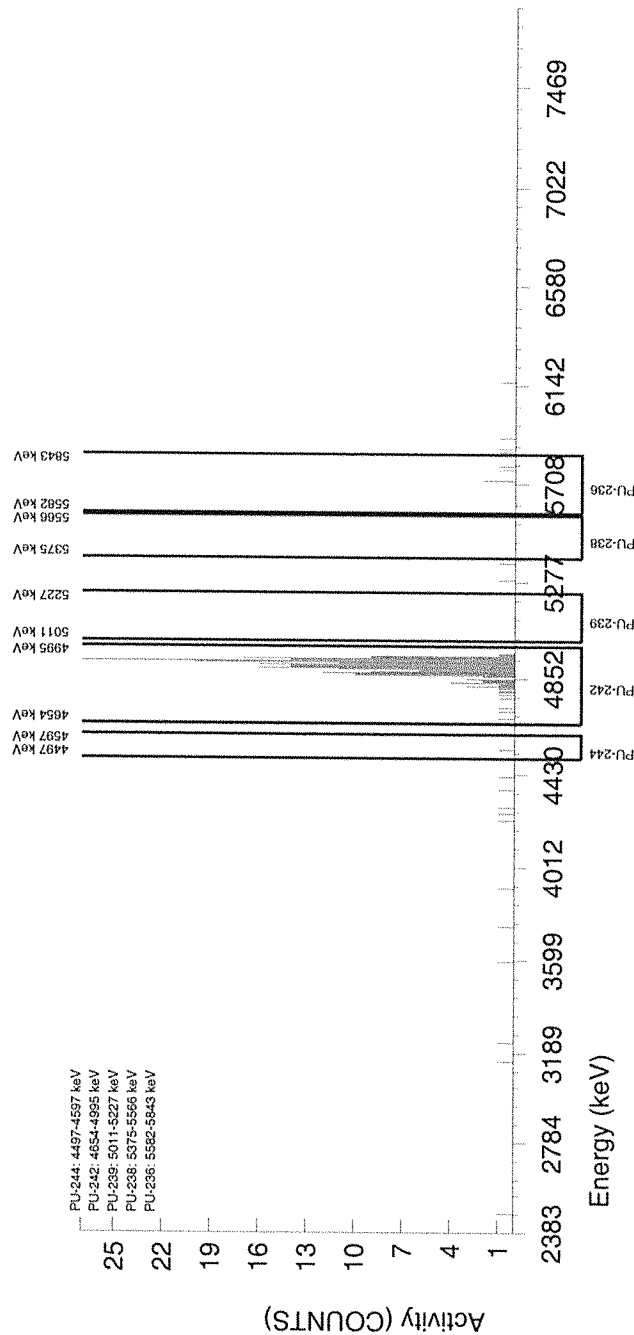
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.4544E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5752.09	4.988	4.000	1.840	2.160	1.4697	100.000	3.42E-02	8.61E-02	1.56E-01	5.00E-02	8.59E-02
PU-238	5486.00	5470.35	0.000	0.000	-0.240	0.240	0.4899	99.900	-3.72E-03	3.22E-02	7.44E-02	1.39E-02	3.21E-02
PU-239	5155.00	5118.69	0.000	0.000	-0.480	0.480	0.6928	99.900	-7.40E-03	3.28E-02	8.54E-02	1.96E-02	3.27E-02
PU-242	4890.00	4897.81	44.581	254.000	251.840	2.160	1.4697	100.000	3.88E+00	7.14E-01	1.29E-01	4.15E-02	4.89E-01
PU-244	4589.00	4566.43	0.000	2.000	2.000	0.000	0.0000	99.900	3.08E-02	5.30E-02	4.63E-02	0.00E+00	5.28E-02

Quality



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
SAMPLE ID : R0405235071_PU
SAMPLE QTY : 0.515 G +/-0.194 %
SAMPLE DATE : 11-Dec-2015 00:00:00
ANALYST : KXB2
% YIELD : 83.6 +/-6.282 %

CHAMBER : 075
DETECTOR S/N : 80010
AVERAGE %EFFICIENCY : 32.3452
AVERAGE %EFF ERROR : 0.6238
COUNT DATE : 17-Sep-2016 11:42:35
ELAPSED LIVE TIME(SEC) : 14400.00

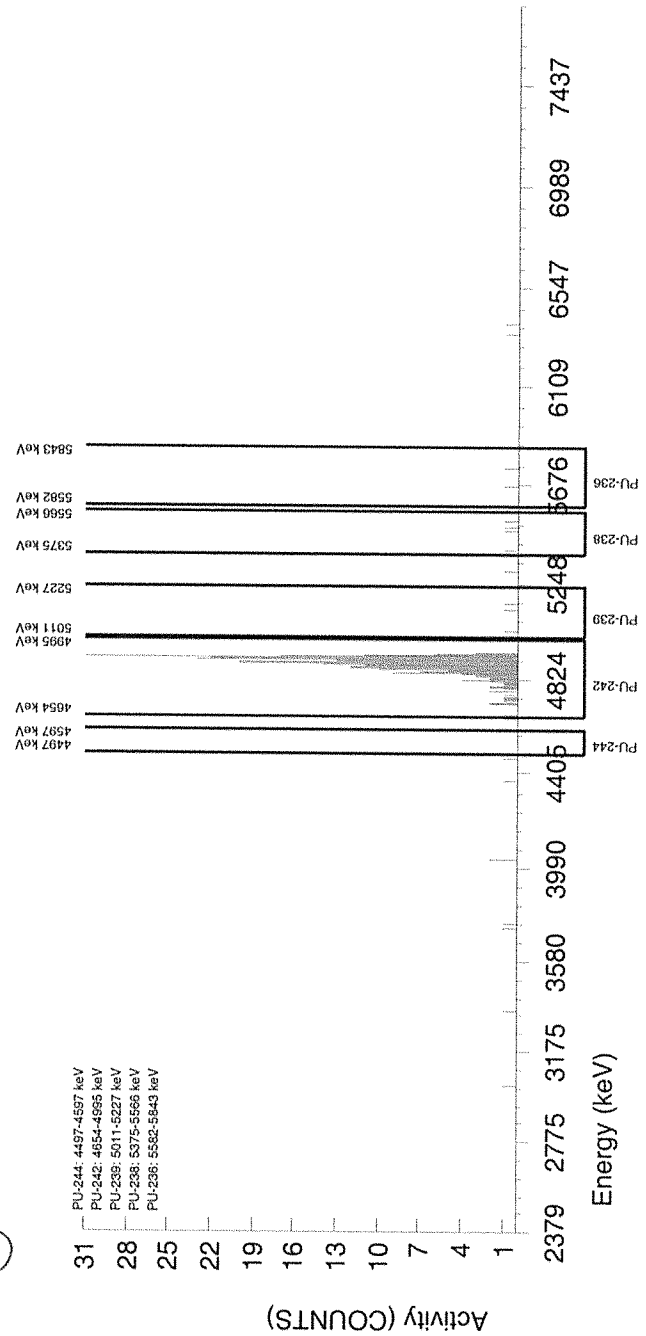
LIB FILE : PU
BKG FILE : B075.CNF;1821
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W075.CNF;478
CAL DATE : 03-Sep-2016

TRACER
ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.6626E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5711.01	78.677	2.000	0.320	1.680	1.2961	100.000	5.20E-03	5.93E-02	1.26E-01	3.86E-02	5.93E-02
PU-238	5486.00	5470.55	122.933	4.000	3.760	0.240	0.4899	99.900	5.11E-02	6.06E-02	6.51E-02	1.22E-02	6.02E-02
PU-239	5155.00	5107.51	118.016	3.000	2.760	0.240	0.4899	99.900	3.73E-02	5.39E-02	6.47E-02	1.21E-02	5.37E-02
PU-242	4890.00	4883.78	34.421	286.000	284.320	1.680	1.2961	100.000	3.83E+00	6.67E-01	1.04E-01	3.20E-02	4.48E-01
PU-244	4589.00	4546.97	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	2.73E-02	4.05E-02	0.00E+00	2.72E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
SAMPLE ID : R0405235072_PU
SAMPLE QTY : 0.513 G +/-0.195 %
SAMPLE DATE : 15-Dec-2015 00:00:00
ANALYST : KXB2
% YIELD : 73.7 +/-6.539 %

CHAMBER : 078
DETECTOR S/N : 38633
AVERAGE %EFFICIENCY : 33.4433
AVERAGE %EFF ERROR : 0.6444
COUNT DATE : 17-Sep-2016 11:42:36
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B078.CNF;1726
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 59999.99
EFF FILE : W078.CNF;447
CAL DATE : 03-Sep-2016

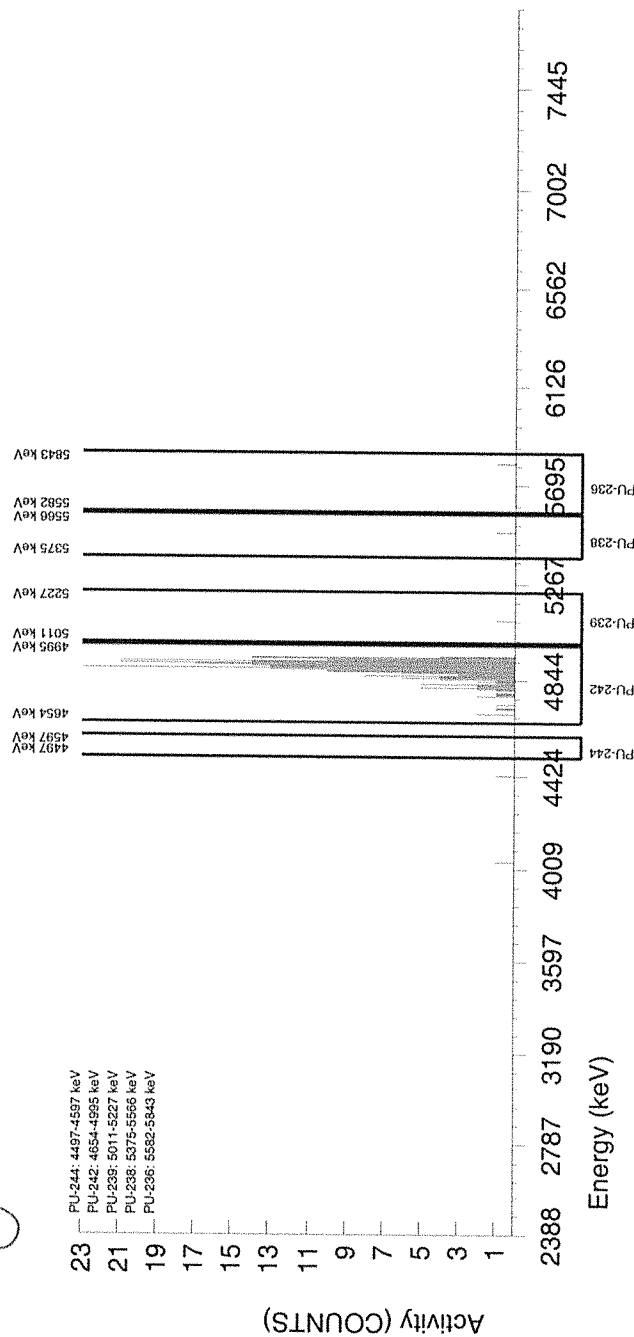
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.2303E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5791.39	4.964	1.000	-0.200	1.200	1.0954	100.000	-3.57E-03	5.36E-02	1.25E-01	3.58E-02	5.36E-02
PU-238	5486.00	5491.03	4.964	1.000	0.760	0.240	0.4899	99.900	1.14E-02	4.27E-02	7.17E-02	1.34E-02	4.26E-02
PU-239	5155.00	5102.49	4.964	1.000	0.760	0.240	0.4899	99.900	1.13E-02	4.24E-02	7.12E-02	1.33E-02	4.24E-02
PU-242	4890.00	4888.52	53.358	260.000	259.280	0.720	0.8485	100.000	3.85E+00	6.97E-01	9.07E-02	2.31E-02	4.70E-01
PU-244	4589.00	4591.43	4.964	1.000	0.760	0.240	0.4899	99.900	1.13E-02	4.24E-02	7.12E-02	1.33E-02	4.24E-02

Signature



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
SAMPLE ID : R0405235073_PU
SAMPLE QTY : 0.505 G +/-0.198 %
SAMPLE DATE : 11-Dec-2015 00:00:00
ANALYST : KXB2
% YIELD : 86.0 +/-6.014 %

CHAMBER : 080
DETECTOR S/N : 78197
AVERAGE %EFFICIENCY : 34.4422
AVERAGE %EFF ERROR : 0.6633
COUNT DATE : 17-Sep-2016 11:42:36
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B080.CNF;1728
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 59999.99
EFF FILE : W080.CNF;446
CAL DATE : 03-Sep-2016

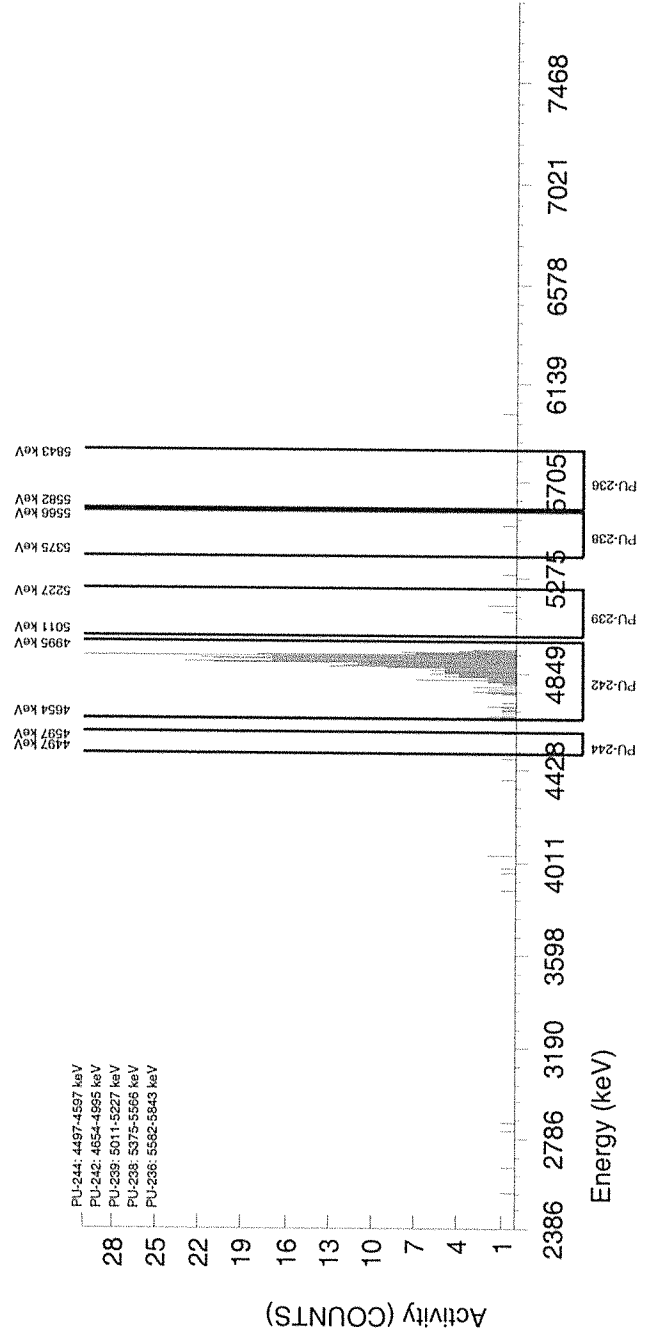
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.7686E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SiDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	-0.240	0.240	0.4899	100.000	-3.63E-03	3.14E-02	7.25E-02	1.36E-02	3.13E-02
PU-238	5486.00	5505.30	4.969	1.000	0.520	0.480	0.6928	99.900	6.57E-03	3.66E-02	7.00E-02	1.60E-02	3.65E-02
PU-239	5155.00	5143.01	4.969	3.000	2.040	0.960	0.9798	99.900	2.56E-02	5.11E-02	8.28E-02	2.25E-02	5.10E-02
PU-242	4890.00	4888.02	39.117	312.000	311.520	0.480	0.6928	100.000	3.91E+00	6.51E-01	6.95E-02	1.59E-02	4.35E-01
PU-244	4589.00	4590.46	0.000	2.000	1.520	0.480	0.6928	99.900	1.91E-02	4.39E-02	6.96E-02	1.59E-02	4.39E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
SAMPLE ID : R0405235074_PU
SAMPLE QTY : 0.501 G +/-0.200 %
SAMPLE DATE : 15-Dec-2015 00:00:00
ANALYST : KXB2
% YIELD : 46.0 +/-8.229 %

CHAMBER : 081
DETECTOR S/N : 79996
AVERAGE %EFFICIENCY : 33.0506
AVERAGE %EFF ERROR : 0.6369
COUNT DATE : 17-Sep-2016 11:42:36
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B081.CNF:1734
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 59999.99
EFF FILE : W081.CNF:446
CAL DATE : 03-Sep-2016

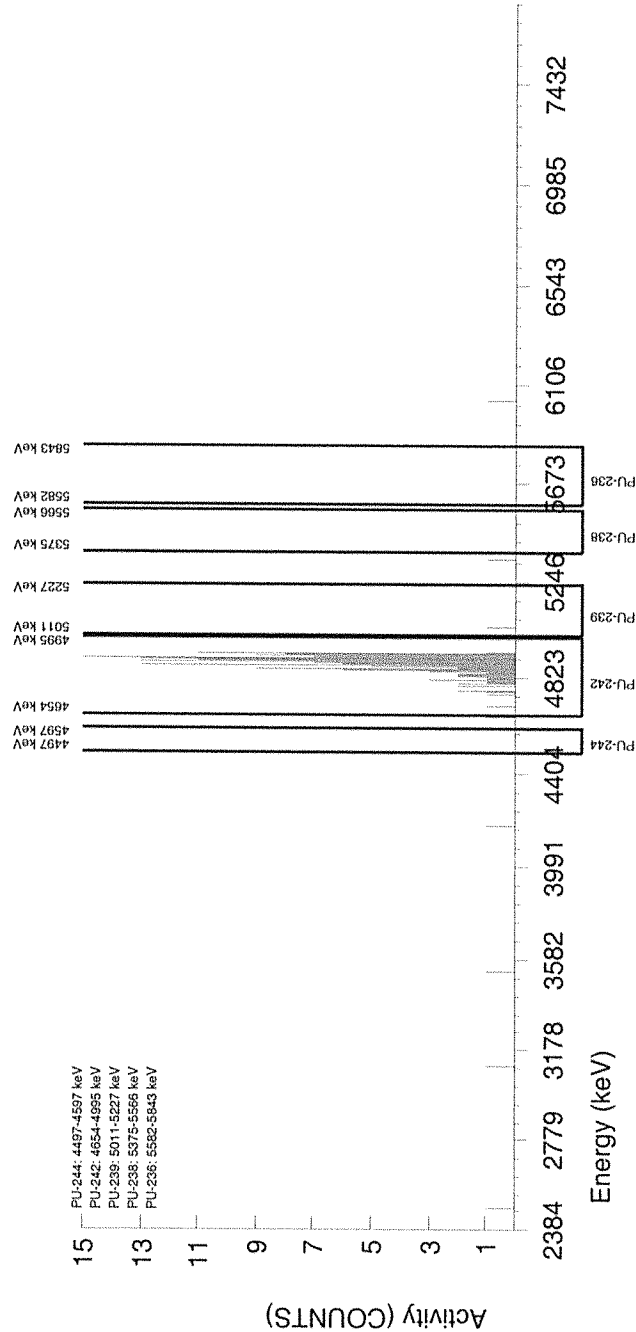
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 2.0181E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SiDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma cnt Unc	
										TPU pCi/G	Lc pCi/G	MDA pCi/G	pCi/G
PU-236	5749.00	5712.23	0.000	0.000	-0.240	0.240	0.4899	100.000	-7.10E-03	6.15E-02	1.42E-01	2.66E-02	6.13E-02
PU-238	5486.00	5470.33	0.000	0.000	0.000	0.0000	99.900	99.900	0.00E+00	5.01E-02	7.44E-02	0.00E+00	5.00E-02
PU-239	5155.00	5044.07	4.901	1.000	0.040	0.960	0.9798	99.900	9.86E-04	7.32E-02	1.62E-01	4.42E-02	7.31E-02
PU-242	4890.00	4880.83	67.881	162.000	160.080	1.920	1.3856	100.000	3.94E+00	8.98E-01	1.99E-01	6.25E-02	6.17E-01
PU-244	4589.00	4597.20	0.000	1.000	0.520	0.480	0.6928	99.900	1.28E-02	7.13E-02	1.36E-01	3.13E-02	7.12E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
SAMPLE ID : R0405235075_PU
SAMPLE QTY : 0.508 G +/-0.197 %
SAMPLE DATE : 16-Dec-2015 00:00:00
ANALYST : KXB2
% YIELD : 76.7 +/-6.584 %

CHAMBER : 082
DETECTOR S/N : 79997
AVERAGE %EFFICIENCY : 31.9848
AVERAGE %EFF ERROR : 0.6168
COUNT DATE : 17-Sep-2016 11:42:36
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B082.CNF:1724
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 59999.99
EFF FILE : W082.CNF:423
CAL DATE : 03-Sep-2016

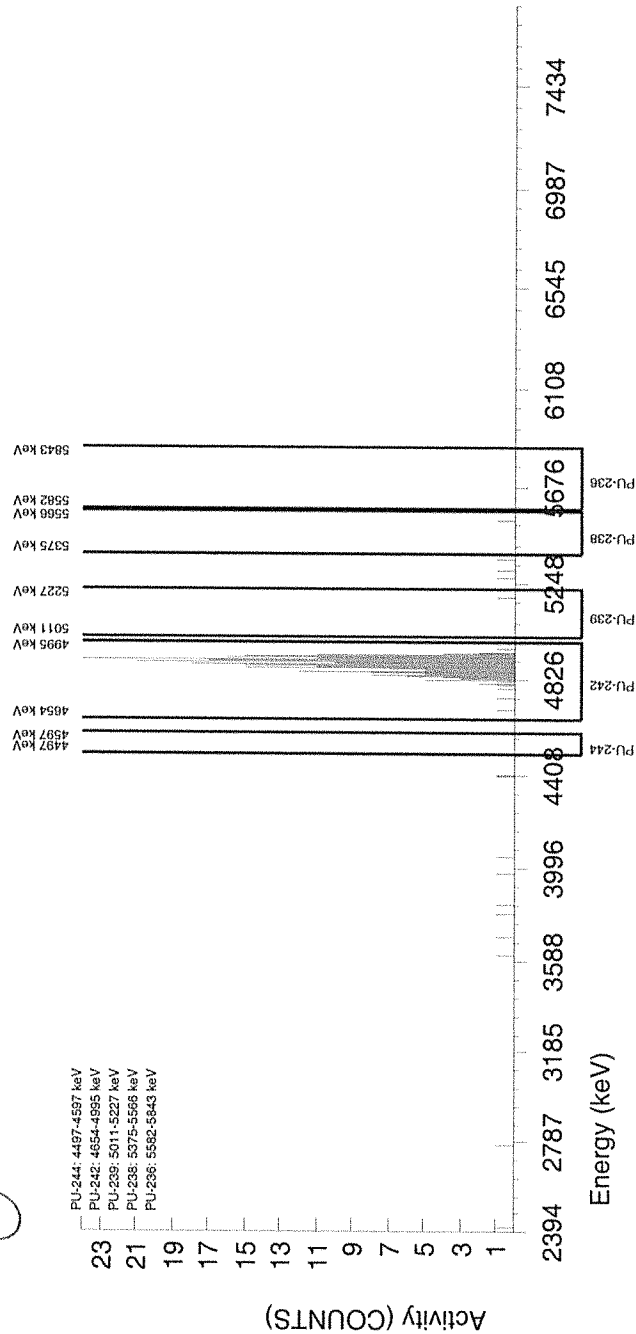
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.3625E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Umc pCi/G
PU-236	5749.00	5712.23	0.000	0.000	-0.720	0.720	0.8485	100.000	-1.30E-02	3.94E-02	1.11E-01	2.81E-02	3.93E-02
PU-238	5486.00	5525.58	4.883	1.000	-0.200	1.200	1.0954	99.900	-3.03E-03	4.56E-02	1.06E-01	3.04E-02	4.55E-02
PU-239	5155.00	5189.96	4.883	1.000	-3.080	4.080	2.0199	99.900	-4.64E-02	5.15E-02	1.57E-01	5.58E-02	5.15E-02
PU-242	4890.00	4891.83	54.322	261.000	258.120	2.880	1.6971	100.000	3.89E+00	7.09E-01	1.39E-01	4.68E-02	4.78E-01
PU-244	4589.00	4546.96	0.000	0.000	-0.240	0.240	0.4899	99.900	-3.62E-03	3.13E-02	7.23E-02	1.35E-02	3.12E-02

Good



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
SAMPLE ID : R0405235076_PU
SAMPLE QTY : 0.512 G +/-0.195 %
SAMPLE DATE : 11-Dec-2015 00:00:00
ANALYST : KXB2
% YIELD : 104 +/-5.477 %

CHAMBER : 083
DETECTOR S/N : 78785
AVERAGE %EFFICIENCY : 35.3477
AVERAGE %EFF ERROR : 0.6805
COUNT DATE : 17-Sep-2016 11:42:37
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B083.CNF;1740
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W083.CNF;485
CAL DATE : 03-Sep-2016

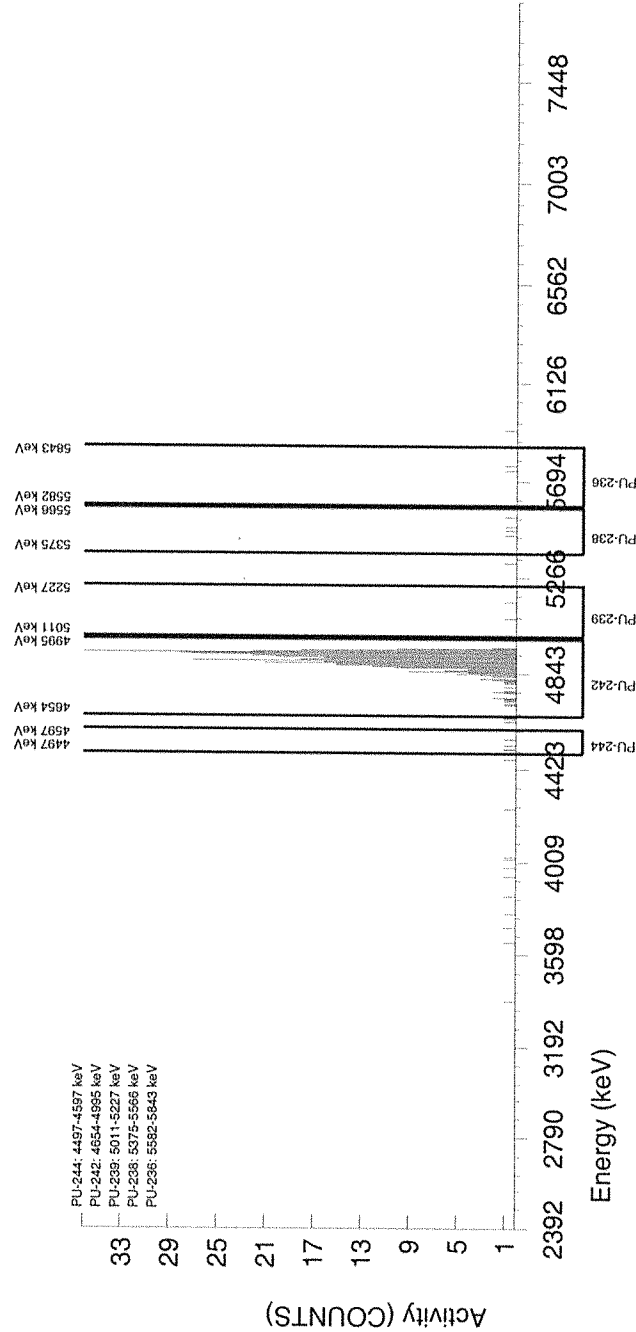
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 4.5599E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5747.57	24.717	2.000	1.520	0.480	0.6928	100.000	1.83E-02	4.20E-02	6.66E-02	1.53E-02	4.20E-02
PU-238	5486.00	5487.40	79.093	4.000	3.520	0.480	0.6928	99.900	3.53E-02	4.49E-02	5.56E-02	1.27E-02	4.48E-02
PU-239	5155.00	5122.63	74.150	2.000	1.040	0.960	0.9798	99.900	1.04E-02	3.55E-02	6.58E-02	1.79E-02	3.55E-02
PU-242	4890.00	4901.61	56.848	389.000	386.840	2.160	1.4697	100.000	3.86E+00	5.85E-01	8.36E-02	2.68E-02	3.86E-01
PU-244	4589.00	4525.17	49.433	4.000	3.520	0.480	0.6928	99.900	3.51E-02	4.47E-02	5.53E-02	1.27E-02	4.45E-02

Good



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
SAMPLE ID : R0405235077_PU
SAMPLE QTY : 0.510 G +/-0.196 %
SAMPLE DATE : 17-Dec-2015 00:00:00
ANALYST : KXB2
% YIELD : 65.9 +/-6.779 %

CHAMBER : 084
DETECTOR S/N : 78265
AVERAGE %EFFICIENCY : 34.7248
AVERAGE %EFF ERROR : 0.6686
COUNT DATE : 17-Sep-2016 11:42:37
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B084.CNF;1729
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W084.CNF;476
CAL DATE : 03-Sep-2016

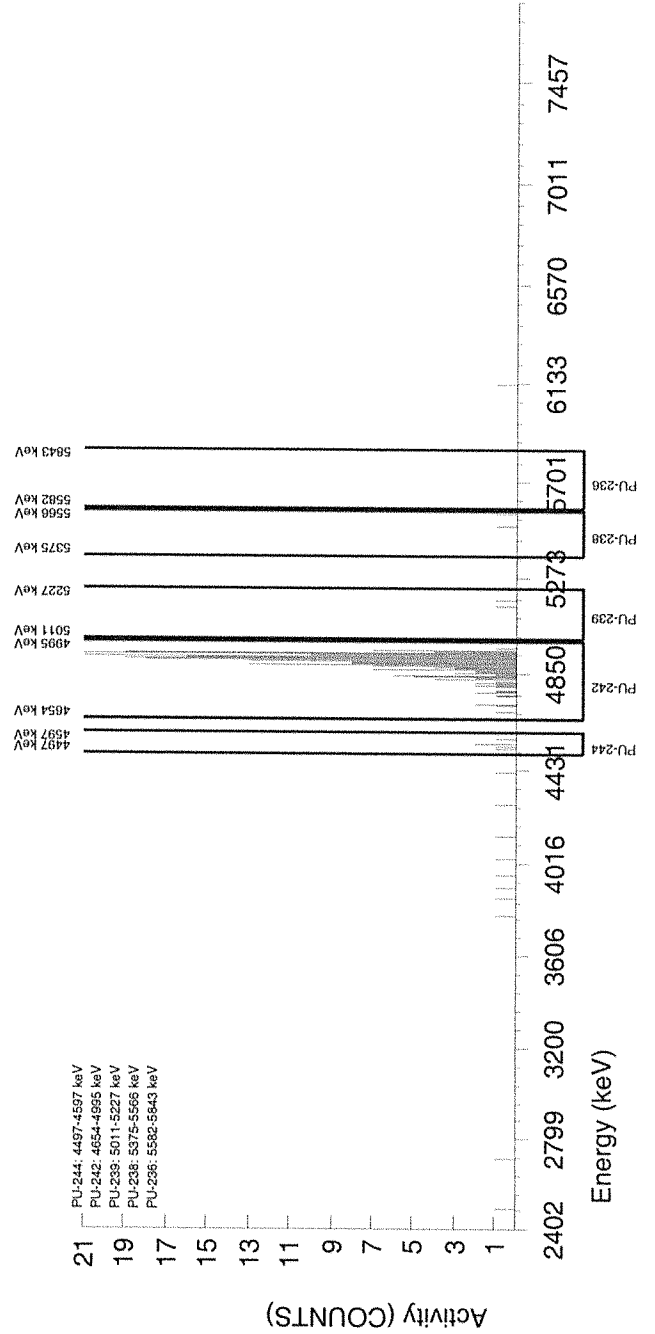
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 2.8865E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.25	0.000	0.000	-0.720	0.720	0.8485	100.000	-1.39E-02	4.21E-02	1.18E-01	3.00E-02	4.20E-02
PU-238	5486.00	5529.44	54.265	2.000	2.000	0.000	0.0000	99.900	3.24E-02	5.57E-02	4.86E-02	0.00E+00	5.55E-02
PU-239	5155.00	5164.30	29.599	2.000	0.320	1.680	1.2961	99.900	5.16E-03	5.88E-02	1.25E-01	3.82E-02	5.87E-02
PU-242	4890.00	4899.77	54.182	242.000	240.560	1.440	1.2000	100.000	3.87E+00	7.27E-01	1.19E-01	3.54E-02	4.92E-01
PU-244	4589.00	4543.42	4.933	5.000	4.760	0.240	0.4899	99.900	7.67E-02	7.88E-02	7.72E-02	1.45E-02	7.81E-02

Good



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
SAMPLE ID : R0405235078_PU
SAMPLE QTY : 0.505 G +/-0.198 %
SAMPLE DATE : 17-Dec-2015 00:00:00
ANALYST : KXB2
% YIELD : 82.8 +/-6.241 %

CHAMBER : 085
DETECTOR S/N : 78776
AVERAGE %EFFICIENCY : 32.9780
AVERAGE %EFF ERROR : 0.6356
COUNT DATE : 17-Sep-2016 11:42:37
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B085.CNF;1732
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W085.CNF;479
CAL DATE : 03-Sep-2016

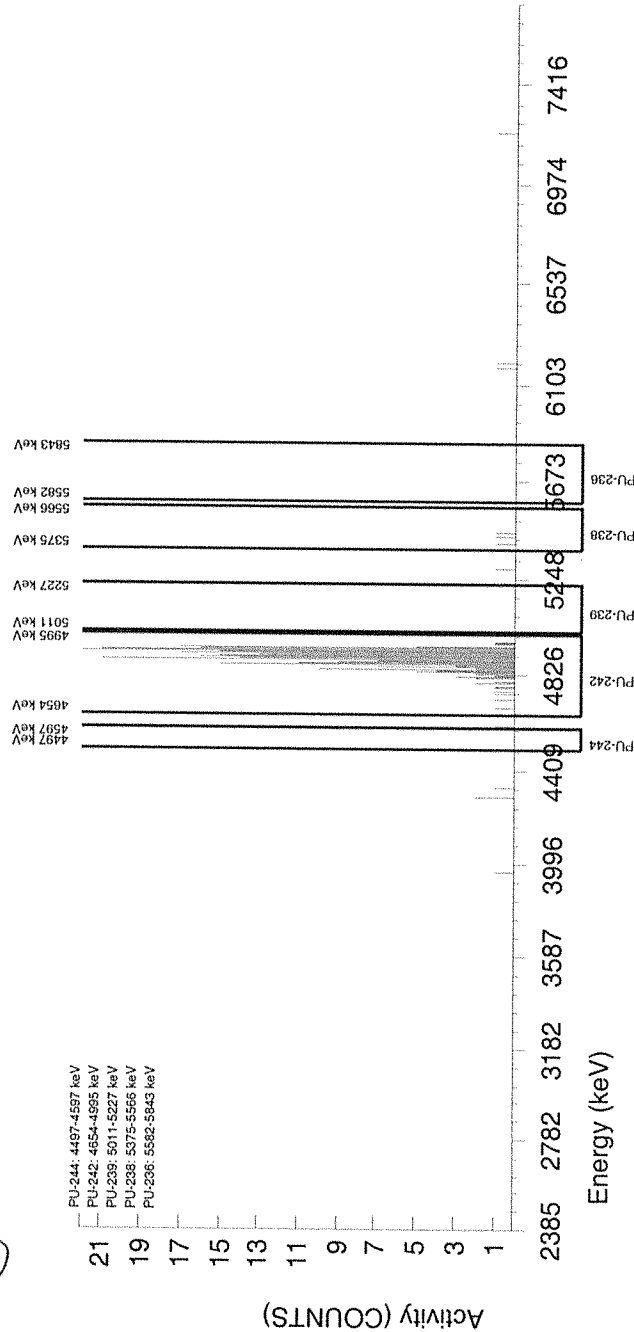
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.6297E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SiDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	-1.200	1.200	1.0954	100.000	-1.96E-02	3.72E-02	1.15E-01	3.28E-02	3.72E-02
PU-238	5486.00	5428.03	49.309	3.000	1.320	1.680	1.2961	99.900	1.81E-02	5.68E-02	1.06E-01	3.25E-02	5.67E-02
PU-239	5155.00	5215.97	4.931	1.000	-0.440	1.440	1.2000	99.900	-5.99E-03	4.14E-02	1.01E-01	2.99E-02	4.14E-02
PU-242	4890.00	4894.63	73.141	288.000	287.280	0.720	0.8485	100.000	3.91E+00	6.76E-01	8.31E-02	2.12E-02	4.54E-01
PU-244	4589.00	4546.97	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	2.75E-02	4.09E-02	0.00E+00	2.75E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
SAMPLE ID : R1203621772_PU
SAMPLE QTY : 0.518 G +/-0.193 %
SAMPLE DATE : 15-Sep-2016 00:00:00
ANALYST : KXB2
% YIELD : 83.0 +/-6.420 %

CHAMBER : 086
DETECTOR S/N : 78198
AVERAGE %EFFICIENCY : 31.1951
AVERAGE %EFF ERROR : 0.6019
COUNT DATE : 17-Sep-2016 11:42:37
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B086.CNF;1733
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W086.CNF;455
CAL DATE : 03-Sep-2016

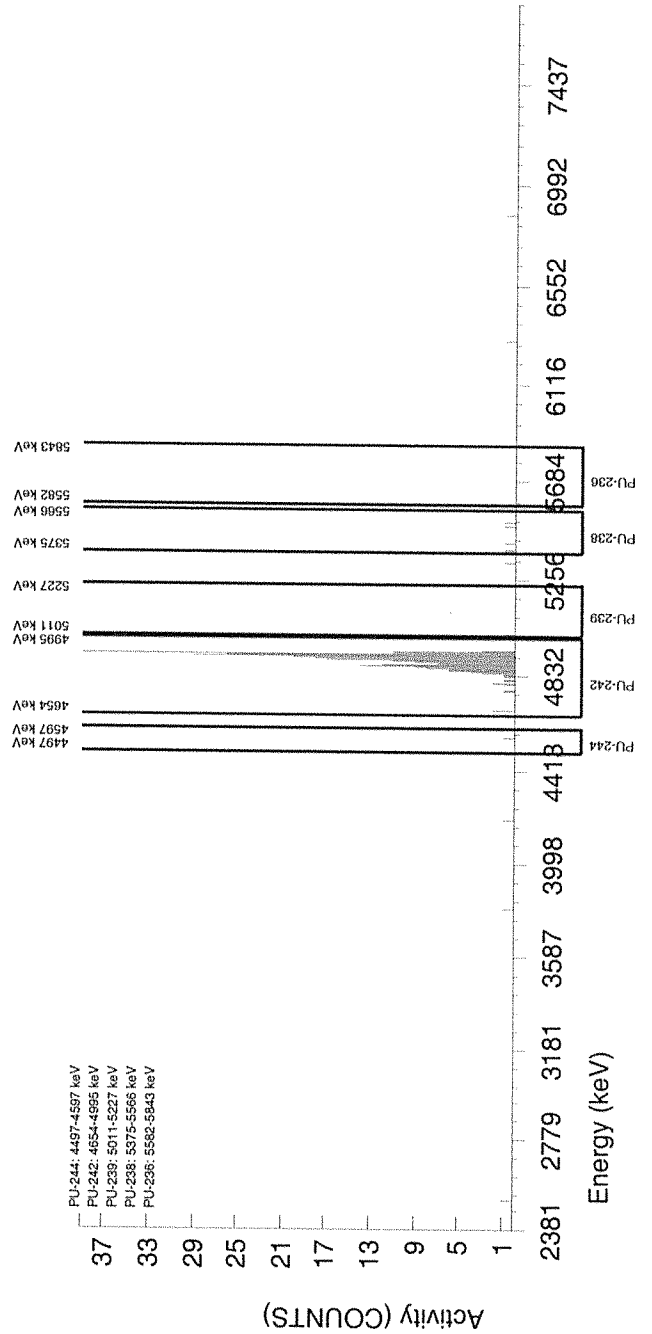
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.6379E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	-0.720	0.720	0.8485	100.000	-1.01E-02	3.05E-02	8.56E-02	2.18E-02	3.05E-02
PU-238	5486.00	5437.23	118.750	5.000	4.040	0.960	0.9798	99.900	5.66E-02	6.93E-02	9.23E-02	2.51E-02	6.89E-02
PU-239	5155.00	5017.21	4.948	1.000	0.040	0.960	0.9798	99.900	5.60E-04	4.16E-02	9.23E-02	2.51E-02	4.15E-02
PU-242	4890.00	4898.93	19.527	275.000	272.360	2.640	1.6248	100.000	3.81E+00	6.78E-01	1.25E-01	4.17E-02	4.56E-01
PU-244	4589.00	4559.45	4.948	1.000	0.520	0.480	0.6928	99.900	7.28E-03	4.05E-02	7.76E-02	1.78E-02	4.05E-02

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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
SAMPLE ID : R1203621773_PU
SAMPLE QTY : 0.507 G +/-0.197 %
SAMPLE DATE : 14-Dec-2015 00:00:00
ANALYST : KXB2
% YIELD : 92.4 +/-6.111 %

CHAMBER : 088
DETECTOR S/N : 83291
AVERAGE %EFFICIENCY : 31.2191
AVERAGE %EFF ERROR : 0.6024
COUNT DATE : 17-Sep-2016 11:42:37
ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
BKG FILE : B088.CNF;1728
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W088.CNF;463
CAL DATE : 03-Sep-2016

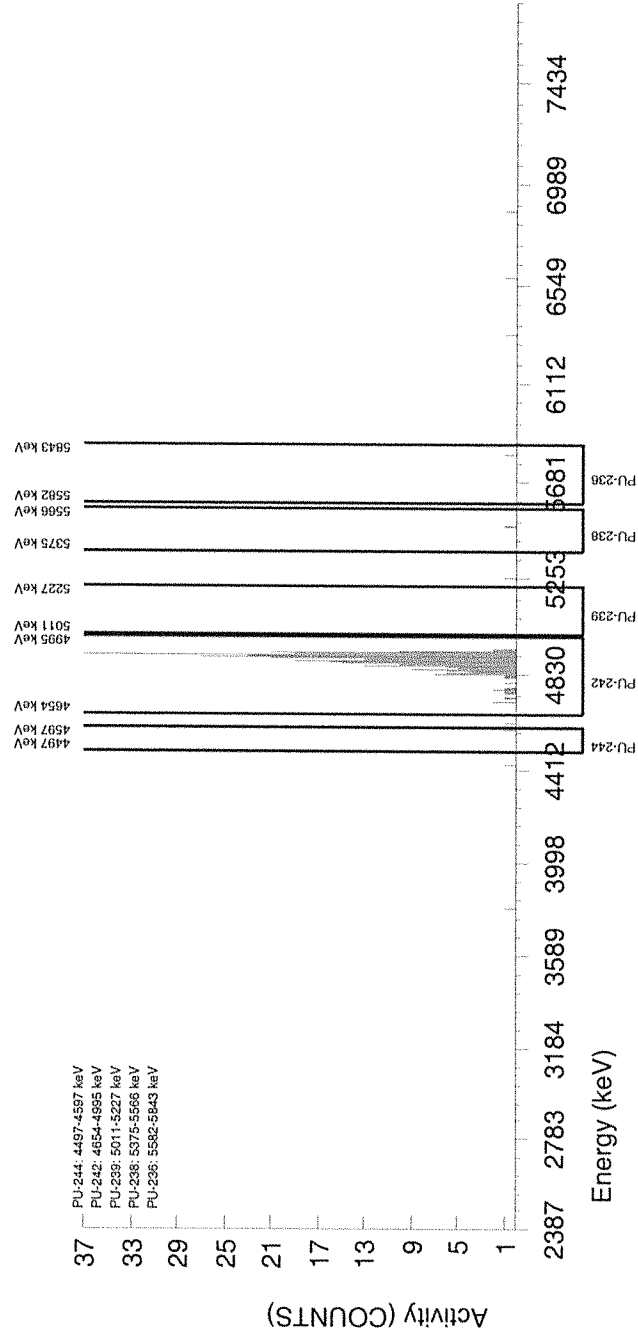
TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 4.0488E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5798.83	4.923	1.000	0.520	0.480	0.6928	100.000	8.03E-03	4.47E-02	8.55E-02	1.96E-02	4.46E-02
PU-238	5486.00	5485.03	9.845	2.000	1.760	0.240	0.4899	99.900	2.28E-02	4.48E-02	6.20E-02	1.16E-02	4.47E-02
PU-239	5155.00	5118.68	0.000	0.000	-1.440	1.440	1.2000	99.900	-1.85E-02	2.99E-02	9.50E-02	2.82E-02	2.98E-02
PU-242	4890.00	4892.91	36.398	306.000	303.360	2.640	1.6248	100.000	3.89E+00	6.59E-01	1.15E-01	3.82E-02	4.41E-01
PU-244	4589.00	4589.29	4.923	1.000	1.000	0.000	0.0000	99.900	1.28E-02	3.62E-02	3.85E-02	0.00E+00	3.61E-02

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GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596422
 SAMPLE ID : R1203621774_PU
 SAMPLE QTY : 0.518 G +/-0.193 %
 SAMPLE DATE : 15-Sep-2016 00:00:00
 ANALYST : KXB2
 % YIELD : 65.8 +/-7.799 %

CHAMBER : 170
 DETECTOR S/N : 72549
 AVERAGE %EFFICIENCY : 25.7306
 AVERAGE %EFF ERROR : 0.4988
 COUNT DATE : 17-Sep-2016 11:44:22
 ELAPSED LIVE TIME(SEC) : 14400.00

LIB FILE : PU
 BKG FILE : B170.CNF;874
 BKG DATE : 16-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W170.CNF;241
 CAL DATE : 13-Sep-2016

TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 2.8831E+00 dpm

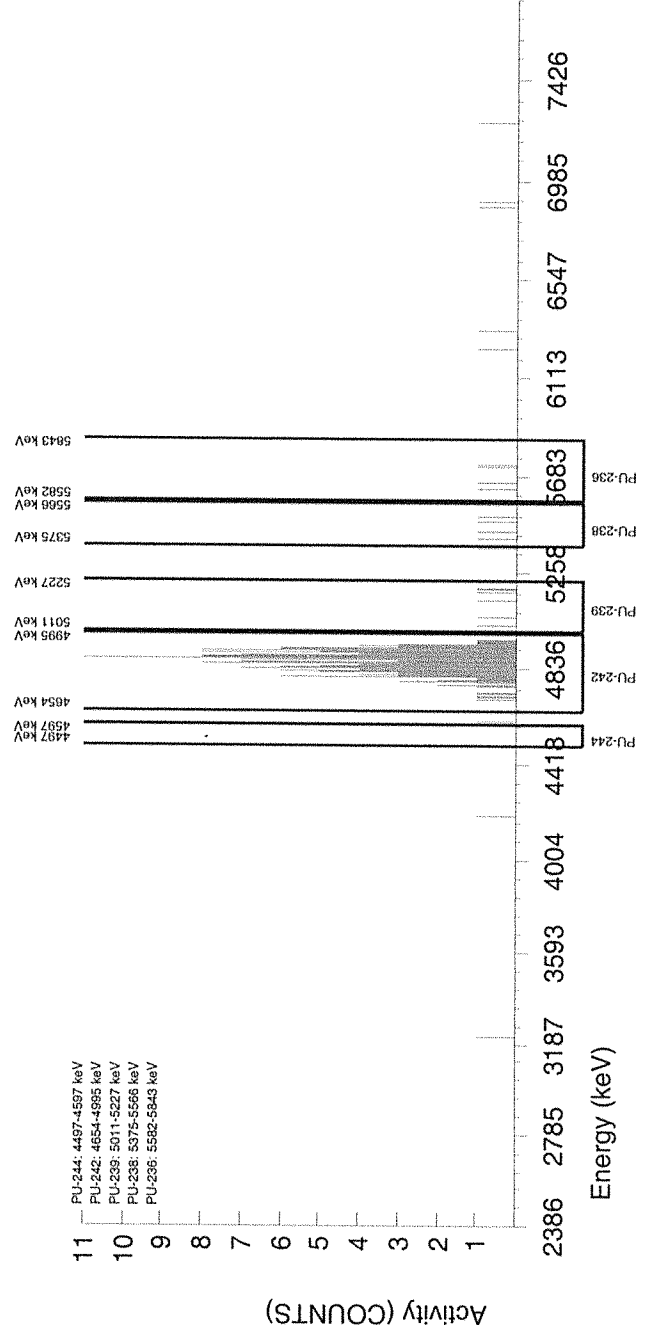
LCS

ID
 NUCLIDE
 NOMINAL (pCi/G)
 % RECOVERY

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5687.51	104.059	4.000	1.360	2.640	1.6248	100.000	2.92E-02	1.00E-01	1.92E-01	6.38E-02	1.00E-01
PU-238	5486.00	5462.09	94.148	4.000	2.320	1.680	1.2961	99.900	4.97E-02	9.85E-02	1.66E-01	5.09E-02	9.82E-02
PU-239	5155.00	5133.29	158.566	6.000	5.280	0.720	0.8485	99.900	1.13E-01	1.14E-01	1.31E-01	3.33E-02	1.13E-01
PU-242	4890.00	4868.44	120.246	179.000	178.040	0.960	0.9798	100.000	3.81E+00	8.23E-01	1.41E-01	3.84E-02	5.63E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.720	0.720	0.8485	99.900	-1.54E-02	4.67E-02	1.31E-01	3.33E-02	4.66E-02

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Batch# 1596414 Product: Pu-241 Date: 9/29/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			AA
Samples have been blank corrected (If required). Blank correction reported included (If required).			AAA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	/		
Instrument source check is within limits.	/		
Instrument bkg check is within limits.	/		
Method RDL/ LLD has been met.	/		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	/		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	/		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	/		
Sample was run within hold time.		/	OGN# 1561743
Sample was correctly preserved if required.			AA AA
Smears Taken for Radioactive batches.			AA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	/		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	/		
Aux data is correct.			AA
Client Special requirements page has been checked.	/		
Raw Data and/ or spectrum are included and properly stasured.	/		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	/		
Hit notification complete (if necessary)			AA
Batch entered into Case Narrative.	/		
Batch Data Exception Reports (DER) completed, if applicable.	/		OGN# 1561743
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	/		OGN# 1561743
Allquot Correction completed if required.			AA
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	/		

Primary Review Performed By: [Signature] 9/29/16

Secondary Review Performed By: [Signature] 09/30/16

10/4
MJWC

DATA EXCEPTION REPORT

Mo.Day Yr. 27-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LSC	Test / Method: DOE EML HASL-300, Pu-11-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1596414	Sample Numbers: See Below		

Potentially affected work order(s)(SDG): 405235

Application Issues:

Peak Centroid Values Off
Sample received out of holding

**Specification and Requirements
Exception Description:**

1. Samples 405235041, 405235042, 405235043, 405235044, 405235045, 405235046, 405235047, 405235048, 405235049, 405235050, 405235051, 405235052, 405235053, 405235054, 405235055, 405235056, 405235057, 405235058, 405235059, 405235060, and 1203621752 were received and analyzed out of holding.
2. The Pu-242 tracer peak centroid for sample 405235047 is greater than 50 keV from the expected energy value of 4890 keV.

DER Disposition:

1. Reporting results.
2. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.

Originator's Name:

Jessica Davis 30-SEP-16

Data Validator/Group Leader:

Melanie Aycocock 30-SEP-16

Pu-241 Queue Sheet

Batch #: 1596414 Analyst: HAKB First Client Due Date: 04-OCT-16 Internal Due Date: 30-SEP-16
 Tracer Isotope: Pu-242/Pu-236 Tracer Code: 1770-A Expiration Date: 8/3/17 Vol: 0.1
 LCS Isotope: Pu-241 LCS Code: 1410-B Expiration Date: 10/28/16 Vol: 0.1
 Spike Isotope: Pu-241 Spike Code: Expiration Date: Vol:
 Prep Date: 9/20/16 Initials: HAKB Pipet ID: 1840027 Balance ID: 16107662 Witness: JEB 9/20/16

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g)/l/f	LSC Rack#	Alpha Spec Det #
405235041-1	4.4D.R.1.4	SAMPLE		15 pCi/g	SOIL	MJWC001	30-NOV-15	1	1	0.509	82-2	67
405235042-1	4.4D.R.2.3	SAMPLE		15 pCi/g	SOIL	MJWC001	30-NOV-15	2	2	0.500	82-3	69
405235043-1	4.4D.R.2.4	SAMPLE		15 pCi/g	SOIL	MJWC001	30-NOV-15	3	3	0.507	82-4	70
405235044-1	4.4D.R.4.2	SAMPLE		15 pCi/g	SOIL	MJWC001	30-NOV-15	4	4	0.505	82-5	71
405235045-1	4.4D.R.5.2	SAMPLE		15 pCi/g	SOIL	MJWC001	30-NOV-15	5	5	0.502	82-6	72
405235046-1	4.5A.R.1.3	SAMPLE		15 pCi/g	SOIL	MJWC001	07-DEC-15	6	6	0.514	82-7	73
405235047-1	4.5A.R.1.4	SAMPLE		15 pCi/g	SOIL	MJWC001	07-DEC-15	7	7	0.503	82-8	74
405235048-1	4.5B.R.1.2	SAMPLE		15 pCi/g	SOIL	MJWC001	07-DEC-15	8	8	0.507	82-9	75
405235049-1	4.5B.R.1.3	SAMPLE		15 pCi/g	SOIL	MJWC001	07-DEC-15	9	9	0.506	82-10	78
405235050-1	4.5B.R.1.4	SAMPLE		15 pCi/g	SOIL	MJWC001	07-DEC-15	10	10	0.504	82-11	80
405235051-1	4.5B.R.2.3	SAMPLE		15 pCi/g	SOIL	MJWC001	07-DEC-15	11	11	0.502	82-12	81
405235052-1	4.5B.R.2.4	SAMPLE		15 pCi/g	SOIL	MJWC001	07-DEC-15	12	12	0.508	0-1	82
405235053-1	4.5C.R.5.2	SAMPLE		15 pCi/g	SOIL	MJWC001	01-DEC-15	13	13	0.500	0-2	89
405235054-1	4.5C.R.1.3	SAMPLE		15 pCi/g	SOIL	MJWC001	02-DEC-15	14	14	0.500	87-3	90
405235055-1	4.5C.R.1.4	SAMPLE		15 pCi/g	SOIL	MJWC001	02-DEC-15	15	15	0.510	87-4	91
405235056-1	4.5C.R.2.2	SAMPLE		15 pCi/g	SOIL	MJWC001	02-DEC-15	16	16	0.509	87-5	92
405235057-1	4.5C.R.2.3	SAMPLE		15 pCi/g	SOIL	MJWC001	02-DEC-15	17	17	0.500	87-6	93
405235058-1	4.5C.R.2.4	SAMPLE		15 pCi/g	SOIL	MJWC001	02-DEC-15	18	18	0.512	87-7	95
405235059-1	5.1A.R.1.2	SAMPLE		15 pCi/g	SOIL	MJWC001	16-DEC-15	19	19	0.503	87-8	96
405235060-1	5.1A.R.1.3	SAMPLE		15 pCi/g	SOIL	MJWC001	16-DEC-15	20	20	0.515	87-9	97
1203621754-1	MB for batch 1596414	MB		15 pCi/g	SOIL	QC ACCOUNT		21	21	0.515	87-10	99
1203621755-1	4.4D.R.1.4(405235041DUP)	DUP		15 pCi/g	SOIL	QC ACCOUNT	30-NOV-15	22	22	0.511	87-11	103
1203621756-1	LCS for batch 1596414	LCS		15 pCi/g	SOIL	QC ACCOUNT		23	24	0.515	87-12	105

Bkg Rack #: 82-1
 Data Reviewed By: [Signature]
 Instrument Used: LS6000 (Red) 7065155, LS6500 (Blue) 7067083, LS6500 (Green) 7067404, Wallac (Yellow) 7069123, Silver 7060656, 4140127, LS6000 (Brown) 7060655, LS6500 (Gold) 7070506, Purple 7069123, Silver 7060656, (White) 4140299, Wallac (Teal) 4140421, Wallac (Gray) 4150033, 7069693 (Mocha)
 GEL Laboratories LLC - Radiochemistry Division

Plutonium-241 Solid

Filename : PU241.XLS
 File type : Excel
 Version # : 1.3.4

Tracer S/N : 1770-A
 Tracer Exp Date : 8/3/2017
 Tracer Volume Added : 0.10
 Tracer Error : 0.44%

Procedure Code : LSC41PUS
 Parmname : Plutonium-241
 Required MDA : 15 pCi/g
 Half-life of Pu-241 : 14,290 years
 Pu-241 Abundance : 1.00
 Tracer Abundance : 1.00
 Half-life of Tracer : 373500.000 years

Batch : 1596414
 Analyst : HAKB
 Prep Date : 9/20/2016
 Method Uncertainty : 0.0839

Geometry:

2mL DI/1 drop HNO3/13mL Ecoscint Ultra

Pos.	Sample Characteristics			Tracer Calculations			Tracer Decay	Tracer Count Time (sec.)	Detector Serial #	Detector Efficiency (cpm/dpm)	Detector Efficiency StDev. (cpm/dpm)
	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G	Tracer Concentration DPM	Tracer Bkg Counts	Tracer Net CPM					
1	405235041.1	0.5090	3.2722E-03	4.3831	0.501	0.891	1.000	7510	78780	0.291959	0.005641
2	405235042.1	0.5000	3.2712E-03	4.3831	0.501	1.153	1.000	7518	78795	0.329662	0.006355
3	405235043.1	0.5070	3.2720E-03	4.3831	0.376	1.217	1.000	7522	78262	0.312964	0.006038
4	405235044.1	0.5050	3.2718E-03	4.3831	0.547	1.056	1.000	8208	80020	0.321394	0.006198
5	405235045.1	0.5020	3.2714E-03	4.3831	0.684	1.018	1.000	8212	67584	0.318335	0.006139
6	405235046.1	0.5140	3.2727E-03	4.3831	1.236	1.134	1.000	8242	78775	0.335965	0.006474
7	405235047.1	0.5030	3.2715E-03	4.3831	1.41	1.237	1.000	8245	83296	0.303767	0.005864
8	405235048.1	0.5070	3.2720E-03	4.3831	0.962	1.178	1.000	8250	80010	0.323452	0.006238
9	405235049.1	0.5060	3.2719E-03	4.3831	0.415	1.167	1.000	8305	38633	0.334433	0.006444
10	405235050.1	0.5040	3.2717E-03	4.3831	0.277	1.334	1.000	8310	78197	0.344422	0.006633
11	405235051.1	0.5020	3.2714E-03	4.3831	1.109	1.082	1.000	8314	79996	0.330506	0.006369
12	405235052.1	0.5080	3.2721E-03	4.3831	1.35	0.962	1.000	8318	79997	0.319848	0.006168
13	405235053.1	0.5000	3.2712E-03	4.3831	1.56	1.664	1.000	8466	79988	0.292461	0.005651
14	405235054.1	0.5000	3.2712E-03	4.3831	0.283	1.114	1.000	8496	78263	0.334344	0.006443
15	405235055.1	0.5100	3.2723E-03	4.3831	0.850	0.975	1.000	8499	78259	0.347245	0.006687
16	405235056.1	0.5090	3.2722E-03	4.3831	1.87	1.842	1.000	8504	80063	0.303421	0.006658
17	405235057.1	0.5000	3.2712E-03	4.3831	0.284	1.141	1.000	8507	33206	0.330892	0.006377
18	405235058.1	0.5120	3.2725E-03	4.3831	0.000	1.016	1.000	8560	38626	0.304247	0.005873
19	405235059.1	0.5030	3.2715E-03	4.3831	0.571	1.033	1.000	8564	80016	0.325188	0.006269
20	405235060.1	0.5150	3.2728E-03	4.3831	205	1.429	1.000	8568	83288	0.353557	0.006805
21	1203621754.1	0.5150	3.2728E-03	4.3831	192	0.714	1.000	8573	80059	0.356284	0.006858
22	1203621755.1	0.5110	3.2724E-03	4.3831	159	0.869	1.000	8695	79461	0.338848	0.006527
23	1203621756.1	0.5150	3.2728E-03	4.3831	135	1.015	1.000	8703	78777	0.336886	0.006490

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-035
 Instrument SOP: GL-RAD-I-014

Count raw Data		Calibration Data										Sample Recovery		Calculated Sample Recovery		Sample Recovery Error %		Detector Efficiency		Background Count	
Pos.	Rack Position #	Counting Time (min.)	Quench#	Gross cpm	Bkg cpm	Bkg Count Time (min.)	Bkg Quench#	Corrected Bkg cpm	Count Start Date/Time	Sample Decay	Sample Recovery %	Sample Recovery Error %	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)	Detector Error (cpm/dpm)	Background Rack Position #	Background Count Start Date/Time		
1	82-2	60	714.11	9.5	9.60	60	714.11	9.6000	9/23/2016 13:25	0.961	59.6%	9.74%	LSCTEAL	2/1/2016	1/31/2017	0.1971	0.00792	82-1	9/23/2016 12:24		
2	82-3	60	708.61	9.64	9.60	60	714.11	9.3843	9/23/2016 14:26	0.961	79.8%	8.59%	LSCTEAL	2/1/2016	1/31/2017	0.1867	0.00792	82-1	9/23/2016 12:24		
3	82-4	60	709.02	9.54	9.60	60	714.11	9.3985	9/23/2016 15:27	0.961	88.7%	8.37%	LSCTEAL	2/1/2016	1/31/2017	0.1875	0.00792	82-1	9/23/2016 12:24		
4	82-5	60	709.74	9.17	9.60	60	714.11	9.4242	9/23/2016 16:29	0.961	75.0%	8.60%	LSCTEAL	2/1/2016	1/31/2017	0.1888	0.00792	82-1	9/23/2016 12:24		
5	82-6	60	708.81	9.22	9.60	60	714.11	9.3912	9/23/2016 17:30	0.961	73.0%	8.75%	LSCTEAL	2/1/2016	1/31/2017	0.1871	0.00792	82-1	9/23/2016 12:24		
6	82-7	60	710.25	9.09	9.60	60	714.11	9.4429	9/23/2016 18:31	0.962	77.0%	8.31%	LSCTEAL	2/1/2016	1/31/2017	0.1897	0.00792	82-1	9/23/2016 12:24		
7	82-8	60	705	9.17	9.60	60	714.11	9.2703	9/23/2016 19:32	0.962	76.4%	8.76%	LSCTEAL	2/1/2016	1/31/2017	0.1801	0.00792	82-1	9/23/2016 12:24		
8	82-9	60	708.76	9.19	9.60	60	714.11	9.3895	9/23/2016 20:33	0.962	83.1%	8.15%	LSCTEAL	2/1/2016	1/31/2017	0.1870	0.00792	82-1	9/23/2016 12:24		
9	82-10	60	709.53	10.49	9.60	60	714.11	9.4166	9/23/2016 21:34	0.962	79.6%	8.15%	LSCTEAL	2/1/2016	1/31/2017	0.1884	0.00792	82-1	9/23/2016 12:24		
10	82-11	60	709.89	9.81	9.60	60	714.11	9.4297	9/23/2016 22:35	0.962	88.3%	7.64%	LSCTEAL	2/1/2016	1/31/2017	0.1891	0.00792	82-1	9/23/2016 12:24		
11	82-12	60	711.01	9.69	9.60	60	714.11	9.4717	9/23/2016 23:36	0.962	74.7%	8.46%	LSCTEAL	2/1/2016	1/31/2017	0.1912	0.00792	82-1	9/23/2016 12:24		
12	0-1	60	711.42	10.01	9.60	60	714.11	9.4876	9/24/2016 0:38	0.962	68.6%	8.97%	LSCTEAL	2/1/2016	1/31/2017	0.1919	0.00792	82-1	9/23/2016 12:24		
13	0-2	60	704.95	9.62	9.60	60	714.11	9.2689	9/24/2016 1:39	0.961	83.8%	8.52%	LSCTEAL	2/1/2016	1/31/2017	0.1800	0.00792	82-1	9/23/2016 12:24		
14	87-3	60	711.67	9.18	9.60	60	714.11	9.4975	9/24/2016 3:52	0.961	76.0%	8.24%	LSCTEAL	2/1/2016	1/31/2017	0.1924	0.00792	82-1	9/23/2016 12:24		
15	87-4	60	709.68	9.48	9.60	60	714.11	9.4220	9/24/2016 4:53	0.961	64.1%	8.79%	LSCTEAL	2/1/2016	1/31/2017	0.1887	0.00792	82-1	9/23/2016 12:24		
16	87-5	60	709.58	9.62	9.60	60	714.11	9.4184	9/24/2016 5:54	0.961	98.2%	7.67%	LSCTEAL	2/1/2016	1/31/2017	0.1885	0.00792	82-1	9/23/2016 12:24		
17	87-6	60	710.3	8.67	9.60	60	714.11	9.4448	9/24/2016 6:55	0.961	78.6%	8.14%	LSCTEAL	2/1/2016	1/31/2017	0.1898	0.00792	82-1	9/23/2016 12:24		
18	87-7	60	708.61	9.57	9.60	60	714.11	9.3843	9/24/2016 7:57	0.961	76.2%	8.57%	LSCTEAL	2/1/2016	1/31/2017	0.1867	0.00792	82-1	9/23/2016 12:24		
19	87-8	60	710.3	8.72	9.60	60	714.11	9.4448	9/24/2016 8:58	0.963	72.5%	8.52%	LSCTEAL	2/1/2016	1/31/2017	0.1898	0.00792	82-1	9/23/2016 12:24		
20	87-9	60	707.22	9.85	9.60	60	714.11	9.3381	9/24/2016 9:59	0.963	92.2%	7.31%	LSCTEAL	2/1/2016	1/31/2017	0.1841	0.00792	82-1	9/23/2016 12:24		
21	87-10	60	709.22	9.79	9.60	60	714.11	9.4056	9/24/2016 11:00	0.999	85.7%	7.53%	LSCTEAL	2/1/2016	1/31/2017	0.1878	0.00792	82-1	9/23/2016 12:24		
22	87-11	60	709.84	8.81	9.60	60	714.11	9.4278	9/24/2016 12:01	0.961	73.5%	8.24%	LSCTEAL	2/1/2016	1/31/2017	0.1890	0.00792	82-1	9/23/2016 12:24		
23	87-12	60	708.76	32.43	9.60	60	714.11	9.3895	9/24/2016 13:02	0.999	62.6%	8.93%	LSCTEAL	2/1/2016	1/31/2017	0.1870	0.00792	82-1	9/23/2016 12:24		

Notes:
 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml): N/A
 Spike Volume Added: N/A
 LCS S/N : 1610-B
 LCS Exp Date : 10/28/2016
 LCS Activity (dpm/ml): 1692.50
 LCS Volume Added: 0.10

* - RPD changed to 0% due to sample & dup activity below MDA

Pos.	Decision Level		Critical Level		Required MDA		Sample Act. Conc.		Sample Act. Error %		Net Count Rate		Net Count Rate Error		2 SIGMA Counting Uncertainty		2 SIGMA Total Prop. Uncertainty		Sample Type		Sample QC		Nominal pCi/G		Recovery	
	pCi/G	pCi/G	pCi/G	pCi/G	MDA	MDA	pCi/G	pCi/G	%	CPM	CPM	CPM	CPM	pCi/G	pCi/G	pCi/G	pCi/G	RPD	REER	Sample Type	Sample QC	RPD	REER	pCi/G	pCi/G	Recovery
1	8.8460	6.2453	15	12.8262	-0.6711	564.30%	-0.1000	0.5642	7.4218	7.4219	SAMPLE									SAMPLE						
2	8.1973	5.7874	15	11.8893	1.6084	220.39%	0.2557	0.5631	6.9424	6.9528	SAMPLE									SAMPLE						
3	7.2461	5.1158	15	10.5094	0.7860	397.24%	0.1415	0.5618	6.1183	6.1211	SAMPLE									SAMPLE						
4	8.5639	6.0462	15	12.4202	-1.6671	219.16%	-0.2542	0.5567	7.1552	7.1553	SAMPLE									SAMPLE						
5	8.9181	6.2962	15	12.9345	-1.1712	325.42%	-0.1712	0.5569	7.4676	7.4677	SAMPLE									SAMPLE						
6	8.1502	5.7541	15	11.8199	-2.2005	157.69%	-0.3529	0.5558	6.7916	6.7916	SAMPLE									SAMPLE						
7	8.7824	6.1864	15	12.7110	-0.6787	552.67%	-0.1003	0.5544	7.3511	7.3511	SAMPLE									SAMPLE						
8	7.7457	5.4685	15	11.2342	-1.1853	279.08%	-0.1995	0.5565	6.4810	6.4811	SAMPLE									SAMPLE						
9	8.0509	5.6840	15	11.6764	6.6199	54.23%	1.0734	0.5760	6.9628	7.1274	SAMPLE									SAMPLE						
10	7.2652	5.1293	15	10.5367	2.1152	149.09%	0.3803	0.5663	6.1728	6.1909	SAMPLE									SAMPLE						
11	8.5545	6.0395	15	12.4057	1.4265	258.99%	0.2183	0.5651	7.2374	7.2451	SAMPLE									SAMPLE						
12	9.1717	6.4753	15	13.3006	3.6565	109.50%	0.5224	0.5701	7.8207	7.8705	SAMPLE									SAMPLE						
13	8.0500	5.6633	15	11.6775	2.1824	160.03%	0.3511	0.5611	6.8355	6.8547	SAMPLE									SAMPLE						
14	8.4006	5.9309	15	12.1822	-2.0344	175.93%	-0.3175	0.5579	7.0073	7.0073	SAMPLE									SAMPLE						
15	9.9223	7.0053	15	14.3905	0.4404	968.43%	0.0590	0.5613	8.3595	8.3602	SAMPLE									SAMPLE						
16	6.4907	4.5825	15	9.4135	1.0021	279.57%	0.2016	0.5633	5.4891	5.4937	SAMPLE									SAMPLE						
17	8.2062	5.7937	15	11.9012	-4.8634	71.39%	-0.7748	0.5495	6.7600	6.7601	SAMPLE									SAMPLE						
18	8.3815	5.9174	15	12.1564	1.1944	302.79%	0.1857	0.5621	7.0853	7.0909	SAMPLE									SAMPLE						
19	8.8363	6.2385	15	12.8149	-4.8988	76.40%	-0.7248	0.5502	7.2891	7.2891	SAMPLE									SAMPLE						
20	6.9545	4.9099	15	10.0874	2.7388	110.71%	0.5119	0.5655	5.9298	5.9600	SAMPLE									SAMPLE						
21	7.0911	5.0064	15	10.2846	2.0895	147.33%	0.3844	0.5656	6.0257	6.0435	SAMPLE									SAMPLE						
22	8.6289	6.0921	15	12.5144	-4.0816	89.62%	-0.6178	0.5513	7.1387	7.1388	MB								DUP							
23	9.7538	6.8863	15	14.1467	172.4050	9.69%	23.0405	0.8349	12.2441	43.3144	LCS									LCS						116.5%

1586 414

Pu-241 TEAL

PROTOCOL : 4 Pu-241 60 min
DATE : 2016/09/23
TIME : 12:23
ID : P04AS243

Pu-241

Wallac 1414 WinSpectral v3.0 S/N4140421

Counting mode : CPM
Isotope(s) : H3
H3 = 5- 350,12.43 y
Protocol name : Pu-241 60 min
Counting time : 3600
Repeats : 1
Cycles : 1
Replicates : 1
2 sigma % : 2.00
Minimum cpm : 0.00 Checking time: 10
Advanced modes : Chemilum
Output to Display :
POS,DPM1,CPMw2,CLMM,FNCT2,
RACK,RACKPOS,FNCT1,SQPE,DATE,
TIME,CPMw1,CPM,CPM1,CTIME
Additions to Display : Spectrum,Header,Listing
Header : Pu-241
Spectrum : Rnd.Cos,Beta
Window 1 : 25- 220 /Beta
Window 2 : 25- 220 /Rnd.Cos
Window 3 : 1-1024 /Beta
Window 4 : 1-1024 /Beta
Window 5 : 1-1024 /Beta
Window 6 : 1-1024 /Beta
FNCT1 = FNCT1 : CTIME/60
FNCT2 = FNCT2 : CPMW1-CPMW2
FNCT3 = FNCT3 :
FNCT4 = FNCT4 :

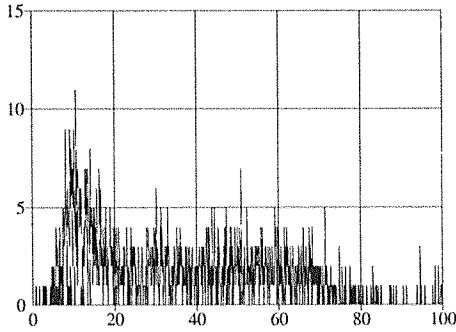
Total count rate:

H3 183.3 CPM

Pu-241 TEAL

Rack_position 82 Count_Time(min) 60.01 Quench_number 714.11 Pu241_cpm 9.60 Run_Date 9/23/2016 12:24 PM

322



Counts Chem

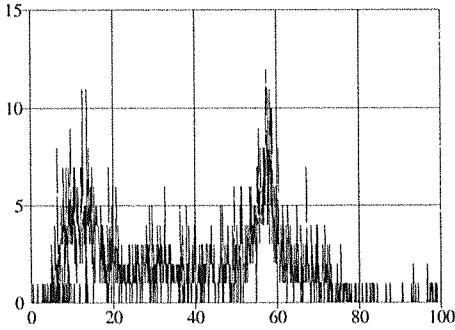
Counts Beta

Gross_B_CPM 10.20 LUMEX 0.00

Lumex_CPM 0.60 DPM 0.00

Rack_position 82 Count_Time(min) 60.00 Quench_number 714.11 Pu241_cpm 9.50 Run_Date 9/23/2016 1:25 PM

1



Counts Chem

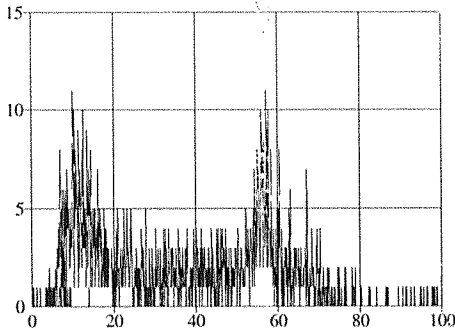
Counts Beta

Gross_B_CPM 9.90 LUMEX 0.00

Lumex_CPM 0.40 DPM 0.00

Rack_position 82 Count_Time(min) 60.00 Quench_number 708.61 Pu241_cpm 9.64 Run_Date 9/23/2016 2:26 PM

2



Counts Chem

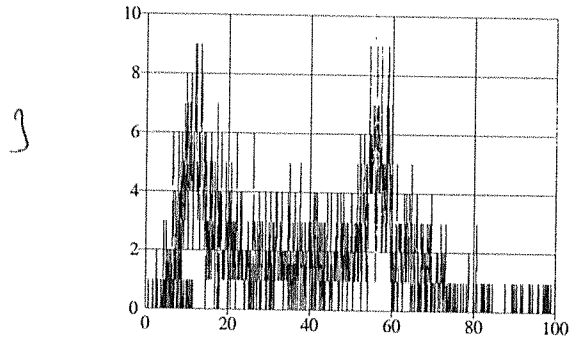
Counts Beta

Gross_B_CPM 10.00 LUMEX 0.00

Lumex_CPM 0.30 DPM 0.00

Pu-241 TEAL

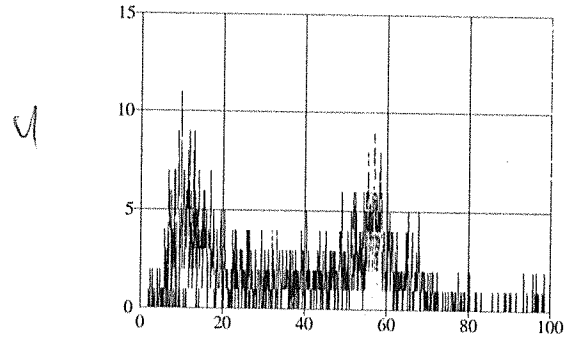
Rack_position 82 Count_Time(min) 60.00 Quench_number 709.02 Pu241_cpm 9.54 Run_Date 9/23/2016 3:27 PM



Counts Chem
Counts Beta

Gross_B_CPM 10.10 LUMEX 0.00
Lumex_CPM 0.50 DPM 0.00

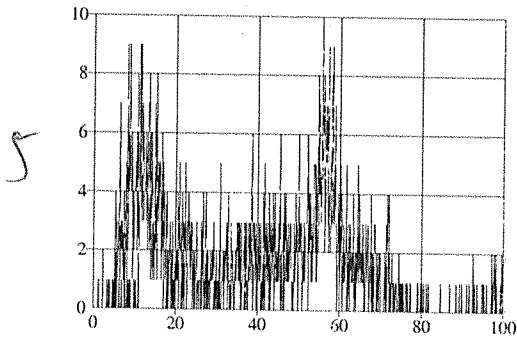
Rack_position 82 Count_Time(min) 60.00 Quench_number 709.74 Pu241_cpm 9.17 Run_Date 9/23/2016 4:29 PM



Counts Chem
Counts Beta

Gross_B_CPM 9.70 LUMEX 0.00
Lumex_CPM 0.50 DPM 0.00

Rack_position 82 Count_Time(min) 60.00 Quench_number 708.81 Pu241_cpm 9.22 Run_Date 9/23/2016 5:30 PM

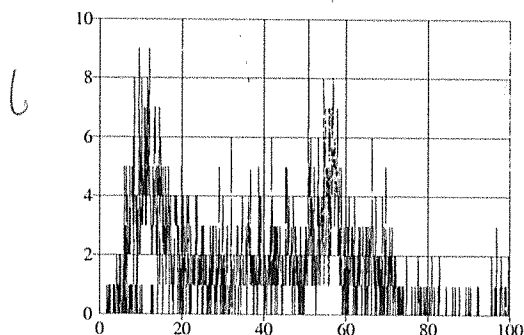


Counts Chem
Counts Beta

Gross_B_CPM 9.50 LUMEX 0.00
Lumex_CPM 0.30 DPM 0.00

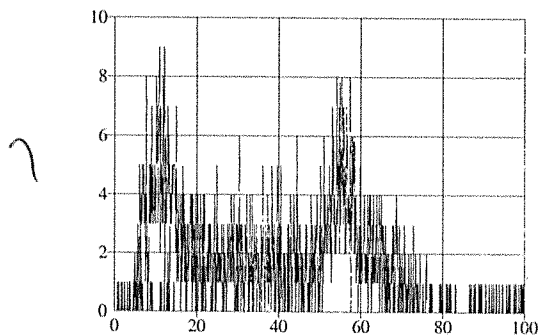
Pu-241 TEAL

Rack_position 82 Count_Time(min) 60.00 Quench_number 710.25 Pu241_cpm 9.09 Run_Date 9/23/2016 6:31 PM



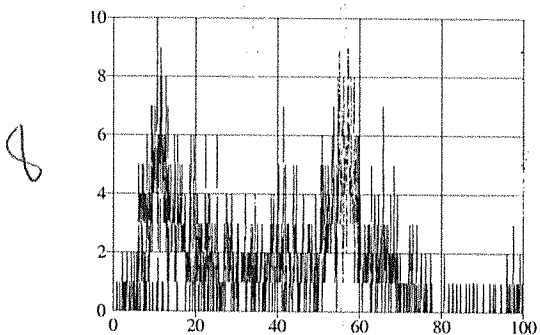
Gross_B_CPM 9.40 LUMEX 0.00
Lumex_CPM 0.30 DPM 0.00

Rack_position 82 Count_Time(min) 60.00 Quench_number 705.00 Pu241_cpm 9.17 Run_Date 9/23/2016 7:32 PM



Gross_B_CPM 9.60 LUMEX 0.00
Lumex_CPM 0.40 DPM 0.00

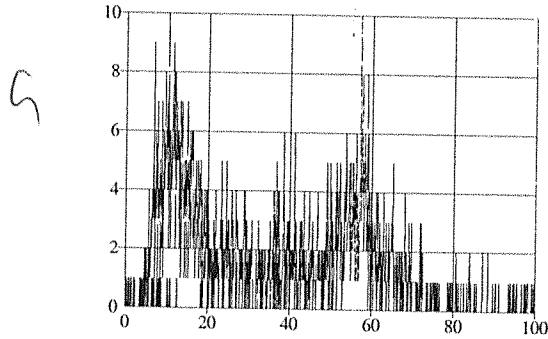
Rack_position 82 Count_Time(min) 60.00 Quench_number 708.76 Pu241_cpm 9.19 Run_Date 9/23/2016 8:33 PM



Gross_B_CPM 9.60 LUMEX 0.00
Lumex_CPM 0.40 DPM 0.00

Pu-241 TEAL

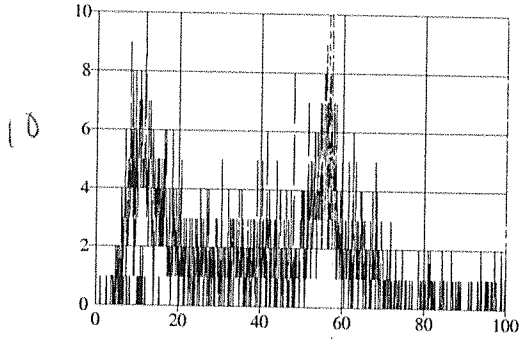
Rack_position 82 Count_Time(min) 60.00 Quench_number 709.53 Pu241_cpm 10.49 Run_Date 9/23/2016 9:34 PM



Counts Chem
Counts Beta

Gross_B_CPM 10.70 LUMEX 0.00
Lumex_CPM 0.30 DPM 0.00

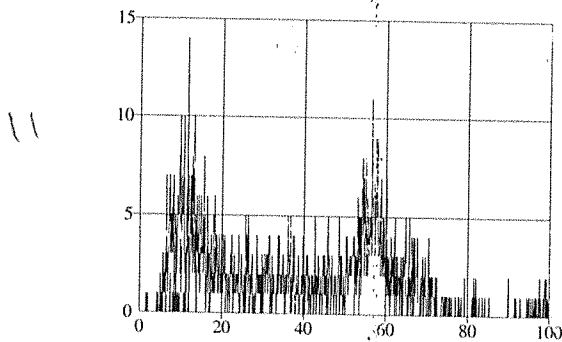
Rack_position 82 Count_Time(min) 60.00 Quench_number 709.89 Pu241_cpm 9.81 Run_Date 9/23/2016 10:35 PM



Counts Chem
Counts Beta

Gross_B_CPM 10.20 LUMEX 0.00
Lumex_CPM 0.40 DPM 0.00

Rack_position 82 Count_Time(min) 60.00 Quench_number 711.01 Pu241_cpm 9.69 Run_Date 9/23/2016 11:36 PM

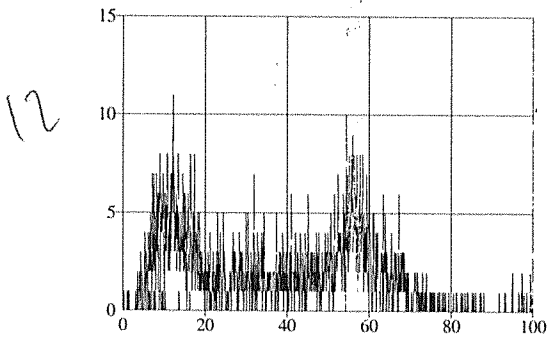


Counts Chem
Counts Beta

Gross_B_CPM 10.00 LUMEX 0.00
Lumex_CPM 0.40 DPM 0.00

Pu-241 TEAL

Rack_position 0 1 Count_Time(min) 60.00 Quench_number 711.42 Pu241_cpm 10.01 Run_Date 9/24/2016 0:38 AM



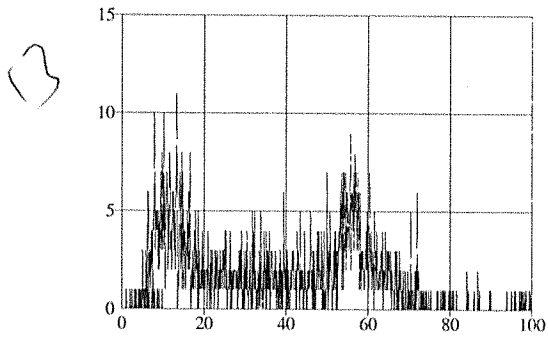
Counts Chem

Counts Beta

Gross_B_CPM 10.20 LUMEX 0.00

Lumex_CPM 0.20 DPM 0.00

Rack_position 0 2 Count_Time(min) 60.00 Quench_number 704.95 Pu241_cpm 9.62 Run_Date 9/24/2016 1:39 AM



Counts Chem

Counts Beta

Gross_B_CPM 9.90 LUMEX 0.00

Lumex_CPM 0.30 DPM 0.00

1590414

Pu-241 TEAL

PROTOCOL : 4 Pu-241 60 min
DATE : 2016/09/24
TIME : 03:52
ID : P04AS244

Pu-241

Wallac 1414 WinSpectral v3.0 S/N4140421

Counting mode : CPM
Isotope(s) : H3
H3 = 5- 350,12.43 y
Protocol name : Pu-241 60 min
Counting time : 3600
Repeats : 1
Cycles : 1
Replicates : 1
2 sigma % : 2.00
Minimum cpm : 0.00 Checking time: 10
Advanced modes : Chemilum
Output to Display :
POS,DPM1,CPMw2,CLMM,FNCT2,
RACK,RACKPOS,FNCT1,SQPE,DATE,
TIME,CPMw1,CPM,CPM1,CTIME
Additions to Display : Spectrum,Header,Listing
Header : Pu-241
Spectrum : Rnd.Cos,Beta
Window 1 : 25- 220 /Beta
Window 2 : 25- 220 /Rnd.Cos
Window 3 : 1-1024 /Beta
Window 4 : 1-1024 /Beta
Window 5 : 1-1024 /Beta
Window 6 : 1-1024 /Beta
FNCT1 = FNCT1 : CTIME/60
FNCT2 = FNCT2 : CPMW1-CPMW2
FNCT3 = FNCT3 :
FNCT4 = FNCT4 :

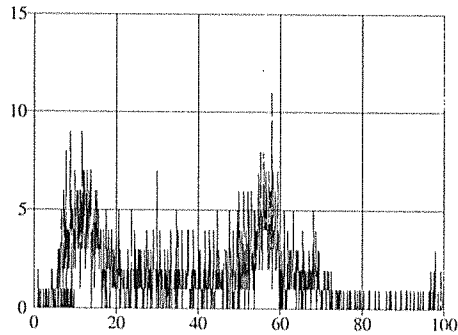
Total count rate:

H3 153.0 CPM

Pu-241 TEAL

Rack_position 87 Count_Time(min) 60.00 Quench_number 711.67 Pu241_cpm 9.18 Run_Date 9/24/2016 3:52 AM

14



Counts Chem

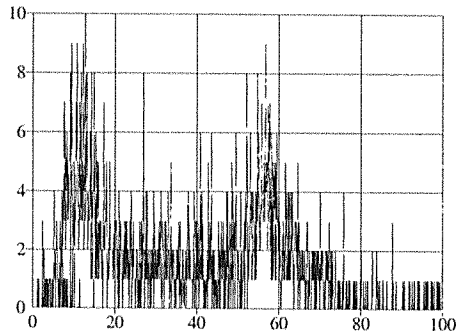
Counts Beta

Gross_B_CPM 9.60 LUMEX 0.00

Lumex_CPM 0.40 DPM 0.00

Rack_position 87 Count_Time(min) 60.00 Quench_number 709.68 Pu241_cpm 9.48 Run_Date 9/24/2016 4:53 AM

15



Counts Chem

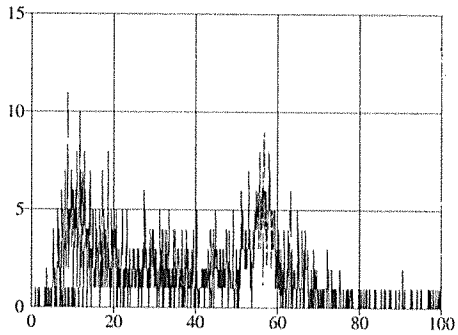
Counts Beta

Gross_B_CPM 9.80 LUMEX 0.00

Lumex_CPM 0.30 DPM 0.00

Rack_position 87 Count_Time(min) 60.00 Quench_number 709.58 Pu241_cpm 9.62 Run_Date 9/24/2016 5:54 AM

16



Counts Chem

Counts Beta

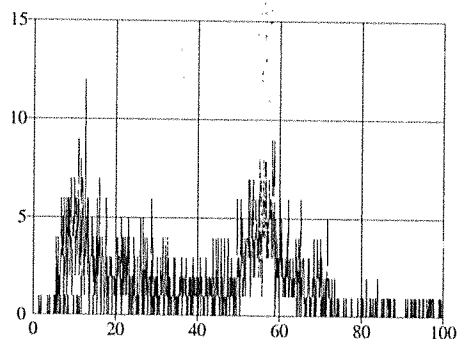
Gross_B_CPM 9.90 LUMEX 0.00

Lumex_CPM 0.30 DPM 0.00

Pu-241 TEAL

17

Rack_position 87 Count_Time(min) 60.00 Quench_number 710.30 Pu241_cpm 8.67 Run_Date 9/24/2016 6:55 AM

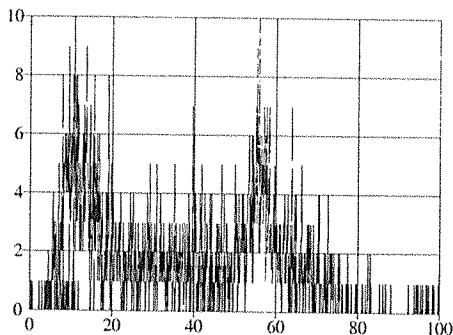


Counts Chem
Counts Beta

Gross_B_CPM 8.90 LUMEX 0.00
Lumex_CPM 0.30 DPM 0.00

18

Rack_position 87 Count_Time(min) 60.00 Quench_number 708.61 Pu241_cpm 9.57 Run_Date 9/24/2016 7:57 AM

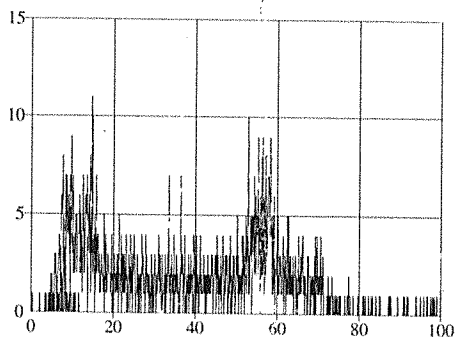


Counts Chem
Counts Beta

Gross_B_CPM 10.00 LUMEX 0.00
Lumex_CPM 0.40 DPM 0.00

19

Rack_position 87 Count_Time(min) 60.00 Quench_number 710.30 Pu241_cpm 8.72 Run_Date 9/24/2016 8:58 AM



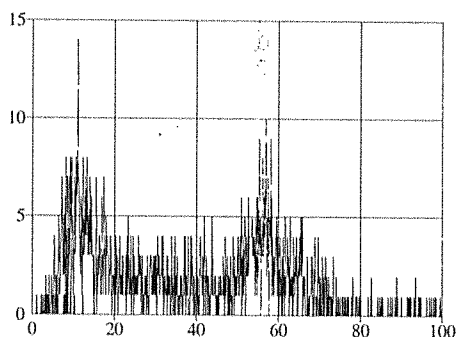
Counts Chem
Counts Beta

Gross_B_CPM 9.20 LUMEX 0.00
Lumex_CPM 0.50 DPM 0.00

Pu-241 TEAL

70

Rack_position	Count_Time(min)	Quench_number	Pu241_cpm	Run_Date
87	9	60.00	707.22	9/24/2016 9:59 AM

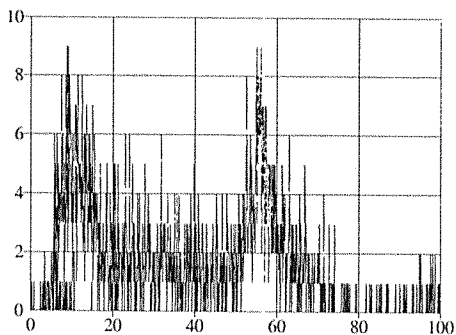


Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
10.20	0.00
Lumex_CPM	DPM
0.30	0.00

71

Rack_position	Count_Time(min)	Quench_number	Pu241_cpm	Run_Date
87	10	60.00	709.22	9/24/2016 11:00 AM

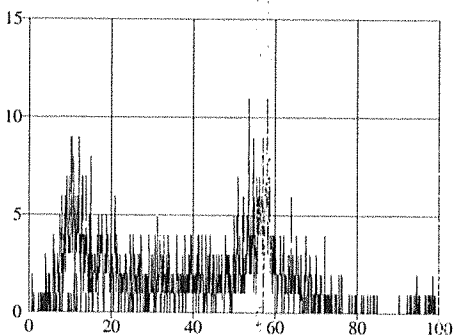


Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
10.10	0.00
Lumex_CPM	DPM
0.30	0.00

72

Rack_position	Count_Time(min)	Quench_number	Pu241_cpm	Run_Date
87	11	60.00	709.84	9/24/2016 12:01 PM



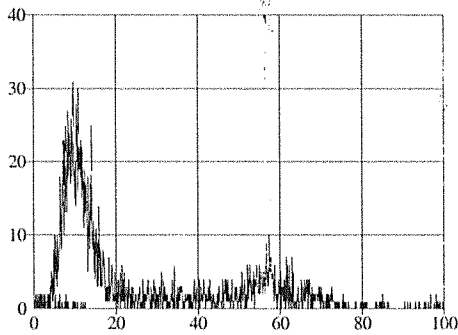
Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
9.20	0.00
Lumex_CPM	DPM
0.40	0.00

Pu-241 TEAL

24

Rack_position Count_Time(min) Quench_number Pu241_cpm Run_Date
87 12 60.00 708.76 32.43 9/24/2016 1:02 PM



Counts
Chem

Counts
Beta

Gross_B_CPM LUMEX
32.90 0.00

Lumex_CPM DPM
0.50 0.00

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

LIB FILE : PU
BKG FILE : B067.CNF;1813
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W067.CNF;476
CAL DATE : 03-Sep-2016

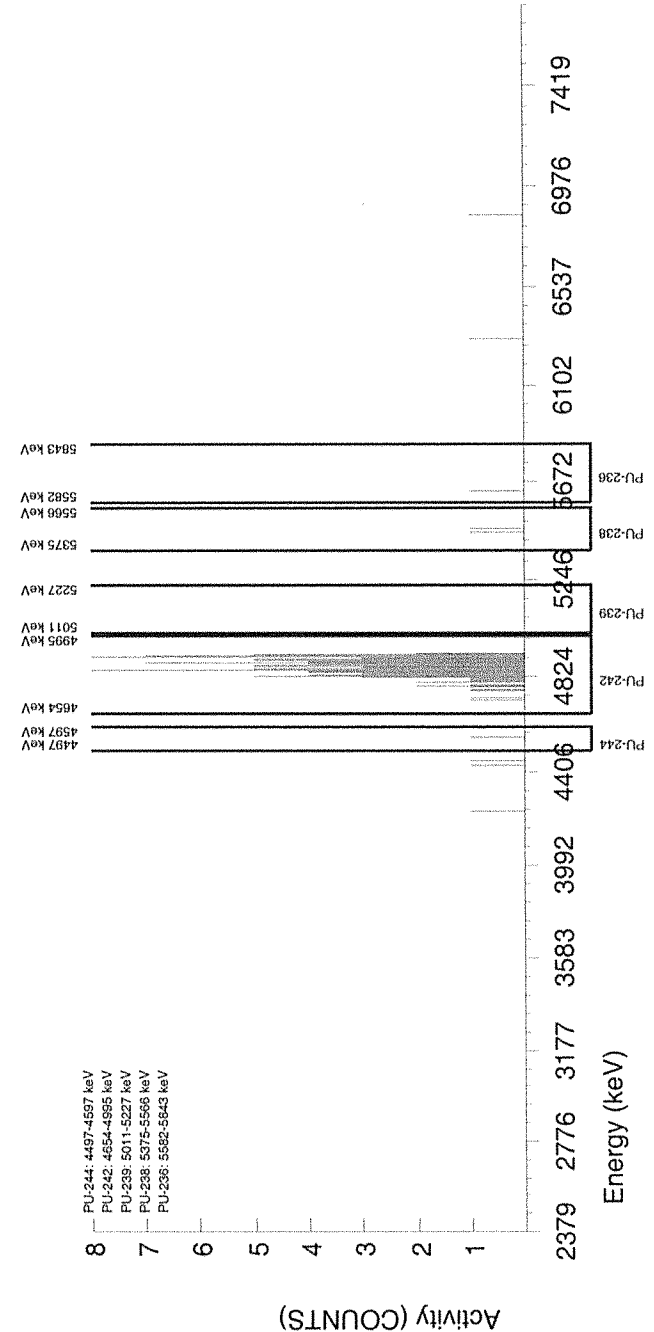
CHAMBER : 067
DETECTOR S/N : 78780
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AVERAGE %EFF ERROR : 0.5641
COUNT DATE : 22-Sep-2016 09:56:19
ELAPSED LIVE TIME(SEC) : 7510.30

BATCH NUMBER : 1596414
SAMPLE ID : R0405235041_PU
SAMPLE QTY : 0.509 G +/-0.196 %
SAMPLE DATE : 30-Nov-2015 00:00:00
ANALYST : HAKB
% YIELD : 69.6 +/-9.741 %

TRACER ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.0510E+00 dpm

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma cnt Unc
										TPU pCi/G	Lc pCi/G	
PU-236	5749.00	5634.56	4.935	1.000	0.374	0.626	0.7911	100.000	1.59E-02	2.44E-01	5.85E-02	1.20E-01
PU-238	5486.00	5461.05	19.738	2.000	2.000	0.000	0.0000	99.900	7.01E-02	1.05E-01	0.00E+00	1.19E-01
PU-239	5155.00	5118.69	0.000	0.000	-0.250	0.250	0.5003	99.900	-8.72E-03	1.65E-01	3.04E-02	6.98E-02
PU-242	4890.00	4862.17	92.935	112.000	111.499	0.501	0.7076	100.000	3.88E+00	1.90E-01	4.30E-02	7.25E-01
PU-244	4589.00	4556.91	4.935	1.000	1.000	0.000	0.0000	99.900	3.48E-02	1.04E-01	0.00E+00	9.69E-02

NUCLIDE ACTIVITY SUMMARY



GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596414
 SAMPLE ID : R0405235042_PU
 SAMPLE QTY : 0.500 G +/-0.200 %
 SAMPLE DATE : 30-Nov-2015 00:00:00
 ANALYST : HAKB
 % YIELD : 79.8 +/-8.595 %

CHAMBER : 069
 DETECTOR S/N : 78795
 AVERAGE %EFFICIENCY : 32.9662
 AVERAGE %EFF ERROR : 0.6355
 COUNT DATE : 22-Sep-2016 09:56:19
 ELAPSED LIVE TIME(SEC) : 7518.12

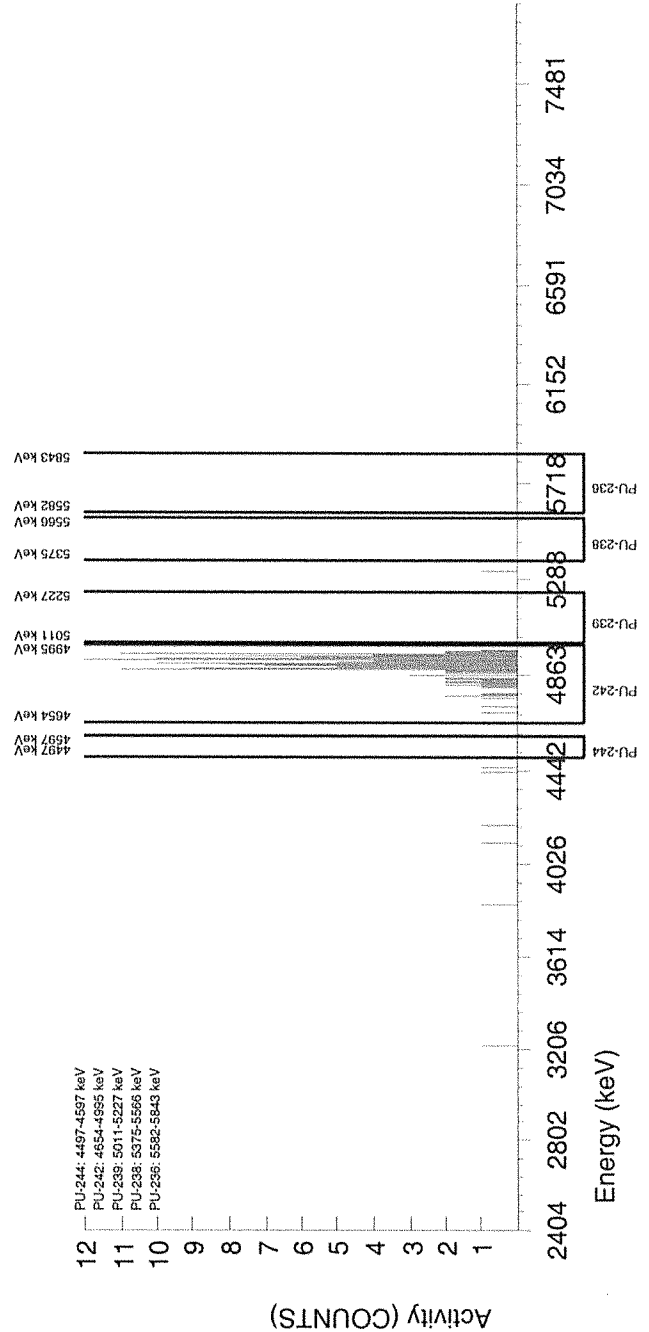
LIB FILE : PU
 BKG FILE : B069.CNF;1819
 BKG DATE : 16-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W069.CNF;495
 CAL DATE : 03-Sep-2016

TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.4981E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.25	0.000	0.000	-0.251	0.251	0.5006	100.000	-8.34E-03	6.70E-02	1.58E-01	2.91E-02	6.68E-02
PU-238	5486.00	5470.34	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	5.46E-02	8.26E-02	0.00E+00	5.44E-02
PU-239	5155.00	5118.68	0.000	0.000	-0.376	0.376	0.6131	99.900	-1.03E-02	5.55E-02	1.41E-01	2.93E-02	5.53E-02
PU-242	4890.00	4905.23	69.971	144.499	0.501	0.7080	0.7080	100.000	3.95E+00	9.40E-01	1.50E-01	3.38E-02	6.47E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.125	0.125	0.3540	99.900	-3.43E-03	5.47E-02	1.16E-01	1.69E-02	5.45E-02



GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596414
 SAMPLE ID : R0405235043_PU
 SAMPLE QTY : 0.507 G +/-0.197 %
 SAMPLE DATE : 30-Nov-2015 00:00:00
 ANALYST : HAKB
 % YIELD : 88.8 +/-8.370 %

CHAMBER : 070
 DETECTOR S/N : 78262
 AVERAGE %EFFICIENCY : 31.2964
 AVERAGE %EFF ERROR : 0.6038
 COUNT DATE : 22-Sep-2016 09:56:19
 ELAPSED LIVE TIME(SEC) : 7521.69

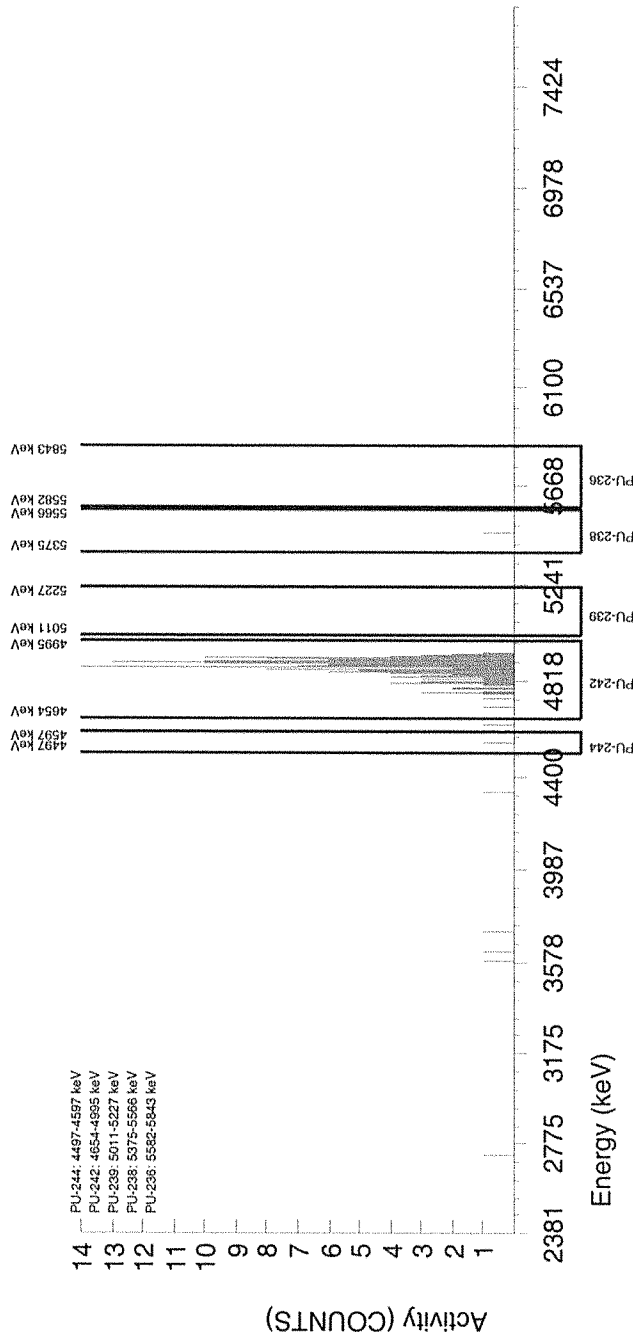
LIB FILE : PU
 BKG FILE : B070.CNF;1821
 BKG DATE : 16-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W070.CNF;500
 CAL DATE : 03-Sep-2016

TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.8901E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG S/Dev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.24	0.000	0.000	-0.752	0.752	0.8673	100.000	-2.34E-02	6.44E-02	1.87E-01	4.70E-02	6.42E-02
PU-238	5486.00	5464.34	4.900	1.000	0.624	0.376	0.6133	99.900	1.60E-02	7.25E-02	1.32E-01	2.75E-02	7.24E-02
PU-239	5155.00	5118.67	0.000	0.000	-0.627	0.627	0.7917	99.900	-1.60E-02	5.25E-02	1.47E-01	3.53E-02	5.24E-02
PU-242	4890.00	4871.68	53.083	153.000	152.624	0.376	0.6133	100.000	3.89E+00	9.03E-01	1.31E-01	2.73E-02	6.21E-01
PU-244	4589.00	4545.79	4.900	1.000	1.000	0.000	0.0000	99.900	2.55E-02	7.12E-02	7.66E-02	0.00E+00	7.11E-02



Handwritten: 6/22/16

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-1-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596414
SAMPLE ID : R0405235044_PU
SAMPLE QTY : 0.505 G +/-0.198 %
SAMPLE DATE : 30-Nov-2015 00:00:00
ANALYST : HAKB
% YIELD : 75.0 +/-8.598 %

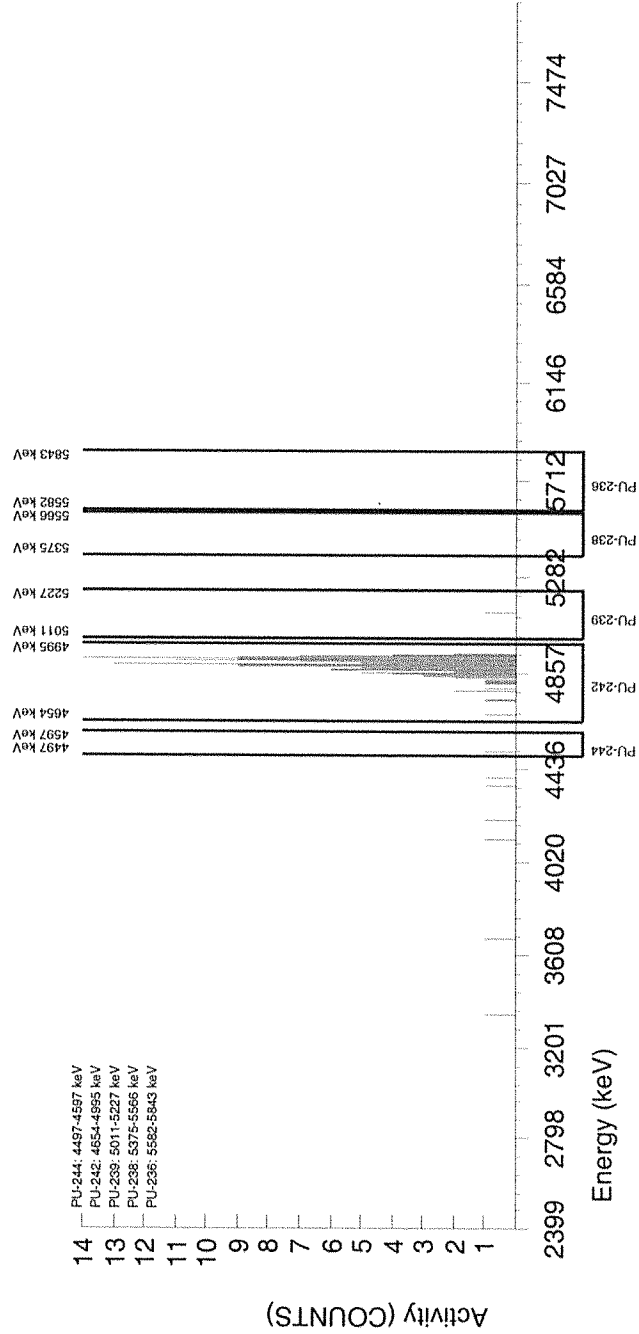
CHAMBER : 071
DETECTOR S/N : 80020
AVERAGE %EFFICIENCY : 32.1394
AVERAGE %EFF ERROR : 0.6198
COUNT DATE : 22-Sep-2016 09:56:24
ELAPSED LIVE TIME(SEC) : 8207.94

LIB FILE : PU
BKG FILE : B071.CNF;1814
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W071.CNF;464
CAL DATE : 03-Sep-2016

TRACER
ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.2855E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc
PU-236	5749.00	5712.25	0.000	0.000	-0.274	0.274	0.5231	100.000	-9.02E-03	6.67E-02	1.59E-01	3.03E-02	6.64E-02
PU-238	5486.00	5470.34	0.000	0.000	-0.137	0.137	0.3699	99.900	-3.73E-03	5.46E-02	1.17E-01	1.77E-02	5.44E-02
PU-239	5155.00	5127.52	4.953	1.000	0.726	0.274	0.5231	99.900	1.97E-02	7.63E-02	1.31E-01	2.49E-02	7.61E-02
PU-242	4890.00	4893.28	47.057	144.453	144.453	0.547	0.7397	100.000	3.91E+00	9.31E-01	1.51E-01	3.51E-02	6.41E-01
PU-244	4589.00	4514.88	4.953	1.000	1.000	0.000	0.0000	99.900	2.71E-02	7.56E-02	8.13E-02	0.00E+00	7.54E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER : 1596414
 SAMPLE ID : R0405235045_PU
 SAMPLE QTY : 0.502 G +/-0.199 %
 SAMPLE DATE : 30-Nov-2015 00:00:00
 ANALYST : HAKB
 % YIELD : 73.0 +/-8.753 %

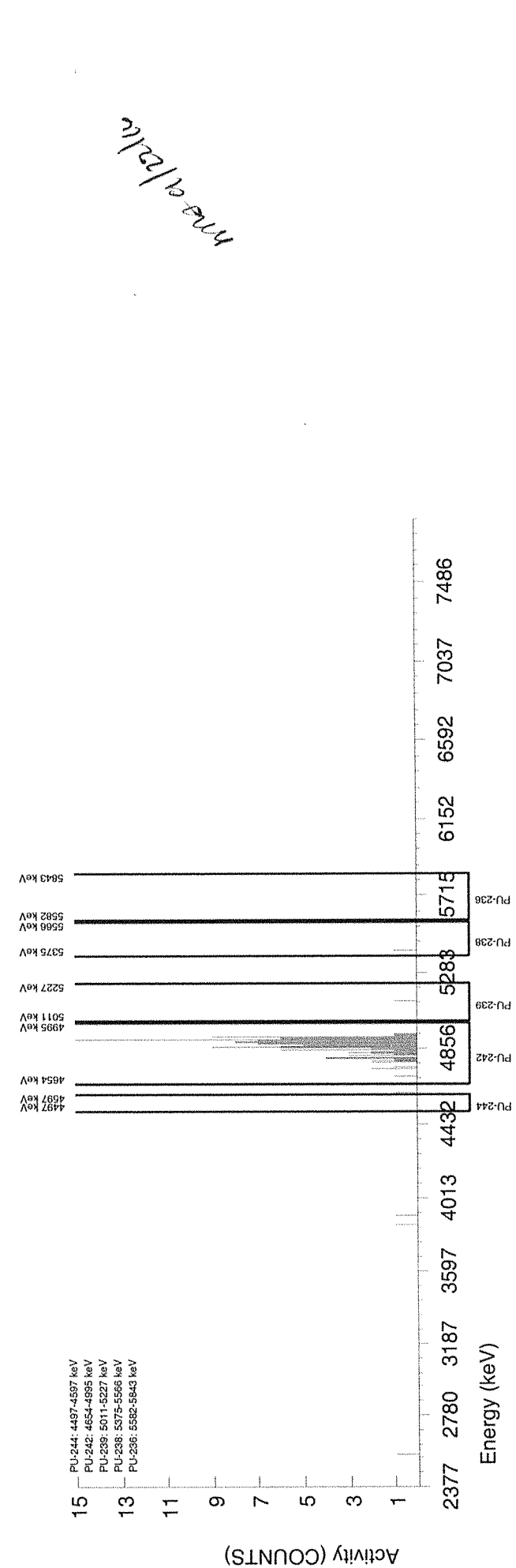
LIB FILE : PU
 BKG FILE : B072.CNF;1821
 BKG DATE : 16-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W072.CNF;475
 CAL DATE : 03-Sep-2016

CHAMBER : 072
 DETECTOR S/N : 67584
 AVERAGE %EFFICIENCY : 31.8335
 AVERAGE %EFF ERROR : 0.6139
 COUNT DATE : 22-Sep-2016 09:56:24
 ELAPSED LIVE TIME(SEC) : 8211.60

TRACER ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.1977E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	0.000	0.000	0.0000	100.000	0.00E+00	6.83E-02	1.03E-01	0.00E+00	6.80E-02
PU-238	5486.00	5407.13	5.004	1.000	0.863	0.137	0.3699	99.900	2.45E-02	7.97E-02	1.22E-01	1.85E-02	7.96E-02
PU-239	5155.00	5122.44	5.004	1.000	0.042	0.958	0.9788	99.900	1.19E-03	8.14E-02	1.82E-01	4.85E-02	8.12E-02
PU-242	4890.00	4867.99	58.484	140.000	139.316	0.684	0.8272	100.000	3.93E+00	9.54E-01	1.67E-01	4.10E-02	6.57E-01
PU-244	4589.00	4546.97	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	5.61E-02	8.48E-02	0.00E+00	5.59E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596414
SAMPLE ID : R0405235046_PU
SAMPLE QTY : 0.514 G +/-0.195 %
SAMPLE DATE : 07-Dec-2015 00:00:00
ANALYST : HAKB
% YIELD : 77.0 +/-8.313 %

CHAMBER : 073
DETECTOR S/N : 78775
AVERAGE %EFFICIENCY : 33.5965
AVERAGE %EFF ERROR : 0.6474
COUNT DATE : 22-Sep-2016 09:56:24
ELAPSED LIVE TIME(SEC) : 8241.52

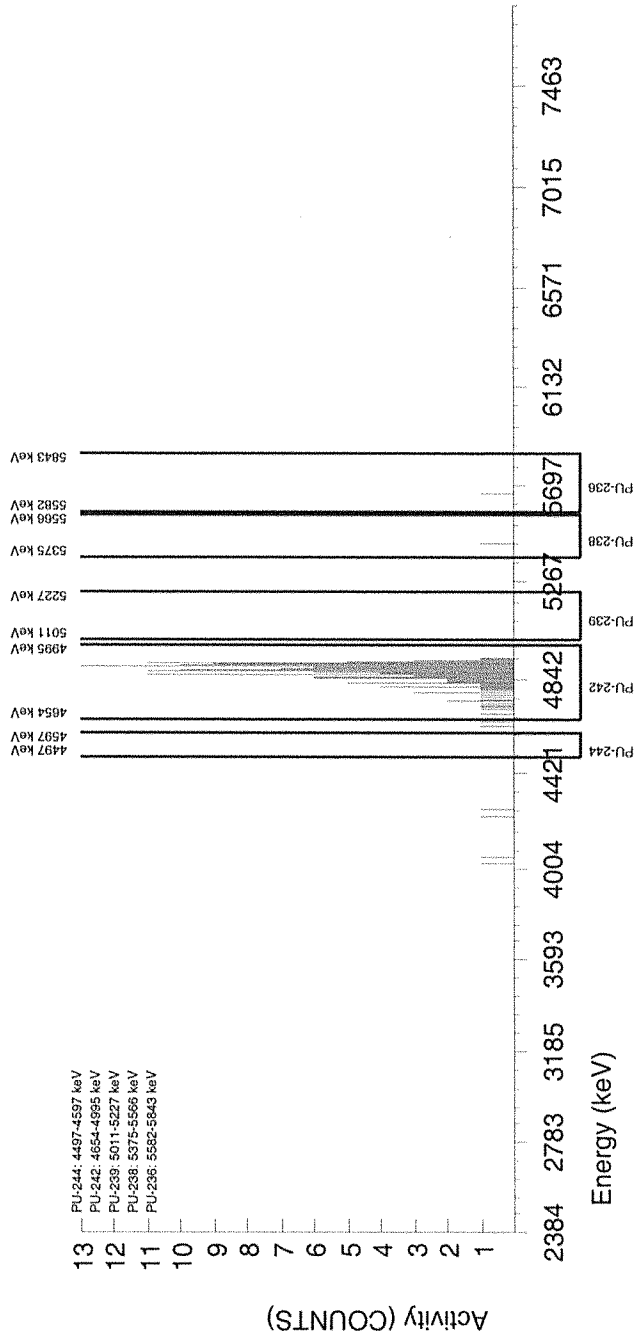
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BKG FILE : B073.CNF;1820
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W073.CNF;495
CAL DATE : 03-Sep-2016

TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.3753E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5659.37	4.947	1.000	0.038	0.962	0.9806	100.000	1.15E-03	8.61E-02	1.93E-01	5.14E-02	8.60E-02
PU-238	5486.00	5438.60	4.947	1.000	0.588	0.412	0.6419	99.900	1.46E-02	7.03E-02	1.30E-01	2.80E-02	7.01E-02
PU-239	5155.00	5118.68	0.000	0.000	-0.687	0.687	0.8287	99.900	-1.70E-02	5.12E-02	1.46E-01	3.59E-02	5.10E-02
PU-242	4890.00	4861.75	55.965	157.000	155.764	1.236	1.1119	100.000	3.84E+00	8.85E-01	1.70E-01	4.81E-02	6.08E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.275	0.275	0.5241	99.900	-6.78E-03	4.99E-02	1.19E-01	2.27E-02	4.97E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596414
SAMPLE ID : R0405235047_PU
SAMPLE QTY : 0.503 G +/-0.199 %
SAMPLE DATE : 07-Dec-2015 00:00:00
ANALYST : HAKB
% YIELD : 76.4 +/-8.758 %

CHAMBER : 074
DETECTOR S/N : 83296
AVERAGE %EFFICIENCY : 30.3767
AVERAGE %EFF ERROR : 0.5864
COUNT DATE : 22-Sep-2016 09:56:24
ELAPSED LIVE TIME(SEC) : 8245.21

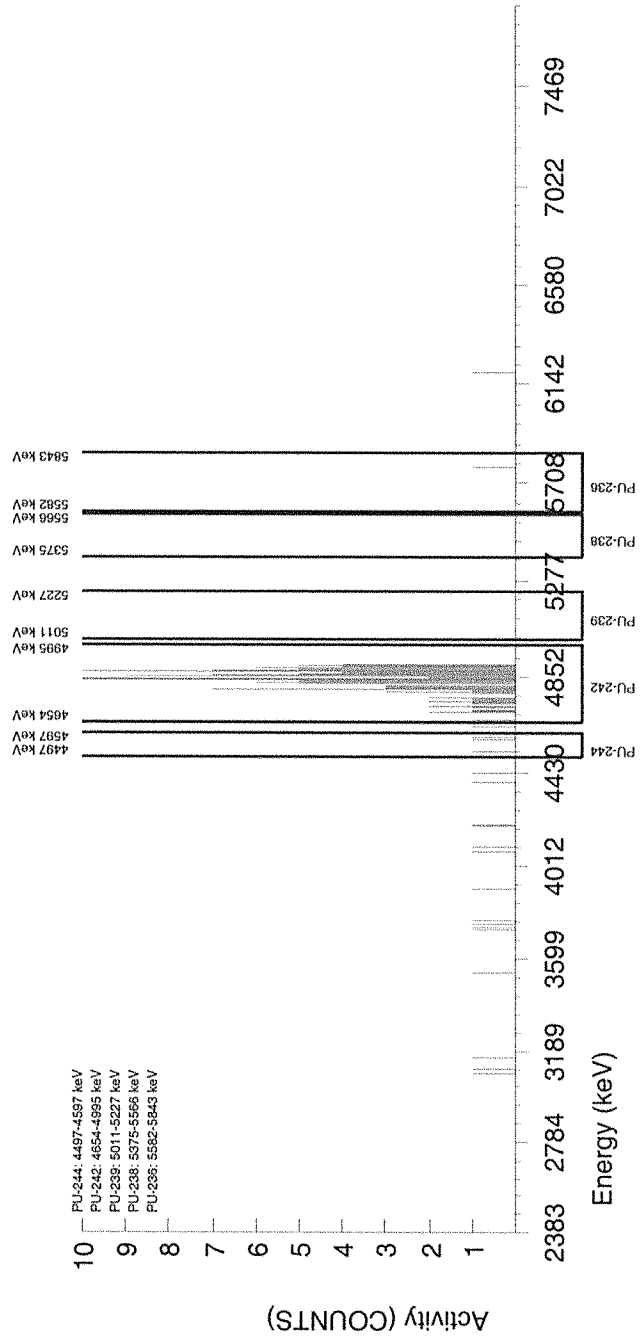
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BKG FILE : B074.CNF;1838
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W074.CNF;511
CAL DATE : 03-Sep-2016

TRACER ID : 1770-A

NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.3481E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5777.78	4.988	1.000	-0.237	1.237	1.1121	100.000	-8.06E-03	9.89E-02	2.35E-01	6.65E-02	9.88E-02
PU-238	5486.00	5470.35	0.000	0.000	-0.137	0.137	0.3707	99.900	-3.89E-03	5.67E-02	1.22E-01	1.84E-02	5.65E-02
PU-239	5155.00	5118.69	0.000	0.000	-0.275	0.275	0.5243	99.900	-7.73E-03	5.69E-02	1.36E-01	2.59E-02	5.66E-02
PU-242	4890.00	4834.56	93.942	141.000	139.763	1.237	1.1121	100.000	3.93E+00	9.52E-01	1.94E-01	5.48E-02	6.56E-01
PU-244	4589.00	4557.66	64.845	3.000	3.000	0.000	0.0000	99.900	8.43E-02	1.11E-01	8.43E-02	0.00E+00	1.10E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

LIB FILE : PU
BKG FILE : B075.CNF;1821
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W075.CNF;478
CAL DATE : 03-Sep-2016

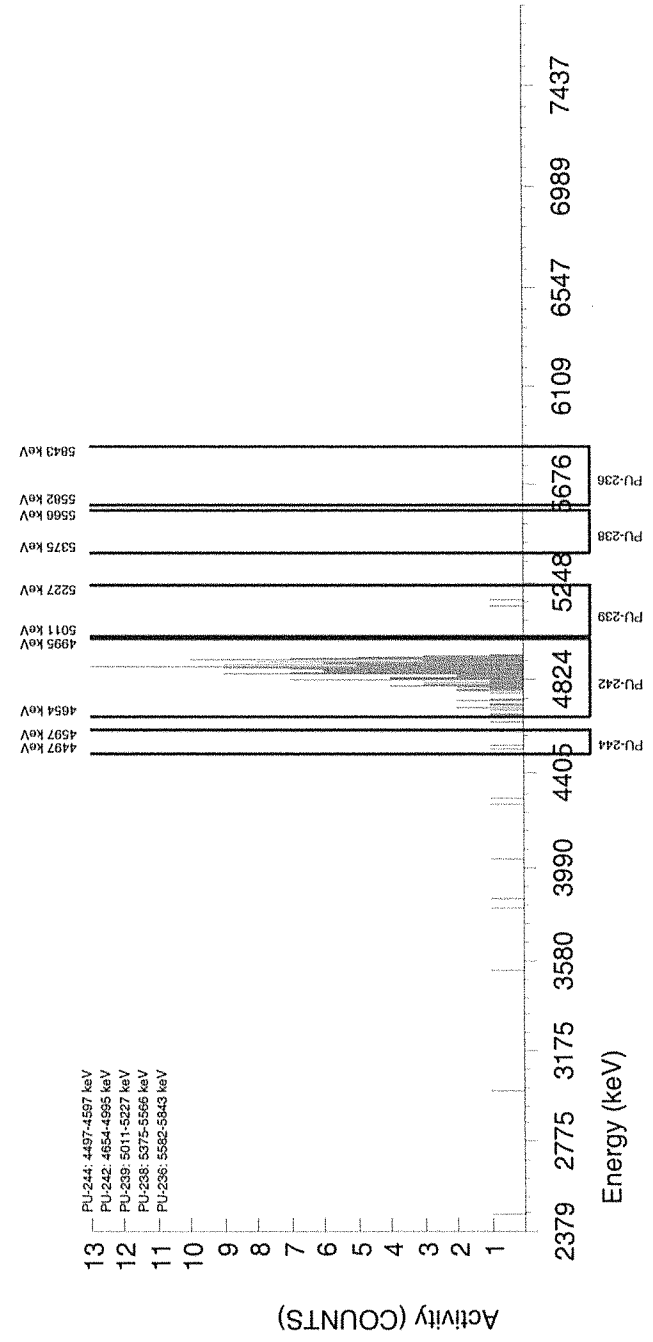
CHAMBER : 075
DETECTOR S/N : 80010
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AVERAGE %EFF ERROR : 0.6238
COUNT DATE : 22-Sep-2016 09:56:24
ELAPSED LIVE TIME(SEC) : 8249.61

BATCH NUMBER : 1596414
SAMPLE ID : R0405235048_PU
SAMPLE QTY : 0.507 G +/-0.197 %
SAMPLE DATE : 07-Dec-2015 00:00:00
ANALYST : HAKB
% YIELD : 83.1 +/-8.150 %

TRACER ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.6436E+00 dpm

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma	
										TPU pCi/G	Lc pCi/G
PU-236	5749.00	5712.24	0.000	0.000	-0.962	0.962	0.9810	100.000	-2.81E-02	6.15E-02	6.13E-02
PU-238	5486.00	5470.34	0.000	0.000	-0.137	0.137	0.3708	99.900	-3.33E-03	4.85E-02	4.83E-02
PU-239	5155.00	5154.42	29.504	2.000	1.863	0.137	0.3708	99.900	4.48E-02	8.25E-02	8.22E-02
PU-242	4890.00	4853.22	90.151	163.000	162.038	0.962	0.9810	100.000	3.89E+00	8.79E-01	6.04E-01
PU-244	4589.00	4522.01	19.669	2.000	2.000	0.000	0.0000	99.900	4.81E-02	8.23E-02	8.19E-02

NUCLIDE ACTIVITY SUMMARY



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GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596414
SAMPLE ID : R0405235049_PU
SAMPLE QTY : 0.506 G +/-0.198 %
SAMPLE DATE : 07-Dec-2015 00:00:00
ANALYST : HAKB
% YIELD : 79.6 +/-8.146 %

CHAMBER : 078
DETECTOR S/N : 38633
AVERAGE %EFFICIENCY : 33.4433
AVERAGE %EFF ERROR : 0.6444
COUNT DATE : 22-Sep-2016 09:56:26
ELAPSED LIVE TIME(SEC) : 8305.06

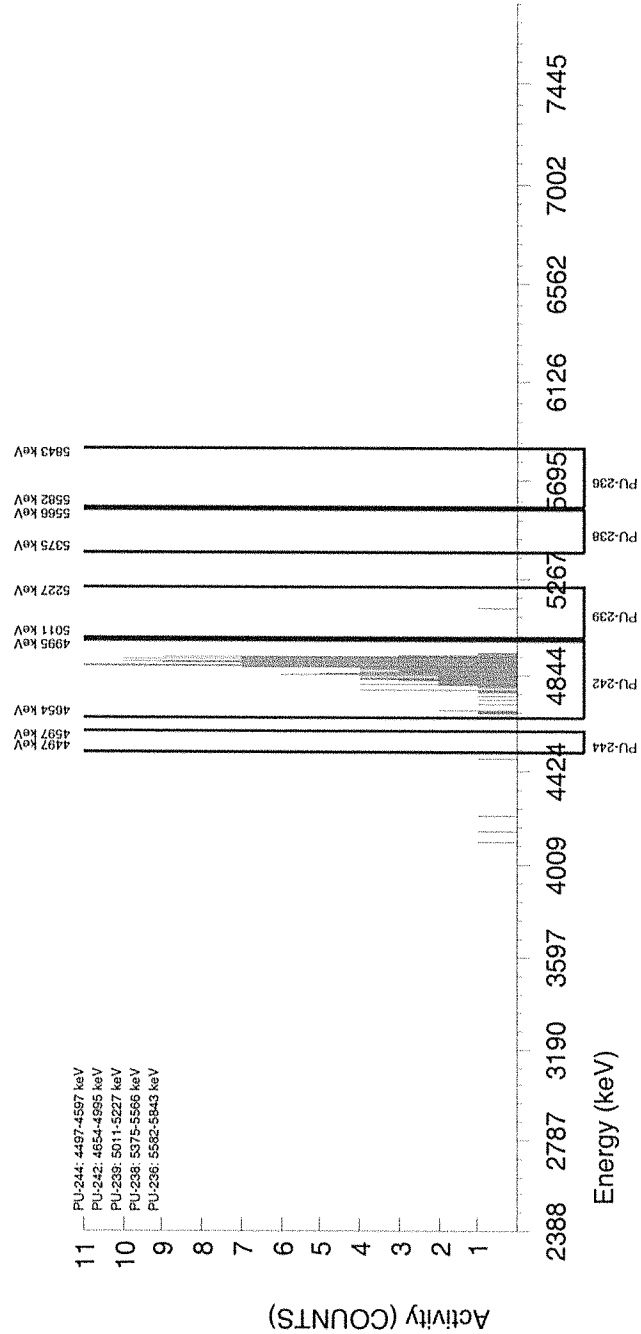
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BKG FILE : B078.CNF:1726
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 59999.99
EFF FILE : W078.CNF:447
CAL DATE : 03-Sep-2016

TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.4906E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.27	0.000	0.000	-0.692	0.692	0.8319	100.000	-2.03E-02	6.08E-02	1.73E-01	4.28E-02	6.06E-02
PU-238	5486.00	5470.35	0.000	0.000	-0.138	0.138	0.3720	99.900	-3.37E-03	4.87E-02	1.05E-01	1.59E-02	4.86E-02
PU-239	5155.00	5134.30	4.964	1.000	0.862	0.138	0.3720	99.900	2.08E-02	6.78E-02	1.04E-01	1.58E-02	6.76E-02
PU-242	4890.00	4863.39	78.589	162.000	161.585	0.415	0.6444	100.000	3.90E+00	8.81E-01	1.27E-01	2.73E-02	6.04E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.138	0.138	0.3720	99.900	-3.35E-03	4.84E-02	1.04E-01	1.58E-02	4.83E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER : 1596414
 SAMPLE ID : R0405235050_PU
 SAMPLE QTY : 0.504 G +/-0.198 %
 SAMPLE DATE : 07-Dec-2015 00:00:00
 ANALYST : HAKB
 % YIELD : 88.3 +/-7.644 %

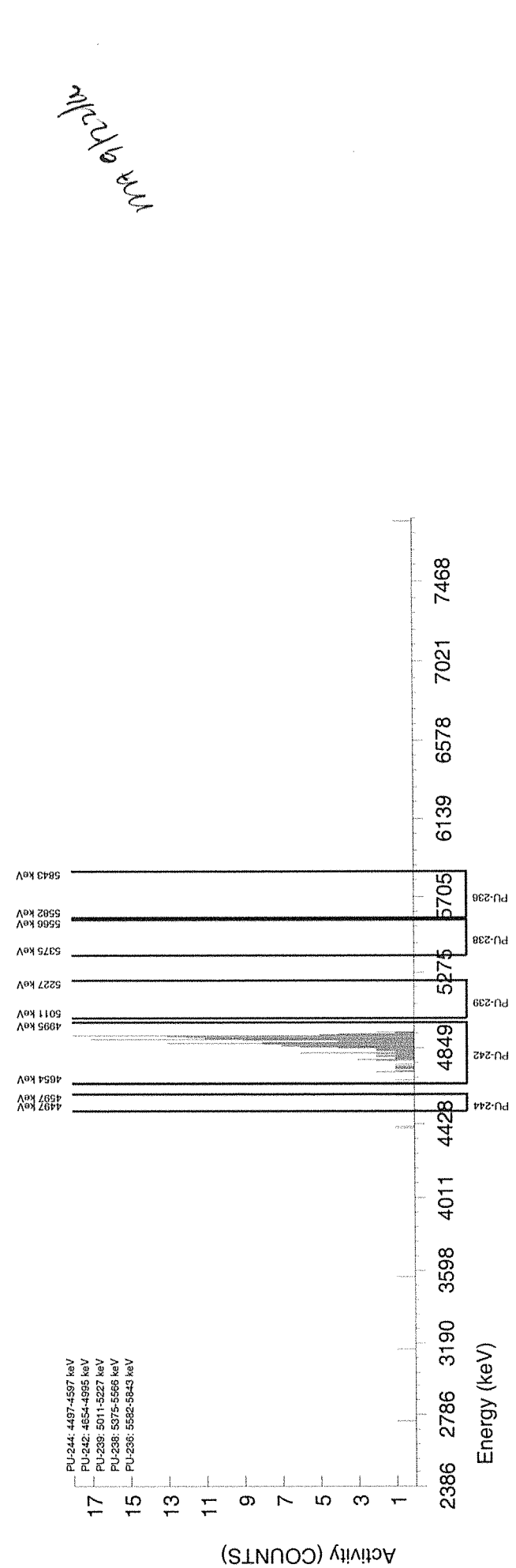
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 BKG DATE : 16-Sep-2016
 BKG LIVE TIME(SEC) : 59999.99
 EFF FILE : W080.CNF;446
 CAL DATE : 03-Sep-2016

CHAMBER : 080
 DETECTOR S/N : 78197
 AVERAGE %EFFICIENCY : 34.4422
 AVERAGE %EFF ERROR : 0.6633
 COUNT DATE : 22-Sep-2016 09:56:26
 ELAPSED LIVE TIME(SEC) : 8310.24

TRACER ID : 1770-A
 NUCLEID : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.8723E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	-0.139	0.139	0.3722	100.000	-3.56E-03	5.15E-02	1.11E-01	1.68E-02	5.14E-02
PU-238	5486.00	5470.35	0.000	0.000	-0.277	0.277	0.5263	99.900	-5.92E-03	4.32E-02	1.04E-01	1.97E-02	4.31E-02
PU-239	5155.00	5118.69	0.000	0.000	-0.554	0.554	0.7443	99.900	-1.18E-02	4.37E-02	1.19E-01	2.77E-02	4.36E-02
PU-242	4890.00	4873.72	47.164	185.000	184.723	0.277	0.5263	100.000	3.92E+00	8.29E-01	1.03E-01	1.96E-02	5.67E-01
PU-244	4589.00	4585.20	4.969	1.000	0.723	0.277	0.5263	99.900	1.53E-02	5.98E-02	1.03E-01	1.96E-02	5.97E-02



GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596414
 SAMPLE ID : R0405235051_PU
 SAMPLE QTY : 0.502 G +/-0.199 %
 SAMPLE DATE : 07-Dec-2015 00:00:00
 ANALYST : HAKB
 % YIELD : 74.7 +/-8.464 %

CHAMBER : 081
 DETECTOR S/N : 79996
 AVERAGE %EFFICIENCY : 33.0506
 AVERAGE %EFF ERROR : 0.6369
 COUNT DATE : 22-Sep-2016 09:56:26
 ELAPSED LIVE TIME(SEC) : 8313.82

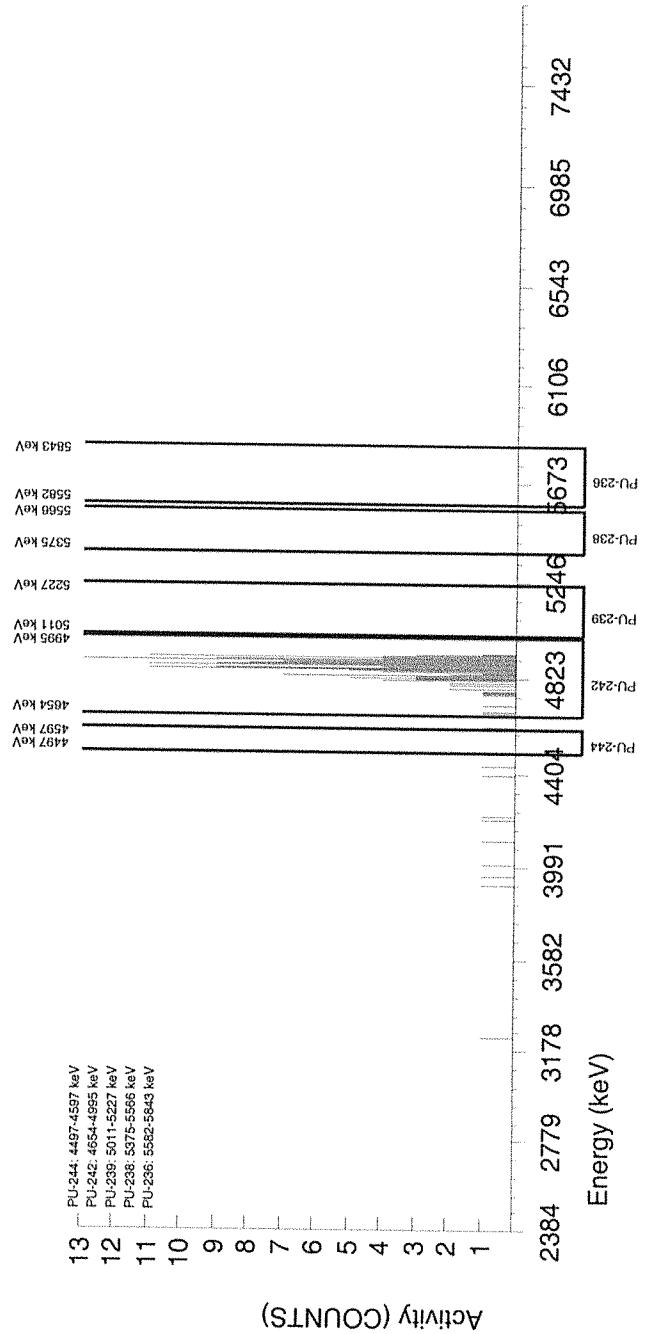
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 BKG LIVE TIME(SEC) : 59999.99
 EFF FILE : W081.CNF;446
 CAL DATE : 03-Sep-2016

TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.2730E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.23	0.000	0.000	-0.139	0.139	0.3722	100.000	-4.41E-03	6.38E-02	1.37E-01	2.08E-02	6.36E-02
PU-238	5486.00	5470.33	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	5.25E-02	7.93E-02	0.00E+00	5.23E-02
PU-239	5155.00	5118.67	0.000	0.000	-0.554	0.554	0.7445	99.900	-1.46E-02	5.41E-02	1.47E-01	3.43E-02	5.39E-02
PU-242	4890.00	4864.26	77.280	151.000	149.891	1.109	1.0529	100.000	3.93E+00	9.22E-01	1.76E-01	4.85E-02	6.34E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.277	0.277	0.5264	99.900	-7.28E-03	5.31E-02	1.27E-01	2.43E-02	5.29E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596414
SAMPLE ID : R0405235052_PU
SAMPLE QTY : 0.508 G +/-0.197 %
SAMPLE DATE : 07-Dec-2015 00:00:00
ANALYST : HAKB
% YIELD : 68.6 +/-8.975 %

CHAMBER : 082
DETECTOR S/N : 79997
AVERAGE %EFFICIENCY : 31.9848
AVERAGE %EFF ERROR : 0.6168
COUNT DATE : 22-Sep-2016 09:56:26
ELAPSED LIVE TIME(SEC) : 8317.64

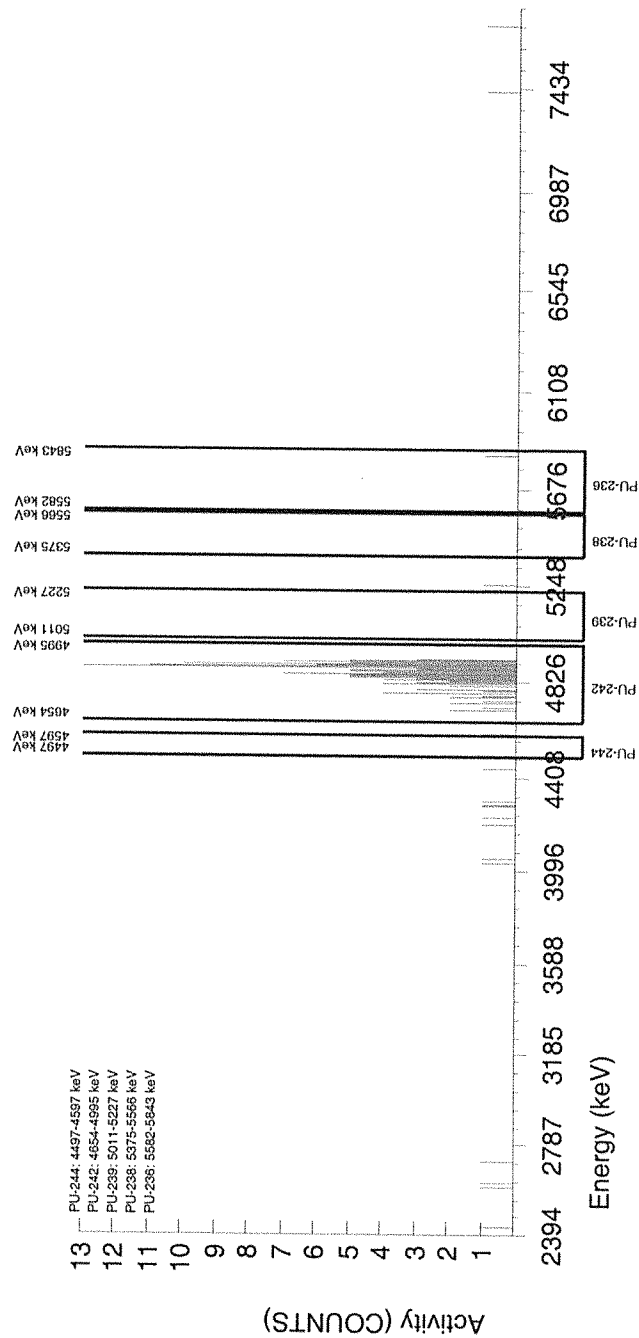
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BKG FILE : B082.CNF;1724
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 59999.99
EFF FILE : W082.CNF;423
CAL DATE : 03-Sep-2016

TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.0072E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5821.05	4.883	1.000	0.584	0.416	0.6449	100.000	2.06E-02	1.00E-01	1.86E-01	4.00E-02	9.98E-02
PU-238	5486.00	5470.33	0.000	0.000	-0.693	0.693	0.8325	99.900	-2.04E-02	6.10E-02	1.74E-01	4.29E-02	6.08E-02
PU-239	5155.00	5118.67	0.000	0.000	-2.357	2.357	1.5351	99.900	-6.88E-02	6.66E-02	2.45E-01	7.86E-02	6.63E-02
PU-242	4890.00	4861.94	51.270	135.000	133.336	1.664	1.2898	100.000	3.89E+00	9.66E-01	2.19E-01	6.60E-02	6.67E-01
PU-244	4589.00	4501.82	4.883	1.000	0.861	0.139	0.3723	99.900	2.51E-02	8.18E-02	1.26E-01	1.91E-02	8.16E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596414
 SAMPLE ID : R0405235053_PU
 SAMPLE QTY : 0.500 G +/-0.200 %
 SAMPLE DATE : 01-Dec-2015 00:00:00
 ANALYST : HAKB
 % YIELD : 83.8 +/-8.522 %

CHAMBER : 089
 DETECTOR S/N : 79988
 AVERAGE %EFFICIENCY : 29.2461
 AVERAGE %EFF ERROR : 0.5651
 COUNT DATE : 22-Sep-2016 09:56:29
 ELAPSED LIVE TIME(SEC) : 8465.80

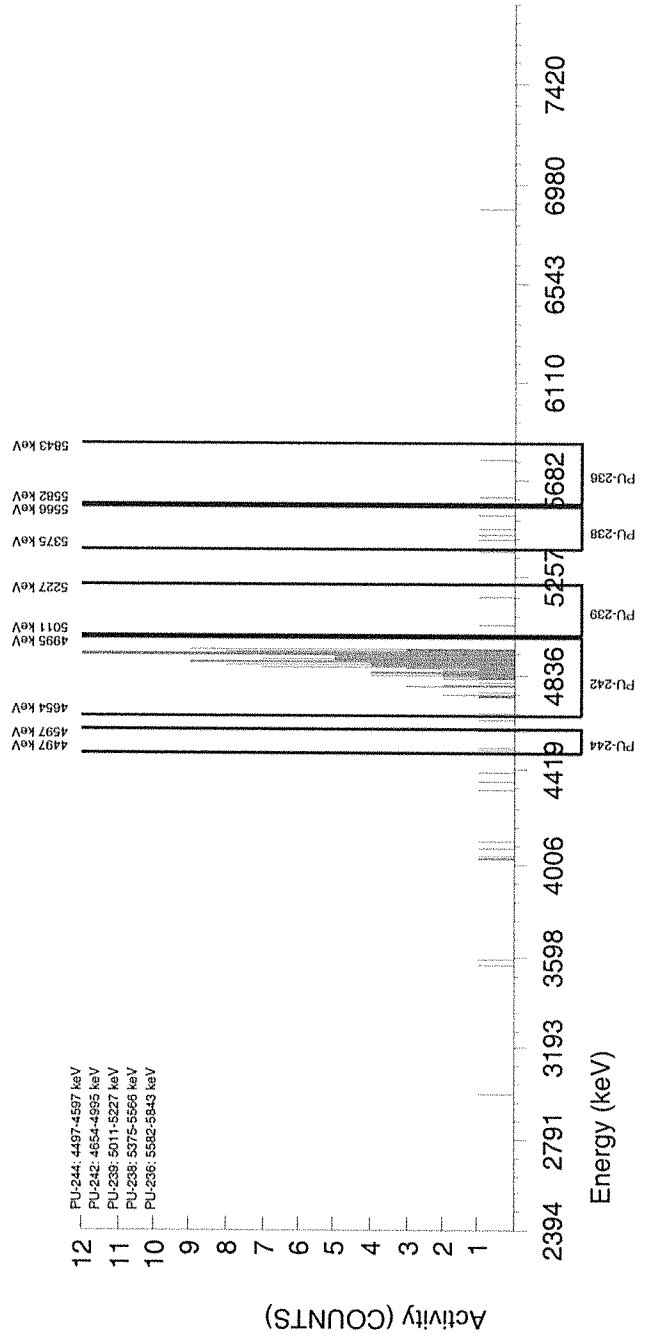
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 BKG FILE : B089.CNF;1433
 BKG DATE : 16-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W089.CNF;384
 CAL DATE : 06-Sep-2016

TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.6710E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5689.75	158.029	2.000	-2.092	4.092	2.0228	100.000	-6.64E-02	1.18E-01	3.21E-01	1.13E-01	1.18E-01
PU-238	5486.00	5464.90	103.707	4.000	2.871	1.129	1.0624	99.900	7.54E-02	1.18E-01	1.77E-01	4.90E-02	1.17E-01
PU-239	5155.00	5111.91	118.522	2.000	0.307	1.693	1.3012	99.900	8.01E-03	9.24E-02	1.98E-01	5.97E-02	9.23E-02
PU-242	4890.00	4887.02	76.957	156.000	151.485	4.515	2.1249	100.000	3.95E+00	9.32E-01	2.73E-01	9.73E-02	6.42E-01
PU-244	4589.00	4538.81	83.953	3.000	2.012	0.988	0.9938	99.900	5.25E-02	1.05E-01	1.69E-01	4.56E-02	1.04E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596414
SAMPLE ID : R0405235054_PU
SAMPLE QTY : 0.500 G +/-0.200 %
SAMPLE DATE : 02-Dec-2015 00:00:00
ANALYST : HAKB
% YIELD : 76.0 +/-8.237 %

CHAMBER : 090
DETECTOR S/N : 78263
AVERAGE %EFFICIENCY : 33.4344
AVERAGE %EFF ERROR : 0.6443
COUNT DATE : 22-Sep-2016 09:56:29
ELAPSED LIVE TIME(SEC) : 8495.79

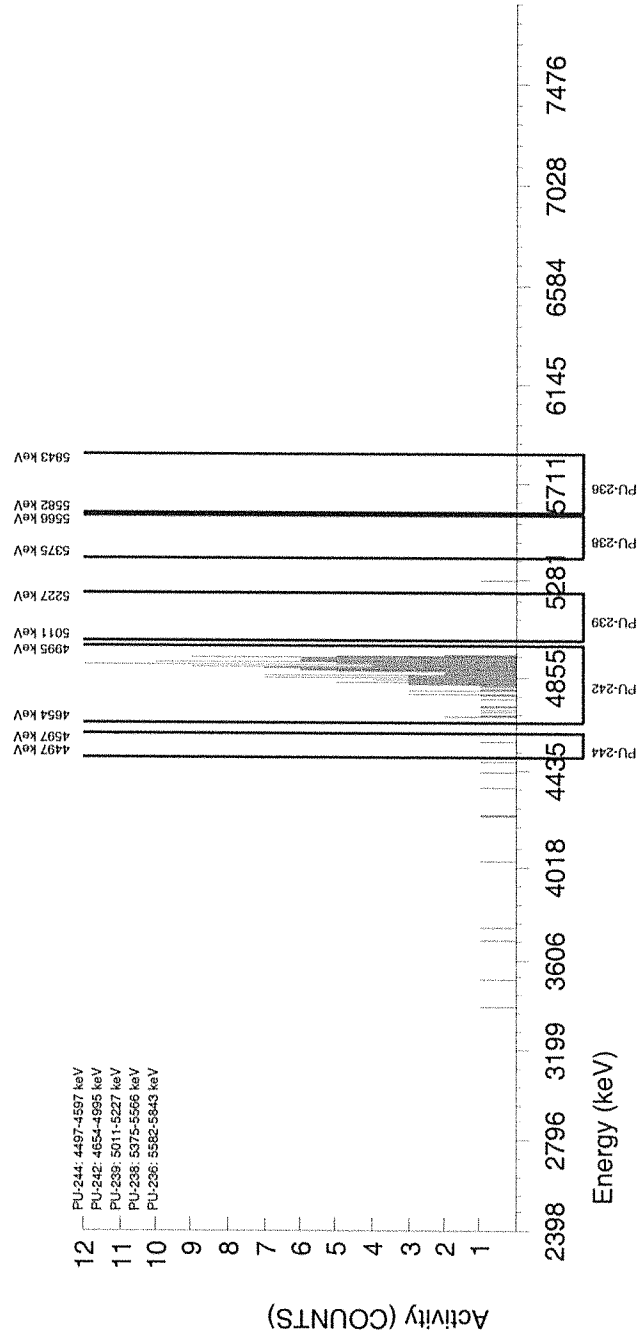
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BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W090.CNF;374
CAL DATE : 06-Sep-2016

TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.3314E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.25	0.000	0.000	-0.425	0.425	0.6518	100.000	-1.29E-02	6.23E-02	1.61E-01	3.49E-02	6.21E-02
PU-238	5486.00	5470.34	0.000	0.000	-0.283	0.283	0.5322	99.900	-7.14E-03	5.11E-02	1.23E-01	2.36E-02	5.09E-02
PU-239	5155.00	5118.68	0.000	0.000	-0.283	0.283	0.5322	99.900	-7.10E-03	5.07E-02	1.22E-01	2.34E-02	5.06E-02
PU-242	4890.00	4876.09	89.071	158.000	157.717	0.283	0.5322	100.000	3.95E+00	9.01E-01	1.22E-01	2.34E-02	6.19E-01
PU-244	4589.00	4565.61	4.948	1.000	0.858	0.142	0.3763	99.900	2.15E-02	7.03E-02	1.08E-01	1.66E-02	7.02E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596414
SAMPLE ID : R0405235055_PU +/-0.196 %
SAMPLE QTY : 0.510 G
SAMPLE DATE : 02-Dec-2015 00:00:00
ANALYST : HAKB
% YIELD : 64.1 +/-8.794 %

CHAMBER : 091
DETECTOR S/N : 78259
AVERAGE %EFFICIENCY : 34.7245
AVERAGE %EFF ERROR : 0.6687
COUNT DATE : 22-Sep-2016 09:56:29
ELAPSED LIVE TIME(SEC) : 8499.46

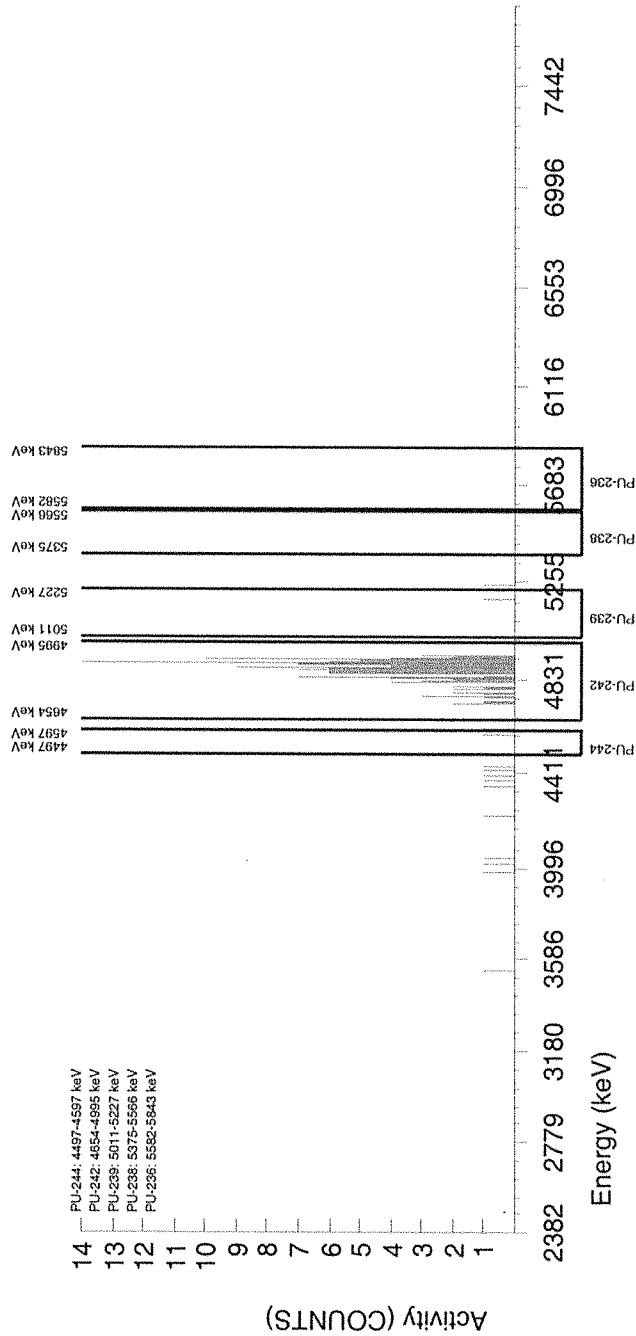
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BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
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CAL DATE : 06-Sep-2016

TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 2.8085E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.25	0.000	0.000	-0.708	0.708	0.8416	100.000	-2.42E-02	7.10E-02	2.03E-01	5.04E-02	7.07E-02
PU-238	5486.00	5470.34	0.000	0.000	-0.708	0.708	0.8416	99.900	-2.00E-02	5.88E-02	1.68E-01	4.18E-02	5.86E-02
PU-239	5155.00	5180.03	4.930	1.000	-0.558	1.558	1.2483	99.900	-1.57E-02	8.25E-02	2.07E-01	6.15E-02	8.23E-02
PU-242	4890.00	4864.81	40.262	139.000	138.150	0.850	0.9219	100.000	3.87E+00	9.43E-01	1.75E-01	4.54E-02	6.50E-01
PU-244	4589.00	4583.70	4.930	1.000	0.858	0.142	0.3764	99.900	2.41E-02	7.87E-02	1.21E-01	1.86E-02	7.85E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596414
SAMPLE ID : R0405235056_PU
SAMPLE QTY : 0.509 G +/-0.196 %
SAMPLE DATE : 02-Dec-2015 00:00:00
ANALYST : HAKB
% YIELD : 98.2 +/-7.671 %

CHAMBER : 092
DETECTOR SIN : 80063
AVERAGE %EFFICIENCY : 30.3421
AVERAGE %EFF ERROR : 0.5858
COUNT DATE : 22-Sep-2016 09:56:29
ELAPSED LIVE TIME(SEC) : 8503.81

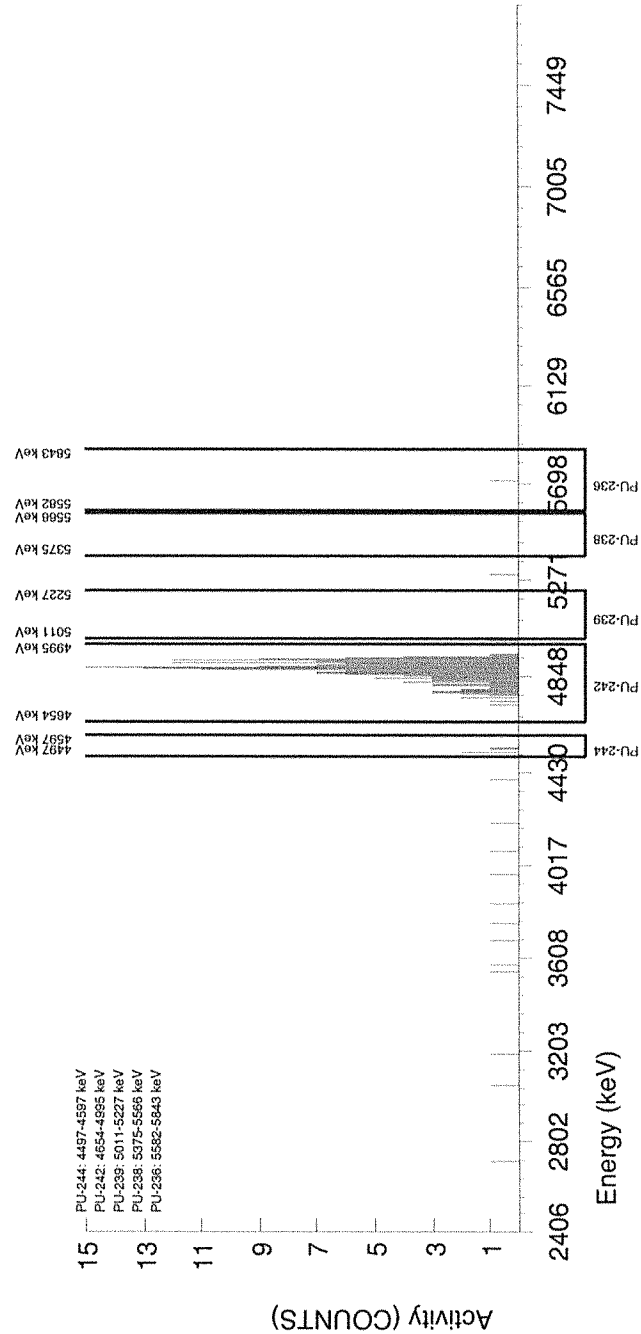
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BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W092.CNF;414
CAL DATE : 06-Sep-2016

TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 4.3056E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt/Unc pCi/G
PU-236	5749.00	5708.47	4.922	1.000	1.000	0.000	0.0000	100.000	2.55E-02	7.11E-02	7.65E-02	0.00E+00	7.10E-02
PU-238	5486.00	5470.34	0.000	0.000	-0.992	0.992	0.9960	99.900	-2.09E-02	4.47E-02	1.37E-01	3.69E-02	4.46E-02
PU-239	5155.00	5118.68	0.000	0.000	-0.850	0.850	0.9222	99.900	-1.78E-02	4.40E-02	1.31E-01	3.40E-02	4.39E-02
PU-242	4890.00	4876.40	50.204	187.000	185.158	1.842	1.3574	100.000	3.88E+00	8.24E-01	1.63E-01	5.00E-02	5.63E-01
PU-244	4589.00	4528.02	4.922	4.000	3.717	0.283	0.5324	99.900	7.79E-02	9.32E-02	1.02E-01	1.96E-02	9.25E-02



Handwritten note: mmm

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596414
SAMPLE ID : R0405235057_PU
SAMPLE QTY : 0.500 G +/-0.200 %
SAMPLE DATE : 02-Dec-2015 00:00:00
ANALYST : HAKB
% YIELD : 78.6 +/-8.140 %

CHAMBER : 093
DETECTOR S/N : 33206
AVERAGE %EFFICIENCY : 33.0892
AVERAGE %EFF ERROR : 0.6377
COUNT DATE : 22-Sep-2016 09:56:29
ELAPSED LIVE TIME(SEC) : 8507.47

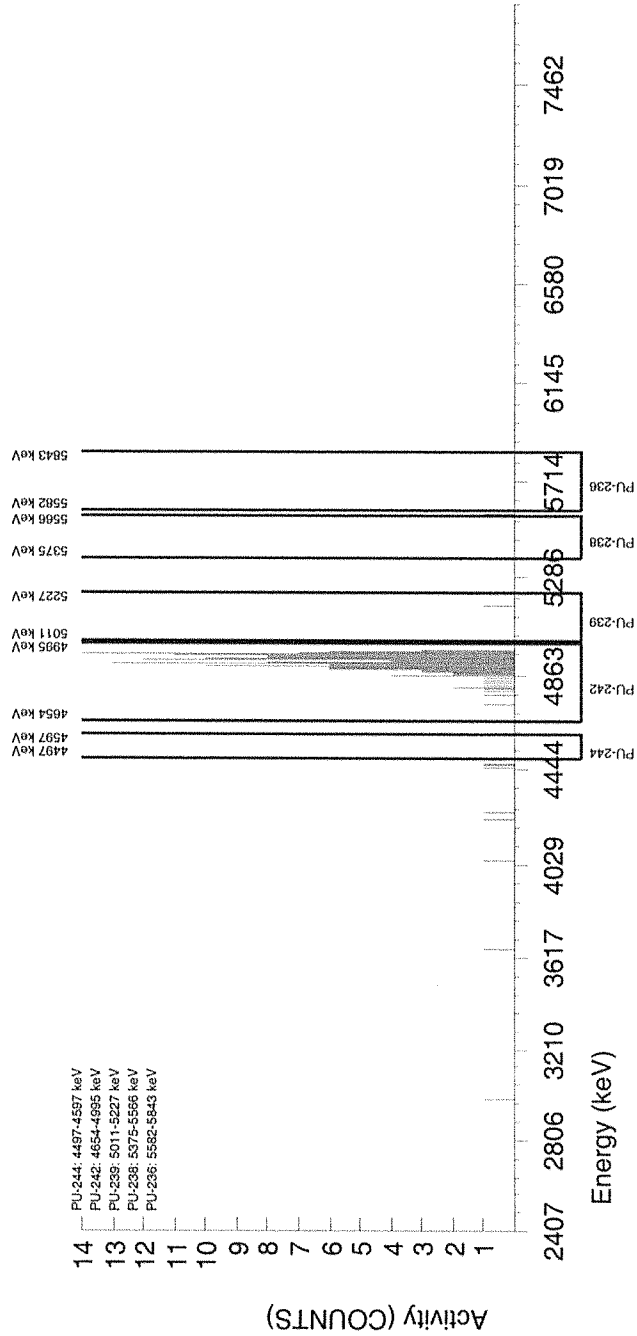
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CAL DATE : 06-Sep-2016

TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.4468E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5708.26	0.000	2.000	1.291	0.709	0.8420	100.000	3.84E-02	1.03E-01	1.77E-01	4.40E-02	1.03E-01
PU-238	5486.00	5470.35	0.000	0.000	-0.851	0.851	0.9224	99.900	-2.09E-02	5.17E-02	1.54E-01	3.99E-02	5.15E-02
PU-239	5155.00	5164.40	4.969	1.000	0.433	0.567	0.7531	99.900	1.06E-02	6.95E-02	1.38E-01	3.24E-02	6.94E-02
PU-242	4890.00	4914.26	58.384	162.000	161.716	0.284	0.5325	100.000	3.95E+00	8.90E-01	1.19E-01	2.29E-02	6.11E-01
PU-244	4589.00	4496.21	0.000	2.000	1.858	0.142	0.3766	99.900	4.54E-02	8.39E-02	1.06E-01	1.62E-02	8.35E-02



mra 9/22/16

GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596414
 SAMPLE ID : R0405235058_PU
 SAMPLE QTY : 0.512 G +/-0.195 %
 SAMPLE DATE : 02-Dec-2015 00:00:00
 ANALYST : HAKB
 % YIELD : 76.2 +/-8.565 %

CHAMBER : 095
 DETECTOR S/N : 38626
 AVERAGE %EFFICIENCY : 30.4247
 AVERAGE %EFF ERROR : 0.5873
 COUNT DATE : 22-Sep-2016 09:56:32
 ELAPSED LIVE TIME(SEC) : 8560.38

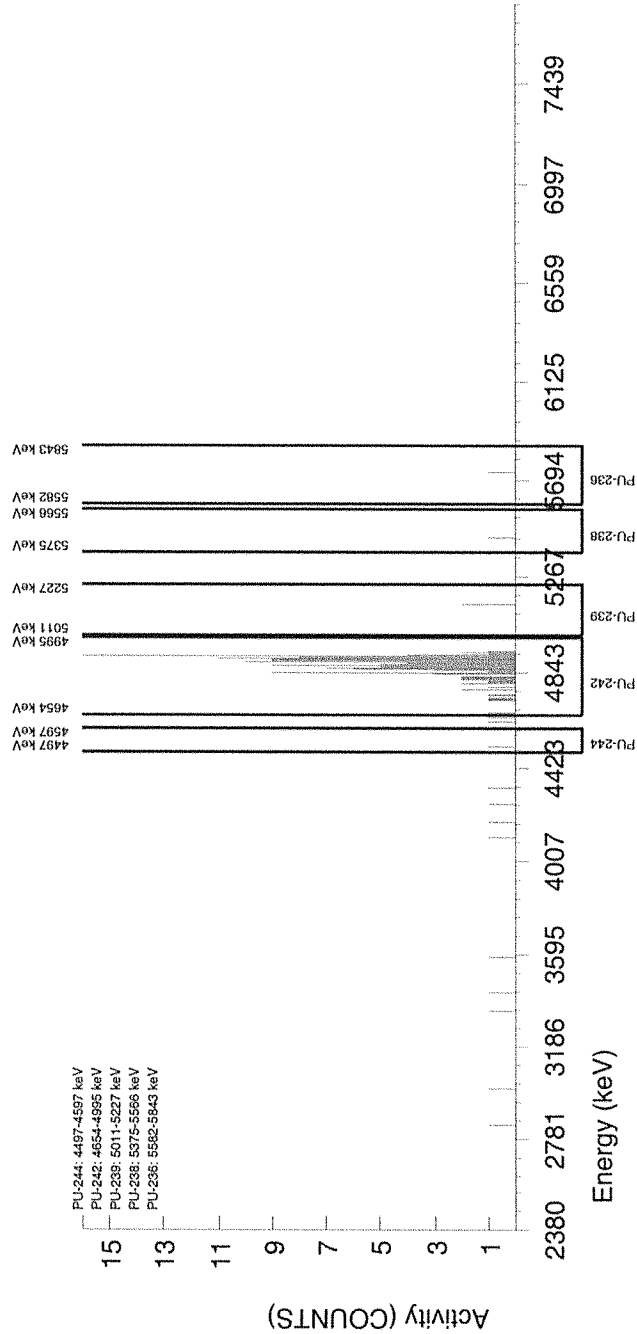
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 EFF FILE : W095.CNF;408
 CAL DATE : 06-Sep-2016

TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.3404E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5725.89	4.993	1.000	0.144	0.856	0.9252	100.000	4.66E-03	2.02E-01	5.26E-02	9.28E-02
PU-238	5486.00	5436.95	4.993	1.000	0.429	0.571	0.7554	99.900	1.15E-02	1.52E-01	3.56E-02	7.61E-02
PU-239	5155.00	5144.38	4.993	2.000	1.429	0.571	0.7554	99.900	3.81E-02	1.51E-01	3.54E-02	9.19E-02
PU-242	4890.00	4871.52	74.066	145.000	0.000	0.000	0.0000	100.000	3.86E+00	7.98E-02	0.00E+00	6.30E-01
PU-244	4589.00	4517.34	4.993	1.000	1.000	0.000	0.0000	99.900	2.66E-02	7.99E-02	0.00E+00	7.42E-02



GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
 Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596414
 SAMPLE ID : R0405235059_PU
 SAMPLE QTY : 0.503 G +/-0.199 %
 SAMPLE DATE : 16-Dec-2015 00:00:00
 ANALYST : HAKB
 % YIELD : 72.5 +/-8.515 %

CHAMBER : 096
 DETECTOR SIN : 80016
 AVERAGE %EFFICIENCY : 32.5188
 AVERAGE %EFF ERROR : 0.6269
 COUNT DATE : 22-Sep-2016 09:56:32
 ELAPSED LIVE TIME(SEC) : 8564.06

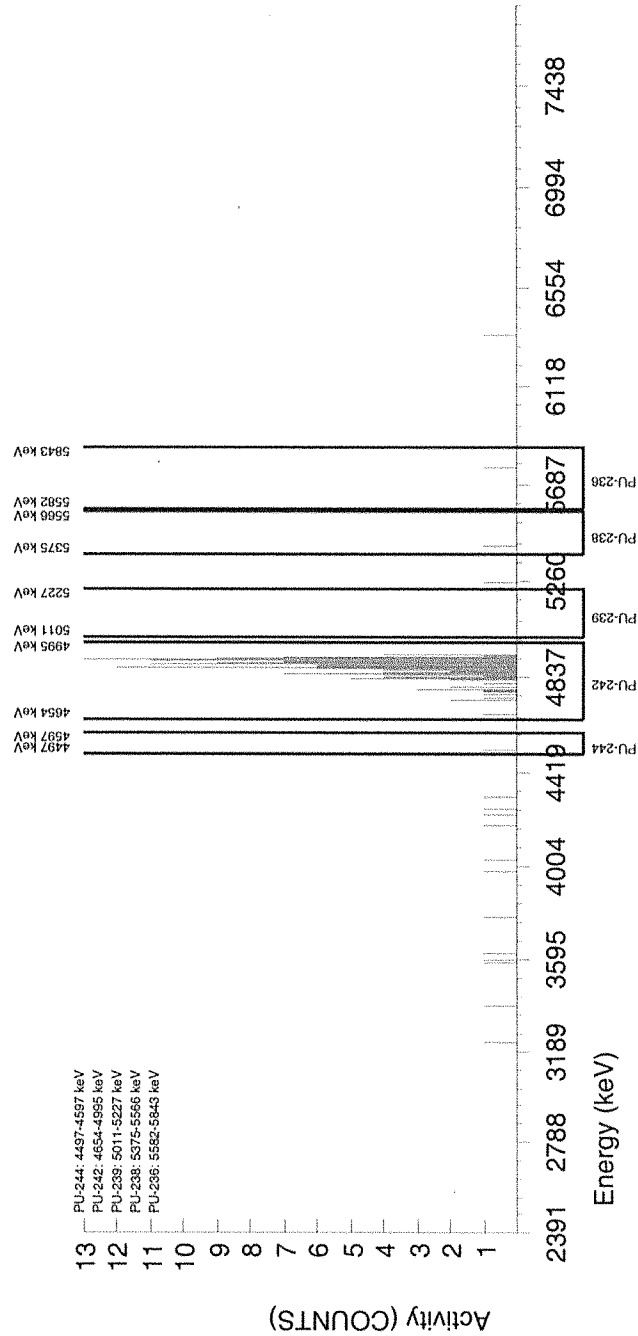
LIB FILE : PU
 BKG FILE : B096.CNF;1397
 BKG DATE : 16-Sep-2016
 BKG LIVE TIME(SEC) : 60000.00
 EFF FILE : W096.CNF;357
 CAL DATE : 06-Sep-2016

TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.1763E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma		1.96-sigma cnt/Unc
										TPU pCi/G	Lc pCi/G	
PU-236	5749.00	5756.61	4.934	1.000	0.286	0.714	0.8448	100.000	9.19E-03	1.92E-01	4.77E-02	9.16E-02
PU-238	5486.00	5414.05	4.934	1.000	0.572	0.428	0.6544	99.900	1.53E-02	1.42E-01	3.09E-02	7.58E-02
PU-239	5155.00	5118.69	0.000	0.000	-0.428	0.428	0.6544	99.900	-1.14E-02	1.41E-01	3.07E-02	5.43E-02
PU-242	4890.00	4878.73	70.307	148.000	147.429	0.571	0.7556	100.000	3.93E+00	1.51E-01	3.54E-02	6.37E-01
PU-244	4589.00	4517.50	4.934	1.000	0.429	0.571	0.7556	99.900	1.14E-02	1.51E-01	3.54E-02	7.57E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596414
SAMPLE ID : R0405235060_PU
SAMPLE QTY : 0.515 G +/-0.194 %
SAMPLE DATE : 16-Dec-2015 00:00:00
ANALYST : HAKB
% YIELD : 92.2 +/-7.310 %

CHAMBER : 097
DETECTOR S/N : 83288
AVERAGE %EFFICIENCY : 35.3557
AVERAGE %EFF ERROR : 0.6805
COUNT DATE : 22-Sep-2016 09:56:32
ELAPSED LIVE TIME(SEC) : 8567.84

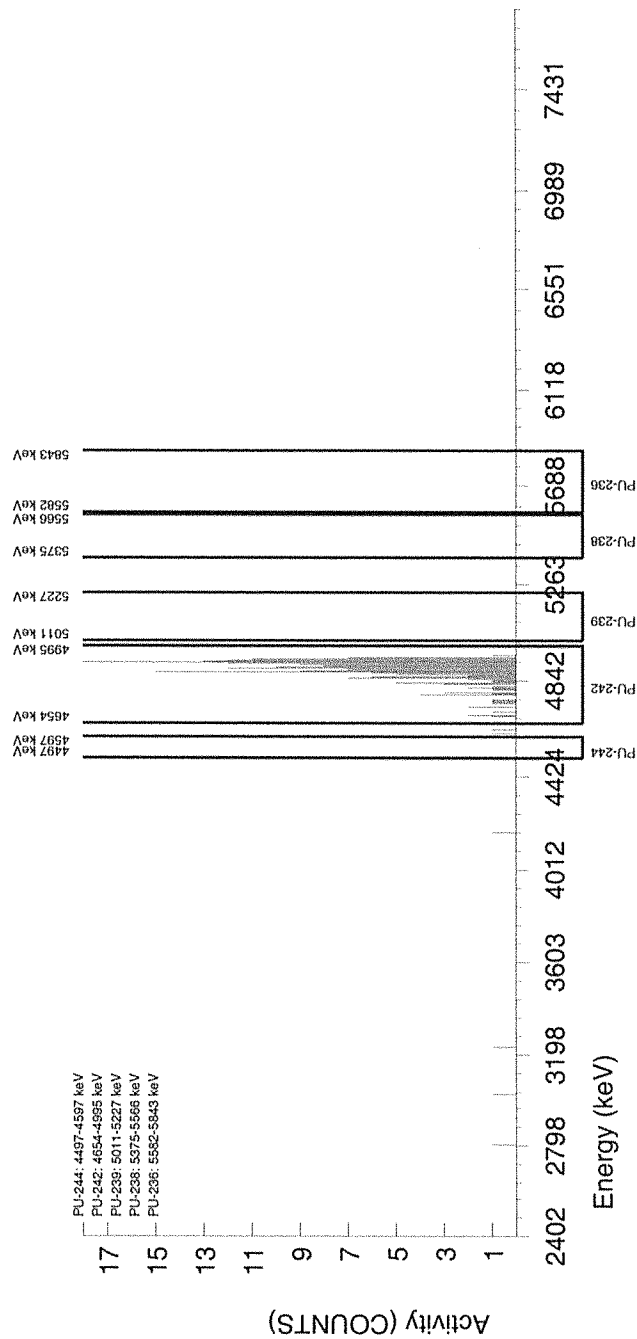
LIB FILE : PU
BKG FILE : B097.CNF;1394
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W097.CNF;381
CAL DATE : 06-Sep-2016

TRACER

ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 4.0407E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc
PU-236	5749.00	5712.26	0.000	0.000	-0.286	0.286	0.5344	100.000	-6.47E-03	4.59E-02	1.11E-01	2.13E-02	4.57E-02
PU-238	5486.00	5470.35	0.000	0.000	-0.571	0.571	0.7558	99.900	-1.08E-02	3.90E-02	1.07E-01	2.52E-02	3.89E-02
PU-239	5155.00	5118.69	0.000	0.000	-0.428	0.428	0.6545	99.900	-8.06E-03	3.84E-02	9.97E-02	2.17E-02	3.83E-02
PU-242	4890.00	4882.92	59.932	204.000	0.000	0.9998	1.000	100.000	3.83E+00	7.76E-01	1.22E-01	3.30E-02	5.29E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.143	0.143	0.3779	99.900	-2.69E-03	3.77E-02	8.14E-02	1.25E-02	3.76E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596414
SAMPLE ID : R1203621754_PU +/0.194 %
SAMPLE QTY : 0.515 G
SAMPLE DATE : 20-Sep-2016 00:00:00
ANALYST : HAKB
% YIELD : 85.7 +/-7.528 %

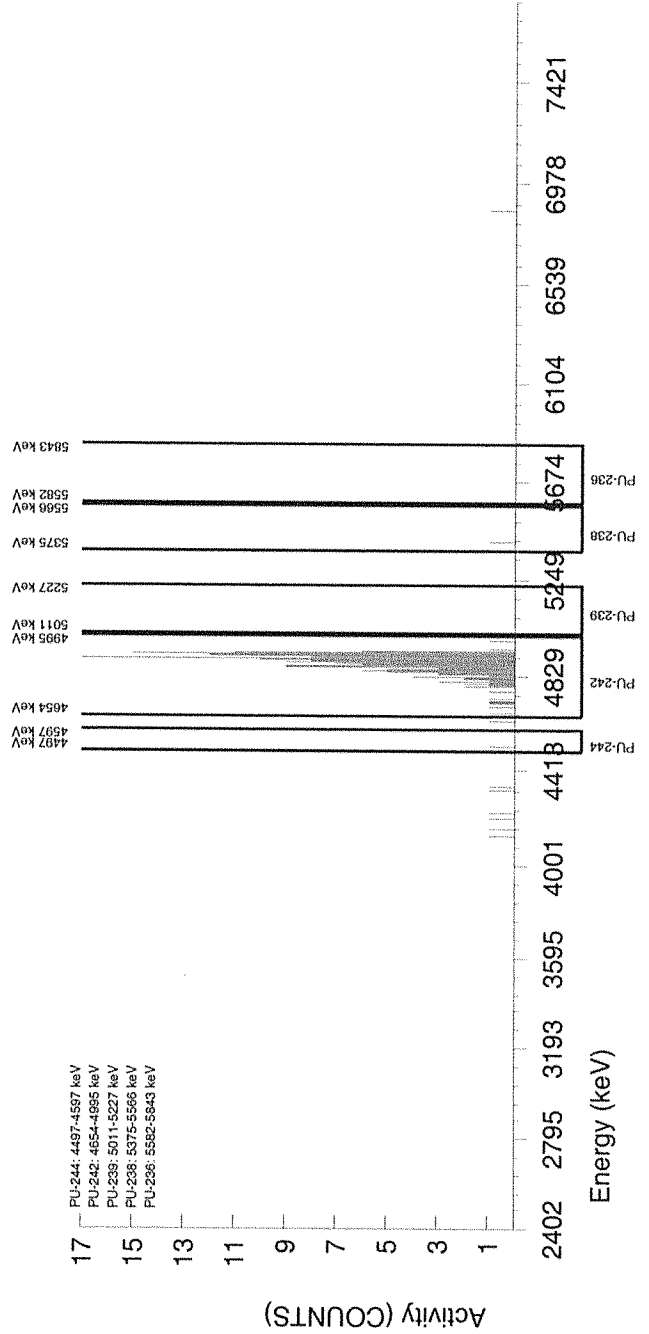
CHAMBER : 099
DETECTOR S/N : 80059
AVERAGE %EFFICIENCY : 35.6284
AVERAGE %EFF ERROR : 0.6858
COUNT DATE : 22-Sep-2016 09:56:32
ELAPSED LIVE TIME(SEC) : 8572.83

LIB FILE : PU
BKG FILE : B099.CNF;1397
BKG DATE : 16-Sep-2016
BKG LIVE TIME(SEC) : 60000.00
EFF FILE : W099.CNF;383
CAL DATE : 06-Sep-2016

TRACER ID : 1770-A
NUCLIDE : PU-242
NOMINAL : 4.3831E+00 dpm
RESULTS : 3.7576E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.24	0.000	0.000	-0.857	0.857	0.9259	100.000	-1.72E-02	4.22E-02	1.26E-01	3.27E-02	4.21E-02
PU-238	5486.00	5413.43	4.881	1.000	0.428	0.572	0.7560	99.900	8.60E-03	5.71E-02	1.14E-01	2.67E-02	5.70E-02
PU-239	5155.00	5118.67	0.000	0.000	-0.286	0.286	0.5346	99.900	-5.73E-03	4.06E-02	9.79E-02	1.89E-02	4.05E-02
PU-242	4890.00	4878.90	61.418	192.000	191.286	0.714	0.8452	100.000	3.83E+00	7.99E-01	1.20E-01	2.98E-02	5.46E-01
PU-244	4589.00	4511.04	24.405	2.000	2.000	0.000	0.0000	99.900	4.01E-02	6.86E-02	6.02E-02	0.00E+00	6.83E-02



Handwritten note: mma 11/22/14

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-035

BATCH NUMBER : 1596414
 SAMPLE ID : R1203621755_PU
 SAMPLE QTY : 0.511 G +/-0.196 %
 SAMPLE DATE : 30-Nov-2015 00:00:00
 ANALYST : HAKB
 % YIELD : 73.5 +/-8.243 %

CHAMBER : 103
 DETECTOR S/N : 79461
 AVERAGE %EFFICIENCY : 33.8848
 AVERAGE %EFF ERROR : 0.6527
 COUNT DATE : 22-Sep-2016 09:56:16
 ELAPSED LIVE TIME(SEC) : 8694.85

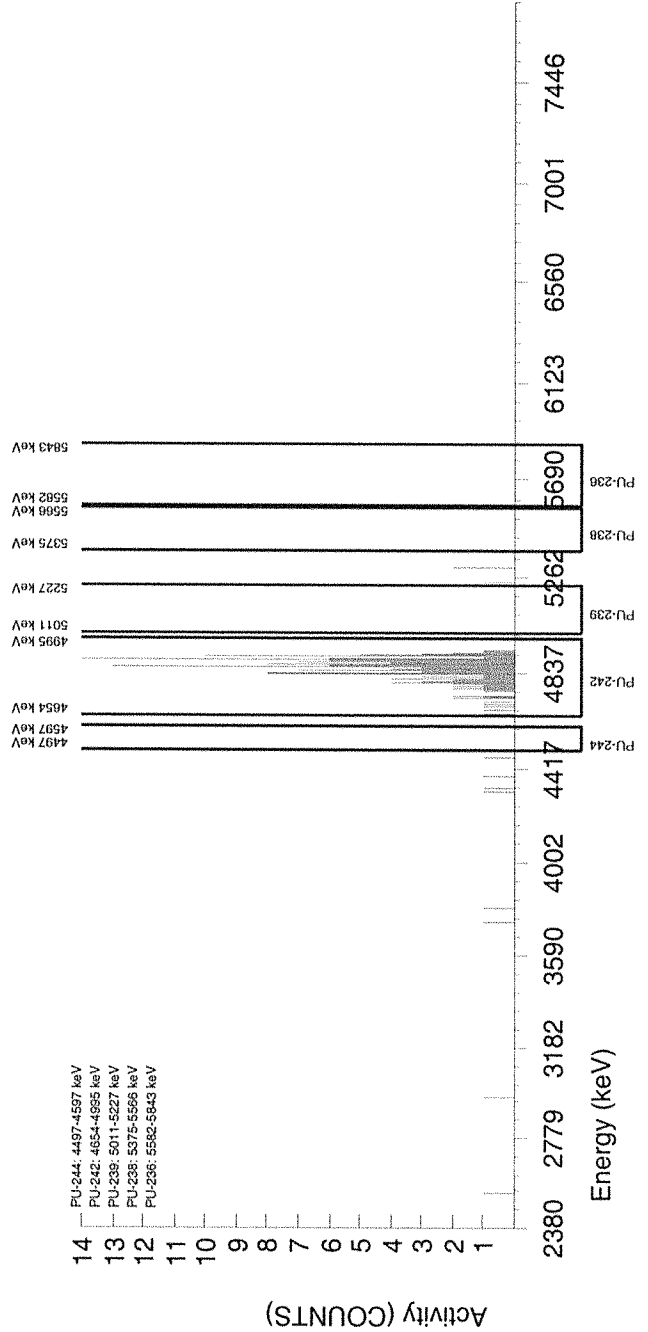
LIB FILE : PU
 BKG FILE : B103.CNF;1412
 BKG DATE : 16-Sep-2016
 BKG LIVE TIME(SEC) : 59999.99
 EFF FILE : W103.CNF;395
 CAL DATE : 06-Sep-2016

TRACER

ID : 1770-A
 NUCLIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 3.2203E+00 dpm

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.26	0.000	0.000	-0.290	0.290	0.5384	100.000	-8.63E-03	6.04E-02	1.46E-01	2.82E-02	6.02E-02
PU-238	5486.00	5470.35	0.000	0.000	-0.290	0.290	0.5384	99.900	-7.13E-03	4.99E-02	1.21E-01	2.33E-02	4.97E-02
PU-239	5155.00	5118.69	0.000	0.000	-0.145	0.145	0.3807	99.900	-3.54E-03	4.91E-02	1.06E-01	1.64E-02	4.89E-02
PU-242	4890.00	4851.52	78.116	159.000	158.131	0.869	0.9325	100.000	3.86E+00	8.82E-01	1.54E-01	4.01E-02	6.06E-01
PU-244	4589.00	4546.97	0.000	0.000	-0.145	0.145	0.3807	99.900	-3.54E-03	4.91E-02	1.06E-01	1.64E-02	4.89E-02



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER : 1596414
 SAMPLE ID : R1203621756_PU
 SAMPLE QTY : 0.515 G +/-0.194 %
 SAMPLE DATE : 20-Sep-2016 00:00:00
 ANALYST : HAKB
 % YIELD : 62.6 +/-8.930 %

CHAMBER : 105
 DETECTOR S/N : 78777
 AVERAGE %EFFICIENCY : 33.6886
 AVERAGE %EFF ERROR : 0.6490
 COUNT DATE : 22-Sep-2016 09:56:16
 ELAPSED LIVE TIME(SEC) : 8702.78

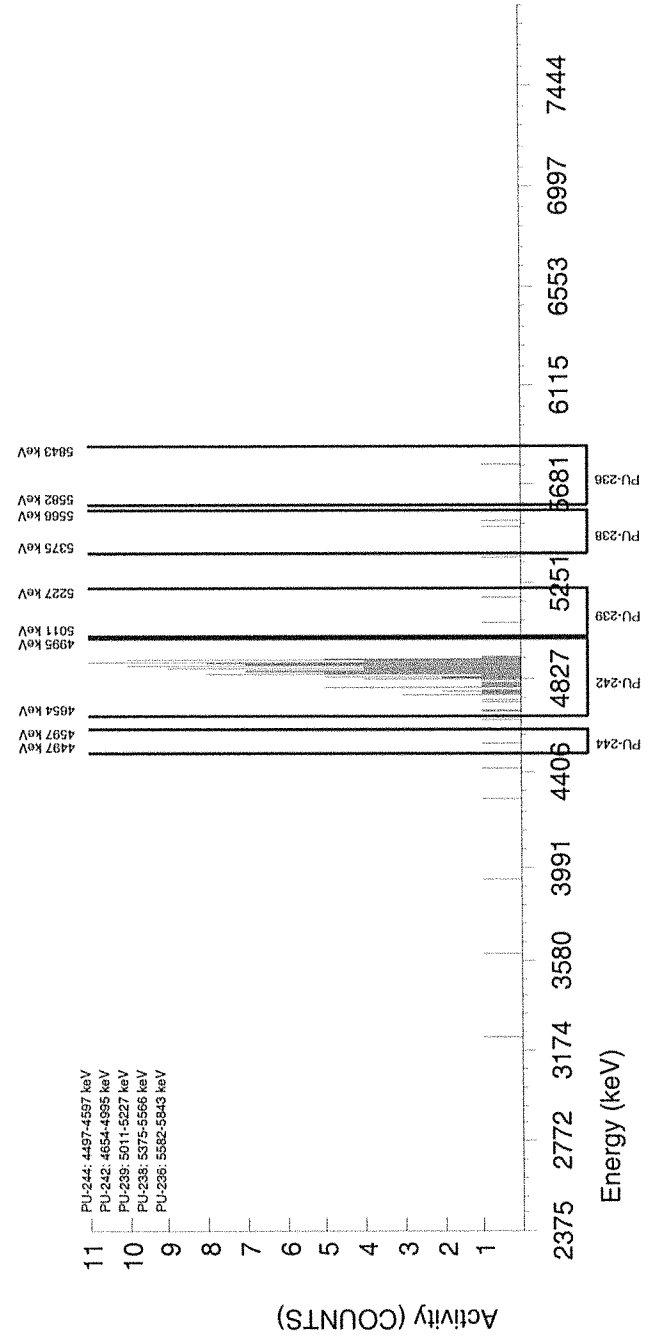
LIB FILE : PU
 BKG FILE : B105.CNF;1396
 BKG DATE : 16-Sep-2016
 BKG LIVE TIME(SEC) : 59999.99
 EFF FILE : W105.CNF;364
 CAL DATE : 06-Sep-2016

TRACER ID : 1770-A
 NUCLEIDE : PU-242
 NOMINAL : 4.3831E+00 dpm
 RESULTS : 2.7420E+00 dpm

LCS
 NUCLEIDE ID
 NOMINAL (pCi/G)
 % RECOVERY

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG SDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5767.11	4.933	1.000	0.275	0.725	0.8516	100.000	7.87E-03	8.21E-02	1.72E-01	4.30E-02	8.19E-02
PU-238	5486.00	5505.68	29.596	2.000	1.420	0.580	0.7617	99.900	4.07E-02	9.92E-02	1.63E-01	3.84E-02	9.89E-02
PU-239	5155.00	5126.05	108.519	2.000	1.855	0.145	0.3808	99.900	5.31E-02	9.84E-02	1.24E-01	1.92E-02	9.79E-02
PU-242	4890.00	4855.54	65.394	135.000	133.985	1.015	1.0076	100.000	3.83E+00	9.49E-01	1.87E-01	5.08E-02	6.54E-01
PU-244	4589.00	4537.21	4.933	1.000	0.565	0.435	0.6597	99.900	1.62E-02	8.12E-02	1.52E-01	3.33E-02	8.10E-02



Handwritten note: mca

21-Sep-2016

Batch# 1597416 Product: Tc99 Date: 9/21/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits. Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	see DSR 1559801
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DSR 1559801
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER 1559801
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: 

Secondary Review Performed By: 

MSUC
10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 21-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LSC	Test / Method: DOE EML HASL-300, Tc-02-RC Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1597416	Sample Numbers: See Below		

Potentially affected work order(s)(SDG): 405235

Application Issues:

Sample received out of holding

**Specification and Requirements
Exception Description:**

1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, and 1203624309 were received and analyzed out of the method specified hold time.

DER Disposition:

1. Reporting results.

Originator's Name:

Elizabeth Krouse 21-SEP-16

Data Validator/Group Leader:

Lyndsey Pace 21-SEP-16

Prep Logbook

MJWC 10/4/16

The Determination of Technetium-99 Using Analytical Grade 1X8 Resin

Batch ID: 1597416
 Analyst: Angela Johnson
 Method: DOE EML HASL-300, Tc-02-RC Modified
 Lab SOP: GL-RAD-A-059 REV# 4
 Instrument: BAL-18550299

Type: LCS
 Sample Id: 1203624310
 Description: Technetium-99 SPIKE
 Serial Number: 1621-B
 Spike Amount: .1
 Spike Units: mL

Sample ID	Prep Date	Matrix	Dry or Wet	Unadjusted Aliquot (g)	Aliquot (g)
405235001	14-SEP-2016 05:23:51	Soil	W	1.914	1.542
405235002	14-SEP-2016 05:23:51	Soil	W	2.089	1.622
405235003	14-SEP-2016 05:23:51	Soil	W	2.317	1.915
405235004	14-SEP-2016 05:23:51	Soil	W	1.98	1.596
405235005	14-SEP-2016 05:23:51	Soil	W	2.013	1.603
405235006	14-SEP-2016 05:23:51	Soil	W	2.281	1.836
405235007	14-SEP-2016 05:23:51	Soil	W	2.168	1.707
405235008	14-SEP-2016 05:23:51	Soil	W	2.099	1.664
405235009	14-SEP-2016 05:23:51	Soil	W	2.161	1.65
405235010	14-SEP-2016 05:23:51	Soil	W	2.226	1.778
405235011	14-SEP-2016 05:23:51	Soil	W	2.428	2.032
405235012	14-SEP-2016 05:23:51	Soil	W	2.176	1.807
405235013	14-SEP-2016 05:23:51	Soil	W	2.363	1.853
405235014	14-SEP-2016 05:23:51	Soil	W	2.315	1.964
405235015	14-SEP-2016 05:23:51	Soil	W	2.299	2.135
405235016	14-SEP-2016 05:23:51	Soil	W	2.077	1.652
405235017	14-SEP-2016 05:23:51	Soil	W	2.088	1.618
405235018	14-SEP-2016 05:23:51	Soil	W	2.119	1.66
405235019	14-SEP-2016 05:23:51	Soil	W	2.032	1.676
405235020	14-SEP-2016 05:23:51	Soil	W	2.011	1.724
1203624308 MB	14-SEP-2016 05:23:51	Soil	W	2.181	2.135
1203624309 DUP (405235001)	14-SEP-2016 05:23:51	Soil	W		
1203624310 LCS	14-SEP-2016 05:23:51	Soil	W		

Comments:
 Spike Pipet ID: RAD-LSC-2272418
 Tracer Pipet ID: RAD-LSC-4099802

Reagent/Solvent Lot ID	Description	Amount
2280154.26	Hydrogen Peroxide 30% ACS Reagent	10 mL
2402130.4	120LBS 30 Gallons	15 mL
2418926	Ecosint GL Scintillation Solution	.1 uL
2429641	Quenching Agent	100 mL
2441205	RL-0.1M Hydrochloric Acid	20 mL
2451825	RL-0.01M Nitric Acid	25 mL
TC207-A	RL-0.1M Nitric Acid tracer	1 mL

GEL Laboratories LLC

Analytical Logbook version 1 11-04-2002

Technetium-99 Solid

Filename : TC99.XLS
 File type : Excel
 Version # : 1.2.16

Tracer S/N : TC2074-A
 Tracer Exp Date : 9/16/2016
 Tracer Volume Added : 1.00

Batch : 1597416
 Analyst : GXR1
 Prep Date : 9/14/2016
 Tc-99 Method Uncertainty : 0.0576

Procedure Code : LSC99TCS
 Parmaname : Technetium-99
 Required MDA : 5 pCi/g
 Tc-99 Abundance : 1.00
 Half-life of Tc-99 : 211100 years

Geometry: 15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin

Pos.	Sampl Sample Characteristics			Tracer Calculations			Tracer Samp.			Tracer		
	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G	Tracer Ref. Activity (CPM)	Tracer Ref. Count Uncertainty (%)	Tracer Samp. Activity (CPM)	Tracer Samp. Count Uncertainty (%)	Tracer Aliquot (mL)	Tracer Aliquot (mL)	Tracer Aliquot StDev. (mL)		
1	405235001.1	1.5420	3.3797E-03	31859	0.95%	29243	0.95%	1.0	1.0	0.002000		
2	405235002.1	1.6220	3.3880E-03	31859	0.95%	29088	0.95%	1.0	1.0	0.002000		
3	405235003.1	1.9150	3.4183E-03	31859	0.95%	29116	0.95%	1.0	1.0	0.002000		
4	405235004.1	1.5960	3.3853E-03	31859	0.95%	29408	0.95%	1.0	1.0	0.002000		
5	405235005.1	1.6030	3.3860E-03	31859	0.95%	27752	0.95%	1.0	1.0	0.002000		
6	405235006.1	1.8360	3.4102E-03	31859	0.95%	30052	0.94%	1.0	1.0	0.002000		
7	405235007.1	1.7070	3.3988E-03	31859	0.95%	27752	0.96%	1.0	1.0	0.002000		
8	405235008.1	1.6640	3.3923E-03	31859	0.95%	28939	0.96%	1.0	1.0	0.002000		
9	405235009.1	1.6500	3.3909E-03	31859	0.95%	28466	0.94%	1.0	1.0	0.002000		
10	405235010.1	1.7780	3.4042E-03	31859	0.95%	28132	0.95%	1.0	1.0	0.002000		
11	405235011.1	2.0320	3.4305E-03	31859	0.95%	29521	0.95%	1.0	1.0	0.002000		
12	405235012.1	1.8070	3.4072E-03	31859	0.95%	30040	0.94%	1.0	1.0	0.002000		
13	405235013.1	1.8530	3.4119E-03	31859	0.95%	28538	0.95%	1.0	1.0	0.002000		
14	405235014.1	1.9540	3.4234E-03	31859	0.95%	26603	0.96%	1.0	1.0	0.002000		
15	405235015.1	2.1350	3.4411E-03	31859	0.95%	28682	0.95%	1.0	1.0	0.002000		
16	405235016.1	1.6520	3.3911E-03	31859	0.95%	28276	0.95%	1.0	1.0	0.002000		
17	405235017.1	1.6180	3.3876E-03	31859	0.95%	28010	0.96%	1.0	1.0	0.002000		
18	405235018.1	1.6600	3.3919E-03	31859	0.95%	28392	0.95%	1.0	1.0	0.002000		
19	405235019.1	1.6760	3.3936E-03	31859	0.95%	28853	0.94%	1.0	1.0	0.002000		
20	405235020.1	1.7240	3.3986E-03	31859	0.95%	28656	0.95%	1.0	1.0	0.002000		
21	1203624308.1	2.1350	3.4411E-03	31859	0.95%	28896	0.95%	1.0	1.0	0.002000		
22	1203624309.1	1.7570	3.4020E-03	31859	0.95%	29563	0.95%	1.0	1.0	0.002000		
23	1203624310.1	2.1350	3.4411E-03	31859	0.95%	30790	0.94%	1.0	1.0	0.002000		

Pipet, 0.1 ml Sidev : +/- 0.000200 ml
 Pipet, 0.5 ml Sidev : +/- 0.001000 ml
 Pipet, 1 ml Sidev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-059
 Instrument SOP: GL-RAD-I-014

Count raw Data										Calibration Data				Detector Efficiency		Background Count			
Pos.	Rack Position #	Counting Time (min.)	Quench#	Gross cpm	Bkg cpm	Bkg Count Time (min.)	Bkg Quench#	Corrected Bkg cpm	Count Start Date/Time	Sample Decay	Calculated Sample Recovery %	Sample Recovery Error %	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)	Detector Error (cpm/dpm)	Background Position #	Background Start Date/Time
1	14-2	15	655.55	11.14	14.06	15	666.62	13.9735	9/20/2016 4:40	1.000	91.8%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6297	0.00792	14-1	9/20/2016 12:15
2	14-3	15	689.13	12.11	14.06	15	666.62	13.8613	9/20/2016 4:56	1.000	91.3%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6477	0.00792	14-1	9/20/2016 12:15
3	14-4	15	679.49	13.08	14.06	15	666.62	14.0196	9/20/2016 5:12	1.000	91.4%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6450	0.00792	14-1	9/20/2016 12:15
4	14-5	15	644.25	11.28	14.06	15	666.62	13.8048	9/20/2016 5:28	1.000	92.3%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6183	0.00792	14-1	9/20/2016 12:15
5	14-6	15	672.78	12.87	14.06	15	666.62	14.0624	9/20/2016 5:44	1.000	87.1%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6420	0.00792	14-1	9/20/2016 12:15
6	14-7	15	666.74	11.83	14.06	15	666.62	14.0604	9/20/2016 6:01	1.000	94.3%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6384	0.00792	14-1	9/20/2016 12:15
7	14-8	15	648.12	13.01	14.06	15	666.62	13.8896	9/20/2016 6:17	1.000	87.1%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6225	0.00792	14-1	9/20/2016 12:15
8	14-9	15	667.26	13.35	14.06	15	666.62	14.0619	9/20/2016 6:33	1.000	90.8%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6387	0.00792	14-1	9/20/2016 12:15
9	14-10	15	639.9	11.83	14.06	15	666.62	13.7255	9/20/2016 6:49	1.000	89.4%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6132	0.00792	14-1	9/20/2016 12:15
10	14-11	15	658.09	11.14	14.06	15	666.62	14.0014	9/20/2016 7:05	1.000	86.3%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6319	0.00792	14-1	9/20/2016 12:15
11	14-12	15	635.02	11.97	14.06	15	666.62	13.6306	9/20/2016 7:21	1.000	92.7%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6070	0.00792	14-1	9/20/2016 12:15
12	0-1	15	662.93	12.53	14.06	15	666.62	14.0418	9/20/2016 7:38	1.000	94.3%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6357	0.00792	14-1	9/20/2016 12:15
13	0-2	15	661.34	12.73	14.06	15	666.62	14.0305	9/20/2016 7:54	1.000	89.6%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6345	0.00792	14-1	9/20/2016 12:15
14	0-3	15	663.58	14.46	14.06	15	666.62	14.0459	9/20/2016 8:10	1.000	83.5%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6362	0.00792	14-1	9/20/2016 12:15
15	14-2	15	676.07	13.29	14.06	15	666.62	14.0478	9/20/2016 12:31	1.000	93.8%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6436	0.00792	14-1	9/20/2016 12:15
16	0-5	15	678.75	11.97	14.06	15	666.62	14.0269	9/20/2016 8:42	1.000	88.8%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6447	0.00792	14-1	9/20/2016 12:15
17	0-6	15	641.39	11.76	14.06	15	666.62	13.7533	9/20/2016 8:58	1.000	87.9%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6150	0.00792	14-1	9/20/2016 12:15
18	0-7	15	658.15	12.87	14.06	15	666.62	14.0020	9/20/2016 9:14	1.000	92.3%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6320	0.00792	14-1	9/20/2016 12:15
19	0-8	15	674.28	13.08	14.06	15	666.62	14.0572	9/20/2016 9:31	1.000	90.6%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6427	0.00792	14-1	9/20/2016 12:15
20	0-9	15	666.91	11.97	14.06	15	666.62	14.0609	9/20/2016 9:47	1.000	89.9%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6385	0.00792	14-1	9/20/2016 12:15
21	0-10	15	685.86	14.54	14.06	15	666.62	13.9289	9/20/2016 10:03	1.000	93.8%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6470	0.00792	14-1	9/20/2016 12:15
22	0-11	15	633.65	12.46	14.06	15	666.62	13.6032	9/20/2016 10:19	1.000	92.8%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6052	0.00792	14-1	9/20/2016 12:15
23	0-12	15	689.69	13.24	14.06	15	666.62	13.8482	9/20/2016 10:35	1.000	96.6%	0.73%	LSCYELLOW	7/4/2016	6/30/2017	0.6478	0.00792	14-1	9/20/2016 12:15

Notes:

- 1 - Results are decay corrected to Sample Date/Time
- 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
- 3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml) : N/A
 Spike Volume Added: N/A

* - RPD changed to 0% due to sample & dup activity below MDA

LCS S/N : 1621-B
 LCS Exp Date : 1/5/2017
 LCS Activity (dpm/ml): 1911.38
 LCS Volume Added (ml): 0.10

Pos.	Decision Level		Critical Level	Required MDA	MDA	pCi/G	Sample Act. Conc.	Sample Act. Error %	Net Count Rate	CPM	Net Count Rate Error	CPM	Net Count Rate Error	CPM	2 SIGMA		Sample QC	Sample Type	RPD	REER	Nominal pCi/G	Recovery
	pCi/G	pCi/G													Counting Uncertainty	Total Prop. Uncertainty						
1	1.6073	1.1348	1.1348	5	2.3706	-1.4320	45.68%	-2.8335	1.2939	1.2817	1.2817	1.2817	1.2817	1.2817	1.2817		SAMPLE					
2	1.4875	1.0502	1.0502	5	2.1943	-0.8224	75.14%	-1.7513	1.3158	1.2111	1.2111	1.2111	1.2111	1.2111	1.2111		SAMPLE					
3	1.2711	0.8974	0.8974	5	1.8746	-0.3749	143.05%	-0.9396	1.3441	1.0512	1.0512	1.0512	1.0512	1.0512	1.0512		SAMPLE					
4	1.5632	1.1036	1.1036	5	2.3062	-1.2486	51.23%	-2.5248	1.2932	1.2534	1.2534	1.2534	1.2534	1.2534	1.2534		SAMPLE					
5	1.6032	1.1319	1.1319	5	2.3642	-0.5992	112.38%	-1.1924	1.3400	1.3197	1.3197	1.3197	1.3197	1.3197	1.3197		SAMPLE					
6	1.2998	0.9176	0.9176	5	1.9168	-0.9087	58.91%	-2.2304	1.3138	1.0491	1.0491	1.0491	1.0491	1.0491	1.0491		SAMPLE					
7	1.5419	1.0886	1.0886	5	2.2745	-0.4183	155.73%	-0.8596	1.3386	1.2768	1.2768	1.2768	1.2768	1.2768	1.2768		SAMPLE					
8	1.4886	1.0509	1.0509	5	2.1952	-0.3322	189.68%	-0.7119	1.3518	1.2362	1.2362	1.2362	1.2362	1.2362	1.2362		SAMPLE					
9	1.5705	1.1088	1.1088	5	2.3172	-0.9444	68.87%	-1.8955	1.3053	1.2747	1.2747	1.2747	1.2747	1.2747	1.2747		SAMPLE					
10	1.4454	1.0205	1.0205	5	2.1317	-1.2991	45.26%	-2.8614	1.2946	1.1521	1.1521	1.1521	1.1521	1.1521	1.1521		SAMPLE					
11	1.2379	0.8740	0.8740	5	1.8268	-0.6544	78.68%	-1.6606	1.3064	1.0091	1.0091	1.0091	1.0091	1.0091	1.0091		SAMPLE					
12	1.3258	0.9360	0.9360	5	1.9552	-0.6287	88.04%	-1.5118	1.3310	1.0848	1.0848	1.0848	1.0848	1.0848	1.0848		SAMPLE					
13	1.3629	0.9622	0.9622	5	2.0100	-0.5562	102.71%	-1.3005	1.3357	1.1196	1.1196	1.1196	1.1196	1.1196	1.1196		SAMPLE					
14	1.3766	0.9719	0.9719	5	2.0301	0.1788	332.88%	0.4141	1.3785	1.1665	1.1665	1.1665	1.1665	1.1665	1.1665		SAMPLE					
15	1.1145	0.7869	0.7869	5	1.6436	-0.2648	178.16%	-0.7578	1.3500	0.9248	0.9248	0.9248	0.9248	0.9248	0.9248		SAMPLE					
16	1.5183	1.0720	1.0720	5	2.2392	-0.9801	64.01%	-2.0569	1.3165	1.2295	1.2295	1.2295	1.2295	1.2295	1.2295		SAMPLE					
17	1.6246	1.1470	1.1470	5	2.3969	-1.0263	65.44%	-1.9933	1.3042	1.3161	1.3161	1.3161	1.3161	1.3161	1.3161		SAMPLE					
18	1.4817	1.0461	1.0461	5	2.1852	-0.5268	118.24%	-1.1320	1.3385	1.2209	1.2209	1.2209	1.2209	1.2209	1.2209		SAMPLE					
19	1.4728	1.0398	1.0398	5	2.1720	-0.4512	137.65%	-0.9772	1.3450	1.2172	1.2172	1.2172	1.2172	1.2172	1.2172		SAMPLE					
20	1.4514	1.0247	1.0247	5	2.1404	-0.9513	63.01%	-2.0909	1.3173	1.1747	1.1747	1.1747	1.1747	1.1747	1.1747		SAMPLE					
21	1.1033	0.7790	0.7790	5	1.6274	0.2123	225.44%	0.6111	1.3777	0.9383	0.9383	0.9383	0.9383	0.9383	0.9383		MB					
22	1.4325	1.0114	1.0114	5	2.1140	-0.5219	115.31%	-1.1432	1.3182	1.1794	1.1794	1.1794	1.1794	1.1794	1.1794	405235001.1	DUP		0.0%			
23	1.0669	0.7532	0.7532	5	1.5739	39.9496	2.85%	118.5518	3.1225	2.0623	2.0623	2.0623	2.0623	2.0623	2.0623		LCS			40.3269	99.1%	

ASSAY 16-Sep-16 12:42:59

Protocol id 12 TC99_REC
Time limit 500
Count limit 10000
Isotope Tc-99m
Protocol date 23-Sep-13 14:21:59
Run id. 20

POS	RACK	BATCH	TIME	COUNTS	CPM	ERROR	% RECOVERY	COUNT TIME
1	34	1	21	11108	31858.7	0.95		12:43:05
2	34	2	23	11158	29242.6	0.95	91.79	12:43:38
3	34	3	23	11087	29087.5	0.95	91.30	12:44:13
4	34	4	23	11085	29116.4	0.95	91.39	12:44:48
5	34	5	23	11183	29407.5	0.95	92.31	12:45:23
6	81	6	24	10998	27751.8	0.95	87.11	12:46:12
7	81	7	23	11397	30051.7	0.94	94.33	12:46:47
8	81	8	24	10973	27751.6	0.96	87.11	12:47:22
9	81	9	23	10952	28938.8	0.96	90.83	12:47:58
10	81	10	24	11229	28466.1	0.94	89.35	12:48:34
11	66	11	24	11079	28132.3	0.95	88.30	12:49:28
12	66	12	23	11126	29520.9	0.95	92.66	12:50:03
13	66	13	23	11309	30039.5	0.94	94.29	12:50:38
14	66	14	24	11200	28538.3	0.95	89.58	12:51:13
15	66	15	25	10866	26602.8	0.96	83.50	12:51:49
16	99	16	23	11206	29881.8	0.95	93.79	12:52:40
17	99	17	24	11055	28275.8	0.95	88.75	12:53:15
18	99	18	24	10939	28009.9	0.96	87.92	12:53:51
19	99	19	23	10986	29392.4	0.95	92.26	12:54:27
20	99	20	24	11241	28852.7	0.94	90.56	12:55:02
21	60	21	24	11147	28655.6	0.95	89.95	12:55:51
22	60	22	23	11131	29896	0.95	93.84	12:56:27
23	60	23	23	10995	29563.3	0.95	92.80	12:57:02
24	60	24	23	11436	30790.1	0.94	96.65	12:57:37

END OF ASSAY

1597416

PROTOCOL : 15 Tc-99 15 min
 DATE : 2016/09/20
 TIME : 12:14
 ID : P15AS102

Tc-99

Wallac 1414 WinSpectral v1.40 S/N 4140127

Counting mode : CPM
 Isotope(s) : H3
 H3 = 5- 350,12.43 y
 Protocol name : Tc-99 15 min
 Counting time : 900
 Repeats : 1
 Cycles : 1
 Replicates : 1
 2 sigma % : 2.00
 Minimum cpm : 0.00 Checking time: 10
 Advanced modes : Chemilum
 Output to Display :
 POS,CPMw2,CLMM,FNCT2,RACK,RACKPOS,FNCT1,SQPE,DATE,TIME,CPMw1,CPM,CPM1,CTIME
 Additions to Display : Listing,Header,Spectrum
 Header : Tc-99
 Spectrum : Rnd.Cos,Beta
 Window 1 : 70- 600 /Beta
 Window 2 : 70- 600 /Rnd.Cos
 Window 3 : 1-1024 /Beta
 Window 4 : 1-1024 /Beta
 Window 5 : 1-1024 /Beta
 Window 6 : 1-1024 /Beta
 FNCT1 = FNCT1 : CTIME/60
 FNCT2 = FNCT2 : CPMW1-CPMW2
 FNCT3 = FNCT3 :
 FNCT4 = FNCT4 :

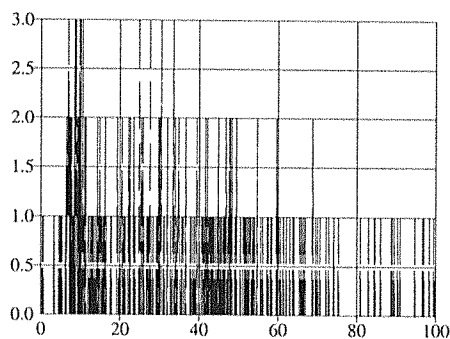
Total count rate:

H3 14.4 CPM

Tc-99 YELLOW

Rack_position Count_Time(min) Quench_number Tc-99_Cpm Run_Date
14 1 15.00 666.62 9/20/2016 12:15 PM

Ret

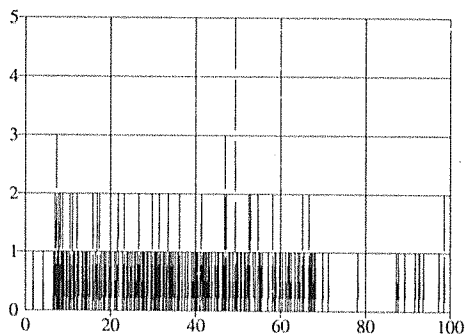


Counts Chem
Counts Beta

Gross_B_CPM LUMEX
16.30 0.00
Lumex_CPM
2.20

Rack_position Count_Time(min) Quench_number Tc-99_Cpm Run_Date
14 2 15.00 676.07 9/20/2016 12:31 PM

15



Counts Chem
Counts Beta

Gross_B_CPM LUMEX
13.60 0.00
Lumex_CPM
0.30

1597410

Tc-99 YELLOW

PROTOCOL : 15 Tc-99 15 min
DATE : 2016/09/20
TIME : 04:23
ID : P15AS101

Tc-99

Wallac 1414 WinSpectral v1.40 S/N 4140127

Counting mode : CPM
Isotope(s) : H3
H3 = 5- 350,12.43 y
Protocol name : Tc-99 15 min
Counting time : 900
Repeats : 1
Cycles : 1
Replicates : 1
2 sigma % : 2.00
Minimum cpm : 0.00 Checking time: 10
Advanced modes : Chemilum
Output to Display :
POS,CPMw2,CLMM,FNCT2,RACK,RACKPOS,FNCT1,SQPE,DATE,TIME,CPMw1,CPM,CPM1,CTIME
Additions to Display : Listing,Header,Spectrum
Header : Tc-99
Spectrum : Rnd.Cos,Beta
Window 1 : 70- 600 /Beta
Window 2 : 70- 600 /Rnd.Cos
Window 3 : 1-1024 /Beta
Window 4 : 1-1024 /Beta
Window 5 : 1-1024 /Beta
Window 6 : 1-1024 /Beta
FNCT1 = FNCT1 : CTIME/60
FNCT2 = FNCT2 : CPMW1-CPMW2
FNCT3 = FNCT3 :
FNCT4 = FNCT4 :

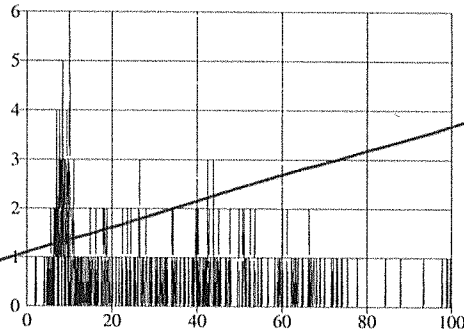
Total count rate:
H3 233.2 CPM

Tc-99 YELLOW

9/20/16

Ref

Rack_position	Count_Time(min)	Quench_number	Tc-99_Cpm	Run_Date
14	1	15.00	694.32	9/20/2016 4:24 AM

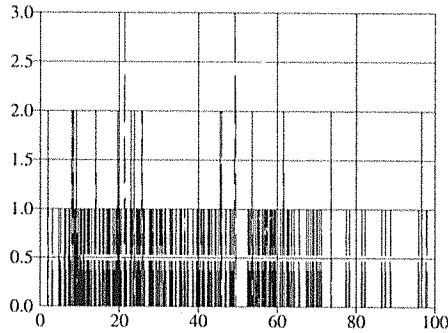


Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
17.90	0.00
Lumex_CPM	
3.70	

Rack_position	Count_Time(min)	Quench_number	Tc-99_Cpm	Run_Date
14	2	15.00	655.55	9/20/2016 4:40 AM

1

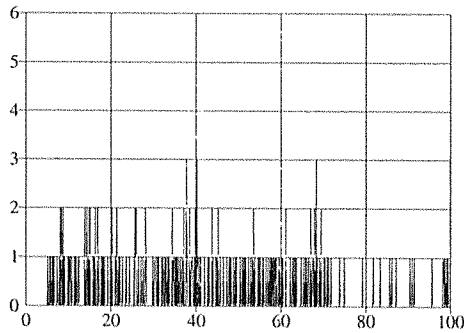


Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
11.60	0.00
Lumex_CPM	
0.50	

Rack_position	Count_Time(min)	Quench_number	Tc-99_Cpm	Run_Date
14	3	15.00	689.13	9/20/2016 4:56 AM

2



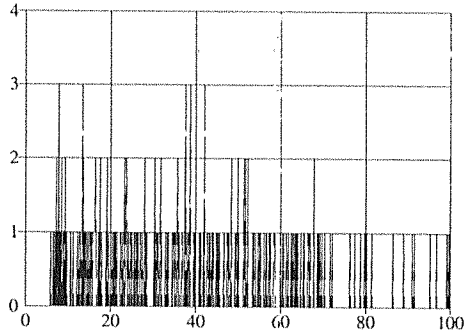
Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
12.30	0.00
Lumex_CPM	
0.20	

Tc-99 YELLOW

3

Rack_position 14 Count_Time(min) 15.00 Quench_number 679.49 Tc-99_Cpm 13.08 Run_Date 9/20/2016 5:12 AM

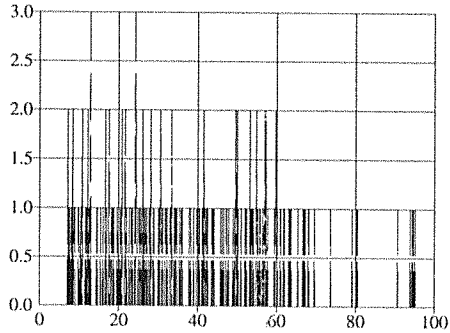


Gross_B_CPM 13.80 LUMEX 0.00

Lumex_CPM 0.80

4

Rack_position 14 Count_Time(min) 15.00 Quench_number 644.25 Tc-99_Cpm 11.28 Run_Date 9/20/2016 5:28 AM

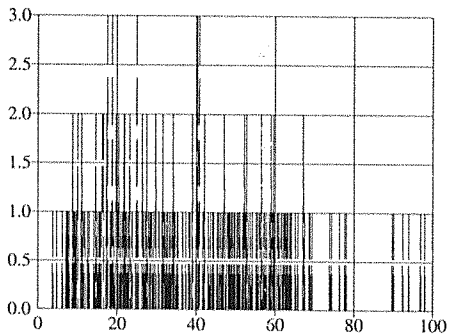


Gross_B_CPM 11.60 LUMEX 0.00

Lumex_CPM 0.30

5

Rack_position 14 Count_Time(min) 15.00 Quench_number 672.78 Tc-99_Cpm 12.87 Run_Date 9/20/2016 5:44 AM

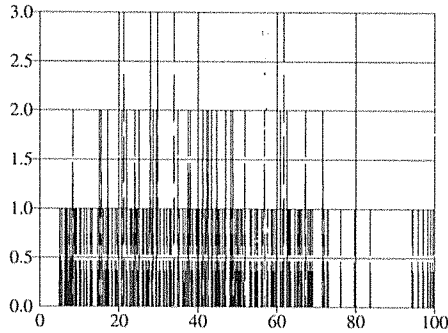


Gross_B_CPM 13.40 LUMEX 0.00

Lumex_CPM 0.50

Tc-99 YELLOW

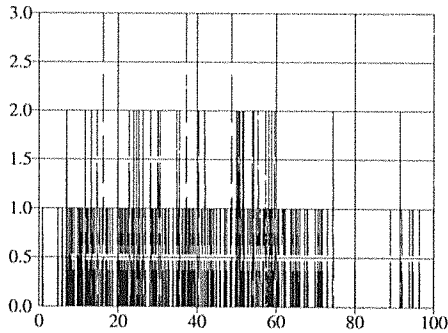
6
 Rack_position 14 Count_Time(min) 7 Quench_number 666.74 Tc-99_Cpm 11.83 Run_Date 9/20/2016 6:01 AM



Counts Chem
 Counts Beta

Gross_B_CPM 12.00 LUMEX 0.00
 Lumex_CPM 0.20

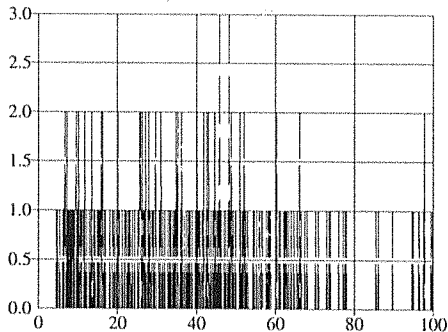
7
 Rack_position 14 Count_Time(min) 8 Quench_number 648.12 Tc-99_Cpm 13.01 Run_Date 9/20/2016 6:17 AM



Counts Chem
 Counts Beta

Gross_B_CPM 13.70 LUMEX 0.00
 Lumex_CPM 0.70

8
 Rack_position 14 Count_Time(min) 9 Quench_number 667.26 Tc-99_Cpm 13.35 Run_Date 9/20/2016 6:33 AM

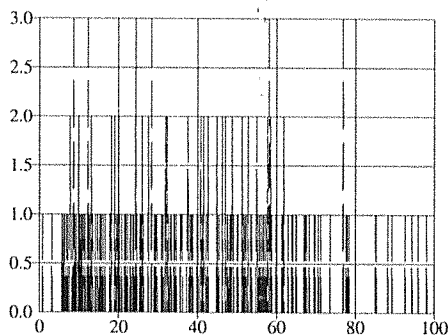


Counts Chem
 Counts Beta

Gross_B_CPM 14.30 LUMEX 0.00
 Lumex_CPM 0.90

Tc-99 YELLOW

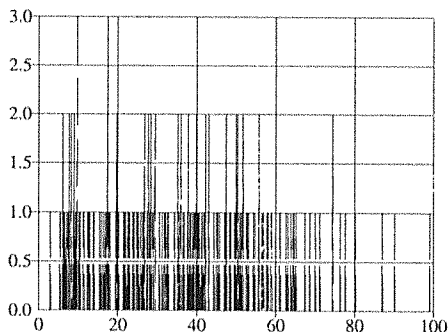
9 Rack_position 14 10 Count_Time(min) 15.00 Quench_number 639.90 Tc-99_Cpm 11.83 Run_Date 9/20/2016 6:49 AM



Gross_B_CPM 12.20 LUMEX 0.00

Lumex_CPM 0.40

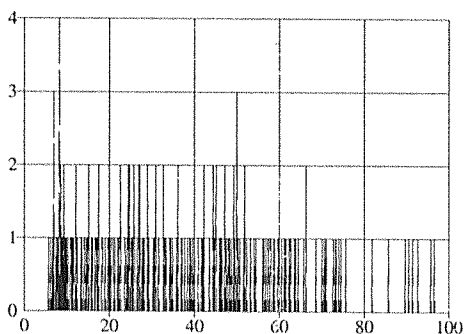
10 Rack_position 14 11 Count_Time(min) 15.00 Quench_number 658.09 Tc-99_Cpm 11.14 Run_Date 9/20/2016 7:05 AM



Gross_B_CPM 11.60 LUMEX 0.00

Lumex_CPM 0.50

11 Rack_position 14 12 Count_Time(min) 15.00 Quench_number 635.02 Tc-99_Cpm 11.97 Run_Date 9/20/2016 7:21 AM

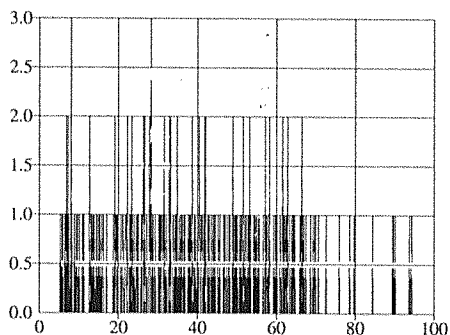


Gross_B_CPM 12.80 LUMEX 0.00

Lumex_CPM 0.80

Tc-99 YELLOW

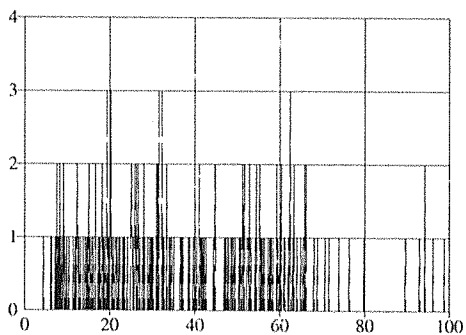
12
 Rack_position 0 1 Count_Time(min) 15.00 Quench_number 662.93 Tc-99_Cpm 12.53 Run_Date 9/20/2016 7:38 AM



Gross_B_CPM 12.90 LUMEX 0.00

Lumex_CPM 0.40

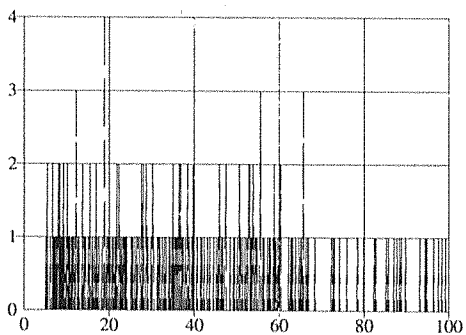
13
 Rack_position 0 2 Count_Time(min) 15.00 Quench_number 661.34 Tc-99_Cpm 12.73 Run_Date 9/20/2016 7:54 AM



Gross_B_CPM 13.30 LUMEX 0.00

Lumex_CPM 0.60

14
 Rack_position 0 3 Count_Time(min) 15.00 Quench_number 663.58 Tc-99_Cpm 14.46 Run_Date 9/20/2016 8:10 AM



Gross_B_CPM 15.30 LUMEX 0.00

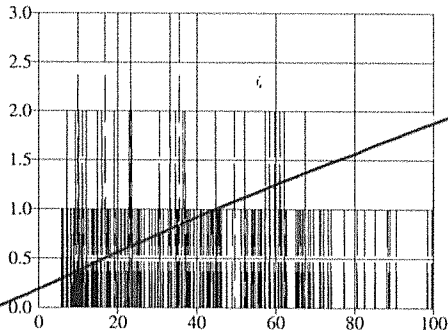
Lumex_CPM 0.80

Tc-99 YELLOW

9/20/16

15

Rack_position	Count_Time(min)	Quench_number	Tc-99_Cpm	Run_Date
0 4	15.00	698.61	11.49	9/20/2016 8:26 AM

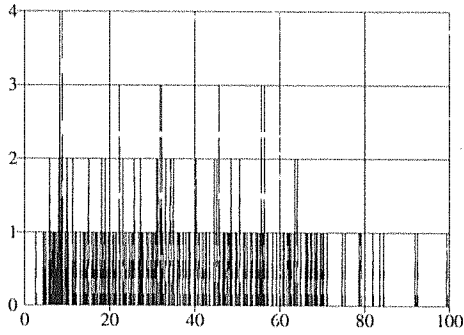


Gross_B_CPM	LUMEX
12.20	0.00
Lumex_CPM	
0.70	

Counts Chem
Counts Beta

16

Rack_position	Count_Time(min)	Quench_number	Tc-99_Cpm	Run_Date
0 5	15.00	678.75	11.97	9/20/2016 8:42 AM

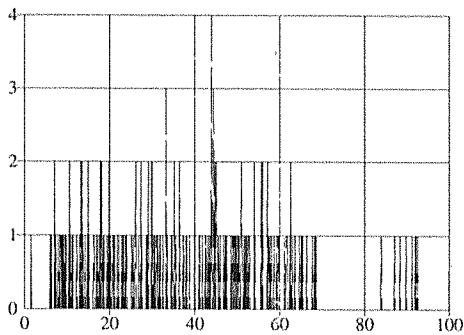


Gross_B_CPM	LUMEX
13.30	0.00
Lumex_CPM	
1.30	

Counts Chem
Counts Beta

17

Rack_position	Count_Time(min)	Quench_number	Tc-99_Cpm	Run_Date
0 6	15.00	641.39	11.76	9/20/2016 8:58 AM

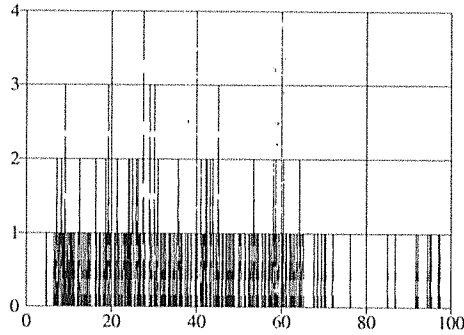


Gross_B_CPM	LUMEX
12.40	0.00
Lumex_CPM	
0.60	

Counts Chem
Counts Beta

Tc-99 YELLOW

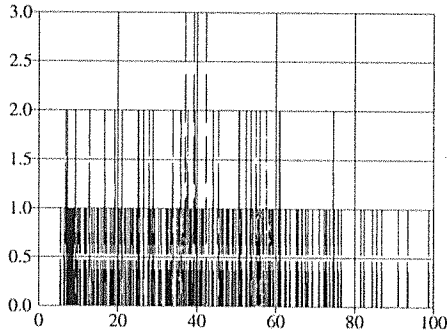
18 Rack_position 0 7 Count_Time(min) 15.00 Quench_number 658.15 Tc-99_Cpm 12.87 Run_Date 9/20/2016 9:14 AM



Counts Chem
Counts Beta

Gross_B_CPM 13.60 LUMEX 0.00
Lumex_CPM 0.80

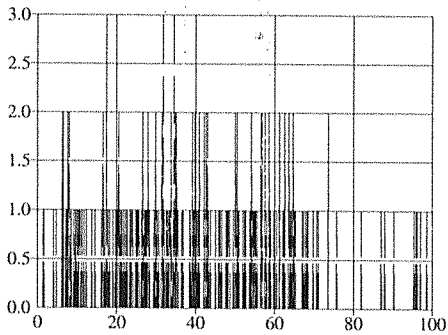
19 Rack_position 0 8 Count_Time(min) 15.00 Quench_number 674.28 Tc-99_Cpm 13.08 Run_Date 9/20/2016 9:31 AM



Counts Chem
Counts Beta

Gross_B_CPM 13.60 LUMEX 0.00
Lumex_CPM 0.60

20 Rack_position 0 9 Count_Time(min) 15.00 Quench_number 666.91 Tc-99_Cpm 11.97 Run_Date 9/20/2016 9:47 AM



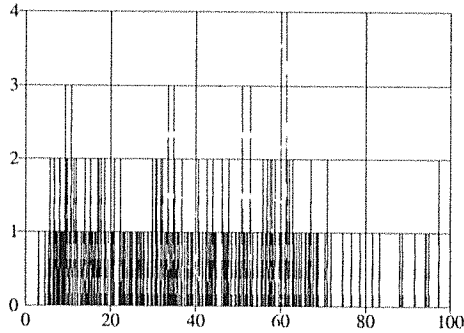
Counts Chem
Counts Beta

Gross_B_CPM 12.50 LUMEX 0.00
Lumex_CPM 0.50

Tc-99 YELLOW

21

Rack_position Count_Time(min) Quench_number Tc-99_Cpm Run_Date
0 10 15.00 685.86 9/20/2016 10:03 AM



Counts
Chem

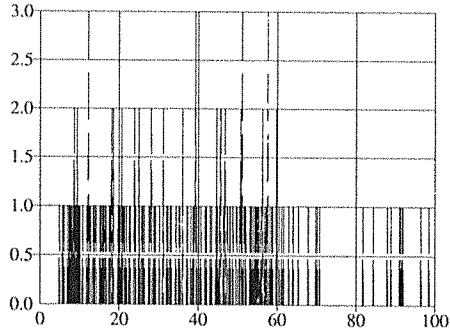
Counts
Beta

Gross_B_CPM LUMEX
15.20 0.00

Lumex_CPM
0.70

22

Rack_position Count_Time(min) Quench_number Tc-99_Cpm Run_Date
0 11 15.00 633.65 9/20/2016 10:19 AM



Counts
Chem

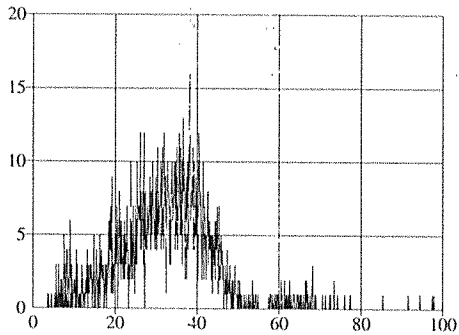
Counts
Beta

Gross_B_CPM LUMEX
13.00 0.00

Lumex_CPM
0.60

23

Rack_position Count_Time(min) Quench_number Tc-99_Cpm Run_Date
0 12 15.00 689.69 9/20/2016 10:35 AM



Counts
Chem

Counts
Beta

Gross_B_CPM LUMEX
133.00 0.00

Lumex_CPM
0.60

Batch# 1598078 Product: CU4 Date: 9/23/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			NA
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	see DSR 1560896
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DSR 1560896
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER 1560896
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: [Signature]

Secondary Review Performed By: [Signature] 9/23/16

MSWC
10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 23-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LSC	Test / Method: EPA EERF C-01 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1598078	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235001, 405235002, 405235003, 405235004, 405235005, 405235006, 405235007, 405235008, 405235009, 405235010, 405235011, 405235012, 405235013, 405235014, 405235015, 405235016, 405235017, 405235018, 405235019, 405235020, 1203626106, and 1203626107 were received and analyzed out of the method specified hold time.</p>		<p>1. Reporting results.</p>	

Originator's Name:
Elizabeth Krouse 23-SEP-16

Data Validator/Group Leader:
Lyndsey Pace 23-SEP-16

10/4
MSJC

15

Prep Logbook

The Determination of Carbon-14 in Water, Soil, Vegetation and Other Solid Matrices

Batch ID: 1598078
 Analyst: Angela Johnson
 Method: EPA EERF C-01 Modified
 Lab SOP: GL-RAD-A-003 REV# 15
 Instrument: BAL-18550299

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
LCS	1203626108	Carbon-14 SPIKE	1646-B	.1	mL
MS	1203626107	Carbon-14 SPIKE	1646-B	.1	mL

Sample ID	Prep Date	Matrix	Dry or Wet	Unadjusted Aliquot (g)	Aliquot (g)	Flask #
405235001	14-SEP-2016 11:11:07	Soil	W	1.774	1.429	1
405235002	14-SEP-2016 11:11:07	Soil	W	1.864	1.447	2
405235003	14-SEP-2016 11:11:07	Soil	W	1.692	1.398	3
405235004	14-SEP-2016 11:11:07	Soil	W	1.631	1.315	4
405235005	14-SEP-2016 11:11:07	Soil	W	1.888	1.503	5
405235006	14-SEP-2016 11:11:07	Soil	W	1.617	1.302	6
405235007	14-SEP-2016 11:11:07	Soil	W	1.631	1.284	8
405235008	14-SEP-2016 11:11:07	Soil	W	1.579	1.252	83
405235009	14-SEP-2016 11:11:07	Soil	W	1.528	1.167	84
405235010	14-SEP-2016 11:11:07	Soil	W	1.643	1.313	86
405235011	14-SEP-2016 11:11:07	Soil	W	1.599	1.338	400
405235012	14-SEP-2016 11:11:07	Soil	W	1.699	1.411	402
405235013	14-SEP-2016 11:11:07	Soil	W	1.862	1.46	404
405235014	14-SEP-2016 11:11:07	Soil	W	1.663	1.411	405
405235015	14-SEP-2016 11:11:07	Soil	W	1.634	1.517	406
405235016	14-SEP-2016 11:11:07	Soil	W	1.567	1.247	506
405235017	14-SEP-2016 11:11:07	Soil	W	1.594	1.235	507
405235018	14-SEP-2016 11:11:07	Soil	W	1.814	1.421	514
405235019	14-SEP-2016 11:11:07	Soil	W	1.698	1.4	519
405235020	14-SEP-2016 11:11:07	Soil	W	1.625	1.393	530
1203626105 MB	14-SEP-2016 11:11:07	Soil	W	1.517	1.517	706
1203626106 DUP (405235001)	14-SEP-2016 11:11:07	Soil	W	1.858	1.497	708
1203626107 MS (405235001)	14-SEP-2016 11:11:07	Soil	W	1.681	1.355	729
1203626108 LCS	14-SEP-2016 11:11:07	Soil	W		1.517	733

Comments:
 Spike Pipet ID: RAD-LSC-2970968
 Data Entry Date: 21-SEP-2016 12:23 BAL-18550299 Angela Johnson

Reagent/Solvent Lot ID	Description	Amount
2242305.2	Ecoscint A Scintillation Solution	10 mL
2398913.5	Methanol 4L Plastic Bottle	9 mL
2440076.3	Potassium Persulfate 99+%	5 g
2440953	RL-0.4M Hydrochloric Acid	50 mL
2454859.17	16M Nitric Acid Poly Coated Bottle	25 mL
2455949	RL-1M Silver Nitrate	2 mL

Carbon-14 Solid

Filename : C14.XLS
 File type : Excel
 Version # : 1.3.10

Batch : 1598078
 Analyst : ANGELA095
 Prep Date : 9/14/2016
 Method Uncertainty : 0.0363

Procedure Code : LSC_14CS
 Carbon-14
 2 pCi/G
 Required MDA :
 C-14 Abundance : 1.00
 Half-life of Carbon-14 : 5700.00 years

Geometry: 3mL Ethanolamine/9mL Methanol/10mL EcoScint A

Pos.	Sample Characteristics			Counting			Count raw Data			Corrected Bkg cpm	Count Start Date/Time	C-14 Normalization Factor	Sample Decay		
	Sample ID	Sample Aliquot G	Sample Aliquot SI Dev. G	Sample Date/Time	Rack Position #	Counting Time (min.)	Quench#	Gross cpm	Bkg cpm					Bkg Count Time (min.)	Quench#
1	405235001.1	1.4290	3.3679E-03	12/10/2015 14:20	82-2	45	628.36	10.87	11.58	45	625.79	11.5682	9/22/2016 0:38	1.00000	1.000
2	405235002.1	1.4470	3.3698E-03	12/10/2015 14:30	82-3	45	629.07	11.51	11.58	45	625.79	11.5629	9/22/2016 1:25	1.00000	1.000
3	405235003.1	1.3980	3.3647E-03	12/10/2015 14:35	82-4	45	628.12	10.91	11.58	45	625.79	11.5697	9/22/2016 2:11	1.00000	1.000
4	405235004.1	1.3150	3.3561E-03	12/9/2015 14:00	87-1	45	634.48	12	11.58	45	625.79	11.4934	9/22/2016 4:10	1.00000	1.000
5	405235005.1	1.5030	3.3756E-03	12/10/2015 13:15	87-2	45	628.12	11.14	11.58	45	625.79	11.5697	9/22/2016 4:56	1.00000	1.000
6	405235006.1	1.3020	3.3547E-03	12/10/2015 13:25	87-3	45	629.79	11.74	11.58	45	625.79	11.567	9/22/2016 5:42	1.00000	1.000
7	405235007.1	1.2840	3.3529E-03	12/10/2015 13:55	87-4	45.0166664	630.86	11.14	11.58	45	625.79	11.5458	9/22/2016 6:29	1.00000	1.000
8	405235008.1	1.2520	3.3495E-03	12/10/2015 14:05	87-5	45.0166664	629.25	11.72	11.58	45	625.79	11.5614	9/22/2016 7:15	1.00000	1.000
9	405235009.1	1.1670	3.3407E-03	12/10/2015 10:30	87-6	45	635.2	12.76	11.58	45	625.79	11.4801	9/22/2016 8:01	1.00000	1.000
10	405235010.1	1.3130	3.3559E-03	12/10/2015 10:35	87-7	45	629.9	12.02	11.58	45	625.79	11.557	9/22/2016 8:47	1.00000	1.000
11	405235011.1	1.3380	3.3585E-03	12/9/2015 10:13	87-8	45	629.73	11.37	11.58	45	625.79	11.5572	9/22/2016 9:34	1.00000	1.000
12	405235012.1	1.4110	3.3661E-03	12/10/2015 11:25	87-9	45	631.69	12.23	11.58	45	625.79	11.5359	9/22/2016 10:20	1.00000	1.000
13	405235013.1	1.4600	3.3712E-03	12/8/2015 11:23	87-10	45	631.63	11.4	11.58	45	625.79	11.5366	9/22/2016 11:06	1.00000	1.000
14	405235014.1	1.4110	3.3661E-03	12/8/2015 10:49	87-11	45	631.27	11.4	11.58	45	625.79	11.5410	9/22/2016 11:52	1.00000	1.000
15	405235015.1	1.5170	3.3771E-03	12/8/2015 10:56	87-12	45	629.13	12.32	11.58	45	625.79	11.5624	9/22/2016 12:39	1.00000	1.000
16	405235016.1	1.2470	3.3490E-03	12/8/2015 11:29	0-1	45	634.48	12.18	11.58	45	625.79	11.4934	9/22/2016 13:25	1.00000	1.000
17	405235017.1	1.2350	3.3478E-03	12/2/2015 10:02	0-2	45	629.79	11.24	11.58	45	625.79	11.5567	9/22/2016 14:11	1.00000	1.000
18	405235018.1	1.4210	3.3671E-03	12/2/2015 10:19	0-3	45	631.27	11.72	11.58	45	625.79	11.5410	9/22/2016 14:58	1.00000	1.000
19	405235019.1	1.4000	3.3649E-03	12/8/2015 14:30	0-4	45	629.9	12.11	11.58	45	625.79	11.5557	9/22/2016 15:44	1.00000	1.000
20	405235020.1	1.3930	3.3642E-03	12/8/2015 13:50	0-5	45	630.02	10.78	11.58	45	625.79	11.5545	9/22/2016 16:30	1.00000	1.000
21	1203626105.1	1.5170	3.3771E-03	9/14/2016 0:00	0-6	45	633.77	10.98	11.58	45	625.79	11.5056	9/22/2016 17:16	1.00000	1.000
22	1203626106.1	1.4970	3.3750E-03	12/10/2015 14:20	0-7	45	633.53	10.94	11.58	45	625.79	11.5095	9/22/2016 18:03	1.00000	1.000
23	1203626107.1	1.3550	3.3603E-03	12/10/2015 14:20	59-1	15	632.76	128.5	11.58	45	625.79	11.5213	9/22/2016 18:50	1.00000	1.000
24	1203626108.1	1.5170	3.3771E-03	9/14/2016 0:00	59-2	15	627.94	121.92	11.58	45	625.79	11.5709	9/22/2016 19:06	1.00000	1.000

C1598078

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
Pipet, 0.5 ml Stdev : +/- 0.001000 ml

Analytical SOP: GL-RAD-A-003
Instrument SOP: GL-RAD-I-014

Calibration Data		Calibration	Detector	Detector	Detector	Background	Background
Pos.	Counted on	Date	Due Date	Efficiency (cpm/dpm)	Error (cpm/dpm)	Rack Position #	Count Start Date/Time
1	LSCYELLOW	6/1/2016	5/31/2017	0.6866	0.00792	82-1	9/21/2016 23:52
2	LSCYELLOW	6/1/2016	5/31/2017	0.6872	0.00792	82-1	9/21/2016 23:52
3	LSCYELLOW	6/1/2016	5/31/2017	0.6863	0.00792	82-1	9/21/2016 23:52
4	LSCYELLOW	6/1/2016	5/31/2017	0.6918	0.00792	82-1	9/21/2016 23:52
5	LSCYELLOW	6/1/2016	5/31/2017	0.6863	0.00792	82-1	9/21/2016 23:52
6	LSCYELLOW	6/1/2016	5/31/2017	0.6879	0.00792	82-1	9/21/2016 23:52
7	LSCYELLOW	6/1/2016	5/31/2017	0.6889	0.00792	82-1	9/21/2016 23:52
8	LSCYELLOW	6/1/2016	5/31/2017	0.6874	0.00792	82-1	9/21/2016 23:52
9	LSCYELLOW	6/1/2016	5/31/2017	0.6924	0.00792	82-1	9/21/2016 23:52
10	LSCYELLOW	6/1/2016	5/31/2017	0.6880	0.00792	82-1	9/21/2016 23:52
11	LSCYELLOW	6/1/2016	5/31/2017	0.6879	0.00792	82-1	9/21/2016 23:52
12	LSCYELLOW	6/1/2016	5/31/2017	0.6896	0.00792	82-1	9/21/2016 23:52
13	LSCYELLOW	6/1/2016	5/31/2017	0.6895	0.00792	82-1	9/21/2016 23:52
14	LSCYELLOW	6/1/2016	5/31/2017	0.6892	0.00792	82-1	9/21/2016 23:52
15	LSCYELLOW	6/1/2016	5/31/2017	0.6873	0.00792	82-1	9/21/2016 23:52
16	LSCYELLOW	6/1/2016	5/31/2017	0.6918	0.00792	82-1	9/21/2016 23:52
17	LSCYELLOW	6/1/2016	5/31/2017	0.6879	0.00792	82-1	9/21/2016 23:52
18	LSCYELLOW	6/1/2016	5/31/2017	0.6892	0.00792	82-1	9/21/2016 23:52
19	LSCYELLOW	6/1/2016	5/31/2017	0.6880	0.00792	82-1	9/21/2016 23:52
20	LSCYELLOW	6/1/2016	5/31/2017	0.6881	0.00792	82-1	9/21/2016 23:52
21	LSCYELLOW	6/1/2016	5/31/2017	0.6913	0.00792	82-1	9/21/2016 23:52
22	LSCYELLOW	6/1/2016	5/31/2017	0.6911	0.00792	82-1	9/21/2016 23:52
23	LSCYELLOW	6/1/2016	5/31/2017	0.6905	0.00792	82-1	9/21/2016 23:52
24	LSCYELLOW	6/1/2016	5/31/2017	0.6861	0.00792	82-1	9/21/2016 23:52

Notes:
 * - Results are decay corrected to Sample Date/Time
 * - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 * - Spike Nominals are decay corrected to Sample Date/Time
 * - RPD changed to 0% due to sample & dup activity below MDA

Spike S/N : 1646-B
 Spike Exp Date : 1/5/2017
 Spike Activity (dpm/ml): 1681.40
 Spike Volume Added: 0.10

LCS S/N : 1646-B
 LCS Exp Date : 1/5/2017
 LCS Activity (dpm/ml): 1681.40
 LCS Volume Added: 0.10

Pos.	Decision Level	Critical Level	Required MDA	MDA	Sample Act. Conc.	Sample Act. Error	Net Count Rate	Net Count Rate Error	2 SIGMA Counting Uncertainty	2 SIGMA Total Prop. Uncertainty	Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
1	0.7671	0.5416	2	1.1138	-0.3206	101.15%	-0.6982	0.7061	0.6355	0.6355		SAMPLE				
2	0.7567	0.5342	2	1.0986	-0.0240	1353.38%	-0.0529	0.7161	0.6358	0.6358		SAMPLE				
3	0.7845	0.5538	2	1.1390	-0.3098	107.14%	0.7068	0.7068	0.6504	0.6504		SAMPLE				
4	0.8246	0.5822	2	1.1974	0.2509	142.63%	0.5066	0.7225	0.7013	0.7015		SAMPLE				
5	0.7297	0.5152	2	1.0594	-0.1877	165.31%	-0.4297	0.7104	0.6081	0.6081		SAMPLE				
6	0.8399	0.5930	2	1.2195	0.0922	392.52%	0.1833	0.7195	0.7093	0.7093		SAMPLE				
7	0.8500	0.6001	2	1.2341	-0.2067	174.97%	-0.4058	0.7100	0.7087	0.7087		SAMPLE				
8	0.8742	0.6172	2	1.2692	0.0830	453.59%	0.1586	0.7192	0.7379	0.7379		SAMPLE				
9	0.9280	0.6551	2	1.3475	0.7136	57.35%	1.2799	0.7339	0.8021	0.8038		SAMPLE				
10	0.8327	0.5879	2	1.2090	0.2316	155.88%	0.4643	0.7238	0.7075	0.7077		SAMPLE				
11	0.8174	0.5771	2	1.1868	-0.0917	381.20%	-0.1872	0.7138	0.6848	0.6848		SAMPLE				
12	0.7724	0.5453	2	1.1215	0.3214	104.70%	0.6941	0.7267	0.6595	0.6599		SAMPLE				
13	0.7466	0.5271	2	1.0840	-0.0611	522.47%	-0.1366	0.7139	0.6262	0.6262		SAMPLE				
14	0.7730	0.5457	2	1.1224	-0.0653	506.23%	-0.1410	0.7140	0.6483	0.6483		SAMPLE				
15	0.7217	0.5095	2	1.0478	0.3273	96.17%	0.7576	0.7285	0.6169	0.6174		SAMPLE				
16	0.8696	0.6139	2	1.2627	0.3585	105.64%	0.6866	0.7253	0.7423	0.7428		SAMPLE				
17	0.8855	0.6251	2	1.2856	-0.1679	224.75%	-0.3167	0.7118	0.7397	0.7397		SAMPLE				
18	0.7676	0.5419	2	1.1145	0.0823	401.76%	0.1790	0.7190	0.6482	0.6482		SAMPLE				
19	0.7810	0.5514	2	1.1339	0.2593	130.82%	0.5543	0.7252	0.6648	0.6650		SAMPLE				
20	0.7847	0.5540	2	1.1394	-0.3640	90.96%	-0.7745	0.7045	0.6489	0.6489		SAMPLE				
21	0.7157	0.5053	2	1.0392	-0.2258	134.49%	-0.5256	0.7069	0.5951	0.5951		MB				
22	0.7256	0.5123	2	1.0536	-0.2480	124.03%	-0.5695	0.7063	0.6028	0.6028	405235001.1	DUP		0.0%	55.9010	100.8%
23	1.1353	0.8016	2	1.6994	56.3249	2.67%	116.9787	2.9703	2.8032	4.9756	405235001.1	MS			49.9267	95.6%
24	1.0226	0.7220	2	1.5305	47.7547	2.75%	110.3491	2.8957	2.4562	4.2626		LCS				

PROTOCOL : 4 C-14 45 min
 DATE : 2016/09/21
 TIME : 23:51
 ID : P04AS407

C-14

Wallac 1414 WinSpectral v1.40 S/N 4140127

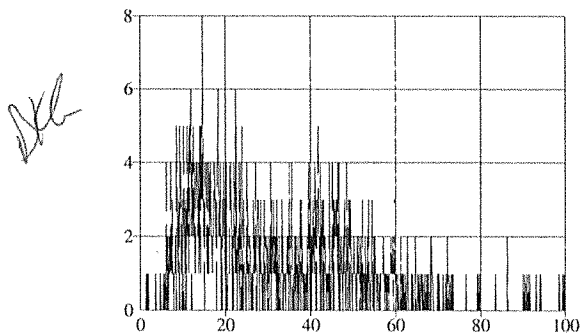
Counting mode : DPM
 Quench index : SQP(E)
 Isotope(s) : C14
 C14 = ,5730.00 y
 Protocol name : C-14 45 min
 Counting time : 2700
 Repeats : 1
 Cycles : 1
 Replicates : 1
 2 sigma % : 2.00
 Minimum cpm : 0.00 Checking time: 10
 Sp. library of isotope C14 : Wallac
 Vial type : Diffuse
 Liquid system : HiSafe
 Advanced modes : Chemilum
 Output to Display :
 POS,DPM1,CPMw2,CLMM,FNCT2,
 RACK,RACKPOS,FNCT1,SQPE,DATE,
 TIME,CPMw1,CPM,CPM1,CTIME
 Additions to Display : Listing,Header,Spectrum
 Header : C-14
 Spectrum : Rnd.Cos,Beta
 Window 1 : 35- 300 /Beta
 Window 2 : 35- 300 /Rnd.Cos
 Window 3 : 1-1024 /Beta
 Window 4 : 1-1024 /Beta
 Window 5 : 1-1024 /Beta
 Window 6 : 1-1024 /Beta
 FNCT1 = FNCT1 : CTIME/60
 FNCT2 = FNCT2 : CPMW1-CPMW2
 FNCT3 = FNCT3 :
 FNCT4 = FNCT4 :

Total activity:

C14 50.8 DPM 0.001 kBq

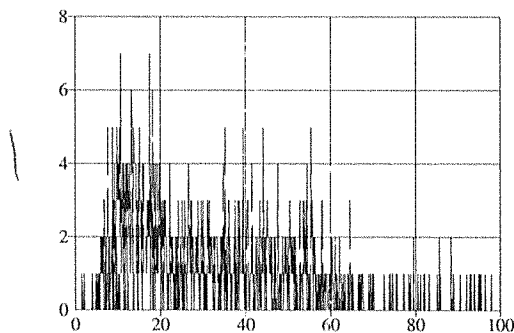
C-14 YELLOW

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
82	1	45.00	625.79	11.58
				9/21/2016 11:52 PM



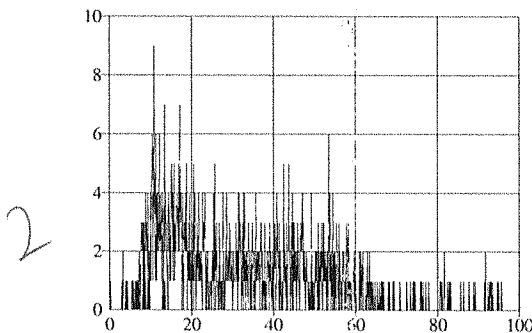
Gross_B_CPM	LUMEX
11.70	0.00
Lumex_CPM	DPM
0.10	13.30

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
82	2	45.00	628.36	10.87
				9/22/2016 0:38 AM



Gross_B_CPM	LUMEX
11.30	0.00
Lumex_CPM	DPM
0.40	11.10

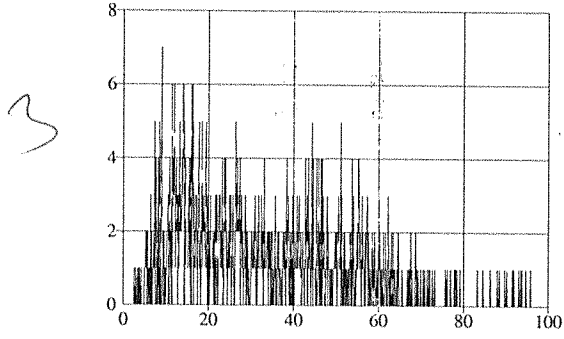
Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
82	3	45.00	629.07	11.51
				9/22/2016 1:25 AM



Gross_B_CPM	LUMEX
11.90	0.00
Lumex_CPM	DPM
0.30	13.30

C-14 YELLOW

Rack_position Count_Time(min) Quench_number C14_CPM Run_Date
82 4 45.00 628.12 10.91 9/22/2016 2:11 AM



Gross_B_CPM LUMEX
11.40 0.00

Lumex_CPM DPM
0.50 13.10

PROTOCOL : 4 C-14 45 min
DATE : 2016/09/22
TIME : 04:09
ID : P04AS408

C-14

Wallac 1414 WinSpectral v1.40 S/N 4140127

Counting mode : DPM
Quench index : SQP(E)
Isotope(s) : C14
 C14 = ,5730.00 y
Protocol name : C-14 45 min
Counting time : 2700
Repeats : 1
Cycles : 1
Replicates : 1
2 sigma % : 2.00
Minimum cpm : 0.00 Checking time: 10
Sp. library of isotope C14 : Wallac
Vial type : Diffuse
Liquid system : HiSafe
Advanced modes : Chemilum
Output to Display :
 POS,DPM1,CPMw2,CLMM,FNCT2,
 RACK,RACKPOS,FNCT1,SQPE,DATE,
 TIME,CPMw1,CPM,CPM1,CTIME
Additions to Display : Listing,Header,Spectrum
Header : C-14
Spectrum : Rnd.Cos,Beta
Window 1 : 35- 300 /Beta
Window 2 : 35- 300 /Rnd.Cos
Window 3 : 1-1024 /Beta
Window 4 : 1-1024 /Beta
Window 5 : 1-1024 /Beta
Window 6 : 1-1024 /Beta
FNCT1 = FNCT1 : CTIME/60
FNCT2 = FNCT2 : CPMW1-CPMW2
FNCT3 = FNCT3 :
FNCT4 = FNCT4 :

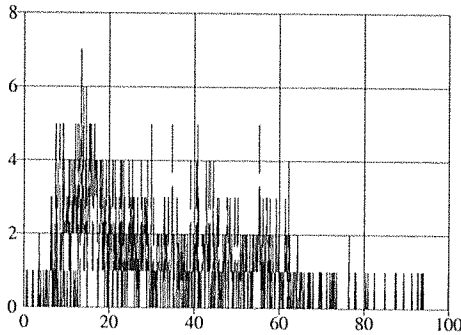
Total activity:

C14 249.5 DPM 0.004 kBq

C-14 YELLOW

Rack_position 87 Count_Time(min) 45.00 Quench_number 634.48 C14_CPM 12.00 Run_Date 9/22/2016 4:10 AM

4

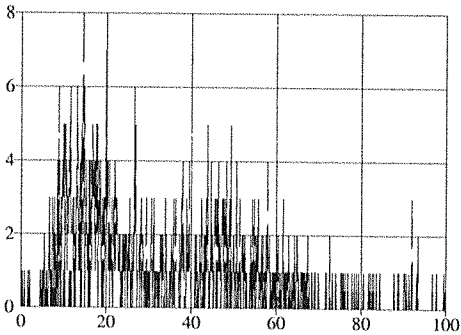


Counts Chem
Counts Beta

Gross_B_CPM 12.50 LUMEX 0.00
Lumex_CPM 0.50 DPM 13.40

Rack_position 87 Count_Time(min) 45.00 Quench_number 628.12 C14_CPM 11.14 Run_Date 9/22/2016 4:56 AM

5

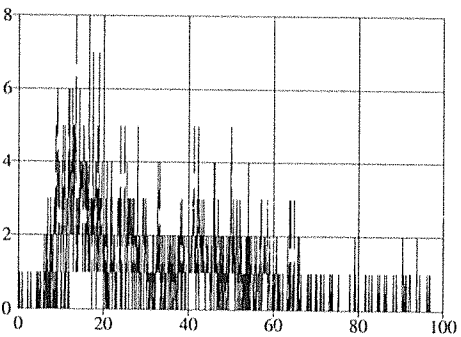


Counts Chem
Counts Beta

Gross_B_CPM 11.60 LUMEX 0.00
Lumex_CPM 0.40 DPM 12.60

Rack_position 87 Count_Time(min) 45.00 Quench_number 629.79 C14_CPM 11.74 Run_Date 9/22/2016 5:42 AM

6



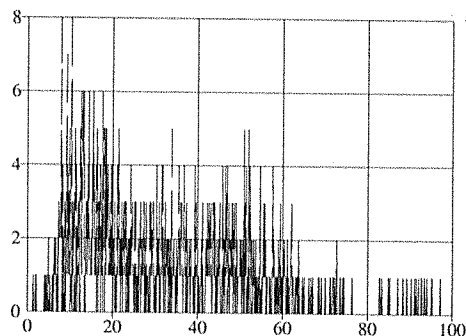
Counts Chem
Counts Beta

Gross_B_CPM 12.20 LUMEX 0.00
Lumex_CPM 0.50 DPM 13.20

C-14 YELLOW

Rack_position 87 Count_Time(min) 45.02 Quench_number 630.86 C14_CPM 11.14 Run_Date 9/22/2016 6:29 AM

7



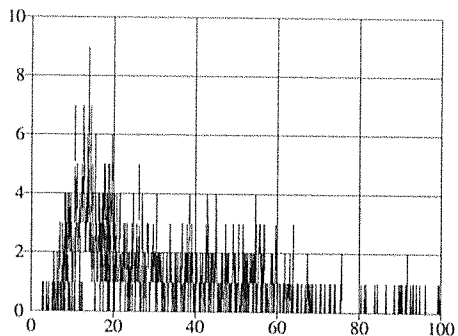
Counts Chem
Counts Beta

Gross_B_CPM 11.50 LUMEX 0.00

Lumex_CPM 0.30 DPM 12.80

Rack_position 87 Count_Time(min) 45.02 Quench_number 629.25 C14_CPM 11.72 Run_Date 9/22/2016 7:15 AM

8



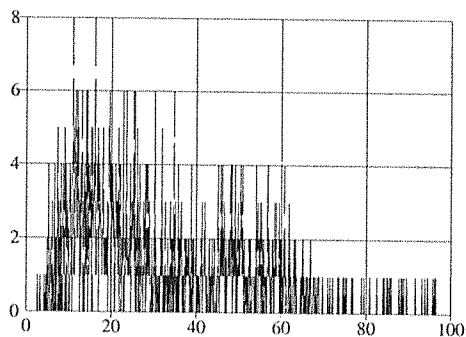
Counts Chem
Counts Beta

Gross_B_CPM 12.00 LUMEX 0.00

Lumex_CPM 0.30 DPM 13.10

Rack_position 87 Count_Time(min) 45.00 Quench_number 635.20 C14_CPM 12.76 Run_Date 9/22/2016 8:01 AM

9



Counts Chem
Counts Beta

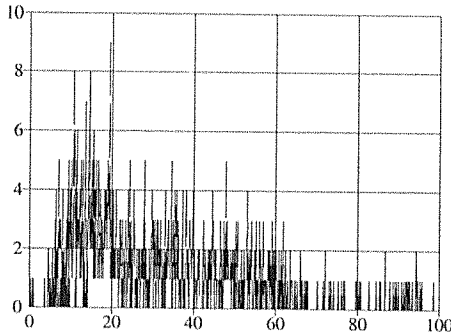
Gross_B_CPM 13.10 LUMEX 0.00

Lumex_CPM 0.30 DPM 14.40

C-14 YELLOW

Rack_position 87 Count_Time(min) 45.00 Quench_number 629.90 C14_CPM 12.02 Run_Date 9/22/2016 8:47 AM

10



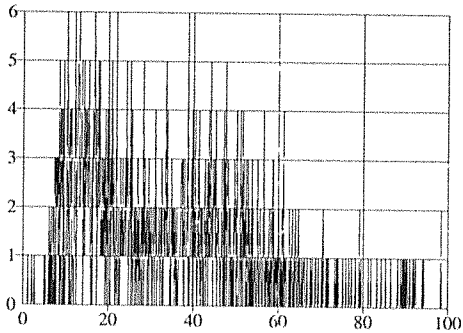
Counts Chem
Counts Beta

Gross_B_CPM 12.40 LUMEX 0.00

Lumex_CPM 0.40 DPM 13.70

Rack_position 87 Count_Time(min) 45.00 Quench_number 629.73 C14_CPM 11.37 Run_Date 9/22/2016 9:34 AM

11



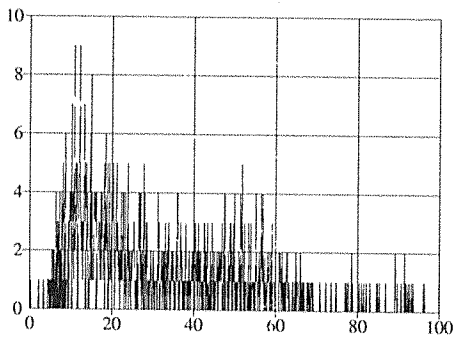
Counts Chem
Counts Beta

Gross_B_CPM 11.80 LUMEX 0.00

Lumex_CPM 0.40 DPM 13.80

Rack_position 87 Count_Time(min) 45.00 Quench_number 631.69 C14_CPM 12.23 Run_Date 9/22/2016 10:20 AM

12



Counts Chem
Counts Beta

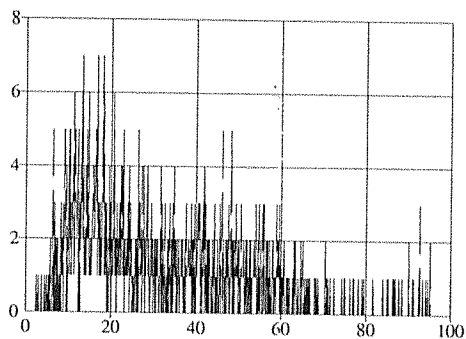
Gross_B_CPM 12.80 LUMEX 0.00

Lumex_CPM 0.60 DPM 13.80

C-14 YELLOW

Rack_position 87 Count_Time(min) 45.00 Quench_number 631.63 C14_CPM 11.40 Run_Date 9/22/2016 11:06 AM

13



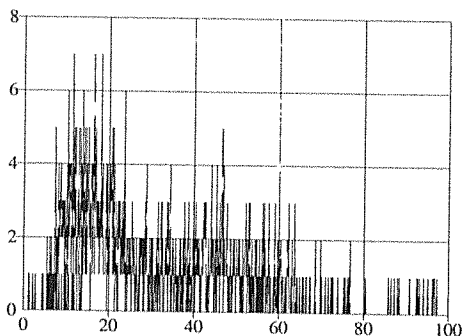
Counts Chem
Counts Beta

Gross_B_CPM 11.70 LUMEX 0.00

Lumex_CPM 0.30 DPM 13.60

Rack_position 87 Count_Time(min) 45.00 Quench_number 631.27 C14_CPM 11.40 Run_Date 9/22/2016 11:52 AM

14



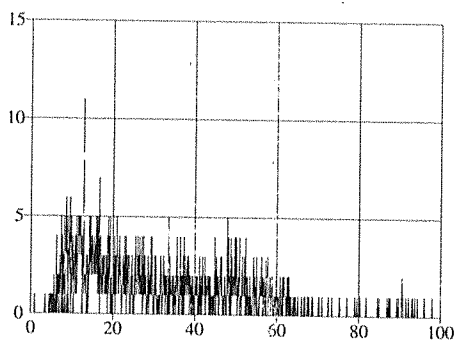
Counts Chem
Counts Beta

Gross_B_CPM 11.90 LUMEX 0.00

Lumex_CPM 0.50 DPM 13.20

Rack_position 87 Count_Time(min) 45.00 Quench_number 629.13 C14_CPM 12.32 Run_Date 9/22/2016 12:39 PM

15



Counts Chem
Counts Beta

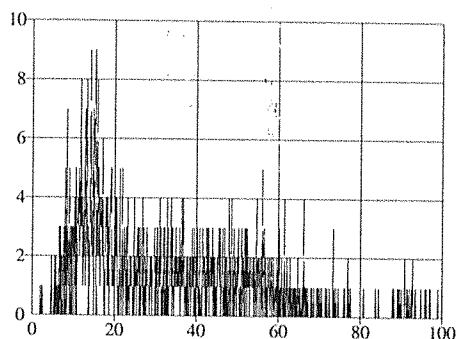
Gross_B_CPM 12.60 LUMEX 0.00

Lumex_CPM 0.30 DPM 14.00

C-14 YELLOW

Rack_position Count_Time(min) Quench_number C14_CPM Run_Date
 0 1 45.00 634.48 12.18 9/22/2016 1:25 PM

16

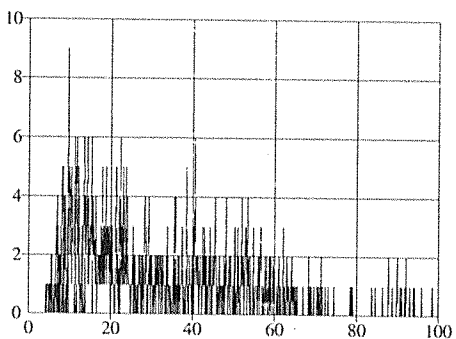


Gross_B_CPM LUMEX
 12.70 0.00

Lumex_CPM DPM
 0.60 12.80

Rack_position Count_Time(min) Quench_number C14_CPM Run_Date
 0 2 45.00 629.79 11.24 9/22/2016 2:11 PM

17

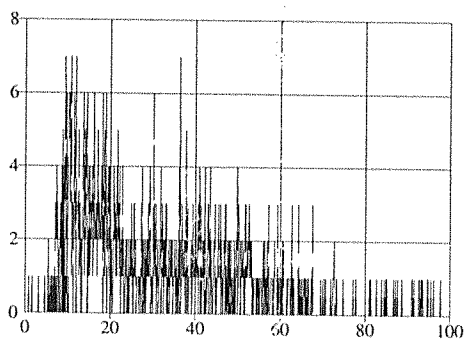


Gross_B_CPM LUMEX
 11.70 0.00

Lumex_CPM DPM
 0.50 12.60

Rack_position Count_Time(min) Quench_number C14_CPM Run_Date
 0 3 45.00 631.27 11.72 9/22/2016 2:58 PM

18



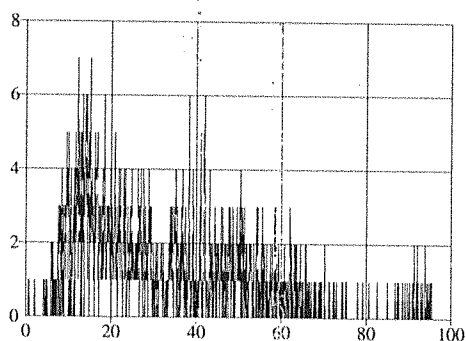
Gross_B_CPM LUMEX
 12.20 0.00

Lumex_CPM DPM
 0.50 12.30

C-14 YELLOW

Rack_position 0 4 Count_Time(min) 45.00 Quench_number 629.90 C14_CPM 12.11 Run_Date 9/22/2016 3:44 PM

19



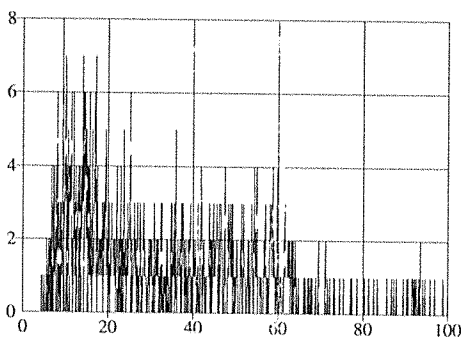
Counts Chem
Counts Beta

Gross_B_CPM 12.60 LUMEX 0.00

Lumex_CPM 0.50 DPM 14.50

Rack_position 0 5 Count_Time(min) 45.00 Quench_number 630.02 C14_CPM 10.78 Run_Date 9/22/2016 4:30 PM

20



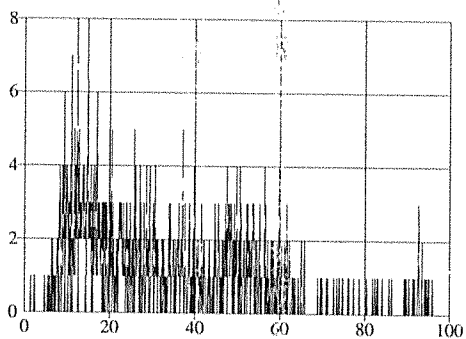
Counts Chem
Counts Beta

Gross_B_CPM 11.30 LUMEX 0.00

Lumex_CPM 0.50 DPM 12.10

Rack_position 0 6 Count_Time(min) 45.00 Quench_number 633.77 C14_CPM 10.98 Run_Date 9/22/2016 5:16 PM

21



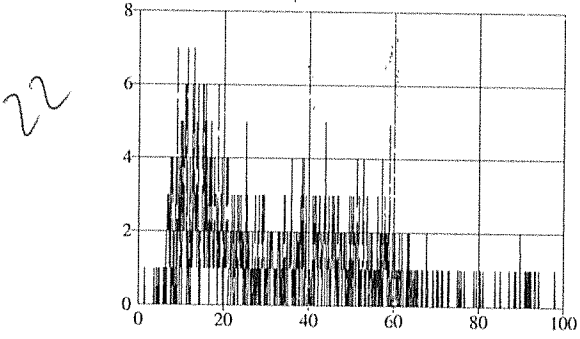
Counts Chem
Counts Beta

Gross_B_CPM 11.20 LUMEX 0.00

Lumex_CPM 0.20 DPM 12.70

C-14 YELLOW

Rack_position Count_Time(min) Quench_number C14_CPM Run_Date
0 7 45.00 633.53 10.94 9/22/2016 6:03 PM



Gross_B_CPM LUMEX
11.30 0.00

Lumex_CPM DPM
0.30 11.20

PROTOCOL : 5 C-14 15 min
 DATE : 2016/09/22
 TIME : 18:49
 ID : P05AS355

C-14

Wallac 1414 WinSpectral v1.40 S/N 4140127

Counting mode : DPM
 Quench index : SQP(E)
 Isotope(s) : C14
 C14 = ,5730.00 y
 Protocol name : C-14 15 min
 Counting time : 900
 Repeats : 1
 Cycles : 1
 Replicates : 1
 2 sigma % : 2.00
 Minimum cpm : 0.00 Checking time: 10
 Sp. library of isotope C14 : Wallac
 Vial type : Diffuse
 Liquid system : HiSafe
 Advanced modes : Chemilum
 Output to Display :
 POS,DPM1,CPMw2,CLMM,FNCT2,
 RACK,RACKPOS,FNCT1,SQPE,DATE,
 TIME,CPMw1,CPM,CPM1,CTIME
 Additions to Display : Listing,Header,Spectrum
 Header : C-14
 Spectrum : Rnd.Cos,Beta
 Window 1 : 35- 300 /Beta
 Window 2 : 35- 300 /Rnd.Cos
 Window 3 : 1-1024 /Beta
 Window 4 : 1-1024 /Beta
 Window 5 : 1-1024 /Beta
 Window 6 : 1-1024 /Beta
 FNCT1 = FNCT1 : CTIME/60
 FNCT2 = FNCT2 : CPMW1-CPMW2
 FNCT3 = FNCT3 :
 FNCT4 = FNCT4 :

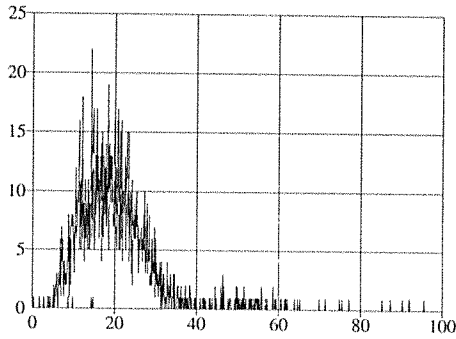
Total activity:

C14	308.8 DPM	0.005 kBq
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C-14 YELLOW

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
59	1	15.00	632.76	9/22/2016 6:50 PM

23

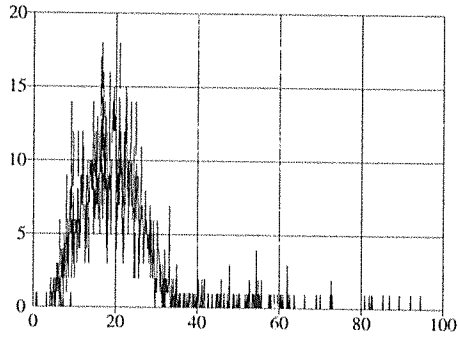


Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
128.80	0.00
Lumex_CPM	DPM
0.30	155.00

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
59	2	15.00	627.94	9/22/2016 7:06 PM

24



Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
122.10	0.00
Lumex_CPM	DPM
0.20	153.80

Batch# 1598080 Product: C-14 Date: 9/26/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			NA
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	DER 1561231
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasued.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER 1561231
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: [Signature]

Secondary Review Performed By: [Signature]

MJWC 10/4/16

DATA EXCEPTION REPORT

Mo.Day Yr. 26-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LSC	Test / Method: EPA EERF C-01 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1598080	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235021, 405235022, 405235023, 405235024, 405235025, 405235026, 405235027, 405235028, 405235029, 405235030, 405235031, 405235032, 405235033, 405235034, 405235035, 405235036, 405235037, 405235038, 405235039, 405235040, 1203626127, and 1203626128 were received and analyzed outside of the method specified hold time.</p>		<p>1. Reporting results.</p>	

Originator's Name:
Lyndsey Pace 26-SEP-16

Data Validator/Group Leader:
Angela Johnson 27-SEP-16

MJWC 10/4/10 70 10/4

Prep Logbook

The Determination of Carbon-14 in Water, Soil, Vegetation and Other Solid Matrices

Batch ID: 1598080
 Analyst: Tiffany Jordan
 Method: EPA EERF C-01 Modified
 Lab SOP: GL-RAD-A-003 REV# 15
 Instrument: BAL-16107662

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
LCS	1203626129	Carbon-14 SPIKE	1646-B	.1	mL
MS	1203626128	Carbon-14 SPIKE	1646-B	.1	mL

Sample ID	Prep Date	Matrix	Dry or Wet	Unadjusted Aliquot (g)	Aliquot (g)	Flask #
405235021	21-SEP-2016 15:56:10	Soil	W	1.257	1.049	1
405235022	21-SEP-2016 15:56:10	Soil	W	1.343	1.083	2
405235023	21-SEP-2016 15:56:10	Soil	W	1.264	0.979	3
405235024	21-SEP-2016 15:56:10	Soil	W	1.363	1.099	4
405235025	21-SEP-2016 15:56:10	Soil	W	1.282	1.008	5
405235026	21-SEP-2016 15:56:10	Soil	W	1.276	1.064	6
405235027	21-SEP-2016 15:56:10	Soil	W	1.338	1.095	8
405235028	21-SEP-2016 15:56:10	Soil	W	1.33	1.028	83
405235029	21-SEP-2016 15:56:10	Soil	W	1.446	1.167	84
405235030	21-SEP-2016 15:56:10	Soil	W	1.254	0.954	86
405235031	21-SEP-2016 15:56:10	Soil	W	1.311	1.015	400
405235032	21-SEP-2016 15:56:10	Soil	W	1.371	1.092	402
405235033	21-SEP-2016 15:56:10	Soil	W	1.36	1.12	404
405235034	21-SEP-2016 15:56:10	Soil	W	1.347	1.083	405
405235035	21-SEP-2016 15:56:10	Soil	W	1.311	1.098	406
405235036	21-SEP-2016 15:56:10	Soil	W	1.286	1.058	506
405235037	21-SEP-2016 15:56:10	Soil	W	1.31	1.228	507
405235038	21-SEP-2016 15:56:10	Soil	W	1.392	1.164	514
405235039	21-SEP-2016 15:56:10	Soil	W	1.359	1.241	519
405235040	21-SEP-2016 15:56:10	Soil	W	1.259	1.073	530
1203626126 MB	21-SEP-2016 15:56:10	Soil	W	1.318	1.241	706
1203626127 DUP (405235021)	21-SEP-2016 15:56:10	Soil	W	1.288	1.1	708
1203626128 MS (405235021)	21-SEP-2016 15:56:10	Soil	W	1.288	1.075	729
1203626129 LCS	21-SEP-2016 15:56:10	Soil	W		1.241	733

Reagent/Solvent Lot ID	Description	Amount	Comments:
22423505.2	Ecosint A Scintillation Solution	10 mL	Spike Pipet ID: RAD-LSC-2970968
24460076.3	Potassium Persulfate 99+%	5 g	
2440953	RL-0.4M Hydrochloric Acid	50 mL	
2444293.4	Methanol 4L Plastic Bottle	9 mL	
2454859.17	16M Nitric Acid Poly Coated Bottle	25 mL	
2455949	RL-1M Silver Nitrate	2 mL	

Carbon-14 Solid

Filename : C14.XLS
 File type : Excel
 Version # : 1.3.10

Batch : 1598080
 Analyst : TIF02034
 Prep Date : 9/21/2016
 Method Uncertainty : 0.0363

Procedure Code : LSC_14CS
 Carbon-14
 2 pCi/G
 Required MDA : 1.00
 C-14 Abundance : 5700.00
 Half-life of Carbon-14 : years

Geometry: 3mL Ethanolamine/9mL Methanol/10mL EcoScint A

Pos.	Sample Characteristics			Counting Data				Count raw Data				Sample Decay		
	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G	Sample Date/Time	Rack Position #	Counting Time (min.)	Quench#	Gross cpm	Bkg cpm	Bkg Count Time (min.)	Corrected Bkg Quench#		Count Start Date/Time	C-14 Normalization Factor
1	405235021.1	1.0490	3.3284E-03	12/8/2015 14:17	91-2	70	627.64	11.47	11.14	70	625.67	11.1323	9/23/2016 8:39	1.00000
2	405235022.1	1.0830	3.3320E-03	12/8/2015 13:43	91-3	70	632.05	12.21	11.14	70	625.67	11.0909	9/23/2016 9:50	1.00000
3	405235023.1	0.9790	3.3212E-03	12/2/2015 10:40	91-4	70.0166702	631.87	11.87	11.14	70	625.67	11.0933	9/23/2016 11:02	1.00000
4	405235024.1	1.0990	3.3336E-03	12/8/2015 14:13	91-5	70	632.23	12.12	11.14	70	625.67	11.0885	9/23/2016 12:13	1.00000
5	405235025.1	1.0080	3.3242E-03	12/8/2015 13:38	91-6	70	630.8	11.99	11.14	70	625.67	11.1062	9/23/2016 13:24	1.00000
6	405235026.1	1.0640	3.3300E-03	12/8/2015 10:15	91-7	70	627.16	11.96	11.14	70	625.67	11.1348	9/23/2016 14:35	1.00000
7	405235027.1	1.0950	3.3332E-03	12/8/2015 10:19	91-8	70	629.67	12	11.14	70	625.67	11.1175	9/23/2016 15:47	1.00000
8	405235028.1	1.0280	3.3263E-03	11/23/2015 14:50	91-9	70	632.11	11.71	11.14	70	625.67	11.0901	9/23/2016 16:58	1.00000
9	405235029.1	1.1670	3.3407E-03	11/23/2015 11:10	91-10	70	634.66	11.56	11.14	70	625.67	11.0499	9/23/2016 18:09	1.00000
10	405235030.1	0.9540	3.3185E-03	11/23/2015 14:44	91-11	70	629.84	11.25	11.14	70	625.67	11.1159	9/23/2016 19:20	1.00000
11	405235031.1	1.0150	3.3249E-03	11/26/2015 14:25	91-12	70	632.34	11.83	11.14	70	625.67	11.0870	9/23/2016 20:32	1.00000
12	405235032.1	1.0920	3.3299E-03	11/23/2015 11:48	0-1	70	630.98	11.89	11.14	70	625.67	11.1041	9/23/2016 21:43	1.00000
13	405235033.1	1.1200	3.3358E-03	11/23/2015 11:53	0-2	70	629.13	11.32	11.14	70	625.67	11.1221	9/23/2016 22:54	1.00000
14	405235034.1	1.0830	3.3320E-03	11/23/2015 11:20	0-3	70	631.93	11.68	11.14	70	625.67	11.0925	9/24/2016 0:05	1.00000
15	405235035.1	1.0980	3.3335E-03	11/23/2015 11:06	59-1	70	631.69	11.67	11.14	70	625.67	11.0956	9/24/2016 3:41	1.00000
16	405235036.1	1.0580	3.3294E-03	11/23/2015 11:12	59-2	70	633.77	11.77	11.14	70	625.67	11.0653	9/24/2016 4:52	1.00000
17	405235037.1	1.2280	3.3471E-03	11/30/2015 11:19	59-3	70	632.88	11.22	11.14	70	625.67	11.0793	9/24/2016 6:03	1.00000
18	405235038.1	1.1640	3.3404E-03	11/30/2015 10:40	59-4	70	629.96	12.36	11.14	70	625.67	11.1148	9/24/2016 7:14	1.00000
19	405235039.1	1.2410	3.3484E-03	11/30/2015 10:43	59-5	70	631.51	11.48	11.14	70	625.67	11.0979	9/24/2016 8:26	1.00000
20	405235040.1	1.0730	3.3309E-03	11/30/2015 13:23	59-6	70	630.74	11.56	11.14	70	625.67	11.1068	9/24/2016 9:37	1.00000
21	1203626126.1	1.2410	3.3484E-03	9/21/2016 0:00	59-7	70	632.17	11.66	11.14	70	625.67	11.0893	9/24/2016 10:48	1.00000
22	1203626127.1	1.1000	3.3337E-03	12/8/2015 14:17	59-8	70	633.77	10.79	11.14	70	625.67	11.0909	9/24/2016 11:59	1.00000
23	1203626128.1	1.0750	3.3311E-03	12/8/2015 14:17	59-9	70	632.05	128.55	11.14	70	625.67	11.0909	9/24/2016 11:59	1.00000
24	1203626129.1	1.2410	3.3484E-03	9/21/2016 0:00	59-10	70	631.33	129.06	11.14	70	625.67	11.1000	9/24/2016 13:11	1.00000

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml

Analytical SOP: GL-RAD-A-003
 Instrument SOP: GL-RAD-I-014

Calibration Data		Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Background Rack Position #	Background Count Start Date/Time
1	LSCYELLOW	6/1/2016	5/31/2017	0.6858	0.00792	91-1	9/23/2016 7:28	
2	LSCYELLOW	6/1/2016	5/31/2017	0.6899	0.00792	91-1	9/23/2016 7:28	
3	LSCYELLOW	6/1/2016	5/31/2017	0.6898	0.00792	91-1	9/23/2016 7:28	
4	LSCYELLOW	6/1/2016	5/31/2017	0.6901	0.00792	91-1	9/23/2016 7:28	
5	LSCYELLOW	6/1/2016	5/31/2017	0.6888	0.00792	91-1	9/23/2016 7:28	
6	LSCYELLOW	6/1/2016	5/31/2017	0.6854	0.00792	91-1	9/23/2016 7:28	
7	LSCYELLOW	6/1/2016	5/31/2017	0.6878	0.00792	91-1	9/23/2016 7:28	
8	LSCYELLOW	6/1/2016	5/31/2017	0.6900	0.00792	91-1	9/23/2016 7:28	
9	LSCYELLOW	6/1/2016	5/31/2017	0.6920	0.00792	91-1	9/23/2016 7:28	
10	LSCYELLOW	6/1/2016	5/31/2017	0.6880	0.00792	91-1	9/23/2016 7:28	
11	LSCYELLOW	6/1/2016	5/31/2017	0.6901	0.00792	91-1	9/23/2016 7:28	
12	LSCYELLOW	6/1/2016	5/31/2017	0.6890	0.00792	91-1	9/23/2016 7:28	
13	LSCYELLOW	6/1/2016	5/31/2017	0.6873	0.00792	91-1	9/23/2016 7:28	
14	LSCYELLOW	6/1/2016	5/31/2017	0.6898	0.00792	91-1	9/23/2016 7:28	
15	LSCYELLOW	6/1/2016	5/31/2017	0.6896	0.00792	91-1	9/23/2016 7:28	
16	LSCYELLOW	6/1/2016	5/31/2017	0.6913	0.00792	91-1	9/23/2016 7:28	
17	LSCYELLOW	6/1/2016	5/31/2017	0.6906	0.00792	91-1	9/23/2016 7:28	
18	LSCYELLOW	6/1/2016	5/31/2017	0.6881	0.00792	91-1	9/23/2016 7:28	
19	LSCYELLOW	6/1/2016	5/31/2017	0.6894	0.00792	91-1	9/23/2016 7:28	
20	LSCYELLOW	6/1/2016	5/31/2017	0.6888	0.00792	91-1	9/23/2016 7:28	
21	LSCYELLOW	6/1/2016	5/31/2017	0.6900	0.00792	91-1	9/23/2016 7:28	
22	LSCYELLOW	6/1/2016	5/31/2017	0.6913	0.00792	91-1	9/23/2016 7:28	
23	LSCYELLOW	6/1/2016	5/31/2017	0.6899	0.00792	91-1	9/23/2016 7:28	
24	LSCYELLOW	6/1/2016	5/31/2017	0.6893	0.00792	91-1	9/23/2016 7:28	

Notes:
 * - Results are decay corrected to Sample Date/Time
 * - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 * - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : 1646-B
 Spike Exp Date : 1/5/2017
 Spike Activity (dpm/ml): 1681.40
 Spike Volume Added: 0.10

LCS S/N : 1646-B
 LCS Exp Date : 1/5/2017
 LCS Activity (dpm/ml): 1681.40
 LCS Volume Added: 0.10

* - RPD changed to 0% due to sample & dup activity below MDA

Pos.	Decision Level pCi/G	Critical Level pCi/G	Required MDA pCi/G	MDA pCi/G	Sample Conc. pCi/G	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA		Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
									Counting Uncertainty pCi/G	Total Prop. Uncertainty pCi/G						
1	0.8228	0.5809	2	1.1887	0.2114	168.27%	0.3377	0.5682	0.6974	0.6976		SAMPLE				
2	0.7908	0.5583	2	1.1425	0.6747	51.56%	1.1191	0.5769	0.6818	0.6836		SAMPLE				
3	0.8751	0.6178	2	1.2642	0.5182	73.74%	0.7767	0.5727	0.7489	0.7498		SAMPLE				
4	0.7791	0.5500	2	1.1255	0.6127	55.83%	1.0315	0.5758	0.6704	0.6719		SAMPLE				
5	0.8516	0.6012	2	1.2302	0.5735	65.00%	0.8838	0.5744	0.7305	0.7317		SAMPLE				
6	0.8119	0.5732	2	1.1729	0.5098	69.61%	0.8252	0.5744	0.6955	0.6965		SAMPLE				
7	0.7855	0.5546	2	1.1347	0.5279	65.12%	0.8825	0.5747	0.6737	0.6748		SAMPLE				
8	0.8330	0.5881	2	1.2035	0.3937	92.07%	0.6199	0.5707	0.7105	0.7111		SAMPLE				
9	0.7304	0.5156	2	1.0552	0.2846	111.42%	0.5101	0.5683	0.6214	0.6218		SAMPLE				
10	0.9013	0.6363	2	1.3021	0.0920	421.66%	0.1341	0.5653	0.7605	0.7605		SAMPLE				
11	0.8434	0.5954	2	1.2184	0.4778	77.01%	0.7430	0.5722	0.7212	0.7221		SAMPLE				
12	0.7858	0.5548	2	1.1353	0.4706	72.94%	0.7859	0.5731	0.6726	0.6735		SAMPLE				
13	0.7687	0.5427	2	1.1105	0.1158	266.17%	0.1979	0.5662	0.6495	0.6495		SAMPLE				
14	0.7910	0.5585	2	1.1427	0.3543	97.09%	0.5875	0.5704	0.6741	0.6746		SAMPLE				
15	0.7805	0.5511	2	1.1276	0.3417	99.29%	0.5744	0.5703	0.6650	0.6655		SAMPLE				
16	0.8070	0.5697	2	1.1658	0.4341	81.06%	0.7047	0.5712	0.6895	0.6903		SAMPLE				
17	0.6964	0.4917	2	1.0061	0.0748	401.01%	0.1407	0.5644	0.5877	0.5877		SAMPLE				
18	0.7385	0.5214	2	1.0669	0.7004	46.51%	1.2452	0.5791	0.6384	0.6405		SAMPLE				
19	0.6908	0.4877	2	0.9980	0.2012	148.62%	0.3821	0.5679	0.5861	0.5863		SAMPLE				
20	0.8001	0.5649	2	1.1558	0.2762	125.57%	0.4532	0.5690	0.6799	0.6802		SAMPLE				
21	0.6899	0.4871	2	0.9967	0.3002	99.90%	0.5707	0.5701	0.5878	0.5882		MB				
22	0.7761	0.5480	2	1.1213	-0.1631	202.96%	-0.2753	0.5588	0.6488	0.6488	405235021.1	DUP	* 0.0%	70.4613	101.3%	
23	0.7967	0.5625	2	1.1510	71.3477	1.47%	117.4591	1.4124	1.6815	5.4782	405235021.1	MS		61.0304	101.8%	
24	0.6910	0.4878	2	0.9982	62.1167	1.46%	117.9600	1.4150	1.4605	4.7647		LCS				

PROTOCOL : 5 C-14 70 min
 DATE : 2016/09/23
 TIME : 07:27
 ID : P05AS356

C-14

Wallac 1414 WinSpectral v1.40 S/N 4140127

Counting mode : DPM
 Quench index : SQP(E)
 Isotope(s) : C14
 C14 = ,5730.00 y
 Protocol name : C-14 70 min
 Counting time : 4200
 Repeats : 1
 Cycles : 1
 Replicates : 1
 2 sigma % : 2.00
 Minimum cpm : 0.00 Checking time: 10
 Sp. library of isotope C14 : Wallac
 Vial type : Diffuse
 Liquid system : HiSafe
 Advanced modes : Chemilum
 Output to Display :
 POS,DPM1,CPMw2,CLMM,FNCT2,
 RACK,RACKPOS,FNCT1,SQPE,DATE,
 TIME,CPMw1,CPM,CPM1,CTIME
 Additions to Display : Listing,Header,Spectrum
 Header : C-14
 Spectrum : Rnd.Cos,Beta
 Window 1 : 35- 300 /Beta
 Window 2 : 35- 300 /Rnd.Cos
 Window 3 : 1-1024 /Beta
 Window 4 : 1-1024 /Beta
 Window 5 : 1-1024 /Beta
 Window 6 : 1-1024 /Beta
 FNCT1 = FNCT1 : CTIME/60
 FNCT2 = FNCT2 : CPMW1-CPMW2
 FNCT3 = FNCT3 :
 FNCT4 = FNCT4 :

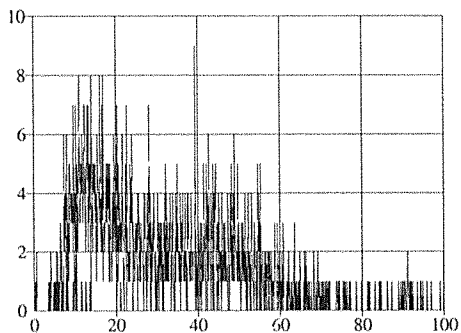
Total activity:

C14	194.6 DPM	0.003 kBq
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C-14 YELLOW

Rack_position 91 Count_Time(min) 70.00 Quench_number 625.67 C14_CPM 11.14 Run_Date 9/23/2016 7:28 AM

DKK

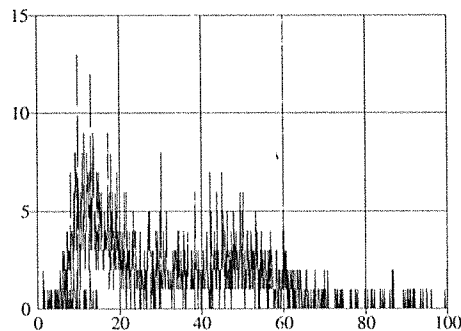


Counts Chem
Counts Beta

Gross_B_CPM 11.50 LUMEX 0.00
Lumex_CPM 0.30 DPM 13.40

Rack_position 91 Count_Time(min) 70.00 Quench_number 627.64 C14_CPM 11.47 Run_Date 9/23/2016 8:39 AM

1

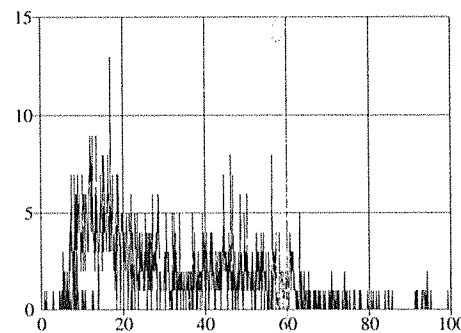


Counts Chem
Counts Beta

Gross_B_CPM 12.00 LUMEX 0.00
Lumex_CPM 0.50 DPM 12.50

Rack_position 91 Count_Time(min) 70.00 Quench_number 632.05 C14_CPM 12.21 Run_Date 9/23/2016 9:50 AM

2

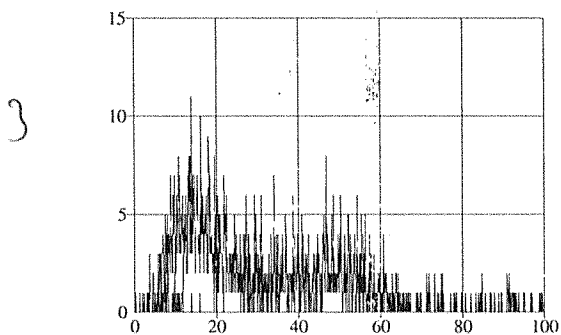


Counts Chem
Counts Beta

Gross_B_CPM 12.70 LUMEX 0.00
Lumex_CPM 0.50 DPM 13.90

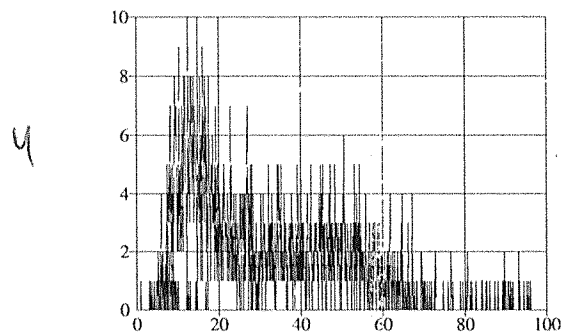
C-14 YELLOW

Rack_position 91 Count_Time(min) 70.02 Quench_number 631.87 C14_CPM 11.87 Run_Date 9/23/2016 11:02 AM



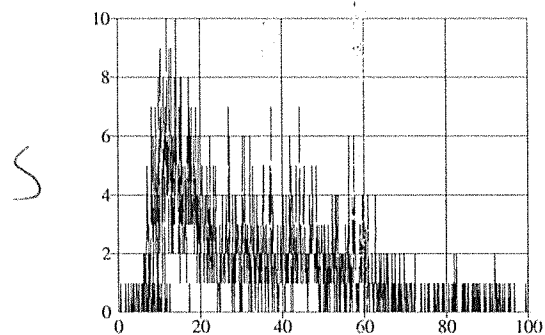
Gross_B_CPM 12.40 LUMEX 0.00
Lumex_CPM 0.60 DPM 13.10

Rack_position 91 Count_Time(min) 70.00 Quench_number 632.23 C14_CPM 12.12 Run_Date 9/23/2016 12:13 PM



Gross_B_CPM 12.60 LUMEX 0.00
Lumex_CPM 0.50 DPM 13.60

Rack_position 91 Count_Time(min) 70.00 Quench_number 630.80 C14_CPM 11.99 Run_Date 9/23/2016 1:24 PM

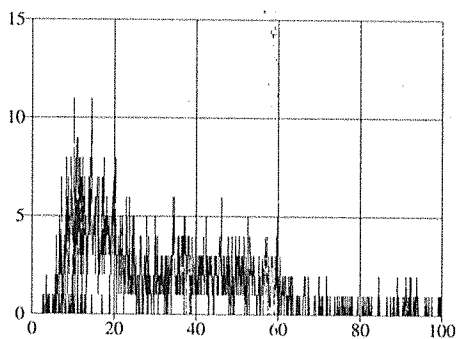


Gross_B_CPM 12.30 LUMEX 0.00
Lumex_CPM 0.30 DPM 13.40

C-14 YELLOW

Rack_position 91 Count_Time(min) 70.00 Quench_number 627.16 C14_CPM 11.96 Run_Date 9/23/2016 2:35 PM

6

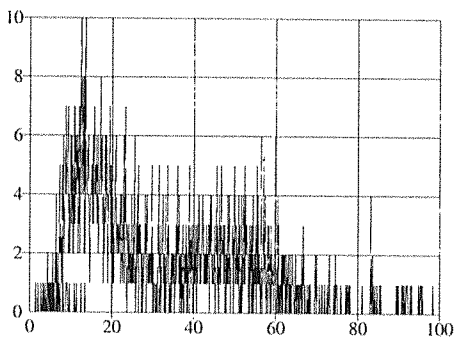


Counts Chem
Counts Beta

Gross_B_CPM 12.50 LUMEX 0.00
Lumex_CPM 0.50 DPM 13.20

Rack_position 91 Count_Time(min) 70.00 Quench_number 629.67 C14_CPM 12.00 Run_Date 9/23/2016 3:47 PM

7

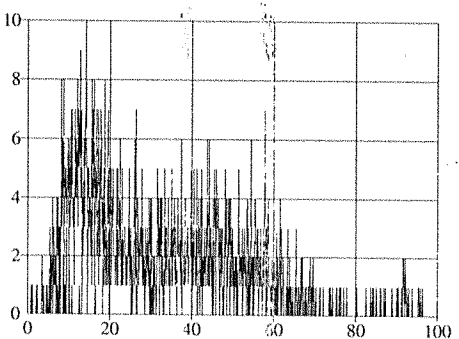


Counts Chem
Counts Beta

Gross_B_CPM 12.30 LUMEX 0.00
Lumex_CPM 0.30 DPM 13.00

Rack_position 91 Count_Time(min) 70.00 Quench_number 632.11 C14_CPM 11.71 Run_Date 9/23/2016 4:58 PM

8

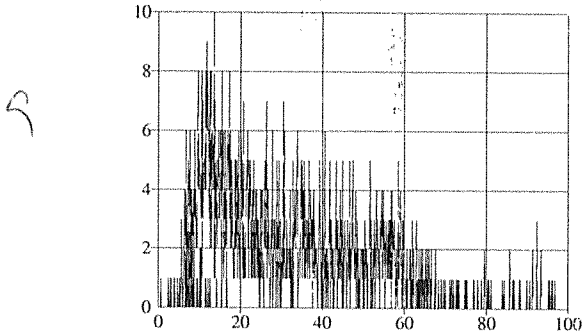


Counts Chem
Counts Beta

Gross_B_CPM 12.10 LUMEX 0.00
Lumex_CPM 0.40 DPM 12.70

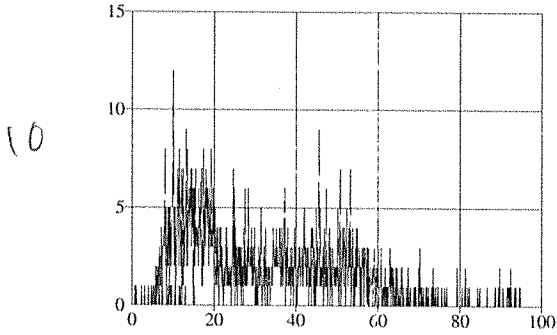
C-14 YELLOW

Rack_position 91 Count_Time(min) 70.00 Quench_number 634.66 C14_CPM 11.56 Run_Date 9/23/2016 6:09 PM



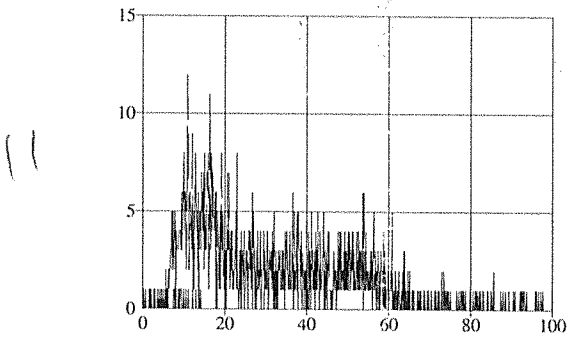
Gross_B_CPM 12.00 LUMEX 0.00
Lumex_CPM 0.50 DPM 13.30

Rack_position 91 Count_Time(min) 70.00 Quench_number 629.84 C14_CPM 11.25 Run_Date 9/23/2016 7:20 PM



Gross_B_CPM 11.60 LUMEX 0.00
Lumex_CPM 0.30 DPM 12.40

Rack_position 91 Count_Time(min) 70.00 Quench_number 632.34 C14_CPM 11.83 Run_Date 9/23/2016 8:32 PM

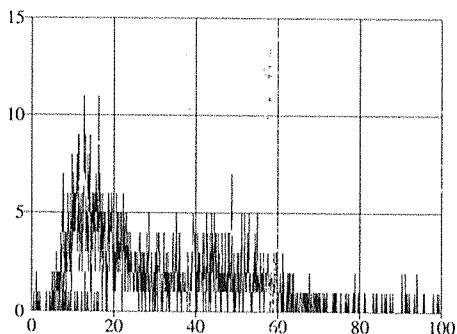


Gross_B_CPM 12.10 LUMEX 0.00
Lumex_CPM 0.30 DPM 12.60

C-14 YELLOW

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
0 1	70.00	630.98	11.89	9/23/2016 9:43 PM

12

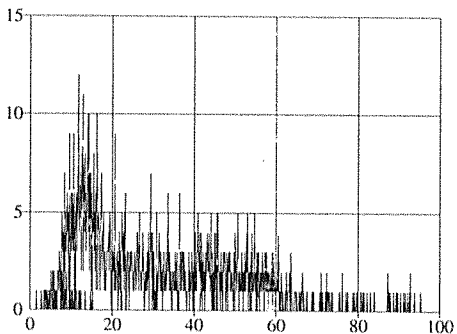


Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
12.30	0.00
Lumex_CPM	DPM
0.40	13.00

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
0 2	70.00	629.13	11.32	9/23/2016 10:54 PM

13

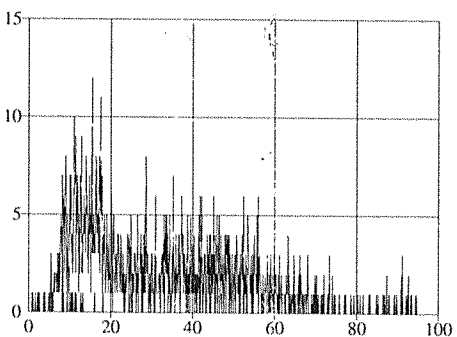


Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
11.80	0.00
Lumex_CPM	DPM
0.50	12.30

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
0 3	70.00	631.93	11.68	9/24/2016 0:05 AM

14



Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
12.00	0.00
Lumex_CPM	DPM
0.30	12.20

1598080

C-14 YELLOW

PROTOCOL : 5 C-14 70 min
DATE : 2016/09/24
TIME : 02:29
ID : P05AS357

C-14

Wallac 1414 WinSpectral v1.40 S/N 4140127

Counting mode : DPM
Quench index : SQP(E)
Isotope(s) : C14
C14 = ,5730.00 y
Protocol name : C-14 70 min
Counting time : 4200
Repeats : 1
Cycles : 1
Replicates : 1
2 sigma % : 2.00
Minimum cpm : 0.00 Checking time: 10
Sp. library of isotope C14 : Wallac
Vial type : Diffuse
Liquid system : HiSafe
Advanced modes : Chemilum
Output to Display :
POS,DPM1,CPMw2,CLMM,FNCT2,
RACK,RACKPOS,FNCT1,SQPE,DATE,
TIME,CPMw1,CPM,CPM1,CTIME
Additions to Display : Listing,Header,Spectrum
Header : C-14
Spectrum : Rnd.Cos,Beta
Window 1 : 35- 300 /Beta
Window 2 : 35- 300 /Rnd.Cos
Window 3 : 1-1024 /Beta
Window 4 : 1-1024 /Beta
Window 5 : 1-1024 /Beta
Window 6 : 1-1024 /Beta
FNCT1 = FNCT1 : CTIME/60
FNCT2 = FNCT2 : CPMW1-CPMW2
FNCT3 = FNCT3 :
FNCT4 = FNCT4 :

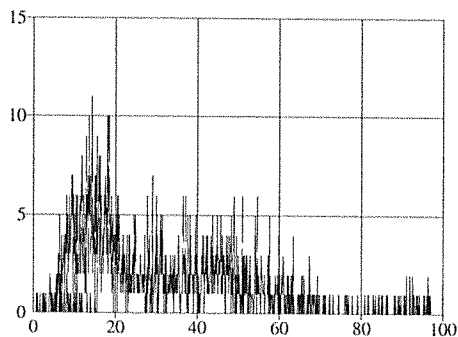
Total activity:

C14 431.2 DPM 0.007 kBq

C-14 YELLOW

Rack_position 59 1 Count_Time(min) 70.00 Quench_number 631.69 C14_CPM 11.67 Run_Date 9/24/2016 2:29 AM

15

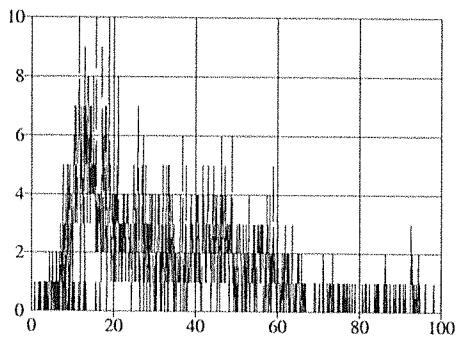


Counts Chem
Counts Beta

Gross_B_CPM 12.20 LUMEX 0.00
Lumex_CPM 0.50 DPM 12.80

Rack_position 59 2 Count_Time(min) 70.00 Quench_number 633.77 C14_CPM 11.77 Run_Date 9/24/2016 3:41 AM

16

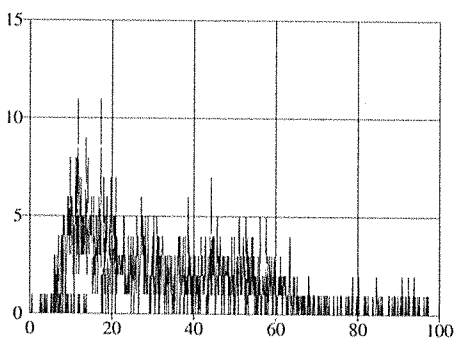


Counts Chem
Counts Beta

Gross_B_CPM 12.20 LUMEX 0.00
Lumex_CPM 0.40 DPM 14.20

Rack_position 59 3 Count_Time(min) 70.00 Quench_number 632.88 C14_CPM 11.22 Run_Date 9/24/2016 4:52 AM

17



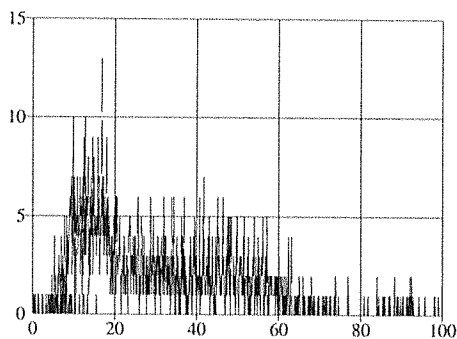
Counts Chem
Counts Beta

Gross_B_CPM 11.60 LUMEX 0.00
Lumex_CPM 0.40 DPM 12.80

C-14 YELLOW

18

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
59	4	70.00	12.36	9/24/2016 6:03 AM

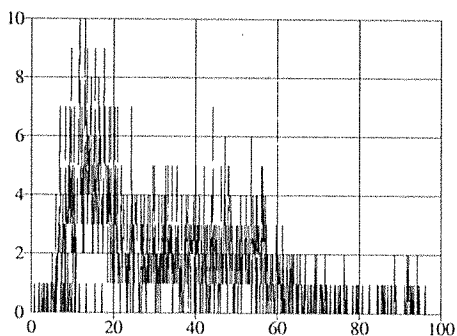


Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
12.80	0.00
Lumex_CPM	DPM
0.40	14.40

19

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
59	5	70.00	11.48	9/24/2016 7:14 AM

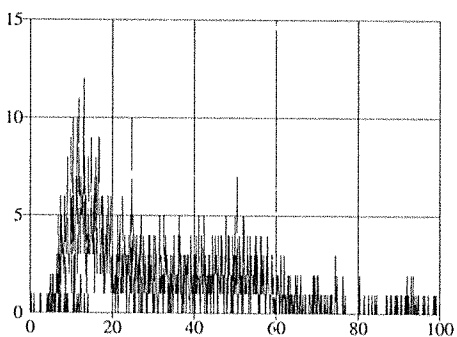


Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
11.80	0.00
Lumex_CPM	DPM
0.30	12.60

20

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
59	6	70.00	11.56	9/24/2016 8:26 AM



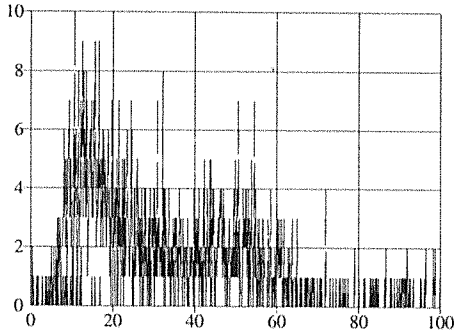
Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
11.90	0.00
Lumex_CPM	DPM
0.40	12.10

C-14 YELLOW

21

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
59	7	70.00	632.17	9/24/2016 9:37 AM

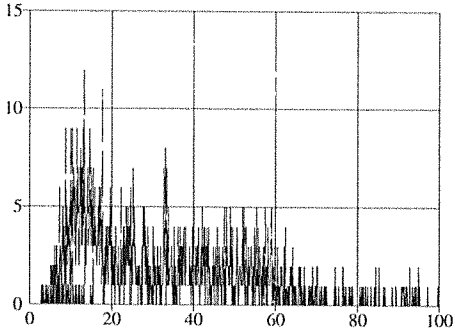


Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
12.20	0.00
Lumex_CPM	DPM
0.50	13.70

22

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
59	8	70.00	633.77	9/24/2016 10:48 AM

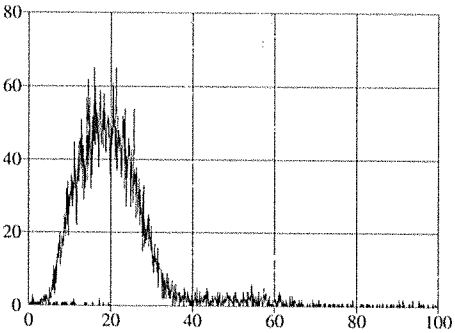


Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
11.30	0.00
Lumex_CPM	DPM
0.50	11.40

23

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
59	9	70.00	632.05	9/24/2016 11:59 AM



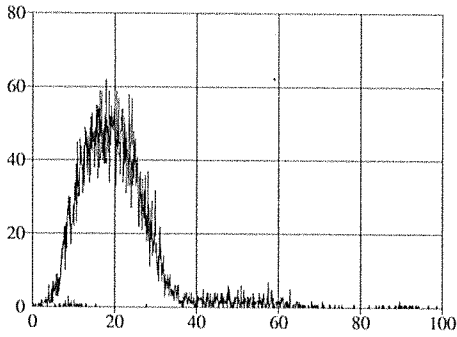
Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
128.90	0.00
Lumex_CPM	DPM
0.40	163.20

C-14 YELLOW

Rack_position Count_Time(min) Quench_number C14_CPM Run_Date
59 10 70.00 631.33 129.06 9/24/2016 1:11 PM

24



Gross_B_CPM LUMEX
129.50 0.00

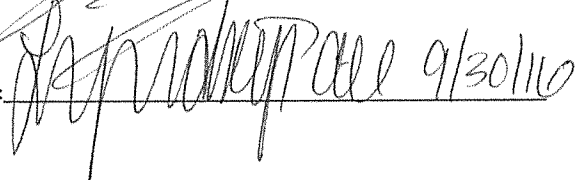
Lumex_CPM DPM
0.40 164.00

Batch# 1598082 Product: 44 Date: 9/30/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			NA
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.		✓	See DER 1563139
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasued.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER 1563139
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		DER 1563139
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: 

MSWC

Secondary Review Performed By:  9/30/16

10/4

DATA EXCEPTION REPORT

Mo.Day Yr. 30-SEP-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LSC	Test / Method: EPA EERF C-01 Modified	Matrix Type: Solid	Client Code: MJWC
Batch ID: 1598082	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 405235			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Samples 405235061, 405235062, 405235063, 405235064, 405235065, 405235066, 405235067, 405235068, 405235069, 405235070, 405235071, 405235072, 405235073, 405235074, 405235075, 405235076, 405235077, 405235078, 1203626114, and 1203626115 were received and analyzed out of method specified hold time.</p>		<p>1. Reporting results.</p>	

Originator's Name:

Elizabeth Krouse 30-SEP-16

Data Validator/Group Leader:

Lyndsey Pace 30-SEP-16

Prep Logbook

The Determination of Carbon-14 in Water, Soil, Vegetation and Other Solid Matrices

Batch ID: 1598082
 Analyst: Tiffany Jordan
 Method: EPA EERF C-01 Modified
 Lab SOP: GL-RAD-A-003 REV# 15
 Instrument: BAL-16107662

Type: LCS MS
 Sample Id: 1203626116 1203626115
 Description: Carbon-14 SPIKE Carbon-14 SPIKE
 Serial Number: 1646-B 1646-B
 Spike Amount: .1 .1
 Spike Units: mL mL

MSD SK 9/28/16
 ASDC 10/4

9/28/16

Sample ID	Prep Date	Matrix	Dry or Wet	Unadjusted Aliquot (g)	Aliquot (g)	Flask #
405235061	27-SEP-2016 14:02:47	Soil	W	1.255	1.034	1
405235062	27-SEP-2016 14:02:47	Soil	W	1.25	1.008	2
405235063	27-SEP-2016 14:02:47	Soil	W	1.304	1.167	3
405235064	27-SEP-2016 14:02:47	Soil	W	1.25	1.148	4
405235065	27-SEP-2016 14:02:47	Soil	W	1.321	1.188	5
405235066	27-SEP-2016 14:02:47	Soil	W	1.302	1.181	6
405235067	27-SEP-2016 14:02:47	Soil	W	1.301	1.121	8
405235068	27-SEP-2016 14:02:47	Soil	W	1.28	1.102	83
405235069	27-SEP-2016 14:02:47	Soil	W	1.261	1.127	84
405235070	27-SEP-2016 14:02:47	Soil	W	1.26	1.022	86
405235071	27-SEP-2016 14:02:47	Soil	W	1.252	1.045	400
405235072	27-SEP-2016 14:02:47	Soil	W	1.28	1.175	402
405235073	27-SEP-2016 14:02:47	Soil	W	1.276	1.035	404
405235074	27-SEP-2016 14:02:47	Soil	W	1.38	1.233	405
405235075	27-SEP-2016 14:02:47	Soil	W	1.378	1.23	406
405235076	27-SEP-2016 14:02:47	Soil	W	1.358	1.079	506
405235077	27-SEP-2016 14:02:47	Soil	W	1.309	1.179	507
405235078	27-SEP-2016 14:02:47	Soil	W	1.308	1.097	514
1203626113 MB	27-SEP-2016 14:02:47	Soil	W		1.233	519
1203626114 DUP (405235061)	27-SEP-2016 14:02:47	Soil	W	1.33	1.096	530
1203626115 MS (405235061)	27-SEP-2016 14:02:47	Soil	W	1.309	1.079	706
1203626116 LCS	27-SEP-2016 14:02:47	Soil	W		1.233	708

Comments:
 Spike Pipet ID: RAD-LSC-2970968

Reagent/Solvent Lot ID	Description	Amount
2242305.2	Eoscient A Scintillation Solution	10 mL
2431394.13	16M Nitric Acid Poly Coated Bottle	25 mL
2440076.3	Potassium Persulfate 99+% Methanol 4L Plastic Bottle	5 g 9 mL
2444293.4	RL-1M Silver Nitrate	2 mL
2455949	RL-0.4M Hydrochloric Acid	50 mL
2458954		

Carbon-14 Solid

Filename : C14.XLS
 File type : Excel
 Version # : 1.3.10

Batch : 1598082
 Analyst : TIF02034
 Prep Date : 9/27/2016
 Method Uncertainty : 0.0363

Procedure Code : LSC_14CS
 Carbon-14
 2
 1.00 pCi/G
 5700.00 years
 Required MDA :
 C-14 Abundance :
 Halflife of Carbon-14 :

Geometry: 3mL Ethanolamine/9mL Methanol/10mL EcoScint A

Pos.	Sample Characteristics			Count raw Data			Counting			Corrected			Count		C-14 Normalization Factor	Sample Decay
	Sample ID	Sample Aliquot G	Sample Aliquot SI Dev. G	Sample Date/Time	Rack Position #	Counting Time (min.)	Quench#	Gross cpm	Bkg Count (min.)	Bkg Quench#	Bkg cpm	Bkg Count (min.)	Count Start Date/Time	Count End Date/Time		
1	405235061.1	1.0340	3.3269E-03	12/14/2015 13:47	59-2	70	629.73	12.37	12.41	622.39	70	12.3881	9/29/2016 0:31	9/29/2016 0:31	1.00000	1.000
2	405235062.1	1.0080	3.3242E-03	12/14/2015 13:10	99-1	70	632.23	12.46	12.41	622.39	70	12.3597	9/29/2016 2:55	9/29/2016 2:55	1.00000	1.000
3	405235063.1	1.1670	3.3407E-03	12/14/2015 13:15	99-2	70	628.3	12.51	12.41	622.39	70	12.3994	9/29/2016 4:06	9/29/2016 4:06	1.00000	1.000
4	405235064.1	1.1480	3.3387E-03	12/14/2015 13:25	99-3	70	628.06	12.79	12.41	622.39	70	12.4010	9/29/2016 5:17	9/29/2016 5:17	1.00000	1.000
5	405235065.1	1.1880	3.3429E-03	12/14/2015 13:56	99-4	70	625.79	11.87	12.41	622.39	70	12.4109	9/29/2016 6:29	9/29/2016 6:29	1.00000	1.000
6	405235066.1	1.1810	3.3422E-03	12/14/2015 14:00	99-5	70	628.77	11.91	12.41	622.39	70	12.3961	9/29/2016 7:40	9/29/2016 7:40	1.00000	1.000
7	405235067.1	1.1210	3.3359E-03	12/11/2015 11:30	99-6	70	630.68	12.21	12.41	622.39	70	12.3786	9/29/2016 8:51	9/29/2016 8:51	1.00000	1.000
8	405235068.1	1.1020	3.3340E-03	12/11/2015 10:27	99-7	70	633.53	12.35	12.41	622.39	70	12.3404	9/29/2016 10:02	9/29/2016 10:02	1.00000	1.000
9	405235069.1	1.1270	3.3366E-03	12/16/2015 12:45	99-8	70	633	12.34	12.41	622.39	70	12.3486	9/29/2016 11:14	9/29/2016 11:14	1.00000	1.000
10	405235070.1	1.0220	3.3256E-03	12/11/2015 10:10	99-9	70.0166702	632.82	12.12	12.41	622.39	70	12.3513	9/29/2016 12:25	9/29/2016 12:25	1.00000	1.000
11	405235071.1	1.0450	3.3280E-03	12/11/2015 10:25	99-10	70	631.33	12.55	12.41	622.39	70	12.3712	9/29/2016 13:36	9/29/2016 13:36	1.00000	1.000
12	405235072.1	1.1750	3.3415E-03	12/15/2015 13:35	99-11	70.0166702	635.91	12.99	12.41	622.39	70	12.2969	9/29/2016 14:47	9/29/2016 14:47	1.00000	1.000
13	405235073.1	1.0350	3.3270E-03	12/11/2015 11:35	99-12	70	631.04	13.24	12.41	622.39	70	12.3947	9/29/2016 15:59	9/29/2016 15:59	1.00000	1.000
14	405235074.1	1.2330	3.3476E-03	12/15/2015 14:10	0-1	70	628.95	13.02	12.41	622.39	70	12.3947	9/29/2016 17:10	9/29/2016 17:10	1.00000	1.000
15	405235075.1	1.2300	3.3473E-03	12/16/2015 9:31	0-2	70	629.96	12.05	12.41	622.39	70	12.3860	9/29/2016 18:21	9/29/2016 18:21	1.00000	1.000
16	405235076.1	1.0790	3.3316E-03	12/11/2015 14:19	0-3	70	632.17	12.36	12.41	622.39	70	12.3605	9/29/2016 19:32	9/29/2016 19:32	1.00000	1.000
17	405235077.1	1.1790	3.3420E-03	12/17/2015 13:30	0-4	70	629.84	12.82	12.41	622.39	70	12.3871	9/29/2016 20:44	9/29/2016 20:44	1.00000	1.000
18	405235078.1	1.0970	3.3334E-03	12/17/2015 12:40	0-5	70	632.64	12.82	12.41	622.39	70	12.3539	9/29/2016 21:55	9/29/2016 21:55	1.00000	1.000
19	1203626113.1	1.2330	3.3476E-03	9/27/2016 0:00	0-6	70	629.9	12.97	12.41	622.39	70	12.3865	9/30/2016 0:17	9/30/2016 0:17	1.00000	1.000
20	1203626114.1	1.0960	3.3333E-03	12/14/2015 13:47	0-7	70	632.64	13.89	12.41	622.39	70	12.3539	9/30/2016 1:29	9/30/2016 1:29	1.00000	1.000
21	1203626115.1	1.0790	3.3316E-03	12/14/2015 13:47	0-8	70	634.31	126.18	12.41	622.39	70	12.3273	9/30/2016 2:40	9/30/2016 2:40	1.00000	1.000
22	1203626116.1	1.2330	3.3476E-03	9/27/2016 0:00	0-9	70	631.81	130.01	12.41	622.39	70	12.3652			1.00000	1.000

Pipet, 0.1 ml Stdev : +/- 0.00200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml

Analytical SOP: GL-RAD-A-003
 Instrument SOP: GL-RAD-I-014

Calibration Data		Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Background Rack Position #	Background Count Start Date/Time
1	LSCYELLOW	6/1/2016	5/31/2017	0.6879	0.00792	59-1	9/28/2016 23:20	
2	LSCYELLOW	6/1/2016	5/31/2017	0.6901	0.00792	59-1	9/28/2016 23:20	
3	LSCYELLOW	6/1/2016	5/31/2017	0.6865	0.00792	59-1	9/28/2016 23:20	
4	LSCYELLOW	6/1/2016	5/31/2017	0.6863	0.00792	59-1	9/28/2016 23:20	
5	LSCYELLOW	6/1/2016	5/31/2017	0.6839	0.00792	59-1	9/28/2016 23:20	
6	LSCYELLOW	6/1/2016	5/31/2017	0.6870	0.00792	59-1	9/28/2016 23:20	
7	LSCYELLOW	6/1/2016	5/31/2017	0.6887	0.00792	59-1	9/28/2016 23:20	
8	LSCYELLOW	6/1/2016	5/31/2017	0.6911	0.00792	59-1	9/28/2016 23:20	
9	LSCYELLOW	6/1/2016	5/31/2017	0.6907	0.00792	59-1	9/28/2016 23:20	
10	LSCYELLOW	6/1/2016	5/31/2017	0.6905	0.00792	59-1	9/28/2016 23:20	
11	LSCYELLOW	6/1/2016	5/31/2017	0.6893	0.00792	59-1	9/28/2016 23:20	
12	LSCYELLOW	6/1/2016	5/31/2017	0.6928	0.00792	59-1	9/28/2016 23:20	
13	LSCYELLOW	6/1/2016	5/31/2017	0.6890	0.00792	59-1	9/28/2016 23:20	
14	LSCYELLOW	6/1/2016	5/31/2017	0.6871	0.00792	59-1	9/28/2016 23:20	
15	LSCYELLOW	6/1/2016	5/31/2017	0.6881	0.00792	59-1	9/28/2016 23:20	
16	LSCYELLOW	6/1/2016	5/31/2017	0.6900	0.00792	59-1	9/28/2016 23:20	
17	LSCYELLOW	6/1/2016	5/31/2017	0.6880	0.00792	59-1	9/28/2016 23:20	
18	LSCYELLOW	6/1/2016	5/31/2017	0.6904	0.00792	59-1	9/28/2016 23:20	
19	LSCYELLOW	6/1/2016	5/31/2017	0.6880	0.00792	59-1	9/28/2016 23:20	
20	LSCYELLOW	6/1/2016	5/31/2017	0.6904	0.00792	59-1	9/28/2016 23:20	
21	LSCYELLOW	6/1/2016	5/31/2017	0.6917	0.00792	59-1	9/28/2016 23:20	
22	LSCYELLOW	6/1/2016	5/31/2017	0.6897	0.00792	59-1	9/28/2016 23:20	

Notes:
 * - Results are decay corrected to Sample Date/Time
 * - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 * - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : 1646-B
 Spike Exp Date : 1/5/2017
 Spike Activity (dpm/ml): 1681.40
 Spike Volume Added: 0.10

LCS S/N : 1646-B
 LCS Exp Date : 1/5/2017
 LCS Activity (dpm/ml): 1681.40
 LCS Volume Added: 0.10

* - RPD changed to 0% due to sample & dup activity below MDA

Pos.	Decision Level pCi/G	Critical Level pCi/G	Required MDA pCi/G	MDA pCi/G	Sample Act. Conc. pCi/G	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA		Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
									Counting Uncertainty pCi/G	Total Prop. Uncertainty pCi/G						
1	0.8780	0.6199	2	1.2669	-0.0115	3280.39%	-0.0181	0.5947	0.7383	0.7383		SAMPLE				
2	0.8968	0.6331	2	1.2940	0.0650	593.52%	0.1003	0.5955	0.7559	0.7559		SAMPLE				
3	0.7798	0.5506	2	1.1252	0.0622	539.57%	0.1106	0.5965	0.6575	0.6575		SAMPLE				
4	0.7931	0.5599	2	1.1443	0.2224	154.22%	0.3890	0.5999	0.6723	0.6723		SAMPLE				
5	0.7693	0.5431	2	1.1100	-0.2999	108.89%	-0.5409	0.5890	0.6400	0.6400		SAMPLE				
6	0.7700	0.5436	2	1.1110	-0.2699	121.22%	-0.4861	0.5893	0.6413	0.6413		SAMPLE				
7	0.8085	0.5708	2	1.1667	-0.0984	351.46%	-0.1686	0.5927	0.6778	0.6778		SAMPLE				
8	0.8184	0.5778	2	1.1809	5.686E-03	6178.65%	0.0096	0.5939	0.6886	0.6886		SAMPLE				
9	0.8010	0.5655	2	1.1558	-4.993E-03	6883.12%	-0.0086	0.5939	0.6737	0.6737		SAMPLE				
10	0.8835	0.6238	2	1.2749	-0.1477	255.60%	-0.2313	0.5912	0.7397	0.7397		SAMPLE				
11	0.8664	0.6117	2	1.2501	0.1118	333.73%	0.1788	0.5967	0.7314	0.7315		SAMPLE				
12	0.7642	0.5395	2	1.1028	0.3836	86.71%	0.6931	0.6010	0.6518	0.6524		SAMPLE				
13	0.8752	0.6179	2	1.2628	0.5467	69.91%	0.8654	0.6049	0.7490	0.7500		SAMPLE				
14	0.7373	0.5205	2	1.0638	0.3325	96.37%	0.6253	0.6026	0.6280	0.6284		SAMPLE				
15	0.7378	0.5209	2	1.0646	-0.1788	175.86%	-0.3360	0.5908	0.6164	0.6164		SAMPLE				
16	0.8378	0.5915	2	1.2090	-2.959E-04	121534.89%	-0.0005	0.5943	0.7048	0.7048		SAMPLE				
17	0.7699	0.5435	2	1.1109	0.2404	138.63%	0.4329	0.6001	0.6533	0.6535		SAMPLE				
18	0.8234	0.5813	2	1.1882	0.2772	128.67%	0.4661	0.5997	0.6991	0.6994		SAMPLE				
19	0.7360	0.5196	2	1.0620	0.3098	103.16%	0.5835	0.6019	0.6264	0.6268		SAMPLE				
20	0.8242	0.5819	2	1.1892	0.9145	39.87%	1.5361	0.6123	0.7145	0.7176	405235061.1	MB	* 0.0%	70.2000	97.9%	
21	0.8347	0.5893	2	1.2044	68.7219	1.50%	113.8527	1.4067	1.6642	5.2903	405235061.1	MS		61.4262	101.4%	
22	0.7336	0.5179	2	1.0585	62.3156	1.47%	117.6448	1.4262	1.4806	4.7849	LCS					

PROTOCOL : 5 C-14 70 min
 DATE : 2016/09/28
 TIME : 23:19
 ID : P05AS360

C-14

Wallac 1414 WinSpectral v1.40 S/N 4140127

Counting mode : DPM
 Quench index : SQP(E)
 Isotope(s) : C14
 C14 = ,5730.00 y
 Protocol name : C-14 70 min
 Counting time : 4200
 Repeats : 1
 Cycles : 1
 Replicates : 1
 2 sigma % : 2.00
 Minimum cpm : 0.00 Checking time: 10
 Sp. library of isotope C14 : Wallac
 Vial type : Diffuse
 Liquid system : HiSafe
 Advanced modes : Chemilum
 Output to Display :
 POS,DPM1,CPMw2,CLMM,FNCT2,
 RACK,RACKPOS,FNCT1,SQPE,DATE,
 TIME,CPMw1,CPM,CPM1,CTIME
 Additions to Display : Listing,Header,Spectrum
 Header : C-14
 Spectrum : Rnd.Cos,Beta
 Window 1 : 35- 300 /Beta
 Window 2 : 35- 300 /Rnd.Cos
 Window 3 : 1-1024 /Beta
 Window 4 : 1-1024 /Beta
 Window 5 : 1-1024 /Beta
 Window 6 : 1-1024 /Beta
 FNCT1 = FNCT1 : CTIME/60
 FNCT2 = FNCT2 : CPMW1-CPMW2
 FNCT3 = FNCT3 :
 FNCT4 = FNCT4 :

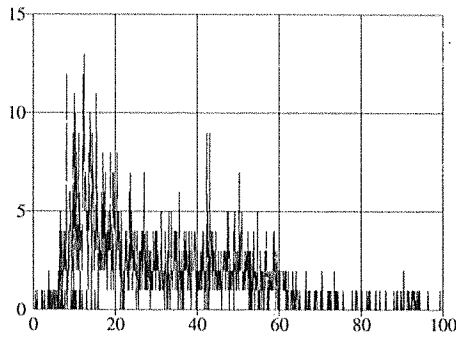
Total activity:

C14	28.2 DPM	0.000 kBq
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C-14 YELLOW

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
59	1	70.00	622.39	12.41
				9/28/2016 11:20 PM

BK



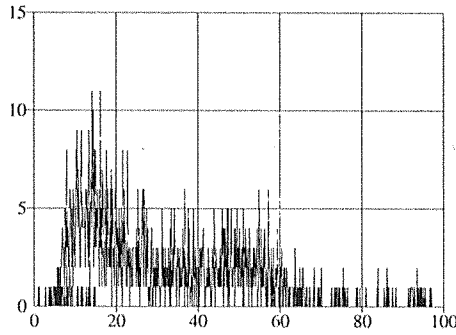
Counts Chem

Counts Beta

Gross_B_CPM	LUMEX
12.80	0.00

Lumex_CPM	DPM
0.40	14.20

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
59	2	70.00	629.73	12.37
				9/29/2016 0:31 AM



Counts Chem

Counts Beta

Gross_B_CPM	LUMEX
12.90	0.00

Lumex_CPM	DPM
0.50	14.00

PROTOCOL : 6 C-14 70 min
 DATE : 2016/09/29
 TIME : 02:54
 ID : P06AS205

C-14

Wallac 1414 WinSpectral v1.40 S/N 4140127

Counting mode : DPM
 Quench index : SQP(E)
 Isotope(s) : C14
 C14 = ,5730.00 y
 Protocol name : C-14 70 min
 Counting time : 4200
 Repeats : 1
 Cycles : 1
 Replicates : 1
 2 sigma % : 2.00
 Minimum cpm : 0.00 Checking time: 10
 Sp. library of isotope C14 : Wallac
 Vial type : Diffuse
 Liquid system : HiSafe
 Advanced modes : Chemilum
 Output to Display :
 POS,DPM1,CPMw2,CLMM,FNCT2,
 RACK,RACKPOS,FNCT1,SQPE,DATE,
 TIME,CPMw1,CPM,CPM1,CTIME
 Additions to Display : Listing,Header,Spectrum
 Header : C-14
 Spectrum : Rnd.Cos,Beta
 Window 1 : 35- 300 /Beta
 Window 2 : 35- 300 /Rnd.Cos
 Window 3 : 1-1024 /Beta
 Window 4 : 1-1024 /Beta
 Window 5 : 1-1024 /Beta
 Window 6 : 1-1024 /Beta
 FNCT1 = FNCT1 : CTIME/60
 FNCT2 = FNCT2 : CPMW1-CPMW2
 FNCT3 = FNCT3 :
 FNCT4 = FNCT4 :

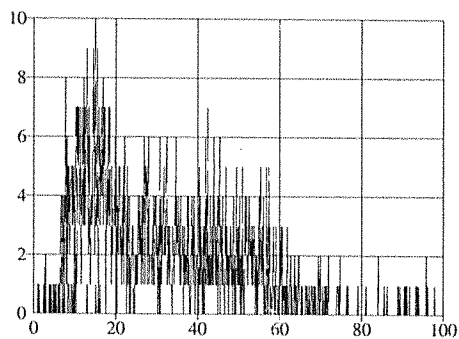
Total activity:

C14 590.7 DPM 0.010 kBq

C-14 YELLOW

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
99	1	70.00	632.23	12.46
				9/29/2016 2:55 AM

2



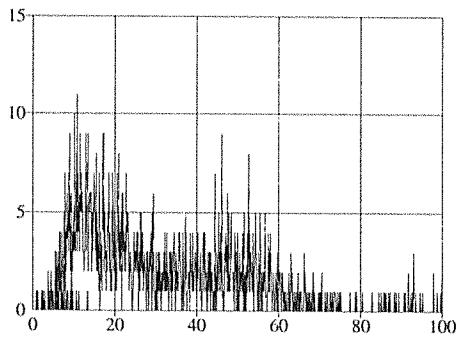
Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
12.80	0.00

Lumex_CPM	DPM
0.40	13.60

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
99	2	70.00	628.30	12.51
				9/29/2016 4:06 AM

3



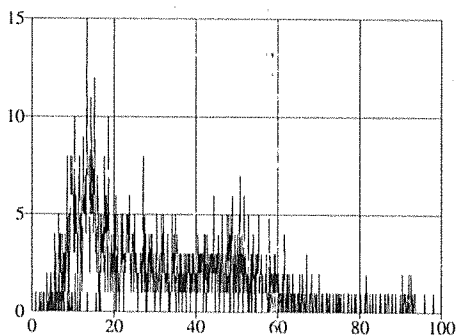
Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
12.70	0.00

Lumex_CPM	DPM
0.20	14.30

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
99	3	70.00	628.06	12.79
				9/29/2016 5:17 AM

4



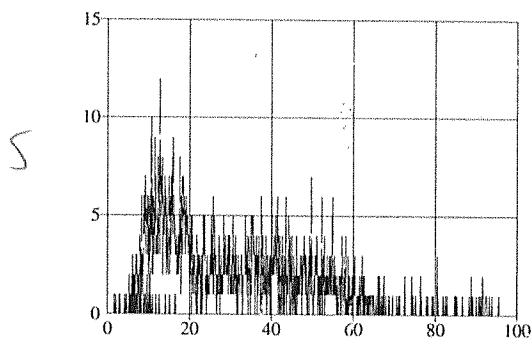
Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
13.20	0.00

Lumex_CPM	DPM
0.40	14.20

C-14 YELLOW

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
99	4	70.00	11.87	9/29/2016 6:29 AM

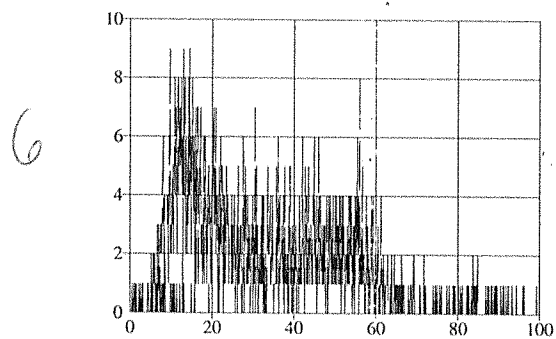


Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
12.30	0.00

Lumex_CPM	DPM
0.40	13.20

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
99	5	70.00	11.91	9/29/2016 7:40 AM

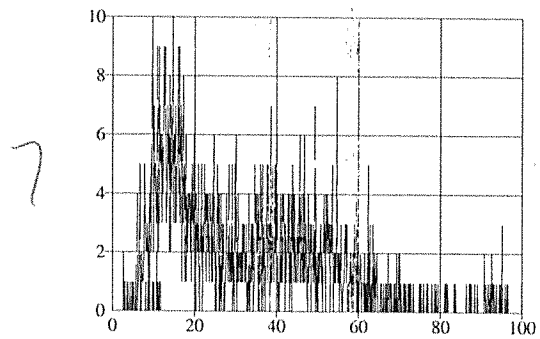


Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
12.30	0.00

Lumex_CPM	DPM
0.40	14.20

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
99	6	70.00	12.21	9/29/2016 8:51 AM



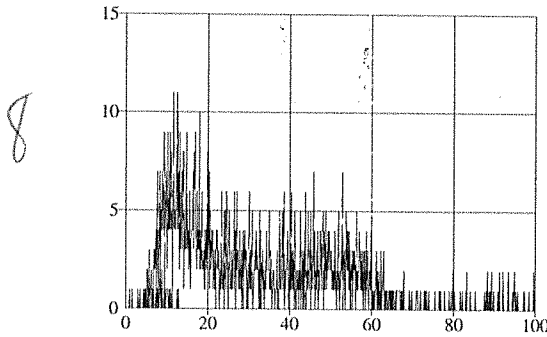
Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
12.50	0.00

Lumex_CPM	DPM
0.30	13.60

C-14 YELLOW

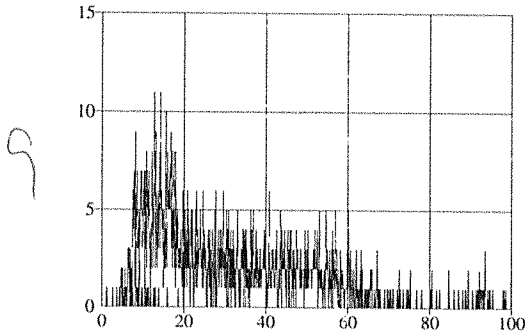
Rack_position 99 Count_Time(min) 70.00 Quench_number 633.53 C14_CPM 12.35 Run_Date 9/29/2016 10:02 AM



Counts Chem
Counts Beta

Gross_B_CPM 12.80 LUMEX 0.00
Lumex_CPM 0.40 DPM 13.10

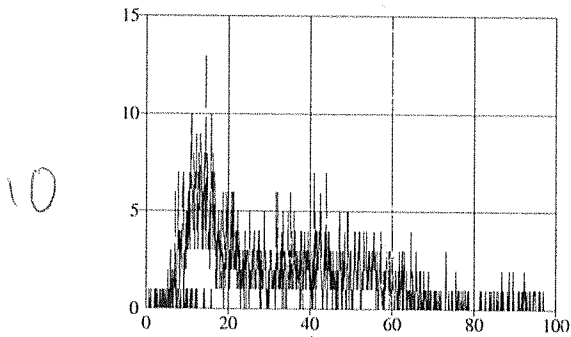
Rack_position 99 Count_Time(min) 70.00 Quench_number 633.00 C14_CPM 12.34 Run_Date 9/29/2016 11:14 AM



Counts Chem
Counts Beta

Gross_B_CPM 12.80 LUMEX 0.00
Lumex_CPM 0.50 DPM 13.90

Rack_position 99 Count_Time(min) 70.02 Quench_number 632.82 C14_CPM 12.12 Run_Date 9/29/2016 12:25 PM



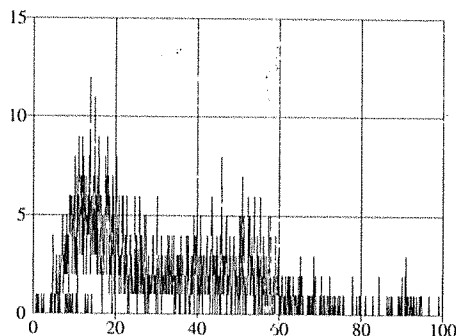
Counts Chem
Counts Beta

Gross_B_CPM 12.60 LUMEX 0.00
Lumex_CPM 0.40 DPM 12.70

C-14 YELLOW

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
99	10	70.00	12.55	9/29/2016 1:36 PM

11



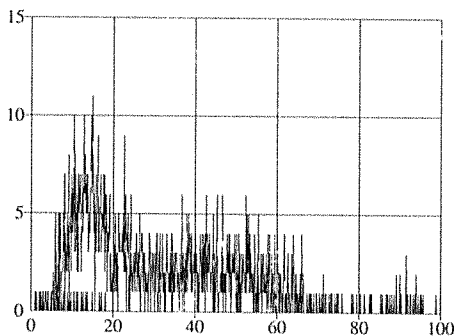
Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
12.90	0.00

Lumex_CPM	DPM
0.40	13.70

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
99	11	70.02	12.99	9/29/2016 2:47 PM

12



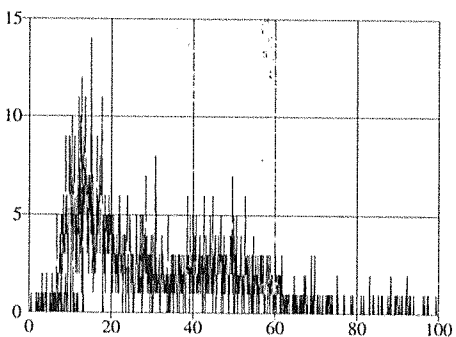
Counts Chem
Counts Beta

Gross_B_CPM	LUMEX
13.40	0.00

Lumex_CPM	DPM
0.40	13.80

Rack_position	Count_Time(min)	Quench_number	C14_CPM	Run_Date
99	12	70.00	13.24	9/29/2016 3:59 PM

13



Counts Chem
Counts Beta

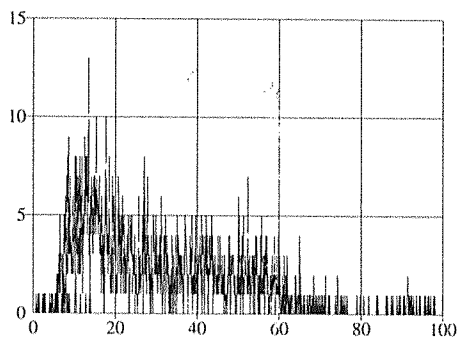
Gross_B_CPM	LUMEX
13.70	0.00

Lumex_CPM	DPM
0.50	14.80

C-14 YELLOW

Rack_position 0 1 Count_Time(min) 70.00 Quench_number 628.95 C14_CPM 13.02 Run_Date 9/29/2016 5:10 PM

14



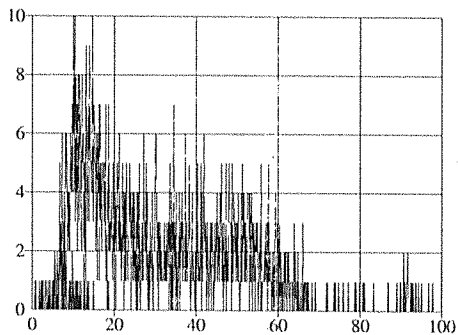
Counts Chem
Counts Beta

Gross_B_CPM 13.40 LUMEX 0.00

Lumex_CPM 0.40 DPM 15.00

Rack_position 0 2 Count_Time(min) 70.00 Quench_number 629.96 C14_CPM 12.05 Run_Date 9/29/2016 6:21 PM

15



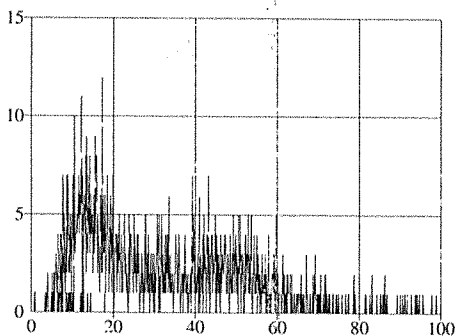
Counts Chem
Counts Beta

Gross_B_CPM 12.60 LUMEX 0.00

Lumex_CPM 0.50 DPM 13.60

Rack_position 0 3 Count_Time(min) 70.00 Quench_number 632.17 C14_CPM 12.36 Run_Date 9/29/2016 7:32 PM

16



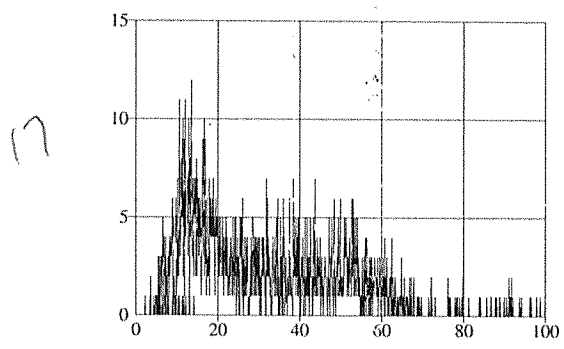
Counts Chem
Counts Beta

Gross_B_CPM 12.70 LUMEX 0.00

Lumex_CPM 0.30 DPM 13.90

C-14 YELLOW

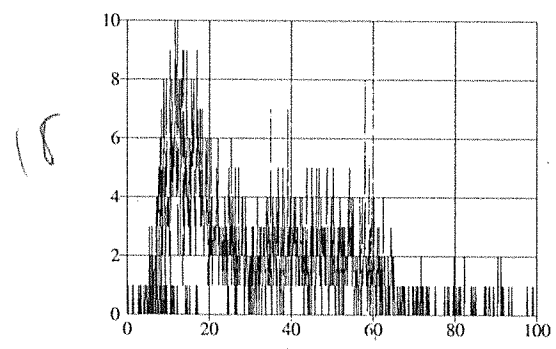
Rack_position Count_Time(min) Quench_number C14_CPM Run_Date
 0 4 70.00 629.84 12.82 9/29/2016 8:44 PM



Counts Chem
 Counts Beta

Gross_B_CPM LUMEX
 13.30 0.00
 Lumex_CPM DPM
 0.40 14.40

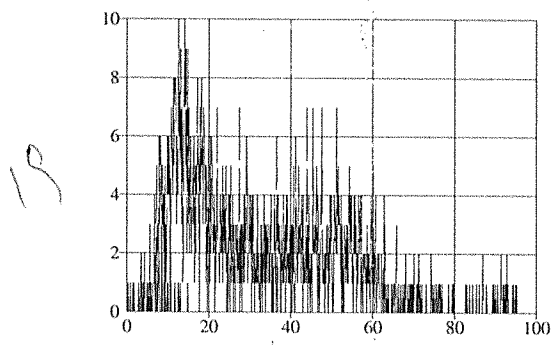
Rack_position Count_Time(min) Quench_number C14_CPM Run_Date
 0 5 70.00 632.64 12.82 9/29/2016 9:55 PM



Counts Chem
 Counts Beta

Gross_B_CPM LUMEX
 13.30 0.00
 Lumex_CPM DPM
 0.50 13.50

Rack_position Count_Time(min) Quench_number C14_CPM Run_Date
 0 6 70.00 629.90 12.97 9/29/2016 11:06 PM

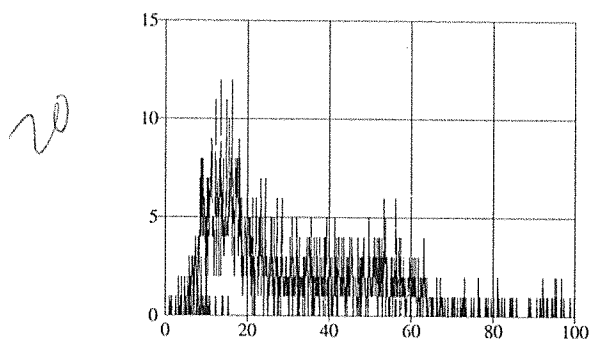


Counts Chem
 Counts Beta

Gross_B_CPM LUMEX
 13.30 0.00
 Lumex_CPM DPM
 0.30 14.30

C-14 YELLOW

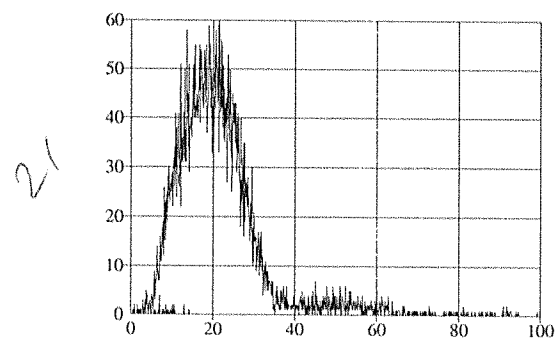
Rack_position Count_Time(min) Quench_number C14_CPM Run_Date
 0 7 70.00 632.64 13.89 9/30/2016 0:17 AM



Gross_B_CPM LUMEX
 14.40 0.00
 Lumex_CPM DPM
 0.50 15.00

Counts Chem
 Counts Beta

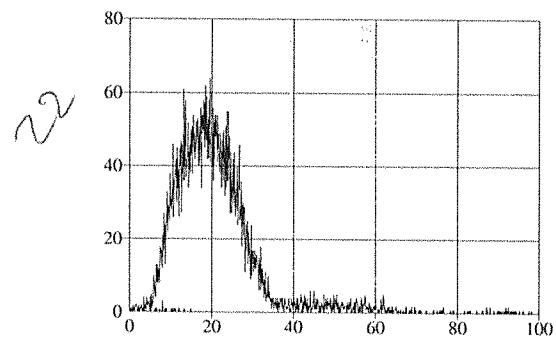
Rack_position Count_Time(min) Quench_number C14_CPM Run_Date
 0 8 70.00 634.31 126.18 9/30/2016 1:29 AM



Gross_B_CPM LUMEX
 126.60 0.00
 Lumex_CPM DPM
 0.40 161.60

Counts Chem
 Counts Beta

Rack_position Count_Time(min) Quench_number C14_CPM Run_Date
 0 9 70.00 631.81 130.01 9/30/2016 2:40 AM



Gross_B_CPM LUMEX
 130.30 0.00
 Lumex_CPM DPM
 0.30 164.40

Counts Chem
 Counts Beta


Continuing Calibration Data



Liquid Scintillation Counter Checks for 19-SEP-2016

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LSCBLUE	Carbon-14	03:45	1.45		114334	-1.7		
	Carbon-14	03:47	1.4		115141	1.27		
	Tritium	03:49	1.35		161254	0.56		
	Tritium	03:50	1.35		160859	-0.32		
	BKG	03:52	30		26	-0.12		
	BKG	04:23	30		26	-0.29		
LSCBROWN	Carbon-14	03:27	1.4		115593	1.02		
	Carbon-14	03:29	1.4		115230	-0.25		
	Tritium	03:31	1.3		167287	-0.04		
	Tritium	03:33	1.3		167561	0.73		
	BKG	03:35	30		27	0.72		
	BKG	04:05	30		27	0.09		
LSCGOLD	Carbon-14	03:14	1.3		125555	-1.3		
	Carbon-14	03:16	1.3		125753	-0.74		
	Tritium	03:18	1.35		151637	1.18		
	Tritium	03:20	1.35		151895	1.76		
	BKG	03:22	30		24	2.48		
	BKG	03:52	30		23	1.21		
LSCGREEN	Carbon-14	03:28	1.4		114947	-0.87		
	Carbon-14	03:29	1.4		114820	-1.3		
	Tritium	03:32	1.25		173540	1.15		
	Tritium	03:33	1.25		172408	-1.3		
	BKG	03:35	30		27	0.46		
	BKG	04:06	30		25	-1.5		
LSCORANGE	Carbon-14	00:52	1.012433		107636	0.1		
	Tritium	00:56	1.012433		179933	0.58		
	BKG	01:28	30.01243		10	-1.3		
	Carbon-14	01:30	1.012433		107423	-0.51		
	Tritium	01:31	1.012333		179440	-0.64		
	BKG	02:01	30.01243		12	0.61		

LSCPINK	Carbon-14	04:25	1.012433	119744	1.94
	Tritium	04:28	1.012433	138218	0.66
	BKG	05:01	30.01243	9.01	0.16
	Carbon-14	05:02	1.012433	119671	1.75
	Tritium	05:04	1.012433	137937	0.08
	BKG	05:34	30.01243	9.31	0.69
LSCRED	Carbon-14	03:48	1.4	115290	1.3
	Carbon-14	03:50	1.4	114472	-1.4
	Tritium	03:52	1.3	164778	-0.94
	Tritium	03:54	1.3	165587	0.86
	BKG	03:56	30	27	1.34
	BKG	04:26	30	27	1.04
LSCSILVER	Carbon-14	03:18	1.35	121331	0.42
	Carbon-14	03:19	1.35	121534	1.08
	Tritium	03:21	1.25	170276	0.58
	Tritium	03:23	1.25	170725	1.54
	BKG	03:25	30	26	0.36
	BKG	03:56	30	26	0.48
LSCTEAL	Carbon-14	04:14	1.617	106499	1.6
	Carbon-14	04:16	1.583	105776	-1.3
	Tritium	04:19	1.217	145016	-1.1
	Tritium	04:21	1.217	145361	-0.47
	BKG	04:23	30	14	-0.75
	BKG	04:54	30	15	-0.61
LSCYELLOW	Carbon-14	03:33	1.483	114173	-0.74
	Carbon-14	03:36	1.483	114451	0.17
	Tritium	03:38	1.483	149477	-0.05
	Tritium	03:40	1.483	149617	0.27
	BKG	03:43	30	16	0.85
	BKG	04:14	30	15	-0.23

Reviewed by: 
Lyndsey Pace

Date: 19-SEP-16


GEL Laboratories LLC



Liquid Scintillation Counter Checks for 20-SEP-2016

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LSCBLUE	Carbon-14	02:22	1.4		115022	0.83		
	Carbon-14	02:23	1.4		114977	0.66		
	Tritium	02:26	1.35		161375	0.83		
	Tritium	02:27	1.35		161082	0.18		
	BKG	02:29	30		27	0.5		
	BKG	03:00	30		25	-0.96		
LSCBROWN	Carbon-14	03:08	1.4		115056	-0.85		
	Carbon-14	03:10	1.4		114978	-1.1		
	Tritium	03:12	1.3		167546	0.68		
	Tritium	03:14	1.3		166833	-1.3		
	BKG	03:16	30		27	-0.01		
	BKG	03:46	30		27	-0.01		
LSCGOLD	Carbon-14	02:24	1.3		125533	-1.4		
	Carbon-14	02:25	1.3		126069	0.21		
	Tritium	02:27	1.35		150855	-0.54		
	Tritium	02:29	1.35		151136	0.08		
	BKG	02:31	30		23	0.48		
	BKG	03:02	30		22	-0.28		
LSCGREEN	Carbon-14	04:54	1.4		115524	1.12		
	Carbon-14	04:56	1.4		114743	-1.6		
	Tritium	04:58	1.25		172769	-0.49		
	Tritium	04:59	1.25		171985	-2.2		
	BKG	05:01	30		29	2.59		
	BKG	05:32	30		27	0.53		
LSCORANGE	Carbon-14	03:40	1.012433		108483	2.55		
	Tritium	03:43	1.012433		180246	1.35		
	BKG	04:16	30.01243		9.78	-1.8		
	Carbon-14	04:17	1.012433		108001	1.16		
	Tritium	04:18	1.01235		179827	0.31		
	BKG	04:49	30.01243		11	-0.47		

LSCPINK	Carbon-14	03:58	1.012433	119412	1.07
	Tritium	04:01	1.012433	138148	0.52
	BKG	04:34	30.01243	8.53	-0.69
	Carbon-14	04:35	1.012433	118707	-0.76
	Tritium	04:37	1.012333	138085	0.39
	BKG	05:07	30.01243	8.84	-0.14
LSCRED	Carbon-14	03:23	1.4	114705	-0.65
	Carbon-14	03:25	1.4	114932	0.11
	Tritium	03:27	1.3	164582	-1.4
	Tritium	03:28	1.3	165089	-0.25
	BKG	03:31	30	26	0.16
	BKG	04:01	30	26	-0.11
LSCSILVER	Carbon-14	02:53	1.35	121094	-0.34
	Carbon-14	02:55	1.35	120555	-2.1
	Tritium	02:57	1.25	169537	-0.98
	Tritium	02:59	1.25	169712	-0.61
	BKG	03:01	30	26	0.21
	BKG	03:31	30	26	0.64
LSCTEAL	Carbon-14	03:50	1.617	106086	-0.06
	Carbon-14	03:53	1.583	105622	-1.9
	Tritium	03:55	1.217	144638	-1.9
	Tritium	03:57	1.217	144505	-2.1
	BKG	03:59	30	15	0.52
	BKG	04:30	30	15	-0.32
LSCYELLOW	Carbon-14	03:10	1.517	114246	-0.51
	Carbon-14	03:13	1.467	114575	0.57
	Tritium	03:15	1.483	149889	0.9
	Tritium	03:18	1.483	149963	1.08
	BKG	03:20	30	14	-1.3
	BKG	03:51	30	16	1.22

Reviewed by: 
Lyndsey Pace

Date: 20-SEP-16


GEL Laboratories LLC



Liquid Scintillation Counter Checks for 21-SEP-2016

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LSCBLUE	Carbon-14	02:43	1.4		115058	0.96		
	Carbon-14	02:44	1.4		114669	-0.49		
	Tritium	02:47	1.35		161307	0.68		
	Tritium	02:48	1.35		161425	0.95		
	BKG	02:50	30		26	-0.14		
	BKG	03:21	30		25	-0.72		
LSCBROWN	Carbon-14	03:13	1.4		114936	-1.3		
	Carbon-14	03:15	1.4		114765	-1.9		
	Tritium	03:17	1.3		166676	-1.7		
	Tritium	03:19	1.3		166849	-1.3		
	BKG	03:21	30		28	1.49		
	BKG	03:51	30		25	-1.3		
LSCGOLD	Carbon-14	02:58	1.3		125863	-0.41		
	Carbon-14	03:00	1.3		125511	-1.5		
	Tritium	03:02	1.35		151057	-0.1		
	Tritium	03:03	1.35		151270	0.38		
	BKG	03:05	30		23	1.13		
	BKG	03:36	30		20	-2.5		
LSCGREEN	Carbon-14	01:14	1.4		115237	0.13		
	Carbon-14	01:16	1.4		115132	-0.23		
	Tritium	01:18	1.25		172328	-1.4		
	Tritium	01:20	1.25		171870	-2.4		
	BKG	01:22	30		28	1.96		
	BKG	01:52	30		26	-0.57		
LSCORANGE	Carbon-14	01:32	1.01245		107464	-0.39		
	Tritium	01:35	1.012433		179632	-0.17		
	BKG	02:08	30.01243		11	0.1		
	Carbon-14	02:09	1.012433		107717	0.34		
	Tritium	02:11	1.01235		180069	0.91		
	BKG	02:41	30.01243		10	-1.2		

LSCPINK	Carbon-14	04:03	1.012433	118816	-0.48
	Tritium	04:06	1.012433	137783	-0.25
	BKG	04:39	30.01243	9.11	0.33
	Carbon-14	04:40	1.012433	118422	-1.5
	Tritium	04:42	1.012333	137656	-0.51
	BKG	05:12	30.01243	8.94	0.03
LSCRED	Carbon-14	03:27	1.4	114866	-0.11
	Carbon-14	03:28	1.4	114673	-0.76
	Tritium	03:30	1.3	164972	-0.51
	Tritium	03:32	1.3	165211	0.02
	BKG	03:34	30	28	2
	BKG	04:05	30	27	0.94
LSCSILVER	Carbon-14	02:59	1.35	121455	0.82
	Carbon-14	03:00	1.35	121168	-0.1
	Tritium	03:02	1.25	170391	0.83
	Tritium	03:04	1.25	168865	-2.4
	BKG	03:06	30	25	-0.67
	BKG	03:37	30	25	-0.86
LSCTEAL	Carbon-14	03:56	1.617	105606	-2
	Carbon-14	03:59	1.583	105739	-1.5
	Tritium	04:01	1.217	144994	-1.2
	Tritium	04:03	1.217	144459	-2.2
	BKG	04:05	30	14	-0.89
	BKG	04:36	30	15	0.1
LSCYELLOW	Carbon-14	03:16	1.467	114999	1.96
	Carbon-14	03:19	1.483	114319	-0.27
	Tritium	03:21	1.483	150151	1.51
	Tritium	03:24	1.483	149876	0.87
	BKG	03:26	30	15	-0.35
	BKG	03:57	30	15	-0.23

Reviewed by: 
Lyndsey Pace

Date: 21-SEP-16


GEL Laboratories LLC



Liquid Scintillation Counter Checks for 22-SEP-2016

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LSCBLUE	Carbon-14	04:01	1.4		114872	0.27		
	Carbon-14	04:03	1.4		114794	-0.02		
	Tritium	04:05	1.35		161567	1.26		
	Tritium	04:07	1.35		160846	-0.34		
	BKG	04:09	30		26	-0.31		
	BKG	04:39	30		25	-0.6		
LSCBROWN	Carbon-14	03:04	1.4		115281	-0.07		
	Carbon-14	03:06	1.4		115272	-0.1		
	Tritium	03:08	1.3		167601	0.84		
	Tritium	03:09	1.3		167450	0.42		
	BKG	03:11	30		27	0.69		
	BKG	03:42	30		28	1.39		
LSCGOLD	Carbon-14	02:57	1.3		125041	-2.9		
	Carbon-14	02:59	1.3		125422	-1.7		
	Tritium	03:01	1.35		151877	1.71		
	Tritium	03:02	1.35		151445	0.76		
	BKG	03:04	30		22	-0.28		
	BKG	03:35	30		23	0.77		
LSCGREEN	Carbon-14	01:27	1.4		115497	1.02		
	Carbon-14	01:29	1.4		115264	0.22		
	Tritium	01:31	1.25		172310	-1.5		
	Tritium	01:33	1.25		171978	-2.2		
	BKG	01:35	30		26	-0.02		
	BKG	02:05	30		28	2.12		
LSCORANGE	Carbon-14	03:32	1.01245		107833	0.67		
	Tritium	03:35	1.012433		179335	-0.9		
	BKG	04:08	30.01243		11	-0.77		
	Carbon-14	04:09	1.012433		107477	-0.36		
	Tritium	04:10	1.012433		179458	-0.6		
	BKG	04:41	30.01243		11	0.47		

LSCPINK	Carbon-14	03:52	1.012433	119501	1.31
	Tritium	03:55	1.012433	138282	0.8
	BKG	04:28	30.01243	8.3	-1.1
	Carbon-14	04:29	1.012433	119031	0.08
	Tritium	04:31	1.01235	138426	1.1
	BKG	05:01	30.01243	9.58	1.17
LSCRED	Carbon-14	03:25	1.4	115277	1.26
	Carbon-14	03:27	1.4	114629	-0.91
	Tritium	03:29	1.3	165161	-0.09
	Tritium	03:31	1.3	164848	-0.79
	BKG	03:33	30	28	2.42
	BKG	04:03	30	25	-0.56
LSCSILVER	Carbon-14	01:13	1.35	121680	1.55
	Carbon-14	01:14	1.35	121441	0.78
	Tritium	01:16	1.25	170008	0.02
	Tritium	01:18	1.25	169523	-1
	BKG	01:20	30	26	0.09
	BKG	01:51	30	26	0.51
LSCTEAL	Carbon-14	01:13	1.6	105369	-2.9
	Carbon-14	01:16	1.583	105803	-1.2
	Tritium	01:18	1.217	144923	-1.3
	Tritium	01:20	1.217	145264	-0.65
	BKG	01:22	30	14	-1.2
	BKG	01:53	30	14	-1.2
LSCYELLOW	Carbon-14	02:58	1.467	114697	0.97
	Carbon-14	03:00	1.467	114804	1.32
	Tritium	03:03	1.483	149146	-0.82
	Tritium	03:05	1.483	149246	-0.59
	BKG	03:07	30	16	0.37
	BKG	03:38	30	15	0.25

Reviewed by: 
Lyndsey Pace

Date: 22-SEP-16


GEL Laboratories LLC



Liquid Scintillation Counter Checks for 23-SEP-2016

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LSCBLUE	Carbon-14	03:30	1.4		114373	-1.6		
	Carbon-14	03:31	1.4		114742	-0.22		
	Tritium	03:33	1.35		160868	-0.3		
	Tritium	03:35	1.35		161438	0.97		
	BKG	03:37	30		25	-0.76		
	BKG	04:08	30		27	0.17		
LSCBROWN	Carbon-14	03:17	1.4		115344	0.15		
	Carbon-14	03:19	1.4		114799	-1.8		
	Tritium	03:21	1.3		167822	1.45		
	Tritium	03:23	1.3		167302	0.01		
	BKG	03:25	30		27	-0.01		
	BKG	03:55	30		27	0.57		
LSCGOLD	Carbon-14	03:00	1.3		125892	-0.33		
	Carbon-14	03:02	1.3		125732	-0.81		
	Tritium	03:04	1.35		150953	-0.33		
	Tritium	03:05	1.35		151123	0.05		
	BKG	03:07	30		22	-0.1		
	BKG	03:38	30		23	1.02		
LSCGREEN	Carbon-14	03:58	1.4		115028	-0.59		
	Carbon-14	04:00	1.4		115348	0.51		
	Tritium	04:02	1.25		172582	-0.89		
	Tritium	04:03	1.25		172525	-1		
	BKG	04:05	30		25	-1.1		
	BKG	04:36	30		27	0.83		
LSCORANGE	Carbon-14	01:25	1.012433		107658	0.17		
	Tritium	01:29	1.012433		179167	-1.3		
	BKG	02:01	30.01243		10	-1.2		
	Carbon-14	02:03	1.012433		107861	0.75		
	Tritium	02:04	1.012333		179401	-0.74		
	BKG	02:34	30.01243		11	-0.06		

LSCPINK	Carbon-14	03:49	1.012433	118374	-1.6
	Tritium	03:53	1.012433	137033	-1.8
	BKG	04:25	30.01243	9.01	0.16
	Carbon-14	04:27	1.012433	119327	0.85
	Tritium	04:28	1.012333	138564	1.39
	BKG	04:58	30.01243	8.94	0.03
LSCRED	Carbon-14	03:29	1.4	114914	0.05
	Carbon-14	03:30	1.4	114470	-1.4
	Tritium	03:32	1.3	164978	-0.5
	Tritium	03:34	1.3	164353	-1.9
	BKG	03:36	30	26	0.62
	BKG	04:07	30	28	1.66
LSCSILVER	Carbon-14	03:01	1.35	121112	-0.28
	Carbon-14	03:03	1.35	121337	0.44
	Tritium	03:05	1.25	169232	-1.6
	Tritium	03:06	1.25	169592	-0.86
	BKG	03:09	30	26	0
	BKG	03:39	30	26	0.03
LSCTEAL	Carbon-14	03:58	1.583	106191	0.37
	Carbon-14	04:01	1.583	106019	-0.32
	Tritium	04:03	1.217	145387	-0.42
	Tritium	04:05	1.217	144376	-2.4
	BKG	04:08	30	15	-0.04
	BKG	04:38	30	13	-2.2
LSCYELLOW	Carbon-14	03:18	1.483	114452	0.17
	Carbon-14	03:20	1.483	114216	-0.6
	Tritium	03:23	1.483	149493	-0.02
	Tritium	03:25	1.483	149237	-0.61
	BKG	03:28	30.017	14	-1.8
	BKG	03:58	30	15	-0.83

Reviewed by: 
Lyndsey Pace

Date: 23-SEP-16


GEL Laboratories LLC



Liquid Scintillation Counter Checks for 24-SEP-2016

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LSCBLUE	Carbon-14	02:01	1.4		114891	0.34		
	Carbon-14	02:03	1.4		114675	-0.47		
	Tritium	02:05	1.35		161211	0.47		
	Tritium	02:07	1.35		162025	2.28		
	BKG	02:09	30		25	-0.66		
	BKG	02:39	30		26	-0.14		
LSCBROWN	Carbon-14	00:55	1.4		115175	-0.44		
	Carbon-14	00:57	1.4		115269	-0.11		
	Tritium	00:59	1.3		167266	-0.09		
	Tritium	01:01	1.3		167305	0.01		
	BKG	01:03	30		27	0.69		
	BKG	01:33	30		26	-0.34		
LSCGOLD	Carbon-14	00:38	1.3		125545	-1.4		
	Carbon-14	00:39	1.3		125999	-00		
	Tritium	00:41	1.35		151026	-0.16		
	Tritium	00:43	1.35		151579	1.06		
	BKG	00:45	30		23	0.85		
	BKG	01:16	30		21	-1		
LSCGREEN	Carbon-14	03:16	1.4		115096	-0.36		
	Carbon-14	03:18	1.4		115069	-0.45		
	Tritium	03:20	1.25		172241	-1.6		
	Tritium	03:21	1.25		172168	-1.8		
	BKG	03:23	30		28	1.68		
	BKG	03:54	30		25	-1.1		
LSCORANGE	Carbon-14	03:43	1.01245		107778	0.51		
	Tritium	03:46	1.012433		179830	0.32		
	BKG	04:19	30.01243		12	1.32		
	Carbon-14	04:20	1.012433		107941	0.99		
	Tritium	04:22	1.01235		179155	-1.3		
	BKG	04:52	30.01243		10	-1.3		

LSCPINK	Carbon-14	04:07	1.012433	119155	0.4
	Tritium	04:10	1.012433	138210	0.65
	BKG	04:43	30.01243	9.38	0.81
	Carbon-14	04:44	1.012433	118932	-0.18
	Tritium	04:46	1.012333	137462	-0.92
	BKG	05:16	30.01243	9.78	1.52
LSCRED	Carbon-14	03:29	1.4	115119	0.73
	Carbon-14	03:31	1.4	114742	-0.53
	Tritium	03:33	1.3	165161	-0.09
	Tritium	03:34	1.3	164649	-1.2
	BKG	03:36	30	26	0.29
	BKG	04:07	30	27	0.78
LSCSILVER	Carbon-14	02:04	1.35	120756	-1.4
	Carbon-14	02:05	1.35	121411	0.68
	Tritium	02:07	1.25	169787	-0.45
	Tritium	02:09	1.25	169016	-2.1
	BKG	02:11	30	27	1.58
	BKG	02:41	30	24	-1.3
LSCTEAL	Carbon-14	02:41	1.583	106006	-0.38
	Carbon-14	02:43	1.583	105712	-1.6
	Tritium	02:46	1.217	144115	-2.9
	Tritium	02:48	1.217	144196	-2.7
	BKG	02:50	30	14	-1.2
	BKG	03:21	30	16	1.65
LSCYELLOW	Carbon-14	01:17	1.483	114491	0.3
	Carbon-14	01:20	1.483	113911	-1.6
	Tritium	01:22	1.5	148410	-2.5
	Tritium	01:24	1.5	148822	-1.6
	BKG	01:27	30	14	-2
	BKG	01:58	30	14	-1.7

Reviewed by: 
Lyndsey Pace

Date: 25-SEP-16


GEL Laboratories LLC



Liquid Scintillation Counter Checks for 25-SEP-2016

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LSCBLUE	Carbon-14	05:19	1.4		114997	0.73		
	Carbon-14	05:21	1.4		114783	-0.06		
	Tritium	05:23	1.35		160646	-0.79		
	Tritium	05:25	1.35		160956	-0.1		
	BKG	05:27	30		24	-1.2		
	BKG	05:57	30		23	-1.8		
LSCBROWN	Carbon-14	05:33	1.4		115064	-0.83		
	Carbon-14	05:35	1.4		114456	-3		
	Tritium	05:37	1.3		167494	0.54		
	Tritium	05:39	1.3		166971	-0.92		
	BKG	05:41	30		27	0.18		
	BKG	06:11	30		26	-0.72		
LSCGOLD	Carbon-14	04:56	1.3		125590	-1.2		
	Carbon-14	04:58	1.3		125659	-1		
	Tritium	05:00	1.35		151037	-0.14		
	Tritium	05:01	1.35		151983	1.95		
	BKG	05:03	30		23	0.74		
	BKG	05:34	30		22	-0.39		
LSCGREEN	Carbon-14	05:30	1.4		115286	0.3		
	Carbon-14	05:32	1.4		115610	1.42		
	Tritium	05:34	1.25		173063	0.13		
	Tritium	05:35	1.25		171971	-2.2		
	BKG	05:37	30		26	-0.39		
	BKG	06:08	30		28	2.18		
LSCORANGE	Carbon-14	05:34	1.012433		107676	0.22		
	Tritium	05:37	1.012433		179256	-1.1		
	BKG	06:10	30.01243		9.99	-1.5		
	Carbon-14	06:11	1.012433		107554	-0.13		
	Tritium	06:12	1.012333		179482	-0.54		
	BKG	06:43	30.01243		11	-0.43		

LSCPINK	Carbon-14	05:52	1.012433	118719	-0.73
	Tritium	05:55	1.012433	138659	1.59
	BKG	06:28	30.01243	8.4	-0.92
	Carbon-14	06:29	1.012433	118066	-2.4
	Tritium	06:31	1.012433	138493	1.24
	BKG	07:01	30.01243	9.17	0.44
LSCRED	Carbon-14	05:20	1.4	114798	-0.34
	Carbon-14	05:21	1.45	114118	-2.6
	Tritium	05:23	1.3	164887	-0.7
	Tritium	05:25	1.3	164537	-1.5
	BKG	05:27	30	26	0.52
	BKG	05:58	30	26	0.58
LSCSILVER	Carbon-14	04:57	1.35	121004	-0.63
	Carbon-14	04:59	1.35	121316	0.37
	Tritium	05:01	1.25	169407	-1.3
	Tritium	05:02	1.25	169802	-0.42
	BKG	05:05	30	26	0.48
	BKG	05:35	30	24	-1.1
LSCTEAL	Carbon-14	05:45	1.583	106015	-0.34
	Carbon-14	05:48	1.583	106322	0.89
	Tritium	05:50	1.217	145301	-0.58
	Tritium	05:52	1.217	144564	-2
	BKG	05:54	30	15	0.1
	BKG	06:25	30	15	-0.61
LSCYELLOW	Carbon-14	05:09	1.483	114166	-0.77
	Carbon-14	05:11	1.483	114276	-0.41
	Tritium	05:14	1.483	149487	-0.03
	Tritium	05:16	1.483	149641	0.33
	BKG	05:19	30	15	0.01
	BKG	05:49	30	14	-1.2

Reviewed by: 
Lyndsey Pace

Date: 25-SEP-16


GEL Laboratories LLC



Liquid Scintillation Counter Checks for 26-SEP-2016

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LSCBLUE	Carbon-14	03:54	1.4		114664	-0.51		
	Carbon-14	03:56	1.4		114711	-0.33		
	Tritium	03:58	1.35		161404	0.9		
	Tritium	03:59	1.35		160997	-0.01		
	BKG	04:02	30		26	-0.5		
	BKG	04:32	30		24	-1.7		
LSCBROWN	Carbon-14	03:37	1.4		114587	-2.5		
	Carbon-14	03:39	1.4		115476	0.62		
	Tritium	03:41	1.3		167431	0.37		
	Tritium	03:42	1.3		166820	-1.3		
	BKG	03:45	30		26	-0.14		
	BKG	04:15	30		26	-0.65		
LSCGOLD	Carbon-14	03:24	1.3		126048	0.14		
	Carbon-14	03:26	1.3		126189	0.57		
	Tritium	03:28	1.35		151447	0.77		
	Tritium	03:29	1.35		151436	0.74		
	BKG	03:31	30		22	-0.02		
	BKG	04:02	30		23	0.99		
LSCGREEN	Carbon-14	03:37	1.4		115047	-0.53		
	Carbon-14	03:39	1.4		115072	-0.44		
	Tritium	03:41	1.25		172190	-1.7		
	Tritium	03:42	1.25		171975	-2.2		
	BKG	03:45	30		26	0.09		
	BKG	04:15	30		27	1.01		
LSCORANGE	Carbon-14	04:14	1.012433		107821	0.64		
	Tritium	04:17	1.012433		179032	-1.6		
	BKG	04:50	30.01243		11	-0.57		
	Carbon-14	04:51	1.012433		107110	-1.4		
	Tritium	04:53	1.012333		179952	0.62		
	BKG	05:23	30.01243		11	0.51		

LSCPINK	Carbon-14	04:35	1.012433	118962	-0.1
	Tritium	04:38	1.012433	138535	1.33
	BKG	05:11	30.01243	9.38	0.81
	Carbon-14	05:12	1.012433	119208	0.54
	Tritium	05:14	1.01235	138696	1.67
	BKG	05:44	30.01243	7.86	-1.9
LSCRED	Carbon-14	03:58	1.4	115192	0.98
	Carbon-14	03:59	1.4	114565	-1.1
	Tritium	04:01	1.3	164605	-1.3
	Tritium	04:03	1.3	164629	-1.3
	BKG	04:05	30	25	-0.4
	BKG	04:36	30	27	0.85
LSCSILVER	Carbon-14	03:27	1.35	121193	-0.02
	Carbon-14	03:29	1.35	120776	-1.4
	Tritium	03:31	1.25	169374	-1.3
	Tritium	03:33	1.25	169519	-1
	BKG	03:35	30	27	0.87
	BKG	04:05	30	27	0.76
LSCTEAL	Carbon-14	04:24	1.583	105975	-0.5
	Carbon-14	04:26	1.583	105930	-0.68
	Tritium	04:29	1.217	145129	-0.92
	Tritium	04:31	1.2	145923	0.63
	BKG	04:33	30	16	1.51
	BKG	05:04	30	15	0.24
LSCYELLOW	Carbon-14	03:43	1.483	114030	-1.2
	Carbon-14	03:46	1.483	114473	0.24
	Tritium	03:48	1.483	149496	-0.01
	Tritium	03:51	1.483	149146	-0.82
	BKG	03:53	30	14	-0.95
	BKG	04:24	30	15	-0.59

Reviewed by: 
Lyndsey Pace

Date: 26-SEP-16

GEL Laboratories LLC




Liquid Scintillation Counter Checks for 27-SEP-2016

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LSCBLUE	Carbon-14	04:42	1.4	114741	-0.22			
	Carbon-14	04:43	1.4	114681	-0.45			
	Tritium	04:45	1.35	161264	0.59			
	Tritium	04:47	1.35	160845	-0.35			
	BKG	04:49	30	25	-0.77			
	BKG	05:20	30	25	-0.68			
LSCBROWN	Carbon-14	00:55	1.4	114679	-2.2			
	Carbon-14	00:57	1.4	114982	-1.1			
	Tritium	00:59	1.3	167151	-0.42			
	Tritium	01:01	1.3	167469	0.47			
	BKG	01:03	30	27	0.69			
	BKG	01:33	30	25	-1.5			
LSCGOLD	Carbon-14	02:58	1.3	126462	1.39			
	Carbon-14	03:00	1.3	125826	-0.52			
	Tritium	03:02	1.35	150691	-0.9			
	Tritium	03:03	1.35	151249	0.33			
	BKG	03:05	30	22	0.3			
	BKG	03:36	30	23	0.88			
LSCGREEN	Carbon-14	02:03	1.4	115229	0.1			
	Carbon-14	02:05	1.4	114521	-2.3			
	Tritium	02:07	1.25	172325	-1.4			
	Tritium	02:09	1.25	172659	-0.73			
	BKG	02:11	30	27	0.9			
	BKG	02:41	30	27	1.41			
LSCORANGE	Carbon-14	02:44	1.012433	107710	0.32			
	Tritium	02:48	1.012433	178996	-1.7			
	BKG	03:20	30.01243	11	-0.29			
	Carbon-14	03:22	1.012433	107395	-0.59			
	Tritium	03:23	1.012433	179324	-0.93			
	BKG	03:53	30.01243	11	0.24			

LSCPINK	Carbon-14	02:33	1.012433	118221	-2
	Tritium	02:36	1.012433	138042	0.3
	BKG	03:09	30.01243	9.01	0.16
	Carbon-14	03:10	1.012433	119488	1.27
	Tritium	03:11	1.012417	138168	0.56
	BKG	03:42	30.01243	9.01	0.16
LSCRED	Carbon-14	01:50	1.4	115263	1.21
	Carbon-14	01:52	1.4	114979	0.27
	Tritium	01:54	1.3	164824	-0.84
	Tritium	01:55	1.3	164771	-0.96
	BKG	01:58	30	26	0.13
	BKG	02:28	30	26	-0.24
LSCSILVER	Carbon-14	02:58	1.35	120884	-1
	Carbon-14	03:00	1.35	121886	2.21
	Tritium	03:02	1.25	169186	-1.7
	Tritium	03:04	1.25	169493	-1.1
	BKG	03:06	30	24	-1.7
	BKG	03:36	30	25	-1.1
LSCTEAL	Carbon-14	03:57	1.583	105907	-0.78
	Carbon-14	03:59	1.583	105667	-1.7
	Tritium	04:02	1.217	145199	-0.78
	Tritium	04:04	1.217	145483	-0.23
	BKG	04:06	30	16	1.79
	BKG	04:37	30	15	0.24
LSCYELLOW	Carbon-14	00:08	1.483	114093	-1
	Carbon-14	00:11	1.467	114523	0.4
	Tritium	00:13	1.483	149436	-0.15
	Tritium	00:15	1.483	149889	0.9
	BKG	00:18	30	14	-1.6
	BKG	00:49	30	16	0.49
	Carbon-14	03:17	1.483	114114	-0.94
	Carbon-14	03:20	1.483	114040	-1.2
	Tritium	03:22	1.5	149018	-1.1
	Tritium	03:25	1.5	149063	-1

BKG	03:27	30	14	-0.95
BKG	03:58	30	15	-0.47

Reviewed by: 
Lyndsey Pace

Date: 27-SEP-16

GEL Laboratories LLC



Liquid Scintillation Counter Checks for 28-SEP-2016


Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LSCBLUE	Carbon-14	01:48	1.4		115521	2.69		
	Carbon-14	01:49	1.4		114439	-1.3		
	Tritium	01:51	1.35		161162	0.36		
	Tritium	01:53	1.35		161914	2.03		
	BKG	01:55	30		27	0.09		
	BKG	02:26	30		26	-0.45		
LSCBROWN	Carbon-14	03:22	1.4		114977	-1.1		
	Carbon-14	03:23	1.4		114752	-1.9		
	Tritium	03:25	1.3		167219	-0.23		
	Tritium	03:27	1.3		167102	-0.55		
	BKG	03:29	30		27	0.12		
	BKG	04:00	30		26	-0.91		
LSCGOLD	Carbon-14	03:05	1.3		125416	-1.8		
	Carbon-14	03:07	1.3		125584	-1.3		
	Tritium	03:09	1.4		150452	-1.4		
	Tritium	03:11	1.35		150922	-0.39		
	BKG	03:13	30		24	1.57		
	BKG	03:43	30		23	1.21		
LSCGREEN	Carbon-14	02:37	1.4		115346	0.5		
	Carbon-14	02:39	1.4		115265	0.22		
	Tritium	02:41	1.25		172643	-0.76		
	Tritium	02:43	1.25		173588	1.25		
	BKG	02:45	30		27	1.46		
	BKG	03:15	30		26	0.28		
LSCORANGE	Carbon-14	01:05	1.01245		108762	3.36	Outside Three Sigma	
	Tritium	01:09	1.012433		179550	-0.37		
	BKG	01:41	30.01243		11	0.33		
	Carbon-14	01:42	1.012433		107260	-0.98		
	Tritium	01:44	1.01235		179063	-1.6		
	BKG	02:14	30.01243		12	1.04		

	Carbon-14	05:49	1.012433	107209	-1.1
	Tritium	05:52	1.012433	179463	-0.59
	BKG	06:25	30.01243	12	1.61
	Carbon-14	06:26	1.012433	107590	-0.03
	Tritium	06:27	1.012333	179422	-0.69
	BKG	06:58	30.01243	13	2.13
LSCPINK	Carbon-14	04:07	1.012433	118824	-0.46
	Tritium	04:10	1.012433	137837	-0.13
	BKG	04:43	30.01243	9.11	0.33
	Carbon-14	04:44	1.012433	119359	0.94
	Tritium	04:46	1.012333	137374	-1.1
	BKG	05:16	30.01243	9.78	1.52
LSCRED	Carbon-14	03:34	1.4	114564	-1.1
	Carbon-14	03:36	1.4	114909	0.03
	Tritium	03:38	1.3	164730	-1
	Tritium	03:40	1.3	164358	-1.9
	BKG	03:42	30	27	1.5
	BKG	04:12	30	26	-0.17
LSCSILVER	Carbon-14	00:24	1.35	121336	0.44
	Carbon-14	00:26	1.35	121211	0.04
	Tritium	00:28	1.25	170645	1.37
	Tritium	00:29	1.25	170205	0.43
	BKG	00:32	30	27	0.78
	BKG	01:02	30	26	0.42
LSCTEAL	Carbon-14	04:03	1.617	106220	0.48
	Carbon-14	04:05	1.583	106078	-0.09
	Tritium	04:08	1.217	145076	-1
	Tritium	04:10	1.217	144818	-1.5
	BKG	04:12	30	14	-0.89
	BKG	04:43	30	15	-0.47
LSCYELLOW	Carbon-14	01:56	1.483	114479	0.26
	Carbon-14	01:58	1.483	114349	-0.17
	Tritium	02:01	1.483	149679	0.42
	Tritium	02:03	1.5	149021	-1.1

BKG 02:05 30 14 -1.6

BKG 02:36 30.017 14 -1.2

LSCORANGE: CLEARED BY RERUN

Reviewed by: 
Lyndsey Pace

Date: 28-SEP-16

GEL Laboratories LLC




Liquid Scintillation Counter Checks for 29-SEP-2016

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LSCBLUE	Carbon-14	01:05	1.4		114675	-0.47		
	Carbon-14	01:07	1.4		115000	0.74		
	Tritium	01:09	1.35		161467	1.04		
	Tritium	01:11	1.35		161527	1.17		
	BKG	01:13	30		25	-0.62		
	BKG	01:43	30		25	-0.89		
LSCBROWN	Carbon-14	03:27	1.4		115077	-0.78		
	Carbon-14	03:29	1.4		115354	0.19		
	Tritium	03:31	1.3		167493	0.54		
	Tritium	03:33	1.3		167278	-0.06		
	BKG	03:35	30		26	-0.62		
	BKG	04:05	30		27	-0.05		
LSCGOLD	Carbon-14	01:09	1.3		125794	-0.62		
	Carbon-14	01:11	1.3		126371	1.12		
	Tritium	01:13	1.35		151686	1.29		
	Tritium	01:15	1.35		151709	1.34		
	BKG	01:17	30		20	-1.9		
	BKG	01:47	30		23	1.24		
LSCGREEN	Carbon-14	00:12	1.4		115064	-0.47		
	Carbon-14	00:14	1.4		115266	0.23		
	Tritium	00:16	1.25		172346	-1.4		
	Tritium	00:17	1.25		172474	-1.1		
	BKG	00:19	30		25	-0.75		
	BKG	00:50	30		25	-1.2		
LSCORANGE	Carbon-14	01:49	1.012433		107533	-0.19		
	Tritium	01:53	1.012433		179410	-0.72		
	BKG	02:25	30.01243		11	0.1		
	Carbon-14	02:27	1.012433		107033	-1.6		
	Tritium	02:28	1.012333		179407	-0.72		
	BKG	02:59	30.01243		10	-0.95		

LSCPINK	Carbon-14	04:04	1.012433	119416	1.08	
	Tritium	04:07	1.012433	138232	0.69	
	BKG	04:40	30.01243	8.63	-0.52	
	Carbon-14	04:41	1.012433	118959	-0.11	
	Tritium	04:43	1.012333	137835	-0.14	
	BKG	05:13	30.01243	8.2	-1.3	
LSCRED	Carbon-14	02:42	1.4	114621	-0.93	
	Carbon-14	02:44	1.4	114804	-0.32	
	Tritium	02:46	1.3	164596	-1.4	
	Tritium	02:47	1.3	163365	-4.1	Outside Three Sigma
	BKG	02:49	30	27	0.91	
	BKG	03:20	30	24	-1.7	
	Tritium	05:33	1.3	164580	-1.4	
	Tritium	05:35	1.3	164361	-1.9	
LSCSILVER	Carbon-14	01:56	1.35	121466	0.86	
	Carbon-14	01:58	1.35	121206	0.02	
	Tritium	02:00	1.25	169653	-0.74	
	Tritium	02:02	1.25	170069	0.15	
	BKG	02:04	30	26	0.39	
	BKG	02:35	30	24	-1.1	
LSCTEAL	Carbon-14	03:58	1.617	105537	-2.3	
	Carbon-14	04:01	1.583	106267	0.67	
	Tritium	04:03	1.217	145391	-0.41	
	Tritium	04:05	1.217	145006	-1.2	
	BKG	04:07	30	15	0.24	
	BKG	04:38	30	16	0.94	
LSCYELLOW	Carbon-14	01:43	1.483	113779	-2	
	Carbon-14	01:45	1.483	114107	-0.96	
	Tritium	01:48	1.483	149297	-0.47	
	Tritium	01:50	1.5	149094	-0.94	
	BKG	01:52	30	15	-0.83	
	BKG	02:23	30	16	0.49	

LSCRED: CLEARED BY RERUN

Reviewed by: 
Lyndsey Pace

Date: 29-SEP-16


GEL Laboratories LLC



Liquid Scintillation Counter Checks for 30-SEP-2016

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LSCBLUE	Carbon-14	01:43	1.4		114746	-0.2		
	Carbon-14	01:45	1.4		115430	2.35		
	Tritium	01:47	1.35		160996	-0.01		
	Tritium	01:49	1.35		160389	-1.4		
	BKG	01:51	30		26	-0.14		
	BKG	02:21	30		26	-0.31		
LSCBROWN	Carbon-14	00:40	1.4		115167	-0.47		
	Carbon-14	00:42	1.4		115035	-0.93		
	Tritium	00:44	1.3		168127	2.3		
	Tritium	00:46	1.3		166997	-0.85		
	BKG	00:48	30		26	-0.78		
	BKG	01:18	30		25	-1.2		
LSCGOLD	Carbon-14	02:57	1.3		125788	-0.64		
	Carbon-14	02:59	1.3		125887	-0.34		
	Tritium	03:01	1.4		150680	-0.93		
	Tritium	03:02	1.35		151080	-0.05		
	BKG	03:05	30		23	0.85		
	BKG	03:35	30		22	0.3		
LSCGREEN	Carbon-14	00:40	1.4		115004	-0.68		
	Carbon-14	00:42	1.4		114486	-2.5		
	Tritium	00:44	1.25		172720	-0.6		
	Tritium	00:46	1.25		172738	-0.56		
	BKG	00:48	30		25	-1.4		
	BKG	01:18	30		26	-0.24		
LSCORANGE	Carbon-14	03:19	1.01245		107974	1.08		
	Tritium	03:23	1.012433		180655	2.36		
	BKG	03:55	30.01243		12	0.75		
	Carbon-14	03:57	1.012433		107589	-0.03		
	Tritium	03:58	1.01235		180022	0.8		
	BKG	04:29	30.01243		11	0.47		

LSCPINK	Carbon-14	04:02	1.012433	119240	0.63
	Tritium	04:05	1.012433	136976	-1.9
	BKG	04:38	30.01243	8.26	-1.2
	Carbon-14	04:39	1.012433	119567	1.48
	Tritium	04:41	1.012333	137395	-1.1
	BKG	05:11	30.01243	7.72	-2.1
LSCRED	Carbon-14	03:13	1.4	114989	0.3
	Carbon-14	03:15	1.4	115029	0.43
	Tritium	03:17	1.3	164164	-2.3
	Tritium	03:19	1.3	164597	-1.3
	BKG	03:21	30	25	-0.73
	BKG	03:51	30	27	0.97
LSCSILVER	Carbon-14	01:39	1.35	121403	0.65
	Carbon-14	01:41	1.35	121309	0.35
	Tritium	01:43	1.25	169717	-0.6
	Tritium	01:45	1.25	169402	-1.3
	BKG	01:47	30	25	-0.27
	BKG	02:17	30	26	0.24
LSCTEAL	Carbon-14	01:37	1.583	105852	-01
	Carbon-14	01:40	1.583	106162	0.25
	Tritium	01:43	1.217	144338	-2.5
	Tritium	01:45	1.217	144655	-1.8
	BKG	01:47	30	15	-0.32
	BKG	02:18	30	16	2.07
LSCYELLOW	Carbon-14	03:52	1.483	114303	-0.32
	Carbon-14	03:54	1.483	114156	-0.8
	Tritium	03:56	1.483	149572	0.17
	Tritium	03:59	1.483	149558	0.14
	BKG	04:01	30	16	1.1
	BKG	04:32	30	16	1.34

Reviewed by: 
Lyndsey Pace

Date: 30-SEP-16

GEL Laboratories LLC




Liquid Scintillation Counter Checks for 01-OCT-2016

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LSCBLUE	Carbon-14	03:27	1.4		115213	1.54		
	Carbon-14	03:29	1.4		114582	-0.81		
	Tritium	03:31	1.35		161421	0.94		
	Tritium	03:33	1.35		160717	-0.63		
	BKG	03:35	30		25	-0.68		
	BKG	04:05	30		25	-0.73		
LSCBROWN	Carbon-14	03:29	1.4		115046	-0.89		
	Carbon-14	03:31	1.4		114946	-1.2		
	Tritium	03:33	1.3		167819	1.45		
	Tritium	03:34	1.3		166906	-1.1		
	BKG	03:36	30		27	0.57		
	BKG	04:07	30		27	0.05		
LSCGOLD	Carbon-14	02:16	1.3		125710	-0.87		
	Carbon-14	02:17	1.3		125748	-0.76		
	Tritium	02:19	1.35		151942	1.86		
	Tritium	02:21	1.35		151575	1.05		
	BKG	02:23	30		22	-0.46		
	BKG	02:54	30		23	0.41		
LSCGREEN	Carbon-14	06:03	1.4		114624	-2		
	Carbon-14	06:04	1.4		114382	-2.8		
	Tritium	06:06	1.25		172579	-0.9		
	Tritium	06:08	1.25		172632	-0.78		
	BKG	06:10	30		27	0.72		
	BKG	06:40	30		27	1.05		
LSCORANGE	Carbon-14	04:06	1.01245		107866	0.77		
	Tritium	04:09	1.012433		180610	2.25		
	BKG	04:42	30.01243		12	1.42		
	Carbon-14	04:43	1.012433		107556	-0.13		
	Tritium	04:45	1.01235		179803	0.25		
	BKG	05:15	30.01243		10	-1		

LSCPINK	Carbon-14	00:54	1.012433	118820	-0.47	
	Tritium	00:58	1.012433	137908	0.02	
	BKG	01:30	30.01243	8.2	-1.3	
	Carbon-14	01:32	1.012433	118892	-0.28	
	Tritium	01:33	1.012333	138217	0.66	
	BKG	02:04	30.01243	9.28	0.64	
LSCRED	Carbon-14	01:48	1.4	115040	0.47	
	Carbon-14	01:50	1.4	114366	-1.8	
	Tritium	01:52	1.3	164638	-1.3	
	Tritium	01:53	1.3	164544	-1.5	
	BKG	01:55	30	26	-0.21	
	BKG	02:26	30	26	0.45	
LSCSILVER	Carbon-14	05:19	1.35	121262	0.2	
	Carbon-14	05:56	1.35	121504	0.98	
	Tritium	05:58	1.25	169543	-0.97	
	Tritium	05:59	1.25	169883	-0.25	
	BKG	06:01	30	26	0.42	
	BKG	06:32	30	27	0.76	
LSCTEAL	Carbon-14	05:06	1.583	106001	-0.4	
	Carbon-14	05:09	1.583	105761	-1.4	
	Tritium	05:11	1.217	144704	-1.7	
	Tritium	05:13	1.217	143979	-3.2	Outside Three Sigma
	BKG	05:16	30	15	0.66	
	BKG	05:46	30	15	-0.47	
	Tritium	06:51	1.233	143776	-3.6	Outside Three Sigma
	Tritium	06:53	1.217	144545	-2.1	
	Tritium	08:45	1.233	143817	-3.5	Outside Three Sigma
	Tritium	08:47	1.233	143879	-3.4	Outside Three Sigma
	Tritium	12:11	1.25	144389	-2.4	
	Tritium	12:13	1.217	144312	-2.5	
	Tritium	12:17	1.217	144270	-2.6	
	Tritium	12:19	1.25	144568	-2	
LSCYELLOW	Carbon-14	03:19	1.483	114321	-0.26	
	Carbon-14	03:21	1.483	114205	-0.64	

Tritium	03:24	1.483	149799	0.7
Tritium	03:26	1.483	149999	1.16
BKG	03:29	30	15	-0.83
BKG	03:59	30	15	-0.47

LSCTEAL: CLEARED BY RERUN

Reviewed by: 
Lyndsey Pace

Date: 03-OCT-16

GEL Laboratories LLC




Liquid Scintillation Counter Checks for 03-OCT-2016

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LSCBLUE	Carbon-14	03:32	1.4		115093	1.09		
	Carbon-14	03:34	1.4		114894	0.35		
	Tritium	03:36	1.35		160863	-0.3		
	Tritium	03:37	1.35		162173	2.61		
	BKG	03:40	30		25	-0.79		
	BKG	04:10	30		25	-1.1		
LSCBROWN	Carbon-14	03:15	1.4		114578	-2.5		
	Carbon-14	03:16	1.4		114931	-1.3		
	Tritium	03:18	1.3		166870	-1.2		
	Tritium	03:20	1.3		167135	-0.46		
	BKG	03:22	30		25	-1.5		
	BKG	03:53	30		26	-0.3		
LSCGOLD	Carbon-14	03:02	1.3		125906	-0.28		
	Carbon-14	03:03	1.3		126051	0.15		
	Tritium	03:05	1.35		151102	0.01		
	Tritium	03:07	1.35		150900	-0.44		
	BKG	03:09	30		22	0.12		
	BKG	03:40	30		23	0.85		
LSCGREEN	Carbon-14	03:15	1.4		114941	-0.89		
	Carbon-14	03:17	1.4		114962	-0.82		
	Tritium	03:19	1.25		172993	-0.02		
	Tritium	03:20	1.25		171891	-2.4		
	BKG	03:22	30		26	-0.68		
	BKG	03:53	30		26	0.13		
LSCORANGE	Carbon-14	03:52	1.01245		107309	-0.84		
	Tritium	03:55	1.012433		178863	-2.1		
	BKG	04:28	30.01243		11	-0.67		
	Carbon-14	04:29	1.012433		107442	-0.46		
	Tritium	04:31	1.01235		179328	-0.92		
	BKG	05:01	30.01243		11	-0.06		

LSCPINK	Carbon-14	05:25	1.01245	119380	0.99	
	Tritium	05:28	1.01245	138559	1.38	
	BKG	06:01	30.01243	8.23	-1.2	
	Carbon-14	06:02	1.01245	118940	-0.16	
	Tritium	06:04	1.012333	137824	-0.16	
	BKG	06:34	30.01243	8.67	-0.45	
LSCRED	Carbon-14	03:34	1.4	114899	-00	
	Carbon-14	03:36	1.4	114968	0.23	
	Tritium	03:38	1.3	163595	-3.6	Outside Three Sigma
	Tritium	03:40	1.3	163877	-3	
	BKG	03:42	30	26	-0.31	
	BKG	04:12	30	27	0.65	
	Tritium	05:13	1.3	164195	-2.2	
	Tritium	05:14	1.3	164161	-2.3	
LSCSILVER	Carbon-14	03:05	1.35	121058	-0.46	
	Carbon-14	03:07	1.35	120713	-1.6	
	Tritium	03:09	1.25	169774	-0.48	
	Tritium	03:10	1.25	170047	0.1	
	BKG	03:12	30	27	1.46	
	BKG	03:43	30	25	-0.46	
LSCTEAL	Carbon-14	04:02	1.617	106025	0.51	
	Carbon-14	04:04	1.583	105633	-1.1	
	Tritium	04:07	1.217	144220	-0.67	
	Tritium	04:09	1.233	143519	-1.9	
	BKG	04:11	30	15	0.39	
	BKG	04:42	30	14	-1.6	
	Tritium	05:44	1.25	143943	-1.2	
	Tritium	05:46	1.233	143598	-1.8	
	Tritium	08:19	1.233	143320	-2.3	
	Tritium	08:21	1.233	143002	-2.8	
	Tritium	08:23	1.233	143601	-1.8	
Tritium	08:25	1.233	143124	-2.6		
LSCYELLOW	Carbon-14	03:21	1.483	114290	-0.36	
	Carbon-14	03:24	1.483	114361	-0.13	

Tritium	03:26	1.483	149843	0.8
Tritium	03:28	1.483	149471	-0.07
BKG	03:31	30	16	0.37
BKG	04:02	30	16	0.85

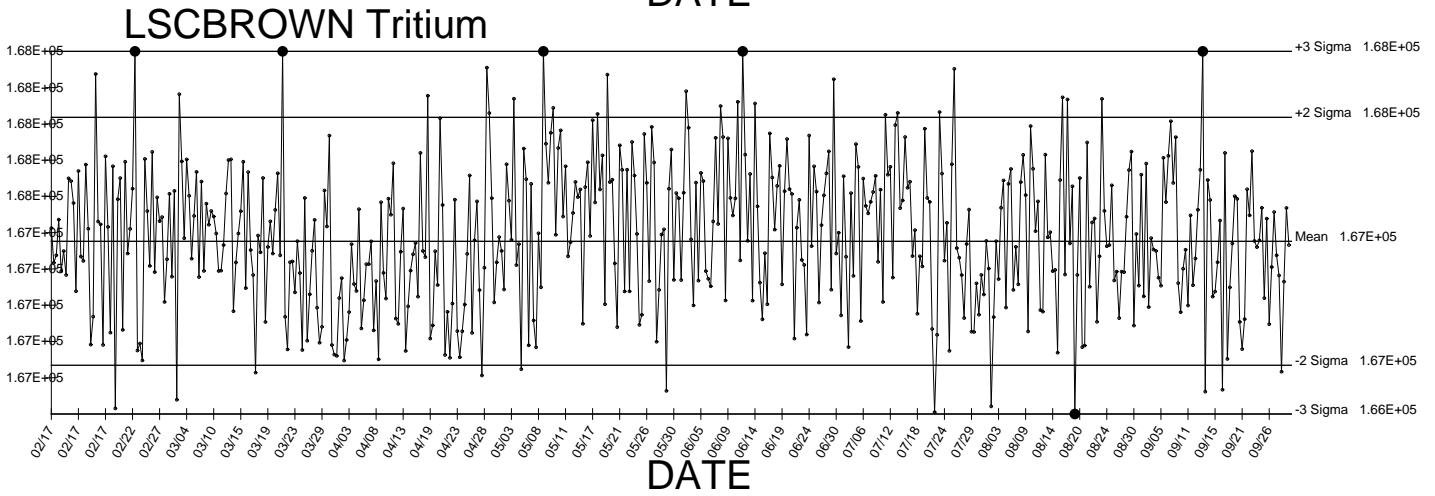
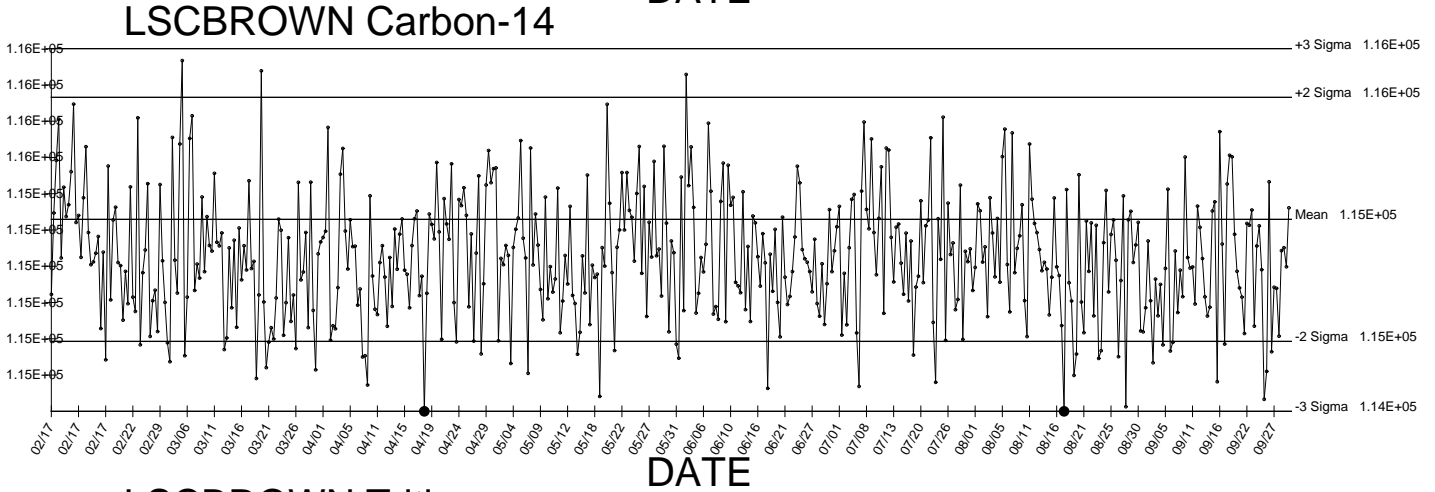
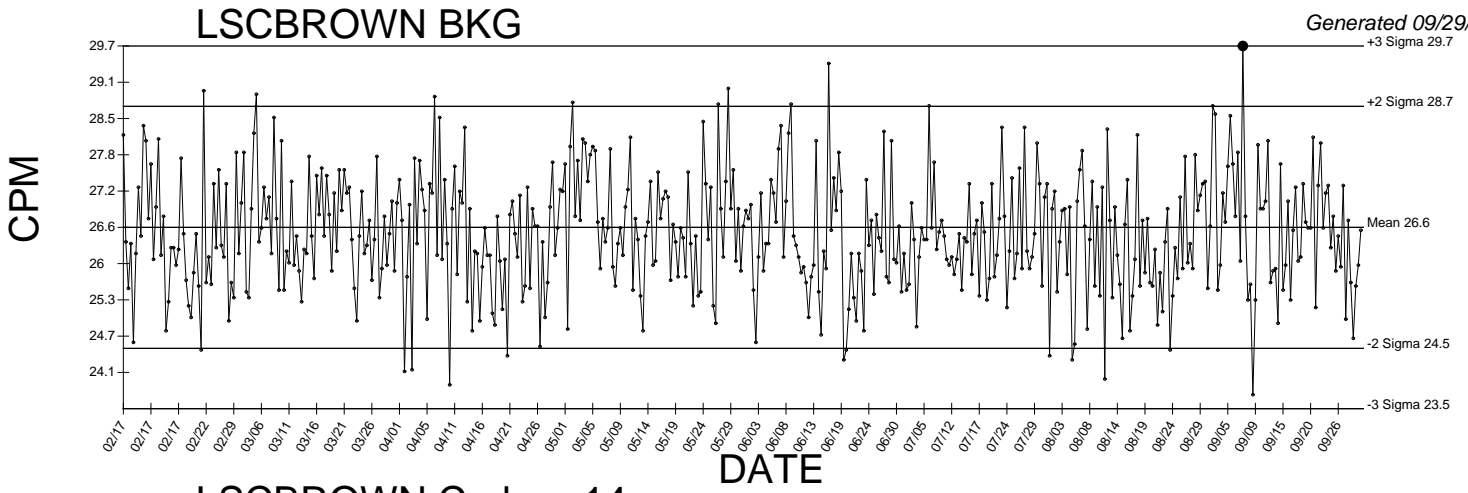
LSCRED: CLEARED BY RERUN

Reviewed by: 
Lyndsey Pace

Date: 03-OCT-16

GEL Laboratories LLC

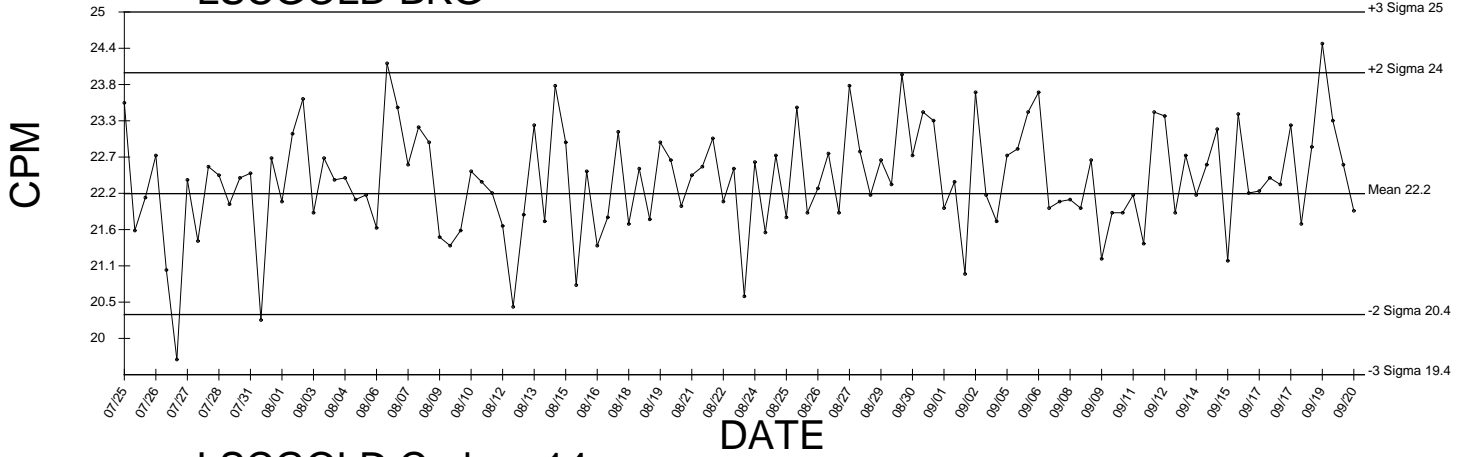
Background and Efficiency Data



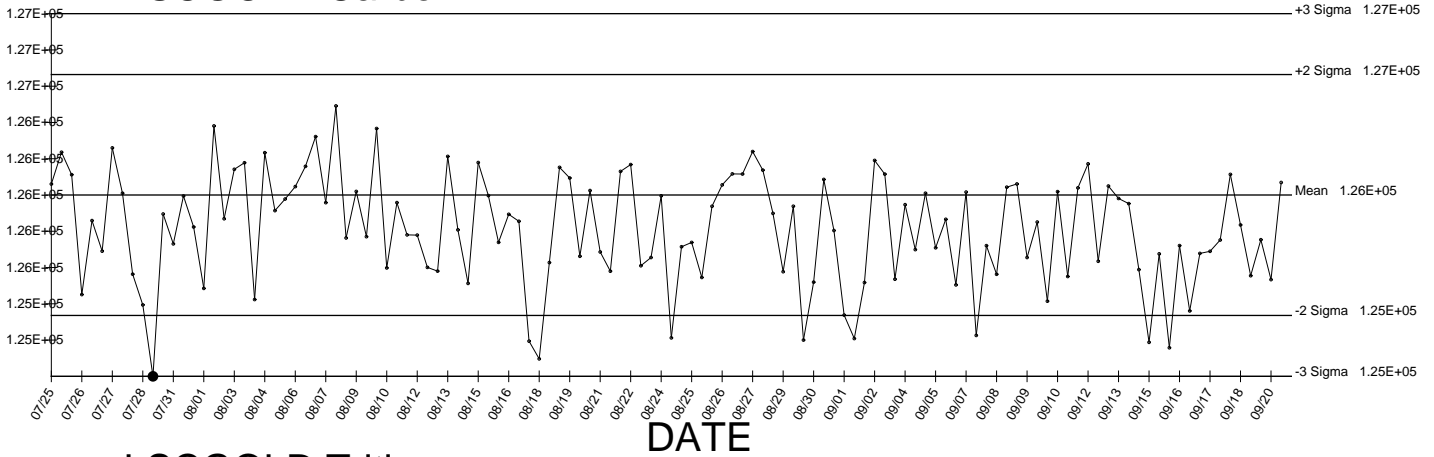
● Denotes Outlier

LSCGOLD BKG

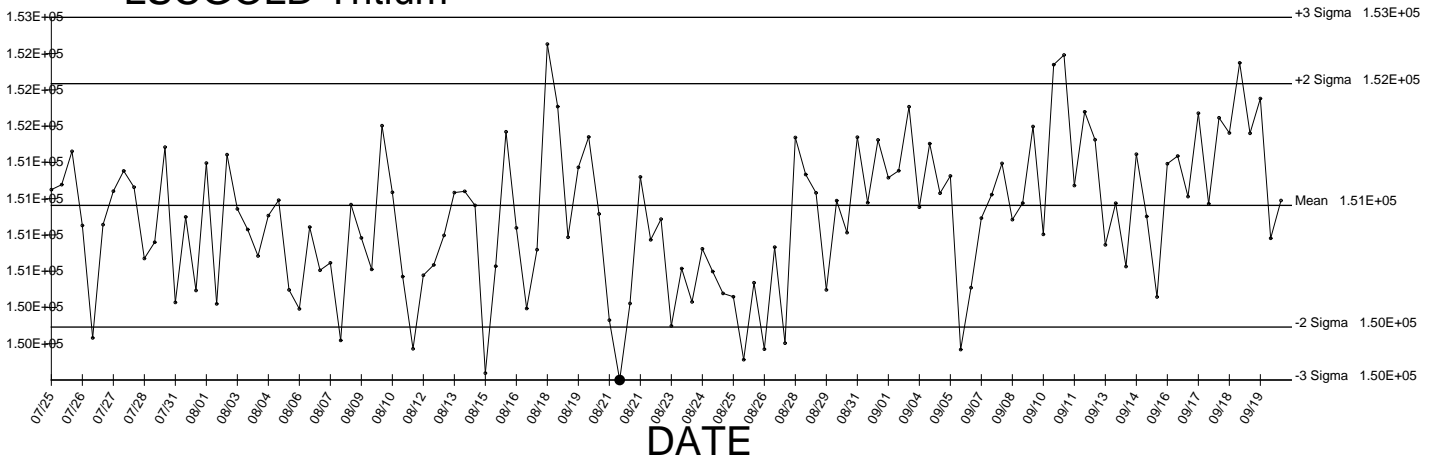
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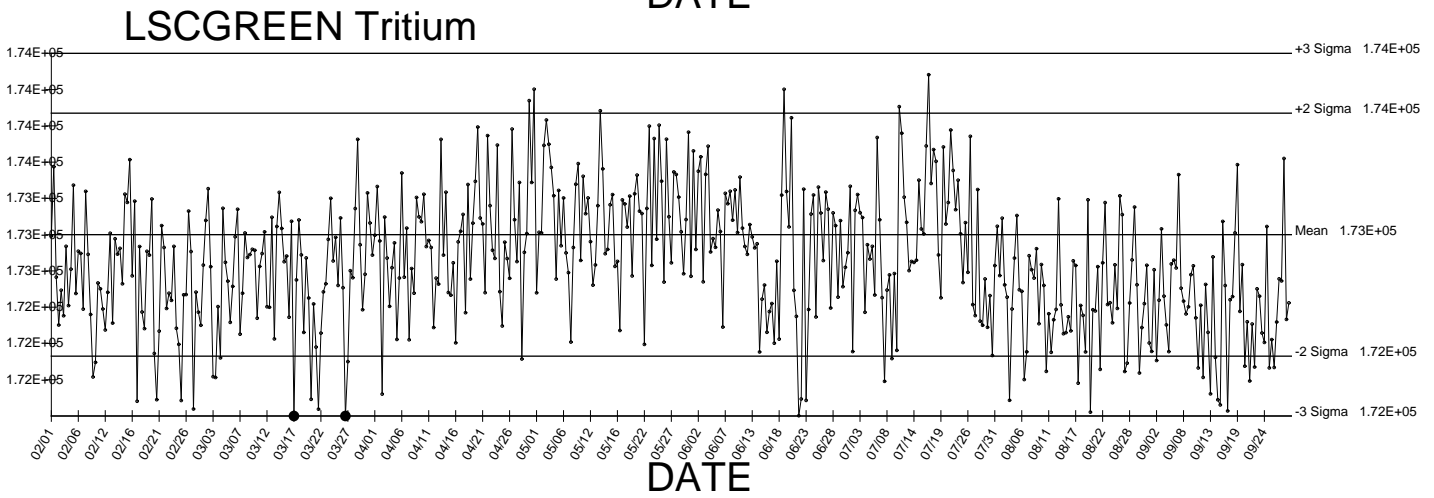
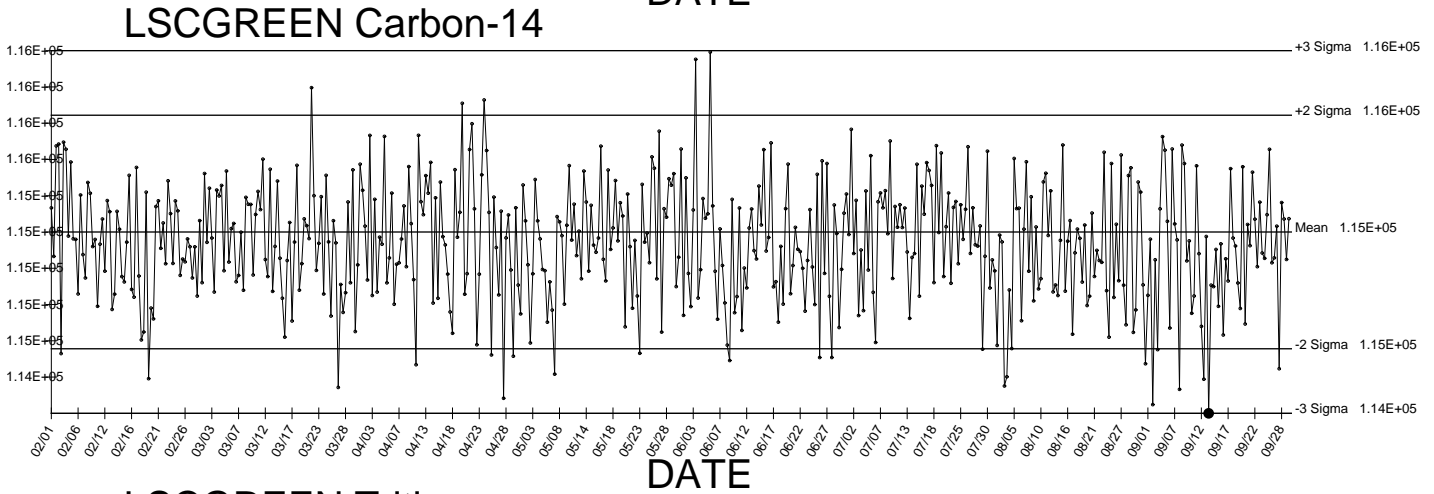
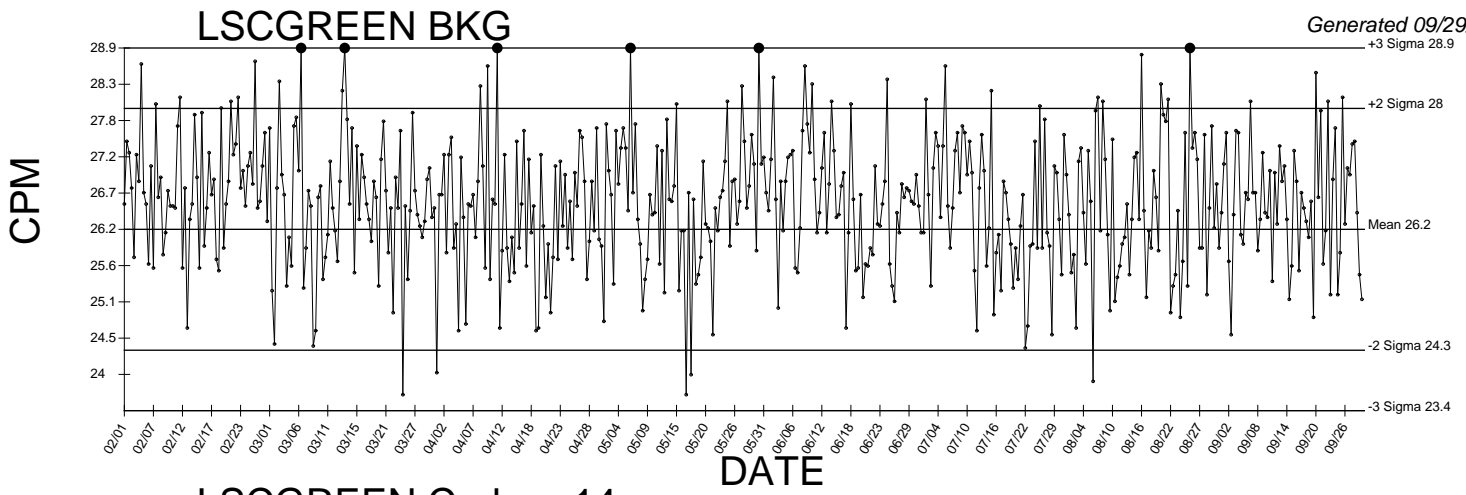
LSCGOLD Carbon-14



LSCGOLD Tritium



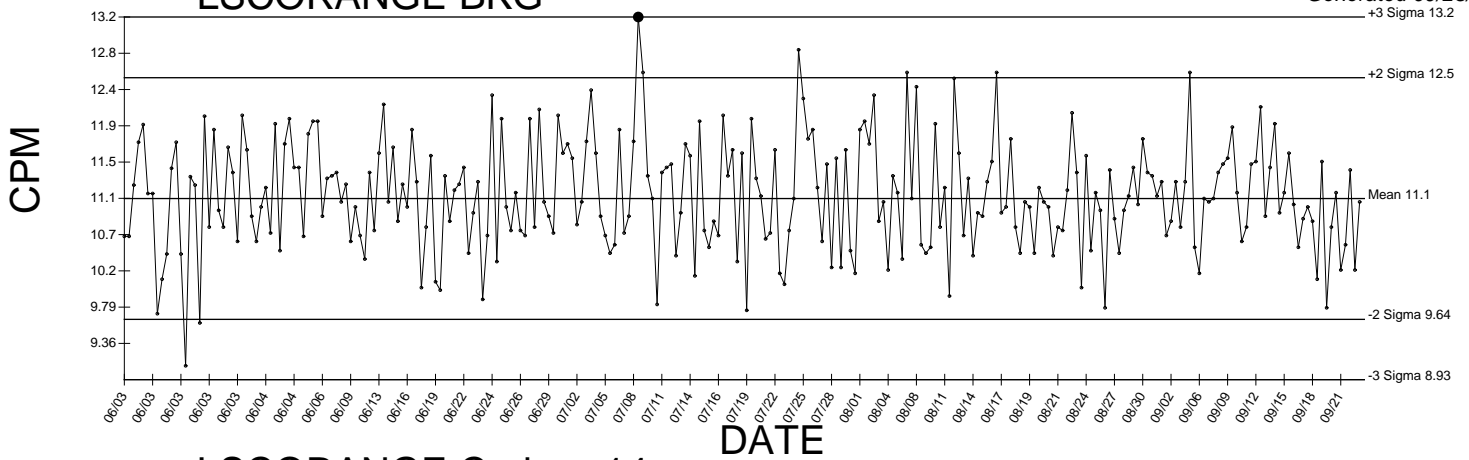
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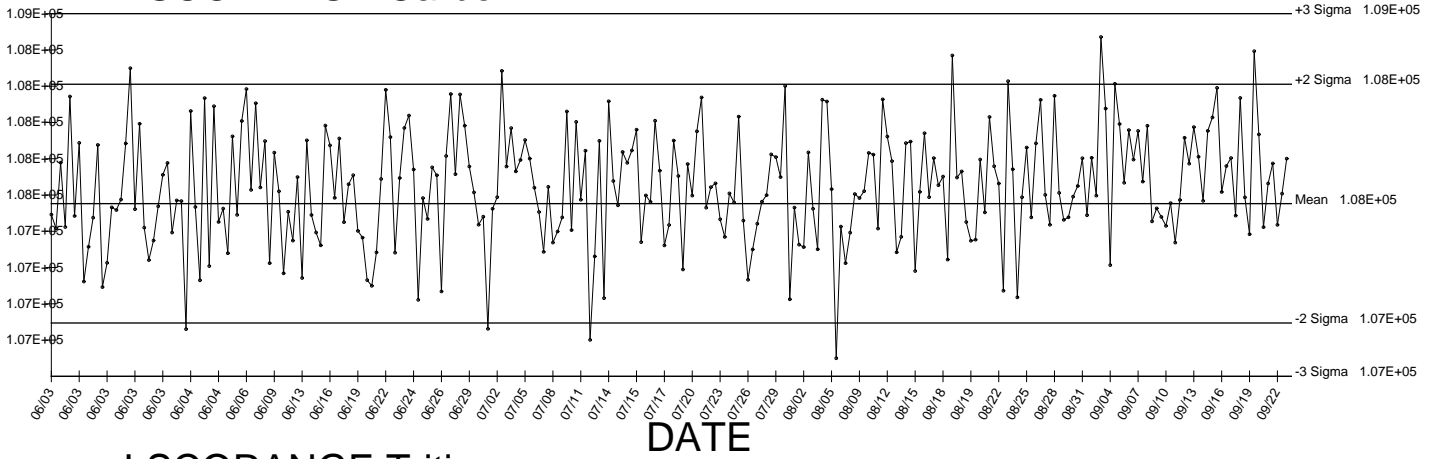
● Denotes Outlier

LSCORANGE BKG

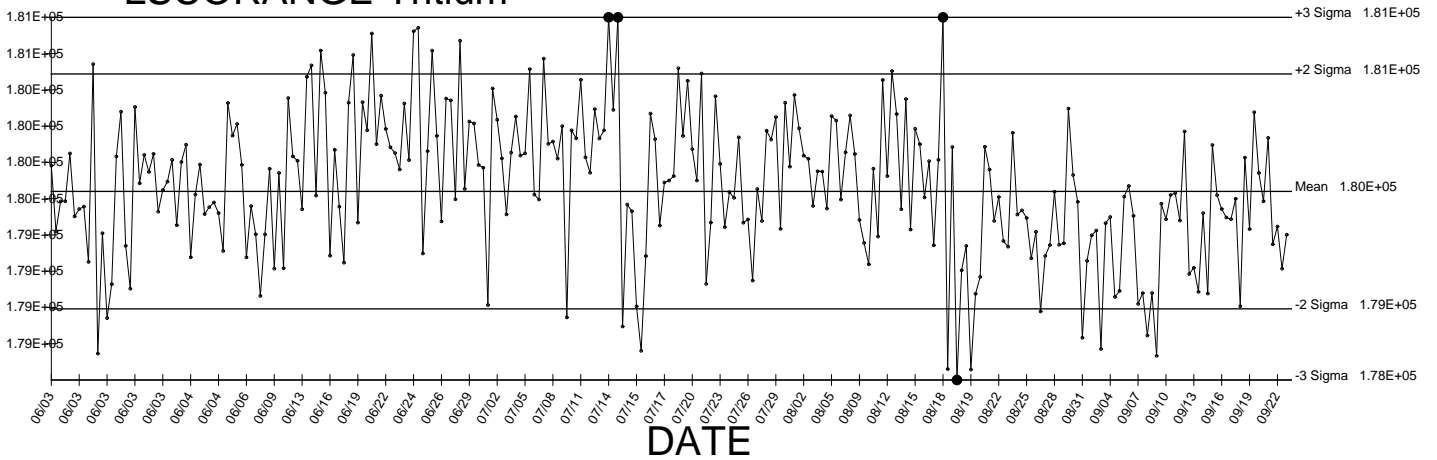
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LSCORANGE Carbon-14



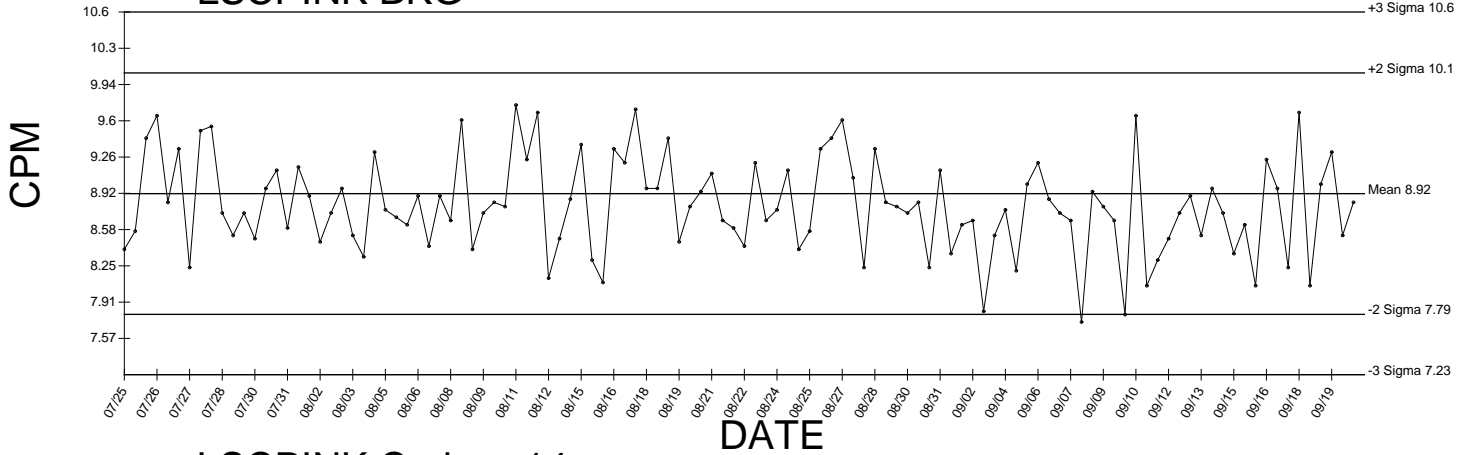
LSCORANGE Tritium



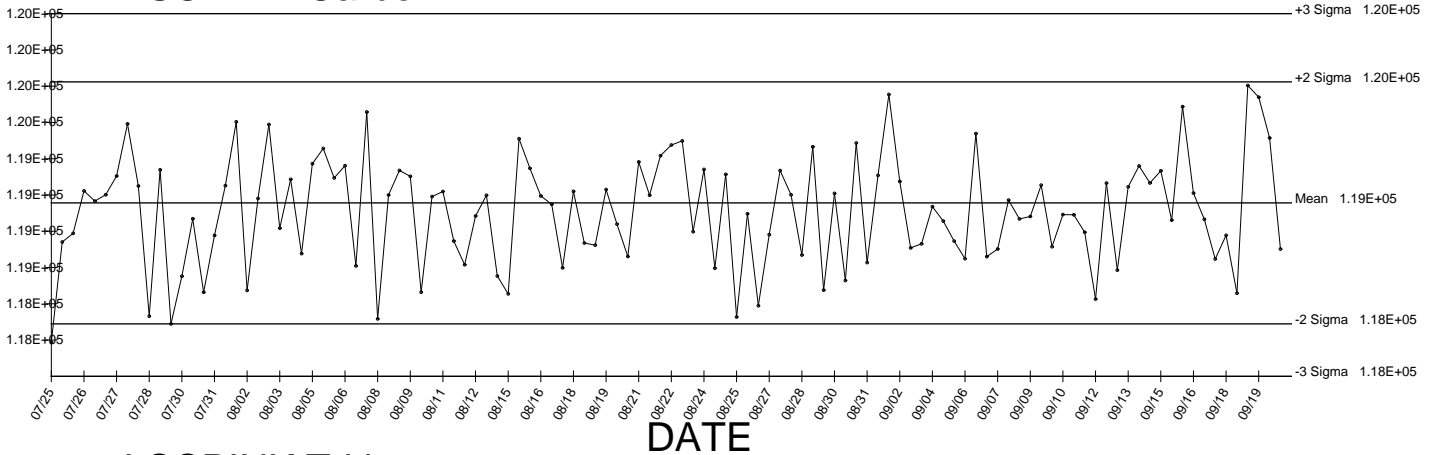
● Denotes Outlier

LSCPINK BKG

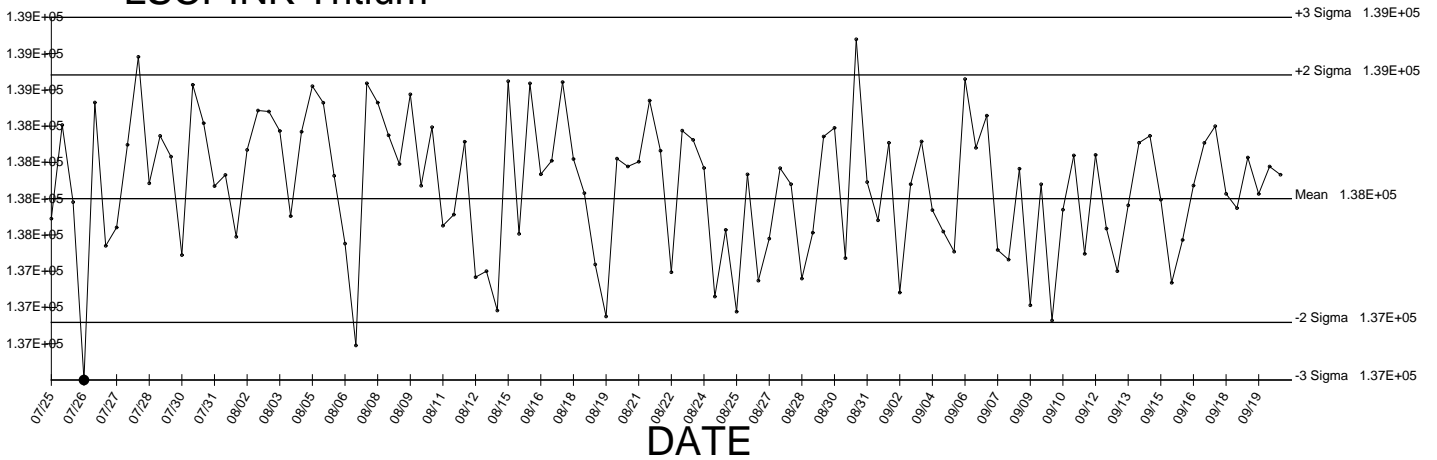
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LSCPINK Carbon-14



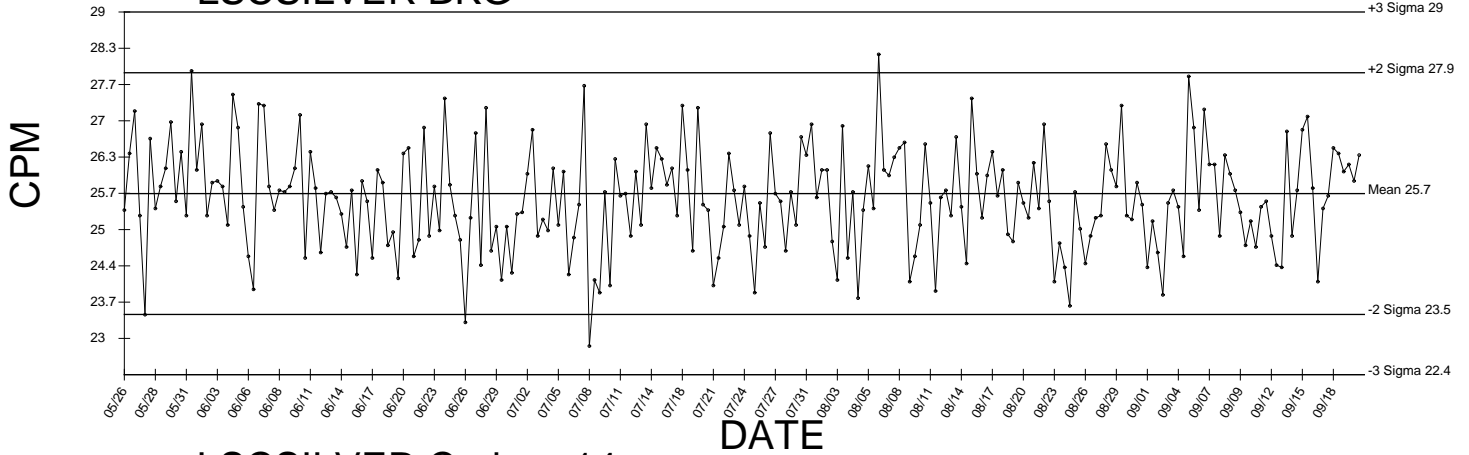
LSCPINK Tritium



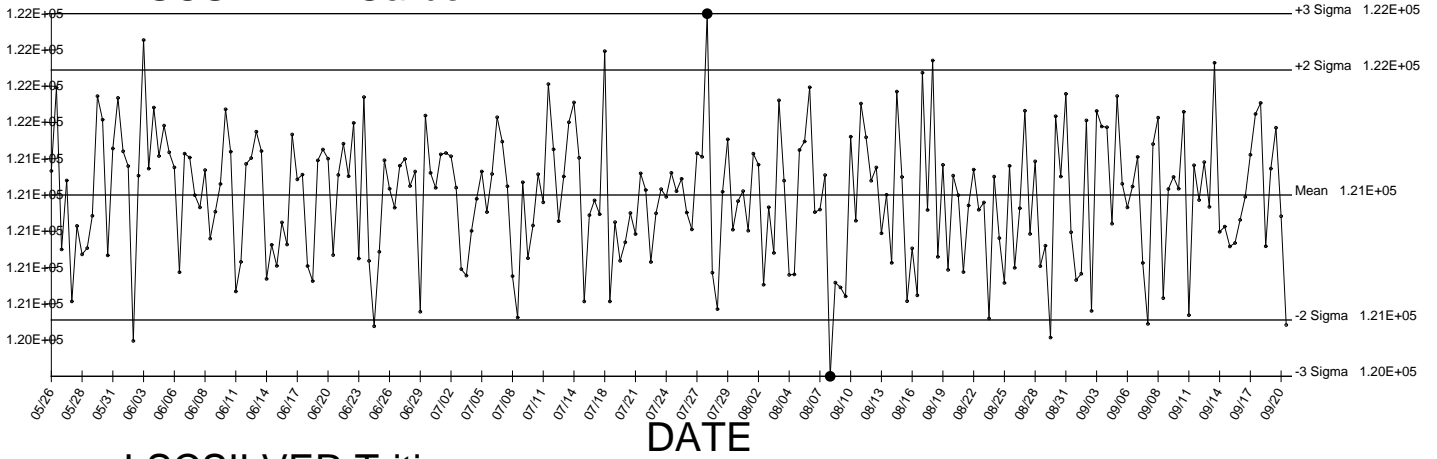
● Denotes Outlier

LSCSILVER BKG

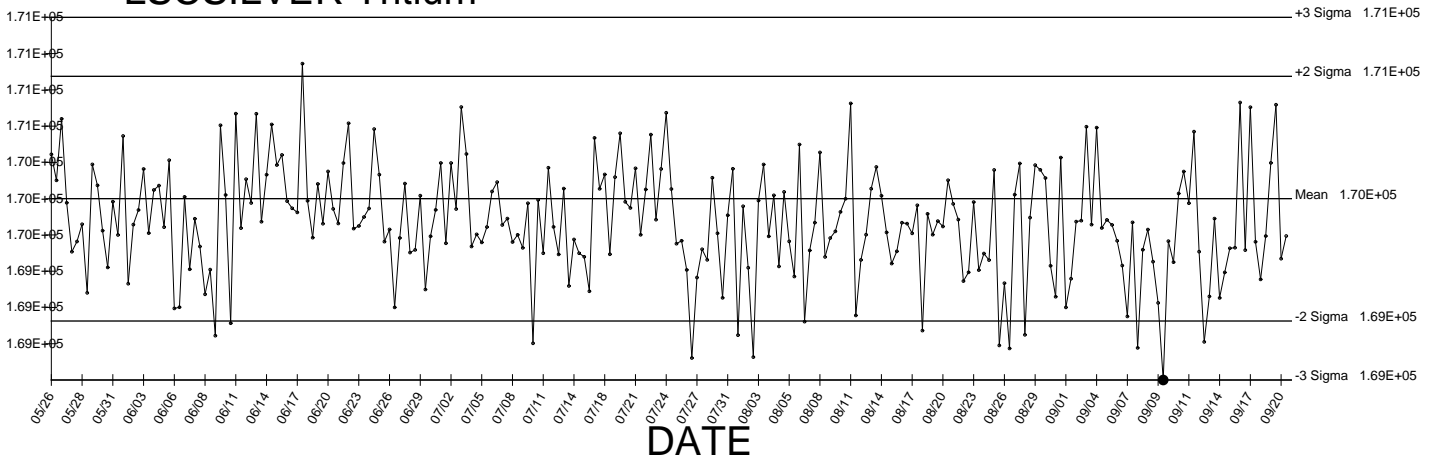
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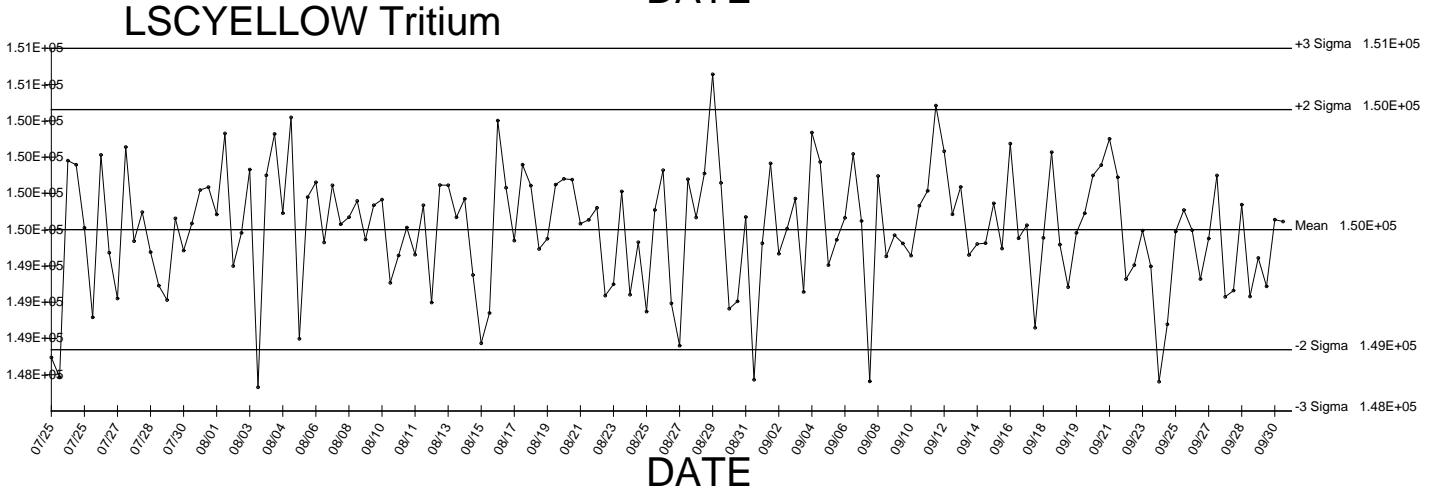
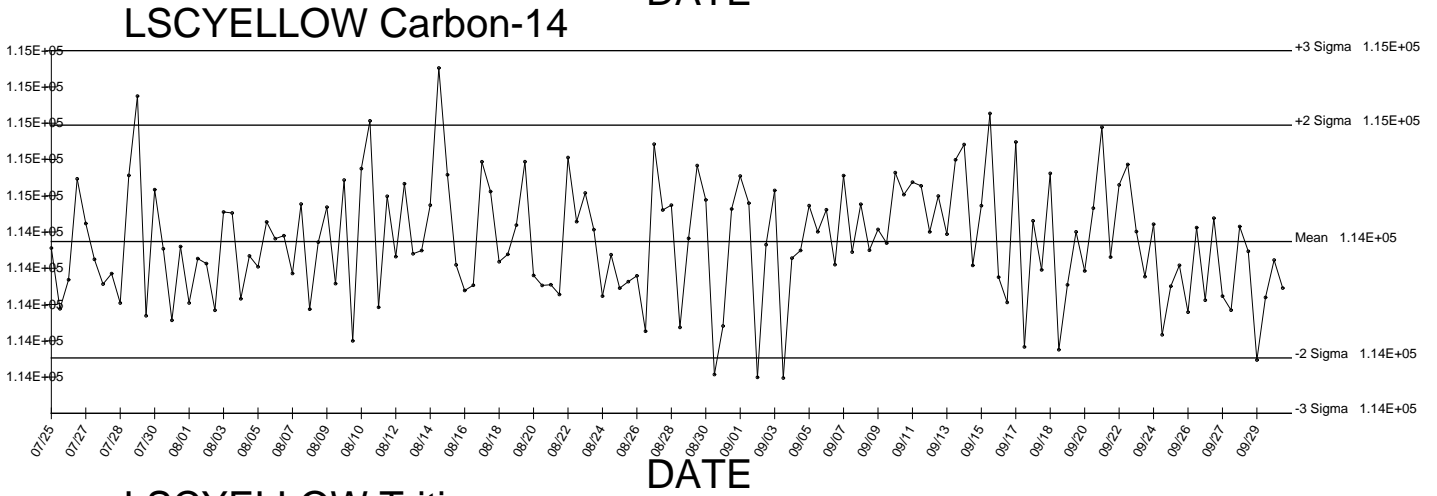
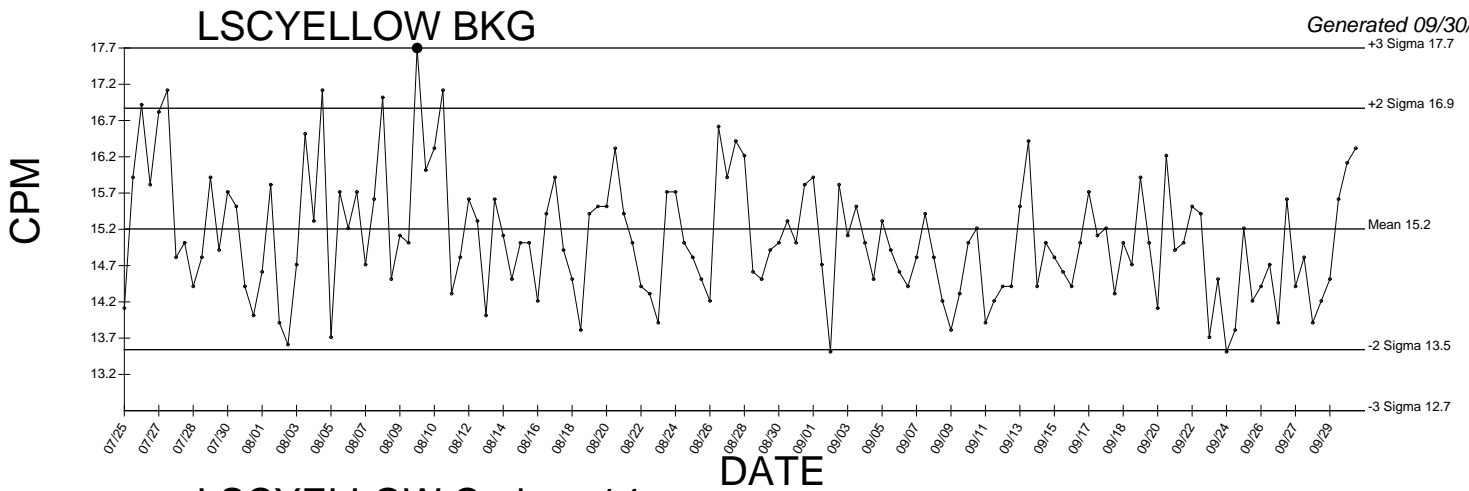
LSCSILVER Carbon-14



LSCSILVER Tritium



● Denotes Outlier



● Denotes Outlier

RAD Standards Traceability



Eckert & Ziegler

Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analytcsinc.com

CERTIFICATE OF CALIBRATION Standard Radionuclide Source

1646

92408

C-14 5 mL Liquid in Flame Sealed Vial

Customer: General Engineering Labs
P.O. No.: GEL 1303160, Item 1 **Product Code:** 8014G-5FSA-37kBq

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide calibration and purity were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty* , %			Reference Date (12:00 PM EST)
			u _A	u _B	U	
C-14	2.082E+06	4.004E+04	0.2	2.0	4.0	02/01/2013

*Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

Impurities: γ -impurities < 0.1%.
5.08352 g of solution 50 μ g/g glucose + 1 mg/g formaldehyde in H₂O.

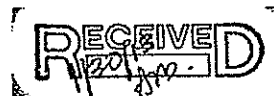
Source Prepared by: _____

Z. Dimitrova
Z. Dimitrova, Radiochemist

QA Approved: _____

J.D. McCorvey
J.D. McCorvey, Counting Room Manager

Date: 28 JAN 13





Standard Traceability Log Rad

Source Material Info	
Parent Code:	1646
Prepared By:	Ashley Drochter
Carrier Conc:	formaldehyde/glucose/water
Reference Date:	02/01/2013
Ampoule Mass (g):	5.08352 g
Uncertainty:	+/- 4 %
LogBook No:	RC-S-065-075

A Solution Material Info			
Isotope:	Carbon-14		
Prepared By:	Gregory Ramsay		
Prep Date:	02/04/2013		
Verification Date:	01/05/2016		
Expiration Date:	01/05/2017		
Primary Code:	1646-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	4.9916 g		
Density(g/mL):	0.9996	Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.9916 \text{ g}) * (40040 \text{ Bq}) * (60 \text{ dpm/Bq}) / (5.08352 \text{ g} * 100 \text{ mL}) = 23589.5990 \text{ dpm/mL}$
$(4.9916 \text{ g}) * (40040 \text{ Bq}) * (60 \text{ dpm/Bq}) / (0.9996 \text{ g/mL}) / (5.08352 \text{ g} * 100 \text{ mL}) = 23597.9527 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
02/06/2013	Gregory Ramsay	35.6417	500	1646-B	1682.1423 dpm/ml	01/05/2016	01/05/2017
08/13/2013	Christina Kimball	.996	250	1646-C	94.0142 dpm/ml	09/15/2016	09/15/2017

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for C-14 Standard 1646-B

v1.0.2

Instrument	Red
Analyst	GXR1
Verification Prep Date	1/5/2016

Standard Information	
Isotope	C-14
Serial Number	1646-B
Isotope Half-life	5.7000E+03 Y
Reference Date	2/1/2013
Ref. Act. (DPM/mL)	1682.1423
Amount of Std. (mL)	0.2
Standard Prep Date	2/6/2013

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	1/6/2016	64.40	367.60	44.60
2	1/6/2016	64.80	358.60	44.60
3	1/6/2016	64.90	355.20	44.60

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	323.00	0.935480	1726.39	345.28
2	314.00	0.935480	1678.28	335.66
3	310.60	0.935480	1660.11	332.02

Mean Value = 1688.26
 Stdev = 34.24599987
 Certificate Value* = 1681.5
 Two sigma = 68.492
 10 % of Mean = 168.826
 Rule A (Pass/Fail) Pass
 % Recovery 100.40%
 Rule B (Pass/Fail) Pass
 Expiration Date 1/5/2017

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
 Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for C-14 source 1646-B by transferring 0.2 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCRed for C-14 source standard verification. The C-14 efficiency calibration which was used for verification calculations was performed on 1/5/2016 using C-14 source A2926-A.

Standard results for each verification source was calculated as follows:

$$\text{Source dpm/mL} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency (cpm/dpm), and
- D = volume used for standard verification.

RAD-M-001

Asfa J. Qureshi
 118114

1/6/16



Eckert & Ziegler

Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION Standard Radionuclide Source

1610

90784

Pu-241 5 mL Liquid in Flame Sealed Vial



Customer: GEL Laboratories, LLC
P.O. No.: 936825RD, Item 4

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide calibration and purity were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty* , %			Reference Date (12:00 PM EST)
			u _A	u _B	U	
Pu-241	5.241E+03	3.858E+04	0.2	1.6	3.2	04/27/2012

***Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

Impurities: γ -impurities (other than decay products) < 0.1%; Am-241 1807 Bq; other α -impurities 0.05%.
5.51992 g 3M HNO₃ solution. Carrier free.

Source Prepared by:
Z. Dimitrova, Radiochemist

QA Approved:
J.D. McCorvey, Counting Room Manager

Date: 27 APR 12



RC-S-065-040



Standard Traceability Log Rad

Source Material Info	
Parent Code:	1610
Prepared By:	Gregory Ramsay
Carrier Conc:	3M HNO3
Reference Date:	04/27/2012
Ampoule Mass (g):	5.51992 g
Uncertainty:	+/- 3.2 %
LogBook No:	RC-S-065-040

A Solution Material Info			
Isotope:	Plutonium-241		
Prepared By:	Gregory Ramsay		
Prep Date:	06/13/2012		
Verification Date:	01/07/2016		
Expiration Date:	01/07/2017		
Primary Code:	1610-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	5.3865 g		
Density(g/mL):	1.0966	Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(5.3865 \text{ g}) * (38550 \text{ Bq}) * (60 \text{ dpm/Bq}) / (5.51992 \text{ g} * 100 \text{ mL}) = 22570.9331 \text{ dpm/mL}$
$(5.3865 \text{ g}) * (38550 \text{ Bq}) * (60 \text{ dpm/Bq}) / (1.0966 \text{ g/mL}) / (5.51992 \text{ g} * 100 \text{ mL}) = 20582.9307 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
01/04/2013	Gregory Ramsay	50.895	500	1610-B	2095.1365 dpm/mL	10/28/2015	10/28/2016
08/23/2013	Christina Kimball	5.538	250	1610-C	455.9531 dpm/mL	08/25/2014	08/25/2015

GEL Laboratories LLC
Version 1.0 9/18/2000

v1.02

Verification for Pu-241 Standard 1610-B

Instrument	GOLD
Analyst	TCI
Verification Prep Date	10/28/2015

Standard Information	
Isotope	Pu-241
Serial Number	1610-B
Isotope Half-life	14.2900 Y
Reference Date	4/27/2012
Ref. Act. (DPM/mL)	2095.1365
Amount of Std. (mL)	0.5
Standard Prep Date	1/4/2013

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	10/28/2015	110.10	205.47	8.60
2	10/28/2015	109.00	209.27	8.60
3	10/28/2015	110.90	208.47	8.60

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	196.87	0.218983	1798.04	899.02
2	200.67	0.218983	1832.75	916.37
3	199.87	0.218983	1825.44	912.72

Mean Value = 1818.74 dpm/mL
 Stdev = 18.29670867

Certificate Value* = 1767.9
 Two sigma = 36.593
 10 % of Mean = 181.874
 Rule A (Pass/Fail) Pass
 % Recovery 102.88%
 Rule B (Pass/Fail) Pass
 Expiration Date 10/28/2016

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
 Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for Pu-241 source 1610-B by transferring 0.5 mL portions of the standard into glass liquid scintillation vials. 15 mL of Ecoscint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 15 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCGOLD for Pu-241 source standard verification. The Pu-241 efficiency calibration which was used for verification calculations was performed on 10/28/2015 using Pu-241 source 1628-A.

Standard results for each verification source was calculated as follows:

$$\text{Source dpm/mL} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency (cpm/dpm), and
- D = volume used for standard verification.

RAD-M-001

TCI
10-29-15

J
H.H.H.



National Institute of Standards & Technology

Certificate

Standard Reference Material[®] 4334I 1770

Plutonium-242 Radioactivity Standard

This Standard Reference Material (SRM) consists of a solution of a standardized and certified quantity of radioactive plutonium-242 in a suitably stable and homogeneous matrix. It is intended primarily for the calibration of instruments that are used to measure radioactivity and for the monitoring of radiochemical procedures. A unit consists of a solution, whose composition is specified in Table 1, contained in a flame-sealed 5 mL borosilicate-glass ampoule (see Note 1)*.

The certified **Plutonium-242** massic activity value, at a **Reference Time of 1200 EST, 01 January 2010**, is:

$$(26.77 \pm 0.18) \text{ Bq}\cdot\text{g}^{-1}.$$

Additional physical, chemical, and radiological properties for this SRM, as well as details on the standardization method, are given in Table 1. Uncertainties for the certified quantities are expanded ($k=2$). The uncertainties are calculated according to the ISO Guide (see Note 2). Table 2 contains a specification of the components that comprise the uncertainty analyses.

Expiration of Certification: The certification of **SRM 4334I** is valid indefinitely provided the SRM is handled and stored properly and that no evaporation or change in composition has occurred. The solution matrix, in an unopened ampoule, is homogeneous and stable within its half-life-dependent useful lifetime provided the SRM is handled in accordance with instructions given in this certificate (see "Instructions for Storage and Handling"). The certification is nullified if the SRM is damaged, contaminated, or otherwise modified.

Maintenance of Certification: NIST will monitor this SRM over the period of its certification. If substantive technical changes occur that affect the certification before the expiration of this certificate, NIST will notify the purchaser. Registration (see attached sheet) will facilitate notification.

This SRM may represent a radiological hazard and a chemical hazard. Consult the Material Safety Data Sheet (MSDS), enclosed with the SRM shipment, for details.

This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, M.P. Unterweger, Group Leader. The overall technical direction and physical measurement leading to certification were provided by L. Lucas of the NIST Radioactivity Group.

Support aspects involved in the issuance of this SRM were coordinated through the NIST Measurement Services Division.

INSTRUCTIONS FOR STORAGE AND HANDLING

Storage: SRM 4334I should be stored and used at a temperature between 5 °C and 65 °C. The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material.

Handling: If the ampoule is transported, it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) because of both the radioactivity and the strong acid. The ampoule should be opened only by persons qualified to handle both radioactive material and alkaline and/or acidic solutions. Appropriate shielding and/or distance should be used to minimize personnel exposure. Refer to MSDS for further information.

Lisa R. Karam, Chief
Ionizing Radiation Division

Gaithersburg, MD 20899
Certificate Issue Date: 30 June 2010

Robert L. Watters, Jr., Chief
Measurement Services Division



GL-CED-297-063

* Notes and references may be found on pages 4 and 5.
SRM 4334I

Table 1. Properties of SRM 4334I

Certified values

Radionuclide	Plutonium-242
Reference time	1200 EST, 1 January 2010 (See Note 3) *
Massic activity of the solution	26.77 Bq·g ⁻¹
Relative expanded uncertainty (<i>k</i> = 2)	0.68 % (see Note 2)

Uncertified information

Source description	Liquid in a flame-sealed 5 mL borosilicate-glass ampoule (see Note 1)
Solution composition	3.2 mol L ⁻¹ HNO ₃
Solution density	(1.105 ± 0.002) g mL ⁻¹ at 22 °C (see Note 4)
Solution mass	Approximately 5.5 g
Alpha-particle- emitting impurities	²⁴¹ Am : (0.0016 ± 0.0003) Bq g ⁻¹ (See Note 3, 5 and 6)
Beta-particle- emitting impurities	²⁴¹ Pu : (0.044 ± 0.009) Bq g ⁻¹ (see Note 4)
Photon-emitting impurities	None detected (see Note 7)
Half-lives used	²⁴² Pu : (373 500 ± 1100) a (see Note 8) [1] ²⁴¹ Pu : (14.290 ± 0.006) a ²⁴⁰ Pu : (6 561 ± 7) a ²³⁹ Pu : (24 110 ± 30) a ²³⁸ Pu : (87.7 ± 0.1) a ²⁴¹ Am : (432.6 ± 0.6) a
Calibration methods (and instruments)	The certified massic activity for ²⁴² Pu was obtained by 4π α liquid scintillation (LS) spectrometry using four commercial LS counters, a calibrated germanium detector system, and a silicon surface-barrier detector.

* Notes and references may be found on pages 4 and 5.
SRM 4334I

Table 2. Uncertainty evaluation for the massic activity of SRM 4334I

Uncertainty component		Assessment Type [†]	Relative standard uncertainty contribution on massic activity of ²⁴² Pu (%)
1	Massic alpha-particle emission rate, corrected for background and decay. Standard deviation of the mean for 180 4π liquid-scintillation measurements.	A	0.06
2	Half life of ²⁴² Pu; standard uncertainty of the half life	B	3 × 10 ⁻⁶
3	Decay-scheme data; standard uncertainty of the probability of decay by alpha-particle emission	B	0.001
4	Extrapolation of the alpha-particle-count-rate-versus-energy to zero energy	B	0.25
5	Gravimetric measurements	B	0.10
6	Live time	B	0.10
7	Alpha-particle detection efficiency of scintillators	B	0.10
8	²⁴¹ Pu detection efficiency of scintillators	B	0.04
9	Alpha-particle emitting impurities; limit of detection	B	0.10
10	²⁴¹ Pu impurity	B	0.02
11	Photon emitting impurities; limit of detection	B	0.10
Relative combined standard uncertainty			0.34
Relative expanded uncertainty (k = 2)			0.68

[†] = (A) denotes evaluation by statistical methods; (B) denotes evaluation by other methods.

Note 1. Refer to <http://physics.nist.gov/Divisions/Div846/srm.html> (accessed Jun 2010) for assistance and instructions on how to properly open an ampoule. Information on additional storage and handling requirements is also included on the website. This SRM is contained in a generic borosilicate-glass ampoule and not in the standard NIST ampoule.

Note 2. The uncertainties on certified values are expanded uncertainties, $U = ku_c$. The quantity u_c is the combined standard uncertainty calculated according to the ISO Guides [2-3]. The combined standard uncertainty is multiplied by a coverage factor of $k = 2$ and was chosen to obtain an approximate 95 % level of confidence.

Note 3. The ^{242}Pu was chemically purified 07 June 1994 at the Lawrence Livermore National Laboratory (LLNL). Americium-241, the daughter of ^{241}Pu , was removed but has been growing in since that time.

Note 4. The stated uncertainty is two times the standard uncertainty. See reference 3.

Note 5. The estimated limits of detection for alpha-particle-emitting impurities, expressed as massic alpha-particle emission rates (number of alpha-particles emission rates per second per gram), are:

- 0.003 $\text{s}^{-1} \text{g}^{-1}$ for energies less than 3.1 MeV,
- 0.03 $\text{s}^{-1} \text{g}^{-1}$ for energies between 3.1 MeV and 4.4 keV, and
- 0.003 $\text{s}^{-1} \text{g}^{-1}$ for energies greater than 5.0 MeV

Note 6. The ^{242}Pu was chemically purified 07 June 1994. The relative massic activities of radionuclidic impurities after purification follow;

Radionuclide	Relative Activity As Determined By	
	LLNL	NIST
^{242}Pu	1	1
^{241}Pu	--	$(3.5 \pm 0.4) \times 10^{-3}$ (a)
$^{240}\text{Pu} + ^{239}\text{Pu}$	$< 10^{-6}$ (b)	$(2.0 \pm 2.1) \times 10^{-5}$ (c)
$^{238}\text{Pu} + ^{241}\text{Am}$	$< 1.6 \times 10^{-5}$ (b)	$(9 \pm 16) \times 10^{-6}$ (c)
^{241}Am	--	assumed 0 (a)

- (a) The stated uncertainty is the standard uncertainty. The ^{241}Pu activity was calculated from a gamma-ray measurement of the ^{241}Am ingrowth as of 25 November 1998, assuming that ^{241}Am was completely removed at the time of chemical purification.
- (b) Using alpha-particle spectrometry. The value shown is an estimated upper limit based upon background and counting statistics. Measurements were made at the Lawrence Livermore National Laboratory (LLNL) in July of 1994.
- (c) Using alpha-particle spectrometry. The stated uncertainty is the standard uncertainty. Measurements were made at the National Institute of Standards and Technology (NIST) in June and July 1999.

Note 7. The estimated limits of detection for photon-emitting impurities, expressed as massic photon emission rates (numbers of photons per second per gram), are:

- $5 \times 10^{-5} \text{ s}^{-1} \text{ g}^{-1}$ for energies between 19 keV and 39 keV,
- $7 \times 10^{-5} \text{ s}^{-1} \text{ g}^{-1}$ for energies between 49 keV and 92 keV,
- $2 \times 10^{-5} \text{ s}^{-1} \text{ g}^{-1}$ for energies between 106 keV and 507 keV,
- $1 \times 10^{-5} \text{ s}^{-1} \text{ g}^{-1}$ for energies between 515 keV and 1456 keV, and
- $5 \times 10^{-6} \text{ s}^{-1} \text{ g}^{-1}$ for energies between 1465 keV and 2750 keV.

provided that the photons are separated in energy by 4 keV or more from photons emitted in the decay of ^{242}Pu , ^{241}Pu , or ^{241}Am .

Note 8. The stated uncertainty is the standard uncertainty. See reference 2.

REFERENCES

- [1] Evaluated Nuclear Structure Data File (ENSDF), online database, National Nuclear Center, Brookhaven National Laboratory (Upton, NY), accessed November 2009. Refer to <http://www.nndc.bnl.gov/nudat2/> (accessed Jun 2010).
- [2] JCGM 100:2008; *Evaluation of Measurement Data — Guide to the Expression of Uncertainty in Measurement* (ISO GUM 1995 with Minor Corrections); Joint Committee for Guides in Metrology (2008); available at http://www.bipm.org/utis/common/documents/jcgm/JCGM_100_2008_E.pdf (accessed May 2010); see also Taylor, B.N.; Kuyatt, C.E.; *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*; NIST Technical Note 1297; U.S. Government Printing Office: Washington, DC (1994); available at <http://www.nist.gov/physlab/pubs/index.cfm> (accessed Jun 2010).
- [3] Thompson, A.; Taylor, B.N.; *Guide for the Use of the International System of Units (SI)*; NIST Special Publication 811; U.S. Government Printing Office: Washington, DC (2008); available at: http://ts.nist.gov/WeightsAndMeasures/Metric/mpo_pubs.cfm (accessed Jun 2010).

Users of this SRM should ensure that the Certificate in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 926-4751; e-mail srminfo@nist.gov; or via the Internet at <http://www.nist.gov/srm>.



Standard Traceability Log Rad

Source Material Info	
Parent Code:	1770
Prepared By:	Gregory Ramsay
Carrier Conc:	3.2M HNO3
Reference Date:	01/01/2010
Ampoule Mass (g):	5.5 g
Uncertainty:	+/- .34 %
LogBook No:	GL-CED-297-063

A Solution Material Info			
Isotope:	Plutonium-242		
Prepared By:	Tim Chandler		
Prep Date:	08/03/2016		
Verification Date:	08/03/2016		
Expiration Date:	08/03/2017		
Primary Code:	1770-A		
Dilution(mL):	200 mL		
Mass of Parent(g):	5.4578 g		
Density(g/mL):	1.0312	Balance ID:	C31514

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq/g)}) * (\text{conversion dpm to Bq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq/g)}) * (\text{conversion dpm to Bq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(5.4578 \text{ g}) * (26.77 \text{ Bq/g}) * (60 \text{ dpm/Bq}) / (200 \text{ mL}) = 43.8316 \text{ dpm/mL}$
$(5.4578 \text{ g}) * (26.77 \text{ Bq/g}) * (60 \text{ dpm/Bq}) / (1.0312 \text{ g/mL}) / (200 \text{ mL}) = 42.5054 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
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GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Pu-242 Standard 1770-A

v1.2

Analyst	TC1
Verification Prep Date	8/3/2016

Tracer Information	
Isotope	Pu-239
Serial Number	0338-MM
Amount of Std. (mL)	0.5
Expiration Date	7/20/2017

Standard Information	
Isotope	Pu-242
Serial Number	1770-A
Isotope Half-life	3.7350E+05 Y
Reference Date	1/1/2010
Ref. Act. (dpm/mL)	43.8316
Amount of Std. (mL)	0.5
Standard Prep Date	8/3/2016

Std #	Count Date	Activity pCi	Standard dpm/mL
1	8/4/2016	9.460	42.00
2	8/4/2016	9.440	41.91
3	8/4/2016	9.830	43.65

Mean Value = 9.577 42.520
 Stdev = 0.219620885 0.975116731

pCi 9.8719
 Certificate Value* = 9.8719
 Two sigma = 0.4392
 10 % of Mean = 0.9577
 Rule A (Pass/Fail) Pass
 % Recovery 97.01%
 Rule B (Pass/Fail) Pass
 Expiration Date 8/3/2017

dpm/mL
 43.8311
 1.9502
 4.2520
 Pass
 97.01%
 Pass

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Verification Prep Date.

The analyst prepared three standard verification sources for Pu-242 standard 1770-A using 0.5 mL for each source. Each standard was combined with 0.5 mL of Pu-239 standard 0338-MM and was diluted in a 50 mL plastic centrifuge tube containing 10 mL of 2M HCl. Five drops of 25% hydrazine dichloride, 100 micrograms of neodymium carrier and three mL of 48% HF was added to precipitate neodymium (and Plutonium) fluoride. After 30 minutes, each sample was filtered following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. DPM values for Pu-242 were calculated by comparison to Pu-239 certified values.

8-5-16

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

1621

91973

Tc-99 5 mL Liquid in Flame Sealed Vial

Customer: General Engineering Labs
P.O. No.: GEL 1202297, Item 1

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide calibration and purity were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty*, %			Reference Date (12:00 PM EST)
			u _A	u _B	U	
Tc-99	7.710E+07	4.025E+04	0.3	1.3	2.7	09/28/2012

***Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

Impurities: γ -impurities < 0.1%.
5.01799 g 0.001M NaOH solution. Carrier free.

Source Prepared by: M. I. Taskaeva
M. I. Taskaeva, Radiochemist

QA Approved: J.D. McCorvey
J.D. McCorvey, Counting Room Manager

Date: 27 SEP 12

RECEIVED
FWD/11/12
AW





Standard Traceability Log Rad

Source Material Info	
Parent Code:	1621
Prepared By:	Ashley Drochter
Carrier Conc:	0.001M NaOH
Reference Date:	09/28/2012
Ampoule Mass (g):	5.01799 g
Uncertainty:	+/- 2.7 %
LogBook No:	RC-S-065-051

A Solution Material Info			
Isotope:	Technetium-99		
Prepared By:	Gregory Ramsay		
Prep Date:	06/06/2013		
Verification Date:	01/05/2016		
Expiration Date:	01/05/2017		
Primary Code:	1621-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	4.887 g		
Density(g/mL):	0.9959	Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.887 \text{ g}) * (40250 \text{ Bq}) * (60 \text{ dpm/Bq}) / (5.01799 \text{ g} * 100 \text{ mL}) = 23519.5865 \text{ dpm/mL}$
$(4.887 \text{ g}) * (40250 \text{ Bq}) * (60 \text{ dpm/Bq}) / (0.9959 \text{ g/mL}) / (5.01799 \text{ g} * 100 \text{ mL}) = 23616.2004 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
01/13/2015	Gregory Ramsay	40.468	500	1621-B	1911.4008 dpm/mL	01/05/2016	01/05/2017

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Tc-99 Standard 1621-B

v1.0.2

Instrument	Red
Analyst	GXR1
Verification Prep Date	1/5/2016

Standard Information	
Isotope	Tc-99
Serial Number	1621-B
Isotope Half-life	2.1110E+05 Y
Reference Date	9/28/2012
Ref. Act. (DPM/mL)	1911.4008
Amount of Std. (mL)	0.2
Standard Prep Date	1/13/2015

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	1/6/2016	63.30	420.20	46.20
2	1/6/2016	63.30	393.80	46.20
3	1/6/2016	62.40	417.40	46.20

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	374.00	0.984256	1899.91	379.98
2	347.60	0.984256	1765.80	353.16
3	371.20	0.984256	1885.69	377.14

Mean Value = 1850.47
 Stddev = 73.66731519
 Certificate Value* = 1911.4
 Two sigma = 147.335
 10 % of Mean = 185.047
 Rule A (Pass/Fail) Pass
 % Recovery 96.81%
 Rule B (Pass/Fail) Pass
 Expiration Date 1/5/2017

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
 Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for Tc-99 source 1621-B by transferring 0.2 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCRed for Tc-99 source standard verification. The Tc-99 efficiency calibration which was used for verification calculations was performed on 1/5/2016 using Tc-99 source 1297-A.

Standard results for each verification source was calculated as follows:

$$\text{Source dpm/mL} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency (cpm/dpm), and
- D = volume used for standard verification.

RAD-M-001

Handwritten signature and date:
 1/6/16
 1/8/16

Tracer Log


Isotope	Tc-99m
Prep Date	9/13/16
Source Code	TC 207B
Prepared By	(Signature)
Expiration Date	9/14/16

Triad Isotopes Inc -- Charleston (LE) (843) 556-1113	
<small>44 Folly Road Charleston, SC 29407</small>	<small>Charleston, SC 29407</small>
RX#619055	
Account Name: GEL Laboratories LLC	
<small>2040 Savage Rd Charleston, SC 29407</small>	<small>Charleston, SC 29407</small>
Delivery D/T: 09/13/2016 12:00 Container:1	
Patient: PER PHYSICIAN ORDER	
Product: Sodium Pertechnetate Tc-99m	
Procedure: Flood Source	
Physician: George McAbee RSU	
Ordered Amount: 1 mCi Quantity: 1	
Cal Date/Time: 09/13/2016 17:00	
Actual Amount: 1.108 mCi Quantity: 1 Volume: 5.00 ml	
Exp Date/Time: 09/14/2016 03:28	
Filled By: Chad Leo PharmD, BCNP	
Lot #(s): E-20160913-0012345 0.016	
NOTES: 5 ML VOLUME - PLEASE DELIVER AROUND 8AM	
CAUTION: RX ONLY	
All Tc-99m Products are below 0.15uCi of Mo-99/mCi Tc-99m at expiration time	

Reviewed by: (Signature) Date: 9/13/16

Tracer Log

Isotope	Tc-99m
Prep Date	9/15/16
Source Code	T02074
Prepared By	AL
Expiration Date	9/16/16

Triad Isotopes Inc - Charleston (LE) (843) 556-1113	
<small>44 Folly Road Charleston, SC 29407</small>	<small>Charleston, SC 29407</small>
RX#619432	
Account Name: GEL Laboratories LLC	
<small>2040 Swains Rd Charleston, SC 29407</small>	<small>Charleston, SC 29407</small>
Delivery D/T: 09/15/2016 12:00 Container:1	
Patient	PER PHYSICIAN ORDER
Product	Sodium Pertechnetate Tc - 99m
Procedure	Flood Source
Physician	George McAbee RSO
Ordered Amount: 1 mCi Quantity: 1	
Cal Date/Time --: 09/15/2016 17:00	
Actual Amount--: 0.998 mCi Quantity: 1 Volume: 5.00 ml	
Exp Date/Time -: 09/16/2016 08:06	
Filled By: Rachel Sanford, PharmD	
Lot # (s): E-20160915-006 0.013	
NOTES: 5 mL VOLUME - PLEASE DELIVER AROUND BATH	
CAUTION: RX ONLY	
<small>All Tc-99m Products are below 0.15uCi of Mo-99/mCi Tc-99m at expiration time</small>	

Reviewed by:  Date: 9/15/16



Standard Traceability Log Rad

Source Material Info	
Parent Code:	TC2073
Prepared By:	Christina Sanchez
Carrier Conc:	Deionized Water
Reference Date:	09/13/2016
Ampoule Mass (g):	5 g
Uncertainty:	+/-
LogBook No:	

A Solution Material Info			
Isotope:	Technetium-99m TRACER		
Prepared By:	Christina Sanchez		
Prep Date:	09/13/2016		
Verification Date:	09/14/2015		
Expiration Date:	09/14/2016		
Primary Code:	TC2073-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	.1389 g		
Density(g/mL):	1.0000	Balance ID:	C31514

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parent Activity (mci)}) * (\text{conversion dpm to mci}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parent Activity (mci)}) * (\text{conversion dpm to mci}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(.1389 \text{ g}) * (1.1389 \text{ mci}) * (2220000000 \text{ dpm/mci}) / (5 \text{ g} * 100 \text{ mL}) = 702377.8524 \text{ dpm/mL}$
$(.1389 \text{ g}) * (1.1389 \text{ mci}) * (2220000000 \text{ dpm/mci}) / (1.0000 \text{ g/mL}) / (5 \text{ g} * 100 \text{ mL}) = 702377.8524 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
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GEL Laboratories LLC
Version 1.0 9/18/2000



Standard Traceability Log Rad

Source Material Info	
Parent Code:	TC2074
Prepared By:	Christina Sanchez
Carrier Conc:	Deionized Water
Reference Date:	09/15/2016
Ampoule Mass (g):	5 g
Uncertainty:	+/-
LogBook No:	

A Solution Material Info			
Isotope:	Technetium-99m TRACER		
Prepared By:	Christina Sanchez		
Prep Date:	09/15/2016		
Verification Date:	09/16/2015		
Expiration Date:	09/16/2016		
Primary Code:	TC2074-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	.1401 g		
Density(g/mL):	1.0000	Balance ID:	C31514

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (mci)}) * (\text{conversion dpm to mci}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (mci)}) * (\text{conversion dpm to mci}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(.1401 \text{ g}) * (.998 \text{ mci}) * (2220000000 \text{ dpm/mci}) / (5 \text{ g} * 100 \text{ mL}) = 620799.9120 \text{ dpm/mL}$
$(.1401 \text{ g}) * (.998 \text{ mci}) * (2220000000 \text{ dpm/mci}) / (1.0000 \text{ g/mL}) / (5 \text{ g} * 100 \text{ mL}) = 620799.9120 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
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GEL Laboratories LLC
Version 1.0 9/18/2000



CERTIFICATE OF CALIBRATION Standard Reference Source

1753

100124

H-3 5 mL Liquid in Flame Sealed Vial

Customer: GEL Laboratories, LLC
P.O. No.: GEL1511998, Item 3 **Product Code:** 8003-5FSA-185kBq



This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide calibration and purity were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty* , %			Reference Date (12:00 PM EST)
			u _A	u _B	U	
H-3	4.500E+03	1.847E+05	0.1	1.5	3.0	09/01/2015

***Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

Impurities: γ -impurities < 0.1%.
5.00138 g of tritiated water.

Source Prepared by:
Z. Dimitrova, Radiochemist

QC Approved:
J. S. Jahn, Spectroscopist

Date: 28 AUG 15



Standard Traceability Log Rad

Source Material Info	
Parent Code:	1753
Prepared By:	Gregory Ramsay
Carrier Conc:	Water
Reference Date:	09/01/2015
Ampoule Mass (g):	5.00138 g
Uncertainty:	+/- 1.5 %
LogBook No:	GL-CED-297-046

A Solution Material Info			
Isotope:	Tritium		
Prepared By:	Gregory Ramsay		
Prep Date:	11/02/2015		
Verification Date:	11/02/2015		
Expiration Date:	11/02/2016		
Primary Code:	1753-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	4.9357 g		
Density(g/mL):	0.9967	Balance ID:	C31514

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parent Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parent Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.9357 \text{ g}) * (184700 \text{ Bq}) * (60 \text{ dpm/Bq}) / (5.00138 \text{ g} * 100 \text{ mL}) = 109364.6702 \text{ dpm/mL}$
$(4.9357 \text{ g}) * (184700 \text{ Bq}) * (60 \text{ dpm/Bq}) / (0.9967 \text{ g/mL}) / (5.00138 \text{ g} * 100 \text{ mL}) = 109726.7685 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
11/02/2015	Gregory Ramsay	12.3299	500	1753-B	2705.8402 dpm/mL	11/02/2015	11/02/2016

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for H-3 Standard 1753-B

v1.0.2

Instrument	GOLD
Analyst	GXR1
Verification Prep Date	11/2/2015

Standard Information	
Isotope	H-3
Serial Number	1753-B
Isotope Half-life	12.3200 Y
Reference Date	9/1/2015
Ref. Act. (DPM/mL)	2705.8402
Amount of Std. (mL)	0.5
Standard Prep Date	11/2/2015

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	11/2/2015	70.60	548.20	43.80
2	11/2/2015	70.70	545.00	43.80
3	11/2/2015	71.00	533.60	43.80

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	504.40	0.371451	2715.84	1357.92
2	501.20	0.371451	2698.61	1349.30
3	489.80	0.371451	2637.23	1318.61

Mean Value = 2683.89
 Stdev = 41.32014609
 Certificate Value* = 2680.1
 Two sigma = 82.640
 10 % of Mean = 268.389
 Rule A (Pass/Fail) Pass
 % Recovery 100.14%
 Rule B (Pass/Fail) Pass
 Expiration Date 11/2/2016

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
 Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for H-3 source 1753-B by transferring 0.5 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecocint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 10 mL of Ecocint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCGOLD for H-3 source standard verification. The H-3 efficiency calibration which was used for verification calculations was performed on 11/2/2015 using H-3 source 1712-A.

Standard results for each verification source was calculated as follows:

$$\text{Source dpm/mL} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency (cpm/dpm), and
- D = volume used for standard verification.

RAD-M-001

Handwritten signatures and dates:
 11/2/15
 11/3/15
 11/2/15

Runlogs

Instrument Run Log

Instrument Type: LSC

Batch ID: 1596394

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235001	SAMPLE	JXH2	LSCTEAL	SEP-30-16 05:39:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235002	SAMPLE	JXH2	LSCTEAL	SEP-30-16 06:41:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235005	SAMPLE	JXH2	LSCTEAL	SEP-30-16 09:44:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235007	SAMPLE	JXH2	LSCTEAL	SEP-30-16 11:46:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235008	SAMPLE	JXH2	LSCTEAL	SEP-30-16 12:47:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235009	SAMPLE	JXH2	LSCTEAL	SEP-30-16 13:49:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235010	SAMPLE	JXH2	LSCTEAL	SEP-30-16 14:50:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235012	SAMPLE	JXH2	LSCTEAL	SEP-30-16 16:52:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235013	SAMPLE	JXH2	LSCTEAL	SEP-30-16 17:53:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235014	SAMPLE	JXH2	LSCTEAL	SEP-30-16 18:54:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235015	SAMPLE	JXH2	LSCTEAL	SEP-30-16 19:55:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235016	SAMPLE	JXH2	LSCTEAL	SEP-30-16 20:57:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235017	SAMPLE	JXH2	LSCTEAL	SEP-30-16 21:58:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235019	SAMPLE	JXH2	LSCTEAL	OCT-01-16 00:00:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235020	SAMPLE	JXH2	LSCTEAL	OCT-01-16 01:01:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
1203621703	MB	JXH2	LSCTEAL	OCT-01-16 02:02:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
1203621705	LCS	JXH2	LSCTEAL	OCT-01-16 04:05:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00

Instrument Run Log

Instrument Type: LSC

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235003	SAMPLE	JXH2	LSCTEAL	OCT-01-16 17:08:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235004	SAMPLE	JXH2	LSCTEAL	OCT-01-16 19:09:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235006	SAMPLE	JXH2	LSCTEAL	OCT-01-16 21:10:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235011	SAMPLE	JXH2	LSCTEAL	OCT-03-16 08:28:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235018	SAMPLE	JXH2	LSCTEAL	OCT-03-16 10:29:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
1203621704	DUP	JXH2	LSCTEAL	OCT-03-16 12:30:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00

Instrument Run Log

Instrument Type: LSC

Batch ID: 1596402

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235021	SAMPLE	MXS2	LSCBROWN	SEP-28-16 05:20:50	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235022	SAMPLE	MXS2	LSCBROWN	SEP-28-16 06:07:46	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235026	SAMPLE	MXS2	LSCBROWN	SEP-28-16 09:15:23	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235027	SAMPLE	MXS2	LSCBROWN	SEP-28-16 10:02:16	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235028	SAMPLE	MXS2	LSCBROWN	SEP-28-16 10:49:08	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235029	SAMPLE	MXS2	LSCBROWN	SEP-28-16 11:35:59	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235030	SAMPLE	MXS2	LSCBROWN	SEP-28-16 12:22:49	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235031	SAMPLE	MXS2	LSCBROWN	SEP-28-16 13:09:39	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235032	SAMPLE	MXS2	LSCBROWN	SEP-28-16 13:56:34	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235033	SAMPLE	MXS2	LSCBROWN	SEP-28-16 14:43:24	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235034	SAMPLE	MXS2	LSCBROWN	SEP-28-16 15:30:12	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235035	SAMPLE	MXS2	LSCBROWN	SEP-28-16 16:16:59	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235036	SAMPLE	MXS2	LSCBROWN	SEP-28-16 17:03:45	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235037	SAMPLE	MXS2	LSCBROWN	SEP-28-16 17:50:32	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235038	SAMPLE	MXS2	LSCBROWN	SEP-28-16 18:37:17	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235040	SAMPLE	MXS2	LSCBROWN	SEP-28-16 20:10:44	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
1203621725 MB		MXS2	LSCBROWN	SEP-28-16 22:08:37	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00

Instrument Run Log

Instrument Type: LSC

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1203621727	LCS	MXS2	LSCBROWN	SEP-28-16 23:41:58	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235023	SAMPLE	MXS2	LSCBROWN	SEP-29-16 10:42:04	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235024	SAMPLE	MXS2	LSCBROWN	SEP-29-16 11:28:41	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235025	SAMPLE	MXS2	LSCBROWN	SEP-29-16 12:15:20	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235039	SAMPLE	MXS2	LSCBROWN	SEP-29-16 13:01:57	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
1203621726	DUP	MXS2	LSCBROWN	SEP-29-16 13:48:33	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00

Instrument Run Log

Instrument Type: LSC

Batch ID: 1596414

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235041	SAMPLE	HAKB	LSCTEAL	SEP-23-16 13:25:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235042	SAMPLE	HAKB	LSCTEAL	SEP-23-16 14:26:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235043	SAMPLE	HAKB	LSCTEAL	SEP-23-16 15:27:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235044	SAMPLE	HAKB	LSCTEAL	SEP-23-16 16:29:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235045	SAMPLE	HAKB	LSCTEAL	SEP-23-16 17:30:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235046	SAMPLE	HAKB	LSCTEAL	SEP-23-16 18:31:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235047	SAMPLE	HAKB	LSCTEAL	SEP-23-16 19:32:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235048	SAMPLE	HAKB	LSCTEAL	SEP-23-16 20:33:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235049	SAMPLE	HAKB	LSCTEAL	SEP-23-16 21:34:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235050	SAMPLE	HAKB	LSCTEAL	SEP-23-16 22:35:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235051	SAMPLE	HAKB	LSCTEAL	SEP-23-16 23:36:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235052	SAMPLE	HAKB	LSCTEAL	SEP-24-16 00:38:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235053	SAMPLE	HAKB	LSCTEAL	SEP-24-16 01:39:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235054	SAMPLE	HAKB	LSCTEAL	SEP-24-16 03:52:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235055	SAMPLE	HAKB	LSCTEAL	SEP-24-16 04:53:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235056	SAMPLE	HAKB	LSCTEAL	SEP-24-16 05:54:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235057	SAMPLE	HAKB	LSCTEAL	SEP-24-16 06:55:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00

Instrument Run Log

Instrument Type: LSC

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235058	SAMPLE	HAKB	LSCTEAL	SEP-24-16 07:57:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235059	SAMPLE	HAKB	LSCTEAL	SEP-24-16 08:58:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235060	SAMPLE	HAKB	LSCTEAL	SEP-24-16 09:59:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
1203621754	MB	HAKB	LSCTEAL	SEP-24-16 11:00:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
1203621755	DUP	HAKB	LSCTEAL	SEP-24-16 12:01:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
1203621756	LCS	HAKB	LSCTEAL	SEP-24-16 13:02:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00

Instrument Run Log

Instrument Type: LSC

Batch ID: 1596422

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235061	SAMPLE	KXB2	LSCTEAL	SEP-21-16 14:35:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235062	SAMPLE	KXB2	LSCTEAL	SEP-21-16 16:06:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235063	SAMPLE	KXB2	LSCTEAL	SEP-21-16 17:37:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235064	SAMPLE	KXB2	LSCTEAL	SEP-21-16 19:08:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235065	SAMPLE	KXB2	LSCTEAL	SEP-21-16 20:39:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235066	SAMPLE	KXB2	LSCTEAL	SEP-21-16 22:10:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235067	SAMPLE	KXB2	LSCTEAL	SEP-21-16 23:41:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235068	SAMPLE	KXB2	LSCTEAL	SEP-22-16 02:25:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235069	SAMPLE	KXB2	LSCTEAL	SEP-22-16 03:56:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235070	SAMPLE	KXB2	LSCTEAL	SEP-22-16 05:27:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235071	SAMPLE	KXB2	LSCTEAL	SEP-22-16 06:58:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235072	SAMPLE	KXB2	LSCTEAL	SEP-22-16 08:29:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235073	SAMPLE	KXB2	LSCTEAL	SEP-22-16 10:00:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235074	SAMPLE	KXB2	LSCTEAL	SEP-22-16 11:32:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235075	SAMPLE	KXB2	LSCTEAL	SEP-22-16 13:03:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235076	SAMPLE	KXB2	LSCTEAL	SEP-22-16 14:34:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
405235077	SAMPLE	KXB2	LSCTEAL	SEP-22-16 16:05:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00

Instrument Run Log

Instrument Type: LSC

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235078	SAMPLE	KXB2	LSCTEAL	SEP-22-16 17:36:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
1203621772	MB	KXB2	LSCTEAL	SEP-22-16 19:07:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
1203621773	DUP	KXB2	LSCTEAL	SEP-22-16 20:39:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00
1203621774	LCS	KXB2	LSCTEAL	SEP-22-16 22:10:00	DONE	2mL DI/1 drop HNO3/13mL Ecoscint Ultra	01-FEB-16 00:00

Instrument Run Log

Instrument Type: LSC

Batch ID: 1597412

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235021	SAMPLE	CXS7	LSCGOLD	SEP-20-16 10:44:48	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235022	SAMPLE	CXS7	LSCGOLD	SEP-20-16 11:16:43	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235023	SAMPLE	CXS7	LSCGOLD	SEP-20-16 11:48:39	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235024	SAMPLE	CXS7	LSCGOLD	SEP-20-16 12:20:36	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235026	SAMPLE	CXS7	LSCGOLD	SEP-20-16 12:52:35	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235025	SAMPLE	CXS7	LSCGOLD	SEP-20-16 13:24:33	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235028	SAMPLE	CXS7	LSCGOLD	SEP-20-16 13:56:31	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235027	SAMPLE	CXS7	LSCGOLD	SEP-20-16 14:28:24	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235030	SAMPLE	CXS7	LSCGOLD	SEP-20-16 15:00:24	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235029	SAMPLE	CXS7	LSCGOLD	SEP-20-16 15:32:22	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235031	SAMPLE	CXS7	LSCGOLD	SEP-20-16 16:04:21	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235032	SAMPLE	CXS7	LSCGOLD	SEP-20-16 16:36:23	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235033	SAMPLE	CXS7	LSCGOLD	SEP-20-16 17:08:15	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235034	SAMPLE	CXS7	LSCGOLD	SEP-20-16 17:40:12	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235035	SAMPLE	CXS7	LSCGOLD	SEP-20-16 18:12:06	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235036	SAMPLE	CXS7	LSCGOLD	SEP-20-16 18:44:03	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235037	SAMPLE	CXS7	LSCGOLD	SEP-20-16 19:15:57	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235038	SAMPLE	CXS7	LSCGOLD	SEP-20-16 19:47:53	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235039	SAMPLE	CXS7	LSCGOLD	SEP-20-16 20:19:48	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235040	SAMPLE	CXS7	LSCGOLD	SEP-20-16 20:51:39	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
1203624301	MB	CXS7	LSCGOLD	SEP-20-16 21:23:32	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
1203624302	DUP	CXS7	LSCGOLD	SEP-20-16 21:55:30	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
1203624303	LCS	CXS7	LSCGOLD	SEP-20-16 22:27:24	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00

Instrument Run Log

Instrument Type: LSC

Batch ID: 1597414

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235052	SAMPLE	CXS7	LSCSILVER	SEP-20-16 12:07:06	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
405235041	SAMPLE	CXS7	LSCSILVER	SEP-20-16 13:38:50	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
405235042	SAMPLE	CXS7	LSCSILVER	SEP-20-16 13:55:16	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
405235043	SAMPLE	CXS7	LSCSILVER	SEP-20-16 14:11:43	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
405235044	SAMPLE	CXS7	LSCSILVER	SEP-20-16 14:28:09	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
405235045	SAMPLE	CXS7	LSCSILVER	SEP-20-16 14:44:37	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
405235046	SAMPLE	CXS7	LSCSILVER	SEP-20-16 15:01:06	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
405235047	SAMPLE	CXS7	LSCSILVER	SEP-20-16 15:17:33	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
405235048	SAMPLE	CXS7	LSCSILVER	SEP-20-16 15:34:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
405235049	SAMPLE	CXS7	LSCSILVER	SEP-20-16 15:50:27	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
405235050	SAMPLE	CXS7	LSCSILVER	SEP-20-16 16:06:55	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
405235051	SAMPLE	CXS7	LSCSILVER	SEP-20-16 16:23:22	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
405235053	SAMPLE	CXS7	LSCSILVER	SEP-20-16 16:39:54	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
405235054	SAMPLE	CXS7	LSCSILVER	SEP-20-16 16:56:20	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
405235057	SAMPLE	CXS7	LSCSILVER	SEP-20-16 17:12:48	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
405235056	SAMPLE	CXS7	LSCSILVER	SEP-20-16 17:29:16	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
405235055	SAMPLE	CXS7	LSCSILVER	SEP-20-16 17:45:43	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
405235060	SAMPLE	CXS7	LSCSILVER	SEP-20-16 18:02:12	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
405235059	SAMPLE	CXS7	LSCSILVER	SEP-20-16 18:18:40	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
405235058	SAMPLE	CXS7	LSCSILVER	SEP-20-16 18:35:08	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
1203624304	MB	CXS7	LSCSILVER	SEP-20-16 18:51:36	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
1203624305	DUP	CXS7	LSCSILVER	SEP-20-16 19:08:03	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00
1203624306	LCS	CXS7	LSCSILVER	SEP-20-16 19:24:31	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	07-JUL-16 00:00

Instrument Run Log

Instrument Type: LSC

Batch ID: 1597416

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235001	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 04:40:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235002	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 04:56:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235003	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 05:12:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235004	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 05:28:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235005	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 05:44:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235006	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 06:01:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235007	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 06:17:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235008	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 06:33:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235009	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 06:49:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235010	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 07:05:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235011	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 07:21:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235012	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 07:38:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235013	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 07:54:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235014	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 08:10:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235016	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 08:42:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235017	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 08:58:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235018	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 09:14:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235019	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 09:31:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235020	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 09:47:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
1203624308	MB	GXR1	LSCYELLOW	SEP-20-16 10:03:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
1203624309	DUP	GXR1	LSCYELLOW	SEP-20-16 10:19:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
1203624310	LCS	GXR1	LSCYELLOW	SEP-20-16 10:35:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235015	SAMPLE	GXR1	LSCYELLOW	SEP-20-16 12:31:00	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00

Instrument Run Log

Instrument Type: LSC

Batch ID: 1597417

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235061	SAMPLE	CXS7	LSCPINK	SEP-20-16 05:58:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235062	SAMPLE	CXS7	LSCPINK	SEP-20-16 06:26:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235063	SAMPLE	CXS7	LSCPINK	SEP-20-16 06:53:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235064	SAMPLE	CXS7	LSCPINK	SEP-20-16 07:21:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235065	SAMPLE	CXS7	LSCPINK	SEP-20-16 07:48:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235066	SAMPLE	CXS7	LSCPINK	SEP-20-16 08:16:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235067	SAMPLE	CXS7	LSCPINK	SEP-20-16 08:43:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235068	SAMPLE	CXS7	LSCPINK	SEP-20-16 09:11:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235069	SAMPLE	CXS7	LSCPINK	SEP-20-16 09:38:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235070	SAMPLE	CXS7	LSCPINK	SEP-20-16 10:06:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235071	SAMPLE	CXS7	LSCPINK	SEP-20-16 10:33:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235072	SAMPLE	CXS7	LSCPINK	SEP-20-16 11:01:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235073	SAMPLE	CXS7	LSCPINK	SEP-20-16 11:28:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235074	SAMPLE	CXS7	LSCPINK	SEP-20-16 11:56:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235075	SAMPLE	CXS7	LSCPINK	SEP-20-16 12:23:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235076	SAMPLE	CXS7	LSCPINK	SEP-20-16 12:51:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235077	SAMPLE	CXS7	LSCPINK	SEP-20-16 13:18:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
405235078	SAMPLE	CXS7	LSCPINK	SEP-20-16 13:46:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
1203624311	MB	CXS7	LSCPINK	SEP-20-16 14:13:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
1203624312	DUP	CXS7	LSCPINK	SEP-20-16 14:41:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00
1203624313	LCS	CXS7	LSCPINK	SEP-20-16 15:09:59	DONE	15mL Ecoscint GL/5mL DI H2O/AG 1x8 Resin	04-JUL-16 00:00

Instrument Run Log

Instrument Type: LSC

Batch ID: 1598072

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235001	SAMPLE	AEA	LSCGREEN	SEP-19-16 13:26:09	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235002	SAMPLE	AEA	LSCGREEN	SEP-19-16 14:59:08	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235003	SAMPLE	AEA	LSCGREEN	SEP-19-16 16:32:08	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235004	SAMPLE	AEA	LSCGREEN	SEP-19-16 18:05:12	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235005	SAMPLE	AEA	LSCGREEN	SEP-19-16 19:38:13	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235006	SAMPLE	AEA	LSCGREEN	SEP-19-16 21:11:15	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235007	SAMPLE	AEA	LSCGREEN	SEP-19-16 22:44:15	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235008	SAMPLE	AEA	LSCGREEN	SEP-20-16 00:17:15	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235009	SAMPLE	AEA	LSCGREEN	SEP-20-16 01:50:17	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235010	SAMPLE	AEA	LSCGREEN	SEP-20-16 03:23:20	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235011	SAMPLE	AEA	LSCGREEN	SEP-20-16 06:07:20	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235012	SAMPLE	AEA	LSCGREEN	SEP-20-16 07:40:24	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235013	SAMPLE	AEA	LSCGREEN	SEP-20-16 09:13:27	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235014	SAMPLE	AEA	LSCGREEN	SEP-20-16 10:46:30	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235015	SAMPLE	AEA	LSCGREEN	SEP-20-16 12:19:34	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235016	SAMPLE	AEA	LSCGREEN	SEP-20-16 13:52:37	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235017	SAMPLE	AEA	LSCGREEN	SEP-20-16 15:25:29	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235018	SAMPLE	AEA	LSCGREEN	SEP-20-16 16:58:35	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235019	SAMPLE	AEA	LSCGREEN	SEP-20-16 18:31:42	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235020	SAMPLE	AEA	LSCGREEN	SEP-20-16 20:04:46	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
1203626094	MB	AEA	LSCGREEN	SEP-20-16 21:37:49	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
1203626095	DUP	AEA	LSCGREEN	SEP-20-16 23:10:53	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
1203626096	MS	AEA	LSCGREEN	SEP-21-16 00:42:20	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
1203626097	LCS	AEA	LSCGREEN	SEP-21-16 00:58:37	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00

Instrument Run Log

Instrument Type: LSC

Batch ID: 1598075

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235021	SAMPLE	TXP3	LSCORANGE	SEP-22-16 15:03:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
405235022	SAMPLE	TXP3	LSCORANGE	SEP-22-16 15:35:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
405235023	SAMPLE	TXP3	LSCORANGE	SEP-22-16 16:08:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
405235024	SAMPLE	TXP3	LSCORANGE	SEP-22-16 16:40:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
405235025	SAMPLE	TXP3	LSCORANGE	SEP-22-16 17:13:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
405235026	SAMPLE	TXP3	LSCORANGE	SEP-22-16 17:45:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
405235027	SAMPLE	TXP3	LSCORANGE	SEP-22-16 18:18:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
405235028	SAMPLE	TXP3	LSCORANGE	SEP-22-16 18:51:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
405235029	SAMPLE	TXP3	LSCORANGE	SEP-22-16 19:23:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
405235030	SAMPLE	TXP3	LSCORANGE	SEP-22-16 19:56:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
405235031	SAMPLE	TXP3	LSCORANGE	SEP-22-16 20:28:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
405235032	SAMPLE	TXP3	LSCORANGE	SEP-22-16 21:01:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
405235033	SAMPLE	TXP3	LSCORANGE	SEP-22-16 21:33:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
405235034	SAMPLE	TXP3	LSCORANGE	SEP-22-16 22:06:59	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
405235035	SAMPLE	TXP3	LSCORANGE	SEP-22-16 22:38:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
405235036	SAMPLE	TXP3	LSCORANGE	SEP-22-16 23:11:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
405235037	SAMPLE	TXP3	LSCORANGE	SEP-22-16 23:44:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
405235038	SAMPLE	TXP3	LSCORANGE	SEP-23-16 00:17:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
405235039	SAMPLE	TXP3	LSCORANGE	SEP-23-16 00:49:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
405235040	SAMPLE	TXP3	LSCORANGE	SEP-23-16 02:37:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
1203626098	MB	TXP3	LSCORANGE	SEP-23-16 03:10:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
1203626099	DUP	TXP3	LSCORANGE	SEP-23-16 03:42:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
1203626100	MS	TXP3	LSCORANGE	SEP-23-16 04:15:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00
1203626101	LCS	TXP3	LSCORANGE	SEP-23-16 04:32:58	DONE	10mL DW/13mL Ecoscint Ultra	15-JUN-16 00:00

Instrument Run Log

Instrument Type: LSC

Batch ID: 1598078

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235001	SAMPLE	AEA	LSCYELLOW	SEP-22-16 00:38:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235002	SAMPLE	AEA	LSCYELLOW	SEP-22-16 01:25:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235003	SAMPLE	AEA	LSCYELLOW	SEP-22-16 02:11:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235004	SAMPLE	AEA	LSCYELLOW	SEP-22-16 04:10:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235005	SAMPLE	AEA	LSCYELLOW	SEP-22-16 04:56:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235006	SAMPLE	AEA	LSCYELLOW	SEP-22-16 05:42:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235007	SAMPLE	AEA	LSCYELLOW	SEP-22-16 06:29:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235008	SAMPLE	AEA	LSCYELLOW	SEP-22-16 07:15:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235009	SAMPLE	AEA	LSCYELLOW	SEP-22-16 08:01:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235010	SAMPLE	AEA	LSCYELLOW	SEP-22-16 08:47:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235011	SAMPLE	AEA	LSCYELLOW	SEP-22-16 09:34:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235012	SAMPLE	AEA	LSCYELLOW	SEP-22-16 10:20:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235013	SAMPLE	AEA	LSCYELLOW	SEP-22-16 11:06:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00

Instrument Run Log

Instrument Type: LSC

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235014	SAMPLE	AEA	LSCYELLOW	SEP-22-16 11:52:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235015	SAMPLE	AEA	LSCYELLOW	SEP-22-16 12:39:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235016	SAMPLE	AEA	LSCYELLOW	SEP-22-16 13:25:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235017	SAMPLE	AEA	LSCYELLOW	SEP-22-16 14:11:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235018	SAMPLE	AEA	LSCYELLOW	SEP-22-16 14:58:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235019	SAMPLE	AEA	LSCYELLOW	SEP-22-16 15:44:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235020	SAMPLE	AEA	LSCYELLOW	SEP-22-16 16:30:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
1203626105	MB	AEA	LSCYELLOW	SEP-22-16 17:16:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
1203626106	DUP	AEA	LSCYELLOW	SEP-22-16 18:03:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
1203626107	MS	AEA	LSCYELLOW	SEP-22-16 18:50:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
1203626108	LCS	AEA	LSCYELLOW	SEP-22-16 19:06:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00

Instrument Run Log

Instrument Type: LSC

Batch ID: 1598080

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235021	SAMPLE	TXJ1	LSCYELLOW	SEP-23-16 08:39:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235022	SAMPLE	TXJ1	LSCYELLOW	SEP-23-16 09:50:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235023	SAMPLE	TXJ1	LSCYELLOW	SEP-23-16 11:02:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235024	SAMPLE	TXJ1	LSCYELLOW	SEP-23-16 12:13:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235025	SAMPLE	TXJ1	LSCYELLOW	SEP-23-16 13:24:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235026	SAMPLE	TXJ1	LSCYELLOW	SEP-23-16 14:35:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235027	SAMPLE	TXJ1	LSCYELLOW	SEP-23-16 15:47:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235028	SAMPLE	TXJ1	LSCYELLOW	SEP-23-16 16:58:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235029	SAMPLE	TXJ1	LSCYELLOW	SEP-23-16 18:09:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235030	SAMPLE	TXJ1	LSCYELLOW	SEP-23-16 19:20:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235031	SAMPLE	TXJ1	LSCYELLOW	SEP-23-16 20:32:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235032	SAMPLE	TXJ1	LSCYELLOW	SEP-23-16 21:43:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235033	SAMPLE	TXJ1	LSCYELLOW	SEP-23-16 22:54:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00

Instrument Run Log

Instrument Type: LSC

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235034	SAMPLE	TXJ1	LSCYELLOW	SEP-24-16 00:05:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235035	SAMPLE	TXJ1	LSCYELLOW	SEP-24-16 02:29:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235036	SAMPLE	TXJ1	LSCYELLOW	SEP-24-16 03:41:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235037	SAMPLE	TXJ1	LSCYELLOW	SEP-24-16 04:52:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235038	SAMPLE	TXJ1	LSCYELLOW	SEP-24-16 06:03:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235039	SAMPLE	TXJ1	LSCYELLOW	SEP-24-16 07:14:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235040	SAMPLE	TXJ1	LSCYELLOW	SEP-24-16 08:26:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
1203626126	MB	TXJ1	LSCYELLOW	SEP-24-16 09:37:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
1203626127	DUP	TXJ1	LSCYELLOW	SEP-24-16 10:48:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
1203626128	MS	TXJ1	LSCYELLOW	SEP-24-16 11:59:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
1203626129	LCS	TXJ1	LSCYELLOW	SEP-24-16 13:11:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00

Instrument Run Log

Instrument Type: LSC

Batch ID: 1598081

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235041	SAMPLE	TXJ1	LSCBROWN	SEP-26-16 16:33:44	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235042	SAMPLE	TXJ1	LSCBROWN	SEP-26-16 17:45:29	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235043	SAMPLE	TXJ1	LSCBROWN	SEP-26-16 18:57:15	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235044	SAMPLE	TXJ1	LSCBROWN	SEP-26-16 20:09:04	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235045	SAMPLE	TXJ1	LSCBROWN	SEP-26-16 21:20:53	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235046	SAMPLE	TXJ1	LSCBROWN	SEP-26-16 22:32:39	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235047	SAMPLE	TXJ1	LSCBROWN	SEP-26-16 23:44:25	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235048	SAMPLE	TXJ1	LSCBROWN	SEP-27-16 02:07:16	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235049	SAMPLE	TXJ1	LSCBROWN	SEP-27-16 03:19:02	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235050	SAMPLE	TXJ1	LSCBROWN	SEP-27-16 04:30:46	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235051	SAMPLE	TXJ1	LSCBROWN	SEP-27-16 05:42:30	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235052	SAMPLE	TXJ1	LSCBROWN	SEP-27-16 06:54:15	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235053	SAMPLE	TXJ1	LSCBROWN	SEP-27-16 08:06:04	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00

Instrument Run Log

Instrument Type: LSC

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235054	SAMPLE	TXJ1	LSCBROWN	SEP-27-16 09:17:51	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235055	SAMPLE	TXJ1	LSCBROWN	SEP-27-16 10:29:36	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235056	SAMPLE	TXJ1	LSCBROWN	SEP-27-16 11:41:24	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235057	SAMPLE	TXJ1	LSCBROWN	SEP-27-16 12:53:11	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235058	SAMPLE	TXJ1	LSCBROWN	SEP-27-16 14:04:58	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235059	SAMPLE	TXJ1	LSCBROWN	SEP-27-16 15:16:46	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235060	SAMPLE	TXJ1	LSCBROWN	SEP-27-16 16:28:37	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
1203626109	MB	TXJ1	LSCBROWN	SEP-27-16 17:40:19	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
1203626110	DUP	TXJ1	LSCBROWN	SEP-27-16 18:52:05	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
1203626111	MS	TXJ1	LSCBROWN	SEP-27-16 20:03:50	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
1203626112	LCS	TXJ1	LSCBROWN	SEP-27-16 21:15:32	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00

Instrument Run Log

Instrument Type: LSC

Batch ID: 1598082

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235061	SAMPLE	TXJ1	LSCYELLOW	SEP-29-16 00:31:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235062	SAMPLE	TXJ1	LSCYELLOW	SEP-29-16 02:55:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235063	SAMPLE	TXJ1	LSCYELLOW	SEP-29-16 04:06:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235064	SAMPLE	TXJ1	LSCYELLOW	SEP-29-16 05:17:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235065	SAMPLE	TXJ1	LSCYELLOW	SEP-29-16 06:29:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235066	SAMPLE	TXJ1	LSCYELLOW	SEP-29-16 07:40:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235067	SAMPLE	TXJ1	LSCYELLOW	SEP-29-16 08:51:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235068	SAMPLE	TXJ1	LSCYELLOW	SEP-29-16 10:02:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235069	SAMPLE	TXJ1	LSCYELLOW	SEP-29-16 11:14:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235070	SAMPLE	TXJ1	LSCYELLOW	SEP-29-16 12:25:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235071	SAMPLE	TXJ1	LSCYELLOW	SEP-29-16 13:36:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235072	SAMPLE	TXJ1	LSCYELLOW	SEP-29-16 14:47:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235073	SAMPLE	TXJ1	LSCYELLOW	SEP-29-16 15:59:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00

Instrument Run Log

Instrument Type: LSC

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235074	SAMPLE	TXJ1	LSCYELLOW	SEP-29-16 17:10:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235075	SAMPLE	TXJ1	LSCYELLOW	SEP-29-16 18:21:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235076	SAMPLE	TXJ1	LSCYELLOW	SEP-29-16 19:32:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235077	SAMPLE	TXJ1	LSCYELLOW	SEP-29-16 20:44:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
405235078	SAMPLE	TXJ1	LSCYELLOW	SEP-29-16 21:55:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
1203626113	MB	TXJ1	LSCYELLOW	SEP-29-16 23:06:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
1203626114	DUP	TXJ1	LSCYELLOW	SEP-30-16 00:17:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
1203626115	MS	TXJ1	LSCYELLOW	SEP-30-16 01:29:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00
1203626116	LCS	TXJ1	LSCYELLOW	SEP-30-16 02:40:00	DONE	3mL Ethanolamine/9mL Methanol/10mL EcoScint A	01-JUN-16 00:00

Instrument Run Log

Instrument Type: LSC

Batch ID: 1598092

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235041	SAMPLE	TXP3	LSCBROWN	SEP-23-16 21:31:07	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235042	SAMPLE	TXP3	LSCBROWN	SEP-23-16 23:14:37	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235043	SAMPLE	TXP3	LSCBROWN	SEP-24-16 02:09:19	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235044	SAMPLE	TXP3	LSCBROWN	SEP-24-16 03:52:50	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235045	SAMPLE	TXP3	LSCBROWN	SEP-24-16 05:36:19	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235046	SAMPLE	TXP3	LSCBROWN	SEP-24-16 07:19:51	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235047	SAMPLE	TXP3	LSCBROWN	SEP-24-16 09:03:23	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235048	SAMPLE	TXP3	LSCBROWN	SEP-24-16 10:46:56	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235049	SAMPLE	TXP3	LSCBROWN	SEP-24-16 12:30:30	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235050	SAMPLE	TXP3	LSCBROWN	SEP-24-16 14:14:06	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235051	SAMPLE	TXP3	LSCBROWN	SEP-24-16 15:57:40	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235052	SAMPLE	TXP3	LSCBROWN	SEP-24-16 17:41:16	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235053	SAMPLE	TXP3	LSCBROWN	SEP-24-16 19:24:59	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235054	SAMPLE	TXP3	LSCBROWN	SEP-24-16 21:08:34	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235055	SAMPLE	TXP3	LSCBROWN	SEP-24-16 22:52:16	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235056	SAMPLE	TXP3	LSCBROWN	SEP-25-16 00:35:52	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235057	SAMPLE	TXP3	LSCBROWN	SEP-25-16 02:19:28	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235058	SAMPLE	TXP3	LSCBROWN	SEP-25-16 06:47:23	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235060	SAMPLE	TXP3	LSCBROWN	SEP-25-16 10:17:45	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
1203626144	MB	TXP3	LSCBROWN	SEP-25-16 12:01:20	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
1203626145	DUP	TXP3	LSCBROWN	SEP-25-16 13:44:59	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
1203626146	MS	TXP3	LSCBROWN	SEP-25-16 15:28:34	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
1203626147	LCS	TXP3	LSCBROWN	SEP-25-16 17:12:10	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235059	SAMPLE	TXP3	LSCBROWN	SEP-26-16 09:50:20	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00

Instrument Run Log

Instrument Type: LSC

Batch ID: 1598096

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
405235061	SAMPLE	TXP3	LSCGREEN	SEP-26-16 13:35:34	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235062	SAMPLE	TXP3	LSCGREEN	SEP-26-16 15:10:05	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235063	SAMPLE	TXP3	LSCGREEN	SEP-26-16 16:43:58	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235064	SAMPLE	TXP3	LSCGREEN	SEP-26-16 18:17:14	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235065	SAMPLE	TXP3	LSCGREEN	SEP-26-16 19:50:32	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235066	SAMPLE	TXP3	LSCGREEN	SEP-26-16 21:23:43	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235067	SAMPLE	TXP3	LSCGREEN	SEP-26-16 22:58:52	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235068	SAMPLE	TXP3	LSCGREEN	SEP-27-16 00:32:43	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235069	SAMPLE	TXP3	LSCGREEN	SEP-27-16 03:16:51	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235070	SAMPLE	TXP3	LSCGREEN	SEP-27-16 04:50:47	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235071	SAMPLE	TXP3	LSCGREEN	SEP-27-16 06:25:03	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235072	SAMPLE	TXP3	LSCGREEN	SEP-27-16 07:58:42	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235073	SAMPLE	TXP3	LSCGREEN	SEP-27-16 09:32:24	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235074	SAMPLE	TXP3	LSCGREEN	SEP-27-16 11:06:03	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235075	SAMPLE	TXP3	LSCGREEN	SEP-27-16 12:39:41	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235076	SAMPLE	TXP3	LSCGREEN	SEP-27-16 14:13:30	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235077	SAMPLE	TXP3	LSCGREEN	SEP-27-16 15:47:13	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
405235078	SAMPLE	TXP3	LSCGREEN	SEP-27-16 17:21:04	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
1203626152	MB	TXP3	LSCGREEN	SEP-27-16 18:54:46	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
1203626153	DUP	TXP3	LSCGREEN	SEP-27-16 20:28:21	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
1203626154	MS	TXP3	LSCGREEN	SEP-27-16 21:59:52	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
1203626155	LCS	TXP3	LSCGREEN	SEP-29-16 08:14:13	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00